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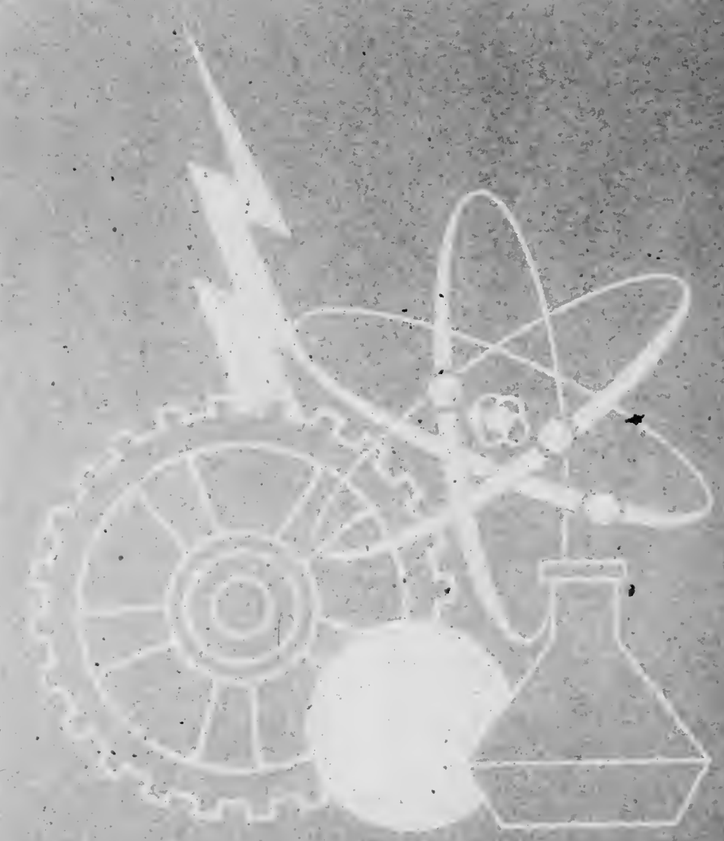
# OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

March 5, 1996



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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE
March 5, 1996 Volume 1184 Number 1

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### Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1181 O.G. 50, on December 19, 1995.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on September 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987, and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed, effective June 20, 1995, due to a change in the exchange rate of the U.S. dollar with regard to the German mark, and was announced in the *Official Gazette* at 1181 O.G. 49, on December 19, 1995.

International fees were changed, effective on January 1, 1996, due to a change in the exchange rate of the U.S. dollar with regard to the Swiss franc, and were announced in the *Official Gazette* at 1181 O.G. 49, on December 19, 1995.

Certain domestic PCT fees and charges for International Search and Preliminary Examination were changed, effective October 1, 1995, and were announced in the *Official Gazette* at 1177 O.G. 171, on August 29, 1995.

The schedule of PCT fees (in U.S. dollars), effective January 1, 1996, is as follows:

| | |
|---|---|
| International Application (PCT Chapter I) fees: | |
| Transmittal fee | 220.00 |
| Search Fee | |
| U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA) | |
| —No corresponding prior U.S. national application filed | 660.00 |
| —Corresponding prior U.S. national application filed | 430.00 |
| —Supplemental search fee, per additional invention (payable only upon invitation) | 190.00 |
| European Patent Office as ISA | 1700.00 |
| International fees | |
| Basic fee | 677.00 |
| Basic Supplemental fee (for each page over 30) | 13.00 |
| Designation fee per country or region | |
| —For the first 11 national or regional offices designated | 164.00 |
| —For each designation in excess of 11 offices | No Charge |
| Precautionary designation fee and confirmation fee for each precautionary designation confirmed (PCT Rule 15.5) | |
| —Designation fee | 164.00 |
| —Confirmation fee | 82.00 |
| International Application (PCT Chapter II) fees associated with filing a Demand for Preliminary Examination: | |
| Handling fee | 207.00 |
| Preliminary examination fee | |
| USPTO as International Preliminary Examining Authority (IPEA) | |
| —USPTO was ISA in PCT Chapter I | 470.00 |
| —Additional examination fee, per additional invention (payable only upon invitation) | 140.00 |
| —USPTO was not ISA in PCT Chapter I | 710.00 |
| —Additional examination fee, per additional invention (payable only upon invitation) | 250.00 |

| U.S. National Stage Fees | Small Entity | Regular |
|---|---|---|
| Basic National fee | | |
| USPTO was IPEA | | |
| —All claims presented satisfied provisions of PCT Article 33(2) to (4) | 47.00 | 94.00 |
| —All claims presented did not satisfy provisions of PCT Article 33(2) to (4) | 340.00 | 680.00 |
| USPTO was ISA but not IPEA | 375.00 | 750.00 |
| USPTO was neither ISA nor IPEA | | |
| —Search report has not been prepared by the European Patent Office or the Japanese Patent Office | 505.00 | 1010.00 |
| —Search report has been prepared by the European Patent Office or the Japanese Patent Office | 440.00 | 880.00 |
| Other National fees | | |
| —For each independent claim in excess of 3 | 39.00 | 78.00 |
| —For each claim in excess of 20 | 11.00 | 22.00 |
| —For each application containing a multiple dependent claim | 125.00 | 250.00 |
| —Surcharge for filing oath or declaration after the time limit applicable under PCT Article 22 or 39(l) | 65.00 | 130.00 |
| —Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(l) | 130.00 | 130.00 |

Nov. 27, 1995

BRUCE A. LEHMAN
*Assistant Secretary of Commerce and Commissioner of Patents and Trademarks*

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### Notice of Maintenance Fees Payable

Title 37 Code of Federal Regulations (CFR), Section 1.362(d) provides that maintenance fees may be paid without surcharge for the six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in the patent requiring such payment the patent will expire on the 4th, 8th, or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on March 02, 1993 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,189,735 through 5,191,657
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on February 28, 1989 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,807,301 through 4,809,363
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on February 26, 1985 for which maintenance fees due at 11 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,501,023 through 4,502,152
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after Dec. 12, 1980, but before Aug. 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months, 7 years and six months, and 11 years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1994, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9(f)) ..... $495.00
By other than a small entity ..... $990.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9(f)) ..... $995.00
By other than a small entity ..... $1,990.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§ 1.9(f)) ..... $1,495.00
By other than a small entity ..... $2,990.00

The amount of the surcharge for paying the maintenance fee during the grace period or after expiration of the patent are set forth in 37 CFR 1.20(h), and (i) which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980:

By a small entity (§ 1.9(f)) ..... $65.00
By other than a small entity ..... $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been:

(1) unavoidable ..... $660.00
(2) unintentional ..... $1,550.00

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## Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

*PATENTS WHICH EXPIRED January 03, 1996*
*DUE TO FAILURE TO PAY MAINTENANCE FEES*

| Patent Number | Serial Number | Issue Date |
|---|---|---|
| Re. 33,115 | 07/232,461 | 11/21/89 |
| (4,715,592) | (06/910,802) | (12/29/87) |
| Re. 33,190 | 07/349,842 | 04/03/90 |
| (4,715,177) | (07/038,136) | (12/29/87) |
| Re. 33,373 | 07/231,403 | 10/09/90 |
| (4,716,010) | (06/561,018) | (12/29/87) |
| Re. 33,413 | 07/445,367 | 10/30/90 |
| (4,715,498) | (06/934,413) | (12/29/87) |
| Re. 33,791 | 07/455,289 | 01/07/92 |
| (4,715,727) | (06/627,761) | (12/29/87) |
| 4,423,523 | 06/404,516 | 01/03/84 |
| 4,423,528 | 06/374,444 | 01/03/84 |
| 4,423,529 | 06/264,702 | 01/03/84 |
| 4,423,538 | 06/404,273 | 01/03/84 |
| 4,423,545 | 06/290,411 | 01/03/84 |
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| 4,423,560 | 06/314,532 | 01/03/84 |
| 4,423,565 | 06/219,143 | 01/03/84 |
| 4,423,571 | 06/279,591 | 01/03/84 |
| 4,423,575 | 06/288,756 | 01/03/84 |
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| Patent Number | Serial Number | Issue Date |
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## Reissue Applications Filed

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.12(b)).

**Re. 33,375**, Re. S.N. 08/574,498, Dec. 19, 1995, Cl. 514/2, TREATMENTS EMPLOYING DRUG-CONTAINING

MATRICES FOR INTRODUCTION INTO CELLULAR LESION AREAS, Edward E. Luck, et. al., Owner of Record: *Matrix Pharmaceuticals Inc., Menlo Park, Calif.*, Attorney or Agent: Bertram I. Rowland, Ex. Gp.: 1803

**4,727,379**, Re. S.N. 08/572,580, Dec. 14, 1995, Cl. 346, ACOUSTICALLY SOFT INK JET NOZZLE ASSEMBLY, Robert I. Keur, et. al., Owner of Record: *Videojet Systems International Inc., Elk Grove Village, Ill.*, Attorney or Agent: William T. Rifkin, Ex. Gp.: 2108

**5,033,818**, Re. S.N. 08/568,552, Dec. 7, 1995 Cl. 359, ELECTRONIC DIVING SYSTEM AND FACE MASK DISPLAY, Howard S. Barr, Owner of Record: *Inventor*, Attorney or Agent: Michael L. Fuller, Ex. Gp.: 2507

**5,041,330**, Re. S.N. 08/570,194, Dec. 11, 1995, Cl. 428, WATER AND/OR OIL-IMPERMEABLE SEALING MAT CONSISTING SUBSTANTIALLY OF A SUBSTRATE LAYER, A LAYER OF SWELLABLE CLAY AND A COVER LAYER, Georg Heerten, Owner of Record: *Inventor*, Attorney or Agent: Douglas E. Jackson, Ex. Gp.: 1504

**5,065,427**, Re. S.N. 08/562,305, Nov. 22, 1995, Cl. 379, FAX/DATA RECEIVING SYSTEM AND METHOD, Vishwas R. Godbole, Owner of Record: *Inventor*, Attorney or Agent: Michael J. Ure, Ex. Gp.: 2601

**5,088,218**, Re. S.N. 08/567,815, Dec. 6, 1995, Cl. 40, STRUCTURE OF THE ROTARY TYPE CRYSTAL BALL, J. H. Liu, Owner of Record: *Inventor*, Attorney or Agent: Harold L. Novick, Ex. Gp.: 3509

**5,111,226**, Re. S.N. 08/571,630, Dec. 13, 1995, Cl. 354, OPERATION CONTROL APPARATUS OF ELECTRIC ZOOM CAMERA, Toshiyuki Nakamura, et. al., Owner of Record: *Nikon Corp., Tokyo, Japan*, Attorney or Agent: Nelson H. Shapiro, Ex. Gp.: 2101

**5,128,520**, Re. S.N. 08/570,626, Dec. 11, 1995, Cl. 235/375, SCANNER WITH COUPON VALIDATION, Joseph F. Rando, et. al., Owner of Record: *Spectra-Physics Scanning Systems, Inc., Eugene, Oreg.*, Attorney or Agent: John A. Rafter, Jr., Ex. Gp.: 2309

**5,138,176**, Re. S.N. 08/571,631, Dec. 13, 1995, Cl. 250, PROJECTION OPTICAL APPARATUS USING PLURAL WAVELENGTHS OF LIGHT, Kenji Nishi, Owner of Record: *Nikon Corp., Tokyo, Japan*, Attorney or Agent: Mitchell W. Shapiro, Ex. Gp.: 2509

**5,144,358**, Re. S.N. 08/576,167, Dec. 19, 1995, Cl. 354, AUTOMATIC FOCUSING CAMERA, Hiroyuki Tsuru, et. al., Owner of Record: *Nikon Corp., Tokyo, Japan*, Attorney or Agent: Nelson H. Shapiro, Ex. Gp.: 2101

**5,148,524**, Re. S.N. 08/574,858, Dec. 19, 1995, Cl. 395, DYNAMIC VIDEO RAM INCORPORATION ON CHIP VECTOR/IMAGE MADE LINE MODIFICATION, Roy E. Harlin, Jr., et. al., Owner of Record: *Matsushita Electric Industrial Co., Osaka, Japan*, Attorney or Agent: Don W. Bulso, Ex. Gp.: 2316

**5,150,392**, Re. S.N. 08/573,606, Dec. 15, 1995, Cl. 378, X-RAY MASK CONTAINING A CANTILEVERED TIP FOR GAP CONTROL AND ALIGNMENT, Fritz J. Hohn, Owner of Record: *International Business Machines, Armonk, N.Y.*, Attorney or Agent: Stephen S. Strunck, Ex. Gp.: 2506

**5,255,426**, Re. S.N. 08/548,236, Oct. 25, 1995, Cl. 29/597, METHOD OF MAKING A CARBON COMMUTATOR, Charles P. Farago, et. al., Owner of Record: *Kirkwood Industries, Cleveland, Ohio*, Attorney or Agent: John E. Miller, Ex. Gp.: 3206

**5,267,986**, Re. S.N. 08/567,510, Dec. 5, 1995, Cl. 604/294, CARTRIDGE FOR APPLYING MEDICAMENT TO AN EYE FROM A DISPENSER, Daniel Py, Owner of Record: *Inventor*, Attorney or Agent: John H. Lee, Ex. Gp.: 3308

**5,273,092**, Re. S.N. 08/578,955, Dec. 27, 1995, Cl. 152/213, DEVICE FOR STORING AND INSTALLING VEHICULAR CHAINS, Robert W. Simpson, Owner of Record: *Inventor*, Attorney or Agent: John E. Vanderburgh, Ex. Gp.: 1301

**5,273,604**, Re. S.N. 08/578,954, Dec. 27, 1995, Cl. 156/187, METHOD AND APPARATUS FOR MANUFACTURING PAINT ROLLER AND PRODUCT PRODUCED THEREBY, Jamie A. Garcia, Owner of Record: *Newell Operating Co., Freeport, Ill.*, Attorney or Agent: James G. Staples, Ex. Gp.: 1304

**5,276,476**, Re. S.N. 08/563,437, Nov. 24, 1995, Cl. 354, AUTOMATIC FOCUSING DEVICE, Yukio Uenaka, Owner of Record: *Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan*, Attorney or Agent: Bruce H. Bernstein, Ex. Gp.: 2101

**5,282,182**, Re. S.N. 08/511,015, Aug. 3, 1995, Cl. 369/21, VIDEO MONITOR AND HOUSING ASSEMBLY, Monroe E. Kreuzer, et. al., Owner of Record: *Inventors*, Attorney or Agent: Kent A. Rowald, Ex. Gp.: 2516

**5,293,097**, Re. S.N. 08/578,804, Dec. 26, 1995, Cl. 315/154, FULLY AUTOMATIC ENERGY EFFICIENT LIGHTING CONTROL AND METHOD OF MAKING SAME, Brian E. Elwell, Owner of Record: *Novitas Inc., Culver City, Calif.*, Attorney or Agent: Robert Berliner, Ex. Gp.: 2502

**5,376,165**, Re. S.N. 08/561,270, Nov. 21, 1995, Cl. 95/212, METHOD FOR THE TREATMENT OF GASES, ELLIPSOIDAL PACKING AND ITS USE, Wolfram Ruff, et. al., Owner of Record: *Euro-Matic LTD, London, England, VAW Aluminium AG, Boeselager-Strasse, Germany*, Attorney or Agent: Seth H. Jacobs, Ex. Gp.: 1305

**5,380,466**, Re. S.N. 08/571,041, Dec. 12, 1995, Cl. 252/389.22, REACTION PRODUCT OF NITROGEN BASES AND PHOSPHATE ESTERS AS CORROSION INHIBITORS, Richard L. Martin, et. al., Owner of Record: *Petrolite Corp., St. Louis, Mo.*, Attorney or Agent: Kenneth Solomon, Ex. Gp.: 1208

**5,411,502**, Re. S.N. 08/571,466, Dec. 13, 1995, Cl. 606/10, SYSTEM FOR CAUSING ABLATION OF IRRADIATED MATERIAL OF LIVING TISSUE WHILE NOT CAUSING DAMAGE BELOW A PREDETERMINED DEPTH, Eliezer Zair, Owner of Record: *Laser Industries LTD, Tel Aviv, Israel*, Attorney or Agent: Robert J. Hess, Ex. Gp.: 3309

**5,414,150**, Re. S.N. 08/576,241, Dec. 21, 1995, Cl. 568/729, PREPARATION OF 4,4'-DIHYDROXY-ALPHA-ALKYLSTILBENES AND 4,4'-DIHYDROXY-ALPHA, ALPHA'-DIALKYLSTILBENES, Robert E. Hefner, et. al., Owner of Record: *Dow Chemical Co., Midland, Mich.*, Attorney or Agent: Glenn H. Korfhage, Ex. Gp.: 1204

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### Requests for Reexaminations Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

**4,589,815**, Reexam. No. 90/004,113, Jan. 23, 1996, Cl. 324/758, ELECTRONIC TEST HEAD POSITIONER FOR TEST SYSTEMS, Nathan R. Smith, Owner of Record: *InTest Corp., Cherry Hill, N.J.*, Attorney or Agent: Allan Ratner, Ratner & Prestia, Valley Forge, Pa., Ex. Gp.: 2213, Requester: Owner

**4,609,548**, Reexam. No. 90/004,117, Jan. 24, 1996, Cl. 424/205.1, VACCINES FOR PSEUDORABIES DISEASE AND METHODS FOR USE OF SAME, Malon Kit, et. al., Owner of Record: *Novagene, Inc., Houston, Tex.*, Attorney or Agent: Gordon Kit, Shugrue, Mion, Zinn, MacPeak & Seas, Washington, D.C., Ex. Gp.: 1806, Requester: John P. White, Cooper & Dunham, New York, N.Y.

**5,044,096**, Reexam. No. 90/004,111, Jan. 16, 1996, Cl. 036/003R, SOLE STRUCTURE FOR FOOTWEAR, Mario Polegato, Owner of Record: *POL Scarpe Sportive SRL, Biade, Italy*, Attorney or Agent: Modiano & Associati, Milano, Italy, Ex. Gp.: 3208, Requester: Allen-Edmonds Shoe Corp., Port Washington, Wis., c/o Andrus Sceales Starke & Sawall, Milwaukee, Wis.

**5,133,772**, Reexam. No. 90/004,118, Jan. 24, 1996, Cl. 623/023, FEMORAL IMPLANT FOR HIP ATHROPLASTY, Bradford H. Hack, et. al., Owner of Record: *Osteonics Corp., Allendale, N.J.*, Attorney or Agent: Keith E. Gilman, Lerner, David Littenberg, Krumholz & Mentlik, Westfield, N.J., Ex. Gp.: 3308, Requester: Owner

**5,210,930**, Reexam. No. 90/004,108, Dec. 29, 1995, Cl. 029/609, METHOD OF MANUFACTURING WOUND CORE, Tadatoshi Watabe, et. al., Owner of Record: *Denki Tetsushin Industries Co., Ltd., Tokyo, Japan*, Attorney or Agent: Nikaido Marmelstein Murray & Oram, Washington, D.C. Ex. Gp.: 3206, Requester: Douglas P. Mueller, Merchant Gould Smith Edell Welter & Schmidt, Minneapolis, Minn.

**5,269,721**, Reexam. No. 90/004,115, Jan. 31, 1996, Cl. 452/117, METHOD AND APPARATUS FOR PROCESSING POULTRY, Cornelius Meyn, Owner of Record: *Machine Fabriek Meyn B.V., Oostzaan, Netherlands*, Attorney or Agent: Dority & Manning, Greenville, S.C., Ex. Gp.: 3203, Requester: Owner

**5,377,973**, Reexam. No. 90/004,109, Dec. 29, 1995, Cl. 273/085CP, METHODS AND APPARATUS FOR PLAYING CASINO CARD GAMES INCLUDING A PROGRESSIVE JACKPOT, Daniel A. Jones, et. al., Owner of Record: *D & D Gaming Patents, Inc., Pampano Beach, Fla.*, Attorney or Agent: Reilly & Purcell, Denver, Colo., Ex. Gp.: 3304, Requester: Janal M. Kalis, Oppenheimer Wolff & Donnelly, Minneapolis, Minn.

**5,388,650**, Reexam. No. 90/004,112, Jan. 22, 1996, Cl. 175/071, NON-CRYOGENIC PRODUCTION OF NITROGEN FOR ON-SITE INJECTION IN DOWNHOLE DRILLING, Keith Michael, Owner of Record: *Generon Systems, Houston, Tex.*, Attorney or Agent: Bill McNeil, Generon Systems, Houston, Tex., Ex. Gp.: 3506, Requester: Sue Z. Shaper, Butler & Binion, Houston, Tex.

**5,397,567**, Reexam. No. 90/004,110, Dec. 29, 1995, Cl. 424/78.04, GEL, ESPECIALLY FOR OPTHALMOLOGY, Hans-Georg Labering, et. al., Owner of Record: *Medproject Pharma Entwicklungs Und Vetriebs Gesellschaft mbH, Sauerlack, Germany*, Attorney or Agent: Lynn A. Malinoski, Woodcock, Wash., Ex. Gp.: 1502, Requester: Owner

**5,450,630**, Reexam. No. 90/004,116, Jan. 23, 1996, Cl. 002/239, SOCK AND METHOD OF MAKING SAME, Don W. Hale, Owner of Record: *Wyoming Woolens, Jackson Hole, Wyo.*, Attorney or Agent: Welsh & Katz, Chicago, Ill., Ex. Gp.: 3408, Requester: Owner

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### Notice of Expiration of Trademark Registrations Due To Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.



According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

TRADEMARK REGISTRATIONS WHICH EXPIRED NOVEMBER 27, 1995
DUE TO FAILURE TO RENEW

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| Reg. Number | Serial Number | Reg. Date |
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| 602,466 | 71/658,508 | 02/22/1955 |
| 602,472 | 71/663,146 | 02/22/1955 |
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| 1,005,038 | 72/462,944 | 02/18/1975 |
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| 1,005,041 | 72/403,832 | 02/18/1975 |
| 1,005,042 | 72/438,910 | 02/18/1975 |
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| 1,005,053 | 72/453,093 | 02/18/1975 |
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| 1,005,057 | 72/407,236 | 02/18/1975 |
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| 1,005,129 | 72/422,016 | 02/18/1975 |
| 1,005,130 | 72/422,052 | 02/18/1975 |

### Reinstatement to Register

The following list of persons, whose names have been previously removed from the Register of Attorneys and Agents pursuant to the provisions of 37 CFR 10.11 (b), have been reinstated in view of the required fee and information they furnished to the Office of Enrollment and Discipline.

Auyang, Hunter L., 140 Genebern Way, San Francisco, Calif. 94112

Crow, Morgan L., 113 Ashburne Glen Ln., Ovilla, Tex. 75154

Lee, Larry M., Lee & Van Fleet, L.L.P., 4801 Woodway, Suite 100E, Houston, Tex. 77056

Roebuck, Glenn M., P.O. Box 866, Houston, Tex. 77001

February 5, 1996 KAREN L. BOVARD
*Director Office of Enrollment & Discipline*

### Registration To Practice

The following list contains the names of persons who successfully passed the registration examination that was held May 3, 1995 and have been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office until their registration certificates are mailed to them. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. 37 [CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before April 19, 1996.

Lindvall, Scott G., 400 East 71st St., #23A, New York, N.Y. 10021

Nichols, Steven L., 4030 N. Washington Blvd., #5, Arlington, Va. 22201

February 5, 1996 KAREN L. BOVARD
*Director Office of Enrollment and Discipline*

### 37 CFR 1.47 Notice by Publication

Notice is hereby given of the filing of a national stage application with a petition under 37 CFR 1.47 requesting acceptance of the application without the signature of all inventors. The petition has been granted. A notice has been sent to the last known address of the non-signing inventor. The inventor whose signature is missing (Alan Peter Shuttle) may join in the application by promptly filing an appropriate oath or Declaration complying with 37 CFR 1.63. The international application number is PCT/GB92/01480 and was filed on 10 August 1992 in the names of Luke Richard John Whale, Alan Peter Shuttle, Leonard Michael Beale, James Francis Pirrie Goebel, and Michael Anthony McNully for the invention entitled APPARATUS FOR MANUFACTURING A TRUSS. The national stage application number is 08/381,954 and has a 35 U.S.C. 371 date of 14 September 1995.

### Availability of Interference Files and Interference Related Application and Patent Files

This notice describes simplified procedures for inspecting and/or obtaining copies of interference files and related application and patent files. Prior to April, 1995, pending and terminated interference files and other files involved in pending interferences could be inspected and released for copying at the self-service copy center located at the Board of Patent Appeals and Interferences. Because of (1) repeated and substantial file integrity problems with released files and (2) the growing space needs of the Board, this facility was discontinued. Copies of files could only be obtained through Certification Division. In order to improve the availability of these files this procedure has been modified. The new procedures are described below.

#### Terminated Interferences

Subject to statutory and regulatory limitations on availability (35 U.S.C. § 122; 37 C.F.R. §§ 1.11 and 1.14) terminated interference files and application and patent files involved in terminated interferences may be inspected at and copies obtained through the Files Information Unit. ((703) 308-2733.)

#### Pending Interferences

As a general matter, pending applications and interference files are not available to the public. 35 U.S.C. § 122; 37 C.F.R. §§ 1.11(e) and 1.14. The parties to an interference or their representatives (e.g., those having a duly executed power to inspect) may inspect pending interference files and involved

application and patented files, by appointment, at the Board of Patent Appeals and Interferences. Appointments should be made with the Clerk of the Board at (703) 308-9797. The parties to a pending interference or their representatives may obtain copies of pending interference files and involved files by placing an order through Certification Division ((703) 308-9726 in the Washington, D.C., Metro Area or (800) 972-6382 outside Washington, D.C.).

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|---|---|---|---|
| 5,472,095 | 5,474,442 | 5,474,961 | 5,477,671 |
| 5,473,034 | 5,474,533 | 5,476,403 | 5,479,865 |
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| 5,473,636 | 5,474,960 | 5,476,999 | |

BRUCE H. STONER, JR.
*Acting Chief Administrative Patent Judge*

## Certificate of Correction For Week of March 5, 1996

| | | | |
|---|---|---|---|
| P. 09,097 | 5,391,580 | 5,438,844 | 5,457,956 |
| P. 09,349 | 5,392,879 | 5,439,085 | 5,458,042 |
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| 5,337,093 | 5,425,993 | 5,451,572 | 5,467,269 |
| 5,337,186 | 5,426,862 | 5,451,687 | 5,467,288 |
| 5,340,581 | 5,427,779 | 5,451,943 | 5,467,353 |
| 5,342,298 | 5,431,908 | 5,451,992 | 5,467,445 |
| 5,342,909 | 5,432,109 | 5,452,097 | 5,468,056 |
| 5,344,467 | 5,432,615 | 5,452,404 | 5,468,327 |
| 5,356,947 | 5,434,388 | 5,453,294 | 5,468,761 |
| 5,364,268 | 5,434,579 | 5,454,555 | 5,468,789 |
| 5,364,642 | 5,435,825 | 5,454,651 | 5,468,945 |
| 5,366,739 | 5,435,946 | 5,455,003 | 5,469,080 |
| 5,368,591 | 5,436,666 | 5,455,251 | 5,469,249 |
| 5,369,410 | 5,437,153 | 5,455,690 | 5,469,619 |
| 5,370,854 | 5,437,178 | 5,455,709 | 5,469,694 |
| 5,381,745 | 5,437,555 | 5,455,886 | 5,469,800 |
| 5,384,166 | 5,437,608 | 5,456,254 | 5,469,888 |
| 5,384,317 | 5,437,911 | 5,456,762 | 5,470,081 |
| 5,385,238 | 5,437,962 | 5,457,183 | 5,470,085 |
| 5,385,872 | 5,438,061 | 5,457,435 | 5,471,354 |
| 5,389,628 | 5,438,092 | 5,457,540 | 5,471,611 |
| 5,389,990 | 5,438,666 | 5,457,568 | 5,471,652 |



**Summary of Final Decisions**
**Issued by the**
**Trademark Trial and Appeal Board**
**November 27 - December 1, 1995**

| Date Issued | Type of Case[1] | Proceeding or App'n No. | Party/Parties | Issue | TTAB Decision | Opposer's/ Petitioner's Mark and Goods/Services | Applicant's/ Respondent's Mark and Goods/Services | Mark and Goods Cited by Examining Attorney | Recommended for Publication |
|---|---|---|---|---|---|---|---|---|---|
| 11-27 | EX | 74/438,943 | MCO Properties Inc. | 2(e)(2) | Refusal Affirmed | | "FOUNTAIN HILLS" [real estate development services] | | No |
| 11-28 | EX (R) | 74/337,765 | P.I.P., Inc. | 2(d) | Request for Reconsideration Denied (Refusal Affirmed) | | "P.I.P." [courier services and delivery and freight transportation of goods, namely, personal property, general commodities and hazardous materials, by truck] | "PIP" (and design) [insuring packages against loss or damage during shipment by carriers]; "PIP PRINTING" (and design) [printing services]; et al. | No |
| 12-1 | EX | 74/165,174 | The Copyrights Co. Ltd. | 2(e)(1) [generiticness]; acquired distinctiveness under Sec. 2(f) | Refusal Affirmed (on basis of lack of acquired distinctiveness; concurring judge would have refused on genericness grounds as well) | | "COPYRIGHTS" [intellectual property rights licensing—services] | | No |
| 12-1 | EX | 74/378,741 | Tera Computer Co. | 2(d) | Refusal Affirmed | | "TERASOFT" [general purpose parallel processing computers and computer software therefor] | "TERASOFT" [development and distributorship services in the field of computer programs; computer consulting services] | No |
| 12-1 | EX | 74/454,926 | Agri-Dealers Supply Co., Inc. | 2(d) | Refusal Reversed | | "CRACKER JACK" [livestock feed] | "CRACKERJACK" [fertilizers] | No |

(1)EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (R)=REQ. FOR RECONSIDERATION

| Date Issued | Type of Case[1] | Proceeding or App'n No. | Party/Parties | Issue | TTAB Decision | Recommended for Publication |
|---|---|---|---|---|---|---|
| | | | | | | |
| 12-1 | EX | 74/371,586 | Plastica Mfg., Inc. | 2(d) | Refusal Reversed | No |

| Opposer's/ Petitioner's Mark and Goods/Services | Applicant's/ Respondent's Mark and Goods/Services | Mark and Goods Cited by Examining Attorney |
|---|---|---|
| | "PRO MASTER INDUSTRIES" [golf cart parts, namely, windshields, tops, bumpers, sweater baskets and cup holders] | "PRO MASTER" [golf clubs] |

(1)EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (R)=REQ. FOR RECONSIDERATION



## SPECIAL BOXES FOR PATENT MAIL

Special box designations should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these special boxes. If any documents other than the specified type identified for each special box are addressed to that box, they will be significantly delayed in reaching the appropriate area for which they are intended.

Please address mail as follows:

Box _____
Assistant Commissioner for Patents
Washington, D.C. 20231

| Box Designations | Explanation |
|---|---|
| Box 7 | Reissue applications for patents involved in litigation and subsequently filed related papers. |
| Box 12 | Contributions to the Examiner Education Program. |
| Box 313b | Petitions under 37 CFR 1.313(b) to withdraw a patent application from issue after payment of the issue fee and any papers associated with the petition, including papers necessary for filing a continuing application. |
| Box AF | Expedited procedure for processing amendments and other responses after final rejection. |
| Box Comments Patents | Public comments regarding patent related regulations and procedures. |
| Box DAC | Petitions decided by the Office of Petitions including petitions to revive and petitions to accept late payment of issue fees or maintenance fees. |
| Box DD | Disclosure Documents or materials related to the Disclosure Document Program. |
| Box FWC | Requests for File Wrapper Continuation Applications (under 37 CFR 1.62). |
| Box Interference | Communications relating to interferences and applications and patents involved in interference. |
| Box Issue Fee | All communications following the receipt of a PTOL-85, "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments are the exception. Assignments should be submitted in a separate envelope and not be sent to Box Issue Fee. |
| Box M Fee | Correspondence related to a patent that is subject to the payment of a maintenance fee. |
| Box MPEP | Submissions concerning the Manual of Patent Examining Procedures. |
| Box Non-Fee-Amendment | Non-fee amendments to patent applications. (Use Box AF for responses after final rejection). |
| Box PATENT APPLICATION | New patent applications and associated papers and fees. |
| Box Patent Ext. | Applications for patent term extension. |
| Box PCT | Mail related to applications filed under the Patent Cooperation Treaty. |
| Box Provisional Patent Application | The filing of all provisional patent applications and any communications relating thereto. |
| Box Reconstruction | Correspondence pertaining to the reconstruction of lost patent files. |
| Box Reexam | Requests for Reexamination for *original* request papers *only*. |
| Box Sequence | Submission of diskette for biotechnical application. |
| Box SN | For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications *prior* to the Office's standard notification (return postcard or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application"). |

## SPECIAL BOXES FOR TRADEMARK MAIL

Special box designations should be used to allow forwarding of particular types of trademark mail to the appropriate areas as quickly as possible. In addition to these box designations, filers are encouraged to indicate whether the contents of the envelope contain a fee. Envelopes containing a fee should be marked "FEE;" envelopes not containing a fee should be marked "NO FEE." Box designations and "FEE/NO FEE" indicators should appear on the envelope as well as on the cover sheet or first page of any document.

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Assistant Commissioner for Trademarks
2900 Crystal Drive
Arlington, Virginia 22202-3513

| Box Designations | Explanation |
|---|---|
| Box NEW APP FEE | New trademark applications and fees. |
| Box ITU FEE | Statements of Use (SOU's), and extension requests. |
| Box TTAB FEE | Oppositions, cancellation petitions, and ex parte appeals. |
| Box TTAB NO FEE | Interferences, motions, and extension requests. |
| Box STATUS NO FEE | Written status inquiries. |
| Box POST REG FEE | Affidavits, renewals, corrections, and amendments. |
| Box RESPONSES NO FEE | Responses to Examining Attorneys' Office actions and Post Registration actions. |

## SPECIAL BOXES APPLICABLE TO *BOTH* PATENT AND TRADEMARK MAIL

The following special box designations are applicable to both patent and trademark related mail, and the recommendations for "Special Boxes for Patent Mail" (above) should be followed for the types of mail listed below.
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| Box Designations | Explanation |
|---|---|
| Box 3 | Mail for the Office of Personnel from NFC. |
| Box 4 | Mail for the Deputy Assistant Secretary of Commerce and Deputy Commissioner of Patents and Trademarks; Office of Legislative and International Affairs. |
| Box 6 | Mail for the Office of Procurement. |
| Box 8 | All papers for the Office of the Solicitor *except* communications relating to *pending litigation and disciplinary proceedings*; papers relating to pending litigation in court cases shall be mailed only to Office of the Solicitor, P.O. Box 15667, Arlington, Virginia 22215 and papers relating to pending disciplinary proceedings before the Administrative Law Judge or the Commissioner shall be mailed only to the Office of the Solicitor, P.O. Box 16116, Arlington, Virginia 22215. |
| Box 9 | Coupon orders for U.S. patent and trademark copies. |
| Box 10 | Orders for certified copies of PTO documents. |
| Box 11 | Electronic Ordering Service (EOS). |
| Box 13 | Mail for the Employee and Labor Relations Division. |
| Box 14 | Mail directed to the APS Contracts Office. |
| Box 16 | Deposit Account Replenishment Checks. |
| Box 17 | Invoices directed to the Office of Finance. |
| Box 171 | Vacancy Announcement Applications. |
| Box Assignment | All assignment documents except those filed with new applications. |
| Box EEO | Mail for the Office of Civil Rights. |
| Box OED | Mail for the Office of Enrollment and Discipline. |

## Reference Collections of U.S. Patents and Trademarks Available for Public Use in Patent and Trademark Depository Libraries

The following libraries, designated as Patent and Trademark Depository Libraries (PTDLs), receive patent and trademark information in various formats from the U.S. Patent and Trademark Office. Many PTDLs have on file all full-text patents issued since 1790, trademarks published since 1872, and select collections of foreign patents. All PTDLs have both the patent and trademark sections of the *Official Gazette of the U.S. Patent and Trademark Office*. The full-text utility and design patents are distributed numerically on 16 mm microfilm, and plant patents on color microfiche. Patent and trademark search systems on CD-ROM (Compact Disc-Read Only) format are available at all PTDLs to increase utilization of and enhance access to the information found in patents and trademarks. It is through the CD-ROM systems that preliminary patent and trademark searches can be conducted through the numerically arranged collections.

All information is available for use by the public free of charge.

In addition, each PTDL offers reference publications which outline and provide access to the patent and trademark classification systems, as well as other documents and publications which supplement the basic search tools. PTDLs provide technical staff assistance in using all materials. Facilities for making paper copies of patent and trademark information are generally provided for a fee.

Since there are variations in the scope of patent and trademark collections among the PTDLs, and their hours of service to the public vary, anyone contemplating use of these collections at a particular library is urged to contact that library in advance about its collections, services, and hours in order to avert possible inconvenience.

| *State* | *Name of Library* | *Telephone Contact* |
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| Alabama | Auburn University Libraries | (205) 844-1747 |
| | Birmingham Public Library | (205) 226-3620 |
| Alaska | Anchorage: Z.J. Loussac Public Library | (907) 562-7323 |
| Arizona | Tempe: Noble Library, Arizona State University | (602) 965-7010 |
| Arkansas | Little Rock: Arkansas State Library | (501) 682-2053 |
| California | Los Angeles Public Library | (213) 228-7220 |
| | Sacramento: California State Library | (916) 654-0069 |
| | San Diego Public Library | (619) 236-5813 |
| | San Francisco Public Library | (415) 557-4488 |
| | Sunnyvale Patent Clearinghouse | (408) 730-7290 |
| Colorado | Denver Public Library | (303) 640-6249 |
| Connecticut | New Haven: Science Park Library | (203) 786-5447 |
| Delaware | Newark: University of Delaware Library | (302) 831-2965 |
| Dist. of Columbia | Washington: Howard University Libraries | (202) 806-7252 |
| Florida | Fort Lauderdale: Broward County Main Library | (305) 357-7444 |
| | Miami-Dade Public Library | (305) 375-2665 |
| | Orlando: University of Central Florida Libraries | (407) 823-2562 |
| | Tampa Campus Library, University of South Florida | (813) 974-2726 |
| Georgia | Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology | (404) 894-4508 |
| Hawaii | Honolulu: Hawaii State Public Library System | (808) 586-3477 |
| Idaho | Moscow: University of Idaho Library | (208) 885-6235 |
| Illinois | Chicago Public Library | (312) 747-4450 |
| | Springfield: Illinois State Library | (217) 782-5659 |
| Indiana | Indianapolis-Marion County Public Library | (317) 269-1741 |
| | West Lafayette Siegesmund Engineering Library, Purdue University | (317) 494-2872 |
| Iowa | Des Moines: State Library of Iowa | (515) 281-4118 |
| Kansas | Wichita: Ablah Library, Wichita State University | (316) 689-3155 |
| Kentucky | Louisville Free Public Library | (502) 574-1611 |
| Louisiana | Baton Rouge: Troy H. Middleton Library, Louisiana State University | (504) 388-2570 |
| Maine | Orono: Raymond H. Fogler Library, University of Maine | (207) 581-1678 |
| Maryland | College Park: Engineering and Physical Sciences Library, University of Maryland | (301) 405-9157 |
| Massachusetts | Amherst: Physical Sciences Library, University of Massachusetts | (413) 545-1370 |
| | Boston Public Library | (617) 536-5400 Ext. 265 |
| Michigan | Ann Arbor: Engineering Library, University of Michigan | (313) 764-5298 |
| | Big Rapids: Abigail S. Timme Library, Ferris State University | (616) 592-3602 |
| | Detroit: Great Lakes Patent and Trademark Center | (313) 833-1450 |
| Minnesota | Minneapolis Public Library and Information Center | (612) 372-6570 |
| Mississippi | Jackson: Mississippi Library Commission | (601) 359-1036 |
| Missouri | Kansas City: Linda Hall Library | (816) 363-4600 |
| | St. Louis Public Library | (314) 241-2288 Ext. 390 |
| Montana | Butte: Montana College of Mineral Science and Technology Library | (406) 496-4281 |
| Nebraska | Lincoln: Engineering Library, University of Nebraska-Lincoln | (402) 472-3411 |
| Nevada | Reno: University of Nevada, Reno Library | (702) 784-6579 |
| New Hampshire | Durham: University of New Hampshire Library | (603) 862-1777 |
| New Jersey | Newark Public Library | (201) 733-7782 |
| | Piscataway: Library of Science and Medicine, Rutgers University | (908) 445-2895 |
| New Mexico | Albuquerque: University of New Mexico General Library | (505) 277-4412 |
| New York | Albany: New York State Library | (518) 474-5355 |
| | Buffalo and Erie County Public Library | (716) 858-7101 |

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| | New York Public Library (The Research Libraries) | (212) 930-0917 |
| North Carolina | Raleigh: D.H. Hill Library, North Carolina State University | (919) 515-3280 |
| North Dakota | Grand Forks: Chester Fritz Library, University of North Dakota | (701) 777-4888 |
| Ohio | Akron: Summit County Public Library | Not Yet Operational |
| | Cincinnati and Hamilton County, Public Library of | (513) 369-6936 |
| | Cleveland Public Library | (216) 623-2870 |
| | Columbus: Ohio State University Libraries | (614) 292-6175 |
| | Toledo/Lucas County Public Library | (419) 259-5212 |
| Oklahoma | Stillwater: Oklahoma State University Center for International Trade Development | (405) 744-7086 |
| Oregon | Portland: Paul L. Boley Law Library, Lewis & Clark College | Not Yet Operational |
| Pennsylvania | Philadelphia, The Free Library of | (215) 686-5331 |
| | Pittsburgh, Carnegie Library of | (412) 622-3138 |
| | University Park: Pattee Library, Pennsylvania State University | (814) 865-4861 |
| Puerto Rico | Mayaquez General Library, University of Puerto Rico | Not Yet Operational |
| Rhode Island | Providence Public Library | (401) 455-8027 |
| South Carolina | Clemson University Libraries | (803) 656-3024 |
| South Dakota | Rapid City: Devereaux Library, South Dakota School of Mines and Technology | (605) 394-6822 |
| Tennessee | Memphis & Shelby County Public Library and Information Center | (901) 725-8877 |
| | Nashville: Stevenson Science Library, Vanderbilt University | (615) 322-2775 |
| Texas | Austin: McKinney Engineering Library, University of Texas at Austin | (512) 495-4500 |
| | College Station: Sterling C. Evans Library, Texas A & M University | (409) 845-3826 |
| | Dallas Public Library | (214) 670-1468 |
| | Houston: The Fondren Library, Rice University | (713) 527-8101 Ext. 2587 |
| Utah | Salt Lake City: Marriott Library, University of Utah | (801) 581-8394 |
| Virginia | Richmond: James Branch Cabell Library, Virginia Commonwealth University | (804) 828-1104 |
| Washington | Seattle: Engineering Library, University of Washington | (206) 543-0740 |
| West Virginia | Morgantown: Evansdale Library, West Virginia University | (304) 293-2510 |
| Wisconsin | Madison: Kurt F. Wendt Library, University of Wisconsin Madison | (608) 262-6845 |
| | Milwaukee Public Library | (414) 286-3051 |
| Wyoming | Casper: Natrona County Public Library | (307) 237-4935 |

## PATENT EXAMINING CORPS

BRUCE A. LEHMAN, Commissioner
LAWRENCE J. GOFFNEY Jr., Assistant Commissioner for Patents
EDWARD R. KAZENSKE, Deputy Assistant Commissioner for Patents
STEPHEN G. KUNIN, Deputy Assistant Commissioner for Patent Policy
J.O. THOMAS, JR., Deputy Assistant Commissioner for Patent Process Services

| PATENT EXAMINING GROUPS | Phone number Area Code 703 | New Case Date* |
|---|---|---|
| **CHEMICAL EXAMINING GROUPS** | | |
| GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, ENGINEERING AND DESIGNS, GROUP 1100—JOHN E. KITTLE, Director | 308-0661 | 07/21/94 |
| ORGANIC CHEMISTRY, DRUG, BIO-AFFECTING AND BODY TREATING COMPOSITION, GROUP 1200—RICHARD V. FISHER, Director | 308-1235 | 07/02/94 |
| SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300—BARRY S. RICHMAN, Director | 308-0651 | 08/30/94 |
| HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY STOCK MATERIALS AND COMPOSITIONS, GROUP 1500—THEODORE MORRIS, Director | 308-2351 | 10/13/94 |
| BIOTECHNOLOGY, GROUP 1800—JOHN J. DOLL, Director | 308-0196 | 04/29/94 |
| **ELECTRICAL EXAMINING GROUPS** | | |
| INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100—STEWART LEVY, Director | 308-1782 | 03/14/94 |
| SPECIAL LAWS AND ADMINISTRATION, GROUP 2200—ROBERT E. GARRETT, Director | 308-0511 | 07/26/94 |
| COMPUTER SYSTEMS AND COMPUTER APPLICATION, GROUP 2300—BOBBY R. GRAY, Director | 305-9600 | 07/22/93 |
| SPECIAL COMPUTER APPLICATIONS: COMPUTER GRAPHICS, BUSINESS PRACTICES, & DIAGNOSTIC TESTING, GROUP 2400—GERALD GOLDBERG, Director | 305-3800 | 04/05/94 |
| ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500—JANICE A. HOWELL, Director | 308-0956 | 07/19/94 |
| COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 2600—NICHOLAS P. GODICI, Director | 305-4700 | 06/14/94 |
| DESIGN, GROUP 2900—JOHN E. KITTLE, Director | 308-0661 | 07/25/94 |
| **MECHANICAL EXAMINING GROUPS** | | |
| HANDLING AND TRANSPORTATION MEDIA, GROUP 3100—F.R. SCHMIDT, Director | 308-1113 | 05/17/94 |
| MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200—CARLTON R. CROYLE, Director | 308-1148 | 09/07/94 |
| MEDICAL INSTRUMENTS, DIAGNOSTIC EQUIPMENT AND TREATMENT DEVICES; SURGERY AND SURGICAL SUPPLIES; AMUSEMENT AND EXERCISING DEVICES; ANIMAL HUSBANDRY; SPORTING GOODS; TOBACCO PRODUCTS AND MANUFACTURING EQUIPMENT; AND PRINTING, GROUP 3300—J.J. LOVE, Director | 308-0858 | 11/21/94 |
| SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400—DONALD O. KELLY, Director | 308-0861 | 10/20/94 |
| GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500—A.L. SMITH, Director | 308-1021 | 07/19/94 |

*A communication from the examiner should have been received in most applications filed prior to this date.

Patents will Expire as Follows:
(1) The term of any utility or plant patent that is in force on or results from an application filed before June 8, 1995 is the greater of the 20 year term provided in 35 U.S.C. 154(a)(2) or 17 years from grant subject to any terminal disclaimers. 35 U.S.C. 154(c)(1).
(2) All utility and plant patents granted on applications having an actual United States filing date on or after June 8, 1995 are granted for a term which begins on the date on which the patent is granted and ends 20 years from the date on which the application was filed in the United States. If the application contains a specific reference to an earlier application under 35 U.S.C. 120, 121 or 365(c), the patent term ends twenty years from that date on which the earliest application was filed. 35 U.S.C. 154(a)(2).
(3) All design patents are granted for a term of 14 years from the date of the grant.
However, the term of any patent may have been curtailed by disclaimer under the provisions of 35 U.S.C. 153, have lapsed due to failure to pay maintenance fees, or have been extended under the provisions of 35 U.S.C. 154, 155, or 156. Thus, if more reliable information is needed with respect to a particular patent, then the specific patent file should be reviewed to determine the actual date of patent expiration.

# TRADEMARK OPERATION

**Bruce A. Lehman, Commissioner**
**Philip G. Hampton, II, Assistant Commissioner**
**Robert M. Anderson, Deputy Assistant Commissioner**
**David E. Bucher, Director, Trademark Examining Office**
**Condition of Trademark Applications as of February 1, 1996**

| Law Office | Oldest Date New* | Oldest Date Amendment Filed |
|---|---|---|
| Law Office 101—Ron Sussman, Acting Managing Attorney, (703) 308–9101—4th Floor<br>Foods, Beverages, Wines & Spirits—Int. Classes 29, 30, 31, 32, 33<br>Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 06/28/95 | 11/03/95 |
| Law Office 102—Myra Kurzbard, Managing Attorney, (703) 308–9102—5th Floor<br>Scientific Equipment & Furniture—Int. Classes 9, 20<br>Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 08/11/95 | 10/03/95 |
| Law Office 103—Kathryn Erskine, Managing Attorney, (703) 308–9103—5th Floor<br>Scientific Equipment & Furniture—Int. Classes 9, 20<br>Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 07/25/95 | 01/04/96 |
| Law Office 104—Sidney Moskowitz, Managing Attorney, (703) 308–9104—6th Floor<br>Unwrought metals, Industrial Equipment, Tools, Installation, Vehicles, Firearms, Musical Instruments, Building Materials & Floor Coverings—Int. Classes 6, 7, 8, 11, 12, 13, 15, 19, 27 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 07/10/95 | 11/20/95 |
| Law Office 105—Thomas Howell, Managing Attorney, (703) 308–9105—6th Floor<br>Chemicals, Paints, Lubricants, Pharmaceuticals, Medical Apparatus & Tobacco—Int. Classes 1, 2, 4, 5, 10, 34 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 08/17/95 | 08/31/95 |
| Law Office 106—Mary Sparrow, Managing Attorney, (703) 308–9106—7th Floor<br>Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 08/11/95 | 07/25/95 |
| Law Office 107—Thomas Lamone, Managing Attorney, (703) 308–9107—7th Floor<br>Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 08/11/95 | 10/18/95 |
| Law Office 108—David Shallant, Managing Attorney, (703) 308–9108—8th Floor<br>Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26<br>Services–Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 08/18/95 | 10/25/95 |
| Law Office 109—Deborah Cohn, Managing Attorney, (703) 308–9109—8th Floor<br>Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26<br>Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 09/18/95 | 11/15/95 |
| **Collective Marks—Class 200<br>**Certification Marks—Classes A & B | | |
| Office of Trademark Services—John Walker, Director, (703) 308-9100<br>Trademark Assistance Center—(703) 308-9000<br>Pre-Examination—Alan Lambert, Supervisor, (703) 308-9401 ext. 188<br>Intent-To-Use—(ITU)—(703) 308-9500<br>Post Registration Section—Mary Bowman, Supervisor, (703) 308-9500 ext. 126 | | |
| Affidavits Under Sections 8 & 15 (All Classes) | 06/05/95 | —0— |
| Renewals (All Classes) | 10/20/95 | —0— |
| Section 12(c) Publications (All Classes) | 08/14/95 | —0— |

1. ** Assigned to all Law Office

2. Applicants with inquiries concerning the status of their applications and a touch telephone should call (703) 305–8747 through (703) 305-9752 from 6:30 a.m. to Midnight EST, Monday through Friday. This automated voice system will provide the current status of your application. Applicants are urged not to file unnecessary inquiries concerning the status of their applications. See SECTION 411 of the TRADEMARK MANUAL OF EXAMININO PROCEDURE.

3. * These dates identify the oldest unassigned new case in each Law Office. All cases with earlier dates have either been examined and made the subject of an action or are currently being worked on by the assigned examining attorney.

# REEXAMINATIONS

## MARCH 5, 1996

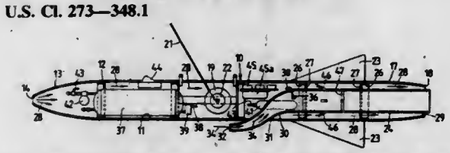
Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

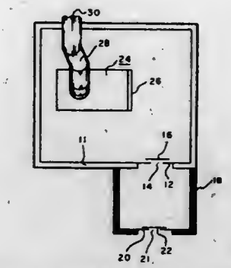
**B1 4,428,583 (2806th)**

### AIRBORNE TARGET FOR GENERATING AN EXHAUST PLUME SIMULATING THAT OF A JET POWERED AIRCRAFT

**Hugh B. Feagle, Leeds, Ala., assignor to Hayes International Corporation, Birmingham, Ala.**

**Reexamination Request No. 90/002,388, Jul. 19, 1991.**
**Reexamination Certificate for Patent 4,428,583, issued Jan. 31, 1984, Ser. No. 443,056, Nov. 19, 1982.**
**Int. Cl.[6] F41J** *9/08;9/10*
**U.S. Cl. 273—348.1**





AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–8** are cancelled.

**1.** An airbrone target for generating an exhaust plume simulating that of a jet powered aircraft, comprising:

(a) an elongated target body carrying a longitudinally extending combustion chamber and having an air receiving inlet facing in the direction of travel of said body and in communication with the forwardmost end of said combustion chamber, with there being an outlet at the rearmost end of said combustion chamber for exhausting said plume,

(b) means between said air receiving inlet and said forwardmost end of said combustion chamber for increasing the expansion of a stream of air flowing therethrough and for reducing the velocity thereof,

(c) fuel injection means carried by said body in position to inject hydrocarbon fuel at a predetermined rate under pressure into said stream of air to provide a predetermined fuel-air mixture,

(d) at least one igniter carried by said body for igniting said fuel-air mixture, and

(e) a flame holder carried by said body rearwardly of said igniter in position for the ignited fuel-air mixture to attach thereto and provide sustained burning after the igniter is spent and produce an exhaust plume of a predetermined length which simulates the same spectral distribution of infrared energy as that produced from a jet engine burning the same fuel.

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**B1 4,604,111 (2807th)**

### PARTICULATE CONTAMINATION CONTROL METHOD AND FILTRATION DEVICE

**Anthony Natale, Maple Shade, N.J., assignor to GPAC, Inc., Cinnaminson, N.J.**

**Reexamination Request No. 90/002,209, Nov. 23, 1990.**
**Reexamination Certificate for Patent 4,604,111, issued Aug. 5, 1986, Ser. No. 735,716, May 20, 1985.**
**Int. Cl.[6] B01D** *46/42*
**U.S. Cl. 95—284**

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–43** are cancelled.

[1. A method of establishing a negative pressure environment within an existing building for removing dangerous solid materials from the building, said method comprising:

(1) defining an enclosed space within said building using existing wall structure to define at least a portion of said enclosed space;

(2) establishing at least one flow path for air to enter said enclosed space;

(3) continuously evacuating air from said enclosed space through a filter means to remove dangerous solid materials from said evacuated air and to establish a negative air pressure in said enclosed space so that air exiting said space passes through said filter means; and

(4) sealing said flow path against air exiting from said air space to the exterior of said enclosed space in the event of loss of negative air pressure in said enclosed space.]

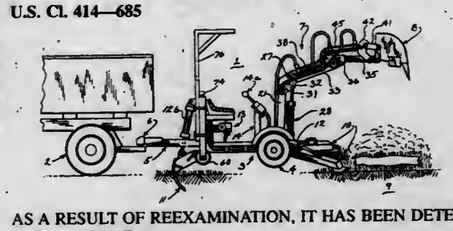
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**B1 4,925,358 (2808th)**

### TRAILERABLE EARTH DIGGING APPARATUS

**Paul J. Cook, New Berlin, Wis., assignor to HCC Inc., Mendota, Ill.**

**Reexamination Request No. 90/003,717, Feb. 1, 1995.**
**Reexamination Certificate for Patent 4,925,358, issued May 15, 1990, Ser. No. 122,544, Nov. 12, 1987.**
**Continuation of Ser. No. 931,921, Nov. 14, 1986, abandoned, which is a continuation of Ser. No. 610,349, May 15, 1984, abandoned.**
**Int. Cl.[6] E02F** *3/00*
**U.S. Cl. 414—685**



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–12** is confirmed.

**1.** A self-contained trailerable back-hoe apparatus adapted for direct over-the-road trailering by an automobile-type vehicle, comprising

a support frame having a front trailering hitch means,

a wheel assembly affixed to the frame and including back wheel means including laterally spaced rotating back wheels having an axis extending transversely of the front to back of the frame and supporting the back-hoe as a two-wheel trailer unit for over-the-road trailering at normal over-the-road speeds, said wheel assembly including laterally spaced front wheel means secured to the support frame forwardly of said rotating wheels and located above ground level during over-the-road travel and located to support the frame with the frame detached from the vehicle,

a three point dig-stabilizing means connected to said frame and including first and second individual support means secured in laterally spaced relation to the frame to the back of said wheel assembly and a third individual support means secured to the frame to the front of said wheel assembly and located cen-

trally of said pair of individual support means, said stabilizing means including powered means connected between the frame and each of said individual support means for moving the support means betweenn a raised transport position and a lowered ground-engaging digging position, said third support means having a lower cutting edge for forcing the third support means into the adjacent ground and projecting downwardly and rearwardly of the frame, and establishing a horizontal holding force opposing the horizontal and vertical forces of the bucket for digging,

a vertical pivot support secured to said frame rearwardly of said wheel assembly,

an articulated back-hoe digging arm assembly rotatably mounted on said vertical pivot support, a bucket secured to the outer end of said arm assembly, said arm assembly having a position to establish a balanced loading on the frame about said laterally spaced back wheels to permit convenient moving of the apparatus on-site, power means connected to said arm assembly for pivoting said arm assembly about said vertical support, said arm assembly including a plurality of articulated arm members adapted to be selectively extended and contracted and to selectively place said bucket in ground engagement for digging with said three point stabilizing means in ground engagement and for moving the apparatus with said frame supported by said wheel assembly, said apparatus being movable substantially directly perpendicular to the front to back of said frame by manipulation of said arm assembly and bucket with selective engagement of the bucket with the ground and by rotating said arm assembly about said vertical pivot support, and

bucket control powered means connected to said frame and to said arm assembly and connected to said arm members for positioning said bucket and said arm assembly and said arm members.

# STATUTORY INVENTION REGISTRATIONS

## PUBLISHED MARCH 5, 1996

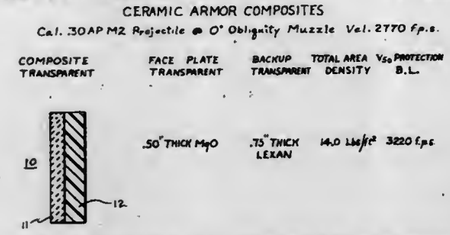
A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

### H1519

### TRANSPARENT CERAMIC COMPOSITE ARMOR

**Charles W. Semple, Everett, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Jan. 24, 1966, Ser. No. 522,788**
**Int. Cl.[6] F41H 5/26**
**U.S. Cl. 89—36.02** **6 Claims**




1. Transparent ceramic armor comprising a light weight composite of transparent material adapted to shatter on impact projectiles with a muzzle velocity of approximately 3000 f.p.s., consisting of a transparent ceramic face plate backed by a transparent plastic plate and bonded thereto with a transparent adhesive so constructed and arranged that the light weight composite affords complete ballistic protection against projectiles with a muzzle velocity of 3000 f.p.s. or less.

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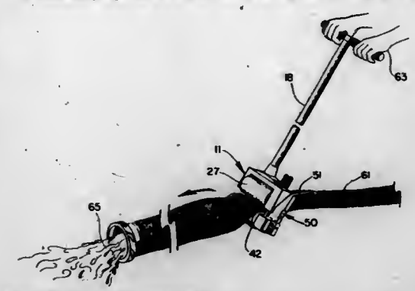
### H1520

### FUEL LINE SQUEEGEE

**Anthony E. Hannula, Fort Walton Beach, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.**

**Filed Dec. 18, 1989, Ser. No. 451,657**
**Int. Cl.[6] B30B 3/04; B05C 1/08**
**U.S. Cl. 100—171** **2 Claims**

1. A manually operated device for forcing fluid along a flexible




collapsible conduit, comprising:

(a) a yoke including a web and first and second leg members projecting therefrom;

(b) a first roller disposed between said first and second leg members and journaled at respective ends thereof into said first and second leg members for rotation about a first axis defined along said first roller;

(c) a block member supporting an axle and a second roller for rotation about a second axis substantially parallel to said first axis;

(d) said second leg member and said block member each having at least one hole therethrough for receiving a corresponding at least one bolt connecting said block to said second leg member, and spring means interconnecting each bolt and second leg member for resiliently holding said block member and said second roller in a substantially parallel juxtaposed position near said second leg member and said first roller;

(e) overcenter locking means interconnecting said second leg member and said block for selectively locking said second roller into resilient rolling engagement with said first roller with a flexible collapsible conduit disposed between said first and second rollers; and

(f) a handle connected to said yoke for manually pulling said yoke and rollers in said resilient rolling engagement along said flexible collapsible conduit to force fluid through said conduit.

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Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 35,164

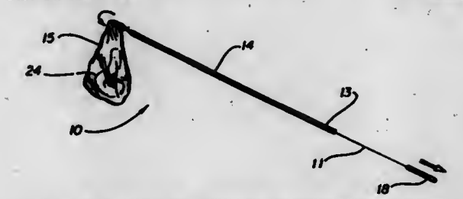
## SURGICAL DEVICE FOR ENCLOSING AN INTERNAL ORGAN

**Richard C. Kindberg, Doylestown, Pa.; Chao Chen, Edison, N.J.; Lyn Freeman, Flemington, N.J.; Constance E. Rosbdy, New Egypt, N.J., and Alastair W. Hunter, Bridgewater, N.J., assignors to Ethicon, Inc., Somerville, N.J.**

**Original No. 5,143,082, dated Sep. 1, 1992, Ser. No. 679,893, Apr. 3, 1991. Application for reissue Jul. 23, 1993, Ser. No. 97,555**

**Int. Cl.[6] A61B** *10/00*

**U.S. Cl. 128—749** **22 Claims**




*9. A medical device for enclosing an internal bodily organ or tissue during surgery comprising:*

*a) a continuous, filamentary strand having a distal noose portion secured with a knot, and a proximal free end portion, said free end portion enclosed within a generally rigid, longitudinal tubular sleeve so as to facilitate handling of said device, said knot configured in a manner so as to allow movement of the free end portion proximally and to prevent the noose portion from loosening when engaged about said bodily organ or tissue;*

*b) a surgical bag having an open end therein, said bag fixedly attached along substantially the entire perimeter of said open end thereof to said noose portion of said filamentary strand along substantially the entire circumferential length of said noose portion thereof; and*

*c) means for pulling said free end portion of said filamentary strand proximally so as to continually reduce the diameter of said noose portion thereby continually closing said open end of said surgical bag;*

*wherein said tubular sleeve has a constricted cross-section diameter at its distal end, and said knot abuts said constricted distal end when said free end portion of said filamentary strand is pulled proximally, and said constricted distal end has a cross-section diameter effective to prevent said knot from passing through said tubular sleeve when said free end portion of said filamentary strand is pulled proximally.*

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Re. 35,165

## PILE DRIVING APPARATUS

**Kong S. Seng, Jakarta Selatan, Indonesia, assignor to V-Pile Technology Luxembourg, Luxembourg**

**Original No. 5,161,625, dated Nov. 10, 1992, Ser. No. 860,240, Mar. 27, 1992. Continuation of Ser. No. 338,113, Mar. 14, 1989, abandoned. Application for reissue Oct. 6, 1994, Ser. No. 319,080**

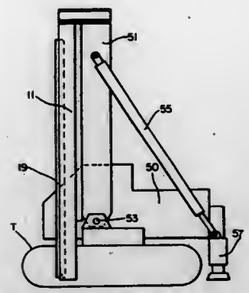
**Claims priority, application United Kingdom, Apr. 15, 1988, 8808988**

**Int. Cl.[6] E21B** *1/00*

**U.S. Cl. 173—53** **17 Claims**

1. Pile driving apparatus comprising:

jack means positioned at least partially alongside a pile to be driven for exerting a pile driving force in a direction substantially parallel to but spaced apart from the longitudinal axis of the pile to be driven, at least a part of said jack means extending along-side the pile;




transmission means for transmitting the pile driving force from said jack means onto the pile;

reaction means for providing a reaction force to the pile driving force;

a column for receiving the pile to be driven, said column having an upper end and a lower end; and

a base frame attached to said lower end of said column, said base frame including ballast support means for supporting ballast, said jack means being [positioned on said base frame.] *attached to said column.*

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Re. 35,166

## CATALYST

**Paul Chapple, Clwyd, Wales, assignor to Unilever Patent Holdings B.V., Rotterdam, Netherlands**

**Original No. 5,021,145, dated Jun. 4, 1991, Ser. No. 533,443, Jun. 5, 1990. Division of Ser. No. 328,715, Mar. 27, 1989, Pat. No. 4,948,769, which is a continuation of Ser. No. 153,482, Feb. 2, 1988, abandoned, which is a continuation of Ser. No. 870,545, Jun. 4, 1986, abandoned. Application for reissue May 10, 1994, Ser. No. 240,156**

**Claims priority, application United Kingdom, Jun. 5, 1985, 8514209**

**Int. Cl.[6] C10G** *11/04*

**U.S. Cl. 208—120** **1 Claim**

1. A method of cracking vanadium containing hydrocarbon feedstocks wherein the feedstock is contacted with a catalyst composition comprising:

(i) a crystalline zeolite,

(ii) a matrix material, and

(iii) a single phase crystalline mixed oxide selected from calcium and barium tin oxides, the strontium tin oxides $Sr_2SnO_4$ and $Sr_3Sn_2O_7$, strontium titanium oxides and [the barium titanium oxides $BaTi_2O_5$, $BaTi_4O_9$, $BaTi_5O_{11}$, $Ba_2TiO_4$, $Ba_2Ti_5O_{12}$, $Ba_2Ti_9O_{20}$, $Ba_4Ti_{13}O_{30}$, and $Ba_6Ti_{17}O_{40}$, and] mixtures thereof.

Re. 35,167

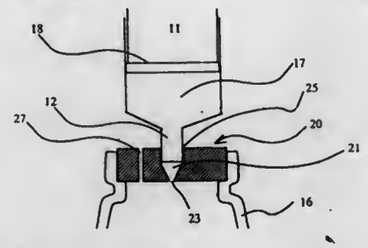
## MEDICINE VIAL CAP FOR NEEDLELESS SYRINGE

**Marvin L. Mouchawar, 1 Iris La., and Alan E. Mouchawar, 1 Marigold La., both of San Carlos, Calif. 94070**

**Original No. 5,036,992, dated Aug. 6, 1991, Ser. No. 499,760, Mar. 27, 1990. Application for reissue Nov. 2, 1992, Ser. No. 970,368**

**Int. Cl.[6] B65D** *51/16;39/00*

**U.S. Cl. 215—307** **12 Claims**




*9. An apparatus, comprising:*

*a medicine vial;*

*a liquid medicine suitable for intravenous injection into a patient; and*

*a cap sealing the liquid medicine in the medicine vial, a rupturable portion of the cap being rupturable under a pressure exerted by a syringe having a plunger when no needle is attached to a neck of the syringe, the cap defining an opening, the rupturable portion forming bounding surface of the opening.*

*12. A method, comprising the steps of:*

*(a) rupturing a portion of a cap of a medicine vial using a syringe, no needle being attached to a neck of the syringe;*

*(b) after step (a), extracting a medicine from the medicine vial using the syringe by moving a plunger of the syringe; and*

*(c) introducing the medicine extracted from the medicine vial into a patient by coupling the syringe to an intravenous system and then injecting the medicine from the syringe and into the intravenous system.*

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Re. 35,168

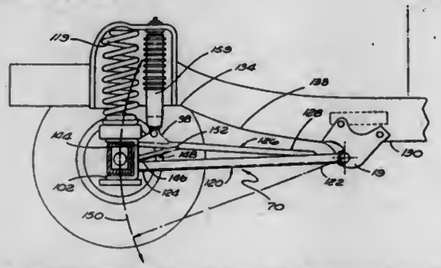
## VEHICLE SUSPENSION ASSEMBLY

**William Golpe, San Bernardino, Calif., assignor to Monroe Auto Equipment Company, Monroe, Mich.**

**Original No. 4,943,081, dated Jul. 24, 1990, Ser. No. 309,460, Feb. 10, 1989. Application for reissue May 24, 1993, Ser. No. 66,503**

**Int. Cl.[6] B60G** *3/00*

**U.S. Cl. 280—666** **1 Claim**




**8.** [An apparatus according to claim **7.**] *A suspension assembly for supporting a wheel on one side of a motor vehicle, the motor vehicle having a chassis with a first longitudinal chassis member, a second longitudinal chassis member spaced apart from the first longitudinal chassis member, and a suspension cross member coupled between the first and second longitudinal chassis members, the suspension cross member defining a downwardly protruding center region and having an inverted "U" shaped cross section, the inverter "U" shaped cross section defining a base part, two side parts, and two horizontal lip parts, the first longitudinal chassis member containing thereulong a mid-region suspension connection point, the suspension assembly comprising:*

*suspension bracket mounted to the base part and at least one of the side parts of the suspension cross member at a point proximate to the second longitudinal chassis member, and remote from the first longitudinal chassis member;*

*an axle beam, having an outboard end and an inboard end, the inboard end movably mounted to the suspension bracket;*

*a spindle mounted to the outboard end of the axle beam; and*

*a radius arm, having a rear end and a front end, the front end of the radius arm coupled to the axle beam adjacent to the spindle, and the rear end of the radius arm movably coupled to the longitudinal chassis member at the mid-region suspension connection point* wherein the radius arm comprises:

a radius arm bracket having a first side remote from the axle beam and a second side adjacent to be the axle beam:

a lower tube, having a first end and a second end, the first end movably coupled to the longitudinal chassis member at the mid-region suspension connection point, and the second end fixed to the first side of the radius arm bracket;

an upper tube, having a first end and a second end, the first end fixed to the lower tube at a point adjacent to the first end of the lower tube, and the second end of the upper tube fixed to the radius arm bracket distant from the lower tube;

a gusset tube having a first end and a second end, the first end fixed to both the second end of the lower tube and to the radius arm bracket, and the second end mounted to the upper tube at a point remote from the radius arm bracket; and

a shock absorber mount bracket having an upper end and a lower end, the upper end movably mounted to a shock absorber, and the lower end fixed to the second end of the upper tube.

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Re. 35,169

## METHOD FOR DETERMINING ORTHODONTIC BRACKET PLACEMENT

**Marc S. Lemchen, New York, N.Y., and Craig A. Andreiko, Alta Loma, Calif., assignors to Ormco Corporation, Glendora, Calif.**

**Original No. 5,011,405, dated Apr. 30, 1991, Ser. No. 301,606, Jan. 24, 1989. Application for reissue Apr. 30, 1993, Ser. No. 56,519**

**Int. Cl.[6] A61C** *3/00*

**U.S. Cl. 433—24** **45 Claims**

**1.** A method [for determining] *of forming an* orthodontic bracket *for* placement on a malocclused tooth in a patient's jaw to correct the malocclusion comprising the steps of:

[generating digital information defining] *scanning* the shape and location of the malocclused tooth with respect to the patient's jaw *and generating as a result thereof digital information defining physical characteristics of the individual patient;*

generating, *with the aid of a computer,* a mathematical model of the malocclused tooth as positioned in the jaw from the [digitized] *digital* information;

calculating, *with the aid of the computer, with respect to the mathematical model and from the digital information,* the finish position in the jaw to which the malocclused tooth is to be moved [from the digitized information] *that is based on the physical characteristics of the individual patient;* [and]

calculating, *with the aid of the computer from the digital information,* the placement position of an orthodontic bracket on the malocclused tooth required in order to move the malocclused tooth to its finish position by a preselected orthodontic treatment; *and*

*forming, with the aid of a computer, an orthodontic bracket that is based on physical characteristics of the patient, for placement on the malocclused tooth at the calculated placement position, so as to move* the tooth to its calculated finish position, the forming step being in accordance with the results of the calculating steps.



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Re. 35,170

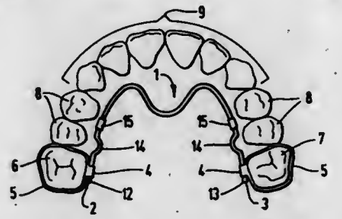
## NI-TI ORTHODONTIC PALATAL EXPANSION ARCH AND METHOD OF IMPARTING FORCES ON TEETH

**Wendell V. Arndt, 26650 W. 143rd St., Olathe, Kans. 66062, and Carl J. Berendt, 2612 Via Masada, Carlsbad, Calif. 92008**

**Original No. 5,167,499, dated Dec. 1, 1992, Ser. No. 662,204, Feb. 27, 1991. Application for reissue Jun. 29, 1993, Ser. No. 84,804**

**Int. Cl.[6] A61C** *3/00*

**U.S. Cl. 433—7** **10 Claims**




*3. A method for uprighting, rotating, and distalizing molars and expanding the mandibular or maxillary dental arch of a patient comprising:*

*providing a generally mishaped archwire composed of a temperature-affected material having a martensitic phase to austenitic phase transition temperature below mouth temperature.*

*forming said archwire to present a configuration of a desired post-treatment palatal arch when said archwire achieves its austenitic phase configuration,*

*deforming the formed archwire while in its martensitic state to the configuration of a patient's pre-treated malaligned palatal arch, and*

*attaching the ends of the archwire into lingually projecting molar sheaths to impart a corrective force to said dental arch and molars as said archwire achieves its austenitic phase configuration.*

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Re. 35,171

## COMPOSITIONS FOR DETECTING RAS GENE PROTEINS AND CANCER THERAPEUTICS

**Francis P. McCormick, Berkeley; Kirston E. Koths, El Cerrito; Robert F. Halenbeck, San Rafael, and Mary M. Trahey, San Carlos, all of Calif., assignors to Cetus Oncology Corporation, Emeryville, Calif.**

**Original No. 5,104,975, dated Apr. 14, 1992, Ser. No. 216,888, Jul. 8, 1988. Application for reissue Apr. 14, 1994, Ser. No. 227,651**

**The portion of the term of this patent subsequent to Jul. 3, 2004, has been disclaimed.**

**Int. Cl.[6] C07K** *1/02;1/18*

**U.S. Cl. 530—350** **18 Claims**

**1.** A isolated and substantially pure protein molecule comprising art apparent molecular weight of about 115,000–120,000 daltons as assessed by sodium dodecyl sulfate polyacrylamide gel electrophoresis run under reducing condition that simulate non-oncogenic ras p21 GTPase activity but does not substantially affect GTPase activity of oncogenic routants.

# PLANT PATENTS

## GRANTED MARCH 5, 1996

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

**9,461**

**BARBERRY PLANT 'GENTRY' CULTIVAR**

**Leo E. Gentry, 22835 SE. Tillstrom Rd., Gresham, Oreg. 97080**

**Filed Aug. 23, 1994, Ser. No. 295,412**

**Int. Cl.[6] A01H** *5/00*

**U.S. Cl. Plt.—58** **1 Claim**

1. A new and distinct variety of *Berberis thunbergii* substantially as shown and described, characterized particularly by the rich blush burgundy color of its newly-formed leaves which mature to a reddish-black satin patina, and by the resistance of the leaves to sunburn and scald.

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**9,462**

**HYDRANGEA PLANT NAMED 'HOBELLA'**

**J. G. Hofstede, and W. J. G. Hofstede, both of Doormanstraat 6, 6852 AK Hulssen, Netherlands**

**Filed Mar. 7, 1995, Ser. No. 399,471**

**Int. Cl.[6] A01H** *5/00*

**U.S. Cl. Plt.—67.1** **1 Claim**

1. A new and distinct variety of Hydrangea plant substantially as shown and described, characterized by changing flower coloration.

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**9,463**

**CHRYSANTHEMUM PLANT NAMED 'CHALECAT'**

**Jean-Pierre Challet, Lafayette, Calif., assignor to Selection New Plant Sarl, Le Cannet Des Maures, France**

**Filed Jul. 12, 1994, Ser. No. 273,998**

**Int. Cl.[6] A01H** *5/00*

**U.S. Cl. Plt.—76** **1 Claim**

1. A new and distinct cultivar of Chrysanthemum plant named 'Chalecat', substantially as herein shown and described, which
(a) exhibits attractive large double incurved pompon blossoms that are cherry pink on the inner surface and light pastel pink on the outer surface,
(b) exhibits a flower response period of approximately nine weeks,
(c) forms attractive dark green glossy foliage,
(d) achieves a short to medium plant height, and
(e) is particularly suited for pot mum production on a recurrent basis throughout the year.

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**9,464**

**CHRYSANTHEMUM PLANT NAMED 'CHAPLOU'**

**Jean-Pierre Challet, Lafayette, Calif., assignor to Selection New Plant Sarl, Le Cannet Des Maures, France**

**Filed Jul. 12, 1994, Ser. No. 273,992**

**Int. Cl.[6] A01H** *5/00*

**U.S. Cl. Plt.—82.3** **1 Claim**

1. A new and distinct cultivar of Chrysanthemum plant named 'Chaplou', substantially as herein shown and described, which
(a) exhibits in profusion attractive large red bronze anemone blossoms,
(b) exhibits a flower response period of approximately eight weeks,
(c) is highly amenable to branching by pinching,
(d) achieves a short plant height, and
(e) is particularly suited for pot mum production on a recurrent basis throughout the year.

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**9,465**

**CHRYSANTHEMUM PLANT NAMED 'CHAKARA'**

**Jean-Pierre Challet, Lafayette, Calif., assignor to Selection New Plant Sarl, Le Cannet des Maures, France**

**Filed Jul. 12, 1994, Ser. No. 273,994**

**Int. Cl.[6] A01H** *5/00*

**U.S. Cl. Plt.—82.3** **1 Claim**

1. A new and distinct cultivar of Chrysanthemum plant named 'Chakara', substantially as herein shown and described, which
(a) exhibits in profusion attractive large bright bronze anemone blossoms,
(b) exhibits a flower response period of approximately eight weeks,
(c) is highly amenable to branching by pinching,
(d) achieves a short plant height, and
(e) is particularly suited for pot mum production on a recurrent basis throughout the year.

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**9,466**

**ALSTROEMERIA 'REDCOAT'**

**Mark P. Bridgen, Storrs, Conn., assignor to University of Connecticut, Storrs, Conn.**

**Filed Dec. 13, 1994, Ser. No. 355,061**

**Int. Cl.[6] A01H** *5/00*

**U.S. Cl. Plt.—87.1** **1 Claim**

1. A new and distinctive Alstroemeria plant substantially as shown and described, distinguished by its unique flower color, short growth habit, strong and numerous flowering stems, and numerous florets per inflorescence.

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**9,467**

**BROMELIAD PLANT NAMED 'GUZ 215'**

**Jeffrey C. Kent, Vista, Calif., assignor to Kent's Bromeliad Nursery Inc., Vista, Calif.**

**Filed Dec. 27, 1994, Ser. No. 364,597**

**Int. Cl.[6] A01H** *5/00*

**U.S. Cl. Plt.—88.8** **1 Claim**

1. A new and distinct Guzmania plant, substantially as herein shown and described, characterized particularly as to novelty by the floral bracts of linear acute form about six inches by one and one-quarter inches decreasing in size to two and one quarter by three-quarter inches at the apex, the lower bracts being light green stained with cream and ruby red, the obverse and reverse, gradually less cream and ruby red to the upper two-thirds of the inflorescence, after anthesis the bracts gradually darken to buff, retaining the cream color for about two months.



169–177 O.G.–96–2: QL3

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# PATENTS

## GRANTED MAR. 12, 1996

### ERRATA

| For CLASS | See PATENT NO. |
|---|---|
| 043–012 | 5,497,580 |
| 043–042 | 5,497,581 |
| 043–044 | 5,497,582 |
| 108–023 | 5,497,706 |
| 223–074 | 5,497,908 |
| 297–016 | 5,498,054 |
| 297–068 | 5,498,055 |
| 415–173 | 5,498,193 |
| 415–173 | 5,498,193 |
| 477–110 | 5,498,195 |
| 216–020 | 5,498,311 |
| 204–452 | 5,498,324 |
| 252–108 | 5,498,343 |
| 252–404 | 5,498,344 |
| 252–589 | 5,498,345 |
| 419–028 | 5,498,393 |
| 435–007 | 5,498,499 |
| 424–195 | 5,498,637 |
| 422–223 | 5,498,756 |
| 426–520 | 5,498,757 |
| 426–520 | 5,498,757 |
| 427–255 | 5,498,758 |
| 427–353 | 5,498,759 |
| 427–452 | 5,498,760 |
| 427–542 | 5,498,761 |
| 428–001 | 5,498,762 |
| 428–229 | 5,498,763 |
| 429–218 | 5,498,764 |
| 430–323 | 5,498,765 |
| 435–009 | 5,498,766 |
| 437–008 | 5,498,767 |
| 437–192 | 5,498,768 |
| 430–327 | 5,498,769 |
| 502–116 | 5,498,770 |
| 505–210 | 5,498,771 |
| 502–216 | 5,498,772 |

## ERRATA–CONTINUED

| For CLASS | See PATENT NO. |
|---|---|
| 504–103 | 5,498,773 |
| 504–246 | 5,498,774 |
| 514–025 | 5,498,775 |
| 514–183 | 5,498,776 |
| 514–206 | 5,498,777 |
| 514–309 | 5,498,778 |
| 514–309 | 5,498,778 |
| 514–428 | 5,498,779 |
| 514–492 | 5,498,780 |
| 523–213 | 5,498,781 |
| 525–126 | 5,498,782 |
| 525–162 | 5,498,783 |
| 562–581 | 5,498,790 |
| 548–230 | 5,498,719 |
| 528–337 | 5,498,784 |
| 562–474 | 5,498,795 |
| 514–261 | 5,498,819 |
| 514–261 | 5,499,922 |
| 365–189 | 5,499,234 |
| 320–005 | 5,499,263 |

# PATENTS

GRANTED MARCH 5, 1996

## GENERAL AND MECHANICAL

**5,495,620**
**BODY ARMOR VEST AND METHOD OF MANUFACTURE**

Richard W. Schoenweiss, 1121 Algoma St., Deltona, Fla. 32735, and Cheryl K. Allen, 1154 Arrowhead Trail, Enterprise, Fla. 32725

Continuation of Ser. No. 965,976, Oct. 26, 1992, Pat. No. 5,325,538, which is a continuation of Ser. No. 799,361, Nov. 27, 1991, Pat. No. 5,157,792, which is a continuation of Ser. No. 642,711, Jan. 17, 1991, abandoned, which is a continuation of Ser. No. 402,215, Sep. 1, 1989, abandoned. This application Jun. 23, 1994, Ser. No. 264,575

The portion of the term of this patent subsequent to Oct. 27, 2009, has been disclaimed.

Int. Cl.[6] F41H *1/02;* A41D *1/04;27/20*

U.S. Cl. 2—2.5 2 Claims



1. A method of making a ballistic panel carrier vest comprising the steps of:

constructing a vest-type garment having an outer front portion and an outer back portion with each portion having an outer appearance substantially identical to a conventional uniform, said garment being characterized by a generally V-shape, collarless neck opening and a pair of arm openings coincidental with a sleeve attachment area on the conventional uniform, said front portion being further characterized by an outer surface having at least one front pocket having a flap with a button, and a plurality of spaced buttons sewn in a vertical array extending downward from centrally of said neck opening;

sewing a first inner layer of fabric to an inside surface of the front portion of the garment to define a front inner pocket between said first inner layer and said front outer portion for receiving a front ballistic panel in a front torso protecting position;

sewing a second inner layer of fabric to an inside surface of the back portion of the garment to define a back inner pocket between said second inner layer and said outer back portion for receiving a back ballistic panel in a back torso protecting position;

inserting a ballistic panel in each of the front inner pocket and back inner pocket;

providing at least one side opening in the garment extending from one of the arm openings to a lower edge of the garment; and

attaching a hook and pile type fastening means along the at least one side opening to permit the garment to be drawn snugly about a wearer.

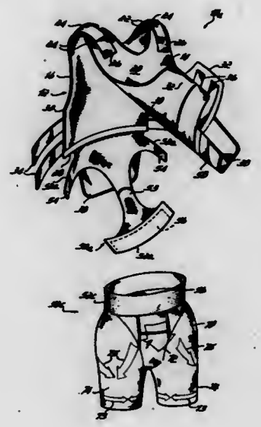
**5,495,621**
**BODY ARMOR VEST ANCHORING SYSTEM AND METHOD**

Rick E. Kibbee, 9470 Hunters Creek, Cincinnati, Ohio 45242

Continuation-in-part of Ser. No. 58,985, May 5, 1993, Pat. No. 5,398,340. This application Mar. 17, 1995, Ser. No. 406,370

Int. Cl.[6] F41H *1/02*

U.S. Cl. 2—2.5 14 Claims



1. A bullet proof vest comprising:

a fabric shell having bullet resistant wearer protective panels of impact absorbing anti-ballistic material secured in fixed positions thereon so as to form a non-stretchable enclosure to at least partially protectively surround the upper torso of a wearer when the vest is worn, the shell having a front and a back, a waist level extending around the front and the back at the approximate height of a wearer's waist when the vest is worn, and at least two detachable fasteners spanning across a horizontal extent of the waist level at the front and back of the shell;

a horizontally and vertically elastic lower garment having:

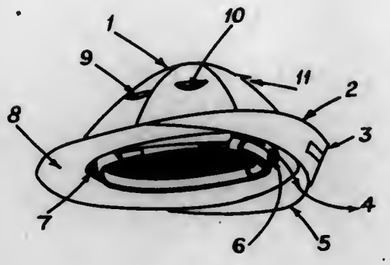
a waistband of an elastic material including an elastic fiber and adapted to surround the waist of a wearer,

a body portion having a top edge connected to the waistband and extending downwardly from the top edge to elastically extend between the legs of the wearer, the body portion including a pair of leg encircling bands each extending horizontally from between the legs of the wearer each to elastically surround one of the thighs of the wearer,

the lower garment having a front and a back and mating fasteners extending horizontally across the front and the back, respectively, in the vicinity of the waistband and top edge of the body portion, and in detachable engagement with the detachable fasteners of the shell to thereby connect the front and back of the lower garment to the front and back of the shell at the waist level thereof,

whereby the lower garment connects the back and front of the shell together and elastically holds the back and the front of the shell both vertically and horizontally at the waist level.

5,495,622
**VENTILATED HAT**
Harold C. Kaufman, 7127 Northampton, Houston, Tex. 77055
Filed Sep. 2, 1994, Ser. No. 298,963
Int. Cl.[6] A42B 1/00
U.S. Cl. 2—175.1 19 Claims

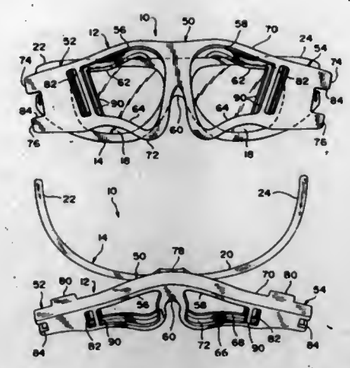



1. An all-weather runner's hat, the aerodynamic design of which promotes airflow around the head of a person while, at the same time, deflecting rain and other elements wherein the hat comprises:
a. a generally dome-shaped crown which fits over the upper portion of a head wherein the crown has a top and a lower edge and a front and a back, and wherein the lower edge has an inside surface and an outside surface,
b. a brim fixedly attached to the lower edge of the crown and extending generally outwardly and perpendicularly therefrom at an angle of about 15 degrees from a horizontal line running from the back of the crown to the front of the crown, said brim varying in width from the front of the crown to the back of the crown,
c. 4 to 10 vents positioned around the crown generally halfway between the lower edge and the top of the crown,
d. a headband, adjacent the inside of the lower edge of the crown of the hat, extending around the inside of the crown in approximately parallel relation with the lower edge thereof and having a surface facing the inside of the hat and a surface facing the head of wearer when the hat is being worn,
e. an air space between the inside lower edge of the crown and the headband which allows air flow in and around the head,
f. a rear brim turning downward from a an outermost edge of a portion of said brim which extends rearwardly and outwardly from the lower edge of the back of the crown, said rear brim extending substantially perpendicularly from the horizontal line running from the back of the crown to the front of the crown, and
g. 3 to 8 spacers fixedly attached to the inside lower edge of the crown and to the surface of the headband facing the inside the hat.

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5,495,623
**SPORTS PAD FOR EYEWEAR FRAMES**
Peter F. Leonardi, Gloversville, N.Y., assignor to Halo Sports and Safety, Inc., Gloversville, N.Y.
Filed Feb. 14, 1994, Ser. No. 195,468
Int. Cl.[6] A61F 9/02
U.S. Cl. 2—431 17 Claims

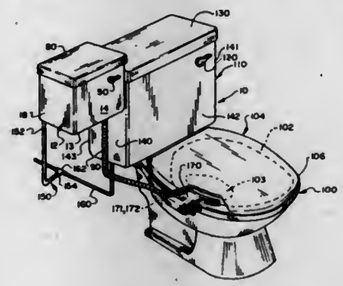
13. Sports eyewear for eye protection, comprising:
a substantially rigid eyewear frame having a front portion with at least one lens coupled thereto, a first temple portion being coupled to a first end of said front portion of said frame, and a second temple portion being coupled to a second end of said front portion of said frame; and
a soft, stretchable, elastomeric pad removably coupled to said frame for covering certain exposed areas of said frame, said pad including



a front portion having a front wall, a rear wall spaced from said front wall, a top peripheral wall extending between said front wall and said rear wall and a bottom peripheral wall extending between said front wall and said rear wall for forming a channel to receive the eyewear frame therebetween, each of said front and rear walls having a pair of lens apertures with a nose portion formed therebetween which interconnects said top and bottom peripheral walls, said front portion of said pad being shaped to removably overlie said front portion of said frame;
a first temple portion integrally formed as a one-piece, unitary member with said front portion of said pad and shaped to removably overlie said first temple portion of said frame; and
a second temple portion integrally formed as a one-piece, unitary member with said pad being coupled to said second end of said front portion of said pad and shaped to removably overlie said second temple portion of said frame.

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5,495,624
**TOILET BOWL WATER CONSERVATION UNIT**
Ira M. Lisook, 42 Marilyn Rd., Milton, Mass. 02186, and Edward Lombardi, 48 Lawrence Rd., Derry, N.H. 03038
Filed Aug. 5, 1994, Ser. No. 286,549
Int. Cl.[6] E03D 1/12
U.S. Cl. 4—325 26 Claims



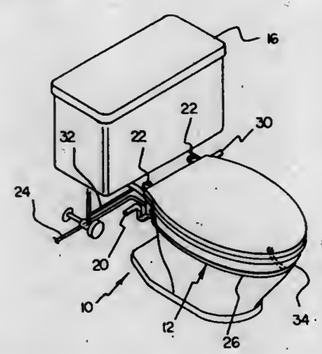
1. A water conservation unit for a toilet having a primary water reservoir with a predetermined volume, a bowl with a rim defining a perimeter and a water supply, comprising:
(a) a secondary water reservoir having an input orifice and a discharge orifice, said secondary water reservoir having a volume less than the volume of said primary water reservoir and adapted to be mounted externally of said primary reservoir;
(b) input means for introducing and controlling the flow of water into the input orifice of said secondary water reservoir;



(c) a water feed member having an inlet orifice, an outlet orifice, and a continuous passage therethrough connecting said inlet and outlet orifices, said water feed member comprising a substantially flat portion intermediate said inlet and outlet orifices and a depending leg portion including said outlet orifice therein said water feed member adapted to be attached to said bowl rim in such a manner that said outlet orifice is contained within and directed along the perimeter of said bowl;
(d) means for coupling the discharge orifice of said secondary water reservoir to the inlet orifice of said water feed member; and
(e) discharge means for opening and closing the discharge orifice of said secondary water reservoir.

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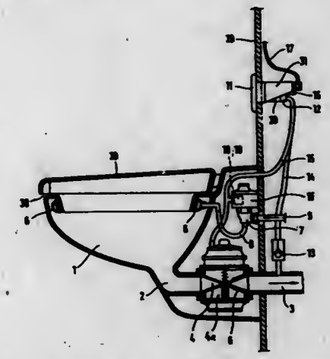
5,495,625
**TOILET BOWL BIDET ATTACHMENT**
Thayard A. McGuire, 11341 Blackbark Dr., Riverview, Fla. 33569
Filed Dec. 12, 1994, Ser. No. 354,467
Int. Cl.[6] E03D 9/08
U.S. Cl. 4—420.5 10 Claims




1. A toilet bowl bidet attachment comprising:
a toilet having a toilet bowl;
a water supply means positioned in adjacency to the toilet bowl of the toilet for communicating with hot and cold water supply lines, the water supply means comprising a first valve mounted to a first toilet seat attaching bolt extending through the toilet to mount the first valve substantially behind and slightly beneath the toilet bowl of the toilet, the first valve being couplable to the hot water supply line; a hot water conduit of substantially arcuate configuration extending about the toilet bowl of the toilet beneath a rim thereof; a second valve mounted to a second toilet seat attaching bolt extending through the toilet to mount the second valve substantially behind and slightly beneath the toilet bowl of the toilet, the second valve being couplable to the cold water supply line; a cold water conduit of substantially arcuate configuration extending about the toilet bowl of the toilet beneath the rim thereof, the hot water conduit being in fluid communication with the cold water conduit, with the nozzle means extending into fluid communication with both the hot water conduit and the cold water conduit of the water supply means, each of the valves of the water supply means comprising a substantially cylindrical valve body, with the valve body receiving and engaging the respective toilet seat attaching bolt therewithin; and a handle extending from the valve body for effecting proportionate control of a volume of fluid through the valve; and,
a nozzle means positioned in fluid communication with the water supply means and extending through an aperture in the toilet bowl of the toilet for directing water from the water supply means onto a genital area of a user.

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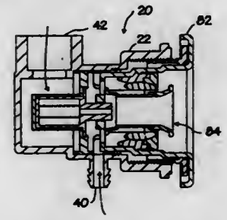
5,495,626
**ELECTRICAL CONTROL DEVICE**
Gunnar Lindroos, Helsingfors, Finland, and Paul Wallström, Kristianstad, Sweden, assignors to Evac AB, Bromolla, Sweden
Filed Apr. 15, 1994, Ser. No. 228,139
Claims priority, application Finland, Apr. 19, 1993, 931757
Int. Cl.[6] E03D 11/10
U.S. Cl. 4—435 2 Claims



1. A vacuum sewer toilet system comprising a toilet compartment, a toilet bowl installed in the toilet compartment, a vacuum sewer, a rinse water supply valve for controlling supply of rinse water to the toilet bowl, a sewer valve connecting the toilet bowl to the vacuum sewer, vacuum activated actuators for the rinse water supply valve and the sewer valve respectively, a human-responsive activation element for selectively communicating partial vacuum or ambient pressure to a port of the activation element, an air duct connecting the actuator for the sewer valve to said port of the activation element, and a delay device connected between said air duct and the actuator for the rinse water supply valve for impeding flow of air from the actuator for the rinse water supply valve to the air duct, whereby closing of the rinse water supply valve is delayed slightly relative of closing of the sewer valve.

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5,495,627
**COMBINATION ADJUSTABLE JET VALVE**
Gregg Leaverton, 3412 Meadowview Dr., and Steve Bork, 846 Rivertree Dr., both of Oceanside, Calif. 92054
Filed Nov. 2, 1993, Ser. No. 147,171
Int. Cl.[6] A61H 33/00
U.S. Cl. 4—541.6 15 Claims

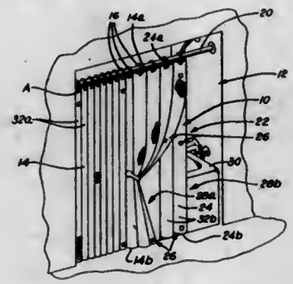



1. A spa jet valve capable of utilizing a standard spa jet housing for discharging an adjustable mixture of air and water into a spa,

said spa jet valve comprising: a cylindrical hollow valve body having a cylindrical shape and a central axis, an aeration chamber positioned in said valve body, said valve body having a water inlet port and a separate air inlet port for directing water and air through said valve body and into said aeration chamber, means mounted in said valve body to manually control and adjust the flow of water into said aeration chamber; and a tubular rotatable nozzle mounted within said valve body and extending into the spa interior, said nozzle communicating with said aeration chamber for discharging a set of water and air from said aeration chamber into the spa, said nozzle including means of manually controlling the flow of air in to said aeration chamber independent of said means to control and adjust the flow of water, said nozzle further including means of directional adjustment for controlling the direction of the set discharging into the spa.

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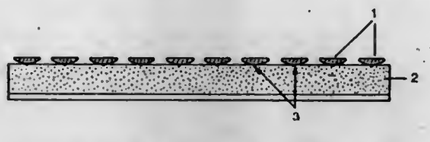
**5,495,628**
**SHOWER CURTAIN HAVING SELECTIVELY RAISABLE LOWER PORTION**
**Kim Logan, 17534 Margate Ave., Lathrup Village, Mich. 48076**
**Filed Apr. 3, 1995, Ser. No. 415,255**
**Int. Cl.[6] A47K *3/14***
**U.S. Cl. 4—558** **12 Claims**



1. A shower curtain having a selectively raisable lower portion comprising:
a flexible shower curtain material having a top end and an opposite bottom end, a right side end and an opposite left side end, and a first side and an opposite second side;
releasable fastener means connected with said material for releasably retaining said material in at least one raised level configuration, said releasable fastener means comprising first and second components that are mutually releasably engaged when respectively mated;
a plurality of one of said first and second components arranged on said first side of said material in a first row located a first predetermined distance from said bottom end;
a plurality of the other of said first and second components arranged on said first side of said material in a second row located a second predetermined distance from said bottom end, wherein said second distance exceeds said first distance;
wherein each of said first and second components of said first and second rows are serially spaced along each of said first and second rows in a series of coinciding first columns;
wherein said material is first folded along a first horizontal fold located a third predetermined distance from said bottom end so that said components of said first row are matable with respective said components of said second row;
a plurality of one of said first and second components arranged on said second side of said material in a third row located a fourth predetermined distance from said bottom end;
a plurality of the other of said first and second components arranged on said first side of said material in a fourth row located a fifth predetermined distance from said bottom end, wherein said fifth distance exceeds said fourth distance;
wherein each of said first and second components of said third and fourth rows are serially spaced along each of said third and fourth rows in a series of coinciding second columns; and,
wherein said material after being said first folded, is second folded along a second horizontal fold located a sixth predetermined distance from said bottom end so that said third row coincides with said fourtn row, whereupon said components of said fourth row are matable with respective said components of said fifth row.

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**5,495,629**
**SUPPORT GRID FOR SITTING OR LYING FURNITURE, AS WELL AS SUPPORT ELEMENTS FOR THE SUPPORT GRID**
**Balthasar Hüsler, Oberbipp, Switzerland, assignor to Studio Hüsler AG, Zug, Switzerland**
**Filed Sep. 30, 1994, Ser. No. 316,030**
**Claims priority, application Switzerland, Sep. 30, 1993, 2935/93**
**Int. Cl.[6] A47C *23/06***
**U.S. Cl. 5—236.1** **16 Claims**



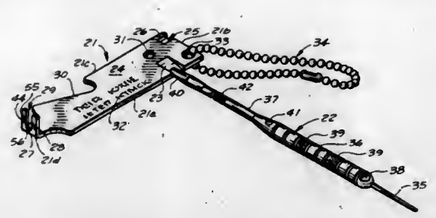
1. A support grid for sitting or lying furniture comprising
at least two elongated spring bodies extending generally parallel with each other;
a plurality of support elements extending generally perpendicular to said spring bodies and resting on upper surfaces of said spring bodies, each of said support elements comprising
an elongated member having a generally planar upper surface and a lower surface shaped, at least at areas of contact with said spring bodies, so that, in cross-section, said elongated member is thicker along a longitudinal midline of said member than along longitudinal side edges of said member so that said member makes contact with said spring bodies along a linear area much narrower than a width of said member when not supporting a load; and
a plurality of fastener means flexibly holding said support elements to said spring bodies so that each said support element is restrained against longitudinal movement relative to said spring bodies and is movable in a rocking motion on said spring bodies.

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**5,495,630**
**DART TOOL**
**Kevin M. Estein, 4152 W. Tierra Buena, Phoenix, Ariz. 85023, and Michael F. Nauroth, 6105 W. Gelding Dr., Glendale, Ariz. 85306**
**Filed Jan. 5, 1994, Ser. No. 178,059**
**Int. Cl.[6] B25B *13/00***
**U.S. Cl. 7—138** **15 Claims**

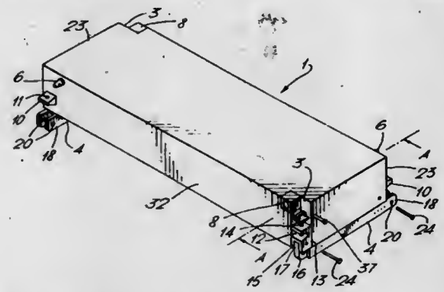
1. A dart tool suitable for adjusting a dart assembly having a flight shaft, a barrel and a dart tip, comprising, in combination,
a. elongated, planar handle means comprising two planar sides, two longitudinal edges, two ends, and at least one end edge; and
b. recessed inwardly from a said at least one of three edges of said handle means and adjacent a first said end of said handle means said terminus comprising thin nub means, wedge means for opening a flight lock in a dart.





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**5,495,631**
**BRIDGE MODULE**
**Richard C. Connor, and Keith J. Mitchell, both of Barton on Sea, United Kingdom, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England**
**PCT No. PCT/GB93/00704, § 371 Date Oct. 12, 1994, § 102(e) Date Oct. 12, 1994, PCT Pub. No. WO93/21390, PCT Pub. Date Oct. 28, 1993**
**PCT Filed Apr. 2, 1993, Ser. No. 318,713**
**Claims priority, application United Kingdom, Apr. 15, 1992, 9208291**
**Int. Cl.[6] F01D *15/14***
**U.S. Cl. 14—2.6** **22 Claims**

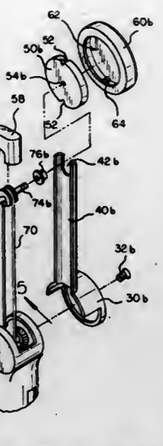


1. Bridge module comprising:
a buoyant structure with buoyancy sufficient to support a load on said bridge module when said module is floated in water;
at least one end of said buoyant structure having module interconnection means for connecting the module end to an end of an adjacent module so as to form a bridge comprising a plurality of said modules, said bridge module further comprising at least one removable link member with link connection means and link securing means, each of said at least one link member being releasably securable to the buoyant structure by said link securing means and being longitudinally connectable to a link member of an adjacent module by said link connection means, said link members carrying tensile forces experienced by a bridge comprising a plurality of said modules.

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**5,495,632**
**MOTORIZED HAND HELD SCRUBBER**
**Rhonda Baker, 3030 Acacia #M203, Hemet, Calif. 92544**
**Continuation of Ser. No. 55,559, May 3, 1993, abandoned. This application Nov. 7, 1994, Ser. No. 335,553**
**Int. Cl.[6] A46B *13/02***
**U.S. Cl. 15—4** **8 Claims**

2. A motorized scrubber comprising:

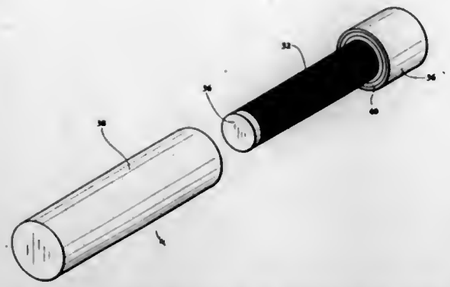


a first elongated body portion having opposed first and second ends defining a handle for said scrubber, said handle having a first longitudinal axis passing through said first and second ends defining said handle,
a second elongated body portion having opposed first and second ends defining a head and neck for said scrubber, said head and neck having a second longitudinal axis passing through said first and second ends defining said head and neck,
means for pivotally connecting said head and neck to said first end of said handle such that said head and neck is movably adjustable relative to said handle through a range of positions where said first axis is co-linear with said second axis in a first position and where said first axis makes an angle with respect to said second axis in a second position,
an axle rotatably mounted to said second elongated body portion proximal to said head thereof for rotation about an axis extending orthogonally relative to said second axis, said axle having opposed first and second ends;
a first hub fixedly secured to said first end of said axle, and a second hub fixedly secured to said second end of said axle;
a first cleaning member having a work engaging face, said first cleaning member being removably coupled to said first hub such that said work engaging face of said first cleaning member projects in a first outward direction; and,
a second cleaning member having a work engaging face, said second cleaning member being removably coupled to said second hub such that said work engaging face of said second cleaning member projects in a second outward direction oppositely oriented relative to said first outward direction,
wherein said first end of said first elongated body portion is shaped so as to define a mounting cylinder, and further wherein said second elongated body portion comprises a first half section including a first pivot half section with a first neck half section projecting therefrom, and a second half section including a second pivot half section with a second neck half section projecting therefrom, said first and second pivot half sections being rotatably mounted to opposed ends of said mounting cylinder such that said first and second neck half sections are positioned in an abutting relationship.

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**5,495,633**
**PORTABLE ANTI-STATIC DEVICE**
**Kandi L. Speer, 9323 S. Oxford Ave., Tulsa, Okla. 74137-4130**
**Filed Jun. 14, 1993, Ser. No. 76,593**
**Int. Cl.[6] H05F *1/00;3/00***
**U.S. Cl. 15—104.94** **2 Claims**

1. A portable anti-static device for removing static electricity from a person's clothing which comprises:
a cylindrical holding means;



an absorbent material supported on the exterior of said cylindrical holding means;
an anti-static material impregnated into said absorbent material;
a cylindrical cover of larger diameter size than said cylindrical holding means for covering the absorbent material;
a handle at one end of said cylindrical holding means with a circular groove therein;
the size of the holding means, cover, and groove are such that when one end of said cover is fitted into said groove, the cover is not in contact with the absorbent material.

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**5,495,634**
**VACUUM SWEEPER ROLLER BRUSH**
**Rudolph F. Brundula, Gates Mills, and William P. Brundula, Kirtland, both of Ohio, assignors to Bruns Brush Inc. (Ohio Corporation), Willoughby, Ohio**
**Filed Jun. 30, 1994, Ser. No. 270,721**
**Int. Cl.[6] A47L** *5/30*
**U.S. Cl. 15—182** **6 Claims**

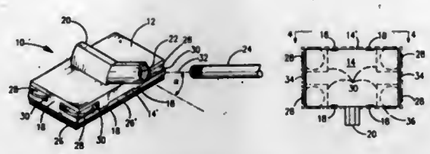


1. A generally cylindrical brush roller for use in a vacuum sweeper including in combination, a generally cylindrical shaped mounting member comprising an integral molded plastic material having first and second end portions, a plurality of circumferentially spaced and helically extending stiffener bars integrally formed on the exterior surface of said mounting member and extending generally from said first to said second end portions thereof, said mounting member adapted for rotation in a given direction, a plurality of spaced and drilled brush tuft receiving openings provided in said mounting member closely in front of said stiffener bars in relation to said given rotational direction and extending generally from said first to said second end portions, brush tufts in said brush tuft receiving openings, staples securing said brush tufts in said brush tuft receiving openings, said brush tufts adapted to engage said stiffener bars upon engaging a surface such as a carpet being swept which stiffener bars tend to keep said brush tufts erect and aid in the brushing action.

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**5,495,635**
**PAINT TRIMMING DEVICE**
**Thomas A. Williams, 628 D St. SE., Miami, Okla. 74354**
**Filed Jun. 2, 1995, Ser. No. 459,355**
**Int. Cl.[6] B05C** *17/00*
**U.S. Cl. 15—210.1** **11 Claims**

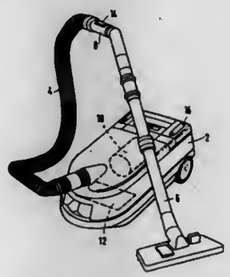
1. A paint trimming device for applying paint to a first surface closely adjacent to an adjoining second surface, comprising:



a base having opposing first and second faces and a body portion extending between the faces;
a handle means projecting outwardly from the first face such that it can be gripped by a user closely adjacent to the base, and also having extension capability allowing the user to manipulate the base from a position remote from the base;
a paint pad means, for carrying paint to be applied to the first surface, which has a peripheral edge and is secured to the base upon the second face thereof; and
spacer means, extending outwardly from the body portion of the base, for spacing the peripheral edge of the paint pad means from and out of contact with the second surface while applying paint to the first surface, the outermost points of the spacer means defining a closed linear boundary whose perpendicular projection, in a plane in which the paint pad means lies, completely surrounds and is spaced from the peripheral edge of the paint pad means.

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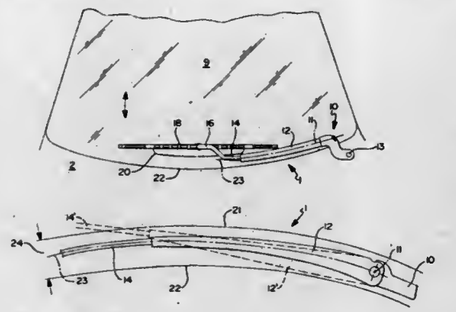
**5,495,636**
**VACUUM CLEANER WITH INDEPENDENTLY OPERATING ON/OFF SWITCHES ON THE HANDLE AND THE MOTOR HOUSING**
**Jan H. Dekker, and Bert P. Bultena, both of Hoogeveen, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**
**Filed Apr. 5, 1995, Ser. No. 417,296**
**Claims priority, application European Pat. Off., Apr. 6, 1994, 94200935**
**Int. Cl.[6] A47L** *9/28*
**U.S. Cl. 15—339** **7 Claims**



1. A vacuum cleaner comprising a motor housing (2), which accommodates a suction motor (10) and a control unit (12) for controlling the suction motor (10), a hose (4), which can be coupled to the motor housing (2) and has a handle (8), a command switch (14) on the handle (8), for supplying an on/standby command signal to the control unit (12), and a main switch (16) on the motor housing (2), wherein the main switch (16) is a switch for supplying a second on/standby command signal to the control unit (12).



**5,495,637**
**WINDSHIELD WIPER SYSTEM OF A MOTOR VEHICLE INCLUDING A WIPER ARM**
**Bruno Egner-Walter, Heilbronn, Germany, assignor to SWF Auto-Electric GmbH, Germany**
**Continuation of Ser. No. 857,919, Jan. 4, 1993, abandoned. This application Feb. 16, 1995, Ser. No. 390,271**
**Claims priority, application Germany, Sep. 15, 1990, 40 29 342.4**
**Int. Cl.[6] B60S** *1/32;1/04*
**U.S. Cl. 15—250.351** **3 Claims**

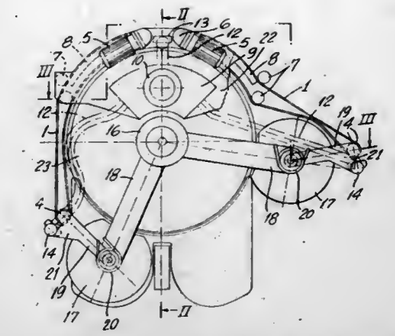


1. In a windshield wiper system including a wiper arm on a motor vehicle, said system having a windshield with a curved windshield surface and a curved lower edge, said curved lower edge defining a curved line of contact with a connecting area of said vehicle, said vehicle also having a hood with a curved rear edge, a gap existing between the curved rear edge of the hood and the curved windshield surface adjacent tbe lower edge, the improvement comprising:
a multi-sided elongated articulated member having a first end pivotally mounted to said vehicle and a second end;
a multi-sided elongated wiper rod extending longitudinally away from said second end; and
a wiper blade secured to said wiper rod, wherein said member, said rod, and said wiper blade rest within gap when at a common start and repose position, first opposing longitudinal sides of said member and said rod having a curvature along their length substantially parallel to the windshield surface adjacent the lower edge and the rear edge of the hood, resulting in a minimized overall height of said wiper arm and providing for a minimized gap between the rear edge of the hood arid the windshield surface adjacent the lower edge, second opposing longitudinal sides perpendicular to said first opposing sides of said member arid a portion of said rod secured to said member having a curvature along their length substantially parallel to the line of contact.

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**5,495,638**
**SWEEPING UNIT**
**Kurt Zachhuber, Karlstr. 111, D-8122 Penzberg, Germany**
**PCT No. PCT/EP92/01294, § 371 Date Dec. 7, 1993, § 102(e) Date Dec. 7, 1993, PCT Pub. No. WO92/01275, PCT Pub. Date Dec. 10, 1992**
**PCT Filed Jun. 9, 1992, Ser. No. 157,173**
**Claims priority, application Germany, Jun. 7, 1991, 4118708**
**Int. Cl.[6] A47L** *5/30*
**U.S. Cl. 15—380** **15 Claims**

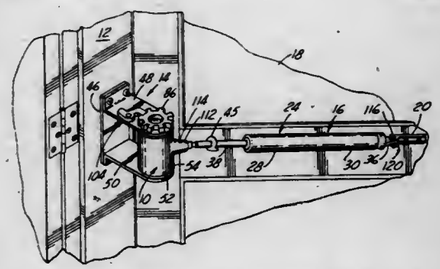
1. A sweeping unit for use with a sweeping machine to clean a floor area when said sweeping unit moves in a working direction, the sweeping unit comprising:
a mounting platform;
driven sweeping means for engaging said floor area, said driven sweeping means including a first portion and a second portion;



first guide means for constraining said driven sweeping means relative to said mounting platform, said guide means including first guide elements positioned at fixed locations on said mounting platform, and a second guide element which is movable relative to said mounting platform generally in a plane,
said first portion of said driven sweeping means being constrained to a fixed path relative to said platform by said first guide elements, said second portion of said driven sweeping means being constrained by said second guide element to movement generally in said plane,
a distance between a fixed line oriented in said working direction on said platform and said second guide element being varied as said second guide element is moved, whereby a width of said floor area that is swept when said sweeping machine moves in said working direction, is variable; and
means for movably mounting said second guide element relative to said platform.

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**5,495,639**
**DOOR CLOSING APPARATUS**
**George Wartian, 34938 Island View Dr., E., Mt. Clemens, Mich. 48045**
**Filed Dec. 6, 1994, Ser. No. 349,797**
**Int. Cl.[6] E05F** *1/08*
**U.S. Cl. 16—79** **7 Claims**



1. Door closing apparatus for a door hinged to a fixed frame comprising:
a spring unit,
a bracket for mounting said spring unit on the fixed frame,
said spring unit comprising a housing having an axis of rotation,
means mounting said housing on said bracket for rotation about said axis,
a spring in said housing having a first end and a second end,
a first retainer affixed to said housing and engaging the first end of said spring to compel said first end of said spring to rotate with said housing,
a second retainer rotatably mounted on said housing and engaging said second end of said spring,

releasable means for securing said second retainer in adjusted rotative position with respect to said bracket, so that when said housing is rotated in one direction, the stress on said spring is increased,

a door closer having a first end connected to said housing and having a second end adapted to be connected to the door and operative, when the door is swung open, to rotate said housing in said one direction, and

means for holding said housing from rotation beyond a selected point in the opposite direction so that said closer may be safely disconnected from the door for any reason,

said holding means comprising a stop on said bracket, and

an abutment on said housing engageable with said stop when said housing is rotated in said opposite direction to prevent further rotation thereof in said opposite direction.

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**5,495,640**

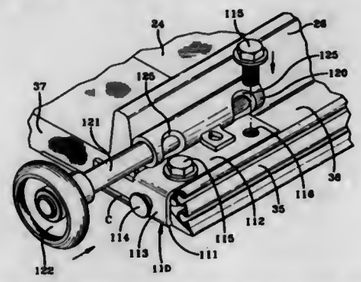
## SECTIONAL OVERHEAD DOOR

**Willis J. Mullet, Pensacola Beach; Albert W. Mitchell, Pace, both of Fla., and Thomas B. Bennett, III, Wooster, Ohio, assignors to Wayne-Dalton Corp., Mt. Hope, Ohio**

**Division of Ser. No. 260,108, Jun. 15, 1994. This application Apr. 18, 1995, Ser. No. 423,899**

**Int. Cl.[6] E05D *13/00***

**U.S. Cl. 16—97** **4 Claims**




1. A bracket assembly for the bottom of the lower panel of a sectional overhead door operable by rollers in a track system and counterbalanced by a tensioned cable comprising, an L-shaped plate overlying a portion of the inner surface and side edge of the lower panel, anchor means for securing the cable to said plate, a generally cylindrical sleeve affixed on said plate for receiving a shaft mounting one of the rollers, fastener means for attaching said L-shaped plate to the lower panel positioned to underlie a portion of said cylindrical sleeve and said shaft, and cut-out means in said cylindrical sleeve positioned substantially above said fastener means, whereby said fastener means may be removed only when said shaft is not positioned in said cylindrical sleeve.

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**5,495,641**

## KNOB TURNING DEVICE AND METHOD

**Patrick E. Going, 6545 White Falcon Ct., Colorado Springs, Colo. 80918, and William R. Youmans, 7235 S. Steele Cir., Colorado Springs, Colo. 80920**

**Filed Apr. 8, 1994, Ser. No. 224,233**

**Int. Cl.[6] E05B *1/04***

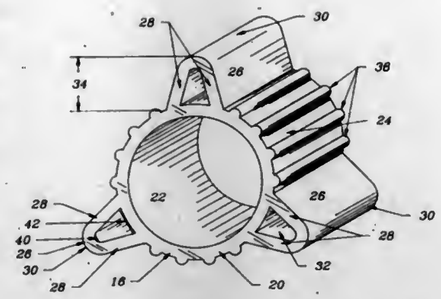
**U.S. Cl. 16—121** **9 Claims**

1. A device for turning a knob, comprising:

a. a substantially round cover with an interior and an exterior, suitable for snugly surrounding the knob when said interior is placed in contact with the knob, and

b. a plurality of resilient levers protruding from the exterior of said cover,

c. wherein each resilient lever further comprises two, prongs extending toward said cover from a rounded apex, each of which prongs surrounds a U-shaped air space, each of which prongs is attached at one end to the rounded apex and at the other end to the exterior of said cover.




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**5,495,642**

## METHOD AND APPARATUS FOR DETACHING FIBER TUFTS FROM TEXTILE FIBER BALES AS A FUNCTION OF BALE HEIGHT

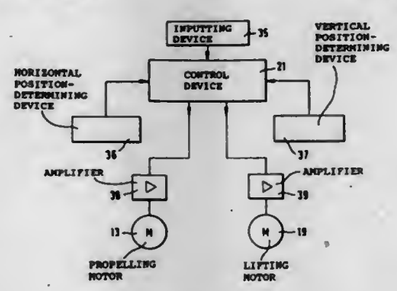
**Hans Trützschler, Mönchengladbach, Germany, assignor to Trützschler GmbH & Co. KG, Mönchengladbach, Germany**

**Filed Sep. 23, 1994, Ser. No. 311,589**

**Claims priority, application Germany, Sep. 24, 1993, 43 32 496.7; Jun. 28, 1994, 44 22 574.1**

**Int. Cl.[6] D01G *7/06;7/14***

**U.S. Cl. 19—80 R** **21 Claims**




1. In a method of detaching fiber tufts from an upper surface of fiber bales by a detaching device, each fiber bale having, prior to performing a detaching operation thereon, a height portion defining an upper zone in which a fiber density increases downwardly; a height portion defining a lower zone in which the fiber density decreases downwardly; and a heighi portion defining a middle zone in which the fiber density is at a maximum, constant value as viewed vertically; including the steps of

propelling the detaching device at a travelling speed above the fiber bales in forward and return passes;

detaching fiber tufts from the upper bale surface during the passes;

periodically displacing the detaching device with a vertical feed as the bales are consumed; and

advancing the removed fiber tufts to a fiber tuft advancing device;

the improvement comprising the step of increasing said travelling speed in said lower zone as a function of the decreasing actual height of the fiber bales.



**5,495,643**

## METHOD AND APPARATUS FOR CONTROLLING THE ROCKING OF A NIPPER FRAME IN A LAP NIPPING MECHANISM FOR A COMBER

**Mutsuhiko Katori, Nagoya, Japan, assignor to Kabushiki Kaisha Hara Shokki Seisakusho, Gifu, Japan**

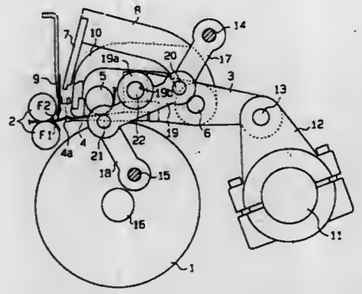
**PCT No. PCT/JP94/01018, § 371 Date Jan. 4, 1995, § 102(e) Date Jan. 4, 1995, PCT Pub. No. WO95/03440, PCT Pub. Date Feb. 2, 1995**

**PCT Filed Jun. 24, 1994, Ser. No. 362,543**

**Claims priority, application Japan, Jul. 21, 1993, 5-180472**

**Int. Cl.[6] D01G *19/16***

**U.S. Cl. 19—225** **9 Claims**




1. A method of controlling the rocking of a nipper frame in a comber which comprises:

a pair of detaching rollers for feeding a fleece forward and backward;

a combing cylinder for combing a lap supplied thereto to produce a succeeding fleece;

a top comb for combing the rear end of said succeeding fleece;

a nipper frame, disposed above said combing cylinder, to be rocked forward and backward;

a cushion plate mounted on said nipper frame at a distal end portion thereof;

a nipper member which repeatedly approaches and moves away from said cushion plate in response to the rocking of said nipper frame, and which nips the lap in cooperation with said cushion plate;

a nipper shaft pivotable in forward and reverse directions;

a driving arm which is fixed on said nipper shaft and whose distal end is pivotably linked to said nipper frame at its rear end; and

a four-node link mechanism having two stationary pivots and two movable pivots with a connector located therebetween, said connector and the front portion of said nipper frame being pivotably linked together, wherein said nipper frame and said cushion plate rock in a predetermined rocking section in response to the driving action of said nipper shaft and said driving arm,

said method comprising the steps of:

rocking said nipper frame such that the tip of said cushion plate moves along an upward projecting arc in a rear section of said predetermined rocking section where the tip of said cushion plate moves in proximity to said combing cylinder while nipping the lap in cooperation with said nipper member; and

rocking said nipper frame such that the tip of said cushion plate moves along a downward projecting arc in a front section of said predetermined rocking section where the tip of said cushion plate approaches said pair of detaching roller with releasing the lap which was nipped in cooperation with said nipper member.

**5,495,644**

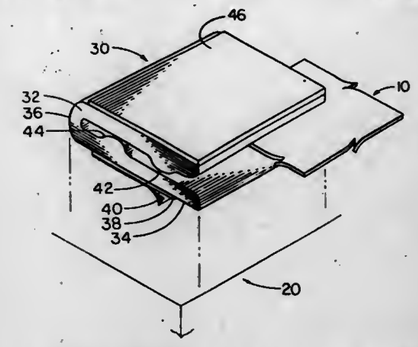
## ORNAMENTAL GRIPPING DEVICE FOR HOLDING GIFT CARDS ONTO GIFT PACKAGES

**James A. Mesher, 4800 Phinney Ave., N., #4, Seattle, Wash. 98103, and Ofra R. Haviv-Levy, 7600 SE. 29th St., #101, Mercer Island, Wash. 98040**

**Filed Jun. 14, 1994, Ser. No. 259,490**

**Int. Cl.[6] B42F *1/00;* A44B *21/00***

**U.S. Cl. 24—3.12** **6 Claims**




1. An ornamental gripping device for releasing and holding a gift card to a gift package, comprising:

a. a U-shaped gripping device with first and second side members spaced apart and aligned in a parallel manner, said first and second side members being joined together at one end, said first and second side members capable of applying sufficient clamping force on said gift card when placed therebetween to thereby enable the gift card to be selectively attached to said gripping device, said first and second side members each having outside and inside surfaces;

b. an ornamental means located on said outside surface of said first side member; and,

c. an adhesive means located on said outside surface of said second side member enabling said gripping device to be attached to said gift package.

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**5,495,645**

## TYING METHOD AND MEMBER

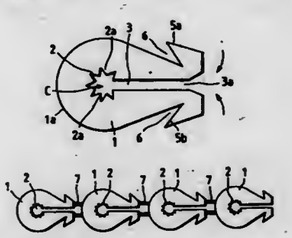
**Seiichi Suzuki, and Yutaka Kamura, both of Tokyo, Japan, assignors to Max Co., Ltd., Tokyo, Japan**

**Filed Sep. 7, 1993, Ser. No. 116,763**

**Claims priority, application Japan, Sep. 7, 1992, 4-264263**

**Int. Cl.[6] B65D *77/00***

**U.S. Cl. 24—30.5 S** **11 Claims**




1. A tying member comprising:

a flat flexible material portion having an edge, said material portion having a first opening formed therethrough which is spaced away from said edge, and a second opening defining a slot which communicates with said first opening and extends to said edge, said slot defining opposing first and second side regions on either side of said slot, a part of said first side

region being engageable in overlapping manner with a part of said second side region;

wherein said first and second side regions comprise first and second mating members, respectively, which engage with each other by making use of the flexibility of said material portion, said mating members being provided on the respective sides of said slot adjacent to said edge of said material portion,

wherein, when said part of said first side region is engaged with said part of said second side region, said material portion adopts a conical shape with said first opening disposed at an apex of the cone and a constrictive tying force is imparted at said first opening.

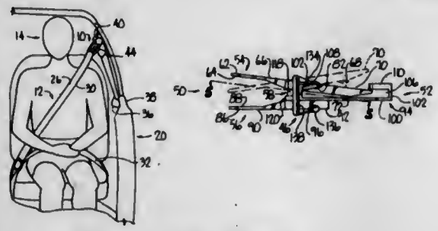
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**5,495,646**

## SEAT BELT COMFORT CLAMP

**Edward D. Scrutchfield, 2313 Waterfield Dr., Blue Springs, Mo. 64014, and Drake L. Koch, Kansas City, Mo., assignors to Edward D. Schrutchfield, Blue Springs, Mo.**

**Filed Jul. 27, 1994, Ser. No. 281,068**
**Int. Cl.[6] A44B *11/00*; A62B *35/00***
**U.S. Cl. 24—500** **15 Claims**



1. A seat belt comfort clamp, comprising:

a clamp assembly having first and second arms and pivot means for pivotally coupling said first and second arms together, said pivot means defining an axis extending substantially parallel to the seat belt, and said first arm being pivotal between an open position and a closed position; and

a means for biasing said first arm from said open position to said closed position,

said first and second arms being adapted to engage opposite sides of the seat belt and secure the seat belt in a comfortable position when said first arm is in said closed position, and

said second arm including a guide means for slidably and adjustably coupling the comfort clamp to the seat belt when said first arm is in said open position,

said guide means including a first surface and a second discontinuous surface spaced apart from said first surface, said second discontinuous surface being adapted to receive the width of the seat belt therethrough and said first and second surfaces of said guide means slidably and adjustably receiving the seat belt therebetween.

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**5,495,647**

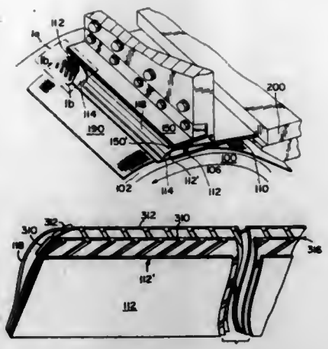
## COMPRESSIVELY TREATING FLEXIBLE SHEET MATERIALS

**Richard R. Walton, Boston; George E. Munchbach, Roslindale, both of Mass., and Richard C. Walton, 30 Old Orchard Rd., Sherborne, Mass. 01770, assignors to Richard C. Walton, Boston, Mass.**

**Filed Feb. 22, 1993, Ser. No. 20,551**
**Int. Cl.[6] D06C *21/00*; *23/04***
**U.S. Cl. 26—18.6** **20 Claims**

18. A method for manufacture of knit fabric, comprising the steps:

knitting yarn into a knit tube;



processing said knit tube in a processing line that includes apparatus to slit said knit tube into a flat configuration, wherein as a by-product of said processing, said web is deformed to have variations in density across its length and width;

processing said deformed web in a microcreping apparatus comprising:

a cylindrical drive roll for advancing the web,

a smooth-surfaced primary member arranged over the drive roll to press the web into driven engagement with the drive roll, and

a generally-stationary retarder downstream of said primary member positioned to engage and retard the web before the web has left said drive roll, said retarder defining

an initially-effective retarder surface facing the web, comprising a large multiplicity of parallel ridges and grooves in a set extending across the width of the web to be treated, the ridges and grooves being uniformly biased at an angle to the direction of drive of the web, said ridges and grooves being effective to longitudinally compress the web and to orient the web to flow at a flow angle to the original direction of drive of the web induced by said drive roll, and

a reorienting retarding surface disposed to be effective after an incremental advance of the web at said flow angle, said reorienting retarding surface constructed to have a supplementary retarding effect that is cooperative with said drive roll to reorient the travel of the web to a direction generally parallel to said original direction of drive;

said microcreping processing effective to reduce the variation of density of said web across its length and width.

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**5,495,648**

## SNAP-IN RECESSED INSERT FOR DISH OF BURIAL CASKET

**Ilija Rojdev, Fairfield, Ohio, and Will Schebler, Batesville, Ind., assignors to Batesville Casket Company, Inc., Batesville, Ind.**

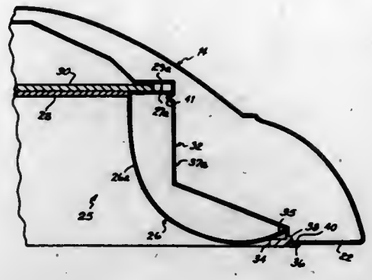
**Filed Jan. 6, 1995, Ser. No. 369,350**
**Int. Cl.[6] A61G *17/00***
**U.S. Cl. 27—19** **21 Claims**

1. In a burial casket having a lid hingedly connected to a body, the lid having a hollow internal side substantially surrounded by a flange and an interior therein, the interior comprising:

a recessed insert connectably received within the internal open side of the lid, the recessed insert having an outwardly extending ledge engaging the flange and the recessed insert further having an inwardly extending ledge;

a dish removably mounted within the recessed insert, the dish including a puffing with a plurality of puffing sections, each of the puffing sections having an inner edge and an outer edge, the outer edges of the puffing sections held in place by the inwardly extending flange of the recessed insert;





the dish further including,

a backing member located adjacent to and supporting the inner edges of the puffing sections, and

a panel insert held within the puffing sections adjacent the backing member, whereby the border, the backing member and the panel insert are removable from the recessed insert and the recessed insert is removable from the lid.

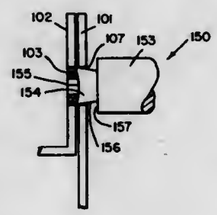
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**5,495,649**

## TOOL FOR SEPARATING A PAIR OF OPPOSITELY DISPOSED SPOT-WELDED SHEET METAL PANELS

**James A. Long, 1741 Jim Long Rd., Hillsboro, Tenn. 37342**

**Division of Ser. No. 159,161, Nov. 30, 1993, Pat. No. 5,349,737. This application Sep. 23, 1994, Ser. No. 311,584**
**Int. Cl.[6] B25B *27/14*; B26F *1/00***
**U.S. Cl. 29—275** **3 Claims**



1. A tool for applying pressure between a pair of oppositely disposed spot-welded sheet metal panels for separating the panels, comprising:

a base;

a cylindrical portion extending from the base and, said cylindrical portion having a front end and a rear end and having a portion at its rear end to be received by an actuating device;

a projecting member mounted at the front end of said cylindrical portion so to contact a hole in a first spot-welded sheet metal panel, said projecting member having a top portion having a concave profile and side portions having a conical profile;

said cylindrical portion having a shoulder at its front end for limiting movement of said projecting member through the panel and having larger cross-sectional width than the diameter of said projecting member, said shoulder providing sole support for said projecting member and providing no obstruction of access of said projecting member to said panels;

said projecting member having a minimum length which is selected to be greater than the thickness of said first sheet metal panel, so that when a pulsating movement is applied to said hole in said first sheet metal panel the second sheet metal panel with a remaining spot-weld is separated from said first sheet panel.

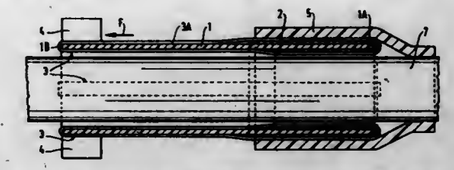
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**5,495,650**

## TUBULAR SUPPORT FOR INSTALLING A CONTRACTABLE ELASTIC SLEEVE

**Denis Crepel, Eremboddegem, and Jozef Cardinaels, Lochristi, both of, Belgium, assignors to Euromold, Brussels, Belgium**

**Filed Jun. 24, 1994, Ser. No. 265,156**
**Claims priority, application France, Jun. 25, 1993, 93 07774**
**Int. Cl.[6] B23P *19/02***
**U.S. Cl. 29—235** **13 Claims**



1. A tubular support for installing a contractable elastic sleeve, the support receiving the expanded sleeve for the purpose of installing it on a rigid cylindrical element threaded through said support, the support comprising a rigid tube and a film having a low coefficient of friction covering the outside surface of the rigid tube over at least a fraction of the length of the rigid tube and running substantially from a front end thereof, which end corresponds to a front margin of said film, wherein said film is mounted so as to be completely free relative to said rigid tube, and wherein the tubular support also includes guide and drive means for said film for guiding and driving said film from the outside surface of said rigid tube, around the front end, and along the inside surface of said rigid tube.

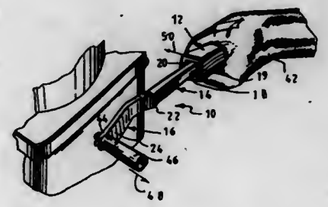
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**5,495,651**

## HAND TOOL FOR REMOVING HOSES

**Kurtis K. Tsuha, 91-920 Laaulu St.; Unit A, Ewa Beach, Hi. 96706**

**Filed Nov. 4, 1994, Ser. No. 334,045**
**Int. Cl.[6] B23P *19/02***
**U.S. Cl. 29—235** **2 Claims**



1. A hand held tool for prying a hose from a mounting pipe, comprising;

removable grasping handle means having a square blind bore;

an elongated slender shaft having a square end inserted into said square blind bore and a pry bar means disposed on the opposite end,

said pry bar means comprising;

a substantially flat end portion having upper and lower surfaces;

a U-shaped slot cut into a distal end of said flat end portion to form a pair of substantially parallel prongs which are "U" shaped slot meeting said upper and lower surfaces of said flat portion at sharp corners so as to prevent pinching together of the hose as it is pried from the mounting tube;

double fulcrum means for improving the prying efficiency, said double fulcrum means comprising an intermediate flat lower surface and an inner flat lower surface, a first fulcrum means formed by a bend between said lower surface of said substantially flat end portion surface and said intermediate

flat lower surface for providing a large force advantage during a first part of a prying action, a second fulcrum means formed by a bend between said intermediate flat lower surface and said inner flat lower surface for providing a large motion advantage during a second part of the prying action.

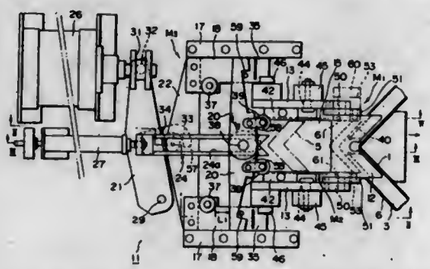
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5,495,652

## INSERTION MECHANISM, A CAULKING MECHANISM AND AN INSERTION/CAULKING DEVICE

**Masatoshi Kitamura, and Eitarou Sakurai, both of Daito, Japan, assignors to Nawaseikiseisakusho Corporation, Osaka, Japan**

**Filed Jun. 30, 1994, Ser. No. 268,513**
**Claims priority, application Japan, Jul. 5, 1993, 5-165486**
**Int. Cl.[6] B23P *19/00*; B23Q *7/10***
**U.S. Cl. 29—243.5** **3 Claims**



1. A corner piece insertion mechanism for inserting an L-shaped corner piece into corner portions of concave outward flanges formed on open edges of a duct having a rectangular cross section comprising:

a pair of vertically swingable push arms parallel to each other, the push arms having a forward end and a rearward end;

a vertically swingable swing arm having a forward end supported at the forward end of each of the push arms through support pins;

a vertically swingable pressure member for contacting with and pushing down the corner piece supported at the forward end of each of the swing arms through swing pins;

a stopper pin on each of the push arms for restricting the swing arms from rising at their forward ends beyond a specified angle relative to the push arms; and

the rearward ends of the push arms being connected to and interlocked with a drive actuator through a drive force transmission mechanism for driving the push arms in a vertical direction.

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5,495,653

## APPARATUS AND METHOD FOR DISPLAYING AND DISPENSING CHAIN OR THE LIKE

**Lester N. Schrock, St. Charles, and Richard George, Winona, both of Minn., assignors to Peerless Chain Company, Winona, Minn.**

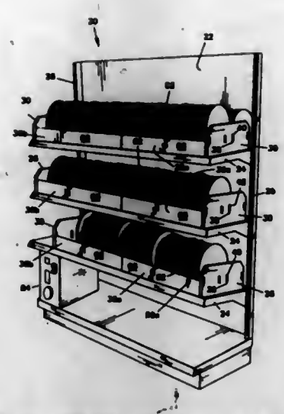
**Filed Aug. 1, 1994, Ser. No. 285,631**
**Int. Cl.[6] B21K *21/16*; A47F *5/00***
**U.S. Cl. 29—401.1** **6 Claims**

4. A method of making a display dispensing apparatus for chain utilizing an existing shelf, the method comprising the steps of:

telescopically interconnecting two V-shaped members to one another so as to form a V-shaped support;

attaching the V-shaped support to two side plates at opposite sides of the V-shaped support by inserting projections on the V-shaped members into apertures in the side plates;

fastening the side plates to the shelf; and



positioning reels containing chain product on the V-shaped support.

6. A display apparatus including:

a pair of spaced apart side plates, each of the side plates including apertures;

two telescopically engageable, generally V-shaped members including projections, the V-shaped members being connectable to the side plates by insertion of the projections on the V-shaped members through the apertures in the side plates.

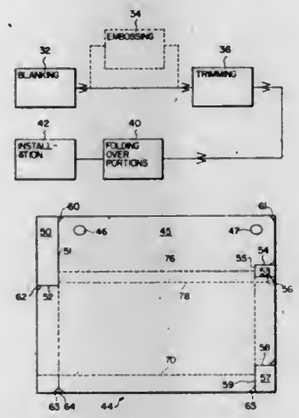
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5,495,654

## PREPARING SHEET METAL AND FABRICATING ROOFING SHINGLES

**Robert R. Goodhart, New Cumberland, W. Va.; Jane M. Brown, and William E. Carnahan, both of Toronto, Ohio, assignors to Weirton Steel Corporation, Weirton, W. Va.**

**Filed Apr. 8, 1994, Ser. No. 225,326**
**Int. Cl.[6] B23P *17/00***
**U.S. Cl. 29—527.4** **14 Claims**




1. Preparation of sheet metal and fabrication of roofing shingle structures, comprising the steps of:

(A) processing flat-rolled sheet metal to preselected thickness gage, mechanical properties and surface characteristics;

(B) cutting the flat-rolled sheet metal into generally-rectangular-configuration unitary blanks, each for fabricating into a unitary roofing shingle structure,

such a unitary structure having:



a horizontally-directed axis extending in a direction which is substantially coincident with assembling shingle structures in side-by-side interfitting relationship in a substantially-horizontal direction to provide roof covering, and

a vertically-directed axis in substantially right-angled relationship to such horizontally-directed axis and extending in a direction in which shingle structures are assembled in overlapping relationship to provide a roof covering;

(C) designating portions of the unitary blank to be cut away from and portions to be folded over in relation to remaining portions of the unitary blank for fabrication of a shingle structure having an exterior and an interior surface, such exterior surface presenting:

an upper cover portion which, during roofing assembly of shingle structures in overlapping relationship in such vertical direction, is covered by next vertically-adjacent course shingle structure means in an upward direction, and

a lower course portion which remains exposed during roofing assembly of shingle structures in such vertical direction overlapping relationship and in such horizontal direction interfitting side-by-side relationship;

(D) cutting away portions of such unitary blank to assist in providing for folding over sheet metal layers of the shingle structure being fabricated;

(E) folding over a vertically-extending sheet metal layer on each lateral side of the shingle structure along at least such lower course portion, with

one such lateral edge layer being folded over onto the exterior surface of the shingle structure being fabricated, and

the remaining lateral edge layer being folded over onto the interior surface of such shingle structure, with

each such lateral edge sheet metal layer being folded over along such lower course portion so as to enable receiving a folded over lateral edge sheet metal layer located on an opposite surface of a contiguous shingle structure to provide a weatherproofing interlock along each lateral side of an exposed course portion as part of side-by-side assembly of shingle structures in such generally horizontal direction for roof covering;

(F) folding over sheet metal layers extending in such horizontal direction, including:

folding over a lower edge sheet metal layer so as to form a horizontally-extending upwardly-opening slot for receiving a portion of a vertically-adjacent shingle structure, and

folding over multiple sheet metal layers along a centrally-located horizontally-extending portion of the shingle structure to extend between its lateral sides and be positioned contiguous to a location separating the upper cover portion from the lower exposed course portion of the shingle structure, with

such centrally-located horizontally-extending folded-over multiple sheet metal layers defining horizontally-extending centrally-located slot means for distal end intercoupling with folded-over multiple sheet metal layers defining a horizontally-extending centrally-located slot means of an adjacent side-by-side shingle structure being assembled in such horizontal direction.

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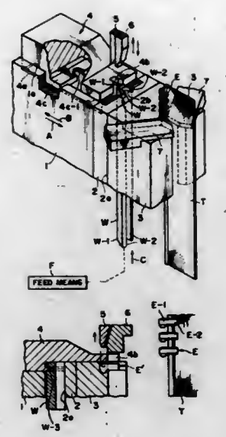
5,495,655

## METHOD AND APPARATUS FOR FORMING SLIDE-FASTENER COUPLING ELEMENT

**Koitsu Morioka, Toyama, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan**

**Filed Jun. 21, 1994, Ser. No. 263,375**
**Claims priority, application Japan, Jun. 22, 1993, 5-150614**
**Int. Cl.[6] B21D *53/52***
**U.S. Cl. 29—410** **3 Claims**

1. A method of forming a slide-fastener coupling element, of the type in which a continuous metal wire having a substantially Y-shaped cross section including a head portion and a pair of leg portions is intermittently fed in a vertically upward direction through a cutoff die at a predetermined pitch, then the metal wire is




cut into a blank piece of an individual product thickness by a co-action between a cutting edge formed at a rear end of the cutoff die reciprocally movable rearwards and forwards by a ram and a cutting edge of a fixed cutoff punch relatively slidable on the reciprocating cutoff die, and thereafter a head portion of the blank piece is shaped into a coupling head by a co-action between a head-forming die attached to a front end of the cutoff die and a pocket-forming punch disposed above a head-forming position and vertically reciprocally movable toward and away from the head-forming die in synchronism with the reciprocating movement of the head-forming die, wherein the improvement comprises:

substantially at the same time one blank piece is cut off from the metal wire, chamfering the metal wire along a next cutting line to form a substantially V-shaped groove extending in and along the peripheral surface of the head portion and the outside surface of each of the leg portions of the metal wire.

3. An apparatus for forming a slide-fastener coupling element having a coupling head and a pair of legs, of the type including means for intermittently feeding a continuous metal wire having a substantially Y-shaped cross section including a head portion and a pair of leg portions in a vertically upward direction at a predetermined pitch, a horizontally reciprocating ram, a cutoff die having a vertical guide groove for the passage therethrough of the metal wire and driven by said ram to reciprocate across the passage of the metal wire, a head-forming die attached to a front end of said cutoff die, a fixed cutoff punch having a cutoff edge formed at a front end thereof and relatively slidable on a top surface of said cutoff die to cut off a blank piece from the metal wire, and a pocket-forming punch disposed on a head-forming position and vertically reciprocally movable in synchronism with the reciprocating movement of said head-forming die so as to shape a head portion of the sliced blank piece into a coupling head of a finished coupling element, wherein the improvement comprises:

a chamfering blade provided on said cutoff punch and having a chamfering edge horizontally and rearwardly spaced from said cutting edge of said cutoff punch, said chamfering edge being vertically and downwardly spaced from said top surface of said cutoff die by a distance equal to said thickness of the sliced blank piece, said chamfering edge having a substantially equilateral triangular cross section and being complementary in shape with the contour of a corresponding portion of the metal wire defined by the peripheral surface of the head portion and the outside surface of each of the leg portions of the metal wire, a contour defining the chamfering edge being slightly smaller in size than the contour of the metal wire.

**5,495,656**

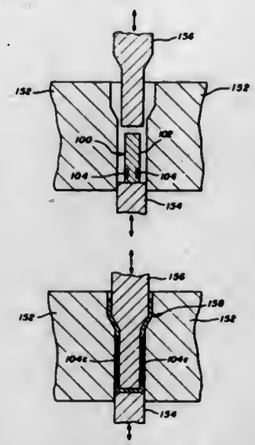
## METHOD OF MAKING BLANKS AND CLAD PARTS

**John P. Waggoner, Decatur, Ind., assignor to Amcast Industrial Corporation, Dayton, Ohio**

**Continuation of Ser. No. 144,142, Oct. 27, 1993, abandoned, which is a continuation-in-part of Ser. No. 110,069, Aug. 19, 1993, abandoned. This application Mar. 1, 1995, Ser. No. 396,871**

**Int. Cl.[6] B23P** *17/00*

**U.S. Cl. 29—417** **9 Claims**



1. A method for making a clad part having a portion clad with a brazing alloy for securing said part to another part, said method comprising the steps of:

forming a blank having a brazing alloy clad material affixed to form a first portion of an outer surface area of said blank, said first portion of said outer surface area of said blank comprising said brazing alloy material;

inserting said blank into a die; and

inserting a punch into said die to forge said blank by substantially expanding said outer surface area of said blank including said first portion of said outer surface area of said blank to form said clad part to have an integral coating of said clad material on a first portion of an expanded outer surface area of said clad part, said first portion of the expanded outer surface area of said clad part being substantially larger than said first portion of the outer surface area of said blank.

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**5,495,657**

## METHOD FOR PRODUCING A COMMUTATOR MOTOR

**Pius Zeisner, Arnstein, and Peter Adam, Hoechberg, both of, Germany, assignors to Siemens Aktiengesellschaft, Germany**

**Filed Jul. 21, 1994, Ser. No. 278,305**

**Claims priority, application European Pat. Off., Apr. 8, 1994, 94105474**

**Int. Cl.[6] H02K** *15/14*

**U.S. Cl. 29—597** **12 Claims**

1. A method for producing a commutator motor having a brush holder, on the stator side, in which brushes are guided and are pressed against a commutator such that they make contact, having the following method steps:

(a) the brushes are initially locked, by means of a restraining part, in a radially raised installed position;

(b) the restraining part is held in a preinstalled manner in the brush holder;

(c) before being installed on the stator side, the brush holder is placed onto one end part of an installation mandrel, the brushes remaining in an installed position, by resting on the circumferential surface of the installation mandrel, as a result of axial displacement of the restraining part;

(d) the installation mandrel is moved such that its other end part, which corresponds at least to the external diameter of the commutator, is in a coaxial position with respect to the commutator, and the brush holder with the brushes is subsequently moved, by further axial displacement along the installation mandrel, into its axial end position, in terms of operation, relative to the commutator;

(e) the installation mandrel is removed by axial withdrawal, the brushes sliding radially onto the commutator.

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**5,495,658**

## METHOD OF MAKING CYLINDRICAL FERROMAGNETIC BODY AND COVER ASSEMBLY FOR ROTOR OF DC MOTOR

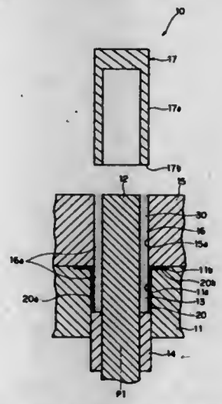
**Toshiyuki Teshigawara, Maebashi, and Yoshikazu Kokubun, Gunma, both of, Japan, assignors to Sanden Corp., Isesaki, Japan**

**Filed Jul. 13, 1994, Ser. No. 274,636**

**Claims priority, application Japan, Jul. 16, 1993, 5-197710**

**Int. Cl.[6] H02K** *15/02*

**U.S. Cl. 29—598** **8 Claims**



1. A method of making a cylindrical ferromagnetic body and cover assembly for a rotor of a dc motor, the method comprising the steps of:

(a) preparing a generally cylindrically-shaped non-magnetic cover element, said cover element having a cylindrical body having a top end and an outwardly extending annular flange around said top end;



(b) forming an elongated vertical cylindrical space by said cover element and a plurality of molds, said elongated cylindrical space being coaxial with said cylindrical body of said cover element and partially defined by a cylindrical internal periphery of said cylindrical body of said cover element;

(c) depositing a predetermined quantity of a powdered ferromagnetic material including a heat-curable binder in said vertical cylindrical space;

(d) compressing downwardly said powdered ferromagnetic material deposited in said vertical cylindrical space to form a cylindrically-molded ferromagnetic material in a manner that the top thereof is at a level in a proximity of the level of said annular flange;

(e) heating up said cylindrically-molded ferromagnetic material to a predetermined high temperature so that said heat-curable binder is cured and said cylindrically-molded ferromagnetic material firmly adheres to said cover element; and

(f) bending said annular flange of said cover element radially inwardly over to a top of said cylindrically-molded ferromagnetic material so as to obtain a cylindrical ferromagnetic body and cover assembly.

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**5,495,659**

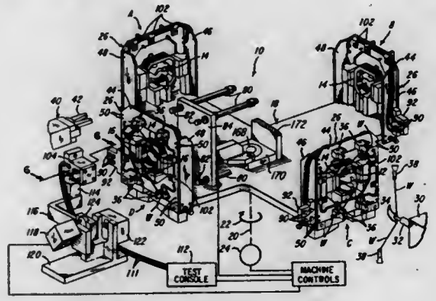
## STATOR MANUFACTURING APPARATUS

**John M. Beakes, Fairborn, and Lawrence E. Newman, Tipp City, both of Ohio, assignors to Globe Products Inc., Huber Heights, Ohio**

**Filed Mar. 30, 1994, Ser. No. 219,847**

**Int. Cl.[6] H02K** *15/085*

**U.S. Cl. 29—736** **8 Claims**




1. Stator manufacturing apparatus comprising:

a stator support for a stator to be manufactured;

plural temporary wire clamps;

structures that support said wire clamps in fixed relation to said stator support;

mechanisms for moving said support with a stator core mounted thereon along with said clamps into a winding station and from the winding station to a coil lead terminating station;

mechanisms at said winding station that wind coils of wire on said stator core and insert lead wires extending to and from said coils into said wire clamps;

mechanisms at said coil lead terminating station that connect said lead wires to terminals or terminal supports affixed to said stator core by steps including the drawing of the coil lead wires from said temporary clamps;

wherein each of said wire clamps comprises a fixed clamp jaw having a first clamping surface, a pivotal clamp jaw having a second clamping surface confronting said first clamping surface, and a clamp spring biasing said movable clamp jaw so that said second clamping surface presses against said first clamping surface, said second clamping surface moving away from said first clamping surface when a coil lead wire is inserted between said clamp jaws at said winding station; and

plural air operated actuators, one for each of said temporary wire clamps, located adjacent said coil lead terminating station, each of said actuators engaging its associated said pivotal clamp jaw to pivot it against the bias of its associated clamp spring to move said second clamping surface thereof away from its associated first clamping surface to ensure release of the lead wire gripped thereby.

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**5,495,660**

## APPARATUS FOR INSERTING ROTATION SHAFT OF SMALL-SIZED MOTOR INTO GEAR

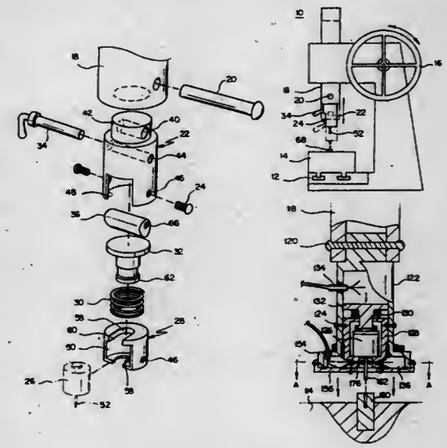
**Young Suk Choi, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea**

**Filed Aug. 29, 1994, Ser. No. 297,216**

**Claims priority, application Rep. of Korea, Aug. 28, 1993, 93-16926; Aug. 30, 1993, 93-16975; Aug. 30, 1993, 93-16990**

**Int. Cl.[6] H02K** *15/00;* **B23P** *19/04*

**U.S. Cl. 29—732** **10 Claims**



1. An apparatus for inserting a shaft of a motor into a gear, said apparatus comprising:

a hand press having a substrate with a bottom portion, a vertical portion and a ceiling portion, a chuck suspended by said ceiling portion and a handle for moving the chuck in an up/down direction attached to said substrate;

a means for fixing a gear provided on the bottom portion of said hand press;

a cylindrical housing having a closed upper end, said cylindrical housing being fixedly inserted in a lower portion of said chuck;

a motor fixing means having a motor receiving portion for fixing said motor at a lower portion thereof, said motor fixing means being inserted in a lower portion of said cylindrical housing;

a piston between the closed upper portion of said cylindrical housing and an upper portion of said motor, said piston being provided with a spring, a lower portion of said piston being forwarded into said motor fixing means to push and to support a rear end portion of said motor by applying a pushing force onto an upper portion of said piston; and

a pushing cam provided on the upper portion of said piston for applying the pushing force by operating an external lever.

**5,495,661**

## APPARATUS FOR EQUIPPING PRINTED CIRCUITED BOARDS

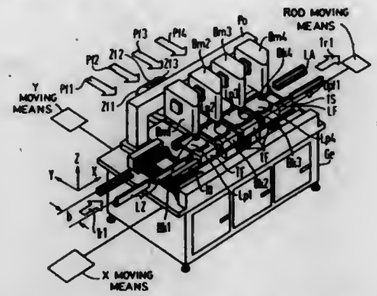
**Kurt Gromer, Kraichtal; Franz Haan, Bruchsal; Werner Jung, Waghaeusel-Wi, and Friedrich Pedall, Karlsdorf-Neuthard-K, all of, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany**

**Filed Jan. 28, 1992, Ser. No. 827,020**

**Claims priority, application Germany, Jan. 28, 1991, 41 02 461.3**

**Int. Cl.[6] H05K** *3/30*

**U.S. Cl. 29—740** **14 Claims**




1. An apparatus for automatically equipping printed circuit boards with components, comprising:

equipping modules arranged at a distance from one another, each of said equipping modules including equipping heads operable to position the components at predetermined equipping positions on the printed circuit boards, said equipping heads being arranged at a predetermined substantially uniform spacing from one another;

printed circuit board displacement means for substantially simultaneously moving a plurality of the printed circuit boards so that each of said printed circuit boards are moved to a same position relative to corresponding ones of said equipping heads, one of the printed circuit boards is positioned at an equipping position relative to a selected one of said equipping heads, said printed circuit boards being maintained at a spacing from one another corresponding to said predetermined unIform spacing of said equipping heads;

means for actuating the selected one of said equipping heads when the one of the printed circuit boards has been moved to the equipping position by said printed circuit board displacement means to position the component on the one of the printed circuit boards; and

printed circuit board conveyer means for clock step-by-clock step conveying of the printed circuit boards from equipping module to equipping module while maintaining said spacing of the printed circuit boards so that an unequipped circuit board is moved in a conveying direction to a first of said equipping heads and an equipped printed circuit board is discharged from a last of said equipping modules at every clock step.

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**5,495,662**

## CABLE GUIDE FOR A TERMINAL CRIMPING APPARATUS

**Yoshio Nitta, and Sadahiko Hachino, both of Kanazawa, Japan, assignors to Sumitomo Wiring Systems, Ltd., Mie, Japan**

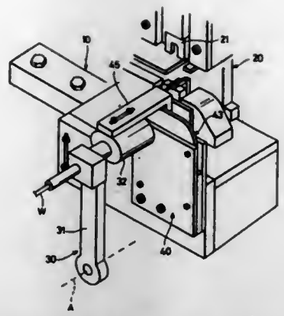
**Filed Feb. 3, 1994, Ser. No. 190,845**

**Claims priority, application Japan, Feb. 9, 1993, 5-045905**

**Int. Cl.[6] H01R** *43/04*

**U.S. Cl. 29—753** **11 Claims**

1. A cable guide for a terminal crimping apparatus for feeding a cable to a predetermined feeding position relative to an applicator



by turnably displacing and holding said cable-with a hand, said cable guide comprising:

a rigid guide member serving to guide lateral displacement of said cable to said predetermined feeding position relative to said applicator within the range of a displacement path for said cable;

a holding mechanism for resiliently holding said guide member to allow said cable to be displaced from said predetermined feeding position toward a caulking die of said applicator by a predetermined distance; and

a restricting piece disposed between said guide member and said applicator preventing said cable from being displaced in a direction opposite to that of the turnable displacement of said hand.

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**5,495,663**

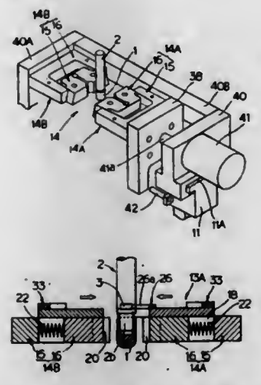
## APPARATUS FOR REMOVING AN ELECTRODE CHIP FROM A SHANK OF A RESISTANCE WELDING MACHINE

**Akihiro Saito, 864 Nakashinden, Ebina-shi, Kanagawa-ken, Japan**

**Filed Jun. 4, 1993, Ser. No. 72,176**

**Int. Cl.[6] B23P** *19/04*

**U.S. Cl. 29—762** **7 Claims**



1. Apparatus for removing an electrode chip from a shank of a resistance welding machine, said shank holding the electrode chip on one end of the shank, said apparatus comprising:

first and second shank holders movable transverse to an axis of the shank for engaging the shank from opposite directions;

first and second electrode chip holders movable in said opposite directions for gripping the electrode chip from said opposite directions;

and means for moving said electrode chip holders in a direction parallel to said axis of the shank and away from the one end of the shank while said shank holders engage the shank and said electrode chip holders maintain a grip of the electrode chip, thereby removing the electrode chip from the shank.



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**5,495,664**

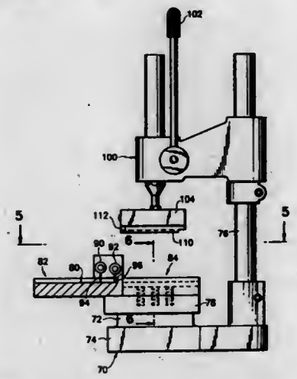
## APPARATUS FOR MAKING PERSONAL COMPUTER CARDS

**Harry K. Semple, Fanwood, and Carmine Bartiromo, West Orange, both of N.J., assignors to A.K. Stamping Co. Inc., Mountainside, N.J.**

**Filed Jul. 21, 1994, Ser. No. 278,640**

**Int. Cl.[6] B23P** *19/00*

**U.S. Cl. 29—823** **6 Claims**



1. Apparatus for making an accurately dimensioned personal computer card having a generally rectangular plan configuration including longitudinal sides and lateral ends, and a prescribed thickness along the longitudinal sides and lateral ends of the personal computer card from a blank having first and second enclosure members, each enclosure member having a generally rectangular plan configuration and including a panel, longitudinal side edges corresponding to the longitudinal sides of the personal computer card, and lateral end edges corresponding to the lateral ends of the personal computer card, channels integral with the panel of at least the second enclosure member and extending longitudinally along the longitudinal side edges of the second enclosure member, the channels having an external channel width extending altitudinally and corresponding to the prescribed thickness of the personal computer card along the longitudinal sides and the lateral ends of the personal computer card, and an internal channel width, and side walls integral with the panel of at least the first enclosure member and extending longitudinally along the longitudinal side edges of the first enclosure member, the side walls having a side wall width extending altitudinally, the relative dimensions and locations of the internal channel width and the side wall width being such that upon juxtaposition of the first and second enclosure member in opposed arrangement, the panels confront one another and the side walls of the first enclosure member are nested within the channels of the second enclosure member to secure the first and second enclosure members together with the panels opposed to one another and spaced apart to establish an enclosure of prescribed dimensions for accommodating an electronic device between the opposed panels, the apparatus comprising:

a frame;

a loading station on the frame;

a forming station on the frame downstream of the loading station along a longitudinal path of travel;

a carrier for holding the blank with the enclosure members juxtaposed with one another;

a track on the frame for guiding the carrier along the longitudinal path of travel from the loading station to the forming station;

closing elements on the frame and juxtaposed with the track between the loading station and the forming station for nesting the side walls of the first enclosure member with the channels of the second enclosure member as the carrier is moved from the loading station to the forming station;

forming dies at the forming station and juxtaposed with the longitudinal side edges when the carrier is located at the forming station; and

a press at the forming station for operating the forming dies to deform the nested side walls and channels when the carrier is located at the forming station to thereby qualify the prescribed dimensions of the enclosure and complete the accurately dimensioned personal computer card.

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**5,495,665**

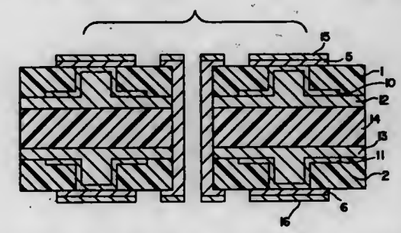
## PROCESS FOR PROVIDING A LANDLESS VIA CONNECTION

**Richard W. Carpenter, Johnson City, and Robert E. Ruane, Endicott, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Nov. 4, 1994, Ser. No. 336,107**

**Int. Cl.[6] H05K** *3/36*

**U.S. Cl. 29—830** **10 Claims**



1. A process for connecting at least two electrically conductive patterns through a dielectric material by a landless electrical connection which comprises:

(a) providing a dielectric substrate having a conductive plane on one of the major surfaces thereof and a temporary support layer covering said conductive plane, where by said conductive plane is located between said dielectric substrate and said temporary support layers;

(b) providing blind vias in said dielectric substrate;

(c) plating vias in said dielectric substrate and on said dielectric substrate with an electrically conductive material;

(d) removing said temporary support layer to thereby provide a landless electrical connection through said dielectric material whereby said conductive plane is available for providing external electrical conductive pattern.

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**5,495,666**

## METHOD FOR ASSEMBLING A CONNECTOR TO THE EDGE OF A CIRCUIT BOARD

**Iosif Korsunsky; Joanne E. Shipe, both of Harrisburg; Tod M. Harlan, Mechanicsburg; Gerald L. Foreman, Hummelstown; Robert C. Klotz, and Robert W. Brown, both of Harrisburg, all of Pa., assignors to The Whitaker Corporation, Wilmington, Del.**

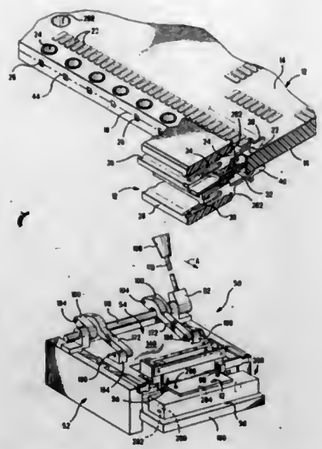
**Division of Ser. No. 116,170, Sep. 2, 1993, Pat. No. 5,444,906.**

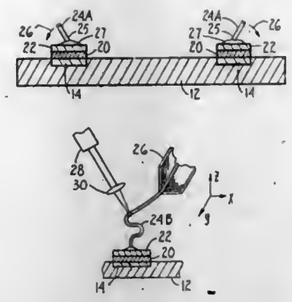
**This application May 26, 1995, Ser. No. 453,049**

**Int. Cl.[6] H05K** *3/32;* **H01R** *9/09*

**U.S. Cl. 29—834** **4 Claims**

1. A method for assembling an electrical connector to an edge of a circuit board by attaching leads of said connector to circuitry on at least one of first and second opposed major surfaces of said circuit board utilizing a machine for positioning said electrical connector with respect to said edge of a said circuit board, said





circuit board having a thickness between said opposed major surfaces and defining a plane that intersects the center of an edge surface of said edge and is substantially parallel with said major surfaces, said machine including: a frame; means attached to said frame for receiving said circuit board and positioning said second major surface with respect to said frame; sensing means for sensing the thickness of said circuit board; alignment means coupled to said frame and responsive to said sensing means for positioning said connector in a first position in alignment with said plane; and advancing means for moving said connector from said first position along said plane and in alignment therewith to a second position wherein said leads of said connector are in engagement with said circuitry on said circuit board, the method comprising the steps:

(a) securing said circuit board in said means for receiving said board;

(b) placing said connector in a connector holding module of said machine;

(c) sensing said thickness of said circuit board and aligning said connector in said first position with a centerline of said connector substantially coincident with said plane; and

(d) moving said connector from said first position along said plane and in alignment therewith to said second position in assembled engagement with said edge of said circuit board.

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**5,495,667**

**METHOD FOR FORMING CONTACT PINS FOR SEMICONDUCTOR DICE AND INTERCONNECTS**

**Warren M. Farnworth, Nampa; Salman Akram, and Alan G. Wood, both of Boise, all of Id., assignors to Micron Technology, Inc., Boise, Id.**

**Filed Nov. 7, 1994, Ser. No. 335,262**

**Int. Cl.[6] H01R *9/06***

**U.S. Cl. 29—843** **30 Claims**

1. A method for forming a contact structure on an interconnect, said contact structure adapted to establish an electrical connection with a contact location on a semiconductor die, said method comprising:

providing a substrate;

attaching a wire to the substrate using a method selected from the group consisting of wire bonding and welding;

heating and shaping the wire into a compliant structure during said attaching step; and

severing the wire to form a contact pin.

**5,495,668**

**MANUFACTURING METHOD FOR A SUPERMICRO-CONNECTOR**

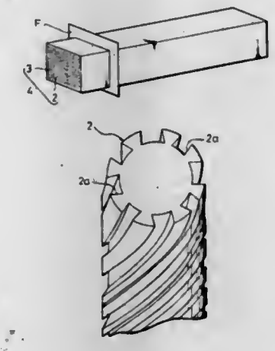
**Keisuke Furusawa, Yokohama; Takao Orimo, Machida, and Takuya Suzuki, Kawasaki, all of, Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan**

**Filed Dec. 19, 1994, Ser. No. 359,070**

**Claims priority, application Japan, Jan. 13, 1994, 6-015883; Jul. 14, 1994, 6-161728**

**Int. Cl.[6] H01R *43/16***

**U.S. Cl. 29—879** **30 Claims**



1. A manufacturing method for a supermicro-connector, comprising:

a step of fixing a plurality of conductor wires, arranged substantially parallel to one another, by means of an elastic insulator interposed between the conductor wires, thereby making a composite structure formed of the conductor wires and the insulator;

a step of cutting the composite structure along a plane extending at right angles to the conductor wires, thereby making a plurality of composite chips;

a step of removing the insulator from at least one cut surface of each of the composite chips by dissolution by means of an agent, thereby exposing respective end portions of the conductor wires for a predetermined length; and

a step of forming solder bumps individually on the respective exposed end portions of the conductor wires.



**5,495,669**

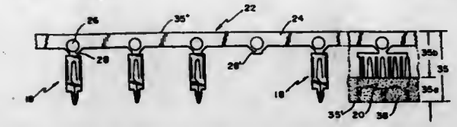
**METHOD OF MAKING BOX CONTACTS**

**Janos Legrady, Putnam Valley, and William S. Searles, Monroe, both of N.Y., assignors to Zierick Manufacturing Corp., Mt. Kisco, N.Y.**

**Division of Ser. No. 124,977, Sep. 21, 1993. This application Dec. 6, 1994, Ser. No. 349,975**

**Int. Cl.[6] H01R *43/00***

**U.S. Cl. 29—885** **2 Claims**



1. A method of manufacturing box contacts comprising the steps of advancing a continuous strip of metallic material along a predetermined path, said strip of metallic material having a predetermined width and provided with a solderable surface and defining first and second longitudinal edges; advancing a continuous strip of solder resistant tape along said predetermined path and juxtaposed with said strip of metallic material, said strip of tape having a width smaller than said predetermined width and provided with adhesive on a side facing said strip of metallic material; attaching said strip of tape to said metallic strip to cover a first continuous longitudinal surface portion of said metallic strip proximate to said first longitudinal edge to thereby leave exposed a second continuous longitudinal surface portion of said metallic strip proximate to said second longitudinal edge; die cutting and forming said attached strips to form upper portions of box contacts detachably connected to a continuous carrier strip formed from said second longitudinal surface portion and lower portions of box contacts and mounting legs for each box contact formed from said second continuous longitudinal surface portion, whereby said lower portions of the box contacts and mounting legs are at least partially covered with said solder resistant tape to prevent wicking into and blocking a lower open end of the box contact.

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**5,495,670**

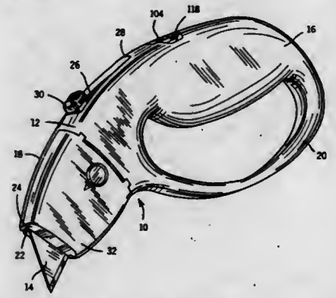
**UTILITY KNIFE**

**Charles E. Quinn, Sun Prairie, Wis., assignor to Fiskars Inc., Madison, Wis.**

**Filed May 4, 1995, Ser. No. 434,478**

**Int. Cl.[6] B26B *1/08***

**U.S. Cl. 30—162** **24 Claims**



1. A utility knife of the type adapted to support a retractable blade having an upper non-cutting edge and a lower cutting edge, the utility knife comprising:

a handle having an internal cavity for housing the retractable blade, a first slot in an end thereof through which the blade may be extended and retracted, and a carrier glideway extending within the cavity from the first slot, the first slot having opposed first and second lateral sides and opposed upper and lower edges extending between the first and second sides;

a blade guard secured to the handle and extending along the upper edge and over at least a portion of the first and second sides of the first slot;

a blade carrier configured to support the blade and movable along the carrier glideway within the cavity; and

an actuator including an actuating arm pivotally coupled to the blade carrier and an actuating button, the actuating button being movable along an elongated second slot in the handle to extend and retract the blade, the actuator also including a protrusion extending therefrom and engagable in notches within the handle for selectively securing the blade in extended and retracted positions.

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**5,495,671**

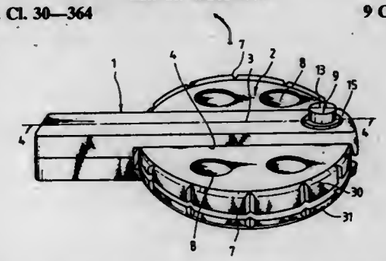
**APPARATUS FOR MULTI-SHAPE CUTTING**

**Wang Shun-Yi, F1.11-2, No. 7. Sec. 3, Hsin Sheng N. Rd., Taipei, Taiwan, Prov. of China**

**Filed Sep. 28, 1994, Ser. No. 313,874**

**Int. Cl.[6] B26F *1/04***

**U.S. Cl. 30—364** **9 Claims**



1. A paper punch device for forming a selectively-shaped paper cutout comprising:

(a) a cutting table assembly having an upper, a central, and a lower body member, each of said body members coaxially-aligned and coupled each to the other by a connecting means, said upper and lower body members being spaced apart by said central body member and having an axial central through opening for passage therethrough of said connecting means, said upper and lower body members being characterized by a substantially planar contour circumferentially defined about said axial central through opening by a side rim portion which has formed therein a plurality of elongate grooves, said upper body member having formed adjacent said side rim portion thereof a plurality of upper openings, said lower body member having formed adjacent to said side rim portion thereof a plurality of lower openings substantially aligned with said upper openings, each of said lower openings having a predetermined shape;

(b) a plurality of cutting means respectively and retractably captured within said upper openings, each of said cutting means including a mold body having a cutting surface opposing a corresponding one of said lower openings, said cutting surface being adapted to extend at least partially into said corresponding lower opening to cooperate therewith to form a paper cutout having said predetermined shape of said corresponding lower opening when said cutting means is actuated after a sheet of paper is inserted between said cutting surface of said mold body and said corresponding lower opening, said mold body being spring-biased in an upward direction to a retracted position and having formed thereon distal from said cutting surface a top shoulder portion for supporting said cutting means within a respective upper opening of said upper body member;

(c) a plurality of annular retaining rings coupled to said upper body member, each of said plurality of annular retaining ring being coupled to said upper body member adjacent said shoulder portion of a respective mold body for capturing said cutting means within a respective upper opening of said upper body member; and,

(d) a base assembly for supporting said cutting table assembly, said base assembly having a main body and a pair of support bracket arms extending therefrom, said support bracket arms rotatably capturing said cutting table assembly therebetween, said connecting means coupled to said support bracket arms, said base assembly having a locking pin retractably protruding from said main body for releasably engaging in a selective manner at least one of said side rim portion grooves of said upper and lower body members of said cutting table assembly, said base assembly having punching means for actuating said cutting means.

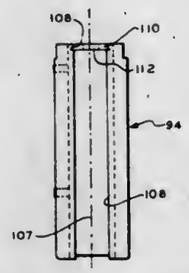
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**5,495,672**

**TUBE CUTTER**

**Simon Kritchever, Glenview, and Miles J. Dubinsky, Carol Stream, both of Ill., assignors to The Pullman Co., Lebanon, N.J.**

**Filed Aug. 29, 1994, Ser. No. 297,228**
**Int. Cl.[6] B26D *3/16***
**U.S. Cl. 30—97** **41 Claims**




1. A tube cutter for cutting a circular cylindrical tube comprising:
handle means;
power operated drive means secured to the handle means; and
tube cutter means secured to the handle means for receiving a tube to be cut and responsive to the drive means for cutting the received tube, said tube cutter means including means for rotating the cutter means about an axis in response to the drive means, said cutter means including first and second jaws including means for supporting and cutting a received tube, said cutter means including centering means coupled to said jaws for simultaneously moving and centering said jaws for positioning said received tube concentric with said axis.

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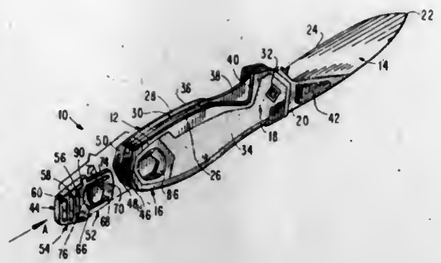
**5,495,673**

**KNIFE WITH DETACHABLE SUPPORT**

**Walter A. Gardiner, Waccabuc; Oleh Stecyk, Kerhonkson, and David A. Swinden, Ellenville, all of N.Y., assignors to Imperial Schrade Corp., Ellenville, N.Y.**

**Filed Dec. 8, 1994, Ser. No. 351,619**
**Int. Cl.[6] B26B *1/02***
**U.S. Cl. 30—155** **24 Claims**

1. A knife, comprising:
a frame extending along a longitudinal axis between a back end region and a front end region, one of said end regions having a cavity extending along the longitudinal axis;
a blade mounted on the frame at the front end region; and
a support having locking means insertable into the cavity for locking engagement with the frame, means, including an attachment portion having an aperture, for attaching an object extending through the aperture to the support, and release means for releasing the locking means from the cavity to detach the support from the frame with the object attached to the support.



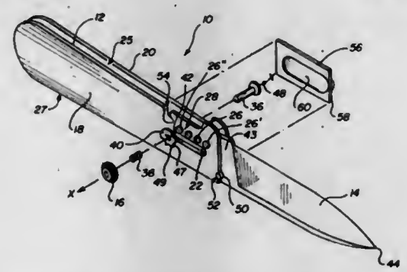

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**5,495,674**

**FOLDING KNIFE WITH MOVEABLE PIVOT AXIS**

**William J. Taylor, Jr., Marietta, Ga., assignor to Camillus Cutlery Co., Camillus, N.Y.**

**Filed Jun. 24, 1994, Ser. No. 264,970**
**Int. Cl.[6] B26B *3/06***
**U.S. Cl. 30—160** **58 Claims**




1. A folding knife comprising:
a) an elongated casing having first and second spaced, opposed walls defining an open space, said first and second walls having respective outwardly facing surfaces, a closed edge and a blade receiving edge;
b) a blade pivotally mounted to said casing and being operable between open and closed positions with respect thereto;
c) a plurality of spaced apart bosses fixedly protruding from said outwardly facing surface of said first wall;
d) a longitudinally slidable button mounted to said casing for actuation by a user of said knife; and
e) means for pivotally moving said blade between said open and closed positions, said pivoting means being operatively attached to said blade and cooperatively positioned with respect to said plurality of bosses, whereby upon actuation of said button, said pivoting means translates said longitudinal sliding actuation into a rotational force, thereby effecting pivotal movement of said blade between said open and closed positions.

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**5,495,675**

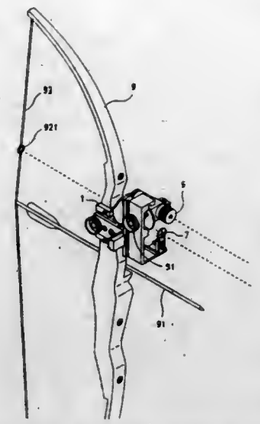
**LASER SIGHT FOR USE IN ARCHERY**

**Chaochi Huang, Taipei, Taiwan, Prov. of China, assignor to Quarton, Inc., Taipei, Taiwan, Prov. of China**

**Filed Mar. 28, 1995, Ser. No. 411,510**
**Int. Cl.[6] F41G *1/36***
**U.S. Cl. 33—241** **3 Claims**

1. A laser sight comprising a mounting base fixed to the bow back of a bow, a first holder frame fastened to said mounting base by a dovetail joint and adjusted in the X-axis direction, a second holder frame fastened to said first holder frame by a dovetail joint and adjusted in the Y-axis direction, a third holder frame fastened to said second holder frame by a dovetail joint and adjusted in the






Z-axis direction, and a laser module fastened to said third holder frame, wherein said third holder frame comprises a swivel laser module holder fixed in place by an adjustment screw to hold said laser module in place, and a sight blade disposed below said swivel laser module holder, said laser module holder being turned about said adjustment screw to adjust the angle of inclination of said laser module for allowing the laser beam from said laser module to be aimed at a target when said sight blade is aligned with said target.

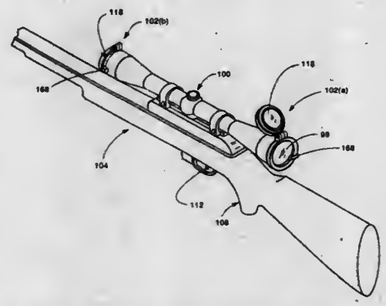
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**5,495,676**

**LENS CAP ASSEMBLY AND REMOVAL METHOD**

**M. Gaines Chesnut, Grand Junction; Dennis D. Sweet, Loma; Marc A. Ulasik, Clifton, and James B. Watson, Grand Junction, all of Colo., assignors to Blount, Inc., Montgomery, Ala.**

**Filed Apr. 25, 1994, Ser. No. 233,116**
**Int. Cl.[6] F41G *1/04; 1/01***
**U.S. Cl. 33—244** **4 Claims**




1. A method for using polarized lenses with a firearm scope, comprising:
providing a firearm scope having a first scope lens and a second scope lens with a firearm scope body defined therebetween, said second scope lens being located more adjacent to a free end of a barrel of the firearm than said first scope lens;
connecting a first lid assembly having a rotatable first polarized lens with a center to said first scope lens;
mounting a second lid assembly having a rotatable second polarized lens with a center to said second scope lens;
rotating said first polarized lens in a first direction about an axis through said center thereof relative to said second polarized lens while a shooter is viewing through said first polarized lens and said first scope lens wherein cross-polarization is effected in which light, that is allowed to pass through said first and second polarized lenses, changes; and
rotating said first polarized lens in a second direction about said axis, opposite said first direction, relative to said first polarized lens while the shooter is viewing through said first polarized lens and said first scope lens wherein cross-polarization is effected in which light, that is allowed to pass through said first and second polarized lenses, changes.

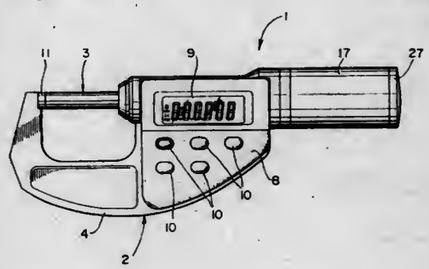
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**5,495,677**

**DIGITAL DISPLAY MICROMETER GAUGE**

**Masahiko Tachikake, and Masamichi Suzuki, both of Kawasaki, Japan, assignors to Mitutoyo Corporation, Tokyo, Japan**

**Filed Sep. 28, 1994, Ser. No. 313,833**
**Claims priority, application Japan, Jan. 1, 1993, 5-246850**
**Int. Cl.[6] G01B *3/18***
**U.S. Cl. 33—784** **30 Claims**



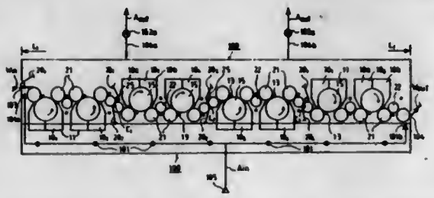

1. A digital display micrometer gauge comprising:
a U-shaped main frame having an anvil;
a spindle having a longitudinal axis and first and second ends, said first end coupled to said main frame for axial displacement relative to said main frame and said second end adapted to abut against said anvil upon displacement;
an engagement member provided at said first end of said spindle and radially protruding from said spindle;
an inner sleeve coupled to said main frame and having an outer periphery, an inner surface, and a slit therein extending in a direction parallel to said axis of said spindle, wherein said engagement member is slidably engaged with said slit;
an outer sleeve concentrically secured around said outer periphery of said inner sleeve to be circumferentially rotatable, said outer sleeve having an inner side with a spiral groove that engages with said engagement member;
a slide member provided at said first end of said spindle in sliding contact with said inner surface of said inner sleeve near said engagement member to support said spindle;
a linear encoder that detects and outputs a displacement amount of said spindle comprising a main scale attached to said spindle extending along said axis of said spindle so that said main scale is insertable into said inner sleeve during displacement of said spindle, and an index scale provided on said main frame opposed to said main scale, wherein said linear encoder detects the displacement amount of said spindle from a relative displacement amount between said main scale and said index scale;
a gap control mechanism that controls a gap between said main scale and said index scale; and
a display coupled to said linear encoder that displays the output of said linear encoder in digital form.

5,495,678

## DRYING MODULE AND DRYER SECTIONS THAT MAKE USE OF SAME, IN PARTICULAR FOR A HIGH-SPEED PAPER MACHINE

Antti Ilmarinen; Heikki Ilvespää; Antti Kuhasalo, all of Jyväskylä; Jouko Yli-Kauppila, Muurame; Pertti Heikkilä, Raisio; Ilkka Jokioinen, Lieto; Matti Korpela, Turku; Henrik Pettersen, Myllymäki; Mikko Karvinen, Vihtavuori; Väinö Sallas, Vaajakoski; Pekka Taskinen, Jyväskylä, all of, Finland, and Dick Parker, Cape Elizabeth, Me., assignors to Valmet Paper Machinery, Inc., Helsinki, Finland

Filed Feb. 24, 1994, Ser. No. 201,555
Claims priority, application Finland, Mar. 22, 1993, 931263
Int. Cl.[6] F26B *11/02*
U.S. Cl. 34—117 30 Claims



1. Drying module for a dryer section of a paper machine, comprising

a drying wire guided in a loop by guide rolls,

a large-diameter cylinder having a diameter greater than about 2 m and arranged inside the loop of the drying wire, a web being carried on said drying wire over a contact sector a of said large-diameter cylinder, said sector a having a magnitude greater than about 180°,

said large-diameter cylinder having an outer mantle provided with grooves and/or being penetrable by drying gas,

a drying hood arranged over the contact sector a of said large-diameter cylinder, said drying hood having an interior and a nozzle field arranged in said interior in proximity to an outer face of the web, said nozzle field applying drying-gas jets at a high velocity against the web over a substantial area of the contact sector a,

smooth-faced heated contact-drying cylinders arranged in proximity to, and at both sides of, said large-diameter cylinder, said contact-drying cylinders having diameters less than the diameter of said large-diameter cylinder and being arranged outside the drying-wire loop, the web being carried on said drying wire over contact sectors b of each of said contact-drying cylinders, said sectors b having a magnitude greater than about 180°, and

at least one reversing suction roll arranged adjacent to a respective one of said contact-drying cylinders, said suction roll being arranged inside the drying-wire loop and having a diameter less than the diameter of said contact-drying cylinders, the web being carried on said drying wire over a contact sector c of said suction roll, said sector c having a magnitude greater than about 180°.

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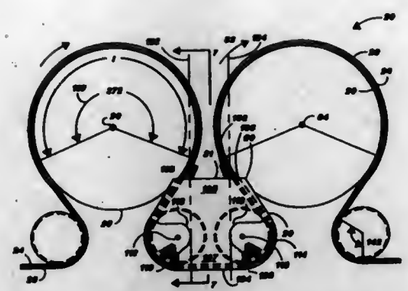
## PAPERMAKING DRYER WITH MULTI-ROLL VACUUM CHAMBER

Rajendra D. Deshpande, rockton, and Jeffrey H. Pulkowski, Roscoe, both of Ill., assignors to Beloit Technologies, Inc., Wilmington, Del.

Filed Jan. 27, 1995, Ser. No. 379,372
Int. Cl.[6] F26B *11/02*
U.S. Cl. 34—117 12 Claims

1. An apparatus for drying a paper web supported by a dryer fabric as part of a paper manufacturing process, the apparatus comprising:

a first rotatable cylindrical dryer roll;



a second rotatable cylindrical dryer roll spaced from the first dryer roll;

a first reversing roll rotatably mounted after the first dryer roll; a second reversing roll rotatably mounted after the first reversing roll and before the second dryer roll;

a cover positioned between the first dryer roll and the second dryer roll, wherein the cover overlies the reversing rolls, and wherein the dryer fabric and web travel over the first dryer roll and are engaged with the first reversing roll at a position adjacent the cover, and the dryer fabric and web pass from the first reversing roll to the second reversing roll and from the second reversing roll to the second dryer roll; and

a means for drawing air from the cover to define a region of reduced pressure defined by the cover, the reversing rolls, and the dryer fabric and web.

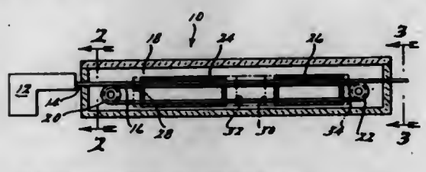
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5,495,680

## CURING LINE OVEN WITH VARIABLE IN-LINE UHF MODULE

Gerard Mesnel, Carrieres, France, assignor to The Standard Products Company, Cleveland, Ohio

Filed Jan. 21, 1994, Ser. No. 184,474
Int. Cl.[6] F26B *3/34*
U.S. Cl. 34—264 6 Claims



1. A continuous curing line oven includes:

an elongated hot air furnace with a conveyor device in the interior thereof for conveying an extrudate along a length of said furnace through the interior thereof,

at least one UHF module in the interior of said furnace and selectively linearly movable along a length of said conveyor device within the hot air furnace.

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5,495,681

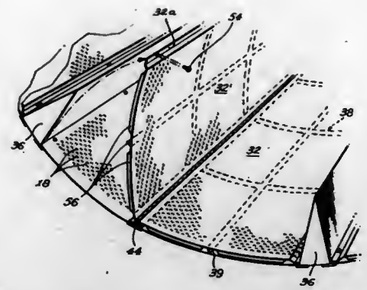
## PIVOTABLE PANEL FOR CLOTHES DRYER DRUM

AndréParadis, 22, rue de l'Aqueduc, C.P. 102 Ste-Brigitte-de-Laval, Québec, Canada

Filed May 24, 1995, Ser. No. 447,858
Int. Cl.[6] F26B *11/02*
U.S. Cl. 34—602 7 Claims

1. A panel assembly for use inside the rotatable perforated drum of an industrial clothes dryer for heat drying damp clothes made at least partially from plastic material, said panel assembly comprising:





(a) a perforated panel member having a plurality of bores, said panel member having a shape adapted to be complementary to that of a peripheral sector portion of said drum;

(b) an anti-adhesive compound, coating said perforated panel member for preventing lint and dust debris and plastic parts of the clothes from accidentally sticking to the panel member, and for preventing clogging of said panel member bores by the lint and dust debris;

(c) mounting means, for edgewisely mounting said panel member releasably to the interior wall of said drum peripheral sector portion for relative movement of said panel member between a closed position, in which said panel member generally conforms to said drum peripheral sector portion spacedly therefrom, and an open position, in which said panel member extends transversely to said drum peripheral sector portion radially interiorly thereof; and

(d) locking means, for releasably locking said panel member in its said closed position; wherein said panel member will sustain lower thermal transfer loads from thermal elements forming part of the clothes dryer, compared to those sustained by the rotatable drum, wherein heat fusing of the clothes plastic parts with said panel member is substantially prevented.

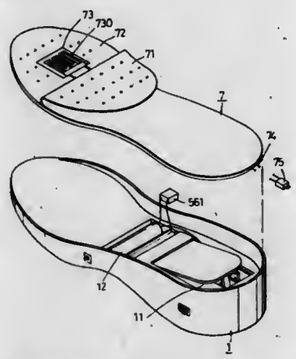
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5,495,682

## DYNAMOELECTRIC SHOES

Shi-Hlu Chen, 5F-1, No. 564, Sec. 1, Chung-Te Rd., Taichung City, Taiwan, Prov. of China

Filed Mar. 1, 1995, Ser. No. 396,711
Int. Cl.[6] A43B *7/04*
U.S. Cl. 36—2.6 7 Claims



1. A dynamoelectric shoe comprising:

a shoe sole having a heel portion formed with a compartment unit;

a pressure-operated electric generator unit provided inside said compartment unit, said electric generator unit including a hollow base with a longitudinal partition plate provided therein, a pivot plate disposed in said hollow base on one side of said partition plate, said pivot plate having one end fixed to a shaft which extends through said partition plate and which mounts pivotally said pivot plate to said hollow base, a volute spring having one end connected to said shaft and biasing said shaft so as to position normally said pivot plate in an upwardly inclining position, a driving gear secured on a distal end of said shaft, a unidirectional gear set including a smaller gear wheel which meshes with said driving gear and a larger gear wheel, a speed increasing gear set driven rotatably by said larger gear wheel of said unidirectional gear set, a press plate having a rear end that is mounted pivotally on an open top of said hollow base and a front end that is provided with a downwardly projecting push plate which has a distal end that extends into said open top of said hollow base and that abuts against said pivot plate, and an alternator unit which is disposed in said hollow base and which has a rotor drive shaft that is provided with a gear member which meshes with said speed increasing gear set, said alternator unit producing a voltage signal when said gear member rotates due to repeated application of pressure on said press plate during use; and

a rechargeable battery unit connected electrically to said alternator unit and provided in said compartment unit of said hollow base, said rechargeable battery unit including an electrical socket mounted on said shoe sole and being charged by said voltage signal from said alternator unit.

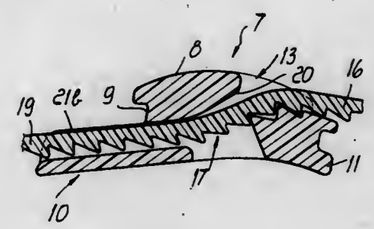
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5,495,683

## ENGAGEMENT DEVICE PARTICULARLY FOR TOOTHED BANDS FOR SPORTS SHOES

Onorio Miotto, S. Stefano Di Valdobbiadene, and Claudio Zorzi, Paderno de Ponzano Veneto, both of, Italy, assignors to Nordica S.p.A., Trevignano, and AM S.r.l., Monsigo Di Moriago Della Battaglia, both of, Italy

Filed Feb. 14, 1994, Ser. No. 195,104
Claims priority, application Italy, Apr. 15, 1993, TV93U0020
Int. Cl.[6] A43B *5/04;11/00;* A43C *11/00*
U.S. Cl. 36—50.5 15 Claims



1. A device for engaging toothed closure bands (16, 18) in sports shoes (1,2,3,5,6) comprising;

a body (7) defining a head (8);

a tab (10) connected to said body (7) at an opposite side thereof with respect to said head (8);

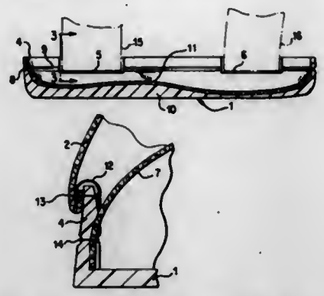
an elongate bottom (14) defined by said tab (10);

a slot (13) formed in said head (8) for insertion of a toothed band (16, 18), said slot (13) extending transversely with respect to said tab (10) and said bottom (14);

a curved surface (20) formed in said head (8) adjacent said slot (13), and;

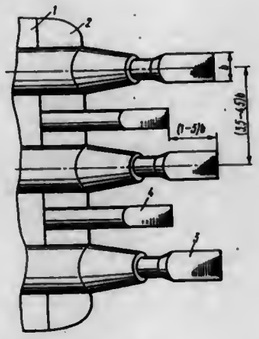
toothed engagement means (18) located at said slot (13) at a side thereof opposite said curved surface (20) for releasably engaging a toothed band (16, 18), said bottom (14), said toothed engagement means (18) and said curved surface (20) together defining a substantially S-shaped path for a toothed band (16, 18).

5,495,684
**SHOE WITH ATTACHED LEGGING FOR USE IN A CLEAN ROOM**
Karl-Heinz Herber, Simtal-Mottgers, Germany, assignor to ALSA GmbH, Steinau-Uerzell, Germany
Filed Mar. 1, 1994, Ser. No. 204,562
Int. Cl.[6] A43B *1/02;3/16;* A41D *17/00*
U.S. Cl. 36—84 7 Claims



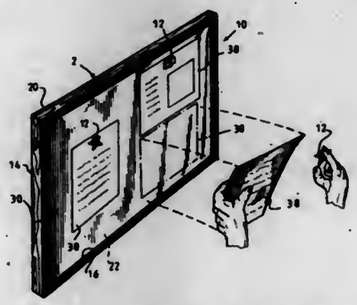
1. A shoe for use in a clean room comprising an antistatic shoe bottom which comprises an upwardly extending peripheral seam edge containing a seam; a legging connected to said seam, wherein the shoe bottom is adapted to the size of the foot; and an upper connected to the seam edge below said seam, to the upwardly extending peripheral seam edge wherein the legging is sewn with a binding which reaches in the shape of a U over the upper edge of the upwardly extending seam edge between an outer section of the binding and an inner face of the seam edge..

5,495,685
**EXCAVATOR BUCKET**
Viktor N. Labutin; Alfred R. Mattis; Sergei V. Shishaev, all of Novosibirsk; Vladimir N. Tsvetkov, Ekaterinburg; Alexandr V. Tolmachev, Ekaterinburg, and Genrikh K. Bolke, Ekaterinburg, all of, Russian Federation, assignors to Institut Gornogo Dela Sibirskogo Otdelenia Akademii Nauk SSSR, and Proizvodstvennoe Obidinenie Uralmash, Russian Federation
Continuation of Ser. No. 217,226, Mar. 24, 1994, abandoned, which is a continuation of Ser. No. 901,263, Jun. 19, 1992, abandoned. This application Jun. 16, 1995, Ser. No. 491,029
Claims priority, application Russian Federation, Jun. 19, 1991, 4942599
Int. Cl.[6] E02F *3/36*
U.S. Cl. 37—446 3 Claims



1. An excavator bucket comprising:
a body with a working edge;
at least two striking teeth for breaking up rock, each of said at least two striking teeth having a cutting edge and being mounted on said body for reciprocal movement along the longitudinal axis of each striking teeth, adjacent striking teeth being spaced from each other along said working edge at a distance sufficient to form a ridge of rock in which there are cracks weakening it, the distance between the longitudinal axes of at least two adjacent striking teeth being determined by the relationship (3.5 . . . 4.5)b, where b is the width of said cutting edge of a striking tooth;
static teeth having the purpose of breaking up the upper part of the rock ridge formed by adjacent striking teeth, said static teeth being rigidly mounted with respect to said body and the number of which is one less than the number of said at least two striking teeth, each of said static teeth having a cutting edge and being positioned between said at least two adjacent striking teeth so that the cutting edges of the static and striking teeth lie in substantially the same plane passing through the longitudinal axes of the adjacent striking teeth, wherein the cutting edge of a static tooth is spaced rearwardly from the cutting edge of the striking tooth a distance determined by the relationship (1 . . . 3)b.

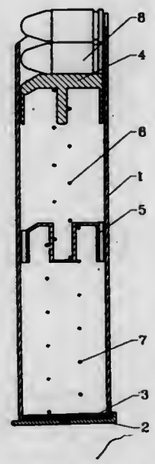
5,495,686
**DECORATIVE DEVICE WITH A SMOOTH OPAQUE MAGNETIC SURFACE FOR MAGNETS**
Sharon L. Millard, 136 Giller Ave., Holbrook, N.Y. 11741, and Bruce V. Hayes, 305 Richmond Blvd., Ronkonkama, N.Y. 11779
Continuation of Ser. No. 45,739, Apr. 14, 1993, abandoned.
This application Jan. 3, 1995, Ser. No. 368,713
Int. Cl.[6] G09F *7/04*
U.S. Cl. 40—621 5 Claims



1. A decorative device with a smooth opaque magnetic display surface in combination with magnets comprising:
a) an opaque frame member with a front side and a rear side having a viewing opening and a recessed portion formed about the viewing opening in the rear side of the frame member;
b) an opaque magnetic plate of solid steel fitted against the recessed portion in said opaque frame member;
c) means for securing said opaque magnetic plate of solid steel to said frame member comprising a plurality of glazier points, each of which is pressed into the rear side of said frame member of the recessed portion to hold said opaque magnetic plate of solid steel thereto;
d) opaque backing panel means of corrugated paper material fitted against and attached to said opaque magnetic plate of solid steel facing the rear side of said frame member and enclosing said glazier points so that said glazier points are between said magnetic plate of solid steel and said opaque backing panel when said device is assembled for use;
e) means for removably affixing said frame member to a vertical flat surface so that the magnets can be placed onto said opaque magnetic plate of solid steel facing the front side of said frame member to be seen through the viewing opening in said frame member, said removably affixing means including at least one picture hanger fastened into the rear side of said frame member so that said picture hanger can be hooked onto a fastener placed into the vertical flat surface; and
f) an opaque non-magnetic sheet of thin vinyl material laminated onto said opaque magnetic plate of solid steel facing the front side of said frame member so that the magnets can be placed onto said opaque non-magnetic sheet of thin vinyl material and held thereto by said opaque magnetic plate of solid steel, said sheet of thin vinyl material having decorative indicia thereon.



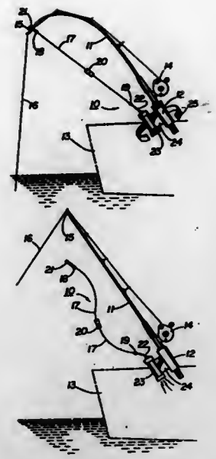
5,495,687
**FIREARM MAGAZINE**
Shimon Waiser, 1227 E. 84 St., Brooklyn, N.Y. 11236
Filed Feb. 16, 1995, Ser. No. 389,766
Int. Cl.[6] F41A *9/70*
U.S. Cl. 42—50 15 Claims



1. A firearm magazine comprising a tube having lateral walls, a cartridge pushing means including at least one main spring, at least one main follower being under the action of said main spring having an upper and a bottom ends, at least one auxiliary spring and at least one auxiliary follower being under the action of said auxiliary spring having an upper and a bottom ends, said auxiliary follower having an upper surface and a bottom surface, said upper surface of the auxiliary follower having at least one recess in which the bottom end of the main spring is located when the magazine is empty and in which almost the entire main spring is located when the magazine is fully loaded with cartridges, said bottom surface of the auxiliary follower having at least one recess in which the upper end of the auxiliary spring is located when the magazine is empty and in which almost the entire auxiliary spring is located when the magazine is fully loaded.

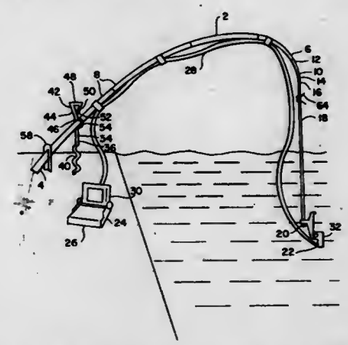
5,495,688
**FISH STRIKE ALARM SYSTEM**
Sean W. Sondej, and William R. Sondej, both of 118 Noyes Rd., Vestal, N.Y. 13850
Filed Jun. 8, 1994, Ser. No. 257,503
Int. Cl.[6] A01K *91/06;97/00*
U.S. Cl. 43—16 10 Claims

1. A system to issue an alarm when a fish strikes a bait on a fishing pole, comprising:
alarm indicator means, including switch means, for issuing a predetermined signal when actuated;



attachment means for retaining said alarm indicator means in a predetermined location relative to a user;
flexible line means having a predetermined length extending between a first end and a second end, said second end being attached to said alarm indicator means;
said second end of said flexible line means is connected to said switch means; and
releasable means for connecting said first end of said flexible line means to the end of a fishing pole furthermost from a user when said fishing pole is flexed in a set position;
so that when a fish strikes and said fishing pole straightens from said set position, said switch means actuates said alarm indicator means to issue said predetermined signal.

5,495,689
**FISH FINDER AND POLE ASSEMBLY**
Craig J. Cassem, 2415 N. Park Lake Dr., Morris, Ill. 60450
Filed Jun. 5, 1995, Ser. No. 463,252
Int. Cl.[6] A01K *79/02*
U.S. Cl. 43—17.1 14 Claims



1. A fish finder and pole assembly comprising an elongated pole having a handle end and an oppositely disposed connecting end, an elongated connecting rod having a first end and an oppositely disposed second end, connecting means to fixedly couple said first end of said connecting rod with said connecting end of said elongated pole whereby said connecting rod rotates with said elongated pole when said elongated pole is rotated, signal transmitting and receiving means to transmit fish finding signal means

on a path through a body of water to impinge on fish in said path and to receive fish located signal means back on the same path when said fish finding signal means does impinge on said fish, said signal transmitting and receiving means includes a signal sending and pick up component shaving a working side facing in the direction said fish finding signal means is transmitted therefrom and at which said fish located signal means is received, said signal sending and pick up component being fixedly connected to said connecting rod whereby said signal sending and pick up component rotates with said connecting rod when it is rotated by rotating said elongated pole, vertical positioning means to position said connecting rod in a substantially vertical position when it extends from said elongated pole and said connecting means coupling said connecting rod to said pole, said signal sending and pick up component being fixedly connected to said connecting rod with its said working side facing in a direction normal to the axis of said elongated connecting rod whereby said fish finding signal means are transmitted therefrom and said fish located signal means are received back thereto on a substantially horizontal path when said connecting rod is in said substantially vertical position.

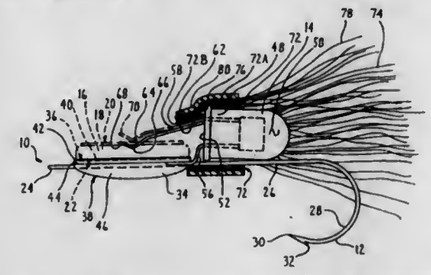
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**5,495,690**

## ELECTRONIC FIREFLY LURE

**Jack Hunt, 69034 42nd Ave., Covert, Mich. 49043**

**Filed Jan. 11, 1995, Ser. No. 371,289**
**Int. Cl.[6] A01K** *85/01*
**U.S. Cl. 43—17.6** **19 Claims**



12. An fishing lure for use with a removable electrical source, said lure comprising:

a hook having a shank, an eyelet at a first end of said shank for attachment of a fishing line, and an arcuate hook section extending from a second end of said shank;

a light source mounted to said shank and having first and second electrical terminals:

a plurality of elongate feather-like members positioned in generally surrounding relation to said light source and projecting outwardly therebeyond to at least partially surround said hook section, said members having base end parts thereof fixedly secured relative to said light source;

mounting means provided for mounting said light source to said shank, said mounting means comprising at least a first sleeve like material layer disposed about said light source and said shank;

a mounting plate mounted to said shank intermediate said eyelet and said light source and having a receiving surface, said receiving surface having a recess defined by a peripheral rim and adapted to removably seat said electrical source thereon, said mounting plate including means for electrically connecting said electrical source receiving surface to said first electrical terminal of said light source; and

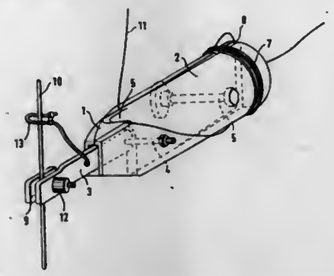
biasing means having a proximal end electrically connected to and secured to said second terminal of said light source and a distal end disposed a spaced distance away from said receiving surface for engaging and holding said electrical source between said distal end and said receiving surface so as to complete an electrical circuit path and activate said light source.

**5,495,691**

## LINE TRIGGER DEVICE FOR USE WITH A DOWNRIGGER

**Teuvo Keisala, Saarenkylä, Finland, assignor to Outek Oy, Saarenkyla, Finland**

**Filed Apr. 15, 1994, Ser. No. 228,036**
**Claims priority, application Finland, Apr. 16, 1993, 931724**
**Int. Cl.[6] A01K** *91/08*
**U.S. Cl. 43—43.12** **16 Claims**



1. A line trigger device for releaseably securing a fishing line to a wire of a downrigger or a sideplanar, comprising

first and second bodyparts operatively coupled to each other to form a first slit therebetween through which a fishing line is passed, each of said bodyparts having a groove on an outer periphery thereof, said first bodypart comprising a locking finger through which the fishing line passes to said grooves on said bodyparts and then into said first slit,

adjusting means for setting the magnitude of a force required to release the fishing line from said first slit,

fixing means for coupling said bodyparts to the wire of the downrigger or sideplanar, said fixing means comprising an adjustable clamp, and

a stud for connecting said bodyparts to said fixing means, said stud being a shaft about which said bodyparts and said fixing means rotate.

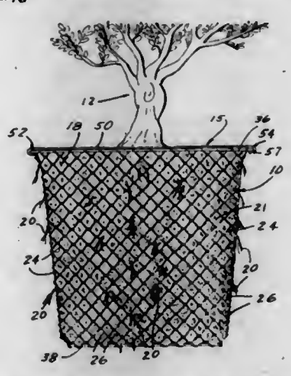
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**5,495,692**

## ROOT PROTECTION APPARATUS

**Francis X. LoJacono, Jr., Rte. 2, Box 172B, Templeton, Calif. 93465**

**Filed Feb. 16, 1994, Ser. No. 197,243**
**Int. Cl.[6] A01G** *9/02*
**U.S. Cl. 47—78** **6 Claims**



1. In combination, an apparatus for protecting the soil-bound root system of a plant comprising a collapsible wire basket structure having a plurality of annularly interlinked sinusoidal wire strands defining a circumferential side wall and a bottom wall, said sinusoidal wire strands being loosely woven and connected to an upper annular support ring so as to be expanded to allow said collapsible wire basket structure to receive and confine the soil-bound root system, and wherein the improvement comprises:

means for supporting said collapsible wire basket structure in an extended position around said soil-bound root system, said supporting means being formed so as to be mounted to said upper annular support ring in a position over the top of said soil-bound root system, and said support means including a first coupling means rotatably attached to said upper annular support ring and a second coupling means for fixedly securing said support means to said upper annular support ring of said collapsible wire basket structure;

said supporting means comprising an elongated strap having a length corresponding to a distance between opposite sides of said upper annular support ring of said collapsible basket, wherein said first coupling member is integrally formed on one end of said strap and said second coupling means is integrally formed on the opposite end of said strap;

wherein said first coupling means comprises a first coupling member having a keeper means formed therein to receive said upper annular support ring for rotation thereon; and

wherein said second coupling means comprises locking means formed therein to lockingly engage said upper annular support ring therein when said strap is rotated for engagement with said upper annular support ring.



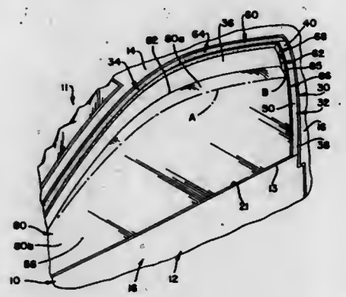
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**5,495,693**

## VEHICLE DOOR ASSEMBLY

**Roy F. Tiesler, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.**

**Filed Dec. 19, 1994, Ser. No. 359,126**
**Int. Cl.[6] B60J** *5/04*
**U.S. Cl. 49—502** **10 Claims**



1. A vehicle door assembly comprising:

a window movably mounted on a lower door structure for vertical movement between a raised closed position and a lowered open position;

the window being a single integral window including a lower portion having a generally constant transverse curvature and an upper portion having an accelerated transverse curvature greater than the transverse curvature of the lower portion; and

the window including a side edge, the window having a notch on the side edge of the upper portion of the window.

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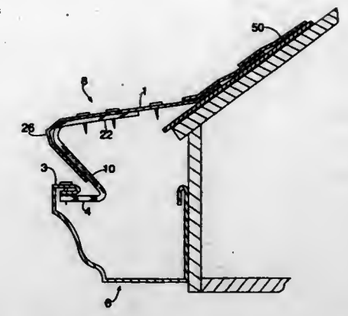
**5,495,694**

## DEFLECTOR ASSEMBLY FOR A RAIN GUTTER

**Richard L. Kuhns, 210 Broad St., Red Bank, N.J. 07701**

**Filed Sep. 6, 1994, Ser. No. 301,543**
**Int. Cl.[6] E04D** *13/00*
**U.S. Cl. 52—12** **29 Claims**

1. An improved rain gutter deflector assembly comprising:



a top portion for extending from a roof line and having a distal edge located over a rain gutter;

an arcuate portion, formed along said distal edge of said top portion and extending toward said rain gutter, having a curvature for carrying rain water from said top portion into said rain gutter;

a bracket, attached between said top portion and said rain gutter, for supporting said top portion above said rain gutter; and

said top portion having a first end and a second end each containing two attachment apertures proximate thereto, a first attachment aperture having a smaller diameter than a second attachment aperture, said top portion being attached to said bracket using said first attachment aperture.

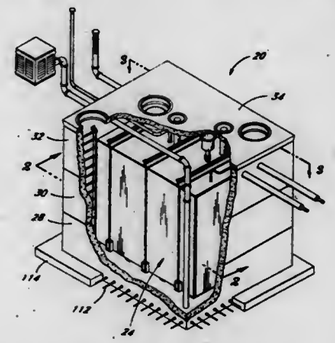
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**5,495,695**

## VAULTED UNDERGROUND STORAGE TANK

**Thomas P. Elliott, Jr., Houston, Tex., assignor to Dalworth Concrete Products, Inc., Katy, Tex.**

**Continuation of Ser. No. 7,311, Jan. 21, 1993, abandoned.**
**This application Jan. 31, 1995, Ser. No. 381,272**
**Int. Cl.[6] E04C** *3/10*; **E02D** *29/14*
**U.S. Cl. 52—20** **53 Claims**



1. An underground storage system, comprising:

a vault substantially buried in the ground, comprising:

a generally rectangular bottom;

a first pair of opposing upstanding walls;

a second pair of opposing upstanding walls, said bottom, said first pair of walls and said second pair of walls comprising concrete and cooperating to form a box-shaped container having an open upper end, a generally rectangular horizontal cross-section and a generally rectangular vertical cross-section; and

a top covering said open upper end, said top defining an opening sized and shaped such that an adult can pass through said opening;

a storage vessel for containing liquids, said storage vessel comprising:

a top;

a bottom;

a first pair of opposing upstanding sides; and

a second pair of opposing upstanding sides, said storage vessel having a generally rectangular horizontal cross-section and a generally rectangular vertical cross-section; and, spacers supporting said bottom of said storage

vessel above said bottom of said vault, wherein said vault is sized and shaped and said vessel is positioned within said vault such that there is sufficient space between said storage vessel and said vault such that an adult can enter said vault through said opening in said top of said vault and move along at least two of said walls between said vessel and said vault to visually inspect each of said sides of said storage vessel and said bottom of said vault.

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**5,495,696**

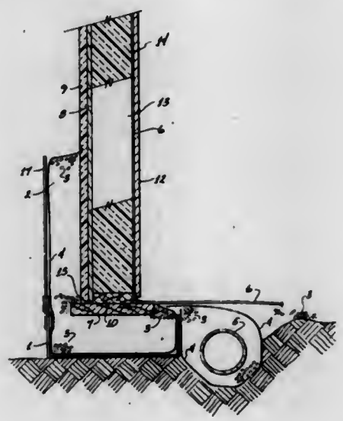
**FOUNDATION DRAINAGE SYSTEM**

**Raymond R. Repka, Lancaster, N.Y., assignor to Kent R. Repka, Lancaster, N.Y.**

**Filed Aug. 25, 1994, Ser. No. 296,033**

**Int. Cl.[6] F02B *11/00*; F02D *19/00***

**U.S. Cl. 52—169.5** **8 Claims**



1. A water drain system for building foundations which comprises in combination a vertically-disposed foundation, a crushed stone retainer adjacent said foundation, a drain tile network and a waterproof barrier covering substantially all exposed outside surfaces of said foundation, said barrier positioned between said retainer and said foundation, said retainer containing in substantially all of its inner volume crushed stone, a water-permeable membrane in contact with all sides, bottom and top exposed portions of said retainer, said water-permeable membrane surrounding said drain tile with crushed stone positioned between said membrane and said drain tile, said crushed stone in said retainer and around said drain tile forming a water-draining conduit with means to allow any subsurface water to drain through said crushed stone to said drain tile and out to a water drain sump or network, and wherein said retainer is a mesh material forming apertures therein having dimensions smaller than substantially all of said crushed stone.

**5,495,697**

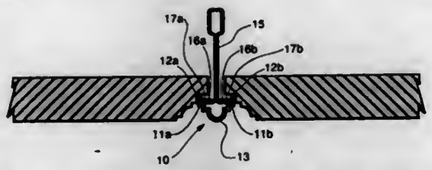
**DECORATIVE ELEMENTS FOR SUBCEILINGS**

**Wesley T. K. Bischel, 707 McGrann Blvd., Lancaster, Pa. 17601; Joan V. Greenslade, 120 Letort Rd., Millersville, Pa. 17551; Chester W. Hallett, 1959 Lititz Pike, and Henry G. Stein, 106 Treetops Dr., both of Lancaster, Pa. 17601**

**Filed Mar. 24, 1994, Ser. No. 217,534**

**Int. Cl.[6] F04B *9/26***

**U.S. Cl. 52—311.3** **4 Claims**




1. In combination, a subceiling of the type having panels supported by a suspended framework consisting essentially of (1) longitudinally extending main runner members and cross runner members, each runner member being configured as an Inverted T-bar rail having a transverse pair of opposed bottom flanges extending longitudinally, (2) a plurality of miniature plastic beams, each having sufficient flexibility to be snapped over said flanges of the T-bar rails, each of said beams consisting essentially of:

two flat portions each having an upper surface and a bottom surface and a width defined by two longitudinal edges;

a first return flange disposed along one upper edge of one flat portion integral therewith and extending inwardly;

a second return flange disposed along the second flat portion integral therewith and extending inwardly;

each of said return flanges having a downwardly-facing surface and an inwardly-facing edge;

said return flanges adapted to hold the upper surface of each flat portion substantially flush against the longitudinally extending T-bar rails of the runner member;

a pair of inwardly sloped sidewalls integral with and extending downwardly from said bottom surfaces of said flat portions and longitudinally along the length of said bottom surfaces of said flat portions, said sidewalls being connected to each other or integral with each other to provide a V-shaped or U-shaped visual appearance when viewed from below; and

(3) a plurality of panels extending longitudinally with said runner members, said panels adapted to rest on the return flanges of the beams.

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**5,495,698**

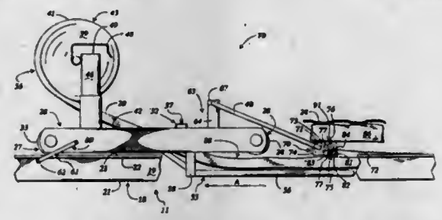
**ROOFING METHOD AND APPARATUS**

**Robert J. Alderman, San Antonio, and James E. Taylor, Seguin, both of Tex., assignors to Owens-Corning Fiberglas Technology, Inc., Summit, Ill.**

**Division of Ser. No. 147,511, Nov. 5, 1993. This application Jun. 5, 1995, Ser. No. 462,470**

**Int. Cl.[6] E04D *5/00***

**U.S. Cl. 52—742.12** **4 Claims**



1. A method of insulating a roof structure of an industrial building of the type including a series of parallel approximately equally spaced purlins comprising the steps of:



mounting roll-support stands on said purlins with reels of heat insulation sheets supported on the roll-support stands;

intermittently moving the roll-support stands along the purlins;

in response to moving the roll-support stands along the purlins paying out the heat-insulation sheets from the reels and placing the heat insulation sheets from the reels in between the purlins with the edges of the heat insulation sheets in engagement with the purlins;

placing elongated heat-insulation sheets on top of and extending across the purlins to form a substantially uninterrupted upper layer of heat insulation material over the purlins; and

placing heat reflective sheets on the heat-insulation sheets paid out from the reels to form a heat reflective barrier beneath the upper layer of heat insulation material extending longitudinally between the purlins.

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**5,495,699**

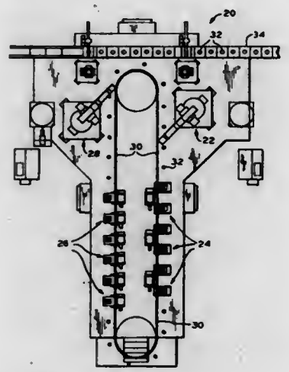
**METHOD AND APPARATUS FOR PRESSURE FILLING AND SEALING A VESSEL**

**Thomas I. Buckley, Jr., Stevensville, Mich., assignor to Weldun International, Inc., Bridgman, Mich.**

**Filed Nov. 9, 1994, Ser. No. 336,764**

**Int. Cl.[6] B65B *31/02*; *7/28***

**U.S. Cl. 53—81** **20 Claims**




1. An apparatus for filling a canister with pressurized fluid and sealing the said filled canister, the canister having a weldable end wall with an opening therein for receiving a weld ball, said apparatus comprising:

a weld head assembly including a head having an opening for receiving a pressurized gas, said opening defining a terminal end, said head further having a seal operably associated with said terminal end for engaging the said end wall of the said canister, said weld head assembly further including a welding electrode; and

a ball shuttle assembly including a shuttle block, said shuttle block having a passage for receiving the said weld ball and means for receiving the weld ball from said passage means and holding the said weld ball, said ball shuttle assembly further including positioning means for positioning said shuttle block whereby the said weld ball is in substantially coaxial alignment with said opening, and moving means for moving said receiving and holding means whereby the weld ball is disposed in said opening;

said passage being fluidly disassociated from said opening when said seal is engaged with the said end wall of the said canister.

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**5,495,700**

**PROCESS AND APPARATUS FOR PROCESSING PRINTING PRODUCTS**

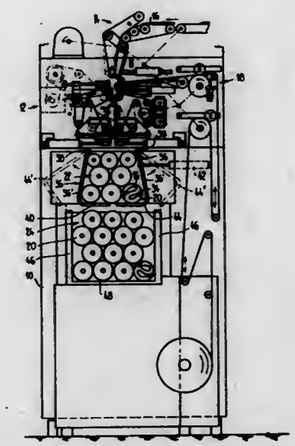
**Hans-Ulrich Stauber, Grüt, Switzerland, and Willem F. S. M. Van Wegen, Baarn, Netherlands, assignors to Ferag AG, Hinwil, Switzerland**

**Filed Mar. 31, 1994, Ser. No. 220,820**

**Claims priority, application Switzerland, Apr. 1, 1993, 01 001/93**

**Int. Cl.[6] B65B *63/04***

**U.S. Cl. 53—118** **3 Claims**



1. An apparatus for processing printing products, comprising

a machine frame (**10**),

printing product conveying means (**14**) for serially delivering printing products along a path of travel,

a pack-forming unit (**12**) which includes means (**56**, **112**) for forming the delivered printing products (**16**) into a tube-like configuration,

means (**18**, **56**, **112**) for feeding and applying a retaining element (**34**) to each of the printing products (**16**) so as to maintain the printing products (**16**) in the tube-like configuration and form packs (**20**) thereof, and thereafter releasing the formed packs (**20**),

a first stack compartment (**22**) positioned below said feeding and applying means for receiving the released packs (**20**) therein in a generally longitudinally aligned relationship, said stack compartment (**22**) including a movable base (**40**) for selectively opening and closing the bottom thereof,

a second stack compartment (**24**) positioned below said first stack compartment (**22**) and into which the packs (**20**) stacked in the first stack compartment (**22**) fall upon an opening of the base (**40**),

an ejector (**26**) positioned adjacent the second stack compartment (**24**) for laterally ejecting the packs (**20**) therefrom, and

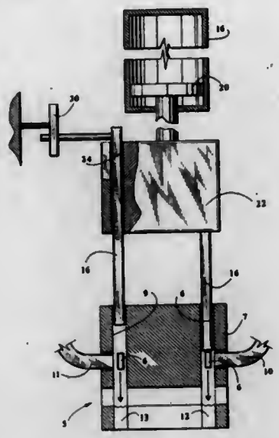
bundle-forming means (**28**) positioned adjacent said second stack compartment (**24**) for positioning a bundling element (**30**) round the stacked packs (**20**) which have been laterally ejected by said ejector and so as to maintain the packs together.

5,495,701

## CLIP ATTACHMENT MECHANISM FOR FASTENING A SINGLE CLIP OR TWO CLIPS SIMULTANEOUSLY

William M. Poteat, Cary; Thomas E. Whittlesey, Apex; Kim L. Poling, Fuquay Varina; Edward P. Brinson, and Bryan E. Wilkins, both of Raleigh, all of N.C., assignors to Delaware Capital Formation, Inc., Apex, N.C.

Filed Nov. 10, 1993, Ser. No. 150,689
Int. Cl.[6] B65B 51/04
U.S. Cl. 53—138.2 12 Claims



1. In apparatus for attachment of generally U-shaped metal clips about gathered material, said apparatus including a body, a first clip channel in the body, means for feeding a clip into the first channel, an anvil supported by the body at one end of the first channel for forming a clip driven in the first channel about gathered material adjacent the anvil in the pathway of the clip driven in the first channel, a first punch reciprocally mounted in the first channel and movable therein for engaging and driving a clip in the first channel, and fluid drive means supported on the body and connected to the first punch for driving the first punch in the first channel, the improvement comprising, in combination:

a second punch parallel to the first punch, means on the body defining a second clip channel parallel to the first clip channel, and a second anvil; and

means for releasably attaching the first punch to the second punch for movement therewith and for coaction with a second U-shaped metal clip driven in the second clip channel against the second anvil to thereby attach substantially simultaneously a first clip and a second clip about gathered material adjacent the respective anvils in the pathway of clips in each of the respective channels, said means for releasable attaching including

(a) a block member having a through passage for the second punch, the block member connected to the first punch, the second punch including a punch retaining pin,

(b) a catch mounted on the body, pivotal between a retaining pin engaging position and a second non-engaging position;

(c) said block member further including a retaining pin slot opening into the through passage, the slot defining an end in the direction of punch travel to engage the pin and limit free movement of the pin therethrough the slot,

(d) said block further including a transverse passage extending into the through passage,

(e) a second punch engaging key slidable in the transverse passage between a first position limiting movement of the second punch in the through passage, and a second position of non-interference with the through passage; and

(f) means for sliding the key between the first position and the second position and for pivoting the catch between non-engaged position and the engaged position, to thereby operate both punches simultaneously when the key is in the first position limiting movement of the second punch relative to the block member and the catch is in the non-engaged position.

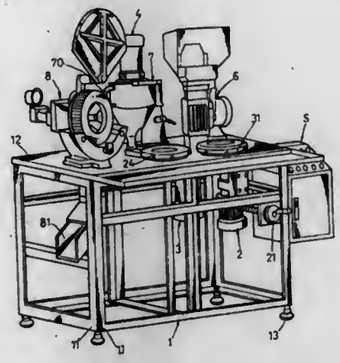
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5,495,702

## MEDICAL POWDER FILLING MACHINE

Hsienli Ko, P.O. Box 1-394, Chungho, Taipei Hsien, Taiwan, Prov. of China

Filed Apr. 3, 1995, Ser. No. 415,542
Int. Cl.[6] B65B 43/26
U.S. Cl. 53—381.4 4 Claims



1. A medical powder filling machine comprising a machine frame, a medicine dish motor, a medical capsule dish motor, a stirring motor, a control box, a powder hopper with a powder filling assembly having a mouth and an automatic medical capsule slotter, the medical powder filling machine characterized in that: said medical capsule dish motor drives a side shaft by means of gears, said side shaft being fitted with a cam the circumference of said cam having a screw groove containing a ratchet pawl, as the cam rotates said ratchet pawl swings to drive a ratchet in an intermittent movement;

the ratchet being attached to the bottom of a rotating shaft, a medical capsule dish with a mold cavity therein rests on the top of said rotating shaft and rotates with it, said medical capsule dish rotates intermittently when the cam rotates;

a connecting link hinged to the side of the cam and connected to said automatic capsule slotter;

the automatic capsule slotter inserts the medical capsules into the mold cavity of said medical capsule dish accurately by means of the intermittent rotation of the medical capsule dish the medical capsule dish containing the capsules is placed in the medicine dish and filled through the powder hopper.

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5,495,703

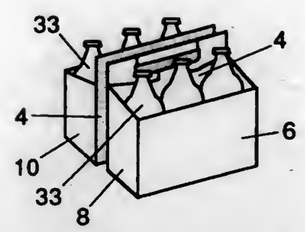
## PROCESS AND AN APPARATUS FOR PACKAGING CONTAINERS IN A CARRIER IN TWO ROWS OF EACH AT LEAST TWO PIECES AS WELL AS A BLANK TO BE USED THEREIN

Jan P. Kruit, Gouda, and Nicolaas P. Verwey, Leiden, both of, Netherlands, assignors to Heineken Technical Services, B.V., Amsterdam, Netherlands

Filed Apr. 26, 1994, Ser. No. 233,077
Claims priority, application Netherlands, Apr. 28, 1993, 9300727
Int. Cl.[6] B65B 21/02;43/10;5/08
U.S. Cl. 53—398 16 Claims

1. A process for packaging containers in a carrier in two rows of each at least two pieces, in which process the carrier is made from





two blanks and is at least partly erected around the containers and glued up, characterized by:

erecting a first blank to form and fill a first half carrier by feeding a first blank in a flat initial form,

bringing a blank section forming a bottom of the carrier into a horizontal position,

bringing a blank section forming a first longitudinal wall, hingedly connected to the bottom, into a vertically upward position from the bottom,

folding at least one partition flap cut from the first longitudinal wall and two blank sections each forming a side wall of the carrier into a vertical position extending perpendicularly to the first longitudinal wall,

inserting a container between a side wall and a flap, which container rests on the bottom and is in contact with the first longitudinal wall,

bringing a blank section forming a second longitudinal wall, hingedly connected to the bottom, into a vertically upward position from the bottom, parallel to the first longitudinal wall, and connecting the blank section forming a second longitudinal wall both to one and to the other side wall,

erecting a second blank equal to the first one to form a second half carrier and filling it, after which both half carriers are directed with a longitudinal wall towards each other and the longitudinal walls facing each other are interconnected to form a carrier with two rows of containers.

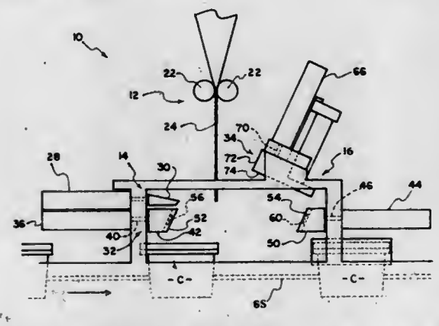
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5,495,704

## HEAT-SHRINKABLE BAND APPLICATION MACHINE

Victor V. Menayan, 103 Rothschild Pl., Cary, N.C. 27511

Division of Ser. No. 31,314, Mar. 15, 1993, Pat. No. 5,305,578. This application Apr. 25, 1994, Ser. No. 232,774
Int. Cl.[6] B65B 9/10
U.S. Cl. 53—399 27 Claims



8. A method of applying bands to containers conveyed past the band application machine, comprising:

(a) cutting a band from a supply strip;

(b) opening the band;

(c) engaging opposite sides of the band and holding the band in an open configuration above the containers being conveyed and wherein at least one side of the band is held by a suction cup while the band is supported above the containers;

(d) releasing the held cut band at a position above the containers;

(e) moving a plunger mounted above a cut band back and forth between a retracted position where the plunger is spaced above the cut band to an engaged position where the plunger actually engages the top of the cut band; and

(f) transferring the open cut band held above the containers onto an underpassing target container by moving the plunger downwardly from the retracted position and engaging the top of the band while the band is above the target container and pushing band downwardly onto the target container.

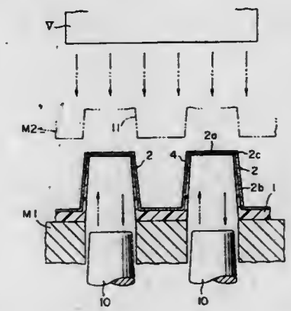
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5,495,705

## PACKAGE MANUFACTURING METHOD

Hideo Miura; Yoshiaki Watanabe, and Mitsuhiro Sumimoto, all of Tokyo, Japan, assignors to Sankyo Company, Limited, and Dai Nippon Printing Co., Ltd., both of, Japan

PCT No. PCT/JP93/00809, § 371 Date Apr. 5, 1994, § 102(e) Date Apr. 5, 1994, PCT Pub. No. WO93/25451, PCT Pub. Date Dec. 23, 1993
PCT Filed Jun. 16, 1993, Ser. No. 193,194
Claims priority, application Japan, Jun. 16, 1992, 4-183048
Int. Cl.[6] B65B 5/02;47/04;61/00
U.S. Cl. 53—411 7 Claims



1. A method of manufacturing a package, comprising the steps of:

preparing a thermoplastic synthetic resin sheet;

providing an openable mold having mold elements;

placing said thermoplastic synthetic resin sheet in said mold;

forming within said mold at least one pocket-shaped molded portion in said thermoplastic synthetic resin sheet in such a manner that it protrudes outward from one surface thereof, and also forming within said mold and on the other surface of said thermoplastic synthetic resin sheet an opening for said pocket-shaped molded portion, to obtain a molded sheet, said pocket-shaped molded portion being caused to have inner and outer surfaces;

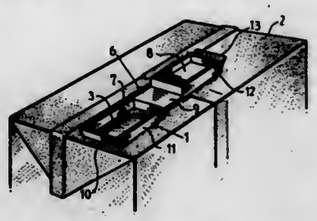
forming a deposit layer over at least one of said inner and outer surfaces of said pocket-shaped molded portion while said molded sheet is held on one of said mold elements and while the one element of the mold is cooled;

removing the molded sheet with said deposit layer thereon;

accommodating an object to be packaged within the pocket-shaped molded portion; and

bonding a sealing sheet to said other surface of said molded sheet in such a manner as to seal said opening of said pocket-shaped molded portion.

**5,495,706**
**OPENING ARRANGEMENT AND A METHOD OF PRODUCING SAME**
**Bengt Björck, Bjärred, and Lars Carlsson, Blentarp, both of, Sweden, assignors to Tetra Laval Holdings & Finance S.A., Pully, Switzerland**
**Division of Ser. No. 14,256, Feb. 5, 1993. This application Aug. 2, 1994, Ser. No. 284,235**
**Claims priority, application Sweden, Feb. 11, 1992, 9200391**
**Int. Cl.[6] B65B** *61/18*
**U.S. Cl. 53—412** **12 Claims**

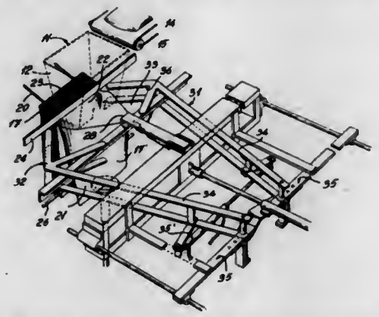


1. A method of providing a liquid package manufactured from a material web or sheet with an opening arrangement comprising the steps of:
providing a hole or hole indication in the material web or sheet;
sealing the hole or hole indication with a sealing strip;
sealing a pouring element of a thermoplastic device, the thermoplastic device having a sealing element against an outside of the material web or sheet, the pouring element having a side wall defining a pouring opening, the side wall being sealed around the sealing strip such that the sealing strip is disposed entirely within the pouring opening; and
removably attaching the sealing element of the device over the pouring element,
wherein the sealing strip can be grasped through the pouring opening after the sealing element is removed from the pouring element.

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**5,495,707**
**BAGGING MACHINE WITH IN-LINE ATTACHING MECHANISM**
**Robert Lauzon, Montreal, Canada, assignor to Glopak, Inc., Quebec, Canada**
**Filed Jun. 22, 1994, Ser. No. 263,598**
**Int. Cl.[6] B65B** *43/28;43/54;51/14*
**U.S. Cl. 53—572** **6 Claims**

1. An automatic bagging machine for use in combination with



article discharge means for discharging one or more articles in an open top end of a plastic bag held and supported at a discharge location under said discharge means, bag holding means for holding a plurality of collapsed juxtaposed bags adjacent said discharge location, said bag holding means comprises support means for displaceably engaging a top flap of said juxtaposed bags above said mouth opening, and a stationary arresting element for frictional retention of a lower end portion of said outermost one of said bags adjacent said discharge location, said bag holding means having bag opening means for opening a mouth of an outermost one of said bags to form said open top end, automatic bag separation means to permit said outermost one of said bags adjacent said discharge location to be separated from said plurality of juxtaposed bags simultaneously when said one or more articles are discharged in said open top end thereof while maintaining retention and support of said bag at said discharge location, and means for horizontally displacing said bag with said articles therein away from said discharge location; said automatic bag separation means being comprised of the combination of said bag holding means, said stationary arresting element and said bag opening means whereby the introduction of said one or more articles in said mouth opening of said outermost one of said bag will apply a pulling force on said outer side wall of said outermost one of said bags causing said outermost one of said bags to be pulled from said stationary arresting element and an adjacent bag becoming in contact and frictionally arrested by said stationary arresting element, said means for horizontally displacing said bag with said articles therein comprises gathering means for gathering an upper end portion of said bag below said open top end to form a gathered neck portion, pulling means to move said gathering means along a horizontal plane to pull said outermost one of said bags to an attaching device for attachment of said gathered neck portion of said bag, discharge means for discharging said attached bag from said bagging machine, said gathering means being comprised of a first and second pair of bag gathering and engaging V-shaped arms, each pair of arms being spaced apart vertically and aligned with one another and offset with said other pair of arms to engage said bag at spaced intervals when displaced towards one another on a pivot connection from a respective side of said outermost one of said bags to define said gathered neck portion between said pairs of arms by gathering a top portion of said bag into opposed trough ends of said V-shaped arms, said V-shaped arm of each pair of arms have a pair of fingers defining a mouth with a large open end which narrows to said trough end, said arms being mounted on a displacement mechanism to move said arms toward one another to embrace said upper end portion of said bag and retain said bag, said arms being secured to a carriage which is displaceable in-line in said horizontal plane between said discharge location and said attaching device where said bag is discharged.

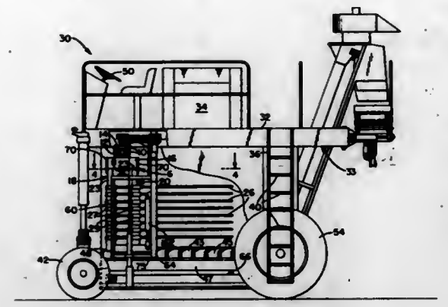
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**5,495,708**
**CANOPY HARVESTER WITH FORCE BALANCED DRIVE**
**Phillip R. Scott, Madera; Franklin P. Orlando, Morgan Hill; Richard K. Warren, Sanger, and Larry L. Slates, Madera, all of Calif., assignors to FMC Corporation, Chicago, Ill.**
**Filed Aug. 31, 1994, Ser. No. 298,917**
**Int. Cl.[6] A01D** *46/26;46/28*
**U.S. Cl. 56—329** **29 Claims**

21. An apparatus for catching fruit falling from plants, comprising:
a first row of flexible closures, wherein the flexible closures have a first end which has a rectangular shape, and a second end, which has a diamond shape;
a second row of flexible closures, wherein the flexible closure have a first end which has a rectangular shape, and a second end, which has a diamond shape, and wherein the second ends of the first row of flexible closures are adjacent to the second ends of the second row of flexible closures;
a first catching plate mechanically connected to the first ends of the first row of flexible closures; and
a second catching plate mechanically connected to the first ends of the second row of flexible closures.

29. A method of removing fruits from plants, comprising the steps of:

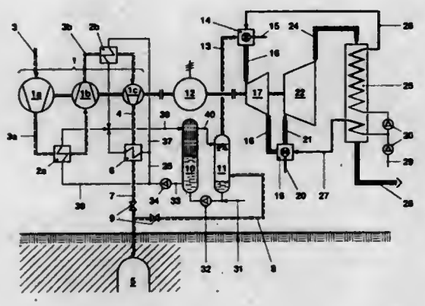




moving a harvester around a row of plants so that plants pass near the center of the harvester;
providing a first plurality of horizontal shaker rods on a first side of the plants;
providing a second plurality of horizontal shaker rods on a second side of the plants;
mechanically connecting the first plurality and second plurality of horizontal shaker rods to a shaker means; and
oscillating the shaker means and the first and second plurality of shaker rods about a vertical axis between the plurality of first and second shaker rods.

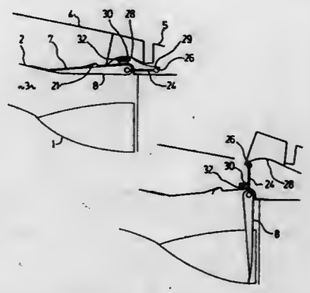
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**5,495,709**
**AIR RESERVOIR TURBINE**
**Hans U. Frutschi, Riniken, Switzerland, assignor to ABB Management AG, Baden, Switzerland**
**Filed Aug. 5, 1994, Ser. No. 286,211**
**Claims priority, application Switzerland, Aug. 5, 1994, 02 453/94**
**Int. Cl.[6] F02C** *7/00*
**U.S. Cl. 60—39.55** **12 Claims**



1. An air reservoir turbine installation having a gas turbine group connected to a compressed air reservoir, and comprising a hot water reservoir, a waste heat steam generator connected to receive an exhaust gas flow downstream of the gas turbine, the gas turbine group comprising a compressor unit, at least one combustion chamber and at least one turbine, wherein the waste heat steam generator is connected to introduce steam into the gas turbine group for increasing an output of the at least one turbine, and further comprising at least one heat exchanger to cool working air compressed by the compressor unit and a partial pressure evaporator to introduce water vapor into the working air, the at least one heat exchanger being connected to deliver heated water to the partial pressure evaporator.

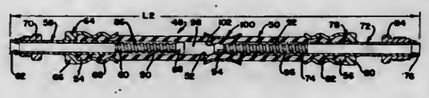
**5,495,710**
**DUAL-FLOW TURBINE ENGINE EQUIPPED WITH A THRUST REVERSAL SYSTEM AND A DEVICE FOR RESTRICTING THE ANNULAR CHANNEL FOR THE EJECTION OF COLD GASES, AND A RESTRICTION DEVICE EQUIPPING SUCH A TURBINE ENGINE**
**Guy Servanty, Leguevin, France, assignor to Conception Aeronautique du Snd-Ouest, Blagnac, France**
**Filed Mar. 23, 1995, Ser. No. 408,962**
**Claims priority, application France, Mar. 28, 1994, 94 03919**
**Int. Cl.[6] F02K** *3/02*
**U.S. Cl. 60—226.2** **10 Claims**



1. A restriction device for the annular by-pass duct (3) defined by a dual-flow turbine engine pipe (2), having a fitting (7) forming a seat (9), and a shutter (8) whose shape is adapted for being housed inside the seat (9) of the fitting (7), in a closed position, the said shutter being borne by a shaft (23) pivoting with respect to the fitting (7) and being mounted so as to project with respect to the said shaft, the said restriction device comprising:
sealing means (14, 15) disposed between the shutter (8) and the seat (9), adapted for defining at least one sealed chamber between the said shutter and seat, in the closed position of the shutter, each seat (9) having, in line with each of the chambers, at least one orifice (18),
elastic means (21) arranged so as to act each shutter (8) i such a way as to produce an initial release of the said shutter from its closed position.

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**5,495,711**
**TUNER HOSE ASSEMBLY FOR POWER STEERING SYSTEM**
**Jesse Kalkman, Saginaw; Roy W. Heath, Davisburg, and David F. Hammerbacher, Saginaw, all of Mich., assignors to General Motors Corporation, Detroit, Mich.**
**Filed Dec. 7, 1994, Ser. No. 350,573**
**Int. Cl.[6] F16D** *31/02*
**U.S. Cl. 60—469** **4 Claims**



1. A tuner hose assembly comprising:
a flexible elastomeric hose having a cylindrical inner wall surface,
a first flexible and radially inelastic tuner tube inside of said flexible hose cooperating with said cylindrical inner wall thereof in defining a first annular chamber between said first tuner tube and said cylindrical inner wall,
means connecting said first tuner tube at a first end thereof to a pump discharge and closing a first end of said first annular chamber,

a second flexible and radially inelastic tuner tube inside of said flexible hose cooperating with said cylindrical inner wall thereof in defining a second annular chamber between said second tuner tube and said cylindrical inner wall,

means connecting a first end of said second tuner tube to a steering gear inlet port and closing a first end of said second annular chamber,

a second end of said second tuner tube being longitudinally separated from a second end of said first tuner tube by a wave interference gap within said flexible hose open to said first annular chamber,

closure means closing said second annular chamber at said second end of said second tuner tube and defining a fluid seal between said second annular chamber and said wave interference gap, and

means defining a fluid leak path from inside of said second tuner tube to said second annular chamber.

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**5,495,712**

**VARIABLE DISPLACEMENT TYPE HYDRAULIC SYSTEM**

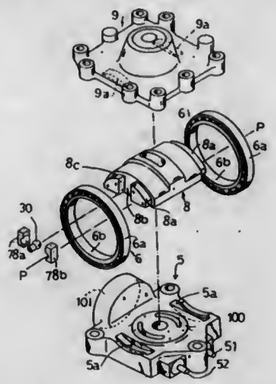
**Kazuhiko Yano; Shigenori Sakikawa, and Ryota Ohashi, all of Amagasaki, Japan, assignors to Kanzaki Kokyukoki Mfg. Co., Ltd., Amagasaki, Japan**

**Filed Jun. 17, 1994, Ser. No. 261,995**

**Claims priority, application Japan, Sep. 17, 1993, 5-232009**

**Int. Cl.[6] F16D *39/00*; F01B *3/00***

**U.S. Cl. 60—487** **11 Claims**



1. A hydraulic system, comprising:

a housing;

a variable displacement hydraulic unit contained in said housing, said hydraulic unit being provided with a rotatable cylinder block having a plurality of pistons movable in reciprocation and a swash plate having an abutting surface for abutting against heads of said pistons and an axis of slanting movement;

operating means for controllably slantingly moving said abutting surface of said swash plate with respect to a rotary axis of said cylinder block; and

a roller bearing fixedly positioned in said housing having an inner ring with an inner circumference, said swash plate including a guide on a side surface thereof having a circumference smaller than said inner circumference of said inner ring of said roller bearing such that a size and weight of said swash plate is reduced, said guide being fitted within said inner ring for slantingly movably supporting said swash plate in a slantingly movable position within said housing, wherein a center of radius of curvature of said guide coincides with the axis of slanting movement of said swash plate.

**5,495,713**

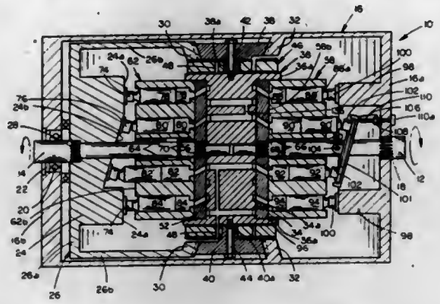
**HYDROSTATIC DIFFERENTIAL TRANSMISSION**

**Richard E. Leker, R.R. 1, Box 93B, Emerado, N. Dak. 58228**

**Filed Nov. 22, 1994, Ser. No. 343,250**

**Int. Cl.[6] F16D *39/00***

**U.S. Cl. 60—488** **6 Claims**



1. A hydrostatic differential transmission, comprising:

a hollow, cylindrical input housing having opposing forward and rearward ends and a cylindrical side wall;

an input drive shaft extending through an aperture in the forward wall of said input housing with a rearward end disposed within the interior of the input housing,

said input shaft connected coaxially with said input housing for rotation therewith;

an output shaft extending through an aperture in the rearward end of the input housing with a forward end disposed within the interior of the input housing, said output shaft freely rotatable in the rearward end aperture, coaxial with the input shaft;

a generally disk-shaped differential coaxially mounted on the forward end of the output shaft and the rearward end of the input shaft, for free rotation on said shafts;

a plurality of pinion gears rotatably mounted uniformly around a circumferential surface of the differential for free rotation about axes extending radially from the differential;

a forward ring gear mounted on the interior of said input housing side wall for rotation therewith and in operable engagement with said pinion gears;

an output housing coaxially mounted on the rearward end of said output shaft within the interior of the input housing, for rotation with said output shaft;

said output housing including a generally disk-shaped base portion and a forwardly projecting cylindrical side wall;

a rearward ring gear mounted on a forward edge of said output housing side wall for rotation therewith and in operable engagement with said pinion gears;

a forward hydraulic pump rotatably mounted on said input shaft for free rotation thereon between a forward valve plate and a rearward surface of the input housing forward end;

said forward pump presenting a plurality of bores extending therethrough parallel to said input shaft and arranged uniformly around a circle concentric to said input shaft;

pistons disposed for reciprocating movement in the respective bores of said forward pump to displace hydraulic fluid therein;

a forward swash plate adjustable connected to the input housing for interaction with said forward pump pistons to effect reciprocating movement thereof;

a rearward hydraulic pump rotatably mounted on said output shaft for free rotation thereon between a rearward valve plate and the base of said output housing;

said rearward pump presenting a plurality of bores extending therethrough and arranged with passageways through the valve plates and differential in a substantially closed hydraulic circuit with said forward pump bores, whereby fluid displaced in each pump is directed to the other pump;



pistons disposed for reciprocating movement in the respective bores of the rearward pump to displace hydraulic fluid therein;

a rearward fixed swash plate formed on a forward surface of the output housing base for interaction with said rearward pump pistons to effect reciprocating movement thereof;

said rearward swash plate having a planar surface in contact with said rearward pump pistons, said surface oriented in a plane offset at a predetermined angle from perpendicular to the axis of the output shaft;

said forward swash plate adjustable mounted for selective pivotal movement from a neutral position within a plane oriented at the same angle from perpendicular to the input shaft axis as the fixed swash plate, to a direct-drive position within a plane oriented perpendicular to the axis of the input shaft;

said forward and rearward pumps connected to said differential for rotation therewith; and

control means connected between said input housing and said forward swash plate, for selective adjustment of the forward swash plate between the neutral and direct-drive positions;

whereby rotation of the input shaft with the forward swash plate in the neutral position will cause a transfer of fluid between corresponding bores of said forward and rearward pumps; and

whereby rotation of the input shaft with the forward swash plate in the direct drive position will prevent reciprocation of the forward pump pistons, thereby preventing flow of hydraulic fluid and locking the input and output shafts at substantially identical velocity.

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**5,495,714**

**CONDENSER ENVELOPE MADE OF CONCRETE FOR A STRUCTURALLY INDEPENDENT LOW PRESSURE MODULE**

**Jean-Pierre Gros, Villemomble, and Gérard Foucher, Tremblay en France, both of, France, assignors to GEC Alsthom Electromecanique SA, Paris, France**

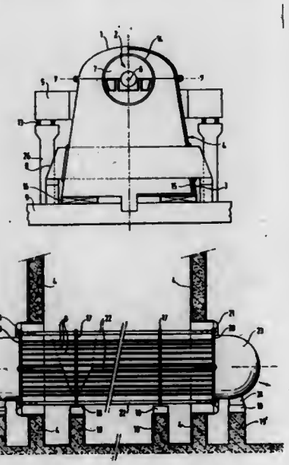
**Continuation of Ser. No. 138,104, Oct. 20, 1993, abandoned.**

**This application May 15, 1995, Ser. No. 441,010**

**Claims priority, application France, Jan. 21, 1992, 92 12580**

**Int. Cl.[6] F01K *11/02***

**U.S. Cl. 60—687** **6 Claims**



1. A structure comprising an LP module of a steam turbine supported by a concrete support-block carried by posts standing on a concrete raft, and a vacuum enclosure made of concrete, including an exhaust box surrounding the LP module and a condenser envelope provided with bundles disposed beneath the LP module, said exhaust box being connected to the LP module by means of first elastic seals and said condenser envelope being connected to said bundles by means of second elastic seals.

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**5,495,715**

**ENGINE FUEL METERING SYSTEM**

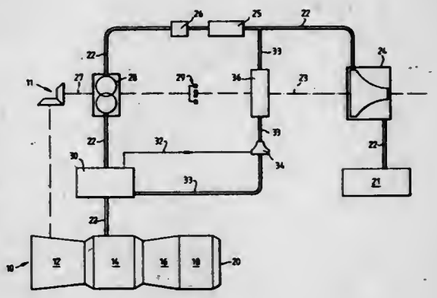
**Russell A. Loxley, Leicestershire, England, assignor to Rolls-Royce plc, Derby, England**

**Filed Aug. 23, 1994, Ser. No. 294,342**

**Claims priority, application United Kingdom, Sep. 8, 1993, 9318624**

**Int. Cl.[6] F02G *3/00*; F02C *1/00***

**U.S. Cl. 60—734** **7 Claims**



1. A fuel metering system for varying the supply of fuel to an engine comprising a fuel tank, a first fuel pump having an inlet connected to the fuel tank and an outlet connected to an inlet of a second fuel pump, the second fuel pump being of the fixed displacement type, delivery control means being connected to an outlet of the second fuel pump to control the amount of fuel supplied to the engine and to divert fuel in excess to the engine requirements back to the inlet of the second pump, the second pump being driven at a speed proportional to the speed of the engine, the first pump being selectively driven by either a mechanical drive between the first and second pumps or by a variable drive, automatic clutch means being provided which operates in response to the difference between the rotational speeds of the first and second pumps to selectively connect the mechanical drive between the first and second pumps, whereby in operation if the delivery control means detects that the fuel delivered by the first and second fuel pumps is required by the engine the automatic clutch means engages to provide a direct mechanical drive between the first and second pumps so that the first pump is driven at the same speed as the second pump, however if the delivery control means detects that the first and second pumps are delivering fuel in

excess to the engine requirement the automatic clutch means disengages and the fuel in excess to the engine requirements is diverted, the energy of the diverted fuel being used to drive the variable drive of the first pump at a speed higher than the speed of the second pump.

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**5,495,716**

**Patent Not Issued For This Number**

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**5,495,717**

## INSULATED CONTAINER FOR STORING LIQUID HELIUM

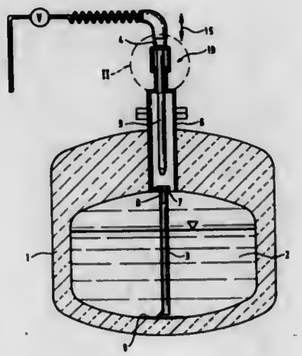
**Bernd Gottschlich, Betzdorf, and Hans Lugmayr, Krefeld, both of, Germany, assignors to Messer Griesheim GmbH, Frankfurt, Germany**

**Filed Oct. 25, 1994, Ser. No. 329,090**

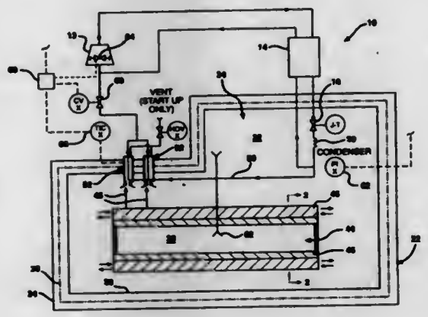
**Claims priority, application European Pat. Off., May 4, 1994, 94107013**

**Int. Cl.[6] F17C *7/02***

**U.S. Cl. 62—45.1** **20 Claims**



**1.** An insulated container for storing liquid helium comprising a container for the helium, the container having an upper end, a draw-off siphon mounted to the upper end of the container, the draw-off siphon including a first part and a second part, the first part being a lower part extending into the container for contacting helium from the container, and the second part being thermally separated from the first part to prevent heat conduction from the second part to the first part and then into the container.




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**5,495,718**

## REFRIGERATION OF SUPERCONDUCTING MAGNET SYSTEMS

**James G. Pierce, 632 Teteridge Rd., Columbus, Ohio 43214; Charles B. Hood, 4051 Gulf Shore Blvd. N., #202, Naples, Fla. 33940; Sibley C. Burnett, and John R. Purcell, both of Advanced Cryomagentics, Inc., P.O. Box 910132, San Diego, Calif. 92191-0132**

**Filed Jan. 14, 1994, Ser. No. 182,439**

**Int. Cl.[6] F17C *5/02***

**U.S. Cl. 62—47.1** **28 Claims**

**1.** A liquefier for supplying cryogenic fluid to refrigerate at least one load, said liquefier comprising liquefier parts, including:

a compressor, refrigerator, and a condenser element downstream therefrom, operatively interconnected and defining a closed loop flow path for a first supply of fluid, and wherein said condenser element is configured for heat exchange with gas outside said flow path therethrough; and

a dewar defining a volume for storage of a cryogenic liquid including ullage thereabove, said cryogenic liquid produced from a second supply of fluid isolated from said first supply of fluid for refrigeration of at least one load;

wherein said condenser element of said evaporation component is positioned in said dewar to liquefy said second fluid in the dewar to refrigerate a load; and

wherein said liquefier further includes:

a load positioned for substantial immersion in cryogenic liquid produced from said second fluid; and

a separately defined cold vapor storage chamber suitable for storage of liquid cryogen, said cold vapor storage chamber being at least partially surrounded by said load, generally positioned below the cryogenic liquid level substantially immersing said load, and connected to communicate with cold vapor generated by operation of said load.



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**5,495,719**

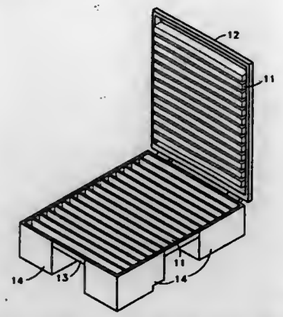
## METHOD OF PRESERVING SPERMATOZOA

**Carl O. Gray, Jr., 14240 Fancher Rd., Johnstown, Ohio 43031**

**Filed Nov. 14, 1994, Ser. No. 338,365**

**Int. Cl.[6] F25D *17/02***

**U.S. Cl. 62—78** **4 Claims**



**1.** A method of preserving spermatozoa which comprises placing a mixture of spermatozoa and a cryoprotectant for said spermatozoa in a flexible flat container, and thereafter freezing said container under restraints so that the thickness of said container, when frozen, will not exceed 4 millimeters.

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**5,495,720**

## PROCESS FOR SETTING, CONTROLLING AND MONITORING THE LEVEL IN A REFRIGERANT EVAPORATOR

**Wilhelm Buck, St. Hülfe 200, D-2840 Diepholz, Germany**

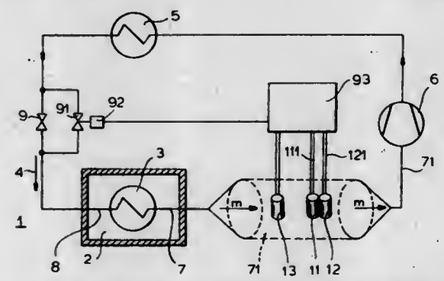
**PCT No. PCT/EP92/02739, § 371 Date May 27, 1994, § 102(e) Date May 27, 1994, PCT Pub. No. WO93/11394, PCT Pub. Date Jun. 10, 1993**

**PCT Filed Nov. 27, 1992, Ser. No. 244,551**

**Claims priority, application Germany, Nov. 28, 1991, 41 39 064.4**

**Int. Cl.[6] F25B *41/04***

**U.S. Cl. 62—115** **17 Claims**



**1.** A process for setting, controlling and monitoring a filling level of a refrigerant evaporator in a closed circuit of a refrigerating machine and evaporating a mass flow of refrigerant into a substantially dry gas in a suction line of said circuit downstream of said refrigerant evaporator, said process comprising the steps of:

(a) inserting into said suction line a heatable measuring body so that said body contacts said gas and is impacted by refrigerant drops;

(b) heating said body to a temperature differential above the temperature of the suction line gas and applying a measuring and evaluation circuit to record a measuring signal representing the energy supplied and establishing a basic signal comprised of a signal component representing electronic noise of said measuring and evaluating circuit and another signal representing passage of dry gas past said body;

(c) measuring, with said measuring and evaluation circuit during said mass flow, energy needed to evaporate refrigerant drops hitting said body, thereby producing a measuring signal;

(d) forming a difference between said measuring signal and said basic signal

(e) comparing said difference with an adjustable reference value establishing a threshold above which the gas traversing said suction line is considered to contain excess liquid; and

(f) setting, controlling and monitoring said filling level in response to determination as to the liquid content of said gas in said suction line.

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**5,495,721**

## PROCESS FOR COOLING AND CONDITIONING AIR

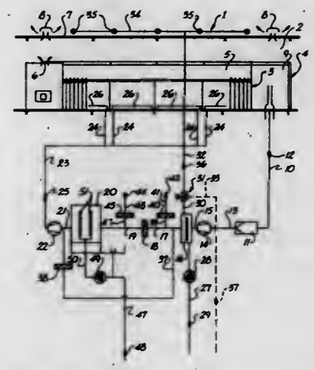
**Helmut Stueble, Spartanburg, S.C., assignor to LTG Lufttechnishche GmbH, Stuttgart, Germany**

**Filed Jul. 29, 1994, Ser. No. 283,026**

**Claims priority, application Germany, Jun. 3, 1994, 44 19 441.2**

**Int. Cl.[6] F25D *17/02***

**U.S. Cl. 62—121** **18 Claims**



**1.** A method for cooling and conditioning heated waste air generated in a textile room from textile machines carrying out a textile process, said process comprising:

drawing the heated waste air from the textile room and passing the air through a liquid medium heat exchanger;

drawing a liquid cooling medium at a desired temperature from a constant source and passing the liquid cooling medium through the heat exchanger to cool the heated waste air, the liquid cooling medium thereby being heated by the heated waste air;

recycling at least a portion of the cooled air exiting the heat exchanger back to the textile room; and

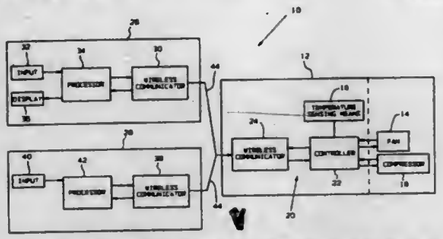
directing the heated liquid cooling medium from the heat exchanger to an operative location in the textile process requiring a separate medium of approximately the temperature of the heated liquid cooling medium, and using the heated liquid cooling medium at the location as a source of the separate medium to reduce the overall energy consumption of the textile process.

5,495,722

## REMOTE CONTROL FOR DIAGNOSTICS OF AN AIR CONDITIONER

**Larry J. Manson, Baroda Township, Berrien County; John K. Paustian, Millburg, and Patrick J. Glotzbach, Ann Arbor, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.**

**Filed Apr. 21, 1994, Ser. No. 230,963**
**Int. Cl.[6] F25B *49/02***
**U.S. Cl. 62—125** **9 Claims**



1. An electronic control for use in operating a room air conditioner in a particular diagnostic test mode, said electronic control comprising:

a remote control unit adapted to be located remote from said room air conditioner, said remote control unit including:

input means for selecting the operational parameters of the particular diagnostic test mode of said room air conditioner and for generating selection signals;

processing means for processing said selection signals into a plurality of output signals, said output signals including an encoded sequence corresponding to the particular diagnostic test selected said room air conditioner operating according to said encoded sequence;

memory means for maintaining in memory said selection signals are operably associated with said processor means; and

first wireless communication means for sending said output signals; and

a room air conditioner control unit including

a second wireless communication means for receiving said output signals, and

switch means for controlling said room air conditioner in the particular diagnostic test mode selected, said switch means operatively connected to said second wireless communication means.

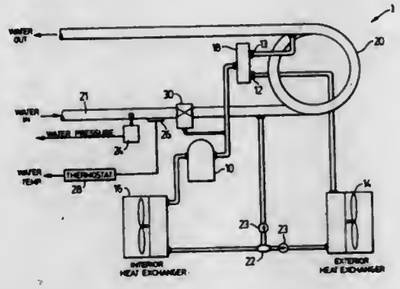
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5,495,723

## CONVERTIBLE AIR CONDITIONING UNIT USABLE AS WATER HEATER

**Kenneth MacDonald, R.R. #1, 11753 Trafalgar Road, Georgetown, Ontario, Canada**

**Filed Oct. 13, 1994, Ser. No. 322,931**
**Int. Cl.[6] F25B *39/04***
**U.S. Cl. 62—183** **20 Claims**



1. In an air conditioner system including, in operative combination, a compressor having an inlet and outlet from which flows refrigerant, a fan-forced air-cooled exterior heat exchanger for bringing refrigerant into a heat exchange relationship with an exterior environment, a fan-forced indoor heat exchanger for bringing refrigerant into heat exchange relationship with an interior environment, an improvement for converting said system into a water supply heater, comprising:

a water cooled condenser having a refrigerant throughflow passageway and a water throughflow conduit for bringing a water supply pumped therethrough into heat exchange relationship with said refrigerant;

a directional three-way valve for connecting the compressor outlet to an inlet of said exterior heat exchanger and to an inlet of said water cooled condenser, said air cooled exterior heat exchanger and said water cooled condenser being connected at their outlets to said indoor heat exchanger; and

control means for selectively directing said three-way valve to route the refrigerant either through said water cooled condenser in a water supply heating mode or through said air-cooled exterior heat exchanger but not through both said water cooled condenser and said air cooled heat exchanger at the same time;

(i) said control means including a water pressure switch for actuating said three-way valve to route the refrigerant from said compressor to said water cooled condenser and de-energizing the fan associated with said air-cooled exterior heat exchanger in response to inflow water pressure in said water cooled condenser exceeding a minimum pressure level, whereby said water supply heating mode is engaged,

(ii) a refrigerant pressure activated water regulator valve mounted on the inflow side of said water throughflow conduit for regulating the amount of water flowing through said water through flow conduit in order to maintain a desired level of refrigerant pressure, and

(iii) a thermostat for actuating said three-way valve to route refrigerant from said compressor to said air-cooled exterior heat exchanger and energizing the fan associated therewith in response to the temperature of said water supply exceeding a threshold temperature level, whereby said water supply heating mode is disengaged.

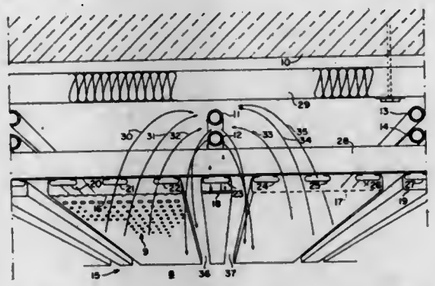
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5,495,724

## COOLING SYSTEM

**Helmut Koster, Karl-Bieber-Hohe 15, D-6000, Frankfurt am Main, Germany**

**Filed Jun. 14, 1993, Ser. No. 39,344**
**Claims priority, application Germany, Aug. 20, 1991, 41 27 479.2; May 15, 1992, 42 16 136.3**
**Int. Cl.[6] F25D *23/12*; F24F *5/00***
**U.S. Cl. 62—259.1** **13 Claims**



1. Cooling system which can be fastened on a ceiling (**10**) with a suspension (**16** to **19**, **41** to **44**, **69** to **71**, **115**, **116**) provided underneath the ceiling (**10**) disposed above a space (**8**) to be cooled, and with a plurality of adjacent cooling pipes (**11** to **14**; **48**, **49**; **82** to **85**, **102** to **105**) between ceiling (**10**) and suspension (**16** to **19**, **41** to **44**, **69** to **71**, **115**, **116**), the space (**8**) to be cooled and the space between ceiling (**10**) and suspension (**16** to **19**, **41** to **44**, **69** to **71**, **115**, **116**) are connected with each other through an air current path, condensation water channels are disposed in vertical arrangements underneath the cooling pipes (**11** to **14**), characterized in that the condensation water channels are first panels (**18**, **19**) providing along with second panels (**16**, **17**) which are disposed below and between horizontally adjacent cooling pipes (**11** to **14**) said suspension in which the air current paths (**36**, **37**) are provided by gaps between the first and second panels (**16** to **19**).



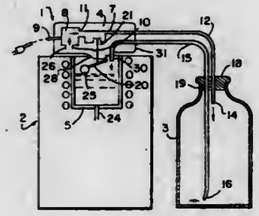
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5,495,725

## WATER TRANSFER ASSEMBLY FOR WATER COOLER

**William Middlemiss, 3935 NW. 38th Ave., Fort Lauderdale, Fla. 33309**

**Filed Nov. 25, 1994, Ser. No. 348,934**
**Int. Cl.[6] B67D *5/62***
**U.S. Cl. 62—389** **8 Claims**



1. For a bottled water cooler having a cooled water reservoir with an open top adapted to support an inverted water container, a water transfer assembly for transferring water automatically from a non-inverted bottle of water having a constricted neck and positioned below said reservoir to the reservoir, the water transfer assembly comprising:

(A) a housing arranged to be installed on said reservoir in place of said inverted container by simply laying said housing on said reservoir;

(B) an air pressure system including an electrically powered air pump, said pump having an air inlet and a pressurized air outlet, said pump being contained within said housing;

(C) a closure for hermetically sealing the neck of said non-inverted bottle;

(D) an elongate, flexible tube means having two ends for fluid connection with said outlet at a first end and extending from said housing and through said closure and arranged for opening within said bottle at a second end for providing air pressure to said bottle for water transfer;

(E) an elongate, flexible water pipe means for transferring water from said bottle to said reservoir, said pipe means having a first terminus arranged to be at the bottom of said bottle, said pipe means extending from said first terminus, through said closure, and through said housing and arranged to deliver water from a second terminus to said reservoir; and

(F) water level sensing means supported by said housing and disposed for sensing the level of water within said reservoir, said sensing means cooperating with said air pressure system to reduce air pressure within said bottle when water in said reservoir reaches a predetermined level.

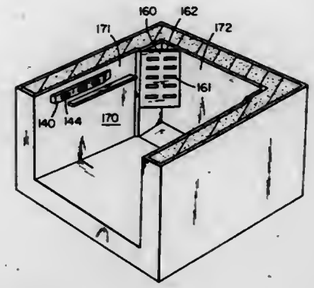
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5,495,726

## MECHANISM FOR COOLING A FRESH FOOD COMPARTMENT OF A REFRIGERATOR

**Jeoungowan Lee, Incheon, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea**

**Filed Sep. 26, 1994, Ser. No. 311,458**
**Claims priority, application Rep. of Korea, Sep. 24, 1993, 93-19561; Sep. 24, 1993, 93-19564**
**Int. Cl.[6] F25D *17/08***
**U.S. Cl. 62—413** **9 Claims**



8. A mechanism for cooling a fresh food compartment of a refrigerator comprising:

a guide plate disposed at a corner between a side and a rear walls of the fresh food compartment, the guide plate including a plurality of first exhaust ports formed at the guide plate, the side and rear walls of the fresh food compartment and the guide plate together defining a vertical channel;

a rear channel section disposed in the side wall of the fresh food compartment, the rear channel section including a concave bottom plate having a side wall channel defined in the concave bottom plate, a first slit and a second slit formed respectively near a left end and at a middle portion of the concave bottom plate, and a base hook disposed between the first and second slits, and a flange provided at a left outer periphery of the concave bottom plate;

a front port section including a plurality of second exhaust ports formed at the front port section, and first, second, and third front hooks disposed respectively near a left end, at a middle portion, and near a right end of an inner surface of the front port section; and

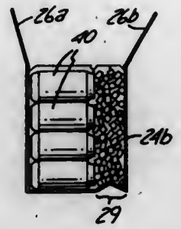
a support plate section disposed between the rear channel section and the front port section and being in close contact with the flange of the rear channel section, the support plate section including an inflow opening formed near a right end of the support plate section, an exhaust opening formed at a middle portion of the support plate section, first and second holes formed respectively near left and right ends of the exhaust opening, and a heat insulating barrier provided between the inflow opening and a right end of the exhaust opening on an inner surface of the support plate section, the first front hook extending through the first hole into the first slit and being engaged in the first slit, the second front hook extending through the exhaust opening into the second slit and being engaged in the second slit, the base hook extending through the exhaust opening and being engaged with a left inner peripbery of the exhaust opening, and the third front hook extending through the second hole and being engaged in the second hole so that the support plate section is in close contact with the rear channel section and the front port section is tightly fitted at the support plate section to cover the exhaust opening, whereby an air-flowing path is established by the inflow opening, the side wall channel, the exhaust opening, and the second exhaust ports.

**5,495,727**

## CONTAINER AND EXPANDABLE COOLER

**Bryan Strong, 240 Mississippi Dr., and Nicholous Dahlheimer, 231 E. River St., P.O. Box 254, both of Monticello, Minn. 55362**

**Filed Apr. 22, 1994, Ser. No. 231,312**
**Int. Cl.[6] B65D** *5/00;5/355;* **F25D** *3/08*
**U.S. Cl. 62—529** **16 Claims**




1. A package for packaging a plurality of containers comprising:
a) first and second major side panels spaced apart and substantially parallel to each other;
b) a plurality of minor side panels connecting the first and second major side panels, wherein the minor side panels are located in planes substantially perpendicular to the first and second major side panels, and further wherein the major side panels intersect with each of the minor side panels along edges;
c) a plurality of drainage openings in the package, all of the drainage openings located along the perimeter of one of the major or minor side panels; and
d) means for sealing the package to prevent leakage of fluids from the package when the plurality of drainage openings lie above the lowermost plane occupied by the package.

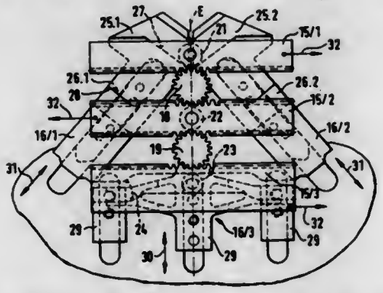
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**5,495,728**

## ADJUSTING DEVICE FOR CAM PARTS OF FLAT KNITTING MACHINES WITH MOTOR PINION ACTING ON CONTROL SLIDERS

**Franz Schmid, Bodelshausen, and Martin Wörnle, Dusslingen, both of, Germany, assignors to H. Stoll GmbH & Co., Reutlingen, Germany**

**Filed Oct. 27, 1994, Ser. No. 331,360**
**Claims priority, application Germany, Nov. 5, 1993, 43 37 775.0**
**Int. Cl.[6] D04B** *15/36*
**U.S. Cl. 66—78** **8 Claims**




1. An adjusting device for opposite adjustment of both drawing off cam parts of a cam system of a flat knitting machine carriage, the adjusting device comprising a common stepper motor moving with the machine carriage and providing a rotary movement; means for converting said rotary movement into a longitudinal movement of a carriage running direction and cam parts to be adjusted; at least one control curve through which the rotary movement of said stepper motor is transferred to the cam parts to be adjusted, said stepper motor being provided with a driven pinion; two first control sliders adjustable in the carriage running direction and provided with a toothed strip, said driven pinion acting simultaneously and oppositely directly on said first control sliders; and at least two second control sliders each connected with a cam part to be adjusted, with which said first control sliders are drivingly coupled through said control curve in a drawing manner.

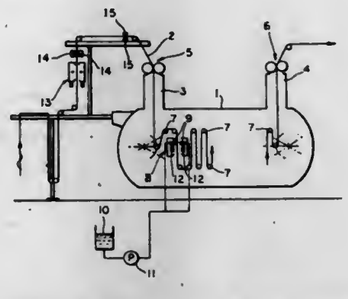
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**5,495,729**

## METHOD FOR HIGH TEMPERATURE AND HIGH PRESSURE CONTINUOUS DYEING OF A CLOTH AND AN APPARATUS THEREFOR

**Yoshiteru Sando; Hiroshi Ishidoshiro, and Koji Sando, all of Wakayama, Japan, assignors to Sando Iron Works Co., Ltd., Wakayama, Japan**

**Filed Nov. 7, 1994, Ser. No. 335,477**
**Claims priority, application Japan, Nov. 8, 1993, 5-278481**
**Int. Cl.[6] D06B** *3/12*
**U.S. Cl. 68—5 E** **1 Claim**




1. An apparatus for high temperature and high pressure continuous dyeing comprising a transport path for a long cloth to be dyed, a moisture supplying box for wetting the long cloth, a moisture rate determining sensor arranged in succession to the moisture supplying box, a cloth-width detecting sensor arranged in succession to the moisture rate determining sensor, a high pressure steamer arranged next to the cloth-width detecting sensor, a nozzle for supplying a dye solution to the wetted cloth in the steamer, and a controlling mechanism for controlling the width of the dye solution jetted from the nozzle corresponding to the width of the cloth on the basis of an output from the cloth-width detecting sensor.

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**5,495,730**

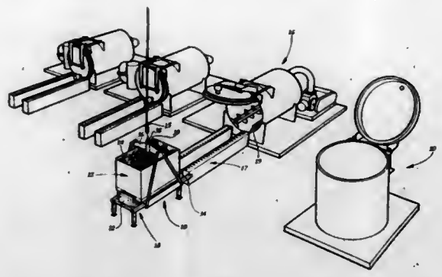
## ADAPTER FOR USING A HORIZONTAL PACKAGE DYEING CARRIER WITH A VERTICAL TREATMENT MACHINE

**Matthew A. Meeker; James K. Turner, and Thomas W. Van Scyoc, all of Stanley, N.C., assignors to Gaston County Dyeing Machine Company, Stanley, N.C.**

**Continuation-in-part of Ser. No. 49,835, Apr. 19, 1993, Pat. No. 5,410,892. This application Jun. 21, 1994, Ser. No. 263,046**
**Int. Cl.[6] D06B** *5/06*
**U.S. Cl. 68—10** **15 Claims**

1. An adapter for using a yarn package carrier in both vertically and horizontally oriented treatment vats comprising a platform for supporting the yarn package carrier: said platform including adjustable retaining means for retaining carriers of different sizes on said platform, means for engagement of said adapter by a carrier transfer device, said engagement means being mounted to said





platform and fluid passageway means formed in said platform for directing treatment fluid from the vertically oriented vat into the yarn package carrier.

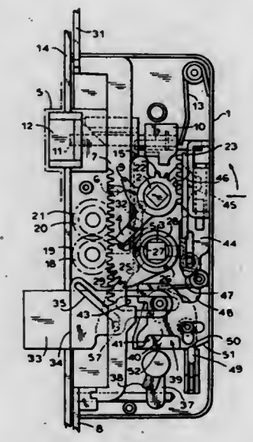
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**5,495,731**

## MULTIPLE-BOLT DOOR LOCK

**Peter Riznik, Tillmitsch, Austria, assignor to Roto Frank Eisenwarenfabrik Aktiengesellschaft, Karlsdorf bei Graz, Austria**

**Filed Mar. 25, 1994, Ser. No. 218,324**
**Claims priority, application Austria, Mar. 26, 1993, 623/93**
**Int. Cl.[6] E05B** *59/00*
**U.S. Cl. 70—108** **10 Claims**




1. A door lock comprising:
a housing adapted to be mounted on an edge of the door;
inside and outside nuts rotatable about respective inside and outside axes on the housing;
respective inside and outside handles fixed to the nuts and respectively projecting inward and outward from the door, each handle being movable upward and downward from a central position;
a pair of bolt-actuating slides in the housing each movable between an outer position and an inner position;
respective bolts coupled to the slides and movable jointly therewith between a position extended from the door in the outer position of the respective slide and a position recessed in the door in an inner position of the respective slide;
an actuating arm on the inside nut;
stops on one of the slides flanking the inside-nut arm and coupling the arm to the one slide;
means including a gear train meshing on one side with the outside nut and on the other side with both of the slides for opposite movement of the two slides on rotation of the outside nut;
respective inside and outside lost-motion couplings between the inside nut and the one slide and between the outside nut and the gear train for permitting limited angular movement of the inside and outside nuts without movement of the one slide and gear train, the outside lost-motion coupling comprising
a radial formation on the outside nut, and
a ring rotatable on the outside nut and having a pair of angularly spaced stop surfaces engageable with the formation and spaced apart by a distance permitting the formation to move through a predetermined angle between a position contacting one of the stop surfaces and a position contacting the other stop surface; and
means urging the nuts and handles into the central positions.

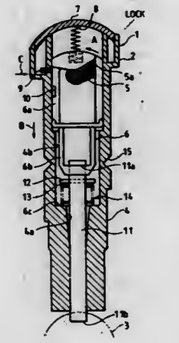
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**5,495,732**

## STEERING LOCK APPARATUS

**Kazuaki Nagae, and Minoru Morikawa, both of Aichi, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan**

**Filed Nov. 24, 1993, Ser. No. 156,815**
**Claims priority, application Japan, Nov. 25, 1992, 4-314939**
**Int. Cl.[6] B60R** *25/02*
**U.S. Cl. 70—252** **7 Claims**



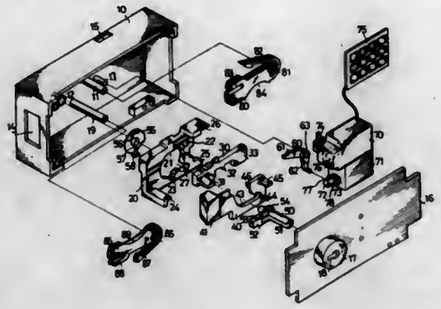

1. A steering lock apparatus comprising:
a lock body including a cylindrical body section and a cylindrical guide section protruding from said body section toward a steering shaft;
a cam member provided rotatably in said body section; a lock stopper provided movably along an inner surface of said guide section in accordance with a rotation of said cam member;
urging means for urging said lock stopper toward said steering shaft;
a lock bar having a first end portion engaged with said lock stopper for being moved together with said lock stopper, and a second end portion protruding toward said steering shaft for locking said steering shaft, said lock bar including a spring accommodating chamber near said first end portion; and
regulating means for regulating said lock bar from protruding toward said steering shaft in cooperation with said guide section when said lock bar is disengaged from said lock stopper, said regulating means including an engaging step portion formed on said inner surface of said guide section and a torsion coil spring held in said spring accommodating chamber.

**5,495,733**

## LOCK FOR A SAFE-DEPOSIT BOX

**Chieh-Cheng Yen, No. 9, Lane 37, Sec. 1, Chang-An E. Rd., and Wen-Tung Chien, 3Fl., No. 2-2, Lane 178, Chingnien Rd., both of Taipei, Taiwan, Prov. of China**

**Filed Oct. 12, 1994, Ser. No. 322,074**
**Int. Cl.[6] E05B *47/00;25/00***
**U.S. Cl. 70—279** **20 Claims**



12. A lock comprising:
a case defining an aperture and a slot;
a first latch including a blade projecting therefrom, a tab projecting therefrom, a mandrel-pushing element projecting therefrom, an aperture defined therein and a recess defined therein, wherein the first latch is slidably receivable in the case;
a ring including a lower shoulder formed thereon, an upper shoulder formed thereon and a tab formed on an edge, wherein the ring is pivotably receivable in the aperture defined in the first latch while the tab formed on the ring is receivable in the recess defined in the first latch;
a third latch including a blade projecting therefrom and a trigger-shaped element projecting therefrom, wherein the third latch is slidably receivable in the case;
a second latch including a tongue projecting therefrom, a tab projecting therefrom, a cutout defined therein, thus forming an arched edge and a curved edge, wherein the second latch is slidably receivable in the case while the tongue is insertable through the aperture defined in the case;
a lever including a first end and a second end, wherein the lever is pivotably receivable in the case;
an electromagnetic valve including a mandrel projecting therefrom, wherein the electromagnetic valve is receivable in the case while the mandrel is linked to the second end of the lever;
a control unit including a microswitch, a switch bar and a keypad operatively linked thereto, wherein the control unit is operatively connected with the electromagnetic valve while the switch bar is insertable through the slot defined in the case;
a latch-driving element including an axle insertable through the ring, a link projecting from the axle and a dialing element projecting from the link;
an upper group of key-engaging strips each including an arched lower edge and defining a slot, wherein the upper group of key-engaging strips are pivotably received in the case; and
a lower group of key-engaging strips each including an arched upper edge and defining a slot, wherein the lower group of key-engaging strips are pivotably received in the case;
whereby teeth of a renter's key are engageable with the arched lower edges of the upper group of key-engaging strips for aligning the slots defined in the upper group of key-engaging strips with one another for receiving the blade projecting from the third latch for allowing the movement of the third latch;
whereby the renter's key is engageable with the latch-driving element and rotatable clockwise for engaging the link with the trigger-like element for driving the third latch for pressing the microswitch for actuating the control unit;
whereby after the control unit is actuated, a code can be input through the keypad to the control unit for driving the electromagnetic valve for retracting the mandrel into the electromagnetic valve for pivoting the lever, thus disengaging the first end of the lever from the tab formed on the third latch;
whereby after the tab of the third latch is released from the first end of the lever the link is further pivotable by means of the renter's key for engaging with the curved edge for retracting the tongue into the case;
whereby teeth of a clerk's key are engageable with the arched upper edges of the lower group of key-engaging strips for aligning the slots defined in the lower group of key-engaging strips with one another for receiving the blade projecting from the first latch for allowing the movement of the first latch;
whereby the clerk's key is engageable with the latch-driving element and pivotable counterclockwise for engaging the dialing element with the lower shoulder for pivoting the ring for driving the first latch because of the engagement of the tab formed on the ring with the recess defined in the first latch, so that the control unit is turned off as the switch bar is moved by means of the tab projecting from the first latch and that the tab projecting from the second latch is released from the first end of the lever as the lever is pivoted by means of the mandrel pushed by means of the mandrel-pushing element.

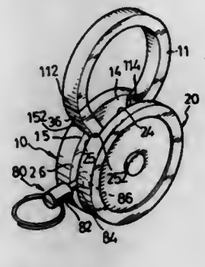
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**5,495,734**

## KEY RING ASSEMBLY

**San-chih Yu, No. 73-17, Sec. 2, Chung Hsing Rd., Ta Li City, Taichung Hsien, Taiwan, Taiwan, Prov. of China**

**Filed Jan. 30, 1995, Ser. No. 380,387**
**Int. Cl.[6] A47G *29/10***
**U.S. Cl. 70—456 R** **4 Claims**



1. A key ring assembly comprising:
a first half body having a first flange portion which is laterally formed along a periphery thereof and projects outwardly therefrom and comprises a first distal end and a second distal end, a hook member having a first end portion located above said first distal end of said first flange portion and a second end portion formed on said second distal end of said first flange portion, and a first opening defined between said first distal end of said first flange portion and said second end portion of said hook member;
a second half body coupled to said first half body and having a second flange portion which is laterally formed along a periphery thereof and projects therefrom facing towards said first flange portion and comprises a first free end and a second free end, a sliding groove defined between said first and second flange portions and, and a second opening defined between said first and second free ends of said second flange portion and communicating with said first opening;
a pivot member pivotally mounted between said first and second half bodies, a retaining arm formed on said pivot member and abutting against said first distal end of said first flange portion and said first free end of said second flange portion and in alignment with said first end portion of said hook member to form a loop, said retaining arm being able to pivot with said pivot member to slide in said first and second openings; and
a biasing member mounted between said first and second half bodies and comprising a first urging end abutting against said retaining arm and a second urging end abutting against said second end portion of said hook member.



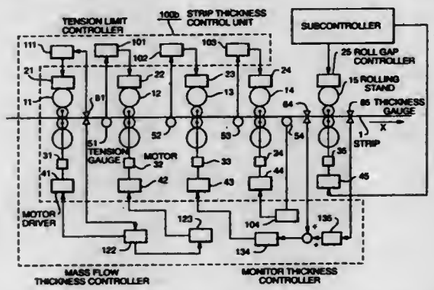
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**5,495,735**

## SYSTEM FOR CONTROLLING STRIP THICKNESS IN ROLLING MILLS

**Yoichi Nishimura, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan**

**Continuation of Ser. No. 2,571, Jan. 27, 1993, abandoned. This application Oct. 4, 1994, Ser. No. 317,824**
**Claims priority, application Japan, Jan. 28, 1992, 4-013116**
**Int. Cl.[6] B21B *37/02***
**U.S. Cl. 72—8.2** **2 Claims**




1. A system for controlling a thickness of a strip being rolled by a rolling mill having more than two rolling stands, a final stand being a matt roll stand and the remaining stands being bright roll stands, in tandem configuration, comprising:
subcontrol means for controlling a rolling speed and a rolling load of the final rolling stand according to a predetermined control schedule;
a plurality of tension gauge means installed between adjacent rolling stands for detecting a tension of the strip;
a plurality of thickness gauge means including at least second thickness gauge means installed on an output side of a penultimate rolling stand, and final thickness gauge means installed on an output side of the final rolling stand, for detecting a deviation in the thickness of the strip from a predetermined value; and
thickness control means, connected to each of the tension gauge means and each of the thickness gauge means, for controlling the thickness and the tension of the strip to respective predetermined values by adjusting roll gaps and rolling speeds of each of the rolling stands except the final rolling stand, based on the detected tensions and the detected deviations in the thickness of the strip, the thickness control means including feedback means for adjusting a rolling speed of an antepenultimate rolling stand according to the detected deviation in the thickness of the strip by the second thickness gauge means, said deviation being corrected by a value calculated from the deviation in the thickness of the strip detected by the final thickness gauge, to control the thickness of the strip at the output side of the final rolling stand to the predetermined value;
the feedback means including a first control unit for determining a first corrected amount by which a desired value of a strip thickness on the output side of the penultimate rolling stand is to be corrected according to the deviation in the thickness of the strip detected by the final thickness gauge means, and a second control unit for determining a second corrected amount representing a corrected strip thickness deviation at the penultimate rolling stand and an amount by which the rolling speed of the antepenultimate rolling stand is to be corrected to control the strip thickness at the output side of the penultimate rolling stand to a desired value, based on the deviation in the thickness of the strip detected by the second thickness gauge means and the first corrected amount.

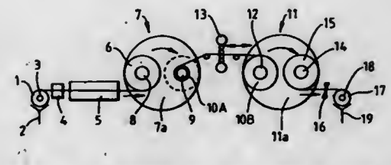
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**5,495,736**

## METHOD AND APPARATUS FOR DESCALING AND COLD ROLLING METAL STRIP

**Hidetoshi Nishi, and Hideo Kobayashi, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Jul. 2, 1993, Ser. No. 85,299**
**Claims priority, application Japan, Jul. 2, 1992, 4-175482**
**Int. Cl.[6] B21B *1/36;* B65H *18/08***
**U.S. Cl. 72—39** **29 Claims**



1. Apparatus for descaling and cold rolling of metal strip, comprising:
a welder for joining a plurality of coils of strip into a long length strip;
a descaler for continuous passage therethrough of said long length strip directly from said welder;
a reversible multi-pass cold rolling mill for reversibly rolling said long length strip after passage through said descaler; and
an upstream coiling uncoiling device, disposed between said descaler and said reversible cold rolling mill and having at least two upstream coiling drums, said upstream coiling uncoiling device being simultaneously and mutually alternatingly operable to receive and coil said long length strip from said descaler by one of said upstream coiling drums and to uncoil and coil another said long length strip undergoing rolling in said reversible cold rolling mill by another of said upstream coiling drums.

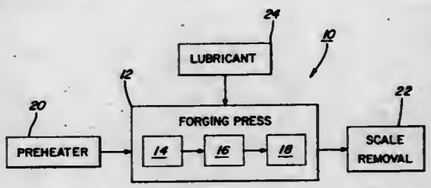
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**5,495,737**

## ELEVATED TEMPERATURE METAL FORMING LUBRICATION

**Edgar E. Graham, Lyndhurst, Ohio, assignor to Cleveland State University, Cleveland, Ohio**

**Filed Jul. 15, 1994, Ser. No. 275,449**
**Int. Cl.[6] B21B *45/02;45/00***
**U.S. Cl. 72—42** **15 Claims**




1. A method of forging a metal workpiece preheated to at least 800° C. with a metal forging die at forming temperatures of at least 250° C. which comprises the steps of:
(a) contacting the shaping region of the forging die with an aqueous mist of a lubricant preparation containing at least 0.5 percent by volume of a vaporizable and polymerizable organic reactant selected from the group consisting of phosphate esters and phosphazene compounds in combination with graphite particulates,

(b) vaporizing the applied organic reactant at the elevated forming temperatures,

(c) polymerizing the vaporized organic reactant in the vapor phase upon further contacting the shaping region of the forging die with the preheated workpiece to form a solid polymer lubricant in the shaping region of the forging die,

(d) forming the preheated metal workpiece in the lubricated forging die, and

(e) removing the formed workpiece from the forging die.

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**5,495,738**

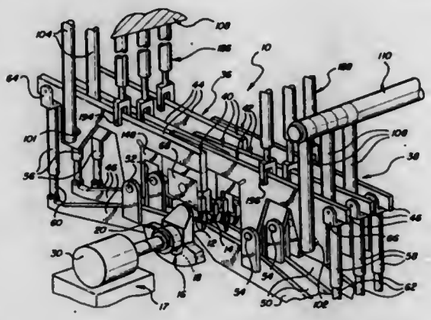
**METAL ROLLING MACHINE WITH OPPOSING BANKS OF JAW UNITS FOR WORKING A CENTERED WORKPIECE AND METHOD OF ROLLING ANNULAR FILLETS OF WORKPIECES**

**William P. Gottschalk, Davisburg, Mich., assignor to Hegenscheidt Corporation, Troy, Mich.**

**Filed May 13, 1994, Ser. No. 242,262**

**Int. Cl.[6] B21H 7/00**

**U.S. Cl. 72—110** **9 Claims**



1. A machine for fatigue strengthening a ductile iron crankshaft for an internal combustion engine that has a centralized axis of rotation and a plurality of cylindrical crank pin journals parallel to the axis of rotation with adjacent fillets and with facing fillets by simultaneously mechanically working the substrate of the adjacent and of the facing fillets of said cylindrical crank pin journals, said machine comprising first and second support means, first and second swing arm means, first and second pivot means operatively connecting said first and second swing arm means respectively to said first and second support means, first and second clamping jaw sets extending laterally toward said crankshaft respectively from points on opposite sides of said crankshaft, each said jaw set having a lower jaw and an upper jaw and pivot means for pivotally connecting said lower jaw and said upper jaw to one another, additional pivot means for connecting said each said upper jaw to said swing arm means associated therewith, each of said jaw sets having tool holding means for holding tools for simultaneously working the substrate of the adjacent and of the facing fillets of said crank pin journal by the rotation of said crankshaft about said axis of rotation causing each of said swing arm means supporting said associated jaw set to swing on said first and second pivot means and oscillate in an arc while the jaws of each of said jaw sets orbit about said associated crank pin journal.

**5,495,739**

**APPARATUS FOR FORMING SCROLLS FROM STRIP MATERIAL**

**Roy Beecher, 88 Low Road, Thornhill Edge, Dewsbury, W. Yorks, England**

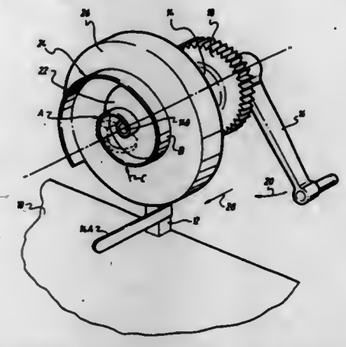
**PCT No. PCT/GB92/01380, § 371 Date Mar. 11, 1994, § 102(e) Date Mar. 11, 1994, PCT Pub. No. WO93/05899, PCT Pub. Date Apr. 1, 1993**

**PCT Filed Jul. 24, 1992, Ser. No. 204,377**

**Claims priority, application United Kingdom, Sep. 13, 1991, 9119549; Mar. 7, 1992, 9204989**

**Int. Cl.[6] B21C 47/00**

**U.S. Cl. 72—146** **17 Claims**



1. An apparatus for forming a strip of material into a scroll, said apparatus comprising:

a scroll forming jig secured to a shaft and having an axis of rotation;

the scroll forming jig having spirally aligned first and second spiral-shaped scroll forming portions mounted for rotation therewith for formiag first and second revolutions of the scroll respectively as the shaft and thereby the jig and scroll forming portions are rotated;

the first and second scroll forming portions being displaceable along the axis of rotation with respect to each other and normally urged into a common plane by a spring means connected to one of the first and second portioas whereby the strip of material can be inserted into the first portion at an oblique angle with respect to the axis of rotation to thereafter be swingable into a position perpendicular to the axis of rotation thereby contacting and axially displacing the second portion against the force of the spring means such that the jig can be rotated to begin formation of the first revolution of the scroll around the first portion; and

whereby when at least half of the first revolution of the scroll is formed, the second portion has a radial gap therein for accommodating the strip of material and thereby allowing the spring means to return the first and second portions back into the common plane so that the second revolution of the scroll can be formed in a continuous motion with the first revolution of the scroll.

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**5,495,740**

**PIPE BENDING MACHINE**

**Rigobert Schwarze, Olpener Str. 462, 51109 Koeln, Germany**

**Filed Aug. 19, 1994, Ser. No. 292,180**

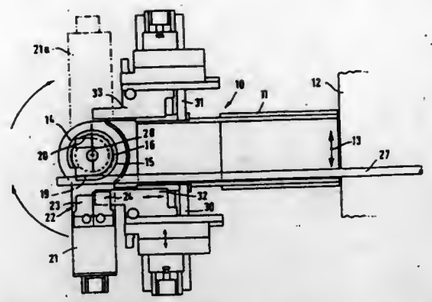
**Claims priority, application Germany, Jan. 21, 1993, 9316052 U**

**Int. Cl.[6] B21D 7/02**

**U.S. Cl. 72—149** **9 Claims**

1. A pipe bending machine comprising a bending template (14), pivot means for effecting rotation of said bending template in opposite directions about an axis of said pivot means, a pivot arm (21), said pivot arm (21) being pivotable through substantially 180





degrees, a clamping jaw (22) carried by said pivot arm (21), a pair of slide rails (32, 33) disposed on opposite sides of said bending template (14); said bending template (14) and clamping jaw (22) having cooperative means (18 or 19; 23 or 24, respectively) for clamping a pipe and effecting bending thereof upon pivoting of said pivot arm (21) in opposite directions with contemporaneous rotation of said bending template (14), cooperative counterforce absorption being effected by a selective one (32 or 33) of said pair of slide rails (32, 33) during pivoting of said pivot arm (21) in said opposite directions, and said cooperative clamping means (18 or 19; 23 or 24, respectively) being operative absent reversal of said clamping jaw (22) and said pivot arm (21).

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**5,495,741**

**APPARATUS FOR BENDING A BAND-SHAPED WORK**

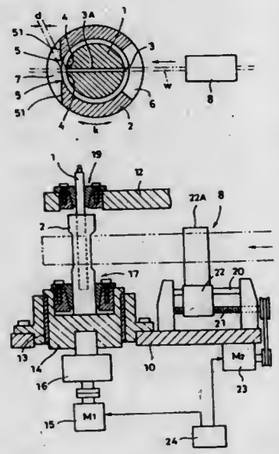
**Toshio Yamada, Osaka, Japan, assignor to Santex Co. Ltd., Osaka, Japan**

**Filed May 23, 1994, Ser. No. 247,918**

**Claims priority, application Japan, May 24, 1993, 5-121731**

**Int. Cl.[6] B21D 7/02**

**U.S. Cl. 72—387** **1 Claim**



1. An apparatus for bending a band-shaped work, the apparatus comprising:

a stationary cylinder having at least a pair of slits on diametrically opposite sides thereof, the slits providing a passageway in which the work is inserted through the slits;

a rotary sleeve accepting the stationary cylinder with a gap interposed therebetween, the rotary sleeve having a first opening and a second opening on diametrically opposite sides thereof;

a first driving means for feeding the work passed through the passageway in the stationary cylinder and the first and second openings of the rotary sleeve; [and]

a second driving means for rotating the rotary sleeve by a predetermined amount while the movement of the work is stopped so as to bend the work between the stationary cylinder and the rotary sleeve;

a first adjustable chuck for receiving and supporting rotary sleeves of various sizes, the first adjustable chuck being drivingly coupled to the second driving means and supporting the rotary sleeve; and

a second adjustable chuck for receiving and supporting stationary cylinders of various sizes, the second adjustable chuck supporting the stationary cylinder, the first and second chucks being coaxially aligned.

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**5,495,742**

**PRESS FOR HEMMING PANELS**

**Michael W. Dorsett, Weybridge, United Kingdom, assignor to D. V. Automation Limited, Surrey, United Kingdom**

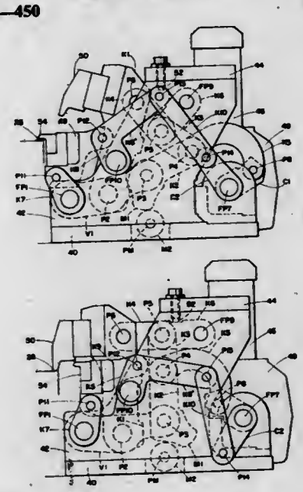
**PCT No. PCT/GB92/01713, § 371 Date Dec. 3, 1993, § 102(e) Date Dec. 3, 1993, PCT Pub. No. WO93/05902, PCT Pub. Date Apr. 1, 1993**

**PCT Filed Sep. 17, 1992, Ser. No. 162,041**

**Claims priority, application United Kingdom, Sep. 27, 1991, 9120627**

**Int. Cl.[6] B21J 9/18**

**U.S. Cl. 72—450** **10 Claims**



1. A press comprising:

a frame;

a lever (V1) pivoted about a first fixed pivot point (FP1) on the frame;

first and second linkages (K1, K2) pivotally connected to the lever about second and third pivot points (P2, P3), respectively, the second pivot point (P2) being intermediate the first and third pivot points (FP1, P3);

a third linkage (K3) pivotally connected to the second linkage about a fourth pivot point (P4);

a mechanism (K5, P8, C1) for moving the fourth pivot point;

a fourth linkage (K4) pivotally connected to the third linkage about a fifth pivot point (P5) and pivotally connected to the first linkage about a sixth pivot point (P6); and

a press tool (50) mounted on the first linkage and facing in a direction generally parallel to an axis intersecting the sixth pivot point and the second pivot point;

wherein, as the press approaches a final pressing position of the press tool:

the fifth pivot point is fixed relative to the frame;
the press tool moves in a direction generally parallel to the axis intersecting the sixth and second pivot points; and
the third, fourth and fifth pivot points approach alignment.

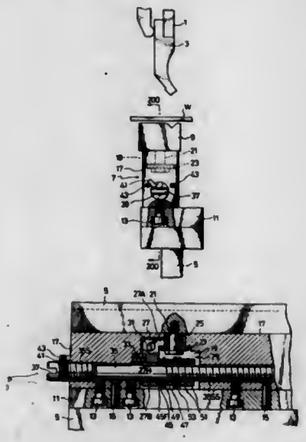
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**5,495,743**

## LOWER TOOL DEVICE FOR PRESS BRAKE

**Susumu Kawano, Atsugi, Japan, assignor to Amada Metrecs Company, Limited, Isehara, Japan**

**Filed May 31, 1994, Ser. No. 251,136**
**Int. Cl.[6] B21D** *37/04*
**U.S. Cl. 72—481.9** **14 Claims**



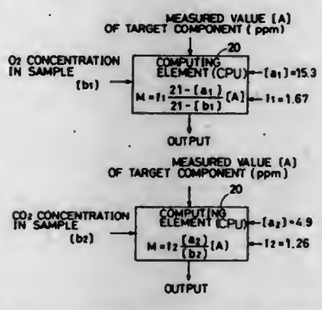
1. A lower tool holding device for a press brake, the press brake being equipped with upper and lower tools for cooperating with each other to effect bending in a workpiece placed therebetween, the device comprising:
a tool holder block adapted to be mounted on a lower table of a press brake, and formed with a T-shaped slot for receiving a flange member coupled to the lower tool,
a push member attached to the tool holder block, for clamping the flange member inserted into the T-shaped slot, the push member including a bell crank pivotally attached to the tool holder block; and
a push urging device for urging the push member so as to clamp the flange member, said push urging device including:
a screw rod having an axial direction and formed with a first threaded portion engaged with the tool holder block, so that the screw rod is moved in a longitudinal direction of the tool holder block when rotated,
a sleeve supported by the screw rod so as to be movable in the axial direction of the screw rod, and brought into contact with the bell crank, and
an elastic member supported by the screw rod to urge the sleeve toward the bell crank.

**5,495,744**

## METHOD OF CORRECTING COMPONENTIAL CONCENTRATION IN EXPIRATION AND EXPIRATION ANALYZER

**Hideo Ueda, Osaka; Mitsuo Hiromoto, Kyoto; Meng Gang, Kyoto, and Yutaka Yamasaki, Kyoto, all of, Japan, assignors to Kyoto Dai-Ichi Kagaku Co., Ltd., Kyoto, Japan**

**Filed Oct. 24, 1994, Ser. No. 327,909**
**Claims priority, application Japan, Jan. 25, 1993, 5-290131**
**Int. Cl.[6] G01N** *33/497*; **A61B** *5/00;10/00*
**U.S. Cl. 73—1 G** **10 Claims**




1. A method of correcting componential concentration in expiration, comprising the steps of:
analyzing an expiration sample of alveolar air, being mixed with at least one of air from a dead space and ambient air, for obtaining a measured value of a target component;
measuring at least one of $O_2$ gas concentration and $CO_2$ gas concentration as a standard gas concentration in said expiration sample; and
correcting said measured value of said target component by a measured value of said standard gas concentration in said expiration sample with reference to a standard gas concentration in end-tidal air.

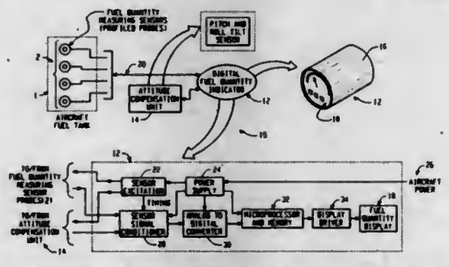
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**5,495,745**

## APPARATUS AND METHOD FOR IMPROVING LIQUID GAGING SYSTEM USING ERROR COMPENSATION DATA

**Ivor Hughes, North Ferrisburg, Vt., assignor to Simmonds Precision Products, Inc., Akron, Ohio**

**Filed May 31, 1994, Ser. No. 250,973**
**Int. Cl.[6] G01F** *17/00*
**U.S. Cl. 73—1 H** **9 Claims**




1. Apparatus for improving the accuracy of art operational fuel gaging system previously installed on an airplane of the type having a number of fuel level sensors that each produce an output signal that can be combined to determine fuel volume within a first tolerance range, the apparatus comprising: control means for receiving the sensor signals and calculating a first volume value; and an attitude indicator connected to the control means and that produces signals corresponding to the attitude of the fuel level relative to the sensors; said control means comprising memory means for storing volume measurement compensation data based on predetermined volume measurement errors that are a function of attitude and fuel volume; said control means compensating said first volume value with selected said compensation data based on said attitude signals to produce a second fuel volume value that is more accurate than said uncompensated first volume value.



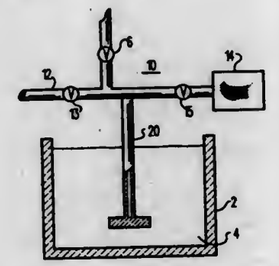
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**5,495,746**

## GAS ANALYZER FOR MOLTEN METALS

**Geoffrey K. Sigworth, 321 Tioga St., Johnstown, Pa. 15905**

**Continuation-in-part of Ser. No. 113,344, Aug. 30, 1993, Pat. No. 5,345,808. This application Jul. 18, 1994, Ser. No. 276,457**
**Int. Cl.[6] G01N** *7/10*
**U.S. Cl. 73—19.07** **11 Claims**




1. A hollow probe for immersion in a molten metal for determining the gas content thereof by drawing a vacuum on the probe and permitting gas to permeate from the molten metal and equilibrate in the probe wherein gas pressure can be measured to determine the gas pressure in the molten metal, the probe comprising:
(a) a porous filter head permeable to gas in said molten metal and impermeable to said molten metal;
(b) a small diameter metal tube having an upper portion and a lower portion, the tube attached to said filter head at the lower portion; and
(c) said tube attached at said upper portion to means for drawing a vacuum on said tube and means for measuring gas pressure in said tube.

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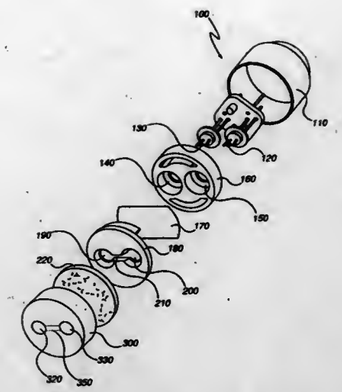
**5,495,747**

## DEVICE FOR DETECTING GASES FOR USE IN DIFFUSION AND FORCED FLOW MODES

**Roberta A. Herman, Cranberry Township; Daniel E. Bruce, Murrysville; Alan A. Schneider, Wexford, and Stephen E. Long, Murrysville, all of Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.**

**Filed Sep. 30, 1994, Ser. No. 315,709**
**Int. Cl.[6] G01N** *27/16;27/00;* **G08B** *17/10*
**U.S. Cl. 73—23.21** **13 Claims**

1. A gas detection device for the detection of combustible gases in a surrounding environment comprising, an exterior housing, an active pelement disposed within the exterior housing and a compensating pelement disposed within the exterior housing, the gas detection device further comprising a porous frit seated within a distal end of the exterior housing to separate the active pelement and the compensating pelement from the surrounding environment, the porous frit adapted to prevent flashback into the surrounding environment while allowing entry of environmental gas through the porous frit to contact the active pelement and the compensating pelement, the porous frit having an interior side within the exterior housing and an exterior side outside the exterior housing, the gas detection device further comprising a flow guide for directing flow of environmental gas into the gas detection device disposed adjacent the exterior side of the porous frit, the flow guide comprising an inlet port through which a forced flow of environmental gas is directed by an external pump to pass through the porous frit and into the exterior housing in a direction generally parallel to the axis of the exterior housing to contact the active pelement and the compensating pelement, the flow guide further comprising an outlet port through which gas may exit the exterior housing.



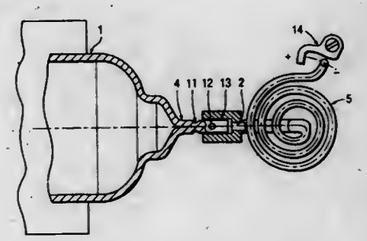

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**5,495,748**

## GAS LEAKAGE MONITORING OF A GAS OR LIQUID CONTAINER

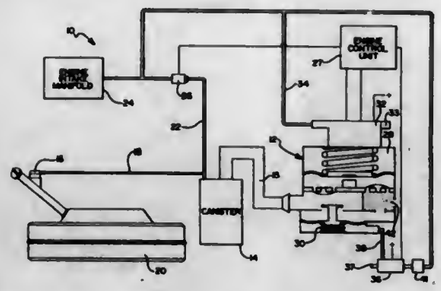
**Uwe Brede, Furth, and Josef Kraft, Berg, both of, Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany**

**Filed Mar. 7, 1994, Ser. No. 207,026**
**Claims priority, application Germany, Mar. 9, 1993, 43 07 378.6**
**Int. Cl.[6] G01M** *3/04*
**U.S. Cl. 73—40** **10 Claims**




1. An apparatus for monitoring gas leakage from a gas or liquefied gas container of a generator for inflating an inflatable airbag of a vehicle, wherein the container has a sealed filling opening, which comprises a measuring chamber connected to a zone surrounding the sealed filling opening, said measuring chamber comprising a narrow spiral tube, one end of which is connected to the zone surrounding the filling opening and the other end of which is closed and which is associated with actuating members in such a way that, in the event of an increase in pressure in the measuring chamber, the spiral tube moves and the actuating members are automatically actuated.

**5,495,749**
**LEAK DETECTION ASSEMBLY**
**Gary D. Dawson, Rochester, and William B. Blomquist, Clarkston, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.**
**Continuation of Ser. No. 245,796, May 19, 1994, abandoned, which is a continuation-in-part of Ser. No. 61,978, May 14, 1993, abandoned. This application Jul. 10, 1995, Ser. No. 500,108**
**Int. Cl.[6] F02M *33/02***
**U.S. Cl. 73—49.7** **3 Claims**




1. In a leak detection assembly for an evaporative emission control system in an automotive vehicle including a fuel tank, a canister for collecting volatile fuel vapors from the fuel tank, a purge valve disposed between the canister and an intake manifold of an engine operative to allow flow of the fuel vapors from the canister to the intake manifold, a vacuum actuated pump in communication with the canister having a first three-port solenoid fluidly connected to the intake manifold, and a vent control valve operative to selectively allow and prevent communication between the canister and a first atmospheric vent of the vacuum actuated pump, said leak detection assembly comprising:

a second three-port solenoid fluidly connected to the vacuum actuated pump and the intake manifold and a second atmospheric vent;

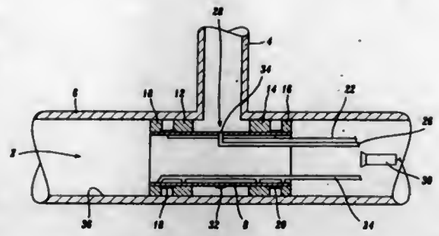
a vacuum line fluidly connecting said second three-port solenoid to the vent control valve, said second three-port solenoid selectively communicating with the intake manifold to allow a vacuum in said vacuum line during a first operating mode to close the vent control valve and selectively communicating with said second atmospheric vent during a second operating mode to open the vent control valve; and

an engine control unit electrically connected to said first three-port solenoid of the vacuum actuated pump and the purge valve and said second three-port solenoid for closing the purge valve and for energizing said second three-port solenoid to close the vent control valve and seal the canister and for energizing the first three-port solenoid of the vacuum actuated pump to pressurize the evaporative emission control system and for de-energizing said first three-port solenoid of the vacuum actuated pump and said second three-port solenoid to open the vent control valve to depressurize the evaporative emission control system.

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**5,495,750**
**HYDROSTATIC DRAIN TESTING MACHINE**
**Andrew K. Dufresne, P.O. Box 3310, Richmond, Nelson, New Zealand**
**Filed Sep. 19, 1991, Ser. No. 762,877**
**Claims priority, application New Zealand, Sep. 21, 1990, 235422**
**Int. Cl.[6] G01M *3/08***
**U.S. Cl. 73—49.1** **13 Claims**

1. An apparatus suitable for detecting leaks in pipe systems, the apparatus comprising: an elongate body;



a first pair of inflatable seals adjacent one end of the body and a second pair of inflatable seals adjacent the opposite end of the body to define a testing zone between the first and second pairs of seals, the seals of each pair being spaced one from the other along the length of the body, the seals being substantially external to the body, and the seals when inflated being capable of sealingly engaging the inner walls of a pipe to be tested;

inflation means to inflate the seals by the introduction of fluid to the interior of the seals;

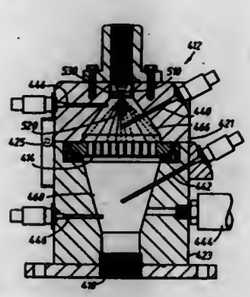
liquid supply means to supply a liquid to the testing zone;

a sealing leak detection means between the seals of each pair to detect incomplete sealing between the seals and the inner wall of the pipe, when they are inflated; and

a level sensing means within the testing zone to detect changes in liquid level in the testing zone.

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**5,495,751**
**STREAMING POTENTIAL MEASURING CELL**
**James C. Petzold; Reading, and Roger A. Allen, Prestwood, both of, Great Britain, assignors to The Wiggins Teape Group Limited, Basingstoke, England**
**PCT No. PCT/GB92/00852, § 371 Date Nov. 12, 1993, § 102(e) Date Nov. 12, 1993, PCT Pub. No. WO92/21026, PCT Pub. Date Nov. 26, 1992**
**PCT Filed May 12, 1992, Ser. No. 146,118**
**Claims priority, application United Kingdom, May 13, 1991, 9110318**
**Int. Cl.[6] G01N *27/00***
**U.S. Cl. 73—53.03** **11 Claims**

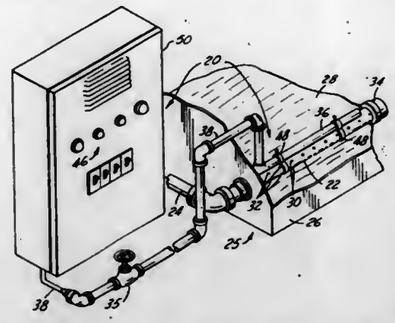


1. A measurement cell for measuring an electrokinetic potential of a fibrous dispersion comprising a housing having an internal chamber divided into two compartments by a filter mesh, a port in one compartment for introducing a fibrous dispersion into the chamber to form a fibrous pad on one side of the filter mesh, and means for introducing a fluid into the other compartment to flush the pad from the filter mesh, wherein:

said fluid-introducing means comprises a nozzle adapted to provide a full cone of pressurized-fluid spray over the side of the filter mesh facing said other compartment.



**5,495,752**
**EROSION DETECTOR FOR A FEED WATER STEAM NOZZLE**
**Johnnie V. Townsend, 20230 Marx, Detroit, Mich. 48203**
**Filed Feb. 1, 1995, Ser. No. 382,088**
**Int. Cl.[6] G01N *17/00***
**U.S. Cl. 73—86** **22 Claims**



1. An erosion detector for detecting steam caused erosion of holes of a feed water steam nozzle and for signaling the detection of steam caused erosion, said erosion detector comprising:

erosion detection pipe means for receiving thereinto steam from an adjoining feed water steam nozzle, said erosion detection pipe means having a sidewall having a predetermined sensitivity to steam caused erosion, wherein steam is received into said erosion detection pipe means responsive to said sidewall being eroded by the steam;

conduit means connected with said erosion detection pipe means for providing a conduit for steam or steam borne metal fragments from said erosion detection pipe means;

sensor means connected with said conduit means for detecting at least one of steam and steam borne metal fragments in said conduit means to thereby provide detection of steam caused erosion of said sidewall of said erosion detection pipe means;

signal means connected with said sensor means for providing a signal that steam caused erosion of said sidewall of said erosion detection pipe means has been detected by said sensor means; and

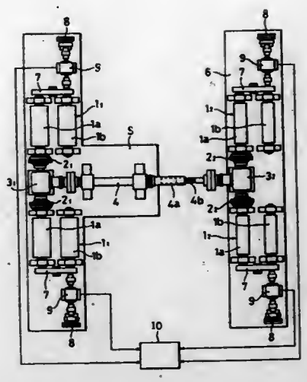
discharge means for atmospherically discharging the steam from said conduit;

wherein the detected steam caused erosion of said sidewall of said erosion detection pipe means is responsive to steam caused erosion of at least one hole of a feed water steam nozzle adjoining said erosion detection pipe means, wherein the detected steam caused erosion of said sidewall of said erosion detection pipe means is such that steam from the feed water steam nozzle enters into said erosion detection pipe means and thereupon passes into said conduit means.

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**5,495,753**
**APPARATUS AND METHOD OF TESTING ANTI-LOCK BRAKE SYSTEM**
**Shinichi Watanabe; Takao Shibayama; Kimitake Uzuyama; Kazuyuki Fukamachi; Keiichiro Maekawa, and Masaru Maruo, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**
**Division of Ser. No. 852,960, Mar. 17, 1992, Pat. No. 5,339,682. This application Jan. 24, 1994, Ser. No. 185,417**
**Claims priority, application Japan, Apr. 2, 1991, 3-069996; Apr. 2, 1991, 3-069997; May 16, 1991, 3-111946; Feb. 12, 1992, 4-025521**
**Int. Cl.[6] G01L *5/28***
**U.S. Cl. 73—123** **6 Claims**

1. An apparatus for testing an anti-lock brake system on wheels of a motorcar, said apparatus having rolls for supporting each of the wheels of the motorcar to be tested, means for detecting rotational changes of said rolls for each of said wheels after said motorcar having an anti-lock brake system to be tested is mounted thereon with said wheels of said motorcar placed on said rolls and said anti-lock brake system is actuated after a predetermined speed of said wheels on said rolls has been attained, and means for judging operating conditions of said anti-lock brake system from changes in rotational speed of each of said rolls at a time of braking, wherein:



a friction coefficient of each of said rolls is set to such a value that a frictional force acting between each of said rolls and each of said wheels at the time of braking exceeds an inertia force of each of said rolls;

an inertia of each of said rolls is set to such a value that deceleration of each of said wheels at the time of braking can be increased to above a predetermined level required to start an anti-lock control of said anti-lock brake system being tested and that each of said wheels does not stop before the completion of a first braking pressure reduction by said anti-lock control;

the value of said friction coefficient and the value of said inertia being sufficient to preclude slippage between said wheels and said rolls.

6. A method of testing an anti-lock brake system in which a vehicle having mounted thereon an anti-lock brake system is run while wheels of said vehicle are on respective rolls and said anti-lock brake system is actuated when a predetermined speed of said rolls has been attained to test said anti-lock brake system, said method comprising the steps of:

measuring a braking time required from a time of start of braking operation to a time of stop of each of said rolls;

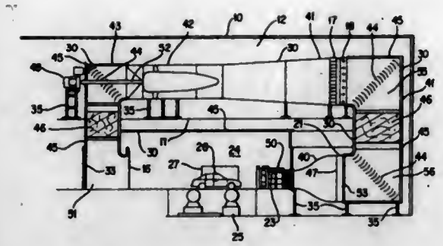
measuring the number of peaks of deceleration and a value of each of said peaks which occur during said braking time, said peaks being limited to such peaks which occur when said deceleration of said rolls changes beyond a predetermined level; and

comparing said braking time, said number of peaks and said values of peaks, all measured, respectively, in the preceding steps, with respectively set standard values to judge whether said anti-lock brake system is acceptable.

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**5,495,754**
**ENVIRONMENTAL WIND TUNNEL**
**Rogers F. Starr, Jr., Manchester; Steve Pearson, Cowan, and Ronald G. Lutz, Tullahoma, all of Tenn., assignors to Sverdrup Technology, Inc., Tullahoma, Tenn.**
**Filed Jan. 4, 1994, Ser. No. 177,031**
**Int. Cl.[6] G01M *9/00***
**U.S. Cl. 73—147** **22 Claims**

1. A wind tunnel for producing air flow over a vehicle, said wind tunnel comprising:



a test chamber for receiving a vehicle, wherein at least a portion of the surfaces of the test chamber include acoustic treatment means;

a large area fan;

a low angle diffuser, an upstream end of which is disposed adjacent to a downstream end of the large area fan;

a first section of large area duct work an upstream end of which is coupled to a downstream end of the low angle diffuser for directing air from the downstream end of the low angle diffuser to a downstream end of the first section of large area duct work, wherein a flow conditioning screen is disposed within a downstream portion of the first section of large area duct work and wherein at least a portion of the surfaces of the first section of large area duct work include acoustic treatment means;

a large area ratio contraction, an upstream end of which is coupled to the downstream end, of the first section of large area duct work, wherein the surfaces of the large area ratio contraction do not include acoustic treatment means;

a nozzle, an upstream end of which is coupled to the downstream end of the large area ratio contraction, the downstream end of the nozzle being open into the test chamber;

a second section of large area duct work for directing air from the testing chamber to an upstream end of the large area fan, wherein at least a portion of the surfaces of the second section of large area duct work include acoustic treatment means;

a third section of large area duct work extending from the upstream end of the large area fan to the upstream end of the first section of large area duct work, wherein the surfaces of the third section of large area duct work do not include acoustic treatment means; and

at least one large area corner section for directing air within one of the first and second sections of large area duct work around a corner, wherein the at least one large area corner section includes a turning

vane having acoustic treatment means and wherein at least a portion of the interior surfaces of the large area corner include acoustic treatment means.

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**5,495,755**

**SLICK LINE SYSTEM WITH REAL-TIME SURFACE DISPLAY**

**Boyd B. Moore, 427 Mignon, Houston, Tex. 77024**

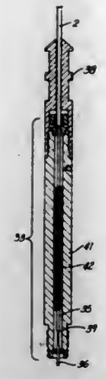
**Filed Aug. 2, 1993, Ser. No. 101,321**
**Int. Cl.[6] E21B *34/10*; H01R *4/64***
**U.S. Cl. 73—152** **18 Claims**

1. A slick line assembly for logging subterranean formation characteristics in conjunction with a well having a wellhead and containing a completion string having an axial bore, comprising:

a slick line lubricator mounted on the wellhead;

a driven slick line drum positioned adjacent the well and carrying a wireline extending through the lubricator into the bore of the completion string;

said wireline comprising an electrically conductive metal tube forming an internal longitudinal bore, said metal tube having a welded seam and having an outside diameter of about ⅛ inch and a wall thickness selected to have a value substantially equal to 0.022 inch to form a tube sufficiently flexible to



be coiled on the slick line drum and to be used with the lubricator without being permanently deformed, and a helically formed, multiple strand, thermally and electrically insulated electrical conductor extending through the tube bore and being coextensive with and in frictional contact with the tube wall, said insulated conductor having a diameter smaller than that of the tube bore and being free to move axially therewithin except as restrained by the frictional contact;

a formation characteristic measuring tool attached to the bottom of the wireline and being operatively connected with the metal tube and insulated conductor to form a circuit, said tool being positioned in the completion string bore for raising and lowering therethrough, said tool being adapted, when energized, to emit signals indicative of the formation characteristic;

a power source for energizing the circuit; and

means at ground surface for receiving the emitted signals and producing a display thereof.

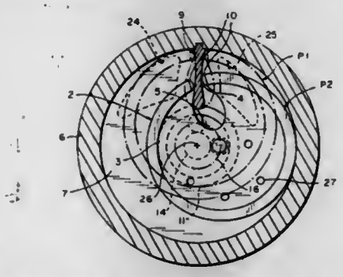
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**5,495,756**

**CYLINDRICAL CHAMBER FOR LIQUID METER WITH OSCILLATING PISTON**

**Thierry Robitaille, Riedisheim, and Frédéric Walch, Altkirch, both of, France, assignors to Société Sappel, Saint Louis, France**

**Filed Jun. 1, 1994, Ser. No. 251,933**
**Claims priority, application France, Jun. 2, 1993, 93 06591**
**Int. Cl.[6] G01F *3/08***
**U.S. Cl. 73—257** **17 Claims**



1. In an oscillating piston type liquid meter having a cylindrical chamber, a side wall, a bottom, a lid and a fixed partition wall made of rigid material and enclosing a cylindrical piston, the piston including a vertical slot extending parallel to a cylindrical axis of the piston, the slot including two parallel slot edges defining the slot therebetween, the piston being slidably held along said fixed partition wall by the slot edges during a counting



oscillation of the piston, the piston including an internal flat wall, the flat wall including an aperture having an aperture perimeter connecting to the slot edges, at least two ports being in said cylindrical chamber, wherein the profile of the fixed partition wall is a biconcave profile; wherein the improvement comprises:

the biconcave profile having a shape, in cross section perpendicular to a cylindrical chamber axis, defined by the set of points C of a segment AC orthogonal to the segment AB, where A, B, C belong to the plane formed by the flat wall, A belongs to the median plane of the fixed partition wall, B belongs to the cylinder generated by the rotation of the axis of the piston, the segment AB has a length equal to the radius of the piston, and the segment AC has a length equal to at most half of the width of the slot.

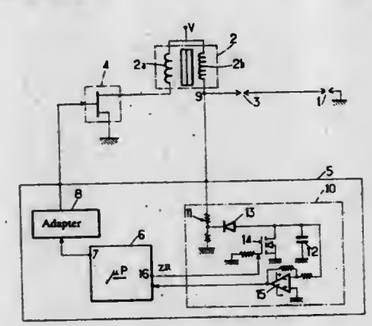
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**5,495,757**

**METHOD AND DEVICE FOR DETECTION OF IGNITION FAILURES IN AN INTERNAL COMBUSTION ENGINE CYLINDER**

**Alain A. Atanasyan, Tournefeuille, and Serge C. Guipaud, Ramonville St Agne, both of, France, assignors to Siemens Automotive S.A., Toulouse Cedex, France**

**PCT No. PCT/EP92/00977, § 371 Date May 5, 1995, § 102(e) Date May 5, 1995, PCT Pub. No. WO92/20912, PCT Pub. Date Nov. 26, 1992**
**PCT Filed Mar. 5, 1992, Ser. No. 142,326**
**Claims priority, application France, May 15, 1991, 91 05868**
**Int. Cl.[6] G01M *15/00*; F02P *5/04;5/15;17/04***
**U.S. Cl. 73—35.06** **12 Claims**



1. A method of detecting an ignition failure in an internal combustion engine cylinder into which an air/fuel mixture is introduced and a spark is electrically generated for igniting the air/fuel mixture, which comprises:

triggering a first spark in a cylinder for igniting an air/fuel mixture in the cylinder;

subsequently triggering a second spark in the cylinder during a combustion stroke initiated with the first spark;

measuring a breakdown overvoltage of the second spark;

comparing the measured breakdown overvoltage to a predetermined threshold voltage and determining whether the measured breakdown overvoltage is greater or less than the predetermined threshold voltage; and

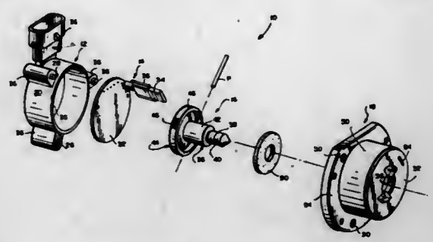
deducing, from a result obtained in the comparing step, whether or not an ignition failure has occurred prior to the second spark.

**5,495,758**

**TACHOMETER ASSEMBLY WITH INTEGRAL INTERNAL WRENCH**

**Neil Griffen, Westerville, and Mark Azyenberg, Columbus, both of Ohio, assignors to Lake Shore Cryotronics, Inc., Westerville, Ohio**

**Filed Jun. 17, 1993, Ser. No. 77,455**
**Int. Cl.[6] G01P *1/04***
**U.S. Cl. 73—493** **16 Claims**



1. In a tachometer assembly for attachment to an output shaft of a rotary machine having a machine housing, wherein the tachometer assembly includes a tachometer housing enclosing a sensor fixed to a tachometer shaft, the tachometer shaft extending from said tachometer housing and adapted for attachment to the output shaft of the rotary machine for rotation therewith, and a sensor pad located peripherally adjacent said sensor; the improvement comprising: internal wrench means including cooperative means mounted on said tachometer shaft and on said tachometer housing, respectively, for locking said tachometer shaft to said tachometer housing and thereby preventing relative rotation therebetween so as to facilitate engagement between said tachometer shaft and said output shaft, and for unlocking said tachometer shaft from said tachometer housing to thereby permit relative rotation therebetween and to permit said tachometer shaft to rotate with said output shaft after said tachometer housing is secured to the rotary machine.

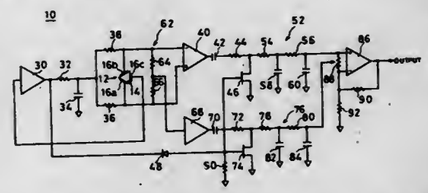
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**5,495,759**

**DETECTING CIRCUIT WHICH SUPPRESS A DRIFT SIGNAL**

**Takeshi Nakamura, Nagaokakyo, Japan, assignor to Murata Manufacturing Co., Ltd., Kyoto, Japan**

**Filed Jul. 20, 1994, Ser. No. 277,643**
**Claims priority, application Japan, Jul. 22, 1993, 5-202590**
**Int. Cl.[6] G01P *9/04***
**U.S. Cl. 73—504.12** **3 Claims**



1. A detecting circuit for detecting an output of a vibratory gyroscope including a prism-shaped vibrating body and two driving and detecting members formed on a surface of said vibrating body used both for driving to vibrate said vibrating body and for detecting to obtain an output corresponding to a rotational angular velocity, said detecting circuit comprising:

a summing circuit for outputting a sum of output signals from said driving and detecting members;

a differential circuit for outputting a difference between said output signals from said driving and detecting members;

a first synchronous detection circuit for synchronously detecting an output signal of said differential circuit in synchronous with a synchronizing signal;

a second synchronous detection circuit for detecting an output signal of said summing circuit in synchronous with said synchronizing signal; and

a composite circuit for composing an output signal of said first synchronous detection circuit and an output signal of said second synchronous detection circuit;

wherein a phase difference between a driving signal applied to said driving and detecting members and said synchronizing signal applied to said first and second synchronous detection circuits is 90 degree.

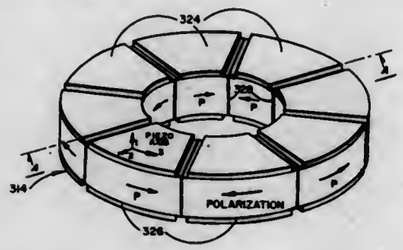
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**5,495,760**

## BEERMUG GYROSCOPE

**Thomas M. Wirt, Irvine, Calif., assignor to Rockwell International Corporation, Seal Beach, Calif.**

**Filed Jul. 5, 1994, Ser. No. 270,978**
**Int. Cl.[6] G01P *15/14***
**U.S. Cl. 73—504.13** **9 Claims**




1. In a gyroscopic sensor of piezoelectric material, the combination of:

(a) at least one hollow cylindrical driving member;

(b) a pickoff member of generally circular configuration operatively attached to each said driving member, each said driving member and pickoff member being coaxially aligned along their respective longitudinal axes;

(c) drive electrode means fixed to each said cylindrical driving member for transmitting electrical signals for driving said driving member in alternating radial expansion and contraction, said drive electrode means being constituted by a single electrode on an inner diameter of each said hollow cylindrical driving member and a single electrode on an outer diameter of each said hollow cylindrical driving member; and

(d) pickoff electrode means fixed to each said pickoff member for transmitting electrical signals generated in said pickoff member in response to Coriolis-induced distortion thereof.

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**5,495,761**

## INTEGRATED ACCELEROMETER WITH A SENSITIVE AXIS PARALLEL TO THE SUBSTRATE

**Bernard Diem, Echirolles, and France Michel, Sassenage, both of, France, assignors to Commissariat a l'Energie Atomique, Paris, France**

**Filed Dec. 22, 1993, Ser. No. 171,642**
**Claims priority, application France, Dec. 28, 1992, 92 15770**
**Int. Cl.[6] G01P *15/125***
**U.S. Cl. 73—514.32** **9 Claims**

1. Integrated accelerometer comprising:

a conductive substrate,

a mobile mass mechanically connected to the substrate by at least one flexible beam and an insulator, said mobile mass being movable in a first direction (Y) parallel to the substrate, the mobile mass having on at least one side conductive mobile teeth which are electrically interconnected and oriented in a second direction (X) parallel to the substrate and perpendicular to the first direction (Y),

fixed conductive teeth which are electrically interconnected, integral and insulated with respect to the substrate, said fixed teeth being parallel to the second direction (X) and alternating with the mobile teeth in order to form variable capacitance capacitors for measuring displacements of the mass in the first direction or servocontrolling said displacements of the mass,

at least one electrostatic screen formed from finger-like fixed electrodes parallel to the second direction (X), said fixed electrodes being electrically interconnected, each of said fixed electrodes being placed between one of said fixed teeth and one of said mobile teeth in such a way that each of said mobile tooth is intercalated between one of said finger-like fixed electrodes and one of said fixed teeth.

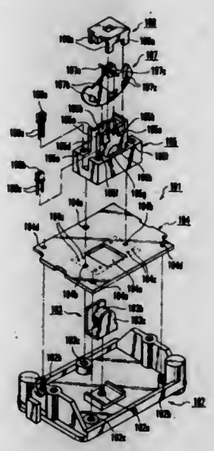
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**5,495,762**

## PENDULUM ACCELERATION SENSOR

**Kazuyuki Tamura, and Hiroshi Ilyama, both of Saitama, Japan, assignors to Jeco Co., Ltd., Saitama, Japan**

**Filed Apr. 1, 1994, Ser. No. 221,881**
**Claims priority, application Japan, Apr. 27, 1993, 5-027223 U**
**Int. Cl.[6] G01P *3/44***
**U.S. Cl. 73—519.01** **5 Claims**



1. A pendulum acceleration sensor comprising:

a plate-like pendulum which is comprised of nonmagnetic conductive material and swings about a shaft in a direction parallel to side surfaces of said pendulum in accordance with an acceleration;

at least a pair of detection sensors, arranged to oppose each other with said pendulum interposed therebetween, for detecting a displacement amount of said pendulum as it swings;

a holder unit made of a resin material and including sensor storing members for storing said detection sensors and positioning said detection sensors with respect to said pendulum, and shaft support members, integrally formed with said sensor storing members, for pivotally supporting two ends of the shaft of said pendulum and defining a swing space for said pendulum, said holder unit having a fitting hole formed in a bottom portion thereof to communicate with the swing space defined by the shaft support members, wherein said shaft support members and said sensor storing members are integrally formed with the holder unit, and wherein said shaft support members are comprised of a pair of shaft support portions for respectively supporting two ends of said pendulum, and a pair of support walls integrally having upper ends on which the shaft support portions are integrally formed, the support walls extending vertically upward from said sensor storing members to sandwich the swing space for said pendulum; and

a magnetic damper, arranged in said holder unit to be near a side surface of said pendulum, for generating a magnetic flux in a direction perpendicular to a swinging direction of said pendulum and damping swing of said pendulum, wherein said magnetic damper is fitted and positioned in the swing space through the fitting hole of said holder unit, and further wherein said magnetic damper including a yoke having a U-shaped cross-section and a permanent magnet fixed to one inner surface of the yoke, the yoke being arranged to cause said pendulum to cross a space between the other inner surface of the yoke and the permanent magnet, and

wherein said shaft support members have extended portions extended toward the fitting hole and having recess portions in which the yoke and permanent magnet of said magnetic damper are fitted, and said magnetic damper fitted through the fitting hole of said holder unit is positioned and fixed by fitting the yoke and the permanent magnet in the recess portions of the extended portions, and

wherein said extended portions of said shaft support members are formed slightly protruding into the swing space of said pendulum, said recess portions are formed outside the extended portions, and said yoke and said permanent magnet of said magnetic damper are positioned and fixed in said recess portions so as to oppose each other with the extended portions interposed therebetween.

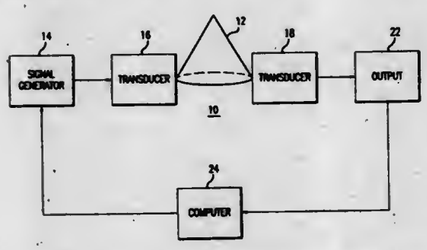
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**5,495,763**

## METHOD FOR RESONANT MEASUREMENT

**George W. Rhodes, 5201 Rio Grande Blvd., N.W., Albuquerque, N.M. 87107; Albert Migliori, Rte. 4, Box 258 Tano Rd., Sante Fe, N.M. 87501, and Raymond D. Dixon, 396 Connie Ave., White Rock, N.M. 87544**

**Filed Jun. 10, 1993, Ser. No. 75,159**
**Int. Cl.[6] G01H *13/00***
**U.S. Cl. 73—579** **5 Claims**




1. A method for determination of flaws in objects comprising the steps of:

a. mathematically determining degenerate modes having degenerate resonant frequencies of a mathematical model of said object;

b. examining object resonances in at least one region predicted to exhibit degeneracy;

c. observing a splitting of degenerate modes of said object resonances into at least two peaks;

d. identifying objects which exhibit splitting of degenerate modes into at least two peaks as flawed, and

e. computing and measuring degenerate modes which are dependent only on the shear modulus in step a.

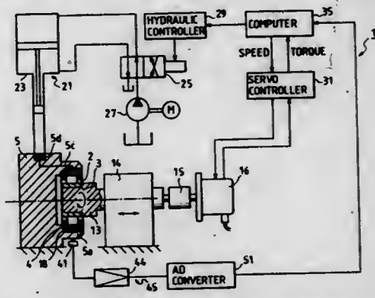
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**5,495,764**

## VIBRATION MEASUREMENT SYSTEM FOR A ROLLING BEARING

**Hiroyuki Matsuzaki, and Hisakazu Tadokoro, both of Kanagawa, Japan, assignors to NSK Ltd., Tokyo, Japan**

**Filed Apr. 6, 1995, Ser. No. 417,962**
**Claims priority, application Japan, Apr. 6, 1994, 6-092999**
**Int. Cl.[6] G01M *13/04***
**U.S. Cl. 73—593** **4 Claims**




1. A vibration measurement system for measuring a rolling bearing comprising: means for holding by fitting at least one of an inner ring and an outer ring of a rolling bearing to be measured having at least one bearing ring and a plurality of rolling elements; means for driving at least one of the inner ring and the outer ring of said rolling bearing fitted into said holding means; and means for detecting vibration of said rolling bearing, wherein the improvement comprises:

means for elastically deforming uniformly radially said holding means into which said rolling bearing is fitted whereby urging one of the inner ring and the outer ring of said rolling bearing radially toward said rolling elements;

clearance detection means for detecting a bearing clearance of the rolling bearing in a fit state between said rolling bearing and said holding means; and

deformation control means for enabling the elastical deformation to be applied to said deformation means until an amount of the bearing clearance detected by said clearance detection means reaches a predetermined value.

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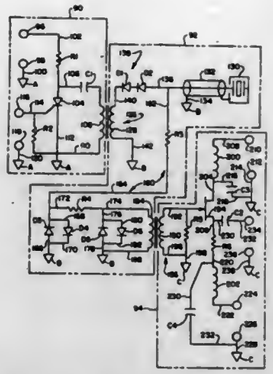
**5,495,765**

## ULTRASONIC INSPECTION SYSTEM WITH IMPROVED ELECTRICAL ISOLATION SCHEME USING STEP-UP TRANSFORMERS

**Edward R. Dykes, and William F. Splichal, Jr., both of San Jose, Calif., assignors to General Electric Company, San Jose, Calif.**

**Division of Ser. No. 694,730, May 2, 1991, Pat. No. 5,303,591.**
**This application Jun. 22, 1993, Ser. No. 80,794**
**Int. Cl.[6] G01N *29/22***
**U.S. Cl. 73—632** **6 Claims**

1. A circuit for operating an ultrasonic transducer, comprising:



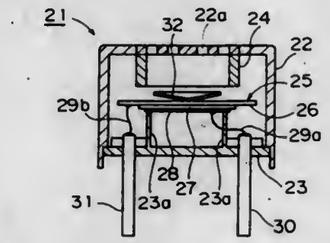
a pulser circuit responsive to a trigger signal for generating an excitation signal;

a transducer circuit connectable with a transducer and having an input network comprising unidirectional conducting means for conveying said excitation signal to effect the excitation of said transducer and isolating a return signal therefrom from said pulser circuit, and having an output network exhibiting a predetermined impedance and including a first primary inductive winding for receiving said return signal, said first primary inductive winding having one terminal connected to a first ground; and

a receiver circuit having a first secondary inductive winding operatively associated in inductive transfer relationship with said first primary inductive winding for receiving said return signal, said first secondary inductive winding having one terminal connected to a second ground which is electrically isolated from said first ground, and an amplifier stage responsive to said inductively received return signal to derive a corresponding response output signal for conveyance thereof to a data acquisition facility, wherein said primary inductive winding and said secondary inductive winding are configured as a step-up transformer having a turns ratio.

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**5,495,766**
**ULTRASONIC SENSOR**
**Masaharu Kota, and Kazuya Nakatera, both of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan**
**Filed Sep. 26, 1994, Ser. No. 311,923**
**Claims priority, application Japan, Sep. 28, 1993, 5-241749**
**Int. Cl.[6] G01H *11/00***
**U.S. Cl. 73—652** **9 Claims**




1. An ultrasonic sensor comprising:

a case being provided with at least one through hole in a surface for receiving/transmitting ultrasonics;

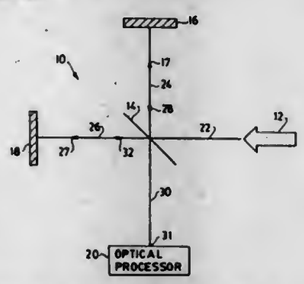
a piezoelectric diaphragm being arranged in said case;

a vibrator being bonded to a surface of said piezoelectric diaphragm for transmitting/receiving ultrasonics and to vibrate with said piezoelectric diaphragm; and

a tubular member having a cylindrical inner surface formed with a substantially uniform diameter along an axial direction of said tubular member and being arranged in said case in front of said vibrator for guiding ultrasonics from said vibrator to the exterior of said case or from the exterior to said vibrator and said piezoelectric diaphragm.

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**5,495,767**
**LASER VIBROMETER**
**Xingwu Wang, Alfred, and James C. Simpson, Alfred Station, both of N.Y., assignors to Alfred University, Alfred, N.Y.**
**Filed Jul. 26, 1994, Ser. No. 280,847**
**Int. Cl.[6] G01B *9/02***
**U.S. Cl. 73—657** **9 Claims**




1. An laser vibrometer for measuring the rate at which a specified target vibrates comprised of:

(a) means for producing a first laser beam;

(b) a laser beam splitter disposed in front of said means for producing a first laser beam, wherein:

1. a portion of said first laser beam is transmitted through said laser beam splitter as a second laser beam, and

2. a portion of said first laser beam is reflected by said laser beam splitter as a third laser beam;

(c) a first reflector comprised of reflective tape attached to said target disposed in the path of said second laser beam and adapted to produce a fourth laser beam reflected back to said laser beam splitter;

(d) a second reflector disposed in the path of said third laser beam and adapted to produce a fifth laser beam reflected back to said laser beam splitter;

(e) an optical processor comprised of a top face, wherein:

1. said fourth laser beam is reflected by said laser beam splitter as a sixth laser beam directed towards said top face of said optical processor, and

2. said fifth laser beam is transmitted by said laser beam splitter as a seventh laser beam towards said top face of said optical processor, wherein said sixth laser beam and said seventh laser beam interfere with each other to produce a laser beam interference pattern;

3. said optical processor is comprised of a bi-cell containing a first optical sensor and a second optical sensor separated from each other by a distance of from 0.5 millimeters to 5.0 centimeters, wherein each of said optical sensors converts said laser beam interference pattern into electrical signals, including a first electrical signal and a second electrical signal, which vary in intensity, whereby said first electrical signal and said second electrical signal are produced by said first sensor and said second sensor, respectively;

(f) means for amplifying each of said first electrical signal and said second electrical signal, thereby producing an amplified first electrical signal and an amplified second electrical signal;

(g) means for digitizing each of said amplified first electrical signal and said amplified second electrical signal, thereby producing a first digitized signal and a second digitized signal;

(h) flip flop means for combining said first digitized signal and said second digitized signal into a Q signal and a Q bar signal;



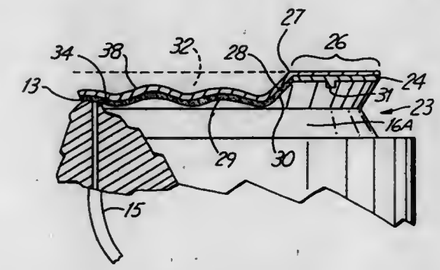
(i) means for combining said Q signal with said second digitized signal, thereby producing a first input signal;

(j) means for combining said Q bar signal with said second digitized signal, thereby producing a second input signal;

(k) an up counter and a down counter for counting said first input signal and said second input signal and for producing a digital sequence based upon such counting.

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**5,495,768**
**PRESSURE ISOLATOR ASSEMBLY FOR SANITARY PROCESSING**
**Bennett L. Louwagie, Plymouth; Steven M. Lemire, Chaska, and Craig A. Everett, Minnetonka, all of Minn., assignors to Rosemount Inc., Eden Prairie, Minn.**
**Continuation of Ser. No. 52,161, Apr. 23, 1993, abandoned. This application Jul. 20, 1994, Ser. No. 277,710**
**Int. Cl.[6] G01L *7/00***
**U.S. Cl. 73—706** **9 Claims**




1. A pressure sensitive remote isolator diaphragm assembly for use in sanitary processing applications where high intensity fluid cleaning systems are employed, comprising:

an isolator diaphragm support member having a planar outer periphery surface, a recessed interior surface portion with an annular inclined surface therebetween and an aperture formed in the recessed interior portion;

a thin flexible isolator diaphragm having an exposed surface capable of receiving a localized spray from a cleaning system, the exposed surface comprising a peripheral surface portion, a recessed flexible interior portion and an annular inclined section between the peripheral surface portion and the interior portion overlying the recessed interior surface portion of the support member, the recessed interior portion being positioned to receive the localized spray from a cleaning system to generate substantially unequal pressure gradients thereacross;

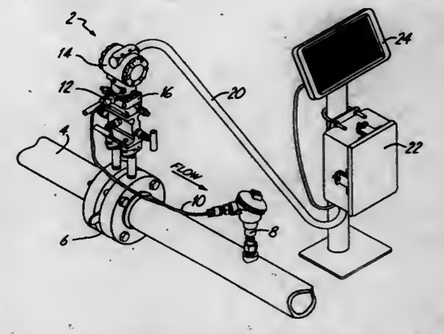
bonding means disposed between the peripheral surface portion and the planar outer periphery area for bonding the peripheral surface portion to the planar outer periphery area of the support member;

a tube connected to the aperture and leading to a pressure sensor and forming an enclosed fluid tight cavity between the diaphragm and the recessed interior surface portion in the recessed area of the support member; and

a non-compressible fluid within the fluid-tight cavity, for communicating movement of the diaphragm through the tube to the connected pressure sensor.

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**5,495,769**
**MULTIVARIABLE TRANSMITTER**
**David A. Broden, Chanhassen; Kelly M. Orth, Apple Valley; Dale W. Borgeson; Jane B. Lanctot, both of Minneapolis, and Kevin D. Voegele, Shakopee, all of Minn., assignors to Rosemount Inc., Eden Prairie, Minn.**
**Continuation of Ser. No. 117,479, Sep. 7, 1993, abandoned. This application May 22, 1995, Ser. No. 445,469**
**Int. Cl.[6] G01F *1/34***
**U.S. Cl. 73—718** **7 Claims**




1. A two wire transmitter transmitting mass flow of a fluid, comprising:

a first pressure sensor for sensing a differential pressure of the fluid;

a second pressure sensor for sensing a line pressure of the fluid;

an input for receiving a temperature variable representative of process grade temperature;

a compensation microprocessor receiving the temperature variable and signals from the first and second pressure sensors and providing a compensated differential pressure output and a compensated line pressure output;

a mass flow microprocessor receiving the compensated differential pressure output and the compensated line pressure signal output and providing an output representative of mass flow; and

a communications microprocessor receiving the mass flow output for formatting the mass flow output and coupling to a two wire circuit which powers the transmitter.

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**5,495,770**
**DEVICE FOR MEASURING EXPANSIONS AND COMPRESSIONS**
**Emil Stark, Jr., Kommunger Strasse 48, A-6840 Gotzis, Austria**
**Continuation-in-part of Ser. No. 728,136, Jul. 10, 1991, abandoned. This application Jul. 30, 1993, Ser. No. 99,522**
**Claims priority, application Germany, Jul. 19, 1990, 40 22 957.2**
**Int. Cl.[6] G01B *7/16***
**U.S. Cl. 73—774** **9 Claims**

1. Strain gauge device in which a strain gauge used, for measuring expansion, compression,-strength, distortion of length of variable components, including machine parts, bridges, ski lift masts, crane girders and jibs, trailer bridges for motor cars, street and rail bridges, lines of rails, which constitute test objects, comprising:

a housing (1),

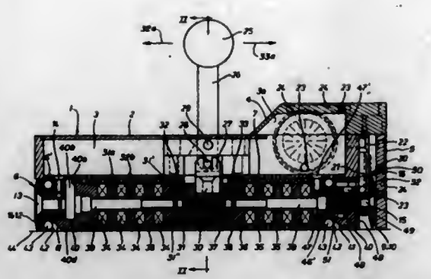
a pair of spaced apart knives (9, 11) in the housing,

one of the knives (11) being fixedly secured to the housing (1) and the other knife (9) being movable in the direction of the length variation of an object to be tested.

magnets (34) in the housing, and

lifting and lowering means in the housing operable, in response to actuation thereof, selectively for:

(a) lowering the housing toward the said component and simultaneously therewith energizing the magnets to mag-



netically secure the housing against the said component and thereby causing the knives to grip into the surface of the said component, and

(b) lifting the housing and lifting the knives therewith, and simultaneously therewith nullifying the magnets.

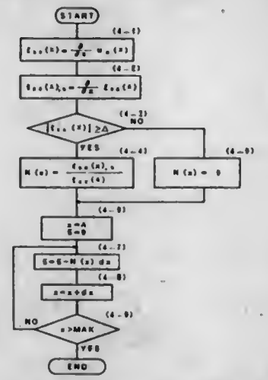
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**5,495,771**

## ELASTICITY MEASURING METHOD AND ELASTICITY MEASURING APPARATUS

**Chikayoshi Sumi, Saitama, and Kiyoshi Nakayama, 2-12-9, Honcho, Koganei-shi, Tokyo, 184, both of, Japan, assignors to Kiyoshi Nakayama, Tokyo, and Fujitsu Limited, Kawasaki, both of, Japan**

**Filed Apr. 28, 1994, Ser. No. 233,420**
**Claims priority, application Japan, Aug. 12, 1993, 5-200801**
**Int. Cl.[6] G01D** *7/02*
**U.S. Cl. 73—789** **28 Claims**




1. An elasticity measuring method comprising the steps of:

generating and transmitting ultrasonic waves in a direction along a predetermined straight line extending inside of a subject having a surface;

receiving reflected ultrasonic waves to obtain a received ultrasonic signal;

detecting the ratio of elastic value of the surface-to-elastic value of inside of the subject, which is based on the received ultrasonic signal and which is representative of level of elasticity involved in a reference point on the predetermined straight line extending inside of the subject and a predetermined observation point on the straight line, respectively, by detecting the ratio of strain of the surface-to-strain of the inside of the subject, which is involved in said reference point and said observation point, respectively, with respect to the direction toward which the straight line extends,

wherein it is determined whether an absolute value of the strain on the observation point exceeds a predetermined threshold, and if the absolute value is less than the threshold, a predetermined value by which the ratio of strain of the surface-to-strain of the inside of the subject involved in said reference point and said observation point is replaced is associated with said observation point, instead of said ratio of strain of the surface-to-strain of the inside of the subject.

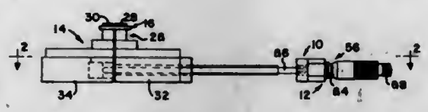
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**5,495,772**

## APPARATUS AND METHOD FOR MEASURING THE CURE STATE FOR ELASTOMERIC ARTICLES

**Boris Dinzburg, Niles, and Jone Deng, Hoffman Estates, both of Ill., assignors to SKF USA Inc., Elgin, Ill.**

**Filed Oct. 25, 1994, Ser. No. 328,466**
**Int. Cl.[6] G01N** *3/32*
**U.S. Cl. 73—832** **10 Claims**



1. A method of rapidly determining the cure state of a molded rubber article, said method comprising controlling the temperature of an annular elastomeric article whose cure state is to be measured to such that said temperature is at least 90° C., placing said article over a test fixture having separable parts, said article being sized so that radially inner portions of said article engage said test fixture with an interference fit, repeatedly moving said separable parts away from each other in steps of equal, predetermined distances so as to tension said article stepwise, each of said steps being a small proportion of the total elastic deformation able to be undergone by said article, permitting the tension induced by said movement of said separable parts to relax for a given time period following each tensioning step, measuring the tensile force remaining in said test article after each of said tensioning and relaxation steps, using the values of the forces and deflections thus generated to determine a force/deflection line having a given slope characteristic of that article during plural successive tensioning and relaxation steps, and thereafter comparing the slope of said force/deflection line with the slope of a force/deflection line characterizing successive tensioning and relaxation steps of an optimally cured rubber article made in the same size, shape and from the same material as determined by a prior empirical method, thereby determining the extent to which the cure state of said tested article corresponds to that of an article having an optimal cure state.

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**5,495,773**

## APPARATUS FOR WEIGHING CONTINUOUSLY FLOWING FLOWABLE MATERIAL

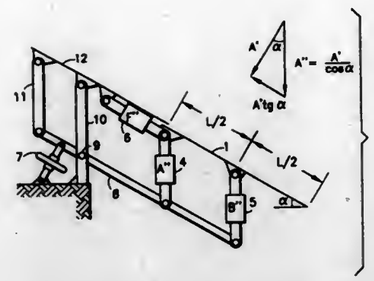
**Henry T. Olesen, Fuengirola, Spain, assignor to Cimbria Unigrain Ltd. A/S, Denmark**

**PCT No. PCT/DK92/00045, § 371 Date Oct. 17, 1994, § 102(e) Date Oct. 17, 1994, PCT Pub. No. WO93/16356, PCT Pub. Date Aug. 19, 1993**
**PCT Filed Feb. 12, 1994, Ser. No. 284,623**
**Int. Cl.[6] G01F** *1/30*
**U.S. Cl. 73—861.73** **4 Claims**

1. Apparatus for weighing continuously flowing granular or powdery material, in which the mass flow is determined as a function of measurements of forces exerted on an inclined plate, which is substantially rectilinear in the direction of flow and on which the flowing material flows slidingly, wherein

a) said plate is supported at two different levels by first force-measuring means capable of measuring forces, of which the gravitational force exerted by the material flowing upon the plate at each of said two levels comprises as a calculable component the force exerted by the flowing material on the plate in a vertical plane and at right angles to the direction of flow, and either





a1) by a second force-measuring means capable of measuring the frictional force exerted by the flowing material upon said first plate and/or

a2) by a second plate placed in the path of the flow of material and adapted to change the direction of the flow having third force-measuring means capable of measuring solely the force, with which the flow is deflected to change its direction, as well as

b) by calculating means for calculating the mass flow from

b1) the forces as measured by said first force-measuring means or as calculated from such measurements, and either

b2) from the frictional force as measured by said second force-measuring means, and/or

b2b) from the deflection force as measured by said third force-measuring means.

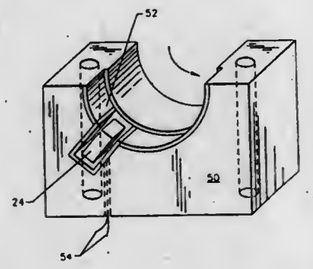
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**5,495,774**

## MAGNETOSTRICTIVE TORQUE SENSOR AIR GAP COMPENSATOR

**Robert D. Klauber; Erik B. Vigmostad, and Frederick P. Sprague, all of Fairfield, Iowa, assignors to Sensortech L.P., Fairfield, Iowa**

**Continuation-in-part of Ser. No. 74,861, Jun. 10, 1993, Pat. No. 5,313,826. This application Apr. 5, 1994, Ser. No. 223,522**
**Int. Cl.[6] G01L** *3/02*
**U.S. Cl. 73—862.333** **14 Claims**



1. An apparatus for detecting variation in torque in a rotating power transmitting member, said apparatus comprising:

a magnetostrictive sensor positioned adjacent the rotating power transmitting member and defining an air gap therebetween, said magnetostrictive sensor including a drive coil;

means for obtaining a first signal and a second signal from said magnetostrictive sensor, said first signal being related to the torsional stress in the member produced by a first at least one torque producing event, said second signal being related to the torsional stress in the member produced by a second at least one torque producing event; and

means for driving said drive coil within a predetermined frequency range so that said first and second signals are substantially independent of any variations in the air gap between said magnetostrictive sensor and said rotating power transmitting member.

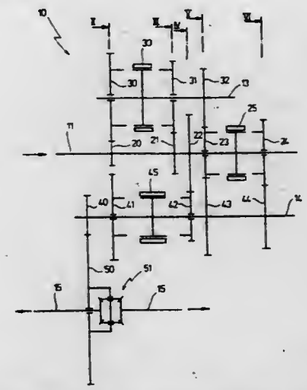
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**5,495,775**

## STEPPED MOTOR VEHICLE TRANSMISSION

**Wolfgang Lees, Ludwigsburg, and Gerold Mörk, Waiblingen, both of, Germany, assignors to Getrag Getriebe-Und Zahnradfabrik Hermann . . ., Ludwigsburg**

**Filed Oct. 12, 1994, Ser. No. 321,687**
**Int. Cl.[6] F16H** *3/087*
**U.S. Cl. 74—331** **1 Claim**



1. A stepped motor vehicle transmission, comprising:

an input shaft;

a first intermediate shaft extending parallel to said input shaft;

a second intermediate shaft extending parallel to said input shaft;

an output shaft extending parallel to said input shaft;

a first fixed toothed wheel on said input shaft and a first loose toothed wheel on said first intermediate shaft meshing with each other and constituting a first forward gear;

a second fixed toothed wheel on said input shaft and a second loose toothed wheel on said first intermediate shaft meshing with each other and constituting a second forward gear;

first gearshift sleeve means arranged on said first intermediate shaft to drivingly connect either said first or said second loose toothed wheel with said first intermediate shaft;

a third loose toothed wheel on said input shaft and a third fixed toothed wheel on said second intermediate shaft meshing with each other and constituting a third forward gear;

a fourth loose toothed wheel on said input shaft and a fourth fixed toothed wheel on said second intermediate shaft meshing with each other and constituting a fourth forward gear;

second gearshift sleeve means arranged on said input shaft to drivingly connect either said third or said fourth loose toothed wheel with said input shaft;

a fifth loose toothed wheel on said second intermediate shaft and a fifth fixed toothed wheel on said input shaft meshing with each other and constituting a fifth forward gear;

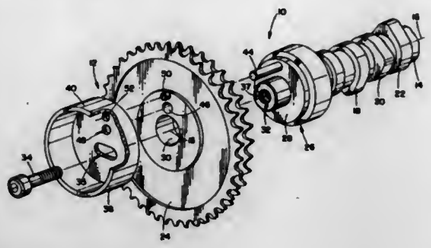
a sixth loose toothed wheel on said second intermediate shaft meshing with said first loose toothed wheel and constituting a reverse gear;

third gearshift sleeve means arranged on said second intermediate shaft to drivingly connect either said fifth or said sixth loose toothed wheel with said second intermediate shaft;

a sixth fixed toothed wheel on said first intermediate shaft meshing with said third loose toothed wheel; and

a seventh fixed toothed wheel on said second intermediate shaft and an eighth toothed wheel on said output shaft meshing with each other.

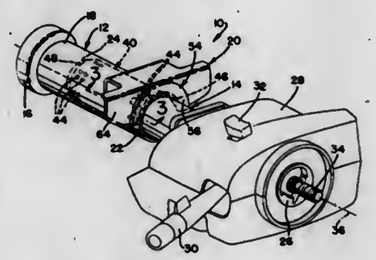
5,495,776
**CAM SHAFT TIMING ADJUSTMENT DEVICE**
**Timothy R. Allen, Lavaca, Ark., assignor to Cloyes Gear & Products, Inc., Willoughby, Ohio**
**Filed Nov. 1, 1993, Ser. No. 146,528**
**Int. Cl.[6] F01L *1/34*; F16H *35/06***
**U.S. Cl. 74—395** **15 Claims**



9. Apparatus comprising:
a shaft having an axis of rotation and an end face in a plane perpendicular to the axis of rotation;
a circular sprocket carried on the end face in axial alignment with the axis of rotation;
a first pin extending from said end face parallel to the axis of rotation at a location radially outwardly thereof, said first pin extending through an enlarged opening in the sprocket;
an adjusting plate engaged with the sprocket on the side of the sprocket opposite the end face, the adjusting plate positively engaged with the first pin with at least one second pin extending between the adjusting plate and the sprocket parallel to the axis of rotation but at a radial location different than the first pin such that angular adjustment of the adjusting plate about the axis of the first pin produces angular adjustment of the sprocket relative to the axis of rotation of the shaft; and,
connecting means including means aligned with the axis of rotation for holding the sprocket and the adjusting plate connected to the shaft during angular adjustment of the adjusting plate and operable to clamp the sprocket and the adjusting plate to the end face in desired positions of angular adjustment.

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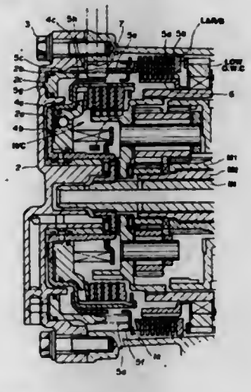
5,495,777
**STEERING COLUMN FOR MOTOR VEHICLE**
**Douglas M. Schneider, Bridgeport, and Robert E. Tuggle, Saginaw, both of Mich., assignors to General Motors Corporation, Detroit, Mich.**
**Filed Mar. 25, 1994, Ser. No. 217,817**
**Int. Cl.[6] B62D *1/18***
**U.S. Cl. 74—492** **5 Claims**



1. A motor vehicle steering column comprising:
a tubular lower mast jacket rigidly attached to a vehicle body and having an outboard end,
a tubular upper mast jacket disposed telescopically inside said lower mast jacket and cooperating therewith in defining an annulus at an overlap between an inboard end of said upper mast jacket and said outboard end of said lower mast jacket,
a tubular ball sleeve in said annulus having a first circular edge at a first end thereof exposed through said outboard end of said lower mast jacket and a second circular edge at a second end thereof and a plurality of pockets therein,
a plurality of steel spheres loosely received in respective ones of said pockets and interference fit between said upper and said lower mast jackets operative to rigidly support said upper mast jacket on said lower mast jacket in cantilever fashion and to roll tracks in said upper and said lower mast jackets during an energy absorbing collapse stroke of said steering column characterized by relative telescopic bodily movement between said upper and said lower mast jackets in the direction of a longitudinal centerline of said steering column,
an anti-rotation bracket means rigidly mounted on said vehicle body, and
means on said anti-rotation bracket means and on said tubular ball sleeve cooperating in positively preventing rotation of said ball sleeve about said longitudinal centerline of said steering column while permitting longitudinal translation of said ball sleeve in the direction of said longitudinal centerline during said energy absorbing collapse stroke of said steering column.

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5,495,778
**AUTOMOTIVE AUTOMATIC TRANSMISSION STRUCTURE**
**Akira Mochizuki, Shizuoka, Japan, assignor to Jatco Corporation, Fuji, Japan**
**Continuation of Ser. No. 944,174, Sep. 11, 1992, abandoned.**
**This application Sep. 16, 1994, Ser. No. 307,094**
**Claims priority, application Japan, Sep. 13, 1991, 3-234698**
**Int. Cl.[6] F16H *57/02***
**U.S. Cl. 74—606 R** **3 Claims**

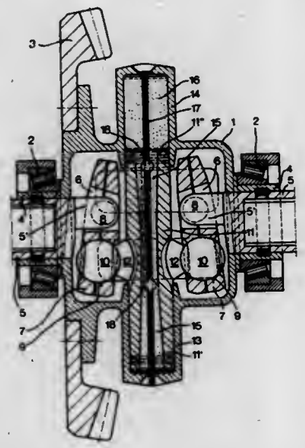


1. In an automatic transmission:
a torque converter;
a transmission casing having one end adjacent to said torque converter and the opposite end open, said opposite end being spaced further from said torque converter than said one end is;
a cover attached to said transmission casing to close said opposite end and defining one limit of the automatic transmission, said cover being formed with a support portion opening to the interior of said transmission casing and a cylinder chamber opening to the interior of said transmission casing, said cylinder chamber being disposed radially outward of said support portion;
a clutch arranged in said transmission casing and including a clutch drum having a portion extending into said support portion of said cover and a hydraulically operated clutch piston disposed in said portion of said clutch drum extending into said support portion of said cover; and
a brake arranged in said transmission casing, said brake including a set of interleaved plates and a hydraulically operated brake piston received by said cylinder chamber.



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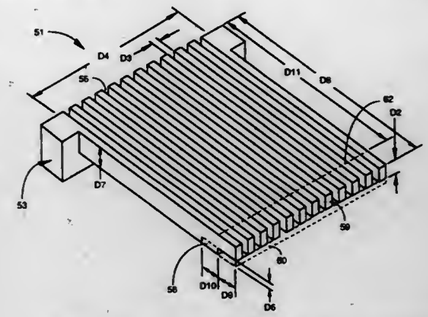
5,495,779
**SMOOTH RIMMED DIFFERENTIAL GEAR**
**Ewald Harr, Schwaigerner Strasse 19, D-74193 Schwaigern, Germany**
**Filed Nov. 5, 1993, Ser. No. 147,551**
**Claims priority, application Germany, Nov. 6, 1992, 42 37 463.4**
**Int. Cl.[6] F16H *21/14***
**U.S. Cl. 74—650** **6 Claims**



1. Differential gear with a swivel-mounted bearing means, which may be rotated by a drive element; two output elements, which are swivel-mounted in the bearing means and are coaxial to its axis of rotation; and a clutching device, which can be moved relative to the bearing means and the output elements and which connects the output elements to the bearing means in a manner that allows different speeds both between the output elements and the bearing means and also between the output elements, the improvement wherein
a) neither the clutching device nor the output elements includes a toothed rim;
b) each of the two output elements having a connecting link with a connecting point, which lies eccentrically with respect to the axis of rotation of the output element for connecting said clutching device; and
c) said clutching device includes a coupling link which is mounted in the bearing means so as to rotate about an axis, which extends perpendicularly to the axis of rotation of the bearing means between the two output elements, said coupling link including a cylindrical center piece which can be moved longitudinally in said bearing means; a pair of arms, having free ends in the shape of at least one incomplete ball projects in opposite radial directions; each of said balls forming a ball joint which is embedded in a spherical bearing bed of a first or second swash plate; connecting bodies being connected at a distance from the center of the bearing bed to the assigned connecting link at an eccentrically arranged connecting point so as to swivel around an articulated axis, extending at right angles to its axis of rotation.

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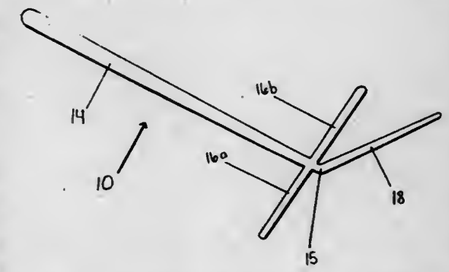
5,495,780
**METHOD FOR SHARPENING AN IC LEAD-FRAME PUNCH**
**EE-Chang Ong, Cupertino, Calif., assignor to Integrated Packaging Assembly Corporation, San Jose, Calif.**
**Division of Ser. No. 120,280, Sep. 13, 1993, Pat. No. 5,452,635.**
**This application May 4, 1995, Ser. No. 435,086**
**Int. Cl.[6] B21D *28/10***
**U.S. Cl. 76—101.1** **5 Claims**



1. A method for reworking a punch having a substantially rectangular punch body with a first length, a width, and a thickness, a spaced-apart plurality of grooves on a first side of said punch body beginning at a first end, spaced apart across the width, extending in the direction of the first length for a second length equal to or less than the first length, and having a common depth less than the thickness, the grooves providing a spaced-apart array of ribs on the first side, the grovved punch body having a step across the first end, the step extending across the width on a second side opposite the first side to a second depth greater than the thickness less the common depth of the grooves, such that the spaced apart array of ribs extends from the first end of the punch body as an array of separate punch teeth, comprising steps of:
(a) machining away the separate punch teeth in the direction of the first length for a distance great enough to remove wear or damage; and
extending the step in the direction of the first length for a distance great enough to expose new punch teeth, thereby providing reworked teeth on the punch body.

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5,495,781
**ROOF SHINGLE REMOVER**
**Sterling Wirth, 1101 N. Ist, Tacoma, Wash. 98403**
**Filed Jul. 11, 1994, Ser. No. 273,314**
**Int. Cl.[6] E04D *15/00***
**U.S. Cl. 81—45** **1 Claim**

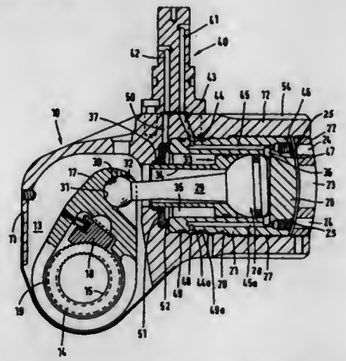


1. A hand held Roof Shingle Remover used for lifting, loosening and removing existing roofing shingles from roof structures comprising:

(a) a relatively long rigid handle having a straight longitudinal axis;
(b) said handle extends from one free end downward to an elbow on a lower end of said handle;
(c) a plurality of members of substantially equal length attached at one end immediately above said elbow;
(d) said members are disposed in a straight longitudinal axis in relation to each other;
(e) said members are disposed in a plane perpendicular to the longitudinal axis of said handle;
(f) said members are of a length to cover at least two boards of skip sheeting boards that wood shingles are commonly nailed to;
(g) an elongated tongue attached at one end to said elbow;
(b) said elbow disposes said elongated tongue at a predetermined angle to longitudinal axis of said handle; and
(i) said elongated tongue is disposed in a plane perpendicular to the longitudinal axis of said plurality of members; whereby
(j) said elongated tongue utilizes one free end as a means to extend under shingles by way of gaps in skip sheeting boards that wood shingles are commonly nailed to; and
(k) said plurality of members rest on top of and span at least 2 (two) boards of skip sheeting boards to act as a fulcrum means providing leverage to said elongated tongue to lift shingles from roof when downward pressure is applied to said handle.

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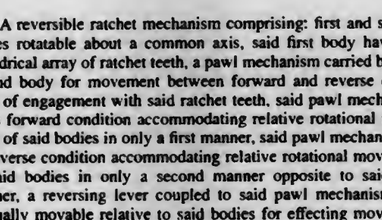
**5,495,782**
**POWER WRENCH**
**Klaus Ruessmann, Koenigswinter; Thomas Beyert, and Paul-Heinz Wagner, both of Much, all of, Germany, assignors to Paul-Heinz Wagner, Germany**
**Filed Apr. 25, 1994, Ser. No. 231,809**
**Claims priority, application Germany, May 6, 1993, 9306871 U; Apr. 6, 1994, 9405697 U**
**Int. Cl.[6] B25B** *13/46*
**U.S. Cl. 81—57.39** **11 Claims**



1. A power wrench comprising a housing (10) having a front end and a rear end, said housing (10) including a head portion (11) at said front end housing a rotatably supported annular member (14) and a rotatably supported lever (17) for driving said annular member (14), said housing rear end including a drive portion (12) having a front portion more adjacent said housing front end than a rear portion of said drive portion (12), a cylinder sleeve (21) within said drive portion (12), a piston (28) movable in said cylinder sleeve (21), a piston rod (29) connected to said piston (28) and engaging said lever (17), said piston (28) and a rear portion of said cylinder sleeve (21) at said rear portion of said drive portion (12) defining a cylinder chamber (36) of said cylinder sleeve (21), a hose connection device (40) having a pair of hose connectors (41, 42), said hose connection device (40) being located at said front portion of said drive portion (12), a pressure channel (45) extending in said cylinder sleeve (21) substantially longitudinally relative to an axis of said cylinder sleeve (21), a transverse bore (43) extending through said front portion of said drive portion (12) and being in fluid communication with one (41) of said pair of hose connectors (41, 42) and said pressure channel (45), the fluid communication between said transverse bore (43) and said pressure channel (45) including a circumferential groove (48) in an exterior surface of said cylinder sleeve (21) in fluid communication with said pressure channel (45) via a transverse bore (44) in said cylinder sleeve (21), and another bore (47) placing said pressure channel (45) in fluid communication with said cylinder chamber (36) of said cylinder sleeve (21) at said housing rear end.

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**5,495,783**
**REVERSIBLE RATCHET WRENCH WITH DIRECTION INDICIA**
**Randall J. Slusar, Greenfield, and Jeffrey H. Hoff, Kenosha, both of Wis., assignors to Snap-on Incorporated, Kenosha, Wis.**
**Filed Jul. 8, 1994, Ser. No. 271,965**
**Int. Cl.[6] B25B** *13/46*
**U.S. Cl. 81—63.2** **20 Claims**



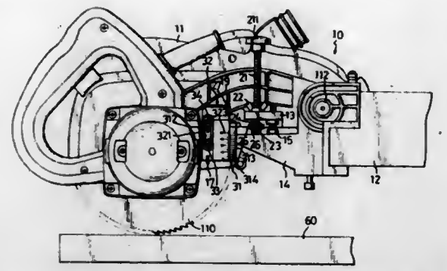
1. A reversible ratchet mechanism comprising: first and second bodies rotatable about a common axis, said first body having a cylindrical array of ratchet teeth, a pawl mechanism carried by said second body for movement between forward and reverse conditions of engagement with said ratchet teeth, said pawl mechanism in its forward condition accommodating relative rotational movement of said bodies in only a first manner, said pawl mechanism in its reverse condition accommodating relative rotational movement of said bodies in only a second manner opposite to said first manner, a reversing lever coupled to said pawl mechanism and manually movable relative to said bodies for effecting movement of said pawl mechanism between the forward and reverse conditions thereof, said lever and said second body respectively having first and second external surfaces, and indicia disposed on said first and second surfaces so as to be at all times exposed in their entirety to view by a user for cooperation to indicate the condition of said pawl mechanism.

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**5,495,784**
**CUTTING DEPTH SETTING DEVICE FOR A SAW MACHINE**
**Ruey-Zon Chen, No. 261, Jenhwa Rd., Tali City, Taichung Hsien, Taiwan, Prov. of China**
**Filed Sep. 29, 1994, Ser. No. 314,856**
**Int. Cl.[6] B27B** *5/29*
**U.S. Cl. 83—471.2** **8 Claims**

1. A cutting depth setting device for a saw machine (10) which comprises a base portion (12) having a positioning block (14) protruding therefrom, a drive arm (11) pivotally engaged with said base portion (12) about a pivot axle (112), a protruding block (13) projecting from said drive arm (11) and located above said positioning block (14), a threaded hole (131) vertically defined through said protruding block (13), a circular saw blade (110) rotatably mounted on said drive arm (11) to pivot therewith for cutting a





workpiece (80), a working platform (60) mounted beneath said saw blade (110) for holding said workpiece (80), said cutting depth setting device comprising:
an adjusting bolt (21) threadedly extending through said threaded hole (131) of said protruding block (13) to be displaced vertically relative to said protruding block (13), a head (211) fixedly mounted on an upperside of said adjusting bolt (21) for rotating said adjusting bolt (21), a pointer (27) pivotally engaged on an underside of said adjusting bolt (21) to move vertically therewith;
a first panel (31) movably mounted on said drive arm (11) and having a flat surface (313) which is located adjacent to said pointer (27) and has a plurality of graduations (314) formed thereon for aligning with said pointer (27); and
a second panel (32) movably mounted on said drive arm (11) and enclosed on said first panel (31), a plurality of numerals (323) formed on said second panel (32) for respectively aligning with said plurality of graduations (314).

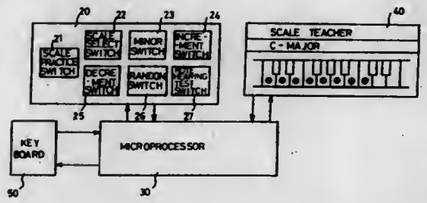
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**5,495,785**

**Patent Not Issued For This Number**

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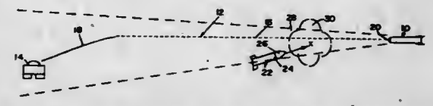
**5,495,786**
**METHOD AND APPARATUS FOR CONTROLLING SCALE PRACTICE OF ELECTRONIC MUSICAL INSTRUMENT**
**Kwang S. Choi, Kyungki-Do, Rep. of Korea, assignor to Goldstar Co., Ltd., Rep. of Korea**
**Filed Nov. 30, 1993, Ser. No. 159,817**
**Claims priority, application Rep. of Korea, Nov. 30, 1992, 22807/1992**
**Int. Cl.[6] G09B** *15/00*
**U.S. Cl. 84—470 R** **5 Claims**




1. An apparatus for controlling scale practice of an electronic musical instrument, having function select switching means for selecting a desired one of various functions of the electronic musical instrument according to a user's selection, said function select switching means comprising:
a scale practice switch for selecting a scale practice mode;
a scale select switch for selecting a desired scale;
a minor switch for selecting a major or minor of the scale selected by said scale select switch;
an increment switch for selecting a tune, notes of which are sequentially incremented;
a decrement switch for selecting a tune, notes of which are sequentially decremented;
a random switch for selecting a tune, notes of which are varied at random; and
a note hearing test switch for selecting a note hearing test mode.

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**5,495,787**
**ANTI-MISSILE MISSILES HAVING MEANS TO "BLIND", AND THUS RENDER INEFFECTIVE, PRECISION, SEEKER GUIDED MUNITIONS**
**Lynn L. Boyer, III, 2202 Manassas Dr., SW., Huntsville, Ala. 35803**
**Filed Jun. 17, 1994, Ser. No. 262,326**
**Int. Cl.[6] F42B** *12/36*
**U.S. Cl. 89—1.11** **10 Claims**

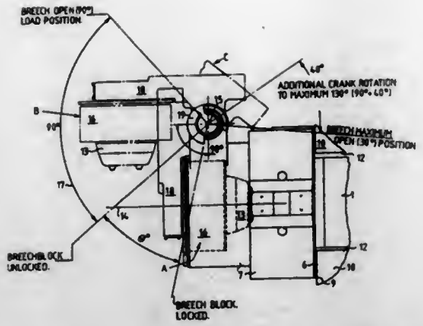


8. An anti-missile missile for preventing an incoming threat missile from impacting a target without requiring impact of said anti-missile missile with said incoming threat missile, said incoming threat missile having a seeker provided with an aperture having a window and a guidance and control system disposed for receiving a source of energy from an external source associated with said target, through said seeker aperture window, for guiding said threat missile to impact with said target, said anti-missile missile comprising:
a body;
a container carried by said body;
shield means defined as silica material carried in said container for ejection from said container in the vicinity of said threat missile, said shield means disposed for physically altering said aperture window so that insufficient energy from said external source is passed therethrough for operational control of said guidance and control system thereby rendering said guidance and control system ineffective to guide said threat missile to said target; and
ejection means for ejecting said shield means in the vicinity of said threat missile.

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**5,495,788**
**DRIVE DEVICES**
**John B. Gorst, Kendal, United Kingdom, assignor to Vickers Shipbuilding and Engineering Limited, United Kingdom**
**Continuation of Ser. No. 91,332, Jul. 12, 1993, abandoned. This application Sep. 23, 1994, Ser. No. 311,368**
**Claims priority, application United Kingdom, Jul. 15, 1992, 9215052**
**Int. Cl.[6] F41A** *5/36*
**U.S. Cl. 89—4.1** **18 Claims**

1. A gun comprising a power-operated mechanism and a drive device operative to actuate said mechanism, the drive device comprising
(i) a driving member,
(ii) a driven member,
(iii) a first element and a second element wherein the second element is movable relative to the first element between a first position at which the first and second elements abut, and a second position at which the first and second elements are spaced apart, the arrangement being such that the second element approaches and contacts the first element on returning to the first position, and




(iv) means of storing energy derived from the coming together of the elements and of transferring the energy to the driving member thereby to drive the driven member, wherein the driving member is connected to the first element and the driven member is connected to the second element so that the driving member and the driven member are separable as the elements move between their first and second positions and re-engageable as the elements move between their second and first positions;

wherein the respective connections between said driving member and said first element and between said driven member and said second element permit when the driving and driven members are engaged, said driving and driven members to execute a rotary motion about an essential common axis.

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**5,495,789**

**SWASH PLATE TYPE COMPRESSOR WITH LUBRICATING MECHANISM BETWEEN THE SHOE AND SWASH PLATE**

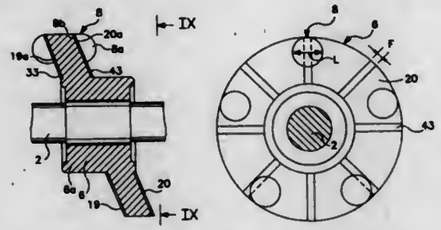
**Toshiyuki Ogura, Sawa; Kenji Saito, Ashikaga; Shigemi Shimizu, Sawa, and Masakatsu Sakaki, Isesaki, all of, Japan, assignors to Sanden Corporation, Isesaki, Japan**

**Filed Mar. 9, 1994, Ser. No. 207,640**

**Claims priority, application Japan, Mar. 10, 1993, 5-010140 U; Mar. 12, 1993, 5-010753 U; Mar. 18, 1993, 5-012092 U; May 18, 1993, 5-025710 U; Dec. 9, 1993, 5-065784 U**

**Int. Cl.[6] F01B *3/00***

**U.S. Cl. 92—71** **10 Claims**




1. A swash plate type refrigerant compressor comprising:

a compressor housing enclosing therein a crank chamber, a suction chamber and a discharge chamber, said compressor housing including a cylinder block;

a plurality of cylinder bores formed in said cylinder block;

a plurality of pistons slidably disposed within corresponding said cylinder bores, each of said pistons having a corresponding axis;

a drive shaft rotatably supported in said cylinder block;

a swash plate tiltably connected to said drive shaft and having a pair of sliding surfaces at axial sides thereof, said sliding surfaces having contacting surfaces where a plurality pairs of shoes and said sliding surfaces engage, said shoes coupling said swash plate to said pistons so that said pistons may be driven in a reciprocating motion within said cylinder bores upon rotation of said swash plate; and

at least one lubricating means associated with at least one of said contacting surfaces of said swash plate for lubricating between said shoes and said swash plate, said lubricating means formed at least on the contacting surfaces corresponding to a portion of a compression stroke of the swash plate;

said at least one lubricating means formed eternally to and on the sliding surface of said swash plate;

wherein said lubricating means is a recessed portion formed in said contacting surfaces of said swash plate,

wherein said recessed portion extends radially from a center of said swash plate.

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**5,495,790**

**PISTON CATCHER FOR A PYROTECHNIC LINEAR PISTON AND CYLINDER DRIVE**

**Hartmut Greiner, Alfdorf, Germany, assignor to TRW Repa GmbH, Alfdorf, Germany**

**Filed Jan. 18, 1995, Ser. No. 373,985**

**Claims priority, application Germany, Jan. 18, 1994, 9400764 U**

**Int. Cl.[6] F01B *11/02***

**U.S. Cl. 92—85 R** **4 Claims**



1. A piston catcher for a pyrotechnic linear piston and cylinder drive on a safety belt pretensioner, wherein said cylinder has a free end of frustroconical shape and said piston has an end portion tapering towards said free cylinder end, an annular piston member of a plastically deformable material being slipped over and frictionally engaged with said tapering piston end portion, and said tapering piston end portion having an axial length substantially greater than an axial length of said annular piston member, and said annular piston member being normally located on the side of said free cylinder end.

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**5,495,791**

**ACTUATOR FOR TRANSFER OF FORWARD AND BACKWARD ROTATIONAL MOVEMENT**

**Kurt Sande, Risløkka 47A, N-1600 Fredrikstad; Edgar J. Heim, Nymannsveien 165, N-4015 Stavanger, and Torbjørn Staaland, Krystallveien 14, N-4875 Nedenes, all of, Norway**

**PCT No. PCT/NO93/00089, § 371 Date Dec. 9, 1994, § 102(e) Date Dec. 9, 1994, PCT Pub. No. WO93/25818, PCT Pub. Date Dec. 23, 1993**

**PCT Filed Jun. 7, 1993, Ser. No. 351,355**

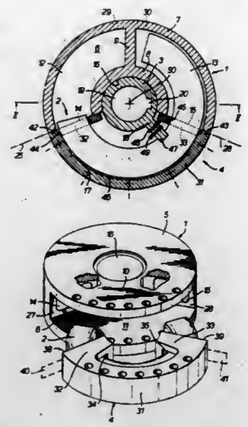
**Claims priority, application Norway, Jun. 15, 1992, 92 2351**

**Int. Cl.[6] F01C *9/00***

**U.S. Cl. 92—120** **5 Claims**

1. A fluid-operated actuator comprising a chamber part including chamber walls and at least one chamber which is adapted to be supplied with a pressurized fluid, a carrier which is mounted in the chamber part in such a manner that it can rotate about an axis of rotation, and which is adapted to be connected with an object which has to be rotated, and a plunger piston whose longitudinal axis extends in the form of a circular arc which curves circularly about an axis which is coincident with the carrier's axis of rotation, which plunger pistion is arranged to be rotated about the axis of rotation, and to connect with the carrier, and wherein the plunger piston passes sealingly by way of a sealing device through an





opening in the said at least one chamber to extend therein such that there is clearance between a section of the plunger piston which is located in the chamber and the chamber walls, and wherein a section of the plunger piston which is located outside the chamber is slidingly supported along a radial outer surface by a support part which is removably attached to the chamber part.

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**5,495,792**

**DOUBLE ACTING HYDRAULIC CYLINDER WITH IMPROVED LUBRICATION AND PISTON ROD GUIDES**

**Akira Izumi, and Toshiyuki Takeuchi, both of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan**

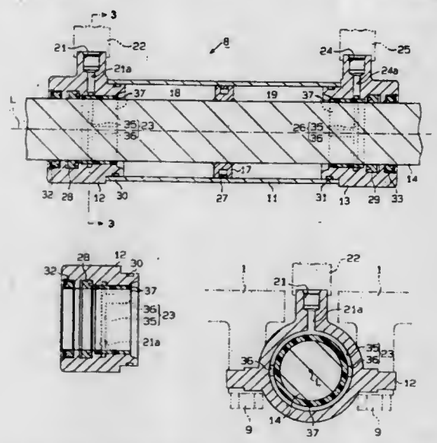
**PCT No. PCT/JP93/01630, § 371 Date Sep. 30, 1994, § 102(e) Date Sep. 30, 1994, PCT Pub. No. WO94/11232, PCT Pub. Date May 26, 1994**

**PCT Filed Nov. 10, 1993, Ser. No. 256,325**

**Claims priority, application Japan, Nov. 10, 1992, 4-300180**

**Int. Cl.[6] F16J *15/18***

**U.S. Cl. 92—166** **18 Claims**



1. A hydraulic cylinder having a cylinder tube and a pair of rod guides respectively provided at opposite ends of the cylinder tube, wherein a piston rod is mounted in the cylinder tube and the rod guides for reciprocation relative to said cylinder tube and rod guides in accordance with changes of pressure of hydraulic fluids in a pair of pressure chambers, said hydraulic cylinder further comprising:

an individual bushing provided between the piston rod and each of the rod guides for enabling the piston rod to slide within the cylinder tube and rod guides, said bushings having a uniform unbroken outer cylindrical surface;

said rod guides having oil inlet ports open to outer surfaces of said rod guides and extending linearly inward in a radial direction of the cylinder tube to communicate with inner circumferential surfaces of said rod guides and said outer surfaces of said bushings, said oil inlet ports having means for connection to an external source of oil; and

oil passages formed in the rod guides for connecting the oil inlet ports to a respective one of said pressure chambers.

17. A hydraulic cylinder having a cylinder tube and a pair of rod guides respectively provided at both ends of the cylinder tube, wherein a piston rod is inserted in the cylinder tube and the rod guides for reciprocation in accordance with changes of pressure of hydraulic fluids in a pair of pressure chambers, said hydraulic cylinder comprising:

bushings respectively provided between the piston rod and the rod guides for enabling the piston rod to slide along the cylinder tube therein;

said rod guides having oil inlet ports open to outer surfaces of said rod guides and linearly extending inward in a radial direction of the cylinder tube to communicate with inner circumferential surfaces of said rod guides, said oil inlet ports having means for connection to an external device; and

oil passages formed in the rod guides and the bushings for connecting the oil inlet ports to the pressure chambers, at least a selected one from the group consisting of the inner circumferential surface of each rod guide and an outer surface of each bushing has grooves for forming said oil passages, said oil grooves including a first oil groove extending along the inner circumferential surface of each rod guide, and a second oil groove formed parallel to the axis of the piston rod for connecting said first oil groove to the associated pressure chamber, said second oil groove being formed 90 degrees away from an opening portion of the associated oil inlet port in each first oil groove.

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**5,495,793**

**METHOD AND APPARATUS FOR PREPARING A BEVERAGE**

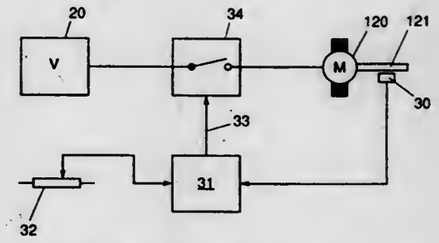
**Jan A. Muis, and Johannes H. Edelbroek, both of Odijk, Netherlands, assignors to Sara Lee/De N.V., Utrecht, Netherlands**

**Filed May 27, 1994, Ser. No. 249,354**

**Claims priority, application Netherlands, May 27, 1993, 9300913**

**Int. Cl.[6] A47J *31/34***

**U.S. Cl. 99—280** **9 Claims**




1. An apparatus for preparing a beverage, comprising:

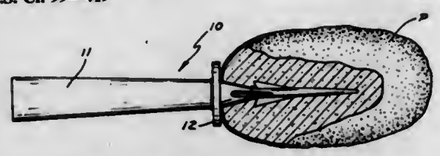
at least one chamber receiving a flavor-imparting substance;

an apparatus part displaceable relative to said at least one chamber;

an electromotor receiving input power and having a driven shaft coupled to said apparatus part, said driven shaft displaces said apparatus part relative to said at least one chamber;
means for detecting a position of said apparatus part relative to said at least one chamber;
a sensor coupled to said driven shaft; and,
a control device having a signal input receiving a signal produced by said sensor, wherein said control device controls the power input of said electromotor in dependence on said sensor signal.

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**5,495,794**
**VEGETABLE HOLDING UTENSIL**
**Clark Ulysse, 6930-54th Ave. N., Apt. 201, Minneapolis, Minn. 55428**
**Filed Feb. 6, 1995, Ser. No. 383,933**
**Int. Cl.[6] A47J *37/04***
**U.S. Cl. 99—419** **2 Claims**

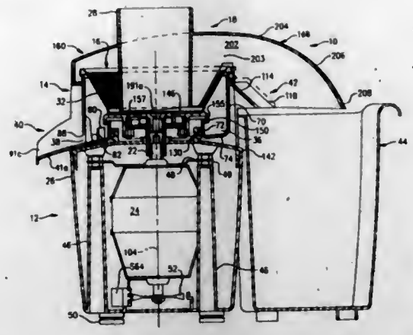


1. A vegetable holding device, comprising
an elongated hand held member having a cylindrical handle, having an outer and an inner end,
a circular flange integral with the inner end of said handle,
a slender slightly tapered rod-like projection extending forwardly of said inner end of said handle,
said projection terminating in a point adapted to penetrate a vegetable,
a pair of triangular like projections extending from said rod like projection in opposed relation to each other and being tapered in the direction of said point of said rod like projection and having rearward upwardly extending shoulders,
a second pair of said triangular like projections on said rod like projections extending above said first pair of projections and at right angles thereto,
whereby upon being inserted into a vegetable said shoulders hold said vegetable onto said device.

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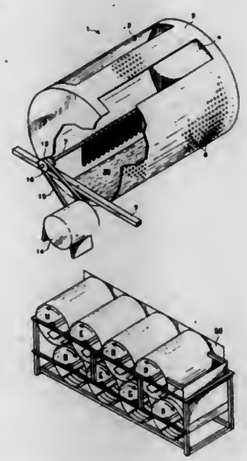
**5,495,795**
**JUICE EXTRACTORS**
**Robert G. Harrison, Poulsbo, Wash.; Bong-Sool Kim, Pusan, Rep. of Korea, and Robert D. Lamson, Seattle, Wash., assignors to Trillium Health Products, Inc., Seattle, Wash.**
**Continuation-in-part of Ser. No. 811,572, Dec. 20, 1991, Pat. No. 5,355,784. This application Jan. 8, 1993, Ser. No. 2,248**
**Int. Cl.[6] A23N *1/00; 1/02***
**U.S. Cl. 99—492** **3 Claims**

1. A juice extractor comprising:
a base which includes a motor;
means for extracting juice from comestibles, said juice extracting means being drive-connected to said motor;
a juice bowl for collecting extracted juice, said juice bowl being lockable to said base in surrounding relationship to the juice extracting means;
a cover which is removably installable on the juice bowl;
safety interlock means for activating said motor only if said juice bowl is locked to the juice extractor base and the cover is installed on and locked to the juice bowl; and
separate and independent systems spaced at intervals around the extractor for locking the juice bowl cover to the juice bowl, said locking systems each having interengageable cover- and juice bowl-incorporated components and the components of the separate locking means being so configured that the engagement of the components of one of said locking systems requires the simultaneously engaging of the components of all of said locking systems.



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**5,495,796**
**APPARATUS FOR DESPINING CACTUS**
**Dennis M. Mueller, 7856 2nd St., Wellington, Colo. 80549**
**Filed Feb. 22, 1994, Ser. No. 199,436**
**Int. Cl.[6] A23N *17/00***
**U.S. Cl. 99—567** **4 Claims**

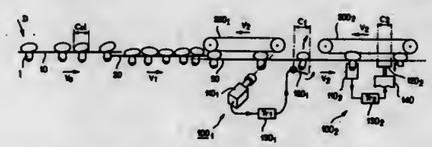


1. An apparatus for despining spiny cactus pads comprising a plurality of pad treating stages, each of said stages comprising:
a. a cylindrical wall defining a chamber;
b. opening means in said wall to permit said pads to be fed thereto;
c. spine shearing means partially lining said wall's interior surface;
d. an elongated shaft means within and oriented generally concentric to said chamber;
e. a plurality of fingers connected at one end thereof to said shaft means and extending towards said wall, terminating in close proximity to but not touching said wall;
f. means for rotating said shaft means so as to swing said fingers around said shaft means and within said chamber so that said fingers impel spiny cactus pads against said shearing means in order to shear spines from said spiny pads and form spine pieces and despined pads;
g. a plurality of perforations in said wall, said perforations being large enough to permit said spine pieces, but not despined pads, to exit said chamber;
wherein each chamber is located substantially adjacent and parallel to another respective chamber, wherein each chamber includes slot means to permit pads to enter and exit each chamber as said pads are impelled centrifugally within each chamber; wherein said slot means on adjacent chambers are aligned with one another so that pads exiting from one chamber are caused to enter an adjacent chamber.



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**5,495,797**
**DEVICE FOR AUTOMATICALLY PROCESSING MUSHROOMS AT AN OPTIMUM PROCESSING RATE**
**Alain Meulnart, Paris, France, assignor to S.A. Royal Champignon, Saumur, France**
**PCT No. PCT/FR93/00088, § 371 Date Jul. 29, 1994, § 102(e) Date Jul. 29, 1994, PCT Pub. No. WO93/14653, PCT Pub. Date Aug. 5, 1993**
**PCT Filed Jan. 28, 1993, Ser. No. 256,987**
**Claims priority, application France, Jan. 31, 1992, 92 01077**
**Int. Cl.[6] A23N *15/04***
**U.S. Cl. 99—637** **4 Claims**

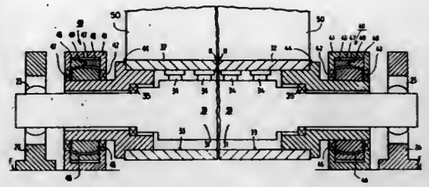


1. A device for automatically processing mushrooms comprising:
a) conveyor means for bringing mushrooms fed to the device to
b) at least one processing station that includes (i) detection means for determining mushroom size, (ii) a processing member for processing each mushroom individually for a distance C, and (iii) control means for bringing the processing member into operation at a time Tr following detection-means determination of mushroom size and in a manner based on mushroom size as determined by the detection means,
wherein the device is suitable for processing mushrooms having a mean cap diameter Cal, which are fed to the device at a mean mushroom-flow rate D not greater than 1/Tr, and wherein the conveyor means includes a set of receiver belts for receiving mushrooms fed to the device, which can be driven at a speed $V_0$ not less than Cal×D, and a set of accumulator belts, which can be driven at a speed $V_1$ equal to Cal×D and a set of separator belts, which can be driven at a speed $V_2$ not less than C/(1/D–Tr).

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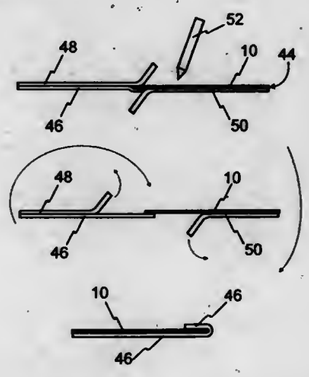
**5,495,798**
**ADJUSTABLE-CROWN ROLL**
**Juhani Niskanen, Munrame, and Kyösti Uuttana, Jyväskylä, both of, Finland, assignors to Valmet Paper Machinery, Inc., Helsinki, Finland**
**Continuation of Ser. No. 816,139, Dec. 31, 1991, Pat. No. 5,273,626. This application Oct. 19, 1993, Ser. No. 139,938**
**Claims priority, application Finland, Jan. 7, 1991, 910080**
**Int. Cl.[6] D21G *1/00*; B30B *3/04***
**U.S. Cl. 100—162 B** **20 Claims**

1. An arrangement for an adjustable-crown roll in nip-defining relationship with a counter-roll, comprising
a machine frame,
an adjustable crown roll comprising a stationary roll axle and a roll mantle arranged to revolve on said roll axle,
articulated bearings including respective non-revolving bearing blocks, said roll axle being supported on said machine frame by means of said articulated bearings,
loading members arranged in a space between said roll axle and said roll mantle and being fitted substantially in a plane of the nip defined by said variable-crown roll and said counter-roll, said loading members regulating the profile of the nip,
at least one support bushing attached to a respective end of said roll mantle and arranged concentrically with said roll mantle such that said at least one support bushing revolves along with said roll mantle,
a hydrostatic bearing coupled to said machine frame and to said at least one support bushing attached to said roll mantle, said hydrostatic bearing structured and arranged to receive axial forces from said roll mantle through said at least one support bushing and transfer said axial forces of said roll mantle to said machine frame,
said hydrostatic bearing including a non-revolving housing coupled to said machine frame and a hydrostatic pressure chamber situated between said at least one support bushing and said non-revolving housing.



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**5,495,799**
**PRINTING PLATE WITH A MESH LAYER FORMING PIGMENT STORING WELLS**
**Jonathan R. Daniel, 48 Eastview Ct., Jericho, N.Y. 11753**
**Filed Jul. 8, 1994, Ser. No. 272,684**
**Int. Cl.[6] B41L *7/00*; B41F *3/36***
**U.S. Cl. 101—150** **8 Claims**



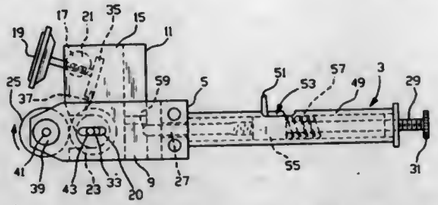

1. A printing plate comprising:
a mesh material having first and second surfaces and having first and second ends;
a removable substrate attached to one of said first and second surfaces;
a substrate attached to one of said first and second ends of said mesh material; and
a paper backing removably attached to said substrate.

5,495,800

## ENHANCED APPLICATION PRINTING INK HAND PROOFING DEVICE

Leonard Weissbein, Bridgewater, N.J., and James F. Queroli, Philadelphia, Pa., assignors to Cavanagh Corporation, Flemington, N.J.

Filed Mar. 29, 1995, Ser. No. 411,582
Int. Cl.[6] B41F 9/00
U.S. Cl. 101—329 18 Claims



1. An anilox roll printing ink hand proofing device, which comprises:

a. a base frame, having an elongated member adapted to receive a handle and sideframes;

b. a handle connected to said base frame, said handle including a hollow elongated member and containing a pressure rod in said hollow elongated member, and including pressure rod adjustment means connected to said pressure rod and to said handle so as to be movable relative to one of said rod and said handle so as to adjust a position of said rod relative to said handle for the purpose of at least indirectly changing pressure on an anilox roll against a transfer roll, and including pressure rod release means attached to one of said rod, said pressure rod adjustment means and said handle, said pressure rod release means having a first, fixed position wherein said pressure rod is in an engaged location applying pressure, at lease indirectly, to an anilox roll, and having a second, different fixed position wherein said pressure rod is in a disengaged location wherein no pressure is applied to an anilox roll;

c. sideframes located at opposite ends of said base frame elongated member and adapted to receive an anilox roll and a transfer roll so that at least one of said anilox roll and said transfer roll is movable relative to one another;

d. an anilox roll nesting subframe, which is adapted to receive and rotatably mount an anilox roll therein, and which is adapted to movably mount within said sideframes and against said pressure rod so as to be moveable by said pressure rod so as to force an anilox roll against a transfer roll at predesired pressure levels;

e. an anilox roll rotatably nested in said subframe and having end pins extending from said anilox roll and located within said sideframes;

f. a doctor blade adjustively mounted on said subframe and located against said anilox roll;

g. blade adjustment means connected to at least one of said blade and said subframe and adapted to adjust a blade level; and,

h. a transfer roll rotatably mounted within said sideframes and against said anilox roll.

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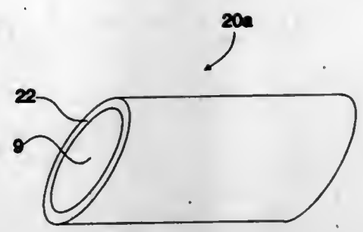
5,495,801

## PRESSURE-SENSITIVE TACKY PRINTING ROLLER FOR REMOVING PRINTING INKS FROM A PRINTING PLATE

Fred Dankert, R.R. 3, Box 99, Oxford, N.Y. 13830

Filed Jun. 24, 1994, Ser. No. 265,166
Int. Cl.[6] B41F 31/26
U.S. Cl. 101—348 6 Claims

1. A printing roller having a pressure-sensitive tack for cleanly removing inks from non-image areas of a waterless planographic plate, said printing roller comprising a roller base having a pressure-sensitive tack for cleanly removing said ink from said non-image areas of said waterless planographic plate, irrespective of a wide range of tackiness characteristics of inks, a material for said roller base providing a pressure-sensitive tacky surface, and comprising in admixture a liquid butadiene acrylonitrile copolymer and a liquid epoxide terminated polysulfide in an approximate ratio by weight of at least 2:1 butadiene acrylonitrile copolymer to expoxide terminated polysulfide.



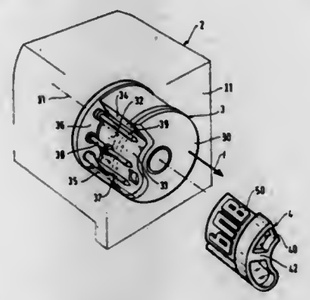
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5,495,802

## PRINT BLOCK CASSETTE FOR FRANKING MACHINE PRINT DRUM

Jean-Claude Haroutel, Orsay, and Gérard Moizeau, Longjumeau, both of, France, assignors to Neopost Industrie, Bagneux, France

Filed Sep. 1, 1994, Ser. No. 299,545
Claims priority, application France, Sep. 2, 1993, 93 10473
Int. Cl.[6] B41F 13/10
U.S. Cl. 101—377 3 Claims



1. A print block cassette for franking machine print drums, comprising:

a support having a support side and comprising sleeves;

longitudinal guide and support members extending perpendicularly to said support side; and

a plurality of separate print blocks, each having a section which mounts said print block on at least one of said longitudinal support members so that said print block is interchangeable with another print block, said longitudinal guide and support members being held in said sleeves of said support and being adapted to be inserted into said print drum.

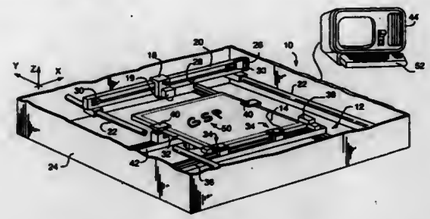


5,495,803

## METHOD OF FORMING A PHOTOMASK FOR A PRINTING PLATE WITH AN INK JET

H. Joseph Gerber, West Hartford; Russell F. Croft, Tolland, and Daniel J. Sullivan, Hartford, all of Conn., assignors to Gerber Scientific Products, Inc., Manchester, Conn.

Filed Jul. 25, 1994, Ser. No. 279,935
Int. Cl.[6] G03F 1/00
U.S. Cl. 101—401.1 1 Claim



1. A method for preparing a printing plate comprising the steps of:

(a) providing a substrate having an unexposed light sensitive emulsion applied thereto; said emulsion being sensitive to UV radiation;

(b) positioning the substrate in a printing mechanism having a printhead for dispensing ink onto the emulsion, said ink being transparent to UV radiation;

(c) providing the printing mechanism with data defining a pattern to be printed on the emulsion;

(d) printing the pattern on the emulsion by means of the printing mechanism according to the data provided;

(e) coating the emulsion with a UV opaque ink which will not adhere to the printed pattern;

(f) exposing the emulsion using the printed pattern as an exposure mask to form exposed and unexposed regions of the emulsion, and

(g) washing the ink and one of the exposed and unexposed regions of the emulsion from the substrate to provide a pattern of raised areas of hardened emulsion supported by the substrate, said substrate and supported pattern of raised areas forming a printing plate.

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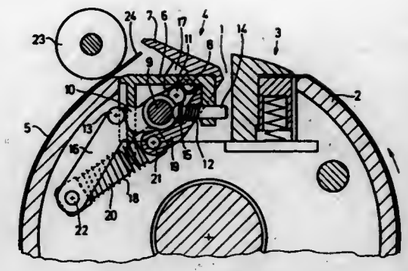
5,495,804

## DEVICE FOR FASTENING A FLEXBILE PRINTING PLATE ON A PLATE CYLINDER OF A ROTARY PRINTING PRESS

Rudi Stellberger, Kronau; Uwe Kleinschmidt, Östringen, and Hans-Jürgen Kusch, Neckargemund, all of, Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Germany

Filed Feb. 3, 1995, Ser. No. 383,077
Claims priority, application Germany, Feb. 3, 1994, 94 01 760.3
Int. Cl.[6] B41F 27/06
U.S. Cl. 101—415.1 4 Claims

1. A device for fastening a flexible printing plate on a plate cylinder of a rotary printing press, wherein the plate cylinder has a cylinder gap formed therein axially parallel and the plate cylinder includes two end walls at opposite ends thereof, comprising a tensioning bar disposed in the cylinder gap formed in the plate cylinder, a clamping bar swivellably fastened to said tensioning bar, pins fastened to said clamping bar, a cam shaft supported in respective end walls of the plate cylinder, a first and a second cam pair carried by said cam shaft, bearing brackets connected to said tensioning bar, cam rollers fixed to said bearing brackets, first and second spring means cooperating with said first and second cam pairs, said cam shaft being rotatable in one direction for actuating said first cam pair to shift said tensioning bar via said cam rollers and against a force of said first spring means into a printing-plate take-up position, and for actuating said second cam pair to open said clamping bar via said pins attached thereto against a force of said second spring means so that a trailing end of the printing plate is insertable into the open clamping bar, said cam shaft being rotatable in a direction opposite to said one direction for initially actuating said second spring means to close said clamping bar and for then actuating said first spring means to shift the tensioning bar into a printing-plate tensioning position.



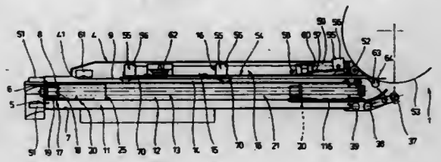
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5,495,805

## DEVICE FOR SUPPLYING PRINTING PLATES TO A PRINTING MACHINE

Hermann Beisel, Walldorf; Peter T. Blaser, Dielheim; Dieter Hauck, Eberbach; Rudolf Hutzenlaub, Mannheim; Helmut Jäger, Königsbach-Stein; Hans-Georg Jahn, Wiesenbach; Robert Müller, Mörlenbach; Anton Rodi, Leimen, and Nikolaus Spiegel, Walldorf, all of, Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Germany

PCT No. PCT/EP92/02057, § 371 Date May 12, 1994, § 102(e) Date May 12, 1994, PCT Pub. No. WO93/04864, PCT Pub. Date Mar. 18, 1993
PCT Filed Sep. 7, 1992, Ser. No. 211,098
Claims priority, application Germany, Sep. 12, 1991, 41 30 359.8
Int. Cl.[6] B41F 21/00
U.S. Cl. 101—477 17 Claims



1. In a printing machine, an apparatus for removing and delivering printing plates to a printing plate cylinder of the printing machine for automatic printing plate exchange, comprising:

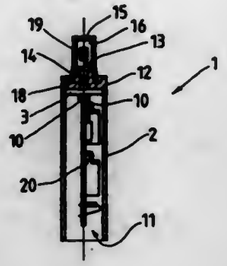
a magazine, a plate removal and a plate delivery device disposed in said magazine, said plate removal device having first retaining means;

said plate delivery device having a plurality of second retaining means for the printing plate disposed in distributed fashion and activatable successively;

a sensor disposed in said magazine for monitoring a rear edge of the printing plate with regard to satisfactory delivery to the printing plate cylinder;

said second retaining means including a retaining device associated with a front edge of the printing plate, said retaining device being shiftably mounted for shifting in controlled fashion transversely to a plane defined by the printing plate upon delivery of the printing plate to the printing plate cylinder so that the rear edge of the printing plate can move past said retaining device without colliding therewith.

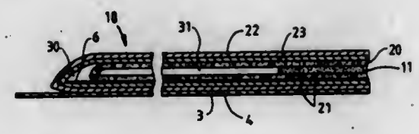
5,495,806
**DETONATORS**
Christopher A. Willey, Johannesburg, South Africa, assignor to Altech Industries (Proprietary) Limited, Boksburg, South Africa
Filed Sep. 27, 1994, Ser. No. 310,784
Int. Cl.[6] F42C 19/02;19/08
U.S. Cl. 102—202.14 20 Claims



1. A method of assembling a detonator comprising:
fitting an electric igniter having an ignition area with a conflagration charge thereon within a tubular body having open first and second ends, so that the said ignition area is accessible from the first end, the electric igniter being fitted by insertion thereof from the second end;
locating a primary explosive charge in operative proximity to the conflagration charge by insertion thereof through the first end; and
locating a secondary explosive charge in operative proximity to the primary explosive charge by fitting a tubular extension containing the secondary explosive charge over the said first end.

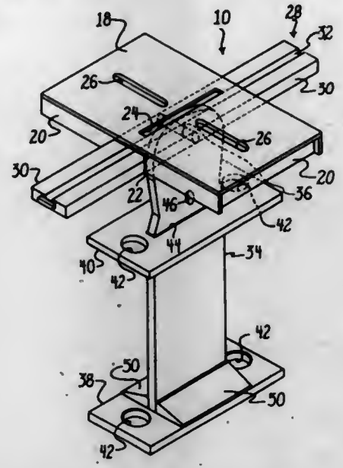
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5,495,807
**GAS-GENERATING MODULE FOR AN AIRBAG UTILIZED IN MOTOR VEHICLES**
Martin Klober, Heideck, and Wolfgang Schwarz, Nurnberg, both of, Germany, assignors to Diehl GmbH & Co., Nurnberg, Germany, and Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 886,411, May 20, 1992, Pat. No. 5,273,313. This application Jul. 14, 1993, Ser. No. 92,745
Claims priority, application Germany, May 23, 1991, 41 16 879.8
Int. Cl.[6] C06D 5/06; F42B 3/00; C06B 35/00
U.S. Cl. 102—289 9 Claims



1. A gas-generating composition for an airbag utilized in motor vehicles including an igniting composition boused in a container, said gas-generating composition being constituted from sodium azide ($NaN_3$), potassium nitrate ($KNO_3$) and a first binder consisting of nitrocellulose; and a second elastic binder consisting of silicone rubber being admixed with said gas-generating composition.

5,495,808
**CEILING MOUNTING BRACKET FOR A MINE TUNNEL**
Stanislaw F. Wegrecki, 510 Allison Ave., Washington, Pa. 15301
Filed Jan. 14, 1994, Ser. No. 181,039
Int. Cl.[6] E01B 25/22
U.S. Cl. 104—111 11 Claims



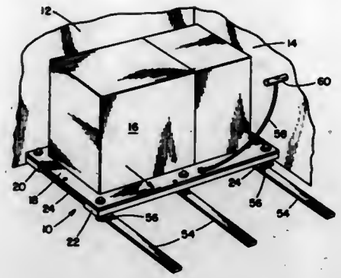
1. A ceiling mounting bracket for suspending successive segments of rail from a mine tunnel ceiling, comprising:
a flat mounting plate for securement contiguous to the mine tunnel ceiling;
the mounting plate having a longitudinal slot which extends substantially the length of the mounting plate;
lateral adjustment means integral to the ceiling mounting bracket for allowing selective lateral positioning of the mounting plate against the mine tunnel ceiling;
an elongated ceiling bracket bar supported by and disposed subjacent to the mounting plate and capable of slidable, reciprocable, longitudinal movement parallel with the slot for positioning the rail beneath the mine tunnel ceiling; and
a rail hanger mounted to the ceiling bracket bar so that the rail hanger is pendent from the ceiling bracket bar, the rail hanger moving longitudinally in conjunction with the movement of the ceiling bracket bar beneath the mine tunnel ceiling.

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5,495,809
**MOVABLE PLATFORM HAVING REMOVABLE WHEELS FOR ORIENTATION CHANGING**
Paul L. Carbo, P.O. Box 295, Northford, Conn. 06472
Filed Nov. 7, 1994, Ser. No. 334,962
Int. Cl.[6] B61D 15/00; B61F 3/16;5/28
U.S. Cl. 105—157.1 7 Claims

1. A movable platform system for supporting apparatus and moving it to an accessable location comprising:
a movable platform having a flat platen adapted to receive apparatus;
a plurality of parallel elongated support members secured to the underside of the said platen;
a plurality of roller assemblies secured to the underside of each support member;
each roller assembly comprising an axle;
a roller positioned on the axle;
a pair of roller guides on the axle at opposite sides of the roller;
said roller guides being of greater diameter than an associated said roller;
mounting means to secure each roller assembly to a respective said support member;

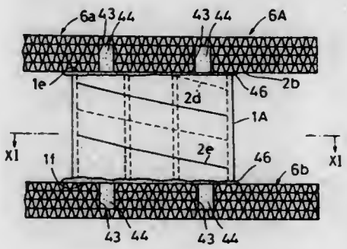




said mounting means being adjustable whereby the associated roller may be mounted in a plurality of predetermined positions to determine the direction of movement of the movable platform;
a plurality of parallel track sections positioned under the movable platform and each adapted to receive a plurality of said rollers;
the pair of roller guides associated with each roller extending on both sides of an associated said track section;
a plurality of track extension sections;
the adjacent ends of each track section and track extension section being formed in a puzzle connection to secure them together; and
means to connect an associated said section to each tract section to provide a track to move said platform from a first location to a second location.

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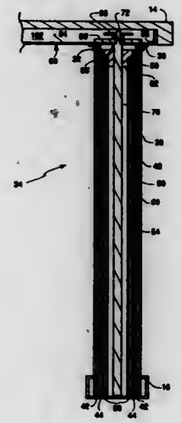
5,495,810
**CORRUGATED CARDBOARD TUBE AND PALLET USING THE SAME**
Hisashi Yoshii, 1056, Natsukawa, Okayama-shi, Okayama 701-01, Japan
Filed Jun. 14, 1994, Ser. No. 261,123
Claims priority, application Japan, Jun. 14, 1993, 5-168593
Int. Cl.[6] B65D 19/00
U.S. Cl. 108—51.3 9 Claims



1. A pallet which comprises upper and lower tables, and a plurality of corrugated cardboard tubes, each of said corrugated cardboard tubes comprising a tubular laminar structure of single-lined corrugated cardboard, said tubular laminar structure including a plurality of strips of single-lined corrugated cardboard spirally wound into a substantially cylindrical configuration to form corresponding single-lined corrugated cardboard layers overlapping and bonded with each other in a radial direction, each of said strips of single-lined corrugated cardboard composed of an elongated liner sheet and a corrugated sheet having a plurality of parallel ridges and furrows, each of said strips of single-lined corrugated cardboard being spirally turned in a direction perpendicular to the ridges, said corrugated cardboard tubes being positioned between the upper and lower tables with opposite annular ends of each corrugated cardboard tube bonded firmly to the upper and lower tables.

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5,495,811
**HEIGHT ADJUSTABLE TABLE**
David R. Carson; Barry R. Carson, both of Larkspur, and John H. Brion, Highlands Ranch, all of Colo., assignors to Ergoflex Systems, Larkspur, Colo.
Filed Apr. 5, 1994, Ser. No. 222,856
Int. Cl.[6] A47B 9/00
U.S. Cl. 108—147 34 Claims



1. A height-adjustable support assembly comprising:
a base portion;
a base support surface; and
adjustable subassembly interconnecting said base portion with said support surface, said adjustable subassembly comprising:
a first member interconnected with said base portion;
a second member interconnected with said support surface, said second member being extendable relative to said first member between a retracted position and an extended position;
a third member slidably engaged with and floatably extendable relative to said first member, said third member being slidably engaged with said second member;
a means, interconnected with said second member and threadably interconnected with said base portion, for moving said second member relative to said first member, said means for moving comprising a single threaded rod and a means for rotating said single threaded rod, wherein said means for rotating said single threaded rod comprises a power drive unit;
means, associated with said second and third members, for preventing further extensive movement of said second member relative to said third member when said second member has extended to a first position relative to said third member, said third member being floatably extendable relative to said first member as said single threaded rod extends said second member relative to said first member to said extended position; and
a telescoping shell surrounding said first, second, and third members, wherein said power drive unit is positioned within said telescoping shell.

5,495,812

**PLANT FOR INCINERATING EXPLOSIVE SUBSTANCES**

Walter Schulze, Holzminden, Germany, assignor to bowas-induplan chemie ges.m.b.h., Salzburg, Austria

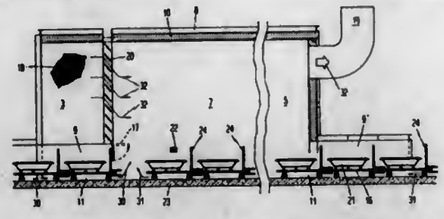
PCT No. PCT/EP92/00973, § 371 Date Nov. 4, 1993, § 102(e) Date Nov. 4, 1993, PCT Pub. No. WO92/20969, PCT Pub. Date Nov. 26, 1992

PCT Filed May 5, 1992, Ser. No. 140,181

Claims priority, application Germany, May 10, 1991, 41 15 234.4

Int. Cl.[6] F23G *7/00;5/00;5/12*

U.S. Cl. 110—237 8 Claims



1. An installation for the deflagration of explosives comprising:

a splinter and explosive-proof tunnel housing having open ends;

a deflagration reactor positioned inside said tunnel housing and having an entry passage and entry zone, a deflagration zone and an exit zone and exit passage;

conveyor means extending from outside said reactor and into and through and out of said reactor and including a plurality of carrier means movable along said conveyor means for receiving and transporting explosives into and through said entry zone and into said reactor zone for ignition and burning of the explosives in said reactor zone, each of said carrier means including means for closing in substantially airtight manner said entry passage and exit passage as said carrier means move through said reactor; and

means cooperating with said means for closing said entry passageway and said exit passageway for allowing a controllable residual airflow through said reactor.

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5,495,813

**COMBUSTION METHOD AND APPARATUS**

Robert D. Chapman, Dacre Harrogate, and Paul A. Gredley, Ravenshead, both of, United Kingdom, assignors to The BOC Group pcl, Windlesham, England

Continuation of Ser. No. 154,229, Nov. 18, 1993, abandoned.

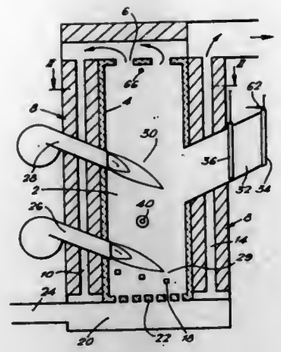
This application Mar. 10, 1995, Ser. No. 402,755

Claims priority, application United Kingdom, Nov. 18, 1993, 9224211

Int. Cl.[6] F23B *7/00*

U.S. Cl. 110—341 6 Claims

1. A method for incinerating waste material comprising feeding to the main combustion region batches of combustible waste material with varying califoric value, burning said batches of waste material in said main combustion region and thereby forming products containing combustibles, transferring said combustibles to a secondary combustion region, supplying to said secondary combustion region an oxygen-enriched gas for a first period of time comprising the time immediately before the batches of waste material are fed to the main combustion region at a first rate to react with said combustibles to form combustion products, flue gas or a combination thereof, said first rate being independent of the composition of the combustion products or flue gas, supplying the oxygen-enriched gas to the secondary combustion region for a second period of time, alternating with said first period of time, at a second rate, and monitoring the concentration of at least one component of the combustion products or flue gas, said second rate of supplying said oxygen-enriched gas being determined as a function of the monitored concentration of said at least one component of said combustion products or flue gas.



5,495,814

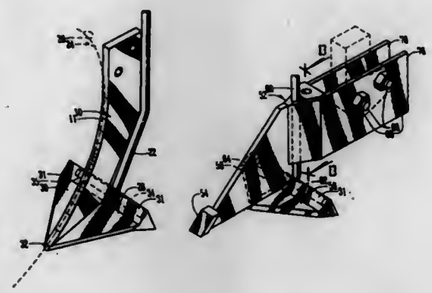
**SUB-ZONE TILLER WITH OFFSET FERTILIZER PLACEMENT**

David R. Primus, 5445 20th Ave., Mount Auburn, Iowa 52313

Filed Mar. 15, 1994, Ser. No. 213,046

Int. Cl.[6] A01C *23/00*

U.S. Cl. 111—124 10 Claims



1. A seed furrow cutting knife adapted for cutting a seed furrow fluffing the furrow sidewalls to avoid soil compaction, and for offset placement of fertilizer in the furrow to the side of the seed adjacent the furrow sidewalls, comprising:

a furrow cutting knife for cutting a seed furrow to have a bottom and sidewalls, said cutting knife having a pair of knife wings for fluffing said furrow sidewalls and means for discharge of liquid fertilizer offset from the bottom of said seed furrow but in said furrow adjacent or on the sidewalls; and

wherein said pair of knife wings are disposed on each side of said knife, said pair of knife wings being substantially flat along the surface of the wings and having a leading and a trailing edge, said trailing edge being substantially straight and perpendicular to the path of travel of the knife, said trailing edge having a flat upwardly projecting rear portion, and wherein said knife wings each have a wing tip formed at the outer portion of the knife wing and being parallel to the remainder of the knife wing.



5,495,815

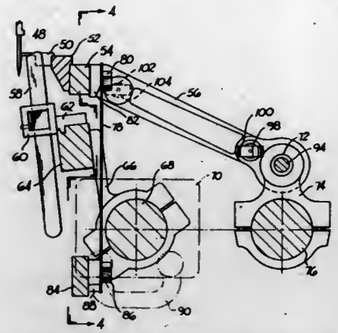
**TUFTING MACHINE HOOK DRIVE**

Arthur F. Bagnall, Manchester BG2, assignor to Spencer Wright Industries, Inc., Dalton, Ga.

Filed May 25, 1995, Ser. No. 450,721

Int. Cl.[6] D05C *15/22*

U.S. Cl. 112—80.5 14 Claims



1. In a tufting machine having a bed, a plurality of laterally spaced hooks for seizing loops of yarn presented thereto, a laterally extending oscillating shaft mounted in the bed, a plurality of rocker arms fastened to said shaft for oscillating therewith, a link having a first end pivotally journalled on each rocker arm and a second end, and means including a hook bar for securing said hooks to said second end of said links, the improvement comprising: resilient means having a first end fixed in said bed and a second end, and means for securing said second end of said resilient means to said hook bar, said resilient means flexing as said hooks rock in response to oscillation of said rocker arms.

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5,495,816

**MULTI-NEEDLE SEWING MACHINE WITH THREAD TENSION CONTROL**

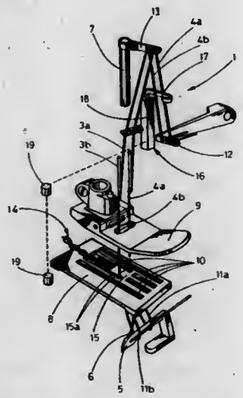
Roberto Sanvito, Buccinasco, and Franco Marchesi, San Martino Siccomario, both of, Italy, assignors to Rimoldi Necchi S.R.L., Milan, Italy

Filed Jul. 28, 1994, Ser. No. 281,750

Claims priority, application Italy, Sep. 10, 1993, MI93A1941

Int. Cl.[6] D05B *1/08;49/00;47/00*

U.S. Cl. 112—165 16 Claims



1. A device to form a continuous chain in a multi-needle sewing machine for making an ornamental stitch without a cover stitch, said sewing machine having:

at least two sewing needles (3*a*, 3*b*) to carry needle threads (4*a*, 4*b*),

a needle plate (8),

a reciprocating needle bar (7),

a lower looper (5), said lower looper being positioned under the needle plate (8) to interlace an interconnecting thread (6) with said needle threads (4*a*, 4*b*);

a feed unit positioned to feed the needle threads (4*a*, 4*b*) to said needles (3*a*, 3*b*);

an upper thread take-up (13) fastened to a top of the needle bar (7) and positioned to operatively receive the needle threads (4*a*, 4*b*) in order to take up a predetermined amount of thread from the feed unit at every reciprocating cycle of the needle bar said device comprising;

intervening means (16) to engage at least one of said needle threads (4*a*) to release tension on said at least one needle thread (4*a*),

said intervening means (16) has at least one intermediate lug (17) positioned in side by side relation with the needle bar (7), said intermediate lug (17) being independently selectively movable between a rest position in which said needle threads (4 *a*, 4*b*) exhibit a predetermined orientation relative to the upper thread take-up (13) and a work position in which said intermediate lug (17) engages said at least one needle thread (4*a*) close to said upper thread take-up (13) to move a portion of said at least one needle thread (4*a*) relative to said predetermined orientation to release tension on said at least one needle thread (4*a*) during the movement of the needle bar (7) towards a needle bar upper dead position from a needle bar lower dead position;

said intermediate lug (17) engages said at least one needle thread (4*a*) when said needle bar (7) is lowered towards the needle bar lower dead position, and

the feed unit has an auxiliary thread take-up (12) driven with an oscillatory motion for cyclically supplying needle threads (4*a*, 4*b*) to the upper thread take-up (13) during movement of the needle bar (7) towards the needle bar upper dead position.

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5,495,817

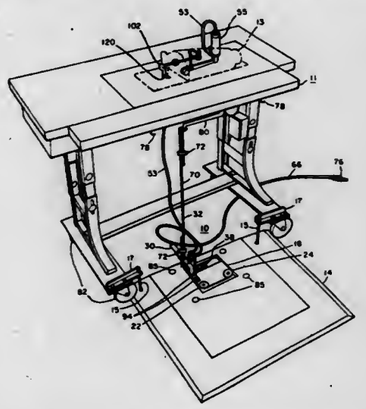
**PEDAL MECHANISM FOR OPERATING PRESSER AND MOTOR IN SEWING MACHINES**

Roger D. Zeigler, Sr., and John F. Matsko, Jr., both of Middleburg, Pa., assignors to Blough-Wagner Manufacturing Co., Inc., Middleburg, Pa.

Filed May 22, 1995, Ser. No. 446,420

Int. Cl.[6] D05B *69/06;69/08;* G05G *13/00*

U.S. Cl. 112—217.3 15 Claims

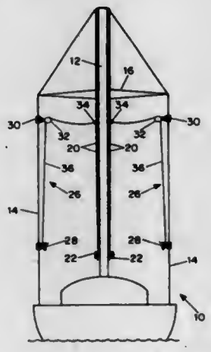


1. A pedal mechanism for controlling a sewing machine comprising in combination:

a base member;
a tiltable treadle pivotally and movably attached to said base member;
a motor control arm attached to said sewing machine;
a motor control bracket attached to said tiltable treadle;
a motor control member coupled to said motor control bracket and to said motor control arm of said sewing machine;
a valve support bracket adjustably attached to said base member and extending to juxtaposition with said motor control bracket;
a valve-activating member attached to said motor control bracket;
air control valve means attached to said valve support bracket and in juxtaposition with the rotation of said valve-activating member;
said air control valve means comprising in combination;
a valve-activating plunger attached to said air control valve means;
an inlet element in said air control valve means said inlet element connected to a pressure air line;
an outlet element in said air control valve means in controlled communication with said inlet element;
an exhaust element in said air control valve means said exhaust element in communication with the atmosphere and in controlled communication with said inlet element;
whereby upon depression of said activating plunger by said activating member, said inlet element is connected to said outlet element allowing pressured air to flow into said outlet element;
upon release of said activating plunger said outlet element is disconnected from said inlet element and said outlet element is connected with said exhaust element and the atmosphere;
an air cylinder in communication with said outlet element of said air control valve means;
a piston within said air cylinder;
a presser foot controlling means attached to said sewing machine and coupled to said piston.

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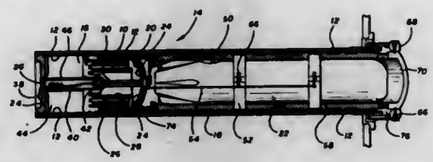
**5,495,818**
**SHROUD SLAP STOPPING MECHANISM**
**Carl H. Woodcock, 663 E. Bay Ave., Barnegat, N.J. 08005**
**Filed Jun. 7, 1995, Ser. No. 478,956**
**Int. Cl.[6] B63H** *9/04*
**U.S. Cl. 114—111** **11 Claims**




1. Apparatus for preventing the slapping of a movable rigging line against a mast, along which the rigging line extends, including:
a member for movably engaging the movable rigging line intermediate the ends of the run thereof along the mast,
a further line connected to the movably engaging member, and means directing the further line laterally away from the mast under light tension, whereby the rigging line is freely movable longitudinally without interference from the movably engaging member.

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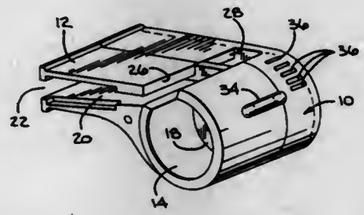
**5,495,819**
**ENDOTHERMIC GAS GENERATOR FOR USE IN A DEVICE PROPULSION**
**Frank A. Marion, 4707 W. Harmont Ave., Glendale, Ariz. 85302**
**Filed Mar. 9, 1994, Ser. No. 209,634**
**Int. Cl.[6] B63B** *1/00*
**U.S. Cl. 114—238** **53 Claims**



1. In combination,
enclosure means,
exothermic means disposed in the enclosure means and having properties of combusting to produce gases and solid providing no deleterious effect on the enclosure means, and
endothermic means disposed in the enclosure means and having properties of decomposing at the heat of combustion of the exothermic means to limit the temperature in the enclosure means to a particular value providing for a re-use of the enclosure means and to convert the gases produced from the combustion of the exothermic means to gases providing no visible indications in water and air.

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**5,495,820**
**WHISTLE WITH TONE CHANGING ROTATOR**
**Suren V. Seron, Minooka, Ill., assignor to Seron Manufacturing Company, Joliet, Ill.**
**Filed Oct. 4, 1994, Ser. No. 317,373**
**Int. Cl.[6] G10K** *5/00*; **A63H** *5/00*
**U.S. Cl. 116—137 R** **13 Claims**

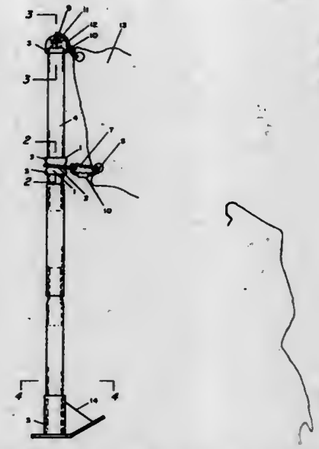



1. A whistle comprising:
a whistle body including a resonating chamber and a mouth piece connected thereto, said mouth piece having a duct extending to said chamber so that air under pressure may be introduced into said chamber, and a sounding aperture in said body and extending to said chamber;
a plurality of tone altering apertures in said body and extending to said chamber; and
a closure movably mounted on said body and movable between positions closing one, some and all of said tone altering apertures, said closure not blocking said sounding aperture when said closure is in any one of said positions; whereby the tone of said whistle may be selectively altered by selectively positioning said closure in a desired one of said positions.

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**5,495,821**
**ANTI-FOULING TETHERING DEVICE FOR DISPLAYING FLAGS**
**Omer F. Brewer, 30 S. Shrub La., N. Fort Myers, Fla. 33917**
**Filed Aug. 26, 1994, Ser. No. 296,453**
**Int. Cl.[6] G09F** *17/00*
**U.S. Cl. 116—174** **14 Claims**

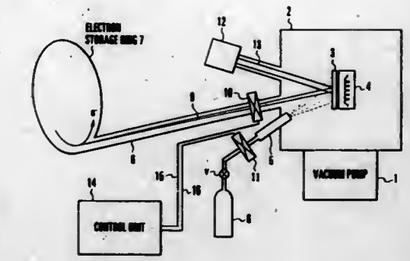


7. A device to display and to tether a flag or a banner with a supporting member, demountably engaged with a mounting member comprising:
said mounting member with means to attach to a base and means to receive said supporting member;
said supporting member with means to attach to said mounting member;
a pivot housing with means to fasten to said supporting member;
a means to provide tether connection to said pivot housing from said flag;
a pair of guides with means to fasten to said supporting member;
a floating link with means to surround said pair of guides; and
a means to provide tether connection to said floating link from said flag.

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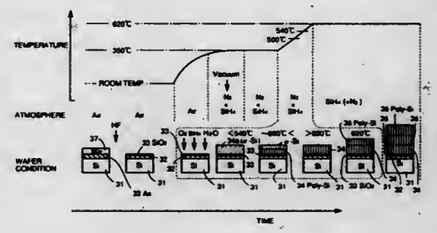
**5,495,822**
**METHOD OF SELECTIVELY GROWING SI EPITAXIAL FILM**
**Yuichi Utsumi, and Housei Akazawa, both of Kanagawa, Japan, assignors to Nippon Telegraph and Telephone Corporation, Japan**
**Filed Jul. 22, 1994, Ser. No. 279,231**
**Claims priority, application Japan, Aug. 10, 1993, 5-216945**
**Int. Cl.[6] C30B** *25/02*
**U.S. Cl. 117—1** **6 Claims**

1. A method of selectively growing a Si epitaxial film, in which a gas consisting of not less than one type of a gas containing at least silane gas is used as a source gas, a substrate obtained by partially forming an insulating film pattern on a single-crystal Si substrate is heated to a selected temperature in a vacuum, and a Si epitaxial film is grown on exposed single-crystal Si except for said insulating film pattern, wherein intermittent irradiation by vacuum ultraviolet light, from a vacuum ultraviolet light source, on said heated substrate is performed at selected time intervals of irradiation and non-irradiation, said time intervals of non-irradiation being of a duration so as to avoid the formation of poly-Si on said insulating film pattern.



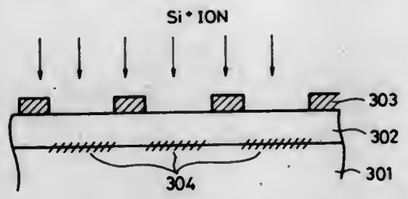

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**5,495,823**
**THIN FILM MANUFACTURING METHOD**
**Kiyoteru Kobayashi, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**
**Division of Ser. No. 16,441, Feb. 11, 1993, abandoned. This application Jul. 14, 1994, Ser. No. 274,932**
**Claims priority, application Japan, Mar. 23, 1992, 4-064829; Jan. 18, 1993, 5-006059**
**Int. Cl.[6] H01L** *21/20*
**U.S. Cl. 117—8** **19 Claims**




1. A method of manufacturing a semiconductor device, which method comprises:
placing a single-crystalline substrate in a chamber maintained at a first temperature;
introducing into the chamber an atmosphere comprising a source gas to form an amorphous thin film on the single-crystalline substrate;
increasing the temperature of the atmosphere in said chamber to a second temperature greater than the first temperature to crystallize said amorphous thin film during its formation while increasing the temperature of the atmosphere to the second temperature; and
maintaining the temperature of the atmosphere in said chamber at the second temperature.

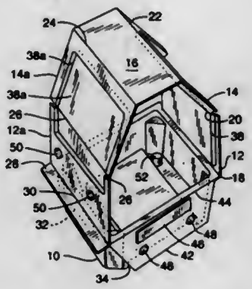
5,495,824
**METHOD FOR FORMING SEMICONDUCTOR THIN FILM**
**Takao Yonehara, and Yoshiyuki Osada, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**
**Continuation of Ser. No. 155,635, Nov. 22, 1993, abandoned, which is a continuation of Ser. No. 682,680, Apr. 9, 1991, abandoned. This application Dec. 1, 1994, Ser. No. 352,113**
**Claims priority, application Japan, Apr. 10, 1990, 2-94778; Jun. 6, 1990, 2-147863**
**Int. Cl.[6] H01L** *21/20*
**U.S. Cl. 117—8** **18 Claims**




1. A method of forming a semiconductor thin film comprising the steps of:
(a) forming an amorphous thin film on a substrate;
(b) selectively injecting ions into said amorphous thin film with an injection energy satisfying the following relation: injection depth of ions into amorphous thin film/amorphous thin film thickness=1; and
(c) crystallizing said amorphous thin film by conducting a heat treatment.

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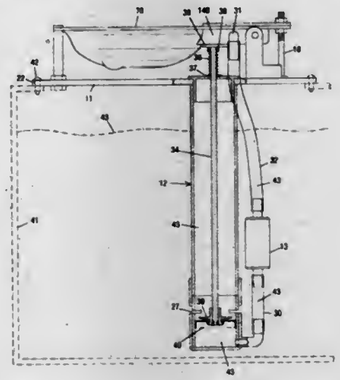
5,495,825
**DISPOSABLE BIRD FEEDER**
**Bruce W. Eckelman, 5450 SW. 18th Dr., Portland, Oreg. 97201**
**Filed May 9, 1994, Ser. No. 239,905**
**Int. Cl.[6] A01K** *39/01*
**U.S. Cl. 119—57.8** **6 Claims**




1. A disposable bird feeder for mounting on an upright glass surface comprising:
a base portion having bottom, rear, front and side walls and also having an open top,
said base portion forming a container for holding a supply of bird feed,
said base portion having a lateral extension which together with said base portion is formed from a single blank of material,
said lateral extension being hingedly connected across one side of said base portion adjacent the open top thereof,
said lateral extension having hinge means intermediate its ends that extend parallel with the hinge connection to said base portion,
said lateral extension being capable of hinged shaping on its hinged connection with said base portion and with its intermediate hinge means to extend upwardly and be contoured into a raised cover for said base portion,
the front and rear of said cover being open to provide access for birds using the feeder at the front,
and pressure sensitive adhesive means at the rear of said base portion for removably attaching the bird feeder to a glass surface and allow viewing of birds feeding thereon from an opposite side of the glass surface.

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5,495,826
**LIVESTOCK FEEDING PUMP OPERATED BY LICKING ACTION**
**Frank R. Lindbloom, 6501 Ellen La., Forestville, Calif. 95436, and Leonard C. Lindbloom, 1804 Walnut Creek Ct., Santa Rosa, Calif. 95403**
**Filed Oct. 11, 1994, Ser. No. 320,928**
**Int. Cl.[6] A01K** *7/06*
**U.S. Cl. 119—75** **14 Claims**



1. An animal feeding device for dispensing food from a container, comprising:
a dish-shaped lever having a hinge for pivoting movement, and
a pump having an intake adapted to communicate with said container, said pump having an outlet communicating with said dish-shaped lever, said pump having an actuator connected to said dish-shaped lever and operated by the pivoting movement thereof, so that an animal licking and thus pivoting said dish-shaped lever also operates said actuator to pump said food from said container onto said dish-shaped lever.

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5,495,827

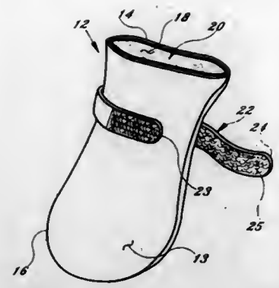
**Patent Not Issued For This Number**

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5,495,828
**ANIMAL BOOTS WITH DETACHABLE, VERTICALLY ADJUSTABLE FASTENING STRAP**
**Irving Solomon, and Phyllis Solomon, both of 7850 W. McNab Rd., #116, Tamarac, Fla. 33321**
**Filed Jun. 30, 1994, Ser. No. 269,207**
**Int. Cl.[6] A01K** *13/00;* **A61D** *9/00*
**U.S. Cl. 119—850** **16 Claims**

1. An animal boot for covering and protecting the paws and lower legs of pet animals from injuries caused by glass, thorns and other sharp objects and from snow, ice and their melting chemicals, said animal boot comprising:

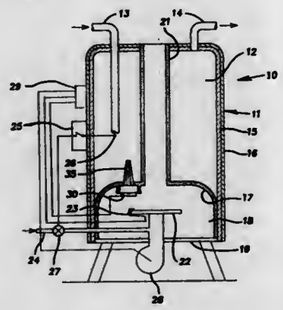





a flexible, stitchless and non-porous sleeve for insertion over an animal's paw and lower leg so as to conform to portions of the animal's paw and lower leg, said sleeve defining a front side and a back side, integrally formed as a single, uniform sleeve, said front and back sides being substantially symmetrical in shape and size;
a fabric liner defining an interior surface of said sleeve, said sleeve permanently and sealingly joined to said liner;
an open top end defined by said sleeve for receiving the animal's paw and wrapping around the animal's lower leg;
a closed end opposite said top end and defined by said sleeve for containing the animal's paw; and
a detachable, vertically adjustable fastening strap removably attached to said sleeve for adjustably wrapping around said sleeve to secure said sleeve to the animal's leg, said strap being vertically adjustable along said sleeve.

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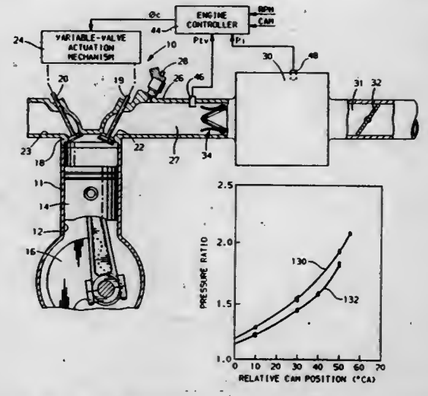
5,495,829
**WATER HEATER WITH THERMOELECTRIC MODULE AND THROUGH-CHAMBER HEAT SINK**
**Viswanath Jayaraman, Brecksville, Ohio; David H. McFadden, Lexington, and Scott J. Hynek, Waltham, both of Mass., assignors to Consolidated Natural Gas Service Company, Inc., Pittsburgh, Pa.**
**Filed Sep. 14, 1994, Ser. No. 306,128**
**Int. Cl.[6] F22B** *9/12*
**U.S. Cl. 122—110** **24 Claims**




1. A water heater comprising a tank adapted for storing hot water in an interior space and including a wall defining a portion of a combustion chamber at a lower zone thereof, said wall defining an opening connecting said tank interior space and said combustion chamber, a heat sink for conducting heat through said opening into said interior space of said tank, means for sealing said opening to prevent said hot water in said interior space from entering said combustion chamber, a powered burner associated with said combustion chamber and having a combustion zone, and a thermoelectric module in thermal communication with said combustion chamber for generating operating power for said burner, said thermoelectric module having a cold side in thermal communication with said heat sink and a hot side in thermal communication with the combustion zone of said burner.

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5,495,830
**VARIABLE VALVE TIMING**
**Ko-Jen Wu, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.**
**Filed Apr. 5, 1995, Ser. No. 417,347**
**Int. Cl.[6] F01L** *1/34*
**U.S. Cl. 123—90.15** **7 Claims**

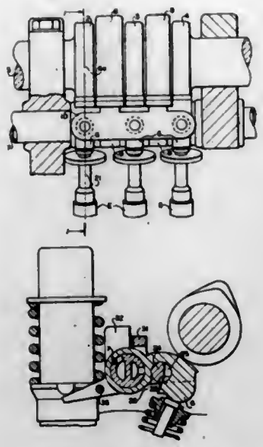


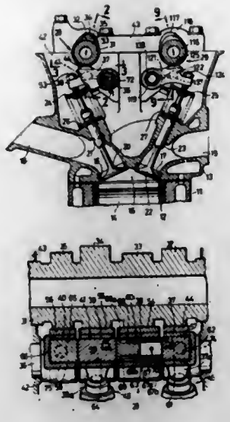

1. In an internal combustion engine having at least one cylinder with an intake valve which opens to allow inlet air passing through an intake air passage having a check valve to enter the cylinder, the cylinder having a piston disposed therein and coupled to a crankshaft for timed reciprocation, the timing of the intake valve being variably controlled relative to the crank angle of the piston, a method of determining the iotake valve timing relative to the crank angle of the piston, comprising the steps of:
determining when the piston is substantially at a predetermined crank angle providing an inlet air region within the cylinder of a known volume;
sampling pressure in the intake air passage between the check valve and the intake valve when the piston is determined to substantially be at the predetermined crank angle;
while the intake valve is closed, sampling pressure in the intake air passage;
determining the intake valve timing as a predetermined function of the samples of pressure.

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5,495,831
**VALVE ACTUATING MECHANISM FOR AN INTERNAL COMBUSTION ENGINE**
**Michael Paul, Bad Friedrichshall; Peter Hubschle, and Wilhelm Hannibal, both of Neckarsulm, all of, Germany, assignors to Audi AG, Germany**
**PCT No. PCT/EP93/00276, § 371 Date Sep. 30, 1994, § 102(e) Date Sep. 30, 1994, PCT Pub. No. WO93/17227, PCT Pub. Date Sep. 2, 1993**
**PCT Filed Feb. 5, 1993, Ser. No. 290,893**
**Claims priority, application Germany, Feb. 21, 1992, 42 05 230.0**
**Int. Cl.[6] F01L** *13/00;1/26*
**U.S. Cl. 123—90.16** **10 Claims**

1. A valve actuation mechanism for an internal combustion engine including at least two inlet valves (E) per cylinder, comprising:





means for actuating said inlet valves, said actuating means including a camshaft having cams, and first and second rocker arms (6 and 9);

a common shaft for pivotally supporting said first rocker arms (6), and first cams (2,3,4), said first rocker arms interacting with said inlet valves and said first cams for a first rotational speed range;

a common shaft for pivotally supporting said second rocker arms (9), and second cams (8), said second rocker arms interacting with said inlet valves and said second cams for a second rotational speed range;

coupling means (13, 24) for selectively coupling said first and second rocker arms together in said second rotational speed range and for decoupling said first and second rocker arms in said first rotational speed range; and including

three of said inlet valves and three of said first rocker arms per cylinder;

two of said second rocker arms, each one arranged between two adjacent first rocker arms; and

two of said second cams being substantially identically contoured for interacting with said two second rocker arms.

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**5,495,832**

**VALVE OPERATING DEVICE FOR INTERNAL COMBUSTION ENGINE**

**Noriaki Fujii, and Ichirou Ohmura, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Aug. 18, 1994, Ser. No. 292,690**

**Claims priority, application Japan, Aug. 19, 1993, 5-204985**

**Int. Cl.[6] F01L *13/00***

**U.S. Cl. 123—90.16** **6 Claims**

2. A valve operating device for use in an internal combustion engine for varying operating characteristics of a pair of engine valves in multi-stages depending upon operating conditions of the engine, said device comprising a cam shaft having four cams with four different cam profiles, a rocker shaft having first, second, third and fourth rocker arms pivotally mounted thereon in side-by-side relationship, each rocker arm engaging a different said cam for being pivoted by the engaged cam, said second and third rocker arms separately engaging said pair of valves for operating each of said valves in response to pivoting of said rocker arm engaging said valve, and switching means provided in said four rocker arms for selectively disconnecting all four of said rocker arms in a low-speed operating range of the engine, for selective connecting said first and second rocker arms in a medium-speed operating range of the engine and for selectively connecting said second, third and fourth rocker arms in a high speed operating range of the engine, said switching means comprising switching pins slidably mounted in cylindrical bores provided in all four of said rocker arms, said switching pins including a medium-speed switching pin in said first rocker arm for movement to a position to interconnect said first rocker arm and said second rocker arm in the medium-speed operating range of the engine, a first high-speed switching pin in said third rocker arm for movement to a position to interconnect said third rocker arm and said fourth rocker arm in the high-speed operating range of the engine, and a second high-speed switching pin adjacent and operatively connected to said first high-speed switching pin and positioned in said fourth rocker arm for movement to a position to interconnect said fourth rocker arm and said second rocker arm in the high-speed operating range of the engine.

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**5,495,833**

**LUBRICATING OIL FEEDING APPARATUS AND OIL FEEDING STRUCTURE FOR STARTER DRIVEN GEAR BEARING IN INTERNAL COMBUSTION ENGINE**

**Takashi Ishizaka; Shinichi Nakano; Yukihiro Yasuda; Akira Shigihara; Tomoyasu Satou; Ryushi Tsubota; Hiroshi Yamura, and Tsuneo Akamatsu, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Division of Ser. No. 297,826, Aug. 30, 1994. This application May 5, 1995, Ser. No. 435,167**

**Claims priority, application Japan, Aug. 30, 1993, 5-237404; Aug. 30, 1993, 5-237405**

**Int. Cl.[6] F01M *1/06***

**U.S. Cl. 123—179.25** **2 Claims**

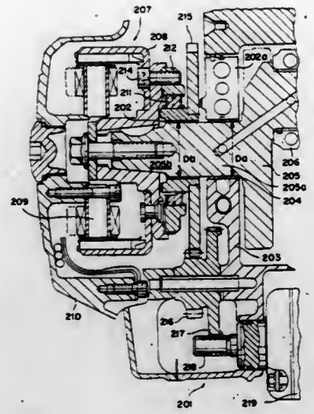
1. An oil feeding structure for a starter driven gear bearing in an internal combustion engine having a crankshaft supporting portion rotatably supported by a crankcase, and a starter driven gear disposed on a driven gear shaft portion provided on an outer end side of said crankshaft supporting portion, the oil feeding structure comprising:

an outside diameter of said crankshaft supporting portion being the same as that of said driven gear bearing shaft portion;

said crankshaft supporting portion being disposed near said driven gear shaft portion; and

a lead groove in a receiving surface of a slide bearing press-fitted in said starter driven gear bearing portion.





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**5,495,834**

**MULTI-CYLINDER INTERNAL-COMBUSTION ENGINE AIR INTAKE SYSTEM**

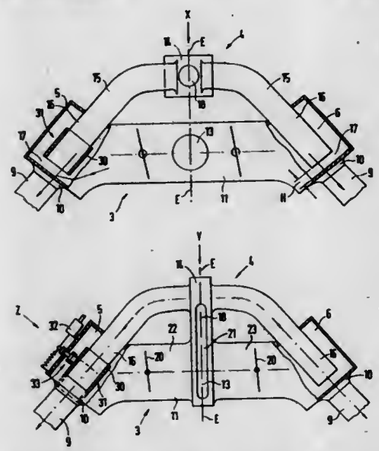
**Erwin Rutschmann, Tiefenbronn, and Wolfgang Horlacher, Gerlingen, both of, Germany, assignors to Dr. Ing. h.c.F. Porsche AG, Germany**

**Filed Jan. 30, 1995, Ser. No. 380,663**

**Claims priority, application Germany, Jan. 29, 1994, 44 02 717.6**

**Int. Cl.[6] F02M *35/10***

**U.S. Cl. 123—184.31** **20 Claims**



1. Air intake system of a multi-cylinder internal-combustion engine, comprising two opposite cylinder banks, cylinders of one respective cylinder bank being connected by suction pipes to a respective resonance container associated therewith, the resonance containers being combined by a connecting pipe and having suction pipe extensions extending in sections inside the respective resonance container with sliding sleeves which, as a function of operating parameters of the internal-combustion engine, are adjustable between inlet openings of the suction pipes from a first spaced position into a second non-spaced position, wherein a plurality of sliding sleeves of one cylinder bank are combined to form a constructional unit configured to cooperate with an adjusting device, and the sliding sleeves surround the suction pipe extension sections configured constructed as inserts.

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**5,495,835**

**IDLING SPEED CONTROL METHOD AND APPARATUS FOR AN INTERNAL COMBUSTION ENGINE**

**Katsunori Ueda, Tokyo, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan**

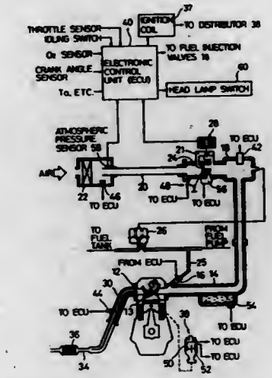
**PCT No. PCT/JP93/00532, § 371 Date Feb. 23, 1994, § 102(e) Date Feb. 23, 1994, PCT Pub. No. WO93/22569, PCT Pub. Date Nov. 11, 1993**

**PCT Filed Apr. 23, 1993, Ser. No. 167,857**

**Claims priority, application Japan, Apr. 24, 1992, 4-106571**

**Int. Cl.[6] F02D *41/16;43/04***

**U.S. Cl. 123—339.11** **46 Claims**



1. In an idling speed control system for adjusting an amount of intake air supplied to an internal combustion engine by controlling an engine output torque so that an engine speed matches a target speed when the engine is idling, an idling speed control method comprising the steps of:

(a) detecting a value of a predetermined parameter representative of a rotation state of an engine output shaft;

(b) predicting a torque correction factor, indicative of excess or deficiency of an engine output torque due to a response delay in an intake system of the engine, in accordance with the detected value of the predetermined parameter; and

(c) controlling the engine output torque in accordance with the predicted torque correction factor, wherein an instantaneous value of the predetermined parameter is further detected, the detected instantaneous value is subjected to first order delay processing, a ratio of the detected instantaneous value of the predetermined parameter to a value obtained by the first order delay processing is determined, and the torque correction factor is predicted in step (b) in accordance with the determined ratio.

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**5,495,836**

**THROTTLE-VALVE CONTROL APPARATUS FOR SPARK-IGNITION TWO-CYCLE ENGINES**

**Shinichi Wakabayashi; Shoji Masuda; Masahiko Abe; Yoshiyasu Uchida, and Yoichi Ishibashi, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Nov. 25, 1994, Ser. No. 348,896**

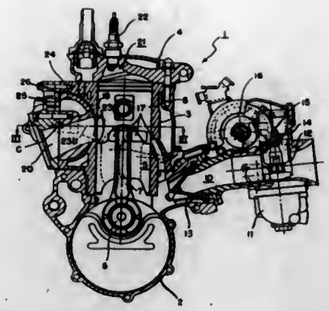
**Claims priority, application Japan, Nov. 27, 1993, 5-321037**

**Int. Cl.[6] F02D *9/10;41/08***

**U.S. Cl. 123—339.13** **15 Claims**

7. A throttle-valve control apparatus for an AR-combustible spark-ignition two-cycle engine wherein, at least in a region of light-load operations, a compression-start pressure is properly controlled in order to let a fresh air/fuel mixture in a combustion chamber self-ignite so as to undergo active thermal atmosphere combustion, said throttle-valve control apparatus comprising:

a throttle valve fixed in an air intake passage;



a throttle-valve operation member for manually operating said throttle valve;

a throttle-valve opening means for opening said throttle valve in accordance with amounts of manual operation of said throttle-valve operation member; and

a throttle-valve-opening control means for driving said throttle-valve opening means by determining whether a current state is a state for operating said AR-combustible spark-ignition two-cycle engine by combustion resulting from spark ignition or a state for operating said AR-combustible spark-ignition two-cycle engine by AR-combustion resulting from self-ignition at a controlled ignition time, and setting a lower-limit value of the opening of said throttle valve resulting from manual operations of said throttle-valve operation member small in comparison with a lower-limit value of those in a state for operating said AR-combustible spark-ignition two-cycle engine by ordinary combustion resulting from spark ignition if said current state was determined to be a state for operating said AR-combustible spark-ignition two-cycle engine by AR combustion resulting from self-ignition at a controlled ignition time.

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**5,495,837**

**ENGINE VALVE HAVING IMPROVED HIGH-TEMPERATURE WEAR RESISTANCE**

**Akira Mitsuhashi; Saburo Wakita, both of Omiya; Tsutomu Oka, and Osami Noguchi, both of Okegawa, all of, Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan**

**Filed Dec. 12, 1994, Ser. No. 353,915**

**Claims priority, application Japan, Jun. 11, 1993, 5-166236; Feb. 18, 1994, 6-043293; Feb. 28, 1994, 6-054504**

**Int. Cl.[6] F01L** *3/02*

**U.S. Cl. 123—188.3** **26 Claims**



1. An engine valve having improved high-temperature wear resistance and having a valve face coated with an Fe-based alloy powder, said engine valve being characterized in that the Fe-based alloy forming said coated valve face has a composition consisting essentially of, by weight:

0.7 to 1.5% of C,

10 to 15% of Mn,

24 to 30% of Cr,

6.1 to 9.8% of Mo,

10 to 15% of Ni,

0.1 to 0.4% of N,

0.2 to 1.5% of Si, and

the balance substantially Fe and inevitable impurities, and has a two-phase structure formed of an austenitic phase and an eutectic carbide phase.

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**5,495,838**

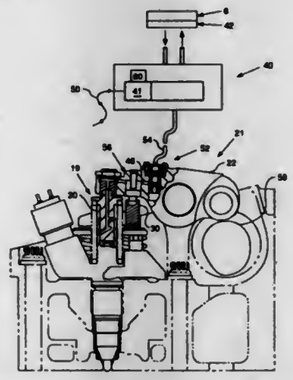
**COMPRESSION BRAKING SYSTEM**

**John L. Johnson, Jr., Brimfield, Ill., assignor to Caterpillar Inc., Peoria, Ill.**

**Filed May 12, 1995, Ser. No. 439,682**

**Int. Cl.[6] F01L** *13/06;* **F02D** *13/04*

**U.S. Cl. 123—322** **5 Claims**



1. A compression braking system for a four cycle engine having a low pressure oil supply, an oil reservoir, and a plurality of cylinders, each of said cylinders having first and second normally closed engine inlet valves, first and second normally closed engine exhaust valves, an inlet bridge extending between the inlet valves and adjacent an associated inlet rocker arm, an exhaust bridge extending between the engine exhaust valves and adjacent an associated exhaust rocker arm, a cam system associated with each inlet and exhaust rocker arm for controllably moving the rocker arm and the associated valves to an open position, and an electronically controlled fuel injector unit and an associated fuel injection rocker arm system, comprising:

a bridge connector having first and second ends and being fixedly connected at a respective end to the inlet bridge and the exhaust bridge, said inlet and exhaust bridges being of a construction sufficient for rocking motion of the inlet and exhaust bridges relative to their associated inlet and exhaust valves;

an on/off brake controlling system connectable to the low pressure oil supply;

a piston positioned between the bridge connecter and the associated unit injector rocker arm and being connected to the unit injector outlet and adapted for controllably pressurizing said piston, contacting said bridge connecter and moving said bridge connector and one engine inlet valve and one engine exhaust valve to an open position in response to movement of the unit injector rocker arm; and a check valve positioned between the brake controlling system and the piston.



**5,495,839**

**ENGINE FUEL INJECTION CONTROLLER**

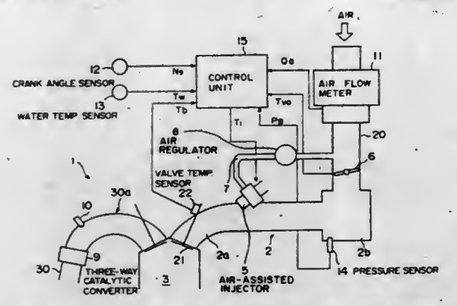
**Satoshi Samejima, Yokohama; Hirofumi Tsuchida, and Koji Ishihara, both of Yokosuka, all of, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan**

**Filed Aug. 10, 1994, Ser. No. 295,601**

**Claims priority, application Japan, Aug. 19, 1993, 5-205332**

**Int. Cl.[6] F02M** *51/00*

**U.S. Cl. 123—478** **6 Claims**




1. An engine fuel injection controller for use with an engine including a cylinder, an intake passage provided with an intake valve for aspirating air into said cylinder, a throttle for regulating an air flowrate in said passage, an injector situated between said throttle and said intake valve for injecting fuel into said passage, and means for promoting atomization of the fuel spray from said injector, said controller comprising:

means for detecting engine running conditions;

control means functioning to

compute a basic fuel injection amount based on said engine running conditions,

store short-term delay flow corrections depending on various engine running conditions, each of said corrections corresponding to a delay of fuel flow in said passage with a relatively fast time constant,

store long-term delay flow corrections depending on various engine running conditions, each of said corrections corresponding to a delay of fuel flow in said passage with a relatively slow time constant,

read a stored short-term delay flow correction based on said detected engine running conditions,

read a stored long-term delay flow correction based on said detected engine running conditions,

estimate a particle diameter of the fuel spray,

modify at least one of said read delay flow corrections such that said long-term delay flow correction is increased, and said short-term delay flow correction is decreased, as the particle diameter of the fuel spray is smaller,

correct said basic fuel injection amount based on said modified delay flow corrections to determine a corrected amount of fuel; and

means for controlling said injector to inject said corrected amount of fuel.

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**5,495,840**

**FUEL INJECTION TIMING CONTROL DEVICE FOR AN INTERNAL COMBUSTION ENGINE**

**Kaoru Ohtsuka, and Mamoru Yoshioka, both of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan**

**Filed Nov. 22, 1994, Ser. No. 346,233**

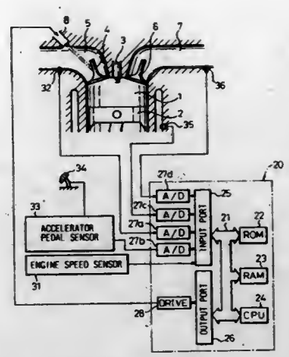
**Claims priority, application Japan, Nov. 25, 1993, 5-295216; Feb. 18, 1994, 6-021118**

**Int. Cl.[6] F02M** *51/00*

**U.S. Cl. 123—478** **12 Claims**

1. A fuel injection timing control system for an internal combustion engine, comprising:

a fuel injector for injecting fuel into an intake port; and




a controller for controlling a fuel injection end-timing such that said end-timing is varied gradually from occurring at a time of a first crank angle which occurs during an intake stroke, to occurring at a time of a second crank angle which occurs before said intake stroke, in accordance with a current engine operating condition.

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**5,495,841**

**DEVICE AND METHOD OF CORRECTING THE FUEL AMOUNT SUPPLIED TO OTTO ENGINES**

**Peter Gillbrand, Stockholm, and Lars Tegnelius, Strängnäs, both of, Sweden, assignors to Saab Automobile Aktiebolag, Sweden**

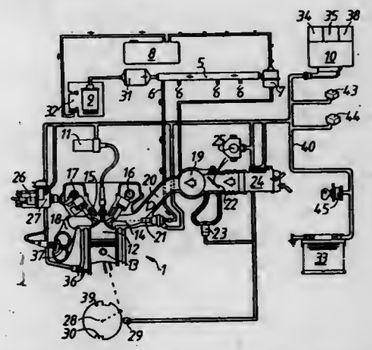
**PCT No. PCT/SE93/00594, § 371 Date Jan. 4, 1995, § 102(e) Date Jan. 4, 1995, PCT Pub. No. WO94/01668, PCT Pub. Date Jan. 20, 1994**

**PCT Filed Jun. 30, 1993, Ser. No. 362,559**

**Claims priority, application Sweden, Jul. 7, 1992, 9202098**

**Int. Cl.[6] F02D** *41/24;41/30*

**U.S. Cl. 123—492** **10 Claims**



1. A device for correcting the amount of fuel supplied during fuel injection in an internal combustion engine having at least one cylinder with at least one inlet valve selectively openable and closeable during repetitive cycles of the engine to control the introduction of fuel into the cylinder, which device comprises:

means for determining the stroke position of the engine;

fuel injection means selectively activatable during respective cycles of the engine for injecting fuel towards the inlet valve; and

control means for controlling the activation and deactivation of the fuel injection means in accordance with a fuel amount demand, the control means including:

(i) a memory for storing the fuel amount demand during one cycle of operation as a base value;
(ii) interrupt means for storing a preliminary value of a time period during which the injection means is to remain activated, the preliminary value being determined in accordance with the base value;
(iii) means for determining the instantaneous fuel demand; and
(iv) means for comparing the instantaneous fuel demand with the base value and, if the instantaneous fuel demand differs from the base value by a predetermined amount, changing the preliminary value to a corrected value corresponding to the instantaneous fuel demand, the injection means remaining activated for a time period equal to the preliminary value or, if the preliminary has been changed, the corrected value.

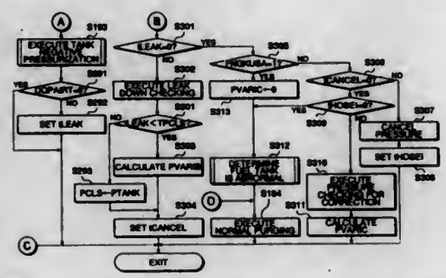
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**5,495,842**

## EVAPORATIVE FUEL-PROCESSING SYSTEM FOR INTERNAL COMBUSTION ENGINES

**Masayoshi Yamanaka; Kazutomo Sawamura; Hiroshi Maruyama, and Yasunari Seki, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Sep. 9, 1994, Ser. No. 303,681**
**Claims priority, application Japan, Sep. 10, 1993, 5-249933; Nov. 25, 1993, 5-319155**
**Int. Cl.[6] F02M *25/08***
**U.S. Cl. 123—520** **32 Claims**




1. In an evaporative fuel-processing system for an internal combustion engine having an intake system, and a fuel tank, including evaporative emission control means having a canister for adsorbing evaporative fuel generated within said fuel tank, a charging passage extending between said canister and said fuel tank, a purging passage extending between said canister and said intake system of said engine, an open-to-atmosphere passage for communicating an interior of said canister with the atmosphere, a purge control valve arranged in said purging passage, for opening and closing said purging passage, said purge control valve having a valve opening amount thereof being controllable, an open-to-atmosphere valve arranged in said open-to-atmosphere passage, for selectively opening and closing said open-to-atmosphere passage, and pressure detecting means arranged in said evaporative emission control means, for detecting pressure within said evaporative emission control means,

the improvement comprising:

negative pressure-introducing means for introducing negative pressure from said intake system of said engine into said evaporative emission control means and said fuel tank by opening said purge control valve and closing said open-to-atmosphere valve; and

purge control means operable when said negative pressure-introducing means is operating, for comparing a value of said pressure within said evaporative emission control means detected by said pressure detecting means with a predetermined negative pressure value, and for controlling said valve opening amount of said purge control valve so as to vary a flow rate of said evaporative fuel to be purged into said intake system, based on results of said comparison.

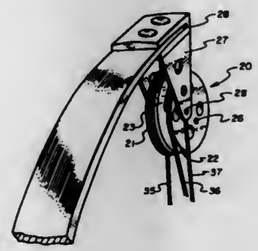
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**5,495,843**

## COMPOUND ARCHERY BOW

**Marlow W. Larson, Ogden, Utah, assignor to Browning, Morgan, Utah**

**Continuation of Ser. No. 343,088, Apr. 25, 1989, Pat. No. 5,054,462, which is a continuation-in-part of Ser. No. 198,231, May 25, 1988, Pat. No. 5,020,507, which is a division of Ser. No. 236,781, Feb. 23, 1981, Pat. No. 4,748,962, and a continuation-in-part of Ser. No. 12,799, Feb. 9, 1987, Pat. No. 4,774,927, which is a continuation-in-part of Ser. No. 676,740, Nov. 29, 1984, Pat. No. 4,686,955. This application Jul. 31, 1991, Ser. No. 738,569**
**Int. Cl.[6] F41B *5/10***
**U.S. Cl. 124—25.6** **32 Claims**




1. In a compound archery bow including a handle, a pair of limbs extending from opposite ends of the handle, a pair of eccentrics mounted on axles at the respective distal ends of said limbs and a pair of cables, each anchored at one end to a respective limb and wrapped around the eccentric mounted at the opposite limb to provide a wound end and a strung end, said strung ends being connected to opposite ends of a bow string so that as the bowstring is pulled away from its rest position near the handle through an intermediate peak drawn position towards the fully drawn condition of the bow, the eccentrics pivot on their respective axles to permit unwinding of the strung ends of the cables from the eccentrics and winding of additional cable following said wound ends onto said eccentrics, the improvement comprising:

a non-circular winding track in each of said eccentrics positioned to receive respective said wound ends of said cables, said winding tracks being configured so that as said bow string is pulled from its intermediate peak drawn position to wind additional cable following said wound ends on to said eccentrics, successive portions of said winding tracks receiving cable are located closer to the axles of said eccentrics, thereby reducing the effective diameters of said winding tracks at the drawn condition of the bow; and

a track of different configuration than said winding track in each of said eccentrics positioned for unwinding said strung ends; whereby

the final portions on said winding tracks receiving additional cable as said bow string is pulled from its intermediate peak drawn position are located further away from said unwinding tracks than at said intermediate peak drawn position.

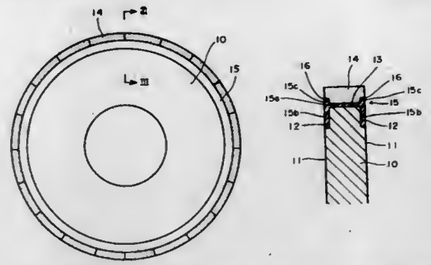


**5,495,844**

## SEGMENTAL GRINDING WHEEL

**Masato Kitajima, Hekinan; Hajime Fukami, Oobu; Shinji Soma, Handa; Koji Nishi, Kariya, and Masahiro Yoshida, Nishikasugai, all of, Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan**

**Continuation of Ser. No. 971,479, Nov. 4, 1992, abandoned. This application Aug. 5, 1994, Ser. No. 286,228**
**Claims priority, application Japan, Nov. 6, 1991, 3-090831 U**
**Int. Cl.[6] B28D *1/04; 1/12***
**U.S. Cl. 125—13.01** **7 Claims**




1. A segmental grinding wheel for use in a grinding machine, said grinding wheel comprising:

a wheel core having a disk-like shape, including a radially outer peripheral surface;

a plurality of segmented grinding chips forming abrasive teeth or segments spaced about the radially outer peripheral surface of the wheel core and disposed on the radially outer peripheral surface of said wheel core; and

a bonding layer on the radially outer peripheral surface and filled between said wheel core and said grinding chips for bonding said grinding chips to said wheel core;

wherein said bonding layer has a pair of side portions which extend along respective side surfaces of said grinding wheel in a radial direction.

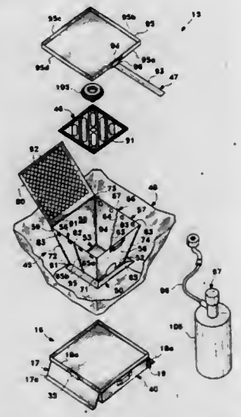
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**5,495,845**

## COMPACT OUTDOOR COOKING UNIT

**Paul W. Hait, Sunriver, Oreg., assignor to Pyromid, Inc., Redmond, Oreg.**

**Filed Dec. 21, 1994, Ser. No. 361,144**
**Int. Cl.[6] F24C *1/16***
**U.S. Cl. 126—9 R** **24 Claims**



1. A firebox for an outdoor cooking unit comprising:

(a) a base plate having a sloping hook flange disposed along one side thereof; and

(b) a foldable stove having a folded state for transporting and storage mode, said foldable stove having an extended state for a cooking mode, said foldable stove being hingedly attached to said base plate along an end wall thereof opposite to the side of said base plate having a sloping hook flange, said foldable stove comprising a releasable sloping locking flange along the lower end of an end wall thereof that is opposite the end wall thereof hinged to said base plate, said sloping locking flange of said foldable stove being received by and releasably secured to said sloping hook flange of said base plate in overlying sloping engagement when said foldable stove is in an extended state for the cooking mode.

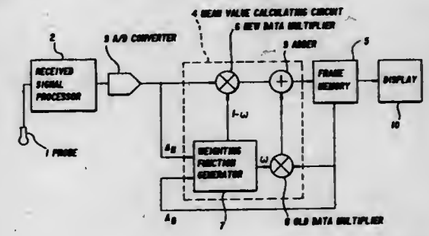
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**5,495,846**

## ULTRASONIC DIAGNOSTIC APPARATUS

**Shoichi Uehara, and Dai Morita, both of Tokyo, Japan, assignors to GE Yokogawa Medical Systems, Limited, Tokyo, Japan**

**PCT No. PCT/JP93/00190, § 371 Date Jul. 18, 1994, § 102(e) Date Jul. 18, 1994, PCT Pub. No. WO93/15659, PCT Pub. Date Aug. 19, 1993**
**PCT Filed Feb. 10, 1993, Ser. No. 256,674**
**Claims priority, application Japan, Feb. 12, 1992, 4-025474**
**Int. Cl.[6] A61B *8/00***
**U.S. Cl. 128—660.07** **1 Claim**




1. An ultrasonic diagnostic apparatus which performs interframe averaging to smooth out changes in image data between frames, said apparatus comprising:

weighting function generator means;

means for setting in said weighting function generator means a maximum value of ω, a minimum value of ω, a minimum value of the absolute value of the difference in new frame data and old frame data for eliminating noise, and limits on values of the new frame data when the absolute values of the difference in new frame data and old frame data are the same;

new frame multiplier means;

means for supplying said new frame data concurrently to said new frame multiplier means and to said weighting function generator means;

old frame multiplier means;

old frame memory means for storing old frame data from a preceding processing step;

means for supplying said old frame data from said old frame memory means to said old frame multiplier means and concurrently to said weighting function generator means;

said weighting function generator means responsive to said new frame data, and absolute value of the difference in said new frame data and said old frame data, and constrained by the said values set in said weighting function generator means, for generating a first coefficient (1−ω), and a second coefficient (ω), said first coefficient being supplied to said new frame multiplier means and said second coefficient being supplied to said old frame multiplier means, and wherein said second coefficient (ω) being directly proportional to the absolute value of the difference in new frame data and old frame data;

said new frame multiplier means multiplying said first coefficient and said new frame data thereby to generate a first output signal;

said old frame multiplier means multiplying said second coefficient and said old frame data obtained from said old frame memory means thereby to generate a second output signal; and

adding means for adding said first output signal and said second output signal, and for thereby producing a display signal which provides improved imaging of moving and stationary portions of a display with substantial eliminating of noise, and whereby the display signal is stored in said old frame memory means as an old frame data to be fed back for use in the averaging process with the next new frame data.

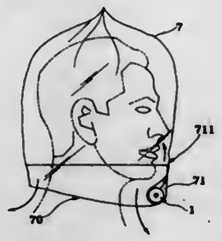
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**5,495,847**

## SURVIVAL HOOD

**Wei Hu, 10-1 Fl., No. 23, Sec. 1, Hang-Chou S. Rd., Taipei, Taiwan, Prov. of China**

**Filed May 17, 1995, Ser. No. 442,998**
**Int. Cl.[6] A62B** *18/08;7/08*
**U.S. Cl. 128—202.26** **2 Claims**




1. A survival hood comprising:

a transparent, flexible, fire-resisting hood for the head and neck, said hood comprising an opening for putting on the user's head, and at least a pocket on the inside, said pocket having at least one upward outlet at an elevation lower than the user's nose and mouth; and

a gas generator carried in said pocket of said hood for releasing oxygen for breathing, said gas generator comprising a flexible cylindrical shell having a longitudinal series of air outlets, a fragile cylindrical water-tight container longitudinally mounted within said shell at the center, a chemical solution contained in said container, a plurality of linings coaxially mounted within said shell around said container, layers of a solid chemical filled in spaces between said linings, and two end cap means respectively fixed to said shell at two opposite ends to hold two opposite ends of said container for holding by hand to bend said shell and said container in breaking said container, permitting said chemical solution to mix with said solid chemical in releasing oxygen through said air outlet for breathing.

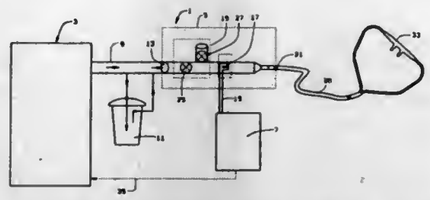
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**5,495,848**

## MONITORING SYSTEM FOR DELIVERY OF THERAPEUTIC GAS

**Alonzo C. Aylsworth, Glencoe, and Gregory R. Miller, Chesterfield, both of Mo., assignors to Nellcar Puritan Bennett, St. Charles, Mo.**

**Filed Nov. 25, 1994, Ser. No. 344,848**
**Int. Cl.[6] A61M** *16/00*
**U.S. Cl. 128—207.18** **8 Claims**



1. A monitoring system for periodically detecting the flow of a therapeutic gas from a gas source to a patient, comprising:

a gas source for providing a therapeutic gas;

a flow management module operatively connected to the gas source, said flow management module containing a valve assembly and a sensor;

an electronics module operatively connected to the sensor;

means for delivering the therapeutic gas no a patient;

said valve assembly further comprising a first valve positioned between the gas source, the sensor, and the breathing patient, and a second valve positioned between an ambient airport, the sensor, and the breathing patient, said valve assembly having an energized state wherein said first valve is in an open position and said second valve is in a closed position;

the sensor having means for detecting a flow of the therapeutic gas or a flow of ambient air through the valve assembly and independently to the breathing patient;

the sensor further comprising means for sending a signal to the electronics module in response to the flow of the therapeutic gas or the flow of ambient air;

said electronics module logs, displays, and/or transmits the flow of the therapeutic gas or the flow of ambient air through the valve assembly;

said electronics module further having means for determining a presence, rate and strength of inhalations based upon the flow of ambient air through the valve assembly and to the breathing patient, when the valve assembly is in said energized state;

said electronics module further having means for activating or deactivating said gas source in response to its determination of the rate of inhalations of the patient of ambient air;

said electronic modules further comprising means for activating or deactivating the gas source in response to a predetermined pattern of inhalations or a predetermined pattern of interruptions in a flow of the ambient air through the valve assembly and to the breathing patient; and

wherein said predetermined pattern of inhalations and predetermined pattern of interruptions in the flow of ambient air prevent an improper activation of the gas source or an improper deactivation of the gas source.

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**5,495,849**

## BIOLOGIC MAGNETOMETER FOR DETERMINING AN ELECTRIC CURRENT DISTRIBUTION IN A LIVING ORGAN

**Takehiko Hayashi; Takaki Shimura; Takao Goto, and Yoshiyasu Nakashima, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

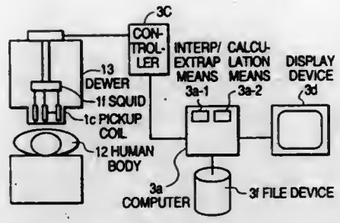
**Continuation of Ser. No. 924,484, Aug. 4, 1992, abandoned.**
**This application Jun. 30, 1994, Ser. No. 268,675**
**Claims priority, application Japan, Aug. 12, 1991, 3-201028**
**Int. Cl.[6] A61B** *5/05*
**U.S. Cl. 128—653.1** **9 Claims**

1. A biologic magnetometer for measuring an electric current generated on a living organ, comprising:

a plurality of pickup coils for measuring magnetic field intensities induced from the current;

interpolation and extrapolation means for one of spatially interpolating locations and extrapolating locations of the pickup coils so as to determine one of an interpolation point and extrapolation point, and estimating magnetic field intensities at said one of interpolation point and extrapolation point from said magnetic field intensities measured by said pickup coils; and






calculation means for calculating an amount and a location of a hypothetically located electric current by the use of both said magnetic field intensities measured by said pickup coils and said magnetic filed intensities estimated at said one of interpolated point and extrapolated point, wherein the electric current is determined and the calculation means includes a computing device.

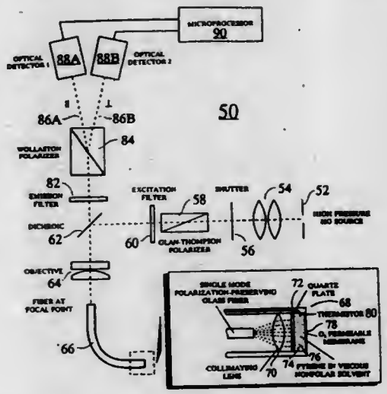
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**5,495,850**

## METHOD FOR THE MEASUREMENT OF OXYGEN CONCENTRATION LEVELS BY THE STEADY-STATE DETERMINATION OF FLUORESCENCE LIFETIME

**Ralph Zuckerman, 226 W. Rittenhouse Sq., Philadelphia, Pa. 19103**

**Division of Ser. No. 231,191, Apr. 21, 1994. This application Jan. 25, 1995, Ser. No. 378,147**
**Int. Cl.[6] A61B** *5/00*
**U.S. Cl. 128—634** **15 Claims**




1. A method of measuring an oxygen concentration or partial pressure of a fluid comprising the steps of:

(a) contacting the fluid with a sensor comprising a housing containing a lipid soluble fluorescent probe substance having a fluorescence lifetime (τ) which is sensitive to quenching by oxygen, admixed in a nonpolar solvent;

(b) irradiating the fluorescent probe substance of step (a) within the sensor housing with continuous, linearly polarized ultraviolet light at wavelengths strongly absorbed by the fluorescent probe substance to emit fluorescence having vector components parallel and perpendicular to the plane of polarization of the ultraviolet light;

(c) resolving the emitted fluorescence of step (b) into vector components parallel and perpendicular to the plane of polarization of the ultraviolet light;

(d) calculating a fluorescence anisotropy in time of the fluorescence emitted by the fluorescent probe substance of step (a) within the sensor housing from the vector components of step (c) by applying a first mathematical function, the first mathematical function being in the form of a first equation; and

(e) applying a second mathematical function which relates fluorescence anisotropy to oxygen concentration or partial pressure, the second mathematical function being in the form of a second equation.

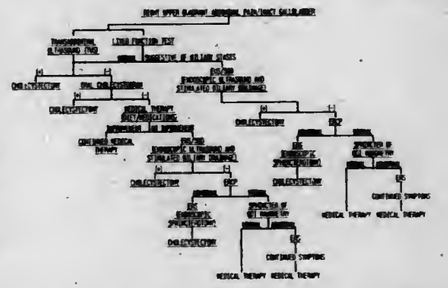
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**5,495,851**

## USE OF ENDOSCOPIC ULTRASOUND AND STIMULATED BILARY DRAINAGE IN THE DIAGNOSIS OF CHOLECYSTITIS AND MICROLITHIASIS

**James E. Dill, Goodview, and Linda Berkhouse, Roanoke, both of Va., assignors to Roanoke Gastroenterology, P.C., Roanoke, Va.**

**Filed Mar. 23, 1995, Ser. No. 409,177**
**Int. Cl.[6] A61B** *8/00*
**U.S. Cl. 128—660.03** **36 Claims**



1. A method for diagnosing subtle cholecystitis or microlithiasis of a gallbladder in a patient which comprises the following steps:

inserting an endoscopic ultrasound device within the antrum of a stomach;

positioning said endoscopic ultrasound device within said stomach such that said endoscopic ultrasound device is allowed to have a substantially unobstructed view of said gallbladder;

activating said endoscopic ultrasound device such that it is capable of detecting whether said gallbladder exhibits any of the following: gallbladder sludge or small gallstones, focal wall thickening, or adhesions about said gallbladder and/or cystic duct;

delivering a cholecystokinin analogue intravenously to said patient to enable said gallbladder to contract and to produce an ejection fraction of bile from said gallbladder during each contraction thereof;

determining the degree of contraction of said gallbladder by means of measuring each said ejection fraction of said gallbladder; and

removing said ejection fractions from said patient and analyzing said ejection fractions to detect the presence or absence of calcium bilirubinate and/or cholesterol granules or crystals therein.

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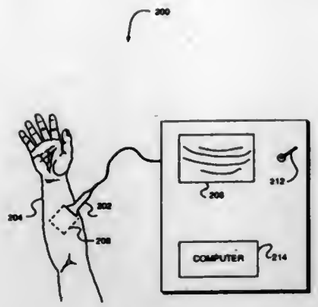
**5,495,852**

## METHOD AND APPARATUS FOR ESTIMATING DIAMETER OF AN ARTERY USING B-MODE ULTRASONIC IMAGES

**Robert W. Stadler; W. Clem Karl, both of Cambridge, and Robert S. Lees, Brookline, all of Mass., assignors to Boston Heart Foundation, Cambridge, Mass.**

**Filed Jan. 27, 1995, Ser. No. 379,852**
**Int. Cl.[6] A61B** *8/00*
**U.S. Cl. 128—660.07** **11 Claims**

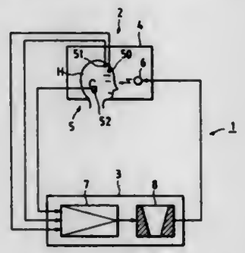
1. Apparatus for estimating diameter of an artery having a centerline and an inner wall, comprising:




(a) means for acquiring an ultrasonic image of the artery, the image-acquiring means having an imaging plane, the image-acquiring means being positioned so as to orient the imaging plane skew to the artery, whereby it intersects the centerline of the artery;
(b) edge-detecting means, coupled to the image-acquiring means, for detecting a plurality of near-edge points and a plurality of far-edge points on the acquired image of the artery,
(c) curve-fitting means, coupled to the edge-detecting means, for fitting a first curve to the plurality of near-edge points and a second curve to the plurality of far-edge points; and
(d) means, coupled to the curve-fitting means, for measuring at least one distance between the first and second curves and for estimating diameter of the artery from the at least one distance.

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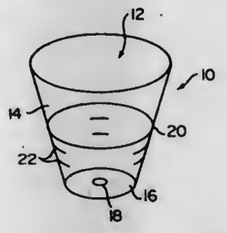
**5,495,853**
**SYSTEM FOR EVOKING ELECTROENCEPHALOGRAM SIGNALS**
**Mitsuo Yasushi, Kawagoe, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan**
**Continuation of Ser. No. 498,671, Mar. 26, 1990, abandoned. This application Sep. 14, 1994, Ser. No. 305,755**
**Claims priority, application Japan, Aug. 10, 1989, 1-205780**
**Int. Cl.[6] A61B *5/04***
**U.S. Cl. 128—732** **5 Claims**




1. A system for evoking a desired electroencephalogram (EEG) signal from the brain of a user by feeding back a detected brain wave component to the user, the system comprising:
means for evoking the desired EEG signal, said evoking means comprising:
headgear means for being mounted on the head of the user;
light-emitting means for applying an EEG signal evoking photic stimulus to the eyes of the user;
electrode means for detecting brain waves produced by the user;
light shield means, mounted on said headgear means so as not to contact a user's face, for covering the user's eyes, thereby shielding the eyes from external light; and
signal processing means for extracting, from the detected brain waves, only that brain wave having a frequency which is equal to a frequency of the desired EEG signal;
said electrode means being integrally mounted on said headgear means so as to automatically abut in a desired position against the scalp of the user to detect the brain wave of the user when said headgear means is mounted on the user's head, said EEG signal evoking photic stimulus being a user stimulating light which flickers at the frequency of the brain wave extracted by said signal processing means, and said light-emitting means being mounted on said light shield means so as to face the user and so as to be positioned within the user's visual field, further comprising a light sensor for detecting ambient brightness, and means for varying a brightness of the photic stimulus depending on the ambient brightness detected by the light sensor.

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**5,495,854**
**SELF-TESTING DEVICE FOR MEASURING URINARY FLOW RATES**
**Richard J. Currie, 1238 Hazelwood Dr., Fort Washington, Pa. 19034**
**Filed Aug. 5, 1994, Ser. No. 286,140**
**Int. Cl.[6] A61B *5/00***
**U.S. Cl. 128—760** **16 Claims**



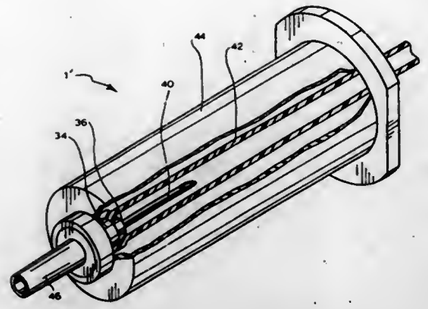

1. A device for non-invasive detection of urinary tract obstructions and bladder condition, comprising:
a receptacle having a sidewall and a base capable of temporarily confining a volume of urine and allowing a level of said urine to be visually observed;
said receptacle having an open end for receiving a stream of said urine;
said receptacle having a port at said base allowing a quantity of said urine to exit at a predetermined rate; and
flow-level indicia provided on said sidewall of said receptacle to allow visual relative comparison of said indicia with said level of urine;
said sidewall being continuous between said base and said flow-level indicia;
whereby a level of urine reaching the flow-level indicia indicates a satisfactory urinary flow rate.

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**5,495,855**
**BLOOD SAMPLING UNIT WITH PROTECTED NEEDLE AND A METHOD FOR SAMPLING BLOOD**
**Thomas E. Dudar, Palatine, Ill., and Peter Graham, Pinckney, Mich., assignors to Baxter International Inc., Deerfield, Ill.**
**Filed Jan. 4, 1995, Ser. No. 368,563**
**Int. Cl.[6] A61M *5/00***
**U.S. Cl. 128—763** **9 Claims**

1. A blood sampling unit comprising:
a generally tubular tube holder configured to removably retain a blood sampling tube, the tube holder having a rear end defining an opening to allow the insertion and removal of the tube, and a forward end defining an opening;

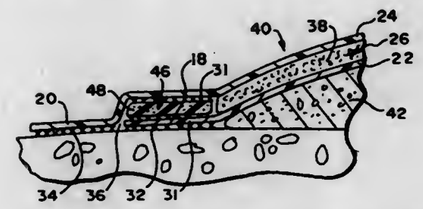





an adapter extending through the opening of the forward end of the tube holder, the adapter being removably coupled to the tube holder, the adapter having a rear end including a sharp cannula which extends rearward within the tube holder and having a cannula forming a forward end which extends forward from the tube holder; and
a shield removably engaged to the rear end of the adapter and extending rearward through the length of the tube holder with a rear portion extending outward from the tube holder to permit grasping and removal of the shield when the adapter is coupled to the tube holder, the shield being configured to cover the sharpened cannula when the adapter is decoupled from the tube holder.

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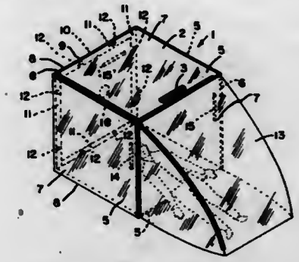
**5,495,856**
**MOISTURE BARRIER FOR INDWELLING CATHETERS AND THE LIKE**
**Philip W. Fentress, Memphis, Tenn., assignor to Tabex Industries, Inc., Memphis, Tenn.**
**PCT No. PCT/US92/04239, § 371 Date Nov. 23, 1993, § 102(e) Date Nov. 23, 1993, PCT Pub. No. WO92/21394, PCT Pub. Date Dec. 10, 1992**
**Continuation-in-part of Ser. No. 706,937, May 29, 1991, Pat. No. 5,230,350. This PCT application May 20, 1992, Ser. No. 142,373**
**Int. Cl.[6] A61F *5/37*; A61M *5/00***
**U.S. Cl. 128—846** **30 Claims**




1. A moisture barrier for an area exposed to moisture comprising:
a moisture resistant body having a generally light-transmissive portion and an interior region that is surrounded by a peripheral edge,
means on the peripheral edge for adhering the body to the area while forming a seal for impeding the passage of moisture into the interior region, and
moisture sensing means that is positioned for contact with moisture that penetrates the seal and that is visible through the generally light-transmissive portion of the body, the moisture sensing means displaying a first visible characteristic when out of contact with the moisture, thereby indicating that moisture has not penetrated the seal, and for displaying a second visible characteristic when in contact with the moisture, thereby indicating that the moisture has penetrated the seal.

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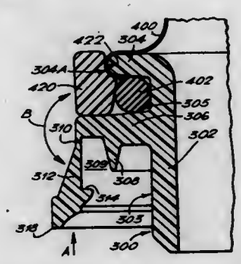
**5,495,857**
**THERAPEUTIC ENCLOSURE FOR A PATIENT**
**Kevin Fegan, 245 Meyersville Rd., Meyersville, N.J. 07933**
**Filed Jun. 6, 1994, Ser. No. 254,600**
**Int. Cl.[6] A61F *5/37*; A61G *10/00***
**U.S. Cl. 128—846** **11 Claims**



1. A therapeutic enclosure for a patient comprising:
framework means having a predetermined configuration;
transparent plastic means covering at least said framework means to provide said enclosure for said patient; and
a temperature sensitive strip secured to an outside of said plastic means to measure a temperature within said enclosure and to be observable from an exterior of said enclosure.

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**5,495,858**
**MALE INCONTINENCE DEVICE**
**Peter L. Steer, East Grinstead; Graham D. Bannister, Lindfield, and Howard Barrett, Dorking, all of, United Kingdom, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.**
**Filed Oct. 26, 1994, Ser. No. 329,384**
**Claims priority, application United Kingdom, Jan. 28, 1993, 9322234; Sep. 5, 1994, 9417824**
**Int. Cl.[6] A61F *5/48***
**U.S. Cl. 128—885** **6 Claims**




1. A male incontinence device comprising:
a first coupling assembly having a first penile orifice, said first coupling assembly having a rib projecting therefrom with an engageable undersurface;
a second coupling assembly having a second penile orifice, said second coupling assembly having a peripheral rim, said rim including a flip-over bi-stable annulus member extending therefrom, said annulus member being stable in a flipped-down closed position and a flipped-up open position; said rim having a preformed and predeterminedly dimensioned recess for receiving said rib when said annulus is in said flipped-up

open position for aligning said first and second coupling assemblies for coupling when said rib is received in said recess, and for mating with and capturing said rib when said annulus is in said flipped-down closed position, said rim also including a predefined and preformed hinge about which said bi-stable annulus is pivotable into said open and closed positions; said annulus member having a catch, said catch capable of engaging said rib undersurface when in a flipped-down closed position so as to couple together said first and second coupling assemblies, said first and second penile orifices being fixedly aligned when said first and second coupling assemblies are coupled together, said coupled assemblies being separable when said annulus member is in a flipped-up open position; and

means for securing a male condom catheter to one of said coupling assemblies.

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**5,495,859**

**CIGARETTE SMOKE FILTER SYSTEM**

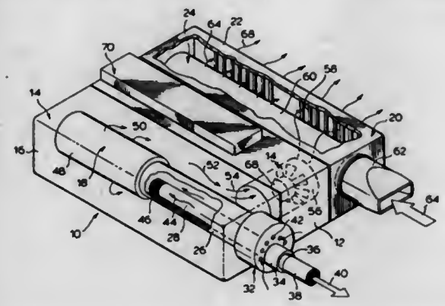
**Larry Bowen, Orangeville, and Stanislav M. Snaidr, Mississauga, both of, Canada, assignors to 1149235 Ontario Inc., Ontario, Canada**

**Filed Apr. 13, 1994, Ser. No. 226,890**

**Claims priority, application United Kingdom, Apr. 14, 1993, 9307710**

**Int. Cl.[6] A24F *7/00***

**U.S. Cl. 131—202** **42 Claims**



1. A filter for use in a smoker's accessory for filtering sidestream cigarette smoke or exhaled cigarette smoke, said filter comprising:

a tubular filter consisting essentially of micro-fibres for removing particulate material from sidestream or exhaled cigarette smoke, said tubular filter having an inlet end for directing sidestream or exhaled cigarette smoke into an end of an inner elongate chamber within said tubular filter, said tubular filter having a closed end opposite said inlet end to close off said chamber at the opposite end, said micro-fibres having an average diameter in the range of about 0.5 to about 10 microns and made from a suitable fibre forming composition,

said tubular filter being of sufficient thickness to remove substantially all particulate components from cigarette smoke passing from said inner elongate chamber through said tubular filter, said micro-fibre filter material having a low pressure drop to permit an air stream to flow through said filter with minimal resistance to such flow.

**5,495,860**

**STRUCTURES FORMED FROM CELLULOSE ACETATE, USE THEREOF FOR THE MANUFACTURE OF FILTER TOW, USE OF THE FILTER TOW FOR THE MANUFACTURE OF A TOBACCO SMOKE FILTER ELEMENT, AS WELL AS A FILTER TOW AND A TOBACCO FILTER ELEMENT**

**Eberhard Teufel, Gundelfingen, and Rolf Willmund, Emmendingen, both of, Germany, assignors to Rhone-Poulenc Rhodia AG, Freiburg, Germany**

**Filed Jul. 20, 1993, Ser. No. 94,563**

**Claims priority, application Germany, Jul. 9, 1993, 43 22 966.2**

**Int. Cl.[6] A24D *3/10***

**U.S. Cl. 131—331** **21 Claims**

1. Filaments or staple fibers formed of cellulose acetate and at least one nitrogenous organic compound capable of forming under the action of microorganisms at least one of $NH_3$ or a basic compound containing at least one —NH or $NH_2$ group whereby a basic medium is formed and partial hydrolysis of said cellulose acetate occurs and wherein said at least one nitrogenous organic compound has been introduced into the cellulose acetate solution prior to the formation of said filaments and staple fibers.

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**5,495,861**

**HAIR BUNDLING DEVICE**

**Moni Y. Liberman, 124 W. 93rd St. Ste. 4F, New York, N.Y. 10025**

**Continuation-in-part of Ser. No. 148,658, Nov. 5, 1993, abandoned. This application Aug. 1, 1994, Ser. No. 282,823**

**Int. Cl.[6] A45D *8/00***

**U.S. Cl. 132—273** **17 Claims**



1. A device for holding hair in a bundle, comprising:

(a) a body member configured in a generally spiral manner from proximate a main axis of the device to an opening for receiving hair; portions of said body member that are radially adjacent to each other with respect to said main axis presenting confronting surfaces for applying pressure to hair and defining a generally spirally shaped hair-receiving volume;

(b) a sufficient extent of said body member comprising resilient material for allowing an ordinary user to increase said hair-receiving volume, during insertion of the device onto a bundle of hair, more than about 50 percent in an outermost 180° spiral region bounded by said opening for receiving hair; and

(c) when the device is unflexed, said hair-receiving volume decreases in radial dimension with respect to said main axis more than 15 percent from a radially outer, to a radially inner portion of one spiral turn of said hair-receiving volume other than innermost and outermost 45° spiral regions of said hair-receiving volume, so as to create an increasing holding pressure on hair received within said hair-receiving volume as said hair is moved radially inwardly along said one spiral turn.



**5,495,862**

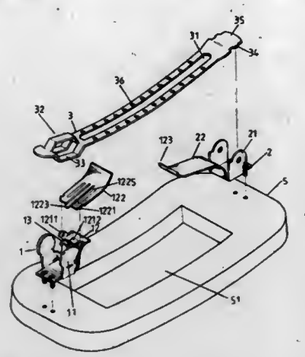
**BARRETTE**

**Andrew Dewing, P.O. Box 82-144, Taipei City, Taiwan, Prov. of China**

**Filed Aug. 15, 1994, Ser. No. 290,135**

**Int. Cl.[6] A45D *8/22***

**U.S. Cl. 132—279** **3 Claims**



1. A barrette comprising:

an ornamental cover having a recess at a central portion;

a first bracket fixedly mounted on an end of said ornamental cover and including a pair of ledges extending upwardly from a bottom thereof, a curved platform extending upwardly from the bottom and having a pair of lugs and a stop portion between said lugs, and a pair of hooks extending upwardly from the bottom and located between said ledges and said curved platform;

a second bracket fixedly mounted on another end of said ornamental cover and having a pair of arms extending upwardly from a base of the second bracket and a spring board curving upwardly from said base;

a release member pivotally connected with the lugs of the platform of said first bracket and having a longitudinal tongue extending toward the stop portion of said curved platform; and

a locking member provided with an engaging portion at one end and a journal portion at another end, said engaging portion including two arched bridges and a dented part interposed therebetween for engaging the hooks of said first bracket and the journal portion including a pair of pivot portions engaged with the arms of said second bracket.

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**5,495,863**

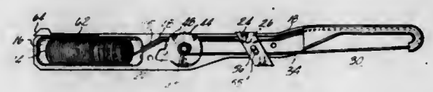
**FLOSSING DEVICE WITH ADVANCING AND TENSIONING MECHANISMS**

**Mark C. Bergman, 13545 Treasure Way, Chino Hills, Calif. 91709**

**Filed May 5, 1994, Ser. No. 238,389**

**Int. Cl.[6] A61C *15/00***

**U.S. Cl. 132—326** **19 Claims**



1. A hand-held dental flossing device, comprising:

(a) a housing having a handle and a flossing arm and a top and a bottom;

(b) a dental floss supply disposed in the housing;

(c) a winding gear rotatably mounted to the housing for having a free end of a dental floss strand from the supply attached to the gear, the winding gear having a portion extending through the top of the housing proximate the handle;

(d) a floss tensioning button mounted in the housing and having floss passing from the supply past the button to the flossing arm and returning to the winding gear, the button being movable from a floss threading position where the floss strand is relatively loose so that it may be wound by the winding gear to a floss locking position where the floss strand is locked by friction fit between the button and the housing so that the floss is relatively tight and where, in response to further winding of the winding gear with the button in the floss locking position, the floss strand will be further tensioned between the button and the winding gear, wherein the button has a first end extending from the top of the housing at a location closer to the flossing arm than the winding gear is to the flossing arm, whereby a user of the device can wind the floss and press the first end of the button using a hand which is holding the handle.

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**5,495,864**

**APPARATUS FOR WASHING AND DRYING DISCRETE PARTS**

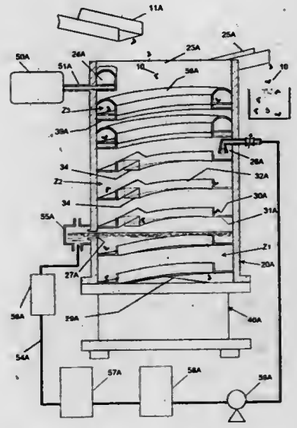
**Masami Takagi, Mie; Yukihisa Kenpe, Tsu; Hisashi Tsuge, Mie, and Yasuo Miyake, Tsu, all of, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan**

**Filed Jun. 15, 1994, Ser. No. 260,314**

**Claims priority, application Japan, Apr. 25, 1993, 6-086812; Jun. 21, 1993, 5-149448; Aug. 27, 1993, 5-213147; Aug. 27, 1993, 5-213148**

**Int. Cl.[6] B08B *3/02;3/04***

**U.S. Cl. 134—63** **7 Claims**



1. An apparatus for washing and drying discrete parts which comprises:

a vessel with a vertical axis, a closed bottom and a side wall extending upwardly from the circumference of said bottom, said vessel having an inlet for introducing the discrete parts on the bottom of said vessel, an outlet for removing said parts out of said vessel, said outlet being formed in an upper end of said side wall;

a spiral track formed on the interior surface of said side wall and ascending therealong in a spiral manner about said vertical axis from said bottom and reaching said outlets;

a liquid supply line for supplying a cleaning liquid into said vessel;

level control means for keeping a level of said supplied cleaning liquid well below said outlet in such a manner as to divide the

length of said spiral track into a washing zone immersed in said cleaning liquid and drying zone disposed above said level;

said spiral track further including a dripping zone for dropping the cleaning liquids off said parts, said dripping zone being disposed above the level of said cleaning liquid within said vessel and leading to said drying zone, said spiral track in said dripping zone comprising a perforated bed on which said parts are fed upwardly to said drying zone;

a vibrator operatively connected to said vessel for applying thereto vertical and circumferential vibrations which supply a driving force for feeding said discrete parts upwardly along said spiral track to said outlet through said cleaning zone and continuously through said drying zone, said discrete parts being washed by said cleaning liquid while being fed through said cleaning zone; and

dryer means for directing a forced hot air flow along said drying zone to remove the cleaning liquid from said discrete parts.

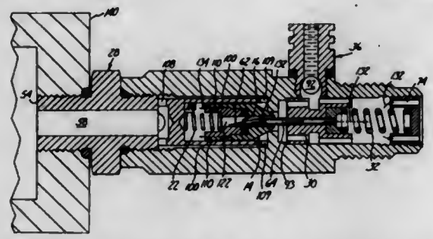
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**5,495,865**

## TEMPERATURE RELIEF VALVE WITH THERMAL TRIGGER

**Lloyd G. Wass, Eagan, and Kurt L. Drewelow, Skakopee, both of Minn., assignors to Mirada Controls, Inc., Henry, S. Dak.**

**Filed Feb. 28, 1995, Ser. No. 411,493**
**Int. Cl.[6] F16K *17/38***
**U.S. Cl. 137—68.3** **29 Claims**



1. A pressure relief valve for use with a receptacle containing compressed gas, the pressure relief valve comprising:

a valve body having an inlet, an outlet and a flow path between the inlet and the outlet, the valve body configured to be connectable to the receptacle so that the inlet is in communication with an interior of the receptacle, the flow path being configured to define an orifice within the valve body, the orifice having a longitudinal axis and a diameter;

a poppet valve assembly comprising:

a poppet within the flow path adjacent to the inlet, the poppet having a first end oriented toward the orifice, a second end opposite the first end, a longitudinal axis and a longitudinal passage extending from the first end to the second end;

first bias means in operable association with the poppet for biasing the first end of the poppet toward the orifice; and

a seal in the longitudinal passage;

a movable member within the flow path adjacent the outlet, the movable member being coaxially aligned with the orifice and the longitudinal passage of the poppet, the movable member being movable from a first position to a second position;

second bias means in operable association with the movable member for biasing the movable member toward the second position; and

a thermally responsive restraining member operably coupled with the movable member, the restraining member holding the movable member in the first position when ambient temperature is below a predetermined temperature threshold, the restraining member releasing the movable member when the ambient temperature is above the predetermined temperature threshold so as to allow the movable member to move to the second position to interrupt the seal in the passage of the poppet and thereby expose the flow path.

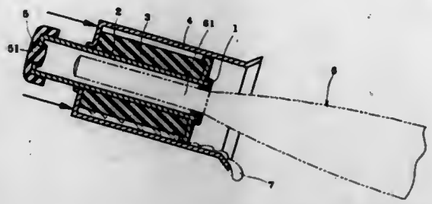
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**5,495,866**

## UMBRELLA DRIP WATER COLLECTOR

**Li-An Lu, Taipei, Taiwan, Prov. of China, assignor to Conser Technology, Inc., Taipei, Taiwan, Prov. of China**

**Filed Jun. 5, 1995, Ser. No. 463,284**
**Int. Cl.[6] A45B *25/28***
**U.S. Cl. 135—48** **1 Claim**



1. An umbrella drip water collector for attaching to the ferrule of an umbrella to collect drip water, comprising:

a receptacle having an open top side, a closed bottom side, and a bottom hole at the center of said closed bottom side, the diameter of said top open side gradually increasing toward the outside;

a sponge mounted inside said receptacle and having a longitudinal center through hole aligned with the bottom hole on said receptacle;

a hollow barrel inserted into the longitudinal center through hole, said barrel comprising an outward flange at a top end thereof covered on said sponge inside said receptacle, a bottom hole at the center of a bottom end thereof disposed outside the bottom hole of said receptacle, said outward flange having a plurality of radial slots for guiding water to said sponge inside said receptacle;

a top rubber cap fastened to said barrel and stopped above said outward flange, defining a stepped center through hole for permitting the ferrule of the umbrella to be inserted into the inside of said barrel; and

a bottom rubber cap fastened to said barrel and stopped outside said receptacle to seal the bottom hole of said receptacle, having a headed inside stud fastened to the bottom hole of said barrel;

wherein when said receptacle is moved axially relative to said barrel, water is squeezed out of said sponge by said outward flange of said barrel.

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**5,495,867**

## DUAL HANDLED CANE

**Randall D. Block, Salt Lake City, Utah, assignor to Momentum Medical Corp., Salt Lake City, Utah**

**Filed Nov. 16, 1993, Ser. No. 153,456**
**Int. Cl.[6] A61H *3/02***
**U.S. Cl. 135—65** **8 Claims**

1. A walking cane having a unitary structure and a pair of vertically spaced handles to provide uprisal characteristics comprising:

a continuous slender structural member forming the body and handles of the cane and terminating in a straight shaft load bearing member having a cane tip at its distal end;

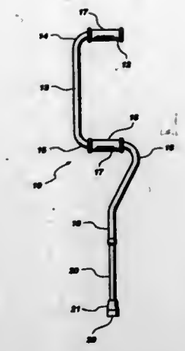
a first handle member having a lateral aspect when said can is in a vertical orientation, said first handle forming the top most portion of the cane;

a second, lower handle member spaced a predetermined fixed distance from said first handle, said lower handle having a lateral aspect when said cane is in a vertical orientation;

a web portion of the structural member joining said first and second handles, said web member joining said handles by smoothly curved portions adjacent said handles;

a gooseneck curved portion of said structural member joining said second handle to the straight shaft load bearing portion of said cane; and





a straight shaft loading bearing member having a predetermined length to position said second handle a fixed preselected distance from the distal end of said cane, said shaft member positioned to have its longitudinal axis extending through said handles substantially at the geometric centers of said handles.

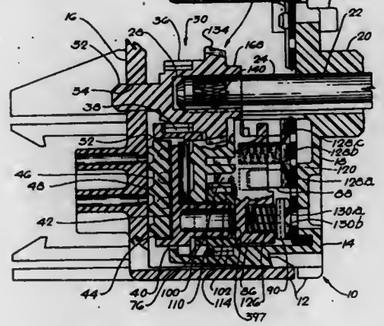
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**5,495,868**

## ROTARY VACUUM-ELECTRIC SWITCH

**John G. Cummings, Cary, Ill., assignor to Indak Manufacturing Corp., Northbrook, Ill.**

**Division of Ser. No. 107,890, Aug. 16, 1993, Pat. No. 5,396,928, which is a division of Ser. No. 697,592, May 8, 1991, Pat. No. 5,250,770. This application Dec. 30, 1994, Ser. No. 367,806**
**Int. Cl.[6] F16K *11/065;31/54;51/00***
**U.S. Cl. 137—315** **2 Claims**



1. A rotary vacuum valve, comprising

a housing,

an operating shaft rotatable in said housing to a plurality of angularly spaced positions,

a pinion gear rotatable with said shaft in said housing,

a valve carriage movable in said housing and having a gear rack meshing with said pinion gear,

guide means in said housing and on said valve carriage for guiding said valve carriage for translatory movement along a predetermined path,

said guide means including slidably engagable components which are in sliding engagement when said valve carriage is assembled with said housing,

vacuum valve means on said valve carriage and said housing for performing vacuum valving functions when said valve carriage is translated in said housing,

and mating key and keyway elements located on said housing and said valve carriage in a selected one of a plurality of predetermined keying positions to assure correct mating of said valve carriage and said housing during the initial assembly of said valve carriage with said housing.

said mating key and keyway elements being momentarily engaged and mated during said initial assembly but being completely out of engagement when said valve carriage is fully assembled with said housing,

one of said elements being disposed on said valve carriage while the other of said elements is disposed on said housing,

the element disposed on said housing being positioned on said housing to obstruct the assembly of an incorrect valve carriage with the housing when the elements are not properly mated with one another.

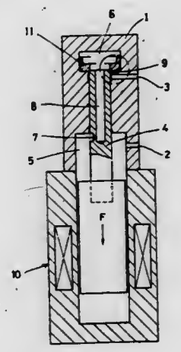
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**5,495,869**

## CHANGEOVER VALVE AND FLOW CONTROL VALVE ASSEMBLY HAVING THE SAME

**Koichi Hashida, Itami, Japan, assignor to Sumitomo Electric Industries, Inc., Osaka, Japan**

**Filed May 26, 1994, Ser. No. 249,741**
**Claims priority, application Japan, May 27, 1993, 5-125886**
**Int. Cl.[6] G05D *7/01***
**U.S. Cl. 137—504** **6 Claims**



1. A flow control valve assembly, comprising:

a housing having an inlet port, an outlet port, an inner peripheral surface, and a land portion on said inner peripheral surface;

a spool that is slidably and substantially liquid-tightly mounted in said housing, said spool having an outer peripheral surface portion opposable to said land portion of said housing;

a first fluid chamber provided at one end of said spool in said housing and a second fluid chamber provided at the other end of said spool in said housing for exerting fluid pressure on said spool;

a fluid passage communicating said first fluid chamber with said second fluid chamber and extending between said inlet port and said outlet port, said fluid passage having an orifice therein;

an annular seal made of an elastic material disposed on said inner peripheral surface of said housing; and

a biasing means for biasing said spool;

wherein a valve portion is formed by said land portion of said inner peripheral surface of said housing and said outer peripheral surface portion of said spool in said fluid passage for opening and closing said fluid passage between said inlet port and said outlet port, the degree of opening of said valve portion being automatically adjusted by movement of said spool such that a spool driving force produced by a fluid

pressure difference between said first and second fluid chambers balances with a biasing force of said biasing means, counteracting the spool driving force, whereby fluid flows through said orifice to said outlet port at a rate determined by said fluid pressure difference and the sectional area of said orifice; and

wherein said spool is movable between a first position in said housing in which said outer peripheral surface portion abuts said annular seal and said land portion of said housing, whereby said fluid passage is closed, a second position in said housing in which said outer peripheral surface portion does not abut either said annular seal or said land portion, whereby said fluid passage is open, and a third position in which said outer peripheral surface portion of said spool contacts said land portion of said housing but does not abut said annular seal.

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**5,495,870**

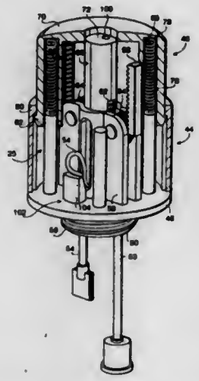
## COMBINATION TOY AND BEVERAGE DISPENSING DEVICE

**Juan F. Dorta, 2902 S. Western Ave., Los Angeles, Calif. 90018**

**Continuation-in-part of Ser. No. 812,414, Dec. 23, 1991, Pat. No. 5,277,642. This application Jan. 6, 1994, Ser. No. 178,738**

**Int. Cl.[6] F16K** *24/00;31/44;* **A47G** *19/22*

**U.S. Cl. 137—588** **20 Claims**



1. A valve mechanism for dispensing a liquid from a generally enclosed chamber, said valve mechanism comprising:

a) a supporting frame;

b) a liquid delivery tube extending from said supporting frame and having an end located in the liquid for withdrawing the liquid and enabling dispensing of same;

c) an air supply tube extending from said frame and having an end located in said generally enclosed chamber and an end in communication with an external atmosphere to equalize pressure in the chamber when liquid is withdrawn therefrom;

d) a reciprocally shiftable stem means associated with said frame and extending outwardly therefrom, said liquid delivery tube extending through said stem means such that an end of the stem means can be engaged by the lips of a user to withdraw liquid dispensed through the liquid delivery tube extending axially through the stem means; and

e) actuable means associated with the stem means and being actuated when the stem means is reciprocally shifted thereby causing a blocking of the liquid delivery tube when the actuable means is unactuated, but causing an opening of the liquid delivery tube when the actuable means is engaged by a user and pushed against to be actuated and thereby enabling a withdrawal of liquid.

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**5,495,871**

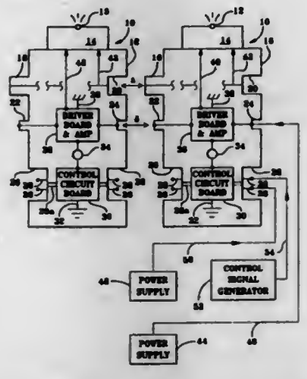
## MULTIPLE VALVE MANIFOLD WITH PLURAL POWER SUPPLIES

**Joseph L. Meloche, Bryan, Ohio, and Jeffery W. Smith, Angola, Ind., assignors to The Aro Corporation, Bryan, Ohio**

**Filed Apr. 3, 1995, Ser. No. 415,561**

**Int. Cl.[6] F16K** *11/10*

**U.S. Cl. 137—884** **5 Claims**



1. In a system comprising multiple electromagnetically actuable valves arranged on a common fluid manifold, the valves being housed in discrete pluggable valve units, each unit including both a fluid circuit and an electrical circuit to supply actuating signals to the electromagnetically actuable valves in response to control signals, the improvement comprising:

a first electrical power supply to provide the actuating signals at a first voltage and a first current to the electromagnetically actuable valves in a first electrical circuit;

control means for providing control signals to actuate a selectable number of valves;

a second power supply for providing the control means with power at a second voltage and second current in a second electrical circuit;

isolation means for electrically isolating the first and second electrical circuits from one another;

amplifier means interposed between the first and second electrical circuits to amplify the control signals to a level required for the actuation signals.

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**5,495,872**

## FLOW CONDITIONER FOR MORE ACCURATE MEASUREMENT OF FLUID FLOW

**James E. Gallagher, Kingwood; Ronald E. Beaty, Katy, and Paul J. Lanasa, Houston, all of Tex., assignors to Integrity Measurement Partners, Kingwood, Tex.**

**Filed Jan. 31, 1994, Ser. No. 189,100**

**Int. Cl.[6] F15D** *1/02*

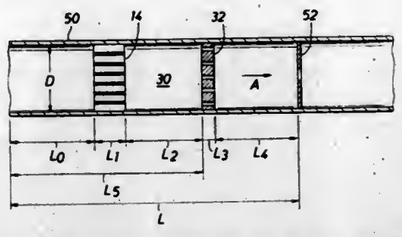
**U.S. Cl. 138—44** **15 Claims**

1. A flow conditioner for use in a tubular pipe, of inside diameter D, to enable more accurate measurement of the rate of fluid flow in said pipe, the flow conditioner comprising:

(a) an anti-swirl device for positioning in a pipe upstream from a flow measuring device to reduce swirl to less than 2°;

(b) a profile device for positioning in a pipe upstream at a distance greater than about 0.5 D from the measuring device;





(c) a settling chamber intermediate said anti-swirl and profile devices, said settling chamber comprising an unconstricted elongate passage for fluid flow of sufficient length to decouple flow patterns generated by the profile plate of anti-swirl device effects when fluid flows in a pipeline from the anti-swirl device to the profile device.

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**5,495,873**

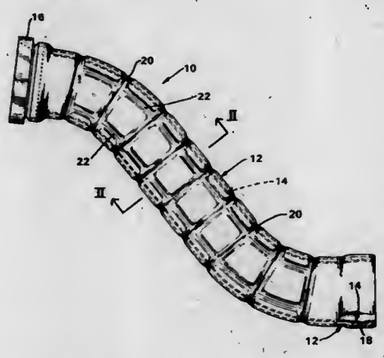
## PATTERNED AIR GAP ENGINE EXHAUST CONDUIT

**Steven J. Butkiewicz, Wyoming; Samuel H. Carrier, Ravenna; Donald L. Fellows, Jr.; Frederick B. Hill, Jr., both of Rockford; Earl W. Mattson, Cedar Springs, and Terrence L. Scofield, Alto, all of Mich., assignors to Benteler Industries, Inc., Grand Rapids, Mich.**

**Filed Oct. 13, 1993, Ser. No. 136,415**

**Int. Cl.[6] F16L** *9/18*

**U.S. Cl. 138—114** **17 Claims**



1. An acoustically improved, air gap engine exhaust conduit comprising:

a dual wall, air gap, metal exhaust conduit having an outer metal jacket and a thin inner metal liner;

said jacket having a length, having a wall, and having at least one inlet and an outlet;

said liner having a wall, and at least one inlet and an outlet;

said jacket inlet and said liner inlet being adjacent each other;

said liner being secured to said jacket adjacent said jacket inlet and said liner inlet, said liner outlet being in engagement with said jacket, and said liner otherwise being spaced from said jacket from said liner inlet to said liner outlet to form a continuous air gap therebetween from said liner inlet to said liner outlet; and

a pattern of elongated indentation ribs protruding from at least one of said jacket and said liner, said ribs extending continuously along axial paths that extend over substantially the entire length of at least one of said jacket and said liner, said indentation ribs spaced from the other of said jacket and said liner to be out of physical contact with the other of said jacket and said liner and leave an air gap between said indentation ribs and the other of said jacket and said liner to maintain said continuous air gap between said jacket and liner so as to improve the acoustical properties of said exhaust conduit.

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**5,495,874**

## WOVEN FABRIC SHEETING

**Gary L. Heiman, Cincinnati, Ohio, assignor to Standard Textile Co., Inc., Cincinnati, Ohio**

**Filed Apr. 22, 1994, Ser. No. 232,828**

**Int. Cl.[6] D03D** *15/00*

**U.S. Cl. 139—420 A** **21 Claims**

1. A woven fabric sheeting having a combination of the "feel" and absorption characteristics of cotton and the durability characteristics of polyester,

said sheeting being formed by warp yarns and filling yarns and said yarns occupying and defining the top and bottom surfaces of the sheeting,

said sheeting being characterized in that

the warp yarns are yarns comprised essentially of spun cotton staples, and

the filling yarns are predominantly continuous filament, polyester yarns.

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**5,495,875**

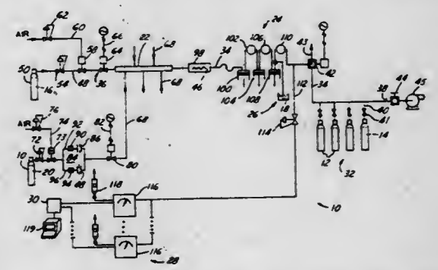
## SYSTEM FOR CONTINUOUS BLENDING OF A LIQUID INTO A GAS

**Michael A. Benning, Allentown, and Stephen B. Miller, Doylestown, both of Pa., assignors to Scott Specialty Gases, Inc., Plumsteadville, Pa.**

**Filed Dec. 1, 1994, Ser. No. 347,636**

**Int. Cl.[6] B65B** *31/00*

**U.S. Cl. 141—83** **20 Claims**



1. A method of filling a plurality of cylinders with a final blended mixture containing a gas component as a balance gas and at least one vaporized liquid component, the gas component being a gas at an ambient pressure and an ambient temperature, the liquid component being a liquid at said ambient pressure and said ambient temperature, said method comprising the steps of:

1) flowing a balance gas through a primary fill line, said balance gas being at an initial temperature and being at an initial pressure;

2) regulating the pressure of said balance gas to a first pressure;

3) compressing said balance gas, whereby the pressure of said balance gas is increased to a second pressure, said second pressure being greater than said first pressure, whereby the increase in pressure of said balance ass results in an increase in temperature to a vaporizing temperature, said vaporizing temperature being a temperature wherein said liquid component is vaporized;

4) injecting said liquid component into said balance gas after said compressing step when said balance gas being at said vaporizing temperature, thereby forming said final blended mixture;

5) cooling said final blended mixture; and

6) filling said plurality of cylinders with said final blended mixture.

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**5,495,876**

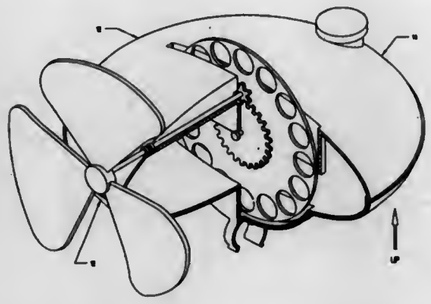
**SPILL-PROOF BUBBLE MACHINE**

**Michael R. Schramm, 120 Glacier Ave., South, Pacific, Wash. 98047**

**Continuation of Ser. No. 828,345, Jan. 30, 1992, Pat. No. 5,246,046. This application Jul. 1, 1993, Ser. No. 86,541**

**Int. Cl.[6] B65B** *1/04;3/04*

**U.S. Cl. 141—98** **12 Claims**



12. A bubble making apparatus comprising a container defining an inner cavity, and a funnel attached to and extending into the inner cavity of said container to provide communication between said inner cavity and the exterior of said container and a bubble device movably mounted to said funnel.

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**5,495,877**

**DEVICE, KIT, AND PROCESS FOR FILLING OF A PRINT CARTRIDGE OF AN INK JET PRINTER**

**Peter Schwenk, Schenkenzell, and Christoph Henzler, Schramberg, both of, Germany, assignors to PMS GmbH Production + Recycling von Bueromaschinenzubehoer, Eschbronn-Locherhof, Germany**

**Filed Aug. 15, 1994, Ser. No. 290,411**

**Claims priority, application Germany, Aug. 13, 1993, 43 27 178.2**

**Int. Cl.[6] B65B** *1/04;3/00*

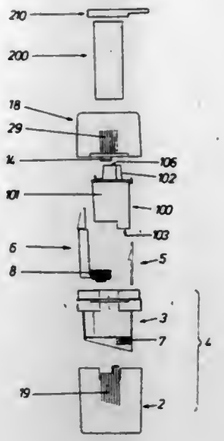
**U.S. Cl. 141—370** **19 Claims**

1. A device for refilling a print cartridge (**100**, **100'**), said print cartridge comprising a casing, an ink nozzle at a lower surface, a bore hole at an upper surface, and an ink chamber within said print cartridge, said device comprising:

a receptacle (**4**) adapted to receiving said print cartridge (**100**, **100'**) with close sideways tolerance, said receptacle provided with a sealing element (**7**) adapted to sealingly engage said ink nozzle of said print cartridge when said print cartridge is seated in said receptacle;

a locking element (**5**) for urging said ink nozzle of said print cartridge into sealing engagement against said sealing element of said receptacle; and

a hollow needle carrier (**18**, **18'**) comprising a hollow needle (**17**, **17'**) and a carrier frame, said carrier frame adapted to be seatable upon the print cartridge (**100**, **100'**) after said print cartridge is seated in said receptacle (**4**), said hollow needle being positioned so that a first end of said needle penetrates through said bore hole (**106**, **106'**) into said ink chamber provided on the inside of said print cartridge (**100**, **100'**) when said hollow needle carrier is seated on said print cartridge, and the second end of said hollow needle projects upwardly.




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**5,495,878**

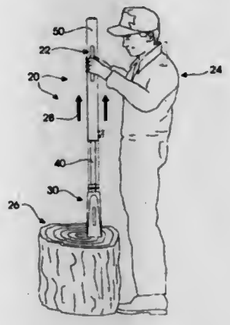
**HAND HELD LOG SPLITTER**

**Robert E. McKenen, Jr., Hot Springs, Ak., assignor to R.E.M. Incorporated, Hot Springs, Ark.**

**Filed Mar. 10, 1995, Ser. No. 402,537**

**Int. Cl.[6] B27L** *7/00*

**U.S. Cl. 144—193 C** **11 Claims**




1. A hand-held log splitter comprising:

a rigid wedge adapted to be forcibly driven into a log for penetrating and splitting it;

a rigid, elongated tool control shaft fastened to said wedge and extending upwardly therefrom, said shaft comprising a top and bottom;

quick release collar means for releasably joining said wedge to said shaft;

a rigid, elongated, sleeve coaxially, telescopingly receiving said shaft, said sleeve having a top and a bottom;

a weight fixedly disposed coaxially within said sleeve at said sleeve top for forcibly contacting said shaft top when said sleeve is moved maximally axially downwardly;

an annulus formed between said shaft and said sleeve;

an upper guide coaxially disposed within said annulus and fixed to said shaft top, said upper guide slidably received within said sleeve;

a lower guide spaced apart from said upper guide and coaxially disposed within said annulus, said lower guide fixedly secured within said sleeve bottom and coaxially, slidably penetrated by said shaft;



means for selectively locking said shaft relative to said sleeve to safely configure said splitter for transportation wherein said locking means threadably penetrates said sleeve and said lower guide;

handle means projecting from said sleeve for operating said splitter; and,

whereby said sleeve may be axially reciprocated with respect to said shaft to drive said wedge into said log wben said weight forcibly impacts said shaft top.

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**5,495,879**

**PROCESS AND APPARATUS FOR STABILIZING THE OSCILLATIONS OF A VEHICLE, AND VEHICLE EQUIPPED WITH SUCH AN APPARATUS**

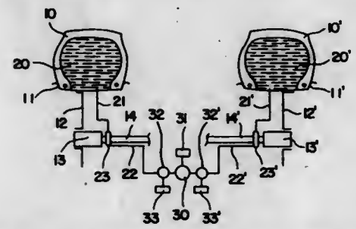
**Abelardo Cabestrero, Almeria, Spain, assignor to Compagnie General des Etablissements Michelin - Michelin & Cie, Clermont-Ferrand Cedex, France**

**Filed Dec. 29, 1993, Ser. No. 175,263**

**Claims priority, application France, Dec. 31, 1992, 92 16054**

**Int. Cl.[6] B60C** *23/00*

**U.S. Cl. 152—415** **13 Claims**




1. An apparatus for stabilizing oscillations of a vehicle equipped with at least two tires on rims, the two tires and rims being located on opposite sides or ends of the vehicle, the tires and their rims defining two volumes containing non-compressible fluid, said apparatus comprising a system of fluid transmission connections between said inner volumes of the tires, said system being filled with a constant volume of non-compressible fluid, and rotating joints and conduits establishing fluid transmission communications between at least the two inner volumes of said tires which are respectively located at opposite sides or ends of the vehicle and on opposite sides of one of the vertical planes passing through the center of gravity of the vehicle.

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**5,495,880**

**MULTIPLE TIRES ON A SINGLE WHEEL**

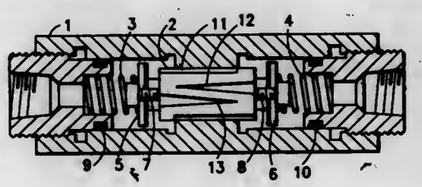
**Ozaki Yasushi, 25-16, Tokumaru 7-chome, Itabashi-ku, Tokyo, Japan**

**Continuation-in-part of Ser. No. 120,289, Sep. 13, 1993, abandoned, which is a continuation of Ser. No. 788,202, Nov. 5, 1991, Pat. No. 5,244,026. This application Sep. 21, 1994, Ser. No. 309,747**

**Claims priority, application Japan, Jun. 18, 1991, 3-174303**

**Int. Cl.[6] B60C** *23/02;29/00*

**U.S. Cl. 152—415** **10 Claims**




1. A combination of multiple tires comprising:

a first and a second tire disposed adjacently parallel to each other on a single wheel;

said first tire having a first internal space and a first pressure in said first internal space;

said second tire having a second internal space and a second pressure in said second internal space;

means for transferring a fluid between said first and second internal spaces;

said means for transferring including a valve having a first closed position, an open position, and a second closed position;

said first and second closed positions being effective to prevent a flow of said fluid between said first and said second internal spaces;

said open position being effective to allow a flow of said fluid between said first and said second internal spaces;

means for placing said valve in said first closed position when a difference between said first pressure and said second pressure falls below a first differential pressure;

means for placing said valve in said open position when said difference is greater than said first differential pressure;

means for placing said valve in said second closed position when said difference is greater than a second differential pressure; and

said second differential pressure being greater than said first differential pressure.

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**5,495,881**

**SEALING RING BETWEEN THE BEADS OF A TIRE**

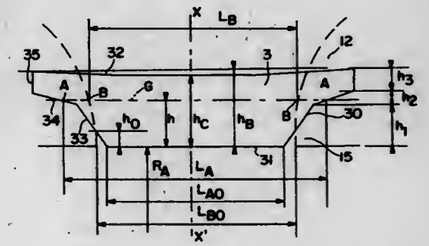
**Dominique Girard, Chateaugay, France, assignor to Compagnie Generale Des Etablissements Michelin- Michelin & Cie, Clermont Ferrand Cedex, France**

**Filed May 17, 1994, Ser. No. 243,287**

**Claims priority, application France, May 26, 1993, 93 06608**

**Int. Cl.[6] B60C** *19/04;25/14*

**U.S. Cl. 152—514** **9 Claims**

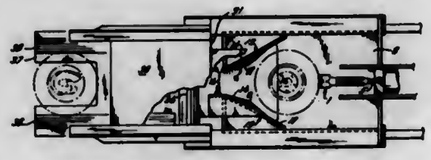



1. A sealing ring for mounting on the flat rim base of a tubeless tire's service rim between the beads of the tire having an inner form ratio H/S at most equal to 0.8, H being the height of the inner cavity of the tire and S being the maximum axial width of the inner cavity of the tire, comprising in an unmounted state a meridian section defined by a radially inner generatrix of radius $R_A$ equal to the radius $R_J$ of the rim base of the service rim and of axial width $L_{AO}$ of between 0.8 and 1 times the axial distance $L_{BO}$ between the axially inner ends of the toes of the beads of the tire to be mounted on the service rim, a radially outer generatrix of radius greater than the radius $R_A$ by an amount $h_c$ of between 0.05 $R_J$ and 0.40 $R_J$ and two lateral sides of identical profile, the transverse clamping $L_A$–$L_B$ of the ring on the inner walls of the beads being negative or zero at the level of the inner generatrix, increasing slightly over a radial distance $h_1$ at least equal to 0.05 $R_J$, said slight increase being uniform, continuous and substantially linear and then increasing more greatly over a radial distance $h_2$ at most equal to 0.4 $R_J$, said increase being uniform, continuous and substantially linear, then becoming at most constant over the radial distance $h_3$ at least equal to 0.02 $R_J$, the sum of the distances $h_1$, $h_2$ and $h_3$

being equal to the height $h_B$ of the lateral sides of the ring, the difference $h_B-h_C$ being at most equal to 0.05 $R_J$ and the distances $L_A$ and $L_B$ being the axial width of the ring and the axial distance between the beads, respectively, measured across a generatrix G located at a variable radial distance h from the generatrix of the meridian section of radius $R_A$.

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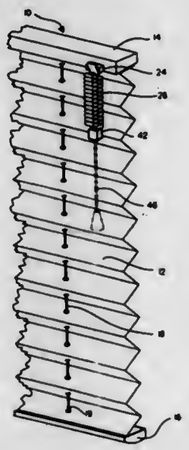
**5,495,882**
**TIRE DERIMMING MACHINE**
**Carl A. Trant, Palmer, Mass., assignor to Tire Recycling and Development, Inc., Palmer, Mass.**
**Filed Jul. 1, 1994, Ser. No. 269,489**
**Int. Cl.[6] B60C *25/07***
**U.S. Cl. 157—1.21** **22 Claims**



1. A tire derimming machine comprising:
a) an elongated frame;
b) a single ram supported at one end of the frame;
c) a mandrel attached to the frame said mandrel including angled and inclined plates, said plates being angled and inclined such that a tire/rim combination pushed completely therethrough by said ram is reduced in outer dimension to uncouple the tire from the rim.

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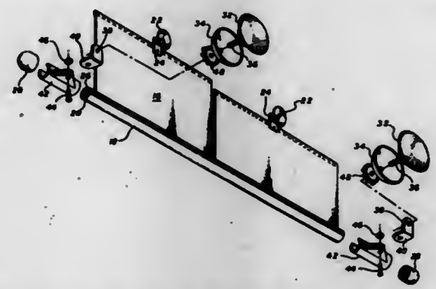
**5,495,883**
**WINDOW SHADE CORD SAFETY SHROUD**
**Ralph Jelic, Valencia, Pa., assignor to Vereosl USA Inc., Pittsburgh, Pa.**
**Filed Aug. 5, 1994, Ser. No. 286,626**
**Int. Cl.[6] A47H *5/00***
**U.S. Cl. 160—84.04** **15 Claims**



1. A cord shroud for use in cooperation with a window covering assembly having a bottomrail and a headrail with a cord lock attached thereto, the window shade assembly having at least two lift cords, each of which are connected at one end to the bottomrail, pass through the headrail and cord lock, have an opposite end accessible to an operator, and an exposed portion which extends from the headrail to the opposite ends when the window shade is open, wherein said lift cords are joined at said opposite ends, the cord shroud comprising:
an elongated, flexible ribbon, the ribbon having a first end connected to the headrail, a second end accessible to the operator, and a plurality of apertures through which the lift cords pass, and of a length sufficient to fit over substantially all of the exposed portion of the lift cords disposed along the length of said ribbon, wherein said lift cords are disposed through and are movable through said plurality of apertures.

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**5,495,884**
**REAR WINDOW SHADE WITH WINDOW MOUNTING SUCTION CUPS**
**Arie Shikler, Woodland Hills, Calif., assignor to Auto-Shade, Inc., Moorpark, Calif.**
**Continuation of Ser. No. 172,602, Dec. 21, 1993, abandoned. This application Oct. 27, 1994, Ser. No. 330,116**
**Int. Cl.[6] B60J *1/20***
**U.S. Cl. 160—120** **4 Claims**



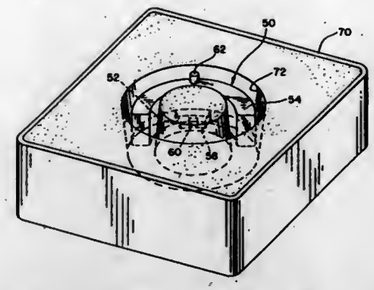
1. A window shade for an automobile window, comprising:
a rod;
a shade that can be pulled from said rod;
a shade suction cup that is attached to said shade and which can be pressed onto the window;
a clamp that can slide easily along said rod;
a bracket pivotally connected to said clamp;
a rod suction cup coupled to said bracket and adapted to be pressed onto the window such that said rod and said shade are mounted to the window;
a shell disposed between the bracket and the rod suction cup; and
a rotatable lock nut coupled to said rod suction cup such that rotation of said nut causes said rod suction cup to be locked in a different position relative to said bracket.

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**5,495,885**
**METHOD FOR MAKING ROTOR COUNTERWEIGHT INSERT APPARATUS**
**Jeffrey C. Fowlkes, Paris, and Gary L. Gilmore, McKenzie, both of Tenn., assignors to Tecumseh Products Company, Tecumseh, Mich.**
**Division of Ser. No. 279,952, Jul. 25, 1994. This application May 18, 1995, Ser. No. 443,855**
**Int. Cl.[6] B22D *19/00***
**U.S. Cl. 164—98** **3 Claims**

1. A method of manufacturing a rotor end ring, said method comprising:
providing a mold with a cavity having the form of a rotor end ring;

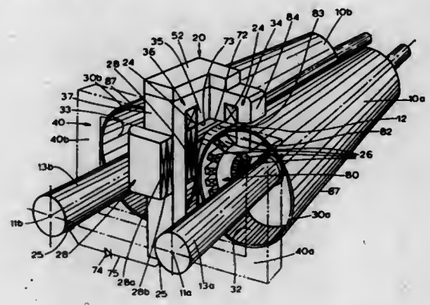




inserting a counterweight into said cavity; and
pouring molten metal into said cavity to die cast a rotor end ring about said counterweight.

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**5,495,886**
**APPARATUS AND METHOD FOR SIDEWALL CONTAINMENT OF MOLTEN METAL WITH VERTICAL MAGNETIC FIELDS**
**Anatoly F. Kolesnichenko, Kieve, Ukraine, assignor to Inland Steel Company, Chicago, Ill.**
**Filed Apr. 29, 1994, Ser. No. 236,366**
**Int. Cl.[6] B22D *11/06;27/02***
**U.S. Cl. 164—467** **79 Claims**

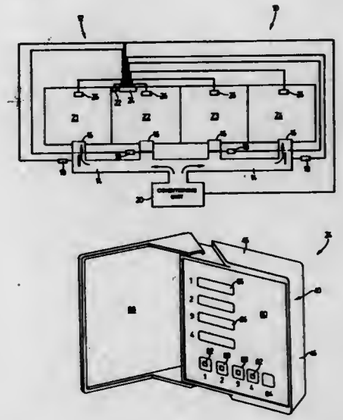


1. A magnetic confining apparatus for preventing the escape of molten metal through an open side of a gap between two horizontally disposed members, between which the molten metal is located, said apparatus comprising:
first electromagnet means for generating a first, mainly vertical magnetic field extending through the open side of said gap to said molten metal to exert a confining pressure against an edge of the molten metal in the gap; and
second electromagnet means for forming a second vertical magnetic field, at said molten metal edge, such that the interaction of said two vertical magnetic fields, at said molten metal edge, is sufficient to prevent the molten metal from escaping through the open side of the gap.

62. A magnetic confining method for preventing the escape of molten metal through an open side of a vertically extending gap between two horizontally spaced members and between which said molten metal is located, said method comprising the steps of:
disposing a pair of vertically spaced, cooperating magnet poles adjacent to the open side of said gap;
generating, at a location adjacent the open side of said gap, a first vertical magnetic field which extends through the open side of said gap to a free edge of said molten metal from said pair of spaced magnet poles;
generating said first vertical magnetic field sufficiently proximate to said open side of the gap so that said vertical magnetic field has a strength sufficient to exert a confining magnetic pressure against the molten metal in said gap; and
generating a second vertical magnetic field, at said molten metal edge, such that the magnetic effect of said two vertical magnetic fields, at said molten metal edge, is sufficient to prevent the molten metal from escaping through the open side of the gap.

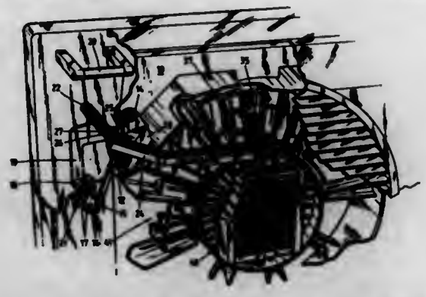
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**5,495,887**
**TEMPERATURE CONTROL SYSTEM AND CONTROLLER THEREFOR**
**Jerry Kathnelson, Nepean, and Michael S. D. Reid, Burgeo, both of, Canada, assignors to Erie Manufacturing (Canada) Co. Limited, Stouffville, Canada**
**Filed May 21, 1993, Ser. No. 64,653**
**Int. Cl.[6] F25B *29/00***
**U.S. Cl. 165—11.1** **24 Claims**



1. A temperature control system to supply conditioned air to a plurality of zones via ducts extending to the zones comprising:
at least one temperature sensing device in each of said zones;
a thermostat to allow a desired temperature setting to be selected; and
a controller acting between said thermostat and said temperature sensing devices, said controller including selection means to allow one of said zones to be designated as a control zone and to allow other zones to be selected by opening dampers in the ducts extending to the selected zones to control the flow of conditioned air thereto, the dampers in the ducts extending to deselected zones being maintained in a closed condition to isolate them from conditioned air; and display means to provide a visual indication of the selected zones and a different visual indication of the control zone, said controller making a heating or cooling decision for said temperature control system on the basis of the desired temperature setting and the output of the at least one temperature sensing device in said control zone.

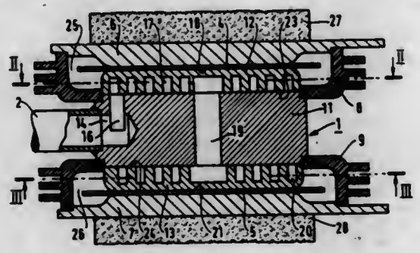
5,495,888
**HEATER CONTROL**
Robert W. James, St. Marys, Australia, assignor to F F Seeley Nominees Pty Ltd., St. Marys, Australia
PCT No. PCT/AU94/00122, § 371 Date Nov. 9, 1994, § 102(e) Date Nov. 9, 1994, PCT Pub. No. WO94/20796, PCT Pub. Date Sep. 15, 1994
PCT Filed Mar. 11, 1994, Ser. No. 335,735
Claims priority, application Australia, Mar. 12, 1993, PL 7800
Int. Cl.[6] F24F 3/14
U.S. Cl. 165—60 6 Claims



1. A heater control for controlling operation of a heater switch in an evaporative cooler having shutter means movable between an open free air flow position useable in a cooler mode and a closed part airflow position useable in a heater mode, comprising
an operator carried by a structure of said cooler coupled to said shutter means and movable to control said shutter means between its said positions,
a said heater switch being carried by said structure and having an extending actuating finger,
spring means biasing said switch actuating finger towards an open contact state,
and a cam face on said operator co-acting with said spring means to compress said spring means and thereby cause said switch to revert to its closed contact state, upon movement of said operator to close said shutter means.

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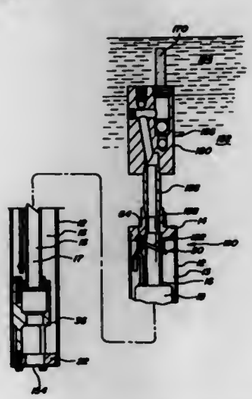
5,495,889
**COOLING DEVICE FOR POWER ELECTRONIC COMPONENTS**
Jean-Luc Dubelloy, Brea, France, assignor to GEC Alsthom Transport SA, Paris, France
Filed Feb. 9, 1994, Ser. No. 194,015
Claims priority, application France, Feb. 10, 1993, 93 01459
Int. Cl.[6] H01L 23/34
U.S. Cl. 165—104.33 7 Claims



1. Cooling device for power electrical components having electrodes, the device comprising a heatsink including a circuit for carrying a flow of cooling fluid and at least one first side for exchange of heat with the component to be cooled, an electrically insulative and heat conductor material plate disposed between said at least one first side of said heatsink and a first side of an electrical connection so as to provide electrical independence between said heatsink and said components, said electrical connection having a second side adapted to make thermal and electrical contact with one electrode of a component, and means mechanically joining said heatsink and said electrical connection, said means mechanically joining being electrically insulative, wherein the device forms a compact assembly.

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5,495,890
**FLOAT OPERATED PNEUMATIC PUMP**
David H. Edwards, Ann Arbor; Kevin L. Newcomer, Monroe, and K. Lynn Niehaus, Manchester, all of Mich., assignors to QED Environmental Systems, Inc., Ann Arbor, Mich.
Continuation of Ser. No. 116,288, Sep. 3, 1993, Pat. No. 5,358,038, which is a continuation-in-part of Ser. No. 38,835, Mar. 29, 1993, Pat. No. 5,358,037. This application Oct. 19, 1994, Ser. No. 325,699
The portion of the term of this patent subsequent to Oct. 25, 2011, has been disclaimed.
Int. Cl.[6] E21B 43/00; 1/06
U.S. Cl. 166—105 18 Claims



1. A pump for directing liquid out of a well, said pump comprising:
a pump housing having a closed upper end and a closed lower end, said pump housing defining at least one interior chamber;
means for defining a pump refill mode and a pump discharge mode disposed within said interior chamber; and
a discharge valve connected to said upper end of said pump housing for selectively permitting said liquid to enter said interior chamber in said pump refill mode and permitting said liquid to be discharged from said interior chamber in said pump discharge mode.

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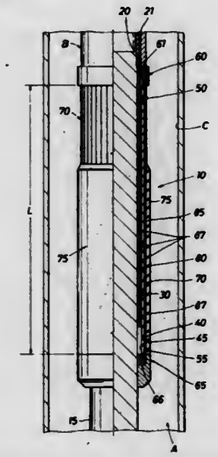
5,495,891
**FOAMED GEL EMPLOYED AS A DRILLING FLUID, A LOST CIRCULATION FLUID, OR A COMBINED DRILLING/LOST CIRCULATION FLUID**
Robert D. Sydansk, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio
Filed Nov. 8, 1994, Ser. No. 336,150
Int. Cl.[6] E21B 21/00; 33/138
U.S. Cl. 166—295 24 Claims

1. A process for drilling a wellbore from a wellhead at the surface into a subterranean formation for production of hydrocarbons, the process comprising:
placing a foamed gel in a wellbore being drilled, wherein said foamed gel comprises a crosslinkable carboxylate-containing polymer, a crosslinking agent containing a reactive transition metal cation, a surfactant, an aqueous solvent, and an added gas; and
substantially plugging a wellbore face of said wellbore with said foamed gel to prevent significant lost circulation of fluid from said wellbore across said wellbore face into a surrounding formation.



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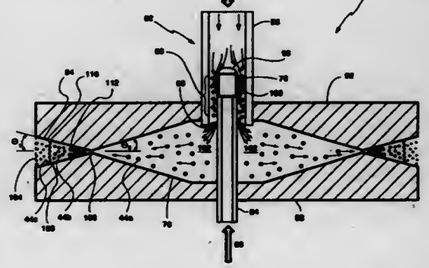
5,495,892
**INFLATABLE PACKER DEVICE AND METHOD**
James V. Carisella, P.O. Box 10498, New Orleans, La. 70181
Filed Dec. 30, 1993, Ser. No. 175,603
Int. Cl.[6] E21B 33/127
U.S. Cl. 166—387 2 Claims



1. An inflatable packer device for use in a subterranean well bore having a wall and carryable into said well bore on a conduit, said inflatable packer device being inflatable by pressured fluid communicated to the packer from a source of pressured fluid, said inflatable packer device comprising:
(a) a body having means on its upper end for selective engagement to said conduit, said body further having an exterior surface;
(b) an inflatable elastomeric bladder concentrically disposed around said body, said bladder having an interior, the bladder further having a first bladder end and a second bladder end, the interior of said bladder further having a length extending between the bladder ends, the bladder further being selectively movable between deflated and inflated positions, the bladder further having a capacity to seal around the exterior surface of said body during at least one of inflation or deflation of the bladder;
(c) first securing means engageable with one of said bladder ends for sealably securing said bladder end to said body;
(d) second securing means engageable with the other of said bladder ends for sealably securing said other bladder end to said body at least one of said first and second securing means enabling at least one of said bladder ends to move slidably relative to said body during inflation and deflation of said bladder;
(e) fluid transmission means for communicating said pressured fluid between the source of pressured fluid and the interior of said bladder to move the bladder between each of deflated and inflated positions, whereby the inflatable packer device may be moved into one of sealing and unsealing relationship with the wall of the well bore; and
(f) fluid path means disposed along said length of said interior of said bladder for communicating said pressured fluid along said length of said interior of said bladder, whereby said seal does not obstruct the effective communication of said pressured fluid along the length of said interior of said bladder, wherein said fluid path means comprises a tube concentrically disposed between said body and said bladder, said tube having an inner diameter, said body having an outer diameter, and further, said inner diameter of said tube being larger than said outer diameter of said body, whereby an annular gap is formed between said tube and said body, said tube further having a plurality of fluid passageways disposed therethrough along said length of said interior of said bladder, whereby said plurality of fluid passageways and said annular gap define a path for communication of pressured fluid along the length of said interior of said bladder.

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5,495,893
**APPARATUS AND METHOD TO CONTROL DEFLAGRATION OF GASES**
Daryl Roberts, Winchester, Mass., and James R. Butz, Denver, Colo., assignors to ADA Technologies, Inc., Englewood, Colo.
Filed May 10, 1994, Ser. No. 240,271
Int. Cl.[6] A62C 35/68
U.S. Cl. 169—37 16 Claims



1. In a system for suppressing an exothermic reaction in a defined region in response to a signal generated by a sensing device, an apparatus for dispersing a stream of liquid droplets in the defined region comprising:
means for contacting a gas with a liquid to form a fluid;
a channel communicating with and extending radially outward from the contacting means, wherein the cross-sectional area of the channel at a first radial distance from the contacting means is more than the channel cross-sectional area at a second radial distance from the contacting means, the first radial distance being less than the second radial distance; whereby the fluid is accelerated as it passes through the channel and
an outlet at the outer perimeter of the channel, said outlet having a cross-sectional area at a third radial distance from the contacting means that is less than the outlet cross-sectional area at a fourth radial distance from the contacting means, the third radial distance being less than the fourth radial distance, wherein the liquid has a supersonic velocity in at least one of the channel and the outlet and the outlet disperses a plurality of liquid droplets outward from the device.

5,495,894

## FIRE PROTECTION FILTER

Michael M. Späth, Lindwurmstr. 10/VII, D-8000 Munich 2, Germany

PCT No. PCT/EP89/00633, § 371 Date Sep. 27, 1993, § 102(e) Date Sep. 27, 1993

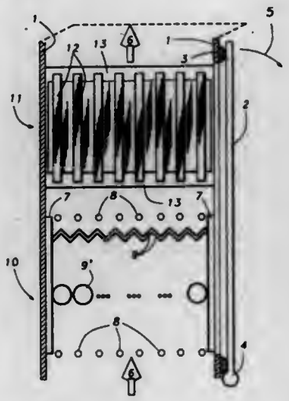
PCT Filed Jun. 6, 1989, Ser. No. 458,712

Claims priority, application Germany, Jun. 6, 1988, 38 19 258.6

The portion of the term of this patent subsequent to Mar. 27, 2010, has been disclaimed.

Int. Cl.[6] A62C 4/00

U.S. Cl. 169—48 12 Claims



1. Fire control closure for a ventilation duct, said fire control closure having at least one package of fireproofing plates consisting of a material that expands strongly under heat, said package being oriented in a direction of flow in the ventilation duct and filling a cross section of the ventilation duct, wherein at least one insert that fills the cross section of the ventilation duct is disposed near the package, said insert being filled with expanding material that is strongly beat conducting material.

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5,495,895

## TINE DEVICE FOR SOIL CONDITIONING AERATION MACHINE

Koichi Sakamoto, Ishikawa, Japan, assignor to Kabushiki Kaisha Sakamoto Seiki, Ishikawa, Japan

Filed Jun. 22, 1994, Ser. No. 263,668

Claims priority, application Japan, May 11, 1994, 6-097595

Int. Cl.[6] A01B 45/02

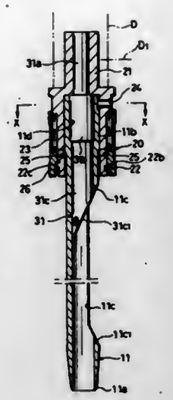
U.S. Cl. 172—22 7 Claims

1. A tine device for a soil conditioning aeration machine, the tine device comprising:

a pipe-shaped tine;

a coupler for removably mounting the tine onto a tine driving portion of a soil conditioning machine body, said coupler comprising engaging means and urging means for urging the engaging means against an upper portion of said tine when the upper portion of said tine is inserted in said coupler to removably attach the tine to the coupler; and

an internal member to be placed within the coupler, said internal member having a shaft portion capable of being inserted into a rear end position of said tine.



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5,495,896

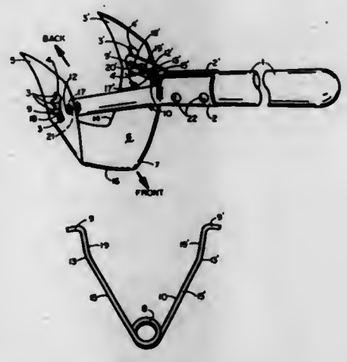
## ADJUSTABLE PITCH GARDEN HOE TOOL

James A. Bojar, 53226 Pasadena Blvd., Wauwatosa, Wis. 53226

Continuation-in-part of Ser. No. 16,252, Feb. 11, 1993, Pat. No. 5,285,855. This application Feb. 7, 1994, Ser. No. 192,613

Int. Cl.[6] A01B 1/06; 1/22

U.S. Cl. 172—372 5 Claims



1. As an article of manufacture, an adjustable pitch garden hoe tool comprising:

a a handle;

b ferrule leg mount segments attached to said handle;

c a base blade being mounted on said ferrule leg mount segments by means of fastening pivot pins so that the base blade may pivot on said ferrule leg mount segments;

d a compression V spring mounted between said ferrule leg mount segments, said compression V spring having two legs;

e arms attached to the legs of said compression V spring which extend into pitch set slots and pitch set stops in vertical sides of said base blade; and

f said arms of said compression V spring are movable back and forth from and into said pitch set stops to adjust the angle of said base blade with respect to the ferrule leg mount segments.



5,495,897

## PLOW DISK OF THE TYPE INTENDED TO BE MOUNTED FREE IN ROTATION ON A SHAFT INTEGRAL WITH THE FRAME OF A PLOW

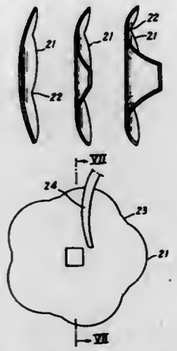
Jean-Charles Javerlhac, Les Rosiers - Glumps, 16300 - Barbezieux, France

Continuation of Ser. No. 773,879, Dec. 30, 1991, abandoned. This application Jun. 18, 1993, Ser. No. 78,039

Claims priority, application France, May 2, 1989, 89 05815; Nov. 3, 1989, 89 14424

Int. Cl.[6] A01B 15/16;23/06

U.S. Cl. 172—604 11 Claims



1. A plow disk for being mounted on a frame of a plow, said disk undergoing self-rotation during displacement of said plow on the ground, a central part of the disk being able to be mounted on a rotation shaft, the periphery of said disk being constituted by a plurality of substantially circular convex lobes, each of said lobes meeting adjacent lobes by a slightly rounded apex.

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5,495,898

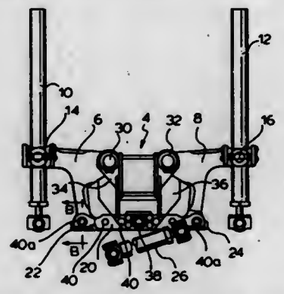
## BLADE CONTROL SYSTEM FOR MOTOR GRADERS

Edward McGugan, Holyrood, Canada, assignor to Champion Road Machinery Limited, Ontario, Canada

Filed Jul. 13, 1994, Ser. No. 274,410

Int. Cl.[6] E02F 3/76

U.S. Cl. 172—780 6 Claims



1. In a motor grader having a main frame with a drawbar universally connected at a forward end thereof to the main frame, a blade carrying moldboard secured to the end of said drawbar remote the universal connection with said main frame, two opposed bell cranks each pivotally secured at a position intermediate the bellcrank at one side of the main frame, lift cylinders located either side of the grader frame with a lower end of each cylinder connected to blade carrying moldboard, each bell crank at an upper distal end supporting a lift cylinder with a lower distal end of each bellcrank having a pivotal connection between the bell crank and a rigid link member connecting said bellcranks such that movement of one bell crank causes predetermined movement of the other bell crank, said link member having a plurality of locking ports which cooperate with a locking pin secured to said grader frame to lock said rigid link member and said bellcranks in various locked positions determined by said locking ports, and at least one of said locking ports being located within one of the pivotal connections of said bellcranks to said rigid link.

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5,495,899

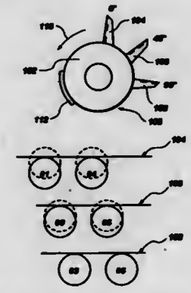
## REAMER WING WITH BALANCED CUTTING LOADS

Paul E. Pastusek, Salt Lake City, and Steve R. Matson, West Valley City, both of Utah, assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Apr. 28, 1995, Ser. No. 431,269

Int. Cl.[6] E21B 10/26;10/46; E21C 25/10

U.S. Cl. 175—57 15 Claims



1. An apparatus for enlarging a borehole in a subterranean formation, comprising:

a tubular, longitudinally-extending body adapted for rotation about a longitudinal axis therethrough;

a plurality of longitudinally-extending, circumferentially-spaced, generally radially-extending blades, each having a profile on the exterior thereof between said body and a gage diameter deemed by at least one of said blades;

at least one cutting element on the profile of one of said blades located with respect to at least one other cutting element on the profile of another of said blades in overlapping lateral relationship thereto as said body is rotated;

said at least one cutting element on said one of said blades being located with respect to said at least one other cutting element on said another of said blades so as to result in a cutting depth of said at least one cutting element which differs from that of said at least one other cutting element.

9. A method of modifying the depth of cut of at least two radially adjacent cutting elements which cut rotational paths which laterally overlap, said at least two cutting elements being set at different circumferentially-spaced positions on a subterranean formation boring tool, the method comprising: determining the relative circumferential positions of said at least two cutting elements; and

setting one of said at least two cutting elements at a depth of cut which substantially equalizes the volume of formation material cut by each of said at least two cutting elements.

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5,495,900

## DRILL STRING DEFLECTION SUB

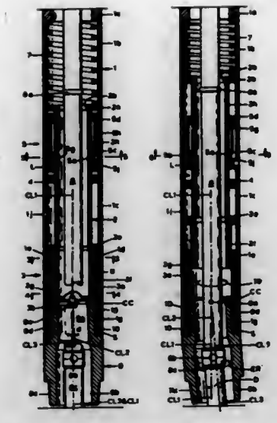
Thomas E. Falgout, Sr., 110 Charles Read St., Lafayette, La. 70503

Filed Jun. 29, 1994, Ser. No. 267,563

Int. Cl.[6] E21B 7/08

U.S. Cl. 175—74 17 Claims

1. A deflection control sub for use as an element of a drill string for selecting straight or deflected configuration of the down hole



assembly by particular manipulations of the surface drilling fluid controls, the sub comprising:

a) a generally tubular body with upper and lower portions bearingly connected for limited rotation therebetween, said upper portion having a first independent tubular: axis and said lower portion having a second independent tubular axis, said portions bearingly connected for said limited rotation about a third axis which is deflected a generally equal amount from said first and said second axes, the body having means at each end for fluid tight attachment to continuing drill string elements, and a fluid channel to conduct drilling fluid between said elements; and

b) a fluid motor, drilling fluid powered and responsive to drilling fluid flow, situated in one of said portions with an output shaft connected no the other said portion to rotationally move said lower portion from a first rotational position to a preselected second rotational position relative to said upper portion;

whereby a drill string containing said sub can be installed in a well in a straight configuration and be changed to a deflected configuration when drilling fluid flow is established.

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**5,495,901**

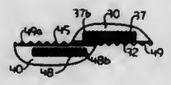
**SURFACE ADJUSTABLE ADJUSTABLE BENT HOUSING**

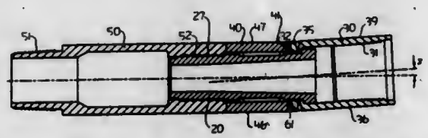
**Raymond D. Livingstone, Edmonton; David Kutinsky, Nisku; Murray Wilson, and Winston Smith, both of Edmonton, all of, Canada, assignors to Canadian Downhole Drill Systems Inc., Alberta, Canada**

**Filed Feb. 28, 1995, Ser. No. 395,995**

**Int. Cl.[6] E21B** *7/08;17/042*

**U.S. Cl. 175—74** **7 Claims**





1. An adjustable bent housing for use in downhole drilling, the adjustable bent housing comprising:

a housing having a housing central axis and a downward facing end face defining a plane whose normal is offset from the housing central axis, the housing also having an inner shoulder parallel to the downward facing end face;

a mandrel having a mandrel central axis and a first end dimensioned to fit inside the housing, the first end of the mandrel having a downward facing outer shoulder defining a plane whose normal is offset from the mandrel central axis;

a ring axially slidable on the mandrel, the ring having a ring central axis and an upward facing end face defining a plane whose normal is offset from the ring central axis; and

locking means connectable to the mandrel for engaging and disengaging the upward facing end face of the ring with the downward facing end face of the housing and simultaneously engaging and disengaging the inner shoulder of the housing with the outer shoulder of the mandrel.

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**5,495,902**

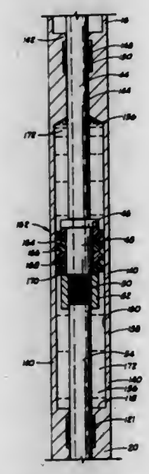
**COIL TUBING HYDRAULIC JAR DEVICE**

**Charles D. Hailey, 11628 Burning Oaks, Oklahoma City, Okla. 73150, and Ronald M. Beagle, P.O. Box 73875, Metairie, La. 70033**

**Continuation-in-part of Ser. No. 100,929, Aug. 3, 1993, Pat. No. 5,411,107. This application Jun. 3, 1994, Ser. No. 253,355**

**Int. Cl.[6] E21B** *31/113*

**U.S. Cl. 175—296** **25 Claims**



1. A jar device for suspension from coil tubing to loosen a stuck object, comprising:

a tubular body having an upper end and an axial opening therethrough, and being positively coupled to a gripping means that can be secured to the stuck object;

a mandrel including an impact surface and a cylindrical portion connected to an actuating plunger that extends reciprocally down through said tubular body axial opening;

connector means securing said mandrel to the coil tubing to place vertical push and pull forces on said mandrel;

guide means secured between said mandrel cylindrical portion and said tubular body for preventing relative rotation therebetween;

a hydraulic cylinder with a central fluid restrictor of reduced diameter formed generally centrally along said tubular body axial opening;

hydraulic fluid approximately half filling said hydraulic cylinder; and

a metering ring disposed on said actuating plunger and being reciprocal up and down through the hydraulic cylinder and central fluid restrictor in response to said vertical push and pull forces on said mandrel;

whereby said metering ring and central restrictor coact on both the up and down mandrel reciprocations to delay plunger movement for subsequent release and accelerated movement to impact in both the up and down reciprocations.



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**5,495,903**

**PULSATION NOZZLE, FOR SELF-EXCITED OSCILLATION OF A DRILLING FLUID JET STREAM**

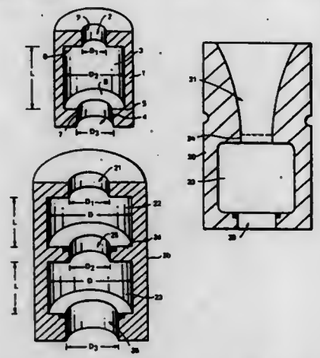
**William A. Griffin, Templeulace, Templemichael, Glanmire, Co. Cork, and Sextus M. De Almeida, 5 Glendower Court, Ballincollig Cork, both of, Ireland**

**PCT No. PCT/GB91/01790, § 371 Date Sep. 8, 1994, § 102(e) Date Sep. 8, 1994, PCT Pub. No. WO93/08365, PCT Pub. Date Apr. 29, 1993**

**PCT Filed Oct. 15, 1991, Ser. No. 211,686**

**Int. Cl.[6] E21B** *7/18;7/24;* **B05B** *1/08;* **F15B** *21/12*

**U.S. Cl. 175—424** **12 Claims**



1. A pulsation nozzle for self-excited oscillation of a thixotropic fluid, comprising a cavity having a diameter (D) and an axial length (L), and which nozzle further defines an axisymmetric inlet orifice having a diameter ($D_1$) and an outlet orifice having a diameter ($D_3$) in fluid communication with said cavity, wherein the inlet orifice is adapted to restrict and accelerate an incoming flow of a thixotropic drilling fluid when the nozzle is placed in a drill tool,

the diameter ($D_3$) of the outlet orifice being greater than the diameter ($D_1$) of the inlet orifice,

the diameter of the cavity (D) being greater than the diameter ($D_3$) of the outlet orifice,

wherein the axial length (L) of the cavity is chosen so as to induce the cyclical propagation of disturbances in a shear boundary defined between the thixotropic fluid passing directly through the nozzle and thixotropic fluid which is momentarily trapped in the cavity, thereby inducing a self-excited oscillating flow of said fluid within the nozzle, and a rapid pulsing flow emitting from the nozzle.

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**5,495,904**

**WHEELCHAIR POWER SYSTEM**

**Paul Zwaan, and Peter A. Nyberg, both of Auckland, New Zealand, assignors to Fisher & Paykel Limited, Auckland, New Zealand**

**Filed Sep. 13, 1994, Ser. No. 305,185**

**Claims priority, application New Zealand, Sep. 14, 1993, 248656**

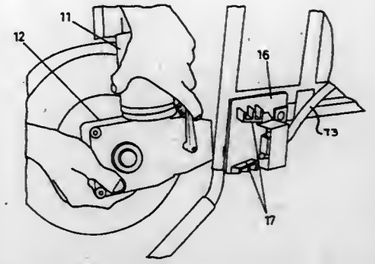
**Int. Cl.[6] B62D** *11/04*

**U.S. Cl. 180—11** **17 Claims**

1. A drive unit for a powered wheel chair comprising:

an electric motor having a rotor and a case,

a shaft driven by said rotor, said shaft adapted to have a wheelchair drive wheel mounted thereon, said shaft in static spatial position relative to said motor case,



a substantially vertically extending first connector mechanically coupled to and stationary relative to said motor case,

and a complementary shaped second connector within which said first connector engages in use and to restrict an engaged said first connector from all relative rotational movement and allow relative axial movement of said first connector in only a substantially vertical downward direction, said second connector adapted to be mounted on a wheelchair frame.

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**5,495,905**

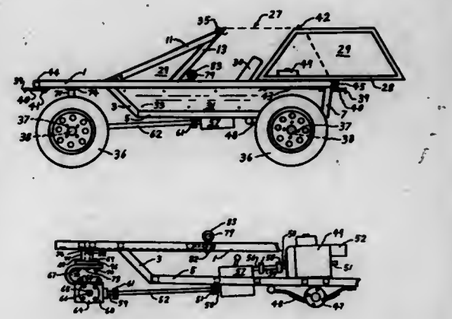
**MODULAR MOTOR VEHICLE**

**Anthony W. Fini, Jr., 4273 Mundy St., Blasdell, N.Y. 14219**

**Filed Sep. 21, 1994, Ser. No. 309,733**

**Int. Cl.[6] B62D** *61/00;21/00;* **B60G** *9/02;11/10*

**U.S. Cl. 180—21** **10 Claims**

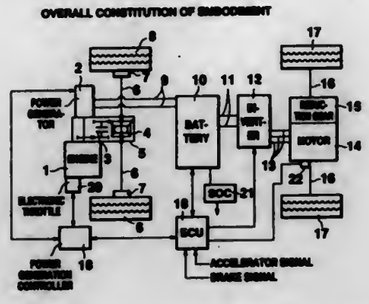


1. A vehicle having a body and frame constructed of members, means for joining said members, two main members parallel to each other and spanning the length of said vehicle and encompassing the outermost sides of said vehicle, shorter members joined to the top and bottom of said main members at angles to said main members starting at a distant point from the front of said main members and forming an arrow-like body and frame, panel inserts mounted between said members forming an enclosure for said vehicle, means for mounting said panel inserts, and the area under said main members from the front of said main members to said distant point is vacant for the front wheels, steering, and suspension of said vehicle.

## 5,495,906
## CONTROLLER OF HYBRID ELECTRIC VEHICLE

Masayuki Furutani, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jan. 24, 1994, Ser. No. 185,407
Claims priority, application Japan, Jan. 25, 1993, 5-9972
Int. Cl.[6] B60L *11/02*
U.S. Cl. 180—65.2 7 Claims




1. A controller of a hybrid electric vehicle having an engine and a motor for controlling driving of the engine and the motor, comprising:

a battery for supplying electric power to the motor;

motor-generated driving-force transfer means for transferring the driving force generated by the motor to wheels;

a power generator driven by the engine to supply generated electric power to the battery;

engine-generated driving-force transfer means for transferring the driving force generated by the engine to wheels;

running state detection means for detecting a vehicle running state; and

control means for controlling whether to transfer a driving force generated by an engine to a generator or wheels in accordance with a detected vehicle running state, wherein the control means transfers the driving force generated by the engine when said running state is a predetermined value or more, transfers the driving force generated by the motor to wheels when said running state is less than the predetermined value, and transfers the driving force generated by the engine to the power generator, and wherein the control means sets a period for transferring the driving forces generated by both the engine and motor to wheels when said running state changes from a value equal to or less than a predetermined value to a value larger than the predetermined value.

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## 5,495,907
## ENGINE DRIVEN GENERATOR SET SYSTEM HAVING SUBSTANTIALLY NO ROLL TORQUE

Stanley E. Data, Ramsey, Minn., assignor to Onan Corporation, Minneapolis, Minn.

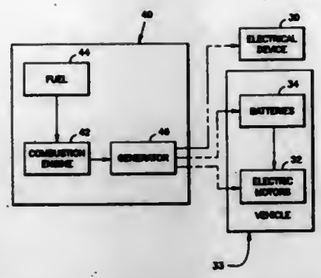
Continuation of Ser. No. 92,134, Jul. 15, 1993, abandoned.
This application Jun. 7, 1995, Ser. No. 481,183
Int. Cl.[6] B60K *1/00*
U.S. Cl. 180—65.2 17 Claims

15. A hybrid electric vehicle having an engine driven generator set as an auxiliary power unit, comprising:

a battery assembly providing electricity to the hybrid electric vehicle, the battery assembly being electrically connected to an electric motor of the hybrid electric vehicle;

the engine driven generator set electrically connected to the battery assembly for charging the battery assembly when the battery assembly needs charging; and

wherein the engine driven generator set system includes a generator having its rotor and stator mounted on counter rotating, concentric shafts so as to provide an auxiliary power unit having substantially no net angular momentum.

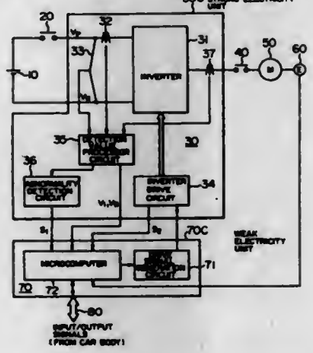



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## 5,495,908
## ELECTRIC CAR CONTROL SYSTEM

Sanshiro Obara, Ibaraki; Hiroyuki Yamada; Shigeyuki Yoshihara, both of Katsuta, and Nobunori Matsudaira, Hitachi, all of, Japan, assignors to Hitachi, Ltd., Tokyo, and Hitachi Automotive Engineering Co., Ltd., Ibaraki, both of, Japan

Filed Oct. 5, 1993, Ser. No. 131,607
Claims priority, application Japan, Jan. 6, 1992, 4-267051
Int. Cl.[6] B60K *1/00*; B60L *15/02*
U.S. Cl. 180—65.8 12 Claims




1. A control system for an electric car, comprising:

a motor connected to a battery as a main power source for driving the electric car;

a high voltage apparatus including an inverter for outputting a driving output for driving said motor based on power supplied thereto from said battery, said high voltage apparatus outputting data for controlling said inverter;

a low voltage apparatus, connected to said high voltage apparatus through a signal path, including a microcomputer for processing said data supplied from said high voltage apparatus through said signal path in order to output a calculation result for controlling said inverter, said low voltage apparatus outputting a drive signal to said high voltage apparatus through said signal path for controlling said inverter based on said calculation result;

connection means for connecting said high and low voltage apparatuses through said signal path in such a manner that said signal path is connected between said high and low voltage apparatuses in an electrically isolated state;

wherein signal transmission between said high and low voltage apparatuses is carried out using signals electrically isolated between these apparatuses; and



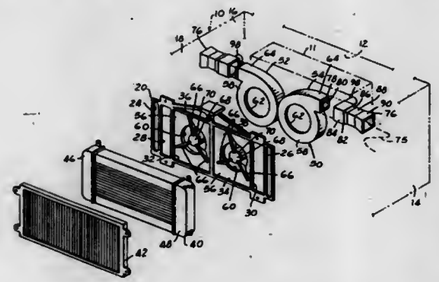
wherein said inverter is controlled in accordance with said drive signal sent from said low voltage apparatus through said signal path.

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## 5,495,909
## AUTOMOTIVE VEHICLE ENGINE BAY VENTILATION BY DUCTED-FAN-OPERATED EJECTOR

Herbert N. Charles, Chatham, Canada, assignor to Siemens Automotive Limited, and Siemens Aktiengesellschaft, both of, Germany

Continuation of Ser. No. 637,098, Jan. 3, 1991, abandoned.
This application Mar. 1, 1993, Ser. No. 24,884
Int. Cl.[6] B60K *11/06*
U.S. Cl. 180—68.1 14 Claims



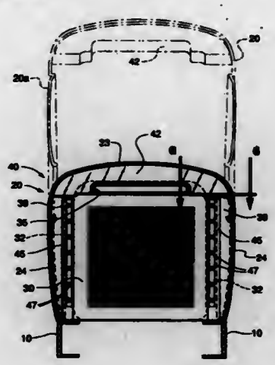
1. In an automotive vehicle which has an engine bay containing an engine for powering the vehicle, heat exchange structure which bridges a portion of said engine bay and provides cooling for said engine, a ducted fan system disposed on the engine bay side of said heat exchange structure and comprising a ducted fan structure that encloses the engine bay side of said heat exchange structure for drawing air through said heat exchange structure and a conduit structure that conveys the effluent from the ducted fan structure to a location outside the engine bay, the improvement which comprises said ducted fan structure comprising a scroll having an outlet via which the drawn air is delivered to said conduit structure, said improvement further comprising ejector means which is associated with said ducted fan outlet and said conduit structure such that effluent from said ducted fan outlet that passes to said conduit structure is caused to pass through said ejector means, said ejector means comprising means effective under certain conditions of operation to cause the flow of effluent therethrough to create a relatively lower pressure zone within said ejector means wherein the pressure is less than that of a relatively higher pressure zone that lies within a region that is exterior to the engine and that consists of that portion of said engine bay surrounding the engine and a location exteriorly adjacent said engine bay which is exposed to heat from said engine bay, said ejector means comprising means providing a tee connection to said relatively lower pressure zone, and ventilating conduit means connected to said tee connection communicating said relatively higher pressure zone that lies within said region to said relatively lower pressure zone within said ejector means such that the pressure differential existing between said relatively higher pressure zone and said relatively lower pressure zone is effective to induce a ventilating flow from said relatively higher pressure zone through said ventilating conduit means to said ejector means for entrainment with effluent passing through said ejector means and ensuing discharge to a location outside said engine bay.

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## 5,495,910
## RADIATOR SEALS FOR REAR HINGED TRACTOR HOOD

David B. Stauffer, New Holland; Robert D. Kurtz, Jr., Leola, both of Pa., and Herman A. Cease, Geneseo, Ill., assignors to New Holland North America, Inc., New Holland, Pa.

Filed Oct. 5, 1994, Ser. No. 318,316
Int. Cl.[6] B62D *25/10*
U.S. Cl. 180—69.2 9 Claims



1. In a tractor having a wheeled chassis adapted for movement over the ground; an engine mounted on said chassis to provide operative power therefor; a radiator supported on said chassis forwardly of said engine, said radiator being in operative communication with said engine for a circulation of engine fluids therethrough to effect a cooling thereof; and an engine hood pivotally supported from said chassis for movement between a closed position in which said engine and said radiator are inaccessibly covered and an opened position in which said engine and said radiator are accessible, the improvement comprising:

a hinge member pivotally connecting said engine hood to said chassis to provide a pivotal movement of substantially the entire engine hood in a generally vertical manner about a horizontal pivot axis; and

sealing means operatively positioned between said engine hood and said radiator to prevent the passage of air heated by said engine rearwardly of said radiator to pass forwardly of the radiator between said radiator and said engine hood, said sealing means including:

a top seal affixed to said engine hood to be compressible against said radiator when said engine hood is moved to said closed position; and

a pair of laterally opposed resilient side seals affixed, respectively, to laterally opposing sides of said radiator to engage with said engine hood when moved to said closed position to prevent said heated engine air from moving forwardly of said radiator along the sides thereof.

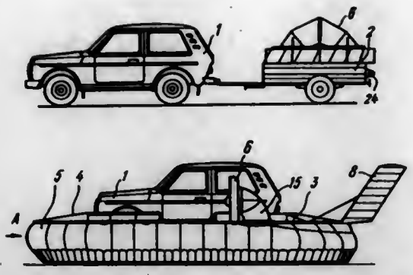
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## 5,495,911
## TRAILER-CONTAINER CONVERTIBLE INTO AIR CUSHION SUPPORT BASE FOR AUTOMIBILE

Alexandr S. Mamonov, Kirov, Russian Federation, assignor to Tovarischestvo S. Ogranichennoi Otvetstvennostju, Kirov, Russian Federation

Filed Apr. 5, 1994, Ser. No. 162,179
Int. Cl.[6] B60V *3/00*; B63B *7/00*
U.S. Cl. 180—116 11 Claims

1. An apparatus that can be hauled as a trailer by a vehicle and that can be converted into an air cushion support base for the vehicle, said trailer comprising a body for containing cargo, said air cushion support base having at least one air duct for an inflatable air tank and a cavity for an air cushion, said apparatus comprising section means for forming the body of the trailer and



for converting the body into a platform for supporting the vehicle, said section means comprising undersurface sections, perimeter sections, girder sections, and hinge means for connecting said undersurface sections to said perimeter sections such that the perimeter sections can be linked to the undersurface sections by the girder sections to form the at least one air duct, each of said undersurface and perimeter sections having a planar surface whereby the undersurface sections and perimeter sections can be folded with the planar surface of each perimeter section lying flat against the planar surface of, said apparatus further comprising flexible inflatable skirt means connected in air-tight relationship to said perimeter sections for forming the cavity for the air cushion.

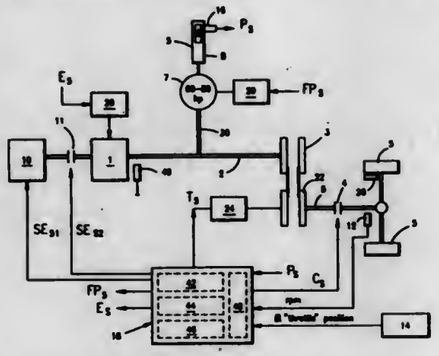
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**5,495,912**

## HYBRID POWERTRAIN VEHICLE

**Charles L. Gray, Jr., Pickney; Karl H. Hellman, and Michael J. Safoutin, both of Ann Arbor, all of Mich., assignors to The United States of America as represented by the Administrator of the U.S. Environmental Protection Agency, Washington, D.C.**

**Filed Jun. 3, 1994, Ser. No. 253,944**
**Int. Cl.[6] B60K *26/00***
**U.S. Cl. 180—165** **16 Claims**



1. A hybrid powertrain vehicle comprising:
a vehicle frame;
drive wheels rotatably mounted on said vehicle frame;
a primary engine, mounted on said vehicle frame, for providing engine power by rotation of an output shaft;
power storage means, mounted on said vehicle frame, for storing and releasing power generated by said primary engine;
first drive train means for transmitting said engine power to said drive wheels, said first drive train means including a transmission having adjustable speed input and output;
reversible means for selectively, while driven by said rotation of said engine in a first mode, transmitting said engine power to said power storage means or, operating as a motor in a second mode, transmitting stored power from said power storage means to said first drive train;
second drive train means, in parallel with at least a portion of said first drive train means, connecting said reversible means to said first drive train means, for, in said second mode, transmitting said stored power to said first drive train means and for, in said first mode, transmitting said rotation of said engine to said reversible means for transfer of a portion of said engine power to said power storage means simultaneously with transfer of the remainder of said engine power to said drive wheels;
vehicle speed sensor means for sensing vehicle speed;
stored power sensor means for sensing a quantity of power stored within said power storage means;
power demand sensing means for sensing power demanded of the vehicle by a driver;
comparing means for comparing said sensed quantity of stored power with a predetermined minimum amount of stored power and generating a demand signal upon determination that said sensed quantity is below said predetermined amount;
power output determining means for determining an additional increment of power in accordance with said demand signal and for determining an engine output power as a sum of the sensed power demand and the additional increment of power;
engine speed control means for controlling speed of said rotation of said output shaft by changing the input speed of said transmission responsive to a transmission signal;
engine speed determining means for determining an engine speed of optimum efficiency in accordance with said determined engine output power and said sensed vehicle speed and for outputting the transmission signal, indicative of the determined engine speed, to said engine speed control means;
engine load control means for controlling said engine power by controlling fuel feed to said primary engine responsive to said transmission signal; and
mode control means for converting operation of said reversible means between said first and second modes responsive to the demand signal.

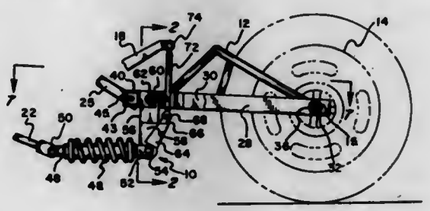
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**5,495,913**

## MOTOR VEHICLE AND SUSPENSION LINKAGE

**Frederick R. Salisbury, 8 Simpson Ave., Pitman, N.J. 08071**

**Filed Nov. 8, 1994, Ser. No. 335,682**
**Int. Cl.[6] B62K *11/00***
**U.S. Cl. 180—227** **22 Claims**



1. A shock absorbing apparatus for use on a motor vehicle comprising a horizontal axle on which a wheel rotates, and a frame having frame connection points positioned horizontal distances in a first direction from the horizontal axle, the connection points comprising at least one upper frame connection, a lower frame connection point, and at least one median frame connection point at a height between the upper frame connection points and the lower frame connection point, the device comprising:
(a) a swing arm member connected generally horizontally in the first direction from a rear end rigidly connected to the axle, the swing arm member comprising a front section terminating at a front end pivotal connection to the median frame connection point of the frame, said connection allowing the swing arm member to pivot in a vertical plane, and a median connection point on the front section of the swing arm member,
(b) shock absorbing means to absorb hard sudden forces comprising:
(i) a front end having a pivotal connection to the lower frame connection point of the frame, said connection allowing the shock absorbing means to pivot in a vertical plane, and
(ii) a moveable piston member extending rearwardly toward the axle,
(c) an integral linkage member comprising:
(i) a generally vertically disposed section comprising an upper end pivotally connected at a connection to the median connection point on the front section of the swing arm member, and a lower end pivotally connected at a connection to a terminal end of the moveable piston member of the shock absorbing means, said connections allowing the integral linkage member and the shock absorbing means to pivot in a vertical plane, and
(ii) a rearwardly, upwardly angled section comprising at least one rear connection point positioned rearwardly of the vertically disposed section, and
(d) at least one anchor arm member, disposed generally vertically, comprising:
(i) an upper end having a pivotal connection to an upper frame connection point of the frame, and
(ii) a lower end having a pivotal connection to a rear connection point of the rearwardly, upwardly angled section of the integral linkage member,
wherein the said connections of the anchor arm member allow the integral linkage member and the anchor arm member to pivot in a vertical plane.



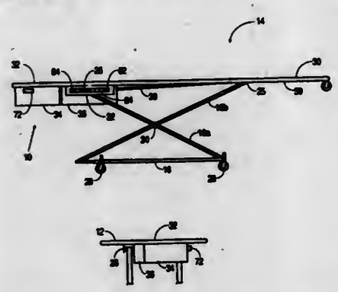
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**5,495,914**

## POWER LIFTING UNIT AND METHOD FOR CONNECTING MOBILE PATIENT TRANSPORTER

**Vito A. DiMucci, 14343 Old Wood Rd., Saratoga, Calif. 95070, and Michael V. DiMucci, P.O. Box 53, Saginaw, Minn. 55779-0053**

**Filed Aug. 9, 1993, Ser. No. 103,851**
**Int. Cl.[6] A61G *1/02***
**U.S. Cl. 182—141** **24 Claims**



1. A power lifting unit apparatus for adjusting the height of a gurney, the gurney having a platform with a top surface for holding a person and a bottom surface, an undercarriage containing wheels, and means connecting said platform to said undercarriage by using a scissors-like structure, said apparatus comprising:
an electric motor;
a lead screw coupled to and driven by said motor, said lead screw being mounted on a housing;
a threaded assembly engaged with said lead screw and capable of being slidably mounted on said bottom surface such that when said lead screw is rotated in a first direction, the threaded assembly moves away from said motor and when said lead screw is rotated in a second direction the threaded assembly moves toward said motor; and
a tension arm having a first end capable of being connected to a nonsliding support arm which is part of said scissors-like structure, and having a second end connected to said housing, said housing being capable of containing a sliding arm which is also part of said scissors-like structure;
wherein said threaded assembly is capable of being connected to said scissors-like structure such that rotating said lead screw in said first direction creates a tensile force in said tension arm and moves the sliding arm towards the nonsliding arm thereby moving said platform away from said undercarriage.

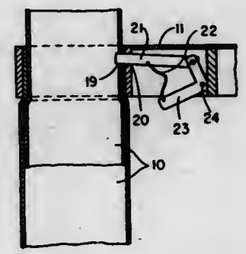
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**5,495,915**

## COLLAPSIBLE LADDER

**James T. Weston, and Richard Weston, both of Essex, Great Britain, assignors to Charles A. McDonnell, New City, N.Y., and Fergus R. Fitzgerald, Dublin, Ireland**

**Continuation of Ser. No. 930,694, Oct. 5, 1992, abandoned.**
**This application Dec. 29, 1994, Ser. No. 366,405**
**Claims priority, application United Kingdom, May 26, 1990, 9010990; Dec. 24, 1990, 9026295; Apr. 10, 1991, 9008092**
**Int. Cl.[6] E06C *1/12***
**U.S. Cl. 182—195** **14 Claims**



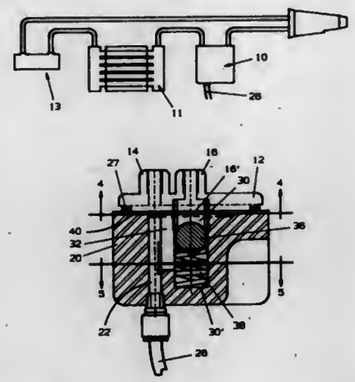
1. A collapsible ladder having two stiles formed of telescopically collapsible sections, said ladder comprising:
a plurality of at least three adjacent rungs, each rung mounted between two individual sections of the respective stiles,
a pair of latch mechanisms located in said at least three adjacent rungs for automatically locking the sections of the stiles relative to one another when the telescopic stile sections are fully extended,
a release mechanism operatively associated with each pair of latch mechanisms for releasing its operatively associated pair of latch mechanisms from locking engagement with said stile sections to cause said ladder to collapse automatically in a bottom-to-top sequence, said release mechanisms actuating release of their operatively associated latch mechanisms from underneath a said rung,
such that when a pair of latch mechanisms in a first rung is released from locking engagement with a pair of stile sections for a second rung immediately above said first rung, said second rung collapses downwardly against said first rung whereupon the release mechanism operatively associated with the latch mechanisms of said second rung engages the first rung and automatically releases the latch mechanisms of the second rung from locking engagement with the stile sections for a third rung immediately above said second rung to cause automatic collapse of said third rung against said second rung, said ladder automatically collapsing in sequence from bottom to top.

**5,495,916**

## METHOD AND TOOL FOR QUICKLY DRAINING THE TRANSMISSION FLUID IN AN AUTOMOTIVE VEHICLE

John DiMatteo, 1375 Leisure Dr., Hayden Lake, Id. 83835

Filed Nov. 25, 1994, Ser. No. 344,872
Int. Cl.[6] F16N *23/00;31/00*
U.S. Cl. 184—1.5 19 Claims



14. In an automotive vehicle having an automatic transmission, a transmission-filter element connected to a mounting bracket having an inlet orifice and an outlet orifice spaced apart a specified distance, the improvement comprising:

a transmission-fluid drainage element for use in place of said transmission-filter element when draining transmission fluid;

said transmission-fluid drainage element comprising a main housing having an upper surface and a lower surface;

an inlet opening and an outlet opening formed in said upper surface;

at least one passageway extending between said upper and lower surfaces, said passageway being in fluid communication with said upper inlet opening and having a lower opening;

tube-means operatively associated with said lower opening of said passageway for directing drained transmission fluid away from said at least one passageway;

said upper inlet opening and said upper outlet opening being spaced apart a specified distance substantially equal to the distance between the outlet and the inlet of said mounting bracket.

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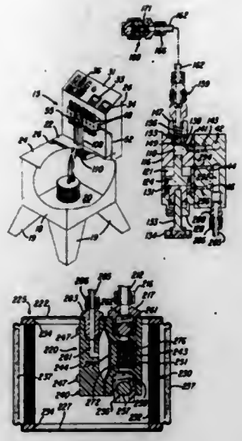
**5,495,917**

## LIQUID DISTRIBUTING APPARATUS FOR LUBRICATING PARTS

Steven J. Pax, Celina, Ohio, assignor to Pax Products, Inc., Celina, Ohio

Filed Jan. 3, 1995, Ser. No. 367,737
Int. Cl.[6] F16N *27/00*
U.S. Cl. 184—7.4 24 Claims

1. Apparatus adapted for repetitively distributing a predetermined amount of lubricating fluid to at least one point on a metal forming press, comprising at least one distribution pump including a body defining a pump chamber having an inlet and an outlet with corresponding check valves, an air actuated reciprocating piston within said chamber, a distribution line connecting said outlet to a discharge nozzle having a check valve, a fluid supply line connecting said inlet to an air actuated fluid supply pump including a body defining a pump chamber having an inlet and an outlet with corresponding check valves, an air actuated reciprocating piston within said supply pump chamber, said inlet of said supply pump chamber connected to receive a supply of fluid, an air controller connected to operate said piston of said fluid supply pump and said piston of said distribution pump in timed relation, and said controller including means for moving said piston in said supply pump in a direction to supply lubricating fluid to said distribution pump and for simultaneously moving said piston in said distribution pump in a direction for receiving the fluid from said supply pump for maintaining the fluid in said distribution line at a substantial minimum pressure.



23. Apparatus adapted for repetitively distributing a predetermined amount of lubricating fluid to at least one point on a metal forming press, comprising at least one distribution pump including a body defining a pump chamber having an inlet and an outlet with corresponding check valves, an air actuated reciprocating piston within said chamber, a distribution line connecting said outlet to a discharge nozzle having a check valve, a fluid supply line connecting said inlet to a fluid supply, said discharge nozzle including a tubular body, a nozzle spray tip removably secured to said body, said nozzle check valve including a tubular plastic insert within said body and having an internal annular groove retaining a resilient annular seat member, and a spring biased valve member within said insert and engaging said annular seat in a closed position.

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**5,495,918**

## SMOOTH AND QUIET LINEAR INDUCTION MOTOR ELEVATOR DOOR OPERATION

Richard E. Peruggi, Glastonbury; Thomas M. McHugh, Farmington; Edward E. Ahigian, West Hartford; Jerome F. Jaminet, South Windsor; Thomas He, Unionville; Thomas M. Kowalczyk, Farmington; Richard E. Kulak, Bristol, and David W. Barrett, East Hartland, all of Conn., assignors to Otis Elevator Company, Farmington, Conn.

Filed Apr. 6, 1994, Ser. No. 224,022
Int. Cl.[6] B66B *13/06;* E05F *1/04*
U.S. Cl. 187—316 4 Claims

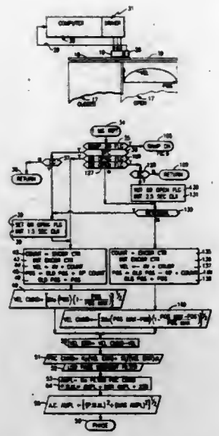
1. A method of operating a linear induction motor for opening and closing an elevator car door to which it is connected, comprising:

providing a predetermined magnetizing current signal indicative of an amplitude of a magnetizing current component of current to be provided to windings of said motor for generating magnetic fields working with advancing magnetic fields induced in said motor to provide force;

providing a force signal indicative of a magnitude of a linear force component of force producing current required in conjunction with said magnetizing current component to cause said linear induction motor to exert a desired force on the elevator door;

providing a total amplitude signal as the vector summation of said force signal and said magnetizing signal;





providing a frequency signal in response to said force signal indicative of the necessary slip frequency to provide the force indicated by said force signal; and

providing currents to said motor in response to said total amplitude signal and said frequency signal;

characterized by the improvement comprising:

providing said predetermined magnetizing current signal indicative of a normal force which is insufficient to overcome the gravitational pull on said door.

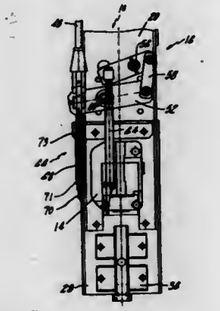
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**5,495,919**

## SAFETY BRAKE APPARATUS FOR AN ELEVATOR CAR OR COUNTERWEIGHT

Richard J. Ericson, Southington, and James M. Draper, Woodstock, both of Conn., assignors to Otis Elevator Company, Farmington, Conn.

Filed Apr. 25, 1994, Ser. No. 232,566
Int. Cl.[6] B66B *5/04*
U.S. Cl. 187—373 23 Claims



9. An elevator, comprising:

a hoistway;

a vehicle, for travel within said hoistway;

a governor rope assembly, having an overspeed brake and a governor rope extending throughout said hoistway;

a pair of safety brakes, each having an actuator arm for actuating said brake on one of said guiderails, wherein one of said brakes is attached to a first side of said vehicle and the other of said brakes is attached to a second side of said vehicle, said first and second sides being opposite one another; and

a safety apparatus, comprising:

a first link, pivotly attached to said first side of said vehicle, said first link also attached to said governor rope;

a connector rod, extending through said first side and a second side of said vehicle, and pivotly mounted in said sides;

a pair of second links, one of said second links fixed to said connector rod on said first side and the other of said second links fixed to said connector rod on said second side, wherein each said second link is attached to said actuator arm of said safety brake on the respective side of said vehicle;

an intermediate link for connecting said first and second links on said first side of said vehicle;

wherein in an overspeed condition, said overspeed brake brakes said governor rope and thereby causes said governor rope to actuate said first link, said intermediate link, and said second links, said second links in turn actuating said safety brakes, thereby causing said safety brakes to brake said vehicle.

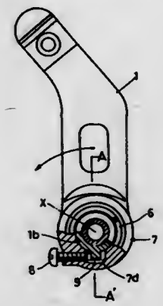
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**5,495,920**

## BRAKING FORCE ADJUSTING APPARATUS FOR A BICYCLE

Sakashita Tsuyoshi, Sakai, Japan, assignor to Shimano, Inc., Osaka, Japan

Filed Dec. 13, 1994, Ser. No. 357,604
Claims priority, application Japan, Dec. 16, 1993, 5-67119 U
Int. Cl.[6] B62L *1/14*
U.S. Cl. 188—24.22 25 Claims



1. A brake assembly for attachment to a bracket fixed to a bicycle comprising:

a brake caliper for pivotally mounting to said bracket;

a cover for pivotally mounting to said bracket between said brake caliper and said bracket, wherein said cover is movable relative to said brake caliper;

a biasing spring having a first leg attached to said cover and a second leg for attachment to said bracket;

a screw holder formed on said cover;

an adjusting screw meshed with said screw holder; and

a contact portion formed on said brake caliper for contacting said adjusting screw.

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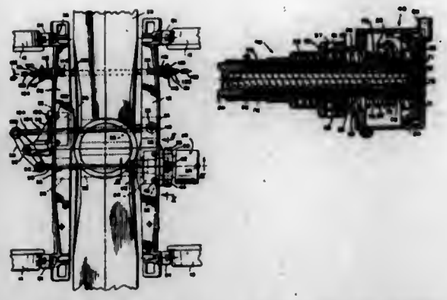
**5,495,921**

## SINGLE ACTUATOR TRUCK MOUNT BRAKE SYSTEM

Zdzislaw Samulak, Watertown, and Lyle Jantzi, Adams, both of N.Y., assignors to New York Air Brake, Watertown, N.Y.

Continuation-in-part of Ser. No. 118,719, Sep. 10, 1993, Pat. No. 5,400,874. This application Feb. 17, 1995, Ser. No. 390,523
Int. Cl.[6] F16D *65/56*
U.S. Cl. 188—202 9 Claims

1. A brake actuator for a rail vehicle's brake comprising:



a piston in a housing responsive to fluid pressure for actuating a brake;
a ram extending from said housing for connecting said actuator to said brake; and
a slack adjuster for adjustably interconnecting said piston and said ram as a function of the length of travel of the ram between its brake released and brake applied positions;
said slack adjuster including
a screw threadably connected to and rotatable with respect to said ram,
a first clutch for preventing rotation of said screw for a first relative position of said piston to said screw, a second clutch for preventing rotation of said screw for a second relative position of said piston to said screw, and said screw being rotatable for relative positions of said piston to said screw between said first and second relative positions,
said first clutch being a friction clutch to allow rotation of said screw for excess force on said ram pulling said screw toward a relative position with respect to said piston beyond said first relative position and out of relative positions between said first and second relative positions and wherein said second clutch is a toothed clutch.

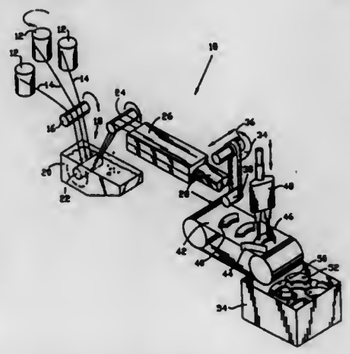
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**5,495,922**

## UNIFORM COMPOSITE FRICTION UNITS

**Benjamin V. Booher, Scottsdale, Ariz., assignor to Universal Design Research and Technology, Scottsdale, Ariz.**

**Continuation of Ser. No. 32,269, May 24, 1993, abandoned, which is a continuation-in-part of Ser. No. 647,137, Jan. 29, 1991, Pat. No. 5,156,787. This application Jul. 8, 1994, Ser. No. 272,030**
**Int. Cl.[6] F16D *69/02***
**U.S. Cl. 188—251 A** **20 Claims**



1. A composite friction unit comprising:
a three dimensional body formed of a uniform array of predominately glass strands of reinforcing fibers in matrix of phenolic resin material, said reinforcing fibers distributed throughout said body in a predetermined uniform distribution and orientation forming a friction unit having a predetermined size and configuration and uniform distribution and alignment of fibers throughout.

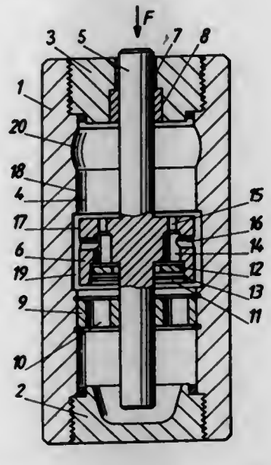
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**5,495,923**

## ELASTOMERIC SHOCK ABSORBER

**Marek Bruski, Kańczuga; Andrzej Chmielewski, Przeworsk; Józef Kędzior, Warsaw; Antoni Kubicki, Przeworsk; Kazimierz Milczarski; Wojciech Popławski, both of Warsaw, and Eugeniusz Strzyż, Kańczuga, all of, Poland, assignors to Kamax S.A. Fabryke Urzadzeń Mechanicznych, Kańczuga, Poland**

**Filed Feb. 18, 1994, Ser. No. 198,316**
**Claims priority, application Poland, Apr. 28, 1993, 298757**
**Int. Cl.[6] F16F *9/30***
**U.S. Cl. 188—268** **5 Claims**



1. An elastomeric shock absorber having enhanced damping characteristics comprising a casing (1) filled with a compressible elastomer; a piston rod (5) immersed in said elastomer; a piston head (6) mounted on said piston rod, said piston head being provided with connecting ports (14) communicating with front and back spaces of said piston head and being equipped with a mobile member (12); said mobile member being located between surface from which said connecting ports emerge as well as a ring or stop block (13); said stop block being mounted on a section of said piston head facing a flow chamber (19, 21–23), wherein said piston head moves into and out of an inner cylindrical surface (18) of said casing and wherein at least one annular groove is provided on said inner surface (18) of the casing, which together with an outer cylindrical surface (17) of the piston head form said flow chamber; said flow chamber shaped as a solid of revolution, and said solid of revolution being selected from the group comprising a cone, a ring, a torus and any combination thereof.

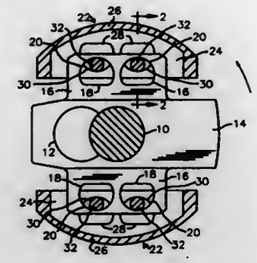


**5,495,924**

## HALF-ORDER CENTRIFUGAL PENDULUM VIBRATION ABSORBER SYSTEM

**Steven W. Shaw, Williamston, and Cheng-Tang Lee, Lansing, both of Mich., assignors to Quiescence Engineering Corp., Williamston, Mich.**

**Filed Jul. 13, 1994, Ser. No. 274,326**
**Int. Cl.[6] F16F *7/10***
**U.S. Cl. 188—378** **5 Claims**



1. A method of absorbing torsional oscillations within a member rotating about an axis at Q radians per second wherein the member is subjected to N torque pulses each rotation, using pairs of torsional oscillation absorbing masses movably mounted on the rotating member for angular movement relative to the member axis comprising the step of mounting the absorbing masses for oscillating movement on the rotating member in out-of-phase relation to each other to individually generate oscillating torques of base frequency NQ/2 such that when added together all harmonic components cancel except those of frequency NQ, which add directly to absorb the torsional oscillations of the rotating member.

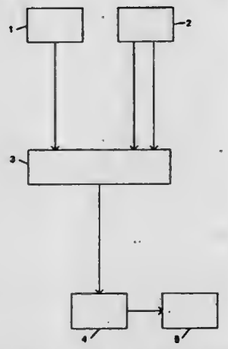
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**5,495,925**

## ANTI-THEFT DEVICE FOR A MOTOR VEHICLE

**Karl-Georg Eak, Schweinfurt, Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Germany**

**Filed Mar. 15, 1994, Ser. No. 212,962**
**Claims priority, application Germany, Mar. 16, 1993, 43 08 326.9**
**Int. Cl.[6] B60R *25/00*; B60K *23/02***
**U.S. Cl. 192—3.63** **15 Claims**



5. In a motor vehicle, a drive system including an anti-theft device, the drive system comprising:
an engine for generating mechanical power,
a key-operated ignition system for starting the engine and providing a reference time point for said anti-theft device,
wheel means for receiving the mechanical power to move the motor vehicle,
clutch means for engaging the engine with the wheel means, the clutch means having an engaged position for engaging the engine with the wheel means, and a disengaged position for disengaging the engine and the wheel means,
means for automatically moving the clutch means between the engaged and disengaged positions to automatically engage and disengage the engine and the wheel means, and
means for monitoring at least one operating condition of the motor vehicle and producing a signal corresponding to said at least one operating condition,
control means for operating said means for automatically moving, said control means comprising means for receiving said produced operating condition signal and means for operating said means for automatically moving to automatically engage and disengage said clutch means in response to said produced operating condition signal, and
said anti-theft device, said anti-theft device comprising:
means for producing a signal for permitting engagement of the clutch means to permit engagement of the engine with the wheel means; and
said control means comprising means for receiving said produced engagement signal of said anti-theft device to correspondingly operate said means for automatically engaging and disengaging to:
permit engagement of the clutch for an authorized user upon receipt of said produced engagement signal within a predetermined period of time before or after starting of the engine, and
disengage the clutch for an unauthorized user upon not receiving said produced engagement signal within a predetermined period of time immediately before or after starting of the engine.

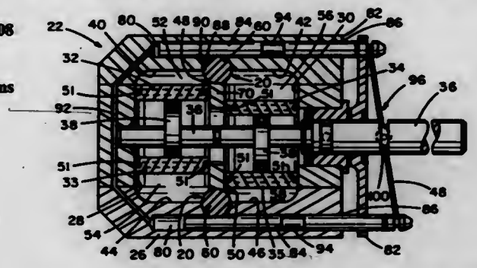
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**5,495,926**

## HYDRAULIC POWER TRANSMISSION APPARATUS

**Lawrence M. Rheingold, 10965 Clairmont Cir., Tamarac, Fla. 33321-5803**

**Filed May 23, 1994, Ser. No. 247,332**
**Int. Cl.[6] F16D *31/02***
**U.S. Cl. 192—60** **20 Claims**



11. In a power transmission apparatus having a housing with surfaces defining a hydraulic material pathway through which hydraulic material flows between a pair of cylinders, said housing surfaces defining a plurality of seating surfaces, a valve for regulating the flow of hydraulic material through the hydraulic material pathway, the valve comprising:
a circularly cylindrical occluding member having a longitudinal axis extending generally perpendicularly to the direction of flow of hydraulic material through the pathway and engaged by the seating surfaces of the housing for rotational movement of the occluding member about its longitudinal axis, said occluding member being disposed in occluding position within said hydraulic material pathway to divide said pathway into a first side and a second side;
said occluding member having at least one slot therein; and
rotating means for rotating said occluding member about its longitudinal axis to move said at least one slot between a first

position in which the flow of the occluding member is in fluid communication with both said first and second sides of said housing pathway to allow said hydraulic material to flow through said slot between said first and second cylinders, and a second position in which the slot of the occluding member is out of fluid communication with at least one of said first and second sides so that said hydraulic material is prevented from flowing between said first and second cylinders;

wherein said power transmission apparatus has a housing defining said plurality of seating surfaces and said occluding member is displaceable generally perpendicularly to its longitudinal axis, under the influence of the hydraulic material, from a first position in abutment with a first set of said plurality of seating surfaces to a second position in abutment with a second set of said plurality of seating surfaces.

20. A power transmission apparatus comprising:

a cylinder block defining a pair of hollow cylinders;

a pair of pistons disposed for reciprocation in each of said cylinders;

hydraulic material disposed within said cylinders;

said cylinder block defining at least one flow passageway connecting said cylinders with one another to permit reciprocating flow of said hydraulic material therethrough in response to reciprocation of said pistons; and

a valve disposed in said flow passageway for variable control of flow between said cylinders;

each said pair of pistons defining a cylinder space therebetween;

said cylinder space between each said pair of pistons being substantially filled with hydraulic material.

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**5,495,927**

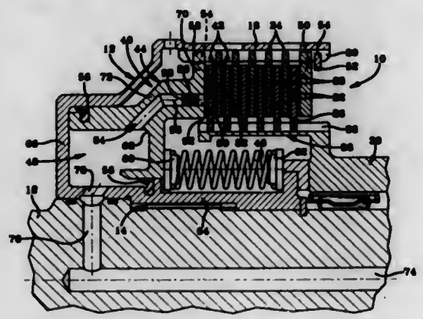
## CONTROLLED COOLING APPARATUS FOR TORQUE TRANSFER DEVICES

**Farzad Samie, Birmingham, and Andrew L. Bartos, Clarkston, both of Mich., assignors to General Motors Corporation, Detroit, Mich.**

**Filed Jun. 24, 1994, Ser. No. 266,814**

**Int. Cl.[6] F16D** *13/72;25/064*

**U.S. Cl. 192—70.12** **13 Claims**



1. A torque transfer device comprising:

a reaction plate;

a piston assembly;

a plurality of first, apply torque plates;

a plurality of second, reaction torque plates;

each said first and second torque plates having a generally flat, annular disk portion;

said disk portions on said first and second torque plates being interleaved:

said piston assembly having a head portion selectively to compress said interleaved torque plates against said reaction plate;

an annular groove in said head portion;

passage means penetrating said disk portions;

an annular friction disk interposed between the disk portion of each said first and second interleaved torque plates;

aperture means penetrating each said friction disk;

an annular channel means in an obverse engaging face of said friction disks;

said annular groove in said head portion being disposed to communicate with said annular channel means in a contiguously juxtaposed friction disk;

said passage means in said disk portions of said first and second torque plates being disposed in register with each other and with said aperture means penetrating said friction disks.

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**5,495,928**

## VEHICULAR CLUTCH ASSISTED OPERATION APPARATUS

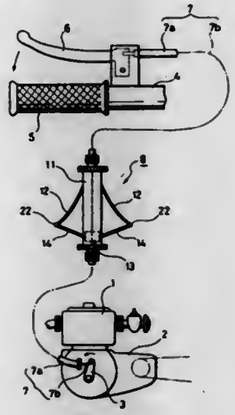
**Koichiro Sando, Villa Erumana A-7, 1-26-6 Sukedo, Ashikaga-shi, Japan**

**Filed Sep. 7, 1994, Ser. No. 301,883**

**Claims priority, application Japan, Nov. 30, 1993, 5-323389**

**Int. Cl.[6] F16D** *23/12*

**U.S. Cl. 192—89.29** **4 Claims**



1. A vehicular clutch assisted operation apparatus, comprising:

a frame having end portions provided with holes through which a clutch cable passes and a spaced portion disposed between the ends;

two flat springs each having one end affixed to one end of the frame and another end extending towards the other end of the frame;

a bracket that is clamped to a clutch cable passing through the spaced portion of the frame and is positioned at the other end when the clutch is engaged and moves together with the cable;

two linking rods which are at least shorter than the flat springs, are pivotally connected at one end to the clamp bracket and at the other end to the free ends of the flat springs and which push the free ends of the flat springs away from each other when the clutch is engaged.



**5,495,929**

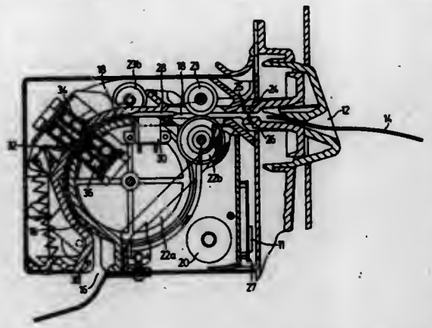
## APPARATUS AND METHOD FOR VALIDATION OF BANK NOTES AND OTHER VALUABLE DOCUMENTS

**Valeri V. Batalianets, #112-14/1 Rusanovskaja St., and Georgi O. Antonov, #42-39aKrasnozvezdnaja St., both of Kiev, Ukraine**

**Filed Mar. 16, 1994, Ser. No. 213,792**

**Int. Cl.[6] G07D** *7/00*

**U.S. Cl. 194—207** **15 Claims**



13. A method for validating the authenticity of bank notes and other documents having a predefined signature produced by magnetizable material in said documents, said method comprising:

(a) moving said document past a sensor head in proximity to said sensing head but without pressing said document against said sensor head,

(b) providing an oscillator connected to said sensor head so that said sensor head forms an inductance element of said oscillator, and generating an AC oscillator signal in said oscillator to produce an AC magnetic field adjacent said sensor head, said oscillator signal having a parameter dependant on the inductance of said inductance element,

(c) the presence of a document containing magnetizable material in proximity to said sensor head causing a variation in said inductance in said oscillator circuit and hence causing a variation in said parameter of said oscillator signal,

(d) processing said oscillator signal and generating an output validation signal indicative of an authentic document.

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**5,495,930**

## COIN-DEPOSIT LOCK

**Aage Lenander, Rungsted Kyst, and Bertil Engströ, Graested, both of, Denmark, assignors to Catena-Systems APS, Denmark**

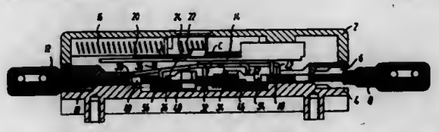
**PCT No. PCT/DK93/00141, § 371 Date Oct. 13, 1994, § 102(e) Date Oct. 13, 1994, PCT Pub. No. WO93/22750, PCT Pub. Date Nov. 11, 1993**

**PCT Filed Apr. 28, 1993, Ser. No. 318,827**

**Claims priority, application Denmark, May 1, 1992, 0573/92**

**Int. Cl.[6] G07F** *7/00*

**U.S. Cl. 194—212** **9 Claims**



1. Coin-deposit lock to be placed on a trolley capable of being part of a row of such trolleys connected to each other, said trolleys especially being in the form of shopping trolleys and baggage trolleys, said coin-deposit lock being adapted to liberate a trolley connected to the row by the insertion of a coin of a certain value in the lock and to free the coin having been inserted when the trolley is replaced and re-connected to the row, said coin-deposit lock being of the kind comprising a coin-insertion opening (66), a pivotable release member (34) and two key openings capable of being blocked, viz. a first key opening (6) for receiving and retaining a first key (8) belonging to the coin-deposit lock and a second key opening (10) for receiving and retaining a second key (12) belonging to a corresponding coin-deposit lock on a preceding trolley in the row, characterized by the combination of a sensing means for the coin size comprising a spring-biased main slide (14) and a spring-biased measuring slide (20) and the pivotable release member (34), in which the insertion of a correct coin (C) in the coin-insertion opening (66) followed by the insertion of the first key (8) in the first key opening (6) causes the coin (C), the main slide (14) and the measuring slide (20) to be moved forward to a retained position within the lock and pivoting of the release member (34) to a first position (FIG. 2), in which a first latching member (36) on the release member (34) engages in a throughgoing aperture (24,26) in the main slide (14) and the measuring slide (20) and retains these slides, and a second latching member (38) on the release member (34) is disengaged from an aperture (40) in the second key (12) and frees the latter from the second opening (10), and in which re-insertion of the second key (12) in the second key opening (10) causes pivoting of the release member (34) to a second position (FIG. 1), in which the first latching member (36) frees the main slide (14) and the measuring slide (20), and the coin (C) is returned to the coin-insertion opening (66), and in which the second latching member (38) engages in the aperture (40) in the second key (12) and retains the latter in the second key opening (10), and in which the release member (34) has a third latching member (42), in the first position (FIG. 2) of the release member (34) engaging in an aperture (44) in the first key (8) and retaining the latter in the first key opening (6), and in the second position (FIG. 1) of the release member (34) being disengaged from the aperture (44) in the first key (8) and liberates the latter from the first key opening (6).

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**5,495,931**

## METHOD AND APPARATUS FOR CALIBRATING A COIN CHECKING DEVICE

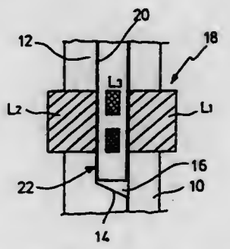
**Klaus Meyer-Steffens, Deinste, and Manfred Gröhlich, Buxtehude, both of, Germany, assignors to National Rejectors Inc. GmbH, Buxtehude, Germany**

**Filed Oct. 1, 1993, Ser. No. 130,356**

**Claims priority, application Germany, Jan. 2, 1992, 42 33 194.3**

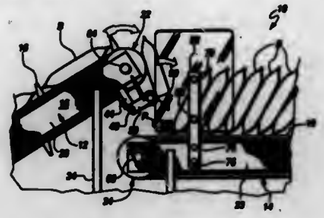
**Int. Cl.[6] G07D** *5/08*

**U.S. Cl. 194—317** **15 Claims**



1. A method for calibrating a coin checking device including at least one sensor, the method including the steps of inserting a calibrating module in a coin passing section accommodating all of said at least one sensor, generating sensor signals representing a physical feature of an acceptable coin by generating at least one measuring signal with the calibrating module, calculating a calibrating factor from the measuring signal determining at least one reference value from the sensor signals generated in the sensor, and storing said each reference value in a RAM memory of the coin checking device.

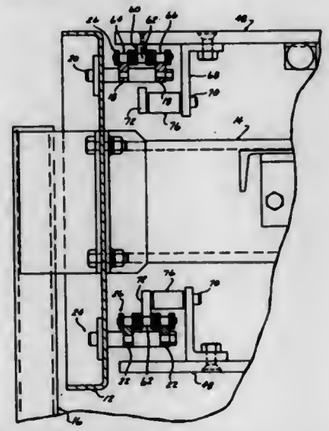
5,495,932
**CONVEYOR APPARATUS FOR COLLATING BAGGED FOOD PRODUCTS**
William B. Dyess, Rowlett, Tex., assignor to A. C. Horn & Co., Dallas, Tex.
Filed Mar. 9, 1994, Ser. No. 208,644
Int. Cl.[6] B65G 47/22
U.S. Cl. 198—464.1 4 Claims



1. A conveyor apparatus comprising:
an inclined conveyor portion having a discharge end from which bagged food products are dropped;
a horizontal conveyor portion disposed beneath the discharge end of the inclined conveyor portion for receiving the dropped bagged food products; and
bar means disposed beneath the discharge end of the inclined conveyor portion, said bar means comprising a cylindrical shaped roller for engaging the bagged food products as they fall from the inclined conveyor portion and flipping the bagged food products forward such that the bagged food products land in a substantially upright position on the horizontal conveyor portion, thereby collating them.

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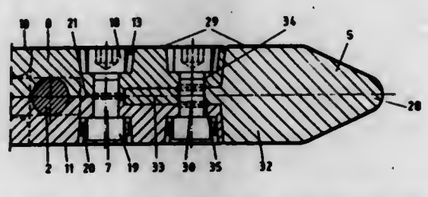
5,495,933
**CHAIN DRIVEN PALLET ACCUMULATING OVER/UNDER CHAIN CONVEYOR**
Jack D. Gyger, Charlotte, Mich., assignor to Roberts Sinto Corporation, Lansing, Mich.
Continuation of Ser. No. 49,343, Apr. 21, 1993, abandoned. This application May 9, 1995, Ser. No. 437,519
Int. Cl.[6] B65G 37/00
U.S. Cl. 198—465.3 14 Claims



1. An accumulating conveyor comprising:
a conveyor frame extending along the length of said conveyor;
a pair of triple roller strand drive chain loops on each side of said conveyor frame, each triple strand chain loop supported for recirculating movement to advance along an upper region of said conveyor frame and return along a lower region of said conveyor frame;
a pair of chain sprockets rotated about a common axis and located to receive a roller strand of a respective chain loop and guiding said chain through said recirculating movement, each of said drive chain loops passing around a respective sprocket in its recirculating movement;
a series of pallets resting on said drive chain loops in said upper region of said conveyor chain to be frictionally driven thereby;
a pair of pallet drive discs, each having a rim and mounted for rotation about an axis aligned with said chain sprocket axes, each pallet drive disc mounted adjacent to a respective chain sprocket with another roller strand of a respective chain passing over said rim of said pallet drive disc;
a series of circumferentially spaced recesses on each of said pallet drive discs and two side-by-side sets of a lengthwise spaced pair of engagement features on the underside of each of said pallets located to be successively received in recesses of said pallet drive discs as said pallet drive disc rotates, so that said pallets are successively driven by said pallet drive discs to be inverted and deposited on the chain loops in said lower region of said conveyor frame to be frictionally driven in a return path; and
means for holding said sets of pallet engagement features in said pallet drive disc recesses by said triple roller strand chain loops in passing around the axis of rotation of said pallet drive discs and sprockets, whereby said pallets are held in being inverted by rotation about said axis.

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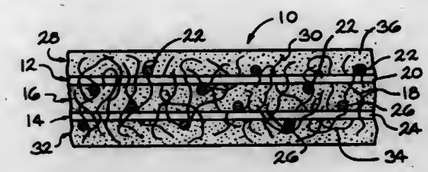
5,495,934
**REVERSIBLE CONVEYOR BELT WITH DOUBLE HELICAL CHAIN**
Johann Tekathen, Dinslaken, and Reinold Krohm, Herne, both of, Germany, assignors to HT Maschinenvertrieb GmbH, Bottrop, Germany
Filed Sep. 2, 1994, Ser. No. 300,140
Claims priority, application Germany, Sep. 28, 1993, 43 32 656.0; Jun. 29, 1994, 44 22 736.1
Int. Cl.[6] B65G 19/24
U.S. Cl. 198—731 12 Claims



1. Chain belt for chain conveyors used in underground mining and tunnel construction, having vertical and horizontal links and pushers spaced apart and encompassing the horizontal links, said pushers being equipped at the end with guide shoes adapted to the guide profile of the troughs, characterized in
that the guide shoes (5) are connected releasably to the base (8) of the pusher (4); that the guide shoes (5) are symmetrical when viewed transversely to the conveying direction (9); and that the base (9) is divided lengthwise in the center and has identically constructed top (10) and bottom (11) parts.



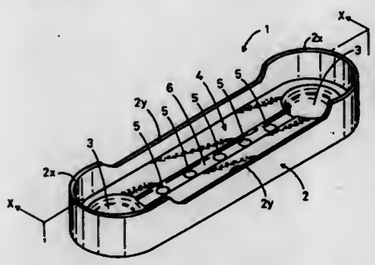
5,495,935
**CONVEYOR BELTING AND METHOD OF MANUFACTURE**
Florian S. Zabrou, Orchard Park; David K. Rice, Alden, both of N.Y., and Ernest E. Atkins, Phoenix, Ariz., assignors to Globe International Inc., Buffalo, N.Y.
Filed Aug. 12, 1994, Ser. No. 289,767
Int. Cl.[6] B65G 15/34
U.S. Cl. 198—847 59 Claims



1. A conveyor belting, which comprises:
a) at least two generally planar and parallel scrim means, each comprising a plurality of substantially parallel textile yarns;
b) fibrous material provided intermediate the two scrim means, the fibrous material being in the form of discrete staple fibers consolidated together through entanglement of the individual fibers and the discrete staple fibers being integrated with the yarns comprising the scrim means by entanglement of the fibrous material therewith to connect the two scrim means together, both entanglements being of the character produced by a needling operation; and
c) a polymeric material encapsulating the adjacent scrim means and the connecting fibrous material.

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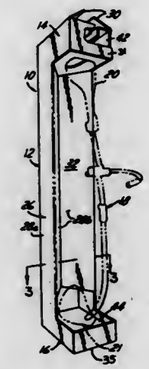
5,495,936
**DEVICE AND METHOD FOR FORMING AND RETAINING WATERDROPS**
Junichi Kuwabara, Osaka, Japan, assignor to Clover Manufacturing Co. Ltd., Osaka, Japan
Filed Aug. 29, 1994, Ser. No. 296,186
Claims priority, application Japan, Apr. 8, 1994, 6-070907
Int. Cl.[6] B05C 17/00; B44D 3/06
U.S. Cl. 206—1.7 13 Claims



1. A device for forming and retaining waterdrops comprising:
a water passage surface for flowing of water;
a plurality of waterdrop retaining recesses formed in the water passage surface;
means for removably supplying water to the water passage surface to form waterdrops at the respective waterdrop retaining recesses;
the water passage surface being formed with a linear water guide groove;
the waterdrop retaining recesses being formed at the water guide groove in a row extending therealong; and
the water supplying means comprising two water reservoirs, each water reservoir being provided at a respective end of the water guide groove for containing water at a level lower than the water passage surface.
5. A device for forming and retaining waterdrops comprising an upwardly open case which has a pair of water reserviors, the case further having a water guide groove connecting between the pair of water reserviors, the water guide groove being formed with a series of waterdrop retaining recesses spaced along the groove, the water guide groove having a bottom located higher than a bottom portion of each of the water reserviors.

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5,495,937
**SHIPPING AND DISPLAY CONTAINER FOR MOTORIZED IMPLEMENT**
Ronald A. Fraser, Chandler, Ariz., assignor to Ryobi North America, Inc., Easley, S.C.
Continuation-in-part of Ser. No. 6,375, Jan. 19, 1993, Pat. No. 5,332,085. This application Jul. 25, 1994, Ser. No. 279,657
The portion of the term of this patent subsequent to Jul. 26, 2011, has been disclaimed.
Int. Cl.[6] B65D 5/50; 71/08
U.S. Cl. 206—45.14 25 Claims



1. A point-of-sale display and access arrangement comprising:
a substantially fully assembled motorized implement having a housing with a motor therein, an elongate member extending from the housing and a handle attached to one of the housing and the elongate member; and
a folded-up cardboard display carton having a first portion, a second portion, a body portion connecting the first and second portions and an insert, at least one of the first and second portions having the insert disposed therein with the insert providing structural support to the first and second portion and the insert retaining a portion of the motorized implement;
the body portion having a rear panel and a pair of side panels which at least partially define an open channel, each side panel including a first side section and a second side section, the first side sections extending generally perpendicularly from the rear panel and the second side sections extending from the first side sections back toward the rear panel with the second side sections engaging the insert;
the first portion is contiguous with the side panels of the body portion and has a pair of side sections extending outwardly from the rear panel and a face section extending between the side sections of the first portion and spaced from the rear panel;
the second portion is contiguous with the side panels of the body portion and has a pair of side sections extending outwardly from the rear panel beyond the first side sections and a face section extending between and perpendicular to the side sections of the second portion and spaced from the rear panel, the second portion adapted for supporting the motorized imple-

ment in a generally vertical orientation when the second portion is placed upon a flat horizontal surface;

wherein the arrangement may be oriented in an upright position with the second portion resting upon a horizontal surface and the first portion being maintained vertically thereabove so that the motorized implement may be displayed; and

wherein the elongate member lies adjacent the open channel between the first and second portions so that the elongate member is displayed and the motorized implement is tactilely accessible at the point of sale and the arrangement of the carton and motorized implement can be carried in a generally horizontal fashion by using the motorized implement as a handle to carry the arrangement to a cash register and ultimately to a consumer's final destination.

21. A point-of-sale display and access arrangement comprising:

a substantially fully assembled motorized implement having a housing with a motor therein and an elongate member extending from the housing; and

a folded-up cardboard display carton having a first portion, a second portion, and a body portion connecting the first and second portions and an insert, at least one of the first and second portions having the insert disposed therein with the insert providing structural support to the at least one of the first and second portions and the insert retaining a portion of the motorized implement, the body portion having a rear panel and a pair of first outboard side panels, the first outboard side panels attaching to the rear panel to at least partially define an open channel, the body portion further including a pair of second inboard side panels cooperatively engaging the respective first side panels and extending rearwardly therefrom at an inclined angle toward and engaging the rear panel, the pair of second inboard side panels being supported by the first outboard side panels and the rear panel to form an angled display surface for point-of-sale graphics;

the first portion is contiguous with the outboard side panels of the body portion and has a pair of side sections extending outwardly from the rear panel and a face section extending between the side sections of the first portion and spaced from the rear panel;

the second portion is contiguous with the outboard side panels of the body portion and has a pair of side sections extending outwardly from the rear panel and a face section extending between the side sections of the second portion and spaced from the rear panel;

wherein the arrangement may be oriented in an upright position with the second portion resting upon a horizontal surface and the first portion being maintained vertically thereabove so that the motorized implement is displayed in a vertical manner; and

wherein the elongate member lies adjacent the open channel between the inboard side panels so that the elongate member is displayed and the motorized implement is tactilely accessible at the point-of-sale.

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**5,495,938**

**CONVERTIBLE DISPLAY CASE AND DESK ORGANIZER**

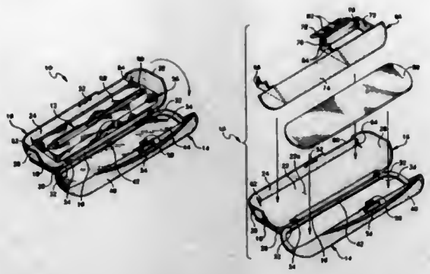
**Neville Bedford, Johnston, R.I., and Eduard U. Milea, Attleboro, Mass., assignors to The Quill Company, Inc., Cranston, R.I.**

**Filed Jan. 11, 1995, Ser. No. 371,281**
**Int. Cl.[6] A45C *11/34*; B65D *85/26***
**U.S. Cl. 206—45.14** **8 Claims**

1. A convertible display case and desk organizer comprising:

hingedly connected top and bottom sections pivotable with respect to one another between a closed position and an open position;

a first insert adapted to be releasably placed in the bottom section, said first insert being adapted to releasably receive an article, such as a writing instrument, the arrangement being such that, when said first insert is disposed within the bottom section, the top and bottom sections and first insert assume a display case mode;



a second insert adapted to be releasably placed in the bottom section when the first insert is removed therefrom, said second insert having an outwardly extending portion which extends outwardly beyond the edge of the top and bottom sections when they are in their closed position, said outwardly extending portion having at least one aperture formed therein for receiving an article, such as a writing instrument in a substantially upright position, the arrangement being such that, when said second insert is disposed within the bottom section, the top and bottom sections and the second insert assume a desk organizer mode.

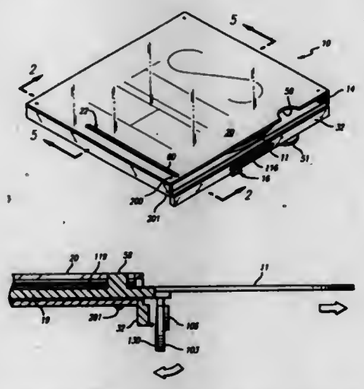
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**5,495,939**

**EJECTABLE COMPACT DISC CONTAINER**

**Tryfon Castritis, 421 N. Rodgo Dr., Ste. 15690, Beverly Hills, Calif. 90210**

**Filed Apr. 7, 1995, Ser. No. 418,181**
**Int. Cl.[6] B65D *85/57***
**U.S. Cl. 206—307** **11 Claims**



1. An ejectable portable hand held container for storing a compact disc therein comprising:

a substantially rigid box comprising a base portion, a cover portion, a front wall, a rear wall, a right side wall, and a left side wall.

hinging means associated with the front wall and either said base portion or cover portion for hinging the front wall to a selected one of the base portion and the cover portion such that the front wall can change in configuration from an open position to a closed position;

a tray portion disposed in a parallel relationship between the base portion and the cover portion, the tray having a right edge corresponding to the right wall, a left edge corresponding to the left wall, and a rear edge corresponding to the rear wall, said tray portion having a cavity therein conforming to said compact disc adapted to receive at least a portion of said compact disc therein;

sliding means for sliding the tray portion from a retracted position within said box to an extended position extending out of said box wherein a portion of the compact disc protrudes beyond the front wall when the tray portion is in the extended position, and said tray portion having a hinged flange extending outwardly therefrom toward said front wall, said flange having a hub portion extending upwardly therefrom, said hub portion being semi-circular and adapted to extend into the center hole of a compact disc when a compact disc is disposed in said tray portion, said hinged flange being adapted to move downwardly to a position perpendicular to said tray portion when said tray portion is in the extended position.



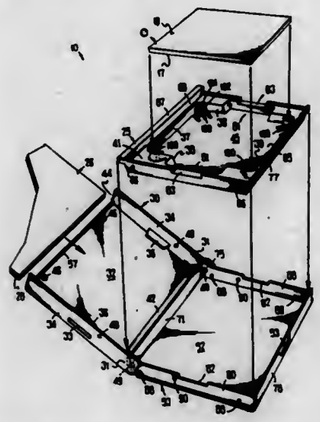
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**5,495,940**

**STORAGE CONTAINER FOR MINI-DISK CARTRIDGES**

**Yoshihiko Taniyama, Alpharetta, Ga., assignor to Sony Corporation, Tokyo, Japan**

**Continuation of Ser. No. 929,276, Aug. 13, 1992, abandoned, which is a continuation-in-part of Ser. No. 889,598, May 26, 1992, abandoned, which is a continuation-in-part of Ser. No. 869,815, Apr. 16, 1992, Pat. No. 5,310,054. This application Apr. 15, 1994, Ser. No. 227,903**
**The portion of the term of this patent subsequent to Dec. 7, 2010, has been disclaimed.**
**Int. Cl.[6] B65D *85/57***
**U.S. Cl. 206—308.1** **33 Claims**



1. An enclosure adapted to hold a substantially rectangular object having corners, said enclosure comprising:

a base tray including:

an inside bottom surface,

a pair of side walls extending upwardly from said inside bottom surface,

a rear wall extending upwardly from said inside bottom surface, and

a front wall extending upwardly from said inside bottom surface;

a cover including:

an inside top surface, and

a pair of side walls protruding downwardly from said inside top surface;

hinge means for pivotally connecting said base tray to said cover;

a receiving tray insertable into said base tray for receiving the object, said receiving tray including:

a pair of side walls, each having an inside portion,

a front wall formed to a front edge of said side walls and having an inside portion,

a rear wall formed to a rear edge of said side wall and having an inside portion,

a floor having an inner top surface integrally formed with a bottom portion of said receiving tray,

said inside portions of said side walls, said front wall, and said rear wall collectively forming an opening having a center and having a plurality of first corners, said opening corresponding to the shape of the object,

wherein each of at least two of said first corners of said opening having a respective second corner set off from said first corner in the direction of said center, said second corner being adapted to substantially surround the corresponding corners of the object when the object is inserted into said opening, thus securely holding the object, and wherein a step is integrally formed above said inner top surface in each of said second corners for supporting said object; and

connecting means for connecting said receiving tray to said base tray when said receiving tray is inserted into said base tray.

15. An enclosure adapted to hold a substantially rectangular object, said enclosure comprising:

a base tray including:

an inside bottom surface,

a pair of side walls extending upwardly from said inside bottom surface,

a rear wall extending upwardly from said inside bottom surface, and

a front wall extending upwardly from said inside bottom surface;

a cover including:

an inside top surface, and

a pair of side walls protruding downwardly from said inside top surface;

hinge means for pivotally connecting said base tray to said cover;

a receiving tray insertable into said base tray for receiving the object, said receiving tray including:

a pair of side walls, each having an inside portion,

a front wall formed to a front edge of said side walls and having an inside portion,

a rear wall formed to a rear edge of said side wall and having an inside portion,

said inside portions of said side walls, said front wall, and said rear wall collectively forming an opening corresponding to the shape of the object and further forming a window, and

each of said inside portions being flexible for surrounding and securely holding the object when the object is inserted into said opening; and

connecting means for connecting said receiving tray to said base tray when said receiving tray is inserted into said base tray.

20. An enclosure adapted to hold a substantially rectangular object having corners, said enclosure comprising:

a base tray including:

an inside bottom surface,

a pair of side walls extending upwardly from said inside bottom surface,

a rear wall extending upwardly from said inside bottom surface, and

a front wall extending upwardly from said inside bottom surface;

a cover including:

an inside top surface, and

a pair of side walls protruding downwardly from said inside top surface;

hinge means for pivotally connecting said base tray to said cover;

a receiving tray insertable into said base tray for receiving the object, said receiving tray including:

a pair of side walls, each having an inside portion,

a front wall formed to a front edge of said side walls and having an inside portion,

a rear wall formed to a rear edge of said side wall and having an inside portion,

said inside portions of said side walls, said front wall, and said rear wall collectively forming an opening having corners and corresponding to the shape of the object, and

at least two of said corners of said opening being adapted to substantially surround the corresponding corners of the object when the object is inserted into said opening, thus securely holding the object,

a floor having an inner top surface integrally formed with a bottom portion of said receiving tray, and having a disk mounting hub integrally formed with said top surface of said floor of said receiving tray for insertion into a hole located in said object, thereby contacting said hub with a surface surrounding the hole, for further securely holding said object when said object is inserted into said opening of said receiving tray, and

connecting means for connecting said receiving tray to said base tray when said receiving tray is inserted into said base tray.

**24**. An enclosure adapted to hold a substantially rectangular object, said enclosure comprising:

a base tray including:

an inside bottom surface,

a pair of side walls extending upwardly from said inside bottom surface,

a rear wall extending upwardly from said inside bottom surface, and

a front wall extending upwardly from said inside bottom surface;

a cover including:

an inside top surface, and

a pair of side walls protruding downwardly from said inside top surface;

hinge means for pivotally connecting said base tray to said cover;

a receiving tray insertable into said base tray for receiving the object, said receiving tray including:

a pair of side walls, each having an inside portion,

a front wall formed to a front edge of said side walls and having an inside portion,

a rear wall formed to a rear edge of said side wall and having an inside portion, and

said inside portions of said side walls, said front wall, and said rear wall collectively forming an opening having corners and corresponding to the shape of the object,

at least one of said inside portions having a flexible segment adapted to securely hold the object when the object is inserted into said opening,

a floor having an inner top surface integrally formed in a bottom portion of said receiving tray, and

wherein a step is integrally formed above said top surface in at least two of said corners of said opening; and

connecting means for connecting said receiving tray to said base tray when said receiving tray is inserted into said base tray.

**29**. An enclosure adapted to hold a substantially rectangular object having corners, said enclosure comprising:

a base tray including:

an inside bottom surface,

a pair of side walls extending upwardly from said inside bottom surface,

a rear wall extending upwardly from said inside bottom surface, and

a front wall extending upwardly from said inside bottom surface;

a cover including:

an inside top surface, and

a pair of side walls protruding downwardly from said inside top surface;

hinge means for pivotally connecting said base tray to said cover;

a receiving tray insertable into said base tray for receiving the object, said receiving tray including:

a pair of side walls, each having an inside portion,

a front wall formed to a front edge of said side walls and having an inside portion,

a rear wall formed to a rear edge of said side wall and having an inside portion,

said inside portions of said side walls, said front wall, and said rear wall collectively forming an opening corresponding to the shape of the object,

at least one of said inside portions having at least one rigid segment with a bottom edge,

a floor having an inside top surface formed to at least one of said bottom edges, said top surface located beneath said opening, and

at least one of said inside portions having a flexible segment adapted to securely hold the object when the object is inserted into said opening; and

connecting means for connecting said receiving tray to said base tray when said receiving tray is inserted into said base tray.

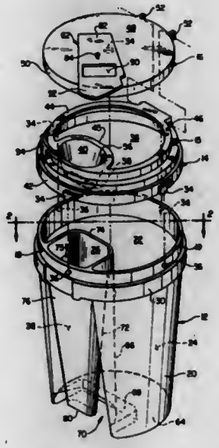
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**5,495,941**

## DUAL COMPARTMENT STERILIZABLE WASTE CONTAINMENT UNIT

**Jeremy W. Leonard, Dallas, Tex., assignor to Roatan Medical Services Corporation, Dallas, Tex.**

**Filed Apr. 8, 1994, Ser. No. 224,812**
**Int. Cl.[6] B65D *85/24***
**U.S. Cl. 206—366** **30 Claims**



**1**. A reusable article for collecting and safely containing mixed medical waste to be sterilized in situ, comprising:

a rigid walled container having a rim circumscribing the mouths of a soft waste cavity and a separate sharp waste compartment;

a removable closure defining an opening for the soft waste cavity and a smaller opening for the sharp waste compartment, said closure being mounted on the rim with the respective openings for the soft waste cavity and the sharp waste compartment leading into said mouths;

a cover mounted on the article above the closure, having a wall placeable to prevent access to the container by blocking said opening for the soft waste cavity and said opening for the sharp waste compartment;

the cover being liftable to access the sharp waste compartment and the soft waste cavity by exposing the opening of said soft waste cavity and said sharp waste compartment leading to said mouths whereby sharp waste can be deposited in said sharp waste compartment or soft waste deposited into said soft waste cavity.

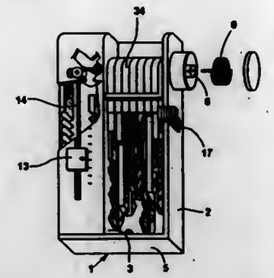


**5,495,942**

## AUTOMATIC EXTENDING MEMBER SELECTOR

**Allan Izhak, 2 High Point Dr., Poughkeepsie, N.Y. 12603**

**Filed Oct. 20, 1994, Ser. No. 326,316**
**Int. Cl.[6] A45C *11/32*; B25G *3/38***
**U.S. Cl. 206—372** **14 Claims**



**1**. A device for selectively extending one member selected from a plurality of extending members having mounting apertures, when retained in said device said device comprising,

a frame assembly comprising parallel side plates, including a first side plate and a second side plate, spaced apart from each other, a rear wall connecting said side plates at one longitudinal edge of said side plates and a bottom plate bridging said side plates at a bottom portion of said side plates, said side plates, rear wall, and bottom plate defining an open cavity of sufficient depth to allow for partial enclosure of extending members to be retained, said cavity being open in a frontal position parallel to said rear wall, and in a top position parallel to said bottom plate;

a hollow shaft extending between said side plates through throughholes, said shaft being capable of mating with mounting apertures of the extending members whereby the extending members can be rotatably mounted on said shaft, said shaft further having an open raceway formed therein;

a selector capable of selecting one retained extending member, said selector comprising a cylindrical member having a tailpiece extending therefrom, said selector being positioned within said hollow shaft with said tailpiece extending through said raceway to an exterior of said shaft whereby said shaft is capable of contacting a retained extending member selected for extension, said selector being movable within said shaft between said side plates,

a selector control for controlling said position of said selector,

a shaft biasing member for biasing said shaft to rotate between a closed position and an extended position, a retarding member preventing said shaft from rotating, and a release member for releasing said retarding member whereby said shaft is rotated by force of said biasing member.

**14**. A device for selectively extending one member selected from a plurality of extending members having mounting apertures, said device comprising;

at least one extending member,

a frame assembly comprising parallel side plates, including a first side plate and a second side plate, spaced apart from each other, a rear wall connecting said side plates at one longitudinal edge of said side plates and a bottom plate bridging said side plates at a bottom portion of said side plates, said side plates, rear wall, and bottom plate defining an open cavity of sufficient depth to at least partially enclose said at least one extending member, said cavity being open in a frontal position parallel to said rear wall, and in a top position parallel to said bottom plate;

a hollow shaft extending between said side plates through throughholes, said shaft being adapted to mate with mounting apertures of said at least one extending member whereby said at least one extending member can be rotatably mounted on said shaft, said shaft further having an open raceway formed therein,

a selector adapted to select one extending member, said selector comprising a cylindrical member having a tailpiece extending therefrom, said selector being positioned within said hollow shaft with said tailpiece extending through said raceway to an exterior of said shaft to contact one extending member selected for extension, said selector being movable within said shaft between said side plates,

a selector control for controlling said position of said selector,

a shaft biasing member for biasing said shaft to rotate between a closed position and an extended position, a retarding member preventing said shaft from rotating, and a release member for releasing said retarding member whereby said shaft is rotated by force of said biasing member.

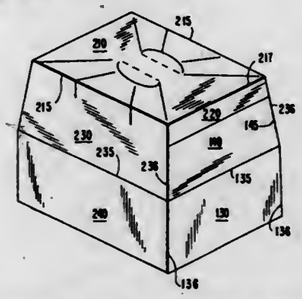
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**5,495,943**

## CLOSED PACKAGE FOR OBJECTS

**Patrick Bleusine, Milly sur Therain, France, assignor to 4 P Emballages France, Beauvais Cedex, France**

**Filed Jul. 8, 1994, Ser. No. 273,106**
**Claims priority, application France, Jul. 9, 1993, 93 08493**
**Int. Cl.[6] B65D *75/28*; *5/32***
**U.S. Cl. 206—427** **16 Claims**



**1**. A closed package for grouping a plurality of objects, comprising a first part having a central zone defining a horizontal wall and two other zones defining first and second generally vertical opposite walls; a second part which is separate from said first part and has a central zone defining another horizontal wall and two other zones defining third and fourth generally vertical opposite walls and connecting said first generally vertical wall to said second generally vertical wall in assembled condition; and locking means provided at two opposite ends of one of said parts and in said central zone of the other of said parts and locking said parts with one another, said central zone of said first part forming a bottom wall of the package, said second part having two further zones extending below and along said bottom wall, said locking means including locking openings formed in said bottom wall and locking tabs provided in said two further zones and cooperating with said locking openings.

**10**. A closed package for grouping a plurality of objects, comprising a first part having a central zone defining a horizontal wall and two other zones defining first and second generally vertical opposite walls; a second part which is separate from said first part and has a central zone defining another horizontal wall and two other zones defining third and fourth generally vertical opposite walls and connecting said first generally vertical wall to said second generally vertical wall in assembled condition; and locking means provided at two opposite ends of one of said parts and in said central zone of the other of said parts and locking said parts with one another, said first part having flaps which border said first and second generally vertical walls and extend internally against lateral edges of said third and fourth generally vertical walls, said locking means including a locking opening provided in each of said flaps bordering said first and second generally vertical walls at an intermediate height, and an arrangement formed on said second part of the package in the vicinity of said third and fourth generally vertical walls and cooperating with said locking openings.

**5,495,944**

## BOTTLE WITH TAMPER EVIDENT WRAPPING

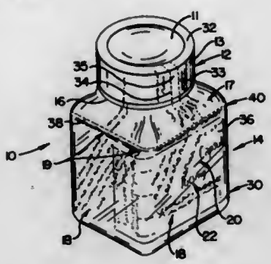
**Stephen C. Lermer, Greenville, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.**

**Filed Oct. 14, 1994, Ser. No. 323,400**

**Claims priority, application United Kingdom, Jan. 21, 1993, 9321755**

**Int. Cl.[6] B65B** *5/43*

**U.S. Cl. 206—459.1** **15 Claims**



1. A sealed tamper-evident container, comprising:

a bottle having a side wall portion and an open mouth portion;

a cap connected to said bottle mouth portion;

a frangible label connected to said bottle side wall portion;

a wrapper having an upper portion and a lower portion, with said upper portion overlying said cap and said lower portion overlying said bottle so that said cap is sealably fixed to said bottle, and with said wrapper lower portion overlying at least a portion of said label, said wrapper upper portion being removable from said container and said cap so that said cap can be separated from said container; and

means for securing said wrapper lower portion with said frangible label, whereby removal of said wrapper lower portion ruptures said frangible label, said rupture serving as a visible indicia of the removal of said wrapper bottom portion therefrom.

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**5,495,945**

## LOW DEPTH NESTABLE TRAY FOR BOTTLES OR THE LIKE

**William Apps, Anaheim, and Jonathan Kalin, Manhattan Beach, both of Calif., assignors to Rehrig Pacific Company, Inc., Los Angeles, Calif.**

**Continuation-in-part of Ser. No. 25,746, Mar. 3, 1993, Pat. No. 5,445,273, which is a continuation-in-part of Ser. No. 963,678, Oct. 20, 1992, Pat. No. 5,305,884, and a continuation-in-part of Ser. No. 9,358, Jun. 11, 1993, Pat. No. Des. 356,211, and a continuation-in-part of Ser. No. 9,359, Jun. 11, 1993, Pat. No. Des. 356,679. This application Oct. 8, 1993, Ser. No. 133,375**

**Int. Cl.[6] B65D** *21/02*

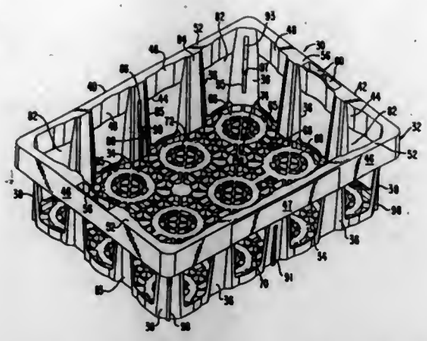
**U.S. Cl. 206—519** **18 Claims**

17. A low-depth nestable tray for bottles, said tray adapted to be nested with other similar trays when empty of bottles and low-depth stacked with other similar trays when loaded with bottles, said tray comprising:

a low-depth wall structure including a peripheral tray band, said wall structure including side walls and end walls;

a floor having a floor top surface and a floor bottom surface, said floor top surface comprising a plurality of support areas for supporting an array of bottles vertically upright, said floor bottom surface including upwardly recessed bottle top receiving areas for receiving tops of bottles in at least one similar tray therebeneath; and

a plurality of columns along said wall structure interconnecting said band and said floor, said columns configured and positioned so as to not interfere with bottles or multi-packs of bottles supported on said floor and to empty nest with similar



columns of another similar tray, wherein at least two of said columns are ribbed columns, each said ribbed column comprising:

(a) an exterior rib extending vertically downward and outward such that the bottom of said exterior rib is substantially flush with said floor bottom surface,

(b) an interior rib extending vertically upward and inward from said floor top surface opposite said exterior rib, and

(c) a vertical slot positioned above said interior rib,

wherein the top of said interior rib and the bottom of said slot form a nesting rib and said slot is configured and positioned to matingly receive the exterior rib of another similar tray empty nested thereabove and therewith such that the bottom of the exterior rib rests on said nesting rib of said tray when empty and nested with another tray thereabove.

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**5,495,946**

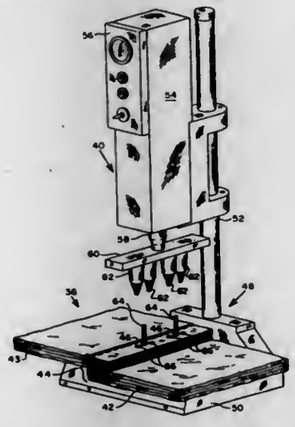
## WICKETLESS SADDLE PACK OF PLASTIC BAGS

**Gordon F. Pickering, Lyons, and Bruce R. Wilkes, Mendon, both of N.Y., assignors to Huntsman Packaging Corp., Macedon, N.Y.**

**Continuation-in-part of Ser. No. 235,499, Apr. 29, 1994. This application Dec. 19, 1994, Ser. No. 358,736**

**Int. Cl.[6] B65D** *33/14*

**U.S. Cl. 206—554** **5 Claims**



1. A wicketless saddle pack of thermoplastic bags comprising:

a first stack of a plurality of individual thermoplastic bags, each bag thereof being consecutively arranged in the stack and having a bottom edge, upper and lower walls, a pair of side edges, and an open top end;



a second stack of a plurality of individual thermoplastic bags, each bag thereof being consecutively arranged in the stack and having a bottom edge, upper and lower walls, a pair of side edges, and an open top end;

a lip segment formed adjacent the open end of each individual bag, said lip segment being an extension of the lower wall of a respective bag, each bag being removable from its respective lip segment along a perforated tear line formed between the open end of the bag and the lip segment, the consecutive lip segments defined by the first stack positioned atop the consecutive lip segments defined by the second stack of bags so that the bags in the first stack are oppositely opposed to those in the second stack;

a pad being formed by said consecutive lip segments of both the first and second stack of bags, said pad being bonded together with ultrasonic vibratory energy from a shaped ultrasonic horn; and

at least one locating passageway formed through the bonded pad, said at least one passageway for suspending the two bag stacks over a mounting bar so that an individual bag from either stack is removable from the bonded pad by tearing the bag therefrom along its respective perforated tear line.

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**5,495,947**

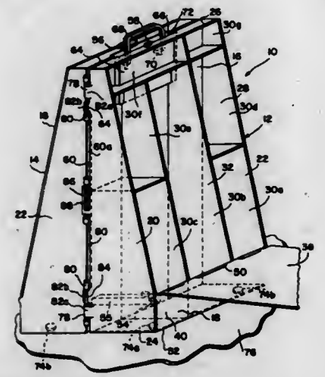
## BINGO BOX

**Donald E. Zarske, 3965 Sunstream Pkwy., Virginia Beach, Va. 23456**

**Filed Jan. 5, 1995, Ser. No. 369,105**

**Int. Cl.[6] A63F** *7/22*; **A45C** *11/00*

**U.S. Cl. 206—579** **12 Claims**



1. A bingo box comprising:

relatively rigid first and second containers, each having base and work sidewalls opposite each other, tapered right and left edge walls opposite each other, and wider and narrower end walls opposite each other, said walls being interconnected to define together a storage space therebetween such that when the base sidewall is supported at, and approximately parallel to, a horizontal support surface the end walls are substantially perpendicular to the horizontal support surface and the work sidewall is held above the horizontal support surface at upper edges of the end walls for receiving bingo cards on an angled outer surface of the work sidewall, there being a handle at said narrower end wall of at least one of said first and second containers for being used to carry said bingo box;

wherein each of said work sidewalls includes at least one angled panel attached to other elements of the respective first and second container by a hinge, said angled panel defining said angled outer surface when said angled panel is in a closed position for closing said storage space, but said angled panel being rotatable on said hinge to an open position for providing access to said storage space;

wherein said first container includes a right complementary hinge means at an intersection of its tapered right edge wall and base sidewall and the second container includes a left complementary hinge means at an intersection of its tapered left edge wall and base sidewall, said right and left complementary hinge means having the function of engaging one another for allowing said first and second containers to rotate relative to one another between a carrying configuration in which said base sidewalls are adjacent one another and a working configuration in which said base and work sidewalls are approximately coplanar to one another;

wherein, when said first and second containers are in said carrying configuration said handle can be used for carrying both said first and second containers, and anything in said storage compartments, while said angled panels can be hinged for access to said storage space; and

wherein, when said first and second containers are in said working configuration they can be simultaneously placed on said horizontal support surface, with said base sidewalls adjacent said horizontal support surface, and bingo cards can be place on said angled panel for playing said bingo cards while said angled panels can be hinged for accessing said storage space.

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**5,495,948**

## ASH MELTING FURNACE ARRANGEMENT AND METHOD FOR SUPPLYING ASH TO ASH MELTING FURNACE

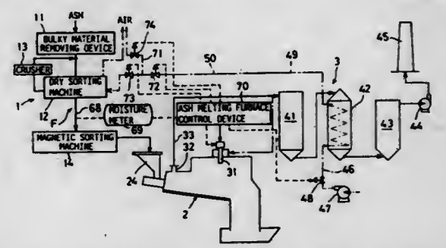
**Michio Ishida, Nara; Tsutomu Kuwahara, Kashihara; Satoshi Kawaguchi, Kawachinagano; Tadashi Kono; Norihiro Aoki, both of Toyonaka; Yoshitoshi Sekiguchi, Maizuru; Kunio Sasaki, Maizuru, and Hideo Shimotani, Maizuru, all of, Japan, assignors to Hitachi Zosen Corporation, Osaka, Japan**

**Filed May 31, 1994, Ser. No. 251,716**

**Claims priority, application Japan, Jun. 1, 1993, 5-129861; Jan. 14, 1993, 5-256810; Feb. 28, 1994, 6-029242**

**Int. Cl.[6] B03B** *1/00*; **B03C** *1/30*

**U.S. Cl. 209—11** **2 Claims**




1. An ash melting furnace arrangement including an ash pretreating unit for pretreating ash which contains a large quantity of water and for supplying the ash to an ash melting furnace, said pretreating unit comprising a dry sorting machine for removing solids of a size larger than a predetermined value from the ash and for drying the ash, a magnetic sorting machine for removing metals from the ash dried by the dry sorting machine, and a drying air pipe for introducing high-temperature air heat-recovered from exhaust gases discharged from the ash melting furnace to the dry sorting machine as drying air, wherein said dry sorting machine comprises:

a casing having a first end and a second end,

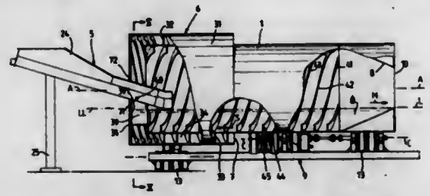
a screen having a vibratory frame arranged within the casing to slant from the first end of the casing downwardly toward the second end thereof, a plurality of spaced apart comblike blade plates attached to the vibratory frame in a descending series of cascades, and a vibrator connected to the vibratory frame;

an ash supply port disposed above the first end of the casing for supplying ash therethrough;

a solids discharge port disposed below the second end of the casing;
an ash exhaust port disposed below the screen; and
a drying air supply port connected to the drying air pipe and disposed below the screen.

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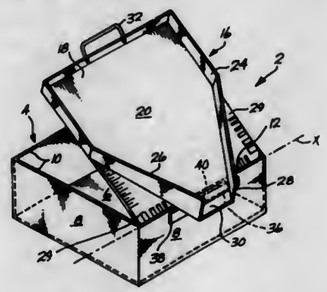
**5,495,949**
**SYSTEM FOR TREATING SOLID PARTICLES IN A MEDIUM**
**Paul A. Olivier, Handzamestnoat 159, B-8610 Handzame, Belgium**
**Filed Jul. 9, 1993, Ser. No. 88,538**
**The portion of the term of this patent subsequent to Dec. 21, 2012, has been disclaimed.**
**Int. Cl.[6] B03B 5/42**
**U.S. Cl. 209—172.5** **22 Claims**



1. A system for a solid particles—liquid treatment, said system comprised of
(a) a first longitudinal scrolled barrel containing a liquid bath wherein the treatment takes places;
(b) a second scrolled barrel attached to and communicating with the first barrel, said second barrel being provided with a means for preventing the freeflow of medium from out of the bottom of the bath while at the same time allowing for the free passage of solid particles through the bottom of the bath;
(c) a means for insuring a substantially uniform liquid level in the bath, and
(d) a means for rotating the two barrels.

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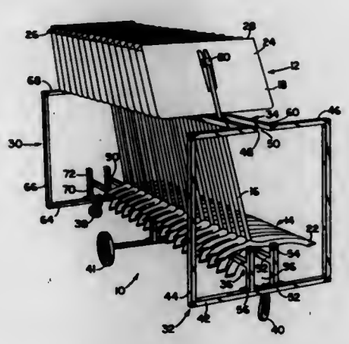
**5,495,950**
**ARTICLE SORTER**
**Roger D. Jellum, 29202-37th Pl. S., Auburn, Wash. 98001**
**Filed Aug. 18, 1994, Ser. No. 292,780**
**Int. Cl.[6] B07C 7/04; B65D 85/00**
**U.S. Cl. 209—703** **10 Claims**



1. A device for sorting articles comprising:
a base having an upper horizontal support surface with an outer mounting edge;
a tray having a bottom wall with an upper sorting surface and an opposite lower surface, and sidewalls extending upwardly from peripheral portions of said bottom wall; said tray having a discharge end, and said sidewalls having converging portions converging toward said discharge end to define a discharge opening in said sidewalls at said end; and said tray having a reduced width end portion terminating in said discharge end; and
a hinge attached to said mounting edge of said base and to said lower surface of said bottom wall of said tray to pivotably mount said tray on said base, said hinge being attached to said bottom wall at a location spaced inwardly from said discharge end and said reduced width end portion to permit said tray to be pivoted between a sorting position, in which said bottom wall rests on said support surface, and a discharge position, in which said discharge end is tilted downwardly relative to said mounting edge to allow discharge of articles from said sorting surface, through said opening, into a container placed adjacent to said base, and to permit said reduced width end portion to be tilted downwardly into a container placed adjacent to said base and having a top opening wider than said discharge end.

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**5,495,951**
**MOBILE MUSIC STAND CART AND METHOD**
**Americole Biasini, Bellingham, Wash., assignor to Manhasset Speciality Co., Yakima, Wash.**
**Filed Mar. 1, 1994, Ser. No. 204,646**
**Int. Cl.[6] A47F 7/00**
**U.S. Cl. 211—13** **7 Claims**

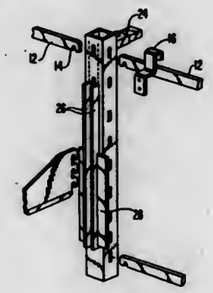


1. A mobile music stand storage rack arranged to support a plurality of music stands, each stand comprising an upper laterally extending panel section, a vertical support column, and a base having support means extending outwardly from a lower end of said support column, said storage rack having a front end, a rear end, and a forward to rear extending longitudinal center axis, said rack comprising:
a. a central longitudinally extending support/guide section, comprising;
i. an upper guide section comprising a pair of laterally spaced, parallel upper guide rods defining therebetween a substantially unobstructed passageway to receive an upper portion of support columns of the music stands, said passageway aligned along said longitudinal center axis, said upper guide rods each having an upwardly facing upper support surface to engage lower positioned edges of the panel sections of the music stands in a manner to constrain upper ends of the support columns to be centrally located along said longitudinal center axis
ii. a lower longitudinally extending lower support means providing an elongate upwardly facing lower support surface to engage a lower base surface portion of the base of each music stand;
b. a forward frame section connected to the upper guide rods and to the lower support means, said forward frame section presenting an unobstructed entry area leading into the passageway and having laterally spaced side support members defining a forward open area sufficiently wide to permit the base of each music stand to pass therethrough;
c. forward stop means connected to said forward frame section adjacent said lower support means for preventing the base of a forwardmost music stand from moving forwardly outward from a storage position in the rack;
d. a rear frame section connected to the upper guide rods and to said lower support means;
e. a pair of laterally spaced ground support wheels positioned at a central support location of said rack on opposite sides of the rack and constrained for rotation along horizontal transverse axes; and
f. a forward swivel mounted ground engaging wheel mounted at the front of the rack and centered on said longitudinal axis, and a rear swivel mounted ground engaging wheel mounted at the rear of the rack and centered on said longitudinal axis,
whereby when the rack is loaded from the front to the rear of the rack with a plurality of music stands a center of collective mass of the music stands is constrained to be located along the longitudinal center axis of the rack near the central support location, and lateral loads produced by a turning force applied to the rack are reacted mainly into one or the other of the side wheels, thereby enhancing stability and turning maneuverability of the rack.



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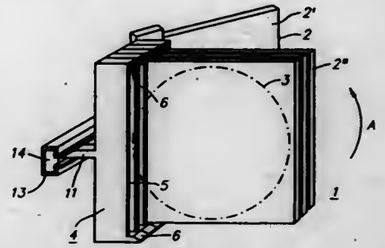
**5,495,952**
**SHOP OR EXHIBITION FITTINGS**
**Kurt Kainz, Thern, Denmark, assignor to AM System Silkeborg A/S, Thern, Denmark**
**Filed Apr. 6, 1994, Ser. No. 223,749**
**Int. Cl.[6] A47F 5/08**
**U.S. Cl. 211—90** **8 Claims**



1. A shelf and wall system comprising a plurality of shelf carrier posts having suspension apertures in at least three sides thereof, a plurality of shelves having associated brackets for mounting in selected front apertures of said posts, transverse carrier rods for mounting between neighbouring posts in engagement with the apertures in a side of said posts, and a plurality of wall panel elements having suspension means for engaging said carrier rods, said wall panel elements having a width larger than a distance between the posts so as when suspended to rest against outermost front side portions of its associated posts, and said wall panel elements having a height measured between their lower edges and their suspension means for engaging such that the wall panels are mounted in suspended positions with their lower edges located at or above a top side plane of underlying shelves.

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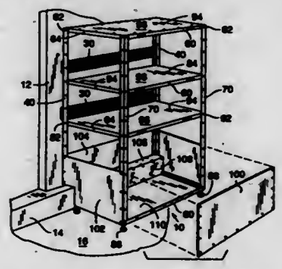
**5,495,953**
**DEVICE FOR STORING COMPACT DISCS AND THE LIKE**
**Urs Bearth, Zeunerstrasse 7, CH-8037 Zürich, Switzerland**
**Filed Mar. 7, 1994, Ser. No. 206,936**
**Claims priority, application Switzerland, Mar. 8, 1993, 00684/93**
**Int. Cl.[6] A47G 29/00**
**U.S. Cl. 211—40** **8 Claims**



1. A device for storing and holding compact discs (3) in cases (2) each having a respective hinge area, comprising:
at least one vertically arranged holder element (4,4') for grasping selectively the hinge area or an opposite side of one of the cases (2);
means, in an upper area of the holder element (4,4'), for permitting a lateral surface (2") of the case (2) to be supported at least partly resiliently on a roof-shaped part (9) of an interior of the holder element (4,4');
wherein the holder element (4) includes an interior U-shaped inserting device (6) and an exterior box-shaped frame (5) enclosing it, and wherein the interior inserting device (6) and the exterior box-shaped frame (5) are fixedly connected with each other in a lower area of the holder elements (4), and wherein the interior inserting device (6) is a predetermined distance from the exterior box-shaped frame (5) in the upper area of the holder element (4) and can be supported in a meander-shaped manner on the lateral surface (2") of the case (2) of the compact discs (3) in the roof-shaped area (9); and wherein
the holder elements (4) are provided with a pivot journal (11) which can be longitudinally displaced in a vertically disposed guide (13).

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**5,495,954**
**MODULAR STORAGE UNIT KIT**
**Joel A. Schmit, 1916 NW. 86th Cir., Vancouver, Wash. 98665**
**Filed May 16, 1994, Ser. No. 243,846**
**Int. Cl.[6] A47F 5/00**
**U.S. Cl. 211—90** **8 Claims**



1. An easily assembled storage unit kit securable to a vertical support wall and supported on a non level floor surface, comprising:

a pair of support rails having predetermined mounting positions and adapted for cooperative attachment to the vertical support wall with the mounting positions of each rail in horizontal alignment and the mounting positions of the two rails in parallel spaced apart relation;

a framework having mounting positions mated to the mounting positions of the support rails for mounting the framework to said support rail at said mated mounting positions and independent of said floor surface and achieving thereby level orientation of the framework; and

an adjustable bottom support on said framework, said support adjustable as between the level framework and the non level floor surface and thereby adding to the wall support cooperative support for the framework by said non level floor surface.

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**5,495,955**

**METHOD AND APPARATUS OF DAMPING THE SWAY OF THE HOISTING ROPE OF A CRANE**

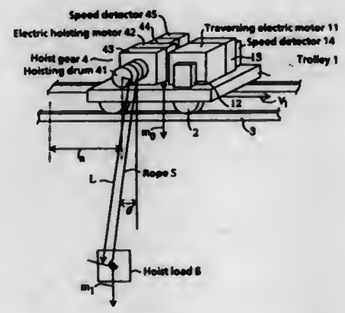
**Naotake Shibata, Tokyo, Japan, assignor to Kabushiki Kaisha Yaskawa Denki, Fukuoka, Japan**

**Continuation of Ser. No. 74,875, Jun. 11, 1993, abandoned. This application May 30, 1995, Ser. No. 453,313**

**Claims priority, application Japan, Jan. 18, 19[illegible]1, 3-299740**

**Int. Cl.[6] B66C *13/06***

**U.S. Cl. 212—275** **15 Claims**




1. A method of damping the sway of a hoisting rope of a suspension crane comprising a trolley drive control unit including a traveling motor for driving a trolley; a hoist motor for hoisting a hoist load; and a hoisting motor drive control unit for driving and controlling the hoist motor; said method comprising the steps of:

detecting the traveling speed of the trolley and producing a speed signal in response thereto;

determining a torque reference signal by means of a speed regulating controller on the basis of a deviation signal representing a deviation of said speed signal from a speed reference signal;

controlling the rotating speed of the traveling motor according to said torque reference signal;

calculating a damping control speed correction signal ($N_{RFDP}$) by a damping controller by using:

$$N_{RFDP}=\{(2\delta g)/(\omega_E V_R)\}(E\Theta) \text{ and } \omega_E=(g/L_E)^{1/2}$$

where $E\Theta$ is a swing angle of the hoisting rope, $\delta$ is a set damping factor, g is the gravitational acceleration constant, $V_R$ is the traveling speed of the trolley corresponding to a rated rotating speed of the traveling motor, and $L_E$ is a length of the hoisting rope between a hoisting drive drum and the hoist load; and

controlling the rotating speed of the traveling motor according to said speed reference signal obtained by subtracting said damping control speed correction signal ($N_{RFDP}$) from a speed reference signal ($N_{RFD}$).

**5,495,956**

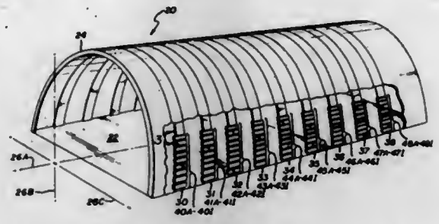
**CRANE ASSEMBLY**

**James K. Arnold, and Paul R. Schumacher, both of Newhall, Calif., assignors to Lockheed Corporation, Calabasas, Calif.**

**Filed Dec. 12, 1994, Ser. No. 354,575**

**Int. Cl.[6] B66C *19/00***

**U.S. Cl. 212—331** **5 Claims**



1. A crane system for a building for the assembly of a gas bag for a lighter-than-air vehicle, the building having a floor and a roof thereover with a longitudinal, vertical and lateral axis, the crane assembly comprising:

a plurality of crane carriage rail assemblies in the form of arches aligned with the lateral axis of and mounted within the building, said carriage rail assemblies in a spaced relationship along the longitudinal axis;

a plurality of crane carriages movably mounted on each of said crane rail assemblies;

a winch mounted on each crane carriage, having an extendible and retractable cable; and

a control system for moving said crane carriages by rows aligned with the longitudinal axis of the building along said crane carriage rail assemblies to specific locations along the lateral axis and for adjusting the length of said cables of said winches in each of said rows as a function of the distance of each of said rows along the lateral axis of the building.

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**5,495,957**

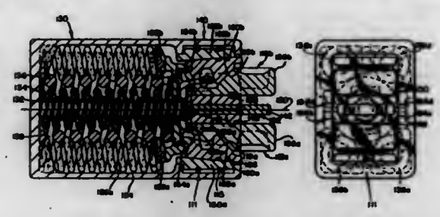
**VARIABLE ANGLE FRICTION CLUTCH MECHANISM FOR A DRAFT GEAR ASSEMBLY**

**Walter H. Merker, Jr., Downersgrove, and Howard R. Sommerfeld, Oak Forest, both of Ill., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.**

**Division of Ser. No. 183,838, Jan. 21, 1994, Pat. No. 5,443,170, which is a division of Ser. No. 3,109, Jan. 11, 1993, abandoned. This application Feb. 23, 1995, Ser. No. 393,274**

**Int. Cl.[6] B61G *7/00***

**U.S. Cl. 213—32 C** **4 Claims**



1. A variable angle draft gear assembly used to cushion both buff and draft shocks which are encountered during operation by railroad rolling stock and having a centerline along it's major axis, said variable angle draft gear assembly comprising:

(a) a hollow housing member having a generally tubular body portion with a first open end and an opposed second closed end;

(b) a spring system disposed within said hollow housing member adjacent said second closed end thereof, said spring system including an inner coil spring member, a middle coil spring member, an outer coil spring member and a plurality of corner coil spring members;

(c) a friction clutch means disposed adjacent and at least partially within said first open end of said hollow housing member, said friction clutch means including;

(i) a friction plate member, substantially centrally disposed along said major axis, having a first end which extends out of said hollow housing member and a second end situated down in said first open end,

(ii) first and second barrier plate members disposed one on either side of said friction plate member, said first and second barrier plate members being anchored against longitudinal movement and responding to lateral pressure,

(iii) first and second friction wedge members, said first friction wedge member being disposed on one side of said first barrier plate member and said second friction wedge member being disposed on one side of said second barrier plate member, each of said first and second friction wedge members having first and second predetermined angled surfaces,

(iv) first and second friction wedge shoe members, said first friction wedge shoe member being disposed on one side of said first friction wedge member and said second friction wedge shoe member being disposed on one side of said second friction wedge member, each of said first and second friction wedge shoe members having first and second predetermined angled surfaces,

(v) first and second wear liner plate members, said first wear liner plate member being disposed on one side of said first friction wedge shoe member and said second wear liner plate member being disposed on one side of said second friction wedge shoe member, and being anchored to said first open end of said hollow housing member against longitudinal movement, and

(vi) a release wedge member having a horizontally extending body portion and having first and second predetermined angles cooperable with said second predetermined angled surfaces of said first and second friction wedge members;

(d) a spring seat means having an aperture formed substantially centrally therethrough and an angled portion cooperating with said second predetermined angled surface of said friction wedge shoe member; and

(e) at least one resilient member engaging said inner surface of said hollow housing member adjacent to at least one of said wear liner plate members, said at least one resilient member disposed within a group formed in at least one of said wear liner plate members.

said at least one resilient member providing an angular degree of freedom to at least one of said first and second wear liner plate members while exerting a predetermined lateral force on said friction clutch means which is at least sufficient to maintain said plurality of said friction surfaces in frictional engagement even when a predetermined amount of wear has occurred to said plurality of said members of said friction clutch means.

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**5,495,958**

**CLOSURE DEVICE FOR A CYLINDRICAL HOUSING**

**Franz Konrad, Regau; Günther Pakanecz, and Manfred Lederer, both of Kremsmünster, all of, Austria, assignors to C. A. Greiner & Söhne Gesellschaft m.b.H, Kremsmünster, Austria**

**Division of Ser. No. 131,470, Oct. 4, 1993, which is a division of Ser. No. 963,941, Oct. 20, 1992, Pat. No. 5,275,299, which is a continuation of Ser. No. 573,008, Dec. 6, 1990, abandoned. This application Oct. 28, 1994, Ser. No. 332,389**

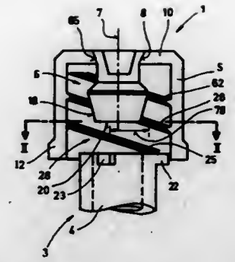
**Claims priority, application Australia, Apr. 15, 1988, A 972/88; Dec. 23, 1988, A 3141/88**

**Int. Cl.[6] B65D *41/04***

**U.S. Cl. 215—329** **11 Claims**

11. In combination with a cylindrical housing having a longitudinal axis and an open end,





(a) a closure cap having a coincident longitudinal axis and fitting over the open housing end, the cap including

(1) a transverse end wall extending over the open housing end and defining a bore, and

(b 2) a cylindrical shell depending from the end wall and having a concentric inner surface,

(b) a sealing device arranged between the bore and the open end, the sealing device having

(1) an outer cylindrical sealing surface mating with an inner cylindrical bearing surface of the cylindrical housing adjacent the open housing end, and

(c) a coupling device arranged between the closure cap and the cylindrical housing, the coupling device including

(1) x number of spiral webs extending on the inner surface of the closure cap shell along a longitudinal path at a pitch angle between a first and second transverse plane extending perpendicularly to the longitudinal axis, the pitch angle varying over the longitudinal path, the first plane being remote from the end wall and the second plane being close to the end wall, each web having respective ends in the first and second plane, and the web ends in the first plane being circumferentially spaced from the web ends in the second plane by an angle of less than 360° divided by x, wherein x is selected from the numbers 2 and 3,

(2) x number of guide lugs radially extending from the cylindrical housing at the open end thereof for engagement with the webs, the guide lugs being circumferentially spaced from each other by an angle of about 180°, and

(3) the second plane having a distance from the transverse end wall of the closure cap which exceeds the length of the guide lugs extending parallel to the longitudinal axis.

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**5,495,959**

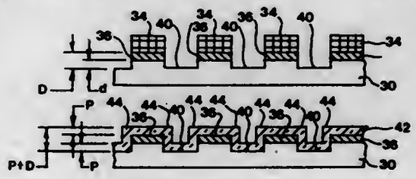
**METHOD OF MAKING SUBSTRACTIVE RIM PHASE SHIFTING MASKS**

**J. Brett Rolfson, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.**

**Continuation of Ser. No. 241,277, May 11, 1994, abandoned. This application Jun. 13, 1995, Ser. No. 489,777**

**Int. Cl.[6] B44C *1/22***

**U.S. Cl. 216—12** **18 Claims**



1. A method for forming a rim phase shifting mask for semiconductor manufacture comprising:

forming an opaque layer having a thickness of "t" on a transparent substrate;

forming a mask on the opaque layer;

etching openings through the opaque layer to the substrate using the mask to form a pattern of opaque light blockers having sidewalls;

etching the substrate aligned with the openings to a depth of "d";

removing the mask; and

forming phase shifters on the sidewalls of the opaque light blockers and light transmission openings in the openings by conformally depositing a transparent phase shift layer over the opaque light blockers and the sidewalls and over the etched substrate into the openings to a thickness of "P";

said phase shift layer not being etched and remaining in said light transmission openings, such that said rim phase shifters have a width of "P" and a thickness of "t"+"d"+"P" with "t" and "d" selected for establishing a phase shift for light passing through a rim phase shifter relative to light passing through a light transmission opening.

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**5,495,960**

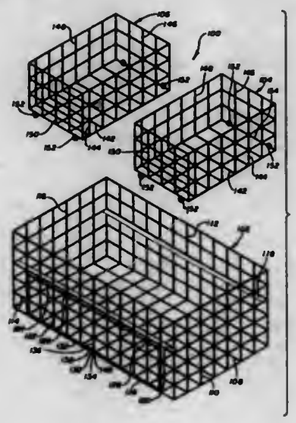
## MULTI-TIER STORAGE APPARATUS

**Peter W.-H. Lam, and Stacey H. Lam, both of P.O. Box #251953, Los Angeles, Calif. 90025**

**Filed Feb. 6, 1995, Ser. No. 383,800**

**Int. Cl.[6] B65D *85/00***

**U.S. Cl. 220—485** **18 Claims**



1. A multi-tier storage apparatus comprising:

first container means having a plurality of upright walls and a bottom surface each including a mesh construction, said first container means for storing and displaying merchandise;

horizontal projection means extending into said first container means from said upright walls; and

multiple second container means mounted on said horizontal projection means for storing and displaying merchandise, each of said second container means having a mesh construction and being movable relative to other of said second container means and to said first container means along said horizontal projection means for accessing said first container means.

**5,495,961**

## PORTABLE PROGRAMMABLE MEDICATION ALARM DEVICE AND METHOD AND APPARATUS FOR PROGRAMMING AND USING THE SAME

**Federico A. Maestre, 2 Hawthorne Pl.-Apt. 6M, Boston, Mass. 02114**

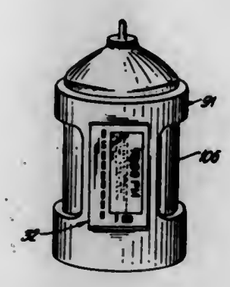
**Continuation of Ser. No. 860,414, Mar. 30, 1992, Pat. No. 5,347,453. This application Sep. 12, 1994, Ser. No. 304,347**

**The portion of the term of this patent subsequent to Sep. 13, 2011, has been disclaimed.**

**Int. Cl.[6] G06F *159/00***

**U.S. Cl. 221—3** **15 Claims**

1. A portable medication alarm device for use in the administration of an eye medication prescribed to a patient which comprises:



a casing of physically thin dimensions;

data storage means, disposed in said casing, for storing data representative of at least one prescribed eye medication dosage schedule specifying a prescribed administration time, a prescribed dosage amount and a prescribed administration route for each eye medication dosage to be administered to said patient;

data programming means, disposed in said casing, for programming in said data storage means, data representative of said prescribed eye medication dosage schedule;

timing means, disposed in said casing, for timing the occurrence of each said prescribed administration time specified in said prescribed eye medication dosage schedule;

alarm signal generating means, disposed in said casing, for generating a dosage alarm signal in response to the timed occurrence of each said prescribed administration time;

display means, disposed in said casing, for visually displaying in response to the timed occurrence of each said administration time, a graphical representation of the prescribed dosage amount and the administration route for said medication dosage specified in said prescribed eye medication dosage schedule; and

an eye medication dispenser bottle holder having a base portion, an upper portion with a substantially circular opening,

a side wall portion connecting said base portion and said upper portion,

an inner cavity accessible through said substantially circular opening, and adapted for slidable receipt of an eye medication dispenser bottle having flexible side walls and containing a quantity of said eye medication,

said side wall portion permitting said patient to squeeze and deform the flexible side walls of said eye medication dispenser bottle so as to manually express from said eye medication dispenser bottle, a number of drops of eye medication in accordance with the prescribed dosage amount displayed on said display means, and to administer said drops into the eyes of said patient in accordance with the prescribed administration route visually displayed on said display means, and

said casing being mounted to either said base portion, said upper portion or said side wall portion of said eye medication dispenser bottle holder.



**5,495,962**

## CONSTANT QUANTITY DISCHARGING DEVICE FOR POWDERED OBJECT

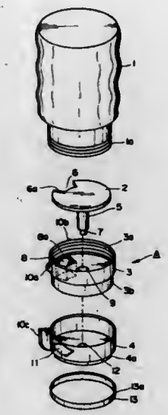
**Akichika Nomura, Yotsu-kaido, Japan, assignor to Kabushiki Kaisha N-Tec, Japan**

**Filed Nov. 10, 1994, Ser. No. 337,062**

**Claims priority, application Japan, Nov. 11, 1993, 5-060775 U; Aug. 19, 1994, 6-195621**

**Int. Cl.[6] B67D *5/00***

**U.S. Cl. 222—80** **7 Claims**



1. A constant quantity discharging device for discharging a constant quantity of powdered object from a powdered object accommodating container, comprising:

a fixed cap made of a thick disk fixed to an opening portion of the powdered object accommodating container;

a rotary disk slidably and rotatably disposed on a surface of the fixed cap at a side of the powdered object accommodating container;

a rotary cap slidably and rotatably disposed on a surface of the fixed cap at an opposite side of the powdered object accommodating container;

a knob for rotation provided on an upper opening portion of the powdered object accommodating container;

a rotary shaft for connecting said knob to the rotary disk and the rotary cap;

a plurality of powdered object storing apertures of different volumes penetrating vertically through a peripheral portion of the fixed cap;

a scale mark provided on the fixed cap to read a rotation position of the knob for rotation corresponding to a selected one of the plurality of storing apertures;

a powdered object taking out aperture formed in the rotary disk to overlap sequentially with the plurality of powdered object storing apertures;

a powdered object discharging aperture formed in the rotary cap to overlap with the selected one of the plurality of powdered object storing apertures and to be spaced from the powdered object taking out aperture in a circumferential direction by at least a width of the powdered object storing aperture; and

rotation range restricting means for restricting a rotation range of the rotary disk and the rotary cap with respect to the fixed cap in a range which includes at least a powdered object taking out position at which the plurality of powdered object storing apertures and the powdered object taking out aperture are overlapped with each other and a powdered object discharging position at which the powdered object discharging aperture and the plurality of powdered object storing apertures are overlapped with each other.

**5,495,963**

## VALVE FOR CONTROLLING PRESSURE AND FLOW

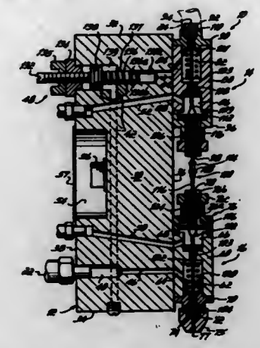
**Scott R. Miller, Roswell, and Roger A. Ziecker, Lawrenceville, both of Ga., assignors to Nordson Corporation, Westlake, Ohio**

**Filed Jan. 24, 1994, Ser. No. 185,699**

**Int. Cl.[6] B67D *5/34***

**U.S. Cl. 222—318** **1 Claim**

1. A fluid dispenser for dispensing a liquid in an intermittent manner including a recirculation loop for circulating said liquid when said dispenser is off and a variable restrictor valve in said recirculation loop for adjusting the pressure therein, the fluid dispenser comprising:



a first cylindrical chamber communicating with a fluid outlet,

a second cylindrical chamber having a fluid inlet communicating therewith and being larger in diameter than said first chamber,

an axially adjustable elongated cylindrical valve member contained with a sliding fit within said first chamber and including a helical groove in an outer surface portion thereof, said valve member having and outer surface in abutting relationship to a wall of said first chamber to create a restricted flow path within said helical groove, said groove communicating with said first chamber and said fluid outlet at a downstream end and with said second chamber and said fluid inlet at an upstream end,

a seal assembly coupled to said valve member and disposed in said second chamber for movement with said valve member and creating a dynamic seal with an inner wall of said chamber, and

a sleeve and a valve stem attached to said valve member wherein said sleeve and said valve stem have respectively mating internal and external threaded portions, and said valve stem being received by said sleeve whereby rotation of said valve stem causes axial adjustment of said valve stem with respect to said sleeve and adjustment of the amount of said helical groove contained within said first chamber and said external threaded portion on said valve stem being of smaller diameter than said seal assembly and said second chamber.

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**5,495,964**

## MEASURING/DISPENSING DEVICE FOR GRANULAR OR POWDER PRODUCTS

**Evans Santagiuliana, Vicenza, Italy, assignor to Taplast SRL, Dueville, Italy**

**PCT No. PCT/EP93/03030, § 371 Date Jun. 10, 1994, § 102(e) Date Jun. 10, 1994, PCT Pub. No. WO94/10541, PCT Pub. Date May 11, 1994**

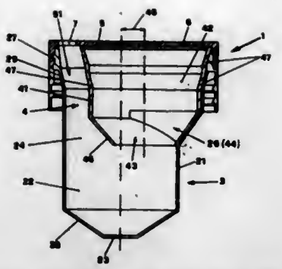
**PCT Filed Oct. 29, 1993, Ser. No. 244,777**

**Claims priority, application Italy, Nov. 2, 1992, VI92A0167**

**Int. Cl.[6] G01F *11/26***

**U.S. Cl. 222—455** **7 Claims**

1. A device for measuring and dispensing granular or powder products from a container having an opening comprising:



a first element adapted to be secured on the container opening formed with an annular rim and a holding chamber for holding measured product, having a closed bottom; an overlying collecting chamber; a joining wall having at least one first opening connecting the holding chamber and said collecting chamber;

a second element located coaxially offset within the collecting chamber of the first element; a dispensing duct defined by said collecting chamber and said second element, said second element formed with a product measuring chamber having a first open bottom and a second opening connected with the at least one first opening of the first element;

a lid applied on the annular rim of the first element and having at least one opening communicating with the dispensing duct of the first element, for allowing dispensing of the product;

each of the first and second elements having corresponding slanted walls, a top and a circular bottom, said slanted walls of each of said first and second elements converging towards the bottom of the corresponding element.

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**5,495,965**

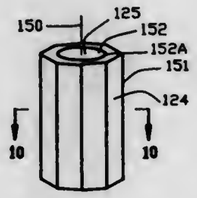
**DIP TUBE FOR HAND OPERATED DISPENSING DEVICE**

**Michael G. Knickerbocker, Crystal Lake, Ill., assignor to Aptar Group, Inc., Cary, Ill.**

**Filed Apr. 25, 1994, Ser. No. 233,039**

**Int. Cl.[6] B67D *5/60***

**U.S. Cl. 222—464.1** **17 Claims**



1. A dip tube for a hand operated dispensing device comprising a dispenser affixed to a container with the dispenser having a dip tube receiver for frictionally securing the dip tube thereto with the dip tube extending into the fluid in proximity to a bottom of the container for directing the fluid from the container into the dispenser for dispensing the fluid from a terminal orifice, the improvement comprising:

said dip tube comprising a longitudinally extending tube defined about a central longitudinal tube axis;

said dip tube having an outer surface and an inner surface for defining a wall thickness therebetween;

said inner surface defining an internal channel having a predetermined cross-sectional area;

a plurality of surface projections protruding from said outer surface of said dip tube and extending longitudinally along said dip tube;

said plurality of surface projections being uniformly radially disposed about said dip tube for defining a plurality of recessed portions therebetween;

said plurality of surface projections defining major wall thickness portions proximate each of said plurality of surface projections for providing structural strength for said dip tube;

said plurality of recessed portions defining minor wall thickness portions proximate each of said plurality of recessed portions for reducing the volume of material used in the construction of the dip tube; and

said dip tube being secured to the dip tube receiver of the dispenser for extending into the fluid within the container with said internal channel having said predetermined cross-sectional area with a reduced volume of material used in the construction of the dip tube.

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**5,495,966**

**FLUID CONTAINER PLUG**

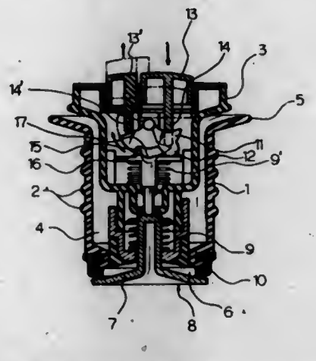
**Jea-Doo Won, 19-902 Shindong-a Apartment, Hak-ik 5-Dong, Nam-gu, Inch'on, Rep. of Korea**

**Filed Aug. 18, 1994, Ser. No. 293,371**

**Claims priority, application Rep. of Korea, Sep. 2, 1993, 1993-17397**

**Int. Cl.[6] B65D *51/00***

**U.S. Cl. 222—508** **8 Claims**



1. A fluid container plug comprising:

an outer casing with threads formed on its circumference for coupling with the mouth of a container, and with its upper and lower ends open;

an inner casing installed within the outer casing keeping a gap with said outer casing;

a discharge path formed through the lower open portion of said outer casing and along said gap;

an opening/closing member installed within said inner casing in a reciprocating manner, its lower end being provided with a lead for opening or closing the lower opening portion of said outer casing, and its upper end extending into said inner casing;

one or a plurality of pressure setting springs for elastically biasing said opening/closing member relative to the inner casing so as for the lead of the opening/closing member to be positioned to close the lower opening portion;

a swinging member hinge-coupled with said inner casing, and provided with a projecting portion, said projecting portion contacting with the upper portion of said opening/closing member for pressing down the upper portion of said opening/closing member during the swinging of the swinging member;

two push buttons installed on the upper portion of said inner casing; and

two actuation rods extending from said two push buttons to be connected to the opposite sides of said swinging member.



**5,495,967**

**UNOBTRUSIVE CARRIER HAVING QUICK RELEASE ACCESS FOR PROTECTIVE DEVICES**

**Katherine E. Parton, Scottsdale, Ariz., assignor to Hoosier Investment Company, Scottsdale, Ariz.**

**Filed Oct. 18, 1994, Ser. No. 324,715**

**Int. Cl.[6] A45F *3/02***

**U.S. Cl. 224—202** **17 Claims**



1. An unobtrusive carrier for a protective device comprising:

a body portion having top, bottom and opposite ends, each of said ends having a height extending from said top to said bottom; support means attached to said body portion, said body portion having defined therein one or more general purpose storage compartments accessible from said top and a discrete special storage compartment for storing a protective device, said discrete special storage compartment being independently accessible from the one or more general storage compartments through an opening disposed along the entire height of one of said opposite ends of said body portion and having a pivotally operable spring-biased frame means disposed about said opening and operatively associated with said opening to pivot about an axis extending between planes defined by said top and said bottom, respectively, to open said opening, said spring-biased frame means including operatively coupled first and second spring-biased frame members, said discrete special storage compartment further having an operable locking means operatively associated with said first and second spring-biased frame members of said spring-biased frame means to maintain said spring-biased frame means in a closed position when desired to prevent access into said discrete special storage compartment, and actuatable to empower the spring bias of said spring-biased frame means to move said spring-biased frame means into an open position to open said opening and provide ready access to said discrete special storage compartment.

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**5,495,968**

**CANOE PORTAGING THWART**

**Ross Miller, 120 Smirle Ave., Ottawa, Canada**

**Continuation-in-part of Ser. No. 86,037, Jul. 6, 1993, abandoned. This application Sep. 16, 1994, Ser. No. 307,009**

**Claims priority, application Canada, Jul. 28, 1992, 2074792**

**Int. Cl.[6] A45F *5/00***

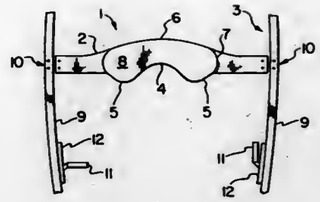
**U.S. Cl. 224—266** **11 Claims**

1. A canoe portaging thwart assembly comprising:

an elongate rigid yoke having a central portion adapted to rest on the shoulders and neck of a canoeist, and end portions adapted to attach to opposite gunwales of a canoe such that said yoke is positioned generally perpendicularly to said gunwales; and

rotation means adapted to allow said central portion of said yoke to rotate about an axis generally perpendicular to the longitudinal axis of said yoke comprising a pair of bearing assemblies;

wherein the range of rotation of said yoke is limited.



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**5,495,969**

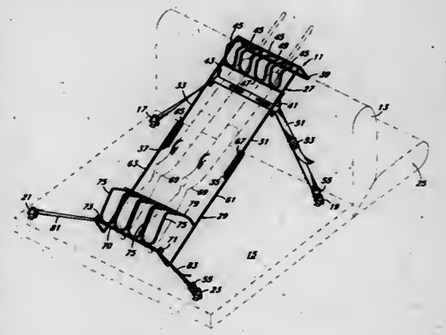
**RECREATIONAL VEHICLE PORTABLE GUN RACK SYSTEM**

**John Cardenas, 339 W. Norman Ave., Arcadia, Calif. 91007**

**Filed Aug. 31, 1994, Ser. No. 298,789**

**Int. Cl.[6] B60R *7/14***

**U.S. Cl. 224—275** **14 Claims**



1. A gun rack comprising:

an upwardly disposed rifle barrel support supported by an upper end of an upper portion of said gun rack;

an upwardly disposed rifle burnt support supported by a lower end of a lower portion of said gun rack, and wherein said upper portion of said gun rack is pivotable with respect to said lower portion of said gun rack from an open position about a central axis to a position where said rifle barrel support is adjacently disposed with respect to said rifle butt support; and,

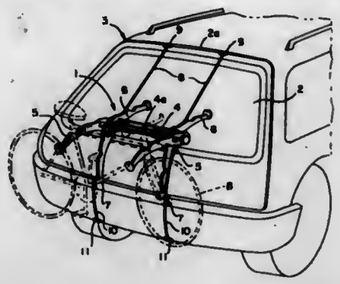
said lower portion of said gun rack further including a pair of "P" shaped elongated loops each having a first segment disposed on said central axis and an opposite segment spaced from said first segment, each opposite segment defining a support disposed parallel to said central axis and wherein said upper portion of said gun rack has a pair of loops each pivotally engaging said first segments, respectively, of the "P" shaped loops of said lower portion of said gun rack, said opposite segments of said "P" shaped loops adapted to overlie and abut said upper position to support said upper and lower portions in said open position.

5,495,970

## DEVICE FOR CARRYING ARTICLES, PARTICULARLY BICYCLES, ON THE REAR PORTION OF A MOTOR-VEHICLE

Fabio Pedrini, Via Zamboni 1, scala A, piano 1, int. 3, 40125 Bologna, Italy

Filed Mar. 6, 1995, Ser. No. 399,389
Claims priority, application Italy, Mar. 7, 1994, T094A0155
Int. Cl.[6] B60R 9/00;9/04
U.S. Cl. 224—314 10 Claims



1. Device for carrying articles, in particular bicycles, on the rear portion of a motor-vehicle, comprising:
- at least one first structure for carrying articles to be transported, said first structure having at least one hub,
- a second and a third structures for supporting said device on the rear portion of the motor-vehicle, each of said second and third structures having at least one hub and feet for abutment against the rear portion of the motor-vehicle,
- a connecting member, rigidly connecting said hubs of said first, second and third structures to each other,
- wherein said connecting member comprises an elongated bar having a non-circular cross-section at least on a portion of its length, and wherein the hubs of at least two of said first, second and third structures each have a central aperture receiving said bar, said aperture having a non-circular cross-section corresponding to that of said bar, so that these two structures mount on said bar in different angular positions relative to each other and relative to the remaining one of said three structures.

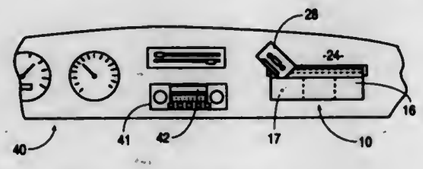
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5,495,971

## AUDIO CASSETTE HOLDER

Melba J. Holliday, 263 S. Temple Dr., Milpitas, Calif. 95035

Filed Jan. 13, 1994, Ser. No. 180,744
Int. Cl.[6] B60R 7/00
U.S. Cl. 224—483 5 Claims



1. An audio cassette holder comprising:
- a flexible sheet having a front surface and rear surface;
- a series of cassette-holding pockets on said front surface and each sized to receive and hold an inserted cassette;
- a hooks and loops fastener first element attached to said rear surface adjacent to an upper edge of said rear surface;
- wherein a hooks and loops fastener second element is attachable to a desired substantial vertical holder-supporting surface such that said first element is detachably connected to said second element to fasten said flexible sheet and said series of pockets to said supporting surface such as to suspendingly hold a cassette inserted into any one of said series of pockets;
- wherein said flexible sheet is a single integral sheet of fabric, said sheet of fabric being foldable to form said series of pockets and being stitchable to define the vertical edges of each of said pockets;
- wherein said series of pockets linearly extend along said first surface;
- in which said sheen of fabric is a rectangular in shape and when multi-folded includes an integral back piece forming said sheet rear surface, an integral inwardly-facing front piece of said pockets, an integral outwardly-facing front piece of said pockets and an integral front outwardly-facing piece above said pockets forming said sheet front surface; and wherein the upper and lower edges of said sheet of fabric are stitched together at an upper top edge of said holder and at the vertical side edges of each of said pockets.

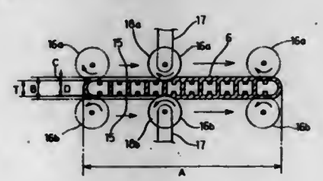
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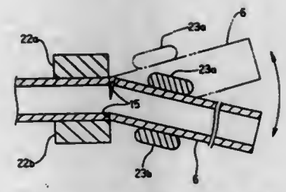
5,495,972

## METHOD AND APPARATUS FOR CUTTING FLAT TUBES

Kunihiko Nishishita, and Takashi Sugita, both of Saitama, Japan, assignors to Zexel Corporation, Tokyo, Japan

Division of Ser. No. 35,239, Mar. 23, 1993, Pat. No. 5,407,116, which is a continuation of Ser. No. 797,768, Nov. 1, 1991, abandoned, which is a continuation-in-part of Ser. No. 591,276, Oct. 2, 1990, abandoned. This application Nov. 29, 1994, Ser. No. 350,991
Claims priority, application Japan, Jan. 4, 1989, 1-259631
Int. Cl.[6] B32D 21/00
U.S. Cl. 225—2 7 Claims





1. A method of cutting a flat multiport tube having a plurality of passages into unit pieces, which comprises the steps of:
- feeding in a first direction a flat multiport tube having an upper wall, a lower wall, and side walls,
- moving a pair of disc cutters in a second direction perpendicular to said first direction to form a pair of cutting grooves on said upper and lower walls,
- fixing said flat multiport tube at a position upstream of said cutting grooves; and
- moving an end portion of said flat multiport tube downstream of said cutting grooves relative to said fixed flat multiport tube so as to break off said end portion at said cutting grooves;
- said cutting grooves having a distance T between them that satisfies the following relational expression:

$$D<T<B$$

wherein B and D are a height and an inside minor diameter of said flat metal tube so that part of said upper and lower walls remains uncut, thereby preventing not only production of any cutting burrs but also sawdust clogging and collapse of said passages, and
- further wherein said step of feeding said flat multiport tube in said first direction is in synchronism with said step of moving said pair of disc cutters in said second direction to form said pair of cutting grooves so that said cutting grooves are formed without stopping said flat tube feeding during said cutting groove formation.



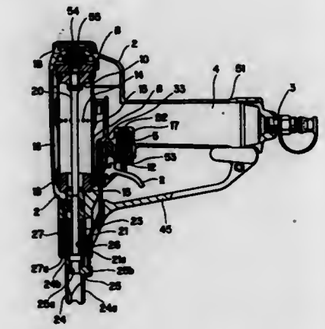
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5,495,973

## NAIL GUN HAVING SAFETY DEVICE FOR PREVENTING ACCIDENTAL FIRINGS

Yoshinori Ishizawa, and Katsuaki Tobita, both of Katsuta, Japan, assignors to Hitachi Koki Co., Ltd., Tokyo, Japan

Filed Feb. 4, 1994, Ser. No. 191,920
Claims priority, application Japan, Feb. 5, 1993, 5-003027 U; Jan. 21, 1994, 6-005286
Int. Cl.[6] B25C 1/04
U.S. Cl. 227—8 9 Claims



1. A pneumatically operated nail gun for striking a head of a nail into a workpiece, including:
- a housing frame (2) for providing a compressed air chamber (4) connected to a compressed air source (C),
- a cylinder (9) disposed in the frame,
- a piston (10) slidably movable in the cylinder and driven by the compressed air,
- a bit (20) connected integrally to the piston for striking the head of the nail (30),
- a trigger lever (11) for selectively applying the compressed air in the compressed air chamber to the piston to move the bit,
- a bit guide fixed to a lower end of the housing frame for guiding reciprocal travel of the bit,
- a nail guide (24) slidably supported on the bit guide, the nail guide having an inner diameter greater than an outer diameter of a head of the nail, the nail having a sufficient length which is protruding from the nail guide when inserted and set therein, the improvement comprising:
  - said nail guide (24) being formed with an axially oriented slit (24a) at one side thereof;
  - a movable segment (25, 125) having a pipe-shaped portion (25a, 125a) and an arm portion (25b, 125b) connected to the pipe-shaped portion, the pipe-shaped portion being movably disposed within the nail guide (24) and having an inner diameter greater than an outer diameter of the bit, the arm portion being movable within the slit, the bit being operative to protrude through the pipe-shaped portion for striking the head of the nail;
- a safety arm (26) having one end positioned adjacent the trigger lever (11) and another end coupled to the arm portion (25b, 125b), said one end of the safety arm being selectively engageable with the trigger lever to render the latter inoperative, and
- a biasing spring (33) connected to the safety arm (26) for urging the safety arm in one direction to maintain engagement between the one end of the safety arm and the trigger lever.

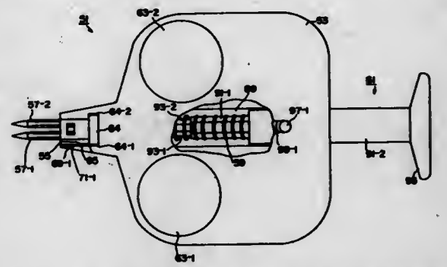
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5,495,974

## FASTENER ATTACHING TOOL

Charles L. Deschenes, North Attleboro; Terence J. Jones, Bolton, both of Mass., and William J. Cooper, Woonsocket, R.I., assignors to Avery Dennison Corporation, Pasadena, Calif.

Continuation of Ser. No. 989,197, Dec. 11, 1992, abandoned.
This application May 2, 1994, Ser. No. 236,667
Int. Cl.[6] B65C 5/00; A41H 37/10
U.S. Cl. 227—71 4 Claims



2. A tool for dispensing individual fasteners from a fastener clip into a desired article, the fastener clip comprising a pair of generally parallel runner bars and one or more fasteners, each fastener comprising an elongated flexible filament and a pair of transverse bars, one transverse bar being disposed at each end of said elongated flexible filament, the elongated flexible filament having a longitudinal axis and being disposed in a plane of the pair of generally parallel runner bars, each of the pair of transverse bars being connected to a corresponding runner bar by a connector post, the connector posts being severably connected to outer sides of their respective transverse bars, each connector post extending at right angles to the longitudinal axis of the elongated filament, said tool comprising:
- a) a body having a front end, a top, a rear end and a channel, said rear end having an opening, said channel extending inward from said opening;
- b) a pair of needles projecting from the front end of the body, each of said needles having a front end which is adapted to insertion into the article, a side, a longitudinally extending bore appropriately dimensioned to permit one of the transverse bars of the fastener to slide therthrough, a knife edge and a longitudinal slot, said longitudinal slot communicating with said longitudinally extending bore to permit the end of the filament adjacent to the transverse bar to extend therethrough, said knife edge being on the side of said needle spaced from said front end to cut the connector post as the transverse bar passes by; and
- c) an ejector mechanism slidably mounted in said channel and manually movable back and forth in said channel through the opening in the rear end of said body, said ejector mechanism including a pair of ejector rods for pushing the transverse bars of the fastener into and through said longitudinally extending bores of said needles and into the desired article,
- d) said body having a feed slot, said feed slot extending inwardly from the top and located behind said needles through which the fastener clip is inserted for positioning the transverse bars of a desired fastener directly behind said needles and in alignment with said longitudinally extending bores in said needles,
- e) said feed slot in said body of said fastener attaching tool is provided with registration elements for assisting proper alignment of the transverse bars of the fasteners of said fastener clip with said longitudinally extending bores of said needles, and wherein said feed slot includes inside walls and wherein

said registration elements on said feed slot include bars formed on the inside walls of said feed slot.

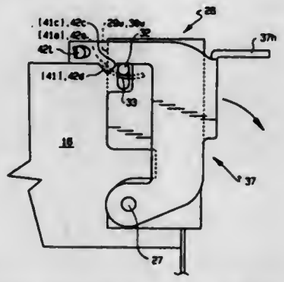
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**5,495,975**

## STAPLER WITH SHEATH CONTROL MECHANISM

**Sarwan A. Jairam, Richmond Hill, and Frank H. F. Lin, College Point, both of N.Y., assignors to Acco USA, Inc., Wheeling, Ill.**

**Filed Dec. 12, 1994, Ser. No. 353,875**
**Int. Cl.[6] B25C *5/00*; B27F *7/17***
**U.S. Cl. 227—123** **10 Claims**




1. In a stapler having a head and a sheath positioned adjacent the head to form a staple driving transport channel and having adjacent said channel a removable staple blank cartridge to feed staples to said channel, the improvement comprising

(a) pivot means on the head and sheath for pivotal movement of the sheath with respect to the head;

(b) first latch means on the sheath;

(c) second latch means on the head for engaging the first latch means, said second latch means in turn comprising an opening in the head having a top surface and a bottom surface, a latch pin positioned in the opening and a spring urging such pin toward the top surface.

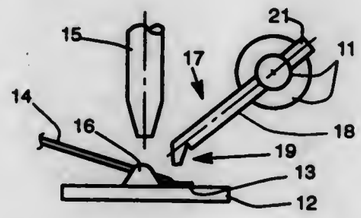
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**5,495,976**

## TILTED WEDGE BONDING TOOL

**Dan Mironesco, Yokneam; Yoav Venkert, Haifa, and Beni Nachon, Qiriat-Ata, all of, Israel, assignors to Kulicke and Soffa Investments, Inc., Wilmington, Del.**

**Filed May 27, 1994, Ser. No. 250,542**
**Int. Cl.[6] B23K *20/10***
**U.S. Cl. 228—110.1** **8 Claims**




7. A method of bonding an electrical conductor to a bonding target without obscuring the bonding target area, comprising the steps of:

providing a tapered wedge-shaped bonding tool with a flat area working face on an elongated body,

providing an ultrasonic transducer with a horizontal axis,

providing a recessed groove in the working face of said bonding tool wherein said groove is orthogonal to said horizontal axis,

mounting said tapered shape bonding tool in said ultrasonic transducer so that the elongated body of the bonding tool extends diagonally and orthogonally to the side and from under the end of said ultrasonic transducer so that the bonding target area is not obscured by said ultrasonic transducer during the bonding operation,

pressing said recessed groove of said bonding tool over said electrical conductor, and

bonding said electrical conductor to said bonding target by ultrasonically moving said electrical conductor relative to said bonding target.

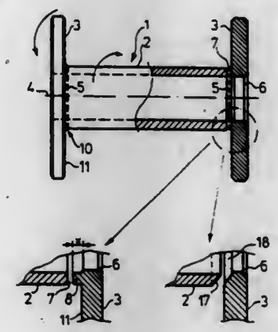
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**5,495,977**

## BOBBIN FOR FIBROUS WOUND MATERIAL AND METHOD FOR PRODUCING THE SAME

**Dieter Hildebrandt, Bad Wörishofen, and Michael Prechtel, München, both of, Germany, assignors to Hildebrandt-Spulen-Bobbins GmbH, Germany**

**PCT No. PCT/EP92/01088, § 371 Date Jan. 19, 1993, § 102(e) Date Jan. 19, 1993, PCT Pub. No. WO92/20603, PCT Pub. Date Nov. 26, 1992**
**Continuation of Ser. No. 965,245, Jan. 19, 1993, abandoned.**
**This PCT application May 18, 1992, Ser. No. 349,003**
**Claims priority, application Germany, May 17, 1991, 41 16 139.4**
**Int. Cl.[6] B23K *20/12***
**U.S. Cl. 228—112.1** **12 Claims**




1. A method for producing a bobbin assembly to be used for winding fibrous material thereon, comprising the steps of:

providing a cylindrical core tube and first disk-type bobbin flange at a one end of the core tube as an integral forge or extrusion part, said core tube having a free end opposite the one end;

frictional welding a second disk-type bobbin flange to the free end of said core tube to form a bobbin assembly, in a manner that a resulting frictional welding bead is disposed exactly in a corner formed between a face of the second flange and the free end of the core tube, thereby causing a smooth transition of metallurgical grain line orientation between the second flange and the core tube.

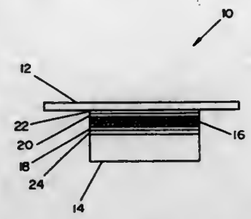


**5,495,978**

## BONDING DIVERSE THERMAL EXPANSION MATERIALS

**David L. Moth, Columbia, Pa., assignor to Thermacore, Inc., Lancaster, Pa.**

**Filed Sep. 6, 1994, Ser. No. 300,857**
**Int. Cl.[6] B23K *1/19;103/16***
**U.S. Cl. 228—122.1** **3 Claims**




1. A process for bonding materials with different coefficients of thermal expansion comprising:

(A) placing a first layer of brazing material 18 with a thickness in the range between 0.0005 inch and 0.0015 inch on one surface of a higher thermal expansion material layer;

(B) selecting a sinterable material with a particle diameter in the range between 0.125 mm and 1.00 mm so that the sinterable material will have a porosity after sintering in the range between 20 percent and 80 percent;

(C) placing a layer of the selected sinterable material with a thickness of at least twice the diameter of the particles in the selected sinterable material to cover the exposed surface of the first layer of brazing material;

(D) placing a second layer of brazing material 20 with a thickness in the range between 0.0005 inch and 0.0015 inch on the exposed surface of the layer of applied sinterable material;

(E) placing a surface of a lower expansion material layer in contact with the exposed surface of the second layer of brazing material; and

(F) sintering the sinterable layer and bonding the higher thermal expansion layer and the lower thermal expansion layer to the sinterable layer by raising the temperature of the assembled layers to a temperature high enough to melt the brazing material and to cause the brazing material to wet the surfaces of the higher and lower thermal expansion layers.

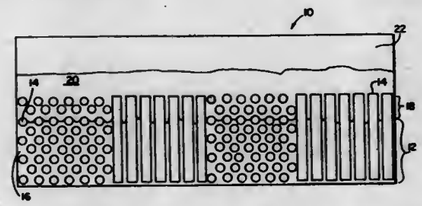
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**5,495,979**

## METAL-BONDED, CARBON FIBER-REINFORCED COMPOSITES

**Suri A. Sastri; J. Paul Pemsler, both of Lexington; Richard A. Cooke, Framingham; John K. Litchfield, Bedford, and Mark B. Smith, Ipswich, all of Mass., assignors to Surmet Corporation, Burlington, and Castle Technology Corporation, Lexington, both of Mass.**

**Filed Jun. 1, 1994, Ser. No. 252,601**
**Int. Cl.[6] B23K *1/20***
**U.S. Cl. 228—124.1** **26 Claims**




1. A method of bonding metals to carbon-carbon composites, which consist of a carbon matrix binder material reinforced with carbon fibers, said method comprising the steps of providing a carbon-carbon composite which is substantially free of said binder material in a zone extending to a depth below the surface thereof effective to provide a binding site for a metal, said matrix-free zone being provided by bonding a layer of unimpregnated carbon tows to the surface of said carbon-carbon composite, and infiltrating said metal therein to fill a substantial portion of said matrix-free zone and provide a surface layer of the metal, whereby to form a strong bond between said carbon-carbon composite and said metal.

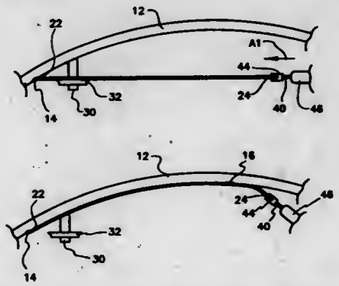
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**5,495,980**

## PROTECTIVE LINING METHOD AND APPARATUS FOR ARCUATE CONTAINER WALLS

**Steve Reynolds, 2406 Citation Ave., Owensboro, Ky. 42301**

**Filed Oct. 12, 1994, Ser. No. 321,450**
**Int. Cl.[6] B23K *37/04***
**U.S. Cl. 228—184** **5 Claims**




5. A method of attaching flexible, planar, rectangular sheet material to an arcuate container wall comprising the steps of:

positioning said sheet such that a first edge of said sheet is proximate the container wall;

attaching said first edge fixedly to the container wall;

applying compressive force on a second edge of said sheet, where said second edge is distal and opposite to said first edge such that said flexible sheet bows to bring a side of said sheet into substantially completely contact with the arcuate container wall;

attaching at least one additional peripheral portion of said sheet to said arcuate container wall such that said sheet is held in the bowed position brought about by said force application step;

removing said compressive force;

attaching all unattached portions of said periphery of said sheet to said arcuate container wall.

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**5,495,981**

## TRANSACTION CARD MAILER AND METHOD OF MAKING

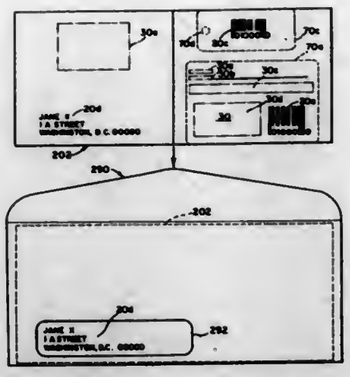
**Richard O. Warther, 25 Sheffield La., West Chester, Pa. 19380**

**Filed Feb. 4, 1994, Ser. No. 191,975**
**Int. Cl.[6] B65D *27/04*; B42D *15/00***
**U.S. Cl. 229—71** **20 Claims**

1. A card mailer comprising:

a generally rectangular envelope having a length and a width and a front face with a window; and

an integral card/insert sheet section having a length and a width sufficient so that the sheet section is received in the envelope without folding and substantially without movement, the sheet section including a core, the core being printed in a first data field with a unique code in a machine readable format and in a second, separate data field with a name and mailing address of an individual assigned the unique code, the second data field being located on the sheet section aligned with and



visible through the window of the envelope, the sheet section including an at least generally U-shaped scoring which scoring cuts at least sufficiently through the sheet section to define a generally rectangular card element removable from a remainder of the sheet section, the removable card element including at least the first data field with the unique code, the removable card element having a given material composition and the remainder of the sheet section immediately adjoining the scoring having a material composition identical to the material composition of the card portion, at least one portion of the sheet section including the removable card element being of a laminate construction with a predetermined plurality of layers including the core and another portion of the sheet product including the second data field with the name and mailing address being of fewer layers than the predetermined number of layers.

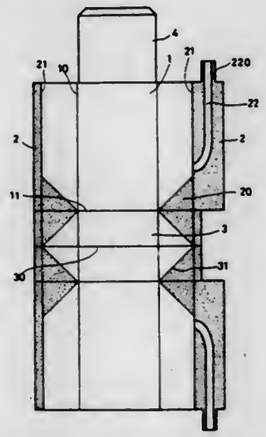
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**5,495,982**

**PAPER CUP WITH A STRAW**

**Mein-Ajng Wang, No. 42, Alley 121, Lane 56, Go-An, St. Tainan, Taiwan, Prov. of China**

**Filed Jan. 20, 1995, Ser. No. 492,582**
**Int. Cl.[6] B65D *5/74***
**U.S. Cl. 229—103.1** **1 Claim**



**1.** A paper cup with an integral straw formed of a sheet of paper by folding and adhering, comprising:

a cup body portion, having two lengthwise parallel folding lines and two lateral parallel folding lines defining a bottom portion between said two lateral lines;

lengthwise adhered portions respectively at each of two opposite sides of said cup body portion, a W-shaped adhered portion respectively at two opposite sides of the bottom portion, and a pair of said lengthwise adhered portions having a semicircular groove with an upper projection extending upward from an upper edge of said cup body portion;

the bottom portion limited between the two lateral folding lines having a center, a lateral folding line in the center, and a W-shaped folding line respectively at two opposite sides of the bottom portion; and,

a cap portion extending upward from the upper lateral edge of said cup body portion; whereby, said lengthwise adhered portions having the semicircular grooves with an upper projection form a straw, said straw having an upper end serving as an outlet and a lower end communicating with an interior of said cup body, said cap portion folded down to close and seal an upper opening of the cup body.

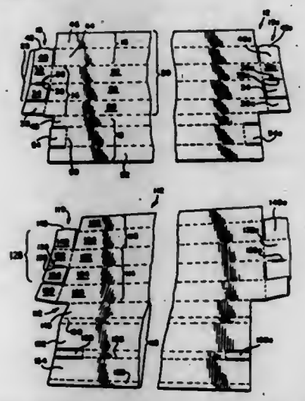
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**5,495,983**

**SHIPPING AND STORAGE CONTAINER WITH INTEGRAL DIVIDER INSERT**

**Gregory A. Lelek, 9662 Indian Creek Way, Escondido, Calif. 92026**

**Filed Jan. 28, 1994, Ser. No. 187,857**
**Int. Cl.[6] B65D *25/04***
**U.S. Cl. 229—120.13** **13 Claims**



**1.** A combination storage and shipment container made from a single blank of stiff, foldable sheet material, and being adapted to be loaded with product to be shipped through its open top during erection, said container comprising, in combination, a container section and a divider insert section, said container section having an exterior bottom wall panel and opposed, first and second exterior sidewall panels, with each of said panels being separated from adjacent panels by longitudinal fold lines, and a pair of opposed container section end portions each being formed by plural end flaps including an inner end flap attached to one of said first and second sidewall panels and an outer end flap attached to the other of said first and second opposed sidewall panels, with one of said end flaps including a pad flap joined thereto along a fold line and with one of said end flaps having a locking flap joined thereto along a fold line, with said pad flap being folded into overlying relation to said bottom wall panel, with said inner end flap being folded so as to lie inside said outer end flap and said locking flap being folded over said inner end flap and having a free edge in contact with said pad flap to secure both of said end flaps against movement, whereby said container section includes sidewalls, a bottom wall, opposed end portions and an open top, said container



section also including a cover assembly comprising a top wall panel joined at a fold line along one of its edges to one of said first and second sidewall panels, a closure panel joined at a fold line to the other edge of said top wall panel, said divider insert section including a plurality of vertically and horizontally extending divider panels, with one of said divider panels being secured along a fold line to the other of said first and second container sidewall panels, and each of the remainder of said divider panels being of reduced length relative to the length of said sidewall and bottom wall forming panels and being joined to an adjacent divider panel along a fold line, with all said insert-forming divider panels being constructed and arranged to lie entirely within said container and with said one of said divider panels lying alongside said other of said first and second sidewall panels, when said container is erected, and with all of said divider panels being arrayed so as to divide said interior of said container into separate spaces, each of which is accessible throughout its entire length from the top of said container from time to time during positioning of said divider panels within said open container.

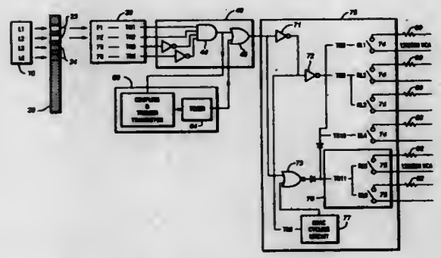
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**5,495,984**

**ENERGY SAVING OPTOELECTRONIC CODE READING ACCESS DEVICE**

**Juan Santarriaga, Atizapan de Zaragoza, Mexico, assignor to Novedades Electronicas Internacionales S.A. de C.V., San Mateo Telocopan Edo., Mexico**

**Filed Dec. 22, 1993, Ser. No. 172,486**
**Int. Cl.[6] G05D *23/00***
**U.S. Cl. 236—46 R** **21 Claims**



**1.** An energy saving, optoelectronic system for energizing and deenergizing electrical loads, comprising:

(a) a light transmission source emitting a continuous light signal;

(b) a photoelectric receiving circuit placed to receive a continuous light signal from said light transmission source, and to transmit a first output signal or a second output signal in response to the particular light signal received from said light transmission source;

(c) a photoelectric switching card removably insertable between said light transmission source and said receiving circuit, such that when said switching card is not inserted, said receiving circuit receives an unabbreviated light signal from said light transmission source and transmits a first output signal, and when said switching card is inserted, said receiving circuit receives a predetermined, unique, abbreviated light signal from said light source and transmits a second output signal;

(d) a gating circuit coupled to receive output signals from said receiving circuit such that said gating circuit transmits an open circuit signal in response to a first output signal and transmits a close circuit signal in response to a second output signal, the gating circuit comprising NOT gates arranged such that the receiving circuit will transmit the second output signal upon receiving the predetermined light signal;

(e) a first power switch coupled to said gating circuit such that it is open in response to an open circuit signal from said gating circuit and said first power switch is closed in response to a close circuit signal from said gating circuit;

(f) a second power switch coupled to said gating circuit such that it is closed in response to a close circuit signal from said gating circuit; and

(g) a cycling circuit coupled to said gating circuit and to said second power switch such that when said gating circuit transmits an open circuit signal, said cycling circuit will repeatedly open and close the second power switch.

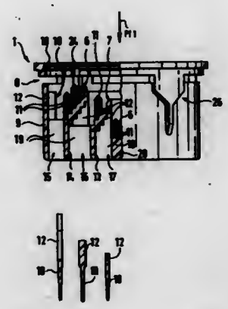
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**5,495,985**

**JET REGULATOR FOR ATTACHMENT TO SANITARY FITTINGS**

**Holger Nehm, and Hermann Grether, both of Mullheim, Germany, assignors to Dieter Wildfang GmbH, Mullheim, Germany**

**Filed Sep. 30, 1994, Ser. No. 315,698**
**Claims priority, application Germany, Jan. 2, 1993, 9314990 U**
**Int. Cl.[6] B05B *1/14***
**U.S. Cl. 239—428.5** **20 Claims**



**10.** A flow controller and aerator for attachment to a faucet comprising a tubular sleeve adapted to be disposed axially of the flow, a perforated plate adapted to be disposed on the upstream side of the sleeve transverse to the flow, the plate being formed with a number of holes, a first circular ring wall concentrically supported in the sleeve, deflection slopes supported on the wall in the form of pins having their distal ends conical and directed toward the plate to deflect jets emanating from the holes in a direction outward with respect to the centerline of the sleeve, and means for drawing air into the space between the holes and the deflection slopes.

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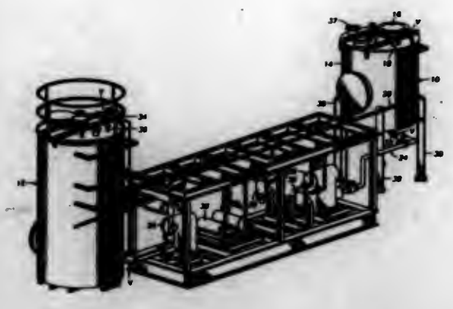
**5,495,986**

**METHOD FOR PROVIDING A FUEL MIXTURE**

**Ricky W. Davenport, 814 Omega Dr., Lafayette, La. 70506**

**Continuation of Ser. No. 60,753, May 12, 1993, abandoned. This application Dec. 30, 1994, Ser. No. 368,386**
**Int. Cl.[6] B02C *23/36;23/08***
**U.S. Cl. 241—21** **5 Claims**

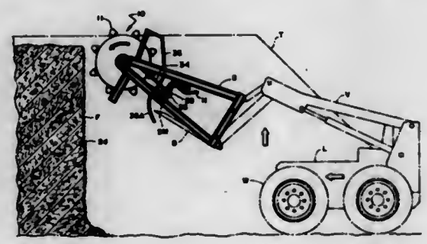
**1.** A method for providing a fuel mixture, including a liquid blend stock and solid waste particles, said method including the steps of:



delivering the liquid blend stock to a dispersion unit,
delivering solid waste pieces along with a container used to hold the solid waste pieces to said dispersion unit,
causing the liquid blend stock, the solid waste pieces and the container used to hold the solid waste pieces to pass through means for shearing the solid waste pieces and the container used to hold the solid waste pieces into solid waste particles, said means for shearing the solid waste pieces and the container used to hold the solid waste pieces into solid waste particles also dispersing the solid waste particles in the liquid blend stock within said dispersion unit; and
magnetically separating metal fragments from the liquid blend stock and solid waste particle mixture in said dispersion unit,
discharging the liquid blend stock with the solid waste particles dispersed therein from the dispersion unit,
discharging said magnetically separated metal fragments from said dispersion unit.

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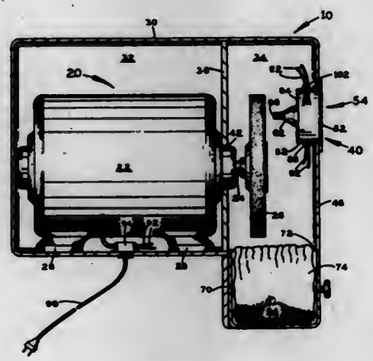
**5,495,987**
**DEVICE FOR SLICING ENSILAGE FROM A COMPACTED ENSILAGE MASS**
**Kenneth A. Slaby, Rte. 1, Box 224, Whitehall, Wis. 54773**
**Filed May 20, 1994, Ser. No. 246,694**
**Int. Cl.[6] B02C** *18/16;23/00*
**U.S. Cl. 241—27** **18 Claims**



1. A method for providing an uncompacted and free flowing ensilage product from a compacted ensilage mass with an ensilage slicing attachment comprising a rotatable reel equipped with a plurality of slicing knives circumferentially positioned about the reel so as to uniformly slice ensilage transversely from a vertical face of the compacted ensilage, mounting means for mounting the attachment to a boom assembly of a skid steer loader, and rotational means for rotationally propelling said reel along said face so as to uniformly slice and transversely remove ensilage stemmings from the face of said compacted ensilage mass, said method comprising:
a) attaching the attachment to the boom assembly of the skid steer loader equipped with elevational means for positioning said reel along said face, a power source for rotationally propelling the reel, and mobile means regulating a slicing depth of the slicing knives along the face;
b) operationally positioning the rotatable reel along the face of the compacted ensilage mass so as to permit the slicing knives to transversely penetrate said face; and
c) sweeping, while rotationally propelling the reel, the operationally positioned reel along said face so as to transversely slice and uniformly remove the free flowing ensilage product from the face of the compacted ensilage mass.

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**5,495,988**
**HYPODERMIC NEEDLE GRINDER**
**Robert D. Follese, 3951 NW. 4th Ct., Coconut Creek, Fla. 33066, and Felix Castro, 577 NW. 87th Terr., Coral Springs, Fla. 33071**
**Filed Jul. 11, 1994, Ser. No. 273,458**
**Int. Cl.[6] B02C** *23/00;* **B24B** *7/08*
**U.S. Cl. 241—36** **16 Claims**



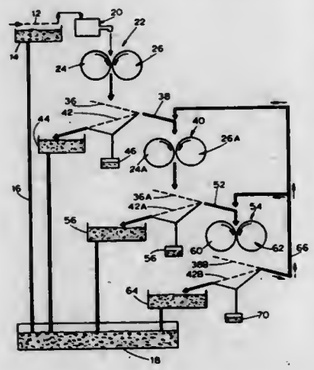
1. A compact and portable apparatus for preparing a hypodermic needle having a needle shaft with a pointed end and a hub end and having a needle hub joined to said hub end for safe disposal of said hypodermic needle, the compact and portable apparatus comprising:
metal grinder means comprising a grinding member having a grinding surface and means for moving said grinding member,
needle guide means for holding said needle shaft adjacent to said grinding member and said pointed end oriented substantially toward said grinding surface, for guiding said needle shaft toward and against said grinding surface to progressively grind said shaft into particles,
a cable for delivering electric current to said motor from a power source for powering said motor, said cable having electrical switch means, and
wherein said need guide means comprises a recess in said housing wall, said recess having a recess bottom wall in which said needle opening is located, and having a side wall in which an optical needle detecting means are mounted for detecting the presence of a needle in said recess and for simultaneously activating said electrical switch means to activate said motor.

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**5,495,989**
**APPARATUS FOR MILLING CLAY WITHOUT SUBSTANTIAL GENERATION OF POWDER**
**Maynard Teppo, Belle Fourche, S. Dak., assignor to American Colloid Company, Arlington Heights, Ill.**
**Division of Ser. No. 177,938, Jan. 6, 1994, Pat. No. 5,379,948. This application Aug. 8, 1994, Ser. No. 287,244**
**Int. Cl.[6] B02C** *21/00;23/10;23/14*
**U.S. Cl. 241—65** **11 Claims**

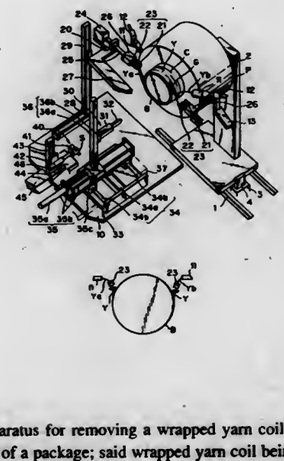
1. Apparatus for crushing clay to reduce the size of the clay to a



uniform particle size distribution, without generating a substantial percentage of under-size particles, comprising:
a first roller mill comprising a first pair of counter-rotating rollers, each having a plurality of parallel grooves in an outer surface thereof, said rollers being separated by a first roller gap;
means for rotating each of the rollers of said first roller mill at a different speed to pull the clay through said gap, such that a majority of the clay particles exiting the first roller mill are smaller than the clay particles fed to the first roller mill;
means for feeding the clay to said first roller mill;
means for separating particles exiting the first roller mill, into three particle size distributions: (1) particles that have the desired particle size distribution, (2) particles that are under-size and (3) over-size clay particles, before feeding the over-size particles to a second roller mill;
a second roller mill comprising a second pair of counter-rotating rollers that are separated by a second roller gap that is smaller than said first roller gap;
means for feeding the over-size clay particles that exit the first roller mill to said second roller mill;
means for separating particles exiting the second roller mill, into three particle size distributions: (1) particles that have the desired particle size distribution, (2) particles that are under-size and (3) over-size clay particles; and
means for reducing the particle size of the over-size particles from said second roller mill.

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**5,495,990**
**METHOD AND APPARATUS FOR REMOVING WRAPPED YARN GROUP ON PACKAGE BOBBIN END**
**Masayuki Tamura, Matsuyama; Akira Shinohara, Ehime; Koichi Kobayashi, Mihara; Yasushi Maekawa, and Minoru Yoshida, both of Matsuyama, all of, Japan, assignors to Teijin Limited, Osaka, Japan**
**Filed Mar. 25, 1993, Ser. No. 36,667**
**Claims priority, application Japan, Mar. 25, 1992, 4-067121; Jun. 5, 1992, 4-145656; Aug. 14, 1992, 4-216854; Jan. 29, 1992, 4-291464**
**Int. Cl.[6] B65H** *54/00;54/02;69/04;75/32*
**U.S. Cl. 242—18 R** **18 Claims**



2. An apparatus for removing a wrapped yarn coil of an initial yarn portion of a package; said wrapped yarn coil being wound on a bobbin while being gripped by a slit-like groove formed on the bobbin, and being followed by a transfer tail yarn; comprising:
a driving means for rotating the package along an axis of the package to unwind the wrapped yarn coil,
a cutting means for severing the wrapped yarn coil to produce two severed ends at a position on a bobbin end in which a transfer tail yarn exists,
a yarn suction means for holding one end of said two severed ends of the wrapped yarn coil by suction,
a seal delivery means for fixing one end of the transfer tail yarn to the bobbin end by adhering a seal on the end of the transfer tail yarn, and
a yarn twisting means for gripping the one end with a gripper and rotating the gripper away from the bobbin, as the bobbin is rotated by the driving means to unwind the coil from the slit-like groove.

9. A method for removing a wrapped yarn coil of an initial yarn portion of a package; said wrapped yarn coil being wound on a bobbin while being gripped by a slit-like groove formed on the bobbin end along a peripheral circle of the bobbin, and being followed by a transfer tail yarn; comprising the steps of:
severing the wrapped yarn coil to produce two severed ends at a position on the bobbin end in which the slit-like groove does not exist,
holding one end of said two severed ends of the wrapped yarn coil by suction,
gripping the one end with a gripper,and
rotating the gripper to impart a twist to the yarn coil and displacing the gripper away from the bobbin, as the bobbin is rotated to unwind the yarn coil from the slit-like groove.

5,495,991

## APPARATUS FOR TRANSPORTING EMPTY YARN WINDING TUBES AND FULLY WOUND TEXTILE YARN PACKAGES TO AND FROM A WINDING LOCATION

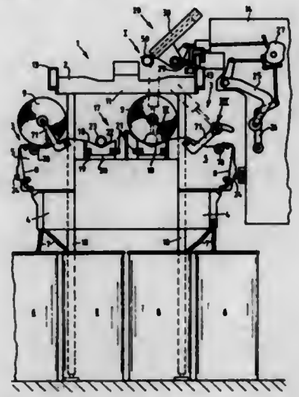
Hans Raasch; Heinz-Dieter Gobbels, and Wolfgang Loers, all of Moenchengladbach, Germany, assignors to W. Schlafhorst AG & Co., Moenchengladbach, Germany

Filed Apr. 4, 1994, Ser. No. 222,129

Claims priority, application Germany, Apr. 24, 1993, 43 13 522.6; Jan. 26, 1994, 44 02 143.7

Int. Cl.[6] B65H *54/02*; D01H *9/14*

U.S. Cl. 242—35.5 A 21 Claims



1. An apparatus for transporting empty yarn-winding tubes and fully wound textile yarn packages to and from a textile machine having a plurality of adjacently arranged yarn-winding work stations each with a winding head, said apparatus comprising:

a plurality of transport units configured for selectively carrying one of an empty tube and a wound yarn package to and from the yarn-winding stations, each said transport unit having an upwardly facing transport receiver surface that is freely accessible from above,

an endless guide track partially disposed along one side of the work stations laterally adjacent the winding head of each work station,

means disposed on said transport units for guiding said transport units along said guide track,

means for joining said transport units in a transport assembly along said guide track,

means for driving said transport assembly along said guide track,

means positionable above said transport units for lifting empty tubes off said transport receiver surfaces and transferring the empty tubes to the work stations, and

means for laterally displacing wound textile yarn packages from the winding heads onto said transport receiver surfaces.

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5,495,992

## BELT-DRIVEN MAGNETIC TAPE CARTRIDGE HAVING A DEVICE FOR APPLYING MECHANICAL TENSION TO THE TAPE IN THE CARTRIDGE

Oivind A. Nielsen, Oslo, Norway, assignor to Tandberg Data A/S, Oslo, Norway

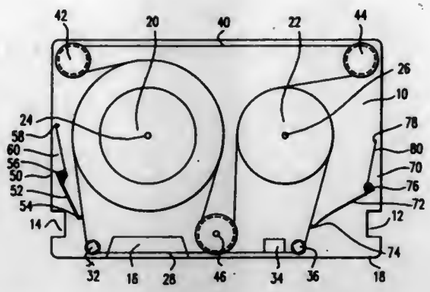
Filed Apr. 15, 1992, Ser. No. 868,703

Claims priority, application Germany, Feb. 12, 1992, 42 04 134.1

Int. Cl.[6] G11B *23/087*

U.S. Cl. 242—346.1 4 Claims

4. In a cartridge having first and second reels with a tape entrained therebetween for winding said tape on one of said reels while unwinding said tape from the other of said reels, each reel



rotating around a respective reel hub, a first guide roller disposed for guiding said tape onto and off of said first reel and a second guide roller disposed for guiding said tape onto and off of said second reel, with said tape running along a substantially straight line path between said first and second guide rollers, the improvement comprising:

first means for mechanically pre-loading said tape with a variable force while said tape is running and being disposed for acting on said tape between said first reel and said first guider roller;

second means for mechanically pre-loading said tape with a variable force while said tape is running and being disposed for acting on said tape between said second reel and said second guide roller;

said first and second means for pre-loading said tape controlling, in combination, tension of said tape along said straight line path between said guide rollers; and

each of said first and second means for mechanically pre-loading said tape including a coil spring for generating said variable force.

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5,495,993

## RETRACTOR FOR SEAT BELT

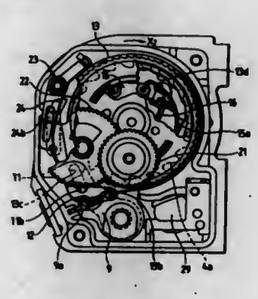
Ganta Hibata, Kanagawa, Japan, assignor to NSK Ltd., Tokyo, Japan

Filed Sep. 19, 1994, Ser. No. 308,445

Claims priority, application Japan, Sep. 21, 1993, 5-256266; Mar. 14, 1994, 6-068148

Int. Cl.[6] B60R *22/415*

U.S. Cl. 242—382.2 7 Claims



1. A retractor for a seat belt, comprising:

a base;

a sensor cover disposed on an outer portion of said base;

a ratchet plate including a winding shaft for winding a webbing. said winding shaft being rotatably fitted to said base;

a ratchet member rotatable in response to a rotation of said winding shaft in a webbing draw-out direction and including a pawl engaging said ratchet plate for locking the rotation of said winding shaft;



a lock arm rotatable between a first position where said lock arm engages with said ratchet plate and a second position where said lock arm does not engage with said ratchet plate;

a control plate rotated corresponding to the rotation of said winding shaft;

an operation mode switching lever having a flexible arm portion with a first swing end portion and a guide pin with a second swing end portion for rotating said lock arm to said first position and said second position, said guide pin being guided by a guide groove of said control plate, said guide groove including:

a first cam groove for guiding said guide pin so as to rotate said lock arm to said second position;

a second cam groove for guiding said guide pin so as to rotate said lock arm to said first position; and

a switching area connecting an end point of said first cam groove to a start point of said second cam groove, and operated to deliver said guide pin to said second cam groove for switching said lock arm from said second position to said first position; and

an urging means for urging said operation mode switching lever so as to rotate said lock arm to said first position and said second position, selectively, wherein said urging means comprises:

a first lock convex portion having a triangular section disposed on an inner wall of said sensor cover; and

a second lock convex portion engaging said first lock convex portion and having a triangular section formed on said first swing end portion.

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5,495,994

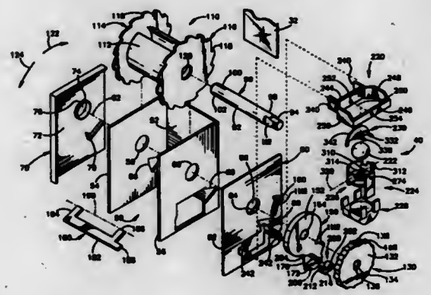
## INERTIA SENSITIVE SEAT BELT RETRACTOR

Robert J. Rumpf, Grosse Pointe; Lawrence J. Verellen, Washington, and Gary M. Ray, Royal Oak, all of Mich., assignors to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed Sep. 7, 1994, Ser. No. 301,708

Int. Cl.[6] B60R *22/40*

U.S. Cl. 242—384.4 5 Claims



1. A seat belt webbing retractor comprising:

a frame;

a spool on which seat belt webbing is wound, said spool being supported on said frame for rotation about a first axis in a belt retraction direction and in an opposite belt withdrawal direction;

means for blocking rotation of said spool in the belt withdrawal direction in response to vehicle deceleration above a predetermined deceleration, said means comprising:

a ratchet rotatable about said first axis;

a pawl supported for pivotal movement about a second axis between a disengaged position and an engaged position in engagement with said ratchet;

a first inertia member movable from an unactuated position to an actuated position in response to vehicle deceleration above a predetermined deceleration;

support means for supporting said first inertia member in said unactuated position when said retractor is in any one of a plurality of different inclined orientations, said support means and said first inertia member having the same predetermined orientation at each of said plurality of different inclined orientations of said retractor, said first inertia member being movable relative to said support means from the unactuated position to the actuated position;

said support means comprising a second inertia member which is supported on said frame for pivotal movement relative to said frame about a third axis to maintain said predetermined orientation of said first inertia member and of said support means at said plurality of different inclined orientations of said retractor; and

sensor means for moving said pawl from the disengaged position to the engaged position in response to movement of said first inertia member relative to said second inertia member from the unactuated position to the actuated position;

said second inertia member comprising a plastic shell and a metal weight connected with said plastic shell, said plastic shell having an upper support surface, said first inertia member comprising a metal ball disposed on said upper support surface of said second inertia member.

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5,495,995

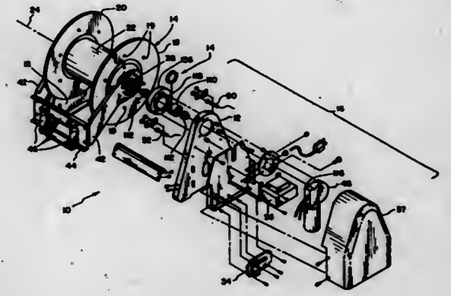
## MOTOR DRIVEN HOSE REEL

Cecil G. Dominique, Fort Wayne; Edward L. Walter, and Norman L. Franklin, both of Columbia City, all of Ind., assignors to Reelcraft Industries, Inc., Columbia City, Ind.

Filed Jan. 31, 1994, Ser. No. 189,255

Int. Cl.[6] B65H *75/48*

U.S. Cl. 242—390.1 12 Claims



1. A reel assembly for carrying a flexible elongate member, said reel assembly comprising:

a reel for connection to one end of the elongate member;

a frame rotatably supporting said reel;

an electric motor supported by said frame and rotatably driving said reel in a direction to retract the elongate member;

at least one sensor for sensing rotational movement of said reel; and

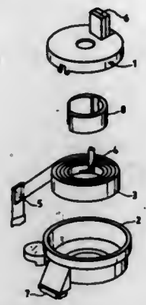
control means interconnecting said sensor and said motor for determining when said reel is rotated a first predetermined amount in a payout direction opposite the retraction direction and in response thereto actuating said motor to drive said reel in the retraction direction through sufficient rotation to completely rewind the elongate member, said control means further determining when said reel is rotated in said payout direction a second predetermined amount greater than said first predetermined amount and payout has stopped and actuating said motor to drive said reel in the retraction direction through a third predetermined amount less than that necessary to completely rewind the elongate member.

**5,495,996**

## CABLE REEL

**Yoshito Sakamoto, and Haruo Saeu, both of Tochigi, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan**

**Filed Jun. 10, 1994, Ser. No. 258,489**
**Claims priority, application Japan, Jun. 14, 1993, 5-141635**
**Int. Cl.[6] H01R** *35/04*
**U.S. Cl. 242—402** **16 Claims**



1. A cable reel comprising:

a housing including an inner cylinder having an inner cylinder hole and an outer cylinder having an outer cylinder hole; and

a tape-shaped cable which is spirally housed in said housing, both end portions of said tape-shaped cable being introduced to outside of said housing through said inner cylinder hole and said outer cylinder hole, respectively;

wherein said tape-shaped cable includes at least one high-strength conductor having a tensile strength of from 500 to 1500 N/mm$^2$, an elongation percentage of 0.5 to 50% and a spring limitation value of 400 to 2000 N/mm$^2$; and

wherein said cable reel absorbs relative rotation between an external member that generates an external force and said inner cylinder by tightening and loosening of windings of said tape-shaped cable.

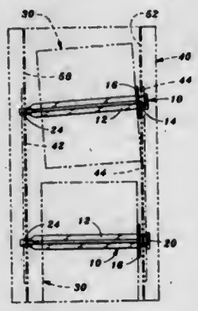
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**5,495,997**

## SUPPORT APPARATUS FOR CORELESS TOILET TISSUE ROLL

**John R. Moody, Antioch, Calif., assignor to James River Paper Company, Inc., Richmond, Va.**

**Filed Oct. 4, 1994, Ser. No. 317,398**
**Int. Cl.[6] B65H** *16/06;19/10*
**U.S. Cl. 242—561** **1 Claim**



1. In combination:

a toilet tissue dispenser cabinet defining a cabinet interior and having spaced side walls defining opposed, generally vertically oriented, elongated slots;

a careless toilet tissue roll comprised of a plurality of toilet tissue web convolutions and having a central aperture defined by the innermost toilet tissue web convolution; and

support spindle apparatus including a double-ended elongated spindle body positioned in the central aperture of said coreless toilet tissue roll and having an outer peripheral surface in tight frictional engagement with the innermost toilet tissue web convolution of the coreless toilet tissue roll to resist sliding of the coreless toilet tissue roll relative to said support spindle apparatus in an axial direction, a roll stop element fixedly attached to said elongated spindle body and extending outwardly from said elongated spindle body at a location on said elongated spindle body between the ends of the elongated spindle body, said roll stop element abutting against an end of the coreless toilet tissue roll to positively prevent movement of the coreless toilet tissue roll relative to the support spindle apparatus in a single axial direction, an enlargement fixedly attached to the elongated spindle body at an end of the elongated spindle body, the enlargement being spaced from the roll stop element and having a bearing surface oriented toward said roll stop element, said elongated spindle body being located in one of the slots of the toilet tissue dispenser cabinet with the roll stop element being located on one side of the wall defining the slot within which the elongated spindle body is located and the enlargement located on the other side of the wall defining the slot within which the elongated spindle body is located, said support spindle apparatus being tiltably disposed within the cabinet interior with said enlargement bearing surface and said coreless toilet tissue roll both in engagement with said toilet tissue dispenser cabinet to resist downward movement of the support spindle apparatus and coreless toilet tissue roll within the toilet tissue dispenser cabinet under the influence of gravity, said enlargement comprising a circular-shaped flange radiating outwardly from said elongated spindle body and said elongated spindle body having a circular-shaped cross-section between said roll stop element and said enlargement, said support spindle apparatus additionally comprising an extension member attached to the end of said elongated spindle body remote from said enlargement, said extension member being substantially coaxial with said elongated spindle body and having a peripheral cross-section smaller than the maximum peripheral cross-section of said elongated spindle body, said extension member being unsupported and projecting into the slot opposed to the slot in which the elongated spindle body is located, the maximum cross-sectional dimension of said extension member being smaller than the slot into which the extension member projects, and said roll stop element and said enlargement being spaced apart a distance greater than the thickness of the side wall defining the slot within which said elongated spindle body is located.

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**5,495,998**

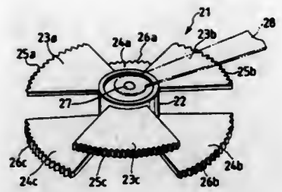
## TAPE REEL STRUCTURE FOR MAGNETIC TAPE CASSETTE

**Hidetoshi Hirata, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Feb. 9, 1994, Ser. No. 194,022**
**Claims priority, application Japan, Feb. 9, 1993, 5-008739 U**
**Int. Cl.[6] B65H** *75/18*
**U.S. Cl. 242—614** **4 Claims**

1. A method of molding a tape reel for a magnetic tape cassette, said tape reel is provided with a hub for winding a magnetic tape, and a plurality of upper flange members and lower flange members vertically spaced from said upper flange member, said upper and lower flange members are formed alternately when viewed from the winding direction of said magnetic tape, and outer peripheral edge portions of said lower flange members are substantially continuous with outer periphery edge portions of said upper flange members when viewed from a reel rotary shaft axial direction, comprising steps of:





preparing an upper movable mold and a lower stationary mold, said upper mold having a plurality of first core members for molding said lower flange members, and said lower mold having a plurality of second core members for molding said upper flange members, said first and second core members are alternately disposed such that the outer peripheral edge portions of said lower flange members are formed substantially continuous with the outer periphery edge portions of said upper flange members and each of said upper and lower flange members comprises a gear member at an outer peripheral edge thereof;

injecting molten resin into cavities formed by said core members and said mold; and

separating said upper mold from said lower mold thereby forming said hub, and said upper and lower flange members of said tape reel at the same time.

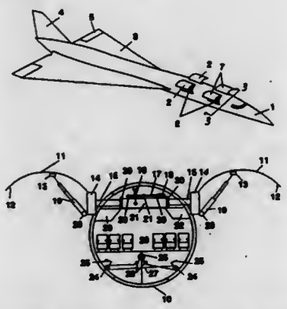
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**5,495,999**

## RETRACTABLE CANARD WING SURFACES FOR AIRPLANES

**Hermann K. Cymara, 106 Stonehaven Cir., Newfield, N.Y. 14867**

**Filed Feb. 17, 1995, Ser. No. 390,553**
**Int. Cl.[6] B64C** *3/56*
**U.S. Cl. 244—45 A** **10 Claims**



1. A retractable canard wing apparatus for aircraft having a fuselage with forward and rear halves and a surface, comprising:

a pair of canard wings on opposite sides of the fuselage, having a shape conforming to sections of the fuselage surface, located in the forward half of the fuselage;

each of the canard wings being attached at one end thereof by a hinge to a rotatable platform;

each rotatable platform comprising a platform base, an extension arm extending into the fuselage of the aircraft, and a lifting mechanism connected to the platform base and the canard wing, such that when the lifting mechanism is activated the canard wing is pivoted on the hinge from a first, lowered position parallel to the fuselage to a second, raised position;

support cylinder means for supporting and rotating the extension arms of the rotatable platforms, rotatably mounted within the fuselage between the rotatable platforms;

the extension arms of the rotatable platforms slidably extending into the support cylinder, such that the extension arms can slide from a first, inboard position to a second, outboard position, being rotatably fixed to the extension arms such that when the support cylinder is rotated along its axis the extension arms and platforms are rotated, altering the angle of the canard wings relative to the fuselage;

rotation means for rotating the support cylinder, attached to the fuselage and to the support cylinder;

extension means for moving the extension arms from the first inboard position to the second outboard position.

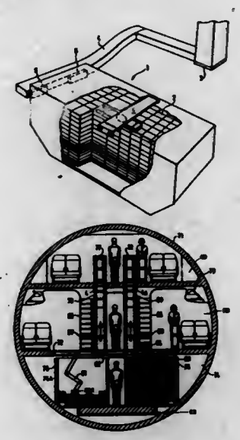
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**5,496,000**

## SYSTEM FOR STORING AND TRANSPORTING FOOD AND BEVERAGES ON BOARD OF AIRCRAFT

**Hans-Juergen Mueller, Henstedt-Ulzburg, Germany, assignor to Daimler-Benz Aerospace Airbus GmbH, Hamburg, Germany**

**Filed Feb. 1, 1994, Ser. No. 189,880**
**Claims priority, application Germany, Feb. 1, 1993, 4302706**
**Int. Cl.[6] B64D** *11/04*
**U.S. Cl. 244—118.1** **27 Claims**



1. An apparatus for handling food and beverages on board an aircraft, comprising a container for storing a plurality of food and beverage boxes, at least one distribution station, and a transport channel for directly and independently transporting said boxes operatively interposed between said container and said distribution station, wherein said transport channel comprises at least one vertical conveyor and a substantially horizontally extending channel having a substantially flat cross-sectional configuration with a relatively greater horizontal channel width and a relatively smaller vertical channel height, and wherein said food and beverage boxes are substantially flat boxes having a relatively greater horizontal box width and a relatively smaller vertical box height.

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**5,496,001**

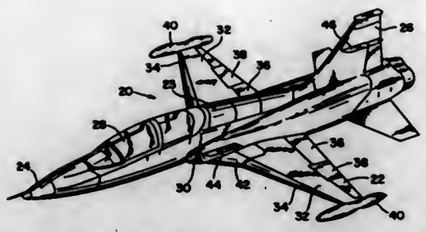
## T-38 AIRCRAFT MODIFIED WITH AN F-5 WING

**Andrew Skow, 2 Dobbin La., Rolling Hills Estates, Calif. 90274**

**Filed Jan. 28, 1994, Ser. No. 188,566**
**Int. Cl.[6] B64C** *1/26;23/06*
**U.S. Cl. 244—119** **7 Claims**

1. A method for modifying an existing aircraft, comprising the steps of:

a) providing an aircraft which has a wing attached to a fuselage which has a tail and a pair of nacelles each located at a wing



root section of said fuselage, said aircraft also having a plurality of wing fittings that establish a wing angle of incidence;

b) removing said wing from said fuselage;

c) removing said wing fittings from said fuselage;

d) attaching a plurality of new wing fittings to said fuselage;

e) attaching a new wing to said new wing fitting, said new wing having a leading edge flap at a leading edge of said new wing and a trailing edge flap at a trailing edge of said new wing, wherein said new wing fittings change the wing angle of incidence approximately 2°; and,

f) attaching a pair of leading edge extensions to said new wing and to said nacelles.

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**5,496,002**

**AIRCRAFT WINGS**

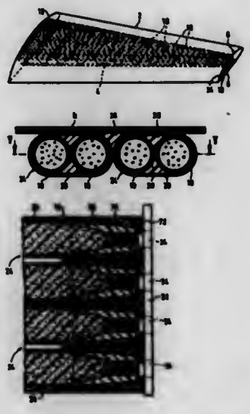
**Rainer Schütze, Braunschweig, Germany, assignor to Deutsche Forschungsanstalt fur Luft-und Raumfahrt e.V., Cologne, Germany**

**Filed Sep. 2, 1994, Ser. No. 300,786**

**Claims priority, application Germany, Sep. 3, 1993, 43 29 744.7**

**Int. Cl.[6] B64C *3/18***

**U.S. Cl. 244—123** **10 Claims**



1. An aircraft wing comprising wing shell portions made of composite fibre material, a wing spar box, said wing spar box having ribs, stringers arranged longitudinally of the wing, and a wing skin lying on and adhering to the stringers, wherein said stringers are in the form of rods, each said rod comprising a tubular wall made of composite fibre material on a core, said tubular wall comprising at least one layer of axially parallel, unidirectional fibres and a fabric tube or sleeve over said layer with fibres crossing at an angle to the axis of said rod, each said rod being provided with a rotationally symmetrical connection element at one end of the wing, for axially introducing tension and/or compression forces, said connection element having an outwardly directed end face, and said connection element being surrounded by said tubular wall of said rod and being provided with a coaxial connection thread and a conical portion having a surface tapering towards said end of said rod, said axially parallel, unidirectional fibres contacting said surface of said conical portion of said connection element over its entire length, and said tubular wall protrudes beyond said outwardly directed end face of said connection element, and a peripheral winding is provided at least adjacent said conical position of said connection element, and said conical portion of said connection element has a cone tip angle ($2\alpha$) such that said connection element is held in self-locking manner in the conical end portion of said tubular wall of said rod, and a compression plate is further arranged at said end of said rod and lies against said end face of said tubular wall.

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**5,496,003**

**SYSTEM FOR TRANSMISSION OF INFORMATION BETWEEN THE GROUND AND MOVING OBJECTS, IN PARTICULAR IN GROUND-TRAIN COMMUNICATIONS**

**Patrice H. Bernard, Paris, France, assignor to Societe Nationale des Chemins de fer Francais, Paris, France**

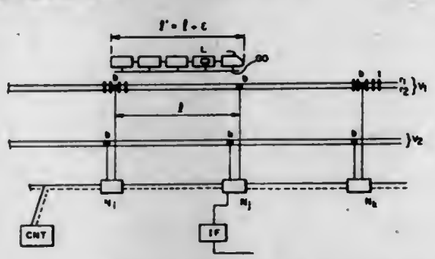
**PCT No. PCT/FR92/00364, § 371 Date Dec. 15, 1993, § 102(e) Date Dec. 15, 1993, PCT Pub. No. WO92/19483, PCT Pub. Date Nov. 12, 1992**

**PCT Filed Apr. 23, 1992, Ser. No. 137,866**

**Claims priority, application France, Apr. 24, 1991, 91 05045**

**Int. Cl.[6] B61L *3/00***

**U.S. Cl. 246—29 R** **13 Claims**



1. A short-range bidirectional transmission system comprising a ground-based network including a plurality of beacons disposed successively along a path on the ground, each beacon having a maximum coverage length, and a moving object having an antenna and being operative to move along said path, wherein said antenna installed on the moving object has a coverage area substantially longer in the longitudinal dimension of the moving object (i) than in the transverse direction and (ii) than said maximum coverage length of each of said beacons.

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**5,496,004**

**DIRECT SUPPORT FROG ASSEMBLY**

**Stephen R. Kuhn, Richton Park, Ill., assignor to ABC Rail Products Corporation, Chicago, Ill.**

**Continuation-in-part of Ser. No. 217,698, Mar. 25, 1994. This application Aug. 17, 1995, Ser. No. 516,504**

**Int. Cl.[6] E01B *7/00***

**U.S. Cl. 246—470** **10 Claims**

1. A frog assembly mounted on a base plate and having a fixed wing, longitudinally extending railroad frog casting and securely clamped between a pair of wing rails at the intersection of a mainline rail and a turnout line rail comprising:

said railroad frog casting having a planar, longitudinally-extending bottom support surface; a heel end; a heel extension adapted to be attached to a pair of heel rails; a frog point integral with said heel end defined in part by said bottom surface, a pair of diverging side surfaces and a top surface which defines a mainline running surface and a turnout line running surface for railroad car wheels; and a toe end having a first wing and a second wing each defined in part by said bottom surface, an outer longitudinally extending perimeter side wall and a top wheel running surface;

wherein said first and second wings lie on opposite sides of and extend forwardly of said frog point and extend parallel to and are spaced laterally from one of said diverging side surfaces of said point to define a flangeway groove therebetween;

said first wing rail having a base with a bottom surface which rests on said base plate and a pair of opposed inclined fishing surfaces connected by a web to a head having a mainline wheel running top surface and a pair of opposed inclined fishing surfaces and said second wing rail having a base with a bottom surface which rests on said base plate and a pair of opposed inclined fishing surfaces connected by a web to a head having a turnout line wheel running top surface and a pair of opposed inclined fishing surfaces;

said first wing rail having a first wing receiving section which complements and extends parallel to said perimeter side wall of said first wing and receives said first wing and a first guard rail section and said second wing rail having a second wing receiving section which complements and extends parallel to said perimeter side wall of said second wing and receives said second wing and a second guard rail section;

wherein the top wheel running surfaces of said first and second wings are parallel to said mainline and said turnout line wheel running surfaces of said wing rails and said bottoms of said first and second wings are parallel to the bottom surface of said first and second wing rails;

wherein said railroad frog casting is freestanding such that substantially the entire bottom surface of said casting is spaced from and interposed between the base of each of said wing rails such that said entire bottom surface of said casting rests upon said rail plate;

aligned bores formed in said first and second wing rails and said railroad frog casting;

a bolt assembly having a smaller diameter than said aligned bores mounted in said aligned bores to clamp said railroad frog casting between said first and second wing rails; and

wherein said bolt assembly is sized sufficiently smaller than said aligned bores to allow limited vertical movement of said railroad frog casting with respect to said first and second wing rails to ensure that any wheel loads imposed on said frog casting are transmitted to said base plate and are not taken by said bolt assembly.

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**5,496,005**

**HANGER FOR ELECTRICAL CONDUITS**

**Dale E. Dieringer, 5195 W. 58th Ave., Ste. 300, Arvada, Colo. 80002**

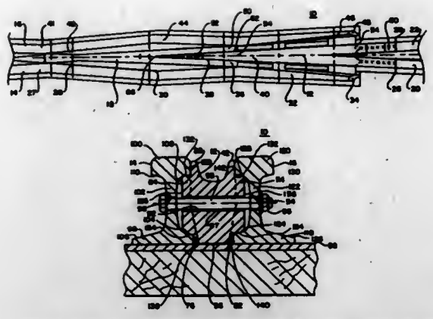
**Filed Feb. 8, 1994, Ser. No. 193,429**

**Int. Cl.[6] F21V *21/00***

**U.S. Cl. 248—74.2** **9 Claims**

1. A hanger for electric wiring, comprising,





an elongated base member having first and second ends and told and bottom surfaces and where at least a portion of at least one of either the top or bottom surfaces is serrated,

a strap depending from the first end of the base member, and springable clamp means carried by the depending strap for securely holding at least one electrical conductor, and

a curved spur depending from the base member intermediate its first and second ends and curving toward the depending strap.

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**5,496,006**

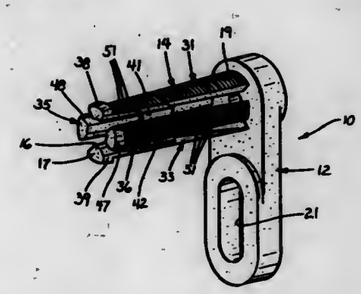
**FASTENING DEVICE AND METHOD OF ATTACHMENT**

**Frederick C. Kulka, Troy, and Michael G. Wunsch, Romeo, both of Mich., assignors to General Motors Corporation, Detroit, Mich.**

**Filed Jul. 5, 1994, Ser. No. 270,603**

**Int. Cl.[6] A47F *5/08***

**U.S. Cl. 248—231.9** **4 Claims**



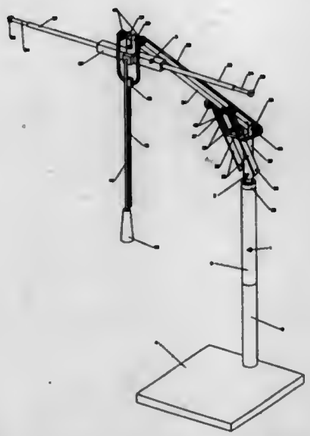
1. A fastening device for attaching a part having a wall with an aperture therein to a surface and providing three-dimensional adjustment to compensate for surface and part dimensional variations comprising:

a leg having an elongated hole therethrough and a cylindrical body extending from the leg, the cylindrical body being elongated with grippers on the outer periphery thereof and terminating at an enlarged, hooked end;

wherein the cylindrical body is resilient and has an axial opening through the enlarged, hooked end with a plurality of radial openings extending radially through the cylindrical body connecting to the axial opening providing for contraction and expansion of the body and wherein the enlarged, hooked end is expandable and contractible; and

an expander inserted into the axial opening forcing the grippers radially outward against the wall of the aperture, locking the part in location on the cylindrical body.

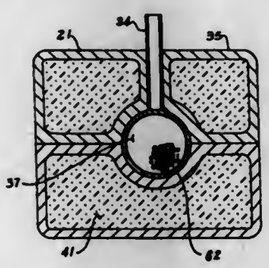
5,496,007
**DEVICE FOR HOLDING OUT-SIZED DOCUMENTS**
Cecil L. Reece, 4016 6th Ave., Los Angeles, Calif. 90008; Edmund Hansberry, 4569 W. 62nd St., Los Angeles, Calif. 90043, and Edward Thurman, 2320 Bullis Rd., Compton, Calif. 90221
Filed May 13, 1994, Ser. No. 263,948
Int. Cl.[6] A47B 5/04
U.S. Cl. 248—441.1 8 Claims



1. A device for holding out-sized documents, which comprises:
(a) a vertical support stand, comprising a base, a lower tubular shaft which is connected at one end vertically to the base, an upper tubular shaft which is connected at one end to the lower tubular shaft, and a short bearing shaft, said bearing shaft having a portion of its length stepped down in diameter to fit snugly inside the upper end of said upper tubular shaft, and having a socket formed in its larger diameter along its axis providing a bearing surface;
(b) a support arm assembly pivotally mounted on said support stand by connection to said socket in said bearing shaft, said support arm assembly comprising
a vertical yoke having a forked end at its upper proximate end and a stepped down diameter portion at its distal end to fit in said bearing shaft,
a first pivot pin mounted horizontally through a lower portion of said vertical yoke near to its distal end,
a second pivot pin mounted between the furcations of the forked end of said vertical yoke and having ends projecting outwards from said furcations,
a long arm member mounted pivotally at one end to said second pivot pin and functioning as an extended support arm,
a third pivot pin mounted horizontally through said arm member and having ends projecting outwards, said third pivot pin being located at a distance approximately one fourth of the length of said arm member from said second pivot pin to apply a suitable point for application of lever action on said support arm,
two flat plate members mounted one on each side of said arm member, each said plate member being fastened at near its proximate lower end to said first pivot pin, and at near its distal upper end to said third pivot pin, each said plate member having a long slot with multiple notches cut in its surface starting at near its distal upper end, said third pivot pin projecting through said slot and normally being held in any one of said notches, thereby providing cantilever support for said arm member, said slot with multiple notches in each plate member, acting together with said third pivot pin to provide a variable vertical angle locking position for said arm member;
(c) a fastening pin, said fastening pin connecting both said plate members at about their center, providing structural rigidity;
(d) an extension rod assembly comprising
a yoke having a forked end,
a fourth pivot pin, mounted between the furcations of the forked end of said yoke and having ends projecting outwards from said furcations, said fourth pivot pin being passed through the free end of said support arm which is fitted in said forked end of said yoke, for suspension of said yoke from the end of said support arm,
a rectangular cross-section block member having its long axis fastened at its center to the bottom of said yoke at 90 degrees to the vertical axis of said yoke,
two identical primary extension rods made of tubing, each primary extension rod being connected to an end of said block member in line so as to form a single horizontal arm composed of three parts, each said primary extension rod having a length long enough to support a large size document, and
a guide rod, said guide rod being connected to the approximate center of said block member and at 90 degrees to the long axis of said block member so that said guide rod hangs downward, said guide rod including a handle fastened to its lower end for an equipment user, said guide rod enabling a user to remotely move said extension rod assembly up, down or in a horizontal arc around said vertical support stand; and
(e) means for remotely adjusting the height position of said extension rod assembly in cooperation with said guide rod.

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5,496,008
**RUBBER MOLDING APPARATUS**
Dennis J. Orlewicz; William P. Orlewicz, both of Plymouth, and Lawrence W. Orlewicz, Milford, all of Mich., assignors to Magnum Manufacturing, Inc., Mich.
Division of Ser. No. 28,535, Mar. 8, 1993, Pat. No. 5,362,429.
This application Sep. 7, 1994, Ser. No. 301,878
Int. Cl.[6] B29C 33/76
U.S. Cl. 249—61 8 Claims



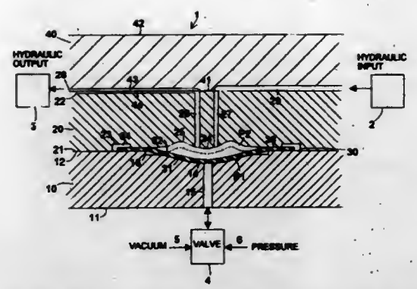

1. An apparatus for molding complex parts from rubber materials comprising: a mold assembly comprised of an upper portion and a lower portion; a frangible unitary core suspended inside of said mold between upper and lower portions of said mold, said core comprising a rigid cellular material covered with a thin coating of a hard non-porous quick set resin.

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5,496,009
**VALVE**
Gregory A. Farrell, Ridgewood, N.J.; Kevin J. Hanmann, Cary, N.C.; Peter Schmitz, Carmel, N.Y.; Bruce E. Behringer, Park Ridge, N.J., and James A. Mawhirt, Brooklyn, N.Y., assignors to Bayer Corporation, Tarrytown, N.Y.
Filed Oct. 7, 1994, Ser. No. 319,918
Int. Cl.[6] F16K 31/128
U.S. Cl. 251—61.1 16 Claims

1. A valve comprising:
a first rigid layer having a substantially planar first surface;

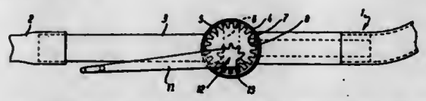





a second rigid layer having a substantially planar second surface facing the first surface and a substantially planar third surface opposite the second surface;
a flexible layer positioned between the first and second surfaces;
a valve chamber demarcated by a concave surface in the substantially planar first surface and one surface of the flexible layer;
at least one first fluid passageway in the first rigid layer opening into the valve chamber at the concave surface to alternatively apply a vacuum and pressure thereto;
a fluid chamber demarcated by another surface of the flexible layer and a concave-convex surface in the substantially planar second surface and comprising an inner circular convex portion defining a valve seat and a concentric annular outer concave portion spaced below said valve seat; and
at least two second fluid passageways in the second rigid layer opening into the valve chamber at the valve seat;
whereby when a vacuum is applied to the valve chamber the flexible layer flexes to space the other surface of the flexible layer apart from the concave-convex surface to permit communication between the at least two second fluid passageways and when a pressure is applied to the valve chamber, the flexible layer flexes across the concave-convex surface to positively wrap and seal around the convex portion of the concave-convex surface to prevent communication between the at least two second fluid passageways.

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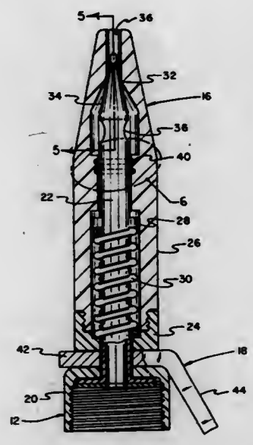
5,496,010
**CLOSURE MEANS**
Graham J. Collyer, Via Hyde, United Kingdom, assignor to Simpla Plastics Limited, Cardiff, Wales
Continuation of Ser. No. 174,421, Dec. 28, 1993, abandoned, which is a continuation of Ser. No. 836,008, Apr. 15, 1992, abandoned. This application Sep. 22, 1994, Ser. No. 310,809
Claims priority, application United Kingdom, Sep. 2, 1989, 8919872
Int. Cl.[6] F16K 5/00
U.S. Cl. 251—78 3 Claims



1. A tap for interconnection between a urine collection bag and tubing means conjoined with Urine reservoir means comprising:
(a) an elongate passage;
(b) a barrel, disposed within and substantially at a right angle to said passage;
(c) a control member disposed in said barrel and rotatable in relation thereto for defining therewith respective open and closed positions of said tap;
(d) a lever arm connected to the control member by an intermediate lost motion device whereby to effect rotatable movement of said control member on rotational movement of said lever arm; and
(e) said lever arm extending in substantially opposite longitudinal directions relative to said elongate passage in said open and closed positions of said control member, said lever arm lying alongside and in close proximity to said elongate passage in each of said open and closed positions, wherein said lever arm is connected to and mounted for rotation with said control member by means of said lost motion device whereby rotation of the lever arm between said substantially opposite longitudinal directions effects a degree of angular movement of said control member which is substantially smaller than the angular movement of the lever arm.

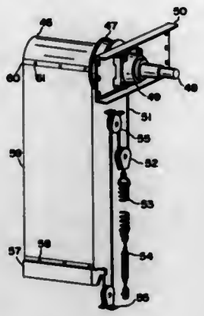
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5,496,011
**CONTAINER DISPENSING VALVE**
Daniel L. Samargo, and Patty S. Samargo, both of P.O. Box 617, Rivesville, W. Va. 26588
Filed Jan. 23, 1995, Ser. No. 376,925
Int. Cl.[6] F16K 31/44
U.S. Cl. 251—246 2 Claims



1. A container dispensing valve comprising: a mounting means for securing to a neck of a container, the mounting means comprising a cap being securable to a neck of the container, the cap including an aperture directed therethrough; a valve means coupled to the mounting means for selectively permitting dispensing of the contents of the container, the valve means comprising a central tube projecting through the aperture of the cap; and an actuator means movably mounted to the mounting means for selectively actuating the valve means the central tube is positionable for sealing engagement against a neck of a container to which the mounting means is attachable, the central tube being substantially hollow; a base member and a central aperture extending therethrough are positioned about the central tube such that the central tube projects through the central aperture thereof; a nozzle removably coupled to the base member so as to extend concentrically over the central tube, the central tube including a radially projecting flange; a coil spring interposed between the flange and an interior surface of the base member so as to biases the base member towards the cap to maintain the nozzle over the central tube, the nozzle being shaped so as to define a valve seat of reduced cross-sectional dimension continuing into contiguous communication with an exit aperture thereof, the central tube being shaped so as to define a needle point valve engaging the valve seat of the nozzle and a plurality of lateral apertures extending therethrough, wherein the nozzle can be selectively moved relative to the central tube so as to bias the valve seat from the needle point valve.

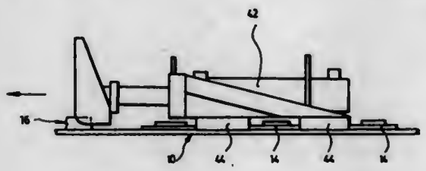
5,496,012
**INDUSTRIAL ROLL-UP DAMPER**
Larry A. Kenny, III, Rindge, N.H., assignor to C&W Fabricators, Inc., Gardner, Mass.
Filed Jan. 3, 1994, Ser. No. 176,670
Int. Cl.[6] F16K *31/00*
U.S. Cl. 251—294 9 Claims



4. A roll-up damper comprising:
a damper frame comprising an inlet duct section, an outlet duct section and a gap formed therebetween;
a drive tube rotatably fixed to said damper frame, said drive tube comprising a membrane-engaging section having a first diameter and a cable spool section having a second diameter larger than said first diameter;
a damper membrane having a top portion and a bottom floating portion, said top portion being coupled to said drive tube; and
means for opening and closing said damper, comprising a cable having a first end fixed to said cable spool section and a second end fixed to said bottom portion of said membrane;
so that upon rotation of said drive tube, said damper membrane bottom floating portion is lowered through said gap and isolates said inlet duct section from said outlet duct section.

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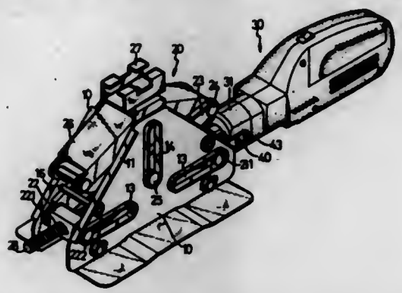
5,496,013
**DEVICE FOR MOVING LARGE AND HEAVY LOADS**
Michel Lussier, Longueuil, Canada, assignor to Les Systems M.L.G. Inc., Longueuil, Canada
PCT No. PCT/CA93/00090, § 371 Date Jun. 23, 1994, § 102(e) Date Jun. 23, 1994, PCT Pub. No. WO93/16951, PCT Pub. Date Sep. 2, 1993
PCT Filed Dec. 23, 1993, Ser. No. 256,874
Claims priority, application Canada, Feb. 26, 1992, 2061864
Int. Cl.[6] B66F *1/00*
U.S. Cl. 254—105 19 Claims



1. A device upon which a heavy load is moved by at least one hydraulic jack, said device comprising, in combination:
modular rail sections (**10**) that can be assembled to form a pair of parallel rails (**15***a*, **15***b*) of a given length;
a load-carrying plate (**16**) sized to extend transversely between said rails (**15***a*, **15***b*), said plate being movable along said rails; and
at least one hydraulic jack (**42**) for incrementally pushing said heavy load positioned on top of said plate (**16**) along said rails (**15***a*, **15***b*);
characterized in that:
each of said rail sections (**10**) comprises an upper surface (**12**) from which a row of supporting elements (**14**) extending centrally at regular intervals along the length of said rail sections project upwardly, each of said supporting elements (**14**) comprising an upper layer (**30**) made of a friction material;
the load-carrying plate (**16**) has an undersurface (**20**) with two opposite edge portions (**13***a*, **13***b*) overlying said rails, each of said edge portions comprising two parallel rows of guiding elements (**18**) projecting down from the undersurface (**20**), said guiding elements (**18**) being positioned at regular intervals and each comprising a bottom layer (**38**) made of a friction material, said rows of guiding elements (**18**) being positioned and sized to define therebetween a guiding channel (**21**) which may releasably engage said central row of supporting elements (**14**) projecting up from the corresponding rails (**15***a*, **15***b*); and
said supporting elements (**14**) and guiding elements (**18**) are of the same height and cooperate for guiding said load-carrying plate (**16**) along said rails (**15***a*, **15***b*);
whereby, upon engagement of said load-carrying plate (**16**) on said rails (**15***a*, **15***b*), the bottom layers (**38**) of said guiding elements (**18**) bear on said upper surface (**12**) of said rail sections (**10**) on both sides of said rows of supporting elements (**14**) and the upper layers (**30**) of said supporting elements (**14**) bear on the undersurface of said plate (**16**) in said guiding channels (**21**), thereby facilitating sliding of said plate (**16**) and load on said rails (**15***a*, **15***b*).

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5,496,014
**MOTORIZED SCREW JACK ASSEMBLY**
Kun-Shan Hsu, No. 3, Ha Ko Lian, Pei Hou Lei, Chia Yi, Taiwan, Prov. of China
Filed Jun. 27, 1994, Ser. No. 266,487
Int. Cl.[6] B66F *3/22*
U.S. Cl. 254—122 2 Claims



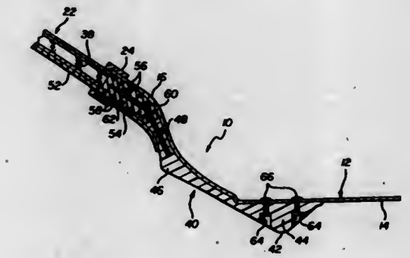
1. A jack assembly comprising:
a pair of wall members fixed together in parallel with each other and each including two horizontal grooves and a vertical groove arranged between said horizontal grooves;
a pair of frames including a middle portion pivotally coupled together at a shaft, said shaft including two ends slidably engaged in said vertical grooves of said wall members, said pair of frames including two lower ends and two upper ends, two blocks pivotally secured to said lower ends of said pair of beams at two axles, a first axle of said two axles including end portions slidably engaged in said horizontal grooves;
a bolt engaged through said blocks;
a bracket;
a pair of arms including lower ends pivotally coupled to said upper ends of said frames and upper ends pivotally coupled to said bracket; and



means for actuating said bolt so as to move said blocks toward each other or away from each other in order to move said bracket upward or downward, said actuating means including a housing, a motor disposed in said housing, engaging means for engaging with said bolt, and gearing means coupling said motor to said engaging means so as to rotate said bolt; said gearing means including a first gear secured to said motor, a sleeve fixed in said housing and having a first internal gear formed therein, at least one first disc having at least one first pinion rotatably engaged thereon, said first pinion being engaged with said first gear and engaged with said first internal gear, a second gear secured to said first disc, a second disc including at least one second pinion rotatably engaged thereon, said second pinion being engaged with said second gear and engaged with said first internal gear, said second disc including a second internal gear formed therein; said engaging means including a third gear engaged with said second internal gear, and a head having an engaging surface formed therein for engaging with said bolt.

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5,496,015
**ROOFER'S RIPPING SPADE**
Joseph A. Carmien, 525 N. Maple Dr., Beverly Hills, Calif. 90210
Filed Nov. 18, 1994, Ser. No. 342,384
Int. Cl.[6] A47L *13/02*; B25G *3/34*
U.S. Cl. 254—131.5 17 Claims

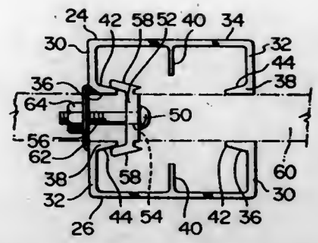


1. A roofer's ripping spade, comprising:
a tool head including a blade, a back-side cavity in the blade, and a handle receiving socket extending from the blade;
a tool handle having an end inserted into the handle receiving socket of the tool head;
a molded composite block underlying and positioned adjacent to a lower surface of the blade, the composite block including a fulcrum portion extending away from the lower surface of the blade, and a frog portion situated within and configured to fill the back-side cavity of the blade;
means for attaching the fulcrum portion of the composite block to the blade; and
means for interconnecting the frog portion of the composite block with the end of the tool handle inserted into the handle receiving socket of the tool head.

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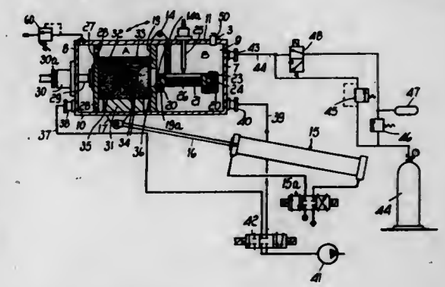
5,496,016
**FENCE SYSTEM**
Harvey E. Parisien, Kingston, Canada, assignor to Alcuf Inc., Kingston, Canada
Filed Jul. 12, 1994, Ser. No. 273,984
Claims priority, application Canada, Jul. 19, 1993, 2100853
Int. Cl.[6] F04H *17/14*
U.S. Cl. 256—68 3 Claims

1. In a fence system including a plurality of vertical posts supporting top and bottom rails, each post comprising:
parallel spaced-apart channel members having opposed channels and lower ends secured to a base, wherein each channel member has first and second side walls and an interconnecting wall, wherein free ends of each of the side walls being turned inwardly to form a pair of flanges having side faces parallel to the interconnecting walls to define a channel opening for accommodating the rail therein;
a connector comprising a body;
an aperture in the body to receive a bolt;
a washer received on the bolt for engaging said side walls of the channel members of the post;
a pair of ribs on the body, one of the ribs being disposed on each side of the body to engage the flanges on the channel members when the bolt is tightened to urge the channel members for engaging and clamping the rail therebetween; and when the post is assembled, the top and bottom rails extend between the channel members of the posts and rest on an associated connector.



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5,496,017
**KILN FOR FIRING AND/OR CASTING PROSTHODONTIC PRODUCTS**
Alberto Gagliano, Cavalcaselle di Castelnuovo del Garda, Italy, assignor to Peacock Limited L.C., Cheyenne, Wyo.
Filed Sep. 13, 1994, Ser. No. 305,277
Claims priority, application Italy, Sep. 20, 1993, VR93A0069; Sep. 28, 1993, VR93A0072
Int. Cl.[6] C21D *1/74*
U.S. Cl. 266—208 13 Claims



1. A firing kiln comprising:
a containment casing which internally forms at least one treatment chamber, said containment casing having thermally insulating walls, said at least one treatment chamber having a firing kiln section and a cooling chamber section;
at least one part holder movably mounted inside said treatment chamber;
at least one opening for access to said treatment chamber;
a door for opening and closing said opening, said part holder being movably supported by an inner portion of said door;
actuation means for moving said door between an open position and a closed position;

means for extending and retracting said part holder with respect to said door in order to move said part holder between said firing kiln section and said cooling chamber section; and conditioning means for producing a vacuum and introducing inert gas into said treatment chamber.

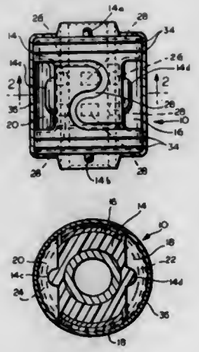
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**5,496,018**

## FLUID DAMPED BUSHING WITH ENCAPSULATED WINDOW METAL

**Douglas M. McLelland, and Paul T. Wolfe, both of Ft. Wayne, Ind., assignors to GenCorp Inc., Fairlawn, Ohio**

**Filed Aug. 10, 1994, Ser. No. 289,027**
**Int. Cl.[6] F16M *1/00***
**U.S. Cl. 267—140.12** **13 Claims**



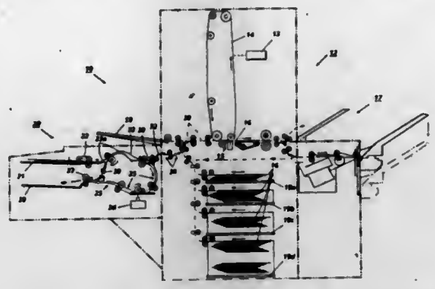
1. A fluid damped bushing comprising:
a rigid cylindrical member;
an annular elastomeric member having an inner surface, said inner surface of said elastomeric member engaging an outer surface of said rigid cylindrical member in surface to surface contact, said annular elastomeric member further having first and second circumferentially spaced apart recesses in an outer, generally cylindrical surface thereof;
an inertia track passage formed in an outer surface of said annular elastomeric member, said inertia track passage providing restricted fluid communication between said first and second circumferentially spaced apart recesses;
window metal means encapsulated in said annular elastomeric member, said window metal means comprising first and second rings longitudinally spaced apart at locations external to said first and second circumferentially spaced apart recesses and web means extending between said first and second rings to join said first and second rings to one another in a unitary member, said web means comprising radially outwardly projecting pad means serving to support said inertia track passage;
an outermost sleeve circumscribing said elastomeric member, said outermost sleeve sealing a damping fluid contained in said first and second circumferentially spaced apart recesses; and
a substantially incompressible damping fluid contained in said circumferentially spaced apart recesses, said damping fluid being added by immersing a subassembly comprising said annular elastomeric member and said window metal means in damping fluid and then pressing the subassembly into said outermost sleeve.

**5,496,019**

## DUAL FUNCTION SHEET FEEDER

**John R. Yonovich, Shortsville, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Apr. 25, 1994, Ser. No. 232,980**
**Int. Cl.[6] B65H *5/00***
**U.S. Cl. 271—3.19** **5 Claims**



1. A dual mode sheet feeder/separator system for an electronic document imaging and printing system with an electronic document imaging station, a printing engine, an externally accessible sheet stacking tray, a sheet feeder/separator for separating and feeding documents from said sheet stacking tray, and at least two selectably different sheet feeding paths for the sheets stacked in said sheet stacking tray after they are separated and initially fed by said sheet feeder/separator operatively connecting with said sheet stacking tray, said two selectably different sheet feeding paths comprising a first sheet path for feeding documents to said electronic document imaging station to be electronically imaged in a first operating mode and a second sheet path for feeding sheets to said printing engine in a second operating mode, and a sheet path selection system for selecting between said first and second sheet paths in response to selecting between said first and second operating modes, wherein in said first operating mode said sheet stacking tray contains documents to be electronically imaged and said documents are fed through said first sheet path to be electronically imaged, and wherein in said second mode said sheet stacking tray contains special copy sheets which are fed by said second sheet path into said printing engine to be printed; wherein said first sheet path for feeding documents to said electronic document imaging station to be electronically imaged in said first operating mode further includes a return path for returning said documents to be restacked ending adjacent to said sheet stacking tray.

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**5,496,020**

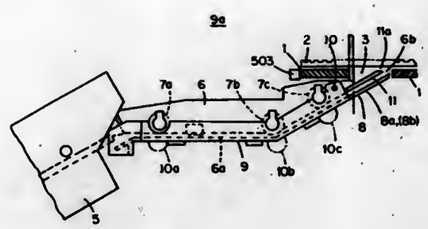
## BANK NOTE TRANSPORTING APPARATUS IN GAME MACHINE ISLAND

**Takatoshi Takemoto; Toshikazu Chida, both of Tokyo; Noriaki Kano, Hanamaki; Eiji Ito, Hanamaki; Koji Murakami, Hanamaki; Takashi Itagaki, Hanamaki; Kozo Sekimoto, Sendai, and Masanori Suzuki, Hanamaki, all of, Japan, assignors to Kabushiki Kaisha Ace Denken, Tokyo, Japan**

**PCT No. PCT/JP92/01440, § 371 Date May 9, 1994, § 102(e) Date May 9, 1994, PCT Pub. No. WO93/09517, PCT Pub. Date May 13, 1993**
**PCT Filed Nov. 7, 1991, Ser. No. 240,710**
**Claims priority, application Japan, Nov. 7, 1991, 3-291576**
**Int. Cl.[6] B65H *3/44***
**U.S. Cl. 271—9.01** **16 Claims**

1. A bank note transporting apparatus for transporting externally inserted bank notes, which is provided in a game machine island in which a plurality of game machines and a plurality of game media lending machines for lending game media used for playing games are disposed, comprising:
main transporting means provided within the island for transporting bank notes to a destination position; and





introducing means disposed in at least one position along the length of said main transporting means for merging bank notes externally inserted into the island to said main transporting means;
said main transporting means including an accepting slot for accepting the bank notes from said introducing means;
said introducing means including a bank note inserting unit into which the bank notes are externally inserted and a merging unit for guiding and transporting the inserted bank notes to said accepting slot;
said merging unit including a passage member for transporting the bank notes and a passage frame which is pivotally mounted on one end of the passage member; and
said passage frame being mounted on said passage member in such a manner that said passage frame is disposed in parallel with said passage member to form a transporting passage therebetween when said introducing means is driven and is separated from the transporting passage defining face of said transporting member when said passage frame is pivoted about a pivot shaft perpendicular to a transporting direction of the bank notes and parallel to surfaces of the bank notes.

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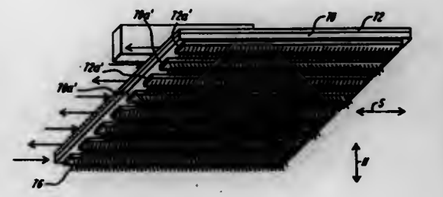
**5,496,021**

## METHOD AND APPARATUS FOR AUTOMATED HANDLING OF CUT MATERIAL

**Stephen L. Bellio, West Roxbury; Edward Bernardon, Bedford; Mark J. Condon, Brighton; Robert S. Flory, Concord; Donald C. Fyler, Needham; Mitchell L. Hansberry, Framingham; Tommy W. Lee, Wilmington, and James F. Mueller, North Reading, all of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.**

**Division of Ser. No. 27,898, Mar. 5, 1993, Pat. No. 5,463,921.**
**This application Oct. 19, 1994, Ser. No. 325,484**
**Int. Cl.[6] B65H *3/22***
**U.S. Cl. 271—18.3** **6 Claims**

1. A segment pickup apparatus comprising:
A. a segment picker having an array of carding strips mounted thereon wherein alternate strips of said array are movable relative to each other in the direction of a shift axis, each of said carding strips including a plurality of discrete sub-strips, each of said sub-strips having a base portion and a multiplicity of substantially parallel, elongated, resilient needle-like elements extending from said base portion with distal tips thereof lying in a plane, wherein said needle-like elements of sub-strips of transversely adjacent strips are angularly offset with respect to each other,
B. a controller for selectively establishing said relative movement of said adjacent carding strips in the direction of said axis including a plurality of discrete substrips and



C. actuator means for displacing each of said substrips in a direction perpendicular to said plane between an advanced position and a retracted position, and
D. a controller for selectively controlling said actuator means to establish a predetermined subset of said substrips to be in said advanced position.

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**5,496,022**

**Patent Not Issued For This Number**

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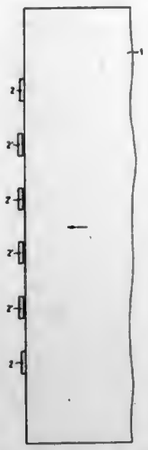
**5,496,823**

## LEADING EDGE STOP FOR ALIGNING PAPER SHEETS ON A FEEDER TABLE

**Willi Becker, Bammental, and Stefan Dipke, Eppelheim, both of, Germany, assignors to Heidelberber Druckmaschinen AG, Heidelberg, Germany**

**Continuation of Ser. No. 283,286, Feb. 28, 1994, abandoned.**
**This application Mar. 27, 1995, Ser. No. 410,403**
**Claims priority, application Germany, Feb. 27, 1993, 43 06 238.5**
**Int. Cl.[6] B65H *9/04***
**U.S. Cl. 271—245** **13 Claims**

1. On a feeder table of a sheet-processing machine, the combination comprising a front lay member cyclically swivelable about an axis, in accordance with a sheet-conveying cycle, and leading-edge stops for effecting an alignment of paper sheets, said leading-



edge stops being disposed on and swivelable with said front lay member out of an alignment position, into a rest position and back into said alignment position, each of said leading-edge stops being adjustment means for adjustably fastening said respective leading-edge stop in a respective position thereof in a conveying and counter to a conveying direction, respectively, of the paper sheets with respect to said front lay member in said alignment position of said front lay member, said adjustment means including a sheet abutting surface formed on each of said leading-edge stops, each of said leading-edge stops having an axially symmetric construction and being mounted in said front lay member so as to be rotatable about the axis of symmetry thereof, and said leading-edge stops and said front lay member including corresponding deflecting elements for producing a translatory displacement of said respective leading-edge stop in direction of said axis due to rotation about said axis.

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**5,496,024**

**CONVEYING DEVICE FOR TRANSPORTING PRINTED PRODUCTS ALONG A CONVEYING CHANNEL HAVING AN UPSTREAM END REGION WITH ADJUSTABLE HEIGHT**

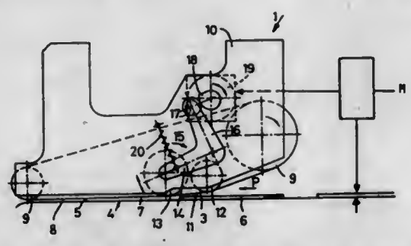
**Ernst Luethi, Brittnau, and Daniel Langenegger, Strengelbach, both of, Switzerland, assignors to Grapha-Holding AG, Hergiswil, Switzerland**

**Filed Feb. 14, 1994, Ser. No. 195,284**

**Claims priority, application Switzerland, Feb. 18, 1993, 496/93**

**Int. Cl.[6] B65H** *5/02*

**U.S. Cl. 271—273** **8 Claims**



1. In a conveying device for transporting printed products regularly following one another on a flat support formed by at least one first, driven belt, the conveying device including a run of at least one second belt, with the run being disposed above the support, driven uniformly with the support, and forming a conveying channel with the support, the improvement comprising means for periodically adjusting the height of the conveying channel in an upstream end region of the conveying channel, the periodic adjusting corresponding to a cadence of the supplied printed products.

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**5,496,025**

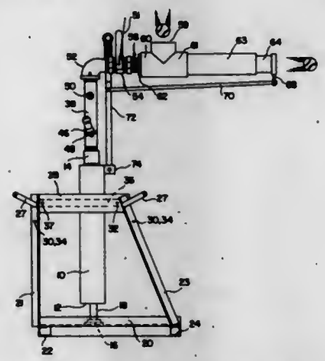
**PNEUMATIC BALL PITCHING MACHINE FOR DIFFERENT SIZED BALLS**

**Wiley Phillips, Rte. 1, Box 270, Bay Springs, Miss. 39422, and Woodrow W. Welborn, Rte. 12, Box 400, Laurel, Miss. 39440**

**Filed Feb. 25, 1994, Ser. No. 201,962**

**Int. Cl.[6] F41B** *15/00*

**U.S. Cl. 273—26 D** **12 Claims**



1. A ball projecting machine for propelling a ball at a desired set speed from a barrel, which comprises a frame supporting a barrel whereby balls are propelled therethrough an air pressure tank, an air pressure control valve, ball admitting means for admitting a ball into an area juxtaposed said air pressure control valve and said barrel from which said ball is propelled, a housing secured at one end to said means for admitting a ball into the area from which the ball is propelled, means connected to and between said outer end of said barrel and means adjacent said ball admitting means for longitudinally moving said barrel, and said barrel is slidable within said housing to open said means for admitting said ball and to close said ball admitting means so that said ball is propelled through said barrel, said barrel having sufficient length to extend with an inner end adjacent said air pressure control valve from which the ball is propelled and an outer end which extends beyond an open end of said housing.

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**5,496,026**

**SPONGE EGGBALL**

**Lawrence M. Montgomery, 300 Northlake Dr., Crystal Bay, Nev. 89402**

**Continuation-in-part of Ser. No. 249,782, May 26, 1994, Pat. No. 5,413,332. This application May 9, 1995, Ser. No. 437,697**

**Int. Cl.[6] A63B** *37/02*

**U.S. Cl. 273—58 R** **20 Claims**

1. A sponge-type ball for amusement exercise and athletic competition comprising in operative combination:

a) a solid body of generally egg-shaped exterior configuration having a first major axis and a second minor axis;

b) the ratio of said major axis to said minor axis lying within the range of about 1.3 to about 1.6;

c) said ball has a first small end generally parabolic in cross section, a second, opposed, larger end of generally hemispherical configuration, and an intermediate zone having a smooth generally flattened curve so that said opposed ends smoothly fair into said intermediate zone;

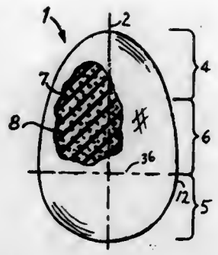
d) said ball is composed of a sponge elastomer having a density in the range of from about 5 to about 20 psi as determined by ASTM D-1056;

e) said ball has a length in the range of about 2½" to about 4½" along its major axis;

f) said ball has a mass in the range of from about 30 to 90 grams; and

g) said ball is of a size to fit comfortably in the human hand between the index and little fingers and which is controllable to impart spin along selective ones of said axes to control the rebound thereof.





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**5,496,027**

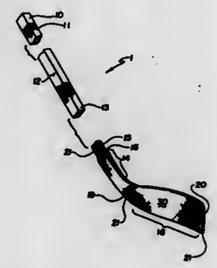
**REINFORCED HOCKEY STICK BLADE AND METHOD OF MAKING SAME**

**William D. Christian, and Roger A. Christian, both of Warroad, Minn., assignors to Christian Brothers, Inc., Warroad, Minn.**

**Filed Apr. 1, 1994, Ser. No. 222,424**

**Int. Cl.[6] A63B** *59/14*

**U.S. Cl. 273—67 A** **18 Claims**



1. A hockey stick comprising:

a handle having a hollow lower end;

a replacement blade having a connection end insertable into said hollow lower end, a blade portion, and a shaft portion; and

reinforcement material comprised of a plurality of reinforcement fibers covering at least a portion of said connection end, wherein said connection end with said reinforcement material thereon is insertable into said hollow lower end of said handle and said reinforcement material is disposed between said connection end and said hollow lower end when said connection end is so inserted.

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**5,496,028**

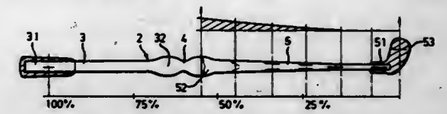
**GOLF CLUB SHAFT WITH TWO FLEX POINTS**

**Jih-Shiao Chien, Taichung Hsien, Taiwan, Prov. of China, assignor to Rapport Composite Co. Ltd., Taipei, Taiwan, Prov. of China, and Ralph Maltby Ent., Inc., Newark, Ohio**

**Filed Jan. 30, 1995, Ser. No. 380,567**

**Int. Cl.[6] A63B** *53/10*

**U.S. Cl. 273—80 B** **3 Claims**



1. A golf club shaft made of a composite material and comprising an upper portion with an enlarged lower end section, and a lower portion with an enlarged upper end section which is adjacent to said enlarged lower end section of said upper portion, said enlarged lower and upper end sections defining a contracted section therebetween near a middle portion of said shaft, said upper portion decreasing in diameter from an upper end thereof to an upper end of said enlarged lower end section and having a maximum diameter at an axial point which is located on said enlarged lower end section, an upper end of said upper portion being adapted to couple with a grip, said lower portion increasing in diameter from a lower end thereof to a lower end of said enlarged upper end section and having a maximum diameter at another axial point which is located on said enlarged upper end section, the lower end of said lower portion being adapted to couple with a club head, and wherein said shaft is tubular and includes a first layer reinforced by differential directional carbon fibers and extending the whole length of said upper portion of said shaft, a second layer wrapped around said first layer, extending from said first layer to an intermediate portion of said lower portion of said shaft, reinforced by carbon fibers which form a small angle with the axis of said shaft at said upper portion of said shaft and which form a large angle with the axis of said shaft at said contracted section and said lower portion of said shaft, said large angle being larger than said small angle, a third layer wrapped around said second layer, having an upper end located on said contracted section of said shaft, extending from said contracted section of said shaft to said lower portion of said shaft, reinforced by carbon fibers which form an angle of about 45° with the axis of said shaft, a coating layer having an upper section wrapped around said third layer and a lower section wrapped around said second layer and extending along the whole length of said shaft, whereby two flex points are formed on the shaft, one flex point being located on said contracted section and the other flex point on said lower portion below said enlarged end section.

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**5,496,029**

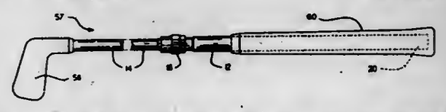
**ADJUSTABLE GOLF SHAFT**

**Jeffrey R. Heath, 746 Fruithurst Dr., and Rodney Stevens, 836 Fruithurst Dr., both of Pittsburgh, Pa. 15228**

**Filed Sep. 13, 1994, Ser. No. 304,936**

**Int. Cl.[6] A63B** *69/36;53/16*

**U.S. Cl. 273—80 D** **10 Claims**



1. A golf shaft for a golf club having a head and a grip, the golf shaft comprising:

(a) a first shaft member having a first end, a second end, an inner diameter and an outer diameter;

(b) a second shaft member having a first end, a second end, and an outer diameter, the second shaft member telescopically positioned within the first shaft member, the second shaft

member outer diameter at the second end being larger than the first shaft member inner diameter at the first end whereby the second shaft member can not be separated from the first shaft member by extracting the second shaft member second end through the first shaft member first end; and

(c) means for compressing the first shaft member first end around the second shaft member to fixedly attach the first shaft member to the second shaft member at one of a plurality of locations along the length of the second shaft member such that when the head of the golf club impacts a golf ball the first shaft member and the second shaft member will remain in a fixed longitudinal relationship with respect to each other wherein the compression means comprises

a bolt having a head and a hollow cylindrical rod extending from the head, the cylindrical rod having external threads and at least one longitudinal slit allowing the inner diameter of the rod to decrease to a diameter smaller than the outer diameter of the first shaft member first end, the bolt slidably positioned on the first shaft member;

a nut having internal threads that mate with the external threads of the bolt and slidably positioned on the golf shaft; and

a compression ring positioned between the golf shaft and the nut.

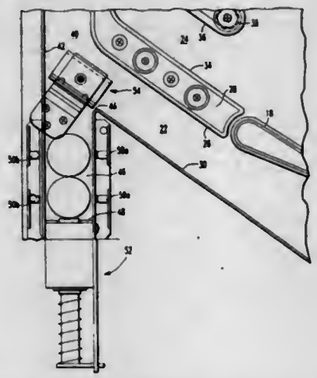
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**5,496,030**

**PINBALL KICK BACK PLAY FEATURE**

**Claude A. Fernandez, Palantine, Ill., assignor to Capcom Coin-Op, Inc., Arlington Heights, Ill.**

**Filed May 2, 1995, Ser. No. 433,710**
**Int. Cl.[6] A63F 7/22**
**U.S. Cl. 273—119 R** **20 Claims**



1. A pinball machine, comprising:

an inclined playfield for supporting a rolling ball having associated therewith at least one flipper;

a door mechanism associated with said playfield having a movable door;

a holding area positioned behind said door for allowing said ball to be stored therein;

a kicker mechanism associated with said holding area for launching said ball therefrom;

a first switch associated with said door mechanism for causing said door to move from a first position wherein said ball is prevented from accessing said holding area to a second position wherein said ball is provided access to said holding area; and

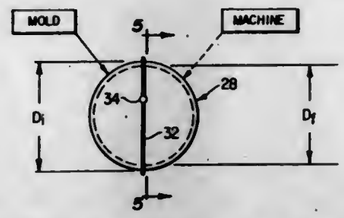
a second switch associated with said kicker mechanism and said door mechanism for causing said door to be positioned in said second position and for thereafter causing said kicker mechanism to launch said ball from said holding area.

**5,496,031**

**METHOD OF FABRICATING A TABLE SOCCER OF FUSSBALL PLAYING GAME BALL**

**Calvin E. McCloud, 4959 Rendon Rd., Fort Worth, Tex. 76140**

**Continuation of Ser. No. 113,421, Aug. 27, 1993, abandoned, which is a division of Ser. No. 715,430, Jun. 14, 1991, Pat. No. 5,240,250, which is a division of Ser. No. 641,582, Jan. 15, 1991, Pat. No. 5,058,892. This application Mar. 10, 1995, Ser. No. 402,305**
**Int. Cl.[6] A63B 71/04;37/00**
**U.S. Cl. 273—128 A** **5 Claims**




1. A method of fabricating a table soccer or fussball game playing ball, having a select playing diameter, for the play of fussball, said method comprising the steps of:

forming a playing ball blank, said playing ball blank having a generally spherical exterior of a select initial diameter; and

forming a finished playing ball, having a select playing diameter, by using a centerless grinding machine to reduce the diameter of said playing ball blank to said select playing diameter and providing it with a sphericity which does not vary by more than about 0.001" on any external surface portion thereof.

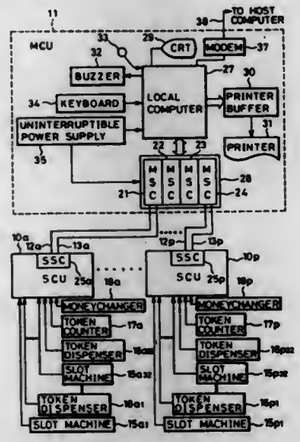
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**5,496,032**

**MANAGEMENT METHOD FOR GAMING HALL**

**Kazuo Okada, Tokyo, Japan, assignor to Universal Sales Co., Ltd., Tokyo, Japan**

**Filed Feb. 3, 1994, Ser. No. 191,294**
**Claims priority, application Japan, Feb. 3, 1993, 5-016351**
**Int. Cl.[6] A63F 9/00**
**U.S. Cl. 273—138 A** **35 Claims**




1. Apparatus for detecting fraud in and managing playing conditions of games, the games being played in a gaming hall by using playing media, the gaming hall comprising a plurality of gaming machines for paying out said playing media as dividends when a win occurs, a plurality of playing media dispensers for dispensing said playing media corresponding in number to the amount of inserted money, and at least one playing media counter for counting the number of said playing media to be exchanged for a premium, said detecting and managing apparatus comprising:

a local computer means, said local computer means comprising means for calculating an expected sales amount for each said gaming machine in accordance with data representing a number of said playing media used by said gaming machines and data representing a number of said dividend playing media, said data being supplied from each of said gaming machines, means for calculating an actual sales amount in accordance with data representing one of said inserted money amount and said number of playing media dispensed by said playing media dispenser, and means for comparing said expected sales amount with said actual sales amount; and

means for displaying an alarm signal specific to a result of said comparison.



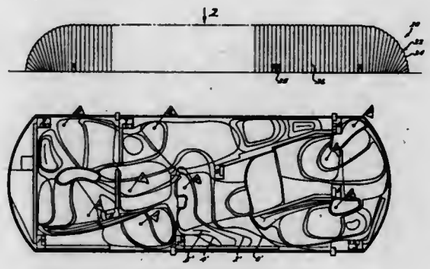
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**5,496,033**

**INDOOR GOLF FACILITY**

**Michael A. Thompson, 8255 Smiley Ave., Utica, Mich. 48087**

**Continuation of Ser. No. 624,574, Dec. 10, 1990, abandoned. This application Jul. 1, 1992, Ser. No. 908,850**
**Int. Cl.[6] A63J 3/00; E04B 1/343**
**U.S. Cl. 273—176 R** **1 Claim**



1. An indoor golf facility comprising

an undulating natural grass playing surface,

an air pressure differential supported enclosure of ultraviolet light translucent material enclosing said playing surface, the light translucent material of said enclosure extending over all portions of said playing surface and downwardly to close proximate relation to said playing surface along the periphery thereof, and

a plurality of curtains suspended from said enclosure and arranged in an array that demarks a plurality of conventional golf playing areas comprising tees, fairways and greens, respectively; each of said golf playing areas being of generally triangular configuration with the tee thereof at an apex and the green at an opposite side of each triangular playing area whereby each fairway is divergent from the tee to the green of each playing area, said curtains extending downwardly from close proximity to said enclosure and having undulating bottom edges, respectively, complementary to the undulations of said playing surface and in close proximate relation thereto so as to preclude passage of a golf ball from one playing area to an adjacent playing area.

**5,496,034**

**THREAD WOUND GOLF BALL**

**Takashi Maruko, and Shinichi Kakiuchi, both of Yokohama, Japan, assignors to Bridgestone Sports Co., Ltd., Tokyo, Japan**

**Filed Dec. 9, 1994, Ser. No. 352,633**
**Claims priority, application Japan, Dec. 9, 1993, 5-340861**
**Int. Cl.[6] A63B 37/08;37/12**
**U.S. Cl. 273—216** **1 Claim**

1. A thread-wound golf ball having a liquid center wound by rubber thread and further having a cover placed thereon, wherein the major component of the cover is an ionomer whose JIS-C hardness is 70–85, and wherein the thickness of the cover is 1.0–1.8 mm, the outside diameter of the liquid center is 27–30 mm, the center bag hardness of the liquid center, in terms of JIS-A hardness, is 44–62, and the thickness of the center bag is 1.8–2.3 mm.

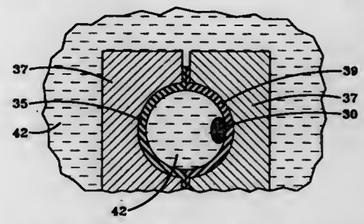
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**5,496,035**

**GOLF BALL CENTER**

**Herman T. Gilchrist; Sue C. Welsh, both of Ashland; Harvey A. McGowan, Mansfield; Gary A. Weller, Ashland, and Richard T. Robertson, Nova, all of Ohio, assignors to Abbott Laboratories, Abbott Park, Ill.**

**Continuation of Ser. No. 114,559, Aug. 30, 1993, abandoned. This application May 12, 1995, Ser. No. 440,267**
**Int. Cl.[6] A63B 37/08**
**U.S. Cl. 273—231** **20 Claims**




1. A golf ball center comprising a spherical polymeric shell which surrounds a liquid composition of matter, said liquid composition of matter comprising water and a water soluble poly (ethylene oxide) polymer.

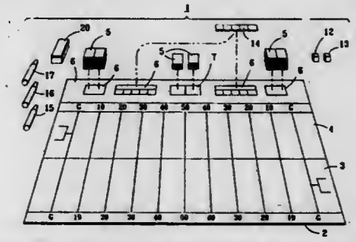
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**5,496,036**

**FOOTBALL CARD BOARDGAME**

**Keith D. Chester, 1009 Cherrywood, Garland, Tex. 75040**

**Filed Jun. 12, 1995, Ser. No. 489,612**
**Int. Cl.[6] A63F 3/00**
**U.S. Cl. 273—247** **10 Claims**



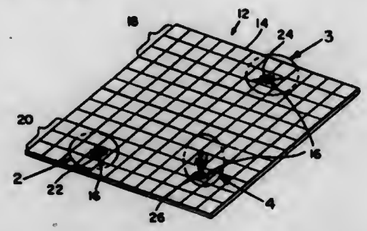
1. A football game apparatus comprising, in combination:

a. a markable erasable game board having a pair of adjacent football fields lengthwise thereon,

b. a slidable offensive yard marker for each field to identify the position of the football on said field,
c. a set of different colored markers to indicate respectively, the football position before the ball is snapped, and the gain or loss position of the football after each play,
d. an equal number of action cards for each game player,
e. a pair of dice, wherein one die is regular and includes numbered dots thereon, and the second die designates numbers of yards,
f. a set of rules requiring one player to roll said dice, and
g. the other player to turn his top card over,
h. the resulting game action being the sum or difference of the numbers shown on the action card and on the yard die, and
i. a score chart for identifying the game winner after a number of offensive plays have occurred for each player in each game quarter.

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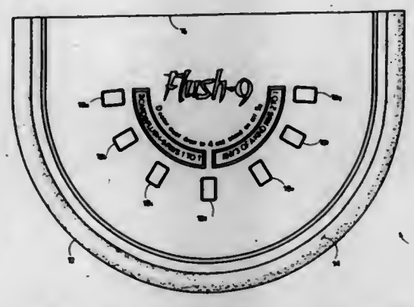
**5,496,037**
**BATTLEFIELD BOARD GAME**
**Frank J. Rumph, 5700 Bayshore Rd. #806, Palmetto, Fla. 34221-9359**
**Filed Feb. 6, 1995, Ser. No. 383,895**
**Int. Cl.[6] A63F *3/00***
**U.S. Cl. 273—255** **3 Claims**




1. A method of playing a war simulation board game having a player one and a player two, a square game board comprising twelve rows of square boxes forming a grid pattern, a player one set-up zone formed by the first three rows of square boxes and a player two set-up zone formed by the first three rows of square boxes located at an opposite end from the player one set-up zone, playing pieces comprising tank playing piece, soldier playing pieces and anti-tank gun playing pieces, comprising the steps of:
a ) arranging by a player one, tank playing pieces, soldier playing pieces and anti-tank gun playing pieces in the player one set-up zone;
b ) arranging by a player two, tank playing pieces, soldier playing pieces and anti-tank gun playing pieces in the player two set-up zone;
c) moving the playing pieces about the game board in order to remove an opponent player's playing pieces, wherein the steps of moving playing pieces about the game board comprises;
i) moving said playing pieces in a direction selected from the group consisting of forwards, backwards, sideways, but not diagonally;
ii ) jumping over a player's own playing piece, but not jumping over the playing pieces of an opponent; and
iii) moving any of the game pieces any number of square boxes, so that the total number of square boxes traversed upon by playing pieces is equivalent to the number indicated by a chance determining device, wherein upon a conflict between playing pieces:
I) a tank playing piece can cause an opponent tank playing piece, soldier playing piece and anti-tank gun playing piece to be removed from play;
II) an anti-tank gun playing piece causes an opponent anti-tank gun playing piece and tank playing piece to be removed from play; and
III) a soldier playing piece causes an opponent soldier playing piece and anti-tank gun playing piece to be removed from play.

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**5,496,038**
**CARD GAME**
**Adisorn Kangsanaraks, 2658 Karen Ct. #621, Las Vegas, Nev. 89109**
**Filed Feb. 24, 1995, Ser. No. 394,272**
**Int. Cl.[6] A63F *1/00***
**U.S. Cl. 273—292** **9 Claims**



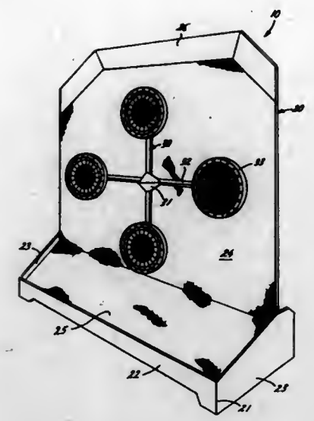

1. A method of playing a card game, comprising the following steps:
(a) Providing at least one deck of playing cards comprising four suits totaling fifty two cards, with each suit including thirteen cards ranking from ace through king;
(b) assigning a value to each of the cards with the ace through nine of each suit respectively being assigned values of one through nine points, and the ten through king of each suit each being assigned a value of zero;
(c) placing wagers on the outcome of play of the card game;
(d) forming dealer and player hands by dealing two of the cards randomly to each player and to the dealer of the game, with the first card to the dealer being dealt face up and all others face down, and;
(e) adding the values of the cards in each of the hands and dropping the tens digit to provide a number between zero and nine points, and determining a winning hand by determining which hand is closest to a total of nine points.

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**5,496,039**
**DART GAME APPARATUS**
**Samuel N. Zammuto, Rockford, Ill., assignor to Arachnid, Inc., Rockford, Ill.**
**Filed May 26, 1994, Ser. No. 249,842**
**Int. Cl.[6] F41J *3/00***
**U.S. Cl. 273—368** **20 Claims**

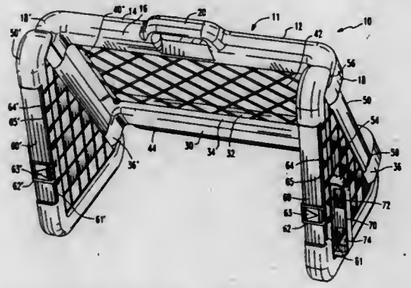
1. A dart game apparatus adapted for play in combination with darts, the dart game apparatus comprising:
a backstop, the backstop including a frame having a foot and a vertical portion upstanding from the foot; and
a web mounted on the frame vertical portion, the web providing a backstop vertical surface adapted to intercept errant darts; and
a target assembly, the target assembly including
a hub rotatably mounted to the backstop forward of the vertical surface;
one or more arms radiating outward from the hub; and
a dart board mounted on each of the arms;
the dart board or dart boards including a plurality of target segments, the target segments being adapted to capture darts striking the target segments.






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**5,496,040**
**FOLDABLE SOCCER AND HOCKEY GOAL AND EQUIPMENT SET**
**James D. Amburgey, Richardson, and Peter C. Hill, Plano, both of Tex., assignors to Today's Kids, Inc., Boonville, Ark.**
**Filed Feb. 4, 1994, Ser. No. 191,960**
**Int. Cl.[6] A63B *63/00***
**U.S. Cl. 273—411** **15 Claims**

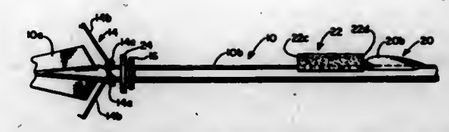



1. A soccer and hockey goal, comprising:
an inclined net holder;
a net attached to said inclined net holder;
first and second upright support members hingedly attached to said inclined net holder;
a first rung attached to said first upright support member and a second rung attached to said second upright support member for receiving an elongated member therethrough for holding said first and second upright support members in a folded position against said inclined net holder.

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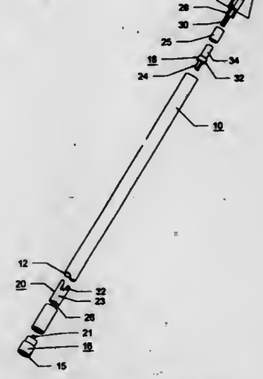
**5,496,041**
**ARROW PENETRATION BRAKE AND STOP ASSEMBLY**
**Hartwell N. Broussard, 900 Prairie Ave., Abbeville, La. 70510**
**Filed Dec. 9, 1994, Ser. No. 352,355**
**Int. Cl.[6] F42B *6/04***
**U.S. Cl. 273—416** **17 Claims**

1. In an arrow penetration brake assembly mounted on an arrow to decelerate the arrow shaft of an arrow shot from a bow when said arrow contacts an object, said arrow having a point on one end for penetrating an object, a nock on the other end of said arrow, and fletchings on said arrow adjacent to said nock, said brake assembly having a penetration limiter slidably connected to the arrow shaft adjacent to the point of said arrow, said penetration limiter having a plurality of arms extending therefrom for contacting the object struck with said arrow, the improvement comprising a rigid stop means rigidly connected to said arrow shaft for contacting and stopping said penetration limiter when said penetration limiter slides along said arrow shaft, said stop means extending partially around the circumference of said arrow shaft, shock absorbing means for decelerating said arrow shaft rigidly connected to said arrow shaft between said stop means and said penetration limiter means, and a washer slidably connected to said arrow shaft between said shock absorbing means and said penetration limiter means.




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**5,496,042**
**TWISTING ARROWHEAD**
**William C. Craft, and Ruth L. Craft, both of R.F.D. #5 Box 5510, Skowhegan, Me. 04976**
**Filed Mar. 31, 1995, Ser. No. 414,211**
**Int. Cl.[6] F42B *6/08***
**U.S. Cl. 273—421** **5 Claims**

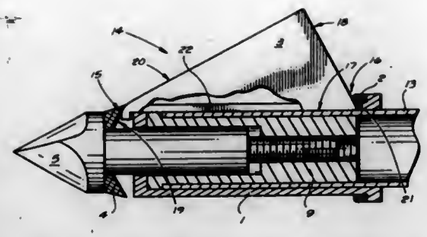



1. In an arrow the improvement comprising:
a. a longitudinal hollow shaft compartment,
b. a sliding element disposed in the hollow shaft compartment,
c. a rotatably mounted arrowhead located near the forward end of the hollow shaft compartment,
d. a receiving element connected to the arrowhead to cause the arrowhead to twist when struck with the sliding element upon the impact of the arrow with a target.

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**5,496,043**
**OVER THE ARROW SHAFT BROAD HEAD**
**Lee Ester, 4627 W. Elgin St., Chandler, Ariz. 85226**
**Filed Aug. 7, 1992, Ser. No. 926,502**
**Int. Cl.[6] F42B *6/08***
**U.S. Cl. 273—422** **4 Claims**

1. In an arrow having an arrow shaft with a threaded insert at a first end thereof, said insert being internal to and concentric with



said shaft, and an arrow tip, having a threaded extension, thread coupled to said insert, the improvement comprising:

a broad head cutting blade;

means coupled to said shaft for coupling said broad head cutting blade to said arrow shaft at first end of said shaft and above the outer surface of said shaft;

wherein said means for coupling said broad head cutting blade to said arrow shaft further comprises means coupled to said shaft for lockingly, removably coupling said broad head cutting blade to said shaft; and

wherein said means for lockingly, removeably coupling said broad head cutting blade to said shaft comprises locking means coupled to said shaft in cooperation with said arrow tip whereby the threaded rotation of said tip functions to lock and release said broad head cutting blade from its coupling with said shaft; and

wherein said locking means comprises means coupling said arrow tip, said shaft, and said cutting blade for drawing said cutting blade into locked, intimate contact with said outer surface of said shaft as said tip is threadedly rotated into said threaded insert and for releasing said locked, intimate contact as said tip is threadedly rotated out of said threaded insert.

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**5,496,044**

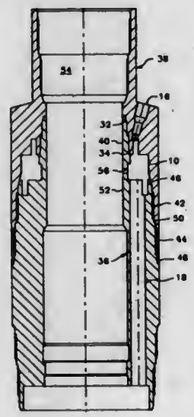
**ANNULAR CHAMBER SEAL**

**Clifford H. Beall, Broken Arrow; Michael S. Rawson, Tulsa, and Kurt A. Hickey, Broken Arrow, all of Okla., assignors to Baker Hughes Incorporated, Houston, Tex.**

**Filed Mar. 24, 1993, Ser. No. 36,345**

**Int. Cl.[6] F16J** *15/08*

**U.S. Cl. 277—1** **10 Claims**



1. An apparatus for isolating a chamber from pressures applied internally or externally of a wall of a tubular-shaped downhole tool, comprising:

an elongated housing having components, said components when assembled forming a wall, said wall having an interior and exterior face and defining a chamber therein;

at least one internal seal to prevent flow into said chamber from pressure against said internal face;

at least one external seal to prevent flow into said chamber from pressure against said external face;

said chamber disposed in said housing between said seals;

said internal and external seals formed by metal-to-metal contact between said housing components;

said internal seal is formed by a radial interference fit between said housing components;

said chamber extending annularly within said wall;

said internal seal comprises a plurality of radial interference seals;

said housing components further comprise a pin member and a box member;

said pin secured to said box by an interengaging thread;

said thread applying a sealing force on said internal seal.

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**5,496,045**

**BRUSH SEAL WITH POROUS UPSTREAM SIDE-PLATE**

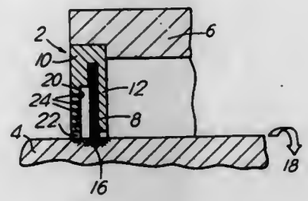
**Philip J. Millener, and Timothy M. Edmunds, both of Bristol, England, assignors to Rolls-Royce PLC, London, England**

**Filed Aug. 16, 1994, Ser. No. 291,555**

**Claims priority, application United Kingdom, Aug. 17, 1993, 9317083**

**Int. Cl.[6] F16J** *15/447*

**U.S. Cl. 277—53** **9 Claims**



1. A brush seal for sealing a leakage gap between a rotating member and a relatively stationary member, said gap extending between an upstream, high pressure region and a downstream, low pressure region, the brush seal comprising:

a mass of bristles packed together in an annular layer between upstream and downstream side-plates, the downstream side-plate being spaced from the rotating member to form a seal gap, the bristles being disposed against the upstream face of said downstream side-plate and laying with a radial component, the bristles having free ends which extend towards a surface of the rotating member to form a seal thereagainst, the upstream side-plate is disposed with its downstream face adjacent the upstream side of the layer and said upstream side-plate includes a foraminate region having a uniformly distributed porous region with a porosity within a range of about 16% to about 40%.

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**5,496,046**

**TURBINE SEAL RUB PROTECTION MEANS**

**Ronald E. Brandon, 652 Jubilee St., Melbourne, Fla. 32940**

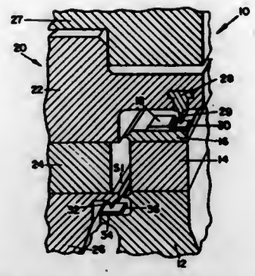
**Continuation-in-part of Ser. No. 35,223, Mar. 22, 1992, abandoned. This application Dec. 7, 1994, Ser. No. 350,898**

**Int. Cl.[6] F16J** *15/48*

**U.S. Cl. 277—53** **8 Claims**

1. In a compressible rotating machine having stationary and rotating elements and employing seal teeth between the stationary and rotating elements capable of being rubbed, worn and damaged





by the rotating elements, the improvement which comprises a small patch of hard, cutting and grinding material on a small portion of the rotating element disposed in opposition to the seal teeth and capable of intermittent cutting of the seal teeth without melting and mushrooming during temporary contact so as to leave them sharp and thin and preventing harm such as grooving to the surface of the rotating elements.

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**5,496,047**

**MECHANICAL SEAL CONTAINING A SEALING FACE WITH GROOVED REGIONS WHICH GENERATE HYDRODYNAMIC LIFT BETWEEN THE SEALING FACES**

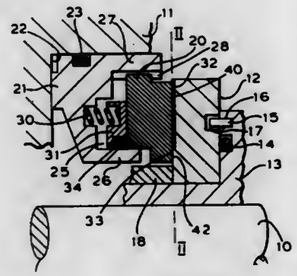
**Ian M. Goldswain, Woodlands Park, and Martin W. D. B. Hignett, Chiswick, both of, United Kingdom, assignors to John Crane UK Limited, Slough, United Kingdom**

**Filed Jun. 14, 1993, Ser. No. 76,542**

**Claims priority, application United Kingdom, Jul. 4, 1992, 9214282**

**Int. Cl.[6] F16J** *15/34*

**U.S. Cl. 277—96.1** **8 Claims**



1. A mechanical face seal for providing a seal between a pair of relatively rotatable components comprising a first sealing ring adapted to be mounted non-rotatably and sealed with respect to one of said components, a second sealing ring adapted to be mounted non-rotatably and sealed with respect to the other component, said second sealing ring being mounted in axial alignment with the first sealing ring and means being provided to resiliently urge a sealing face of the second sealing ring axially into sealing engagement with a sealing face of the first sealing ring; the sealing face of one of the sealing rings having a first and a second set of hydrodynamic lift generating grooved areas, the grooved areas of each set being spaced angularly around the circumference of the sealing face the grooved areas of one set being spaced angularly of the grooved areas of the other set, the grooved areas of both sets opening to one edge of the sealing face and extending part way across the sealing face, each grooved area defining a trailing edge relative to the direction of rotation of one seal face relative to the other, the trailing edge being inclined in the plane of the sealing face at an obtuse angle to the direction of rotation each grooved area being of constant axial depth, the axial depth of the grooved areas of the first set being less than 10 μm and the axial depth of the grooved areas of the second set being from 20 μm to 125 μm.

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**5,496,048**

**GOLF CART**

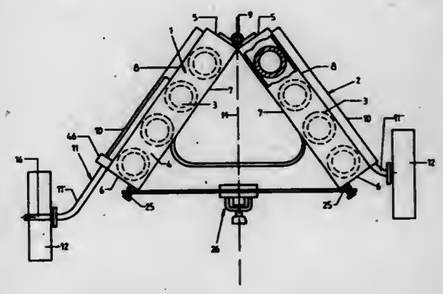
**Gunter Adam, Ostendstrasse 3a, 94315 Straubing, Germany**

**Filed Dec. 22, 1993, Ser. No. 171,529**

**Claims priority, application Germany, Jan. 23, 1993, 43 36 185.4**

**Int. Cl.[6] A63B** *55/08*

**U.S. Cl. 280—42** **16 Claims**



1. A cart for golf clubs having a folded and an unfolded condition, said cart comprising:

two storage elements, each storage element having a top side and a bottom side, each storage element having several compartments for holding the golf clubs;

a pivot swingably connecting the top sides of said storage elements so as to permit them to swing about a longitudinal axis of the golf cart, from the folded position in which the bottom sides of the storage elements are adjacent to each other, into an unfolded position in which the bottom sides of said storage elements are separated from each other;

a strut arrangement connecting the bottom sides of said storage elements, said arrangement having two strut elements, each strut element having a respective inner and outer end, a pivot connecting said outer end of each of said strut elements to the bottom sides of respective storage elements, and an articulation connected by a pivot to an inner end of each respective strut element in the region of a central vertical plane which contains the longitudinal axis of the golf cart, said articulation providing clearance between said strut elements and said articulation so as to permit said strut elements to swing into alignment with each other about the axis of the respective pivot so that said strut elements are transverse to said central vertical plane when the cart is in the unfolded condition, and clamping means for reducing said clearance between the respective inner end of a strut element and said articulation in a plane including one of said pivot axes;

a handlebar attached to said strut arrangement; and

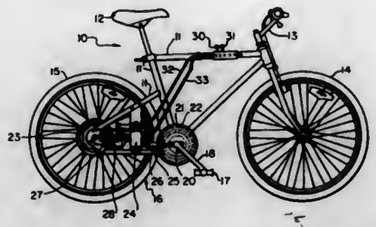
lock means including a projection and a recess upon said strut arrangement, said projection and recess being adapted to lock said strut elements in a position perpendicular to said central vertical plane, said projection and said recess being adapted to be engaged with each other by said clamping means.

**5,496,049**

## VARIABLE DRIVE MECHANISM FOR CYCLE TYPE VEHICLES

**Francisco Escobedo, 23305 Ladeene Ave., Torrance, Calif. 90505**

**Filed Apr. 20, 1994, Ser. No. 230,255**
**Int. Cl.[6] B62M *11/04*; F16H *1/12;3/08***
**U.S. Cl. 280—238** **8 Claims**



1. A variable drive mechanism for a cycle-type vehicle comprising:
a driving gear;
a driven gear;
gear means interconnecting said driving gear with said driven gear;
said gear means includes a pair of shift gears selectively coupled with said driving gear and said driven gear respectively;
manual control means operatively and selectively connected between said pair of shift gears for independently moving each of said shift gears in said pair into and out of mesh with said driving and said driven gear respectively;
a vehicle frame rotatably mounting said driving gear and said driven gear in spaced-apart relationship;
each of said driving gear and driven gear being a flat plate having a plurality of gear teeth carried thereon outwardly projecting laterally so as to be selectively engageable with said gear means;
said driving gear having a flexible mounting for each of said gear teeth carried thereon;
said plurality of gear teeth are arranged in concentric spaced-apart rows;
said gear means further having transmission gears interconnecting said pair of shift gears;
transmission control means separate from said control means for said shift gears operable increase and decrease the speed of said driven gear; and
spring-biasing means connected between said shift gears cooperating with said manual control means to releasably retain said shift gears in engaging relationship with a selected row of teeth on said driving gear and said driven gear respectively.

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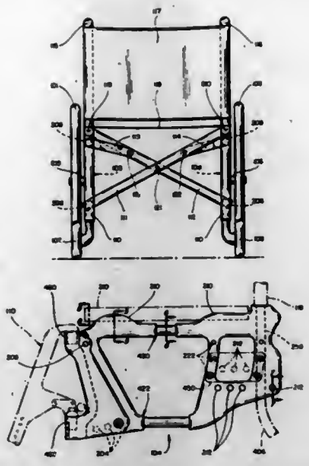
**5,496,050**

## FOLDABLE WHEELCHAIR AND SIDE FRAME ASSEMBLY FOR FOLDABLE WHEELCHAIR

**Richard Geiger, Alameda; A. Scott Robertson, and Neville Page, both of San Francisco, both of Calif., assignors to Everest & Jennings International Ltd., St. Louis, Mo.**

**Continuation of Ser. No. 886,850, May 22, 1992, Pat. No. 5,284,350. This application Feb. 8, 1994, Ser. No. 193,501**
**Int. Cl.[6] B62M *1/14***
**U.S. Cl. 280—250.1** **19 Claims**

1. A wheelchair side frame assembly comprising:
a side frame piece;
a caster frame piece;
mounting means located at a forward region of the side frame piece for pivotally mounting the caster frame piece at a pivot point on the side frame piece to permit relative pivoting movement between the side frame piece and the caster frame piece about said pivot point;



a plurality of spaced apart discretely defined mounting positions located at a rearward region of the side frame piece for mounting a drive wheel, said spaced apart discretely defined mounting positions being disposed along an arc of a circle having a center of curvature coincident with said pivot point.

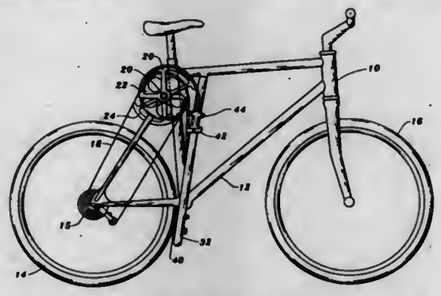
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**5,496,051**

## APPARATUS FOR PROPELLING A MANUALLY-POWERED CYCLE

**George T. Farmos, 5733 Crestmont Ave., Livermore, Calif. 94550**

**Filed Apr. 15, 1994, Ser. No. 228,509**
**Int. Cl.[6] B62M *1/04;1/06***
**U.S. Cl. 280—252** **10 Claims**



1. Apparatus for propelling a manually-powered cycle including a frame and at least two cycle wheels for supporting the frame, said apparatus comprising in combination:
a first pedal;
a second pedal;
mounting means mounting said first and second pedals for reciprocating movement relative to said frame between retracted and extended positions and said mounting means restricting reciprocal movement of said first and second pedals between said retracted and extended positions to spaced, linear paths of movement; and
transmission means operatively associated with said first and second pedals and at least one cycle wheel to transfer power alternately from said first and second pedals to said at least one cycle wheel to impart torque to said at least one cycle wheel during alternate depression of said pedals from said retracted positions to said extended positions by a cycle rider



and during movement of said first and second pedals along said spaced, linear paths of movement, said transmission means including a double-ended first flexible transmission element connected to said first pedal at one of the ends thereof, a second double-ended flexible transmission element connected to said second pedal at one of the ends thereof, a first rotatable crank member having a curved outer surface connected to and in supporting engagement with said first flexible transmission element at the other of the ends thereof remote from said first pedal, and a second rotatable crank member having a curved outer surface connected to and in supporting engagement with said second flexible transmission element at the other of the ends thereof remote from said second pedal, said pedals upon depression thereof and movement thereof toward said extended positions exerting pulling forces on said flexible transmission elements which rotate said rotatable crank members and unwind said flexible transmission elements from said rotatable crank members, said rotatable crank members being rotatable about a common axis, and said curved outer surfaces thereof being eccentrically positioned relative to said common axis whereby said first and second flexible transmission elements move closer to said common axis where the flexible transmission elements separate from the curved outer surfaces of said rotatable crank members as said rotatable crank members rotate and said flexible transmission elements unwind from said rotatable crank members in response to depression of said pedals and movement of said pedals along said spaced, linear paths of movement toward said extended positions.

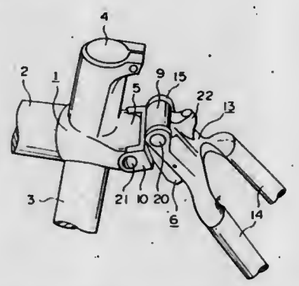
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**5,496,052**

## DAMPER MECHANISM OF BICYCLE FRAME

**Shigeru Tamaishi, Chigasaki, Japan, assignor to Miyata Industry Co., Ltd., Chigasaki, Japan**

**Filed May 31, 1994, Ser. No. 251,250**
**Claims priority, application Japan, Dec. 21, 1993, 5-073048 U**
**Int. Cl.[6] B62K *25/04***
**U.S. Cl. 280—284** **4 Claims**



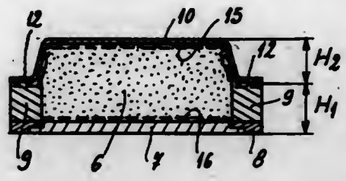
1. A damper mechanism for a bicycle frame comprising:
a damper member interposed between connecting portions of a seat lug and a mono-seat lug, said damper member including a base element facing to said mono-seat lug, and first and second hinge portions at an upper end of said base element, said first hinge portion being projected from a rear side of the base element so as to be movably pivotally attached to the connecting portion of said seat lug and said second hinge portion being projected from a front side of the base element so as to be movably pivotally attached to the upper portions of said mono-seat lug; and
elastic means interposed between said base element of said damper member and said mono-seat lug, said elastic means including a plurality of kinds of soft and hard elastic members which are adapted to be used in a stacked condition with one another.

**5,496,053**

## SKI INCLUDING SIDES AND AN UPPER SHELL

**Roger Abondance, La Murette, France, assignor to Skis Rossignol S.A., Voiron, France**

**Filed Mar. 22, 1994, Ser. No. 215,636**
**Claims priority, application France, Apr. 16, 1993, 93 04727**
**Int. Cl.[6] A63C *5/12***
**U.S. Cl. 280—609** **35 Claims**



1. A ski extending in a longitudinal direction, comprising a main body portion and upwardly curved front and rear end portions, the main body portion comprising:
a lower face including a central sliding sole delimited by two lower edges, the lower edges being located on opposite sides of the sliding sole;
two reinforcing elements extending in the longitudinal direction of the ski, each reinforcing element being supported on one of the lower edges and forming a side of the ski, wherein the reinforcing elements extend over a part of a height of the ski;
a shell having a central top portion and two peripheral edge portions, the central top portion and the two peripheral edge portions extending in the longitudinal direction of the ski, wherein the peripheral edge portions are supported by the reinforcing elements, wherein in at least one zone of the ski which includes at least a central longitudinal portion of the main body, the central longitudinal portion of the shell is spaced above the peripheral edge portion to define a height of the shell, and the central portion is connected to the peripheral edge portions by inclined lateral side portions, and wherein in the at least one zone of the ski, the height of the shell decreases from said central longitudinal portion toward said and portions and varies directly proportionately over the length of the at least one zone with a height of at least one reinforcing element; and
a core located between inner lateral sides of the reinforcing elements.

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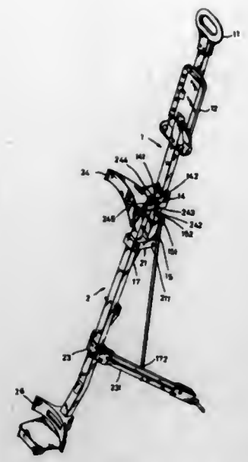
**5,496,054**

## FOLDING COLLAPSIBLE FRAME FOR GOLF CARTS

**Ching-Chang Wu, No. 35-1, Jin Hsin Street, Tu Cheng Hsiang Taipei Hsien, Taiwan, Prov. of China**

**Filed Nov. 18, 1994, Ser. No. 341,118**
**Int. Cl.[6] B62B *1/12***
**U.S. Cl. 280—646** **1 Claim**

1. A folding collapsible frame for a golf cart of the type comprising an elongated main frame, a first bag cradle pivotably mounted on one end of said main frame, a second bag cradle fixedly mounted on an opposite end of said main frame, a handle bracket fixedly mounted on said main frame and spaced between said first bag cradle and said second bag cradle, a wheel holder bracket fixedly mounted on said main frame and spaced between said handle bracket and said second bag cradle, a handle frame having one end terminating in a hand grip and an opposite end fixedly fastened with a connecting block, said connecting block having one end fixedly connected to said handle frame and an opposite end pivotably connected to said handle bracket by pivot means, a locating block fixedly mounted on said handle frame for connection to said first bag cradle, a pair of wheel holders pivotably connected to said wheel holder bracket by pivot means, and a pair of links pivotably connected between said connecting block and said pair of wheel holders, wherein said first bag cradle can be



pivoted about said pivot means between an extended position perpendicular to said main frame and a folded position extending in a longitudinal direction of said main frame, said first bag cradle having two opposite bottom edges, two lugs respectively extended from said bottom edges, and a locating bolt connected between said lugs of said first bag cradle; said locating block comprises a top wall portion, which abuts against said bottom edges of said first bag cradle when said handle frame is in an extended position, a curved locating groove formed in said top wall portion of said locating block said groove adapted to extend between said lugs for receiving said locating bolt when said handle frame is in said extended position and said first bag cradle is pivoted to the extended position.

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**5,496,055**

**SUSPENSION SYSTEM FOR STEERED WHEEL**

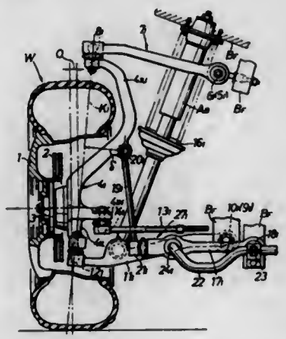
**Yasuji Shibahata, and Kiyoshi Nakajima, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Apr. 26, 1993, Ser. No. 53,109**

**Claims priority, application Japan, Apr. 28, 1992, 4-110373; Aug. 11, 1992, 4-213915; Jan. 19, 1993, 5-007004**

**Int. Cl.[6] B60G** *3/26*

**U.S. Cl. 280—665** **28 Claims**



1. A suspension system for a steered wheel, comprising:

a knuckle for steerably supporting the steered wheel about a king pin axis;

upper and lower arms pivotally supported on a vehicle body and connected at free ends thereof to upper and lower portions of said knuckle, respectively;

a link mechanism including a first substantially vertically extending rod connected to the knuckle at a location more inward of the vehicle body than said king pin axis, and a second rod connected at one end thereof to said first rod and at the other end to at least one of the vehicle body and the lower arm;

said link mechanism being resiliently deformed during a steering operation to an extent corresponding to the Steering operation; and

a resilient means connected to said link mechanism for exhibiting a resilient force repulsive to deformation of said link mechanism So as to apply a restoring torque to the steering knuckle.

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**5,496,056**

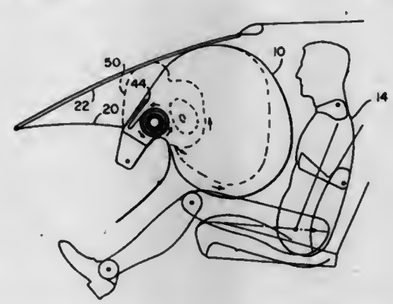
**AUTOMOTIVE PASSENGER AIR BAG MODULE CUSHION FOLD**

**David J. Dyer, Kaysville, Utah, assignor to Morton International, Inc., Chicago, Ill.**

**Filed Feb. 21, 1995, Ser. No. 391,891**

**Int. Cl.[6] B60R** *21/20*

**U.S. Cl. 280—728.1** **11 Claims**



1. A method of folding an inflatable air bag cushion made of air bag fabric and having a mouth defined by a cushion diffuser of a reaction canister comprising the steps, with the cushion initially unfolded and uninflated and positioned with the bottom facing up and the mouth at a central side position thereof:

a. tucking the center of the cushion toward the mouth to create an upper pleat and a lower pleat;

b. initially holding about 20 millimeters of the lower and upper pleats, folding a succession of folds, each of which is about 50 millimeters long, into a roll over the upper pleat until a predetermined extended air bag length of about 60% of the original length thereof is reached;

c. folding one side wing panel of the cushion fabric on top of the upper pleat, and therefore, toward the bottom of the cushion;

d. folding the opposite side wing panel of the cushion fabric on top of the folded said one side wing panel thereof and therefore also toward the bottom of the cushion, the width of the folded cushion being about the width of the mouth of the cushion;

e. inserting the roll of and folded side wing panel fabric of cushion into the mouth of the cushion diffuser with the fabric of the folded side wing panels facing the cushion diffuser and with a loop of excess cushion fabric protruding; and

f. folding the loop of excess fabric over the fabric of the roll and folded side wing panels of the cushion.



**5,496,057**

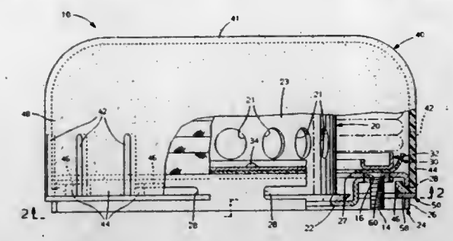
**AIR BAG MODULE COVER RETAINER**

**Robert R. Niederman, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.**

**Filed Mar. 31, 1995, Ser. No. 415,017**

**Int. Cl.[6] B60R** *21/16*

**U.S. Cl. 280—728.2** **10 Claims**



1. An air bag module including an air bag and an inflator for discharging gas to inflate the air bag, the air bag module comprising:

a brace plate,

a cover for covering the air bag and inflator, the cover including a plurality of hook means for connecting the cover to the base plate;

the base plate including a plurality of apertures for capturing the hook means of the cover therein; and

a cover retainer being a discontinuous resilient ring, the retainer being radially deformable for snap-fitted engagement with the apertures of the base plate directly adjacent the hook means of the cover such that the retainer traps the hook means between the base plate and the retainer and prevents removal of the hook means from the apertures of the base plate to anchor the cover to the base plate and hold the cover in position relative to the base plate during air bag inflation.

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**5,496,058**

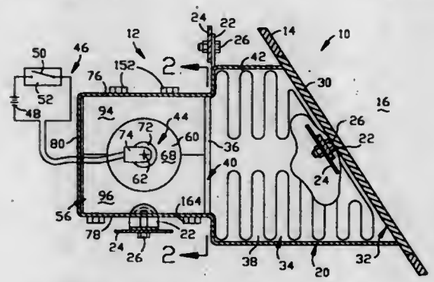
**APPARATUS WITH INFLATOR MOUNTING STRUCTURE**

**Scott A. Kelley, Algonac, and Andrew J. Smydra, Rochester, both of Mich., assignors to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio**

**Filed May 17, 1995, Ser. No. 442,656**

**Int. Cl.[6] B60R** *21/16*

**U.S. Cl. 280—728.2** **20 Claims**



1. An apparatus comprising:

inflator means for providing a source of inflation fluid;

canister means having a chamber for receiving said inflator means; and

support means for supporting said inflator means in a fixed position within said chamber of said canister means;

said support means including two clamp halves which have a mating relationship to engage and surround a portion of said inflator means, and fastener means for securing said clamp halves to each other in their mating relationship and for securing said clamp halves to said canister means.

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**5,496,059**

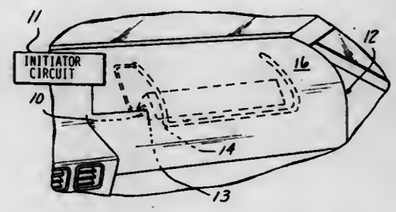
**AIR BAG INSTALLATION USING INTEGRATED ENERGY DEVICE TO FORM TRIM PIECE AIR BAG DEPLOYMENT OPENINGS**

**David J. Bauer, West Bloomfield, Mich., assignor to Tip Engineering Group, Inc., Farmington Hills, Mich.**

**Filed Oct. 26, 1994, Ser. No. 329,475**

**Int. Cl.[6] B60R** *21/16*

**U.S. Cl. 280—728.3** **12 Claims**




1. In combination, an air bag assembly including an air bag receptacle container, a folded air bag and an inflator device for generating an inflating gas flow, and an initiator circuit for activating said inflator device;

an interior trim structure having a substrate panel and a covering layer;

a deployment opening formed in said interior trim structure substrate panel with a hinge deployment door panel fit in said deployment opening, said covering layer smoothly extending over said deployment door panel and adjacent regions of said substrate panel;

said air bag receptacle mounted aligned with said deployment opening;

a flattened tube mounted beneath said covering layer and extending around said deployment opening;

an outwardly directed cutting edge extending along said flattened tube and located to be forced into said covering layer upon expansion of said flattened tube;

a gas pressure source activatable to generate a gas flow upon initiation of said air bag inflation; and,

a fluid passage connecting said gas pressure source and said flattened tube causing a gas flow into said flattened tube to occur upon initiation of said air bag inflation to cause said flattened tube to expand and said cutting edge to be driven to sever said covering layer about said substrate panel deployment opening.

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**5,496,060**

**ONE PIECE DETACHABLE COVER FASTENER**

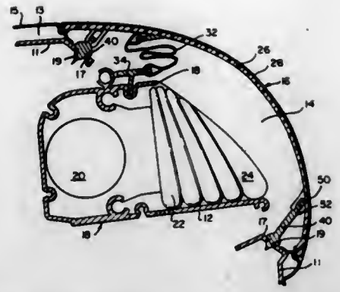
**Timothy J. Whited, Auburn Hills, and Russell S. Gans, Westland, both of Mich., assignors to Morton International, Inc., Chicago, Ill.**

**Filed Jan. 5, 1995, Ser. No. 368,934**

**Int. Cl.[6] B60R** *21/20*

**U.S. Cl. 280—728.3** **13 Claims**

1. In an air bag installation for a vehicle in which an inflatable air bag is mounted in a recess in the instrument panel for deployment through a rectangular opening in said instrument panel, having a peripheral recessed abutment with spaced apertures, which is closed by a rectangular cover door that engages the abutment to form a net fit when installed and is secured to the instrument panel, retaining means for releasably securing the door installed in the panel opening, comprising



a plurality of thermoplastic resin fasteners secured to a plurality of integral channels molded in the underside of the cover, each fastener having a bulbous head, juxtaposed spaced winged shoulder portions extending from said head, an intermediate bulbous portion, which has a greater circumference than said bulbous head and a terminal flanged portion for securing the cover door to the instrument panel inserted through said apertures in said recess of abutment, said channels molded into the underside of the cover door having slotted ends for releasably engaging the bulbous head of the fastener for securing the door against inadvertent premature disengagement from the instrument panel, whereby the application of sufficient force to said cover causes disengagement of the bulbous head of the fasteners from the channels molded in the underside of the door cover thus freeing the door cover to facilitate its opening.

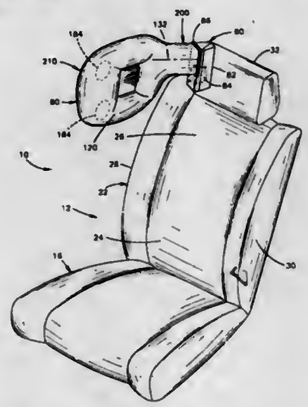
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**5,496,061**

## SEAT MOUNTED AIR BAG ASSEMBLY

**Louis R. Brown, Oxford, Mich., assignor to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio**

**Filed Mar. 31, 1995, Ser. No. 414,941**
**Int. Cl.[6] B60R *21/22***
**U.S. Cl. 280—730.2** **28 Claims**



1. A vehicle safety apparatus comprising:

a seat for supporting an occupant of the vehicle in a seated position with the occupant's head disposed adjacent to a side structure of the vehicle, said seat including a seat bottom portion and a seatback;

a housing;

an inflatable vehicle occupant restraint in said housing for, when inflated, protecting the occupant of the vehicle, said inflatable restraint having a neck portion and a body portion which lie adjacent to the occupant's head and neck when inflated for engagement by the occupant's head and neck;

an inflator for directing inflation fluid into said inflatable restraint to inflate said inflatable restraint;

means for sensing a side impact to the vehicle of a magnitude sufficient to require protection of the vehicle occupant and for actuating said inflator to inflate said inflatable restraint in response to sensing said side impact to the vehicle; and

support means for supporting said housing on said seatback for inflation of said body portion of said inflatable restraint between the vehicle occupant's head and the vehicle side structure;

said neck portion of said inflatable restraint having an elongate tubular configuration and being connected in fluid communication between said inflator and said body portion of said inflatable restraint;

said neck portion of said inflatable restraint when inflated extending from said housing and having a longitudinal central axis extending through said neck portion;

said neck portion of said inflatable restraint when inflated having a relatively small height as measured in a vertical direction transverse to said axis and said body portion of said inflatable restraint when inflated having a relatively large height as measured in said vertical direction transverse to said axis.

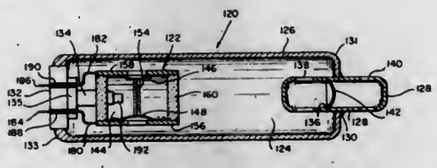
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**5,496,062**

## LIQUID-FUELED DEVICE TO COMBINE THE FUNCTIONS OF A LOW PRESSURE SWITCH (LPS), SQUIB, AND GAS GENERATOR

**Karl K. Rink, Liberty, and Marcus T. Clark, Kaysvill, both of Utah, assignors to Morton International, Inc., Chicago, Ill.**

**Continuation-in-part of Ser. No. 197,627, Feb. 16, 1994, Pat. No. 5,429,387. This application Feb. 21, 1995, Ser. No. 392,633**
**Int. Cl.[6] B60R *21/26*; H01H *35/34***
**U.S. Cl. 280—737** **23 Claims**



1. A liquid-fueled device to combine the functions of a low pressure switch, squib and gas generator for a compressed gas air bag inflator comprising,

first and second diaphragms each of which are electrically conducting,

electrically non-conductive spacer means having a first side and a second side,

attaching means attaching said first diaphragm and said second diaphragm in opposed and sealing relation to said first and second sides, respectively, of said spacer means thereby forming a hermetically sealed chamber, with said first diaphragm and said second diaphragm being movable toward and away from each other from a predetermined spaced relationship as the pressure of the environment externally of said hermetically sealed chamber increases and decreases relatively to the pressure in said hermetically sealed chamber,

a liquid fuel normally stored under a high pressure oxidizing environment in said hermetically sealed chamber,

a pyrotechnic initiator contained in said hermetically sealed chamber, said pyrotechnic initiator igniting in response to an electrical current of predetermined level thereto,

a pressure monitoring resistor having first and second ends positioned so as to make and break electrical-contact with said first and second diaphragms as said first and second diaphragms are moved toward and away from each other from a predetermined spaced relation, and



electrical circuit means to which said pressure monitoring resistor and said pyrotechnic initiator are connected, said electrical circuit means normally having a flow of electrical monitoring current therein which is too low to ignite said pyrotechnic initiator in said hermetically sealed chamber, but having a capability of having produced therein a flow of electrical current at a predetermined level high enough to cause initiation of said pyrotechnic initiator,

whereby, with said hermetically sealed chamber pressurized to a predetermined reference level, in atmospheric environment conditions the pressure in said chamber is higher than atmospheric pressure and said first and second diaphragms are caused to move away from each other and thereby break the electrical contact of said pressure monitoring resistor and cause a change of resistance in said electrical circuit means,

whereby with the pressure of the environment external to said hermetically sealed chamber higher by a predetermined amount than said predetermined reference level in said chamber, said first and second diaphragms are caused to move toward each other and cause said pressure monitoring resistor to make electrical contact with said diaphragms and cause a change of resistance in said electrical circuit means,

whereby, if the seal of said hermetically sealed chamber fails, the resulting equalization of the chamber pressure and the pressure of the environment external to said chamber causes said first diaphragm and said second diaphragm to move away from each other and break the electrical contact of said pressure monitoring resistor and cause a change in the resistance of said electrical circuit means, and

whereby with a flow of a large electrical current through said pyrotechnic initiator, that is, an electrical current at a level high enough to cause initiation thereof, said pyrotechnic initiator is initiated and ignites said liquid fuel in said hermetically sealed chamber.

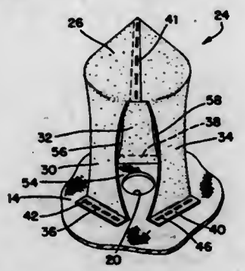
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**5,496,063**

## PARTICULATE IMPINGEMENT DEVICE FOR AIR BAG

**James K. Conlee, Dayton; Daniel A. Rhule, Miamisburg, and Joel M. Werbelow, Vandalia, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.**

**Filed Nov. 25, 1994, Ser. No. 352,962**
**Int. Cl.[6] B60R *21/28***
**U.S. Cl. 280—739** **3 Claims**



1. In a vehicle air bag system having an air bag inflatable by inflation gas generated by an inflator and a vent hole in the bag through which inflation gas is vented into the vehicle passenger compartment, the improvement comprising:

a particulate impingement device carried by the air bag and having an impingement surface attached to the air bag by a plurality of radially spaced apart fabric support straps which fold atop the air bag and are erectable to define therebetween a plurality of radial flow openings communicating directly into the passenger compartment and to space the impingement surface at a distance spaced away from the vent hole and in axial overlying relationship therewith so that the inflation gas exiting the air bag through the vent hole impinges on the impingement surface to deposit particulate byproducts within the inflation gas upon the impingement surface and the inflation gas is then diverted through the plurality of radial flow openings in a direction radially of the vent hole and the impingement surface directly into the passenger compartment.

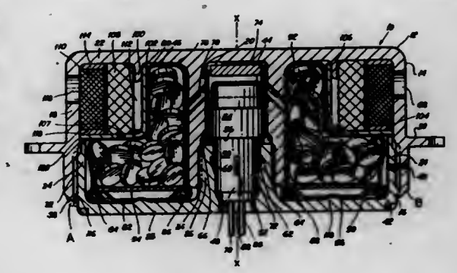
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**5,496,064**

## INFLATOR ASSEMBLY HAVING PARTITIONING MEMBER REDIRECTING GAS FLOW

**Scott Osborne, Rochester Hills, Mich.; Roger E. Bates, Tampa, and Anthony C. Burgi, Lakeland, both of Fla., assignors to Breed Automotive Technology, Inc., Lakeland, Fla.**

**Division of Ser. No. 233,357, Apr. 26, 1994. This application Apr. 28, 1995, Ser. No. 430,221**
**Int. Cl.[6] B60R *21/26***
**U.S. Cl. 280—740** **9 Claims**



1. A gas assembly inflator comprising:

a housing formed of a annular inner wall, an annular outer wall, disposed about a common longitudinal axis, and a first and second circular bases attached to said inner and outer wall and axially spaced from each other to form a central chamber disposed coaxially with said longitudinal axis and an annular chamber disposed about said central chamber and separated therefrom by said inner wall, said inner wall having a plurality of inner holes directed radially and axially outward of said inner chamber;

an initiator disposed in said inner chamber for generating primer gas;

a partitioning member for partitioning said outer chamber into a first portion and a second portion, said partitioning member having partition holes, and the partitioning member extending radially to the outer wall;

a canister enclosing gas generator material disposed in said first portion, said material receiving said primer gas through said inner holes, said canister having a first section having a radial dimension substantially larger than a second section to define an L-shaped cross section, the partitioning member being provided with an axial section engaging an axial section of the second section of the canister, wherein the canister is radially disposed between the inner wall and the partitioning member; and

a filter media disposed in said second portion and receiving gases from said first portion through said partition holes;

said inner and partition holes defining respectively a first and second gas path, the gas paths being disposed at a path angle of at least 90°; and

said outer wall being formed with a plurality of exit holes for dispensing gases through said filter media.

**5,496,065**

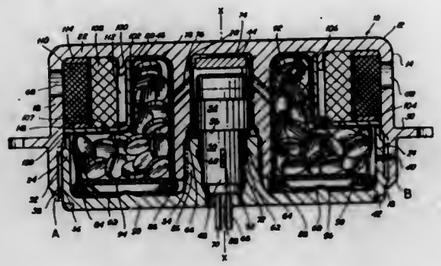
## INFLATOR ASSEMBLY

**Scott Osborne, Rochester Hills, Mich.; Roger E. Bates, Tampa, and Anthony C. Burgi, Lakeland, both of Fla., assignors to Breed Automotive Technology, Inc., Lakeland, Fla.**

**Division of Ser. No. 233,357, Apr. 26, 1994. This application Apr. 28, 1995, Ser. No. 431,498**

**Int. Cl.[6] B60R** *21/26*

**U.S. Cl. 280—740** **9 Claims**



1. An inflator assembly comprising:

a housing formed of a first cup and a second cup, each having an inner annular wall disposed along a longitudinal axis and an outer annular wall concentric with said inner wall and a circle base, the walls and base of each cup being made integrally and the cups being disposed in a facing relationship with the inner walls being interlocked and the outer walls being interlocked to form with the bases within said housing a central cylindrical chamber and an outer annular chamber;

an initiator disposed in said central chamber;

a partitioning retaining member disposed in said outer chamber and arranged for partitioning said outer annular chamber into a first portion and a second portion, said partitioning retaining member being a ring having a first ring part normal to said axis and a second ring part disposed in parallel to said axis and spaced from the inner walls to define a space therebetween forming a part of said first portion of outer annular chamber;

a sealed canister disposed in said first portion including said space and holding gas generating material for generating gas; and

a filter media disposed in said second portion for filtering particulate matter from said gas.

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**5,496,066**

## SAFETY DEVICE FOR THE PASSENGER COMPARTMENT OF A MOTOR VEHICLE BODY

**Rainer Hoffmann, Alzenau; Michael Bischoff, Karlstein; Joachim Franz, Waldaschaff, and Thomas Thein, Sennfeld, all of, Germany, assignors to Pars - Passive Ruckhaltesysteme GmbH, Alzenau, Germany**

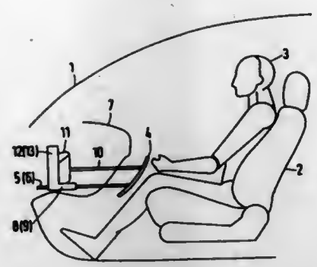
**Filed Aug. 19, 1994, Ser. No. 293,000**

**Claims priority, application Germany, Aug. 24, 1993, 43 28 446.9**

**Int. Cl.[6] B60R** *21/04*

**U.S. Cl. 280—753** **14 Claims**

1. A safety device for the passenger compartment of a motor vehicle, which device consists of a cushion plate (4), which is disposed at knee level in front of a passenger (3) seated in a seat (2) of the vehicle, the cushion plate is integrated in the front part of the passenger compartment and is secured to a guide (5, 6) and in response to an impact is movable by drive means toward the knees of the passenger, the drive means including a leaf spring (11) which is connected to the cushion plate (4) and is fixed in the vehicle and is prestressed in a state of rest and is releasable to move opposite to the direction of travel of the vehicle.



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**5,496,067**

## CHASSIS FOR VEHICLES NOTABLY FOR MOTOR VEHICLES

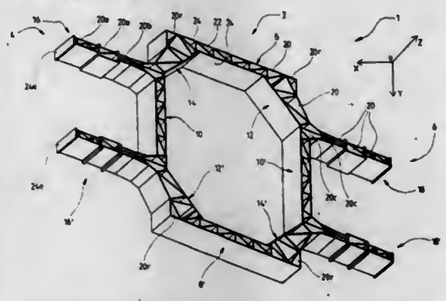
**Daniel Stoll, Neuchâtel, and Jacques Müller, Reconvilier, both of, Switzerland, assignors to SMH Management Services AG, Biel, Switzerland**

**Filed Sep. 19, 1994, Ser. No. 306,445**

**Claims priority, application France, Jan. 5, 1993, 93 11940**

**Int. Cl.[6] B62D** *21/15*

**U.S. Cl. 280—784** **13 Claims**



1. A chassis for a motor vehicle, said chassis consisting of a monolithic structure comprising a rigid base frame with front and rear impact energy absorption zones at the front and the rear of the base frame, respectively, the impact energy absorption zones extending parallel to a rolling axis of the chassis, said monolithic structure comprising an open framework of cells bounded only by walls extending parallel to a yaw axis of the chassis.

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**5,496,068**

## INERTIA SENSITIVE BUCKLE FOR SEAT BELT PRETENSIONER SYSTEM

**Keith R. Ball, New Baltimore; Timothy J. Cahill, Dryden; Robert P. Ellis, Almont; Charles W. Sorenson, Utica, and Carl M. Petersen, III, Waterford, all of Mich., assignors to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio**

**Filed Jan. 20, 1995, Ser. No. 376,111**

**Int. Cl.[6] B60R** *22/46;* **A44B** *11/26*

**U.S. Cl. 280—806** **21 Claims**

1. An apparatus for use with a seat belt, said apparatus comprising:

a tongue;

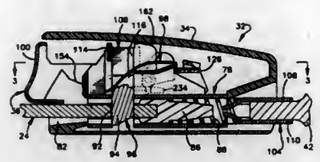
a buckle for receiving and retaining said tongue,

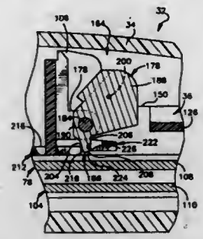
said buckle including a base, an actuator member movable relative to said base from an unactuated position to an actuated position to effect operation of said buckle to release said tongue for movement from said buckle, a cam connected with said actuator member and having a longitudinally extending surface and an end surface, a mass movable relative to said base, and a cam follower connected with said mass, said longitudinally extending surface on said cam being slidable along said cam follower during at least a portion of the movement of said actuator member between the unactuated and actuated positions; and

a pretensioner connected with said buckle and operable to move said buckle through a pretensioning stroke to remove slack from the seat belt;

said cam follower having surface means for applying force resulting from inertia of said mass to said end surface on said cam to resist movement of said actuator member to the actuated position upon operation of said pretensioner.







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**5,496,069**

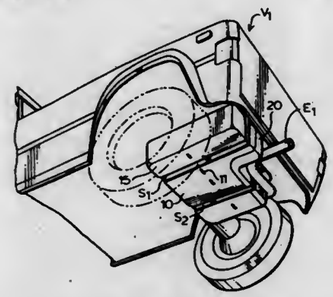
## HEAT MANAGEMENT SHIELDING DEVICE

**Frank Milligan, 2009 Wyecroft Road, Oakville, Ontario, Canada**

**Filed Sep. 20, 1991, Ser. No. 764,509**

**Int. Cl.[6] B60P** *3/22*

**U.S. Cl. 280—830** **16 Claims**



14. A composite protective shield installed with a vehicle for protecting a fuel tank affected by the elements, (for example abrasive road wear and heat), the composite shield comprising mounting means to mount the shield adjacent the fuel tank and mounted at a gap therefrom, which may be an air gap or said gap may be filled with insulation, the shield being formed from a resilient sheet matrix of flame retardant phenolic or polyester glass fibre resin compound, providing the form thereof, the resin compound having predetermined heat distortion properties and abrasive resistance properties to provide maximum shielding from heat and abrasion, the resilient sheet matrix of the shield having raised portions formed with the shield raised laterally inwardly toward the fuel tank and which raised portions establish the gap between the shield and the fuel tank when the shield is installed with the fuel tank, the shield being provided with a layer of reflective material fastened to the sheet matrix remote the fuel tank, the sheet matrix and the reflective material having therebetween disposed at least adjacent the fuel tank insulating material having low thermal conductivity and low heat storage capability, the layer of reflective material and the insulating material for dissipating the heat on the side of the shield opposite the fuel tank to which heat may be applied thus maintaining the fuel tank harmless and safe.

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**5,496,070**

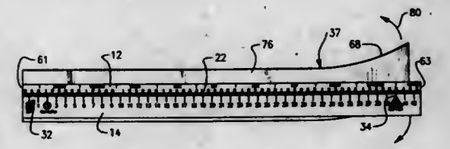
## CALENDAR DATE MONITORING SYSTEM

**Stephen Thompson, 775 1st Ave. North, Naples, Fla. 33940**

**Filed Sep. 20, 1994, Ser. No. 309,846**

**Int. Cl.[6] G01B** *3/10;3/02*

**U.S. Cl. 283—2** **16 Claims**



1. A pregnancy date monitoring system comprising:

an elongate, substantially flat calendar strip, which includes a first set of indicia, arranged longitudinally on said calendar strip to define calendar days and months;

a separate elongate, substantially flat interval strip, which includes a second set of indicia, arranged longitudinally on said interval strip to define predetermined time intervals; said second set of indicia including a first guide mark formed proximate one end of said interval strip and representing the first day of a patient's last menstrual period, a second guide mark formed proximate the opposite end of said interval strip and representing the approximate birth date and a plurality of intermediate marks arranged between said first and second guide marks for representing respective intermediate dates, and

means for holding said calendar strip and said interval strip in a longitudinally juxtaposed and fixedly interconnected condition such that said first and second guide marks are aligned with selected Indicia representing first and second dates on said calendar strip and said Intermediate marks are aligned with indicia representing corresponding intermediate dates on said calendar strip, said means for holding including a support element having, a generally flat upper surface for supporting, said strips thereon and an adhesive carried by a lower surface of said strips, said adhesive enabling said lower surface to be selectively fixed to at least one of an upper surface of the other said strip and said upper surface of said support element such that said strips are longitudinally immovable relative to each other.

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**5,496,071**

## METHOD OF PROVIDING ARTICLE IDENTITY ON PRINTED WORKS

**Margaret A. Walsh, 65 South St., Apt. 111, Auburn, N.Y. 13021**

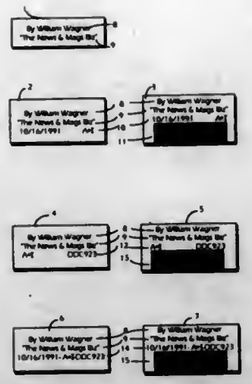
**Continuation of Ser. No. 100,151, Aug. 2, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 469,509**

**Int. Cl.[6] B42D** *15/00*

**U.S. Cl. 283—70** **8 Claims**

6. A method of generating identification information for enabling search and classification of each of a plurality of articles printed on a page of a mass distributable print media comprising the steps of:

obtaining identification information including a relative subject matter index for each article and a complete date of publica-



tion for said print media; and printing said identification information on said page of said print media in close proximity to each of the respective plurality of articles.

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**5,496,072**

## HEAT TRANSFER RECORDING MEDIA

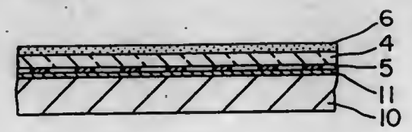
**Mineo Yamauchi; Katsuyuki Oshima; Jitsuhiko Ando; Masanori Torii; Hideo Fujimura, and Tamami Iwata, all of Tokyo, Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan**

**Continuation of Ser. No. 118,210, Sep. 9, 1993, Pat. No. 5,387,013, which is a continuation of Ser. No. 582,216, Oct. 1, 1990, Pat. No. 5,267,755. This application Nov. 14, 1994, Ser. No. 340,354**

**Claims priority, application Japan, Jan. 31, 1989, 1-22346; Feb. 13, 1989, 1-33455; Feb. 13, 1989, 1-33456; Nov. 20, 1989, 1-299774; Nov. 20, 1989, 1-299775; Nov. 20, 1989, 1-299776; Nov. 27, 1989, 1-304844; Nov. 27, 1989, 1-304845**

**Int. Cl.[6] B42D *15/00***

**U.S. Cl. 283—86** **12 Claims**



1. A heat transfer sheet comprising:

a support;

a protective layer formed releasably on the support, the protective layer having a hologram comprising a hologram forming layer and a hologram effect layer formed on a relief surface of the hologram effect layer, the hologram effect layer comprising a material having sufficient transparency with high reflecting properties at a certain angle and being different in index of refraction from the hologram forming layer.

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**5,496,073**

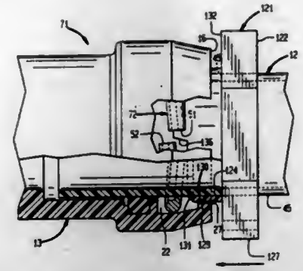
## DISENGAGEMENT TOOL FOR USE WITH A PIPE JOINT ASSEMBLY

**Wilfred J. Grenier, Rutland, Mass., assignor to Rovac Corporation, Rochdale, Mass.**

**Filed Nov. 29, 1993, Ser. No. 158,347**

**Int. Cl.[6] F16L *37/088;35/00***

**U.S. Cl. 285—39** **9 Claims**



1. A disengagement tool for use with a coupling assembly for use in connecting a first tubular member at a first end thereof to a component of a piping system and including a receiving tubular member on said component and defining an opening adapted to receive said first tubular member, said receiving tubular member having an inner portion defining an inner bore dimensioned to snugly receive said first end and an outer portion defining an internal annular cavity intersecting said inner bore and projecting radially outwardly therefrom, said annular cavity comprising an annular tapered wall portion tapered radially inwardly and projecting longitudinally toward said opening;

a split lock ring disposed in said annular cavity between said first tubular member and said receiving tubular member, said lock ring having first and second normally axially displaced ends and an outer circumferential surface portion adapted to engage said tapered wall portion and an inner circumfereotial surface portion adapted to engage an external wall portion of said first tubular member, said lock ring being adapted to expand circumferentially into said annular cavity during insertion of said first tubular member into said receiving tubular member and to be compressed between said tapered wall portion and said external wall portion in response to relative longitudinal separating movement between said first tubular member and said receiving tubular member and, said inner circumferential surface portion defining circumferentially extending knife edge means for penetrating said external wall portion so as to prevent longitudinal movement of said first tubular member relative to said receiving tubular member;

an annular sealing member disposed in said annular cavity between said lock ring and said inner bore, said sealing member dimensioned to be engaged between said first tubular member and receiving tubular member; and

said disengagement tool comprising;

a plurality of arcuately shaped parts each having an inner surface conforming to the outer surface of said first tubular member and adapted for engagement therewith in a juxtaposed relationship thereabout, said parts adapted for sliding movement on said first tubular member and having actuator end portions adapted to be pushed through said opening into said annular cavity and into forcible engagement with said lock ring so as to cause circumferential expansion thereof and thereby eliminate engagement between said knife edge and said first tubular member, at least one of said parts having a driver portion adapted to engage said first end of said lock ring and facilitate axial rotation thereof about said first tubular member in response to axial rotation of said one part about said outer surface of said first tubular member.

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**5,496,074**

## QUICK CONNECTION

**Henri Viratelle, Mont St Sulpice, and Michel Andre, Romorantin, both of, France, assignors to Etablissements Caillau, Moulineaux, France**

**Filed Jan. 20, 1995, Ser. No. 375,602**

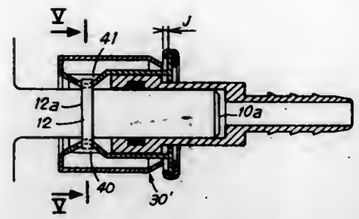
**Claims priority, application France, Jan. 26, 1994, 94 00829**

**Int. Cl.[6] F16L *11/12***

**U.S. Cl. 285—45** **13 Claims**

1. A connector for connecting a free end of a rigid tube to a free end of a pipe, said connector comprising:





a) an annular swell surrounding the rigid tube at a predetermined axial distance from the free end of the rigid tube; and

b) a connection element attached to the free end of the pipe for joining the pipe and the rigid tube in fluid communication, said connection element including:

i) a generally tubular connector housing defining a longitudinal aperture extending from the pipe to a free end of said connector housing for receiving the free end of the rigid tube such that said annular swell is positioned adjacent the free end of said connector housing;

ii) an O-ring positioned in said connector housing for contacting the rigid tube between said swell and the free end of the rigid tube;

iii) a locking ring mounted on an intermediate segment of said tubular connector housing;

iv) a stop means formed on said tubular connector housing between said locking ring and the free end of said tubular connecting housing for retaining said locking ring;

v) at least one locking lug connected to said locking ring and extending axially across said stop means and past the free end of said connector housing, said locking lug being elastically deformable in a radial direction and having an inwardly-angled front ramp at a free end of said locking lug;

vi) a transverse slot means formed in said locking lug adjacent the front ramp for receiving and securing said annular swell when the free end of the rigid tube is positioned in the aperture of said tubular connector housing; and

vii) a spacer means for selectively deforming said locking lug in a radially outward direction to release said annular swell from said transverse slot.

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**5,496,075**

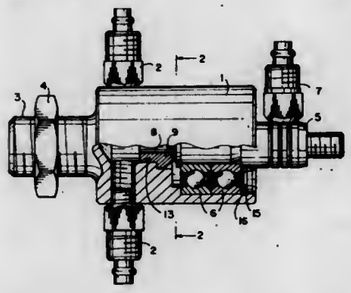
## ROTATIVE JOINT APPLICABLE IN PNEUMATIC AIR PRESSURE CONTROL ASSEMBLY

**Juergen W. Ostermann, Sao Paulo, Brazil, assignor to VDO Kienzle Comercio E Servicos Ltda., Sao Paulo, Brazil**

**Filed Apr. 7, 1995, Ser. No. 418,504**

**Int. Cl.[6] F16L *3/00***

**U.S. Cl. 285—62** **10 Claims**



1. Rotative joint for a pneumatic air pressure control assembly for a vehicle, comprising

a body including at least one air outlet, said body having an interior and being disposed along a substantially longitudinal axis,

means arranged on said body for fixing said body to the vehicle,

an elongate shaft having a first end situated in said body interior and a second end opposed to said first end situated exterior to said body, said shaft being disposed along an axis coinciding with said axis of said body,

bearing means for supporting said shaft in said body while allowing relative rotational movement between said shaft and said body, said shaft having an air inlet opening situated exterior to said body and a hollow interior into which said air inlet opening leads,

said body defining an air chamber in its interior, said air chamber providing air communication from said hollow interior of said shaft to said at least one air outlet of said body, and

pneumatic sealing means arranged in said air chamber for sealing said air chamber, said sealing means comprising a material having low friction properties and high resistance to wear.

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**5,496,076**

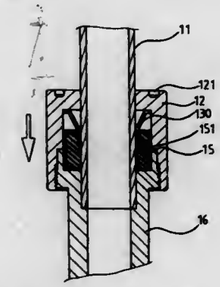
## FAST TUBE CONNECTOR STRUCTURE

**Yo-Chia Lin, 5th Fl., No. 1, Lane 193, Chung Cheng N. Road, Sauchung City, Taipei Hsien, Taiwan, Prov. of China**

**Filed Aug. 30, 1994, Ser. No. 298,252**

**Int. Cl.[6] F16L *17/035***

**U.S. Cl. 285—110** **2 Claims**



1. A tube connector comprising:

a tube connector including an outer threaded portion, an inner annular stepped tube seat, and an inner annular stepped washer seat;

a rubber fastening washer having a first and second end with said first end that is placed on said washer seat of said tube connector;

a guiding sleeve means placed on said fastening washer, said guiding sleeve means including an inwardly tapered guiding flange for securely receiving said second end of said fastening washer;

a conic spring washer that abuts said guiding sleeve means, said conic spring washer including a plurality of fissures in a narrow end thereof, said narrow end being received in said guiding flange of said guiding sleeve means; and

a nut including an inner threaded portion, said nut being screwed onto said outer threaded portion of said tube connector, said nut further including a receiving means to receive and seat a tube and an annular conic spring washer seat to receive said conic spring washer; and wherein

an end of a tube is inserted into said receiving means of said nut and respectively through said conical spring washer, said guiding sleeve means, and said fastening washer, said end of said tube received in said annular stepped tube seat,

said nut being tightened onto said threaded portion of said tube connector, thereby compressing said conic spring washer into said guiding flange and into engagement with said tube and said guiding sleeve means, and said fastening washer into said annular stepped washer seat in said tube connector.

said narrow end of said conic spring washer tightly gripping said tube so that said tube is firmly fixed in said tube connector.

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**5,496,077**

**Patent Not Issued For This Number**

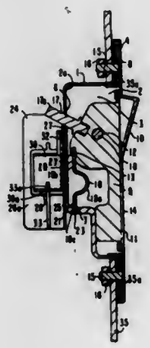
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**5,496,078**

## FLUSH HANDLE ASSEMBLY

**Sachio Yasuda, Tokyo, Japan, assignor to Takigen Manufacturing Co. Ltd., Tokyo, Japan**

**Filed Feb. 16, 1994, Ser. No. 197,066**
**Claims priority, application Japan, May 27, 1993, 5-148646**
**Int. Cl.[6] E05C 1/12**
**U.S. Cl. 292—165** **5 Claims**



1. A flush handle assembly, comprising:
a casing (1) for fixedly mounting on a door (35)
a handle (9) having its base-end portion pivoted to a side wall (3) of said casing (1) through a cross pivot (18), said handle (9) being retractable in a front concave portion (2) of said casing (1);
a leaf spring (19) for keeping a projected or retracted position of said handle (9) and for urging the handle to be projected from and retracted in said front concave portion (2) of said casing (1), said leaf spring (19) being interposed between said handle (9) and a bottom portion (2*a*) of said front concave portion (2) of said casing (1);
a control projection (17) fixedly mounted on a rear surface of said handle (9);
a latch casing (24) fixedly mounted on a rear surface of said casing (1), said latch casing (24) being provided with guide portions (28, 29) in its opposite side walls (26*a*, 26*b*);
a latch element (30) which is provided with an oblique portion in its front-end portion (31) and has its oblique-plate portion (32) projected from its side surface, said latch element (30) being oriented substantially perpendicular to said casing (1);
a biasing spring (33,34) provided between said latch casing (24) and said latch element (30) for urging said latch element (30) forward;
wherein said latch element (30) has its oblique-plate portion (32) abut against said control projection (17); said handle (9) is projected from or retracted in said front concave portion (2) of said casing (1) so as to have said control projection (17) move back and forth, so that said latch element (30) is slidably moved horizontally along said guide portions (28, 29) of said latch casing (24), whereby said front-end portion (31) of said latch element (30) can be engaged with and disengaged from a receiving portion (37) of a stationary frame element (36).

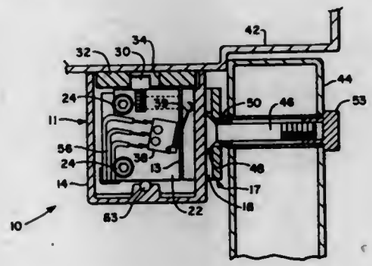
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**5,496,079**

## SWINGING ELECTROMAGNETIC LOCK

**George Frolov, Farmington, Conn., assignor to Harrow Products, Inc., Grand Rapids, Mich.**

**Filed Oct. 6, 1994, Ser. No. 319,955**
**Int. Cl.[6] E05C 17/56**
**U.S. Cl. 292—251.5** **20 Claims**



1. A security system for a door comprising:
frame means adapted for mounting a housing means to a door frame, said frame means having a mounting surface;
electromagnetic means for generating an electromagnetic field and defining an attraction surface;
said housing means comprising an elongated structure for housing said electromagnetic means, said housing means having a first end portion and a longitudinally spaced second end portion, said attraction surface disposed at one side of said housing means;
pivot means for pivotally mounting said first end portion of said housing means to said frame means, said pivot means defining a pivot axis substantially perpendicular to said mounting surface and parallel to said attraction surface; and
switch means actuatable in response to pivotal displacement of said housing means relative to said frame means for generating a first electrical signal.

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**5,496,080**

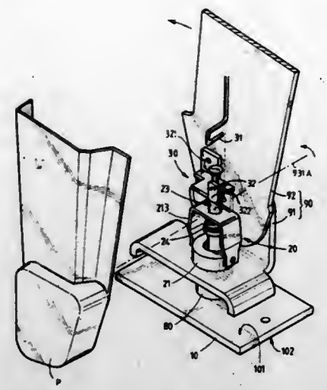
## LOCK WITH PREFERABLY AUTOMATIC LATCHING AND ITS USE ESPECIALLY FOR A REMOVABLE VEHICLE SEAT

**Jean-Pierre Chabanne, Champvallon; Gerard Anglade, Pannes; Jean-Marie Blanchard, Sur Vernisson, and Francois Fourrey, Montbellard, all of, France, assignors to CESA-Compagne Europenne De Sieges Pour Automobiles, Levallois-Perret, France**

**Filed Dec. 23, 1993, Ser. No. 172,071**
**Claims priority, application France, Dec. 29, 1992, 92-15857**
**Int. Cl.[6] B60N 2/10**
**U.S. Cl. 292—252** **16 Claims**

1. An arrangement of a lock in a seat for a motor vehicle provided with a floor,
the seat comprising a subframe having first and second parts (91, 92) joined together by an articulation (93), the first part forming a sole-plate and the second part (92) forming a leg, the second part (92) being able to move, relative to the first part (91), between an opened-out position and a folded position,





the lock comprising a catch bolt (20) having a locking body (21) forming a broach intended to be latched in an opening (111) formed in a striker plate (10), the locking body (21) being supported by the first part (91) and the striker plate (10) being fixed to the floor,
the arrangement comprising a safety device allowing the latching or the release of the locking body (21) only when the second part (92) is in the open-out position, wherein the locking body (21) comprises a cylindrical guide cavity (210), an open extremity (211) and at least one channel (212) transpiercing the locking body (21) in order to come out into the cavity (210),
wherein the catch bolt (20) comprises further at least one ball (22) housed in the channel (212) and movable between a first projecting position so as to be in contact with the striker plate in order to lock the catch bolt (20) and a second retracted position so as to unlock the catch bolt (20), a needle (23) housed in the cavity (210) and movable be means of a control device (30) between an inactive position and an active position in order to cause the ball (22) to pass from one of its positions to the other,
and wherein, the safety device (60) comprises two interacting elements (61, 62), a first one (62) carried by the second part (92) and a second one (61) carried by the needle (23).

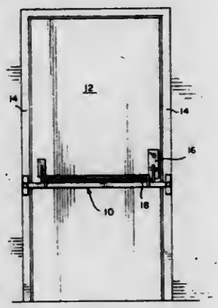
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**5,496,081**

## DOOR SECURITY DEVICE

**Brian J. Rice, Columbia City, Ind., assignor to Richard J. Bagan, Inc., Columbia City, Ind.**

**Continuation-in-part of Ser. No. 45,363, Apr. 8, 1993, Pat. No. 5,364,140. This application Sep. 24, 1993, Ser. No. 127,301**
**Int. Cl.[6] E05C 19/18**
**U.S. Cl. 292—259 R** **31 Claims**



1. A security device for a door mounted within a frame, comprising:
a generally elongate support bar having first and second ends, said support bar having a length which exceeds a width of said door;
an attachment mechanism mounted to said support bar for movably attaching said device to a portion of said frame in a substantially horizonal orientation such that said first and second ends of said support bar are disposed adjacent opposing vertical members of said door frame;
at least one blocking member attached to said support bar, said blocking member being positionable against said door; and
a handle assembly mounted to the attachment mechanism adjacent said support bar, such that said handle assembly is pivotable with respect to said support bar so as to engage said attaching means to said door frame.

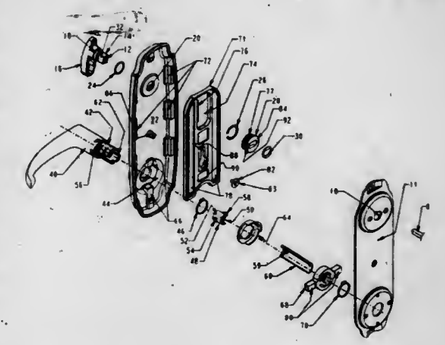
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**5,496,082**

## INTERCONNECTED LOCK

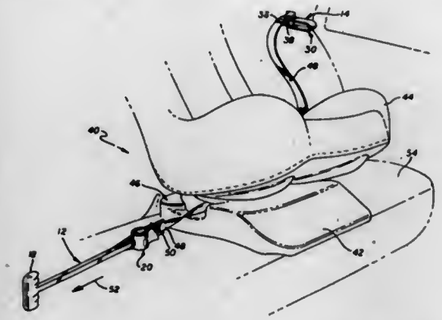
**Martin Zuckerman, Villa Park, Calif., assignor to Emhart Inc., Newark, Del.**

**Filed Dec. 20, 1994, Ser. No. 359,967**
**Int. Cl.[6] E05B 3/00**
**U.S. Cl. 292—336.3** **6 Claims**



1. An interconnected lockset comprising
an upper deadbolt assembly including
a rotatable spindle,
a turn piece secured to said spindle, said turn piece rotatable from either of two symmetrical unlocked orientations to a locked orientation, and
a pinion secured to said turn piece,
a lower lever assembly including
a rotatable element,
an operator secured to said rotatable element, and
a cam having opposed arms secured for displacement with said operator, and
a rose for supporting said turn piece and said operator,
a vertically displaceable rack including
a pair of adjacent legs for engagement with said opposed arms,
a vertically extending row of rack teeth,
said row of rack teeth being selectively located so that said teeth can be either located on one side of said pinion to rotate said turn piece clockwise from one of said unlocked orientations to said neutral locked orientation or located on the other side of said pinion to rotate said turn piece counterclockwise from the other unlocked orientation to said neutral locked orientation.

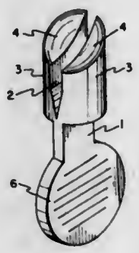
5,496,083
**SYSTEM FOR INSTALLING AUTOMOBILE BABY SEATS**
William E. Sbouse, Jr., 831 W. Philadelphia, Unit A, Ontario, Calif. 91762
Filed Oct. 3, 1994, Ser. No. 316,901
Int. Cl.[6] B25B 27/14; B25J 1/00
U.S. Cl. 294—1.1 8 Claims



1. Apparatus for use in securing a baby seat of the type that includes a transverse channel in an automobile by means of a seat belt comprising, in combination:
a) means for preventing retraction of said seat belt; and
b) means for guiding said seat belt through said channel.

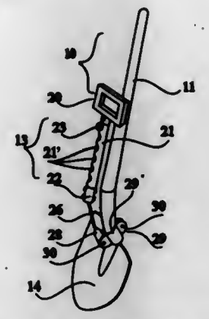
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5,496,084
**CONTACT LENS FITTER-REMOVER**
Eliseo Miralles Medan, Ronda Zamenhof, 118 3° 1ª, Sabadell (Barcelona), Spain
Filed Sep. 15, 1993, Ser. No. 121,940
Claims priority, application Spain, Sep. 17, 1992, 9201867
Int. Cl.[6] A61F 9/00
U.S. Cl. 294—1.2 5 Claims



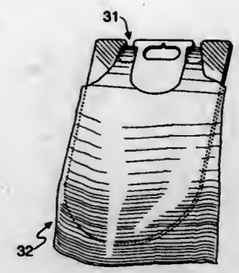
1. A device for inserting and removing contact lenses comprising:
an elongated body; said elongated body comprising a substantially cylindrical elongated part;
said cylindrical part having a first end and a second end, a diametral notch extending along said cylindrical part from said first end towards said second end, said notch defining two resilient legs each having a free end, each of said free ends of said legs having a concavely curved cup-shaped surface that is configured to substantially correspond to the convexity of a convex front surface of a contact lens, said concavely curved surfaces being smooth and devoid of any projections said notch forming straight, parallel, spaced facing walls on the legs extending laterally entirely across said cylindrical part.

5,496,085
**AUXILIARY HANDLE UNIT FOR LONG HANDLED HAND TOOLS**
David J. Middleton, 20 Quarry Crossing, Hudson Falls, N.Y. 12839
Filed Jan. 13, 1995, Ser. No. 372,448
Int. Cl.[6] A01B 1/22; B25G 3/38
U.S. Cl. 294—58 1 Claim



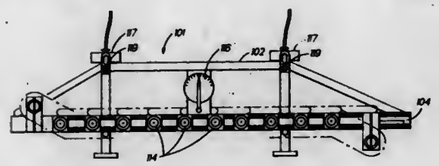
1. An improvement in an auxiliary handle unit for long handled tools having an elongated primary handle with upper and lower ends and an engaging head at the lower end thereof wherein the auxiliary handle unit consists of,
an extensible shaft unit,
a hand grip dimensioned to receive one end of the extensible shaft unit,
an angled connecting bar unit connected to the opposite end of the extensible shaft unit,
said angled connecting bar unit pivotally secured to a retrofitable securing means,
said retrofitable securing means attached to a main shaft of the long handled tool,
wherein said extensible shaft unit comprises elongated upper and lower shaft members each having respective upper and lower ends, the upper and lower shaft members being adjustably reciprocal with each other and secured together with a stop button, and one end of the upper shaft member is fitted with a first and second set of apertures whereby the first set of apertures are formed around an end periphery of the upper shaft member to selectively secure said hand grip thereto by a first nut and bolt assembly for various hand positions, and the second set of apertures are spaced along the longitudinal axis of the upper shaft member, the upper shaft member's opposite end being dimensioned to fit over a first end of the lower shaft member such that the first end of the lower shaft member receives said upper shaft member reciprocally, and said lower shaft member is fitted with a first set of apertures and a second aperture, wherein the second aperture is located near the first end of the lower shaft member and is dimensioned to receive said stop button, and the first set of apertures are located near a second end of the lower shaft member for securing said angled connecting bar unit thereto, wherein one end of said angled connecting bar unit is wedged into the second end of the lower shaft member and is secured thereto by a second nut and bolt assembly extending through the first set of apertures in the lower shaft member, said angled connecting bar unit is comprised of an
elongated bar having an upper end with an aperture, a middle section with an aperture, and a lower end with an aperture, wherein the upper end of the angled connecting bar unit is angled obliquely with respect to the middle section in order to provide securement within said lower shaft member's second end, and the lower end of the angled connecting bar unit is also angled obliquely with respect to the middle section and contains a distal end portion that is twisted with respect to the remaining portion of the lower end, said distal end portion having an aperture to pivotally connect between the retrofitable securing means, wherein said retrofitable securing means comprises a pair of metal bars each having apertured front and back ends with a concave center portion therebetween, said concave center portion of said retrofitable securing means being frictionally attachable to the circumference of the primary handle and securable thereto by a third nut and bolt assembly extending through an aperture of either the front or back walls of the metal bars of said retrofitable securing means thereby pivotally securing said angled connecting bar unit thereto, wherein an equal number of washers and spacers are disposed on each side of said angled connecting bar unit to align the lower end of said angled connecting bar unit between the pair of metal bars of said retrofitable securing means in order to secure said auxiliary handle unit to the primary handle.





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5,496,086
**APPARATUS FOR TRANSPORTING A BALUSTRADE FOR A PASSENGER CONVEYOR**
Willy Adrian, Obernkirchen; Joachim Arens, Suthfeld, and Gerald Wente, Pohle, all of, Germany, assignors to Otis Elevator Company, Farmington, Conn.
Division of Ser. No. 173,391, Dec. 23, 1993, Pat. No. 5,421,076. This application Sep. 16, 1994, Ser. No. 307,115
Int. Cl.[6] B66C 1/02
U.S. Cl. 294—65 4 Claims



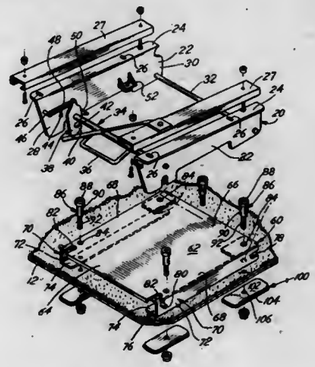
1. An apparatus for transporting a pair of aligned escalator balustrades for assembly onto an escalator, comprising:
a frame;
a left support arm, having means for attaching one of the escalator balustrades, attached to said frame;
a right support arm, having means for attaching the other of the escalator balustrades, attached to said frame;
wherein said attaching means attach said transporting apparatus to the escalator balustrades, thereby enabling the aligned pair of balustrades to be transported for installation onto the escalator.

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5,496,087
**SUPPORT DEVICE FOR BAGS**
Judith Lathrop, 151 Rivergate Dr., Wilton, Conn. 06897
Filed Feb. 7, 1994, Ser. No. 192,340
Int. Cl.[6] B65D 33/06
U.S. Cl. 294—137 5 Claims

3. A flat device to support, carry and store used bags comprising a singular integral unitary planar body substantially elongated and U shaped with two elongated side edges, a rounded bottom portion connected to the side edges and a substantially straight upper edge extending and connected to the continuous side edges and in the upper edge two symmetrical, perimetric, spaced recesses extending downwardly to receive bag hanger elements, formed from the upper edge and an open space between the recesses, adjacent to the upper edge to form a handle or hand holding device.

5,496,088
**QUICK RELEASE PEDESTAL SEAT**
David A. Stewart, 22322 County Rd. 4 East, Elkhart, Ind. 46514
Filed Oct. 8, 1993, Ser. No. 134,417
Int. Cl.[6] B60N 2/00
U.S. Cl. 296—65.1 34 Claims

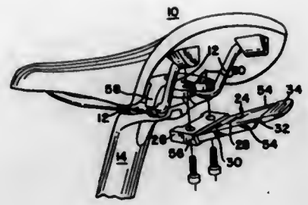


1. A seat assembly for use in a vehicle, said vehicle including a floor board therein, comprising:
a seat;
a support connected to said seat;
a base;
a mechanism to attach said support to said base; and
wherein the base includes a top surface having a front portion, a back portion and opposing sides, the base further including flanges connected to the sides thereby forming a channel substantially between each flange and the top surface.

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5,496,089
**SEAT POST BAG CLIP**
Kenneth J. Muderlak, Shorewood, Wis., assignor to Trek Bicycle, Corp., Waterloo, Wis.
Filed Mar. 28, 1994, Ser. No. 218,572
Int. Cl.[6] A47C 7/62
U.S. Cl. 297—188.12 4 Claims

1. A seat post for supporting a bicycle seat having rails comprising:
a supporting shaft;
a clamping base for receiving the rails of the bicycle seat, said base being formed integrally on the top of said shaft;
a clamp cap for clamping the rails of the bicycle seat between said cap and said base, said cap having projecting ears;



a receiver for removably mounting a cargo bag to the bicycle seat, said receiver being connected to the bag and removably connected to said seat post, said receiver comprising a top wall having an edge, a bottom wall, and two side walls;

a clip directly mounted to said projecting ears of said clamp cap, said clip comprising a mounting cleat and a tab, said tab extending from said mounting cleat and adapted to be slidably contained within said receiver, said tab comprising a resilient leaf and a pawl, said leaf biasing said pawl into engagement with said edge of said receiver, said pawl abutting said edge of said receiver in a locked position, said pawl and said edge being disconnected in an unlocked position; and

an actuator for releasing said pawl from the locked position to the unlocked position, said actuator connected to said pawl.

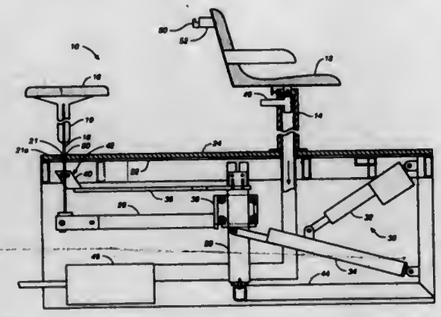
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**5,496,090**

**HAIRCUT WORK STATION**

**Frank E. Emmett, Penngrove, and Greg Luzaich, Windsor, both of Calif., assignors to Frank E. Emmett, Inc., Penngrove, Calif.**

**Filed Aug. 24, 1994, Ser. No. 294,955**
**Int. Cl.[6] A47C *15/00***
**U.S. Cl. 297—240** **13 Claims**



1. A haircut work station comprising:

a customer chair supported by a customer chair support member upon a floor-level deck plate bearing a generally circular travel arc slot about said customer chair;

an operator seat supported by an operator seat support member upon a swinging arm extending radially outward from a below-floor center post, said operator seat support member penetrating said floor-level deck plate through said generally circular travel arc slot;

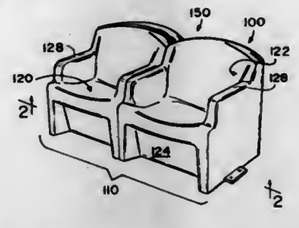
a lift assembly linked to said swinging arm to enable simultaneous circular and vertical movement of said swing arm and said operator seat relative to said floor-level deck plate and said customer chair.

**5,496,091**

**CHAIR AND GROUPING THEREOF**

**Richard B. Karl, St. Charles, and Harvey Hanig, North Aurora, both of Ill., assignors to Norix Group, Inc., West Chicago, Ill.**

**Filed Mar. 14, 1994, Ser. No. 213,161**
**Int. Cl.[6] A47C *15/00***
**U.S. Cl. 297—248** **19 Claims**



1. A chair assembly comprising:

a) a first and a second shaped, one-piece chair form each having a pair of oppositely disposed arms, a chair seat between the arms and a chair back support ergonomically related to the chair seat;

b) a joining means for securing the first shaped, one-piece chair form to the second shaped, one-piece chair form; wherein each of the shaped one-piece chair forms includes:

c) a means for adding weight thereto;

d) a base below the chair seat;

e) the joining means being situated in the base;

f) the means for adding weight being situated in the base;

g) the pair of oppositely disposed arms including a first arm and a second arm;

h) the joining means including a set of indentations;

i) the set of indentations including a first indentation, a second indentation and a third indentation;

j) the first indentation being near the first arm;

k) the second indentation being near the second arm;

l) the third indentation being near the chair back support;

m) the first indentation, the second indentation, and the third indentation each having at least one threaded member secured therein; and

n) the first indentation, the second indentation, and the third indentation each receiving a plate.

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**5,496,092**

**MULTI-POSITION PEDIATRIC IMMOBILIZER AND TRANSPORT DEVICE**

**Gary R. Williams, Carlsbad, Calif., and Irvin D. Pollock, Wilmington, Ohio, assignors to Gary R. Williams, Carlsbad, Calif.**

**Continuation of Ser. No. 879,852, May 6, 1992, abandoned.**
**This application Apr. 25, 1994, Ser. No. 231,851**
**Int. Cl.[6] A47D *1/10*; B60N *2/28***
**U.S. Cl. 297—250.1** **31 Claims**

1. A multiple position child restraint device which can be folded into substantially planar condition for storage and shipment, said restraint device comprising:

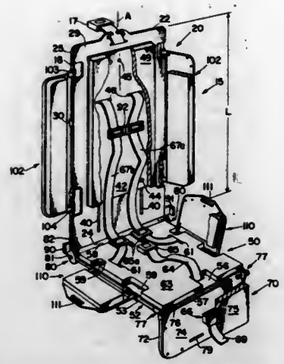
a substantially planar back support member having a longitudinal length and upper and lower edges along that length and a rear surface;

a substantially planar seat support member having front and rear edges and a rear face, said seat support member attached to said back support member adjacent said rear and lower edges, respectively, by a hinge assembly;

a leg support member pivotally attached adjacent said front edge of said seat support member;

means associated with said back support and seat support members for selectively locking said back support and seat support members against forward and rearward movement in one of a





plurality of predetermined angular orientations, said leg support member and said seat support member being adapted to be oriented in a substantially coplanar relationship and be folded in an overlapping planar arrangement with said back support member with the rear face of said seat support member and the rear surface of said back support member in substantially face-to-face relationship without a need for structural reconfiguration; and

a multiple strap restraint means for securing a child on said seat and back support members, said restraint means attached to said restraint device and comprising a pair of shoulder straps and a releasable buckle arrangement for selective connection with a crotch member strap on said restraint device.

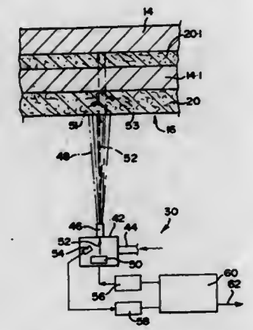
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**5,496,093**

**OPERATING A CONTINUOUS MINER**

**Desmond T. Barlow, Pretoria, South Africa, assignor to Csir & Sasol Mining Proprietary Ltd., Johannesburg, South Africa**

**Filed Dec. 23, 1994, Ser. No. 363,491**
**Int. Cl.[6] E21C *39/00*; E21F *5/00***
**U.S. Cl. 299—1.1** **18 Claims**



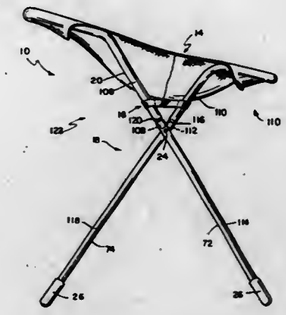
1. A method of mining a valuable mineral deposit present in the form of a seam within host rock by means of a continuous miner, the method including, in respect of at least one of a roof and a floor, repeatedly measuring the thickness of a relatively thin layer of valuable mineral deposit left against the host rock by means of ultrasonic sound waves, including establishing contact between an ultrasonic soundwave generator/receiver and a mining face by means of a jet of fluid, recording and extrapolating the measurements and comparing them with a predetermined thickness by means of logic, and generating a control signal by means of the logic to limit an extremity of a sweep of a rotor of the continuous miner to control the thickness of the layer of valuable mineral deposit left against the host rock.

**5,496,094**

**SEAT WITH EXPANDABLE FRAME**

**Robert A. Schwartzkopf, Columbus, Ind., and Richard E. Cone, Athens, Ohio, assignors to Cosco, Inc., Columbus, Ind.**

**Continuation of Ser. No. 130,006, Sep. 30, 1993, abandoned.**
**This application Feb. 3, 1995, Ser. No. 384,608**
**Int. Cl.[6] A47C *4/48***
**U.S. Cl. 297—45** **20 Claims**



1. A chair comprising

a first floor and seat engaging frame member and a second floor and seat engaging frame member pivotally joined to one another to permit collapsing of the chair from an erected seating position by pivoting of the first and second frame members to be substantially coextensive with one another,

the first frame member having a substantially straight U-shaped first bight end portion angled with respect to the first frame member and the second frame member having a substantially straight U-shaped second bight end portion angled with respect to the second frame member, and

a seat surface-providing member of a shape having at one end a first pocket for engaging and enclosing an extremity of the first angled bight of the first frame member and at a second end a second pocket for engaging and enclosing an extremity of the second angled bight of the second frame member, wherein the first and second bight end portions provide the only support for the seat-supporting member and with the remaining portions of the frame members providing no support for the seat-supporting member.

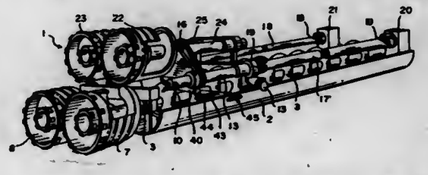
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**5,496,095**

**MINING MACHINE HAVING VERTICALLY MOVABLE PRIMARY AND SECONDARY CUTTERS**

**Rex Scholl, Rte. 1, Box 181, Given, W. Va. 25245**

**Filed Sep. 20, 1994, Ser. No. 309,972**
**Int. Cl.[6] F21C *27/24***
**U.S. Cl. 299—57** **10 Claims**



1. A mining machine for mining coal from outside a hill containing a coal seam comprising, a longitudinally extending pan, a longitudinally extending auger conveyor having a drive shaft rotatably mounted in said pan, a first primary cutter connected to one end of said auger conveyor drive shaft, the opposite end of said auger conveyor drive shaft being connected to one end of a thrust and torque transmitting unit, the opposite end of the thrust and

torque transmitting unit being operatively connected to a prime mover positioned outside said hill, means connected to the first primary cutter for moving the cutter in a vertical plane, to thereby allow the operator to control the direction of the hole being drilled, a secondary cutter positioned above the first primary cutter, means for detachably connecting said secondary cutter to said pan, said secondary cutter being operatively connected to said auger conveyor drive shaft and means connected to the secondary cutter for moving the cutter in a vertical plane relative to the first primary cutter, to thereby allow the machine to accomodate different seam thicknesses.

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**5,496,096**

## METHOD OF AND AN APPARATUS FOR REGULATING AN ELECTRICALLY REGULATED BRAKE CIRCUIT OF A MULTI-CIRCUIT BRAKE MECHANISM

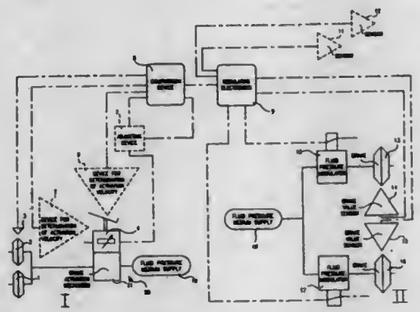
**Erwin Petersen, Wunstorf, and Manfred Schult, Garbsen, both of, Germany, assignors to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Germany**

**Filed Dec. 7, 1989, Ser. No. 447,499**

**Claims priority, application Germany, Dec. 12, 1988, 38 41 750.2**

**Int. Cl.[6] B60T** *8/26*

**U.S. Cl. 303—3** **36 Claims**



1. A method of regulating at least one electrically regulated brake circuit that forms a portion of a multi-circuit brake mechanism, said multi-circuit brake mechanism includes a plurality of brakes which respond to and are activated by a predetermined fluid pressure medium, said method comprising the steps of:

(a) initiating a brake application by manipulating a brake activation mechanism;

(b) said brake application mechanism emitting at least one first electric brake value signal and at least one pressure signal when it is manipulated;

(c) communicating said pressure signal from said brake activation mechanism to a fluid pressure responsive brake circuit, a magnitude of said first electric brake value signal and of said pressure signal depends upon at least one of a force applied to said brake activation mechanism and a travel distance of at least one member of said brake activation mechanism in step (a);

(d) measuring a brake value produced by said fluid pressure responsive brake circuit;

(e) transforming said brake value measured in step (d) to a second electric brake value signal; and

(f) at least regulating in part said electrically regulated brake circuit in a normal mode of operation by said second electric brake value signal and in an exceptional mode of operation by said first electric brake value signal.

**5,496,097**

## PROCESS FOR THE ADJUSTMENT OF A BRAKING VALUE TO A DESIRED BRAKING VALUE

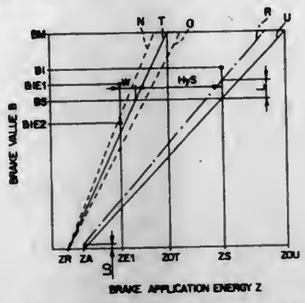
**Horst Eckert, Rehburg-Loccum, Germany, assignor to WABCO Vermogensverwaltungs GmbH, Hanover, Germany**

**Filed May 18, 1994, Ser. No. 245,427**

**Claims priority, application Germany, May 28, 1993, 43 17 846.4**

**Int. Cl.[6] B60T** *13/66*

**U.S. Cl. 303—155** **13 Claims**




1. A process for adjusting a braking value B to a desired braking value BS in a braking system having at least one brake (12, 13), wherein said braking value B evolves as functions of brake application energy Z for brake actuation and for brake release, and a difference between said brake actuation function V and said brake release function T is a hysteresis Hy of the braking system for a given braking value B, comprising

feeding brake application energy Z to said at least one brake,

producing an actual braking value BI by said braking system as said brake application energy Z is fed to said brake (12, 13), and

decreasing existing brake application energy ZS by a value HyS+W, which comprises hysteresis HyS associated with said desired braking value BS and an effect drop-off W, when the actual braking value BI deviates from the desired braking value BS in the direction of higher braking values B after a rise in said brake application energy Z.

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**5,496,098**

## BRAKING IN ELECTRONIC BRAKING SYSTEMS

**Malcolm Brearley, Solihull, Great Britain, assignor to Lucas Industries Public Limited Company, Solihull, England**

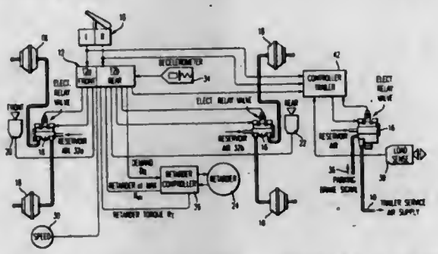
**PCT No. PCT/GB93/00594, § 371 Date Sep. 26, 1994, § 102(e) Date Sep. 26, 1994, PCT Pub. No. WO93/18949, PCT Pub. Date Sep. 30, 1993**

**PCT Filed Mar. 23, 1993, Ser. No. 313,065**

**Claims priority, application United Kingdom, Mar. 24, 1992, 9206344**

**Int. Cl.[6] B60T** *13/58;8/18*

**U.S. Cl. 303—22.2** **7 Claims**



1. An electronic braking system for a vehicle having at least front and rear axles and having foundation brakes and a vehicle



retarder which includes a variable retarder braking torque separate from said foundation brakes, wherein an electrical braking demand signal is generated from a single brake pedal and wherein said retarder is operably adjusted as displacement of said pedal is increased from zero up to a partial point in a range of movement of the pedal which is calculated to give a substantially maximum retarder power based upon total mass of the vehicle, such that for a fully laden condition of said vehicle said partial point occurs at low pedal deflection and, in an unladen condition of said vehicle, said point occurs at a higher pedal deflection, and in both the fully laden and unladen conditions, pushing of said pedal beyond said calculated partial point causes foundation braking to be commenced to supplement said retarder torque.

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**5,496,099**

## VEHICLE HYDRAULIC DUAL-CIRCUIT BRAKE SYSTEM

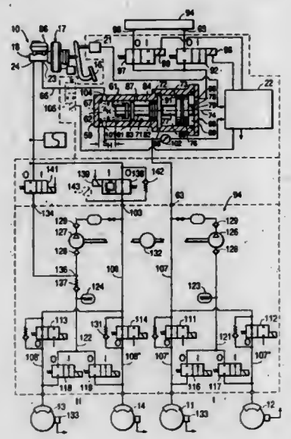
**Reinhard Resch, Stuttgart, Germany, assignor to Mercedes-Benz AG, Germany**

**Filed May 4, 1995, Ser. No. 434,805**

**Claims priority, application Germany, May 4, 1994, 44 15 613.8**

**Int. Cl.[6] B60T** *8/26;8/60*

**U.S. Cl. 303—114.1** **18 Claims**



1. A hydraulic dual-circuit brake system for a road vehicle having an anti-lock system (ABS) operational on a recirculation principle and a device for driving-dynamics control (DDC) operational on a principle of keeping longitudinal and lateral vehicle wheel slip within limits compatible overall with dynamic stability of the road vehicle by an automatic electronically controlled activation of at least one wheel brake, and a device for automatically initiating full braking when a vehicle driver actuates a brake pedal at a speed higher than a relevant threshold value, comprising

(a) brake-circuit division comprising front axle and rear axle brake circuits and, a brake-pressure control unit including a static master cylinder operatively arranged to be actuable by the brake pedal via a brake booster and having pressure outlets assigned individually to front and rear brake circuits;

(b) brake-pressure regulating valves of the anti-lock system operable to be selectively triggered for selection of at least one wheel brake to be activated in the driving-dynamics control mode;

(c) a pedal-position sensor configured to generate electrical output signals characteristic of an instantaneous position of the brake pedal;

(d) an electronic control unit for processing said signals to control at least one of anti-lock mode and driving-dynamics control mode as desired-value data for vehicle deceleration desired by the vehicle driver, and

(e) a pressure sensor operable to generate electrical output signals characteristic of instantaneous values of the brake pressure fed into the front-axle brake circuit and processable by the electronic control unit as brake-pressure actual-value information signals, wherein

(f) the brake-pressure control unit configured to be controllable into a brake-pressure supply mode both by pedal-controlled pressure loading of a drive-pressure space of the associated brake booster and by valve-controlled pressure loading of the drive-pressure space of the brake booster, said valve-controlled pressure loading being initiatable automatically by output signals from the electronic control unit;

(g) an auxiliary cylinder provided for one of a supplementary and sole supply of brake pressure to the front-axle brake circuit of the brake system so as, by way of valve control, selectively loadable with and relieved of outlet pressure of an auxiliary pressure source and via which, both during normal driver-controlled partial or full braking and during automatically controlled partial or full braking, a brake quantity fluid is displaceable into the brake circuit connected to the primary pressure outlet of the brake-pressure control unit, the auxiliary cylinder constituting a pressure intensifier whose maximum outlet-pressure level is sufficiently high for utilization of high adhesion coefficients in the driving-dynamics control mode; and

(h) the brake-fluid quantity displaceable into the front-axle brake circuit is controllable in a predeterminable monotonic correlation from a comparative processing of output signals of the pedal-position sensor with output signals of the pressure sensor.

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**5,496,100**

## PRESSURE LIMITED SOLENOID VALVE FOR A BRAKE SYSTEM

**Otto Schmid, Fischen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany**

**PCT No. PCT/DE93/00886, § 371 Date Jun. 15, 1994, § 102(e) Date Jun. 15, 1994, PCT Pub. No. WO94/08831, PCT Pub. Date Apr. 28, 1994**

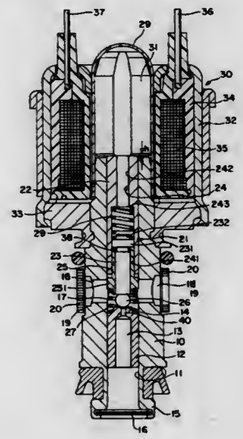
**PCT Filed Sep. 18, 1993, Ser. No. 244,933**

**Claims priority, application Germany, Jan. 15, 1992, 42 34 749.1**

**Int. Cl.[6] B60T** *8/36*

**U.S. Cl. 303—119.2** **13 Claims**

1. A solenoid valve with a pressure limitation for motor vehicle



brake systems with slip control, having a valve seat (14) formed on a valve body (12) which is fitted in a sleeve-like valve housing (10), said valve seat (14) surrounding a valve opening (40) of said valve body (12), a valve element (26) with said valve seat for releasing and closing the valve opening (40), said valve element forms a portion of an axially displaceable valve tappet (21; 21') and is held in a valve-open position by a restoring spring (27), having an electromagnet (30), acting on the valve tappet (21; 21'), for transferring the valve element (26) into the valve-closed position and having a pressure-limiting spring (28), acting in the valve-closed position, for predetermining a valve-opening pressure, the valve tappet (21; 21') is subdivided into first and second tappet elements (22, 23; 22', 23') which are coaxial to each other and relatively displaceable, of which the second tappet element (23; 23') supports the valve element (26) and the first tappet element (22; 22') can be driven by the electromagnet (30), and the pressure-limiting spring (28) is arranged between the first and second tappet elements (22, 23; 22', 23'), and supported axially against the second tappet element (23, 23'), said first tappet element (22; 22') is of an at least partially hollow-cylindrical design and is guided axially displaceably in the valve housing (10), the second tappet element (23; 23') that supports the valve element (26) is guided axially displaceably in the hollow-cylindrical first tappet element (22; 22'), the restoring spring (27) is supported between the valve body (12) and the hollow-cylindrical first tappet element (22; 22') and brings the first tappet element to bear against an armature (31) of the electromagnet (30) and the pressure-limiting spring (28), acting between the first and second tappet elements (22, 23; 22', 23'), brings the second tappet element (23; 23') bearing the valve element (26) to bear against a stop means (38), the bearing surface for the pressure-limiting spring (28) is formed by an annular shoulder (243) at a transition of two hollow-cylindrical sections (241, 242) with different inside diameters in the hollow-cylindrical first tappet element (22) and in that the tappet guide bush (25), with the second tappet element (23) lying inside, and the pressure-limiting spring (28) are arranged in the hollow-cylindrical section (241) having the larger inner diameter.

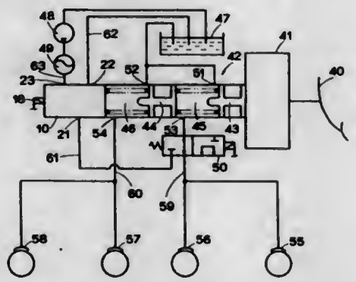
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**5,496,101**

## PRESSURE CONTROL APPARATUS IN A VEHICLE BRAKING SYSTEM

**Takashi Kurokawa, Nagoya; Michiharu Nishii, Toyota, and Masakazu Sugisawa, Takahama, all of, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan**

**Filed Dec. 6, 1994, Ser. No. 354,142**
**Claims priority, application Japan, Dec. 7, 1993, 5-306683**
**Int. Cl.[6] B60T *8/58***
**U.S. Cl. 303—125** **9 Claims**




1. A pressure control apparatus in a vehicle braking system having a wheel cylinder operatively mounted on a road wheel, a reservoir for storing an amount of brake fluid, and a master cylinder for receiving the brake fluid from said reservoir and for generating a master cylinder pressure in response to depression of a brake pedal to supply the master cylinder pressure to said wheel cylinder, comprising:

a housing for defining therein a pressure chamber which communicates with said wheel cylinder;

control means actuated by a current fed thereto for providing a set pressure in response to the current and for regulating the pressure in said pressure chamber to the set pressure;

valve means for increasing the pressure in said pressure chamber when the master cylinder pressure is higher than the pressure in said pressure chamber, or when the set pressure is higher than the pressure in said pressure chamber, said valve means decreasing the pressure in said pressure chamber when the master cylinder pressure is lower than the pressure in said pressure chamber, or when the set pressure is lower than the pressure in said pressure chamber;

a power pressure source for receiving the brake fluid from said reservoir and discharging a power pressure to said housing, said housing having a first port connected to said reservoir and a second port connected to said power pressure source, said valve means selectively communicating said first port with said pressure chamber to decrease the pressure therein and communicating said second port with said pressure chamber to increase the pressure therein; and

said valve means including a first sliding member slidably disposed in said housing, said first sliding member sliding in response to a difference between the master cylinder pressure and the pressure in said pressure chamber, and said first sliding member having a bore defined axially therein and a closed end, a second sliding member slidably received in said bore of said first sliding member, said pressure chamber being selectively communicated with said first port and said second port in accordance with the relative position of said second sliding member to said first sliding member, and said second sliding member being actuated by said control means to move toward or away from the closed end of said first sliding member.

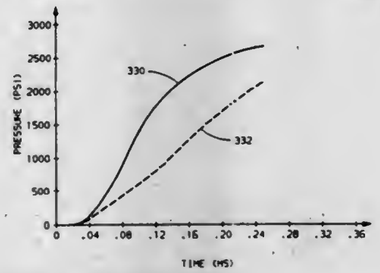
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**5,496,102**

## BRAKE SYSTEM

**Michael A. Dimatteo, Kettering; Schuyler S. Shaw, Dayton; Michael B. Monahan, Miamisburg; Robert J. Disser, Dayton; Jeff A. Foust, Eaton; Paul D. Wilkey, Vandalia, and Gary C. Fulks, Spring Valley, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.**

**Filed Mar. 2, 1995, Ser. No. 397,675**
**Int. Cl.[6] B60T *8/58***
**U.S. Cl. 303—162** **8 Claims**




1. A brake system comprising:

a hydraulic brake, wherein the brake includes a displaceable braking surface, wherein the hydraulic brake requires low pressure to affect displacement during initiation of a brake apply and increased pressure to affect displacement as brake apply progresses, wherein the increased pressure exponentially increases in a non-linear response curve;

a motor driven hydraulic actuator having a rotary input provided by a motor and a hydraulic output coupled to the hydraulically actuated brake, wherein the rotary input requires low torque during the initiation of brake apply to affect displacement of the hydraulically actuated brake and requires increased torque to affect rotary motion and displacement of the hydraulically actuated brake as brake apply progresses;

the motor characterized by a progressively changing non-linear operation having a low torque mode and a high torque mode; and

a control apparatus for the motor controlling the motor to affect displacement of the hydraulic brake, wherein the motor provides increased torque versus displacement in an exponentially increasing non-linear response curve and wherein the motor provides maximum velocity versus displacement in an exponentially decreasing non-linear response curve, wherein the brake system minimizes apply time of the hydraulically actuated brake.



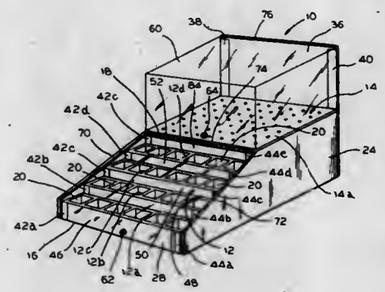
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**5,496,103**

## PRODUCT DISPLAY AND STORAGE CABINET

**Burton Kozak, 1300 N. Lake Shore Dr., Chicago, Ill. 60610**

**Filed Aug. 3, 1993, Ser. No. 101,393**
**Int. Cl.[6] A47F *3/14***
**U.S. Cl. 312—118** **14 Claims**




1. A product display cabinet, comprising:

first and second distinct product display sections arranged integrally adjacent to one another, said first section having a plurality of distinct product display levels extending from a lower extreme to an upper extreme in generally step-like fashion, said second section having a single product display level extending from said first section at said upper of said extremes;

said first section including a plurality of product display bins at each of said product display levels, said second section including a generally horizontal surface integral with and extending from said upper extreme of said first section, and a plurality of walls integrally surrounding said first and second sections to define an enclosure for product storage therein;

said product display levels each being defined by a continuous outwardly facing vertical riser surface extending in front of all of said bins at said product display level, and including means associated with said riser surface for identifying a product in each of said bins immediately behind said riser surface, said bins being arranged in a plurality of rows and columns with each of said rows defining one of said product display levels and each of said columns defining vertical steps; and

separate transparent means for covering said first section and said second section to restrict access while permitting viewing of products within each of said sections, said separate transparent means including a generally planar lid covering said first section and a generally rectangular bubble shaped lid covering said second section.

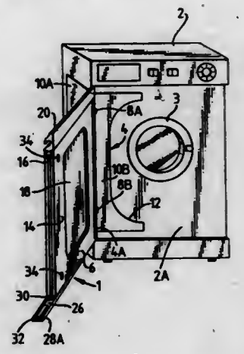
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**5,496,104**

## OUTER DECORATIVE DOOR ASSEMBLY FOR DOMESTIC APPLIANCES

**John E. S. Arnold, Rochester, and Carl Adams, Eccles, both of, United Kingdom, assignors to J.E.S. Arnold (Domestic Appliances) Limited, Rochester, England**

**PCT No. PCT/GB92/01896, § 371 Date Apr. 18, 1994, § 102(e) Date Apr. 18, 1994, PCT Pub. No. WO93/08323, PCT Pub. Date Apr. 29, 1993**
**PCT Filed Oct. 16, 1992, Ser. No. 211,890**
**Claims priority, application United Kingdom, Jan. 17, 1991, 9122079**
**Int. Cl.[6] A47B *17/04***
**U.S. Cl. 312—204** **22 Claims**




1. An assembly for attachment to a domestic electrical appliance comprising:

a plate;

magnetic means for attaching the plate to the appliance;

a door including a decorative panel; and

hinge means for mounting the door on the plate, where the plate is attachable to a ferromagnetic domestic appliance, weight of the door and decorative panel being supported on the appliance via the hinge means and plate, with the decorative panel being mounted on the door to provide the appliance with a desired external appearance.

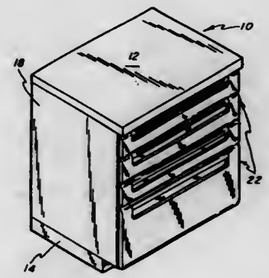
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**5,496,105**

## CABINET HAVING DRAWERS WITH COVER FLANGES

**Joseph A. Czarnecky; Christopher J. Neff, both of Troy, and Scott L. Strait, Greenville, all of Ohio, assignors to Midmark Corporation, Versailles, Ohio**

**Filed Jul. 14, 1994, Ser. No. 274,792**
**Int. Cl.[6] A47B *88/16***
**U.S. Cl. 312—334.4** **18 Claims**




1. A cabinet comprising:

(a) a top, base, back and sides;

(b) an inner panel affixed to an inner surface of each of said cabinet sides, each said inner panel further comprising at least one pair of aligned front and rear slots;

(c) at least one drawer, further comprising:

(1) a front, back, sides, and bottom; and

(2) a cover flange located adjacent each of said drawer sides, wherein a channel is formed between each drawer side and each cover flange; and

(d) a slide mechanism secured within each of said channels, wherein said slide mechanisms are protected by said cover flanges, each of said slide mechanisms including a support plate having a pair of aligned front and rear bayonets incorporated thereon for mounting said slide mechanism to each of said cabinet inner panels by insertion of said bayonets into said slots.

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**5,496,106**

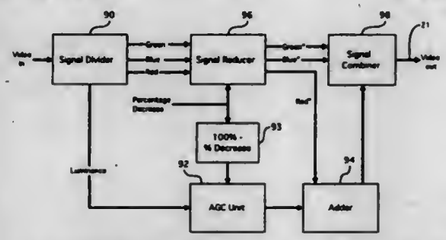
**SYSTEM AND METHOD FOR GENERATING A CONTRAST OVERLAY AS A FOCUS ASSIST FOR AN IMAGING DEVICE**

**Eric C. Anderson, San Jose, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.**

**Filed Dec. 13, 1994, Ser. No. 355,031**

**Int. Cl.[6] H04N** *5/20;5/52*

**U.S. Cl. 348—255** **19 Claims**




1. An apparatus for generating a contrast false color overlay as a focus assist from an input signal, the apparatus comprising:

a signal reducer having an input and an output, the input of the signal reducer coupled to receive the input signal, the signal reducer reducing the amplitude of the input signal by a predetermined amount;

an automatic gain control unit having an input and an output for producing a contrast signal whose amplitude is proportional to the contrast in an image, the input of the automatic gain control unit coupled to receive the input signal; and

an adder having a first input, a second input and an output for summing two signals, the first input of the adder coupled to the output of the signal reducer, the second input of the adder coupled to the output of the automatic gain control unit.

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**5,496,107**

**METHOD FOR PRODUCING A BASE MIXTURE OF RUBBER**

**Julius Peter, Dommayergasse 7/13, A-1130 Vienna, Austria, assignor to Julius Peter, Vienna, Austria, and Continental Aktiengesellschaft, Hanover, Germany**

**Division of Ser. No. 221,411, Mar. 30, 1994. This application Feb. 17, 1995, Ser. No. 390,942**

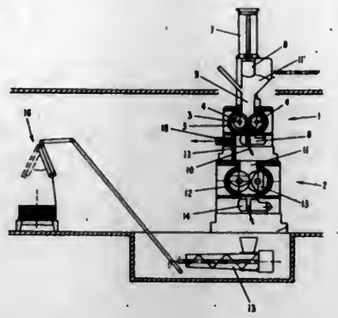
**Claims priority, application Germany, Mar. 30, 1993, 43 14 706.2**

**Int. Cl.[6] B29B** *7/18;13/04*

**U.S. Cl. 366—91** **1 Claim**

1. A method for producing a rubber mixture, said method comprising the steps of:

mixing in a ram mixer in a batchwise operation rubber and non-reactive additives to from a rubber base mixture;



transferring the rubber base mixture into a ramless mixer;

cooling the rubber base mixture in the ramless mixer and finely dispersing with the ramless mixer the non-reactive additives within the rubber base mixture;

introducing the rubber base mixture into an extruder;

conveying the rubber base mixture containing the finely dispersed non-reactive additives with the extruder to a second mixing stage;

in the second mixing stage adding reactive additives to the rubber base mixture containing the finely dispersed non-reactive additives; and

finishing-mixing in the second mixing stage the rubber base mixture containing the finely dispersed non-reactive additives and the reactive additives to form a finished rubber mixture.

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**5,496,108**

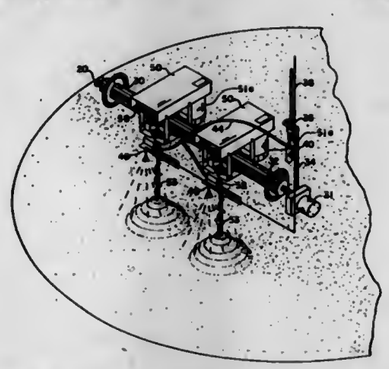
**METHOD AND MEANS FOR ADDING MOISTURE TO PARTICULATE MATERIAL**

**Eugene G. Sukup, Hampton, Iowa, assignor to Sukup Manufacturing Company, Sheffield, Iowa**

**Filed Jul. 27, 1994, Ser. No. 281,791**

**Int. Cl.[6] B01F** *5/04;7/24*

**U.S. Cl. 366—172.1** **9 Claims**



1. A machine for adding moisture to particulate material for use in a bin having an upper portion with an elongated supporting rail means, comprising,

an elongated substantially horizontal support member having outer and inner ends,

a rail adapter means on said outer end of said support member,

a support means secured to said inner end of said support member and adapted to be connected to a bin structure for holding said inner end of said support member at a level position with respect to said outer end,



first power means connected to said support member for rotating said support member about a horizontal axis,

at least a pair of support brackets mounted on said support member,

downwardly extending elongated mixing augers rotatably mounted on said support brackets,

second power means on said support brackets for rotating said mixing augers about a vertical axis,

fluid nozzles mounted on said support brackets adjacent to said mixing augers,

and control means connected to said first and second power means and to said fluid nozzles, to cause rotation of said elongated member, and being operatively connected to said fluid nozzles to cause fluid to flow therethrough onto particulate material in said bin while said mixing augers are moving through said particulate material.

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**5,496,109**

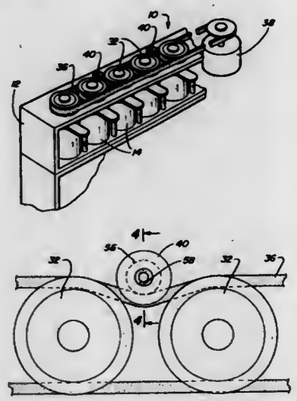
**PAINT STIRRING EQUIPMENT WITH IMPROVED IDLER WHEEL**

**John T. Dedoes, Brighton, Mich., assignor to Dedoes Industries, Inc., Walled Lake, Mich.**

**Filed Apr. 20, 1995, Ser. No. 425,399**

**Int. Cl.[6] B01F** *7/20*

**U.S. Cl. 366—198** **5 Claims**



1. Automatic paint stirring equipment comprising

a rack adapted to removably receive and support a plurality of paint cans, each paint can having a cover and a paint stirring assembly mounted to the cover, said paint stirring assembly having a paddle positioned within the paint can and a driven member positioned above the cover and mechanically connected to the paddle,

a plurality of drive assemblies, each drive assembly having a drive shaft rotatably mounted to the rack, a drive member secured to one end of said drive shaft which is mechanically drivingly connected to the driven member of the cover of one paint can positioned in the rack,

a plurality of drive pulleys, one drive pulley being secured to the other end of each drive shaft,

a motor,

a belt for drivingly connecting said motor to said drive pulleys,

a plurality of idler wheels, each said idler wheel having a cylindrical outer surface, each said idler wheel being constructed of a plastic material,

means for mounting said idler wheels to said rack so that said outer surface of one idler wheel abuts against said belt between every other drive pulley wherein each idler wheel includes an axial throughbore and wherein said idler wheel mounting means comprises a shoulder bolt extending through said axial throughbore and an opening in said rack, and a nut for securing each shoulder bolt to said rack.

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**5,496,110**

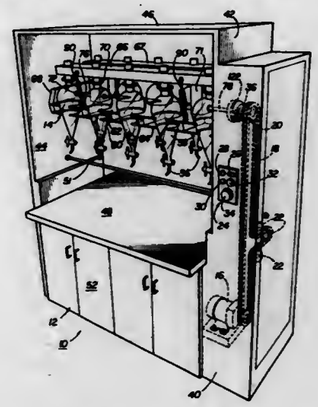
**APPPARATUS FOR MIXING AND EXTRACTING SAMPLES**

**James W. Geier, 8495 Big Cedar Ct., Riverdale, Ga. 30274, and Jeff E. Newman, 1055 Salisbury Trail, Riverdale, Ga. 30296**

**Filed Apr. 4, 1994, Ser. No. 222,682**

**Int. Cl.[6] B01F** *9/10;15/02*

**U.S. Cl. 366—214** **19 Claims**



1. Apparatus for rotating a plurality of vessels to mix materials within the vessels, comprising

(a) means for holding the vessels;

(b) means for rotating the holding means to agitate the materials, including

(1) a drive shaft connecting to the holding means;

(2) means for rotating the drive shaft; and

(3) means for controlling the speed of the drive shaft;

(c) means for controlling the number of rotations made by the holding means;

(d) means for releasing pressure within the vessels; and

(e) a tube assembly for adjustably holding the pressure releasing means.

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**5,496,111**

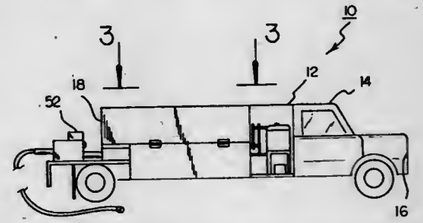
**SOIL MIXING AND PUMPING TRUCK SYSTEM**

**Louis LaVerne, 6700 Coolidge St., Groves, Tex. 77619**

**Filed Jun. 10, 1994, Ser. No. 258,547**

**Int. Cl.[6] B01F** *7/00*

**U.S. Cl. 366—297** **3 Claims**




1. A new and improved soil mixing and pumping truck system comprising, in combination:

a truck having a cab at the forward section and a support region therebehind;

a chamber for the receipt of soil to be dispensed located on the support region, the chamber including a bottom wall, side walls and tapering intermediate walls therebetween, the chamber having an aperture extending downwardly therefrom with a conduit to a mud pump, the chamber having three linearly extending rods rotatable on bearing members, each rod having plural sets of blades for churning soil thereadjacent, each rod having a shaft thereon exterior the chamber and spaced from the cab;

drives for rotating the rods and blades in a common direction, the drives include a motor, transmission and drive box with associated chains between the drive box and the shafts for the rotation thereof during the pumping of the soil from the chamber;

a mud pump located on the support region rearwardly of the chamber and coupled at an input end to the conduit from the chamber with a hose at an outlet end for the dispensing of soil from the chamber;

a water pump located on the support region rearwardly of the chamber with a hose at the inlet for sucking extraneous water from the area to receive soil and a hose at the outlet for feeding such water from the hose to remote locations; and

a storage box located beneath the chamber on at least one side thereof.

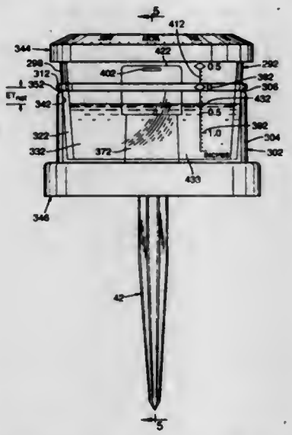
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**5,496,112**

**MINIATURE PAN EVAPORIMETER FOR GAUGING THE DIFFERENCE BETWEEN EVAPOTRANSPIRATION AND EFFECTIVE RAINFALL**

**Christopher L. Browne, Corvallis, Oreg., assignor to Moisture Dynamics, Inc., Corvallis, Oreg.**

**Filed Dec. 21, 1993, Ser. No. 172,139**
**Int. Cl.[6] G01N *25/56*; G01W *1/00***
**U.S. Cl. 374—54** **20 Claims**



1. An evaporimeter for gauging the difference between an amount of water removed by evapotranspiration from healthy, nonstressed plants and an amount of water effectively replenished by rainfall, comprising:

a first container for holding water, the first container having a first container outlet for water overflow;

a second container for holding water, the second container having a second container outlet for water overflow and being positioned with respect to the first container such that water from the first container flows from the first container and into the second container when the water level in the first container exceeds the height of the first container outlet, at least one of the containers having an upwardly facing opening for exposing water in the evaporimeter to the atmosphere so that the water can evaporate, the first and second containers having parts that engage one another in such a manner that water can not flow through the first container outlet when the parts are engaged and the evaporimeter is in use gathering data so that any excess water entering the first container overflows from the first container into the second container, the parts being separable so that the excess water can be drained from the second container by separating the parts to open the first container outlet; and

a scale for gauging the height of water in the containers, the scale having a zero mark at the same height as the first container outlet and having a series of indicia below the zero mark, the indicia being positioned to indicate the net amount of water that would have been removed by evapotranspiration from healthy, nonstressed plants in the locality of the evaporimeter and that was not effectively replenished by rainfall since a known time when the first container was filled with water to the level of the first container outlet, this net amount being a gauge and reference for regulating the irrigation of grass and other plant species that share the same locality as the evaporimeter.

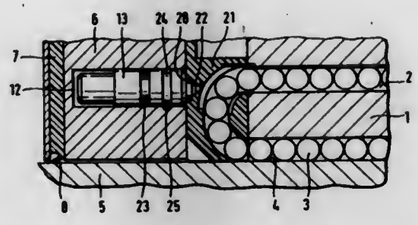
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**5,496,113**

**LINEAR BEARING ELEMENT**

**Ludwig Winkelmann, and Hartmut Koschmieder, both of Erlangen, Germany, assignors to Ina Walzlager Schaeffler KG, Germany**

**PCT No. PCT/EP93/03037, § 371 Date Apr. 25, 1995, § 102(e) Date Apr. 25, 1995, PCT Pub. No. WO94/11644, PCT Pub. Date May 26, 1994**
**PCT Filed Oct. 30, 1993, Ser. No. 428,123**
**Claims priority, application Germany, Nov. 19, 1992, 42 38 910.0**
**Int. Cl.[6] F16C *29/06***
**U.S. Cl. 384—13** **13 Claims**



1. A linear bearing element (1) mounted on a running face (4) of a guide rail (5) and comprising, on at least one of its two front ends, a wiper (7, 31) which bears by an end region against the running face (4) to retain lubricant in the bearing element (1), at least one lubricant supply device, with its inlet end connected to an outer supply duct (9) and its outlet end connected with the bearing region (2) being arranged on or in the bearing (1), characterized in that the supply device is configured as a dosing valve (13) and arranged in a chamber (12) of an attachment body (6, 30) comprising distributing canals (10) which are connected to the outer supply duct (9) and open into the chamber (12), the attachment body (6, 30) being fixed on an end face of the bearing element (1).

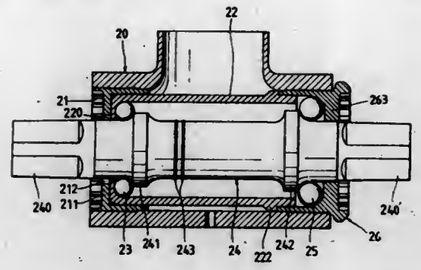


**5,496,114**

**BOTTOM BRACKET BEARING AXLE MOUNTING STRUCTURE FOR BICYCLES**

**Wen-Hwa Lin, No. 262, Sec. 1, Chung San Rd., Ta Chia Chen, Taichung Hsien, Taiwan, Prov. of China**

**Filed Jan. 13, 1995, Ser. No. 372,343**
**Int. Cl.[6] F16C *19/08***
**U.S. Cl. 384—458** **1 Claim**



1. A bottom bracket bearing axle mounting structure comprising a bracket having a transverse mounting hole and a first inner thread and a second inner thread at two opposite ends of said transverse mounting hole, a barrel mounted within said transverse mounting hole, an axle inserted through said barrel, a left screw cap and a right screw cap respectively fastened to the two opposite ends of said transverse mounting hole to hold said barrel and said axle, a first ring of balls and a second ring of balls respectively mounted around said axle and received inside said left screw cap and said right screw cap respectively, said axle comprising a first square rod at one end extended out of said left screw cap, a second square rod at an opposite end extended out of said right screw cap, two ball bearing races spaced between said first and second square rods to bear said first ring of balls and said second ring of balls respectively, and two annular grooves near one ball bearing for easy recognition of the mounting direction, wherein:

said left screw cap comprises an outer thread threaded into said first inner thread of said bracket, an inside annular flange at one end, which stops one end of said barrel, and a center through hole through which said first square rod of said axle passes;

said barrel comprises a longitudinal center through hole, through which said axle passes, a ball bearing race on the inside at one side, which bears said first ring of balls, an outside flange stopped against one end of said right screw cap, and an outer thread connected to one end of said right screw cap; and

said right screw cap comprises an inner thread threaded onto the outer thread of said barrel, an outer thread threaded into the second inner thread of said bracket, an inside annular flange at an opposite end defining the a ball bearing race, which bears said second ring of balls, and a longitudinal center through hole, through which said second square rod of said axle passes.

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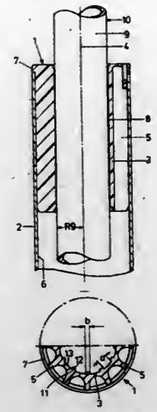
**5,496,115**

**GUIDE SLEEVE FOR A LENGTH-ADJUSTABLE COLUMN FOR CHAIRS OR TABLES**

**Hans J. Bauer, Altdorf, Germany, assignor to Suspa Compart Aktiengesellschaft, Altdorf, Germany**

**Continuation of Ser. No. 8,569, Jan. 22, 1993, Pat. No. 5,413,414. This application Mar. 17, 1995, Ser. No. 405,725**
**Claims priority, application Germany, Jan. 25, 1992, 92 00 884.4**
**Int. Cl.[6] F16C *33/10*; A47C *3/00*; F16M *11/00***
**U.S. Cl. 384—291** **9 Claims**

1. A guide sleeve for a length-adjustable column for chairs or tables, of which an outside is formed to be received and supported in a guide tube (2) of the column and which is provided on an internal surface (8) with a guide surface concentric of a central longitudinal axis (4) to a guide cylindrical housing (9) of an adjusting element (10) and which is made in one piece of plastic material, wherein guide webs (11) are formed on said internal surface (8) which project towards the central longitudinal axis (4) and which are separated from each other by recesses (13) and wherein, produced on the guide webs (11) by chip removal, partial cylinder surfaces (12) concentric of the axis (4) are formed as guide surfaces for the housing (9) and wherein it is provided with rib webs (5) which project outwards radially to the central longitudinal axis (4) and wherein the width (a) of the recesses (13) in the circumferential direction exceeds the width (b) of the partial cylinder surfaces (12) in the circumferential direction.



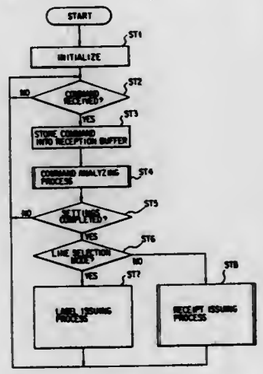
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**5,496,116**

**ARTICLE INFORMATION PRINTER HAVING PAGE AND LINE PRINT MODES**

**Kouji Senda, Shizuoka, Japan, assignor to Kabushiki Kaisha TEC, Shizuoka, Japan**

**Filed May 25, 1994, Ser. No. 249,262**
**Claims priority, application Japan, May 31, 1993, 5-129015**
**Int. Cl.[6] B41J *5/30***
**U.S. Cl. 400—61** **5 Claims**




1. An article information printer comprising:

a printing head having a row of dot printing elements, for performing a printing on paper by said dot printing elements;

a feed mechanism for feeding the paper in a direction substantially perpendicular to the row of dot printing elements each time said printing head is driven;

a memory for storing print image data in a dot matrix form; and

a print controller for reading the print image data from Said memory in units of dot lines and for driving said printing head in accordance with the read print image data;

wherein said print controller includes mode setting means for setting one of a page selection mode and a line selection mode, first image producing means for performing in the page selection mode a process of converting print data for one page supplied from an external source as article information into dot images and storing the dot images in said memory as the print image data, and second image producing means for performing in the line selection mode a process of converting print data for one line supplied from the external device as article information into dot images and storing the dot images as the print image data; and

said second image producing means includes printing height changing means for changing the number of dot lines for the print image data according to a maximum height of the dot images converted for one line.

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**5,496,117**

**TAPE PRINTER**

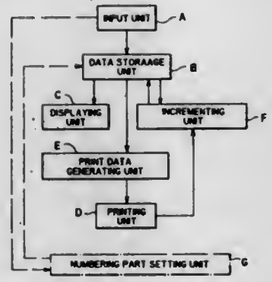
**Akihiro Sawada, Nagoya; Masaharu Mori, Anjyo; Kazuaki Kole, Tokoname, and Kazuko Ishida, Konan, all of, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan**

**Filed Nov. 25, 1994, Ser. No. 348,111**

**Claims priority, application Japan, Nov. 24, 1993, 5-319133; Dec. 27, 1993, 5-349583**

**Int. Cl.[6] B41J** *5/30*

**U.S. Cl. 400—61** **13 Claims**




1. A tape print device for printing bar codes on a print tape, the device comprising:

input means for inputting data indicative of a bar code desired to be printed on a tape;

data storage means for temporarily storing the inputted data, wherein the input means includes bar code mode input means for inputting data of a first character string constituted from a plurality of first characters indicative of a bar code desired to be printed on a tape, the first character string including a common first character string part and a countable first character string part, the data storage means temporarily storing the inputted data of the first character string;

increment means for serially incrementing at least a part of the data stored in the data storage means at lest one time, in accordance with a predetermined order, to thereby produce at least one incremented data indicative of at least one incremented bar code, the thus produced at least one incremented data being stored in the data storage means, wherein the increment means serially increments data of the countable first character string part of the first character string stored in the data storage means, in accordance with the predetermined order, to thereby produce data of at least one incremented first character string indicative of at least one incremented bar code, the thus produced data of at least one incremented first character string being stored in the data storage means;

print data generating means for producing print data for the desired bar code and the at lest one incremented bar code, based on the data stored in the data storage means;

printing means for receiving the print data and for printing images of the desired bar code and the at least one incremented bar code on a print tape; and

check digit data calculating means for calculating a check digit data based on the common first character string part and the countable first character string part of the inputted data of the first character string, the calculated check digit data being stored in the data storage means together with the inputted data of the first character string, the check digit data calculating means further calculating another check digit data relating to the common first character string part and the incremented countable first character string part of each of the at least one incremented first character string, the thus calculated another check digit data being stored in the data storage means together with the corresponding incremented first character string.

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**5,496,118**

**TAPE PRINTING DEVICE**

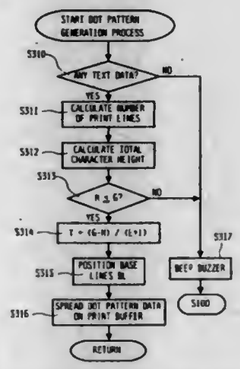
**Hideo Ueno, Nagoya; Minako Ishida, Ama, and Sachiyo Nagase, Nishikasugai, all of, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan**

**Continuation of Ser. No. 28,197, Mar. 9, 1993, abandoned. This application Jan. 5, 1995, Ser. No. 369,311**

**Claims priority, application Japan, Apr. 30, 1992, 4-139929**

**Int. Cl.[6] B41J** *5/30*

**U.S. Cl. 400—61** **21 Claims**




1. A printing control system for controlling spacing of a plurality of printed lines of characters by a tape printing device to form a print image on a tape having a width, comprising:

memory means for storing character data including character height, print data including number of lines in the print image and size data including a print allowance area within the width of the tape;

image generation means for generating dot pattern data from character data and size data;

spacing means for determining a blank space width adjacent both upper and lower sides of each printed line of characters based on the stored character data including the character height, the stored print data including the number of lines in the print image and the stored size data; and

positioning means for positioning the plurality of printed lines of characters evenly spaced within the print allowance area on the tape according to the blank space width.



**5,496,119**

**TAPE PRINTER HAVING A DISPLAY**

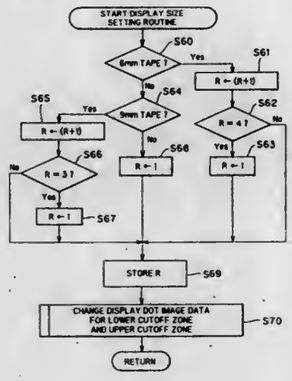
**Yasushi Kawakami, Nagoya; Kazuaki Kole, Tokoname; Sachiyo Nakahigashi, Aichi; Kengo Omura, Toyoake; Shiro Yamada, Kasugai; Yasuyo Ooshio, Nagoya; Kazuko Ishida, Konan; Hideo Ueno, Nagoya, and Minako Ishida, Aichi, all of, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan**

**Filed Dec. 28, 1994, Ser. No. 365,101**

**Claims priority, application Japan, Dec. 29, 1993, 5-351252; Dec. 29, 1993, 5-351253; Dec. 29, 1993, 5-351254**

**Int. Cl.[6] B41J** *3/36*

**U.S. Cl. 400—70** **12 Claims**




1. A tape printer for printing desired characters onto a tape, the tape printer comprising:

input means for inputting characters desired to be printed on a tape and a variety of commands;

data memory means for storing data of the inputted characters;

font memory means for storing dot pattern data for a plurality of characters in a plurality of sizes;

tape cassette receiving means for being detachably loaded with a tape cassette containing a tape;

tape width detection means for detecting a tape width of the tape contained in the tape cassette loaded in the tape cassette receiving means;

display data production means for receiving data on the detected tape width, for retrieving dot pattern data of a display size from the font memory means for the characters stored in the data memory means, the display size corresponding to the tape width, and for producing display dot image data representing an image of the inputted characters which appears the same when displayed as when printed;

a display data buffer for storing the produced display dot image data;

display means for receiving the display dot image data from the display data buffer and for displaying the image of the inputted characters; and

printing means for printing the image of the inputted characters on the tape.

**5,496,120**

**DRIVE FORCE TRANSMISSION MECHANISM**

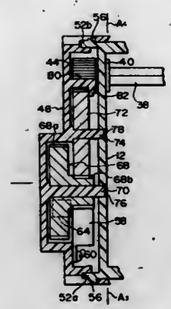
**Kazuhiro Kakuguchi, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan**

**Continuation of Ser. No. 61,530, May 14, 1993, abandoned, which is a continuation of Ser. No. 615,545, Nov. 19, 1990, abandoned. This application Nov. 14, 1994, Ser. No. 340,466**

**Claims priority, application Japan, Nov. 20, 1989, 1-301018**

**Int. Cl.[6] B41J** *19/12*

**U.S. Cl. 400—569** **6 Claims**




1. A drive force transmission mechanism of a printer for transmitting a drive force to a driven element supported by a main printer frame, said drive force transmission mechanism comprising:

said main printer frame having a side wall;

fixture means integrally extending from said side wall of said main printer frame;

a subsidiary printer frame having tongue means and at least one shaft member integrally formed therewith, said tongue means detachably attached to said fixture means of said main printer frame and said subsidiary printer frame having said at least one shaft member extending from said subsidiary printer frame and having an end projected therefrom, said end of said shaft member being received in a hole formed in the main printer frame, to therein increase a rigidity of said at least one shaft member, said subsidiary printer frame and said at least one shaft member being an integrally molded synthetic resin structure; and

at least one transmission member rotatably supported on said at least one shaft member to be engaged with said driven element which is supported by said main printer frame such that the drive force is transmitted thereto, said at least one transmission member comprising one member selected from a group of members comprising a gear, a cam and a lever.

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**5,496,121**

**TRANSFER MATERIALS SUPPLIER**

**Ernest M. Gunderson, Minneapolis, Minn., assignor to Fargo Electronics, Inc., Eden Prairie, Minn.**

**Continuation of Ser. No. 121,752, Sep. 14, 1993, Pat. No. 5,378,072. This application Dec. 21, 1994, Ser. No. 360,590**

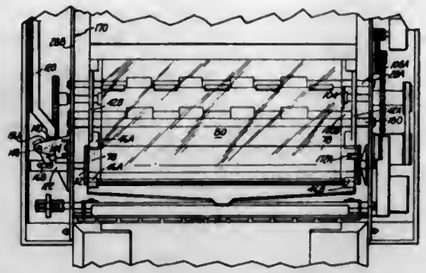
**Int. Cl.[6] B41J** *29/02*

**U.S. Cl. 400—692** **9 Claims**

1. An entry controlled ribbon core engager for a recorder having an interior space accessible through a cover means that is selectively movable between an open position, in which a ribbon core having a supply ribbon at least partially wound therearound can selectively be provided in said interior space and removed therefrom, and a closed position, in which such providing and removing is prevented, said ribbon core engager comprising:

a first hub means located in said interior space having a first hub portion that is selectively rotatable about a hub axis;

a second hub means located in said interior space having a second hub portion spaced apart from said first hub portion



along said hub axis and being movable back and forth along, and rotatable about, said hub axis such that a said ribbon core can be positioned between said second hub and said first hub portions when said second hub means is moved back from said first hub portion; and

a motion converter means for moving said second hub portion along said hub axis toward said first hub portion when said cover means is correspondingly moved toward said closed position therefor and for allowing said second hub portion to move back along said hub axis from said first hub portion when said cover means is correspondingly moved toward said open position therefor, whereby said cover means being placed in said open position therefor allows positioning back said second hub portion from said first hub portion, and said cover means being placed in said closed position therefor causes said second hub portion to be positioned toward said first hub portion to thereby force any said ribbon core positioned therebetween against first and second hub portions.

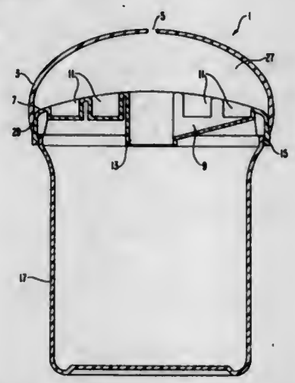
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**5,496,122**

**REPLACEABLE STICK DEODORANT PACKAGE**

**Joseph E. Fattori, Mendham, N.J., assignor to The Mennen Company, Morristown, N.J.**

**Continuation of Ser. No. 942,798, Sep. 10, 1992, abandoned.**
**This application Nov. 29, 1993, Ser. No. 158,379**
**Int. Cl.[6] A45D *40/00;40/16***
**U.S. Cl. 401—98** **34 Claims**



1. A method of hot-filling a solid stick product, comprising the steps of:

assembling a retaining member and a cover together, so as to form an assembly, the retaining member and the cover forming a cavity therebetween to be supplied with molten solid stick product, wherein a surface of the retaining member forming a border of the cavity has retention wells extending thereinto for anchoring solidified product on the retaining member, the solidified product filling the retention wells so as to anchor the solidified product, the retaining member having a fill hole therethrough for filling the product into the cavity, the retention wells having vent channels extending therefrom and extending along the retaining member to a location spaced from the retention wells, so as to remove air, trapped in the retention wells during filling the product into the cavity, to the location spaced from the retention wells, the vent channels being sloped so as to facilitate flow of air from the retention wells in forming the solid stick product to be retained on the retaining member;

inverting the assembly of the retaining member and the covert so that the fill hole opens upwardly;

filling the cavity with molten solid stick product through the fill hole, with air trapped in the retention wells being removed therefrom through the vent channels, the molten solid stick product filling the retention wells during the step of filling the cavity; and

cooling the molten product so as to form the solid stick product.

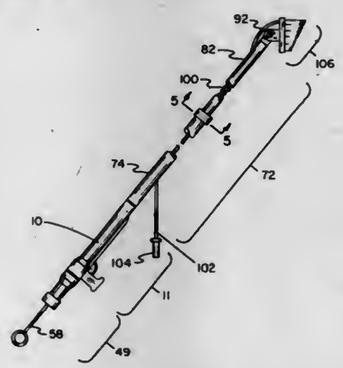
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**5,496,123**

**SELF-LOADING PAINT APPLICATOR GUN**

**Charles E. Gaither, 2982 Martha Dr., Ventura, Calif. 93003**

**Filed May 2, 1994, Ser. No. 235,860**
**Int. Cl.[6] A46B *11/02***
**U.S. Cl. 401—176** **2 Claims**



2. A self-loading paint applicator gun for painting comprising:

a hollow stock having a cartridge cavity formed therein for receiving a paint cartridge filled with paint;

valve means disposed in the stock for engaging a paint cartridge received in the stock, allowing the flow of paint from a paint cartridge in an opened orientation, and preventing the flow of paint from the paint cartridge in a closed orientation;

manually operated trigger linkage means for placing the valve means in the opened orientation and the closed orientation;

a hand grip extended from the stock at a location adjacent to the trigger linkage means for allowing a user a firm grip when actuating the trigger linkage means;

a hollow butt coupled to the stock;

plunging means disposed within the butt for applying a force for allowing paint to flow from the paint cartridge;

a barrel having a base end coupled to the stock and a tip and extended therefrom;

a barrel handle having a first end coupled to the barrel and a second end with a grip formed thereon for holding the barrel in an upwardly extending orientation;

a transfer hose having a base end and tip end with the base end coupled to the valve means; and

a brush having a handle on one end coupled to the tip end of the barrel, bristles on the other end, and a hollow and perforated sash therebetween coupled to the tip end of the transfer hose;



whereby when a paint cartridge is disposed in the stock and a plunging force is applied to the plunging means, paint from the paint cartridge flows through the valve means, transfer hose, and sash of the brush to wet the bristles of the brush for painting.

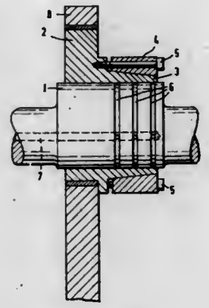
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**5,496,124**

**TENSIONING ASSEMBLY**

**Alfred Bareis, Uhingen; Wilfried Abt, Rechberghausen; Rudolf Augst, Heiningen; Robert Czapka, Eislingen, and Horst Pfisterer, Göppingen, all of, Germany, assignors to L. Schuler GmbH, Goeppingen, Germany**

**Continuation of Ser. No. 967,114, Oct. 27, 1992, abandoned.**
**This application Jun. 28, 1994, Ser. No. 266,782**
**Claims priority, application Germany, Nov. 2, 1991, 41 36 216.0**
**Int. Cl.[6] F16D *1/00***
**U.S. Cl. 403—15** **17 Claims**



1. A tensioning assembly comprising:

a cylindrical exterior circumferential surface of a drivable shaft section;

a driven sleeve arranged on the shaft section, said driven sleeve including an interior cone ring having a cylindrical interior circumferential surface arranged on said cylindrical exterior circumferential surface, the interior cone ring having a conical exterior circumferential surface; and

an exterior cone ring arranged on the conical exterior circumferential surface of the interior cone ring, the exterior cone ring having tensioning screws which are coaxial with respect to the drivable shaft section and by which the interior and exterior cone rings are tensioned with one another and the interior cone ring is tensioned with the drivable shaft section;

wherein said driven sleeve further includes a driven element, the driven sleeve having an axial length along the drivable shaft section which exceeds an axial length of the interior and exterior cone rings by at least an amount of the axial length of the driven element, wherein the driven element is located axially apart from the interior cone ring; and

grooves provided in at least one of the cylindrical circumferential surfaces, the grooves admitting a liquid pressure medium only to the pairing of the cylindrical interior and exterior circumferential surfaces, with the admission of pressure medium to the pairing of the cylindrical interior and exterior surfaces acting as a hydraulic release system for the tensioning between the shaft section and the driven sleeve.

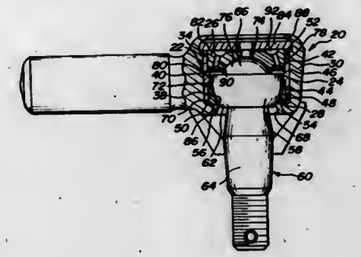
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**5,496,125**

**COMPRESSION PRE-LOADED BALL AND SOCKET JOINT ASSEMBLY**

**Garth Maughan, Delta, Ohio, assignor to Dana Corporation, Toledo, Ohio**

**Filed Jul. 20, 1994, Ser. No. 277,714**
**Int. Cl.[6] F16C *11/06***
**U.S. Cl. 403—137** **14 Claims**



1. A bearing set for a ball and socket joint comprising:

a generally cylindrical sleeve extending about an axis of symmetry, said sleeve including at least one cavity defined by an inner skirt;

a first bearing received in a first portion of said sleeve, said first bearing including a first spherical inner seat face and a generally cylindrical outer wedge surface, a diameter of said outer wedge surface of said first bearing being greater than a corresponding diameter of said skirt such that a pre-load results between said sleeve and said first bearing; and

a second bearing received in a second portion of said sleeve, said second bearing including a second spherical inner seat face and a generally cylindrical outer wedge surface, a diameter of said outer wedge surface of said second bearing being greater than a corresponding diameter of said skirt such that a pre-load results between said sleeve and said second bearing, said first and second faces in facing relationship to one another.

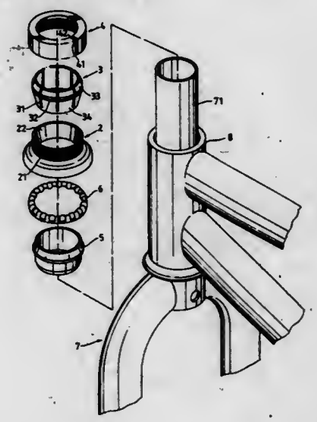
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**5,496,126**

**BICYCLE FRONT FORK MOUNTING STRUCTURE**

**Wen-Hwa Lin, No. 262, Sec. 1, Chung Shan Road, Ta Chia Chen, Taichung Hsien, Taiwan, Prov. of China**

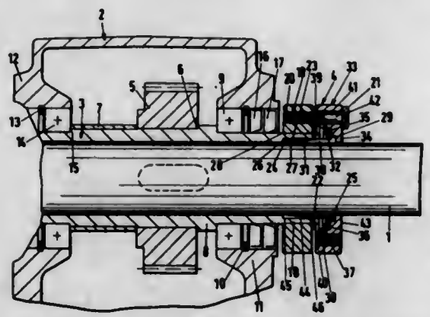
**Filed Dec. 20, 1994, Ser. No. 360,027**
**Int. Cl.[6] B62K *21/18***
**U.S. Cl. 403—370** **1 Claim**



1. A bicycle front fork mounting structure comprising:
a locating socket mounted around a top coupling tube of a front fork and supported on a ball bearing, which is supported on a ring-shaped bearing block, which is mounted around said top coupling tube of said front fork and supported above a head tube of a bicycle frame, said locating socket having a tapered center through hole, and an outer thread around said tapered center through hole;
a holding-down ring mounted around said top coupling tube of said front fork and supported on said locating socket, said holding-down ring having a tapered bottom outer wall fitted into said tapered center through hole of said locating socket, a tapered top outer wall, an annular groove around the periphery between said tapered bottom outer wall and said tapered top outer wall, and a plurality of longitudinal splits;
a lock nut threaded onto said outer thread of said locating socket to compress said holding-down ring against said top coupling tube of said front fork, causing said holding-down ring and said locating socket to securely fix said front fork to said head tube, said lock nut comprising an inside annular flange fitted into said annular groove of said holding-down ring, and a tapered inside surface portion fitting over said tapered top outer wall of said holding-down ring.

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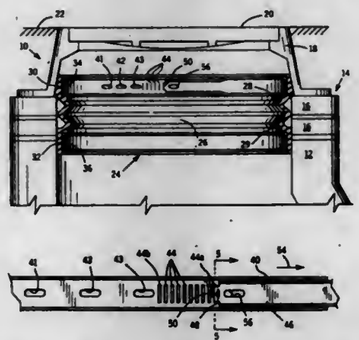
**5,496,127**
**TENSIONING DEVICE FOR FASTENING A PART, PARTICULARLY A HOLLOW SHAFT, UPON A DRIVING SHAFT**
**Friedrich Müller, Eisingen, and Jörg Recktenwald, Karlsdorf, both of, Germany, assignors to Stöber Antriebstechnik GmbH & Co., Pforzheim, Germany**
**Filed Sep. 9, 1993, Ser. No. 118,525**
**Claims priority, application Germany, Sep. 16, 1992, 42 30 941.7**
**Int. Cl.[6] F16B *2/14***
**U.S. Cl. 403—371** **14 Claims**



1. A tensioning device for fastening of a part which is a hollow shaft, upon a driving shaft, including two tensioning cones, which engage against each other with tensioning-cone surfaces, being arranged at least partially in a region between the hollow shaft to be tensioned and the driving shaft and being shiftable relative to each other via at least one ring-shaped tensioning element, which is rigidly connected axially with a tensioning cone, comprising:
at least one force receiving and taking-up part arranged upon at least one part to be secured and clamped in a region of the tensioning cones, said force-receiving taking-up part taking up radial forces encountered during tensioning procedure, the force taking-up part being connected with the ring-shaped tensioning element by tensioning screws, which are screwable into the force taking-up part, said force taking-up part being a ring which is axially secured as seated upon one part to be clamped and secured, one tensioning cone engaging against the hollow shaft to be fastened, the tensioning cone engaging the driving shaft being provided with said ring-shaped tensioning element which is connected with the force taking-up part by the tensioning screws, said force taking-up part surrounding the other tensioning cone, one said tensioning cone being a part separate from said ring-shaped tensioning element and having a take-along means with which said tone tensioning cone is connected axially fixed with said ring-shaped tensioning element, said force taking-up part being seated directly upon said hollow shaft, said hollow shaft being arranged in a region of said force taking-up part between the tensioning cone engaging against the hollow shaft and the force taking-up part.

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**5,496,128**
**ADJUSTABLE FASTENING BAND FOR A MANHOLE CHIMNEY SEAL AND METHOD OF USING**
**Frank J. Odill, West Allis, Wis., assignor to Cretex Companies, Inc., Elk River, Minn.**
**Filed Jan. 9, 1995, Ser. No. 370,077**
**Int. Cl.[6] E02D *29/14***
**U.S. Cl. 404—25** **30 Claims**



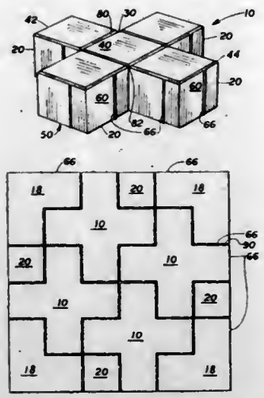
1. A fastening band for forcing an expandable resilient seal against a surface of a manhole, said fastening band having a first end portion and a second end portion which overlap and which when connected together form a continuous hoop with an outer perimeter which substantially continuously engages the expandable resilient seal, the first end portion has a plurality of holes spaced longitudinally along the fastening band, and the second end portion has a tab for engaging one of the plurality of holes to connect the first end portion to the second end portion with the one of the plurality of holes being selected to adjust a perimeter of the fastening band to a desired size.

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**5,496,129**
**FRANGIBLE INTERLOCKING PAVING STONE**
**Michael S. Dubé, 873 Longfellow St., Tracy, Calif. 95376**
**Filed Aug. 6, 1993, Ser. No. 103,433**
**Int. Cl.[6] E01C *5/00***
**U.S. Cl. 404—29** **18 Claims**

1. Pavement formed from a plurality of preformed module-type paving stones for use as road structure or other type of traffic bearing surfaces, comprising in combination:
a solid mass of load supporting material interposed between a top surface and a bottom surface,
said mass consisting of a plurality of similarly sized rectangular square sectors, each said sector extending from said top surface to said bottom surface including substantially rectangular peripheral faces, and
means integral with said paving stone to facilitate linear cracking and dividing of said paving stone from said top surface to said bottom surface between some of said sectors,

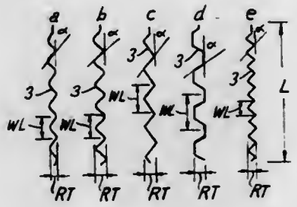




said linear crack facilitating means includes at least one of said sectors divided by a substantially V-shaped groove formed in said top surface,
said groove including a crease at a lowermost portion thereof, said mass having a peripheral surface, wherein said peripheral surface is defined by a plurality of said faces with adjacent pairs of said faces intersecting to form corners on said mass, each of said faces having a single protruding rib thereon extending between said top and bottom surfaces and being parallel to said corners to define a spacer, the spacers on each respective pair of intersecting faces being disposed on said faces wherein the spacer on one of said faces is spaced from said intersection a distance substantially equal to one-third the width of said faces, and the spacer on the other of said pair of faces is spaced from said intersection a distance substantially equal to (two-thirds the width of said faces.

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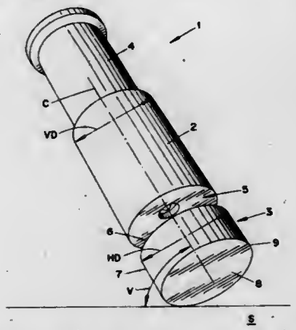
**5,496,130**
**METHOD OF SURFACE TREATING WORKPIECES TO BE COATED**
**Elmar Tschegg, Vienna, Austria, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein**
**Filed Jul. 13, 1994, Ser. No. 274,598**
**Claims priority, application Austria, Jul. 13, 1993, 1377/93**
**Int. Cl.[6] E01C *7/06***
**U.S. Cl. 404—75** **5 Claims**



1. A method of surface treating workpieces formed of cement, bituminous or other bonding materials where a surface of the work pieces has to be coated with a cover layer, such as road, airport, and bridge surfaces where the surface to be coated and the cover layer is formed of grains having a range of sizes and including a largest grain size, including the steps of roughening the surface and forming undulations extending in at least one direction and then cleaning the undulating surface to be coated before applying the coating, wherein the improvement comprises the step of forming the roughened undulating surface with a roughness depth (RT) corresponding to one-half of a diameter of the largest frame size of the grains forming the surface to be coated or of the cover layer the undulations (WL) of the roughened surface having a width corresponding at least to the diameter of the largest grain.

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**5,496,131**
**TOOL FOR ROAD PLANING CUTTER**
**Bo G. Tibäck, Borlänge, Sweden, assignor to Sandvik AB, Sandviken, Sweden**
**Filed Jul. 27, 1994, Ser. No. 281,276**
**Claims priority, application Sweden, Jan. 27, 1992, 9200219**
**Int. Cl.[6] E01C *23/12***
**U.S. Cl. 299—40.1** **20 Claims**

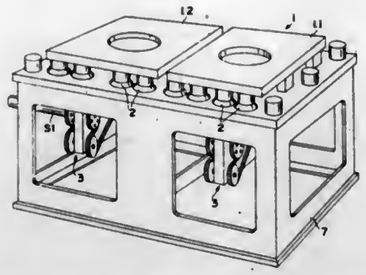


1. A road planing tool including a tool blank, a bearing portion disposed at a rear end of said tool blank and a metal tip disposed at a front end of said tool blank, said bearing portion configured to be freely rotatably mounted in a road planing apparatus with said metal tip contacting the road surface, a longitudinal axis of said tool forming, in an operative position of the road planing apparatus, an angle in the interval 20°–90° relative to a road surface, said metal tip including a rear end surface attached to said front end of said tool blank and having one of a cylindrical or slightly conical portion extending forwardly from said rear end surface to a front end surface of said metal tip, the metal tip having a sharp circular cutting edge in the transition between said front end surface and said one of the cylindrical or slightly conical portion.

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**5,496,132**
**VIBRATION CONTROLLER DESIGNED IN PARTICULAR FOR VIBRATING, TAMPING AND COMPACTING EQUIPMENT**
**Monsiour J. C. Pelletier, Roanne, France, assignor to Societe Materials Vincent Vaillant MVV S.A.**
**PCT No. PCT/FR92/00459, § 371 Date May 6, 1994, § 102(e) Date May 6, 1994, PCT Pub. No. WO92/20467, PCT Pub. Date Nov. 26, 1992**
**PCT Filed May 22, 1992, Ser. No. 142,320**
**Claims priority, application France, May 22, 1991, 91 06353**
**Int. Cl.[6] B06B *1/16***
**U.S. Cl. 404—133.05** **21 Claims**

1. Device controlling vibrations imparted to machines of the type comprising a vibration generator equipped with pulleys having flyweights and rotated by drive shafts wherein the vibration generator has a first, second, third and fourth pulley, the first and second pulley being linked by a first belt, the third and fourth pulley being linked by a second belt, the pulleys being operable to accept flyweights fitted only to a aliametric part thereof, the first and third pulley being mounted on a first shaft, the second and fourth pulley being mounted on a second shaft, the first and second shafts being connected to a phase-shift device designed to cause certain of the pulleys to rotate, thus changing an angular position of the corresponding flyweights, and generating, depending upon



said position of the flyweights selected, maximum, partial and minimum vibration with no unwanted torque, one of the shafts being driven by a motor running continuously regardless of the operating phase, and wherein the flyweights can be in static and dynamic equilibrium when the position for minimum vibration is selected; and wherein each of the first and second shafts has both a keyed pulley and art idle pulley, thus forming an alternating and opposed system of pulleys with each pair of pulleys linked by a belt driving a keyed pulley on one shaft and an idle pulley on one shaft.

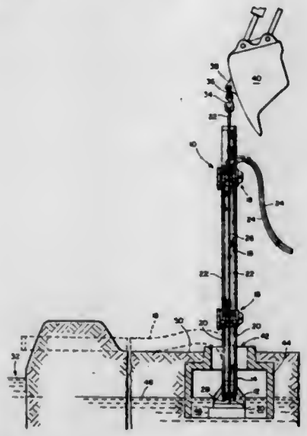
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**5,496,133**

## TRANSPORT ASSEMBLY FOR PUMP AND DISCHARGE LINE

**Louis Sclarretti, 6303 Champlain Ter., Davie, Fla. 33331**

**Filed Apr. 6, 1995, Ser. No. 417,833**
**Int. Cl.[6] E02B** *13/00*
**U.S. Cl. 405—52** **7 Claims**



1. A water drainage assembly comprising:

a water submersible pump located at a terminal end of the water drainage assembly for evacuating water collected at a construction site,

a discharge line connected at one end to said pump for removing water evacuated by said water submersible pump from the construction site,

at least two brackets secured to said discharge line, said at least two brackets each including two hydraulic hose connectors positioned on an exterior peripheral surface of said at least two brackets and connecting adjacent sections of hydraulic hose from said water submersible pump extending along said discharge line, and

a cable connected to said water submersible pump at one end, said cable being connected to said at least two brackets on said exterior peripheral surface and said cable having an opposite end forming an opposite terminal end of the water drainage assembly for connecting said cable to a lifting apparatus so that said discharge line can be lifted into a vertical orientation at the construction site by lifting said opposite end of said cable.

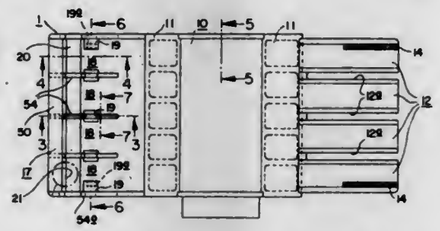
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**5,496,134**

## SLIDING SKID RING FOR PIPE FEEDTHROUGHS

**Siegfried Goehner, Christophstrasse 15, D-72116 Moessingen, Germany**

**Filed May 11, 1994, Ser. No. 241,085**
**Claims priority, application Germany, May 11, 1993, 43 15 424.7**
**Int. Cl.[6] F16L** *1/00;1/024;1/06*
**U.S. Cl. 405—154** **5 Claims**



1. Sliding skid ring for a pipe member, to be laid underground inside a jacket pipe, consisting of at least two segments, connected to each other by means of tightening elements, held under pretension against the pipe member in a nonpositive manner, and carry outward-pointing sliding skids, characterized in that; the sliding skid ring (1) is comprised of several identical segments (10); each segment (10) being provided on one side with a radial section in the form of one of more tabs (12) and, on the opposite side, with another radial section in the form of a closure part (17) having one or more insertion slots (18) designed to accept the tabs, the tabs (12) of an adjacent segment (10) being engaged in the slots; the tabs (12) have a plurality of parallel and equidistant grooves (13), which are at a slant of a few degrees to the axial direction; the closure part (17) has, in the engagement area of the tabs (12), an axially oriented guide grooves (20) for a tongue-like wedge (30, 40), which is inserted therein; the wedge (30, 40) having grooves (33, 43), which are oriented to correspond with the grooves (13) in the tabs (12) and are in engagement therewith; the wedge (30, 40) being driven axially into the guide grooves (20) until the two adjacent segments (10) are tightened together and the sliding skid ring (1) is thus held pressed against the pipe member.

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**5,496,135**

## ARTICULATED VEHICLE FOR USE IN CONFINING TRENCH WORK

**C. Wayne Penix, Watauga, Tenn., assignor to C. Darrin Godsey, and Clyde Godsey, both of Johnson City, Tenn.**

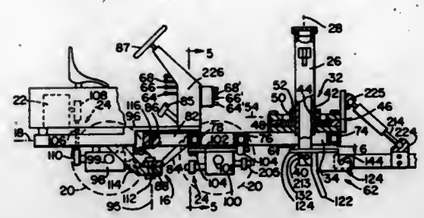
**Filed Mar. 1, 1994, Ser. No. 203,427**
**Int. Cl.[6] E02F** *5/10*
**U.S. Cl. 405—179** **9 Claims**

1. A powered vehicle for preparing a trough in crushed stone of similar material layed in a trench, and for covering over a drain pipe positioned in the trough with the material previously displaced therefrom, said vehicle comprising

(a) body means having a rear section and a front section,

(b) swivel means connecting said sections together and providing a swivel axis on which pivoting of said sections relative to each other in a substantially horizontal plan occurs,





(c) wheel means on each of said sections,

(d) motor means on said body means and transmission means connected to said motor means and to said wheel means for driving said wheel means selectively in a forward or rearward direction,

(e) implement means supporting means comprising stanchion means having a vertical position axis and a longitudinal axis,

(f) cooperating pivot means on said stanchion means and on an outer end portion of said front section, said pivot means allowing said stanchion means to be maintained in a generally upright posture on said front section while providing angular adjustability to said stanchion means, said adjustability comprising individual rotational and tilting paths of motion with respect to said vertical position axis,

(g) said stanchion means further comprising work shaft means to which an implement means can be affixed, and cooperating elements of first bearing means on said work shaft means and on said stanchion means for allowing said work shaft means to move substantially longitudinally of said stanchion means in a generally up or down direction to provide a parallel path of motion with respect to said longitudinal axis for an implement means affixed to said work shaft means, said first bearing means being adapted to direct said shaft means and an implement means affixed thereto to move coincidentally with said stanchion means through each of said rotational and tilting paths of motion,

(h) said pivot means comprising stationary race means on said outer end portion of said rear or front section, and armature means on said stanchion means and rotationally retained by said race means for allowing said rotational path of motion, said pivot means further comprising cooperating elements of second bearing means on said stanchion means and on said armature means and providing to said second bearing means a pivot axis oriented substantially normal to said vertical position axis for allowing said tilting path of motion,

(i) first power means engaging said work shaft means for selectively moving the same in said generally up or down direction for providing said parallel path of motion, second power means engaging said stanchion means for selectively rotating the same in either direction about said vertical position axis to provide said rotational path of motion, and third power means engaging said stanchion means for selectively rotating the same in either direction about said pivot axis of said second bearing means to provide said tilting path of motion,

(j) coupling means on said work shaft means for removably affixing an implement means thereto, and

(k) individual control means on said vehicle for selectively actuating each of said first, second and third power means.

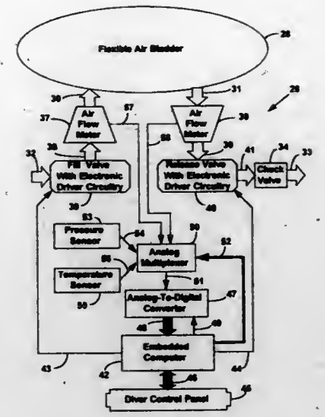
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**5,496,136**

## AUTOMATIC BUOYANCY COMPENSATOR WITH ELECTRONIC VERTICAL MOTION

**Mark P. Egan, 8215 Walden Ave., Inyokern, Calif. 93527**

**Filed Mar. 23, 1995, Ser. No. 410,015**
**Int. Cl.[6] B63C** *11/02*
**U.S. Cl. 405—186** **12 Claims**




7. A method to maintain an established neutral buoyancy state of a diver, the method comprising:

acquiring sequential pressure measurements, using a pressure measurement means, to identify a pressure change, which occurs when said diver changes depth;

maintaining an estimate of air mass in an expandable displacement chamber, which is exposed to the water and attached to said diver;

maintaining an estimate of temperature of the air in said displacement chamber;

computing the change in air volume in said displacement chamber caused by the change in depth of said diver, by using said pressure measurements, the air mass estimate and the air temperature estimate of the air in said displacement chamber; and

adjusting said air volume in said displacement chamber, using a gas valve means to add air to said displacement chamber or release air from said displacement chamber, to attain a neutral buoyancy air volume, whereby said neutral buoyancy state of said diver is maintained.

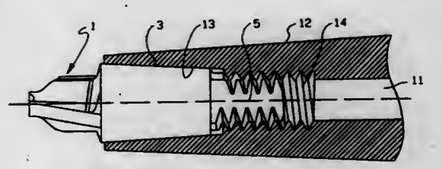
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**5,496,137**

## CUTTING INSERT

**Moti Ochayon, Nahariya, and Arie Falk, Moshav Merhavia, both of, Israel, assignors to ISCAR Ltd., Israel**

**Filed Aug. 12, 1994, Ser. No. 289,460**
**Claims priority, application Israel, Aug. 15, 1993, 106697**
**Int. Cl.[6] B23B** *51/00*
**U.S. Cl. 408—226** **7 Claims**




1. A cutting insert comprising a cutting bead and a coupling shank integral at one end thereof with said cutting head and including a screw threaded portion, characterized in that

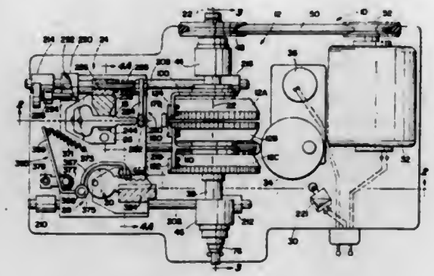
said cutting insert is formed by a powder metallurgy process of compacting and sintering and said screw threaded portion is constituted by a substantially cylindrical body having a pair of diametrically opposed, longitudinally truncated planar portions interposed between substantially curved cylindrical portions having arcuate surfaces on which there are formed a non-continuous screw thread, said arcuate surfaces extending between 50 to 85% of the total peripheral extent of the cylindrical body of which they form part.

**5,496,138**

## DUPLICATING KEY MACHINE AND METHOD OF OPERATING SAME

**Mordeki Drori, 6400 Center St., Suite A #201, Mentor, Ohio 44060**

**Filed Jan. 27, 1994, Ser. No. 186,982**
**Int. Cl.[6] B23C** *3/35*
**U.S. Cl. 409—81** **39 Claims**



**4**. A key duplicating machine comprising:
a chassis;
at least one cutter unit mounted on a support secured to said chassis, said cutter unit comprising:
at least one shaft having a longitudinal axis extending therethrough and being adapted for connection at one end to a drive system for transferring rotational movement to said shaft about said longitudinal axis; and
at least one cutter mounted to said shaft whereby said cutter rotates around and reciprocates in a linear direction along said longitudinal axis; and
at least one guiding unit for reciprocally moving said at least one cutter in a linear direction along said longitudinal axis in accordance with the grooves of a key to be duplicated.

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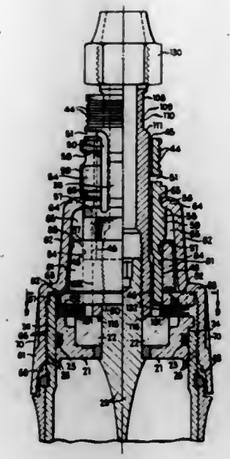
**5,496,139**

## COLLET LOCK ARRANGEMENT FOR POWER TOOL

**Anil P. Ghode, Libertyville, Ill.; Martin S. Scolaro, Racine, Wis.; Gordon A. Putney, Lake Geneva, Wis., and Steven R. Wente, Kenosha, Wis., assignors to Snap-on Incorporated, Kenosha, Wis.**

**Filed Sep. 19, 1994, Ser. No. 308,678**
**Int. Cl.[6] B25F** *5/00;* **G05G** *5/06*
**U.S. Cl. 409—182** **16 Claims**

**10**. A collet lock arrangement for a power tool having a housing, said collet lock arrangement comprising:
a powered rotatable shaft including a distal end portion defining a collet for adaptably connecting a tool attachment thereto; and
a locking structure for securely locking said shaft to said housing to selectively prevent said shaft from rotating when in a locked position while allowing said shaft to freely rotate in an unlocked position;
said locking structure having:
a clamp nut fixedly connectable to said housing; and
a locking sleeve, including two axially spaced apart grooves, coaxially coupled around said shaft for axial movement relative thereto between the locked and unlocked positions, a first one of said grooves engaging said clamp nut in the locked position while a second of said grooves engaging said clamp nut in the unlocked position to inhibit axial movement of said sleeve from said positions.



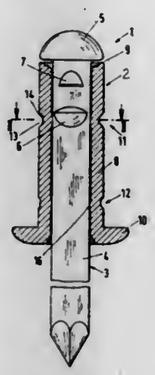
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**5,496,140**

## BLIND RIVETS AND METHOD FOR ITS MANUFACTURE

**Richard Gossmann, Dietzenbach, and Eckhard Ditzel, Erzhausen, both of, Germany, assignors to Gesipa Blindniettechnik GmbH, Frankfurt am Main, Germany**

**Filed Dec. 8, 1994, Ser. No. 352,244**
**Claims priority, application Germany, Dec. 17, 1993, 43 43 171.2**
**Int. Cl.[6] F16B** *13/04;13/06;* **B21K** *1/44*
**U.S. Cl. 411—43** **18 Claims**



**1**. A blind rivet comprising:
a mandrel shaft having a head disposed at one axial end;
a hollow rivet shell having a cylindrical shape including an inner cylindrical surface and an outer cylindrical surface, said rivet shell surrounding said mandrel shaft, said outer cylindrical surface having at least one attenuation groove, said at least one attenuation groove including at least two recesses each having a surface that substantially forms a secant with respect to said outer cylindrical surface.

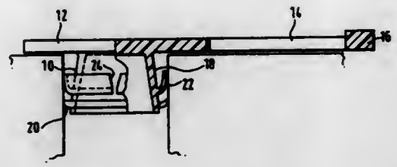


**5,496,141**

## ARTICLE FOR INSERTION INTO AN OPENING

**Robert S. Popsys, Bicester, United Kingdom, assignor to Moss Plastic Parts Limited, Oxford, United Kingdom**

**Filed May 20, 1994, Ser. No. 245,605**
**Claims priority, application United Kingdom, May 22, 1993, 9310609**
**Int. Cl.[6] F16B** *19/00;* **F16L** *55/10*
**U.S. Cl. 411—510** **17 Claims**



**1**. An article for insertion into an opening, said article comprising:
a body, the body having a front and back and defining an axis;
a plurality of projections, each projection having a root and extending outwardly from the body from the root;
the projections defining an outer extent thereof which is for contacting a wall defining the opening, and the part of the body which is directly behind the projection being tapered from the root of each projection.

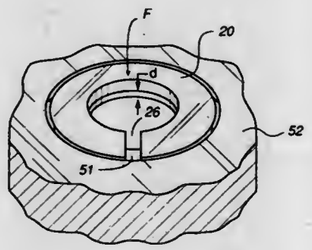
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**5,496,142**

## SLOTTED CONICAL SPRING WASHER

**Mark A. Fodor, Los Gatos; Craig Bercaw, Sunnyvale, and Charles Dornfest, Fremont, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.**

**Filed Jul. 20, 1993, Ser. No. 94,674**
**Int. Cl.[6] F16B** *39/24;43/02;* **H01R** *4/38*
**U.S. Cl. 411—544** **23 Claims**



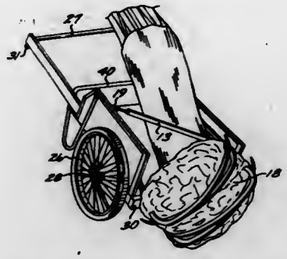
**1**. A fastener component comprising:
a conical spring washer split on one side having generally parallel inside and outside conical surfaces, said washer having an outside diameter,
a washer retaining member having a continuous ring, an inside dimension of said ring encircling said outside diameter of said washer, said ring being disposed to restrict the radial movement of said outside diameter of said washer away from a center axis of said washer.

**5,496,143**

## TREE AND SHRUB LIFTING SYSTEM

**Stephen R. Breyer, Tripple Brook Farm, 37 Middle Rd., Southampton, Mass. 01073**

**Filed Apr. 11, 1994, Ser. No. 225,642**
**Int. Cl.[6] A01G** *23/02*
**U.S. Cl. 414—23** **8 Claims**



**1**. A system for lifting trees or shrubs for transplanting comprising:
a set of a plurality of hooks each said hook having an upright leg, a transverse arm, and an angled section between said upright leg and said transverse arm;
each said upright leg having an upper end and a lower end, said upper end affixed to a flexible lifting member, said lower end affixed to said angled section;
said transverse arm having an arcuate shape and a pointed end, said transverse arm extending between said angled section and said pointed end, said transverse arm being formed of a slender, elongate member;
said angled section being shorter than said transverse arm and forming an angle of approximately 90°, said angled section having a radius of curvature smaller than the radius of curvature of said arcuate transverse arm;
a cart, said cart having a bed, and an axle fulcrum;
said cart having a fastening point, wherein when said cart is in the vertical position, the flexible lifting member can be attached to the fastening point, and then the cart can be rotated around the axle fulcrum from the vertical position toward the horizontal position, and thereby a lifting force can be applied to the hook attached to the lifting member.

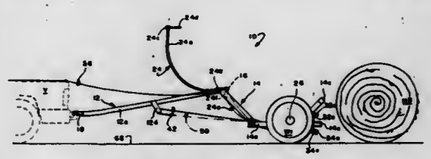
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**5,496,144**

## SELF-LOADING HAY BALE TRANSPORT TRAILERS

**Monroe Wetz, 19597 FM 2252, San Antonio, Tex. 78266-2521**

**Filed Oct. 4, 1994, Ser. No. 317,940**
**Int. Cl.[6] A01D** *90/00*
**U.S. Cl. 414—24.5** **33 Claims**



**1**. A self-loading trailer comprising:
a forward hitch frame and a rearward cradle frame coupled to one another to allow for relative articulation about an articulation axis; and
wheel assemblies journally coupled to said cradle frame to support said trailer for rolling movement across a ground surface, wherein
said cradle frame includes a rearward cross-brace and at least one frame extension foot extending rearwardly of said cradle

frame and positioned below said cross-brace when said trailer is configured for rolling movement across the ground surface, and wherein

said at least one frame extension foot is engageable with the ground surface in advance of said cross-brace during a loading operation in response to rearward trailer movement to cause said cradle frame to pivot about said ground-engaged frame extension foot and thereby lift the wheel assemblies out of ground engagement, and wherein

continued pivotal movement of said cradle frame about said ground-engaged frame extension foot subsequently causes said rearward cross-brace to become engaged with the ground surface, such ground engagement of said rearward cross-brace thereby causing said frame extension foot to become disengaged with, and said wheel assemblies to be further incrementally lifted above, the ground surface.

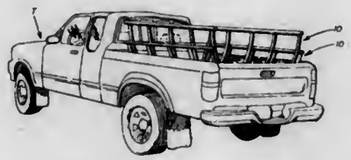
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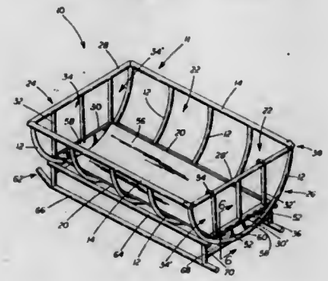
**5,496,145**

## COMBINATION ROUND BALE FEEDER

**Joseph E. Monin, Bardstown, Ky., assignor to Agri-Supply Mfg., Inc., Bardstown, Ky.**

**Filed Dec. 5, 1994, Ser. No. 349,655**
**Int. Cl.[6] A01K *1/10***
**U.S. Cl. 414—24.5** **12 Claims**





1. A portable combination livestock feeder primarily for a horizontally positioned round hay bale, comprising:

a plurality of U-shaped ribs being spaced apart to form a cradle framework providing full longitudinal support for said bale;

two elongated side members extending along the length of said framework and connecting the ends of said U-shaped ribs;

front and rear end frame means enclosing said framework and forming a single enclosure; and

a mounting platform for supporting said enclosure above ground,

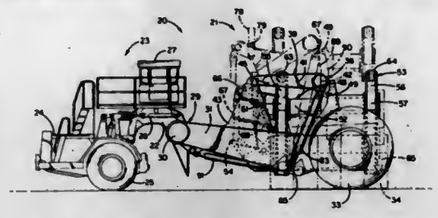
whereby said single enclosure functions both as a support structure for the enclosed bale and as a direct interface for the feeding livestock.

**5,496,146**

## STEEL SLAB AND COIL CARRIER

**Dennis R. Thomas, and Paul A. Kane, both of Peoria, Ill., assignors to Kress Corporation, Brimfield, Ill.**

**Filed Oct. 19, 1994, Ser. No. 325,799**
**Int. Cl.[6] B60P *3/00;3/42***
**U.S. Cl. 414—460** **30 Claims**



1. A load handling apparatus attached to a main frame of a vehicle for handling loads including a first type of loads suitable for being penetrated and a second type of loads suitable for being clamped when disposed in a load carrying space thereof, comprising, in combination,

a lift frame, said lift frame being moveable relative to said main frame between a raised position and a lowered position, the difference in elevation of the lift frame relative to the main frame between said lowered and raised positions providing the lifting capability of the lift frame;

a tong assembly suspended from said lift frame for vertical movement up and down relative to said main frame, said tong assembly including at least one tong actuator and a pair of depending tongs for gripping and carrying one of said second types of loads disposed in the load carrying space;

a probe assembly connected to the lift frame for vertical movement up and down relative to said main frame, said probe assembly including a displaceable probe having a first position within the load carrying space and a second position substantially withdrawn from the load carrying space;

means for moving the probe between the first position for penetrating one of said first type of loads being entered into the load carrying space and the second position for avoiding said second types of loads disposed in the load carrying space;

means for actuating the tong assembly for clamping the depending tongs onto one of said second types of loads when disposed in the load carrying space; and

means for actuating said lift frame to raise and lower the probe assembly and tong assembly relative to the main frame, thereby lifting and lowering the first and second types of loads in the load carrying space.

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**5,496,147**

## BARREL HANDLING DEVICE

**Donald R. Taube, Fort Wayne, Ind., assignor to Barrel Racking Systems, Inc., Fort Wayne, Ind.**

**Filed Aug. 12, 1994, Ser. No. 289,948**
**Int. Cl.[6] B66F *9/18***
**U.S. Cl. 414—607** **20 Claims**

1. An apparatus for lifting and moving a barrel, said apparatus adapted for connection to a fork lift, said apparatus comprising:

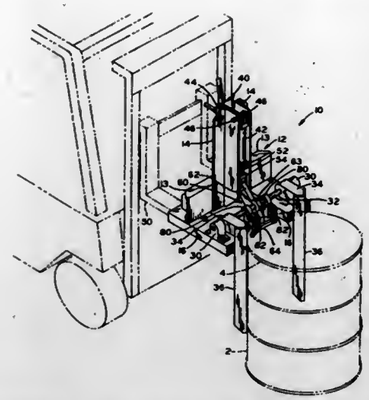
a frame connectable to a fork lift;

at least one support member pivotally connected to said frame for directly engaging and supporting the barrel:

a barrel bead clamping device connected to one of said frame and said support member, and movable between a clamped position and an unclamped position;

means, interconnecting said frame with each of said at least one support member and said bead clamping device, for selectively and simultaneously moving each of said support member and said bead clamping device, said moving means moving said support member from a substantially horizontal position to a substantially vertical position, and from said





substantially vertical position to said substantially horizontal position, said moving means further moving said bead clamping device from said clamped position to said unclamped position, and from said unclamped position to said clamped position.

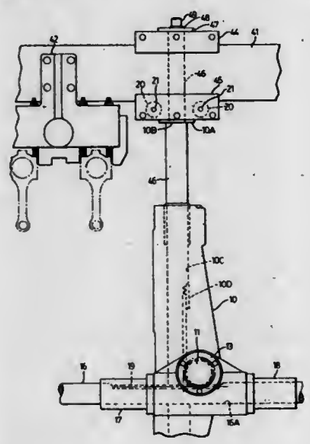
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**5,496,148**

## WORKPIECE CARRIER FOR TRANSFER MACHINES

**Joel Jones, Windsor, Canada, assignor to Tri-Way Machine Ltd., Windsor, Canada**

**Filed Dec. 17, 1993, Ser. No. 168,146**
**Int. Cl.[6] B65G *35/00***
**U.S. Cl. 414—749** **16 Claims**



1. In combination:

frame means,

a plurality of upright support members supported on said frame means,

an elongate transfer bar extending horizontally,

rack and pinion means for adjusting the vertical position of all support members simultaneously with respect to the frame means said rack and pinion means comprising a gear rack provided along each upright support member, for each gear rack a pinion gear shaft extending substantially horizontally in a direction perpendicular to the long direction of the transfer bar, and having elongate gear teeth engaging the respective gear rack, and a horizontally extending elongate actuation bar adapted for axial movement in the direction of its elongation, the actuation bar having gear rack teeth along its length, the actuation bar simultaneously engaging the teeth of all said pinion gear shafts, such that axial movement of the actuation bar simultaneously rotates all said pinion gear shafts, which in turn cause simultaneous vertical movement of the associated upright support members,

carrier bracket means attached to each support member, said carrier bracket means receiving and supporting the transfer bar so as to permit free horizontal movement of the transfer bar in its long direction, while restraining movement of the transfer bar in directions perpendicular to its long direction,

and housing means mounted on said transfer bar, said housing means having holder means for locating and retaining workpieces.

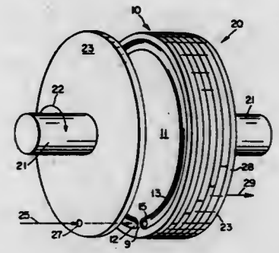
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**5,496,149**

## THIN PLATE TURBINE

**Jeffrey S. Dugan, Asheville, N.C., assignor to BASF Corporation, Mount Olive, N.J.**

**Filed Mar. 10, 1995, Ser. No. 401,812**
**Int. Cl.[6] F01D *01/36***
**U.S. Cl. 415—90** **40 Claims**



1. A plate-type rotor comprising:

(A) at least one circular flow plate, each circular flow plate comprising a circumferential groove formed on a first facial surface of said circular flow plate, said groove having a fluid inlet end and a fluid outlet comprising a through-bole flow passage in said circular flow plate, wherein said through-hole flow passage extends from said first facial surface to an opposite second facial surface of said circular flow plate, said through-hole passage extending in a direction which is substantially normal to said first facial surface; and

(B) an energy-transferring means in communication with said at least one circular flow plate.

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**5,496,150**

## FIELD-SERVICEABLE SOLIDS-HANDLING VERTICAL TURBINE PUMP

**Ernest J. Claxton, III, Cornelia, and Eugene F. Poser, Toccoa, both of Ga., assignors to Patterson Pump Co., Toccoa, Ga.**

**Filed Oct. 14, 1994, Ser. No. 321,857**
**Int. Cl.[6] F04D *11/00;29/04***
**U.S. Cl. 415—229** **14 Claims**

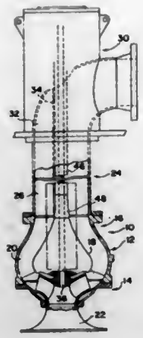
1. A vertical turbine pump comprising:

a pump bowl assembly including a casing having a bulbous diffuser section between axially opposed upstream and downstream sections which are narrower than said diffuser section;

a bulbous diffuser core disposed centrally in said casing diffuser section;

a drive shaft extending centrally and axially through said diffuser core;

a rotary impeller fastened to an end of said drive shaft and disposed in said casing upstream section adjacent a fluid inlet,



said impeller incorporating flared shrouds which are axially spaced from each other and spirally oriented impeller vanes disposed between said shrouds and spaced from each other equiangularly about the axis of impeller rotation;

three stationary diffuser vanes spaced equiangularly about said diffuser core, said diffuser vanes extending laterally between said diffuser core and said casing and having upstream ends which curve about said diffuser core and downstream ends which extend generally axially through said casing downstream section; and

a bearing cartridge separably fastened within said diffuser core, said bearing cartridge carrying axially spaced bearings which surround and rotatably support said drive shaft.

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**5,496,151**

**COOLED TURBINE BLADE**

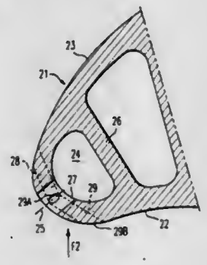
**Xavier G. A. Coudray, Fontainebleau, and Philippe M. P. Pichon, Yerres, both of, France, assignors to Societe Nationale D'Etude et de Construction de Moteures D'Aviation "Snecma", Paris, France**

**Filed Jan. 27, 1995, Ser. No. 379,293**

**Claims priority, application France, Feb. 3, 1994, 94 01194**

**Int. Cl.[6] F01D *5/18***

**U.S. Cl. 416—97 R** **9 Claims**



1. A turbine blade for a turbojet engine, comprising:

an outer wall having an outer surface and defining a leading edge zone, an intrados face and an extrados face of said blade, at least one longitudinal internal cavity which, in use, is swept by cooling air, and a plurality of rows of holes located in said outer wall for the escape of cooling air from said internal cavity, at least one first row of said rows of holes being disposed in said leading edge zone of said blade wherein each hole of said at least one first row of holes communicates at one end with a first cavity of said at least one longitudinal internal cavity and is opened at its other end in the outer surface of said outer wall, and at least one second row of said rows of holes being provided in said leading edge zone, said at least one second row of holes being parallel to a center line of said leading edge zone such that each hole of said at least one second row communicates at one end with a respective one of said holes in said at least one first row at a position between the two ends of said respective first row hole and opens at its other end in said outer surface of said outer wall, such that the holes of said first and second rows of holes intersect each other in pairs and cooling air from said first longitudinal internal cavity flows through the holes of said at least one first row and cooling air from said holes of said at least one first row flows through the holes of said at least one second row.

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**5,496,152**

**PUMP WITH INTERNAL VALVE BETWEEN SUCTION AND PRESSURE REGIONS**

**Manfred Heise, Weinbach; Hans J. Lauth, Usingen; Van D. Nguyen, Frankfurt, and Erwin Stammler, Kronberg, all of, Germany, assignors to Luk Farhzeug-Hydraulik GmbH & Co. KG, Bad Homburg, Germany**

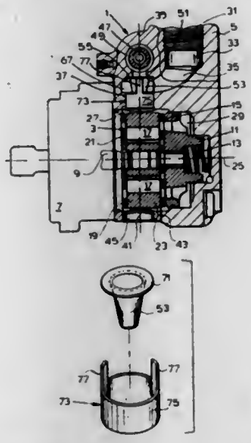
**PCT No. PCT/EP92/02584, § 371 Date Sep. 30, 1994, § 102(e) Date Sep. 30, 1994, PCT Pub. No. WO93/10354, PCT Pub. Date May 27, 1993**

**PCT Filed Nov. 11, 1992, Ser. No. 244,158**

**Claims priority, application Germany, Nov. 23, 1991, 41 38 516.0**

**Int. Cl.[6] F04B *23/08*; B05B *1/00***

**U.S. Cl. 417—87** **2 Claims**



1. A pump, comprising:

a housing formed with an inlet at a suction region and an outlet at a pressure region;

a delivery system in said housing for displacing a liquid from said suction region to said pressure region, said housing being formed with a fluid supply passage communicating with said suction region;

a control valve connected between said suction region and said pressure region;

an injector receiving said liquid under high pressure from said valve for discharging a jet of said liquid;

means in said housing forming an annular channel connected to said passage and surrounding said injector, whereby said jet entrains liquid from said channel into said suction region, said housing being further formed with a bore aligned with said injector; and

a sleeve fastening said injector in said housing forming an insert received in said bore, said sleeve having an anchoring ring anchored in said bore of said housing and two webs provided on said ring and extending inwardly from said ring into engagement with a collar of said injector, said webs being arranged so as not to interfere with aspiration of liquid by said jet into and through said sleeve.



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**5,496,153**

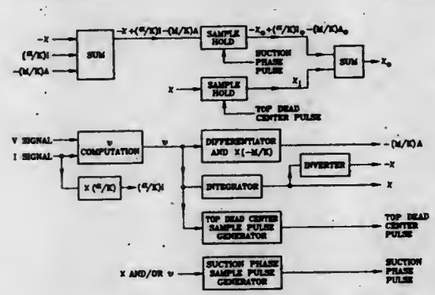
**METHOD AND APPARATUS FOR MEASURING PISTON POSITION IN A FREE PISTON COMPRESSOR**

**Robert W. Redlich, Athens, Ohio, assignor to Sunpower, Inc., Athens, Ohio**

**Continuation-in-part of Ser. No. 42,662, Apr. 5, 1993, Pat. No. 5,342,176. This application Jul. 29, 1994, Ser. No. 282,631**

**Int. Cl.[6] F04B *49/00***

**U.S. Cl. 417—212** **6 Claims**



1. An improved gas or vapor compressor including a control apparatus and a free piston linked to a spring and reciprocating in a cylinder in alternating suction and pressure phases, the piston during reciprocation having an alternating component of displacement, a velocity, an acceleration and an end displacement of the piston's excursion in the cylinder, the piston being driven in reciprocation by an electromagnetic linear motor drivingly linked to the piston, the linear motor including a magnet and a winding having an associated resistance and inductance, the motor having input terminals and a characteristic electro/mechanical transfer constant, the motor being driven by an alternating voltage applied to and a current forced through the input terminals of the motor winding, wherein the improvement is a feedback control apparatus comprising:

(a) a voltage detector circuit connected to said winding input terminals for detecting the voltage applied to the winding as a function of time;

(b) a current detector circuit connected to said winding for detecting the current through the winding as a function of time;

(c) a command signal input for inputting a command signal representing a selected, required end displacement;

(d) a computing circuit generating a signal representing a measured value of said end displacement and comparing said measured value signal to said command signal to generate an error signal by:

(i) computing the velocity of the reciprocating piston as a function of time from the detected voltage and current in accordance with the equation:

$$v=(1/\alpha)(V-L(dI/dt)-IR);$$

wherein

$\alpha$ is said transfer constant

V is said voltage

I is said current

R is said winding resistance

L is said winding inductance

t is time;

(ii) integrating the computed velocity as a function of time to compute the alternating component of displacement of said piston as a function of time;

(iii) differentiating the computed velocity as a function of time to compute the acceleration of the piston as a function of time;

(iv) detecting the alternating component of displacement resulting from step (ii) when the computed velocity is zero;

(v) computing the displacement of the reciprocating piston at the end of its excursion in accordance with the equation:

$$X_c=x_i-x_o+(\alpha/K)I_o-(M/K)A_o;$$

wherein:

$X_c$ is said end displacement

$x_i$ is the alternating displacement when the velocity is zero and is changing from toward said end displacement to away from said end displacement

$x_o$ is the alternating displacement from step (ii) at a selected time during the suction phase

$A_o$ is the acceleration from step (iii) at said selected time

$I_o$ is the current detected from the current detector at said selected time

M is the mass of the reciprocating body

K is the spring constant of the spring;

(vi) comparing said command signal to the computed end displacement signal $X_c$ to generate an error signal; and

(e) a motor voltage control circuit having an input connected to receive said error signal and having an output connected to said motor winding for changing the voltage applied to the motor winding in response to said error signal in a direction minimizing the error signal.

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**5,496,154**

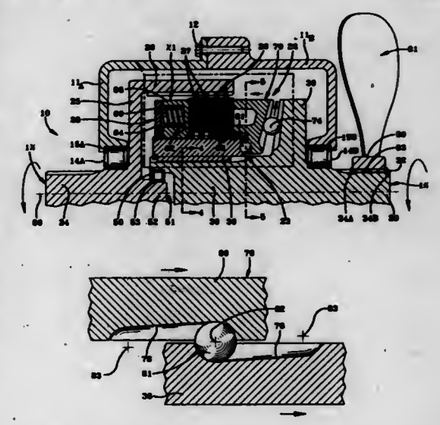
**FAN DRIVE WITH HIGH TORQUE RELEASE**

**Arthur Hall, III, Cicero, and Robert F. Combs, Mulberry, both of Ind., assignors to General Motors Corporation, Detroit, Mich.**

**Filed Apr. 18, 1994, Ser. No. 228,844**

**Int. Cl.[6] F04B *49/02*; F16D *43/06***

**U.S. Cl. 417—223** **15 Claims**



1. A fan drive with high torque release comprising:

an input shaft member;

an output shaft member;

torque transfer friction means operatively to connect said input shaft member with said output shaft member;

spring apply means for engaging said torque transfer friction means;

centrifugal apply means for engaging said torque transfer friction means in response to rotation of said shaft members; and

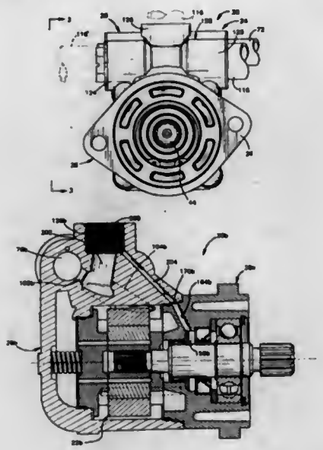
means for releasing at least said centrifugal apply means under predetermined high torque conditions.

5,496,155

## ROTARY DEVICE HAVING PLURAL MOUNTING ORIENTATIONS AND FLUID CONNECTIONS

Bruce C. Noah, West Lafayette; Robert S. Phillips, and Frederick D. Venable, both of Lafayette, all of Ind., assignors to TRW Inc., Lyndhurst, Ohio

Filed Feb. 24, 1994, Ser. No. 201,616
Int. Cl.[6] F04B 49/02; F01C 1/344;13/00;19/00
U.S. Cl. 417—310 16 Claims



1. A rotary device for use with fluid, said rotary device comprising:

means for pumping fluid, said means for pumping fluid including a drive shaft;

housing means for enclosing said means for pumping fluid, said housing means including a main section and a cover section, said main section and said cover section of said housing means being movable relative to each other to any one of a plurality of orientations, said main section of said housing means at least partially defining a chamber in which said means for pumping fluid is disposed, said main section of said housing means defining a fluid inlet passage through which fluid is conducted to the chamber in said main section of said housing means to supply fluid to said means for pumping fluid, said cover section of said housing means being effective to at least partially block one end of said chamber in said main section of said housing means;

seal means connected with said cover section and engaging said drive shaft to block leakage of fluid along said drive shaft;

a manifold chamber disposed between said cover section and said main section of said housing means;

first passage means disposed in said cover section of said housing means and extending between said manifold chamber and a location disposed between said means for pumping fluid and said seal means; and

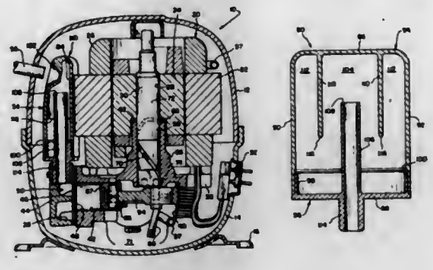
second passage means disposed in said main section of said housing means for conducting fluid away from said manifold chamber directly to said inlet passage, said second passage means being spaced from said chamber in said main section of said housing means to enable fluid to be conducted through said second passage means to said inlet passage without passing through said chamber in said main section of said housing means, said first and second passage means being movable relative to each other during movement of said main section and said cover section of said housing means relative to each other.

5,496,156

## SUCTION MUFFLER

Harold M. Harper, Brooklyn; Raymond J. Schmitz, III, and Tara C. Kandpal, both of Tecumseh, all of Mich., assignors to Tecumseh Products Company, Tecumseh, Mich.

Continuation of Ser. No. 310,418, Sep. 22, 1994, abandoned.
This application Sep. 5, 1995, Ser. No. 525,860
Int. Cl.[6] F04B 39/00
U.S. Cl. 417—312 19 Claims



1. A compressor comprising:

a housing;

a motor compressor unit disposed within said housing for compressing fluid, said housing having a suction inlet tube emptying refrigerant fluid into the interior of said housing; and

a suction muffler comprising:

a rounded plastic box shaped muffler housing having a front wall, a back wall, and side walls connecting therebetween, said front wall having a countersunk inlet port, said suction inlet tube spaced apart from and emptying a first portion of the refrigerant fluid into said inlet port to impact said back wall whereby semi-direct fluid flow into said inlet port is created, said suction inlet tube emptying the remainder of the refrigerant fluid outside of said muffler and into said compressor housing, thereby improving motor cooling;

a suction standpipe having an inlet rim and disposed within said muffler housing extending from said compressor assembly to a location a spaced distance away from said inlet port, said spaced distance dimensioned to provide maximum flow of fluid through said standpipe after fluid from said suction tube impacts said back wall of said muffler housing; and

a baffle wall disposed within said muffler housing extending from said front wall to said back wall, said baffle wall located between said standpipe and a said side wall of said muffler housing to form a lateral subcavity that acts as a resonator, said baffle wall located in said muffler housing such that said suction standpipe inlet rim is within line of sight of said back wall impacted by the refrigerant so that said first portion of refrigerant fluid may directly enter said suction standpipe after impacting said back wall.

5,496,157

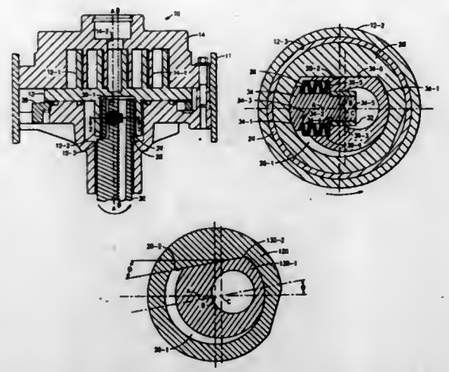
## REVERSE ROTATION PREVENTION FOR SCROLL COMPRESSORS

Stephen L. Shoulders, Baldwinsville, and Thomas R. Barito, East Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 21, 1994, Ser. No. 360,482
Int. Cl.[6] F04C 18/04
U.S. Cl. 418—14 9 Claims

1. A scroll compressor means including a pair of scrolls one of which being an orbiting scroll, a slider block and a crankshaft wherein said orbiting scroll has a hub with a bore which has an axis and which receives said slider block, and said crankshaft has an axis of rotation and a drive pin which is received in a bore in said slider block, one of said pin and said slider block having a flat surface normally engaged by the other one of said pin and said





slider block, said bore in said slider block being larger than said pin and generally coaxial with said bore in said hub and said drive pin acting through said slider block to drive said orbiting scroll during normal operation and said orbiting scroll tending to act through said slider block to drive said drive pin and crankshaft during reverse operation and pressure equalization through said compressor means at shutdown, reverse rotation prevention means comprising:

said orbiting scroll and said slider block being movable with respect to said drive pin along said flat surface between a first position in which said orbiting scroll engages the other one of said pair of scrolls during normal operation and a second position in which said orbiting scroll is separated from the other one of said pair of scrolls upon slowing down and any tendency for reverse operation and pressure equalization;

centrifugal force produced solely by movement of said orbiting scroll and said slider block during normal operation tends to keep said orbiting scroll and said slider block in said first position;

means for causing said orbiting scroll and said slider block to move along said flat surface from said first position to said second position under conditions associated with slowing down and reverse operation whereby said pair of scrolls is separated, an unimpeded flow path is established through said compressor means and reversing torque caused by gas loads is decreased by reduction of orbit radius.

5,496,158

## DRIVE FOR SCROLL COMPRESSOR

Thomas R. Barito, East Syracuse, and Cheryl M. Keiling, Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 22, 1994, Ser. No. 361,399
Int. Cl.[6] F04C 18/04; G05G 1/00
U.S. Cl. 418—55.5 20 Claims

1. A crankshaft drive comprising:

driven means having an axially extending opening therein;

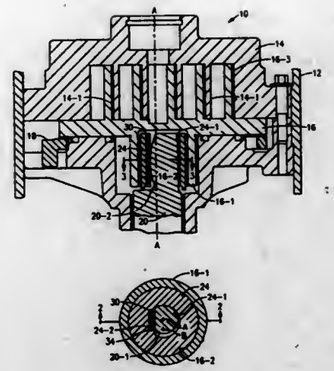
a crankshaft having an axis;

axially extending drive means integral with said crankshaft and having an axis eccentrically located with respect to said axis of said crankshaft;

said drive means being located in said opening of said driven means for rotatably driving said driven means;

beating means in said opening permitting relative movement between said driving and driven means;

said bearing means including a plurality of bearing elements located in said opening between said drive means and said driven means and movable with respect to both said drive means and said driven means whereby when said drive means coacts with said driven means through said bearing means, said drive means and said driven means rotate as a unit and there is a substantial reduction in resistance to relative movement between said drive means and said driven means.

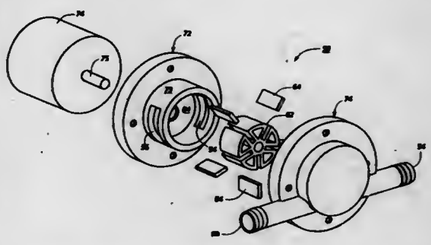


5,496,159

## ROTARY DISPLACEMENT PUMP HAVING A SEPARABLE MEMBER THAT CONTROLS THE FLUID FLOWPATH

Ronald D. Devore, Santa Clara, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 22, 1994, Ser. No. 216,214
Int. Cl.[6] F01C 21/00
U.S. Cl. 418—178 4 Claims



1. A rotary displacement pump, comprising:

an external member integrally configured to define a cavity therein, the external member further having colinear inlet and outlet channels;

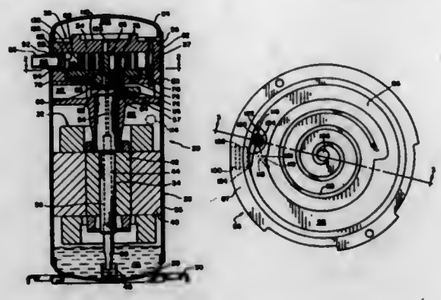
an internal member having a flange and an integrally attached shell, the shell having an inlet opening and an outlet opening therein, with the flange externally fitted against the external member in sealing attachment to together define a sealed pump housing, and with said shell being positioned in said cavity of the external member to align said inlet opening and said outlet opening with said colinear inlet and outlet channels; and

a fluid drive member received within the pump housing, the fluid drive member being rotatably driven by a motor to move fluid from said inlet to outlet channels.

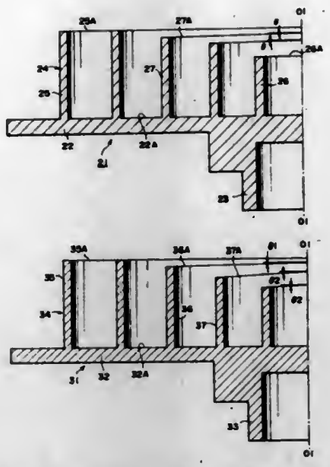
## 5,496,160
## SCROLL COMPRESSOR HAVING A SUCTION CHECK VALVE

**Hubert Richardson, Jr., Brooklyn, and Todd W. Herrick, Tecumseh, both of Mich., assignors to Tecumseh Products Company, Tecumseh, Mich.**

**Filed Jul. 3, 1995, Ser. No. 498,021**
**Int. Cl.[6] F01C *1/04***
**U.S. Cl. 418—55.1** **13 Claims**







1. A scroll compressor comprising:
an orbiting scroll member and a fixed scroll member each having an end plate and a spiral wrap, said spiral wraps being intermeshed to define therebetween compression chambers;
a suction port and a discharge port, said suction port extending through said fixed scroll member;
a suction chamber formed between said scroll, members, said suction chamber in communication with said suction port, said suction port having an opening adjacent said suction chamber; and
a check valve for preventing reverse refrigerant flow from said suction chamber back through said suction port thereby preventing reverse orbital movement of said orbiting scroll member, said valve being pivotally mounted to said fixed scroll member and being disposed in said suction chamber, said valve pivoting about a pivot point so as to substantially cover and seal said suction port to substantially prevent the reverse flow of refrigerant upon compressor shutdown.

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## 5,496,161
## SCROLL FLUID APPARATUS HAVING AN INCLINED WRAP SURFACE

**Shigeru Machida, Ibaraki; Takashi Saitoh, and Susumu Sakamoto, both of Kanagawa, all of, Japan, assignors to Tokico Ltd., Kanagawa, Japan**

**Filed Dec. 27, 1994, Ser. No. 364,111**
**Claims priority, application Japan, Dec. 28, 1993, 5-354645**
**Int. Cl.[6] F01C *1/04***
**U.S. Cl. 418—55.2** **4 Claims**

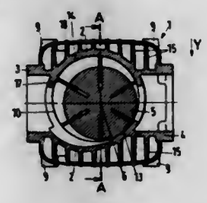
1. A scroll-fluid apparatus comprising:
a fixed scroll component having a first end plate and a scroll wrap section installed on said first end plate and projecting therefrom;
an orbital scroll component revolvably provided to face said fixed scroll component and having a second end plate and a scroll wrap section installed on said second end plate and projecting therefrom, to form a plurality of compression chambers between said scroll wrap section of said fixed scroll component and said scroll wrap section of said orbital scroll component;
wherein at least one of said scroll wrap section of said fixed scroll component and said scroll wrap section of said orbital scroll component constitutes a profiled scroll wrap section;
wherein said profiled scroll wrap section comprises an outer section of at least the outermost one turn of said profiled scroll wrap section, an inner section of at least a portion of said innermost turn of said profiled scroll wrap section, and an intermediate section extending between said inner section and said outer section;
wherein said outer section has a constant height along its entire length;
wherein said inner section has a constant height along its entire length, said height of said inner section being less than said height of said outer section; and
wherein said intermediate section has a height which continuously linearly decreases from said outer section toward said inner section.

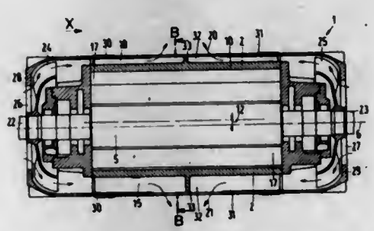
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## 5,496,162
## AIR-COOLED VANE-CELL COMPRESSOR

**Manfred Schnell, Schopfheim, Germany, assignor to Mannesmann Aktiengesellschaft, Düsseldorf, Germany**

**Filed Dec. 5, 1994, Ser. No. 349,266**
**Claims priority, application Germany, Dec. 3, 1993, 43 41 716.7**
**Int. Cl.[6] F01C *21/06***
**U.S. Cl. 418—101** **6 Claims**





1. An air-cooled vane-cell compressor, comprising: a housing having end faces, a bore hole that runs between the end faces, an



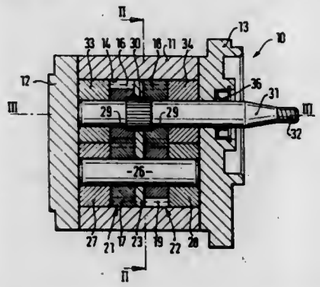
outer surface, an upper side and a lower side, the housing further having a longitudinal axis and an axis transverse to the longitudinal axis; cooling air fins arranged on the outer surface of the housing in a longitudinal direction of the housing; a rotor having two free shaft ends and arranged within the housing, the rotor having a top dead center position and a bottom dead center position; covers arranged on the end faces of the housing, the rotor being rotatably supported in the covers; a suction flange and an ejection flange arranged in the housing at 90° to the covers and along a common longitudinal axis, the rotor having a rotational axis that is symmetrically arranged to the outer surface contour of the housing and to the flanges, the housing bore being doubly eccentric to the rotational axis of the rotor in the direction of top dead center position of the rotor, the fins vary over the outer surface of the housing so that taller fins are provided in an area of the bottom dead center and the ejection flange than fins in an area of the suction flange and top dead center; a first set of four feet, each one of the feet being arranged in a respective corner region of the upper side of the housing so as to be symmetric relative to the longitudinal and transverse axes of the housing; a second set of four feet, each one of the second set of feet being arranged in a respective corner region of the lower side of the housing so as to be symmetric relative to the longitudinal and transverse axes of the housing; a first fan propeller connected to a first one of the free shaft ends of the rotor; a second fan propeller connected to a second one at the free shaft ends of the rotor; a further cover arranged to partially cover the fins; and a cross-fin arranged on the housing at a midpoint of the longitudinal axis of the housing.

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## 5,496,163
## GEAR MACHINE HAVING SHAFT TOOTHING FOR DRIVING A GEAR

**Klaus Griese, Kupferzell; Guido Bredenfeld, Markgroeningen, and Horst Hesse, Stuttgart, all of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany**

**PCT No. PCT/DE94/00033, § 371 Date Jul. 20, 1994, § 102(e) Date Jul. 20, 1994, PCT Pub. No. WO94/18455, PCT Pub. Date Aug. 18, 1994**
**PCT Filed Jan. 18, 1994, Ser. No. 256,700**
**Claims priority, application Germany, Feb. 5, 1993, 43 03 337.7**
**Int. Cl.[6] F01C *1/18;11/00;* F04C *2/18;11/00***
**U.S. Cl. 418—200** **9 Claims**



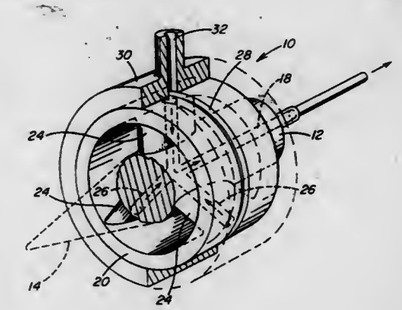
1. A gear machine, comprising a drive shaft; at least one pair of externally meshing toothed wheels including a driven toothed wheel which is driven by said shaft and a complementary toothed wheel, each of said toothed wheels having an external toothing engaging with an external toothing of another of said toothed wheels, said driven toothed wheel having an additional toothing engaging with said drive shaft, said additional toothing of said driven toothed wheel having a width which is smaller than a width of said external toothing of said driven toothed wheel, said drive shaft having an additional toothing meshing with said additional toothing of said driven toothed wheel and having a shoulder, said driven toothed wheel contacting said shoulder of said additional toothing of said drive shaft in a positive-working manner, said driven toothed wheel being arranged on said drive shaft so as to be free of radial play, the width of said additional toothing of said driven toothed wheel being smaller than one-half of said width of said external toothing, said driven toothed wheel being slidingly supported on said shaft and abutting against said drive shaft over a whole width of said driven toothed wheel not covered by said additional toothing.

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## 5,496,164
## IN-LINE TUBING DIE

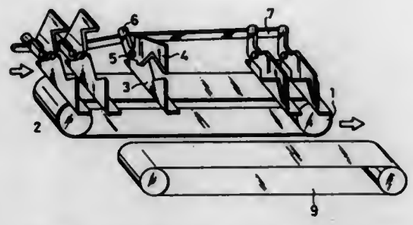
**David H. Czarnik, Twining, Mich., assignor to The Conair Group, Inc., Pittsburgh, Pa.**

**Continuation of Ser. No. 712,222, Feb. 20, 1995, which is a continuation of Ser. No. 123,222, Feb. 20, 1996, each , Feb. 20, 0which is a continuation-in-part of Ser. No. 666,722, Feb. 20, 1994. This application Oct. 20, 1994, Ser. No. 326,647**
**Int. Cl.[6] B29C *47/86;47/90***
**U.S. Cl. 425—72.1** **11 Claims**



8. An in-line tubing die for forming extruded plastic tubing comprising:
a hub over which the extruded plastic is passed to form said tubing;
said hub having an internal air passage communicating with the interior of said tubing;
an annular housing coaxial with said hub and spaced from said hub;
a plurality of radially extending fins supporting said hub within said housing;
air passages formed in every one of said plurality of fins to introduce air to said internal air passage of said hub and thereby into the interior of said extruded plastic tubing;
a first annular passage formed in said housing and communicating with said air passages in every one of said fins;
a second annular passage formed in said housing and axially removed from said first annular passage;
a plurality of channels within said housing connecting said first and second annular passages;
air conduit means communicating with said second annular passage to introduce air to said second annular passage from where it passes through said plurality of channels into said first annular passage so that air entering said air passages in every one of said fins is at the same temperature.

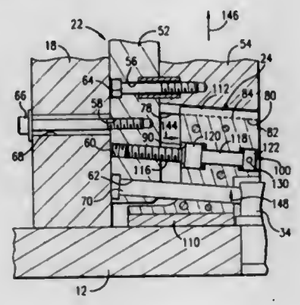
**5,496,165**
**SHAPING CUTTER**
**Mitsuo Yamaguchi, and Yuji Shimamoto, both of Sakado, Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan**
**Filed Dec. 27, 1994, Ser. No. 363,876**
**Claims priority, application Japan, Dec. 27, 1993, 5-069872 U**
**Int. Cl.[6] A21C *11/10***
**U.S. Cl. 425—289** **2 Claims**



1. A shaping cutter comprising: upper and lower blades fastened at one end so as to open in the shape of the letter X and cut when they close, said upper blade having an operating lever extending from the end at which said upper and lower blades are fastened; an endless linear conveyor on which said lower blades are fixed; and a guide rod on which the operating levers of said upper blades slide to cause said upper blades to move from the opening position to-the closing position relative to said lower blades while said endless linear conveyor runs to carry said lower blades, thereby cutting into pieces an elongated edible dough running at the same speed in the same direction as said endless linear conveyor runs.

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**5,496,166**
**HIGHLY ACCURATE POSITION ADJUSTMENT MECHANISM FOR THE MOLD SECTIONS OF AN INJECTION STRETCH BLOW MOLDING MACHINE**
**Matthew T. Vogel, Lee's Summit; David H. Wescoat, Peculiar, both of Mo., and Ronald W. Chaffin, Hot Springs, Ark., assignors to R & D Tool and Engineering, Inc., Lee's Summit, Mo.**
**Filed Aug. 25, 1994, Ser. No. 295,617**
**Int. Cl.[6] B29C *45/04***
**U.S. Cl. 425—451** **16 Claims**



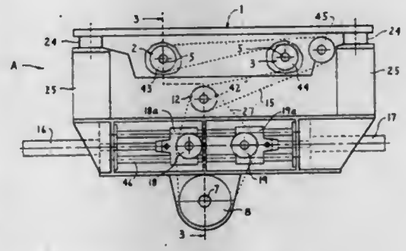
1. In an injection stretch blow molding machine having a base defining a planer support surface, a platen movable relative to the base in a direction parallel to the support surface and a mold section supported for movement with the platen, the improvement comprising:

a carrier means for supporting the mold section for movement with the platen, the carrier means presenting a planer engagement surface that is angled relative to the support surface; and

an adjustment means for adjusting the position of the mold section relative to the platen within a plane transverse to the support surface, the adjustment means including a block supported for movement relative to the platen, the block presenting a planer engagement surface parallel to and bearing against the engagement surface of the carrier means, and a force transmitting means for moving the block relative to the mold section in a direction that is angled relative to the engagement surfaces.

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**5,496,167**
**VIBRATING ARRANGEMENT**
**Antonio P. Diaz, Poligono Industrial Juncarril, Parcela 240, 18220 Albolote (Granada), Spain**
**Filed Dec. 2, 1993, Ser. No. 161,321**
**Claims priority, application European Pat. Off., Dec. 3, 1992, 9203576**
**Int. Cl.[6] B28B *1/08*; B06B *1/16***
**U.S. Cl. 425—456** **5 Claims**



1. A vibrating unit for machinery, comprising:

a frame;

a table supported on the frame through vibration-isolating cushions to permit vertical vibration of the table relative to the frame while substantially isolating the frame from the vibrations;

first and second vibration generators rotatably mounted on said table in generally parallel but sidewardly spaced relationship for permitting imposition of a vertically oriented up-and-down vibration on the table;

each said vibration generator including first and second coaxially aligned and rotatable shafts which respectively mount thereon first and second radially eccentric weights, the first and second radially eccentric weights of each said vibration generator being sized and positioned so as to be effectively balanced and induce no rotational vibration when the weights are disposed in a first position wherein they are substantially radially opposed, said weights when relatively moved into a second position wherein they are both disposed in the same radial direction being such as to create an unbalanced vertical vibratory force when the respective vibration generator is rotated;

first and second drive trains connected between said table and said frame for rotatably driving both of said first and second vibration generators at the same rotational speeds but in opposite rotational directions;

said first drive train including first flexible drive belt means drivingly connected to and driven from a first driving pulley which is rotatably supported on said frame, said first drive belt means being drivingly engaged with the first shaft of each of said first and second vibration generators for effecting simultaneous and synchronous rotation of each of said first shafts in an opposite rotational direction relative to the other of said first shafts;

said second drive train including second flexible drive belt means drivingly engaged with and driven from a second driving pulley which is rotatably supported on said frame, said second drive belt means being drivingly engaged with each of the second shafts of said first and second vibration generators for causing simultaneous and synchronous rotation of each of said second shafts in an opposite direction relative to the other of said second shafts; and

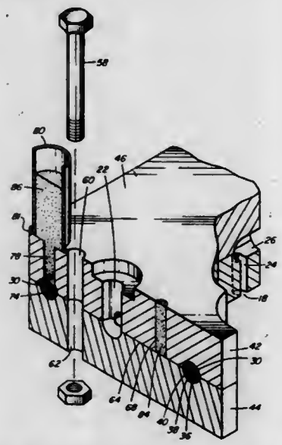
position adjusting means cooperating with said second drive belt means for adjusting the position of said second drive belt means relative to said first drive belt means during the simultaneous rotations thereof to cause a corresponding angular adjustment in the positions of said second shafts relative to said first shafts to enable the eccentric weights on said second shafts to be angularly adjusted relative to said first shafts;

said position adjusting means comprising at least one elongate guide member mounted to said frame and extending transverse to first and second intermediate belt reaches of said second drive belt means, first and second intermediate position-adjusting pulleys engaged with said first and second intermediate belt reaches respectively and rotatably mounted on respective first and second slide members which are slidably engaged with said guide member, and driving means for shiftably moving said slide members transversely in the same direction along said guide member to move said intermediate position-adjusting pulleys for changing the lengths of said intermediate belt reaches and angularly adjusting said second shafts relative to said first shafts.



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**5,496,168**
**INJECTION MOLDING MANIFOLD HAVING A HEATING ELEMENT EXTENDING BETWEEN THE PLATES**
**Craig W. Renwick, 224 Barber Drive, Georgetown, Ontario, Canada, assignor to Craig W. Renwick, Georgetown, Canada**
**Filed Jun. 6, 1994, Ser. No. 254,558**
**Int. Cl.[6] B29C *45/22***
**U.S. Cl. 425—547** **2 Claims**

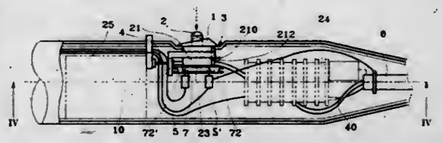


1. An injection molding manifold having a rear face, a front face, an electrical heating element having a predetermined diameter embedded therein, and a melt passage extending therethrough from a common inlet on the rear face to a plurality of outlets spaced on the front face, the melt passage having an inlet bore, a plurality of outlet bores, and a branching portion connecting each of the outlet bores to the inlet bore, the inlet bore extending forwardly from the common inlet on the rear face, the outlet bores each extending rearwardly from a respective one of the outlets spaced on the front face, the branching portion extending in a first plane extending transversely to the inlet bore and the outlet bores of the melt passage, the improvement wherein;

the electrical heating element extends in a second plane extending transversely to the inlet bore and the outlet bores of the melt passage, the second transverse plane being substantially the same as the first transverse plane in which the branching portion of the melt passage extends.

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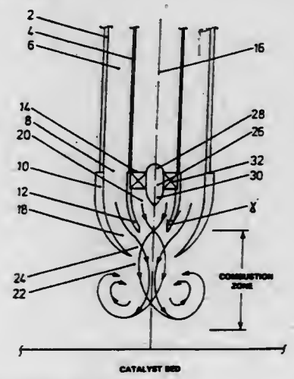
**5,496,169**
**SAFETY CONTROL SWITCH FOR GAS-FIRED IGNITION GUNS**
**Tung-Yu Chen, 3 Fl., No. 174, Tzu Chiang St., Taipei City, Taiwan, Prov. of China**
**Filed May 10, 1995, Ser. No. 438,362**
**Int. Cl.[6] F23D *11/36***
**U.S. Cl. 431—153** **3 Claims**



1. A safety control switch comprising a push button ignition switch for controlling gas flow and ignition in a gas-fired ignition gun, said push button ignition switch comprising a slide moved in a track of the housing of the gas-fired ignition gun, a push button supported on a compression spring in a through bole on said slide, a contact metal spring plate and a brake block fixed to said push button, wherein a locking device is mounted on the housing of the gas-fired ignition gun and moved relative to said brake block between a first position to stop said push button and said slide from operation and a second position to let said push button and said slide be operated.

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**5,496,170**
**SWIRLING-FLOW BURNER**
**Ivar I. Primdahl; Thomas S. Christensen, both of Copenhagen, and Lise Olsen, Askeby, all of, Denmark, assignors to Haldor Topsøe A/S, Denmark**
**Continuation of Ser. No. 986,975, Dec. 7, 1992. This application Jul. 8, 1994, Ser. No. 309,346**
**Claims priority, application Denmark, Dec. 6, 1991, 1974/91**
**Int. Cl.[6] F23C *7/00*; *9/00***
**U.S. Cl. 431—187** **5 Claims**




1. A swirling-flow burner comprising:

an outer, peripheral burner tube;

a central oxidizer supply tube concentric with and spaced from the burner tube, defining an outer annular fuel gas channel

between the tubes, the oxidizer supply tube and the fuel gas channel having separate inlet ends and separate outlet ends;

a fuel gas injector connected to the outlet end of the fuel gas channel, said fuel gas injector having a wall with a U-shaped cross sectional inner surface around a common axis of the burner tube and the injector and having a circular outlet end around the common axis, said U-shaped cross sectional inner surface narrowing toward said circular outlet end, for providing an unobstructed flow of fuel injected toward the common axis of the fuel gas injector;

a central oxidizer injector connected to the outlet end of the central oxidizer supply tube, said oxidizer injector having a wall with a U-shaped cross sectional surface coaxial with and spaced from said fuel gas injector, said oxidizer injector having a circular and sharp-edged outlet end around the common axis, the sharp edge being formed by inner and outer surfaces of the oxidizer injector meeting to form a tip, the sharp edge having a tip angle of between 15° and 60° between the inner and outer surfaces, taken at the tip, which outlet end of the oxidizer injector is recessed from the outlet end of the fuel gas injector, said cross sectional surface narrowing toward said circular outlet end of said oxidizer injector;

a cylindrical bluff-body coaxially arranged within the oxidizer injection chamber, the bluff-body having a domeshaped upstream end and a tapered downstream end; and

a swirler installed on the bluff-body between its upstream end and its downstream end, the swirler having static swirler blades extending to the surface of the oxidizer injector;

whereby oxidizer supplied to the oxidizer injector is injected into a downstream combustion zone in a swirling flow by means of the bluff-body and the swirler, which oxidizer flow is directed around the common axis of the injectors and the combustion zone after having passed through the oxidizer injector;

the oxidizer is mixed in a high temperature inner region of the combustion zone with fuel gas being supplied to the fuel gas injector and injected into the combustion zone in an inwardly flow direction towards the common axis of the combustion zone after having passed through the fuel gas injector; and

combustion products in a low temperature outer region of the combustion zone having an external, recirculation flow direction.

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**5,496,171**

## SURFACE COMBUSTION BURNER

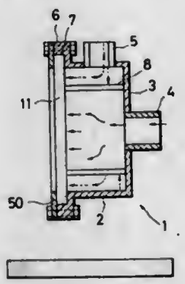
**Hidenari Ozawa, Musashino; Kazutaka Kato, Tokyo; Keiichi Ohgi, Tokyo, and Masahiro Yahagi, Tokyo, all of, Japan, assignors to Tokyo Gas Co., Ltd., Tokyo, Japan**

**Division of Ser. No. 994,328, Dec. 21, 1992, abandoned. This application Aug. 25, 1994, Ser. No. 295,491**

**Claims priority, application Japan, Dec. 24, 1991, 3-341334; Dec. 24, 1991, 3-341336; May 21, 1992, 4-033673 U**

**Int. Cl.[6] F23D** *3/40*

**U.S. Cl. 431—326** **5 Claims**




1. A surface combustion burner comprising a porous member having its front surface constituting a combustion surface, a casing extending rearward from an outer peripheral rear surface of said porous member, a mixing chamber defined by said porous member and said casing, opening means for suppling fuel air mixture to said mixing chamber, a partition wall dividing said mixing chamber into a first mixing chamber positioned at a central portion of a rear surface of said porous member and said mixing chamber and a second mixing chamber surrounding said first mixing chamber, and openings for supplying fuel air mixture to said first and second mixing chambers, respectively, said porous member having a percentage of voids which is higher at a portion confronting said first mixing chamber than at a portion confronting said second mixing chamber.

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**5,496,172**

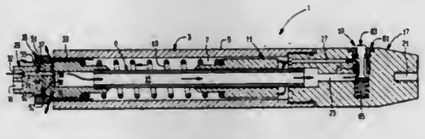
## PNEUMATIC REMOVER FOR USE IN REMOVING DENTAL PROSTHETICS

**David Albeida, 5 Franklin Ave., White Plains, N.Y. 10601; Kafri Moshe, Beit Yeoshua, Beit Yeoshua, Israel, and Christian Bat-Genstein, 1 Rue Poirier, Saint Maude, France**

**Filed Aug. 10, 1994, Ser. No. 292,808**

**Int. Cl.[6] A61C** *1/07;3/03;3/08*

**U.S. Cl. 433—120** **10 Claims**



1. A pneumatic remover assembly which comprises:

a housing unit which comprises an outer housing, a work chamber disposed within said outer housing, a shaft member centrally disposed within said work chamber, an internal mass reciprocally disposed about said shaft member, and a spring means disposed between said internal mass and a rear end of said housing unit, said shaft member having a first conduit means disposed along its entire length which allows for passage of a compressed air or gas therethrough;

a first end unit disposed at an end of said housing unit such that said internal mass is disposed between said spring means and said first end unit, said first end unit comprising a valve means, a means for securing a dental appliance to said first end unit, a second conduit means for introducing said compressed air or gas from said first conduit means to said valve means, a third conduit means disposed within said valve means which is capable of passing said compressed air or gas from said second conduit means through said valve means, and a fourth conduit means for removing said compressed air or gas from said valve means and introducing said compressed air or gas into said work chamber where it is capable of acting on said internal mass by moving it away from said first end unit;

a second end unit disposed at the opposite end of said housing unit from said first end unit such that said spring means is disposed between said second end unit and said internal mass, said second end unit comprising a fifth conduit means which is capable of introducing said compressed air or gas into said first conduit means of said shaft member, at least one sixth conduit means capable of removing said compressed air or gas from said center chamber and out of said assembly; and

a means for adjusting the flow rate of said compressed air or gas which is introduced to said pneumatic remover assembly via said fifth conduit means.



**5,496,173**

## DENTAL HANDPIECE HAVING AN AUTOMATICALLY CONTROLLED TURBINE DRIVE

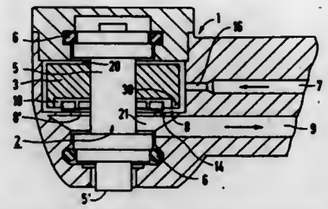
**Juergen Wohlgemuth, Darmstadt, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany**

**Filed Jun. 14, 1994, Ser. No. 261,149**

**Claims priority, application Germany, Jun. 21, 1993, 43 20 532.1**

**Int. Cl.[6] A61C** *1/05*

**U.S. Cl. 433—132** **11 Claims**




1. In a dental handpiece having a turbine drive including a rotor disc having a plurality of blades on a circumference thereof, said rotor disc being mounted for rotation on an axis in a turbine chamber of a housing of the handpiece with the blades being positioned to be charged with a tangential inflow of compressed air from a nozzle located in the housing, and adjustment means being disposed in the flow path of the exhaust air for regulating the turbine speed, the improvement comprising the rotor disc having an end face with a recess with a cylindrical annular wall, an outlet channel being formed between the rotor disc and a radially extending annular wall of the turbine chamber in the housing, said adjustment means being an elastically deformable ring arranged concentrically on the axis of the rotor disc in said recess to rotate with the rotor disc and said ring being resiliently deformed against the annular wall by centrifugal forces to be deformed from a circular cross section to an oval cross section extending in an axial direction into the outlet channel so that with increasing speeds, the ring deforms into the outlet channel to decrease the effective cross sectional area of the outlet channel and with a reduced speed, the ring withdraws from the outlet channel to increase the effective cross sectional area thereof.

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**5,496,174**

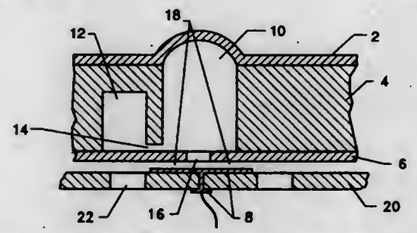
## METHOD AND DEVICE FOR PRODUCING A TACTILE DISPLAY USING AN ELECTRORHEOLOGICAL FLUID

**H. Douglas Garner, Newport News, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.**

**Filed Aug. 4, 1994, Ser. No. 286,031**

**Int. Cl.[6] G09B** *21/00*

**U.S. Cl. 434—114** **15 Claims**




15. A method for producing a tactually readable pattern of dots, comprising the steps of:

reading data from a data storage medium;

producing electrical signals representative of said data;

translating the electrical signals into a Braille representation;

selectively producing voltages in response to the Braille representation of the electrical signals;

applying the voltages uniformly across an electrotheological fluid to increase the electrorheological fluid's viscosity, by means of a single, flat-surfaced ground electrode common to each individual dot and a flat-surfaced conductive electrode corresponding to each individual tactile dot and whose flat surface is parallel to the common ground electrode;

utilizing the viscosity increase of said electrorheological fluid to effect valving external to a dot actuator chamber to produce a build-up of electrorheological fluid in the chamber; and

using the pressure increase produced by the build-up of electrorheological fluid in the chamber to form a tactually readable dot on a display surface.

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**5,496,175**

## QUESTIONNAIRE SYSTEM

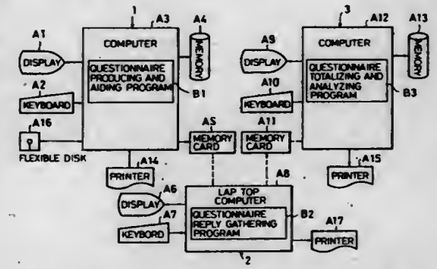
**Hiroaki Oyama, Yokohama; Tadashi Temma; Miyuki Maeda, both of Sagamihara; Tetsuo Kusuzaki, Kawasaki; Hiromichi Kimura, Yokohama; Kazumi Abe, Hoya; Naohiko Kunishi, Tokyo; Akira Kinefuchi, Hoya, and Takahiro Miura, Matsudo, all of, Japan, assignors to Hitachi, Ltd., and Nichirei Corporation, both of Tokyo, Japan**

**Filed Jan. 31, 1992, Ser. No. 831,194**

**Claims priority, application Japan, Feb. 1, 1991, 3-11925**

**Int. Cl.[6] G09B** *7/00*

**U.S. Cl. 434—118** **18 Claims**




1. A questionnaire producing and aiding system, comprising:

a computer including a processor, a memory, input means for inputting information to said computer, a display and connecting means used in connecting a portable storage medium to said computer;

wherein said memory stores at least one file which includes previously-produced questionnaire elements, each previously-produced questionnaire element having one previously-produced question and a plurality of previously-produced reply choices corresponding to said previously-produced question;

wherein said input means inputs 1) a readout command to read out said at least one file from said memory, 2) a selection command to select at least one of said previously-produced questionnaire elements of said at least one file, and 3) a new questionnaire element having one new question and a plurality of new reply choices corresponding to said one new question to said computer;

wherein said processor executes a questionnaire-producing program which 1) reads out said at least one file from said memory as a previously-produced questionnaire in response to said readout command, 2) selects said at least one of said previously-produced questionnaire elements in response to said selection command, 3) produces a new questionnaire by utilizing said selected previously-produced questionnaire element and said new questionnaire element input from said input means, 4) stores said new questionnaire into said portable storage medium, and 5) displays said new questionnaire; and

wherein said new questionnaire includes said new questionnaire element and at least one of said previously-produced questionnaire elements, wherein said new questionnaire element includes a reply limitation condition, pursuant to which the new questionnaire skips to a specific question depending upon a selection of said reply choices by a user.

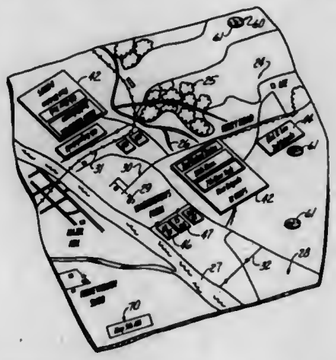
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**5,496,176**

## MILITARY STRATEGY MAPPING APPARATUS AND METHOD OF USE

**Jeffrey A. Swanson, 1777 Ivy Oak Sq., Reston, Va. 22090**

**Filed Mar. 4, 1994, Ser. No. 205,450**
**Int. Cl.[6] G09B** *19/00*
**U.S. Cl. 434—154** **10 Claims**



1. An apparatus for allowing a student of military history to gain a true appreciation of the strategy and maneuvers actually employed by opposing forces during the course of a military engagement as recorded in a historically accurate military text, wherein the apparatus comprises:

a map comprising an enlarged generally flat rectangular map member provided with accurate to scale cartographic representations of both natural and man made terrain features; and

a plurality of military unit markers comprising a plurality of different sized generally flat rectangular marker members, wherein the relative size of the individual military unit markers are representative of the relative size and strength from a manpower and armament standpoint of the actual military units that are identified on the marker members through a printed legend and wherein said marker members are adapted to be movably deployed on said map member.

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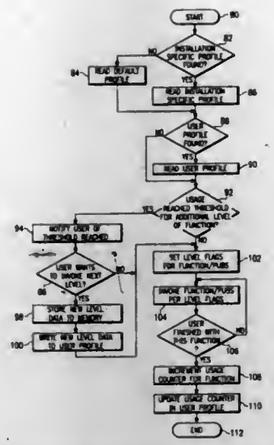
**5,496,177**

## METHOD AND APPARATUS FOR PRESENTING NEW COMPUTER SOFTWARE FUNCTIONS TO A USER BASED UPON ACTUAL USAGE

**Sherry S. Collia, Boulder, Colo.; Greg P. Fitzpatrick, Ft. Worth, and William R. Sterrett, Dallas, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Continuation of Ser. No. 36,117, Mar. 23, 1993, abandoned. This application Mar. 15, 1994, Ser. No. 214,085**
**Int. Cl.[6] G09B** *19/00*
**U.S. Cl. 434—118** **8 Claims**

1. A computer implemented method of introducing to a user at least one previously unrevealed function of a computer software application, the software application comprising a plurality of functions including at least one function needed for basic operation of the application and the at least one previously unrevealed function, comprising the steps of:



dividing a software application into a plurality of levels including at least a first level and a second level as determined by which ones of a plurality of functions are utilized therein, said first level utilizing at least the at least one function needed for basic operation and said second level utilizing at least the at least one previously unrevealed function;

defining a profile which includes a user adjustable criteria for triggering introduction of each of said plurality of levels, said criteria corresponding to actual usage of said software application;

presenting only-said first level to the user for initial use of said software application;

optionally introducing additional ones of said plurality of levels to the user upon attainment of said adjustable criteria therefor; and

presenting said first level and any of said additional ones of said plurality of levels subsequently introduced to the user by said attainment of said adjustable criteria therefor upon continuing use of said software application by the user.

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**5,496,178**

## TELEVISION RECEIVER HAVING VIDEO ACCOMPANIMENT FUNCTIONS

**Dong-cheri Back, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea**

**Filed Jan. 21, 1994, Ser. No. 183,848**
**Claims priority, application Rep. of Korea, Mar. 8, 1993, 93-3422**
**Int. Cl.[6] G10H** *1/36;* **H04N** *5/765*
**U.S. Cl. 434—307 A** **41 Claims**

1. A television receiver having a video accompaniment function comprising:

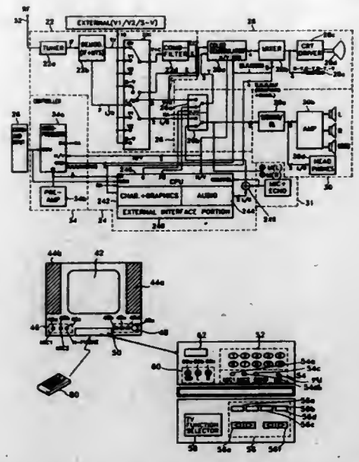
a television signal generator for receiving a television signal and providing a video signal and an audio signal;

a video accompaniment signal generator for reading background/lyrics information and accompaniment information of a program selected among a plurality of programs stored in a memory, providing a video signal for accompaniment and an accompaniment signal, and generating a pseudo-sync signal;

a first selector for selectively providing the video signal supplied from the television signal generator and the pseudo-sync signal supplied from the video accompaniment signal generator;

a second selector for selectively providing the audio signal supplied from the television signal generator and the accompaniment signal supplied from the video accompaniment signal generator;





a video output unit for receiving a first signal selected from the first selector and the accompaniment video signal and for providing the received signal as a video output;

an audio output unit for receiving a second signal selected in the second selector and providing the received signal as an audio output; and

a controller for controlling said video accompaniment signal generator, said first selector and said second selector responsive to selection between a television mode of operation and a video accompaniment mode of operation.

33. A television receiver providing a video accompaniment function and having a television signal generator for receiving a television signal and providing a video signal and an audio signal, a video output unit for receiving a selected video signal as a video output and an audio output unit for receiving a selected audio signal as an audio output, said receiver comprising:

a video accompaniment signal generator for reading background and lyric information and accompaniment information corresponding to a program selected from a plurality of programs stored in a memory, and providing an accompaniment video signal and an accompaniment audio signal;

a first selector for providing a selected one of the video signal supplied from the television signal generator and the accompaniment video signal supplied from the video accompaniment signal generator to said video output unit as said selected video signal;

a second selector for providing a selected one of the audio signal supplied from the television signal generator and the accompaniment audio signal supplied from the video accompaniment signal generator to said audio output unit as said selected audio signal; and

a controller for controlling said video accompaniment signal generator, said first selector and said second selector responsive to mode selection between a television mode of operation and a video accompaniment mode of operation.

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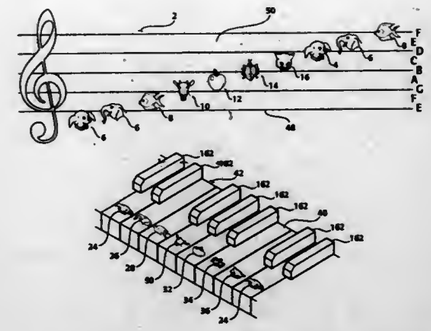
**5,496,179**

## SYSTEM FOR TEACHING MUSIC READING

**Christine Hoffman, 80 Whitson Rd., Huntington Station, N.Y. 11746**

**Filed Jul. 21, 1993, Ser. No. 94,230**
**Int. Cl.[6] G09B** *15/02*
**U.S. Cl. 434—433** **10 Claims**

1. The combination of at least one first musical note constituted only by a representation of one of a three dimensional object and creature readily identifiable by a young child and including physical indicia constituting means connoting the alphabetical name of



but one of the tones of the musical scale; with a musical staff in which said representation constituting said first musical note is on said staff occupying a position designated for said but one tone; and with one of a singular musical instrument having a plurality of instrumentalities which generate all of the tones of the musical scale including an instrumentality which generates said but one tone and a representation of said singular musical instrument including representations of instrumentalities which generate all of the tones of the musical scale including a representation of an instrumentality which generates said but one tone, and at least one second musical note which is a duplicate of said first mentioned musical note, said second musical note being constituted only by a representation of the same one of a three dimensional object and creature as said representation constituting said first musical note, readily identifiable by a young child and constituting means connoting the same musical tone as connoted by said representation constituting said first musical note, and said second musical note is on said instrumentality which generates said but one tone included in said one of said singular musical instrument and representation of said singular musical instrument, said combination constituting means for a young student to read said first musical note on said staff occupying said position designated for said but one tone and to play the tone connoted by said representation of one of said object and creature on said singular musical instrument or representation thereof.

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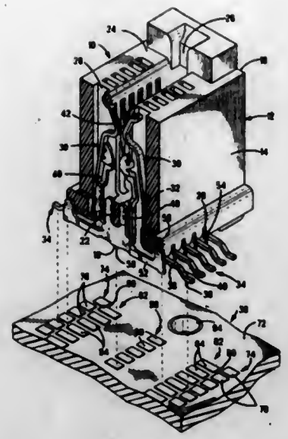
**5,496,180**

## SURFACE MOUNTABLE CARD EDGE CONNECTOR

**David J. Fabian, Mount Joy; Timothy L. Kocher, Camp Hill; Shane D. Northcraft, New Cumberland; Douglas R. Sarver, Millerstown, and Mark R. Thumma, Oberlin, all of Pa., assignors to The Whitaker Corporation, Wilmington, Del.**

**Filed Apr. 6, 1994, Ser. No. 223,895**
**Int. Cl.[6] H01R** *9/09*
**U.S. Cl. 439—60** **6 Claims**

1. A surface mountable electrical connector for use with a circuit board of the type having an outer row of trace termini and an inner row of trace termini closely spaced therefrom on the mounting surface of said board, said connector comprising a dielectric housing having a mounting face and a mating face and at least one row of electrical terminal members extending therebetween, said terminal members arranged adjacent to each other and in a dense array in said at least one row with some of said terminal members being associated with said outer row of termini and others of said terminal members being associated with said inner row of termini, said terminal members including elongate arm portions extending from said housing and generally parallel to said mounting face thereof, at least each said terminal members associated with said outer row of termini including an intermediate portion extending at an angle from said elongate arm portion and generally away from said mounting face, said intermediate portion concluding in a surface mount contact section that extends generally parallel to said mounting face, said intermediate portion defining a surface



facing said inner row of trace termini that is abruptly directed away from said mounting surface of said circuit board at least a selected distance above the spacing between said outer and inner rows of said termini to provide clearance above solder used to solder said surface mount contact section to a respective trace termini in said outer row thereby preventing solder from wicking to closely adjacent ones of said termini of said inner row.

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5,496,181

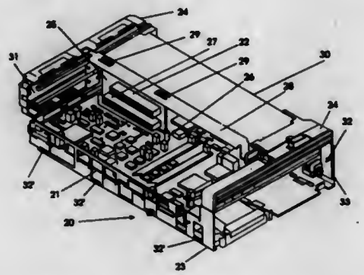
**SERVICEABLE DATA TERMINAL STRUCTURE**

**Danny H. Addison, Durham; Johnnie M. Carnes, Apex; Robert L. Cowardin, Cary; Albert N. Gore, III, Raleigh; Robert C. Lynch, Cary; Charles M. McCray, Raleigh, all of N.C.; Shigeji Narisawa, Kanagawa, Japan; William L. Talley, Raleigh, N.C.; Yoshinair Toyosato, Kawasaki, Japan, and Craig W. Turner, Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Continuation of Ser. No. 61,990, May 14, 1993, Pat. No. 5,395,261. This application Oct. 3, 1994, Ser. No. 317,004**

**Int. Cl.[6] H05K** *1/14*

**U.S. Cl. 439—61** **5 Claims**



1. A structure for mounting and supporting a bus extender card on a mother board or circuit card and at least one feature circuit card in operative contact with the bus extender card comprising:

a base member for supporting the said mother board;

a bus extender card connector mounted on the mother board and electrically connected to a bus on the mother board for receiving a bus extender card;

a pair of spaced opposed walls extending vertically from said base, said opposed walls being orthogonal to the bus extender card connector mounted on the mother board and each including at least one feature card support channel on the opposed walls in predetermined spaced relationship to each other; and,

a bus extender card support means connected to each one of the pair of spaced opposed walls and adapted to engage a bus extender card when installed to restrict movement of the bus extender card.

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5,496,182

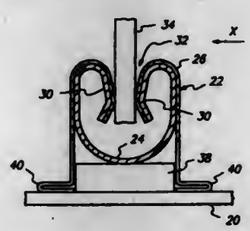
**CONNECTOR DEVICE FOR ELECTRICALLY INTERCONNECTING PRINTED CIRCUIT BOARD LIKE MEMBERS**

**Gary Yasumura, Santa Clara, Calif., assignor to Beta Phase, Inc., Menlo Park, Calif.**

**Division of Ser. No. 98,785, Jul. 29, 1993, abandoned. This application Apr. 7, 1995, Ser. No. 418,428**

**Int. Cl.[6] H01R** *23/68*

**U.S. Cl. 439—62** **1 Claim**



1. A connector assembly for being mounted on a first printed circuit board like member to electrically interconnect the first printed circuit board like member to a second printed circuit board like member, comprising: support means for providing a support; flexible circuitry disposed on the support means; said flexible circuitry including generally parallel-spaced individual electrical conductors for being electrically connected to electrical contacts on the first printed circuit board like member, said electrical conductors being positioned to electrically mate with electrical contacts on the second printed circuit board like member when the second printed circuit board like member is mounted on the connector assembly; and portions of said metal support member and portions of said flexible circuitry being punched outwardly in a direction away from the metal support member with respect to surrounding areas of the metal support member and the flexible circuitry, the punched out portions of the flexible circuitry each having at least one of the individual electrical conductors disposed thereon.

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5,496,183

**PRESTRESSED SHIELDING PLATES FOR ELECTRICAL CONNECTORS**

**Lucas Soes, Rosmalen, and Petrus R. M. van Dijk, 's-Hertogenbosch, both of, Netherlands, assignors to The Whitaker Corporation, Wilmington, Del.**

**Filed Mar. 15, 1994, Ser. No. 213,275**

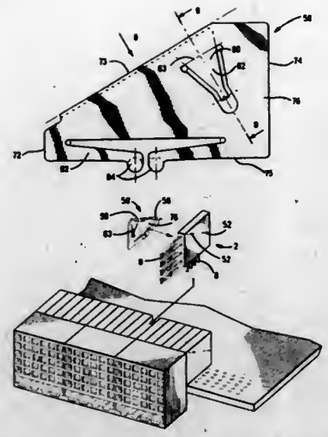
**Claims priority, application United Kingdom, Apr. 6, 1993, 9307127**

**Int. Cl.[6] H01R** *9/09*

**U.S. Cl. 439—79** **20 Claims**

1. An electrical connector assembly comprising an insulating housing and assembled thereto a plurality of terminal modules and electrically conductive shields inserted between adjacent terminal modules, each terminal module having a plurality of contacts including a mating contact portion, a conductor connecting portion and an intermediate portion therebetween, the connector assembly characterized in that the terminal module has an insulative web that encapsulates some or all of the intermediate portion; and the electrically conductive shield has a mounting member that is engageable with a complementary mounting member of the terminal module, the shield being prestressed such that when the mounting member and the complementary mounting member are engaged, the shield is held resiliently against the terminal module due to elastic deformation of the shield.





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5,496,184

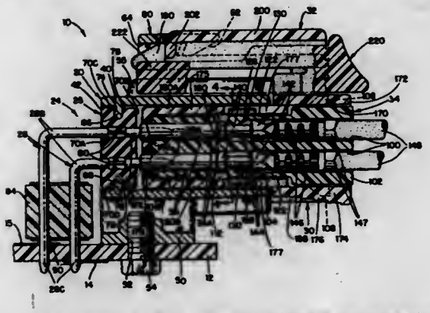
**HEADER ASSEMBLY FOR PRINTED CIRCUIT BOARD**

**Roger L. Garrett, New Wilmington, Pa.; Bruce J. Serbin, Canfield, and Randy L. Fink, Warren, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.**

**Filed Jul. 5, 1994, Ser. No. 270,975**

**Int. Cl.[6] H01R** *13/422;23/70*

**U.S. Cl. 439—79** **10 Claims**



1. A header assembly for a printed circuit substrate comprising:

a header housing having a central through opening, a side opening extending normal to and communicating with said center opening and mounting means for mounting the housing to the circuit board,

a connector subassembly connectable to said header housing and comprising a connector body having a plurality of axially extending cavities therethrough and a plurality of metal socket terminals disposed within said cavities,

a pin terminal and carrier subassembly comprising a plastic, generally rectangularly shaped carrier strip having a plurality of openings extending therethrough and a plurality of pin terminals inserted through the openings in the carrier strip and retained in the strip so that their forward and rearward end portions extend outwardly from the carrier strip,

one of said header housing and said carrier strip having a pair of rails and the other of said header housing and carrier strip having grooves therein for receiving said rails,

said carrier strip being connectable to said header housing by sliding said carrier strip through said side opening and into the header housing so that said rails are received in said grooves whereby said pin terminals are located within said central through opening of said header housing,

said socket terminals of said connector subassembly being connected to said forward end portions of said pin terminals by axially moving the connector subassembly into the central through opening of said header housing until it is connected to the header housing.

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5,496,185

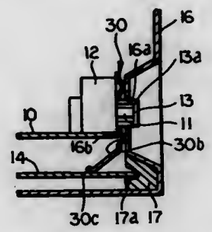
**CONNECTING DEVICE OF DATA CABLE**

**Soon K. Beak, Kyungki-do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea**

**Filed Jul. 11, 1994, Ser. No. 273,213**

**Int. Cl.[6] H01R** *13/648*

**U.S. Cl. 439—95** **11 Claims**



1. A connector assembly for data cable comprising a signal terminal part fastened on a printed circuit board, said signal terminal part containing an input/output terminal fixed at one end of the signal terminal part, said input/output terminal having a plurality of pin holes formed at one side of the input/output terminal, said connector assembly further comprising:

elastic connecting means comprising a guide opening in the center thereof for inserting the input/output terminal to discharge electromagnetic waves generated around said input/output terminal to a chassis frame installed in a case of a main body in a computer system, wherein said elastic connecting means is a plate type spring comprising a pair of reinforcement ribs above and below said guide opening for firmly coupling the signal terminal part with the main body case; and

fixing means for stably supporting said elastic connecting means in contacting relation with said chassis frame.

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5,496,186

**ELECTRIC PLUG CONNECTOR**

**Joris Dobbelaere, Beernem, and Artur Wohlfart, Bad Durkheim, both of, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany**

**Filed Oct. 3, 1994, Ser. No. 317,197**

**Claims priority, application Germany, Jan. 1, 1993, 43 33 605.1**

**Int. Cl.[6] H01R** *13/62*

**U.S. Cl. 439—157** **8 Claims**

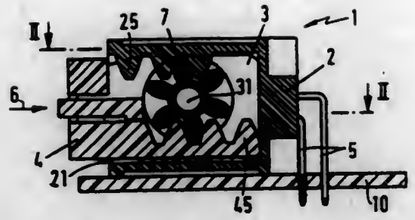
1. An electric plug connector, comprising:

first, second and third housing parts;

one of said housing parts being a plug receptacle for receiving a contact element, said plug receptacle forming a plug channel;

another of said housing parts being a plug for receiving a complementary contact element, said plug having outer contours adapted to said plug channel;

a further of said housing parts being an actuation element in the form of a longitudinally movably guided slide for moving said plug into and out of said plug receptacle; and



three sets of teeth each being disposed on a respective one of said housing parts and having a predetermined gear ratio, two of said sets of teeth being racks each being firmly connected to a respective one of said first and second housing parts, and one of said sets of teeth being a gear wheel being rotatably supported on said third housing part for meshing with said two racks.

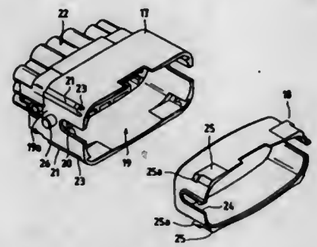
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**5,496,187**

## LEVER CONNECTION TYPE WATERPROOFING CONNECTOR

**Akira Shinchi, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan**

**Division of Ser. No. 194,397, Feb. 10, 1994, Pat. No. 5,431,574. This application Apr. 25, 1995, Ser. No. 428,821**
**Claims priority, application Japan, Feb. 10, 1993, 5-022735**
**Int. Cl.[6] H01R *13/62***
**U.S. Cl. 439—157** **2 Claims**



1. A lever connection type waterproofing connector, comprising:
a male housing including opposing projections;
a female housing having an inlet portion for receiving said male housing, said inlet portion being partially defined by opposing side walls each having a receiving slit and a pair of engagement grooves recessed therein on opposite sides of said receiving slit and extending parallel thereto, a stopper being formed at a terminal end of each of said engagement grooves;
an engagement ring adapted to be inserted into said inlet portion of said female housing, said engagement ring including opposing side walls each having a guide slit formed therein in respective alignment with said receiving slits of said female housing, and a pair of engagement portions formed on each of said side walls of said engagement ring and adapted to be respectively received by said grooves, each engagement portion including an engagement pawl which cooperates with an associated stopper for locking said engagement ring in said female housing;
a sealing member elastically fitted on a bottom surface defining said inlet portion of said female housing; and
a lever rotatably disposed on opposite side walls of said female housing for urging said male housing into said female housing, said lever having a connecting slit formed on opposite side walls thereof for respectively receiving said projections of said male housing to cam said male housing into said inlet portion of said female housing by rotating said lever.

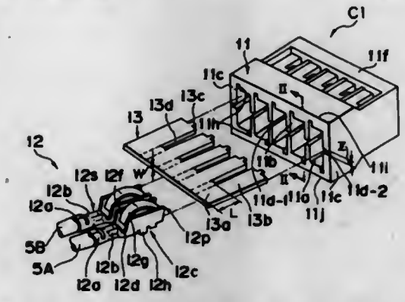
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**5,496,188**

## CONNECTOR

**Kenji Okamura; Shigeki Murayama; Masamitsu Chishima, and Yutaka Noro, all of Yokkaichi, Japan, assignors to Sumitomo Wiring Systems, Ltd., Yokkaichi, Japan**

**Filed Dec. 6, 1993, Ser. No. 161,573**
**Claims priority, application Japan, Dec. 9, 1992, 4-329476**
**Int. Cl.[6] H01R *31/08***
**U.S. Cl. 439—189** **16 Claims**



1. An electrical connector for electrically connecting a primary line connected to a first terminal to a plurality of secondary lines each connected to a second terminal, said connector comprising:
a substantially flat joint terminal means made by an electrically conductive material having slit clearance means; and
a housing means having a plurality of terminal housing means extending in a first direction and having an opening at one end for receiving therethrough one of said first and second terminals, each of said terminal housing means being in alignment with each other side by side, said housing means being provided with a groove means extending in a second direction and opening at said one end for receiving said joint terminal means, whereby when said substantially flat joint terminal means is placed in said groove means, said first and second terminals accommodated in said terminal housing means are electrically connected through said joint terminal so that said primary line is electrically connected to said secondary terminals.

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**5,496,189**

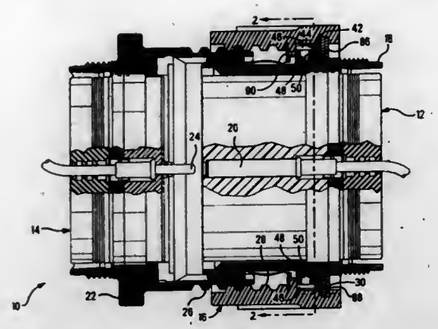
## ELECTRICAL CONNECTOR ASSEMBLY INCLUDING IMPROVED DECOUPLING RETARDATION MECHANISM

**Gary L. Over, Harrisburg; Teresa K. Black, Etters, and David T. Shaffer, Mechanicsburg, all of Pa., assignors to The Whitaker Corporation, Wilmington, Del.**

**Filed Oct. 19, 1994, Ser. No. 326,303**
**Int. Cl.[6] H01R *13/62***
**U.S. Cl. 439—321** **8 Claims**

1. An electrical connector assembly comprising:
an electrical plug connector subassembly including a substantially cylindrical first shell having at least one first electrical contact secured therein;
an electrical receptable connector subassembly including a substantially cylindrical second shell having at least one second electrical contact secured therein each mateable with a respective said first contact in the first shell, said second shell having an external thread thereon;
a coupling ring rotatably mounted on the first shell and restrained from axial movement with respect thereto, said coupling ring being adapted to selectively couple and decouple said first shell and said second shell, said coupling ring having an interior wall provided with an internal thread connectable with the external thread on the second shell for connecting the first and second shells together and thereby holding said first and second contacts in mated relationship; and
means for retarding rotational movement of the coupling ring with respect to the first shell, said retarding means comprising:
an annular region extending around the interior of said coupling ring and having an inner circumferential surface thereof provided with a plurality of engageable teeth, each of said teeth having first and second generally straight sides meeting at an apex, said first side having a steeper angle than said second side, with said first side leading said second side when said coupling ring is rotated to decouple said first shell from said second shell;
an annular channel formed by an inwardly extending wall of said coupling ring and an outwardly extending wall of said first shell, said channel being so located that said teeth occupy its outer surface between said walls; and
a leaf spring member having a central portion mounted to said first shell within said channel and a pair of wings extending within said channel in opposite directions from said central portion each to a respective distal end disposed against the exterior of said first shell, each of said wings having a first generally arcuate portion extending from said central portion and disposed against the exterior of said first shell within said channel, and a second portion between said first portion and the distal end of said each wing with ends of said second portion adapted to engage the exterior of said first shell within said channel so that said second portion is raised away from the exterior of said first shell and biased against inner circumferential surface, and
each said second portion of said wings having a radially outwardly extending projection engaging and yieldably biased against said teeth to retard rotational movement of said coupling ring; whereby more torque is required to decouple said shells than to couple said shells.





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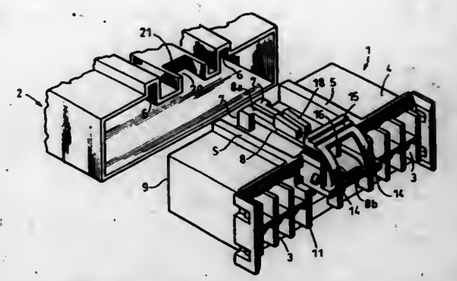
**5,496,190**

## ELECTRICAL CONNECTOR CASINGS

**Jean Ittah, Villeneuve la Garenne, and Thierry Badaroux, St Germain en Laye, both of, France, assignors to Connecteurs Cinch, Montigny Le Bretonneux, France**

**Filed Aug. 9, 1994, Ser. No. 287,419**
**Claims priority, application France, Sep. 10, 1993, 93 10814**
**Int. Cl.[6] H01R *13/627***
**U.S. Cl. 439—354** **3 Claims**

1. Electrical connector casings, comprising:
a male casing member adapted to receive first electrical connection members;
a female casing member including an opening for insertion of said male casing member in an insertion direction, said female casing member adapted to receive second electrical connection members capable of coupling with said first electrical connection members;
said male casing member comprising:
a first end that is adapted to be inserted into an opening in said female casing member, and a second end opposite said first end;
pillars positioned near said first end of said male casing member; and
an elastic bar extending laterally, substantially parallel to a direction of insertion of said male member into said female member, said elastic bar including two ends, with one of said two ends being fastened to said male casing member adjacent said second end of said male casing member, and the other of said two ends being fastened to said pillar, said elastic bar being inclined towards said second end, and an abutment is positioned partway along the length of said elastic bar, with said abutment comprising a substantially parallelpiped-shaped block;
said female casing comprising:
a passage adapted to receive said elastic bar, and a projection positioned partway along said passage along a path of travel of said elastic bar, said projection comprising a steep edge on a side facing towards said opening of said female casing member, said steep edge joining at right angles a part joining at right angles a retaining steep edge interacting with said abutment to lock said male casing member and said female casing member together, so that said male casing member is automatically inserted and locked when said male casing member is inserted to a particular position within said female casing member; and
said male casing member including an unlocking member positioned near said one end of said elastic bar to enable release of said abutment from said projection for separation of said male casing member and said female casing member.



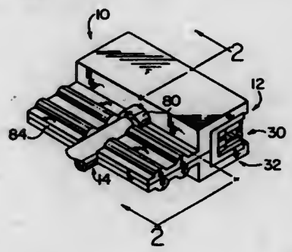
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**5,496,191**

## CORD ASSEMBLY AND METHOD FOR MAKING

**James J. Johnston, Newington, Conn., assignor to The Wiremold Company, West Hartford, Conn.**

**Filed Apr. 15, 1994, Ser. No. 228,104**
**Int. Cl.[6] H01R *4/24***
**U.S. Cl. 439—404** **19 Claims**



1. A cord assembly for releasable plugging connection to an inline array of insulation displacement connectors including at least two connectors, said cord assembly comprising a plug having a housing defining an exterior opening for receiving the insulation displacement connectors, a cord including a plurality of insulated solid wire conductors having spaced apart bridging portions extending across said exterior opening, reinforcing means on said housing for supporting said bridging portions, and retaining means for securing said bridging portions in predetermined positions relative to said housing and each other to cooperate in releasable plugging engagement within the insulation displacement connectors in response to insertion of the inline array of insulation displacement connectors into said opening.

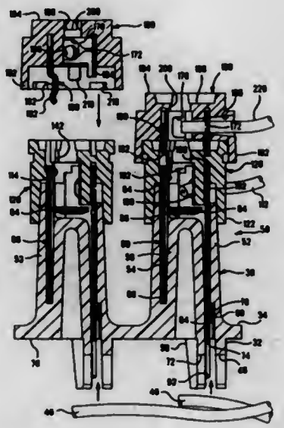
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**5,496,192**

## CROSS-CONNECTION MODULE PROVIDING FOR UNINTERRUPTIBLE TRANSMISSION DURING SERVICING

**James S. Hower, Harrisburg; Maris A. Glass, York; Clyde T. Carter, Shermans Dale, and James W. Robertson, Oberlin, all of Pa., assignors to The Whitaker Corporation, Wilmington, Del.**

**Filed Oct. 18, 1994, Ser. No. 325,004**
**Int. Cl.[6] H01R** *4/24*
**U.S. Cl. 439—409** **32 Claims**



1. An electrical connector for connection of a secondary wire to a terminal in addition to connection of a primary wire thereto, comprising:

a housing defining a silo having a terminal-receiving cavity therein;

a first terminal disposed in said terminal-receiving cavity and including a contact section adapted to be terminated to a respective primary conductor wire;

an actuator movably affixed to said silo to enclose said first terminal therein, said actuator including a wire-receiving aperture thereinto aligned with said contact section of said first terminal, said actuator being movable from a first position to a second position with respect to said silo, and said actuator adapted to move one of a said primary wire and said first terminal to terminate them together in electrical engagement;

a second terminal mountable onto said actuator and including a first contact section adapted to be inserted through a respective first opening of said actuator to become electrically engaged with said first terminal, and further including a second contact section adapted to be terminated to a secondary conductor wire; and

a cap affixed onto said actuator and enclosing said second terminal therewithin, said cap including a wire-receiving aperture thereinto aligned with said second contact section of said second terminal;

said cap and said actuator including cooperating locking sections permitting said cap to be moved in a first direction with respect to said actuator from a first position to a second position relative thereto, to terminate said secondary wire to said second terminal and engaging said locking sections locking said cap in a terminated position with respect to said actuator and said second terminal, and

said actuator thereafter being movable in a second direction from said second position to said first position relative to said silo by movement of said cap thereon in said second direction, for untermination of said primary wire and carrying said second terminal and said secondary wire terminated thereto in said second direction, all while said secondary wire remains terminated to said second terminal and said first contact section of said second terminal remains in electrical engagement with said first terminal assuring an electrical connection of said secondary wire to said first terminal during untermination of said primary wire.

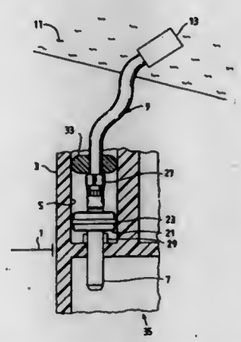
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**5,496,193**

## OIL INTERRUPTING CONNECTOR

**Isao Kameyama, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan**

**Filed Oct. 18, 1994, Ser. No. 324,986**
**Claims priority, application Japan, Jan. 18, 1993, 5-282137**
**Int. Cl.[6] H01R** *4/70*
**U.S. Cl. 439—589** **4 Claims**



1. An oil interrupting electrical connector comprising:

a connector housing extends through a support member in intimate contact therewith, the connector housing provided with a terminal receiving chamber in an inner portion thereof; and

an elastomeric oil retaining plug held on an electrical terminal, an outer periphery of the oil retaining plug being in intimate contact with an inner periphery of the terminal receiving chamber, and the oil retaining plug surrounding and being in intimate contact with a first portion of the terminal, the entire oil retaining plug disposed between a conductor clamping portion and a positioning stabilizer of the terminal, so that the oil retaining plug forms a seal between the inner periphery of the oil retaining plug and the terminal.

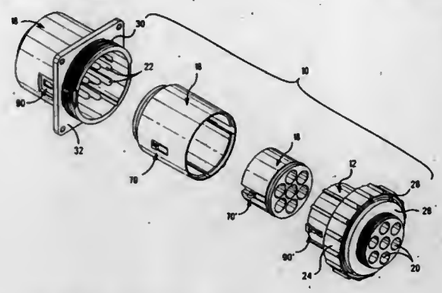


**5,496,194**

## ELECTRICAL CONNECTOR WITH TWO STAGE LATCH HAVING IMPROVED RETAINING MEANS

**John P. Huss, Jr., Harrisburg, Pa., assignor to The Whitaker Corporation, Wilmington, Del.**

**Continuation-in-part of Ser. No. 133,232, Oct. 4, 1993. This application Apr. 28, 1994, Ser. No. 234,761**
**Int. Cl.[6] H01R** *13/40*
**U.S. Cl. 439—595** **10 Claims**



1. An electrical connector having:

(a) a housing;

(b) a plurality of contacts insertable in a first direction into said housing;

(c) a retainer movable in a second direction opposite to say first direction for retaining said contacts in said housing and movable in said first direction for releasing said contacts so that said contacts are removable from said housing; and

(d) a retainer latch associated with said retainer comprising:

an opening in said housing extending through a floor of a recess in an outer surface of said housing and having a first enlarged portion and a necked down portion of said opening; and

a latch attached to said retainer and resiliently biased into latching engagement with said first enlarged portion of said opening upon movement of said retainer in said second direction into a latched position to retain said contacts in said housing, said latch being manually movable from said outer surface of said housing and arranged so that when said latch is depressed in opposition to said resilient bias and moved in said first direction, a portion of said latch is moved from said first enlarged portion into said necked down portion of said opening and said retainer is moved in said first direction thereby releasing said contacts.

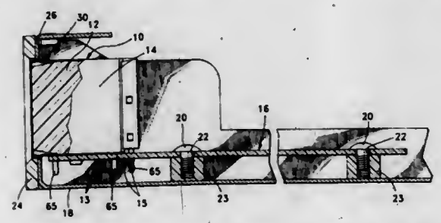
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**5,496,195**

## HIGH PERFORMANCE SHIELDED CONNECTOR

**Carl G. Reed, Clemmons, N.C., assignor to The Whitaker Corporation, Wilmington, Del.**

**Filed Mar. 13, 1995, Ser. No. 403,028**
**Int. Cl.[6] H01R** *13/648*
**U.S. Cl. 439—607** **8 Claims**



1. A shielded high performance electrical connector of the type for mounting to a printed circuit board and adapted to be secured within a metal panel housing, where said connector comprises a dielectric housing having a planar top surface, a printed circuit board engaging surface, a pair of side walls, a rear wall and a front surface, and at least one cavity extending interiorly from the front surface thereof for electrically eogaging a complementary electrical connector, said connector including a one-piece shielding member stamped and formed from a sheet metal blank to offer low resistance grounding of the connector to said metal panel housing, said shielding member adapted to lie contiguous with at least said top surface, said side walls and said rear wall, and a plurality of elongated cantilevered tabs struck from said metal shielding member, said tabs having a secured end and a free end, where said secured end extends from an internal location remote from said front surface, and said free end extends toward said front surface; said tabs further characterized by said free end having a reverse bend therein which in a resiled position extends above the plane of said shielding member contiguous with said planar top surface.

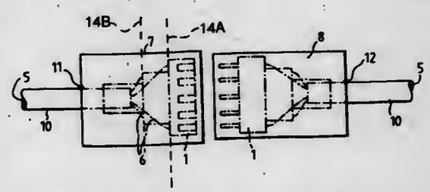
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**5,496,196**

## CDDI CONNECTOR FOR HIGH-SPEED NETWORKS OF VOICE AND DATA TRANSMISSIONS

**Winfried Schachtebeck, Berlin, Germany, assignor to Krone Aktiengesellschaft, Berlin-Zehlendorf, Germany**

**Filed Dec. 3, 1993, Ser. No. 161,895**
**Claims priority, application Germany, Dec. 9, 1992, 42 42 404.6**
**Int. Cl.[6] H01R** *13/10*
**U.S. Cl. 439—682** **10 Claims**



1. A copper distributed data interface (CDDI) connector for the connector distribution and connection box area of high-speed networks of voice and data transmissions, the connector comprising:

a plurality of contact elements positioned about a first circle and a second circle, said first and second circles being substantially concentric and said first circle being smaller and inside said second circle, said plurality of contact elements includes only four (4) contact elements arranged on said first circle and only four (4) contact elements arranged on said second circle, a wire termination of said plurality of contact elements positioned about said first circle are in a plane spaced from another plane containing a wire termination of said plurality of contact elements positioned about said second circle, each of said contact elements on said first circle is at an angular position substantially halfway between angular positions of adjacent said contact elements on said second circle, each of said contact elements on said second circle is at an angular position substantially halfway between angular positions of adjacent said contact elements on said first circle.

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**5,496,197**

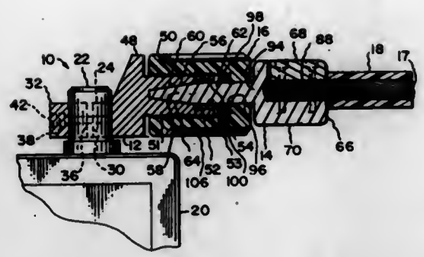
## BATTERY CONNECTOR ASSEMBLY

**Michael J. Grivet, 6492 Bose La., San Jose, Calif. 95120**

**Filed Jun. 24, 1994, Ser. No. 265,315**
**Int. Cl.[6] H01R** *4/28;13/52*
**U.S. Cl. 439—726** **17 Claims**

1. A battery connector assembly comprising:

a cable end having a first connector detachably connected to an end of a cable and having a pin having an outer surface extending out from said cable end;



a terminal end having a second connector detachably connected to a battery terminal and having a post with a threaded exterior and a tubular pocket having an inner surface; and

a sleeve rotatably seated on said pin and having a threaded interior, the threaded interior of said sleeve engaging with the threaded exterior of the post so that when said sleeve is fully engaged on said post substantially the entire outer surface of said pin is engaged with substantially the entire inner surface of the tubular pocket in said post.

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**5,496,198**

**TROLLING MOTOR CONTROL APPARATUS**

**Terry King, 546 Johnson King Rd., Swansea, S.C. 29160**

**Continuation-in-part of Ser. No. 164,007, Dec. 8, 1993, abandoned. This application Feb. 1, 1995, Ser. No. 381,778**

**Int. Cl.[6] B60L** *11/02*

**U.S. Cl. 440—6** **20 Claims**



1. An apparatus for maneuvering a boat on water, said apparatus comprising:

a trolling motor having

a first shaft with a first axis, said trolling motor rotating about said first axis, and

a first pulley coupled to said first shaft, said first pulley rotating with said first shaft about said first axis in a clockwise direction and a counterclockwise direction, said trolling motor rotating with said first shaft;

a bearing assembly having a second shaft with a second axis, said bearing, assembly being formed to receive a chair;

a second pulley mounted to said second shaft, said second pulley rotating about said second shaft;

a first cable connecting said second pulley to said first pulley, said first cable rotating said first pulley when said second pulley is rotated in said clockwise direction;

a second cable connecting said second pulley to said first pulley, said second cable rotating said first pulley when said second pulley is rotated in said counterclockwise direction; and

means for activating said trolling motor, said activating means carried by said bearing assembly.

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**5,496,199**

**ELECTRON BEAM RADIATOR WITH COLD CATHODE INTEGRAL WITH FOCUSING GRID MEMBER AND PROCESS OF FABRICATION THEREOF**

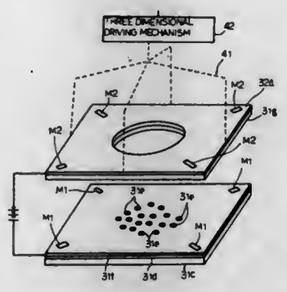
**Hideo Makishima; Keizo Yamada, and Yoshinori Tomihari, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan**

**Division of Ser. No. 185,386, Jan. 24, 1994. This application May 23, 1995, Ser. No. 447,700**

**Claims priority, application Japan, Jan. 25, 1993, 5-009631**

**Int. Cl.[6] H01J** *9/18;1/30*

**U.S. Cl. 445—4** **4 Claims**




1. A process of fabricating an electron beam radiator comprising the steps of:

a) preparing a first laminated sub-structure and a second laminated sub-structure,

said first laminated sub-structure comprising a semiconductor substrate, a first insulating layer formed on a major surface of the semiconductor substrate and having a plurality of first apertures exposing central sub-areas of a central area on said major surface, a plurality of emitter electrodes respectively formed on said central sub-areas and accommodated in said first apertures, and a gate electrode formed on said first insulating layer and having a plurality of second apertures exposing said plurality of emitter electrodes,

said second laminated sub-structure comprising a second insulating layer formed having a third aperture larger in area than said central area, and a grid electrode formed on said second insulating layer and having a fourth aperture larger in area than said central area;

b) aligning said first laminated sub-structure with said second laminated sub-structure by means of an optical aligning system in such a manner that said central area is positioned inside of said third and fourth apertures; and

c) fixing said first laminated sub-structure to said second laminated sub-structure.

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**5,496,200**

**SEALED VACUUM ELECTRONIC DEVICES**

**Ming-Tzong Yang, Hsin Chu, and Hong-Tsz Pan, Chang-hua, both of, Taiwan, Prov. of China, assignors to United Microelectronics Corporation, Hsinchu, Taiwan, Prov. of China**

**Filed Sep. 14, 1994, Ser. No. 305,560**

**Int. Cl.[6] H01J** *1/30;9/02*

**U.S. Cl. 445—25** **23 Claims**

1. A method of manufacturing a sealed vacuum field emission device, comprising the steps of:

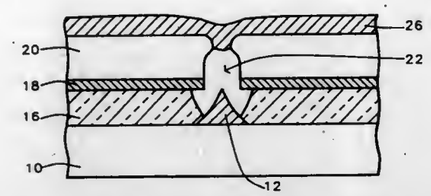
forming a field emitter tip on a silicon substrate;

forming a first dielectric layer over said field emitter tip and over said silicon substrate;

planarizing said first dielectric layer to provide a smooth top surface of said first dielectric layer that is co-planar with the top of said field emitter tip;

forming a grid metal layer over said first dielectric layer;





forming a second dielectric layer over said grid metal layer;

patterning said second dielectric layer to provide an opening, vertically located over said field emission device, to said grid metal layer;

patterning said grid metal layer in area defined by said opening;

removing said first dielectric layer in the region defined by said opening and also a portion of said first dielectric layer under said grid metal layer;

narrowing the upper portion of said opening; and

forming in a vacuum environment a second metal layer over said second dielectric layer and over said narrowed opening, whereby said field emitter tip is in a sealed vacuum.

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**5,496,201**

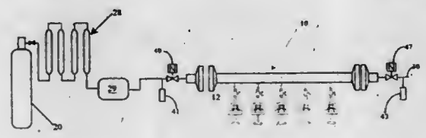
**EXTENDABLE EXHAUSTING ASSEMBLY FOR THE MANUFACTURE OF GAS DISCHARGE LAMPS**

**Ching-Hsien Hwang, Hsinchu, Taiwan, Prov. of China, assignor to Industrial Technology Research Institute, Hsinchu, Taiwan, Prov. of China**

**Filed Jun. 16, 1994, Ser. No. 261,368**

**Int. Cl.[6] H01J** *9/38*

**U.S. Cl. 445—38** **17 Claims**



1. A purging assembly for the manufacturing of gas discharge lamps containing a filler material sealed in a lamp envelope comprising:

(a) a manifold having first and second ends for connection to an inert gas supply piping system and a vacuum piping system, respectively;

(b) a branch tube connected to and in communication with said manifold;

(c) a purging connector for receiving said lamp envelope; and

(d) a filler valve connected between said branch tube and said purging connector so as to shield said lamp envelope from atmosphere when closed and allow a filler material to travel therethrough when opened, wherein said manifold is connected to said inert gas supply and said vacuum piping system via a pair of detachable joints, respectively, and each of said detachable joints comprises a pair of matching flanges.

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**5,496,202**

**FLYING GLIDER SYSTEM**

**Daniel L. Pons, 180 S. 1000 West, Provo, Utah 84601**

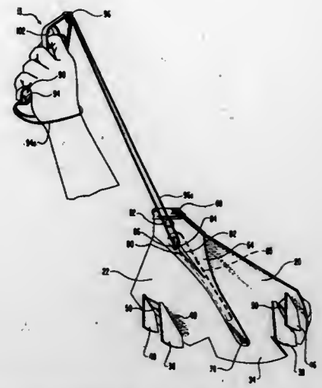
**Filed Apr. 15, 1994, Ser. No. 228,040**

**Int. Cl.[6] A63H** *27/14;27/00*

**U.S. Cl. 446—64** **7 Claims**

1. A toy flying glider system comprising

a launcher having an elongate handle with a rubber ban affixed to one end thereof and having a notch to receive a thumb and



an overhang turned back along and spaced from said handle to protect the thumb at said end to which said rubber band is affixed; and

a glider comprising a flat body with a nose section, a central body section extending from said nose section, oppositely disposed wing sections at opposite sides of said body section and a tail section extending from said body section; a hook projecting from said flat body to engage said rubber band, and two spaced apart pair of fins, with one pair of fins extending above and below one of said wings and the other pair of said fins extending above and below the other of said wings, and an flat tail fin spacer extending between each pair of fins extending above the wings and another flat tail fin spacer extending between each pair of fins beneath the wings, said tail fin spacers each being affixed to said wings.

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**5,496,203**

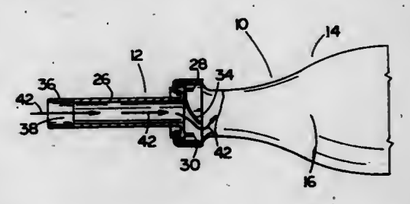
**BALLOON VALVE ASSEMBLY**

**Robert H. Murray, 52 Manor Hill Dr., Fairport, N.Y. 14450**

**Filed Mar. 25, 1994, Ser. No. 218,270**

**Int. Cl.[6] A63H** *3/06*

**U.S. Cl. 446—222** **23 Claims**



1. A balloon valve assembly for use in inflating balloons, the balloon valve assembly comprising:

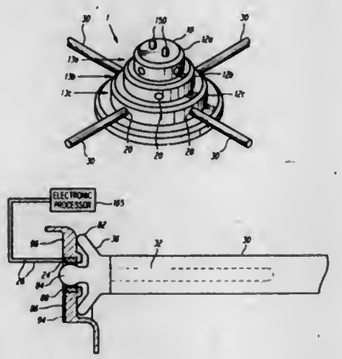
(a) a tube portion including a passageway therethrough, a first free end, and a second free end;

(b) a head portion adapted for insertion into the neck of an inflatable balloon, said head portion being connected to said second end of said tube portion and having a bottom wall forming a flange to said second end, an orifice through said bottom wall communicating with said passageway, and a side wall extending from said bottom wall and defining a substantially non-circular outer surface of said head portion, wherein said non-circular outer surface has a cross-sectional shape defined by a major axis and a minor axis, and wherein the ratio of the length of said major axis to the length of said minor axis is at least 1.2; and

(c) a valve flap member mounted to said bottom wall for sealing said orifice in said bottom wall.

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**5,496,204**
**ROTATING JUMPING APPARATUS**
**Rosalie E. Brown, Monterey; Geoffrey H. Willis, Berkeley, and Douglas M. Brown, Monterey, all of Calif., assignors to Outside Design Corporation, Monterey, Calif.**
**Filed Jul. 22, 1994, Ser. No. 279,230**
**Int. Cl.[6] A63H *1/00*; A63B *5/22***
**U.S. Cl. 446—236** **29 Claims**

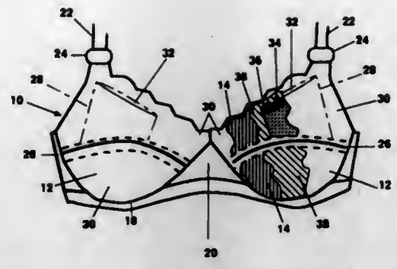


1. An apparatus comprising:
a base;
a hub rotatably attached to said base, said hub comprising a first cylindrical portion comprising a first circumference and a second cylindrical portion comprising a second circumference, said second cylindrical portion integral with and adjacent said first cylindrical portion, said first circumference greater than said second circumference;
a rotator mounted in said hub, said rotator drive in communication with said hub such that when said rotator drive rotates, said hub rotates;
at least one socket, said at least one socket disposed in said first cylindrical portion, said at least one socket comprising a flat surround;
a spring detent disposed in said at least one socket;
a switch disposed in said socket, said switch in communication with said rotator drive such that when said switch is in a first position, said rotator drive rotates and when said switch is in a second position, said rotator drive does not rotate, said switch biased to said second position; and
at least one arm, said at least one arm comprising a first end and a second end, said first end comprising a hilt comprising a circular lip and a ball, said at least one arm removably inserted in one of said at least one socket, said circular lip abutting said flat surround, said spring detent maintaining said ball in said at least one socket, said ball holding said switch in said first position.

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**5,496,205**
**BRASSIERE WITH CONCEALED CLOSABLE POCKETS**
**Lausanne Lee, P.O. Box 373, Denver, Colo. 80201**
**Filed Nov. 22, 1994, Ser. No. 358,488**
**Int. Cl.[6] A41C *3/00*; A41D *27/20***
**U.S. Cl. 450—89** **2 Claims**

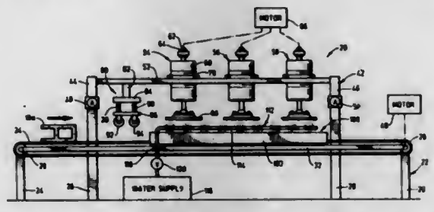
1. A combination brassiere with concealed closable pocket openings in each cup section for carrying small valuables, which are normally carried in a handbag or purse comprising:



a brassiere formed of a front-outer lining, an intermediate padded lining, a rear-outer lining, and pocket deposed between said intermediate padded lining and the rear-outer lining;
said front-outer lining, intermediate padded lining and rear-outer lining are sewn together to form an upper and lower formation of said cup;
each of said linings include an upper edge in said upper formation of said cup;
each cup includes a pair of inside pockets; said inside pockets are positioned and attached to an upper seam of said intermediate padding lining and of said rear-outer lining adjacent said upper edge;
the said pockets include confronting edges adjacent said upper edges; and fastening means for securing the confronting edges together; and
the pocket is constructed of flexible material attached to said intermediate padded lining and the rear-outer lining for concealed visibility from the front view of the brassiere.

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**5,496,206**
**BUILDING BLOCK FACE ENHANCEMENT APPARATUS**
**Thomas D. Young, 3235 W. Greenridge Dr., Tucson, Ariz. 85741**
**Filed Nov. 14, 1994, Ser. No. 338,338**
**Int. Cl.[6] B24B *7/06*; B28D *1/24***
**U.S. Cl. 451—260** **9 Claims**



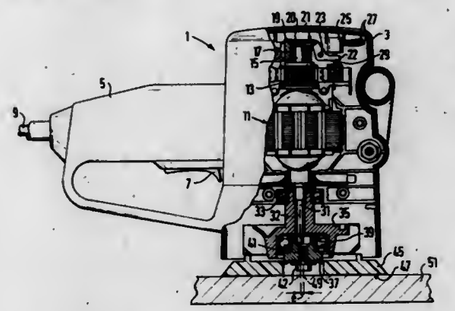
1. A face enhancing apparatus for masonry building blocks comprising:
a conveyer system for transporting masonry building blocks along a predetermined path;
a frame for supporting said conveyer system at a convenient height and for supporting other elements of the apparatus;
a first spring biased element mounted to said frame for applying a downward force on a block being transported by said conveyer system;
a plurality of cutting disks adjustably mounted to said frame for removing a predetermined amount of material from a face of a block being transported by said conveyor system passed said disks;
a housing for each of said plurality of cutting disks for supporting said disks and for providing that the disks are adjustable in a vertical direction, each of said housings having a generally cylindrical shape with an outer surface having an external screw thread;



said frame including a plate positioned in a generally horizontal plane and having an opening for each of said housings for each of said plurality of disks, each of said openings being surrounded by a threaded surface where said threads of each of said surfaces correspond to the threads of each of said housings;
a lock nut for each of said housings with an inner surface having a thread corresponding to the screw thread on the housing for restraining rotation of said housing when in a locking position and for allowing rotation of said housing to provide for vertical adjustment when in a non-locking position;
a second spring biased element mounted to said frame for applying lateral forces on a block being transported by said conveyer system for restraining said block when it is moved passed said cutting disks;
motor means connected to each of said disks for causing said disks to rotate, and connected to said conveyer system for causing said conveyer system to move said blocks; and
a tube connected to said frame for directing a liquid to the regions of contact between said plurality of disks and said blocks.

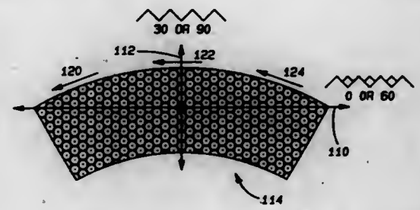
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**5,496,207**
**ORBITAL DISK GRINDER**
**Friedrich Hornung; Klaus Günther, both of Stuttgart; Bernd Upphoff, Leinfelden-Echterdingen, and Julian Pfaundler, Filderstadt, all of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany**
**PCT No. PCT/DE93/00157, § 371 Date Oct. 8, 1993, § 102(e) Date Oct. 8, 1993, PCT Pub. No. WO93/17828, PCT Pub. Date Sep. 16, 1993**
**PCT Filed Feb. 24, 1993, Ser. No. 133,025**
**Claims priority, application Germany, Mar. 4, 1992, 42 06 753.7**
**Int. Cl.[6] B24B *23/03***
**U.S. Cl. 451—357** **12 Claims**



1. An orbital disk grinder, comprising a housing; a grinding disk which can be applied to a working surface; a motor for moving said grinding disk so that said grinding disk gyrates in a circular orbit and simultaneously rotates about its axis; and speed control means operative for setting a speed of said grinding disk low when a normal force acting on the working surface is low, and high when the normal force acting on the working surface is high, so that an axial force acting on said grinding disk serves as a setting variable of said speed control means, said speed control means including a micro-switch which picks up the normal force acting on the grinding disk and as soon as the normal force acting on the grinding disk is smaller than a reference force, sets a lower speed, while as soon as the normal force acting on the grinding disk is larger than the reference force, it sets a higher speed.

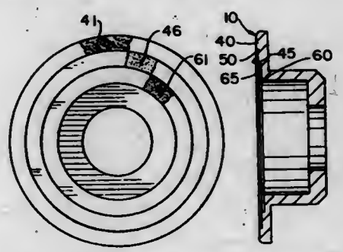
**5,496,208**
**GRINDING WHEEL**
**Charles E. Neff, 406 Ripple Creek, Houston, Tex. 77024**
**Continuation of Ser. No. 62,562, May 17, 1993, abandoned, which is a continuation-in-part of Ser. No. 952,682, Sep. 24, 1992, which is a division of Ser. No. 453,684, Dec. 20, 1989, Pat. No. 5,181,939. This application Jun. 7, 1995, Ser. No. 487,570**
**Int. Cl.[6] B23F *21/03***
**U.S. Cl. 451—541** **6 Claims**



1. A grinding wheel having an axis of rotation and a radially extending face concentric with said rotational axis, said radially extending face having a plurality of sectors, the improvement comprising:
a plurality of discrete abrasive elements disposed on each of said sectors, each of said elements being generally the same in size and shape and having a central axis,
the central axes of the elements of each of said sectors being aligned in generally parallel rows with the spacing between elements within a row being substantially uniform and the spacing between adjacent elements in one row being substantially the same as the spacing between adjacent elements in other rows,
said sector having two ends defined by two radials, wherein said two radials form an acute angle at the axis of rotation of said wheel.

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**5,496,209**
**BLADE GRINDING WHEEL**
**Jonathan P. Gaebe, 438 Woodlawn, St. Louis, Mo. 63119**
**Filed Dec. 28, 1993, Ser. No. 174,511**
**Int. Cl.[6] B24B *9/00*; B24D *7/14***
**U.S. Cl. 451—548** **4 Claims**

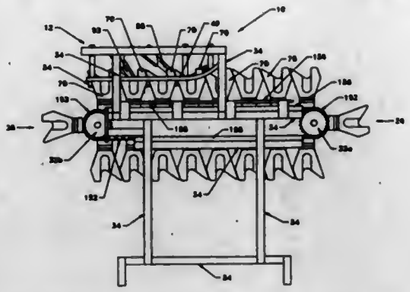


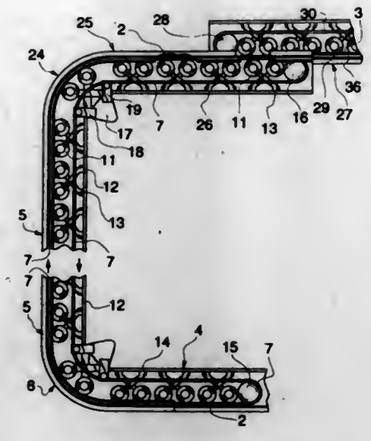
1. In a grinding wheel for sharpening the blades of automatic fabric cutting machines, said wheel having a metal hub and a rim integral with said bub and projecting radially from an edge of said hub, said rim having a radially extending outer face and abrasive grains bonded to said face, the improvement comprising a first outermost annular, radially planar surface along and extending radially inboard from a radially outer edge of said face, and, radially inwardly from said first outermost annular surface, a plurality of concentric annular radially planar surfaces, stepped axially inwardly successively from the radially outermost to the radially innermost.

## 5,496,210
## CONVEYORIZED WING PORTIONING SYSTEM

James F. Davis, 11976 Bells Ferry Rd., Canton, Ga. 30114

Filed Jan. 18, 1994, Ser. No. 183,191
Int. Cl.[6] A22C 21/00
U.S. Cl. 452—169 24 Claims





1. An apparatus for separating the bones of poultry wing portions comprising:

a guide block including a wing saddle portion;

a conveyor to which said guide block is attached;

a drive means for moving said conveyor to direct said guide block through a linear path;

an overhead support frame disposed above, at least, a portion of said linear path;

a blade disposed within said linear path, said blade being ultimately supported by said overhead support frame;

a blade adjustment means for adjusting the position of said blade relative to said guide block and wherein,

said blade adjustment means is connected between said blade and said overhead support frame, whereby said blade adjustably depends into said linear path, and

said blade adjustment means includes, at least,

a sleeve partially enclosing a first portion of said blade and from which a second portion of said blade depends, and

a blade retaining means for releasably retaining said first portion of said blade within said sleeve,

whereby said first portion of said blade enclosed by said sleeve is adjusted by sliding said blade relative to said sleeve upon sufficient release of said blade retaining means, and

whereby the depth of penetration of said blade relative to said guide block is adjusted; and

an elongated guide bar adjustably suspended from said overhead support frame and extending within said linear path, whereby said elongated guide bar restrains and positions different sizes of poultry wings;

whereby the wing portion of a bird supported on said wing saddle portion is moved along said linear path into engagement with said blade to effect separation of the wing portion;

whereby the horizontal position and depth of penetration of said blade are adjustable relative to said guide block to adjustably effect cutting of the wing portion.

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## 5,496,211
## DEVICE FOR VERTICALLY CONVEYING COINS

Gert Zimmermann, Berlin, Germany, assignor to F. Zimmermann & Co., Berlin, Germany

Filed Mar. 14, 1994, Ser. No. 213,242
Claims priority, application Germany, Mar. 15, 1993, 43 08 725.6
Int. Cl.[6] G07D 3/16
U.S. Cl. 453—3 9 Claims

7. Device for vertically delivering coins, comprising:

a lower horizontal guide;

a vertical guide;

an upper horizontal guide;

approximately arc-shaped deflection portions connecting said lower horizontal guide to said vertical guide and connecting said lower horizontal guide and said vertical guide to said upper horizontal guide, said guides and deflection portions defining guide paths with guide rails, the rails being arranged on both sides of said guide paths, spaced a distance which is greater than a diameter of the largest coins to be delivered;

feeding means for feeding the coins flatly one by one at the beginning of the lower horizontal guide;

transferring means for transferring the coins at the end of the upper horizontal guide;

a conveyor belt and rollers, said conveyor belt being guided around said rollers, said rollers being arranged at a spaced location from said deflection portions to define an essentially constant delivery gap of a thickness of the coins to be delivered; and

coin counting means for counting the coins for recognizing the value of and for counting the coins and/or for presorting and delivering the coins according to value and/or for sorting out foreign coins, said coin counting means being provided at the beginning of said lower horizontal guide and at the end of said upper horizontal guide.

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## 5,496,212
## COIN SORTING DEVICE

Heinz-Werner Meyer-Weingartner, Hollenbeck, and Heinz Rehfinger, Kammerbusch, both of, Germany, assignors to National Rejectors, Inc. Gmbh, Buxtehude, Germany

Filed Apr. 12, 1994, Ser. No. 226,757
Claims priority, application Germany, Apr. 24, 1993, 9306231 U
Int. Cl.[6] G07D 3/14
U.S. Cl. 453—4 30 Claims

11. A coin sorting device for sorting a plurality of coins as the coins pass through a coin chute, the device comprising:

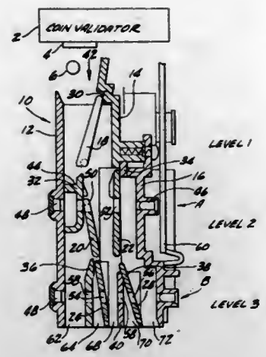
a coin flap located in the coin chute, the coin flap being movable between a first position and a second position;

means for moving the coin flap between the first and the second positions;

an emitter for passing a beam of light through the coin chute across a path of the coin and through the coin flap; wherein the coin flap is movable relative to the beam of light;

a detector for detecting the light emitted by the emitter after the light has passed through the coin chute and through the coin flap and for producing an output signal representative of the detected light, said output signal corresponding to the passage of the coin along the path and through the beam of light; and





a power supply for intermittently providing power to the means for moving the coin flap and including a control circuit responsive to the detector for inhibiting the power supply from providing power to the means for moving the coin flap as a function of the output signal representative of the light passing through the coin flap,

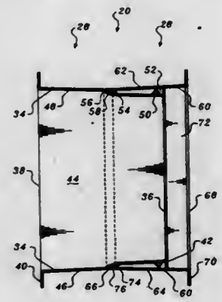
whereby the amount of power used by the means for moving the coin flap during operation of the coin sorting device is reduced.

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## 5,496,213
## FOUNDATION VENT

Barry K. Miller, Seattle, Wash., assignor to Noll Manufacturing Co., Richmond, Calif.

Continuation-in-part of Ser. No. 15,605, Feb. 9, 1993, Pat. No. 5,444,447. This application Nov. 22, 1993, Ser. No. 156,412
Int. Cl.[6] F24F 7/00
U.S. Cl. 454—271 14 Claims



1. Apparatus for creating an opening when forming concrete with forms, comprising:

(a) a first frame comprising:

(i) a first hollow body including a plurality of walls and having a first inner end and a first outer end;

(ii) a first flange surrounding said first outer end, said first flange including first means for attachment to the forms; and

(iii) at least one shoulder circumscribing at least a portion of an exterior surface of at least two of said plurality of walls of said first hollow body; and

(b) a second frame comprising:

(i) a second hollow body including a plurality of walls and having a second inner end and a second outer end, said second inner end having a perimeter larger than the perimeter of said first inner end of said first hollow body;

(ii) a second flange surrounding said second outer end, said second flange including second means for attachment to the forms; and

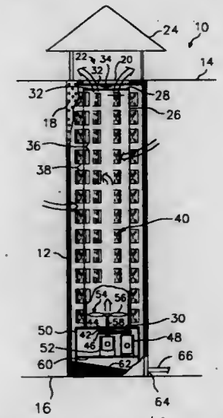
(iii) at least one ridge disposed around at least a portion of the inside of at least two of said plurality of walls of said second hollow body, said at least one ridge being shaped to engage said at least one shoulder of said first frame as said second inner end of said second frame is telescoped over said first inner end of said first frame.

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## 5,496,214
## APPARATUS FOR REMOVING SMOKE

Anthony Marcreigns, P.O. Box 205, Mangum, Okla. 73554

Filed Mar. 1, 1995, Ser. No. 396,667
Int. Cl.[6] F24F 7/007
U.S. Cl. 454—341 20 Claims



1. An apparatus for removing smoke, comprising:

an outer column having means for receiving the smoke therein;

an inner column rotatably disposed in said outer column;

wherein said inner column has means for collecting the smoke therein when said inner column is rotated; and

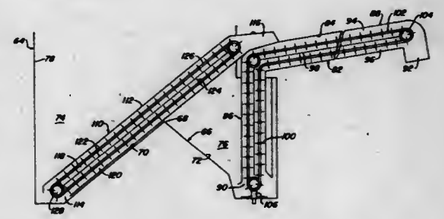
means for venting the smoke collected in said inner column.

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## 5,496,215
## UNLOADING SYSTEM FOR A COMBINE

Mark R. Underwood, Burr Oak, Kans., and Alan Van Nahmen, Columbus, Ind., assignors to Deere & Company, Moline, Ill.

Filed Sep. 1, 1994, Ser. No. 299,556
Int. Cl.[6] A01F 12/46
U.S. Cl. 460—114 16 Claims



1. In an apparatus having a mobile frame, an improved storage means for storing grain comprising in combination:

a grain bin mounted to the frame, the grain bin having a lower portion with a partition dividing the lower portion of the grain bin into two compartments;

a discharge conveyor mounted to the frame having a generally vertical lower section and a generally horizontal upper section, the discharge conveyor having an intake on the lower section which is in communication with one of the two compartments, the discharge conveyor having a discharge end located on the horizontal upper section remote from the intake for discharging grain from the grain bin; and

an auxiliary conveyor having an inlet in communication with the other of the two compartments and a grain outlet which opens into the upper section of the discharge conveyor for delivering grain from the other of the two compartments into the upper section of the discharge conveyor, the Upper section of the discharge conveyor transporting and discharging grain from said one of the two compartments and the auxiliary conveyor so that grain is unloaded from the grain bin.

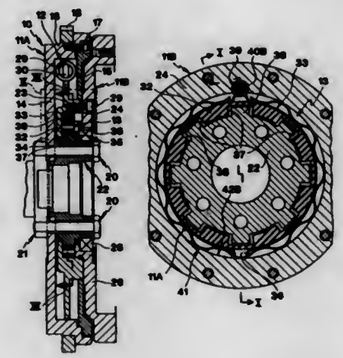
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**5,496,216**

## TORSION DAMPER WITH RESILIENT RADIAL ACTING SPRING

**Dieter Röhrle, Montmorency, and Ciriaco Bonfilio, Clichy, both of, France, assignors to Valeo, Paris, France**

**Filed Dec. 7, 1993, Ser. No. 162,615**
**Claims priority, application France, Dec. 7, 1992, 92 14707**
**Int. Cl.[6] F16D *3/52***
**U.S. Cl. 464—66** **10 Claims**



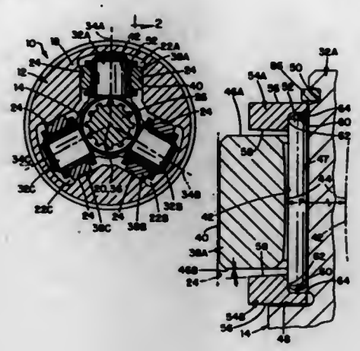
1. A torsion damper comprising: a primary part; a secondary part; means mounting the said primary and secondary parts coaxially with each other for relative rotation of said coaxial parts; resilient means disposed between the coaxial parts for resisting said relative rotation; and friction means operatively arranged between the said coaxial parts, wherein the said friction means comprises a radially acting friction ring in the form of a sleeve, meshing with a first one of the coaxial parts and defining a clearance between itself and the first one of the coaxial parts, and a spacing ring coaxial with the said friction ring and mounted on the other of said coaxial parts, the spacing ring being in engagement with one of the outer and inner peripheries of the friction ring, wherein the spacing ring is a profiled leaf element and comprises a small local portion in local engagement around a peg carried by and anchored in the other one of said coaxial parts whereby the spacing ring is mounted on the other one of said coaxial parts for rotation therewith, said spacing ring being gripped between said peg and the other one of coaxial parts.

**5,496,217**

## STROKING CONSTANT VELOCITY UNIVERSAL JOINT

**Scott J. Perrow, and Jon N. Miller, both of Saginaw, Mich., assignors to General Motors Corporation, Detroit, Mich.**

**Filed Jul. 5, 1994, Ser. No. 270,553**
**Int. Cl.[6] F16D *3/205***
**U.S. Cl. 464—111** **4 Claims**



1. In a stroking constant velocity universal joint including

a shaft having a longitudinal centerline,

a spider on said shaft having three radial trunnions each defining a cylindrical bearing race symmetric about a corresponding one of three radial centerlines of said spider in a common plane perpendicular to said longitudinal centerline of said shaft,

three cylindrical drive rollers each including a pair of planar ends and a bore therethrough, defined by an inner convex surface, said bore having a minimum diameter at the crown of said inner convex surface,

said drive rollers being disposed around respective ones of said radial trunnions with said inner convex surfaces thereof facing said cylindrical bearing races on said respective trunnions, and

a full complement of needle rollers on each bearing race whereby said drive rollers are supported on said respective radial trunnions for rotation about said corresponding radial centerlines and for tipping relative to said corresponding radial centerlines through a predetermined tipping angle,

the improvement comprising:

a pair of annular washers on each radial trunnion at opposite ends of said cylindrical bearing race thereon each including

a first side facing one of said planar ends of said corresponding drive roller and engageable thereon,

a second side opposite said first side, and

a counterbore in said first side having a side wall defining a cylindrical retaining surface around an end of said full complement of needle bearings the diameter of which is less than said minimum diameter of said inner convex surface in said corresponding drive roller and a bottom defining an annular retaining surface in a plane perpendicular to said corresponding radial centerline adjacent an end of said full complement of needle bearings, and

means on each of said radial trunnions operative to prevent dislodgement therefrom in said direction of said corresponding radial centerline of each of said pair of annular washers thereon.

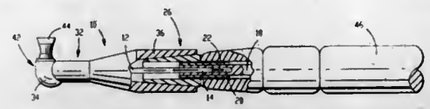


**5,496,218**

## COUPLING MEANS FOR THE DRIVE SHAFT OF PROPHY ANGLES

**George R. Brahler, Lawrence, Kans., assignor to Brahler Products, Inc., Lawrence, Kans.**

**Filed Aug. 22, 1994, Ser. No. 293,480**
**Int. Cl.[6] A61C *1/12*; F16D *1/104***
**U.S. Cl. 464—182** **7 Claims**



1. A coupling means for a drive shaft of prophy angles comprising:

an upper drive shaft assembly including a finger-type clutch, said finger-type clutch having the shape of a pointing finger;

a lower drive shaft assembly including a main drive shaft with a clutch receptacle located at one end of said drive shaft, and a drive shaft clamp, said clutch receptacle engagable by said finger-type clutch, said drive shaft clamp having an interior space engagable by said main drive shaft;

said main drive shaft with said clutch receptacle having an expansion slot extending from side to side through the center of the main drive shaft substantially along the length of the clutch receptacle;

said drive shaft clamp having an expansion slot extending from side to side through the center of the main drive shaft clamp, and substantially along the length of the drive shaft clamp;

said drive shaft clamp fitting over said clutch receptacle end of main drive shaft, said expansion slots being oriented perpendicular to each other; and

a coupled condition of said upper drive shaft assembly and said lower drive shaft assembly being created when said finger-type clutch engages said clutch receptacle by inserting said finger-type clutch into said clutch receptacle.

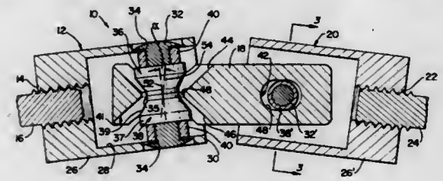
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**5,496,219**

## UNIVERSAL JOINT WITH DUAL ROLLERS

**William E. Anspach, Jr., Palm Beach Gardens, and Eddy H. del Rio, Royal Palm Beach, both of Fla., assignors to The Anspach Effort, Inc., Palm Beach Gardens, Fla.**

**Filed Oct. 19, 1993, Ser. No. 146,295**
**Int. Cl.[6] F16D *3/16***
**U.S. Cl. 464—119** **11 Claims**



1. A universal joint comprising:

link having a first and second apertures therethrough wherein each aperture tapers so that a cross sectional area of each aperture decreases with increasing distance from a surface of said link;

a first body having a first mechanism for connecting a first shaft thereto;

a first roller having a longitudinal axis and a conical surface wherein a diameter of the first roller decreases going along the longitudinal axis toward one end of said first roller;

a second roller having a longitudinal axis and a conical surface wherein a diameter of said second roller decreases going along the longitudinal axis toward one end of said second roller;

a first pin attached to said first body and extending through the first aperture in said link, and extending through said first and second rollers with the one end of said first roller adjacent the one end of said second roller;

a second body having a second mechanism for connecting a second shaft thereto;

a third roller having a longitudinal axis and a conical surface wherein a diameter of the third roller decreases going along the longitudinal axis toward one end of said third roller;

a fourth roller having a longitudinal axis and a conical surface wherein a diameter of said fourth roller decreases going along the longitudinal axis toward one end of said fourth roller; and

a second pin attached to said second body and extending through the second aperture in said link, and extending through said third and fourth rollers with the one end of said third roller adjacent the one end of said fourth roller.

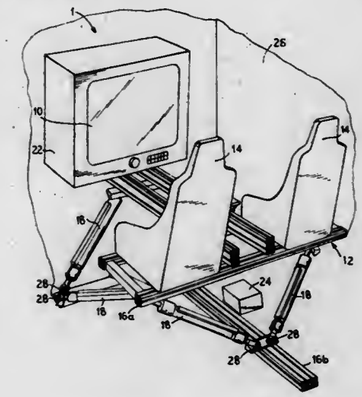
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**5,496,220**

## SENSORY SIMULATOR

**Brad Engstrand, 2658 N. Dayton, Chicago, Ill. 60614, assignor to Brad Engstrand, Chicago, Ill.**

**Filed Jun. 2, 1994, Ser. No. 253,094**
**Int. Cl.[6] A63G *31/16*; A63J *5/02***
**U.S. Cl. 472—60** **4 Claims**



1. A system for recording and playing back motion recorded on a medium, the system comprising:

a bracket with at least one seat mounted on the bracket;

a plurality of pneumatic cylinders mounted on a level base and extending to the bracket;

a controller selectively controlling supply and release of air to the plurality of pneumatic cylinders, the controller responsive to a signal on the medium wherein the signal is indicative of a desired position of the at least one seat and further corresponds to the recorded motion on the medium; and

a screen mounted on the bracket facing the at least one seat, the screen displaying an image recorded on the medium wherein the bracket has a first leg holding the at least one seat and a second leg, the second leg holding the screen.

5,496,221

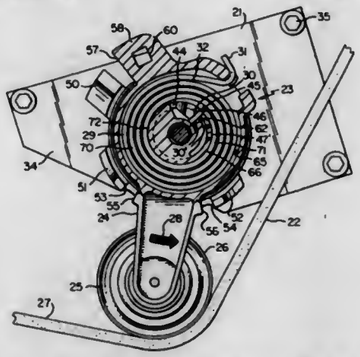
## BELT TENSIONING SYSTEM, BELT TENSIONER THEREFOR AND METHODS OF MAKING THE SAME

David E. Gardner, Royal Oak, and David B. Novak, Bloomfield Hills, both of Mich., assignors to Dayco Products, Inc., Dayton, Ohio

Division of Ser. No. 229,252, Apr. 18, 1994, Pat. No. 5,405,297, which is a division of Ser. No. 99,283, Jul. 29, 1993, Pat. No. 5,334,110, which is a division of Ser. No. 970,345, Oct. 30, 1992, Pat. No. 5,254,048, which is a division of Ser. No. 832,297, Feb. 7, 1992, Pat. No. 5,190,502. This application Jan. 27, 1995, Ser. No. 379,055

Int. Cl.[6] F16H 7/08

U.S. Cl. 474—135 10 Claims



1. In a belt tensioning system comprising a support means having an abutment means, an endless transmission belt construction carried by said support means and arranged to move in a certain path relative to said support means, an arm pivotally mounted to said support means, a pulley rotatably carried by said arm and being in engagement with said belt construction, and a wound coiled spring having opposed ends one of which is operatively interconnected to said abutment means of said support means and the other of which is operatively interconnected to said arm whereby the force of said wound coiled spring tends to pivot said arm in a direction that urges said pulley against said belt construction with a force that tensions said belt construction, the improvement wherein said arm has a shoulder means for being engaged by said one of said opposed ends of said wound coiled spring by the force of said wound coiled spring so as to permit removal of said arm and said wound coiled spring as a self-contained unit from said support means when said arm is pivoted to a certain position where said shoulder means of said arm engages said one end of wound coiled spring and effectively moves said one end of said wound coiled spring out of contact with said abutment means of said support means, said abutment means of said support means comprises an arcuate part of said support means and having a free end that is engageable with said one end of said wound coiled spring.

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5,496,222

## FRONT DERAILLEUR FOR A BICYCLE

Satoru Kojima, and Naohiro Nishimoto, both of Sakai, Japan, assignors to Shimano, Inc., Osaka, Japan

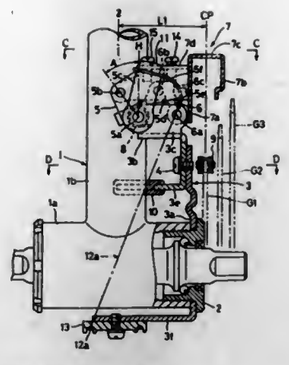
Filed Nov. 14, 1994, Ser. No. 337,861

Claims priority, application Japan, Nov. 12, 1993, 5-060911 U; Nov. 12, 1993, 5-283358; Nov. 12, 1993, 5-283359; Apr. 22, 1994, 6-084217; Apr. 22, 1994, 6-084218

Int. Cl.[6] F16H 9/00

U.S. Cl. 474—80 18 Claims

1. A front derailleur apparatus attachable to a frame of a bicycle and operable by an operating force transmitted through a control cable to shift a bicycle chain among a plurality of front chainwheels, comprising:



a fixed section fixed to said frame;

a chain guide for contacting said chain to shift said chain;

a movable section disposed above said fixed section and fixedly supporting said chain guide;

a first and a second links disposed between and pivotally connected to said fixed section and said movable section, said first and second links relatively movably connecting said movable section to said fixed section;

a cable connector fixed to said first link for securing said control cable; and

an auxiliary projection extending from said cable connector for contacting said control cable in a position substantially spaced from said cable connector.

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5,496,223

## LOAD SHIFT TRANSMISSION WITH STEPLESS HYDROSTATIC GEARING

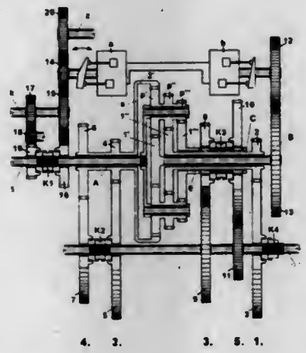
Friedrich Jarchow, Am Ruhrstein 37, 45133 Essen, Germany

Filed May 31, 1994, Ser. No. 251,695

Claims priority, application Germany, May 28, 1993, 43 17 763.8; Jul. 13, 1993, 43 23 358.9

Int. Cl.[6] F16H 47/04; B60K 17/06

U.S. Cl. 475—72 20 Claims



4. 3. 3. 5. 1.

1. A load shift transmission with stepless hydrostatic gearing comprising:

a five-shaft planetary gear transmission of which a first shaft (1) forms the input shaft, a second shaft (B) transmits rotary power and is operatively connected to the input shaft and through a first hydrostatic displacement machine, which along with a second displacement machine form a steplessly adjustable hydrostatic transmission, a third shaft (E) of the five-shaft planetary gear transmission functions as a slow-running coupling shaft, a fourth shaft (A) functions as a fast-running coupling shaft, and a fifth shaft (C) functions as a startup coupling shaft;

a stepped planetary gear arrangement mounted on a planet gear carrier and including a first planet gear section which meshes with a first sun gear and with a ring gear, a second planet gear stepped section which meshes with a second sun gear, and a third planet gear stepped section which meshes with a third sun gear, wherein the planet gear carrier is connected to the input shaft, wherein an extension of the first planet gear section forms the second shaft, wherein an extension of the second planet gear section forms the startup coupling shaft, wherein an extension of the ring gear forms the fast-running coupling shaft, and wherein an extension of the third planet gear section forms the slow-running coupling shaft; and

a first plurality of drive gears mounted on the fast running coupling shaft, a second plurality of drive gears operatively connectable to the slow running coupling shaft, and a third plurality of drive gears operatively connectable to the startup coupling shaft, the first, second and third plurality of drive gears being operatively connectable to an output shaft for alternately transferring the rotary power through gear shifting means for connecting a respective one of the plurality of drive gears to the output shaft of the load shift transmission, whereby at a predetermined position of the hydrostatic machine the changing of individual gear shifting means occurs without interruption of tractive power and at synchronous revolution velocities.



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5,496,224

## TORSIONAL VIBRATION DAMPER

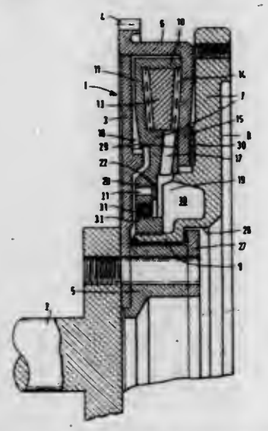
Ulrich Rohs, Roonstrasse 11, D-52351 Düren, and Dietmar Heidingsfeld, Aachen, both of, Germany, assignors to Ulrich Rohs, Düren, Germany

Filed May 20, 1994, Ser. No. 247,048

Claims priority, application Germany, Jun. 1, 1993, 43 18 165.1

Int. Cl.[6] F16D 31/04

U.S. Cl. 475—91 22 Claims



1. A device with a liquid medium for damping torsional vibration of a drive shaft, the device comprising:

a revolving, primary gear connected to the drive shaft and including bevel gear teeth;

a plurality of planetary gears, each having a central axis of revolution radially aligned with the drive shaft and a frusto-conical shape with a cross sectional area increasing in a direction away from the drive shaft; and

a driven, revolving secondary gear having a planetary gear carrier including a plurality of pockets formed therein for supporting said plurality of planetary gears devoid of axle journals in meshed connection with said bevel gear teeth,

said revolving primary gear and said plurality of planetary gears forming a gear pump for closed circulation of the liquid damping medium through pressure ducts, and

said primary gear and said secondary gear forming a sealed housing, including

(i) an intake space for containing the liquid damping medium,

(ii) means for controlling a flow rate of the liquid damping medium based on the number of revolutions per unit time, said control means being located between the intake space and the pressure ducts, and

(iii) means for eliminating pressure peaks.

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5,496,225

## VEHICLE SEAT ARTICULATIONS

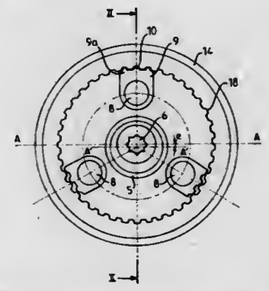
Georges Droulon, Saint Georges Des Groseillers, France, assignor to Bertrand Faure Automobile "BFA", Massy, France

Filed Jul. 22, 1994, Ser. No. 278,887

Claims priority, application France, Jul. 26, 1993, 93 09188

Int. Cl.[6] F16H 1/32

U.S. Cl. 475—177 1 Claim



1. A vehicle seat articulation, comprising: a fixed flange; a mobile flange; a cup member for enabling said mobile flange to execute an orbital movement causing an angular movement of said articulation; and a dish member for maintaining said mobile flange against said fixed flange; said cup member having two shoulders, a first one of said shoulders being off-centered by a predetermined distance with respect to a second one of said shoulders; said mobile flange having a plurality of semi-cut portions each formed with teeth; said dish member having an edge formed with outer teeth that cooperate with said teeth of said semi-cut portions; said teeth of said edge of said dish member and said teeth of said semi-cut portions, each having a height equal to twice said predetermined distance.

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5,496,226

## FRICTION DRIVE UNIT FOR RIDING LAWN MOWERS AND THE LIKE

Clair D. Splittstoesser; Donald P. Crosby; David G. Park, and Larry S. Funk, all of Coffeyville, Kans., assignors to Dixon Industries, Inc., Coffeyville, Kans.

Filed May 17, 1994, Ser. No. 243,966

Int. Cl.[6] F16H 15/20; B62D 11/12

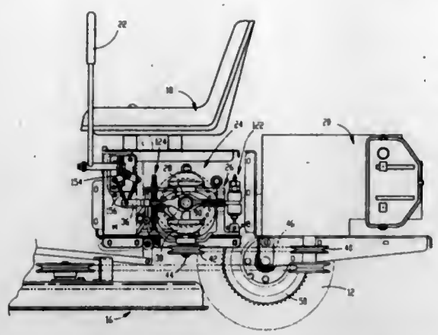
U.S. Cl. 476—24 17 Claims

1. A variable speed friction drive apparatus comprising:

a frame;

a pair of drive cones supported by the frame for rotation about a common first axis;

a carriage extending in a direction generally transverse to the first axis and including opposed first and second axial ends;



a drum supported by the carriage for rotation about a second axis extending in a direction transverse to the length of the carriage;

a carriage support means for supporting the carriage relative to the frame for movement between a neutral position in which the drum is disengaged from either of the cones and a plurality of driving positions in which the drum engages either of the cones,

the support means including a universal joint for connecting the first end of the carriage to the frame for universal pivotal movement about the joint, a first biasing means for biasing the first end of the carriage toward the neutral position, and a second biasing means for biasing the second end of the carriage toward the neutral position; and

a drive engaging means connected to the second end of the carriage for moving the carriage against the forces exerted by the first and second biasing means between the neutral and driving positions.

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**5,496,227**

## TORQUE CONTROL METHOD AND APPARATUS FOR INTERNAL COMBUSTION ENGINE AND MOTOR VEHICLES EMPLOYING THE SAME

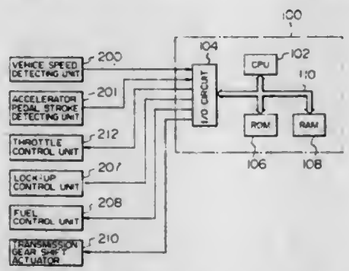
**Toshimichi Minowa, Ibaraki; Yoshishige Ohyama, Katsuta; Hiroshi Kimura, Katsuta; Naoyuki Ozaki, Katsuta; Takashi Shiraishi, Ibaraki, all of, Japan; Junichi Ishii, Novi, Mich.; Masahiko Ibamoto, and Hiroatsu Tokuda, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Continuation-in-part of Ser. No. 260,362, Aug. 2, 1994, which is a continuation of Ser. No. 936,005, Aug. 27, 1992, Pat. No. 5,343,781, which is a division of Ser. No. 686,527, Apr. 17, 1991, Pat. No. 5,150,635. This application Oct. 7, 1994, Ser. No. 319,719**

**Claims priority, application Japan, Apr. 18, 1990, 2-100321**

**Int. Cl.[6] B60K** *41/10;41/28*

**U.S. Cl. 477—62** **43 Claims**




1. A torque control method for an internal combustion engine of a motor vehicle, wherein a value of a desired drive shaft torque for said motor vehicle is determined on the basis of at least an accelerator pedal stroke for thereby controlling a drive shaft torque of said motor vehicle so as to assume said desired drive shaft torque by controlling a gear ratio of a transmission gear coupling an output shaft of said engine to at least a drive shaft of said motor vehicle on the basis of the value of said desired drive shaft torque as determined,

said method comprising the step of:

changing over procedures from one to other for determining a gear ratio of said transmission gear and a flow rate of intake air fed to said internal combustion engine in dependence on whether or not a torque transfer mechanism coupling the output shaft of said internal combustion engine to an input shaft of said transmission gear is in a lock-up state in which said output shaft and said input shaft are coupled directly without slip.

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**5,496,228**

## EVAPORATED FUEL CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE RESPONSIVE TO TORQUE REDUCTION DURING SHIFTING

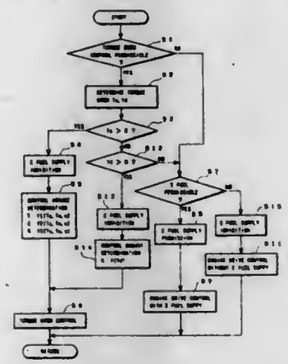
**Tetsuya Takata, Aki, and Kazuo Nilde, Hiroshima, both of, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan**

**Filed Jan. 25, 1994, Ser. No. 186,162**

**Claims priority, application Japan, Jan. 29, 1993, 5-014304**

**Int. Cl.[6] F02N** *25/00*

**U.S. Cl. 477—107** **14 Claims**



1. An evaporated fuel control system in a vehicle having an internal combustion engine having:

a cylinder;

a fuel supply system for supplying fuel into the cylinder; and

torque down control means for executing torque down control of said internal combustion engine at a predetermined condition,

the evaporated fuel control system comprising:

evaporated fuel supply means for trapping fuel evaporated from the fuel supply system and supplying the evaporated fuel into the cylinder; and

evaporated fuel supply control means for controlling the supply of evaporated fuel into the cylinder in accordance with the execution of torque down control.



**5,496,229**

## VALVE ACTUATOR RESPONSIVE TO GEAR SHIFT FOR REDUCING TORQUE SHOCK

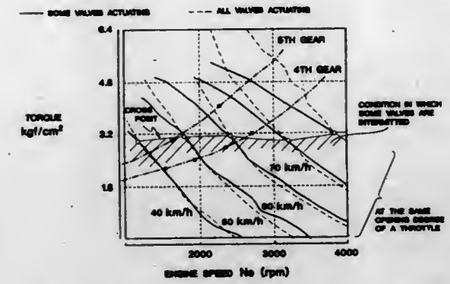
**Katsuhiko Miyamoto, Kyoto, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Mar. 26, 1993, Ser. No. 37,361**

**Claims priority, application Japan, Mar. 26, 1992, 4-068238**

**Int. Cl.[6] B60K** *41/06*

**U.S. Cl. 477—111** **12 Claims**




1. A valve moving apparatus for an internal combustion engine comprising:

control means for switching at least one valve of a cylinder by controlling a driving condition of an intake/exhaust valve in accordance with a driving condition of the internal combustion engine,

load detecting means for detecting a load applied to the internal combustion engine,

switch control means for outputting a switch signal to said control means so as to reduce number of actuating valves at a time when the load becomes equal or lower than a predetermined level and to increase number of actuating valves at a time when the load becomes higher than said predetermined level, and

gear shift detecting means for detecting a gear shift in a gearbox,

wherein in the event that said gear shift detecting means detects a relatively low gear shift, said switch control means changes said predetermined level to another predetermined level lower than said predetermined level.

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**5,496,230**

## CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION

**Masahiko Ando, Okazaki; Yoshihisa Yamamoto, Nishio; Akira Fukatsu; Mamoru Niimi, both of Anjo; Masato Kaigawa, Toyota; Hidehiro Oba, Aichi; Hiromichi Kimura, Okazaki; Yasuo Hojo, Nagoya; Atsushi Tabata, Okazaki, and Kunihiro Iwatsuki, Toyota, all of, Japan, assignors to Aisin AW Co., Ltd., and Toyota Jidosha Kabushiki Kaisha, both of, Japan**

**PCT No. PCT/JP94/00166, § 371 Date Nov. 28, 1994, § 102(e) Date Nov. 28, 1994, PCT Pub. No. WO94/18024, PCT Pub. Date Aug. 18, 1994**

**PCT Filed Feb. 4, 1994, Ser. No. 318,896**

**Claims priority, application Japan, Feb. 8, 1993, 5-019996**

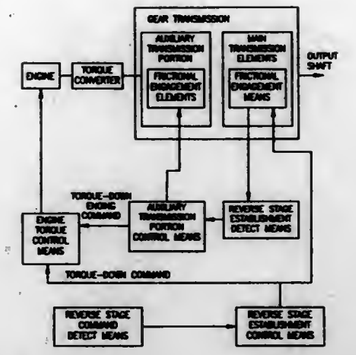
**Int. Cl.[6] B60K** *41/06;* **F16H** *61/00*

**U.S. Cl. 477—111** **1 Claim**

1. A control system for an automatic transmission, comprising a gear transmission unit for establishing a predetermined gear stage by applying a plurality of frictional engagement elements selectively, wherein said gear transmission unit includes a main transmission portion capable of establishing at least a reverse gear stage, and an auxiliary transmission portion capable of switching a high gear stage and a low gear stage, and wherein said auxiliary transmission portion is set to the high gear stage at the shifting time to the reverse gear stage,

wherein the improvement comprises:

means for detecting generation of a command for shifting to the reverse gear stage;




reverse stage establishment control means for establishing the reverse gear stage by controlling the application of predetermined ones of said frictional engagement elements of said main transmission portion when the reverse stage shifting command is generated;

engine torque control means for executing a torque-down of an engine at the time of controlling the engagement of said frictional engagement elements for establishing the reverse gear stage;

means for detecting establishment of the reverse gear stage in said main transmission portion;

means for setting said auxiliary transmission portion to the high gear stage by controlling the applications of predetermined ones of said frictional engagement elements of said auxiliary transmission portion in response to the detected output of said means;

means for detecting a shift of said auxiliary transmission portion to the high gear stage; and

means for sending a signal to end the engine torque-down to said engine torque control means in response to the detected output of said detecting means.

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**5,496,231**

## HYDRAULIC CONTROL FOR A MULTI-SPEED POWER TRANSMISSION

**James R. Eaton, Carmel, Ind., assignor to General Motors Corporation, Detroit, Mich.**

**Filed Sep. 22, 1994, Ser. No. 310,448**

**Int. Cl.[6] F16H** *61/18;61/12*

**U.S. Cl. 477—126** **2 Claims**

2. In combination, a multi-speed transmissions and control comprising:

fluid operated friction means for providing at least four forward speed ratios and a reverse speed ratio;

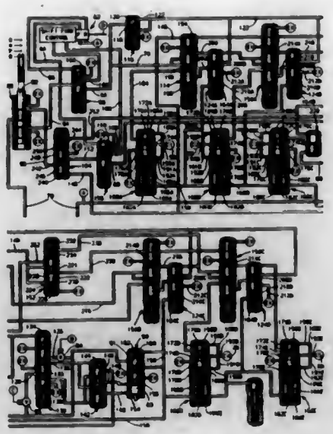
governor means for normally providing governor pressure proportional to vehicle speed;

shift valve means for controlling the establishment of the second through fourth forward speed ratios sequentially in accordance with the governor pressure from the governor means;

selector valve means for selecting a forward drive, a reverse drive and a neutral condition;

inhibitor valve means continuously communicating with said governor means for normally preventing the establishment of the reverse speed ratio if the governor pressure provided by the governor means is above a predetermined level: and

valve means responsive to governor pressure for directing a signal to said inhibitor valve means for preventing the inhibit valve means from operating and for preventing the shift valve means from establishing the fourth forward speed ratio when the selector valve is in neutral and the governor pressure is elevated.

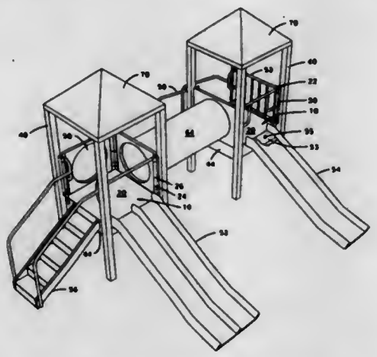


5,496,232

## MODULAR PLAYGROUND EQUIPMENT SYSTEM

Denny W. Morris, 174AA Burney Mountain Rd., Falkville, Ala. 35622, and David W. McNutt, Rte. 4, Box 84A, Tapecott Rd., Hartselle, Ala. 35640

Filed Oct. 31, 1994, Ser. No. 331,987
Int. Cl.[6] A63B 9/00
U.S. Cl. 482—35 10 Claims



1. A module assembly mechanism for connection of a variety of playground equipment modules comprising:

a platform including a base portion, a floor portion covering said base portion said base having a plurality of connector means disposed in spaced apart relation around the periphery of said platform and adapted for attachment to one of said playground equipment modules;

a plurality of upstanding columns each attached at one end thereof to said base portion and adapted at the other end thereof for attachment to at least one of said playground modules;

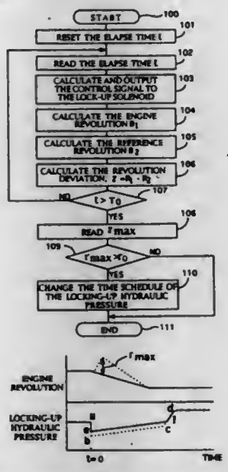
an upstanding stanchion attached to each of said columns, each said stanchion extending downwardly a predetermined distance from said platform so as to provide leg supports for said platform.

5,496,233

## CONTROL DEVICE AND A METHOD FOR CONTROLLING AND RESETTING A LOCK UP HYDRAULIC PRESSURE SCHEDULE FOR SUBSEQUENT GEAR SHIFTINGS IN AN AUTOMATIC TRANSMISSION

Toshiaki Ishiguro, Aichi, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Aug. 31, 1994, Ser. No. 298,404
Claims priority, application Japan, Sep. 1, 1993, 5-217746
Int. Cl.[6] B60K 20/00; F16H 45/02
U.S. Cl. 477—169 3 Claims




1. In a lock-up hydraulic pressure control device of an automatic transmission comprising:

means for memory storing a schedule of hydraulic pressures with respect to time from the beginning of shift operation to the end;

a control means for controlling a looking-up hydraulic pressure in accordance with said schedule to be provided to a lock-up clutch of a hydrodynamic torque converter said automatic transmission and an engine,

the improvement comprising

a second means for storing a time schedule of reference engine

means for detecting engine speeds during said shift operation;

means for determining the differences between said detected engine speeds and said reference engine speeds;

pressure control means for resetting said hydraulic pressure in said schedule for subsequent shifts at higher pressures than the former pressures if a difference between engine speeds and reference engine speeds exceeds a certain given limit during said shift operation.

5,496,234

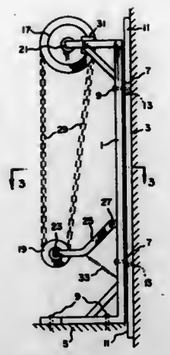
## ENDLESS ROPE EXERCISE DEVICE

Marino Sussich, Werribee, Australia, assignor to Creswin Pty. Ltd., Victoria, Australia

PCT No. PCT/AU93/00149, § 371 Date Oct. 26, 1994, § 102(e) Date Oct. 26, 1994, PCT Pub. No. WO93/22003, PCT Pub. Date Nov. 11, 1993
PCT Filed Apr. 6, 1993, Ser. No. 325,357
Claims priority, application Australia, Apr. 28, 1992, PL2094; Nov. 25, 1992, PL6015
Int. Cl.[6] A63B 21/018
U.S. Cl. 482—37 5 Claims

1. An exercise device comprising frame means, a wheel mounted to said frame means, a second wheel mounted to said frame means spaced from said first wheel, and an endless rope, or cord, passing over the wheels, the spacing of said wheels keeping the rope, or cord, taut, means for applying friction to one of said wheels mounted to said frame means which will apply a restraint to the rope, or cord, which must be overcome by an exercising person pulling on the rope, or cord, and wherein said frame means is rotatably mounted to a sub-frame by a central pivot support for rotation relative to said sub-frame only about said central pivot support, said sub-frame being for supporting said device by said frame means relative to a floor and wherein locking means is provided to permit a desired angle of rotation of said sub-frame about said central pivot support to be held for particular arm related exercises, said mounting by said central pivot support permitting rotation so said rope, or cord, between said first wheel and said second wheel can extend between vertically and horizontally extending user operable positions.



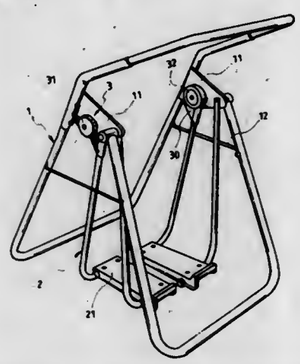


5,496,235

## WALKING EXERISER

Clive G. Stevens, 372 Hills Borough Road, Auckland, New Zealand

Filed Aug. 4, 1995, Ser. No. 511,178
Int. Cl.[6] A63B 2200
U.S. Cl. 482—51 3 Claims



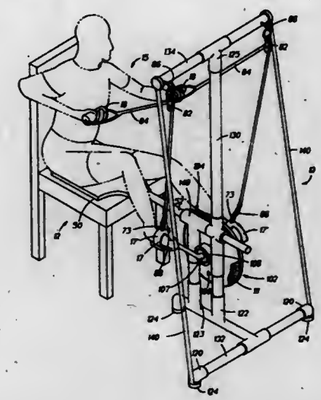
1. A walking exerciser comprising a frame structure having two board members on two sides and a handle member for a user to grip and two sets of swinging support members pivotally mounted on said board members of said frame structure, said exerciser being characterized in that each set of swinging support members includes two swinging support members pivotally mounted on said board members by two pivots on upper ends of the swinging support members and a step pedal pivotally mounted on lower ends of said swinging support members by two pivots on the lower ends of the swinging support members.

5,496,236

## PHYSICAL THERAPY APPARATUS

Robert B. Buonaulto, 6335 Rambling Rd., Newport richey, Fla. 34653

Filed Aug. 1, 1994, Ser. No. 283,512
Int. Cl.[6] A63B 21/04
U.S. Cl. 482—57 14 Claims



1. A physical therapy apparatus adapted to be used by persons seated on any conventional chair comprising a ground engaging frame, a seat coupling member comprising a flange portion for frictional engagement with the seating surface of said chair and an elongated extension for interengaging with said frame to retain said frame and chair in a predetermined spatial relationship for performing workout routines from a seated position on said chair, a pair of handgrips and a pair of foot pedals movably supported by said frame, each of said foot pedals connected to a rotatable member disposed between said foot pedals, and a pair of flexible motion transmitting cables, each of said cables being connected at one end thereof to one of said foot pedals and at the other end, to one of said handgrips for interconnecting each of said foot pedals to each of said handgrips, said frame including a second portion which extends to a level substantially higher than said foot pedals and said seat coupling member, and guide means disposed on the second portion of said frame which is adapted to receive said cables thereon to define a first free span of said cable from each foot pedal to said guide means and a second free span of each cable from said guide means to each handgrip whereby when said cables are in tension, as by applying a force to said handgrips while operating said pedals, the second free span of each of said cables may be operated at various oblique angles in relation to the first free span to enable aerobic exercises of the upper and lower body simultaneously by using said apparatus while in a seated position.

5,496,237

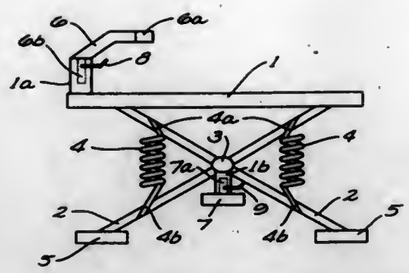
## BICYCLE TRAINING APPARATUS

Stanley A. Hensley, 2551 Driftwood, Pueblo, Colo. 81005

Filed May 8, 1995, Ser. No. 436,888
Int. Cl.[6] A63B 69/16; A63G 17/00
U.S. Cl. 482—57 20 Claims

1. An exercise apparatus comprising:

a) a frame having a front portion, a middle portion, and a rear portion, said frame supporting a seat in an upper part of said




middle portion and further supporting at least one footrest on each side of said frame in a lower part of said middle portion;

b) a handlebar means mounted to an upper part of said front portion of said frame;

c) at least two legs supporting said frame, each of said legs having a first and second end, said first end rotatably attached to said frame, said second end for contact with a ground surface, each of said legs oriented in a diagonal direction wherein the first end of each of said legs is connected to said frame at a common mounting mechanism; and,

d) at least two expansion means, each expansion means connected to said frame and to one of said at least two legs, said expansion means expanding each of said legs to their extended positions.

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**5,496,238**

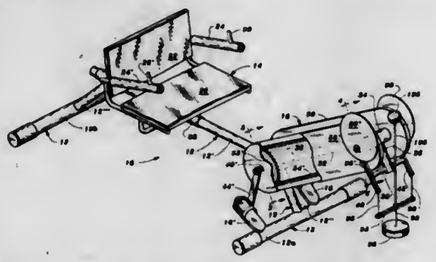
**PHYSICAL CONDITIONING APPARATUS**

**Douglas B. Taylor, 5041 Clayton Rd., Concord, Calif. 94521**

**Continuation-in-part of Ser. No. 979,640, Nov. 19, 1992, abandoned. This application Aug. 19, 1993, Ser. No. 109,975**

**Int. Cl.[6] A63B *22/06***

**U.S. Cl. 482—63** **4 Claims**



3. Physical conditioning apparatus, comprising:

a frame;

a crankshaft operationally connected to said frame;

first movable means mounted on said crankshaft for continuous rotational movement, each complete rotation of which includes an upstroke movement, during which said first movable means moves upward, and a downstroke movement, during which said first movable means moves downward;

second movable means mounted on said crankshaft for continuous rotational movement, each complete rotation of which includes an upstroke movement, during which said second movable means moves upward, and a downstroke movement, during which said second movable means moves downward;

first attaching means for attaching the left foot of a human user to said first movable means;

second attaching means for attaching the right foot of a human user to said second movable means;

first resistance producing means for producing net downstroke opposing force during each downstroke of said first movable means, and for producing net upstroke opposing force during each upstroke of said first movable means;

second resistance producing means for producing net downstroke opposing force during each downstroke of said second movable means, and for producing net upstroke opposing force during each upstroke of said second movable means; and

body supporting means for supporting the body of said human user in such a position that said human user's feet can move said movable means upward and downward;

the net downstroke opposing force applied to said first movable means during one downstroke thereof being less than the net upstroke opposing force applied to said first movable means during the following upstroke thereof, and the net downstroke opposing force applied to said second movable means during one downstroke thereof being less than the net upstroke opposing force applied to said second movable means during the following upstroke thereof; and

said first movable means and said second movable means being independently movable by the action of said human user's left and right feet, respectively.

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**5,496,239**

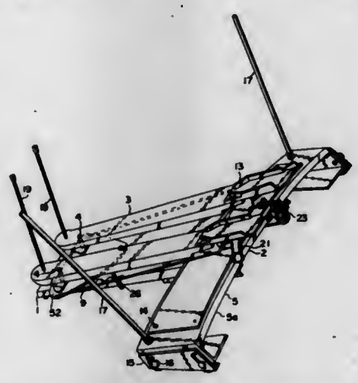
**EXERCISE AND SKI SIMULATING DEVICE**

**Robert Kallman, 506 Gregory Ave., Weehawken, N.J. 07087; Mark Plotnick, 147-11 16th Rd., Whitestone, N.Y. 11357, and Burton A. Weinstein, 4 Windward La., City Island, N.Y. 10464**

**Filed Sep. 16, 1993, Ser. No. 122,789**

**Int. Cl.[6] A63B *69/18***

**U.S. Cl. 482—71** **30 Claims**



1. An exercise or ski simulating device comprising, in combination:

(a) a front assembly means;

(b) a back track connected by attachment means to said front assembly means;

(c) first and second simulated skis pivoted at their forward ends to said front assembly means and extending rearward over said back track;

(d) first and second truck means each attached beneath a rear end of a respective one of said first and second skis, said first and second truck means movably resting upon said back track;

(e) tie-bar means attached to said first and second skis for adjusting the rear separation of said first and second skis, said tie-bar means being slideably connected to sleeves pivotally attached beneath said first and second truck means and said tensioning means connecting said front assembly means to said sliding tie-bar means, permitting simultaneous independent lateral spreading and arc type movements with single control resistance to both.



**5,496,240**

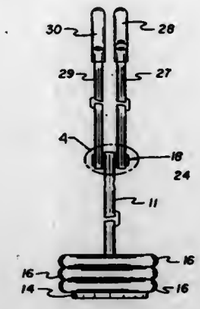
**ARM EXERCISE DEVICE**

**Tony E. Damm, 111 W. Union, Mount Sterling, Ill. 62353**

**Filed Jan. 30, 1995, Ser. No. 380,699**

**Int. Cl.[6] A63B *21/075***

**U.S. Cl. 482—93** **3 Claims**




1. A hand-held type arm exercise device, comprising,

a central rod, the central rod having a rod first end spaced from a rod second end, and a support plate, the support plate having securement means cooperatively mounted to the support plate for selective securement of the central rod second end to the support plate, and

at least one resistance plate arranged for reception onto the support plate about the central rod,

a pivot axle directed orthogonally through the central rod adjacent the central rod first end, with a first handle rod pivotally mounted to the pivot axle on a first side of the central rod, and a second handle rod pivotally mounted to the pivot axle adjacent the second side of the central rod, with the first handle rod having a first arcuate handle, and the second handle rod having a second arcuate handle for ease of manual grasping of the first handle and the second handle.

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**5,496,241**

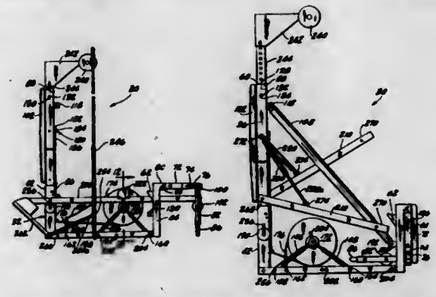
**EXERCISE MACHINE**

**Tyrone D. Sellers, 1409 Columbia Ter., Peoria, Ill. 61606**

**Filed Jul. 25, 1994, Ser. No. 279,911**

**Int. Cl.[6] A63B *22/00;21/015;69/06;69/18***

**U.S. Cl. 482—51** **20 Claims**



1. An exercise machine operable in a first mode for simulating an activity such as skiing or rowing involving reciprocating linear motion in a generally horizontal plane, and in a second mode for simulating climbing steps, said machine comprising:

a frame;

a pair of elongate members, each having a longitudinal axis;

said elongate members functioning as a pair of runners when the exercise machine is operated in said first mode, the runners being mountable on the frame generally parallel to one another for linear reciprocating movement in a generally horizontal plane along the longitudinal axes of the runners between forward and rearward positions; and

at least a part of each of said elongate members functioning as a step when the exercise machine is operated in said second mode, each step having a stepping surface generally adjacent a first end of the step, each step being pivotably connectable to the frame for pivoting about a generally horizontal axis to enable a user to move the stepping surface between raised and lowered positions, and for restricting each step from linear reciprocating movement in the generally horizontal plane along the longitudinal axis of each elongate member, the generally horizontal axis being stationary relative to the frame as the stepping surface is moved between its raised and lowered positions.

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**5,496,242**

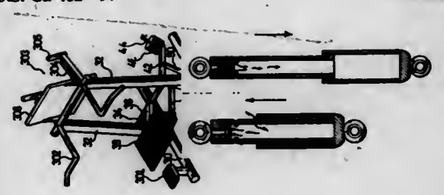
**PULL-UP EXERCISING MACHINE WITH SAFETY AIR BUFFER**

**Leao Wang, Taichung Hsien, Taiwan, Prov. of China, assignor to Greenmaster Industrial Corp., Toupien Tsun Taiping Hsiang, Taiwan, Prov. of China**

**Filed Jan. 21, 1994, Ser. No. 183,766**

**Int. Cl.[6] A63B *23/12***

**U.S. Cl. 482—97** **3 Claims**



1. A pull-up exercising machine comprising:

a) a base frame;

b) an upright frame including a pair of spaced vertical legs supported on and extending upwardly from the base frame;

c) a rotatable axle transversely mounted to the upright frame between the vertical legs;

d) a first supporting rod extending perpendicularly from the middle of the axle and a second supporting rod extending perpendicularly from an end of the axle, the first and second supporting rods extending in substantially opposite directions from the axle;

e) a platform hinged to the first supporting rod and a weight holder mounted on the second supporting rod;

f) a pair of connecting arms including a first pair of ends pivotally connected to the platform and a second pair of ends pivotally connected to the vertical legs of the upright frame for maintaining the platform in a constant horizontal position;

g) whereby downward pressure applied to the platform by a user causes a corresponding rotation of the axle about its axis in a first direction to lift the weight holder, and when pressure is released from the platform by the user, the axle is caused to rotate about its axis in a reverse direction to lower the weight holder; and

h) a retracting air cylinder mounted between the second supporting arm and the base frame for gradually resisting the lowering of the weight holder when pressure is released from the platform by the user, wherein the retracting air cylinder includes:

i) a hollow cylindrical casing including a closed first end secured to the second supporting arm at the middle thereof, an open second end, an internal annular groove at the second end, and a locating ring disposed within the annular groove;

ii) a hollow inner tube slidably received within the casing for retraction therein and extension therefrom, the tube including a first end disposed within the casing, an exterior annular flange at the first end for engaging the locating ring to limit the extension of the tube from the casing, a plurality of air holes longitudinally spaced along the tube, an open second end, a movable blocking plate disposed within the second end, the blocking plate including an air hole therethrough, an annular inwardly directed projection at the second end for limiting the inward movement of the blocking plate, a plug cap secured to the second end and having an air hole therethrough, and the second end being connected to the base frame; and

iii) wherein, when the weight holder is raised, the tube extends from the casing and causes the blocking plate to engage the annular projection for permitting outside air to pass through the air holes of the plug cap and blocking plate and into the inner tube, and when the weight holder is lowered, the blocking plate is moved against the plug cap for blocking the air holes of the blocking plate and the plug cap, thereby permitting air from the inner tube to be exhausted through the longitudinally spaced holes, for resisting the downward movement of the weight holder.

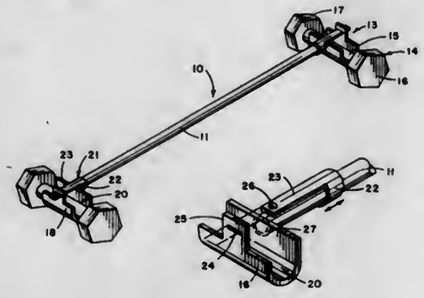
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**5,496,243**

**BARBELL USING DUMBBELLS AS WEIGHT**

**D. Mason Allen, 9202 Beauclerc Circle West, Jacksonville, Fla. 32257**

**Filed Nov. 21, 1994, Ser. No. 343,338**
**Int. Cl.[6] A63B** *21/072*
**U.S. Cl. 482—106** **5 Claims**




1. A weight lifting bar comprising:

an elongated cylindrical lifting bar;

a bracket attached to each end of said elongated cylindrical bar, each bracket having an elongated slot extending transversely to said lifting bar and each bracket having a latching cover over said elongated slot, said latching cover having a collar slidably mounted on said elongated cylindrical lifting bar whereby said latching cover can slide over said elongated slot; and

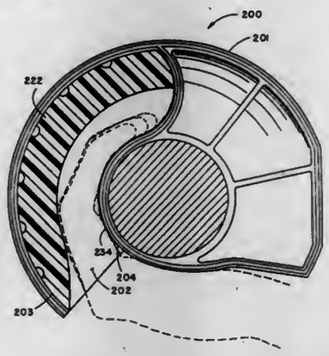
a pair of dumbbells each having a handle bar portion between a pair of weighted ends, said handle bar portion being sized to fit into said bracket elongated slot and to be removably latched therein, whereby a pair of dumbbells are used as weights for a barbell.

**5,496,244**

**HAND-HELD WEIGHT NOT REQUIRING FORCEFUL GRIP**

**Scott Caruthers, Millersville, Md., assignor to DAR Products Corporation, Baltimore, Md.**

**Division of Ser. No. 846,901, Mar. 6, 1992, Pat. No. 5,302,165, which is a division of Ser. No. 470,616, Jan. 26, 1990, Pat. No. 5,139,472, which is a continuation-in-part of Ser. No. 241,297, Sep. 9, 1988, Pat. No. 4,896,880, which is a continuation-in-part of Ser. No. 94,794, Sep. 14, 1987, Pat. No. 4,813,669. This application Feb. 28, 1994, Ser. No. 203,015**
**Int. Cl.[6] A63B** *21/072*
**U.S. Cl. 482—108** **9 Claims**




1. An exercise device comprising a substantially spherical relatively thin-walled rigid housing, the housing having an opening formed therein through which the hand of the user may be inserted, the opening being formed substantially tangentially of the housing, the opening being defined by a pair of walls in the device and including an inner wall and an outer wall, an insert being attached to the outer wall in the opening between the inner wall and the outer wall, whereby the user's hand is substantially curved around the inner wall and the back of the user's hand rests substantially on the insert, and a weight means disposed substantially centrally in the device such that a forceful grip of the user's hand on the weight means is not necessary, and such that the necessity for employing the user's conjunctive adjoining muscles is substantially reduced, thereby substantially reducing the tendency to detract from the development of the user's targeted muscle.

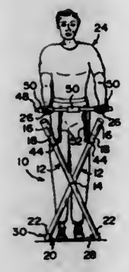
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**5,496,245**

**UPPER BODY EXERCISING APPARATUS**

**Carlyle J. Du Verney, 138-11 244th St., Rosedale, N.Y. 11422**

**Filed Sep. 21, 1994, Ser. No. 309,729**
**Int. Cl.[6] A63B** *21/02*
**U.S. Cl. 482—126** **5 Claims**




1. An upper body exercising apparatus comprising:



a) a pair of elongated tubular handles each having a first end, a second end, a center portion, pivoted together in the center portion thereof;

b) a pair of hand grips one of said hand grips affixed to the first end of one of said handles and the other of said hand grips affixed to the other of said handles;

c) means for biasing the second ends of said handles towards each other, wherein a person can grasp said hand grips by the hands and pull said hand grips away from each other to tone and build up the upper body and arm muscles, said biasing means includes an elastic band, and means for securing opposite ends of said elastic band to the second ends of said handles, wherein when said hand grips are pulled apart said elastic band will stretch to cause an opposite positive force on said hand grips;

d) a tubular cylindrical bar;

e) three hand grips, two of said hand grips located on opposite ends of said bar and said third hand grip located in the middle of said bar;

f) a pair of eye bolts, each extending transversely through said bar on opposite sides of said third hand grip;

g) a pair of nuts, each threaded onto one said eye bolt;

h) a pair of eye hooks, each engaging transversely with the first end of one said handle: and

i) a pair of additional elastic bands, opposite ends of each said additional elastic band can be secured to one said eye bolt and one said eye hook, wherein a person exercising can stand on said elastic band between the second ends of said handles, grasp said two hand grips on said bar and pull up to exercise.

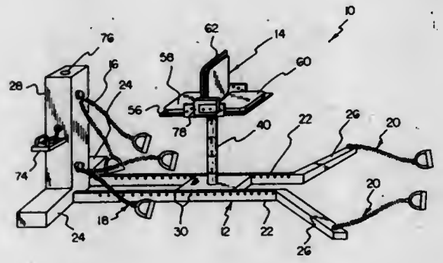
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**5,496,246**

**RESILIENT TENSION EXERCISE APPARATUS**

**Yves J. Pierre, 120 Ellery Ave., Newark, N.J. 07106**

**Filed Dec. 12, 1994, Ser. No. 354,469**
**Int. Cl.[6] A63B** *21/04*
**U.S. Cl. 482—130** **16 Claims**




16. A resilient tension exercise apparatus comprising:

a frame means for positioning upon a ground surface;

an adjustable seat means adjustably coupled to the frame means for supporting an individual relative to the frame means, the seat means comprising a base member having a plurality of wheels rotatably mounted thereto and depending therefrom so as to support the base member in a movable relationship relative to a ground surface; an adjustable stanchion secured and projecting upwardly from the base member; a support plate coupled to an upper end of the adjustable stanchion; the support plate extending in opposed directions from the adjustable stanchion to define a first seat member positioned in an opposed relationship relative to a second seat member; and a back rest member pivotally mounted to the support plate;

and,

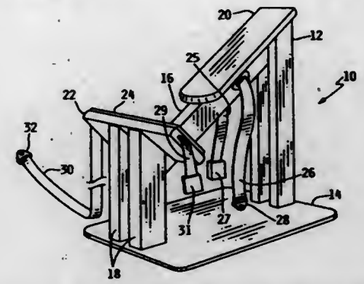
a first exercise means coupled to the frame means for exercising limbs of an individual.

**5,496,247**

**BACK BUILDER**

**Martin D. Anderson, 4131 E. Superior St., Duluth, Minn. 55804**

**Filed Sep. 22, 1994, Ser. No. 310,877**
**Int. Cl.[6] A63B** *23/02;21/068;* **A47C** *16/04*
**U.S. Cl. 482—142** **16 Claims**




1. An exercise bench apparatus for strengthening the muscles of the lower back by confining a portion of the user's body in a relatively immobile position, while permitting the user to freely move between an upright seated position and a forwardly leaning position, comprising:

a) a beam fixedly mounted at a position which is inclined at substantially 30° relative to the horizontal;

b) a seat member affixed to said beam;

c) a knee brace mounted to said beam and at a position spaced away from said seat and proximate a lower end of said beam;

d) a first restraining means for immobilizing the upper portion of a user's legs relative to said seat; said first restraining means comprising a first elongate adjustable belt affixed proximate said seat member whereby said belt may be adjustably tightened about the user's upper leg portions; and

e) a second restraining means for restraining the user's body from movement away from said knee brace; said second restraining means comprising a second elongate adjustable belt affixed proximate said knee brace, whereby said belt may be adjustably tightened about the user's lower back portion and whereby the user's knees are held against said knee brace and pelvic rotation about the hip sockets is restrained.

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**5,496,248**

**PERSONAL EXERCISE DEVICE**

**Robert K. Batscher, 68 Seventh St., Bonita Springs, Fla. 33923-7415**

**Filed Apr. 11, 1995, Ser. No. 419,901**
**Int. Cl.[6] A63B** *22/16*
**U.S. Cl. 482—146** **6 Claims**




1. A balancing exercise device consisting essentially of:

elongated member symmetrical in cross section having first and second ends and a bottom surface,

a pair of generally horizontal upwardly facing foot platforms sized to accommodate a user's feet, positioned one each on each of said ends of said elongated member,

a single pivot point positioned on said bottom surface of said elongated member near each of its ends below said foot platforms and;

wherein said bottom surface is arcuately configured longitudinally and transversely and at said pair of pivot points substantially as shown in FIGS. 4, 18 and 2 and 2*a*, respectively.

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**5,496,249**

**TOOL CHANGER FOR A PROCESSING CENTER**

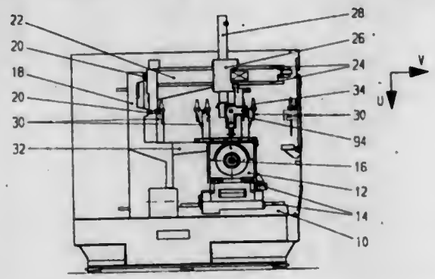
**Guenther Buggle, Villingen-Schwenningen, and Willi Schuetz, Weiden-Dornhan, both of, Germany, assignors to Bernhard Steinel Werkzeugmaschinenfabrik GmbH & Co., Germany**

**Filed Sep. 12, 1994, Ser. No. 304,305**

**Claims priority, application Germany, Sep. 13, 1993, 43 31 064.8**

**Int. Cl.[6] B23Q *3/157***

**U.S. Cl. 483—41** **9 Claims**




1. A work tool changer for a processing center, said processing center including a horizontal work spindle and a work tool magazine in which the work tools are positioned on their vertical axis, the work tool changer comprising

a carriage mounted movably horizontally in the direction perpendicular to the work spindle (V-axis) and in the direction horizontally parallel to the work spindle (W-axis),

a lift sled mounted on the carriage movably in the vertical direction (U-axis),

a motor mounted on the carriage for driving the lift sled in the vertical direction (U-axis),

a gripper head mounted swivelably on the lift sled,

a two armed gripper mounted on said gripper head and rotatable about a gripper axle,

a collision track into which the lift sled enters during the vertical movement of the lift sled for swiveling the gripper head between a position in which the gripper axle is horizontal and a position in which the gripper axle is vertical

whereby the gripper is moveable between positions with vertical and with horizontal orientated work tools, and

wherein the motor drives the lift sled over an endless running lift means and switchably drives the rotational movement of the gripper about its gripper axle.

**5,496,250**

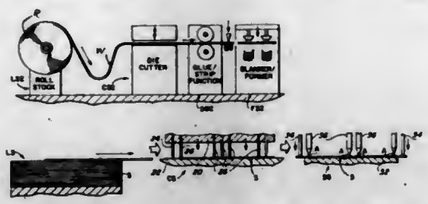
**METHOD FOR FORMING TRAY TYPE CARTONS**

**Larry D. Fielder, 768 Summer Meadow Ct., Stone Mountain, Ga. 30087, and Ronald L. Goelz, 704 Castilleja, Naperville, Ill. 60540**

**Filed Apr. 25, 1994, Ser. No. 231,927**

**Int. Cl.[6] B31B *1/46;3/60;1/74;* B26F *1/00***

**U.S. Cl. 493—169** **13 Claims**




5. A method of forming, from paperboard, on equipment in a completely inline operation, a plurality of tray type cartons, each of said cartons including a body member including a horizontal main wall panel and a plurality of side wall panels, with corner flaps, extending therefrom and adhesively secured to each other, said method comprising the steps of:

(a) positioning said paperboard at a loading station of said equipment;

(b) moving said paperboard from said loading station, to a cutting and scoring station;

(c) die cutting and scoring said paperboard, at said cutting and scoring station, to provide a plurality of interconnected carton blanks;

(d) moving said plurality of interconnected blanks from said cutting and scoring station to a combination stripping and gluing station;

(e) simultaneously stripping waste material from said plurality of interconnected blanks and applying adhesive to pertinent areas of said blanks at said stripping and gluing station;

(f) moving said plurality of interconnected blanks from said stripping and gluing station to a forming station, and, at said forming station, separating said plurality of interconnected blanks from each other; and

(g) forming cartons from said separated blanks by applying forming heads to said separated blanks to engage said separated blanks and push them through forming chambers and into cavities of previously formed and stacked cartons, which cavities and hold said cartons until previously applied adhesive has set.

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**5,496,251**

**METHOD AND APPARATUS FOR MANUFACTURING A SHELL-SHAPED PACKAGE, AND SUCH SHELL-SHAPED PACKAGE**

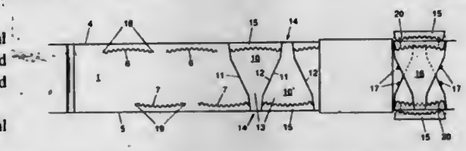
**Sheng C. Cheng, Kaohsiung, Taiwan, Prov. of China, assignor to Jei Lee Corporation, Taiwan, Prov. of China**

**Filed Dec. 20, 1993, Ser. No. 170,122**

**Claims priority, application Netherlands, Sep. 6, 1993, 9301532**

**Int. Cl.[6] B31B *25/00;1/16***

**U.S. Cl. 493—224** **4 Claims**



1. A method of manufacturing shell-shaped packages, each of said packages tapering from a wide opening to a narrow end, the method comprising the steps of:



simultaneously supplying two bands of synthetic material of substantially the same width in a longitudinally superposed fashion so as to form superposed material bands;

in one perforating operation performed from one material band surface side and in a substantially longitudinal direction, perforating completely through both of said superposed material bands in such a manner that at least one edge defining the wide opening is formed along an ornamental line in each of said material bands, so as to form superposed perforated ornamental lines and two separate superposed suspension portions, each one of the perforated ornamental lines extending substantially throughout a length of the wide opening;

cutting said superposed material bands in a transverse direction, across the width of said superposed bands, into separate superposed package portions, having superposed cut edges thereof, such that wide openings of successive shell-shaped packages are located proximate to alternately opposite longitudinal edges of the superposed material bands, and joining the superposed package portions together along the superposed cut edges thereof, wherein the separate superposed package portions are connected to each other along the superposed cut edges so as to form a corresponding one of the shell-shaped packages and wherein each of said suspension portions is connected, along a corresponding one of the ornamental lines, to a corresponding one of the superposed package portions and extends to a corresponding proximate one of the longitudinal edges of the superimposed material bands; and

removing one of the suspension portions from each one of the shell-shaped packages.

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**5,496,252**

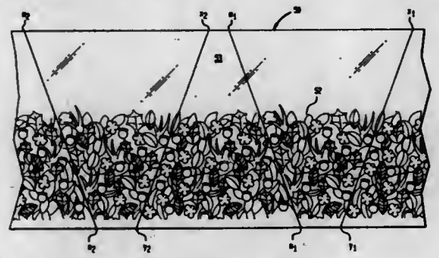
**METHOD FOR MAKING A FLAT TRAPEZOIDAL CONTAINER OF BRIGHTLY PRINTED THERMALLY SEALABLE FILM**

**Scott R. Gilbert, Hinckley, Ohio, assignor to Professional Package Company, Strongsville, Ohio**

**Division of Ser. No. 248,391, May 23, 1994, Pat. No. 5,388,695. This application Jan. 20, 1995, Ser. No. 375,786**

**Int. Cl.[6] B31B *1/64***

**U.S. Cl. 493—224** **2 Claims**



1. A method for forming a container comprising,

feeding first and second webs of substantially similarly imprinted thermally sealable synthetic resinous film from a pair of spaced apart feed rolls in unspaced-apart overlapping relationship over a lateral support surface, each web in a range from 0.5 mil (12.5μ) to 2 mil (50.8μ) thick and having continuously imprinted, in overlapping printed portions thereof, an ornamental decorative design of contrasting bright colors;

maintaining constant tension over the length of each web as said webs travel over said support surface;

continuously advancing said webs longitudinally along said support surface; interrupting said webs on said support surface to stop them at predetermined intervals without interrupting feeding of said webs from a pair of feed rolls;

heat-sealing edges of said lower printed portions of said webs together along a line to provide a water-impervious bottom planar edge for the container, and, also along equally angulated but oppositely directed side edges, to provide the container's exterior lower portion with a printed, smoothly planar surface uninterrupted by an elongated unprinted rectangular portion adjacent each of the side edges in the lower portion, and, an essentially light permeable upper portion free from any portion of printing present in the lower portion;

discarding material intermediate sequentially heat-sealed containers, this material having an area more than one-half that required to form said container; and, collecting a mass of individual and separate containers.

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**5,496,253**

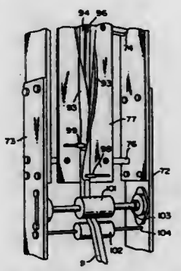
**METHOD AND APPARATUS FOR FORMING BOOKBINDING STRIPS**

**Donald L. Snellman, and Dean G. Tonkin, both of Seattle, Wash., assignors to Norfin International, Inc., Seattle, Wash.**

**Division of Ser. No. 952,604, Sep. 28, 1992, Pat. No. 5,364,215. This application May 4, 1994, Ser. No. 237,642**

**Int. Cl.[5] B65H *45/22***

**U.S. Cl. 493—320** **13 Claims**



11. The method of forming a continuous flat tubular book binding attachment strip comprising the steps of;

pulling a continuous web from a source of web stock;

forming continuous parallel score lines a predetermined distance from each longitudinal edge of the moving web,

then holding the moving web against a backing surface by shoe means having lateral edges in contact with the web spaced from the lateral edges thereof along the score lines, and

simultaneously guiding the edge portions of the web toward each other through an approximately 180° arc about the score lines, thereby forming fold lines with the lateral edges of said shoe means defining the fold lines and with one edge portion overlying the other in surface-to-surface contact to form a lap joint,

whereby a continuous substantially flat double-walled tubular attachment strip with a longitudinal lap joint in one wall thereof is formed, each said wall having an inner and an outer surface.

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**5,496,254**

**LAB CENTRIFUGE WITH IMBALANCE SHUTOFF**

**Bernd Keller, Borsdorf, and Matthias Meyer, Ammelshain, both of, Germany, assignors to Geratebau Eppendorf GmbH, Engelsdorf bei Leipzig, Germany**

**Filed Oct. 13, 1994, Ser. No. 322,611**

**Claims priority, application Germany, Jan. 15, 1993, 43 35 119.0**

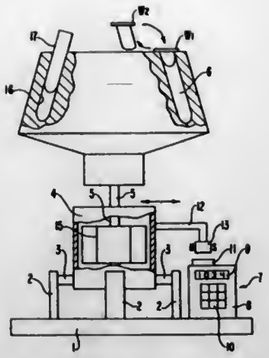
**Int. Cl.[6] B04B *13/00***

**U.S. Cl. 494—7** **6 Claims**

1. A lab centrifuge comprising the combination of

a base;

a centrifuge rotor comprising vessel supports and a motor with a vertical shaft driving said centrifuge rotor into rotation, said motor including a stator;



elastic support means supporting said motor and said stator on said base;

stator deviation detecting means including a stator-carried component and a component fixed to said base for detecting non-rotary stator deviation from a rest position and producing a signal indicating said deviation, one of said components comprising a field generator generating a constant field and the

other component comprising a field intensity detector; and

control means for supplying electrical power to said centrifuge, said control means including analyzer means responsive to said signal for deenergizing said centrifuge at a predetermined maximum permissible threshold deviation of said stator, said analyzer means including

a calibration means for ascertaining a threshold amplitude of centrifuge rotor imbalance during calibration and storing said amplitude as a limit amplitude in a permanent memory of said analyzer means, and

means for determining amplitudes of detected field intensity and comparing said amplitudes to said limit amplitude.

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**5,496,255**

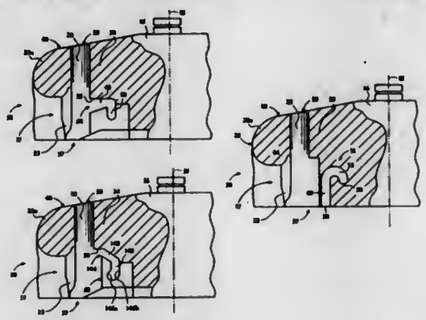
## SWINGING BUCKET CENTRIFUGATION ROTOR WITH CONFORMING BUCKET SEAT

**Kuo-Yen Chang, Santa Clara, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.**

**Filed Dec. 9, 1994, Ser. No. 353,133**

**Int. Cl.[6] B04B *5/02***

**U.S. Cl. 494—20** **21 Claims**



1. A centrifuge rotor comprising:

a rotor head with a plurality of spaced apart cavities, each of the plurality of spaced cavities defined by an inner wall of the rotor head, disposed proximate to a vertical axis of the rotor, and an upper wall of the rotor head, extending radially outward away from the vertical axis and including two opposing side portions extending downwardly from the upper wall and terminating in an opening, with the upper wall, the inner wall and the two opposing side portions defining a chamber and a seat portion, the chamber having an aperture positioned at a peripheral surface of the rotor head, the upper wall including a passageway extending from the opening and terminating in a hole proximate to an upper surface of the rotor head, the upper wall including a slot extending radially outward from the passageway and positioned so as to bifurcate the seat portion.

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**5,496,256**

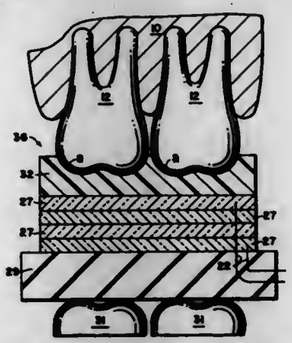
## ULTRASONIC BONE HEALING DEVICE FOR DENTAL APPLICATION

**Robert T. Bock, Brewster, N.Y., and John P. DeLuca, Washington, D.C., assignors to Sonex International Corporation, Brewster, N.Y.**

**Filed Jun. 9, 1994, Ser. No. 257,773**

**Int. Cl.[6] A61B *17/56*; A61C *8/00*; *19/06*; A61F *5/00***

**U.S. Cl. 601—2** **13 Claims**



8. An apparatus operative in an area to be treated for accelerating the process of jawbone healing and regeneration or reattachment of traumatically loosened teeth to the jawbone, comprising a piezoelectric transducer constructed of at least one active element for contracting and expanding volumetrically when energized in response to changing electrical signals and generating vibrations of ultrasonic energy, said transducer transmitting said vibrations through a tooth toward the jawbone when so energized, a transducer support pad, an end cap comprising a one-piece solid molded body which is adapted to fit and engage the crown of at least one tooth, said transducer being sandwiched between and engaging said pad and said end cap, and coupling means coupled to the piezoelectric transducer to transmit ultrasonic frequency electrical signals to said piezoelectric transducer.

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**5,496,257**

## APPARATUS FOR ASSISTING IN THE APPLICATION OF CARDIOPULMONARY RESUSCITATION

**Kenneth B. Kelly, Belle Mead, N.J., assignor to Kelly Medical Products, Inc., Princeton, N.J.**

**Filed Apr. 22, 1994, Ser. No. 231,334**

**Int. Cl.[6] A61H *31/00***

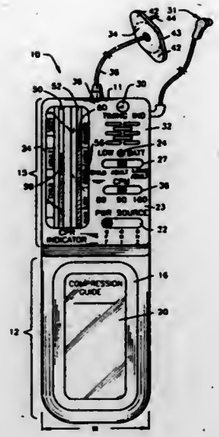
**U.S. Cl. 601—41** **14 Claims**

1. An apparatus for assisting in the application of cardiopulmonary resuscitation to a patient of a predetermined body type, comprising:

a housing capable of being placed on a patient's chest, said housing having at least one surface thereon adapted to receive a manually applied force;

a cushioned member extending from said housing, wherein said cushioned member contacts the patient's chest when said





housing is placed on the patient and said manually applied force is applied to said housing;

an electronic force sensor coupled to said cushioned member, wherein said electronic force sensor produces a first sensor signal indicative of said manually applied force applied to said housing;

an electronic blood flow sensor coupled to said housing and attachable to the patient, wherein said blood flow sensor measures blood flow in the patient and produces a second sensor signal indicative of the blood flow;

a microprocessor contained within said housing, said microprocessor including a comparitor means for comparing said first sensor signal to a predetermined optimal compression force and comparing said second sensor signal to a predetermined optimal blood flow rate;

a warning means controlled by said microprocessor for providing a first warning alarm when said microprocessor determines that said second sensor signal is not within a predetermined range of said optimal blood flow rate;

a first display coupled to said housing for providing a visible display indicative of said first sensor signal; and

a second display for providing a visible display indicative of said second sensor signal.

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**5,496,258**

## ELECTRONIC DEVICE FOR TREATING EPILEPTIC INDUVIDUALS

**Photios Anninos, 20 Ellispontou Str., Alexandroupolis; Nicolaos Tsagas, L. THrakos 3, Xanthi, and Panayiotis Koutsikos, Demertzi IO, Athens, all of, Greece**

**PCT No. PCT/GR91/00011, § 371 Date Jun. 24, 1993, § 102(e) Date Jun. 24, 1993**

**PCT Filed Jul. 25, 1991, Ser. No. 90,020**

**Claims priority, applicatiou Greece, Aug. 24, 1990, 900100630**

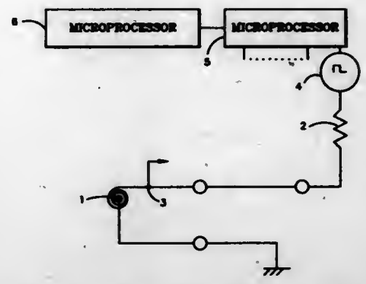
**The portion of the term of this patent subsequent to Jun. 24, 2013, has been disclaimed.**

**Int. Cl.[6] A61N *1/00***

**U.S. Cl. 600—13** **15 Claims**

1. An electronic apparatus for the treatment of an epileptic individual, having an epileptic focal point skull distribution, intensity and frequency as determined by use of a superconducting quantum interference device (SQUID), to inhibit seizure activity, the apparatus comprising:

generating means for generating an alternating low voltage and substantially the same frequency as a magnetic field determined to be emitted from each said epileptic focal point;




emitting means electrically connected to said generating means for emitting a magnetic field to the skull of the epileptic individual at the skull coordinates of each epileptic focal point, said emitting means comprising a plurality of coils; and

microprocessor means electrically connected to said emitting means for selecting a number of said plurality of coils to which to apply the generated voltage and for regulating the intensity, frequency and waveform of a current applied to the selected coils such that each selected coil emits a magnetic field of substantially the same intensity and frequency as a magnetic field emitted by an epileptic focal point.

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**5,496,259**

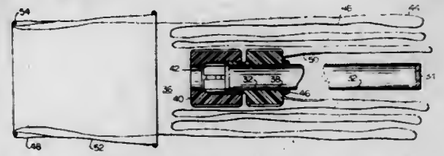
## STERILE PROTECTIVE SHEATH AND DRAPE FOR VIDEO LAPAROSCOPE AND METHOD OF USE

**Jeffrey Perkins, Tully, N.Y., assignor to Welch Allyn, Inc., Skaneateles Falls, N.Y.**

**Filed Sep. 13, 1993, Ser. No. 119,377**

**Int. Cl.[6] A61B *1/00***

**U.S. Cl. 600—124** **7 Claims**



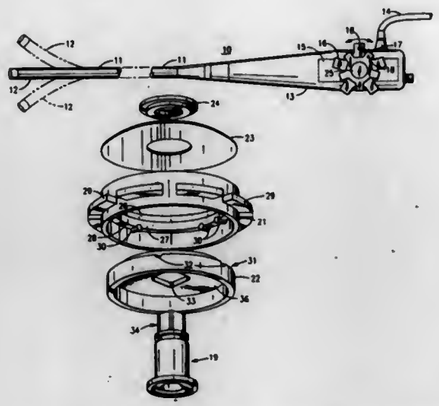
5. A sterile sheath for a laparoscope whicb has a rigid insertion tube of a predetermined outer diameter, imaging means contained within a distal tip of the insertion tube for obtaining an image as viewed by the imaging means of a target, and an elongated flexible umbilical to couple said insertion tube to illumination equipment; the sterile sheath comprising a rigid tube with an inside diameter slightly greater than the outer diameter of the insertion tube for slidably fitting thereover and a transparent face plate at a distal tip of the rigid tube, and a sterile generally tubular drape formed of a flexible membrane having a distal end attached to a proximal end of said rigid tube, and being folded axially back and forth over the rigid tube, with the sterile sheath further comprising a gripping mechanism at a proximal end of said rigid tube, including tightening means for releasably gripping the insertion tube, wherein said gripping mechanism further includes a ring member on a distal end of said gripping mechanism retaining a distal end of said drape on said rigid tube, and wherein said drape has a main body of a predetermined film thickness and a nose portion of a greater film thickness adjacent said ring member, with said drape being free of external securing means along its length, such that after the sterile sheath is installed on said insertion tube for a surgical procedure, the folded drape is unfolded by drawing the same proximally to enclose said umbilical therewithin, and following a surgical procedure, the unfolded drape is inverted by drawing the same distally to ,cover the rigid tube and to contain within the drape any contaminants that have collected on it during said surgical procedure.

**5,496,260**

## TORQUE OVERRIDE KNOB FOR ENDOSCOPES, BORESCOPES, OR GUIDE TUBES

**Allan I. Krauter, Syracuse; Michael P. Kehoskie, Jordan, and Robert L. Vivenzio, Auburn, all of N.Y., assignors to Welch Allyn, Inc., Skaneateles Falls, N.Y.**

**Filed May 16, 1994, Ser. No. 243,390**
**Int. Cl.[6] A61B** *1/00;1/005*
**U.S. Cl. 600—148** **11 Claims**



1. A hand-rotated knob drive for rotating a shaft-driven device comprising:
a hand-rotatable knob;
a drive stem on which said knob is mounted; and torque override means coupling said knob and said drive stem for:
(i) engaging the knob and the stem to enable said knob and stem to rotate as a unit until a predetermined torque is exceeded;
(ii) disengaging the knob from the stem to enable the knob to slip with respect to the stem after said predetermined torque has been exceeded; and
(iii) re-engaging the knob to the stem after the knob and stem have been disengaged when a predetermined rotational alignment has been established therebetween.

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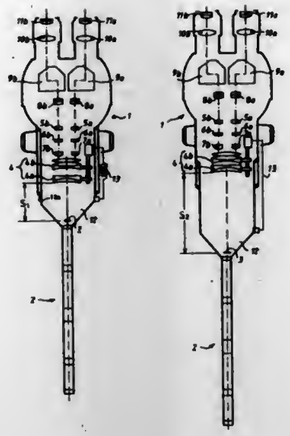
**5,496,261**

## COMBINATION OF A VIEWING AND/OR DOCUMENTING APPARATUS AND AN ENDOSCOPE AS WELL AS A METHOD OF OPERATING THE COMBINATION

**Ulrich Sander, Oberkochen, Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim, Germany**

**Filed Aug. 1, 1994, Ser. No. 283,791**
**Claims priority, application Germany, Jul. 30, 1993, 43 25 577.9**
**Int. Cl.[6] A61B** *1/00;* **G02B** *21/00*
**U.S. Cl. 600—163** **16 Claims**

1. A combination of a viewing and/or documenting apparatus and an endoscope, the combination comprising:
said apparatus which includes a main objective having a variable focal distance;
said endoscope which includes a lens system for generating an intermediate image; and,
means for coupling said endoscope to said apparatus so as to permit said endoscope to be pulled away from said apparatus in a pregiven direction to any length within a pregiven range wherein said apparatus is always focused on said intermediate image irrespective of said length within said range.

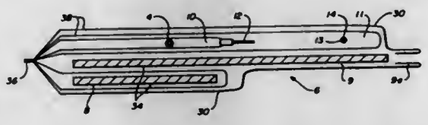


**5,496,262**

## THERAPEUTIC INTERMITTENT COMPRESSION SYSTEM WITH INFLATABLE COMPARTMENTS OF DIFFERING PRESSURE FROM A SINGLE SOURCE

**Glenn W. Johnson, Jr., Summit; Henry J. McVicker, Chatham, and Mark J. McCarthy, Warren, all of N.J., assignors to Aircast, Inc., Summit, N.J.**

**Continuation of Ser. No. 177,916, Jan. 6, 1994, abandoned. This application Jul. 25, 1995, Ser. No. 505,520**
**Int. Cl.[6] A61H** *9/00*
**U.S. Cl. 601—152** **18 Claims**



14. A therapeutic intermittent and sequential compression system for application to a limb comprising:
a cuff-like member adapted to be applied to the limb of a user, said member comprising a sealed chamber having a first length,
an inflatable compartment having a length greater than said first length of said sealed chamber and enclosing said sealed chamber to form an air cell, and
at least two inflatable chambers also being enclosed within said inflatable compartment;
a pressure source for providing intermittent pressure pulses;
means separate from said pressure source for inflating said compartment to a desired level;
a single tube coupling said pressure source to a first one of said inflatable chambers for inflating said first inflatable chamber at a predetermined rate during a pulse cycle;
fluid connection means coupling said at least two inflatable chambers such that the rate of inflation of a second one of said chambers is less than the rate of inflation of said first chamber; and
fluid exhaust means for continuously exhausting the fluid in said inflatable chambers to atmosphere, whereby said inflatable chambers dissipate the fluid pressure in the time cycle between the intermittent pressure pulses and thereby cause said inflatable chambers to deflate.

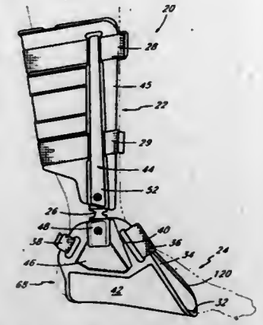


**5,496,263**

## ANKLE STABILIZATION SYSTEM

**Hadwen C. Fuller, II, Parish, N.Y.; Anthony H. G. Bell, Laguna Niguel, Calif.; Lutz Biedermann, VS-Villingen, Germany, and David M. Rodgers, Mission Viejo, Calif., assignors to Ascent Technologies Group, Inc., Parish, N.Y.**

**Filed Oct. 11, 1991, Ser. No. 775,186**
**Int. Cl.[6] A61F** *5/00*
**U.S. Cl. 602—27** **7 Claims**



1. An ankle brace for use during physical activity, said ankle brace being adapted to be worn on a foot of a user and extend partway up the lower leg, said ankle brace comprising:
an upper member comprising plural arcuate submembers overlapping one another to provide an adjustable size opening for receiving the calf of the user;
a lower member adapted to receive the foot of the user;
a hinge connecting said upper member to said lower member to allow said members to flex with respect to one another, said hinge adapted to be positioned on said ankle brace adjacent the talus bone of the user; and
at least a single taloric control device on at least one of said members in the region of the hinge for strengthening and supporting the talus bone in its various articulations, said taloric control device comprising lateral reinforcement areas disposed directly adjacent the hinge, slightly above the hinge, and slightly below the hinge, whereby injury to the ankle is inhibited.

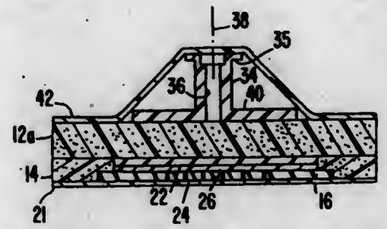
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**5,496,264**

## HEMOSTATIC TRANSDERMAL INJECTION APPLIANCE

**Robert L. Watson, 1600 Singletree Way, Bowling Green, Ky. 42103, and Robert C. Shober, Jr., P.O. Box 143, Alvaton, Ky. 42122**

**Continuation-in-part of Ser. No. 186,280, Jan. 25, 1994, Pat. No. 5,409,466, which is a division of Ser. No. 109,935, Aug. 17, 1993, Pat. No. 5,342,319. This application Jun. 15, 1994, Ser. No. 259,854**
**Int. Cl.[6] A61F** *13/00*
**U.S. Cl. 602—48** **18 Claims**



1. An hemostatic appliance for application to the skin of a patient comprising the combination of

a first layer of foam material having a proximal surface and a distal surface relative to the patient;
an annular layer of foam material having a distal surface adhered to said proximal surface of said first layer, a proximal surface and a central cavity extending entirely through said annular layer;
adhesive means on said proximal surface of said annular layer for adhering said annular layer to skin of a patient;
a continuous elastomeric membrane extending across said central cavity adjacent said first layer and closing a distal side of said cavity; and
a layer of hemostatic material in said cavity adjacent to said membrane, said hemostatic layer having a distal surface against said membrane and a proximal surface exposed through a proximal side of said cavity whereby, when said appliance is placed on the skin of a patient with said proximal side of said cavity toward a wound or puncture site, said annular layer of foam forms an adherent seal with the skin of the patient and inhibits flow of body fluids along the patient's skin, thereby encouraging flow of said fluids to said hemostatic layer so that said hemostatic layer encourages hemostasis.

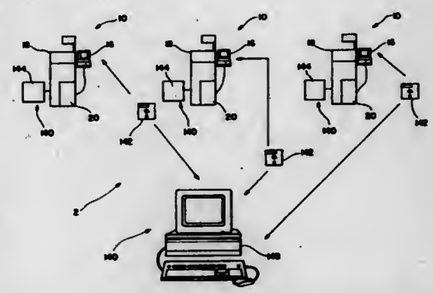
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**5,496,265**

## BLOOD COMPONENT COLLECTION SYSTEM WITH OPTIMIZER

**Robert W. Langley, Westminster; John J. Keller, and Steven G. Urdahl, both of Golden, all of Colo., assignors to Cobe Laboratories, Inc., Arvada, Colo.**

**Continuation-in-part of Ser. No. 912,973, Jul. 10, 1992, abandoned, and a continuation-in-part of Ser. No. 845,677, Mar. 4, 1992, abandoned, and a continuation-in-part of Ser. No. 110,432, Aug. 23, 1993, Pat. No. 5,437,624. This application Oct. 21, 1993, Ser. No. 140,254**
**Int. Cl.[6] A61M** *37/00*
**U.S. Cl. 604—5** **81 Claims**



1. A method for collecting at least one predetermined type of blood component from a source of whole blood using a blood component collection system comprising a blood component collection device and collection procedure, said collection procedure having a plurality of parameters associated therewith, said method comprising the steps of:
providing biological data relating to a source of whole blood, said source being a human donor and said data comprising at least one of said donor's hematocrit, height, weight, and sex;
identifying a desired yield of at least one predetermined type of blood component;
associating a magnitude with each of a plurality of parameters associated with a collection procedure to be performed on said whole blood using a blood component collection system comprising a blood component collection device and said collection procedure, said associating step comprising performing a first deriving step comprising deriving a magnitude for at least one of said parameters from said providing and identifying steps;

inputting said magnitude of each said parameter into said blood component collection system after said associating step; and

performing said collection procedure on said blood component collection device using said inputting step to collect said desired yield of said at least one predetermined type of blood component from said source of whole blood.

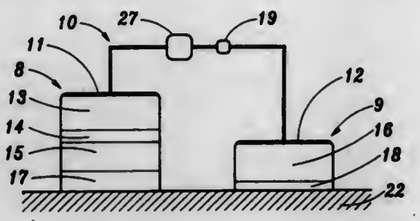
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**5,496,266**

## DEVICE AND METHOD OF IONTOPHORETIC DRUG DELIVERY

**Ronald P. Haak; J. Richard Gyory, both of San Jose, and Felix Theeuwes, Los Altos Hills, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.**

**PCT No. PCT/US90/02414, § 371 Date Oct. 27, 1992, § 102(e) Date Oct. 27, 1992**
**PCT Filed Apr. 30, 1990, Ser. No. 941,421**
**Int. Cl.[6] A61N *1/30***
**U.S. Cl. 604—20** **30 Claims**




1. An electrically powered iontophoretic agent delivery device including a donor electrode assembly, a counter electrode assembly and a source of electrical power adapted to be electrically connected to the donor electrode assembly and the counter electrode assembly, the donor electrode assembly comprising:

an agent reservoir comprising an agent and adapted to be placed in agent transmitting relation with the body surface;

a donor electrode adapted to be electrically connected to the source of electrical power;

a selectively permeable membrane intermediate the electrode and the agent reservoir, the membrane being non-charge selective and being permeable to species of less than a predetermined molecular weight and substantially less permeable to species of greater than the predetermined molecular weight;

wherein the agent is capable of dissociating into agent ions and counter ions of opposite charge, the agent ions having greater than the predetermined molecular weight.

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**5,496,267**

## ASYMMETRIC WATER JET ATHERECTOMY

**William J. Drasler, Minnetonka; Robert G. Dutcher, Maple Grove; Mark L. Jenson, Greenfield; Joseph M. Thielen, Buffalo, and Emmanuil I. Protonotarios, Brooklyn Park, all of Minn., assignors to Possis Medical, Inc., Minneapolis, Minn.**

**Filed Nov. 8, 1990, Ser. No. 610,846**
**Int. Cl.[6] A61B *17/20***
**U.S. Cl. 604—22** **33 Claims**

1. An apparatus for ablating at least a portion of a deposit within a vessel of a patient comprising:

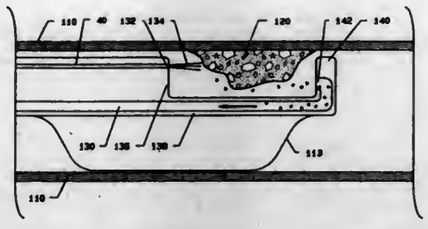
a. catheter having a proximal end and a distal end;

b. a working fluid;

c. means coupled to said proximal end of said catheter for supplying said working fluid under high pressure;

d. means coupled to said distal end of said catheter for directing said working fluid in the form of a stream at a deposit within a vessel of a patient, said means for supplying said working fluid under high pressure and said means for directing said working fluid in the form of a stream being capable of supplying and directing said working fluid at a velocity high enough to generate a stagnation pressure sufficient to remove ablated deposit debris without the use of a vacuum; and,

e. target means coupled to said distal end of said catheter at a location longitudinally spaced from said directing means for preventing said working fluid from directly impinging upon a vessel of a patient; said longitudinal spacing being sufficient to accommodate at least a portion of deposit being ablated.



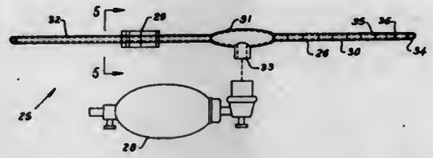

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**5,496,268**

## INFANT MECONIUM ASPIRATING AND VENTILATING APPARATUS

**Ratnavali B. Perla, 1902 Brentwood, Troy, Mich. 48098**

**Filed Aug. 1, 1994, Ser. No. 283,827**
**Int. Cl.[6] A61M *1/00***
**U.S. Cl. 604—27** **11 Claims**




1. An apparatus for suctioning and ventilating a trachea of an infant comprising: a flexible unitary aspirating and ventilating device made from a single piece of material, said aspirating device having an endotracheal tube end portion for intubating said apparatus into a trachea of an infant, an intermediate body portion communicating with said endotracheal tube portion, said endotracheal tube portion having an inside diameter of about 3.0 mm for intubating said apparatus into a trachea of an infant, and a port extending outwardly from the side of said body portion, said port communicating with said endotracheal tube portion for alternatively attaching a ventilating device or regulating the vacuum level in said endotracheal tube portion by closing and opening said port with a physician's finger in varying amounts to regulate said vacuum level in said tube portion, and a flexible outlet tube portion communicating with said body portion for operatively connecting said aspirating device to a line leading to a vacuum source; a ventilating device for supplying oxygen through said port to said endotracheal tube portion, a line for connecting said aspirating device to said vacuum source, and a means for interrupting the vacuum from said vacuum source to said endotracheal tube when said ventilating device is connected to said aspirating device.

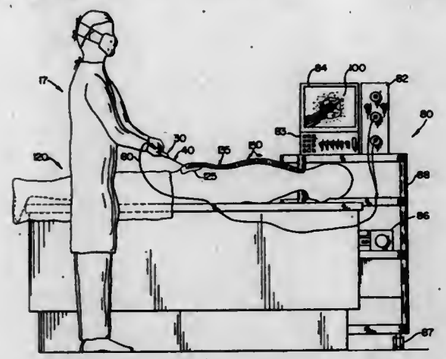


**5,496,269**

## METHOD OF EPIDURAL SURGERY

**Phillip J. Snoke, Atlanta, Ga., assignor to Catheter Imaging Systems, Inc., Atlanta, Ga.**

**Continuation of Ser. No. 129,331, Sep. 30, 1993, Pat. No. 5,354,266, which is a continuation-in-part of Ser. No. 908,403, Jul. 6, 1992, Pat. No. 5,342,299, Ser. No. 963,431, Oct. 19, 1992, Pat. No. 5,423,311, and Ser. No. 970,490, Nov. 2, 1992, Pat. No. 5,399,164. This application Oct. 11, 1994, Ser. No. 321,174**
**Int. Cl.[6] A61M *1/00***
**U.S. Cl. 604—28** **3 Claims**




1. A method of epidural surgery comprising the steps of:

positioning a portion of a catheter into a portion of the epidural space of a patient prior to the step of distending the portion of the epidural space;

distending a portion of the epidural space of a patient by filling the portion of the epidural space with a liquid supplied from the catheter;

positioning a portion of an optical scope in the distended portion of the epidural space by inserting the portion of the optical scope through the same catheter that supplies the distending liquid to thereby provide a visual image of the epidural space; and

performing a therapeutic treatment on a problem area within the distended portion of the epidural space.

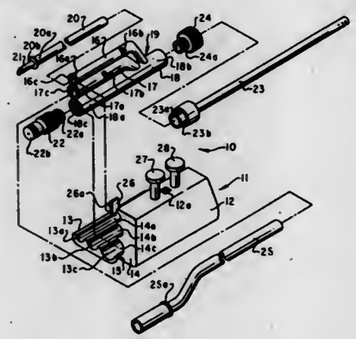
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**5,496,270**

## TRI-TUBULAR SUCTION IRRIGATION DEVICE

**William S. Nettekoven, Sandy, Utah, assignor to MegaDyne Medical Products, Inc., Draper, Utah**

**Filed Sep. 26, 1994, Ser. No. 312,479**
**Int. Cl.[6] A61M *1/00***
**U.S. Cl. 604—30** **20 Claims**




1. A suction-irrigation device comprising:

(a) a unitary disposable tri-tubular cassette having a single output and a plurality of elongated input channels in interior fluid communication with said output all of said channels lying essentially in a first plane and, over a major portion of their lengths being axially parallel to each other;

(b) an elongated housing having a principal elongated central axis and being formed in a plurality of parts, at least two of said parts having interior surfaces, one of said interior surfaces being adapted for receiving, engaging and holding said cassette; and

(c) a plurality of trumpet valve controllers generally disposed along said central axis, said trumpet valve controllers severally engaging different ones of said input channels normally to squeeze said channels and prevent fluid flow therethrough, and when individually operated, to selectively reduce said squeeze on said channels and selectively control fluid flow therethrough.

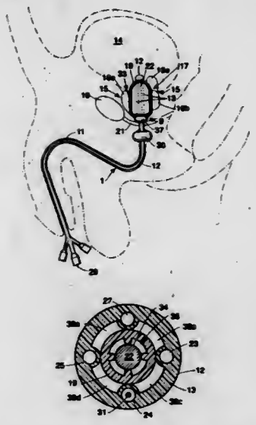
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**5,496,271**

## COMBINED HYPERTHERMIA AND DILATION CATHETER

**John H. Burton, Minnetonka; Timothy C. Cook, Wayzata, and Claude Tihon, Eden Prairie, all of Minn., assignors to American Medical Systems, Inc., Minnetonka, Minn.**

**Continuation-in-part of Ser. No. 582,726, Sep. 14, 1990, abandoned. This application Jun. 16, 1993, Ser. No. 78,367**
**Int. Cl.[6] A61H *31/00***
**U.S. Cl. 604—54** **34 Claims**




1. A method for treatment of conditions in which it is desired to simultaneously hyperthermally treat diseased target tissue in a patient and dilate a lumen of a patient which is being compressed and obstructed by said diseased target tissue and surrounding tissue, said method comprising the steps of:

(a) inserting into the lumen of the patient an apparatus comprising:

(a.i) an outer catheter having a distal end, a proximal end having a plurality of ports therein, and a plurality of lumens situated through said outer catheter, said lumens including a lumen adapted for carrying heating means, inlet and outlet lumens respectively adapted for carrying a fluid into and out of at least one of an inflatable dilation balloon and an inflatable fixation balloon, said fluid being for the inflation of said balloons and alternatively also for acting as a coolant; and up to one or more separate lumens adapted for performing one or more of the functions of carrying temperature sensing means; circulating a coolant fluid through the outer catheter when said fluid for the inflation of said

dilation and fixation balloons is not also a coolant; carrying catheter guiding means; and for drainage of fluid; such that there is a corresponding port in said proximal end of said outer catheter which cooperates with each lumen in said outer catheter;

(a.ii) an inner catheter member, mounted in said outer catheter, and having a distal end, a proximal end, and a plurality of lumens therethrough;

(a.iii) heating means, axially mounted at said distal end of said inner catheter member and extending within one of said plurality of lumens in said inner catheter member provided therefor, said heating means being for applying energy to selected target tissue to produce hyperthermal effects therein, thereby causing a therapeutic alteration of cells in said target tissue;

(a.iv) an inflatable dilation balloon mounted at the distal end of the outer catheter for accomplishing at least one of the functions of enlarging an obstructed lumen in the vicinity of said target tissue by compressing obstructive tissue, and restricting blood flow to at least one of said target tissue and to non-target tissue in the vicinity of said target tissue, in order to reduce the energy absorbing heat sink effect produced by blood-enriched tissue, thereby causing a more complete and more uniform absorption of energy by said target tissue;

said dilation balloon having a preform diameter, and an oriented diameter greater than said preform diameter, such that the ratio of the oriented diameter to the preform diameter is from about 4.0 to about 7.0; said dilation balloon also having a preform length and an oriented length greater than said preform length, such that the ratio of the oriented length to the preform length is from about 1.5 to about 3.0; said dilation balloon being fabricated from a material which imparts sufficient hoop strength and burst pressure to the balloon to enable it to perform its intended function, while being biocompatible and having sufficient softness and pliability to prevent damage to non-target tissue with which it comes into contact;

(a.v) an inflatable fixation balloon mounted within the distal end of said outer catheter adjacent to said dilation balloon, a distance along the length of said outer catheter in a direction toward the proximal end of said outer catheter; said fixation balloon having a preform diameter, and an oriented diameter greater than said preform diameter, such that the ratio of the oriented diameter to the preform diameter is from about 4.0 to about 7.0; said fixation balloon also having a preform length and an oriented length greater than said preform length, such that the ratio of the oriented length to the preform length is from about 1.5 to about 3.0; said fixation balloon being fabricated from a material which imparts sufficient hoop strength and burst pressure to the balloon to enable it to perform its intended function, while being bio-compatible and having sufficient softness and pliability to prevent damage to tissue with which it comes into contact;

(a.vi) temperature sensing means disposed in a manner selected from the group consisting of being carried in a lumen in said outer catheter and mounted on said dilation balloon, said temperature sensing means further including a temperature signal transmitting lead attached at one end thereof to said temperature sensing means, said lead passing through a lumen in said outer catheter provided therefor, and exiting from said proximal end of said outer catheter, at which an opposite end of said lead is connected to means for indicating temperature readings measured by said temperature sensing means; and

(a.vii) at least one fluid for inflating said dilation balloon and said fixation balloon, said at least one fluid for inflating said dilation balloon and said fixation balloon being carried into said dilation balloon and said fixation balloon through at least one inlet lumen in said outer catheter and out of said dilation balloon and said fixation balloon through at least one outlet lumen in said outer catheter;

(b) advancing said outer catheter through said lumen of the patient such that the distal end thereof is located in said lumen of the patient in the vicinity of said target tissue to be treated;

(c) inflating the fixation balloon to hold said outer catheter in position;

(d) inflating the dilation balloon to accomplish at least one of the functions of dilating said lumen of the patient in the vicinity of said target tissue to relieve any constriction therein and compressing tissue in order to restrict blood flow to said tissue during hyperthermal treatment, thereby reducing the heat sink effect of blood-supplied tissue which absorbs hyperthermal energy applied thereto, thereby enabling both greater uniformity of heating of selected target tissue and a reduction in the amount of power required to supply an effective amount of hyperthermal energy to said selected target tissue in order to produce hyperthermal effects therein;

(e) supplying energy to the heating means in order to raise the temperature of the selected target tissue and produce hyperthermal effects therein;

(f) circulating a coolant fluid through the lumen in the outer catheter provided therefor and through the dilation and fixation balloons in order to accomplish at least one of the functions of cooling surrounding tissue, and preventing overheating of the surface of the heating means;

(g) monitoring the temperature of at least one of the target tissue, surrounding non-diseased tissue, and the outlet temperature of the coolant fluid during hyperthermal treatment in order to ensure accomplishment of at least one of attaining a sufficiently high temperature in the target tissue in order to produce a hyperthermally induced changes in the cells thereof, to prevent the attainment of a cell damaging hyperthermal temperature in surrounding, non-target tissue, and to prevent overheating of the heating means and attain an optimum level of energy consumption;

(h) controlling the amount of energy supplied to the heating means in response to temperature measurements;

(i) terminating application of hyperthermal energy to said diseased target tissue after a sufficient time to produce therapeutic results;

(j) terminating the circulation of the coolant fluid through the outer catheter, the dilation balloon and the fixation balloon;

(k) deflating the dilation balloon;

(l) deflating the fixation balloon; and

(m) withdrawing the apparatus from the lumen of the patient.

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**5,496,272**

## ARTIFICIAL INSEMINATION AND EMBRYO TRANSFER DEVICE

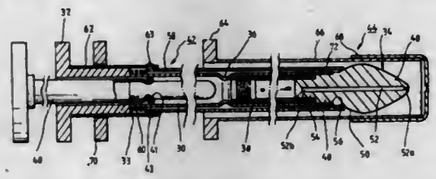
**Byung H. Chung; Kil S. Chung; Hoon T. Lee, all of Seoul; Kyung K. Lee, Daejeon; Byeong H. Lee, Kyunggi-Do; Won C. Lee, and Hwa J. Yoon, both of Seoul, all of, Rep. of Korea, assignors to Kwahak International Co., Ltd., Kyunggi-Do, Rep. of Korea**

**Filed Jun. 3, 1994, Ser. No. 253,941**

**Claims priority, application Rep. of Korea, Jun. 4, 1993, 93-10078; Nov. 30, 1993, 93-25806; May 12, 1994, 94-10334**

**Int. Cl.[6] A61M** *31/00*

**U.S. Cl. 604—55** **30 Claims**



1. An artificial insemination and embryo transfer device, which comprises:

an elongate hollow tube;



a tip secured to a proximal end of said elongate tube, said tip having a conical front portion for smoothly passing it through a cervical canal of a female subject, a tapered middle portion integrally formed with the conical portion, a main body portion integrally formed with the middle portion, and a passage provided therein;

a piston rod slidably mounted in said elongate tube in an axial direction;

means retained between said elongate tube and said piston rod for restraining a free axial movement of the piston rod within said elongate tube;

first contamination preventing means enclosing said elongate tube for protecting said elongate tube against contamination from infectious materials in the cervical canal during the passing of the device through the cervical canal, said first contamination preventing means including a hollow cylindrical sheet wrapping around said elongate tube and in contact with said tip at a front end of the cylindrical sheet, the outer diameter of said cylindrical sheet being smaller than the largest diameter of said tip; and

second contamination preventing means surrounding said tip and said cylindrical sheet for protecting them against contamination from infectious materials in a vaginal canal during the insertion of the device into the vaginal canal.

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**5,496,273**

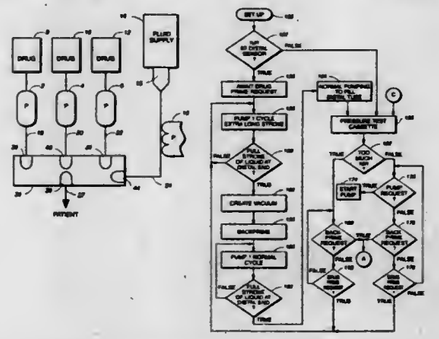
## AUTOMATED DRUG INFUSION SYSTEM WITH AUTOPRIMING

**Giovanni Pastrone, Los Gatos; Noel L. Johnson, San Jose; J. Terry Huang, Sunnyvale, and Timothy Allen, Mountain View, all of Calif., assignors to Abbott Laboratories, Abbott Park, Ill.**

**Continuation of Ser. No. 811,195, Dec. 20, 1991, abandoned. This application Jul. 5, 1994, Ser. No. 267,756**

**Int. Cl.[6] A61M** *31/00*

**U.S. Cl. 604—67** **27 Claims**



1. A pumping system for providing positive displacement, volumetric liquid control comprising:

a liquid supply channel having a liquid supply inlet for receiving liquid from a liquid supply;

a pump included in said liquid supply channel and having a pumping chamber with a pumping chamber inlet and a pumping chamber outlet;

at least one detector, located in said liquid supply channel between the liquid supply inlet and a pumping system outlet, for detecting air in liquid flowing through the liquid supply channel;

a first valve and valve actuator for regulating liquid flow through the liquid supply inlet and a second valve and valve actuator for regulating liquid flow through the pumping system outlet; and

a controller responsive to an output from the detector for controlling the pump, the first valve actuator and the second valve actuator during a bi-directional priming of the liquid supply channel until a quantity of air in liquid within the liquid supply channel corresponds to a predetermined value.

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**5,496,274**

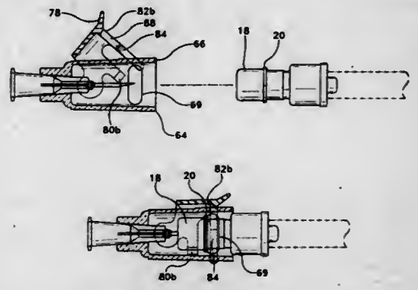
## LOCKING SAFETY NEEDLE ASSEMBLY

**Arlinda Graves, Stamford, Conn.; Niall Sweeney, Rutherford, and Sandor Szabo, Elmwood Park, both of N.J., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.**

**Continuation-in-part of Ser. No. 979,959, Nov. 23, 1992, abandoned. This application Aug. 29, 1994, Ser. No. 297,347**

**Int. Cl.[6] A61M** *37/00;5/32;5/00*

**U.S. Cl. 604—86** **31 Claims**



1. A safety needle assembly for secure connection of a piercing element to an intravenous fitting, comprising:

a protective shield defining a base portion, the shield disposed around said piercing element and including a sheath portion projecting from and about the base a sufficient distance to at least partially envelop the piercing element, the sheath having a distal end defining a passage dimensioned to receive at least a portion of said intravenous fitting therein; and

a latch pivotable about said protective shield for releasably engaging the intravenous fitting within the shield, said latch comprising a pivot arm having an end pivotably connected to the protective shield, means for releasably engaging a portion of the shield spaced a distance from said pivotable end, and means for releasably locking a portion of said intravenous fitting in said shield, said means for releasably locking spaced a second distance from said pivotable end.

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**5,496,275**

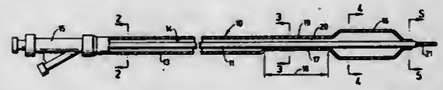
## LOW PROFILE DILATATION CATHETER

**Motasim M. Sirhan, Sunnyvale, and Jovito L. Fernando, Modesto, both of Calif., assignors to Advanced Cardiovascular Systems, Inc., Santa Clara, Calif.**

**Continuation of Ser. No. 95,814, Jul. 20, 1993, abandoned, and Ser. No. 21,062, Apr. 15, 1993, abandoned, which is a continuation of Ser. No. 700,617, May 15, 1991, abandoned, said Ser. No. 95,814is a continuation of Ser. No. 700,617, May 15, 0. This application Feb. 4, 1994, Ser. No. 192,065**

**Int. Cl.[6] A61M** *29/00*

**U.S. Cl. 604—96** **28 Claims**



1. An elongated catheter for performing an intravascular procedure comprising:

a) an elongated catheter shaft which has a distal section with an inner tubular member having a first inner lumen and a distal end with a port in communication with the first inner lumen

and an outer tubular member disposed about the inner tubular member having about 30% to about 90% of the inner periphery thereof along a length of the distal section of at least about 10 cm taking the shape of and being secured to the exterior of the inner tubular member and the outer tubular member having along said length a portion unsecured to the exterior of the inner tubular member, being longitudinally off-set and coextensive with the portion secured and having a second inner lumen extending longitudinally between the inner tubular member and the unsecured portion of the outer tubular member, a transverse cross-section of the distal section along the said length being substantially larger in a first direction than in a second direction perpendicular to the first direction; and

b) means for performing a vascular procedure on the catheter shaft at a location distal to at least a portion of said length.

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**5,496,276**

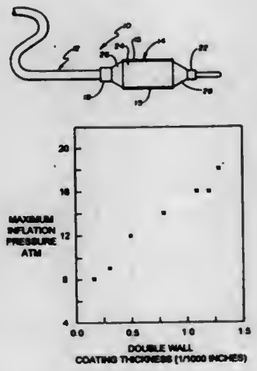
## CATHETER BALLOON WITH RETRACTION COATING

**Lixiao Wang, Minneapolis, and Linda J. Vickerman, Anoka, both of Minn., assignors to Scimed Life Systems, Inc., Maple Grove, Minn.**

**Division of Ser. No. 124,238, Sep. 20, 1993, abandoned. This application May 22, 1995, Ser. No. 447,220**

**Int. Cl.[6] A61M *29/00***

**U.S. Cl. 604—96** **20 Claims**




1. A method for treating a dilatation balloon to prefer a preshaped, deflated folded configuration so that, after inflation to a dilatation pressure, the balloon reattains the preshaped deflated folded configuration when the balloon is deflated, the balloon being made of a wall material, the method comprising forming the balloon into said preshaped deflated folded configuration, coating the balloon with a formulation comprising a coating polymer before or after said forming step and, while the balloon is in said preshaped deflated folded configuration, setting the coating, the coating material and thickness being selected to provide the balloon with the property that the balloon will return to the preshaped folded configuration upon deflation after inflation to a pressure at least one atmosphere higher than the pressure which the same balloon preshaped in the same configuration, but uncoated, would withstand and return to its preshaped folded configuration.

**5,496,277**

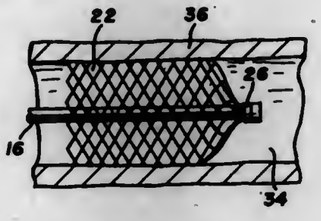
## RADIALLY EXPANDABLE BODY IMPLANTABLE DEVICE

**Paul L. Termin, St. Paul, Minn., and Christopher H. Porter, Woodenville, Wash., assignors to Schneider (USA) Inc., Plymouth, Minn.**

**Division of Ser. No. 80,749, Jun. 22, 1993, Pat. No. 5,378,239, which is a division of Ser. No. 927,771, Aug. 10, 1992, Pat. No. 5,221,261, which is a continuation of Ser. No. 767,418, Sep. 30, 1991, abandoned, which is a division of Ser. No. 508,854, Apr. 12, 1990, Pat. No. 5,071,407. This application Nov. 22, 1994, Ser. No. 343,725**

**Int. Cl.[6] A61M *29/00***

**U.S. Cl. 604—104** **21 Claims**




1. A body implantable device, including:

a flexible member of open weave construction, having a first end and a second end, and elastically compressible into a radially compressed state in which the flexible member has a first diameter substantially over its entire length; and

a substantially rigid retaining element secured to the flexible member proximate the second end, for maintaining the flexible member in the radially compressed state along a second region that includes the second end, while allowing a remainder of the flexible member to radially self-expand under an elastic restoring force, thereby to define along the flexible member a first region including the first end, the second region, and an intermediate region between the first region and the second region;

wherein the flexible member is adapted for positioning within a body cavity at a predetermined location through the radial self-expansion of the first region into an engagement with a wall segment of the body cavity, with the intermediate region allowing the passage of fluid through the body cavity due to its open weave construction.

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**5,496,278**

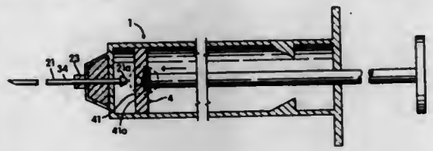
## SAFETY SYRINGE WITH SELF-SEALING NEEDLE RETRACTION AND RETRACTED MEMBER LOCK

**Danny Buff, Rte. 4 Box 996 A, Marion, N.C. 28752**

**Filed Jul. 25, 1994, Ser. No. 285,909**

**Int. Cl.[6] A61M *5/00***

**U.S. Cl. 604—110** **10 Claims**



1. A safety syringe with self-sealing needle retraction and retracted member lock comprising:

a syringe cylinder having a plunger end, a needle end, an outer surface and an inner surface, also having an integral cylinder portion extending from the plunger end to a cover point and an integral tapered portion extending from the cover point to the needle end, the needle end of the syringe cylinder defining a syringe needle slot for aligning a partially inserted needle along a longitudinal axis within the syringe cylinder;

a securing ring affixed to the needle end of the syringe cylinder, the securing ring defining a ring needle slot sized and aligned commensurate with the syringe needle slot for releasingly securing and aligning a partially inserted needle along a longitudinal axis within the syringe cylinder;

a tubular needle means for transferring fluids between a patient and the syringe cylinder comprising an integral shank abutting an integral enlarged needle head, the needle means being partially inserted into the syringe cylinder such that the needle head extends within the cylinder portion of the syringe cylinder and the shank extends outwardly from the securing ring, to which the needle means is releasingly affixed, during such transfer of fluid;

a plunger reciproactively held in the syringe cylinder for boosting a fluid medicine in the syringe cylinder to be injected into and drawing fluid from a patient through the needle means, the plunger having a front surface, the front surface defining a needle clamp securingly engageable with the needle head such that full depression of the plunger causes such engagement and subsequent retraction of the plunger further causes dislodging and retraction of the needle means;

a locking clamp affixed proximate to the plunger end of the inner surface of the cylinder portion of the syringe cylinder for engaging and restraining a sufficiently retracted plunger from subsequent depression; and

a sealing means comprising a cover shaped to essentially conform with the front surface of the plunger and secured about its circumference to the inner surface of the syringe cylinder proximate to the cover point, the cover and the inner surface of the tapered portion of the syringe cylinder defining a sealant cavity containing a conventional liquid repelling sealing compound, the cover further defining a cover needle slot sized and aligned commensurate with the syringe needle slot, such that the sealing compound is drawn into a needle cavity defined by a retracting needle while mixture of the sealing compound with fluid within the syringe cylinder is prevented.



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**5,496,279**

**Patent Not Issued For This Number**

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**5,496,280**

## TROCAR VALVE ASSEMBLY

**Frans Vandenbroek, and Vincent C. Tangherlini, both of Rancho Santa Margarita, Calif., assignors to Applied Medical Resources Corporation, Laguna Hills, Calif.**

**Continuation-in-part of Ser. No. 907,706, Jul. 2, 1992, abandoned. This application May 19, 1994, Ser. No. 245,916**

**Int. Cl.[6] A61M *39/22***

**U.S. Cl. 604—167** **14 Claims**

1. A trocar having a working channel extending along an axis between a distal end and proximal end, the trocar comprising:

a cannula having a tubular configuration and a wall which defines the working channel at the distal end of the trocar;

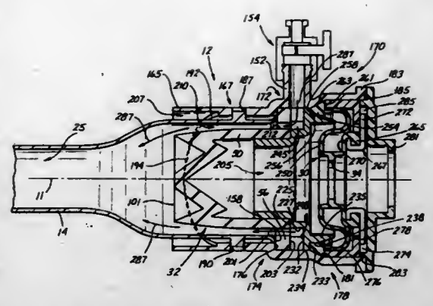
a housing disposed in fixed relationship to the cannula and defining the working channel at the proximal end of the trocar;

a valve disposed in the working channel and separating the channel into regions proximal of the valve and regions distal of the valve;

elastomeric means included in the valve and forming a first seal which is openably closable across the working channel;

a wall included in the valve and extending radially outwardly of the elastomeric means;

portions of the housing engaging the valve wall and forming with the valve wall a second seal which is disposed generally outwardly of the first seal;



means for defining a passage extending from regions exterior of the trocar, through the regions proximal of the valve, and into the regions distal of the valve;

a housing inlet included in the passage defining means, the housing inlet defining a first section of the passage which extends through the housing to provide fluid communication between the regions exterior of the trocar and the regions proximal of the valve;

valve means disposed across the housing inlet for openably closing the first section of the passage to thereby control the administration of a fluid from the regions exterior of the trocar, through the passage and into the working channel of the cannula;

portions of the valve being included in the passage defining means and defining a second section of the passage between the first seal and the second seal; and

a manifold included in the passage defining means and defining a third section of the passage between the first section of the passage and the second section of the passage.

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**5,496,281**

## SPINAL CANNULA WITH TRANSPARENT GRIP PART

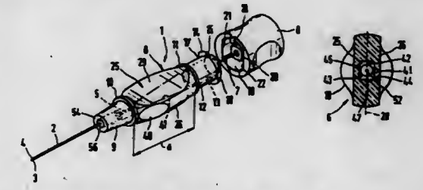
**Peter Krebs, Waldstrasse 39, 78048 VS-Villingen, Germany**

**Filed Sep. 26, 1994, Ser. No. 312,109**

**Claims priority, application Germany, Mar. 26, 1994, 69405166 U**

**Int. Cl.[6] A61M *5/178***

**U.S. Cl. 604—168** **16 Claims**



1. A spinal cannula and grip part, comprising:

a grip part formed of a transparent plastic with a cerebrospinal fluid checking chamber defined within the grip part, said cerebrospinal fluid checking chamber being visible through said transparent plastic of said grip part, said grip part having a proximal end and a distal end, said distal end having a conical Luer plug-type bore, said grip part having an outer surface with a first flange located adjacent to said Luer bore and a second flange and grip surfaces disposed diametrically opposed and symmetrically with respect to a plane of symmetry located in a longitudinal axis of the grip part, said grip surface being recessed radially with respect to said first flange part and said second flange part, said cerebrospinal fluid checking chamber being arranged between said grip surfaces with said cerebrospinal fluid checking chamber extending substantially over an axial distance between said first flange

part and said second flange part, said cerebrospinal fluid checking chamber having a taper toward a proximal end of said grip part, said cerebrospinal fluid checking chamber having a substantially rectangular cross-sectional shape defined by a first pair of opposed flat wall surfaces and a second pair of opposed flat wall surfaces, said first pair of wall surfaces being provided in a wedge shape and said second pair of wall surfaces being provided in a wedge shape, said first pair of wall surfaces being arranged symmetrically with respect to said plane of symmetry of said grip surfaces and having an angle defining said wedge shape which is smaller than an angle defining said wedge shape of said second pair of wall surfaces;

a cannula extending into a proximal end of said grip part;

a Luer plug-type cone disposed in a positive locking manner in said Luer plug-type bore; and

a stylet positioned in said cannula extending through said cerebral fluid checking chamber.

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**5,496,282**

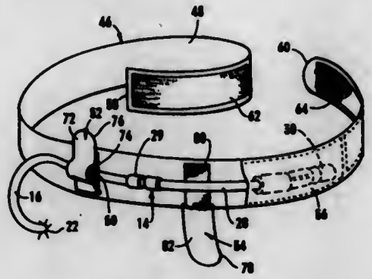
**APPARATUS AND METHOD TO STABILIZE A PERITONEAL DIALYSIS CATHETER**

**George G. Militzer, and Leslie H. Militzer, both of 1402 Carleton Sq., San Diego, Calif. 92106**

**Filed Dec. 12, 1994, Ser. No. 353,931**

**Int. Cl.[6] A61M *25/02;39/00***

**U.S. Cl. 604—179** **19 Claims**




1. An apparatus for stabilizing an implanted peritoneal dialysis catheter, having a valve at a distal end, said catheter at a proximal end having tubing exiting from the abdomen of a user, comprising:

(a) a belt body of elasticized fabric adapted to encircle a user without slipping;

(b) an adhesive-backed fabric band semi-permanently attached to said tubing of said catheter;

(c) a first fastener attached to said adhesive-backed band to firmly secure and stabilize said tubing of said catheter to said belt body at a point proximate to where said tubing of said catheter exits the user;

(d) a second fastener to hold said catheter against said belt body at a point spaced from said first fastener; and

(e) a receptacle spaced from said first and said second fasteners for securely holding said valve against said belt body.

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**5,496,283**

**APPARATUS FOR SECURING INTRAVENOUS OR INTRACAVITY MEDICAL TUBING**

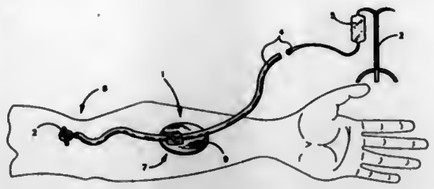
**Gary E. Alexander, Baton Rouge, La., assignor to Medisys Technologies, Inc., Baton Rouge, La.**

**Filed Jul. 28, 1994, Ser. No. 282,529**

**Int. Cl.[6] A61M *25/02***

**U.S. Cl. 604—180** **7 Claims**

1. A system for preventing tug trauma to a patient's skin, comprising:




(a) tubing having a first and second end,

(b) means capable of being inserted into said patient's skin operatively attached to said first end of said tubing, and

(b) a member comprising:

(i) opposing first and second sides whose adjacent edges form a perimeter section of said member,

(ii) a tubing retaining structure affixed to said first side, said tubing retaining structure having interior walls forming a passageway extending end-to-end through said tubing retaining structure, said passageway having an entry opening positioned at about a center section of said first side and shaped to receive said tubing and said passageway having an exit opening positioned adjacent said perimeter section and shaped to permit said tubing to exit said passageway, said passageway sized to receive said tubing and shaped to restrict movement of said tubing through said passageway, wherein said tubing is positioned in said passageway having said first end extending from said exit opening and said second end extending from said entry opening of said passageway, such that said entry opening becomes a center of rotation of said member when a lateral force would be placed on a section of said tubing extending past said entry opening; and

(iii) said second side containing an adhesive means to adhere said member to said patient's skin.

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**5,496,284**

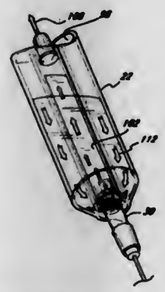
**DUAL-CHAMBER SYRINGE & METHOD**

**Ottfried Waldenburg, P.O. Box 548, Sells, Ariz. 85634**

**Filed Sep. 27, 1994, Ser. No. 312,878**

**Int. Cl.[6] A61M *5/19***

**U.S. Cl. 604—191** **12 Claims**




1. A medical syringe, including

a plunger having at one end a resilient seal,

a barrel having a central longitudinal axis and a pair of opposed ends,

said barrel having at one end an ejection port and at the other end an opening, said ejection port and opening being aligned with each other and disposed along the longitudinal axis,

outer and inner telescopic tubular elements seated inside the barrel to be coaxial with said longitudinal axis,

the outer tubular element being mounted in a stationary position while disposed in the barrel and the inner tubular element being movable axially within the outer tubular element,



said outer tubular element and barrel forming a chamber holding a reservoir of liquid, with the outer tubular element having a fluid passageway therein that allows the liquid to flow from the chamber into the inner tubular element, and

the inner tubular element having an end nearby the injection port with a seal thereon that has an orifice therein, said inner tubular element receiving the end of the plunger with the resilient seal thereon,

said resilient seal fitting snug within the inner tubular element to grip said inner tubular element and, in response to axial movement of the plunger, to move the inner tubular element between a first position where said seal with the orifice therein seals the injection port as the plunger is moved towards said injection port, preventing liquid in the chamber from passing into the inner tubular element and forcing any liquid in the inner tubular element through the orifice and out the injection port, and a second position where said seal with the orifice therein is moved to a retracted position away from the injection port, allowing liquid to flow from the chamber through the passageway and through the orifice into the inner tubular member.

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**5,496,285**

**DISPOSABLE SYRINGE**

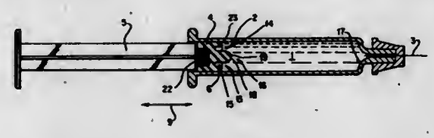
**Herbert Schumacher, Gorxheimertal; Norbert Messner, Neustadt; Ernst Osen, Birkenau, and Dirk Ecknig, Mannheim, all of, Germany, assignors to Firma Carl Freudenberg, Weinheim, Germany**

**Filed Nov. 18, 1994, Ser. No. 341,816**

**Claims priority, application Germany, Nov. 19, 1993, 43 39 528.7**

**Int. Cl.[6] A61M *5/315***

**U.S. Cl. 604—218** **14 Claims**




1. A disposable syringe for administering liquid medicinal agents; comprising:

a hollow cylinder having proximal and distal ends, said hollow cylinder being configured to receive a liquid;

an injection needle located at the proximal end of the hollow cylinder;

a piston made from a thermoplastically processable rubber mixture and being delimited in the proximal direction by a radially deflectable peripheral sealing lip, said piston being provided with a recess radially inside the sealing lip; and a piston rod, said piston being located at one end of the piston rod, said piston rod and said piston being configured to be slidable within the hollow cylinder so that the piston can be displaced by the piston rod within the hollow cylinder towards the injection needle at the proximal end of the cylinder;

wherein the peripheral sealing lip on the piston contacts the hollow cylinder and is configured to be radially deformed so as to reduce the recess when driven by the piston rod towards the proximal end of the hollow cylinder.

**5,496,286**

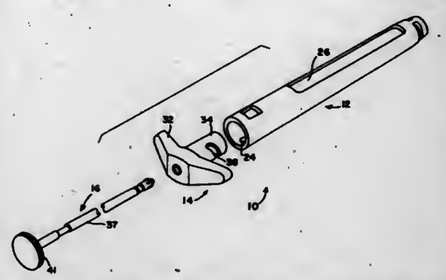
**HYPODERMIC SYRINGE HOLDER WITH DISPOSABLE BODY**

**Mark A. Stiehl, Rochester; William A. Bergstresser, Prattsburgh, and George E. Diaz, Rochester, all of N.Y., assignors to Sterling Winthrop, New York, N.Y.**

**Filed Aug. 17, 1994, Ser. No. 292,118**

**Int. Cl.[6] A61M *5/00***

**U.S. Cl. 604—232** **4 Claims**




1. An improvement in a hypodermic syringe holder adapted to receive a disposable ampoule comprising:

(a) frame portion shaped to receive an ampoule containing a needle hub,

(b) a plunger element having a rod, and

(c) a holding element,

wherein the improvement is that the frame portion:

(a) is a disposable hollow cylinder,

(b) is adapted to receive the disposable ampoule through an opening at its proximal end,

(c) has a head portion at the proximal end thereof and at least one projecting lug on the inside surface of the head portion, wherein the lug positions and frictionally fits with the holding element, and

(d) at the lower end has a slot sized to fit around the ampoule's needle hub and to align the ampoule.

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**5,496,287**

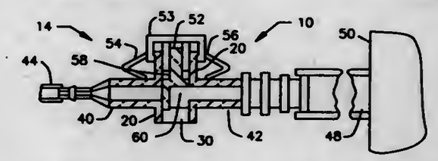
**PULMONARY SUCTION CATHETER**

**Walter J. Jinotti, 10 Scott St., New Brunswick, N.J. 08903**

**Filed Jul. 5, 1994, Ser. No. 270,768**

**Int. Cl.[6] A61M *5/00***

**U.S. Cl. 604—249** **4 Claims**




1. Apparatus for use in treating a pulmonary patient comprising

a valve having a valve body,

a first horizontal path through said valve body having a first end and a second end, said first end having means foe coupling to a patient and said second end having means for coupling to a source of suction,

a source of suction coupled to said second end of said first horizontal path,

a second vertical path through said valve body having an upper end and a lower end,

a solid slidable plunger in said vertical path in said valve body, said plunger having an upper end and a lower end and a through hole between its upper and its lower end which can be aligned with said horizontal path through said valve body in one position thereof and can be moved out of alignment

with said valve body in a second position thereof, and in sais second position, the solid lower end of said plunger blocking said first end of said first horizontal path through said valve body which goes to a patient,

the solid lower end of said plunger having an auxiliary opening which is aligned with and communicates with said second end of said first horizontal path through said valve body and with said source of suction connected thereto when said plunger is in said second position whereby said source of suction communicates with said auxiliary opening in said lower end of said plunger and with the atmosphere with which it communicates, and

means coupled to said plunger for sliding it up and down, said means being positioned in and blocking said upper end of said vertical path through said valve body.

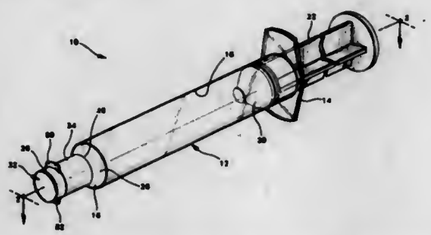
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**5,496,288**

**PROTECTIVE CAP FOR HYPODERMIC SYRINGE**

**Niall Sweeney, Rutherford, N.J., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.**

**Filed Sep. 23, 1992, Ser. No. 950,113**
**Int. Cl.[6] A61B *19/00***
**U.S. Cl. 604—263** **8 Claims**



1. A hypodermic syringe barrel having a protective cap comprising: a syringe barrel having a distal end, a chamber wall adjacent the distal end defining a cylindrical fluid-receiving chamber and a longitudinal axis, said distal end of said syringe barrel having a fluid passageway extending therethrough and communicating with said chamber;

said protective cap including a generally tubular collar having opposed proximal and distal ends and an inner surface extending therebetween, said inner surface being dimensioned and configured for fixed retention on said distal end of said syringe barrel;

a hinge extending from said collar; and

a cover joined to said hinge for rotation about an axis substantially perpendicular to said longitudinal axis of said syringe barrel between an open position where said cover is spaced from said syringe barrel and a closed position where said cover protectively covers said distal end of said syringe barrel, said cover including an inner face having at least one projection for sealing engagement with said distal end of said syringe barrel, said projection comprising an elongate center projection sealingly engageable in said passageway at said distal end of said syringe barrel.

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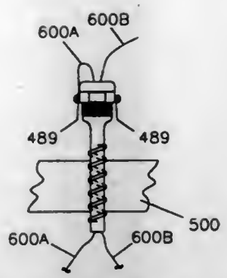
**5,496,289**

**SURGICAL CANNULA SYSTEM**

**Richard F. Wenstrom, Jr., Attleboro, Mass., assignor to Mitek Surgical Products, Inc., Westwood, Mass.**

**Filed Feb. 23, 1994, Ser. No. 200,758**
**Int. Cl.[6] A61M *5/00***
**U.S. Cl. 604—264** **3 Claims**

1. A surgical cannula kit comprising:




a cannula housing comprising a distal end, a proximal end, and a central passageway having a first longitudinal axis extending therebetween, said cannula housing further comprising first and second mount receiving means and including tissue locking means on an exterior surface thereof;

an obturator comprising a shaft having a distal end, a proximal end, and a central passageway having a second longitudinal axis extending therebetween, said obturator further comprising a first mounting means configured for releasable attachment to said first mount receiving means, said obturator being sized so that said obturator shaft is configured for slidable, substantially co-axial and removable location in said central passageway of said cannula housing and said distal end thereof extends distally outwardly from said distal end of said cannula housing when said first mounting means are in operative engagement with said first mount receiving means;

a guide rod comprising a shaft having a third longitudinal axis, a distal end and a proximal end, said guide rod being sized so that said guide rod shaft is configured for slidable, substantially co-axial and removable positioning in said obturator central passageway; and

a dam assembly comprising a third longitudinal axis, a housing, a central passageway, sealing means disposed in said housing, and second mounting means for removably operatively engaging said second mount receiving means so as to substantially co-axially and sealably mount said dam assembly to said cannula housing so that said sealing means of said dam assembly will extend across said central passageway of said cannula housing when said dam assembly is mounted to said cannula housing, said dam assembly further comprising suture holding means for separately and distinctly securing a plurality of suture ends to said dam assembly.

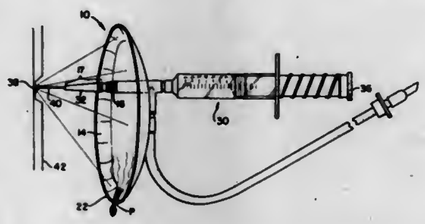
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**5,496,290**

**WOUND IRRIGATION SPLASH SHIELD**

**Bernard Ackerman, Metuchen, N.J., assignor to Ackrad Laboratories, Inc., Cranford, N.J.**

**Filed Nov. 23, 1994, Ser. No. 344,728**
**Int. Cl.[6] A61M *37/00*; A61C *1/16***
**U.S. Cl. 604—268** **16 Claims**



1. A splash shield for use in conjunction with a fluid irrigating device having an elongated tip, said splash shield comprising:



a centrally disposed planar region having a midpoint, said centrally disposed planar region merging into an outer concave region which extends radially from said planar region, said outer concave region terminating at a rim;

connecting means located in said planar region and disposed at a point eccentric to said midpoint, for selectively connecting said splash shield to the elongated tip of the fluid irrigating device, wherein the elongated tip projects through said connecting means and extends beyond said rim.

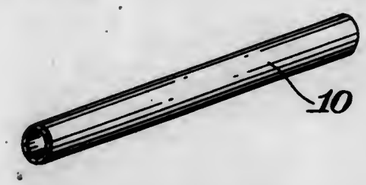
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**5,496,291**

**IONOMERIC MODIFIED POLY-ETHER-ESTER PLASTIC TUBE FOR USE IN CONVEYING MEDICAL SOLUTIONS AND THE LIKE**

**Dudley W. C. Spencer, 619 Shipley Rd., Wilmington, Del. 19809**

**Filed Mar. 30, 1994, Ser. No. 219,828**
**Int. Cl.[6] A61M *25/00***
**U.S. Cl. 604—280** **22 Claims**



1. In an assembly for transferring a fluid between a first location and a remote container by means of plastic tubing, the improvement being in that said plastic tubing is made from an ionomeric modified poly-ether-ester material, said poly-ether-ester being a block copolymer containing both poly-ether and ester blocks modified by an ionomer, said ionomer being a copolymer of ethylene with 1–10% methacrylic acid converted to methacrylate salt, said poly-ether-ester and said ionomer both individually and in combination being plasticizer-free, said material being capable of being welded to itself to form a seal which resists opening at internal pressure of up to 60 psi, and said seal being capable of opening under external finger pressure.

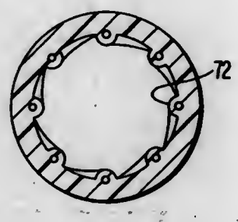
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**5,496,292**

**CATHETER WITH IRREGULAR INNER AND/OR OUTER SURFACES TO REDUCE TRAVELLING FRICTION**

**Warren Burnham, Drawer 317, Glens Falls, N.Y. 12801**

**PCT No. PCT/US92/03668, § 371 Date Nov. 2, 1993, § 102(e) Date Nov. 2, 1993**
**Continuation-in-part of Ser. No. 695,522, May 3, 1991, Pat. No. 5,244,619. This PCT application May 4, 1992, Ser. No. 140,124**
**Int. Cl.[6] A61M *25/00***
**U.S. Cl. 604—282** **8 Claims**



1. A finished reinforced catheter made from a polymeric material and having a bore with an inner diameter and an outer diameter with a first reinforcement member wound in a first rotational direction to form a first helix and a second reinforcement member wound in a second helix in a second rotational direction which is opposite to said first rotational direction to form a second belix, said first and second reinforcement members being completely embedded within the wall of said catheter between said inner diameter and said outer diameter, said first reinforcement member being embedded sufficiently close to said inner diameter as to provide at least a ridge interrupting the smoothness of said inner diameter and following the contour of the reinforcement material located adjacent thereto, said ridge defining a land having an effective I.D. less than an actual I.D. of said interior diameter, so that when used as a guiding catheter, the effective friction force on an axially inserted or rotated concentric catheter is less than that exhibited by a smooth I.D. wall.

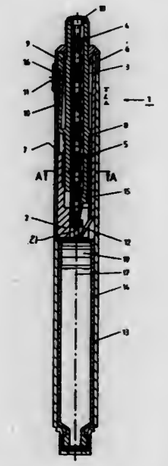
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**5,496,293**

**ADVANCING MECHANISM FOR AN INJECTION DEVICE**

**Heinz Huggenberger, Grafenried, Switzerland, assignor to Medimpex Ets., Liechtenstein**

**Filed May 12, 1994, Ser. No. 241,869**
**Claims priority, application Switzerland, Apr. 6, 1993, 01685/93**
**Int. Cl.[6] A61M *5/00***
**U.S. Cl. 604—208** **7 Claims**



1. A feed mechanism for an injection device comprising the combination of

an outer casing (2);

an ampoule casing having an aperture;

a liquid-containing ampoule in said ampoule casing;

an inner casing (3) in said outer casing and protruding rearwardly from said outer casing (2), said inner casing being longitudinally movable relative to said outer casing in a forward direction manually, said inner and outer casings including stop means for limiting said relative movement to a distance (L);

spring means urging said inner casing in a rearward direction;

a toothed rack (4) having a plurality of teeth (5), each tooth having a length (L) corresponding to one full injection dose, said inner casing having means for engaging said rack and moving said rack forward longitudinally of said outer casing against the force of said spring means when said inner casing is moved manually, said rack being coupled to said ampoule to dispense liquid therefrom when said rack is moved forward;

latch means (9, 10) carried by said inner casing for releasably engaging said aperture (11) when said inner casing (3) reaches an extreme forward position to thereby prevent motion of said inner casing until said latch means is released; and

recoil safety means (12) for preventing rearward motion of said rack.

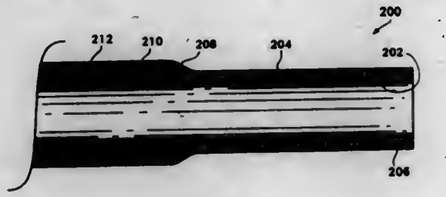
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5,496,294

## CATHETER WITH KINK-RESISTANT DISTAL TIP

Robert Hergenrother, Fremont; June Lim, Union City; Roger Farnholtz, Fremont; Kim Nguyen, Milpitas, and Edward Snyder, San Jose, all of Calif., assignors to Target Therapeutics, Inc., Fremont, Calif.

Filed Jul. 8, 1994, Ser. No. 273,049
Int. Cl.[6] A61M 25/00
U.S. Cl. 604—282 16 Claims




1. A catheter section comprising:

an elongate tubular member having a proximal end and a distal end and a passageway defining an inner lumen extending between those ends, the distal end of the elongate tubular member comprising:

a.) an inner stiffener liner of a first liner material in coaxial relationship with an outer tubular cover,

b.) an outer tubular cover comprising a polyethylene blend containing at least 12% EVA, and

c.) at least a distal radiopaque marker located distally of said inner stiffener liner.

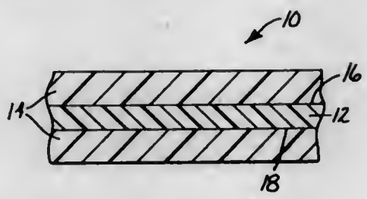
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5,496,295

## MULTILAYERED BARRIER STRUCTURES

Debra L. Wilfong, Lake Elmo, and Richard J. Rolando, Oakdale, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 810,001, Dec. 18, 1991, abandoned. This application Dec. 6, 1993, Ser. No. 163,483
Int. Cl.[6] A61F 5/44; C08F 267/04;2/46
U.S. Cl. 604—332 55 Claims




1. A multilayered structure comprising:

(a) a gas barrier layer having opposing sides, and comprising a non-chlorine containing organic polymer which is substantially impermeable to oxygen gas; and

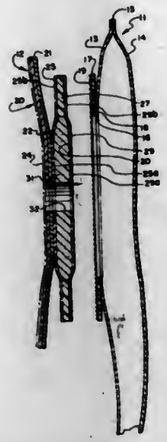
(b) at least one moisture barrier layer comprising a mesophase propylene-based material contacting at least one of the sides of the gas barrier layer.

5,496,296

## OSTOMY APPLIANCE WITH EXTRUDABLE GASKET

Steen Holmberg, Espergaerde, Denmark, assignor to Dansac A/S, Fredensborg, Denmark

Filed Jun. 6, 1994, Ser. No. 254,503
Int. Cl.[6] A61F 5/44
U.S. Cl. 604—336 11 Claims



1. An ostomy appliance comprising a collection pouch and faceplate assembly; said faceplate assembly including a flexible patch having a stoma-receiving opening, a first layer of skin-friendly hydrocolloid-containing adhesive material along one side of said patch about said opening for securing said faceplate assembly to peristomal skin surfaces, and a second layer of adhesive sealant material immediately surrounding said opening; said adhesive sealant material of said second layer being softer more easily deformable and extrudable, and more resistant to being dissolved or disintegrated by stomal fluids than the skinfriendly hydrocolloid-containing adhesive material of said first layer and being displacable inwardly and axially into said opening for forming a stoma-engaging annular gasket to prevent stomal fluids from contacting said first adhesive layer.

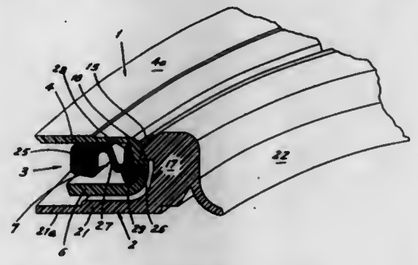
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5,496,297

## OSTOMY COUPLING

Hans Olsen, Bronshoj, Denmark, assignor to Coloplast A/S, Denmark

Filed Feb. 22, 1994, Ser. No. 199,547
Claims priority, application Denmark, Feb. 22, 1993, 0197/93
Int. Cl.[6] A61F 5/48
U.S. Cl. 604—339 18 Claims



1. An ostomy coupling comprising:

a first and a second annular coupling part; and



a locking ring for locking together the two coupling parts,

each of the two coupling parts having an attachment surface for attaching a part associated with the corresponding coupling part,

the first coupling part comprising:

a collar having a radially outwardly projecting annular edge, the edge defining a groove with an in radial direction innermost groove section, and an annular recess positioned in the radial direction inner side of the collar,

the second coupling part comprising:

an axially projecting part having an annular radially outwardly projecting beak, the beak being structured and arranged on the second coupling part so as to engage the annular recess in the first coupling part when the first coupling part is positioned around the second coupling part, and

the locking ring having an annular in the radial direction inwardly projecting protrusion, and the locking ring is positioned in the groove of the first coupling part,

wherein when the locking ring is in a locked position with respect to the first and second coupling parts, an innermost diameter of the locking ring is smaller than a largest diameter of the beak of the second coupling part, and

the annular recess at the inner side of the first coupling part is closer to the attachment surface of the first coupling part than the groove section of the first coupling part.

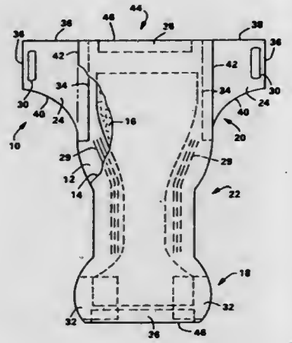
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5,496,298

## ELASTOMERIC EARS FOR DISPOSABLE ABSORBENT ARTICLE

Rebecca J. Kuepper, Appleton, and Christine A. Rasmussen, Medford, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Dec. 28, 1993, Ser. No. 174,565
Int. Cl.[6] A61F 13/15
U.S. Cl. 604—389 30 Claims



1. A disposable absorbent article, said article defining a front portion, a rear portion, and a crotch portion connecting the front and rear portions; said article comprising:

an outer cover;

a liquid-pervious bodyside liner;

an absorbent material located between said cover and said bodyside liner;

a pair of elastomeric ears attached to said rear portion, said ears having a proximal edge, a distal edge, a first connecting edge, and a second connecting edge, said first and second connecting edges connecting said proximal and distal edges, said second connecting edge being non-parallel to said first connecting edge and said proximal edge being longer than said distal edge;

a fastener joined to said elastomeric ears for attaching said elastomeric ears to said front portion in an overlapping relationship; wherein, when in use, said second connecting edge defines at least a portion of a leg opening.

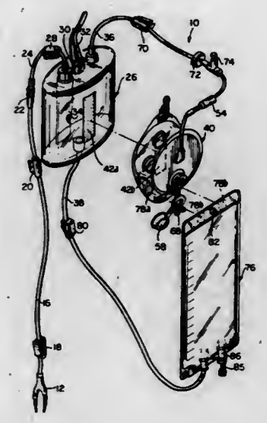
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5,496,299

## SUCTION RESERVOIR

Augustus Felix, Providence, and Gary V. Halick, East Greenwich, both of R.I., assignors to C. R. Bard, Inc., Murray Hill, N.J.

Filed Sep. 21, 1994, Ser. No. 310,267
Int. Cl.[6] A61M 1/00
U.S. Cl. 604—319 6 Claims



1. A suction reservoir means including a pair of circular plates, a resilient sleeve connecting the plates, internal springs urging the plates in a spaced apart relationship, a valve controlled outlet through which air is adapted to be purged from the interior of the suction reservoir means upon collapsing the resilient sleeve by manually squeezing the plates towards one another, the valve controlled outlet including a one way valve means including openings and an umbrella valve including a flexible disc covering the openings for sealing the suction reservoir means interior from the ambient, upon squeezing the plates towards one another the flexible disc flexes outwardly to uncover the opening and permit air within the suction reservoir means to vent through the openings, coupling means for removably mounting the one way valve means on the valve controlled outlet.

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5,496,300

## COUPLING DEVICE FOR A LEG URINAL

Michael P. Hirsch, and Patricia Hirsch, both of 18 Pine Dr., Oyster Bay, N.Y. 11791

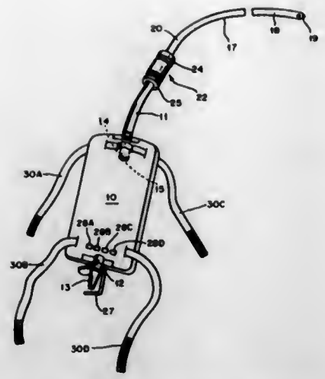
Filed Aug. 26, 1994, Ser. No. 296,500
Int. Cl.[6] A61B 1/00
U.S. Cl. 604—327 13 Claims

1. A coupling device for a urinal comprising:

a urine collection bag with a liquid inlet line;

a flexible tube having an upstream end operationally connectable to a user's catheter and a downstream end; and

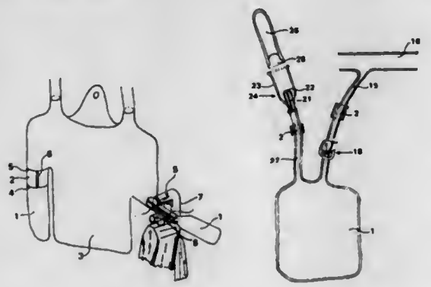
quick-release coupling means for readily connecting and disconnecting said downstream end from said inlet line, said coupling means providing a fluid passageway from said tube to said bag inlet line upon connection and closing both said inlet line and said downstream end of said tube upon disconnection to prevent fluid spillage therefrom and to avoid contaminants from entering said tube, said quick release coupling means having an axial and a radial direction and comprising:



(a) a first coupling member securely connected to said liquid inlet line and having a first aperture and a first spring loaded closure member for closing the first aperture upon disconnection;
(b) a second coupling member securely-connected to said downstream end of said flexible tube and having a second aperture and a second spring loaded closure member for closing the second aperture upon disconnection; and
(c) a radially-inwardly extending arm attached to one of said coupling members for positively displacing said spring loaded closure members away from the respective apertures upon connection.

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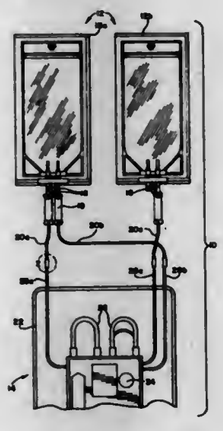
**5,496,301**
**FLUID SAMPLING DEVICE FOR CLOSED COLLECTION SYSTEMS**
**Dennis J. Hlavinka, Golden; Robert L. White, Kittridge, and Todd C. Green, Lakewood, all of Colo., assignors to COBE Laboratories, Inc., Arvada, Colo.**
**Continuation-in-part of Ser. No. 21,507, Feb. 23, 1993, Pat. No. 5,345,070, which is a continuation-in-part of Ser. No. 952,951, Sep. 25, 1992, abandoned. This application Aug. 9, 1993, Ser. No. 104,343**
**Int. Cl.[6] A61B *19/00***
**U.S. Cl. 604—409** **18 Claims**



1. A functionally closed system for maintaining sterile conditions while collecting and sampling biological fluids comprising:
a tubular line for withdrawing biological fluids during a collection procedure;
a sample receptacle connected to said tubular line, said receptacle comprising a sample reservoir and an entry tube connected to said reservoir and to said tubular line for enabling said fluid to flow into said reservoir;
a radio frequency heating apparatus with jaws sized to surround and heat said entry tube to close said tube; and
a thermal insulating sleeve means located around said entry tube, said sleeve means having a low dielectric loss coefficient for insulating said entry tube from said jaws when said jaws are used to close said entry tube after filling said reservoir;
whereby when said sample reservoir is filled with fluid and removed from the closed system to enable laboratory analysis of said fluid the sterility of said closed system is not compromised and danger of spillage from said entry tube or said sample reservoir is averted.

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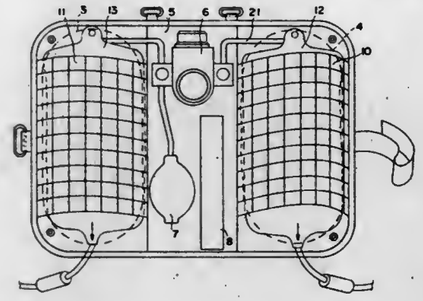
**5,496,302**
**METHOD FOR STERILIZING**
**Billy W. Minshall, Mission Viejo, Calif.; John E. Nygard, Skokie, Ill.; Kwame Sintim-Damoa, Vernon Hills, Ill.; Richard Giesler, Deerfield, Ill.; Archie Woodworth, Barrington, Ill., and Kallash Purohit, Winnetka, Ill., assignors to Baxter International Inc., Deerfield, Ill.**
**Continuation of Ser. No. 678,811, Apr. 1, 1991, abandoned, which is a division of Ser. No. 321,698, Mar. 10, 1989, Pat. No. 5,009,654. This application Apr. 29, 1992, Ser. No. 876,125**
**Int. Cl.[6] A61B *19/00***
**U.S. Cl. 604—410** **6 Claims**



1. A method for sterilizing a first part of a product portion, said first part having means defining a flow path, said flow path having a proximal end communicating with the remainder of said product portion and a terminal end distal from said proximal end, said method comprising the steps of:
blocking said flow path to the ingress of microorganisms at a location spaced from said terminal end so as to form an isolated terminal end portion;
exposing at least a portion of the interior of said isolated terminal end portion to an non-sterile environment;
exposing at least said isolated terminal end portion to an electron beam while shielding at least a part of the remainder of said product portion from the electron beam; and
unblocking said isolated terminal end portion to provide an open flow path between the remainder of said product portion and said terminal end of said flow path.



**5,496,303**
**TRANSFUSION AND PERFUSION DEVICE FOR DRIP AND/OR EMERGENCY INTERVENTION**
**Pierre Antonetti, 7, avenue Jean Jaurès, F-06540 Bresil-sur-Roya, France**
**PCT No. PCT/FR92/00870, § 371 Date Mar. 18, 1994, § 102(e) Date Mar. 18, 1994, PCT Pub. No. WO93/05831, PCT Pub. Date Apr. 1, 1993**
**PCT Filed Sep. 17, 1992, Ser. No. 211,095**
**Claims priority, application France, Sep. 18, 1991, 91 11594**
**Int. Cl.[6] A61B *19/00*; A61M *37/00***
**U.S. Cl. 604—410** **6 Claims**

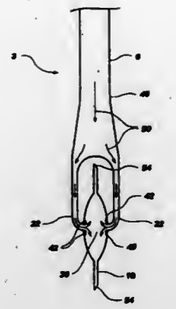


1. Device for intravenous and intra-arterial transfusion and perfusion securable to a subject and operating in closed circuit, comprising two pressure pockets communicating via a calibrated adjustable expansion valve, each pressure pocket being comprised of a balloon contained in an envelope, each said balloon being stretchable and inflatable and of the same shape as its envelope; one of the balloons functioning as a pressure balloon, and the other balloon functioning as a pressing balloon, said pressure balloon continuously supplying the pressing balloon, an inflation bulb for inflating the pressure balloon, an adjustable calibrated expansion valve for regulating fluid under pressure contained in the pressing balloon to a pressure of 100 millibars, a verticalization device for ensuring a vertical drip, each of said envelopes having a sleeve of unstretchable material adapted to receive a flexible pouch of product to be perfused, whereby the pressure balloon contained in its envelope can be inflated either to a high pressure and thus serve as a power pressing balloon to ensure the flow necessary for lifesaving, or as a pressure reserve for regulated pressure for the other pressing balloon contained in the other envelope.

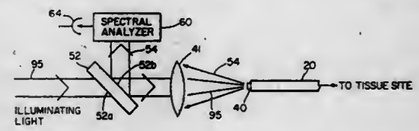
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**5,496,304**
**SURGICAL MARKING PEN**
**Paul E. Chasan, Salt Lake City, Utah, assignor to University of Utah Research Foundation, Salt Lake City, Utah**
**Filed Jul. 20, 1994, Ser. No. 278,021**
**Int. Cl.[6] A61B *17/00***
**U.S. Cl. 606—1** **20 Claims**

1. A marking pen for indicating the proper location of incisions to be made on a patient undergoing surgery, the marking pen comprising:
rotatable penetrating means for penetrating a portion of the epidermis of the patient, the penetrating means including a means for depositing a marking agent within the epidermis;
reservoir means for storing the marking agent and for conveying the marking agent to the penetrating means; and wherein at least a portion of said reservior means is disposed in the penetrating means; and
handle means attached to the penetrating means so as to enable a user to roll the penetrating means across the epidermis of a patient, thereby leaving a line of marking agent in the epidermis.



**5,496,305**
**CATHETER FOR LASER ANGIOSURGERY**
**Carter Kittrell, Cambridge, Mass.; Robert M. Cothren, Jr., Beatrice, Nebr., and Michael S. Feld, Waban, Mass., assignors to Massachusetts Institue of Technology, Cambridge, Mass.**
**Continuation of Ser. No. 420,135, Oct. 11, 1989, Pat. No. 5,104,392, which is a continuation of Ser. No. 58,675, May 26, 1987, Pat. No. 4,913,142, which is a continuation of Ser. No. 715,239, Mar. 22, 1985, abandoned. This application Jan. 29, 1992, Ser. No. 827,990**
**Int. Cl.[6] A61B *5/00***
**U.S. Cl. 606—15** **17 Claims**

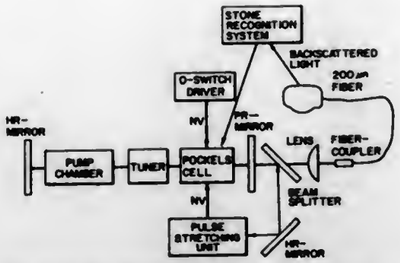



1. A laser system for operating on a treatment site comprising:
a) a fiber optical means having a proximal end and a distal end positionable an operative proximity to the treatment site;
b) a treatment laser source optically connected to the proximal end of said fiber optical means;
c) a diagnostic radiation source connected to the proximal end of said fiber optical means for irradiating the treatment site;
d) responding radiation detector means connected to the proximal end of said fiber optical means for generating a control signal when detecting a particular radiation in response to being irradiated by said diagnostic radiation source from the treatment site; and
e) means responsive to said control signal for controlling said treatment laser source.

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**5,496,306**
**PULSE STRETCHED SOLID-STATE LASER LITHOTRIPTER**
**Ralf Engelhardt, Uetze; Ralf Brinkmann, Nordstemmen, both of, Germany; John C. Walling, Whitehouse Station, and Donald F. Heller, Boundbook, both of N.J., assignors to Light Age, Inc., Somerset, N.J.**
**Continuation of Ser. No. 585,992, Sep. 21, 1990, abandoned. This application Nov. 24, 1992, Ser. No. 982,022**
**Int. Cl.[6] A61B *17/22***
**U.S. Cl. 606—15** **9 Claims**

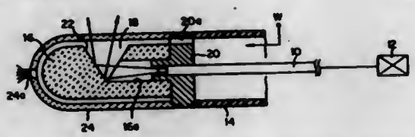
1. An apparatus for conducting laser lithotripsy comprising a pulse-stretched solid state laser having a wavelength between 700 nm and 1.0 μm and a fiber optic delivery means for conducting laser light, said pulsed solid state laser having a feedback means




for controlling pulse duration wherein the pulse duration is in the range of 0.5 to 3 μs, and said pulse energy being between 15 and 200 mJ.

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**5,496,307**
**LASER LIGHT IRRADIATION APPARATUS FOR MEDICAL TREATMENT**
**Norio Daikuzono, Chiba, Japan, assignor to S.L.T. Japan Co., Ltd., Tokyo, Japan**
**Filed Sep. 10, 1993, Ser. No. 118,827**
**Int. Cl.[6] A61B *17/36***
**U.S. Cl. 606—15** **5 Claims**

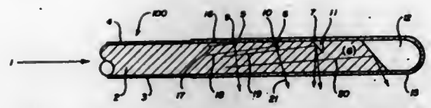


1. A laser light irradiation apparatus for medical treatment by irradiating an object tissue with laser lights transmitted through an optical fiber or fibers, comprising;
- a laser light reflector provided in front of the laser light emitting end of said optical fiber for reflecting the laser light in a lateral direction of the apparatus;
- a covering which covers the reflector and is capable of transmitting the laser light at least at a side portion thereof, said covering being positioned apart from said reflector to form a space completely separating said reflector and said covering; and
- means for continuously supplying fluid to said space between the covering and said reflector; wherein said reflector is linked with the emitting end of the optical fiber by a fastener, said reflector being formed with an opening on a side thereof, said opening having a slanted surface which intersects with the emitted laser light emitted from the optical fiber in the direction of its longitudinal axis.

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**5,496,308**
**RADIAL LASER DELIVERY DEVICE**
**Joseph Brown, 1706 Brookgreen Way, Acworth, Ga. 30101, and Wolfgang Neuberger, KamphausenerWeg 19, 4050 Monchengladbach 3, Germany**
**Continuation-in-part of Ser. No. 908,382, Jul. 6, 1992, Pat. No. 5,292,320. This application Dec. 27, 1993, Ser. No. 173,891**
**Int. Cl.[6] A61M *29/02***
**U.S. Cl. 606—15** **22 Claims**

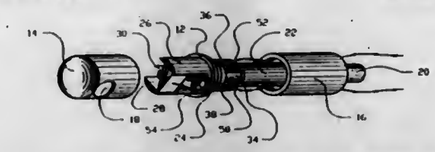
1. A medical delivery system capable of emitting radiation with wavelengths between 190 nm and 16 um in one or more essentially directed, predetermined patterns, which comprises:
- at least one solid optical fiber, having a core and a cladding on said core and said cladding having a refractive index smaller



than the core, having an input end suitably configured to connect to an appropriate radiation source and having a distal end in the proximity of which two or more grooves having been formed in a predetermined pattern are penetrating into the core, said grooves having at least partial reflector capability so as to deflect radiation thereto radially in one or more predetermined patterns.

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**5,496,309**
**CATHETER DEVICE UTILIZING A LASER BEAM LATERALLY DIRECTED BY A HIGH INDEX PRISM IN A LIQUID MEDIUM**
**Vahid Saadat, Irvine; Marvin P. Loeb, Huntington Beach, and L. Dean Crawford, Irvine, all of Calif., assignors to Trimedyne, Inc., Irvine, Calif.**
**Filed May 6, 1994, Ser. No. 239,338**
**Int. Cl.[6] A61B *17/36***
**U.S. Cl. 606—15** **18 Claims**



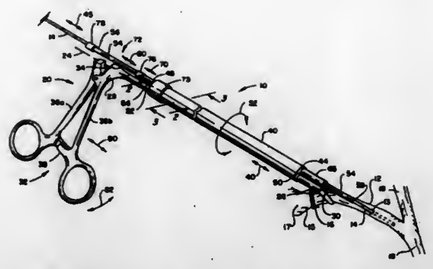
1. A catheter suitable for directing laser energy laterally to a selected site in a body lumen and comprising
- an elongated, hollow housing including a cap at the distal end of the catheter, defining a confined flow passageway for a liquid medium and a sidewall aperture in communication therewith through which said liquid medium flows;
- a fiber optic, the distal end of which is mounted in said housing and the proximal end of which is adapted for coupling to a laser source; and
- a prism covered by said cap and, positioned in said liquid passageway to receive a laser beam emitted by the distal end of said fiber optic and to direct the emitted beam laterally relative to the longitudinal axis of the fiber optic;
- said prism having a refractive index that is higher than the refractive index of said liquid medium in said liquid passageway contiguous with the reflective surface of the prism.

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**5,496,310**
**ENDOSCOPIC CHOLANGIOGRAM GUIDE INSTRUMENT AND METHOD OF USE**
**Primo D. Exconde, 450 N. Pickaway St., Circleville, Ohio 43113, and John S. Thomas, 42 E. Prescott St., Columbus, Ohio 43215**
**Filed Sep. 30, 1994, Ser. No. 315,866**
**Int. Cl.[6] A61B *17/28***
**U.S. Cl. 606—205** **23 Claims**

1. A guide instrument for cannulating a biliary duct with a flexible catheter as part of a laparoscopic cholangiographic surgical procedure, said instrument comprising:
- (a) a grasping forceps component comprising:
  - (i) an elongate shaft extending along a longitudinal axis between a first and a second end;
  - (ii) a pair of jaws positioned at said first end of said shaft and mutually pivotally coupled thereat for movement between an opened and a closed orientation for selectively grasping said duct; and

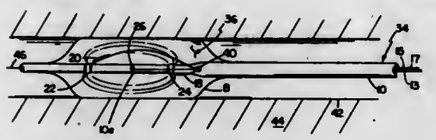




  - (iii) an actuator positioned at said second end of said shaft and coupled in a drive relationship with said jaws for moving said jaws between said opened orientation and said closed orientation; and
- (b) an elongate, generally cylindrical guide tube: slidably supported along said elongate shaft, having an internal catheter channel extending therethrough, said catheter channel having a central axis spaced radially from said longitudinal axis and extending between an input end for receiving the catheter and an output end for expressing the catheter from said guide tube, said guide tube being rotatable about said longitudinal axis to define with the central axis of said catheter channel a first confrontation radius for presenting the catheter expressed from the output end of said catheter channel to said biliary duct at a confrontation angle effective for cannulating said duct as said duct is grasped between the jaws of said grasping forceps component.

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**5,496,311**
**PHYSIOLOGIC LOW STRESS ANGIOPLASTY**
**John E. Abele, Concord, Mass., and Charles D. Lennox, Hudson, N.H., assignors to Boston Scientific Corporation, Watertown, Mass.**
**Continuation of Ser. No. 146,452, Nov. 1, 1993, abandoned, which is a continuation of Ser. No. 965,518, Oct. 23, 1992, abandoned, which is a continuation of Ser. No. 809,237, Dec. 17, 1991, abandoned, which is a continuation of Ser. No. 589,346, Sep. 27, 1990, abandoned, which is a continuation-in-part of Ser. No. 404,483, Sep. 8, 1989, abandoned, which is a continuation-in-part of Ser. No. 263,815, Oct. 28, 1988, Pat. No. 4,955,377. This application May 2, 1994, Ser. No. 236,393**
**Int. Cl.[6] A61M *29/02***
**U.S. Cl. 606—28** **52 Claims**

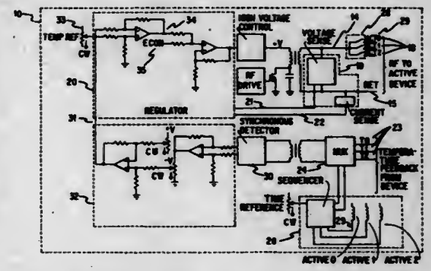


1. A method of angioplasty, comprising:
- providing a catheter having a liquid-expansible dilatation balloon and means for controllably providing heated liquid within the balloon to enable conductive heat transfer from the heated liquid, through the wall of the balloon,
- inserting the catheter into a region of a blood vessel narrowed by plaque or stenotic tissue,
- inflating said balloon to an initial subdilatation pressure sufficient to cause the balloon to engage the wall surface of the narrowed vessel in a conductive heat transfer relationship without substantially displacing the wall of the vessel,
- increasing the temperature of the engaged vessel wall by conductive heat transfer from heated liquid within the balloon while controlling the inflating pressure, the temperature of said liquid within said balloon and the duration of treatment to cause a physiological response in which the heated wall of the vessel yields to said pressure of said dilatation balloon as a result of softening of the wall produced by said conductive heat transfer,

thereby enabling dilatation of said vessel to occur under relatively low stress conditions.

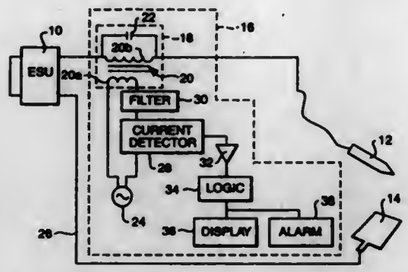
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**5,496,312**
**IMPEDANCE AND TEMPERATURE GENERATOR CONTROL**
**Michael S. Klicek, Boulder, Colo., assignor to Valleylab Inc., Boulder, Colo.**
**Filed Oct. 7, 1993, Ser. No. 133,235**
**Int. Cl.[6] A61B *17/36***
**U.S. Cl. 606—34** **16 Claims**




1. (An automatic control for electrosurgical generator power responsive separately and independently to the level of tissue impedance between active and return electrodes of the electrosurgical generator during tissue desiccation comprising:
- an electrosurgical generator having an active electrode and a return electrode in circuit with the tissue and connected to the electrosurgical generator with an active lead and a return lead respectively so as to supply high frequency electrosurgical power to the tissue therebetween the active electrode and return electrode;
- a plurality of active electrode contacts electrically coupled to and associated with the active electrode, each active electrode contact on the active electrode and positioned for contact with tissue so as to be capable of separately and independently providing high frequency power supplied by the electrosurgical generator through the active lead to the active electrode and the active contacts thereon to electrosurgically effect the tissue thereagainst;
- a monitor connected in circuit between each of the active electrode contacts and the return electrode, the monitor responsive separately and independently to voltage across and current flow through each of the active electrode contacts, the tissue and the return electrode for application in providing impedance signals of instantaneous impedances therebetween, and
- a regulator electrically linked in circuit and associated with an operational output of the electrosurgical generator for separately and independently controlling the electrosurgical generator as a function of tissue impedance between each active electrode contact and the return electrode in accord with monitored impedance signals, the regulator connected in circuit with the electrosurgical generator for changing a level of transmission of high frequency power between the electrosurgical generator and the associated active electrode contact for independent regulation of power passing to the return electrode from each active electrode contact.

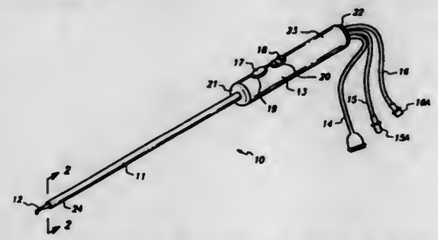
**5,496,313**
**SYSTEM FOR DETECTING PENETRATION OF MEDICAL INSTRUMENTS**
**John S. Gentelia, Madison, and Ernesto G. Sevilla, Herkimer, both of N.Y., assignors to Conmed Corporation, Utica, N.Y.**
**Filed Sep. 20, 1994, Ser. No. 308,913**
**Int. Cl.[6] A61B** *17/36*
**U.S. Cl. 606—34** **20 Claims**




1. In combination, a medical instrument including a tip which is designed to penetrate the wall of an internal cavity of a patient, and a device for detecting when the tip penetrates through said wall, said device comprising: a source of a detection signal; means for coupling said signal to the tip of said medical instrument, said coupling means including a high Q resonant circuit having an initial value of Q when the medical instrument is not in use; means for providing a return path for said signal so that, in use of the instrument, a circuit is completed through said resonant circuit such that when said tip contacts patient tissue the initial Q of the resonant circuit changes and when the tip penetrates through the patient tissue the Q of the circuit is restored to said initial value; and detector means for detecting the change in Q of said resonant circuit and for producing an output when changed Q is restored to the initial value thereof so as to indicate that said tip has penetrated through the patient tissue.

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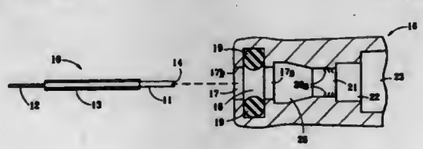
**5,496,314**
**IRRIGATION AND SHROUD ARRANGEMENT FOR ELECTRICALLY POWERED ENDOSCOPIC PROBES**
**Philip E. Eggers, Dublin, Ohio, assignor to Hemostatic Surgery Corporation, Georgetown, Cayman Islands**
**Continuation-in-part of Ser. No. 877,476, May 1, 1992, abandoned. This application Oct. 9, 1992, Ser. No. 958,946**
**Int. Cl.[6] A61B** *17/32*
**U.S. Cl. 606—41** **14 Claims**




1. An instrument for use in endoscopic surgery, the instrument connected to a suction source, an irrigation source, and a power source, the instrument comprising:
an elongated shaft having a proximal end, a distal end, and a central bore;
an electrically powered probe tip connected to the distal end of the elongated shaft;
means for connecting the electrically powered probe tip to the power source;
a handle connected to the proximal end of the elongated shaft, the handle having a first passageway for transmitting suction from the suction source to the central bore, and a second passageway for transmitting irrigation from the irrigation source to the central bore; and
valve means disposed in the first and second passageways for biasing the first and second passageways closed, the valve means enabling either of the first and second passageways to be selectively opened,
wherein the electrically powered probe tip comprises a working end disposed from the distal end of the elongated shaft, the working end having a cross-section extending perpendicularly to the working surface, the working surface maintained at an auto-regulated temperature by conducting a current throughout the cross-section of the working end, the heating element comprising a material having a skin depth extending substantially throughout the cross-section of the working end responsive to the temperature of the heating element and that decreases as the temperature of the element falls below the auto-regulated temperature.

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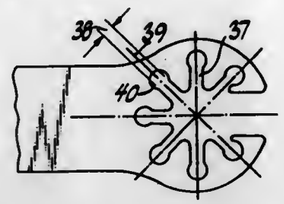
**5,496,315**
**MEDICAL ELECTRODE INSULATING SYSTEM**
**Drew D. Weaver, and William S. Nettekoven, both of Sandy, Utah, assignors to MegaDyne Medical Products, Inc., Draper, Utah**
**Filed Aug. 26, 1994, Ser. No. 296,670**
**Int. Cl.[6] A61B** *17/39*
**U.S. Cl. 606—41** **16 Claims**




1. An electrosurgical pencil comprising:
(a) an elongated housing having a proximal end and a distal end;
(b) an elongated longitudinally disposed interior chamber within said elongated housing, said interior chamber having mounted on its interior walls a plurality of flexible teeth members extending only partially from said walls toward the center of said chamber;
(c) an orifice in said distal end communicating with said interior chamber;
(d) means in said housing including said orifice for receiving and disengageably mounting an elongated electrosurgical instrument having a proximal end, a distal end, a first region at said proximal end of said instrument for making electrical connection to said instrument, and an electrically insulating coating extending from said first region toward said distal end of said instrument, said insulating coating ending before said distal end of said instrument; and
(e) means including an elastomeric insulating sleeve disposed within said housing adjacent said orifice and in spatial communication with said orifice and said interior chamber effective when said proximal end of said instrument is positioned within said distal end of said housing for sealing said instrument around said electrically insulating coating to prevent migration of fluid from without said housing past said insulating coating.



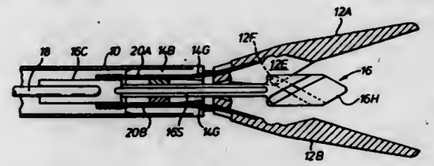
**5,496,316**
**SURGICAL SAW BLADE AND CLAMP**
**Gregory A. Goris, Ojai, Calif., assignor to Hall Surgical, Div. of Zimmer, Inc., Warsaw, Ind.**
**Continuation of Ser. No. 200,342, Feb. 23, 1994. This application Apr. 17, 1995, Ser. No. 424,143**
**Int. Cl.[6] A61B** *17/14*
**U.S. Cl. 606—82** **6 Claims**




5. A blade for selective attachment to a first or second powered surgical saw, said first powered surgical saw having a clamp assembly comprising a plurality of annularly spaced circular locking pins and said second powered surgical saw having a clamp assembly comprising a plurality of annularly spaced rectangular locking pins, said blade comprising:
a plate-like body having parallel side surfaces and an edge extending around the body; and
an end portion for engaging the clamp assembly of the selected first or second powered surgical saw, the end portion having a primary U-shaped through-slot between the side surfaces and opening to the edge of the blade, the blade further including a plurality of radial slots, each radial slot having a first means adapted to engage one of said rectangular locking pins and a second means adapted to engage one of said circular locking pins.

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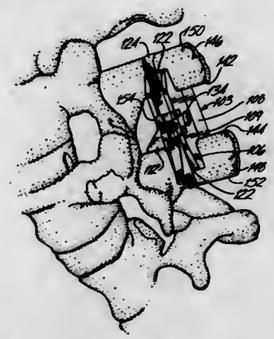
**5,496,317**
**LAPAROSCOPIC SURGICAL INSTRUMENT**
**Nigel M. Goble, Castleton, and Colin C. O. Goble, Canton, both of GB, assignors to Gyrus Medical Limited, United Kingdom**
**Filed May 3, 1994, Ser. No. 237,118**
**Claims priority, application United Kingdom, May 4, 1993, 9309142**
**Int. Cl.[6] A61B** *17/00*
**U.S. Cl. 606—48** **28 Claims**




1. A laparoscopic surgical instrument comprising:
a tube for introduction into the body through an aperture in the body cavity wall;
a housing at the end of the tube;
a pair of jaws extending distally from the housing, at least one of the jaws being pivotally mounted on the housing to allow pivotal opening and closing movements with respect to the other jaw about a transverse pivot axis;
an elongate control member extending inside the tube and reciprocable longitudinally with respect to the tube and the housing, and
an actuator at a distal end of the control member and reciprocable therewith;
wherein the actuator has a guide track, and the at least one pivotally mounted jaw has a guide track follower spaced from the pivot axis and engaging the guide track, and wherein the guide track is so oriented that longitudinal reciprocating movement of the actuator is converted into pivotal movement of the said at least one jaw about the pivot axis; and
wherein each jaw has an electrically conductive portion coupled to a respective electrical supply conductor at least one conductor of which is located in the tube, and wherein the actuator is formed of an electrically insulative material.

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**5,496,318**
**INTERSPINOUS SEGMENTAL SPINE FIXATION DEVICE**
**Robert S. Howland, Seal Beach, Calif.; Richard M. Salib, Excelsior, Minn., and Kenneth Pettine, Fort Collins, Colo., assignors to Advanced Spine Fixation Systems, Inc., Cypress, Calif.**
**Continuation-in-part of Ser. No. 2,230, Jan. 8, 1993, abandoned. This application Aug. 18, 1993, Ser. No. 108,974**
**Int. Cl.[6] A61B** *17/70;* **A61F** *5/00*
**U.S. Cl. 606—61** **9 Claims**

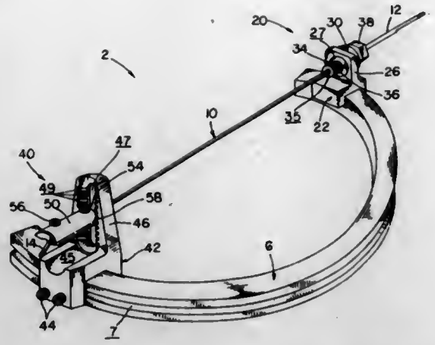



1. A spinal fixation device comprising:
an H-shaped spacer for insertion between adjacent spinous processes comprising a first element forming one side of the H-shape and a second element forming another side of the H shape wherein the first element interlocks with the second element at the crossbar of the H-shape;
a belt, wherein the belt is of sufficient length to encircle adjacent spinous processes and an installed spacer; and
means of attaching the belt to the outside of the spacer.

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**5,496,319**
**EXTERNAL FIXATION APPARATUS**
**Randall N. Allard, Plymouth; Gregory G. Price; Gary T. Hamman, both of Warsaw, and Billy N. Sisk, Claypool, all of Ind., assignors to Zimmer, Inc., Warsaw, Ind.**
**Filed Jun. 27, 1994, Ser. No. 266,917**
**Int. Cl.[6] A61B** *17/62;17/66*
**U.S. Cl. 606—56** **7 Claims**

7. An external bone fixation apparatus comprising:
a frame part adapted to overlie a body extremity, said frame part having a first one end and a second other end,
a transfixation wire adapted for lateral insertion through said bone and having a proximal end and a distal end,
a first clamp shiftably carried by said frame part for pivotally connecting said wire proximal end to one end of said frame part,
second clamp shiftably carried by said frame part for connecting said wire distal end to the other end of said frame part, means carried by said first clamp for tensioning said wire between said first clamp and said second clamp, and




means carried by said second clamp for providing adjustability of the angular orientation of said wire with respect to said frame part between a plurality of discrete positions, and wherein said tensioning means includes a collet having a lateral bore and a bolt extensibly fitted into said collet bore, said bolt having a longitudinal through bore adapted for receiving said wire,

said first clamp has an opening, said collet is seated within said first clamp opening,

said wire extends through said bolt bore with an enlarged shoulder on said wire proximal end abutting said bolt whereby extensible movement of said bolt from said collet urges said wire proximal end away from said collet to tension said wire between said first clamp and said second clamp.

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**5,496,320**
**MOSKOVICH CLAMPS FOR INTERLAMINAR CERVICAL FIXATION**
**Ronald Moskovich, 1010 Constable, Mamaroneck, N.Y. 10543**
**Filed Feb. 14, 1994, Ser. No. 195,478**
**Int. Cl.[6] A61B *17/70***
**U.S. Cl. 606—61** **10 Claims**




1. An interlaminar clamp comprising:
an upper portion with an interior surface having a shape
a lower portion with an interior surface having a shape, and
a screw, between the upper portion and the lower portion, holding the upper and lower portions together, the improvement comprising:

(a) the shape of the interior surface of the upper portion of the clamp following a shape of a curve defined by points indicated by X and Y Cartesian coordinates, as follows:

C1 Top

| X | Y |
|---|---|
| -3.191 | -0.335 |
| -3.417 | -0.726 |
| -3.624 | -1.178 |
| -3.813 | -1.698 |
| -3.943 | -2.276 |
| -3.978 | -2.890 |
| -3.510 | -3.160 |
| -2.487 | -2.762 |
| -1.798 | -2.475 |
| 0.391 | -1.203 |
| 0.994 | -2.233 |
| 1.678 | -2.906 |
| 1.973 | -2.715 |
| 2.493 | -2.769 |
| 2.477 | -2.230 |
| 2.426 | -1.763 |
| 2.361 | -1.363 |
| 2.297 | -1.023 |
| 2.278 | -0.740 |
| 2.214 | -0.471 |
| 2.219 | -0.233 |
| 2.144 | 0.000 |
| 2.099 | 0.221 |
| 2.042 | 0.434 |
| 1.996 | 0.649 |
| 1.903 | 0.847 |
| 1.760 | 1.016 |
| 1.451 | 1.054 |
| 1.178 | 1.060 |
| 1.034 | 1.149 |
| 0.905 | 1.245 |
| 0.834 | 1.445 |
| 0.690 | 1.549 |
| 0.536 | 1.651 |
| 0.377 | 1.773 |
| 0.187 | 1.777 |
| 0.000 | 1.788 |
| -0.181 | 1.721 |
| -0.371 | 1.747 |
| -0.587 | 1.805 |
| -0.797 | 1.790 |
| -0.999 | 1.731 |
| -1.208 | 1.663 |
| -1.465 | 1.627 |
| -1.747 | 1.573 |
| -2.027 | 1.473 |
| -2.333 | 1.347 |
| -2.500 | 1.113 |
| -2.582 | 0.839 |
| -2.669 | 0.567 |
| -2.751 | 0.289 |

and

(b) the shape of the interior surface of the lower portion of the clamp following a shape of a curve defined by points indicated by X and Y Cartesian coordinates as follows:

C2 Bottom

| X | Y |
|---|---|
| -2.593 | -0.273 |
| -2.337 | -0.497 |
| -2.064 | -0.671 |
| -1.894 | -0.843 |
| -1.832 | -1.057 |
| -1.750 | -1.271 |
| -1.640 | -1.477 |
| -1.463 | -1.625 |
| -1.322 | -1.820 |
| -1.143 | -1.981 |



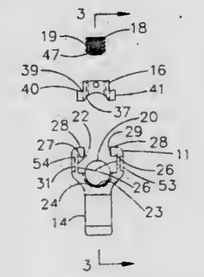
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C2 Bottom

| X | Y |
|---|---|
| -0.943 | -2.118 |
| -0.733 | -2.256 |
| -0.495 | -2.330 |
| -0.249 | -2.372 |
| 0.000 | -2.414 |
| 0.265 | -2.521 |
| 0.549 | -2.581 |
| 0.831 | -2.558 |
| 1.075 | -2.416 |
| 1.280 | -2.217 |
| 1.453 | -2.000 |
| 1.726 | -1.917 |
| 1.966 | -1.770 |
| 2.060 | -1.497 |
| 2.131 | -1.230 |
| 2.157 | -0.961 |
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| 2.348 | 0.000 |
| 2.393 | 0.252 |
| 2.575 | 0.547 |
| 2.694 | 0.875 |
| 2.874 | 1.280 |
| 3.013 | 1.740 |
| 3.031 | 2.202 |
| 2.312 | 2.082 |
| 2.198 | 2.442 |
| 1.288 | 1.772 |
| -1.219 | 1.678 |
| -1.891 | 2.101 |
| -2.582 | 2.325 |
| -3.313 | 2.407 |
| -3.281 | 1.894 |
| -3.872 | 1.724 |
| -3.735 | 1.214 |
| -3.389 | 0.720 |
| -3.028 | 0.318 |

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**5,496,321**
**ROD ANCHOR SEAT HAVING A SLIDING INTERLOCKING ROD CONNECTOR**
**Rolando M. Puno, Prospect, Ky.; Philip Mellinger, Worthington, Ohio, and J. Abbott Byrd, III, Virginia Beach, Va., assignors to Cross Medical Products, Inc., Columbus, Ohio**
**Continuation of Ser. No. 155,430, Nov. 19, 1993, abandoned. This application Dec. 12, 1994, Ser. No. 355,100**
**Int. Cl.[6] A61B *17/70***
**U.S. Cl. 600—61** **13 Claims**

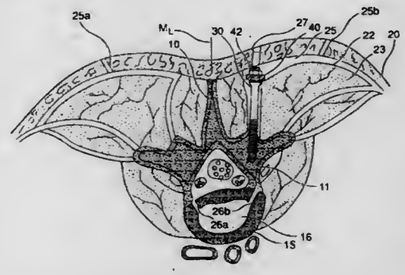



1. A retaining member for use in retaining relative to the spine member an elongated member, the retaining member having a longitudinal axis and comprising:

a seat member having channel means extending along the longitudinal axis and having an opening in at least one side adapted to receive said elongated member and including a top opening defined by first and second lateral opposing surfaces which face inwardly with respect to said channel; attachment means adapted to attach the seat means to the spine member; and closure means having first and second spaced lateral surfaces which face away from each other and a longitudinal arch which cooperates with the channel means top opening for capturing the elongated member; the seat member having at least first and second seat member retaining flanges extending inwardly with respect to said channel means and along a direction parallel to said longitudinal axis, said first seat member retaining flange including said first lateral opposing surface and said second seat member retaining flange including said second lateral opposing surface, and the closure means including at least first and second closure means retaining flanges extending from the arch along a direction parallel to said longitudinal axis; and the seat member retaining flanges and the closure means flanges having a longitudinal sliding mating interface so as to close the top opening of the channel means along the longitudinal axis when the closure means is slid longitudinally into a closed position relative to the seat member; and said longitudinal sliding mating interface including means to create a longitudinal sliding interference fit between the closure means and the seat member so as to releasably retain the closure means by longitudinally sliding into said closure means to said closed position, the means to create the interference fit comprising at least one boss which forms a some portion of a cylinder on said first or second opposing lateral surface of the seat member or on said first or second spaced lateral surface of the closure means and a corresponding hollow on one of said lateral surfaces on the other of the closure means or the seat member respectively.

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**5,496,322**
**METHOD FOR SUBCUTANEOUS SUPRAFASCIAL PEDICULAR INTERNAL FIXATION**
**Hallett H. Mathews, Richmond, Va., assignor to Danek Medical Inc., Memphis, Tenn.**
**Continuation of Ser. No. 267, Jan. 1, 1993, abandoned, which is a division of Ser. No. 938,308, Sep. 1, 1992, abandoned, which is a division of Ser. No. 852,577, Mar. 17, 1992, Pat. No. 5,171,279. This application Jul. 22, 1994, Ser. No. 279,222**
**Int. Cl.[6] A61H *7/00*; A61F *2/44***
**U.S. Cl. 606—61** **4 Claims**




1. A method for implanting a spinal fixation system into a patient having an elongated fixation element configured to be implanted within a patient adjacent the spinal column, comprising the steps of:

providing a cannulated bone engaging fastener having an elongated shank with threads configured for engaging a vertebra at one of the shank, the shank further including means for supporting the elongated fixation element above the muscle tissue and beneath the skin layer of the patient;

inserting a guide pin through the skin layer and muscle tissue of the patient and into a vertebra to be spanned by the elongated fixation element;

successively advancing a plurality of tubular dilators along the guide pin and through the skin layer and muscle tissue, each having a tapered end and each having a successively larger diameter to be received one within the other, the largest diameter dilator being sized to receive the bone engaging fastener therethrough;

removing at least the innermost tubular dilator having the smallest diameter;

advancing a cannulated drill bit along the guide pin and through the innermost remaining dilator to drill a hole to a predetermined depth in the vertebra;

removing the remaining tubular dialators having a diameter less than the diameter of the bone engaging fastener;

advancing a cannulated bone engaging fastener along the guide pin through the innermost remaining dilator and threading the fastener into the drilled hole in the vertebra;

repeating the above steps for a second bone engaging fastener in another vertebra to be spanned by the elongated fixation element; and

clamping the elongated fixation element between each of the bone engaging fasteners.

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**5,496,323**

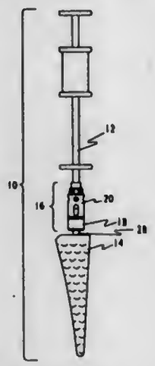
**ORTHOPEDIC INSTRUMENT WITH QUARTER-TURN DISCONNECT MECHANISM**

**Donald W. Dye, Pflugerville, Tex., assignor to Intermedics Orthopedics, Inc., Austin, Tex.**

**Filed Jun. 2, 1994, Ser. No. 253,101**

**Int. Cl.[6] A61B *17/56*; B25G *3/00***

**U.S. Cl. 606—79** **22 Claims**




1. A surgical apparatus comprising

means for manipulating the apparatus,

means for affecting the body of a patient, and

means for selectively connecting said manipulating means and said body affecting means, said manipulating means and said body affecting means being connected to said connecting means and said connecting means comprising

plug means having

a shaft connected to one of said manipulating means and said body affecting means, said shaft having at least one radially extending tab on a distal end thereof, said tab having an axial length and

a sleeve slidingly mounted on said shaft, said sleeve having at least one axially extending tab on a distal end thereof, means for preventing rotation of said sleeve relative to said shaft and

socket means connected to the other of said manipulating means and said body affecting means, said socket means having

a proximal cavity for receiving said distal end of said shaft, said cavity having an axial depth, and

at least one internal tab extending radially inwardly within said proximal cavity at a proximal end thereof and having an axial length less than said axial depth of said proximal cavity, said radially extending tab of said shaft being configured to seat axially beyond said internal tab and said axially extending tab of said sleeve being adapted to fit adjacent said internal tab and forming a means for inhibiting relative rotation of said plug means with respect to said socket means.

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**5,496,324**

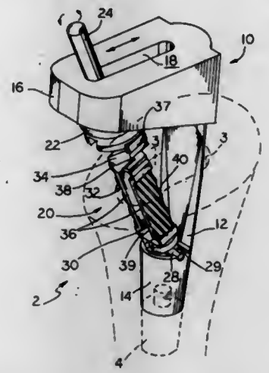
**PROXIMAL BODY MILLING APPARATUS**

**Milton F. Barnes, Warsaw, Ind., assignor to Zimmer, Inc., Warsaw, Ind.**

**Filed Jun. 20, 1994, Ser. No. 262,711**

**Int. Cl.[6] A61B *17/16*;*17/17***

**U.S. Cl. 606—79** **3 Claims**




1. An apparatus used to cut a cavity in a bone for receiving an implant comprising:

a frame part having a distal end insertable into said bone,

a guide extending laterally from said frame and having a race defined therein, said race having a first end and a second end,

an articulated cutter having a longitudinal axis and being pivotally connected to said frame and carded within said guide for rotation about the cutter's longitudinal axis and for movement within said race,

said articulated cutter including a first arm part, a second arm part and a shaft, the second arm part includes blade means for removing a portion of said bone when said cutter is rotated, the first arm part is hingeably connected to the shaft at one end and to the second arm part at an opposite end, said shaft defining the longitudinal axis of the articulated cutter, said articulated cutter being responsive to contact with said race for positioning said second arm part and the blade substantially parallel to said cutter's longitudinal axis when said cutter is shifted to the first end of said race and for angularly positioning said second arm part and the blade away from said cutter's longitudinal axis when said cutter is shifted toward its second end.



**5,496,325**

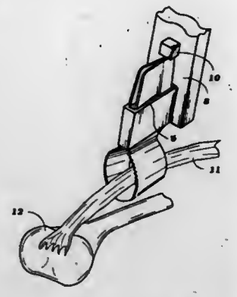
**SPLIT STEM SURGICAL SAW BLADE**

**Donald J. McLees, 2623 Virginia Ave., Everett, Wash. 98201**

**Filed Aug. 9, 1994, Ser. No. 287,933**

**Int. Cl.[6] A61B *17/14***

**U.S. Cl. 606—82** **5 Claims**




1. A peripherally driven bone cutting surgical blade in operative combination with an oscillating drive mechanism, said blade comprising an open ring with teeth protruding from a leading edge and peripheral drive attachment means, said open ring of teeth being closeable to form a substantially circular teeth ring, and said oscillating drive mechanism causing the blade to oscillate about a central longitudinal axis of the teeth ring.

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**5,496,326**

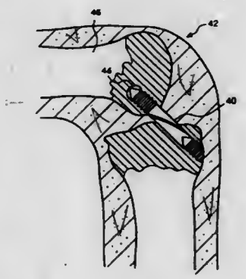
**FIXATION SCREW AND METHOD FOR LIGAMENT RECONSTRUCTION**

**Lanny L. Johnson, 3800 Hagadorn Rd., Okemos, Mich. 48864**

**Continuation of Ser. No. 111,970, Aug. 26, 1993, abandoned, which is a continuation of Ser. No. 848,546, Mar. 9, 1992, abandoned, which is a division of Ser. No. 721,893, Jun. 27, 1991, Pat. No. 5,116,337. This application Oct. 24, 1994, Ser. No. 328,137**

**Int. Cl.[6] A61B *17/00***

**U.S. Cl. 606—88** **15 Claims**




1. A method for fixation of a tendon/bone graft to a bone, comprising the steps of:

sizing one end of the tendon/bone graft to the desired size;

drilling a graft socket in the bone;

compacting the bone surrounding the graft socket by sizing the socket with at least one sizing instrument having a diameter greater than a diameter of the drilled socket;

inserting the sized end of the tendon/bone graft into the sized graft socket;

compacting the bone of the tendon/bone graft into the graft socket with at least one dilating instrument, thereby forming a sized screw socket;

inserting a fixation screw into the sized screw socket.

**5,496,327**

**APPARATUS FOR INSERTING PINS IN OSSEOUS MATERIAL**

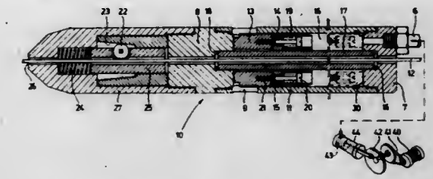
**Arie H. Den Ouden, Goudkruid 46, NL-3068 SZ Rotterdam, Netherlands, and Dirk B. Van Egmond, Utrechtsestraatweg 36, NL-3445 AS Woerden, Netherlands**

**Filed Nov. 9, 1993, Ser. No. 149,118**

**Claims priority, application Netherlands, Nov. 9, 1992, 9201959**

**Int. Cl.[6] A61B *17/18***

**U.S. Cl. 606—104** **7 Claims**



1. An apparatus for inserting a pin in osseous material by means of vibration comprising:

a distal section remote from the osseous material during use;

a proximal outer section located in a vicinity of the osseous material during use, said proximal outer section comprising pin clamping means immobile with respect to both said distal and proximal sections, said clamping means allowing free transport of the pin in a proximal-distal direction only;

pin vibration means located between said proximal section and said distal section;

a pin receiver comprising a cavity extending an entire length of said apparatus, said proximal and said distal sections being connected to one another and immobile with respect to one another to thereby keep said proximal section from vibrating with respect to said distal section during use.

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**5,496,328**

**INSERTING DEVICE FOR DEFORMABLE INTRAOCULAR LENS**

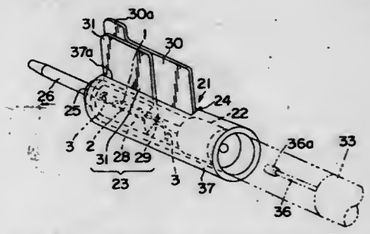
**Toshiyuki Nakajima, and Toshikazu Kikuchi, both of Tokyo, Japan, assignors to Canon Staar Co., Inc., Tokyo, Japan**

**Filed Jul. 13, 1994, Ser. No. 274,681**

**Claims priority, application Japan, Jul. 15, 1993, 5-175332**

**Int. Cl.[6] A61B *17/00***

**U.S. Cl. 606—107** **16 Claims**




1. An apparatus for inserting a deformable intraocular lens into an eye, the lens having an optical part made of an elastic material with predetermined memory characteristics, the lens having a plurality of flexible supports made of a material different than the elastic material, the apparatus comprising:

(a) a body;

(b) first and second half sleeves connected to each other, at least one of the half sleeves being connected to the body, at least one of the half sleeves being movable relative to the other half sleeve, each half sleeve having a proximal end and a distal end, the proximal end being closer to the body than the distal

end, the first and second half sleeves defining a lens-receiving portion for receiving the lens when the half sleeves are open, the first and second half sleeves defining a tube when the half sleeves are closed, the tube having an open proximal end and an open distal end, the proximal end of the tube communicating with the distal end of the tube by a bore, the bore communicating with the body, the first and second half sleeves are adapted to fold the lens inside the bore when the half sleeves are closed, the proximal end of the tube being closer to the body than the distal end of the tube, the proximal end of the tube being farther from the body than the proximal end of the second half sleeve when the half sleeves are closed, the first half sleeve having a cutaway portion located between the proximal end of the tube and the proximal end of the first half sleeve, the proximal end of the tube being open to allow a portion of at least one lens support to protrude through the proximal end of the tube and into the cutaway portion when the lens is folded in the bore;

(c) an insertion tip, the insertion tip having a proximal end and a distal end, the proximal end of the insertion tip being closer to the body than the distal end of the insertion tip, the proximal end of the insertion tip being connected to the distal end of at least one of the half sleeves, the proximal end of the insertion tip communicating with the distal end of the insertion tip by a lumen, the lumen communicating with the bore; and

(d) a pusher rod disposed in the body, the pusher rod in use being inserted into the proximal end of the tube to push the folded lens through the bore, out of the distal end of the tube, through the lumen, out of the distal end of the insertion tip, and into the eye without permanently deforming the protruding lens support.

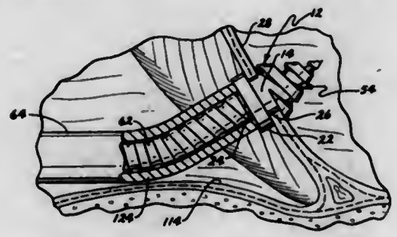
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**5,496,329**

## METHOD AND APPARATUS FOR IMPLANTING A MEDICAL VENTILATION TUBE

**John R. Reisinger, Saint Cloud, Minn., assignor to Alpha Surgical, Inc., Eau Claire, Wis.**

**Filed Sep. 8, 1993, Ser. No. 118,500**
**Int. Cl.[6] A61B *17/00***
**U.S. Cl. 606—109** **30 Claims**



1. A method for implanting a ventilation tube through a substantially intact region of a membrane of a person at a desired location, said ventilation tube having a body defining a bore, a front section, and a rear section, said membrane having a normal plane, said method comprising the steps of:

providing a fixture which engages at least one surface of the body of the ventilation tube to generally maintain the ventilation tube in a predetermined position relative to said fixture;

providing a portion of said fixture or the front section of the ventilation tube with a penetrating edge, said penetrating edge being disposed such that rotation of said penetrating edge about an axis of rotation generally perpendicular to the normal plane of the membrane and generally parallel with the bore of the ventilation tube will cause said penetrating edge to penetrate through the substantially intact region of the membrane;

providing a portion of said fixture and the front section of the ventilation tube with a threaded portion, said threaded portion extending at least partially between said fixture and the front section of the ventilation tube;

placing a portion of said penetrating edge in contact with the membrane of the person at the desired location within the substantially intact region;

rotating said penetrating edge and said threaded portion such that said penetrating edge penetrates the membrane, and said portion of the fixture and the front section of the ventilation tube defining said threaded portion is drawn through the membrane, so that the ventilation tube is at least partially implanted through the membrane; and

detaching said fixture from the ventilation tube such that the ventilation tube remains at least partially implanted through the membrane of the person at the desired location, whereby the ventilation tube is at least partially implanted through the membrane of the user.

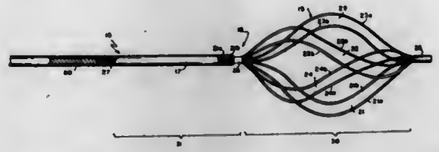
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**5,496,330**

## SURGICAL EXTRACTOR WITH CLOSELY ANGULARLY SPACED INDIVIDUAL FILAMENTS

**James S. Bates, Bloomington, Ind., and Hugh A. Tripp, Foxboro, Mass., assignors to Boston Scientific Corporation, Natick, Mass.**

**Continuation of Ser. No. 19,551, Feb. 19, 1993, abandoned. This application Jun. 10, 1994, Ser. No. 258,121**
**Int. Cl.[6] A61B *19/00***
**U.S. Cl. 606—127** **35 Claims**



1. In a surgical extractor for removing an object from a body including a plurality of threads normally encased in a sheath and wrapped in a helical form whereupon displacement of a portion of the threads from the sheath enables the portions of the threads to become relatively widely angularly spaced to form a basket with distal and proximal ends for retrieving an object, the improvement wherein each thread comprises a plurality of individual filaments that are closely angularly spaced throughout the length of the basket relative to the spacing of adjacent threads upon the displacement of the portions of the threads from the sheath.

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**5,496,331**

## KNOT-FORMING INSTRUMENT AND METHOD OF FORMING KNOTS

**Zhongren Xu, and Masahiro Nudeshima, both of Kanagawa, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan**

**Filed Jul. 27, 1994, Ser. No. 281,174**
**Claims priority, application Japan, Jul. 28, 1993, 5-207310; Aug. 5, 1993, 5-215099**
**Int. Cl.[6] A61B *17/04***
**U.S. Cl. 606—139** **23 Claims**

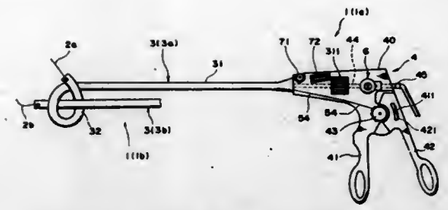
1. A knot forming instrument which forms a knot of a thread, comprising:

a control rod insertable into a communicating tube which communicates an abdominal cavity with the outside of a body of a patient, said control rod having a base portion and a bendable tip portion;

an insertion path formed inside said control rod and having an opening formed at the bendable tip portion of said control rod;

thread introducing means for introducing thread into the insertion path by sucking one end of the thread through said opening; and





a control device provided on said base portion for operating said control rod from outside the body to change said bendable tip portion of said control rod between a substantially straight condition and a bent condition in which the tip portion is bent in at least one direction.

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**5,496,332**

## WOUND CLOSURE APPARATUS AND METHOD FOR ITS USE

**Rolando Sierra, Miami, and Lawrence A. Weinstein, Davie, both of Fla., assignors to Cordis Corporation, Miami Lakes, Fla.**

**Filed Oct. 20, 1994, Ser. No. 326,465**
**Int. Cl.[6] A61B *17/04***
**U.S. Cl. 606—139** **26 Claims**



1. A surgical apparatus for closing an incision or wound in a vessel wall within a living patient, the apparatus comprising:

a tubular member dimensioned for insertion within an incision, said tubular member having a proximal end and a distal end and a center lumen extending longitudinally through said tubular member from said proximal end to said distal end;

a mesh assembly including an expandable portion, said mesh assembly dimensioned for insertion within said center lumen of said tubular member to reversibly position said expandable portion through an incision or wound into a vessel within a living patient, said expandable portion constructed to be configured between an expanded condition and a collapsed condition;

first and second side lumens longitudinally disposed along opposing sides of said center lumen and extending along said tubular member, each said side lumen dimensioned to receive a piercing element therein;

a pair of tubular piercing elements dimensioned to be slidably received within said side lumens, said piercing elements each having a pointed end capable of piercing the wall of a vessel to deliver first and second sutures within the vessel through the wall thereof.

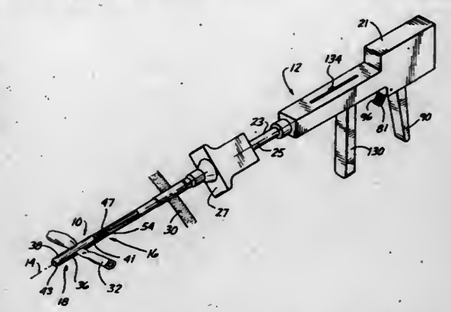
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**5,496,333**

## LAPAROSCOPIC SURGICAL CLAMP

**Jonathan M. Sackier, Del Mar; Michael L. Jones, Capistrano Beach, and Edward E. Dolendo, Huntington Beach, all of Calif., assignors to Applied Medical Resources Corporation, Laguna Hills, Calif.**

**Filed Oct. 20, 1993, Ser. No. 139,919**
**Int. Cl.[6] A61B *17/04***
**U.S. Cl. 606—142** **22 Claims**



1. A surgical clamp having a longitudinal configuration and an axis extending between a proximal end and a distal end of said clamp, the clamp comprising:

a support structure;

first and second opposed jaws coupled to the support structure, the first jaw being pivotally attached to one of the support structure and the second jaw and the jaws being operable between an open state wherein the first jaw is spaced from the second jaw to accept a body conduit, and a closed state wherein the jaws are proximate to at least partially occlude the body conduit;

means carried by the clamp for biasing the first jaw to the open state;

a portion of the first jaw defining a beveled surface which is disposed at an angle to the axis of the clamp;

means carried by the support structure and movable relative to the support structure for engaging at least the first jaw to move the first jaw relative to the second jaw between the open state and the closed state; and

a screw included in the engaging means and disposed at the proximate end of the clamp, the screw being operable to move axially along the beveled surface of the first jaw in the open state to move the first jaw toward the closed state.

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**5,496,334**

## SUTURING APPARATUS

**Kurt Klundt, Hirachhorn; Philipp Moll, Aachen, and Georg Schlöndorff, Roetgen, all of, Germany, assignors to J. Ströbel & Sohne GmbH & Co., München, Germany**

**Filed Mar. 31, 1994, Ser. No. 221,352**
**Claims priority, application Germany, Mar. 31, 1993, 43 10 555.6**
**Int. Cl.[6] A61B *17/04***
**U.S. Cl. 606—145** **58 Claims**

1. An apparatus for suturing together tissue edges comprising:

a housing;

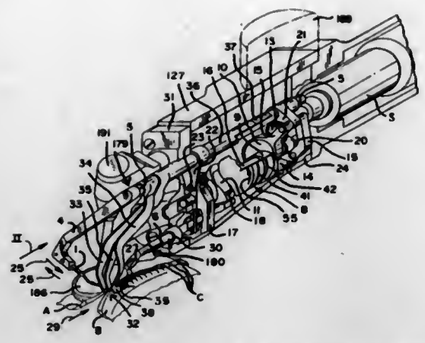
an arc needle movably mounted to said housing for repetitively piercing tissue edges to be sutured;

a loop catcher attached to said housing;

means mounted in said housing for oscillating said arc needle and said loop catcher through respective arcuate paths in a synchronized manner in order to form stitches;

tissue edge bracing means mounted to said housing and including forceps having first and second legs; and

means, mounted in said housing and connected to said forceps, for shifting said first and second legs, in synchronization with



the oscillation of said arc needle, between a closed position wherein said first and second legs are adapted to clamp tissue edges to be sutured prior to the tissue edges being pierced by said arc needle and an open position wherein said first and second legs release the tissue edges following an ensuing exit of said arc needle from the tissue edges.

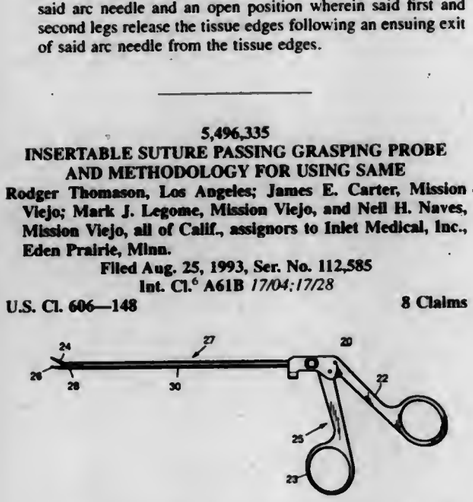
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5,496,335

## INSERTABLE SUTURE PASSING GRASPING PROBE AND METHODOLOGY FOR USING SAME

Rodger Thomason, Los Angeles; James E. Carter, Mission Viejo; Mark J. Legome, Mission Viejo, and Neil H. Naves, Mission Viejo, all of Calif., assignors to Inlet Medical, Inc., Eden Prairie, Minn.

Filed Aug. 25, 1993, Ser. No. 112,585
Int. Cl.[6] A61B *17/04;17/28*
U.S. Cl. 606—148 8 Claims



2. A laparoscopic instrument for passing through a patient's peritoneum and fascia, and closing an open wound with suture material comprising:

(a) detachable piercing, carrying and grasping means having a sharp tip for insertion below skin level and grasping and carrying the suture material;

(b) driving means for driving said detachable means through the patient's peritoneum and fascia at a first point and actuating said detachable means for gripping the suture material, said detachable piercing and grasping means comprises first and second forcep jaws pivotally engaged to each other, said first jaw fixedly engaging a hollow tube and said second jaw engaging a thin wire rod concentrically located within said hollow tube;

(c) said first and second forcep jaws comprising interior upper and lower jaw surfaces having partially knurled areas and a partially unknurled area at a tip point, said upper and lower interior jaw surfaces are inclined downwardly by a small angle from said tip point to the rear of said jaw surfaces; and

(d) said lower interior jaw surface bas an arcuate spring attached thereto from said tip point to the rear of said jaw surfaces for gripping various size suture while allowing the jaws to close completely, whereby the suture material is carried by said detachable means and recovered by driving said detachable means through the patient's peritoneum and fascia at a second point and actuating said detachable means for gripping and pulling the suture material outside the wound providing for rapid closure of the open wound.

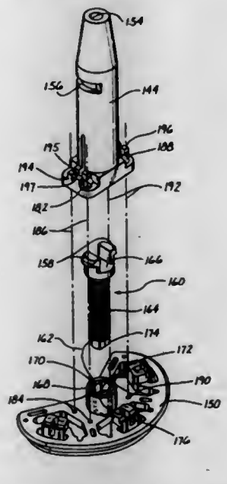
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5,496,336

## FLEXIBLE SUTURE GUIDE AND HOLDER

Delos M. Cosgrove, Hunting Valley, Ohio, and Than Nguyen, Huntington Beach, Calif., assignors to Baxter International Inc., Deerfield, Ill.

Division of Ser. No. 4,214, Jan. 13, 1993, Pat. No. 5,290,300, which is a continuation of Ser. No. 739,925, Aug. 2, 1991, abandoned, which is a continuation-in-part of Ser. No. 444,189, Nov. 30, 1989, Pat. No. 5,041,130, and a continuation-in-part of Ser. No. 387,909, Jul. 31, 1989, abandoned. This application Feb. 2, 1994, Ser. No. 190,755
The portion of the term of this patent subsequent to Nov. 30, 2009, has been disclaimed.
Int. Cl.[6] A61B *17/00*
U.S. Cl. 606—148 14 Claims



6. A suture guide and holder assembly comprising:

a substantially flexible suture guide of predetermined length having a suturable covering;

a rigid body defining a shaped surface against which the suture guide is releasably positioned along said predetermined length;

releasable retaining means for tautly and releasably retaining the suture guide against the shaped surface;

a handle detachably coupled to the body; and

means for tethering the handle to the body;

wherein the retaining means comprises at least one filamentous strand that selectively stitches together respective ends of the suture guide and is attached to the body.

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5,496,337

## DEVICE FOR GAUGING SUTURE DEPTH

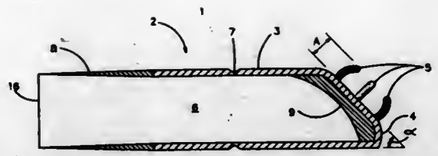
Randall L. Brown, 4637 Chelsea Dr., Baton Rouge, La. 70809

Filed Apr. 6, 1995, Ser. No. 417,795
Int. Cl.[6] A61B *17/04;* A41D *13/08*
U.S. Cl. 606—148 18 Claims

1. An apparatus to determine the depth to which sutures are placed in tissues, which comprises:

(a) a sheath forming an elongated sidewall and a closed end defining an opening opposite said closed end leading into an interior space, said opening and interior space sized to permit





at least a portion of a finger having at least one finger joint to be inserted through said opening and into said interior space; and

(b) a plurality of separated tines affixed to and projecting outwardly from said closed end.

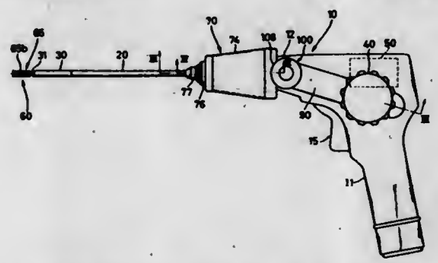
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5,496,338

## MEDICAL INSTRUMENT FOR TREATING SINUSITIS

Kunihiko Miyagi, and Hidetoshi Yoshizawa, both of Tokyo, Japan, assignors to Machida Endoscope Co., Ltd., Tokyo, Japan

Filed Jun. 16, 1994, Ser. No. 260,828
Claims priority, application Japan, Jun. 29, 1993, 5-184382
Int. Cl.[6] A61F *9/00;11/00;* A46B *13/00*
U.S. Cl. 606—162 6 Claims



1. A medical instrument for treating sinusitis, comprising:

(a) a body;

(b) an insert tube extending from said body;

(c) an angle tube extending from a distal end of said insert tube;

(d) a remote control member mounted on said body and adapted to remotely control said angle tube through a control wire extending through said insert tube and said angle tube;

(e) a motor mounted on said body; and

(f) a brush having an elongated rotation transmission portion whose rear end is connected to said motor, and a brush portion attached to a distal end of said rotation transmission portion, said rotation transmission portion being allowed to extend through said insert tube and said angle tube, at least that portion of said rotation transmission portion corresponding to said angle tube being bendable, said brush portion being allowed to project outside from a distal end of said angle tube; and

said angle tube being remotely controlled by said remote control member to be bent so that an angle between said brush portion and said insert tube is adjusted.

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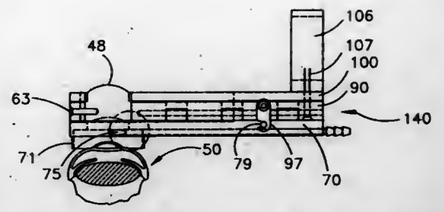
5,496,339

## UNIVERSAL AUTOMATED KERATECTOMY APPARATUS AND METHOD

Russell G. Koepnick, 2323 N. Central Ave., #1505, Phoenix, Ariz. 85004

Filed May 17, 1994, Ser. No. 245,228
Int. Cl.[6] A61B *17/32*
U.S. Cl. 606—166 50 Claims

1. A surgical device for making a surgical cut to the cornea of an eye, said device comprising:



a base, said base comprising a single vacuum chamber adapted to engage the sclera of an eye, said vacuum chamber being connectable to a vacuum source;

an insert, said insert being carried on said base, said insert having a face disposed toward said eye, said face having a surface portion shaped according to a predetermined correction, said vacuum chamber being disposed around said insert, said insert not forming part of said vacuum chamber, and whereby application of vacuum to said vacuum chamber causes the cornea of said eye to engage said surface portion;

a knife having a knife edge, said knife being movable in a plane transverse to said face and adjacent to said face;

said base and said insert being cooperatively shaped such that said knife edge will cut only corneal tissue of said eye directly underneath said surface portion;

a drive device coupled to said knife edge for moving said knife, said drive device being operable such that only said knife and not said drive device is movable across said insert.

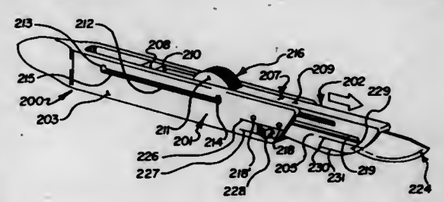
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5,496,340

## COMBINATION GUARDED SURGICAL SCALPEL AND BLADE STRIPPER

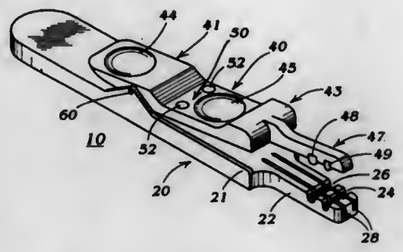
Michael R. Abidin, Tampa, Fla., and Steven P. Lehmbeck, Baltimore, Md., assignors to Leonard Bloom, Towson, Md.

Continuation-in-part of Ser. No. 150,843, Nov. 12, 1993, Pat. No. 5,411,512, which is a continuation-in-part of Ser. No. 40,165, Mar. 30, 1993, Pat. No. 5,275,606, which is a continuation-in-part of Ser. No. 825,556, Jan. 24, 1992, Pat. No. 5,250,063. This application Jul. 19, 1994, Ser. No. 277,165
Int. Cl.[6] A61B *17/32*
U.S. Cl. 606—167 6 Claims



1. A combination guarded surgical scalpel and blade stripper comprising a handle, a guard mounted on the handle for longitudinal sliding movement thereon, wherein the guard has an advanced forward position on the handle in which the blade is covered, and wherein the guard further has a rearward retracted position on the handle in which the blade is uncovered, the handle having a cleat provided with a rib, a blade having a slot receiving the rib on the cleat, thereby mounting the blade on the handle, the blade having a rearward edge portion, manually-manipulatable means carried by the handle and engaging the rearward edge portion of the blade for lifting the rearward edge portion of the blade laterally away from the rib on the cleat, and means carried by the guard for engaging the rearward edge portion of the blade and lifting the blade off the rib longitudinally thereof as the guard is moved forwardly of the handle, thereby stripping the blade from the scalpel.

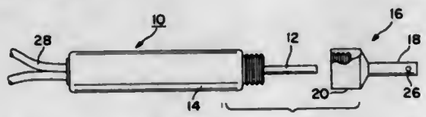
5,496,341
**SURGICAL DEVICE TO PREPARE BODY TISSUE FOR ANASTOMOSIS**
Jude S. Sauer, Pittsford; Theodore J. Tiberio, Hilton, and Roger J. Greenwald, Holley, all of N.Y., assignors to Lasersurge, Inc., Rochester, N.Y.
Continuation of Ser. No. 957,601, Oct. 6, 1992, abandoned. This application Aug. 26, 1994, Ser. No. 296,873
Int. Cl.[6] A61B *17/125;17/32*
U.S. Cl. 606—167 21 Claims




1. A surgical device for preparing body tissue for anastomosis by compressing body tissue and guiding a cutting blade comprising:
a base member having at least one holding groove for holding body tissue and at least one guide groove oriented substantially perpendicular to and intersecting said at least one holding groove for guiding a cutting blade;
a pressure-applying member cooperating with said base member, said pressure-applying member including a compliant finger located adjacent a distal end of said pressure applying member for atraumatically engaging and compressing a portion of said body tissue held within said at least one holding groove.

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5,496,342
**ULTRASONIC DEVICE WITH TEMPERATURE SENSING SLEEVE**
Alex Urich, 27402 Via Caudaloso, Mission Viejo, Calif. 92692
Filed Oct. 19, 1994, Ser. No. 326,021
Int. Cl.[6] A61N *7/00;* A61B *17/32;* G01K *11/00*
U.S. Cl. 606—169 4 Claims

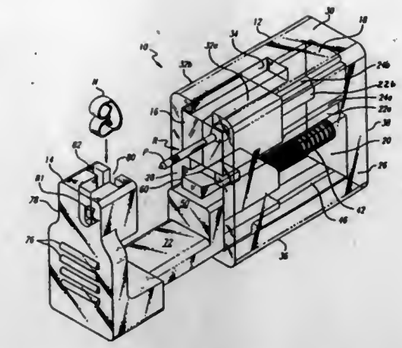



1. An ultrasonic instrument, comprising:
a tip;
an ultrasonic horn attached to said tip for moving said tip in a vibratory manner; and,
a sleeve that is coupled to the tip, said sleeve including temperature sensing means for changing the color of said sleeve as a function of temperature.

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5,496,343
**HAND HELD DISPOSABLE EAR PIERCER**
Vladimir Reil, 30524 Ganado Dr., Rancho Palos Verdes, Calif. 90274
Filed Aug. 18, 1994, Ser. No. 292,249
Int. Cl.[6] A61B *17/34*
U.S. Cl. 606—188 27 Claims

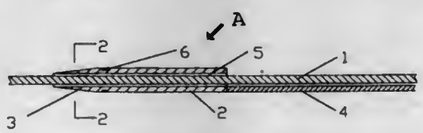
1. A handheld ear piercer, comprising:



an earring jaw, said earring jaw defining first and second channels, said earring jaw having lateral projection means defining an earring gap through which an earring portion may extend;
an earring cartridge, said earring cartridge slidably disposed in said first channel slidably engaging said lateral projection means; and
a nut jaw, said nut jaw slidably engaging said second channel, said nut jaw having ejection means for ejecting said earring cartridge from said earring jaw after said nut jaw has slid into said earring jaw.

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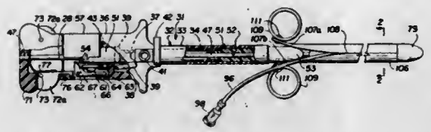
5,496,344
**DILATOR FOR A BALLON CATHETER**
Nozomu Kanesaka, 36 Cathy Rd., and George A. Tashji, 24 Cathy Rd., both of Hillsdale, N.J. 07642
Filed May 3, 1994, Ser. No. 237,126
Int. Cl.[6] A61M *29/00;5/00*
U.S. Cl. 606—191 9 Claims




1. A dilator adapted to be introduced into a blood vessel over a guide wire for enlarging a constricted portion of the blood vessel to introduce a balloon catheter, comprising:
a head formed of a solid material and having a tapered front portion, a rear portion integrally connected to the front portion and a through hole extending throughout an entire length of the head, said tapered front portion having distal and proximal ends and a circular cross section, said distal end of the front portion having an outer diameter less than that at said proximal end of the front portion so that the circular cross section gradually increases from the distal end to the proximal end, said guide wire being adapted to extend through the through hole in the head so that when the dilator is exchanged, the guide wire can be easily engaged with and disengaged from the head, and
a shaft fixed to a part of the rear portion of the head and extending in a direction away from the tapered front portion, said shaft being actuated to enter the head into the blood vessel through the guide wire extending through the through hole of the head and being operated to move and push the head into the constricted portion, said tapered front portion enlarging the constricted portion to thereby establish a path for introducing the balloon catheter into the constricted portion after withdrawing the dilator.



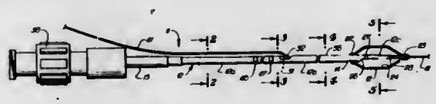
5,496,345
**EXPANSIBLE TUNNELING APPARATUS FOR CREATING AN ANATOMIC WORKING SPACE**
Maciej J. Kieturakis, San Carlos; Kenneth H. Mollenauer, Santa Clara, and Michelle Y. Monfort, Los Gatos, all of Calif., assignors to General Surgical Innovations, Inc., Palo Alto, Calif.
Continuation of Ser. No. 73,737, Jun. 8, 1993, which is a division of Ser. No. 893,988, Jun. 2, 1992. This application Oct. 17, 1994, Ser. No. 324,519
Int. Cl.[6] A61B *19/00*
U.S. Cl. 606—192 20 Claims



1. An expansible tunneling apparatus for creating an anatomic working space in a body comprising:
a substantially rigid tubular member having a bore therein and an open distal end;
a rigid tunneling shaft having a blunt distal end for tunneling bluntly through tissue in the body, said rigid shaft slidably receivable in said bore of said tubular member wherein said blunt distal end of said tunneling shaft extends through and beyond said open distal end to form, together with said tubular member, a blunt tipped obturator for tunneling through tissue in the body;
a balloon, said balloon being deflated and formed into a roll surrounding said tunneling shaft during tunneling through tissue;
a sheath surrounding at least a portion of said deflated balloon and said tunneling shaft, said sheath being provided with a weakened region to permit said sheath to separate from said deflated balloon thereby releasing said balloon; and
means for inflating said deflated balloon after tunneling to a desired location to create the anatomic working space.

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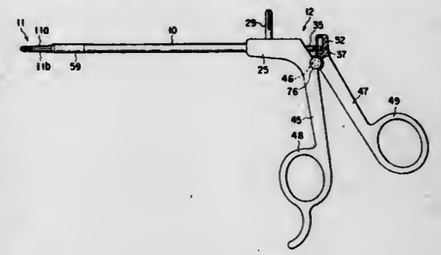
5,496,346
**REINFORCED BALLOON DILATATION CATHETER WITH SLITTED EXCHANGE SLEEVE AND METHOD**
Michael J. Horzewski, Sunnyvale, and Paul G. Yock, San Francisco, both of Calif., assignors to Advanced Cardiovascular Systems, Inc., Santa Clara, Calif.
Continuation of Ser. No. 728,812, Jul. 11, 1991, abandoned, which is a continuation of Ser. No. 199,025, May 26, 1988, abandoned, which is a continuation of Ser. No. 653, Jan. 6, 1987, Pat. No. 4,748,982. This application May 25, 1993, Ser. No. 69,297
The portion of the term of this patent subsequent to Jun. 7, 2005, has been disclaimed.
Int. Cl.[6] A61M *25/00*
U.S. Cl. 606—194 18 Claims



1. A balloon dilatation catheter adapted to be utilized with a guidewire comprising:
a flexible elongated catheter shaft which has a proximal end and a distal end, a relatively stiff proximal section and a relatively flexible distal section;
a first inner lumen which extends within the proximal and distal sections thereof;
an inflatable balloon at an intermediate location of the distal section of the catheter shaft proximal to the distal end thereof having an interior in fluid communication with the first inner lumen;
a distal guidewire opening in the distal end of the catheter shaft;
a proximal guidewire opening in the distal section of the catheter shaft which is at a location proximal to the inflatable balloon and spaced a substantial distance from the proximal end of the catheter shaft; and
a second inner lumen which extends at least from the proximal guidewire opening to the distal guidewire opening and which is configured to receive a guidewire therein.

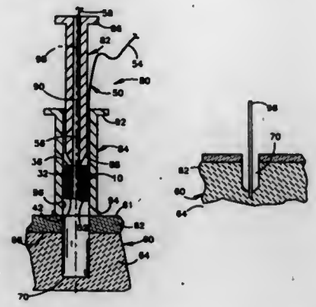
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5,496,347
**SURGICAL INSTRUMENT**
Toshihiko Hashiguchi, Sagamihara; Toshiya Sugai, and Katsumi Sasaki, both of Tokyo, all of, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Mar. 28, 1994, Ser. No. 218,976
Claims priority, application Japan, Mar. 30, 1993, 5-072552; Apr. 5, 1993, 5-078253; Apr. 12, 1993, 5-084881; Apr. 30, 1993, 5-104633; Apr. 30, 1993, 5-104634; Apr. 30, 1993, 5-104635
Int. Cl.[6] A61B *17/28;17/32*
U.S. Cl. 606—205 20 Claims



1. A surgical instrument for treatment in a body cavity, comprising:
an operating section including an operating handle;
a sheath for an insertion section, the sheath including a distal end portion to be inserted into the body cavity and a proximal end portion connected to the operating section;
at least one open-close member for treatment, the at least one open-close member being pivotally mounted on the distal end portion of the sheath by means of a pivot pin;
a cam mechanism connected to the at least one open-close member, the cam mechanism being situated nearer to the proximal end of the sheath than the position of the pivot pin, and the cam mechanism including an inclined cam and a cam pin in engagement with the cam, so that the at least one open-close member is rotated depending on the relationship between the cam pin and the cam, the component members of the cam mechanism having external shapes such that those portions on the proximal end side of the position near the pivot pin do not project from the sheath in every operating state;
a slot provided in the at least one open-close member and in which the pivot pin is fitted such that the slot is shiftable, the slot being inclined in the same direction as the inclined cam corresponding thereto; and
a driving rod member passed through the sheath for reciprocation, and the driving rod member having a front end connected to the cam mechanism and a rear end connected to the operating section, the cam mechanism being activated to open and close the at least one open-close member for treatment as the driving rod member is moved by means of the operating handle of the operating section.

**5,496,348**
**SUTURE ANCHOR**
**Peter M. Bonutti, 1303 W. Evergreen Plz., P.O. Box 1387, Effingham, Ill. 62401**
**Division of Ser. No. 344,466, Nov. 23, 1994, which is a division of Ser. No. 62,295, May 14, 1993, Pat. No. 5,403,348.**
**This application May 19, 1995, Ser. No. 445,049**
**Int. Cl.[6] A61B *17/04***
**U.S. Cl. 606—232** **4 Claims**

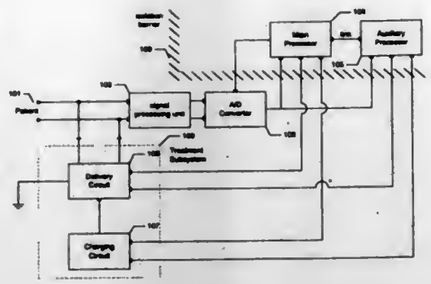


1. An apparatus comprising a suture anchor inserter, said suture anchor inserter including an outer tube and an inner tube, said inner tube being at least partially disposed in said outer tube and being slidable relative to said outer tube, said inner tube having surface means for defining a central channel, a thin elongated member at least partially disposed in said central channel, said thin elongated member having an end portion adapted to be disposed in engagement with body tissue, a suture at least partially disposed in said central channel, and an anchor, said anchor having surface means for defining a passage through which said thin elongated member and said suture extend, said anchor being movable along said thin elongated member from a first position in which said anchor is at least partially disposed within said outer tube to a second position in which said anchor is outside of said outer tube and is disposed in engagement with body tissue, said suture and said thin elongated member being disposed in said passage in said anchor throughout movement of said anchor from the first position to the second position.

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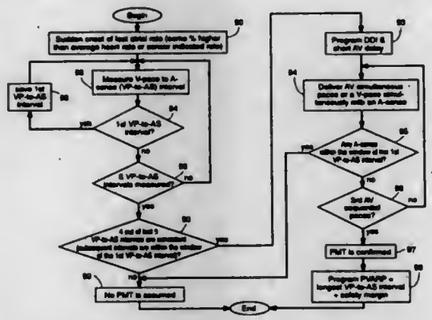
**5,496,349**
**METHOD AND SYSTEM FOR AUTOMATIC OR SEMI-AUTOMATIC DEFILBRILLATION USING REDUNDANT PROCESSING**
**Dean D. Campbell, Seattle, and Robert A. Wiley, Tukwila, both of Wash., assignors to Physio-Control Corporation, Redmond, Wash.**
**Filed Mar. 11, 1994, Ser. No. 209,774**
**Int. Cl.[6] A61N *1/39***
**U.S. Cl. 607—5** **37 Claims**

34. A method for using redundant processing to perform automatic or semi-automatic defibrillation by determining whether a defibrillation shock should be delivered to a patient, the method comprising the steps of:
analyzing electrical signals from the patient under the control of a first processor in order to determine whether the patient should be treated;
analyzing electrical signals from the patient under the control of a second processor in order to determine whether the patient should be treated; and
if the analysis under the control of the second processor determines that the patient should be treated and the analysis under the control of the first processor determines that the patient should be treated, determining that a defibrillation charge should be delivered to the patient.



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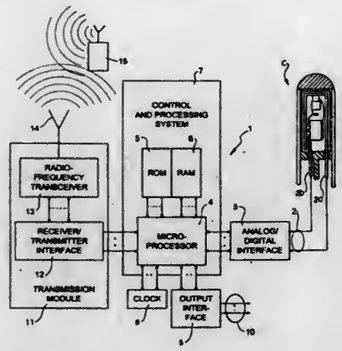
**5,496,350**
**APPARATUS AND METHOD FOR DETECTING, CONFIRMING AND TERMINATING PACEMAKER MEDIATED TACHYCARDIA**
**Richard Lu, Highlands Ranch, Colo., assignor to Telectronics Pacing Systems, Inc., Englewood, Colo.**
**Filed Apr. 12, 1994, Ser. No. 227,306**
**Int. Cl.[6] A61N *1/365***
**U.S. Cl. 607—14** **30 Claims**



26. An implantable pacemaker which automatically detects and confirms the presence of pacemaker mediated tachycardia (PMT) comprising:
(a) means for generating ventricular pacing pulses,
(b) means for measuring the interval between a generated ventricular pacing pulse and the succeeding sensed atrial beat (VP-to-AS interval), and for repeating said interval measurement on at least one subsequent VP-to-AS interval,
(c) means for detecting PMT by determining whether the measured intervals are consistent,
(d) means responsive to the measured intervals being consistent for pacing the patient's heart in a manner expected to preclude retrograde conduction, and
(e) means for confirming that PMT is present only if, while said pacing means operates in a manner expected to preclude retrograde conduction, the pattern of atrial beats sensed is markedly different from the pattern of atrial beats operated on by said measuring means.



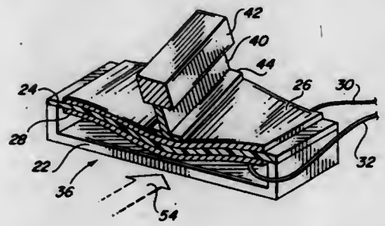
**5,496,351**
**DEVICE FOR DETERMINING MYOCARDIAL FUNCTION AND CORRESPONDING PROCEDURE**
**Gianni Plicchi, and Giorgio Corbucci, both of Bologna, Italy, assignors to Sorin Biomedica S.p.A., Saluggia, Italy**
**Filed Oct. 5, 1994, Ser. No. 318,463**
**Claims priority, application Italy, Jan. 5, 1993, TO93A0729**
**Int. Cl.[6] A61N *1/365***
**U.S. Cl. 607—17** **54 Claims**



1. A method of determining myocardial function of a patient's heart, comprising:
(a) sensing an ECG of the patient;
(b) generating a signal representative of the ECG;
(c) sensing a natural heart acceleration of the patient;
(d) generating a signal representative of the natural heart acceleration; and
(e) selecting at least one time segment of the natural heart acceleration signal based on a predetermined portion of the ECG signal.

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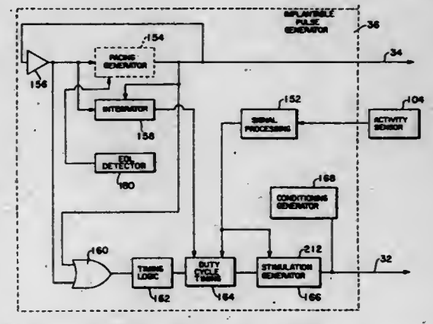
**5,496,352**
**ACTIVITY SENSORS FOR IMPLANTABLE MEDICAL DEVICES**
**Herman L. Renger, Calabasas, Calif., assignor to Pacesetter, Inc., Sylmar, Calif.**
**Filed Apr. 4, 1994, Ser. No. 223,079**
**Int. Cl.[6] G01P *15/09*; H01L *41/04***
**U.S. Cl. 607—19** **13 Claims**



1. An implantable medical device for monitoring physical activity of a patient, comprising:
a housing assembly suitable for implantation in body tissue;
a frame assembly mounted within said housing assembly;
a piezoelectric film having opposing major surfaces and respective ends attached to said frame assembly so that said piezoelectric film is supported within said frame assembly;
a pair of conductive metal coatings affixed to opposite major surfaces of said piezoelectric film;
a pair of electrical conductors, each attached to one of said pair of conductive metal coatings; and
a mass element operative with said piezoelectric film to increase stress applied to said piezoelectric film as a result of acceleration of the of the patient.

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**5,496,353**
**END-OF-LIFE INDICATION SYSTEM FOR IMPLANTABLE PULSE GENERATOR**
**Pierre A. Grandjean, 61, Rue Albert Dekkers, Warsage, Belgium; Robert Leinders, Veersestraat 51, 6143 AM Guttecoven, Netherlands, and Ivan Bourgeois, 9 Rue Jean Gome, Verviers, Belgium**
**Filed Sep. 23, 1993, Ser. No. 126,152**
**Int. Cl.[6] A61N *1/36***
**U.S. Cl. 607—29** **9 Claims**

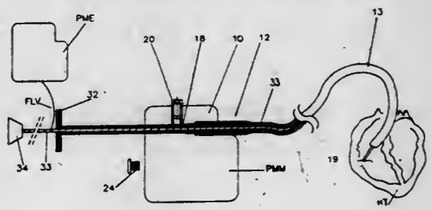


9. An implantable pulse generator comprising:
a stimulation pulse generator for generating muscle stimulation bursts and cardiac pacing pulses in a predefined ratio;
a battery end-of-life monitor for detecting an approaching end-of-life condition for a battery; and
a stimulation pulse modifier coupled to the stimulation pulse generator and the battery end-of-life monitor, the stimulation pulse modifier modifying the predefined ratio of muscle stimulation bursts and cardiac pacing pulses upon detection of the approaching end-of-life condition.

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**5,496,354**
**PACEMAKERS TO ALLOW SAFE AND QUICK REPLACEMENT WITHOUT INTERRUPTING THE ELECTRIC STIMULATION OF THE HEART**
**Ferruccio DeBellis, Rome, Italy, assignor to P.A.&M. S.p.A., Italy**
**Filed Dec. 3, 1993, Ser. No. 161,665**
**Claims priority, application Italy, Dec. 11, 1992, RM92A0891**
**Int. Cl.[6] A61N *1/36***
**U.S. Cl. 607—37** **8 Claims**

1. A pacemaker replacement system specially adapted to allow



uninterrupted electric stimulation of a heart during pacemaker replacement comprising:

an electrode-catheter for stimulating the heart having a contact-pin with first and second contact-pin ends, the first contact-pin end comprising a contact tube and the second contact-pin end adapted to be inserted in the right ventricle of the heart, said electrode-catheter consisting of a helicoidal alloy spiral coated with an insulating sheath;

a first pacemaker being manufactured prior to initial use with a bore having first and second sides, the bore being open on the first and second sides, the first side being shaped to receive the contact-pin of the electrode-catheter, the second side being shaped to receive an elongated tool for pushing the contact-pin out of the first side o the bore and to provide access to the contact-pin when the contact-pin is seated in the bore of the first pacemaker, the first pacemaker having a locking screw extending into the bore for locking the contact-pin therein; and

the elongated tool including a conducting element having first and second ends, the first end being shaped to fit in the second side of the bore in order to act on the contact-pin for pushing it out of the first side of the bore when necessary to replace the first pacemaker with a second pacemaker, the tool having sufficient longitudinal strength for pushing the contact-pin out of the first side of the bore, the first end being electrically conductive and shaped to maintain continuous electrical contact with the electrode-catheter when the tool is used to push the contact-pin out of the first side of the bore, and the second end being electrically conductive and shaped to allow electrical connection to an external pacemaker to continuously electrically stimulate the heart while the contact-pin is being pushed out of the first side of the bore.

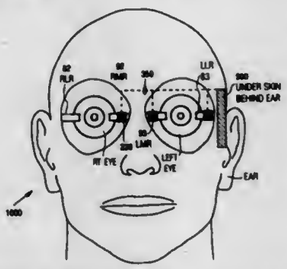
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**5,496,355**

**EXTRAOCULAR MUSCLE SENSOR AND STIMULATOR**

**Stephen N. Lipsky, 1161 York Ave. Apt., 9N, New York, N.Y. 10021**

**Filed Nov. 21, 1994, Ser. No. 342,592**
**Int. Cl.[6] A61N *1/36***
**U.S. Cl. 607—53** **1 Claim**




1. In a patient having a first eye and a second eye, an apparatus for stimulating a paralyzed or non-inervated lateral rectus muscle of the first eye, the first eye moved by an ipsilateral lateral rectus muscle and an ipsilateral medial rectus muscle and the second eye moved by a contralateral medial rectus muscle and a contralateral lateral rectus muscle, the apparatus comprising:

a first electrode adapted to be installed in the ipsilateral lateral rectus muscle;

a second electrode adapted to be installed in the ipsilateral medial rectus muscle;

a third electrode adapted to be installed in the contralateral medial rectus muscle; and

a control unit, said control unit in electrical communication with said first electrode, said second electrode and said third electrode, said control unit providing a stimulation signal to said first electrode of equal magnitude and frequency of neuronal impulses received by the contralateral medial rectus and detected by said third electrode when neuronal impulses are received by said third electrode but not said second electrode, said control unit further providing an electrical impulse of predetermined magnitude and frequency to said first electrode when no neuronal impulses are detected by said second and said third electrodes.

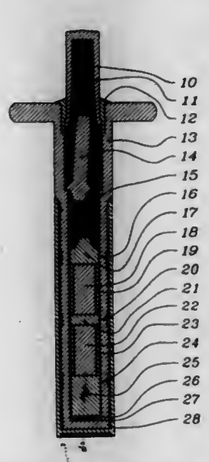
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**5,496,356**

**PIEZO DE-TOXIFIER**

**Paul H. Hudz, 3400 Inverness St., Redding, Calif. 96002**

**Continuation of Ser. No. 38,789, Mar. 29, 1993, abandoned. This application Nov. 16, 1994, Ser. No. 341,268**
**Int. Cl.[6] A61N *1/32***
**U.S. Cl. 607—72** **8 Claims**




1. An apparatus adapted to be hand-held and selectively operable to generate an electric current of high voltage and low amperage and manipulable to conduct said electric current through live tissue containing insect or reptile toxins, for the purpose of electro detoxifying said toxins, said apparatus comprising:

a) a hollow electrically non-conductive housing;

b) at least one piezoelectric member enclosed within said electrically non-conductive housing;

c) means for stressing said at least one piezoelectric member mounted on said housing and selectively operable to generate a low amperage electric current to effect said stressing; and

d) at least one electrode of electrically conductive material mounted exteriorly on said hollow housing adapted for conductive contact with live tissue and adapted to conduct a low amperage electrical current from said piezoelectric member through said live tissue to electro detoxify toxins contained in said live tissue;

e) said means mounted on said housing for stressing said at least one piezoelectric member including a push-button slidably mounted on one end of the hollow housing and positioned for easy application of an axially directed force thereto by digital manipulation to drive said push-button into said hollow housing, a push-button retainer fixedly mounted on said housing for retaining said push-button, said means mounted on said housing operable to stress said piezoelectric member, and said piezoelectric member within said hollow housing.

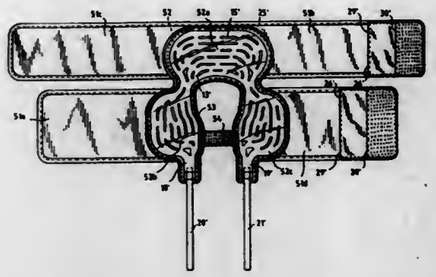


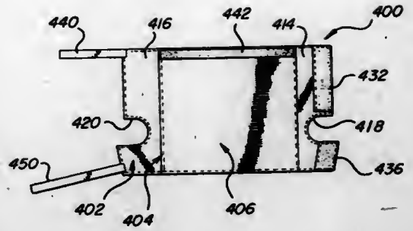
**5,496,357**

**THERMAL BLANKET WITH ELASTIC FIT**

**Marvin E. Jensen, Mundelein, and John A. Biewer, Winthrop Harbor, both of Ill., assignors to Hollister Inc., Libertyville, Ill.**

**Continuation-in-part of Ser. No. 139,286, Oct. 20, 1993. This application Feb. 18, 1994, Ser. No. 198,613**
**Int. Cl.[6] A61F *7/00***
**U.S. Cl. 607—108** **9 Claims**






1. A thermal blanket for thermal treatment of areas of the body, comprising a foldable bodyside panel composed of double layers of thermoplastic sheet material heat-sealed together to define therebetween at least one passage communicating between an inlet opening and an adjacent outlet opening; and a soft, foldable exterior panel extending along said bodyside panel in parallel relation therewith; said bodyside and exterior panels being coplanar and having peripheral edges secured together with to form a unitary foldable blanket; said exterior panel having a soft loop-providing pile over substantially the entire exterior surface thereof; said blanket being provided with at least one attachment patch which projects beyond a free edge at a first end of said blanket and which is elastically stretchable in directions towards and away from said edge; said attachment patch having a bodyside-facing hook providing fabric for releasable attachment to said loop-providing pile of said exterior surface at a generally opposite second end of said blanket for maintaining said blanket in an interlocked but elastic relation about a body area for thermal treatment thereof; said blanket including a rectangular section which terminates in an integral tapered neck portion and two integral leg portions which extend in a transverse direction from said rectangular section, each of said leg portions having a free edge and being provided with at least one of said attachment patches which projects beyond said free edge; said blanket also including parallel and flexible inlet and outlet tubes extending along a bodyside-facing surface of said integral neck portion; said inlet and outlet tubes each being connected at one end to said inlet and outlet openings, respectively, and at their opposite ends to a fluid coupling element; said bodyside-facing surface of said neck portion being provided with a band of material that is secured over said inlet and outlet tubes to maintain said tubes in a parallel relation and prevent kinking and twisting thereof.

along one lateral side of said pouch and a second flexible elastic border portion extending along an opposite lateral side of said pouch, said border portions adapted to be brought together in an overlapping relationship at a first location behind said lower leg region and at a second location under said upper foot region when said pouch is wrapped about said lower leg region and said ankle and said upper foot region, a gap in each of said border portions, said gaps co-operatively defining an opening in said border portions between said first and second locations adapted to receive the heel of said foot when said border portions are brought in to said overlapping relationship at said first and second locations, a first wrap fastener for fastening said border portions together in said overlapping relationship at said first location whereby an upper region of said pouch is adapted to be held against said ankle with an adjustable tension force in said first wrap fastener, a second wrap fastener for fastening said border portions together in said overlapping relationship at said second location whereby a lower region of said pouch is adapted to be held against said ankle with an adjustable tension force in said second wrap fastener independent of that applied by said first wrap fastener, an elastic cinch strap secured to an upper corner of one of said border portions and adapted to wrap about said lower leg region at a location above said ankle, a cinch strap fastener for fastening said cinch strap to an upper transverse margin of said pouch after said cinch strap has been wrapped about said lower leg region, said cinch strap fastener having first and second parts, said first part secured to said upper transverse margin of said pouch along the length thereof, said second part secured to said cinch strap and adapted to fasten to said first part whereby said cinch strap is adapted to bold said upper transverse margin of said pouch against said lower leg region at a location above said ankle with an adjustable tension force independent of that applied by said first and second wrap fasteners, an elastic tension strap secured to one of said border portions at a location below the gap in this said one border portion and adapted to extend diagonally across and over said pouch to said upper transverse margin of said pouch, and a tension strap fastener part secured to said tension strap for fastening said tension strap to said first part of said cinch strap fastener whereby said pouch is adapted to be held by said tension strap against said ankle with an adjustable tension force independent of that applied by said wrap fasteners and said cinch strap.

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**5,496,358**

**THERMAL WRAP FOR A BODY MEMBER**

**Mark A. Rosenwald, Chicago, Ill., assignor to Sport Wrapz, Inc., Chicago, Ill.**

**Continuation-in-part of Ser. No. 76,157, Jun. 14, 1993, Pat. No. 5,395,399. This application Feb. 6, 1995, Ser. No. 383,958**
**Int. Cl.[6] A61F *7/00***
**U.S. Cl. 607—108** **1 Claim**

1. A thermal ankle wrap for application to an ankle of a person, comprising: first and second flexible elastic cloth members co-operatively defining a flexible elastic pouch adapted to receive a thermal medium and be wrapped about a lower leg region and an ankle and an upper foot region of a person, one of said cloth members including a first flexible elastic border portion extending

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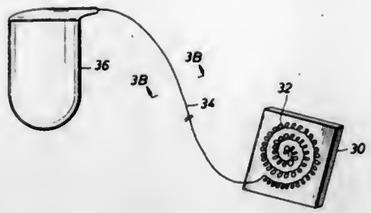
**5,496,359**

**ZIRCONIUM OXIDE AND ZIRCONIUM NITRIDE COATED BIOCOMPATIBLE LEADS**

**James A. Davidson, Germantown, Tenn., assignor to Smith & Nephew Richards, Inc., Memphis, Tenn.**

**Continuation-in-part of Ser. No. 919,932, Jul. 27, 1992, Pat. No. 5,282,850, which is a continuation-in-part of Ser. No. 830,720, Feb. 4, 1992, Pat. No. 5,258,022, which is a continuation-in-part of Ser. No. 819,348, Jan. 9, 1992, Pat. No. 5,152,795, which is a continuation-in-part of Ser. No. 385,285, Jul. 25, 1989, Pat. No. 5,037,438. This application Aug. 26, 1993, Ser. No. 112,587**
**Int. Cl.[6] A61N *1/04***
**U.S. Cl. 607—115** **12 Claims**

1. A biocompatible lead for conducting electrical signals to or from an organ in a living body, the lead comprising;




an elongate flexible body having distal and proximal ends, the flexible body comprising:

(a) an electrically conductive core of low elastic modulus metallic composition for carrying the electrical signals; and

(b) a corrosion-resistant, biocompatible, durable, stable coating selected from the group consisting of zirconium oxides, ranging in color from blue to black, and zirconium nitrides, ranging in color from yellow to orange; said coating disposed on surfaces of the core exposed to body fluid and body tissue when the lead is inserted into the living body.

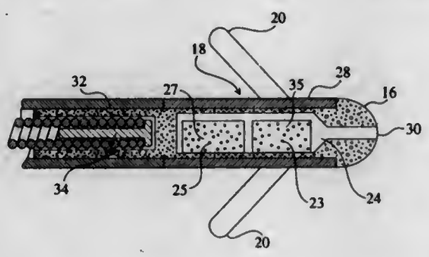
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**5,496,360**

**IMPLANTABLE CARDIAC ELECTRODE WITH RATE CONTROLLED DRUG DELIVERY**

**Drew A. Hoffmann, Los Gatos, and M. Elizabeth Bush, Fremont, both of Calif., assignors to Ventritex, Inc., Sunnyvale, Calif.**

**Filed Apr. 12, 1994, Ser. No. 226,594**
**Int. Cl.[6] A61N *1/04***
**U.S. Cl. 607—120** **28 Claims**




1. An implantable device, comprising:

an electrode for implantation in a patient, said electrode having a reservoir located within said electrode;

an insulated conductor having a distal end and a proximal end and coupled to said electrode at said distal end of said conductor and having a connector at said proximal end of said conductor;

at least one therapeutic drug carried in said reservoir; and

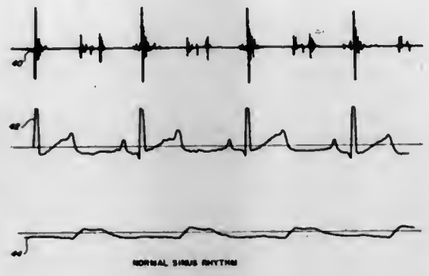
at least one drawing agent contained in said reservoir, having an ability to draw body fluid into said reservoir for modulating drug delivery rate of said at least one therapeutic drug to body tissue.

**5,496,361**

**SYSTEM AND METHOD FOR DETECTING CARDIAC ARRHYTHMIAS USING A CARDIAC WALL ACCELERATION SENSOR SIGNAL**

**Sheldon B. Moberg, Kagel Canyon, and James D. Causey, III, Simi Valley, both of Calif., assignors to Pacesetter, Inc., Sylmar, Calif.**

**Division of Ser. No. 91,636, Jul. 14, 1993. This application Jul. 21, 1994, Ser. No. 278,346**
**Int. Cl.[6] A61N *1/39***
**U.S. Cl. 607—122** **16 Claims**




1. An implantable system for detecting and discriminating among cardiac arrhythmias and for providing therapeutic electrical stimulation to cardiac tissue in response to detected cardiac arrhythmias, said implantable system comprising:

an implantable lead including electrode means for delivering therapeutic electrical stimulation pulses to said cardiac tissue and for transmitting a signal indicative of cardiac electrical activity to said implantable system, said implantable lead further including a cardiac wall acceleration sensor for providing a signal indicative of cardiac wall accelerations;

acceleration signal analyzing means for receiving said signal indicative of cardiac wall acceleration and for using said signal to detect and discriminate among cardiac arrhythmias; and

pulse generating means for generating said therapeutic electrical stimulation pulses for delivery to said cardiac tissue by said electrode means in response to cardiac arrhythmias detected by said cardiac wall acceleration signal analyzing means.

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**5,496,362**

**IMPLANTABLE CONFORMAL COIL PATCH ELECTRODE WITH MULTIPLE CONDUCTIVE ELEMENTS FOR CARDIOVERSION AND DEFIBRILLATION**

**Bruce H. KenKnight, Minneapolis; Roger W. Dahl, Andover, both of Minn., and David K. Swanson, Mountain View, Calif., assignors to Cardiac Pacemakers, Inc., St. Paul, Minn.**

**Filed Nov. 24, 1992, Ser. No. 980,843**
**Int. Cl.[6] A61N *1/05***
**U.S. Cl. 607—129** **9 Claims**

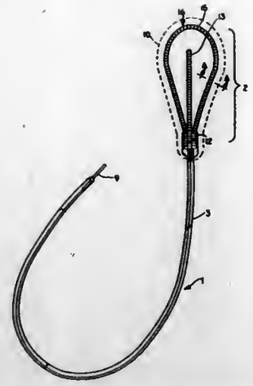
1. A body implantable lead comprising:

an insulative lead body containing an electrically conductive element;

a first electrically conductive member formed into a loop and forming an electrical connection with a distal end of said electrically conductive element, said first conductive member being flexible and having an electrical discharge surface adapted to be directly contacting a heart adjacent an epicardial surface thereof but not penetrating the epicardial surface; and

a second electrically conductive member adapted to directly contact but not penetrate the epicardial surface of the heart, said second member being radially, mechanically connected





to said first conductive member at a proximal end thereof and not mechanically connected to said first conductive member at a distal end thereof.

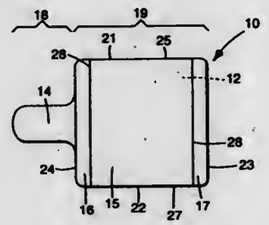
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**5,496,363**

**ELECTRODE AND ASSEMBLY**

**Paul A. Burgio, Grant Township, County of Washington; Richard J. Simonsen, Maplewood, and Donald P. Fogle, Woodbury, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Continuation-in-part of Ser. No. 71,665, Jun. 2, 1993, and a continuation-in-part of Ser. No. 193,430, Feb. 8, 1994. This application Jul. 13, 1994, Ser. No. 274,630**
**Int. Cl.[6] A61N *1/04*; A61B *5/04***
**U.S. Cl. 607—152** **25 Claims**




1. An electrode for transcutaneous electrical nerve stimulation, comprising:

a TENS electrically conductive surface having a pad portion and a tab portion, wherein the electrically conductive surface has electrically conductive particles comprising metal or graphite,

a field of conductive adhesive contacting the pad portion, wherein perimeter dimensions of the field of conductive adhesive are within perimeter dimensions of a corresponding pad portion of the electrically conductive surface contacted by the conductive adhesive, and at least two separate fields of biocompatible pressure sensitive adhesive contacting the pad portion at opposing locations proximal and distal to the tab portion.

**5,496,364**

**SELF-SUPPORTING WOVEN VASCULAR GRAFT**

**Peter J. Schmitt, Garnerville, N.Y., assignor to Meadox Medicals, Inc., Oakland, N.J.**

**Continuation of Ser. No. 949,176, Sep. 21, 1992, Pat. No. 5,385,580, which is a continuation of Ser. No. 573,932, Aug. 28, 1990, abandoned. This application Jan. 31, 1994, Ser. No. 189,310**
**Int. Cl.[6] A61F *2/06***
**U.S. Cl. 623—1** **50 Claims**




1. A self-supporting tubular woven synthetic vascular graft, comprising:

at least one warp yarn and at least one filling yarn woven together to form a weave, and

said filling yarn including a stiffening component to provide radial burst strength, dimensional stability and radial rigidity sufficient to maintain the lumen of the tubular structure open without crimping; and

wherein said stiffening component is present throughout the length of the weave and is present in each pick of the weave.

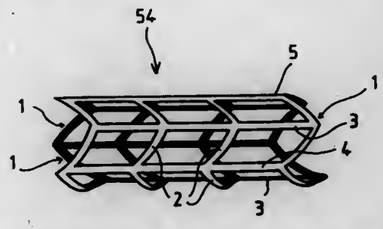
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**5,496,365**

**AUTOEXPANDABLE VASCULAR ENDOPROSTHESIS**

**Jean-Claude Sgro, 42 Cours du General de Gaulle, 21000 Dijon, France**

**Continuation of Ser. No. 907,690, Jul. 2, 1992, abandoned. This application Jul. 15, 1994, Ser. No. 275,913**
**Int. Cl.[6] A61F *2/06;2/02*; A61M *29/02***
**U.S. Cl. 623—1** **15 Claims**




1. An autoexpandable vascular endoprosthesis for supporting walls of an anatomical canal, comprising:

at least two juxtaposed assemblies, each assembly comprising a plurality of longitudinally extending juxtaposed ribs and a plurality of pairs of transverse strands interconnecting said ribs,

said ribs in each assembly including an intermediate rib and a pair of external ribs spaced from and extending along opposite sides of said intermediate rib,

said transverse strands in each assembly interconnecting said intermediate and external ribs and each pair of transverse strands forming a V shape, all of said V shapes being oriented in a same longitudinal direction with respect to said intermediate rib, said transverse strands being flexible and elastic,

wherein said at least two assemblies are juxtaposed and connected together to form an open-ended cylinder with generally parallelogram-shaped openings defined by each pair of adjacent ribs and each pair of adjacent transverse strands, said cylinder

being narrowed for insertion into the canal by applying tension in opposite longitudinal directions to an adjacent pair of said longitudinal ribs.

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**5,496,366**

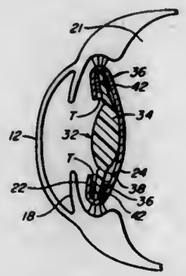
## ACCOMMODATING INTRAOCULAR LENS

**J. Stuart Cumming, 1211 W. LaPalma Ave., Anaheim, Calif. 92801**

**Division of Ser. No. 20,630, Feb. 22, 1993, abandoned, which is a continuation-in-part of Ser. No. 915,453, Jul. 16, 1992, abandoned, which is a continuation-in-part of Ser. No. 515,636, Apr. 27, 1990, abandoned. This application Jun. 7, 1994, Ser. No. 255,356**

**Int. Cl.[6] A61F 2/16**

**U.S. Cl. 623—6** **26 Claims**




1. An ophthalmic method for providing accommodating vision to a human eye having a natural capsular bag attached about its perimeter to the ciliary muscle of the eye and from which the natural lens matrix has been removed, the bag including an elastic posterior capsule urged anteriorly by vitreous pressure in the eye, and an anterior capsulotomy circumferentially surrounded by a capsular remnant having epithelial cells on its posterior side which cause fusion of the remnant to the posterior capsule by fibrosis during a certain postoperative period following surgery, said method comprising the steps of:

providing an intraocular lens having normally anterior and posterior sides and including a central optic, and plate haptics extending from opposite edges of the optic and having inner ends joined to the optic and opposite outer ends movable anteriorly and posteriorly relative to said optic,

paralyzing the ciliary muscle to place the muscle in its relaxed state,

while the ciliary muscle is paralyzed in its relaxed state, implanting said intraocular lens within said capsular bag in a position wherein the outer ends of said haptics are disposed between said capsular remnant and the outer perimeter of said posterior capsule and said optic is aligned with said capsulotomy, and

maintaining the ciliary muscle in its relaxed state during said postoperative period in a manner such that fibrosis occurs about said haptics and the haptics form pockets in the fibrose tissue, and after completion of fibrosis, relaxation of the ciliary muscle causes posterior deflection of the implanted lens and constriction of the ciliary muscle causes anterior accommodation of the implanted lens.

**5,496,367**

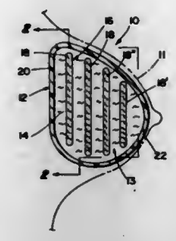
## BREAST IMPLANT WITH BAFFLES

**Jack Fisher, 5884 Fredricksburg, Nashville, Tenn. 37215**

**Continuation of Ser. No. 4,187, Jan. 13, 1993, abandoned. This application Jan. 27, 1994, Ser. No. 189,123**

**Int. Cl.[6] A61F 2/12**

**U.S. Cl. 623—8** **2 Claims**




1. A breast implant comprising an envelope enclosing a chamber containing a fluid material and a plurality of baffles deployed within said chamber, said plurality of baffles only partially restricting the flow of said fluid material within said chamber and wherein each of said plurality of baffles is a unitary body comprising a porous substantially planar sheet.

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**5,496,368**

## TISSUE EXPANDER INFLATING DUE TO OSMOTIC DRIVING FORCES OF A SHAPED BODY OF HYDROGEL AND AN AQUEOUS SOLUTION

**K. Günter Wiese, Heinz-Hilpert-Str. 12, D - 37085 Göttingen, Germany**

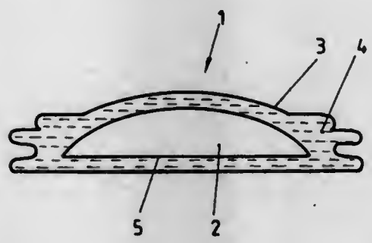
**PCT No. PCT/EP93/01490, § 371 Date Feb. 2, 1994, § 102(e) Date Feb. 2, 1994, PCT Pub. No. WO93/25266, PCT Pub. Date Dec. 23, 1993**

**PCT Filed Jun. 12, 1993, Ser. No. 190,140**

**Claims priority, application Germany, Jun. 12, 1992, 42 19 207.2**

**Int. Cl.[6] A61F 2/12**

**U.S. Cl. 623—8** **6 Claims**




1. A tissue expander for creating cavities for the insertion of implants or to provide tissue for a self transplantation comprising a hydrogel having a shaped body with a surface, said surface acting as a membrane disposed therearound, said hydrogel being capable of inflating due to an osmotic driving force of said hydrogel, a second selectively permeable membrane disposed around said first mentioned membrane and defining a space therebetween, and an aqueous solution disposed in said space between said membranes and generating an osmotic driving force for inflating the tissue expander.



**5,496,369**

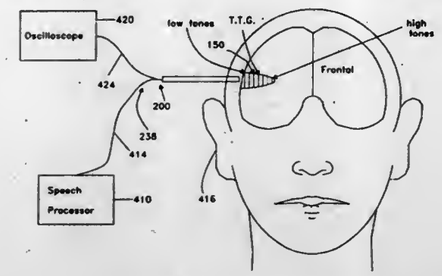
## HUMAN CEREBRAL CORTEX NEURAL PROSTHETIC

**Matthew A. Howard, III, Iowa City, Iowa, assignor to University of Iowa Research Foundation, Iowa City, Iowa**

**Filed Feb. 9, 1994, Ser. No. 194,017**

**Int. Cl.[6] A61F 2/18**

**U.S. Cl. 623—10** **18 Claims**




1. A neural prosthetic device for a primary auditory cortex of a patient, comprising:

a speech processor for receiving and processing audio information and for outputting processed electrical signals;

a mechanical support arranged in said primary auditory cortex supporting a plurality of electrical contacts, said mechanical support being arranged in said primary auditory cortex and each of said plurality of electrical contacts outputting electrical discharges corresponding to said processed electrical signals; and

electrical coupling means for electrically coupling said electrical contacts to said speech processor.

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**5,496,370**

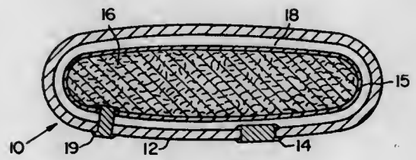
## GEL-LIKE PROSTHETIC DEVICE

**Robert S. Hamas, Woodhill Medical Park, 8345 Walnut Hill La., Suite 120, Dallas, Tex. 75231, assignor to Robert S. Hamas, Dallas, Tex.**

**Continuation of Ser. No. 850,534, Mar. 13, 1992, abandoned. This application Jul. 19, 1993, Ser. No. 93,816**

**Int. Cl.[6] A61F 2/02;2/12**

**U.S. Cl. 623—11** **31 Claims**




1. A surgically implantable prosthetic device comprising:

a sealable outer envelope defining an envelope interior and adapted to be filled with a fluid filler to maintain said fluid filler within said sealable outer envelope;

an inner envelope positioned within said envelope interior of said sealable outer envelope and adapted to be filled with said fluid filler; and

a baffle means for decreasing the displacement rate of said fluid filler positioned within said envelope interior of said outer envelope between said outer and inner envelopes and attached to at least one of said envelopes, said baffle means filling at least a portion of said envelope interior, wherein said baffle means allows for movement of said fluid filler through said baffle means in any direction.

**5,496,371**

## PROSTHETIC IMPLANT

**Barry Eppley, Indianapolis, Ind.; Thomas Sander, Newtown, and Robert D. Torgerson, Branford, both of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.**

**Continuation of Ser. No. 712,987, Jun. 10, 1991, abandoned. This application Jun. 1, 1993, Ser. No. 69,452**

**Int. Cl.[6] A61F 2/28**

**U.S. Cl. 623—16** **30 Claims**




1. A subcutaneous prosthetic maxillofacial implant for tissue or bone comprising at least two segments, at least one of said segments being connected to another segment by a flexible connecting member, said segments having inner and outer surfaces, said outer surfaces configured and dimensioned to alter the appearance of tissue underlying said segments, said inner surfaces adapted to abut surface of underlying bone, whereby said segments and said flexible connecting member cooperate to conform said implant to the contour of at least a portion of underlying bone, wherein said inner surfaces of said segments are configured to conform to at least a portion of maxillofacial bone.

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**5,496,372**

## HARD TISSUE PROSTHESIS INCLUDING POROUS THIN METAL SHEETS

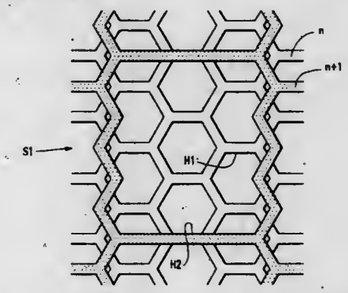
**Shoichi Hamamoto; Hirokazu Amino; Noriyuki Ishida, all of Kyoto; Yasunori Tamura, Gamo; Yoichi Nishio, Kyoto, and Masaru Ichimiya, Gamo, all of, Japan, assignors to Kyocera Corporation, Kyoto, Japan**

**Continuation-in-part of Ser. No. 48,408, Apr. 15, 1993, abandoned. This application Dec. 1, 1993, Ser. No. 159,654**

**Claims priority, application Japan, Apr. 17, 1992, 4-98282; Apr. 19, 1993, 5-091654**

**Int. Cl.[6] A61F 2/28**

**U.S. Cl. 623—16** **6 Claims**




1. A prosthesis for the replacement of hard tissues of human bones and joints comprising a porous lamination component of

metal thin sheets, each having a plurality of through holes and a thickness along a first dimension of 150 μm or less, and being unharmful to the living body, said porous lamination component being formed such that said thin sheets are laid over one another and then diffusion-bonded therebetween into one body by heating so that said through holes communicate with one another in the direction of the first dimension, wherein a single hole formed in at least one of a pair of said thin sheets being vertically adjacent to each other communicates with a plurality of holes formed in the other of the pair in the plan view direction of said thin sheets; said single hole is larger than said plurality of holes of said pair of said thin sheets such that said single hole encloses said plurality of holes of said pair of said thin sheets.

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**5,496,373**

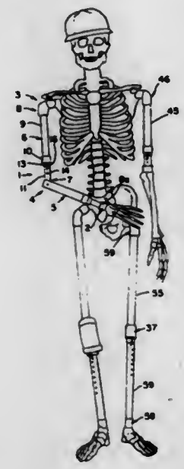
**ARTIFICIAL BONE REPLACEMENT FOR CADAVERS**

**Roderic H. Schmidt, 2544 Swan Blvd., Milwaukee, Wis. 53226**

**Continuation of Ser. No. 947,685, Sep. 21, 1992, abandoned. This application Apr. 14, 1994, Ser. No. 227,684**

**Int. Cl.[6] A61F 2/28**

**U.S. Cl. 623—16** **10 Claims**



1. A replacement bone apparatus for use with cadavers for replacement of removed elongated bone structures, comprising adjustable telescoping members having at least one attachment end which is adapted to be secured to the bone of a cadaver, a hangscrew unit secured to said attachment end and including a coupling member secured to the telescoping member with an end wall and said hangscrew secured to said end wall of said coupling member, said end wall having an inner surface and an outer surface and having an opening, said hangscrew including a threaded portion extended through said opening in said coupling member with clamping nuts on said threaded portion and said clamping nuts including an inner clamping nut and an outer clamping nut firmly threaded onto said threaded portion one each to the opposite sides of said end wall, and secured with said inner clamping nut abutting the inner surface of said end wall and said outer nut abutting said outer surface of said end wall and thereby preventing movement of said hangscrew from said end wall, said hangscrew including a self-tapping screw portion projecting rigidly from said threaded portion and said end wall to an outer end and forming an attachment element for firm connection to a cadaver bone, and whereby said hangscrew can be initially forced into the bone to promote turning of the coupling member and threading the hangscrew to the bone without said hangscrew moving relative to said end wall.

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**5,496,374**

**ION BEAM MODIFICATION OF BIOACTIVE CERAMICS TO ACCELERATE BIOINTEGRATION OF SAID CERAMICS**

**Cheryl Blanchard; Geoffrey Dearnaley, and James Lankford, Jr., all of San Antonio, Tex., assignors to Southwest Research Institute, San Antonio, Tex.**

**Filed Aug. 4, 1994, Ser. No. 285,994**

**Int. Cl.[6] A61F 2/28; B05D 3/00**

**U.S. Cl. 623—16** **38 Claims**

1. A process for increasing the bioactivity and improving the biointegration of a bioactive ceramic implant comprising treating said ceramic implant with ions in a vacuum at a dose and energy sufficient to form a biologically-active calcium hydrocarbonate apatite layer on the surface of said ceramic implant.

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**5,496,375**

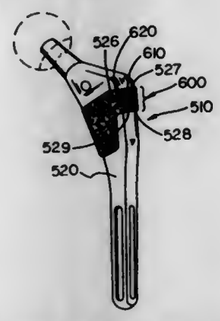
**PROSTHETIC IMPLANT WITH CIRCUMFERENTIAL POROUS PAD HAVING INTERLOCKING TABS**

**Bruce A. Sisk, Bremen, and Alden J. Hartz, South Bend, both of Ind., assignors to Zimmer, Inc., Warsaw, Ind.**

**Filed Sep. 14, 1994, Ser. No. 307,982**

**Int. Cl.[6] A61F 2/28; 2/32**

**U.S. Cl. 623—16** **5 Claims**




1. A prosthetic implant including a stem portion having a discrete, circumferential porous pad mounted directly on the stem portion in surrounding relation thereto, the pad includes a first end and a second end such that when the pad is mounted on the stem portion, the first end and the second end face each other and are interconnected at a seam therebetween by a means for reducing the advancement of wear debris along the seam, and wherein the means for reducing the advancement of wear debris includes at least one pair of mating interlocking tabs on the pad, wherein the at least one pair of tabs includes a first protruding tab member extending from the first end of the pad and a first recessed portion extending into the second end of the pad, said first recessed portion corresponding to and interlocking with the first tab member.



**5,496,376**

**CARBONATE BUILT LAUNDRY DETERGENT COMPOSITION CONTAINING A DELAYED RELEASE POLYMER**

**Anthony J. Falotico, Doylestown, Pa.; Steven A. Bolkan, Hopewell, and Louis R. Mazzola, Mahwah, both of N.J., assignors to Church & Dwight Co., Inc., Princeton, N.J.**

**Filed Jun. 30, 1994, Ser. No. 269,217**

**Int. Cl.[6] C11D 17/00; 1/66; 3/10**

**U.S. Cl. 252—174** **18 Claims**

1. A laundry detergent composition wherein the solids content comprises an active surfactant, at least about 70 wt. % of a builder consisting of a water-soluble alkaline carbonate, and about 0.05 to 5 wt. % of a polymeric polycarboxylate, based on the total weight of solids in the composition, said composition containing delayed release agglomerated granules consisting essentially of said polymeric polycarboxylate and optionally a diluent salt and binder, and having a particle size distribution within the range of about 8 to 30 U.S. mesh size such that the compete release of said polymeric polycarboxylate into wash water under normal washing conditions is delayed to at least about 60 seconds after the complete dissolution of said alkaline carbonate builder.

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**5,496,377**

**PROCESS FOR THE DIRECT DYEING OF KERATINOUS FIBRES USING WATER VAPOR**

**Henri Samain, Bievres, and Jean-Michel Sturla, Saint-Cloud, both of, France, assignors to L'Oreal, Paris, France**

**Filed Dec. 16, 1994, Ser. No. 357,371**

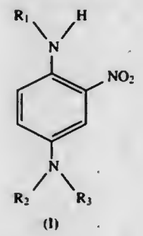
**Claims priority, application France, Dec. 22, 1993, 93 15485**

**Int. Cl.[6] A61K 7/13**

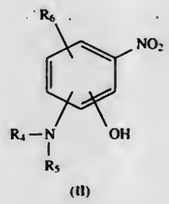
**U.S. Cl. 8—414** **28 Claims**

16. A process for the direct dyeing of keratinous fibres to lower selectivity thereon, comprising the step of:

directly dyeing said fibres to lower said selectivity, by contacting said fibres (I) with a composition containing at least one direct dye selected from the 2-nitro-para-phenylenediamine derivatives of formula (I) and the nitro aminophenol derivatives of formula (II):



(I)



(II)

in which:

$R_1$ is selected from $C_1$-$C_4$ alkyl, $C_2$-$C_4$ monohydroxyalkyl, $C_2$-$C_4$ polyhydroxyalkyl radicals, $C_1$-$C_4$($C_1$-$C_4$ alkoxy) alkyl radicals and $C_1$-$C_4$ aminoalkyl radicals; $R_2$ and $R_3$ are selected from $C_1$-$C_4$ alkyl, $C_2$-$C_4$ monohydroxyalkyl and $C_2$-$C_4$ polyhydroxyalkyl radicals with the proviso that when one of $R_2$ or $R_3$ is $C_{1-4}$ alkyl, the other is $C_{2-4}$ monohydroxyalkyl or $C_{2-4}$ polyhydroxyalkyl; $R_4$ and $R_5$ are selected from hydrogen, $C_1$-$C_4$ alkyl, $C_2$-$C_4$ monohydroxyalkyl, $C_2$-$C_4$ polyhydroxyalkyl, and $C_1$-$C_4$ aminoalkyl radicals; and $R_6$ is selected from hydrogen, $C_1$-$C_4$ alkyl radicals, halogen atoms, and an $NO_2$ group; and (2) with a gas containing water vapour, the temperature of the gas and the contact time between said gas and said fibres being sufficient to lower said selectivity.

**5,496,378**

**IMIDAZOLYMETHYLATED COPPER PHTHALOCYANINE DYES**

**Heidi Hengelsberg, Mannheim; Manfred Ruske, Ludwigshafen, and Udo Mayer, Frankenthal, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany**

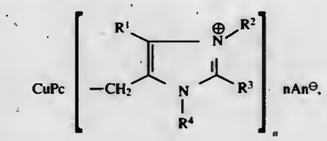
**Filed Sep. 12, 1994, Ser. No. 304,191**

**Claims priority, application Germany, Sep. 11, 1993, 43 30 864.3**

**Int. Cl.[6] C09B 47/04**

**U.S. Cl. 8—436** **12 Claims**

1. Basic dyes of the formula I



(I)

where

n is from 1 to 3,

CuPc is a copper phthalocyanine radical,

$R^1$ is hydrogen or $C_1$–$C_4$-alkyl,

$R^2$ is $C_1$–$C_4$-alkyl,

$R^3$ is hydrogen or $C_1$–$C_4$-alkyl,

$R^4$ is $C_1$–$C_4$-alkyl, and

$An^{\ominus}$ is an anion,

with the proviso that $R^1$ and $R^3$ are not both hydrogen.

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**5,496,379**

**DYEING PROCESS FOR KERATIN MATERIALS, WITH IMPROVED EXHAUSTION OF BATH CONSTITUENTS**

**John A. Rippon, Torquay, and Francis J. Harrigan, Highton, both of, Australia, assignors to Commonwealth Scientific and Industrial Research Organisation, Australia Capital Territory, Australia**

**PCT No. PCT/AU93/00045, § 371 Date Nov. 9, 1994, § 102(e) Date Nov. 9, 1994, PCT Pub. No. WO93/15259, PCT Pub. Date Aug. 5, 1993**

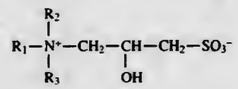
**PCT Filed Feb. 3, 1993, Ser. No. 284,426**

**Claims priority, application Australia, Feb. 4, 1992, PL 0673; Jan. 15, 1992, PL 5373**

**Int. Cl.[6] D06P 3/14; 1/62; 1/607**

**U.S. Cl. 8—490** **42 Claims**

1. A method of applying dye to keratin fibres comprising pretreating the fibres by contacting them with an alkaline solution of an amphoteric surfactant, and thereafter applying dye to the pretreated fibres from a dyeing solution which is substantially deficient of surfactant-type levelling agents but includes one or more insect-proofing agents, wherein said amphoteric surfactant comprises an alkoxylated hydroxysulphobetaine of formula:



where:

$R_1$ is a hydrocarbon group selected from the range $C_{12}H_{25}$ up to $C_{21}H_{43}$; and

$R_2$ and $R_3$ are poly(alkylene oxide) groups, each having n alkylene oxide units, where $3 \leqq n \leqq 21$.

**5,496,380**

## DISPERSE DYE COMPOSITION AND DYEING METHOD EMPLOYING IT

**Hideaki Imafuku; Takashi Fujita; Toshikazu Tamiya, and Kuniko Kira, all of Kitakyushu, Japan, assignors to Dystar Japan Ltd., Osaka, Japan**

**Continuation of Ser. No. 210,366, Mar. 18, 1994, abandoned. This application May 18, 1995, Ser. No. 443,564**

**Claims priority, application Japan, Apr. 19, 1993, 5-115341**

**Int. Cl.[6] C09B** *29/00;* **D06P** *3/87;3/54*

**U.S. Cl. 8—529** **7 Claims**

1. A disperse dye composition, which is:

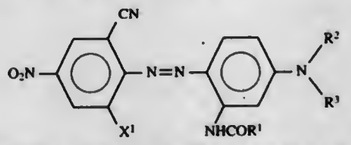
(A) a combination of blue dye composition (1) and red dye composition (2);

(B) a combination of blue dye composition (1) and yellow dye composition (3); or

(C) a combination of blue dye composition (1), red dye composition (2) and yellow dye composition (3); wherein:

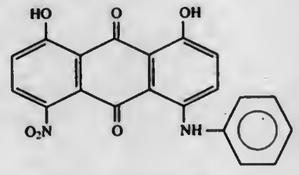
blue dye composition (1) consists of from 35 to 55 wt. % of a compound of formula (I), from 35 to 55 wt. % of a compound of formula (II), and from 2 to 20 wt. % of a compound of formula (III) (the sum of the three compounds having formulas I, II and III being 100 wt. %)

(I)

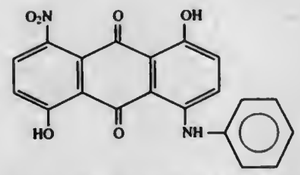


wherein $X^1$ is —CN or $—NO_2$, $R^1$ is a methyl group or an ethyl group, and each of $R^2$ and $R^3$ which are independent of each other, is a $C_2$–$C_4$ alkyl group,

(II)

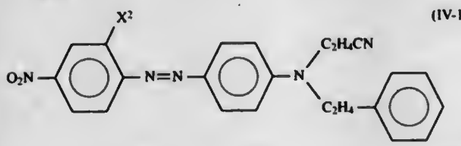


(III)

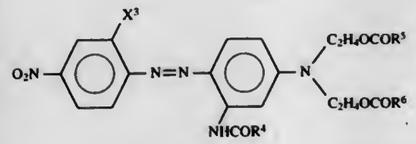


red dye composition (2) consists of at least one red dye selected from the group consisting of compounds of formulas (IV-1) and (IV-2):

(IV-1)



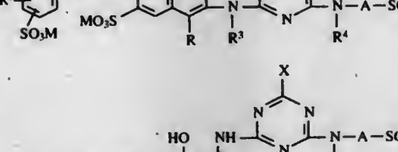
(IV-2)



wherein each of $X^2$ and $X^3$ which are independent of each other, is —CN or a halogen atom, and each of $R^4$, $R^5$ and $R^6$ which are independent of each other, is a methyl group or an ethyl group; and

yellow dye composition (3) consists of at least one yellow dye selected from the group consisting of compounds of formula (V):

(V)



wherein each of $X^4$ and $X^5$ which are independent of each other, is a halogen atom, and $R^7$ is $—C_2H_4CN$ or $—C_2H_4OCOC_6H_5$.

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**5,496,381**

## MIXTURES OF FIBER-REACTIVE DYES AND USE THEREOF FOR DYEING FIBER MATERIALS

**Werner H. Russ, Flörsheim, and Kurt Hussong, Bad Soden, both of, Germany, assignors to Hoechst AG, Germany**

**Filed Sep. 19, 1994, Ser. No. 308,707**

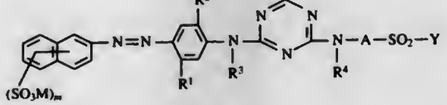
**Claims priority, application Germany, Sep. 21, 1993, 43 32 048.1**

**Int. Cl.[6] C09B** *67/22;67/24;* **D06P** *1/38;3/10*

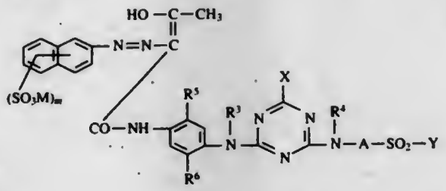
**U.S. Cl. 8—549** **20 Claims**

1. A dye mixture consisting essentially of three to seven fiber-reactive dyes selected from dyes of the below-indicated and -defined formulae (1) to (7) with the proviso that the dye mixture contain at least one representative of the formulae (1) or (2) or a combination thereof, at least one representative of the formulae (3) or (4) or a combination thereof, and at least one representative of the formulae (5), (6) or (7) or a combination thereof:

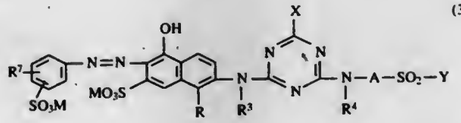
(1)



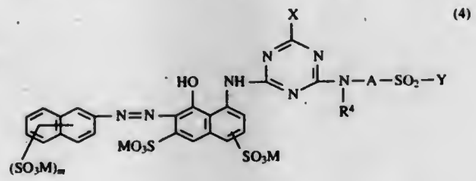
(2)



(3)



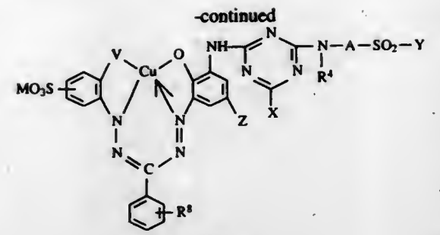
(4)



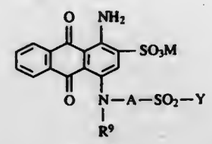


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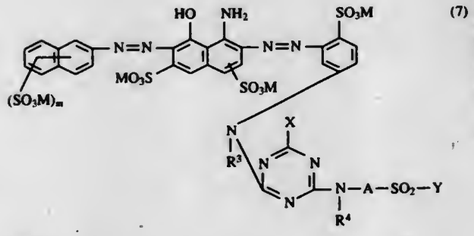
(5)



(6)



(7)



where

M is hydrogen or an alkali metal;

m is 1, 2 or 3;

X is cyanoamino, alkoxy of 1 to 4 carbon atoms or alkoxy of 2 to 4 carbon atoms substituted by alkoxy of 1 to 4 carbon atoms;

Y is vinyl or is ethyl which contains in the β-position a substituent which is eliminable by alkali with the formation of the vinyl group;

Z is hydrogen or $SO_3M$, wherein M is defined above:

$R^1$ is hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy or 1 to 4 carbon atoms, alkanoylamino of 2 to 5 carbon atoms, or ureido;

$R^2$ is hydrogen, sulfo, alkyl of 1 to 4 carbon atoms, or alkoxy of 1 to 4 carbon atoms;

$R^3$ is hydrogen or alkyl of 1 to 4 carbon atoms, which can be substituted by hydroxyl, cyano, $C_1$–$C_4$-alkoxy, carboxyl, carbamoyl, $C_2$–$C_5$-alkoxycarbonyl, $C_2$–$C_5$-alkyl carbonyloxy, sulfo, sulfamoyl or halogen;

$R^4$ is hydrogen or alkyl of 1 to 4 carbon atoms, which can be substituted by hydroxyl, cyano, $C_1$–$C_4$-alkoxy, carboxyl, carbamoyl, $C_2$–$C_5$-alkoxycarbonyl, $C_2$–$C_5$-alkyl carbonyloxy, sulfo, sulfamoyl or halogen or is phenyl which can be substituted by 1 to 2 substituents selected from the group consisting of sulfo, methyl, ethyl, methoxy, ethoxy and carboxyl;

A is alkylene of 2 to 6 carbon atoms, which can be substituted by hydroxyl, $C_1$–$C_4$ -alkoxy, sulfo, carboxyl or halogen;

R is hydrogen or sulfo;

$R^5$ is hydrogen, sulfo, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms;

$R^6$ is hydrogen, sulfo, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms;

$R^7$ is hydrogen, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms;

V is a group of the formula —CO—O— or an oxy group of the formula —O—;

$R^8$ is hydrogen, methyl, ethyl, nitro, sulfo or chlorine;

$R^9$ is phenyl, monosulfophenyl or monocarboxylphenyl;

the one $—SO_3M$ group in the formula (4) and in the formula (7) is attached to the naphthalene nucleus of the aminonaphthol radical meta or para to the amino group.

**5,496,382**

## AMIDE/ESTER HETEROCYCLIC DERIVATIVES OF HYDROCARBYLSUCCINIC ANHYDRIDES AS RUST/CORROSION INHIBITING ADDITIVES FOR FUELS

**David A. Blain, Gravenchon, France; Andrew G. Horodysky, Cherry Hill; Ronald J. Poole, Mullica Hill, both of N.J., and Shi-Ming Wu, Newtown, Pa., assignors to Mobil Oil Corporation, Fairfax, Va.**

**Division of Ser. No. 44,724, Apr. 12, 1993, Pat. No. 5,348,674. This application Sep. 14, 1994, Ser. No. 308,871**

**Int. Cl.[6] C10L** *1/18;1/22*

**U.S. Cl. 44—331** **10 Claims**

1. An improved fuel composition comprising a liquid hydrocarbon or liquid oxygenated fuel and a minor multifunctional antiwear, corrosion inhibiting, rust inhibiting, thermal color stabilizing, antioxidant, dispersant and detergent proportion of an additive product of reaction prepared by reacting (1) a hydrocarbylsuccinic anhydride or its acid equivalent with (2) a hydroxyl-containing amine and (3) an aryltriazole wherein the reaction is carried out in molar ratios of said anhydride to amine to triazole varying from about 100/80/80 to 100/10/1 at temperatures varying from ambient to about 250° C., under pressures varying from ambient to about 100 psi for a time sufficient to obtain the desired additive product of reaction.

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**5,496,383**

## FUEL ADDITIVES, THEIR PREPARATION AND GASOLINE ENGINE FUELS CONTAINING THE ADDITIVES

**Lothar Franz, Mutterstadt; Juergen Mohr, Gruenstadt; Peter Schreyer, Weinheim; Juergen Thomas, Fussgoenheim; Knut Oppenlaender, Ludwigshafen, and Wolfgang Guenther, Mettenheim, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany**

**Filed Mar. 11, 1994, Ser. No. 208,819**

**Claims priority, application Germany, Mar. 23, 1993, 43 09 271.3**

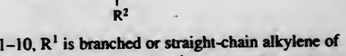
**Int. Cl.[6] C10L** *1/22*

**U.S. Cl. 44—432** **7 Claims**

1. A fuel additive based on a long-chain hydrocarbon having a polar terminal group, obtained by

a) hydroformylating a long-chain olefin having a number average molecular weight of from 250 to 5,000 in the presence of CO and $H_2$ at from 80° to 200° C. and $CO/H_2$ pressures of up to 600 bar,

b) reacting the reaction product with a polyamine of the following formula I



I

where m is 1–10, $R^1$ is branched or straight-chain alkylene of 2 to 6 carbon atoms and the radicals $R^1$ may be different from one another when m is >1, $R^2$ and $R^3$ independently of one another are each hydrogen, alkyl of 1 to 6 carbon atoms or hydroxyalkyl of 1 to 6 carbon atoms, or $R^2$ and $R^3$, together with the nitrogen to which they are bonded, form a heterocyclic ring which may have further heteroatoms,

and then

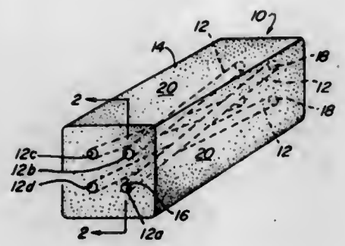
c) catalytically hydrogenating the resulting reaction product in the presence of $H_2$ and in the presence or absence of $NH_3$.

5,496,384

## ARTIFICIAL FIREPLACE LOG

Brian E. Jeskey, 521 Fernleaf, Corona Del Mar, Calif. 92625; Matthew C. Sandt, 1196 N. Viceroy Ave., Covina, Calif. 91722, and Martin A. Supple, 11865 Ashworth St., Artesia, Calif. 90701

Filed May 24, 1994, Ser. No. 248,193
Int. Cl.[6] C10L 5/48;5/00
U.S. Cl. 44—535 20 Claims




1. In combination an artificial fireplace log, the improvement comprising an elongated combustible body defined by a solid core and formed from a substantial quantity of waste sludge material taken from a paper mill sludge pond or clarifier and a substantial quantity of wax mixed with said paper waste sludge material so as to act as a fuel and a binder, wherein at least one longitudinal bore having an upper and lower open end is positioned within said solid core of said combustible body, said longitudinal bore defining an air passage angularly disposed to the longitudinal axis of said combustible body.

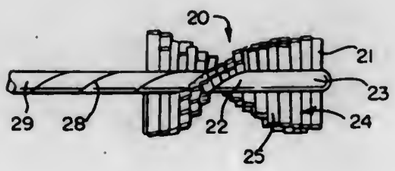
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5,496,385

## INTERNAL FINISHING TOOL AND METHOD OF MAKING SAME

Alfred F. Scheider, Orange, and R. Brown Warner, Westlake, both of Ohio, assignors to Jason, Inc., Cleveland, Ohio

Division of Ser. No. 751,335, Aug. 29, 1991, Pat. No. 5,404,681. This application Jan. 19, 1995, Ser. No. 380,641
Int. Cl.[6] B24D 18/00
U.S. Cl. 51—293 6 Claims



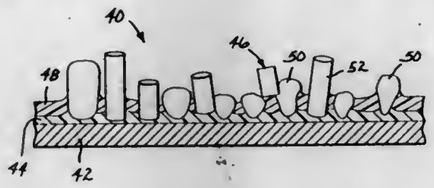

1. A method of making a twisted stem abrading tool comprising the steps of forming an elongated strip of abrasive containing plastic, cutting the strip to a given length, forming transverse slits into the lateral edges of the strip, the slits on one edge being longitudinally offset from the slits on the opposite edge, placing the strip in the bight of a cotter pin, and clamping and twisting the corer pin to form a helical twisted stem abrading tool, the slit edges of the strip forming a helical pattern of abrasive plastic fingers.

5,496,386

## COATED ABRASIVE ARTICLE HAVING DILUENT PARTICLES AND SHAPED ABRASIVE PARTICLES

David E. Broberg, Woodbury, and Donna W. Bange, Eagan, both of Minn., assignors to Minnesota Mining and Manufacturing, St. Paul, Minn.

Continuation of Ser. No. 222,161, Apr. 4, 1994, which is a continuation of Ser. No. 32,983, Mar. 18, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 468,040
Int. Cl.[6] B24D 11/00
U.S. Cl. 51—295 17 Claims




1. A coated abrasive article comprising:

(a) a backing having at least one major surface;

(b) an abrasive coating comprising shaped abrasive particles, diluent particles, and a binder, said binder adhering the shaped abrasive particles and the diluent particles to the at least one major surface of the backing, wherein the abrasive particles comprise

(i) alpha alumina, and

(ii) an oxide of magnesium, zinc, iron, silicon, cobalt, nickel, zirconium, hafnium, chromium, yttrium, praseodymium, samarium, ytterbium, neodymium, lanthanum, gadolinium, cerium, dysprosium, erbium, titanium, and mixtures thereof;

and wherein the abrasive particles are rod-shaped and have an aspect ratio of at least one to one.

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5,496,387

## BINDER PRECURSOR DISPERSION METHOD OF MAKING ABRASIVE ARTICLES MADE FROM REDUCED VISCOSITY SLURRIES, AND METHOD OF REDUCING SEDIMENTATION RATE OF MINERAL PARTICLES

Scott R. Culler, Burnsville, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 251,906, Jun. 1, 1994, which is a division of Ser. No. 177,595, Jan. 5, 1994, Pat. No. 5,368,619, which is a continuation of Ser. No. 992,137, Dec. 17, 1992, abandoned. This application Jul. 17, 1995, Ser. No. 503,019
Int. Cl.[6] B24D 3/34
U.S. Cl. 51—295 11 Claims

1. A method of making a coated abrasive comprising the steps of:

(a) coating a backing material with a slurry, the slurry consisting essentially of a polymerizable resin, abrasive particles, and modifying particles, wherein said modifying particles have a surface area of less than about 300 $m^2/g$ and are present in an amount sufficient to reduce the viscosity of the slurry; and

(b) subjecting the coated backing of step (a) to conditions sufficient to cure the polymerizable resin.

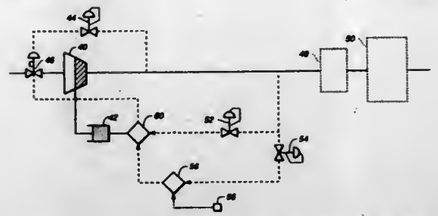


5,496,388

## SYSTEM FOR COMPRESSING AIR AND EXTRACTING NITROGEN FROM COMPRESSED AIR

Nils E. Tellier, Walnut Creek, Calif., assignor to Air Liquide America Corporation, Walnut Creek, Calif.

Filed Jul. 1, 1994, Ser. No. 269,768
Int. Cl.[6] B01D 35/157;53/22
U.S. Cl. 55—210 11 Claims




1. A system for extracting nitrogen from air to produce a flow of nitrogen, comprising:

a compressor for compressing air, said compressor being operable at full capacity and less than full capacity, said compressor including a pair of rotatable rotors, an inlet through which air flows into the compressor and reducing means for reducing an effective length of the rotatable rotors which acts to compress air in order to cause the compressor to operate at less than full capacity;

an air separator connected to the compressor for receiving compressed air from the compressor and producing nitrogen from the compressed air;

an internal pressure control regulator operatively associated with the compressor for regulating discharge pressure from the compressor, said internal pressure control regulator being operable to provide a signal air pressure when the compressor discharge pressure exceeds a predetermined pressure;

an external input means for inputting an external signal indicative of a compressor operating level that is less than full capacity and for providing a signal air pressure based on the external signal;

selecting means connected to the internal pressure control regulator, the external input control device and the reducing means for selecting one of the signal air pressure from the internal pressure control regulator and the signal air pressure from the external input means, and for outputting a control signal to the reducing means based on the selected signal to reduce the effective length of the rotatable rotors which acts to compress air so that the operating level of the compressor is externally controllable to vary nitrogen flow and nitrogen purity while also preventing an increase in pressure beyond the predetermined pressure when the compressor is operating at a reduced operating level.

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5,496,389

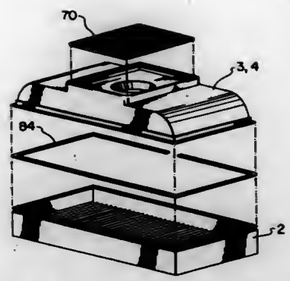
## CLEAN AIR FAN FILTER MODULE

Wayne Wilcox, Nepean, Canada, assignor to Microzone Corporation, Canada

Continuation of Ser. No. 67,986, May 27, 1993, abandoned. This application Jun. 9, 1994, Ser. No. 257,579
Claims priority, application Canada, Apr. 8, 1993, 2093692
Int. Cl.[6] B01D 35/30
U.S. Cl. 55—473 15 Claims

1. A clean air fan filter module without a physical damper or intermediate baffle assembly comprising:

a fan shroud having an air inlet, an air inlet ring having horizontal flanges which sit on said fan shroud and vertical interior walls extending through said air inlet, said ring moveable relative to said air inlet, a pre-filter, two inclined ends, and a planar top surface having formed therein, offset ribs with four sides extending about said air inlet, said ribs including means to receive and support said pre-filter;




a fan/motor mount;

a centrifugal fan blowing air radially toward the fan shroud;

a fan and motor mounted on said fan/motor mount below said air inlet at a level entirely below said shroud top planar surface; and,

a HEPA filter serving as an air outlet.

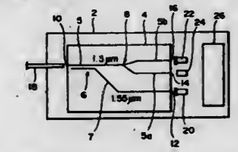
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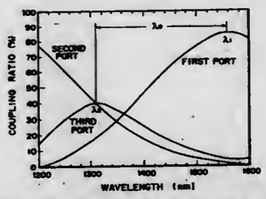
5,496,390

## METHOD OF MANUFACTURING AN OPTICAL MODULE FOR WAVELENGTH DIVISION MULTIPLEX OPTICAL TRANSMISSION WITH REGULATION OF THE COUPLING RATIO AND COUPLING LENGTH

Tadao Arima, and Koji Okamura, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 892,748, Jun. 3, 1992, abandoned. This application Apr. 29, 1994, Ser. No. 235,251
Claims priority, application Japan, Jun. 6, 1991, 3-134872
Int. Cl.[6] G02B 6/255; C03B 37/07
U.S. Cl. 65—378 1 Claim




1. A method of manufacturing an optical module for wavelength-division multiplex optical transmission, said module including a first optical fiber having a first port at one end thereof and a second port at the other end thereof, and second and third optical fibers fused to said first optical fiber at the side face thereof such that said first optical fiber is positioned between center portions of said second and third optical fibers, said second optical fiber having a third port, said third optical fiber having a fourth port, said third and fourth ports being located on a same side as that of said second port of said first optical fiber, said method comprising the steps of:

fusing said second and third optical fibers to said first optical fiber;

regulating an aspect ratio at a fused portion while heating said fused portion and elongating said fused portion at zero speed or at a low rate substantially near zero speed, wherein said aspect ratio is a ratio (b/a) of a longer length (b) of a cross-section of said fused portion to a shorter length (a) of said cross-section of said fused portion, wherein said step of

regulating said aspect ratio includes a step of directing at least a light source to said first port of said first optical fiber; and

regulating a coupling length of said fused portion while elongating said fused portion at a higher speed than in said aspect ratio regulating step under conditions such that a heating temperature of the fused portion is lowered and said aspect ratio is kept unchanged, wherein said coupling length is a length of said fused portion which has been elongated, wherein said step of regulating said coupling length includes a step of directing at least said light source to said first port of said first optical fiber,

wherein an intensity of a light beam outputted from said second port, having a first wavelength ($\lambda 1$), is dependent on said coupling length,

wherein a second wavelength ($\lambda 2$), at which intensities of light beam outputted from said third and fourth ports become equal, is subtracted from said first wavelength ($\lambda 1$) to provide a difference wavelength ($\lambda 1-\lambda 2$), said difference wavelength ($\lambda 1-\lambda 2$) being determined based on said aspect ratio, and

wherein the step of regulating said aspect ratio is performed so that the difference between the first wavelength and the second wavelength ($\lambda 1-\lambda 2$)is 0.25 μm, and the step of regulating said coupling length is performed so that said first wavelength ($\lambda 1$) is equal to 1.55 μm.

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**5,496,391**

**MATERIAL AND A METHOD FOR FORMING A PROTECTIVE COATING ON A SUBSTRATE OF A COPPER-BASED ALLOY**

**Léon Noel, Viroflay, France, assignor to Castolin S.A., Saint-Sulpice, Switzerland**

**Filed Aug. 2, 1994, Ser. No. 285,032**

**Claims priority, application France, Dec. 4, 1992, 92 14653**

**Int. Cl.[6] C22C *19/03***

**U.S. Cl. 75—255** **8 Claims**

1. A powdered metallic material for forming a protective coating for use against high temperature corrosion and erosion on an alloy substrate based on copper, characterized in that the powdered metallic material is selected from at least one of the group consisting of:

| | | |
|---|---|---|
| (1) | Cu: | 5–30 |
| | P: | 0.1–4.0 |
| | B: | 0.5–4.0 |
| | Si: | 0.5–4.0 |
| | Cr: | 0–5.0 |
| | Fe: | 0–3.0 |
| | C: | 0–0.3 |
| | Ni: | substantially the balance |
| (2) | Cu: | 8.0–20.0 |
| | P: | 0.5–2.5 |
| | B: | 0.8–3.0 |
| | Si: | 1.0–3.5 |
| | Cr: | 0–2.0 |
| | Fe: | 0–2.0 |
| | C: | 0–0.2 |
| | Ni: | substantially the balance |
| (3) | Cu: | 12.0–15 |
| | P: | 1–2 |
| | B: | 1.2–1.7 |
| | Si: | 2.0–2.5 |
| | Cr: | 0–0.5 |
| | Fe: | 0–1.0 |
| | C: | 0–0.1 |
| | Ni: | substantially the balance |

said selected material characterized in that it is a mixture of a powdered alloy selected from the group consisting of nickel-phosphorous alloys, nickel-chromium-phosphorus alloys, and copper phosphorus alloys, with a powdered alloy selected from the group consisting of nickel-boron-silicon alloys and nickel-chromium-boron-silicon alloys.

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**5,496,392**

**METHOD OF RECYCLING INDUSTRIAL WASTE**

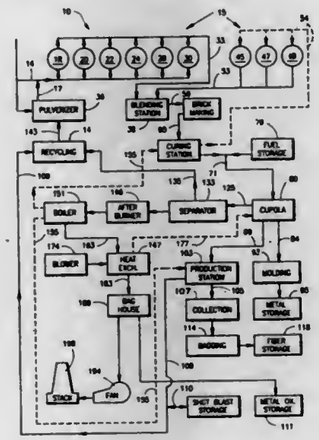
**Bobby H. Sims, Lonsdale, and Carl T. Philipp, Hot Springs, both of Ark., assignors to Envirosclence, Hot Springs, Ark.**

**Continuation-in-part of Ser. No. 38,464, Mar. 29, 1993, Pat. No. 5,364,447, which is a continuation-in-part of Ser. No. 632,000, Dec. 21, 1990, Pat. No. 5,198,190. This application Mar. 29, 1994, Ser. No. 219,527**

**The portion of the term of this patent subsequent to Dec. 21, 2010, has been disclaimed.**

**Int. Cl.[6] C22B *7/00***

**U.S. Cl. 75—414** **23 Claims**




1. A process for recycling industrial waste materials comprising:

a) blending (1) one or more industrial waste materials comprising at least one component selected from the group consisting of reducible metals, volatile metals and nonreducible metal oxides, (2) at least one carbonaceous reducing agent and (3) at least one primary fluxing agent, into a homogenous mass;

b) forming and shaping said homogenous mass into particles having an average mean diameter not greater than four inches;

c) curing and drying said particles at a temperature of from about 170° to 240° F. for a period of time such that the resulting particles have a moisture content of less than about 10.0%;

d) heating and melting the resulting particles at a temperature of from about 1,660° to about 3,100° F. such that a reducing atmosphere is created within the structure of the particles from the release of said reducing agent, thereby forming (1) reducible metals, (2) volatile metals (3) a molten slag comprising non-reducible metal oxides and (4) exhaust products; and



e) separating and recovering at least one component selected from the group consisting of (1) reducible metals, (2) volatile metals, (3) exhaust products, and (4) a molten slag comprising non-reducible metal oxides, resulting from said heating and melting step (d).

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**5,496,393**

**GAS PURIFICATION CAPABILITY MEASURING METHOD FOR GAS PURIFICATION APPARATUS AND GAS PURIFICATION APPARATUS**

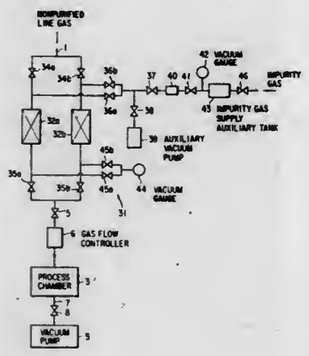
**Kenichi Otsuka, Kawasaki, and Kazuya Mori, Yokohama, both of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Continuation of Ser. No. 314,446, Sep. 28, 1994, abandoned, which is a continuation of Ser. No. 889,396, May 28, 1992, abandoned. This application May 15, 1995, Ser. No. 441,114**

**Claims priority, application Japan, May 31, 1991, 3-157585**

**Int. Cl.[6] B01D *46/46;53/04***

**U.S. Cl. 95—19** **23 Claims**




1. A gas purification capability measuring method for a gas purification apparatus having a gas purification system including a gas purification unit for purifying a gas line in which a getter material is incorporated, comprising the steps of:

providing a gas purification system and gas purification unit in which a getter material is incorporated and supplying an amount of a line gas to said system;

stopping said supplying of said line gas to said system;

evacuating an interior of said gas purification system to a predetermined degree of vacuum sufficient for enabling detection of degradation of a gas purification capability of said gas purification unit;

supplying a selected amount of an impurity gas from an inlet of said gas purification unit through said getter material and into said gas purification system to flow said impurity gas in the same direction as that of the line gas, said selected amount being relatively smaller and at a relatively lower pressure than said amount of said line gas;

allowing said getter material to absorb said impurity gas in said gas purification system during a predetermined period of time after said impurity gas is supplied; and

measuring at an outlet of said gas purification unit in said gas purification system only a pressure of the impurity gas that is not absorbed by said getter material to monitor a gas purification capability of said gas purification unit while a plurality of said gas purification systems are in operation, except for said gas purification system being measured.

**5,496,394**

**CYCLONE SEPARATOR**

**Roland Nied, Raiffeisenstrasse 10, D-8901 Bonstetten, Germany**

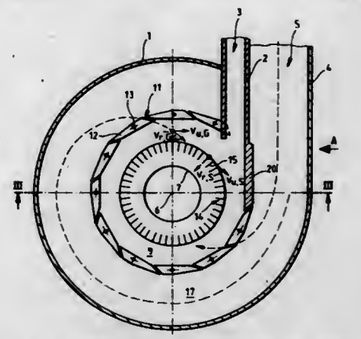
**PCT No. PCT/EP92/02628, § 371 Date May 11, 1994, § 102(e) Date May 11, 1994, PCT Pub. No. WO93/09883, PCT Pub. Date May 27, 1993**

**PCT Filed Nov. 15, 1992, Ser. No. 240,716**

**Claims priority, application Germany, Nov. 15, 1991, 41 37 633.1**

**Int. Cl.[6] B07B *7/00***

**U.S. Cl. 95—271** **6 Claims**



6. Process for separating course material and fine material in a gas comprising

injecting said gas with said material into a cyclone separator having a stationary spiral housing, a vane ring stationarily arranged in the spiral housing, said vane ring having adjustable vanes, a separator wheel arranged coaxially within the vane ring, means for tangentially introducing said gas with said material and a separator gas into said housing, and guide edge means for deflecting coarse particles in an end zone of a spiral flow in an annular space between the vane ring and the separator wheel, said separator comprising

(a) a first tangential inlet pipe for the introduction of material to be separated into the annular space between the vane ring and the separator wheel;

(b) a second tangential inlet pipe for the introduction of separator gas, arranged in parallel to the first inlet pipe for the introduction of the material to be separated;

(c) means for mixing the separator gas introduced through the second inlet pipe With the material to be separated, introduced through the first inlet pipe;

(d) material outlet means in the form of a guide plate at the end of a flow path for the material to be separated, said guide plate being placed obliquely to the flow in the annular space between the vane ring and the separator wheel, inclined in relation to an axis of the separator and having one of its edges on the circumference of the vane ring, being attached to a wall section of the separator housing, and having another edge proximate to the separator wheel, and

(e) outlet means for fine particulate matter, arranged concentrically in said annular space.

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**5,496,395**

**SYSTEM FOR RECOVERING ORGANIC SOLVENT IN SOIL**

**Akira Yamazaki, Tokyo, Japan, assignor to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

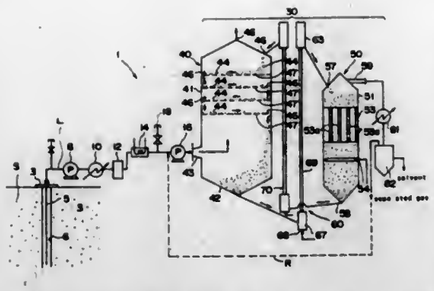
**Filed Dec. 15, 1994, Ser. No. 356,124**

**Claims priority, application Japan, Dec. 28, 1993, 5-349050**

**Int. Cl.[6] B01D *53/12***

**U.S. Cl. 96—123** **9 Claims**

1. A system for recovering an organic solvent contaminant in a soil, comprising:



means for sucking a gas containing the organic solvent contaminant from the soil contaminated by the organic solvent, comprising a solvent collecting tube inserted into the soil and a vacuum device connected to the solvent collecting tube for vacuum sucking the gas containing the organic solvent from the soil; and

a gas treating apparatus connected to a discharge side of the vacuum device through a connection line for adsorbing and recovering the organic solvent in the gas,

said gas treating apparatus comprising:

an adsorption unit connected to the vacuum device and provided with a multistage fluidized bed of activated carbon for adsorbing the organic solvent in the gas;

a desorption unit arranged side by side with the adsorption unit and provided with a moving bed of the activated carbon for desorbing the organic solvent from the activated carbon, said desorption unit being further provided with a heating means for heating the activated carbon of the moving bed and a gas supply means for supplying a carrier gas for carrying away a desorbed solvent gas out of the moving bed;

a first transfer means having one end connected to a bottom portion of the adsorption unit and another end connected to an upper portion of the desorption unit for transferring the activated carbon from the adsorption unit to the desorption unit; and

a second transfer means having one end connected to a bottom portion of the desorption unit and another end connected to an upper portion of the adsorption unit for transferring the activated carbon from the desorption unit to the adsorption unit, wherein the activated carbon is circulated between said adsorption unit and said desorption unit through said first and second transfer means.

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**5,496,396**

**GAS FILTER**

**Andrew M. Allan, Blairgowrie, and Akis Katsakoglou, Arbroath, both of, United Kingdom, assignors to W. L. Gore & Associates (UK) Ltd., London, United Kingdom**

**PCT No. PCT/GB93/00232, § 371 Date Sep. 16, 1994, § 102(e) Date Sep. 16, 1994, PCT Pub. No. WO93/14722, PCT Pub. Date Aug. 5, 1993**

**PCT Filed Feb. 4, 1993, Ser. No. 284,486**

**Claims priority, application United Kingdom, Feb. 4, 1992, 9202360**

**Int. Cl.[6] B01D** *29/05;53/04*

**U.S. Cl. 96—135** **16 Claims**

1. A gas permeable and liquid impermeable hydrogen sulfide filter which comprises a mixture of:

(I) particles of unsintered granular polytetrafluoroethylene (PTFE);

(ii) particles of comminuted sintered expanded porous polytetrafluoroethylene (PTFE); and

(iii) a particulate water-insoluble hydrogen sulphide adsorbent; the particles defined in (I) and (ii) above being fused together such as to form a gas permeable liquid-impermeable network of interconnected particles.

**5,496,397**

**DESICCANT-COATED SUBSTRATE AND METHOD OF MANUFACTURE**

**John C. Fischer, Marietta, Ga., and Kirk T. Mescher, Columbia, Mo., assignors to Semco Incorporated, Columbia, Mo.**

**Division of Ser. No. 1,561, Jan. 6, 1993, Pat. No. 5,401,706. This application Dec. 7, 1994, Ser. No. 350,653**

**Int. Cl.[6] B01D** *53/04;* **B01J** *20/10*

**U.S. Cl. 96—154** **39 Claims**

1. A process for making a device for gas treatment comprising a desiccant-coated substrate capable of being used at temperatures over 150 degrees Fahrenheit, the device having passageways for gas to flow through and contact the desiccant, the desiccant being in the form of particles and the particles having pores and being adhered to the substrate by a binder, the coated substrate being sufficiently flexible and the coating having sufficient adherence to the substrate so that the coated substrate can be formed into corrugated shapes, the desiccant particles in the coated substrate having at least 60% of their original adsorption capacity and the binder having good breathability; said process comprising the steps:

(a) forming an aqueous suspension comprising particles of one or more desiccants, a water-based organic binder, a suspending agent to help maintain the desiccant particles in suspension, and an organic pore-clearing agent at least some of which enters at least some of the pores of the desiccant particles;

(b) depositing the suspension on the substrate;

(c) causing the binder of the deposited suspension to set so that the deposited desiccant particles adhere to the substrate and causing at least some of the pore-clearing agent to leave the pores of the desiccant particles to prevent the binder from occluding at least some of the pores of the adhered desiccant particles, thereby to form a desiccant-coated substrate of sufficient flexibility and a coating having sufficient adherence to the substrate so that the desiccant-coated substrate can be formed into corrugated shapes and in which the desiccant particles in the coated substrate have at least 60% of their original adsorption capacity and the binder has good breathability; and

(d) forming the desiccant-coated substrate into shapes having passageways for the flow of gas arranged so that gas flowing through the passageways comes into contact with the desiccant.

19. A device for gas treatment comprising a desiccant-coated substrate capable of being used at temperatures over 150 degrees Fahrenheit, the device having passageways for gas to flow through and contact the desiccant, the desiccant being in the form of particles and the particles having pores, the desiccant-coated substrate comprising a coating layer and a substrate, the coating layer being from about 2 mils to about 10 mils thick and comprising a water-based organic binder and at least 75% by weight desiccant, the coated substrate being sufficiently flexible and the coating layer having sufficient adherence to the substrate so that the coated substrate can be formed into corrugated shapes, the desiccant particles in the coated substrate having at least 75% of their original adsorption capacity and the binder having good breathability.

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**5,496,398**

**REDUCTION OF MICROORGANISMS IN KAOLIN CLAY SLURRIES**

**Sharon M. Drew; Jeffrey C. Bruns, both of Sandersville, and Jessica E. Kogel, Milledgeville, all of Ga., assignors to Thiele Kaolin Company, Sandersville, Ga.**

**Filed Oct. 28, 1994, Ser. No. 331,323**

**Int. Cl.[6] A61L** *2/02;2/16*

**U.S. Cl. 106—15.05** **9 Claims**

1. A process to reduce microorganisms in a kaolin clay slurry, wherein the process comprises the sequential steps of:

a. heating the slurry for at least 15 minutes at a temperature of at least 93° C.;



b. cooling the heated slurry to a temperature no greater than about 35° C.; and

c. adding a microbiocide to the cooled slurry, wherein the amount of microbiocide added is at least 20 ppm, based on the weight of commercial microbiocide product to total slurry weight.

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**5,496,399**

**STORAGE STABLE CALCIUM PHOSPHATE CEMENTS**

**Ira C. Ison, Campbell; Mark T. Fulmer; Bryan M. Barr, both of San Jose, and Brent R. Constantz, Los Gatos, all of Calif., assignors to Norian Corporation, Mountain View, Calif.**

**Filed Aug. 23, 1994, Ser. No. 294,325**

**Int. Cl.[6] C04B** *12/02*

**U.S. Cl. 106—35** **7 Claims**

1. A method for producing a dry component for a storage stable, two component apatitic cement composition, said method comprising:

mixing an acidic phosphate source with a basic calcium source in the presence of an aqueous solvent, whereby a reaction between said acidic phosphate source and basic calcium source occurs; and

stopping the reaction between said acidic phosphate source and basic calcium source prior to completion by removing substantially all of the free water from said reaction mixture, resulting in solids substantially free of uncombined water;

whereby a dry component comprising said basic calcium source at least partially coated with a partially neutralized acidic calcium phosphate is produced.

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**5,496,400**

**ASPHALT COMPOSITIONS WITH IMPROVED CROSS-LINKING AGENT**

**Michael P. Doyle, Phoenix, Ariz., and Jimmy L. Stevens, Rio Linda, Calif., assignors to Vinzoyl Petroleum Co., Phoenix, Ariz.**

**Continuation-in-part of Ser. No. 258,935, Jun. 13, 1994, Pat. No. 5,437,717. This application Apr. 20, 1995, Ser. No. 425,277**

**Int. Cl.[6] C09D** *195/00;7/12;* **C08L** *91/00;93/00*

**U.S. Cl. 106—220** **24 Claims**

1. An improved cross-linking agent for asphalt compositions, said cross-linking agent comprising:

tall oil;

a strong base;

an anhydrous organic solvent; and

fatty amines;

said cross-linking agent being substantially free of water.

4. The cross-linking agent according to claim 1, wherein said tall oil comprises from about 50 to about 80 weight percent of said cross-linking agent.

17. An asphalt composition comprising:

asphalt;

crumb rubber from used automobile tires; and

an adhesion improving amount of a cross-linking agent comprising tall oil, a strong anhydrous base, an anhydrous organic solvent and fatty amines, said cross-linking agent being substantially free of water.

18. A method for preparing an asphalt composition, said process comprising:

blending with an asphalt an adhesion improving amount of a cross-linking agent comprising the reaction product of tall oil, an anhydrous strong base, an anhydrous organic solvent and fatty amines to provide a first mixture; and

blending with said first mixture crumb rubber from used automobile tires to provide a second mixture.

20. A process for preparing an improved cross-linking agent for asphalt compositions, said process comprising:

blending sodium hydroxide with an anhydrous organic solvent and fatty amines to provide a solubilized anhydrous strong base; and

blending said anhydrous strong base with crude tall oil with mixing and heating until an exothermic saponification reaction is completed.

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**5,496,401**

**AQUEOUS EMULSION CONTAINING AN OXIDATIVELY CROSSLINKED AMINOPOLYSILOXANE**

**Sue-Lein L. Yang, 151 Rolling Hills Rd., Thornwood, N.Y. 01594**

**Division of Ser. No. 991,384, Dec. 16, 1992, Pat. No. 5,391,400. This application Nov. 22, 1994, Ser. No. 343,148**

**Int. Cl.[6] C09D** *183/04*

**U.S. Cl. 106—287.11** **7 Claims**

1. An aqueous emulsion composition comprising:

(a) an aminopolysiloxane having an amine content ranging from about 0.05% to 3.0% by weight, present at 0.1 to 60 parts per hundred of the total emulsion and having the formula $R_3SiO(R_2SiO)_a(RQSiO)_bSiR_3$ wherein: each R is the same or different and is a hydroxyl or a monovalent hydrocarbon group having 1 to 10 carbon atoms; a is from 1 to 5000; b is a number from 1 to 100; Q has the formula: $—(X)_d(X')_e(Y)_f—N(R^1)(R^2)$, wherein X is a linear or branched alkylene group having 1 to 8 carbon atoms; X' is a divalent organic radical; Y is selected from the group consisting of a hydroxyl-substituted acyclic alkylene group 2 to 8 carbon atoms and a hydroxyl-substituted cyclic alkylene group having up to 8 carbon atoms; d, e and f are zero or one provided the sum of d+e is one and the of sum e+f is zero or two; and $R^1$ and $R^2$ are independently selected from the group consisting of hydrogen, an alkyl group having 1 to 8 carbon atoms, a hydroxyalkyl group having 2 to 4 atoms, and an alkyleneamino group having the formula: $—C_gH_{2g}N(R^3)(R^4)$, wherein $R^3$ and $R^4$ are independently either hydrogen or an alkyl group having 1 to 8 carbon atoms and g is an integer from 2 to 8;

(b) a water soluble oxidant present at 0.05 to 5 parts per hundred of the total emulsion; and

(c) water.

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**5,496,402**

**METHOD AND LIQUID COATING COMPOSITION FOR THE FORMATION OF SILICA-BASED COATING FILM ON SUBSTRATE SURFACE**

**Yoshinori Sakamoto, Kanagawa; Yoshio Hagiwara, Tokyo; Hatsuyuki Tanaka, and Toshimasa Nakayama, both of Kanagawa, all of, Japan, assignors to Tokyo Ohka Kogyo Co, Ltd., Tokyo, Japan**

**Filed Sep. 16, 1994, Ser. No. 307,063**

**Claims priority, application Japan, Sep. 30, 1993, 5-244052**

**Int. Cl.[6] C09D** *183/06;* **C03C** *3/06*

**U.S. Cl. 106—287.16** **12 Claims**

1. A liquid coating composition for the formation of a siliceous coating film which comprises, as a uniform solution:

(A) a partial cohydrolysis-cocondensation product of

(a) a first hydrolyzable silane compound represented by the general formula

$HSi(OR)_3$,

in which each R is, independently from the others, an alkyl group having 1 to 4 carbon atoms or a phenyl group, and

(b) a second hydrolyzable silane compound represented by the general formula

$Si(OR)_4$,

in which each R has the same meaning as defined above, in a molar ratio of (a):(b) in the range from 1:9 to 9:1; and

(B) an organic solvent to dissolve the component (A).

9. A method for the preparation of a liquid coating composition for the formation of a siliceous coating film comprising, as a uniform solution:

(A) a partial cohydrolysis-cocondensation product of

(a) a first hydrolyzable silane compound represented by the general formula

$HSi(OR)_3$,

in which each R is, independently from the others, an alkyl group having 1 to 4 carbon atoms or a phenyl group, and

(b) a second hydrolyzable silane compound represented by the general formula

$Si(OR)_4$,

in which each R has the same meaning as defined above, in a molar ratio of (a):(b) in the range from 1:9 to 9:1; and

(B) an organic solvent to dissolve the component (A), which comprises the steps of:

(1) dissolving the first and second hydrolyzable silane compounds in the organic solvent to form a silane solution;

(2) admixing the silane solution with water and an acid as a catalyst to form a hydrolysis reaction mixture; and

(3) agitating the hydrolysis reaction mixture to form a solution containing the cohydrolysis-cocondensation product of the hydrolyzable silane compounds and an alcohol as the hydrolysis product of the cohydrolysis reaction.

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**5,496,403**

## PROCESS FOR PREPARING INORGANIC PIGMENTS OF PARTICULAR PARTICLE SIZE

**Harald Gaedcke, Leonberg; Guenter Etzrodt, Stuttgart, and Egon Liedek, Esslingen, all of, Germany, assignors to BASF Lacke + Farben Aktiengesellschaft, Muenster, Germany**

**Filed Aug. 23, 1990, Ser. No. 571,283**

**Claims priority, application Germany, Sep. 9, 1989, 39 30 098.6**

**Int. Cl.[6] C09C** *1/36*

**U.S. Cl. 106—400** **1 Claim**

1. In a process for preparing inorganic oxide pigments by mixing starting materials in the presence of water and in the presence or absence of assistants; drying; subsequently calcining in a rotary furnace, with or without subsequent milling; and washing with or without drying of the calcined products, the improvement which consists essentially of:

1) dispersing or milling the starting materials in the presence of water to produce a pumpable aqueous suspension wherein the solids have particle sizes of 50%<10 μm and 100%<50 μm, the particle sizes being determined by a laser granulometer;

2) dewatering the produced suspension by spraying the suspension by means of a single-fluid pressure nozzle to produce porous granules which are made up of agglomerates of the particles produced in step 1); and

3) calcining those porous granules which are>97% from 20 to 800 μm in size in a rotary furnace, the particle sizes of the porous granules being determined by sieve analysis.

**5,496,404**

## PROCESS OF RECYCLING PAINT WASTE

**James W. Price, Ventura, and David M. Long, Fullerton, both of Calif., assignors to Waste Markets, Inc., Ventura, Calif.**

**Continuation-in-part of Ser. No. 217,276, Mar. 24, 1994, abandoned, which is a continuation-in-part of Ser. No. 57,177, May 3, 1993, abandoned, which is a continuation-in-part of Ser. No. 403,077, Mar. 13, 1995, abandoned. This application Sep. 5, 1995, Ser. No. 523,192**

**Int. Cl.[6] C04B** *7/36*

**U.S. Cl. 106—407** **3 Claims**

1. The process of recycling waste by utilizing the waste as an additive ingredient in the manufacture of Portland cement substituting for virgin ingredients normally used in the manufacture of the Portland cement eliminating the need for disposing of the waste in a landfill where the Portland cement is produced from a cement clinker which has been produced by burning, said process comprising the following steps:

obtaining a first quantity of a waste selected from the group consisting of latex paint, water base paint, water-soluble pigments, water-soluble adhesives and water-soluble resists with waste being in liquid form or in solid form, or in a combination of liquid and solid;

obtaining a second quantity of a solid material selected from the group consisting of calcium carbonate, combustion ash, diatomaceous earth, perlite, slag fines, aluminum dross fines, clay fines, pyrite ashes, cinder fines, shale fines, bauxite, silica sand and dolomite;

mixing thoroughly together said first quantity and said second quantity producing a non-compacted additive having the consistency of wet earth that is readily pliable with the second quantity by weight not exceeding three times the first quantity by weight;

adding the additive as an ingredient in the manufacture of Portland cement with this adding occurring after the burning of the raw materials producing cement clinker; and

pulverizing of this cement clinker and at the same time evenly mixing of the additive.

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**5,496,405**

## PROCESS FOR THE PREPARATION OF ORGANIC PIGMENTS

**Margot Campos, Charleston; Guenter Franke, and Michael J. Greene, both of Mt. Pleasant, all of S.C., assignors to Bayer Corporation, Pittsburgh, Pa.**

**Filed Dec. 6, 1994, Ser. No. 349,868**

**Int. Cl.[6] C09B** *48/00;67/52;* **C07D** *471/02;221/18*

**U.S. Cl. 106—495** **12 Claims**

1. A process for the preparation of quinacridone pigments comprising

(a) heating, at a temperature of about 80° C. to about 145° C., a reaction mixture comprising

(i) 2,5-dianilinoterephthalic acid or a 2,5-dianilinoterephthalic acid derivative having one or more substituents in at least one aniline ring,

(ii) 2 to 10 parts by weight per 1 part by weight of component (a)(i), of a dehydrating agent, and

(iii) 0.01 to 10 percent by weight, relative to component (a)(i), of a salt other than an iron salt;

(b) drowning the reaction mixture from step (a) by adding said reaction mixture to 3 to 15 parts by weight, relative to component (a)(i), of a liquid in which the pigment is substantially insoluble;

(c) isolating the quinacridone pigment; and

(d) optionally, conditioning the quinacridone pigment.



**5,496,406**

## COATING DEVICE HAVING INFRARED AND SUSPENSION DRYING SECTIONS

**Rudolf Beisswanger, Steinheim, and Martin Kustermann, Heidenheim, both of, Germany, assignors to J. M. Voith GmbH, Heidenheim, Germany**

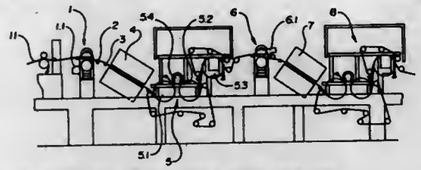
**Filed Aug. 5, 1994, Ser. No. 286,534**

**Claims priority, application European Pat. Off., Aug. 7, 1993, 93112695; Germany, Jan. 5, 1994, 44 00 158.4**

**The portion of the term of this patent subsequent to Apr. 2, 2012, has been disclaimed.**

**Int. Cl.[6] B05B** *1/24*

**U.S. Cl. 118—643** **8 Claims**




1. A device for coating a paper web comprising:

(a) two rolls disposed parallel to one another and forming a roll gap for the passage of a paper web therethrough;

(b) at least one applicator for applying a coating onto a surface of at least one of the rolls, for subsequent transfer of the coating onto one side of the paper web in the roll gap;

(c) guide elements disposed downstream of the roll gap with respect to a direction of travel of the paper web through the device, said guide elements guiding the paper web and comprising at least one air guide beam for creating an air cushion between the paper web and a surface of the at least one air guide beam facing the paper web, said at least one air guide beam being disposed in such a manner as to deflect the paper web at least once downstream of the roll gap, and said at least one air guide beam being disposed directly downstream of the roll gap at a distance therefrom of about 0.3 times to about 1 time a diameter of at least one of the rolls; and (d) a drying portion disposed directly downstream of the at least one air guide beam for drying both sides of the paper web, said drying portion having a plurality of infrared drying sections and a plurality of suspension drying sections, said infrared drying sections and suspension drying sections being alternately disposed with respect to the direction of movement of the web through the device.

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**5,496,407**

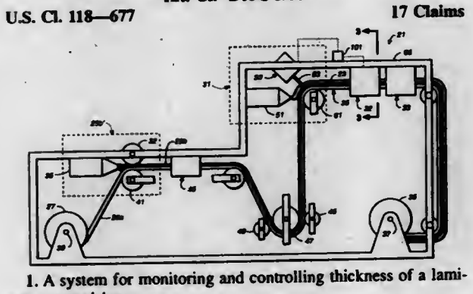
## SYSTEM AND METHOD FOR MONITORING AND CONTROLLING THICKNESS

**Michael E. McAleavey, 559 Gettysburg Dr., San Jose, Calif. 95123**

**Continuation of Ser. No. 49,785, Apr. 19, 1993, abandoned. This application Jan. 20, 1995, Ser. No. 376,649**

**Int. Cl.[6] B05C** *5/00*

**U.S. Cl. 118—677** **17 Claims**



1. A system for monitoring and controlling thickness of a laminate, comprising:

means for applying material on a web;

contacting means, disposed at a distance from the web, for contacting the material applied on the web by the material applying means such that the material forms a material layer upon being contacted by the contacting means, wherein the material layer and the web form a laminate;

measuring means disposed downstream of said contacting means, for measuring whether the thickness of the laminate is equal to a predetermined thickness; and

thickness adjusting means, in communication with said measuring means, for adjusting the thickness of the material layer formed on the web by varying at least one of the distance between the contacting means and the web and an amount of the material applied on the web by the material applying means so that the thickness of the laminate corresponds to the predetermined thickness,

wherein the measuring means includes means for detecting a value corresponding to the thickness of the laminate and means for comparing a detected value with a predetermined value, the comparing means including means for indicating to the thickness adjusting means that the detected value is greater than, less than, or equal to the predetermined value, the detecting means including

first means for emitting a first light beam such that the first light beam is reflected by a top side of the laminate,

first means for detecting and indicating a first distance measured from the first light beam emitting means to a position to which the first light beam is reflected.

second means for emitting a second light beam such that the second light beam is reflected by a bottom side of the laminate,

second means for detecting and indicating a second distance measured from the second light beam emitting means to a position to which the second light beam is reflected, and

means for adding the first and second distances indicated by the first and second detecting and indicating means to obtain the detected value corresponding to the thickness of the laminate.

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**5,496,408**

## APPARATUS FOR PRODUCING COMPOUND SEMICONDUCTOR DEVICES

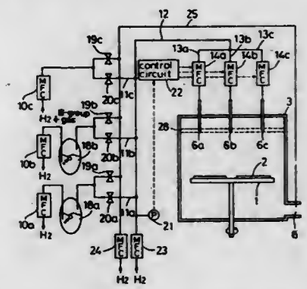
**Takashi Motoda; Shoichi Karakida; Nobuaki Kaneno, and Shigeki Kageyama, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Oct. 4, 1993, Ser. No. 131,529**

**Claims priority, application Japan, Nov. 20, 1992, 4-335049; Feb. 12, 1993, 5-023121; Mar. 30, 1993, 5-071381**

**Int. Cl.[6] C23C** *16/00*

**U.S. Cl. 118—715** **15 Claims**




1. An apparatus for producing a compound semiconductor layer comprising:

first flow rate adjusting means for adjusting flow rates of respective material source gases;

a gas mixing pipe connected to said first flow rate adjusting means for mixing the respective material source gases;

a plurality of gas distributing pipes for distributing the material source gases, said gas distributing pipes being connected to said gas mixing pipe;

second flow rate adjusting means for adjusting flow rates of the material source gases flowing in said gas distributing pipes and for supplying said material source gases to a reaction tube;

means for detecting gas pressure in said gas mixing pipe; and

control means responsive to said means for detecting gas pressure for controlling said second flow rate adjusting means to maintain a constant pressure in said gas mixing pipe.

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**5,496,409**

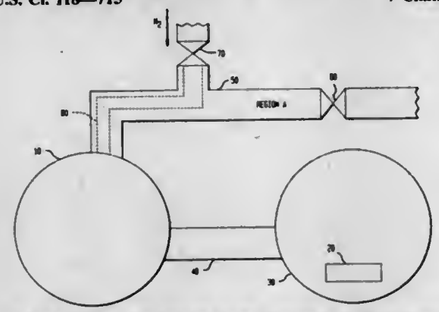
**PARTICLE CONTAMINATION APPARATUS FOR SEMICONDUCTOR WAFER PROCESSING**

**Ping I. Chen, Chung Li, Taiwan, Prov. of China, assignor to United Microelectonics Corporation, Hsin-Chu, Taiwan, Prov. of China**

**Filed Jul. 18, 1994, Ser. No. 276,570**

**Int. Cl.[6] C23C** *16/00;14/00;* **C23F** *1/02*

**U.S. Cl. 118—715** **7 Claims**



6. A fluid circuit for evacuating and venting a wafer processing apparatus, comprising:

a chamber With a single port,

a first fluid connection between said port and a first valve,

a second fluid connection between said port and a second valve, and contained within said first fluid connection, said second fluid connection for conveying a fluid flow therein so that it is isolated from particulate matter present in said first fluid connection.

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**5,496,410**

**PLASMA PROCESSING APPARATUS AND METHOD OF PROCESSING SUBSTRATES BY USING SAME APPARATUS**

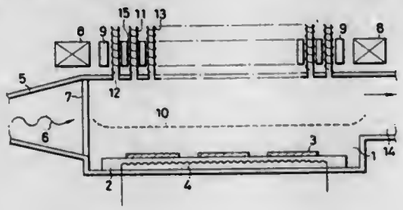
**Takuya Fukuda; Michio Ohue, and Kazuo Suzuki, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Mar. 10, 1993, Ser. No. 29,054**

**Claims priority, application Japan, Mar. 10, 1992, 4-051646**

**Int. Cl.[6] C23C** *16/00*

**U.S. Cl. 118—723 MW** **26 Claims**



1. A plasma processing apparatus, comprising:

a vacuum container in which a workpiece is placed;

gas supply means for gasifying a liquid or solid raw material and for supplying the gasified liquid or solid raw material to the vacuum container through an opening portion provided in an inner wall of the containers, the gas supply means including gas supply structure and said opening portion, none of the gas supply means extending into the container;

processing means for subjecting the supplied gas to electron cyclotron resonance conditions to form a plasma therefrom;

evacuation means for maintaining the inside of the vacuum container at a vacuum condition; and

heating means for heating said gas supply structure and said opening portion of the gas supply means including in a vicinity of the vacuum container.

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**5,496,411**

**ULTRASONIC VIBRATION GENERATOR AND USE OF SAME FOR CLEANING OBJECTS IN A VOLUME OF LIQUID**

**Bruce H. Candy, Basket Range, Australia, assignor to Halcro Nominees Pty. Ltd., Australia**

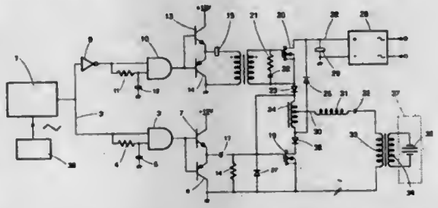
**PCT No. PCT/AU92/00276, § 371 Date Dec. 6, 1993, § 102(e) Date Dec. 6, 1993, PCT Pub. No. WO92/22385, PCT Pub. Date Dec. 23, 1992**

**PCT Filed Jun. 12, 1992, Ser. No. 157,116**

**Claims priority, application Australia, Jun. 14, 1991, PK6691**

**Int. Cl.[6] B08B** *3/12*

**U.S. Cl. 134—1** **10 Claims**



1. An ultrasonic vibration generator comprising: a transducer for converting an electrical signal into an ultrasonic vibration; and driving means for driving the transducer and controlling the frequency of ultrasonic vibration of the transducer to change with a repeated cycle during which the frequency of ultrasonic vibration changes within a predetermined range of frequencies linearly with time and continually in time such that during each cycle the frequency of ultrasonic vibration changes at a rate of at least 4 times a mean frequency of ultrasonic vibration per second in order to improve the efficiency of the ultrasonic vibration.

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**5,496,412**

**APPARATUS AND METHOD FOR CLEANING ROTARY APPLICATOR DEVICES**

**Shamoon Ahmad, 358-C Crowells Rd., Highland Park, N.J. 08904**

**Filed Mar. 8, 1994, Ser. No. 207,147**

**Int. Cl.[6] B05C** *17/02;* **B08B** *3/04*

**U.S. Cl. 134—6** **6 Claims**

1. A method for cleaning debris from a rotary applicator, the method including:

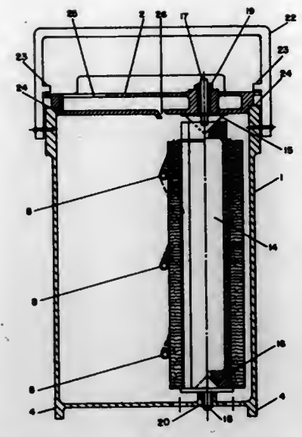
inserting the rotary applicator in a housing;

rotating the rotary applicator within the housing;

introducing a cleaning solution to the housing and directing that solution onto the rotary applicator as it rotates to clean debris from the rotary applicator;

providing a support structure having resilient means providing a resilient force for engaging a rotary applicator;





moving said support structure within the housing in order that a resilient force may be moved toward and away from the rotary applicator surface to provide for positioning the rotary applicator in a cleaning position;

continuing to move the support structure in order that the resilient force is moved into and out of contact with the rotary applicator as it rotates during the cleaning process; and

removing the cleaning solution from the housing along with the debris removed from the rotary applicator.

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**5,496,413**

**VEHICLE CLEANING & WAXING PREPARATION AND METHOD OF USE**

**Brian Phillips, 3022 Blue Field, San Antonio, Tex. 78230**

**Filed Mar. 7, 1994, Ser. No. 206,740**

**Int. Cl.[6] B08B** *3/08*

**U.S. Cl. 134—7** **2 Claims**

1. A method for cleaning and waxing exterior surfaces of an aircraft through application of a single composition said method consisting of the steps of:

selecting a cleaning and waxing preparation, said cleaning and waxing preparation "consisting essentially of: sodium tripolyphosphate; triethanolamines; phosphate ester; hexylene glycol; diethanolamide; water and" a polydimethylsiloxane emulsion;

applying a first measure of said preparation to a first surface area of said aircraft which is to be cleaned;

agitating said first measure of said preparation on said first surface area using a first cleaning cloth portion; and

removing substantially all of said first measure from said first area using a second cleaning cloth portion before said first measure dries on said first surface area.

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**5,496,414**

**STOWABLE AND DEPLOYABLE CONCENTRATOR FOR SOLAR CELLS**

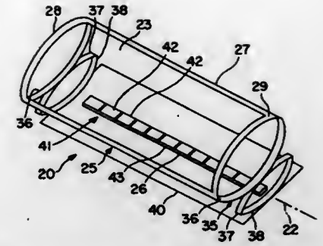
**T. Jeffrey Harvey, 829 Clemens Way, Lompoc, Calif. 93436; P. Alan Jones, 321 Barranca Ave., Santa Barbara, Calif. 93109, and Allister F. Fraser, 1120 N. Milpas St., Santa Barbara, Calif. 93103**

**Filed Jun. 2, 1994, Ser. No. 252,998**

**Int. Cl.[6] H01L** *31/045;31/052*

**U.S. Cl. 136—245** **8 Claims**

1. A stowable and deployable concentrator for solar cells, comprising:



a substrate, at least one Fresnel lens, said lens being flexible and having two parallel sides and two parallel ends;

a frame holding said lens, at both sides and both ends, said frame where it holds said ends being springily deflectable, tending to hold the lens in a trough-like shape when in deployed condition, and reducing said curvature as its own curvature is reduced to move the lens closer to the substrate and to a stowed condition;

at least one solar cell mounted to said substrate in the focal area of said lens; and

deflectable support means mounted to said substrate and connected to said frame, said support means being resilient and inherently biased such as to exert a force in opposition between the substrate and the frame to tend to move the frame and the lens away from the substrate to said deployed condition, and to be deflectable by a force exerted on said frame to overcome said bias and move said frame and said lens closer to said substrate in said stowed condition.

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**5,496,415**

**CONCENTRATOR SOLAR CELL HAVING A MULTI-QUANTUM WELL SYSTEM IN THE DEPLETION REGION OF THE CELL**

**Keith Barnham, Surrey, United Kingdom, assignor to Imperial College of Science, Technology and Medicine, London, Great Britain**

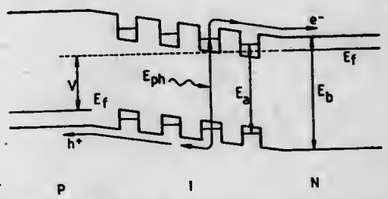
**PCT No. PCT/GB92/01913, § 371 Date Aug. 24, 1994, § 102(e) Date Aug. 24, 1994, PCT Pub. No. WO93/08606, PCT Pub. Date Apr. 29, 1993**

**PCT Filed Oct. 19, 1992, Ser. No. 211,850**

**Claims priority, application United Kingdom, Jan. 18, 1991, 9122197**

**Int. Cl.[6] H01L** *31/06*

**U.S. Cl. 136—255** **12 Claims**



1. A solar cell formed from a semiconductor having a relatively wide band-gap $E_b$, characterized by a multi-quantum well system incorporated in the depletion region of the cell, in which the quantum wells comprise regions of semiconductor with a smaller band gap separated by small amounts of the wide band-gap semiconductor ($E_b$) so that an effective band-gap for absorption ($E_a$) is less than $E_b$; characterized in that the quantum wells are sufficiently deep to ensure that electrons and holes trapped in the quantum wells cannot escape at normal room temperature but are energized to higher levels at higher temperatures so that an energy conversion efficiency of the solar cell is correspondingly increased.

**5,496,416**

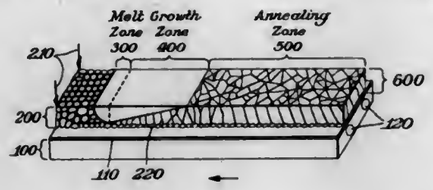
## COLUMNAR-GRAINED POLYCRYSTALLINE SOLAR CELL AND PROCESS OF MANUFACTURE

**Robert B. Hall; Allen M. Barnett, both of Newark, Del.; Sandra R. Collins, Chesapeake City, Md.; Joseph C. Checchi, Newark, Del.; David H. Ford, Wilmington, Del.; Christopher L. Kendall, Wilmington, Del.; Steven M. Lampo, Elkton, Md., and James A. Rand, Oxford, Pa., assignors to Astropower, Inc., Newark, Del.**

**Continuation-in-part of Ser. No. 959,009, Oct. 9, 1992, Pat. No. 5,336,335. This application Aug. 5, 1994, Ser. No. 286,673**

**Int. Cl.[6] H10L** *31/0392;31/0368;31/18*

**U.S. Cl. 136—258** **34 Claims**




1. A process of making an improved columnar-grained polycrystalline sheet for functioning as a substrate for a solar cell, comprising (a) applying granular silicon to a setter material having a release coating at its upper surface and which supports the granular silicon, (b) preheating the setter material and granular silicon in a preheat zone, (c) subjecting the setter material and granular silicon to a thermal profile which causes melting of the granular silicon from the top downwardly, wherein 25 to 90% of the granular silicon depth is melted and the partially melted silicon below the melted material functions as a net to stabilize the melt and to minimize molten silicon contact with the underlying setter material and release coating and to nucleate subsequent crystal growth, (d) transporting the melt pool on the silicon net into a growth zone wherein a thermal profile is created to promote columnar growth of a columnar grain size greater than 20 microns in a direction approximately perpendicular to the plane of the setter material and where both liquid and a growing polycrystalline layer coexist and where the entire layer experiences a liquid state prior to solidification, (e) transporting the grown sheet into an anneal zone wherein a linear temperature gradient along the direction of setter material motion is provided to promote low stress cooling of the sheet, (f) removing the polycrystalline sheet from the setter material, facilitated by a release agent, and (g) reusing the setter material for the making of further columnar-grained polycrystalline sheets.

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**5,496,417**

## PROCESS FOR STEAM CONVERSION COATING ALUMINUM

**Marvin A. Farrugia, Prince Frederick, Md., and Hugh B. Burrell, Dahlgren, Va., assignors to Electro-Steam Generator Co., Alexandria, Va.**

**Filed Jun. 21, 1995, Ser. No. 493,068**

**Int. Cl.[6] C23C** *8/10*

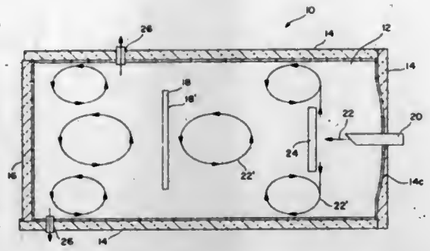
**U.S. Cl. 148—275** **11 Claims**

1. A conversion coating process for pretreating the surface of a metal selected from a group consisting of aluminum and aluminum alloys in order to increase overlying coating adhesion and diminish corrosion and abrasion, the process comprising the steps of:

delivering a flow of pure steam produced from aleionized feedwater into a chamber, the flow having an initial direction of travel;

diffusing the flow of pure steam so as to divert the flow from its initial direction of travel, the diffusion of the flow producing swirling of the pure steam;

subjecting a surface of a metal selected from a group consisting of aluminum and aluminum alloys with the swirling pure steam so as to generate an oxide layer on the metal; and




subjecting the resulting oxide layer to a pressure across its face by the swirling flow of steam so as to prevent the crystallization of the oxide layer in a defined and orderly manner.

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**5,496,418**

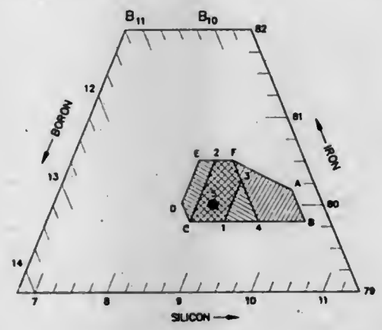
## AMORPHOUS FE-B-SI ALLOYS EXHIBITING ENHANCED AC MAGNETIC PROPERTIES AND HANDLEABILITY

**V. R. V. Ramanan, Dover, and Howard H. Liebermann, Succasunna, both of N.J., assignors to AlliedSignal Inc., Morristown, N.J.**

**Continuation of Ser. No. 259,736, Jun. 10, 1994, abandoned, which is a continuation of Ser. No. 25,715, Mar. 2, 1993, abandoned, which is a continuation of Ser. No. 938,320, Aug. 31, 1992, abandoned, which is a continuation of Ser. No. 832,633, Feb. 7, 1992, abandoned, which is a continuation of Ser. No. 660,166, Feb. 25, 1991, abandoned, which is a continuation of Ser. No. 479,489, Feb. 13, 1990, abandoned. This application Mar. 2, 1995, Ser. No. 397,317**

**Int. Cl.[6] C22C** *38/02*

**U.S. Cl. 148—304** **14 Claims**




1. A metallic alloy consisting essentially of iron, boron and silicon and having a composition in the region A, B, C, D, E, F, A of FIG. 1, said alloy having been annealed and having a crystallization temperature of at least about 490° C., a saturation magnetization value of at least about 174 emu/g at 25° C., a core loss not greater than about 0.3 W/kg, measured at 25° C., 60 Hz and 1.4 T and an exciting power not greater than about 1 VA/kg, measured at 25° C., 60 Hz and 1.4 T.



**5,496,419**

## WEAR-RESISTANT HIGH PERMEABILITY MAGNETIC ALLOY AND METHOD OF MANUFACTURING THE SAME

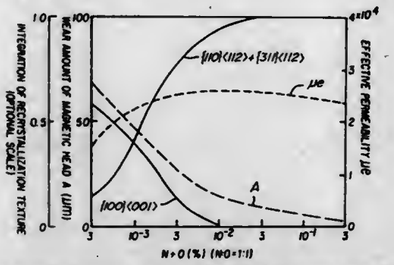
**Yuetsu Murakami, and Katashi Masumoto, both of Sendai, Japan, assignors to The Foundation: The Research Institute of Electric and Magnetic Alloys, Japan**

**Filed Jun. 6, 1994, Ser. No. 254,892**

**Claims priority, application Japan, Jul. 30, 1993, 5-190215**

**Int. Cl.[6] C22C** *19/03*

**U.S. Cl. 148—312** **9 Claims**




8. A magnetic recording reproducing head comprised of a wear-resistant high permeability alloy including Ni in an amount of 60–90 wt. %, Nb in an amount of 0.5–14 wt. %, N and O in an amount of 0.0003–0.3 wt. % in total, a secondary component in an amount of 0.001–30 wt. % in total of at least one element selected from the group consisting of less than 7% of Cr, Mo, Ge and Au, respectively, less than 10% of Co and V, respectively, less than 15% of W, less than 25% of Cu, Ta and Mn, respectively, less than 5% of Al, Si, Ti, Zr, Hf, Sn, Sb, Ga In, Tl, Zn, Cd, rare earth element and platinum element, respectively, less than 3% of Be, Ag, Sr and Ba, respectively, less than 1% of B, less than 0.7% of P and less than 0.1% of S, and a remainder of Fe, the alloy having a recrystallization texture of {110}<112>+{311}<112>, an effective permeability of more than 3000 at 1 KHz and a saturated flux density of more than 4000 G.

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**5,496,420**

## CAN-MAKING STEEL SHEET

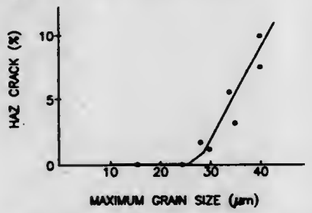
**Hideo Kuguminato; Toshikatsu Kato; Chikako Fujinaga, and Kyoko Hamahara, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Japan**

**Continuation-in-part of Ser. No. 163,950, Dec. 8, 1993, abandoned, which is a continuation of Ser. No. 43,189, Apr. 6, 1993, Pat. No. 5,360,676. This application Jul. 1, 1994, Ser. No. 269,488**

**Claims priority, application Japan, Apr. 6, 1992, 4-84210; Apr. 6, 1992, 4-84212**

**Int. Cl.[6] C22C** *38/26*

**U.S. Cl. 148—320** **3 Claims**




1. An ultra-thin and high strength can-making steel sheet excellent in weldability and flange forming processibility comprising C≦ about 0.004 wt %, Si≦ about 0.03 wt %, Mn: about 0.05–0.6 wt %, P≦ about 0.02 wt %, S≦ about 0.02 wt %, N≦ about 0.01 wt %, Al: about 0.005–0.1 wt %, and Nb: about 0.001–0.1 wt % and the balance Fe, said sheet having a maximum recrystallization grain size of about 30 μm or less, and said sheet having a ratio of area which is occupied by recrystallization grains having crystallized grain sizes of about 5–25 μm, of at least about 50%.

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**5,496,421**

## HIGH-STRENGTH MARTENSITIC STAINLESS STEEL AND METHOD FOR MAKING THE SAME

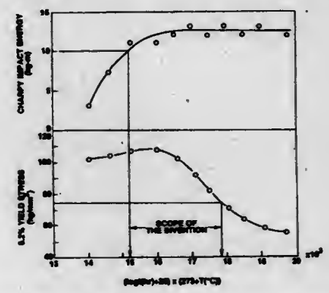
**Shuji Hashizume; Yusuke Minami, and Yoshiichi Ishizawa, all of Kawasaki, Japan, assignors to NKK Corporation, Tokyo, Japan**

**Filed Oct. 17, 1994, Ser. No. 324,268**

**Claims priority, application Japan, Jan. 22, 1993, 5-264909**

**Int. Cl.[6] C22C** *38/42;* **C21D** *9/00*

**U.S. Cl. 148—326** **40 Claims**




1. A high strength martensitic stainless steel consisting essentially of:

0.06 wt. % or less C, 12 to 16 wt. % Cr, 1 wt. % or less Si, 2 wt. % or less Mn, 0.5 to 8 wt. % Ni, 0.1 to 2.5 wt. % Mo, 0.3 to 4 wt. % Cu, 0.05 wt. % or less N, and the balance being Fe and inevitable impurities;

said steel having an area ratio of a δ-ferrite phase of at most 10% expressed as a percent;

said steel including at least 30 fine copper precipitates per 1 square micron meter (μm²); and

said steel having a 0.2% yield stress of 75 kg/mm² or more and a charpy impact energy of 10 kg-m or more.

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**5,496,422**

## CORROSION RESISTANT STAINLESS STEEL

**Norio Morishige, Yokosuka; Kenji Hirano, Yokohama; Kiyofumi Ishikawa, Hiratsuka, and Shuji Furuya, Yokohama, all of, Japan, assignors to Ishikawajima-Harima Heavy Industries Co., Ltd., Yokohama, Japan**

**Division of Ser. No. 933,664, Aug. 24, 1992, Pat. No. 5,387,292, which is a division of Ser. No. 914,025, Jul. 15, 1992, Pat. No. 5,196,272, which is a continuation of Ser. No. 561,072, Aug. 1, 1990, abandoned. This application Oct. 31, 1994, Ser. No. 331,801**

**Claims priority, application Japan, Aug. 1, 1989, 1-199919; Aug. 1, 1989, 1-199920; Aug. 1, 1989, 1-199921; Sep. 8, 1989, 1-234231; Sep. 21, 1989, 1-245682**

**Int. Cl.[6] C21D** *1/09*

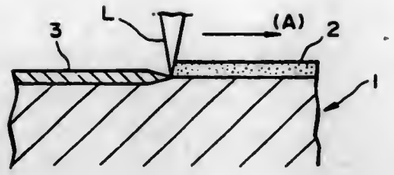
**U.S. Cl. 148—525** **11 Claims**

1. A method for improving adhesion of a cladding layer to stainless steel, thereby improving corrosion resistance of the stainless steel, comprising the steps of:

smoothing a surface of the stainless steel;

applying a coating material onto the surface of the stainless steel to form a coating film, said coating material being a mixture of the binder and a metal powder composed of a chromium-based composite; and

burning the coating film by irradiating with a laser to form the cladding layer;




wherein the binder comprises, based on the total weight of the binder:

(i) 10–60 weight % $SiO_2$;

(ii) 20–50 weight % carbon,

(iii) less than 40 weight % $Al_2O_3$, and

(iv) less than 2 weight % hydrogen.

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**5,496,423**

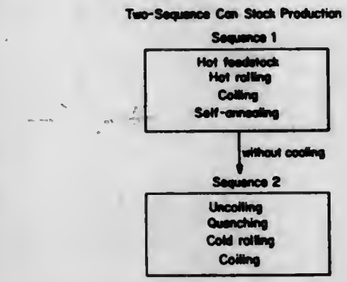
**METHOD OF MANUFACTURING ALUMINUM SHEET STOCK USING TWO SEQUENCES OF CONTINUOUS, IN-LINE OPERATIONS**

**Gavin F. Wyatt-Mair, Lafayette, and Donald G. Harrington, Danville, both of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Pleasanton, Calif.**

**Continuation-in-part of Ser. No. 902,936, Jun. 23, 1992, abandoned, and a continuation-in-part of Ser. No. 902,718, Jun. 23, 1992, abandoned, and a continuation-in-part of Ser. No. 997,583, Dec. 28, 1992, Pat. No. 5,356,495. This application Dec. 23, 1993, Ser. No. 173,352**

**Int. Cl.[6] C22F *1/04***

**U.S. Cl. 148—551** **21 Claims**




1. A method for manufacturing aluminum sheet stock in which the process is carried out in two sequences of continuous, in-line operations comprising in the first sequence, continuously hot rolling a hot aluminum feedstock to reduce its thickness, coiling the hot rolled feedstock while it is hot, holding the hot reduced feedstock at or near the hot rolling exit temperature for at least two minutes to effect recrystallization and solutionization without intermediate heating, and, in the second continuous in-line sequence, the steps of uncoiling the hot coiled feedstock and quenching the annealed feedstock immediately and rapidly to a temperature sufficient for cold rolling.

**5,496,424**

**HYDROGEN ABSORBING ALLOY AND PROCESS FOR PREPARING SAME**

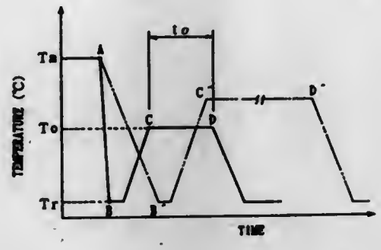
**Shin Fujitani; Hiroshi Nakamura; Hiroshi Watanabe; Ikuo Yonezu, and Toshihiko Saito, all of Moriguchi, Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan**

**Filed Oct. 5, 1993, Ser. No. 131,617**

**Claims priority, application Japan, Jan. 7, 1992, 4-268746; Jan. 7, 1992, 4-268747**

**Int. Cl.[6] C22F *1/10***

**U.S. Cl. 148—555** **6 Claims**




1. A process for preparing a hydrogen absorbing alloy represented by the general formula $R_{1-x}A_x(Ni_{1-y}B_y)_z$ wherein R is Mm (misch metal) or La, A is at least one element selected from the group consisting of Ce, Nd, Pr, Sm and Y, B is at least one element selected from the group consisting of Al, Sn, V, Cr, Mn, Fe, Co and Cu, x is in the range of $0 \leq x \leq 0.5$, y is in the range of $0 < y \leq 1.0$ and z is in the range of $0.8 \leq z \leq 1.2$, and B is present in a measurable amount,

said process comprising the steps of:

cooling a molten alloy at a controlled rate of $10^5$ to $10^6$ K/sec; and

subjecting the resultant alloy to a heat treatment, so that a plateau region between a hydrogen solid solution region (α phase region) and a metal hydride region (β phase region) is flattened to a level of up to 0.04 with respect to a standard deviation σ of a normal cumulative distribution function ψ, whereupon said plateau region is evaluated by the normal cumulative distribution function ψ wherein the hydrogen content of the alloy is taken as frequency and the logarithm of a ratio of equilibrium hydrogen pressure P to unit pressure Po is taken as a random variable,

said normal cumulative distribution function ψ being obtained by integrating a normal probability density function φ:

$$\psi(\ln(P/Po); m,\sigma) = \int_{-\infty}^{\ln(P/Po)} \phi(\ln(P/Po); m,\sigma)d\ln(P/Po)$$

provided that distribution of ln(P/Po) is considered to be the normal probability density function φ of the standard deviation σ and a mean value m, and is expressed by the following equation:

$$\phi(\ln(P/Po); m,\sigma) = (1/\sqrt{2\pi}\,)\exp(-t^2/2)$$

where $t=(\ln(P/Po)-m)/\sigma$, and $m=\ln(Pm/Po)$,

said hydrogen content being determined by the following equation wherein said normal cumulative distribution function is scaled with the width $X_\beta - X_\alpha$ of the plateau region:

hydrogen content$=(X_\beta - X_\alpha)\psi(\ln(P/Po); m,\sigma)$.



**5,496,425**

**COLD FORMED HIGH-STRENGTH STEEL STRUCTURAL MEMBERS**

**Hugh M. Gallagher, Jr., Cincinnati, Ohio, assignor to Consolidated Metal Products, Inc., Cincinnati, Ohio**

**Continuation-in-part of Ser. No. 992,123, Dec. 17, 1992, Pat. No. 5,330,594, which is a continuation-in-part of Ser. No. 848,646, Mar. 9, 1992, Pat. No. 5,236,520, which is a continuation-in-part of Ser. No. 602,675, Oct. 24, 1990, Pat. No. 5,094,698. This application Jul. 15, 1994, Ser. No. 276,217**

**The portion of the term of this patent subsequent to Dec. 17, 2012, has been disclaimed.**

**Int. Cl.[6] C21D *7/02***

**U.S. Cl. 148—651** **11 Claims**

1. A method of making a high-strength steel structural member having a specific uniform cross-sectional configuration comprising the steps of:

providing a blank of high-strength steel material having a ferrite-pearlite microstructure and a tensile strength of at least about 120,000 psi and a yield strength of at least about 90,000 psi that comprises by weight:

| | |
|---|---|
| carbon | about 0.30 to about 0.65% |
| manganese | about 0.30 to about 2.5% |
| at least 1 grain refiner from the group consisting of aluminum, niobium, titanium and vanadium, and mixtures thereof, in an effective amount for grain refiner up to about 0.35% | |
| iron | balance; and |

cold forming said blank by rolling, upsetting, forging or extrusion to provide a structural member having a uniform cross-sectional configuration, said uniform cross-sectional configuration including at least one flange having a thickness less than an overall outer perimeter of said cross-sectional configuration, said at least one flange providing increased load bearing capacity to said structural member, whereby the mechanical properties of tensile strength and yield strength of said structural member are substantially the same or greater than said blank.

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**5,496,426**

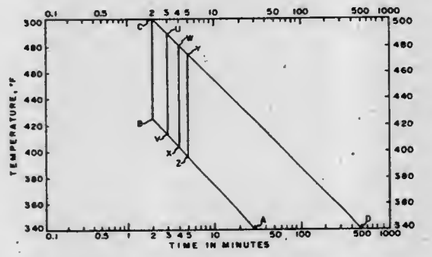
**ALUMINUM ALLOY PRODUCT HAVING GOOD COMBINATIONS OF MECHANICAL AND CORROSION RESISTANCE PROPERTIES AND FORMABILITY AND PROCESS FOR PRODUCING SUCH PRODUCT**

**Shawn J. Murtha, Monroeville, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.**

**Filed Jul. 20, 1994, Ser. No. 278,380**

**Int. Cl.[6] C22F *1/04***

**U.S. Cl. 148—691** **29 Claims**




1. The method of producing an aerospace elongate structural shape cross section comprising:

(a) providing aluminum alloy consisting essentially of about 7.6 to 8.4% zinc, about 1.8 to 2.2% magnesium, about 2 to 2.6% copper, at least one element selected from zirconium, vanadium and hafnium present in a total amount not exceeding about 0.5% the balance substantially aluminum and incidental elements and impurities;

(b) hot rolling said alloy;

(c) subjecting said alloy to a thermal treatment within about 700° to 900° F.;

(d) cold rolling said alloy to a reduction in thickness of from about 20 to about 70%;

(e) subjecting said alloy to a thermal treatment anneal comprising:

(i) subjecting said alloy to temperatures within about 625° to 750° F. for about 2 or more hours; and then

(ii) subjecting said alloy to temperatures within about 350° to 550° F. for about 2 or more hours;

thereby to produce a strip product; and

(f) shaping said strip product to provide an elongate structural shape cross section.

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**5,496,427**

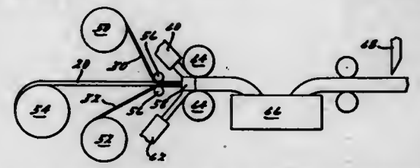
**PROCESS FOR MANUFACTURING AN ELONGATED ELECTROLUMINESCENT LIGHT STRIP**

**Thomas L. Gustafson, Southfield, and Marc A. Brookman, Dearborn, both of Mich., assignors to The Standard Products Company, Dearborn, Mich.**

**Continuation of Ser. No. 16,123, Feb. 10, 1993, abandoned, which is a continuation-in-part of Ser. No. 668,862, Mar. 13, 1991, abandoned. This application May 26, 1994, Ser. No. 249,699**

**Int. Cl.[6] B29C *47/02***

**U.S. Cl. 156—67** **10 Claims**



1. A process for the manufacture of an elongated electroluminescent light strip comprising the steps of:

a) feeding an elongated electroluminescent lamp which includes an electrically conductive layer, a substantially moisture resistant phosphor matrix layer including a coating Of hydrolyzed trimethylaluminum and spaced apart bus strips, wherein said bus strips extend from said electroluminescent lamp to an extruder; and

b) encapsulating the elongated electroluminescent lamp in an extrudate by continuously extruding a polymeric material about said electroluminescent lamp to fully encapsulate said electroluminescent lamp.

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**5,496,428**

**PROCESS FOR MAKING AN ABSORBENT ARTICLE HAVING INFLECTED BARRIER LEG CUFF**

**David M. Sageser; Stanley G. Juergens, both of Cincinnati, and Mark D. Midkiff, Fairfield, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio**

**Continuation-in-part of Ser. No. 178,983, Jan. 7, 1994. This application Jun. 16, 1994, Ser. No. 260,638**

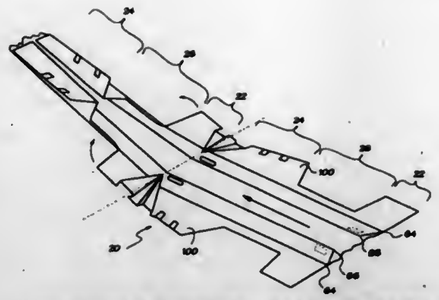
**Int. Cl.[6] A61F *13/15***

**U.S. Cl. 156—73.1** **5 Claims**

1. A method for making a wearable, absorbent article having a longitudinal centerline comprising:

(a) providing a topsheet of indefinite length for an absorbent article, the topsheet having a first waist region and a second waist region and a crotch region located between the first and second waist regions;

(b) attaching a pair of longitudinally extending barrier leg cuffs to the topsheet, each of the barrier leg cuffs having a proximal



portion fixed to the topsheet and a distal portion unsecured at least to a portion of the topsheet, the barrier leg cuff attached such that the distal portion of such barrier leg cuff is oriented inwardly toward the longitudinal centerline;

(c) attaching the barrier cuffs to the first waist region of the topsheet, causing the distal portion of the leg cuffs to be attached inwardly toward the longitudinal centerline in the first waist region;

(d) associating the topsheet with a backsheet and a centrally positioned absorbent core to form a chassis;

(e) cutting leg notches in the crotch region of the chassis thereby forming ear panels in at least the second waist region;

(f) folding the ear panels in the second waist region inwardly toward the longitudinal centerline and attaching the distal portions of the leg cuffs to the ear panels in the second waist region; and

(g) cutting the chassis transversely into individual articles.

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**5,496,429**

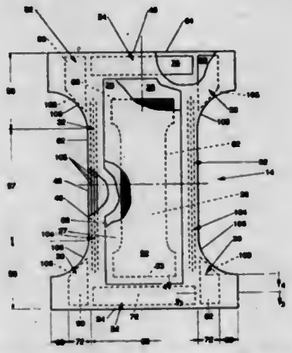
**METHOD OF MAKING AN ELASTICIZED DISPOSABLE TRAINING PANT**

**Margaret H. Hasse; Russell P. Bridges, and Steven W. Miller, all of 6100 Center Hill Rd., Cincinnati, Ohio 45224**

**Division of Ser. No. 795,560, Nov. 21, 1991, Pat. No. 5,246,433. This application Sep. 1, 1993, Ser. No. 115,941**

**Int. Cl.[6] B32B *31/04;31/10;31/18***

**U.S. Cl. 156—73.3** **23 Claims**



1. A method of making a disposable garment having flangeless, separable seams, the method comprising the steps of:

(a) providing a chassis comprising:

a front portion having longitudinal side regions, side panels, and a waistband, said front portion comprising, at least in said longitudinal side regions, a polymeric material;

a rear portion opposed to said front portion, having longitudinal side regions, side panels, and a waistband, said front portion comprising, at least in said longitudinal side regions, a polymeric material having a similar melting point as said polymeric material of said longitudinal side regions of said front portion; and

a crotch portion between said front portion and said rear portion;

(b) superposing said longitudinal side regions of said front portion with said longitudinal side regions of said rear portion to form a first seaming area and a second seaming area;

(c) simultaneously sealing and cutting a portion of said first seaming area by inputting mechanical energy to said first seaming area sufficient to cause the polymeric material of said first seaming area to flow and thin away to sever the polymeric material in a first area while simultaneously bonding the polymeric material in a marginal area adjacent said first area to form a first flangeless seam comprising a mass of fused polymeric material, which extends from the disposable garment about 1/16 of an inch or less, and forms a first leg-opening; and

(d) simultaneously sealing and cutting a portion of said second seaming area by inputting mechanical energy to said second seaming area sufficient to cause the polymeric material of said second seaming area to flow and thin away to sever the polymeric material in a first area while simultaneously bonding the polymeric material in a marginal area adjacent said first area to form a second flangeless seam comprising a mass of fused polymeric material which extends from the disposable garment about 1/16 of an inch or less and forms a second leg-opening, and a waist-opening substantially encircled by said front waistband and said rear waistband, said second leg opening being separated from said first leg opening by said crotch portion.

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**5,496,430**

**TAPING METHOD AND APPARATUS**

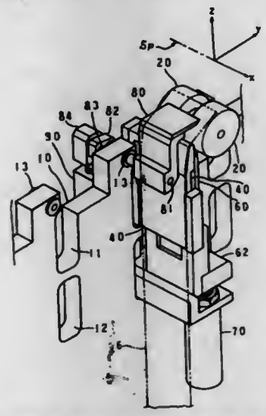
**Yoji Suekane, and Kyoji Takeda, both of Tokyo, Japan, assignors to Tanaka Seiki Co., Ltd., Tokyo, Japan**

**Filed Aug. 4, 1993, Ser. No. 102,044**

**Claims priority, application Japan, Aug. 7, 1992, 4-233025**

**Int. Cl.[6] B32B *31/00***

**U.S. Cl. 156—184** **20 Claims**



1. A taping method for performing a taping operation, wherein the taping operation is performed by adhering part of a tape corresponding to an extra length of adhering allowance located at a foremost end of the tape to an outer surface of a coil having a coil bobbin and a wire wound about the coil bobbin, the coil bobbin being rotatably supported by a spindle, the method comprising the steps of:

retaining the tape with a tape retaining means against a tape rolling means having at least one tape roller located opposite the coil bobbin while the foremost end of the tape is projected, by a distance corresponding to the extra length of adhering allowance, ahead of a retaining position defined by the tape retaining means;

shortening a distance between the coil bobbin and the tape rolling means until the coil bobbin and the tape rolling means come into contact with one another thereby causing the extra length of adhering allowance to adhere to an outer surface of the coil in cooperation with the tape rolling means;

winding the tape about the coil by rotating the spindle;

displacing a tape cutting means to cut the tape while the tape is retained between the tape retaining means and the coil bobbin and such that a subsequent extra length of adhering allowance of the tape does not enter a region defined by the tape retaining means;

winding any tape remaining on the coil by rotating the spindle;

retractively displacing the coil bobbin in an upward direction;

projecting the tape ahead of the retaining position of the tape retaining means by a distance corresponding to the extra length of adhering allowance before a subsequent taping operation is started;

actuating a tape retainer driving means to rotate a tape retainer of the tape retaining means, the tape retainer being rotatably supported about a support shaft so as to be rotatable in both a clockwise direction to bring the tape retainer in contact with the tape during the step of retaining, and a counterclockwise direction to turnably part the tape retainer away from the tape rolling means during the steps of winding the tape, displacing the tape cutting means, winding any tape remaining on the coil, and retractively displacing the coil bobbin; and

actuating a tape guide driving means to displace a tape guide of a tape guiding means in both an upward direction and a downward direction, the tape guide being disposed between the tape rollers and the tape retainer on a base board having a tape unwinder thereon.

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**5,496,431**

**METHOD AND SYSTEM FOR CHANGING PRODUCT SPECIFICATIONS IN A CORRUGATION MACHINE**

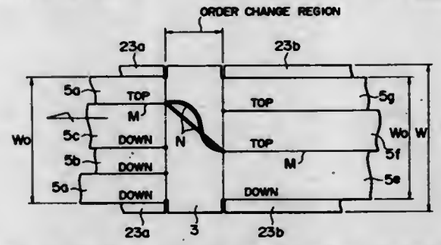
**Tadashi Hirakawa; Yukuharu Seki, and Makoto Ando, all of Mihara, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan**

**Filed Dec. 15, 1993, Ser. No. 166,838**

**Claims priority, application Japan, Jan. 14, 1993, 5-020825**

**Int. Cl.[6] B26D *3/00*; B32B *31/18***

**U.S. Cl. 156—269** **19 Claims**




17. A method for changing over product orders in a corrugation machine which produces corrugated board sheets having various widths and lengths according to specifications of said product orders from a single continuous corrugated board web running through said machine, comprising the steps of:

providing slitter-scorer means including slitter means for forming slit grooves in said web for dividing the web into separate product sheets and scorer means for forming score lines on said web, said slitter-scorer means for receiving said continuous corrugated board web and capable of forming slit grooves and score lines in said web while said web passes through said slitter-scorer means;

providing a plurality of sheet length cut-off devices for cutting said web into sheets of desired lengths, said plurality of cut-off devices being downstream of said slitter-scorer means, said plurality of cut-off devices including at least first and second cut-off devices which are vertically disposed with respect to each other at different heights, wherein said web divides after passing through said slitter-scorer means and divided portions of said web pass to different cut-off devices, so that the first cut-off device receives a first portion of the divided web, and the second cut-off device receives a second portion of the divided web;

forming an order change region free of a central slit groove in said web, wherein said region extends from trailing ends of sheets produced in a first product order to leading ends of sheets to be produced in a second product order; and

forming a transitional slit groove in said order change region of said web connecting a central slit groove of said first order to a central slit groove of said second order, wherein said central slit grooves divide said web into said first and second web portions which are received by respective first and second cut-off devices, wherein continuity of each of said first and second web portions is maintained without completely severing and separating a product sheet from one of said web portions, and wherein said transitional slit groove forms a positive angle with respect to a width direction of said web, said width direction of said web being perpendicular to the running direction of said web.

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**5,496,432**

**METHOD AND DEVICE FOR PEELING A FILM**

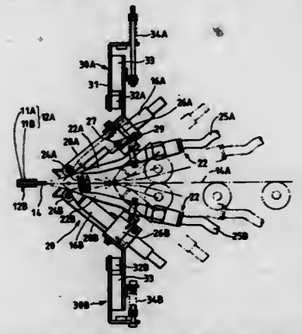
**Shigeo Sumi, and Kenji Kitagawa, both of Saitama, Japan, assignors to Somar Corporation, Tokyo, Japan**

**Filed Oct. 21, 1994, Ser. No. 327,384**

**Claims priority, application Japan, Jun. 6, 1994, 6-124093**

**Int. Cl.[6] B32B *31/00***

**U.S. Cl. 156—344** **35 Claims**



4. A film peeling device for peeling two laminated thin films, each consisting of a photoresist layer and a light transmissive film, respectively coated on the front and back surfaces of a circuit board, comprising:

two vibrators each including a rod respectively disposed above and below the circuit board in such a manner that they surround the circuit board from the front and back surfaces of the circuit board respectively;

wherein the positions of said front and back rods leading ends are disposed to face each other with the circuit board between them, and are set so as to offset each other along the surfaces of said circuit board;

back and front backup members respectively provided at positions opposed to said front and back rods leading ends through said circuit board and said laminated thin films and movable in contact with and along said circuit board and said laminated thin films in synchronization with said opposed front and back rods leading ends;

a film floating means for applying vibratory motions of the rods onto the end portions of the laminated thin films respectively coated on the front and back surfaces of the circuit board to

thereby float part of the light transmissive films from their respective photoresist layers; and

a film peeling means for peeling the films in the floated portions of the light transmissive films.

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**5,496,433**

## HOT PRESS FOR USE IN PRODUCTION OF MULTILAYERED SUBSTRATE

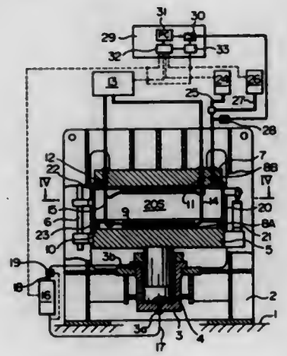
**Akimi Miyashita, Toride; Mutsumasa Fujii, Ibaraki; Kiyonori Kogawa, Hiratsuka, and Masayuki Kyoui, Yokohama, all of, Japan, assignors to Hitachi Techno Engineering Co., Ltd., Tokyo, Japan**

**Filed Mar. 29, 1993, Ser. No. 38,293**

**Claims priority, application Japan, Mar. 27, 1992, 4-071587**

**Int. Cl.[6] B29C** *43/58*

**U.S. Cl. 156—358** **5 Claims**



1. A hot press for producing a multilayered substrate, comprising:

upper and lower bolsters which are arranged to vertically oppose each other and to be movable relative to and toward each other to press multilayered substrate blanks therebetween;

a main ram for imparting relative movement between said upper and lower bolsters to produce a pressing force;

upper and lower heat plates which are provided on said upper and lower bolsters through heat insulating plates respectively;

heating and cooling means for heating said upper and lower heat plates during bonding of said multilayered substrate blanks and for cooling said plates after the bonding;

sealing means including a cylindrical member and defining a hermetically sealed space of variable volume in cooperation with said upper and lower bolsters;

evacuating means for evacuating said hermetically sealed space to reduce the pressure therein during a heating and pressing operation, performed by said heating and cooling means and by said main ram, for softening a bonding agent for said multilayered substrate blanks;

gas supplying means for supplying gas into said hermetically sealed space to elevate the pressure in said space, thereby imparting a bonding pressure to said multilayered substrate blanks during the bonding;

pressure sensing means for sensing the pressure inside said hermetically sealed space; and

control means for effecting pressure compensation by controlling pressure of a hydraulic pressure source to be supplied to said main ram in accordance with outputs from said pressure sensing means so as to cancel an increment in the bonding pressure on said blanks, when the pressure in said hermetically sealed space is reduced by said evacuating means, and to cancel a decrement in the bonding pressure on said blanks when the pressure in said space is elevated by said gas supplying means.

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**5,496,434**

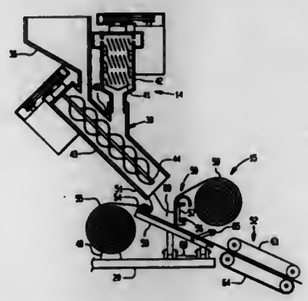
## STRUCTURE FORMING APPARATUS

**LeRoy Payne, 3300 Nicholas La., Molt, Mont. 59057**

**Continuation-in-part of Ser. No. 870,927, Apr. 20, 1992, Pat. No. 5,330,603, which is a continuation-in-part of Ser. No. 753,344, Aug. 30, 1991, Pat. No. 5,145,282, which is a continuation-in-part of Ser. No. 521,442, May 10, 1990, Pat. No. 5,049,006, which is a continuation-in-part of Ser. No. 417,501, Oct. 5, 1989, Pat. No. 4,955,760, which is a continuation-in-part of Ser. No. 235,205, Aug. 23, 1988, Pat. No. 4,872,784. This application May 9, 1994, Ser. No. 239,540**

**Int. Cl.[6] B32B** *31/06;31/08;31/12*

**U.S. Cl. 156—550** **16 Claims**



1. Mobile continuous structure forming apparatus including a supporting portion, a raw material supplying portion, a mixing portion, a matrix forming portion and a control portion; said supporting portion including at least one base section, carriage means operatively associated with said base section; said raw material supplying portion including a plurality of reservoirs operatively connected with said supporting portion, said reservoirs being connected independently with said mixing portion through flexible conduit means, blanket support means mounted on said base section, a continuous blanket advancing from said blanket support means in a direction along a path through said matrix forming portion; said mixing portion including a generally vertically oriented elongated enclosed mixing chamber mounted on said base section adjacent said blanket support means, said mixing chamber including an upper liquid mixing section with a first rotatable mixing element disposed therein, said mixing chamber including a lower liquid/solid particle mixing section disposed below said upper mixing section and connected thereto at an obtuse angle, a solid particle feeding hopper connected to said lower mixing section at a point thereon above its connection with said upper mixing section, a second open rotatable mixing element disposed within said lower mixing section of said mixing chamber; said matrix forming portion including mixture distributing means adjacent an outlet of said mixing chamber, pressure applying means disposed subsequent to said mixture distributing means; said control portion including programmable memory means, coordinating means, sensing means, actuating means, and circuitry transmitting signals from said sensing means to said coordinating means for comparison with said memory means and activation of said actuating means to form and maintain a uniform resin matrix forming mixture with a preselected major proportion of solid particles and to form with said mixture a continuous resin matrix within said blanket.



**5,496,435**

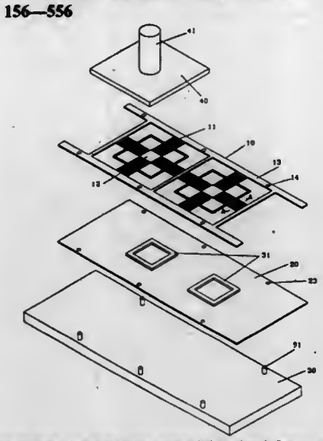
## SEMICONDUCTOR LEAD FRAME LEAD STABILIZATION

**Donald C. Abbott, Norton, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.**

**Division of Ser. No. 892,096, Jun. 2, 1992, Pat. No. 5,352,633. This application Jul. 13, 1994, Ser. No. 275,048**

**Int. Cl.[6] B32B** *31/20;* **H01L** *21/447*

**U.S. Cl. 156—556** **3 Claims**



1. A apparatus for applying material to lead frames to stabilize lead frame leads, comprising:

a support base on which to align a lead frame and the applied stabilizing material;

a carrier base for supporting the applied stabilizing material, the carrier base is positioned between the support base and the lead frame;

a heater block for applying heat to the lead frame and stabilizing material; and

a press for creating pressure to the lead frame and stabilizing material between the support base and heater block.

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**5,496,436**

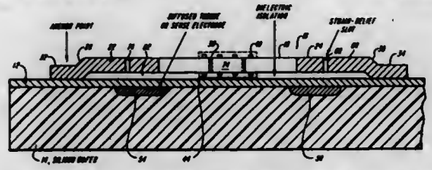
## COMB DRIVE MICROMECHANICAL TUNING FORK GYRO FABRICATION METHOD

**Jonathan J. Bernstein, Medfield, and Marc S. Weinberg, Needham, both of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.**

**Division of Ser. No. 870,414, Apr. 7, 1992, Pat. No. 5,349,855. This application Jun. 15, 1994, Ser. No. 259,989**

**Int. Cl.[6] H01L** *21/306.5;21/00*

**U.S. Cl. 156—628.1** **14 Claims**



1. A method for fabricating a comb drive tuning fork structure adapted for inertial rate sensitivity comprising the steps of:

providing a silicon substrate;

forming in a surface of said substrate a plurality of sense electrodes electrically isolated from each other and electrically contactable through a surface portion of said substrate;

supporting, over the surface of said substrate having said plurality of sense electrodes, by flexures for rotation about an axis through said flexures, an assembly of first and second vibratable elements supported at opposite ends by first and second support electrodes such that said vibratable elements extend either side of said axis of rotation and have, extending away therefrom, first and second sets of driven electrodes on one side and first and second respective masses on the other side;

forming on said substrate first and second drive electrodes which mesh with said first and second driven electrodes of said vibratable elements and electrical contacts for said first and second flexures.

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**5,496,437**

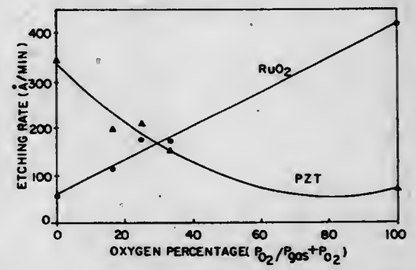
## REACTIVE ION ETCHING OF LEAD ZIRCONATE TITANATE AND RUTHENIUM OXIDE THIN FILMS

**Seshu B. Desu; Wei Pan, and Dilip P. Vijay, all of Blacksburg, Va., assignors to Ceram Incorporated; Sharp Kabushiki Kaisha, and Virginia Tech Intellectual Properties, Inc.**

**Filed Jun. 10, 1993, Ser. No. 75,059**

**Int. Cl.[6] H01L** *21/3065*

**U.S. Cl. 156—643.1** **10 Claims**




1. A method of reactive ion etching a material that includes at least one of $RuO_2$ and lead zirconate titanate, comprising: placing the material into a chamber, the chamber containing $CHClFCF_3$, and producing a glow discharge in the chamber to etch the material.

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**5,496,438**

## METHOD OF REMOVING PHOTO RESIST

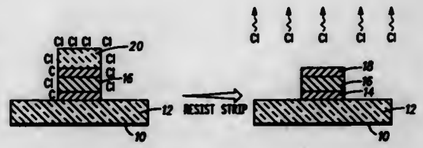
**Phil Wootton, Hamilton; Graeme Morland, Falkirk, both of, Scotland; Karl E. Mautz, Austin, Tex., and John Dalziel, Wishaw, Scotland, assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Dec. 9, 1994, Ser. No. 353,472**

**Claims priority, application United Kingdom, Dec. 23, 1993, 9326310**

**Int. Cl.[6] H01L** *21/00*

**U.S. Cl. 156—643.1** **8 Claims**



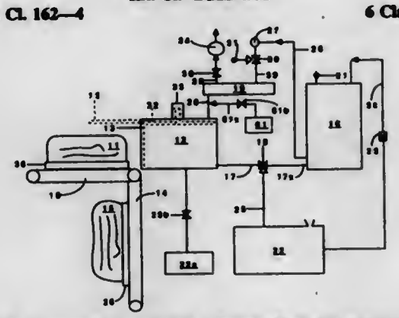

1. A method of removing photoresist from a metal layer formed on a substrate and having a pattern defined thereon by means of a corrosive gas plasma, the method including the steps of plasma etching the resist in an oxygen gas plasma for a period of time and at a sufficiently high temperature to remove substantially all residual corrosive gas absorbed in the photoresist and below the temperature at which the metal begins to reflow.

**5,496,439**

## RECYCLE PROCESSING OF BALED WASTE MATERIAL

Willard E. Carlson, 44 St. James Dr., Palm Beach Gardens, Fla. 33418, and Ivar H. Stockel, 4085 Gulf Shore Blvd., N. Suite 302, Naples, both of Fla. 33940

Filed Jul. 28, 1993, Ser. No. 98,708
The portion of the term of this patent subsequent to Dec. 21, 2010, has been disclaimed.
Int. Cl.[6] D21B *1/32*
U.S. Cl. 162—4 6 Claims



1. In a process for recovering cellulosic fibers from wastepaper contained in baled waste material by:

(A) treating said baled waste material with a fiber softening and swelling liquid to establish fiber debonding swelling of cellulosic fibers in said waste paper forming debonded swollen fibers by confining said baled waste material within a closed chamber for a period during which at least one cycle of consecutive differential pressure conditions is established and sufficient of said liquid is admitted to submerge said baled waste material and

(B) removing the fluid treated baled waste material from said chamber and subjecting it to fibrillation for separation out of said debonded swollen fibers;

the improvements wherein said step of treating said baled waste material in said chamber further includes the steps of:

(a) establishing a first differential pressure condition of negative pressure within said chamber,

(b) after completing step (a) admitting sufficient of said liquid as submerges said baled waste material,

(c) establishing a last differential pressure condition of positive pressure within said chamber and maintaining a sufficiency of said liquid within said chamber as submerges said baled waste material for a finite period sufficient for said liquid to penetrate throughout said baled waste material,

(d) after completing step (c) removing said baled waste material from confinement by opening said chamber to the atmosphere.

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**5,496,440**

## PROCESS FOR THE MANUFACTURE OF PAPER

Bruno Carré, Grenoble, France, and Ulf Carlson, Billdal, Sweden, assignors to Eka Nobel AB, Bohus, Sweden

PCT No. PCT/SE92/00416, § 371 Date Jan. 3, 1994, § 102(e) Date Jan. 3, 1994, PCT Pub. No. WO93/01352, PCT Pub. Date Jan. 21, 1993
PCT Filed Jun. 12, 1992, Ser. No. 170,282
Claims priority, application Sweden, Jul. 2, 1991, 9102052; Jun. 1, 1992, 9201699
Int. Cl.[6] D21H *21/10*
U.S. Cl. 162—168.3 13 Claims

1. A process for the production of paper on a wire by forming and dewatering a stock of lignocellulose-containing fibers, comprising the steps of sequentially adding to said stock of lignocelluosic fibers having a pH within the range of from 3.0 to 7.0:

(a) an alkaline solution of an aluminate, said aluminate being added in an amount of at least 0.001% by weight, calculated as $Al_2O_3$ and based on dry fibers;

(b) a retention agent containing anionic and cationic groups, said retention agent being based on a polysaccharide or being an acrylamide-based polymer, the retention agent based on a polysaccharide is added in an amount of at least 0.05% by weight, based on dry fibers, and the retention agent being an acrylamide-based polymer is added in an amount of at least 0.005% by weight, based on dry fibers; and

(c) an anionic inorganic colloid selected from the group consisting of bentonite, montmorillonite, titanyl sulphate sols, silica sols, aluminum modified silica sols, and aluminum silicate sols, said anionic inorganic colloid being added in an amount of at least 0.005% by weight, based on dry fibers;

wherein the pH of the stock after the addition of aluminate is in the range of from 3.5 to 7.

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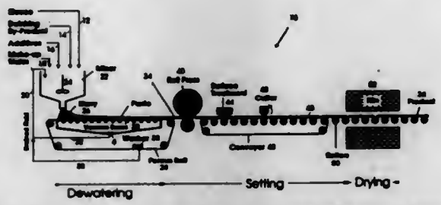
**5,496,441**

## UTILIZATION OF DEINKING BY-PRODUCT IN BUILDING MATERIALS

Hoc N. Tran, Toronto, Canada, assignor to Tran Industrial Research Inc., Toronto, Canada

Filed Dec. 29, 1993, Ser. No. 175,119
Claims priority, application United Kingdom, May 26, 1993, 9310891
Int. Cl.[6] D21H *17/01*
U.S. Cl. 162—181.3 12 Claims

DBP-REINFORCED DRYWALL MANUFACTURING PROCESS




1. A method for the production of a building material, which comprises:

providing a deinking waste sludge from the deinking of wastepaper in a wastepaper recycling procedure comprising a water dispersion having a consistency of about 25 to about 55 wt. % in which the dispersed phase is about 60 to about 80 wt. % organic material and the balance ash,

diluting said deinking waste sludge from a wastepaper recycling procedure to a viscosity at which it can be readily stirred and to a consistency of about 5 to about 10 wt. %,

adding calcium sulfate hemihydrate to said diluted deinking by-product to provide a slurry of calcium sulfate hemihydrate and said diluted deinking by-product having a diluted by-product to calcium sulfate hemihydrate ratio of about 1:1 to about 1:5,

dewatering said slurry to a paste-like mass having a weight ratio of slurry to calcium sulfate of about 0.5:1 to about 1.6:1 for building product formation, and

forming a building product from said paste-like mass.

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**5,496,442**

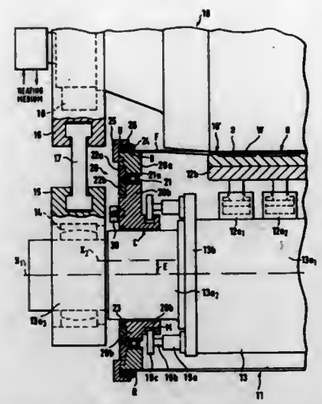
## METHOD AND APPARATUS FOR OPENING A NIP IN AN EXTENDED-NIP PRESS

Jorma Laapotti, Palokka, Finland, assignor to Valmet Paper Machinery Inc., Helsinki, Finland

Filed Mar. 7, 1994, Ser. No. 207,296
Claims priority, application Finland, Mar. 24, 1993, 931321
Int. Cl.[6] D21F *3/02*
U.S. Cl. 162—199 19 Claims

1. A method for opening a nip in an extended-nip press, including an extended-nip press roll and a back-up roll in a nip-forming





relationship, said extended-nip press roll having a central axle, a loading shoe loaded toward the nip by loading members arranged on said extended-nip press roll, said extended-nip press roll having a glide-belt mantle passing through said nip in contact with said loading shoe, said method comprising the steps of:

providing said extended-nip press roll with an end flange having an outer end-flange part and an inner end-flange part operatively coupled by bearing means,

coupling said glide-belt mantle to said outer end-flange part, said end flange having a central axis about which said inner end-flange part, said outer end-flange part and said glide-belt mantle rotate, said central axis of said end flange being located a distance from a central axis of said central axle of said extended-nip press roll, and

rotating said inner end-flange part to cause said glide-belt mantie to be moved away from said back-up roll and out of the nip.

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**5,496,443**

**Patent Not Issued For This Number**

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**5,496,444**

**Patent Not Issued For This Number**

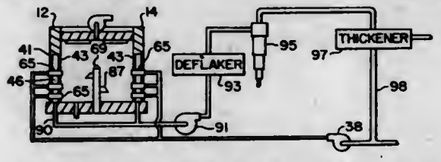
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**5,496,445**

## METHOD AND APPARATUS FOR WASTE PAPER TREATMENT

Ivar H. Stockel, 4085 Gulf Shore Blvd. N., Ste. 302, Naples, Fla. 33940, and Willard E. Carlson, 17 Strawberry Hill Rd., Hilton Head Island, S.C. 29928

Division of Ser. No. 855,212, Mar. 20, 1992, Pat. No. 5,271,805. This application Oct. 5, 1993, Ser. No. 131,588
Int. Cl.[6] D21C *7/00*
U.S. Cl. 162—248 27 Claims




1. An apparatus for treating cellulosic fibers from a bale containing waste papers, said apparatus comprising: a base; an annular upstanding wall, having an upper end and a lower end, said annular wall having a raised position wherein its lower end is spaced away from said base and a lowered position, wherein its lower end is seated on said base; said annular wall cooperating with said base to form a columnar enclosure for containment of said bale when said annular wall is in its lowered position; a piston slidably positioned within said annular wall for vertical motion therealong; said piston being movable downwardly within said annular wall to exert a mechanical force on the contained bale; means for applying a vacuum to said columnar enclosure; and means for passing at least one fiber-treating fluid into and out of said columnar enclosure.

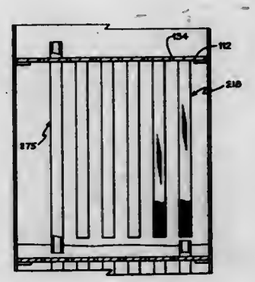
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**5,496,446**

## INTERNALS FOR DISTILLATION COLUMNS INCLUDING THOSE FOR USE IN CATALYTIC REACTIONS

Neil Yeoman, Merrick, N.Y.; Ronald Pinaire, Wichita, Kans.; Michael A. Ulowetz, Wichita, Kans.; Timothy P. Nace, Wichita, Kans., and David A. Furse, Wichita, Kans., assignors to Koch Engineering Company, Inc., Wichita, Kans.

Division of Ser. No. 962,254, Oct. 16, 1992, Pat. No. 5,454,913, which is a continuation-in-part of Ser. No. 775,010, Oct. 11, 1991, Pat. No. 5,291,989, which is a continuation of Ser. No. 475,971, Feb. 6, 1990, Pat. No. 5,108,550. This application Oct. 13, 1993, Ser. No. 135,921
Int. Cl.[6] B01D *3/32;* B01J *8/04*
U.S. Cl. 202—158 13 Claims



1. A structure for use in a column reactor to provide concurrent reaction with distillation of fluid streams flowing through said reactor, said structure comprising:

a plurality of spaced apart plates for presenting a fractional distillation and mass transfer zone;

a plurality of containers extending downwardly from one plate and terminating above a lower plate and containing in a fixed configuration a catalyst to form a catalytic reaction zone, said containers providing a primary flow path for liquid streams flowing between said spaced apart plates; and

means for presenting an open area within said catalytic reaction zone to permit liquid to accumulate within said open area and develop a liquid head which forces the accumulated liquid to flow generally horizontally into said catalyst.

9. A structure for use in a column reactor to provide concurrent reaction with distillation of fluid streams flowing through said reactor, said structure comprising:

a plurality of spaced apart plates for presenting a fractional distillation and mass transfer zone;

a plurality of containers extending downwardly from one plate and terminating above a lower plate and containing in a fixed configuration a catalyst to form a catalytic reaction zone, said containers having a liquid permeable outer wall and providing a primary flow path for liquid streams flowing between said spaced apart plates;

means for presenting an open area within said catalytic reaction zone, said open area being accessible by liquid flowing generally horizontally through said container and the catalyst therein; and

means for presenting a liquid accumulation zone downwardly spaced from and in communication with said open area.

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**5,496,447**

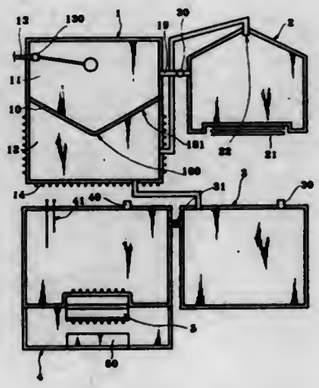
## WATER DISTILLING APPARATUS

**Chin-Tu Wang, No. 1, Alley 6, Lane 244, Hsin Shu Rd., Hsin-chuang City, Taipei Hsien, Taiwan, Prov. of China**

**Filed Mar. 10, 1995, Ser. No. 402,538**

**Int. Cl.[6] B01D *3/42*; C02F *1/04***

**U.S. Cl. 202—180** **3 Claims**



1. A distilling apparatus for distillation of water, comprising:

a condensing chamber defining an upper holding space and a lower holding space, said upper holding space comprising a water inlet connected to a water source, a float switch installed in said water inlet to open said water inlet when the water level in said upper holding space drops below a predetermined value or to close said water inlet:when the water level in said upper holding space surpasses a predetermined value, a water outlet disposed at a lower elevation than said water inlet, and a check valve installed in said water outlet for allowing water to flow out of said upper holding space through said water outlet;

a heating chamber disposed at one side by said condensing chamber to receive water from said check valve, said heating chamber comprising an electric heating element at a bottom side thereof controlled to heat water to the boiling point, and a steam outlet at a top side thereof connected to said lower holding space of said condensing chamber for allowing steam to be condensed into water in said condensing chamber;

a hot water chamber connected to said lower holding space of said condensing chamber to collect condensed water from said lower holding space, the holding space of said hot water chamber being bigger than that of said heating chamber, said hot water, chamber comprising a relief port communicated with the atmosphere, and a normal-open electromagnetic valve at one side for allowing water to flow out of said hot water chamber when water inside said hot water chamber reaches a predetermined full water level; and

a cold water chamber connected to said hot water chamber to receive water from said electromagnetic valve, said cold water chamber comprising an air hole at a top side thereof communicated with the atmosphere, and a water level detecting means for detecting the water level inside said cold water chamber, said water level detecting means closing said normal-open electromagnetic valve and turning off said electric heating element when water in said cold water chamber reaches a predetermined full water level.

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**5,496,448**

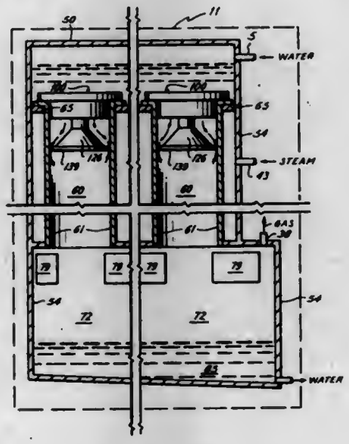
## EVAPORATION MEANS AND METHOD

**Dinh-Cuong Vuong, Nederland, Tex., assignor to Texaco Inc., White Plains, N.Y.**

**Filed Nov. 22, 1993, Ser. No. 155,364**

**Int. Cl.[6] B01D *3/00*; C02F *1/04***

**U.S. Cl. 202—235** **4 Claims**




1. A distillation apparatus comprising:

water means for receiving water to be distilled,

means for evaporating water when heated comprising a plurality of tubes for providing a water vapor,

a plurality of distributor means spatially related to the water means and to the plurality of tubes, each distributor means for uniformly distributing water from the water means to an inner wall of a corresponding tube, comprising a single molded body including:

(i.) a first passing means portion perpendicular to a longitudinal axis of the corresponding tube, having holes arranged in a pattern,

(ii.) a second, cylindrical portion extending into the corresponding tube,

(iii.) a third truncated conical portion having a conical angle with the longitudinal axis of the corresponding tube to direct the passed water from the passing means to move downward and outward, and

(iv.) a fourth, disk shaped portion having a diameter perpendicular to the longitudinal axis of the corresponding tube, sufficiently smaller than the diameter of the corresponding tube so as to direct water in a substantially horizontal direction to encounter the inner wall of the corresponding tube,

heat means for heating the plurality of tubes to an evaporation temperature, and

means for condensing the water vapor from the plurality of tubes to provide distilled water.



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**5,496,449**

## METHOD OF TREATING SALT BATH LIQUID

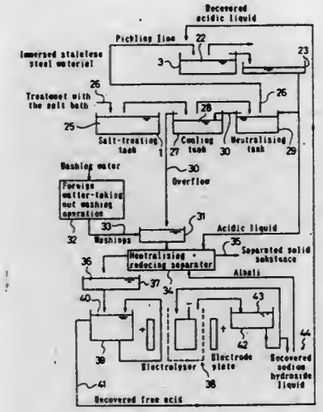
**Tadaya Ishibashi, Suita; Masanori Sasaki, Okazaki; Hideto Obara, Uji; Hiroshi Kano, Uji, and Shintaro Yamashita, Uji, all of, Japan, assignors to Unitika, Ltd., Japan**

**Division of Ser. No. 812,627, Dec. 23, 1991, Pat. No. 5,348,628. This application Jul. 14, 1994, Ser. No. 274,903**

**Claims priority, application Japan, Apr. 2, 1991, 3-68649; May 31, 1991, 3-128069**

**Int. Cl.[6] B01D *61/44*; B08B *7/04*; C02F *1/46*; C23G *1/36***

**U.S. Cl. 205—762** **2 Claims**




1. In a method of treating salt bath liquid used for surface treatment of steel, said surface treatment of steel comprising the steps of:

providing a salt bath furnace containing said salt bath liquid;

immersing said steel in said salt bath liquid for surface treatment;

withdrawing said steel from said salt bath liquid; immersing said steel in cooling water of a cooling bath to cool said steel;

withdrawing said steel from said cooling bath;

immersing said steel in a neutralizing liquid of a neutralizing bath for neutralizing alkalis sticking to the surface of said cooled steel;

withdrawing said steel from said neutralizing liquid bath;

immersing said steel in a pickling liquid of a pickling bath for pickling said steel;

the improvement comprising:

washing foreign matter, sedimented from a bottom portion of said salt bath furnace and withdrawn from said furnace, by means of washings;

providing a storage tank;

storing said cooling water flowing from said cooling bath, said neutralizing liquid flowing from said neutralizing bath, and said washings used for said washing, in said storage tank;

taking out a portion of said pickling liquid from said pickling bath;

taking from said storage tank said cooling water, neutralizing liquid, and washings, and combining them with said portion of pickling liquid, thereby reducing hexavalent salts contained in said combined liquid to trivalent salts whereby said combined liquid is reduced;

adding sodium hydroxide to said reduced liquid, thereby converting metal ions remaining in said reduced liquid into insoluble metal hydroxides and isolating said insoluble metal hydroxides from said reduced liquid; and

feeding said liquid from which said insoluble metal hydroxides are isolated to an electrolyzer for recovering sodium hydroxide.

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**5,496,450**

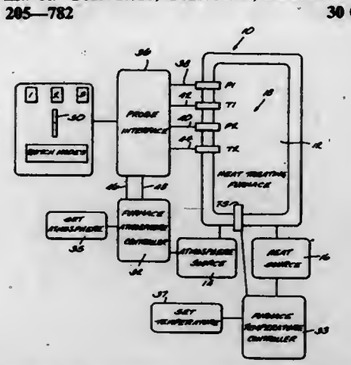
## MULTIPLE ON-LINE SENSOR SYSTEMS AND METHODS

**Robert N. Blumenthal, 17470 Broad Ct., Brookfield, Wis. 53005, and Andreas T. Melville, 204 N. 86th St., Milwaukee, Wis. 53226**

**Filed Apr. 13, 1994, Ser. No. 227,308**

**Int. Cl.[6] G01N *27/26*; G01R *31/08*; F23N *5/00***

**U.S. Cl. 205—782** **30 Claims**




30. A method for monitoring performance at least two probes positioned to simultaneously sense atmosphere of a heat treating furnace comprising the steps of

receiving input signals independently from each probe, the input signals having magnitude, the input signals being related to the atmosphere in the furnace,

periodically sampling the magnitudes of the received input signals from each probe while,

performing a first comparison of the sampled magnitudes to select one of the probes as a control probe and one of the probes as a standby probe based, at least in part, upon the first comparison of the sampled magnitudes, and

performing after the first comparison a second comparison of the sampled magnitudes to generate a diagnostic output when the second comparison fails to meet set criteria.

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**5,496,451**

## METHOD FOR DETECTING CHEMICAL SUBSTANCES

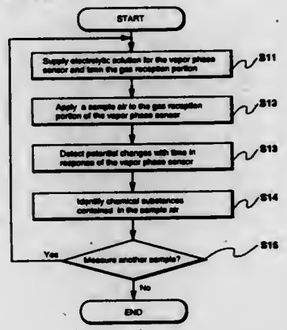
**Akifumi Iwama; Masahiro Iseki, and Azusa Nakagawa, all of Tsukuba, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan**

**Filed Sep. 13, 1994, Ser. No. 305,157**

**Claims priority, application Japan, Sep. 14, 1993, 5-228611; Sep. 14, 1993, 5-228612; Sep. 14, 1993, 5-228613; Jun. 29, 1994, 6-148013**

**Int. Cl.[6] G01N *27/26***

**U.S. Cl. 205—790.5** **7 Claims**



1. A method of detecting a chemical substance in a vapor phase comprising the steps of:

(A) holding an electrolytic solution having a surface coming into direct contact with a vapor phase around electrodes;

(B) diffusing a chemical substance in the vapor phase into the electrolytic solution; and

(C) detecting an electric state at the electrodes existing in the electrolytic solution as change with time based on the diffusion and absorption of the chemical substance on the electrodes, wherein

the chemical substance in the vapor phase is detected based on the detected change with time.

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**5,496,452**

**SUBSTRATE REGENERATING BIOSENSOR**

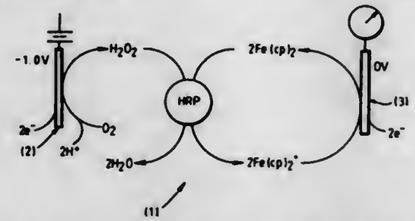
**Norman Hill, deceased, late of Dorset, England; Anthony E. G. Cass, London, England, and Mark H. Smit, Honolulu, Hi., assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England**

**Filed Jan. 4, 1993, Ser. No. 17,187**

**Claims priority, application United Kingdom, May 1, 1990, 9009761**

**Int. Cl.[6] G01N** *27/26;33/53;33/00*

**U.S. Cl. 205—777.5** **17 Claims**




1. A method of detecting and determining the concentration of a compound which inhibits electron transfer activity of an enzyme, said method comprising the steps of:

(a) providing in an aqueous environment an enzyme selected from the group consisting of peroxidase, catalase and oxygenase whose electron transfer activity is inhibited when bound to the compound;

(b) providing hydrogen peroxide in the environment to oxidize the enzyme;

(c) reducing the oxidized enzyme with an electron transfer agent wherein the electron transfer agent is oxidized as the oxidized enzyme is reduced; and

(d) detecting the concentration of the compound by measuring the change in and extent to which the electron transfer agent is regenerated from its oxidized state.

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**5,496,453**

**BIOSENSOR AND METHOD OF QUANTITATIVE ANALYSIS USING THE SAME**

**Harumi Uenoyama, Osaka, and Hisashi Okuda, Uji, both of, Japan, assignors to Kyoto Daiichi Kagaku Co., Ltd., Japan**

**Division of Ser. No. 138,263, Oct. 20, 1993, Pat. No. 5,382,346, which is a continuation of Ser. No. 883,367, May 17, 1992, Pat. No. 5,332,479. This application Oct. 12, 1994, Ser. No. 321,604**

**Claims priority, application Japan, May 17, 1991, 3-113030**

**Int. Cl.[6] G01N** *27/26*

**U.S. Cl. 205—777.5** **20 Claims**

1. A method of quantitative analysis of a specific compound in a liquid sample comprising supplying said liquid sample to a biosensor wherein said biosensor comprises an electrochemical means for detecting the product of a reaction of said specific compound with a biologically active material, and wherein said biologically active material is located at a position remote from the electrochemical detecting means, reading at least two electrochemical signals from the biosensor, which signals are at least a first electrochemical signal produced at the supply of the sample and generated by an electrochemically active substance present in the sample but not a product of a reaction of said specific substance with said biologically active material, and at least a second electrochemical signal generated later than said first signal by a product of a reaction of said specific compound with said biologically active material, and operating both signals, whereby the amount of said specific substance is quantitatively measured.

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**5,496,454**

**METHOD FOR THE OPERATION OF ELECTROLYTIC BATHS TO PRODUCE $FE_3O_4$ ELECTROPHORETICALLY IN A THREE COMPARTMENT CELL**

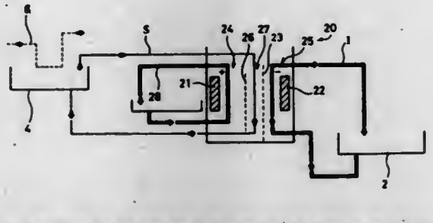
**Tadaya Ishibashi, Saita; Hideto Obara, and Satoshi Tsue, both of Uji, all of, Japan, assignors to Unitika Ltd., Hyogo, Japan**

**Continuation of Ser. No. 107,290, Aug. 16, 1993, abandoned. This application Nov. 16, 1994, Ser. No. 341,444**

**Claims priority, application Japan, Aug. 21, 1992, 4-221856**

**Int. Cl.[6] C25B** *7/00;1/00*

**U.S. Cl. 204—520** **6 Claims**




1. A method for operation of an electrolytic bath in an electrolytic cell comprising an anode electrode and a cathode electrode opposing the anode electrode; said method comprising:

a. providing two diaphragms arranged between said electrodes; said two diaphragms defining an intermediate chamber between said electrodes; a first one of said diaphragms and said cathode electrode defining a cathode chamber; a second one of said diaphragms and said anode electrode defining an anode chamber;

b. wherein said first diaphragm is a cation selectively permeable membrane;

c. circulating different kinds of electrolyte solutions respectively to the anode chamber, the cathode chamber, and the intermediate chamber, characterized in that the cathode chamber solution which is circulatorily supplied into the cathode chamber has a salt containing an ammonium ion and a sodium ion as cations, and a sulfuric ion as anion, and being free from any nitric ions, said ions functioning as electrolytes, for maintaining basic electrical conductivity of said cathode chamber solution;

d. maintaining the pH of the cathode chamber solution at 8.5 to 10.5;

e. circulating an electrolyte solution containing a divalent ferrous ion component to said intermediate chamber;

f. supplying electric current between the anode and the cathode while circulatorily supplying the different kinds of electrolyte solutions respectively into the anode, cathode, and intermediate chambers, causing any divalent ferrous ion component dissolved in the electrolyte solution circulatorily supplied into the intermediate chamber to be selectively electrophoresed toward the cathode;

g. contacting the divalent ferrous ion with the cathode chamber solution to produce triiron tetroxide ($Fe_3O_4$); and

h. separating triiron tetroxide from said cathode chamber solution.



**5,496,455**

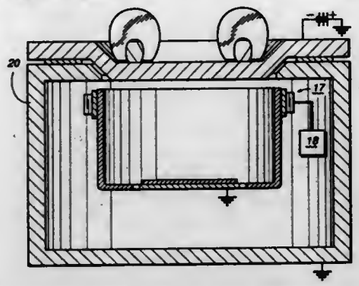
**SPUTTERING USING A PLASMA-SHAPING MAGNET RING**

**Michael Dill, and Mark Mueller, both of San Jose, Calif., assignors to Applied Material, Santa Clara, Calif.**

**Filed Sep. 16, 1993, Ser. No. 122,263**

**Int. Cl.[6] C23C** *14/34*

**U.S. Cl. 204—192.12** **4 Claims**




1. A magnetron plasma sputter deposition apparatus comprising an evacuable chamber, a substrate holder within the chamber for supporting the substrate and defining a substrate plane, a target electrode for supplying a deposition material and having an inner surface defining a target plane, a principal magnetic structure adjacent to an outer surface of the target electrode for producing a magnetic field within the chamber so as to confine a plasma adjacent to the inner surface of the target electrode, and an auxiliary magnetic structure situated between the target plane and the substrate plane and surrounding a planar region disposed between the target electrode and the substrate holder, and further includes a translating means for moving the auxiliary magnetic structure axially in the sputtering chamber.

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**5,496,456**

**VIBRATING CONVEYOR DEVICE DIPPING INTO A LIQUID WITH DAMPING OF VIBRATION TRANSMISSION**

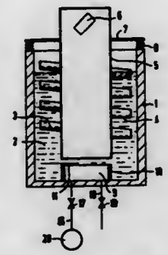
**Jürgen Fischer, Bergisch Gladbach; Siegfried Birkle, Höchstadt/Aisch; Werner Elsel, Erlangen; Johann Gehring, Spardorf; Arnolf Maurer, Bubenreuth, and Waldemar Nippe, Erlangen, all of, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany**

**Continuation of Ser. No. 192,187, Feb. 4, 1994, abandoned, which is a continuation of Ser. No. 755,671, Sep. 6, 1991, abandoned. This application May 23, 1995, Ser. No. 447,902**

**Claims priority, application Germany, Mar. 6, 1989, 39 07 147.2**

**Int. Cl.[6] B65G** *27/02;* **C25D** *17/16*

**U.S. Cl. 204—201** **12 Claims**



1. In a vibrating conveyor assembly for conveying bulk materials comprising a vessel, a liquid partly filling said vessel to a given liquid level, and a vibrating conveyor device dipping into the liquid, the improvement which comprises:

means disposed in said vessel below the liquid level for damping vibrations caused by the vibrating conveyor device and transmitted through the liquid, said damping means comprising a chamber having a volume which is variable as a function of vibrations exerted by the liquid and acting on said chamber.

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**5,496,457**

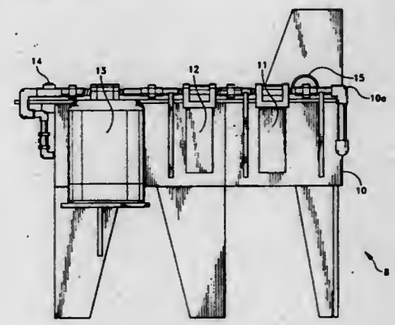
**COMPACT PLATING CONSOLE**

**Perry W. Antelman, Providence; Edward S. Eliasz, Cumberland, and Scott Factor, East Providence, all of R.I., assignors to Tivian Industries, Ltd., East Providence, R.I.**

**Filed Oct. 28, 1994, Ser. No. 330,435**

**Int. Cl.[6] C25D** *17/02*

**U.S. Cl. 204—238** **1 Claim**




1. A compact electroplating console whose total active operating space does not exceed 22 square feet, said console comprising:

a) four five-gallon finishing tanks for receiving electrodeposited finishes, each of said finishing tanks having dragout and cascade rinse tanks connected thereto;

b) one five-gallon electrocleaning tank;

c) one five-gallon acid activator tank;

d) said electrocleaning and acid activator tanks each having a cascade rinse tank connected thereto;

e) said finishing, electrocleaning and acid activator tanks being mounted in side by side relation on said console;

f) constant temperature control means operatively connected to each of said finishing tanks;

g) rectifiers operatively connected to said finishing and electrocleaning tanks;

h) a mixed bed ion exchange holding tank mounted on said console, said holding tank being in communication with said finishing, electrocleaning and acid activator tanks;

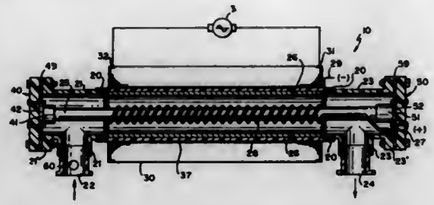
i) valve means for controlling the flow of deionized water from said holding tank to said finishing, electrocleaning and acid activator tanks, and for recirculating the water from said tanks back to said holding tank;

j) means for controlling operation of said constant temperature control means, said rectifier, and said valve means;

k) A particle filter and an organic contaminant filter through which water from said tanks flows as said water returns to said holding tank; and

l) Negative pressure gradient fume removal means connected to said finishing, electrocleaning and acid activator tanks for effecting fume removal therefrom.

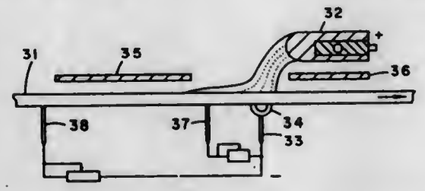
**5,496,458**
**ELECTROMAGNETIC ENRICHING DEVICE FOR ELECTROLYTES**
Ricardo Roch, 4696 E. 10th La., Hialeah, Fla. 33013
Filed May 12, 1995, Ser. No. 440,148
Int. Cl.[6] C02F *1/48*; C25B *9/00*
U.S. Cl. 204—272 4 Claims



1. An electromagnetic enriching device for electrolytes, comprising:
A. housing means having an inlet and an outlet, said inlet being connected to a source of water, and said housing means further including a cathode tubular member having first and second ends;
B. an anode member coaxially housed within said cathode tubular member;
C. direct electric current source means having a positive pole connected to said anode member and a negative pole connected to said cathode member;
D. coil means wound over said housing means; and
E. alternating electric source means connected to said coil means so that an alternating electromagnetic field is created within said cathode tubular member.

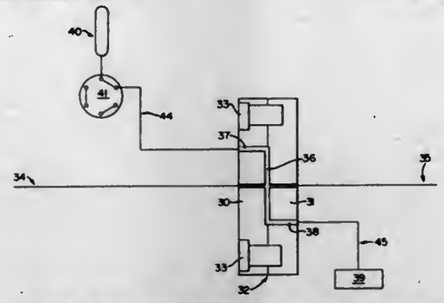
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**5,496,459**
**APPARATUS FOR THE TREATING OF METAL SURFACES**
Moisei Esterlis, Beer-Sheva, Israel, assignor to El-Plasma Ltd., Israel
Division of Ser. No. 24,624, Mar. 1, 1993, Pat. No. 5,393,575.
This application Mar. 18, 1994, Ser. No. 210,885
Claims priority, application Israel, Mar. 3, 1992, 101131; Apr. 16, 1992, 101610
Int. Cl.[6] C23C *14/22*
U.S. Cl. 204—298.41 15 Claims



1. Apparatus for the surface treatment of a metal workpiece comprising an enclosure; means for generating a vacuum in said enclosure; first means for controlled introduction of gas into said enclosure; at least one anode; second means for displaceably supporting said workpiece constituting a cathode in said enclosure; third means for applying an arc generating voltage between said anode and said cathode; fourth means for restricting said arc discharge to successive restricted areas of a first surface of said workpiece; fifth means for ensuring a substantially uniform arc distribution on said anode; and sixth means for effecting a relative displacement between said workpiece and said anode in a given direction.

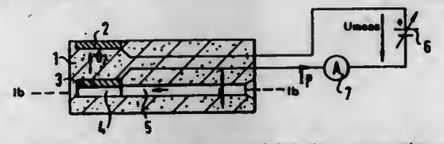
**5,496,460**
**TWO DIMENSIONAL SEPARATION SYSTEM**
James W. Jorgenson, Chapel Hill, and Anthony V. Lemmo, Durham, both of N.C., assignors to The University of North Carolina at Chapel Hill, Chapel Hill, N.C.
Continuation of Ser. No. 28,678, Mar. 9, 1993, Pat. No. 5,389,221. This application Dec. 20, 1994, Ser. No. 359,614
Int. Cl.[6] G01N *27/26*;*27/447*
U.S. Cl. 204—604 22 Claims



1. A flow gating interface having an effluent channel and a gating channel formed therein, said gating channel transversely intersecting said effluent channel at an intersection portion so that said channels are in fluid communication with one another, with said intersection portion dividing said effluent channel into an upstream portion and a downstream portion, and with said intersection portion dividing said gating channel into an upstream portion and a downstream portion, wherein said gating channel has a larger cross-sectional area than said effluent channel, and wherein said flow gating interface further comprises,
valve means operably connected to said gating channel upstream portion for regulating a flow of flush solution to said gating channel upstream portion.

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**5,496,461**
**ELECTROCHEMICAL SENSOR FOR DETERMINING THE OXYGEN CONTENT IN GASES**
Gerhard Hötzel, Stuttgart; Harald Neumann, Vaihingen; Walter Strassner, Schorndorf, and Johann Riegel, Bietigheim-Bissingen, all of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany
Filed Sep. 30, 1994, Ser. No. 316,107
Claims priority, application Germany, Sep. 30, 1993, 43 33 230.7
Int. Cl.[6] G01N *27/26*
U.S. Cl. 204—427 5 Claims



1. A measuring sensor for determining the concentration of oxygen in a gas to be measured or measured gas, the measuring sensor comprising:
a solid electrolyte;
a measuring electrode arranged on said electrolyte to be subjected to said measured gas;
a reference electrode arranged on said electrolyte;
said solid electrolyte having an internal reference gas volume formed therein to communicate directly with said reference electrode;
electric voltage means for applying a voltage of a first polarity across said electrodes during measurement for determining the concentration of oxygen in said measured gas by causing an oxygen ion flow from said measured gas into said internal reference gas volume thereby pumping oxygen from said measured gas into said internal reference gas volume to supply the reference gas;
overpressure compensating means interposed between said internal reference gas volume and said ambient air for defining a diffusion resistance means for facilitating the movement of oxygen only from said internal reference gas volume to the ambient when there is an overpressure of oxygen in said internal reference gas volume; and,
said diffusion resistance means having dimensions of structure which cause said diffusion resistance means to provide a resistance to particle flow from the ambient to said internal reference gas volume which corresponds to a diffusion limit current having a current intensity of 0.5 to 50 microampere which current intensity is measured when said sensor is not in use by applying a voltage of a second polarity across said electrodes opposite said first polarity.



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**5,496,462**
**PROCESS FOR OBTAINING A FINE POWDER OF DENDRITIC CADMIUM**
Luc Albert, Elancourt, France, assignor to Metaleurop S.A., France
Continuation of Ser. No. 825,968, Jan. 27, 1992. This application Feb. 10, 1994, Ser. No. 195,256
Claims priority, application France, Jan. 28, 1991, 9100922
Int. Cl.[6] C25C *5/02*
U.S. Cl. 205—62 6 Claims



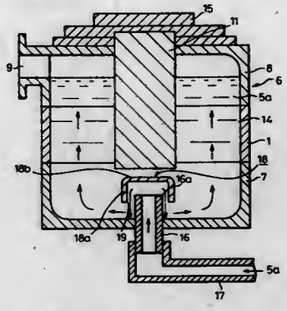
G = 200

1. A process for obtaining a fine powder containing dendritic cadmium, comprising the following steps:
(a) electrolytic production of metallic cadmium on an electrode, with a current density (J) between 700 and 1500 A/m$^2$, with a cadmium concentration (CD) in the electrolyte between 3.5 and 15 kg/m$^3$, and with an electrolytic solution composed of cadmium sulfate and sulfuric acid, the sulfuric acid content being between 5 and 100 g/l, and wherein the cadmium concentration in the electrolyte is specified by the relationship:

$$100\ A.m/kg \leq J/CD \leq 200A.m/kg$$

whereby a sponge consisting of tangled polymorphic dendrites is formed,
(b) removal and washing of the sponge,
(c) disintegration of the sponge in a protective pulpy medium comprising approximately 50 to 200 g of cadmium sponge per liter of solution, said disintegration being performed in a disintegration tank having a peripheral motor-driven agitation device, the shape and speed of said device being chosen so as to obtain a dendritic powder, and
(d) drying the pulp.

**5,496,463**
**PROCESS AND APPARATUS FOR COMPOSITE ELECTROPLATING A METALLIC MATERIAL**
Seiki Mori; Yasutoshi Ohtoh, and Masaaki Beppu, all of Tokyo, Japan, assignors to Nihon Parkerizing Co., Ltd., Tokyo, Japan
Filed Dec. 7, 1994, Ser. No. 350,449
Claims priority, application Japan, Dec. 8, 1993, 5-308201
Int. Cl.[6] C25D *15/00*
U.S. Cl. 205—109 13 Claims

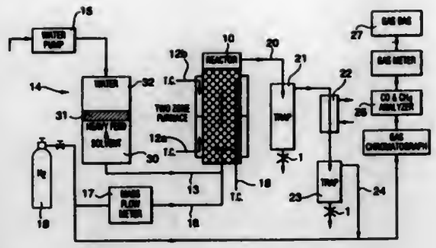


1. A process for composite electroplating a metal material, comprising the steps of:
preparing a composite electroplating liquid containing ions of at least one metal and fine solid particles dispersed in the liquid;
introducing the composite electroplating liquid into an electroplating system comprising a container having a bottom having an inside surface and a side wall extending upward from the bottom, at least a portion of an inside surface of the side wall of the container being formed from a metal material and serving as a first electrode, and a second electrode formed from a metal material, placed in the container and facing the first electrode, in such a manner that the introduced composite electroplating liquid spouts downward against the inside bottom surface of the container;
flowing upward the spouted composite electroplating liquid through an upward flowing path formed between the first electrode and the second electrode; and
applying an electric current between the first electrode and the second electrode, to form a composite plating layer comprising a metal matrix and the fine solid particles uniformly dispersed in the metal matrix on a surface of the first electrode or the second electrode.

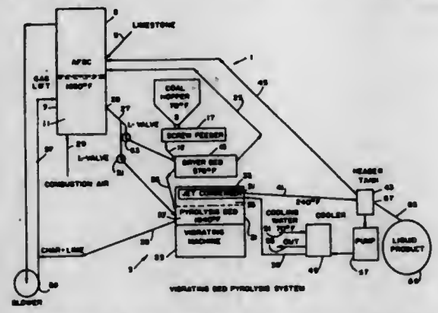
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**5,496,464**
**HYDROTREATING OF HEAVY HYDROCARBON OILS IN SUPERCRITICAL FLUIDS**
Jan Piskorz; Desmond St. A. G. Radlein; Piotr Majerski, and Donald S. Scott, all of Waterloo, Canada, assignors to Natural Resources Canada, Ottawa, Canada
Continuation-in-part of Ser. No. 300,470, Sep. 2, 1994, abandoned, which is a continuation-in-part of Ser. No. 412, Jan. 4, 1993, abandoned. This application Feb. 8, 1995, Ser. No. 385,676
Int. Cl.[6] C10G *47/34*;*45/00*;*1/06*
U.S. Cl. 208—108 12 Claims

1. A process for hydrotreating a heavy hydrocarbon oil to form lower boiling materials, which comprises adding to the heavy hydrocarbon oil a hydrogen-rich hydrocarbon solvent selected from the group consisting of paraffins, isoparaffins and cyclic paraffins and having a critical temperature of less than 500° C. to thereby form a diluted feedstock mixture and subjecting said feedstock mixture to hydrotreating in the presence of activated carbon catalyst without added catalytic metals at a temperature and pressure substantially at or greater than the critical temperature and pressure of the solvent.



5,496,465
**VIBRATING BED COAL PYROLYSIS SYSTEM**
Arthur P. Franz, 1040 Scenic Dr., Knoxville, Tenn. 37919
Filed Apr. 22, 1993, Ser. No. 50,948
Int. Cl.[6] C10G *1/00*; C10B *49/16;49/06;49/18*
U.S. Cl. 208—400 15 Claims

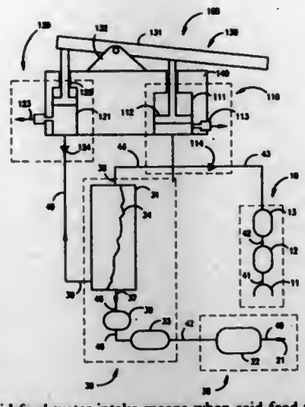


1. A method of producing fluid fuel and feed stock by coal pyrolysis, comprising crushing coal into particles, providing a bed of heated sorbent particles, vibrating the bed of hot sorbent particles by mounting the bed on a vibrating machine, introducing a stream of crushed coal particles to the vibrating bed of heated sorbent particles, rapidly heating the crushed coal particles in the vibrating bed of heated sorbent particles, creating gaseous products from the coal, withdrawing the gaseous products, condensing part of the gaseous products and storing the condensed products.

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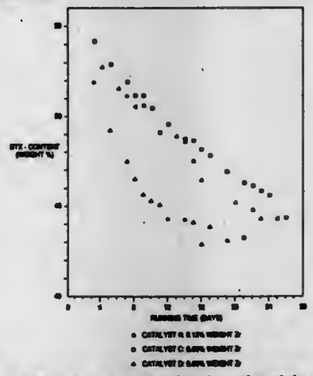
5,496,466
**PORTABLE WATER PURIFICATION SYSTEM WITH DOUBLE PISTON PUMP**
Buddy D. Gray, Dellrose, Tenn., assignor to Teledyne Industries, Inc., Los Angeles, Calif.
Filed Sep. 14, 1993, Ser. No. 120,400
Int. Cl.[6] B01D *61/12*
U.S. Cl. 210—137 8 Claims

8. A water purification system, comprising: a reverse osmosis filter having a feed water input, a concentrate output and a permeate output; and a pump system comprising: (A) a feed water pumping section for inputting feed water to said feed water input, said feed water pumping section including a feed water cylinder, a feed water piston disposed to move axially in said feed water cylinder, a feed water intake means connecting a feed water source to said feed water cylinder, and feed water inputting means connecting said feed water cylinder to said feed water input; (B) a concentrate pumping section for removing concentrate from said concentrate output, said concentrate pumping section including a concentrate cylinder, a concentrate piston axially disposed in said concentrate cylinder, and a concentrate intake means connecting said concentrate cylinder to said concentrate output; wherein feed water enters said feed water cylinder from said feed water source through said feed water intake means when said feed water piston axially moves in said feed water cylinder in a first direction; and wherein feed water exits said feed water cylinder to said feed water input through said feed water inputting means when said feed water piston axially moves in said feed water cylinder in a second direction opposite said first direction, said pump system further comprising feed water control means connected to said feed water intake means and said feed water inputting means for controlling flow of feed water entering and exiting said feed water cylinder such that a portion of the feed water entering said feed water input through said feed water inputting means returns to said feed water cylinder when said feed water piston moves in said first direction, such that a portion of permeate passes through said reverse osmosis membrane due to regular osmosis and, lower pressure caused by said feed water returning to said feed water cylinder.



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5,496,467
**METHOD FOR THE CATALYTIC REFORMING OF NAPHTHA**
Reinhold Brand, Hanau, and Hans L. Rotgerink, Glattbach, both of, Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Germany
Continuation-in-part of Ser. No. 160,869, Dec. 3, 1993, abandoned. This application Mar. 20, 1995, Ser. No. 413,878
Claims priority, application Germany, Dec. 4, 1992, 42 40 863.6
Int. Cl.[6] C10G *35/09;35/095*
U.S. Cl. 208—139 10 Claims

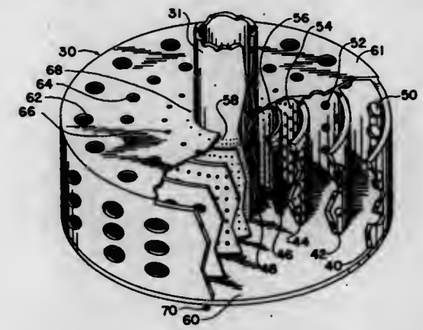


1. A method for the catalytic reforming of naphtha with a high yield of BTX aromatics, comprising, without any partial reformation or fractionation catalytically converting a full boiling range feed stock $C_9$+ containing naphtha under reforming conditions in the presence of a catalyst which contains at least one platinum group metal which is platinum, at least one metal of the group IVB which is zirconium and at least one halogen component which is chlorine on an oxidic carrier, said catalyst being the sole catalyst used for converting naphtha.



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5,496,468
**WASTE WATER MANAGEMENT SYSTEM WITH AN AUXILIARY RESERVOIR**
Réginald Cormier, 319 Boul Saint-Pierre Ouest C.P. 1084, Caraquet, Nouveau-Brunswick, F0B 1K0, Canada
Filed Apr. 29, 1994, Ser. No. 235,333
Int. Cl.[6] B01D *29/15*
U.S. Cl. 210—172 2 Claims

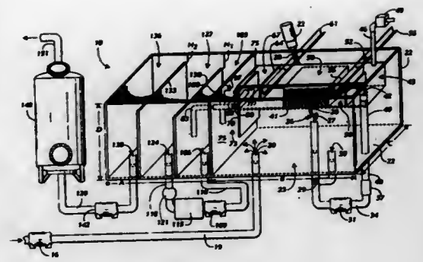


1. A filter composed of concentric elements that include a centre, an upper cover part, and a removable lower part, said filter comprising a number of concentric elements, said filter located at the bottom of a reservoir, said concentric elements having filtering holes whose diameters are smaller as said elements are closer to said center, said upper cover comprising a number of annular concentric rings each having an external side, an internal side and a width corresponding to the distance between two consecutive concentric elements and each ring provided with annular holes, the diameter of said annular holes being generally smaller than the diameter of the filtering holes of the element corresponding to the external side of said ring.

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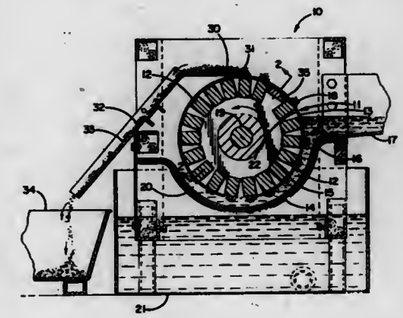
5,496,469
**APPARATUS FOR REDUCING AND SEPARATING EMULSIONS AND HOMGENEOUS COMPONENTS FROM CONTAMINATED WATER**
Charles R. Scraggs, 1000 Abingdon La., Alpharetta, Ga. 30202; Jack R. Creel, 10003 Tupper Lake, and Alonzo L. DeCell, 10030 Cedar Creek, both of Houston, Tex. 77042
Division of Ser. No. 94,684, Jul. 20, 1993, Pat. No. 5,411,665. This application Dec. 28, 1994, Ser. No. 364,696
Int. Cl.[6] C02F *1/40*; B01D *17/022*
U.S. Cl. 210—177 52 Claims

1. An apparatus for separating highly emulsified and/or immiscible components mixed in a fluid, which comprises:
(a) a first treatment tank;
(b) a coalescer channel mounted above said first treatment tank and operative for passing fluid in a substantially horizontal flow path, said coalescer channel comprising an inlet, a coalescer, and an outlet positioned to discharge fluid back into said first treatment tank; and
(c) means for transferring fluid from said treatment tank to said coalescer channel.



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5,496,470
**MAGNETIC SEPARATOR**
Thomas W. Lenhart, Rockton, Ill., assignor to Barnes International, Inc., Rockford, Ill.
Filed May 27, 1994, Ser. No. 250,002
Int. Cl.[6] B01D *35/06*
U.S. Cl. 210—222 3 Claims



2. A magnetic separator for removing magnetic particles from liquid, said separator comprising a housing containing liquid contaminated with magnetic particles, a generally cylindrical drum rotatably supported by said housing and having an outer shell partially disposed in said liquid, a plurality of permanent magnets located within said drum, said magnets being spaced substantially around the inner circumference of said shell and extending axially of the shell, said magnets acting to create a magnetic field around a major and fixed exterior area of said shell whereby said major area of said shell attracts and collects magnetic particles in said liquid as said drum and said shell are rotated, a scraper blade located outside of said liquid and contacting said shell to remove collected magnetic particles from said shell as said particles rotate into engagement with said blade, a discharge chute located adjacent said blade whereby particles scraped from said shell by said blade are pushed onto said chute by subsequently scraped particles, there being a space within said drum and adjacent the inner circumference of said shell, said space extending both axially and circumferentially of said shell and being unoccupied by magnets, and a shunt bar of low magnetic reluctance material located in said space and joined to said shell, said shunt bar reducing said magnetic field around a minor and fixed exterior area of said shell located outwardly of and generally overlying said space whereby the magnetic attraction of particles to said scraper blade is decreased each time said minor and fixed exterior area rotates past said blade thereby facilitating the pushing of scraped particles onto said chute.

5,496,471
**APPARATUS FOR REMOVING COMPONENTS FROM SOLUTIONS**

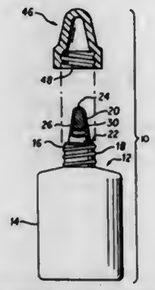
Barbara L. Heyl, Atlanta; Lynn C. Winterton, Roswell; Kai C. Su, Alpharetta, and Jack C. White, Stone Mountain, all of Ga., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 873,215, Apr. 24, 1992, abandoned, which is a continuation-in-part of Ser. No. 814,728, Dec. 19, 1991, which is a division of Ser. No. 671,967, Mar. 18, 1991, Pat. No. 5,080,800, which is a division of Ser. No. 461,988, Jan. 8, 1990, Pat. No. 5,056,689. This application Mar. 1, 1993, Ser. No. 24,224

The portion of the term of this patent subsequent to Oct. 15, 2008, has been disclaimed.

Int. Cl.[6] B01D *15/04*

U.S. Cl. 210—266 17 Claims



1. A device for dispensing an ophthalmic solution, comprising:
(a) a container body defining a solution retaining chamber therein, said chamber containing an ophthalmic solution containing a pharmacologically active substance and having a first pH, said container having an outlet for dispensing the solution from the chamber; and
(b) means for changing the pH of the solution as the solution is dispensed from the chamber through the outlet.

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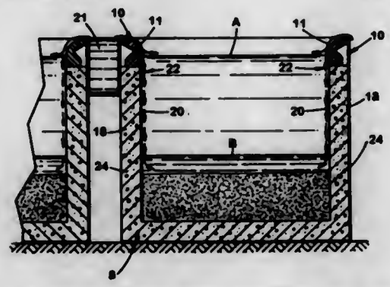
5,496,472
**METHOD AND APPARATUS FOR DENITRIFICATION OF WASTEWATER**

David C. Slack, and Gregory A. Ellard, both of Tampa, Fla., assignors to Tetra Technologies, Inc., The Woodlands, Tex.

Filed Dec. 20, 1993, Ser. No. 170,531

Int. Cl.[6] C02F *3/00*

U.S. Cl. 210—605 11 Claims



1. A method of removing nitrates from wastewater, comprising passing the wastewater over a weir having an outer weir surface with a convex shape and along a wall of denitrification vessel, said denitrification vessel comprising filter media having microorganisms on their surfaces, said wall having an inner surface that is contiguous with the convex outer weir surface, to provide substantially laminar flow of liquid from the weir outer surface to the inner surface of the wall.

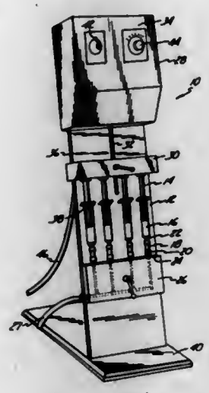
5,496,473
**APPARATUS FOR PROCESSING BIOPOLYMER-CONTAINING COLUMNS**

Flora Chow, Bowie, Md., assignor to Barrskogen, Inc., Bowie, Md.

Continuation-in-part of Ser. No. 860,092, Mar. 30, 1992, abandoned. This application Sep. 30, 1994, Ser. No. 313,221

Int. Cl.[6] B01D *15/08*

U.S. Cl. 210—635 13 Claims



9. A process for the removal, recovery, deprotection, and/or purification of biopolymers from a solid matrix, the process comprising the steps of:
(a) providing a substantially cylindrical column, comprising a biopolymer attached to a solid matrix, said column having, at opposite ends thereof, an inlet port and an outlet port, said inlet port being in fluid communication with said delivery means,
(b) providing an apparatus comprising
(i) syringe-like liquid delivery means comprising a movable plunger within a cylindrical barrel, said delivery means being capable of receiving and holding said liquid and being capable of delivering said liquid into said inlet port of said column upon depression of said plunger,
(ii) liquid receiving means in fluid communication with said outlet port of said column,
(iii) drive means capable of depressing said plunger in a controlled fashion, comprising;
a. plunger engagement means for contacting, in order to depress, said plunger,
b. linkage means capable of moving said plunger engagement means in response to the operation of a motor, and
c. a motor capable of moving said engagement means at a controlled rate to depress the plunger, thereby delivering said liquid to said column, and
(iv) support means capable of retaining said drive means in operational alignment with said delivery means, and capable of releasably receiving and supporting said barrel, said column, and said receiving means in axial alignment with each other,
(c) attaching said column to said apparatus in order to provide fluid communication between said delivery means and said inlet port of said column, and between said receiving means and said outlet port of said column,
(d) sequentially delivering desired liquids useful for the removal, recovery, deprotection, and/or purification of said biopolymer through said column from said delivery means, and
(d) recovering desired fractions of said delivered liquids in said receiving means.



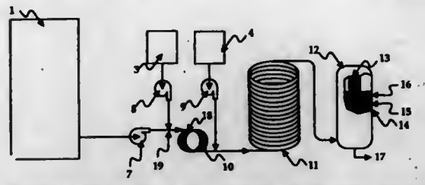
5,496,474
**PROCESS OF RECOVERING SILVER FROM PHOTOGRAPHIC SOLUTIONS AND INHIBITING FORMATION OF UNDESIRABLE PRECIPITATE**

Charles S. Christ, Jr., Fairport, and Albert R. Szembrot, Penfield, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 8, 1994, Ser. No. 351,849

Int. Cl.[6] C02F *1/62;1/66*

U.S. Cl. 210—725 6 Claims



1. A process for inhibiting the formation of an unwanted precipitate comprising $[H_{2-n}TMT]Na_n[HNR_3]$ on the inner surfaces of an apparatus, during precipitation in said apparatus of silver mercapto-s-triazine (AgTMT) from a silver containing photoprocessing solution, wherein said process comprises the steps of:
(a) providing an apparatus having inner surfaces;
(b) pumping the silver containing photoprocessing solution into the apparatus;
(c) pumping TMT reagent into the silver containing photoprocessing solution within the apparatus, to mix the silver containing photoprocessing solution and the TMT reagent, thereby forming AgTMT precipitate;
(d) adding sufficient base to increase the pH of the mixture of the TMT reagent and photoprocessing solution in the apparatus above the pH of the mixture, before addition of base, said added base being mixed:
(i) directly to the photoprocessing solution before mixing TMT reagent with the photoprocessing solution; or
(ii) with the photoprocessing solution concurrently with TMT reagent; or
(iii) immediately after the point TMT reagent begins mixing with the photoprocessing solution.

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5,496,475
**LOW VISCOSITY POLAR-SOLVENT FIRE-FIGHTING FOAM COMPOSITIONS**

Chang H. Jho, Dobbs Ferry; Yung Loh, Woodside, and Karl F. Moeller, New York, all of N.Y., assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

Filed Oct. 30, 1992, Ser. No. 969,622

Int. Cl.[6] A62D *1/00;1/02*

U.S. Cl. 252—2 19 Claims

1. A reduced viscosity aqueous polar-solvent fire-fighting foam concentrate which comprises 1.0 to 3.0% by weight of a polysaccharide gum and a viscosity-reducing amount of 1.0 to 3.5% by weight of a water-soluble, anionic copolymer, wherein said copolymer has a weight average molecular weight of from 10,000 to 250,000 mass units and has units of the formula

$$(M_1)_k—(M_2)_m—(M_3)_n$$

in which
$M_1$ is a radical of a vinyl mono- or dicarboxylic acid or a salt thereof,
$M_2$ is a radical of a water-soluble acrylamide, methacrylamide or vinylamide,
$M_3$ is a radical of one or more other copolymerizable monomers selected from the group consisting of acrylates, methacrylates, vinyl esters, vinyl ethers and styrene,
k is 0.05 to 0.50 and is <m,
m is 0.30 to 0.95 and
n is 0 to 0.50,
where k, m and n are the weight fractions of the respective monomers, and the sum of k+m+n is 1.00.

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5,496,476
**NON-FORMALDEHYDE DURABLE PRESS FINISHING FOR CELLULOSIC TEXTILES WITH PHOSPHONOALKYLPOLYCARBOXYLIC ACID**

Robert H. Tang, Murrysville, and William A. Williams, Jr., Latrobe, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 192,931, Feb. 7, 1994, abandoned, which is a continuation of Ser. No. 993,576, Dec. 21, 1992, abandoned. This application May 24, 1994, Ser. No. 247,943

Int. Cl.[6] D06M *13/192;13/282*

U.S. Cl. 252—8.6 18 Claims

1. A method for treating cellulose-containing fibrous materials free from the generation of formaldehyde and free from formaldehyde condensates comprising the steps of:
(a) treating said fibrous material with an aqueous solution comprising (i) phosphonoalkylpolycarboxylic acid having at least one phosphono group, at least two carboxylic groups and wherein the alkyl group of said acid contains from 3 to 8 carbon atoms, and (ii) polyacrylic acid having a weight average molecular weight less than 8000, and (iii) a catalytic amount of esterification catalyst, said phosphonoalkylpolycarboxylic acid being at least 10 mole percent of the polycarboxylic acids in the aqueous treating solution, and
(b) heating said treated fibrous material at temperatures and for a time sufficient to effect the crosslinking of cellulose in said fibrous material.

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5,496,477
**NON-FORMALDEHYDE DURABLE PRESS FINISHING FOR CELLULOSIC TEXTILES WITH PHOSPHINOCARBOXYLIC ACID**

Robert H. Tang, Murrysville, and William A. Williams, Jr., Latrobe, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 192,932, Feb. 7, 1994, abandoned, which is a continuation of Ser. No. 993,577, Dec. 21, 1992, abandoned. This application May 24, 1994, Ser. No. 247,949

Int. Cl.[6] D06M *13/192;13/282*

U.S. Cl. 252—8.6 10 Claims

1. A method for treating cellulose-containing fibrous materials comprising the steps of:
(a) treating said fibrous material with an aqueous solution comprising (i) polyphosphinocarboxylic acid and (ii) a catalytic amount of esterification catalyst, and
(b) heating said treated fibrous material at temperatures and for a time sufficient to effect the crosslinking of cellulose in said fibrous material.

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5,496,478
**SILICONE CONTAINING IMIDAZOLINE COMPOSITIONS**

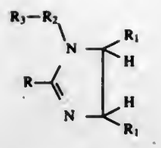
Dennis L. Fost, Ridgewood, and Abe Berger, Summit, both of N.J., assignors to Mona Industries, Inc., Paterson, N.J.

Filed Sep. 12, 1994, Ser. No. 304,563

Int. Cl.[6] C10M *105/08*; C07D *231/10*

U.S. Cl. 252—33.6 4 Claims

1. Silicone containing imidazoline compositions represented by the formula:



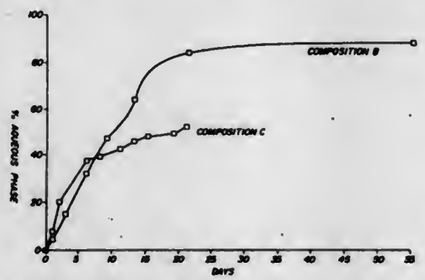
wherein:
R is a organosilicone chain represented by the formula:



wherein:
$R_5$, which can be the same or different, is selected from $R_6$, a group of the formula $(CH_2)_{n1}—B_{n2}—(CH_2)_{n3}—$ and mixtures thereof, wherein $R_6$ is as herein below defined, $n^1$ is zero or an integer from 1 to 12, $n^2$ is 0 or 1, $n^3$ is an integer from 1 to 5, and B is sulfur or oxygen with the proviso that when $n^2$ is 1, $n^1$ and $n^3$ each is at least 1; and with the further proviso that at least one of $R_5$ is a group of the formula $—(CH_2)_{n1}—B_{n2}—(CH_2)_{n3}—$;
$R_6$, which can be the same or different is selected from alkyl, aryl and olefin;
$R_7$ and $R_8$, which can be the same or different are selected from alkyl, aryl, polyoxyalkylene, alkaryl, aralkylene and alkenyl;
a is an integer from 0 to 50,000;
b is an integer from 0 to 5,000; and
c is an integer from 0 to 100;
$R_1$ which can be the same or different is of the group consisting of hydrogen and lower alkyl;
$R_2$ is hydrogen or an alkylene hydrocarbon group; and
$R_3$ is selected from —OH, $—NH_2$, $R_9CONH—$, $R_9COO—$ and —H, wherein $R_9$ is saturated or unsaturated alkyl having from 1–22 carbon atoms.

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**5,496,479**
**COMPOSITIONS FOR AQUEOUS MACHINING FLUIDS AND CYCLODEXTRIN AND FATTY SUBSTANCE BASED AQUEOUS MACHINING FLUIDS**
**Didier Videau, Lille, and Serge Gosset, Lestrem, both of, France, assignors to Roquette Freres, Lestrem, France**
**PCT No. PCT/FR93/00688, § 371 Date Jan. 6, 1995, § 102(e) Date Jan. 6, 1995, PCT Pub. No. WO94/01518, PCT Pub. Date Jan. 20, 1994**
**PCT Filed Jul. 5, 1993, Ser. No. 367,253**
**Claims priority, application France, Jul. 7, 1992, 92 08372**
**Int. Cl.[6] C10M** *173/00*
**U.S. Cl. 252—49.3** **13 Claims**




1. Aqueous machining fluid comprising at least one fatty substance, at least one cyclodextrin, and water.

**5,496,480**
**ASHLESS DISPERSANTS COMPRISING REACTION PRODUCT OF ACYLATING AGENT AND AMINOGUANIDINE**
**Anthony J. Rollin, and Joseph J. Valcho, both of Midlothian, Va., assignors to Ethyl Corporation, Richmond, Va.**
**Division of Ser. No. 77,724, Jun. 16, 1993, Pat. No. 5,433,875. This application May 22, 1995, Ser. No. 447,308**
**Int. Cl.[6] C10M** *133/58;133/56;* **C07D** *249/14*
**U.S. Cl. 252—51.5 A** **10 Claims**

1. An ashless dispersant having in its chemical structure at least one aliphatic hydrocarbyl substituent derived from a liquid, linear polymer of propylene, said polymer having stereo-irregularity and optionally containing up to 25 mol percent of ethylene or $C_4$ to $C_{10}$ monoolefin polymerized into the polymer chain, at least 60 mol percent of said polymer having a terminal vinylidene group, said dispersant being a product formed by reacting (i) an alkenyl succinic acylating agent having said substituent thereon and (ii) a basic salt of aminoguanidine wherein the molar ratio of said aminoguanidine to said acylating agent is in the range of about 1.4:1 to about 2.2:1 such that the product obtained upon reaction thereof exhibits a dominant infrared peak at 1640 $cm^{-1}$.

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**5,496,481**
**ELECTROLYTE FOR ELECTROLYTIC CAPACITOR**
**Yanming Liu, Mundelein, Ill., assignor to Boundary Technologies, Inc., Buffalo Grove, Ill.**
**Filed Dec. 21, 1994, Ser. No. 360,463**
**Int. Cl.[6] H01G** *9/145*
**U.S. Cl. 252—62.2** **34 Claims**

1. An electrolyte composition for electrolytic capacitors comprising:
N,N-diisopropylethylamine, a solvent, and a carboxylic acid wherein the carboxylic acid is a straight chain alkyl dicarboxylic acid or a branched chain alkyl di- or poly-basic acid in which the $CO_2H$ groups of said carboxylic acid are separated by at least 2 carbon atoms.

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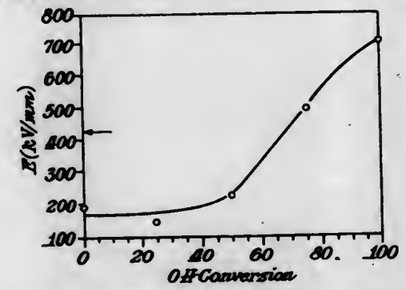
**5,496,482**
**PROCESS FOR THE PREPARATION OF ALKALI METAL ACETATES**
**Gerhard Bettermann, Nörvenich; Günther Schimmel, Erftstadt, and Johannes Himmrich, Hürth-Kendenich, all of, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany**
**Filed Dec. 2, 1992, Ser. No. 984,330**
**Claims priority, application Germany, Dec. 14, 1991, 41 41 300.8**
**Int. Cl.[6] C09K** *3/18*
**U.S. Cl. 252—70** **7 Claims**

1. A process for the preparation of a corrosion-inhibiting liquid de-icing agent based on alkali metal acetates as well as phosphoric acid and an inhibitor selected from the group consisting of benzotriazole, tolyltriazole and imidazole, which comprises initially introducing a 30 to 50 percent by weight strength alkali metal hydroxide solution into a reaction container provided with a cooling device and a mixing device; metering 85 to 100% strength acetic acid into the reaction container until the ratio by weight of acetic acid to alkali metal hydroxide solution therein is (0.20 to 0.45):1; transferring a portion of this solution from the reaction container into a stirred dissolving tank and dissolving therein 0.03 to 1% by weight, relative to the batch of an inhibitor selected from the group consisting of benzotriazole, tolytriazole and imidazole; introducing the solution containing azole and 0.01 to 0.2% by weight, relative to the batch, of phosphoric acid into the reaction container; continuing to meter acetic acid into the reaction container until the density of the solution in the reaction container is 1.07 to 1.39 $g/cm^3$ at 20° C.; introducing small amounts of alkali metal hydroxide solution or acetic acid into the reaction container until the pH of the solution therein is 9.2 to 9.8 and finally withdrawing this solution from the reaction container as a liquid de-icing agent.



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**5,496,483**
**ELECTROVISCOUS LIQUID BASED ON DISPERSED MODIFIED POLYETHERS**
**Udo Herrmann, Dormagen; Günter Oppermann; Günther Penners, both of Leverkusen; Roland Flindt, Cologne, and Hans-Horst Steinbach, Lindlar, all of, Germany, assignors to Bayer AG, Leverkusen, Germany**
**Continuation of Ser. No. 899,724, Jun. 17, 1992, which is a continuation-in-part of Ser. No. 620,845, Dec. 3, 1990, abandoned. This application Apr. 11, 1994, Ser. No. 225,516**
**Claims priority, application Germany, Dec. 14, 1989, 39 41 252.6; Aug. 25, 1990, 40 26 880.2**
**Int. Cl.[6] C09K** *3/00;5/00;5/06*
**U.S. Cl. 252—73** **8 Claims**

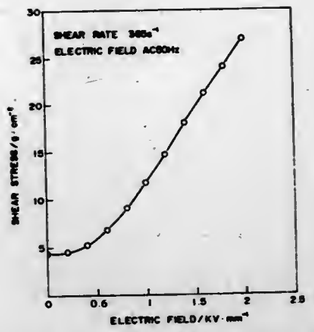



1. A process for making electroviscous liquid, comprising:
dispersing
(a) a linear or branched polyether having functional groups in an amount of 20% to 60% by weight of the electroviscous liquid, and (b), a cross-linking agent selected from the group consisting of difunctional isocyanates, trifunctional isocyanates, acetate cross-linking agents, benzamid cross-linking agents, oxim cross-linking agents, or alkoxy cross-linking agents, wherein the cross-linking agent (b) is used in a sufficient quantity to react with 20–100% of the OH-groups of the polyether and that the sum of (a) and (b) is 40–70% by weight of the electroviscous liquid, in
(c) a non-aqueous dispersion medium, in the presence of
(d) 0.1 to 5.0% by weight based on the electroviscous liquid of a dispersing agent soluble in the dispersion medium, whereby particles of a mixture of (a) & (b) are formed, said particles having a diameter of 0.5 to 200 microns, and
reacting the polyether with the cross linking agent.

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**5,496,484**
**ELECTROVISCOUS FLUIDS CONTAINING SEMICONDUCTING PARTICLES AND DIELECTRIC PARTICLES**
**Koji Shima, Machida; Yukio Chica, Tokyo; Iwao Yamamoto, Yokohama, and Kenji Watanabe, Sagamihara, all of, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan**
**Continuation of Ser. No. 987,731, Dec. 8, 1992, abandoned. This application Dec. 15, 1994, Ser. No. 357,344**
**Claims priority, application Japan, Dec. 17, 1991, 3-333535**
**Int. Cl.[6] C10M** *171/00;169/04*
**U.S. Cl. 252—74** **9 Claims**

1. An electroviscous fluid comprising an electrical insulating liquid and particles dispersed therein,
said particles being composed of (i) semiconducting particles selected from the group consisting of carbonaceous material and polyacene quinone, having a weight average particle size of 1 to 100 μm and composed of a material having an electrical conductivity of $10^{-2}$ to $10^{-10}$ $S·cm^{-1}$ and (ii) dielectric particles selected from the group consisting of titanate dielectric particles and lead containing oxide dielectric particles having a weight average particle size of 0.1 to 3 μm and having a dielectric constant of not less than 100, the weight average particle size of the dielectric particles being not more than 30% of that of the semiconducting particles, the amount of the dielectric particles being 5 to 40 vol % based on the total particles, and the amount of the particles in the whole fluid being 10 to 60 vol %.




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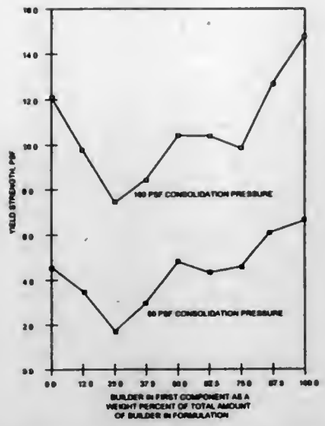
**5,496,485**
**ETCHING COMPOSITIONS**
**David S. Materna ghan, Ilkeston, Great Britain, assignor to Micro-Image Technology Limited, London, England**
**PCT No. PCT/GB93/01083, § 371 Date Dec. 19, 1994, § 102(e) Date Dec. 19, 1994, PCT Pub. No. WO93/23493, PCT Pub. Date Nov. 25, 1993**
**PCT Filed May 17, 1993, Ser. No. 325,333**
**Claims priority, application United Kingdom, May 16, 1992, 9210514**
**Int. Cl.[6] C09K** *13/00*
**U.S. Cl. 252—79.3** **14 Claims**

1. An aqueous composition for etching and cleaning semiconductor devices comprising at least one acid and a surfactant, characterised in that the composition comprises from 100 ppm to 2000 ppm of a surfactant which is a branched chain aliphatic amine having the formula $C_mH_{2m+3}N$, where m is an integer from 7 to 10.

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**5,496,486**
**PROCESS FOR INCREASING LIQUID SURFACTANT LOADING IN FREE FLOWING POWDER DETERGENTS**
**David S. Staley, Rockford, Mich., assignor to Amway Corporation, Ada, Mich.**
**Filed Jun. 30, 1994, Ser. No. 269,371**
**Int. Cl.[6] C11D** *11/00;17/06;3/12*
**U.S. Cl. 252—89.1** **16 Claims**

1. A method for producing a powdered detergent composition comprising:
providing a first portion of a flowable powder detergent builder selected from the group consisting of sodium carbonate, sodium aluminum silicate, pentasodium triphosphate, trisodium nitrilotriacetate, citrates, sulfates and mixtures thereof;
blending said first portion of said flowable powder detergent builder with a liquid surfactant;
blending an effective amount of finely divided, water insoluble, silica barrier particles, with said blend of said first portion of detergent builder and said liquid surfactant to form a first component; and




further blending said first component with a second portion of a flowable powder detergent builder selected from the group consisting of sodium carbonate, sodium aluminum silicate, pentasodium triphosphate, trisodium nitrilotriacetate, citrates, sulfates and mixtures thereof, wherein said first portion of said detergent builder comprises between about 10% to about 75% of the combined total of said first portion of said detergent builder and said second portion of said detergent builder, wherein the total of said first portion and said second portion of flowable powder detergent builder constitutes from about 40% to about 95% of the total of said first portion and said second portion of said flowable powder detergent builder, said finely divided barrier particles, and said liquid surfactant, and wherein said finely divided barrier particles constitute from about 0.5% to about 5% of the total of said first portion and said second portion of said flowable powder detergent builder, said finely divided barrier particles, and said liquid surfactant.

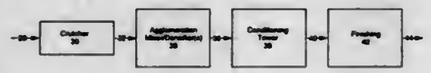
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**5,496,487**

## AGGLOMERATION PROCESS FOR MAKING A DETERGENT COMPOSITION UTILIZING EXISTING SPRAY DRYING TOWERS FOR CONDITIONING DETERGENT AGGLOMERATES

**Scott W. Capeci, North Bend, Ohio; David R. Nassano, Cold Springs, Ky., and Robert G. Welch, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio**

**Filed Aug. 26, 1994, Ser. No. 296,764**
**Int. Cl.[6] C11D** *11/00;17/06*
**U.S. Cl. 252—89.1** **18 Claims**




1. A process for producing a high density granular detergent composition comprising the steps of:

(a) agglomerating starting detergent ingredients by initially treating said starting detergent ingredients in a high speed mixer/densifier and subsequently in a moderate speed mixer/densifier so that detergent agglomerates having a density of at least 650 g/l are formed;

(b) conditioning said detergent agglomerates in a spray-drying tower so as to enhance the free flowability of said detergent agglomerates; and

(c) admixing adjunct detergent ingredients in said detergent agglomerates, thereby producing said high density granular detergent composition.

**5,496,488**

## CLEANSING BAR COMPOSITION CONTAINING PETROLATUM HAVING A SPECIFIC SIZE RANGE

**Mark L. Kacher, Mason; Julie A. Wagner, Cincinnati; James R. Schwartz, West Chester; Efrain Torres; Marcus W. Evans, both of Cincinnati, and James E. Taneri, West Chester, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio**

**Continuation of Ser. No. 909,877, Jul. 7, 1992, Pat. No. 5,312,559. This application May 17, 1994, Ser. No. 245,387**
**Int. Cl.[6] C11D** *9/24;9/48;13/16;17/00*
**U.S. Cl. 252—125** **7 Claims**

1. A solid cleansing bar composition, by weight, consisting essentially of:

(A) 5 parts to 75 parts saturated fatty acid material consisting of a mixture of $C_8$–$C_{22}$ free fatty acid and $C_8$–$C_{22}$ fatty acid soap;

(B) 10 parts to 90 parts water;

(C) 0.5 parts to 35 parts petrolatum having a particle size distribution of from 5 to 120 microns, at least about 20% of the particles having a particle size greater than 10 microns; and

(D) a mild lathering synthetic surfactant; and

wherein said mild lathering synthetic surfactant and said saturated fatty acid material have a ratio of from about 2:1 to about 1:2.

7. A method of making a solid cleansing bar composition, by weight, comprising:

(A) 5 parts to 75 parts saturated fatty acid material consisting of a mixture of $C_8$–$C_{22}$ free fatty acid and $C_8$–$C_{22}$ fatty acid soap;

(B) 10 parts to 90 parts water;

(C) 0.5 parts to 35 parts petrolatum having a particle size distribution of from 5 to 120 microns, at least about 20% of the particles having a particle size greater than 10 microns; and

(D) a mild lathering synthetic surfactant; and

wherein said mild lathering synthetic surfactant and said saturated fatty material have a ratio of from about 2:1 to about 1:2, said method comprising: (1) heating and mixing said free fatty acid to provide a stable melt; (2) forming soap in situ by adding aqueous sodium hydroxide to provide a heated mix; (3) adding said mild synthetic surfactant to said heated mix; (4) adding said petrolatum to said heated mix of (3) using low shear and minimal mixing time to provide a homogeneous mix; (5) pouring the heated homogeneous mix of (4) into bar molds and cooling to provide said solid cleansing bar composition.

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**5,496,489**

## SOLID, TRANSPARENT SOAP COMPOSITION BASED ON FATTY ACID SALTS AND CONTAINING ISOPRENE GLYCOL

**Lydia Dussault, Saint Nom la Breteche, and Alain Caudet, Meudon, both of, France, assignors to L'Oreal, Paris, France**

**Filed Jun. 29, 1994, Ser. No. 267,359**
**Claims priority, application France, Jul. 9, 1993, 93 08510**
**Int. Cl.[6] C11D** *1/72*
**U.S. Cl. 252—134** **10 Claims**

1. Composition in the form of a solid, transparent cake containing, expressed by weight relative to the total weight of the compositions,

a) from 25 to 40% of a soap consisting of a salt of $C_{10}$–$C_{20}$ fatty acids or mixtures thereof;

b) from 2 to 50% of isoprene glycol;

c) from 0 to 48% of a transparency agent selected from the group consisting of $C_2$–$C_6$ diols other than isoprene glycol, $C_3$–$C_6$ polyols, urea and mixtures thereof, the total concentration of b+c being between 25 and 50%; and

d) water in an amount less than or equal to 25%.



**5,496,490**

## LAUNDRY DETERGENT COMPOSITIONS CONTAINING LIPASE AND SOIL RELEASE POLYMER

**Charles A. Beagle, S. Plainfield; Elliot M. Scherr, Princeton, and Riad A. Taha, Spotswood, all of N.J., assignors to Colgate-Palmolive Co., New York, N.Y.**

**Continuation of Ser. No. 117844, Sep. 7, 1993, abandoned. This application Apr. 10, 1995, Ser. No. 419,880**
**Int. Cl.[6] C11D** *3/37;3/386*
**U.S. Cl. 252—135** **10 Claims**

1. A particulate laundry detergent composition having significantly improved oily soil removal activity comprising, by weight, (a) from about 1% to 50% of one or more detergent compounds selected from the group consisting of anionic sulfated or sulfonated detergents and C10–C18 alcohol ethylene oxide condensate nonionic detergents and mixtures thereof; (b) 0.1% to 1.0% of a lipase enzyme in an amount effective for oily soil removal from stained fabric; (c) 0.5% to 10% of a soil release copolymer of polyethylene terephthalate (PET) and polyoxyethylene terephthalate (POET) having a molecular weight in the range of about 15,000 to 50,000 wherein the polyoxyethylene (POET) is of a molecular weight in the range of about 1,000 to 10,000 and the molar ratio of PET to POET units is from 2:1 to 6:1, in an amount effective for oily soil removal from stained fabric; and (d) from about 10% to 75% of a water soluble or water insoluble, inorganic or organic builder for said detergent compound; said laundry detergent composition being capable of removing a variety of oily soils from fabric to an extent greater than the additive soil removing effects measured with comparative compositions containing components (a), (b) and (d) or (a), (c) and (d) respectively, each of said comparative compositions being devoid of any combination of said lipase enzyme and said soil release copolymer.

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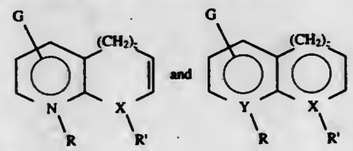
**5,496,491**

## ORGANIC STRIPPING COMPOSITION

**Irl E. Ward, Bethlehem, and Francis W. Michelotti, Easton, both of Pa., assignors to Ashland Oil Company, Dublin, Ohio**

**Continuation-in-part of Ser. No. 983,257, Nov. 30, 1992, Pat. No. 5,417,877, which is a continuation-in-part of Ser. No. 647,487, Jan. 25, 1991, abandoned. This application May 22, 1995, Ser. No. 446,435**
**Int. Cl.[6] C09D** *9/00;* **C11D** *3/43;3/44*
**U.S. Cl. 252—153** **12 Claims**

1. In a stripping composition for photoresists wherein said stripping composition comprises an organic polar solvent and a basic amine, the improvement which comprises that said composition contains about 0.5 to 10% by weight of an inhibitor which is the dissolved salt reaction product of an alkanolamine and a reactant selected from the formula consisting of:



wherein

X represents C, O, N, or S,

Y represents C, O, N, or S,

R represents —OH, —NR"R", —SR", —NO, $NO_2$ or



z is 0 or 1;

R' represents —OH, —NR"R", —SR", —NO, $NO_2$ or



G represents H, —OH and $CO_2R"$, lower alkyl or halo,

R" represents H or lower alkyl, and

R'" represents lower alkyl or lower alkoxy.

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**5,496,492**

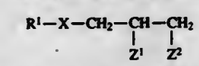
## DETERGENT COMPOSITION

**Hirokazu Hamada, Chiba; Kiyoko Nakagaki, Tokyo, and Masaki Itabashi, Kamagaya, all of, Japan, assignors to Kao Corporation, Tokyo, Japan**

**Continuation of Ser. No. 919,737, Jul. 27, 1992, abandoned. This application Apr. 21, 1994, Ser. No. 232,423**
**Claims priority, application Japan, Jul. 26, 1991, 3-187531**
**Int. Cl.[6] C09D** *9/00;* **A61K** *7/021;* **A01N** *25/00*
**U.S. Cl. 252—170** **7 Claims**

1. A detergent composition consisting essentially of:

(A) from 0.5 to 10 percent by weight of a glycerol derivative having the following formula



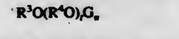
(I)

wherein one of $Z^1$ and $Z^2$ represents $R^2$—Y— and the other of $Z^1$ and $Z^2$ represents —OH and wherein $R^1$ and $R^2$, which may be the same or different, represent hydrocarbon groups having a total carbon atom number of 13 to 40, and X and Y represent an oxygen atom or



(B) from 1 to 30 percent by weight of a water soluble polyhydric alcohol; and

(C) from 10 to 50 percent by weight of a nonionic surfactant selected from the group consisting of a polyoxyethylene alkyl ether, a polyoxyethylene polypropylene alkyl ether, and alkyl glycosides represented by formula (IV)



(IV)

wherein $R^3$ represents a $C_8$–$C_{18}$ alkyl, $C_8$–$C_{18}$ alkylphenyl, $C_8$–$C_{18}$ hydroxyalkyl or $C_8$–$C_{18}$ hydroxyalkylphenyl group, $R^4$ represents $C_2$–$C_4$ alkyl group, t is an integer of 0 to 5, G represents a group derived from a $C_5$–$C_6$ reducing sugar and u represents a number of from 1 to 3.

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**5,496,493**

## ULTRA MILD PERSONAL CLEANSING BAR CONTAINING SMALLER-SIZED PARTICULATE WAX

**Sherri V. Cox, West Chester, and Monica B. Emelko, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio**

**Filed May 10, 1994, Ser. No. 241,077**
**Int. Cl.[6] C11D** *17/00;9/22*
**U.S. Cl. 252—174** **12 Claims**

1. A lathering personal cleansing bar composition comprising:

a) from 20 parts to 90 parts of a lathering surfactant, wherein said lathering surfactant is selected from the group consisting of methyl acyl taurates, N-acyl glutamates, alkyl sulfosuccinates, alkyl phosphate esters, ethoxylated alkyl phosphate esters, trideceth sulfates, ethoxylated alkyl sulfates, alkyl amine oxides, betaines, sultaines, C12–C14 alkyl glyceryl ether sulfonate, C12–C18 acyl sarcosinate, sodium acyl isethionate, sodium isethionate, soaps, and mixtures thereof;

b) from 10 to 50 parts of a plasticizer which comprises small-sized solid wax particles wherein at least 85% of said wax particles have a particle size of less than 16 microns; and

c) from 3 to 30 parts era binder wherein said binder is selected from the group consisting of water, liquid water-soluble aliphatic polyol, polyethylene glycol, polypropylene glycol, and mixtures thereof.

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**5,496,494**

## PROCESS FOR DECREASING THE BUILD UP OF INORGANIC INCRUSTATIONS ON TEXTILES AND DETERGENT COMPOSITION USED IN SUCH PROCESS

**Fulvio Burzio, Milan, Italy, and Roland Beck, Brussels, Belgium, assignors to Ausimont S.p.A., Milan, Italy, and Cerestar Holding B.V., Sas Van Gent, Netherlands**

**Filed Mar. 25, 1994, Ser. No. 218,213**

**Claims priority, application European Pat. Off., Mar. 30, 1993, 93105232**

**Int. Cl.[6] C11D *17/00;17/04***

**U.S. Cl. 252—174.17** **8 Claims**

1. In a process for decreasing the build-up of inorganic incrustations on fabrics and on washing machine components during multiple fabric washing cycles carried out by a detergent composition comprising surfactants, an inorganic persalt, and a zeolite builder, the improvement comprising the addition to the washing cycle of a combination of the detergent composition with a co-builder selected from the group consisting of non-reducing or hydrogenated sugar alcohols having the general formula $HOCH_2(CHOH)_nCH_2OH$, where n has a value from 2 to 5.

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**5,496,495**

## DETERGENT FORMULATIONS FREE OF PHOSPHATES, ZEOLITES AND CRYSTALLINE LAYERED SILICATES

**Rudolf Beck, Marl; Frank Krause, Kleve, and Udo Schoenkaes, Haltern, all of, Germany, assignors to Chemische Fabrik Stockhausen GmbH, Krefeld, Germany**

**Filed Aug. 3, 1994, Ser. No. 285,279**

**Claims priority, application Germany, Aug. 4, 1993, 43 26 129.9**

**Int. Cl.[6] C11D *3/37***

**U.S. Cl. 252—174.23** **13 Claims**

1. A detergent formulation which is free of phosphates, zeolites and crystalline layered silicates, comprising

(a) 3 to 70% by weight of one or more surfactants;

(b) 1 to 60% by weight of a readily biodegradable copolymer having a carbon chain and one or more hydroxyl groups covalently bonded directly thereon, and which consists of monomer units obtained from

(A) 10 to 70% by weight of monoethylenically unsaturated dicarboxylic acids, anhydrides, salts thereof or mixtures thereof,

(B) 20 to 85% by weight of monoethylenically unsaturated monocarboxylic acids, salts thereof or mixtures thereof,

(C) 1 to 50% by weight of monounsaturated monomers which upon polymerization, after hydrolysis or saponification, give monomer units which have one or more free hydroxyl groups covalently bonded directly on a carbon chain of the copolymer, and

(D) 0 to 15% by weight of one or more further monomers capable of free radical copolymerization, said monomers containing groups selected from sulphonyl, sulphate, phosphonic and phosphate groups;

(c) 0 to 60% by weight of washing alkalis; and

(d) 0 to 70% by weight of inorganic neutral salts.

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**5,496,496**

## PROCESS FOR PRODUCING POLYURETHANE ELASTOMERS

**Yasuyuki Kajita, Suita; Tsutomu Kubota, Shimamoto, and Kenji Kudo, Suita, all of, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan**

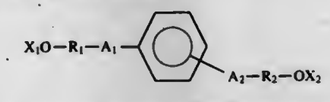
**Filed Feb. 10, 1993, Ser. No. 15,799**

**Claims priority, application Japan, Feb. 18, 1992, 4-031033**

**Int. Cl.[6] C08G *18/32;18/42;18/48***

**U.S. Cl. 252—182.24** **1 Claim**

1. A polyurethane elastomer curing composition which consists of a diol of the general formula



wherein $A_1$ and $A_2$ are the same or different and each represents a bond, —O— or —COO—; $R_1$ and $R_2$ are the same or different and each represents $C_{1-6}$ alkylene; and $X_1$ and $X_2$ are the same or different and each represents H or hydroxylalkyl, and

a triol having a hydroxyl equivalent weight of 60 to 500 and being selected from the group consisting of (a) a trifunctional polyether polyol obtained by random or block addition reaction between at least one of trimethylolpropane or glycerol and at least one alkylene oxide, (b) a trifunctional polyester polyol obtained by addition reaction between at least one of trimethylolpropane or glycerol and at least one cyclic ester and (c) a hydroxyl-containing fatty acid ester which is the product of condensation between at least one of trimethylolpropane and glycerol and at least one hydroxyl-containing fatty acid, the weight ratio of the diol and the triol being 1:0.05 to 1.5.

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**5,496,497**

## LIQUID CRYSTAL PREPOLYMER COMPOSITION AND LIQUID CRYSTAL DISPLAY DEVICE USING THE SAME

**Yasuyuki Takiguchi, Kawasaki; Akihiko Kanemoto, Yokohama, and Yumi Matsuki, Yamato, all of, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan**

**Filed Mar. 31, 1994, Ser. No. 220,699**

**Claims priority, application Japan, Mar. 31, 1993, 5-097182; Nov. 4, 1993, 5-298888**

**Int. Cl.[6] C09K *19/52;* G02F *1/13***

**U.S. Cl. 252—299.01** **28 Claims**

1. A liquid crystal/prepolymer composition which comprises a liquid crystal component, a prepolymer composition and a photopolymerization initiator, said liquid crystal/prepolymer composition, when polymerized, being capable of inducing phase separation into said liquid crystal component and a polymer, said prepolymer composition consisting essentially of:

a monofunctional acrylate component having one double bond, with an HLB value of 3.2 to 5.5; and

a bifunctional acrylate component having two double bonds, with an HLB value of 3.5 to 11, wherein said monofunctional acrylate component is present in an amount of from 20 to 80 wt. % of the total weight of said prepolymer composition.



**5,496,498**

## COMPENSATOR FOR LIQUID CRYSTAL DISPLAY

**Takehiro Toyooka, Yokohama; Shigeki Iida, Kawasaki, and Hiroyuki Itoh, Yokohama, all of, Japan, assignors to Nippon Oil Company, Tokyo, Japan**

**Continuation of Ser. No. 32,426, Mar. 16, 1993, abandoned, which is a continuation of Ser. No. 720,604, Jun. 25, 1991, abandoned. This application Dec. 16, 1994, Ser. No. 357,548**

**Claims priority, application Japan, Jun. 26, 1990, 2-165718**

**Int. Cl.[6] C09K *19/52;* G02F *1/13***

**U.S. Cl. 252—299.01** **13 Claims**




1. A compensator for liquid crystal display of an active matrix type constituted by a film of a liquid crystalline polymer which exhibits a twisted nematic orientation in a liquid crystal state and assumes a glassy state at temperatures below a liquid crystal transition point thereof, the constituent molecules of said liquid crystalline polymer film having a helical structure with a helical axis wherein the twist angle is in the range of 70 to 150 degrees, and the product Δn-d of birefringence Δn of the liquid crystalline polymer film and the film thickness d being in the range of 0.2 to 3.0 μm, and wherein the constituent molecules of the liquid crystalline polymer fill are selected from the group consisting of polyesters, polyamides, polycarbonates, polyesterimides, polyacrylates, polymethacrylates, polymalonates, and polysiloxanes.

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**5,496,499**

## BIPHENYLETHANES AND LIQUID-CRYSTALLINE PHASE

**Eike Poetsch, Mühltal; Volker Meyer, Gross-Zimmern; Klaus P. Stahl, Darmstadt; Volker Reiffenrath, Rossdorf; Ulrich Finkenzeller, Plankstadt; Ekkehard Bartmann, Erzhausen; Reinhard Hittich, Modautal, all of, Germany; David Coates, Wimborne, Great Britain; Simon Greenfield; Graham Smith, both of Poole, Great Britain; Hans A. Kurmeier, Seeheim-Jugenheim, and Dieter Dorsch, Darmstadt, both of, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany**

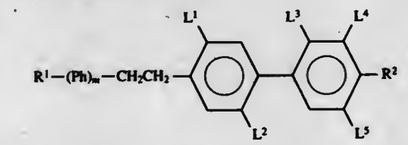
**Continuation of Ser. No. 469,499, Mar. 21, 1990, abandoned. This application Jan. 12, 1994, Ser. No. 180,413**

**Claims priority, application Germany, Jan. 27, 1989, 39 02 328.1; Jan. 27, 1989, 39 02 330.3; Apr. 25, 1989, 39 13 554.3**

**Int. Cl.[6] C09K *19/12;19/30***

**U.S. Cl. 252—299.66** **31 Claims**

1. A nematic liquid crystalline phase containing at least two liquid crystalline components, characterized in that it contains at least one compound of Formula I




in which one of the radicals $R^1$ and $R^2$ is X and the other radical $R^1$ or $R^2$ is R—Y—

where

X is halogen, $—OCHF_2$ or $OCF_3$,

is alkyl, fluoroalkyl, or oxaalkyl radicals of up to 10 C atoms and

Y is O, S, —CO—O—, —O—CO—, —O—CO—O—, a single bond or—in the case where m=1—alternatively trans-1,4-cyclohexylene or




m is 1 or 2,

Ph is in each case identical or different radicals selected from the group comprising 1,4-phenylene, 2-fluoro-1,4-phenylene, 3-fluoro-1,4-phenylene and 3,5-difluoro-1,4-phenylene,

$L^3$ and $L^4$ are each H, or one of these radicals is alternatively F, and

$L^1$, $L^2$

and $L^5$ are each H or F.

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**5,496,500**

## NAPHTHYL ORGANIC COMPOUNDS

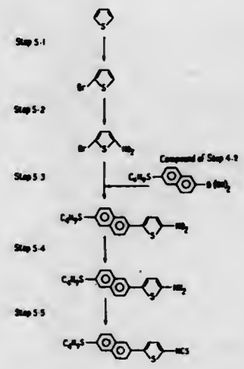
**Kenneth J. Toyne; John W. Goodby; Alexander Seed, all of Humerside; George W. Gray, Dorset; Damien G. McDonnel, Worcestershire; Edward P. Raynes, Worcestershire; Sally E. Day, Worcestershire; Kenneth J. Harrison, Worcestershire, and Michael Hird, Humberside, all of, England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain & Northern Ireland, London, England**

**Continuation of Ser. No. 2,396, Jan. 13, 1993, abandoned. This application Aug. 1, 1994, Ser. No. 283,714**

**Claims priority, application United Kingdom, Mar. 13, 1991, 9105359**

**Int. Cl.[6] C09K *19/34;19/32;* G02F *1/13;* C07D *333/26***

**U.S. Cl. 252—299.61** **16 Claims**




1. A liquid crystalline compound of formula I:

$$R_1—A—(X)_m—(B)_n—R_2$$ Formula I

where A is selected from naphthyl, fluorinated naphthyl, brominated naphthyl, B is thiophene, $R_1$ and $R_2$ containing 1 to 15 carbon atoms are independently selected from the group consisting of alkyl, alkoxy, alkynyl, thioalkyl, Br, CN, SCN, NCS, perfluoroalkyl, perfluoroalkoxy and hydrogen, X is selected from the group consisting of C≡C, COO and C=C, m is 0 or 1, and n is 1.

**5,496,501**

## SILACYCLOHEXANE COMPOUND, A METHOD OF PREPARING IT AND A LIQUID CRYSTAL COMPOSITION CONTAINING IT

**Takaaki Shimizu; Tsutomu Ogihara; Takeshi Kinsho; Tatsushi Kaneko; Ryuichi Saito, all of Niigata, and Hideshi Kurihara, Kawasaki, all of, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan**

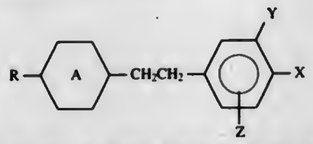
**Filed Dec. 5, 1994, Ser. No. 341,218**

**Claims priority, application Japan, Dec. 7, 1993, 5-339996**

**Int. Cl.[6] C09K *19/34*; C07F *7/08***

**U.S. Cl. 252—299.61** **3 Claims**

1. A silacyclohexane compound represented by the following general formula (I):




(I)

In this formula, R denotes a linear-chain alkyl group with a carbon number of 1–10, a mono- or di-fluoroalkyl group with a carbon number of 1–10, a branched-chain alkyl group with a carbon number of 3–8, an alkoxyalkyl group with a carbon number of 2–7, or an alkenyl group with a carbon number of 2–8;




denotes a trans-1-silacyclohexylene or a trans-4-silacyclohexylene group whose silicon at position 1 or position 4 has a substitutional group(s) of H, F, Cl or $CH_3$; X denotes a CN, F, Cl, $CF_3$, $CF_2$ Cl, CHFCl, $OCF_3$, $OCHF_2$, $OCF_2Cl$, OCHFCl, R or OR group; Y denotes H or F; Z denotes H or F.

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**5,496,502**

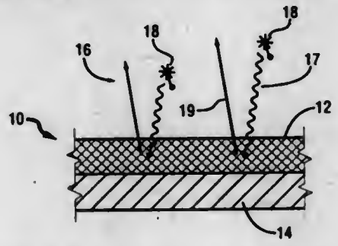
## ADHESIVE PLASTIC SCINTILLATOR

**James Thomson, Groningen, Netherlands, assignor to Packard Instrument, B.V., Groningen, Netherlands**

**Continuation-in-part of Ser. No. 78,142, Jun. 16, 1993, abandoned. This application Nov. 18, 1994, Ser. No. 342,440**

**Int. Cl.[6] C09K *11/06*; G01T *1/203***

**U.S. Cl. 252—301.17** **23 Claims**




1. A scintillating solid support system for analyzing a sample comprising a sample to be analyzed and a solid coating of a plastic scintillator which is bonded to an impermeable solid support medium, said plastic scintillator including a thermoplastic polymer and a fluorescent agent for converting radiation energy from said sample to be analyzed into light energy which is not internally reflected within said solid support medium to propagate through said solid support medium for detection, said solid coating of plastic scintillator having a first and second surface, said coating bonds to said solid support medium along said first surface, said second surface is exposed to said sample, and said solid coating forms a distinct layer of plastic scintillator between said solid support medium and said sample to be analyzed for detecting light energy converted by said solid coating from radiation energy from said sample.

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**5,496,503**

## THIRD-ORDER NONLINEAR OPTICAL MAIN CHAIN POLYMER MATERIAL AND METHOD FOR PREPARING THE SAME

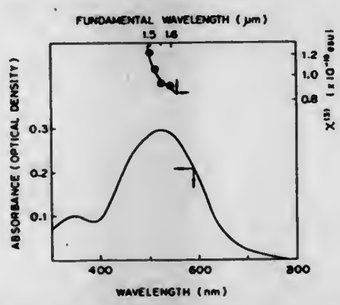
**Takashi Kurihara; Michiyuki Amano; Yubei Mori; Satoru Tomaru, and Toshikuni Kaino, all of Mito, Japan, assignors to Nippon Telegraph and Telephone, Japan**

**Division of Ser. No. 734,257, Jul. 22, 1991, Pat. No. 5,318,729. This application Apr. 7, 1994, Ser. No. 224,216**

**Claims priority, application Japan, Jul. 24, 1990, 2-193936**

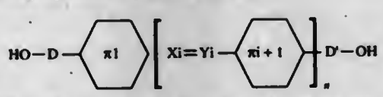
**Int. Cl.[6] F21V *9/00*; G02F *1/35***

**U.S. Cl. 252—582** **34 Claims**




23. A method for synthesizing a nonlinear optical polymer material obtainable by reaction between (a) a diol compound and (b) a bifunctional compound which reacts with said diol (a) and is selected from the group consisting of a diisocyanate compound and a dicarboxylic acid compound, comprising the step of:

using as said diol compound (a), a $\chi^{(3)}$ compound having no less than 3 but no more than 7 π-conjugated bonding groups and having ends each substituted with a hydroxyl group, and being represented by formula (I) below:




(I)

wherein D and D', which are the same or different each represents an electron donor; rings represented by




each represent a π-electron conjugated ring selected from the group consisting of a benzene ring, a thiophene ring, and a furan ring; Xi and Yi, which are the same or different, each represent N or CH, with —Xi=Yi— representing a π-conjugated bonding group; i is a positive integer of 1 to n; and n is a positive integer of 3 to 7,

said $\chi^{(3)}$ compound and said bifunctional compound being subjected to polyaddition to form a third-order nonlinear optical main chain polymer selected from the group consisting of a polyurethane and a polyester, having a $\chi^{(3)}$ component derived from said $\chi^{(3)}$ compound being incorporated in a main chain of said polymer and connected thereto through covalent bonds at both ends of said $\chi^{(3)}$ component so that said polymer main chain is interrupted by said $\chi^{(3)}$ component.



**5,496,504**

## HALOMETHYL-1,3,5-TRIAZINES CONTAINING A MONOMERIC MOIETY

**James A. Bonham; Mitchell A. Rossman, and Richard J. Grant, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Division of Ser. No. 49,555, Apr. 19, 1993, Pat. No. 5,387,682, which is a continuation of Ser. No. 555,301, Jul. 18, 1990, abandoned, which is a continuation-in-part of Ser. No. 241,691, Sep. 7, 1988, abandoned. This application Nov. 28, 1994, Ser. No. 345,594**

**Int. Cl.[6] G03C *1/00***

**U.S. Cl. 252—600** **15 Claims**

1. A radiation-sensitive composition comprising: (1) an ethylenically unsaturated, polymerizable compound, and (2) a compound having at least one halomethyl substituent attached to a carbon atom on a triazine nucleus and at least one polymerizable mononaeric moiety attached to a different carbon atom of the triazine nucleus, said polymerizable monomeric moiety being capable of free radical or ionic chain polymerization.

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**5,496,505**

## AERATING NOZZLE FOR AERATING LIQUIDS CONTAINING ORGANIC SUBSTANCES

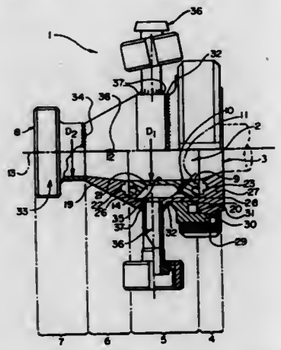
**Günter Walla, Freising, and Simon Redl, Reichertshausen, both of, Germany, assignors to Anton Steinecker Entwicklungs GmbH & Co., Freising/Attaching, Germany**

**Filed Feb. 17, 1994, Ser. No. 198,144**

**Claims priority, application Germany, Feb. 26, 1993, 9302862 U**

**Int. Cl.[6] B01F *5/04*; C02F *3/12***

**U.S. Cl. 261—76** **32 Claims**




1. An aerating nozzle for aerating liquids containing organic substances comprising side walls which define a liquid channel extending between a liquid entrance (3) and a liquid outlet (8), said side walls having angles of inclination and areas of different diameters and having at least one gas entry opening in an aeration region in which said liquid channel is defined by a distribution bushing which is surrounded by an outer sleeve, said angles of inclination of all of said side walls which define said liquid channel (2) being not greater than 30° relative to the longitudinal axis (13) of said aerating nozzle (9) which extends in a direction of flow (38), said distribution bushing being arranged in such a manner that it can be replaced by distribution bushings (9) that differ in number and/or size of said gas entry openings, said side walls of said distribution bushing extending parallel relative to the longitudinal axis (13), and said side walls of said liquid channel diverging before the distribution bushing and converging after the distribution bushing in the direction of flow, said gas entry openings comprising bores which extend along respective bore axes (11) which are inclined along an inflow angle α towards the direction of flow.

**5,496,506**

## PROCESS FOR REMOVING FINE PARTICLES

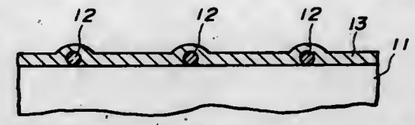
**Junichi Sato, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Filed Sep. 15, 1993, Ser. No. 121,366**

**Claims priority, application Japan, Sep. 21, 1992, 4-250306**

**Int. Cl.[6] H01L *21/304***

**U.S. Cl. 264—400** **16 Claims**




1. A process for removing fine particles from a wafer surface of a wafer comprising the steps of:

forming a sublimable thin film on the wafer surface which has fine particles thereon, and

removing the fine particles with the sublimable film from the wafer surface by supplying a jetting flow of highly pressurized inert gas to said wafer surface.

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**5,496,507**

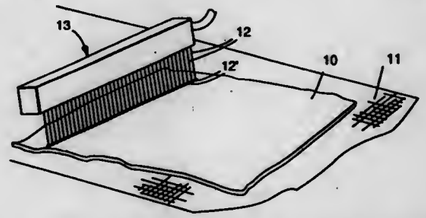
## METHOD OF CHARGING ELECTRET FILTER MEDIA

**Seyed A. Angadjivand, Darlington, England; Marvin E. Jones, and Daniel E. Meyer, both of Stillwater, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Continuation-in-part of Ser. No. 107,517, Aug. 17, 1993, abandoned. This application Aug. 17, 1994, Ser. No. 291,611**

**Int. Cl.[6] B29C *35/10***

**U.S. Cl. 264—423** **13 Claims**




1. A method of charging a nonwoven web of thermoplastic microfibers to provide electret filter media comprising (1) impinging on a nonwoven web of thermoplastic nonconductive microfibers which have a resistivity greater than $10^{16}$ ohm cm and are capable of having a high quantity of trapped charge, jets of water or a stream of water droplets at a pressure sufficient to provide the web with filtration enhancing electret charge and (2) drying said web.

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**5,496,508**

## METHOD OF COMPRESSING AND COOLING PLASTIC PURGE AS IT EMANATES FROM A PLASTIC INJECTION MOLDING MACHINE

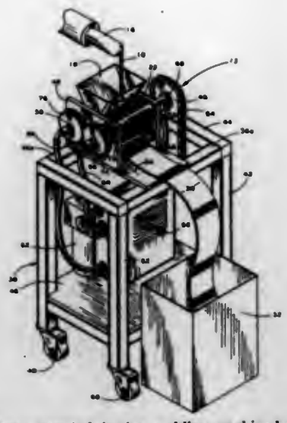
**Siebolt Hettinga, 2123 NW. 111th St., Des Moines, Iowa 50325, and Peter J. Aretz, 5368 NW. 88th Ct., Johnston, Iowa 50131**

**Division of Ser. No. 45,513, Apr. 8, 1993, abandoned. This application Dec. 7, 1994, Ser. No. 350,624**

**Int. Cl.[6] B29C *45/17***

**U.S. Cl. 264—37** **15 Claims**

1. A method for compressing and cooling plastic purge as it emanates from a plastic injection molding machine and for compressing the purge into recyclable sheets for grinding and remolding, said method comprising:



(a) providing a plastic injection molding machine having a purge outlet nozzle;
(b) filling said plastic injection molding machine with a plastic material;
(c) heating said plastic material within said plastic injection molding machine;
(d) forcing said plastic material through said nozzle;
(e) placing a hopper, having a purge inlet and a purge outlet, below said nozzle;
(f) providing at least two rollers operably secured to and below said hopper;
(g) directing purge from said nozzle to said hopper;
(h) transferring said purge from said hopper between said at least two rollers;
(i) revolving at least one of said at least two rollers sufficiently to compress said purge as said purge exits from said hopper;
(j) compressing said purge between said at least two rollers to a thickness sufficient for subsequent reprocessing; and
(k) removing said purge from said at least two rollers.

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**5,496,509**
**METHOD FOR PRODUCING MOLDED PRODUCT**
**Naotaka Yamamoto; Nobuo Yagi, both of Fujisawa; Satoshi Fujii, Komaki; Kenji Yonemochi, Komaki, and Mitsutoshi Myokei, Komaki, all of, Japan, assignors to Dai Nippon Toryo Co., Ltd., Osaka, and Isuzu Motors Limited, Tokyo, both of, Japan**
**Continuation of Ser. No. 961,822, Oct. 16, 1992, abandoned. This application Sep. 26, 1994, Ser. No. 312,074**
**Claims priority, application Japan, Jan. 16, 1991, 3-267801**
**Int. Cl.[6] B29C *45/16;* B29D *9/00***
**U.S. Cl. 264—129** **9 Claims**

1. A method for producing a molded product comprising:
i) molding a fiber-reinforced plastic material in a mold in the presence of heat and under pressure to form a molded product;
ii) injecting a coating composition into said mold to form a coating film on the surface of said molded product in the presence of heat and under pressure to form a coated molded product;
iii) taking said coated molded product., thus obtained, out of said mold; and
iv) plating the surface of said coated molded product; wherein said coating composition comprises:
a) a vehicle component comprising:
i) a polymerizable unsaturated monomer; and
ii) 20 to 60% by weight on the basis of the total coating composition of an oligomer mixture of
a') urethane acrylate oligomer; and
b') epoxy acrylate oligomer;
wherein the weight ratio of a'/b' is from 90/10–10/90;
and
b) 10 to 50% by weight on the basis of the total coating composition of calcium carbonate.

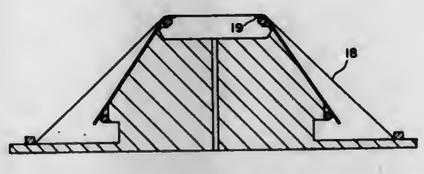
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**5,496,510**
**ACRYLONITRILE FILAMENT PROCESS**
**Gary J. Capone, 3302 Cedar Cove, SW., Decatur, Ala. 35603**
**Filed Aug. 23, 1994, Ser. No. 294,516**
**Int. Cl.[6] D01D *5/06;5/12;10/02;* D01F *6/18***
**U.S. Cl. 264—182** **10 Claims**

1. A process for making acrylonitrile polymer filaments comprising the steps of:
(a) extruding a solution of acrylonitrile polymer into a coagulation bath to form filaments thereof; wherein said acrylonitrile polymer comprises at least 85 percent by weight acrylonitrile monomer units and up to 15 percent by weight neutral comonomer units; wherein said acrylonitrile polymer has from 30 to 250 microequivalents per gram of sulfate groups, sulfonate groups or a combination thereof; wherein said solution comprises solvent consisting of N,N-dimethylacetamide, dimethylformamide or a mixture thereof, 20 to 26 percent by weight of said acrylonitrile polymer and 0 to 3 percent by weight water; wherein said coagulation bath is at a temperature in the range of 10° C. to 32° C.; and wherein said coagulation bath comprises water and said solvent in a mole ratio selected such that Rho, as defined by the formula $Rho=2.44\ R-1.36$, is greater than 0.6, where $R=r_1+r_2-(r_1\times r_2)$, $r_1=e^{[(2-W/S)/2]}$,
W is the moles of water in said coagulation bath,
S is the moles of solvent in said coagulation bath, and
$r_2=e[(\text{microequivalents per sulfate and sulfonate groups}-95)/95]$;
(b) withdrawing said filaments from the bath with a jet stretch of from 0.2 to 1; and
(c) providing said filaments with a wet stretch of 2 to 8.

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**5,496,511**
**METHOD FOR STATICALLY FORMING ROLLED LAMPSHADE EDGES**
**Hubert Juillet, Mulhouse, France, assignor to Corep, Begles Cedex, France**
**PCT No. PCT/FR93/00057, § 371 Date Sep. 21, 1993, § 102(e) Date Sep. 21, 1993, PCT Pub. No. W093-15356, PCT Pub. Date Aug. 5, 1993**
**PCT Filed Jan. 21, 1993, Ser. No. 119,140**
**Claims priority, application France, Jan. 22, 1992, 92 00733**
**Int. Cl.[6] B29C *51/28***
**U.S. Cl. 264—314** **4 Claims**



1. Method of producing a lampshade, comprising fitting a lampshade blank of thermoplastic material and at least one metal hoop on a mandrel, locally heating only edge regions of said lampshade blank, to a softening point of said thermoplastic material, surrounding said lampshade blank and said mandrel with a deformable membrane, and forcing said deformable membrane into contact with said lampshade blank and said mandrel, thereby to deform said heated edge regions to surround said at least one metal hoop.



**5,496,512**
**DECORATIVE MOLDING STRIP METHOD**
**Richard Logan, Kingsville, Canada, assignor to Mid-America Building Products Corporation, Plymouth, Mich.**
**Continuation of Ser. No. 158,163, Nov. 24, 1993, Pat. No. 5,398,469, which is a continuation of Ser. No. 916,399, Jul. 20, 1992, abandoned. This application Dec. 30, 1994, Ser. No. 366,975**
**Int. Cl.[6] B29C *39/02;43/02;45/17***
**U.S. Cl. 264—553** **9 Claims**



1. The method of forming a decorative molding system which can be removably installed at a juncture of a ceiling and a vertical wall, said method comprising:
forming a plurality of thin molding strips of flexible plastic having a length and a width, with each said thin plastic molding strip having an undulating cross sectional configuration, with each said thin plastic molding strip having an upper free edge, a lower free edge, a front surface and a back surface, said upper free edge being adapted to lie against one of said ceiling and said vertical wall along a line spaced from the juncture of the ceiling and said vertical wall and flex relative thereto, said lower free edge being adapted to lie against the other of said ceiling and said vertical wall along a line spaced from the juncture of the ceiling and said vertical wall and flex relative thereto, with each said upper free edge and lower free edge of said plurality of thin molding strips having a configuration such that back of said molding strips is angled outwardly with respect to the wall and the ceiling, said molding strip being sufficiently flexible about its length as well as its width to provide conforming engagement of its upper free edge and its lower free edge with the ceiling and said vertical wall,
forming a plurality of flexible plastic clips with each said flexible plastic clip having a first end and a second free end,
attaching said flexible plastic clips at spaced points along the length of the back surface of said thin molding strip at a point of attachment intermediate the upper free edge and the lower free edge of said molding strip to thereby form a thin molding strip with said flexible plastic clips attached thereto and said second free end of each said clip extends at an acute angle relative to the molding strip from said point of attachment, with said second free end of each said clip being capable of flexing relative to said point of attachment to said molding strip,
forming wall tracks of thin flexible plastic having a back surface, a front surface, an upper edge and a forward leading edge, with said forward leading edge of said track being capable of flexing relative to a remainder of said track, said upper edge of the track being adapted to be mounted on one of said ceiling and said vertical wall adjacent the juncture of said ceiling and said vertical wall,
forming first interengaging means integral with said forward leading edge of said track,
forming second interengaging means integral with said second free end of each said clip,
forming said first interengaging means and said second interengaging means to thereby mount said thin molding strip with the flexible plastic clips attached thereto is mounted on said track by movement of each said second free end of each said clip between the leading edge of said track, the second free end of each said clip is moved toward the leading edge of the track and said flexible forward leading edge of said track and said free ends of said clips flex and said first interengaging means interengage, such that said thin molding strip is restrained against ready removal,
forming said molding strip, said clips and said track such that when said molding strip is in a mounted position on said wall track, the upper edge of said molding strip is angled outwardly from said track and said clips, such that each said clip is positioned between said lower forward free edge of said wall track and its associated wall to cause the forward leading edge of said track to flex so that each said clip is retained by a snap-in fit while permitting the upper free edge and lower free edge of said molding strip to flex into conforming engagement with the ceiling and said vertical wall and said strip is removable by flexing of said clips,
forming said first interengaging means on said forward leading edge of said track and said second interengaging means on said clips such that the molding strip can be easily removed to allow for painting, wall papering, or other decoration.

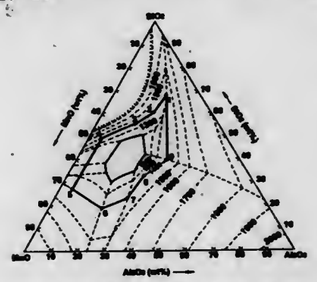
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**5,496,513**
**PREPARATION METHOD OF DENSE SINTERED BODIES FOR SOLID ELECTROLYTES**
**Kenji Nakane; Tetsu Umeda, and Masahide Mohri, all of Tsukuba, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan**
**Filed Dec. 2, 1992, Ser. No. 984,199**
**Claims priority, application Japan, Dec. 6, 1991, 3-322945; May 29, 1992, 4-138672**
**Int. Cl.[6] B22F *3/16***
**U.S. Cl. 419—19** **6 Claims**

1. A method of preparing a dense body formed of beta alumina which has a relative density of at least 85% for a solid electrolyte, which comprises steps of
(1) shaping a mixture consisting essentially of, on the basis of a total amount of the mixture, 1% to 40% by weight of a sodium compound, 0.1% to 10% by weight of a structural stabilizer, an effective amount of a zirconia powder to promote oxidation of an aluminum powder, and the balance of an aluminum powder into a shaped body, and
(2) reaction-sintering the shaped body at 1200° to 1600° C. so as to convert substantially the aluminum to beta alumina.

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**5,496,514**
**STAINLESS STEEL SHEET AND METHOD FOR PRODUCING THEREOF**
**Katsuhisa Yamauchi; Hitoshi Miwa; Tadashi Inoue, and Tomoyoshi Okita, all of Kawasaki, Japan, assignors to NKK Corporation, Tokyo, Japan**
**Continuation-in-part of Ser. No. 99,171, Jul. 29, 1993, Pat. No. 5,314,549. This application Feb. 1, 1994, Ser. No. 189,902**
**Claims priority, application Japan, Mar. 8, 1993, 5-072901; Nov. 30, 1993, 5-326172; Nov. 30, 1993, 5-326173**
**Int. Cl.[6] C22C *29/12;38/42;* C21D *8/02***
**U.S. Cl. 420—34** **20 Claims**



1. A stainless steel sheet having a high fracture resistance comprising:

non-metallic inclusions of $Al_2O_3$, MnO, and $SiO_2$ which inevitably exist in stainless steel;

the non-metallic inclusions having a composition situated in a region defined by nine points given below on terms of percentage by weight in a phase diagram of a 3-component system of "$Al_2O_3$—MnO—$SiO_2$",

Point 1 ($Al_2O_3$: 21%, MnO: 12%, $SiO_2$: 67%),

Point 2 ($Al_2O_3$: 19%, MnO: 21%, $SiO_2$: 60%),

Point 3 ($Al_2O_3$: 15%, MnO: 30%, $SiO_2$: 55%),

Point 4 ($Al_2O_3$: 5%, MnO: 46%, $SiO_2$: 49%),

Point 5 ($Al_2O_3$: 5%, MnO: 68%, $SiO_2$: 27%),

Point 6 ($Al_2O_3$: 20%, MnO: 61%, $SiO_2$: 19%),

Point 7 ($Al_2O_3$: 27.5%, MnO: 50%, $SiO_2$: 22.5%),

Point 8 ($Al_2O_3$: 30%, MnO: 38%, $SiO_2$: 32%),

Point 9 ($Al_2O_3$: 33%, MnO: 27%, $SiO_2$: 40%),

said stainless steel sheet having an 1.0% onset stress of 1520 $N/mm^2$ (155 $kgf/mm^2$) or more, where the 1.0% onset stress is a deformation stress when the sheet is subjected to 1.0% strain;

said stainless steel sheet having an anisotropic difference of 1.0% on-set of 196 $N/mm^2$ (20 $kgf/mm^2$) or less, where the anisotropic difference is an absolute value of a difference of 1.0% onset stresses in a rolling direction and a crosswise direction of the rolling direction;

said stainless steel sheet having a Erichsen number of at least 4.6 mm; and

said stainless steel sheet consists essentially of:

0.01 to 0.2 wt. % C, 0.1 to 2 wt. % Si, 0.1 to 2 wt. % Mn, 4 to 11 wt. % Ni, 13 to 20 wt. % Cr, 0.01 to 0.2 wt. % N, 0.0005 to 0.0025 wt. % soluble Al, 0.002 to 0.013 wt. % O, 0.08 to 0.9 wt. % Cu, 0.009 wt. % or less S, and the balance being Fe.

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**5,496,515**

**FERRITIC STAINLESS STEEL WITH IMPROVED MACHINABILITY**

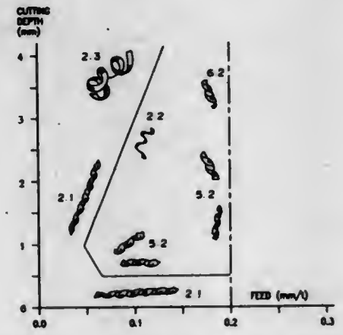
**Pierre Pedarre, Annecy, and Pascal Terrien, Albertville, both of, France, assignors to Ugine Savoie (Societe Anonyme), Ugine Cedex, France**

**Filed Apr. 12, 1995, Ser. No. 420,484**

**Claims priority, application France, May 31, 1994, 94 06590**

**Int. Cl.[6] C22C** *38/18;38/60*

**U.S. Cl. 420—41** **8 Claims**




1. Stainless steel of ferritic structure and with improved machinability which can be used, especially, in the field of screw-machining, which includes, in its composition:

C≦0.17%

Si≦2.0%

Mn'2.0%

Cr [11–20] %

Ni<1%

S≧0.55 %

Ca≧$30\times10^{-4}$%

O≧$70\times10^{-4}$%

the Ca/O ratio, between the calcium content and the oxygen content, being given by 0.2≦Ca/O≦0.6.

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**5,496,516**

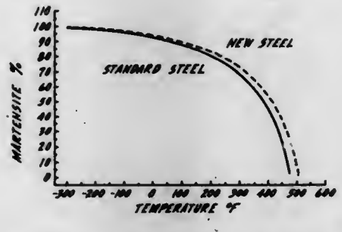
**DUAL PURPOSE STEEL AND PRODUCTS PRODUCED THEREFROM**

**Charles W. Finkl, Evanston, and Algirdas A. Underys, Arlington Heights, both of Ill., assignors to A. Finkl & Sons Co., Chicago, Ill.**

**Filed Apr. 4, 1994, Ser. No. 222,412**

**Int. Cl.[6] C22C** *38/44;38/46;38/50*

**U.S. Cl. 420—109** **3 Claims**




1. A dual purpose steel having both high ductility at room temperature and high strength, high hardness, high wear resistance and high hardenability at elevated temperatures above 300° F. together with easy machinability, said steel having the following composition:

| | |
|---|---|
| C | .48–.53 |
| Mn | .75–.95 |
| P | .025x |
| S | .025x |
| Si | .15–.35 |
| Ni | .80–1.40 |
| Cr | 1.00–1.30 |
| Mo | .65–.85 |
| V | .04–.10 |
| Al | .015–.025 |
| Ti | .005–.015 |

balance Fe and usual impurities, said steel being in a non-drastic quenched condition.

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**5,496,517**

**LABORATORY WORKSTATION USING THERMAL VAPORIZATION CONTROL**

**Robert F. Pfost, Los Altos, and Nebojsa Avdalovic, Cupertino, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.**

**Division of Ser. No. 455,694, Dec. 22, 1989, abandoned. This application Nov. 20, 1991, Ser. No. 795,220**

**Int. Cl.[6] G01N** *35/02*

**U.S. Cl. 422—63** **21 Claims**

1. An automated laboratory workstation comprising:

a receptacle containing a vaporizable substance;

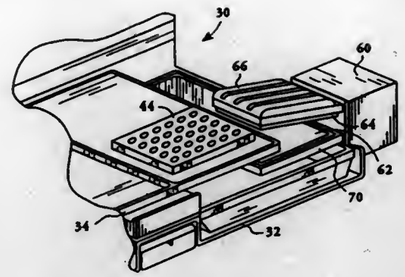
a robotic means for performing a sequence of laboratory operations with respect to the receptacle;

means for heating the vaporizable substance, including the receptacle;

a cover for covering the receptacle, disposed in opposing relation thereto;

means for effecting temperature control of the cover, wherein the means for effecting temperature control of the cover maintains the temperature of the cover above the temperature of the substance; and






means for moving the cover relative to the receptacle to cooperatively engage the cover and the receptacle, including a means for positioning the cover over the receptacle.

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**5,496,518**

**INCUBATOR**

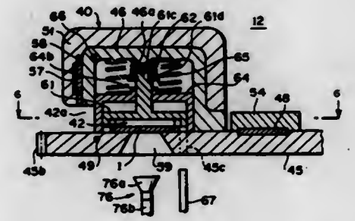
**Kenji Arai; Yoshihiro Seto, and Fumio Sugaya, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Dec. 8, 1994, Ser. No. 355,178**

**Claims priority, application Japan, Dec. 9, 1993, 5-308979**

**Int. Cl.[6] G01N** *37/00*

**U.S. Cl. 422—64** **3 Claims**




1. An incubator for incubating a dry frameless chemical analysis film which comprises a support sheet and a reagent layer formed on the support sheet and is spotted on an upper surface with a sample liquid, the incubator comprising:

an incubator base on which the frameless chemical analysis film is placed,

an incubator cell member which is movable up and down between a lower position and an upper position and presses a peripheral portion of the upper surface of the frameless chemical analysis film at a location outside of the sample liquid against the incubator base while also enclosing a space around the frameless chemical analysis film in the lower position,

a first heating means which heats the incubator based at least at a location in which the frameless chemical analysis film is brought into contact with the incubator base when the incubator cell member is in the lower position, to a first predetermined temperature and holds the incubator base and in turn the frameless chemical analysis film at the first predetermined temperature, and

a second heating means which heats the incubator cell member to a second predetermined temperature higher than the first predetermined temperature.

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**5,496,519**

**DIAGNOSTIC PROCESSING STATION**

**Gottlieb Schacher, Ebikon, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.**

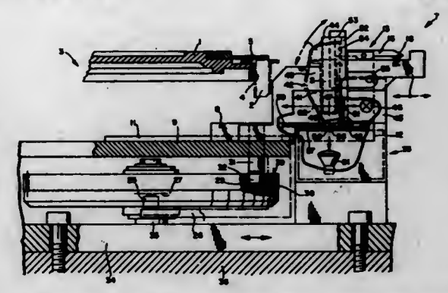
**Division of Ser. No. 49,753, Apr. 19, 1993, Pat. No. 5,384,094. This application Jul. 21, 1994, Ser. No. 278,362**

**Claims priority, application Switzerland, Apr. 30, 1992, 1390/92**

**The portion of the term of this patent subsequent to Jan. 24, 2012, has been disclaimed.**

**Int. Cl.[6] G01N** *37/00*

**U.S. Cl. 422—64** **2 Claims**



1. A processing station for making fluorescence polarization measurements on samples in a plurality of cells under examination in an analytical apparatus, the analytical apparatus containing a conveyor for conveying cells, the processing station being separated from the conveyor, the processing station comprising:

(a) measuring means for making fluorescence polarization measurements on the sample in the cell at a measuring position; and

(b) automatically controlled change-over and positioning means comprising (1) means for removing an individual cell from a position on the conveyor, (2) means for transferring the removed cell to the measuring position in the measuring means, and (3) means for returning the cell to a position on the conveyor after the fluorescence polarization measurement is completed, the change-over and positioning means further comprising (4) pivotable hood means for screening the cell from outside light during the fluorescence polarization measurement, and (5) means for pivoting the pivotable hood means for screening the cell from outside light, the means for pivoting the pivotable hood means and the means for transferring the cell to the measuring position including a cam and cam follower drive means and respective mechanical control linkage means to connect the drive means with the means for transferring the cell to the measuring position and to coordinate operations of removing means, transferring means, returning means and pivoting means.

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**5,496,520**

**ROTARY FLUID MANIPULATOR**

**Arden A. Kelton, 13561 Paysen Dr., Westminster, Calif. 92683; Michael L. Bell, 1357 Granada Way, Corona, Calif. 91720, and Roy A. Chung, 10094 Ellis, Fountain Valley, Calif. 92708**

**Continuation of Ser. No. 338,123, Jan. 8, 1982, abandoned. This application Nov. 16, 1987, Ser. No. 121,289**

**The portion of the term of this patent subsequent to Jul. 3, 2007, has been disclaimed.**

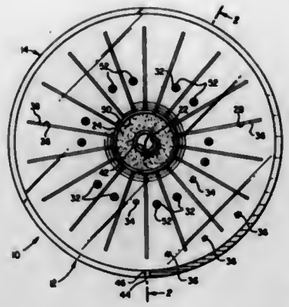
**Int. Cl.[6] G01N** *35/00;33/558;* **C12N** *11/12*

**U.S. Cl. 422—64** **5 Claims**

1. A device comprising: means for testing for the presence of an analyte in a liquid including:

a. a liquid input means having a receiving inlet and a discharge aperture;

b. filter means positioned below said liquid input means and having at least one viewable reaction zone for receiving liquid



from said input means to separate any analyte therefrom and at least one peripheral zone associated with said at least one reaction zone;

c. absorbent means associated with only said peripheral zone of said filter means for drawing said liquid from said reaction zone to said peripheral zone; and

d. retainer means for holding said filter means in position below said liquid input means such that said at least one reaction zone receives liquid therefrom.

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5,496,521

## ANALYZING DEVICE INCLUDING AN ION-PERMEABLE CHANNEL CONNECTING A SAMPLE CHAMBER WITH A REACTION SPACE

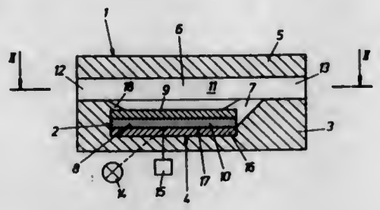
**Marco Leiner, Graz, Austria, assignor to AVL Medical Instruments AG, Schaffhausen, Switzerland**

**Filed Nov. 15, 1991, Ser. No. 792,671**

**Claims priority, application Austria, Feb. 15, 1991, 324/91**

**Int. Cl.[6] G01N** *21/05;21/47*

**U.S. Cl. 422—82.05** **5 Claims**



1. A device for determining the concentration of a reagent from a group consisting of gases having an acid reaction in aqueous environments, gases having an alkaline reaction in aqueous environments, and volatile acids and bases in liquid or gaseous samples, comprising a housing defining a sample chamber, a unit for pH measurement with a reaction space separated from said sample chamber by an ion-impermeable, gas-permeable membrane, said sample chamber containing a buffer solution at least during storage, and means forming an ion-permeable channel configured as a capillary or filled with an ion-permeable material which connects said reaction space with said sample chamber while bypassing said ion-impermeable, gas-permeable membrane.

5,496,522

## BIOSENSOR AND CHEMICAL SENSOR PROBES FOR CALCIUM AND OTHER METAL IONS

**Tuan Vo-Dinh, Knoxville, Tenn., and Pierre Viallet, Perpignan, France, assignors to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.**

**Filed Feb. 7, 1994, Ser. No. 192,429**

**Int. Cl.[6] G01N** *21/00*

**U.S. Cl. 422—82.05** **3 Claims**

1. A sensor for detecting the concentration of metal ions comprising a medium consisting essentially of a gel bonded to a fluorophore, the fluorophore bonded to the gel by way of a carbodiimide comprising 1-(3-dimethylaminopropyl)-3-ethyl carbodiimide hydrochloride.

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5,496,523

## FILTERED MICROPIPETTE TIP FOR HIGH/LOW VOLUME PIPETTORS

**Arnona Gazit, Holon, and Abraham Yaniv, Tel-Aviv, both of, Israel, assignors to Sorenson Bioscience, Salt Lake City, Utah**

**Filed May 6, 1994, Ser. No. 239,477**

**Int. Cl.[6] B01L** *3/02;11/00*

**U.S. Cl. 422—100** **16 Claims**



1. A method of using a single pipette tip body with each of three respective pipettors selected from the group consisting of (i) an air displacement pipettor operable within the approximate range of 0 to 20 microliters, (ii) an air displacement pipettor operable within the approximate range of 20 to 200 microliters, and (iii) an intermediate pipettor operable within the range of 0–100 microliters, said method comprising the steps of:

selecting a pipette tip body having a mounting end, an intermediate section, a distal fluid contacting end, and an axial bore including opposing insert and fill chambers extending in tapering configuration from said mounting end to the fluid contacting end;

inserting a filter means within the axial bore in the intermediate section to provide a dividing barrier between the opposing insert and fill chambers of the pipette tip device wherein a resulting volume of the fill chamber is at least 200 microliters; and

alternatively inserting a terminal insert portion of each of the three respective pipettors in a snug, sealed fit within the insert chamber of the selected pipette tip body without contacting the filter means.

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5,496,524

## REACTOR FOR THE THERMAL CONVERSION OF METHANE

**Jérome Weill, Lyons; Laure Capogna, Saint Denis; Véronique Arrondel, Houilles, and Jean-Jack Boumendil, La Colle sur Loup, all of, France, assignors to Institut Francais du Petrole, Rueil Malmaison; Electricite de France, Paris Cedex, and Gaz de France, Paris, all of, France**

**Division of Ser. No. 962,453, Oct. 19, 1992, Pat. No. 5,365,005. This application Aug. 19, 1994, Ser. No. 293,270**

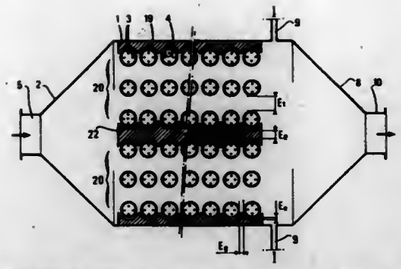
**Claims priority, application France, Jan. 17, 1991, 91 12948**

**Int. Cl.[6] B01J** *19/24; C07C 2/00*

**U.S. Cl. 422—199** **8 Claims**

1. An apparatus comprising a reactor of elongated shape, comprising a square or rectangular cross-section and a longitudinal axis, said reactor having a first end, a second end, inlet means at





said first end for supplying a gaseous mixture, outlet means at said second end for discharging effluent, and means for supplying a cooling medium,

said reactor further comprising at least one longitudinal zone between two walls one of refractory material adjacent said first end, at least one of said walls being disposed between outside walls of said reactor wherein said two refractory walls are substantially parallel to each other and substantially parallel to said axis of said reactor, said at least one longitudinal zone comprising a plurality of elements disposed in at least two layers, said layers being substantially parallel to each other, and substantially parallel to said axis of said reactor, wherein said elements in at least one of said layers comprises a series of sheaths inside which are electric heating means, thereby forming a series of heating elements,

said elements in at least two layers being positioned to define passages for circulation of gas between said elements, between said layers of elements, and/or between said elements and walls, whereby said electric heating means and said sheaths are capable of heating said passages in successive independent sections which are substantially perpendicular to said axis of said reactor, each of said sections comprising at least one transverse row of elements,

said reactor further comprising means for automatic control and modulation of heating connected to said electric heating means, and

said reactor further comprising, adjacent said second end, means for cooling effluent connected to said means for supplying cooling medium.

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5,496,525

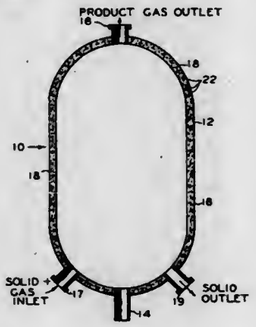
## EROSION RESISTANT, CERAMIC FIBER LINING

**Arthur A. Lietz, Oakhurst; John R. Peterson, Randolph, both of N.J., and Paul E. Schlett, Schenectady, N.Y., assignors to Exxon Research and Engineering Company, Florham Park, N.J.**

**Continuation-in-part of Ser. No. 240,294, Sep. 6, 1988, abandoned. This application Aug. 17, 1990, Ser. No. 569,053**

**Int. Cl.[6] B01J** *19/00*

**U.S. Cl. 422—241** **9 Claims**




1. In a reactor vessel for gas-solids contacting, the reactor vessel having internal walls with insulation fastened thereto, the improvement wherein said insulation comprises an alumina-silicate ceramic fiber blanket material and an agent selected from the group consisting of sodium silicate, potassium silicate and colloidal silica and mixtures thereof substantially uniformly distributed in the ceramic fiber material by the vehicle of an aqueous dispersion or colloidal sol in amounts sufficient to stiffen the fiber material and reduce erosion of the blanket under conditions of use wherein the aqueous dispersion or colloidal sol contains from about 0.01 to about 5 weight percent of a wetting agent selected from the group consisting of sodium and potassium sulfates, phosphates and mixtures thereof.

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5,496,526

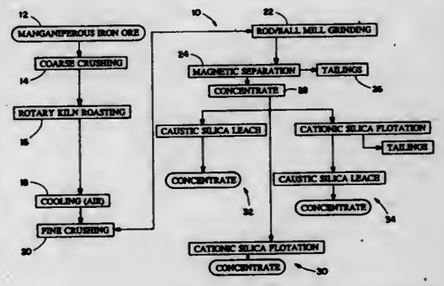
## PRODUCTION OF INTERMEDIATE GRADE MANGANESE CONCENTRATE FROM LOW GRADE MANGANIFEROUS ORES

**Michael G. Pojar, Lino Lakes, and John C. Nigro, Bloomington, both of Minn., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.**

**Filed Aug. 30, 1993, Ser. No. 130,080**

**Int. Cl.[6] C22B** *47/00;1/00;* **C01G** *49/00;* **B03C** *1/30*

**U.S. Cl. 423—49** **7 Claims**




1. A process for producing intermediate grade manganese concentrate from low grade manganiferous ores, comprising the steps of:

(a) providing a low grade manganiferous ore containing silicon, iron, between 1 to 20 percent manganese and oxides of silicon, iron and manganese;

(b) crushing said low grade manganiferousore to reduce the size of said manganiferous ore to a fraction of its original size.

(c) heat treating said low grade manganiferous ore, after crushing, in a atmosphere selected from the group consisting of an oxidizing atmosphere and a neutral atmosphere to a temperature between 1300 and 1500 degrees C. to chemically transform the manganese and iron in said manganiferous ore to an artificial magnetic, manganese-iron spinel;

(d) cooling said manganiferous ore, after heat treating;

(e) fine crushing and then fine grinding said manganiferous ore, after cooling, to between −200 to −500 mesh particle size to liberate said artificial manganese-iron spinel from the silicon and other oxides within said ore; and

(f) magnetically separating said artificial manganese-iron spinel from the silicon and other oxides within said ore to increase the concentration of said artificial manganese-iron spinel and thereby provide an intermediate grade manganese concentrate containing at least 20 percent manganese.

**5,496,527**

**PROCESS OF FORMING A HYDROPHOBIC AEROGEL**

**Hiroshi Yokogawa, Hirakata; Masaru Yokoyama, Yao; Koichi Takahama, Amagasaki, and Yuriko Uegaki, Hirakata, all of, Japan, assignors to Matsushita Electric Works. Ltd., Kadoma, Japan**

**Filed Apr. 28, 1994, Ser. No. 234,965**

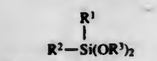
**Claims priority, application Japan, Nov. 12, 1993, 5-283726**

**Int. Cl.[6] C01B** *33/12*

**U.S. Cl. 423—338** **9 Claims**

1. A process of forming a hydrophobic aerogel comprising:

a gelation step of providing a gel having a $SiO_2$ skeleton structure formed by hydrolysis and condensation of an alkoxysilane compound selected from the group consisting of the following formulae I, II, III and IV:



(I)

wherein each of $R^1$, $R^2$ and $R^3$ is independently a $C_1$-$C_5$ alkyl group;



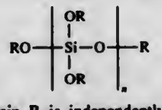
(II)

wherein each of $R^4$ and $R^5$ is independently a $C_1$-$C_5$ alkyl group;



(III)

wherein $R^6$ is a $C_1$- $C_5$ alkyl group; and



(IV)

wherein R is independently a $C_1$- $C_5$ alkyl group and n is an integral number;

a hydrophobic step of reacting said gel in a reaction chamber with a hydrophobic agent selected from the group consisting of organosilanes, carboxylic acids and halogenated alkyl, wherein said hydrophobic agent comprises hydrophobic groups selected from the group consisting of alkyl group, fluoroalkyl group, phenyl group, and a fluorophenyl group as well as functional groups reactive with silanol groups, said functional groups selected from the group consisting of halogens, amino group, imino group, carboxyl group, alkoxyl group and hydroxyl group,

in the presence of a medium selected from the group consisting of $C_1$-$C_4$ alcohols, carbon dioxide, dichlorodifluoromethane, water and mixtures thereof

under a supercritical condition based on said medium to form a hydrophobic gel, said hydrophobic agent being introduced into said reaction chamber after said medium reaches supercritical condition; and

a dry step of supercritically drying said hydrophobic gel to remove said medium to obtain said hydrophobic aerogel which is transparent and of a porous structure.

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**5,496,528**

**RARE EARTH OXIDES**

**Claire David, Paris, and Francoise Seon, Meatreuil, both of, France, assignors to Rhone-Poulenc Chimie, Courbevoie, France**

**Continuation of Ser. No. 9,354, Jan. 26, 1993, abandoned, which is a continuation of Ser. No. 545,150, Jun. 28, 1990, abandoned, which is a continuation of Ser. No. 208,037, Jun. 17, 1988, abandoned. This application Mar. 7, 1994, Ser. No. 206,224**

**Claims priority, application France, Jun. 17, 1987, 87 8440**

**Int. Cl.[6] C01F** *17/00;* **B01J** *23/00*

**U.S. Cl. 423—263** **26 Claims**

1. Particulates of a calcined trivalent rare earth oxide, the rare earth oxide being selected from the group consisting of yttrium



oxide, lanthanum oxide, praseodymium oxide, neodymium oxide, samarium oxide, europium oxide, gadolinium oxide, terbium oxide, dysprosium oxide, bolmium oxide, erbium oxide, lutecium oxide and thulium oxide, the rare earth oxide having a specific surface of at least 44 $m^2/g$ measured after calcination for at least two hours at a temperature of from 350° to 600° C., a pore volume of at least 0.2 $cm^3/g$, and a mean pore diameter of greater than 50 Å.

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**5,496,529**

**ALUMINUM PHOSPHATES AND BINDER COMPOSITIONS/CERAMIC MATERIALS COMPRISED THEREOF**

**William Fogel, Ales, and Laurent Frouin, L'Hay Les Roses, both of, France, assignors to Rhone-Poulenc Chimie, Courbevoie, France**

**Filed Mar. 17, 1994, Ser. No. 214,172**

**Claims priority, application France, Mar. 17, 1993, 93 03063**

**Int. Cl.[6] C01B** *15/16;25/26;* **C04B** *35/10*

**U.S. Cl. 423—305** **8 Claims**

1. A process for the preparation of an aluminum phosphate having an Al/P ratio of at least 1, which comprises reacting at least one aluminum compound, comprising an aluminum oxide, an aluminum hydroxide, or an aluminum oxyhydroxide, with phosphoric acid or an aluminum phosphate, in a liquid reaction medium devoid of inorganic acid anions other than of phosphoric acid, and then spray- or freeze-drying the suspension thus obtained.

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**5,496,530**

**PROCESS FOR THE PREPARATION OF CARBON MONOXIDE RICH GAS**

**Rickard Vannby, Hellerup, and Charlotte S. Nielsen, Holte, both of, Denmark, assignors to Haldor Topsoe A/S, Denmark**

**Filed Dec. 8, 1993, Ser. No. 164,029**

**Claims priority, application Denmark, Dec. 10, 1992, 1489/92**

**Int. Cl.[6] C01B** *31/18;3/12;3/16;* **C07C** *1/12*

**U.S. Cl. 423—418.2** **2 Claims**

1. Process for the preparation of carbon monoxide rich product gas comprising reacting a gas feed of hydrogen and carbon dioxide preheated to a temperature between 400° C. and 650° C. in a molar $H_2/CO_2$ ratio of between 1.5 and 6.5 in the presence of a reforming catalyst at a pressure between 5 and 50 bar to carbon monoxide rich gas, which process comprises reacting part of the carbon dioxide and hydrogen in the gas feed exothermically to methane simultaneously with the carbon monoxide producing reaction and carrying out both reactions under adiabatic conditions, so that the exothermic methane producing reaction provides necessary heat for the endothermic carbon monoxide producing reaction, and the outlet temperature of the product gas is higher than the temperature to which the gas is preheated.



**5,496,531**

**HIGH SURFACE PURITY HEAT TRANSFER SOLIDS FOR HIGH TEMPERATURE FLUIDIZED BED REACTIONS (ER&E CASE NO. C-2708)**

**Stephen M. Davis; LeRoy R. Clavenna; Geoffrey R. Say, all of Baton Rouge, La., and Rocco A. Fiato, Basking Ridge, N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.**

**Division of Ser. No. 60,378, May 11, 1993, Pat. No. 5,360,778. This application Jul. 15, 1994, Ser. No. 276,071**

**Int. Cl.[6] C01B** *3/02:3/26;31/18*

**U.S. Cl. 423—418.2** **9 Claims**

1. In a process for the production of hydrogen and carbon monoxide from a low molecular weight hydrocarbon by contact with a fluidized bed constituted of a catalyst and particulate alpha alumina containing both silicon and boron impurities, at high temperature in the presence of steam, or oxygen, or both steam and oxygen, the improvement wherein the alpha alumina is comprised of particles of alpha alumina the outer peripheral surface layer of which contains no greater than about 5 atom percent silicon and boron, based on the total number of cations within said outer peripheral surface layer, thereby improving resistance to sintering and agglomeration of the fluidized bed, said particles being produced by acid washing of the alpha alumina.

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**5,496,532**

**PROCESS FOR PRODUCING HYDROGEN PEROXIDE**

**Hiroyuki Monzen; Kazuhiko Hiromoto; Shuji Hirayama; Nobuyuki Kondo; Haruki Ishigami, and Yoshimasa Ishimura, all of Kawasaki, Japan, assignors to Showa Denko K. K., Tokyo, Japan**

**PCT No. PCT/JP93/01678, § 371 Date Jul. 19, 1994, § 102(e) Date Jul. 19, 1994, PCT Pub. No. WO94/12428, PCT Pub. Date Jun. 9, 1994**

**PCT Filed Nov. 16, 1993, Ser. No. 256,603**

**Claims priority, application Japan, Nov. 20, 1992, 4-312168; Feb. 26, 1993, 5-038588**

**Int. Cl.[6] C01B** *15/01*

**U.S. Cl. 423—584** **5 Claims**

1. A process for producing hydrogen peroxide comprising the step of:

producing hydrogen peroxide catalytically from hydrogen and oxygen in a reaction medium in the presence of a platinum-group metal catalyst supported on an oxide carrier selected from the group consisting of a niobium oxide and a tantalum oxide, wherein the niobium oxide and tantalum oxide are prepared by heat treating niobic acid and tantalic acid, respectively, at a temperature of from 300° to 700° C.

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**5,496,533**

**RHENIUM COMPLEXES**

**Timothy W. Jackson, Cronulla, Australia; Masaharu Kojima, Morioka, Japan, and Richard M. Lambrecht, Birchgrove, Australia, assignors to Australian Nuclear Science & Technology Organisation, New South Wales, Australia**

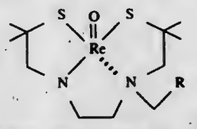
**Filed Jul. 26, 1993, Ser. No. 97,403**

**Claims priority, application Australia, Jul. 31, 1992, PL3882**

**Int. Cl.[6] A61K** *51/04;51/12*

**U.S. Cl. 424—1.65** **21 Claims**

1. A product comprising a rhenium complex of formula (I):



(I)

wherein the rhenium atom is radioactive, or a pharmaceutically acceptable salt

wherein R is straight or branched chain $C_{1-10}$ alkyl, $C_{1-10}$ alkenyl, $C_{1-10}$ alkynyl optionally substituted by $C_{5-6}$ cycloalkyl or phenyl; $C_{5-6}$ cycloalkyl optionally substituted by straight or branched chain alkyl, alkenyl, alkynyl or phenyl; or phenyl optionally substituted by straight or branched chain alkyl, alkenyl, alkynyl or $C_{5-6}$ cycloalkyl; and

a lipid soluble oil selected from the group consisting of iodized poppyseed oil.

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**5,496,534**

**SQUID MAGNETOMETRY USING FERRI-AND FERROMAGNETIC PARTICLES**

**Jo Klaveness; Thorfinn Ege, both of Oslo, Norway, and Scott M. Rocklage, Los Gatos, Calif., assignors to Nycomed Imaging AS, Oslo, Norway**

**PCT No. PCT/EP92/02254, § 371 Date May 28, 1994, § 102(e) Date May 28, 1994, PCT Pub. No. WO93/05818, PCT Pub. Date Apr. 1, 1993**

**PCT Filed Sep. 28, 1992, Ser. No. 199,252**

**Claims priority, application United Kingdom, Sep. 26, 1991, 9120508**

**Int. Cl.[6] A61B** *5/055*

**U.S. Cl. 424—9.32** **4 Claims**

1. A method of generating a magnetometric image of the human or non-human animal body which method comprises administering into the gastrointestinal tract, the reproductive tract, the urinary tract, a closed body cavity or the musculature of said body a physiologically tolerable particulate-ferromagnetic or ferrimagnetic material and generating a magnetometric image of at least a part of said body into which said material distributes.

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**5,496,535**

**FLUOROCARBON CONTRAST MEDIA FOR USE WITH MRI AND RADIOGRAPHIC IMAGING**

**W. Dean Kirkland, El Cajon, Calif., assignor to Alliance Pharmacentical Corp., San Diego, Calif.**

**Filed Apr. 12, 1991, Ser. No. 685,211**

**Int. Cl.[6] A61K** *49/04*

**U.S. Cl. 424—9.37** **23 Claims**

1. A composition for use with in vivo imaging systems, a fluorocarbon liquid and an effective amount of a solid fluorocarbon-insoluble particulate material, selected from the group consisting of a gas-generating, palatability-enhancing, and pharmacological, agent, in direct admixture with said liquid.

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**5,496,536**

**PERCUTANEOUS LYMPHOGRAPHY**

**Gerald Wolf, 5 Hawthorne Rd., Winchester, Mass. 01890**

**Continuation of Ser. No. 128,344, Sep. 28, 1993, abandoned, which is a continuation of Ser. No. 855,570, Mar. 23, 1992, abandoned, which is a division of Ser. No. 530,034, May 29, 1990, Pat. No. 5,114,703, which is a continuation-in-part of Ser. No. 358,678, May 30, 1989, abandoned. This application Apr. 25, 1995, Ser. No. 428,558**

**Int. Cl.[6] A61B** *5/055;8/13*

**U.S. Cl. 424—9.322** **9 Claims**

1. A method for diagnosing disease affecting the lymph nodes through indirect lymphography using ultrasound or magnetic resonance imaging, comprising the steps of:

interstitially administering a diagnostically effective, non-toxic amount of a non-radioactive contrast agent to a mammal, wherein said agent is in particulate or colloidal form, said agent having a mean particle size from about 5 to about 900 nanometers in diameter and being imageable with sufficient resolution through ultrasound or magnetic resonance imaging to permit visualization of intranodal architecture;

permitting the contrast agent to localize in the lymph nodes; and

imaging the lymph nodes of the mammal in which said contrast agent has localized with magnetic resonance imaging or ultrasound within about 1 month of said administration.

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5,496,537

## PROPOFOL HYDROFLUOROCARBON PROPELLANT FORMULATIONS

Richard A. Henry, 7 Toronto Street, Kingston, Ontario, Canada

Filed Mar. 23, 1995, Ser. No. 408,866
Int. Cl.[6] A61K 9/12
U.S. Cl. 424—45 5 Claims

1. An aerosol formulation for oral or nasal delivery to a patient, consisting essentially of:

1–40% w/w propofol; and

60–99% w/w hydrofluorocarbon propellant selected from the group consisting of 1,1,1,2-tetrafluoroethane and 1,1,1,2,3,3,3-heptafluoropropane and combinations thereof.

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5,496,538

## SELF-FOAMING CLEANSER

Amy C. Zimmerman, Ansonia, Conn., and David A. Rosser, Heswall, United Kingdom, assignors to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.

Division of Ser. No. 110,275, Aug. 23, 1993, Pat. No. 5,443,817. This application Sep. 12, 1994, Ser. No. 304,717
Int. Cl.[6] A61K 7/00;9/12
U.S. Cl. 424—45 4 Claims

1. A sprayable cosmetic product comprising:

(i) a clear bottle capable of withstanding at least 10 psig, the bottle including at an open mouth thereof a spray nozzle;

(ii) a clear, single-phase cosmetic composition filling anywhere from 30 to 99% of the bottle, comprising:

(a) from about 0.5 to about 10% by weight of a hydrocarbon propellant having a boiling point less than 50° C.;

(b) from about 0.001 to about 1% by weight of a water-soluble organic dye;

(c) from about 0.5 to about 40% by weight of a surfactant;

(d) from about 0.001 to about 5% by weight of a UV absorber in the 300 to 400 nm range ; and

(e) from about 30 to about 98% by weight of water;

wherein upon actuation of the spray nozzle, a creamy foam mousse is expressed from the bottle.

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5,496,539

## ORAL COMPOSITIONS

Michael J. Mobley, Cincinnati; Michael F. Lukacovic, West Chester; Peter A. Padolik, Mason, and Gregory Berry, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Mason, Ohio

Division of Ser. No. 96,535, Jul. 22, 1993, Pat. No. 5,389,360. This application Oct. 11, 1994, Ser. No. 321,281
Int. Cl.[6] A61K 9/16;9/18;31/30
U.S. Cl. 424—49 5 Claims

1. A toothpaste composition effective against diseases of the oral cavity comprising:

(a) a safe and effective amount of copper bis-glycinate; and

(b) a toothpaste carrier.

5,496,540

## PLAQUE INHIBITION WITH ANTIPLAQUE ORAL COMPOSITION DISPENSED FROM CONTAINER HAVING POLYMERIC MATERIAL IN CONTACT AND COMPATIBLE WITH THE COMPOSITION

Abdul Gaffar, Princeton; Richard S. Robinson, Piscataway; Jeffrey Miller, Sayreville; Chimpiramma Potini, East Brunswick; Michael A. Collins, Keyport, and Theresa G. Shackil, Vincentown, all of N.J., assignors to Colgate Palmolive Company, Piscataway, N.J.

Division of Ser. No. 931,622, Aug. 18, 1992, Pat. No. 5,279,813, which is a division of Ser. No. 505,628, Apr. 6, 1990, Pat. No. 5,167,951, which is a continuation of Ser. No. 427,660, Oct. 26, 1989, Pat. No. 5,135,738. This application Jan. 10, 1994, Ser. No. 179,272
Int. Cl.[6] A61K 7/16;7/18
U.S. Cl. 424—49 18 Claims

1. In a method of inhibiting plaque on teeth comprising applying to the teeth an oral composition dispensed from an article comprising a dispensing container having solid polymeric material in contact with an oral composition in the container, which composition comprises an effective antibacterial antiplaque proportion of a substantially water insoluble non-cationic halogenated diphenyl ether antibacterial antiplaque agent which is normally so incompatible with said solid polymeric material that at least about 25% of said agent is lost after six weeks storage at room temperature in said container, the improvement comprising employing as said solid polymeric material polytetrafluoroethylene which is compatible with said agent in the presence of the oral composition whereby said loss is prevented and the dispensed composition contains more than about 75% of its initial content of said agent.

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5,496,541

## TASTEFUL TOOTHPASTE AND OTHER DENTAL PRODUCTS

Edward T. Cutler, Merion, Pa., assignor to Pilot Research & Development Co., Merion, Pa.

Continuation-in-part of Ser. No. 260,349, Jun. 15, 1994, abandoned, which is a continuation-in-part of Ser. No. 5,341, Jan. 19, 1993, abandoned. This application Jan. 27, 1995, Ser. No. 379,260
Int. Cl.[6] A61K 7/16;7/22
U.S. Cl. 424—50 11 Claims

1. Dental products comprising a surfactant system employing poloxamers as the main surfactant, wherein said poloxamer comprises 0.01 to 10 weight % of said dental product, said system further comprising anionic polysaccharides (AP) plus nonionic cellulose ethers (NCE) in a ternary surfactant system having enhanced foaming power relative to poloxamers alone or to poloxamers plus anionic polysaccharide or to poloxamers plus nonionic cellulose ethers, wherein the weight ratio of said poloxamer to said anionic polysaccharides is greater than 1, and the weight ratio of said anionic polysaccharide to said nonionic cellulose ether is greater than 1.

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5,496,542

## STABLE SODIUM PERCARBONATE FORMULATION

John P. Hauschild, Bridgewater, N.J., assignor to Church & Dwight Co., Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 142,856, Oct. 25, 1993, Pat. No. 5,374,368. This application Sep. 2, 1994, Ser. No. 300,057
Int. Cl.[6] A61K 7/20; C11D 3/39;7/18
U.S. Cl. 424—53 9 Claims

1. A stable hydrogen peroxide-releasing formulation comprising (1) between about 55–90 weight percent of polyalkylene glycol; (2) between about 5–20 weight percent of sodium percarbonate; (3) between about 0.5–6 weight percent of colloidal silica; (4) between about 0–12 weight percent of alkali metal pyrophosphate; and (5) between about 0.2–1 part by weight of water per part of sodium percarbonate.



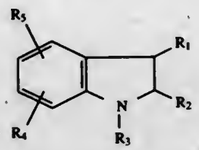
5,496,543

## PRODUCT BASED ON INORGANIC OR ORGANIC PARTICLES BEARING AN INDOLINE-BASED PRODUCT

Alain Lagrange, Chatou; Hervé Andrean, Paris, and Alex Junino, Livry-Gargan, all of, France, assignors to L'Oreal, Paris, France

Filed Dec. 29, 1993, Ser. No. 117,206
Claims priority, application France, Jan. 16, 1992, 92 00417
Int. Cl.[6] A61K 7/032;7/027;7/02
U.S. Cl. 424—70.7 21 Claims

1. Product in powder form consisting of particles, the particles being inorganic or organic particles less than 200 microns in size, the product containing, in or on the particles or in and on the particles, an indoline-based product obtained by oxidative polymerization employing an indoline, the indoline corresponding to the formula



(I)

in which:

$R_1$ and $R_3$ represent, independently of one another, a hydrogen atom or a $C_1$–$C_4$ alkyl group;

$R_2$ represents a hydrogen atom, a $C_1$–$C_4$ alkyl group, a carboxyl group, a $C_1$–$C_4$ a alkoxy carbonyl group, or an n-alkylamino radical;

$R_4$ denotes a hydrogen atom, a $C_1$–$C_4$ alkyl group, a hydroxyl group, a $C_1$–$C_4$ alkozy group, an amino group, a $C_1$–$C_{10}$ alkylamino radical or a halogen atom;

$R_5$ denotes a hydrogen atom, a hydrozyl group, a $C_1$–$C_4$ alkoxy group or an amino group;

at least one of the radicals $R_4$ or $R_5$ denoting a hydroxyl, alkoxy or amino group: with the proviso that when $R_5$ denotes an amino group, $R_4$ cannot denote an alkylamino radical: or

$R_4$ and $R_5$ attached to the carbon atoms joined together form a $C_1$–$C_2$ alkylenedioxy ring, at positions 5 and 6;

as well as the cosmetically acceptable salts.

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5,496,544

## POWDERED COSMETIC COMPOSITION CONTAINING A SILICONE FATTY BINDER

Myriam Mellul, L'Hay les Roses; Sophie Lecomte, Paris; Isabelle Bara, Paris, and Béatrice DeFossez, Paris, all of, France, assignors to L'Oreal, Paris, France

PCT No. PCT/FR93/00221, § 371 Date Jan. 5, 1994, § 102(e) Date Jan. 5, 1994, PCT Pub. No. WO93/17660, PCT Pub. Date Sep. 16, 1993
PCT Filed Mar. 5, 1993, Ser. No. 140,187
Claims priority, application France, Mar. 5, 1992, 92 02654
Int. Cl.[6] A61K 7/02;7/021;7/035
U.S. Cl. 424—78.03 14 Claims

1. Cosmetic composition for the skin, in the form of an anhydrous powder mainly comprising a solid particulate phase mixed with a fatty binder containing a silicone mixture, characterized by the fact that said silicone mixture consists of:

(a) at least one silicone oil,

(b) at least one silicone wax,

(c) at least one silicone resin,

(d) optionally at least one silicone gum, and

(e) optionally at least one phenyl dimethicone,

and in that the said constituents (a), (b), (c), (d) and (e) are present in the binder respectively at concentrations of 12–98.9%, 1–60%, 0.1–25%, 0–3% and 0–20% by weight relative to the total weight of the silicone mixture.

13. Composition according to claim 1, characterized by the fact that it is provided in the form of an eye shadow, a blusher, a face make-up powder or a body powder.

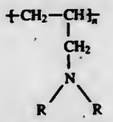
5,496,545

## PHOSPHATE-BINDING POLYMERS FOR ORAL ADMINISTRATION

Stephen R. Holmes-Farley, Arlington; W. Harry Mandeville, III, Lynnfield, and George M. Whitesides, Newton, all of Mass., assignors to GelTex Pharmaceuticals, Inc., Waltham, Mass.

Continuation-in-part of Ser. No. 105,591, Aug. 11, 1993, abandoned. This application May 5, 1994, Ser. No. 238,458
Int. Cl.[6] A61K 31/785
U.S. Cl. 424—78.11 18 Claims

1. A method for removing phosphate from a patient by ion exchange comprising orally administering to said patient a therapeutically effective amount of a composition comprising at least one polymer characterized by a repeat unit having the formula



or a copolymer thereof, wherein n is an integer and each R, independently, is H or a lower alkyl, alkylamino, or aryl group.

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5,496,546

## COMPOSITIONS AND METHODS OF APPLICATION OF REACTIVE ANTIVIRAL POLYADENYLIC ACID DERIVATIVES

Jui H. Wang, 477 LeBrun Rd., Amherst, N.Y. 14226; Insug Kang, and Mohammed H. Rahman, both of Buffalo, N.Y., assignors to Jui H. Wang, Amherst, N.Y.

Continuation-in-part of Ser. No. 22,055, Feb. 24, 1993, abandoned. This application Feb. 23, 1994, Ser. No. 200,650
Int. Cl.[6] A61K 31/765;31/785
U.S. Cl. 424—78.36 18 Claims

1. A composition of matter comprising Y-poly[A] representable by the formula:

$$M_n(Y)_m X_{i(A)_n}$$

where:

[A]n=polyadenylic acid (5') with n adenylic acid residues, n being at least about 20,

Y=FDNP, DNP or partially FDNP and partially DNP,

FDNP=3-fluoro-4,6-dinitrophenyl groups, attached covalently to m of the n 2'-OH groups of $[A]_n$ via ether linkage,

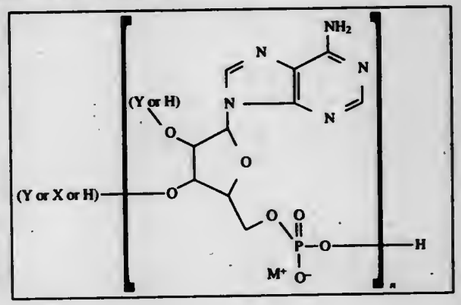
DNP=2,4-dinitrophenyl groups, attached covalently to m of the n 2'-OH groups of $[A]_n$ via ether linkage,

X=an acyl group,

i=0 or 1,

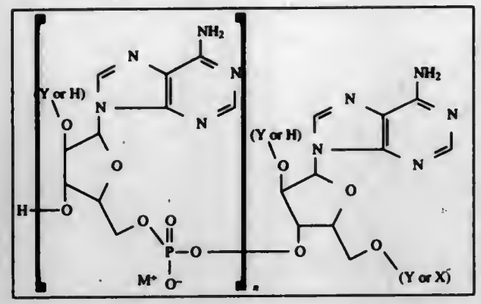
M=a cation selected to provide a desired degree of solubility for the composition,

and has one of the generic structures:



-continued

or



and having a ratio of Y groups to adenine units of at least about 1:5 and wherein n is sufficiently large so that the Y-poly[A] can substantially completely fill the active site cleft of an RNA-virus RT to effectively inactivate reverse transcriptase and/or can effectively inactivate ribonuclease.

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**5,496,547**

**PSEUDOMONAS BIOCONTROL STRAINS**

**Stephen Lam, Raleigh, and Nancy Torkewitz, Hurdle Mills, both of N.C., assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.**

**Filed Jan. 24, 1994, Ser. No. 185,623**

**Int. Cl.[6] A01N** *63/00;* **C12N** *1/20;15/00;1/21*

**U.S. Cl. 424—93.47** **5 Claims**

3. A method for controlling or inhibiting the growth of *Rhizoctania solani* fungus by applying an effective amount of biocontrol strain CGA 319115 deposited as NRRL B-21172 or CGA 321730 deposited as B-21173 to an environment in which the *Rhizoctania solani* fungus may grow.

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**5,496,548**

**HUMAN ANTI-RH(D) MONOCLONAL ANTIBODIES, CELL LINES AND METHODS OF USE OF ANTIBODIES IN IMMUNOASSAYS**

**Benjamin A. De Burgh, Winterbourne Down; Alan Doyle, Salisbury, and Belinda M. Kumpel, Congresbury, all of, England, assignors to National Blood Authority, Watford, England**

**Continuation of Ser. No. 469,517, Apr. 3, 1990, abandoned. This application Apr. 13, 1993, Ser. No. 45,244**

**Claims priority, application United Kingdom, Sep. 18, 1987, 8722019**

**Int. Cl.[6] A61K** *39/395;* **C07K** *16/34;* **C12N** *5/22;* **G01N** *33/53*

**U.S. Cl. 424—142.1** **23 Claims**

1. A human monoclonal antibody having the following essential characteristics:

(a) binding to Rh(D) antigen, but not C, c, E or e antigens of the Rh blood group system;

(b) being IgG3 proteins;

(c) having kappa light chains;

(d) being of the allotype G3m(21);

(e) binding to $D^{u}$ cells by the indirect antiglobulin test;

(f) binding to $D^{IV}$, $D^{V}$ and $D^{Tar}$ ($D^{VII}$) variant antigens; and

(g) not binding to $D^{VI}$ or $D^{\beta}$ variant antigens; and antigen-binding fragments thereof.

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**5,496,549**

**BISPECIFIC MONOCLONAL ANTIBODIES, THROMBOLYTIC AGENT AND METHOD OF CELL LYSIS**

**Hiroh Yamazaki, Tokyo; Kenjiro Tanoue, Ibaraki; Susumu Iwasa, Kyoto, and Tomofumi Kurokawa, Hyogo, all of, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, and Tokyo Metropolitan Institute of Medical Science, Tokyo, both of, Japan**

**Continuation of Ser. No. 673,323, Mar. 22, 1991, abandoned. This application Dec. 6, 1994, Ser. No. 350,497**

**Claims priority, application Japan, Apr. 2, 1990, 2-088985; Jul. 3, 1990, 2-177121**

**Int. Cl.[6] A61K** *51/00;51/10;38/49;* **C07K** *16/38*

**U.S. Cl. 424—158.1** **13 Claims**

1. A bispecific hybrid monoclonal antibody having specificity for both an activated platelet and a protease.

7. A bispecific monoclonal antibody produced by the mouse hybrid-hybridoma deposited as FERM BP-3018.

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**5,496,550**

**METHOD OF REDUCING THE OUTPUT OF EIMERIA OOCYSTS FROM A NEWBORN CHICK**

**Michael Wallach, Jerusalem; Thea Pugatsch, Maaleh Adumin, and David Mencher, Jerusalem, all of, Israel, assignors to Chilwalner, Tel-Aviv, Israel**

**Continuation of Ser. No. 642,219, Jan. 16, 1991, abandoned, which is a continuation-in-part of Ser. No. 310,603, Feb. 14, 1989, abandoned, which is a continuation-in-part of Ser. No. 155,245, Feb. 12, 1988, abandoned, which is a continuation-in-part of Ser. No. 896,611, Aug. 14, 1986, abandoned. This application Aug. 17, 1993, Ser. No. 108,763**

**Claims priority, application Canada, Aug. 13, 1987, 544427**

**Int. Cl.[6] A61K** *39/00;39/012;39/002;39/35*

**U.S. Cl. 424—184.1** **12 Claims**

1. A method of reducing the output of Eimeria oocysts in faces from a newborn chick which comprises administering to a laying hen prior to the hen laying a fertilized egg an amount of a purified or recombinant antigenic protein present in gametocytes of an Eimeria spp. effective to induce in the hen an immune response and transmit maternal antibody to the offspring chick so that the output of oocysts from the chick is reduced, wherein the antigenic protein is selected from the group consisting of proteins derived from Eimeria gametocytes and having molecular weights of 250±20kd, 82±10kd, and 56±5kd, as determined under reducing conditions.

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**5,496,551**

**PEPTIDE STRUCTURES, IMMUNOGENS CONTAINING THEM AND THEIR USES IN THE CONTROL OF FERTILITY**

**Jean-Michel Bidart, Paris; Dominique Bellet, Puteaux, and Claude Bohnon, Paris, all of, France, assignors to Lafon Pharma S.A., Fribourg, France**

**Continuation of Ser. No. 827,867, Jan. 30, 1992, abandoned, which is a continuation of Ser. No. 270,975, Nov. 14, 1988, abandoned. This application Mar. 19, 1993, Ser. No. 34,621**

**Claims priority, application France, Nov. 26, 1987, 87 16420**

**Int. Cl.[6] A61K** *39/38;35/22;* **C07K** *14/59;19/00*

**U.S. Cl. 424—185.1** **12 Claims**

1. A peptide of the sequence:

Thr Met Leu Val Gln Lys Asn Val Thr Ser bonded to the sequence 106–116 of β-hCG.



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**5,496,552**

**OSTEOGENIC DEVICES**

**Thangavel Kuberasampath, Medway, and David C. Rueger, West Roxbury, both of Mass., assignors to Stryker Corporation, Kalamazoo, Mich.**

**Continuation of Ser. No. 103,604, Aug. 6, 1993, abandoned, which is a continuation of Ser. No. 827,052, Jan. 28, 1992, Pat. No. 5,250,302, which is a division of Ser. No. 579,865, Sep. 7, 1990, Pat. No. 5,108,753, which is a division of Ser. No. 179,406, Apr. 8, 1988, Pat. No. 4,968,590. This application Jun. 29, 1994, Ser. No. 268,252**

**Int. Cl.[6] A01N** *25/26;* **A61F** *2/00*

**U.S. Cl. 424—420** **7 Claims**

1. An osteogenic device for implantation in a mammal, the device comprising:

a porous biocompatible matrix; and

substantially pure osteogenic protein disposed in said matrix and comprising a pair of polypeptide chains disulfide bonded to produce a dimeric species having a conformation such that said pair of polypeptide chains is capable of inducing endochondral bone formation in a mammal when disposed within said porous matrix and implanted in a mammal.

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**5,496,553**

**METHODS AND COMPOSITIONS FOR THE TREATMENT OF NIDDM**

**Bary W. Wilson, Kennewick; James A. Campbell, Pasco; Lyle B. Sasser, Richland, all of Wash., and Patricio Hortal, Mar del Plata, Argentina, assignors to Battelle Development Corporation, Richland, Wash.**

**Continuation of Ser. No. 965,904, Oct. 22, 1992, abandoned, which is a continuation of Ser. No. 596,169, Oct. 11, 1990, abandoned, which is a continuation-in-part of Ser. No. 420,266, Oct. 12, 1989, abandoned, which is a continuation-in-part of Ser. No. 180,420, Apr. 12, 1988, abandoned. This application Sep. 2, 1994, Ser. No. 300,927**

**Int. Cl.[6] A61K** *35/78*

**U.S. Cl. 424—195.1** **36 Claims**

1. A hypoglycemic composition, comprising:

a polar solvent extract of the leaves, seed pods, roots or bark of the plant *Hexachlymus edulis*, in combination with a physiologically acceptable carrier or diluent.

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**5,496,554**

**PURIFIED MITE ALLERGEN**

**Satoru Oka; Kazuhisa Ono; Seiko Shigeta, and Takeshi Wada, all of Hiroshima, Japan, assignors to Fumakilla Limited, Tokyo, and Hiroshima University, Hiroshima, both of, Japan**

**Continuation of Ser. No. 480,617, Feb. 15, 1990, abandoned. This application Aug. 4, 1994, Ser. No. 283,905**

**Claims priority, application Japan, Aug. 24, 1989, 1-220064**

**Int. Cl.[6] A61K** *39/35;* **C07K** *14/00*

**U.S. Cl. 424—276.1** **13 Claims**

1. A purified and isolated mite allergen, said allergen possessing the following physicochemical and biological properties:

① being isolated and purified from fecal extracts of mites in cultures;

② being a glycoprotein containing more than 70% sugar;

③ having a weight-average molecular weight of 70,000 to 80,000 as determined by sedimentation equilibrium;

④ possessing allergen activity; and

⑤ being unstainable by Coomassie blue.

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**5,496,555**

**PERSONAL CLEANING COMPOSITION**

**Dennis Colwell, East Windsor, N.J., assignor to Colgate-Palmolive Company, Piscataway, N.J.**

**Continuation-in-part of Ser. No. 48,983, Apr. 16, 1993, abandoned. This application Jul. 21, 1994, Ser. No. 278,444**

**Int. Cl.[6] A61K** *7/48*

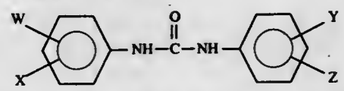
**U.S. Cl. 424—405** **13 Claims**

1. A cleansing composition comprising

a. about 1–99 wt % of a surfactant,

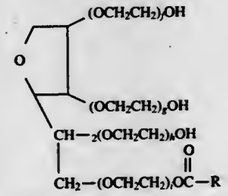
b. a green colorant in an effective amount to cause green coloration,

c. an antibacterial effective, compatible non-irritating amount of a compound of the formula.



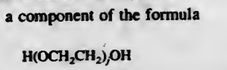
wherein W, X, Y and Z are the same or different and are halogen or hydrogen,

d. A component of the formula



wherein the sum total of f, g, h and i is an integer of average of about 16 to 24 and R is an alkyl of an average number of carbon atoms of about 9 to 13, and

e. a component of the formula



wherein j has an average value of an integer of about 8 to 16 wherein the ratio of d to e is such that the composition color remains stable over time as measured by visual perception and/or the b axis value of a tristimulus colorimeter, d is about 33 to 70 wt % of d and e together and d and e combined are about 0.25 to 1.75 wt % of the composition.

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**5,496,556**

**METHOD OF TREATING PROSTATIC ADENOCARCINOMA**

**Randall K. Johnson, Ardmore, Pa., assignor to Smithkline Beecham Corporation, Philadelphia, Pa.**

**Continuation of Ser. No. 544,709, Jun. 27, 1990, Pat. No. 5,300,294. This application Dec. 20, 1993, Ser. No. 170,481**

**The portion of the term of this patent subsequent to Apr. 5, 2011, has been disclaimed.**

**Int. Cl.[6] A61K** *9/20;9/48;31/56;31/58*

**U.S. Cl. 424—423** **1 Claim**

1. A method of treating human prostatic adenocarcinoma which comprises administering in a human subject in need thereof, a dosage unit containing from about 0.1 mg/kg to about 100 mg/kg of a steroid 5-α -reductase inhibiting compound from one to six times daily.

5,496,557

**ARTICLE FOR THE CONTROLLED DELIVERY OF AN ACTIVE SUBSTANCE, COMPRISING A HOLLOW SPACE FULLY ENCLOSED BY A WALL AND FILLED IN FULL OR IN PART WITH ONE OR MORE ACTIVE SUBSTANCES**

Jan Feijen, Hengelo, and Hilbert Esselbrugge, Enschede, both of, Netherlands, assignors to Akzo N.V., Ls Arnhem, Netherlands

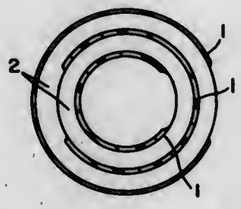
PCT No. PCT/NL91/00013, § 371 Date Aug. 24, 1993, § 102(e) Date Aug. 24, 1993, PCT Pub. No. WO91/11176, PCT Pub. Date Aug. 8, 1991

PCT Filed Jan. 30, 1991, Ser. No. 917,058

Claims priority, application Netherlands, Jan. 30, 1990, 9000221

Int. Cl.[6] A61F *2/00*

U.S. Cl. 424—426 19 Claims




1. An article for the controlled delivery of an active substance, comprising a hollow space fully enclosed by a wall and filled in full or in part with one or more active substances, wherein the wall is comprised of a portion or portions of a first polymeric material that is permeable to the active substance and is degradable and a portion or portions of a second polymeric material that is poorly permeable to the active substance relative to the first polymeric material and is degradable, and wherein there is a transport path for the delivery of the active substance from the hollow space to the surroundings of the article which is a continuous distance leading through the first polymeric material permeable to the active substance, and wherein the first and second polymeric materials are selected from polyesters, polyorthoesters, poly(α-amino acids), polydepsipeptides, polyanhydrides and polyphosphazenes, co- or block co-polymers derived therefrom and stereo complexes of polymers formed from optically active monomers of these biodegradable polymers.

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5,496,558

**SOLID FORM XEROSTOMIA PRODUCT**

Neil J. Napolitano, Fanwood; Kuo-Chen Yeh, Westfield, both of N.J.; Frank J. Sena, Brooklyn, N.Y.; Phil J. Otha, Mendham, and Manuel M. Roque, Nutley, both of N.J., assignors to Block Drug Company Inc., Jersey City, N.J.

Filed Mar. 2, 1993, Ser. No. 25,174

Int. Cl.[6] A61F *13/00;* A61K *9/20*

U.S. Cl. 424—435 12 Claims

1. A solid product for relieving xerostomia symptoms which comprises a lubricating polymer comprising a polyethylene oxide having a molecular weight of 8,000 to 4,000,000 in an amount of about 0.01–5%, a pharmaceutically acceptable organic acid sialogogue in an amount of about 0.1–2%, and a sorbitol containing carrier in an amount of 20–99%, said sorbitol containing carrier containing about 10 to 100% sorbitol.

5,496,559

**POROUS SOLID FORMULATIONS CONTAINING PROTEINACEOUS PHYSIOLOGICALLY ACTIVE SUBSTANCES**

Keiji Fujioka, Amagasaki; Shigeji Sato, Ibaraki, and Yoshihiro Takada, Suita, all of, Japan, assignors to Sumitomo Pharmaceuticals Company, Limited, Osaka, Japan

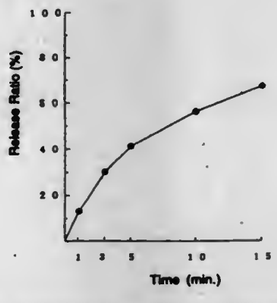
PCT No. PCT/JP92/00420, § 371 Date Sep. 30, 1993, § 102(e) Date Sep. 30, 1993, PCT Pub. No. WO92/17209, PCT Pub. Date Oct. 15, 1992

PCT Filed Apr. 6, 1992, Ser. No. 122,430

Claims priority, application Japan, Apr. 8, 1991, 3-074990; Apr. 8, 1991, 3-074991

Int. Cl.[6] A61F *13/02;* A61K *47/42*

U.S. Cl. 424—435 8 Claims




1. A spongy formulation for buccal or oral administration which contains a therapeutically effective amount of a proteinaceous physiologically active substance as an active ingredient, collagen and a water-soluble additive, said formulation being characterized by having a density of 10 mg/cm$^3$ to 500 mg/cm$^3$, a porosity of from 99% to 23% and a disintegration time of from 1 minute to 30 minutes.

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5,496,560

**BORDERLINE ACTIVE DOSAGE FORMS OF BETA BLOCKERS**

Rainer K. Liedtke, Gruenwald, Germany, assignor to Pharmed Dr. Liedtke GmbH, Gruenwald, Germany

Filed Oct. 13, 1994, Ser. No. 322,420

Claims priority, application Germany, Jan. 13, 1993, 43 34 919.6

Int. Cl.[6] A61F *13/00;* A61K *9/20*

U.S. Cl. 424—449 8 Claims

1. A method of effecting short-term therapy of transient functional cardiovascular symptoms, comprising administering to a patient in need thereof a borderline active dosage form of beta blockers, which produces in a patient only borderline active concentrations of active agent which produce no significant changes in physiological values in a cardiovascular system under resting conditions for the beta blocker used and which significantly reduces adrenergically induced transient stimulation effects from a pharmacodynamic standpoint, and

wherein said dosage form is an oral dosage form, containing 10% to 50% of the currently administered lowest oral therapeutic single dose of the respective beta blocker which is given in a chronic therapy, and

further wherein one dosage is administered about every 24 to 52 hours.



5,496,561

**CONTROLLED RELEASE-INITIATION AND CONTROLLED RELEASE-RATE PHARMACEUTICAL COMPOSITION**

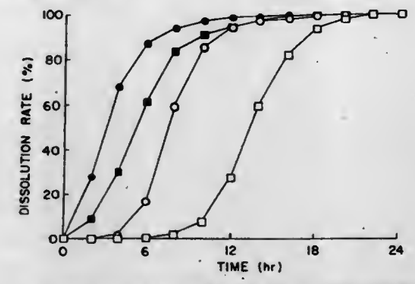
Minoru Okada; Kenji Ono; Shuichi Kasai, and Akira Iwasa, all of Chiba, Japan, assignors to SS Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Aug. 24, 1994, Ser. No. 294,052

Claims priority, application Japan, Aug. 25, 1993, 5-210453

Int. Cl.[6] A61K *9/24;9/32*

U.S. Cl. 424—480 22 Claims




1. A controlled release-initiation and controlled release-rate pharmaceutical composition comprising a drug-containing composition coated with a membrane layer comprising a water insoluble polymer and at least 5% by weight of a silicone, based on the weight of the water insoluble polymer.

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5,496,562

**SOLID MEDIUM AND METHOD FOR DNA STORAGE**

Leigh A. Burgoyne, Seaford, Australia, assignor to Flinders Technologies Pty Ltd, Bedford Park, Australia

Continuation of Ser. No. 671,859, May 29, 1991, abandoned. This application Nov. 30, 1993, Ser. No. 159,104

Claims priority, application Australia, Jan. 5, 1988, PJ0775

Int. Cl.[6] A61K *9/14;9/70*

U.S. Cl. 424—488 16 Claims

1. A dry solid medium for storage of a sample of DNA comprising:

(a) a cellulose based solid matrix; and

(b) a composition consisting essentially of a weak base, a chelating agent, an anionic surfactant or anionic detergent and optionally uric acid or a urate salt,

wherein said composition is adsorbed on or incorporated into said solid matrix.

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5,496,563

**DRY GEL COMPOSITION**

Yoji Ito, and Yasuo Hirai, both of Tokyo, Japan, assignors to Showa Yakuhin Kako Co., Ltd., Tokyo, Japan

PCT No. PCT/JP92/01097, § 371 Date Feb. 28, 1994, § 102(e) Date Feb. 28, 1994, PCT Pub. No. WO93/04670, PCT Pub. Date Mar. 18, 1993

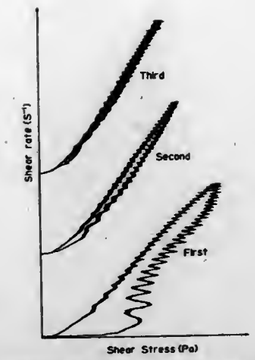
PCT Filed Aug. 28, 1992, Ser. No. 196,070

Claims priority, application Japan, Aug. 30, 1991, 3-220435

Int. Cl.[6] A61K *9/14;47/36*

U.S. Cl. 424—489 12 Claims

1. A dry gel composition comprising 40% by weight or below, based on the whole composition, of a medicine which can be orally administered, 3% by weight or above of a gelling agent comprising pregelatinized starch and 5% by weight or below of a binder, which composition is capable of forming an aqueous gel composition having viscosity of about 100 to 500 cP and having a consistency of gruel, upon mixing with 2 to 15 parts by weight of water per part by weight of the composition at a temperature of 40° C. or below, wherein the medicine which can be orally administered is cinnarizine or allopurinol.




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5,496,564

**SUSPENDIBLE COMPOSITION AND PROCESS FOR PREPARING THE SAME**

Sotoo Asakura, Kyoto; Yasuto Koyama, Itami; Youhei Kiyota, Ikeda; Kiyoko Akashi, Takarazuka; Akira Kagayama, Ikoma; Yoshio Murakami, and Toshiomi Nakate, both of Kobe, all of, Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

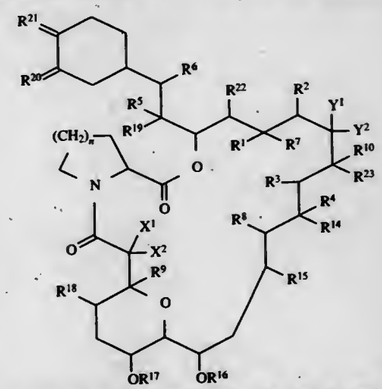
Continuation of Ser. No. 97,617, Jul. 27, 1993, Pat. No. 5,368,865, which is a continuation of Ser. No. 788,041, Nov. 5, 1991, abandoned. This application Aug. 26, 1994, Ser. No. 296,403

Claims priority, application Japan, Nov. 8, 1990, 2-304839; United Kingdom, Mar. 7, 1991, 9104834; Japan, Jan. 7, 1991, 3-259358

Int. Cl.[6] A61K *9/10;9/14;47/00*

U.S. Cl. 424—489 9 Claims

1. A suspendible composition comprising fine particles of a tricyclic compound represented by the following formula (I):




(I)

wherein each of adjacent pairs of $R^1$ and $R^2$, $R^3$ and $R^4$ or $R^5$ and $R^6$ independently

(a) is two adjacent hydrogen atoms, or

(b) may form another bond formed between the carbon atoms to which they are attached,

and further, $R^2$ is an alkyl group;

$R^7$ is a hydrogen atom, a hydroxy group, a protected hydroxy group or an alkoxy group, or an oxo group together with $R^1$;

$R^8$ and $R^9$ each is independently a hydrogen atom or a hydroxy group;

$R^{10}$ is a hydrogen atom, an alkyl group, an alkyl group substituted by one or more hydroxy groups, an alkenyl group, an alkenyl group substituted by one or more hydroxy groups or an alkyl group substituted by an oxo group;
$X^1$ is a hydrogen atom or a hydroxy group;
$X^2$ is a hydrogen atom; or
$X^1$ and $X^2$ may together represent an oxo group or $—CH_2O—$;
$Y^1$ is a hydrogen atom or a hydroxy group;
$Y^2$ is a hydrogen atom; or
$Y^1$ and $Y^2$ may together represent an oxo group, $N—NR^{11}R^{12}$ or $N—OR^{13}$;
$R^{11}$ and $R^{12}$ each is independently a hydrogen atom, an alkyl group, an aryl group or a tosyl group;
$R^{13}$, $R^{14}$, $R^{15}$, $R^{16}$, $R^{17}$, $R^{18}$, $R^{19}$, $R^{22}$ and $R^{23}$ each is independently a hydrogen atom or an alkyl group;
$R^{20}$ and $R^{21}$ each is an oxo group or independently ($R^{20}$a and a hydrogen atom) or ($R^{21}$a and a hydrogen atom) in which $R^{20}$a and $R^{21}$a each is independently a hydroxy group, an alkoxy group or a group represented by the formula $—OCH_2OCH_2CH_2OCH_3$, or $R^{21}$a is a protected hydroxy group, or $R^{20}$a and $R^{21}$a may together represent an oxygen atom in an epoxide ring;
n is an integer of 1, 2 or 3;
in addition to their above definitions, four of $Y^1$, $Y^2$, $R^{10}$ and $R^{23}$, together with the carbon atoms to which they are attached, may represent a saturated or unsaturated 5- or 6-membered nitrogen, sulfur and/or oxygen containing heterocyclic ring optionally substituted by one or more groups selected from the group consisting of an alkyl, a hydroxy, an alkyl substituted by one or more hydroxy, an alkoxy, benzyl and a group of the formula $—CH_2Se(C_6H_5)$;
or a pharmaceutically acceptable salt thereof, said fine particles of the tricyclic compound and its pharmaceutically acceptable salt having the average size of 5 μm or below;
a pharmaceutically acceptable surfactant; and optionally an aqueous medium.

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**5,496,565**

## MICROSPHERULES

**Friedrich Heinze, Frankfurt, and Martina Classen, Hamburg, both of, Germany, assignors to Beiersdorf Aktiengesellschaft, Hamburg, Germany**

**Filed Mar. 15, 1994, Ser. No. 213,341**
**Claims priority, application Germany, Mar. 16, 1993, 43 08 282.3**
**Int. Cl.[6] A61K *9/50***
**U.S. Cl. 424—502** **1 Claim**

1. Microspherules of a composition by weight consisting essentially of
(a) 1–20% if at least one fatty alcohol having 16–22 C atoms and selected from the group consisting of cetyl alcohol, stearyl alcohol and behenyl alcohol,
(b) 1–20% cetyl palmitate,
(c) 1–20% of highly disperse silica, and
(d) optionally at least one cosmetically or pharmaceutically active substance, auxiliary or additive.

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**5,496,566**

## TECHNIQUE FOR COMBATTING UNDESIRED EMF/ELF

**Raymond C. Crippen, 614 Loveville Rd. Apt. D2G, Hockessin, Del. 19707, and Carleton T. Miller, Stewart Rd., Box 840, Rd. #1, Woodstown, N.J. 08098**

**Continuation of Ser. No. 27,470, Mar. 8, 1993, abandoned, which is a continuation-in-part of Ser. No. 847,685, Mar. 6, 1992, abandoned. This application Jul. 19, 1994, Ser. No. 277,508**
**Int. Cl.[6] A01N *59/00;59/06***
**U.S. Cl. 424—687** **5 Claims**

1. A method of installing in a building a suspension containing paramagnetic susceptible elements consisting essentially of:
(A) providing in a non-metallic container a composition consisting essentially of (i) 30–99 wt % of a carbonate or a mixture of two or more carbonates selected from the group consisting of magnesium carbonate, calcium carbonate, strontium carbonate, barium carbonate and mixtures thereof, wherein the carbonate or mixture of carbonates are in powder form, (ii) 1–70 wt % of activated carbon in powder form, (iii) 0.1–10 wt % of an additive selected from the group consisting of magnesium oxide, magnesium hydroxide, calcium oxide, calcium hydroxide, strontium oxide, strontium hydroxide, lithium oxide, lithium hydroxide, sodium oxide, sodium hydroxide, potassium oxide, potassium hydroxide, rubidium oxide, rubidium hydroxide, cesium oxide, cesium hydroxide and mixtures thereof, wherein the additive is in powder form;
(B) adding water to the non-metallic container to form a suspension in water, wherein the proportion of the composition to the added water is 5–12 lbs of the composition per 2 gallons of water;
(C) placing said non-metallic container in a building;
(D) providing two electrically conductive wires;
(E) inserting a bare portion of one electrically conductive wire into the non-metallic container to make contact with the suspension, and making a ground connection with the opposite end of the wire; and
(F) inserting a bare portion of the remaining electrically conductive wire into the non-metallic container to make contact with the suspension, and making a connection to a water pipe in the building with the opposite end of the wire.

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**5,496,567**

## COMPOSITION HAVING BUFFERING AND NUTRITIONAL PROPERTIES

**Linsey McLean, G-4267 South State Rd., Davison, Mich. 48423**

**Filed Aug. 26, 1993, Ser. No. 112,768**
**Int. Cl.[6] A61K *33/08;33/00;31/315;31/195***
**U.S. Cl. 424—692** **22 Claims**

1. An orally administrable buffering composition in a liquid suspension form for use in a living system comprising:
between 3 and 10 percent by weight of a base, said base comprising a buffering ingredient that is substantially insoluble in a neutral medium;
a liquid suspension, said suspension comprising an oil, said oil being provided in the amount of between 10 and 40 percent by weight, said oil being slightly soluble in water; and
between 1 and 5 percent by weight of a vitamin supplement,
whereby the buffering composition raises the pH of the living system to which it is administered.

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**5,496,568**

## FUNGAL DISEASE CONTROL IN CULTIVATED PLANTS

**Anthony E. Winston, East Brunswick, N.J., assignor to Church & Dwight Co., Inc., Princeton, N.J.**

**Filed Jun. 26, 1995, Ser. No. 494,523**
**Int. Cl.[6] A01N *43/28;37/02;37/06;59/00***
**U.S. Cl. 424—717** **21 Claims**

1. A method for controlling fungal disease in cultivated plants which comprises contacting the plant matter with a fungicidally effective application of an aqueous formulation which has a content comprising (1) between about 0.1–2 weight percent of an ingredient selected from the group consisting of alkali metal and ammonium bicarbonates; (2) between about 0–1 weight percent of a basic ingredient selected from the group consisting of alkali metal and ammonium carbonates; (3) between about 0.05–2 weight percent of propiconazole; (4) between about 0–1 weight percent of a surfactant ingredient; (5) between about 0–0.25 weight percent of a hydrotrope ingredient selected from the group consisting of alkali metal and ammonium $C_7$–$C_{10}$ fatty acid salts; and (6) between about 0–0.5 weight percent of a hydrophilic polymer ingredient; based on the formulation weight.

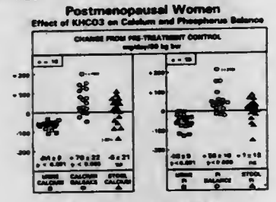


**5,496,569**

## SIMULTANEOUS TREATMENT OF OSTEOPOROSIS AND HYPERTENSION WITH POTASSIUM BICARBONATE

**R. Curtis Morris, Jr., and Anthony Sebastian, both of San Francisco, Calif., assignors to The Regents of the University of California, Oakland, Calif.**

**Continuation-in-part of Ser. No. 420,597, Oct. 17, 1989, Pat. No. 5,171,583, which is a continuation-in-part of Ser. No. 260,856, Oct. 21, 1988, abandoned. This application Apr. 2, 1993, Ser. No. 42,309**
**Int. Cl.[6] A01N *59/00;* A61K *33/00***
**U.S. Cl. 424—717** **9 Claims**




1. A method for the simultaneous treatment of both hypertension and osteoporosis in a person who has or is susceptible to both such diseases and who is on a diet having a normal range of salt content, comprising orally administering to such person a composition containing a major amount of potassium bicarbonate as the principal active ingredient for the simultaneous treatment of hypertension and osteoporosis, the potassium bicarbonate being administered in an amount sufficient to have a measurable effect upon both hypertension and osteoporosis, which can be shown experimentally to be due to the presence of potassium bicarbonate, but not sufficient to induce undesirable toxic effects.

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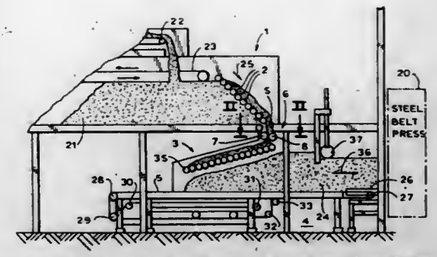
**5,496,570**

## APPARATUS FOR SPREADING PARTICULATE MATERIALS

**Dieter Mauss; Jürgen Pesch, both of Krefeld, and Friedhelm Schlüpen, Straelen, all of, Germany, assignors to Siempelkamp GmbH & Co., Krefeld, Germany**

**Filed Jan. 27, 1994, Ser. No. 187,770**
**Claims priority, application Germany, Feb. 2, 1993, 43 02 850.0**
**Int. Cl.[6] B28B *5/02***
**U.S. Cl. 425—83.1** **8 Claims**

1. An apparatus for spreading particles coated with binder in a mat for the production of a pressed board in a continuous steel-belt press, said apparatus comprising:
a driven continuous band forming a mat-receiving surface displaceable in a given direction;
a bin above said mat-receiving surface containing particles coated with binder to be spread in a mat on said surface;
a discharge roll device at an outlet of said bin for feeding said particles from said bin;
means for forming a spreading head between said device and said surface for spreading said particles in at least one layer forming said mat on said surface, said spreading head comprising:
between said bin and said surface at least one clump breaker having at least one pair of mutually parallel, generally horizontal, counterrotating and generally cylindrical disintegrating rollers extending perpendicular to said direction, each of said rollers having a plurality of circumferential rows of equispaced disintegrating teeth with the rows being equispaced axially from one another, the rows of teeth of the two rollers interdigitating in a radial overlapping region forming between said rollers an axially meandering gap of ziz-zag or wave shape traversed downwardly by said particles and of a gap width determining a disintegrating resolution of the clump breaker, the disintegrating teeth being inclined in a direction opposite the sense of rotation of the respective roller in a sawtooth pattern, said rollers being horizontally offset from one another; and
means for adjusting the horizontally offset of one of said rollers relative to the other of said rollers.



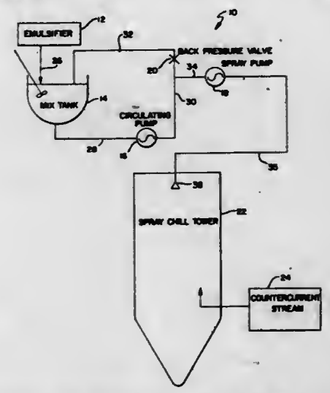

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**5,496,571**

## METHOD FOR INCREASING THE PRODUCTION OF MILK IN RUMINANTS

**Peter A. Blagdon, and Robert D. Morgan, both of Paris, Ill., assignors to Morgan Manufacturing Co., Inc., Paris, Ill.**

**Continuation of Ser. No. 998,819, Dec. 30, 1992, abandoned. This application Mar. 29, 1994, Ser. No. 219,133**
**Int. Cl.[6] A23K *1/00***
**U.S. Cl. 426—2** **16 Claims**




1. A method of increasing the production of milk in a ruminant, comprising:
orally administering to a ruminant a milk-production increasing effective amount of a liquid choline-containing composition, said composition comprising microcapsules substantially each of said microcapsules having an edible, substantially continuous, solid, fusible outer shell encapsulating a discontinuous phase, said discontinuous phase including a multiplicity of choline-containing liquid cores, wherein said outer shell protects said choline-containing liquid cores in said discontinu-

ous phase against metabolism by bacteria in the rumen of the ruminant wherein said shell material is made of a material which remains inert in the rumen.

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**5,496,572**

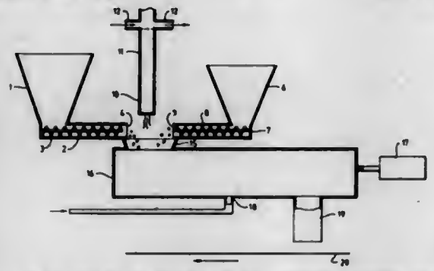
## RUMINANT FEEDSTUFFS AND THEIR PRODUCTION

**Conor Rudden, Eire, Ireland, assignor to Church & Dwight Co., Inc., Princeton, N.J.**

**Continuation of Ser. No. 89,563, Jul. 12, 1993, abandoned, which is a continuation-in-part of Ser. No. 924,493, Aug. 4, 1992. This application Feb. 6, 1995, Ser. No. 384,615**

**Int. Cl.[6] A23K *1/00***

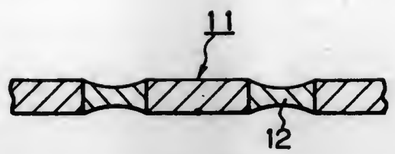
**U.S. Cl. 426—74** **13 Claims**



1. A process for the production of a ruminant feedstuff which process comprises continuously forming on a moving conveyor a compact mass of a substantially homogeneous mixture of animal or vegetable protein nutritional material, one or more fatty acid(s) and a basic calcium or magnesium salt capable of forming an edible, water-insoluble salt with the fatty acid(s) at an elevated temperature sufficient to initiate salt formation, maintaining the temperature processing conditions in the range of 105° to 120° C. in the compact mass on the moving conveyor until the protein nutritional material is rendered substantially non-degradable in the rumen while remaining digestible in the lower gut, and then cooling the product; wherein the compact mass has a water content of 4–18% during the salt formation reaction period.

2. A ruminant feedstuff which comprises, in admixture, one or more edible, water-insoluble calcium or magnesium salts of one or more saturated or unsaturated fatty acids, and animal or vegetable protein nutritional material, the protein nutritional material having been converted during formation of the fatty acid salt into a form which is substantially non-degradable in the rumen but which is digestible in the lower gut; wherein the ruminant feedstuff product is produced by a continuous process in accordance with claim 1.

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**5,496,573**

## COFFEE FILTER MATERIAL AND COFFEE FILTER BAG

**Hiroshi Tsuji, Toyonaka; Hiromasa Saisaka, Izumiotsu; Hideo Murakami, Kyoto; Kaichi Suzuki, Kyoto, and Masaaki Fukuchi, Kyoto, all of, Japan, assignors to Yamanaka Industry Co., Ltd., Kyoto, and Kuraray Co., Ltd., Okayama, both of, Japan**

**Continuation of Ser. No. 122,311, Sep. 14, 1993, abandoned, which is a continuation of Ser. No. 824,722, Jan. 17, 1992, abandoned, which is a continuation of Ser. No. 559,305, Jul. 30, 1990, abandoned. This application Feb. 27, 1995, Ser. No. 395,174**

**Claims priority, application Japan, Aug. 1, 1989, 1-198001; Dec. 29, 1989, 1-340575; May 2, 1990, 2-115191**

**Int. Cl.[6] B65D *85/00***

**U.S. Cl. 426—84** **6 Claims**

1. A coffee filter bag formed from a coffee filter material having a fibrous filter layer comprising a filter nonwoven fabric having pores, said pores varying in volume in accordance with the radius of the pores, said fabric being composed of melt blown polypropylene fibers having an average diameter of 15 μm or less, wherein the filter nonwoven fabric satisfies the relationships (1) to (4):

$$3 \leqq x \leqq 30 \quad (1),$$

$$y \geqq 0.2x \quad (2),$$

$$3 \leqq r_{30} \quad (3),$$

and

$$r_{70} \leqq 40 \quad (4)$$

wherein x represents a basis weight (g/m$^2$) of the filter nonwoven fabric, y represents a cumulative volume value (cm$^3$/g) of said pores in the filter nonwoven fabric, determined by a mercury porosimeter in which mercury is forced into the filter nonwoven fabric and the amount of mercury penetrated into the fabric is measured while changing the forcing pressure of mercury in the range of 0.4 to 10,000 PSI, $r_{30}$ represents a maximum radius (μm) of the pores observed when the volume of the pores in the filter nonwoven fabric are cumulated by said porosimeter starting with the volumes of said pores having a smallest radius and the cumulative volume value becomes equal to 0.3y, and $r_{70}$ represents a maximum radius (μm) of the pores observed when the volumes of the pores in the filter nonwoven fabric are cumulated by said porosimeter starting with the volume of said pores having a smallest radius and the cumulative volume becomes equal to 0.7y, and is capable of removing from a mixture of 400 ml of distilled water and 1.0 gram of an oil and fat component extracted from coffee at least 0.5 gram of said oil and fat component per gram of fiber when the filter nonwoven fabric having an area of 100 cm$^2$ is boiled for 5 minutes in said mixture and a supporting layer comprising at least one sheet of a reinforcing fabric having no substantial influence on the filtering property of the fibrous filter layer and laminated and combined with the fibrous filter layer to form an integrated composite sheet material.

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**5,496,574**

## ENCAPSULATED SENSORY AGENTS

**Dean F. Rushmore; Oliver Chmiel, both of Marysville, Ohio; Marc Furrer, La Sarraz, Switzerland, and Richard T.-S. Liu, Worthington, Ohio, assignors to Nestec S.A., Vevey, Switzerland**

**Filed Feb. 1, 1995, Ser. No. 382,364**

**Int. Cl.[6] A23F *5/46***

**U.S. Cl. 426—98** **21 Claims**

1. A process for encapsulating a sensory agent, the process comprising:

forming an oil-in-water emulsion from a hydrolyzed vegetable oil, an aqueous medium, and water-soluble, carbohydrate-based, film forming agent, the aqueous phase of the emulsion containing at least 50% by weight of the film forming agent and the emulsion containing the sensory agent, and

spraying the oil-in-water emulsion onto soluble beverage powder; the moisture content of the soluble beverage powder after spraying being less than 5% by weight.



**5,496,575**

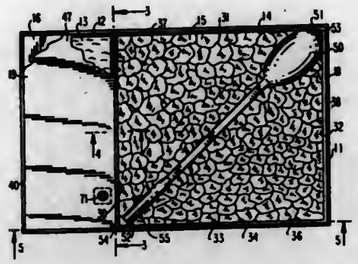
## SINGLE USE CEREAL AND MILK CONTAINER

**Emil Newarski, 135 Jay Ave., Lyndhurst, N.J. 07070**

**Filed Nov. 18, 1994, Ser. No. 341,747**

**Int. Cl.[6] B65D *23/04***

**U.S. Cl. 426—115** **11 Claims**



1. A single use cereal and milk container comprising; first container means for hermetically housing a single serving of cereal, a single serving of cereal disposed in said first container means, and second container means for aseptically housing a supply of milk for said cereal, a supply of milk disposed in said second container means, and wall means separating said first container means and said second container means, said first container means and said second container means having respective bottom walls adjacent to said wall means, said second container bottom wall being disposed above said first container bottom wall, and means for integrally forming said wall means with said first container means and said second container means so as to provide an integral container comprised of said first container means, said second container means and said wall means, said wall means having a first side and a second side oppositely disposed from said first side, said first side comprising said first container means for hermetically housing said cereal and said second side comprising said second container means for aseptically housing said milk, said cereal contactingly engaging said first side and said milk contactingly engaging said second side, said wall means being formed with orifice means communicating with the first and second container means, destructible means for aseptically sealing the milk, said aseptic sealing means being disposed on the wall means and covering said orifice means, said orifice means and aseptic sealing means being disposed adjacent said second container means bottom wall so that with destructing the aseptic sealing means the milk gravity flows from the second container means to the first container means, said first container means comprising cover means for covering the cereal and further comprising said means for hermetically sealing said cereal within the first container means, whereby a user removes said cover means and accesses the cereal and the aseptic sealing means and then destructs the aseptic sealing means to cause the milk to flow from the second container means through the orifice means and wall means into the first container means onto the cereal, and whereinafter the container is not again useable.

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**5,496,576**

## METHOD FOR THAWING FOOD IN MICROWAVE OVEN

**Suk D. Jeong, Kyungsangnam-Do, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea**

**Filed Sep. 21, 1994, Ser. No. 309,689**

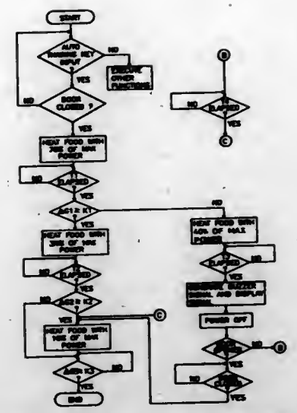
**Claims priority, application Rep. of Korea, Sep. 28, 1993, 20284/1993**

**Int. Cl.[6] A23L *1/025*; H05B *6/68***

**U.S. Cl. 426—233** **9 Claims**

1. A method of thawing a food in a microwave oven including a gas sensor, comprising the steps of:

(a) heating the food with a first predetermined power for a first predetermined time;



(b) comparing a first variation of an output signal from the gas sensor with a first predetermined value after said heating step (a);

(c) determining a relative size of the food to be thawed based on the comparison result from said comparison step (b);

(d) heating the food with a second predetermined power for a second predetermined time when the relative size of the food has been determined to be in a first range at said determining step (c);

(e) heating the food with a third predetermined power for a third predetermined time when the relative size of the food has been determined to be in a second range at said determining step (c);

(f) informing a user to turn the food after said heating step (e);

(g) comparing a second variation of the sensor output signal after the second predetermined time with a second predetermined value;

(h) heating the food with a fourth predetermined power if the second variation is compared to be greater than or equal to the second predetermined value at the step (g); and

(i) comparing a third variation of the sensor output with a third predetermined value if the second variation is compared to be less than the second predetermined value;

wherein the comparison result from said comparing step (i) determines whether or not the food is to be additionally heated so as to thaw the food.

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**5,496,577**

## PROCESS FOR THE PRODUCTION OF A LOW-SUGAR, ALCOHOL-FREE BEVERAGE

**Walter Gresch, late of Niederwenigen, Switzerland, assignor to Bucher-Guyer AG, Maschinenfabrik, Niederwenigen, Switzerland**

**PCT No. PCT/CH93/00007, § 371 Date Jun. 1, 1994, § 102(e) Date Jun. 1, 1994, PCT Pub. No. WO93/14650, PCT Pub. Date Aug. 5, 1993**

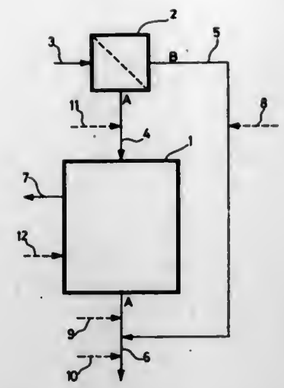
**PCT Filed Jan. 29, 1992, Ser. No. 122,484**

**Claims priority, application Switzerland, Jan. 29, 1992, 0246/92-9**

**Int. Cl.[6] A23L *2/00;2/08;2/70;2/74***

**U.S. Cl. 426—330.5** **12 Claims**

1. A process for the production of a low-sugar, alcohol-free fruit juice beverage from raw juices of fruits, grapes, berries and other fruits comprising the steps of subjecting an initial product consisting of a raw juice to a preliminary separation to divide the raw juice into a first stream having a lower acid/sugar ratio and a higher sugar content relative to the raw juice and a second stream having a higher acid/sugar ratio and a lower sugar content relative to the raw juice, subjecting the first stream to a desugarization process, and introducing the second stream with its high quantitative ratio



of acids to sugar into the first stream after the desugarization thereof to increase the content of acid therein whereby the quality of the first stream is increased.

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**5,496,578**

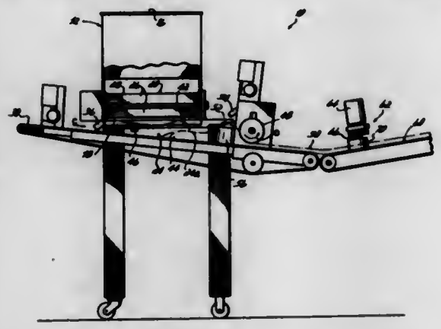
**STRESS FREE DOUGH SHEETING PROCESS FOR BATCH SYSTEMS**

**Bernardus W. Muller, Loveland, and Timothy Mauro-Vetter, Mason, all of Ohio, assignors to Rykaart, Inc., Hamilton, Ohio**

**Division of Ser. No. 80,070, Jun. 18, 1993, Pat. No. 5,427,515. This application Nov. 15, 1994, Ser. No. 339,933**

**Int. Cl.[6] A21C** *11/10;3/10;9/08*

**U.S. Cl. 426—502** **4 Claims**



1. A process for producing a continuous sheet of dough, said process comprising the steps of:

preparing a mass of dough;

sectioning said dough mass into portions of dough, said dough portions being generally of equal volumes;

placing said dough portions serially on a conveyor;

regulating said sectioning and said placing such that a leading end of each said dough portion overlaps a prior dough portion, said regulating including a detection device being positioned to detect a trailing end of each said dough portion on said conveyor, said detection device preventing the sectioning of a subsequent dough portion until said trailing end has been detected to thereby overlap each said dough portion on said conveyor onto a previous dough portion; and

forming said overlapping dough portions into a dough sheet of uniform height.

**5,496,579**

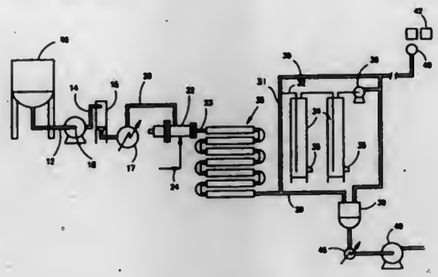
**PROCESS AND APPARATUS FOR PRODUCING A FLAVORING COMPOSITION**

**C. Steve Weigandt, Cordova, Tenn.; Jerry J. Carter, Plano, Tex., and Anthony V. DiMaiolo, Germantown, Tenn., assignors to Kraft Foods, Inc., Northfield, Ill.**

**Filed Mar. 24, 1995, Ser. No. 409,654**

**Int. Cl.[6] A23L** *1/232*

**U.S. Cl. 426—533** **8 Claims**



1. A process for preparing a flavoring composition comprising the steps of:

providing a fat or oil which is suitable for producing an intense grill flavor when subjected to heat in the presence of oxygen;

forming a thin film of the fat or oil and subjecting the thin film of the fat or oil to an elevated temperature of at least about 600° F. in the presence of oxygen in a thin film heat exchanger causing the fat or oil to undergo a phase change to produce an exothermic gaseous material;

cooling the gaseous material to a temperature of between about 210° F. to about 230° F. in about 75 seconds to produce an oil phase and a vapor phase containing an aerosol;

separating the oil phase and the vapor phase and recovering the oil phase as a liquid flavor composition and separating the aerosol from the vapor phase by collecting the aerosol to thereby form a second flavor composition; and

exhausting the gas or smoke.

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**5,496,580**

**METHOD FOR IMPROVING FLAVOR OF FOOD OR DRINK**

**Akira Amano; Kazuhiko Tokoro, and Kenichi Uchiumi, all of Kanagawa, Japan, assignors to Takasago International Corporation, Tokyo, Japan**

**Filed Nov. 22, 1994, Ser. No. 346,194**

**Claims priority, application Japan, Nov. 24, 1993, 5-315803**

**Int. Cl.[6] A23L** *2/56*

**U.S. Cl. 426—534** **3 Claims**

1. A method for improving the flavor of a drink by lifting up the top note of said drink which comprises adding at least one compound selected from the group consisting of (S)-(+)-2-methylbutyric acid esters having an optical purity of 70% e.e. or above at a ratio of from 1 to 150 ppm, in terms of optical purity of 100%, based on the drink.



**5,496,581**

**POLYMERIC COATING**

**Yiannakis P. Ylanni, and Martin C. Wiles, both of Middlesex, United Kingdom, assignors to Biocompatibles Limited, Middlesex, England**

**PCT No. PCT/GB92/01012, § 371 Date Nov. 10, 1993, § 102(e) Date Nov. 10, 1993, PCT Pub. No. WO92/21386, PCT Pub. Date Dec. 10, 1992**

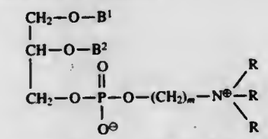
**PCT Filed Jun. 5, 1992, Ser. No. 146,110**

**Claims priority, application United Kingdom, Jun. 7, 1991, 9112267**

**Int. Cl.[6] B05D** *3/04;1/02;1/18;* **A61K** *41/00*

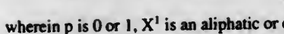
**U.S. Cl. 427—2.12** **24 Claims**

1. A process for coating a surface comprising applying to the surface a solution of a polymer, in an organic solvent and removing the solvent, wherein the polymer is obtained by polymerizing a phospholipid of formula (I):



(I)

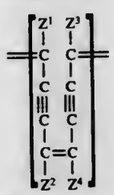
wherein at least one of $B^1$ and $B^2$ is a group of the formula (II):



(II)

wherein p is 0 or 1, $X^1$ is an aliphatic or cycloaliphatic group, $Y^1$ is H or a monovalent aliphatic or cycloaliphatic group, the total number of carbon atoms in $X^1$ and $Y^1$ in each $B^1$ and/or $B^2$ being 8 to 26, and the other of $B^1$ and $B^2$ is either (a) the same or a different group of the formula (II) or (b) is an aliphatic or cycloaliphatic group containing at least 8 carbon atoms; m is 2, 3 or 4 and each R independently represents an alkyl group containing 1 to 4 carbon atoms;

wherein said polymer contains repeating units of the following formula (III)



(III)

wherein one of $Z^1$ and $Z^2$ is $Y^1$ as defined above, and one of $Z^3$ and $Z^4$ are $Y^1$ as defined above, and

wherein the other one of $Z^1$ and $Z^2$ and the other one of $Z^3$ and $Z^4$ are the formula $—X^1—(CO)_p—G$, wherein $X^1$ and p are as defined above, and G is a corresponding remaining portion of the phospholipid of formula (I).

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**5,496,582**

**PROCESS FOR PRODUCING ELECTROLUMINESCENT DEVICE**

**Atsushi Mizutani, Aichi; Masayuki Katayama, Handa; Nobuei Ito, Chiryu, and Tadashi Hattori, Okazaki, all of, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan**

**Filed Aug. 30, 1994, Ser. No. 298,164**

**Claims priority, application Japan, Aug. 30, 1993, 5-213935**

**Int. Cl.[6] B05D** *5/06*

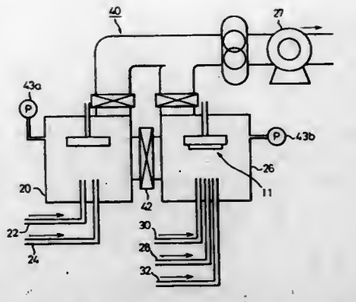
**U.S. Cl. 427—66** **17 Claims**

15. A process for producing an electroluminescent device comprising a luminescent layer located between two electrodes formed on an insulating substrate,

wherein the luminescent layer comprises a host material to which a luminescent center element is added and the host material is composed of an alkaline earth metal element selected from the group consisting of Be, Mg, Ca, Sr, Ba aD.d Ra, and a second element selected from the are consisting of O, S, Se, Te and Po,

which process comprises forming the host material by chemical vapor deposition to react a first gas of an organic compound containing the alkaline earth metal element and a second gas of a compound containing the second element in a reactor,

the first gas being formed from a cyclopentadienyl compound selected from the group consisting of bis-pentamethylcyclopentadienyl strontium-THF adduct, bis-pentamethylcyclopentadienyl calcium-THF adduct and bis-pentamethylcyclopentadienyl barium-THF adduct.



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**5,496,583**

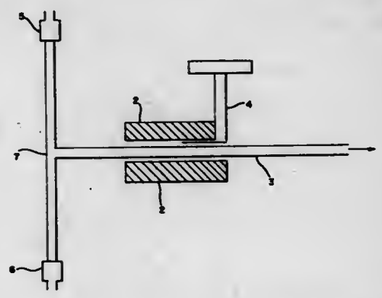
**HYDROGEN FLUORIDE DOPANT SOURCE IN THE PREPARATION OF CONDUCTIVE COATED SUBSTRATE**

**Kai W. Jansen, and Benjamin F. Fieselmann, both of Newtown, Pa., assignors to Amoco/Enron Solar, Frederick, Md.**

**Filed Aug. 29, 1994, Ser. No. 297,400**

**Int. Cl.[6] C23C** *16/00;* **B05D** *5/12*

**U.S. Cl. 427—109** **10 Claims**



1. A process for the preparation of a substrate having a fluoride doped conductive coating thereon comprising:

producing an HF dopant feed gas by heating a fluorocarbon in the presence of a source of oxygen to a temperature sufficient to decompose said fluorocarbon;

introducing said HF dopant feed gas into a conductive coating source gas; and

depositing the coating from said HF dopant feed gas and said source gas on said substrate.

**5,496,584**

## METHOD FOR REMOVING A LIQUID CRYSTAL ALIGNMENT FILM

**Akira Yanagimoto; Takashi Harunari; Akihiro Konno, and Toshiyasu Okamura, all of Tokyo, Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan**

**Continuation of Ser. No. 139,085, Oct. 20, 1993, abandoned. This application Nov. 14, 1994, Ser. No. 340,447**

**Claims priority, application Japan, Jan. 22, 1992, 4-284624**

**Int. Cl.[6] B05D *1/00*; B08B *3/04***

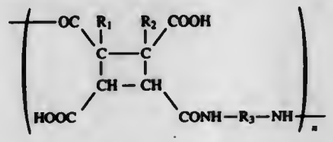
**U.S. Cl. 427—154** **2 Claims**

1. A method for the complete removal of a polyimide alignment film from a liquid crystal cell substrate in a liquid crystal cell in one treatment, said treatment comprising the steps of

a) irradiating said alignment film with ultraviolet rays having wavelengths within the range of 230–300 nm, and

b) treating said liquid crystal cell with an alkaline solvent,

wherein said polyimide alignment film is formed by coating a liquid crystal cell substrate with a solution comprising a polyamic acid having, as the main repeating units, a chemical structure of the following formula:



wherein each of $R_1$ and $R_2$ is hydrogen or methyl, $R_3$ is a bivalent organic group constituting a diamine, and n is from 10–1,000 followed by baking at a temperature in the range of from 140° C. to 350° C.

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**5,496,585**

## METHOD FOR REDUCING VOLATILE ORGANIC COMPOUND EMISSIONS

**C. Richard Hamilton, Arvada; Ross M. Gustafson, Golden, and Ralph Z. Marsh, Lakewood, all of Colo., assignors to Golden Technologies Company, Inc., Golden, Colo.**

**Continuation-in-part of Ser. No. 849,424, Jul. 10, 1992, Pat. No. 5,248,343, which is a continuation-in-part of Ser. No. 624,140, Dec. 7, 1990, abandoned. This application Jun. 10, 1992, Ser. No. 896,413**

**The portion of the term of this patent subsequent to Sep. 28, 2010, has been disclaimed.**

**Int. Cl.[6] B05D *7/22***

**U.S. Cl. 427—239** **28 Claims**

1. A method for reducing volatile organic compound emissions in the application to a surface of a VOC-containing coating, comprising:

a) contacting said surface with an effective amount of a finishing agent having a pH of about 6.0 ph to about 9.0 pH comprising terpene to remove oils present on said surface; and

b) applying to said contacted surface an amount of a VOC-containing coating effective to coat said surface, said VOC-containing coating including a compound selected from the group consisting of toluene, methylene chloride, isopropyl alcohol,

butyl alcohol and mixtures thereof, said VOC-containing coating selected from the group consisting of inks, paints, plastic coatings and mixtures thereof.

**5,496,586**

## PROCESS AND DEVICE FOR COATING THE INNER SURFACE OF GREATLY ARCHED, ESSENTIALLY DOME-SHAPED SUBSTRATE BY CVD

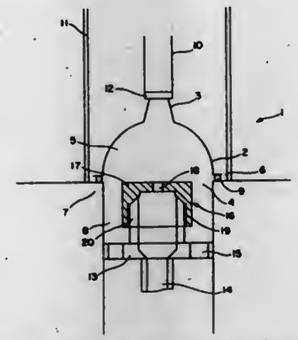
**Ewald Mörsen, Morfelden; Helge Vogt, Nackenheim, and Johannes Segner, Stromberg, all of, Germany, assignors to Schott Glaswerke, Mainz, Germany**

**Filed Oct. 26, 1993, Ser. No. 141,656**

**Claims priority, application Germany, Jan. 26, 1992, 42 36 056.0; Jan. 11, 1993, 43 34 572.7**

**Int. Cl.[6] B05D *3/06***

**U.S. Cl. 427—575** **16 Claims**



1. A process for coating the inner surface of an arched substrate with one or more dielectric layers, one or more metallic layers, or combinations thereof, by chemical deposition, comprising:

introducing reaction gases containing layer-former molecules into a reaction chamber through at least one gas inlet, said reaction gases being discharged from said gas inlet as a gas jet, said reaction chamber containing at least one arched substrate to be coated, said gas inlet being positioned to face the vertex of the arch at a distance from the inner surface of the substrate to be coated; and

subjecting said reaction gases to energy whereby a reaction zone is formed at the inner surface of said at least one substrate to be coated and whereby layer material is deposited on said at least one substrate,

wherein said reaction gases are introduced into said reaction chamber at a speed such that the product of the Reynolds number, R, of the gas jet in the gas inlet and the distance, h, between the gas inlet and the arch vertex satisfies the following relationship:

$400<Rxh<4000$.

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**5,496,587**

## METHOD FOR PRINTING A METALLIC APPEARANCE ON MOLDABLE SHEET PLASTIC

**Arthur Leung, Mississauga, Canada, assignor to Cimmaster Sports Inc., Mississauga, Canada**

**Filed Oct. 4, 1994, Ser. No. 318,496**

**Claims priority, application Canada, Jan. 4, 1993, 2107651**

**Int. Cl.[6] B05D *1/36*; B41M *1/30***

**U.S. Cl. 427—258** **11 Claims**

1. A method for providing a metallic appearance to a plastic article which is formed from sheet material having an upper and lower surface, the method comprising printing on the lower surface of the sheet material two layers of ink, a first layer of at least one colour which will form the base colour of the article, the first layer being printed directly on the lower surface of the sheet material by a lithographic process in a pattern which includes open spaces, and a second solid layer of ink of a colour which is the base colour of a metal over printed on the first layer such that the colour of the second layer is visible from the upper surface of the article through the spaces provided in the first layer to thereby give a metallic appearance to the article.



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**5,496,588**

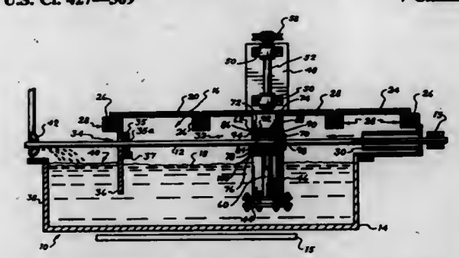
## METHOD AND APPARATUS FOR GALVANIZING LINEAR MATERIALS

**Kalyan K. Maitra, Flossmoor; Daniel G. McInerney, Chicago, and Carl H. Unger, Oak Lawn, all of Ill., assignors to Allied Tube & Conduit Corp., Harvey, Ill.**

**Continuation of Ser. No. 26,432, Mar. 4, 1993, Pat. No. 5,364,661. This application Nov. 14, 1994, Ser. No. 337,865**

**Int. Cl.[6] B05D *3/04***

**U.S. Cl. 427—309** **7 Claims**



1. In a continuous process for galvanizing metal conduit, a method of applying molten zinc to a cleansed and preheated metal conduit to be galvanized comprising:

rolling a band of metal into tubular form having an outside surface with abutting edges;

welding the abutting edges to form said conduit;

cleaning said conduit with acid;

rinsing said conduit;

preheating said conduit in an inert atmosphere;

providing a source of molten zinc;

providing an inert gaseous environment over said source;

propelling a jet of molten zinc from said source through said gaseous environment;

passing said conduit axially through said jet, so that each point on said outside surface of said conduit makes contact with said jet for less than 0.1 second, whereby said outside surface of said conduit is coated with molten zinc and is galvanized.

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**5,496,589**

## CURING COMPOSITION AND METHOD FOR IMPREGNATING WOOD

**Ichiro Igarashi; Hiroyuki Ota, both of Aichi, and Yoshio Mizoguchi, Nagano, all of, Japan, assignors to Toagosei Chemical Industry Co., Ltd., Tokyo, Japan**

**Filed Mar. 22, 1994, Ser. No. 215,722**

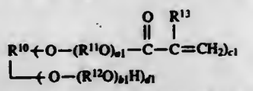
**Claims priority, application Japan, Mar. 23, 1993, 5-088855; Mar. 24, 1993, 5-089382**

**Int. Cl.[6] B05D *3/00***

**U.S. Cl. 427—331** **17 Claims**

1. A method for impregnating wood comprising the steps of: impregnating wood with a curing composition; and curing said curing composition thus impregnated,

said curing composition comprising a reaction product represented by formula (1) obtained by reacting an alkylene oxide adduct of a hydrocarbon polyol and (meth)acrylic acid:



(1)

wherein $R^{10}$ represents a residual group of a hydrocarbon polyol having from 3 to 15 carbon atoms and (c1+d1) hydroxyl groups; $R^{11}$ represents an alkylene group having from 2 to 4 carbon atoms; $R^{12}$ represents an alkylene group having from 2 to 4 carbon atoms; $R^{13}$ represents a hydrogen atom or a methyl group; a1 represents a number of from 0 to 10; b1 represents a number of from 0 to 10; c1 represents a number of not less than 1.5; and d1 represents a number of not less than 0.5; provided that (a1+b1) is not less than 1.

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**5,496,590**

## COMPOSITION FOR TREATING COPPER AND COPPER ALLOY SURFACES AND METHOD FOR THE SURFACE TREATMENT

**Yoshiro Maki; Toshiko Nakagawa; Yoshiaki Furukawa; Minoru Outani; Takashi Haruta; Maki Yamanami, and Sachiko Nakamura, all of Amagasaki, Japan, assignors to MEC Co., Ltd., Amagasaki, Japan**

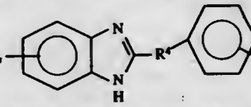
**Filed Aug. 11, 1994, Ser. No. 289,271**

**Claims priority, application Japan, Aug. 11, 1993, 5-217948; Sep. 7, 1993, 5-246194**

**Int. Cl.[6] B05D *3/02*; *5/12***

**U.S. Cl. 427—388.1** **3 Claims**

1. A method for treating surfaces of copper and copper alloys, which comprises applying an aqueous solution or an aqueous dispersion comprising at least one imidazole derivative of the following formulas (1) to (6), or a salt thereof,



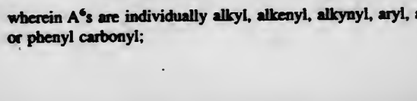
(1)

wherein $A^1$ is alkyl, alkenyl, alkynyl, aryl, aralkyl, phenylcarbonyl, or halogen, $R^1$ is an alkyl, alkenyl, alkynyl, or aryl group containing a halogen atom, and a is an integer of 0 to 4;



(2)

wherein $R^2$ is an alkylene, alkenylene, alkynylene, or arylene, $A^2$ is hydrogen, alkyl, alkynyl, aryl, aralkyl, phenylcarbonyl, or halogen, b is 0 or 1, and $A^1$ and a are the same as defined above;



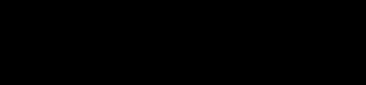
(3)

wherein $A^3$ is alkyl, alkenyl, alkynyl, aryl, aralkyl, phenylcarbonyl, or halogen, $R^3$ is alkylene, alkenylene, alkynylene, or arylene, c is an integer of 0 to 7, and $A^1$, a, and b are the same as defined above;



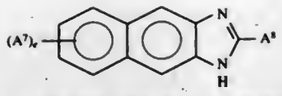
(4)

wherein $A^4$ is alkenyl, alkynyl, aryl, or aralkyl, $A^5$ is alkyl, alkenyl, alkynyl, aryl, aralkyl, phenylcarbonyl, or halogen, $R^4$ is alkylene, alkenylene, alkynylene, or arylene, d is an integer of 0 to 5, and a is an integer of 1 to 4;



(5)

wherein $A^6$s are individually alkyl, alkenyl, alkynyl, aryl, aralkyl, or phenyl carbonyl;



(6)

wherein $A^7$ is hydrogen, lower alkyl, or halogen, $A^8$ is alkyl, alkenyl, alkynyl, aryl, aralkyl, phenylcarbonyl, or halogen, and e is an integer of 0 to 6.

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**5,496,591**

## RADIATION-CURABLE BINDERS

**Reinhard Lang, Neustadt; Erich Beck, Harthausen; Edmund Keil, Ludwigshafen; Adolf Nuber, Boehl-Iggelheim; Harro Petersen, Frankenthal; Hans Renz, Meckenheim, all of, Germany; Horst Schmidt, Oosterbeek, Netherlands, and Wolfram Weiss, Mutterstadt, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany**

**Continuation of Ser. No. 905,187, Jun. 26, 1992, abandoned, which is a continuation of Ser. No. 720,137, Jun. 24, 1991, abandoned. This application May 9, 1994, Ser. No. 239,860**

**Claims priority, application Germany, Jun. 29, 1990, 40 20 766.8**

**Int. Cl.[6] C08J *7/04***

**U.S. Cl. 427—520** **3 Claims**

1. A process for coating an article which comprises

(A) coating the article with a binder composition which consists of

(1) from 10 to 100% by weight of a binder, said binder being a compound which is the reaction product of 1 mole hexamethoxymethylmelamine and 0.6 to 1.8 moles of 4-hydroxybutyl (meth)acrylate;

(2) from 0 to 90% by weight of a second binder compound selected from the group consisting of polyester acrylates, polyether acrylates, polyurethane acrylates, and acrylate-modified epoxy resins;

(3) from 0 to 30% by weight of a solvent

(4) from 0 to 80% by weight of pigments;

(5) from 0 to 10% by weight of assistants; and

(B) exposing the coated article to radiation.

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**5,496,592**

## METHOD AND APPARATUS FOR CONTROLLING ION IMPLANTATION UNIT FOR EARLY DETECTION OF ION IMPLANTATION ERROR

**Yoshiyuki Saito, Yamagata, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Dec. 14, 1994, Ser. No. 358,594**

**Claims priority, application Japan, Dec. 22, 1993, 5-324992**

**Int. Cl.[6] C23C *14/00***

**U.S. Cl. 427—523** **9 Claims**

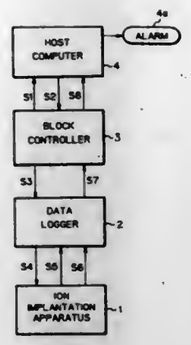
1. A method for controlling an ion implantation unit, comprising the steps of:

calculating a dose of ions implanted by said ion implantation unit into a lot;

determining whether or not said dose of ions is within an allowable range;

operating said ion implantation unit for the next lot when said dose of ions is within the allowable range; and

stopping the operation of said ion implantation unit when said dose of ions is not within the allowable range.




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**5,496,593**

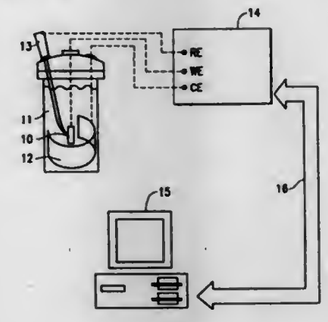
## PROCESS FOR PRODUCING A NITROGEN-ALLOYED STAINLESS STEEL LAYER ON STEEL

**Wen-Ta Tsai, Tainan; Chong-Cheng Huang, Yung-Kang, and Ju-Tung Lee, Tainan, all of, Taiwan, Prov. of China, assignors to National Science Council, Taipei, Taiwan, Prov. of China**

**Filed Nov. 1, 1994, Ser. No. 333,037**

**Int. Cl.[6] B05D *3/06***

**U.S. Cl. 427—556** **12 Claims**




1. A process for producing a nitrogen-alloyed stainless steel layer on a steel substrate, comprising the following steps:

a) cleaning the surface of the steel substrate by mechanical means;

b) applying a mixed metal powder or a stainless powder to the surface of the steel substrate, wherein the mixed metal powder includes at least iron powder, chromium powder and nitride powder, and the stainless powder includes nitride powder; and

c) scanning the surface of the steel substrate with a laser beam so that the heat input generated by the scanning of the laser beam melts the mixed metal powder or the stainless powder including nitride powder, and decomposes the nitride powder into nitrogen and the other element forming the nitride, which then dissolve into the melted mixed metal powder or melted stainless powder, thereby forming the nitrogen-alloyed stainless steel layer on the steel substrate.



**5,496,594**

## CHEMICAL VAPOR DEPOSITION APPARATUS AND METHOD WHEREIN A CORONA DISCHARGE IS GENERATED INSIDE A PERFORATED CAGE WHICH SURROUNDS THE SUBSTRATE

**Udo König, Essen, Germany; Hendrikus van den Berg, Venlo-Blerick, Netherlands, and Ralf Tabersky, Bottrop, Germany, assignors to Widia GmbH, Essen, Germany**

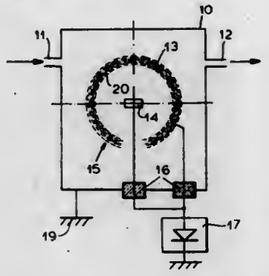
**PCT No. PCT/DE92/01005, § 371 Date Jun. 6, 1994, § 102(e) Date Jun. 6, 1994, PCT Pub. No. WO93/11275, PCT Pub. Date Jun. 10, 1993**

**PCT Filed Nov. 30, 1992, Ser. No. 244,689**

**Claims priority, application Germany, Dec. 5, 1991, 41 40 158.1**

**Int. Cl.[6] H05H *1/24*; C23C *16/50***

**U.S. Cl. 427—569** **16 Claims**




1. A method of coating at least one substrate body by a corona-activated CVD process at a temperature above 300° C. and a pressure below 10,000 Pa comprising the steps of:

(a) supporting the at least one substrate body in a reaction vessel in all-around spaced relationship from walls thereof;

(b) surrounding said at least one substrate body on all sides in a cage provided with thoroughgoing perforations, said cage being spaced from said walls and from said at least one substrate body;

(c) generating along at least an inner surface of said cage a corona discharge by connecting said cage with a voltage source;

(d) passing a reactive gas mixture through said reaction vessel capable of depositing a coating on said at least one substrate body whereby said gas mixture passes through said cage to said at least one substrate body; and

(e) electrically connecting said body to said source whereby said coating is deposited on said at least one substrate body.

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**5,496,595**

## METHOD FOR FORMING FILM BY PLASMA CVD

**Hideyuki Ueda, Takatsuki; Kenji Kuwahara, Nara; Hiroshi Seki; Kiyosi Takahasi, both of Osaka; Masaru Odagiri, Kawanishi, and Mikio Mural, Hirakata, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

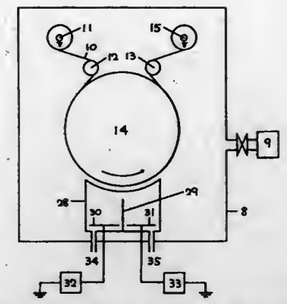
**Filed Oct. 19, 1994, Ser. No. 325,067**

**Claims priority, application Japan, Jan. 20, 1993, 5-262177**

**Int. Cl.[6] H05H *1/24*; G11B *5/00***

**U.S. Cl. 427—569** **3 Claims**

1. A method for forming a film having a continuously changed composition by a plasma CVD method comprising generating glow discharge plasma on a substrate placed in a vacuum chamber using a discharge tube facing said substrate and having at least one partition plate contained within said discharge tube which partitions an interior of said discharge tube into plural sections, wherein each of said sections has a respective discharge electrode and wherein a distance between a top end of said partition plate and said substrate surface is larger than a distance between a top end of said discharge tube and said substrate surface;




wherein said method further comprises introducing raw material gases having different compositions from one another respectively into said sections and energizing each respective discharge electrode to discharge different plasma from within each respective section.

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**5,496,596**

## METHODS FOR PRODUCING DIAMOND MATERIALS WITH ENHANCED HEAT CONDUCTIVITY

**John A. Herb, Palo Alto; John M. Pinneo, Redwood City, and Clayton F. Gardinier, San Francisco, all of Calif., assignors to Crystallume, San Jose, Calif.**

**Continuation of Ser. No. 95,314, Jul. 21, 1993, Pat. No. 5,316,842, which is a division of Ser. No. 789,732, Nov. 8, 1991, Pat. No. 5,284,709, which is a continuation of Ser. No. 704,997, May 24, 1991, which is a continuation of Ser. No. 413,114, Sep. 27, 1989, Pat. No. 5,075,095, which is a continuation of Ser. No. 204,058, Jun. 7, 1988, Pat. No. 4,882,138, which is a continuation of Ser. No. 32,167, Mar. 30, 1987, Pat. No. 4,743,073. This application Jan. 28, 1994, Ser. No. 188,279**

**The portion of the term of this patent subsequent to Dec. 21, 2010, has been disclaimed.**

**Int. Cl.[6] B05D *3/06*; C23C *16/26***

**U.S. Cl. 427—577** **2 Claims**

1. A method for forming a coating on a substrate to form a coated article, said coating consisting essentially of diamond, said diamond characterized by being substantially free of voids, having an average crystallite size greater than about 15 microns, said coating having a maximum intensity of the diamond Raman peak in counts/sec divided by the intensity of photoluminescence at 1270 $cm^{-1}$ greater than about 3, a Raman $sp^3$ full width half maximum less than about 6 $cm^{-1}$ and a diamond-to-graphite Raman ratio greater than about 25, comprising the steps of:

preparing said substrate by abrasion with diamond particles;

placing said substrate in a CVD reactor suitable for diamond deposition;

depositing diamond in said CVD reactor during a first deposition stage by providing an atmosphere consisting essentially of a mixture of about 200 sccm $H_2$ and 10 sccm $CH_4$, at a pressure of about 90 Torr, providing between about 1,800 and 1,950 watts of microwave power at a frequency of about 2.45 GHz to ignite and sustain a plasma in the region of said substrate, and maintaining said substrate at a temperature of between about 625° C. and 675° C. for a period of time sufficient to form a diamond layer which is substantially continuous;

depositing diamond in said CVD reactor during a second deposition stage by providing an atmosphere consisting essentially of a mixture of about 200 sccm $H_2$, 4.6 sccm CO, and 9 sccm of $CH_4$ at a pressure of about 90 Torr, providing between about 1,800 and 1,950 watts of microwave power at a frequency of about 2.45 GHz to ignite and sustain a plasma in the region of said substrate, and maintaining said substrate at a temperature of between about 625° C. and 675° C. for a period of time sufficient to form a diamond layer having a desired thickness; and

removing said substrate from said CVD reactor.

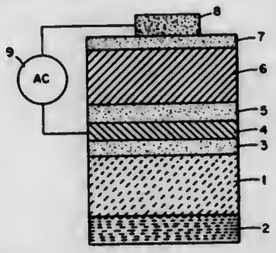
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5,496,597

## METHOD FOR PREPARING A MULTILAYER STRUCTURE FOR ELECTROLUMINESCENT COMPONENTS

Erkki Soininen, and Marja Leppänen, both of Espoo, Finland, assignors to Planar International Ltd., Espoo, Finland

Filed Jul. 20, 1994, Ser. No. 277,818
Claims priority, application Finland, Jul. 20, 1993, 933278
Int. Cl.[6] C23C 16/48; B05D 5/06;5/12
U.S. Cl. 427—584 25 Claims




1. A method for preparing a planar multilayer structure, said method comprising

depositing said multilayer structure comprising at least one phosphor layer and at least one dielectric layer onto a suitable substrate, said phosphor layer comprising at least one alkaline-earth metal sulfide and said dielectric layer comprising at least one metal oxide species, and

depositing at least one of the dielectric layers by means of surface reactions directly onto said alkaline-earth sulfide layer,

wherein

the dielectric layer deposited onto said alkaline-earth sulfide layer is at least partially deposited from a precursor of vaporizable organometal complex containing at least one metal atom and at least one organic ligand bonded to said at least one metal atom via an oxygen atom, whereby an electroluminescent structure is achieved exhibiting a luminance better than 80% of an initial luminance value after 800 operating hours.

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5,496,598

## INSULATING MULTIPLE LAYER SEALED UNITS AND INSULATING SPACER AND ASSEMBLY

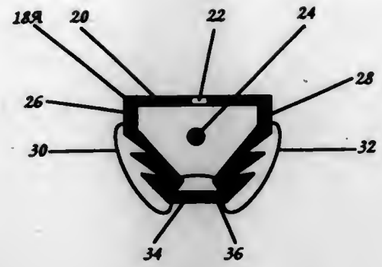
France Delisle, 228, de la Colline, Alma, Quebec, Canada, and James Boudreault, 485, Mgr de Laval, Baie St-Paul, Quebec, Canada

Filed Dec. 2, 1993, Ser. No. 160,152
Claims priority, application Canada, Sep. 2, 1993, 2105460
Int. Cl.[6] B29D 5/02
U.S. Cl. 428—34.1 6 Claims

1. An insulating spacer having an elongated configuration which comprises:

a pair of side surface areas which have opposite angled surfaces spaced apart so as to provide a greater contact surface with a sealing material;

a first surface and second surface connected to said angled surfaces and enclosing an empty space running along a length portion of the spacer, said empty space having a cross-sectional shape with a necked-down portion and a groove that is intermediate a bottom portion of the necked-down portion and a widened portion of the groove opposite the first surface.



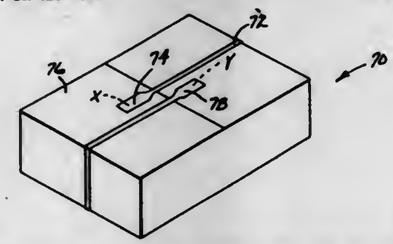

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5,496,599

## METHOD OF UNITIZING PACKAGES BY MEANS OF A STRETCHABLE ADHESIVE TAPE

Mark E. Schwartz, Mahtomedi, Minn., and Karl W. Kreckel, Haan, Germany, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 102,537, Jul. 28, 1993, Pat. No. 5,314,557, which is a continuation of Ser. No. 731,341, Jul. 19, 1991, abandoned. This application Apr. 11, 1994, Ser. No. 225,604
Int. Cl.[6] B32B 3/06; C09J 7/02
U.S. Cl. 428—35.7 5 Claims




1. A package combined with a length of tape, said tape comprising a stretchable, detackifiable pressure-sensitive adhesive tape having a backing having a Young's modulus of at least about 2,500 psi but less than about 100,000 psi, a lengthwise elongation at break of at least about 150% and low recovery of less than about 50% after being stretched, said backing having a layer of pressure-sensitive adhesive thereon, said tape having a first portion thereof in a substantially unstretched condition and adhered to said package and a second portion thereof stretched to at least 200% of its original length and wrapped about said package, whereby the tack of said second portion of said tape is detackified by at least about 10%.

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5,496,600

## MATTE BIAXIALLY ORIENTED, MULTILAYER POLYPROPYLENE FILM AND THE USE THEREOF

Herbert Peiffer, Mainz; Ursula Murschall, Nierstein, and Gunter Schloegl, Kelkheim, all of, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Apr. 25, 1994, Ser. No. 231,761
Claims priority, application Germany, Apr. 27, 1993, 43 13 430.0
Int. Cl.[6] B29D 22/00
U.S. Cl. 428—35.7 20 Claims

1. A multilayer polypropylene film having at least one matte surface, comprising: at least one base layer which comprises a propylene polymer and a hydrocarbon resin; and at least one outer layer which comprises a mixture or a blend of two components I and II, wherein

component I is selected from the group consisting of a propylene homopolymer,



a copolymer of ethylene and propylene,
a copolymer of ethylene and butylene,
a copolymer of propylene and butylene,
a copolymer of ethylene and another α-olefin having 5 to 10 carbon atoms,
a copolymer of propylene and another α-olefin having 5 to 10 carbon atoms,
a terpolymer of ethylene and propylene and butylene,
a terpolymer of ethylene and propylene and another α-olefin having 5 to 10 carbon atoms,
mixtures or blends thereof, and
a blend of two or more of said homopolymers, copolymers and terpolymers, mixed with one or more of said homopolymers, copolymers and terpolymers, and

component II is selected from the group consisting of an HDPE and a blend of two components A and B, where blend component A is essentially
an HDPE and
blend component B is selected from the group consisting of
a propylene homopolymer,
a copolymer of ethylene and propylene,
a copolymer of ethylene and butylene,
a copolymer of propylene and butylene,
a copolymer of ethylene and another α-olefin having 5 to 10 carbon atoms,
a copolymer of propylene and another α-olefin having 5 to 10 carbon atoms,
a terpolymer of ethylene and propylene and butylene,
a terpolymer of ethylene and propylene and another α-olefin having 5 to 10 carbon atoms, and
mixtures or blends thereof.

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5,496,601

## EXTENSIBLE FLATBACK ADHESIVE SHEET

Francis A. Schurb, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 14, 1994, Ser. No. 195,873
Int. Cl.[6] C09J 7/02
U.S. Cl. 428—40 16 Claims

I. An adhesive sheet, comprising:

(a) a non-creped flatback paper backing comprising cellulosic fibers and an elastomeric saturant and having an elongation at break of at least 10% and

(b) an adhesive coating on at least a portion of at least one major surface of said backing,

wherein no mechanical means is used to generate extensibility or conformability in said backing.

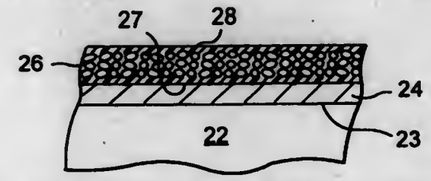
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5,496,602

## LOW RESIN CONTENT UNIDIRECTIONAL FIBER TAPE

Martin P. Wai, Cheshire, Conn., assignor to DOW-United Technologies Composite Products, Inc., Wallingford, Conn.

Filed Nov. 22, 1994, Ser. No. 343,767
Int. Cl.[6] A61F 13/02; D04H 3/02
U.S. Cl. 428—40 11 Claims




I. A unidirectional fiber tape comprising a plurality of unidirectional fibers, a pair of thin, flexible films disposed on opposite sides of the fibers, the films formed of a resin present in an amount sufficient to maintain the fibers in register but below an amount which would significantly inhibit resin infiltration, the resin amount being from about 1 to 20 percent by weight based on the total weight of the tape.

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5,496,603

## NONWOVEN SHEET MATERIALS, TAPES AND METHODS

John E. Riedel, Hugo, and Lauren K. Cran, Denmark, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 114,376, Aug. 30, 1993, which is a continuation-in-part of Ser. No. 830,063, Feb. 3, 1992, abandoned. This application May 16, 1995, Ser. No. 442,161
Int. Cl.[6] A61L 15/16; B32B 33/00; C09J 7/04
U.S. Cl. 428—40 14 Claims

1. A pressure-sensitive adhesive tape comprising a nonwoven backing with first and second surfaces, the nonwoven backing having a pressure-sensitive adhesive coated on the first surface, wherein the nonwoven backing comprises tensilized nonfracturable staple fibers and binder fibers randomly interlaced together to form a fibrous web, the fibrous web being first pattern embossed so as to be readily finger-tearable in the cross web direction and subsequent to being pattern embossed, uniformly interbonded throughout by a chemical bonding agent and further wherein the adhesive tape exhibits a Hand measurement of less than 250 grams for about a 20 cm square sheet and said adhesive tape exhibits wet and dry break tensile strengths of at least 10 N/cm.

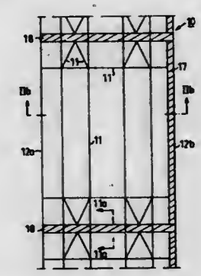
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5,496,604

## PACKAGING LAMINATE WITH GOOD GAS AND AROMA BARRIER PROPERTIES AND METHOD OF MANUFACTURING THE LAMINATE AND PACKAGING CONTAINERS MANUFACTURED FROM THE LAMINATE

Ihorbjörn Andersson, Södra Sandby, Sweden, and Paul W. Ackermann, Leinfelden-Echterdingen, Germany, assignors to Tetra Laval Holdings & Finance S.A., Pully, Switzerland

Filed Feb. 5, 1993, Ser. No. 14,250
Claims priority, application Sweden, Feb. 7, 1992, 9200353
Int. Cl.[6] B27N 5/02
U.S. Cl. 428—34.2 10 Claims




1. Flexible packaging laminate in sheet or strip form for conversion by fold forming and sealing to a packaging container with gas and aroma barrier properties, wherein said packaging laminate comprises:

i) a skeletal layer;

ii) a gas and aroma barrier layer of a silicon-containing chemical substance applied to one side of the skeletal layer, wherein said barrier layer is localized only to those areas of the packaging laminate that are outside the areas along which the packaging laminate is to be sealed during conversion to said packaging container; and

iii) an intermediate polyolefin layer placed between the skeletal layer and the gas and aroma barrier layer, wherein the gas and aroma barrier layer is covalently bound to the intermediate polyolefin layer.

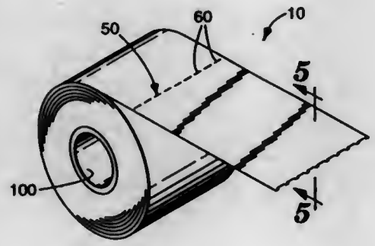
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**5,496,605**

**PERFORATED ROLL OF NONWOVEN SURGICAL TAPE**

George W. Augst, Forest Lake, and Margo A. Liberda, Stillwater, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 114,912, Aug. 31, 1993, abandoned.
This application Aug. 18, 1995, Ser. No. 516,691
Int. Cl.[6] C09J 7/02
U.S. Cl. 428—43 16 Claims




1. A roll of adhesive tape comprising a binder-containing nonwoven web having a longitudinal axis and a lateral axis which is coated on a major surface with a pressure sensitive adhesive which web is substantially resistant to tearing along the lateral axis and which is linerless; the adhesively-coated web having a plurality of longitudinally spaced, laterally extending, perforated separation lines defined by a series of about 0.2 to 5 mm substantially linear perforations separated by about 0.1 to 1 mm connecting segments of tape and a ratio of perforation length to connecting segment length of about 1:1 to 10:1 wherein the perforated tape has a tensile strength of at least about 400 grams per centimeter width and not more than about 3000 grams per centimeter width.

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**5,496,606**

**MAGNETIC RECORDING MEDIUM**

Makoto Mizukami, Yokosuka, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Continuation of Ser. No. 798,930, Nov. 29, 1991, abandoned.
This application Jul. 11, 1994, Ser. No. 272,657
Claims priority, application Japan, Nov. 30, 1990, 2-336119
Int. Cl.[6] B32B 3/02;3/10;5/16; G11B 5/66
U.S. Cl. 428—65.3 1 Claim

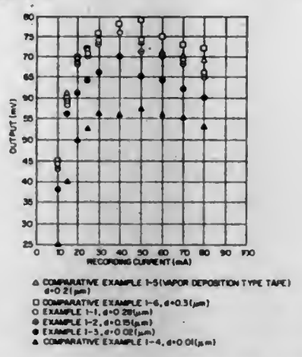
1. A magnetic recording medium comprising:
a circular glass substrate;
a textured surface on one side of said glass substrate, said textured surface comprising fine scratches extending circumferentially on said one side of said substrate so that said textured surface has a surface roughness Ra of substantially 10–100 Å;
a precoat layer on said textured surface, said precoat layer having a thickness in a range of 20 Å to 1 μm and comprised of a material selected from the group consisting of Zr, W, V, Mo, WC and C;
an undercoat film on said precoat layer; and
a magnetic film on said undercoat film, so that a magnetic anisotropy in a circumferential direction is formed and an axis of easy magnetization on said magnetic recording medium extends in a circumferential direction.

**5,496,607**

**MAGNETIC RECORDING MEDIUM**

Hiroo Inaba; Kiyomi Ejiri; Jun-ichi Nakamikawa, and Toshihiko Miura, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 45,171, Apr. 13, 1993, abandoned.
This application Nov. 25, 1994, Ser. No. 348,949
Claims priority, application Japan, Apr. 14, 1992, 4-119608
Int. Cl.[6] B32B 3/02;5/16; G11B 5/66
U.S. Cl. 428—65.3 20 Claims




1. A magnetic recording medium, comprising a non-magnetic support and at least two layers, the at least two layers comprising at least one lower non-magnetic layer comprising non-magnetic particles and a binder, one of the at least one non-magnetic layers being located on the non-magnetic support, and at least one upper magnetic layer comprising ferromagnetic particles and a binder, one of the at least one upper magnetic layers being located on the lower non-magnetic layer located on the non-magnetic support, wherein the upper magnetic layer located on the lower non-magnetic layer located on the non-magnetic support has a mean total thickness d more than 0.01 μm to less than 0.3 μm, and a standard deviation σ of the total thickness of the upper magnetic layer located on the lower non-magnetic layer located on the non-magnetic support and the mean total thickness d satisfy the following relationship:

$0.05<\sigma/d<0.5$.

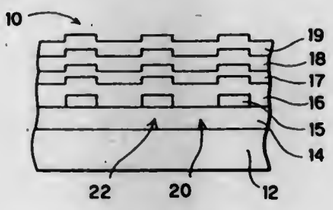
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**5,496,608**

**OPTICAL RECORDING MEDIUM**

Riki Matsuda, and Kazunari Taki, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Sep. 19, 1994, Ser. No. 307,456
Claims priority, application Japan, Sep. 22, 1993, 5-236625; Sep. 22, 1993, 5-236627; Sep. 22, 1993, 5-236628
Int. Cl.[6] B32B 3/00
U.S. Cl. 428—64.1 17 Claims




1. An optical recording medium comprising:
a substrate;
a recording layer;



an enhancement layer formed between said substrate and said recording layer from an unetchable aluminum compound layer made from a compound that contains aluminum;
an unetchable guide layer formed between said substrate and said recording layer into a predetermined pattern; and
an interference layer formed between said substrate and said recording layer.

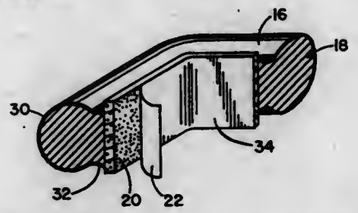
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**5,496,609**

**PROTECTIVE BUMPER**

Susan L. Michelstein, 321 Willow Springs, New Milford, Conn. 06776

Filed Jun. 27, 1994, Ser. No. 265,760
Int. Cl.[6] B32B 1/06
U.S. Cl. 428—71 1 Claim




1. A protective bumper for mounting on the corners and edges of household items comprising:
a) an elongated shell of deformable hypoallergenic vinyl plastic having a modified circular cross section, said modified circular cross section further comprising:
a circular portion;
a flared portion; including
a planar face further comprising:
an adhesive foam material for mounting the shell to the household fixture to be protected; and
b) a soft, resilient foam filler within the elongated shell.

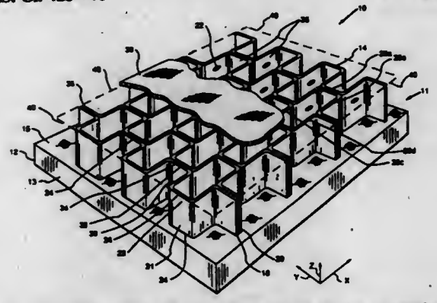
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**5,496,610**

**MOLDABLE PANEL FOR CUSHIONING AND PROTECTING PROTRUSIONS AND AREAS, AND METHOD OF MAKING SAME**

Curtis L. Landi, and Susan L. Wilson, both of Sunnyvale, Calif., assignors to Supracor Systems, Inc., Sunnyvale, Calif.

Filed Jan. 21, 1994, Ser. No. 184,574
Int. Cl.[6] B32B 3/12
U.S. Cl. 428—73 19 Claims



1. A moldable panel for cushioning and protecting protrusions and areas, comprising:
(a) a first panel including
(i) a honeycomb core formed of undulated strips of resilient thermoplastic material, thermal compression bonded together, along a plurality of first bond joints, to form cell walls defining a plurality of contiguous regularly shaped cells, said core having a first face formed by a first extremity of said cell walls and a second face formed by a second extremity of said cell walls, and
(ii) means for maintaining said core in its expanded configuration so that it can anisotropically flex to stabilize and spread a load applied thereto;
(b) a rigid thermoplastic plate having a first surface and a second surface, said first surface of said plate being thermal compression bonded, along a plurality of second bond joints, to said first face to said core of said first panel;
(c) said rigid plate being modable when heated to a first temperature which is sufficient to render said rigid plate flexible but insufficient to melt said first bond joints and said second bond joints; and
(d) said first panel being deformable when heated to a second temperature which is sufficient to relieve stresses built up in said first panel as said plate is being molded but is lower than said first temperature and insufficient to melt said first bond joints and said second bond joints.

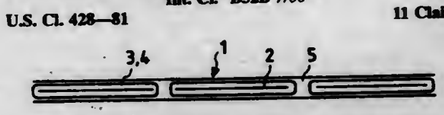
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**5,496,611**

**ANTITHEFT LABEL FOR USE ON OBJECTS AND AN ABSORPTIVE PAD HAVING SUCH AN ANTITHEFT LABEL FOR USE ON FOOD**

Takashi Ikeda, and Akira Homma, both of Kyoto, Japan, assignors to Unitika Ltd., Hyogo, Japan

Filed Jan. 26, 1994, Ser. No. 186,470
Claims priority, application Japan, Jan. 27, 1993, 5-029637; Jan. 27, 1993, 5-292787
Int. Cl.[6] B32B 7/00
U.S. Cl. 428—81 11 Claims




1. An antitheft label comprising an electroconductive nonmagnetic metal member permanently applied to a magnetic metal strip, wherein said electroconductive nonmagnetic metal member is shaped so as to include a plurality of corners, each of said corners of said electroconductive nonmagnetic metal member having a radius of curvature which is greater than or equal to 0.3 mm, wherein edges of said magnetic metal strip do not extend beyond edges of said electroconductive nonmagnetic metal member.

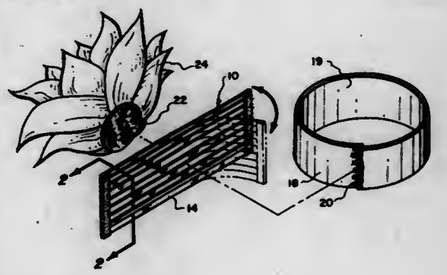
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**5,496,612**

**SHOE ADORNMENT**

Jayne M. Ransbottom, Chatsworth, Calif., assignor to J. J. Moods, Inc., Chatsworth, Calif.

Filed Apr. 17, 1995, Ser. No. 422,788
Int. Cl.[6] A43B 23/24
U.S. Cl. 428—99 9 Claims




1. A shoe adornment comprising:

a base, said base having an upper surface and a lower surface, said base being malleable, said base being deformable from an installing position to an installed position;

a band attached to said lower surface of said base, said band adapted to be mounted about the foot of a human;

an ornament secured to said upper surface of said base; and

whereby after mounting of said band on a foot, the foot is inserted within a shoe with said ornament being positioned directly adjacent the throat of the shoe constituting said installing position of said base, whereby said base is to be deformed to be located against the throat and assume substantially the transverse arcuate shape of the shoe across the throat constituting said installed position.

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**5,496,613**

**PRINTED WIRE BOARDS AND METHOD OF MAKING SAME**

**Erik Middelman, Arnhem, and Pieter H. Zuuring, LW Nijmegen, both of, Netherlands, assignors to AMP-Akzo LinLim VOF, Arnhem, Netherlands**

**PCT No. PCT/EP92/01132, § 371 Date Dec. 2, 1993, § 102(e) Date Dec. 2, 1993, PCT Pub. No. WO92/22191, PCT Pub. Date Dec. 10, 1992**

**PCT Filed May 19, 1992, Ser. No. 157,038**

**Claims priority, application Netherlands, Jun. 4, 1991, 9100957**

**Int. Cl.[6] B32B *9/00***

**U.S. Cl. 428—105** **16 Claims**

1. A laminate, adapted to be used as a supporting board for a printed circuit, comprising layers of an electrically non-conductive matrix material reinforced with unidirectionally (UD) oriented fibers which layers comprise individual matrix material having different directions of orientation and the layers being stacked to form a laminate of crossing layers, the laminate having a core plane relative to which the crossing layers are in mirror image relationship so as to obtain orthotropic properties for the laminate and comprising layers of adhesive material present at least between any pair of layers of UD-reinforced matrix material having different directions of orientation.

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**5,496,614**

**MAGNETIC RECORDING MEDIUM**

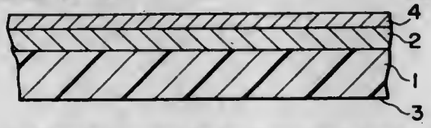
**Yasushi Nakano, Hino; Setsuko Kawahara, Hinode; Yuji Shimizu, and Tohru Miyake, both of Hachioji, all of, Japan, assignors to Konica Corporation, Tokyo, Japan**

**Continuation of Ser. No. 934,903, Aug. 26, 1992, abandoned, which is a continuation of Ser. No. 580,570, Sep. 11, 1990, abandoned. This application Dec. 14, 1994, Ser. No. 358,629**

**Claims priority, application Japan, Sep. 14, 1989, 1-239181**

**Int. Cl.[6] B32B *3/10;27/30;* G11B *5/66***

**U.S. Cl. 428—141** **9 Claims**




1. A magnetic recording medium comprising a non-magnetic support having a lower magnetic layer and an uppermost magnetic layer provided on a surface of said support in said respective order,

wherein said lower magnetic layer comprises

a vinyl chloride copolymer containing a member selected from the group consisting of a —$SO_3M$ group, a —COOM group and a —$PO(OM')_2$ group, in which M is hydrogen or an alkali metal and M' is an alkali metal or a hydrocarbon radical,

a first magnetic material comprising a first magnetic iron oxide in which the atomic number ratio of a divalent iron component $Fe^{2+}$ to a trivalent iron component $Fe^{3+}$ is

$0.13 \leqq Fe^{2+}/Fe^{3+} \leqq 0.45$, and

a lubricant;

wherein said uppermost magnetic layer comprises

a vinyl chloride copolymer containing a member selected from the group consisting of a —$SO_3M$ group, a —COOM group and a —$PO(OM')_2$ group, in which M is hydrogen or an alkali metal and M' is an alkali metal or a hydrocarbon radical,

a second magnetic material comprising a second magnetic iron oxide in which the atomic number ratio of a divalent iron component $Fe^{2+}$ to a trivalent iron component $Fe^{3+}$ is

$0.001 \leqq Fe^{2+}/Fe^{3+} \leqq 0.1$, and

a lubricant; and

wherein said non-magnetic support has from 100,000/mm$^2$ to 4,000,000/mm$^2$ of protuberances on a surface opposite to the surface on which said lower and uppermost magnetic layers are provided.

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**5,496,615**

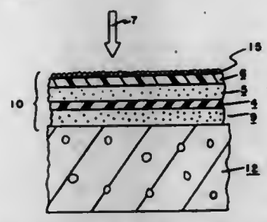
**WATERPROOFING MEMBRANE**

**Keith R. Bartlett, Groveland; Robert F. Jenkins, Wakefield, both of Mass.; Christopher Buss, Le Port Marly, France; Timothy J. Martin, Loxwood, England; Andre Gerber, Hong Lok Yuen, Hong Kong, and Peter C. Colarusso, Saugus, Mass., assignors to W. R. Grace & Co.-Conn., New York, N.Y.**

**Continuation-in-part of Ser. No. 931,121, Aug. 17, 1992, Pat. No. 5,316,848, which is a continuation of Ser. No. 662,853, Mar. 1, 1991, abandoned. This application Oct. 15, 1993, Ser. No. 137,310**

**Int. Cl.[6] C09J *7/02***

**U.S. Cl. 428—144** **12 Claims**




1. A waterproofing membrane for adhering to freshly poured concrete compositions upon curing, comprising: a carrier layer having first and second major faces; a pressure-sensitive adhesive layer against said carrier first major face; an elastomeric protective coating layer contacting said adhesive layer and incorporating at least one additive material comprising a light absorber, light stabilizer, antioxidant, filler, plasticizer, rheological additive, or a mixture thereof; said pressure-sensitive adhesive layer and elastomeric protective coating layer being operative to bond with a cementitious material cast against them and allowed to cure; said waterproofing membrane further comprising a discrete layer of finely divided particulate material applied as a separate coating onto said protective coating layer containing said at least one additive material, said protective coating layer being made before said discrete layer of finely divided particulate material is applied thereupon as a separate coating, said particulate layer comprising particles having a size range of 0.1–1000 microns and being partially embedded as a separate discrete layer on said pre-made elastomeric protective coating layer containing said at least one additive material, said separately coated particulate matter being operative to permit foot traffic on said membrane while in a horizontal position and also operative to permit a cementitious material to be cast against and to form a waterproofing barrier with said adhesive layer and said elastomeric protective coating layer when said cementitious material is allowed to cure.



**5,496,616**

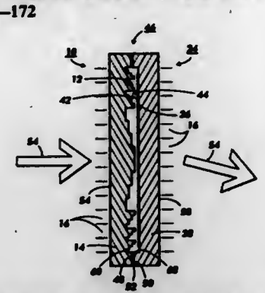
**OPTICAL ELEMENT FOR CORRECTING NON-UNIFORM DIFFRACTION EFFICIENCY IN A BINARY DIFFRACTIVE OPTICAL ELEMENT**

**Ellis D. Harris, Claremont, Calif., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Dec. 27, 1994, Ser. No. 364,904**

**Int. Cl.[6] B32B *3/00;* G02B *5/18***

**U.S. Cl. 428—172** **7 Claims**




1. An optical element assembly for providing a uniform diffraction efficiency to a diffracted beam comprising

a first binary diffractive optical element having a multiple level surface relief phase grating structure on a first substrate, said grating structure of said first binary diffractive optical element being divided into regions, each of said regions having a diffraction efficiency for said diffracted beam,

a second binary diffractive optical element having a binary level surface relief phase grating structure on a second substrate, said grating structure of said second binary diffractive optical element being divided into regions corresponding to said regions of said first binary diffractive optical element, said regions of said second binary diffractive optical element inducing loss to said diffracted beam such that for each region said diffraction efficiency of said first binary diffractive optical element and said loss of said second binary diffractive optical element equal the lowest diffraction efficiency of said regions of said first binary diffractive optical element, and

bonding means for securing said first binary diffractive optical element and said second binary diffractive optical element together.

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**5,496,617**

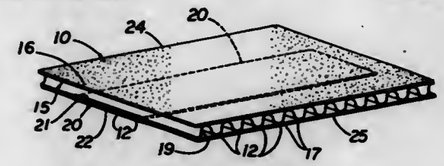
**METHOD OF MAKING REINFORCED CORRUGATED BOARD AND PRODUCT THEREFROM**

**Bobby T. Bullock, Sr., Marietta, Ga., assignor to Mead, Smyrna, Ga.**

**Division of Ser. No. 50,815, Apr. 22, 1993, Pat. No. 5,362,346. This application Aug. 22, 1994, Ser. No. 293,657**

**Int. Cl.[6] B32B *3/28***

**U.S. Cl. 428—182** **10 Claims**




1. A reinforced corrugated board, comprising:

a. a first corrugated board member having a first upper faced surface and an opposite first lower corrugated surface;

b. a non-adhesive reinforcing strip co-planar with said first faced surface having a top surface secured to the first lower corrugated surface of the first corrugated member, and an opposite bottom surface; and

c. a non-adhesive facing liner secured to the bottom surface of the reinforcing strip; and

d. an adhesive disposed both between the first lower corrugated surface and the top surface of the reinforcing strip, and between the bottom surface of the reinforcing strip and the facing liner.

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**5,496,618**

**POLYESTER FILM FOR MAGNETIC RECORDING MEDIA, PROCESS FOR PREPARATION THEREOF AND MAGNETIC RECORDING MEDIUM**

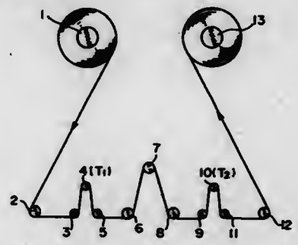
**Hideshi Kurihara, Sagamihara; Sadayoshi Miura, Yamato, and Tsuyoshi Nagai, Sagamihara, all of, Japan, assignors to Teijin Limited, Osaka, Japan**

**Continuation of Ser. No. 903,323, Jun. 24, 1992, abandoned. This application May 26, 1994, Ser. No. 250,115**

**Claims priority, application Japan, Jun. 28, 1991, 3-183913**

**Int. Cl.[6] B32B *27/14***

**U.S. Cl. 428—198** **10 Claims**




1. A polyester film for magnetic recording media having fine protuberances on the film surface of one or both sides of the polyester film, the protuberances comprising fine particles coated with a binder resin with which the protuberances are bound to the film surface, wherein:

(i) the binder resin is substantially confined to areas of the film surface where the fine protuberances exist such that other areas of the film surface are substantially free of binder resin;

(ii) the fine protuberances are bound to the film surface at a density of $1.0\times10^4$ to $1.0\times10^8$ per mm$^2$ and have an average height of 0.15 μm or less; and

(iii) the polyester film possesses a centerline average surface roughness (Ra) in the range of 0.001 to 0.01 μm.

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**5,496,619**

**ASSEMBLY FORMED FROM CONDUCTIVE PASTE AND INSULATING PASTE**

**Minehiro Itagaki, Moriguchi; Kazuyuki Okano, Ikoma; Suzushi Kimura, Toyonaka; Seiichi Nakatani, Hirakata; Yoshihiro Bessho, Higashiosaka; Satoru Yukioku, Osaka; Yasuhiko Hakotani, Nishinomiya, and Kazuhiro Miura, Osaka, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan**

**Division of Ser. No. 59,959, May 13, 1993, abandoned. This application Jun. 6, 1994, Ser. No. 254,414**

**Claims priority, application Japan, May 14, 1992, 4-121610; Sep. 22, 1992, 4-252596**

**Int. Cl.[6] B32B *15/04;17/06;* H01L *21/4763;* H01B *1/16***

**U.S. Cl. 428—209** **4 Claims**

1. An assembly comprising a multilayer ceramic substrate having an insulating material formed of an insulating paste comprising an insulating powder and a via connection formed of a conductive paste extending within said insulating material, said conductive paste comprising:

an inorganic component which consists of 30.0 to 50.0% by weight of a powder of a conductive material and the remainder being a glass powder having a softening point higher than the starting point of sintering of said insulating powder; and

an organic vehicle component which comprises an organic binder and solvent.

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**5,496,620**

**MAGNETIC RECORDING MEDIUM**

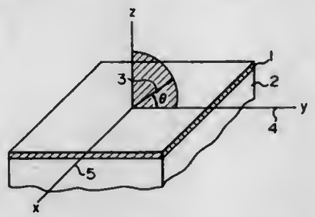
**Osamu Kitakami; Kunio Wakai, both of Ibaraki, and Kazuetsu Yoshida, Kodaira, all of, Japan, assignors to Hitachi Maxell, Ltd., Osaka, and Hitachi Ltd., Tokyo, both of, Japan**

**Continuation of Ser. No. 803,558, Dec. 9, 1991, abandoned. This application Nov. 4, 1994, Ser. No. 334,125**

**Claims priority, application Japan, Dec. 13, 1990, 2-410420**

**Int. Cl.[6] G11B *5/00***

**U.S. Cl. 428—212** **4 Claims**




1. The product produced by the process for the production of a magnetic recording medium, said process comprising the following ordered steps:

(a) treating a nonmagnetic substrate surface with plasma in an atmosphere of an inert gas or an oxygen gas; and

(b) depositing a magnetic film formed from an alloy including cobalt and oxygen, said oxygen content in said magnetic film having an atomic ratio of at least 5%, said magnetic film having a principal axis of magnetic anisotropy rising unidirectionally at 20° to 80° to form an interfacial surface of said film with said non-magnetic substrate before demagnetizing field compensation, and an average principal axis of magnetic anisotrophy rising at 40° or more to said film plane after demagnetizing field compensation, wherein a coercive force Hs on a surface side of said magnetic layer, which ranges from 600 to 2000 Oe. is greater than a coercive force Hb on said interfacial surface of said substrate, said coercive force on said interfacial surface being 520 Oe. or less, and said magnetic layer having a dipulse ratio r of from 0 to 0.3.

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**5,496,621**

**GLASS PANE WITH REFLECTANCE REDUCING COATING AND COMBINER OF HEAD-UP DISPLAY SYSTEM**

**Kensuke Makita, Ichishi; Atsushi Takamatsu, and Katsuto Tanaka, both of Matsusaka, all of, Japan, assignors to Central Glass Company, Limited, Yamanchi, Japan**

**Filed Apr. 15, 1994, Ser. No. 228,522**

**Claims priority, application Japan, Apr. 16, 1993, 5-89636; May 31, 1993, 5-129284**

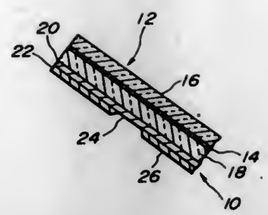
**The portion of the term of this patent subsequent to Apr. 23, 2012, has been disclaimed.**

**Int. Cl.[6] G02B *1/100***

**U.S. Cl. 428—216** **15 Claims**

1. A coated glass pane, comprising a transparent glass substrate and a fluoride-free coating formed on a major surface of the glass substrate, the fluoride-free coating comprising:

a first layer which is a transparent oxide film in direct contact with the major surface of the glass substrate and has a thickness of 70–230 nm and a refractive index in the range from 1.80 to 2.10, said first layer having a major portion and a minor portion which is exposed and adapted to be used as a combiner of a head-up display system; and




a second layer which is a transparent oxide film formed on the major portion of said first layer so as to expose the minor portion of said first layer, said second layer having a thickness of 110–130 nm and a refractive index in the range from 1.40 to 1.50, said second layer together with the major portion of said first layer being adapted to be used as a reflectance reducing coating.

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**5,496,622**

**MAGNETIC RECORDING MEDIUM COMPRISING AN UNDERLAYER CONTAINING αIRON OXIDE POWDER AND A MAGNETIC LAYER CONTAINING FERROMAGNETIC METALLIC POWDER**

**Ryosuke Isobe; Takafumi Yanagita, both of Hino; Akira Saitoh, and Akihiko Seki, both of Saku, all of, Japan, assignors to Konica Corporation, and TKD Corporation, both of, Japan**

**Filed Jul. 26, 1994, Ser. No. 280,793**

**Claims priority, application Japan, Jul. 26, 1993, 5-184012**

**Int. Cl.[6] G11B *5/00***

**U.S. Cl. 428—216** **18 Claims**

1. A magnetic recording medium which comprises a non-magnetic support and a layer containing α-iron oxide powder as a lower layer and a layer containing ferromagnetic metallic powder as an upper layer which are provided on the non-magnetic support in this order from a side of the non-magnetic support,

wherein the surface of the α-iron oxide powder in the lower layer has the average existence ratios of elements of 0 to 40 of aluminum (Al) atom and 1 to 60 of silicon (Si) atom based on the number of iron (Fe) atom as 100 in terms of the number of atoms, and

the ferromagnetic powder in the upper layer contains Fe, Al and a rare earth element.

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**5,496,623**

**NATURALLY FLAME RESISTANT COTTON FIBER**

**Sally V. Fox, Aguila, Ariz., assignor to Natural Cotton Colours, Inc., Wickenburg, Ariz.**

**Filed Jan. 28, 1994, Ser. No. 187,620**

**Int. Cl.[6] D04H *1/00***

**U.S. Cl. 428—224** **5 Claims**

1. Cotton fiber produced by the variety designated 'Buffalo' (ATCC 97210).



**5,496,624**

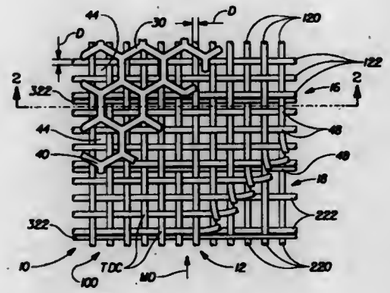
**MULTIPLE LAYER PAPERMAKING BELT PROVIDING IMPROVED FIBER SUPPORT FOR CELLULOSIC FIBROUS STRUCTURES, AND CELLULOSIC FIBROUS STRUCTURES PRODUCED THEREBY**

**Michael G. Stelljes, Jr., West Chester; Glenn D. Boutilier, Cincinnati, and Paul D. Trokhan, Hamilton, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio**

**Filed Jun. 2, 1994, Ser. No. 254,387**

**Int. Cl.[6] D03D *3/00***

**U.S. Cl. 428—229** **19 Claims**




1. A papermaking belt comprising:

a reinforcing structure comprising:

a web facing first layer of interwoven machine direction yarns and cross-machine direction yarns, said machine direction and cross-machine direction yarns of said first layer having a yarn diameter and being interwoven in a weave comprising knuckles, said knuckles defining a web facing top plane, each yarn of said first layer having a top dead center longitude, said top dead center longitude remaining within 1.5 yarn diameters of said top plane;

a machine facing second layer of interwoven machine direction yarns and cross-machine direction yarns, said machine direction and cross-machine direction yarns of said second layer being interwoven in a weave, said first layer and said second layer being tied together by a plurality of tie yarns which do not remain within 1.5 yarn diameters of said top plane, wherein said reinforcing structure has a thickness at least 2.5 times as great as said yarn diameter; and

a pattern layer extending outwardly from said first layer and into said second layer, wherein said pattern layer provides a web contacting surface facing outwardly from top dead center longitude of said first layer, said pattern layer connecting said first layer and said second layer, whereby said pattern layer stabilizes said first layer relative to said second layer during the manufacture of cellulosic fibrous structures thereon.

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**5,496,625**

**MELAMINE THERMAL PROTECTIVE FABRIC AND CORE-SPUN HEAT RESISTANT YARN FOR MAKING THE SAME**

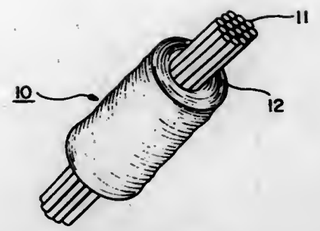
**Harish N. Lilani, Norristown, Pa., assignor to Norfab Corporation, Norristown, Pa.**

**Filed Dec. 30, 1994, Ser. No. 366,854**

**Int. Cl.[6] D02G *3/02*; D03D *3/00*; B32B *7/00***

**U.S. Cl. 428—229** **6 Claims**

1. A weavable, high temperature resistant composite yarn comprised of at least 35% melamine fiber by weight and the balance thereof selected from the group consisting of aramid, polybenzimidazole, phenolic, carbon, flame resistant acrylic and flame resistant cellulosic fibers.




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**5,496,626**

**ABSORBENT PAPER AND ABSORBENT ARTICLE PROVIDED THEREWITH**

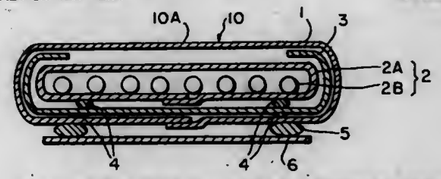
**Mitsugu Hamajima, and Minoru Nakanishi, both of Tochigi, Japan, assignors to Kao Corporation, Tokyo, Japan**

**Filed Apr. 1, 1994, Ser. No. 221,777**

**Claims priority, application Japan, Apr. 1, 1993, 5-075690**

**Int. Cl.[6] A61F *13/15***

**U.S. Cl. 428—284** **7 Claims**




1. In an absorbent article comprising a liquid-permeable surface material, a liquid-retaining absorbent and a liquid-impermeable leakproof material, the improvement wherein said liquid-retaining absorbent comprises an absorbent paper and a high-absorbent polymer, wherein said absorbent paper comprises:

a base layer comprising a material containing from 20 to 80% by weight of a highly bulky cellulose fiber and from 80 to 20% by weight of a hydrophilic microfiber, and

a surface layer which is located on said base layer and comprises a material containing from 50 to 98% by weight of a highly bulky cellulose fiber and from 2 to 30% by weight of a hot-melt adhesive fiber.

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**5,496,627**

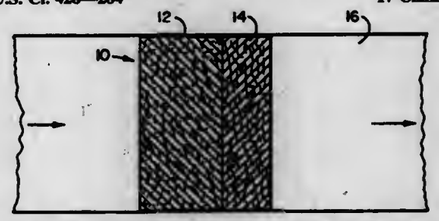
**COMPOSITE FIBROUS FILTERS**

**Shriram Bagrodia, Kingsport; Bobby M. Phillips, Jonesborough, and William A. Haile, Kingsport, all of Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.**

**Filed Jun. 16, 1995, Ser. No. 491,387**

**Int. Cl.[6] D02G *3/00*; B32B *3/00***

**U.S. Cl. 428—284** **17 Claims**




1. A filter for removing particulate matter from a fluid stream comprising a first layer of fibrous material and a second layer of fibrous material, said layers being in face-to-face contact,

a) said first layer comprising fibers having a denier of about 3–15 and grooved in the longitudinal direction, said fibers having a cross-sectional shape factor of greater than 1.5 and a specific volume of about 1.5–5 cc/g, and

b) said second layer comprising melt blown, thermally bonded fibers having a denier of about 0.1–1.0

wherein the pressure drop across said second layer is much greater than the pressure drop across said first layer, the particle holding capacity of said first layer is much greater than the particle holding capacity of said second layer, and the filtration efficiency of said second layer is greater than the filtration efficiency of said first layer.

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**5,496,628**

**SINGLE MEMBRANE INSULATION MATERIAL**

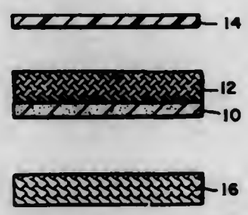
**Robert C. Ribbans, Amherst, N.H., assignor to Textiles Coated Incorporated, Amherst, N.H.**

**Continuation of Ser. No. 199,765, Feb. 22, 1994, abandoned, which is a continuation of Ser. No. 981,198, Nov. 25, 1992, Pat. No. 5,296,287. This application Jun. 28, 1994, Ser. No. 267,560**

**The portion of the term of this patent subsequent to Nov. 25, 2012, has been disclaimed.**

**Int. Cl.[6] B32B *15/00***

**U.S. Cl. 428—285** **4 Claims**




1. An integrally formed insulating composite comprising: a flexible fabric substrate coated on opposite surfaces with polytetrafluoroethylene; a fiberglass fabric insulating layer laminated to one surface of said substrate by means of a melt bondable fluoropolymer adhesive coating applied to said one surface; and a polytetrafluoroethylene tape laminated to the other surface of said substrate.

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**5,496,629**

**MODIFICATION OF POROUS MATERIALS**

**Alan Tallentire, Wilmslow, and Colin S. Sinclair, Manchester, both of, Great Britain, assignors to The Victoria University of Manchester, Manchester, Great Britain**

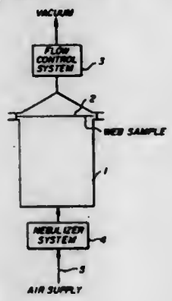
**PCT No. PCT/GB93/01118, § 371 Date Mar. 15, 1995, § 102(e) Date Mar. 15, 1995, PCT Pub. No. WO93/24705, PCT Pub. Date Dec. 9, 1993**

**PCT Filed May 28, 1993, Ser. No. 343,447**

**Claims priority, application United Kingdom, May 29, 1992, 9211378**

**Int. Cl.[6] B32B *3/26***

**U.S. Cl. 428—304.4** **32 Claims**




32. A porous material having a surface coating located selectively within the pores, as producible by a method comprising establishing a pressure differential across the material and treating the higher pressure side with a suspension, dispersion or aerosol of droplets of a liquid so that said droplets enter at least some of the pores, wherein the treatment conditions are such that the aerodynamic forces within the pores exceed the surface tension forces maintaining integrity of the droplets which therefore spread to provide a surface coating within the pores.

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**5,496,630**

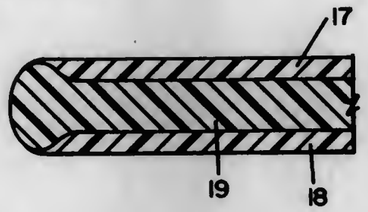
**THERMOPLASTIC MULTILAYER LOUVER WITH A POLISHED METAL LOOK**

**Roman B. Hawryluk, Avon Lake; Karl Lakstigala, and Aslim A. Asgarali, both of Sheffield Lake, all of Ohio, assignors to The Geon Company, Cleveland, Ohio**

**Filed Sep. 13, 1993, Ser. No. 76,328**

**Int. Cl.[6] B32B *5/02***

**U.S. Cl. 428—328** **9 Claims**




1. A multilayer profile in the shape of a louver blind and exhibiting a bright polished metal visual effect, comprising joined first and second layers, wherein the first layer is a rigid base layer, and the second layer is an extruded rigid appearance layer exhibiting said polished metal effect, said appearance layer is absent particulate opacifying pigment, and comprises rigid polyvinyl chloride, powdered aluminum metal flakes, and from 0.05 to 10 weight parts nacreous (pearlescent) pigmentation, wherein said powdered aluminum metal flakes have a average particle size of 50 microns or less and said flakes are present at from 0.05 to 4 weight parts per 100 weight parts of said polyvinyl chloride.

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**5,496,631**

**PERPENDICULAR MAGNETIC FILM, MULTILAYERED FILM FOR PERPENDICULAR MAGNETIC FILM AND PROCESS FOR PRODUCING PERPENDICULAR MAGNETIC FILM**

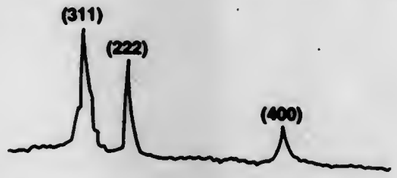
**Kousaku Tamari, Hiroshima, Japan, assignor to Toda Kogyo Corporation, Hiroshima, Japan**

**Filed Nov. 29, 1993, Ser. No. 158,854**

**Claims priority, application Japan, Nov. 30, 1992, 4-345241**

**Int. Cl.[6] B32B *5/16*; G11B *5/66***

**U.S. Cl. 428—332** **4 Claims**




1. A perpendicular magnetic film comprising a spinel thin film having a spinel crystal structure, consisting essentially of Fe, Co, Ni and O, and having a coercive force of less than 3000 Oe, a



saturation magnetization of not less than 200 emμ/cc and a squareness of not less than 0.20,

the thin film being formed on a substrate, the plane (**400**) of the thin film being oriented substantially parallel to said substrate so that the spacing of the plane (**400**) is not more than 2.082 Å, the molar ratio of Co to Fe in the thin film being 0.005 to 0.32 and the molar ratio of Ni to Co in the thin film being not less than 0.6.

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**5,496,632**

**MAGNETIC RECORDING MEDIUM AND MANUFACTURING METHOD THEREOF**

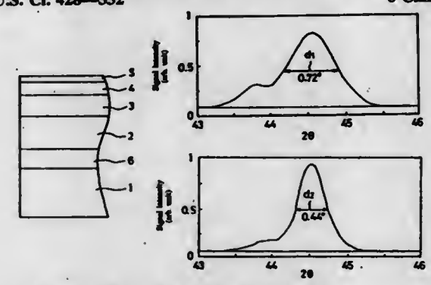
**Kiyoto Yamaguchi, Zushi; Yukiko Mamiya, Yokosuka; Atsushi Ueda, Zushi, and Hiroyuki Uwazumi, Matsumoto, all of, Japan, assignors to Fuji Electric Co., Ltd., Japan**

**Filed Jan. 14, 1994, Ser. No. 181,422**

**Claims priority, application Japan, Jan. 28, 1993, 5-007472**

**Int. Cl.[6] B32B *5/16;15/00*; G11B *5/66***

**U.S. Cl. 428—332** **6 Claims**




1. A magnetic recording medium comprising:

a non-magnetic base substrate;

a non-magnetic metal buffer layer formed on said non-magnetic base substrate, said non-magnetic buffer layer comprising Cr;

a non-magnetic metal under layer formed on said metal buffer layer, said non-magnetic under layer comprising Cr;

a thin-film magnetic layer comprised of a ferromagnetic alloy formed on said metal under layer; and

a protective layer formed on the surface of said thin-film magnetic layer;

wherein $d_1/d_2$ is not less than 1.2 where $d_1$ is a half bandwidth of an X-ray diffraction peak on the (110) plane of the metal buffer layer, and $d_2$ is a half bandwidth of an X-ray diffraction peak on the (110) plane of the metal under layer.

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**5,496,633**

**TRANSFER FILM WITH MAGNETIC LAYER**

**Manfred Steuerwald; Manfred Ohlinger, both of Frankenthal; Jenoe Kovacs, Heasheim, and Dieter Schwarz, Weinheim, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany**

**Continuation of Ser. No. 429,505, Oct. 31, 1989, abandoned. This application Jul. 25, 1991, Ser. No. 735,701**

**Claims priority, application Germany, Dec. 15, 1988, 38 42 176.3**

**Int. Cl.[6] G11B *5/00***

**U.S. Cl. 428—336** **3 Claims**

1. A transfer film having a magnetic layer, consisting essentially of a substrate film, a parting layer and a transfer layer which is detachable from the said parting layer and comprises at least one magnetic layer wherein, on that side of the magnetic layer which faces the substrate film, after detachment of the substrate film, the surface-forming layer consists of a layer which contains inorganic pigments in a crosslinked polymer matrix and has a thickness of from 0.2 to 5.0 μm and a surface resistance of $10^1$ to $10^8$ ohm/square.

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**5,496,634**

**INK JET RECORDING SHEET**

**Susumu Ogawa; Hideaki Senoh, and Kouji Idei, all of Tokyo, Japan, assignors to Mitsubishi Paper Mills Limited, Tokyo, Japan**

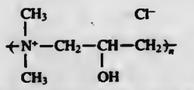
**Filed Sep. 13, 1993, Ser. No. 119,399**

**Claims priority, application Japan, Dec. 16, 1992, 4-336136; Mar. 8, 1993, 5-045596**

**Int. Cl.[6] B41M *5/00*; B05D *5/04***

**U.S. Cl. 428—341** **4 Claims**

1. An ink jet recording sheet which comprises a support and at least one ink-receiving layer coated on one side of the support wherein said ink-receiving layer comprises a coating composition containing a pigment, a binder and a quaternary salt of dimethylamine-epichlorohydrin adduct represented by the following formula (1):




wherein n indicates the degree of polymerization and is a positive number in the range of 2 to 2000.

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**5,496,635**

**DIRECTLY PRINTABLE COATING FOR OLEFINIC POLYMER FILMS AND ARTICLES UTILIZING SUCH COATING**

**Robert C. Francis, Maplewood, Minn.; Robert R. L. Smolders, Antwerp, Belgium; William G. Walsh, Cloughabrody, Ireland, and Ramesh C. Kumar, Maplewood, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Continuation-in-part of Ser. No. 134,333, Oct. 12, 1993, abandoned. This application Mar. 1, 1994, Ser. No. 204,001**

**Int. Cl.[6] C09J *7/02***

**U.S. Cl. 428—352** **12 Claims**

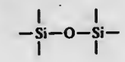
1. A directly printable film comprising polymeric substrate having first and second major surfaces and a layer of directly printable release coating on at least one of the first and second major surfaces which release coating comprises the reaction product of

(i) from 50 to 95 weight percent of a vinyl functional monomer comprising the acrylic and methacrylic acid esters of a non-tertiary alcohol containing from 1 to 14 carbon atoms;

(ii) from 5 to 50 weight percent of a chlorinated olefinic resin;

(iii) from 0 to 30 weight percent of an amide-functional monomer;

(iv) from 0.01 to 5 weight percent of a free radically polymerizable siloxane-containing component containing




units.

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**5,496,636**

**PRINTABLE SELF-WOUND FIRE RETARDANT PRESSURE-SENSITIVE ADHESIVE TAPE**

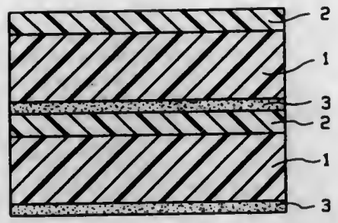
**Fan Gu, Tyngsboro, and Cheryl A. Prudhomme, Methuen, both of Mass., assignors to Ideal Tape Co., an American Biltrite Company, Lowell, Mass.**

**Continuation of Ser. No. 998,808, Dec. 29, 1992, abandoned. This application Jul. 8, 1994, Ser. No. 272,494**

**Int. Cl.[6] C09J *7/02***

**U.S. Cl. 428—352** **15 Claims**

1. A ternary printable, pressure-sensitive adhesive tape not having a release agent or coating consisting essentially of:




a polyester film substrate having first and second opposing sides;

a pressure-sensitive adhesive layer disposed on said first side; and

a rubber base prime coat capable of accepting printing ink being disposed on said second side of said substrate, which prime coat comes in direct contact with said adhesive when the tape is wound up on itself in roll form and which releases said adhesive without the use of a separate release coating; said prime coat comprising natural rubber crosslinked by an isocyanate.

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**5,496,637**

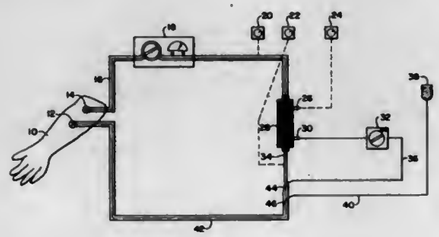
**HIGH EFFICIENCY REMOVAL OF LOW DENSITY LIPOPROTEIN-CHOLESTEROL FROM WHOLE BLOOD**

**Marc E. Parham, Bedford; Richard L. Duffy, Cambridge, and Donald T. Nicholson, Leominster, all of Mass., assignors to W. R. Grace & Co.-Conn., New York, N.Y.**

**Division of Ser. No. 878,580, May 5, 1992, Pat. No. 5,258,149, which is a continuation-in-part of Ser. No. 782,348, Oct. 31, 1991, Pat. No. 5,236,644, which is a continuation-in-part of Ser. No. 618,791, Nov. 27, 1990, Pat. No. 5,187,010. This application Apr. 30, 1993, Ser. No. 54,281**

**Int. Cl.[6] D02G *3/00***

**U.S. Cl. 428—376** **6 Claims**




1. A membrane which binds low density lipoprotein cholesterol prepared by a process comprising:

(a) preparing a hollow fiber membrane from a casting solution comprising about 8 to about 22 weight % of a polysulfone polymer;

(b) submerging said hollow fiber membrane in an acidic solution comprising polyacrylic acid and 0.1 to about 3 weight % calcium chloride and having a pH range of about 1.5 to about 5.5;

(c) vacuum degassing said submerged hollow fiber membrane of step (b);

(d) immobilizing polyacrylic acid to said hollow fiber membrane by heating under pressure the submerged vacuum degassed fibers of step (c); and

(e) annealing the hollow fiber membrane of step (d) by heating under pressure in water.

**5,496,638**

**DIAMOND TOOLS FOR ROCK DRILLING, METAL CUTTING AND WEAR PART APPLICATIONS**

**Mats G. Waldenström, Bromma; Udo K. R. Fischer, Vällingby; Lars H. Hillert, Saltsjö-Boo, all of, Sweden, and Mahlon D. Dennis, Kingwood, Tex., assignors to Sandvik AB, Sandviken, Sweden**

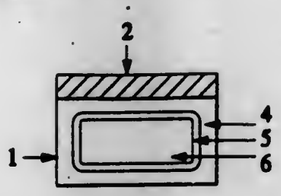
**Continuation of Ser. No. 73,480, Jun. 9, 1993, abandoned, which is a continuation of Ser. No. 774,897, Oct. 11, 1991, Pat. No. 5,264,283. This application Aug. 29, 1994, Ser. No. 297,905**

**Claims priority, application Sweden, Jan. 11, 1990, 9003251**

**The portion of the term of this patent subsequent to Nov. 23, 2010, has been disclaimed.**

**Int. Cl.[6] C23C *16/26***

**U.S. Cl. 428—408** **11 Claims**




1. A tool comprising a diamond portion bonded to a cemented carbide substrate wherein said diamond portion is prefabricated by a CVD- or PVD-technique and subsequently bonded to the cemented carbide substrate by high pressure and high temperature such that the diamond portion is in direct contact with the cemented carbide substrate, the high pressure and high temperature resulting in a high and uniform compression of the diamond portion caused by the difference in thermal expansion between the cemented carbide substrate and the diamond portion.

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**5,496,639**

**POLY(ARYLENE ETHER IMIDAZOLE) SURFACING FILMS FOR FLAT AND PARABOLIC STRUCTURES**

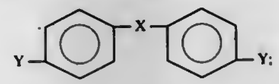
**John W. Connell, Yorktown; Timothy W. Towell, Hampton, and Stephen S. Tompkins, Williamsburg, all of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.**

**Filed May 4, 1994, Ser. No. 238,102**

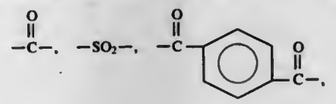
**Int. Cl.[6] H01Q *15/14***

**U.S. Cl. 428—413** **5 Claims**

1. An integral structure comprising a surfacing film of a thermoplastic poly(arylene ether imidazole) chemically bonded (co-cured) to a member selected from the group consisting of neat epoxy or bismaleimide resin panels and composite epoxy or bismaleimide resin panels wherein the thermoplastic poly(arylene ether imidazole) is prepared by reacting a di(hydroxyphenyl)imidazole and an activated aromatic dihalide or dinitro compound having the general structure:

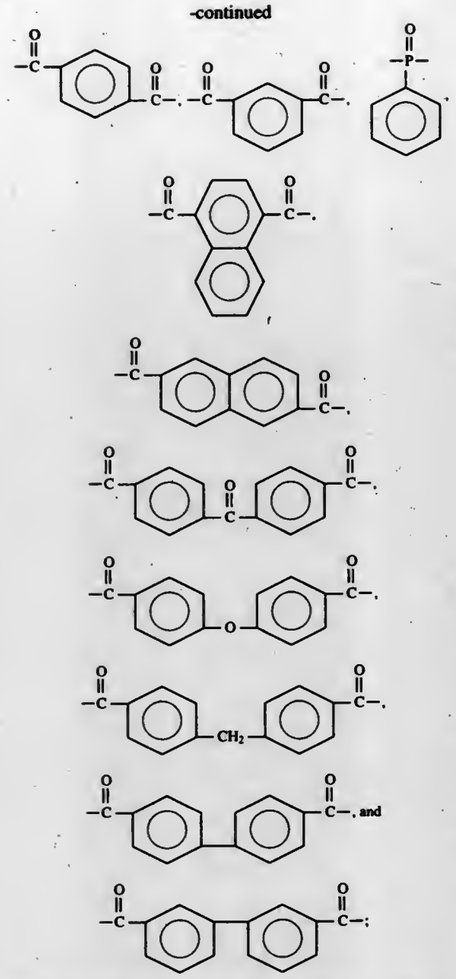



wherein X is a radical selected from the group consisting of:






-continued




wherein Y is selected from the group consisting of: Cl, F and $NO_2$; wherein said reaction is carried out in a polar aprotic solvent selected from the group consisting of: N,N-dimethylacetamide, N-methylpyrrolidinone, sulfolane, diphenylsulfone, N-cyclohexylpyrrolidinone, and dimethylsulfoxide; wherein said reaction is carried out in the presence of an alkali metal base; and wherein said reaction is carried out with the application of heat.

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**5,496,640**

**FIRE RESISTANT TRANSPARENT LAMINATES**

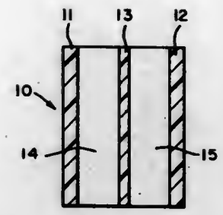
**Nelson Bolton, Trumbauersville, and W. Novis Smith, Philadelphia, both of Pa., assignors to Artistic Glass Products Company, Trumbauersville, Pa.**

**Filed Aug. 15, 1994, Ser. No. 290,178**

**Int. Cl.[6] B32B *27/06***

**U.S. Cl. 428—421** **19 Claims**

1. A fire resistant, impact resistant and transparent laminate comprising at least two spaced parallel sheets of transparent material and at least one interlayer, said interlayer comprising an optically transparent thermoplastic fluorocarbon polymer, said fluorocarbon polymer being modified by polar groups and having a melting point in the range of about 120° to 300° C., wherein said polar groups are selected from carboxyl groups, urethane groups and hydroxyl groups.




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**5,496,641**

**PLASTIC LENS**

**Shoji Mase; Noboru Otani, both of Odawara; Motoaki Yoshida, Tokyo; Satoshi Ishizuka; Hisayuki Kayanoki, both of Takarazuka, and Naoto Hirayama, Yokkaichi, all of, Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan**

**Filed Jun. 11, 1992, Ser. No. 896,966**

**Claims priority, application Japan, Jun. 13, 1991, 3-141696; Jun. 13, 1991, 3-141699; Apr. 22, 1992, 4-103021**

**Int. Cl.[6] B32B *27/00;9/04***

**U.S. Cl. 428—423.1** **11 Claims**

1. A plastic lens formed by laminating, in the order described below,

(A) a plastic lens substrate having a refractive index in the range of 1.50 to 1.70,

(B) a primer layer containing a metal compound of at least one metal selected from the group consisting of Al, Ti, Zr, Sn and Sb and a thermosetting polyurethane obtained by reacting a blocked polyisocyanate and a polyol, and having a refractive index in the range of 1.45 to 1.60 and satisfying both the following equation (1),

$$\sqrt{n_s \cdot n_H} + \frac{|n_s - n_H|}{4} \geq n_p \geq \sqrt{n_s \cdot n_H} - \frac{|n_s - n_H|}{4} \quad (1)$$

wherein:

$n_s$ is the refractive index of the plastic lens substrate (A),

$n_H$ is the refractive index of a coating layer (C) to be described below, and

$n_p$ is the refractive index of the primer layer (B),

and the following equation (2),

$$D=\lambda/4n_p \quad (2)$$

wherein:

$\lambda$ is the wavelength of visible light at 450 to 650 nm,

$n_p$ is as defined above, and

d is the thickness (nm) of the primer layer (B),

(C) a coating layer comprising a silicon based resin, and

(D) a single-layered or multi-layered anti-reflection layer formed by vapor-depositing an inorganic substance.

5,496,642

## LOW VOC, FLUOROCOMPOUND-CONTAINING ONE-COMPONENT AND TWO-COMPONENT COATING COMPOSITIONS FOR SLIPPERY COATINGS

Michael M. Martinez, Fairporte, N.Y.; Adam G. Malofsky, Huntington, Conn.; Kiran B. Chandalia, Cheshire, Conn., and Fred A. Stuber, North Haven, Conn., assignors to Olin Corporation, Cheshire, Conn.

Filed May 9, 1994, Ser. No. 239,883
The portion of the term of this patent subsequent to Dec. 6, 2011, has been disclaimed.
Int. Cl.[6] B32B 27/00;27/40
U.S. Cl. 428—423.1 11 Claims

1. A process for providing a slippery coating on a substrate which comprises:

(a) contacting said substrate with a low volatile-organics, one-component, heat curable coating composition to form a coating on said substrate, said coating composition having a viscosity as measured by ZAHN cup 2 of less than about 200 seconds and consisting essentially of at least one blocked polyisocyanate, a fluorine-containing monoahl alone or in combination with a fluorine-free active hydrogen-containing compound, a solvent in an amount of between 0% and 45% by weight based upon the amount of said polyisocyanate in said composition, and a trimerization catalyst, said composition being essentially free of any mono- and di-isocyanate monomers, and

(b) heating said coating to a curing temperature of between 120° F. and 350° F. for a curing time of between about ten minutes and about six hours in order to cure said coating by trimerizing at least some isocyanate groups of said polyisocyanate to provide a heat-cured coating on said substrate,

said heat-cured coating being characterized by a contact angle of greater than 63 degrees.

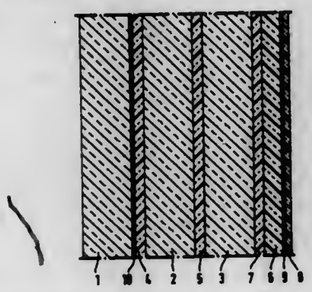
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5,496,643

## BULLETPROOF GLASS PANE OF AUTOMOBILES

Ulrich Von Alpen, Aachen, Germany, assignor to Saint-Gobain Vitrage, Courbevoie, France

Filed Jul. 22, 1994, Ser. No. 279,202
Claims priority, application Germany, Jul. 22, 1993, 9310957 U
Int. Cl.[6] E06B 3/24; B32B 15/00
U.S. Cl. 428—432 10 Claims




1. A bulletproof glass pane for a vehicle comprising:

a glass pane comprising a plurality of silicate glass sheets with intervening layers of thermoplastic polymer;

an impact-resistant plastic sheet or plate bonded by a thermoplastic adhesive film onto a surface of said glass pane, wherein a scratch-resistant coating is provided on a surface of said impact-resistant plastic sheet or plate opposite said glass pane; and

a silicate glass sheet with a thermal radiation-reflecting coating, wherein said silicate glass sheet is on said glass pane, opposite said impact-resistant plastic sheet or plate.

5,496,644

## PLASMA SPRAYED MULLITE COATINGS ON SILICON-BASE CERAMICS

Kang N. Lee, Westlake; Robert A. Miller, Brecksville, and Nathan S. Jacobson, Bay Village, all of Ohio, assignors to The United States of America as represented by the Administrator of the National aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 31,444, Mar. 15, 1993, Pat. No. 5,391,404.
This application Dec. 20, 1993, Ser. No. 169,282
Int. Cl.[6] B32B 9/04
U.S. Cl. 428—446 9 Claims




1. A coated article of manufacture consisting of

a silicon-base ceramic substrate, and

a substantially crack free mullite coating uniformly bonded to a surface of said substrate, said coating being substantially crystalline and free of amorphous mullite.

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5,496,645

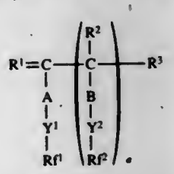
## MAGNETIC RECORDING MEDIUM COMPRISING A MAGNETIC METALLIC THIN FILM AND A LAYER CONTAINING A SPECIFIED FLUORINE COMPOUND AND A SPECIFIED TETRAZAINDENE CYCLIC COMPOUND OR THIOURACIL CYCLIC COMPOUND

toshio Ishida; Masaki Satake, and Tsutomu Okita, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 105,070, Aug. 12, 1993, abandoned.
This application Jan. 12, 1995, Ser. No. 371,672
Claims priority, application Japan, Aug. 12, 1992, 4-215225
Int. Cl.[6] G11B 5/00
U.S. Cl. 428—457 4 Claims

1. A magnetic recording medium comprising a magnetic metallic thin film on at least one side of a non-magnetic support, wherein a layer containing an organic fluorine compound and a rust preventive is formed on said magnetic metallic thin film , wherein the organic fluorine compound is given by the following general formula ( 1 ):

General formula (1)



wherein

$Rf^1$ and $Rf^2$ each represents $CF_3CF_2(CF_2)_n(CH_2)_m$— or $(CF_3)_2CF(CF_2)_n(CH_2)_m$— respectively and may be different or the same, and n is a number from 1 to 10, m is a number from 1 to 20, and n+m is a number from 6 to 30;

$Y^1$ and $Y^2$ each represents —O—, —OCO—, —COO—, —NHCO—or —CONH— and may be different or the same;

$R^1$ represents $=CH_2$, $=CH(CH_2)_kCH_3$ or $=CHCH=CH_2$, and k is a number from 0 to 2;

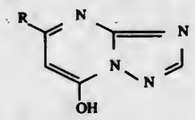
$R^2$ represents H, and $R^2$ is not present when the carbon atom to which $R^2$ is bonded has a double bond;

$R^3$ represents H;



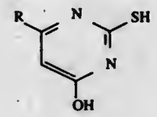
A and B each represents $(CH_2)_k$, where k is a number from 0 to 2, and a is a number of 1 or 2;

$Rf^1$, $Rf^2$, $Y^1$, $Y^2$, $R^1$, $R^2$, $R^3$, k, n and m may be the same or different, and they may be either cis type or trans type, and wherein the rust preventive comprises a tetrazaindene cyclic compound represented by the following formula:



wherein

R represents a $C_3$ to $C_{26}$ hydrocarbon group selected from an alkyl group, an alkoxyl group, or an alkylamide group, and hydrogen atoms may be substituted by fluorine atoms, or a thiouracil cyclic compound represented by the following formula:



wherein

R represents a hydrocarbon group having 3 carbon atoms, and hydrogen atoms may be substituted by fluorine atoms.

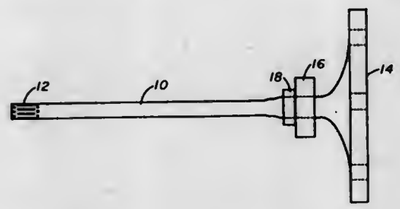
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5,496,646

## INCREASED RETENTION FORCES IN STEEL INTERFERENCE FIT ASSEMBLIES AND METHODS TO INCREASE THE RETENTION FORCES

Nelson A. Bacigalupo, Ann Arbor, Mich., assignor to NTN Technical Center (U.S.A.), Inc., Ann Arbor, Mich.

Continuation of Ser. No. 631,654, Dec. 21, 1990, abandoned.
This application Dec. 2, 1993, Ser. No. 161,200
Int. Cl.[6] C23C 8/12
U.S. Cl. 428—472.2 10 Claims




1. A mechanical assembly comprising:

a pair of components wherein a first of said components defines an aperture and a second of said components is adapted to be forcibly placed into said aperture for assembly and retention therein, said second component and said aperture being dimensioned to provide an interference fit relationship, and

said first and second components each defining an engaging surface formed of iron or steel which are in intimate contact when said components are assembled, at least one of said engaging surfaces having an oxide surface layer formed thereon prior to engagement by heating said surface to a temperature between 500° and 1050° F., said oxide surface layer Including $Fe_2O_3$ and having a controlled thickness enhancing retention of said first and second components when assembled in said interference fit relationship.

5,496,647

## PRIMER COATING, POLYESTER FILM HAVING A PRIMER COATING, AND A PROCESS FOR COATING FILM

James J. Krejci, Medina, Ohio, and John M. Heberger, Greer, S.C., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Continuation of Ser. No. 60,780, May 12, 1993, abandoned, which is a continuation-in-part of Ser. No. 883,445, May 15, 1992, abandoned. This application Jun. 1, 1994, Ser. No. 252,150
The portion of the term of this patent subsequent to Jun. 22, 2011, has been disclaimed.
Int. Cl.[6] B32B 27/36
U.S. Cl. 428—480 5 Claims

1. A primer coating composition for photographic, reprographic and xerographic film which, on a dry basis, consist essentially of,

A) from about 85% to about 99% by weight of a water dispersible copolyester; and

B) from about 1% to about 15% by weight of a suitable surfactant selected from the group consisting of sodium lauryl sulfate, sodium dodecylbenzene sulfonate, sodium alkyl aryl polyether sulfonate, sodium 2-ethylhexyl sulfate, cocamidopropyl betaine, cetrimonium chloride, lauramido propylamine oxide, and alkyloxypolyethylene oxyethanol said alkyloxypolyethyleneoxyethanol has a molecular weight greater than about 1100, said water dispersible copolyester comprising to about 80 to about 98 mol % of at least one dicarboxylic acid or the ester of the acid; and from about 2 to 20 mol % of at least one sulfomonomer containing a sulfonate group attached to dicarboxylic nucleus, and about 100 mol % of at least one glycol having from 2 to 11 carbon atoms.

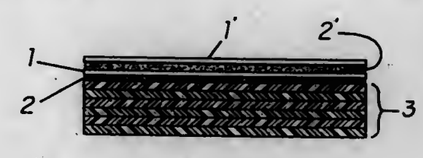
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5,496,648

## FORMABLE COMPOSITE LAMINATES WITH CELLULOSE-CONTAINING POLYMER RESIN SHEETS

Russell K. Held, 7591 N. U.S. 131, Manton, Mich. 49663

Filed Nov. 4, 1994, Ser. No. 334,118
Int. Cl.[6] B32B 23/08;15/08;27/10
U.S. Cl. 428—511 3 Claims




1. A composite laminate consisting essentially of:

at least one outer layer having a top surface and a bottom surface, said at least one outer layer being a wood veneer;

a substrate having a top surface and a bottom surface, said substrate comprising at least one sheet, each sheet including a thermoplastic resin that is self-binding at a temperature of about 300 degrees Fahrenheit and cellulose fibers; and

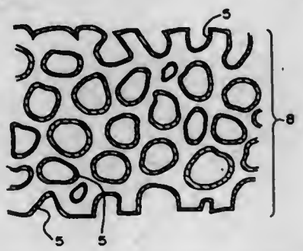
a heat-activatable adhesive material interposed between said bottom surface of said at least one outer layer and said top surface of said substrate, said adhesive material becoming adhesive at a temperature of at least 300 degrees Fahrenheit, whereby said bottom surface of said at least one outer layer is bonded to said top surface of said substrate when said at least one outer layer is cold-pressed onto said top surface of said substrate.

5,496,649
**CROSS-LINKED PVOH COATINGS HAVING ENHANCED BARRIER CHARACTERISTICS**
William M. Mallory, Farmington, and Eber C. Bianchini, Rochester, both of N.Y., assignors to Mobil Oil Corp., Fairfax, Va.
Filed Jul. 21, 1994, Ser. No. 278,458
Int. Cl.[6] B32B *27/08*; C08K *3/22*; B05D *3/04*
U.S. Cl. 428—518 16 Claims

1. A method of providing an improved moisture-resistant oxygen barrier onto a surface of a substrate comprising:
coating said surface of said substrate with a solution of poly(vinyl alcohol), glyoxal and a $C_4$ to $C_{10}$ alcohol, wherein said solution includes an amount of glyoxal sufficient to substantially 100% crosslink said poly(vinyl alcohol) and from about 5 ppm to about 0.5% by weight of said alcohol; and
drying said coated substrate to substantially 100% crosslink said poly(vinyl alcohol) in the absence of a catalyst to provide said moisture-resistant oxygen barrier.

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5,496,650
**METALLIC POROUS SHEET HAVING PORES SURROUNDED BY A THREE-DIMENSIONAL NET-SHAPED FRAMEWORK OF METALLIC LAYERS**
Hirofumi Sugikawa, Toyonaka, Japan, assignor to Katayama Special Industries, Ltd., Osaka, Japan
Filed Sep. 13, 1994, Ser. No. 305,351
Claims priority, application Japan, Sep. 14, 1993, 5-229283; Sep. 14, 1993, 5-229284; Jan. 26, 1993, 5-267591
Int. Cl.[6] B22F *7/00*
U.S. Cl. 428—548 17 Claims

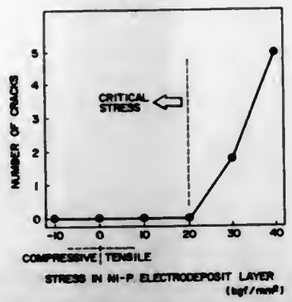



1. A metallic porous sheet comprising pores surrounded by a three-dimensional net-shaped framework, wherein the framework comprises
(a) a conductive metallic layer consisting of sintered fine metallic powders which have sizes of less than 6.0 μm and
(b) a metallic electroplated layer formed on the conductive metallic layer; and
wherein the metallic porous sheet is a continuous sheet and an electrode plate of a battery.

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5,496,651
**MACHINE PART RESISTANT TO ROLLING FRICTION**
Hidetoshi Nishimoto; Yasuaki Sugizaki, both of Kobe; Kenji Umei, Kakogawa; Hiroshi Satoh, Kobe; Yoshinori Terada, Osaka; Tatsuya Yasunaga, Kobe; Takenori Nakayama, Kobe; Yasunori Wada, Kobe, and Keiji Ueda, Kobe, all of, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan
Continuation of Ser. No. 12,761, Feb. 3, 1993, abandoned.
This application Feb. 13, 1995, Ser. No. 387,622
Int. Cl.[6] B32B *15/00*; C25D *3/56*
U.S. Cl. 428—612 12 Claims

1. A machine part comprising: a base part formed of a titanium alloy or an aluminum alloy and having a roughened surface of Ra




0.5 μm or above and $PPI_{30}$ 130 or above; and a Ni—P electrodeposit layer formed over the surface of the base part by an electroplating process using a Ni—P plating bath containing a stress relaxing agent;
wherein the stress induced in the Ni—P electrodeposit layer is 20 kgf/mm$^2$ or below; and
wherein said Ni—P electrodeposit layer has a Vickers hardness of Hv 400 or above, a thickness in the range of 1.0 to 200 μm, and a P content in the range of 0.5 to 7.0% by weight, the balance being Ni.

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5,496,652
**ZINC-PLATED STEEL PLATE HAVING RESIN COATING FILM**
Kenichi Sasaki; Toshiyuki Okuma; Masaaki Yamashita, and Toyofumi Watanabe, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan
Filed Apr. 27, 1993, Ser. No. 53,876
Claims priority, application Japan, Apr. 30, 1992, 4-111890
Int. Cl.[6] B32B *15/08*
U.S. Cl. 428—623 20 Claims

1. A zinc-plated steel sheet having a resin coating film formed on a surface thereof, comprising:
(a) a base steel sheet plated with zinc or a zinc alloy to form a plating layer;
(b) a chromate treating layer formed on the plating layer of said base sheet, said chromate treating layer being deposited in an amount of 1 to 200 mg/m$^2$ in terms of metal chromium; and
(c) a resin coating film formed on the chromate treating layer in a thickness of 0.1 to 5 μm, said resin coating film comprising a composite resin material including (i) a resin composition and (ii) silica in an amount of at most 50% by weight, said resin composition containing a reaction product of an ethylene-based ionomer resin and a silane compound having a single silicon atom and 2 to 4 silyl ether bonds and/or a condensate of the silane compound.

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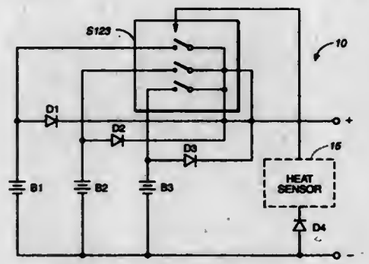
5,496,653
**MAGNETIC RECORDING MEDIUM WITH LONGITUDINAL GLOSSINESS 200 OR MORE**
Shinji Saito; Nobuo Yamazaki, and Hitoshi Noguchi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed May 18, 1994, Ser. No. 245,486
Claims priority, application Japan, May 18, 1993, 5-116140
Int. Cl.[6] G11B *5/66*; *5/70*
U.S. Cl. 428—694 B 4 Claims

1. A magnetic recording medium comprising a non-magnetic support having thereon a magnetic layer comprising a tabular ferromagnetic hexagonal ferrite particle and a binder, wherein said ferromagnetic hexagonal ferrite particle is magnetically oriented in the longitudinal direction of the medium, and said magnetic layer has a coercive force in a longitudinal direction of 500 to 4000 Oe and has a glossiness in the longitudinal direction of the medium of 200% or more and at least 3% higher than that in the width direction of the medium.



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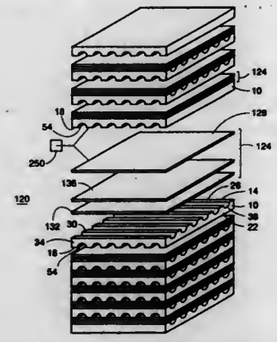
5,496,654
**SECONDARY BATTERY CELL INTERCONNECTION FOR PROTECTION FROM INTERNAL SHORTS**
Bradley A. Perkins, 1166 Nilda Ave., Mountain View, Calif. 94040
Filed Jun. 22, 1994, Ser. No. 263,979
Int. Cl.[6] H01M *10/46*
U.S. Cl. 429—1 4 Claims




1. A multi-cell secondary battery comprising:
a plurality of secondary battery cells connected in parallel;
at least one undirectional current valve connected in series with at least one of the secondary battery cells.
switching means connected in parallel with the unidirectional current valve.

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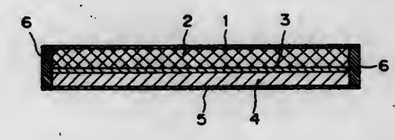
5,496,655
**CATALYTIC BIPOLAR INTERCONNECTION PLATE FOR USE IN A FUEL CELL**
Paul A. Lessing, Idaho Falls, Id., assignor to Lockheed Idaho Technologies Company, Idaho Falls, Id.
Filed Oct. 12, 1994, Ser. No. 322,660
Int. Cl.[6] H01M *8/02*
U.S. Cl. 429—34 29 Claims




1. A bipolar interconnection plate for placement between individual fuel cell units in a stacked, multiple fuel cell power generation system, each fuel cell unit comprising an anode member, a cathode member, and a portion of electrolyte material positioned between said anode member and said cathode member, said bipolar interconnection plate comprising a first side and a second side, said first side comprising a plurality of elongate gas flow channels therein, and said second side comprising a plurality of elongate fuel flow channels therein, said plate being comprised of a catalytic intermetallic compound capable of catalyzing steam reforming of hydrocarbon fuel compositions into hydrogen, carbon monoxide, and carbon dioxide during operation of said fuel cell power generation system, said intermetallic compound being selected from the group consisting of NiAl and $Ni_3Al$, said plate further comprising at least one ceramic filler composition randomly dispersed therein in order to form a porous plate structure having a lower coefficient of thermal expansion compared with plate structures comprised of said intermetallic compound which lack said ceramic filler composition.

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5,496,656
**BATTERY**
Tokuo Inamasu; Kazunari Takeda; Syuichi Izuchi, and Yoetsu Yoshihisa, all of Takatsuki, Japan, assignors to Yuasa Corporation, Osaka, Japan
PCT No. PCT/JP93/00889, § 371 Date Feb. 7, 1994, § 102(e) Date Feb. 7, 1994, PCT Pub. No. WO94/00889, PCT Pub. Date Jan. 6, 1994
PCT Filed Jun. 28, 1993, Ser. No. 193,018
Claims priority, application Japan, Jun. 30, 1992, 4-197661; Sep. 18, 1992, 4-275157; Mar. 15, 1993, 5-081255
Int. Cl.[6] H01M *10/52*
U.S. Cl. 429—57 18 Claims

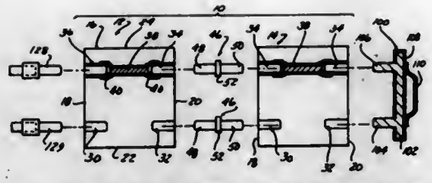



1. A battery which comprises an inside chamber defined by current collector plates and a sealing material, said chamber containing
(A) a cathode composite comprising an active material and another component,
(B) an anode comprising one of
(1) an anode composite comprising an active material and another component, and
(2) the active material only,
(C) an electrolyte,
wherein at least one of the cathode composite, the anode composite and the electrolyte includes an ion-conductive high-molecular weight compound containing at least one ionic compound in solution; and
(D) at least one material capable of eliminating gas produced inside the battery,
wherein said gas eliminating material is active carbon zeolite, hollow glass spheres, ethyl ether, acetone, gelatin, starch or dextrin.

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5,496,657
**MODULAR BATTERY SYSTEM COMPRISING INDIVIDUAL INTERCONNECTED MODULES**
Alfred R. Dixon, Jr., 4023 Far Hill, Bloomfield Hills, Mich. 48304
Continuation-in-part of Ser. No. 213,955, Mar. 16, 1994, Pat. No. 5,378,552. This application Jul. 25, 1994, Ser. No. 279,431
Int. Cl.[6] H01M *2/24*
U.S. Cl. 429—62 41 Claims

1. A battery comprising:
a case containing electroactive material, the case formed with a plurality of exterior walls;
a first connector mounted in one exterior wall of the case and electrically connected to the electroactive material in the case to form a first positive electrode;



a second connector mounted in an external wall of the case and electrically connected to the electroactive material in the case to form a second negative electrode;

at least one of the first and second connectors including compliant contact means for compliantly receiving a tubular terminal.

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**5,496,658**

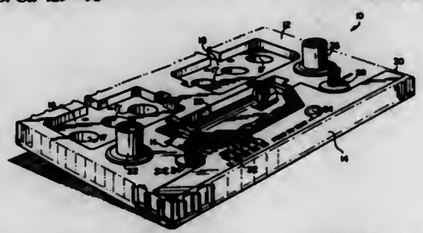
## STORAGE BATTERY STATE-OF-CHARGE INDICATOR

**Edward R. Hein, Mohnton; Gerald D. Hudack, Sinking Spring; John F. Bear, Mohrsville, and Scott J. Crourath, Shillington, all of Pa., assignors to Exide Corporation, Reading, Pa.**

**Filed Jul. 25, 1994, Ser. No. 279,798**

**Int. Cl.[6] H01M** *10/48;2/00;* **H02J** *7/04;* **G08B** *21/00*

**U.S. Cl. 429—93** **20 Claims**



1. In a battery cover including a body having a plurality of vent apertures, at least one negative terminal and at least one positive terminal, the improvement comprising a recess in the cover opening to a top surface thereof; a battery condition indicator assembly including at least one display light secured within said recess, and a thin seal adhered to said cover overlying said recess and sealing said indicator assembly therein, said indicator assembly activated through said film, and with said display light visible through said seal.

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**5,496,659**

## ELECTROCHEMICAL APPARATUS FOR ENERGY STORAGE AND/OR POWER DELIVERY COMPRISING MULTI-COMPARTMENT CELLS

**Ralph Zito, Chapel Hill, N.C., assignor to National Power PLC, Wiltshire, United Kingdom**

**Continuation-in-part of Ser. No. 961,112, Oct. 14, 1992, abandoned. This application Sep. 29, 1993, Ser. No. 128,117**

**Int. Cl.[6] H01M** *4/36;10/36*

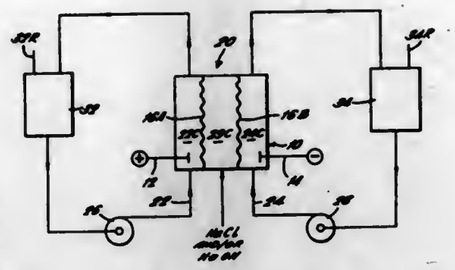
**U.S. Cl. 429—105** **30 Claims**

1. An electrochemical apparatus for energy storage and power delivery comprising, in combination:

(a) means for defining a single cell or an array of repeating cell structures, each cell with a chamber (+[w] chamber) containing a +[w] electrode and a chamber (−[w] chamber) containing a −[w] electrode,

(b) means comprising a plurality of cation exchange membranes for separating the +[w] chamber and the −[w] chamber of each cell by at least one intermediate chamber,

(c) means for circulating a +[w] electrolyte through the +[w] chamber,



(d) means for circulating a −[w] electrolyte through the −[w] chamber,

(e) means for circulating an idler electrolyte through the said intermediate chamber for collecting unwanted ionic species which cross the cation exchange membranes from the +[w] or −[w] chamber,

(f) means for connecting said +[w] electrodes to energy source (charging) means and to delivery (discharge) load means, and

(g) means for recharging the system by driving a DC current into the +[w] electrode and out of the −[w] electrode.

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**5,496,660**

## POLAR ELEMENT FOR STORAGE BATTERIES

**Olimpio Stocchiero, Via Kennedy 4, 36050 Montorso Vincentino (VI), Italy**

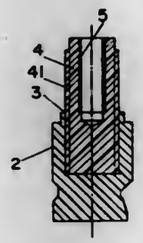
**PCT No. PCT/EP93/03215, § 371 Date Nov. 22, 1994, § 102(e) Date Nov. 22, 1993, PCT Pub. No. WO94/13023, PCT Pub. Date Jun. 9, 1994**

**PCT Filed Nov. 16, 1993, Ser. No. 341,567**

**Claims priority, application Italy, Nov. 20, 1992, VI92U0078**

**Int. Cl.[6] H01M** *2/06*

**U.S. Cl. 429—183** **7 Claims**



1. A polar element for connecting internal elements of a lead acid storage battery with an external terminal, comprising:

a pole securable to the battery for connection with the internal elements thereof, said pole having an external opening therein;

a removable insert formed of a conductive material locatable in the opening of the pole and including means for coupling the insert to the external terminal; and

connecting means including mating portions of the pole and the insert for allowing said insert to be removable with respect to the pole.



**5,496,661**

## SIMPLIFIED PREPARATION OF $LiPF_6$ BASED ELECTOLYTE FOR NON-AQUEOUS BATTERIES

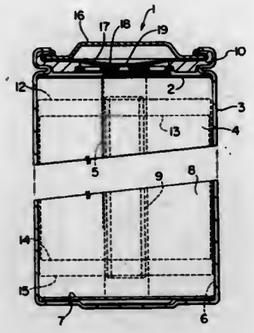
**Huanyu Mao, Burnaby, Canada, assignor to Moli Energy (1990) Limited, Canada**

**Filed Jul. 8, 1994, Ser. No. 272,249**

**Claims priority, application Canada, Aug. 24, 1993, 2104718**

**Int. Cl.[6] H01M** *6/16*

**U.S. Cl. 429—194** **14 Claims**



1. A method of preparing an electrolyte containing $LiPF_6$ in solution comprising:

(a) reacting a salt having a formula $(XH)^+PF_6^-$, wherein $(XH)^+$ denotes a cation comprising an adduct of a proton ($H^+$) and a Lewis base (X), with a lithium base in a solvent to be employed in the electrolyte that does not form a $LiPF_6$ salt or complex, so that $LiPF_6$ is formed in solution;

(b) removing residual reactants and by-products of the reaction while the $LiPF_6$ remains in solution, with no recrystallization or isolation of a $LiPF_6$ solvent salt or complex; and

(c) adding additional required solvents employed in the electrolyte, so that an $LiPF_6$ electrolyte is provided that is suitable for use in lithium ion-type batteries without additional processing.

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**5,496,662**

## CATHODE MATERIAL FOR AN ELECTRIC CELL

**Xavier Andrieu, Bretigny sur Orge, and Béatrice Rambla, Palaiseau, both of, France, assignors to Alcatel Alsthom Compagnie Generale D'Electricite, Paris Cedex, France**

**Filed Oct. 20, 1994, Ser. No. 326,215**

**Claims priority, application France, Jan. 21, 1993, 93 12570**

**Int. Cl.[6] H01M** *4/60*

**U.S. Cl. 429—213** **10 Claims**

1. An electrode for an electrochemical primary cell, the electrode comprising a first electron conducting compound and a second compound wherein said second compound is both a redox compound and an ion conducting compound and wherein said second compound comprises a sulfur-containing polymer with a repeating unit including a polyether, said polymer containing an ionizable salt, and the backbone of said polymer containing sulfur-sulfur bonds which render it capable of reversible oxidation and reduction.

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**5,496,663**

## LITHIUM ION BATTERY WITH LITHIUM VANADIUM PENTOXIDE POSITIVE ELECTRODE

**Charles R. Walk, Herndon, and Nehemiah Margalit, Burke, both of Va., assignors to Tracor Applied Sciences, Inc., Rockville, Md.**

**Continuation-in-part of Ser. No. 292,427, Aug. 19, 1994, abandoned. This application Apr. 11, 1995, Ser. No. 420,294**

**Int. Cl.[6] H01M** *4/02;4/36*

**U.S. Cl. 429—218** **5 Claims**

1. A lithium ion battery comprising:

a lithium free negative electrode, a non-aqueous solvent and a positive electrode including $LiV_2O_5$ admixed with a conductive material, said $LiV_2O_5$ being included in said cell only after forming a quantity of $LiV_2O_5$ in a reactor cell reducing electrochemically an admixture of $V_2O_5$ using a lithium metal containing electrode in a cell having lithium containing electrolyte in a non-aqueous solvent by one Faraday per mole of $V_2O_5$ in said admixture to convert substantially all of said $V_2O_5$ to $LiV_2O_5$, said $LiV_2O_5$ being removed from said cell and formed into said positive electrode; said negative electrode being substantially free of lithium ions when substantially one mole of lithium ions per mole of $V_2O_5$ is in said positive electrode.

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**5,496,664**

## PROCESS FOR PRODUCING A POSITIVE ELECTRODE FOR LITHIUM SECONDARY BATTERIES

**Gerhard Sterr, Kelkheim, Germany, assignor to Varta Batterie Aktiengesellschaft, Hanover, Germany**

**Filed Aug. 9, 1994, Ser. No. 287,642**

**Claims priority, application Germany, Aug. 18, 1993, 43 277 760.8**

**Int. Cl.[6] H01M** *4/50*

**U.S. Cl. 429—224** **6 Claims**

1. A process for producing an active material for a positive electrode for lithium secondary batteries, wherein active material is composed of a lithium-manganese oxide having a spinel structure, and comprising the steps of:

mixing manganese dioxide with a lithium salt selected from the group consisting of lithium formate, lithium acetate, and combinations thereof, thereby producing a mixture; and

heating the mixture at a temperature of from 600° C. to 750° C. for between 10 and 100 hours;

wherein the mixture is produced by spray-drying a suspension of the manganese dioxide in an aqueous solution of the lithium salt.

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**5,496,665**

## HYDROGEN-OCCLUSION-ALLOY ELECTRODE

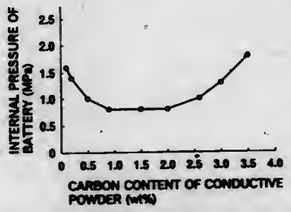
**Jun Furukawa, Iwaki, Japan, assignor to Furukawa Denchi Kabushiki Kaisha, Yokohama, Japan**

**Filed Aug. 22, 1994, Ser. No. 293,847**

**Claims priority, application Japan, Aug. 25, 1993, 5-210072**

**Int. Cl.[6] H01M** *4/62;4/52*

**U.S. Cl. 429—232** **5 Claims**




1. A hydrogen-occlusion-alloy electrode comprising:

a current collector on which an active material mixture is supported, said active material mixture containing hydrogen-occlusion-alloy powder, a binding agent and an electrically conductive material as essential components,

said electrically conductive material is carbonyl nickel powder having a carbon content of 0.2 to 3% by weight.

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**5,496,666**

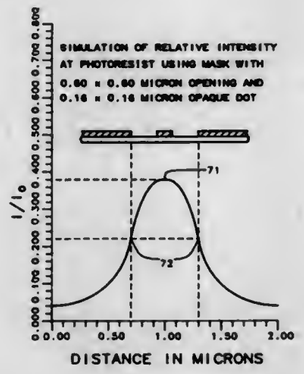
## CONTACT HOLE MASK FOR SEMICONDUCTOR FABRICATION

**Ron-Fu Chu, East Singapore, and Chun H. Yik, Singapore, both of, Singapore, assignors to Chartered Semiconductor Manufacturing PTE Ltd., Singapore**

**Filed Oct. 27, 1994, Ser. No. 329,887**

**Int. Cl.[6] G03F 9/00**

**U.S. Cl. 430—5** **20 Claims**




1. A dot mask for forming improved process latitude images wherein said dot mask is used to form contact hole or via hole openings in a semiconductor integrated circuit element and a single said dot mask is required for the formation of said contact hole or via hole openings, comprising:

a transparent substrate;

a patterned opaque layer formed on said transparent substrate;

a primary opening formed in said patterned opaque layer; and

an opaque blocking pattern formed in said patterned opaque layer on said transparent substrate and within said primary opening wherein the area of said blocking pattern is equal to or less than the area of said primary opening divided by nine.

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**5,496,667**

## X-RAY MASK AND ITS FABRICATION METHOD

**Hideki Yabe; Kenji Marumoto, and Nobuyuki Yoshioka, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

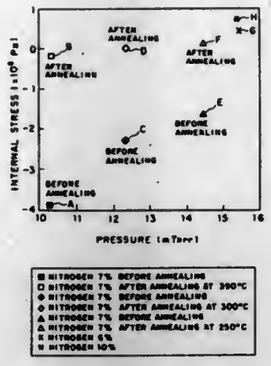
**Continuation of Ser. No. 46,083, Apr. 12, 1993, abandoned. This application Apr. 24, 1995, Ser. No. 427,986**

**Claims priority, application Japan, Jun. 8, 1992, 4-147087**

**Int. Cl.[6] G03F 9/00**

**U.S. Cl. 430—5** **8 Claims**

3. A method for fabricating an X-ray mask according to claim 2, wherein the surface roughness of a substrate prior to the film formation of said X-ray absorber is within the range of 0.05 μm or less.




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**5,496,668**

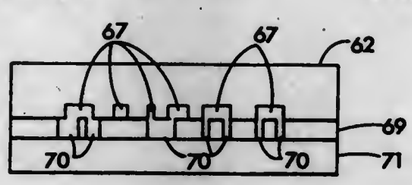
## FORMATION OF MICROSTRUCTURES USING A PREFORMED PHOTORESIST SHEET

**Henry Guckel; Todd R. Christenson, and Kenneth Skrobis, all of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.**

**Division of Ser. No. 66,988, May 24, 1993, Pat. No. 5,378,583, which is a continuation-in-part of Ser. No. 994,952, Dec. 22, 1992, abandoned. This application Nov. 16, 1994, Ser. No. 340,617**

**Int. Cl.[6] G03F 7/26**

**U.S. Cl. 430—9** **16 Claims**




1. A laminate including micromechanical structures therein comprising:

two preformed sheets of photoresist material adhered together at one of the sides of each sheet, the side of each sheet of photoresist which is adhered to the other sheet having a pattern of voids therein which extend partially but not entirely through the sheet, the sheets of photoresist material being adhered together to form a pattern of voids between the sheets on the sides of the sheets where they are joined, each sheet of photoresist being about 3 mm thick or less.

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**5,496,669**

## SYSTEM FOR DETECTING A LATENT IMAGE USING AN ALIGNMENT APPARATUS

**Rainer Pforr, Wilsele, Belgium; Steve Wittekoek, Bergeyk, Netherlands, and Rolf Seltmann, Dresden, Germany, assignors to Interuniversitair Micro-Elektronica Centrum vzw, Leuven, Belgium**

**PCT No. PCT/BE93/00046, § 371 Date Jun. 27, 1994, § 102(e) Date Jun. 27, 1994, PCT Pub. No. WO94/01808, PCT Pub. Date Jan. 20, 1994**

**PCT Filed Jul. 1, 1993, Ser. No. 204,137**

**Claims priority, application Belgium, Jul. 1, 1992, 09200611**

**Int. Cl.[6] G03F 9/00**

**U.S. Cl. 430—22** **19 Claims**

1. In an apparatus for forming an image, by means of projection radiation of a feature on a mask in a photosensitive layer on a substrate, is comprising a mask holder, a substrate holder in spaced






relationship to said mask holder, projection lens means mounted between the mask holder and the substrate holder, and latent image detection means mounted in spaced relationship to said substrate holder for detecting an undeveloped image, formed by means of the projection light, of the mask feature in the photosensitive layer, wherein the latent-image detection device comprises alignment means including a source of non-actinic projection radiation for irradiating said substrate photosensitive layer, intended for aligning, via the projection lens system, the mask pattern with respect to the substrate and is designed for detecting the measure of coincidence of a mask alignment feature and a substrate alignment feature, which alignment device is nonactinic radiation-sensitive detection means and means for detecting the nonactinic radiation reflected from said substrate photosensitive layer and producing electrical signal indicative of the amplitude of the radiation incident on the nonactinic radiation-sensitive detection means reflected from an area of the photosensitive layer onto which there is projected an image of the mask feature,

the improvement wherein said mask feature is a first feature having a spatial frequency which is approximately equal to the useful resolving power of the projection lens means and considerably greater than the resolving power of the alignment means, and said mask has a second feature disposed between said substrate holder and said detection means for superimposition upon an aerial image of said first feature reflected from said photoresistive layer.

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**5,496,670**

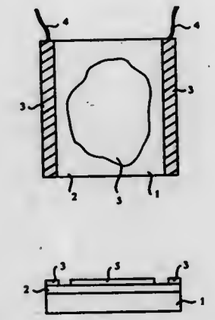
## OPTICAL STORAGE MEDIUM

**Søren Hvilsted, Hørsholm; P. S. Ramanujam, Roskilde, both of, Denmark, and Fulvio Andruzzi, Pisa, Italy, assignors to Risø National Laboratory, Roskilde, Denmark, and Consiglio Nazionale della Richerche, Rome, Italy**

**Filed Aug. 30, 1993, Ser. No. 113,303**

**Int. Cl.[6] G03G 15/00**

**U.S. Cl. 430—56** **43 Claims**




1. A macroscopically isotropic side chain liquid crystal polymer containing photochromic mesogenic groups and which through irradiation with light is permanently or substantially permanently converted into an optically anisotropic phase without having been pre-oriented.

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**5,496,671**

## ELECTROPHOTOGRAPHIC PHOTOCONDUCTOR

**Hiroshi Tamura, Susono; Naoshi Mishima, Numazu, and Yoshiaki Kawasaki, Shizuoka, all of, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan**

**Continuation of Ser. No. 10,868, Jan. 29, 1993, Pat. No. 5,411,827. This application Oct. 17, 1994, Ser. No. 325,093**

**Claims priority, application Japan, Jan. 31, 1992, 4-041937**

**Int. Cl.[6] G03G 5/047**

**U.S. Cl. 430—58** **10 Claims**

1. An electrophotographic photoconductor, comprising an electroconductive substrate, and a photoconductive layer, which comprises a charge generation layer and a charge transport layer successively formed on said substrate in this order, said charge transport layer comprising a reaction product of i) a carbon-carbon double-bond-containing charge transport material and ii) a binder resin which comprises an unsaturated polyester, said components i) and ii) reacting with each other by the application of light or heat thereto.

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**5,496,672**

## COATING SOLUTION FOR CHARGE GENERATION LAYER AND ELECTROPHOTOGRAPHIC PHOTORECEPTOR USING SAME

**Takayuki Akimoto; Shigeru Hayashida; Megumi Matsui, and Mikio Itagaki, all of Ibaraki, Japan, assignors to Hitachi Chemical Co., Ltd., Tokyo, Japan**

**Filed May 10, 1994, Ser. No. 240,358**

**Claims priority, application Japan, Jun. 11, 1993, 5-140808**

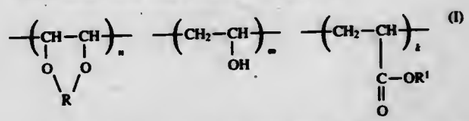
**Int. Cl.[6] G03G 5/04;5/06**

**U.S. Cl. 430—78** **22 Claims**

1. A coating solution for forming a charge generation layer, which comprises:

(A) a phthalocyanine composition containing titanylphthalocyanine,

(B) a binder resin represented by the formula:




wherein R represents an alkylene group, $R^1$ represents an alkyl group; and m, n and k each represent a ratio of recurring unit numbers and are numerals satisfying the relations of k+m+n=1, n>m>0 and $0.3 \geq k \geq 0$,

(C) at least one of a melamine resin and a benzoguanamine resin in an amount of 1- to 5-fold in terms of the weight ratio based on the amount of the binder resin, and

(D) a solvent having both a hydroxyl group and an ether group in one molecule.

5,496,673

## CARRIER FOR DEVELOPER OF ELECTROSTATIC LATENT IMAGES

Tsutomu Saitoh, and Masumi Asanae, both of Kumagaya, Japan, assignors to Hitachi Metals, Ltd., Japan

Continuation of Ser. No. 140,549, Oct. 25, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 467,515

Claims priority, application Japan, Jan. 26, 1992, 4-287407; Nov. 13, 1992, 4-327580

Int. Cl.[6] G03G 9/107;9/113

U.S. Cl. 430—106.6 4 Claims

1. A carrier for the developer of electrostatic latent images comprising a magnetic core coated with a resin layer, the resin layer being covered with carbon black bonded thereto, wherein the carbon black has a pH value lower than 7 and an average particle diameter smaller than 16 nm.

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5,496,674

## PARTICLES SUITABLE AS CARRIERS FOR ELECTROPHOTOGRAPHY

Joerg Adel, Ludwigshafen; Norbert Muenga, Dossenheim, both of, Germany, and Erwin Czech, Kobe, Japan, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP92/02819, § 371 Date Jun. 13, 1994, § 102(e) Date Jun. 13, 1994, PCT Pub. No. WO93/12470, PCT Pub. Date Jun. 24, 1993

PCT Filed Dec. 5, 1992, Ser. No. 244,712

Claims priority, application Germany, Dec. 12, 1991, 41 40 900.0

Int. Cl.[6] G03G 7/113

U.S. Cl. 430—106.6 10 Claims

1. Carrier particles for electrophotography consisting of
a) a magnetic core and
b) a shell consisting of molybdenum oxide, tungsten oxide or a mixture thereof.

5. An electrophotographic two-component developer, comprising carrier particles consisting of
a) a magnetic core and
b) a shell consisting of molybdenum oxide, tungsten oxide or tin oxide or a mixture thereof,
and toner particles.

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5,496,675

## CARRIER COATING AND PROCESSES

John G. Van Dusen, Walworth, N.Y.; Michael Cunningham, Georgetown, Canada, and Bernard A. Kelly, Ontario, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 27, 1994, Ser. No. 265,909

Int. Cl.[6] G03G 9/087;9/083;9/113;9/107

U.S. Cl. 430—137 27 Claims

1. A process for the preparation of conductive, electronegative, submicron polymeric particles comprised of a first polymer selected in an amount of from about 1 to about 99 weight percent and containing from about 1 to about 50 percent by weight of a conductive filler and a second electronegative, contrast polymer, and wherein said conductive polymer particles with optional filler are prepared by mixing at least one monomer with a polymerization initiator, a crosslinking component and a chain transfer component; effecting bulk polymerization at a temperature of from about 45° C. to about 120° C. until from about 5 to about 50 weight percent of the monomer has been polymerized; terminating polymerization by cooling the partially polymerized monomer; adding thereto from about 1 to about 50 weight percent of a conductive filler followed by mixing thereof; dispersing the resulting mixture of conductive filler, and partially polymerized product in water containing a stabilizing component to obtain a suspension of particles with an average diameter of from about 0.05 to about 1 micron in water; polymerizing the resulting suspension at a temperature of from about 45° C. to about 120° C. by heating; adding a second contrast polymer emulsion, suspension or fine dispersion in an amount of from about 1 to about 99 weight percent for said polymer with high shear mixing; and optionally subsequently washing and drying the polymer particles obtained.

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5,496,676

## TONER AGGREGATION PROCESSES

Melvin D. Croucher, St. Catharines; Raj D. Patel, Oakville; Grazyna E. Kmiecik-Lawrynowicz, Burlington; Michael A. Hopper, Toronto, all of, Canada, and Bernard Grushkin, Pittsford, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 27, 1995, Ser. No. 411,196

Int. Cl.[6] G03G 9/087

U.S. Cl. 430—137 48 Claims

1. A process comprising:
(i) preparing a pigment dispersion comprised of pigment, ionic surfactant, and optional charge control agent;
(ii) mixing at least two resins of different molecular composition, molecular weight or Tg in the form of latexes, each latex comprising a resin, ionic and nonionic surfactants and optionally a charge control agent, and wherein the ionic surfactant has a countercharge to the ionic surfactant of (i) to obtain a latex blend;
(iii) shearing said pigment dispersion with the latex blend of (ii) comprised of resins, counterionic surfactant with a charge polarity of opposite sign to that of said ionic surfactant and a nonionic surfactant;
(iv) heating the above sheared blends of (iii) below about the glass transition temperature (Tg) of the resins, to form electrostatically bound toner size aggregates with a narrow particle size distribution; and
(v) subsequently adding further anionic surfactant solution to minimize further growth of the bound aggregates (vi);
(vi) heating said bound aggregates above about the glass transition temperature Tg of the resins to form stable toner particles; and optionally
(vii) separating and drying the toner.

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5,496,677

## PRESENSITIZED PLATE FOR USE IN MAKING LITHOGRAPHIC PRINTING PLATE COMPRISING A MAT LAYER AND COATING LAYER ON THE BACK FACE OF THE SUBSTRATE

Tadao Toyama; Hitoshi Hagiwara, and Nobuyuki Kita, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 928,361, Aug. 12, 1992, abandoned. This application Dec. 15, 1994, Ser. No. 357,085

Claims priority, application Japan, Aug. 19, 1991, 3-206964; Dec. 3, 1991, 3-318258; Mar. 16, 1992, 4-57902

Int. Cl.[6] G03F 7/11;7/021;7/023;7/032

U.S. Cl. 430—162 16 Claims

1. A presensitized plate for use in making a lithographic priming plate comprising an aluminum plate substrate having a thickness of 0.1 to 0.6 ram; a photosensitive layer and a mat layer whose projections have an average diameter of not more than 100 μm, an average height of not more than 10 μm and whose coated mount ranges from 5 to 200 mg/m$^2$, the photosensitive layer and the mat layer being applied onto the upper surface of the substrate in this order; and a coating layer comprising at least one organic polymeric compound having a glass transition point of not less than 20° C., said coating layer having a thickness ranging from 0.01 to 8.0 μm and being preferably insoluble in water and alkaline developers having a pH of not less than 8.5, said coating layer being applied onto the back face of the substrate wherein the organic polymeric



compound is selected from the group consisting of polybutones, polybutadienes, saturated polyester resins, unsaturated polyester resins, polyamides, polyurethanes, polyureas, polyimides, polysiloxanes, polycarbonates, epoxy resins, phenoxy resins, chlorinated polyethylenes, condensed alkylphenol/aldehyde resins, acetal resins, polyvinyl chlorides, polyvinylidene chlorides, polystyrenes, acrylic resins, hydroxycelluloses, polyvinyl alcobols, cellulose acetates and carboxymethyl celluloses.

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5,496,678

## PHOTOSENSITIVE COMPOSITIONS CONTAINING A POLYMER WITH CARBOXYL AND HYDROXYPHENYL GROUPS, A COMPOUND WITH MULTIPLE ETHYLENIC UNSATURATION AND A PHOTO-ACID GENERATOR

Genji Imai; Naozumi Iwasawa, both of Hiratsuka, and Tsuguo Yamaoka, Funabashi, all of, Japan, assignors to Kansai Paint Co., Ltd., Hyogo, Japan

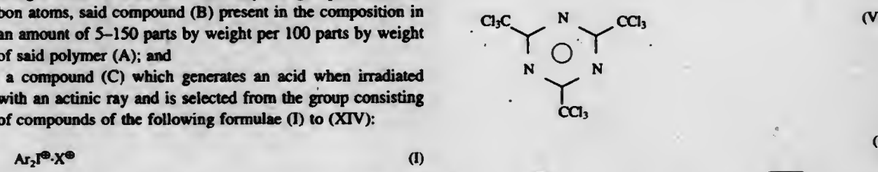
Filed Apr. 14, 1994, Ser. No. 227,346

Claims priority, application Japan, Apr. 16, 1993, 5-113769; Apr. 23, 1993, 5-119353

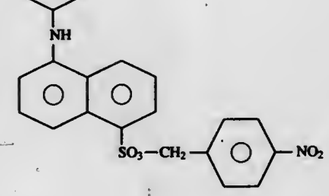
Int. Cl.[6] G03F 7/021;7/029;7/032

U.S. Cl. 430—176 9 Claims

1. A photosensitive composition comprising:
(a) A polymer (A) having 0.5 to 10 equivalents of carboxyl groups per kg of said polymer (A) and at least one equivalent of hydroxyphenyl group per kg of said polymer (A), said polymer (A) having a number-average molecular weight of about 500 to about 100,000 and a glass transition temperature not lower than 0° C.;
(b) a low-molecular weight or high-molecular weight compound (B) having two to four vinyl ether groups each represented by the formula —R'—O—CH=$CH_2$ wherein R' represents a straight-chain or branched-chain alkylene group of 1–6 carbon atoms, said compound (B) present in the composition in an amount of 5–150 parts by weight per 100 parts by weight of said polymer (A); and
(c) a compound (C) which generates an acid when irradiated with an actinic ray and is selected from the group consisting of compounds of the following formulae (I) to (XIV):


(V)

wherein $X^{\ominus}$ has the same definition as in formula (I),

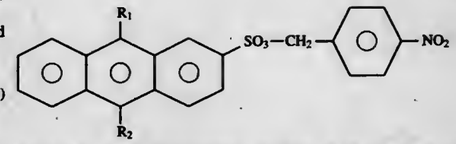

(VI)

wherein $X^{\ominus}$ has the same definition as in formula (I),


(VII)

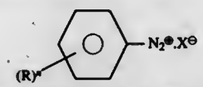
wherein $X^{\ominus}$ has the same definition as in formula (I),


(VIII)

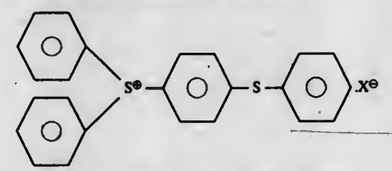

(IX)

wherein $R_1$ and $R_2$ independently represent an alkyl group of 1–12 carbon atoms or an alkoxy group of 1–12 carbon atoms,

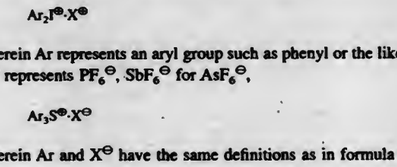

(X)


(III)

wherein R represents an alkyl group of 1–12 carbon atoms or an alkoxy group of 1–12 carbon atoms; n is an integer from 0 to 3; and $X^{\ominus}$ has the same definition as in formula (I),


(IV)

wherein $X^{\ominus}$ has the same definition as in formula (I),


(I)

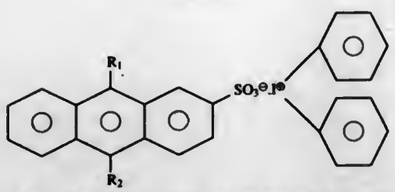
wherein Ar represents an aryl group such as phenyl or the like; and $X^{\ominus}$ represents $PF_6^{\ominus}$, $SbF_6^{\ominus}$ for $AsF_6^{\ominus}$,


(II)

wherein Ar and $X^{\ominus}$ have the same definitions as in formula (I),

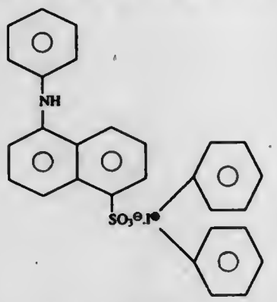
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(XI)

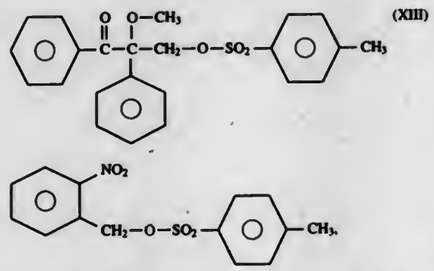


wherein $R_1$ and $R_2$ have the same definitions as in formula (IX).

(XII)



(XIII)



said compound (C) being present in the composition in an amount of 0.1 to 40 parts by weight per 100 parts by weight of the total of said polymer (A) and said compound (B) in the composition.

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**5,496,679**

**IMAGING ELEMENT AND METHOD FOR MAKING LITHOGRAPHIC PRINTING PLATES ACCORDING TO THE SILVER SALT DIFFUSION TRANSFER PROCESS**

**Guido Hauquier; Nijlen; Willem Cortens, Boxtochot; Paul Coppens, Turnhout, and Ludovicus Vervloet, Kasse, all of, Belgium, assignors to AGFA-Gevaert, N.V., Mortsel, Belgium**

**Continuation of Ser. No. 253,262, Jun. 2, 1994, abandoned. This application Mar. 22, 1995, Ser. No. 408,184**

**Claims priority, application European Pat. Off., Jun. 28, 1993, 93201878**

**Int. Cl.[6] G03G** *8/52;8/28;* **G03F** *7/07*

**U.S. Cl. 430—204** **9 Claims**

1. An imaging element comprising on a flexible hydrophobic support in the order given (i) a subbing layer containing a hydrophilic binder and silica in an amount between 200 mg/m$^2$ and 750 mg/m$^2$, (ii) a hardened hydrophilic layer, contiguous to said subbing layer and containing a hydrophilic synthetic homopolymer or copolymer and being hardened with a hydrolyzed tetraalkyl orthosilicate crosslinking agent, (iii) a receiving layer containing physical development nuclei contiguous to said hydrophilic layer, (iv) an intermediate layer comprising a non-proteinic hydrophilic film-forming polymer or hydrophobic polymer beads having an average diameter not lower than 0.2 μm and having been prepared by polymerization of an ethylenically unsaturated monomer and (v) a photosensitive layer containing a silver halide emulsion being in water permeable relationship with said receiving layer.

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**5,496,680**

**COLOR DIFFUSION TRANSFER ELEMENT WITH BENZENESULFONAMIDE**

**Atsuhiro Ohkawa; Hiroshi Iwanaga; Hideaki Naruse, and Masaaki Tsukase, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Nov. 14, 1994, Ser. No. 340,367**

**Claims priority, application Japan, Nov. 15, 1993, 5-285030**

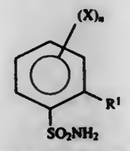
**Int. Cl.[6] G03C** *8/10;8/14*

**U.S. Cl. 430—216** **18 Claims**

1. A color diffusion transfer film unit comprising:

(a) a light-sensitive sheet comprising a transparent support having provided thereon an image-receiving layer, a white color reflection layer, a light-shielding layer, at least one silver halide emulsion layer combined with at least one dye image-forming compound, and at least one compound represented by Formula (I):

(I)



wherein $R^1$ represents an alkyl group; X represents an alkyl group, a cycloalkyl group, an aryl group, alkoxy group, an aryloxy group, an acylamino group, a sulfonylamino group, a ureido group, an alkylthio group, an arylthio group, an alkoxycarbonyl group, a carbamoyl group, a sulfamoyl group, a sulfonyl group, an alkoxycarbonylamino group, an amino group, a sulfamoylamino group, a cyano group, a hydroxy group, or a halogen atom; n represents an integer of 1 to 4; and when n is 2 or more, the plural X groups may be the same or different;

(b) a transparent cover sheet having at least a neutralizing layer and a neutralization timing layer on a transparent support; and

(c) an alkaline processing composition spread between the light-sensitive sheet and the transparent cover sheet.

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**5,496,681**

**SILVER HALIDE PHOTOGRAPHIC MATERIAL AND PHOTOGRAPHIC IMAGE FORMATION METHOD USING THE SAME**

**Toshihide Ezoe, and Tomokazu Yasuda, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Feb. 21, 1995, Ser. No. 393,170**

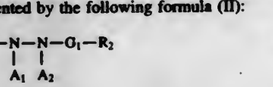
**Claims priority, application Japan, Feb. 23, 1994, 6-047961**

**Int. Cl.[6] G03C** *3/00*

**U.S. Cl. 430—264** **8 Claims**

1. A silver halide photographic material comprising a hydrazine derivative represented by the following formula (I) and a surface active compound represented by the following formula (II):

(I)



wherein

$R_1$ represents an aliphatic group or an aromatic group;

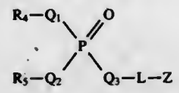
$R_2$ represents a hydrogen atom, an alkyl group, an aryl group, an unsaturated heterocyclic group, an alkoxy group, an aryloxy group, an amino group or a hydrazino group;



$G_1$ represents —CO—, —$SO_2$—, —SO—, —$PO(R_3)$— or —CO—CO—, a thiocarbonyl group or an iminomethylene group, in which $R_3$ has the same meaning as $R_2$;

$A_1$ and $A_2$ are both a hydrogen atom, or one of them is a hydrogen atom and the other is an alkylsulfonyl group, an arylsulfonyl group, or an acyl group;

(II)



wherein

$R_4$ represents an aliphatic group, an alicyclic group, an aromatic group or a heterocyclic group;

$R_5$ represents an aliphatic group, an alicyclic group, an aromatic group, a heterocyclic group or a group represented by —L—Z in which L represents a divalent linkage group; and Z represents an ionic group; and

$Q_1$, $Q_2$ and $Q_3$ each represents a single bond, an oxygen atom, a sulfur atom or a group represented by —$N(R_6)$— or —$N(R_6)$—CO—, in which $R_6$ represents a hydrogen atom or has the same meaning as $R_5$;

with the proviso that, when $R_5$ represents a group represented by —L—Z, the $R_5$ and the —L—Z which is directly bonded to $Q_3$ are the same or different;

two or more of $R_4$, $R_5$ and L may be combined with each other to from a ring; and

the surface active compound may be represented by combining two or more of formulae (II) via $R_4$, $R_5$ and L.

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**5,496,682**

**THREE DIMENSIONAL SINTERED INORGANIC STRUCTURES USING PHOTOPOLYMERIZATION**

**Tariq Quadir, Columbia; Srinivas K. Mirle, and John S. Hallock, both of Ellicott City, all of Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y.**

**Filed Oct. 15, 1993, Ser. No. 138,511**

**Int. Cl.[6] G03C** *5/00*

**U.S. Cl. 430—269** **12 Claims**

1. A photocurable composition suitable for the formation of three dimensional sintered bodies by stereo photolithography, said composition comprising:

40–70 vol. % sinterable ceramic and/or metallic particles,

10–35 wt. % photocurable monomer based on the weight of the sinterable particles,

1–10 wt. % photocurable monomer based on the weight of the monomer,

1–10 wt. % dispersant based on the weight of the sintered particles, and a coupling agent.

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**5,496,683**

**METHOD OF AND APPARATUS FOR OPTICALLY SHAPING PHOTO-SETTING RESIN**

**Junichi Asano, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Filed Jan. 12, 1994, Ser. No. 180,318**

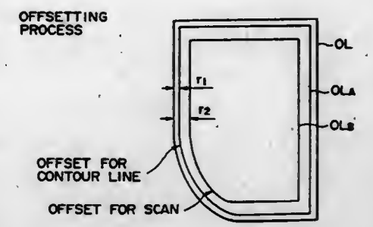
**Claims priority, application Japan, Jan. 12, 1993, 5-003203**

**Int. Cl.[6] G03C** *9/08;* **B29C** *35/08*

**U.S. Cl. 430—269** **2 Claims**

1. A method of optically shaping a photo-setting resin into a three-dimensional resin model by scanning successive resin solution layers of a photosetting resin solution with a radiation beam to form a stack of scanned set layers of photo-setting resin, each of said successive resin solution layers having a shaped region of an isometric section, said method comprising the steps of:

(a) scanning the radiation beam along a contour line of the shaped region to set the shaped region along said contour line, wherein said scanning step (a) comprises the step of scanning the radiation beam using a first line which is spaced a first distance inwardly from said contour line as a central line for scanning thereby to set the shaped region along said contour line; and




(b) scanning the radiation beam in a raster scanning mode to set the shaped region inwardly of said contour line, wherein said scanning step (b) comprises the step of scanning the radiation beam with start of scan and end of scan points being on a second line which is spaced a second distance inwardly from said contour line thereby to set the shaped region inwardly of said second line.

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**5,496,684**

**PHOTOSENSITIVE COMPOSITIONS AND ELEMENTS FOR FLEXOGRAPHIC PRINTING**

**Milton Farber, Cheshire, Conn., and David T. Hughes, Kennedale, Tex., assignors to Chase Elastomer Corporation, Kennedale, Tex.**

**Filed Sep. 17, 1993, Ser. No. 122,400**

**Int. Cl.[6] G03F** *7/00;7/038*

**U.S. Cl. 430—306** **5 Claims**

1. In a process for making a printing plate, the process comprising the steps of:

(a) imagewise exposing to actinic radiation a photosensitive printing element comprising support means having thereon a layer of a photosensitive composition;

(b) removing the unexposed portions of the imagewise exposed layer with a solvent to form a printing plate; and

(c) post development treating the printing plate; wherein the improvement comprises using a photosensitive composition comprising a crosslinking photointiator; a thermoplastic, elastomeric, asymmetric, star-shaped block copolymer having an asymmetric, star-shaped structure

$(A\text{-}B)_m\text{-}X\text{-}(C)_n$

wherein

A is a polymer block of a monoalkenyl arene,

B is a polymer block of a conjugated diene,

C is a polymer block of a conjugated diene,

X is the residue of a multi-functional coupling agent,

$3<m+n\leqq 40$,

the weight average molecular weight of each block A is between about 3,000 and about 125,000 and the weight average molecular weight of each block B and block C is between about 15,000 and about 250,000; and a limited amount of an ethylenically unsaturated, crosslinking agent, the ethylenically unsaturated, crosslinking agent being present in the range from 0 to about 1 part by weight per hundred parts by weight asymmetric, star-shaped block copolymer.

**5,496,685**

## PHOTOSENSITIVE COMPOSITIONS AND ELEMENTS FOR FLEXOGRAPHIC PRINTING

**Milton Farber, Cheshire, Conn., and David T. Hughes, Kennedale, Tex., assignors to Chase Elastomer Corporation, Kennedale, Tex.**

**Filed Sep. 17, 1993, Ser. No. 122,682**
**Int. Cl.[6] G03F 7/00;7/038**
**U.S. Cl. 430—306** **2 Claims**

1. In a process for making a printing plate, the process comprising the steps of:

(a) imagewise exposing to actinic radiation a photosensitive printing element comprising support means having thereon a layer of a photosensitive composition;

(b) removing the unexposed portions of the imagewise exposed layer with a solvent to form a printing plate; and

(c) post development treating the printing plate; wherein the improvement comprises using a photosensitive composition comprising a crosslinking photointiator; a thermoplastic, elastomeric, asymmetric, star-shaped block copolymer having an asymmetric, star-shaped structure

$$(A—B)_m—X—(C)_n$$

wherein

A is a polymer block of a monoalkenyl arene,

B is a polymer block of a conjugated diene,

C is a polymer block of a conjugated diene,

X is the residue of a multi-functional coupling agent,

$3<m+n\leq 40$,

the weight average molecular weight of each block A is between about 3,000 and about 125,000 and the weight average molecular weight of each block B and block C is between about 15,000 and about 250,000; a limited amount of an ethylenically unsaturated, crosslinking agent, the ethylenically unsaturated, crosslinking agent being present in the range from 0 to about 1 part by weight per hundred parts by weight asymmetric, star-shaped block copolymer; and an actinic radiation absorber evenly distributed throughout the photosensitive composition to enhance the exposure latitude of the photosensitive composition.

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**5,496,686**

**Patent Not Issued For This Number**

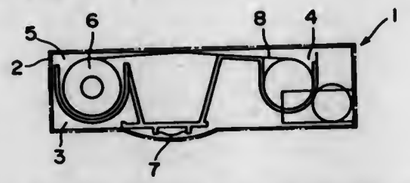
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**5,496,687**

## PHOTOGRAPHIC FILM-INCORPORATED CAMERA

**Fumio Kawamoto, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Continuation of Ser. No. 177,972, Jan. 3, 1994, abandoned. This application Mar. 2, 1995, Ser. No. 398,042**
**Claims priority, application Japan, Jan. 4, 1993, 5-000082; Mar. 11, 1993, 5-050006**
**Int. Cl.[6] G03C 1/76**
**U.S. Cl. 430—496** **8 Claims**




1. A photographic film-incorporated camera comprising a supply room in which an unexposed photographic film drawn from a cylindrical cartridge has been wound up and a wind-up room with which the cylindrical cartridge is enclosed, one exposure of the photographic film drawn from the supply room being fed per a shooting to be wound up in the cylindrical cartridge;

in which the photographic film comprises a photographic layer on a composite of a support and a subbing layer, said composite being obtained by subjecting the support which comprises an aromatic polyester having a glass transition temperature of 70° to 200° C. to heat treatment at a temperature of 40° C. to the glass transition temperature for 0.1 to 1,500 hours before or after forming the subbing layer on the support; wherein the aromatic polyester is derived from ethylene glycol and 2,6- naphthalenedicarboxylic acid; and wherein the photographic film is wound around a spool or vacant core of a diameter of 3 to 12 mm in the supply room.

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**5,496,688**

## BASE FILM FOR PHOTOGRAPHIC FILM

**Hiroshi Okamoto, Tokyo; Kohtaro Katoh; Hiroshi Tomita, both of Sagamihara; Kenji Suzuki, Yokohama, and Kazuyoshi Saitoh, Sagamihara, all of, Japan, assignors to Teijin Limited, Osaka, Japan**

**PCT No. PCT/JP94/00181, § 371 Date Oct. 12, 1994, § 102(e) Date Oct. 12, 1994, PCT Pub. No. WO94/19722, PCT Pub. Date Sep. 1, 1994**
**PCT Filed Feb. 7, 1994, Ser. No. 318,712**
**Claims priority, application Japan, Feb. 16, 1993, 5-026763; Feb. 18, 1993, 5-029066; Feb. 19, 1993, 5-030520; Mar. 1, 1993, 5-039006; Mar. 1, 1993, 5-039007; Mar. 1, 1993, 5-039008; Mar. 1, 1993, 5-039009; Mar. 8, 1993, 5-046482; Mar. 30, 1993, 5-071753; Apr. 2, 1993, 5-076906; Apr. 2, 1993, 5-076907; Apr. 7, 1993, 5-080677**
**Int. Cl.[6] G03C 3/02**
**U.S. Cl. 430—500** **24 Claims**

1. A base film for a photographic film wherein

(a) the refractive index (nz) in the thickness direction is at least 1,498,

(b) the haze value is 2.0% or less,

(c) the base film has one direction in which the tanδ value, at 80° C. by tensile viscoelasticity at 0.05 Hz, is less than 0.085,

(d) the anti-curling ratio at 70° C. is at least 45%,

(e) the thickness is in the range of from 40 to 120 μm, and

(f) the base film is formed form polyethylene-2,6-napthalenedicarboxylate as a raw material.

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**5,496,689**

## SILVER HALIDE COLOR PHOTOGRAPHIC MATERIALS

**Tadashi Ogawa, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Continuation of Ser. No. 80,591, Jun. 24, 1993, abandoned, which is a continuation of Ser. No. 574,161, Aug. 29, 1990, abandoned. This application Jan. 23, 1995, Ser. No. 376,451**
**Claims priority, application Japan, Aug. 29, 1989, 1-222015**
**Int. Cl.[6] G03C 1/035;1/12;1/46**
**U.S. Cl. 430—505** **7 Claims**

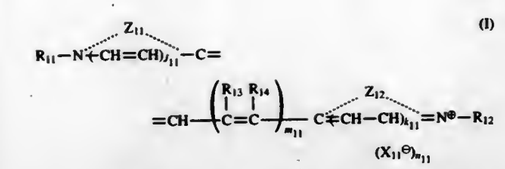
1. A silver halide color photographic material comprising:

(a) support,

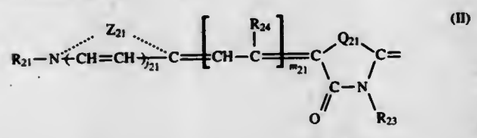
(b) only three silver halide photosensitive emulsion layers comprising silver halide grains on said support, wherein

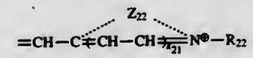
(i) a first of said three photosensitive layers has a spectral sensitivity peak in the wavelength region of 650–690 nm; a second of said three photosensitive layers has a spectral sensitivity peak in the wavelength region of 720–790 nm; and a third of said three photosensitive layers has a spectral sensitivity peak in the wavelength region of 770–850 nm, at least two of said first, second and third photosensitive layers having been sensitized by at least one sensitizing dye selected from the group consisting of the dyes represented by general formula (I), (II) and (III), and






wherein $Z_{11}$ and $Z_{12}$ each represents a group of atoms which is required to form a heterocyclic ring; $R_{11}$ and $R_{12}$ each represents an alkyl group, an alkenyl group, an alkynyl group or an aralkyl group; $m_{11}$ represents an integer of 2 or 3; $R_{13}$ represents a hydrogen atom; $R_{14}$ represents a hydrogen atom, an alkyl group having one to four carbon atoms or an aralkyl group, or it is optionally joined with $R_{12}$ to form a 5- or 6-membered ring; $j_{11}$ and $k_{11}$ represent 0 or 1 $X^{\ominus}_{11}$ represents an acid anion, and $n_{11}$ represents 0 or 1;



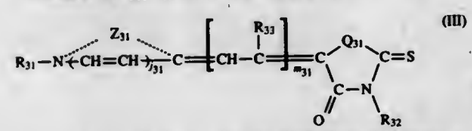




wherein $Z_{21}$ and $Z_{22}$ have the same definition as $Z_{11}$ and $Z_{12}$, respectively; $R_1$ and $R_{22}$ have the same definition as $R_{11}$ and $R_{12}$, respectively; $R_{23}$ represents an alkyl group, an alkenyl group, an alkynyl group or an aryl group; $m_{21}$ represents an integer of 2 or 3; $R_{24}$ represents a hydrogen atom, an alkyl group having one to four carbon atoms or an aryl group or $R_{24}$ is optionally joined with another $R_{24}$ group to form a hydrocarbyl or heterocyclic ring; $Q_{21}$ represents a sulfur atom, an oxygen atom, a selenium atom or an




group, and $R_{25}$ has

the same meaning as $R_{23}$; $j_{21}$, $k_{21}$, $X_{21}^{\ominus}$ and $n_{21}$ have the same definition as $j_{11}$ $k_{11}$ $x_{11}^{\ominus}$ and $n_{11}$, respectively;




wherein $Z_{31}$ represents a group of atoms which is required to form a heterocyclic ring; $Q_{31}$ has the same definition as $Q_{21}$; $R_{31}$ has the same meaning as $R_{11}$ or $R_{12}$; $R_{32}$ has the same definition as $R_{23}$; $m_{31}$ represents 2 or 3; $R_{33}$ has the same definition as $R_{24}$, or it is optionally joined with another $R_{33}$ group to form a hydrocarbyl or heterocyclic ring; $j_{31}$ has the same definition as $j_{11}$;

(ii) one of said three photosensitive layers contains a cyan coupler, another of said three photosensitive layers contains a magenta coupler and another of said three photosensitive layers contains a yellow coupler, and

(iii) said silver halide grains of said three photosensitive emulsion layers comprise silver halide composed of at least 96 mol% silver chloride and wherein said silver halide grains of at least one of said three layers have a local phase on the surface thereof containing from 0.01 to 3 mol% of silver iodide (based on the amount of silver halide in the emulsion), wherein the local phase containing the silver iodide is formed by recrystallization by mixing preformed silver halide grains and silver halide grains which have a different halogen composition from that of the silver halide which has been formed already, and then ripening the mixture.

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**5,496,690**

## BASE FILM HAVING DIMENSIONAL STABILITY AND HIGH TRANSPARENCY, AND PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL COMPRISING SAME

**Toshinori Machida; Atsushi Hirokawa, and Fusao Ito, all of Tokyo, Japan, assignors to Toyo Ink Manufacturing Co., Ltd., Tokyo, Japan**

**Filed Apr. 28, 1994, Ser. No. 233,933**
**Claims priority, application Japan, Jan. 29, 1993, 5-271378; Apr. 7, 1994, 6-069675**
**Int. Cl.[6] G03C 1/76**
**U.S. Cl. 430—533** **16 Claims**

1. A base film having dimensional stability and high transparency, which comprises (A) a plastic film having on both sides thereof (B) a thin film layer comprising (1) an oxide of silicon and (2) a fluoride of alkaline earth metal, said thin film layer (B) being formed by a vacuum film forming process.

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**5,496,691**

## PROCESS FOR PRODUCING SILVER HALIDE PHOTOGRAPHIC MATERIAL

**Hajime Miyamoto, and Masahiko Murayama, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Feb. 6, 1995, Ser. No. 383,931**
**Claims priority, application Japan, Feb. 8, 1994, 6-014669; Feb. 9, 1994, 6-015536; Feb. 9, 1994, 6-035182**
**Int. Cl.[6] G03C 1/785**
**U.S. Cl. 430—539** **20 Claims**

1. A process for producing a silver halide photographic material comprising a polyester support having thereon at least one light-sensitive layer and at least one undercoat layer, wherein said undercoat layer is provided directly on said support by coating a solution containing gelatin for an undercoating binder having a calcium ion ($Ca^{++}$) content of from 10 to 2,500 ppm based on dry gelatin.

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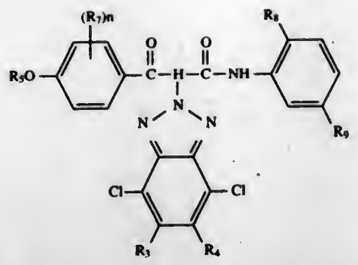
**5,496,692**

## SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

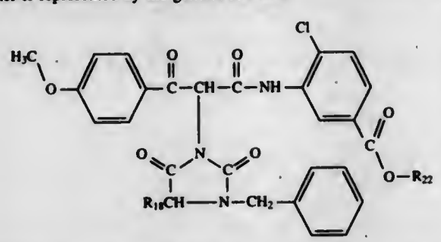
**Massimo Bertoldi, Fossano, and Vinicio Busatto, Savona, both of, Italy, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Filed Nov. 14, 1994, Ser. No. 339,484**
**Claims priority, application European Pat. Off., Dec. 18, 1993, 93119939**
**Int. Cl.[6] G03C 7/305;7/36**
**U.S. Cl. 430—544** **6 Claims**

1. A silver halide color photographic light sensitive material which comprises a support having coated thereon at least one silver halide emulsion layer containing a) an alkoxybenzoylacetanilide DIR coupler having, bonded directly to the coupling active position, a group which provides a compound having a development inhibiting property when the group is released from the coupler active position upon the color development reaction, wherein said group is a 4,7-dihalogen-2-benzotriazolyl group and b) an alkoxybenzoylacetanilide yellow dye forming coupler having a 3-hydantoinyl leaving group bonded to the coupling active position wherein said alkoxybenzoylacetanilide DIR coupler is represented by the formula:



wherein $R_3$ and $R_4$ each represents a hydrogen atom, a halogen atom, an amino group, an alkyl group, an alkoxy group, an hydroxy group, a cyano group, an aryloxy group, and acyloxy group, and acyl group, an alkoxycarbonyl group, an aryloxycarbonyl group, an acylamino group, an alkylsulfonyl group, an arylsulfonyl group, an alkoxysulfonyl group, an aryloxysulfonyl group or an ureido group; $R_5$ represents an alkyl group; $R_7$ represents an alkyl group, an aryl group, a halogen atom or an alkoxy group; n is 0, 1 or 2; $R_8$ represents chlorine; $R_9$ represents an alkoxy group, an alkyl group, an alkenyl group, an aryl group, an amino group an acyl group, an alkoxycarbonyl group, an aryloxycarbonyl group, a carbamoyl group, an acylamino group, an alkylsulfonyl group, an aryl sulfonyl group, an alkoxysulfonyl group, an aryloxysulfonyl group, a sulfamoyl group, or a sulfonamido group, the total number of carbon atom represented by $R_9$ being from 6 to 35, and wherein said alkoxy benzoylacetanilide yellow dye forming coupler is represented by the general formula:



wherein $R_{18}$ is hydrogen atom, an alkyl group or —o—$R_{19}$ or —S—$R_{19}$, wherein $R_{19}$ is hydrogen atom, an alkyl group, an aryl group, a heterocyclic group or an acyl group and $R_{22}$ is an alkyl group having 8 to 32 carbon atoms.

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**5,496,693**

## SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

**Yasuhiro Yoshioka; Kohzaburoh Yamada, and Kiyoshi Takeuchi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan**

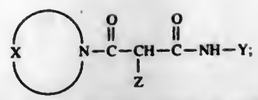
**Division of Ser. No. 52,708, Apr. 27, 1993, Pat. No. 5,409,807. This application Nov. 2, 1994, Ser. No. 333,347**

**Claims priority, application Japan, Apr. 28, 1992, 4-134519**

**Int. Cl.[6] G03C *7/388; 7/36***

**U.S. Cl. 430—545** **13 Claims**

4. A silver halide color photographic material comprising a yellow color forming silver halide emulsion layer formed on a support, said layer containing at least one yellow color forming coupler dispersed by dissolution in a high boiling organic solvent in a weight ratio of high boiling organic solvent to yellow color forming coupler of 1.0 to 3.0, wherein said yellow forming coupler is represented by the following formula (I):



(I)

wherein X represents an organic residue necessary for forming a nitrogen-containing heterocycle with a nitrogen atom; Y represents an aromatic group or a heterocyclic group; Z represents a group which is eliminatable by reaction of the coupler represented by formula (I) with an oxidation product of a developing agent, and wherein said high boiling point organic solvent is represented by the following general formula (S-I):



(S-1)

wherein $R_1$, $R_2$, $R_3$, which may be the same or different, each represent an alkyl group, a cycloalkyl group, an aryl group, an alkoxy group, a cycloalkyloxy group or an aryloxy group.

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**5,496,694**

## SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

**Makoto Kikuchi, and Tetsuo Okutsu, both of Minami-Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Mar. 2, 1994, Ser. No. 204,659**

**Claims priority, application Japan, Mar. 2, 1993, 5-64789**

**Int. Cl.[6] G03C *1/005***

**U.S. Cl. 430—567** **17 Claims**

1. A silver halide photographic light-sensitive material comprising a support having provided thereon a silver halide emulsion layer containing a silver halide emulsion in which, when a specific silver iodide content is I mol % (0.3<I<20), silver halide grains having a silver iodide content ranging between 0.7I and 1.3I and containing not less than 10 dislocatioo lines per grain on a fringe of said silver halide grains account for 100 to 50% of all grains, and an average aspect ratio of all tabular grains is 8 to 40.

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**5,496,695**

## HYDRAZIDE COMPOUNDS USEFUL AS CO-DEVELOPERS FOR BLACK-AND-WHITE PHOTOTHERMOGRAPHIC ELEMENTS

**Sharon M. Simpson, Lake Elmo, Minn., and Lori S. Harring, Hudson, Wis., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.**

**Filed Jan. 6, 1995, Ser. No. 369,730**

**Int. Cl.[6] G03C *1/498***

**U.S. Cl. 430—619** **23 Claims**

1. A heat-developable, photothermographic element comprising:
(a) a photosensitive silver halide;
(b) a non-photosensitive, reducible silver source;
(c) a reducing system for said non-photosensitive, reducible silver source;
(d) a binder; and
(e) a support;
wherein said reducing system consists essentially of at least one hindered phenol and at least one co-developer of the formula:

$$R^1—(C=O)—NHNH—R^2$$

wherein:
$R^1$ represents hydrogen and $R^2$ represents an aryl or substituted aryl group; or,
$R^1$ represents hydrogen, alkyl, or alkenyl groups of up to 20 carbon atoms; alkoxy, thioalkoxy, or amido groups of up to 20 carbon atoms; aryl, alkaryl, or aralkyl groups of up to 20 carbon atoms; aryloxy, thioaryloxy, or anilino groups of up to 20 carbon atoms; aliphatic or aromatic heterocyclic ring groups containing up to 6 ring atoms; carbocyclic ring groups comprising up to 6 ring carbon atoms; or fused ring or bridging groups comprising up to 14 ring atoms; and $R^2$ represents a trityl group.



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**5,496,696**

## SILVER HALIDE IMAGING MATERIALS

**Ranjan C. Patel, Little Hallingbury, and Kevin P. Hall, Leaden Roding, both of, Great Britain, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Filed Aug. 31, 1993, Ser. No. 114,669**

**Claims priority, application United Kingdom, Sep. 2, 1992, 9218599**

**Int. Cl.[6] G03C *1/498***

**U.S. Cl. 430—619** **19 Claims**

1. A photosensitive element having a photosensitive medium comprising silver halide in reactive association with an organoborate salt and wherein said medium is a photothermographic media comprising in one or more layers a reducible silver source, a reducing agent for silver ion and an antifoggant, wherein said element comprises a support having coated thereon a first layer comprising the silver halide, the reducible silver source, the organoborate salt and the antifoggant, and a second layer comprising the reducing agent for silver ion.

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**5,496,697**

## METHODS AND APPARATUS FOR DETECTING THE EFFECT OF CELL AFFECTING AGENTS ON LIVING CELLS

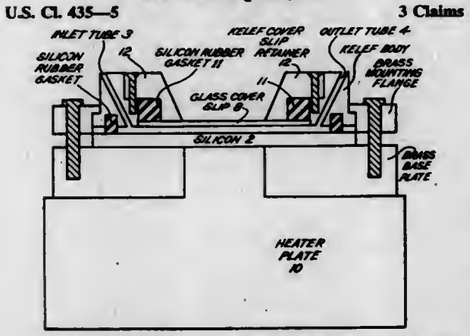
**John W. Parce; Harden M. McConnell, both of Palo Alto; Gillian M. K. Humphries, Los Altos; Karen M. Kercso, Menlo Park; John C. Owicki, and Josef E. Kercso, both of Palo Alto, all of Calif., assignors to Molecular Devices Corporation, Sunnyvale, Calif.**

**Continuation of Ser. No. 833,602, Feb. 11, 1992, abandoned, which is a continuation of Ser. No. 408,896, Sep. 18, 1989, abandoned, which is a continuation-in-part of Ser. No. 260,521, Oct. 21, 1988, abandoned. This application Sep. 8, 1993, Ser. No. 118,094**

**The portion of the term of this patent subsequent to Jan. 11, 2011, has been disclaimed.**

**Int. Cl.[6] C12Q *1/02; 1/70***

**U.S. Cl. 435—5** **3 Claims**




1. A method for detecting a pH change effect of a cell affecting agent on living cells comprising:
(a) providing living cells retained in a micro flow chamber having a height of about 50 μm to about 200 μm and having a means for continuous or intermittent flow of a solution or a suspension containing the cell affecting agent in contact with the cells such that the amount of the cell affecting agent in contact with the cells can be controlled;
(b) flowing a solution or suspension containing the cell affecting agent such that it comes into contact with the living cells thereby producing a change in pH of the solution of suspension about said living cells; and
(c) repetitively stopping the flow and repetitively measuring the change in pH of the solution or suspension about said living cells when the flow is stopped, by a means for detecting Ph to detect any change in Ph caused by the cell affecting agent on said living cells.

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**5,496,698**

## METHOD OF ISOLATING RIBOZYME TARGETS

**Kenneth G. Draper, Boulder, and Dennis G. Macejak, Denver, both of Colo., assignors to Ribozyme Pharmaceuticals, Inc., Boulder, Colo.**

**Continuation-in-part of Ser. No. 935,854, Aug. 26, 1992, abandoned. This application Dec. 7, 1992, Ser. No. 987,130**

**Int. Cl.[6] C12Q *1/68; C12N 9/22***

**U.S. Cl. 435—6** **18 Claims**

1. A method for in vivo selection of a ribozyme active on a defined RNA target, comprising the steps of:
introducing a first population of ribozymes, in which each said ribozyme has a different substrate binding arm, into a second population of cultured cells, wherein said ribozymes are formed from a third population of fragmented target DNA molecules encoding said RNA target into each of which an enzymatic portion of a ribozyme is inserted;
providing said RNA target to said second population of cultured cells, and
identifying those cells which contain a ribozyme active at the RNA target;
wherein said third population is formed by fragmenting target DNA encoding said defined RNA target with DNAseI, and introducing an enzymatic portion of a ribozyme encoding sequence within the fragments generated by said fragmenting by cleaving each said fragment and then ligating said enzymatic portion of a ribozyme encoding sequence into each said fragment.

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**5,496,699**

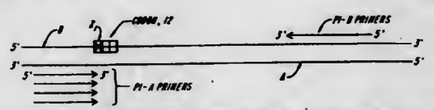
## DETECTION OF ALLELE - SPECIFIC MUTAGENS

**George D. Sorenson, Meriden, N.H., assignor to Trustees of Darmouth College, Hanover, N.H.**

**Continuation of Ser. No. 874,845, Apr. 27, 1992. This application Oct. 25, 1993, Ser. No. 142,845**

**Int. Cl.[6] C12Q *1/68***

**U.S. Cl. 435—6** **21 Claims**




1. A method of detecting a mutant allele, comprising the steps of:
providing a sample of a biological fluid containing soluble DNA, including a mutant allele of interest;
deproteinizing the DNA and substantially simultaneously therewith inactivating any DNases present in the sample;
extracting the DNA from the sample;
denaturing the DNA to dissociate first and second strands of the DNA;
amplifying the mutant allele of interest in an allele-specific manner using at least a first set of four allele-specific oligodeoxynucleotide primers having one primer the 3' terminal nucleotide of which is complementary to a mutation-containing segment on a first strand of the DNA and a first common oligodeoxynucleotide primer for pairing during amplification to each allele-specific oligodeoxynucleotide

primer, the common oligodeoxynucleotide primer being complementary to a segment of a second strand of the DNA distant with respect to the position of the first oligodeoxynucleotide primer; and

detecting the presence of the mutant allele of interest.

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**5,496,700**

## OPTICAL IMMUNOASSAY FOR MICROBIAL ANALYTES USING NON-SPECIFIC DYES

**Frances S. Ligler, Potomac; Lisa C. Shriver-Lake, Monrovia, and Dayaweera C. Wijesuriya, College Park, all of Md., assignors to United States of America as represented by The Secretary of the Navy, Washington, D.C.**

**Filed Aug. 6, 1993, Ser. No. 102,933**

**Int. Cl.[6] G01N** *33/53;33/569;* **C12Q** *1/68;1/70*

**U.S. Cl. 435—7.1** **5 Claims**

1. A method for detecting the presence of a microbial analyte within a sample suspected of containing said microbial analyte comprising the steps of:

(a) adding a dye in a concentration sufficient to stain biological elements in said sample thereby forming a stained sample;

(b) binding a capture molecule, specific for said microbial analyte, to an optical waveguide;

(c) exposing said stained sample to said capture molecule bound to said optical waveguide, whereby, if said stained sample contains said microbial analyte, then a complex of said dye, said microbial analyte and said capture molecule forms; and

(d) optically measuring the formation of said complex by an evanescent wave measurement.

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**5,496,701**

## OPTICAL BIOSENSOR METHOD FOR DETERMINING AN ANALYTE

**Denise V. Pollard-Knight, St. Albans, Great Britain, assignor to Fisons plc, United Kingdom**

**Filed Dec. 3, 1993, Ser. No. 157,079**

**Claims priority, application United Kingdom, Jun. 4, 1991, 9111912**

**Int. Cl.[6] G01N** *33/573*

**U.S. Cl. 435—7.4** **11 Claims**

1. A method of determining an analyte, wherein said analyte is one of two members of an enzyme-substrate pair, comprising:

immobilizing a first member of said enzyme-substrate pair on a surface of an optical waveguide biosensor,

bringing a second member of said pair into contact with said first member at said surface of said optical waveguide biosensor, wherein the members of said pair are selected to form, directly or indirectly, a soluble reaction product,

irradiating the biosensor with radiation from a radiation source, said radiation being of a wavelength at which the reaction product is absorbing, whereby radiation is emitted from the biosensor,

monitoring the radiation emitted, and

correlating the radiation emitted to the presence of the analyte.

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**5,496,702**

## IMMUNOASSAY ELEMENTS HAVING STABLE LEUCO DYE COATINGS

**John F. Bishop, and Linda A. Mauck, both of Rochester, N.Y., assignors to Johnson & Johnson Clinical Diagnostics, Inc., Rochester, N.Y.**

**Filed Sep. 1, 1994, Ser. No. 299,729**

**Int. Cl.[6] G01N** *33/53*

**U.S. Cl. 435—7.9** **7 Claims**

1. A dry immunoassay analytical element for determining a ligand comprising:

(i) a receptor capable of specifically binding a member selected from the group consisting of the ligand, a ligand analog and a specific binder which specifically binds to the ligand and the ligand analog; and

(ii) at least one layer comprising a leuco dye composition comprising:

| Component | | Dry Weight Ratio w/v % |
|---|---|---|
| a) | triarylimidazole leuco dye | 55–80 |
| b) | antioxidant | 7–40 |
| c) | poly[poly(ethylene oxide)-block-poly(propylene oxide)] nonionic block copolymer | 6–20 |
| d) | alkylaryloxypoly(alkylene oxide) nonionic surfactant | 1–16 |

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**5,496,703**

## INDIRECT IMMUNOASSAY FOR DIOXINLIKE COMPOUNDS

**John G. Babish, Brooktondale; Sakina El-Tom, Ithaca; Xinfang Ma, Ithaca, and Geoffrey Wheelock, Ithaca, all of N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.**

**Continuation of Ser. No. 795,193, Nov. 19, 1991, abandoned, which is a continuation-in-part of Ser. No. 792,922, Nov. 15, 1991, abandoned. This application Oct. 5, 1993, Ser. No. 132,164**

**Int. Cl.[6] C12Q** *1/02*

**U.S. Cl. 435—7.21** **2 Claims**

1. A method of detecting, in a test sample, polychlorinated dibenzodioxins, polychlorinated dibenzofurans, and structural analogs thereof which exhibit biological activity of polychlorinated dibenzodioxins and polychlorinated dibenzofurans, said biological activity comprising phosphorylation of tyrosine residues of S-9 supernatant fraction proteins, said method comprising:

administering the test sample to a female C57BL/6 mouse at a dose of 2.0 μg/kg or less of the polychlorinated dibenzodioxins, polychlorinated dibenzofurans, and structural analogs thereof;

examining immunologically the mouse's hepatic S-9 supernatant fraction for phosphorylation of tyrosine residues of the S-9 supernatant fraction proteins; and

correlating the phosphorylation level to the presence of polychlorinated dibenzodioxins, polychlorinated dibenzofurans, and structural analogs thereof in the test sample.

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**5,496,704**

## METHOD FOR IN VITRO DETECTION OF FORMED ELEMENTS IN BIOLOGICAL SAMPLES

**Paul Fiedler, 200 Hemlock Rd., New Haven, Conn. 06515; Robert A. Levine, 31 Pilgrim La., Guilford, Conn. 06437, and Stephen C. Wardlaw, 191 N. Cove Rd., Old Saybrook, Conn. 06475**

**Continuation of Ser. No. 5,086, Jan. 15, 1993, Pat. No. 5,403,714, which is a continuation of Ser. No. 783,397, Oct. 28, 1991, Pat. No. 5,252,460. This application Sep. 26, 1994, Ser. No. 312,513**

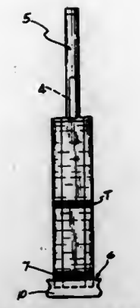
**Int. Cl.[6] G01N** *33/569*

**U.S. Cl. 435—7.22** **9 Claims**

1. A method for testing biological samples for the presence or absence of target analytes which are indicative of disease or parasite infestation in a sample donor, said method comprising the steps of:

a) providing a transparent sample-receiving tube containing a volume-restricting generally cylindrical insert positioned substantially coaxially with a tube axis, said insert being operable to produce a restricted volume annulus in the tube adjacent to a tube side wall;






b) providing a target analyte-highlighting reagent in the tube for differentially highlighting the target analytes from remaining constituents of the sample;

c) forming a mixture of the biological sample and a liquid buffer, which buffer will allow gravimetric separation of target analytes from other formed components in the mixture;

d) substantially filling said tube with said mixture;

e) centrifuging said filled tube to gravimetrically separate any target analytes from other formed components in the mixture; and

f) examining said annulus under magnification to determine the presence or absence of differentially highlighted target analytes in said annulus.

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**5,496,705**

## MONOCLONAL ANTIBODY SPECIFIC FOR RAT SYNAPTOPHYSIN

**Mitsuko Sugano, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Continuation of Ser. No. 929,377, Aug. 14, 1992. This application Apr. 7, 1994, Ser. No. 224,195**

**Claims priority, application Japan, Aug. 16, 1991, 3-229756**

**Int. Cl.[6] G01N** *33/53;33/574*

**U.S. Cl. 435—7.23** **8 Claims**

1. A method of detecting a neuroendocrine tumor, comprising:

contacting (a) a labeled monoclonal antibody produced by the hybridoma RB2-4, deposited with the Fermentation Research Institute and assigned the Deposit No. FERM BP-3944, said monoclonal antibody being of the immunoglobulin class M and specifically binding rat synaptophysin, or (b) a labeled monoclonal antibody having the identifying characteristics of the monoclonal antibody produced by said hybridoma, with an organ, a tissue slice or a tissue homogenate which may contain synaptophysin, to bind said labelled monoclonal antibody to synaptophysin; and

correlating the presence or concentration of said monoclonal antibody bound to said synaptophysin to an indication of a neuroendocrine tumor.

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**5,496,706**

## METHODS AND MATERIALS FOR THE DETECTION OF *STAPHYLOCOCCUS AUREUS*

**Pentti Kuusela, and Pekka Hilden, both of Helsinki, Finland, assignors to Helsinki University Licensing, Ltd., Helsinki, Finland**

**Filed Dec. 17, 1993, Ser. No. 169,524**

**Int. Cl.[6] G01N** *33/569;33/536;33/577*

**U.S. Cl. 435—7.33** **6 Claims**

1. A method for detection of *Staphylococcus aureus* in a sample, comprising the steps of:

(a) culturing a sample suspected of containing *S. aureus*,

(b) mixing colonies resulting from step (a) with MRSA agglutinating antiserum which is produced by immunization with methicillin-resistant *S. aureus* (MRSA) bacteria which do not agglutinate in standard agglutination tests; and

(c) detecting agglutination, wherein the presence of agglutination indicates the presence of *S. aureus* in the sample.

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**5,496,707**

## ASSAY METHOD FOR HEMICELLULASES USING A COLORED SUBSTRATE

**Beat Freiermuth; Dieter Werthemann, both of Basle, Switzerland; Alfred Gaertner, San Bruno, and Spencer Fisk, Burlingame, both of Calif., assignors to Ciba-Geigy Corporation, Tarrytown, and Genencor International, Inc., Rochester, both of N.Y.**

**Filed Apr. 5, 1994, Ser. No. 221,649**

**Int. Cl.[6] C12Q** *1/34;* **C07H** *1/00*

**U.S. Cl. 435—18** **13 Claims**

1. In an assay method for hemicellulases having the steps of a) dyeing, using a reactive dye, wood or other vegetable material that has been mechanically decomposed or homogenized; and b) adding an enzyme to the dyed material produced in step a) and, after an incubation period of from 2 minutes to 4 hours, separating a liquid component from the dyed material and determining the amount of dye liberated in the separated liquid component by spectrophotometric means, the improvement comprising dyeing insoluble wood or other vegetable material that has been mechanically decomposed or homogenized in step a) and, in step b), after incubation, separating the liquid component from the dyed material without the use of an organic solvent.

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**5,496,708**

## REAGENT COMPOSITION FOR QUANTITATIVE ANALYSIS OF INORGANIC PHOSPHOROUS AND DRY ANALYSIS ELEMENT UTILIZING THE SAME

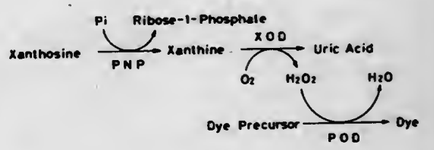
**Kazuya Kawasaki; Yoshikazu Amano; Osamu Seshimoto, and Kiyoshi Yamada, all of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Jun. 14, 1994, Ser. No. 259,616**

**Claims priority, application Japan, Jun. 15, 1993, 5-167285**

**Int. Cl.[6] C12Q** *1/28;* **G01N** *31/22*

**U.S. Cl. 435—28** **10 Claims**




4. A dry analysis element for the quantitative analysis of inorganic phosphorus comprising a reagent layer which contains xanthosine, purine nucleoside phosphorylase, xanthine oxidase, peroxidase and a color-former, said color-former being a precursor for forming a dye in the presence of hydrogen peroxide produced by said xanthine oxidase and said peroxidase.

5,496,709
**PROCESS FOR PRODUCTION OF CANTHAXANTHIN**
**Akira Tsubokura, Kawasaki; Hisashi Yoneda, Yokohama; Mikihiro Takai, Kawasaki, and Takashi Kiyota, Yokohama, all of, Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan**
**Filed Jun. 10, 1994, Ser. No. 258,278**
**Claims priority, application Japan, Jun. 11, 1993, 5-140874**
**Int. Cl.[6] C12P** *7/26*
**U.S. Cl. 435—67** **2 Claims**

1. A process for producing canthaxanthin, comprising: culturing a microorganism belonging to the genus Corynebacterium, wherein the microorganism is Corynebacterium sp. SQH 348 (FERM BP-4284), which produces canthaxanthin, and recovering said canthaxanthin.

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5,496,710
**PROTEASE**
**Hiromasa Nagao, Kanagawa; Takashi Yoneya, Tokyo; Toshio Miyake, Kanagawa; Atsuo Aoyama, Kanagawa; Ken-ichi Kai, Kanagawa; Shun-ichi Kidokoro, Kanagawa; Yoichiro Miki, Kanagawa; Kimiko Endo, and Akiyoshi Wada, both of Tokyo, all of, Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan, and Holland Sweetner Company V.O.F., Netherlands**
**Filed Mar. 29, 1993, Ser. No. 38,932**
**Claims priority, application Japan, Jun. 8, 1992, 4-171479; Aug. 14, 1992, 4-237606; Sep. 18, 1992, 4-273413**
**Int. Cl.[6] C12S** *3/14;13/00;* **C12P** *7/62*
**U.S. Cl. 435—68.1** **8 Claims**

1. A modified neutral metallo-protease having the amino acid sequence of SEQ ID NO:1, wherein at least one amino acid residue selected from the group consisting of the 144th residue, leucine, the 150th residue, aspartic acid, the 187th residue, glutamic acid, and the 227 residue, asparagine, is replaced with a natural L-amino acid residue other than either said amino acid residue or a proline residue, and wherein the 150th residue is substituted with a natural L-amino acid other than an arginine residue.

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5,496,711
**PROCESSES FOR PRODUCING PRE-PRORENNIN, PRORENNIN AND RENNIN**
**Bernadette L. Alford, Ashland; Jen-I Mao, Bedford; Donald T. Moir, Waltham; Alison Taunton-Rigby, Lincoln, and Gerald F. Vovis, Waltham, all of Mass., assignors to Genome Therapeutics Corp., Waltham, Mass.**
**Continuation of Ser. No. 58,739, Jun. 5, 1987, which is a continuation of Ser. No. 640,514, Aug. 13, 1984, abandoned, which is a continuation of Ser. No. 325,481, Dec. 1, 1981, Pat. No. 4,666,847, which is a continuation-in-part of Ser. No. 225,717, Jan. 16, 1981, abandoned. This application Jul. 12, 1989, Ser. No. 379,863**
**The portion of the term of this patent subsequent to May 19, 2004, has been disclaimed.**
**Int. Cl.[6] C12P** *21/06;* **C12N** *15/00;15/12*
**U.S. Cl. 435—69.1** **55 Claims**

1. A pre-prorennin preparation substantially free of other proteolytic protein found in the stomach of a pre-ruminant calf, produced by a transformed living cell selected from the group consisting of fungi, yeast and bacteria, containing genetic material derived from recombinant DNA material comprising a nucleotide sequence coding for pre-prorennin.

5,496,712
**HIGH MOLECULAR WEIGHT COLLAGEN-LIKE PROTEIN POLYMERS**
**Joseph Cappello, San Diego, and Franco A. Ferrari, La Jolla, both of Calif., assignors to Protein Polymer, San Diego, Calif.**
**Continuation-in-part of Ser. No. 791,960, Nov. 12, 1991, abandoned, which is a continuation-in-part of Ser. No. 609,716, Nov. 6, 1990. This application Nov. 5, 1992, Ser. No. 972,032**
**Int. Cl.[6] C12P** *21/02;* **C12N** *15/12;* **C07K** *14/245;14/47*
**U.S. Cl. 435—69.1** **21 Claims**

1. A collagen like polymer of at least about 30 kD, characterized by:
being expressed in a unicellular organism from a construct prepared in vitro;
comprising at least 80 weight % of triads having glycine as the first amino acid and at least 40 number % of said triads comprising at least one proline, wherein the total proline content of said triads is less than 45 number %; and
comprising at least two repetitive units of $(glyXO)_n$, wherein X and O symbolize individual amino acids, X and O are the same or different amino acids in each triad and n is at least 4; wherein at least two triads are selected from the group consisting of the triads gly-ala-pro, gly-pro-ala, gly-pro-pro, gly-ala-ser, gly-pro-gly, gly-pro-ser, gly-ala-gln, gly-ser-pro, gly-ser-gln, gly-leu-gln, gly-pro-arg, gly-pro-lys, gly-ala-lys, gly-ala-arg, gly-glu-arg, gly-asp-arg, gly-glu-pro, gly-asp-ala, gly-ala-his and gly-glu-ala.

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5,496,713
**PROCESS FOR PRODUCING 20 KD HUMAN GROWTH HORMONE**
**Masaru Hoajo, Chiba; Setsuo Yoshino, Fukuoka; Akira Nakayama, and Naokazu Naito, both of Chiba, all of, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan**
**Filed Sep. 9, 1993, Ser. No. 117,809**
**Claims priority, application Japan, Sep. 9, 1992, 4-240936; Jan. 25, 1993, 5-009911**
**Int. Cl.[6] C12P** *21/06;* **C12N** *15/24;* **A61K** *38/27;* **C07K** *14/61*
**U.S. Cl. 435—69.4** **4 Claims**

1. A method for producing 20 kD human growth hormone which comprises the steps of:
(a) preparing a recombinant plasmid comprising:
i. a vector DNA replicable in Escherichia coli;
ii. a DNA fragment comprising a promoter region, a ribosome binding site and a secretion signal coding region, said site and regions being those of the neutral protease gene of *Bacillus amyloliquefaciens;* and
iii. a gene encoding the 20 kD hGH bound to the 3' end of the secretion signal coding region, so that expression and secretion of the 20 kD hGH is directed by the DNA fragment (ii);
(b) transforming *E. coli* cells with the recombinant plasmid to obtain a transformant carrying the recombinant plasmid;
(c) culturing the transformant thus obtained at a temperature between 20° to 30° C. to produce the 20 kD hGH in the periplasm of the transformant; and
(d) recovering the 20 kD hGH from the periplasm.

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5,496,714
**MODIFICATION OF PROTEIN BY USE OF A CONTROLLABLE INTERVEINING PROTEIN SEQUENCE**
**Donald G. Comb, Beverly; Francine B. Perler, Brookline; William E. Jack, Rowley; Ming-Qun Xu, Beverly, all of Mass., and Robert A. Hodges, Manassas, Va., assignors to New England Biolabs, Inc., Beverly, Mass.**
**Filed Dec. 9, 1992, Ser. No. 4,139**
**Int. Cl.[6] C12P** *21/00;* **C12N** *9/22*
**U.S. Cl. 435—69.7** **36 Claims**

1. A modified protein comprising a target protein into which is inserted a controllable intervening protein sequence, wherein said controllable intervening protein sequence is capable of excision under predetermined conditions, and wherein said modified protein is non-naturally occurring.



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5,496,715
**PROCESS FOR PREPARING INDIGO**
**Makoto Goto, Ami; Terukazu Nara, Ibaraki; Masato Terasawa, and Hideaki Yukawa, both of Ami, all of, Japan, assignors to Mitsubishi Chemical Corporation, and Petroleum Energy Center, both of Tokyo, Japan**
**Filed Aug. 24, 1994, Ser. No. 293,969**
**Claims priority, application Japan, Aug. 25, 1993, 5-210439; Apr. 14, 1994, 6-075678**
**Int. Cl.[6] C12P** *1/04;17/16;17/18*
**U.S. Cl. 435—170** **14 Claims**

1. A process for preparing indigo which comprises
bringing an indigo-producing bacteria belonging to genus Acinetobacter which is at least one selected from the group consisting of Acinetobacter species MY-15, *Acinetobacter calcoaceticus* ATCC 19606, Acinetobacter species VA-66 and Acinetobacter species VA-251 into contact with an aqueous solution containing at least indole to have indigo formed and accumulated in the aqueous solution; and
collecting indigo from the aqueous solution.

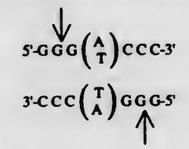
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5,496,716
**STABILIZED CREATIVE KINASE MB COMPOSITION**
**Douglas R. Brandt, Mundelein, Ill., assignor to Abbott Laboratories, Abbott Park, Ill.**
**Continuation of Ser. No. 973,604, Nov. 9, 1992, abandoned, which is a continuation of Ser. No. 429,591, Oct. 31, 1989, abandoned. This application May 10, 1994, Ser. No. 240,794**
**Int. Cl.[6] C12N** *9/96;9/12;* **C12Q** *1/50;* **G01N** *33/53*
**U.S. Cl. 435—188** **10 Claims**

1. A liquid enzyme composition suitable for use as a calibrator or control reference reagent in an immunoassay for creatine kinase MB (CKMB) isoenzyme comprising
1) a predetermined amount of isolated CKMB isoenzyme which is free of CKMM and CKBB isoenzymes and which is not bound to a carrier material;
2) a CKMB stabilizer selected from the group consisting of:
a) a substrate for CKMB isoenzyme selected from the group consisting of:
i) adenosine triphosphate;
ii) oxidized adenosine triphosphate;
iii) adenosine trisposphate analogs;
iv) oxidized adenosine triphosphate analogs;
v) creatine; and
vi) creatine analogs;
b) a pair of products resulting from the action of CKMB isoenzyme on a substrate with one member selected from each group wherein
i) one group consists of adenosine diphosphate, oxidized adenosine diphosphate, adenosine diphosphate analogs and oxidized adenosine diphosphate analogs; and
ii) the other group consists of phosphocreatine, and phosphocreatine analogs;
c) a combination of a CKMB isoenzyme substrate selected from group a hereinabove and of a CKMB isoenzyme product selected from Group b hereinabove;
d) any of the stabilizers a through c and a CKMB isoenzyme activator selected from the group consisting of a sulfhydryl compound, a divalent metal ion and a combination thereof and
e) combinations thereof; and
3) a protein solution comprising human serum, animal serum or artificial serum said composition displaying less than a 10% loss of CKMB isoenzyme concentration after 27 days storage at room temperature, as measured by immunoassay.

5,496,717
**RESTRICTION ENDONUCLEASE**
**Yoshiko Nomura, Kyoto; Fusao Kimizuka, Ohmihachiman; Yoshizumi Ishino, Takatsuki, and Ikunoshin Kato, Uji, all of, Japan, assignors to Takara Shuzo Co., Ltd., Kyoto, Japan**
**Filed Nov. 28, 1994, Ser. No. 348,961**
**Claims priority, application Japan, Nov. 30, 1993, 5-323459**
**Int. Cl.[6] C12N** *9/22;9/16*
**U.S. Cl. 435—199** **5 Claims**

1. A purified restriction endonuclease
(a) which specifically recognizes and which specifically cleaves a heptanucleotide consisting of the following double stranded deoxyribonucleotide sequence at the arrow sites:




wherein A, G, T and C are adenine, guanine, thymine and cytosine, respectively;
(b) which has the following physicochemical properties:
(a) Optimal temperature: approximately 37° C.;
(b) Optimal pH: 7.0 to 9.0;
(c) Molecular weight: 60,000 to 75,000;
and
(c) which can be recovered from Streptomyces sp. AH1825 deposited under accession number FERM BP-4836.

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5,496,718
**CHONDROITINASE ABC ISOLATED FROM PROTEUS VULGARIS ATCC 6896**
**Nobukazu Hashimoto, Sayama; Hideo Mochizuki, Nagoya, and Akio Hamai, Fuusa, all of, Japan, assignors to Seikagaku Kogyo Kabushiki Kaisha (Seikagaku Corporation), Tokyo, Japan**
**Filed Jun. 23, 1993, Ser. No. 82,853**
**Claims priority, application Japan, Jun. 26, 1992, 4-192882; Jan. 26, 1992, 4-310980**
**Int. Cl.[6] C12N** *9/88;1/12;* **C01G** *17/04*
**U.S. Cl. 435—232** **1 Claim**

1. A purified chondroitinase ABC from *Proteus vulgaris* ATCC 6896 having the following characteristics:
(i) a single polypeptide chain having a molecular weight of about 100,000 daltons as measured by a single band in SDS-polyacrylamide gel electrophoresis (SDS-PAGE), in a reduced or unreduced state, and by gel permeation chromatography,
(ii) an isoelectric point from about 8.2 and about 8.5,
(iii) an optimum pH of from about 8.0 to 8.2,
(iv) an optimum reaction temperature of 37° C.,
(v) a specific activity of 300 U/mg or more, and
(vi) a single peak as determined by HPLC;
wherein activity of the chondroitinase ABC is inhibited by contact with a metal ion selected from the group consisting of $Zn^{2+}$, $Ni^{2+}$, $Fe^{3+}$, and $Cu^{2+}$
wherein the purified chondroitinase ABC is essentially free of nucleic acid, endotoxin and protease activity, and has a terminal amino acid sequence of Ala-Thr-X-Asn-Pro-Ala-Phe-Asp-Pro-Ser-Leu-Pro, wherein X is undetermined.

**5,496,719**

## POLYPEPTIDE FROM HUMICOLA ISOLENS POSSESSING PROTEIN DISULFIDE ISOMERASE ACTIVITY GENE ENCODING THE SAME

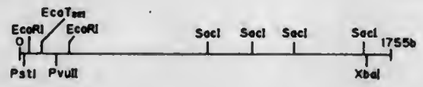
**Yukio Yamada, Tsushima; Osamu Asami, Kounan; Hidehiko Sugiyama; Chie Idekoba, both of Nagoya; Fumihiko Hoshino, Aichi; Masana Hirai, Seto; Tsutomu Kajino, Toyoake; Takao Imaeda, Kasugai, and Kiyoko Sarai, Toyota, all of, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan**

**Filed May 27, 1993, Ser. No. 68,395**

**Claims priority, application Japan, May 27, 1992, 4-135254; Mar. 4, 1993, 5-044013; Mar. 4, 1993, 5-044014**

**Int. Cl.[6] C12N *9/90;9/00;* A61K *38/00;* C07K *1/00***

**U.S. Cl. 435—233** **2 Claims**




1. An isolated thermostable polypeptide of *Humicola insolens* KASI origin, possessing protein disulfide isomerase activity which catalyses a disulfide exchange in protein, and being characterized by the following properties:

A) it carries out disulfide exchange at least on ribonuclease A;

B) a suitable temperature for the enzyme to be active is 20° to 70° C.;

C) its residual activity after a treatment for 30 minutes at pH 7.5 is about 100% at a temperature between 30° C. and 60° C., more than 80% at a temperature of 70° C., and more than 50% at a temperature of 80° C., taking the activity before said treatment as 100%;

D) it is stable at a pH value of 6 to 9;

E) its residual activity after a treatment for 30 minutes at 30° C. is more than 60% at pH 5, more than 80% at pH 6, more than 90% at pH of from 8 to 9, and more than 30% at pH 10, taking the activity before said treatment as 100%; and

F) it has a molecular weight of about 60,000 to 62,000, as measured by SDS-polyacrylamide gel electrophoresis.

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**5,496,720**

## PARTHENOGENIC OOCYTE ACTIVATION

**Joan L. Susko-Parrish, 207 Stone Ter., Monona, Wis. 53716; David L. Northey, 6706 Clovernook Cir., Middleton, Wis. 53562; M. Lorraine Leibfried-Rutledge, 321 Glen Thistle Ct., Madison, Wis. 53705, and Steven L. Stice, 204 Mohican Pass, DeForest, Wis. 53532**

**Filed Feb. 16, 1993, Ser. No. 16,703**

**Int. Cl.[6] C12N *5/00;* A61K *37/00;* A61B *17/425***

**U.S. Cl. 435—240.2** **25 Claims**

1. A process for the in vitro parthenogenic activation of a bovine oocyte comprising the following steps in sequence:

a. increasing intracellular levels of divalent cations in the oocyte; and

b. reducing phosphorylation of cellular proteins in the oocyte.

**5,496,721**

## METHODS OF GENERATING DESIRED AMINO-TERMINAL RESIDUES IN PROTEINS

**Andreas Bachmair, Cologne, Germany; Daniel Finley, Cambridge, and Alexander Varshavsky, Boston, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.**

**Continuation of Ser. No. 988,807, Dec. 10, 1992, abandoned, which is a continuation of Ser. No. 821,720, Jan. 15, 1992, Pat. No. 5,196,321, which is a continuation of Ser. No. 356,378, May 24, 1989, Pat. No. 5,093,242, which is a continuation-in-part of Ser. No. 178,924, Apr. 7, 1988, Pat. No. 5,132,213, which is a continuation-in-part of Ser. No. 103,910, Oct. 1, 1987, abandoned, which is a continuation-in-part of Ser. No. 915,151, Oct. 2, 1986, abandoned. This application May 9, 1994, Ser. No. 239,800**

**The portion of the term of this patent subsequent to Mar. 3, 2009, has been disclaimed.**

**Int. Cl.[6] C12N *1/21;5/10;* C07K *19/00***

**U.S. Cl. 435—240.2** **7 Claims**

1. A fusion protein that is not encoded by a naturally-occurring gene, the fusion protein being encoded by a gene construct, the gene construct comprising a DNA sequence encoding ubiquitin joined to a DNA sequence encoding a protein or polypeptide of interest having a predetermined amino acid residue at its amino terminus, the ubiquitin being proteolytically cleavable by a ubiquitin-specific endoprotease at the junction with the amino terminus of the protein or polypeptide of interest such that cleavage results in the exposure of the predetermined amino-terminal residue of the protein or polypeptide of interest.

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**5,496,722**

## METHOD FOR PRODUCING NON-NEOPLASTIC, THREE DIMENSIONAL, MAMMALIAN TISSUE AND CELL AGGREGATES UNDER MICROGRAVITY CULTURE CONDITIONS AND THE PRODUCTS PRODUCED THEREFROM

**Thomas J. Goodwin, Friendswood; David A. Wolf; Glenn F. Spaulding, both of Houston, and Tacey L. Prewett, Friendswood, all of Tex., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.**

**Continuation-in-part of Ser. No. 939,791, Sep. 3, 1992, Pat. No. 5,308,764, which is a continuation of Ser. No. 317,931, Mar. 2, 1989, Pat. No. 5,153,132, which is a continuation-in-part of Ser. No. 317,776, Mar. 2, 1989, Pat. No. 5,155,034, which is a continuation-in-part of Ser. No. 213,558, Jun. 30, 1988, Pat. No. 5,026,650, and a continuation-in-part of Ser. No. 213,559, Jun. 30, 1988, Pat. No. 4,988,623, and a continuation-in-part of Ser. No. 625,345, Dec. 11, 1990, Pat. No. 5,153,131. This application May 25, 1993, Ser. No. 66,292**

**The portion of the term of this patent subsequent to Oct. 6, 2007, has been disclaimed.**

**Int. Cl.[6] C12N *5/00;5/02;5/06;5/08;* C12M *3/02;1/10;* A01N *1/02***

**U.S. Cl. 435—240.23** **41 Claims**

1. A process for producing aggregates of non-neoplastic mammalian cells comprising:

(a) isolating non-neoplastic mammalian cells;

(b) inoculating the isolated, non-neoplastic cells into a culture vessel containing culture media and a culture matrix;

(c) culturing the non-neoplastic cells under microgravity culture conditions; and

(d) maintaining the microgravity culture conditions whereby three dimensional tissue growth is achieved thereby producing aggregates of non-neoplastic mammalian cells.



**5,496,723**

## STRAINS OF ACINETOBACTER SPECIES (BICOCCUM), ARTHROBACTER SPECIES, AND RHODOCOCCUS SPECIES, AND A METHOD FOR BIOLOGICAL PURIFICATION FROM OIL SPILLS AND POLLUTIONS, USING SAID STRAINS

**Boris G. Murzakov, Novoe shosse, d.91, kv.15, 142712 Moskovskaya obl., Gorki Leninskie; Alexandra I. Zaikina; Rufina A. Rogacheva, both of Moscow, and Elena V. Semenova, Moskovskaya, all of, Russian Federation, assignors to Boris G. Murzakov, Moskovskaya, Russian Federation**

**PCT No. PCT/RU93/00045, § 371 Date Oct. 7, 1994, § 102(e) Date Oct. 7, 1994, PCT Pub. No. WO94/18132, PCT Pub. Date Aug. 18, 1994**

**PCT Filed Feb. 15, 1993, Ser. No. 313,167**

**Int. Cl.[6] C12N *1/12***

**U.S. Cl. 435—252.1** **5 Claims**

1. A method for microbiological treatment of various media and surfaces from petroleum pollution, said method comprising

inoculating into the petroleum pollution at least one bacterial culture isolated from the biocenosis of active silt, containing the petroleum pollution, said culture incorporation the purified strain of Acinetobacter species (bioccum) B-6445, which was deposited on Jul. 6, 1993 in the All-Russian Collection of Industrial Microorganisms of the All-Russian Research Institute for Genetics and Selection of Microorganisms and representing an integrated trophic association, featuring a weight ratio between the biomass of said bacterial culture and the petroleum pollution being treated, equal to $1:10–10^5$, respectively; and

cultivating the Acinetobachter strain on said petroleum pollution, containing petroleum hydrocarbons, mineral salts of nitrogen and phosphorus, iron, manganese, potassium, magnesium, and sulfur, until destruction of the petroleum hydrocarbons being treated occurs, thus providing for cleaning from petroleum pollution.

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**5,496,724**

## GENES ENCODING PLATELET AGGREGATION INHIBITORS

**Robert M. Scarborough, Belmont; David L. Wolf, Palo Alto, and Israel F. Charo, Lafayette, all of Calif., assignors to COR Therapeutics, Inc., South San Francisco, Calif.**

**Continuation of Ser. No. 483,229, Feb. 20, 1990, Pat. No. 5,318,899, which is a continuation-in-part of Ser. No. 418,028, Oct. 6, 1989, abandoned, which is a continuation-in-part of Ser. No. 367,509, Jun. 16, 1989, abandoned. This application May 24, 1993, Ser. No. 67,139**

**The portion of the term of this patent subsequent to Feb. 20, 2010, has been disclaimed.**

**Int. Cl.[6] C12N *1/21;15/71;1/19;15/12***

**U.S. Cl. 435—252.3** **6 Claims**

1. A DNA in isolated and purified form which encodes a modified form of platelet aggregation inhibitor having the full amino acid sequence of eristicophin, crotatroxin, basilicin, cerastin, horridin, molossin, ruberin, lutosin, viridin, cotiarin, lachesin, tergeminin, or barbourin as shown in FIG. 6 or a truncated form thereof comprising at least 20 amino acids including the RGD or KGD binding site of said full amino acid sequence, wherein (1) said DNA encoding said full amino acid sequence in modified by the substitution of 1 to 4 amino acid codons encoding conservative substitutions at sites other than the RGD or KGD site and, if said amino acid sequence contains an RGD site, said RGD site may be substituted by a KGD site and (2) said DNA encoding said truncated form may be modified by the substitution of 1 to 4 amino acid codons encoding conservative substitutions at sites other than RGD or KGD site and, if said amino acid sequence contains an RGD site, said RGD site may be substituted by a KGD site.

**5,496,725**

## SECRETION OF CLOSTRIDIUM CELLULASE BY *E. COLI*

**Ida K. Yu, 3202 Monte Vista Pl., Davis, Calif. 95616**

**Filed Aug. 11, 1993, Ser. No. 105,870**

**Int. Cl.[6] C12N *1/15;1/21;5/10;9/42***

**U.S. Cl. 435—252.3** **5 Claims**

1. A recombinant microorganism comprising a vector for the heterologous expression of a cellulase enzyme wherein said enzyme is capable of digesting chemically or enzymatically untreated natural plant materials and said enzyme has a molecular weight of about 58,000 daltons as measured by gel exclusion chromatography wherein said microorganism comprises:

(a) an expression vector comprising a DNA sequence coding for said cellulase enzyme; and

(b) at least one DNA sequence coding for a signal sequence useful for the secretion of said cellulase enzyme, wherein a first DNA sequence of the expression vector codes for cellulase obtained from Clostridium strain IY-2.

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**5,496,726**

## *STREPTOCOCCUS ZOOEPIDEMICUS* MEDIUM AND PROCESS FOR PREPARING HYALURONIC ACID

**Myoung G. Park; Jae D. Jang, and Whan K. Kang, all of Daejeon, Rep. of Korea, assignors to Lucky Limited, Seoul, Rep. of Korea**

**Filed Apr. 8, 1994, Ser. No. 224,895**

**Claims priority, application Rep. of Korea, Apr. 16, 1993, 1993 6423; Apr. 16, 1993, 1993 6424**

**Int. Cl.[6] C12N *1/20;* C12P *19/04***

**U.S. Cl. 435—253.4** **3 Claims**

1. A strain of *Streptococcus zooepidemicus* having all the identifying characteristics of *Streptococcus zooepidemicus* LBF707(KCTC 0075BP).

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**5,496,727**

## TRICYCLO COMPOUNDS, A PROCESS FOR THEIR PRODUCTION AND A PHARMACEUTICAL COMPOSITION CONTAINING THE SAME

**Masakuni Okuhara; Hirokazu Tanaka; Toshio Goto, all of Niihari; Tohru Kino, Tsuchiura, and Hiroshi Hatanaka, Niihari, all of, Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan**

**Division of Ser. No. 824,384, Jan. 23, 1992, which is a division of Ser. No. 491,285, Mar. 9, 1990, Pat. No. 5,110,811, which is a continuation of Ser. No. 868,749, May 30, 1986, Pat. No. 4,929,611, which is a continuation-in-part of Ser. No. 799,855, Nov. 20, 1985, Pat. No. 4,894,366. This application May 25, 1995, Ser. No. 450,639**

**Claims priority, application United Kingdom, Dec. 3, 1984, 8430455; Feb. 5, 1985, 8502869; Apr. 1, 1985, 8508420**

**Int. Cl.[6] C12N *1/20***

**U.S. Cl. 435—253.5** **2 Claims**

1. A biologically pure culture of the microorganism *Streptomyces hygroscopicus* subsp. *yakushimaensis* No. 7238 having Fermentation Research Institute, Agency of Industrial Science and Technology Accession No. FERM BP-928.

5,496,728

## ENCAPSULATION OF LIQUIDS IN MICRO-ORGANISMS

Frederick E. Hardy, Ponteland; Alan D. Willey, Sandyford, both of, Great Britain, and Stefano Scialla, Rome, Italy, assignors to The Procter & Gamble Company, Cincinnati, Ohio

PCT No. PCT/US92/10391, § 371 Date Jun. 13, 1994, § 102(e) Date Jun. 13, 1994
PCT Filed Dec. 1, 1992, Ser. No. 244,798
Claims priority, application European Pat. Off., Dec. 13, 1991, 91870208
Int. Cl.[6] B01J *13/02*; C11D *3/395*; C12N *1/16;1/18*
U.S. Cl. 435—255.1 6 Claims

1. A method for encapsulating a bleach activator in micro-organism cells for use in laundry compositions, said method comprising the steps of:

(a) deodorizing intact microorganism cells with a peroxygen bleach under conditions whereby the odor of the microorganism cells is reduced while maintaining at least a portion of the deodorized cells intact;

(b) contacting the deodorized microorganism cells from step (a) with a liquid selected from liquid bleach activators and liquids containing solvent and bleach activator under conditions whereby at least a portion of the bleach activator is encapsulated in the intact deodorized microorganism cells; and

(c) collecting the microorganism cell-encapsulated bleach activator.

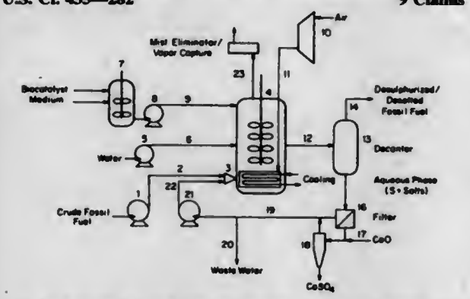
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5,496,729

## PROCESS FOR THE DESULFURIZATION AND THE DESALTING OF A FOSSIL FUEL

Daniel J. Monticello, The Woodlands, Tex., assignor to Energy BioSystems Corporation, The Woodlands, Tex.

Continuation of Ser. No. 876,187, Apr. 30, 1992, Pat. No. 5,356,813. This application Aug. 31, 1994, Ser. No. 298,921
The portion of the term of this patent subsequent to Oct. 18, 2011, has been disclaimed.
Int. Cl.[6] C10G *32/00;29/20;* C02F *3/00;3/02*
U.S. Cl. 435—282 9 Claims




1. A process for reducing the amount of organic sulfur and inorganic salts from a fossil fuel containing organic sulfur compounds and inorganic salts, comprising the steps of:

(a) contacting the fossil fuel with an aqueous phase containing a biocatalyst having sulfur-specific carbon-sulfur bond cleavage ability, thereby forming a fossil fuel and aqueous phase mixture said biocatalyst comprising a bacterial organism or bacterial cell-free fractions;

(b) maintaining the mixture under conditions sufficient for cleavage of the carbon-sulfur bonds of the organic sulfur compounds, by said biocatalysts to form inorganic sulfur compounds, and for water-induced solubilization of said inorganic salts and said inorganic sulfur compounds to occur; and

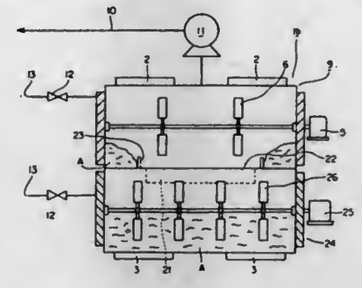
(c) separating the fossil fuel having a reduced organic sulfur and inorganic salt content from the resulting aqueous phase, whereby the resulting aqueous phase has a concentration greater than about 0.5 percent by weight of said inorganic salts.

5,496,730

## ORGANIC WASTE RECYCLING APPARATUS

Kazuo Teramachi, Nagoya, Japan, assignor to Kabushiki Kaisha Toyodynam, Nagoya, Japan

Filed Apr. 20, 1994, Ser. No. 230,398
Claims priority, application Japan, Dec. 1, 1993, 5-338830
Int. Cl.[6] C12M *1/06;1/02*
U.S. Cl. 435—290.2 18 Claims



1. A composter comprising:

a composter housing having an inner wall, said composter housing further having an upper section that defines a fermentation compartment and a lower section that defines a drying compartment;

a partition panel extending inwardly from said composter housing inner wall so as to define said composter housing into said upper and lower sections, said partition panel being formed with a through passage between said sections that is spaced inwardly from said composter housing inner wall, said partition panel including an upwardly extending lip that extends around said through passage;

a shutter seated in said partition panel through passage for selectively opening and closing said through passage;

a first set of stirring blades disposed in said fermentation compartment;

a second set of stirring blades disposed in said drying compartment;

a first set of heating elements disposed in said drying compartment for heating said drying compartment to a first temperature; and

a second set of heating elements disposed at said fermentation compartment for heating said fermentation compartment to a second temperature, said second selected temperature being less than said first temperature to which said drying compartment is heated.

11. A composter comprising:

a composter housing having an interior space, said composter housing including a vertically extending dividing wall for dividing said composter housing interior space into a fermentation compartment and a drying compartment, said dividing wall being formed with an opening to facilitate the transfer of compost from said fermentation compartment to said drying compartment;

a horizontally aligned stirring screw disposed in said fermentation compartment and extending the length thereof, said stirring screw being shaped to horizontally move material being composted so that when said screw rotates in a first direction, said material is displaced toward said dividing wall and when said screw rotates in a second direction opposite said first direction, said material is displaced away from said dividing wall; and

a motor attached to said stirring screw for rotating said screw in said first and second directions, said motor being configured to have a first mode of operation during which said motor alternatively rotates said stirring screw in said first and second directions and a second mode of operation in which said motor continually rotates said stirring screw in said first direction.



5,496,731

## BROAD-SPECTRUM TUMOR SUPPRESSOR GENES, GENE PRODUCTS AND METHODS FOR TUMOR SUPPRESSOR GENE THERAPY

Hong-Ji Xu; Shi-Xue Hu, both of 10 Moonseed Pl., and William F. Benedict, 21 E. Wedgewood Glen, all of The Woodlands, Tex. 77381

Filed Mar. 25, 1993, Ser. No. 38,760
Int. Cl.[6] C12N *15/86;15/85*
U.S. Cl. 435—320.1 12 Claims

1. A DNA molecule encoding $p94^{RB}$ having an amino acid sequence according to SEQ ID NO:3, provided that said DNA molecule does not also code for $p110^{RB}$.

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5,496,732

## ENHANCED INSECT RESISTANCE IN PLANTS GENETICALLY ENGINEERED WITH A PLANT HORMONE GENE INVOLVED IN CYTOKININ BIOSYNTHESIS

Ann C. Smigocki, Silver Spring, and John W. Neal, Jr., Laurel, both of Md., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Apr. 30, 1993, Ser. No. 54,985
Int. Cl.[6] C12N *15/63;15/00;* C07H *21/04;* A01H *1/04*
U.S. Cl. 435—320.1 10 Claims

1. A gene construct capable of conferring enhanced resistance to insect feeding on plants, said construct comprising a wound inducible promoter region fused to a DNA sequence encoding the enzyme isopentenyl transferase.

5. A transformation vector comprising a gene construct capable of conferring enhanced insect resistance on plants, said construct comprising a wound inducible promoter region fused to a DNA sequence encoding the enzyme isopentenyl transferase and a plasmid capable of effectively introducing said vector into a plant.

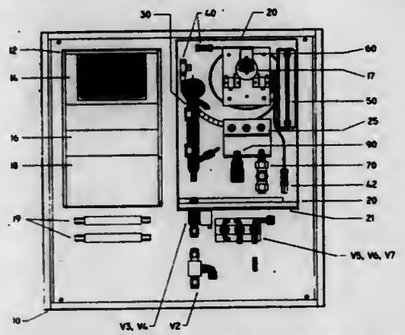
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5,496,733

## DISCHARGE MONITORING SYSTEM

Daniel J. Spandau, 24 Ave. B, Northport, N.Y. 11768, and Wayne Gutschow, 341 Charles St., Yaphank, N.Y. 11980

Filed Aug. 19, 1994, Ser. No. 292,746
Int. Cl.[6] G01N *35/08*
U.S. Cl. 436—52 24 Claims




1. A discharge monitoring system located at an outdoor contaminated site, said system connected to a means for cleaning contaminated material from the contaminated site for monitoring a concentration of volatile organic constituents in a test sample obtained from said means for cleaning the contaminated site, comprising:

means for connecting the discharge monitoring system to the means for cleaning the contaminated site and for obtaining the test sample;

sparging means for separating a volatile organic constituent sample from the test sample;

means for drying the volatile organic constituent sample to remove any water therein by mixing the volatile organic constituents with a drying agent;

means for separating the volatile organic constituents from the drying agent and for concentrating the separated volatile constituents;

means for detecting the concentration of the volatile organic constituents and for generating an electrical signal proportional to the total concentration and type of the volatile organic constituents in the constituent sample; and

microprocessor control means for controlling the operation of the monitoring system and automatically calibrating the system prior to monitoring the test sample, wherein a purified blank liquid sample is produced by the sparging means during the automatic calibration of the system.

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5,496,734

## TREATMENT METHOD FOR BLOOD ANALYSIS

Takashi Sakata, Kakogawa, Japan, assignor to TOA Medical Electronics Co., Ltd., Japan

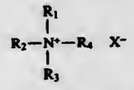
Continuation of Ser. No. 154,795, Nov. 19, 1993, abandoned. This application Jun. 2, 1995, Ser. No. 458,304
Claims priority, application Japan, Nov. 19, 1992, 4-310146
Int. Cl.[6] G01N *33/48*
U.S. Cl. 436—63 14 Claims

1. A method for classifying and counting leukocytes by an optical means which comprises;

(i) treating a blood sample containing leukocytes with an aqueous solution having a pH ranging from 5.0 to 11.0 and comprising an ionic surfactant and a fluorescent dye, to give an optical difference between eosinophils and other leukocytes, wherein

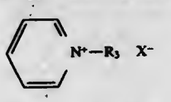
the ionic surfactant is used at a concentration effective to not damage the whole of the cell membrane of leukocytes in the blood sample but effective to damage a part of the cell membrane so as to allow the fluorescent dye to enter the leukocytes and stain intracellular material, and wherein said ionic surfactant is at least one selected from the group consisting of:

a) a quaternary ammonium salt of the following formula:



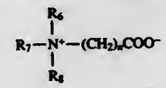
wherein $R_1$, $R_2$ and $R_3$ are independently a hydrogen atom, a $C_1$–$C_8$ alkyl group or a $C_6$–$C_8$ aralkyl group; $R_4$ is a $C_8$–$C_{18}$ alkyl group, a $C_8$–$C_{18}$ alkenyl group or a $C_6$–$C_{18}$ aralkyl group; and $X^-$ is an anion,

b) a pyridinium salt surfactant of the following formula:



wherein R5 is a C8–C18 alkyl group; and $X^-$ is an anion, and

c) an amphoteric surfactant of the following formula:



wherein $R_6$ and $R_7$ are independently a hydrogen atom or a $C_1$–$C_8$ alkyl group; $R_8$ is a $C_8$–$C_{18}$ alkyl group; and n is 1 or 2;

and (II) classifying and counting the leukocytes by measuring an optical difference between eosinophils and other types of leuko-

cytes in the blood sample based on at least two kinds of light selected from the group consisting of forward scattered light, side scattered light, red fluorescence light and green fluorescence light.

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5,496,735

## METHOD FOR CONCENTRATION BASED ANALYSIS OF LIPID FATTY ACIDS AND ITS USE IN DETERMINING THE LIKELIHOOD THAT A PATIENT IS AT RISK FOR DIABETES

Harvey A. Schwertner, San Antonio, Tex., assignor to The United States of America as represented by the Secretary of the Air Force, Wright-Patterson Air Force Base, Ohio

Division of Ser. No. 19,582, Feb. 16, 1993, Pat. No. 5,362,649. This application Sep. 6, 1994, Ser. No. 301,085
Int. Cl.[6] G01N *33/92*
U.S. Cl. 436—71 3 Claims

1. A method for determining the likelihood that a patient is at risk for diabetes, comprising the steps of:
(a) measuring the patient's serum free fatty acid concentration of a fatty acid in absolute weight or absolute moles per volume selected from a group consisting of oleic acid and arachidonic acid;
(b) comparing the measured concentration to a thresbold level of a serum free fatty acid concentration in absolute weight or absolute moles per volume corresponding to the measured fatty acid; and,
(c) determining from the comparison the likelihood that the patient is at risk for diabetes, wherein levels above the threshold level for serum free fatty acid concentration in absolute weight or absolute moles per volume for that fatty acid indicate that the patient is at risk for diabetes.

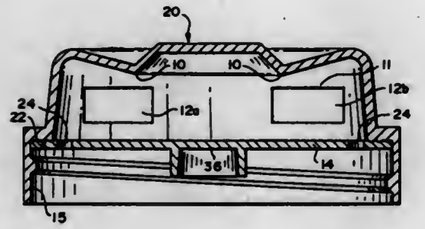
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5,496,736

## PROCESS FOR TESTING FOR SUBSTANCES IN LIQUIDS

Marcia J. Stone, Wellesley, Mass., assignor to HybriVet Systems, Inc., Natick, Mass.

Division of Ser. No. 257,430, Jun. 8, 1994, Pat. No. 5,445,965, which is a continuation of Ser. No. 2,834, Jan. 15, 1993, abandoned. This application May 17, 1995, Ser. No. 442,780
Int. Cl.[6] G01N *33/20*
U.S. Cl. 436—81 14 Claims




1. A method of detecting a substance in a liquid sample, comprising the steps of:
providing a reagent that will react with the substance in such a manner so as to give a visual indication of the reaction;
providing a solution that will not dissolve in the sample and in which the reagent will dissolve;
mixing the reagent, the solution, and the sample together so that the reagent will dissolve in the solution and so that the reagent will be exposed to the sample; and
observing the reagent that is dissolved in the solution for the visual indication.

5,496,737

## SOLVENTLESS PROTEIN ASSAY STANDARD

David Bickar, 27 Stonepath La., Easthampton, Mass. 01027

Continuation-in-part of Ser. No. 804,964, Dec. 11, 1991, abandoned. This application Oct. 15, 1993, Ser. No. 137,501
Int. Cl.[6] G01N *33/00*
U.S. Cl. 436—86 11 Claims

1. A method for preparing a solventless protein standard comprising the steps of:
preparing a dye solution containing a dye and dye solvent;
placing an aliquot of the dye solution within a receptacle;
removing the dye solvent from the receptacle;
preparing a protein solution containing a known amount of protein and a known amount of protein solvent;
placing a known amount of the protein solution within the receptacle containing the dye without the dye solvent such that the amount of protein within the receptacle can be calculated wherein the dye does not substantially solubilize upon the placing of said protein solution; and
removing the protein solvent from the receptacle under conditions to prevent hydrolysis of the protein.

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5,496,738

**Patent Not Issued For This Number**

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5,496,739

## TEST FOR GLYCOL IN WATER

Barry R. Loescher, Barrie; David M. Newman, and Rodney D. Thomson, both of Burlington, all of, Canada, assignors to Zenon Airport Environmental Inc., Burlington, Canada

Filed Mar. 4, 1994, Ser. No. 207,013
Int. Cl.[6] G01N *33/00*
U.S. Cl. 436—131 16 Claims

1. A method of determining the amount of glycol in an aqueous solution consisting essentially of:
(a) providing a container containing a mixture of potassium dichromate, a catalyst comprised of mercuric sulfate and silver sulfate and a non-complexing acid;
(b) adding a controlled volume of an aqueous solution containing glycol to said container to provide a mix;
(c) permitting said mix a time sufficient to change color, said time not being in excess of 15 minutes; and
(d) comparing said color to a set of color standards to determine the presence of glycol in said aqueous solution.

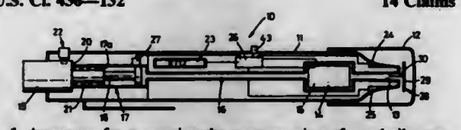
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5,496,740

## METHOD AND APPARATUS FOR DETERMINING THE CONCENTRATION OF COMPONENTS OF LIQUID SYSTEMS

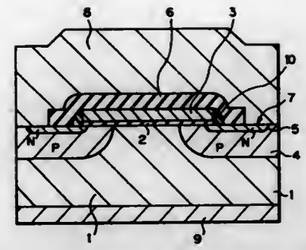
Paul M. Williams, Barry, United Kingdom, assignor to Lion Laboratories PLC, Barry, United Kingdom

PCT No. PCT/GB92/00864, § 371 Date Mar. 2, 1994, § 102(e) Date Mar. 2, 1994, PCT Pub. No. WO93/05893, PCT Pub. Date Mar. 18, 1993
PCT Filed May 14, 1992, Ser. No. 199,322
Claims priority, application United Kingdom, Sep. 4, 1991, 9118913
Int. Cl.[6] G01N *33/48*
U.S. Cl. 436—132 14 Claims




1. Apparatus for measuring the concentration of a volatile component in a person's breath, which is in equilibrium with their saliva, comprising a body having an inlet of a size adapted to be inserted into a user's mouth such that the person's mouth can close around the body to form a mouth head space, an electric sensor for measuring the volatile component, means for drawing a sample, through the inlet, from the mouth head space to the sensor, means for determining when a predetermined period of time has elapsed after the user's mouth is closed around the inlet, means for displaying the volatile component concentration of the breath in the mouth head space measured by the sensor, wherein the apparatus is self-contained within the body.





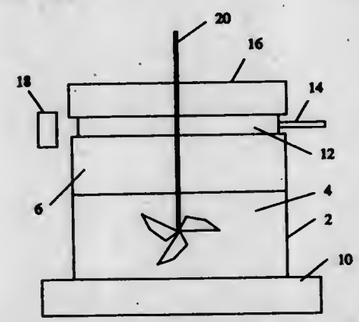

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5,496,741

## DEVICE AND PROCESS FOR INCREASING ANALYTE CONCENTRATION IN A SORBENT

Janusz B. Pawliszyn, Waterloo, Canada, assignor to University of Waterloo, Waterloo, Canada

Filed Apr. 14, 1994, Ser. No. 227,321
Int. Cl.[6] G01N *21/03;21/77*
U.S. Cl. 436—163 33 Claims




1. A process for increasing analyte concentration in a sorbent from a source of analytes contained in a sample using a solid phase microextraction device with cooling means operatively connected to cool said sorbent, a sorbent and a sample containing a source of anayltes, said process comprising locating said sorbent where it can be contacted by said analytes of said sample, contacting said sorbent with said analytes, activating said cooling means, cooling said sorbent to increase the temperature differential between said sample and said sorbent, thereby increasing the analyte concentration in said sorbent.

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5,496,742

## METHOD FOR MANUFACTURING SEMICONDUCTOR DEVICE ENABLING GETTERING EFFECT

Manabu Yamada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 22, 1994, Ser. No. 199,699
Claims priority, application Japan, Feb. 22, 1993, 5-054681
Int. Cl.[6] H01L *21/322*
U.S. Cl. 437—10 5 Claims

1. A method for manufacturing a semiconductor device, comprising the steps of:
forming an insulating layer on a semiconductor substrate of a first conductivity type, said semiconductor substrate serving as a drain region;
forming a conductive layer on said insulating layer;
patterning said conductive layer and said insulating layer to form a gate electrode and a gate insulating layer;
forming a base region of a second conductivity type opposite to the first conductivity type within said semiconductor substrate with a mask of said gate electrode;
forming a source region of the first conductivity type within said base region;
forming an oxidation stopper on a sidewall of said gate electrode and a sidewall of said gate insulating layer, wherein said oxidation stopper forming step further comprises the steps of:
forming a silicon nitride layer; and
etching back said silicon nitride layer using an anisotropic etching process, so that said silicon nitride layer remains only on the sidewall of said gate electrode and the sidewall of said gate insulating layer; and
carrying out a diffusion and oxidation process for gettering impurities from said semiconductor substrate.

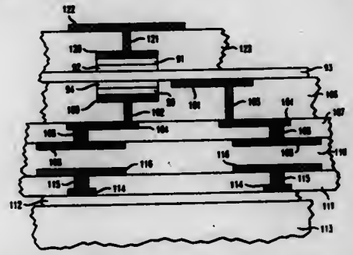
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5,496,743

## METHOD OF MAKING AN ARTICLE COMPRISING A SEMICONDUCTOR DEVICE

Serge Luryi, Bridgewater, N.J., assignor to AT&T Corp., Murray Hill, N.J.

Continuation-in-part of Ser. No. 843,654, Feb. 28, 1992, Pat. No. 5,309,003. This application Dec. 21, 1993, Ser. No. 171,504
Int. Cl.[6] H01L *21/02*
U.S. Cl. 437—31 8 Claims




1. Method of making an article that comprises a semiconductor device, the method comprising
a) providing a semiconductor body having substantially parallel first and second major surfaces and comprising bulk semiconductor material and epitaxial III-V semiconductor material on said bulk material, said epitaxial material forming said first major surface, and said bulk material forming said second major surface;
b) carrying out a first sequence of processing steps on said semiconductor body comprising forming at least first and second contact means on the first major surface, the resulting partially processed semiconductor body to be referred to as the "intermediate" body;
c) providing a carrier body having a major surface with third and fourth contact means thereon;
d) mounting the intermediate body on the carrier body such that said first major surface is facing the carrier body major surface, with said first contact means electrically connected to said third contact means and not electrically connected to said fourth contact means, and with said second contact means electrically connected to said fourth contact means and not electrically connected to said third contact means; and

e) carrying out a second sequence of processing steps on the intermediate body comprising removing, from at least a portion of the second surface, essentially all bulk semiconductor material such that said second surface comprises epitaxial III-V semiconductor material, and further comprising providing means for electrically contacting said epitaxial III-V semiconductor material in said at least portion of the second surface, wherein

f) step d) comprises mounting the intermediate body on the carrier body by means that comprise anisotropic conductor means.

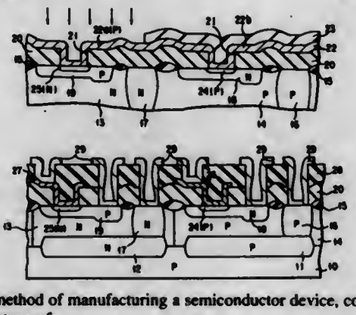
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**5,496,744**

## METHOD OF FABRICATING COMPLEMENTARY POLY EMITTER TRANSISTORS

**Kazunari Ishimaru, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Nov. 14, 1994, Ser. No. 338,691**
**Claims priority, application Japan, Nov. 15, 1993, 5-284781**
**Int. Cl.[6] H01L *21/265***
**U.S. Cl. 437—31** **5 Claims**



5. A method of manufacturing a semiconductor device, comprising the steps of:

selectively forming a collector region of a second conduction type in a first element region of a semiconductor substrate of a first conduction type, and a collector region of a first conduction type in a second element region thereof;

forming a base region of the second conduction type in the second element region on said semiconductor substrate, in which the collector region of the first conduction type is formed, and a base region of the first conduction type in the first element region in which the collector region of the second conduction type is formed;

forming a first insulating film on said semiconductor substrate;

forming emitter contact holes in portions of said first insulating film which correspond to an emitter region of the first conduction type formed in said second element region, and an emitter region of the second conduction type formed in said first element region;

forming a conductor film containing an impurity of the first conduction type, on said first insulating film having the holes therein;

forming a second insulating film on said conductor film;

exposing a portion of said conductor film which corresponds to a first element region in which the emitter region of the second conduction type is formed, by selectively removing said second insulating film;

performing a thermal treatment and diffusion of the impurity of the second conduction type while said portion of said conductor film is exposed, so as to change the impurity of the first conduction type contained in the exposed portion of said conductor film to an impurity of a second conduction type, and diffuse the impurity changed to the second conduction type into a surface region of said semiconductor substrate via the hole formed in the portion of said first insulating film which corresponds to the emitter region formed in said first element region, thereby forming the emitter region of the second conduction type in said first element region, and diffuse the impurity of the first conduction type contained in the non-exposed portion of said conductor film into the surface region of said semiconductor substrate via the hole formed in the portion of said first insulating film which corresponds to the emitter region formed in said second element region, thereby forming the emitter region of the first conduction type in said second element region.

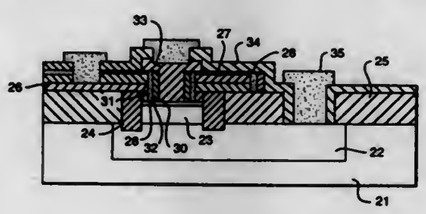
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**5,496,745**

## METHOD FOR MAKING BIPOLAR TRANSISTOR HAVING AN ENHANCED TRENCH ISOLATION

**Byung-Ryul Ryum; Tae-Hyeon Han; Soo-Min Lee; Deok-Ho Cho; Seong-Hearn Lee, and Jin-Young Kang, all of Daejeon, Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Daejeon, and Korea Telecommunications Authority, Seoul, both of, Rep. of Korea**

**Filed Dec. 19, 1994, Ser. No. 358,825**
**Int. Cl.[6] H01L *21/265***
**U.S. Cl. 437—31** **9 Claims**



1. A method of making a bipolar transistor comprising the steps of:

providing a buried collector;

providing a collector above the buried collector;

forming a silicon oxide layer above the buried collector;

using a trench forming mask to form a trench to a predetermined depth of the buried collector;

filling a first insulating layer into the trench;

polishing the first insulating layer to a surface of the silicon oxide layer;

sequentially forming a second insulating layer on the first insulating layer and the silicon oxide layer;

removing the first insulating layer formed on an inactive region other than an active region defined by the trench;

thermal-oxidizing the collector layer formed on the inactive region to form a thermal oxide layer;

removing the second insulating layer and sequentially forming a polysilicon layer, a third insulating layer and a nitride layer;

etching layers formed on a portion of the first insulating layer to form an opening defined by edges in the active region;

forming a first side wall on the edges of the opening and removing the first insulating layer;

forming an intrinsic base at a region where the first insulating layer is removed to electrically connect the intrinsic base with an extrinsic base in self-alignment;

forming a second side wall on the edges of the first side wall; and

forming an emitter layer on the intrinsic base.



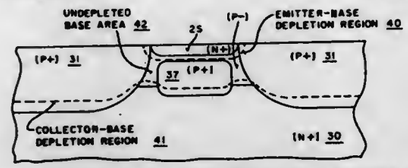
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**5,496,746**

## METHOD FOR FABRICATING A BIPOLAR JUNCTION TRANSISTOR EXHIBITING IMPROVED BETA AND PUNCH-THROUGH CHARACTERISTICS

**James A. Matthews, Milpitas, Calif., assignor to Microsystems Engineering, Inc., Calif.**

**Division of Ser. No. 114,980, Aug. 31, 1993, Pat. No. 5,386,140, which is a continuation of Ser. No. 780,640, Oct. 23, 1991, abandoned. This application Jan. 25, 1995, Ser. No. 378,352**
**Int. Cl.[6] H01L *21/8222***
**U.S. Cl. 437—31** **12 Claims**




1. A method of fabricating a bipolar junction transistor in a silicon substrate comprising the steps of:

forming a collector region in said substrate;

forming extrinsic and intrinsic base regions, said extrinsic region being more heavily doped than said intrinsic region;

introducing a dopant into said intrinsic region to form a heavily doped central area separated from said extrinsic region by a more lightly doped side area in which the lateral dimension of said side area between said extrinsic region and said central area is no greater than about 0.10 micron;

forming an emitter region disposed generally above said central area of said intrinsic base region and surrounded laterally by said extrinsic base region.

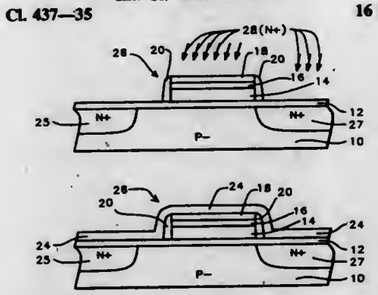
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**5,496,747**

## SPLIT-GATE PROCESS FOR NON-VOLATILE MEMORY

**Gary Hong, Hsin-chu, Taiwan, Prov. of China, assignor to United Microelectronics Corporation, Hsinchu, Taiwan, Prov. of China**

**Filed Aug. 2, 1993, Ser. No. 100,422**
**Int. Cl.[6] H01L *21/8247***
**U.S. Cl. 437—35** **16 Claims**




1. A method of forming a split-gate memory cell on a semiconductor substrate of a first conductivity type, comprising the steps of:

forming a conductive gate overlying said substrate but electrically insulated therefrom by a layer of a first dielectric material,

said gate comprising a first conductive layer of material thereon, a second layer of dielectric material formed thereon, and a second conductive layer of material deposited thereon.

forming first and second sidewall dielectric spacers adjacent to the first edge and the second opposing edge, respectively of said gate,

ion implantation into said substrate of a species of an opposite conductivity type, using a large angle implant, and

a third conductive layer of material deposited upon said second conductive layer and said first and second sidewall dielectric spacers, said third conductive material being in electrical contact with said second conductive layer.

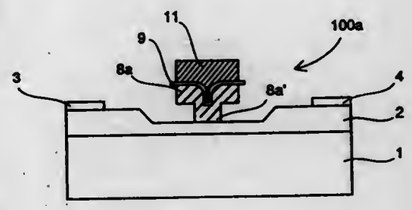
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**5,496,748**

## METHOD FOR PRODUCING REFRACTORY METAL GATE ELECTRODE

**Ryo Hattori, and Yasutaka Kohno, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Sep. 13, 1994, Ser. No. 304,852**
**Claims priority, application Japan, Sep. 20, 1993, 5-232125**
**Int. Cl.[6] H01L *21/265;21/338***
**U.S. Cl. 437—40** **15 Claims**




1. A method for producing a Schottky junction type refractory metal gate electrode having a configuration comprising:

forming a patterning mask layer that is soluble in a solution including hydrogen ions and that has an aperture on a semiconductor substrate;

forming a gate metal layer having an ionization potential larger than that of hydrogen on all of said patterning mask layer;

forming a second metal layer having an ionization potential smaller than that of hydrogen in a pattern on said gate metal layer;

before patterning said gate metal layer, covering part of an upper surface of said second metal layer with a film that does not produce a reduction reaction with the solution including hydrogen ions, leaving part of said second metal layer opposite the aperture exposed;

depositing a third metal layer on said second metal layer where said second metal layer is exposed;

uncovering the upper surface of said second metal layer not covered by said third metal layer and removing the parts of said second metal layer and said first metal layer thus uncovered, thereby exposing part of said patterning mask layer and patterning said gate metal layer, leaving a gate electrode;

covering said gate electrode with a second film that does not produce a reduction reaction with the solution including hydrogen ions;

removing said patterning mask layer employing the solution including hydrogen ions; and

removing said second film.

**5,496,749**

## METHOD OF MANUFACTURING THIN FILM TRANSISTORS IN A LIQUID CRYSTAL DISPLAY APPARATUS

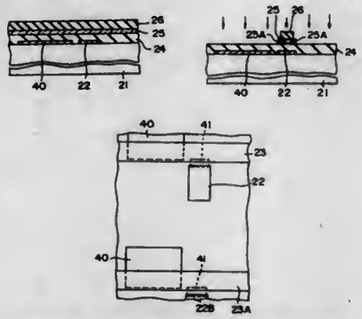
**Yasuhiro Nasu; Teruhiko Ichimura, and Tomotaka Matsumoto, all of Kanagawa, Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Division of Ser. No. 366,914, Dec. 30, 1994, which is a division of Ser. No. 135,030, Oct. 13, 1993, Pat. No. 5,407,845. This application Jun. 1, 1995, Ser. No. 456,836**

**Claims priority, application Japan, Jan. 15, 1992, 4-276884; Feb. 26, 1993, 5-038795; Jul. 8, 1993, 5-169288**

**Int. Cl.[6] H01L *21/786***

**U.S. Cl. 437—40** **6 Claims**



1. A method of manufacturing thin film transistors in a liquid crystal display apparatus, comprising the steps of:

forming an opaque gate electrode and an opaque gate bus line connected to each other by an island-shaped transparent conductive film on a transparent insulating substrate;

growing at least a gate insulator film and a semiconductor film on a region covering said gate electrode and said gate bus line;

applying positive type photoresist onto said semiconductor film;

exposing said positive type photoresist by radiating light from the side of said transparent insulating substrate using said gate electrode and said gate bus line as a mask by exposing from the back of said transparent insulating substrate;

developing said positive type photoresist and leaving the photoresist on said gate electrode and said gate bus line being separated from each other; and

leaving said semiconductor film on said gate electrode and said gate bus line, respectively, by etching said semiconductor film at a portion which is not covered by the pattern of said positive type photoresist.

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**5,496,750**

## ELEVATED SOURCE/DRAIN JUNCTION METAL OXIDE SEMICONDUCTOR FIELD-EFFECT TRANSISTOR USING BLANKET SILICON DEPOSITION

**Mehrdad Moslehi, Los Altos, Calif., assignor to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Sep. 19, 1994, Ser. No. 308,771**

**Int. Cl.[6] H01L *21/265;21/44;21/48***

**U.S. Cl. 437—41** **59 Claims**

1. A method for forming an insulated-gate field-effect transistor comprising the steps of:

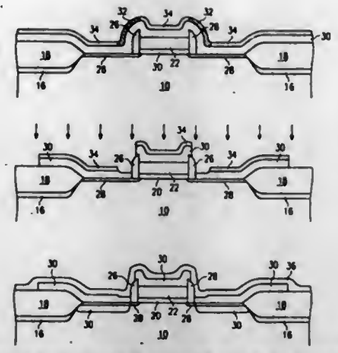
forming a field isolation region surrounding active transistor device regions in a semiconductor substrate;

forming a gate dielectric layer on the surface of said transistor device regions;

forming a gate structure on the surface of said gate dielectric layer;

forming sidewall dielectric spacers on the sidewalls of said gate structure;

forming a blanket conductive layer overall;



forming protective sidewall mask spacers on the portions of said conductive layer extending approximately vertically adjacent to said sidewall dielectric spacers;

forming a protective hard mask layer on the portions of said conductive layer not covered by said protective sidewall mask spacers;

selectively removing said protective sidewall mask spacers; and

selectively etching through exposed regions of said conductive layer where said protective sidewall mask spacers were removed to expose said portions of said conductive layer extending approximately vertically adjacent to said sidewall dielectric spacers.

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**5,496,751**

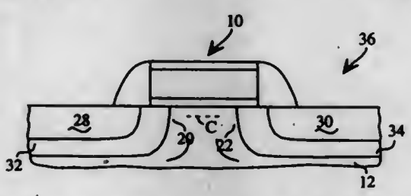
## METHOD OF FORMING AN ESD AND HOT CARRIER RESISTANT INTEGRATED CIRCUIT STRUCTURE

**Yi-Hen Wei; Ying T. Loh, both of Saratoga; Chung S. Wang, Fremont, and Chenming Hu, Alamo, all of Calif., assignors to VLSI Technology, Inc., San Jose, Calif.**

**Continuation of Ser. No. 58,749, May 7, 1993, abandoned. This application Feb. 24, 1995, Ser. No. 394,064**

**Int. Cl.[6] H01L *21/265***

**U.S. Cl. 437—41** **16 Claims**



7. A method for making an integrated circuit device having hot carrier and ESD protection comprising the steps of:

providing a semiconductor substrate of a first polarity type and having a substantially planar substrate surface;

forming a gate over said substrate surface, thereby defining a channel in said substrate having a source side and a drain side;

doping said substrate with a second polarity type by ion implantation into said substrate at an angle between 20° C. and 60° C. With respect to said substrate surface, to form a pair of LDD regions in the substrate, where a drain side LDD is adjacent to said drain side of said channel, and where a source side LDD region is adjacent to said source side of said channel;

forming dielectric spacers over said substrate on said drain side of said gate sidewall and on said source side of said gate sidewall after formation of said source and said drain side LDD regions and prior to formation of a source side DDD region and a drain side DDD region;



doping said substrate with said second polarity type after the formation of said dielectric spacers by ion implantation into said substrate at an angle between 80° C. and 90° C. with respect to said substrate surface, to form a drain region in said substrate proximate said drain side LDD region and to form a source region in said substrate proximate said source side LDD region; and

doping said substrate with said second polarity type by ion implantation into said substrate at an angle between 80° C. and 90° C. with respect to said substrate surface and subsequently annealing the substrate to cause migration of the implanted ions to form said drain side DDD region in said substrate which separates said drain region from said drain side LDD region and isolates said drain region from a bulk portion of said substrate, and said source side DDD region in said substrate which separates said source region from said source side LDD region and isolates said source region from a bulk portion of said substrate to provide ESD protection.

removing at least said contact region between said source electrode and said drain electrode by etching using said source electrode and said drain electrode as a mask.

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**5,496,752**

## METHOD OF MANUFACTURING THIN FILM TRANSISTORS IN A LIQUID CRYSTAL DISPLAY APPARATUS

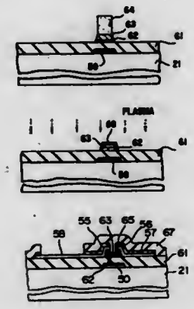
**Yasuhiro Nasu; Teruhiko Ichimura, and Tomotaka Matsumoto, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Division of Ser. No. 366,914, Dec. 30, 1994, Pat. No. 5,462,885, which is a division of Ser. No. 135,030, Oct. 13, 1993, Pat. No. 5,407,845. This application Jun. 1, 1995, Ser. No. 457,264**

**Claims priority, application Japan, Jan. 15, 1992, 4-276884; Feb. 26, 1993, 5-38795; Jul. 8, 1993, 5-169288**

**Int. Cl.[6] H01L *21/786***

**U.S. Cl. 437—41** **10 Claims**



1. A method of manufacturing thin film transistors in a liquid crystal display apparatus, comprising the steps of:

forming a gate electrode on a transparent insulating substrate;

forming a gate insulator film on a region including said gate electrode and forming a pixel electrode transparent conductive film;

growing a first semiconductor film which becomes a semiconductor active layer and a second semiconductor film larger energy band gap than said first semiconductor film on said gate insulator film;

forming a photoresist pattern on the second semiconductor film and inside a position corresponding to a contour of said gate electrode;

patterning to said first semiconductor film and said second semiconductor film using said photoresist pattern as a mask;

forming a contact region by introducing impurities into an upper layer portion of said second semiconductor film after removing said photoresist pattern;

forming a source electrode and a drain electrode connected to said contact region and separated thereon; and

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**5,496,753**

## METHOD OF FABRICATING A SEMICONDUCTOR NONVOLATILE STORAGE DEVICE

**Yasuhiro Sakurai, and Toshiyuki Kishi, both of Saitama, Japan, assignors to Citizen Watch, Co., Ltd., Tokyo, Japan**

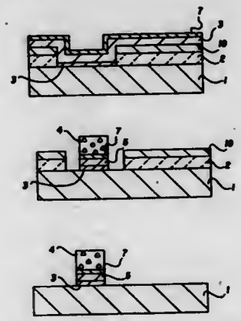
**PCT No. PCT/JP93/00772, § 371 Date Jan. 25, 1994, § 102(e) Date Jan. 25, 1994, PCT Pub. No. WO93/24959, PCT Pub. Date Dec. 9, 1993**

**PCT Filed May 28, 1993, Ser. No. 182,803**

**Claims priority, application Japan, May 29, 1992, 4-161637; Jul. 28, 1992, 4-219643; Mar. 26, 1993, 5-090596**

**Int. Cl.[6] H01L *21/8247***

**U.S. Cl. 437—43** **4 Claims**



1. A method of fabricating a semiconductor device comprising the steps of:

forming a sacrificial oxide film on a silicon substrate;

forming a shielding silicon nitride film over said silicon substrate on which said sacrificial oxide film is formed;

selectively removing said shielding silicon nitride film and said sacrificial oxide film at storage element forming regions to thereby expose the surface of said silicon substrate within each of said storage element forming regions;

forming a tunnel oxide film on the exposed surface of said silicon substrate;

subjecting said tunnel oxide film to a thermal nitriding in an atmosphere including ammonia gas;

forming a charge trapping silicon nitride film or a charge trapping polycrystalline silicon film on said tunnel oxide film which was subjected to the thermal nitriding; and

removing said shielding silicon nitride film at any step after the formation of the charge trapping film.

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**5,496,754**

## METHOD FOR PREVENTING BIT LINE-TO-BIT LINE LEAKAGE IN THE ACCESS TRANSISTOR REGION OF AN AMG EPROM

**Albert M. Bergemont, Santa Clara, Calif., and Graham R. Wolstenholme, Boise, Id., assignors to National Semiconductor Corporation, Santa Clara, Calif.**

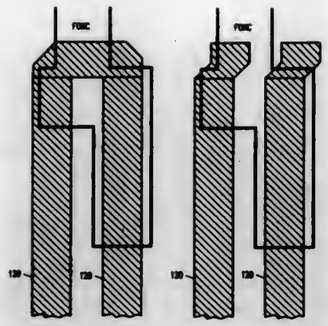
**Filed Mar. 15, 1994, Ser. No. 213,693**

**Int. Cl.[6] H01L *21/8247***

**U.S. Cl. 437—43** **13 Claims**

9. A method for fabricating an electrically programmable read-only-memory (EPROM) on a semiconductor substrate comprising the steps of:

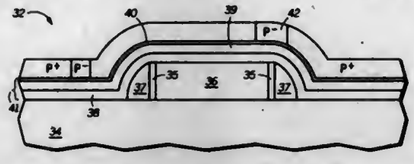
forming a plurality of spaced-apart field oxide regions in the semiconductor substrate;



## 5,496,756
## METHOD FOR FORMING A NONVOLATILE MEMORY DEVICE

Umesh Sharma; Jim Hayden, and Howard C. Kirsch, all of Austin, Tex., assignors to Motorola Inc., Schaumburg, Ill.

Division of Ser. No. 235,735, Apr. 29, 1994. This application Jan. 30, 1995, Ser. No. 340,914
Int. Cl.[6] H01L 21/8247
U.S. Cl. 437—52 9 Claims



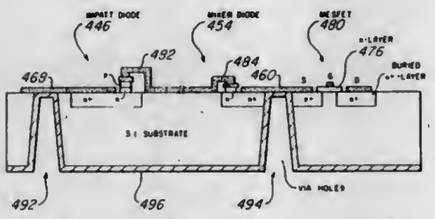
forming a layer of first dielectric material over the semiconductor substrate;
forming a layer of conductive material over the layer of first dielectric material and the field oxide regions;
forming a layer of second dielectric material over the layer of conductive material;
defining a plurality of unmasked, spaced-apart parallel strips, and a plurality of pairs of masked, spaced-apart parallel strips on the layer of second dielectric material, each pair of masked strips having ends which are connected together over a field oxide region; and
etching away the unmasked strips of second dielectric material and the layer of conductive material underlying the unmasked strips of second dielectric material to form a plurality of pairs of spaced-apart parallel strips of second dielectric material and underlying conductive material.

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## 5,496,755
## INTEGRATED CIRCUIT AND METHOD

Burhan Bayraktaroglu, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 443,538, Nov. 29, 1989, Pat. No. 5,347,149. This application Aug. 8, 1994, Ser. No. 287,378
Int. Cl.[6] H01L 21/70
U.S. Cl. 437—51 4 Claims



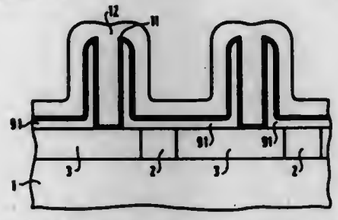

1. A method of fabricating an integrated circuit, comprising the steps of:
(a) implanting contact doped regions in a semi-insulating semiconductor layer;
(b) forming disconnected doped epitaxial semiconductor regions on said semiconductor layer and adjacent said contact regions;
(c) forming diode regions and transistor channel regions in said epitaxial semiconductor regions;
(d) forming diode terminals and transistor gates adjacent said diode regions and transistor channel regions; and
(e) forming interconnections among said diodes and transistors.

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## 5,496,757
## PROCESS FOR PRODUCING STORAGE CAPACITORS FOR DRAM CELLS

Wolfgang Rösner, München, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

PCT No. PCT/DE93/00516, § 371 Date Dec. 6, 1994, § 102(e) Date Dec. 6, 1994, PCT Pub. No. WO94/01891, PCT Pub. Date Jan. 20, 1994
PCT Filed Jun. 15, 1993, Ser. No. 351,464
Claims priority, application Germany, Jul. 8, 1992, 42 22 467.5
Int. Cl.[6] H01L 21/8242
U.S. Cl. 437—52 9 Claims



1. A method for producing storage capacitors for DRAM cells, comprising the steps of:
providing a substrate having a surface entirely covered by $SiO_2$;
depositing a first auxiliary layer of polysilicon over an entire surface of the $SiO_2$ on the substrate;
structuring the first auxiliary layer in accordance with an arrangement of the storage capacitors, so that the first auxiliary layer has openings which in each case surround storage nodes of adjacent storage capacitors;
depositing a second auxiliary layer of $SiO_2$ over an entire surface of the first auxiliary layer, the openings in the first auxiliary layer being filled with $SiO_2$;



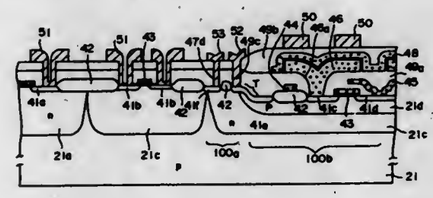
back-etching the second auxiliary layer selectively with respect to the first auxiliary layer, so that the surface of the first auxiliary layer is exposed and dummy portions of $SiO_2$ are left behind in the openings;
completely removing the first auxiliary layer selectively with respect to $SiO_2$;
depositing surface-wide a doped polysilicon layer and structuring the doped polysilicon layer to form storage nodes such that a bottom area defined by the dummy patterns and side walls of the dummy patterns are covered with the storage nodes and the surface of the dummy patterns is in each case exposed in an upper region of the dummy patterns;
substantially removing the dummy patterns selectively with respect to the storage nodes; and
producing surface-wide a storage dielectric and producing a conductive layer as a cell plate.

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## 5,496,758
## FABRICATION PROCESS OF A SEMICONDUCTOR MEMORY DEVICE HAVING A MULTIPLE WELL STRUCTURE IN A RECESSED SUBSTRATE

Taiji Ema, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 14, 1994, Ser. No. 355,489
Claims priority, application Japan, Mar. 1, 1994, 6-031611
Int. Cl.[6] H01L 21/70;27/00
U.S. Cl. 437—52 6 Claims



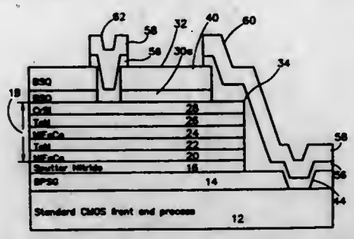
1. A method for fabricating a semiconductor memory device, comprising the steps of:
forming, on a first region of a semiconductor substrate of a first conductivity type, a first well of a second, opposite conductivity type;
a mask process for forming a mask pattern on a surface of said semiconductor substrate, such that a second region, which is included in said first region, is exposed;
introducing an impurity element of said first conductivity type into the surface of said semiconductor substrate in correspondence to said second region while using said mask pattern as a mask;
causing a diffusion of said impurity element in said semiconductor substrate to form a second well of said first conductivity type in said first well in correspondence to said second region;
causing an oxidation of the surface of said semiconductor substrate while using said mask pattern as a mask, to form an oxide layer on said second well such that said oxide layer covers said second well; and
removing said oxide layer to form a recessed surface on the surface of said semiconductor substrate in correspondence to said second region, such that said recessed surface has a level lower than a level of a surface of said first region.

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## 5,496,759
## HIGHLY PRODUCIBLE MAGNETORESISTIVE RAM PROCESS

Jerry Yue, Roseville; Allan T. Hurst, Anoka; Tangshiun Yeh, St. Paul, and Huang-Joung Chen, Eagan, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 29, 1994, Ser. No. 365,852
Int. Cl.[6] H01L 21/8239
U.S. Cl. 437—52 15 Claims




1. A process for forming a magnetoresistive memory on a semiconductor substrate having an underlying integrated circuit component and an insulating layer formed thereover, and forming an interconnecting between said device and said underlying component, comprising the steps of:
forming a first insulating layer on said substrate;
forming a materials stack on said first insulating layer;
forming a first amorphous dielectric layer on said materials stack;
selectively removing portions of said first amorphous dielectric layer to define a pattern for a magnetic bit;
removing portions of said materials stack and said first insulating layer according to said pattern to define a magnetic bit having a bit edge profile and having a bit end located over said underlying component;
forming a second amorphous dielectric layer over said first amorphous dielectric layer;
removing portions of said second amorphous dielectric layer to expose said bit end with a remaining portion of said second amorphous dielectric layer protecting said bit edge profile;
selectively forming a via in said insulating substrate at said bit end to expose a portion of said underlying component;
forming a first conductive layer over said second amorphous dielectric layer, said first conductive layer contacting said bit end and extending into said via and contacting said component; and
etching said first conductive layer to form said interconnection.

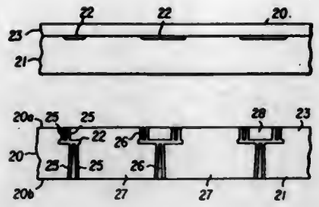
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## 5,496,760
## METHOD FOR MANUFACTURING DIELECTRICS DIVIDING WAFER WITH ISOLATED REGIONS

Kazuo Matsuzaki, Matsumoto, Japan, assignor to Fuji Electric Company, Ltd., Japan

Division of Ser. No. 186,890, Jan. 27, 1994, Pat. No. 5,381,033, which is a continuation of Ser. No. 877,723, May 4, 1992, abandoned. This application Aug. 18, 1994, Ser. No. 291,991
Claims priority, application Japan, May 9, 1991, 3-102897
Int. Cl.[6] H01L 21/301
U.S. Cl. 437—62 1 Claim

1. A method to manufacture a dielectrics dividing wafer, comprising the steps of: forming dielectric films in a pattern on at least one face of two semiconductor substrates; bonding the substrates together at the faces to form a single wafer having a front face surface and a rear face surface and having the dielectric films located internally to the single wafer; cutting grooves in the form of a vertical wall from the front face surface and the rear face surface of the single wafer so that the grooves reach the dielectric films; attaching partition dielectric films to the sides of the grooves; and filling the grooves with polycrystalline silicon; wherein semiconductor regions, surrounded by the partition dielec-



tric films, are formed continuously from the front face surface of the single wafer to the rear face surface of the single wafer.

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**5,496,761**

## METHOD OF MAKING JUNCTION-ISOLATED HIGH VOLTAGE MOS INTEGRATED DEVICE

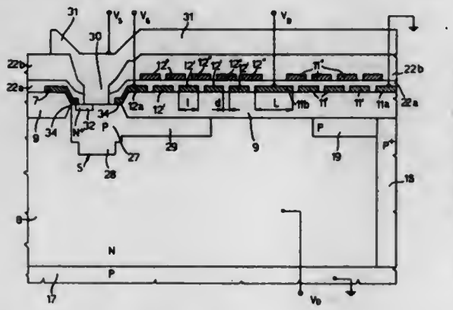
**Enrico M. A. Ravanelli, Monza, and Flavio Villa, Milan, both of, Italy, assignors to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy**

**Division of Ser. No. 47,965, Apr. 15, 1993, Pat. No. 5,434,445. This application Jun. 2, 1995, Ser. No. 456,660**

**Claims priority, application European Pat. Off., Apr. 17, 1992, 92830190**

**Int. Cl.[6] H01L *21/761***

**U.S. Cl. 437—60** **2 Claims**



1. A method of producing a junction-isolated integrated device comprising the steps of:

providing at least one epitaxial pocket of a first conductivity type;

defining source and drain regions within the at least one epitaxial pocket;

substantially surrounding the at least one epitaxial pocket with at least one isolating region of a second conductivity type;

substantially covering the at least one epitaxial pocket with at least one layer of electrically insulating material;

providing at least one electrically conductive connection on the at least one layer of electrically insulating material;

embedding a first chain of capacitors in the at least one layer of electrically insulating material; and

biasing first terminal elements, coupled to the first chain of capacitors, to predetermined voltage potentials.

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**5,496,762**

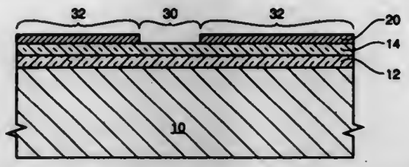
## HIGHLY RESISTIVE STRUCTURES FOR INTEGRATED CIRCUITS AND METHOD OF MANUFACTURING THE SAME

**Gurtej S. Sandhu; Trung T. Doan, and David A. Cathey, all of Boise, Id., assignors to Micron Semiconductor, Inc., Boise, Id.**

**Filed Jun. 2, 1994, Ser. No. 253,849**

**Int. Cl.[6] H01L *21/70***

**U.S. Cl. 437—60** **16 Claims**



1. A process for manufacturing highly-resistive structures for use in integrated circuits, said process comprising the following sequence of steps:

(a) forming an insulative layer on a semiconductor substrate;

(b) depositing a predominantly amorphous titanium carbonitride layer on top of the insulative layer;

(c) depositing a titanium layer on top of the titanium carbonitride layer;

(d) masking the titanium layer so as to protect certain portions thereof and expose other portions thereof;

(e) removing the exposed portions of the titanium layer so as to expose the underlying titanium carbonitride layer; and

(f) oxidizing the exposed portions of the titanium carbonitride layer.

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**5,496,763**

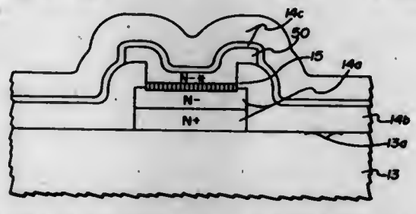
## METHOD OF FABRICATING AN ELECTRICALLY ALTERABLE RESISTIVE COMPONENT ON AN INSULATING LAYER

**Hanan Potash, La Jolla; Melvyn E. Genter, and Bruce B. Roesner, both of San Diego, all of Calif., assignors to Unisys Corporation, Blue Bell, Pa.**

**Division of Ser. No. 133,479, Oct. 7, 1993, Pat. No. 5,407,851, which is a division of Ser. No. 9,372, Jan. 26, 1993, Pat. No. 5,296,722, which is a continuation of Ser. No. 802,572, Dec. 5, 1991, abandoned, which is a division of Ser. No. 237,429, Feb. 23, 1981, Pat. No. 5,148,256. This application Nov. 14, 1994, Ser. No. 337,807**

**Int. Cl.[6] H01L *29/04;21/70***

**U.S. Cl. 437—60** **6 Claims**



1. A process for fabricating an electrically alterable resistive component in an integrated circuit which includes a semiconductor substrate having a major surface and an insulating layer over said surface; said process including the steps of:

forming a bottom electrical lead on said insulating layer;

depositing and patterning a layer of electrically alterable material such that the patterned electrically alterable material overlies and is coupled to said bottom lead;

forming a top electrical lead which extends over and is there coupled to said electrically alterable material;



limiting said electrically alterable material to consist essentially of silicon having dopant atoms which are at interstitial locations in said silicon;

confining said electrically alterable material, from its deposition to the end of said process, to temperatures of less than 600° C.; and,

applying a threshold voltage across said top and bottom electrical leads with a magnitude that causes said silicon to switch irreversibly from an initial high resistance to a greatly reduced resistance.

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**5,496,764**

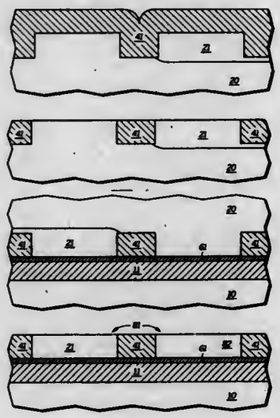
## PROCESS FOR FORMING A SEMICONDUCTOR REGION ADJACENT TO AN INSULATING LAYER

**Shih-Wei Sun, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.**

**Filed Jul. 5, 1994, Ser. No. 270,542**

**Int. Cl.[6] H01L *21/76***

**U.S. Cl. 437—67** **28 Claims**



1. A process for forming a semiconductor region adjacent to an insulating layer comprising the steps of:

forming a first insulating layer over a first substrate;

forming a doped region within a second substrate, wherein:

the doped region has a first conductivity type;.

the second substrate has a second conductivity type that is opposite the first conductivity type; and

this step is performed before bonding the first and second substrates;

forming a trench within a second substrate, wherein the trench is no wider than 1.0 micron;

forming a second insulating layer within the trench;

bonding the first and second substrates together such that the first and second insulating layers are adjacent to each other; and

removing a portion of the second substrate to expose portions of the second insulating layer to form a first active region from the doped region and a second active region from the second substrate, wherein:

the first active region has the first conductivity type and the second active region has the second conductivity type; and

the first and second active regions lie on opposite sides of the trench.

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**5,496,765**

## METHOD FOR MANUFACTURING AN INSULATING TRENCH IN A SUBSTRATE FOR SMART-POWER TECHNOLOGIES

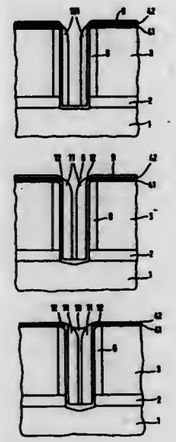
**Udo Schwalke, Heldenstein, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany**

**Continuation of Ser. No. 264,142, Jun. 21, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 479,819**

**Claims priority, application Germany, Jun. 23, 1993, 43 20 884.3**

**Int. Cl.[6] H01L *21/76***

**U.S. Cl. 437—67** **8 Claims**



1. Method for manufacturing an insulation trench in an SOI substrate having integrated logic components and high-voltage power components, said method comprising the steps of:

providing an SOI substrate having a monocrystalline silicon wafer, an insulating layer of $SiO_2$ oriented thereon and a monocrystalline silicon layer oriented on said insulating layer;

etching a trench into said monocrystalline silicon layer, said trench extending down to said insulating layer;

providing sidewalls of said trench with an occupation layer containing a dopant wherein said occupation layer is produced with doped glass in a CVD method at atmospheric pressure (APCVD);

producing diffusion regions in said monocrystalline silicon layer neighboring said trench by drive-out of dopant from said occupation layer onto said monocrystalline silicon layer wherein said drive-out, occurs during a temperature step causing said occupation layer to flow;

removing said occupation layer completely;

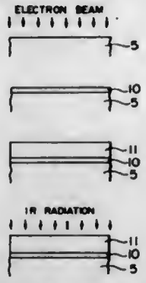
producing a silicon layer having essentially conformal edge coverage of said trench by amorphously depositing said silicon layer; and

producing an insulation structure in said trench by thermal oxidation.

**5,496,766**
**METHOD FOR PRODUCING A LUMINOUS ELEMENT OF III-GROUP NITRIDE**

**Hiroshi Amano; Isamu Akasaki, both of Nagoya; Toshiyuki Tanaka; Teruo Tohma, both of Tsurugashima, and Katsuhide Manabe, Nishikasugai, all of, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan**

**Filed Mar. 28, 1995, Ser. No. 411,467**
**Claims priority, application Japan, Mar. 28, 1994, 6-057545**
**Int. Cl.[6] H01L 21/20**
**U.S. Cl. 437—127** **4 Claims**




1. A process for producing a luminous element of III-group nitride semiconductor having a crystal layer $(Al_xGa_{1-x})_{1-y}In_yN$ $(0 \leq x \leq 1, 0 \leq y \leq 1)$ to which a II-group element is added, comprising the steps of;

forming a crystal layer $(Al_xGa_{1-x})_{1-y}In_yN$ $(0 \leq x \leq 1, 0 \leq y \leq 1)$ to which a II-group element is added;

irradiating a low energy electron beam onto a topmost surface of said crystal layer to reform only said crystal layer;

forming a thin film for absorbing optical energy on said topmost surface of said crystal layer; and

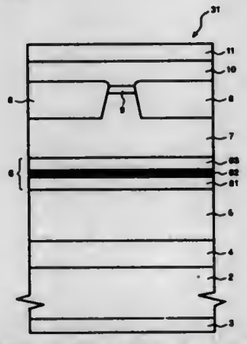
pulse-heating said thin film for absorbing optical energy by heating means to reform only said crystal layer.

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**5,496,767**
**SEMICONDUCTOR LASER AND MANUFACTURING METHOD OF THE SAME**

**Ichiro Yoshida, Yokohama, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan**

**Continuation of Ser. No. 126,623, Sep. 27, 1993, which is a division of Ser. No. 761,869, Sep. 18, 1991, Pat. No. 5,276,698. This application Apr. 28, 1994, Ser. No. 233,437**
**Claims priority, application Japan, Sep. 28, 1990, 2-258743; Jan. 18, 1990, 2-280041**
**Int. Cl.[6] H01L 21/20**
**U.S. Cl. 437—129** **13 Claims**




1. A method for manufacturing a semiconductor laser having a multi-quantum well structure of AlGaInP formed in an active layer, comprising the step of:

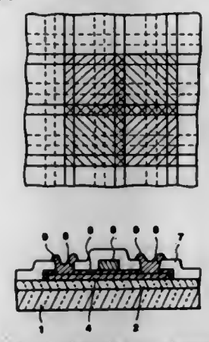
epitaxially growing the multi-quantum well structure by periodically changing a supply rate of only In.

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**5,496,768**
**METHOD OF MANUFACTURING POLYCRYSTALLINE SILICON THIN FILM**

**Toshio Kudo, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan**

**Filed Nov. 23, 1994, Ser. No. 344,502**
**Claims priority, application Japan, Dec. 3, 1993, 5-338960; Jun. 27, 1994, 6-165778**
**Int. Cl.[6] H01L 21/268; C30B 1/00**
**U.S. Cl. 437—174** **17 Claims**




17. A method of manufacturing a polycrystalline silicon thin film, in which a scanning laser beam is irradiated on an amorphous silicon thin film a plurality of times, so as to convert the amorphous silicon thin film into a polycrystalline silicon thin film, comprising:

a first laser beam radiation step comprising irradiating a scanning laser beam on a plurality of first unit regions at a scanning pitch which has a width in a scanning direction which is smaller than an area defined by the beam size of the first scanning laser beam; and

a plurality of steps of laser beam radiation from a second step onward comprising for each of said plurality of steps of laser beam radiation irradiating a second scanning laser beam on a plurality of second unit regions on the amorphous silicon thin film on which the first laser beam radiation step was carried out, at a scanning pitch which has a width which is smaller than an area defined by a beam size of the laser beam in each of said plurality of steps of laser beam radiation, each of said second unit regions being shifted from the regions of the previous laser beam radiation, so that at least a part of said each of the second unit regions in each of said plurality of steps of laser beam radiation overlaps a part of corresponding first unit regions irradiated and scanned in the first laser beam radiation step.

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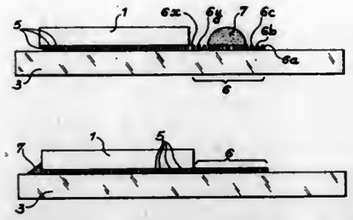
**5,496,769**
**PROCESS FOR COATING ELECTRONIC COMPONENTS HYBRIDIZED BY BUMPS ON A SUBSTRATE**

**François Marion, Saint Egreve, and Michelle Boitel, Fontaine, both of, France, assignors to Commissariat a l'Energie Atomique, France**

**Filed Apr. 14, 1994, Ser. No. 227,583**
**Claims priority, application France, Apr. 30, 1993, 93 05146**
**Int. Cl.[6] H01L 21/44**
**U.S. Cl. 437—183** **3 Claims**

1. A process for coating electronic components fitted on a substrate using a bump hybridization procedure, characterized in that it comprises placing the bumps on the substrate adjacent to an electronic component in order to form a carpet of bumps contiguous to bumps between said electronic component and said substrate and depositing at least one drop of a coating substance on the bump carpet, the bumps of the carpet impregnated with the substance being able to make said substance migrate by capillarity toward the bumps located between the electronic component and said substrate.






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**5,496,770**
**METHOD FOR MANUFACTURING A SEMICONDUCTOR CHIP BUMP HAVING IMPROVED CONTACT CHARACTERISTICS**

**Chun-Geun Park, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea**

**Filed Feb. 8, 1994, Ser. No. 194,361**
**Claims priority, application Rep. of Korea, Feb. 8, 1993, 93-1663**
**Int. Cl.[6] H01L 21/44**
**U.S. Cl. 437—183** **10 Claims**




1. A method for manufacturing a connection bump on a semiconductor chip bonding pad, comprising the steps of:

(a) depositing a first photoresist layer on said bonding pad;

(b) exposing said first photoresist layer;

(c) depositing a second photoresist layer on said exposed first photoresist layer;

(d) exposing a portion of said second photoresist layer and further exposing a portion of said exposed first photoresist layer through a pattern mask;

(e) developing said exposed first and second photoresist layer portions to obtain a photoresist pattern; and

(f) depositing a metal in the photoresist pattern to obtain a connection bump.

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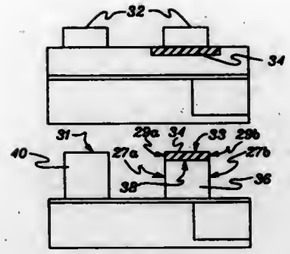
**5,496,771**
**METHOD OF MAKING OVERPASS MASK/INSULATOR FOR LOCAL INTERCONNECTS**

**John E. Cronin, Milton; Carter W. Kaanta, Colchester; Randy W. Mann; Darrell Meulemans, both of Jericho, and Gordon S. Starkey, Essex Junction, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed May 19, 1994, Ser. No. 245,997**
**Int. Cl.[6] H01L 21/44;21/48**
**U.S. Cl. 437—187** **36 Claims**

1. A method for fabricating a semiconductor structure, said method comprising the steps of:

(a) damascening a first mask of electrically insulative material into an electrically conductive material;




(b) forming a second mask above said electrically conductive material;

(c) using both said first mask and said second mask to define a conductor image for an overpass conductor; and

(d) permanently retaining said first mask as an overpass insulator electrically insulating a portion of said electrically conductive material from the overpass conductor.

29. A method for fabricating a gate stack and an overpass conductor, said method comprising the steps of:

(a) forming the gate stack above a substrate, said gate stack forming including damascening an insulator layer into a conductor layer such that said gate stack includes a portion of said conductor layer and a portion of said insulator layer;

(b) using said portion of said insulator layer in said gate stack as an overpass mask to partially define a conductor image for the overpass conductor; and

(c) forming the overpass conductor above said gate stack such that said overpass conductor is insulated from the portion of said conductor layer in said gate stack by the portion of said insulator layer in the gate stack.

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**5,496,772**
**METHOD OF MANUFACTURING FILM CARRIER TYPE SUBSTRATE**

**Akinori Ebe; Kiyoshi Ogata, and Satoshi Nishiyama, all of Kyoto, Japan, assignors to Nissin Electric Co., Ltd., Kyoto, Japan**

**Filed Jun. 4, 1992, Ser. No. 892,380**
**Claims priority, application Japan, Apr. 7, 1992, 4-085757; Apr. 7, 1992, 4-085759**
**Int. Cl.[6] H01L 21/44**
**U.S. Cl. 437—187** **2 Claims**




1. A method of manufacturing a film carrier type substrate in vacuum, comprising the steps of:

depositing metal vapor on a file made of organic high molecular substance; and

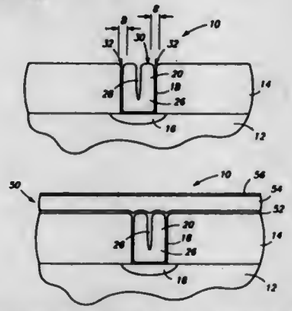
irradiating accelerated nitrogen gas ions on said film simultaneously with the step of depositing metal vapor, an accelerating energy x of which is defined by the range 2 KeV<x<10 KeV, whereby a metal layer is formed over said film and a mixing layer made of a mixture of materials of both said metal layer and said film is formed in an interface between said metal layer and said film.

**5,496,773**

## SEMICONDUCTOR PROCESSING METHOD OF PROVIDING AN ELECTRICALLY CONDUCTIVE INTERCONNECTING PLUG BETWEEN AN ELEVATIONALLY INNER ELECTRICALLY CONDUCTIVE NODE AND AN ELEVATIONALLY OUTER ELECTRICALLY CONDUCTIVE NODE

**Howard E. Rhodes; Timothy P. O'Brien, and Rod C. Langley, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.**

**Filed Apr. 28, 1995, Ser. No. 430,758**
**Int. Cl.[6] H01L** *21/283;21/3065*
**U.S. Cl. 437—189** **17 Claims**



1. A multi-metal layer semiconductor processing method comprising provision and patterning of at least two separate metal layers, the metal layers comprising an inner Metal 1 layer and an outer Metal 2 layer, the method comprising provision of an electrically conductive interconnecting plug between an elevationally inner conductive node location and the Metal 1 layer, the method comprising the following steps:

providing an inner node location to which electrical connection is to be made;

providing an electrically insulative layer outwardly over the inner node location;

patterning and etching a contact opening through the insulative layer to the inner node location;

providing a conductive plug within the contact opening to the inner node location, and providing an outermost fang gap between the conductive plug and the electrically insulative layer, the fang gap having a first width;

widening the fang gap to a second width which is greater than the first width by a timed RF plasma etch of the electrically conductive material;

providing a Metal 1 layer over the conductive plug after the widening step, the Metal 1 layer at least partially filling the widened fang gap;

patterning the Metal 1 layer into a conductive line which electrically interconnects with the electrically conductive plug; and

providing and patterning a Metal 2 layer outwardly of the Metal 1 layer.

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**5,496,774**

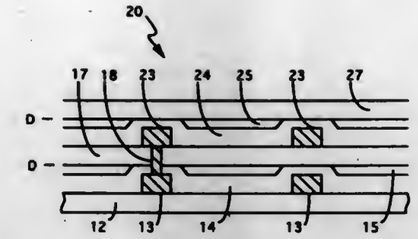
## METHOD IMPROVING INTEGRATED CIRCUIT PLANARIZATION DURING ETCHBACK

**Dipankar Pramanik, Saratoga; Vivek Jain, Milpitas, and Milind G. Weling, San Jose, all of Calif., assignors to VLSI Technology, Inc., San Jose, Calif.**

**Continuation-in-part of Ser. No. 161,642, Dec. 1, 1993, Pat. No. 5,399,533. This application Dec. 21, 1994, Ser. No. 363,062**
**Int. Cl.[6] H01L** *21/44*
**U.S. Cl. 437—195** **10 Claims**

1. A method of manufacturing an integrated circuit, on a substrate, comprising the steps of:

depositing a patterned metal layer on said substrate; and



fabricating a dielectric cover over the patterned metal layer, comprising the steps of:

depositing a first oxide layer over the substrate and the patterned metal layer, wherein the first oxide layer is deposited in such manner to create hills in the first oxide layer having metal thereunder and valleys in the first oxide layer having no metal thereunder;

depositing a nitride layer, absent sufficient oxygen to cause liberation of oxygen during etchback, over the first oxide layer, wherein the nitride layer is deposited in such a manner to create hills in the nitride layer having metal thereunder and valleys in the nitride layer having no metal thereunder;

depositing a spin on glass (SOG) layer on the nitride layer thereby predominantly filling the valleys in the nitride layer;

etching back the SOG layer and the hills of the nitride layer to create a substantially planar surface; and

depositing a second oxide layer on the substantially planar surface resulting in a substantially planar oxide layer.

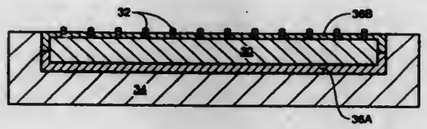
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**5,496,775**

## SEMICONDUCTOR DEVICE HAVING BALL-BONDED PADS

**J. M. Brooks, Caldwell, Id., assignor to Micron Semiconductor, Inc., Boise, Id.**

**Division of Ser. No. 914,275, Jul. 15, 1992, abandoned. This application Apr. 8, 1994, Ser. No. 225,196**
**Int. Cl.[6] H01L** *21/60*
**U.S. Cl. 437—219** **21 Claims**



1. A process for forming a semiconductor device, comprising the following steps:

a) forming a semiconductor die having a back and a front, said front having pads thereon;

b) forming a tower of conductive balls on at least one of said pads;

c) providing a cavity bar holder having a cavity therein;

d) forming a first layer of encapsulation material within said cavity, thereby partially filling said cavity with said first layer of encapsulation material;

e) placing said back of said semiconductor die in contact with said first layer of encapsulation material;

f) forming a second layer of encapsulation material within said cavity to cover said semiconductor die, thereby encapsulating said die with said first and second layers of encapsulation material and leaving a portion of each said tower exposed; and

g) removing the encapsulated die from said cavity.

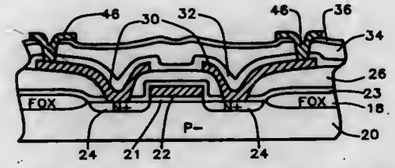


**5,496,776**

## SPIN-ON-GLASS PLANARIZATION PROCESS WITH ION IMPLANTATION

**Sun-Chieh Chien; Chen-Chiu Hsue, and Yu-Ju Liu, all of Hsin-Chu, Taiwan, Prov. of China, assignors to United Microelectronics Corporation, Hsin-Chu, Taiwan, Prov. of China**

**Filed Apr. 27, 1995, Ser. No. 429,809**
**Int. Cl.[6] H01L** *21/469*
**U.S. Cl. 437—231** **10 Claims**



1. A method for forming a moisture sorption and outgassing resistant spin-on-glass sandwich layer for integrated circuit applications, comprising:

forming a first layer of silicon oxide over an integrated circuit surface;

depositing a spin-on-glass layer over the first silicon oxide layer;

thermally curing the spin-on-glass layer to form a cured spin-on-glass layer;

implanting ions selected from the group of ions consisting of Monoatomic Boron, Nitrogen, Oxygen and Monoatomic Fluorine ions into and through the cured spin-on-glass layer, the ions being of sufficient dosage and energy to cause structural changes within the complete depth of the cured spin-on-glass layer, which structural changes cause the cured spin-on-glass layer to be moisture sorption and outgassing resistant; and

depositing a second silicon oxide layer over the cured span-on-glass layer.

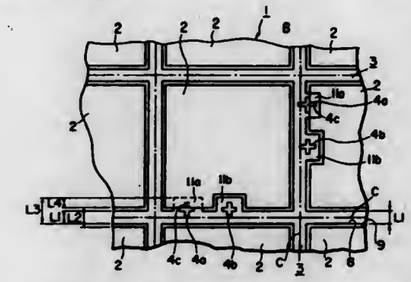
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**5,496,777**

## METHOD OF ARRANGING ALIGNMENT MARKS

**Norio Moriyama, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan**

**Filed Aug. 19, 1994, Ser. No. 293,148**
**Claims priority, application Japan, Aug. 26, 1993, 5-234144**
**Int. Cl.[6] H01L** *21/461*
**U.S. Cl. 437—249** **12 Claims**



1. A method of arranging alignment marks, comprising the steps of:

forming a plurality of structures on a semiconductor wafer with scribing lines between said plurality of structures, each of said scribing lines comprising a first area having a first width, a second area having a second width larger than said first width and a third area having a third width larger than said first width, and forming a first alignment mark arranged within said second area;

covering said second area with a first film such that said second width of said second area is reduced toward said first width of said first area; and

arranging a second alignment mark within said third area.

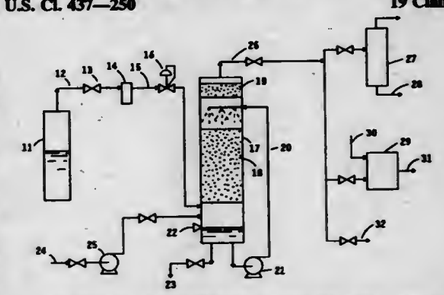
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**5,496,778**

## POINT-OF-USE AMMONIA PURIFICATION FOR ELECTRONIC COMPONENT MANUFACTURE

**Joe G. Hoffman, Cardiff-by-the-Sea, and R. Scot Clark, Fallbrook, both of Calif., assignors to Startec Ventures, Inc., Fallbrook, Calif.**

**Filed Jan. 7, 1994, Ser. No. 179,001**
**Int. Cl.[6] C01C** *1/00*
**U.S. Cl. 437—250** **19 Claims**



1. A system for the preparation of ultra-high purity ammonia, said system comprising:

(a) a reservoir of liquid ammonia with a vapor space above said liquid ammonia;

(b) means for drawing vapor containing ammonia gas from said vapor space;

(c) a filtration membrane removing particles greater than 0.005 micron from vapor thus drawn; and

(d) an aqueous ammonia scrubber containing an aqueous solution of ammonia in deionized water, arranged to contact filtered vapor having passed through said filtration membrane with said aqueous solution, the vapor thus scrubbed being purified ammonia gas.

9. A method for supplying a high-purity ammonia reagent to a workstation in a production line for the manufacture of a high-precision electronic component, said method comprising:

(a) drawing ammonia gas from a vapor space above liquid ammonia in an ammonia-containing reservoir;

(b) passing said ammonia gas through a filtration membrane removing particles greater than 0.005 micron therefrom;

(c) passing said ammonia gas thus filtered through a scrubber wherein said ammonia gas is contacted with an aqueous solution of ammonia in deionized water; and

(d) recovering said ammonia gas emerging from said scrubber and directing said ammonia gas to said workstation.

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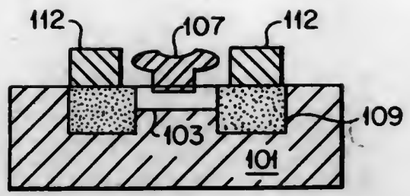
**5,496,779**

## METHOD FOR FABRICATING A SELF-ALIGNED T-GATE METAL SEMICONDUCTOR FIELD EFFECT TRANSISTOR

**Kyung-Ho Lee; Youn-Kyu Bae; Kwang-Eui Pyun, and Kyung-Soo Kim, all of Daejeon, Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Daejeon-Shi, Rep. of Korea**

**Filed Dec. 19, 1994, Ser. No. 358,886**
**Claims priority, application Rep. of Korea, Nov. 15, 1994, 94-29931**
**Int. Cl.[6] H01L** *21/265*
**U.S. Cl. 437—40** **5 Claims**

1. A method for fabricating a metal semiconductor field effect transistor, comprising the steps of




defining an N channel over a GaAs substrate with a photo-resist film and ion implanting Si to form the channel using the photo-resist film;
removing the photo-resist film;
sequentially forming a first insulation layer at a first temperature and a second insulation layer at a second temperature over the surface of the substrate, said first temperature being higher than said second temperature;
coating a photo-resist film on the second insulation layer and patterning it to form a gate pattern;
etching the first and second insulation layers using the gate pattern of the photo-resist pattern as a mask to expose the substrate;
removing the gate pattern of the photo-resist film;
forming a refractory metal over the surface of the first and second insulation layer and the exposed channel region;
etching the refractory metal, thereby dividing it into two parts, of which one is formed on the channel region and the other is formed on the second insulation layer;
selectively etching the first and second insulation layers to lift-off the refractory metal over the first and second insulation layers to lift-off the refractory metal over the first and second insulation layers, thereby forming a gate of a T-shape at the channel region;
coating a photo-resist film and patterning it to form a channel pattern of the photo-resist film;
ion implanting Si into the substrate using the gate and the channel pattern of the photo-resist film to form a self-aligned high concentration ion implantation region;
removing the channel pattern of the photo-resist film;
forming a third insulation layer for preventing As of the substrate from evaporating over all the surfaces of the substrate;
carrying out a rapid thermal annealing for activation;
removing the third insulation layer; and
forming an ohmic electrode using a lift-off process.

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**5,496,780**

**METHOD FOR PRODUCING SILICA BRICK**

**Kenji Ichikawa, Okayama; Hisayuki Harako, Tokyo; Teiichi Fujiwara, and Masashi Taniguchi, both of Okayama, all of, Japan, assignors to Shinagawa Refractories Co., Ltd., Tokyo, Japan**

**Filed Feb. 7, 1995, Ser. No. 385,309**
**Claims priority, application Japan, Mar. 2, 1994, 6-056572**
**Int. Cl.[6] C04B** *35/14*
**U.S. Cl. 501—133** **4 Claims**

1. A method for producing silica brick comprising firing a siliceous stone material containing silica as a main component, wherein from 0.05 to 0.25% by weight of $Na_2O$—CaO— $SiO_2$ fused and solidified material and from 0.1 to 1.0% by weight, in terms of $Fe_2O_3$, of iron oxide, based on the siliceous stone material are added to the siliceous stone material, before firing.

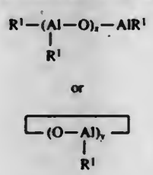
**5,496,781**

**METALLOCENE CATALYST SYSTEMS, PREPARATION, AND USE**

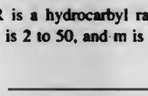
**Rolf L. Geerts; Syriac J. Palackal; Ted M. Pettijohn, all of Bartlesville, and Robert M. Infield, Barnsdall, all of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed May 16, 1994, Ser. No. 242,901**
**Int. Cl.[6] C08F** *4/602;4/605*
**U.S. Cl. 502—104** **23 Claims**

21. A catalyst system useful in olefin polymerization, said catalyst system comprising the reaction product of a metallocene compound, a solid organoaluminoxy product, and an organometal compound represented by the formula $R_mEX_n$, where R is a hydrocarbyl radical having 1 to 20 carbon atoms, E is Mg, Al, B, Ga, or Zn, X is hydride, halide, —OR' wherein R' is an alkyl radical containing 1 to 8 carbon atoms, or $—NH_2$, m is 1 to 3, n is 0 to 2, and the sum of m plus n equals the valence of E;
wherein said solid organoaluminoxy product is prepared by reacting an organoaluminoxane and an oxygen-containing compound selected from the group consisting of organo boroxines, organic peroxides, alkylene oxides, and organic carbonates;
wherein said organoaluminoxane is represented by the formulas:



or



wherein each R is a hydrocarbyl radical containing 1 to 8 carbon atoms, n is 2 to 50, and m is 3 to 50.

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**5,496,782**

**CATALYST SYSTEM, USE OF THIS CATALYST SYSTEM FOR THE (CO)POLYMERIZATION OF OLEFINS, PROCESS FOR PREPARING THIS CATALYST SYSTEM AND OLEFIN (CO) POLYMERIZATION PROCESS**

**Nicola Zandona, Waterloo, Belgium, assignor to Solvay (Société Anonyme), Brussels, Belgium**

**Filed Dec. 8, 1993, Ser. No. 162,940**
**Claims priority, application Belgium, Dec. 17, 1992, 09201105**
**Int. Cl.[6] B01J** *31/00*
**U.S. Cl. 502—113** **18 Claims**

1. A catalyst system comprising (a) at least one ionic metallocene derived from a transition metal, prepared by reaction of a neutral halogenated metallocene with an ionizing agent selected from the group consisting of tris(pentafluorophenyl)boron, triphenylboron, trimethylboron, tris(trimethylsilyl) borate, and organoboroxines or an ionizing agent consisting of a first part exhibiting properties of a Lewis acid selected from the group consisting of carbenium, sulfonium, and oxonium and capable of ionizing said neutral halogenated metallocene, and a second part which is capable of stabilizing said ionic metallocene and which is inert toward the ionized metallocene, (b) at least one catalytic solid containing 15 to 20% by weight of titanium, 0.5 to 20% by weight of magnesium and 30 to 40% by weight of chlorine, and (c) at least one aluminium derivative of general formula $AlX_nT_{3-n}$ in which X denotes a halogen, T denotes a hydrocarbon radical which may optionally include oxygen and n is a number from 0 to 3.



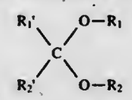
**5,496,783**

**CATALYST FOR THE PRODUCTION OF LIGHT ALPHA OLEFINS BY OLIGOMERIZATION OF ETHYLENE**

**Yves Chauvin, Le Pecq; Dominique Commereuc, Meudon; Francois Hugues, Vernaison; Helene Olivier, Rueil Malmaison, and Lucien Saussine, Croissy sur Seine, all of, France, assignors to Institut Francais du Petrole, Rueil Malmaison, France**

**Division of Ser. No. 88,508, Jul. 9, 1993, Pat. No. 5,345,023. This application Jun. 2, 1994, Ser. No. 253,017**
**Claims priority, application France, Jul. 9, 1992, 92 08658**
**Int. Cl.[6] B01J** *31/38;* **C08F** *4/642*
**U.S. Cl. 502—125** **12 Claims**

1. A catalyst for the conversion of ethylene into light alpha olefins, which comprises:
a zirconium compound of the formula $ZrX_xY_yO_z$, in which X is a chlorine or bromine atom, Y is a radical selected from the group consisting of RO—, $(R)_2N$— and RCOO— groups, in which R is a hydrocarbyl radical having 1 to 30 carbon atoms, x and y are 0 or an integer of 1 to 4, and z is 0 or 0.5, the sum x+y+2z being equal to 4,
an organic acetal or ketal compound of formula



in which $R'_1$ and $R'_2$ are independently a hydrogen atom or a hydrocarbyl radical having 1 to 30 carbon atoms and $R_1$ and $R_2$ are independently hydrocarbyl radicals having 1 to 30 carbon atoms, and
an aluminum compound of the formula $AlR"_nX_{3-n}$, in which R" is a hydrocarbyl radical having 1 to 6 carbon atoms, X is a chlorine or bromine atom and n is a number of from 1 to 2,
such that the molar ratio of the acetal or ketal compound to the zirconium compound is approximately 0.1:1 to 5:1 and the molar ratio of the aluminum compound to the zirconium compound is approximately 1:1 to 100:1.

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**5,496,784**

**CHEMICAL RESISTANT COATING COMPOSITIONS**

**Norman R. Byrd, Villa Park, Calif., assignor to McDonnell Douglas Corporation, Huntington Beach, Calif.**

**Filed Oct. 29, 1990, Ser. No. 604,208**
**Int. Cl.[6] B01J** *31/06;* **B32B** *9/04*
**U.S. Cl. 502—152** **20 Claims**

1. A coating on a substrate, said coating having resistance to chemical warfare agents, said coating comprising a cured mixture of compounds (a) a combination of dimethylsiloxane-vinylmethylsiloxane copolymer and methyl 3,3,3-trifluoropropylvinylmethylsiloxane copolymer, (b) a polysiloxane containing reactive Si-H groups, and (c) an unsaturated compound effective to absorb hydrogen liberated from said Si-H groups during the curing reaction, and to prevent bubbles from forming in said coating.

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**5,496,785**

**DUAL IMPREGNATED ACTIVATED CARBON**

**Mary J. Abler, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Division of Ser. No. 904,994, Jun. 26, 1992, Pat. No. 5,344,626. This application Jun. 15, 1994, Ser. No. 259,988**
**Int. Cl.[6] B01J** *21/18*
**U.S. Cl. 502—180** **8 Claims**

1. A method of making a dual-impregnated activated carbon composition capable of removing gaseous contaminants from a fluid, which method consists essentially of:
(a) impregnating activated carbon with at least one first metal salt that contains a metal from Groups 6–12; and
(b) impregnating the activated carbon with at least one second metal carbonate salt that contains a Group 1 metal;
wherein the molar ratio on the activated carbon of the Group 1 metal or metals to the Group 6–12 metal or metals is 1 or greater.

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**5,496,786**

**CATALYST FOR REDUCING LOWER POLYHYDRIC ALCOHOLS BY HYDROGENOLYSISAL HIGHER POLYHYDRIC ALCOHOLS AND METHOD FOR PREPARING CATALYST**

**Giuseppe Gubitosa, Novara, and Bruno Casale, Cameri, both of, Italy, assignors to Novasol S.r.l., Italy**

**Division of Ser. No. 9,127, Jan. 26, 1993, Pat. No. 5,354,914. This application Oct. 6, 1994, Ser. No. 319,455**
**Claims priority, application Italy, Jan. 31, 1992, TO92A0081**
**Int. Cl.[6] B01J** *23/46*
**U.S. Cl. 502—182** **4 Claims**

1. A catalyst composition for hydrogenolysis reactions of higher polyhydric alcohols comprising:
0.5 to 5% by weight of ruthenium and 0.1 to 10% by weight of tin supported on granular carbon with an atomic Ru/Sn ratio of 1:1 to 2:1,
said catalyst having:
a specific surface area of 600 to 1000 $m^2/g$;
a total pore volume of 0.5 to 1.2 $cm^3/g$;
a total volume of micropores having a radius smaller than 75 Å of 0.4 to 0.55 $cm^3/g$.

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**5,496,787**

**PROCESS FOR PRODUCING A VANADIUM-PHOSPHORUS OXIDE CATALYST PRECURSOR**

**Masakatsu Hatano, Yokohama; Masayoshi Murayama, Yamato; Kenji Shima, and Masumi Ito, both of Yokohama, all of, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan**

**Filed Jan. 28, 1994, Ser. No. 187,715**
**Claims priority, application Japan, Jan. 29, 1993, 5-034348**
**Int. Cl.[6] B01J** *23/22*
**U.S. Cl. 502—209** **34 Claims**

1. A process for producing a vanadium-phosphorus oxide-containing catalyst precursor in the liquid phase and in the absence of a support, which comprises (a) introducing into an organic solvent a vanadium alkoxide as a pentavalent vanadium compound and a phosphorus compound in the presence of a reducing agent capable of reducing the pentavalent vanadium compound to a tetravalent state, (b) hydrolyzing at least a part of the vanadium alkoxide before or after the introduction of the phosphorus compound, and (c) heating the vanadium-containing liquid medium obtained in step (b), in the presence of the phosphorus compound to reduce at least a part of vanadium to a tetravalent state.

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**5,496,788**

**COATING DISPERSION FOR EXHAUST GAS CATALYSTS**

**Rainer Domesle, Alzenau; Bernd Engler, Hanau; Edgar Koberstein, Alzenau; Egbert Lox, Hanau, and Klaus Ostgathe, Hattersheim, all of, Germany, assignors to Degussa Aktiengesellschaft, Germany**

**Filed Feb. 12, 1993, Ser. No. 17,058**
**Claims priority, application Germany, Feb. 14, 1992, 42 04 421.9**
**Int. Cl.[6] B01J** *21/04;23/40*
**U.S. Cl. 502—333** **29 Claims**

1. A coating dispersion for catalysis-promoting coatings on an inert, structure-reinforcing element, comprising: an aqueous dispersion of at least one temperature-resistant support material and at

least one active component, wherein the active component optionally includes at least one promoter, wherein at least one member selected from the group consisting of the temperature-resistant support material, the active component or the promoter has a multimodal particle size distribution including a fine-particle solids fraction and a coarse-particle solids fraction, wherein the coarsest particle solids fraction has an average particle diameter in the range of 20 to 100 μm.

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**5,496,789**

## HYDROGENATION CATALYST BASED ON A PLATINUM METAL PARTIALLY POISONED WITH FINELY DIVIDED SULFUR

**Franz-Josef Weiss, Neuhofen; Hugo Fuchs, Ludwigsafen; Gerald Neubauer, Weinheim, and Heinz-Walter Schneider, Ludwigshafen, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany**

**Filed Apr. 7, 1994, Ser. No. 224,677**

**Int. Cl.[6] B01J** *23/42*

**U.S. Cl. 502—339** **6 Claims**

1. A process for the preparation of a hydrogenation catalyst consisting essentially of

(a) treating a platinum metal salt with finely divided sulfur, and

(b) reducing the treated platinum metal salt to metallic platinum metal.

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**5,496,790**

## THERMAL TRANSFER IMAGE-RECEIVING SHEET

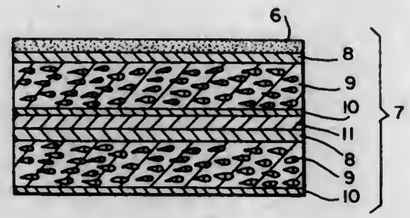
**Akihiko Ohno; Takatoshi Nishizawa, and Akira Iwai, all of Ibaraki, Japan, assignors to Oji Yuka Goseishi Co., Ltd., Tokyo, Japan**

**Filed Jun. 23, 1994, Ser. No. 264,363**

**Claims priority, application Japan, Jun. 23, 1993, 5-174628**

**Int. Cl.[6] B41M** *5/035;5/38*

**U.S. Cl. 503—227** **8 Claims**




1. A thermal transfer image-receiving sheet comprising (1) a support comprising (B) a base layer comprising a biaxially stretched microporous film of a thermoplastic resin containing from 10 to 45% by weight of an inorganic fine powder and (A) a surface layer comprising a biaxially stretched film of a thermoplastic resin having a three-dimensional center-plane average roughness Ra of not more than 0.5 μm, said surface layer (A) having a spatial average wavelength λa defined by the equation: $\lambda a = 2\pi Ra/\Delta a$, wherein Ra is the three-dimensional center-plane average roughness and Δa is the three-dimensional average slope, of not more than 100 μm and a gloss of not less than 93% measured at 75° according to JIS P-8142 and (2) an image-receiving layer provided on the surface of said surface layer (A).

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**5,496,791**

## THERMAL TRANSFER IMAGE-RECEIVING SHEET

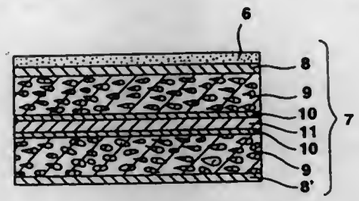
**Akihiko Ohno; Takatoshi Nishizawa; Akira Iwai, and Ayako Shibata, all of Ibaraki, Japan, assignors to Oji Yuka Goseishi Co., Ltd., Tokyo, Japan**

**Filed Oct. 25, 1994, Ser. No. 328,522**

**Claims priority, application Japan, Dec. 21, 1993, 5-344692**

**Int. Cl.[6] B41M** *5/035;5/38*

**U.S. Cl. 503—227** **8 Claims**




1. A thermal transfer image-receiving sheet comprising (1) a support comprising (a) a surface layer comprising a biaxially stretched film of a thermoplastic resin containing from 2 to 60% by weight of titanium dioxide fine powder and (b) a base layer comprising a biaxially stretched microporous film of a thermoplastic resin containing from 10 to 45% by weight of an inorganic fine powder and (2) an image-receiving layer provided on surface layer (a) of support (1), in which support (1) has a void volume of from 30 to 60% calculated according to formula:

$$\text{Void Volume (\%)} = \frac{\text{Density of Unstretched Film} - \text{Density of Stretched Film}}{\text{Density of Unstretched Film}} \times 100$$

and a density of from 0.50 to 0.78 g/cm$^3$, and surface layer (a) of support (1) has a center-line average roughness (Ra) of not more than 0.5 μm and a Bekk's smoothness of from 4,000 to 100,000 seconds as measured according to JIS P-8119.

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**5,496,792**

## CYCLOHEXENONE OXIDE ETHERS AND USE THEREOF AS HERBICIDES

**Ulf Misslitz, Neustadt; Norbert Meyer, Ladenburg; Juergen Kast, Boehl-Iggelheim; Kaspar Bott, Mannheim; Helmut Walter, Obrigheim; Karl-Otto Westphalen, Speyer; Uwe Kardorff, Mannheim, and Matthias Gerber, Mutterstadt, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany**

**PCT No. PCT/EP93/00215, § 371 Date Aug. 11, 1994, § 102(e) Date Aug. 11, 1994, PCT Pub. No. WO93/16063, PCT Pub. Date Aug. 19, 1993**

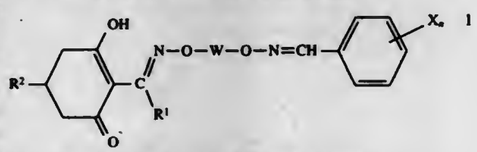
**PCT Filed Jan. 30, 1993, Ser. No. 290,725**

**Claims priority, application Germany, Feb. 13, 1992, 42 04 205.4**

**Int. Cl.[6] A01N** *43/56;* **C07D** *231/12*

**U.S. Cl. 504—100** **6 Claims**

1. A cyclohexenone oxime ether of the formula I



I

where the substituents have the following meaning:

$R^1$ is a $C_1$–$C_6$-alkyl group;

W is an unsubstituted or $C_1$–$C_3$-alkyl-substituted $C_2$–$C_4$-alkylene chain;



X is nitro, cyano, halogen, $C_1$–$C_4$-alkyl or $C_1$–$C_1$–haloalkyl;

n is 0 or n is 1 to 3 when X is nitro, cyano, halogen, $C_1$–$C_4$-alkyl or $C_1$–$C_4$-haloalkyl, where the radicals X are identical or different when n is 2 or 3, and

n can additionally be 4 or 5 if all the X's are halogen;

$R^2$ is a $C_1$–$C_4$-alkoxy-$C_1$–$C_6$-alkyl or $C_1$–$C_4$-alkylthio-$C_1$–$C_6$alkyl group,

a $C_3$–$C_7$-cycloalkyl or a $C_5$–$C_7$-cycloalkenyl group, these groups being unsubstituted or bearing from one to three substituents selected from the group consisting of $C_1$–$C_4$-alkyl, $C_1$–$C_4$-alkoxy, $C_1$–$C_4$-alkylthio, $C_1$–$C_4$-haloalkyl, hydroxyl and halogen; a 5-membered saturated heterocycle which consists of one or two oxygen and/or sulfur atoms as heteroatoms and is unsubstituted or bears from one to three substituents selected from the group consisting of $C_1$–$C_4$-alkyl, $C_1$–$C_4$-alkoxy, $C_1$–$C_4$-alkylthio and $C_1$–$C_4$-haloalkyl; a 6- or 7-membered heterocycle having one or two non-adjacent oxygen and/or sulfur atoms as heteroatoms and which is saturated or mono- or diunsaturated and which is unsubstituted or bears from one to three substituents selected from the group consisting of hydroxyl, halogen, $C_1$–$C_4$-alkyl, $C_1$–$C_4$-alkoxy, $C_1$–$C_4$-alkylthio and $C_1$–$C_4$-haloalkyl; a 5-membered heteroaromatic containing one or two nitrogen atoms and an oxygen or sulfur atom and which is unsubstituted or bears from one to three substituents selected from the group consisting of halogen, cyano, $C_1$–$C_4$-alkyl, $C_1$–$C_4$-alkoxy, $C_1$–$C_4$-alkylthio, $C_1$–$C_4$-haloalkyl, $C_2$–$C_6$-alkenyl, $C_2$–$C_6$-alkenyloxy and $C_1$–$C_4$-alkoxy-$C_1$–$C_4$-alkyl; phenyl or pyridyl, these groups being unsubstituted or bearing from one to three substituents selected from the group consisting of halogen, nitro, cyano, $C_1$–$C_4$-alkyl, $C_1$–$C_4$-alkoxy, $C_1$–$C_4$-alkylthio, $C_1$–$C_4$-haloalkyl, $C_3$–$C_6$-alkenyloxy, $C_3$–$C_6$-alkynyloxy and an amino group —$NR^aR^b$, where

$R^a$ is hydrogen, $C_1$–$C_4$-alkyl, $C_3$–$C_6$-alkenyl or $C_3$–$C_6$-alkynyl and

$R^b$ is hydrogen, $C_1$–$C_4$-alkyl, $C_3$–$C_6$-alkenyl, $C_3$–$C_6$-alkynyl or $C_1$–$C_6$-acyl, or benzoyl which is unsubstituted or bears from one to three radicals selected from the group consisting of nitro, cyano, halogen, $C_1$–$C_4$-alkyl, $C_1$–$C_4$-alkoxy, $C_1$–$C_4$-alkylthio and $C_1$–$C_4$-haloalkyl

and the agriculturally utilizable salts and esters of compounds I with $C_1$–$C_{10}$-carboxylic acids and inorganic acids.

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**5,496,793**

## SUBSTITUTED CARBAMOYLTRIAZOLES

**Roland Andree, Langenfeld; Markus Dollinger, and Hans-Joachim Santel, both of Leverkusen, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany**

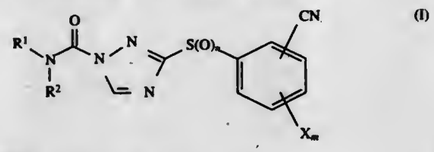
**Filed Nov. 16, 1994, Ser. No. 340,513**

**Claims priority, application Germany, Nov. 23, 1993, 43 39 863.4**

**Int. Cl.[6] A01N** *43/653;* **C07D** *249/12*

**U.S. Cl. 504—273** **7 Claims**

1. A substituted carbamoyltriazole of the formula



(I)

wherein

m represents the numbers 0, 1, 2, 3 or 4,

n represents the numbers 0, 1 or 2,

$R^1$ represents a radical from the group consisting of alkyl, alkenyl or alkinyl, each of which has up to 6 carbon atoms and each of which is optionally substituted by halogen,

$R^2$ represents a radical from the group consisting of alkyl, alkenyl or alkinyl, each of which has up to 6 carbon atoms and each of which is optionally substituted by halogen, or together with $R^1$ represents alkanediyl having 2 to 6 carbon atoms, and

X represents halogen, hydroxyl, amino, mercapto,

X furthermore represents a radical from the group consisting of alkyl, alkoxy, alkylthio, alkylamino, alkanoylamino or alkylsulphonylamino, each of which has up to 6 carbon atoms in the alkyl groups and each of which is optionally substituted by halogen, cyano, hydroxyl, carboxyl, $C_1$–$C_4$-alkoxy, $C_1$–$C_4$-alkyl-carbonyl or $C_1$–$C_4$-alkoxy-carbonyl,

X furthermore represents a radical from the group consisting of cycloalkyloxy, cycloalkylthio, cycloalkylamino, cycloalkylalkoxy, cycloalkyl-alkylthio or cycloalkyl-alkylamino, each of which has 3 to 6 carbon atoms in the cycloalkyl groups and, when present, 1 to 4 carbon atoms in the alkyl groups and each of which is optionally substituted by halogen, cyano, carboxyl, $C_1$–$C_4$-alkyl or $C_1$–$C_4$-alkoxy-carbonyl, or

X furthermore represents a radical from the group consisting of aryloxy, arylthio, arylamino, arylcarbonyl, arylsulphonyl, arylalkyl, arylalkoxy, arylalkylthio, arylalkylamino, arylalkylcarbonyl or arylalkylsulphonyl, each of which has 6 to 10 carbon atoms in the aryl groups and, when present, 1 to 4 carbon atoms in the alkyl groups, and each of which is optionally substituted by halogen, cyano, nitro, hydroxyl, amino, carboxyl, $C_1$–$C_4$-alkyl, $C_1$–$C_4$-halogenoalkyl, $C_1$–$C_4$-alkoxy, $C_1$–$C_4$-halogenoalkoxy, $C_1$–$C_4$-alkylthio, $C_1$–$C_4$-halogenoalkylthio, $C_1$–$C_4$-alkylsulphinyl, $C_1$–$C_4$-halogenoalkylsulphinyl, $C_1$–$C_4$-alkylsulphonyl, $C_1$–$C_4$-halogenoalkylsulphonyl or $C_1$–$C_4$-alkoxycarbonyl.

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**5,496,794**

## FLUORINE-CONTAINING β-INDOLEBUTYRIC ACID COMPOUNDS, AND REGULATION OF PLANT GROWTH THEREWITH

**Masato Katayama; Shozo Fujii, both of Nagoya; Hiroshi Kimoto, Kuwana, and Katsuya Kato, Nagoya, all of, Japan, assignors to Agency of Industrial Science & Technology, and Ministry of International Trade & Industry, both of Tokyo, Japan**

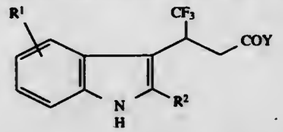
**Filed Oct. 28, 1994, Ser. No. 330,792**

**Claims priority, application Japan, Nov. 9, 1993, 5-304612**

**Int. Cl.[6] C07D** *209/18;* **A01N** *43/38*

**U.S. Cl. 504—284** **10 Claims**

7. A method for regulating the length of roots sprouting from plant seeds and the length of hypocotyls, which comprises causing adhesion to said plant seeds of a substituted fluorine-containing β-indolebutyric acid compound represented by the formula:



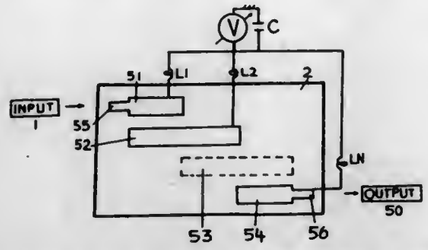

wherein Y stands for one member selected from the class consisting of hydroxyl group, $C_1$–$C_5$-alkoxy group, amino group, and $C_1$–$C_4$-alkylamino group, $R^1$ and $R^2$ stand for one member selected from the class consisting of hydrogen atom, halogen atom, $C_1$–$C_5$-alkyl group, $C_1$–$C_5$-alkoxy group, $C_6$–$C_8$ -aryl group, nitro group, amino group, and $C_1$–$C_4$-alkylamino group, provided $R^1$ and $R^2$ are not both a hydrogen atom.

**5,496,795**

## HIGH TC SUPERCONDUCTING MONOLITHIC FERROELECTRIC JUNABLE B AND PASS FILTER

**Satyendranath Das, P.O. Box 574, Mt View, Calif. 94042-0574**

**Filed Aug. 16, 1994, Ser. No. 291,702**
**Int. Cl.[6] H01P** *1/203;* **H01B** *12/02*
**U.S. Cl. 505—210** **18 Claims**




4. A ferroelectric band pass tunable monolithic filter, having an electric field dependent permittivity, an input, an output, a tunable operating frequency and comprising:

a first microstrip line disposed on a ferroelectric film, characterized by said permittivity, and being one quarter wave long at an operating frequency of the filter;

second, third, fourth . . . (n-1)th, nth microstrip lines;

said second microstrip line disposed on said ferroelectric film, characterized by said permittivity,and being one half wavelength long, at an operating frequency of the filter, and said second microstrip line having a first one quarter wavelength portion being edge coupled to and separate from the first microstrip line and having a remaining second quarter wavelength being coupled to and separate from the following the third microstrip line;

said third, fourth . . . (n-1)th microstrip lines respectively disposed on said ferroelectric film, characterized by said permittivity, each one of said third, fourth . . . (n-1)th microstrip lines respectively being one half wavelength long, at the operating frequency of the filter, having a first one quarter wavelength portion thereof being edge coupled to and separate from previous (n-2)th one of the microstrip lines, and having a remaining second quarter wavelength portion thereof being coupled to and being separate from a succeeding one of the microstrip lines;

said nth microstrip line disposed on said ferroelectric film, characterized by said permittivity, and being one quarter wave long, at an operating frequency of the filter, said nth microstrip line being coupled to and being separate from the (n-1)th microstrip line;

an input ferroelectric transformer, having a bias voltage dependent impedance, being quarter wavelength long at an operating frequency of the filter, and comprised of a ferroelectric film different from said ferroelectric film of the filter, said input ferroelectric transformer being connected to and being a part of the first microstrip line for matching an impedance of an input circuit of the filter to a bias voltage dependent impedance of the first microstrip line and providing a good impedance match over the operating bias voltages;

a first transmission means for coupling energy into the said input ferroelectric transformer at the input;

an output ferroelectric transformer, having a bias voltage dependent impedance, being quarter wavelength long at an operating frequency of the filter, and comprised of a ferroelectric film different from a ferroelectric film of the filter, said output ferroelectric transformer being connected to and being a part of the nth microstrip line of the filter for matching a bias voltage dependent impedance of the nth microstrip line of the filter to an impedance Of an output circuit of the filter and providing a good impedance match over the operating bias voltages;

a second transmission means for coupling energy out of the output ferroelectric transformer at the output;

all microstrip lines and ferroelectric transformers being operated at the same tunable frequency;

voltage means for applying a bias voltage to all said microstrip lines;

said microstrip lines being comprised of a film of a single crystal high Tc superconductor; and

means for operating said band pass tunable filter at a high Tc superconducting temperature slightly above the Curie temperature associated with the ferroelectric film to avoid hysteresis and to provide a maximum change of permittivity of said ferroelectric film of the filter.

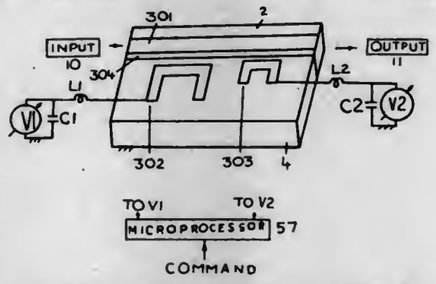
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**5,496,796**

## HIGH TC SUPERCONDUCTING BAND REJECT FERROELECTRIC FILTER (TFF)

**Satyendranath Das, P.O. Box 574, Mt. View, Calif. 94042-0574**

**Filed Sep. 20, 1994, Ser. No. 309,979**
**Int. Cl.[6] H01P** *1/203;* **H01B** *12/02*
**U.S. Cl. 505—210** **17 Claims**




14. A monolithic band reject tunable ferroelectric filter having electric field dependent permittivity, having different operating frequencies, an input, an output, and comprising:

a main microstrip transmission line disposed on a film of a single crystal dielectric material;

a first transmission means for coupling energy into said main microstrip line at the input;

a first branch microstrip line resonator, half a wavelength long at a first operating frequency of the filter, being disposed on a film of a single crystal ferroelectric, and being coupled to and separate from the said main microstrip transmission line;

said film of a single crystal dielectric material being extended up to the said film of a single crystal ferroelectric material without leaving any airgap therebetween;

second, third, . . . nth branch microstrip line resonators, each half a wavelength long at respectively second, third, . . nth operating frequencies of the filter, being respectively disposed on the same film of a single crystal ferroelectric material as associated with said first branch microstrip line resonator and respectively being coupled to and separate from said main microstrip line;

said first, second, third, . . . nth branch microstrip line resonators being operated at separate frequencies;

in the vicinity of a resonant frequency of a corresponding said branch resonator, a low impedance is present on said main microstrip transmission line reducing the level of signal flowing through said main transmission line;

respective separation distances between centers of adjacent resonators being typically three quarters of a wavelength at an operating frequency of the filter;

conductors of said main microstrip transmission line and said microstrip line resonators being respectively comprised of a film of a single crystal high Tc superconductor material;

a second transmission means for coupling energy from said main microstrip line at the output:

means, associated with the filter, for applying separate bias voltages to said first, second, third, . . . nth microstrip line resonators;



a microprocessor for controlling the separate bias voltages of said first, second, third . . . nth microstrip line resonators; and

said filter being operated at a high Tc superconducting temperature appropriately above the Curie temperature associated with said ferroelectric material of film.

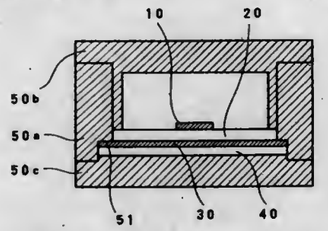
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**5,496,797**

## SUPERCONDUCTING MICROWAVE PARTS HAVING A PACKAGE, TWO SUBSTRATES, AND LINE AND GROUNDING CONDUCTORS

**Kenjiro Higaki, and Hideo Itozaki, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan**

**Continuation of Ser. No. 141,588, Oct. 27, 1993, abandoned, which is a continuation of Ser. No. 781,352, Oct. 25, 1991, abandoned. This application Dec. 5, 1994, Ser. No. 353,344**
**Claims priority, application Japan, Jan. 29, 1990, 2-291195**
**Int. Cl.[6] H01P** *3/08;* **H01B** *12/06*
**U.S. Cl. 505—210** **38 Claims**




1. A superconducting microwave component comprising:

a first substrate comprised of a first dielectric material and having a first surface and a conductor line comprised of an oxide superconductor disposed on the first surface thereof;

a second substrate comprised of the first dielectric material and having a second surface and a grounding conductor comprised of an oxide superconductor disposed on the second surface thereof; and

a package comprised of a conducting material housing the first and the second substrate such that the first and second surfaces are arranged substantially in parallel, at least one part of the grounding conductor electrically contacting an inner surface of the package by direct surface contact therewith, wherein

the package comprises a bottom plate, and a casing having a lower end face fixed to a peripheral edge portion of the bottom plate and a first stepped face defining in part said inner surface, said first stepped face being proximate the lower end face; whereby a peripheral edge portion of the second substrate is held between the bottom plate and the first stepped face.

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**5,496,798**

## SUPERCONDUCTING TUBE FOR SHIELDING MAGNETIC FIELDS

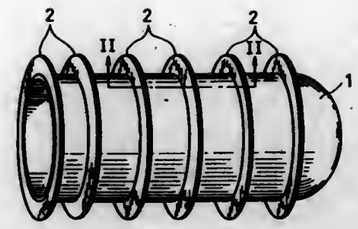
**Hitoshi Sakai, Farmington Hills, Mich., and Hitoshi Yoshida, Okazaki, Japan, assignors to NGK Insulators, Ltd., Japan**

**Continuation of Ser. No. 29,504, Mar. 11, 1993, abandoned. This application Jan. 18, 1995, Ser. No. 375,504**
**Claims priority, application Japan, Mar. 17, 1992, 4-060589**
**Int. Cl.[6] B32B** *9/00*
**U.S. Cl. 505—212** **15 Claims**

1. A superconducting tube for shielding a magnetic field, comprising:

a substrate comprising a tubular wall having radially inner and radially outer surfaces;

an intermediate layer disposed radially inwardly of said substrate and comprising a noble material;




a superconducting layer uniformly disposed radially inwardly of said intermediate layer, said superconducting layer consisting essentially of a superconducting oxide comprising a material selected from the group consisting of (i) a Bismuth compound containing Sr, Ca, Cu and O, and (ii) $REBa_2Cu_3O_{7-y}$, wherein RE is at least one element selected from the group consisting of Y, Sm, Eu, Dy, Ho, Er and Yb, and y ranges from 0 to 1; and

at least two ring-shaped reinforcing members welded to the radially outer surface of said tubular wall, each of said reinforcing members having a thickness of about 1 to 7 times a thickness of said tubular wall;

wherein said intermediate layer prevents a reaction between said substrate and said superconducting layer.

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**5,496,799**

## METHOD FOR MAKING RARE EARTH SUPERCONDUCTIVE COMPOSITE

**Manabu Yoshida, Ama, and Izumi Hirabayashi, Nagoya, all of, Japan, assignors to NGK Insulators, Ltd., and International Superconductivity Technology Center, Japan**

**Continuation of Ser. No. 104,535, Aug. 11, 1993, abandoned. This application Dec. 29, 1994, Ser. No. 366,384**
**Claims priority, application Japan, Aug. 25, 1992, 4-226033**
**Int. Cl.[6] H01L** *39/24*
**U.S. Cl. 505—450** **12 Claims**

1. A method for making a rare earth superconductive composite including a matrix of $REBa_2Cu_3O_{7-x}$ grains and, uniformly dispersed therein, fine particles of $RE_2BaCuO_5$, wherein RE is at least one element selected from the group consisting of Y, Nd, Sm, Eu, Gd, Dy, Ho, Er, Tm, Yb, and Lu, and x ranges from 0 to 1, said rare earth superconductive composite having a critical current density of not less than 17,000 A/cm$^2$ at 77K under one tesla, which comprises the steps of:

(1) forming a compacted mass by application of pressure to a powder material including powder particles of $REBa_2Cu_3O_{7-x}$ and powder particles of $RE_2BaCuO_5$ wherein said powder particles of $REBa_2Cu_3O_{7-x}$ have an average diameter not greater than 6 μm and a maximum diameter not greater than 20 μm, and said powder particles of $RE_2BaCuO_5$ have an average diameter not greater than 6 μm and a maximum diameter not greater than 20 μm;

(2) heating the compacted mass to a temperature which is higher than an incongruent melting temperature of $REBa_2Cu_3O_{7-x}$ and which is lower than an incongruent melting temperature of $RE_2BaCuO_5$ so as to partially melt and decompose the $REBa_2Cu_3O_{7-x}$ in the mass into a melt and to maintain the $RE_2BaCuO_5$ in a solid state;

(3) gradually cooling the mass from an initial temperature so as to recrystallize $REBa_2Cu_3O_{7-x}$ from the melt wherein fine particles of $RE_2BaCuO_5$ are dispersed in $REBa_2Cu_3O_{7-x}$ grains, wherein the melt contains a species to aid in dispersion of the $RE_2BaCuO_5$, said species comprising at least one element selected from the group consisting of Pt, Rh, Pd, Ru, Os and Sc, said melt containing 0.01% to 10% by weight, with respect to the sum of $RE_2BaCuO_5$ and $REBa_2CuO_{7-x}$, of said species; and.

(4) annealing the mass in an atmosphere containing oxygen for a time sufficient for a requisite amount of oxygen to diffuse into the mass.

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5,496,800

## GROWTH INHIBITORY FACTOR FROM UROGENITAL SINUS

David R. Rowley, Houston, Tex., assignor to Baylor College of Medicine, Houston, Tex.

Continuation-in-part of Ser. No. 240,171, Sep. 2, 1988, Pat. No. 5,193,334. This application Aug. 11, 1992, Ser. No. 928,867

Int. Cl.[6] A61K *38/00;* C07K *2/00;* C12P *21/00;* G01N *33/53*

U.S. Cl. 514—12 6 Claims

1. A pharmaceutical composition comprising urogenital sinus derived inhibitory factor having an activity of at least 1 as measured by the UGIF units assay test, being substantially free of albumin and being about 70–8000 fold enriched in UGIF activity over tissue per dry weight of tissue.

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5,496,801

## PARATHYROID HORMONE FORMULATION

Josephus J. M. Holthuis, AJ Leiden; Albert Mekking, CR Woerden, and Alwinus A. Voetman, DT Zwanenburg, all of, Netherlands, assignors to Allelix BioPharmaceuticals Inc., Ontario, Canada

Filed Dec. 23, 1993, Ser. No. 172,206

Int. Cl.[6] A61K *37/02;37/36*

U.S. Cl. 514—12 24 Claims

1. A parathyroid hormone preparation, comprising:
a medically useful amount of parathyroid hormone (1–84);
a polyol excipient that co-lyophilizes with said hormone to yield an amorphous cake;
a non-volatile buffering agent in an amount sufficient to adjust the pH of the preparation to within a physiologically acceptable pH range; and
water.

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5,496,802

## CONTROL OF MILK SECRETION

Colin J. Wilde; Malcolm Peaker, both of Alloway, and Caroline V. P. Addey, Ayr, all of, Scotland, assignors to British Technology Group Ltd, London, England

PCT No. PCT/GB91/00744, § 371 Date Nov. 8, 1993, § 102(e) Date Nov. 8, 1993, PCT Pub. No. WO92/20714, PCT Pub. Date Nov. 26, 1992

PCT Filed May 10, 1991, Ser. No. 140,183

Int. Cl.[6] C07K *14/00;16/06;16/18;* A61K *38/17*

U.S. Cl. 514—2 5 Claims

1. An isolated protein in glycosylated or unglycosylated form which inhibits milk secretion by lactating cows and which is present in the eighth significant peak, shown on the drawing as "6B", when a fraction of the whey proteins of the milk separated by ultrafiltration using filters of cut-off values 10 KDa and 30 KDa, is resolved on an anion exchange column of particles of monodisperse hydrophilic polymer having pendant $-CH_2N(CH_3)_3^+$ groups, the particle diameter being 10±0.5μm, using 10 mM imidazole buffer, pH 7.0 and a sodium chloride elution gradient of 0 to 1.0M and said protein having a molecular weight, as determined by gel filtration chromatography, of about 6.5 KDa, and an isoelectric point determined by isoelectric focussing of material from said peak 6B in a polyacrylamide gel on the product of the 6B peak within the range 5.1 to 5.4.

5,496,803

## PROCESS FOR THE LONG TERM REDUCTION OF BODY FAT STORES, INSULIN RESISTANCE, HYPERINSULINEMIA IN VERTEBRATES

Albert H. Meier, and Anthony H. Cincotta, both of Baton Rouge, La., assignors to Louisiana State University and Agricultural and Mechanical College, Baton Rouge, La.

Continuation of Ser. No. 999,685, Dec. 31, 1992, abandoned, which is a continuation of Ser. No. 192,332, May 10, 1988, abandoned. This application Mar. 5, 1996, Ser. No. 287,066

Int. Cl.[6] C07K *14/54;9/00;* A61K *38/00*

U.S. Cl. 514—12 13 Claims

1. A method for modifying or resetting the phases of circadian oscillations of the brain which control circadian rhythms of prolactin levels in the bloodstream of said patient in need of the modification and resetting comprising
administering prolactin into the blood stream of said patient on a daily basis (i) at a time within the daily interval at which the prolactin level in the bloodstream of a lean insulin-sensitive human reaches its peak value and (ii) in an amount sufficient to increase the sensitivity of the patient to insulin;
continuing the daily administration of prolactin for a period of time sufficient to modify or reset the patient's daily prolactin level cycle so that said cycle mimics in phase and amplitude the daily prolactin level cycle of a lean insulin-sensitive human.

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5,496,804

## METHOD FOR TREATING TAXOL SIDE-EFFECTS WITH G-CSF

Eddie Reed, Germantown; Elise Kohn, Olney, and Gisele Sarosy, Silver Spring, all of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation of Ser. No. 28,411, Mar. 9, 1993, abandoned. This application Nov. 21, 1994, Ser. No. 342,797

Int. Cl.[6] A61K *37/00*

U.S. Cl. 514—12 15 Claims

1. A method of treating a host being treated with taxol in an amount sufficient to cause a side effect selected from the group consisting of myelosupression, mucositis, and peripheral neuropathy, which method comprises administering to said host granulocyte colony-stimulating factor in an amount effective to alleviate or prevent said side effect.

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5,496,805

## INHIBITORS OF NEUTRAL ENDOPEPTIDASE

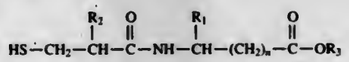
Norma G. Delaney, Princeton; Eric M. Gordon, Pennington, both of N.J.; Jack M. DeForrest, Wycombe, Pa., and David W. Cushman, West Windsor, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation of Ser. No. 59,872, Jun. 8, 1987, abandoned. This application Jul. 12, 1990, Ser. No. 554,976

Int. Cl.[6] A61A *38/05*

U.S. Cl. 514—19 10 Claims

1. The method of producing diuresis, natriuresis, and lowering blood pressure in a mammalian host which comprises administering to said host an effective amount of a neutral endopeptidase inhibitor of the formula



wherein:
$R_2$ is benzyl;
$R_1$ is hydrogen or benzyl;
n is an integer from 1 to 9; and
$R_3$ is hydrogen or a pharmaceutically acceptable salt forming ion.



5,496,806

## GLYCOSIDE COMPOUNDS AND PRODUCTION AND USE THEREOF

R. Erich Klemke, D-78247 Hilzingen, Germany, assignor to R. Erich Klemke, Germany

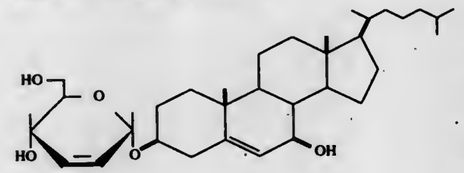
Division of Ser. No. 6,447, Jan. 21, 1993, abandoned, which is a continuation-in-part of Ser. No. 815,691, Jan. 24, 1992, abandoned, which is a continuation-in-part of Ser. No. 733,915, Jul. 22, 1991, abandoned, which is a continuation-in-part of Ser. No. 644,002, Jan. 22, 1991, Pat. No. 5,278,296. This application May 6, 1994, Ser. No. 239,373

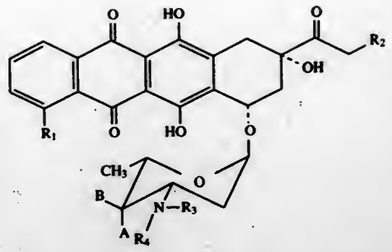
Claims priority, application Germany, Jan. 23, 1990, 40 01 895.4

Int. Cl.[6] A61K *31/705;* C07J *9/00*

U.S. Cl. 514—26 4 Claims

1. A 3β,7β-dihydroxysteryl 2,3-dideoxy-α-D-erythro-hex-2-enopyranoside compound of formula





wherein $R_1$ is hydrogen or methoxy group; $R_2$ is hydrogen or hydroxy group, A and B both represent hydrogen or one of A and B is hydrogen and the other is hydroxy or a group of formula $-OSO_2R_5$ in which $R_5$ is C1–C4 alkyl; $R_3$ is a hydrogen atom or a group of formula 2 and $R_4$ is a group of formula 2

$$-(CH_2)_n-X \qquad 2$$

in which n is 2 or 3 and X is a halogen or a group of formula $-OSO_2R_5$ in which $R_5$ is as defined above; or a pharmaceutically acceptable salt thereof.

5. An antitumor composition comprising an effective amount of an anthracycline glycoside of Formula 1 or a pharmaceutically acceptable salt thereof as defined in claim 1 and a pharmaceutically acceptable diluent or carrier.

6. A method for treatment of tumors in subjects in need thereof, comprising administering thereto an effective amount of the composition of claim 5.

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5,496,807

## METHOD OF TREATMENT OF DIABETIC NEPHROPATHY BY MEANS OF SULODEXIDE OF MEDICINES CONTAINING IT

Egidio Marchi, and Gianfranco Tamagnone, both of Bologna, Italy, assignors to Alfa Wassermann S.p.A., Pescara, Italy

Filed Apr. 14, 1994, Ser. No. 227,502

Claims priority, application Italy, May 10, 1993, BO93A0205

Int. Cl.[6] A61K *31/70;31/69*

U.S. Cl. 514—52 4 Claims

1. A method of treatment of diabetic nephropathy which consists of administering to a living subject affected by diabetic nephropathy, said living subject exhibiting microalbuminuria or macroalbuminuria, a therapeutically effective amount of sulodexide.

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5,496,808

## MONO AND BIS ALKYLAMINO-ANTHRACYCLINES

Alberto Bargiotti; Michele Caruso, both of Milan; Daniela Faiardi, Pavia; Antonino Suarato, and Nicola Mongelli, both of Milan, all of, Italy, assignors to Farmitalia Carlo Erba S.R.L., Milan, Italy

Filed Jun. 26, 1992, Ser. No. 904,650

Claims priority, application United Kingdom, Jul. 5, 1991, 9114549

Int. Cl.[6] A61K *31/70;* C07H *15/24*

U.S. Cl. 514—34 6 Claims

1. An anthracycline glycoside of formula 1:

5,496,809

## STABLE SOLUTIONS OF REBECCAMYCIN ANALOG

Ubrani V. Venkataram, Fayetteville; Miriam K. Franchini, Syracuse, and Joseph B. Bogardus, Manlius, all of N.Y., assignors to Bristol-Myers Squibb Co, New York, N.Y.

Filed May 10, 1989, Ser. No. 349,608

Int. Cl.[6] A61K *31/71;* C07H *19/04*

U.S. Cl. 514—43 13 Claims

1. A stable solution consisting essentially of
(a) water,
(b) 8-N-(diethylaminoethyl)rebeccamycin in an effective dosage amount at a concentration up to 50 mg/ml of water, and
(c) a pharmaceutically acceptable acid, a molar equivalence of which will solubilize compound (b), said acid being present in said solution in an amount in excess of said molar equivalence to provide a stabilizing pH for said solution ranging from 3 to 4.

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5,496,810

## PYRIMIDINE DEOXYRIBONUCLEOSIDE POTENTIATION OF COMBINATION THERAPY BASED ON 5-FLUOROURACIL AND INTERFERON

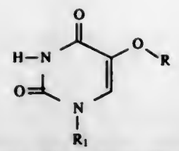
Edward L. Schwartz, White Plains, N.Y., assignor to Montefiore Medical Center, Bronx, N.Y.

Filed Apr. 12, 1994, Ser. No. 226,499

Int. Cl.[6] A61K *31/505;31/70;38/21*

U.S. Cl. 514—50 10 Claims

1. A method of treating a neoplasm which is sensitive to the combination of 5-fluorouracil, interferon-α and a compound of formula (I):



(I)

wherein R is selected from the group consisting of alkyl of 1 to 5 carbon atoms, alkene of 2 to 5 carbon atoms and alkynyl of 2 to 5 carbon atoms; $R_1$ is 2'-deoxyribofuranosyl, said method comprising administering to a host an amount of said combination which is effective to treat a neoplasm which is sensitive to the combination.

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**5,496,811**

## SUBMICRON EMULSIONS AS OCULAR DRUG DELIVERY VEHICLES

**Haim Aviv, Rehovot; Doron Friedman, Carmei Yossef; Amir Bar-Ilan, Neve Monsson, and Micha Vered, Rehovot, all of, Israel, assignors to Pharmos Corp., New York, N.Y.**

**Filed Jan. 5, 1993, Ser. No. 854**

**Claims priority, application Israel, Aug. 28, 1992, 102984; Nov. 27, 1992, 103907**

**Int. Cl.[6] A61K** *31/685;31/66;31/22;31/225*

**U.S. Cl. 514—78** **37 Claims**

1. An ocular drug delivery vehicle of an oil-in-water submicron emulsion consisting essentially of about 0.5 to 50% of a first component of an oil, about 0.1 to 10% of a second component of an emulsifier, comprising a phospholipid, about 0.05 to 5% of a non-ionic surfactant and an aqueous component, said submicron emulsion having a mean droplet size in the range of 0.05 to 0.5 μm, and a weight ratio of surfactant to oil of about 1:1 or less.

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**5,496,812**

## TOPICAL PREPARATION OF TOLNAFTATE AND HYDROCORTISONE TO TREAT FUNGAL INFECTIONS OF THE SKIN

**Chris E. Platt, 14352 Riviera St., Huntington Beach, Calif. 92647**

**Continuation-in-part of Ser. No. 235,282, Apr. 29, 1994, abandoned. This application Oct. 7, 1994, Ser. No. 319,808**

**Int. Cl.[6] A61K** *31/59;31/56;31/16;31/10*

**U.S. Cl. 514—171** **14 Claims**

1. A preparation for the treatment of fungus infection comprising, by weight, between 1% and 3% hydrocortisone, and between 1.5% and 4.5% tolnaftate, in a ratio of approximately 2 to 3 respectively in said topical preparation.

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**5,496,813**

## SPONTANEOUSLY DISPERSIBLE CONCENTRATES AND AQUEOUS MICROEMULSIONS WITH STERYL RETINATES HAVING ANTI-TUMOR ACTIVITY

**Carl Eugster, Riehen; Conrad H. Eugster, Wallisellen; Walter Haldemann, Binningen, all of, Switzerland, and Giorgio Rivara, Turin, Italy, assignors to Marigen S.A., Riehen, Switzerland**

**Filed Aug. 13, 1992, Ser. No. 3,997**

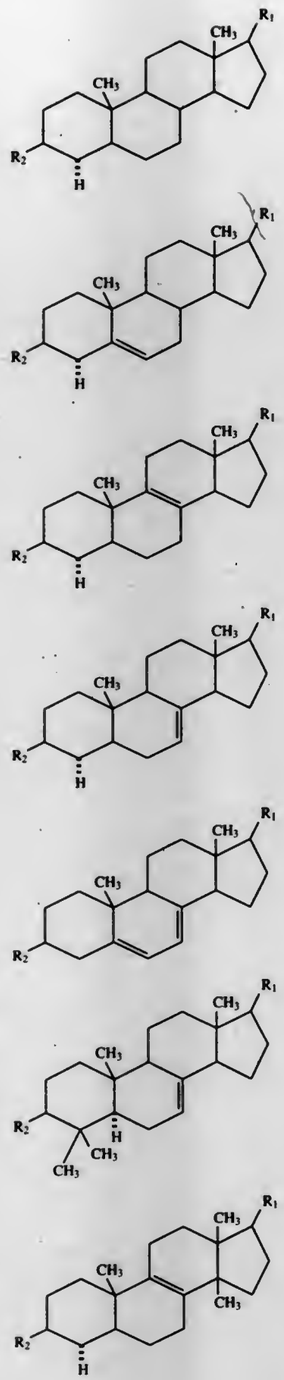
**Claims priority, application Switzerland, Jan. 28, 1991, CH06257/91**

**Int. Cl.[6] A61K** *31/58;31/575;31/57;31/565*

**U.S. Cl. 514—172** **9 Claims**

1. A spontaneously dispersible concentrate which forms an ultramicroemulsion when diluted with water or a glucose solution comprising:

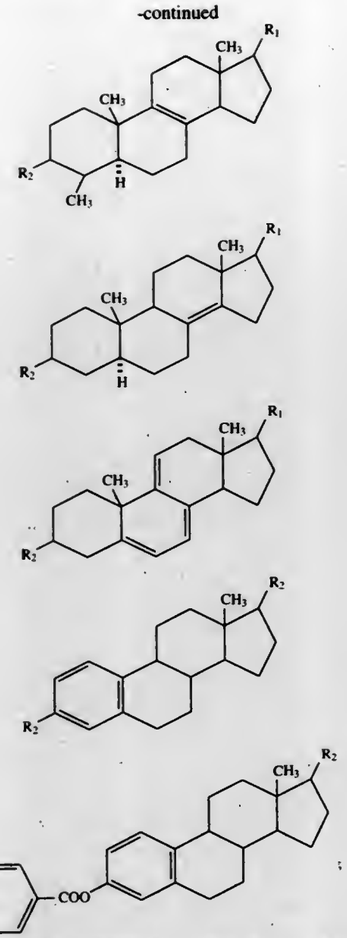
0.001 to 15% by weight of one or a combination of steryl ester compounds selected from the group consisting of compounds of formulae (I) to (XII):



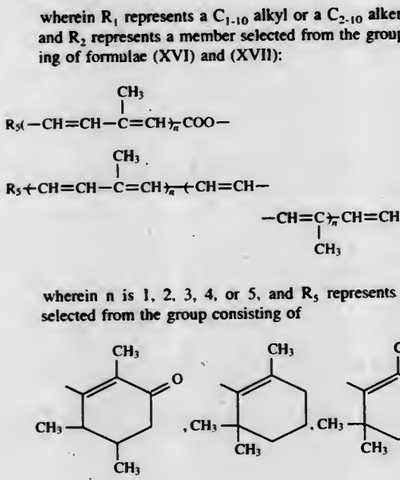
(I) (II) (III) (IV) (V) (VI) (VII)



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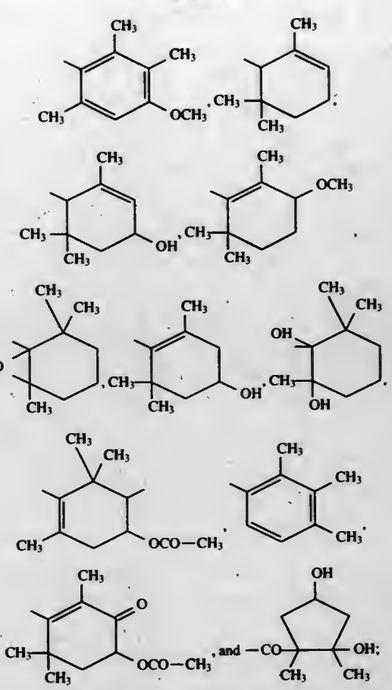


(I) (II) (III) (IV) (V)

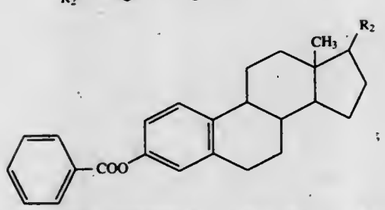


(VI) (VII)

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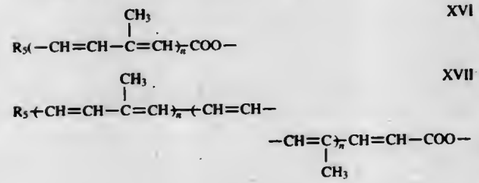


(VIII) (IX) (X) (XI)



(XII)

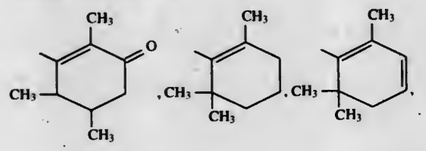
wherein $R_1$ represents a $C_{1-10}$ alkyl or a $C_{2-10}$ alkenyl group and $R_2$ represents a member selected from the group consisting of formulae (XVI) and (XVII):



XVI

XVII

wherein n is 1, 2, 3, 4, or 5, and $R_5$ represents a radical selected from the group consisting of



0 to 40% by weight of a pharmaceutically acceptable solvent or solvent mixture which acts as a hydrotropic agent or co-emulsifier;

0.001 to 90% by weight of a pharmaceutically acceptable surfactant or surfactant mixture;

0 to 10% by weight of a vitamin or provitamin,

up to 10% by weight of a free fatty acid, and

a pharmaceutically acceptable carrier or diluent.

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**5,496,814**

## METHOD OF MODIFYING BONE RESORPTION WITH 9(11)-DEHYDRO-8-ISOESTRONE

**Frederick O. Gemmill, Jr.; Chester E. Orzech, both of Rouses Point, N.Y., and Steven J. Adelman, Doylestown, Pa., assignors to American Home Products Corporation, Madison, N.J.**

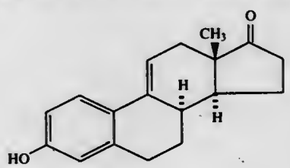
**Division of Ser. No. 224,849, Apr. 8, 1994, Pat. No. 5,395,831. This application Dec. 1, 1994, Ser. No. 347,742**

**Int. Cl.[6] A61K** *31/565*

**U.S. Cl. 514—179** **1 Claim**

1. A method of reducing the ratio of the rate of bone resorption to bone formation in a patient in need thereof comprising administering to said patient an effective amount of the compound (VI)

(VI)



**5,496,815**

## THIAZINE (OR OXAZINE) DERIVATIVES AND PREPARATION THEREOF

**Masakatsu Ozeki, Kawagoe; Shin-ichi Kodato; Kousuke Yasuda, both of Kounosu; Yukitsuka Kudo, Urawa, and Kayoko Maeda, Osaka, all of, Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan**

**Continuation-in-part of Ser. No. 948,659, Sep. 23, 1992, Pat. No. 5,281,592, which is a division of Ser. No. 648,891, Jan. 31, 1991, Pat. No. 5,246,929. This application Oct. 28, 1993, Ser. No. 142,144**

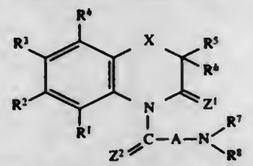
**Claims priority, application Japan, Feb. 8, 1990, 2-31068; Mar. 7, 1990, 2-56220; Mar. 9, 1990, 2-59328**

**The portion of the term of this patent subsequent to Jan. 25, 2011, has been disclaimed.**

**Int. Cl.[6] A61K** *31/54*; **C07D** *279/16*

**U.S. Cl. 514—224.2** **4 Claims**

1. A method for the prophylaxis or treatment of ischemic encephalopathia in a warm-blooded animal which comprises administering to said warm-blooded animal a pharmaceutically effective amount of a compound of the formula:



(I)

wherein $R^1$, $R^2$, $R^4$ and $R^5$ are each a hydrogen atom; $R^3$ is a hydrogen atom or a halogen atom; X is a sulfur atom; $R^6$ is naphthyl, a sulfur containing monoheterocyclic group or a substituted phenyl group; $Z^1$ denotes two hydrogen atoms; $Z^2$ is an oxygen atom; A is a lower alkylene; $R^7$ and $R^8$ are the same or different and are each a hydrogen atom, a lower alkyl group, a lower alkenyl group, a lower alkynyl group or a lower alkyl group that is substituted by a substituted phenyl group, or $R^7$ and $R^8$ together with the adjacent nitrogen atom form a nitrogen-containing monoheterocyclic group; or a pharmaceutically acceptable salt thereof; except for the compound of Formula (I), wherein $R^1$, $R^2$, $R^3$, $R^4$ and $R^5$ are each a hydrogen atom, X is a sulfur atom, $R^6$ is a halogenophenyl group, $Z^1$ denotes two hydrogen atoms, $Z^2$ is an oxygen atom, A is a lower alkylene group, and $R^7$ and $R^8$ are the same or different and are each a lower alkyl group.

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**5,496,816**

## CARBAPENEM ANTIBACTERIAL COMPOUNDS, COMPOSITIONS CONTAINING SUCH COMPOUNDS AND METHODS OF TREATMENT

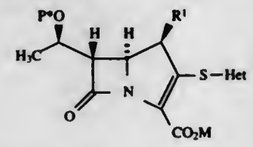
**Timothy A. Blizzard, Rahway; Ronald W. Ratcliffe, Matawan; Sherman T. Waddell, Westfield; Sandra P. Szumiloski, Edison; Robert R. Wilkening, Maplewood, and Kenneth J. Wildonger, Bridgewater, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.**

**Continuation-in-part of Ser. No. 213,314, Mar. 14, 1994, abandoned. This application Dec. 20, 1994, Ser. No. 359,770**

**Int. Cl.[6] A61K** *31/40*; **C07D** *487/04*

**U.S. Cl. 514—210** **34 Claims**

1. A compound or a pharmaceutically acceptable salt thereof represented by formula I:



I

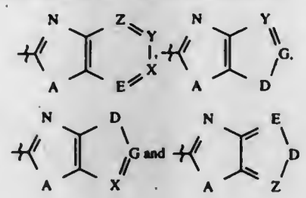
wherein:

$R^1$ represents H or methyl;

$CO_2M$ represents a carboxylic acid, a carboxylate anion, a pharmaceutically acceptable ester group or a carboxylic acid protected by a protecting group;

$P^*$ represents H or a hydroxyl protecting group;

Het has substituent groups which contain from one to three positively charged atoms and is selected from:



wherein:

A is O or S;

D is O, S or $NR^a$;

E, G, X, Y and Z represent CR or N;

each R is independently selected from: —$R^*$; hydrogen; halo; —CN; —$NO_2$; —$OR^c$; —$SR^c$; —$CONR^aR^b$; —$COOR^b$; —$SOR^c$; —$SO_2R^c$; —$SO_2NR^aR^b$; —$NR^aSO_2R^b$; —$COR^a$; —$OCOR^a$; —$OCONR^aR^b$; —$NR^aCONR^bR^c$; —$NR^aCO_2R^b$; —$OCO_2R^b$; —$C_{1\text{-}6}$ straight- or branched-chain alkyl, unsubstituted or substituted with one to four $R^d$ groups; and —$C_{3\text{-}7}$ cycloalkyl, unsubstituted or substituted with one to four $R^d$ groups,

$R^a$, $R^b$ and $R^c$ represent hydrogen, —$C_{1\text{-}6}$ straight- or branched-chain alkyl, unsubstituted or substituted with one to four $R^d$groups; —$C_{3\text{-}7}$ cycloalkyl, unsubstituted or substituted with one to four $R^d$ groups; or -R *

or $R^a$ and $R^b$ taken together with any intervening atoms represent a 4–6 membered saturated ring optionally interrupted by one or more of O, S, $NR^c$, with $R^c$ as defined above, or —C(O)—, said ring being unsubstituted or substituted with one to four $R^f$ groups;

or $R^b$ and $R^c$ taken together with any intervening atoms represent a 4–6 membered saturated ring optionally interrupted by one to three of O, S, $NR^a$, with $R^a$ as defined above, or —C(O)—, said ring being unsubstituted or substituted with one to four $R^f$ groups;

each $R^d$ independently represents halo; —CN; —$NO_2$; —$NR^eR^f$; —$OR^e$; —$SR^e$; —$CONR^eR^f$; —$COOR^e$; —$SOR^e$; —$SO_2R^e$; —$SO_2NR^eR^f$; —$NR^eSO_2R^f$; —$COR^e$; —$NR^e$ $COR^f$; —$OCOR^e$; —$OCONR^eR^f$; —$NR^eCONR^fR^g$; —$NR^eCO_2R^h$; —$OCO_2R^h$; —$C(NR^e)NR^fR^g$; —$NR^eC(NH)NR^fR^g$; —$NR^eC(NR^f)R^g$; —$R^*$ or —Q;

with the proviso that from 1 to 3 R groups are present which contain $R^*$ or Q, said $R^*$ and Q being defined below;

$R^e$, $R^f$ and $R^g$ represent hydrogen; —$C_{1\text{-}6}$ straight- or branched-chain alkyl unsubstituted or substituted with one to four $R^f$ groups, or —$R^*$;

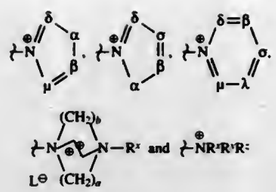
or $R^e$ and $R^f$ taken together with any intervening atoms represent a 4–6 membered saturated ring optionally interrupted by one to three of O, S, —C(O)— or $NR^g$ with $R^g$ as defined above, said ring being unsubstituted or substituted with one to four $R^f$ groups;

each $R^f$ independently represents halo; —CN; —$NO_2$; phenyl; —$NHSO_2R^h$; —$OR^h$, —$SR^h$; —$N(R^h)_2$; —$N^+(R^h)_3$; —$C(O)N(R^h)_2$; —$SO_2N(R^h)_2$; heteroaryl; heteroarylium; —$CO_2R^h$; —$C(O)R^h$; —$OCOR^h$; —$NHCOR^h$; guanidinyl; carbamimidoyl or ureido;

each $R^h$ independently represents H, a —$C_{1\text{-}6}$ straight or branched-chain alkyl group, a —$C_3$–$C_6$ cycloalkyl group or phenyl, or when two $R^h$ groups are present, said $R^h$ groups may be taken in combination and represent a 4–6 membered saturated ring, optionally interrupted by one or two of O, S, $SO_2$, —C(O)—, NH and $NCH_3$;

Q is selected from the group consisting of:





wherein:

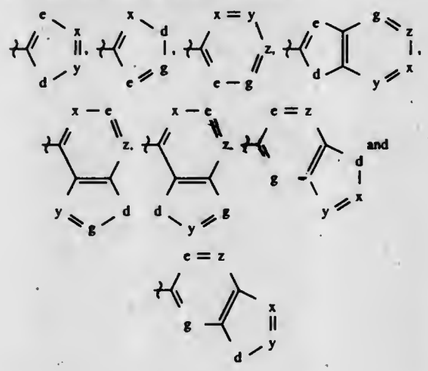
a and b are 1, 2 or 3;

L– is a pharmaceutically acceptable counterion;

α represents O, S or $NR^z$;

β, δ, λ, μ and σ represent $CR^f$, N or $N^+R^f$, provided that no more than one of β, δ, λ, μ and σ is $N^+R^f$;

$R^*$ is selected from the group consisting of:



wherein:

each d independently represents O, S or $NR^k$;

e, g, x, y and z represent $CR^m$, N or $N^+R^k$, provided that no more than one of e, g, x, y and z in any given structure represents $N^+R^k$;

$R^k$ represents hydrogen; —$C^{1\text{-}6}$ straight- or branched-chain alkyl, unsubstituted or substituted with one to four $R^f$ groups; or —$(CH_2)_nQ$ where n=1, 2 or 3 and Q is as previously defined;

each $R^m$ independently represents a member selected from the group consisting of: hydrogen; halo; —CN; —$NO_2$; —$NR^nR^o$; —$OR^n$; —$SR^n$; —$CONR^nR^o$; —$COOR^k$; —$SOR^n$; —$SO_2R^n$; —$SO_2NR^nR^o$; —$NR^nSO_2R^o$; —$COR^n$; —$NR^nCOR^o$; —$OCOR^n$; —$OCONR^nR^o$; —$NR^nCO_2R^k$; —$NR^nCONR^nR^k$; —$OCO_2R^k$; —$CNR^nNR^nR^k$; —$NR^nCNHNR^nR^k$; —$NR^nC(NR^o)R^k$; —$C_{1\text{-}6}$ straight- or branched-chain alkyl, unsubstituted or substituted with one to four $R^f$ groups; —$C_{3\text{-}7}$ cycloalkyl, unsubstituted or substituted with one to four $R^f$ groups; and —$(CH_2)_nQ$ where n and Q are as defined above;

$R^n$ and $R^o$ represent hydrogen, phenyl; —$C_{1\text{-}6}$ straight- or branched-chain alkyl unsubstituted or substituted with one to four $R^f$ groups;

each $R^r$ independently represents hydrogen; phenyl; —$C_{1\text{-}6}$ straight- or branched-chain alkyl, unsubstituted or substituted with one to four $R^f$ groups;

each $R^s$ independently represents hydrogen; halo; phenyl; —CN; —$NO_2$; —$NR^nR^v$; —$OR^w$; —$SR^w$; —$CONR^nR^v$; —$COOR^k$; —$SOR^w$; —$SO_2R^w$; —$SO_2NR^nR^v$; —$NR^nSO_2R^v$; —$COR^w$; —$NR^nCOR^v$; —$OCOR^w$; —$OCONR^nR^v$; —$NR^nCO_2R^v$; —$NR^nCONR^vR^w$; —$OCO_2R^v$;heteroaryl; heteroarylium; —$C_{1\text{-}6}$ straight- or branched-chain alkyl, unsubstituted or substituted with one to four $R^f$ groups;

$R^w$ and $R^v$ represent hydrogen or —$C_{1\text{-}6}$ straight- or branched-chain alkyl, unsubstituted or substituted with one to four $R^f$ groups;

or $R_w$ and $R^v$ together with any intervening atoms represent a 4–6 membered saturated ring optionally interrupted by one or more of O, S, $NR^w$ or —C(O)—, said ring being unsubstituted or substituted with one to four $R^f$ groups;

each $R^w$ independently represents hydrogen or —$C_{1\text{-}6}$ straight- or branched-chain alkyl, unsubstituted or substituted with one to four $R^f$ groups; $C_{3\text{-}6}$ cycloalkyl optionally substituted with one to four $R^f$ groups; phenyl optionally substituted with one to four $R^f$ groups

or $R^k$ and $R^w$ taken together with any intervening atoms represent a 5–6 membered saturated ring, optionally interrupted by one or two of O, S, $SO_2$, NH or $NCH_3$;

$R^z$ represents hydrogen or a $C_{1\text{-}6}$ straight- or branched-chain alkyl, optionally interrupted by one or two of O, S, SO, $SO_2$, $NR^w$, $N^+R^kR^w$ , or —C(O)—, said chain being unsubstituted or substituted with one to four of halo, CN, $NO_2$, $OR^w$, $SR^w$, $SOR^w$, $SO_2R^w$, $NR^kR^w$, $N^+(R^k)_2R^w$, —C(O)—$R^w$, C(O)N-$R^kR^w$, $SO_2NR^kR^w$, $CO_2R^w$, $OC(O)R^w$, $OC(O)NR^kR^w$, $NR^kC(O)R^w$, $NR^kC(O)NR^kR^w$, or a phenyl or heteroaryl group which is in turn optionally substituted with from one to four $R^f$ groups or with one to two $C_{1\text{-}3}$ straight- or branched-chain alkyl groups, said alkyl groups being unsubstituted or substituted with one to four $R^f$ groups;

$R^y$ and $R^z$ represent hydrogen; phenyl; —$C_{1\text{-}6}$ straight or branched chain alkyl, unsubstituted or substituted with one to four $R^f$ groups, and optionally interrupted by O, S, $NR^w$, $N^+R^kR^w$ or —C(O)—;

or $R^z$ and $R^y$ together with any intervening atoms represent a 4–6 membered saturated ring optionally interrupted by O, S, $SO_2$, $NR^w$ , $N^+R^kR^w$ or —C(O)—, unsubstituted or substituted with 1–4 Ri groups,

and when $R^z$ and $R^y$ together represent a 4–6 membered ting as defined above, $R^z$ is as defined above or $R^z$ represents an additional saturated 4–6 membered ring fused to the ring represented by $R^z$ and $R^y$ taken together, optionally interrupted by O, S, $NR^w$ or —C(O)—, said rings being unsubstituted or substituted with one to four $R^f$ groups.

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**5,496,817**

## 3-OXO-1,4-BENZOTHIAZINE DERIVATIVES

**Yoichi Kawashima, Kyoto; Atsutoshi Ota, and Hiroyuki Mibu, both of Osaka, all of, Japan, assignors to Santen Pharmaceutical Co., Ltd., Osaka, Japan**

**PCT No. PCT/JP93/01190, § 371 Date Apr. 22, 1994, § 102(e) Date Apr. 22, 1994, PCT Pub. No. WO94/05647, PCT Pub. Date Mar. 17, 1994**

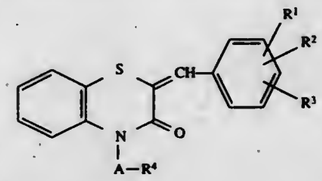
**PCT Filed Aug. 25, 1993, Ser. No. 211,940**

**Claims priority, application Japan, Aug. 31, 1992, 4-231669**

**Int. Cl.[6] C07D** *279/16*; **A61K** *31/54*

**U.S. Cl. 514—224.2** **12 Claims**

1. A compound having the following formula (I) or a salt thereof,



(I)

wherein

$R^1$ is hydroxy, lower alkanoyloxy, lower alkylsulfonyloxy, phenylsulfonyloxy, methylphenylsulfonyloxy, lower alkoxymethyloxy, benoyloxy, benzyloxymethyloxy, tetrahydropyranyloxy or trimethylsilyloxy;

$R^2$ is lower alkyl;

$R^3$ is hydrogen, lower alkyl, hydroxy, lower alkanoyloxy, lower alkylsulfonyloxy, phenylsulfonyloxy, methylphenylsulfonyloxy, lower alkoxymethyloxy, benoyloxy, benzyloxymethyloxy, tetrahydroxpyranyloxy, trimethylsilyloxy or lower alkoxy, and the said lower alkyl can be substituted by hydroxy, lower alkanoyloxy, lower alkylsulfonyloxy, phenylsulfonyloxy, methylphenylsulfonyloxy, lower alkoxymethyloxy, benzoyloxy, benzyloxymethyloxy, tetrahydropyranyloxy, trimethylsilyloxy, amino or lower alkylamino;

$R^4$ is carboxy, lower alkoxycarbonyl, phenyl lower alkoxycarbonyl, aminocarbonyl, lower alkylaminocarbonyl or phenyl lower alkylaminocarbonyl, and

A is alkylene having 1 to 10 carbon atoms.

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**5,496,818**

## STABLE EMULSION SUITABLE FOR PHARMACEUTICAL ADMINISTRATION, THE PRODUCTION THEREOF AND EMULSION FOR PHARMACEUTICAL USE

**Karin Schaupp; Josef Polzer; Johannes Kerbl, all of Graz; Kurt Lanthaler, Poels, all of, Austria; Stanley S. Davis, and Clive Washington, both of Nottingham, Great Britain, assignors to Knoll Aktiengesellschaft, Ludwigshafen, Germany**

**Division of Ser. No. 697,035, May 8, 1991, abandoned. This application May 6, 1993, Ser. No. 57,553**

**Claims priority, application Germany, May 11, 1990, 40 15 108.5**

**Int. Cl.[6] A61K** *31/54;31/275*

**U.S. Cl. 514—225.8** **7 Claims**

1. A stable emulsion which is suitable for pharmaceutical administration of the oil-in-water type, which contains in the lipid phase a hydrophobic pharmaceutical active substance, comprising

a) a dispersed lipid phase formed by a vegetable oil, which is present in the emulsion in an amount of 5–30% by weight and is stabilized by a phospholipid as emulsifier, present in an amount of 0.5–2% by weight of the emulsion,

b) the hydrophobic pharmaceutical active substance being present in said lipid phase, which is soluble in oil, sparingly soluble in water, strongly basic having a pKa of at least 8 and is present in the lipid phase in form of the base,

c) an aqueous phase, which contains a physiologically tolerated buffer system, setting this aqueous phase at an acid pH and due to the low solubility in water a small amount of the active substance in ionized form,

whereby cations of said ionized form of the active substance formed in said acid aqueous phase confer a positive charge at the interface of the emulsion, giving a positive zeta potential of at least +30 mV after dilution of the emulsion ready for administration to a fat content of 0.08% by weight.

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**5,496,819**

## ANTIPHLOGISTIC-ANALGESIC PLASTER COMPRISING TRIACETIN AND PIROXICAM

**Hirohisa Okuyama, Tomisato; Yasuo Ikeda, Narashino; Shigenori Ohtsuka, Chiba; Shuichi Kasai, Narita, and Akira Iwasa, Yotsukaidoh, all of, Japan, assignors to SS Pharmaceutical Co., Ltd., Tokyo, Japan**

**PCT No. PCT/JP92/01473, § 371 Date May 3, 1994, § 102(e) Date May 3, 1994, PCT Pub. No. WO93/09783, PCT Pub. Date May 27, 1993**

**PCT Filed Nov. 11, 1992, Ser. No. 211,948**

**Claims priority, application Japan, Nov. 15, 1991, 3-300361**

**Int. Cl.[6] A61K** *31/51;47/00;31/74;31/745*

**U.S. Cl. 514—226.5** **3 Claims**

1. An antiphlogistic-analgesic plaster comprising 0.05–5 wt. % of piroxicam and 0.05–40 wt. % of at least one of triacetin or triethyl citrate incorporated into a plaster base, said plaster comprising a water-soluble polymer, a glycol, a cross-linking agent and water.

**5,496,820**

## OPHTHALMIC USE OF S-TIMOLOL HEMIHYDRATE

**Markku Perälampi, Katajatie 30 B 3, SF-36200 Kangasala, Finland**

**Continuation of Ser. No. 910,665, Jul. 8, 1992, abandoned, which is a continuation-in-part of Ser. No. 663,853, Apr. 19, 1991, Pat. No. 5,231,095. This application Jul. 27, 1993, Ser. No. 97,880**

**Claims priority, application Finland, Jan. 20, 1988, 884838**

**The portion of the term of this patent subsequent to Jul. 27, 2010, has been disclaimed.**

**Int. Cl.[6] A61K** *31/535*

**U.S. Cl. 514—236.2** **19 Claims**

1. An Ophthalmic topical composition containing a therapeutically effective amount of (S)-(-)-3-morpholino-4-( 3-tert-butylamino-2 hydroxypropoxy)-1, 2,5-thiadiazole hemihydrate together with an ophthalmic carrier.

14. Method for the topical treatment of glaucoma and ocular hypertension which comprises administering to the eye of a human or animal in need of such treatment a therapeutically effective amount of (S)-(-)-3-morpholino-4-(3-tert-butyl-amino-2 hydroxypropoxy)-1,2,5-thiadiazole hemihydrate.

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**5,496,821**

## USE OF L-CARNITINE AND ALKANOYL L-CARNITINES IN THE STORAGE OF BLOOD FOR TRANSFUSIONS AND STABILIZING SOLUTIONS CONTAINING THEM

**Arduini Arduino, Pescara, Italy, assignor to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A., Rome, Italy**

**Filed Jun. 2, 1994, Ser. No. 253,275**

**Claims priority, application Italy, Jun. 2, 1993, RM93A0364**

**Int. Cl.[6] A61K** *31/35;31/535;* **A61M** *5/00;* **A01N** *43/16*

**U.S. Cl. 514—228.8** **8 Claims**

1. A method for stabilizing blood for transfusion, comprising mixing blood with a solution, said solution comprising L-carnitine, alkanoyl L-carnitine, or a pharmaceutically acceptable salt thereof, wherein said pharmaceutically acceptable salt is selected from the group consisting of chloride, bromide, orotate, aspartic acid, acid citrate, acid phosphate, fumarate, acid fumarate, maleate, acid maleate, acid oxalate, acid sulfate, glucoses phosphate, tartrate, and acid tartrate, and wherein said solution comprises 0.5–10.0 mM/L of said L-carnitine, said alkanoyl L-carnitine, or said pharmaceutically acceptable salt thereof.

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**5,496,822**

## COMPOUNDS AND METHODS FOR TREATING TUMORS

**Hiroshi Akimoto, Kobe, and Takenori Hitaka, Takarazuka, both of, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan**

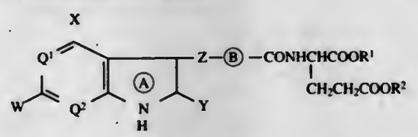
**Continuation of Ser. No. 219,735, Mar. 29, 1994, abandoned, which is a continuation of Ser. No. 990,370, Dec. 15, 1992, abandoned, which is a continuation of Ser. No. 630,984, Dec. 20, 1990, abandoned. This application Sep. 21, 1994, Ser. No. 308,500**

**Claims priority, application Japan, Dec. 20, 1989, 1-332110**

**Int. Cl.[6] A61K** *31/505;* **C07D** *487/04*

**U.S. Cl. 514—258** **15 Claims**

1. A compound of the formula:



wherein the ring A is a pyrrole or pyrroline ring, B' is a thiophen-2,5-ylene or phenyl-1,4-ylene, W' is a hydrogen atom, a $C_{1-4}$ alkyl



group or mercapto group, X is an amino group, hydroxyl group or mercapto group, Y is a hydrogen atom, $R^1$ and $R^2$ independently are a hydrogen atom, $C_{1-8}$ alkyl group, benzyl group which may be substituted with a nitro group or a methoxy group or phenyl group which may be substituted with a nitro group or a methoxy group and Z is $—CH_2CH_2CH_2—$, or its salt.

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**5,496,823**

## PHARMACEUTICAL COMPOSITION FOR INCREASING BLADDER CAPACITY

**Yuko Morioka, and Mitsuru Takano, both of Saitama, Japan, assignors to Hoechst Japan Limited, Tokyo, Japan**

**Continuation of Ser. No. 986,903, Dec. 8, 1992, abandoned. This application Aug. 9, 1994, Ser. No. 287,794**

**Claims priority, application Japan, Dec. 10, 1991, 3-325458**

**Int. Cl.[6] A61K** *31/52*

**U.S. Cl. 514—263** **3 Claims**

1. A method for increasing bladder capacity in a patient in need of said increase which comprises administering a therapeutically effective amount of propentofylline (3,7-dihydro-3-methyl-1-(5-oxohexyl)-7-propyl- 1H-purine-2,6-dione) or a pharmaceutically acceptable acid addition salt thereof to said patient.

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**5,496,824**

## CYCLOPROPANE DERIVATIVES AND ANTI-VIRAL AGENT CONTAINING THE SAME

**Tomoyuki Onishi; Chika Mukai; Takaaki Sekiyama; Takashi Tsuji; Satoshi Iwayama, and Masahiko Okunishi, all of Kawasaki, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan**

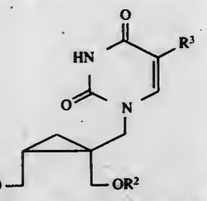
**Filed Oct. 21, 1994, Ser. No. 327,851**

**Claims priority, application Japan, Jan. 21, 1993, 5-263490**

**Int. Cl.[6] C07D** *239/54;* **A61K** *31/505*

**U.S. Cl. 514—274** **11 Claims**

1. A cyclopropane derivative of the formula (I):



(I)

wherein $R^1$ and $R^2$, the same or different, are each a hydrogen atom, a $C_{1-6}$ acyl group or a $C_{1-6}$ acyl group substituted with a $C_{3-8}$ cycloalkyl group or $C_{6-8}$ aryl group; $R^3$ is an (E)-2-haloethenyl group;

or a pharmaceutically acceptable salt thereof.

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**5,496,825**

## ACONITINE COMPOUNDS AND ANALGESIC/ANTI-INFLAMMATORY AGENT CONTAINING THE SAME

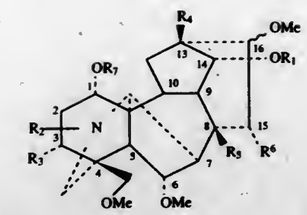
**Mitsuo Murayama, and Takao Mori, both of Utsunomiya, Japan, assignors to Sanwa Shoyaku Kabushiki Kaisha, Tochigi, Japan**

**Continuation-in-part of Ser. No. 50,281, May 5, 1993, abandoned. This application Jun. 28, 1994, Ser. No. 267,604**

**Int. Cl.[6] A61K** *31/435;* **C07D** *221/22*

**U.S. Cl. 514—279** **2 Claims**

1. An aconitine compound of the formula (I) or a salt thereof:



(I)

wherein

$R_1$ and $R_7$ are the same and represent methyl or aliphatic or aromatic acyl;

$R_2$ is (i) hydrogen,

(ii) an acyclic or cyclic, saturated or unsaturated alkyl having 1–8 carbon atoms,

(iii) an oxygen- or nitrogen-containing 5- or 6-membered heterocyclic group,

(iv) acyl derived from an acyclo- or cyclo-aliphatic, aromatic or aromatic-aliphatic carboxylic acid, or

(v) aralkyl;

$R_3$, $R_4$ and $R_6$ are hydrogen; and

$R_5$ is hydroxyl; provided that if $R_1$ is benzoyl, anisoyl, acetyl, trimethylgalloyl, p-nitrobenzoyl or o-methoxybenzoyl, then $R_2$ is methyl.

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**5,496,826**

## PHARMACEUTICAL METHODS OF USING HETEROCYCLIC DERIVATIVES OF N-PHENYLAMIDES

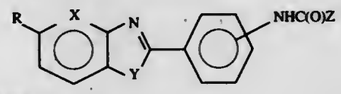
**Brett T. Watson, Wallingford, and Astrid A. Ortiz, Fairfield, both of Conn., assignors to Bristol-Myers Squibb Company, Princeton, N.J.**

**Filed Sep. 2, 1994, Ser. No. 300,671**

**Int. Cl.[6] A61K** *31/44;31/425;31/42;31/415*

**U.S. Cl. 514—303** **24 Claims**

1. A method of eliciting an anticonvulsive effect in a mammal in need thereof comprising the step of administering to said mammal an anticonvulsive amount of a compound of formula I or a pharmaceutically acceptable salt thereof:



(I)

wherein

R=H or $C_{1-4}$ alkoxy;

X=CH or N;

Y=NH, O or S;

Z=$C_{1-4}$ alkyl, $C_{3-6}$ cycloalkyl, $C_{2-3}$ alkenyl, $NH_2$, $C_{1-4}$ alkylamino, or $C_{1-4}$ alkoxyalkyl, with the proviso that Z may not be $CH_3$ when R=H, X=CH, and Y=NH and Z may not be $CH_3$ when R=H, X=N and Y=NH and NHC(O)Z is in the para-position.

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**5,496,827**

## COMPOSITIONS FOR THE TRANSDERMAL DELIVERY OF NUTRIENTS

**Jay Patrick, 14 Morgan, Irvine, Calif. 92718**

**Filed Jul. 15, 1994, Ser. No. 275,437**

**Int. Cl.[6] A61K** *31/47*

**U.S. Cl. 514—310** **17 Claims**

1. A transdermal nutrient delivery composition comprising, in a liquid, between about 0.025 percent and about one percent methyl nicotinate by weight and between about 0.01 percent and about one percent by weight of vitamins and minerals selected from the group consisting of thiamin, riboflavin, pyridoxine, panthenol,

folic acid, cyanocobalamin, para aminobenzoic acid, zinc, magnesium, manganese, chromium, selenium, and biotin.

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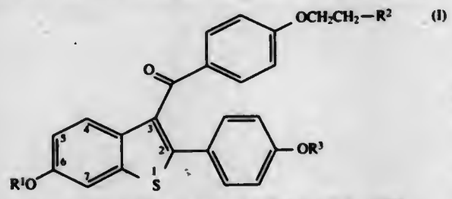
5,496,828

## METHODS OF INHIBITING ULCERATIVE MUCOSITIS

George J. Cullinan, Trafalgar, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

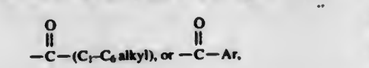
Filed Aug. 22, 1994, Ser. No. 293,790
Int. Cl.[6] A61K 31/445;31/55;31/40
U.S. Cl. 514—324 5 Claims

1. A method of inhibiting radiation or chemotherapy induced ulcerative mucositis comprising administering to a human in need thereof an effective amount of a compound having the formula



(I)

wherein $R^1$ and $R^3$ are independently hydrogen, $—CH_3$,



wherein Ar is optionally substituted phenyl;

$R^2$ is selected from the group consisting of pyrrolidine, hexamethylenemino, and piperidino; or a pharmaceutically acceptable salt of solvate thereof.

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5,496,829

## USE OF 2-NITROXYETHYL (+)APOVINCAMINATE

Shigeru Okuyama; Susumu Otomo; Yutaka Kawashima, and Katsuo Hatayama, all of Tokyo, Japan, assignors to Taisho Pharmaceutical Co., Ltd., Japan

PCT No. PCT/JP94/01601, § 371 Date May 24, 1994, § 102(e) Date May 24, 1994, PCT Pub. No. WO93/11765, PCT Pub. Date Jun. 24, 1993
PCT Filed Dec. 8, 1992, Ser. No. 244,330
Claims priority, application Japan, Dec. 10, 1991, 3-324932; Dec. 10, 1991, 3-325445
Int. Cl.[6] A61K 31/44
U.S. Cl. 514—283 3 Claims

1. A method for treating disturbance of consciousness which comprises administering an effective amount of 2-nitroxyethyl (+)apovincaminate to a patient.

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5,496,830

## INHIBITION OF HEMOFLAGELLATES BY CAMPTOTHECIN COMPOUNDS

Theresa A. Shapiro, Towson; Annette L. Bodley, Elkton, both of Md.; Monroe E. Wall, Chapel Hill, and Mansukh C. Wani, Durham, both of N.C., assignors to Johns Hopkins University, Baltimore, Md., and Research Triangle Institute, Research Triangle Park, N.C.

Filed Sep. 14, 1994, Ser. No. 305,603
Int. Cl.[6] A61K 31/395;31/55;31/54;31/535
U.S. Cl. 514—283 19 Claims

1. A method of inhibiting hemoflagellate growth, comprising contacting living hemoflagellates with an effective inhibitory amount of a camptothecin compound wherein said compound exhibits hemoflagellate topoisomerase I inhibitory activity.

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5,496,831

## INHIBITION OF INSULIN-INDUCED ADIPOSIS

Maria C. Alexander-Bridges, Newtonville, and Hui-Fen Zhao, Brookline, both of Mass., assignors to The General Hospital Corporation, Boston, Mass.

Filed May 13, 1994, Ser. No. 242,409
Int. Cl.[6] A01N 43/42
U.S. Cl. 514—290 18 Claims

1. A method of treating obesity caused by hyperinsulinemia, said method comprising the steps of:

(a) identifying an adult in need of such treatment; and

(b) administering to said adult an amount of rapamycin effective to inhibit insulin-induction of GAPDH, acetyl CoA carboxylase, or GLUT4 gene expression in said adult.

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5,496,832

## METHOD OF TREATING CARDIAC INFLAMMATORY DISEASE

Jay J. Armstrong, Bensalem, Pa., assignor to American Home Products Corporation, Madison, N.J.

Filed Mar. 9, 1995, Ser. No. 401,747
Int. Cl.[6] A61K 31/44
U.S. Cl. 514—291 2 Claims

1. A method of treating myocarditis, cardiomyopathy, endocarditis, and pericarditis in a mammal in need thereof which comprises administering an effective amount of rapamycin to said mammal orally, parenterally, intravascularly, intranasally, intrabronchially, transdermally, or rectally.

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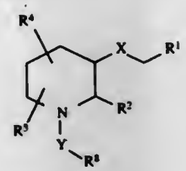
5,496,833

## PIPERIDINE TACHYKININ RECEPTOR ANTAGONISTS

Reymond Baker, Much Hadham; Tamara Ladduwahetty, London; Eileen M. Seward, Bishops Stortford, and Christopher J. Swain, Duxford, all of, England, assignors to Merck Sharp & Dohme Limited, Hertfordshire, United Kingdom

Division of Ser. No. 46,538, Apr. 13, 1993, Pat. No. 5,444,074.
This application Feb. 13, 1995, Ser. No. 387,684
Int. Cl.[6] A61K 31/445; C07D 401/06
U.S. Cl. 514—326 12 Claims

1. A compound of formula (I), or a pharmaceutically acceptable salt or prodrug thereof:



(I)

wherein:

X represents O or S;

Y represents a hydrocarbon chain of 1, 2, 3 or 4 carbon atoms which may optionally be substituted by oxo;

$R^1$ represents unsubstituted phenyl or phenyl substituted by 1, 2 or 3 substituents selected from the group consisting of: $C_{1-6}$alkyl, $C_{2-6}$alkenyl, $C_{2-6}$alkynyl, halo, cyano, nitro, trifluoromethyl, trimethylsilyl, $—OR^a$, $SR^a$, $SOR^a$, $SO_2R^a$, $—NR^aR^b$, $—NR^aCOR^b$, $—NR^aCO_2R^b$, $—CO_2R^a$ and $—CONR^aR^b$;

$R^2$ represents phenyl or benzhydryl, wherein the phenyl or benzhydryl moiety is unsubstituted or substituted by a substituent selected from the group consisting of: $C_{1-6}$alkyl, $C_{1-6}$alkoxy, halo and trifluoromethyl;

$R^4$ and $R^5$ may be present on any available carbon atom of the azacyclic ring and are each independently selected from the group consisting of: H, halo, $C_{1-6}$alkyl, oxo, $CH_2OR^a$, $CO_2R^a$ and $CONR^aR^b$;



$R^6$ represents an aromatic heterocycle selected from the group consisting of: thiazolyl, oxazolyl, oxadiazolyl, thiadiazolyl, isoxazolyl, isothiazolyl and benzoxazolyl, wherein the heterocycle is unsubstituted or substituted with a substituent selected from the group consisting of: $C_{1-6}$alkyl, $C_{1-6}$alkoxy, phenyl, oxo, thioxo, halo, trifluoromethyl, trimethylsilyl, $—NR^aR^b$, $—NR^aCOR^b$, $—CONR^aR^b$, $—CO_2R^a$, $—SR^a$, $—SOR^a$, $SO_2R^a$, and $CH_2OR^a$; and

$R^a$ and $R^b$ are each independently selected from the group consisting of: H, trifluoromethyl, $C_{1-6}$alkyl, unsubstituted phenyl and phenyl substituted by a substituent selected from the group consisting of: $C_{1-6}$alkyl, halo and trifluoromethyl.

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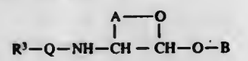
5,496,834

## LACTOL DERIVATIVES, THEIR PRODUCTION AND USE

Takashi Sohda, Osaka; Yukio Fujisawa, Hyogo; Satoru Oi, Nara, and Junji Mizoguchi, Osaka, all of, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Sep. 2, 1994, Ser. No. 300,738
Claims priority, application Japan, Sep. 3, 1993, 5-219655; Jul. 20, 1994, 6-168501; Aug. 12, 1994, 6-190385
Int. Cl.[6] A61K 31/44;31/40;31/35
U.S. Cl. 514—343 22 Claims

1. A compound of the general formula



wherein Q represents one or two amino acid residues which may or may not be substituted; $R^3$ represents a carboxyl group which may or may not be esterified or an acyl group; A represents a C2–C4 alkylene group; B represents hydrogen, an alkyl group which may or may not be substituted or an acyl group; or a salt of the compound.

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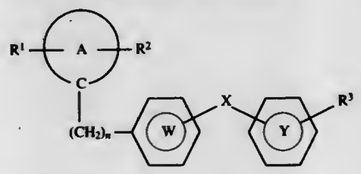
5,496,835

## HETEROCYCLIC COMPOUNDS HAVING ANGIOTENSIN II ANTAGONISTIC ACTIVITY AND USE THEREOF

Keiji Kubo, Osaka; Yoshiyuki Inada, Kawanishi, and Takehiko Naka, Kobe, all of, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Dec. 22, 1993, Ser. No. 171,164
Claims priority, application Japan, Dec. 22, 1992, 4-342917
Int. Cl.[6] C07D 413/10; A61K 31/41
U.S. Cl. 514—361 18 Claims

1. A compound represented by the formula:



wherein:

the ring A stands for a 5–10 membered aromatic heterocyclic group optionally having, besides $R^1$ and $R^2$, a further substituent selected from the group consisting of halogen, nitro, cyano, amino,N-lower ($C_{1-4}$) alkylamino, N,N-di-lower ($C_{1-4}$) akylamino, phenylamino, morpholino, piperidino, piperazino, N-phenylpiperazino, and a group represented by the formula $—U—R^6$, wherein:

U is selected from the group consisting of a bonds —O—, —S— and —CO—, and

$R^6$ is selected from the group consisting of hydrogen, a lower ($C_{1-4}$) alkyl group and a phenyl group, wherein said lower alkyl group may optionally be substituted with hydroxyl, amino, halogen, nitro, cyano, or lower ($C_{1-4}$) alkoxy, and wherein said phenyl group may optionally be substituted with one or two of hydroxyl, amino, N-lower ($C_{1-4}$) alkylamino, N,N-lower ($C_{1-4}$) alkylamino, acetylamino, halogen, nitro, cyano, lower ($C_{1-4}$) alkyl, lower ($C_{1-4}$) alkoxy, lower ($C_{1-4}$) alkylthio, or acetyl;

$R^1$ stands for an optionally substituted hydrocarbon residue selected from the group consisting of

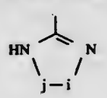
(i) an alkyl, alkenyl, alkynyl or cycloalkyl group which may be substituted with hydroxy, amino, N-lower ($C_{1-4}$) alkylamino, N,N-di-lower ($C_{1-4}$) alkylamino, halogen, lower ($C_{1-4}$) alkoxy or lower ($C_{1-4}$) alkylthio, and

(ii) a phenyl or phenyl-lower ($C_{1-4}$) alkyl group which may be substituted with halogen, nitro, amino, N-lower ($C_{1-4}$) alkylamino, N,N-di-lower ($C_{1-4}$) alkylamino, lower ($C_{1-4}$) alkoxy, lower ($C_{1-4}$) alkylthio, or lower ($C_{1-4}$) alkyl,

which hydrocarbon residue is optionally bonded through a group selected from the group consisting of —O—; $—S(O)_m—$, wherein m is an integer from 0 to 2; and a group of the formula $—N(R^9)—$, wherein $R^9$ is hydrogen or lower ($C_{1-4}$) alkyl;

$R^2$ stands for an optionally esterified carboxyl group;

$R^3$ stands for a group of the formula:



wherein

i is —O— or —S— and j is elected from the group consisting of a carbonyl group, a thiocarbonyl group, and an optionally oxidized sulfur atom or a group convertible thereto;

X is a direct bond,

the ring W is a phenylene group,

the ring Y is a phenylene group, and

n denotes an integer of 1 to 3, or a salt thereof.

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5,496,836

## USE OF FAMOTIDINE AND RELATED COMPOUNDS IN THE TREATMENT OF MOVEMENT DISORDERS

Alessandro Di Rocco, New York, N.Y.; Susan Molinari, River Edge, N.J., and Ram Kaminski, Riverdale, N.Y., assignors to Mount Sinai School of Medicine of the City University of New York, New York, N.Y.

Filed May 5, 1994, Ser. No. 238,704
Int. Cl.[6] A61K 31/425
U.S. Cl. 514—370 6 Claims

1. A method for ameliorating a motor symptom in a subject wherein the motor symptom is caused by a disorder selected from the group consisting of olivo-ponto-cerebellar atrophy, multisystem atrophy, Shy-Drager syndrome, kernicterus, Leigh's Disease, cerebellar ataxias, neonatal hypoxemia syndromes, carbon monoxide poisoning, progressive supranuclear palsy, tardive dystonias, oculogyral crises, manganese poisoning, Wilson's Disease, Huntington's Disease, striatonigral degeneration, ingestion by the subject of phenothiazines, butyrophenones or reserpine, Alzheimer's Disease, normal pressure hydrocephalus, physiologic tremor, benign familial tremor, cerebellar tremor, rubral tremor, toxic tremor, metabolic tremor, senile tremor, chorea, ballism, athetosis, dystonia, tics, tardive dyskinesia, paroxysmal choreoathetosis, tonic spasm, akathisia, muscle rigidity, postural instability, bradykinesia, difficulty in initiating movements, muscle cramps, dyskinesias, myoclonus and Creutzfeldt-Jacob Disease, and wherein the subject does not suffer from Parkinson's Disease, comprising administering, to the subject, a therapeutically effective amount of famotidine or a famotidine-related compound.

## 5,496,837

### ANTI-NEOPLASTIC ANTI-VIRAL AND RIBONUCLEOTIDE REDUCTASE ACTIVITY AFFECTING PHARMACEUTICAL COMPOSITIONS AND METHODS OF TREATMENT

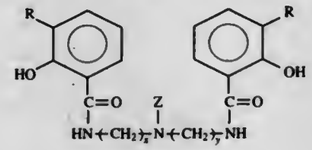
Raymond J. Bergeron, Gainesville, Fla., assignor to University of Florida Research Foundation, Inc., Gainesville, Fla.

Division of Ser. No. 376,889, Jan. 20, 1995, which is a division of Ser. No. 299,126, Sep. 2, 1994, which is a division of Ser. No. 124,557, Sep. 22, 1993, Pat. No. 5,391,563, which is a division of Ser. No. 993,620, Dec. 21, 1992, Pat. No. 5,292,775, which is a division of Ser. No. 645,644, Jan. 25, 1991, Pat. No. 5,173,505, which is a division of Ser. No. 313,734, Feb. 22, 1989, Pat. No. 5,128,353, which is a continuation-in-part of Ser. No. 746,672, Jun. 20, 1985, abandoned. This application Jun. 7, 1995, Ser. No. 477,804

Int. Cl.[6] A01N *43/36;43/38;43/76;* A61K *31/40*

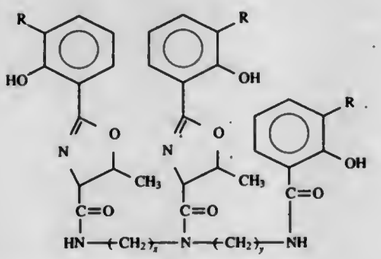
U.S. Cl. 514—374 2 Claims

1. A method for treating a human or non-human animal afflicted with psoriasis comprising administering thereto an effective anti-psoriasis amount of a compound of the formula:



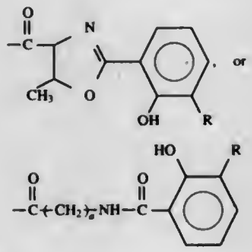
(I)

or,



wherein:

Z is



R is H or OH,

x is 3 or 4,

y is 3 or 4, and

a is 1, 2 or 3, or

a pharmaceutically acceptable salt or complex thereof.

## 5,496,838

### ANTI-NEOPLASTIC, ANTI-VIRAL AND RIBONUCLEOTIDE REDUCTASE ACTIVITY AFFECTING PHARMACEUTICAL COMPOSITIONS AND METHODS OF TREATMENT

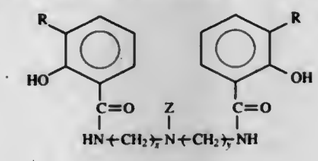
Raymond J. Bergeron, Gainesville, Fla., assignor to University of Florida Research Foundation, Inc., Gainesville, Fla.

Division of Ser. No. 299,126, Sep. 2, 1994, which is a division of Ser. No. 124,557, Sep. 22, 1993, Pat. No. 5,391,563, which is a division of Ser. No. 993,620, Dec. 21, 1992, Pat. No. 5,292,775, which is a division of Ser. No. 645,644, Jan. 25, 1991, Pat. No. 5,173,505, which is a division of Ser. No. 313,734, Feb. 22, 1989, Pat. No. 5,128,353, which is a continuation-in-part of Ser. No. 746,672, Jun. 20, 1985, abandoned. This application Jun. 7, 1995, Ser. No. 485,830

Int. Cl.[6] A01N *43/36;43/38;43/76;* A61K *31/40*

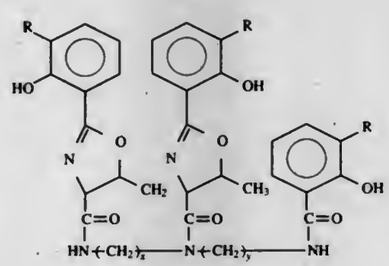
U.S. Cl. 514—374 8 Claims

1. The method for affecting the activity of ribonucleotide reductase in converting ribonucleotides to deoxyribonucleotides in human and non-human animals comprising administering to said animal in need thereof a ribonucleotide reductase activity affecting amount of a compound of the formula:



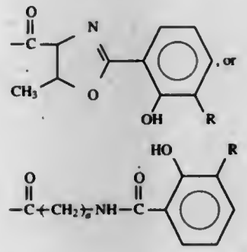
(I)

or



wherein:

R is



R is H or OH,

x is 3 or 4,

y is 3 or 4, and

a is 1, 2 or 3, or a pharmaceutically acceptable salt or complex thereof.



## 5,496,839

### ANTI-NEOPLASTIC, ANTI-VIRAL AND RIBONUCLEOTIDE REDUCTASE ACTIVITY AFFECTING PHARMACEUTICAL COMPOSITIONS AND METHODS OF TREATMENT

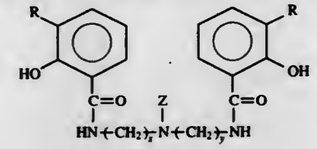
Raymond J. Bergeron, Gainesville, Fla., assignor to University of Florida Research Foundation, Inc., Gainesville, Fla.

Division of Ser. No. 376,889, Jan. 20, 1995, which is a division of Ser. No. 299,126, Sep. 2, 1994, which is a division of Ser. No. 124,557, Sep. 22, 1993, Pat. No. 5,391,563, which is a division of Ser. No. 993,620, Dec. 21, 1992, Pat. No. 5,292,775, which is a division of Ser. No. 645,644, Jan. 25, 1991, Pat. No. 5,173,505, which is a division of Ser. No. 313,734, Feb. 22, 1989, Pat. No. 5,128,353, which is a continuation-in-part of Ser. No. 746,672, Jun. 20, 1985, abandoned. This application Jun. 7, 1995, Ser. No. 475,690

Int. Cl.[6] A01N *43/36;43/38;43/76;* A61K *31/40*

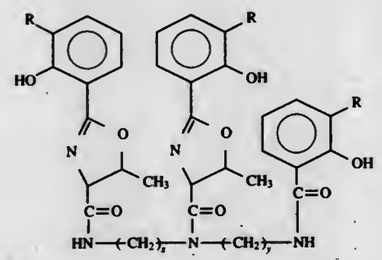
U.S. Cl. 514—374 2 Claims

1. A pharmaceutical composition in unit dosage form adapted for administration to a human or non-human animal comprising a) an anti-malarial effective amount of a compound of the formula:



(I)

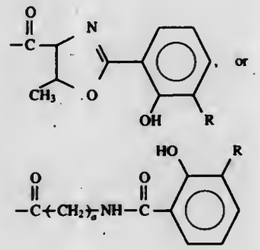
or



(II)

Wherein:

Z is



R is H or OH,

x is 3 or 4,

y is 3 or 4, and

a is 1, 2 or 3, or

a pharmaceutically acceptable salt or complex and b) a pharmaceutically acceptable carrier therefor.

## 5,496,840

### ANTI-NEOPLASTIC, ANTI-VIRAL AND RIBONUCLEOTIDE REDUCTASE ACTIVITY AFFECTING PHARMACEUTICAL COMPOSITIONS AND METHODS OF TREATMENT

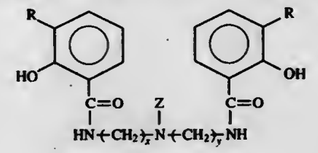
Raymond J. Bergeron, Gainesville, Fla., assignor to University of Florida Research Foundation, Inc., Gainesville, Fla.

Division of Ser. No. 376,889, Jan. 20, 1995, which is a division of Ser. No. 299,126, Sep. 2, 1994, which is a division of Ser. No. 124,557, Sep. 22, 1993, Pat. No. 5,391,563, which is a division of Ser. No. 993,620, Dec. 21, 1992, Pat. No. 5,292,775, which is a division of Ser. No. 645,644, Jan. 25, 1991, Pat. No. 5,173,505, which is a division of Ser. No. 313,734, Feb. 22, 1989, Pat. No. 5,128,353, which is a continuation-in-part of Ser. No. 746,672, Jun. 20, 1985, abandoned. This application Jun. 7, 1995, Ser. No. 476,558

Int. Cl.[6] A01N *43/36;43/38;43/76;* A61K *31/40*

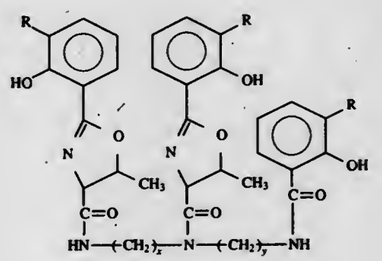
U.S. Cl. 514—374 2 Claims

1. A pharmaceutical composition in unit dosage form for administration to a human or non-human animal comprising a) an anti-psoriasis effective amount of a compound of the formula:



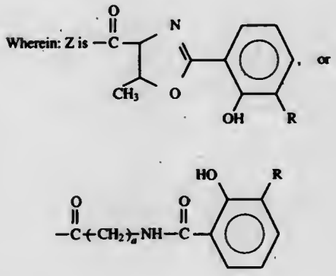
(I)

or



(II)

Wherein: Z is



R is H or OH,

x is 3 or 4,

y is 3 or 4, and

a is 1, 2 or 3, or

a pharmaceutically acceptable salt or complex and b) a pharmaceutically acceptable carrier therefor.

## 5,496,841

## ANTI-NEOPLASTIC, ANTI-VIRAL AND RIBONUCLEOTIDE REDUCTASE ACTIVITY AFFECTING PHARMACEUTICAL COMPOSITIONS AND METHOD OF TREATMENT

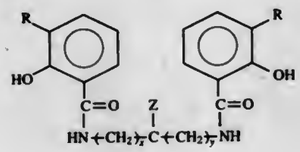
Raymond J. Bergeron, Gainesville, Fla., assignor to University of Flordia Research Foundation, Inc., Gainesville, Fla.

Division of Ser. No. 376,889, Jan. 20, 1995, which is a division of Ser. No. 299,126, Sep. 2, 1994, which is a division of Ser. No. 124,557, Sep. 22, 1993, Pat. No. 5,391,563, which is a division of Ser. No. 993,620, Dec. 21, 1992, Pat. No. 5,292,775, which is a division of Ser. No. 645,644, Jan. 25, 1991, Pat. No. 5,173,505, which is a division of Ser. No. 313,734, Feb. 22, 1989, Pat. No. 5,128,353, which is a continuation-in-part of Ser. No. 746,672, Jun. 20, 1985, abandoned. This application Jun. 7, 1995, Ser. No. 485,836

Int. Cl.[6] A01N 43/36;43/38;43/76; A61K 31/40

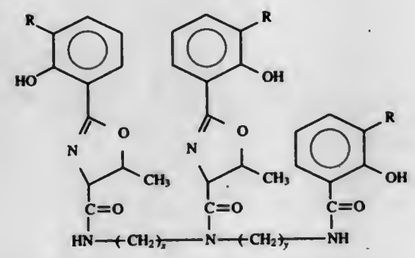
U.S. Cl. 514—374 9 Claims

1. A pharmaceutical composition in unit dosage form adapted for administration to a human or non-human animal comprising a) a ribonucleotide reductase affecting amount of a compound of the formula:

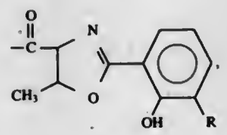


(I)

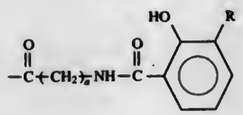
or



wherein Z is



or



R is H or OH,

x is 3 or 4,

y is 3 or 4, and

a is 1, 2 or 3, or

a pharmaceutically acceptable salt or complex thereof, and b) a pharmaceutically acceptable carrier therefor.

## 5,496,842

## SYNERGISTIC WATER SOLUBLE PRESERVATIVE COMPOSITIONS OF BIOCIDAL MIXTURES

John J. Merianos, Middletown, N.J., assignor to ISP Chemicals Inc., Chatham, N.J.

Division of Ser. No. 234,089, Apr. 28, 1994, Pat. No. 5,428,050. This application Feb. 22, 1995, Ser. No. 392,635

Int. Cl.[6] A01N 43/50;47/10

U.S. Cl. 514—389 8 Claims

1. A water soluble preservative antimicrobial composition for addition to commercial use products at predetermined use levels to provide synergistic biocidal activity against a wide range of fungi and gram-negative and gram-positive bacteria, comprising an admixture of

(a) 1,3-dimethylol-5,5-dimethyl hydantoin, and

(b) 3-iodo-2-propynylbutyl carbamate, in a weight ratio of (a):(b) of 100:1 to 2000:1.

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## 5,496,843

## TRICYCLIC INDOLE-2-CARBOXYLIC ACID DERIVATIVES

Ryu Nagata, Kyoto; Norihiko Tanno, Ibaraki, and Nobuyuki Ae, Toyonaka, all of, Japan, assignors to Sumitomo Pharmaceuticals Company, Limited, Osaka, Japan

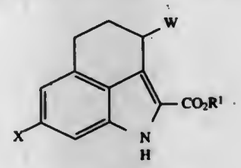
Filed Nov. 14, 1994, Ser. No. 339,687

Claims priority, application Japan, Nov. 17, 1993, 5-312742

Int. Cl.[6] A61K 31/40; C07D 209/62

U.S. Cl. 514—411 19 Claims

1. A tricyclic indole-2-carboxylic acid derivative represented by the formula I:



I

wherein

X represents an alkyl, halogen or cyano;

$R^1$ represents hydrogen, or a protecting group of carboxyl group;

W represents hydrogen, $—CO_2R^{3'}$, $—CONR^{3'}R^{4'}$, $—A—CO_2R^{3'}$ or $—A—CONR^{3'}R4i$, wherein —A— represents an alkylene group containing from 1 to 2 carbon atoms and $R^{3'}$ and $R^{4'}$ independently represent hydrogen, an alkyl group containing from 1 to 6 carbon atoms, an aryl group containing from 6 to 10 carbon atoms, or a substituted $C_{6-10}$ aryl group wherein the substituent on the aryl is selected from the group consisting of alkyl, halogen, —Y—J, or —Z—E, wherein J represents an acidic group which is readily deprotonated in vivo to provide an anion, or a group which is convertible thereto in vivo by hydrolysis, E represents a basic group which is readily protonated in vivo to produce a cation, or a group which is convertible thereto in vivo by hydrolysis, Y represents a single bond, a $C_{1-6}$ alkylene, a $C_{2-6}$ alkenylene, a substituted $C_{1-6}$ alkylene or $Y^1—Q—Y^2$, wherein $Y^1$ represents a single bond or a $C_{1-6}$ alkylene, $Y^2$ represents a $C_{1-6}$ alkylene, and Q represents a heteroatom selected from oxygen or sulfur, and Z represents a $C_{1-6}$ alkylene; wherein the substituent of the term "substituted alkylene" for Y is selected from the group consisting of hydroxy, $—OR^{3s}$, $—OCOR^{3s}$, amino, $—NHCOR^{3s}$, $—NHCO_2R^{3s}$, carboxy, and $—CO_2R^{3s}$, wherein $R^{3S}$ represents alkyl or $C_{3-6}$ alkenyl or a pharmaceutically acceptable salt thereof.



## 5,496,844

## INDOLE DERIVATIVES

Masatoshi Inai; Tadanao Shibutani; Jun Kanaya, all of Itano; Masako Moritake, Tokushima, and Akie Tanaka, Naruto, all of, Japan, assignors to Otsuka Pharmaceutical Factory, Inc., Tokushima, Japan

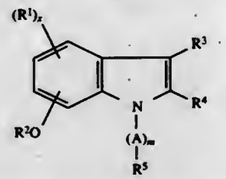
Filed Nov. 8, 1994, Ser. No. 335,833

Claims priority, application Japan, May 8, 1992, 4-116126

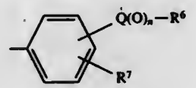
Int. Cl.[6] A61K 31/40; C07D 209/04

U.S. Cl. 514—415 8 Claims

1. An indole derivative of the general formula



wherein $R^1$ is a halogen atom, $R^2$ is a hydrogen atom, a lower alkyl group, a lower alkanoyl group or a benzoyl group, $R^3$ is a hydrogen atom, a lower alkyl group or a halogen atom, $R^4$ is a group of the formula



in which $R^6$ is a lower alkyl group, a cycloalkyl group, a phenyl group which may optionally have a lower alkyl group as a substituent, a phenyl-lower alkyl group or a pyridyl group, $R^7$ is a hydrogen atom or a lower alkyl group, Q is a sulfur or selenium atom and n is an integer of 0 to 2, A is an alkylene group, m is an integer of 0 to 1, $R^5$ is a hydrogen atom, an alkyl group or a benzoyl group having a hydroxyl group or a group of the formula $—O—B—R^8$ in which B is a lower alkylene group and $R^8$ is a phenyl, di-lower alkyl-amino, 1-pyrrolidinyl, piperidino, 1-imidazolyl or 1,2,4-triazol-1-yl group as a substituent when m is 0 or, when m is 1, $R^5$ is a lower alkoxycarbonyl group, a carboxyl group, a hydroxyl group, a group of the formula $—C(=O)—N(R^9)—R^{10}$ in which $R^9$ and $R^{10}$ are the same or different and each is a hydrogen atom, a lower alkyl group, a cycloalkyl group which may optionally have a benzene ring fused or condensed thereto, a phenyl group, a phenyl-lower alkyl group or a lower alkylsulfonyl group or $R^9$ and $R^{10}$ are bound to each other either directly or via an oxygen or sulfur atom to form, together with the adjacent nitrogen atom, a heterocyclic group which may optionally be substituted with a lower alkoxycarbonyl or carboxyl group, a group of the formula $—CH_2—N(R^{11})—R^{12}$ in which $R^{11}$ and $R^{12}$ are the same or different and each is a hydrogen atom, a lower alkyl group, a cycloalkyl group which may optionally have a benzene ring condensed thereto, a phenyl group, a phenyl-lower alkyl group or a lower alkanoyl group or $R^{11}$ and $R^{12}$ are bound to each other either directly or via an oxygen or sulfur atom to form, together with the adjacent nitrogen atom, a heterocyclic group which may optionally be substituted with a lower alkoxycarbonyl or carboxyl group, a group of the formula $—OR^{13}$ in which $R^{13}$ is a lower alkylcarbamoylphenyl group, a lower alkylaminomethylphenyl group, a lower alkylaminomethylpenyl group, a 1-pyrrolidinylcarbonylphenyl group, a 1-pyrrolidinylmethylphenyl group, a 2-di-lower alkylaminoethyl group or a 2-hydroxyl-2-lower alkylaminoethyl group or a phenyl group which may optionally have a hydroxyl, lower alkoxy, 1-pyrrolidinylcarbonyl or 1-pyrrolidinylmethyl group as a substituent, and x is an integer of 0 to 2.

## 5,496,845

## SUSPENSION CONCENTRATE COMPOSITIONS OF ARYLPYRROLE INSECTICIDAL AND ACARICIDAL AGENTS

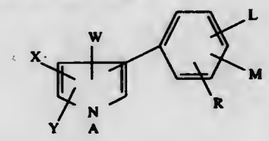
Craig A. Martin, Morrisville, Pa., and Mimi Y. C. Schaaf, Princeton, N.J., assignors to American Cyanamid Co., Wayne, N.J.

Filed May 25, 1994, Ser. No. 248,996

Int. Cl.[6] A01N 43/36

U.S. Cl. 514—427 11 Claims

1. A stable suspension concentrate composition which comprises about 10% to 50% by weight of a particulate aryl-pyrrole compound having a volume mean diameter of about 0.5 to 4 microns and having the structural formula



wherein

X is H, F, Cl, Br, I or $C_1$–$C_4$haloalkyl;

Y is F, Cl, Br, I $C_1$–$C_4$haloalkyl or CN;

W is CN or $NO_2$;

A is $C_1$–$C_4$alkyl optionally substituted with

one to three halogen atoms,

one cyano,

one hydroxy,

one $C_1$–$C_4$alkoxy,

one $C_1$–$C_4$alkythio,

one phenyl optionally substituted with $C_1$–$C_3$alkyl, $C_1$–$C_3$alkoxy, or one to three halogen atoms,

one phenoxy optionally substituted with one to three halogen atom, or

one benzyloxy optionally substituted with one halogen atom,

$C_1$–$C_4$carbalkoxymethyl,

$C_3$–$C_4$alkenyl optionally substituted with one to three halogen atoms,

cyano,

$C_3$–$C_4$alkynyl optionally substituted with one halogen atom,

di-($C_1$–$C_4$alkyl)aminocarbonyl, or

benzoyl optionally substituted with one to three halogen atoms or one to three $C_1$–$C_4$alkyl groups:

L is H, F, Cl or Br;

M and R are each independently H, $C_1$–$C_3$alkyl, $C_1$–$C_3$-alkoxy, $C_1$–$C_3$alkylthio, $C_1$–$C_3$-alkylsulfinyl, $C_1$–$C_3$alkylsulfonyl, cyano, F, Cl, Br, I, nitro, $C_1$–$C_3$-haloalkyl, $R_1CF_2Z$, $R_2CO$ or $NR_3R_4$, or when M and R are on adjacent positions and taken with the carbon atoms to which they are attached they may form a ring in which MR represents the structure:

$—OCH_2O—$, $—OCF_2O—$, $—OCR_6R_7CR_8R_9O—$, $—OCH_2CH_2—$, $—OCH_2CH_2CH_2—$ or $—CH=CH—CH=CH—$;

Z is $S(O)_n$ or O;

$R_1$ is H, F, $CHF_2$, CHFCl, or $CF_3$;

$R_2$ is $C_1$–$C_3$alkyl, $C_1$–$C_3$ alkoxy, or $NR_3R_4$;

$R_3$ is H or $C_1$–$C_3$alkyl;

$R_4$ is H or $C_1$–$C_3$alkyl or $R_5CO$;

$R_5$ is H or $C_1$–$C_3$alkyl;

$R_6R_7R_8$ and $R_9$ are each independently hydrogen, halogen or $C_1$–$C_3$alkyl; and

n is an integer of 0, 1 or 2, about 0.1% to 2% by weight of a dispersing agent selected from the group consisting of the salts of the condensation products of formaldehyde with the sulfonation products of polycyclic aromatic compounds; the salts of polyacrylic acids; the condensation products of fatty acids or aliphatic amines or amides containing at least about twelve carbon atoms in the molecule with ethylene oxide and/or propylene oxide; fatty acid esters of glycerol, sorbitan, sucrose or pentaerythritol and their condensation products with ethylene oxide and/or propylene oxide condensation

products of fatty alcohols or alkyl phenols with ethylene oxide and/or propylene oxide and their sulfates or sulfonates; and alkali or alkaline earth metal salts of sulfuric or sulfonic acid esters containing at least ten carbon atoms in the molecule, about 0.5% to 5% by weight of a steric stabilizer selected from the group consisting of polymers of ethylene oxide and copolymers of ethylene oxide and propylene oxide, about 0.1% to 1% by weight of a suspending agent consisting essentially of one or more natural or synthetic clays or silicates, about 0.01% to 0.5% by weight of a thickening agent selected from the group consisting of xanthan gum, carrageenan, pectin, gum arabic, guar rubber, the methylation products, carboxyalkylation products and hydroxyalkylation products of cellulose or starch derivatives, polyacrylates, polymaleinates and polyvinylpyrrolidone with xanthan gums, about 5% to 15% by weight of an anti-freeze agent comprising a glycol, up to about 1% by weight of an antifoam agent comprising an emulsion of a silicone oil or an emulsion of a fatty alcohol, up to about 0.3% by weight of a preservative selected from the group consisting of 1,2-benzisothiazolin-3-one, epichlorohydrin, phenylglycidyl ether, allylglycidyl ether, and formaldehyde compositions, and water.

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**5,496,846**

## TAXOL TREATMENT OF BREAST CANCER

**Wyndham H. Wilson, and Robert Wittes, both of Washington, D.C., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.**

**Continuation of Ser. No. 950,380, Sep. 22, 1992. This application Jan. 6, 1994, Ser. No. 178,463**

**Int. Cl.[6] A61K *31/335***

**U.S. Cl. 514—449** **1 Claim**

1. A method of treating a patient suffering from breast cancer, which comprises:

(a) intravenously infusing taxol into said patient at a continuous dosage rate of between 17.5 to 35 milligrams of taxol per square meter of patient surface area per 24 hours to infuse between 70 and 140 milligrams of taxol per square meter of patient surface area into said patient over a period of 96 hours; and

(b) repeating said step (a) in 21 day cycles until remission of said patient's breast cancer is obtained.

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**5,496,847**

## AMINOMETHYL-BENZODIOXANE AND BENZOPYRAN SEROTONERGIC AGENTS

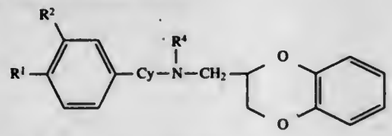
**John D. Catt, Southington, and Ronald J. Mattson, Meriden, both of Conn., assignors to Bristol-Myers Squibb Co., New York, N.Y.**

**Continuation of Ser. No. 136,521, Oct. 14, 1993, Pat. No. 5,391,570. This application Jan. 24, 1995, Ser. No. 378,116**

**Int. Cl.[6] A61K *31/335;31/36;* C07D *319/20***

**U.S. Cl. 514—452** **8 Claims**

1. A compound of Formula I or a pharmaceutically acceptable salt, amide or hydrate thereof:

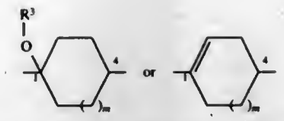


(I)

wherein:

$R^1$ and $R^2$ are both halogen or, taken together, form a —O—$(CH_2)_n$—O— bridge (n=1, 2 or 3);

Cy is either



or



(m=0, 1 or 2), with the phenyl substituent at the 1 position of the cycloalkanyl or cycloalkenyl ring and the amino substituent at the 4 position; and

$R^3$ and $R^4$ are independently H or $C_{1-4}$alkyl.

5. A pharmaceutical composition comprising an effective anxiolytic amount of a compound of claim 1 and a pharmaceutically acceptable carrier.

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**5,496,848**

## PROCESS FOR THE PREPARATION OF SUBSTITUTED DIFLUOROBENZO-1,3-DIOXOLES

**Peter Ackermann, Pfeffingen; Hans-Ruedi Känel, Bubendorf, and Bruno Schaub, Courroux, all of, Switzerland, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.**

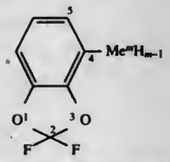
**Division of Ser. No. 399,248, Mar. 6, 1995, which is a division of Ser. No. 147,617, Nov. 5, 1993, Pat. No. 5,420,301, which is a division of Ser. No. 987,902, Dec. 4, 1992, Pat. No. 5,281,718, which is a division of Ser. No. 583,787, Sep. 14, 1990, Pat. No. 5,194,628, which is a continuation-in-part of Ser. No. 321,939, Mar. 10, 1989, abandoned. This application May 12, 1995, Ser. No. 440,171**

**Claims priority, application Switzerland, Mar. 18, 1988, 1044/88; Mar. 18, 1988, 1052/88**

**Int. Cl.[6] A61K *31/33;* C07D *317/06***

**U.S. Cl. 514—465** **3 Claims**

1. A composition comprising a compound of formula VII



(VII)

and a solvent, wherein Me is a metal, m is the valency of the metal and A is an anionic radical and, if A is present, at least one A is an organic basic radical.

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**5,496,849**

## SULFONIC ACID DERIVATIVE AND ITS PHARMACEUTICAL APPLICATION

**Kiyotaka Ohno, Fujisawa; Atsushi Ohtake, Kamakura; Shintaro Nishio, Ebina; Kazuhiro Hoshi, and Shunji Tsukamoto, both of Kamakura, all of, Japan, assignors to Toray Industries, Inc., Japan**

**PCT No. PCT/JP93/01339, § 371 Date May 17, 1994, § 102(e) Date May 17, 1994, PCT Pub. No. WO94/06785, PCT Pub. Date Mar. 3, 1994**

**PCT Filed Sep. 17, 1993, Ser. No. 244,141**

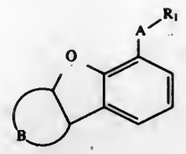
**Claims priority, application Japan, Sep. 18, 1992, 4-249288; Jan. 27, 1993, 5-011938**

**Int. Cl.[6] A61K *31/34;* C07D *307/80;307/78***

**U.S. Cl. 514—468** **7 Claims**

1. Sulfonic acid represented by formula I:



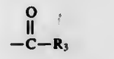


wherein,

$R_1$ is

(i) —$COOR_2$ (wherein, $R_2$ is (1) hydrogen, (2) a pharmacologically acceptable cation, or (3) an alkyl having 1 to 14 carbon atoms) or the group:

(ii)



wherein

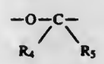
$R_3$ represents an alkyl having 1 to 4 carbon atoms);

A is

(i) —$(CH_2)n$— (wherein, n represents an integer of 0 to 3),

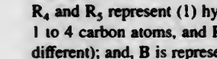
(ii) —CH=CH—, or the group:

(iii)

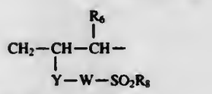


wherein

$R_4$ and $R_5$ represent (1) hydrogen or (2) an alkyl having 1 to 4 carbon atoms, and $R_4$ and $R_5$ may be identical or different); and, B is represented with either formula II or formula III:



(II)



(III)

wherein

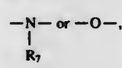
$R_6$ represents

(i) hydrogen, or

(ii) —$OR_9$ (wherein, $R_9$ represents (1) hydrogen, (2) an alkyl having 1 to 4 carbon atoms, (3) an acyl group having 2 to 5 carbon atoms, or (4) an aroyl group having 7 to 11 carbon atoms),

Y is —$(CH_2)m$— (where, m represents 0 or 1),

W is



$R_7$ is

(i) hydrogen, or

(ii) an alkyl having 1 to 4 carbon atoms,

$R_8$ is

(i) an alkyl having 1 to 14 carbon atoms, or

(ii) —Z—$R_{11}$ (wherein, Z is a valence bond or a straight or branched alkylene represented by $C_tH_{2t}$ (where, t is an integer of 1 to 5) and $R_{11}$ represents an aryl group or aryl group having 6 to 16 carbon atoms substituted by 1 to 4 groups selected from the group consisting of alkyl, methoxy, chlorine, bromine, fluorine, iodine, trifluoromethyl, nitro, cyano, phenyl and phenoxy)).

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**5,496,850**

## (I) ANTIMETASTASIS AGENT OF MALIGNANT TUMORS

**Masato Mutoh, Yokohama; Masakazu Hattori, Nagaokakyo; Shintaro Nishio, Ebina, and Kiyotaka Ohno, Fujisawa, all of, Japan, assignors to Toray Industries, Inc., Tokyo, Japan**

**PCT No. PCT/JP92/01313, § 371 Date Aug. 8, 1994, § 102(e) Date Aug. 8, 1994, PCT Pub. No. WO94/08584, PCT Pub. Date Apr. 28, 1994**

**PCT Filed Oct. 9, 1992, Ser. No. 244,668**

**Claims priority, application Japan, Apr. 11, 1991, 3-78819**

**Int. Cl.[6] A61K *31/34***

**U.S. Cl. 514—468** **2 Claims**

1. A method inhibiting a metastasis of a malignant tumor in a patient, the method comprising:

administering to said patient an effective metastasis inhibiting amount of beraprost, or a stereoisomer thereof;

provided that said patient is selected from the group consisting of a human, a monkey, a dog and a mouse, and that said patient is suffering from said malignant tumor; and

provided that said malignant tumor is selected from the group consisting of a melanoma, lung cancer, stomach cancer, liver cancer, breast cancer, colon cancer, brain cancer, a neck cancer and a head cancer.

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**5,496,851**

## METHODS OF INHIBITING CELL-CELL ADHESION

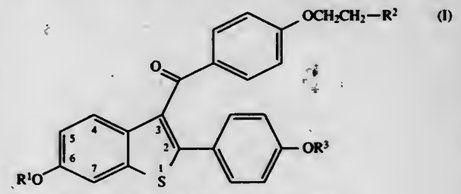
**Brian W. Grinnell, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.**

**Division of Ser. No. 385,934, Feb. 9, 1995. This application Apr. 14, 1995, Ser. No. 422,295**

**Int. Cl.[6] A61K *31/38***

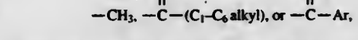
**U.S. Cl. 514—443** **3 Claims**

1. A method to inhibit inflammatory and disrupted normal coagulation process in patients with disorders of the vascular endothelium comprising administering to a patent in need thereof an effective amount of a compound having the formula



(I)

wherein $R^1$ and $R^3$ are independently hydrogen,



wherein Ar is optionally substituted phenyl;

$R^2$ is selected from the group consisting of pyrrolidine, hexamethylenemino, and piperidino; or a pharmaceutically acceptable salt of solvate thereof.

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**5,496,852**

## LOUSE REPELLENT

**William J. Oliver, Darby Green, United Kingdom, assignor to Charwell Consumer Products, Ltd., Vale, Channel Islands**

**Continuation of Ser. No. 761,360, Aug. 28, 1991, abandoned. This application Jun. 8, 1994, Ser. No. 255,822**

**Claims priority, application United Kingdom, Feb. 28, 1989, 8904541**

**Int. Cl.[6] A01N *43/26;35/00;31/08***

**U.S. Cl. 514—463** **5 Claims**

1. A method of repelling head and body lice which comprises:

(a) applying to the hair of the host a composition comprising, a solution of about 1 to 10% by weight of piperonal in water and at least one alcohol which is capable of maintaining the piperonal in solution in contact with the hair of the host, by reducing the rate of evaporation and suppressing crystallization of piperonal for at least 2 hours, and

(b) permitting said composition to remain in contact with said hair for between 2 and 12 hours, whereby said lice are substantially repelled from said hair such that infestation does not occur.

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**5,496,853**

## BENZOXA CONDENSED RING COMPOUNDS, PROCESS FOR PRODUCING THE SAME AND PHARMACEUTICAL COMPOSITION COMPRISING THE SAME

**Tatsuki Shiota; Takumi Takeyasu, both of Hino; Kenichiro Katsuka, Tokyo; Tsutomu Mochizuki, Hino; Hirofumi Tanabe, Hino; Mikio Ota, Hino; Masatoshi Kano, Hino, and Hisao Yamaguchi, Hino, all of, Japan, assignors to Teijin Limited, Osaka, Japan**

**Continuation of Ser. No. 78,274, Jun. 22, 1993, abandoned. This application Apr. 26, 1995, Ser. No. 429,023**

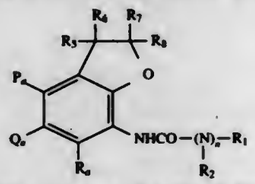
**Claims priority, application Japan, Dec. 28, 1990, 2-415443; Jan. 31, 1991, 3-029143**

**Int. Cl.[6] C07D** *301/79;263/56;* **A61K** *31/34;31/42*

**U.S. Cl. 514—469** **8 Claims**

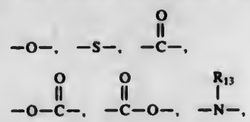
1. A 2,3-dihydrobenzofurane compound represented by the following formula (Ia-2) or its pharmaceutically acceptable salt:

(Ia-2)



wherein $P_a$, $Q_a$ and $R_a$ each independently stands for a hydrogen atom, a halogen atom, an amino, nitro, cyano, carboxyl or hydroxyl group, a $C_1$–$C_{20}$ alkyl, $C_1$–$C_{20}$ alkoxy, $C_1$–$C_{20}$ alkanoylamino, $C_1$ –$C_{20}$ monoalkylamino, $C_1$–$C_{20}$ alkyloxycarbonyl, $C_1$–$C_{20}$ alkanoyl or $C_1$–$C_{20}$ alkanoyloxy group, or a $C_2$–$C_{26}$ dialkylamino group, provided that, two or more of $P_a$, $Q_a$ and $R_a$ are not halogen atoms at the same time; and

the alkyl portion of said groups may be interrupted by:



phenylene or phenyleneoxy,

wherein $R_{13}$ stands for a hydrogen atom, a lower alkyl, or lower alkanoyl group,

or 1 to 3 hydrogen atoms on the carbon atoms of the alkyl portion may be substituted with a phenyl group or phenyloxy group, a halogen atom or a cyano group, and the phenyl portion as the substituent may be substituted with a halogen atom, an amino, nitro, cyano, carboxyl or hydroxyl group, a $C_1$–$C_{20}$ alkyl, $C_1$–$C_{20}$ alkoxy, $C_1$–$C_{20}$ monoalkylamino, $C_1$–$C_{20}$ alkanoylamino, $C_1$–$C_{20}$ alkyloxycarbonyl, $C_1$–$C_{20}$ alkanoyl or $C_1$–$C_{20}$ alkanoyloxy group, or a $C_2$–$C_{26}$ dialkylamino group; and

$R_1$ stands for a group selected from the group consisting of:

(i) an unsubstituted $C_5$–$C_7$ cycloalkyl or $C_6$ cycloalkenyl group or a $C_5$–$C_7$ cycloalkyl or $C_6$ cycloalkenyl group substituted at a position other than the 1-position with a substituent being a $C_1$– $C_{14}$ alkyl, $C_1$–$C_{14}$ alkoxy, $C_1$–$C_{14}$ alkanoylamino, $C_1$–$C_{14}$ monoalkylamino, $C_1$–$C_{14}$ alkyloxycarbonyl, $C_1$–$C_{14}$ alkanoyl or $C_1$–$C_{14}$ alkanoyloxy group or a $C_2$–$C_{26}$ dialkylamino group;

(ii) a group represented by the formula:



wherein $R_9$ and $R_{10}$ each independently stands for a hydrogen atom or a lower alkyl group, or may combine with each other to form a $C_3$–$C_7$ carbon ring; and

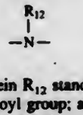
$R_{11}$ stands for a substituted or unsubstituted $C_1$–$C_{19}$ alkyl, $C_2$–$C_{19}$ alkenyl, $C_6$ to $C_{10}$ aryl, $C_7$–$C_{19}$ arylalkyl, $C_1$–$C_{19}$ alkanoyl or $C_1$–$C_{19}$ alkanoyl group having a $C_4$–$C_{19}$ aromatic ring, provided that the substituent when said groups are substituted by a halogen atom, an amino, nitro, cyano, carboxyl or hydroxyl group, a $C_1$–$C_{16}$ alkyl, $C_1$–$C_{16}$ alkoxy, $C_1$–$C_{16}$ alkanoylamino, $C_1$–$C_{16}$ monoalkylamino, $C_1$–$C_{16}$ alkyloxycarbonyl, $C_1$–$C_{16}$ alkyanoyl or $C_1$–$C_{16}$ alkanoyloxy group, or a $C_2$–$C_{26}$ dialkylamino group; or

$R_{11}$ stands for a group represented by the formula:



wherein A stands for a $C_1$–$C_{12}$ alkylene chain;

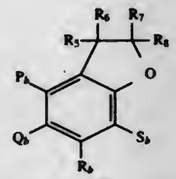
X stands for an oxygen atom, a sulfur atom, or a group represented by the formula:



wherein $R_{12}$ stands for a hydrogen atom or a lower alkyl or lower alkanoyl group; and

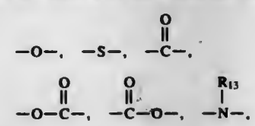
B stands for a substituted or unsubstituted $C_1$–$C_8$ alkyl, $C_6$ or $C_{10}$ aryl or $C_7$–$C_8$ arylalkyl group, provided that the substituent when said groups are substituted is a halogen atom, an amino, nitro, cyano, carboxyl or hydroxyl group, a $C_1$–$C_{12}$ alkyl, $C_1$–$C_{12}$ alkoxy, $C_1$–$C_{12}$ monoalkylamino, $C_1$–$C_{12}$ alkanoylamino, $C_1$–$C_{12}$ alkyloxycarbonyl, $C_1$–$C_{12}$ alkanoyl acyl or $C_1$–$C_1$ alkanoxyloxy group, or a $C_2$–$C_{20}$ dialkylamino group; and

(iii) a substituted or unsubstituted phenyl group or a group represented by the formula:



wherein any one of $P_b$, $Q_b$, $R_b$ and $S_b$ represents a bond with the remaining three substituents independently standing for a group represented by the formula $—R_3$, provided that, when the phenyl group is substituted, the substituent is present at the m- or p-position and the substituent is an amino, cyano, carboxyl or hydroxyl group, $C_1$–$C_{16}$ alkoxy, $C_1$–$C_{16}$ monoalkylamino, $C_1$–$C_{16}$ alkanoylamino, $C_1$–$C_{16}$ alkyloxycarbonyl, $C_1$–$C_{16}$ alkanoyl or $C_1$–$C_{16}$ alkanoyloxy groups, or a $C_2$–$C_{26}$ dialkylamino group; and

the alkyl portion of said groups may be interrupted by:



phenylene or phenyleneoxy,



wherein $R_{13}$ stands for a hydrogen atom, a lower alkyl, or lower alkanoyl group,

or 1 to 3 hydrogen atoms on the carbon atoms of the alkyl portion may be substituted with a phenyl or phenyloxy group, a halogen atom or a cyano group, or the phenyl portion as the substituent may be substituted with a halogen atom, an amino, nitro, cyano, carboxyl or hydroxyl group or a lower alkyl, lower alkoxy, lower monoalkylamino, lower dialkylamino, lower alkanoylamino, lower alkyloxycarbonyl, lower alkanoyl or lower alkanoyloxy group;

$R_2$ stands for a hydrogen atom or a $C_1$–$C_8$ alkyl group;

each $R_3$ independently stands for a hydrogen atom, a halogen atom, an amino, nitro, cyano, carboxyl or hydroxyl group, $C_1$–$C_{20}$ alkyl, $C_1$–$C_{20}$ alkoxy, $C_1$–$C_{20}$ monoalkylamino, $C_1$–$C_{20}$ alkanoylamino, $C_1$–$C_{20}$ alkyloxycarbonyl, $C_1$–$C_{20}$ alkanoyl or $C_1$–$C_{20}$ alkanoyloxy group, or a dialkylamino group, provided that, two or more of each $R_3$ are not halogen atoms at the same time; and

$R_5$, $R_6$, $R_7$ and $R_8$ each independently stands for a hydrogen atom or a $C_1$–$C_{20}$ alkyl group, or $R_5$ and $R_6$ or $R_7$ and $R_8$ combine with a carbon atom bonded thereto to form a $C_5$–$C_7$ carbon ring; and

n is 0 or 1, provided that when any one of $P_a$, $O_a$ and $R_a$ stands for an alkanoylamino group and $R_1$ stands for:



wherein $R_{11}$ represents the unsubstituted or substituted $C_1$–$C_{19}$ alkyl group, both of the alkyl group of the alkanoylamino group and the alkyl group $R_{11}$ do not have carbon atoms of $C_6$ or less at the same time.

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**5,496,854**

## METALLOCENES AS ANTI-TUMOR DRUGS

**Ehud Keinan, 6549 Dennison Ave., San Diego, Calif. 92122, assignor to Technion Research & Development Foundation Ltd., Haifa, Israel, and Ehud Keinan, San Diego, Calif.**

**PCT No. PCT/US93/07875, § 371 Date Feb. 17, 1995, § 102(e) Date Feb. 17, 1995, PCT Pub. No. WO94/04142, PCT Pub. Date Mar. 3, 1994**

**PCT Filed Aug. 19, 1993, Ser. No. 387,785**

**Claims priority, application Israel, Aug. 19, 1992, 102866**

**Int. Cl.[6] A61K** *31/28;* **C07F** *17/00;7/28*

**U.S. Cl. 514—492** **11 Claims**

1. Novel titanocene derivatives which comprise two cyclopentadiene rings linked to titanium as a central atom, which are bound covalently to two phenoxy groups which possess a radical substituent R which is selected from the group consisting of:

$COOCH_3$, $COOC_2H_5$, $COOCH_2CH_2OCH_2CH_2OCH_3$,

being free from amino group, nitro group, chloride and fluoride.

9. A method of treating tumors in a patient, which comprises administering to the patient an effective amount of a titanocene derivative comprising two cyclopentadiene rings linked to titanium as a central atom, which are bound covalently to two phenoxy groups which possess a radical substituent R selected from the group consisting of H, $COOCH_3$, $COOCH_2H_5$, and $COOCH_2CH_2OCH_2CH_2OCH_3$ and are free from amino, nitro, chloride and fluoride groups.

10. A pharmaceutical preparation for treating tumors in a host which comprises a tumor-treating effective amount of one or more titanocene derivatives comprising two cyclopentadiene rings linked to titanium as a central atom, which are bound covalently to two phenoxy groups which possess a radical substituent R selected from the group consisting of H, $COOCH_3$, $COOCH_2H_5$, and $COOCH_2CH_2OCH_2CH_2OCH_3$ and are free from amino, nitro, chloride and fluoride groups.

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**5,496,855**

## ANTI-INFLAMMATORY COMPOUNDS

**Jerry L. Adams; Ravi S. Garigipati, both of Wayne; Margaret E. Sorenson, Swedesburg, and James D. Winkler, Fort Washington, all of Pa., assignors to SmithKline Beecham Corp., Philadelphia, Pa.**

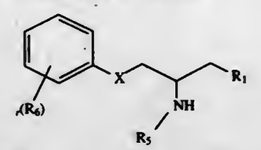
**Filed Jan. 27, 1995, Ser. No. 380,464**

**Int. Cl.[6] A61K** *31/275;* **C07C** *255/44;255/33*

**U.S. Cl. 514—521** **11 Claims**

1. A compound of the formula:

(I)



wherein

$R_1$ is cyano;

$R_3$ is $C(O)(CH_2)_qaryl$ or $S(O)_2(CH_2)_qaryl$;

q is an integer having a value of 1 to 18;

X is carbon, oxygen, $—NC_{1-4}$ alkyl, or sulur;

$R_8$ is independently hydrogen or $alkyl_{1-6}$;

$R_6$ is independently selected from hydrogen, halogen, $alkyl_{1-5}$, $cycloalkyl_{5,8}$, hydroxy, $(CHY)_rcarboxy$, $alkoxy_{1-5}$, $thioalkyl_{1-5}$, $sulphinylalkyl_{1-5}$, $Sulphonylalkyl_{1-5}$, $halosubstituted\ alkyl_{1-6}$, $(CHY)_rN(R_8)_2$, cyano or an optionally substituted aryl $C_{1-4}$alkyl;

r is an integer having a value of 1 or 3;

t is a number having a value of 0 or 1;

Y is hydrogen or $alkyl_{1-4}$;

or pharmaceutically acceptable salt thereof.

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**5,496,856**

## ASPARTAME FOR ITS APPLICATION AS A THERAPEUTICALLY ACTIVE SUBSTANCE

**Edmond Creppy, 16, Avenue Arago, 33600 Pessac, France**

**Filed Nov. 1, 1994, Ser. No. 332,768**

**Claims priority, application France, Dec. 16, 1993, 93 15177**

**Int. Cl.[6] A01N** *37/12*

**U.S. Cl. 514—566** **15 Claims**

1. A pharmaceutical composition which contains aspartame as the active principle, in association with a pharmaceutically acceptable carrier, vehicle or excipient.

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**5,496,857**

## WHITEFLY INSECTICIDE

**Eugene F. Targosz, 1717 E. Union Hills Dr., Phoenix, Ariz. 85024**

**Filed Mar. 17, 1994, Ser. No. 214,828**

**Int. Cl.[6] A01N** *37/18;37/02*

**U.S. Cl. 514—617** **8 Claims**

1. An insecticide for controlling whitefish and other insects, comprising:

an environmental insecticidal concentrate which can safely contact humans and plants, said concentrate comprising by weight

from about 1% to about 50% nonionic surfactants comprising a phenol ethoxylate selected from the group consisting of a condensate product of ethylene oxide and an alkyl phenol or an aliphatic alcohol, and a condensate product of ethylene oxide and an alkyl phenol or an aliphatic alcohol;

oil-containing alkanol amides comprising diethanolamide, said diethanolamide comprising by weight

from about 1% to about 50% cottonseed oil;

from about 1% to about 50% coconut oil; and

from about 1% to about 20% tall oil.

**5,496,858**

## AQUEOUS DISINFECTANT CONCENTRATE AND DISINFECTANT BASED ON ALDEHYDE AND ALCOHOL AND THEIR USE

**Heinz Eggensperger; Bernd Lower, both of Hamburg; Michael Mohr, Kaltenkirchen; Peter Goroncy-Bermes, Ahrensburg, and Rolf Kleinwort, Wedel all of, Germany, assignors to Reckitt & Colman Inc., Montvale, N.J.**

**Filed Jan. 11, 1994, Ser. No. 179,856**

**Claims priority, application Germany, Jan. 15, 1993, 43 01 295.7**

**Int. Cl.[6] A01N** *39/00;47/44*

**U.S. Cl. 514—693** **10 Claims**

1. Aqueous disinfectant concentrate consisting essentially of an aldehyde component selected from the group consisting of succinic dialdehyde, glutaraldehyde and mixtures of such aldehydes, and one or more alcohols of limited miscibility in water, said alcohols having a water miscibility of from 0.1 to 2 wt % and a vapor pressure at 20° C. of less than 2 mbar, and being selected from the group consisting of a phenoxy alkanol with more than 2 carbon atoms in the alkyl chain optionally substituted in the phenyl moiety by $C_1$–$C_{18}$ alkyl, a phenyl alkanol optionally substituted in the phenyl moiety by $C_1$–$C_{18}$ alkyl, and an aliphatic glycol of the formula

$$R_1—(OCH_2—CH_2)_z—OH$$

in which $R_1$ is a straight-chained or branched alkyl group with to 8 carbon atoms.

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**5,496,859**

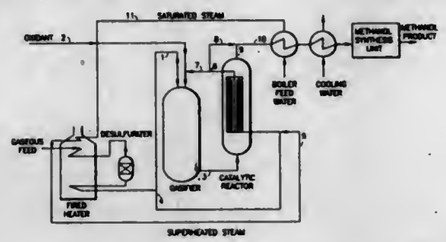
## GASIFICATION PROCESS COMBINED WITH STEAM METHANE REFORMING TO PRODUCE SYNGAS SUITABLE FOR METHANOL PRODUCTION

**Wing-Chiu F. Fong, Yorktown Heights, and Raymond F. Wilson, Fishkill, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.**

**Filed Jan. 28, 1995, Ser. No. 378,831**

**Int. Cl.[6] C07C** *27/06;31/04*

**U.S. Cl. 518—703** **16 Claims**




1. An improved method for the production of methanol comprising:

(a) partially oxidizing a gaseous feedstock containing substantial amounts of methane in a gasifier to produce a hot gasifier synthesis gas stream containing substantial amounts of hydrogen and carbon monoxide;

(b) passing said hot gasifier synthesis gas stream through a steam reforming catalytic reactor in indirect heat exchange with reactants comprising a methane-containing gas and steam undergoing an endothermic catalytic steam reforming reaction in said catalytic reactor, to produce a reformer synthesis gas stream, and wherein the hot gasifier synthesis gas stream becomes cooled and exits the catalytic reactor as a cooled gasifier synthesis gas stream;

(c) combining said cooled gasifier synthesis gas stream with a portion of the reformer synthesis gas stream to form a stoichiometric ratioed synthesis gas stream, which is fed to a methanol synthesis unit to produce methanol, and wherein the stoichiometric ratioed synthesis gas requires little or no external compression to reach the optimal specifications necessary to produce methanol.

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**5,496,860**

## ANTIBACTERIAL FIBER, TEXTILE AND WATER-TREATING ELEMENT USING THE FIBER AND METHOD OF PRODUCING THE SAME

**Nobuya Matsumoto; Shinichi Kunisaki; Goro Fujiwara; Mitsunobu Masuda, all of Osaka; Hiroshi Horie, Funabashi, and Asaichi Kawanaka, Fujieda, all of, Japan, assignors to Suntory Limited; Takuma Co., Ltd., both of Osaka, and Nitivy Company Limited, Tokyo, all of, Japan**

**Filed Dec. 28, 1993, Ser. No. 174,368**

**Claims priority, application Japan, Dec. 28, 1992, 4-347544; Dec. 28, 1992, 4-347555**

**Int. Cl.[6] C08F** *8/42*

**U.S. Cl. 521—31** **5 Claims**

1. A method of producing an antibacterial fiber comprising the steps of:

bonding, through an ion exchange reaction, complex ion of silver, copper or zinc with ion exchange group of cation exchange fiber having sulfonic or carboxyl group as ion exchange group thereof; and

reducing the complex ion.

2. A method of producing an antibacterial fiber comprising the steps of:

bonding, through an ion exchange reaction, complex ion of silver, copper or zinc with ion exchange groups of an anion exchange fiber having primary through tertiary amine groups and quaternary ammonium group; and

reducing the complex ion.

3. A method of producing an antibacterial fiber containing at least silver ion, which comprises the steps of:

bonding, through an ion exchange reaction, a cation of more than one kind of alkali metals or alkaline earth metals selected from the group consisting of Na, K, Ca and Mg with entire ion exchange groups of a cation exchange fiber having sulphonic acid groups or carboxyl groups as ion exchange groups thereof; and replacing a portion of said alkali metals or alkaline earth metals bonded to said ion exchange groups with said silver ion alone or with said silver ion and either copper ion or zinc ion in combination.

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**5,496,861**

## COSMETICS CONTAINING ENZYMATICALLY DEBRANCHED STARCH

**William Rouse, 3, Lakewood, Ohio; Maria Valles, Colonia, N.J.; Gary T. Martino, Plainsboro, N.J., and Chung-Wai Chiu, Westfield, N.J., assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.**

**Continuation of Ser. No. 615,725, Nov. 19, 1990, abandoned. This application Jan. 24, 1994, Ser. No. 186,408**

**Int. Cl.[6] A61K** *7/42;7/48;9/10;9/107*

**U.S. Cl. 514—778** **12 Claims**

1. An improved water-in-oil emulsion- or oil-free emulsion-containing skin cosmetic lotion, wherein the improvement comprises an effective amount of an aqueous dispersion of 15–40% solids, by weight, of a procooked, cold-water-swelling waxy starch which is enzymatically debranched by treatment with an alpha-1,6-D-glucanohydrolase to yield 35% to 100%, by weight, short chain amylose and which is present in an amount sufficient to create a fat-like lubricating texture in the aqueous starch dispersion.



**5,496,862**

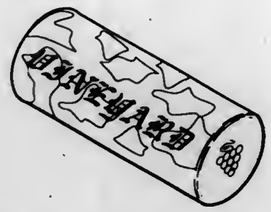
## MOLDED STYRENE BLOCK COPOLYMER CLOSURE FOR A WINE CONTAINER

**Dennis L. Burns, Kent, Wash., assignor to Supreme Corq, Kent, Wash.**

**Filed May 5, 1993, Ser. No. 58,914**

**Int. Cl.[6] C08J** *9/00*

**U.S. Cl. 521—50** **29 Claims**



1. A molded closure for a liquid container containing wine comprising:

(a) a thermoplastic elastomer comprising a styrene block copolymer, and

(b) at least about 3% of a blowing agent,

wherein, upon insertion of said molded closure into a container, said molded closure does not permit substantial passage of oxygen into the container, does not substantially absorb oxygen from the contents of the container, can be removed from said container using a corkscrew without substantial expansion, crumbling, or disintegration, does not substantially taint the contents of said container, permits said container to be placed horizontally substantially immediately after insertion of said molded closure into said container, and can permanently retain printed matter on a surface of said molded closure.

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**5,496,863**

## METHOD OF CROSSLINKING RUBBER AND PLASTIC MOLDINGS

**Yoshihiko Kitagawa; Tadashi Jinno; Masashi Aoshima; Taisuke Okita, all of Osaka; Hideo Shinonaga, Chiba, and Kaoru Kitadono, Shiga, all of, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan**

**Continuation of Ser. No. 291,399, Dec. 27, 1988, abandoned, which is a continuation of Ser. No. 73,332, Jul. 13, 1987, abandoned, which is a continuation of Ser. No. 786,022, Oct. 10, 1985, abandoned. This application Mar. 12, 1991, Ser. No. 667,366**

**Claims priority, application Japan, Mar. 4, 1985, 60-42462; Jun. 11, 1985, 60-126716; Jun. 11, 1985, 60-126717**

**Int. Cl.[6] C08J** *9/00*

**U.S. Cl. 521—50.5** **12 Claims**

1. A process for producing an expanded rubber molding having a smooth surface, comprising:

(1) extruding continously a non-crosslinked rubber molding consisting essentially of a rubber selected from the group consisting of styrene-butadiene rubber, polyisoprene rubber, polychloroprene rubber, acrylonitrile-butadiene rubber, polybutadiene rubber, ethylene-α-olefin rubber, ethylene-α-olefin-non-conjugated diene rubber, natural rubber, chlorinated polyethylene and chlorosulfonated polyethylene, a crosslinking agent selected from the group consisting of sulfur, peroxides and quinoids, and a blowing agent;

(2) irradiating continuously with electron beams at an electron voltage of from 10 kV to 500 kV and at a dose of from 1 Mrad to 30 Mrad to form a crosslinked skin from the surface of the extruded molding of step (1); and

(3) heating continuously the resulting molding to perform crosslinking with the crosslinking agent and expansion with the blowing agent simultaneously.

**5,496,864**

## EXPANDABLE STYRENE POLYMERS

**Rolf Henn, Ketsch; Klaus Hahn, Kirchheim; Hans Höal, Obersülzen; Walter Heckmann, Weinheim; Karl-Heinz Wassmer, Limburgerhof; Erich Klement, Rimbach, and Joachim Fischer, Grosskarlbach, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany**

**Filed May 12, 1995, Ser. No. 439,898**

**Claims priority, application Germany, May 13, 1994, 44 16 852.7**

**Int. Cl.[6] C08J** *9/16;9/20*

**U.S. Cl. 521—59** **11 Claims**

1. An expandable styrene polymer for elastic polystyrene foams, comprising

a) from 50 to 75% by weight of polystyrene and/or a styrene copolymer containing at least 50% by weight of copolymerized styrene,

b) from 5 to 30% by weight of at least one styrene-soluble elastomer, comprising a polybutadiene rubber,

c) from 5 to 20% by weight of at least one block copolymer containing styrene and a polymerizable ethylenically unsaturated monomer as one component,

d) from 15 to 50% by weight of at least one polyolefin,

e) from 1 to 15% by weight, based on the sum of a) and b), of a low-boiling blowing agent, and, if desired,

f) conventional additives in effective amounts.

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**5,496,865**

## ADDITIVE-CHARGED POROUS CARRIER MATERIAL

**Ulrich Heese, Mulligen; Renato Salvel, Zurich, and Wolfgang W. Neumann, Oberbozberg, all of, Switzerland, assignors to Brugg Kabel AG, Switzerland**

**Filed Dec. 5, 1994, Ser. No. 349,396**

**Claims priority, application Switzerland, Dec. 8, 1993, 03651/93**

**Int. Cl.[6] C08J** *9/00*

**U.S. Cl. 521—79** **14 Claims**

1. Process which comprises: producing a pourable porous carrier material from at least one thermoplastic basic polymer having a melting point with additives incorporated in the porous structure; wherein at least one foaming agent is added to the basic polymer, the foaming agent and basic polymer are melted and mixed together with the mixing step taking place at least one of before and after melting, and the mixture cooled to form a granular or pelletized porous carrier material; adding into the porous carrier material at least one additive having a melting point, and mixing said additive with said porous carrier material at a temperature ($T_{Af}$) lying below the melting point of the basic polymer but above the melting point of the additive; and wherein pores of the carrier material contain said additive.

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**5,496,866**

## $C_3$ TO $C_5$ POLYFLUOROALKANES PROPELLANTS

**Claus-Dieter Sommerfeld, Overath; Wilhelm Lamberts, Cologne; Dietmar Bielefeldt, Ratingen; Albrecht Marhold, Leverkusen, and Michael Negele, Cologne, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany**

**Filed Jan. 24, 1990, Ser. No. 469,622**

**Claims priority, application Germany, Feb. 4, 1989, 39 03 336.8**

**Int. Cl.[6] C08J** *9/14;* **C08G** *18/14*

**U.S. Cl. 521—131** **22 Claims**

1. A method of forming plastic foam compositions comprising foaming a plastic based on isocyanate in the presence of a propellant the improvement wherein the propellant comprises at least one polyfluoroalkane of the formula:

$$CX_3—CY_2—R$$

wherein each of the X radicals independently represents hydrogen or fluorine and either:

(1) the $CY_2$ radical represents $CH_2$, CHF or $CH(CF_3)$, and R represents $CH_2F$, $CHF_2$, $CH_3$, $CF_3$, $CF_2$—$CH_3$, $CF_2$—$CH_2F$, $CH_2$—$CH_3$, $CH_2$—$CH_2$—$CH_3$, or CH $(CH_3)$—$CH_3$; or

(2) the $CY_2$ radical represents $CF_2$ and R represents $CH_2F$, $CHF_2$, $CH_3$, $CF_2$—$CH_3$, $CF_2$—$CH_2F$, $CH_2$—$CH_3$, $CH_2$—$CH_2$—$CH_3$, or $CH(CH_3)$—$CH_3$;

wherein the polyfluoroalkane contains at least two fluorine atoms, and

wherein when the $CY_2$ radical represents a —$CH_2$— group and the R radical represents a —$CH_2$—$CH_3$ group, respectively, then the $CX_3$ radical represents a $CHF_2$— group.

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**5,496,867**

## $C_3$ TO $C_5$ POLYFLUOROALKANES PROPELLANTS

**Claus-Dieter Sommerfeld, Overath; Wilhelm Lamberts, Cologne; Dietmar Bielefeldt, Ratingen; Albrecht Marhold, Leverkusen, and Michael Negele, Cologne, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany**

**Division of Ser. No. 469,622, Jan. 24, 1990. This application Nov. 30, 1992, Ser. No. 983,987**

**Claims priority, application Germany, Feb. 4, 1989, 39 03 336.8**

**Int. Cl.[6] C08J *9/14*; C08G *18/14***

**U.S. Cl. 521—131** **2 Claims**

1. A process for producing a polyisocyanate-derived foam by reacting the components comprising a polyisocyanate and a compound having at least two hydrogen atoms reactive toward isocyanate groups, the reaction between said components being accompanied by a blowing step, which comprises carrying out the blowing step with the aid of a blowing agent comprising from 1 to 30% by weight of the foam of an aliphatic fluoroalkane of the formula

$C_4H_2F_8$.

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**5,496,868**

## SEALING MATERIAL AND METHOD

**Hajime Hasegawa, Chigasaki, and Kazuyoshi Usami, Yokohama, both of, Japan, assignors to Bridgestone Corporation, Tokyo, Japan**

**Filed May 3, 1994, Ser. No. 237,101**

**Claims priority, application Japan, May 21, 1993, 5-142976**

**Int. Cl.[6] C08G *18/00***

**U.S. Cl. 521—155** **13 Claims**

1. A sealing material which is disposed in a cavity of a pillar or another member in an automobile and heated for foaming to fill the cavity, said sealing material being prepared by a process comprising the steps of furnishing a liquid composition comprising a compound having at least two active hydrogen atoms, an organic polyisocyanate compound, a foam stabilizer, and a blowing agent which generates gases at a temperature of about 130° to 210° C., uniformly dispersing an inert gas in the liquid composition by mechanical agitation to form a bubbled composition, shaping the bubbled composition into a predetermined shape, and heat curing the bubbled shape at a temperature below the decomposition temperature of said blowing agent.

**5,496,869**

## METHODS AND COMPOSITIONS FOR PREPARING RIGID FOAMS WITH NON-CHLOROFLUOROCARBON BLOWING AGENTS

**Steve Williams; Warren Kaplan; Paul Neill, and Gerardo Chapa, all of Grayslake, Ill., assignors to Stepan Company, Northfield, Ill.**

**Division of Ser. No. 238,388, May 5, 1994, Pat. No. 5,407,967. This application Jun. 7, 1995, Ser. No. 472,442**

**Int. Cl.[6] C08G *18/16;18/22*; C08J *9/14***

**U.S. Cl. 521—172** **10 Claims**

1. A rigid foam having urea or urethane groups as the major recurring polymer unit, the polymer comprising the reaction product obtained by contacting a polyisocyanate with a polyol mixture comprising

(a) from about 40–95% by weight of polyols;

(b) a catalytic amount of a catalyst system comprising a primary catalyst and an amino acid salt derived from sarcosine; and

(c) a non-chlorofluorocarbon blowing agent.

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**5,496,870**

## CURABLE LIQUID RESIN COMPOSITION

**Chander P. Chawla, Batavia, Ill.; Tohru Ohtaka, Kawasaki, Japan; Shinichirou Iwanaga, Yokkaichi, Japan; Tsuyoshi Watanabe, and Katsutoshi Igarashi, both of Yokohama, Japan, assignors to DSM, Elgin, Ill.**

**Continuation of Ser. No. 78,557, Jun. 16, 1993, abandoned, which is a continuation of Ser. No. 779,344, Oct. 18, 1991, abandoned. This application Dec. 21, 1994, Ser. No. 361,449**

**Claims priority, application Japan, Jan. 19, 1990, 2-281092**

**Int. Cl.[6] C08G *18/48;18/67*; G02B *6/02***

**U.S. Cl. 522—90** **16 Claims**

1. A curable liquid resin composition for making a urethane (meth)acrylate polymer that comprises:

(A) a polyol compound consisting of the structural unit groups

—$CH_2CH_2O$— and

—$CH_2CH(CH_2CH_3)O$—;

(B) a polyisocyanate compound; and

(C) at least one (meth)acrylate compound containing a hydroxyl group, wherein the weight ratio of the structural unit groups —$CH_2CH_2O$—/—$CH_2CH(CH_2CH_3)O$— is 2–50/20–98.

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**5,496,871**

## FUMARATE AND FUMARAMIDE SILOXANE HYDROGEL COMPOSITIONS

**Yu-Chin Lai, Pittsford, and Ronald E. Bambury, Fairport, both of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.**

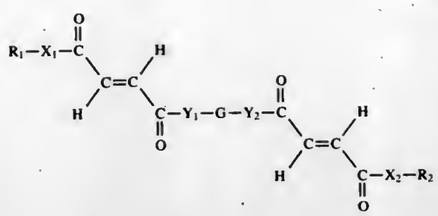
**Division of Ser. No. 295,966, Aug. 24, 1994, Pat. No. 5,420,324, which is a division of Ser. No. 31,428, Mar. 15, 1993, Pat. No. 5,374,662. This application Mar. 1, 1995, Ser. No. 397,300**

**Int. Cl.[6] G02B *1/04***

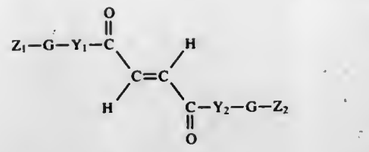
**U.S. Cl. 523—107** **12 Claims**

1. A contact lens produced from a monomer mix comprising a) at least one fumarate-containing or fumaramide-containing monomer having the following schematic representations:

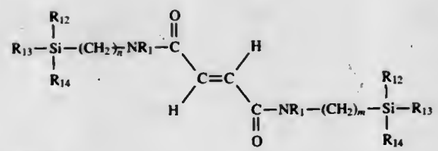




(I)

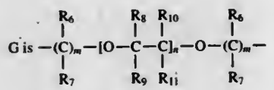


(II)

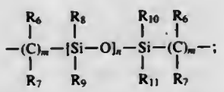


(III)

wherein



or



$X_1$, $X_2$, $Y_1$ and $Y_2$ are independently O or $NR_4$, except that when G is siloxane-containing, $X_1$ and $X_2$ must be $NR_4$;

$Z_1$ and $Z_2$ are independently $OR_3$ or $NR_4R_5$;

$R_1$, $R_2$, $R_3$, $R_4$ and $R_5$ are independently H or an alkyl group having 1 to 10 C atoms;

$R_6$, $R_7$, $R_8$, $R_9$, $R_{10}$ and $R_{11}$ are independently hydrogen or an alkyl-containing group having 1 to 10 C atoms, or fluoroalkyl-containing group having 1 to 10 C atoms;

$R_{12}$, $R_{13}$ and $R_{14}$ are independently methyl, trimethylsiloxy or pentamethyldisiloxanyloxy;

m is 1 to 10;

n is 5 to 100;

b) at least one hydrophilic monomer.

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**5,496,872**

## ADHESIVE COMPOSITIONS FOR SURGICAL USE

**Alain Constancis, Lyons; Gérard Soula, Meyzieu; Jean-Louis Tayot, La Tour de Salvagny, and Jérôme Tiollier, Lyons, all of, France, assignors to Imedex, Chaponost, France**

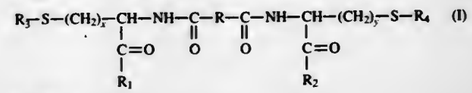
**Filed Jul. 19, 1994, Ser. No. 277,069**

**Claims priority, application France, Jul. 21, 1993, 93 08964**

**Int. Cl.[6] A61K *38/00*; A61L *25/00*; C08G *69/10*; C08L *1/00***

**U.S. Cl. 523—118** **17 Claims**

1. Adhesive, biocompatible, biodegradable and non-toxic composition for surgical use, in particular for binding biological tissues together or for binding a tissue and an implanted biomaterial, said composition being polymerizable and/or cross-linkable to form multidirectional networks, wherein the adhesive composition comprises at least an organic product containing at least two thiol functions and carboxylic functions, which may be protected or unprotected, and/or carbonyl functions, of the following general formula:



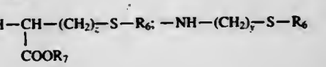
(I)

in which:

x and y=1 or 2,

R is a hydrocarbon, chain containing from 1 to 50 carbon atoms, which is optionally substituted by a hydroxy, amino, acid or ester group, with the proviso that the radical —CO—R—CO— is different from citric acid residue,

$R_1$ and $R_2$ are identical or different and are chosen from the following groups:



wherein z=1 or 2,

$R_3$, $R_4$, $R_5$, $R_6$ and $R_7$ independently represent hydrogen or an aliphatic and/or alicyclic and/or aromatic group, with the proviso that when said organic product comprises only two thiol functions, the composition includes also at least another organic product of the general formula (I) having at least three thiol functions.

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**5,496,873**

## POLYMERIC COMPOSITIONS

**Stephen F. Bush, Poynton; James M. Methven, Moreton, and David R. Blackburn, Withington, all of, United Kingdom, assignors to Scott Bader Co., Ltd., United Kingdom**

**Continuation of Ser. No. 61,823, May 13, 1993, abandoned, which is a continuation of Ser. No. 542,727, Jun. 22, 1990, abandoned. This application Aug. 19, 1994, Ser. No. 293,084**

**Claims priority, application United Kingdom, Dec. 24, 1987, 8730153**

**Int. Cl.[6] C08L *67/06;75/16***

**U.S. Cl. 523—508** **16 Claims**

1. A thickened organic polymeric molding composition from which is absent an inorganic thickener selected from metal oxides and hydroxides and which said composition comprises a cooled mixture of:

a cross-linkable base resin dissolved in an unsaturated monomer; and

as a thickener and shrinkage control agent, an additive resin having a minimum of 8 and a maximum of 40 repeating units and selected from saturated polyesters and saturated amide waxes; said additive resin being crystalline at ambient temperature and having a melting point ($T_m$) below a temperature ($T_c$) at which the base resin cross-linking reaction proceeds at a significant rate; said additive resin and said base resin having a solubility parameter difference therebetween in the range 1 to 3.5 $MPa^{1/2}$, whereby said additive resin is only partially compatible with the base resin;

said partial degree of compatibility allowing crystallization of said additive in said mixture upon cooling from a temperature between $T_m$ and $T_c$ to a temperature between $T_m$ and ambient; whereby,

(a) due to said cooling of said mixture from a temperature between $T_m$ and $T_c$ to a temperature below $T_m$ to produce said cooled mixture, said additive resin is in the form of crystals thereof distributed throughout the mixture, said crystallization thereby rendering the mixture thickened in the absence of a thickener selected from metal oxides and hydroxides; and

(b) when the mixture is heated to a temperature above $T_m$, said mixture is capable of melting and reversibly breaking

down to enable said additive resin, in a molten state, to render the composition capable of shrinkage control during molding.

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**5,496,874**

## MOLDABLE HYDRODISINTEGRATABLE MATERIAL AND PRODUCTS FORMED THEREBY

**Judith K. Faass, Dawsonville; Lee K. Jameson, Roswell; Bernard Cohen, Berkeley Lake, and Lamar H. Gipson, Acworth, all of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.**

**Filed Nov. 2, 1994, Ser. No. 333,561**

**Int. Cl.[6] C08L** *5/00;* **C08K** *5/05;5/3415;* **C08G** *63/91*

**U.S. Cl. 524—56** **15 Claims**

1. An injection moldable, hydrodisintegratable material comprising:

from about 7.5 to about 85 weight percent of at least one water dispersible high molecular weight amorphous polyester having one or more ionic sodiosulfo substituents attached thereto;

from about 7.5 to about 85 weight percent of at least one starch grafted sodium polyacrylate; and

from about 7.5 to about 9.5 weight percent of at least one volatile material.

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**5,496,875**

## DERIVATIVES OF 2,2,6,6-TETRAMETHYL-4-PIPERIDINOL FOR USE AS LIGHT STABILIZERS, HEAT STABILIZERS AND OXIDATION STABILIZERS FOR ORGANIC MATERIALS

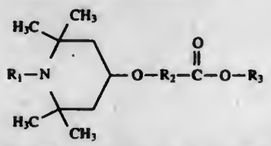
**Valerio Borzatta; Roberto Scrima, both of Bologna, and Primo Carrozza, Verona, all of, Italy, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.**

**Filed Jul. 11, 1994, Ser. No. 273,575**

**Int. Cl.[6] C08K** *5/34*

**U.S. Cl. 524—99** **12 Claims**

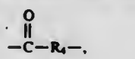
1. A compound of the formula (I)



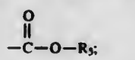
(I)

in which $R_1$ is hydrogen, $C_1$–$C_8$alkyl, O˙, OH, $CH_2CN$, $C_1$–$C_{18}$alkoxy, $C_5$–$C_{12}$ cycloalkoxy, $C_3$–$C_6$alkeny $C_7$–$C_9$phenylalkyl unsubstituted or mono-, di- or tri-substituted on the phenyl by $C_1$–$C_4$alkyl or $R_1$ is aliphatic $C_1$–$C_8$acyl;

$R_2$ is a direct bond, methylene, carbonyl or a group

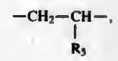


the group $R_4$ being bound to the group

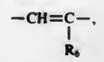


$R_3$ is $C_5$–$C_{18}$alkyl, $C_3$–$C_{18}$alkenyl, $C_5$–$C_{12}$ cycloalkyl unsubstituted or mono-, di- or tri-substituted by $C_1$–$C_4$alkyl, or $R_3$ is $C_7$–$C_9$phenylalkyl which is mono-, di- or tri-substituted on the phenyl by $C_1$–$C_4$alkyl;

$R_4$ is linear $C_1$–$C_4$alkylene, a group



a group



$C_2$–$C_4$oxaalkylene, $C_5$–$C_7$cycloalkyl-1,2-ene or $C_5$–$C_7$cycloalken-1,2-ylene;

$R_5$ is $C_1$–$C_{18}$alkyl or $C_3$–$C_{18}$alkenyl; and

$R_6$ is hydrogen or $C_1$–$C_4$alkyl,

with the proviso that, when $R_1$ is hydrogen and $R_3$ is $-C_{16}H_{33}$, $R_2$ is not a direct bond or a carbonyl group.

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**5,496,876**

## THERMOPLASTIC POLYETHERAMIDE/STYRENE COPOLYMER COMPOSITIONS

**Jean-Pierre Jacquemin, Bernay, and Gerard Deleens, Beaumesnil, both of, France, assignors to Atochem, Puteaux, France**

**Division of Ser. No. 71,611, Jun. 4, 1993, Pat. No. 5,439,975, which is a continuation of Ser. No. 895,250, Jun. 8, 1992, abandoned, which is a continuation of Ser. No. 693,090, Apr. 30, 1991, abandoned, which is a continuation of Ser. No. 338,567, Apr. 14, 1989, abandoned, which is a continuation of Ser. No. 942,185, Dec. 16, 1986, abandoned. This application Sep. 28, 1994, Ser. No. 314,381**

**Claims priority, application France, Dec. 16, 1985, 85 18599**

**Int. Cl.[6] C08L** *77/12*

**U.S. Cl. 524—155** **15 Claims**

1. A thermoplastic polymeric composition of matter, comprising a polyetheramide and a styrene/diene copolymer, wherein the polyetheramide is the predominant component of the polymeric composition relative to the styrene/diene copolymer, and wherein said polyetheramide comprises a copolycondensation block polymerizate of a polyamide having terminal amino groups at each end of the polyamide, with a polyoxyalkylene polyether having terminal carboxylic acid groups at each end of the polyether.

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**5,496,877**

## AMINO COMPOUNDS AS PROCESSING STABILIZERS FOR THERMOPLASTIC MATERIALS

**Alexander Aumueller, Neustadt, and Hubert Trauth, Dudenhofen, both of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany**

**PCT No. PCT/EP93/00951, § 371 Date Oct. 12, 1994, § 102(e) Date Oct. 12, 1994, PCT Pub. No. WO93/22376, PCT Pub. Date Nov. 11, 1993**

**PCT Filed Apr. 20, 1993, Ser. No. 313,115**

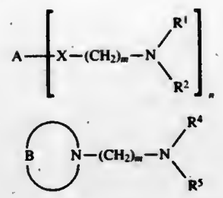
**Claims priority, application Germany, Apr. 29, 1992, 42 14 027.7**

**Int. Cl.[6] C08K** *3/20*

**U.S. Cl. 524—246** **14 Claims**

1. A process for stabilizing thermoplastic materials during processing, which comprises using compounds of the formula (I) or (II)





where

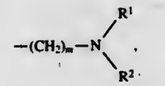
m is 2 or 3,

n is an integer from 1 to 6,

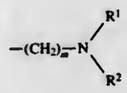
$R^1$ and $R^2$ are, independently of one another, hydrogen, $C_1$- to $C_{18}$-alkyl, $C_3$- to $C_8$-alkenyl or $C_5$- to $C_{12}$-cycloalkyl, $R^4$ and $R^5$ are, independently of one another, hydrogen, $C_1$- to $C_{18}$-alkyl, $C_3$- to $C_8$-alkenyl, $C_5$- to $C_{12}$-cycloalkyl or $C_7$- to $C_{12}$-phenylalkyl, in which the phenyl ring is unsubstituted or substituted by up to 3 $C_1$- to $C_{12}$-alkyl or $C_1$- to $C_{12}$-alkoxy groups,

X is oxygen or $NR^3$,

$R^3$ is an $R^1$ radical or a group of the formula

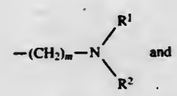


B completes a 3- to 12-membered saturated or unsaturated mononuclear or polynuclear heterocycle, which from 0 to 2 additional hetero atoms selected from the group consisting of nitrogen, oxygen and sulfur, wherein the further nitrogen atoms are unsubstituted or carry as substituents hydrogen, $C_1$- to $C_8$-alkyl or a group of the formula



and for the heterocycle in addition to contain up to 3 carbonyl groups, $C_1$- to $C_8$-alkyl, phenyl, $C_7$- to $C_{12}$-phenylalkyl or $C_5$- to $C_{12}$-cycloalkyl substituents, and

A when n=1 is hydrogen, $C_3$- to $C_{24}$-alkenyl, $C_1$- to $C_{60}$-alkyl, which is uninterrupted or interrupted by up to 29 oxygen atoms or $NR^3$ and is unsubstituted or substituted by up to 6 hydroxyl or amino groups, $C_3$- to $C_{12}$-cycloalkyl, which is unsubstituted or substituted by up to 3 $C_1$- to $C_{12}$-alkyl radicals, $C_7$- to $C_{20}$-bicycloalkyl or a group of the formula



and

A when n>1 is $C_2$- to $C_{24}$-alkylene, $C_4$- to $C_{60}$-alkylene, which is uninterrupted or interrupted by up to 5 $NR^3$ groups or by up to 28 oxygen atoms, $C_3$- to $C_{12}$-alkylene, which carries up to 6 hydroxyl, $C_1$- to $C_4$-alkoxy, amino or $C_1$- to $C_3$-hydroxyalkyl groups, $C_5$- to $C_{12}$-cycloalkylene or $C_7$- to $C_{24}$-bicycloalkylene or polycycloalkylene, and when n> 1 the alkylene radicals are divalent or higher valence, as processing stabilizers for thermoplastic materials.

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**5,496,878**

## THERMOPLASTIC MOLDING MATERIALS BASED ON POLYAMIDES AND CARBOXYL-CONTAINING POLYETHYLENE WAXES

**Walter Goetz, and Walter Betz, both of Ludwigshafen, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany**

**Continuation of Ser. No. 58,355, May 10, 1993, abandoned. This application Sep. 21, 1994, Ser. No. 308,991**

**Claims priority, application Germany, May 15, 1992, 42 16 042.1**

**Int. Cl.[6] C08L** *91/06*

**U.S. Cl. 524—275** **5 Claims**

1. A process for preparing a thermoplastic molding composition which consists essentially of mixing

A) from 0.5 to 5% by weight based on the total composition of a carboxyl-containing polyethylene wax having an average molecular weight $\overline{M}_n$ (number average value) from 500 to 20,000 and

B) from 0 to 50% by weight based on the total composition of fibrous or particulate fillers or mixtures thereof in a melt of

C) from 40 to 99.5% by weight based on the total composition of a polyamide prepolymer having a viscosity number of from 40 to 80 ml/g (measured in a 0.5% by weight solution in 96% sulfuric acid at 23° C.) followed by post-condensation in the solid phase and wherein the ingredients employed in the process consist essentially of A), B) and C).

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**5,496,879**

## PRINTING INK

**Rudolf Griebel, Siegburg; Karl A. Kocherscheid, Hennef-Dondorf, and Klaus Stammen, Lohmar, all of, Germany, assignors to Siegwerk Druckfarben GmbH & Co. KG, Siegburg, Germany**

**Filed Feb. 24, 1993, Ser. No. 22,338**

**Claims priority, application Germany, Feb. 25, 1992, 42 05 713.2**

**Int. Cl.[6] C08K** *5/09;5/05;* **C08L** *29/04;33/04*

**U.S. Cl. 524—320** **13 Claims**

1. A printing ink consisting essentially of:

a solid solventless ink such that said ink is printable in a fused fluid condition having a ready-to-print viscosity for a gravure printing method after addition of heat, and said ink being solidifiable by heat extraction after having been printed onto imprinting material;

said ink including an optional colorant and a binding agent having at least two component groups, each component group including at least one member, said members of the first component group having solvent character for said members of the second component group;

wherein said members of the first component group are present as solid phase crystaline materials at ambient temperatures;

wherein said members of the second component group which are polymers are present as viterous, amorphous materials in solid phase at ambient temperature, which are soluble in said molten members of the first component group, and precipitate at a temperature above the melting point of the members of the first component group; and

wherein upon heat extraction, the members of the first component group are dissolved as a solid solution in the members of the second component group when these are precipitating from the fused fluid condition.

5,496,880

## POLYMER MIXTURES AND ARTICLES FORMED THEREFROM

Jan W. Heuseveldt; Johannes van Helmond, both of Bergen op Zoom, and Hendrikus H. T. M. Ketels, Huybergen, all of, Netherlands, assignors to General Electric Company, Pittsfield, Mass.

Filed May 9, 1994, Ser. No. 239,627

Claims priority, application Netherlands, May 10, 1993, 9300788

Int. Cl.[6] C08K 3/32;3/34;3/04; C08L 67/02

U.S. Cl. 524—417 7 Claims

1. A polymer mixture comprising

A) a first polyalkylene phthalate which comprises more than 35 mol% of units derived from 1,4-butanediol and which comprises more than 35 mol% of units derived from terephthalic acid; and

B) a component selected from the group consisting of:

B1 a second polyalkylene phthalate which comprises less than 15 mol% of units derived from 1,4-butanediol; or

B2 a thermoplastic elastomer selected from a polyether ester block copolymer, a polyester ester urethane and a polyether imide ester or mixture thereof; or

B3 a mixture of B1 and B2, and

C) a transesterification inhibitor selected from an inorganic pyrophosphate; an inorganic phosphate having at least two acid hydrogen atoms or an inorganic orthophosphate or a mixture thereof wherein said transesterification inhibitor is present in an amount from 0.01 to 2 parts by weight per 100 parts by weight A and B, and

D) a nucleating agent selected from the group consisting essentially of talcum; carbon black or a mixture thereof wherein said nucleating agent is present in an amount from 0.05 to 5 parts by weight per 100 parts by weight A and B.

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5,496,881

## COMPOSITION FOR FORMING FIREPROOF COATINGS AND CAULKING AND A METHOD OF USE

Dieter Annemaier, Illerkirchberg, and Robert Graf, Altenstadt-Filzingen, both of, Germany, assignors to Chemische Fabrik Gruenau GmbH, Illertissen, Germany

PCT No. PCT/EP92/02908, § 371 Date Jun. 21, 1994, § 102(e) Date Jun. 21, 1994, PCT Pub. No. WO93/13183, PCT Pub. Date Jul. 8, 1993

PCT Filed Dec. 15, 1992, Ser. No. 256,029

Claims priority, application Germany, Dec. 24, 1991, 41 42 903.6

Int. Cl.[6] C08J 5/10; C08K 3/34; C08L 23/00

U.S. Cl. 524—443 37 Claims

1. An aqueous fireproofing composition, which dries to form a fireproof material, which composition is a mixture comprising:

(a) 5–20% by weight, based on the dry weight of a resin, of a binder resin dispersion;

(b) 10–60% by weight of a particulate flameproofing agent;

(c) 0.2 to 27.5% by weight of non-asbestos inorganic fibers having an average length of 300 μm;

(d) 0.1 to 10% by weight of a plasticizer; and

(e) water, wherein the composition is free from antimony compounds, asbestos and halogen containing flame retardants.

5,496,882

## AQUEOUS POLYMER DISPERSION

Oral Aydin, Mannheim; Michael Portugall, Wachenheim; Josef Neutzner, Neustadt, and Walter Maechtle, Ludwigshafen, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Division of Ser. No. 220,688, Mar. 31, 1994, Pat. No. 5,468,799, which is a division of Ser. No. 38,864, Mar. 29, 1993, Pat. No. 5,350,787. This application Jul. 30, 1993, Ser. No. 413,822

Claims priority, application Germany, Apr. 29, 1992, 42 13 965.1

Int. Cl.[6] C08L 9/08

U.S. Cl. 524—458 14 Claims

1. A process for preparing a final aqueous polymer dispersion having a solids volume concentration of at least 50% by volume and a polydisperse particle size distribution, which comprises polymerizing at least one radical polymerizable monomer with the addition of at least one aqueous dispersion of a starting polymer in a polymerization vessel by the method of free radical aqueous emulsion polymerization in the presence of surface active substances and free radical polymerization initiators with the proviso that

a) the mass of the at least one radical polymerizable monomer relative to the total mass of the at least one radical polymerizable monomer and the starting polymer added in the form of the at least one aqueous dispersion is from 90 to 99.5%,

b) the starting polymer is present in the at least one aqueous dispersion in the form of dispersed starting polymer particles whose non-zero weight average particle diameter is equal to or less than 50 nm,

c) the total number of starting polymer particles added dispersed in the form of at least one aqueous dispersion of a starting polymer is from $10^{15}$ to $10^{19}$ starting polymer particles per liter based on the volume of the final polymer dispersion,

d) of the total amount of the at least one monomer to be polymerized either nothing or at most 10% by weight is introduced into the polymerization vessel as initial charge prior to the start of the free radical aqueous emulsion polymerization,

e) of the total amount of the at least one aqueous dispersion of a starting polymer to be added the amount introduced into the polymerization vessel as initial charge prior to the start of the free radical aqueous emulsion polymerization is either nil or at most such that the total number of starting polymer particles introduced as initial charge is not more than 10% of the total starting polymer particles to be added in the form of the at least one aqueous dispersion,

f) of the total amount of the at least one monomer to be polymerized at least 90% by weight is added to the polymerization vessel after the start of the free radical aqueous emulsion polymerization, in such a way that at any time of this addition the polymerization conversion of the monomers already added previously to the polymerization vessel including the monomers introduced into the polymerization vessel as initial charge is at least 80%, based on the total amount formed of the monomers added previously to the polymerization vessel and the monomers introduced into the polymerization vessel as initial charge,

g) of the total amount of the at least one aqueous dispersion of a starting polymer to be added the proportion added to the polymerization vessel after the start of the free radical aqueous emulsion polymerization is at least such that the total number of the starting polymer particles contained in this added amount of the at least one aqueous dispersion to be added is at least 90% of the starting polymer particles to be added in total in the form of the at least one aqueous dispersion of a starting polymer and that this addition is carried out in such a way that

at any time of this addition the polymerization conversion of the monomers already added previously to the polymerization vessel including the monomers introduced into the polymerization vessel as initial charge is at least 80%, based on the total amount formed of the monomers added previously to the



polymerization vessel and the monomers introduced into the polymerization vessel as initial charge;

at any time after the start of the emulsion polymerization the ratio $V_0$ of the number of moles of the amount already added previously to the polymerization vessel of the at least one monomer including the proportion of the at least one monomer introduced into the polymerization vessel as initial charge to the number of moles of starting polymer particles already added previously to the polymerization vessel in the form of the at least one aqueous dispersion of a starting polymer, standardized for the ratio of the number of moles of the total amount of the at least one monomer to be polymerized to the number of moles of the starting polymer particles to be added in total in the form of the at least one aqueous dispersion of the starting polymer, is within the range from> 0 to 10;

at any time after the start of the emulsion polymerization the ratio $V_n$ of the number of moles of the starting polymer particles already added previously to the polymerization vessel in the form of the at least one aqueous dispersion of a starting polymer excluding the proportion of the at least one aqueous dispersion of a starting polymer introduced into the polymerization vessel as initial charge to the number of moles of the amount of the at least one monomer already added previously to the polymerization vessel excluding the proportion of the at least one monomer introduced into the polymerization vessel as initial charge, standardized for the ratio of the number of moles of the starting polymer particles to be added in total in the form of the at least one aqueous dispersion of a starting polymer to the number of moles of the amount of the at least one monomer to be added in total after the start of the aqueous emulsion polymerization, is within the range from 0 to 10;

on completion of the addition of the at least one monomer at most 10% of the starting polymer particles to be added in total in the form of the at least one aqueous dispersion of a starting polymer are added to the polymerization vessel;

on completion of the addition of the at least one aqueous dispersion of a starting polymer at most 30% by weight of the total amount of the at least one monomer to be polymerized is added to the polymerization vessel;

h) the final aqueous polymer dispersion contains from 1 to 5% of surface active substances, based on the total mass formed of the mass of the at least one radical polymerizable monomer and the mass of starting polymer to be added in the form of the at least one aqueous dispersion,

i) of the total amount of surface active substances contained in the final polymer dispersion at most 15% by weight is introduced into the polymerization vessel as initial charge prior to the start of the free radical aqueous emulsion polymerization (aliquot A),

j) of the total amount of surface active substances contained in the final polymer dispersion at least 50% by weight are already part of the at least one aqueous dispersion to be added of a starting polymer (aliquot B),

k) the proportion of the total amount of surface active substances contained in total in the final polymer dispersion that is neither part of aliquot A nor part of aliquot B (namely aliquot C) is added to the polymerization vessel after the start of the free radical aqueous emulsion polymerization in such a way that at any time the total amount formed of the proportions of aliquots C and B already present in the polymerization vessel is less than 5% by weight, based on the total amount of monomers and polymer present in the polymerization vessel, and

l) the total amount used of free radical polymerization initiators is 0.1 to 5% by weight, based on the total amount of the at least one monomer to be polymerized, and is added to the polymerization vessel in the course of the free radical aqueous emulsion polymerization in such a way that the free radical aqueous emulsion polymerization continues to a minimum polymerization conversion of at least 90% of the total amount of the at least one monomer to be polymerized.

5,496,883

## PNEUMATIC TIRES

Tatsuro Hamada, Kodaira, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Division of Ser. No. 100,339, Aug. 2, 1993, Pat. No. 5,409,967, which is a continuation of Ser. No. 660,812, Feb. 26, 1991, abandoned. This application Dec. 21, 1994, Ser. No. 360,445

Claims priority, application Japan, Mar. 2, 1990, 2-49624; Mar. 2, 1990, 2-49625

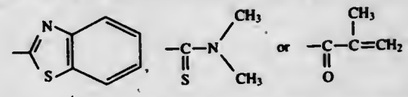
Int. Cl.[6] C08K 3/36

U.S. Cl. 524—492 5 Claims

1. A pneumatic tire comprising a tread made from a rubber composition comprising 10–150 parts by weight of a silica filler, not more than 150 parts by weight of carbon black, wherein said carbon black and silica filler are present in a weight ratio of 95/5–10/90, and 0.2–10 parts by weight of at least one silane coupling agent represented by the following general formula:

$$Y_3—Si—C_nH_{2n}A \quad (I)$$

(wherein Y is an alkyl group or alkoxyl group having a carbon number of 1–4 or a chlorine atom, provided that the three Y's are the same or different, n is an integer of 1–6, and A is an $—S_mC_nH_{2n}Si—Y_3$ group, an —X group or an $S_nZ$ group (in which X is a nitroso group, a mercapto group, an amino group, an epoxy group, a vinyl group, an imido group or a chlorine atom, Z is a:



group, each of m and n is an integer of 1–6 and Y is the same as mentioned above)), based on 100 parts by weight of a polymer or copolymer rubber having a glass transition temperature of not lower than –50° C. obtained by polymerization of 1,3-butadiene or copolymerization of 1,3-butadiene and styrene in an inert organic solvent with an organic alkali metal initiator, or a rubber blend of not less than 30 parts by weight of the above polymer or copolymer and not more than 70 parts by weight of another diene series rubber.

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5,496,884

## AQUEOUS ADHESIVE FOR BONDING ELASTOMERS

Mark A. Weih, Edinboro; Helmut W. Kucera, West Springfield; Patrick A. Warren, Erie, and Douglas H. Mowrey, Pleasantville, all of Pa., assignors to Lord Corporation, Cary, N.C.

Filed Nov. 12, 1993, Ser. No. 152,112.

The portion of the term of this patent subsequent to Apr. 6, 2010, has been disclaimed.

Int. Cl.[6] C08L 29/04

U.S. Cl. 524—503 17 Claims

1. An adhesive composition comprising a polyvinyl alcohol-stabilized butadiene polymer latex and a methylene donor compound wherein the butadiene polymer latex is prepared by an emulsion polymerization in the presence of polyvinyl alcohol.

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5,496,885

## THERMOPLASTIC RESIN COMPOSITION AND PROCESS FOR PREPARING THE SAME

Kiyoji Takagi; Koji Nishida, and Toslo Itou, all of Mie, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Filed May 27, 1993, Ser. No. 67,816

Claims priority, application Japan, Jun. 1, 1992, 4-140405; Jul. 8, 1992, 4-181024

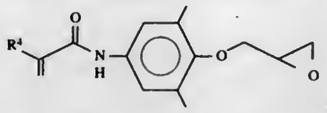
Int. Cl.[6] C08L 65/02;67/02;71/12; C08K 5/03

U.S. Cl. 524—539 11 Claims

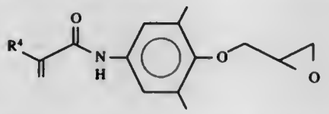
1. A thermoplastic resin composition which comprises:

(a) 4 to 95% by weight of a polyphenylene ether;

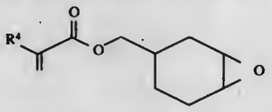
(b) 95 to 4% by weight of a saturated polyester;
(c) 0.5 to 40% by weight of an impact modifier;
(d) 0.01 to 50% by weight of at least one compatibilizer selected from the group consisting of:
(1) hydroxyalkylated polyphenylene ether;
(2) polyhydroxyphenylene ether having an alcoholic hydroxyl group in the side chain;
(3) a compound represented by the formula:



wherein $R^4$ represents a hydrogen atom or a methyl group;
(4) a resin obtained by graft polymerizing a compound represented by the formula:



wherein $R^4$ represents a hydrogen atom or a methyl group or a compound represented by the formula:



wherein $R^4$ represents a hydrogen atom or a methyl group, to a hydrogenated product of a block copolymer comprising a vinyl aromatic compound polymer block and a conjugated diene polymer block; and
(e) 0.1 to 3 part by weight of a polycarbonate based on 100 parts by weight of the above (a) to (d) in total.

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**5,496,886**

## ONE-COAT ADHESIVE FOR BONDING CASTABLE URETHANES TO METAL

**Michael P. Courlias, Erie, Pa., assignor to Lord Corporation, Cary, N.C.**

**Filed Nov. 2, 1994, Ser. No. 333,435**
**Int. Cl.[6] C08K** *3/00*
**U.S. Cl. 524—540** **9 Claims**

1. An aqueous adhesive composition for bonding a molded castable urethane to a metal substrate during the molding cycle of the urethane, said composition comprising:
(a) a water-soluble or water-dispersible thermoplastic phenoxy resin that includes substantially no terminal epoxide groups and comprises a reaction product of bisphenol A with epichlorohydrin;
(b) a water-soluble or water-dispersible phenolic resole resin that comprises a condensation product of an aldehyde having from 1 to 8 carbon atoms with a phenolic compound; and
(c) the balance up to 100% by weight, based on the total composition weight, being water.

**5,496,887**

## PREPARATION OF THERMOPLASTIC POLYESTERS HAVING A LOW CONTENT OF TERMINAL CARBOXYL GROUPS

**Peter Braune, Büdesheim, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Germany**

**Filed Jan. 10, 1995, Ser. No. 370,985**
**Claims priority, application Germany, Jan. 15, 1994, 44 01 055.9**
**Int. Cl.[6] C08K** *5/09*
**U.S. Cl. 524—777** **6 Claims**

1. A process for the production of thermoplastic polyesters which process consists essentially of polycondensing dihydroxy compounds with dicarboxylic acids or their esters or ester-forming derivatives in the presence of an alkali metal compound or an alkaline earth metal compound in an amount of less than 1 mmol, calculated as alkali metal or alkaline earth metal, per kg of polyester.

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**5,496,888**

## RESIN COMPOSITIONS FOR ELECTROPHOTOGRAPHIC TONER AND PROCESS FOR MAKING THE SAME

**Masaharu Nishida, Yamashina, and Tohru Ohhama, Higashiyama, both of, Japan, assignors to Sanyo Chemical Industries, Ltd., Kyoto, Japan**

**Continuation-in-part of Ser. No. 127,175, Sep. 28, 1993, abandoned. This application Mar. 15, 1994, Ser. No. 212,867**
**Int. Cl.[6] C08L** *67/00*
**U.S. Cl. 525—63** **20 Claims**

1. A resin composition suitable for electrophotographic toner, which comprises
(A) a non-crosslinked polymer having a glass transition temperature of 55°–80° C., obtained by polymerizing (a) one or more styrenic monomers, or (b) one or more acrylic or methacrylic monomers, or mixtures of (a) and (b), or any of the foregoing with another monomer (c),
(B) a non-crosslinked non-crystallizable saturated polyester having a glass transition temperature of 36°–60° C., and optionally
(C) a compatibilizer, wherein said compatibilizer is a graft or block polymer having a moiety of polymer of at least one monomer selected from the group consisting of styrenic monomer and acrylic or methacrylic monomer, and a moiety of a polyester, and wherein
said polyester (B) is dispersed, within a matrix of said polymer (A), with an average particle size of not more than 3 μ, and wherein
said composition of (A) and (B) and optionally (C) has a number-average molecular weight of about 2,000 to about 15,000 and weight-average molecular weight of about 100,000 to about 1,000,000.

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**5,496,889**

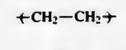
## COMPATIBILIZED FLUOROPOLYMER/AROMATIC POLYESTER THERMOPLASTIC POLYBLENDS

**Bruno Schlund, Chaponost, and Alain Boulloux, Bernay, both of, France, assignors to Elf Atochem S.A., Puteaux, France**

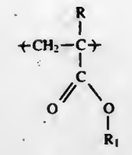
**Division of Ser. No. 261,703, Jun. 17, 1994, Pat. No. 5,444,124. This application Jun. 5, 1995, Ser. No. 465,355**
**Claims priority, application France, Jun. 17, 1993, 93 07298**
**Int. Cl.[6] C08L** *67/02;* **B29D** *22/00*
**U.S. Cl. 525—166** **15 Claims**

1. A shaped article comprising a thermoplastic polyblend composition, which comprises (i) a fluoropolymer, (ii) an aromatic polyester and (iii) a copolymeric compatibilizing agent therefor, said compatibilizing copolymer (iii) comprising recurring structural units of the formulae:

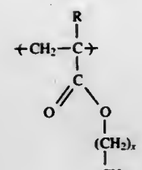




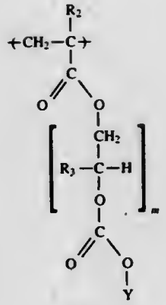
and



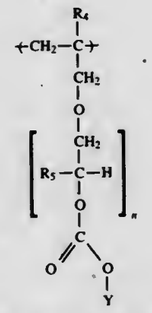
and



and, optionally,

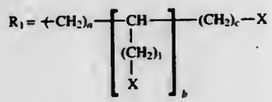


and/or



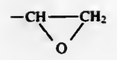
(V)

in which R and $R_2$ are each a hydrogen atom or an alkyl radical having 1 or 2 carbon atoms;

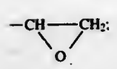


wherein X is $CH_3$ or

(I)

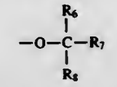


(II) and at least one X is



a is a number ranging from 1 to 10; b is 0 or 1; c is a number ranging from 0 to 10; and l is a number ranging from 0 to 10; $R_3$ and $R_5$ are each a hydrogen atom or a methyl radical; $R_4$ is a hydrogen atom or an alkyl radical having from 1 to 4 carbon atoms; m is 1 or 2; n is 0, 1 or 2; x is a number ranging from 0 to 10; and Y is a hydrogen atom or a radical:

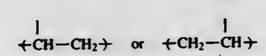
(III)



in which $R_6$ and $R_7$, which may be identical or different, are each an alkyl having from 1 to 4 carbon atoms, and $R_8$ is an alkyl radical having from 1 to 12 carbon atoms, or a phenyl, alkylphenyl or cycloalkyl radical having from 3 to 12 carbon atoms; or else Y is

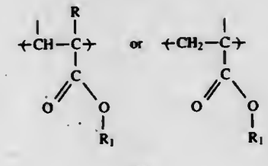
(IV)

(Ia)



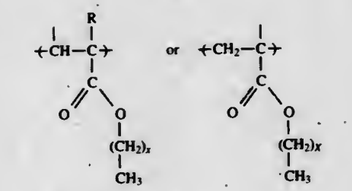
or

(IIa)



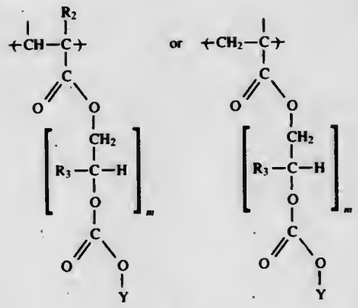
or

(IIIa)



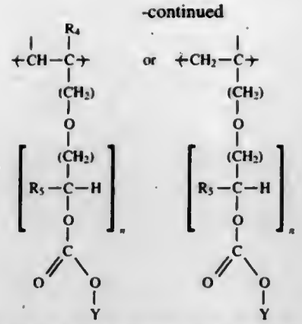
or

(IVa)



or

-continued



(Va)

with the proviso that the amount of said structural units of formulae (Ia), (IIa), (IIIa), (IVa) and (Va), when present, is such that the thermoplasticity of the polyblend is maintained, and said structural units of formulae (Ia), (IIa), (IIIa), (IVa) and (Va) may be directly bonded to structural units of formulae (I), (II), (III), (IV) or (V).

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**5,496,890**

**SUPER-ABSORBENT POLYMERS**

**Günter Sackmann; Rolf-Volker Meyer, both of Leverkusen; Siegfried Korte, Odenthal, and Sergej Schapowalow, Leverkusen, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany**

**Filed Feb. 21, 1995, Ser. No. 391,506**

**Claims priority, application Germany, Mar. 3, 1994, 44 06 951.0**

**Int. Cl.[6] C08F *8/12***

**U.S. Cl. 525—329.1** **2 Claims**

1. Super-absorbent polymers based on partly hydrolyzed, high molecular weight linear homopolymers and/or copolymers of acrylonitrile, in which 30 to 60 mole-% of the nitrile groups are converted into carboxylate groups and 20 to 60 mole-% of the nitrile groups into carbonamide groups and 10 to 20 mole-% of the nitrile groups remain unchanged, the uncrosslinked polymers having a swelling capacity of up to 1,000 g/g in water and up to 90 g/g in physiological sodium chloride solution.

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**5,496,891**

**MIXTURES AND CONCENTRATES FOR THE PREPARATION OF POLYMERS**

**Stanley G. Stead, Hemel Hempstead, and Peter E. Minister, Leeds, both of, Great Britain, assignors to Surfacbem Group PLC, Leeds, United Kingdom**

**PCT No. PCT/GB92/00842, § 371 Date Dec. 29, 1993, § 102(e) Date Dec. 29, 1993, PCT Pub. No. WO93/00369, PCT Pub. Date Jan. 7, 1993**

**PCT Filed May 11, 1992, Ser. No. 170,268**

**Claims priority, application United Kingdom, Jun. 29, 1991, 9114095**

**Int. Cl.[6] C08F *8/42;6/00;* C08J *3/02***

**U.S. Cl. 525—330.2** **45 Claims**

1. A concentrate for preparing a gel of a neutralized cross-linked polymer of a polymerisable olefinically unsaturated carboxylic acid, the unsaturated carboxylic acid constituting at least 70% by weight of the polymer and the polymer being cross-linked with a multifunctional vinylidene compound containing at least two terminal $CH_2$=C<groups, the concentrate comprising at least the cross-linked polymer, the polymer being in the acid form; and a salt of a multivalent cation, the salt being present in an amount of from 0.002 to 0.2 equivalent of the multivalent cation per equivalent of the acid groups of the polymer.

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**5,496,892**

**OXAZOLIDINONE STRUCTURES-CONTAINING PREPOLYMERIC EPOXY RESIN MIXTURE**

**Helmut Markert, Nuremberg; Klaus Kretzschmar, Erlangen; Michael Schreyer, Weisendorf; Günter Mennig, Darmstadt; Peter Braun, Hungen, and Oliver Eitel, Leingarten, all of, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany**

**Filed Jan. 12, 1995, Ser. No. 367,282**

**Claims priority, application Germany, Jul. 17, 1992, 42 23 622.3**

**Int. Cl.[6] B29F *3/00;* C08K *3/34;3/22;3/26***

**U.S. Cl. 525—528** **17 Claims**

1. A process for producing an epoxyoxazolidinone prepolymer mixture, comprising the steps of: feeding a filler-containing, thermally-polymerizable reaction resin component comprising a mixture of a polyepoxy resin, comprising a mixture of di- and polyfunctional epoxy resins, and a polyisocyanate, with a molar ratio of epoxide groups to isocyanate groups of >1, to a continuously working reactor; reacting the reaction resin mixture at a reaction temperature of up to 200° C., the reactor temperature being from 140° to 190° C., in the presence of a catalyst component comprising an inertly substituted imidazole as a catalyst, the catalyst being used in an amount of 0.5 to 2.5% by weight based on the polyepoxy resin; and cooling extrudate emerging from an outlet die of the reactor to a temperature of <50° C. by means of a cooling device located at the outlet die of the reactor.

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**5,496,893**

**MACROMONOMERS HAVING REACTIVE SIDE GROUPS**

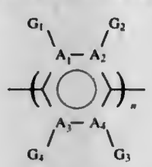
**Robert R. Gagné, Pasadena; Matthew L. Marrocco, III, Santa Ana; Mark S. Trimmer, Pasadena, and Neil H. Hendricks, Brea, all of Calif., assignors to Maxdem Incorporated, San Dimas, Calif.**

**Division of Ser. No. 746,883, Aug. 19, 1991. This application Jun. 2, 1995, Ser. No. 459,366**

**Int. Cl.[6] C08G *6/00***

**U.S. Cl. 525—50** **11 Claims**

1. A method of producing reinforced polymers, comprising physically blending macromonomers having the structure:



wherein each $A_1$, $A_2$, $A_3$, and $A_4$, on each monomer unit, independently, is C or N; each $G_1$, $G_2$, $G_3$, and $G_4$, on each monomer unit, independently, is selected from the group consisting of H, solubilizing side groups, reactive side groups, and reactive solubilizing side groups, provided that (1) at least one monomer unit has at least one solubilizing side group and at least one reactive side group, or (2) at least one monomer unit has at least one reactive solubilizing side group, and provided that when any of $A_1$, $A_2$, $A_3$, and $A_4$ is N, the corresponding $G_1$, $G_2$, $G_3$, or $G_4$ is nil; the macromonomer has a degree of polymerization, $DP_n$, greater than about 6; and adjacent monomer units are oriented head-to-head, head-to-tail, or randomly, with one or more preformed polymers.



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**5,496,894**

**LOW VISCOSITY POLYMER POLYOLS WITH IMPROVED DISPERSION STABILITY**

**Frank E. Critchfield, South Charleston; Donald W. Simroth, Charleston, both of W. Va., and Stuart L. Watson, Midlothian, Va., assignors to ARCO Chemical Technology, L.P., Greenville, Del.**

**Division of Ser. No. 109,777, Aug. 20, 1993, Pat. No. 5,364,906. This application Jun. 10, 1994, Ser. No. 258,031**

**Int. Cl.[6] C08F *283/02***

**U.S. Cl. 525—53** **20 Claims**

1. A stable, low viscosity polymer polyol produced by a method comprising the steps of

(1) producing a first reaction product by polymerizing a first feed in a first continuous reactor in the presence of an initiator, said first feed comprising less than about 50 wt. % of total monomer proportion, in at least about 50 wt. % of a total base polyol proportion;

(2) producing a second reaction product by polymerizing a second feed in a continuous reactor in the presence of an initiator, said second feed comprising: (a) said first reaction product; (b) at least about 50 weight percent of said total monomer proportion; and (c) any balance of said base polyol proportion.

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**5,496,895**

**BIODEGRADABLE POLYMERS**

**Rangaswamy Chinnaswamy, and Milford A. Hanna, both of Lincoln, Nebr., assignors to The Board of Regents of the University of Nebraska, Lincoln, Nebr.**

**Continuation of Ser. No. 393,373, Aug. 14, 1989, abandoned. This application Sep. 8, 1992, Ser. No. 942,132**

**Int. Cl.[6] C08G *63/48;63/91;* C08F *8/00;32/00***

**U.S. Cl. 525—54.2** **4 Claims**

1. A biodegradable polymer comprising polymeric chains that include both monosaccharides from a starch feedstock and hydrocarbon monomers from a feedstock non-biodegradable plastic covalently bound to each other in ratios by weight of between 15 and 80 percent monosaccharide from starch feedstock to hydrocarbon from the feedstock non-biodegradable plastic, wherein at least some of the monosaccharides are bound by covalent bonds within the hydrocarbon chain of the biodegradable polymer.

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**5,496,896**

**CURABLE COMPOSITION BASED ON A MICHAEL ADDITION PRODUCT, PROCESSES FOR ITS PREPARATION AND ITS USE**

**Jung W. Alfons, Ascheberg, Germany, assignor to BASF Lacke & Farben Aktiengesellschaft, Munster, Germany**

**Continuation of Ser. No. 411,523, Sep. 28, 1989, abandoned. This application Apr. 1, 1993, Ser. No. 43,137**

**Claims priority, application Germany, Mar. 28, 1987, 37 10 431.4**

**Int. Cl.[6] C08L *51/00;* C08F *265/06***

**U.S. Cl. 525—74** **36 Claims**

1. A curable composition containing as component A) a compound with at least two activated double bonds (I), selected from the group consisting of α,β-unsaturated carbonyl compounds, α,β-unsaturated carboxylic acid esters and α,β-unsaturated nitriles, and a component B) which contains at least two active hydrogen atoms or at least two groups with active hydrogen atoms or at least one active hydrogen atom and at least one group with an active hydrogen atom and an organic solvent, wherein either component A) or component B) or components A) and B) are based on a branched soluble acrylate copolymer (P) which is obtained by copolymerization of:

a) 3 to 30% by weight of a monomer with at least two ethylenically unsaturated polymerizable double bonds,

5 to 60% by weight of a monomer with a functional group and 5 to 92% by weight of another ethylenically unsaturated monomer,

the sum of a), b) and c) being 100% by weight.

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**5,496,897**

**PROCESS FOR PREPARING UNIFORMLY SIZED, FINE PARTICLES OF POLYMER**

**Akira Yoshimatsu; Akihiro Kondo, and Rikio Tsushima, all of Wakayama, Japan, assignors to Kao Corporation, Tokyo, Japan**

**Continuation of Ser. No. 582,020, Sep. 13, 1990, abandoned, which is a continuation of Ser. No. 247,872, Sep. 21, 1988, abandoned. This application Aug. 10, 1992, Ser. No. 926,384**

**Claims priority, application Japan, Sep. 22, 1987, 62-238383**

**Int. Cl.[6] C08F *4/00***

**U.S. Cl. 525—266** **6 Claims**



1. A process for preparing uniformly sized particles of a polymer, which comprises the steps of:

(1) mixing (A) an oil-soluble, ethylenically unsaturated monomer with (B) a nonionic non-polymerizable organic compound in an amount of 0.5 to 300 wt. % based on said monomer (A) to form a mixture of (A) and (B); said nonionic non-polymerizable organic compound (B) being a liquid at room temperature, being compatible with monomer (A), having a solubility of 0.01 wt. % or greater at 25° C. in water and being more soluble in water than monomer (A);

(2) dispersing said mixture (A) and (B) in water to form a stable, finely dispersed aqueous emulsion of particles of mixture (A) and (B);

(3) adding said stable finely dispersed emulsion to an aqueous dispersion of (C) particles of a seed polymer, so as to allow said mixture to absorb onto said particles (C), said seed polymer particles have an average particle size of 0.1 to 20 microns and a standard deviation in particle size distribution of 10 percent or less; and

(4) polymerizing (A) in the presence of (B) and (C) and an oil-soluble initiator to obtain said uniformly sized, polymer particles.

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**5,496,898**

**STAR POLYMERS OF DIENES, VINYLARENES AND ALKYL METHACRYLATES AS MODIFIED VISCOSITY INDEX IMPROVERS**

**Robert J. Sutherland, and Donn A. DuBois, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.**

**Division of Ser. No. 993,740, Dec. 21, 1992, Pat. No. 5,344,887. This application Mar. 29, 1994, Ser. No. 219,338**

**Int. Cl.[6] C08F *297/02***

**U.S. Cl. 525—299** **6 Claims**

1. A polymer molecule comprising:

at least 3 first arms comprising a preponderance of a completely hydrogenated, polymerized conjugated alkadiene, the first arms having a peak molecular weight from 10,000 to 200,000, wherein at least 5% of the polymerized alkadiene is produced by 1,4-polymerization;

at least 3 second arms comprising a preponderance of a polymerized methacrylate, the second arms having a peak molecu-

lar weight from 1000 to 10,000, wherein the first arms are longer than the second arms and the number of first arms is greater than or equal to the number of second arms; and

a central core comprising a polymerized bisunsaturated monomer, wherein the central core connects the first and second arms in a star configuration and the central core is no more than 10% of the polymer molecular weight.

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**5,496,899**

## CROSSLINKABLE POLYMER MATERIAL WHICH MAY BE USED IN NON-LINEAR OPTICS AND PROCESS FOR OBTAINING IT

**Franck Foll, Carnon Ouest; Dominique Bosc, Lannion; Julienne Liang, Fresnes; Alain Rousseau, and Bernard Boutevin, both of Montpellier, all of, France, assignors to France Telecom, Paris, France**

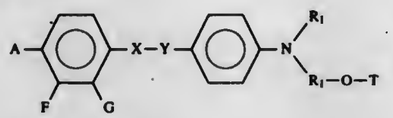
**Filed Sep. 1, 1994, Ser. No. 298,318**

**Claims priority, application France, Sep. 6, 1993, 93 10572**

**Int. Cl.[6] C08F 8/30**

**U.S. Cl. 525—327.2** **18 Claims**

1. A crosslinked material that is active in non-linear optics, obtained by crosslinking a crosslinkable material that contains a polymer having a chain on which are laterally grafted chromophores that are active in non-linear optics and that may be oriented under the effect of a polarizing electric field, the said chromophores containing an anchoring functional group for stabilizing the orientation of the chromophores by crosslinking after their polarization by an electric field, wherein each chromophore is included in a unit of the polymer which corresponds to the following formula (I):




(I)

in which:

T is part of the polymer chain,

A is an $—NO_2$, —CN or $—C(CN)=C(CN)_2$ group,

$R_1$ is a hydrogen atom or a methyl or ethyl group,

$R_2$ is a $CH_2$, $C_2H_4$, or $C_3H_6$ or $C_4H_8$ group, and:

either X=Y is an azo group, F being a hydrogen atom and G being a group —C(O)—O—W or a group —(O)—O—$(CH_2)_n$—O—W, n being an integer between 2 and 6 and W being a hydrogen atom or a dimerizable group, G then constituting the above-mentioned anchoring functional group or X=Y is an azomethine group, F being a group —O—W or $—R_3$—O—W where W is a hydrogen atom or a dimerizable group, $R_3$ being a group —O—C(O)—$R_4$—or —O—$R_4$— where $R_4$ is a $C_1$ to $C_6$ alkyl, and G being a hydrogen atom, F then constituting the said anchoring functional group Or X=Y is an azomethine group, G being a group —O—W or $—R_3$—O—W, where W is a hydrogen atom or a dimerizable group, $R_3$ being a group —O—C(O)—$R_4$—or —O—$R_4$—, where $R_4$ is a $C_1$ to $C_6$ alkyl, and F being a hydrogen atom, G then constituting the said anchoring functional group, the said polymer additionally containing at least one complementary anchoring functional group capable of attaching itself to the anchoring functional group carried by the chromophore during the crosslinking, said crosslinked material being obtained by crosslinking of said crosslinkable material after polarization of its chromophores by an electric field, the crosslinking being obtained by chemical bonding between the anchoring functional group carried by the chromophore and the complementary anchoring functional group.

**5,496,900**

## VULCANIZABLE COMPOSITIONS BASED ON MODIFIED ACRYLIC RUBBERS

**Joseph Da Lio, Ravenna; Laura Lanzavecchia, Milan, and Giuseppe Savini, Ravenna, all of, Italy, assignors to Enichem Elastomeri S.r.l., Milan, Italy**

**Division of Ser. No. 263,570, Jun. 22, 1994. This application Mar. 30, 1995, Ser. No. 413,884**

**Claims priority, application Italy, Jul. 7, 1993, MI93A1640**

**Int. Cl.[6] C08C 19/20;19/22**

**U.S. Cl. 525—346** **7 Claims**

1. Vulcanizable elastomeric composition including:

an elastomeric copolymer obtained by copolymerizing:

a) a monomer selected from the formula $CH_2=CR'—CO—OR$, wherein R is a monofunctional radical selected from linear or branched C1–C6 alkyl radicals and C1–C16 alkoxyalkyl radicals, and R' is selected from —H and $—CH_3$;

(meth)acrylonitrile,

c1) a chlorinated vinyl ester,

a vulcanizable agent selected from the group consisting of:

1) a mixture of:

a) a salt of a saturated or unsaturated fatty acid having from 7 to 30 carbon atoms;

b) sulphur or a sulphur-donor compound;

2) a composition consisting of:

i) polythioltriazine;

ii) a second component selected from thiurams, dithiocarbamates and thiazoles; and

3) a composition consisting of secondary polydiamines and sulphur.

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**5,496,901**

## METHOD OF MAKING FLUOROPOLYMERS

**Joseph M. DeSimone, Chapel Hill, N.C., assignor to University of North Carolina, Chapel Hill, N.C.**

**PCT No. PCT/US93/01626, § 371 Date Sep. 27, 1994, § 102(e) Date Sep. 27, 1994, PCT Pub. No. WO93/20116, PCT Pub. Date Oct. 14, 1993**

**Continuation-in-part of Ser. No. 858,150, Mar. 27, 1992, abandoned. This PCT application Feb. 26, 1993, Ser. No. 302,642**

**Int. Cl.[6] C08F 2/00**

**U.S. Cl. 526—89** **24 Claims**

1. A process for making a fluoroacrylate polymer, comprising:

solubilizing a fluoroacrylate monomer in a solvent, the solvent comprising carbon dioxide fluid; and then

polymerizing the fluoroacrylate monomer in said solvent to produce said fluoroacrylate polymer, wherein said polymerizing step is a solution polymerization step.

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**5,496,902**

## CATALYST SYSTEMS FOR THE POLYMERIZATION OF $C_2$-$C_{10}$-ALK-1-ENES

**Kaspar Evertz, Schifferstadt; Ruerger Schlund, Mannheim; Guenther Schweier, Friedelsheim, all of, Germany; Hans Brintzinger, Tägerwilen, Switzerland; Werner Roell, Konstanz, Germany; Peter Jutzi, Bielefeld, Germany; Ingrid Mieling, Ochtrup, Germany, and Winfried Mengele, Konstanz, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany**

**PCT No. PCT/EP93/00694, § 371 Date Jun. 13, 1994, § 102(e) Date Jun. 13, 1994, PCT Pub. No. WO93/20113, PCT Pub. Date Oct. 14, 1993**

**PCT Filed Mar. 23, 1993, Ser. No. 244,747**

**Claims priority, application Germany, Apr. 3, 1992, 42 11 086.6**

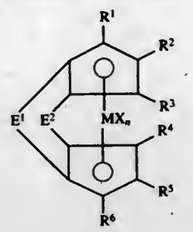
**Int. Cl.[6] C08F 4/642**

**U.S. Cl. 526—127** **6 Claims**

1. A catalyst system for the polymerization of $C_2$– $C_{10}$-alk-1-enes, containing, as active components,



a) a metallocene complex of the formula I




I

where

M is a metal of the subgroup III, IV or V of the Periodic Table of elements or a metal selected from the group consisting of the lanthanides,

X is fluorine, chlorine, bromine, iodine, hydrogen, $C_1$– $C_{10}$-alkyl, $C_6$–$C_{15}$-aryl or $—OR^7$,

$R^7$ is $C_1$–$C_{10}$-alkyl, $C_6$–$C_{15}$-aryl or alkylaryl, arylalkyl, fluoroalkyl or fluoroaryl, 1 to 10 carbon atoms in each alkyl radical and 6 to 20 carbon atoms in each aryl radical,

n is the valency of M minus two,

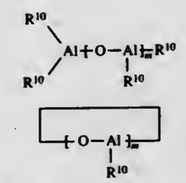
$R^1$ to $R^6$ are each hydrogen, $C_1$–$C_{10}$-alkyl, 5-membered to 7-membered cycloalkyl which in turn may carry $C_1$–$C_{10}$-alkyl as a substituent, $C_6$–$C_{15}$-aryl or arylalkyl, where two adjacent radicals together may furthermore form a cyclic group of 4 to 15 carbon atoms, or $Si(R^8)_3$,

$R^8$ is $C_1$–$C_{10}$-alkyl, $C_6$–$C_{15}$-aryl or $C_3$–$C_{10}$-cycloalkyl,

$E^1$ and $E^2$ are independent of one another and are each $Si(R^9)_2$, $Ge(R^9)_2$, $Sn(R^9)_2$ or $C(R^9)_2$—$C(R^9)_2$ and

$R^9$ is $C_1$–$C_{10}$-alkyl, $C_3$–$C_{10}$-cycloalkyl or $C_6$–$C_{15}$-aryl, and

b) an open-chain or cyclic alumoxane compound of the formula II or III




II

III

where $R^{10}$ is $C_1$–$C_4$-alkyl and m is an integer of from 5 to 30.

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**5,496,903**

## NEAR INFRARED POLYMERIZABLE COMPOSITION

**Emi Watanabe, Osaka; Masami Kawabata, Katano, and Iwao Sumiyoshi, Osaka, all of, Japan, assignors to Nippon Paint Company, Ltd., Osaka, Japan**

**Filed Apr. 25, 1995, Ser. No. 428,818**

**Claims priority, application Japan, Apr. 25, 1994, 6-086378**

**Int. Cl.[6] C08F 2/46;4/52**

**U.S. Cl. 526—204** **16 Claims**

1. A near infrared polymerizable composition comprising a cyanine dye, a S-triazine compound, an organoboron salt and an ethylenically unsaturated compound.

**5,496,904**

## PARTICULATE VINYL POLYMER AND WATER-BASE COATING COMPOSITION USING THE SAME

**Makoto Moriya; Seiji Nishimura, and Yasutaka Doi, all of Nagoya, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan**

**Filed Oct. 6, 1994, Ser. No. 319,036**

**Claims priority, application Japan, Jan. 6, 1993, 5-250538**

**Int. Cl.[6] C08F 20/10**

**U.S. Cl. 526—318.4** **4 Claims**

1. A particulate vinyl polymer, comprising at least 95 wt. % of particles thereof having a minor axis A and a major axis B, said minor and major axes A and B being in a relationship of $1 \leqq B/A \leqq 1.5$ and individually ranging from 30 μm to 400 μm, and said polymer having an acid value of from 30 to 150 mg KOH/g, rendering said particulate vinyl polymer water soluble and wherein said polymer comprises (a) 30 to 90wt. % of methyl methacrylate, (b) 0 to 30 wt. % of an aromatic vinyl compound, (c) 4 to 30 wt. % of an acidic-group-containing vinyl compound and (d) 0 to 66 wt. % of a further vinyl monomer copolymerizable with methyl methacrylate, said aromatic vinyl compound and said acidic-group-containing vinyl compound.

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**5,496,905**

## PAINT RESIN FOR USE IN PARAFFINIC SOLVENTS

**Andre Jean V. Gindre, Gif sur Yvette, and Saadane Rezaiguia, Bruyeres le Chatel, both of, France, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio**

**Filed Mar. 10, 1995, Ser. No. 402,432**

**Int. Cl.[6] C08F 220/12**

**U.S. Cl. 526—329.2** **16 Claims**

1. A resin which is particularly useful in making paraffinic solvent based paints, said resin being comprised of repeat units which are derived from (a) about 10 to about 55 weight percent para-tertiary-butyl styrene, (b) 0 to about 40 weight percent vinyl aromatic monomers in addition to the para-tertiary butyl styrene, (c) about 20 to about 80 weight percent isobutyl methacrylate, and about 2 to about 25 weight percent alkyl acrylate monomers.

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**5,496,906**

## PRODUCTION OF NITROSAMINE-FREE SILICONE ARTICLES

**Edward M. Jeram, Burnt Hills, and Larry N. Lewis, Scotia, both of N.Y., assignors to General Electric Company, Waterford, N.Y.**

**Filed Aug. 31, 1994, Ser. No. 298,728**

**Int. Cl.[6] C08G 77/08**

**U.S. Cl. 528—15** **6 Claims**

1. A method for making nitrosamine-free silicone articles comprising the following steps:

(a) mixing (A) a vinyl-containing organopolysiloxane with (C) a filler;

(b) adding an amount of acid solution to the mixture of said step (a) effective to eliminate nitrosamine,

(c) adding (B) a silicon hydride siloxane or silicon hydride siloxane fluid and (D) a catalytic amount of hydrosilation catalyst to the mixture of said step (b) and cooking said mixture at temperatures of from about 50° to 100° C. for 0.5 to 2.0 hours;

(d) curing the mixture of said step (c); and

(e) post baking the cured mixture of said step (d).

**5,496,907**

## WET ADHESION MONOMERS WITH UREIDO FUNCTIONALITY AND POLYMERS PREPARED THEREFROM

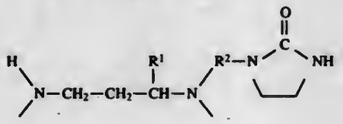
**Michael J. Dochniak, Stillwater, Minn., assignor to H. B. Fuller Licensing & Financing, Inc., Wilmington, Del.**

**Continuation-in-part of Ser. No. 25,091, Mar. 2, 1993, Pat. No. 5,399,706. This application Sep. 2, 1994, Ser. No. 300,309**

**Int. Cl.[6] C08G *18/62***

**U.S. Cl. 528—73** **7 Claims**

1. A free-radically polymerizable monomer or prepolymer compound comprising a free-radically polymerizable ethylenically unsaturated group and a group of the formula:



where $R^1$ is H, or a $C_1$–$C_{17}$ alkyl group, and $R^2$ is a $C_1$–$C_{20}$ alkylene group optionally interrupted with one or more ether oxygen atoms.

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**5,496,908**

## WATER-SOLUBLE POLYURETHANE AND USE THEREOF TO THICKEN WATER-BASED SYSTEMS SUCH AS WATER-BASED PAINTS

**Peter Bostrom, Kungälv; Annelie Askenbom, Stenungsund, and Eva Gottberg-Klingskog, Frölunda, all of, Sweden, assignors to Berol Nobel AB, Stenungsund, Sweden**

**PCT No. PCT/SE93/00732, § 371 Date Mar. 16, 1994, § 102(e) Date Mar. 16, 1994, PCT Pub. No. WO94/06840, PCT Pub. Date Mar. 31, 1994**

**PCT Filed Sep. 9, 1993, Ser. No. 204,369**

**Claims priority, application Sweden, Sep. 15, 1992, 9202648**

**Int. Cl.[6] C08G *18/48***

**U.S. Cl. 528—74.5** **14 Claims**

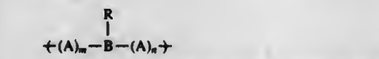
1. A water-soluble polyurethane, comprising:

(a) a polymer backbone;

(b) end groups provided on the ends of the polymer backbone and containing water-soluble oxyethylene groups having a molecular weight ranging from 400 to 15,000;

(c) groups pendant from the polymer backbone and containing hydrocarbon groups having 8–22 carbon atoms, in a number of at least 0.1 per urethane bond; and

(d) a segment contained within the polymer backbone having a formula IIa:



(IIa)

wherein R is a hydrophobic group pendant from the polymer backbone and contains a monovalent hydrocarbon group having 8–22 carbon atoms, A is an oxyalkylene group having 2–4 carbon atoms, B is a trivalent group, and m and n range from 20–140 and have a sum, m+n, which is 50–200, and the number of oxyethylene units being such that the polyurethane becomes water-soluble.

**5,496,909**

## POLYURETHANE MOLDING COMPOUND AND BIODEGRADABLE FILAMENTS MANUFACTURED FROM SUCH MOLDING COMPOUND

**Horst Mühlfeld, Grasellenbach; Lieselotte Klein, Mannheim, and Robert Groten, Weinheim, all of, Germany, assignors to Firma Carl Freudenberg, Weinheim, Germany**

**Filed Jun. 9, 1994, Ser. No. 257,752**

**Claims priority, application Germany, Jun. 11, 1993, 43 19 439.7**

**Int. Cl.[6] C08G *18/40;18/42***

**U.S. Cl. 528—76** **2 Claims**

1. A biodegradable, elastic filament of a thermoplastic polyurethane molding compound which is the reaction product of 100 parts by weight of a polyol mixture with 1,6-hexamethylene diisocyanate, isophorone diisocyanate or dicyclohexylmethane 4,4'-diisocyanate and a diol-chain-lengthener, having an NCO coefficient, determined from the quotients of the equivalency ratios of isocyanate groups multiplied by 100 and of the sum of the hydroxyl groups from the polyol mixture and the chain-lengthener, of from 97 to 99, wherein the polyol mixture comprises 70 to 90 parts by weight of a polyester polyol having a molecular weight of 2000, based on adipic acid with ethane diol, butane diol, hexane diol, diethylene glycol or neopentyl glycol, and 10 to 30 parts by weight of a polyethylene glycol having a molecular weight of 800 to 4000, wherein the chain lengthener is 1,4-butane diol or 1,6-hexane diol, and wherein the diisocyanate is present in an equivalency ratio to the polyol mixture of 2.8:1.0 to 12.0:1.0 and the chain lengthener is present in an equivalency ratio to the polyol mixture of 1.75:1.0 to 11.3:1.0.

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**5,496,910**

## HYDROXYFUNCTIONAL THERMOPLASTIC POLYESTERS

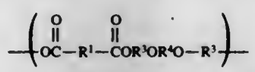
**Michael N. Mang; Jerry E. White, and Paul E. Swanson, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.**

**Filed Jul. 21, 1994, Ser. No. 278,361**

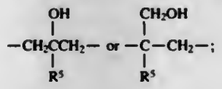
**Int. Cl.[6] C08G *59/68***

**U.S. Cl. 528—88** **15 Claims**

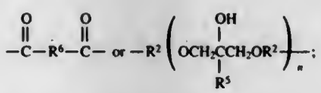
1. A thermoplastic polyester having repeating units represented by the formula:



wherein $R^1$ is a hydrocarbylene substituted with at least one hydroxyl group, optionally in combination with an unsubstituted aromatic moiety or an unsubstituted hydrocarbylene; $R^3$ is



and $R^4$ is



wherein $R^2$ is independently a divalent aromatic moiety or a hydrocarbylene; $R^5$ is independently hydrogen or lower alkyl; $R^6$ is a divalent aromatic moiety, or a hydrocarbylene optionally substituted with at least one hydroxyl group; and n is from 0 to 10.



**5,496,911**

## PROCESS FOR THE PRODUCTION OF POLYUREA BASED ARTICLES

**Stuart B. Smith, Conyers, Ga., assignor to ECP Enichem Polimeri Netherlands, B.V., Amsterdam, Netherlands**

**Continuation of Ser. No. 160,781, Dec. 3, 1993, abandoned, which is a continuation-in-part of Ser. No. 130,762, Oct. 4, 1993, abandoned. This application Mar. 3, 1995, Ser. No. 400,193**

**Int. Cl.[6] C08G *18/10***

**U.S. Cl. 528—77** **15 Claims**

1. The method of reaction injection molding (RIM) to produce a molded article having a flexural modulus ≧80,000 p.s.i. comprising:

admixing a component A) and a component B) in a mold;

reacting said component A) and said component B) in said mold, wherein

component A) comprises an isocyanate quasi pre-polymer component comprising the reaction product of:

i) a polyisocyanate, said polyisocyanate being MDI or modified MDI having a free isocyanate content of from 20–33% by weight NCO; and

ii) a polyether triol component having from 50–85% by weight ethylene oxide units and 15–50% by weight propylene oxide units;

wherein said isocyanate quasi pre-polymer has a final NCO content of from 10–27%; and

component B) comprising:

i) an amine terminated polyether polyol with functionality of 2 or 3 and having a number average molecular weight of 2,000–5,000;

ii) an aromatic diamine; and

iii) a hydroxy terminated and amine started polyether polyol of 200–980 number average molecular weight; wherein said amine terminated polyether polyol (i) and said aromatic diamine (ii) are present in a ratio (i)/(ii) of at least 2:1 and said aromatic diamine (ii) and said hydroxy terminated and amine started polyether polyol (iii) are present in a ratio (ii)/(iii) of ≧2 2.5:1;

gelling said components in said mold wherein gel times are 1.2 to 3 seconds; and

demolding said molded article, wherein the demolding time is 50 seconds or less.

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**5,496,912**

## THERMOTROPIC LIQUID CRYSTAL AROMATIC POLYSTERS

**Giuseppe Motroni, Verbania; Mauro Maritano, Novara; Alfredo Coassolo, Novara, and Giovanni Gianchi, Novara, all of, Italy, assignors to Himont Italia S.r.l., Italy**

**Continuation of Ser. No. 326,811, Oct. 20, 1994, abandoned, which is a continuation of Ser. No. 170,506, Dec. 20, 1993, abandoned, which is a continuation of Ser. No. 912,553, Jul. 13, 1992, abandoned. This application May 5, 1995, Ser. No. 435,275**

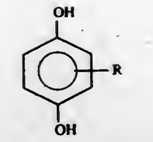
**Int. Cl.[6] C08G *63/02***

**U.S. Cl. 528—193** **4 Claims**

1. A process for making molded articles, films and fibers, said process comprising melt processing a thermotropic liquid crystalline polyester comprising:

a) units derived from at least one aromatic bicarboxylic acid in a mole percentage of 50% with respect to the total mole amount;

b) units derived from a substituted hydroquinone



where R is selected from the group consisting of (1-phenylethyl), (1-methyl-1-phenylethyl), benzyl, benzoyl, phenoxy, and mixtures thereof, optionally substituted, in a mole percentage of from 37.5% to 40% with respect to the total mole amount;

c) units derived from hydroquinone in a mole percentage of from 10% to 12.5 % with respect to the total mole amount.

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**5,496,913**

## AROMATIC POLYCARBONATE, A METHOD FOR PRODUCING THE SAME, AND A PLASTIC OPTICAL WAVEGUIDE USING THE SAME

**Masaki Nishiguchi, Chiba, and Toshimasa Tokuda, Iyo, both of, Japan, assignors to Furukawa Electric Co., Ltd, and Teijin Chemicals Ltd., both of Tokyo, Japan**

**Filed Oct. 25, 1993, Ser. No. 140,414**

**Claims priority, application Japan, Nov. 2, 1992, 4-294428; Nov. 2, 1992, 4-315598; Nov. 2, 1992, 4-315600**

**Int. Cl.[6] C08G *63/68***

**U.S. Cl. 528—198** **8 Claims**

1. An aromatic polycarbonate obtained by reacting a carbonate precursor substance with a dihydric phenol comprising mainly 2,2-bis(4-hydroxyphenol)-1,1,1,3,3,3-hexafluoropropane (hereinafter referred to as bisphenol AF) purified by using an activated clay, the amount of activated clay being from 0.1 to 50% by weight based on bisphenol AF, wherein

(i) the bisphenol AF has the following characteristics:

with respect to a 20 wt % ethanol solution of the bisphenol AF that is dried for 10 hours at 70±10° C. under a reduced pressure of 10 mmHg, after being filtered through a filter having a pore diameter of 0.1 μm, the light transmittance at 400 nm measured using a quartz cell having an optical path length of 250 mm, is 90% or more, and the content of impurities of the bisphenol AF, analyzed by liquid chromatography, is 0.02 wt % or less, and

(ii) the said aromatic polycarbonate has the following characteristics:

with respect to 5 wt % solution of the aromatic polycarbonate in methylene chloride, after being filtered through a filter having a pore diameter of 0.1 μm, the light transmittance at 400 nm measured by using a quartz cell having an optical path length of 250 mm, is 85% or more in terms of light transmittance per cm of the polymer; and when 0.7 g of the aromatic polycarbonate is dissolved in 100 ml of methylene chloride, the specific viscosity of the thus obtained solution measured at 20° C., is in the range of 0.160 to 0.418.

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**5,496,914**

## AMINO ACID COPOLYMERS OF MALEIC ACID

**Louis L. Wood, Rockville, and Gary J. Calton, Elkridge, both of Md., assignors to SRCHEM, Inc., Elkridge, Md.**

**Division of Ser. No. 132,288, Oct. 6, 1993, Pat. No. 5,408,829. This application Jan. 18, 1995, Ser. No. 374,242**

**Int. Cl.[6] C08G *69/10*; C02F *5/12***

**U.S. Cl. 528—328** **10 Claims**

1. A polymer produced by thermally polymerizing (1) a member of the group consisting of maleic acid, malic acid and fumaric acid,

(2) ammonia, and (3) a polyamine containing amino acid in which the ratio of said acid to polyamine containing amino add Is 3:1 or less.

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**5,496,915**

## POLYIMIDES BASED ON DIAMINES CONTAINING CYCLOALIPHATIC UNITS

**Christian Fischer, Ludwigshafen; Karin Elbl-Weiser, Schriesheim, and Jürgen Koch, Neuhofen, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany**

**Filed Feb. 13, 1995, Ser. No. 387,568**

**Claims priority, application Germany, Feb. 16, 1994, 44 04 891.2**

**Int. Cl.[6] C08G** *73/10;69/26*

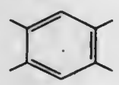
**U.S. Cl. 528—353** **7 Claims**

1. A polyimide obtained by reacting

A) a dianhydride component consisting of

$a_1$) from 50 to 100 mol % of at least one dianhydride of the formula I

where R is a tetravalent aromatic or heteroaromatic radical, with the exception of

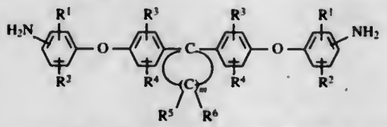


and

$a_2$) from 0 to 50 mol % of a pyromellitic dianhydride with

B) a diamine component consisting of

$b_1$) from 50 to 100 mol % of at least one diamine of the formula II



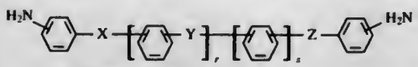
(II)

where $R^1$ to $R^4$ independently of one another, are identical or different and are hydrogen, halogen, $C_1$–$C_{12}$-alkyl, $C_1$–$C_{12}$-alkoxy, $C_5$–$C_7$-cycloalkyl, $C_6$–$C_{18}$-aryl, $C_4$- or $C_5$-hetaryl or $C_1$–$C_{12}$-alkyl-$C_6$–$C_{18}$-aryl,

$R^5$ and $R^6$, independently of one another, are identical or different and can be individually selected for each C atom in the alicyclic ring and are hydrogen, $C_1$–$C_{12}$-alkyl, $C_1$–$C_{12}$-alkoxy, $C_5$-$C_7$-cycloalkyl, $C_6$-$C_{18}$-aryl, $C_4$- or $C_5$-hetaryl or $C_1$-$C_{12}$-alkyl-$C_6$-$C_{18}$-aryl, and

m is an integer from 4 to 7, and

$b_2$) from 0 to 50 mol % of at least one diamine of the formula III



(III)

where X, Y and Z, independently of one another, are identical or different and are a chemical bond or are selected from the group consisting of —O—, —CO—, —S—, —$SO_2$—, —$C(CH_3)_2$—, —$C(CF_3)_2$— and —$Si(CH_3)_2$— and

r and s, independently of one another, are identical or different and are 0 or 1,

with the proviso that the component A is a mixture of $a_1$ and $a_2$ if the component B consists only of $b_1$ and component B is a mixture of $b_1$ and $b_2$ if the component A consists only of $a_1$.

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**5,496,916**

## PROCESS FOR OXIDIZING POLYARYLENE COMPOUNDS CONTAINING THIOETHER GROUPS

**Dietrich Fleischer, Darmstadt; Heinz Strutz, Usingen; Jürgen Kulpe, Frankfurt am Main, and Andreas Schleicher, Einhausen, all of, Germany, assignors to Hoechst Aktiengesellschaft, Germany**

**Filed May 3, 1994, Ser. No. 237,272**

**Claims priority, application Germany, May 4, 1993, 43 14 738.0**

**Int. Cl.[6] C08G** *75/00;* **C08F** *6/00*

**U.S. Cl. 528—373** **15 Claims**

1. A process for preparing a polyarylene sulfone by oxidizing a polyarylene thioether, which comprises carrying out the reaction a) in acetic acid with hydrogen peroxide in the presence of catalytic amounts of concentrated sulfuric acid and/or b) in acetic acid with addition of equilibrium per-acids.

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**5,496,917**

## TWO-STAGE OXIDATION OF POLYARYLENE SULFIDES

**Dietrich Fleischer, Darmstadt; Heinz Strutz, Usingen; Jürgen Kulpe, Frankfurt am Main, and Andreas Schleicher, Einhausen, all of, Germany, assignors to Hoechst Aktiengesellscharf, Germany**

**Filed May 3, 1994, Ser. No. 237,271**

**Claims priority, application Germany, May 4, 1993, 43 14 737.2**

**Int. Cl.[6] C08G** *75/00;* **C08F** *6/00*

**U.S. Cl. 528—373** **20 Claims**

1. A polyarylene thioether having recurring units of the formula

$$[-(S-E-)_a-(-SO-E-)_b-(SO_2-E)_c-] \quad (I)$$

in which E are, independently of one another, phenylene, naphthylene or biphenylene, a and c have, independently of one another, values from 0 to less than 1 and b has values from greater than zero to less than 1, with the proviso that the sum of a+b+c is equal to 1 and at least two of the indices are greater than zero.

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**5,496,918**

## PROCESS FOR IMPROVING THE PROPERTIES OF POLYMERS

**Yash P. Khanna, Cedar Knolls, N.J.; Kevin R. Slusarz, Greenwich, Conn.; Mina K. Gabriel, Whitehouse Sta, N.J.; Annemarie C. Reimschuessel, Morristown, N.J., and John P. Sibilia, Livingston, N.J., assignors to AlliedSignal Inc., Morris Township, N.J.**

**Division of Ser. No. 763,740, Sep. 23, 1991. This application Oct. 13, 1994, Ser. No. 322,976**

**Int. Cl.[6] C08G** *69/46*

**U.S. Cl. 528—480** **18 Claims**

1. A process for increasing the crystallization rate of a polyamide composition comprising:

(a) shearing a melt of said polyamide composition at an effective shear rate; and

(b) reducing the total amount of oligomeric polyamides in said polyamide composition to less than about 3% by weight of said composition, wherein said oligomeric polyamides includes the total amount of polyamide polymers having from one to seven monomer units.



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**5,496,919**

## PROCESS FOR PRODUCTION OF STYRENE-BASED POLYMER MOLDINGS

**Akikazu Nakano, Ichihara, Japan, assignor to Idemitsu Kosan Co., Ltd., Tokyo, Japan**

**Division of Ser. No. 960,577, Oct. 13, 1992, Pat. No. 5,270,442, which is a continuation of Ser. No. 665,930, Mar. 5, 1991, abandoned, which is a continuation of Ser. No. 286,372, Dec. 19, 1988, abandoned. This application Sep. 2, 1993, Ser. No. 116,066**

**Claims priority, application Japan, Jan. 13, 1988, 63-003846**

**Int. Cl.[6] C08F** *6/00;12/08*

**U.S. Cl. 528—481** **14 Claims**

1. A process for producing a styrene polymer molding which comprises heat treating a molding of a crystalline styrene polymer having mainly a syndiotactic configuration and having a crystallinity of more than 10% as determined by X-ray diffraction analysis, said heat treating being carried out at a temperature of 150° to 250° C. for a period of time of 20 seconds to 90 minutes.

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**5,496,920**

## INCREASING THE MOLECULAR WEIGHT OF POLYAMIDES

**Rudolf Pfaendner, Rimbach/Odenwald; Kurt Hoffmann, Lautertal, and Heinz Herbst, Lautertal-Reichenbach, all of, Germany, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.**

**Filed May 27, 1994, Ser. No. 250,133**

**Claims priority, application Switzerland, Jun. 7, 1993, 1694/93**

**Int. Cl.[6] C08G** *63/91;69/48*

**U.S. Cl. 528—487** **9 Claims**

1. A process for increasing the molecular weight of polyamides, which comprises heating a polyamide, with addition of a bismaleimide and a sterically hindered hydroxyphenyl-$C_1$–$C_6$alkylphosphonic acid ester or half-ester, above the melting point or glass transition point of the polyamide.

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**5,496,921**

## MELT PROCESS FOR POLYCARBONATE WITH IMPROVED HEAT STABILITY

**Takeshi Sakashita, and Tomoaki Shimoda, both of Iwakuni, Japan, assignors to GE Plastics Japan, Japan**

**Division of Ser. No. 200,341, Feb. 23, 1994, Pat. No. 5,371,170, which is a division of Ser. No. 903,320, Jun. 24, 1992, Pat. No. 5,306,801. This application Oct. 24, 1994, Ser. No. 327,738**

**Int. Cl.[6] C08F** *6/00*

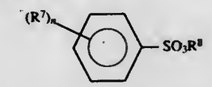
**U.S. Cl. 528—487** **12 Claims**

1. A method for preparing polycarbonates comprising

a) melt polycondensing an aromatic dihydroxy compound and a diester carbonate in the presence of a total amount in the reaction system of $5\times10^{-6}$ to $8\times10^{-7}$ mole of an alkali metal compound or an alkaline earth metal compound per mole of the aromatic dihydroxy compound and

b) adding to the polycarbonate which is the reaction product thereof:

a sulfonic acid compound of the formula



where $R^7$ is a hydrocarbon group having 1–6 carbons in which the hydrogens may be substituted with halogens, $R^8$ is a hydrocarbon group with 1–8 carbons in which the hydrogens may be substituted with halogens and n is an integer from 0 to 3 in an amount of 0.05–10 ppm, based on the weight of the polycarbonate,

an epoxy compound in an amount of 1–2000 ppm, based on the weight of the polycarbonate, and also a phosphorus compound in an amount of 10–1000 ppm based on the weight of the polycarbonate.

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**5,496,922**

## DECOLORIZATION OF POLYSUCCINIMIDE

**David A. Martin, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.**

**Filed Dec. 27, 1994, Ser. No. 364,146**

**Int. Cl.[6] C08G** *69/10*

**U.S. Cl. 528—490** **8 Claims**

1. A process for increasing the whiteness of particulate polysuccinimide prepared by the thermal condensation of L-aspartic acid which comprises forming a slurry of said particles in an aqueous bleach solution for a period of time sufficient to increase the whiteness of said particles, then separating said particles from said solution.

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**5,496,923**

## PURIFICATION PROCESS OF ALIPHATIC POLYESTER

**Hiroshi Suizu; Masatoshi Takagi; Masanobu Ajioka, and Akihiro Yamaguchi, all of Kanagawa, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Chiyoda, Japan**

**Filed Sep. 14, 1994, Ser. No. 305,785**

**Claims priority, application Japan, Sep. 20, 1993, 5-233363; Dec. 22, 1993, 5-323762**

**Int. Cl.[6] C08F** *6/02*

**U.S. Cl. 528—501** **14 Claims**

1. A purification process of an aliphatic polyester prepared in the presence of a catalyst from

(i) an aliphatic hydroxycarboxylic acid,

(ii) a cyclic ester of the aliphatic hydroxycarboxylic acid,

(iii) a combination of an aliphatic polyhydric alcohol and an aliphatic polybasic acid, or

(iv) a mixture of compounds selected from the above (i) to (iii), which comprises deactivating the catalyst or insolubilizing and separating the catalyst, while maintaining the aliphatic polyester in a molten or a dissolved state and successively removing a low molecular weight compound by distillation under reduced pressure.

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**5,496,924**

## FUSION PROTEIN COMPRISING AN INTERLEUKIN-2 FRAGMENT BALLAST PORTION

**Paul Habermann, Taunus, and Friedrich Wengenmayer, Hofheim am Taunus, both of, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany**

**Continuation of Ser. No. 377,313, Jul. 10, 1989, abandoned, which is a continuation-in-part of Ser. No. 934,910, Nov. 25, 1986, abandoned, and Ser. No. 943,804, Dec. 19, 1986, abandoned. This application Dec. 28, 1992, Ser. No. 194,545**

**Claims priority, application Germany, Nov. 27, 1985, 35 41 856.7; Dec. 21, 1985, 35 45 565.9; Jan. 30, 1986, 36 36 903.9**

**Int. Cl.[6] C07K** *14/47;14/62;14/815;19/00*

**U.S. Cl. 530—350** **10 Claims**

1. A fusion protein comprising a ballast portion and a desired protein, said ballast portion forming the N-terminus of the fusion protein and said ballast portion consisting essentially of residues of the amino acid sequence of interleukin-2 (IL-2), wherein said ballast portion contains at least a 22-residue amino acid sequence of IL-2 and lacks IL-2 biological activity in the T-cell proliferation test.

**5,496,925**

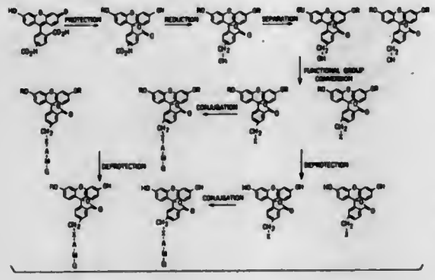
## 5(6)-METHYL SUBSTITUTED FLUORESCEIN DERIVATIVES

**Phillip G. Mattingly, Grayslake, Ill., assignor to Abbott Laboratories, Abbott Park, Ill.**

**Continuation of Ser. No. 260,578, Jun. 16, 1994, abandoned, which is a division of Ser. No. 859,775, Mar. 30, 1992, Pat. No. 5,352,803. This application Apr. 13, 1995, Ser. No. 421,143**

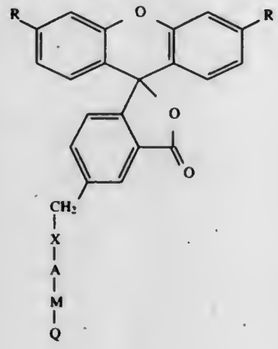
**Int. Cl.**[6] **A61K** *35/14;* **C07K** *14/00;* **C07D** *311/82;* **G01N** *33/53*

**U.S. Cl. 530—350** **1 Claim**



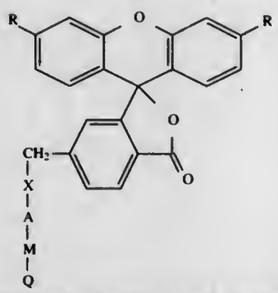
1. Fluorescein conjugates of the following formula XIX or XX:

FORMULA XIX



or

FORMULA XX

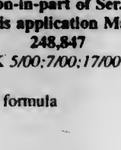


wherein R is hydroxy or protected hydroxy and X is chosen from the group consisting of —N(H)n—, —O—, or —S—;

wherein n=0 or 1, to satisfy the nitrogen valency;

wherein A is a spacer group consisting of from 0 to 50 carbon atoms and heteroatoms, including not more than ten heteroatoms, arranged in a straight or branched chain, saturated or unsaturated, with the provisos that not more than two heteroatoms may be directly linked in the sequence —X—A—M—Q, the sequence —X—A—M—Q cannot contain —O—O—, that when X=—N(H)$_n$— in the sequence —X—A—M—Q, when n=0 then N—A taken together may comprise a ring of not more that 6 atoms; and that branchings may occur only on carbon atoms;

wherein M is a linking group selected from —C(=O), —NH—, —O—C(=O)—, —N(H)—C(=O)—, —N(H)—C(=S)—, —S—, —P(=O)(O—)— and



and

wherein Q is a conjugation partner.

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**5,496,926**

## PROCESS OF PREPARING A SOLUBLE LDL RECEPTOR

**Menachem Rubinstein, Givat Shmuel; Daniela Novick, and Nathan Tal, both of Rehovot, all of, Israel, assignors to Yeda Research and Development Co. Ltd., Rehovot, Israel**

**Continuation-in-part of Ser. No. 4,863, Jan. 19, 1993, abandoned. This application Jul. 19, 1993, Ser. No. 92,817**

**Claims priority, application Israel, Jan. 19, 1992, 100696; Aug. 23, 1992, 102915**

**Int. Cl.**[6] **C07K** *1/14;1/22;14/705*

**U.S. Cl. 530—412** **14 Claims**

1. A process for the preparation of a soluble LDL receptor protein, comprising:

(a) treating, with interferon-γ, cells capable of entering an antiviral state in response to induction by interferon-γ to produce soluble LDL receptor protein;

(b) isolating the soluble LDL receptor protein from the supernatant; and

(c) purifying the soluble LDL receptor.

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**5,496,927**

## PEPTIDASE INHIBITORS

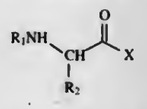
**H. Michael Kolb, Cincinnati; Joseph P. Burkhart, West Chester, both of Ohio; Michel J. Jung, Pfaffenhoffen, France; Fritz E. Gerhart, deceased, late of Kehl Leutesheim, Germany; Eugene L. Giroux, Cincinnati, Ohio; Bernhard Neises, Offenburg-Griesheim, Germany, and Daniel G. Schirlin, Lampertheim, France, assignors to Merrell Pharmaceuticals Inc., Cincinnati, Ohio**

**Continuation of Ser. No. 102,522, Aug. 4, 1993, abandoned, which is a continuation of Ser. No. 980,141, Nov. 23, 1992, abandoned, which is a continuation of Ser. No. 540,033, Jun. 19, 1990, abandoned, which is a continuation-in-part of Ser. No. 372,162, Jun. 27, 1989, abandoned, which is a continuation of Ser. No. 267,758, Nov. 1, 1988, abandoned, which is a continuation of Ser. No. 874,721, Jun. 16, 1986, abandoned, which is a continuation-in-part of Ser. No. 697,987, Feb. 4, 1985, abandoned. This application May 25, 1994, Ser. No. 248,847**

**Int. Cl.**[6] **C07K** *5/00;7/00;17/00;* **A61K** *38/00*

**U.S. Cl. 530—328** **7 Claims**

1. A compound of the formula



the hydrates thereof, and the pharmaceutically acceptable salts thereof useful for inhibiting human leukocyte elastase wherein



$R_2$ is the side chain of the α-amino acids Ala, Leu, Ile, Val, n-Val or n-Leu,

$R_1$ is -$P_2P_3P_4Pg$ with $P_2$ being Pro or Ala,

$P_3$ is Ala, Leu, Ile, Val, n-Val, n-Leu or Lys,

$P_4$ is Ala or is deleted,

$P_g$ is an optional terminal moiety selected from Ac, Suc, Bz, Boc, CBZ, DNS, Iva, MeOSuc, $AdSO_2$, AcAc or 2-CBZ,

X is $X_1$ or $X_2$ wherein

$X_1$ is -$CF_3$, -$CF_2H$, -CO2$R_3$ or -CONH$R_3$,

X2 is



Y is -$OR_3$,

$R_3$ is hydrogen, $C_{1-4}$ straight or branched alkyl, phenyl, benzyl, cyclohexyl or cyclohexylmethyl, and

$R_5$ is deleted, with the proviso that when the $R_1$ moiety bears a Pro in its $P_2$ position, then X is other than $CF_3$.

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**5,496,928**

## ENDOTHELIN ANTAGONISTIC SUBSTANCE

**Kiyofumi Ishikawa; Takehiro Fukami; Takashi Hayama; Kenji Niiyama; Toshio Nagase; Toshiaki Mase; Kagari Fujita; Masaki Ihara; Fumihiko Ikemoto; Mitsuo Yano, and Masaru Nishikibe, all of Tsukuba, Japan, assignors to Banyu Pharmaceutical Co., Ltd., Tokyo, Japan**

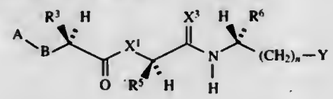
**Continuation of Ser. No. 981,424, Nov. 25, 1992, abandoned, which is a continuation-in-part of Ser. No. 945,414, Sep. 16, 1992, which is a continuation-in-part of Ser. No. 884,642, May 18, 1992, abandoned, which is a division of Ser. No. 712,095, Jun. 7, 1991, abandoned. This application Apr. 20, 1994, Ser. No. 230,534**

**Claims priority, application Japan, Jun. 7, 1990, 1-149105; Dec. 4, 1991, 2-347670; Dec. 18, 1991, 2-353738; Aug. 10, 1992, 3-234207**

**Int. Cl.**[6] **A61K** *38/06*

**U.S. Cl. 530—331** **6 Claims**

1. A peptide of the formula:



wherein

A is a group of the formula $R^{12}R^{13}N$—C(=O)—, wherein $R^{12}$ and $R^{13}$ form, together with the adjacent nitrogen atom, a 5- to 9-membered nitrogen-containing saturated heterocyclic ring having four to eight carbon atoms, and wherein one to four hydrogen atoms on the carbon atoms of the saturated heterocyclic ring may independently be replaced by a lower alkyl group;

B is a group of the formula —$NR^2$—, wherein $R^2$ is a hydrogen atom or a lower alkyl group;

$R^3$ is a lower alkyl group;

$X^1$ is a group of the formula —$NR^4$—, wherein $R^4$ is a hydrogen atom or a lower alkyl group;

$R^5$ is a 3-indolylmethyl group, wherein the indole ring is substituted at the 2-position by a substituent selected from the group consisting of a lower alkylthio group, a lower alkylsulfinyl group and a lower alkylsulfonyl group;

$X^3$ is an oxygen atom;

$R^6$ is a hydrogen atom or a lower alkyl group;

n is 0 or 1;

Y is a group of the formula $CO_2R^{71}$ wherein $R^{71}$ is a hydrogen atom or a lower alkyl group; or a pharmaceutically acceptable salt thereof.

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**5,496,929**

## RADIOPHARMACEUTICAL PRODUCT HAVING IN PARTICULAR A CEREBRAL TROPISM COMPRISING A NITRURO COMPLEX OF A TRANSITION METAL AND METHOD FOR PREPARING SAID PRODUCT

**Roberto Pasqualini, Clamart; Emmanuel Bellande, Saulx les Chartreux; Véronique Comazzi, Issy les Joulineaux, and Jacques Lainé, Antony, all of, France, assignors to Cis Bio International, Saclay, France**

**PCT No. PCT/FR92/00718, § 371 Date May 19, 1994, § 102(e) Date May 19, 1994, PCT Pub. No. WO93/01839, PCT Pub. Date Apr. 2, 1993**

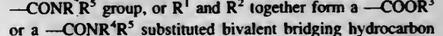
**PCT Filed Jul. 25, 1994, Ser. No. 178,244**

**Claims priority, application France, Jul. 22, 1991, 91 09231**

**Int. Cl.**[6] **A61K** *43/00*

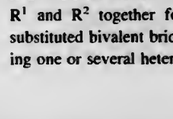
**U.S. Cl. 534—10** **14 Claims**

1. A radiopharmaceutical product comprising a complex of a transition metal satisfying the formula:



(I)

in which M is a radioactive transition metal and in which $L^1$ and $L^2$, which may be identical or different, satisfy the formula:



in which $R^1$ and $R^2$, which may be identical or different, represent a linear or branched alkyl radical with 1 to 10 carbon atoms, optionally substituted by at least one group selected from the group consisting of —O—$R^3$, —OOC$R^3$, —COO$R^3$, —CONR$^4$R$^5$ and —NR$^4$R$^5$ in which $R^3$ is a linear or branched alkyl radical with 1 to 5 carbon atoms, and $R^4$ and $R^5$, which may be identical or different, are hydrogen atoms or linear or branched alkyl radicals with 1 to 5 carbon atoms, or in which $R^1$ and $R^2$ together form a bivalent bridging hydrocarbon optionally containing one or several heteroatoms, optionally substituted by at least one group selected from the group consisting of —O—$R^3$, —OOC$R^3$, —COO$R^3$, —CONR$^4$R$^5$ and NR$^4$R$^5$ and —NR$^4$R$^5$ in which $R^3$, $R^4$, $R^5$ are as defined above,

V and W, which may be identical or different, represent O, S or Se,

X represents C, N—C, P or As, and

l, m and n, which may be identical or different, are equal to 0 or 1,

m and n being equal to 0 when X represents C, and m being equal to 1 when X represent N—C, P or As, provided,

1) when X represents —N—C—, $R^1$ or $R^2$ is an alkyl radical substituted by at least one group which is a —COO$R^3$ or a —CONR$^4$R$^5$ group, or $R^1$ and $R^2$ together form a —COO$R^3$ or a —CONR$^4$R$^5$ substituted bivalent bridging hydrocarbon optionally containing one or several heteroatoms, and

2) when X represents P, with V and W representing O, $R^1$ and $R^2$ is a —COO$R^3$ or a —CONR$^4$R$^5$ substituted alkyl radical or $R^1$ and $R^2$ together form a —COO$R^3$ or a —CONR$^4$R$^5$ substituted bivalent bridging hydrocarbon optionally containing one or several heteroatoms.

**5,496,930**

## UNSATURATD SUGAR COMPOUNDS

**Wolfgang Holla, Hofheim am Taunus, and Reinhold Keller, Bad Soden am Taunus, both of, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany**

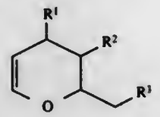
**Division of Ser. No. 924,799, Aug. 6, 1992, Pat. No. 5,380,659, which is a continuation of Ser. No. 336,480, Apr. 12, 1989, abandoned. This application Sep. 30, 1994, Ser. No. 315,500**

**Claims priority, application Germany, Apr. 14, 1988, 38 12 409.2; Aug. 19, 1988, 38 28 190.2**

**Int. Cl.[6] C07H** *1/00;5/04;5/06*

**U.S. Cl. 536—1.11** **2 Claims**

1. A compound of the formula I



I

in which

$R^1$ is hydroxyl and $R^2$ and $R^3$ are independently selected from ($C_1$–$C_{10}$)-acyloxy and benzoyloxy, or

$R^1$ and $R^3$ are independently selected from ($C_1$–$C_{10}$)-acyloxy and benzoyloxy and $R^2$ is hydroxyl, or

$R^1$ and $R^2$ are hydroxyl and $R^3$ is ($C_1$–$C_{10}$)-acyloxy or benzoyloxy, or a hydroxyl-protected derivative thereof, it being possible for the carbon atoms of an acyloxy group to be substituted with one or more of halogen, amino, methoxy, phenyl and phenoxy, and for the carbon atoms of a benzoyloxy group to be substituted with one or more of nitro, halogen and [($C_1$ and $C_2$-alkoxy] ($C_1$ and $C_2$)-alkoxy, with the exception of the compound of the formula I in which $R^1$ and $R^3$ are benzoyloxy and $R^2$ is hydroxyl.

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**5,496,931**

## INSECTICIDE AND MITICIDE A83543 COMPOUNDS AND THEIR METHOD OF PRODUCTION BY FERMENTATION

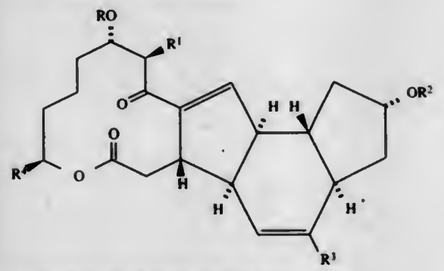
**LaVerne D. Boeck, Indianapolis; Hang Chio, Greenfield; Tom E. Eaton; Otis W. Godfrey, Jr., both of Greenwood; Karl H. Michel; Walter M. Nakatsukasa, both of Indianapolis, and Raymond C. Yao, Carmel, all of Ind., assignors to Dow-Elanco, Indianapolis, Ind.**

**Continuation of Ser. No. 141,174, Oct. 22, 1993, abandoned, which is a division of Ser. No. 773,754, Oct. 10, 1991, Pat. No. 5,362,634, which is a continuation of Ser. No. 429,441, Oct. 30, 1989, abandoned, which is a continuation-in-part of Ser. No. 286,591, Dec. 19, 1988, abandoned. This application Mar. 17, 1995, Ser. No. 406,760**

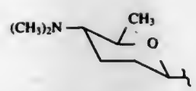
**Int. Cl.[6] C12P** *19/62;* **A01N** *27/00*

**U.S. Cl. 536—7.1** **31 Claims**

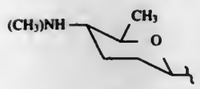
1. A compound of the formula



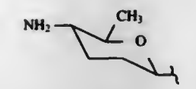
wherein R is H or a group selected from



(a)

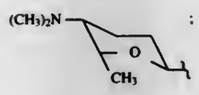


(b)



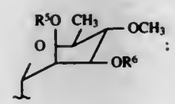
(c)

or



(d)

$R^2$ is



$R^1$, $R^3$, $R^5$ and $R^6$ are hydrogen or methyl;

$R^4$ is methyl or ethyl; and

provided that R, $R^1$, $R^3$, $R^4$ $R^5$ and $R^6$ must be present in one of the following combinations:

| R | $R^1$ | $R^3$ | $R^4$ | $R^5$ | $R^6$ |
|---|---|---|---|---|---|
| (a) | Me | H | Et | Me | Me |
| (b) | Me | H | Et | Me | Me |
| (c) | Me | H | Et | Me | Me |
| (a) | Me | Me | Et | Me | Me |
| (a) | Me | H | Me | Me | Me |
| (a) | H | H | Et | Me | Me |
| (d) | Me | H | Et | Me | Me |
| (a) | Me | H | Et | H | Me |
| (a) | Me | H | Et | Me | H |
| H | Me | H | Et | Me | Me |
| H | Me | Me | Et | Me | Me |
| H | Me | H | Me | Me | Me |
| H | H | H | Et | Me | Me |
| H | Me | H | Et | H | Me |
| H | Me | H | Et | Me | H |

an acid addition salt of a compound wherein R is other than hydrogen.

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**5,496,932**

## PROCESS FOR THE PRODUCTION OF ALKYLPOLYGLYCOSIDE

**Patrick M. McCurry, Jr., Lansdale, Pa.; Brian A. Michel; Carl E. Pickens, both of Fairfield, Ohio, and Janet R. Varvil, Chalfont, Pa., assignors to Henkel Corporation, Plymouth Meeting, Pa.**

**Filed Apr. 14, 1993, Ser. No. 47,217**

**Int. Cl.[6] C07H** *1/06;15/02*

**U.S. Cl. 536—18.5** **18 Claims**

1. A process of preparing an alkylpolyglycoside comprising the steps of

(a) reacting a saccharide and an alcohol in the presence of an acid catalyst to provide an alkylpolyglycoside stream containing unreacted alcohol;



(b) adding to said alkylpolyglycoside stream containing the unreacted alcohol an oxide selected from the group consisting of aluminum oxide, magnesium oxide, calcium oxide and zinc oxide;

(c) contacting a liquid film of the oxide containing alkylpolyglycoside and alcohol stream with an inert gas at temperatures of from about 140° C. to about 240° C. and a pressure less than about 20 mm Hg to remove the unreacted alcohol and

(d) recovering a low odor, light color alkylpolyglycoside containing less than about 5% by weight alcohol.

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**5,496,933**

## SUPER-ABSORBENTS AND A PROCESS FOR THEIR PREPARATION

**Heike Kelkenberg, Gladbeck, Germany, assignor to Chemische Fabrik Stockhausen GmbH, Krefeld, Germany**

**Filed May 17, 1994, Ser. No. 243,791**

**Claims priority, application Germany, Jun. 1, 1993, 43 18 094.9**

**Int. Cl.[6] C08B** *37/08;* **C07C** *17/00;* **C07H** *1/00*

**U.S. Cl. 536—20** **12 Claims**

1. A method of preparing a chitosan super-absorbent comprising:

reacting pulverized chitosan suspended as a powder in an organic solvent with an acid, wherein water is present in an amount of 1–80%, based on the amount of chitosan, and wherein the water content is present in a maximum amount of about 10% by weight based on the weight of the organic solvent; and

isolating the solid super-absorbent chitosan-acid reaction product.

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**5,496,934**

## NUCLEIC ACIDS ENCODING A CELLULOSE BINDING DOMAIN

**Oded Shoseyov, Karmey Yosef; Itai Shpiegl, Rehovot, both of, Israel; Marc A. Goldstein, and Roy H. Doi, both of Davis, Calif., assignors to Yissum Research Development Company of the Hebrew University of Jerusalem, Israel, and The Regents of the University of California, Calif.**

**Filed Apr. 14, 1993, Ser. No. 48,164**

**Int. Cl.[6] C07H** *21/04;* **C12N** *15/31*

**U.S. Cl. 536—23.7** **11 Claims**

1. An isolated nucleic acid encoding a cellulose binding domain (CBD) comprising the nucleic acid sequence depicted in SEQ ID NO: 1 or its complement.

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**5,496,935**

## 2',3'-DIDEOXYNUCLEOSIDE PYRIMIDINE COMPOUNDS AND CARBOCYCLIC ANALOGS

**Eckart Matthes; Martin von Janta-Lipinski; Dieter Scholz; Klaus Gaertner; Juergen Schildt; Christine Lehmann; Peter Langen, and Hans A. Rosenthal, all of Berlin, Germany, assignors to Max-Delbrück-Centrum, Berlin, Germany**

**Continuation of Ser. No. 48,386, Apr. 16, 1993, abandoned, which is a continuation of Ser. No. 933,593, Aug. 20, 1992, abandoned, which is a continuation of Ser. No. 395,393, Aug. 16, 1989, abandoned. This application Apr. 14, 1994, Ser. No. 227,587**

**Int. Cl.[6] C07H** *19/06;15/20*

**U.S. Cl. 536—28.2** **1 Claim**

1. A substituted pyrimidine nucleoside selected from the group consisting of:

1-(2,3-dideoxy-3-fluoro-β-D-ribofuranosyl)-5-methyl-pyrimidine-2-one,

1-(2,3-dideoxy-3-fluoro-β-D-ribofuranosyl)-4-thiothymine,

1-(2,3-dideoxy-3-fluoro-β-D-ribofuranosyl)-4-hydroxylamino-5-methyl-(1H)-pyrimidine-2-one,

5-chloro-1-(2,3-dideoxy-3-fluoro-β-D-ribofuranosyl)-4-thiouracil,

1-(2,3-dideoxy-3-fluoro-β-D-ribofuranosyl)-(1H)-pyrimidine-2-one,

1-(2,3-dideoxy-3-fluoro-β-D-ribofuranosyl)-4-thiouracil,

1-(2,3-dideoxy-3-fluoro-β-D-ribofuranosyl)-4-hydroxylamino-(1H)-pyrimidine-2-one,

1-(2,3-dideoxy-β-D-glycero-pent-2-enofuranosyl)-4-thiothymine,

1-(2,3-dideoxy-βD-glycero-pent-2-enofuranosyl)-5-methyl-(1H)-pyrimidine-2-one,

1-(2,3-dideoxy-β-D-glycero-pent-2-enofuranosyl)-4-hydroxylamino-(1H)-pyrimidine-2-one,

1-(2,3-dideoxy-β-D-glycero-pent-2-enofuranosyl)-4-dimethylamino-(1H)-pyrimidine-2-one,

1-(2,3-dideoxy-3-fluoro-β-D-ribofuranosyl)-5-methyl-pyrimidine-2-one,

1-(2,3-dideoxy-3-fluoro-β-D-ribofuranosyl)-pyrimidine-2-one,

2',3'-dideoxy-2',3'-didehydro-4-thiothymidine,

1-(2,3-dideoxy-3-fluoro-β-D-ribofuranosyl)-2-thiothymine,

1-(5-O-acetyl-2,3-dideoxy-3-fluoro-β-D-ribofuranosyl)-2-thiothymine,

1-(5-O-acetyl-2,3-dideoxy-3-fluoro-β-D-ribofuranosyl)-2,4-dithiothymine,

1-(2,3-dideoxy-3-fluoro-β-D-ribofuranosyl)-2,4-dithiothymine,

1-(2,3-dideoxy-3-fluoro-β-D-ribofuranosyl)-5-ethyl-4-thiouracil,

(±)-1-[1β,3,4β)-3-fluoro-4-(trityloxymethyl)-cyclopentyl]-2-thiothymine,

(±)-1-[1β,3α,4β)-3-fluoro-4-(hydroxymethyl)-cyclopentyl]-2-thiothymine,

3'-deoxy-4-thiothymidine,

1-(5-O-acetyl-2,3-dideoxy-3-fluoro-β-D-ribofuranosyl)-4-thiothymine,

1-(5-O-acetyl-2,3-dideoxy-3-fluoro-β-D-glycero-ribofuranosyl)-4-hydroxylamino-(1H) pyrimidine-2-one,

1-(2,3-dideoxy-3-fluoro-β-D-glycero-ribofuranosyl)-4-hydroxylamino-(1H)-pyrimidine-2-one,

1-(5-O-acetyl-2,3-dideoxy-3-fluoro-β-D-ribofuranosyl)-4-hydroxylamino-5-methyl-(1 H)-pyrimidine-2-one,

1-(5-O-acetyl-2,3-dideoxy-β-D-glycero-pent-2-enofuranosyl)-4-thiothymine, and

1-(2,3-dideoxy-3-fluoro-β-D-ribofuranosyl)-4-thiothymine-5'-triphosphate.

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**5,496,936**

## PRODUCTION PROCESS OF QUICK SOLUBLE AGAR

**Lebbar Thami; Lebbar Rachid, and Riad Abdelwahab, all of Kenitra, Morocco, assignors to Societe d'Etude d'Exploition et d'Algues et Produits Maritimes Setexam, Kenitra, Morocco**

**Filed Jul. 28, 1992, Ser. No. 920,808**

**Claims priority, application Morocco, Jul. 30, 1991, 22521**

**Int. Cl.[6] C08L** *5/12*

**U.S. Cl. 536—124** **9 Claims**

1. In method for processing agar-agar, agar agar is extracted from seaweed in an extraction step and then dehydrated in a dehydrating step to form an agar-agar gel or powder having molecules which exhibit a double helical molecular configuration, said gel or powder having a certain solubility in water, the improvement comprising, after the dehydrating step, extruding the gel or powder in a single or twin screw extruder having a die plate, with a sufficient shearing force so that the die plate is kept at a temperature between 118° C. and 170° C. thereby improving the solubility of the gel or the powder so the gel or powder solubilizes in water at 50° C. under agitation in less than two minutes.

**5,496,937**

## POLYSACCHARIDE SUBSTANCES, PROCESS FOR PRODUCING THEM AND USE OF THEM

**Yoshio Okamoto, Nagoya; Naoki Enomoto, Aichi; Sachiko Furukawa, Chiryu; Yasushi Ogasawara, Hekinan; Hirofumi Akano, Handa, and Yoshiya Kawamura, Khonan, all of, Japan, assignors to Nakano Vinegar Co., Ltd., Handa, Japan**

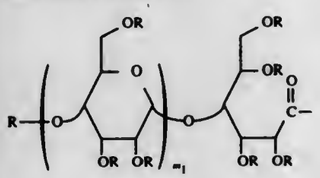
**Filed May 9, 1994, Ser. No. 239,760**

**Claims priority, application Japan, May 14, 1993, 5-135170**

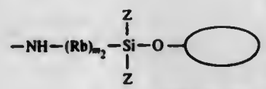
**Int. Cl.[6] B01D** *15/08;* **C08B** *33/02;* **G01N** *30/48*

**U.S. Cl. 536—124** **22 Claims**

1. A substance having the following formula (1) comprising a polysaccharide compound which is chemically bonded to the inner and outer surfaces of a porous carrier at a reducing terminal of said polysaccharide compound



(1)



inner and outer surface of silica gel

wherein R represents Ra, —CO—Ra or —CO—NH—Ra, in which Ra represents a hydrogen atom or a substituent selected from the group consisting of a substituted or unsubstituted alkyl group, a substituted or unsubstituted phenyl group and a substituted or unsubstituted heterocyclic residue; Rb represents a substituted or unsubstituted methylene group, a substituted or unsubstituted phenylene group or a group containing at least one covalently bonded hetero atom; each Z independently represents a member selected from the group consisting of a surface of a porous carrier, a halogen atom, an alkyl group, an alkoxy group, a phenyl group, and a silane agent; $m_1$ represents the number of monosaccharide units and is a number from 10 to 500; and $m_2$ represents an integer of from 1 to 20.

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**5,496,938**

## NUCLEIC ACID LIGANDS TO HIV-RT AND HIV-1 REV

**Larry Gold, Boulder, Colo., and Craig Tuerk, Morehead, Ky., assignors to NeXstar Pharmaceuticals, Inc., Boulder, Colo.**

**Continuation-in-part of Ser. No. 714,131, Jun. 10, 1991, and a continuation-in-part of Ser. No. 536,428, Jun. 11, 1990, abandoned. This application Oct. 21, 1992, Ser. No. 964,624**

**Int. Cl.[6] C07H** *21/02;21/04;* **C12Q** *1/68*

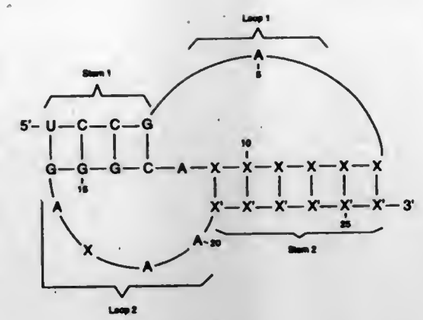
**U.S. Cl. 536—22.1** **10 Claims**

1. A non-naturally occurring nucleic acid ligand to HIV reverse transcriptase (RT) obtained according to a method for identifying a nucleic acid ligand from a candidate mixture of nucleic acids, said method comprising:

a) contacting the candidate mixture with HIV-RT, wherein nucleic acids having an increased affinity to HIV-RT relative to the candidate mixture nucleic acids may be partitioned from the remainder of the candidate mixture;

b) partitioning the increased affinity nucleic acids from the remainder of the candidate mixture; and

c) amplifying the increased affinity nucleic acids, in vitro, to yield a ligand-enriched mixture of nucleic acids, whereby nucleic acid ligands of HIV-RT may be identified and obtained nucleic acids.



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**5,496,939**

## METHOD FOR PRODUCING COPPER PHTHALOCYANINE USING THIOLS

**Kazuhiro Maruyama, Kawasaki, Japan, assignor to Kawasaki Kasei Chemicals Ltd., Tokyo, Japan**

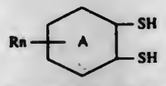
**Filed Mar. 8, 1995, Ser. No. 400,863**

**Claims priority, application Japan, Mar. 16, 1994, 6-045293; Dec. 28, 1994, 6-326916**

**Int. Cl.[6] C09B** *47/04;47/06*

**U.S. Cl. 540—139** **9 Claims**

1. A method for producing copper phthalocyanine, which comprises heating and reacting phthalic acid or a phthalic acid derivative, urea or a urea derivative, and a copper compound, using molybdenum or a molybdenum compound as a catalyst, in the presence or absence of an inert organic solvent, wherein at least one compound selected from the group consisting of an aromatic dithiol compound of the following formula (I), a saturated aliphatic dithiol compound of the following formula (II), and their precursors, or at least one compound selected from the group consisting of a ruthenium compound and an osmium compound, is added to the reaction system:



(I)

chloride-trihydrate, 0.15 g (390 ppm as a ruthenium wherein ring A in the formula (I) is a 6-membered single carbon ring or polycyclic condensed carbon ring aromatic compound, R for $R_n$ in the formula (I) or for $R_x$ in the formula (II) is a mercapto group (—SH), a substituted mercapto group (—SR' wherein R' is a substituent inert in the reaction system), or a substituent substantially inert in the reaction system, m is an integer of from 2 to 4, and n and x are optional integers of from 0 to the maximum number of substitutable positions of the respective compounds other than the positions for the mercapto groups (—SH) (when n and x are 0, the respective formulas represent unsubstituted dithiol compounds).

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**5,496,940**

## ALKYLLITHIUM COMPOUNDS CONTAINING CYCLIC AMINES AND THEIR USE IN POLYMERIZATION

**David F. Lawson, Uniontown; Thomas A. Antkowiak, Wadsworth; James E. Hall, Mogadore; Mark L. Stayer, Jr., Suffield, and John R. Schreffler, Clinton, all of Ohio, assignors to Bridgestone Corporation, Tokyo, Japan**

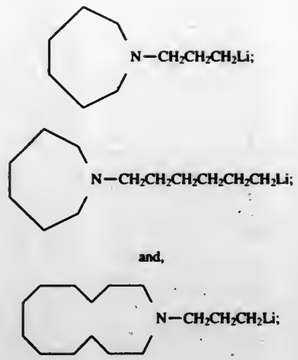
**Filed Feb. 1, 1995, Ser. No. 382,477**

**Int. Cl.[6] C07D** *227/04;223/02*

**U.S. Cl. 540—450** **1 Claim**

1. An organolithium compound containing a cyclic amino group and having a formula selected from the group consisting of





wherein the lithium, Li, is bonded directly to a carbon atom.

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**5,496,941**

## PROCESS FOR CONTINUOUS PURIFICATION OF CRUDE CAPROLACTAM PREPARED FROM 6-AMINOCAPRONITRILE

**Josef Ritz, Ludwigshafen; Rolf Fischer, Heidelberg; Werner Schnurr, Herxheim; Günther Achhammer, Mannheim; Hermann Luyken, Ludwigshafen, and Eberhard Fuchs, Frankenthal, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany**

**Filed Jan. 18, 1995, Ser. No. 375,410**

**Claims priority, application Germany, Jan. 3, 1995, 195 00 041.2**

**Int. Cl.[6] C07D** *201/16*

**U.S. Cl. 540—540** **2 Claims**

1. A process for the continuous purification of crude caprolactam by hydrogenation, subsequent treatment in acidic medium and subsequent distillation in an alkaline medium, wherein

(a) 6-aminocapronitrile is converted into crude caprolactam by reaction with water,

(b) high boilers and low boilers are separated off from the crude caprolactam from step (a),

(c) the crude caprolactam from step (b) is treated with hydrogen at from 50° to 150° C. and from 1.5 to 250 bar in the presence of a hydrogenation catalyst and, if desired, of a solvent to give a mixture A,

(d1) mixture A in a solvent is passed, at from 30° to 80° C. and from 1 to 5 bar, over an ion exchanger containing terminal acid groups to give a mixture B1, or

(d2) mixture A is distilled in the presence of sulfuric acid, any solvent present being removed before the addition of the sulfuric acid, to give a mixture B2, and

(e) mixture B1 or mixture B2 is distilled in the presence of a base to give pure caprolactam.

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**5,496,942**

## 5-SUBSTITUTED TETRAHYDROBENZIMIDAZOLE COMPOUNDS

**Mitsuaki Obta; Tokuo Kolde; Takeshi Suzuki; Akira Matsuhisa, all of Ibaraki; Keiji Miyata, Tokyo; Junya Ohmori, Ibaraki, and Isao Yanagisawa, Tokyo, all of, Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan**

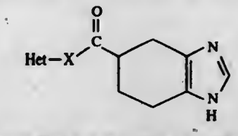
**Division of Ser. No. 990,540, Dec. 14, 1992, abandoned, which is a continuation of Ser. No. 646,699, Jan. 28, 1991, abandoned, which is a division of Ser. No. 567,949, Aug. 15, 1990, abandoned, which is a continuation-in-part of Ser. No. 470,950, Jan. 26, 1990, abandoned. This application Feb. 14, 1994, Ser. No. 195,566**

**Claims priority, application Japan, Feb. 2, 1989, 1-25397; Feb. 28, 1989, 1-48897; Jan. 20, 1989, 1-273444; Dec. 28, 1989, 1-342939**

**Int. Cl.[6] C07D** *279/36;235/04;235/12;235/26;235/30;235/28*

**U.S. Cl. 544—31** **1 Claim**

1. A tetrahydrobenzimidazole compound of formula (1) or a pharmaceutically acceptable salt thereof:



(I)

wherein Het is mono-, di or tri-cyclic heterocyclic which contains 1–3 heteroatoms selected from N, O and S, and which is unsubstituted or substituted with 1 to 3 substituents selected from $C_1$–$C_6$ alkyl, $C_1$–$C_6$ alkenyl, $C_1$–$C_6$ alkynyl, cycloalkyl-$C_1$–$C_6$ alkyl, aralkyl, $C_1$–$C_6$ alkoxy, nitro, hydroxyl and ($C_1$–$C_6$ alkoxy) carbonyl groups and halogen atoms; and X is a single bond or —NH— and X is bonded to a carbon or nitrogen atom of the heterocyclic ring.

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**5,496,943**

## HETEROCYCLIC COMPOUNDS AND THEIR PRODUCTION

**Otohiko Tsuge, Fukuoka; Taizo Hatta, Kumamoto; Satoshi Urano, Tsuzuki; Noriyuki Tsuboniwa, Higashiosaka, and Ryuzo Mizuguchi, Yawata, all of, Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan**

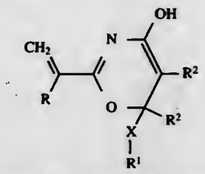
**Filed Mar. 13, 1992, Ser. No. 850,914**

**Claims priority, application Japan, Mar. 14, 1991, 3-049906**

**Int. Cl.[6] C07D** *265/06;265/10;309/32;211/40*

**U.S. Cl. 544—97** **5 Claims**

1. A heterocyclic compound selected from the group consisting of the compounds IV to VII wherein the compounds IV to VII are represented by the formulas:

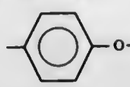


IV

wherein R is a lower alkyl group; $R^1$ is an alkyl having 1 to 6 atoms, an aryl group having 6 to 10 carbon atoms, an aralkyl group having 7 to 8 carbon atoms, an alkenyl having 2 or 3 carbon atoms or an alkynyl having 2 or 3 carbon atoms; each $R^2$ is the same or different and respectively indicates —H, —$R^1$, or —$OR^1$, —$CONR_2^1$, —$CONHR^1$, —CHO, —$COR^1$, —$CO_2R^1$, —$NO_2$ or halogen atom, or $R^1$ and $R^2$ may not bond together;
X is



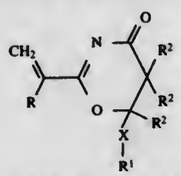
—O—, —S—, or



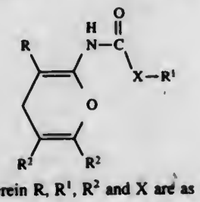
two substituents —$R^1$ on N atom is the same or different when X is



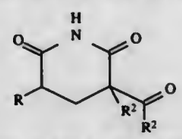
and they may bond together with O to form a six-membered ring with the oxygen in the 4 position to the ring N; and the above substituents $R^1$ and $R^2$ may be substituted with a substituent selected from the group consisting of an alkyl, alkenyl, aralkyl, alkynyl, aryl, cycloalkyl, alkoxy, halogen, acyl, ester, nitro, cyano, sulfide, sulfone, tertiary amino, and silicon,



wherein R, $R^1$, $R^2$ and X are as defined above,



wherein R, $R^1$, $R^2$ and X are as defined above.



wherein R, and $R^2$ are as defined above.

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**5,496,944**

**PROCESS FOR PREPARING TRIS-PYRROLIDONYL TRIAZINE CROSSLINKER**

**R. B. Gupta, Bronx, N.Y., and Robert G. Lees, South Stamford, Conn., assignors to Cytec Technology Corp., Wilmington, Del.**

**Division of Ser. No. 1,697, Jan. 7, 1993, which is a continuation of Ser. No. 973,676, Nov. 9, 1992, abandoned, which is a continuation-in-part of Ser. No. 793,077, Nov. 15, 1991, abandoned. This application Jun. 6, 1995, Ser. No. 469,720**

**Int. Cl.[6] C07D** *403/14*

**U.S. Cl. 544—198** **12 Claims**

1. A process for preparing tris-pyrrolidonyl triazine from N,N',N"-tris(4 -halobutyryl)melamine comprising: contacting said N,N',N"-tris(4 -halobutyryl)melamine with a base at a temperature and length of time sufficient to produce tris-pyrrolidonyl triazine.

**5,496,945**

**PROCESS FOR THE SYNTHESIS OF 9-(2-HYDROXYETHOXY METHYL) GUANINE**

**Tiberio Bruzzese; Giuseppe Guazzi, both of Milan; Marco Rognoni, Lodivecchio, and Giuliano Marcon, Erba, all of, Italy, assignors to Solar Chemical S.A., Luxembourg, Luxembourg**

**Filed Jun. 13, 1994, Ser. No. 261,053**

**Claims priority, application Italy, Jun. 14, 1993, MI93A1264**

**Int. Cl.[6] C07D** *473/18*

**U.S. Cl. 544—276** **10 Claims**

1. A process for the synthesis of 9-(2-hydroxyethoxy methyl) guanine, comprising reacting guanine, or a salt thereof with between 2 and 4 moles of hexamethyldisilazane, in the presence of an aprotic solvent and of a catalytic amount of ammonium sulphate; reacting the resulting guanine trimethylsilyl derivative, without being isolated, with a stoichiometric quantity of acyloxyethoxy methyl halide at a temperature of 50° to 100° C.; and hydrolyzing with a sodium acetate or sodium hydroxyde water solution the resulting 9-(2-acetoxyethoxy methyl) guanine, to provide 9-(2-hydroxyethoxy methyl) guanine.

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**5,496,946**

V **PRODUCTION OF PYRROLOPYRIMIDINES AND INTERMEDIATES THEREFOR**

**Hiroshi Akimoto, Kobe; Takenori Hitaka, Takarazuka, and Tetsuo Miwa, Kobe, all of, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan**

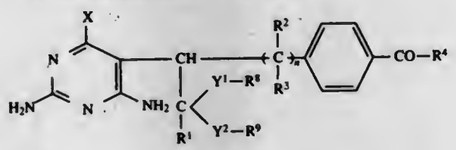
**Division of Ser. No. 29,310, Mar. 8, 1993, Pat. No. 5,349,064, which is a continuation of Ser. No. 537,807, Jun. 14, 1990, abandoned. This application Jun. 9, 1994, Ser. No. 257,512**

**Claims priority, application Japan, Jun. 14, 1989, 1-150910; Sep. 18, 1989, 1-242975; Apr. 6, 1990, 2-092391**

**Int. Cl.[6] C07D** *239/50;239/48*

VI **U.S. Cl. 544—321** **13 Claims**

1. A compound represented by the formula:



VII wherein

X represents an amino, hydroxyl, or mercapto group;

$R^1$ represents hydrogen or a $C_{1-6}$ alkyl group which may be substituted;

$R^2$ and $R^3$ each, being the same or different from each other, and which may be different individually in the n repeating units, represents hydrogen or a $C_{1-6}$ alkyl, $C_{2-6}$ alkenyl, or $C_{2-6}$ alkynyl group, any of which may be substituted;

$R^4$ represents $OR^5$ wherein $R^5$ represents hydrogen or a hydrocarbon group selected from the group consisting of $C_{1-5}$ alkyl, benzyl, and phenyl any which may be substituted or $NHCH(COOR^6)CH_2CH_2COOR^7$ wherein $R^6$ and $R^7$ each represents hydrogen or a hydrocarbon group selected from the group consisting of $C_{1-5}$ alkyl, benzyl, and phenyl which may be substituted;

n represents an integer from 1 to 4;

$Y^1$ and $Y^2$ are independently oxygen or sulfur;

$R^8$ and $R^9$ independently represents hydrogen or a hydrocarbon group selected from the group consisting of $C_{1-5}$ alkyl, benzyl, and phenyl any which may be substituted;

or a salt thereof;

wherein in the above formulae, the substituted alkyl, substituted alkenyl and substituted alkynyl groups of $R^1$, $R^2$, $R^3$, $R^5$, $R^6$, $R^7$, $R^8$ and $R^9$ are substituted with one to three substituents selected from the group consisting of halogen, nitro, cyano, alkoxy of 1 to 4 carbon atoms, alkanoyl of 1 to 4 carbon atoms, and alkanoyloxy of 1 to 4 carbon atoms, alkoxycarbonyl of 1 to 4 carbon atoms, trifluoromethyl, alkylthio of 1 to 4 carbon atoms, alkylsulfinyl of 1 to 4 carbon atoms, alkylsulfonyl of 1 to 4 carbon atoms; and wherein the substituted phenyl and substituted benzyl groups of $R^3$, $R^6$, $R^7$, $R^8$ and $R^9$ are substituted with one to three substituents selected from the group consisting of halogen, nitro, cyano, alkoxy of 1 to 4 carbon atoms, alkanoyl of 1 to 4 carbon atoms, alkanoyloxy of 1 to 4 carbon atoms, alkoxycarbonyl of 2 to 4 carbon atoms, trifluoromethyl, alkythio of 1 to 4 carbon atoms, alkylsulfinyl of 1 to 4 carbon atoms, alkylsulfonyl of 1 to 4 carbon atoms alkyl of 1 to 4 carbon atoms, alkenyl of 2 to 3 carbon atoms, and alkynyl of 2 to 3 carbon atoms.

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**5,496,947**

**QUINOLONE CARBOXYLIC ACID DERIVATIVES**

**Sung-June Yoon, Seoul; Young-Ho Chung, Kyunggi-do; Chi-Woo Lee, Anyang; Yoon-Seok Oh, Kyungki-do; Dong-Rack Choi, Kyungki, and Nam-Doo Kim, Kyungki, all of, Rep. of Korea, assignors to Dong Wha Pharmaceutical Industrial Co., Ltd., Rep. of Korea**

**Filed Feb. 8, 1994, Ser. No. 193,475**

**Int. Cl.[6] C07D** *471/04;401/14*

**U.S. Cl. 544—362** **2 Claims**

1. The quinolone carboxylic acid derivative 1-(5-fluoro-2-pyridyl)-6-fluoro-7-(4-methyl-1 -piperazinyl)-1,4-dihydro-4-oxo-1,8-naphthyridine-3-carboxylic acid, or a pharmaceutically acceptable salt or hydrate thereof.

2. The quinolone carboxylic acid derivative 1-(5-fluoro-2-pyridyl)-6-fluoro-7-(4-methyl-1 -piperazinyl)-1,4-dihydro-4-oxoquinoline-3-carboxylic acid, or a pharmaceutically acceptable salt or hydrate thereof.

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**5,496,948**

**PROCESS FOR MAKING HIV PROTEASE INHIBITORS**

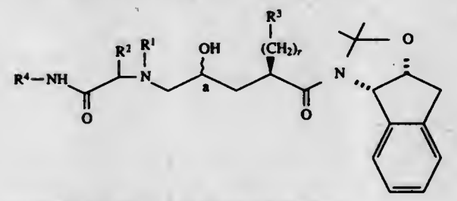
**David Askin, Warren; Kan K. Eng, Jersey City, and Ralph P. Volante, Cranbury, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.**

**Division of Ser. No. 187,664, Jan. 26, 1994, which is a continuation-in-part of Ser. No. 93,225, Jul. 16, 1993, abandoned. This application Jun. 21, 1995, Ser. No. 459,069**

**Int. Cl.[6] C07D** *241/02*

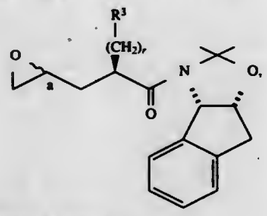
**U.S. Cl. 544—368** **7 Claims**

1. A process for making a compound of formula I



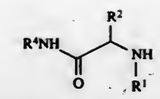
I

comprising reacting a compound of formula IV



IV

with an amine of formula V



V

wherein:

stereocenter a is in either the R configuration, the S configuration or is racemic;

r is an integer from zero through and including 5;

$R^1$ and $R^2$ are independently selected at each occurrence from the group consisting of:

1) hydrogen,

2) —$C_{1-4}$ alkyl unsubstituted or substituted with one or more of

a) hydroxy,

b) $C_{1-3}$ alkoxy,

c) aryl unsubstituted or substituted with one or more of $C_{1-4}$alkyl, hydroxy or aryl,

d) —W-aryl or —W-benzyl, wherein W is —O—, or —S—,

e) a 5–7 membered cycloalkyl group unsubstituted or substituted with one or more of

i) hydroxy,

ii) $C_{1-3}$ alkoxy, or

iii) aryl,

f) heterocycle unsubstituted or substituted with one or more of hydroxy, $C_{1-4}$alkyl, $C_{1-4}$alkyl substituted with hydroxy, or Boc,

g) —NH—$COOC_{1-3}$alkyl,

h) —NH—CO—$C_{1-3}$alkyl,

i) —NH—$SO_2C_{1-3}$alkyl,

j) —COOR, or

k) —$((CH_2)_mO)_nR$, or

3) aryl, unsubstituted or substituted with one or more of

a) halo,

b) hydroxy,

c) —$NO_2$ or —$N(R)_2$,

d) $C_{1-4}$alkyl,

e) $C_{1-3}$ alkoxy, unsubstituted or substituted with one or more of —OH or $C_{1-3}$ alkoxy,

f) —COOR,

g) —$CON(R)_2$,

h) —$CH_2N(R)_2$,

i) —$CH_2NHCOR$,

j) —CN,

k) —$CF_3$,

l) —NHCOR,

m) aryl $C_{1-3}$ alkoxy,

n) aryl,

o) —$NRSO_2R$,

p) —$OP(O)(OR_z)_2$, or

q) —$R^5$, as defined below; or

$R^1$ and $R^2$ can be joined together with the nitrogen to which $R^1$ is attached and the carbon to which $R^2$ is attached to form a 3 to 10 membered monocyclic or bicyclic saturated ring system which consists of the nitrogen to which $R^1$ is attached and from 2 to 9 carbon atoms and is unsubstituted or substituted with one or more of:

1) hydroxy,

2) $C_{1-4}$ alkyl unsubstituted or substituted with one or more of

a) halo,

b) hydroxy,

c) $C_{1-3}$ alkoxy,

d) aryl,

e) a 5–7 membered cycloalkyl group unsubstituted or substituted with one or more of

i) hydroxy,

ii) $C_{1-3}$ alkoxy, or

iii) aryl, or

f) heterocycle,

3) $C_{1-3}$ alkoxy,

4) —NH—$COOC_{1-3}$alkyl,

5) —NH—CO—$C_{1-3}$alkyl,

6) —NH—$SO_2C_{1-3}$alkyl,

7) heterocycle,
8) —W-aryl, or
9) —W—CO-aryl, wherein W is defined above; or

$R^1$ and $R^2$ can be joined together with the nitrogen to which $R^1$ is attached and the carbon to which $R^2$ is attached to form a 3 to 10 membered monocyclic or bicyclic saturated ring system which consists of the nitrogen to which $R^1$ is attached, from 1 to 8 carbon atoms and one or more unsubstituted or substituted heteroatom selected from

1) $-N(V-R^1)-$,

wherein V is absent or $-CO-Q-$ or $-SO_2-Q-$,
$R^1$ is defined as above for when $R^1$ is independent from and not joined to $R^2$,
and wherein Q is absent or $-O-$, $-N(R)-$, or heterocycle optionally substituted with $-C_{1-4}$alkyl,

2) $-N($heterocycle$)-$,

3) $-N($$C_{1-4}$alkenyl, unsubstituted or substituted with aryl$)-$

4) $-N($$SO_2-C_{1-4}$alkenyl, unsubstituted or substituted with aryl$)-$

5) $-S(O)_p-$,

where in p is zero, 1 or 2, or

6) $-O-$,

$R^3$ is selected from the group consisting of:
1) hydrogen,
2) $-C_{1-4}$ alkyl
3) $C_5-C_{10}$ cycloalkyl, optionally substituted with hydroxy,
4) $C_6-C_{10}$ aryl, unsubstituted or substituted with one or more of:
a) halo,
b) hydroxy,
c) $-NO_2$ or $-N(R)_2$,
d) $C_{1-4}$ alkyl,
e) $C_{1-3}$ alkoxy, unsubstituted or substituted with one or more of —OH or $C_{1-3}$ alkoxy,
f) —COOR,
g) $-CON(R)_2$,
h) $-CH_2N(R)_2$,
i) $-CH_2NHCOR$,
j) —CN,
k) $-CF_3$,
l) —NHCOR,
m) aryl $C_{1-3}$ alkoxy,
n) aryl,
o) $-NRSO_2R$,
p) $-OP(O)(OR_x)_2$, or
q) $-R^5$, as defined below, or
5) monocyclic or bicyclic heterocycle containing from 1 to 3 heteroatoms chosen from the group consisting of N, O, and S, and which is unsubstituted or substituted with $R^5$ and optionally with one or more of
a) halo,
b) $C_{1-4}$ alkyl, or
c) $C_{1-3}$ alkoxy;

m is 2, 3, 4 or 5;
n is zero, 1, 2 or 3;
R is hydrogen or $C_{1-4}$ alkyl;
$R_x$ is H or aryl;
$R^4$ is $C_{1-5}$ alkyl, straight or branched chain; and
$R^5$ is
1) $-W-(CH_2)_m-NR^6R^7$ wherein W and m are defined above, and $R^6$ and $R^7$ are independently selected at each occurrence from:
a) hydrogen,
b) $C_{1-6}$ alkyl, unsubstituted or substituted with one or more of
i) $C_{1-3}$ alkoxy,
ii) —OH, or
iii) $-N(R)_2$,
c) aromatic heterocycle unsubstituted or substituted with one or more of
i) $C_{1-4}$ alkyl, or
ii) $-N(R)_2$,
d) or $R^6$ and $R^7$ are joined together with the nitrogen to which they are attached to form a 5–7 member heterocycle containing up to two additional heteroatoms selected from —N(R), —O—, —S—, —S(O)— or $-S(0)_2-$, the heterocycle optionally substituted with $C_{1-4}$ alkyl,
2) $-(CH_2)_q-NR^6R^7$ wherein q is an integer from 1–5, and $R^6$ and $R^7$ are defined above, except that $R^6$ or $R^7$ are not H or unsubstituted $C_{1-6}$ alkyl, or
3) benzofuryl, indolyl, azacycloalkyl, azabicyclo $C_{7-11}$ cycloalkyl, or benzopiperidinyl, unsubstituted or substituted with $C_{1-4}$ alkyl.

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**5,496,949**

## PYRAZINE DERIVATIVES

**Ichiro Toida, Sayama; Setsuko Yamamoto, Tokyo; Nanao Watanabe, Nara, and Toshikazu Ura, Osaka, all of, Japan, assignors to Koei Chemical Co., Ltd., Osaka, Japan**

**PCT No. PCT/JP94/00254, § 371 Date Oct. 24, 1994, § 102(e) Date Oct. 24, 1994, PCT Pub. No. WO94/19328, PCT Pub. Date Sep. 1, 1994**

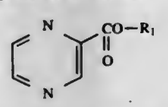
**PCT Filed Feb. 18, 1994, Ser. No. 325,262**

**Claims priority, application Japan, Feb. 26, 1993, 5-063461**

**Int. Cl.[6] C07D *241/18***

**U.S. Cl. 544—406** **3 Claims**

1. A pyrazine compound of the formula



wherein $R_1$ represents an octyl group or a pivaloyloxymethyl group.

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**5,496,950**

## USE FOR BIS-HETEROCYCLIC COMPOUNDS AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

**Oliver J. McConnell, Vero Beach, Fla.; Gabriel Saucy, Essex Fells, N.J.; Robert Jacobs, Santa Barbara, Calif., and Sarath P. Gunasekera, Vero Beach, Fla., assignors to Harbor Branch Oceanographic Institution, Inc., Fort Pierce, Fla.**

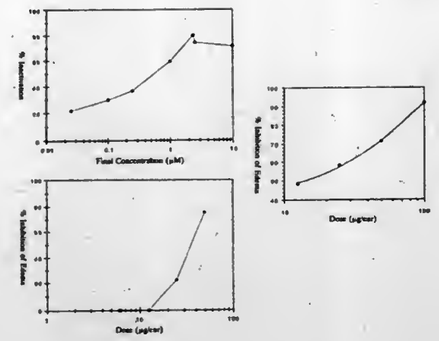
**Division of Ser. No. 201,309, Feb. 24, 1994, which is a continuation-in-part of Ser. No. 21,929, Feb. 24, 1993, Pat. No. 5,290,777. This application Oct. 28, 1994, Ser. No. 330,651**

**Int. Cl.[6] C07D *241/02;403/02;241/04;* A61K *31/495***

**U.S. Cl. 544—408** **3 Claims**

1. A compound selected from the group consisting of hamacanthin A, hamacanthin B, or a pharmaceutical acceptable salt thereof.






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**5,496,951**

## 4-OXOQUINOLINE-3-CARBOXYLIC ACID DERIVATIVES THEIR PREPARATION AND THEIR USE

**Masayuki Iwata, Tokyo; Tomio Kimura, Ube; Teruhiko Inoue, Ube; Yoshimi Fujihara, Ube, and Tetsushi Katsube, Ube, all of, Japan, assignors to Sankyo Company, Limited, Tokyo, and Ube Industries Limited, Ube, both of, Japan**

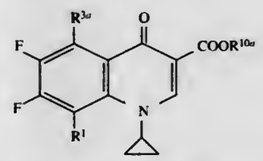
**Division of Ser. No. 227,678, Apr. 14, 1994, Pat. No. 5,436,367, which is a division of Ser. No. 594,283, Oct. 9, 1990, Pat. No. 5,348,961, which is a division of Ser. No. 381,025, Jul. 17, 1989, abandoned. This application Jan. 27, 1995, Ser. No. 379,975**

**Claims priority, application Japan, Jul. 20, 1988, 63-180557; Sep. 7, 1988, 63-224220**

**Int. Cl.[6] C07D *215/56***

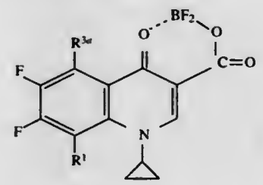
**U.S. Cl. 546—13** **15 Claims**

1. A compound of the formula



wherein $R^1$ is a fluorinated methoxy group, $R^{10a}$ is a hydrogen atom or a $C_1-C_6$ alkyl group and $R^{3a}$ is a hydrogen atom, a nitro group or an amino group.

12. A compound of the formula



wherein $R^1$ is a fluorinated methoxy group and $R^{3a}$ is a hydrogen atom or an amino group.

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**5,496,952**

## METHOD OF MAKING ASYMMETRIC DE RING INTERMEDIATES FOR THE SYNTHESIS OF CAMPTOTHECIN AND CAMPTOTHECIN ANALOGS

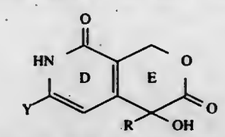
**Daniel L. Comins, Cary, N.C., assignor to North Carolina State University, Raleigh, N.C.**

**Filed Feb. 7, 1995, Ser. No. 384,758**

**Int. Cl.[6] C07D *491/052;213/55***

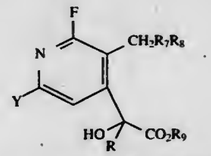
**U.S. Cl. 546—116** **22 Claims**

1. A method of making a compound of Formula (III)



(III)

wherein R is loweralkyl, and Y is H or halogen; by hydrolyzing a compound of Formula (X)



(X)

wherein $R_7$ is loweralkoxy, $R_8$ is loweralkoxy and the $R_9$ moiety has a configuration that forces R and the —OH group of the compound (X) to take a first stereochemical orientation about the chiral carbon at position 7 by sterically hindering the formation of an opposite, second stereochemical orientation about the chiral carbon at position 7; in an aqueous solution under heat with an inorganic acid to yield the compound of Formula (III).

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**5,496,953**

## COCAINE RECEPTOR BINDING LIGANDS

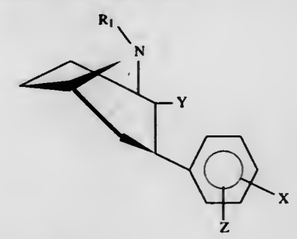
**Michael J. Kuhar, Baltimore, Md.; Frank I. Carroll, Durham, N.C.; Joh W. Boja, Baltimore, Md.; Anita H. Lewin, Chapel Hill, and Philip Abraham, Cary, both of N.C., assignors to Research Triangle Institute, Research Triangle Park, N.C.**

**Continuation-in-part of Ser. No. 792,648, Nov. 15, 1991, abandoned, which is a continuation-in-part of Ser. No. 564,755, Aug. 9, 1990, Pat. No. 5,128,118. This application Dec. 10, 1993, Ser. No. 164,576**

**Int. Cl.[6] C07D *451/02;* A61K *51/04***

**U.S. Cl. 546—125** **2 Claims**

1. A compound of the formula below.



wherein Y=$CONRR_2$,
$R_2$=hydrogen, $C_{1-5}$ alkyl,
X=H, $C_{1-6}$ alkyl, $C_{3-8}$ cycloalkyl, $C_{1-4}$ alkoxy, $C_{1-6}$ alkynyl, halogen, amino, acylamido.

R and $R_2$ independently are H, $C_{1-6}$ alkyl, alkene or alkyne, phenyl, phenyl substituted with 1–3 of $C_{1-6}$ alkyl, alkene, alkyne or alkoxy, C1–6 alkoxy, phenoxy, amine, amino substituted with 1 or 2 $C_{1-6}$ alkyl, alkene, alkyne, alkoxy, phenyl or phenoxy, or R and $R_2$ may combine to form a cyclic structure selected from the group consisting of pyrrolidinyl, morpholinyl and piperidinyl. moleties,

Z=H, I, Br, Cl, F, CN, $CF_3NO_2$, $N_3$, $OR_1$, $CO_2NH_2$, $CO_2R_1$, $C_{1-6}$ alkyl, $NR_4R_5$, $NHCOF_8$, $NHCOR_6$,

wherein $R_4$–$R_6$are each $C_{1-6}$ alkyl with the proviso that said compound comprises at least one $^{11}C$ atom or Z is iodine selected from the group consisting of $^{123}I_{125}$ and $^{131}I$.

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**5,496,954**

**6-HETEROCYCLYL-1-(SUBSTITUTED PHENYL)BENZOTRIAZOLE HERBICIDAL AGENTS**

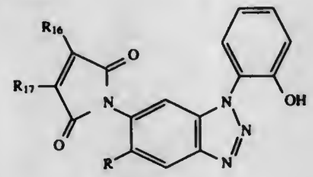
**Michael E. Condon, Lawrenceville; Alvin D. Crews, Jr., Voorhees, and Mark C. Manfredi, Hamilton, all of N.J., assignors to American Cyanamid Co., Wayne, N.J.**

**Continuation of Ser. No. 387,140, Feb. 10, 1995. This application May 5, 1995, Ser. No. 437,099**

**Int. Cl.[6] C07D** *403/04*

**U.S. Cl. 548—261** **1 Claim**

1. A method for the preparation of a compound having the structural formula



wherein

R is hydrogen, halogen or $C_1$–$C_4$alkyl; and

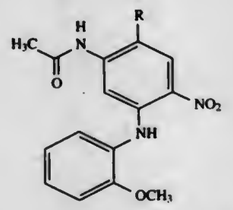
$R_{16}$ and $R_{17}$ are each independently hydrogen,

$C_1$–$C_6$alkyl optionally substituted with one or more halogen atoms, or

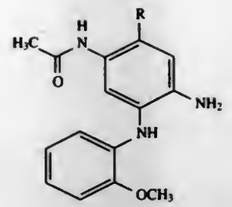
$C_3$–$C_6$cycloalkyl optionally substituted with one or more halogen atoms, and

when $R_{16}$ and $R_{17}$ are taken together with the atoms to which they are attached, they may form a ring in which $R_{16}R_{17}$ is a $C_2$–$C_5$alkylene group optionally substituted with one to three methyl groups or one or more halogen atoms,

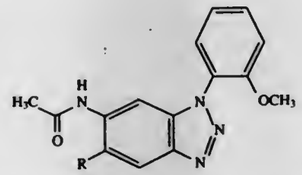
which comprises: reducing a first compound having the structural formula



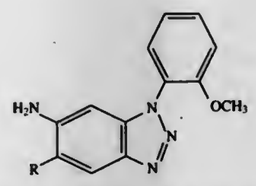
wherein R is as described above with iron in the presence of an organic acid to form a second compound having the structural formula



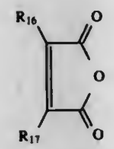
wherein R is as described above, cyclizing the second compound with sodium nitrite in the presence of an organic acid to form a third compound having the structural formula



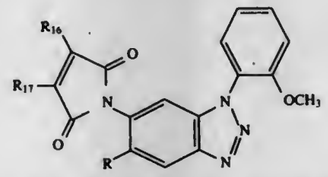
wherein R is as described above, reacting the third compound with aqueous acid to form a fourth compound having the structural formula



wherein R is as described above, reacting the fourth compound with an anhydride compound having the structural formula



wherein $R_{16}$ and $R_{17}$ are as described above to form a fifth compound having the structural formula



wherein $R_{16}$ and $R_{17}$ are as described above, and reacting the fifth compound with boron tribromide.



**5,496,955**

**PREPARATION OF D-HISTIDINE AND DERIVATIVES THEREOF FROM L-HISTIDINE**

**Yigal Becker; Yonit Assaf-Biran, both of Tel Aviv, and Youval Shvo, Kfar Shmariahu, all of, Israel, assignors to Bromine Compounds Limited, Beer-Sheva, Israel**

**Continuation of Ser. No. 728,893, Jul. 10, 1991, abandoned. This application Sep. 16, 1993, Ser. No. 122,805**

**Claims priority, application Israel, Jul. 11, 1990, 95038**

**Int. Cl.[6] C07D** *233/64*

**U.S. Cl. 548—334.5** **15 Claims**

1. A process for manufacture of D-histidine or esters thereof from L-histidine, comprising the steps of mixing L-histidine and tartaric acid with an aldehyde selected from the group consisting of salicylaldehyde and 3,5-dichlorosalicylaldehyde in an acetic acid medium and thereafter precipitating D-histidine tartrate from the reaction mass.

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**5,496,956**

**HERBICIDAL SUBSTITUTED ARYL-HALOALKYLPYRAZOLES**

**Scott S. Woodard, Ballwin; Bruce C. Hamper, Kirkwood; Kurt Moedritzer, Webster Groves; Michael D. Rogers, Maryland Heights; Deborah A. Mischke, Defiance, and Gerard A. Dutra, St. Louis, all of Mo., assignors to Monsanto Company, St. Louis, Mo.**

**Division of Ser. No. 144,384, Nov. 2, 1993, which is a division of Ser. No. 763,762, Sep. 25, 1991, Pat. No. 5,281,571, which is a continuation-in-part of Ser. No. 600,031, Oct. 18, 1990, abandoned. This application Apr. 4, 1995, Ser. No. 416,570**

**Int. Cl.[6] C07D** *231/10*

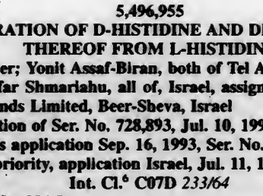
**U.S. Cl. 548—377.1** **3 Claims**

1. Process for the method of using



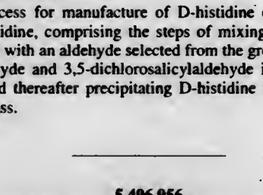
Z

compounds according to Formula Y,



Y

in the preparation of compounds of Formula Z



comprising the reaction of a compound of Formula Y with (1) a $C_{1-5}$ alcohol in the presence of a mineral acid or (2) a mineral acid followed by a $C_{1-5}$ alcohol, and thereafter isolating a compound of Formula Z, wherein

$R_1$ is methyl;

$R_2$ is $C_{1-5}$ haloalkyl;

$R_3$ is halo;

$R_5$ is halo;

$R_6$ is halo; and

$R_{38}$ is —$OC_{1-5}$ alkyl.

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**5,496,957**

**TRYPTAMINE ANALOGS WITH 5-HT1D SELECTIVITY**

**Richard A. Glennon, Richmond, Va., assignor to Virginia Commonwealth University, Richmond, Va.**

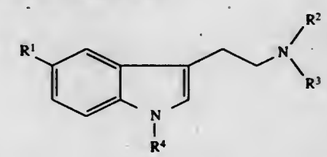
**Continuation-in-part of Ser. No. 115,003, Sep. 1, 1993, abandoned. This application Oct. 4, 1994, Ser. No. 317,907**

**Claims priority, application WIPO, Aug. 31, 1994, PCT/CA94/00476**

**Int. Cl.[6] C07D** *209/04*

**U.S. Cl. 548—491** **22 Claims**

1. A compound of the formula:



wherein

$R^1$ represents a chain selected from $C_{8-11}$alkyl, $C_{7-10}$alkoxy, $C_{8-11}$alkanoyl and $C_{7-10}$alkanoyloxy wherein said chain is optionally substituted by hydroxyl, $C_{1-4}$alkyl or $C_{1-4}$alkoxy and wherein one of the intervening carbons of said chain is optionally replaced with a heteroatom selected from oxygen, nitrogen and sulfur;

$R^2$ and $R^3$ each independently represent H or $C_{1-3}$alkyl; and

$R^4$ represents H, $C_{1-4}$alkyl, aryl or aryl$C_{1-4}$alkyl.

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**5,496,958**

**PREPARATION OF 5-VINYLPYRROLIDONES**

**Rolf Fischer, Heidelberg; Werner Hoffmann, Neuhofen; Ernst Langguth, Kirchheim, and Hardo Siegel, Speyer, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany**

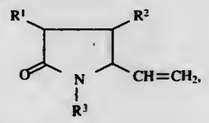
**Filed Jun. 27, 1994, Ser. No. 266,141**

**Claims priority, application Germany, Jul. 1, 1993, 43 21 870.9**

**Int. Cl.[6] C07D** *207/26*

**U.S. Cl. 548—552** **6 Claims**

1. A process for the preparation of a 5-vinylpyrrolidone of the formula



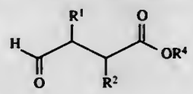
I

wherein

each of $R^1$ and $R^2$ is hydrogen or $C_1$–$C_8$-alkyl, and $R^3$ is a substituent selected from the group consisting of hydrogen, $C_1$–$C_{20}$-alkyl, $C_3$–$C_8$-cycloalkyl, aryl, $C_7$–$C_{12}$-alkylaryl and $C_7$–$C_{12}$-arylalkyl,

said process comprising:

firstreacting a 3-formylpropionic acid ester of the formula



IV

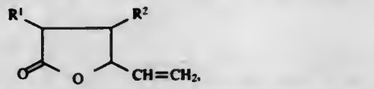
where

each of $R^1$ and $R^2$ is hydrogen or $C_1$–$C_8$-alkyl, and $R^4$ is a substituent selected from the group consisting of hydrogen, $C_1$–$C_{20}$-alkyl, $C_3$–$C_8$-cycloalkyl, aryl, $C_7$–$C_{12}$-alkylaryl and $C_7$–$C_{12}$-arylalkyl,

with a vinylymagnesium halide of the formula

$$CH_2{=}CH{-}Mg{-}X \qquad V.$$

where X is chlorine, bromine or iodine, at a temperature of from −30° to 100° C., under a pressure of from 0.001 to 10 bar and in a molar ratio of V:IV of from 0.3:1 to 3:1 to obtain as an intermediate product a gamma-vinylbutyrolactone of the formula



II

where $R^1$ and $R^2$ have the abovementioned meaning; and

then reacting said intermediate of the formula II with ammonia or a primary amine of the formula

$$R^3{-}NH_2 \qquad III.$$

where $R^3$ has the abovementioned meaning, at a temperature of from 150° to 350° C. and under a pressure of from 0.1 to 200 bar.

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**5,496,959**

**PREPARATION OF N-ACYL TAURATES**

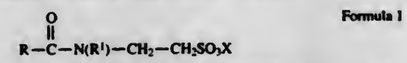
**James F. Day, Charlotte, N.C., assignor to Hoechst Celanese Corporation, Somerville, N.J.**

**Filed May 23, 1994, Ser. No. 247,920**

**Int. Cl.[6] C07C 231/00**

**U.S. Cl. 554—69** **3 Claims**

1. A method for making compounds of Formula I:

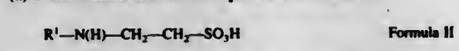


Formula I

wherein: R is selected from the group consisting of $C_7$–$C_{17}$ saturated or unsaturated straight chain or branched hydrocarbyl group; $R^1$ is selected from the group consisting of hydrogen, methyl and cyclohexyl; and X is selected from the group consisting of sodium, potassium and magnesium,

wherein said method comprises the following steps:

(a) a direct amidation of a compound of Formula II:



Formula II

with a fatty acid of Formula III: R-COOH, at a temperature between 180 degrees C. and 205 degrees C. in the presence of a catalytic amount of at least one compound selected from the group consisting of boric acid, zinc oxide and magnesium oxide;

(b) addition of up to 20 percent by weight of paraffin waxes during reaction;

(c) quenching the reaction with up to 50 percent by weight of water; and

(d) forming a salt of Formula I.

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**5,496,960**

**PROCESS FOR PRODUCTION OF BIS-(PENTAFLUOROPHENYL) BORANE AND USE THEREOF FOR PRODUCTION OF BASE FREE ZWITTERIONIC HOMOGENEOUS ZIEGLER-NATTA OLEFIN POLYMERIZATION CATALYSTS**

**Warren E. Piers, and Rupert E. von Haken Spence, both of Guelph, Canada, assignors to University of Guelph, Ontario, Canada**

**Filed Jan. 20, 1995, Ser. No. 375,692**

**Claims priority, application United Kingdom, Nov. 23, 1994, 9423606**

**Int. Cl.[6] C07F 5/02;19/00;17/00;7/00**

**U.S. Cl. 556—8** **19 Claims**

1. A compound having the formula $[(C_6R_5)_2BH]_n$, wherein n is selected from the group consisting of 1 and 2, and wherein R is selected from the group consisting of fluorine (F), hydrogen (H), (trifluoromethyl) ($CF_3$) groups, and combinations thereof but not consisting entirely of H.

18. A compound having the formula $Cp_2Zr\{R''[(\mu\text{-}H)B(C_6F_5)_2]\}$ wherein Cp is cyclopentadienyl and R'' is selected from the group consisting of $CH_2$ and ($\eta^3$ -$CH(C_6H_5)$).

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**5,496,961**

**TRIAZENE OXIDE-TRANSITION METAL COMPLEXES AS HYDROSILYLATION CATALYSTS**

**Jochen Dauth, Burghausen; Josef Wolferseder, Altoetting, and Berward Deubzer, Burghausen, all of, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany**

**Filed May 10, 1995, Ser. No. 437,830**

**Claims priority, application Germany, Jul. 1, 1994, 44 23 195.4**

**Int. Cl.[6] C07F 7/08;7/10;15/00**

**U.S. Cl. 556—9** **4 Claims**

1. A process comprising reacting organosilicon compounds having Si-bonded hydrogen atoms with organic compounds having aliphatic multiple bonds in the presence of triazene oxide-transition metal complexes of the formula

$$M(ANNNOR^1)_aX_b \qquad (1)$$

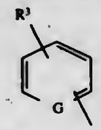
where

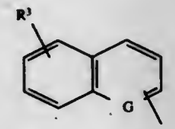
M is Pt, Pd, Rh, Ru, Os or Ir,

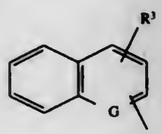
$R^1$ is a monovalent, unsubstituted or substituted hydrocarbon radical having from 1 to 18 carbon atoms per radical, a radical of the formula $-SiR^2_c(OR^2)_{3-c}$ or A,

$R^2$ is identical or different and is an alkyl radical having from 1 to 8 carbon atoms per radical,

A is identical or different and is a radical of the formula

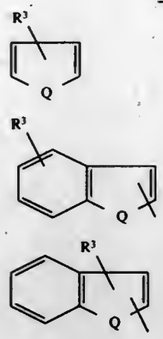








-continued



or

G is CH or N

Q is S, O or NH,

$R^3$ is a monovalent, unsubstituted or substituted hydrocarbon radical having from 1 to 12 carbon atoms per radical or is a radical of the formula —F, —Cl, —Br, —I, —H, $—NH_2$, $—NR^2_2$, $—NO_2$, —OH, $OR^2$, —SH, —CN, —COOH, —COCl, $—CONH_2$, $—COR^2$, —CHO, $—SO_2NHR^2$, $—SO_3H$, $—SO_2Cl$ or $—R^4—SiR^2_c(OR^2)_{3-c}$,

$R^4$ is a divalent hydrocarbon radical having from 1 to 8 carbon atoms per radical,

$R^2$ is identical or different and is an alkyl radical having from 1 to 8 carbon atoms per radical,

X is identical or different and is a ligand selected from the group consisting of Cl, Br, I, $NH_3$, $P(C_2H_5)_3$, $P(C_6H_5)_3$, H, CO, 1,5-cyclooctadiene, pyridine, bipyridine, acetate, acetylacetonate, phenylnitrile, ethylenediamine, acetonitrile, 2,5-norbornadiene, nitrate, nitrite, $H_2O$, benzene, diphenylphosphinoethane, 1,3-divinyl-1,1,3,3-tetramethyldisiloxane, ethylene and diphenylacetylene,

a is 1, 2, 3 or 4,

b is 0, or an integer from 1 to 6 and

c is 0, 1, 2 or 3,

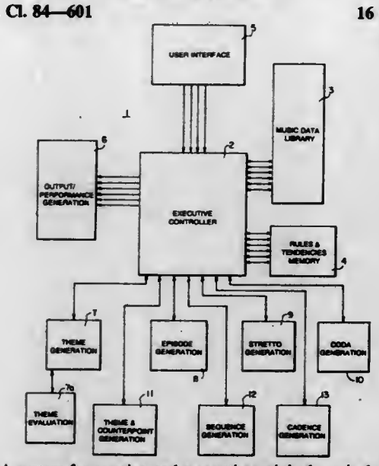
wherein the triazene oxide-transition metal complexes are activated by heating at temperatures of from 50° C. to 250° C. irradiation with light, or by heating and irradiation with light.

**5,496,962**

## SYSTEM FOR REAL-TIME MUSIC COMPOSITION AND SYNTHESIS

**Sidney K. Meier, 2 Sheepfold La., Hunt Valley, Md. 21030, and Jeffrey L. Briggs, 20525 Keeney Mill Rd., Freeland, Md. 21053**

**Filed May 31, 1994, Ser. No. 252,110**
**Int. Cl.[6] G01H *7/00***
**U.S. Cl. 84—601** **16 Claims**




1. A system for creating and generating original musical compositions in a computer-based data processing system, comprising:

an executive controller for generating musical form and key data to control formation of a musical composition;

a user interface operatively connected to said executive controller, for inputting user selected data for determining the form and key data generated by said executive controller;

a library memory means connected to said executive controller, for storing music data to be accessed by said executive controller in generating the form and key data;

a plurality of section generation elements, each of said section generating elements having data means for storing parameter data configured to a specific musical section for a selected section generation element, means for generating a data structure to be filled with note data for playing based on the form and key data from said executive controller, means for generating a plurality of notes to be tested for filling the data structure, means for testing each of the plurality of generated notes and for selecting notes in accordance with the parameter data for the selected section generation element from among the plurality of generated notes, and means for filling the data structure with selected notes until the data structure is filled in accordance with the form and key data, wherein

said executive controller activates selected ones of said plurality of section generation elements based on the form and key data to generate selected sections, said executive controller further assembling the generated selected sections into musical composition data;

a rules, tendencies, and articulation (RTA) memory means connected to said executive controller, for storing musical rules, musical tendencies and articulation data to be accessed by said plurality of section generation elements, said executive controller further for generating the rules, tendencies, and articulation data based on the selected form and key data; and

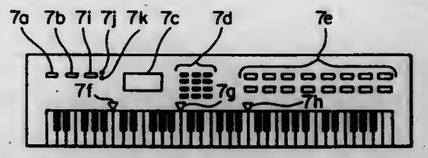
a music output performance generation element connected to receive the musical composition data from said executive controller, for configuring the musical composition data for outputting to an audio output system, and for interfacing with the audio output system.

**5,496,963**

## ELECTRONIC MUSICAL INSTRUMENT THAT ASSIGNS A TONE CONTROL PARAMETER TO A SELECTED KEY RANGE ON THE BASIS OF A LAST OPERATING KEY

**Shinichi Ito, Hamamatsu, Japan, assignor to Yamaha Corporation, Japan**

**Filed Nov. 14, 1991, Ser. No. 792,232**
**Claims priority, application Japan, Nov. 16, 1990, 2-310243**
**Int. Cl.[6] G10H *1/18***
**U.S. Cl. 84—653** **4 Claims**




1. An electronic musical instrument having a keyboard, on which a plurality of keys is provided, and generating musical tones based on an operation applied to the keys, the electronic musical instrument comprising:

division point designation means for designating at least one division point which divides the keys of the keyboard into a plurality of key ranges;

parameter input means for inputting a desired tone control parameter which is common to each of the plurality of key ranges;

operation key range selection means for selecting a key range from the plurality of key ranges on the basis of a last operated key of the keyboard; and

parameter assign means for assigning the input tone control parameter to the selected key range.

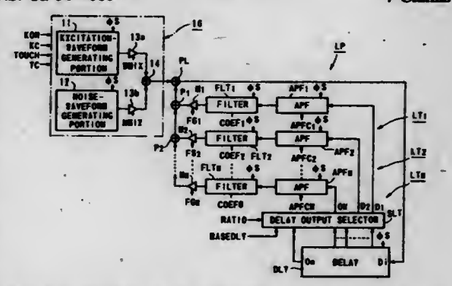
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**5,496,964**

## TONE GENERATOR FOR ELECTRONIC MUSICAL INSTRUMENT INCLUDING MULTIPLE FEEDBACK PATHS

**Hideo Suzuki, Hamamatsu, Japan, assignor to Yamaha Corporation, Japan**

**Filed Mar. 24, 1994, Ser. No. 217,478**
**Claims priority, application Japan, Mar. 26, 1993, 5-068872**
**Int. Cl.[6] G10H *1/08;1/12***
**U.S. Cl. 84—660** **7 Claims**




4. A tone generator for an electronic musical instrument, comprising:

excitation means for generating an excitation signal;

a closed loop circuit for circulating said excitation signal therein, said closed loop circuit including at least two feedback paths, each of which includes a delay circuit and an all-pass filter connected together in a cascade-connection manner, said excitation signal being provided to said plurality of feedback paths in said closed loop circuit;

delay-ratio control means for controlling a ratio between delay times of said delay circuits provided in said feedback paths in accordance with a designated delay ratio; and

addition means for adding output signals from each of said feedback paths and said excitation signal to produce a musical tone signal.

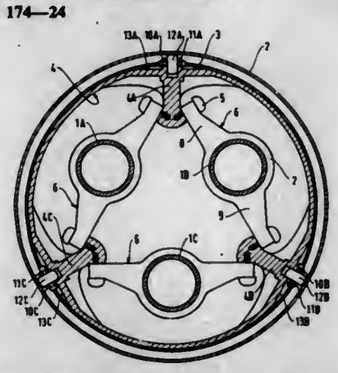
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**5,496,965**

## LINE FOR CONVEYING ELECTRICAL POWER

**Edmond Thuries, Pusignan; Gilles Voisin, Vaugneray, and René Tixier, Lyons, all of, France, assignors to GEC Alsthom T & D SA, Paris, France**

**Filed Sep. 23, 1994, Ser. No. 311,058**
**Claims priority, application France, Sep. 27, 1993, 93 11454**
**Int. Cl.[6] H01B 9/06**
**U.S. Cl. 174—24** **3 Claims**



1. A three-phase electrical power line comprising a sealed tubular envelope of steel filled with insulating gas under pressure, e.g. nitrogen or carbon dioxide $CO_2$, and having three conductive bars placed therein together with a thin tubular envelope of aluminum which is located between the steel envelope and the bars, wherein the conductive bars are held by collars made of non-magnetic material, having an outside diameter equal to the inside diameter of the aluminum tubular envelope, and possessing three radial arms which are screwed to tabs of insulating supports that enclose the conductive bars.

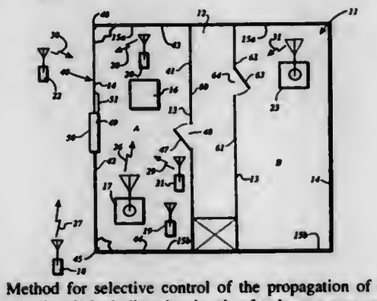
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**5,496,966**

## METHOD FOR CONTROLLING INDOOR ELECTROMAGNETIC SIGNAL PROPAGATION

**Neale C. Hightower, Stone Mountain, and Douglas R. O'Neil, Atlanta, both of Ga., assignors to BellSouth Corporation, Atlanta, Ga.**

**Filed Jun. 12, 1991, Ser. No. 713,858**
**Int. Cl.[6] H05K 9/00**
**U.S. Cl. 174—35 MS** **3 Claims**



1. Method for selective control of the propagation of electromagnetic signals including the signals of at least one communications system operating within a certain frequency range throughout a bounded region, the method comprising the steps of:

attenuating said signals within said certain frequency range that enter or leave said bounded region; and

permitting the relatively unattenuated passage across the boundary of signals in at least one second frequency range outside said certain frequency range,

so that users of each communications system within said bounded region can communicate therein without interfering with or interference from another communications system using the same frequency range and located outside said bounded region, and also can communicate through said boundary and outside said bounded region with an exterior communications system operating in said second frequency range.

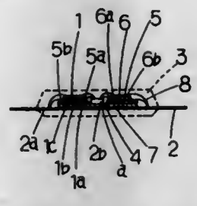
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**5,496,967**

## PACKAGE FOR HOLDING IC CHIP

**Shizuki Hashimoto, and Nobuhiro Nishijima, both of Mine, Japan, assignors to Kabushiki Kaisha Sumitomo Kinzoku Ceramics, Yamaguchi, Japan**

**Filed Dec. 28, 1993, Ser. No. 173,519**
**Claims priority, application Japan, Dec. 29, 1992, 4-361050**
**Int. Cl.[6] H01L 23/02**
**U.S. Cl. 174—52.4** **21 Claims**



1. A package for holding an IC chip, said package comprising:

IC chip supporting means;

a lead frame having a pattern of leads extending outwardly from a central region thereof; and

a ceramic relay substrate provided with a metallized wiring pattern extending outwardly from a central region thereof and corresponding to the pattern of leads of the lead frame, said ceramic relay substrate and metallized wiring being disposed between the IC chip supporting means and the leads of the lead frame;

wherein portions of the metallized wiring pattern near the IC chip as supported on the IC chip supporting means are exposed on the surface of the ceramic relay substrate to form inner leads electrically connected to the IC chip, and

wherein portions of the wiring pattern in the periphery of the relay substrate adjacent to the leads of the lead frame are exposed on the surface of the ceramic relay substrate to form outer leads electrically connected to the leads of the lead frame.

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**5,496,968**

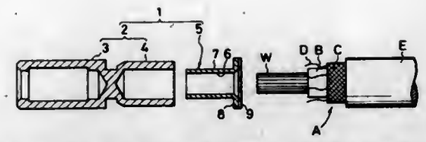
## SHIELDED CABLE CONNECTING TERMINAL

**Hisaharu Katoh, and Hirotaka Fukushima, both of Shizuoka, Japan, assignors to Yazaki Corporation, Japan**

**Filed Apr. 28, 1994, Ser. No. 234,924**
**Claims priority, application Japan, Apr. 30, 1993, 5-103998**
**Int. Cl.[6] H02G 15/02**
**U.S. Cl. 174—74 R** **11 Claims**

1. A terminal for connecting shielded cable including a conductor, a cable sheath insulating said conductor, and a conductive braid wound around said cable sheath, said terminal comprising:





a terminal body having an electrically connecting portion connectable to a mating terminal at one end and a cylindrical portion connectable to the end of said shielded cable at the other end; and

a conductive pipe for receiving said conductor of said shielded cable therein and fitting into said cylindrical portion, said conductive pipe having an insulating portion formed at the peripheral edge into which said shielded cable is to be inserted.

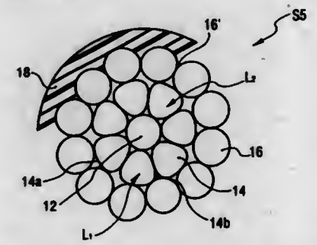
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**5,496,969**

## CONCENTRIC COMPRESSED UNILAY STRANDED CONDUCTORS

**Andrew Blackmore, King City, Canada, assignor to Ceeco Machinery Manufacturing Ltd., Concord, Canada**

**Continuation-in-part of Ser. No. 873,312, Apr. 24, 1992, Pat. No. 5,260,516. This application Jul. 26, 1993, Ser. No. 48,321**
**The portion of the term of this patent subsequent to Nov. 9, 2010, has been disclaimed.**
**Int. Cl.[6] H01B 7/00; D02G 3/36; D07B 1/06**
**U.S. Cl. 174—113 R** **30 Claims**



1. A multi-wire strand of unilay construction comprising a central layer consisting of at least one wire; at least one additional layer consisting of a plurality of wires stranded about said central layer, at least two of said layers consisting of more than one wire and the number of wires in said layers which consist of more than one wire being such that the number of wires in adjacent layers are integers that are not divisible by a common number with the exception of the integer one, the wires in at least one of the layers being compressed to provide area reductions, and the number of wires in each of the layers being selected such that adjacent wires in each of the layers, with appropriate area reductions, are substantially in contact with each other and the strand configuration has a stable substantially circular cross-section.

14. A method of forming a multi-wire strand of unilay construction comprising the steps of stranding at least one additional layer consisting of a plurality of wires about a central layer consisting of at least one wire, at least two of said layers consisting of more than one wire and the number of wires in said central layer and additional layers which consist of more than one wire being such that the number of wires in adjacent layers are integers that are not divisible by a common number with the exception of the integer one; and compressing the wires in at least one of the layers to provide area reductions therein, the number of wires in each of the layers being selected such that adjacent wires in each of the layers, with appropriate area reductions, are substantially in contact with each other and the strand configuration has a stable substantially circular cross-section.

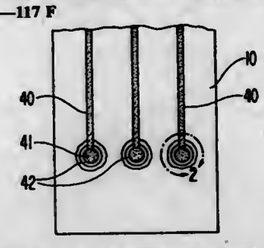
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**5,496,970**

## PLANAR CABLE ARRAY

**Mark S. Spencer, Phoenix, Ariz., assignor to W. L. Gore & Associates, Inc., Newark, Del.**

**Continuation-in-part of Ser. No. 111,673, Aug. 25, 1993, Pat. No. 5,449,862, which is a continuation-in-part of Ser. No. 65,344, May 20, 1993, Pat. No. 5,383,788. This application Sep. 20, 1994, Ser. No. 309,375**
**Int. Cl.[6] H01B 7/00; H05K 1/00; H01R 9/07;13/64**
**U.S. Cl. 174—117 F** **2 Claims**



1. A planar cable array for transmitting electrical signals comprising:

an elongated planar strip of electrical insulating material **10**, said strip having a plurality of boles **42** extending through the strip at a section thereof;

a plurality of parallel electrical conductors **40** affixed to and extending lengthwise along said strip;

one end of each conductor having a conductive pad attached thereto, said pad of each conductor being disposed and positioned within a corresponding aforesaid hole, whereby each said pad freely floats within said hole in the Z axis direction of said planar strip so as to promote contact with an abutting electrical panel.

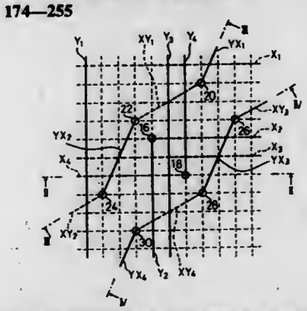
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**5,496,971**

## CIRCUIT ARRANGEMENT FOR MULTILAYER PRINTED CIRCUIT BOARD

**Kiyokazu Morilzumi, and Mikio Nishihara, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Filed Aug. 29, 1994, Ser. No. 297,419**
**Claims priority, application Japan, Sep. 29, 1993, 5-242924**
**Int. Cl.[6] H05K 1/02**
**U.S. Cl. 174—255** **3 Claims**



1. A circuit arrangement for a multilayer printed circuit board, comprising:

a substrate member;

a first circuit layer comprising a first dielectric layer formed on said substrate member, said first circuit layer having a circuit pattern formed on said first dielectric layer which includes conductive segments having only an X-directional component;

a second circuit layer comprising a second dielectric layer formed on said first circuit layer, said second circuit layer having a circuit pattern formed on said second dielectric layer

which includes conductive segments having only a Y-directional component perpendicular to said X-directional component; and

electrical connections between said X-directional conductive segments and said Y-directional conductive segments being suitably established by vias provided in said second circuit layer,

wherein the circuit pattern of said first circuit layer further includes slant conductive segments having both X-directional and Y-directional components and arranged in a blank zone which is not occupied by said X-directional conductive segments, and the circuit pattern of said second circuit layer further includes slant conductive segments having both X-directional and Y-directional components and arranged in a blank zone which is not occupied by said Y-directional conductive segments; electrical connections between the slant conductive segments of said first circuit layer and the slant conductive segments of said second circuit layer being suitably established by vias provided in said second circuit layer.

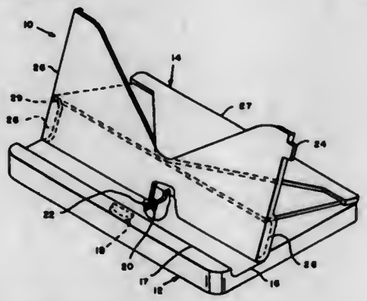
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**5,496,972**

**ARTICULATING WEIGHING SCALE PLATFORM**

**David A. Demar, Trumbull; Thomas J. Pendleton, Danbury, and Sandor F. Weisz, Stamford, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.**

**Filed Sep. 17, 1993, Ser. No. 129,931**
**Int. Cl.[6] G01G *21/00;21/22***
**U.S. Cl. 177—126** **9 Claims**



1. A weigh scale platform, comprising:

(a) a first portion;

(b) a second portion;

(c) a first hinge connecting said first portion and said second portion;

(d) said first portion and said second portion being horizontal and co-planar in a first, closed position to form a horizontal surface for supporting objects to be weighed;

(e) said first portion is rotatable about said first hinge to a second, open position for supporting an oversized object to be weighed in a substantially vertical orientation; and

(f) a platform base supporting said first and second portions, wherein said second portion is connected to said scale base by a second hinge, wherein said second portion rotates about said second hinge to support said first portion in said second position.

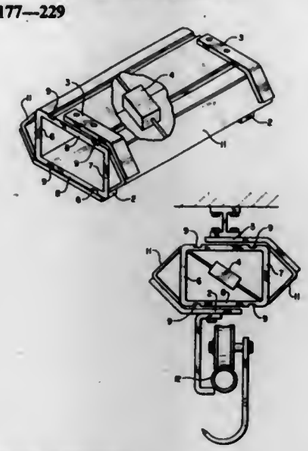
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**5,496,973**

**TWO POINT LOAD CELL**

**Johannes Wirth, Zurich, Switzerland, assignor to Wirth Gallo Messtechnik AG, Zurich, Switzerland**

**Continuation of Ser. No. 955,742, Dec. 7, 1992, Pat. No. 5,365,022. This application Jul. 7, 1994, Ser. No. 271,846**
**Claims priority, application Switzerland, Jun. 24, 1991, 01859/91**
**The portion of the term of this patent subsequent to Nov. 15, 2011, has been disclaimed.**
**Int. Cl.[6] G01G *3/08***
**U.S. Cl. 177—229** **11 Claims**



1. A load cell comprising:

a guide section (1) including a frame (6), a load-bearing element (7), two substantially parallel plates (8) each having a first end and a second end, and a plurality of band-shaped flexural joints (9) , wherein the first end of each one of the two substantially parallel plates (8) is connected to the frame (6) by one of the plurality of band-shaped flexural joints (9) and the second end of each one of the two substantially parallel plates (8) is connected to the load-bearing element (7) by one of the plurality of band-shaped flexural joints (9), and wherein each of the band-shaped flexural joints (9) extend across the overall length of the guide section (1);

two feet (2), each attached to one end of the frame (6) of said guide section (3);

two mounting elements (3), each attached to one end of the load-bearing element (7) of said guide section (1);

a force sensor (4) installed between the frame (6) and the load-bearing element (7) at the center of the guide section (1);

wherein the flexural strength of the frame (6), the load-bearing element (7), and the substantially parallel plates (8), are greater than the flexural strength of the band-shaped flexural points (9);

wherein a longitudinal extension of said guide section (1) is greater than a lateral dimension of said guide section (1);

wherein the frame (6) and the load-bearing element (7) are more rigid than the two substantially parallel plates (8);

wherein each one of said two mounting elements (3) include an elbow fitting (11) having two ends and being attached at each end to the load-bearing element (7) at the same longitudinal position as a corresponding one of the two feet (2); and

wherein said force sensor (4) is installed in a diagonal position at half the length of said guide section (1), with the force sensor extending from the frame (6) to the load-bearing element (7).



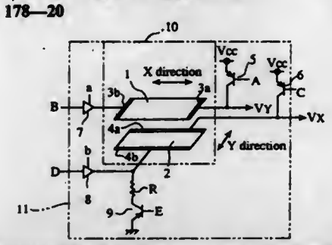
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**5,496,974**

**APPARATUS FOR DETECTING THE COORDINATE POSITION OF A CONTACT POINT ON TOUCH PANEL**

**Kazuhiko Akebi, and Kensuke Taki, both of Moriyama, Japan, assignors to Gunze Limited, Ayabe, Japan**

**Filed May 6, 1994, Ser. No. 238,844**
**Claims priority, application Japan, May 11, 1993, 5-109389**
**Int. Cl.[6] G08C *21/00***
**U.S. Cl. 178—20** **5 Claims**



1. An apparatus for detecting a coordinate position of a contact point in a touch panel including a first resistance layer having first and second electrodes opposed in an X direction and a second resistance layer having first and second electrodes opposed in a Y direction, said first resistance layer and said second resistance layer being opposed in a Z direction, said apparatus comprising:

voltage application means for applying an application voltage to said first and second electrodes of said first resistance layer when said apparatus is in an input stand-by state;

resistance means for applying a resistance between one of said first electrode and second electrode of a second resistance layer and ground when said apparatus is in said input stand-by state;

voltage detection means for detecting an induced voltage induced to a remaining one of said first and second electrodes of said second resistance layer when said first resistance layer and said second resistance layer contact with each other in an event of a depressing operation; and

control means for controlling a transition from said input stand-by state to another state in which an operation for detecting said coordination position is executed, when said induced voltage is induced to said remaining one of said first and second electrodes.

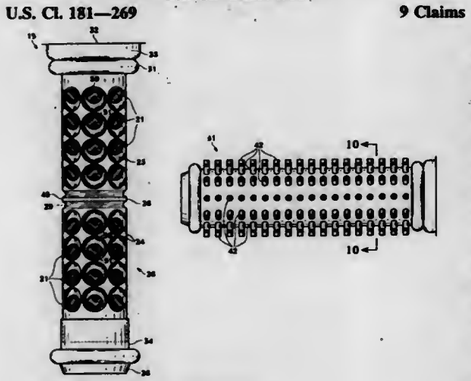
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**5,496,975**

**PLUG MUFFLER FOR AIRCRAFT AND METHOD OF CONSTRUCTION THEREOF**

**Dane Wagner, P.O. Box 211291, Anchorage, Ak. 99521**

**Filed Jun. 6, 1994, Ser. No. 254,782**
**Int. Cl.[6] F01N *1/08***
**U.S. Cl. 181—269** **9 Claims**



1. An aircraft muffler comprising:

a) an exhaust gas conduit having a cylindrical wall, said cylindrical wall having an outer surface, an inlet, an outlet, and a hollow interior;

b) partition means for sealing the hollow interior of said exhaust gas conduit, positioned within said exhaust gas conduit at a point intermediate of the inlet and outlet, to prevent the flow of exhaust gas therethrough;

c) a plurality of perforations formed through the cylindrical wall of said exhaust conduit in a region upstream and downstream of said partition means, said plurality of perforations being formed such that the cylindrical wall of said exhaust gas conduit is raised upward above the outer surface of said cylindrical wall for each perforation at a point in those perforations closest to the inlet, on the inlet side of the partition means, and the cylindrical wall of said exhaust gas conduit is depressed downward below the outer surface of said cylindrical wall, for each perforation at a point in the perforations closest to the outlet, on the outlet side of the partition means;

d) an outer housing, sealably placed over said exhaust gas conduit, to constrain the flow of exhaust gasses within the outer housing; and

e) connection means for connecting said aircraft muffler to an aircraft exhaust system.

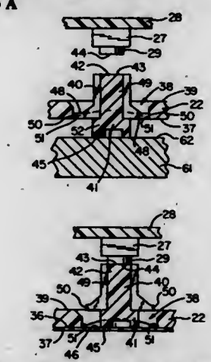
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**5,496,976**

**CONTROL DEVICE AND METHOD OF MAKING THE SAME**

**William S. Hayes, Holland, Mich., assignor to Robertshaw Controls Company, Richmond, Va.**

**Division of Ser. No. 96,758, Jul. 23, 1993, Pat. No. 5,408,057. This application Mar. 30, 1995, Ser. No. 413,692**
**Int. Cl.[6] H01H *9/00;11/00;13/70***
**U.S. Cl. 200—5 A** **20 Claims**



1. In a control device comprising a housing means, a plurality of electrical switch means carried by said housing means and each having a movable actuator means, said housing means having a part thereof provided with a plurality of opening means and being respectively aligned with said actuator means, said housing means comprising a cover means having a plurality of finger movable areas respectively covering said opening means, and a plurality of plunger means having first parts thereof respectively disposed in said opening means and having second parts thereof being engagable with said actuator means, the improvement wherein each said plunger means was initially integral and one-piece with said part of said housing means and has been separated therefrom to freely float relative to said housing means between its respective movable area of said cover means and its respective actuator means whereby each movable area of said cover means is adapted to be finger depressed to move its respective plunger means and thus its respective actuator means to change the operating condition of its respective switch means.

11. In a method of making a control device comprising a housing means, a plurality of electrical switch means carried by said housing means and each having a movable actuator means,

said housing means having a part thereof provided with a plurality of opening means and being respectively aligned with said actuator means, said housing means comprising a cover means and having a plurality of finger movable areas respectively covering said opening means, and a plurality of plunger means having first parts thereof respectively disposed in said opening means and having second parts thereof being engagable with said actuator means, the improvement comprising the steps of forming each said plunger means to be initially integral and one-piece with said part of said housing means, and then separating said plunger means from said housing means so that said separated plunger means freely float relative to said housing means between its respective movable area of said cover means and its respective actuator means whereby each movable area of said cover means is adapted to be finger depressed to move its respective plunger means and thus its respective actuator means to change the operating condition of its respective switch means.

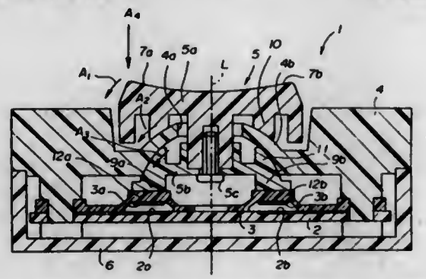
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**5,496,977**

## MULTIPLE CIRCUIT SWITCH WITH IMPROVED MULTIPOSITION FOR JOYPAD ACTUATOR

**Toshinori Date, and Yasuo Takasu, both of Tokyo, Japan, assignors to Sega Enterprises, Ltd., Tokyo, Japan**

**Filed Jun. 28, 1993, Ser. No. 83,670**
**Claims priority, application Japan, Jun. 30, 1992, 4-173020**
**Int. Cl.[6] H01H *25/04;13/70***
**U.S. Cl. 200—6 A** **10 Claims**



1. A multi-directional switch assembly comprising: a contact plate, and at least a first contact portion provided on said contact plate and a contact member having at least one second contact portion wherein an operating force applied thereto causes said second contact portion to touch said first contact portion so that predetermined electrical contact is established, the causing of said second contact portion touching said first contact portion resulting from an operating force elastically transforming the shape of said contact member;

tilting means for tilting said contact member with respect to said contact plate in response to an operating force being applied to said contact member, said tilting occurring as a result of said tilting means defining a manner of said elastic transformation of said contact member, said tilting means comprising:

a guiding member substantially fixed to said contact plate said guiding member having a half-sphere shape wherein a concavity surface thereof faces said contact plate and a through bole in substantially the center of said half-sphere shape, wherein said contact member further comprises:

a sliding member substantially fixed to said contact member; wherein said sliding member may slide on said guiding member so that said contact member is tilted with respect to said contact plate in response to an operating force applied to said contact member;

a key portion and a pad portion with said key portion and said pad portion being fixed to each other via said through hole and with said key portion located at a first side of said half-sphere shape of said guiding member while said pad portion is located at a second side of said half-sphere shape of said guiding member, which second side of said half-sphere shape of said guiding member faces said contact plate;

whereby corresponding electrical contact is established as a result of each of said plurality of first contact portions being touched by a corresponding respective one of said plurality of second contact portions by said contact member tilting in a respective direction with respect to said center line of said control-key device, said tilting in respective directions being caused by appropriate respective operating forces as an effect of said tilting means.

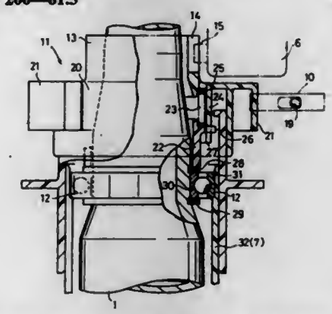
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**5,496,978**

## AUTO-CANCEL DEVICE

**Kazunori Umezawa, and Kiyoshi Sashida, both of Saitama, Japan, assignors to Toyo Denso Kabushiki Kaisha, Tokyo, Japan**

**Filed Apr. 16, 1993, Ser. No. 47,027**
**Claims priority, application Japan, Apr. 17, 1992, 4-032391 U**
**Int. Cl.[6] H01H *3/16***
**U.S. Cl. 200—61.3** **4 Claims**



1. An auto-cancel device for permitting a manually operated turning switch to automatically return to a neutral position upon termination of a turn comprising:

a non-rotatable fixed housing for rotatably mounting a steering shaft;

a cancel cam operatively positioned within said housing and being secured to said steering shaft to rotate together therewith;

an operating lever including a first end rotatably mounted on a support shaft operatively disposed within said housing and a second end projecting from said housing;

a cancel pin operatively positioned between said first end of said operating lever and said cancel cam;

said turning switch being disposed within said housing and being manually operated upon actuation of said operating lever in a direction to indicate a right turn and a left turn;

wherein manually actuating said operating lever imparts movement to said cancel pin for actuating said turning switch and termination of a turn imparts movement to said cancel cam for actuating said operating lever to return to a neutral position; and

a spring holder operatively disposed adjacent to said steering shaft, a bearing mounted between said spring holder and said housing, and a cam spring interposed between said spring holder and said cancel cam for biasing said cancel cam and said spring holder in a direction away from each other;



wherein said cancel cam, said spring holder and said cam spring do not move rotationally relative to one another thereby avoiding frictional noise therebetween.

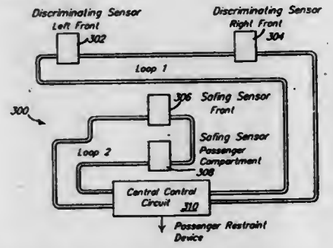
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**5,496,979**

## ACCELEROMETER WITH OPTICAL SWITCH

**Leonard W. Behr, White Lake, Mich., assignor to Automotive Systems Laboratory, Inc., Farmington Hills, Mich.**

**Filed Mar. 11, 1994, Ser. No. 212,560**
**Int. Cl.[6] H01H *35/14***
**U.S. Cl. 200—61.45 M** **2 Claims**




1. A vehicle crash discrimination system comprising:

a central monitoring and control means;

a first set of accelerometers connected to said central monitoring and control means in a first loop, said first set of accelerometers being responsive to a first vehicle acceleration threshold; and

a second set of accelerometers connected to said central monitoring and control means in a second loop, said second set of accelerometers being responsive to a second vehicle acceleration threshold higher than said first threshold;

wherein each of said plurality accelerometers includes:

a housing having a passage extending therein;

stop means defining a first end of the passage;

a magnetically-permeable element secured to said housing proximate to the passage;

a magnetic sensing mass in the passage, said sensing mass being magnetically biased towards said magnetically-permeable element so as to remain in a first position against the stop means until said magnetic bias is overcome by acceleration of said housing, whereupon said sensing mass is displaced in response to such acceleration from said first position towards a second position in the passage, said magnetic bias being sufficient to return said sensing mass to said first position from any other position in the passage, and

an input optical fiber for emitting a beam of light generated by said central monitoring and control means;

an output optical fiber positioned to receive said emitted light; and

means for interposing said sensing mass between said input fiber and said output fiber, whereby the transmission of light from said input fiber to said output fiber is interrupted when said sensing mass is displaced towards said second position, wherein said output fiber of one of said plurality of accelerometers forms said input fiber of another of said plurality of accelerometers connected to the same loop, said central monitoring and control means triggering a passenger restraint device in response to any of said first set and any of said second set of accelerometers generating output signals indicative of respective sensing mass displacement to respective second positions.

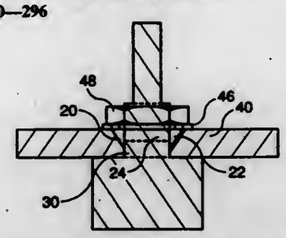
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**5,496,980**

## SWITCH KNOB ADAPTED TO BE FIXED AND SEALED TO A SUPPORT

**Jean-Christophe Villain, Paris, France, assignor to Alcatel Mobile Communication, Paris, France**

**Filed Dec. 21, 1994, Ser. No. 360,952**
**Claims priority, application France, Dec. 29, 1993, 93 15810**
**Int. Cl.[6] H01H *9/02***
**U.S. Cl. 200—296** **5 Claims**




1. Switch knob having a mobile first part adapted to switch from one contact to another by rotation and a second part adapted to be fixed to a support of the device on which said knob is mounted by assembly means and clamping means, wherein said assembly means comprises two opposed prism-shape members linked by two ring parts each including a hinge, said assembly means being disposed between said second part and said support in a housing of said support with a top of said prism-shape members facing towards an interior of said housing and bases thereof outside said housing so that clamping of said clamping means, by applying a force to said bases of said prism-shape members, moves said members towards each other and locks said second part to said support, and wherein said movement towards each other is facilitated by said hinges of said two ring parts.

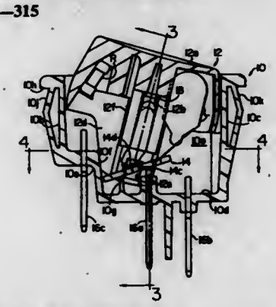
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**5,496,981**

## ELECTRICAL SWITCH

**Richard W. Sorenson, 6540 SE. Harbor Cir., Stuart, Fla. 34996**

**Filed Jul. 21, 1994, Ser. No. 278,385**
**Int. Cl.[6] H01H *9/00***
**U.S. Cl. 200—315** **8 Claims**



1. An electrical switch comprising:

an upwardly open housing of generally rectangular configuration with spaced front and rear walls that are integrally connected to one another by end walls and by a bottom wall to define a cavity,

a rocker having skirt portions that define axle projections received in openings defined in said front and rear housing walls, said rocker being pivotable on a rocker pivot axis and said skirt portions being moveable between said housing front and rear walls and defining a space therebetween,

a moveable contact having a segment provided in said space between said rocker skirt portions,

said moveable contact having projecting ears at said moveable contact segment in said space defined by said skirt portions, said ears being received in slots provided in said skirt portions

to allow limited movement of said movable contact toward and away from said pivot axis of said rocker and to allow rocking movement of said movable contact on a second axis defined by said ears,

at least first and second contacts in said housing bottom wall with upper ends provided inside said housing, said fixed contacts provided in said bottom wall being of identical geometry, said first fixed contact having its upper end spaced above an upper end of said second fixed contact and a single compression spring having a substantial portion retained by said rocker between said skirt portions and having a free end portion engaging said moveable contact segment for urging said moveable contact toward said upper ends of said fixed contacts,

whereby pivotal movement of said rocker causes said moveable contact to pivot and slide across said upper end of said first fixed contacts and to selectively make contact with said upper end of said second fixed contact.

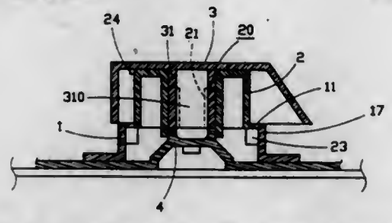
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**5,496,982**

## KEY SWITCH

**Ching-Cheng Tsai, Keelung, Taiwan, Prov. of China, assignor to Chicony Electronics Co., Ltd., Taipei, Taiwan, Prov. of China**

**Filed Jun. 6, 1994, Ser. No. 254,607**
**Int. Cl.[6] H01H *13/70***
**U.S. Cl. 200—345** **1 Claim**




1. For a keyboard having a keyboard frame and a circuit board disposed below the keyboard frame, a key switch comprising:

a key cap including a plunger, the plunger including a downward-opening inner hole;

a key base including

four walls upstanding from the keyboard frame in a square configuration, the four walls defining four base corners therebetween,

four flanges extending inwardly from respective ones of the walls at an upper end of the key base,

a flange notch in the middle of each of the flanges, and

four 45-degree bevels extending, between adjacent flanges, across each of the base corners at the upper end of the key base;

a key body including

four stub rods slidably disposed within the base corners of the key base, each of the stub rods including a respective cylindrical stop for abutting against an underside of a respective one of the bevels to restrain upward sliding of the key body within the key base,

a central square through-hole having four body corners and sized to accept therein the plunger of the key cap,

four air passages disposed along the body corners of the through-hole, the air passages each communicating between the inner hole of the key cap and a space outside of the key, and

a single projection aligned with one of the flange notches; and

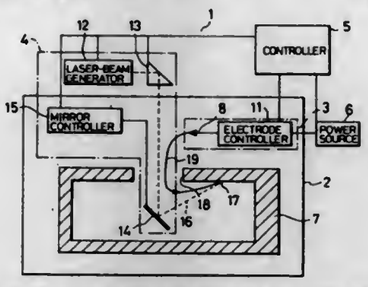
a rubber cone disposed between the circuit board and a lower end of the plunger for exerting upward force on the key cap, the rubber cone being compressed when the key body is depressed to trigger a circuit of the circuit board.

**5,496,983**

## LASER GUIDED DISCHARGE MACHINING APPARATUS AND METHOD

**Yoshinobu Hoshi, Tsukuba, Japan, assignor to Agency of Industrial Science & Technology, and Ministry of International Trade & Industry, both of Tokyo, Japan**

**Filed Aug. 5, 1994, Ser. No. 285,448**
**Claims priority, application Japan, Aug. 5, 1993, 5-213339**
**Int. Cl.[6] B23H *1/00***
**U.S. Cl. 219—69.17** **3 Claims**




3. A laser guided discharge machining method, comprising:

housing a workpiece and a discharge electrode in a vacuum chamber;

reducing the pressure in the vacuum chamber to 3000 Pa or below;

projecting a laser beam at a part of the workpiece that is not in a direct line of sight with the discharge electrode; and

emitting charged particles with said discharge electrode to machine said part of said workpiece.

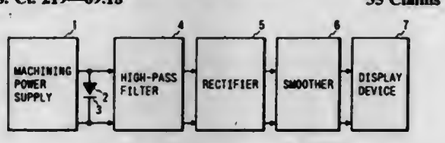
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**5,496,984**

## ELECTRICAL DISCHARGE MACHINE AND MACHINING METHOD THEREFOR

**Akihiro Goto; Yoshio Ozaki; Atsushi Taneda, all of Aichi; Tatsushi Sato, and Yoshihito Imai, both of Hyogo, all of, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Dec. 30, 1992, Ser. No. 998,840**
**Claims priority, application Japan, Jan. 7, 1992, 4-000786; Feb. 17, 1992, 4-029711; Nov. 20, 1992, 4-311963**
**Int. Cl.[6] B23H *1/02***
**U.S. Cl. 219—69.18** **35 Claims**




3. An electrical discharge machine for machining a workpiece by generating pulse discharges at a machining gap formed by a machining electrode and said workpiece opposed to each other, comprising:

low frequency intercepting means for passing only alternating-current components or high frequency components of at least one of the current, voltage and impedance of said machining gap;

rectifying means for rectifying the output of said low frequency intercepting means;

integrating means for integrating the output of said rectifying means;

control means for controlling the start and reset of said integrating means at the beginning of each pulse discharge; and

display means for displaying, for each pulse, whether or not the output of the integrating means indicates a normal discharge.

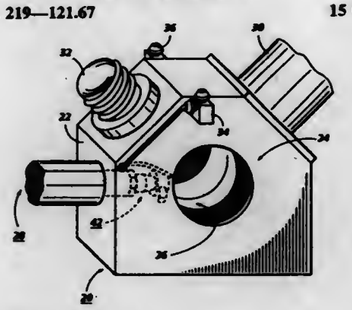


**5,496,985**

## LASER ABLATION NOZZLE

**Robert S. Foltz, Rochester; Ronald A. Gaither, Fairport; Alfred O. Klein, Rochester; John J. Wilbert, Macedon; Henry T. Mastalski, Webster; Peter J. Schmitt, Ontario; Eugene A. Swain, Webster, all of N.Y., and Christopher E. Dackson, Ypsilanti, Mich., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Apr. 1, 1994, Ser. No. 221,955**
**Int. Cl.[6] B23K *26/14***
**U.S. Cl. 219—121.67** **15 Claims**




1. An apparatus comprising:

(a) a housing defining an opening in a side of the housing in communication with a chamber suitable for enclosing a predetermined length of a coated substrate to result in an enclosed coated substrate portion, wherein there exists a gap between the enclosed substrate portion and the housing in communication with air outside the housing;

(b) a nozzle, disposed through the housing, and positioned adjacent the enclosed substrate portion, comprising:

(i) a nozzle housing comprised of a bottom surface;

(ii) a first orifice defined by the bottom surface;

(iii) a second orifice defined by the bottom surface;

(iv) a first passageway defined by the nozzle housing in communication with the first orifice; and

(v) a second passageway defined by the nozzle housing in communication with the second orifice, wherein the portion of the second passageway adjacent the second orifice forms an angle $\theta_3$ with the portion of the first passageway adjacent the first orifice, wherein the angle $\theta_3$ is effective for directing a first fluid stream through the second orifice at the surface of the enclosed substrate portion to facilitate removal of the coating in the form of coating debris during or subsequent to exposure of the coating of the enclosed substrate portion to high energy radiation;

(c) a high energy radiation generating apparatus, coupled to the nozzle, wherein the radiation passes through the first passageway and the first orifice of the nozzle towards the surface of the enclosed substrate portion;

(d) a first fluid stream generating apparatus, coupled to the nozzle, wherein the first fluid stream passes through the second passageway and the second orifice of the nozzle towards the surface of the enclosed substrate portion, wherein the first fluid stream may move a portion of the coating debris outside the housing in the absence of (e);

(e) a second fluid stream nozzle disposed in a direction for directing a second fluid stream against the first fluid stream to keep the coating debris inside the housing, thereby minimizing movement of the coating debris into the air outside the housing; and

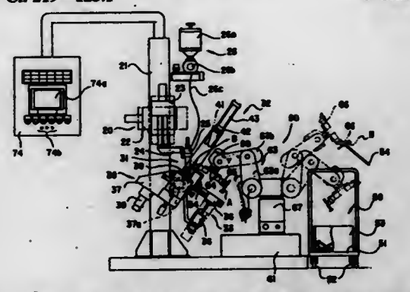
(f) exhausting apparatus coupled to the housing to remove the coating debris.

**5,496,986**

## APPARATUS FOR APPLYING HARD FACING TO VALVE

**Hiroshi Miyata; Yoshio Chiba; Osamai Nogachi; Tsutomu Oka, and Minoru Nakane, all of Okegawa, Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan**

**Filed Dec. 16, 1994, Ser. No. 358,170**
**Claims priority, application Japan, Dec. 27, 1993, 5-333737; Jan. 14, 1994, 6-002793; Mar. 8, 1994, 6-037367**
**Int. Cl.[6] B23K *9/04***
**U.S. Cl. 219—125.1** **5 Claims**



1. A fillet welding apparatus for fillet-welding a material on valve heads of intake valves or exhaust valves for use with internal combustion engines, such material being different from the material of said valve heads, characterized in that said apparatus comprises valve blank stock means for storing valve blanks to be fillet-welded, a welding torch for performing fillet welding on a valve head of each said valve blanks, valve blank holding means for holding such valve blank such that the valve head of said held valve blank faces said welding torch, product valve stock means for storing product valves having been fillet-welded by said welding torch, and valve transfer means for transferring a valve blank from said valve blank stock means to said valve blank holding means, and for transferring a product valve from said valve blank holding means to said product valve stock means, wherein said valve transfer means includes swing arm means mounted to be swingable about at lest one point on the stationary side from said valve blank stock means to said valve blank holding means, then from said valve blank bolding means to said product valve stock means, and then from said product valve stock means to said valve blank stock means, said swing arm means having chuck means attached to its distal end to grasp a valve stem of a valve blank or a product valve from both sides of said valve stem.

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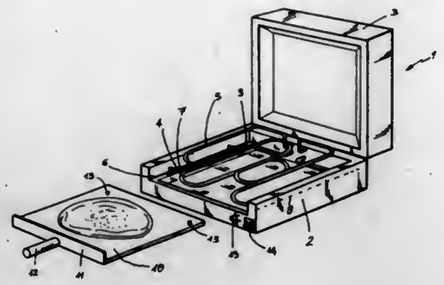
**5,496,987**

## ELECTRIC OVEN, FOR DOMESTIC USE, PARTICULARLY DESIGNED TO COOKING PIZZAS, CAKES AND THE LIKE

**Enrico Siccardi; Alberto Siccardi, both of Via B. Panizza, 20144 Milan; Roberto Lombardi, and Luigi Lombardi, both of Via S. Pancrazio 18/10, 20060 Gessate (Milan), Italy**

**Filed Jun. 8, 1994, Ser. No. 255,450**
**Claims priority, application Italy, Jun. 10, 1993, MI93U0479**
**Int. Cl.[6] F24C *7/10***
**U.S. Cl. 219—386** **5 Claims**

1. An electric oven for cooking pizzas, cakes and the like, comprising an oven base, on which there is applied a raisible covering construction, and said base housing a pair of lower and top metal heating coils connected to an inner rear wall of said oven base, said oven being moreover provided with a cooking plate which slides between said pair of metal coils along guides applied to two side walls of said base.



5,496,988

## DEVICE FOR SOLDERING COMPONENTS ON PLATES

Peter Saile, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

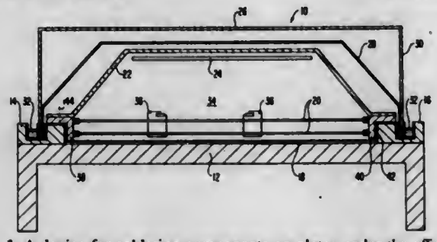
PCT No. PCT/DE93/00491, § 371 Date Dec. 27, 1994, § 102(e) Date Dec. 27, 1994, PCT Pub. No. WO94/00267, PCT Pub. Date Jan. 6, 1994

PCT Filed Jun. 8, 1993, Ser. No. 362,415

Claims priority, application Germany, Jun. 25, 1992, 42 20 802.5

Int. Cl.[6] F27B 9/04;9/32; F27D 1/18

U.S. Cl. 219—388 5 Claims



1. A device for soldering components on plates under the effect of a gas comprising a furnace chamber which is enclosed by an at least two-piece housing, and wherein: a first housing element has a reservoir for a sealing means into which a second housing element dips partially; the first housing element has a continuous wall area defining the reservoir; said sealing means is a liquid; said second housing element has a supporting part and a sealing part enclosing said furnace chamber; said sealing part encloses said supporting part in the area of said sealing means; and the continuous wall area is provided with reinforcing means in the area of the liquid reservoir.

5,496,989

## WINDSHIELD TEMPERATURE CONTROL SYSTEM

Michael P. Bradford, Orange, and Thomas Perrotta, Brookfield, both of Conn., assignors to United Technology Corporation, Hartford, Conn.

Filed May 5, 1994, Ser. No. 238,553

Int. Cl.[6] H05B 1/02; B60L 1/02

U.S. Cl. 219—497 37 Claims

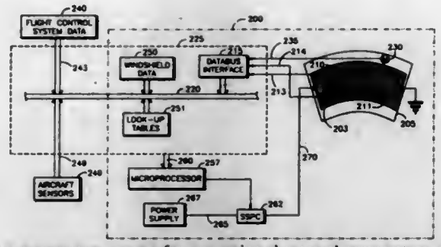
1. A windshield temperature control system comprising:

a windshield having heating means which heats said windshield in response to the application of a voltage to said heating means;

voltage supply means for providing a supply voltage;

power control means which applies said supply voltage to said heating means in response to a control signal and which disconnects said supply voltage from said heating means in response to the absence of said control signal;

the system being characterized by:



a temperature sensor for measuring the actual temperature of said heating means;

means for providing windshield characteristic data indicative of fixed physical properties of said windshield;

means for measuring parameters indicative of windshield operating environment; and

processing means responsive to said windshield characteristic data and said parameters indicative of windshield operating environment for determining a desired heating means temperature to produce a heat output, for determining an error signal as the difference between said desired heating means temperature and said actual heating means temperature, and for providing control signals to said power control means to drive the magnitude of said error signal to zero.

5,496,990

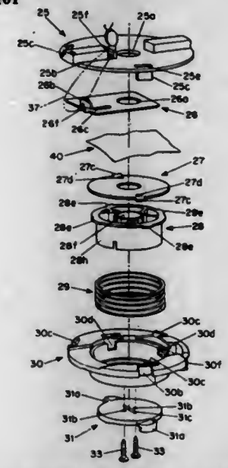
## VERSATILE LOCKING MECHANISM FOR POSTAGE METERS

Christian Gillieron, Solothurnstrasse 7, Fraubrunnen, Switzerland

Filed Dec. 1, 1993, Ser. No. 159,850

Int. Cl.[6] G07G 1/00

U.S. Cl. 235—101 23 Claims



1. A postal-lock mechanism adapted to be rotatably mounted in a housing of a postage meter for rotation between a first position securing the meter against resetting, and a second position permitting access to the postage meter for resetting, including

an external member located at the exterior of the postage meter housing and rotatable with respect to the postage-meter housing;

an internal member located at the interior of the postage meter housing and manually rotatable with respect to the postage-meter housing;

means connecting said internal member to said external member through an opening in the postage-meter housing;



at least one element of the postal-lock mecbanism releasably engaging a stationary part of the postage meter in rotation preventing relation, whereby access to the meter for resetting is prevented until at least one element is released from engagement with the stationary part of the postage meter; and

at least one member of the postal-lock mechanism being engageable with a postage meter chassis-connected part to lock the housing to the chassis in said first and second positions of the postal-lock mechanism, said postal-lock mechanism being rotatable to a third position to withdraw the at least one member from the chassis-connected part to permit removal of the housing from the chassis.

5,496,991

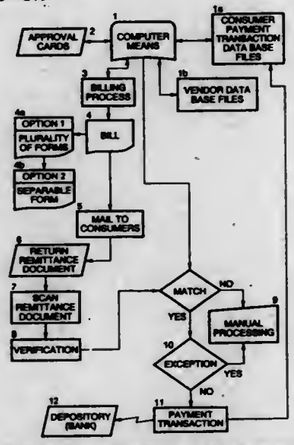
## AUTOMATED REMITTANCE SYSTEM

Frank W. Deifer, III, 7560 Shelborne Dr., Loomis, Calif. 95650, and Barry D. Stigers, 5332 Rimwood Dr., Fair Oaks, Calif. 95628

Continuation of Ser. No. 879,061, Apr. 30, 1992, abandoned, which is a continuation of Ser. No. 309,267, Feb. 9, 1989, abandoned. This application Jul. 26, 1994, Ser. No. 281,522

Int. Cl.[6] G06F 17/60

U.S. Cl. 235—379 3 Claims




1. For billing individual consumers, an automated remittance billing system for electronically transferring into a plurality of vendor depository accounts funds from a plurality of vendor associated consumer depository accounts, wherein said funds correspond to an amount due from each said consumer to said vendor, comprising:

means for pre-authorizing said transferring of funds;

a remittance document encoded with a single unique current billing indicium that includes a current indication of said amount of funds due to said vendor and said remittance document has a disposition action marking area for noting by each consumer acceptance of or disagreement with said amount due;

computer means of said billing service provider having vendor data base files for said vendors and consumer payment transaction data base files for vendor associated consumers programmed to:

control and maintain currency of said automated remittance system;

verify upon receipt of a returned remittance document said remittance document's indicium by comparing said remittance document's indicium to said payment transaction data base files;

process said verified remittance documents by creating current transmittal data base files; and

initiate said transfer of funds from said vendor associated consumer's account into an associated vendor's account;

means for scanning said vendor associated consumers' returned remittance documents to obtain current consumer payment transaction disposition data and transmitting said current consumer payment transaction disposition data to said computer means for said verification and processing of said transactions; and

means for the remittance document triggered transmission of said transactions to said vendor associated consumers' depositories via a host depository to initiate the transfers of funds by said consumers' depositories to said associated vendors' accounts.

5,496,992

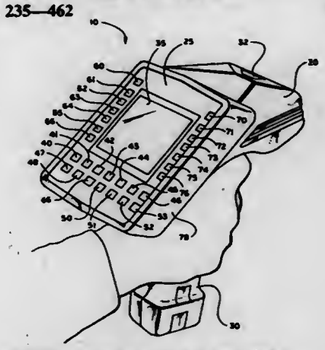
## DUAL TRIGGER MULTIPLEXED DATA ENTRY TERMINAL

Esteban C. Madan; Randolph R. Beebe, both of Duluth, and Teresa H. Stanfield, Lawrenceville, all of Ga., assignors to LXE, Inc., Norcross, Ga.

Filed Jun. 21, 1994, Ser. No. 262,967

Int. Cl.[6] G06K 7/10

U.S. Cl. 235—462 27 Claims



1. A wireless data entry terminal, comprising:

a terminal housing;

a processor located within said housing, said processor operative for running a data entry program having a plurality of key definition tables;

a data transceiver located within said housing and operatively connected to said processor, said data transceiver operative for receiving said program from a remote host computer and routing said program to said processor, said data transceiver being further operative for transmitting data entered at said terminal from said terminal to said host computer; and

a set of data entry keys on said housing,

at least one key of said set of data entry keys operative for scrolling through said plurality of key definition tables,

a subset of said set of data entry keys operative for entering data in a manner defined by a particular key definition table selected from said plurality of key definition tables.

5,496,993

## OPTICAL PICKUP DEVICE WITH WEDGE SHAPED AND CONCAVE LENS FOR CORRECTING A COMA AND ASTIGMATISM

Ikuo Kasuga, Nagano, Japan, assignor to Kabushiki Kaisha Sanko Seiki Seisakusho, Nagano, Japan

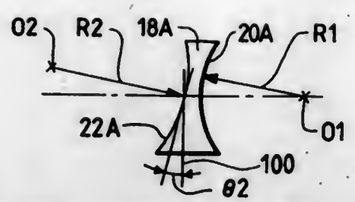
Filed Jul. 23, 1993, Ser. No. 95,193

Claims priority, application Japan, Jul. 25, 1992, 4-057841 U

Int. Cl.[6] G02B 7/04

U.S. Cl. 250—201.5 5 Claims

1. An optical pickup device comprising:




a light source for irradiating a light beam onto an object from a light source;
a half mirror for introducing the light beam reflected by the object to an optical detector; and
a wedge-shaped optical element, disposed between said half mirror and said optical detector, for cancelling out a coma produced by said half mirror, wherein
said wedge-shaped optical element has a surface formed by combining a wedge form and a cylindrical form, and wherein
said surface of said wedge-shaped optical element on said half mirror side is a concave cylindrical surface.

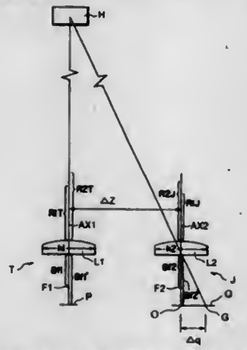
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**5,496,994**

## RANGE DETECTION OPTICAL SYSTEM WITH LIGHT EMITTER BEHIND PROJECTION LENS FOCAL POINT AND LIGHT RECEIVER BEHIND RECEIVING LENS FOCAL POINT

**Motoyuki Ohtake, Ohmiya, Japan, assignor to Nikon Corporation, Tokyo, Japan**

**Filed Aug. 29, 1994, Ser. No. 296,888**
**Claims priority, application Japan, Aug. 27, 1993, 5-235501**
**Int. Cl.[6] G02B *7/04*; G01C *3/08***
**U.S. Cl. 250—201.6** **12 Claims**




1. A range detection optical system, for detecting a range of an object, comprising:
a light projection system for projecting light flux onto the object, including
a light emission source emitting the light flux, and
a light projection lens disposed to receive the light flux from said light emission source and direct the light flux along an optical axis of said light projection system and onto the object, said light projection lens having a focal point between said light emission source and a surface of said light projection lens closest to said light emission source; and
a light receiving optical system for condensing reflected light flux from the object and measuring a range to the object from said range detection optical system, including
a light receiving lens, and
a light receiving element disposed a first predetermined distance from said light receiving lens along an optical axis of said light receiving optical system, the optical axis of said light projection system and the optical axis of said light receiving optical system positioned a second predetermined distance from each other, said light receiving element producing an output for determining the range by indicating deviation of the reflected light flux from the optical axis of said light receiving optical system.

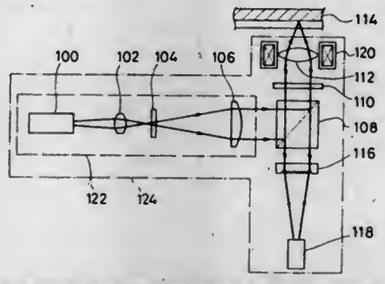
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**5,496,995**

## SUPERRESOLUTION SCANNING OPTICAL DEVICE

**Makoto Kato, Hyogo, and Kenichi Kasazumi, Osaka, both of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Mar. 18, 1993, Ser. No. 34,750**
**Claims priority, application Japan, Mar. 19, 1992, 4-063761**
**Int. Cl.[6] H01J *3/14***
**U.S. Cl. 250—216** **2 Claims**




1. A superresolution scanning optical device comprising image forming means for forming the image of light from a coherent light source unit in the form of a fine spot on a imaging face through an image forming optical system, and scanning means for scanning said fine spot formed on said imaging face,
said coherent light source unit having an output incident on a phase shifter so as to generate at least a first light source and a second light source presenting a phase reverse to that of said first light source,
said first and second light sources having the relationship that the main lobe of the image of said second light source on said imaging face is superposed on the lateral sides of the main lobe of the image of said first light source on said imaging face.

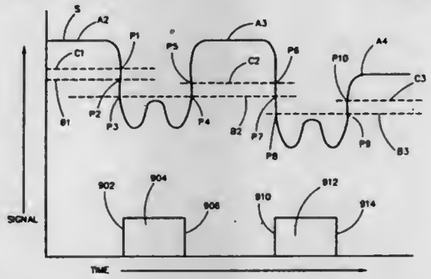
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**5,496,996**

## PHOTOELECTRIC DEVICE WITH CAPABILITY TO CHANGE THRESHOLD LEVELS IN RESPONSE TO CHANGING LIGHT INTENSITIES

**Kenneth F. Barnes, and Hongzhi Kong, both of Freeport, Ill., assignors to Honeywell Inc., Minneapolis, Minn.**

**Filed Jan. 24, 1995, Ser. No. 378,134**
**Int. Cl.[6] G01N *9/04***
**U.S. Cl. 250—223 B** **14 Claims**






1. A sensor, comprising:
a radiation source;
a radiation sensitive device, said radiation sensitive device providing a first signal representative of an intensity of radiation imposed on said radiation sensitive device, said radiation sensitive device being disposed to receive a beam of radiation from said radiation source;
means for comparing said first signal to a first threshold magnitude in order to detect the presence of an object in the path of said beam of radiation;
first means connected in signal communication with said radiation sensitive device for determining an updated value of said first threshold magnitude as a function of the maximum value of a magnitude of said intensity of radiation imposed on said radiation sensitive device during a first preselected period of time;
means for deactivating said first determining means during a second preselected period of time; and
means for replacing a previous value of said first threshold magnitude with said updated value of said first threshold magnitude upon the detection of said object in the path of said beam of radiation.

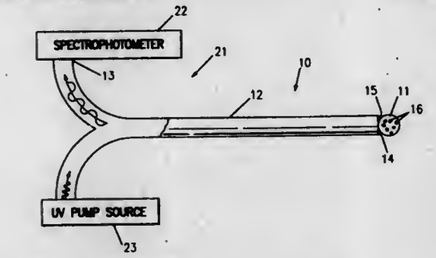
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**5,496,997**

## SENSOR INCORPORATING AN OPTICAL FIBER AND A SOLID POROUS INORGANIC MICROSPHERE

**Edward J. A. Pope, 447 Lorenzo Dr., Agoura, Calif. 91301**

**Filed Jan. 3, 1994, Ser. No. 176,522**
**Int. Cl.[6] H01J *5/16***
**U.S. Cl. 250—227.21** **17 Claims**




1. A sensor comprising:
a. a solid porous inorganic microsphere; and
b. an optical fiber having a proximal end and a distal end, said distal end of said optical fiber being coupled to said solid porous inorganic microsphere.

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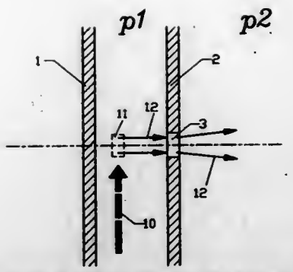
**5,496,998**

## TIME-OF-FLIGHT MASS-SPECTROMETER WITH GASPHASE ION SOURCE, WITH HIGH SENSITIVITY AND LARGE DYNAMIC RANGE

**Thorald Bergmann, Buchenweg 9a, 82441 Ohlstadt, Germany, assignor to Thorald Bergmann, and Eva Martina Bergmann, Ohlstadt, Germany**

**Filed Jul. 1, 1994, Ser. No. 269,544**
**Claims priority, application Germany, Jul. 2, 1993, 43 22 102.5**
**Int. Cl.[6] H01J *49/40***
**U.S. Cl. 250—287** **21 Claims**

1. A time-of-flight mass-spectrometer,
said time-of-flight mass-spectrometer being subdivided into two or more regions of different pressures p1, p2, p3, . . . ,
at least two of said regions of different pressures being connected via flow restrictions(3,6),
with gasphase ion source,
having a number of electrodes(1,2,4,5) for producing electrical fields,




in which is defined a region of space called extraction volume (11), said region containing ions at start-time of mass-analysis, the mass of said ions being determined by measuring their time-of-flight,
in which a further region of space is defined,
a) that contains the extraction volume(11),
b) in which the electrical field is everywhere nonzero and directed such as to accelerate, (not decelerate) the ions or electrons,
c) in which the ions or electrons to be detected are accelerated in an uninterrupted phase of time, immediately following the start-time of mass analysis, at least to some fraction of the final drift velocity in the time-of-flight mass spectrometer,
characterized by one or several electrodes(1,2,4,5), said electrodes simultaneously
having integrated gas flow restrictions(3,6)
being able to influence the electrical field in one or both of the previously defined regions of space.

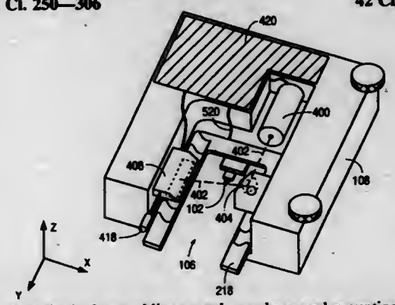
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**5,496,999**

## SCANNING PROBE MICROSCOPE

**Frederick L Linker, 936 Crane St., Menlo Park, Calif. 94025; Michael D. Kirk, 355 S. 16th St., San Jose, Calif. 95112; John D. Alexander, 160 Aries Way, #3, Sunnyvale, Calif. 94086; Sang-il Park, 865 Loma Verde Ave., Palo Alto, Calif. 94303; Sung-il Park, 1055 Wilmington Ave., San Jose, Calif. 95129; Ian R. Smith, 228 Dover St., Los Gatos, Calif. 95032, and Peter R. Swift, 36 Pondview Dr., Amherst, Mass. 01002**

**Continuation of Ser. No. 850,669, Mar. 13, 1992, Pat. No. 5,376,790. This application Oct. 11, 1994, Ser. No. 320,490**
**Int. Cl.[6] H01J *37/26***
**U.S. Cl. 250—306** **42 Claims**




1. A method of assembling a probe package and mounting said probe package in a scanning probe microscope, said method comprising the steps of:
providing a chip and a cantilever extending from an edge of said chip;
attaching said chip to a plate to form said probe package, a first set of alignment features being formed in said plate; and
mounting said probe package in said scanning probe microscope by mating said first set of features to a second set of alignment features in said microscope, said cantilever thereby being

mounted to an accuracy of approximately 20 microns or less with respect to said microscope.

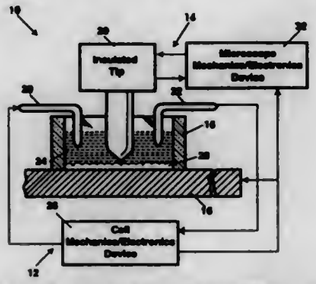
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**5,497,000**

## METHOD OF ELECTROCHEMICAL DETECTION/ IDENTIFICATION OF SINGLE ORGANIC MOLECULES USING SCANNING TUNNELING MICROSCOPY

**Nongjian Tao, Miami, Fla., and Stuart M. Lindsay, Tempe, Ariz., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Jan. 27, 1994, Ser. No. 187,028**
**Int. Cl.[6] H01J** *37/00*
**U.S. Cl. 250—307** **15 Claims**




1. An improved method of detecting/identifying organic molecules, in situ, using electrochemistry and scanning tunneling microscopy concurrently, comprising the steps of:

adsorbing said organic molecules onto the surface of a conducting substrate to form a monolayer(s) of adsorbed organic molecules by adjusting and then holding the surface of said conducting substrate to an overall predetermined voltage potential for a predetermined time;

increasing the voltage potential on the surface of said conducting substrate from the overall predetermined voltage potential until an electrochemically-induced change characteristic of said adsorbed organic molecules occurs therein, thereby permitting detection/identification thereof; and

generating concurrently with increasing the voltage potential of the surface of said conducting substrate, by a scanning tunneling microscope in cooperation with an electrochemical cell, photomicrographic images, to a resolution of a single one of said adsorbed organic molecules, the contrast of the photomicrographic images being sensitive to the electrochemically-induced change, and, thus, also being characteristic of said adsorbed organic molecules, thereby extending the detection/identification to a single one thereof.

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**5,497,001**

## FLASH TUBE DEVICES

**Andrew S. Filo, Cupertino, Calif., assignor to Dittler Brothers Incorporated, Atlanta, Ga., and Simon Marketing, Inc., Los Angeles, Calif.**

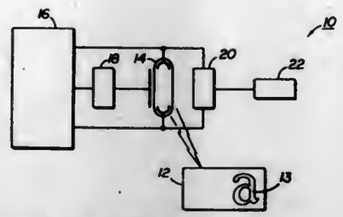
**Filed Sep. 15, 1994, Ser. No. 306,865**
**Int. Cl.[6] G03G** *5/00*
**U.S. Cl. 250—316.1** **24 Claims**

1. An image reproduction apparatus, comprising:

a substrate;

an image on the substrate, the image being responsive to visible light applied thereto for converting the applied visible light into infrared light;

a flash device applying pulses of visible light to the image on the substrate, the intensity and duration of the applied pulses being controlled to result in the conversion of said pulses into an infrared light replica of said image, the flash device comprising:



a source of electrical energy;

a flash tube emitting light in response to said electrical energy;

means for adjusting the electrical energy in response to light emission of the flash tube; and

an image forming layer responsive to said infrared light replica to develop a visible replica of said image.

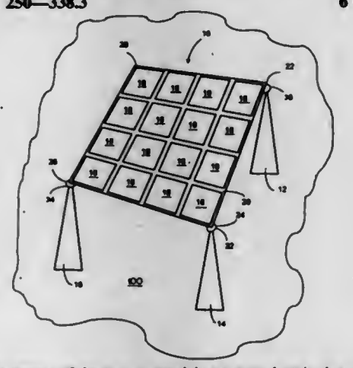
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**5,497,002**

## PYROELECTRIC CRYSTAL ELEMENT AND ARRAY MOUNTING METHOD

**Shankar Baliga, Bethpage, and George Rullman, Dix Hills, both of N.Y., assignors to Servo Corporation of America, Hicksville, N.Y.**

**Filed Oct. 24, 1994, Ser. No. 327,995**
**Int. Cl.[6] G01J** *5/02*
**U.S. Cl. 250—338.3** **6 Claims**



1. In a sensor of the type comprising a pyroelectric detector, the improvement comprising a plurality of flexible legs extending from a base to the pyroelectric detector, each of said plurality of legs reaching a portion of a preselected reduced diameter, said portions of reduced diameter being fixed to said pyroelectric detector and said flexible legs providing a sbock mounting for said pyroelectric detector to said base.

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**5,497,003**

## PYROELECTRIC DETECTOR ARRAY WITH OPTICAL FILTER ELEMENTS

**Shankar B. Baliga, Bethpage, and George Rullman, Dix Hills, both of N.Y., assignors to Servo Corporation Of America, Hicksville, N.Y.**

**Filed Feb. 15, 1995, Ser. No. 389,153**
**Int. Cl.[6] G01J** *3/36;5/08*
**U.S. Cl. 250—338.3** **8 Claims**

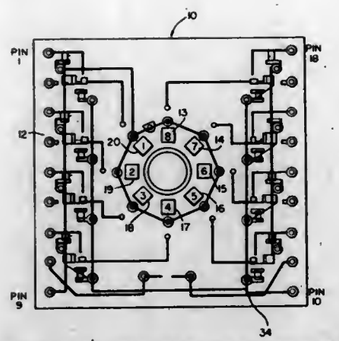
1. A thermal detector comprising:

a substrate;

a plurality of pyroelectric detector elements on said substrate;

electronics on said substrate for interfacing outputs of said plurality of pyroelectric detector elements;






a plurality of optical filter elements, each of said optical filter elements having a different preselected optical passband and corresponding to one of said pyroelectric detector elements; and

means for holding said plurality of optical filter elements immediately adjacent to said pyroelectric detector elements so that incident radiation striking any one of said optical filter elements passes only through to the pyroelectric detector element in correspondence with said one optical filter element and does not pass through to any other of said pyroelectric detector elements of said plurality.

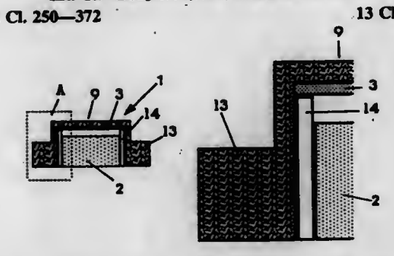
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**5,497,004**

## ULTRAVIOLET SENSOR

**Bernd Rudolph, Alzenau; Frank Kellner, Hammersbach, and Uwe Kroenert, Bruchkoebel, all of, Germany, assignors to Heraeus Xenotest GmbH, Hanau, Germany**

**Filed Nov. 8, 1994, Ser. No. 337,447**
**Claims priority, application Germany, Nov. 12, 1993, 43 38 807.8; Sep. 29, 1994, 44 34 858.4**
**Int. Cl.[6] G01J** *1/04;5/08;* **G02B** *1/00;5/02*
**U.S. Cl. 250—372** **13 Claims**




1. A UV sensor comprising an $SiO_2$-containing dispersive element disposed ahead of a photodetector in the direction of incident UV radiation, wherein said dispersive element comprises quartz glass having interior boundary surfaces whose orientations are statistically homogeneously distributed.

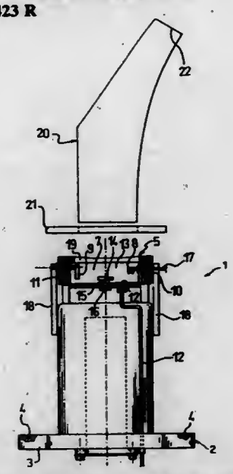
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**5,497,005**

## METHOD AND APPARATUS FOR PRODUCING A STREAM OF IONIC ALUMINUM

**Candido Medulla, Trecastagni (CT), and Mario Raspagliesi, S.Giovanni La Punta (CT), both of, Italy, assignors to Consorzio per la Ricerca sulla Microelettronica nel Mezzogiorno, Catania, Italy**

**Filed Jul. 26, 1994, Ser. No. 280,759**
**Int. Cl.[6] H01J** *27/00*
**U.S. Cl. 250—423 R** **9 Claims**



1. A method for producing a stream of ionic aluminum, particularly intended for aluminum ion implantation in the microelectronics industry, comprising the steps of:

supplying a stream of an ionization gas into an ionization chamber;

providing an amount of an aluminum-containing feed material inside the ionization chamber;

generating, within the ionization chamber, an electron flow by supplying an electrode with a large current;

bombarding the ionization gas stream with the electron flow to create a plasma;

causing the plasma to attack the feed material so as to become enriched with aluminum ions;

taking the plasma out of the ionization chamber;

removing from the plasma, by application of a magnetic field, those ions which have a significantly different equivalent weight from the equivalent weight of the aluminum ions;

wherein the ionization gas and the feed material are selected to produce ions having a significantly different equivalent weight from an equivalent weight of the aluminum ions.

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**5,497,006**

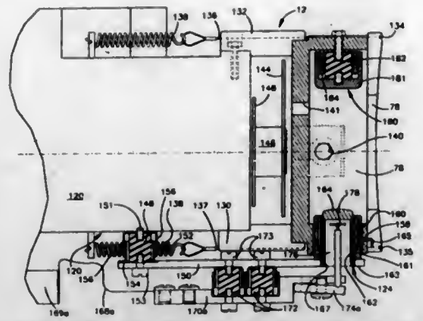
## ION GENERATING SOURCE FOR USE IN AN ION IMPLANTER

**Piero Sferlazzo, Lynnfield; Edward K. McIntyre, Jr., Franklin; William E. Reynolds, Topsfield; Richard M. Cloutier, Salisbury, and Thomas N. Horsky, Boxborough, all of Mass., assignors to Eaton Corporation, Cleveland, Ohio**

**Filed Nov. 15, 1994, Ser. No. 339,554**
**Int. Cl.[6] H01J** *37/08*
**U.S. Cl. 250—427** **19 Claims**

1. An ion source for use in an ion implanter, said ion source comprising:

a) a confinement chamber having conductive chamber walls that bound a confinement chamber interior and which defines an ion exit aperture to allow ions to exit the confinement chamber, said confinement chamber further defining an access opening in one of the conductive chamber walls at a location



spaced from the exit aperture that allows access to the chamber interior from outside the chamber;

b) a base for supporting said confinement chamber in a position relative to structure spaced from the confinement chamber for forming an ion beam from ions exiting said confinement chamber through the ion exit aperture;

c) a supply in communication with said confinement chamber for delivering an ionizable material into the interior of the confinement chamber;

d) a cathode supported by said base and positioned with respect to said confinement chamber to emit ionizing electrons into the chamber interior for ionizing said material, said cathode comprising a tubular conductive body that extends through the access opening into said confinement chamber and supports a conductive cap at one end that faces into the interior of the confinement chamber and that has an open end at a location axially opposite said conductive cap;

e) a filament supported by said base at a position inside the tubular conductive body of said cathode for heating said cap to cause the ionizing electrons to be emitted from the conductive cap into said confinement chamber;

f) a first mounting arm that is spaced from said base by at least one insulator and that supports the cathode within the access opening in a spaced relation to the conductive chamber wall that defines the access opening while positioning the conductive cap in the interior of said confinement chamber: and

g) mounting structure electrically isolated from the first mounting arm that extends into the open end of said tubular conductive body to support the filament in spaced relation to the conductive cap of said cathode.

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**5,497,007**

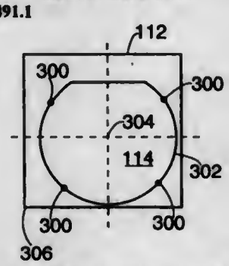
## METHOD FOR AUTOMATICALLY ESTABLISHING A WAFER COORDINATE SYSTEM

**Yuri S. Uritsky, Newark, and Harry Q. Lee, Mountain View, both of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.**

**Filed Jan. 27, 1995, Ser. No. 379,246**

**Int. Cl.[6] G01B** *21/04*

**U.S. Cl. 250—491.1** **20 Claims**




1. A method for establishing a wafer coordinate system comprising the steps of:

(a) setting an initial magnification level for a wafer imaging system;

(b) determining coordinates of a wafer center location in an imaging system coordinate system;

(c) increasing the magnification level of the wafer imaging system;

(d) repeating step (b) and (c) until a maximum magnification level is attained;

(e) resetting the magnification level to the initial magnification level;

(f) determining coordinates of a wafer landmark location in an imaging system coordinate system;

(g) increasing the magnification level of the wafer imaging system;

(h) repeating step (f) and (g) until a maximum magnification level is attained;

(i) defining a wafer coordinate system.

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**5,497,008**

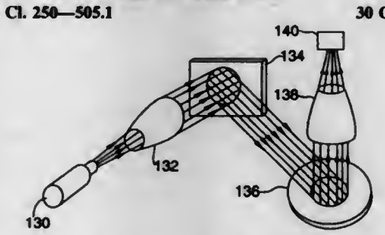
## USE OF A KUMAKHOV LENS IN ANALYTIC INSTRUMENTS

**Muradin A. Kumakhov, Moscow, U.S.S.R., assignor to X-Ray Optical Systems, Inc., Albany, N.Y.**

**Continuation of Ser. No. 259,337, Jun. 13, 1994, abandoned, which is a continuation of Ser. No. 678,437, Apr. 1, 1991, abandoned, which is a continuation-in-part of Ser. No. 678,208, Apr. 1, 1991, Pat. No. 5,192,869, which is a continuation-in-part of Ser. No. 607,456, Oct. 13, 1990, abandoned. This application Feb. 1, 1995, Ser. No. 383,605**

**Int. Cl.[6] G02B** *5/124*

**U.S. Cl. 250—505.1** **30 Claims**




1. An analytical instrument for analyzing a sample by means of analysis radiation, the analysis radiation being selected from the group consisting of x-ray radiation, gamma-ray radiation, neutron-beam radiation, and ion-beam radiation, the instrument comprising:

(a) a radiation source adapted to produce source analysis radiation, the source analysis radiation selected from the group consisting of x-ray radiation, gamma-ray radiation, neutron-beam radiation, and ion-beam radiation;

(b) sample-positioning means for positioning a sample in a sample-irradiation position for irradiating the sample with analysis radiation from the source analysis radiation produced by the radiation source;

(c) a radiation detector for detecting analysis radiation from the sample, an instrument radiation path being defined from the radiation source to the radiation detector, the sample-irradiation position being located in the radiation path at a position intermediate between the radiation source and the radiation detector; and

(d) a multiple-channel, multiple-total-external-reflection lens positioned in the instrument radiation path at a radiation-reorientation position, the multiple-channel, multiple-total-external-reflection lens including at least one polycapillary-bundle element, each polycapillary-bundle element being a substantially unitary structure having a plurality of passageways extending through the polycapillary bundle element in a generally longitudinal direction to define a plurality of capillary-channel passageways, each capillary-channel passageway having substantially smooth inner-surface portions



capable of providing total external reflection of analysis radiation incident upon the surface portions at an angle below a critical angle of total external reflection for radiation of the energy of the analysis radiation, each capillary-channel passageway having a longitudinal axis defined extending longitudinally through the capillary channel passageway, each polycapillary-bundle element having an input radiation-capture face and an output radiation-emission face, each capillary-channel passageway of the polycapillary-bundle element opening at a first end through the input radiation-capture face of the polycapillary-bundle element to define a radiation-capture input opening of the passageway, each capillary-channel passageway of the polycapillary-bundle element opening at a second end through the output radiation-emission face of the polycapillary-bundle element to define a radiation-emission output opening of the passageway, each polycapillary-bundle element being shaped so that the longitudinal axis of each of the capillary channel passageways of the element polycapillary bundle extend substantially parallel to a curvilinear path which defines a multiple-reflection total-external-reflection path associated with the passageway, the multiple-reflection total-external-reflection path being defined so that for each capillary-channel passageway analysis radiation incident upon the radiation-capture input opening of the capillary-channel passageway propagating in a direction sufficiently close to the direction of the longitudinal axis of the passageway at the radiation-capture input opening can be channeled through the passageway in a series of reflections by total external reflection from inner wall surfaces of the passageway, the number of such reflections by total external reflection for each passageway being generally greater than two, each polycapillary-bundle element of the multiple-channel, multiple-total-external-reflection lens being shaped to capture at the respective input radiation-capture face, reorient, and emit from the output-emission face analysis radiation so that the multiple-channel, multiple-total-external-reflecting lens captures, reorients, and emits analysis radiation in the radiation path of the analytical instrument.

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**5,497,009**

## PHOTOELECTRIC SMOKE SENSOR AND FIRE DETECTING SYSTEM, AND SENSITIVITY TESTING METHOD THEREFOR

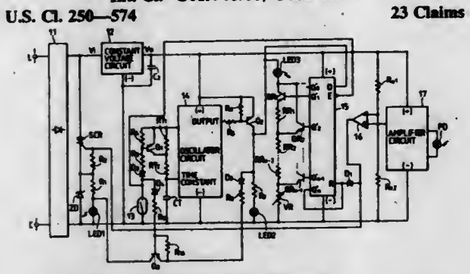
**Yasuo Torikoshi; Naoki Kosugi, and Tetsuya Nagashima, all of Tokyo, Japan, assignors to Hochiki Corporation, Tokyo, Japan**

**Filed Oct. 27, 1994, Ser. No. 329,906**

**Claims priority, application Japan, Jan. 29, 1993, 5-271134; May 6, 1994, 6-094087**

**Int. Cl.[6] G01N** *15/06;* **G08B** *17/10*

**U.S. Cl. 250—574** **23 Claims**



1. A photoelectric smoke sensor comprising:

first light emitting means for emitting light to detect scattered light due to smoke;

first light receiving means for receiving the scattered light due to smoke;

second light emitting means for lighting continuously when a quantity of light received by said light receiving means is equal to or more than a threshold value;

sensitivity test starting means for starting a sensitivity test of said photoelectric smoke sensor;

third light emitting means for blinking with a predetermined period to emit light to said light receiving device;

blinking starting means for starting to blink said second light emitting means when said test is started;

increment means for increasing in steps a quantity of light received by said light receiving means;

comparison means for comparing the threshold value with said quantity of light received by said light receiving means; and

lighting continuing means for stopping the blinking of said second light emitting means and to continue the lighting of said second light emitting means when the quantity of light received by said light receiving means is greater than or equal to the threshold value.

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**5,497,010**

## HIGH-VOLTAGE SEMICONDUCTOR DEVICE

**Manfred Vogel, Ditzingen-Heimerdingen; Werner Herden, Gerlingen; Volkmar Denner, Pfullingen, and Anton Mindl, Tuebingen, all of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany**

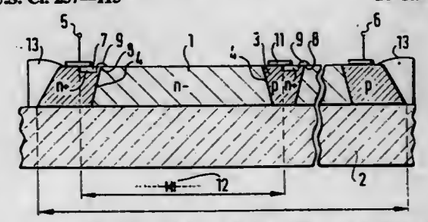
**PCT No. PCT/DE91/00900, § 371 Date Jun. 16, 1993, § 102(e) Date Jun. 16, 1993, PCT Pub. No. WO92/11659, PCT Pub. Date Jul. 19, 1992**

**PCT Filed Nov. 16, 1991, Ser. No. 78,281**

**Claims priority, application Germany, Dec. 22, 1990, 40 41 581.3; Mar. 16, 1991, 41 08 611.2**

**Int. Cl.[6] H01L** *29/74;31/111*

**U.S. Cl. 257—113** **20 Claims**




1. High-voltage semiconductor device comprising a single chip having a plurality of semiconductor elements connected in series with each other, said single chip comprising:

an insulating substrate (2);

a monocrystalline semiconductor carrier (1) of a first conductivity type formed on said insulating substrate (2);

at least two terminals (5,6), said at least two terminals being located on opposite sides of said chip;

a plurality of strip-like areas (3) of a second conductivity type formed in said monocrystalline semiconductor carrier (1), wherein said monocrystalline semiconductor carrier (1) is n-doped and each of said strip-like areas (3) is p-doped and extends across said semiconductor carrier (1) at right angles to a direction between said at least two terminals at said opposite sides and said strip-like areas (3) are spaced from each other in said direction over said single chip and penetrate an entire thickness of said semiconductor carrier to form said semiconductor elements;

an adjoining $n^+$-doped area provided in each of said p-doped strip-like areas (3); and

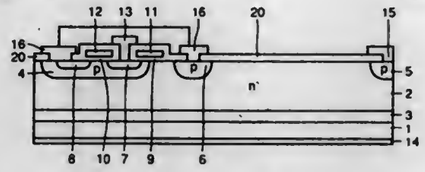
a metallic coating (11) partially covering at least one of said p-doped strip-like areas and said adjoining $n^+$-doped area.

**5,497,011**

## SEMICONDUCTOR MEMORY DEVICE AND A METHOD OF USING THE SAME

**Tomohide Terashima, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Jun. 2, 1995, Ser. No. 459,219**
**Claims priority, application Japan, Sep. 19, 1994, 6-222991**
**Int. Cl.[6] H01L** *29/74*
**U.S. Cl. 257—147** **12 Claims**




1. A semiconductor device comprising:
a semiconductor layer of a first conductivity type having a main surface;
a first impurity region of a second conductivity type formed at a predetermined region on said main surface of said semiconductor layer;
second and third impurity regions of the first conductivity type formed on said main surface of said first impurity region with a predetermined space between each other;
a fourth impurity region of the second conductivity type formed on said main surface of said semiconductor layer with a predetermined space with respect to said first impurity region;
a fifth impurity region of the second conductivity type formed on a region of said main surface of said semiconductor layer located between said first and fourth impurity regions;
a first gate electrode formed on a region of said main surface of said first impurity region located between a side end of said second impurity region remote from said third impurity region and said main surface of said semiconductor layer;
a second gate electrode formed on a region of said main surface of said first impurity region located between said second and third impurity regions;
a cathode electrode formed in contact with said second impurity region;
an anode electrode formed in contact with said fourth impurity region; and
a short-circuit electrode formed in contact with both said first and third impurity regions, wherein
said first and fifth impurity regions are electrically short-circuited.

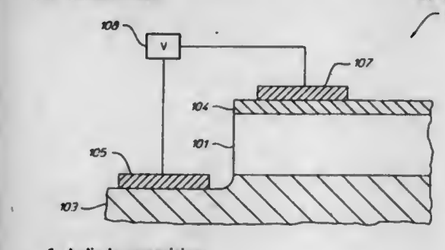
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**5,497,012**

## UNIPOLAR BAND MINIMA DEVICES

**Nicolas J. Moll, La Honda, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed Jun. 15, 1994, Ser. No. 259,808**
**Int. Cl.[6] H01L** *31/0328;29/06;31/0336;31/072*
**U.S. Cl. 257—183** **20 Claims**




1. A diode comprising:
a first semiconductor material having a type of majority carriers, having a main sub-band, and having
a sub-band ordering associated with the majority carriers;
a second semiconductor material arranged so as to contact the first material at a region, the second semiconductor material having the same type of majority carriers as the first semiconductor material, the second material further having a satellite sub-band, and having a sub-band ordering associated with the majority carriers that is different from that of the first semiconductor material;
a heterojunction comprising the region where the second semiconductor material contacts the first semiconductor material; the heterojunction including an energy barrier between the main sub-band of the first semiconductor material and the satellite sub-band of the second semiconductor material; and
a first electrical contact and a second electrical contact respectively coupled to each of the first and second semiconductor materials for applying a voltage to control a flow of the majority carriers across the heterojunction.

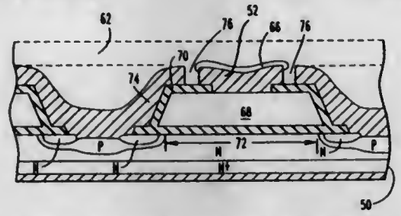
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**5,497,013**

## SEMI-CONDUCTOR CHIP HAVING INTERDIGITATED GATE RUNNERS WITH GATE BONDING PADS

**Victor A. K. Temple, Clifton, N.Y., assignor to Harris Corporation, Melbourne, Fla.**

**Division of Ser. No. 51,832, Apr. 26, 1993, Pat. No. 5,366,932.**
**This application Jul. 18, 1994, Ser. No. 276,464**
**Int. Cl.[6] H01L** *23/48;29/44;29/52;29/60*
**U.S. Cl. 257—203** **12 Claims**




1. A cellular semiconductor chip with a first electrode in intercellular spaces and a second electrode overlying the cells, both electrodes on a chip upper surface that is to be covered with a lid, the chip comprising:
plural runners overlying and contacting said first electrode in predetermined intercellular spaces, the plural runners being applied in the same processing step as the second electrode, each of the plural runners having a widened area where said runners may be bonded to the lid lower surface.

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**5,497,014**

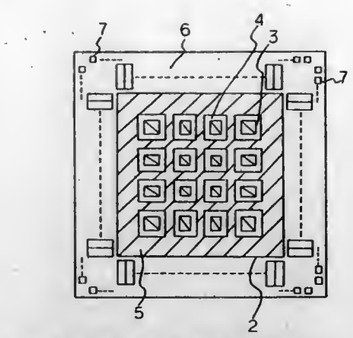
## BI-CMOS GATE ARRAY SEMICONDUCTOR INTEGRATED CIRCUITS AND INTERNAL CELL STRUCTURE INVOLVED IN THE SAME

**Takayuki Momose, Kanagawa, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Sep. 2, 1994, Ser. No. 300,132**
**Claims priority, application Japan, Sep. 3, 1993, 5-219386**
**Int. Cl.[6] H01L** *27/10;29/76*
**U.S. Cl. 257—205** **14 Claims**

1. An internal cell structure contained within an internal cell region of a semiconductor integrated circuit, comprising:
a plurality of MOS transistor cell units each including a plurality of MOS transistors; and
a plurality of bipolar junction transistor cell units each including a plurality of bipolar junction transistors;
whereby a distribution ratio is obtained by comparing a number of said plurality of MOS transistor cell units to a number of said plurality of bipolar junction transistor cell units;






wherein said internal cell region comprises:
a first region having a high distribution ratio;
a third region having a low distribution ratio; and
a second region having an intermediate distribution ratio which is lower in distribution ratio than said high distribution ratio and higher in distribution ratio than said low distribution ratio.

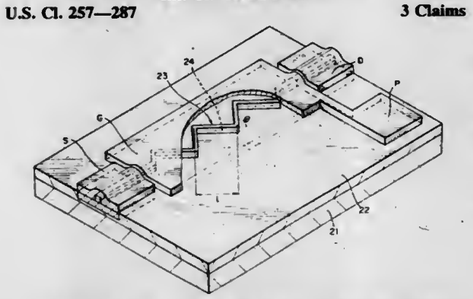
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**5,497,015**

## QUANTUM INTERFERENCE TRANSISTOR

**Akira Ishibashi; Kenji Funato, both of Kanagawa, and Yoshifumi Mori, Chiba, all of, Japan, assignors to Sony Corporation, Tokyo, Japan**

**Filed Nov. 13, 1989, Ser. No. 435,987**
**Claims priority, application Japan, Nov. 12, 1988, 1-286568; Dec. 20, 1988, 1-321749; Apr. 21, 1989, 2-102790**
**Int. Cl.[6] H02L** *29/80*
**U.S. Cl. 257—287** **3 Claims**




1. A semiconductor device in which a channel portion comprising a zigzag line is provided between a source and a drain, said zigzag line having a width which is negligible in comparison to the length of said line.

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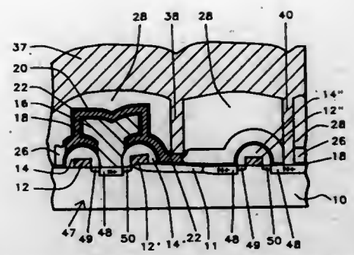
**5,497,016**

## STACKED DRAM POLY PLATE CAPACITOR

**Chao-Ming Koh, Hsinchu, Taiwan, Prov. of China, assignor to Industrial Technology Institute Research, Hsinchu, Taiwan, Prov. of China**

**Division of Ser. No. 114,150, Sep. 1, 1993, Pat. No. 5,364,813.**
**This application Nov. 4, 1994, Ser. No. 334,271**
**Int. Cl.[6] H01L** *27/108*
**U.S. Cl. 257—306** **19 Claims**

1. A device comprising an integrated circuit capacitor on a semiconductor substrate comprising
a first insulating layer formed on said substrate,
a first doped polysilicon, conducting, capacitor node structure, a second insulating layer, and an outer, second capacitor plate layer, said capacitor node structure having a projecting overhang extending over portions of said second insulating layer and portions of said second capacitor plate layer, said substrate and said insulating layer,
said second insulating layer formed over all exposed surfaces of said capacitor node structure including the surfaces of said projecting overhang and the remainder of said substrate,
said outer capacitor plate layer formed over said second insulating layer, said second insulating layer serving as a capacitor dielectric between said node and said outer capacitor plate layer,
a third insulating layer comprising silicon nitride formed on said outer capacitor plate,
a blanket smoothed BPSG dielectric layer formed over said device,
a via hole formed in said smoothed BPSG dielectric layer down through said BPSG dielectric layer and said third insulating layer to said outer capacitor plate layer, and
a blanket metal layer formed on said device extending down into contact with said outer capacitor plate layer.



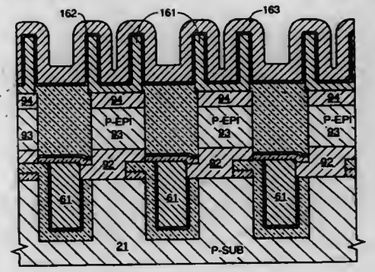

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**5,497,017**

## DYNAMIC RANDOM ACCESS MEMORY ARRAY HAVING A CROSS-POINT LAYOUT, TUNGSTEN DIGIT LINES BURIED IN THE SUBSTRATE, AND VERTICAL ACCESS TRANSISTORS

**Fernando Gonzales, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.**

**Filed Jan. 26, 1995, Ser. No. 378,424**
**Int. Cl.[6] H01L** *27/108;29/76*
**U.S. Cl. 257—306** **19 Claims**




1. A dynamic random access memory array fabricated on a semiconductor substrate comprising:
(a) a series of parallel metal digit lines, each digit line being at least partially buried within a dielectrically lined trench in the substrate; and
(b) a plurality of individual memory cells arranged in a cross-point layout, each cell having both a cell capacitor located at a level that is above the digit lines and an insulated-gate field-effect access transistor, said transistor having first and second source/drain regions and a vertical channel, said source/drain regions and said channel being formed in

expitaxially-grown semiconductor material, said transistor selectively coupling the capacitor to one of said digit lines.

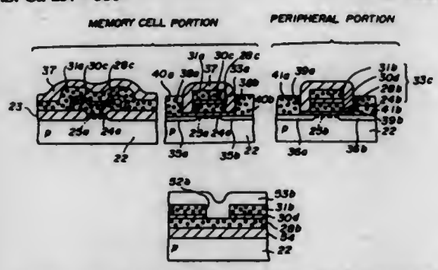
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**5,497,018**

## SEMICONDUCTOR MEMORY DEVICE HAVING A FLOATING GATE WITH IMPROVED INSULATION FILM QUALITY

**Tatsuya Kajita, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan**

**Division of Ser. No. 974,721, Nov. 13, 1992, Pat. No. 5,449,629. This application Aug. 31, 1994, Ser. No. 297,552**
**Claims priority, application Japan, Nov. 14, 1991, 3-299281**
**Int. Cl.[6] H01L** *29/788*
**U.S. Cl. 257—316** **2 Claims**



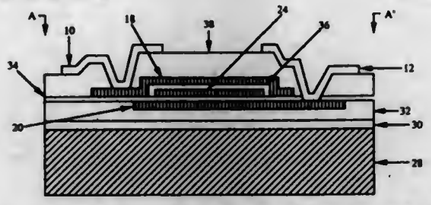

1. A non-volatile semiconductor memory device, comprising:
a substrate defined with a first device region and a second device region;
a first gate insulation film provided on said substrate so as to cover said substrate in correspondence to said first device region, said first gate insulation film having a thickness so as to allow a tunneling of carriers therethrough;
a second gate insulation film provided on said substrate so as to cover said substrate in correspondence to said second device region;
a first electrode provided on said first gate insulation film;
a second electrode provided on said second gate insulation film;
a first dielectric film provided on said first electrode so as to cover an upper major surface and a side wall thereof, said first electrode thereby forming an isolated, floating electrode surrounded by said first gate insulation film and said first dielectric film;
a second dielectric film provided on said second electrode;
a third electrode provided on said first dielectric film;
a fourth electrode provided on said second dielectric film; and
a contact hole provided on said second dielectric film for contacting said second electrode and fourth electrode electrically with each other;
said first and second electrodes having a substantially identical composition and thickness;
said third and fourth electrodes having a substantially identical composition and thickness;
said first and second dielectric films having a substantially identical composition and thickness;
said first gate insulation film, said first electrode, said first dielectric film and said third electrode forming thereby a memory cell transistor that store information in said first electrode in the form of electric charges;
said second gate insulation film, said second electrode, said second dielectric film and said fourth electrode forming thereby a peripheral transistor,
wherein said contact hole exposes the surface of said second electrode, said second electrode and said fourth electrode establishing an electrical contact at said contact hole by a fifth electrode provided on said fourth electrode so as to fill said contact hole.

**5,497,019**

## SILICON-ON-INSULATOR GATE-ALL-AROUND MOSFET DEVICES AND FABRICATION METHODS

**Donald C. Mayer, Palos Verdes, and Kenneth P. MacWilliams, Redondo Beach, both of Calif., assignors to The Aerospace Corporation, El Segundo, Calif.**

**Filed Sep. 22, 1994, Ser. No. 310,915**
**Int. Cl.[6] H01L** *21/70*
**U.S. Cl. 257—347** **6 Claims**



1. A MOSFET device having a gate all around structure for enhanced depletion mode operation, said device comprising:
a semiconductor layer having a source region and
a channel region and
a drain region,
a bottom gate dielectric disposed under said semiconductor layer,
a bottom gate electrode disposed under said bottom gate dielectric, said semiconductor layer is not in contact with said bottom gate electrode as separated by said bottom gate dielectric,
a top gate dielectric disposed over said drain region and said channel region and said source region of said semiconductor layer,
a top gate electrode disposed over said top gate dielectric, said topgate electrode and said channel region and said bottom gate are disposed in alignment with each other,
a bottom insulating layer deposited and disposed under said bottom gate electrode and having a flat bottom surface, and
a substrate of a semiconductor material having a bulk portion and an insulating oxide layer portion thermally grown from said bulk portion, said insulating oxide layer portion having uniform thickness and a flat top surface which is bonded to said flat bottom surface of said bottom insulating layer creating a flat planar interface therebetween.

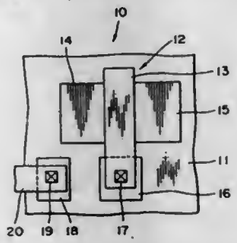
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**5,497,020**

## CHARGE DRAIN FOR A MIS DEVICE

**Junya Suzuki, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Continuation of Ser. No. 36,241, Mar. 24, 1993, abandoned. This application Aug. 2, 1994, Ser. No. 284,759**
**Claims priority, application Japan, Mar. 25, 1992, 4-098797**
**Int. Cl.[6] H01L** *23/62;27/148*
**U.S. Cl. 257—356** **7 Claims**



1. A semiconductor device having a MIS structure which comprises a semiconductor body, an insulating layer over a surface of said semiconductor body, and a gate electrode on said insulating layer formed over an active area, said semiconductor device comprising:
a charge draining region formed on said semiconductor body which has a portion remote from said active area, wherein said gate electrode extends to said portion of said charge draining region and is directly connected thereto so as to drain charges from said gate electrode and a high concentration region formed in an upper layer of said semiconductor body and a conductor with one end connected to ground potential and the other end connected to said high concentration region.



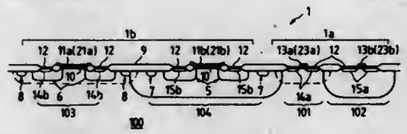
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**5,497,021**

## CMOS STRUCTURE WITH VARYING GATE OXIDE THICKNESS AND WITH BOTH DIFFERENT AND LIKE CONDUCTIVITY-TYPE GATE ELECTRODES

**Gen Tada, Kawasaki, Japan, assignor to Fuji Electric Co., Ltd., Kanagawa, Japan**

**Continuation of Ser. No. 53,273, Apr. 28, 1993, abandoned. This application Dec. 7, 1994, Ser. No. 351,569**
**Claims priority, application Japan, Apr. 30, 1992, 4-111330**
**Int. Cl.[6] H01L** *29/94*
**U.S. Cl. 257—369** **4 Claims**



1. A semiconductor device, comprising:
a first MIS transistor circuit including a first-conductivity-type first MIS transistor and a second-conductivity-type second MIS transistor on a surface side of a semiconductor substrate, impurities of the same conductivity type being introduced into gate electrodes of said first MIS transistor and said second MIS transistor; and
a second MIS transistor circuit including a first-conductivity-type third MIS transistor and a second-conductivity-type fourth MIS transistor, the thicknesses of gate insulating films of said third MIS transistor and said fourth MIS transistor being larger than the thicknesses of gate insulating films of said first MIS transistor and said second MIS transistor of said first MIS transistor circuit, a gate electrode of said first-conductivity-type third MIS transistor being formed of polycrystalline silicon into which a first-conductivity-type impurity is introduced, and a gate electrode of said second-conductivity-type fourth MIS transistor being formed of polycrystalline silicon into which a second-conductivity-type impurity is introduced.

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**5,497,022**

## SEMICONDUCTOR DEVICE AND A METHOD OF MANUFACTURING THEREOF

**Osamu Sakamoto, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Jan. 24, 1994, Ser. No. 185,439**
**Claims priority, application Japan, Jan. 22, 1993, 5-009372; Dec. 22, 1993, 5-325041**
**Int. Cl.[6] H01L** *29/78*
**U.S. Cl. 257—377** **16 Claims**

1. A semiconductor device comprising:
a semiconductor layer,
a polycrystalline silicon layer formed on said semiconductor layer with an oxide film therebetween, and having an end portion,
an interlayer insulating layer formed to cover a surface of said semiconductor layer and a surface of said polycrystalline silicon layer,
a contact hole formed to expose a surface of said semiconductor layer in the proximity of said end portion of said polycrystalline silicon layer and a surface of said end portion of said polycrystalline silicon layer, and
a silicon layer embedded in said contact hole so as to directly come into contact with the surface of said end portion of said polycrystalline silicon layer and said surface of said semiconductor layer, said silicon layer having an upper surface which is essentially flat along its entire length,
wherein said polycrystalline silicon layer and said silicon layer have the same type of conductivity.

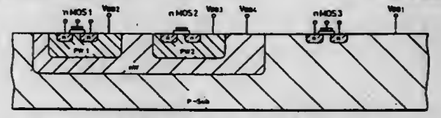
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**5,497,023**

## SEMICONDUCTOR MEMORY DEVICE HAVING SEPARATELY BIASED WELLS FOR ISOLATION

**Shinji Nakazato; Hideaki Uchida; Yoshikasu Saito; Masahiro Yamamura, all of Takasaki; Yutaka Kobayashi, Katsuta; Takahide Ikeda, Tokorozawa; Ryoichi Hori; Goro Kitsukawa, both of Hinode; Kiyoo Itoh, Higashikurume, all of, Japan; Nobuo Tanba, Palo Alto, Calif.; Takao Watanabe, New Haven, Conn.; Katsuhiro Shimohigashi, Musashimurayama, and Noriyuki Homma, Kodaira, both of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Division of Ser. No. 229,340, Apr. 12, 1994, Pat. No. 5,386,135, which is a division of Ser. No. 769,680, Oct. 2, 1991, Pat. No. 5,324,982, which is a continuation of Ser. No. 645,351, Jan. 23, 1991, Pat. No. 5,148,255, which is a continuation of Ser. No. 262,030, Oct. 25, 1988, abandoned, which is a continuation-in-part of Ser. No. 899,405, Aug. 22, 1986, abandoned, Ser. No. 87,256, Jul. 13, 1987, abandoned, and Ser. No. 29,681, Mar. 24, 1987, abandoned. This application Dec. 8, 1994, Ser. No. 352,238**
**Claims priority, application Japan, Sep. 25, 1985, 60-209971; Nov. 20, 1985, 60-258506; Mar. 24, 1986, 61-64055; Mar. 26, 1986, 61-65696; Aug. 1, 1986, 61-179913; WIPO, Nov. 12, 1986, PCT/JP86/00579**
**Int. Cl.[6] H01L** *29/78*
**U.S. Cl. 257—394** **15 Claims**



1. A semiconductor integrated circuit device comprising:
a semiconductor substrate having a main surface of a first conductivity type;
a first semiconductor region of a second conductivity type, opposite to said first conductivity type, formed in said main surface of said semiconductor substrate;
a second semiconductor region of said first conductivity type formed in said first semiconductor region;
a first MISFET of said second conductivity type formed in a first region of said main surface of said semiconductor substrate, said first region being different from said first semiconductor region; and
a second MISFET of said second conductivity type formed in a surface of said second semiconductor region,

wherein a first voltage is to be applied to said first semiconductor region, a second voltage is to be applied to said second semiconductor region, and a third voltage is to be applied to said main surface of said semiconductor substrate, such that said first voltage is to be applied to said first semiconductor region for electrically isolating said second semiconductor region from said main surface of said semiconductor substrate, and wherein a value of said second voltage is to be different from that of said third voltage.

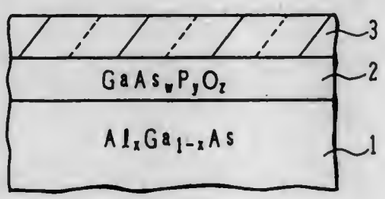
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**5,497,024**

## GAAS MIS DEVICE

**Akira Shibuya, Narashino; Kazuo Hattori, 1-3, Uehara, Ogasaki-cho, Toyohashi-shi, Aichi, and Masashi Ozeki, Tsukuba, all of, Japan, assignors to Asahi Kogyosha Co., Ltd., Tokyo; Kazuo Hattori, Toyohashi, and Fujitsu Limited, Kawasaki, all of, Japan**

**Filed Apr. 5, 1994, Ser. No. 223,501**
**Claims priority, application Japan, Jun. 8, 1993, 5-137214**
**Int. Cl.[6] H01L** *23/58;29/76*
**U.S. Cl. 257—410** **16 Claims**




1. A semiconductor device comprising:
a $Al_xGa_{1-x}As$ ($0<x\leqq 1$) semiconductor region; and
a $GaAs_wP_yO_z$ (w, y, z>0) insulating film formed on the surface of the semiconductor region.

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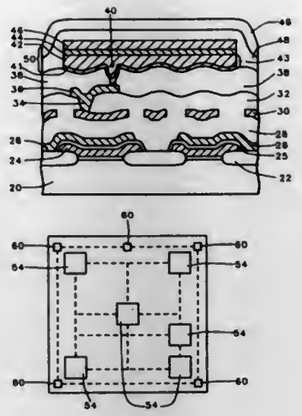
**5,497,025**

## METHODS TO FABRICATE LARGE HIGHLY REFLECTIVE METAL REFLECTOR PLATES FOR APPLICATIONS IN GAME CHIPS OR SIMILAR VIRTUAL IMAGE PROJECTION USE

**George Wong, Singapore, Singapore, assignor to Chartered Semiconductor Manufacturing, Singapore, Singapore**

**Division of Ser. No. 231,503, Apr. 22, 1994, Pat. No. 5,393,700. This application Feb. 13, 1995, Ser. No. 387,179**
**Int. Cl.[6] H01L** *31/0224;31/0232*
**U.S. Cl. 257—435** **14 Claims**

1. An integrated circuit chip comprising:
a memory cell and associated circuitry on and within said integrated circuit chip;
a plurality of highly reflective surfaces formed on the surface of said integrated circuit chip wherein said reflective surfaces comprise:
a first layer of aluminum with a thickness of between about 1500 and 2000 Angstroms;
a second layer of aluminum with a thickness of between about 2000 and 5000 Angstroms, over said first layer of aluminum, having a grain size of between about 3 and 10 micrometers;
a conductive layer over said second layer of aluminum, with a thickness of between about 400 and 800 Angstroms;
a layer of pure aluminum over said layer of titanium, having a grain size of less than about 0.5 micrometers; and
a plurality of I/O pads formed on the surface of said integrated circuit chip for I/O connections to said memory cell and associated circuitry.







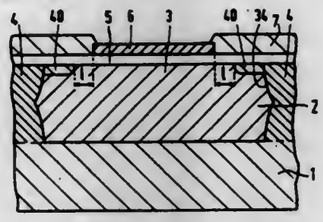
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**5,497,026**

## SEMICONDUCTOR DEVICE WITH IMPROVED BREAKDOWN VOLTAGE CHARACTERISTICS

**Dirk A. Vogelzang, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**

**Continuation of Ser. No. 202,719, Feb. 23, 1994, abandoned, which is a continuation of Ser. No. 907,422, Jul. 1, 1992, abandoned. This application Jan. 13, 1995, Ser. No. 372,699**
**Claims priority, application European Pat. Off., Jul. 2, 1991, 91201690**
**Int. Cl.[6] H01L** *23/58;23/48*
**U.S. Cl. 257—487** **3 Claims**




1. A semiconductor device comprising a semiconductor body with an electrically-isolated island-shaped region of a first conductivity type adjoining a surface of the semiconductor body and being surrounded by an isolating region of a second, opposite conductivity type with which the island-shaped region forms a pn-junction, and means for maintaining said electrically-isolated island-shaped region at a floating potential, said means comprising the electrically-isolated island-shaped region being completely covered by a continuous insulating layer on which a contact pad is provided, the lateral extent of said contact pad being less than the lateral extent of said island-shaped region in all directions; and the device being provided with means for increasing the breakdown voltage of the pn-junction between the island-shaped region and the isolating region, said means being everywhere laterally spaced from said contact pad and extending around the periphery of said island-shaped region.

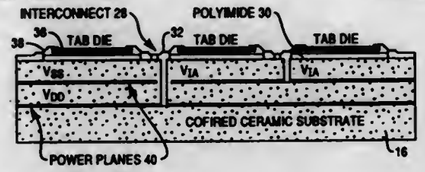


**5,497,027**

## MULTI-CHIP MODULE PACKAGING SYSTEM

**Harold S. Crafts, Colorado Springs, Colo., assignor to AT&T Global Information Solutions Company, Dayton, Ohio; Hyundai Electronics America, Milpitas, Calif., and Symbios Logic Inc., Fort Collins, Colo.**

**Filed Nov. 30, 1993, Ser. No. 159,898**
**Int. Cl.[6] H01L** *23/02*
**U.S. Cl. 257—528** **35 Claims**




1. A logic cube, comprising:
(a) a base plate;
(b) at least two backplanes mechanically mounted to the base plate;
(c) a plurality of substrates mechanically mounted between the backplanes and electrically coupled thereto, each substrate having voltage and ground vias, wherein the power planes and ground planes are sandwiched by dielectric and selectively connected to the vias;
(d) at least one logic chip mounted on each of the substrates;
(e) at least one interconnect chip mounted on each of the substrates; and
(f) each substrate having a chip-to-chip interconnect pattern therein for electrically interconnecting the backplanes, the logic chips and the interconnect chips.

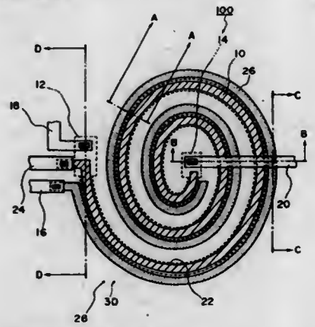
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**5,497,028**

## LC ELEMENT AND SEMICONDUCTOR DEVICE HAVING A SIGNAL TRANSMISSION LINE AND LC ELEMENT MANUFACTURING METHOD

**Takeshi Ikeda, 2-5-6-213, Sanno, Ohta-Ku, Tokyo, Japan, and Susumu Okamura, 4-1-12-1305, Hiroo, Shibuya-ku, Tokyo, Japan**

**Filed Nov. 2, 1994, Ser. No. 335,420**
**Claims priority, application Japan, Nov. 10, 1993, 5-305954; Nov. 29, 1993, 5-323149; Dec. 28, 1993, 5-353810**
**Int. Cl.[6] H01L** *29/00*
**U.S. Cl. 257—531** **82 Claims**




1. An LC element comprising:
a first electrode functioning as a gate having a predetermined shape, said first electrode formed on an insulation layer on a semiconductor substrate,
a second electrode having a predetermined shape, said second electrode formed on said semiconductor substrate at an area adjacent to said first electrode,
a channel formed in said semiconductor substrate at an area corresponding to said first electrode,
a first diffusion region formed near one end of said channel,
a second diffusion region formed near the other end of said channel,
inductors respectively formed from said channel and said second electrode,
a distributed constant type capacitor formed between said channel and said second electrode, and
a signal transmission line formed from at least said channel.

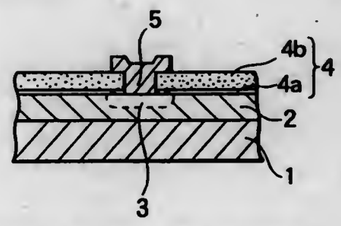
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**5,497,029**

## TIN-INDIUM ANTIMONIDE INFRARED DETECTOR

**Katsuyoshi Fukuda, Yokosuka; Fumio Nakata, Urayasu; Keitaro Shigenaka, Hachioji, and Keijiro Hirahara, Tokyo, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan**

**Filed Sep. 13, 1994, Ser. No. 305,516**
**Claims priority, application Japan, Sep. 14, 1993, 5-229165**
**Int. Cl.[6] H01L** *31/0304*
**U.S. Cl. 257—613** **8 Claims**




1. A compound semiconductor device, comprising:
a substrate composed of indium antimonide (InSb);
a first conductive layer deposited on said substrate and composed of tin-indium antimonide having a composition represented by the chemical formula $Sn_x(InSb)_{1-x}$, where $0.05\leqq x\leqq 0.3$;
a second conductive region that is a semiconductor device region (active region) formed in said first conductive layer;
an electrode provided on said second conductive layer; and
a surface protective film deposited on said first conductive layer except for said electrode portion.

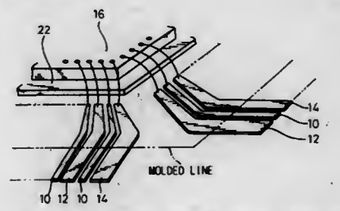
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**5,497,030**

## LEAD FRAME AND RESIN-MOLDED-TYPE SEMICONDUCTOR DEVICE

**Yukiharu Takeuchi, Nagano, Japan, assignor to Shinko Electric Industries Co., Ltd., Nagano, Japan**

**Filed Jun. 15, 1994, Ser. No. 260,322**
**Claims priority, application Japan, Jun. 24, 1993, 5-153350**
**Int. Cl.[6] H01L** *29/52*
**U.S. Cl. 257—676** **10 Claims**




1. A resin-molded-type semiconductor device comprising:
a lead frame comprising:
a die-pad and

a plurality of leads arranged side by side to constitute a co-planar structure and having respective inner lead portions, said plurality of leads comprising:

at least one first lead to be used as a signal lead and at least two second leads to be used as ground or power supply leads arranged at the sides of said signal lead, said second leads are not integrally formed with the die-pad, but individually formed to be separate therefrom;

each said signal lead having a predetermined lead and predetermined distances to the adjacent ground or power supply leads, said width and said distances being determined in such a manner that said signal lead has a desired characteristic impedance;

a semiconductor chip mounted on said die-pad of said lead frame;

connecting means for electrically connecting said semiconductor chip to said plurality of leads; and

a hermetically-sealed resin molding containing at least said semiconductor chip, said die-pad, said inner lead portions and said connecting means.

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**5,497,031**

## SEMICONDUCTOR DEVICE HAVING SEMICONDUCTOR CHIP WITH BACKSIDE ELECTRODE

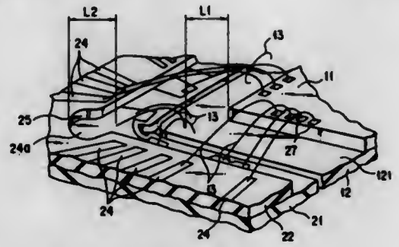
**Hiroyuki Kozono, Oomiya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Sep. 22, 1994, Ser. No. 310,303**

**Claims priority, application Japan, Sep. 24, 1993, 5-238144**

**Int. Cl.[6] H01L** *23/053;23/12*

**U.S. Cl. 257—700** **11 Claims**




1. A semiconductor device comprising:

a semiconductor chip having a plurality of pad electrodes on its top and a backside electrode on its backside;

a chip-mounting section on which said semiconductor chip is mounted, said chip-mounting section having a conductive layer on its top which is in contact with said backside electrode of said semiconductor chip;

a conduction path forming section disposed around said chip-mounting section, said conduction path forming section including first, second and third insulating layers, said second insulating layer being located over said first insulating layer, said third insulating layer being located over said second insulating layer, said first, second and third insulating layers having their respective openings which increase in diameter in the order of said first, second and third insulating layers, said semiconductor chip being placed in said opening of said first insulating layer; a plurality of external terminals arranged on said third insulating layer; a first group of conduction paths formed on said first insulating layer and having their one ends exposed in said opening of said second insulating layer and their other ends connected to said external terminals; and a second group of conduction paths formed on said second insulating layer and having their one ends exposed in said opening of said third insulating layer and their other ends connected to said external terminals;

a first group of bonding wires for electrically connecting said one ends of said first group of conduction paths with said conductive layer of said chip-mounting section;

a second group of bonding wires for electrically connecting said one ends of said second group of conduction paths with said pad electrodes of said semiconductor chip; and

a heat sinking board bonded to said backside of said chip-mounting section and part of the backside of said conduction path forming section,

said second insulating layer having notches which are cut in the opposite direction to said semiconductor chip, and the exposed area of said first group of conduction paths being set larger than that of said second group of conduction paths.

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**5,497,032**

## SEMICONDUCTOR DEVICE AND LEAD FRAME THEREFORE

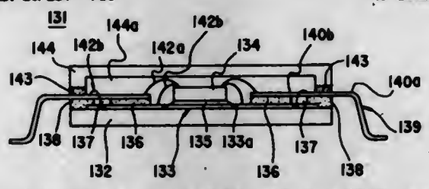
**Kazuto Tsuji; Yoshiyuki Yoneda; Hideharu Sakoda; Michio Sono; Ichiro Yamaguchi; Toshio Hamano; Yoshihiro Kubota; Michio Hayakawa; Yoshihiko Ikemoto, all of Kawasaki; Yukio Saigo, and Naomi Miyaji, both of Kagoshima, all of, Japan, assignors to Fujitsu Limited, Kawasaki, and Kyushu Fujitsu Electronics Limited, Kagoshima, both of, Japan**

**Filed Mar. 16, 1994, Ser. No. 213,720**

**Claims priority, application Japan, Mar. 17, 1993, 5-056262; Mar. 17, 1993, 5-057527; Feb. 17, 1994, 6-020642**

**Int. Cl.[6] H01L** *23/10;23/48;23/52;23/02*

**U.S. Cl. 257—710** **45 Claims**




1. A semiconductor device having a package in which a semiconductor chip is sealed, said semiconductor device comprising:

a base;

a metallic film formed on a surface of the base, the semiconductor chip being formed on the metallic film, and a pad formed on the semiconductor chip being connected to the metallic film by a wire;

a sealing layer formed on the metallic film;

a plurality of leads formed on the sealing layer; and

a connecting layer formed on the metallic film and containing electrically conductive particles, said connecting layer being in contact with a lead of said plurality of leads for a power supply system and connecting the metallic film to said lead.

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**5,497,033**

## EMBEDDED SUBSTRATE FOR INTEGRATED CIRCUIT MODULES

**Raymond A. Fillion, Niskayuna; Robert J. Wojnarowski, Ballston Lake; Michael Gdula, Knox; Herbert S. Cole, Burnt Hills; Eric J. Wildi, Niskayuna, and Wolfgang Daum, Schenectady, all of N.Y., assignors to Martin Marietta Corporation, Bethesda, Md.**

**Division of Ser. No. 87,434, Jul. 9, 1993, Pat. No. 5,353,498, which is a continuation-in-part of Ser. No. 14,481, Feb. 8, 1993, abandoned. This application Jun. 20, 1994, Ser. No. 262,181**

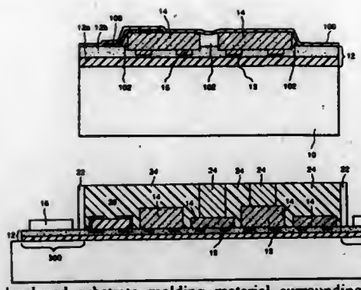
**Int. Cl.[6] H01L** *23/29;23/14;* **H05K** *7/10*

**U.S. Cl. 257—723** **6 Claims**

1. An integrated circuit module, comprising:

a plurality of chips, each of said chips having contact pads disposed thereon, all of said pads located on a common plane;






hardened substrate molding material surrounding said chips, except for the faces of said chips, said substrate material comprising a blend of polyimide, epoxy, and crosslinking catalyst, and said substrate material including a filler material comprising a selected one of the group consisting of glass, alumina, aluminum nitride, aluminum silicon carbide, aluminum and diamond, graphite;

a thermal plug extending from the backside of at least one of said plurality of chips at least through to the opposite side of said hardened substrate molding material; and

HDI means, formed over said chip top surfaces, for electrically interconnecting predetermined ones of said contact pads.

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**5,497,034**

## IC WIRING CONNECTING METHOD AND APPARATUS

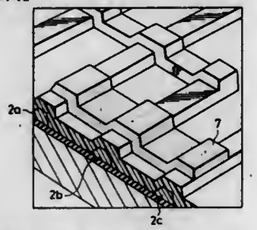
**Hiroshi Yamaguchi, Fujisawa; Mikio Hongo, Yokohama; Tateoki Miyauchi, Yokohama; Akira Shimase, Yokohama; Satoshi Haraichi, Yokohama; Takahiko Takahashi, Tokyo, and Keiya Saito, Yokohama, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Division of Ser. No. 238,888, May 6, 1994, which is a division of Ser. No. 13,539, Jan. 28, 1993, abandoned, which is a continuation of Ser. No. 705,957, May 28, 1991, abandoned, which is a continuation of Ser. No. 389,862, Aug. 4, 1989, abandoned, which is a division of Ser. No. 32,753, Mar. 31, 1987, Pat. No. 4,868,068. This application Oct. 5, 1994, Ser. No. 318,267**

**Claims priority, application Japan, Mar. 31, 1986, 61-070979**

**Int. Cl.[6] B21C** *27/00;* **H01L** *23/48;29/46*

**U.S. Cl. 257—741** **72 Claims**




1. A multilayer IC device comprising:

a substrate;

an insulating film which is formed over the substrate;

a plurality of conductive lines which are located over the insulating film and include at least one upper conductive line and at least one lower conductive line sandwiching an intermediate insulating film, an upper conductive line and intermediate insulating film being on a lower conductive line and having at least one hole through said upper conductive line and said intermediate insulating film so as to expose the lower conductive line, whereby edges of the upper conductive line are exposed by said at least one hole, the at least one hole being formed by irradiating with a focussed energy beam;

a protective film which covers the conductive lines, the protective film having a hole therethrough, connected to a corresponding hole through the upper conductive line and intermediate insulating film so as to expose the lower conductive line, the protective film being formed by irradiating with a focussed energy beam;

a deposition insulating layer which covers said edges of the upper conductive line; and

metal wiring portions which are provided in the holes, the metal wiring portions being portions formed by focussed energy beam chemical vapor deposition, such that the lower conductive line is connected electrically with said metal wiring portions without shorting electrically to the upper conductive line.

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**5,497,035**

**Patent Not Issued For This Number**

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**5,497,036**

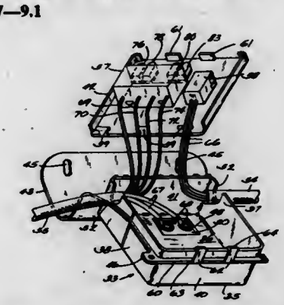
## MOTORCYCLE TERMINAL BOX ASSEMBLY

**Alvin Zemlicka, Elkhart Lake, Wis., assignor to Harley-Davidson, Milwaukee, Wis.**

**Filed Oct. 21, 1994, Ser. No. 327,052**

**Int. Cl.[6] H02B** *1/04;* **H02H** *3/20*

**U.S. Cl. 307—9.1** **6 Claims**



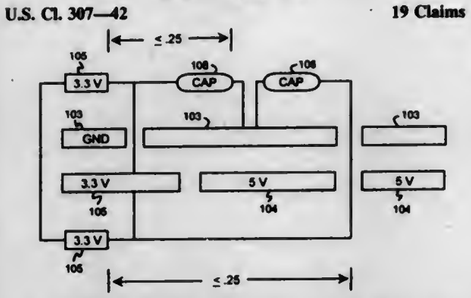
1. A junction box for a motorcycle having a frame, a plurality of electrical components mounted on said frame, a plurality of electrical circuits connected respectively to said electrical components, said junction box including a receptacle and a cover mounted on said receptacle to form an enclosure, said cover being movable between open and closed positions relative to said receptacle and having an outer surface and an inner surface facing said enclosure, a terminal assembly mounted on the inner surface of said cover, means for mounting said junction box on the motorcycle, a plurality of circuit interrupting means for interrupting a circuit upon the occurrence of a fault, said plurality of circuit interrupting means being mounted on said terminal assembly and each being adapted to be connected respectively to one of plurality of electrical circuits, a first additional circuit interrupting means for interrupting a circuit upon the occurrence of a fault and being mounted in said enclosure and being connected to a separate one of said additional plurality of electrical circuits, a second additional circuit interrupting means mounted in said enclosure and being connected to interrupt all of said electrical circuits, at least one of said first and second additional circuit interrupting means being mounted on the inner surface of said cover and the remaining circuit interrupting means being mounted in said receptacle.

5,497,037

## METHOD AND APPARATUS FOR DECOUPLING OF UNUSED POWER SUPPLY PINS OF A PRINTED CIRCUIT BOARD CAPABLE OF OPERATING AT A PLURALITY OF PREDETERMINED VOLTAGES

Sherman Lee, Rancho Palos Verde, and Mark Mah, San Jose, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jul. 14, 1994, Ser. No. 274,871
Int. Cl.[6] H05K 1/16
U.S. Cl. 307—42 19 Claims




1. A printed circuit board (PCB) capable of operating at first and second predetermined voltage levels comprising:

a plurality of metal layers, one of the metal layers being divided to provide two electrically isolated sections, the two electrically isolated sections being on substantially the same plane; one of the electrically isolated sections being associated with the first predetermined voltage level and the other of the electrically isolated sections being associated with the second predetermined voltage level;

a first plurality of signal pins coupled to the one of the electrically isolated sections; and

at least one capacitor coupled to a ground plane, the first plurality of signal pins and the one of the electrically isolated metal sections; wherein an alternating current path is provided.

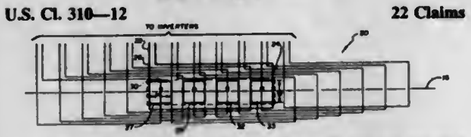
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5,497,038

## LINEAR MOTOR PROPULSION DRIVE COIL

John D. Sink, Yorba Linda, Calif., assignor to Power Paragon, Inc., Anaheim, Calif.

Filed Apr. 8, 1994, Ser. No. 224,429
Int. Cl.[6] H02K 41/02
U.S. Cl. 310—12 22 Claims



1. A drive coil assembly for a linear motor of the type having a magnet assembly including a plurality of evenly spaced pole ends and having a predetermined length along a longitudinal axis and a width transverse to the longitudinal axis, the drive coil assembly comprising:

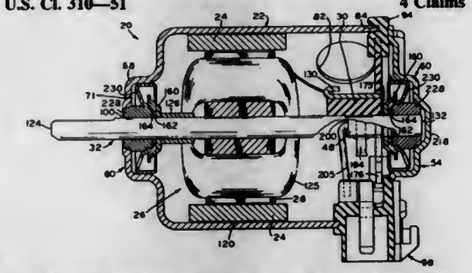
a plurality of regularly spaced wire coils, each coil including conductive wire wound a plurality of turns and having a length along the longitudinal axis and a width transverse to the longitudinal axis, wherein each turn of each coil is at least as long as the magnet assembly in the longitudinal axis direction.

5,497,039

## VIBRATION REDUCTION SYSTEM FOR AN ELECTRIC MOTOR

Harald E. Blaettner, Hendersonville, Tenn.; Richard F. Uhen, Ft. Wayne, Ind.; Robert E. Ellis, Ft. Wayne, Ind.; Eldon R. Cunningham, Ft. Wayne, Ind.; Michael J. Usher, Ft. Wayne, Ind., and Joseph E. Miller, Ft. Wayne, Ind., assignors to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 38,218, Mar. 29, 1993, Pat. No. 5,358,341, which is a division of Ser. No. 805,080, Dec. 11, 1991, Pat. No. 5,237,231, which is a division of Ser. No. 423,827, Oct. 19, 1989, Pat. No. 5,113,104. This application Oct. 4, 1994, Ser. No. 317,728
Int. Cl.[6] H02K 5/24
U.S. Cl. 310—51 4 Claims



1. An axial vibration reduction system for an electric motor having magnet means mounted in a frame, an armature having a lamination core mounted on a shaft and two bearing means operatively positioned relative to the shaft, the axial vibration reduction system comprising:

resilient means, operatively positioned on the shaft proximate each bearing means, for resisting movement of the armature relative to the frame, the armature being positioned in the frame such that the lamination core is not axially centered relative to the magnet means whereby a force is generated on the resilient means most proximate an end of the lamination core closest an axial center of the magnet means.

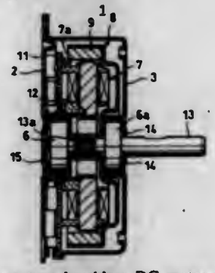
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5,497,040

## OUTER ROTOR TYPE BRUSLESS DC MOTOR

Hironobu Sato, Ohta, Japan, assignor to Sanyo Electric Co., Ltd., Ora, Japan

Filed Sep. 19, 1994, Ser. No. 308,405
Claims priority, application Japan, Nov. 30, 1993, 5-300590; Nov. 30, 1993, 5-300591; Nov. 30, 1993, 5-300592; Jan. 31, 1994, 6-009685
Int. Cl.[6] H02K 7/00
U.S. Cl. 310—67 R 14 Claims



1. An outer rotor type brushless DC motor including a stator having coils each wound on a multiple teeth of said stator, and a rotor having magnets arranged to surround said stator, said DC motor comprising:



a first housing member formed of a sheet metal by press-working and having a first central bearing receiver formed by press-working in the form of generally bottomed hollow cylinder;

a second housing member formed from a sheet metal by press-working and having a second central bearing receiver also pressed in the form of generally bottomed hollow cylinder which is coaxial with said first bearing receiver, said second housing member mating, and securely connected with, said first housing member at their rims to form a space inside thereof;

a hollow cylindrical stator support formed of a sheet metal by press-working and having one end mounted on said bearing receiver of said first housing member and another end for receiving said stator on the outer surface of said stator support;

a magnets support which is press-worked from a electrical steel sheet metal for supporting magnets around said stator and inside said second housing member;

a first bearing mounted in said first bearing receiver;

a second bearing mounted in said second bearing receiver coaxially with said first bearing; and

a freely rotatable shaft mounted on said first and second bearings, for securely supporting on said shaft said magnets support.

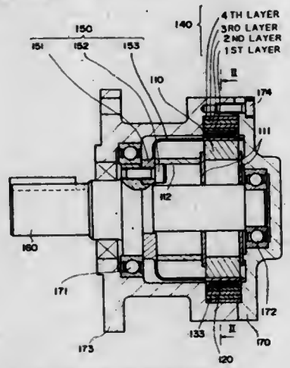
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5,497,041

## LOW SPEED GEARED MOTOR

Masatoshi Kondoh, and Miyoji Minegishi, Chiba, both of, Japan, assignors to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

Filed Aug. 3, 1993, Ser. No. 101,025
Claims priority, application Japan, Aug. 6, 1992, 4-210341
Int. Cl.[6] H02K 21/12
U.S. Cl. 310—156 2 Claims




1. A low speed geared motor comprising:

a flexible permanent magnetic ring in which S-poles and N-poles are sequentially disposed in a circumferential direction;

an external gear positioned around an outer periphery of said flexible permanent magnetic ring and capable of being radially deformed together with said flexible permanent magnetic ring;

an internal gear position around said external gear and capable of meshing with a major axis portions of said external gear when said external gear is radially deformed;

a stator which is fixed around an outer periphery of said internal gear, and which generates magnetic poles arranged in correspondence with magnetic poles of said permanent magnetic ring for radially deforming said external gear and electrically rotates the magnetic poles;

a transmission means for absorbing a radially deformed component of said external gear and for extracting only a rotational component of said external gear; and

an output shaft connected to said transmission means to be rotated at the same speed as the rotational component of said external gear.

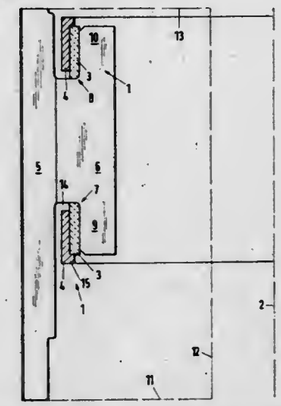
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5,497,042

## COLLECTOR AND REINFORCED RING THEREFOR

Friedrich W. Nettelhoff, Menden, Germany, assignor to Friedrich Nettelhoff Kommanditgesellschaft Spezialfabrik fuer Kleinkollektoren, Menden, Germany

PCT No. PCT/EP94/00220, § 371 Date Sep. 19, 1994, § 102(e) Date Sep. 19, 1994, PCT Pub. No. WO94/18726, PCT Pub. Date Aug. 18, 1994
PCT Filed Jan. 27, 1994, Ser. No. 318,752
Claims priority, application Germany, Feb. 1, 1993, 43 02 759.8
Int. Cl.[6] H02K 13/00
U.S. Cl. 310—219 22 Claims




1. A unitized ring means for an electric motor collector having a collector axis and individual lamellas having lamellar inner cross members which secure said individual lamellas and wherein the cross members project outwardly and extend generally parallel to said collector axis and wherein the cross members have undercut faces which are adapted to receive said unitized ring means, said unitized ring means comprising a metallic clamping ring and an insulating supporting ring on the inner surface of said clamping ring, said metallic clamping ring and said insulating supporting ring having a pre-tensioned relationship such that said metallic clamping ring and said insulating supporting ring are joined solidly together as a unit by said pre-tensioned relationship, said unitized ring means being disposed on said cross members such that said supporting ring faces said undercut faces, said supporting ring comprising a material which is compression-resistant and insulating effective at high operating temperatures.

5,497,043

## VIBRATION REDUCTION

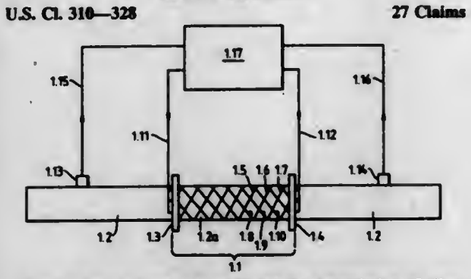
Ronnie C. Leung, Gosport, and Mark F. L. Harper, Cambridge, both of, United Kingdom, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Feb. 10, 1995, Ser. No. 382,039

Claims priority, application United Kingdom, Aug. 13, 1992, 9217129

Int. Cl.[6] H01L *41/08*

U.S. Cl. 310—328 27 Claims




1. A cross axis actuator for reducing the transmission of vibration along an elongate member, said actuator comprising:

a series of windings wound around and along at least part of the elongate member in clockwise and anti-clockwise fashion and anchored at two or more points to the member, and

means for subjecting said windings to strain, the windings being capable of being subjected to strain in order to cause deformation of the member in at least part of the regions between attachment points wherein at least part of the member is formed to produce an impedance mismatch with respect to the remainder of the member.

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5,497,044

## SUPPORTING STRUCTURE FOR A VIBRATOR

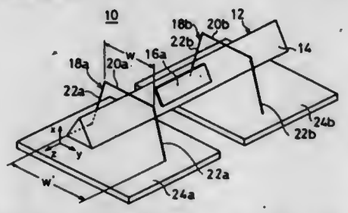
Takeshi Nakamura; Yoshiaki Heinouchi, and Takayuki Kaneko, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 167,488, Dec. 16, 1993, abandoned. This application Nov. 18, 1994, Ser. No. 345,356

Claims priority, application Japan, Jan. 8, 1993, 5-018164

Int. Cl.[6] G01C *19/56*

U.S. Cl. 310—348 11 Claims




1. A three-dimensional supporting structure for a vibrator having a supporting member for supporting a prism-shaped vibrator above a mounting board, wherein said supporting member comprising:

a straight linear intermediate portion being fixed to said vibrator and extending in a widthwide direction of said vibrator; and

two straight linear leg portions extending from both ends of said intermediate portion, each straight leg portion have first and second ends, said second end being a tip fixed to said mounting board, and said first end connected to said straight linear intermediate portion, a distance W' between said tips expanding wider than a length W of said intermediate portion.

5,497,045

## SPARK PLUG HAVING A NOBLE METAL ELECTRODE PORTION

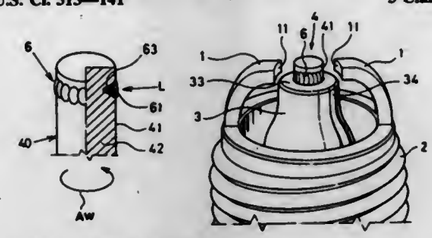
Wataru Matsutani, and Junichi Kagawa, both of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Aug. 13, 1993, Ser. No. 105,611

Claims priority, application Japan, Aug. 19, 1992, 4-220044

Int. Cl.[6] H01T *13/20;21/02*

U.S. Cl. 313—141 3 Claims




1. A spark plug comprising:

a cylindrical metallic shell having a tubular insulator in which a columnar center electrode is placed, a front end of the center electrode extending beyond the insulator;

a noble metal portion bonded to an outer side wall of the front end of the center electrode by means of laser beams so as to form a spark gap between the noble metal portion and a ground electrode which is extended from the metallic shell;

the noble metal portion having a molten alloy layer in which the center electrode is melted into the noble metal portion, and a diffused alloy layer in which the noble metal portion is diffused into the center electrode, so that the molten alloy layer forms a spark discharge surface against a front end of the ground electrode.

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5,497,046

## THIN-TYPE PICTURE DISPLAY DEVICE

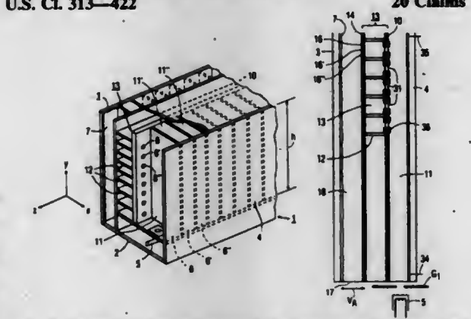
Gerardus G. P. Van Gorkom; Petrus H. F. Trompenaars; Siebe T. De Zwart, and Nicolaas Lambert, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 335,218, Nov. 7, 1994, abandoned, which is a continuation of Ser. No. 223,962, Jul. 17, 1992, abandoned, which is a continuation of Ser. No. 715,072, Jun. 13, 1991, abandoned. This application Mar. 28, 1995, Ser. No. 415,220

Claims priority, application Netherlands, Jul. 5, 1990, 9001528

Int. Cl.[6] H01J *29/20;29/72*

U.S. Cl. 313—422 20 Claims



1. A display device comprising an evacuable envelope and including a face plate bearing a luminescent screen and means for selectively directing electrons toward the screen for producing an image composed of pixels, said means comprising:



a. at least one electron source;

b. a plurality of adjacent, longitudinally extending transport ducts having respective walls comprising an electrically insulating material having a predetermined secondary emission coefficient, said ducts each having an input portion in communication with the at least one electron source for receiving electrons and having a plurality of apertured extraction locations for enabling the extraction of electrons from the duct;

c. an arrangement of distribution ducts located between the transport ducts and the luminescent screen, said arrangement including a wall facing the luminescent screen and having at least two selection apertures in communication with each of the extraction locations;

d. extraction electrode means disposed adjacent the extraction locations for selectively effecting extraction of electrons from the transport ducts at selected ones of said locations;

e. selection electrode means disposed adjacent the selection apertures for selectively effecting transport of electrons from the distribution ducts through selected ones of the selection apertures; and

f. means for directing toward the screen the electrons which are transported through the selection apertures.

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5,497,047

## FLUORESCENT DISPLAY DEVICE

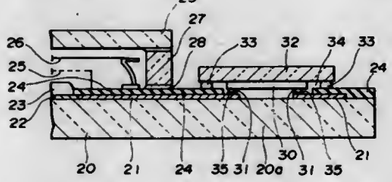
Hisashi Nakata; Yoshihisa Yonezawa, and Yasuhiro Nohara, all of Mobara, Japan, assignors to Futaba Denshi Kogyo K.K., Mobara, Japan

Filed Jan. 31, 1994, Ser. No. 188,725

Claims priority, application Japan, Jan. 29, 1993, 5-006060 U

Int. Cl.[6] H01J *1/62*

U.S. Cl. 313—493 3 Claims




1. A fluorescent display device comprising:

a body assembled by means of a sealing medium and including a substrate and a wiring conductor provided on said substrate;

said substrate including an extension formed so as to outwardly extend from said body;

said wiring conductor being formed so as to extend from an interior of said body to said extension of said substrate;

a semiconductor element arranged on said extension of said substrate and provided with metal bumps electrically connected to said wiring conductor;

a face plate arranged so as to interposedly holding said semiconductor element between said face plate and said extension of said substrate; and

a sealing material arranged between a periphery of said face plate and said extension of said substrate to form a mounting chamber in cooperation with said face plate and extension in which said semiconductor element is mounted;

said sealing material being made of an in organic material having an operating temperature lower than said sealing medium of said body.

5,497,048

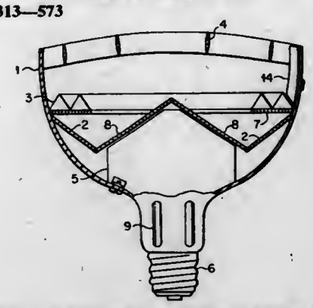
## MULTIPLE TRIANGULARLY SHAPED CONCENTRIC ANNULAR FLUORESCENT TUBES FOR REFLECTIVE LAMPS

David M. Burd, P.O. Box 123, Bentonville, Va. 22610

Filed Sep. 12, 1994, Ser. No. 302,469

Int. Cl.[6] H01J *5/10*

U.S. Cl. 313—573 9 Claims




1. A fluorescent lamp device comprising a housing including a light outlet opening, at least two annular fluorescent lamp tubes disposed in concentric relation within said housing adjacent to each other in substantially the same plane so as to define an open central space centrally of said lamp tubes within said housing, said lamp tubes each being in the shape of a triangle in cross section including two sides meeting a common apex and a base, said apex being directed toward said outlet opening and said device further comprising reflector means, disposed within said housing on the side of said tubes away from said outlet opening, for directing light emitted in a direction away from said light opening from the region of said base such that the emitted light follows a path through said central space and out through said outlet opening.

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5,497,049

## HIGH PRESSURE MERCURY DISCHARGE LAMP

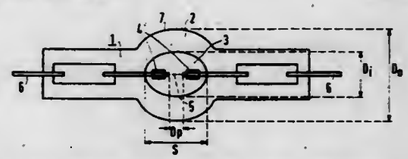
Hanns E. Fischer, Stolberg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 12, 1993, Ser. No. 46,426

Claims priority, application European Pat. Off., Jun. 23, 1992, 92201858

Int. Cl.[6] H01J *17/16;61/30*

U.S. Cl. 313—634 17 Claims




1. A high pressure mercury discharge lamp, comprising:

a quartz glass lamp vessel having a region surrounding a discharge space;

spaced-apart tungsten electrodes disposed in the lamp vessel and defining a discharge path $D_p$, current conductors connected to said electrodes and which extend through the lamp vessel to the exterior;

a filling of at least 0.2 mg Hg/mm$^3$, $10^{-6}$ - $10^{-4}$ μmol Br/mm$^3$ and a rare gas in the discharge space,

the discharge space being spheroidal in shape, having a dimension S in the direction of the discharge path which is

S (mm)=e*$D_i$, wherein

e is in the range of 1.0–1.8,

$D_i$ (mm)=f*(3.2+0.011(mm/W)*P(W)), wherein $D_i$ is the largest inside diameter of the discharge vessel transverse to the discharge path,

f has a value in the range of 0.9–1.1.

P is the power consumed at nominal operation, which is in the range of 70–150 W,

the lamp vessel having in the region surrounding the discharge space a convex outer surface, which in a plane in which $D_i$ is situated has an outside diameter $D_a$ which is $D_a \geq 3.2+0.055$ (mm/W)*P(W), and

the length of the discharge path $D_p$ is in the range of 1.0–2.0 mm.

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**5,497,050**

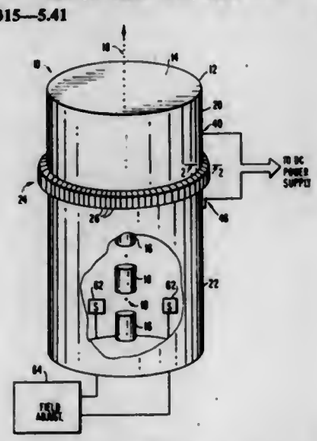
## ACTIVE RF CAVITY INCLUDING A PLURALITY OF SOLID STATE TRANSISTORS

**Bernard R. Cheo, Teaneck, N.J., assignor to Polytechnic University, Brooklyn, N.Y.**

**Filed Jan. 11, 1993, Ser. No. 2,603**

**Int. Cl.[6] H05H *9/00*; H03F *3/60***

**U.S. Cl. 315—5.41** **18 Claims**




1. An active RF cylindrical resonant cavity having a resonant frequency, comprising:

a conductive wall defining said cylindrical resonant cavity, said conductive wall being comprised of at least two longitudinal sections; and

a plurality of individual solid state power transistors respectively mounted between adjacent ones of the at least two sections of said conductive wall and being electrically connected to the adjacent ones of said at least two sections, said solid state power transistors being responsive to an RF driving signal for inducing an RF current at an inner surface of said conductive wall so that an electromagnetic (EM) field oscillating at said resonant frequency is provided within said cylindrical resonant cavity.

6. An active RF cavity according to claim 1; further comprising means for introducing charged particles into said cavity; and means disposed within said cavity for applying said oscillating EM field to said charged particles to accelerate said charged particles whereby said active RF cavity functions as a particle accelerator.

**5,497,051**

## CURRENT SUPPLY MEANS FOR A LASER FLASH LAMP

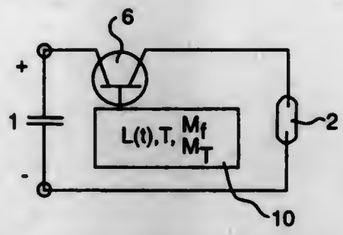
**Lutz Langhans; Wolfgang Seifert, and Olaf Mann, all of Starnberg, Germany, assignors to Carl Baasel Lasertechnik GmbH, Starnberg, Germany**

**Filed Apr. 15, 1994, Ser. No. 227,872**

**Claims priority, application Germany, Apr. 22, 1993, 43 13 231.6**

**Int. Cl.[6] H05B *37/00***

**U.S. Cl. 315—200 A** **18 Claims**




1. A current supply means for a laser flash lamp which is connected to a constant voltage source with a charging capacitor and provides a train of current pulses, each pulse having a certain different duration and amplitude, characterized by a fast switch and control means for adjusting depth of modulation ($M_T$) and/or a modulating frequency ($M_f$) in addition to mean pulse height and pulse duration of each pulse independently of said train of pulses.

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**5,497,052**

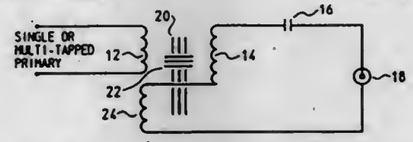
## ISOLATED CONSTANT WATTGE LAMP BALLAST

**Paul J. Buckley, II, Blytheville, Ark., assignor to MagneTek, Inc., Paramus, N.J.**

**Filed Jun. 9, 1994, Ser. No. 257,346**

**Int. Cl.[6] H05B *41/14***

**U.S. Cl. 315—276** **16 Claims**




1. An isolated constant wattage autotransformer ballast for an HID lamp comprising:

a primary winding for connection to a source voltage,

a secondary winding,

means for magnetically coupling said primary winding to said secondary winding to induce a voltage into said secondary winding from said primary winding, said primary and secondary windings being electrically isolated,

an auxiliary winding electrically isolated from said primary winding and positioned with respect to said magnetic coupling means to be closely coupled to said primary winding so as to induce a voltage from said primary winding to said auxiliary winding, and

means for electrically connecting one end of said auxiliary winding to one end of said secondary winding to add the voltage induced in said auxiliary winding from said primary winding to the voltage induced in said secondary winding from said primary winding, the additive voltage of said auxiliary winding and said secondary winding present between the other ends of said auxiliary and secondary windings being available to operate the HID lamp.



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**5,497,053**

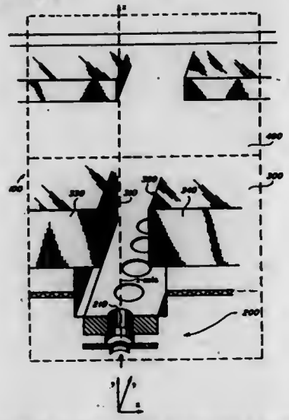
## MICRO-ELECTRON DEFLECTOR

**Cha-Mei Tang, Potomac; Antonio C. Ting, Silver Spring, both of Md., and Thomas A. Swyden, Falls Church, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Nov. 15, 1993, Ser. No. 151,678**

**Int. Cl.[6] G09G *1/04*; H03F *3/54*; G21K *1/08***

**U.S. Cl. 315—366** **18 Claims**




1. A deflection device responsive to a microwave input signal for producing an output signal, said deflection device comprising:

(a) a focusing array for producing a collimated electron beam input ribbon in the direction of a propagation axis, the input ribbon being elongated along an array axis perpendicular to the propagation axis and being relatively thin along a deflection axis perpendicular to the array axis and to the propagation axis, said focussing array comprising a plurality of cathode units, each cathode unit comprising means independent of any electric fields external to said cathode unit for emitting an electron beamlet and means for focussing the beamlet, the plurality of focussed beamlets produced by said plurality of cathode units constituting the input ribbon;

(b) first and second deflector faces, said first and second deflector faces forming a deflection region therebetween and being disposed so that the propagation-axis passes through said deflection region, said deflection region being external to said focussing array, said first and second deflector faces and said focussing array (a) constituting an integrated structure;

(c) means responsive to the input signal for applying time varying first and second potentials to said first and second deflector faces, respectively, so as to produce a modulated electric field in said deflection region for deflecting the input ribbon over the course of a temporal deflection cycle to produce a continuously modulated output ribbon of substantially the same frequency as the input signal; and

(d) an anode section responsive to the continuously modulated output ribbon for producing a microwave output signal having frequency of substantially the same order of magnitude as the input signal frequency.

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**5,497,054**

## AUTOMATIC DIGITAL CONVERGENCE CORRECTING METHOD AND APPARATUS THEREFOR

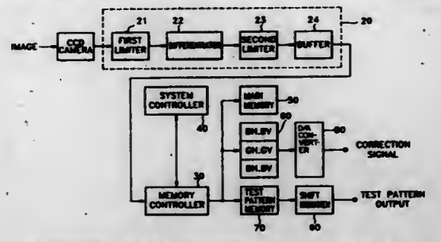
**Kyeong-keol Ryu, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki, Rep. of Korea**

**Filed Aug. 31, 1994, Ser. No. 298,743**

**Claims priority, application Rep. of Korea, Aug. 31, 1993, 1993-17547**

**Int. Cl.[6] H01J *29/51***

**U.S. Cl. 315—368.11** **9 Claims**




1. An automatic digital convergence correction method for correcting a convergence of a display employing red, green and blue CRTs, said method comprising the steps of:

generating a box test pattern via said green CRT;

adjusting a geometrical position between a projector and a screen using said box test pattern as a reference;

generating a predetermined number of seed points within the box test pattern;

generating horizontal and vertical tracking reference patterns that pass through one of the seed points at a predetermined location, said one of the seed points being generated by said green CRT in said seed-point generating step; and

tracking the horizontal and vertical tracking reference patterns generated in said tracking reference pattern generating step by employing a tracking pattern generated via said red CRT and said blue CRT at a seed point corresponding to the green seed point of said predetermined location, wherein said tracking step is performed simultaneously with said generating horizontal and vertical tracking reference patterns step by counting a time interval between a component of one of said horizontal and vertical tracking reference patterns signal and a component of a tracking pattern signal and by comparing the counted values and by making the counted values match each other.

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**5,497,055**

## PARABOLIC SIGNAL TIMING LOOP

**John B. George, Carmel, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.**

**Filed Dec. 8, 1994, Ser. No. 351,906**

**Claims priority, application United Kingdom, Mar. 24, 1994, 9405799**

**Int. Cl.[6] G09G *1/04*; H01J *29/70*; H04N *3/23***

**U.S. Cl. 315—371** **18 Claims**

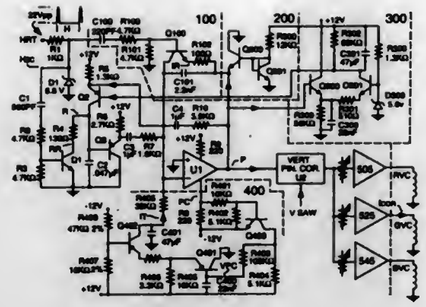
1. A correction waveform signal generator, comprising:

an integrator having an input and generating a generally parabolically shaped deflection correction waveform;

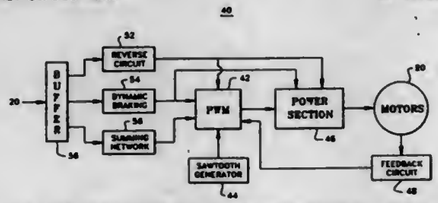
a deflection rate ramp generator coupled to said integrator input to generate said generally parabolically shaped waveform;

a DC signal coupled to said integrator input to thereby determine a timing of a maximum value of said generally parabolically shaped waveform relative to a period of said deflection rate; and,

means for measuring said timing of said generally parabolically shaped waveform, to generate said DC signal for controlling said timing, thereby maintaining a predetermined timing.



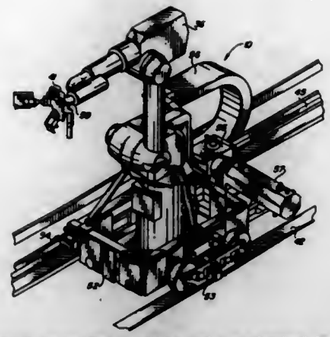
5,497,056
**METHOD AND SYSTEM FOR CONTROLLING A MOTORIZED WHEELCHAIR USING CONTROLLED BRAKING AND INCREMENTAL DISCRETE SPEEDS**
**Marvin Kurland, East Brunswick; Thomas J. Noonan, Neshanic; David L. Martin, West Trenton, and Eric Z. Riff, Hamilton Square, all of N.J., assignors to Trenton State College, Trenton, N.J.**
**Filed May 10, 1994, Ser. No. 241,146**
**Int. Cl.[6] H02P 7/00**
**U.S. Cl. 318—269** **20 Claims**



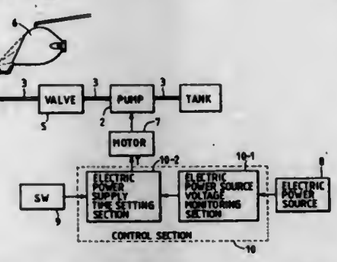
1. A method of controlling a wheelchair operated by a user with severely limited dexterity, comprising the steps of:
a) determining a braking interval as a function of the weight of the user of the wheelchair and a coefficient of friction between the user and the wheelchair; and
b) braking the wheelchair as a function of the determined braking interval.

5,497,057
**MECHANICAL BRAKE HOLD CIRCUIT FOR AN ELECTRIC MOTOR**
**Craig T. Danielson, Tucson; Gregory T. Kishi, Oro Valley; Michael P. McIntosh, Tucson; Hector E. Mery, Tucson, and Scott M. Rockwell, Tucson, all of Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.**
**Division of Ser. No. 28,066, Mar. 8, 1993, Pat. No. 5,394,069. This application Oct. 31, 1994, Ser. No. 331,446**
**Int. Cl.[6] H02P 3/26; G11B 17/22**
**U.S. Cl. 318—371** **11 Claims**

1. An automated storage library comprising:
a plurality of storage slots, each arranged to accept and store a data storage element;
one or more data drives arranged to read and write data from and to said data storage elements; and a robotic picker mechanism for transferring said data storage elements between said plurality of storage slots and said one or more data drives, said robotic picker mechanism including an electric motor and a braking control, said electric motor further including motor windings, a mechanical brake and a dynamic electrical brake, said braking control including resistors in series with the motor windings, said braking control activating said dynamic electrical brake and disabling said mechanical brake at or above a predetermined motor speed, said braking control including:
a mechanical brake power supply;
a brake solenoid; and
a relay having a plurality of contacts, each of said contacts connected between said brake solenoid and at least one of said relay and said brake power supply.



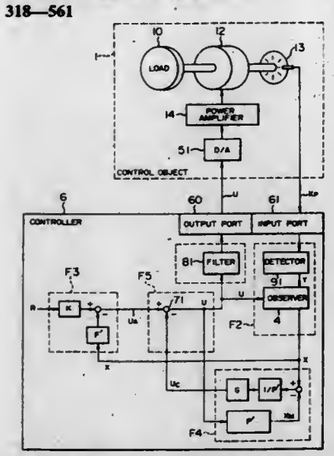
5,497,058
**HEADLAMP CLEANING DEVICE CAPABLE OF ATTAINING A CONSTANT CLEANING CAPACITY**
**Taketoshi Fujigaya, Shizuoka, Japan, assignor to Koito Manufacturing Co., Ltd., Tokyo, Japan**
**Filed Dec. 28, 1994, Ser. No. 365,365**
**Claims priority, application Japan, Dec. 28, 1993, 5-074369**
**Int. Cl.[6] B60S 1/00**
**U.S. Cl. 318—446** **7 Claims**



1. A headlamp cleaning device which ejects cleaning water stored in a tank onto a headlamp through a nozzle by driving a motor for a predetermined time period in response to a switch operation, comprising:
an electric power source voltage monitoring means, which monitors the electric power source voltage supplied to the motor; and
a motor driving time circuit, which sets a longer driving time for the motor as the value of the monitored electric power source voltage decreases, but sets a shorter driving time for the motor as the value of the monitored electric power source voltage increases.



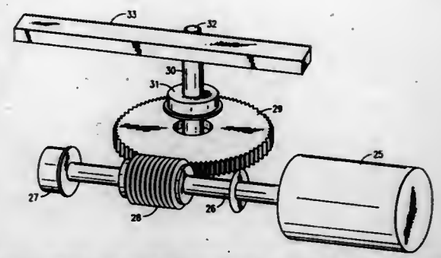
5,497,059
**CONTROL METHOD AND APPARATUS FOR A SERVO-MECHANISM**
**Fujio Tajima, Tsuchiura; Hideki Tanaka, Toyohashi; Kooetsu Okuyama, Tsuchiura; Tomokazu Ishii, Niihari, and Kenji Toki, Odawara, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**
**Continuation of Ser. No. 948,266, Sep. 21, 1992, Pat. No. 5,352,961. This application Oct. 4, 1994, Ser. No. 322,411**
**Claims priority, application Japan, Sep. 20, 1991, 3-268777**
**Int. Cl.[6] G05B 17/02**
**U.S. Cl. 318—561** **7 Claims**



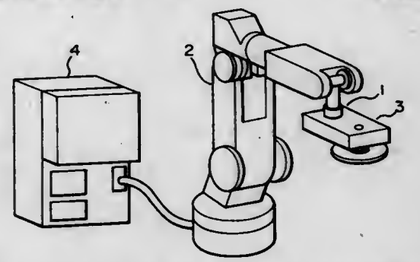
1. A control apparatus for controlling a servo-mechanism, the servo-mechanism including a control object, the control object having an input for receiving a first operation signal and an output for outputting a control signal in response to the first operation signal, the control apparatus comprising:
a first control signal loop including
the control object,
detecting means for detecting the control signal from the control object and generating an actual control signal representing the detected control signal, and
means, responsive to the actual control signal and a desired control signal representing a control signal desired to be output from the control object, for generating a second operation signal for causing the actual control signal to become equal to the desired control signal; and
a second control signal loop including
the control object,
the detecting means,
means, responsive to the actual control signal and the first operation signal, for generating a model-based operation signal, and
means, responsive to the second operation signal and the model-based operation signal, for generating the first operation signal such that the first operation signal causes the second operation signal to become equal to the model-based operation signal.

5,497,060
**POSITIONING STAGE**
**Albert M. Juergens, III, Box 114B–1, Huntersfield Rd., Prattsville, N.Y. 12468**
**Filed Jun. 21, 1993, Ser. No. 79,401**
**Int. Cl.[6] G02B 21/26; B23Q 16/00**
**U.S. Cl. 318—563** **12 Claims**

1. A positioning stage wherein a table is movable with respect to a frame within at least two predetermined degrees of freedom by a drive through a motion transmission system with lost motion therebetween, the improvement comprising
a) a slide translatable on the frame along a first straight linear travel path,
b) the table being translatable on the slide along a second straight linear travel path,
c) encoder pair means on the table and frame for sensing motion of the table directly in reference to the frame and generating a signal indicating such motion independent of lost motion in the drive and transmission system,
d) microprocessor means responsive to said encoder means signal for operating the drive to fix the table in a predetermined position with respect to the frame irrespective of lost motion in the drive and transmission system, and
e) adjustable pressure bearing means associated with said slide and said table for guiding said slide and table and preventing loss of placement of said table at said predetermined position with respect to the frame.



5,497,061
**METHOD OF CONTROLLING ROBOT'S COMPLIANCE**
**Youichi Nonaka, Fujisawa, and Shiyuki Sakane, Hiratsuka, both of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**
**Filed Mar. 24, 1994, Ser. No. 216,975**
**Claims priority, application Japan, Mar. 31, 1993, 5-073343**
**Int. Cl.[6] G05B 19/42; G06F 15/46**
**U.S. Cl. 318—568.11** **4 Claims**



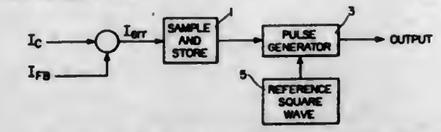
1. A method of controlling the compliance of robot having multiple degrees of movement and freedom, said robot including means for sensing a velocity of an end effector and means for sensing an external force to the end effector, said method comprising the steps of: sensing the external force so that the motion of the end effector of said robot may have a proper mechanical compliance against the external force;
calculating an angular momentum of a rotational body provided at the end effector of said robot, a gyro moment occurring at said rotational body due to the motion of said robot, a moment of inertia and rotational velocity of said rotational body and an operating velocity of said robot; and subtracting said gyro moment from the signal of said means for sensing the external force.

5,497,062

## DIGITAL PULSE-WIDTH MODULATED SYSTEM FOR PROVIDING CURRENT TO A LOAD

Brian J. Fenstermacher, Telford, and James P. Detweiler, Lansdale, both of Pa., assignors to Performance Controls, Inc., Horsham, Pa.

Filed Sep. 20, 1993, Ser. No. 123,677
Int. Cl.[6] H02P 5/40
U.S. Cl. 318—599 7 Claims




1. A method of producing a pulse-width modulated signal for providing current through a load according to an input signal, the method comprising the steps of:

a) providing a reference square wave, the square wave having a plurality of pulses of equal width, each pulse having a leading edge and a trailing edge, wherein the pulses are spaced apart by a time interval equal to the width of the pulses, the width of the pulses being called P,

b) repeatedly sampling the input signal at times corresponding to edges of the pulses of the reference square wave, to produce a series of values, the values being called $E_0$, $E_1$, $E_2$, . . . $E_n$, where n is a positive integer, and generating a series of intermediate pulses, each intermediate pulse having a width, wherein the width of every other intermediate pulse corresponds to $E_0$, $E_2$, $E_4$ . . . , and wherein the widths of the remaining intermediate pulses correspond to P-$E_1$, P-$E_3$, P-$E_5$, . . . , each of the intermediate pulses having a leading edge corresponding to successive edges of the reference square wave,

c) generating a series of output pulses, the output pulses having widths, wherein the widths of the output pulses correspond to $2P-(E_0+E_1)$, $2P-(E_2+E_3)$, $2P-(E_4+E_5)$, . . . , and wherein there are intervals between the output pulses, the intervals having widths corresponding to $E_1+E_2$, $E_3+E_4$, $E_5+E_6$, . . . , and

d) using the output pulses to provide current through the load.

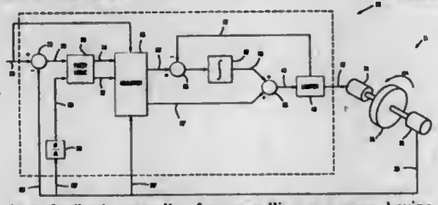
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5,497,063

## FUZZY LOGIC SERVO CONTROLLER

Chia Day, Solon, and Ernst Dummermuth, Chesterland, both of Ohio, assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Sep. 16, 1993, Ser. No. 123,020
Int. Cl.[6] G05B 11/42
U.S. Cl. 318—610 10 Claims



1. A feedback controller for controlling a process having a process input and process output, the feedback controller receiving a reference input related to a desired process output and producing a process input, the feedback controller comprising:

a comparator for comparing the reference input to the process output to produce an error signal;

a differentiator for differentiating a function of the process output to create feedback difference signal;

fuzzy logic applying a set of fuzzy rules to the error signal and the feedback difference signal to produce a proportional action signal and a differential action signal both being fuzzy functions of both the error signal and the feedback difference signal;

an integrator receiving the differential action signal to produce an integrated action signal; and

a summing junction for summing the integrated action signal and the proportional action signal to produce the process input.

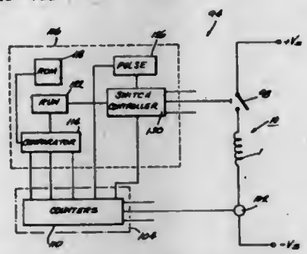
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5,497,064

## APPARATUS FOR STARTING A SWITCHED RELUCTANCE MOTOR

Thomas G. Van Sistine, Menomonee Falls, Wis., assignor to A. O. Smith Corporation, Milwaukee, Wis.

Filed Mar. 14, 1995, Ser. No. 404,471
Int. Cl.[6] H02P 7/00
U.S. Cl. 318—701 19 Claims




1. A switched reluctance electronic motor comprising:

a rotor mounted for rotation about an axis and including a plurality of rotor poles;

a stator surrounding said rotor and including at least three stator phases; and

a circuit for controlling said motor, the circuit including pulse means for supplying a seek current to each of said phases of said motor without causing rotation of said rotor, said seek currents in said phases each having a respective seek current rise time which is a function of the proximity of said rotor poles to said respective phases;

timing means for measuring the amount of time required for said seek current in each phase to reach a predetermined seek current threshold;

comparing means for comparing said seek current rise times and for establishing a priority sequence determined by which of said phases has the lowest seek current rise time, the intermediate seek current rise time, and the highest seek current rise time; and

energizing means connected to said comparing means for energizing a selected one of said phases based upon said priority sequence to cause rotation of said rotor.

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5,497,065

## INVERTER OPERATION COMMAND PROCESS

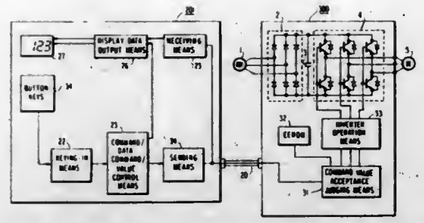
Tomotaka Ito, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 945,248, Sep. 15, 1992, which is a continuation of Ser. No. 658,488, Feb. 20, 1991. This application Apr. 26, 1994, Ser. No. 236,885
Claims priority, application Japan, Feb. 22, 1990, 2-41499
Int. Cl.[6] H02P 5/34; G05B 19/18
U.S. Cl. 318—802 1 Claim

1. A process for controlling the operation of an inverter and an associated motor, comprising the steps of:

setting, by a user controlling an operation command input means, one or more of a plurality of individual operation commands to a user-defined value required for operation of the motor controlled by said inverter;






storing said one or more of the plurality of the individual operation commands in a storage means as an operation command group, at selected addresses in said storage means;

repeating said setting and storing steps to store a plurality of operation command groups;

selecting an operation command group from among said plurality of operation command groups stored in said storage means;

reading said selected operation command group from said storage means; and

operating said inverter to control said motor in accordance with said selected operation command group; said process further comprising the steps of:

modifying, in whole or in part, one or more of the individual operation commands in said selected operation command group; and

storing said modified operation command group in said storage means as a new operation command group at one of the same addresses as those of the individual operation commands prior to being modified and different addresses from those of said selected operation command group; wherein said plurality of operation command groups stored in the different addresses are selected in correspondence to different application purposes and load conditions of said motor.

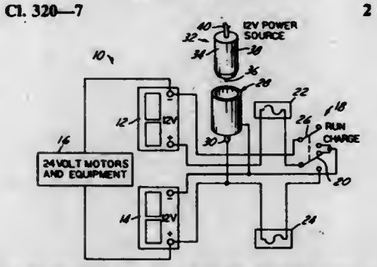
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5,497,066

## BATTERY BOOSTER SYSTEM

John R. Drouillard, Romulus, and James E. Drouillard, Westland, both of Mich., assignors to D & D Advanced Technologies, Inc., Romulus, Mich.

Filed Feb. 23, 1994, Ser. No. 200,436
Int. Cl.[6] H02J 7/00
U.S. Cl. 320—7 2 Claims




1. In an electrical power system that includes a pair of twelve volt batteries connected to twenty-four volt equipment, a battery power booster system for charging said batteries comprising:

electrical switch means coupled to said batteries for alternately connecting said batteries in series to supply twenty-four volt power to the twenty-four volt equipment in a first switch position or in parallel for charging in a second switch position,

a twelve volt power socket connected across one of said batteries independent of said switch means and across the other of said batteries through said switch means when said switch means is in said second position, said twenty-four volt equipment being connected to said batteries independent of said power socket, and

means including a twelve volt power plug removably insertable into said socket for connecting said socket to a source of twelve volt charging power, said socket being available for supplying twelve volt power to twelve volt equipment external to said power system and separate from said twenty-four volt equipment when said switch is in said first position by reason of said socket being connected across said one of said batteries independent of both said switch means and said twenty-four volt equipment.

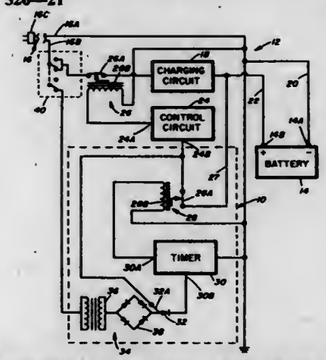
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5,497,067

## BATTERY CHARGER WITH TIMER-CONTROLLED CHARGING, SHUT-OFF AND RESET OPERATIONS

Donald E. Shaw, 9206 Peppertree Cir., Wichita, Kans. 67226

Filed Feb. 18, 1994, Ser. No. 198,468
Int. Cl.[6] H02J 7/02
U.S. Cl. 320—21 3 Claims




1. In combination with a battery charger having a charging circuit connect ed to a battery to be charged and adapted to operate to charge the battery, a control circuit having an input connected in a feedback circuit path with the battery and being adapted to sense the charge condition of the battery and to reset in response to sensing opening of said feedback circuit path with the battery, and a main relay connected between said charging circuit and an output of said control circuit and being operable to close a circuit path to said charging circuit to initiate operation of said charging circuit to charge the battery in response to actuation of said main relay by said control circuit as a result of said reset of said control circuit and to open said circuit path to terminate operation of said charging circuit to charge the battery in response to deactuation of said main relay by said control circuit as a result of said control circuit sensing the battery reaching a full charge, a timer control circuit which controls on a timed basis a sequence of charging, shut-off and reset operations of said battery charger, said timer control circuit comprising:

(a) a timer preset to operate to repetitively and automatically turn on for a first preset timing period selected to be of a substantially longer duration than a maximum length of time that said charging circuit of said battery charger would take to fully charge the battery and to allow sufficient time for the battery to partially discharge before another charging of the battery is initiated, turn off for a second preset timing period selected to be of a substantially shorter duration than said maximum length of time that said charging circuit of said battery charger would take to fully charge the battery but of a longer duration than a period of time needed by said control circuit of said battery charger to reset, and then turn on again for said first preset timing period;

(b) an electrical power source connected to said timer; and

(c) an auxiliary relay having an actuator portion and a switch portion, said actuator portion of said auxiliary relay being

connected to said timer and actuated by said timer at the start of said first preset timing period and deactuated by said timer at the start of said second preset timing period, said switch portion of said auxiliary relay normally assuming an open condition when said actuator portion of said auxiliary relay is deactuated by said timer and being movable by said actuator portion of said auxiliary relay to a closed condition in response to actuation of said actuator portion of said auxiliary relay by said timer, said switch portion of said auxiliary relay being connected in said feedback circuit path between the battery and said input of said control circuit of said battery charger such that upon initiation of each said second preset timing period, when said timer turns off, said actuator portion of said auxiliary relay is deactuated in response to said timer turning off so as to permit said switch portion of said auxiliary relay to open said feedback circuit path and thereby disconnect the battery from said input of said control circuit of said battery charger permitting said control circuit of said battery charger to reset in preparation for said control circuit of said battery charger to actuate said main relay and thereby initiate another charging of the battery by said charging circuit of said battery charger, whereas upon initiation of each said first preset timing period, when said timer turns on, said actuator portion of said auxiliary relay is actuated in response to said timer turning on so as to cause said switch portion of said auxiliary relay to close said feedback circuit path to said input of said control circuit of said battery charger causing said control circuit of said battery charger to actuate said main relay and thereby initiate another charging of the battery by said charging circuit of said battery charger.

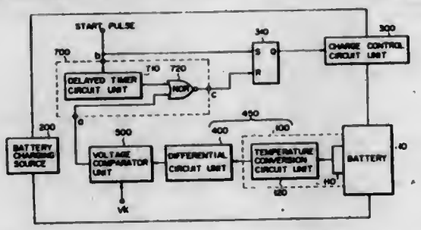
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**5,497,068**

## SECONDARY BATTERY CHARGING CIRCUIT

**Nobuo Shiojima, Tokyo, Japan, assignor to Toshiba Battery Co., Ltd., Tokyo, Japan**

**Division of Ser. No. 775,755, Oct. 15, 1991, Pat. No. 5,391,974.**
**This application Aug. 8, 1994, Ser. No. 287,305**
**Claims priority, application Japan, Jan. 15, 1990, 2-273243; Jan. 15, 1990, 2-273244; Jan. 29, 1991, 3-91774; Feb. 12, 1991, 3-18865; May 22, 1991, 3-117484; Jul. 25, 1991, 3-186476**
**Int. Cl.[6] H02J** *7/00*
**U.S. Cl. 320—35** **4 Claims**




1. A secondary battery charging circuit comprising:
- a charging source for supplying a charging current to a secondary battery;
- temperature change rate detection means for detecting a rate of change in temperature of said secondary battery during a charging operation;
- comparator means for comparing an output value from said temperature change rate detection means during the charging operation with a setting value, and for, when the relationship between the output value and the setting value is reversed, generating an inverted output;
- charge control means for starting the charging operation of said secondary battery in response to a charge start signal, and controlling the charging operation of said secondary battery on the basis of the inverted output from said comparator means; and
- charge control inhibition means for inhibiting charge control by said charge control means for a predetermined period of time from the beginning of the charging operation of said secondary battery.

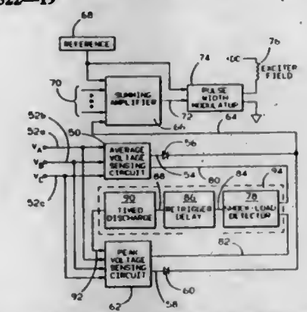
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**5,497,069**

## SHOCK LOAD STABILIZATION CIRCUIT AND VOLTAGE REGULATOR HAVING SAME

**Michael H. Shriver, Rockford, and Rich A. Helm, Crystal Lake, both of Ill., assignors to Sundstrand Corporation, Rockford, Ill.**

**Filed Jun. 24, 1994, Ser. No. 265,305**
**Int. Cl.[6] H02H** *7/06*
**U.S. Cl. 322—19** **10 Claims**




7. An electronic voltage regulator for generators controlled by means of an exciter field current, comprising:
- an average voltage sensing circuit connected to the output of the generator;
- a peak voltage sensing circuit connected to the output of the generator;
- an error signal circuit operatively connected to said average voltage sensing and said peak voltage sensing circuits effective to generate an error signal when the generator's average output voltage varies from a predetermined value or when the generator's peak voltage exceeds a predetermined limit;
- an exciter field current control circuit, operatively connected to said error signal circuit effective to control the generator field current in response to said error signal; and
- a shock load stabilization circuit operatively connected to said average voltage sensing circuit and to said peak voltage sensing circuit effective to sense an application of a shock load to the generator and to disable said peak voltage sensing circuit thereupon.

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**5,497,070**

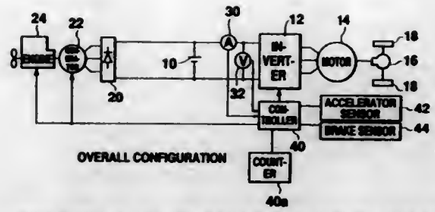
## CONTROLLER OF AN ENGINE DRIVEN GENERATOR FOR AN ELECTRIC VEHICLE

**Masayuki Furutani, Susono, and Yoshihide Ny, Fuji, both of, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan**

**Division of Ser. No. 180,329, Jan. 12, 1994, Pat. No. 5,412,251.**
**This application Jan. 24, 1995, Ser. No. 377,429**
**Claims priority, application Japan, Jan. 14, 1993, 5-4494; Feb. 16, 1993, 5-26887**
**Int. Cl.[6] H02P** *9/04*; **B60L** *11/02*
**U.S. Cl. 322—23** **5 Claims**

1. A controller for controlling the operation of an engine driven generator in an electric vehicle including a motor to be driven by electric power derived from a battery wherein said engine driven generator charges the battery, the controller comprising:
- output torque detection means for producing signals associated with a motor output torque;
- voltage detection means for detecting a voltage of said battery; and






control means for receiving detection values from said detection means and, if said battery voltage is not more than a predetermined value when said output torque is not more than a predetermined value, starting the operation of said engine driven generator.

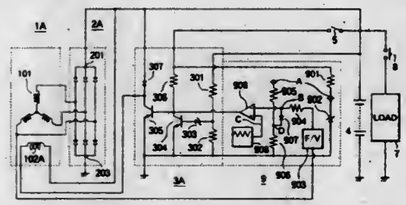
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**5,497,071**

## OUTPUT POWER CONTROL DEVICE FOR AUTOMOTIVE AC GENERATOR

**Shirou Iwatani; Katsuhiko Kusumoto, and Kelichi Komurasaki, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Mar. 18, 1994, Ser. No. 214,544**
**Claims priority, application Japan, Mar. 23, 1993, 5-064245; Dec. 28, 1993, 5-338075**
**Int. Cl.[6] H02J** *7/16*
**U.S. Cl. 322—28** **12 Claims**




1. An output power control device for an automotive AC generator including a field coil, said output power control device comprising:
- switching means coupled in series with said field coil of said automotive AC generator for controlling a current supplied to said field coil;
- rotational speed detector means for detecting a value corresponding to a rotational speed of said automotive AC generator; and
- field current control means, coupled to said rotational speed detector means and said switching means, for reducing an effective level of said current supplied to said field coil when said rotational speed of said automotive AC generator exceeds a first predetermined rotational speed level;
- wherein a current output by said automotive AC generator exceeds a total electric load of a vehicle associated with said automotive AC generator when a rotational speed of said automotive AC generator is above a second predetermined rotational speed level lower than said first predetermined rotational speed level.

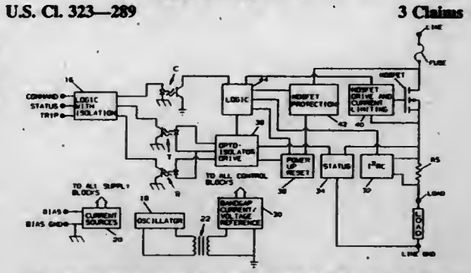
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**5,497,072**

## SOLID STATE POWER CONTROLLER WITH POWER SWITCH PROTECTION APPARATUS

**Norman E. LeComte, West Greenwich, R.I.; Sepideh H. Nott, Fall River, Mass.; Keith W. Kawate, Attleboro Falls, Mass., and Thomas R. Maher, Plainville, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Division of Ser. No. 985,411, Dec. 4, 1992, Pat. No. 5,444,590.**
**This application Mar. 3, 1995, Ser. No. 398,248**
**Int. Cl.[6] G05F** *1/575*
**U.S. Cl. 323—289** **3 Claims**




1. Apparatus for limiting current through at least one MOSFET to a selected level comprising:
- at least one MOSFET, each MOSFET having a drain, a source and a gate,
- a shunt resistor serially connected to the drain-source of each MOSFET,
- a comparator having an inverting terminal, a non-inverting terminal and an output, the shunt resistor coupled to the non-inverting terminal, a reference voltage coupled to the inverting terminal,
- a first current source connected between a supply voltage and each MOSFET gate and a second current source connected between each MOSFET gate and ground, the output of the comparator connected to a third current source providing a linear relationship between the output of the comparator and the value of the second current source between one extreme where the value of the second current source will be zero when the output of the comparator is low causing current to be conducted from the first current source to each gate and an opposite extreme where current will flow from the first current source and out from each gate to the second current source when the output of the comparator is high whereby when the voltage at the non-inverting terminal of the comparator exceeds the voltage at the inverting terminal the output of the comparator will increase causing current to flow from each gate causing the source-drain resistance to increase and lower the load current and voltage across the shunt.

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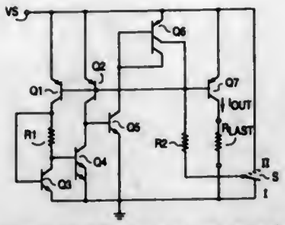
**5,497,073**

## CONSTANT CURRENT SOURCE HAVING BAND-GAP REFERENCE VOLTAGE SOURCE

**Rolf Böhme, Bad Friedrichshall; Wolfgang Eckstein, Obersulm-Sülzbach, and Jens Wirth, Heilbronn, all of, Germany, assignors to Temic Telefunken microelectronic GmbH, Heilbronn, Germany**

**Filed Dec. 20, 1994, Ser. No. 360,030**
**Claims priority, application Germany, Dec. 24, 1993, 43 44 447.4**
**Int. Cl.[6] G05F** *3/04*; *3/16*
**U.S. Cl. 323—312** **4 Claims**

1. Constant current source with a first and a second controlled current source, a first, a second and a third transistor each having a base, a collector and an emitter, and a first resistor, where the base of the second transistor is connected to the collector of the first transistor, the emitter of the first transistor is at a reference potential of the circuit, the first controlled current source is connected to the base of the first transistor, the second controlled current source is connected to the collector of the second transistor, which in turn




is connected to the base of the third transistor, and where either the first resistor connects the base of the first transistor with its collector and the emitter of the second transistor is at the reference potential or the first resistor connects the emitter of the second transistor with the reference potential and the base of the first transistor is connected directly to its collector, wherein a current balancing circuit is provided with an input and an output, with said input being connected to the collector of the third transistor and with said output driving the first and second current sources and being connected via a second resistor and a changeover switch with the reference potential or with an operating voltage source and wherein a third current source controlled by the current balancing circuit supplies a constant output current.

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**5,497,074**

## BALANCED VOLTAGE-TO-CURRENT CONVERTER WITH QUIESCENT CURRENT CONTROL

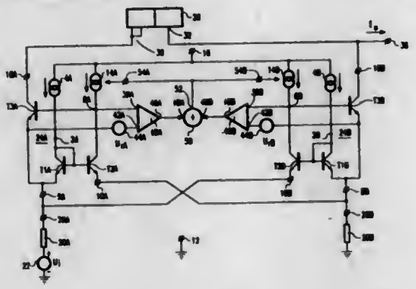
**Hendrik Boezen, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Apr. 14, 1994, Ser. No. 227,829**

**Claims priority, application Belgium, Apr. 16, 1993, 09300384**

**Int. Cl.[6] G05F** *3/26*

**U.S. Cl. 323—316** **17 Claims**





1. A voltage-to-current converter comprising: a first cell which comprises: a first input terminal, a second input terminal and an output terminal, a first current source, a first transistor having a first main electrode, a second main electrode and a control electrode, having a main current path defined by the first and the second main electrode of the first transistor and coupled to the first current source at a first node for the passage of a first current to be supplied by the first current source, and having a junction defined by the first main electrode and the control electrode of the first transistor and connected in a forward direction between the first node and the first input terminal, a second current source, a second transistor of a first conductivity type, having a first main electrode connected to the second input terminal, a control electrode connected to the first node, and a second main electrode coupled to the second current source at a second node, and a third transistor of the first conductivity type, having a first main electrode connected to the first input terminal, a control electrode connected to the second node, and a second main electrode coupled to the output terminal, characterised in that the second current source comprises a controllable current source having a control input, wherein the first cell further comprises a differential amplifier having an output and inputs which are arranged to compare a voltage difference between the control electrode and the first main electrode of the third transistor with a reference voltage which is a measure of the current through the third transistor, a first and a second common input terminal, a second cell identical to the first cell, the first input terminal of the first cell and a second input terminal of the second cell being interconnected at the first common input terminal, and the second input terminal of the first cell and a first input terminal of the second cell being interconnected at the second common input terminal, an adder having inputs coupled to respective outputs of the respective differential amplifiers of the first and second cells, and having an output coupled to the respective control inputs of the second current sources of the first and second cells to supply a respective control signal to the control inputs, and a reference voltage source to supply the reference voltage for the first and the second cell.

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**5,497,075**

## APPARATUS FOR MEASURING PULSE ENERGY

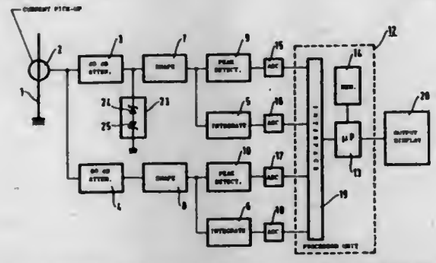
**Yves Bourdet, Saint Cloud, and Christian Girard, Montmagny, both of, France, assignors to Alcatel Cable, Clichy Cedex, France**

**Filed Dec. 2, 1994, Ser. No. 352,727**

**Claims priority, application France, Dec. 3, 1993, 93 14539**

**Int. Cl.[6] G01R** *31/02*

**U.S. Cl. 324—72** **5 Claims**



1. An apparatus for measuring pulse energy, the apparatus being designed to measure the energy from high-current disturbances carried by a cable, said apparatus including:

a current-to-voltage converter delivering at an output end thereof a voltage that is proportional to the current in said cable;

an analog measurement circuit connected at an input end thereof to the output end of said current-to-voltage converter; and

a processing and storage assembly having an input end, coupled to an output end of said measurement circuit, and an output end coupled to an output display;

said apparatus being characterized in that said analog measurement circuit comprises at least two measurement branches, each of which includes an input attenuator (3, 4) and an output integrator (5, 6) having an input end coupled to an output end of said input attenuator, the attenuators in said branches being of different attenuations and having respective input ends connected in parallel to said current-to-voltage converter (2).



**5,497,076**

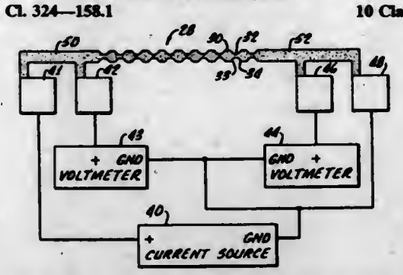
## DETERMINATION OF FAILURE CRITERIA BASED UPON GRAIN BOUNDARY ELECTROMIGRATION IN METAL ALLOY FILMS

**Arthur T. C. Kuo, and Ratan Choudhury, both of Milpitas, Calif., assignors to LSI Logic Corporation, Milpitas, Calif.**

**Filed Oct. 25, 1993, Ser. No. 143,271**

**Int. Cl.[6] G01R** *31/28;27/14*

**U.S. Cl. 324—158.1** **10 Claims**




1. A method for evaluating electromigration induced failure of a thin film conductor that is typical of thin film conductors incorporated in microcircuitry and other integrated circuits, wherein the conductor is subject to failure due to grain boundary and bulk electromigration of atoms in said conductor when the conductor is stressed by electric current and temperature, said method comprising the steps of:

forming a plurality of conductive test patterns on a semiconductor substrate, said conductive test patterns exhibiting a resistance rise $\Delta R$ when an electric current flows therein,

selecting a critical value $\Delta R_c$ of resistance rise that results from electromigration that is predominantly grain boundary electromigration,

electrically stressing said conductive test patterns at a plurality of current densities by application of electric current thereto,

measuring resistance rise of said patterns as they are stressed,

recording time elapsed until said measured resistance rise is at said critical value $\Delta R_c$,

employing said recorded elapsed time to determine values of activation energy Ea, a proportionally constant A, and a current density exponent N in a first equation $MTTF=A(J)^{-N}\exp(Ea/KT)$, where MTTF is elapsed time, K is the Boltzmann constant, and T is temperature of said conductive test patterns, and

solving said equation for MMTF for a predetermined current density and a temperature using said determined values of Ea, A and N;

wherein said step of selecting a critical value of $\Delta R$ for which temperature of the electrically stressed conductive test patterns is not greater than a temperature at which bulk electromigration predominates in said conductive test patterns.

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**5,497,077**

## POWER CALCULATING DEVICE

**Tadashi Nukui, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Jul. 21, 1994, Ser. No. 278,311**

**Claims priority, application Japan, Jul. 21, 1993, 5-179501**

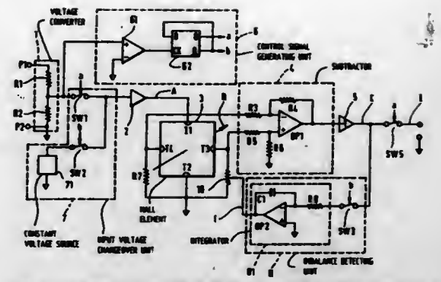
**Int. Cl.[6] G01R** *33/00*

**U.S. Cl. 324—117 H** **13 Claims**

1. A power calculating device, comprising:

control signal generating means for generating a control signal determining a power calculating period and an imbalance compensation period;

input voltage changeover means which receives a first voltage corresponding to a voltage of a system under measurement and said control signal for changing over between said first voltage and a constant voltage under the control of said control signal to generate a second voltage;




said second voltage being said first voltage during said power calculating period and said constant voltage during said imbalance compensation period;

a Hall element member which receives a current corresponding to said second voltage for flowing said current in said Hall element member between current terminals thereof to generate a third voltage corresponding to a product of said second voltage and a magnetic density generated by a magnetic field applied to said Hall element member;

imbalance detecting means which receives said control signal and said third voltage for detecting an offset of said Hall element member based on said third voltage when said control signal shows said imbalance compensation period to generate an offset compensation signal corresponding to said offset;

variable resistor means connected to said Hall element member and which receives said offset compensation signal, a resistance value thereof being changed by said offset compensation signal; and

power value outputting means which receives said third voltage and said control signal for outputting said third voltage when said control signal shows said power calculating period as an output of said power calculating device corresponding to a power of said system under measurement;

whereby an imbalance voltage of said Hall element member being compensated.

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**5,497,078**

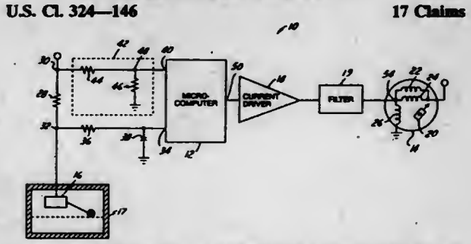
## METHOD AND SYSTEM FOR DRIVING AN AIR CORE GAUGE WITH IMPROVED POINTER RESOLUTION

**Joseph R. Queen, Royal Oak; Terry T. Cwilk, Salem, and Charles G. Hellebuyck, Dearborn, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.**

**Filed Dec. 27, 1994, Ser. No. 363,810**

**Int. Cl.[6] G01R** *5/16;23/00*

**U.S. Cl. 324—146** **17 Claims**




1. A method for driving a gauge having a pointer, said method comprising the steps of:

generating a first gauge control signal responsive to a gauge measurement signal, said first gauge control signal having a first duty cycle corresponding to a first pointer position;

generating a second gauge control signal responsive to said signal, said second gauge control signal having a second duty cycle corresponding to a second pointer position; and

modulating between said first gauge control signal and said second gauge control signal alternating drive periods to drive the pointer to display an average pointer position.

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**5,497,079**

## SEMICONDUCTOR TESTING APPARATUS, SEMICONDUCTOR TESTING CIRCUIT CHIP, AND PROBE CARD

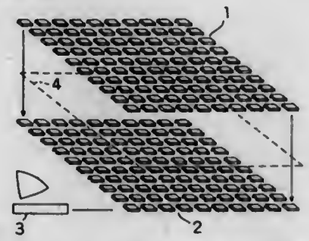
**Toshio Yamada, Osaka; Atsushi Fujiwara, Kyoto; Michihiro Inoue, Nara, and Kazuhiro Matsuyama, Osaka, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Aug. 31, 1993, Ser. No. 113,689**

**Claims priority, application Japan, Sep. 1, 1992, 4-233379; Feb. 24, 1993, 5-035039; Apr. 5, 1993, 5-077846**

**Int. Cl.[6] G01R** *31/28*

**U.S. Cl. 324—158.1** **4 Claims**




1. A semiconductor testing apparatus for testing semiconductor integrated-circuit chips, comprising:

a plurality of semiconductor testing circuit chips, each of which functions to test a single semiconductor integrated-circuit chip;

a computer for controlling said semiconductor testing circuit chips and for collecting the results of the testing of said semiconductor integrated-circuit chips, said results generated by each of said plurality of semiconductor testing circuit chips; and

means for connecting each of said plurality of semiconductor testing circuit chips to a single semiconductor integrated-circuit chip to be tested.

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**5,497,080**

## ROTATION VELOSITY SENSOR FOR A TAPE REEL DISK IN WHICH LIGHT IS REFLECTED OFF OF THE REEL DISK

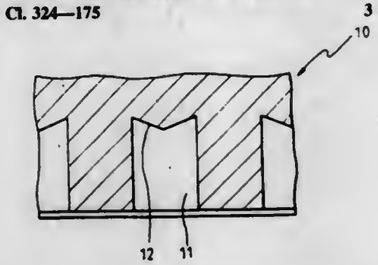
**Jong-woo Kim, Bucheon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki, Rep. of Korea**

**Filed Jul. 21, 1994, Ser. No. 278,223**

**Claims priority, application Rep. of Korea, Aug. 16, 1993, 93-15767**

**Int. Cl.[6] G01P** *3/36;* **G01D** *5/34*

**U.S. Cl. 324—175** **3 Claims**




1. A rotation velocity sensor comprising:

a reel disk;

a light source which emits light onto the bottom of said reel disk;

a light sensor which detects the rotation velocity of the reel disk by detecting the light reflected from the bottom of the reel disk;

said reel disk having a plurality of flat portions and a plurality of grooves alternately formed on the bottom of said reel disk, whereby said plurality of flat portions reflect light evenly and said plurality of grooves reflect light irregularly, each of said grooves having a sloped surface formed therein, wherein said sloped surface comprises two portions, each of said portions slopes outward toward an adjacent one of said flat portions from a central portion between two adjacent flat portions.

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**5,497,081**

## MECHANICALLY ADJUSTABLE LINEAR-OUTPUT ANGULAR POSITION SENSOR

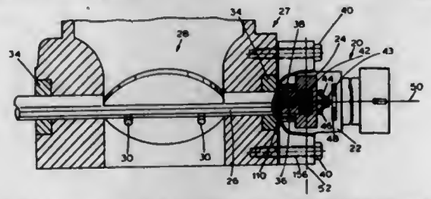
**Ronald J. Wolf, Goshen, and Larry Hedeen, Howe, both of Ind., assignors to Durakool Incorporated, Elkhart, Ind.**

**Continuation-in-part of Ser. No. 902,075, Jun. 22, 1992, Pat. No. 5,332,965. This application Apr. 28, 1993, Ser. No. 51,412**

**The portion of the term of this patent subsequent to Jul. 26, 2011, has been disclaimed.**

**Int. Cl.[6] G01B** *7/14;* **G01R** *35/00*

**U.S. Cl. 324—207.12** **12 Claims**




1. An angular position sensor for sensing the angular position of a pivotally mounted device about a predetermined pivot axis comprising:

a housing;

means for providing a mechanical coupling to said pivotally mounted device, rotatably mounted relative to said housing;

a magnet having north and south magnetic poles;

means responsive to said providing means for generating an electrical signal representative of the angular position of said pivotally mounted device; said generating means being at least partially disposed between said north and south poles of said magnet; and

means for mechanically adjusting the sensitivity of said generating means, wherein said adjusting means includes a flux concentrator and means for carrying said flux concentrator a predetermined distance relative to said generating means.

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**5,497,082**

## QUADRATURE DETECTOR WITH A HALL EFFECT ELEMENT AND A MAGNETORESISTIVE ELEMENT

**Peter G. Hancock, Plano, United Kingdom, assignor to Honeywell Inc., Minneapolis, Minn.**

**Filed Jan. 25, 1995, Ser. No. 377,871**

**Int. Cl.[6] G01B** *7/14;* **G01R** *33/02;33/12;* **G01P** *3/42*

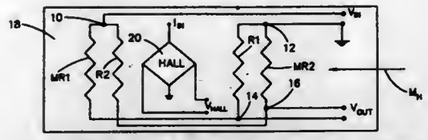
**U.S. Cl. 324—207.14** **12 Claims**

1. A quadrature detector, comprising:

a first magnetically sensitive device disposed on a first surface of a substrate to sense a first directional component of a magnetic field; and

a second magnetically sensitive device disposed on said first surface of said substrate to sense a second directional component of said magnetic field, said first and second directional components of said magnetic field being perpendicular to each other, said first magnetically sensitive device comprising a Hall effect element, said second magnetically sensitive device comprising a magnetoresistive element.






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**5,497,083**

## ROD AXIAL POSITION DETECTOR INCLUDING A FIRST SCALE HAVING EQUIDISTANT MAGNETIC PARTS AND A SECOND SCALE HAVING UNEQUALLY DISTANT PARTS AND DIFFERING FIELD STRENGTHS

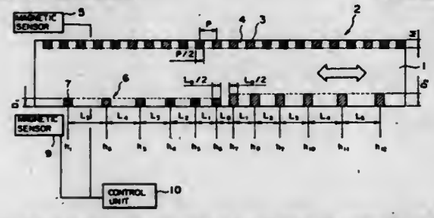
**Masakazu Nakazato; Youichi Shimoura, and Masamichi Sugihara, all of Kanagawa, Japan, assignors to Kayaba Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Dec. 15, 1993, Ser. No. 168,096**

**Claims priority, application Japan, Dec. 24, 1992, 4-344902; Apr. 14, 1993, 5-087544**

**Int. Cl.[6] G01B** *7/14;21/02*

**U.S. Cl. 324—207.24** **4 Claims**




1. An axial position detector for a rod made of magnetic material, comprising a first magnetic scale comprising a plurality of non-magnetic parts arranged axially on the rod at equidistant intervals, a second magnetic scale parallel to said first scale comprising a plurality of non-magnetic parts arranged axially on the rod at unequal intervals, a first magnetic sensor for outputting a signal according to a positional change of the non-magnetic parts of said first magnetic scale, a second magnetic sensor for outputting a signal according to a positional change of the non-magnetic parts of said second magnetic scale, said magnetic sensors being respectively disposed in fixed positions facing said magnetic scales, means for separately memorizing absolute positions of the non-magnetic parts on said second magnetic scale in advance, means for detecting an interval between the non-magnetic parts passing said second sensor based on the output signal from said second sensor, means for identifying a non-magnetic part which has passed based on said detected interval, means for calculating a displacement amount of the rod from said identified non-magnetic part to its current position based on the output signal from said first sensor, and means for calculating the current position of the rod from the absolute position of the identified non-magnetic part and the calculated displacement, characterized in that:

the non-magnetic parts of said second magnetic scale are symmetrically arranged on both sides of a predetermined position on the rod, and

said identifying means comprises means for distinguishing on which side of said predetermined position said second magnetic sensor is situated and means for identifying the non-magnetic parts based on said distinguished side and said detected interval.

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**5,497,084**

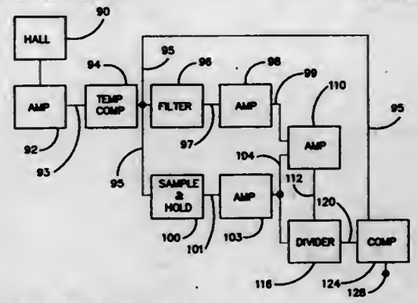
## GEARTOOTH SENSOR WITH MEANS FOR SELECTING A THRESHOLD MAGNITUDE AS A FUNCTION OF THE AVERAGE AND MINIMUM VALUES OF A SIGNAL OF MAGNETIC FIELD STRENGTH

**Robert E. Bicking, Freeport, Ill., assignor to Honeywell Inc., Minneapolis, Minn.**

**Filed Mar. 3, 1995, Ser. No. 398,414**

**Int. Cl.[6] G01B** *7/30;* **G01P** *3/488;* **H03K** *5/153;5/08*

**U.S. Cl. 324—207.25** **18 Claims**




1. A magnetic sensor, comprising:

a permanent magnet;

a magnetically sensitive component disposed proximate said magnet;

first means, connected to said magnetically sensitive component, for providing a first output signal which is representative of the presence of a ferromagnetic member within a detection zone of said sensor;

second means, connected to said first providing means, for providing a second output signal which is representative of an average value of said first output signal over a first preselected period of time;

third means, connected to said first providing means, for providing a third output signal which is representative of a minimum value of said first output signal over a second period of time;

fourth means, connected to said second and third providing means, for providing a fourth output signal which is a function of the difference between said second and third output signals; and

fifth means, connected to said first and fourth providing means, for providing a fifth output signal which is representative of the difference between said first and fourth output signals.

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**5,497,085**

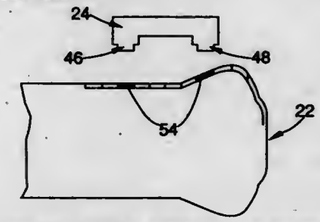
## METHOD FOR DETERMINING AN OUTER DIAMETER ROLLOFF IN A PROCESS FOR MAKING MAGNETIC DISKS

**Hong Tian, Milpitas; Jia-Kuen J. Lee, San Jose, and Ellis T. Cha, Santa Clara, all of Calif., assignors to Conner Peripherals, Inc., San Jose, Calif.**

**Filed Dec. 19, 1994, Ser. No. 358,282**

**Int. Cl.[6] G11B** *5/60*

**U.S. Cl. 324—212** **16 Claims**




1. A method for testing a magnetic disk to be used in a disk drive, comprising the steps of:

measuring an outer radial edge of the disk, along a radius extending outwardly from the center of the disk, to obtain a series of dimensions representing a height profile:

determining, as a function of the dimensions, a slope value for each of a sequence of radial segments of the disk;

selecting pairs of slope values, and for each pair of slope values, calculating a difference value between the slope values of the pair;

comparing each difference value to a preselected threshold difference value; and

indicating the difference value which is equal to or less than the threshold difference value.

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**5,497,086**

**APPARATUS AND METHOD FOR DETERMINING THE DENSITY OF A METAL PLATED POROUS FOAM**

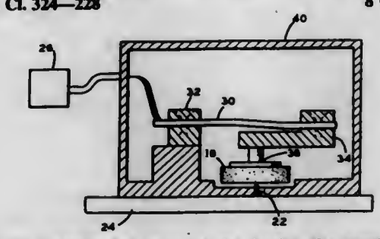
**Paul A. Hynek, Burlington; Vladimir Paserin, Mississanga, and John Ambrose, Oakville, all of, Canada, assignors to Inco Limited, Toronto, Canada**

**Filed Apr. 15, 1994, Ser. No. 228,075**

**Claims priority, application Canada, Jun. 9, 1993, 2098073**

**Int. Cl.[6] G01N *27/72*; G01R *33/12;33/00***

**U.S. Cl. 324—228** **8 Claims**




1. An apparatus for measuring the density of a metal plated porous foam sample, the apparatus comprising a magnet, the magnet connected to a load cell, means for maintaining the magnet a fixed distance away from the sample, the load cell adapted to produce an output signal that is a function of the density of the sample, and the output signal of the load cell connected to a density display device.

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**5,497,087**

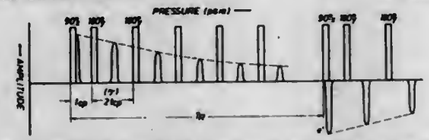
**NMR LOGGING OF NATURAL GAS RESERVOIRS**

**Harold J. Vinegar, Houston, Tex.; Ridvan Akkurt, Mandeville, La., and Pierre Tutunjian, Houston, Tex., assignors to Shell Oil Company, Houston, Tex.**

**Filed Oct. 20, 1994, Ser. No. 326,560**

**Int. Cl.[6] G01V *3/08;3/14***

**U.S. Cl. 324—303** **10 Claims**




1. A method to estimate the pore size within a formation containing hydrocarbon gas, the hydrocarbon gas having a longitudinal relaxation time, the method comprising the steps of:

obtaining a pulsed NMR log using a recovery time that is equal to or greater than the longitudinal relaxation time of the hydrocarbon gas;

determining, from the NMR log using a recovery time that is equal to or greater than the longitudinal relaxation time of the hydrocarbon gas, a distribution of transverse relaxation times;

determining from the distribution of transverse relaxation times a restricted diffusion coefficient of hydrocarbon gas within the formation; and

estimating from the restricted diffusion coefficient of hydrocarbon gas within the formation the pore size within the formation.

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**5,497,088**

**MRI IMAGING METHOD AND APPARATUS**

**Yuichi Hayano, and Susumu Kosugi, both of Tokyo, Japan, assignors to GE Yokogawa Medical Systems, Limited, Tokyo, Japan**

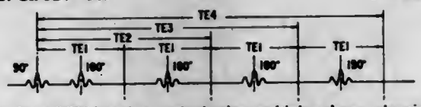
**PCT No. PCT/JP93/00645, § 371 Date Oct. 14, 1994, § 102(e) Date Oct. 14, 1994, PCT Pub. No. WO93/22967, PCT Pub. Date Nov. 25, 1993**

**PCT Filed May 17, 1993, Ser. No. 318,800**

**Claims priority, application Japan, May 20, 1992, 4-127142**

**Int. Cl.[6] G01V *3/14***

**U.S. Cl. 324—309** **4 Claims**




1. In an MRI imaging method using multiple echoes, wherein N views constituting K space are divided into an even number S of blocks, each block being formed of successive M views including a DC view;

collecting multiple echoes of a first order to an Sth order and assigning successive echoes to successive blocks;

repeating said collecting and assigning of said successive multiple echoes to successive blocks for each of said successive M views;

providing phase gradients so that phases corresponding to different blocks are encoded for the first order to the Sth order, and so that phases corresponding to different view in each block are encoded for the first time to the Mth time; and

processing data of said N views to obtain a reconstructed image; the improvement comprising

providing an offset to each phase gradient so that the phase encoded gradient representing the DC view is disposed away from a boundary between adjacent blocks and substantially in the middle of one of said blocks.

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**5,497,089**

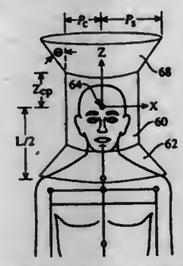
**WIDE APERATURE GRADIENT SET**

**David A. Lampman, Eastlake; Michael A. Morich, Mentor, and Labros Petropoulos, Cleveland Heights, all of Ohio, assignors to Picker International, Inc., Highland Heights, Ohio**

**Filed Mar. 15, 1994, Ser. No. 213,099**

**Int. Cl.[6] G01V *3/14***

**U.S. Cl. 324—318** **19 Claims**




1. In an insertable gradient coil for a magnetic resonance imaging apparatus, which insertable gradient coil includes a central cylindrical portion having an interior bore of a first cross-section dimensioned to receive a head of the subject to be imaged, the central cylindrical portion carrying gradient coil windings for creating linear magnetic field gradients in the interior bore through the subject's head, THE IMPROVEMENT COMPRISING:



the insertable gradient coil further including a first end portion of a second cross-section dimensioned to receive shoulders of the subject to be imaged, the second cross-section being larger than the first cross-section, the first end portion being connected with a first end of the central cylindrical portion adjacent a patient receiving end of the insertable gradient coil, the gradient coil windings extending in part along the first end portion such that the gradient coil windings lie in part on the central cylindrical portion and in part off the central cylindrical portion on the first end portion.

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**5,497,090**

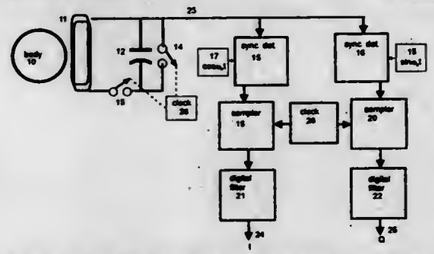
**BANDWIDTH EXTENSION SYSTEM USING PERIODIC SWITCHING**

**Albert Macovski, 2505 Alpine Rd., Menlo Park, Calif. 94025**

**Filed Apr. 20, 1994, Ser. No. 230,503**

**Int. Cl.[6] G01V *3/00***

**U.S. Cl. 324—322** **19 Claims**




1. In a method for receiving an electromagnetic field signal using a high-Q low-loss coil tuned with a capacitor to form a tuned circuit tuned to the frequency of the signal the steps of:

periodically de-energizing the tuned circuit to substantially remove the signal whereby the effective bandwidth of the tuned circuit is substantially increased and;

detecting the resulting signal.

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**5,497,091**

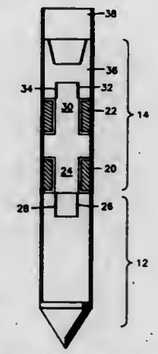
**SURFACE MOUNTED PH SENSOR FOR CONE PENETRATION TESTING**

**Wesley L. Bratton, South Royalton, and J. Christopher Bianchi, Pittsfield, both of Vt., assignors to Applied Research Associates, Inc., Albuquerque, N.M.**

**Filed Sep. 1, 1994, Ser. No. 299,584**

**Int. Cl.[6] G01N *33/22;33/24***

**U.S. Cl. 324—348** **6 Claims**




1. An apparatus for providing continuous pH measurements of soil in real time during soil penetration, said apparatus comprising:

a cone penetrometer test apparatus including a penetrometer probe for penetrating the soil to a depth of up to 300 feet,

at least two electrodes mounted on a peripheral exterior surface of said penetrometer probe, one of said electrodes being a reference electrode and another one of said electrodes being a measurement electrode made of antimony, and

means for transmitting a continuous electrical potential difference during depth penetration of said penetrometer probe through the soil from said at least two electrodes to a surface of the soil for continuous, real time measurement of pH simultaneously with continuous penetration of the soil by the penetrometer probe.

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**5,497,092**

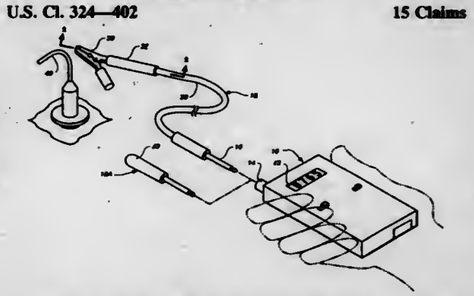
**APPARATUS FOR DETECTING AND DISPLAYING ENGINE SPEED**

**Arthur J. Kaszanics, 7340 Wren Ave., Gilroy, Calif. 95020**

**Filed Feb. 3, 1994, Ser. No. 191,167**

**Int. Cl.[6] F02P *17/00***

**U.S. Cl. 324—402** **15 Claims**



1. Apparatus for detecting and displaying the revolution speed of an internal combustion engine having an electrical distribution system including at least one spark cable, said apparatus comprising, in combination:

a hand held housing having a digital display;

an antenna connected to said housing and projecting therefrom, said antenna for placement adjacent to a spark cable of an internal combustion engine for receiving electromagnetic energy pulses radiating from said spark cable; and

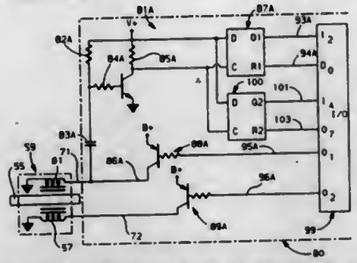
pulse to direct digital counter interphase circuit means disposed in said housing in operative association with said antenna and with said digital display to count the electrical energy pulses received by said antenna from said spark cable within a predetermined time frame to determine electrical pulse frequency and to directly convert the determined electrical pulse frequency into internal combustion engine revolution speed and to display said internal combustion engine revolution speed on said digital display, said pulse to direct digital counter interphase circuit means including incoming signal shaper means and a phase locked loop in operative association with said incoming signal shaper means for multiplying the pulse frequency of said incoming signal, and said pulse to direct digital counter interphase circuit means including switch means operatively associated with said phase locked loop to vary the multiplication factor for multiplying the pulse frequency of said incoming signal.

5,497,093

## METHOD AND APPARATUS FOR DIAGNOSING A TWIN-COIL, BI-STABLE, MAGNETICALLY LATCHED SOLENOID

Arthur R. Sundeen, Lansing; James C. Byrne, Farmington Hill, and Vincent A. Cichocz, Eastpointe, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 2, 1994, Ser. No. 236,053
Int. Cl.[6] G01R *31/02;31/327;* G08B *21/00*
U.S. Cl. 324—415 6 Claims



1. A method for diagnosing electrical integrity and mechanical integrity of a bi-stable magnetically latched solenoid, said solenoid comprising a pair of independently energizable coils, a plunger actuatable into one of two independent positions corresponding to the previously energized coil, a magnet providing flux through said plunger, said method comprising the steps:

energizing one of the coils;

monitoring a voltage across the other of the coils not energized;

determining from said monitored voltage the electrical integrity of the coils and mechanical actuation integrity of the plunger.

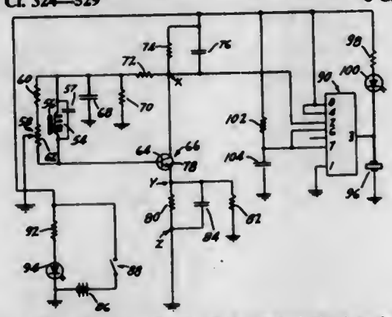
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5,497,094

## ELECTRICAL CIRCUIT IDENTIFICATION MEANS

David L. George, 12 Andras Rd., Sandy Hook, Conn. 06482

Filed Jan. 21, 1994, Ser. No. 184,602
Int. Cl.[6] G01R *31/28;19/00*
U.S. Cl. 324—529 8 Claims



1. A hand-held electronic means for inductively detecting low frequency pulses of high magnitude and short duration in an electrical circuit, comprising in combination:

a) an inductive pick-up coil and a magnetic core therefor, said pick-up coil having two terminals,

b) electrical signalling means,

c) an electrical power source for electrically energizing said signalling means,

d) an electronic trigger means responsive to voltage induced in said pick-up coil for effecting energization of the signalling means from said power source, said trigger means having a ground terminal at electrical ground potential and an input terminal responsive to drive voltages applied to it, and

e) a control means connected to the terminals of said pick-up coil, said control means comprising a manually-adjustable variable value resistive device which connects to and bridges the terminals of said pick-up coil, said resistive device adjustably reducing the value of the useful voltage across said pick-up coil terminals as the value of said resistive device is manually reduced, and simultaneously pulling down the voltage on the input terminal of said trigger means with respect to the ground potential of the said ground terminal all in response to the reduction in the value of said resistive device.

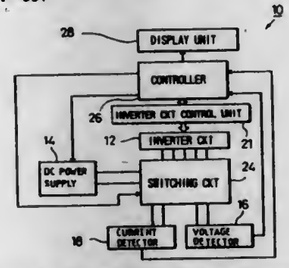
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5,497,095

## APPARATUS FOR INSPECTING ELECTRIC COMPONENT FOR INVERTER CIRCUIT

Atsushi Ueyama; Yoshinari Tsukada, and Fumitomo Takano, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 8, 1994, Ser. No. 337,479
Claims priority, application Japan, Nov. 8, 1993, 5-278241; May 26, 1994, 6-112748; Sep. 22, 1994, 6-227965
Int. Cl.[6] G01R *31/02*
U.S. Cl. 324—537 14 Claims




1. An apparatus for inspecting an electric component in an inverter circuit composed of a voltage-smoothing electrolytic capacitor, a plurality of transistors, and a plurality of diodes coupled in inverse parallel connection to said transistors, respectively, comprising:

a DC power supply for supplying a direct current to the inverter circuit;

voltage detecting means for detecting a voltage at a predetermined position in the inverter circuit;

current detecting means for detecting a current flowing at a predetermined position in the inverter circuit;

switching means for changing positions at which the direct current is supplied from said DC power supply to the inverter circuit, positions at which the voltage is detected in the inverter circuit by said voltage detecting means, and positions at which the current is detected in the inverter circuit by said current detecting means;

switching control means for outputting a switching signal to said switching means;

electrolytic capacitor determining means for calculating an electrostatic capacitance of the electrolytic capacitor based on a time consumed after the electrolytic capacitor has started being charged by the direct current supplied from said DC power supply through a resistor until a voltage across the electrolytic capacitor as detected by said voltage detecting means reaches a predetermined voltage, and also on a resistance of said resistor, and determining whether the electrostatic capacitance falls within a preset range; and

transistor determining means for determining whether a $V_{CE}$-$I_C$ curve generated from a collector-to-emitter voltage $V_{CE}$ of each of the transistors as detected by said voltage detecting means and a collector current $I_C$ of the transistor as detected by said current detecting means, falls within a preset range;

the arrangement being such that the electrolytic capacitor and the transistors will be determined as to whether they are acceptable or not by changing said positions at which the direct current is supplied from said DC power supply to the inverter circuit, said positions at which the voltage is detected



in the inverter circuit by said voltage detecting means, and said positions at which the current is detected in the inverter circuit by said current detecting means, based on the switching signal outputted from said switching control means.

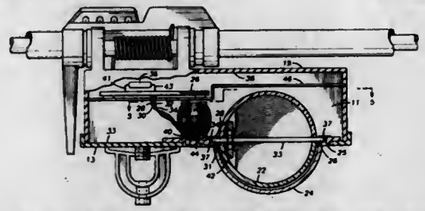
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5,497,096

## FAULTED CIRCUIT INDICTOR WITH THREE-DIMENSIONAL DISPLAY DEVICE

John F. Banting, Waukesha, Wis., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Jul. 2, 1993, Ser. No. 87,447
Int. Cl.[6] H01H *31/02*
U.S. Cl. 324—555 38 Claims



1. An indicator for indicating either a normal or fault current through a conductor, comprising:

a housing;

an electromagnet connected to said housing and having a normal coil and a trip coil;

a current monitor for sensing the current through the conductor, said current monitor producing an induced current signal proportional to the current in the conductor;

a trip circuit connected to said current monitor for receiving said induced current signal, said trip circuit including:

detection circuitry for detecting the fault current in the conductor, said detection circuitry electrically connected to said trip coil;

wherein said detection circuitry produces a first signal when the fault current is detected in the conductor, and wherein, said trip coil receives said first signal;

a reset circuit connected to said current monitor for receiving said induced current signal and connected to said detection circuitry, said reset circuit including:

activation circuitry for activating said normal coil, said activation circuitry electrically connected to said normal coil and producing a second signal upon receipt of said induced current;

wherein said normal coil is activated upon receipt of said second signal, and wherein said activation circuitry receives said first signal from said detection circuitry and, in response to said first signal, said activation circuitry is deactivated;

said normal coil producing a first polarity of said electromagnet upon receipt of the second signal from said activation circuitry, and said trip coil producing a second polarity of said electromagnet upon receipt of the first signal from said detection circuitry;

a permanent magnet rotatably mounted adjacent said electromagnet such that said permanent magnet aligns with the polarity of said electromagnet;

a three-dimensional display having an external surface area and being coupled to said permanent magnet, said display having a normal side formed by a first half of said surface area and a trip side formed by a second half of said surface area; and

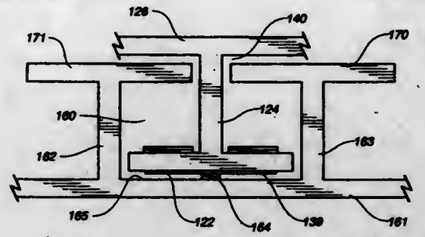
said permanent magnet and display being positioned during said first polarity so that said first half of said surface area of said normal side is visible and more than fifty percent of said first half of said surface area of said normal side projects outward from said housing, and being positioned during said second polarity so that said second half of said surface area of said trip side is visible and more than fifty percent of said second half of said surface area of said trip side projects outward from said housing.

5,497,097

## APPARATUS FOR DETECTING A CONNECTION BETWEEN ADJACENT PANELS OF A CURTAIN WALL

Walter W. Walling, and Patrick T. Brunette, both of Conroe, Tex., assignors to GSE Lining Technology, Inc., Houston, Tex.

Filed May 2, 1994, Ser. No. 235,939
Int. Cl.[6] G01R *31/02*
U.S. Cl. 324—555 18 Claims




1. A device for detecting a connection between interlocking connectors of adjacent vertical panels, each of the interlocking connectors having a connector member and a channel formed therein, the device comprising:

a first contact element positioned on the connector member of one of the panels;

a second contact element affixed to a surface on the channel of the interlocking connector of the adjacent panel, said second contact element positioned in proximity to said first contact element when the connector member is received by the channel;

a first conductive line connected to said first contact element and extending along a length of the connector member;

a second conductive line connected to said second contact element and extending along a length of the channel;

a means for passing a current to at least one of said first and second conductive lines; and

a means for detecting a current in one of said first and second conductive lines.

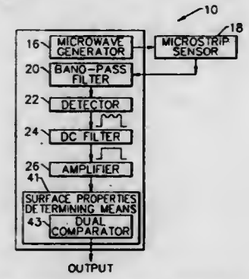
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5,497,098

## MICROWAVE SENSOR FOR IDENTIFYING THE SURFACE PROPERTIES OF A WORKPIECE AND ASSOCIATED METHOD

Garret G. Heil, St. Peters; John J. Domalewski, University City; Frederick C. Wear, St. Louis; Stephen C. Buckner, St. Ann; Arthur C. Lind, Chesterfield, and Jeffry K. Hoyt, St. Louis, all of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Nov. 10, 1994, Ser. No. 338,007
Int. Cl.[6] G01R *27/04;* G01N *22/00*
U.S. Cl. 324—637 18 Claims




1. A sensor for identifying the surface properties of a workpiece, the sensor comprising:

a microwave generator for producing microwave signals at a predetermined frequency;

microstrip sensing means, electrically coupled to said microwave generator, for supporting propagation of the microwave signals produced by said microwave generator from a first end portion toward a second end portion and for transmitting at least a portion of the propagating microwave signals to the workpiece such that the workpiece can influence the strength of the transmitted microwave signals, the second end portion being spaced apart from and electrically connected to the first end portion;

detector means, electrically coupled to the second end portion of said microstrip sensing means, for detecting the propagating microwave signals at the second end of the microstrip sensing means; and

surface properties determining means, responsive to said detector means, for determining the surface properties of the workpiece based upon the strength of the detected microwave signals such that workpieces comprised of a conductive material, an insulative material and a conductive material coated with a radar absorbing material can be distinguished.

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**5,497,099**

## ANTENNA SYSTEM FOR SOOT DETECTING

**Frank B. Walton, Pinawa, Canada, assignor to Engine Control Systems Ltd., Canada**

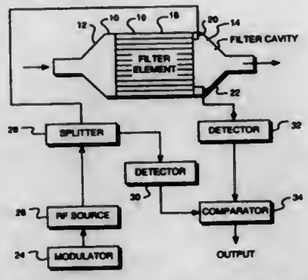
**PCT No. PCT/CA92/00374, § 371 Date Mar. 4, 1994, § 102(e) Date Mar. 4, 1994, PCT Pub. No. WO93/05388, PCT Pub. Date Mar. 18, 1993**

**PCT Filed Sep. 3, 1992, Ser. No. 204,255**

**Claims priority, application Japan, Sep. 6, 1991, 3-227355**

**Int. Cl.[6] G01R** *27/32*

**U.S. Cl. 324—641** **7 Claims**




1. In an apparatus for detecting the accumulation of particulate material on a filter medium, the filter medium formed of dielectric material and disposed in a chamber, said apparatus having means for generating and transmitting an RF signal through said filter medium and for monitoring the transmission loss of said signal through at least a portion of said filter medium so as to provide an indication of the content of particulate material accumulated on said filter medium, the improvement comprising:

an input antenna for transmitting said signal and having at least a first antenna element extending longitudinally within said chamber and disposed within said filter medium; and

an output antenna for receiving the signal transmitted by said input antenna and having at least a second antenna element extending longitudinally within said chamber and disposed within said medium in parallel, spaced apart, axially overlapping relation with respect to said first antenna element.

**5,497,100**

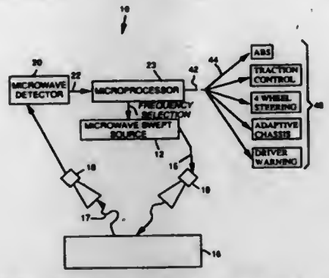
## SURFACE CONDITION SENSING SYSTEM

**Kurt Reiser, Agoura; Scott Y. Harmon, Oak Park, and Jennifer M. Butler, Pacific Palisades, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.**

**Filed Oct. 17, 1994, Ser. No. 324,436**

**Int. Cl.[6] G01N** *22/04*

**U.S. Cl. 324—643** **25 Claims**




1. A surface condition sensing system comprising:

a source of electromagnetic power for producing signals in a band of frequencies;

sweep control means, operatively connected to said source, to control selectively the frequencies produced by said source in said frequency band periodically over a predetermined time interval by continuously outputting a control signal to said source to cause the frequency output of said source to vary continuously within said band of frequencies;

means for coupling said band of frequencies to a surface to be examined;

signal monitoring means for comparing power and frequencies transmitted into and reflected from said surface to be examined, and for generating a plurality of absorption signals, each of said absorption signals representative of the difference between the amplitude of the electromagnetic power transmitted into said surface and the corresponding amplitude of the signal reflected from said surface for a frequency in said band of frequencies;

evaluator means, connected to said signal monitoring means, for generating a surface condition signal, for each plurality of absorption signals, by quantizing and comparing the minimum return amplitude of power sensed over the whole frequency band, as represented by said plurality of absorption signals, with a sequence of surface profiles;

control means connected to said evaluator means for generating a status signal in accordance with said surface condition signal.

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**5,497,101**

## DEVICE FOR EFFECTING DYNAMIC MEASUREMENT OF THE DISTANCE BETWEEN THE FACING FACES OF THE ROTOR AND THE STATOR OF A ROTARY MACHINE

**Jean-Claude Fillion, Paris, France, assignor to Societe Nationale D'Etude et de Construction de Moteurs D'Aviation "Snecma", Paris, France**

**Filed Nov. 17, 1994, Ser. No. 343,870**

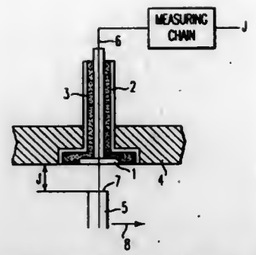
**Claims priority, application France, Nov. 17, 1993, 93 13708**

**Int. Cl.[6] G01R** *27/26*

**U.S. Cl. 324—662** **12 Claims**

1. A device for effecting dynamic measurement of the clearance between the tips of rotating blades and the stator of a turbomachine, comprising at least one capacitive sensor intended to be mounted in the stator in line with said blades, said sensor having an electrode intended to cooperate with the tips of said blades so as to define a capacitor with variable capacitance every time a blade passes under the electrode of said sensor, and at least one measuring chain connected to said sensor, said measuring chain including






a device for conditioning the sensor and providing an output signal, and means for processing the signal from said conditioning device, wherein said conditioning device comprises a load amplifier having a high-pass filter structure, and said capacitive sensor and said load amplifier are arranged to be polarized by the same direct voltage, said direct polarization voltage being determined in such a manner that the mean value of said output signal from said conditioning device is equal to a desired voltage value.

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**5,497,102**

## METHOD AND APPARATUS FOR DETECTION OF LIQUID INCENDIARIES BY CHANGES IN CAPACITANCE

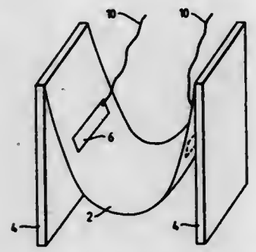
**John D. Burrows, and Kenneth R. Mann, both of Farnborough, United Kingdom, assignors to Her Majesty the Queen in right of Canada, as represented by the Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, Canada**

**Filed Aug. 24, 1994, Ser. No. 295,018**

**Claims priority, application United Kingdom, Aug. 25, 1993, 9317633**

**Int. Cl.[6] G01R** *27/26;* **G01N** *27/22*

**U.S. Cl. 324—663** **15 Claims**



1. A device for detecting liquid incendiaries contained in a bottle, said device comprising:

a flexible cradle mounted between two supports, said cradle supporting said bottle,

two conductors arranged laterally on the cradle to form a capacitor,

an electrical circuit comprising an alternating current power source applied to said conductors whereby a signal is developed with a strength proportional to capacitance of said capacitor, and

indication means responsive to the strength of the signal in the circuit.

**5,497,103**

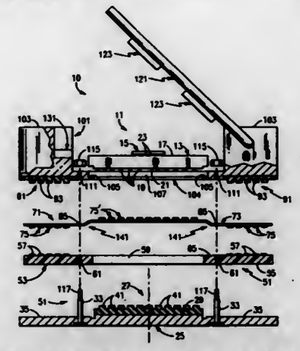
## TEST APPARATUS FOR CIRCUITIZED SUBSTRATE

**William S. Ebert, Endicott; David E. Eagle; Kishor V. Desai, both of Vestal, and Thomas G. Macek, Endicott, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jan. 25, 1995, Ser. No. 378,348**

**Int. Cl.[6] G01R** *1/04*

**U.S. Cl. 324—754** **25 Claims**



19. A method for testing a first circuitized substrate, having a plurality of conductors, said method comprising the steps of:

positioning a second circuitized substrate having a first plurality of conductive elements thereon on a base;

positioning a third circuitized substrate having first and second portions each including a plurality of conductive elements thereon on said second circuitized substrate such that said plurality of conductive elements on said second portion engages said conductive elements on said second circuitized substrate;

positioning a cover on said third circuitized substrate in aligned manner relative to said base;

positioning said first circuitized substrate on or within said cover, selected ones of said conductors of said first circuitized substrate engaging respective ones of said conductive elements on said first portion of said third circuitized substrate when said cover is positioned on said circuitized substrate in said aligned manner relative to said base; and

applying electrical current to said second circuitized substrate whereby said current will pass to said conductors on said first circuitized substrate and said first circuitized substrate will be tested.

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**5,497,104**

## FLEXIBLE INTERFACE IC TEST CLIP

**Marik Balyasny, Burbank, Calif., assignor to ITT Corporation, New York, N.Y.**

**Continuation-in-part of Ser. No. 893,181, Jun. 3, 1992, abandoned. This application Sep. 13, 1994, Ser. No. 305,531**

**Int. Cl.[6] G01R** *1/073;* **H01R** *23/72*

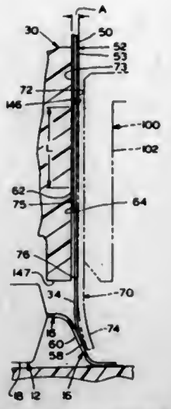
**U.S. Cl. 324—755** **8 Claims**

1. A test clip for testing an integrated circuit device (12) that has a body (18) and leads (16) extending from the body, comprising:

a clip housing (30) with locating walls (32) for closely engaging a circuit device body to locate said housing with respect to said circuit device body, said clip housing having a substantially vertical cable-supporting wall (146) that has a lower end (147);

a first device (38) mounted on said clip housing and having a plurality of contact elements (36);

a flat flexible cable (52) mounted on said clip housing, said cable having a flexible insulative material (53) and a plurality of conductors (50) embedded in said insulative material, said conductors having upper ends (92) electrically connected to said contact elements, said conductors having parallel lower



ends (58) that are devoid of insulation to form exposed lead-engaging lower contact portions (34) to enable them to directly engage said leads, with the upper end and lead-engaging lower end portion of each conductor being integral; said cable has an elongated located portion (L) with a first face (73) lying facewise against said substantially vertical cable-supporting wall with said conductors extending vertically therealong, and including a second device (100, 70) that presses against an opposite second face (72) of said cable elongated located portion to press said first face thereof against said cable-supporting wall, with said exposed lead-engaging lower end portions of said cable extending vertically down from said elongated located portion of said cable to a location below the lower end (147) of said cable-supporting wall.

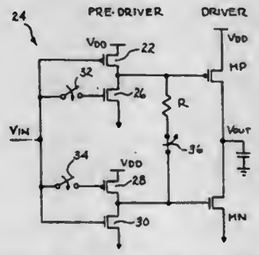
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**5,497,105**

## PROGRAMMABLE OUTPUT PAD WITH CIRCUITRY FOR REDUCING GROUND BOUNCE NOISE AND POWER SUPPLY NOISE AND METHOD THEREFOR

**Sung-Hun Oh, and Richard M. Taylor, both of Phoenix, Ariz., assignors to VLSI Technology, Inc., San Jose, Calif.**

**Filed Jun. 30, 1994, Ser. No. 269,800**
**Int. Cl.[6] H03K** *17/16*
**U.S. Cl. 326—27** **16 Claims**




1. A programmable output pad for use with one of a high supply voltage and a low supply voltage, comprising, in combination:
pre-driver means coupled to an input of said programmable output pad for transferring a signal from said input, said pre-driver means comprising a plurality of transistors;
driver means coupled to said pre-driver means for transferring said signal from said pre-driver means to an output of said programmable output pad, said driver means comprising:
a first transistor having a control junction thereof coupled to a first portion of said pre-driver means, and
a second transistor having a control junction thereof coupled to a second portion of said pre-driver means; and
controllable delay means coupled between said pre-driver means and said driver means for providing a plurality of different time delays for delaying activation of said driver means by different amounts of time and for reducing ground bounce noise on a ground supply of said programmable output pad, and for reducing noise on one of said high supply voltage and said low supply voltage of said programmable output pad, said controllable delay means comprising impedance means coupled between said control junction of said first transistor and said control junction of said second transistor for delaying said activation of said driver means.

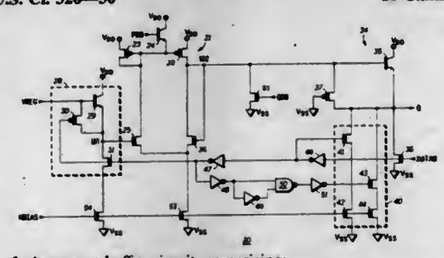
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**5,497,106**

## BICMOS OUTPUT BUFFER CIRCUIT HAVING OVERSHOOT PROTECTION

**Donovan Raatz; Taisheng Feng, and Alan R. Bormann, all of Austin, Tex., assignors to Motorola Inc., Schaumburg, Ill.**

**Filed Sep. 19, 1994, Ser. No. 308,854**
**Int. Cl.[6] H03K** *19/003*
**U.S. Cl. 326—30** **16 Claims**



1. An output buffer circuit, comprising:
a voltage converter having an input terminal for receiving a reference voltage having a first voltage level and a second voltage level, and an output terminal for providing an output voltage directly proportional to the reference voltage;
a first transistor having a first current electrode coupled to a first power supply voltage terminal, a control electrode coupled to the output terminal of the voltage converter, and a second current electrode for providing an output signal;
a second transistor having a first current electrode coupled to the second current electrode of the first transistor, a control electrode for receiving an input signal, and a second current electrode coupled to a second power supply voltage terminal; and
means for providing the reference voltage at the first voltage level as the input signal transitions from a first logic state to a second logic state, and when the input signal is at the second logic state, the reference voltage is provided at the second voltage level.

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**5,497,107**

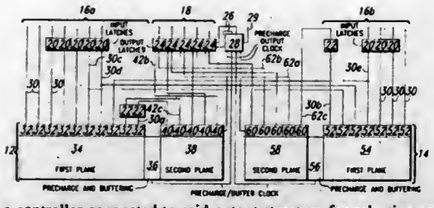
## MULTIPLE, SELECTABLE PLAS HAVING SHARED INPUTS AND OUTPUTS

**Andre Szczepanek, Brickhill, United Kingdom, assignor to Texas Instruments Incorporated, Dallas, Tex.**

**Filed May 13, 1993, Ser. No. 61,643**
**Int. Cl.[6] H03K** *19/173;* **G06F** *7/38*
**U.S. Cl. 326—39** **21 Claims**

1. A state machine, comprising:
at least two programmable logic array matrix structures, with each matrix structure having corresponding input terminals and output terminals and performing preselected logic operations;
an output structure connected to said output terminals of said matrix structures; and






a controller connected to said output structure for selecting said output terminals of one of said matrix structures to provide operational outputs for said state machine, said controller further connected to said matrix structures for selecting which matrix structure is provided power for its operation.

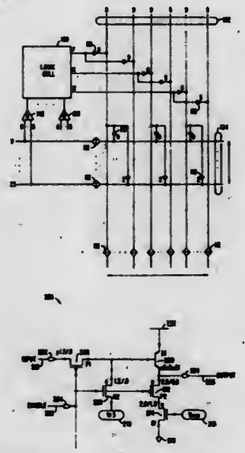
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**5,497,108**

## BICMOS REPEATER CIRCUIT FOR A PROGRAMMABLE LOGIC DEVICE

**Suresh M. Menon, Sunnyvale; Stanley Wilson, Mountain View, and Tsung C. Whang, Cupertino, all of Calif., assignors to Dynalogic Corporation, Sunnyvale, Calif.**

**Filed Dec. 8, 1994, Ser. No. 352,402**
**Int. Cl.[6] H03K** *19/0175*
**U.S. Cl. 326—84** **16 Claims**



1. A programmable logic device comprising:
a plurality of logic cells in which logic functions are performed;
a plurality of input lines for supplying signals to the plurality of logic cells;
a plurality of output lines for receiving signals from the plurality of logic cells;
a first potential source coupled to the plurality of logic cells;
a second potential source coupled to the plurality of logic cells; and
a plurality of repeater circuits coupling the output lines to the input lines, the plurality of repeater circuits including bipolar and CMOS transistors.

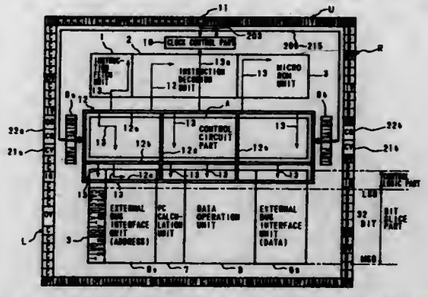
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**5,497,109**

## INTEGRATED CIRCUIT WITH REDUCED CLOCK SKEW

**Nubuhiko Honda; Toyohiko Yoshida, and Yukihiko Shimazu, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 40,244, Mar. 30, 1993, Pat. No. 5,376,842. This application Jun. 1, 1994, Ser. No. 252,520**
**Claims priority, application Japan, Nov. 14, 1989, 1-296840**
**Int. Cl.[6] H03K** *19/02;* **H01L** *25/00*
**U.S. Cl. 326—93** **1 Claim**



1. An integrated circuit formed on a single rectangular chip, said chip comprising:
a pad coupled to an external clock signal;
a first edge;
second and third edges adjoining said first edge;
a first circuit which outputs a derived clock signal in response to said external clock signal, said first circuit formed substantially near said first edge; and
two of a second circuit, each coupled to said first circuit, each of which outputs an internal clock signal in cooperation with the other in response to said derived clock signal, one of said second circuits formed substantially near said second edge, the other of said second circuits formed substantially near said third edge;
wherein
said internal clock signals of said second circuits are coupled to each other and input to said first circuit.

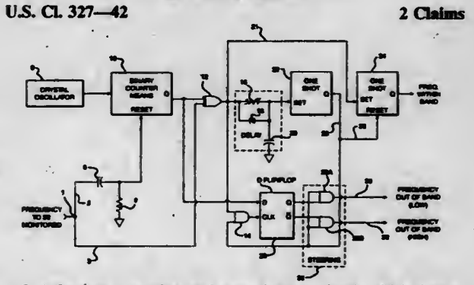
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**5,497,110**

## FREQUENCY MONITOR AND ERROR DETECTOR CIRCUIT

**Gerald L. Smith, Torrance, Calif., assignor to MAGL Power Inc., Torrance, Calif.**

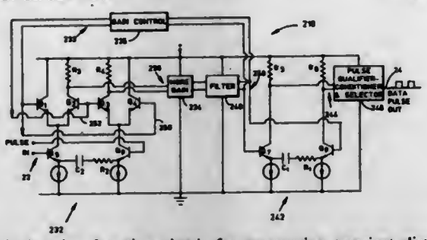
**Filed Apr. 12, 1995, Ser. No. 420,493**
**Int. Cl.[6] G01R** *23/02*
**U.S. Cl. 327—42** **2 Claims**



1. A frequency monitor and error detector circuit which detects any input ac signal deviation from a certain fixed reference frequency, said circuit comprising in combination:
(a) a device input terminal for connecting an input ac wave which is to be monitored;

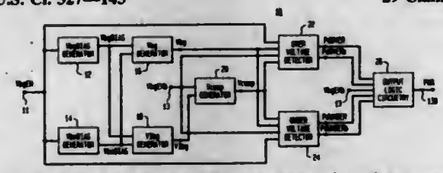
(b) a crystal oscillator, said crystal oscillator producing a signal which is a multiple of said reference frequency;
(c) a binary counter means, said binary counter means having its input terminal connected to an output of said crystal oscillator;
(d) a differentiating circuit comprising a first capacitor and a resistor, said first capacitor being connected to said device input terminal, said differentiating circuit producing a signal pulse marking a positive-going leading edge of said input ac wave at its capacitor to resistor connection, said signal pulse being directly connected to a RESET terminal of said binary counter means;
(e) an exclusive OR gate having an input connected to a Q output terminal of said binary counter means, and a second input connected to said device input terminal; said exclusive OR gate producing an output positive pulse whose width is proportional to a frequency error of said input ac wave being monitored;
(f) a delay circuit means connected to the output positive pulse of said exclusive OR gate; said delay circuit means setting a selected frequency tolerance band and producing a high output signal when an out-of-tolerance condition is found;
(g) a first one-shot; said first one-shot having its SET terminal connected to the output of said exclusive OR gate; said first one-shot, when set by the output of said exclusive OR gate, producing a high signal at its Q output, said high signal of said first one-shot indicating a Frequency Within Band condition; and
(h) an error detector cult comprising a second one-shot, a first AND gate, a D flip/flop, a second AND gate and a third AND gate, said second and third AND gates being connected to form a steering circuit; said second one-shot having its SET terminal connected to the output of said delay circuit means and producing a high signal at its Q output when activated, said Q output of said second one-shot being connected to a RESET terminal of said first one-shot and disabling said first one-shot, and also connected for a purpose of enabling, to input terminals of said steering circuit and said first AND gate; said first AND gate having an input terminal connected to an output of said exclusive OR gate, said first AND gate output being connected to a CLK input terminal of said D flip/flop; said D flip/flop having its D input terminal connected to the output of said binary counter means; said D flip/flop comparing its D input signal with a positive-going edge of its input CLK signal and switching a high signal to either its Q output or to its Q-bar output, said Q output of said D flip/flop being connected to an input terminal of said second AND gate in said steering circuit, said Q-bar output being connected to an input terminal of said third AND gate in said steering circuit; said second AND gate, when activated, having its output go high; said third AND gate, when activated, having its output go high;
said error detector circuit operating by said second one-shot receiving said high output signal of said delay circuit means, thereby causing the Q output of said second one-shot to produce the high signal; said high signal from said second one-shot being input to the RESET terminal of said first one-shot and disabling said first one-shot Q output; said high signal from said second one-shot also enabling said first AND gate and the second and third AND gates in said steering circuit to thereby activate said first AND gate and permit the output signal of said exclusive OR gate to propagate through said first AND gate into the CLK terminal of said D flip/flop; said D flip/flop comparing its D and CLK input signals and switching a high signal to its Q output or its Q-bar output;
said Q output of said D flip/flop, if high, activating said second AND gate and causing its output to go high, indicating a Frequency Out Of Band (Low) condition;
said Q-bar output of said D flip/flop, if high, activating said third AND gate and causing its output to go high, indicating a Frequency Out Of Band (High) condition.

**5,497,111**
**PEAK DETECTION CIRCUIT FOR SUPPRESSING MAGNETORESISTIVE THERMAL ASPERITY TRANSIENTS IN A DATA CHANNEL**
**Earl A. Cunningham, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.**
**Filed Dec. 22, 1994, Ser. No. 363,431**
**Int. Cl.[6] G01R** *19/00*
**U.S. Cl. 327—58** **13 Claims**



1. A pulse detecting circuit for suppressing transient disturbances in an input signal waveform having amplitude and frequency characteristics including a stream of pulses, said circuit comprising:
an input node for receiving said input signal;
differentiating means connected to said input node for generating a differentiated signal substantially representative of a time rate of change of said input signal amplitude;
variable gain amplifier (VGA) means coupled to said differentiating means for amplifying said differentiated signal responsive to the amplitude of said differentiated signal to create an output signal having a stable amplitude and a mean value;
zero-crossing detector means coupled to said VGA means for creating an output pulse responsive to the transition of said stable output signal passing said mean value; and
qualifying means coupled to said zero-crossing detector means for discarding each said output pulse in response to a maximum time rate of change of said output signal that is less than a predetermined threshold at a corresponding transition of said output signal.

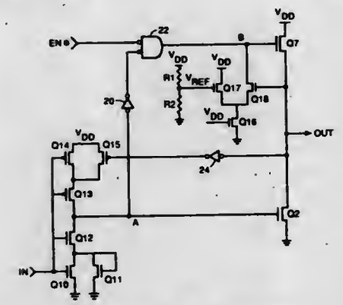
**5,497,112**
**POWER-OUT RESET SYSTEM**
**Chinh L. Hoang, San Diego, Calif., assignor to General Instrument Corporation of Delaware, Hatboro, Pa.**
**Filed Jul. 12, 1994, Ser. No. 274,046**
**Int. Cl.[6] H03L** *17/22*
**U.S. Cl. 327—143** **29 Claims**



1. Circuitry for detecting if a voltage level of a voltage source exceeds preselected voltage levels comprising:
reference voltage generator means for generating first and second reference voltages at first and second outputs, respectively, thereof;
delay/disable means, which has an input coupled to the second output of the reference voltage generator means, and which has an output, for generating, after a predetermined delay, a third reference voltage at the output of the delay/disable means, and for generating a disable output signal at the output of the delay/disable means if the voltage level of the voltage source is below a minimum level;
voltage detector means, which has a first input which is coupled to the first output of the reference voltage generator means, which has a second input coupled to the output of the delay/disable means, and which has a third input coupled through a voltage translator network thereof to a voltage source terminal, the voltage source terminal being connectable to the voltage source, for detecting if the voltage level of the voltage source is within the preselected voltage levels and for generating at outputs thereof signals indicative of whether the voltage level of the voltage source is within or outside the preselected voltage levels, and for being disabled if the voltage level of the voltage source is below the minimum level.

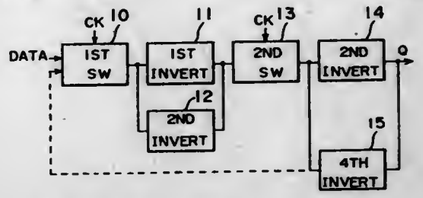


**5,497,113**
**VARIABLE-SLOPE DRIVER FOR PULLUP-TERMINATED TRANSMISSION LINES**
**Richard Uber, Stow, Mass., assignor to Quantum Corporation, Milpitas, Calif.**
**Filed May 16, 1994, Ser. No. 242,769**
**Int. Cl.[6] H03K** *5/12;5/08*
**U.S. Cl. 327—170** **15 Claims**



1. A transmission line driver circuit, comprising:
a first N-type field-effect transistor (N-FET) having a conductive channel including a source connected to ground and a drain connected to an output node (OUT) of said circuit coupled during circuit operation to a transmission line having a pull termination to a positive termination voltage supply (Vt) relative to ground;
a second N-FET having a source connected to ground and having a gate and drain connected together, said second N-FET having a thresbold voltage substantially the same as a threshold voltage of said first N-FET;
a third N-FET substantially smaller than said second N-FET and having a source connected to ground, having a drain connected to both the gate and drain of said second N-FET, and having a gate connected to an input node (IN) of said circuit; and
a fourth N-FET having a conductive channel connected between the gate of said first N-FET and said drain of said second N-FET and having a gate connected to said input node (IN)
such that during a logical LOW to HIGH transition at the input node (IN), a transition slope from logical LOW to HIGH at the output node (OUT) is steep until the threshold voltage of the first N-FET is reached and thereafter is less steep, as determined by a ratio of size between the third N-FET and the second N-FET,

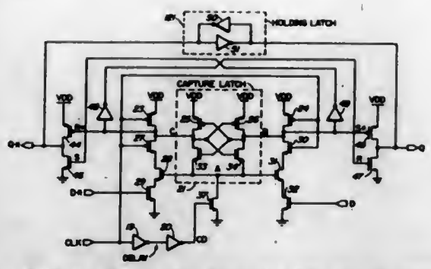
**5,497,114**
**FLIP-FLOP CIRCUIT**
**Motoki Shimozono; Shinya Udo, and Fumitaka Asami, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, and Kyushu Fujitsu Electronics Limited, Kagoshima, both of, Japan**
**Filed Sep. 2, 1994, Ser. No. 299,117**
**Claims priority, application Japan, Dec. 22, 1993, 5-323953**
**Int. Cl.[6] H03K** *17/22;5/13*
**U.S. Cl. 327—202** **3 Claims**



1. A flip-flop circuit comprising:
first switch means, made up of a first conductivity type transistor, for controlling passing of input data in response to a single clock signal;
first inverter means for inverting the data passed through said first switch means;
second inverter means for inverting the data output from said first inverter means into inverted data and for inputting the inverted data to said first inverter means;
second switch means, made up of a second conductivity type transistor, for controlling passing of the data output from said first inverter means in response to said single clock signal, said second conductivity type transistor being one of a P-channel and N-channel transistors, said first conductivity type transistor being the other of the P-channel and N-channel transistors;
third inverter means for inverting the data passed through said second switch means; and
fourth inverter means for inverting the data output from said third inverter means into inverted data and for inputting the inverted data to said third inverter means,
said first inverter means having a driving capability larger than that of said second inverter means,
said third inverter means having a driving capability larger than that of said fourth inverter means, and
means for inputting the data output from said fourth inverter means to said first switch means, said fourth inverter means having a driving capability larger than that of said second inverter means.

**5,497,115**
**FLIP-FLOP CIRCUIT HAVING LOW STANDBY POWER FOR DRIVING SYNCHRONOUS DYNAMIC RANDOM ACCESS MEMORY**
**Bruce Millar, Stittsville, Canada; Richard C. Foss, Kirkcaldy Fife, Scotland, and Tomasz Wojcicki, Kanata, Canada, assignors to Mosaid Technologies Incorporated, Kanata, Canada**
**Filed Apr. 29, 1994, Ser. No. 235,647**
**Int. Cl.[6] H03K** *3/356*
**U.S. Cl. 327—211** **6 Claims**

1. A flip-flop circuit for driving an input circuit of a synchronous dynamic random access memory (SDRAM) comprising:
a) a complementary pair of data inputs for receiving data pulses,
b) a clock input for receiving clock pulses,
c) a capture latch circuit for capturing a data pulse bit, having a pair of complementary inputs and a pair of complementary outputs,
d) means for applying data pulses from the complementary data inputs to the inputs of the capture latch,




e) means for triggering the capture latch from the clock pulses, and

f) means for connecting the complementary outputs to each other through a bidirectional holding latch,

whereby during coincidence of a rising edge of a clock pulse and the presence of a data pulse of one polarity, the capture latch is enabled to store said data pulse bit and to drive the pair of complementary outputs, and following said rising edge of a clock pulse and said presence of said data pulse of one polarity the complementary outputs remain driven by the holding latch.

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**5,497,116**

**METHOD AND APPARATUS FOR PROCESSING SIGNALS**

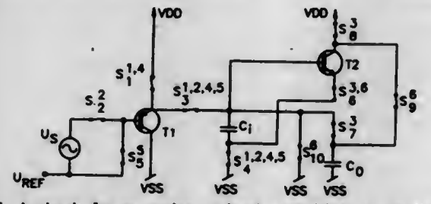
**Juha Rapeli, Oulu, Finland, assignor to Nokia Mobile Phones Ltd., Salo, Finland**

**Filed Apr. 12, 1994, Ser. No. 226,557**

**Claims priority, application Finland, Apr. 23, 1993, 931831**

**Int. Cl.[6] H03K** *5/00*

**U.S. Cl. 327—337** **19 Claims**




1. A circuit for processing a signal comprising: a sampling capacitance;

a summing capacitance electrically coupleable to said sampling capacitance;

means for providing an input signal to be processed;

means for providing a predetermined reference signal selected to produce a sum signal, when summed with said input signal, that is always of the same polarity as said reference signal;

charge supplying means for supplying a quantity of charge of equivalent magnitude and opposite polarity to a quantity of charge representative of said reference signal;

means for summing said input signal and said reference signal and producing a quantity of charge representative of said sum signal on said sampling capacitance; and

switching means, separately electrically coupling said summing means, said sampling capacitance, said summing capacitance, and said charge supplying means, for successively transferring;

a quantity of charge representative of the sum signal quantity of charge on the sampling capacitance, to the summing capacitance;

a quantity of charge having a magnitude and polarity representative of the reference signal, from said reference signal providing means to the sampling capacitance; and

a quantity of charge of equivalent magnitude and opposite polarity to the quantity of charge transferred to the sampling capacitance representative of the reference signal, from said charge supplying means to the summing capacitance.

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**5,497,117**

**INPUT SENSE CIRCUIT HAVING SELECTABLE THRESHOLDS**

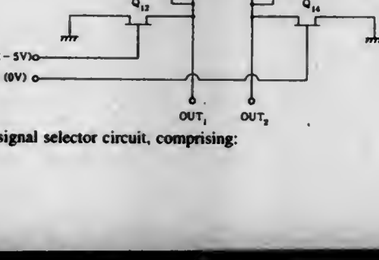
**Takao Nakajima, Ebina, and Kenichi Nakamura, Tokyo, both of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Feb. 27, 1995, Ser. No. 395,033**

**Claims priority, application Japan, Mar. 3, 1994, 6-033575**

**Int. Cl.[6] H03K** *17/687*

**U.S. Cl. 327—404** **7 Claims**




1. A semiconductor integrated circuit comprising:

an input signal terminal to which an input signal is supplied from an outer unit;

a plurality of input voltage sensing circuits, each having a different circuit threshold value and connected to said input signal terminal, for sensing whether a voltage of said input signal is higher or lower than the respective threshold value;

a power supply voltage sensing circuit for sensing whether a power supply voltage applied from outer unit is higher or lower than a predetermined power supply level;

a selection circuit for selecting a corresponding one from a plurality of said input voltage sensing circuits in accordance with an output of said power supply sensing circuit; and

an internal circuit to which an output of a selected one of said input voltage sensing circuits is connected.

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**5,497,118**

**SIGNAL SELECTOR CIRCUIT AND SIGNAL-GENERATING CIRCUIT**

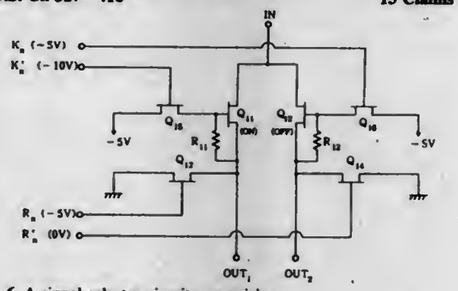
**Toshiaki Ueno, Yokohama, and Shigeru Nakagawa, Kawasaki, both of, Japan, assignors to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed Jul. 19, 1993, Ser. No. 93,824**

**Claims priority, application Japan, Jul. 31, 1992, 4-224728**

**Int. Cl.[6] H03K** *17/693*

**U.S. Cl. 327—416** **13 Claims**




6. A signal selector circuit, comprising:



a first switching field effect transistors (FET) ($Q_{11}$) and a second switching FET ($Q_{12}$), said FETs having coupled drain terminals for use as a signal input terminal, and source terminals not coupled together for use as signal output terminals, and gate terminals;

a first impedance ($R_{11}$) coupled between the gate and source of the first switching FET and a second impedance ($R_{12}$) coupled between the gate and source of the second switching FET; and

circuits connected with said gate terminals of said first and second switching FETs, said circuits exhibiting a high impedance when the gates are activated to drive the FETs on;

wherein the impedances of the first and second resistances are lower than the impedances of the circuits connected with the gate terminals.

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**5,497,119**

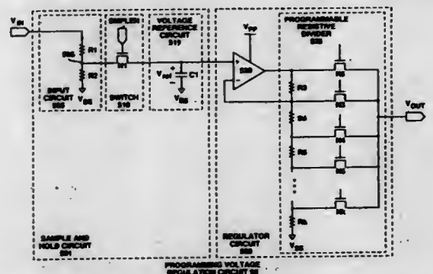
**HIGH PRECISION VOLTAGE REGULATION CIRCUIT FOR PROGRAMMING MULTILEVEL FLASH MEMORY**

**Kerry D. Tedrow, Orangevale; Stephen N. Keeney, Sunnyvale; Albert Fazio, Los Gatos; Gregory E. Atwood, San Jose; Johnny Javanifard, Sacramento, and Kenneth Woiciechowski, Folsom, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.**

**Filed Jun. 1, 1994, Ser. No. 252,585**

**Int. Cl.[6] G05F** *1/10;* **H03K** *3/02*

**U.S. Cl. 327—540** **28 Claims**




1. A voltage regulation circuit, comprising:

a sample and hold circuit for sampling an input voltage and for holding a reference voltage generated in response to the input voltage, the sample and bold circuit including a capacitor that holds the reference voltage; and

a regulator circuit coupled to the capacitor of the sample and hold circuit, the regulator circuit for outputting an output voltage using the reference voltage supplied by the capacitor.

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**5,497,120**

**DIFFERENTIAL AMPLIFIER CIRCUIT HAVING A BIAS CIRCUIT WITH A DIFFERENTIAL AMPLIFIER**

**Masao Ito, Itami, and Takahiro Miki, Kawanishi, both of, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Nov. 29, 1994, Ser. No. 350,030**

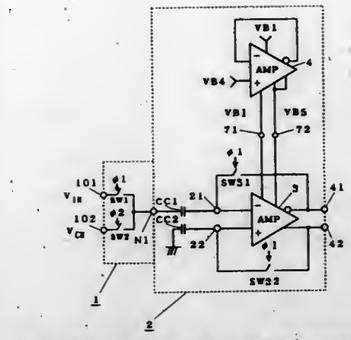
**Claims priority, application Japan, Dec. 21, 1993, 5-322592; Jul. 7, 1994, 6-155823**

**Int. Cl.[6] H03K** *17/16;* **H03F** *3/45*

**U.S. Cl. 327—563** **15 Claims**

1. A differential amplifier circuit, comprising:

a first differential amplifier including first and second input parts, first and second output parts and a bias terminal, said first differential amplifier amplifying a potential difference between said first and said second input parts and outputting a first resultant signal from said first output part and a first inverse signal of said first resultant signal from said second output part, and




a bias circuit which is connected to said bias terminal to output a bias voltage to said bias terminal, wherein

said bias circuit includes a second differential amplifier which is formed on a substrate which seats said first differential amplifier, said second differential amplifier including third and fourth input parts and third and fourth output parts, said second differential amplifier amplifying a potential difference between said third and said fourth input parts and outputting a second resultant signal from said third output part and a second inverse signal of said second resultant signal from said fourth output part, said third input part and said third output part being shorted to each other, said second differential amplifier receiving a predetermined input voltage at said fourth input part and outputting said second inverse signal to said bias terminal as said bias voltage.

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**5,497,121**

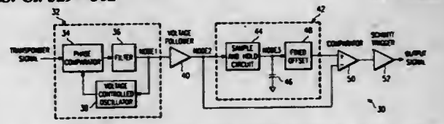
**AUTOMATICALLY CORRECTING DATA DETECTION CIRCUIT AND METHOD FOR FSK MODULATED SIGNALS**

**Loek D'Hont, Almelo, Netherlands, assignor to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Nov. 30, 1994, Ser. No. 347,782**

**Int. Cl.[6] H04L** *27/152*

**U.S. Cl. 329—302** **20 Claims**




16. A method of detecting data from a frequency-shift keying modulated signal, comprising the steps of:

receiving a modulated signal;

converting the modulated signal to voltage levels corresponding to respective frequencies of the modulated signal;

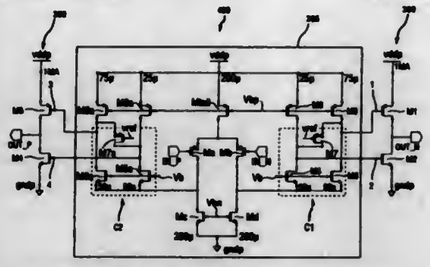
sampling and storing one of said voltage levels representing a logic level;

providing a trip point voltage equal to a sum of the stored voltage level and a fixed voltage offset;

comparing the voltage levels corresponding to the frequency of the modulated signal to the trip point voltage level; and

providing a logic output responsive to the step of comparing.

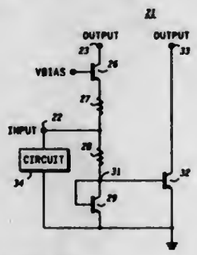
5,497,122
**LOW POWER CLASS-AB INTEGRATED CIRCUIT AMPLIFIER**
Shyam S. Somayajula, Austin, Tex., assignor to Crystal Semiconductor, Austin, Tex.
Filed Jan. 20, 1995, Ser. No. 377,529
Int. Cl.[6] H03F 3/45
U.S. Cl. 330—253 20 Claims



1. An integrated circuit amplifier circuit, comprising:
a pair of differential input transistors, said pair including a first input transistor and a second input transistor;
a first dual transconductance current path connected to said first input transistor, said first dual transconductance current path having at least first and second transconductance current paths;
a third transistor, a drain of said third transistor connected to said first transconductance current path and a source of said third transistor connected to said second transconductance current path; and
a first output stage driven in class AB mode coupled to said drain and said source.

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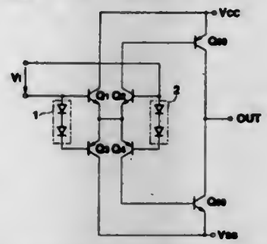
5,497,123
**AMPLIFIER CIRCUIT HAVING HIGH LINEARITY FOR CANCELLING THIRD ORDER HARMONIC DISTORTION**
W. Eric Main, Mesa, and Jeffrey C. Durec, Chandler, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Dec. 23, 1994, Ser. No. 363,089
Int. Cl.[6] H03F 3/45
U.S. Cl. 330—257 16 Claims



1. An amplifier comprising:
a first transistor having a first electrode, a control electrode coupled for receiving a bias voltage, and a second electrode;
a first resistor having a first terminal coupled to said second electrode of said first transistor and a second terminal;
a second resistor having a first terminal coupled to said second terminal of said first resistor and a second terminal; and
a second transistor having a first electrode and a control electrode coupled in common to said second terminal of said second resistor, and a second electrode coupled for receiving a power supply voltage, the amplifier having an input coupled to said second terminal of said first resistor for receiving an input signal and a first output coupled to said first electrode of said first transistor for providing an output signal wherein said first and second resistors have an impedance approximately one half an impedance of said first and second transistors for nulling out a third harmonic distortion.

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5,497,124
**CLASS AB PUSH-PULL DRIVE CIRCUIT, DRIVE METHOD THEREFOR AND CLASS AB ELECTRONIC CIRCUIT USING THE SAME**
Kazuo Yamashita; Nobuyuki Adachi; Masatoyo Nishibe; Masahiko Egawa, and Akiharu Inoue, all of Mitaka, Japan, assignors to Japan Radio Co., Ltd., Tokyo, Japan
Filed Dec. 30, 1994, Ser. No. 366,891
Claims priority, application Japan, Jan. 19, 1994, 6-004181; Jun. 27, 1994, 6-144539
Int. Cl.[6] H03F 3/26
U.S. Cl. 330—267 19 Claims



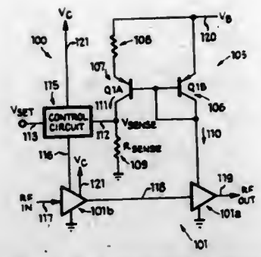
19. A class AB push-pull drive circuit comprising:
first to fourth semiconductor elements, the first and second semiconductor elements receiving a differential input signal, each of the first to fourth semiconductor elements having a supply electrode, a drive electrode and a control electrode, the first and second semiconductor elements having a first polarity and the third and fourth semiconductor elements having a second polarity, the supply electrodes of the first to fourth semiconductor elements being connected together, a current substantially equal to that of the supply electrode flowing through each of the drive electrodes, the current flowing in each of the drive electrodes being controlled by the corresponding one of the control electrodes;
a first constant voltage circuit for maintaining the voltage between the control electrodes of the first and third semiconductor elements constant;
a second constant voltage circuit for maintaining the voltage between the control electrodes of the second and fourth semiconductor elements constant; and
a first output circuit for inverting and adding the currents flowing in the drive electrodes of the first and third semiconductor elements to generate a class AB drive current which is in turn outputted therefrom.

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5,497,125
**CURRENT SENSE CIRCUIT APPARATUS FOR POWER AMPLIFIER CONTROL**
Ian D. Royds, Shamley Green, Great Britain, assignor to Vtech Communications, Ltd., Hong Kong
Filed Jun. 1, 1994, Ser. No. 252,261
Claims priority, application United Kingdom, Jun. 2, 1993, 9311338
Int. Cl.[6] H03F 1/30; H03G 3/30
U.S. Cl. 330—290 26 Claims

1. A power control system for controlling the power output of a power amplifier, said power control system drawing power from a variable voltage supply, such as a battery, and receiving a signal input for indicating the desired power output, said power control system comprising:

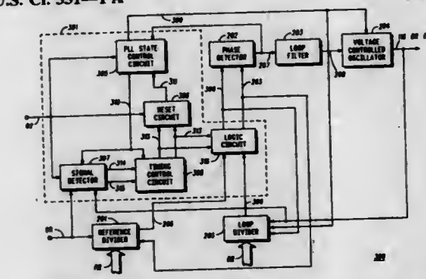




power amplifier means for amplifying an electrical signal, said power amplifier means drawing a current from said variable voltage supply, said power amplifier means of the type wherein said drawn current is indicative of the power output from said power amplifier means;
current sense means operably connected between the variable voltage supply and the power amplifier means for sensing the current drawn by the power amplifier and for simultaneously producing an output current, wherein said output current is directly correlated to said sensed current; and
control means operably accepting said output current and the signal input for comparing said output current to said signal input so as to produce a control signal for controlling the power output by said power amplifier means.

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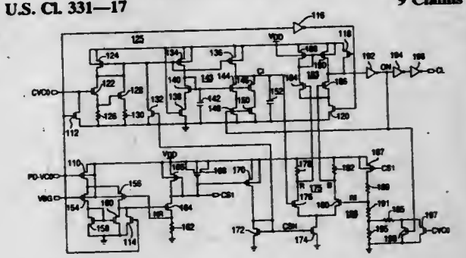
5,497,126
**PHASE SYNCHRONIZATION CIRCUIT AND METHOD THEREFOR FOR A PHASE LOCKED LOOP**
Jeannie H. Kosiec, Schaumburg, and Steven F. Gillig, Roselle, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Nov. 9, 1993, Ser. No. 149,259
Int. Cl.[6] H03L 7/18
U.S. Cl. 331—1 A 11 Claims



1. A phase synchronization circuit for a phase locked loop (PLL) that generates an output frequency signal responsive to a reference frequency signal, the output frequency signal and the reference frequency signal are each characterized by frequency and phase, the frequency of the reference frequency signal is divided to produce a divided reference frequency signal, the output frequency signal is divided to produce a feedback signal, a phase error is indicative of a difference between the phase of the reference frequency signal and the phase of the output frequency signal, the PLL is operative to reduce the phase error responsive to a periodic indication of the phase error, the PLL has a first and a second state responsive to a request signal, an occurrence of the request signal is not synchronized in time with the periodic indication of the phase error, the phase synchronization circuit for the PLL comprising:
a PLL state control circuit coupled to receive the request signal, the periodic indication of the phase error, and a first reset signal, and operative to produce a set signal and a PLL state control signal;
a signal detector coupled to receive the request signal, the output frequency signal, the reference frequency signal, and the set signal, and operative to produce second and third reset signals;
a timing control circuit coupled to receive the second and third reset signals, and the set signal, and operative to produce first and second timing signals;
a reset circuit coupled to receive the request signal and the first and second timing signals and operative to produce the first reset signal; and
a logic circuit coupled to receive the first and second timing signals, the divided reference frequency signal, and the feedback signal, and operative to produce a synchronized divided reference frequency signal and a synchronized feedback signal.

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5,497,127
**WIDE FREQUENCY RANGE CMOS RELAXATION OSCILLATOR WITH VARIABLE HYSTERESIS**
Donald J. Sauer, Allentown, N.J., assignor to David Sarnoff Research Center, Inc., Princeton, N.J.
Filed Dec. 14, 1994, Ser. No. 355,562
Int. Cl.[6] H03K 3/0231;3/354; H03L 7/089;7/099
U.S. Cl. 331—17 9 Claims



1. A variable frequency oscillator which produces an output signal, the oscillator comprising:
a ramp circuit which generates a ramp signal having a rate of change defined by a first control signal, the ramp circuit being responsive to a second control signal being in first and second states to generate a positive-going ramp and a negative-going ramp, respectively;
a hysteresis circuit which, responsive to the second control signal being in the first and second states, generates a signal having a relatively high value and a relatively low value, respectively, the relatively high value and relatively low value defining a hysteresis range, wherein the hysteresis circuit is responsive to the first control signal to change the hysteresis range; and
a comparator which compares the ramp signal to the hysteresis signal to generate the output signal of the oscillator and the second control signal, the second control signal being in the

first state when the ramp signal is less than the hysteresis signal and being in the second state when the ramp signal is greater than the hysteresis signal.

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**5,497,128**

## LOCAL OSCILLATOR SYSTEM AND FREQUENCY SWITCHING METHOD FOR MINIMIZING SPURIOUS COMPONENTS

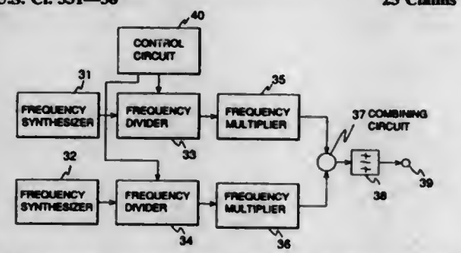
**Yutaka Sasaki, Tokyo, Japan, assignor to NEC Corporation, Japan**

**Filed Oct. 5, 1993, Ser. No. 132,043**

**Claims priority, application Japan, Jan. 5, 1992, 4-265690; Nov. 25, 1992, 4-314768**

**Int. Cl.[6] H03B** *21/00;21/01*

**U.S. Cl. 331—38** **23 Claims**




**9**. A frequency switching method of a local oscillator system for an RF communication system, said method comprising the steps of:

generating signals having different frequencies;

dividing a frequency of one of said signals by a dividing factor n by controlling frequency dividers so that one of said frequency dividers is in an active operation mode and the remaining frequency dividers are in an inactive operation mode, wherein n is an integer equal to or greater than two;

combining a signal output from one of said frequency dividers which is in an active operation mode and at least one signal output from the remaining frequency dividers which are in an inactive operation mode, thereby generating a single output signal; and

selecting a component with a frequency obtained through said dividing step from said single output signal as a local signal.

**22**. A frequency switching method comprising the steps of:

generating a first signal having a fixed frequency of k times as much as a given frequency, where k is an integer equal to or greater than two;

dividing the frequency of the first signal by a dividing factor k to output a resulting frequency-divided signal;

generating second signals each having different frequencies from each other;

mixing the frequency of said frequency-divided signal with the frequency of one of the second signals to generate an output signal;

selecting a component with a desired local frequency from the output signal generated in the mixing step: wherein

the step of dividing the frequency of the first signal includes the step of controlling a plurality of frequency dividers provided for said respective second signals so that one of said frequency dividers is in an active mode in which the frequency of said first signal is divided to output said frequency-divided signal while the remaining frequency dividers are in an inactive mode in which no signals are output.

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**5,497,129**

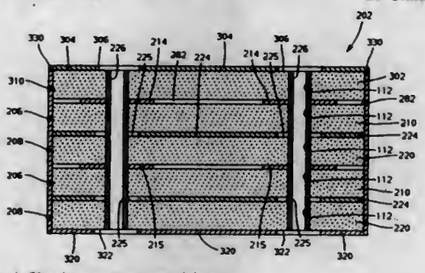
## FILTER ELEMENTS HAVING FERROELECTRIC-FERROMAGNETIC COMPOSITE MATERIALS

**Joseph V. Mantese, Troy; Adolph L. Michell, Harrison Township; Dennis F. Dungan, Mt. Clemens; Norman W. Schubring, Troy, and Clyde M. Callewaert, Sterling Heights, all of Mich., assignors to General Motors Corporation, Detroit, Mich.**

**Filed Jun. 27, 1994, Ser. No. 265,897**

**Int. Cl.[6] H03H** *7/00*

**U.S. Cl. 333—182** **20 Claims**




**1**. A filter/connector comprising:

at least one connector pin;

a first and a second component layer;

the first component layer including a first ferroelectric-ferromagnetic composite layer having a clearance hole formed in the first composite layer for each connector pin; a metallization pad deposited on a top surface of the first composite layer in an area immediately adjacent each clearance hole but not entirely across the top surface of the first composite layer; said first ferroelectric-ferromagnetic composite layer consisting essentially of two phases wherein each phase is interconnected to the other phase throughout the first composite layer;

the second component layer comprising a second ferroelectric-ferromagnetic composite layer having a clearance hole formed therein for each connector pins; and a metallization plane deposited on a top surface of the second composite layer everywhere except for a pin isolation area formed immediately adjacent each clearance hole in the second component layer where no metallization is deposited, said second ferroelectric-ferromagnetic composite layer consisting essentially of two phases wherein each phase is interconnected to the other phase throughout the second composite; and said component layers being sintered together to form a single block;

wherein each of said ferroelectric-ferromagnetic composite layers comprises about 30 to about 70 percent by volume of a ferromagnetic material, and about 30 to about 70 percent by volume of a ferromagnetic material, and wherein the ferromagnetic material comprises a $AB_2O_4$ type material where A is at least one selected from the group consisting of Cu, Mg, Zn, Ni and Mn; and B includes primarily Fe.

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**5,497,130**

## LAYERED TRANSMISSION LINE FILTER WITH A CAPACITIVELY COUPLED ELECTRODE IN A LAYER OPPOSING STRIPLINE RESONATORS

**Takami Hirai, Nishikamo, and Shinsuke Yano, Nagoya, both of, Japan, assignors to NGK Insulators, Ltd., Japan**

**Division of Ser. No. 23,395, Feb. 26, 1993, Pat. No. 5,374,909. This application Sep. 1, 1994, Ser. No. 299,073**

**Claims priority, application Japan, Feb. 28, 1992, 4-43792; Jan. 6, 1992, 4-267299; Jan. 6, 1992, 4-267300**

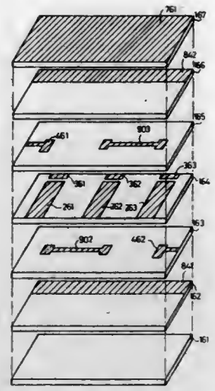
**Int. Cl.[6] H01P** *1/203;7/08*

**U.S. Cl. 333—204** **15 Claims**

**1**. A transmission line filter, comprising:

a dielectric body;





a first ground electrode provided on an outer surface of said dielectric body;

a first resonator disposed in said dielectric body, having an end portion short-circuited to said first ground electrode, an open-circuited end portion, and first and second opposite main surfaces;

a second resonator disposed in said dielectric body and being inductively coupled to said first resonator, said second resonator having an end portion short-circuited to said first ground electrode, an open-circuited end portion, and first and second opposite main surfaces;

a first coupling adjusting electrode having a main surface and being disposed in said dielectric body such that said main surface of said first coupling adjusting electrode opposes a portion of said first main surface of said first resonator and a portion of said first main surface of said second resonator.

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**5,497,131**

## STRIP LINE FILTER HAVING DUAL MODE LOOP RESONATORS

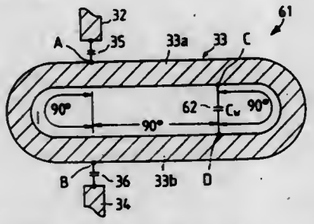
**Kazuaki Takahashi, Kawasaki; Makoto Hasegawa, Tokyo; Mitsuo Makimoto, Yokohama, and Munenori Fujimura, Kawasaki, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Division of Ser. No. 53,535, Apr. 29, 1993, Pat. No. 5,369,383. This application Nov. 28, 1994, Ser. No. 348,169**

**Claims priority, application Japan, Apr. 30, 1992, 4-111127; May 11, 1992, 4-117111; Jun. 12, 1992, 4-153238; Sep. 14, 1992, 4-244374**

**Int. Cl.[6] H01P** *1/70*

**U.S. Cl. 333—204** **5 Claims**




**1**. A strip dual mode loop resonator in which a microwave is resonated, comprising:

a loop-shaped strip line having a pair of parallel lines arranged in parallel to each other, a line length of the loop-shaped strip line being equal to a wavelength of the microwave to resonate the microwave which is circulated in the loop-shaped strip line in two difference directions according to a characteristic impedance of the loop-shaped strip line, and the parallel lines being coupled to each other in electromagnetic coupling to change the characteristic impedance of the loop-shaped strip line;

an input strip line in which the microwave is transmitted;

an input impedance element for coupling the input strip line to the loop-shaped strip line in electromagnetic coupling to transmit the microwave from One input strip line to an input point of tile loop-shaped strip line;

an output strip line in which the microwave resonated in the loop-shaped strip line is transmitted;

an output impedance element for coupling the output strip line to the loop-shaped strip line in electromagnetic coupling to transfer the microwave from an output point of the loop-shaped strip line to the output strip line, the output point of the loop-shaped strip line being spaced a half of the wavelength of the microwave apart from the input point of the loop-shaped strip line; and

a line-to-line impedance element arranged between the parallel lines of the loop-shaped strip line for changing the characteristic impedance of the loop-shaped strip line, one end of the line-to-line impedance element connected to one of the parallel lines being spaced a quarter of the wavelength of the microwave apart from the input point of the Loop-shaped strip line, and another end of the line-to-line impedance element connected to the other parallel line being positioned to the output point of the loop-shaped strip line.

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**5,497,132**

## RELAY

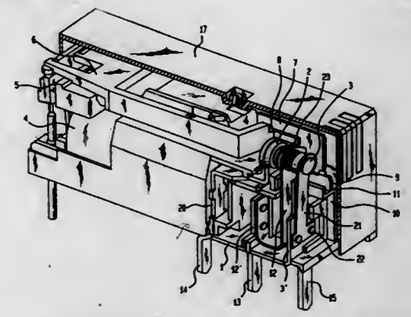
**Leopold Mader, Mödling, Austria, assignor to EH-Schrack Components Aktiengesellschaft, Vienna, Austria**

**Filed Jun. 30, 1994, Ser. No. 269,007**

**Claims priority, application Austria, Jul. 2, 1993, 1310/93**

**Int. Cl.[6] H01H** *51/22*

**U.S. Cl. 335—78** **3 Claims**



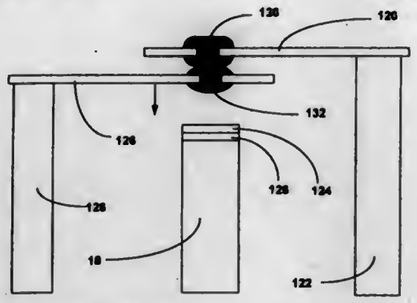
**1**. A relay having a coil, a magnetic system and a contact system which is actuatable via a comb made of an electrically insulating material and includes at least one essentially fixed contact and a movable contact controlled by the magnetic system, wherein the essentially fixed contact (3) is arranged on a resilient holder (21), with the resilient holder (21) being secured on an essentially rigid contact carrier (3') wherein the resilient holder (21) is prestressed against the contact carrier (3') by a stopper which is bent outwardly from this contact carrier (3') and supports the resilient holder.

**5,497,133**

## SWITCH WITH IMPROVED CONTACTS FOR USE IN HIGH TEMPERATURE ENVIRONMENTS

**Arthur W. Dawson, Freeport, and Kundan L. Malik, Rockford, both of Ill., assignors to Honeywell Inc., Minneapolis, Minn.**

**Filed Apr. 12, 1995, Ser. No. 420,952**
**Int. Cl.[6] H01H** *51/22*
**U.S. Cl. 335—83** **12 Claims**




1. A switch, comprising:
a first stationary contact carrier;
a first contact pad rigidly attached to said first stationary contact carrier, said first contact pad comprising a nickel silver alloy;
a second stationary contact carrier;
a second contact pad rigidly attached to said second stationary contact carrier, said second contact pad comprising fine silver;
a movable contact carrier; and
a third contact pad rigidly attached to said movable contact carrier, said third contact pad comprising a silver cadmium oxide alloy.

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**5,497,134**

**Patent Not Issued For This Number**

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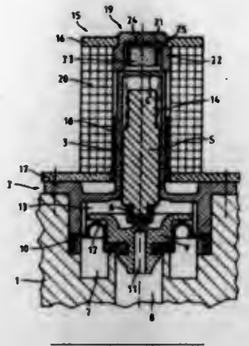
**5,497,135**

## BISTABLE ELECTROMAGNET, PARTICULARLY AN ELECTROMAGNETIC VALVE

**Michael Wiskirchen, Neukirch, and Bernd Geser, Wasserburg, both of, Germany, assignors to Harald Schrott, Lindau, Germany**

**PCT No. PCT/DE94/00358, § 371 Date Nov. 30, 1994, § 102(e) Date Nov. 30, 1994, PCT Pub. No. WO94/23435, PCT Pub. Date Oct. 13, 1994**
**PCT Filed Mar. 30, 1994, Ser. No. 347,314**
**Claims priority, application Germany, Mar. 31, 1993, 43 10 415.0; Sep. 28, 1993, 43 32 960.8**
**Int. Cl.[6] H01F** *7/08*
**U.S. Cl. 335—253** **18 Claims**

1. A bistable electromagnet, comprising:
a yoke;
a coil connected to said yoke and having a interior region;
an element located within the interior region of said coil and defining a hollow space therein;
an armature at least partially located within the interior region of said coil and being movable between two operating positions;
a spring acting upon said armature; and
a permanent magnet arranged in the hollow space of said element and holding said armature against a force of said spring in one of the operating positions, said permanent magnet being freely movable between two end positions in the hollow space in a direction of movement of said armature.



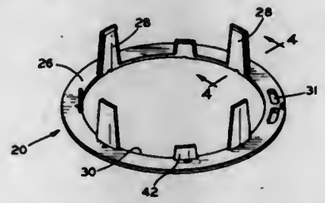

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**5,497,136**

## LOCATING RING FOR ENCAPSULATING A COIL

**John H. Wall, Columbia City, Ind., assignor to Dana Corporation, Toledo, Ohio**

**Continuation-in-part of Ser. No. 983,461, Nov. 30, 1992, abandoned. This application May 4, 1994, Ser. No. 238,619**
**Int. Cl.[6] H01F** *5/00;27/02;27/30;* **H02K** *1/00*
**U.S. Cl. 335—299** **20 Claims**




1. A locating ring for positioning and supporting an electric coil within a mold for encapsulation by a dielectric material, said locating ring comprising:
a body including an inner peripheral edge, an outer peripheral edge, and a support surface extending between said inner peripheral edge and said outer peripheral edge, said support surface adapted to support the electric coil thereon within the mold for encapsulation; and
a support tab extending from said support surface of said body adjacent to said inner peripheral edge, said support tab including an inner radial face defining a first width, an outer radial face defining a second width, and a sidewall extending between said inner radial face and said outer radial face, said first width of said inner radial face being less than said second width of said outer radial face so as to define a recessed area in said sidewall, said outer radial face of said support tab adapted to engage the inner surface of the electric coil to position the electric coil on said support surface of said body within the mold for encapsulation by the dielectric material.

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**5,497,137**

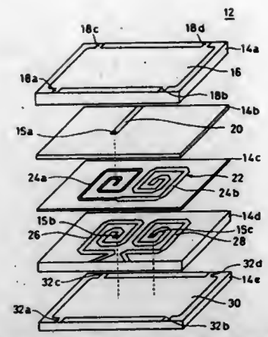
## CHIP TYPE TRANSFORMER

**Yasuhiro Fujiki, Nagaokakyo, Japan, assignor to Murata Manufacturing Co., Ltd., Japan**

**Filed Dec. 16, 1994, Ser. No. 357,704**
**Claims priority, application Japan, Dec. 17, 1993, 5-344361**
**Int. Cl.[6] H01F** *5/00*
**U.S. Cl. 336—200** **6 Claims**

1. A chip type transformer comprising:
a first strip line having a first portion and a second portion;






a second strip line with a shape corresponding to said first portion of said first strip line, which is opposite to said first portion with a dielectric substrate sandwiched therebetween; and
a third strip line with a shape corresponding to said second portion of said first strip line, which is opposite to said second portion with said dielectric substrate sandwiched therebetween;
said second and third strip lines being opposite to an earth electrode with another dielectric substrate sandwiched therebetween, one end of each of said second and third strip lines being connected to said earth electrode.

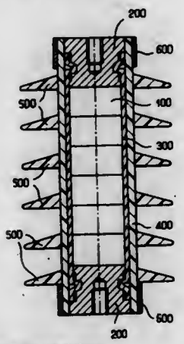
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**5,497,138**

## VARISTOR SURGE ARRESTORS, IN PARTICULAR FOR HIGH TENSION

**Frédéric Malpiece, Bagneres de Bigorre; Alain Rousseau, Orignac, and Dominique Mercier, Billere, all of, France, assignors to Soule, Bagneres de Bigorre, France**

**Filed Nov. 23, 1993, Ser. No. 157,383**
**Claims priority, application France, Nov. 27, 1992, 92 14303**
**Int. Cl.[6] H01C** *7/10*
**U.S. Cl. 338—21** **39 Claims**




12. A surge arrestor comprising:
a stack of varistors;
a first envelope of composite material comprising fibers impregnated by a resin formed on the stack of varistors said first envelope being at least semi-rigid and having constant outside section over its length, to compensate for surface non-uniformities in the stack of varistors due to defects of alignment and to dispersions in dimensions of the varistors; and
a finned external envelope placed on the first envelope made of composite material;
the finned external envelope comprising firstly an outer envelope of substantially constant thickness formed by extrusion on the first envelope, and secondly annular fins subsequently installed on the outer envelope after the outer envelope has been extruded.

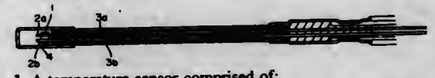
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**5,497,139**

## TEMPERATURE SENSOR AND ITS MANUFACTURING METHOD

**Masayuki Takahashi, Sapporo; Hiroki Moriwake, Sanda; Yoko Sakoda, Osaka, and Takuoki Hata, Moriguchi, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan**

**Filed Sep. 23, 1994, Ser. No. 311,060**
**Int. Cl.[6] H01C** *7/10*
**U.S. Cl. 338—22 SD** **12 Claims**




1. A temperature sensor comprised of:
a thermistor disposed in a heat-resistant cap and lead wires electrically connected to said thermistor in order to connect said thermistor to an external circuit wherein;
said thermistor is comprised of materials defined by the following chemical formula:

$$(Al_{1-x-y}Cr_xFe_y)_2O_3$$

wherein $0.05 \leqq x+y \leqq 0.95$, and $0.05 \leqq y/(x+y) \leqq 0.6$.

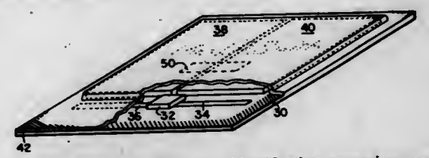
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**5,497,140**

## ELECTRICALLY POWERED POSTAGE STAMP OR MAILING OR SHIPPING LABEL OPERATIVE WITH RADIO FREQUENCY (RF) COMMUNICATION

**John R. Tuttle, Corrales, N.M., assignor to Micron Technology, Inc., Boise, Id.**

**Continuation of Ser. No. 928,899, Aug. 12, 1992, abandoned. This application Dec. 17, 1993, Ser. No. 168,909**
**Int. Cl.[6] G01S** *13/74*
**U.S. Cl. 342—51** **5 Claims**




1. A miniature radio frequency identification transceiver, comprising:
(a) a thin sheet bounded by first and second outer surfaces;
(b) a thin, flat battery bounded by first and second planar electrodes separated by less than 30 mils so that the battery has a thickness less than 30 mils, the first electrode being mounted on and bonded directly to the first surface of the sheet;
(c) an integrated circuit including a radio frequency identification transceiver circuit, having a thickness less than 30 mils, and being mounted on and bonded directly to the first surface of the sheet:
(d) a first conductive strip on the first surface of the sheet, the strip being no greater than 2 mils in thickness and being shaped so as to function as a radio frequency antenna, the strip being connected to the integrated circuit by electrically conductive adhesive; and
(e) a second conductive strip on the first surface of the sheet, the strip being no greater than 2 mils in thickness and having one end connected to the battery and an opposite end connected to the integrated circuit, both connections being secured by electrically conductive adhesive;

(f) a cover bonded directly to the sheet at a mutual periphery so that the cover and the sheet sealingly enclose the battery and the integrated circuit;

(g) wherein the sheet and the cover each have a thickness not substantially greater than either the thickness of the battery or the thickness of the integrated circuit, whereby the transceiver is extremely thin.

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5,497,141

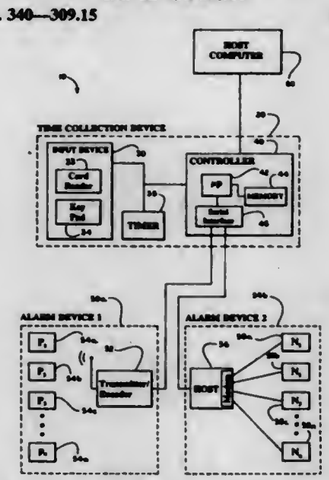
## AUTOMATED LABOR ALERT AND REMOTE MESSAGING SYSTEM

Marshall R. Coles, Roswell; Robert P. Brooks, Cumming, and Antony J. Castagno, Alpharetta, all of Ga., assignors to Timecorp Systems, Inc., Atlanta, Ga.

Filed May 12, 1994, Ser. No. 241,494

Int. Cl.[6] G08B *1/00*

U.S. Cl. 340—309.15 35 Claims




1. An alarm system for alerting when an employee has worked beyond a predeternined time limit, said system comprising:

a time collection device including:

an input device for detecting an input time when the employee clocks in and, in response to the detection of said input time, for generating an input signal indicating the input time and an employee identification signal identifying the employee;

a controller interfaced with said input device, said controller including means for storing information relating to employees whose hours require monitoring, and means, responsive to the input signal for the employee if the employee is one whose hours require monitoring, for determining said predetermined time limit and storing said predetermined time limit in memory; and

a timer interfaced with said controller for recording said input time and for detecting an elapsed time after said input time; and

at least one alarm device interfaced with said controller, wherein when said elapsed time exceeds said predetermined time limit, an alert message is communicated from said time collection device to said at least one alarm device.

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5,497,142

## DIRECTIONAL SEPARATOR-COUPLER CIRCUIT FOR MEDIUM-FREQUENCY CARRIER CURRENTS ON A LOW-VOLTAGE ELECTRICAL LINE

Daniel Chaffanjon, Montgeron, France, assignor to Electricite de France, Paris, France

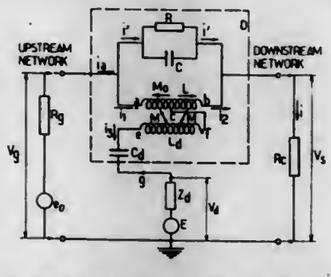
PCT No. PCT/FR92/00976, § 371 Date Jun. 4, 1993, § 102(e) Date Jun. 4, 1993, PCT Pub. No. WO93/08653, PCT Pub. Date Apr. 29, 1993

PCT Filed Oct. 15, 1992, Ser. No. 66,117

Claims priority, application France, Jan. 17, 1991, 91 12821

Int. Cl.[6] H04M *11/04*

U.S. Cl. 340—310.06 10 Claims




1. A directional separator-coupler circuit for medium-frequency carrier currents on an electrical line of a low voltage alternating current network having a characteristic frequency, said circuit comprising a parallel resonant circuit connected in the electrical line and having a resonant frequency close to the central frequency of the pass band of the medium-frequency carrier currents, and a transmitter-receiver circuit for transmitting and receiving said carrier currents which is voltage coupled to said resonant circuit by a connecting circuit, said connecting circuit comprising a series connecting branch for current coupling said transmitter-receiver circuit to said line at said medium-frequency and for decoupling said transmitter-receiver circuit from said line at the characteristic frequency of the low-voltage alternating current network.

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5,497,143

## ELECTRONIC DEVICE FOR A VEHICLE

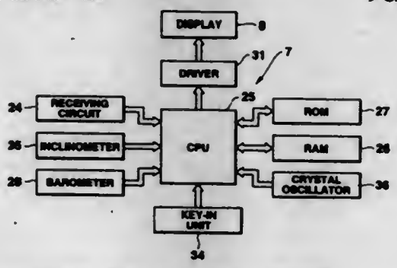
Mitsuaki Matsuo, Hachioji; Yasuo Kuroki, and Takashi Kanzaki, both of Akishima, all of, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Jun. 10, 1994, Ser. No. 258,091

Claims priority, application Japan, Jun. 24, 1993, 5-177337; Jun. 30, 1993, 5-189321

Int. Cl.[6] B62J *3/00*; B60Q *1/00*

U.S. Cl. 340—432 9 Claims




1. An electronic device for a vehicle, comprising:

atmospheric pressure measuring means for measuring an atmospheric pressure to provide data on the measured atmospheric pressure;



first atmospheric pressure data storage means for storing first data on an atmospheric pressure at a first point measured by the atmospheric pressure measuring means;

second atmospheric pressure data storage means for storing second data on an atmospheric pressure measured by the atmospheric pressure measuring means at a second point different from the first point;

height difference data storage means for storing data on the difference between the first and second heights;

difference pressure calculating means for providing data on the actual atmospheric pressure difference between the first and second atmospheric pressures, data on which are stored in the first and second atmospheric pressure storage means, respectively; and

display means for displaying data based on data on the actual atmospheric pressure difference provided by the difference pressure calculating means.

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5,497,144

## TESTING AND ADJUSTMENT OF SCATTERED-LIGHT SMOKE DETECTORS

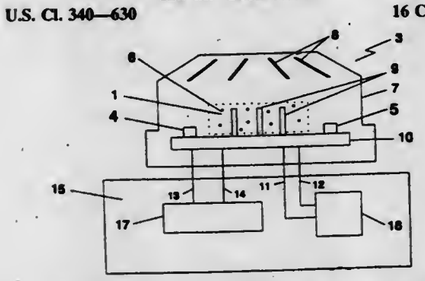
Hans-Peter Schäppi, Zürich, and Arthur Hidber, Esslingen, both of, Switzerland, assignors to Cerberus AG, Maennedorf, Switzerland

Filed Jan. 27, 1994, Ser. No. 187,650

Claims priority, application Switzerland, Jul. 7, 1993, 2037/93

Int. Cl.[6] G08B *17/10*

U.S. Cl. 340—630 16 Claims




1. A method for adjusting a scattered-light smoke detector having a light source, a measurement volume within range of the light source, and sensor-and-evaluation means disposed for producing a signal depending on light scattered in the measurement volume, the method comprising:

inserting a substantially transparent body including scattering centers into the detector such that the measurement volume is occupied at least in part by the body; and

adjusting the detector depending on a resulting signal from the sensor-and-evaluation means.

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5,497,145

## SELECTIVE CALL RECEIVER WITH BATTERY SAVING FEATURES AND METHOD THEREFOR

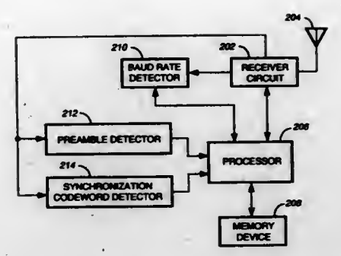
Weng F. Yung, and Dee N. Ong, both of Singapore, Singapore, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 5, 1994, Ser. No. 270,977

Int. Cl.[6] G08B *5/22*; H04L *7/00*; H04B *7/00*

U.S. Cl. 340—825.44 16 Claims

1. A method for battery saving in a selective call receiver having a baud rate detector and a receiver circuit, wherein the receiver circuit receives and demodulates a selective call signal, and wherein the selective call signal includes a preamble and a plurality of data batches, and further wherein each of the plurality of data batches comprises a synchronization codeword and a plurality of assigned data frames, the method comprising the steps of:




82

performing baud rate detection by the baud rate detector during reception of at least one of the plurality of assigned data frames; and

determining whether to activate the receiver circuit during a synchronization codeword of a subsequent one of the plurality of data batches in response to the baud rate detection by determining to activate the receiver circuit during the synchronization codeword of the subsequent one of the plurality of data batches when the baud rate is not detected in the at least one of the plurality of assigned data frames or determining to not activate the receiver circuit during the synchronization codeword of the subsequent one of the plurality of data batches when the baud rate is detected in the at least one of the plurality of assigned data frames.

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5,497,146

## MATRIX WIRING SUBSTRATES

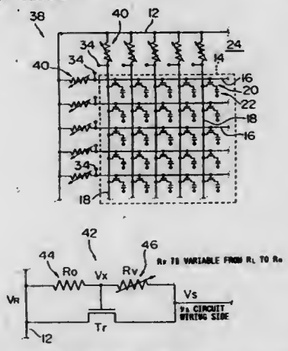
Hiroyuki Hebiguchi, Sendai, Japan, assignor to Frontec, Incorporated, Sendai, Japan

Filed May 27, 1993, Ser. No. 68,461

Claims priority, application Japan, Jun. 3, 1992, 4-143009; Jul. 10, 1992, 4-184208; Feb. 18, 1993, 5-29462

Int. Cl.[6] H04Q *1/18*

U.S. Cl. 340—825.91 9 Claims




1. A matrix wiring substrate comprising:

a wiring matrix including a plurality of first parallel conductive lines and a plurality of second parallel conductive lines, said second parallel conductive lines being perpendicular to said first parallel conductive lines;

a separable portion formed along a periphery of said wiring matrix and connected to each of said first and second parallel conductive lines; and

a guard ring formed along an outer periphery of said separable portion such that said separable portion is located between said guard ring and said wiring matrix;

wherein the separable portion includes:

a transistor having a first terminal connected to said guard ring, a second terminal connected to one of said first and second parallel conductive lines, and a gate; and

a fixed resistor having a fixed resistance value and a variable resistor having a variable resistance value changeable in response to an external field, said fixed resistor and said variable resistor being connected in series between the guard ring and said one of said first and second parallel conductive lines, said fixed resistor and said variable resistor being connected in parallel with said transistor;

wherein a node located between said fixed resistor and said variable resistor is connected to the gate of said transistor.

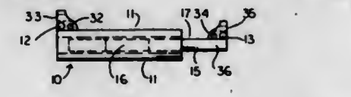
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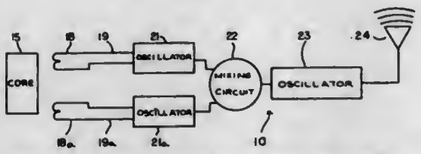
**5,497,147**

## DIFFERENTIAL VARIABLE RELUCTANCE TRANSDUCER

**Steven W. Arms, and Christopher P. Townsend, both of Burlington, Vt., assignors to MicroStrain, Company, Burlington, Vt.**

**Filed Jun. 21, 1993, Ser. No. 78,467**
**Int. Cl.[6] G08C 19/06**
**U.S. Cl. 340—870.35** **3 Claims**






1. Differential variable reluctance transducer and telemetry system, for use in industrial and medical research applications to measure strains in areas previously considered inaccessible, comprising:

a housing;

said housing comprising a hollow tubular structure;

said housing further comprising a stainless steel tube;

said housing having positioning means attached at least one end of said housing;

said housing further having removal means attached; slideable core means located within said housing;

said slideable core means having positioning means attached;

said slideable core means further having removal means attached;

said slideable core means comprising a magnetically permeable metallic center;

said permeable metallic center having a circumference of stainless steel;

a plurality of coils surrounding said slideable core means;

said coils having implanting means for positioning said coils within said housing;

said coil implanting means comprising potting said coils in epoxy;

said coils further having circuitry means attached thereto;

said circuitry means comprising wire means;

said wire means having flexible polymeric means surrounding said wire means for permitting protection and flexibility;

said circuitry means having signal sending means attached;

said signal sending means comprising a transmitting system;

said transmitting system comprising oscillators attached to each of said coils for controlling the frequency of resonance of said coils;

said transmitting system further comprising a mixing circuit for producing the frequency difference between said coils;

said transmitting system further comprising a high frequency oscillator for wireless data transmission which is modulated by said frequency differences;

said transmitting system further comprising an FM antenna; and

said circuitry means further comprising a receiving system for receiving a signal from said FM antenna.

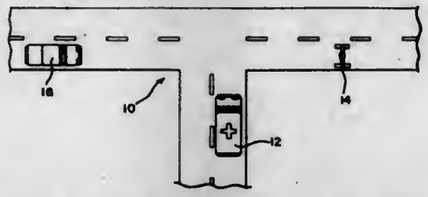
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**5,497,148**

## TRAFFIC INFORMATION WARNING SYSTEM

**David C. Oliva, Chicago, Ill., assignor to Cobra Electronics Corporation, Chicago, Ill.**

**Filed Aug. 30, 1994, Ser. No. 297,969**
**Int. Cl.[6] G08G 1/09**
**U.S. Cl. 340—905** **10 Claims**




1. A traffic information warning system for conveying a message of traffic information from a traffic advisory site to a vehicle, the system comprising a transimitter adapted for placement at said advisory site and a receiver adapted for placement at said vehicle, wherein:

said transmitter includes means for transmitting a first unmodulated carrier signal at a first discrete frequency and means for transmitting a second unmodulated carrier signal at a second discrete frequency, wherein

said first and second frequencies are each located at a frequency location and said message is specified by the specific frequency locations of said first and second discrete frequencies; and

said receiver includes means for detecting said first and second signals, means responsive to said detecting means for determining said message of said traffic information and means responsive to said determining means for announcing said message of said traffic information.

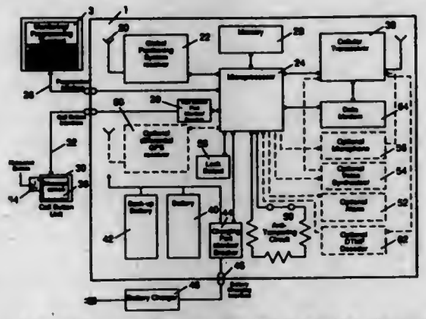
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**5,497,149**

## GLOBAL SECURITY SYSTEM

**Ray Fast, 15515 - 111 A Avenue, Surrey, B.C., Canada**

**Continuation of Ser. No. 116,077, Sep. 2, 1993, abandoned.**
**This application Feb. 21, 1995, Ser. No. 392,026**
**Int. Cl.[6] G08G 1/123**
**U.S. Cl. 340—988** **19 Claims**



1. A security system for protecting and locating an object, and for alerting supervising personnel responsible for said object, said security system determining the geographic position of said object using position signals transmitted by a geographic positioning system, comprising

a terminal, and

an object beacon;

said object beacon including

a geographic position determining device attached to said object including

a microprocessor and a memory for storing programs to be executed by said microprocessor,

first receiving means for receiving said position signals from transmitters of said geographic positioning system,

a wireless communication port connected to a receiver and a transmitter for transmitting alert messages and receiving first data,

said first data including confirmation data and deactivation data,

a wired connection port for transferring said programs and second data from said terminal to said memory;

said second data including allowed geographic position data defining at least one allowed geographical area for said object predetermined by said supervising personnel and defining all areas outside said at least one allowed geographical area as disallowed geographical areas for said object, and data identifying said object to be protected; said second data remaining unmodified when said terminal is not connected to said wired connection port;

said programs including

a first program for determining an actual geographic position of said object using said position signals received by said first receiving means and supplied to said microprocessor,

a second program including a first subprogram for comparing said so determined actual geographic position with said allowed geographic position data and generating a first alert message if said actual position does not match said allowed position data, said second program repeating said alert message until said receiver receives said deactivation data;

a first timer for periodically executing said first program,

a second timer for repetitively executing said second program;

said terminal for generating said programs and transferring said programs via said wired connection port of said object beacon to said memory, and for receiving said alert messages via said wireless communication port,

said terminal being locally independent of said object beacon when monitoring said geographic position determining device and including means for generating and transmitting messages to said supervising personnel upon receiving an alert message from said object beacon.



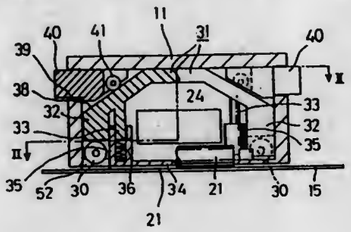
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**5,497,150**

## IMAGE SCANNER

**Takuji Kimura, and Tang L. Lee, both of Tokyo, Japan, assignors to SMK Corporation, Tokyo, Japan**

**Filed Apr. 5, 1993, Ser. No. 42,828**
**Int. Cl.[6] H03M 1/22**
**U.S. Cl. 341—1** **3 Claims**




1. A hand-held image scanner comprising:

a housing;

a pair of first rollers retractably disposed within said housing;

said first rollers being capable of rotational motion in a first direction;

a pair of second rollers retractably disposed within said housing;

said second rollers being capable of rotational motion in a second direction;

said first rollers being mounted at right angles to said second rollers;

an opening within said housing through which light transmitted from a light source passes;

said opening also receiving light reflected from said object passes, thereby forming at least one reflected image of said object on an image detector;

said opening being disposed parallel to said first rollers;

said first rollers being coupled to a first direction movement detector;

said first rollers being held in substantial contact with said object in an initial condition;

said first direction movement detector being capable of determining distance moved in said first direction;

said second rollers being coupled to a second direction movement detector;

said second rollers being held in a retracted position out of contact with said object in an initial condition;

said second direction movement detector being capable of determining distance moved in said second direction; and

means for retracting said first rollers and placing said second rollers in contact with said object, whereby said scanner generates a plurality of sets of coordinates of position from said object, each of said plurality being associated with said at least one reflected image.

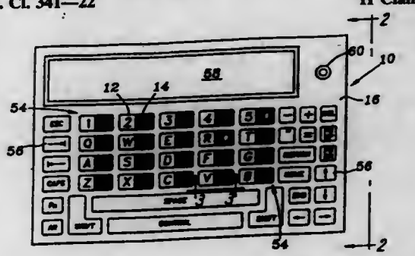
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**5,497,151**

## COMPACT ONE-HANDED TYPING KEYBOARD HAVING KEYS CORRESPONDING TO A STANDARD TWO-HANDED KEYBOARD

**Michael L. Dombroski, 321 N. Lincoln St., Bay City, Mich. 48708**

**Division of Ser. No. 782,064, Oct. 24, 1991, Pat. No. 5,329,278.**
**This application May 16, 1994, Ser. No. 243,568**
**Int. Cl.[6] H03K 17/94**
**U.S. Cl. 341—22** **11 Claims**




1. A compact keyboard comprising a plurality of individually movable keys arranged in a plurality of parallel, spaced apart rows and a plurality of parallel, spaced apart columns, all of said keys of said compact keyboard being operable by the fingers of one hand of a person, and the keys of said compact keyboard corresponding in number to a complement of a corresponding number of keys of a prior art keyboard having a first plurality of keys operable by the fingers of a persons's left hand and a second plurality of keys operable by the fingers of such person's right hand, each of said columns of keys having a left hand key and an adjacent right hand key, the left hand keys of each column of keys corresponding to those keys of the prior art keyboard operable by the fingers of the left hand of a person and the right hand keys of each column of

keys of said compact keyboard corresponding to those keys of the prior art keyboard operable by the fingers of the right hand of a person.

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5,497,152

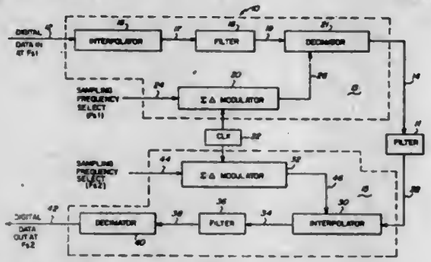
## DIGITAL-TO-DIGITAL CONVERSION USING NON-UNIFORM SAMPLE RATES

James Wilson, Sharon; Ronald A. Cellini, Newton, and James M. Sobol, Norfolk, all of Mass., assignors to Analog Devices, Inc., Norwood, Mass.

Continuation-in-part of Ser. No. 120,957, Sep. 13, 1993, abandoned, and Ser. No. 121,104, Sep. 13, 1993. This application May 11, 1994, Ser. No. 241,859

Int. Cl.[6] H03M 7/00

U.S. Cl. 341—61 4 Claims




1. A digital-to-digital converter, comprising:

first interpolation means for receiving a digital signal at a first data rate and for supplying digital signals at a first increased data rate;

first decimation means, coupled to the interpolation means, for decimating the digital signals at the first increased data rate to provide digital signals at a second data rate;

first sigma-delta modulator means, coupled to and controlling the decimation means, for providing a first sigma-delta modulated output signal representative of the first data rate and for controlling the decimation means to provide the digital signals at the second data rate;

second interpolation means, coupled to the first decimation means, for receiving the digital signals at the second data rate and for supplying the digital signals at a second increased data rate;

second decimation means, coupled to the second interpolation means, for decimating the digital signals at the second increased data rate to provide digital signals at a third data rate; and

second sigma-delta modulator means, coupled to and controlling the second interpolation means, for providing a second sigma-delta modulated output signal representative of the third data rate and for controlling the second interpolation means to provide the digital signals at the second increased data rate.

4. The digital-to-digital converter of claim 1, further comprising:

phase locked loop means, coupled to the second sigma-delta modulator means, for receiving a signal representative of the third data rate, locking to the signal, and providing a second control signal to the second sigma-delta modulator means that controls the second sigma-delta modulator means to provide the second sigma-delta modulated output signal.

5,497,153

## SYSTEM FOR VARIABLE-LENGTH-CODING AND VARIABLE-LENGTH-DECODING DIGITAL DATA FOR COMPRESSING TRANSMISSION DATA

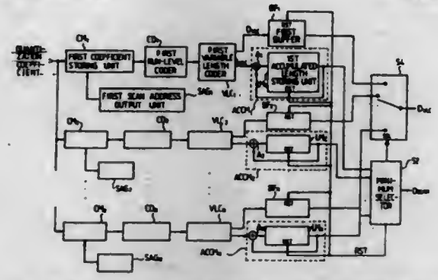
Jechang Jeong, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea

Filed Jul. 23, 1993, Ser. No. 95,468

Claims priority, application Rep. of Korea, Jul. 23, 1992, 92-13171

Int. Cl.[6] H03M 7/40

U.S. Cl. 341—67 13 Claims



1. A variable-length-coding method for variable-length-coding digital data which is divided into block units of a predetermined size, the method comprising the steps of:

obtaining quantization coefficients of digital data;

arranging said quantization data as quantized block data;

scanning the block data according to a plurality of scanning patterns, and coding the scanned data to symbols in accordance with each of the scanning patterns;

variable-length-coding respective symbols coded according to said plurality of scanning patterns;

separately accumulating a plurality of lengths of data which are variable-length-coded at said variable-length-coding step according to said various scanning patterns;

selecting a scanning pattern corresponding to a minimum value among accumulated values of lengths of variable-length-coded data obtained at said accumulating step; and

selecting as transmission data, the data which is variable-length-coded at said variable-length-coding step according to scanning patterns selected at said selecting step.

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5,497,154

## DITHER GENERATING APPARATUS

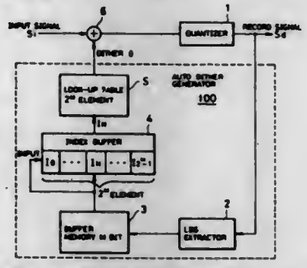
Mitsuya Komamura, Tsurugashima, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Aug. 26, 1994, Ser. No. 296,132

Claims priority, application Japan, Aug. 31, 1993, 5-216678

Int. Cl.[6] H03M 1/08

U.S. Cl. 341—131 1 Claim




1. A dither generating apparatus comprising:

extracting means for sequentially extracting a specific bit of each quantized digital data;



first memory means for storing M (M: a natural number) specific bits newly extracted by said extracting means, and shifting data associated with said specific bit, stored early, bit by bit every time a new specific bit is input;

second memory means for storing $2^M$ pieces of first M-bit data consisting of said M specific bits stored in said first memory means, and shifting said first M-bit data, stored previously, piece by piece every time said first M-bit data is input; and

third memory means for storing $2^M$ random values in a row and outputting said random values as dithers for second M-bit data input from said second memory means,

a value of said first M-bit data being input data stored in said second memory means and one piece of data from said stored $2^M$ M-bit data being used as an address for calling said second M-bit data.

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5,497,155

## ANALOG TO DIGITAL CONVERTOR APPARATUS HAVING AN INTERPOLATION

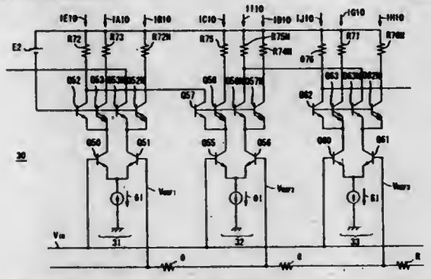
Kunihiko Izuhara, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 30, 1993, Ser. No. 129,606

Claims priority, application Japan, Sep. 30, 1992, 4-285415; Sep. 30, 1992, 4-285416; Sep. 30, 1992, 4-285522; Sep. 30, 1992, 4-285523

Int. Cl.[6] H03M 1/14

U.S. Cl. 341—156 12 Claims



1. A comparator circuit, comprising:

a first differential input stage for inputting an input signal and a first reference signal, and outputting a first inverted comparison output current corresponding to said first reference signal and a first non-inverted comparison output current;

a second differential input stage for inputting said input signal and a second reference signal, and outputting a second inverted comparison output current corresponding to said second reference signal and a second non-inverted comparison output current;

a current divider means for dividing said first and second inverted comparison output current, and said non-inverted comparison output current in predetermined ratios, respectively; and

an interpolation output means for generating a composite inverted output current by adding said divided first and second inverted comparison output current in a predetermined ratio, and generating a composite non-inverted output current by adding said first and second non-inverted comparison output current in a predetermined ratio, and then said interpolation output means comparing said composite inverted output current and the second non-inverted comparison output current which is in inverted relation to said composite inverted output current, comparing said composite non-inverted output current and the first inverted output current which is in inverted relation to said composite non-inverted output current, and comparing said first inverted output current and said second non-inverted output current, respectively, or said interpolation output means comparing said composite inverted output current and the first non-inverted comparison output current which is in inverted relation to said composite inverted output current, comparing said composite non-inverted output current and the second inverted output current which is in said composite non-inverted output current, and comparing said second inverted output current and said first non-inverted output current, respectively, as a result said interpolation output means obtaining a comparison result of said input signal with a virtual reference signal existing between said first and second reference signals.

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5,497,156

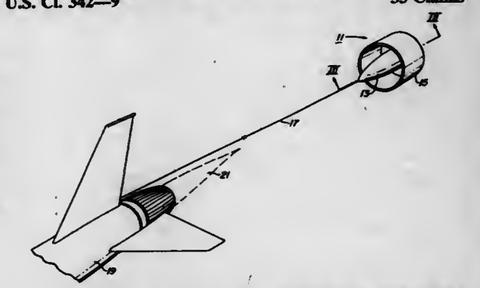
## TOWED TARGET

Boyd B. Bushman, Lewisville, Tex., assignor to Lockheed Corporation, Ft. Worth, Tex.

Filed Apr. 15, 1994, Ser. No. 228,306

Int. Cl.[6] H01Q 15/14; B64D 3/00

U.S. Cl. 342—9 33 Claims



1. An apparatus for avoiding heat-seeking missile attacks on a jet aircraft which produces an exhaust plume which emits infrared radiation, comprising:

a decoy having a body with an exterior surface which has an infrared radiation reflective portion;

means for towing the body on a line behind the aircraft in a position for causing the infrared radiation reflective portion to receive and reflect infrared radiation emitted by the exhaust plume so as to attract heat-seeking missiles fired at the aircraft; and wherein the decoy comprises:

a nose section on a forward end of the body; and

a sidewall section extending rearward from the nose section, wherein the infrared radiation reflective portion is located both on the nose section and the sidewall section.

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5,497,157

## METHOD OF MONITORING AN AREA, AND A DEVICE FOR CARRYING OUT THE METHOD

Wilhelm Gruener, and Tiang-Gwan Liem, both of Ulm, Germany, assignors to Deutsche Aerospace AG, Munich, Germany

PCT No. PCT/EP93/03366, § 371 Date Aug. 22, 1994, § 102(e) Date Aug. 22, 1994, PCT Pub. No. WO94/15226, PCT Pub. Date Jul. 7, 1994

PCT Filed Dec. 1, 1993, Ser. No. 290,966

Claims priority, application Germany, Dec. 23, 1992, 42 43 669.9

Int. Cl.[6] G01S 13/91;13/93

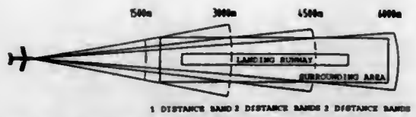
U.S. Cl. 342—36 19 Claims

1. Method of monitoring an area with the aid of a frequency-modulated continuous-wave radar comprising:

emitting a frequency-modulated continuous-wave transmitting signal with at least one transmitting antenna having a directional pattern whose main azimuthal direction depends on the frequency of the transmitting signal,

wherein:

related to a predeterminable direction, an azimuthal region is selected,




in the selected region, an azimuthal swivelling of the directional pattern of the transmitting antenna is carried out by changing the frequency of the transmitting signal,

in the selected region, each azimuthal value is assigned a frequency value of the transmitting signal,

the selected region is divided into a predeterminable number of azimuthal increments adjoining one another,

in each of said increments, a monotonous change of the frequency of the transmitting signal occurs;

receiving a reflected portion of the transmitting signal, which is reflected by the area to be monitored, with a receiving antenna, and

performing a coherent signal processing for evaluating the receiving signal for each increment.

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**5,497,158**

## METHOD OF CLASSIFYING AND IDENTIFYING AN OBJECT USING DOPPLER RADAR

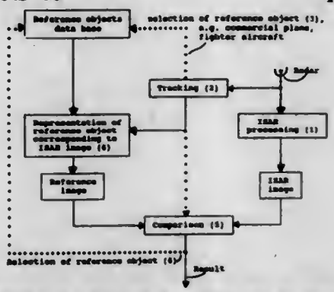
**Johannes Schmid, Behringweg, and Peter Schmitt, Bellenberg, both of, Germany, assignors to Daimler-Benz Aerospace AG, Ulm, Germany**

**Filed Jul. 13, 1994, Ser. No. 274,317**

**Claims priority, application Germany, Jul. 15, 1993, 43 23 625.1; Mar. 3, 1994, 44 06 907.3**

**Int. Cl.[6] G01S *7/292;13/53;13/90;7/41***

**U.S. Cl. 342—90** **10 Claims**




1. A method of classifying and identifying an object with a Doppler radar system in which a video signal is generated by means of coherent signal processing, comprising:

determining at least position, change of position and spatial orientation of a rotational axis of the object from tracking data of the object;

representing the object as an inverse aperture synthetic radar image;

selecting a reference object with the aid of the tracking data and the determinations of said determining step;

rotating a representation of the reference object into a position that corresponds to the spatial orientation of the rotational axis of the object;

superimposing the representation of the rotated reference object over the inverse synthetic aperture radar image of the object; and

comparing the representation of the rotated reference object with the inverse synthetic aperture radar image to identify the object.

**5,497,159**

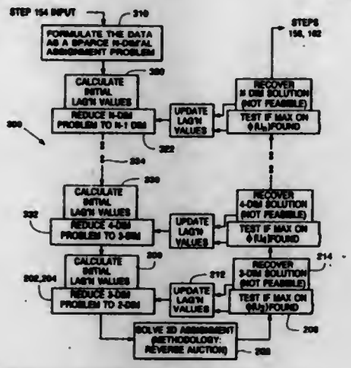
## METHOD AND SYSTEM FOR TRACKING MULTIPLE REGIONAL OBJECTS BY MULTI-DIMENSIONAL RELAXATION

**Aubrey B. Poore, Jr., Fort Collins, Colo., assignor to Colorado State University Research Foundation, Fort Collins, Colo.**

**Continuation-in-part of Ser. No. 171,327, Dec. 21, 1993, Pat. No. 5,406,289. This application Mar. 14, 1995, Ser. No. 404,024**

**Int. Cl.[6] G01S *13/00***

**U.S. Cl. 342—96** **62 Claims**




1. A system for tracking objects comprising:

means for repeatedly scanning a region containing a set of at least one moving object;

means for generating M sequential images or data-sets of said region using an output from said means for repeatedly scanning, wherein a plurality of points in said images or data-sets provide positional information for said at least one object in said set;

means for providing at least one track of said at least one object in said set;

means for defining first optimization problem having a computational complexity, M dimensions and a first objective function, wherein said first objective function is specified using a plurality of costs for extending said at least one track using said points;

means for reducing said computational complexity of said first optimization problem to a second optimization problem, wherein a said second optimization problem is m-dimensional, where 2<=m<M;

means for solving said second optimization problem;

means for defining third optimization problem using a solution of said second optimization problem wherein said third optimization problem has M−m+1 dimensions;

means for solving said third optimization problem; and

means for recovering an optimal or near-optimal solution to said first optimization problem using a solution to said third optimization problem.

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**5,497,160**

## METHOD AND APPARATUS FOR IMPROVED AUTO-CORRELATION AND RANGE CORRELATION IN PSEUDO-RANDOM NOISE CODED SYSTEMS

**Thomas F. Koehler, Scottsdale, and Carl M. Willis, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Sep. 17, 1993, Ser. No. 123,508**

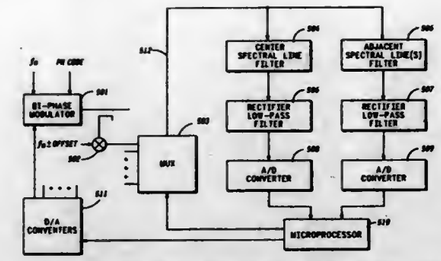
**Int. Cl.[6] G01S *13/12;13/28;13/40***

**U.S. Cl. 342—145** **26 Claims**

1. A method for improving autocorrelation in a pseudo-random noise coded system, comprising the steps of:

phase modulating a carrier frequency with a pseudo-random noise code sequence to produce a phase modulated carrier frequency, said phase modulated carrier frequency having two






phase states, said phase states having a relative phase difference of approximately one-hundred eighty degrees;

transmitting a transmit signal that includes said phase modulated carrier frequency;

adjusting said relative phase difference between said two phase states of said phase modulated carrier frequency based on a magnitude of a center spectral line of said transmit signal to maintain a predetermined phase offset from said relative phase difference; and

correlating a received signal with a reference signal that has spectral characteristics of said pseudo-random noise code sequence.

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**5,497,161**

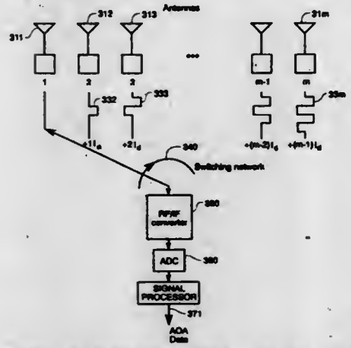
## ANGLE OF ARRIVAL (A)A) SOLUTION USING A SINGLE RECEIVER

**David C. Tsui, Centerville, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.**

**Filed Oct. 26, 1994, Ser. No. 330,162**

**Int. Cl.[6] G01S *13/06;* G01R *23/00***

**U.S. Cl. 342—147** **3 Claims**




1. Apparatus for measuring an angle of arrival (AOA) of an incoming signal using m antennas separated from one another by a distance d, m being an integer greater that one, said antennas being coupled via delay line means and a switching means to a single receiver means;

wherein the switching means comprises electronic means to sample the incoming signal as received at the m antennas sequentially in repetitive cycles with a given sampling rate and cycle time, and wherein delays provided by the delay line means is such that the sampled signals for each antenna represent a signal arriving at the antennas at the same instant of time in each cycle;

said receiver means comprising input means for receiving input signals from the switching means and for supplying IF signals to a single analog-to-digital converter means which operates at said given sampling rate to provide digitized samples for each of the m antennas each cycle; and

signal processing means coupled to the single analog-to-digital converter means for analyzing the digitized samples and determining to angle of arrival of the incoming signal, wherein the signal processing means includes FFT means.

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**5,497,162**

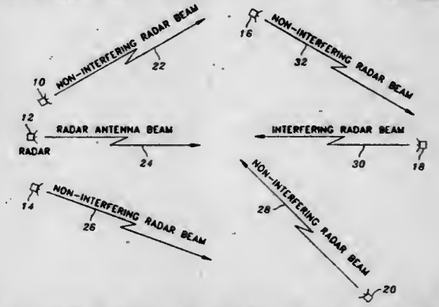
## RADAR SIGNAL SELECTION BASED UPON ANTENNA BEARING

**Stephen G. Kaiser, Hoffman Estates, Ill., assignor to Northrop Grumman Corporation, Los Angeles, Calif.**

**Filed Jan. 9, 1995, Ser. No. 370,052**

**Int. Cl.[6] G01S *13/00***

**U.S. Cl. 342—159** **10 Claims**




1. A method for mitigating interference among a plurality of radar sets, said method comprising the steps of:

a) determining the direction in which a directional radar antenna is pointing;

b) selecting one of a plurality of different non-interfering radar signals based upon the direction that the radar antenna is pointing, each different non-interfering radar signal being dedicated to a particular direction of the radar antenna; and

c) utilizing the selected radar signal;

d) wherein radar antennae pointed toward one another do not interfere with one another since they are both using different non-interfering radar signals.

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**5,497,163**

## DOPPLER RADAR MODULE USING MICRO-STRIPLINE TECHNOLOGY

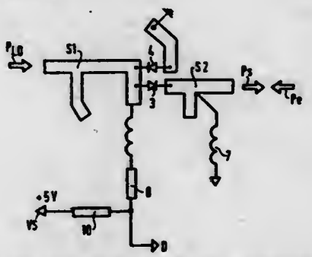
**Gerhard Lohninger, Munich, and Walter Zimmermann, Dorfen, both of, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany**

**Filed Aug. 4, 1994, Ser. No. 285,737**

**Claims priority, application European Pat. Off., Aug. 9, 1993, 93112716**

**Int. Cl.[6] G01S *7/03***

**U.S. Cl. 342—175** **12 Claims**




1. A Doppler radar module for forming Doppler signals from reflections from an object, comprising:

a housing of electrically conductive material;
a dielectric resonator mounted in said housing;
a local oscillator connected to said dielectric resonator, said dielectric resonator stabilizing an oscillator signal from said local oscillator;
a mixer connected to an output of said local oscillator to receive said oscillator signal;
a mismatch circuit connected between said mixer and said local oscillator;
a microwave antenna connected in series with said mixer to receive said oscillator signal from said output of said local oscillator via said mixer so that a transmission signal is emitted from said microwave antenna, said microwave antenna receiving reflections of said transmission signal from the object and connected to transmit received signals to said mixer; and
an antenna matching circuit connected between said mixer and said antenna;
wherein said mixer is connected to mix part of said oscillator signal from said local oscillator with the received signal to form a Doppler signal.

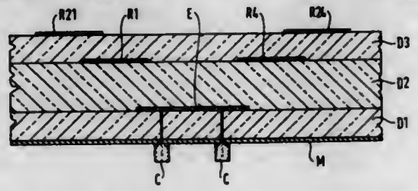
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**5,497,164**

## MULTILAYER RADIATING STRUCTURE OF VARIABLE DIRECTIVITY

**Frédérice Croq, Toulouse, France, assignor to Alcatel N.V., Amsterdam, Netherlands**

**Filed Jun. 1, 1994, Ser. No. 252,210**
**Claims priority, application France, Jun. 3, 1993, 93 06660**
**Int. Cl.[6] H01Q *1/38***
**U.S. Cl. 343—700 MS** **12 Claims**



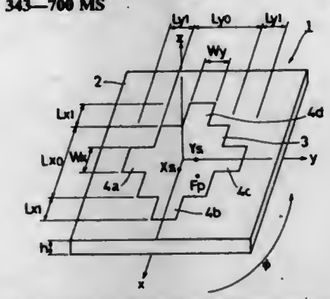

1. A multilayer radiating structure based on microstrip technology for an array antenna, comprising:
radiating patch elements disposed in an upper portion of said structure; and
feeding patch means disposed in a lower portion of said structure and coupled for electromagnetic excitation of said radiating patch elements by a distribution of electromagnetic excitation energy between said radiating patch elements, said upper portion comprising at least:
a first dielectric substrate having a surface where a first plurality of radiating patch elements are disposed for forming a first electromagnetic coupling area with said feeding patch means; and
a second dielectric substrate having a surface where a second plurality of radiating patch elements are disposed for forming a second electromagnetic coupling area with said first plurality of radiating patch elements, said first dielectric substrate and said second dielectric substrate being stacked on said lower portion with said second electromagnetic coupling area being larger than said first electromagnetic coupling area so as to form said multilayer radiating structure.

**5,497,165**

## MICROSTRIP ANTENNA

**Yuichi Murakami, Chiryu, and Kiyokazu Ieda, Toyota, both of, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan**

**Continuation of Ser. No. 62,730, May 18, 1993, abandoned, which is a continuation of Ser. No. 805,985, Dec. 12, 1991, abandoned. This application Feb. 10, 1995, Ser. No. 386,345**
**Claims priority, application Japan, Dec. 14, 1990, 2-402145; Dec. 14, 1990, 2-402146**
**Int. Cl.[6] H01Q *1/38***
**U.S. Cl. 343—700 MS** **6 Claims**




1. A microstrip antenna for linearly polarized waves comprising:
a dielectric plate having a thickness to be sufficiently shorter than a free space wavelength;
a rectangular-shaped radiation conductive plate member defined by four sides and having only one feeding point thereon, said plate member being mounted on one surface of the dielectric plate and each side being longer than ¼ of a guide wavelength and shorter than ½ of a guide wavelength; and
a pair of opposed conductive parts each of which is extended from a center portion of each side of said plate member and each side of said parts is less than ¼ of guide wavelength in length for shortening a length of each side of the plate member in comparison with ½ of a guide wavelength and determining the resonant frequency, said feeding point being located on a line connecting said pair of opposed parts.

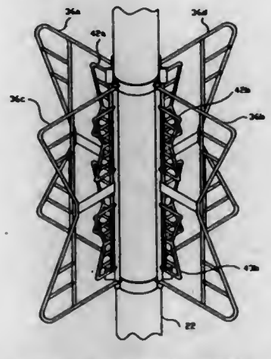
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**5,497,166**

## DUAL FREQUENCY BATWING ANTENNA

**Ali R. Mahnad, 5063 Olive Oak Way, Carmichael, Calif. 95608**

**Continuation of Ser. No. 84,293, Jun. 28, 1993, abandoned. This application Nov. 10, 1994, Ser. No. 337,129**
**Int. Cl.[6] H01Q *21/20***
**U.S. Cl. 343—795** **4 Claims**




1. A radio frequency antenna for radiating a pair of radio frequency signals having first and second frequencies with a ratio of substantially two to one or greater comprising:



a first pair of batwing radiating elements for mounting on a vertical support mast and for radiating said first frequency;
each said batwing element having an effective conductive sheet partially formed by a top horizontal termination and a bottom horizontal termination which also circumscribe with said support mast a substantially vacant rectangular space;
two or more smaller batwing radiating elements for radiating a second higher frequency mounted to said mast substantially within said vacant rectangular space of one of said first pair of batwing elements and being substantially co-linear with said effective conductive sheet of said one element.

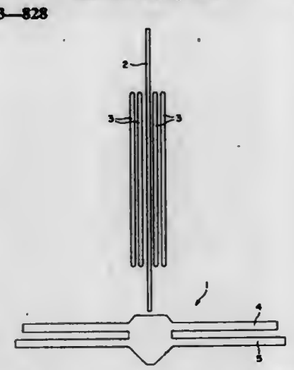
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**5,497,167**

## ANTENNA FOR MOUNTING ON A VEHICLE WINDOW

**Ari-Matti Luoma, Kempele, Finland, assignor to Window Antenna Oy, Kempele, Finland**

**Continuation-in-part of Ser. No. 958,127, Dec. 29, 1992, abandoned. This application Mar. 28, 1994, Ser. No. 219,297**
**Claims priority, application Finland, Aug. 1, 1990, 903836**
**Int. Cl.[6] H01Q *9/38***
**U.S. Cl. 343—828** **8 Claims**



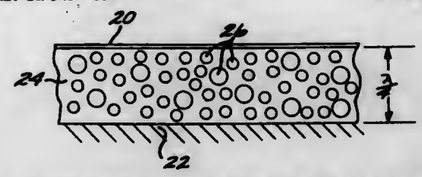

1. An antenna for transmitting and receiving a radio frequency signal for mounting on a window of a vehicle and adapted to connect to an antenna cable comprising:
a vertical radiator element of electrically conductive material having a length of at least ½ wavelength of said radio frequency signal and a substantially smaller width than said length as well as a connecting end at one end thereof, said connecting end adapted to be connected to a conductor of said antenna cable;
grounding elements having a width substantially the width of said vertical radiator element, said grounding elements spaced from said vertical radiator so as not to contact said vertical radiator element, and extending substantially horizontally in a direction away from the connecting end of the vertical radiator element in opposite directions for a distance of about ⅛ to ½ of the antenna wavelength; and
at least one parasitic element of electrically conductive material, having a width of the order of the width of the vertical radiator element, extending parallel with the vertical radiator element at a distance from the vertical radiator element substantially equal to the width of the parasitic element, and spaced apart from said grounding elements to avoid a connection therewith.

**5,497,168**

## RADIATOR BANDWIDTH ENHANCEMENT USING DIELECTRICS WITH INVERSE FREQUENCY DEPENDENCE

**Michael D. Thomas, Thousand Oaks; Ronald I. Wolfson; Jerome I. Glaser, both of Los Angeles; Joseph P. Smalanskas, Westchester; Shane H. Hunter, Redondo Beach, and Allen M. Tran, Torrance, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.**

**Continuation of Ser. No. 878,706, May 1, 1992, abandoned. This application Aug. 4, 1994, Ser. No. 286,105**
**Int. Cl.[6] H01Q *19/10***
**U.S. Cl. 343—834** **17 Claims**




1. A frequency independent radiating element having a signal operating frequency band, said radiating element comprising a radiator which launches a forward-directed wave and a back-directed wave, a reflecting groundplane separated from said radiator by nominal constant spacing distance equivalent to one quarter wave-length at a nominal frequency within said frequency band, and a dielectric material structures disposed between said radiator and said groundplane, said dielectric material structure having an intrinsic, frequency-dependent relative dielectric constant that varies in monotonically decreasing function with inverse frequency dependence for signals within said frequency band, said variation of said dielectric constant occurring intrinsically without application of control signals such that said dielectric material structure simultaneously present different dielectric constants to multi-frequency RF signals propagating through said structure, wherein said back-directed wave passes through said dielectric material structure, is reflected from said group plane, and passes again through said dielectric material structure so that said forward-directed wave and said reflected back-directed wave reinforce one another to improve a radiation efficiency of said radiating element over said frequency band for simultaneous multi-frequency operation, wherein said radiating efficiency is substantially independent of frequency for operation over said frequency band.

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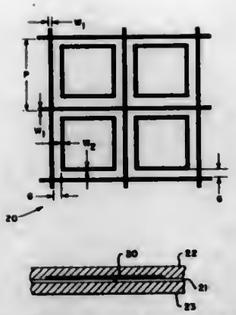
**5,497,169**

## WIDE ANGLE, SINGLE SCREEN, GRIDDED SQUARE-LOOP FREQUENCY SELECTIVE SURFACE FOR DIPLEXING TWO CLOSELY SEPARATED FREQUENCY BANDS

**Te-Kao Wu, Rancho Palos Verdes, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.**

**Filed Jul. 15, 1993, Ser. No. 94,331**
**Int. Cl.[6] H01Q *15/23***
**U.S. Cl. 343—909** **3 Claims**

1. A wide angle, single screen, gridded square-loop frequency selective surface for receiving and diplexing two signals in closely separated frequency bands, one of said two signals being at a first frequency and the other of said two signals being at a second frequency, said frequency selective surface comprising a single-screen array of a square grid of intersecting orthogonal x and y conductive elements defining square spaces therebetween and of square-loop conductive patch elements disposed within respective ones of the square spaces, said patch elements being symmetrically spaced with respect to said square grid of intersecting orthogonal x and y conductive elements with each square-loop patch element having respective sides evenly spaced from corresponding ones of said orthogonal x and y conductive elements of said square grid sandwiched between two layers of low loss dielectric material,



each layer having a dielectric constant greater than 2 and a thickness of 0.0889 cm, whereby said wide angle, single screen gridded square-loop frequency selective surface will transmit a received signal at said first frequency and reflect a received signal at said second frequency, said second frequency being closely separated from said first frequency, and wherein each side of each square of said square grid around each square-loop patch element has a length P which is 0.3286λ, said sides of each square-loop patch element being spaced from each of said x and y conductive elements of said square grid with a spacing G, and said x and y conductive elements of each square of said square grid have a width $W_1$=0.0205λ while said square-loop patch elements have a width $W_2$=0.041λ on each side thereof, and said transmitted signal at said first frequency is an X-band signal and said reflected signal at said second frequency is a Ku-band signal, whereby the resonant frequency of said transmitted signal at said first frequency is closely separated from said reflected signal at said second frequency with good performance over a wide angle of incidence of radiation from 0°, normal, to about 40° from normal.

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**5,497,170**

## HEADUP DISPLAY APPARATUS

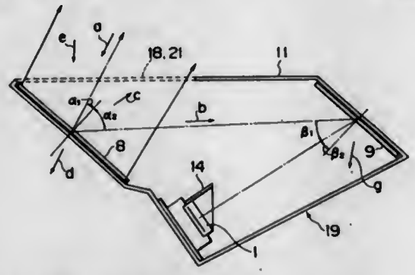
**Masayuki Kato; Hirokazu Aritake; Tsuyoshi Matsumoto; Junji Tomita; Fumio Yamagishi; Masato Nakashima, all of Kanagawa; Masao Suzuki, Shizuoka; Toshiaki Fujiwara, Shizuoka; Masaya Sugita, Shizuoka, and Koichi Takoa, Shizuoka, all of, Japan, assignors to Yazaki Corporation, Tokyo, and Fujitsu Limited, Kawasaki, both of, Japan**

**Continuation of Ser. No. 73,630, Jun. 8, 1993, abandoned, which is a continuation of Ser. No. 760,837, Sep. 13, 1991, abandoned. This application Dec. 5, 1994, Ser. No. 353,304**

**Claims priority, application Japan, Sep. 20, 1990, 2-98770 U; Sep. 20, 1990, 2-248921; Sep. 20, 1990, 2-248922; Sep. 21, 1990, 2-253558; Nov. 6, 1990, 2-298991; Nov. 6, 1990, 2-298992**

**Int. Cl.[6] G09G *3/02***

**U.S. Cl. 345—9** **17 Claims**



2. A headup display apparatus comprising:

an illuminating type indicator for emitting display light in a visible wavelength range;

a single off-axis reflective hologram for reflecting the display light from the indicator in a predetermined direction, said off-axis reflective hologram being fixed and non-pivoting and having a reflection surface that reflects incident external light coming in a direction reverse to the path of the display light toward a direction different from that of the visible display light of the indicator;

an optical system for forming a real image of the indicator on the off-axis reflective hologram to eliminate chromatic aberration; and

a reflection member arranged in a viewing field of a driver, said reflection member having an appropriate reflection factor, said reflection member reflecting the display light from the off-axis reflective hologram toward the eye position of the driver so that a virtual image of the display formed by the display light reflected by the reflection member is superimposed on an exterior view seen through the reflection member.

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**5,497,171**

## ELECTRONIC DISPLAY ARRANGEMENT

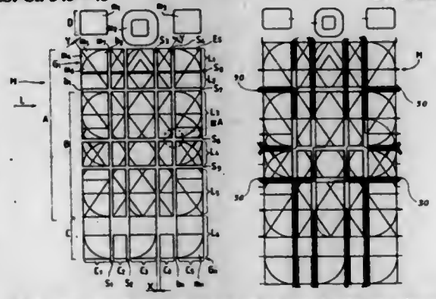
**Yvan Teres, Le Locle, and Rolf Klappert, Peseux, both of, Switzerland, assignors to Asulab S.A., Bienne, Switzerland**

**Division of Ser. No. 270,788, Jul. 5, 1994, abandoned, which is a continuation of Ser. No. 730,880, Mar. 20, 1992, abandoned. This application Feb. 14, 1995, Ser. No. 388,884**

**Claims priority, application Switzerland, Nov. 27, 1989, 4243/89; France, Dec. 18, 1989, 89 16864; Switzerland, Nov. 12, 1990, 3610/90**

**Int. Cl.[6] G09G *3/04***

**U.S. Cl. 345—43** **20 Claims**



1. An electronic display arrangement having at least one electro-optic display means including elementary patterns conforming to and being based on a series of stylized and selected alpha-numeric characters in the form of a composite mosaic type structure, said mosaic-type structure being formed by:

forming in a grid layer curved separations having a width (Y),

forming in said grid layer diagonally extending separations having said width (Y), said diagonally extending separations including a first group and a second group of separations with separations in said first group intersecting separations in said second group,

forming in said grid layer horizontally extending separations having said width (Y),

said curved separations, said diagonally extending separations and said horizontally extending separations dividing said grid layer into a mosaic of elementary patterns of different sizes and shapes, some of said elementary patterns exhibiting homogenous and complementary contours so that one elementary pattern nests within another elementary pattern; and

overlaying with a plurality of optically passive bands regions in said grid layer in which said diagonally extending separations intersect, said optically passive bands having first edges



which, with said diagonally extending separations, define optically passive regions of small surface, said optically passive bands having a width (X) which is greater than said width (Y) and the widths of said regions of small surface.

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**5,497,172**

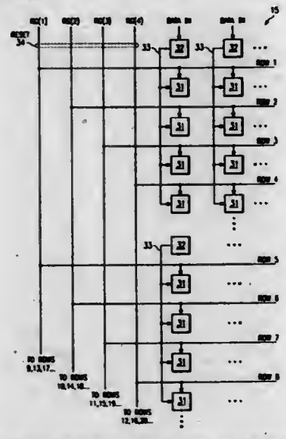
## PULSE WIDTH MODULATION FOR SPATIAL LIGHT MODULATOR WITH SPLIT RESET ADDRESSING

**Donald B. Doherty, Richardson; Robert J. Gove, Plano; Mark L. Burton, Dallas, and Rodney D. Miller, Frisco, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Jun. 13, 1994, Ser. No. 259,402**

**Int. Cl.[6] G09G *3/34***

**U.S. Cl. 345—85** **13 Claims**



1. A method of loading frames of data to a spatial light modulator having individually addressable pixel elements, for a pulse width modulated display, comprising the steps of:

dividing the display period for each said frame of data into a number of time slices;

formatting each frame of data into bit-planes, each bit-plane having one bit of data for each of said pixel elements, and each bit-plane representing a bit-weight of the intensity value to be displayed by that pixel element, and each bit-plane having a display time corresponding to a number of said time slices;

sub-formatting said bit-planes into reset groups, each reset group having data for a group of pixel elements to be loaded at a different time from other pixel elements, wherein said reset groups are defined by one memory cell providing data to more than one pixel element;

segmenting into segments, the display times of reset groups of bit-planes of one or more of the more significant bit weights;

front-frame loading said segments at the beginning of said frame period, such that, for all reset groups, segments having the same bit weight are loaded at substantially the same time;

mid-frame loading the reset groups of bit-planes of one or more of the less significant bits at the middle of said frame period; and

end-frame loading the remaining of said segments at the end of said frame period, such that for all reset groups, segments having the same bit-weight are loaded at substantially the same time.

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**5,497,173**

## METHOD AND APPARATUS FOR MULTIPLEX ADDRESSING OF A FERRO-ELECTRIC LIQUID CRYSTAL DISPLAY

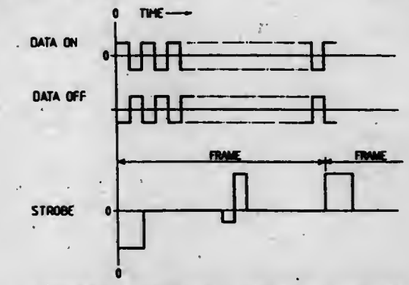
**Jonathan R. Hughes, Worcester, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England**

**Continuation of Ser. No. 488,028, May 16, 1990, Pat. No. 5,348,042. This application Apr. 25, 1994, Ser. No. 231,917**

**Claims priority, application United Kingdom, Nov. 18, 1987, 8726996**

**Int. Cl.[6] G09G *3/36***

**U.S. Cl. 345—94** **14 Claims**




1. A multiple addressed liquid crystal display comprising:

a liquid crystal cell including a layer of ferro-electric smectic liquid crystal material contained between two walls, each wall bearing a set of electrodes, said electrodes in combination comprising a matrix of addressable intersections;

driver circuits for applying data waveforms to one set of electrodes and blanking and strobe waveforms to the other set of electrodes in a multiplexed manner;

waveform generators for generating data and blanking and strobe waveforms for applying to the drive circuits; and

means for controlling the order of data waveforms so that a desired display pattern is obtained, said waveform generators including:

a data waveform generator means for generating two continuous sets of data waveforms of equal amplitude and frequency but opposite sign, each data waveform comprising continuous d.c. pulses of alternate sign, each pulse having a single time slot duration ts;

a blanking waveform generator for generating a blanking waveform; and

a strobe waveform generator means for generating strobe waveforms comprising a pair of strobe pulses of different amplitude, each strobe pulse having a duration coincident with and equal to said time slot duration ts.

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**5,497,174**

## VOLTAGE DROP CORRECTION FOR INK JET PRINTER

**Joseph F. Stephany, Williamson; Juan J. Becerra, Webster; Thomas P. Courtney, Fairport; Gary A. Kneezel, Webster; Richard V. LaDeana, Fairport; Peter J. John, Rochester; Thomas E. Watrobski, Penfield, and Joseph J. Wysocki, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.**

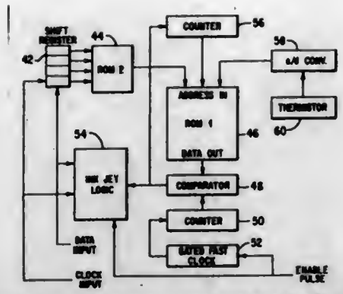
**Filed Mar. 11, 1994, Ser. No. 209,050**

**Int. Cl.[6] B41J *2/05***

**U.S. Cl. 347—13** **16 Claims**

1. An apparatus for compensating for a voltage drop of electrical pulse signals selectively applied to a plurality of heater elements on a printhead of an ink jet printing device, comprising:

first determining means for determining a position on the printhead of each of said plurality of heater elements to be pulsed; and




selecting means for selecting a time duration of each of the pulse signals based on the determined position of a corresponding one of the heater elements to be pulsed, wherein a gradient of the time duration of the pulse signals increases as the position of the heater elements is closer to a center of the plurality of heater elements.

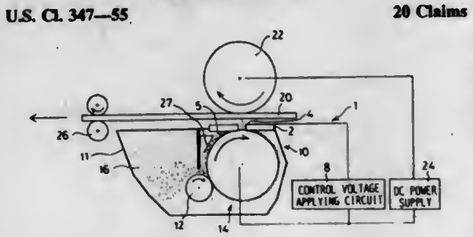
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**5,497,175**

## IMAGE FORMING APPARATUS HAVING APERTURE ELECTRODES WITH LUBRICATING LAYER THEREON

**Masataka Maeda, Konan, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan**

**Filed Jul. 12, 1994, Ser. No. 273,927**
**Claims priority, application Japan, Jan. 22, 1993, 5-264644**
**Int. Cl.[6] B41J** *2/415*
**U.S. Cl. 347—55** **20 Claims**




1. A image forming apparatus, comprising:

a toner carrier having charged toner particles for supplying the charged toner particles;

a toner flow control member having openings therein with control electrodes formed around said openings, said toner flow control member controlling a flow of the charged toner particles from said toner carrier through said openings with an electric field, and said toner flow control member having a lubricant layer disposed on a surface directly contacting said toner carrier; and

a back electrode confronting said toner flow control member and attracting charged toner particles that have passed through said openings, wherein said back electrode and said toner flow control member are positioned to sandwich an image receiving medium therebetween.

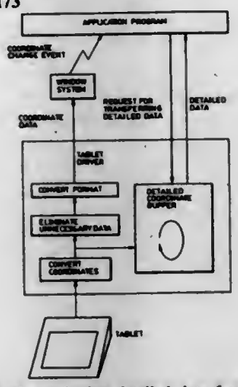
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**5,497,176**

## METHOD OF TRANSFERRING DETAILED DATA BY TABLET DRIVER

**Takeshi Sasaki, Saitama, Japan, assignor to Kabushiki Kaisha Wacom, Saitama, Japan**

**Continuation of Ser. No. 917,631, Jul. 23, 1992, abandoned. This application Aug. 1, 1994, Ser. No. 290,629**
**Claims priority, application Japan, Jul. 23, 1991, 3-205729**
**Int. Cl.[6] G09G** *5/00*
**U.S. Cl. 345—173** **7 Claims**




1. A method of transferring detailed data from a tablet to an application program via a tablet driver, the tablet driver including a buffer for storing detailed data derived from the tablet, the method comprising sequentially storing the tablet data in the buffer, supplying a request for detailed data from the application program to the tablet driver when the application program requires the detailed data, supplying the detailed data to the application program from the buffer in response to the request, otherwise eliminating some data points of the coordinate data having the high sampling rate to provide remaining data having a reduced sampling rate, and supplying only the remaining data having the reduced sampling rate to a window system.

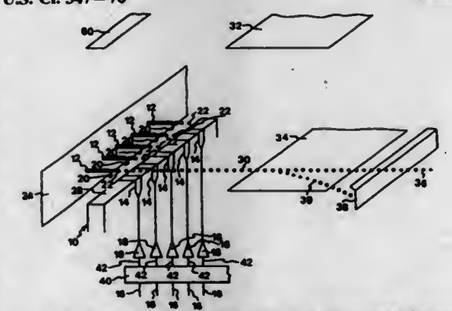
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**5,497,177**

## COMPENSATION FOR CROSSTALK BETWEEN CHANNELS OF AN INK JET PRINTER

**Ulf Björkengren, Lund, Sweden, assignor to Plotcon HB, Lund, Sweden**

**PCT No. PCT/SE90/00729, § 371 Date May 11, 1992, § 102(e) Date May 11, 1992, PCT Pub. No. WO91/07283, PCT Pub. Date May 30, 1991**
**PCT Filed Nov. 13, 1990, Ser. No. 856,037**
**Claims priority, application Sweden, Nov. 14, 1989, 8903819**
**Int. Cl.[6] B41J** *2/085*
**U.S. Cl. 347—76** **7 Claims**




1. A method of compensating for electrical crosstalk between adjacent charging electrodes (14) in a continuous ink jet printer having multiple printing jets (12) or channels, each with one charging electrode (14), said method comprising applying, in order to provide a desired drop charge in a specific channel X, to the corresponding charging electrode ($14_X$) a charge potential $V_X$ which is compensated for any charge potentials $V_{X-1}$ and $V_{X+1}$ being applied to charging electrodes ($14_{X-1}$, $14_{X+1}$) of the nearest channel X−1 and X+1, respectively, on each side of the specific channel X, and at least any charge potentials $V_{X-2}$ and $V_{X+2}$ applied to charging electrodes ($14_{X-2}$, $14_{X+2}$) of the next nearest channel X−2 and X+2, respectively, on each side of the specific channel X, said channel X, said nearest channels X−1 and X+1 and said next nearest channels X−2 and X+2 jointly forming a channel group, said compensation being achieved by selecting, for a given charge situation I of said channel group, $V_X$ as equalling a value V(I) associated with the charge situation I and included in a matrix of compensated predetermined potential values

| | | | |
|---|---|---|---|
| V(0) | V(1) | V(2) | V(3) |
| V(4) | V(5) | V(6) | V(7) |
| V(8) | V(9) | V(10) | V(11) |
| V(12) | V(13) | V(14) | V(15) |
| V(16) | V(17) | V(18) | V(19) |
| V(20) | V(21) | V(22) | V(23) |
| V(24) | V(25) | V(26) | V(27) |
| V(28) | V(29) | V(30) | V(31) |

compiled by an iterative, or equivalent, technique according to which there is calculated, in each iteration step and for every possible charge situation I of said channel group, a new value of V(I) as a function of the value of V(I) calculated in the immediately preceding iteration step and a deviation of the desired charge in the charge situation I for the specific channel X from a charge $Q_X(I)$ which, for the charge situation I, is obtained in the specific channel X according to the formula

$$Q_X(I) = \sum_{i=X-2}^{X+2} C_i V_i(I)$$

wherein $C_i$ is a capacitance between the printing jet ($12_X$) for the specific channel X and the charging electrode for channel No. "i" of said channel group, and wherein $V_i(I)$ is a charge potential value which, for channel No. "i" of the said channel group, is determined by means of the values of V(I) calculated in the immediately preceding iteration step.

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**5,497,178**

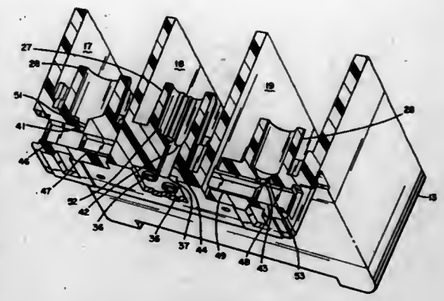
## MULTICOLOR LIQUID INK JET PRINT HEAD

**Stephen F. DeFosse; Ganesh V. Phatak, both of Lexington, Ky., and Matthew C. Sauers, West Lafayette, Ind., assignors to Lexmark International, Inc., Greenwich, Conn.**

**Continuation of Ser. No. 490,411, Mar. 8, 1990, abandoned, and a continuation-in-part of Ser. No. 301,586, Jan. 26, 1989, Pat. No. 5,125,097. This application Dec. 10, 1993, Ser. No. 165,691**
**Int. Cl.[6] B41J** *2/175*
**U.S. Cl. 347—87** **3 Claims**

1. An ink jet print head body comprising sidewalls and a bottom defining an interior space and having an exterior, an interior wall dividing the interior space into first and second ink chambers, the bottom of the print head body being formed to define first and second ink exit ports, the bottom of the print head body being formed to also define a crossflow channel communicating with the first ink exit port and with an opening in the bottom of the first ink chamber, the second exit port communicating with an opening in the bottom of the second ink chamber, said crossflow channel also communicating with the exterior of the print head body and further comprising a plug in the crossflow channel sealing the channel from the exterior of the print head body.





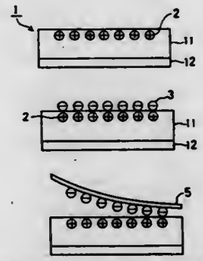

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**5,497,179**

## CHARGE CARRIER MEDIUM AND REPRODUCTION OF ELECTROSTATIC LATENT IMAGE

**Takashi Aono; Kayoko Sugiyama, and Masayuki Iijima, all of Tokyo, Japan, assignors to Dai Nippon Printing Co., Ltd., Tokyo, Japan**

**PCT No. PCT/JP92/00615, § 371 Date Mar. 8, 1993, § 102(e) Date Mar. 8, 1993**
**PCT Filed May 14, 1992, Ser. No. 969,231**
**Claims priority, application Japan, May 15, 1991, 3-110447**
**Int. Cl.[6] G01D** *15/06*
**U.S. Cl. 347—112** **11 Claims**




1. A charge carrier medium for carrying information, said charge carrier medium including an insulating layer laminated on an electrically conductive layer with an electrostatic latent image representative of said information recorded on the insulating layer, characterized in that charges opposite in polarity to said electrostatic latent image are provided to the surface of said insulating layer and collected thereon in accordance with said electrostatic latent image, thereby attenuating a surface potential pattern of said electrostatic latent image on the insulating layer and rendering said electrostatic latent image substantially undetectable and invisible.

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**5,497,180**

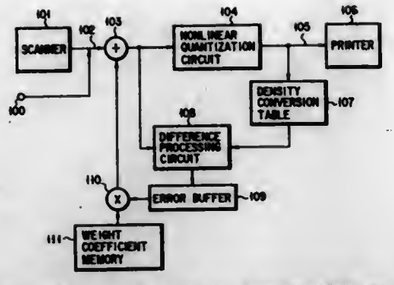
## IMAGE RECORDING APPARATUS FOR REPRESENTING A HALFTONE BY USE OF A PLURALITY OF RECORDED DOTS

**Haruko Kawakami; Hidekazu Sekizawa, both of Yokohama, and Naofumi Yamamoto, Tokyo, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Jun. 4, 1993, Ser. No. 71,000**
**Claims priority, application Japan, Jun. 4, 1992, 4-144581**
**Int. Cl.[6] H04N** *1/21*
**U.S. Cl. 347—131** **18 Claims**

1. An image recording apparatus for representing a halftone by use of a plurality of recorded dots, comprising:

means for nonlinear-quantizing an input image signal and forcefully setting at least one signal, having a highlight tone level higher than a predetermined highlight tone level at which a




recording density is unstable, to a limited highlight tone level to output a nonlinear-quantized signal;

error diffusion processing means for subjecting the input image signal to an error diffusion process for diffusing an error in accordance with a difference between the input image signal and the nonlinear-quantized signal, and sending an error-diffusion-processed signal to said nonlinear-quantizing means to obtain a record image signal therefrom; and

means for recording the record image signal obtained by said nonlinear quantizing means as an image.

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5,497,181

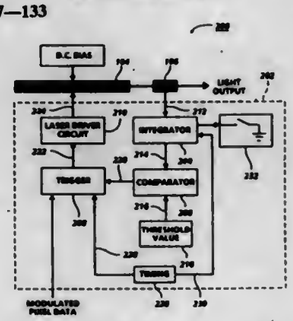
## DYNAMIC CONTROL OF INDIVIDUAL SPOT EXPOSURE IN AN OPTICAL OUTPUT DEVICE

Thomas L. Paoli, Los Altos, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 29, 1992, Ser. No. 906,145

Int. Cl.[6] G01D 15/14

U.S. Cl. 347—133 10 Claims




1. A method for dynamic control of individual spot exposure in an optical output device having a light source, means for driving the light source in accordance with a pulsed data signal so as to produce light source output comprised of individual light pulses, means for terminating the light source output independently of the data signal, a photodetector for converting at least a portion of each of said individual light pulses into a photocurrent pulse, an integrator for determining the measure of energy in each of said light pulses, a threshold memory, and a comparator for comparing the measure of energy in each of said light pulses and the contents of the threshold memory, comprising the steps of:

driving the light source in accordance with the pulsed data signal so as to cause the light source to emit light;

detecting at least a portion of the light emitted by the light source, wherein the detected portion of the emitted light is comprised of individual light pulses;

converting each of said detected light pulses into a photocurrent pulse;

producing the time-integral of a full length of the photocurrent pulse;

comparing the time-integral of the full length of the photocurrent pulse to the contents of the threshold memory; and

terminating the light source output independently of the data signal when the time-integral of the full length of the photocurrent pulse becomes equal to or greater than the value of the contents of the threshold memory.

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5,497,182

## PRINTER HAVING A ROTATING DRUM

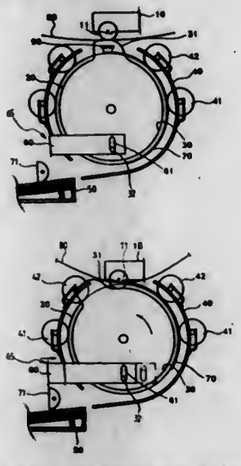
Moon-bae Park, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea

Filed Sep. 23, 1994, Ser. No. 309,495

Claims priority, application Rep. of Korea, Sep. 28, 1993, 93-20365

Int. Cl.[6] B41J 25/304;2/325

U.S. Cl. 347—197 7 Claims



7. A printer having a drum rotated about a drum axis to convey a paper sheet to be fed, a ribbon coated with dyes, and a printing head for printing an image on the paper sheet while compressing the ribbon, said printer comprising:

paper placing means for placing a leading edge of the paper sheet at an initial printing position; and

lifting means for raising and lowering said printing head so that said printing head compresses the leading edge of the paper sheet, said lifting means comprising a cam disk situated on said drum axis on each end of said drum and having a cam protrusion, and a rotation means for rotating said cam disk for a predetermined angle, so that said printing head is lowered along said cam protrusion and thereby compresses the leading edge of the paper sheet.



5,497,183

## THERMAL TRANSFER RECORDING METHOD AND APPARATUS WITH OPPOSITELY CONVEYED INK SHEET AND RECORDING MEDIUM CONTROLLED TO MAINTAIN A SUBSTANTIALLY CONSTANT CONVEYANCE RATIO

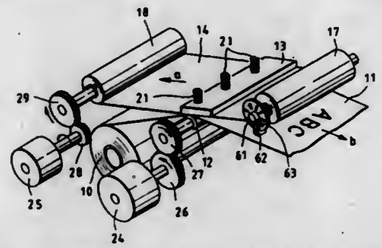
Takehiro Yoshida, Tokyo; Hisao Terajima, Yokohama; Satoshi Wada, Kawasaki; Takeshi Ono, Yokohama; Makoto Kobayashi; Yasushi Ishida, both of Tokyo; Akihiro Tomoda, Yokohama; Minoru Yokoyama, and Takashi Awai, both of Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 409,880, Sep. 20, 1989, abandoned. This application Dec. 30, 1992, Ser. No. 998,928

Claims priority, application Japan, Sep. 22, 1988, 63-236368; Jan. 4, 1988, 63-248980; Jan. 28, 1988, 63-270879; Nov. 4, 1988, 63-277488

Int. Cl.[6] B41J 17/10

U.S. Cl. 347—215 17 Claims




1. A recording apparatus for transferring an ink of an ink sheet to record an image on a recording medium, said apparatus comprising:

a supply roller for supplying said ink sheet;

a winding roller for winding said ink sheet supplied from said supply roller, said ink sheet being conveyed only by a drive of said winding roller;

driving means for driving said winding roller;

rotation amount detecting means for detecting a rotation amount of said supply roller; and

detecting means for detecting a using amount of said ink sheet in accordance with the rotation amount of said supply roller with respect to a predetermined rotation of said winding roller by said driving means.

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5,497,184

## LASER SCANNING SYSTEM

Taizo Saito, Tokyo; Nobuaki Nakano, Kawagoe; Hiroto Watanabe, Kiyose; Toshihisa Ohno, Sakado, and Yoshiyuki Araki, Tokyo, all of, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 136,027, Oct. 14, 1993, abandoned, which is a continuation of Ser. No. 691,411, Apr. 25, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 480,867

Int. Cl.[6] B41J 2/435

U.S. Cl. 347—257 22 Claims

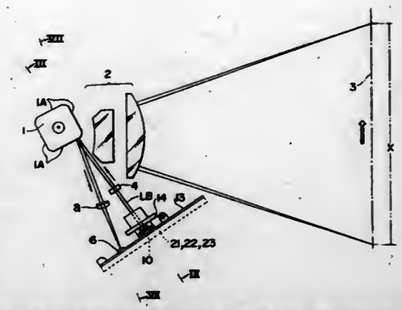
1. A laser scanning system for an electrophotographic image recording apparatus having a photoconductive material to be exposed to a laser beam, comprising:

a laser source for emitting said laser beam;

means for deflecting said laser beam emitted by said laser source to repeatedly scan a region that includes a predetermined angle zone;

means for receiving said laser beam deflected by said deflecting means, said receiving means being separate from said laser source and being positioned in an area of said region outside of said predetermined angle zone;

a first mounting member for mounting said deflecting means; and




a second mounting member for mounting only said laser source and said light receiving means, said second mounting member being separate from said first mounting member, said laser source and said light receiving member being mounted to said second mounting member so as to have a predetermined positional relationship, wherein a horizontal synchronous signal is produced based upon said laser beam deflected by said deflecting means and received by said receiving means.

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5,497,185

## REMOTE CONTROL SYSTEM FOR TELEVISION AUDIENCE DATA GATHERING

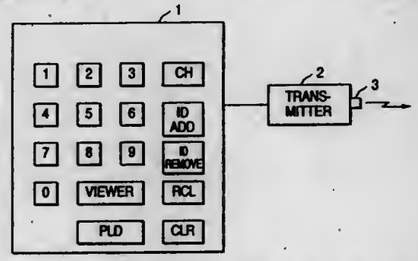
Michel Dufresne, Boucherville; Pierre Garneau, Montreal; Maurice Milot, Anjou, and Jean-Paul Brassard, St-Lambert, all of, Canada, assignors to Le Groupe Videotron Ltee., Quebec, Canada

Division of Ser. No. 213,825, Mar. 14, 1994, Pat. No. 5,373,315, which is a continuation of Ser. No. 735,884, Jul. 25, 1991, abandoned. This application Aug. 17, 1994, Ser. No. 291,888

Claims priority, application Canada, Apr. 25, 1991, 2041211

Int. Cl.[6] H04N 5/44; H04H 9/00

U.S. Cl. 348—2 3 Claims

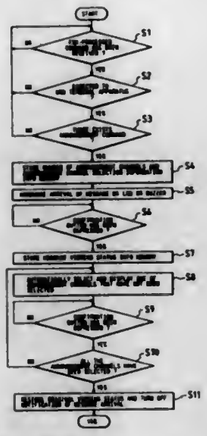



1. A remote control system for at least selecting television channels comprised of a controller having a plurality of numeric keys and more than one accept key, means for generating remote control signals corresponding to the depression of a numeric and an accept key; means removed from the remote control for receiving the remote control signals, and creating various commands relating the selected numeric keys which commands are different depending on the subsequent selection of a particular different accept key, one of said commands being a channel change command, and another of said commands being to cause display of viewer identification data on a television screen.

## 5,497,186
## CATV SYSTEM IN WHICH MESSAGE RECEPTION CAN BE CONFIRMED BY A VIEWER

**Masahiko Kawasaki, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan**

**Filed Jul. 14, 1992, Ser. No. 913,015**
**Claims priority, application Japan, Sep. 10, 1991, 3-230116**
**Int. Cl.[6] H04N 7/16**
**U.S. Cl. 348—6** **15 Claims**



1. A CATV system comprising:

a center facility for transmitting, together with a television signal carrying a broadcast program, a message directed to a particular terminal apparatus, address data of the particular terminal apparatus, and quantity data indicating a quantity of the message; and

a plurality of terminal apparatuses each operable to receive said address data, wherein the address data enables said particular terminal apparatus to display the entire message on an associated TV receiver based on the quantity data and to finish the display of the message when receiving an instruction from a user indicating reception of the entire message.

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## 5,497,187
## IN-BAND/OUT-OF-BAND DATA TRANSMISSION METHOD AND APPARATUS FOR A TELEVISION SYSTEM

**Robert O. Banker, Cumming, and Steven R. Yothment, Lawrenceville, both of Ga., assignors to Scientific-Atlanta, Inc., Norcross, Ga.**

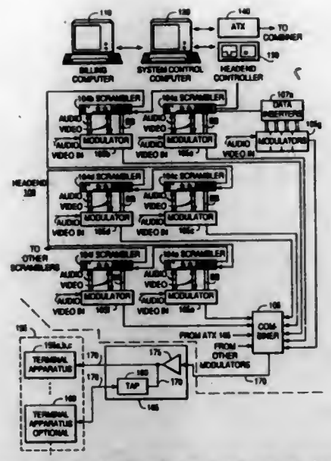
**Continuation of Ser. No. 983,766, Dec. 1, 1992, abandoned, which is a continuation-in-part of Ser. No. 799,987, Nov. 29, 1991, Pat. No. 5,317,391, Ser. No. 800,002, Nov. 29, 1991, Pat. No. 5,301,028, Ser. No. 800,241, Nov. 29, 1991, Pat. No. 5,247,364, and Ser. No. 800,836, Nov. 29, 1991. This application Dec. 22, 1994, Ser. No. 361,465**
**Int. Cl.[6] H04N 7/10;7/087;7/025;7/06**
**U.S. Cl. 348—6** **7 Claims**

1. Data transmission apparatus for a television system comprising

a system controller for formatting a plurality of transactions to be transmitted to subscriber terminals, the transactions to be transmitted comprising in-band video data, in-band audio data and out-of-band data,

at least one in-band data inserter for transmitting data in a predetermined video channel comprising an audio carrier and a video picture carrier and

an out-of-band data transmitter for transmitting out-of-band data,



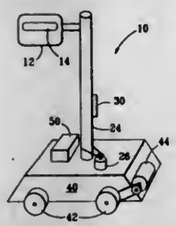
the transactions being of different types and having variable lengths, a first type of transaction having at least one transaction code and comprising a predetermined number of bytes between twelve and thirty-six where the predetermined number is M, a second type of transaction comprising a predetermined number of bytes between sixteen and forty-eight where the predetermined number is N, and a third type of transaction comprising a predetermined number of bytes between twenty-four and seventy-two, where the predetermined number of bytes is a multiple of M or N.

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## 5,497,188
## METHOD FOR VIRTUALIZING AN ENVIRONMENT

**Perry Kaye, 6446 Lupton Dr., Dallas, Tex. 75225**

**Filed Jul. 6, 1993, Ser. No. 85,779**
**Int. Cl.[6] H04N 7/18**
**U.S. Cl. 348—36** **5 Claims**



4. A method of gathering optical information using an apparatus comprising a platform mounted on a plurality of wheels on which said platform can roll, motor means for rotating at least one said wheel, circuit means for delivering power to said motor means from a power source, a switch for controlling the delivery of power to said wheels through said circuit, an essentially vertical positioning shaft mounted on said platform, a camera, structurally connected to said shaft, for gathering images in the form of environmental picture elements, range gathering means for finding the distances of said images from said camera for computation of the coordinates of said images in real space in said environment, means for rotating said camera relative to said platform for orienting said camera within said environment, camera elevation control means for translationally moving said camera along said shaft and relative to said platform for positioning said camera within said environment, computer means having programming and zoom means on said camera, comprising the steps of:

gathering image information at a series of image locations in a 360 degree environment,



gathering range information matching the image locations with video gathering means,

storing and reconciling said images, said distances of said images from said camera and corresponding positions and orientations of said camera within said environment as data for computing said coordinates of said images in real space,

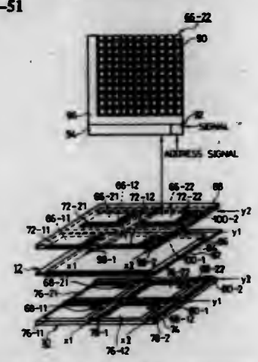
combining said data to create and store in a database a topographic, three dimensional virtual image of said environment.

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## 5,497,189
## STEREOSCOPIC DISPLAY APPARATUS

**Hirokazu Aritake; Masayuki Kato; Manabu Ishimoto; Noriko Sato, and Masato Nakashima, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Filed Sep. 23, 1993, Ser. No. 125,660**
**Claims priority, application Japan, Sep. 30, 1992, 4-260924**
**Int. Cl.[6] H04N 15/00**
**U.S. Cl. 348—51** **8 Claims**



1. A stereoscopic display apparatus comprising:

image display means for setting a virtual plane in which a plurality of visual point positions are two-dimensionally arranged at a resolution such that a change in view of an object can be recognized when a position of eyes is changed for the object to be displayed and for time-divisionally switching and displaying a plurality of two-dimensional images obtained by observing said object from each of the visual point positions, in which said plurality of visual point positions are set at a resolution such that the change in view of the object can be recognized when the position of the eyes is changed; and

beam deflecting means for deflecting a light from each pixel constructing said plurality of two-dimensional images which are time-divisionally switched and displayed by said image display means toward virtual openings corresponding to said plurality of visual point positions set on said virtual plane.

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## 5,497,190
## DIGITAL TO ANALOG CONVERTER ARITHMETIC CIRCUIT

**Masahiko Okamura, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

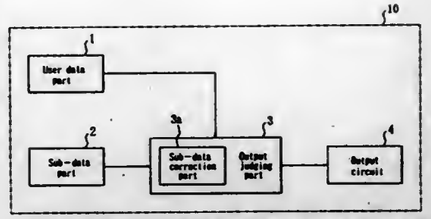
**Filed Jul. 6, 1994, Ser. No. 271,300**
**Claims priority, application Japan, Jul. 7, 1993, 5-167971**
**Int. Cl.[6] H04N 5/44;9/73**
**U.S. Cl. 348—189** **4 Claims**

1. A DAC arithmetic circuit comprising:

a user data part having adjustable user data;

a sub-data part having sub-data for compensating for irregularities in characteristics of an IC;

an output judging part which includes a sub-data correction part for modifying said sub-data to reduce a value thereof in



response to a decrease in said user data when said user data is below a predetermined value, said output judging part issuing output data based on said sub-data and said user data; and

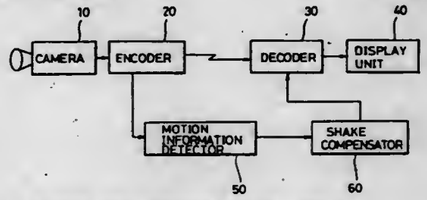
an output circuit for receiving and issuing said output data.

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## 5,497,191
## IMAGE SHAKE COMPENSATION CIRCUIT FOR A DIGITAL VIDEO SIGNAL

**Yong T. Yoo, and Choon Lee, both of Seoul, Rep. of Korea, assignors to Goldstar Co., Ltd., Seoul, Rep. of Korea**

**Filed Dec. 7, 1994, Ser. No. 351,779**
**Claims priority, application Rep. of Korea, Dec. 8, 1993, 26931/1993**
**Int. Cl.[6] H04N 5/225**
**U.S. Cl. 348—208** **19 Claims**



1. An image shake compensation circuit comprising:

motion information detection means for detecting motion information in an encoded video signal;

shake compensation means for obtaining a start display position of an image of a present frame according to the motion information detected by said motion information detection means; and

decoding means for correcting a display position of the image of the present frame in response to an output signal from said shake compensation means.

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## 5,497,192
## VIDEO SIGNAL PROCESSING APPARATUS FOR CORRECTING FOR CAMERA VIBRATIONS USING CCD IMAGER WITH A NUMBER OF LINES GREATER THAN THE NTSC STANDARD

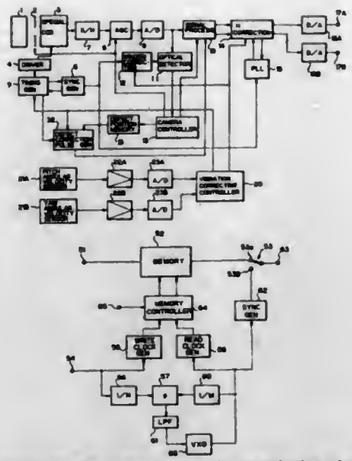
**Shigeki Ishizuka, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Division of Ser. No. 70,957, Jun. 4, 1993, Pat. No. 5,396,286. This application Feb. 28, 1995, Ser. No. 395,900**
**Claims priority, application Japan, Jun. 9, 1992, 4-174896**
**Int. Cl.[6] H04N 5/228**
**U.S. Cl. 348—208** **3 Claims**

1. A video signal processing apparatus for correcting vibration in a video signal, comprising:

image pickup means having a number of lines in a vertical direction that is greater than a number of lines in a television standard system of the video signal and thereby forming a number of surplus lines;

vibration detecting means for detecting an amount of vibration in horizontal and vertical directions relative to said image pickup means;



high-speed transfer control means for transferring charges on said image pickup means at a high speed during a video signal vertical blanking period within a range of the number of surplus lines equal to a difference between the number of lines of said image pickup means and the number of lines of the television standard system in response to the vibration amount in the vertical direction detected by said vibration detecting means and for correcting the vibration in the vertical direction said high speed being relative to a speed of transferring charges on said image pickup means during the vertical blanking period outside said range of the number of surplus lines;

line memory means containing a video signal having vibration in the vertical direction corrected, said line memory means being written to by a write clock signal and read out by a read clock signal, in which said read clock signal has a frequency lower than a frequency of the write clock signal, thereby performing a magnification in the horizontal direction of the video signal; and

line memory control means for line-locking the write clock and the read clock, for setting a frequency ratio of the write clock and the read clock in accordance with a magnification ratio in the horizontal direction, and for shifting the reading position or writing posjtion of said line memory means, thereby correcting vibration in the horizontal direction.

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**5,497,193**

**ELECTRONIC STILL CAMERA WITH DUAL CONTACT SHUTTER SWITCH FOR PICTURE REVIEW**

**Syoji Mitsuhashi, and Satoru Gozu, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan**

**Filed Oct. 28, 1993, Ser. No. 144,809**

**Claims priority, application Japan, Jan. 29, 1992, 4-314120**

**Int. Cl.[6] H04N *5/225***

**U.S. Cl. 348—231** **13 Claims**

1. An electronic still camera comprising:

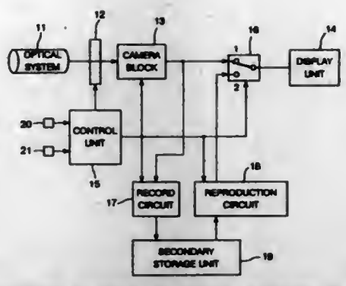
an image forming means for forming an image of an object to be photographed and providing an electrical picture signal;

a shutter means for allowing light of said object to reach said image forming means;

a display means for displaying a picture and/or information such as an operation mode of the camera;

a mode setting means for setting an operation mode including an EE mode;

a first switching means having at least first and second contacts, the contacts being selectively energized;



a picture data recording and reproducing means including a memory, for recording said picture signal from said image forming means in said memory as picture data and reproducing the same;

a second switching means, operatively connected to said image forming means, said picture data recording and reproducing means, and said display means, for selectively outputting said picture signal from said image forming means or said reproduced picture data from said picture data recording and reproducing means to said display means; and

a control means responsive to said first switching means and said mode setting means, and being operatively connected to said second switching means, said shutter means, and said picture data recording and reproducing means, for controlling said shutter means in response to said second contact of said first switching means, and for controlling said second switching means in response to said first contact of said first switching means and/or said mode setting means, and for controlling said picture data recording and reproducing means, wherein during operation,

a) said control means energizes said image forming means to continuously display said picture signal from said image forming means on said display means through said second switching means, when said mode setting means is set to said EE mode and said first and second contacts of said first switching means are not energized,

b) said control means energizes said shutter means and said picture data recording and reproducing means to take a picture of said object and record the picture signal in said memory in said picture data recording and reproducing means as said picture data, when said second contact of said first switching means is energized, and

c) said control means energizes said second switching means and said picture data recording and reproducing means to reproduce said picture data recorded in said memory and display it on said display means, when said first contact of said first switching means is energized and the energization is continued for a predetermined time.

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**5,497,194**

**ELECTRONIC CAMERA FOR PHOTOGRAPHING AND RECORDING AN IMAGE AND FOR RECORDING AND REPRODUCING A VOICE**

**Kouhun Sakagami, Yokohama; Eiichi Maeda, Kawasaki, and Masafumi Tanaka, Osaka, all of, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan**

**Continuation-in-part of Ser. No. 639,094, Jan. 9, 1991, abandoned. This application Jan. 10, 1992, Ser. No. 819,066**

**Claims priority, application Japan, Jan. 11, 1990, 2-4298**

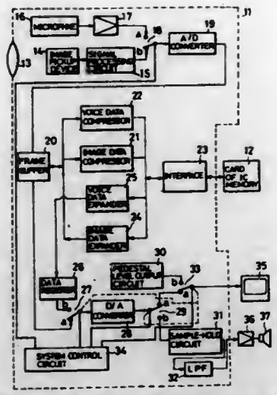
**Int. Cl.[6] H04N *5/335;5/92***

**U.S. Cl. 348—222** **5 Claims**

1. An electronic camera for photographing and recording an image, and for recording and reproducing a voice, comprising:

an image converting means for converting image data of photographed images to digital image signals and for outputting the converted digital image signals;





a voice converting means for converting voices input thereto to digital sound signals and for outputting the converted digital sound signals;

an image data compressing and expanding means for compressing and storing the output digital image signals from said image converting means and for expanding and outputting the compressed and stored digital image signals;

a voice data compressing and expanding means for compressing and storing the digital sound signals output from said voice converting means and for expanding and outputting the compressed and stored digital sound signals;

a single digital/analog converter for converting the output digital image signals from said image data compressing and expanding means to analog image signals and for converting the output digital sound signals from said voice data compressing and expanding means to analog sound signals;

a sample-holding means for sampling and holding the converted analog sound signals from said single digital/analog converter and for supplying the sample-held analog sound signals to a sound signal output portion;

a pedestal level generating means for generating signals indicative of pedestal levels on the analog image signals;

a change-over switching means for connecting said voice data compressing and expanding means to said sample-holding means through said single digital/analog converter in order to supply the analog sound signals to said sample-holding means when said pedestal level generating means is supplying the signals indicative of pedestal levels to an image signal output portion of the electronic camera, and for connecting said image data compressing and expanding means to the image signal output portion through said single digital/analog converter in order to supply the analog image signals to the image signal output portion when said pedestal level generating means is not supplying the signals indicative of pedestal levels to the image signal output portion; and

a system control means for controlling the operation of the electronic camera including an operation of the change-over switching means.

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**5,497,195**

**ELECTRONIC COLOR SNAPSHOT TECHNIQUE AND STRUCTURE USING VERY HIGH RESOLUTION MONOCHROME FULL FRAME CCD IMAGERS**

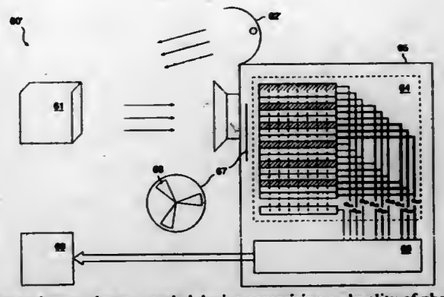
**Michel Sayag, Mt. View, Calif., assignor to Loral Fairchild Corporation, Syosset, N.Y.**

**Continuation of Ser. No. 994,875, Dec. 23, 1992, abandoned. This application Oct. 20, 1994, Ser. No. 325,959**

**Int. Cl.[6] H04N *9/07;9/04***

**U.S. Cl. 348—266** **26 Claims**

**26.** A method for producing multiple images without intervening readout periods using a monochrome charge-coupled device, the monochrome charge-coupled device comprising a plurality of photosensitive semiconductor storage cells being controlled by gate electrodes, the photosensitive semiconductor storage cells being configured in an array comprising vertical columns and horizontal rows, the method comprising the steps of:



exposing the monochrome charge-coupled device to a portion of an image, thereby generating charge packets in the array of photosensitive semiconductor storage cells;

moving said charge packets stored in a first set of horizontal rows of photosensitive semiconductor storage cells into a second set of horizontal rows of photosensitive semiconductor storage cells, said charge packets remaining in the array of photosensitive semiconductor storage cells for subsequent exposures;

where the total number of portions of the image to which the charge-coupled device is exposed exceeds two, repeating said exposing and moving steps for each exposure in excess of two, charge packets from each successive exposure being combined in the array of photosensitive semiconductor storage cells in a predetermined manner with charge packets from previous exposures;

exposing the monochrome charge-coupled device to a final portion of the image, thereby generating final charge packets in the array of photosensitive semiconductor storage cells, selected ones of the final charge packets comprising charge from more than one horizontal row and from more than one exposure stored in a single horizontal row; and

processing the final charge packets to determine each of the multiple images.

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**5,497,196**

**VIDEO CAMERA HAVING AN ADAPTIVE AUTOMATIC IRIS CONTROL CIRCUIT**

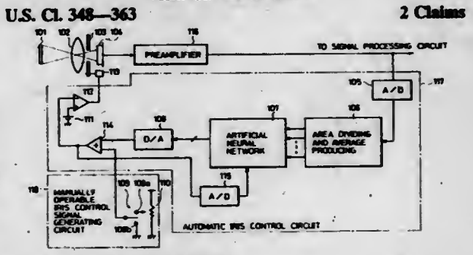
**Kazuhito Nishida, Tochigi, Japan, assignor to Sharp Kabushiki Kaisha, Japan**

**Continuation of Ser. No. 849,673, Mar. 11, 1992, Pat. No. 5,331,422. This application Apr. 14, 1994, Ser. No. 227,670**

**Claims priority, application Japan, Mar. 15, 1991, 3-51702; Jan. 27, 1992, 4-12140**

**Int. Cl.[6] H04N *5/238***

**U.S. Cl. 348—363** **2 Claims**



1. A video camera comprising:

optical means for gathering incident light from an object to form an image on a predetermined image information plane;

incident light amount regulating means, responsive to an incident light amount regulating signal, for regulating an incident light amount;

image sensing means for image sensing the image of the object within a predetermined frame formed by said optical means to provide a luminance signal;

luminance distribution characteristics extraction means, connected to said image sensing means, for dividing said predetermined frame into a predetermined plurality of sub-areas and for extracting a luminance distribution of the image in said predetermined frame as a luminance value for each of said sub-areas according to said luminance signal to provide the extracted luminance distribution as a plurality of luminance distribution signals, said luminance distribution characteristics extraction means including

A/D converting means for A/D converting said luminance signal provided from said image sensing means and for outputting a digital luminance data indicating the luminance of the image, and

average luminance calculating means for integrating said digital luminance data over a predetermined integrating time period for each of said sub-areas to calculate an average luminance for each of said sub-areas as said luminance distribution signals;

adaptive means, coupled to said luminance distribution characteristics extraction means and having an artificial neural network to which said plurality of luminance distribution signals are input, for generating an aperture signal in accordance with a predetermined conversion, the predetermined conversion being made adaptive so that an offset between a teacher signal and said aperture signal is minimized;

target value generating means, coupled to an output of said adaptive means, for generating a target value signal for determining a target value of said incident light amount regulating signal;

means for producing said incident light amount regulating signal according to said target value signal; and

manually operable selecting means, responsive to operation by the user and operatively connected to said target value generating means, for selecting said aperture signal or an aperture signal as arbitrarily offset by the user as said target value signal output from said target value generating means, said target value signal being used to produce said teacher signal.

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**5,497,198**

## CIRCUIT FOR CONVERTING HDTV SIGNALS INTO CONVENTIONAL TV SIGNALS WITH THE LETTER BOX MODE

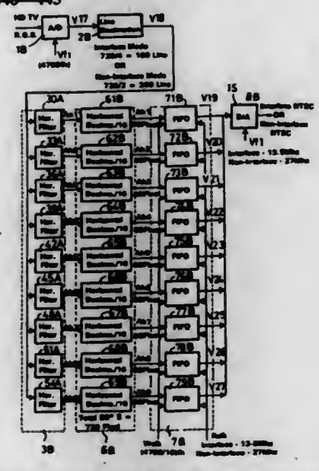
**Kyung S. Kim, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Rep. of Korea**

**Filed Mar. 17, 1994, Ser. No. 210,175**

**Claims priority, application Rep. of Korea, Mar. 17, 1993, 4091/1993**

**Int. Cl.[6] H04N 7/01;5/46**

**U.S. Cl. 348—445** **3 Claims**



1. A high definition television signal conversion circuit using a letter box mode, comprising:

analog/digital conversion means for converting a high definition television signal into a digital signal at a first sampling frequency;

line decimation means for performing a vertical decimation of output data from said analog/digital conversion means according to a scanning mode to delete lines;

horizontal filtering means having a number of horizontal filters equal to a number of an interpolation, for delaying sequentially output data from said line decimation means to perform a horizontal interpolation of the output data from said line decimation means;

horizontal decimation means having a number of horizontal decimation units equal to the number of said horizontal filters, each horizontal decimation unit performing a horizontal decimation of output data from a corresponding one of said horizonal filters;

memory means having a number of memories equal to the number of said decimation units, each memory storing output data from said horizontal decimation means in response to a first write clock and outputting the stored data in response to a first read clock, said first read clock being determined according to the scanning mode; and

a single line of video data for processing by the video processor so as to allow vertical processing of the video lines for each horizontal strip.

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**5,497,197**

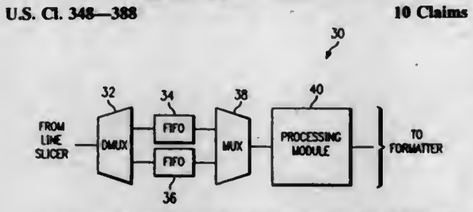
## SYSTEM AND METHOD FOR PACKAGING DATA INTO VIDEO PROCESSOR

**Robert J. Gove, Plano; Donald B. Doherty, Irving; Stephen W. Marshall, Richardson; Carl W. Davis, Plano; Joseph G. Egan, Garland; Richard C. Meyer; Jeffrey B. Sampsell, both of Plano, and Scott D. Heimbuch, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Nov. 4, 1993, Ser. No. 147,801**

**Int. Cl.[6] H04N 7/12;11/02**

**U.S. Cl. 348—388** **10 Claims**




1. A system for packing data in a video processor, comprising:

a plurality of buffer memories, each operable to store video lines for a horizontal strip of a video field; and

a multiplexer responsive to said buffer memories and operable to combine one line of video data from each buffer memory into



first digital/analog conversion means for converting output data from said first memory means into an analog signal at a second sampling frequency, said second sampling frequency being determined according to the scanning mode.

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**5,497,199**

## APPARATUS FOR PROCESSING PROGRESSIVE SCANNING VIDEO SIGNAL COMPRISING PROGRESSIVE TO INTERLACED SIGNAL CONVERTER AND INTERLACED TO PROGRESSIVE SIGNAL CONVERTER

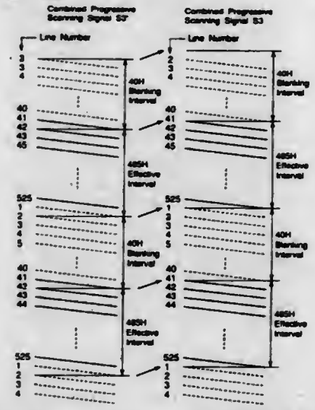
**Ryoji Asada, Hirakata, and Kunio Sekimoto, Katano, both of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Oct. 19, 1994, Ser. No. 325,828**

**Claims priority, application Japan, Jan. 20, 1993, 5-262138**

**Int. Cl.[6] H04N 7/01**

**U.S. Cl. 348—446** **9 Claims**




1. An apparatus for processing a progressive scanning video signal, comprising a progressive to interlaced signal converter for converting an input progressive scanning video signal into an interlaced scanning video signal including a main signal and a subsignal,

wherein said progressive to interlaced signal converter comprises:

first switch means for switching said input progressive scanning video signal alternately every one horizontal scanning line of progressive scanning so as to be divided into a main original signal and a sub-original signal;

first time expanding means for expanding a time interval of said main original signal outputted from said first switch means so as to convert said main original signal into a main signal having a period of horizontal scanning of interlaced scanning;

second time expanding means for expanding a time interval of said sub-original signal outputted from said first switch means so as to convert said sub-original signal into a sub-signal having the period of the horizontal scanning of the interlaced scanning; and

first synchronizing means for performing a synchronizing process on said main signal outputted from said first time expanding means and said sub-signal outputted from said second time expanding means so as to output an interlaced scanning signal including said main signal and said sub-signal in synchronous with each other, and so that said main signal and said sub-signal start respectively from a pair of two horizontal lines which is continuously inputted after the first horizontal scanning line of the input progressive scanning video signal.

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**5,497,200**

## DIGITAL TIME BASE CORRECTOR

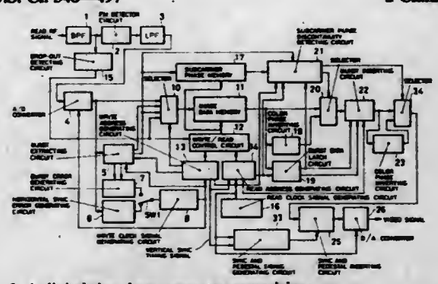
**Hiroshi Otaki, and Masahiro Nakajima, both of Koufu, Japan, assignors to Pioneer Video Corporation, Yamanashi, and Pioneer Electronic Corporation, Tokyo, both of, Japan**

**Filed Dec. 16, 1994, Ser. No. 357,750**

**Claims priority, application Japan, Dec. 16, 1993, 5-316941**

**Int. Cl.[6] H04N 5/95**

**U.S. Cl. 348—497** **2 Claims**



1. A digital time base corrector comprising:

A/D converting means for sampling a color video signal which was read out and reproduced from a recording medium and for converting said color video signal into a digital signal;

polarity data generating means for generating polarity data indicative of a polarity of a burst signal from said digital signal at every horizontal scan period;

an image data memory for storing said digital signal as image data on a sample unit basis at every horizontal scan period;

a subcarrier phase memory having memory locations of said polarity data of the number as many as only the number of said image data to be written into said image data memory;

memory control means for controlling writing of said image data at memory locations in said image data memory which are sequentially designated in accordance with a write clock signal whose phase is synchronized with a time base fluctuation included in said color video signal, for controlling writing of said polarity data at memory locations in said subcarrier phase memory which are sequentially designated in accordance with said write clock signal, for controlling reading of said image data from the memory locations in said image data memory which are sequentially designated in accordance with a read clock signal of a predetermined period, and for controlling reading of said polarity data from the memory locations in said subcarrier phase memory which are sequentially designated in accordance with said read clock signal;

latch means for holding and outputting said polarity data read from said image data memory during a reading operation period of said memory control means corresponding to a horizontal scan period in which said polarity data is generated by said polarity data generating means;

first discrepancy detecting means for generating a first discrepancy detection signal when a discrepancy between said polarity data read out by said memory control means and the polarity data held in said latch means is detected;

second discrepancy detecting means for generating a second discrepancy detection signal for a new horizontal scan period when it is detected that said memory control means is not shifted to a data writing operation in said new horizontal scan period in the case where said memory control means starts a data reading operation from said image data memory and said subcarrier phase memory for said new horizontal scan period;

color phase inverting means for relaying said image data read out by said memory control means, for inverting a color phase of said image data read out by said memory control means in accordance with said first or second discrepancy detection signal, and for relaying said color phase inverted image data; and

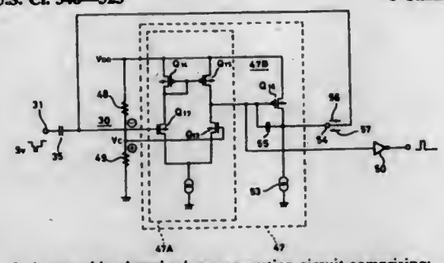
means for generating an analog video signal on the basis of said image data which is outputted from said color phase inverting means.

5,497,201

## SYNC CHIP CLAMPING/SYNC SEPARATOR CIRCUIT

Akihide Ogawa, Nagasaki; Hiroshi Yamagata, Kanagawa; Kazuhiro Takeda, Nagasaki, and Yoshiharu Ito, Tokyo, all of, Japan, assignors to Sony Corporation, Japan

Filed Jul. 21, 1994, Ser. No. 278,149
Claims priority, application Japan, Jul. 27, 1993, 5-204684
Int. Cl.[6] H04N 5/08
U.S. Cl. 348—525 8 Claims



1. A sync chip clamping/sync separation circuit comprising:

a differential amplification circuit which comprises a final output amplification section comprising a P channel FET, with the drain terminal of said P channel FET being connected to an inverting input terminal of a previous stage differential amplification section;

current limitation means which limits a current which pulls down the drain terminal of the P channel FET of said differential amplification circuit to a current which is less than the current which flows when said P channel FET is ON;

voltage supply means which supplies a constant voltage to a non inverting input terminal of said differential amplification circuit;

an input coupling capacitor which is interposed between the inverting input terminal of said differential amplification circuit and a positive polarity video signal input terminal; and

sync signal output means which takes out a sync signal from an output of the previous stage differential amplification section, wherein said sync signal output means has an input connected between said output of the previous stage differential amplification section and the gate terminal of the P channel FET of said differential amplification circuit.

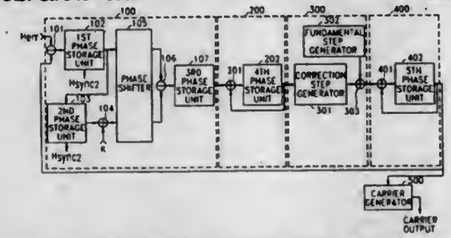
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5,497,202

## AUTOMATIC DIGITAL FREQUENCY CONTROL CIRCUIT

Ji-ho Kim, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki, Rep. of Korea

Filed Mar. 13, 1995, Ser. No. 402,945
Claims priority, application Rep. of Korea, Mar. 11, 1994, 94-4803
Int. Cl.[6] H04N 5/12; H03L 7/00
U.S. Cl. 348—536 18 Claims



1. An automatic digital frequency control circuit for generating a carrier which is synchronized to a digital horizontal sync signal, said automatic digital frequency control circuit comprising:

a phase difference calculator for calculating and providing a phase difference signal between two adjacent scanning lines in response to an error value representative of an error between digital horizontal sync signal with respect to a present scanning line and a phase value of a previous scanning line;

a phase difference accumulator receiving the phase difference signal for combining the received phase difference signal with a phase difference accumulated value, which has been already stored in said accumulator so as to permit output of a new phase difference accumulated value as the result of an accumulation operation;

an oscillation step corrector generating fundamental oscillation step data, generating correction step data correcting the fundamental oscillation according to the phase difference accumulated value supplied from said phase difference accumulator by using correction step data, thereby generating the corrected oscillation step data;

a phase value generator receiving the corrected oscillation step data, increasing a phase value, which has been already stored responsive to said corrected oscillation data, generating a plurality of phase values for carrier generation with respect to the present scanning line, and supplying respective generated phase values to said phase difference calculator; and

a carrier generator generating a carrier having a frequency corresponding to each of said respective phase value generated from said phase value generator.

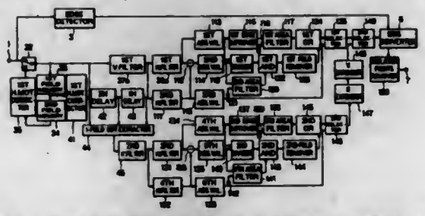
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5,497,203

## MOTION DETECTION CIRCUIT FOR HIGH DEFINITION TELEVISION BASED ON MUSE

Hiroshi Kayashima; Jun Ido; Naoki Hayashi; Kenji Urasaki, and Akio Sasai, all of Kyoto, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 29, 1992, Ser. No. 968,532
Claims priority, application Japan, Jan. 30, 1991, 3-283419; Apr. 1, 1992, 4-079565; May 22, 1992, 4-130580; May 22, 1992, 5-130582
Int. Cl.[6] H04N 7/01; 11/20
U.S. Cl. 348—699 43 Claims



38. A method of motion detection in a MUSE (multiple sub-Nyquist encodation) decoder comprising:

a) detecting edges in present video signal frame information and producing an edge information signal;

b) receiving interleaved present and previous video signal frame information as an interfield signal;

c) obtaining a differential motion signal from the interfield signal;

d) filtering the differential motion signal to remove high frequencies in a frequency range where folding disturbance signals may exist to produce a filtered differential motion signal;

e) selectively adding high frequency information in the frequency range where folding disturbance components exist to the filtered differential motion signal only when the high frequency information is not due to folding disturbances in the video signal to produce a high frequency enhanced motion signal to enhance the reproduction of moving images; and

f) adjusting sensitivity of said high frequency enhanced motion signal in the area of image edges in response to said edge information signal to produce motion detection data.

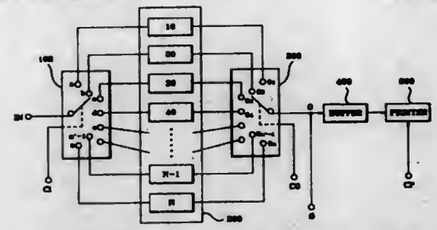


5,497,204

## PICTURE MEMORY SYSTEM FOR VIDEO PRINTER

Han I. Ko, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki, Rep. of Korea

Continuation of Ser. No. 113,753, Aug. 31, 1993, abandoned.
This application Jan. 26, 1995, Ser. No. 378,950
Claims priority, application Rep. of Korea, Aug. 31, 1992, 92-15691
Int. Cl.[6] H04N 1/21
U.S. Cl. 348—715 6 Claims



1. A picture memory system capable of storing video signals from a video signal source to print selectively pictures out of the received video signals, said picture memory system comprising:

input signal switching means for performing selection operations for user-adjustable time intervals so as to output the received video signals through one of a plurality of output terminals under the control of input control signals;

memory means having a plurality of semiconductor memory devices, for storing output signals of said input signal switching means into relevant portions of said memory means in sequence;

output signal switching means for selecting the relevant portions of said memory means in accordance with the control of output control signals to output the relevant video signals stored in the selected semiconductor memory device;

a buffer for adjusting an output level of video signals output from said output signal switching means; and

a video printer for printing output picture signals of said buffer in accordance with print control signals.

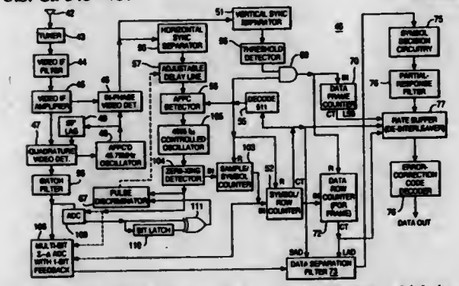
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5,497,205

## APPARATUS FOR PROCESSING BPSK SIGNAL TRANSMITTED WITH NTSC TV ON QUADRATURE-PHASE VIDEO

Jian Yang, Bensalem, Pa., and Allen L. Limberg, Ringoes, N.J., assignors to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea

Division of Ser. No. 179,588, Jan. 5, 1994, Pat. No. 5,448,299.
This application Apr. 17, 1995, Ser. No. 422,834
Int. Cl.[6] H04N 5/455
U.S. Cl. 348—737 14 Claims



7. A digital signal receiver for use with a system which in a combined transmission with a video carrier wave the amplitude of which is modulated in accordance with a composite video signal transmits binary phase-shift keying modulation sidebands of a suppressed carrier wave in quadrature phasing with said video carrier wave, a first bit-serial digital signal being encoded in a binary phase-shift keying signal having a prescribed phase-shift keying rate that is a multiple of a horizontal scan line rate for said composite video signal and modulating the amplitude of said suppressed carrier to generate said binary phase-shift keying modulation sidebands thereof, said combined transmission being made after vestigial-sideband filtering, said digital signal receiver comprising:

a tuner for supplying intermediate-frequency signal response to a selected radio-frequency signal comprising an amplitude-modulated video carrier wave modulated in accordance with a composite video signal and a binary phase-shift-keyed suppressed carrier wave in quadrature phasing with said video carrier wave, said binary phase-shift-keyed suppressed carrier wave being modulated in accordance with a binary phase-shift-keying signal encoding a first bit-serial digital signal;

an intermediate-frequency amplifier for said intermediate-frequency signal response, said intermediate-frequency amplifier including filtering and amplifying elements and supplying an amplified intermediate-frequency amplifier response;

first controlled oscillator circuitry for generating in-phase and quadrature-phase intermediate-frequency video carrier waves, at an intermediate frequency and average phase which are controlled by a frequency and phase error signal;

an in-phase video detector receptive of said amplified intermediate-frequency amplifier response for synchronously detecting, in accordance with said in-phase intermediate-frequency video carrier wave supplied thereto, modulation of the amplitude of said video carrier to generate an in-phase detected signal in which said composite video signal is regenerated, because of said vestigial-sideband filtering the regenerated composite video signal being accompanied by upper-frequency remnants of said binary phase-shift keying signal;

a quadrature-phase video detector receptive of said amplified intermediate-frequency amplifier response for synchronously detecting, in accordance with said quadrature-phase intermediate-frequency video carrier wave supplied thereto, modulation of the amplitude of said video carrier to generate a quadrature-phase detected signal in which said binary phase-shift-keying signal is regenerated accompanied by said frequency and phase error signal, because of said vestigial-sideband filtering the regenerated binary phase-shift-keying signal being further accompanied by at least upper-frequency remnants of said composite video signal;

a horizontal sync separator for separating horizontal synchronizing pulses from the composite video signal detected by said in-phase video detector;

line-locked second controlled oscillator circuitry for generating clocking oscillations at a frequency and phase controlled by said separated horizontal synchronizing pulses, which oscillations are at a multiple of said horizontal scan line rate for said composite video signal;

an analog-to-digital converter having an input connection for receiving said quadrature-phase detected signal as its analog input signal and having an output connection for supplying digitized response to samples of said quadrature-phase detected signal, as sampled at said prescribed phase-shift keying rate to provide a digital quadrature-phase detected signal;

first and second one-frame digital delays in cascade connection, said first one-frame digital delay receptive of said quadrature-phase detected signal for supplying said quadrature-phase detected signal as delayed by the duration of a frame of said composite video signal as its respective delayed response, and said second one-frame digital delay receptive of the delayed response of said first one-frame digital delay for supplying said quadrature-phase detected signal as delayed by the duration of two frames of said composite video signal as its respective delayed response;

a first digital subtractor for differentially combining said quadrature-phase detected signal from said analog-to-digital converter and the delayed response of said first one-frame digital delay, thereby to generate a first difference signal;

a second digital subtractor for differentially combining the delayed response of said first one-frame digital delay and the delayed response of said second one-frame digital delay, thereby to generate a second difference signal;

means, responding to said first difference signal, for providing a first highpass line-comb filter response which includes three-level digital response to phase-shift keying symbols, with said remnants of said composite video signal being suppressed in said first highpass line-comb filter response;

first symbol decision circuitry responsive to said first highpass line-comb filter response for deciding the identity of each phase-shift keying symbol, thereby to generate each successive bit in a second bit-serial digital signal;

a first partial-response filter, responding to said second bit-serial digital signal, for generating a third bit-serial digital signal that substantially reproduces said first bit-serial digital signal;

means, responding to said second difference signal, for providing a second highpass line-comb filter response which includes five-level digital response to phase-shift keying symbols, with said remnants of said composite video signal being suppressed in said second highpass line-comb filter response;

second symbol decision circuitry responsive to said second highpass line-comb filter response for deciding the identity of each phase-shift keying symbol, thereby to generate each successive bit in a fourth bit-serial digital signal;

a second partial-response filter, responding to said fourth bit-serial digital signal, for generating as its response a fifth bit-serial digital signal that substantially reproduces said first bit-serial digital signal; and

means for selecting the successive bits of a sixth bit-serial digital signal, by selecting as the current bit of said sixth bit-serial digital signal the one of the current bits of said third and fifth bit-serial digital signals least likely to be in error owing to remnants of said composite video signal affecting symbol decision.

11. A digital signal receiver for use with a system which in a combined transmission with a video carrier wave the amplitude of which is modulated in accordance with a composite video signal transmits binary phase-shift keying modulation sidebands of a suppressed carrier wave in quadrature phasing with said video carrier wave, a first bit-serial digital signal being encoded in a binary phase-shift keying signal having a prescribed phase-shift keying rate that is a multiple of a horizontal scan line rate for said composite video signal and modulating the amplitude of said suppressed carrier to generate said binary phase-shift keying modulation sidebands thereof, said combined transmission being made after vestigial-sideband filtering, said digital signal receiver comprising:

a tuner for supplying intermediate-frequency signal response to a selected radio-frequency signal comprising an amplitude-modulated video carrier wave modulated in accordance with a composite video signal and a binary phase-shift-keyed suppressed carrier wave in quadrature phasing with said video carrier wave, said binary phase-shift-keyed suppressed carrier wave being modulated in accordance with a binary phase-shift-keying signal encoding a first bit-serial digital signal;

an intermediate-frequency amplifier for said intermediate-frequency signal response, said intermediate-frequency amplifier including filtering and amplifying elements and supplying an amplified intermediate-frequency amplifier response;

first controlled oscillator circuitry for generating in-phase and quadrature-phase intermediate-frequency video carrier waves, at an intermediate frequency and average phase which are controlled by a frequency and phase error signal;

an in-phase video detector receptive of said amplified intermediate-frequency amplifier response for synchronously detecting, in accordance with said in-phase intermediate-frequency video carrier wave supplied thereto, modulation of the amplitude of said video carrier to generate an in-phase detected signal in which said composite video signal is regenerated, because of said vestigial-sideband filtering the regenerated composite video signal being accompanied by upper-frequency remnants of said binary phase-shift keying signal;

a quadrature-phase video detector receptive of said amplified intermediate-frequency amplifier response for synchronously detecting, in accordance with said quadrature-phase intermediate-frequency video carrier wave supplied thereto, modulation of the amplitude of said video carrier to generate a quadrature-phase detected signal in which said binary phase-shift-keying signal is regenerated accompanied by said frequency and phase error signal, because of said vestigial-sideband filtering the regenerated binary phase-shift-keying signal being further accompanied by at least upper-frequency remnants of said composite video signal;

a horizontal sync separator for separating horizontal synchronizing pulses from the composite video signal detected by said in-phase video detector;

line-locked second controlled oscillator circuitry for generating clocking oscillations at a frequency and phase controlled by said separated horizontal synchronizing pulses, which oscillations are at a multiple of said horizontal scan line rate for said composite video signal;

an analog-to-digital converter having an input connection for receiving said quadrature-phase detected signal as its analog input signal and having an output connection for supplying digitized response to samples of said quadrature-phase detected signal, as sampled at said prescribed phase-shift keying rate to provide a digital quadrature-phase detected signal;

first and second one-frame digital delays in cascade connection, said first one-frame digital delay receptive of said quadrature-phase detected signal for supplying said quadrature-phase detected signal as delayed by the duration of a frame of said composite video signal as its respective delayed response, and said second one-frame digital delay receptive of the delayed response of said first one-frame digital delay for supplying said quadrature-phase detected signal as delayed by the duration of two frames of said composite video signal as its respective delayed response;

a first digital subtractor for differentially combining said quadrature-phase detected signal from said analog-to-digital converter and the delayed response of said first one-frame digital delay, thereby to generate a first difference signal;

a second digital subtractor for differentially combining the delayed response of said first one-frame digital delay and the delayed response of said second one-frame digital delay, thereby to generate a second difference signal;

means, responding to said first difference signal, for providing a first highpass line-comb filter response which includes three-level digital response to phase-shift keying symbols, with said remnants of said composite video signal being suppressed in said first highpass line-comb filter response;

first symbol decision circuitry responsive to said first highpass line-comb filter response for deciding the identity of each phase-shift keying symbol, thereby to generate each successive bit in a second bit-serial digital signal;

a first partial-response filter, responding to said second bit-serial digital signal, for generating a third bit-serial digital signal that substantially reproduces said first bit-serial digital signal;

means, responding to said first difference signal, for providing a second highpass line-comb filter response which includes five-level digital response to phase-shift keying symbols, with said remnants of said composite video signal being suppressed in said second highpass line-comb filter response;

second symbol decision circuitry responsive to said second highpass line-comb filter response for deciding the identity of each phase-shift keying symbol, thereby to generate each successive bit in a fourth bit-serial digital signal;

a second partial-response filter, responding to said fourth bit-serial digital signal, for generating as its response a fifth bit-serial digital signal that substantially reproduces said first bit-serial digital signal;

means for selecting the successive bits of a sixth bit-serial digital signal, by selecting as the current bit of said sixth bit-serial digital signal the one of the current bits of said third and fifth bit-serial digital signals least likely to be in error owing to remnants of said composite video signal affecting symbol decision;

means, responding to said second difference signal, for providing a third highpass line-comb filter response which includes five-level digital response to phase-shift keying symbols, with said remnants of said composite video signal being suppressed in said third highpass line-comb filter response;

third symbol decision circuitry responsive to said third highpass line-comb filter response for deciding the identity of each phase-shift keying symbol, thereby to generate each successive bit in a seventh bit-serial digital signal;

a third partial-response filter, responding to said seventh bit-serial digital signal, for generating an eighth bit-serial digital signal;

means, responding to said second difference signal, for providing a fourth highpass line-comb filter response which includes nine-level digital response to phase-shift keying symbols, with said remnants of said composite video signal being suppressed in said fourth highpass line-comb filter response;

fourth symbol decision circuitry responsive to said fourth highpass line-comb filter response for deciding the identity of each phase-shift keying symbol, thereby to generate each successive bit in a ninth bit-serial digital signal;

a fourth partial-response filter, responding to said ninth bit-serial digital signal, for generating as its response a tenth bit-serial digital signal;

means for selecting the successive bits of an eleventh bit-serial digital signal, by selecting as the current bit of said eleventh bit-serial digital signal the one of the current bits of said eighth and tenth bit-serial digital signals least likely to be in error owing to remnants of said composite video signal affecting symbol decision;

an exclusive-OR gate having a first input for receiving said eleventh bit-serial digital signal, having a second input, and having an output for supplying a twelfth bit-serial digital signal;

means for selecting the successive bits of a thirteenth bit-serial digital signal, by selecting as the current bit of said thirteenth bit-serial digital signal the one of the current bits of said sixth and twelfth bit-serial digital signals least likely to be in error owing to remnants of said composite video signal affecting symbol decision; and

a third one-frame digital delay receptive of said thirteenth bit-serial digital signal for supplying to the second input of said exclusive-OR gate said thirteenth bit-serial digital signal after being delayed by the duration of a frame of said composite video signal.



an audio signal determination means for determining whether the received audio signal is a mono or stereo-type signal, and generating a logic signal in accordance with the result of the determination;

a video signal detecting means for receiving a video signal and outputting a video detection signal indicating whether or not the video signal is present;

a control signal generating means for generating a control signal after logically combining the logic signal output from said audio signal determination means and the video detection signal; and

a switching circuit for switching the audio signal based on the control signal so as to always output a stereo sound regardless of whether the audio signal is a mono or stereo-type signal.

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**5,497,207**

## OVERHEAD PROJECTOR

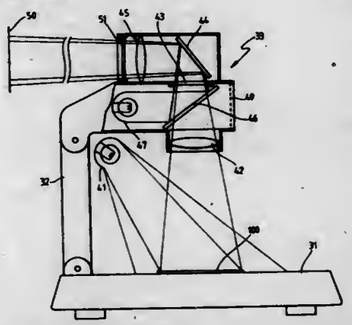
**Hoo-shik Kim, Kyungki-do, Rep. of Korea, assignor to Samsung Aerospace Industries, Ltd., Changwon, Rep. of Korea**

**Filed Aug. 29, 1994, Ser. No. 297,617**

**Claims priority, application Rep. of Korea, Aug. 31, 1993, 93-17558**

**Int. Cl.[6] G03B 21/28**

**U.S. Cl. 353—66** **17 Claims**



1. An overhead projector comprising:

first illuminating means for irradiating light having a predetermined wavelength onto an object placed on a planar surface;

focusing means for focusing the light irradiated by said first illumination means and reflected from the object;

first isolating means for passing a specific wavelength of the light being incident from said focusing means, and for reflecting the light not having the specific wavelength at a predetermined angle;

image forming means for forming an image of the object by a photosensitive reaction by employing the light having a specific wavelength and which has passed said first isolating means;

second illuminating means for irradiating illuminance light, said illuminance light having a visible light component which is irradiated onto said image forming means at a predetermined angle;

second isolating means for irradiating the visible light component of the illuminance light irradiated from said second illuminating means onto said image forming means, and for removing the specific wavelength component of said illuminance light;

reflection means for reflecting the image onto which the visible light component irradiated from said second isolating means onto said image forming means is projected at a predetermined angle; and

means for enlarging and projecting the object image onto a projection screen, said enlarging and projecting means being incident to said reflection means.

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**5,497,206**

## CIRCUIT FOR CONTROLLING AN AUDIO SIGNAL OUTPUT OF A TELEVISION

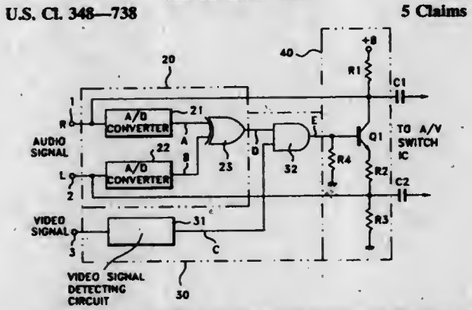
**Sung Y. Ji, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea**

**Filed Aug. 31, 1994, Ser. No. 298,741**

**Claims priority, application Rep. of Korea, Aug. 31, 1993, 1993-17374**

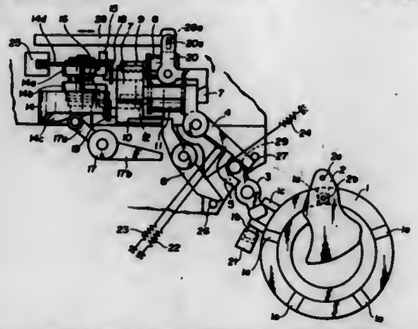
**Int. Cl.[6] H04N 5/60**

**U.S. Cl. 348—738** **5 Claims**




1. A circuit for controlling the audio signal output of a television having a plurality of audio output channels and which receives an audio signal provided from an external signal source, comprising:

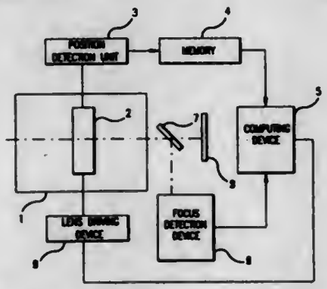
5,497,208
**CAMERA HAVING A LENS SHUTTER MECHANISM**
Yu Sato, Hachioji; Kazutoshi Shiratori, and Hiroyoshi Watanabe, both of Hino, all of, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Sep. 9, 1994, Ser. No. 304,501
Claims priority, application Japan, Sep. 10, 1993, 5-225867; Sep. 10, 1993, 5-225868; Sep. 10, 1993, 5-225869; Sep. 10, 1993, 5-225870
Int. Cl.[6] G03B 9/08
U.S. Cl. 354—234.1 25 Claims



1. A camera having a lens shutter mechanism, comprising:
a shutter means for forming a predetermined exposure aperture;
a shutter driving means for opening said shutter means;
an aperture speed selecting means for selecting an aperture speed; and
an aperture speed changing means interlocked with said aperture speed selecting means in order to drive said shutter driving means, said aperture speed changing means including a plurality of lever means constrained to move in the same direction by a plurality of elastic means.

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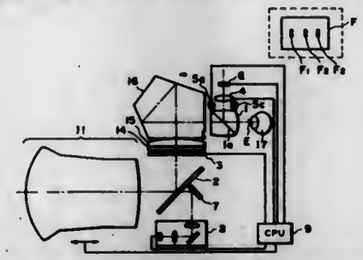
5,497,209
**AUTOMATIC FOCUSING DEVICE AND AUTOMATIC FOCUSING METHOD**
Toru Iwane, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan
Filed Dec. 27, 1994, Ser. No. 364,233
Claims priority, application Japan, Dec. 28, 1993, 5-337212
Int. Cl.[6] G03B 13/36
U.S. Cl. 354—402 18 Claims




1. An automatic focusing device for a focusing lens in a lens system having a predetermined focal plane and an image forming plane, comprising:
a focus detection means for detecting a defocus amount ΔBf of the image forming plane from the predetermined focal plane of the lens system;
a memory means for storing a specific conversion coefficient γ for converting the defocus amount ΔBf into a driving amount Δx for the focusing lens, and for storing a plurality of correction coefficients Lm (m=1, 2, . . . ) for correcting the specific conversion coefficient γ according to the defocus amount ΔBf;
a conversion coefficient calculation means for calculating a conversion coefficient γs based on the specific conversion coefficient γ stored in the memory means and the plurality of correction coefficients Lm (m=1,2, . . . ) stored in the memory means, wherein the conversion coefficient calculation means calculates the conversion coefficient γs by successively correcting the correction coefficients Lm using a next correction coefficient L(m+1) and the defocus amount ΔBf and corrects the specific correction coefficient γ using the correction coefficients and the defocus amount ΔBf;
lens driving amount calculation means for calculating the driving amount Δx of the focusing lens from the defocus amount ΔBf calculated by the focus detection means using the conversion coefficient γs calculated by the conversion coefficient calculation means; and,
a lens driving means for controlling driving of the focusing lens based on the driving amount Δx calculated by the lens driving amount calculation means.

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5,497,210
**APPARATUS WITH FOCUS DETECTION MEANS AND SIGHT AXIS DETECTION MEANS**
Yukio Odaka, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 970,029, Nov. 2, 1992, abandoned.
This application Dec. 15, 1994, Ser. No. 357,152
Claims priority, application Japan, Nov. 6, 1991, 3-318320; Nov. 6, 1991, 3-318322
Int. Cl.[6] G03B 13/36
U.S. Cl. 354—402 14 Claims



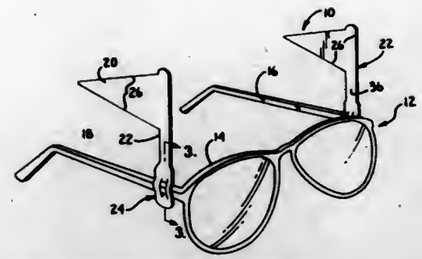

1. A focus adjustment device for an objective lens, comprising:
multi-point focus state detection means for detecting focus states of said objective lens for a plurality of areas in a field;
sight point detection means for detecting a sight point state; and
control means comprising multi-point focus state control means for executing a detection operation of said multi-point focus state detection means, and sight point control means for executing a detection operation of said sight point detection means,
wherein said multi-point focus state control means and said sight point control means execute their respective operations in parallel.

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5,497,211
**INDICIA DISPLAY DEVICE FOR EYEGLASSES OR THE LIKE**
William J. McNulty, 527 E. Minor, Kansas City, Mo. 64131
Filed Aug. 15, 1994, Ser. No. 290,061
Int. Cl.[6] G02C 11/02
U.S. Cl. 351—52 11 Claims

7. An indicia display device of unitary construction for use with eyeglasses, goggles, a mask or the like having a frontal lens-holding portion and a pair of templepieces, comprising:

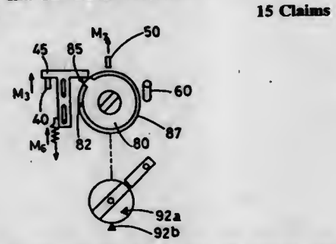




(a) a generally triangular indicia display member;
(b) an elongate, generally planar support member having a first end, a second end, and a planar indicia display surface therebetween, said first end being coupled with said display member;
(c) a generally planar fastener for adjustably coupling said support member second end to one of said templepieces in a generally upright orientation; and
(d) wherein said fastener includes a pair of parallel slots for slidably accepting said templepiece therebetween and permitting adjustable positioning of said device along said templepiece and outside the peripheral vision of a wearer.

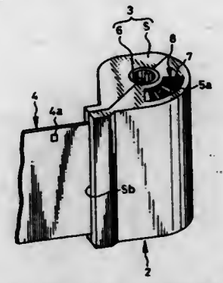
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5,497,212
**REWINDING DEVICE FOR CAMERAS**
Kunio Kawamura, Kawachinagano; Hiroyuki Okada, Sakai; Sadafusa Tsuji, Tondabayashi; Masaaki Chikasaki, Toyonaka; Michihiro Iwata, and Shuji Izumi, both of Sakai, all of, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 794,512, Nov. 19, 1991, abandoned.
This application Mar. 1, 1994, Ser. No. 203,759
Claims priority, application Japan, Nov. 20, 1990, 2-316295
Int. Cl.[6] G03B 7/00; 17/02
U.S. Cl. 354—21 15 Claims



1. A camera using a film cartridge, wherein the film cartridge has a film rewinding shaft and indicates whether a film in said film cartridge is exposed or unexposed by a phase of rotation of the film rewinding shaft, said camera comprising:
a film cartridge chamber for accommodating said film cartridge, said film cartridge chamber having an opening through which said film cartridge is inserted into said film cartridge chamber and taken out therefrom;
a lid of said film cartridge chamber that is movable for opening and closing said opening;
a driving mechanism which engages with and drives said film rewinding shaft; and
a blocking mechanism which prevents said lid from opening when said driving mechanism is not in a phase of rotation in which an exposed condition of film is indicated after film rewinding is finished.

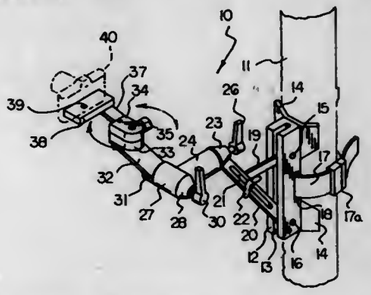
5,497,213
**METHOD AND APPARATUS FOR READING BAR CODE OF PHOTOGRAPHIC FILM CASSETTE**
Yutaka Yoshida, and Yoshihiro Yoshikawa, both of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Jun. 16, 1994, Ser. No. 260,812
Claims priority, application Japan, Jun. 18, 1993, 5-148012
Int. Cl.[6] G03B 7/00
U.S. Cl. 354—21 19 Claims



1. A method of reading a bar code from a photographic film cassette, the cassette having a cassette shell, a spool rotatably mounted within the cassette shell and wound with a photographic film, a bar code disc rotating with the spool, and a bar code disposed on the bar code disc in the rotation direction, said bar code being constituted by plural bars of a black type and of a white type, each of the black and white bars comprising a wide bar and a narrow bar in the rotation direction to represent binary information, said method comprising the steps of:
measuring a pass time required for each said bar passing a measuring poiot during the rotation of said bar code disc;
determining a reference value in accordance with said pass time of a last read old bar which is the same type as or a different type from a presently read new bar; and
comparing said pass time of said new bar presently read with said reference value, in order to determine whether said new bar is said wide bar or said narrow bar.

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5,497,214
**CAMERA MOUNT**
Michael A. Labree, 13 Beard Rd., Hillsboro, N.H. 03244
Filed Jul. 11, 1994, Ser. No. 273,488
Int. Cl.[6] G03B 29/00
U.S. Cl. 354—81 6 Claims



1. A camera mount, comprising,
a support plate arranged for receiving a camera thereon, with a linkage means extending from the support plate for permitting articulation of the support plate, with the linkage means extending to a support boss, the support boss having at least one concave base plate for securement about a support post, and the support boss arranged for receiving the linkage

means, with the linkage means including a first lever pivotally secured to the support boss, and a second lever spaced from a first lever, with the second lever pivotally mounted to the support boss, and

a first clamp arranged for permitting sliding adjustment of the first lever relative to the second lever.

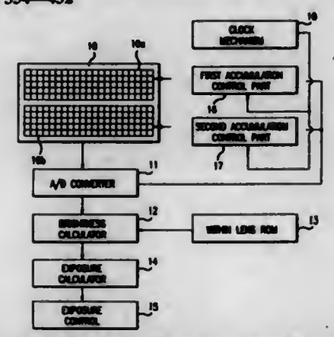
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**5,497,215**

## CAMERA PHOTOMETRY SYSTEM

**Hiroyuki Iwasaki, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan**

**Continuation of Ser. No. 285,395, Mar. 3, 1994, abandoned.**
**This application Feb. 2, 1995, Ser. No. 384,355**
**Claims priority, application Japan, Mar. 30, 1993, 5-095203**
**Int. Cl.[6] G03B 7/08**
**U.S. Cl. 354—432** **8 Claims**




1. A camera including a photometry system for avoiding the problem of smear phenomenon, comprising:

a photometry part defining a subject field and divided into a first photometry area in a first portion of said photometry part and a second photometry area in a a second portion of said photometry part, said photometry part being positioned in said camera so that said first photometry area receives an image of an object area that is higher throughout than the object area for which said second photometry area receives an image when the camera is held in a normal horizontal photographing position with the image field in the horizontal direction exceeding the image field in the vertical direction;

a plurality of photometry regions each comprising accumulation-type photoelectric elements in each of said first and second photometry areas;

a photoelectric mechanism for converting light received by each of said accumulation-type photoelectric elements in said first photometry area and said second photometry area of said photometry part into electrical charges and storing the electrical charges;

a transmission mechanism for transmitting the electrical charges representing the received light; and

a brightness value calculator for calculating a brightness value using the transmitted electrical charges.

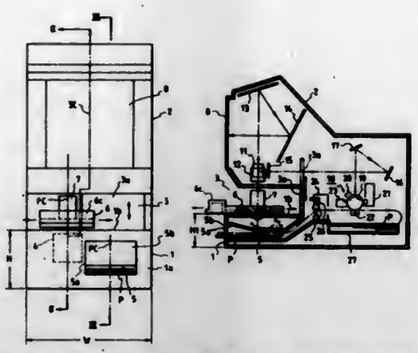
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**5,497,216**

## READER-PRINTER

**Kazuhiko Onuki, Tokyo, and Yoshihiro Ishibe, Kawasaki, both of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 990,917, Dec. 15, 1992, abandoned.**
**This application Jan. 3, 1995, Ser. No. 368,233**
**Claims priority, application Japan, Dec. 24, 1991, 3-356393; Dec. 24, 1991, 3-356394**
**Int. Cl.[6] G03B 13/28**
**U.S. Cl. 355—45** **18 Claims**



1. A film reader-printer unit, comprising:

a screen for displaying an image on a film, said screen located in a front portion of the reader-printer unit;

a projection lens disposed below said screen;

a first optical system for projecting an imaging light of film emitted through said projection lens to said screen to be displayed;

printing means for recording an image of the film on a recording medium, said printing means having a discharge portion for discharging the recording medium from the front portion of the reader-printer unit, said discharge portion being disposed below said projection lens;

a second optical system for projecting an imaging light of the film emitted through said projection lens to said printing means; and

a film carrier for holding the film in a plane, said film carrier being disposed between said projection lens and said discharge portion and being movable in a back and forth direction and right and left direction along a horizontal plane to dispose a desired image on the film into an optical path of said projection lens, wherein

when viewed from the front portion of the reader-printer unit, a center of said discharge portion is located at one side of a vertically extending centerline of said screen, an optical axis of said projection lens is located at the other side of the centerline of said screen, and the center of said discharge portion and the optical axis of said projection lens are located between right and left sides of said screen.

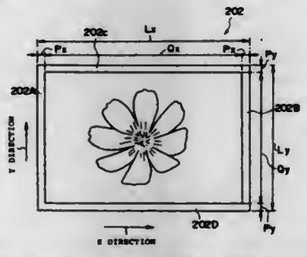
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**5,497,217**

## METHOD OF COPYING A PHOTOGRAPH BY USING A COPIER WITH BORDER ELIMINATING MODE

**Futoshi Yoshida, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed May 15, 1995, Ser. No. 440,934**
**Claims priority, application Japan, Sep. 30, 1994, 6-237932**
**Int. Cl.[6] G03B 27/32**
**U.S. Cl. 355—77** **20 Claims**




1. A method of copying a photograph by using a copier, by using a copier in which copying processing is carried out with an original abutting a member provided at a position corresponding to one side of a platen glass, said method forming, from a photograph original having white borders at the four peripheral portions thereof, a photographic print in which the borders are eliminated, said method comprising the steps of:

effecting magnification setting processing, in which, given that P is a transverse dimension of each of the white borders and Q is an image dimension, magnification is set to a predetermined enlargement magnification of greater than or equal to 100×(Q+2P)/Q and the photograph original is enlarged at the predetermined enlargement magnification, said magnification setting processing being effected by selection of a border eliminating mode; and

effecting reference position shifting processing in which a reference position, which is a reference at a time at which one of exposure processing and transfer processing is carried out during copying processing, is shifted by an amount corresponding to the transverse dimension P of the white border at one side of the photograph original which one side abuts the member provided at the position corresponding to the one side of the platen glass.



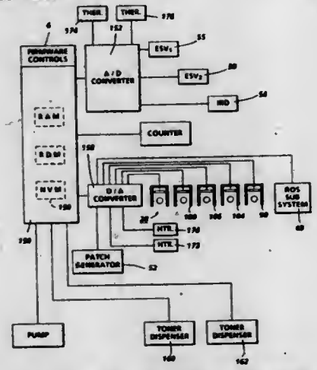
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**5,497,218**

## THREE POINT THERMISTOR TEMPERATURE SET UP

**Mark S. Amico, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Aug. 24, 1994, Ser. No. 295,375**
**Int. Cl.[6] G03G 15/20; 13/20**
**U.S. Cl. 355—208** **18 Claims**




1. A method of controlling the surface temperature of a heated fuser member having a heater structure operatively supported internally thereof, said method including the steps of:

supporting a heated fuser member in pressure engagement with a pressure roller for fusing toner images

heating said heated fuser member using a heater structure supported internally thereof;

supporting at least one thermistor in temperature sensing relationship with said heated fuser member;

establishing calibration bit values at three different temperatures for said at least one thermistor;

storing said calibration bit values in non-volatile memory

storing standby and runtime bit values in non-volatile memory

using said bit values and standby and runtime bit values for calculating said runtime and standby target values for said at least one thermistor;

storing said target values in non-volatile memory; and

utilizing said target values for controlling the operating characteristics of said heat structure.

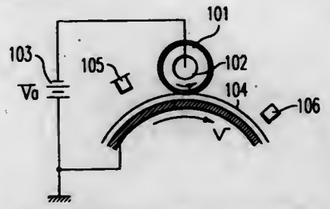
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**5,497,219**

## CHARGE ROLLERS HAVING IMPROVED LAYER STRUCTURE AND/OR SURFACE CHARACTERISTICS IN AN IMAGE FORMING APPARATUS

**Junji Kurokawa, Yokohama; Kazuo Nojima, Chiba, and Masaki Sekizawa, Kawasaki, all of, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan**

**Filed Apr. 15, 1994, Ser. No. 228,380**
**Claims priority, application Japan, May 31, 1993, 5-154481; Dec. 22, 1993, 5-346527**
**Int. Cl.[6] G03F 15/02**
**U.S. Cl. 355—219** **26 Claims**




1. A charge roller for an image forming apparatus in which the charge roller charges a photoconductive member, the charge roller including a metallic core, a conductive elastic layer covering the metallic core, and a surface layer covering the conductive elastic layer;

wherein a ten-point mean surface roughness Rd of the conductive elastic layer and a surface roughness Rs of the surface layer satisfy the following relationships:

Rd>Rs,

5 μm<Rd<15 μm.

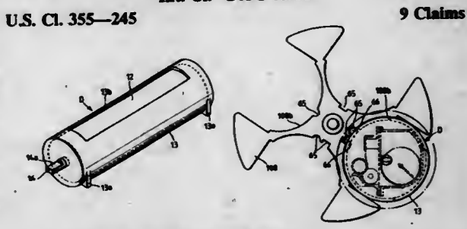
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**5,497,220**

## DEVELOPING CARTRIDGE HAVING SUPPORT MEMBER FOR ROTATABLY SUPPORTING DEVELOPING DEVICE, AND DEVELOPING APPARATUS

**Mitsugu Inomata, Kawasaki, and Hisayoshi Kojima, Yokohama, both of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Feb. 23, 1994, Ser. No. 200,690**
**Claims priority, application Japan, Feb. 24, 1993, 5-059746; Feb. 24, 1993, 5-059751**
**Int. Cl.[6] G03G 15/08**
**U.S. Cl. 355—245** **9 Claims**



1. A developing cartridge comprising:

a developing device having a containing portion containing developer, and a bearing member for bearing the developer;

a support member adapted to rotatably support said developing device and having an opening portion; and

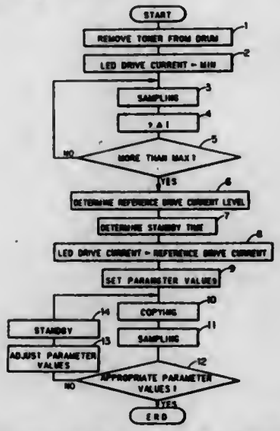
lock means for locking a rotation of said developing device with respect to said support member at a position where said bearing member is not aligned with said opening portion.

**5,497,221**

## METHOD OF ADJUSTING IMAGE DENSITY PARAMETERS BY REPETITIVELY ADJUSTING IMAGE DENSITY PARAMETER VALUES BASED UPON REFERENCE PATTERN DENSITY AT STANDBY TIME INTERVALS

**Mitsutoshi Takemoto, Osaka, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan**

**Filed Sep. 12, 1994, Ser. No. 304,483**
**Claims priority, application Japan, Sep. 20, 1993, 5-257797**
**Int. Cl.[6] G03G *21/00***
**U.S. Cl. 355—246** **7 Claims**




1. A density parameter adjusting method comprising the steps of:
(i) determining a level of reference drive current for a reflection type photosensor;
(ii) finding a standby time for allowing a photoconductor to recover from light fatigue caused by irradiating the photoconductor with light from the reflection type photosensor based upon the level of the reference drive current determined in step (i);
(iii) imaging a reference density pattern on the photoconductor;
(iv) setting drive current for the reflection type photosensor to the level of the reference drive current obtained in step (i) to detect a density of an image of the reference density pattern on the photoconductor by the reflection type photosensor;
(v) adjusting values of image density parameters based upon at least the density of the image of the reference density pattern obtained in step (iv) and
(vi) repetitively performing step (iii) to step (v) at intervals of the standby time obtained in step (ii) to obtain appropriate values of the image density parameters.

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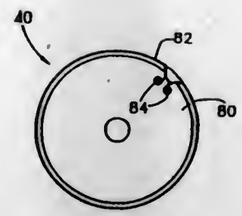
**5,497,222**

## IMAGE TRANSFER APPARATUS INCORPORATING AN INTEGRAL HEATER

**Benzion Landa, Edmonton, Canada; Hanna Pinhas, Holon, and Paul Fenster, Petach Tikva, both of, Israel, assignors to Indigo N.V., Veldhoven, Netherlands**

**Continuation of Ser. No. 249,984, May 27, 1994, which is a continuation of Ser. No. 17,410, Feb. 11, 1993, Pat. No. 5,335,054, which is a continuation of Ser. No. 777,008, Oct. 16, 1991, abandoned, which is a continuation of Ser. No. 393,631, Aug. 14, 1989, Pat. No. 5,089,856, which is a continuation-in-part of Ser. No. 306,065, Feb. 6, 1989, Pat. No. 4,984,025. This application Mar. 20, 1995, Ser. No. 406,396**
**Int. Cl.[6] G03G *15/12***
**U.S. Cl. 355—279** **22 Claims**

1. Imaging apparatus comprising:




an image bearing surface having a toner image formed thereon; and

a drum type intermediate transfer member having a transfer surface which receives the toner image from the image bearing surface and subsequently transfers the image to a substrate, wherein the intermediate transfer drum comprises a rigid core and an intermediate transfer blanket which is fixedly and replaceably secured and attached to the core.

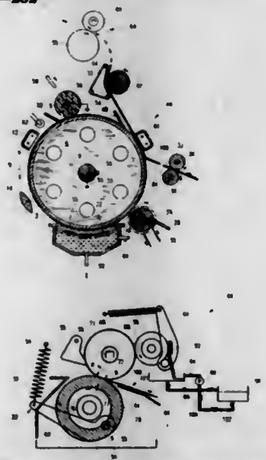
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**5,497,223**

## METHOD FOR FUSING DEVELOPED IMAGE

**Benzion Landa, Edmonton, Canada, assignor to Indigo N.V., S.M. Veldhoven, Netherlands**

**Continuation of Ser. No. 202,687, Jun. 6, 1988, Pat. No. 5,270,776. This application Sep. 10, 1993, Ser. No. 118,794**
**Int. Cl.[6] G03G *15/10;15/20***
**U.S. Cl. 355—282** **13 Claims**



1. In an imaging process which comprises the steps of developing an electrostatic image with liquid toner including pigmented thermoplastic polymer particles and a liquid carrier, transferring the developed image to a substrate and fusing and fixing the substrate-supported developed image by the application of heat from a surface of an elastomer-coated first roller thereto, said substrate being transported through a nip defined by a portion of the surface of said first roller facing a surface of the substrate supporting the image and a portion of surface of a second elastomer-coated roller, wherein, in the absence of carrier liquid, that portion of the liquid toner which is non-volatile, has a viscosity of not less than about $2\times10^6$ centipoise at a temperature of about 121±1° C.,

the improvement comprising: pre-selecting at least the following conditions, namely, the temperature at which the fusing and fixing is effected, the rate of transport of the substrate, and the properties of the liquid carrier, such that less than about half of the liquid carrier present in the transferred image is removed during fusing and fixing.



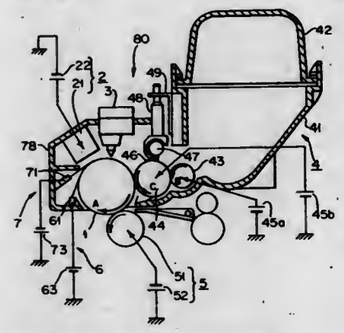
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**5,497,224**

## IMAGE FORMING APPARATUS

**Masaaki Ishikawa; Seiji Arai, and Michihisa Iguchi, all of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan**

**Filed Mar. 3, 1994, Ser. No. 205,229**
**Claims priority, application Japan, Mar. 4, 1993, 5-043627**
**Int. Cl.[6] G03G *21/00***
**U.S. Cl. 355—301** **16 Claims**




1. An image forming apparatus comprising:
a photosensitive member;
charging means for charging the photosensitive member;
exposing means for exposing the charged photosensitive member to form a latent image on the photosensitive member;
developing means for developing the latent image with toner to form a developed toner image on the photosensitive member;
transferring means for transferring the developed toner image to a sheet-like material;
a paper powder removal brush, located between the transferring means and the charging means, and supplied with a positive voltage, for removing paper powder adhered on the photosensitive member;
distributing means for distributing residual toner remaining on the photosensitive member after the transfer of the developed toner image and before a subsequent image is to be formed, the distributing means including:
a distributing brush located between the transferring means and the charging means, having a contact portion contacting the photosensitive member, and
voltage supply means for supplying a direct current voltage to the distributing brush, the voltage difference between the distributing brush and the photosensitive member being sufficient to cause a discharge to occur between the distributing brush and the photosensitive member; and
removing means for removing the distributed residual toner on the photosensitive member by transferring the distributed residual toner from the photosensitive member to the developing means, the removing means being operated simultaneously with the developing means.

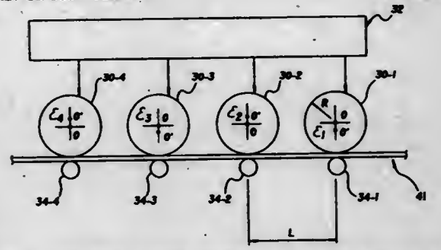
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**5,497,225**

## COLOR IMAGE FORMING APPARATUS HAVING A PLURALITY OF DRUMS FOR A PLURALITY OF COLORS

**Masato Matsuzuki, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan**

**Filed Aug. 29, 1994, Ser. No. 297,100**
**Claims priority, application Japan, Nov. 19, 1993, 5-314333**
**Int. Cl.[6] G03G *15/01***
**U.S. Cl. 355—326 R** **28 Claims**




1. A color image forming apparatus for forming a multi-color image on a sheet, comprising:
a plurality of photosensitive drums provided corresponding to a plurality of colors and having eccentric phases each shifted by a quantity corresponding to a radius of each of said photosensitive drums and a distance between transfer positions of said photosensitive drums;
a plurality of charging units, provided corresponding to said photosensitive drums, for charging said photosensitive drums;
an exposing source for effecting an image exposure on said photosensitive drums;
a plurality of developing units, provided corresponding to said photosensitive drums, for forming toner images on said photosensitive drums by developing electrostatic latent images on said photosensitive drums; and
a plurality of transferring units, provided corresponding to said photosensitive drums, for transferring the toner images on said photosensitive drums onto the sheet.

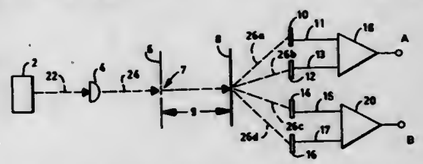
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**5,497,226**

## QUADRATURE DIFFRACTIVE ENCODER

**Paul F. Sullivan, Westwood, Mass., assignor to Polaroid Corporation, Cambridge, Mass.**

**Filed Aug. 22, 1994, Ser. No. 293,811**
**Int. Cl.[6] G01B *11/02***
**U.S. Cl. 356—4.01** **10 Claims**




1. An optical encoder for detecting relative position between two objects, said optical encoder comprising:
a light source providing a light beam;
a collimating lens for receiving said light beam from the light source and producing a collimated light beam;
a mask comprising an aperture comprising one or more slits, each slit having a same length, for selectively passing said collimated light beam, said mask being physically associated with a first of said two objects;
a diffractive grid for receiving said collimated light beam from the aperture of the mask and producing diffracted light beams which are either transmitted through or reflected from said diffractive grid, said diffractive grid comprising a first pattern

and a second pattern arranged in a side-by-side relationship with respect to each other, said first pattern comprising a plurality of first sections where pairs of said first sections are connected along common borders within said first pattern, said second pattern comprising a plurality of second sections where pairs of said second sections are connected along common borders within said second pattern, said first and second sections each having a length equal to the slit lengths, each said first section comprising a plurality of equidistant, parallel and straight lines or textures, each said second section comprising a plurality of equidistant, parallel and straight lines or textures, said first and second patterns being offset by one-half of one section length, said diffractive grid being physically associated with a second of said two objects;

first and second photodetectors positioned to produce first and second photodetector signals in response to detecting first ones and second ones of said diffracted light beams, respectively;

a first comparator for producing a first system output in response to receiving said first and second photodetector signals;

third and fourth photodetectors positioned to produce third and fourth photodetector signals in response to detecting third ones and fourth ones of said diffracted light beams, respectively; and

a second comparator for producing a second system output in response to receiving said third and fourth photodetector signals, said second system output being ninety degrees out of phase with said first system output.

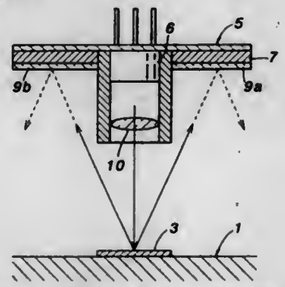
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**5,497,227**

**SYSTEM FOR DETERMINING THE AUTHENTICITY OF AN OBJECT**

**Itsuo Takeuchi; Hidekazu Hoshino, and Mutumi Sasaki, all of Kanagawa, Japan, assignors to NHK Spring Co., Ltd., Kanagawa, Japan**

**Filed Aug. 16, 1993, Ser. No. 549,610**
**Claims priority, application Japan, Sep. 29, 1992, 4-285270**
**Int. Cl.[6] G06K *9/74;7/10;* G03H *1/00***
**U.S. Cl. 356—71** **7 Claims**




1. A system for identifying an object, comprising:

an identification element comprising

a reflective layer affixed to an object to be identified, said reflective layer having such a reflective directivity that when an incident light beam is impinged thereon the reflected light is directed at least in two directions which are 180 degrees apart around said incident light beam, and

a polarization plane rotating layer placed on said reflective layer for rotating a polarization plane of light emitted from said reflective layer by 90 degrees relative to said incident light beam;

light emitting means for producing said incident light beam as a linearly polarized light beam;

light receiving means consisting of a plurality of pairs of light detecting segments arranged around said light emitting means, wherein each of said pairs of light detecting segments comprises a first segment and a second segment, said first segment and said second segment being positioned 180 degrees apart around said light emitting means;

a first filter placed on said first segment of each of said pairs of light detecting segments, said first filter having the property of transmitting substantially only the light emitted from said identification element whose plane of polarization is rotated by said polarization plane rotating layer;

a second filter placed on said second segment of each of said pairs of light detecting segments, said second filter having the property of transmitting substantially only the light emitted from said identification element whose plane of polarization is not rotated by said polarization plane rotating layer; and

means for comparing intensities of light detected by said light detecting segments, and for determining the authenticity of said object according to a pattern of the intensities of light detected by said light detecting segments, wherein said means for comparing and for determining includes means for computing a ratio of the intensities of light received by said first segment and said second segment, respectively, in each of said pairs of light detecting segments, and for determining the authenticity of said object when said ratio is greater than a prescribed threshold level for a prescribed one of said pairs of light detecting segments.

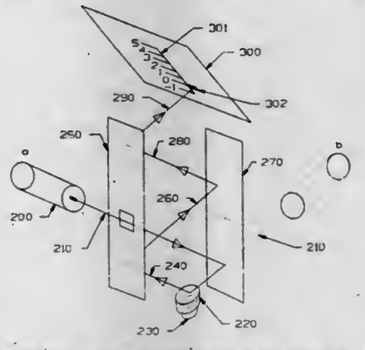
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**5,497,228**

**LASER BEVEL METER**

**Duane E. Grant, 445 S. 65Th St., Boulder, Colo. 80303, and Lawrence Viele, 235 Silver Cloud, Boulder, Colo. 80302**

**Filed Nov. 21, 1994, Ser. No. 343,100**
**Int. Cl.[6] G01B *11/26***
**U.S. Cl. 356—154** **9 Claims**




1. An apparatus for visual measurement of the angle on a bevel of a flat surface, comprising:

(a) a means for generating photons;

(b) a means for reflecting photons and tracking said bevel edge, which receives photons from said means for generating photons;

(c) a means for mounting said means for reflecting photons and tracking said bevel edge;

(d) a means for transmitting photons, which receives photons from said means for reflecting photons and tracking said bevel edge;

(e) a means for indicating the presence of photons with bevel angle measurement, which receives photons from said means for transmitting photons.

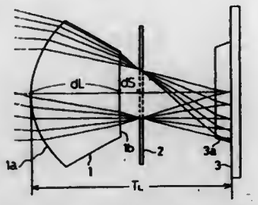


**5,497,229**

**PHOTOMETERING APPARATUS HAVING A SPLIT LIGHT RECEIVING DEVICE**

**Takayuki Sensui, and Chikara Yamamoto, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed May 27, 1994, Ser. No. 250,626**
**Claims priority, applicatiou Japan, May 28, 1993, 5-127152**
**Int. Cl.[6] G01J *1/42***
**U.S. Cl. 356—218** **12 Claims**




1. A photometering apparatus for measuring the brightness of an object to be photographed, comprising:

a condenser lens having at least one aspheric lens surface, said condenser lens gathering a bundle of rays reflected from the object; 'a diaphragm provided at a predetermined distance behind said condenser lens with respect to the object; and,

a split type light receiving device having a plurality of divided light measuring areas, said split type light receiving device provided behind said diaphragm with respect to the object and receiving light which passes through said diaphragm;

wherein the following formula is satisfied:

$$0.3 \leq L_{ASP}/T_L \leq 0.7$$

wherein "$T_L$" represents distance between a surface of said condenser lens nearer to the object to be photographed and said split type light receiving device, and wherein "$L_{ASP}$" represents reduced distance between said aspheric surface of said condenser lens and said diaphragm, represented by $L_{ASP}=(d_L/N)+d_s$, wherein "$d_L$" represents thickness of said condenser lens, "$d_s$" distance between said diaphragm and a surface of said condenser lens nearer to an image of the object, and "N" refractive index of said condenser lens at e-line.

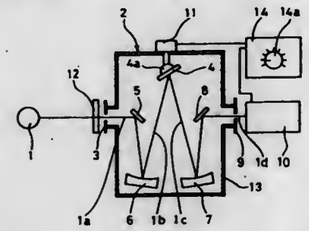
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**5,497,230**

**SPECTRORADIOMETER**

**Kazuaki Ohkubo, Takatsuki, and Yasuo Nakagawa, Omiya, both of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Nov. 4, 1994, Ser. No. 334,066**
**Claims priority, application Japan, Nov. 4, 1993, 5-274715**
**Int. Cl.[6] G01J *3/28***
**U.S. Cl. 356—328** **10 Claims**




1. A spectroradiometer comprising:

an entrance slit from which to be measured enters into said spectroradiometer;

an exist slit from which dispersed light having a predetermined wavelength exits;

a sharp-cut filter disposed in front of said entrance slit for cutting off light having a wavelength equal to or less than the cut-off wavelength of said sharp-cut filter;

a collimator system for converting said light entering through said entrance slit to a parallel light beam;

a dispersion system for dispersing said parallel light beam;

a focusing system for focusing a portion of said parallel light beam dispersed by said dispersion system having a predetermined wavelength on said exit slit;

a photo-sensitive device disposed at the rear of said exit slit for detecting light exiting through said exit slit;

a wavelength control device for controlling an incident angle of said parallel light beam from said collimator system to said dispersion system and an exit angle of said light beam from said dispersion system to said focusing system, thereby varying a wavelength of the portion of the parallel light beam focused on said exit slit; and

a processor for subtracting a stray light component from an output of said photo-sensitive device, said stray light component being an output of said photo-sensitive device which is previously obtained by controlling said wavelength control device so that said wavelength of the portion of the parallel light beam focused on said exit slit is equal to or less than said cut-off wavelength of said sharp-cut filter.

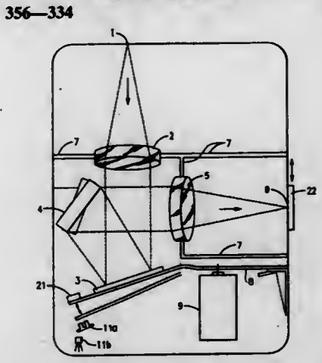
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**5,497,231**

**MONOCHROMATOR HAVING AN OSCILLIATING MIRROR BEAM-ELEMENT FOR SPECTROMETERS**

**Werner Schmidt, Meisenweg 7, D-78465 Konstanz, Germany**

**Filed May 26, 1994, Ser. No. 250,710**
**Int. Cl.[6] G01J *3/06***
**U.S. Cl. 356—334** **14 Claims**




1. A monochromator for single-beam spectrometers, comprising an enclosed housing having an entrance slit, a first optical system for collimating light entering through said entrance slit, a diffracting grate for spectral decomposition of the light entering through said entrance slit and collimated by the first optical system, a driven beam-deflecting element for scanning a monochromatic portion of the spectrally decomposed light and a second optical system for focusing the scanned monochromatic portion of light on an exit slit;

wherein said driven beam-deflecting element is a mechanically oscillating element with an adjustable amplitude of oscillation and having a scanning mirror (**3**) attached thereto;

an electromagnetic coil (**9**) spaced from said oscillating element (**8**) for deflecting said oscillating element (**8**) into resonant oscillations with electromagnetic energy; and

a control circuit (**10***a*, **10***b*), for periodically connecting and disconnecting current with said coil (**9**) to stabilize said resonant oscillation of said oscillating element (**8**) and for adjusting the coil current to adjust the amplitude of resonant oscillation, with a sensor (**11***a*, **11***b*) for detecting the deflection of

said oscillating element (8) and providing an output signal that is used as a feedback signal by said control circuit (10*a*, 10*b*);

whereby when said scanning mirror is arranged with respect to a said diffracting grate having 1200 slits per millimeter, a single sweep of the scanning mirror scans a spectral range of at least about 400 nm.

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**5,497,232**

**APPARTUS AND METHOD FOR MONITORING GRANULAR SIZE AND SHAPE DURING A GRANULATION OR COATING PROCESS**

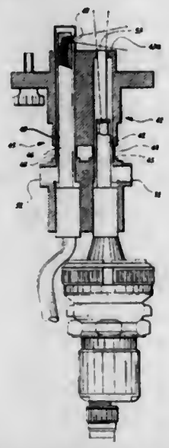
**Satoru Watano, Osaka; Yoshihiro Itoh, Tokyo; Nobuhito Oda, Tokyo; Teturo Kamata, Tokyo; Noboru Kawakami, Tokyo, and Nobuharu Moriya, Osaka, all of, Japan, assignors to Fuji Paudal Co., Ltd., Osaka, Japan**

**Filed Sep. 2, 1994, Ser. No. 300,798**

**Claims priority, application Japan, Jan. 26, 1993, 5-288833**

**Int. Cl.[6] G01N *15/02***

**U.S. Cl. 356—335** **20 Claims**



1. In a granulation or coating apparatus of the type having a processing vessel defining a granulation chamber for processing a particulate charge material therein into granules, an apparatus for photographing material under process in the granulation chamber for use in controlling physical characteristics of granules produced therein, the apparatus comprising means for projecting a source of illuminating light in the form of a generally flat beam through a portion of the granulation chamber, means for focusing a photographic camera within the projected light beam along an optical line of sight oriented generally perpendicular to the projected light beam, and means for directing a stream of gas in the region of the intersection of the projected light beam and the line of sight to disperse the charge material in the region during photography to promote photography of individualized particles of the charge material.

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**5,497,233**

**OPTICAL WAVEGUIDE VIBRATION SENSOR AND METHOD**

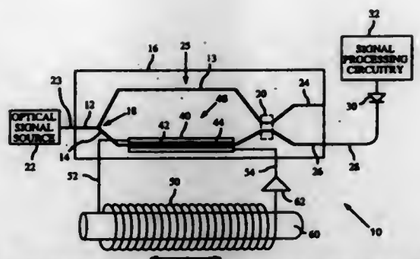
**A. Douglas Meyer, West Hills, Calif., assignor to Litton Systems, Inc., Woodland Hills, Calif.**

**Filed Jul. 27, 1994, Ser. No. 281,338**

**Int. Cl.[6] G01B *9/02***

**U.S. Cl. 356—345** **12 Claims**

1. A sensor for measuring parameters of vibrations, comprising:




an interferometer including a first leg having a first optical path length and a second leg having a second optical path length formed such that the first optical path length is longer than the second optical path length;

an optical signal generator connected to the interferometer to apply a frequency modulated optical signal input thereto;

a first pair of electrodes placed adjacent one of the legs of the interferometer to form a first phase modulator;

a coil of wire connected between the pair of electrodes;

a magnet arranged to have freedom of motion longitudinally inside the coil in response to externally applied forces, thereby inducing a voltage in the coil, the voltage being applied to the first pair of electrodes, which causes phase modulation of optical signals guided by the leg of the interferometer adjacent the first pair of electrodes; and

apparatus for processing optical signals output from the interferometer to determine the velocity and acceleration associated with the vibration.

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**5,497,234**

**INSPECTION APPARATUS**

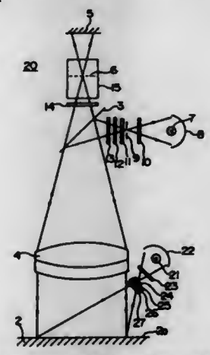
**Kazumi Haga, c/o New Creation 2-1 Koshino, Hachioji-shi, Tokyo-to, Japan**

**Filed Mar. 10, 1994, Ser. No. 208,311**

**Claims priority, application Japan, Apr. 30, 1993, 5-127883**

**Int. Cl.[6] G01N *21/00***

**U.S. Cl. 356—371** **5 Claims**



1. An apparatus for inspecting the surface condition of an object, comprising:

(A) first light irradiating means for irradiating said object;

(B) an optical element comprising an achromatic lens having a back focal plane for converging the light reflected by the surface of the object at the back focal plane to form an image behind the back focal plane;

(C) an aperture stop arranged at or near the back focal plane for cutting off a scattered component of the reflected light;

(D) observing means arranged behind the back focal plane for observing the image; and

(E) second light irradiating means for irradiating the object in a different incident direction from said first light irradiating means, said second light irradiating means being movable so as to change its incident direction relative to the object.



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**5,497,235**

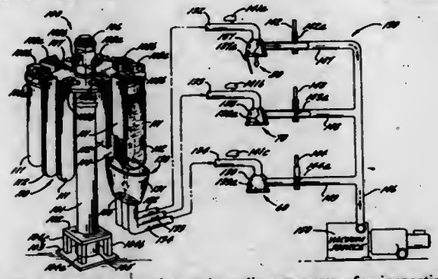
**INSPECTING AND GRADING APPARATUS FOR HOSIERY AND METHOD OF INSPECTING SAME**

**Cecil R. Bell, Pinnacle, N.C., assignor to Monarch Knitting Machinery Corporation, Flushing, N.Y.**

**Filed Jan. 12, 1995, Ser. No. 371,810**

**Int. Cl.[6] G01N *21/84;21/00***

**U.S. Cl. 356—430** **26 Claims**



18. A hosiery inspecting and grading apparatus for inspecting and grading a completed hosiery article, the apparatus comprising:

a base member;

a plurality of pairs of elongate and spaced-apart boarding members having upper portions thereof mounted to rotate about an upper portion of said base member, each said pair of elongate and spaced-apart boarding members extending downwardly from the upper portion of said base member and respectively positioned to mount a pair of legs of a completed pantyhose thereon so that a gusset portion of the completed pantyhose extends between said pair of elongate and spaced-apart boarding members, each of said boarding members being formed of a translucent material;

a first light emitter positionally aligned with at least one of said boarding members and positioned to vertically travel generally parallel to a front surface of said boarding member to emit light onto and through the front surface of said boarding member and a portion of a leg of a completed pantyhose when mounted thereon;

a first light detector positionally aligned with said first light emitter and said at least one of said plurality of boarding members and positioned to vertically travel generally parallel to a back surface of said at least one elongate boarding member to detect the presence and absence of light traveling from said light emitter and through said boarding member and the portion of a leg of a completed pantyhose mounted thereon so that presence and absence of defects in the completed pantyhose mounted on said boarding member are thereby determined;

a second light emitter arranged to emit light through a gusset portion extending between a pair of legs of pantyhose mounted on said pair of boarding members;

a second light detector positionally aligned with said second light emitter and arranged to detect light traveling from said second light emitter and through a gusset portion of a completed pantyhose so that presence and absence of defects in the gusset portion are thereby determined;

a controller in electrical communication with said first and second light emitters and said first and second light detectors and arranged to determine the presence and absence of defects in at least a leg and a gusset portion of a completed pantyhose responsive to electrical signals representative of the presence or absence of light received from said first and second light detectors; and

means positioned downstream from said first and second light emitters and said first and second light detectors for grading and sorting inspected pantyhose into one of at least three predetermined quality groups, said grading and sorting means including means positioned adjacent to said pair of boarding members for removing and receiving a completed pantyhose mounted thereon.

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**5,497,236**

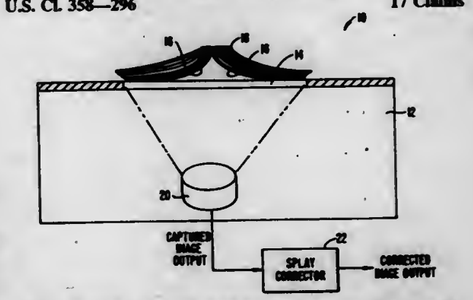
**METHOD AND APPARATUS FOR DISTORTION CORRECTION OF SCANNED IMAGES**

**Gregory J. Wolff, Fremont, and David G. Stork, Stanford, both of Calif., assignors to Ricoh Company Ltd., Tokyo, Japan, and Ricoh Corporation, Mountain View, Calif.**

**Filed Jun. 23, 1993, Ser. No. 82,118**

**Int. Cl.[6] H04N *1/387;1/00;1/04***

**U.S. Cl. 358—296** **17 Claims**




1. A distortion correction apparatus for correcting distortion in a distorted image of a page caused by the page not being fully aligned with an image capture surface at the time the distorted image is captured, comprising:

input means, for accepting the distorted image and formatting the distorted image into a form processable by the distortion correction apparatus;

a line locator coupled to said input means, for identifying paths of each of a plurality of lines within the distorted image;

a coefficient generator coupled to said line locator, for generating, from said paths, coefficient values representative of distortion of said plurality of lines;

a transform means coupled to said coefficient generator and said input means, for transforming the distorted image into a corrected image according to a transformation dictated by a predetermined relation among said coefficient values; and

output means coupled to said transform means, for outputting said corrected image, wherein said corrected image comprises an image of the page with less spatial distortion than the spatial distortion in the distorted image.

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**5,497,237**

**METHOD OF CONVERTING A FIELD OF A REGENERATIVE SIGNAL A VTR AND APPARATUS EMPLOYING THE SAME**

**Kyoichi Hosokawa; Hitoaki Owashi; Kazuhiko Yoshizawa; Miyoko Yoshikoshi, all of Yokohama; Toshiaki Takahashi, Katsuta; Yasuo Inagaki, Katsuta, and Koutaro Okiguchi, Katsuta, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Oct. 29, 1992, Ser. No. 968,579**

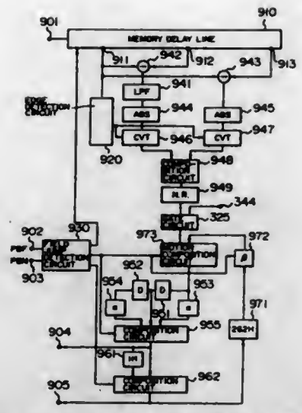
**Claims priority, application Japan, Jan. 29, 1991, 3-308230; Nov. 8, 1991, 3-293276; Nov. 13, 1991, 3-297020**

**Int. Cl.[6] H04N *9/79***

**U.S. Cl. 358—310** **6 Claims**

1. A method of converting a field of a regenerative signal in a VTR, comprising the steps of:

delaying video signals which have been inputted in sequence to produce a plurality of delayed video signals which are delayed by about integral multiples of one field;



outputting a motion signal for representing a degree of the motion by

obtaining motion among n frames (n: positive integral number) on the basis of video signals of a first field which are being inputted at present and said delayed video signals which are prior to said first field by the n frames,

storing data relating to said motion in a motion memory of one field,

outputting said data relating to said motion stored in said motion memory as said motion signal of said video signals of said first field when said video signals of said first field are obtained by repetition of a field just before said first field, and

when said video signals of said first field are not obtained by the repetition of the field just before said first field, performing a filtering processing in a time direction by multiplying said data relating to said motion stored in said motion memory by predetermined coefficients and performing a feed back processing on said multiplied data, composing said data after said filtering processing and said data relating to said motion stored in said motion memory at a predetermined ratio, and outputting said composed data as said motion signal of said video signals of said first field;

separating a video signal of said first field into a luminance signal and a carrier chrominance signal;

separating a video signal of a second field which is to be interlaced with said first field into a luminance signal and a carrier chrominance signal;

performing an inter-field signal processing to form field data of a predetermined field number by using said luminance signals and said carrier chrominance signals of said first and second fields, wherein when said video signals which have been inputted in a normal direction are processed, a phase of said carrier chrominance signal of said second field is inverted, and when said video signals which have been inputted in a reverse direction are processed, the phase of said carrier chrominance signal of said second field is not inverted;

performing an inter-line signal processing to form field data of a predetermined field number by using said luminance signal and said carrier chrominance signal of said first field; and

outputting field data, wherein when said motion signal represents a still part, said outputted field data is produced by outputting said field data obtained by said inter-field signal processing, when said motion signal represents a moving part, said outputted field data is produced by outputting said field data obtained by said inter-line signal processing, and when an abnormal state of said inputted video signals is detected, said outputted field data is produced by outputting said field data obtained by said inter-line signal processing is outputted at least until said abnormal state is no longer detected and video signals required to perform the inter-field signal processing have been inputted, wherein said abnormal state includes any state which does not occur during any normal playback mode.

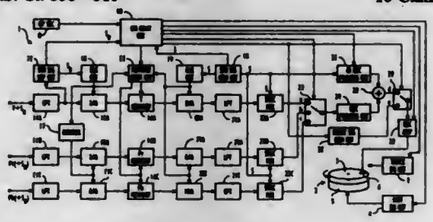
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**5,497,238**

## CONTROLLING ERASING OF TRACKS OF A RECORDING MEDIUM USED WITH A STILL VIDEO APPARATUS

**Koichi Sato, and Harumi Aoki, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 160,157, Dec. 2, 1993, abandoned.**
**This application May 11, 1995, Ser. No. 439,443**
**Claims priority, application Japan, Dec. 3, 1992, 4-350908; Dec. 3, 1992, 4-350909**
**Int. Cl.[6] H04N 5/76**
**U.S. Cl. 358—310** **10 Claims**



1. A still video apparatus, comprising:

means for recording image signals corresponding to one picture composed of at least one field on a plurality of tracks formed on a recording medium and successively arranged thereon, said image signals being recorded with serial identification data associated with said image signals;

means for selecting at least one track group that includes tracks from said plurality of tracks, based upon said serial identification data;

means for determining whether said tracks of said at least one track group selected by said selecting means includes an incomplete track, based upon said serial identification data;

means for designating a track having an image signal to be erased from said plurality of tracks;

means for erasing said image signal recorded on said track designated by said designating means by a one track erasure; and

controlling means for enabling said one track erasure of said designated track by said erasing means, when said determining means determines that said tracks of said selected at least one track group includes an incomplete track, and for disallowing said one track erasure of said designated track in said selected at least one track group by said erasing means, when said determining means determines that all tracks of said track group do not include any incomplete track therein.

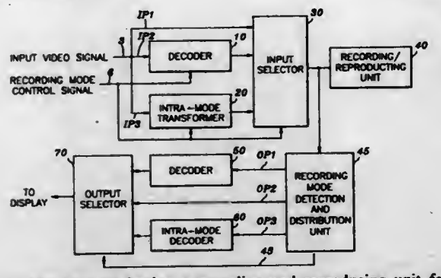


**5,497,239**

## DIGITAL VIDEO SIGNAL RECORDING/REPRODUCING APPARATUS HAVING MULTIPLE RECORDING AND REPRODUCING PATHS

**Oh-Sang Kwon, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea**

**Filed Jun. 3, 1994, Ser. No. 253,479**
**Claims priority, application Rep. of Korea, Jun. 4, 1993, 1993/10123**
**Int. Cl.[6] H04N 5/76**
**U.S. Cl. 358—335** **2 Claims**



1. An apparatus having a recording and reproducing unit for recording and reproducing an encoded digital video signal received from a transmitter, which comprises:

a first means for passing the encoded video signal for the direct recording thereof in a first recording mode;

a second means for processing the encoded video signal to produce a decoded video signal for the recording thereof in a second recording mode;

a third means for processing the encoded video signal to produce an intra-mode compressed video signal for the recording thereof in a third recording mode;

means for generating a first, a second and a third recording mode control signals representing the first, the second and the third recording modes, respectively;

an input selector for selecting one of the video signals from the first, the second and the third means in accordance with the first, the second or the third recording mode control signal and providing the selected video signal and its associated recording mode to the recording and reproducing unit for the recording and reproducing thereof;

a recording mode detection and distribution unit, when the video signal is reproduced by the recording and reproducing unit, for detecting the recording mode of the reproduced video signal and distributing the reproduced video signal in accordance with the detected recording mode;

a fourth means for processing the reproduced video signal distributed thereto for the reproduction thereof, wherein the reproduced video signal is the encoded video signal directly recorded in the first recording mode;

a fifth means for passing the reproduced video signal distributed thereto for the reproduction thereof, wherein the reproduced video signal is the decoded video signal recorded in the second recording mode; and

a sixth means for processing the reproduced video signal distributed thereto for the reproduction thereof, wherein the reproduced video signal is the intra-mode compressed video signal recorded in the third recording mode, wherein the third means includes:

an intra-mode transformer for transforming the encoded video signal to the intra-mode compressed video signal, said intra mode transformer containing:

a decoder for decoding the encoded video signal to produce a decoded video signal; and

an encoder block for encoding the decoded video signal using an intraframe correlation to produce the intra-mode compressed video signal, said encoder block having a discrete cosine transform coder for transforming the decoded video signal into a set of intra-mode transform coefficients, an intra-mode quantizer for quantizing the set of intra-mode transform coefficients using a quantization step size to produce an intra-mode quantization signal, and a variable length coder for coding the intra-mode quantization signal to produce the intra-mode compressed video signal.

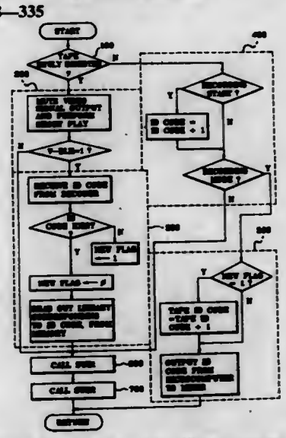
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**5,497,240**

## VIDEO LIBRARY SYSTEM AND A METHOD THEREFOR

**Jae C. Yoo, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki, Rep. of Korea**

**Division of Ser. No. 99,547, Jul. 30, 1993, Pat. No. 5,450,210.**
**This application Aug. 12, 1994, Ser. No. 289,556**
**Claims priority, application Japan, Jul. 31, 1992, 4-13756**
**Int. Cl.[6] H04N 5/782**
**U.S. Cl. 358—335** **6 Claims**



1. A method for operating a video library system for recording and reproducing index information during corresponding recording and play modes of operation, said index information including a tape index code and an index code stored in a vertical blanking period of a video signal, and selecting a desired portion of said video signal for playback using a library accessible from a memory via a microcomputer and corresponding to said index information, said method comprising the steps of:

(a) detecting said vertical blanking period from said video signal when a video tape is newly inserted;

(b) checking for existence of said index code in a vertical blanking signal of said vertical blanking period when said vertical blanking period is detected;

(c) reading out said library corresponding to said index code from said memory using said microcomputer;

(d) checking for a start of recording when said video tape is not newly inserted;

(e) determining whether or not said system is in a recording mode of operation after increasing said index code when said start of recording is confirmed;

(f) checking for an indication of insertion of a new video tape when said recording mode is selected;

(g) generating said index code permitting display on a screen after increasing said tape index code when said video tape is the new video tape;

(h) displaying said library on said screen after performance of said steps (a), (c) and (e), thereby providing an on-screen display; and

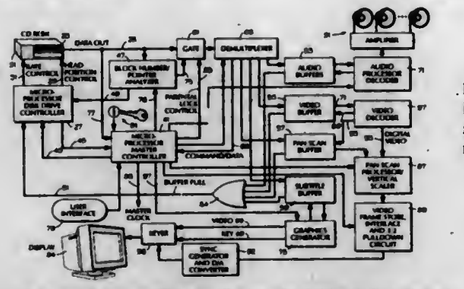
(i) searching for the desired portion of said video signal corresponding to the received index code, after confirming a content of said library displayed on said screen.

5,497,241

## SYSTEM AND METHOD FOR CONTROLLING DISPLAY OF MOTION PICTURE SUBTITLES IN A SELECTED LANGUAGE DURING PLAY OF A SOFTWARE CARRIER

Lewis S. Ostrover; Christopher J. Cookson, and Warren N. Lieberfarb, all of Los Angeles, Calif., assignors to Time Warner Entertainment Co., L.P., Burbank, Calif.

Filed Oct. 29, 1993, Ser. No. 144,793
Int. Cl.[6] H04N 5/781;5/76
U.S. Cl. 358—341 8 Claims



1. A system for controlling the display of subtitles during play of a software carrier, said software carrier having recorded thereon

i) an image program,

ii) at least one audio track synchronized with said image program,

iii) a plurality of subtitle tracks, each containing data representative of subtitles in a respective language, and

iv) a set of codes for indicating the available subtitle languages, comprising:

(a) means for playing said software carrier and deriving therefrom said subtitle codes, said subtitle data, an image signal, and an audio signal,

(b) means for selecting a subtitle language for display, and

(c) means responsive to said subtitle codes and said selected language for processing the subtitle data representative of subtitles in the selected language and controlling display of such subtitles synchronized with said image signal and said audio signal,

and wherein said image program, at least one audio track and said plurality of subtitle tracks are all recorded together in separately identifiable blocks on said software carrier, with multiple different types of data being recordable in any individual carrier block and, with each carrier block having variable-length sections for its different types of data and containing indicia of which subtitle tracks in the block contain subtitle data; and said processing means operates on only the subtitle track in any block that contains data representative of subtitles in the selected language.

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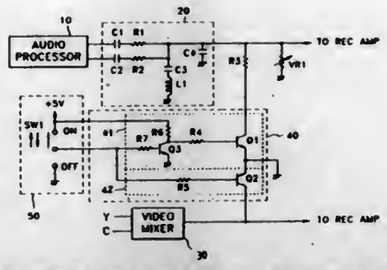
5,497,242

## WRITE CURRENT CONTROL CIRCUIT FOR AUDIO RECORDING

Tae-sun Jun, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Continuation-in-part of Ser. No. 902,377, Jun. 23, 1992, abandoned. This application Dec. 10, 1993, Ser. No. 164,574
Claims priority, application Rep. of Korea, Jul. 11, 1991, 91-10624
Int. Cl.[6] H04N 5/782
U.S. Cl. 358—341 18 Claims

1. A write control circuit for audio signals in a video recorder having an audio signal processor for signal processing a received audio signal in order to record the received audio signal and a video signal processor for signal processing a received video signal in order to record the received video signal, said circuit having a normal recording mode in which both the received audio and video signals are simultaneously recorded on a recording medium and the level of the received audio signal is limited to a predetermined



level for recording on the recording medium to prevent mutual interference between the audio and video signals, and an exclusive audio recording mode in which only the received audio signal is recorded on the recording medium, said circuit comprising:

mode setting means for setting one of the normal recording mode and the exclusive audio recording mode under control of a user; and

a bias control circuit for adjusting the level of the received audio signal output from said audio signal processor in response to the normal recording mode setting so that the level of the received audio signal is no larger than the predetermined level, and for allowing the received audio signal to reach an optimum level which is greater than the predetermined level in response to the exclusive audio recording mode setting.

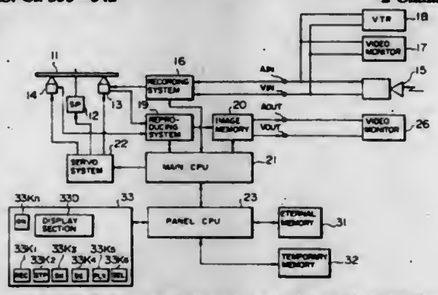
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5,497,243

## VIDEO DISK RECORDER HAVING A REAL-TIME EDITING FUNCTION

Haruyasu Sakata; Nobuo Haino, and Yoshihiro Utsumi, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jan. 28, 1994, Ser. No. 187,480
Claims priority, application Japan, Feb. 1, 1993, 5-015001
Int. Cl.[6] H04N 5/781; G11B 5/596;7/00;15/18
U.S. Cl. 358—342 2 Claims



1. A video disk recorder having a real-time editing function, comprising:

recording means including moving means for moving a recording head in a radial direction of a re-recordable disk, for recording a video signal to said disk by said recording head;

reading means for reading an address on said disk of said recording head; and

control means for performing operations of: setting, in response to a generation of a recording command signal, the recording head to a recording mode and storing said address as a determinate disk address; canceling, in response to a generation of a stop command signal, said recording mode and storing the address as a temporary disk address; in a case where a skip command signal is generated during the recording mode, moving the recording head to said determinate disk address stored at the time of a start of the recording mode; and in cases where the skip command signal is generated in modes



other than the recording mode, moving the recording head to said temporary disk address.

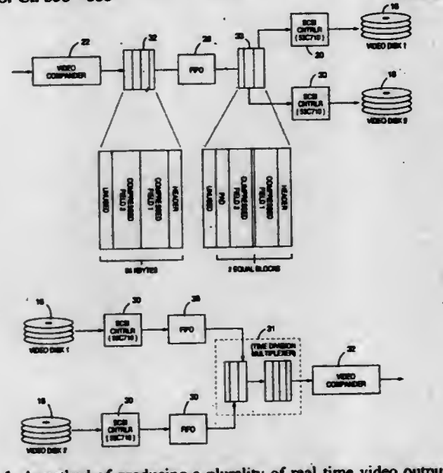
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5,497,244

## METHOD FOR STORAGE AND RETRIEVAL OF VIDEO FROM DISKS

James E. Chargin, Jr., Auburn; Charles Q. Hoard; Dallas B. Wivholm, both of Grass Valley; Keith A. Merson, Auburn, and Shawn V. A. Carnahan, Nevada City, all of Calif., assignors to Scitex Digital Video, Inc., Grass Valley, Calif.

Continuation of Ser. No. 11,274, Jan. 29, 1993, abandoned. This application May 23, 1994, Ser. No. 247,500
Int. Cl.[6] H04N 5/76
U.S. Cl. 358—335 9 Claims



1. A method of producing a plurality of real time video output signals from input video materials which contain frames of video data at a frame rate, said method comprising:

(a) compressing frames of an input video signal having the frame rate to generate a compressed input video signal, where the compressed input video signal comprises fewer bytes than the input video signal and has said frame rate,

(b) dividing the compressed input video signal into a plurality of independent segments by dividing each frame of said compressed input video signal into a predetermined number of segments,

(c) forming a plurality of series of frame segments with each series in said plurality including like segments of different frames,

(d) storing the separate series of segments as separately accessible records,

(e) retrieving a first group of the records,

(f) recombining the retrieved segments of the first group of the records to produce a first output signal containing a first segment of each of the frames of said compressed input video signal and having said frame rate,

(g) retrieving a second group of the records concurrently with retrieval of the first group,

(h) recombining the retrieved segments of the second group of the records to produce a second output signal concurrent with the first output signal, containing a second segment of each of the frames of said compressed input video signal, and having said frame rate, and

(i) time division multiplexing the first output signal with the second output signal to generate a final output video signal capable of being displayed on a single display screen.

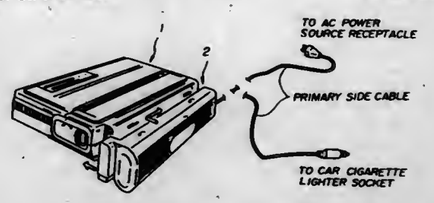
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5,497,245

## FACSIMILE MACHINE INCLUDING A POWER SOURCE ADAPTOR USED THEREIN

Shirou Uchida, Isehara, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jul. 20, 1993, Ser. No. 93,690
Claims priority, application Japan, Jul. 21, 1992, 4-193590
Int. Cl.[6] H04N 1/00
U.S. Cl. 358—406 13 Claims




1. A portable facsimile machine used with various power sources including an AC power source, a car battery power source and a rechargeable battery power source, the portable facsimile machine comprising:

a main body performing a facsimile function and having first mechanical engaging means and first electrical contacting means for electrical power supply; and

a plurality of power source adaptors provided separately from said main body and respectively corresponding to one of the various power sources, each power source adaptor having second mechanical engaging means and second electrical contacting means for making contact with said first electrical contacting means so as to supply an electric power to said main body, said second mechanical engaging means and said second contacting means being provided in the same arrangement on each power source adaptor,

wherein said first electrical contacting means automatically makes contact with said second electrical contacting means when one of said power source adaptors is attached to said main body by engaging said second mechanical engaging means with said first mechanical engaging means of said main body.

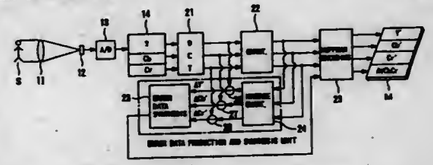
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5,497,246

## IMAGE SIGNAL PROCESSING DEVICE

Nobuaki Abe, Sapporo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 15, 1994, Ser. No. 275,357
Claims priority, application Japan, Jul. 15, 1993, 5-197994; May 12, 1994, 6-123093
Int. Cl.[6] H04N 1/41;11/02; G06T 9/00
U.S. Cl. 358—426 14 Claims



1. An image signal processing device, comprising:

orthogonal transformation means for applying an orthogonal transformation to original image data comprising at least one image component to obtain orthogonal transformation coefficients corresponding to predetermined spatial frequencies for each image component, said original image data comprising a first, a second, and a third image component;

quantization means for quantizing said orthogonal transformation coefficients, comprising quantization tables including quantization coefficients to obtain quantized orthogonal transformation coefficients;

first inverse quantization means for inversely quantizing said quantized orthogonal transformation coefficients to obtain restored orthogonal transformation coefficients;

error data producing means for obtaining quantized error data of a difference between said restored orthogonal transformation coefficients and said orthogonal transformation coefficients for each image component;

encoding means for encoding said quantized error component and said quantized orthogonal transformation coefficients to form a compressed image data;

error data synthesizing means for arranging said quantized error data into unit data of a fixed length for each same spatial frequency of components so as to synthesize a fourth component, said encoding means encodes said fourth component and said quantized orthogonal transformation coefficients to form compressed image data; and

recording means for recording said compressed image data to a recording medium.

14. An image signal processing device according to claim 12, further comprising:

decoding means for reading out the compressed image data from the recording medium and decoding quantized orthogonal transformation coefficients and an error component from the compressed image data;

second inverse quantization means for inversely quantizing said quantized orthogonal transformation coefficients to reproduce orthogonal transformation coefficients;

error data separating means for separating error data of components comprising the compressed image data from said error component;

adding means for adding said error data to said orthogonal transformation coefficients; and

inverse orthogonal transformation means for performing an inverse orthogonal transform on said orthogonal transformation coefficients outputted from said adding means to reproduce image data.

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**5,497,247**

## FACSIMILE APPARATUS CAPABLE OF OUTPUTTING A PLURALITY OF COPIES OF RECEIVED INFORMATION AND HANDLING THE OCCURRENCE OF ERRORS THEREIN

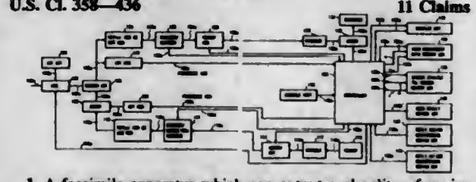
**Takehiro Yoshida, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Apr. 28, 1994, Ser. No. 233,419**

**Claims priority, application Japan, Apr. 30, 1993, 5-127940; Apr. 30, 1993, 5-127941**

**Int. Cl.[6] H04N *1/21;1/327***

**U.S. Cl. 358—436** **11 Claims**



1. A facsimile apparatus which can output a plurality of copies of image data received in one communication, said facsimile apparatus comprising:

reception means for receiving image data;

image data memory means for storing received image data;

recording means for recording the received image data;

instruction means for outputting an instruction regarding a plurality-of-copies mode for the image data received in one communication; and

control means for controlling said recording means in accordance with the output of said instruction means,

wherein when said instruction means does not instruct the plurality-of-copies mode, said control means causes said recording means to record the received image data, and wherein when said instruction means instructs the plurality-of-copies mode, said control means causes the received image data to be stored into said image data memory means, and causes said recording means to record the stored image data so as to output a plurality of copies after received image data having no error page in one communication is obtained.

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**5,497,248**

## METHOD AND APPARATUS FOR VIEWING SCREENED IMAGES

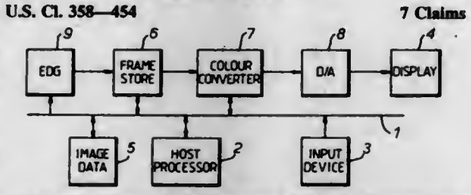
**Richard A. Kirk, and Malcolm D. M. Roe, both of Hertfordshire, England, assignors to Crosfield Electronics Limited, Hertfordshire, England**

**Filed Sep. 23, 1992, Ser. No. 949,150**

**Claims priority, application United Kingdom, Jan. 18, 1991, 9122154**

**Int. Cl.[6] G03F *1/00***

**U.S. Cl. 358—454** **7 Claims**




1. A method of viewing on a monitor the effect of outputting on an output device, screened colour separations which overlie each other to generate a coloured image, each of said screened colour separations being represented by digital data defining a respective colour component content of pixels of the image, the method comprising

a) selecting a part of said coloured image;

b) generating from said digital data, data simulating half-tone dots representing a portion of each of said screened colour separations corresponding to said selected coloured image part as it would appear after screening by said output device, said half-tone dots being defined by sets of half-tone dot pixels; and,

c) combining data defining said colour separation portions to generate combined data simulating the effect of overlying said colour separation portions; and controlling a monitor in response to said combined data to display a simulation of said selected coloured image part on said monitor.

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**5,497,249**

## IMAGE DATA PROCESSING APPARATUS WITH SELECTIVE PROCESSING FILTERS

**Taeko Koizumi, and Michiko Kawano, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Filed May 31, 1994, Ser. No. 252,010**

**Claims priority, application Japan, Aug. 18, 1993, 5-204138**

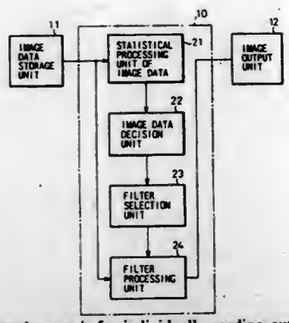
**Int. Cl.[6] H04N *1/407***

**U.S. Cl. 358—462** **8 Claims**

1. An image data processing apparatus which applies processing to original image data input from an image data storage unit and then supplies the processed image data to an image output unit, wherein said original image data is comprised of data L* representing saturation and data a*b* representing hue and brightness, expressed under a uniform color space, said image data processing apparatus comprising:

an image data statistical processing unit which receives only the data a*b* of the original image data from the image data storage unit and extracts and performs statistical processing on the picture element distribution in the picture expressed by the original image data, said image data statistical processing unit further comprising:






a line read-out unit for individually reading out the data a* and b* of the picture elements for each line in a picture comprised of a plurality of lines,

a level difference calculation unit for calculating the corresponding level differences of the data a* and b* between adjoining picture elements from the output of the line read-out unit, and

a level difference cumulative calculation unit for extracting the calculated level differences which exceed a certain threshold and cumulatively adding the extracted, calculated level differences for each picture, thereby to calculate and output a cumulative value;

an image data decision unit which decides, based on the results of the statistical processing by the image data statistical processing unit, whether, the picture belongs to a first kind of picture suited for sharpening processing or a second kind of picture suited for smoothing processing;

a filter selection unit which selects a first type of filter when it is judged, based on the results of the decision by the image data decision unit, that the picture belongs to the first kind and selects a second type of filter, of a filter size larger than the first type, when it is judged that the picture belongs to the second kind; and

a filter processing unit which uses the selected one of the first type of filter and the second type of filter, as selected by the filter selection unit, to apply filter processing on the original image data from the image data storage unit and supplies the resultant image data to the image output unit.

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**5,497,250**

## DOCUMENT SCANNING APPARATUS HAVING A STAMP AND METHOD FOR CONTROLLING THE STAMPING POSITION

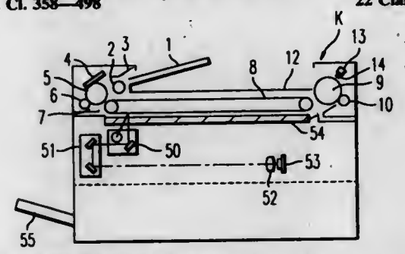
**Yasuhiro Kawashima, Atsugi, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan**

**Filed Aug. 12, 1994, Ser. No. 289,550**

**Claims priority, application Japan, Aug. 12, 1993, 5-200810**

**Int. Cl.[6] H04N *1/21;1/23;1/04***

**U.S. Cl. 358—498** **22 Claims**




1. A document scanning apparatus, comprising:

an automatic document feeder having a pick-up section including a first document reversal section which reverses an orientation of a sheet picked up from said pick-up section from facing upwardly to facing downwardly, and a document eject section including a second document reversal section which reverses an orientation of the sheet from facing downwardly to facing upwardly;

a sensor in said pick-up section for detecting a length of a document to be scanned;

a scanning mechanism disposed at a region under the automatic document feeder between the pick-up section and the document eject section;

a stamp located in said document eject section for stamping a scanned document; and

a controller for controlling a stamping position on said scanned document using said detected length of said document.

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**5,497,251**

## COMBINATION SPECULAR AND DIFFUSE IMAGE CHMSL

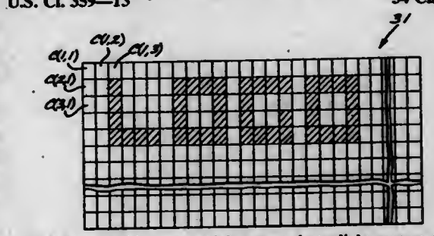
**John E. Wreede, Azusa; Michael J. Virgadamo, Pasadena; Richard B. Upper, Sherman Oaks, and Ronald T. Smith, Torrance, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.**

**Filed Nov. 22, 1993, Ser. No. 155,318**

**The portion of the term of this patent subsequent to Nov. 15, 2013, has been disclaimed.**

**Int. Cl.[6] G02B *5/32;* G03H *1/30***

**U.S. Cl. 359—13** **34 Claims**




1. A holographic center high mounted stoplight system for a vehicle, comprising:

a light source for providing a reconstruction beam;

a first array of non-overlapping bright transmission bologram cells and dim transmission hologram cells, each transmission hologram cell producing a specular image viewable in a first predetermined angular field that extends rearwardly relative to the vehicle pursuant to diffraction of a portion of said reconstruction beam, said first array of cells arranged in a first predetermined pattern so as to produce a pattern of bright and dim areas; and

a second array of non-overlapping bright transmission hologram cells and dim transmission hologram cells, each transmission hologram cell producing diffuse image viewable in a second predetermined angular field that extends rearwardly relative to the vehicle pursuant to diffraction of a portion of said reconstruction beam, said second array of cells arranged in a second predetermined pattern so as to produce a pattern of bright and dim areas;

whereby said specular and diffuse images produced by said first and second holograms form stoplight illumination.

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**5,497,252**

## INTERNAL DRUM PLOTTER WITH MULTIPLE FOCAL POINT HOLOGRAPHIC OPTICAL ELEMENT

**Ilan Ben-David, Petach Tikva, Israel, assignor to Scitex Corporation Ltd., Herzlia, Israel**

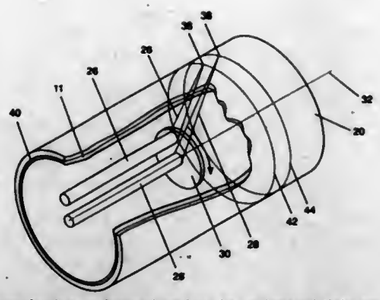
**Filed Aug. 17, 1993, Ser. No. 107,970**

**Claims priority, application Israel, Aug. 30, 1992, 102996**

**Int. Cl.[6] G02B *5/32;26/10;26/18;* G06K *7/10***

**U.S. Cl. 359—17** **11 Claims**

1. An internal drum plotter comprising:



a drum having an internal surface for an internal light sensitive medium;

at least one light source for providing a plurality of modulated light beams;

a multiple focal point optical element having a plurality of focal points one for each light beam, said multiple focal point optical element being positioned within said drum for focussing said plurality of light beams each onto its corresponding one of said plurality of facal points located on said light sensitive medium; and

a motion assembly which moves said multiple faocal point optical element, thereby to affect simultaneous plotting of said plurality of modulated light beams in respective discrete lines on said light sensitive medium axially spaced from one another.

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**5,497,253**

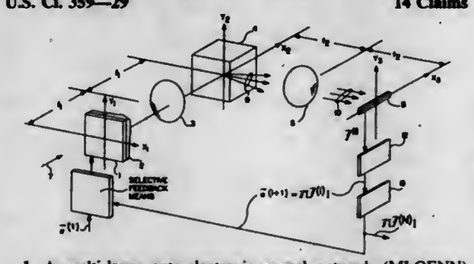
**MULTI-LAYER OPTO-ELECTRONIC NEURAL NETWORK**

**Harold M. Stoll, Rancho Palos Verdes, and James J. Reis, Mountain View, both of Calif., assignors to Northrop Grumman Corporation, Los Angeles, Calif.**

**Continuation-in-part of Ser. No. 811,589, Dec. 20, 1991, Pat. No. 5,235,439, which is a continuation-in-part of Ser. No. 562,294, Aug. 3, 1990, Pat. No. 5,099,434, which is a continuation-in-part of Ser. No. 220,769, Jul. 18, 1988, abandoned. This application Jul. 30, 1993, Ser. No. 99,882**

**Int. Cl.[6] G03H *1/16*; G02B *27/46***

**U.S. Cl. 359—29** **14 Claims**



1. A multi-layer opto-electronic neural network (MLOENN) pattern classification apparatus, comprising:

a volume holographic medium having a plurality of Fourier-space volume holograms representing neural network weight vectors stored within;

means, having an output optically coupled to said medium by a first Fourier transform lens means, for spatially modulating a spatially uniform laser beam in accordance with an unknown pattern;

means, having an input optically coupled by a second Fourier transform lens means to an angular spectrum of plane waves generated by said medium in response to the output of said spatial modulating means, for detecting plane waves that correspond to vector inner products generated within said medium in response to the unknown pattern;

means by which the output of said detecting means are nonlinearly processed in a serial manner;

means by which said nonlinearly processed output is temporarily stored; and

means by which the output of said temporary storage means may be selectively read out and selectively fed back into said spatial modulating means for further processing by the MLOENN as input signals to a next layer of the MLOENN.

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**5,497,254**

**OPTICAL APPARATUS INCLUDING A LIQUID CRYSTAL MODULATOR**

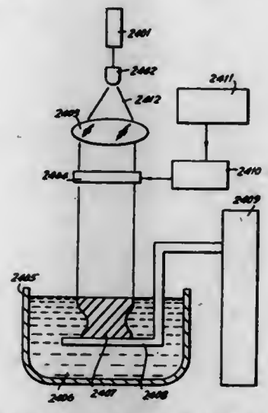
**Jun Amako; Hirotsuna Miura; Tomio Sonehara, and Yoshio Watanabe, all of Suwa, Japan, assignors to Seiko Epson Corporation, Japan**

**Continuation of Ser. No. 682,167, Apr. 5, 1991, abandoned. This application Dec. 20, 1994, Ser. No. 359,713**

**Claims priority, application Japan, Apr. 5, 1990, 2-90729; Aug. 27, 1990, 2-224826; Sep. 21, 1990, 2-252266; Jan. 23, 1990, 2-285242; Jan. 29, 1990, 2-291247; Nov. 14, 1990, 2-307836; Nov. 16, 1990, 2-310466; Jan. 25, 1991, 3-007612; Feb. 22, 1991, 3-028432; Feb. 22, 1991, 3-028435**

**Int. Cl.[6] G02F *1/133*; *1/08*; *1/10*; G03H *1/02***

**U.S. Cl. 359—53** **12 Claims**



1. An optical apparatus for controlling the wave front of a coherent light by using phase distributions recorded in a spatial light modulator, comprising:

at least one electrically addressed liquid crystal spatial light modulator, said liquid crystal spatial light modulator including a liquid crystal panel having a liquid crystal layer sandwiched between a pair of substrates, a plurality of discrete electrodes formed on at least one of said substrates, active elements connected to the respective electrodes, said electrodes and active elements defining an array of pixels and at least one director for orienting the molecules of said liquid crystal layer so that the liquid crystal molecules are oriented uniformly parallel to the panel substrates at the initial stage of operation;

means for driving said liquid crystal spatial light modulator;

means for polarizing the coherent light into a linearly polarized light before application to said at least one liquid crystal spatial light modulator, said polarized light having a direction parallel to a plane defined by a line normal to said substrates and by said director of the liquid crystal molecules.



**5,497,255**

**SPACIAL LIGHT MODULATION DEVICE INCLUDING A PIXEL ELECTODE LAYER AND A METHOD FOR MANUFACTURING THE SAME**

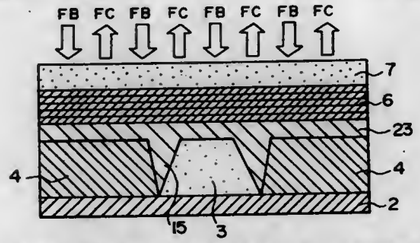
**Tetsuhiro Yamazaki; Hiromitsu Takenaka, both of Yokohama, and Yuichi Kuromizu, Yokosuka, all of, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan**

**Filed Oct. 28, 1994, Ser. No. 330,589**

**Claims priority, application Japan, Jan. 30, 1993, 5-294774; Nov. 30, 1993, 5-326133**

**Int. Cl.[6] G02F *1/135*; *1/1335***

**U.S. Cl. 359—72** **15 Claims**




1. A spacial light modulation device in which a photoconductive layer, a pixel electrode layer, a dielectric reflection layer, and a liquid crystal layer are laminated in sequence between first and second drive electrode layers, wherein the pixel electrode layer includes a plurality of pixel electrodes partitioned by an insulating substance layer and arranged at predetermined intervals; and a surface area of each of the pixel electrodes formed on the photoconductive layer side is smaller than that formed on the dielectric reflection layer side.

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**5,497,256**

**NORMALLY BLACK MODE LIQUID CRYSTAL DISPLAY APPARATUS HAVING LIQUID CRYSTAL CELL OF THE FIRST MINIMUM DESIGN**

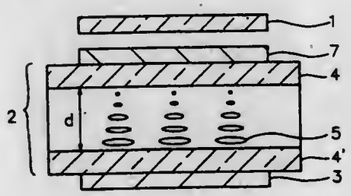
**Kaori Aoyama, Tenri, and Toshiyuki Yoshimizu, Kyoto, both of, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Sep. 14, 1994, Ser. No. 305,644**

**Claims priority, application Japan, Sep. 14, 1993, 5-229134**

**Int. Cl.[6] G02F *1/1335***

**U.S. Cl. 359—73** **15 Claims**




1. A liquid crystal display which operates in a normally black mode, comprising:

a liquid crystal cell including a pair of substrates and a liquid crystal filled between the substrates, the liquid crystal cell being of a first minimum design; and

a phase plate located adjacent to one of the substrates of the liquid crystal cell and having a retardation value of 400 to 500 nm, the wavelength dependency of the retardation value of the phase plate being substantially uniform, thereby improving display quality in the normally black mode.

**5,497,257**

**FERROELECTRIC LIQUID CRYSTAL DEVICE**

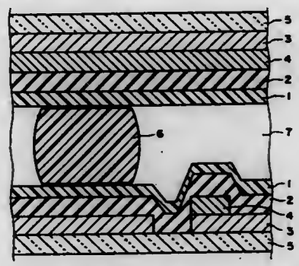
**Yoshio Hotta; Yukio Hanyu, both of Atsugi; Tadashi Mihara, Isehara; Yasuto Kodera, Fujisawa, and Katsutoshi Nakamura, Atsugi, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 150,984, Nov. 12, 1993, abandoned, which is a division of Ser. No. 8,543, Jan. 25, 1993, Pat. No. 5,285,304. This application Jun. 7, 1995, Ser. No. 483,156**

**Claims priority, application Japan, Jan. 24, 1992, 4-032865; Jan. 27, 1992, 4-034029**

**Int. Cl.[6] G02F *1/1339*; *1/13***

**U.S. Cl. 359—81** **8 Claims**



1. A ferroelectric liquid crystal device, comprising: a pair of substrates each having thereon a group of electrodes for driving a liquid crystal, and a ferroelectric liquid crystal layer disposed between the substrates, said ferroelectric liquid crystal being in a uniform alignment state satisfying a relationship of Ⓗ> θa> /2, wherein Ⓗ denotes a half of cone angle and θa denotes an apparent tilt angle of the ferroelectric liquid crystal, said liquid crystal device further comprising thermosetting adhesive particles and resilient thermoplastic polymer particles dispersed between the substrates in densities sufficient to suppress movement of the ferroelectric liquid crystal along the surfaces of the substrates, said thermoplastic polymer particles having a columnar shape; wherein

molecules of the ferroelectric liquid crystal are aligned inclined to the surfaces of both substrates, and

the ferroelectric liquid crystal comprises a plurality of molecular layers each composed of plural molecules in which both the liquid crystal molecules and the molecular layers are aligned inclined to the surfaces of both substrates.

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**5,497,258**

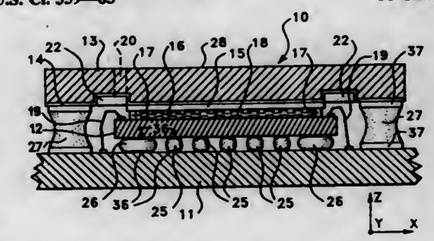
**SPATIAL LIGHT MODULATOR INCLUDING A VLSI CHIP AND USING SOLDER FOR HORIZONTAL AND VERTICAL COMPONENT POSITIONING**

**Teh-Hua Ju; Yung-Cheng Lee, and Wei Lin, all of Boulder, Colo., assignors to The Regents of the University of Colorado, Boulder, Colo.**

**Filed May 27, 1994, Ser. No. 250,182**

**Int. Cl.[6] G02F *1/1333*; *1/1343***

**U.S. Cl. 359—83** **38 Claims**




1. A liquid crystal spatial light modulator, comprising;

a substrate member having a generally flat upper surface,

a semiconductor chip having at least one liquid crystal modulating circuit thereon, said semiconductor chip having a generally flat upper surface and a generally flat lower surface that is spaced from said upper surface of said substrate member,

means mounting said semiconductor chip on said upper surface of said substrate member, in spaced relation to said upper surface of said substrate member, and with said lower surface of said semiconductor chip spaced above said upper surface of said substrate member,

a cover glass having a generally flat lower surface,

liquid crystal cavity spacer means,

a plurality of solder joints mounting said cover glass on upper surface of said substrate member with said liquid crystal spacer means confined between said lower surface of said cover glass and said upper surface of said semiconductor chip, to thereby define a liquid crystal cavity between said upper surface of said semiconductor chip and said lower surface of said cover glass, and a liquid crystal layer in said liquid crystal cavity,

each of said plurality of solder joints being of generally the same volume, said volume being selected to ensure solder joint shrinkage upon cooling of said solder joints.

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**5,497,259**

**LOCAL AREA NETWORK WITH OPTICAL TRANSMISSION**

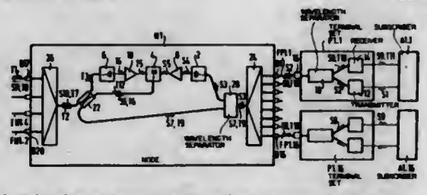
**Jean-Jacqoes Bernard, Vert le Grand; Fabrice Pitel, Etrechy, and Patrice Comte, Bezons, all of, France, assignors to Cegelec, Levallois Perret, France**

**Filed Oct. 13, 1994, Ser. No. 322,336**

**Claims priority, application France, Jan. 14, 1993, 93 12225**

**Int. Cl.[6] H04B *10/20*; H04J *14/00***

**U.S. Cl. 359—118** **9 Claims**



1. A local area network with optical transmission including:

a plurality of terminal sets (P1-1 . . . P4-16) for transmitting and receiving optical signals;

a plurality of nodes (N1 . . . N4), connected to respective ones of said terminal sets, for transmitting and receiving said optical signals;

a plurality of primary fibers (FP1-1 . . . FP1-16) optically connecting each of said nodes (N1) to a respective one of said terminal sets (P1-1 . . . P1-1);

a plurality of secondary fibers (FN1-4) optically connecting each of said nodes (N1) to others of said nodes such that each of said nodes is connected at least indirectly to all of the others of said nodes;

each of said nodes (N1) receiving an incoming optical signal (S2, T1), carrying data via one of said primary or said secondary fibers, and responding by transmitting corresponding outgoing optical signals (S8, S11, T8, T10) carrying data to all the respective terminal sets (P1-1 . . . P1-16) and to all of the others of said nodes (N2, N4) connected directly thereto, said node comprising:

a receive transducer (2, 6) for transforming said incoming optical signal into an electrical reception signal (S4, T4);

an amplifier (8, 10) for amplifying said electrical reception signal (S4, T4) and producing an amplified electrical signal (S5, T5); and

a transmit transducer (4) for transforming the amplified electrical signal (S5, T5) into an outgoing transmitted optical signal (T6, S6), each said receive transducer (2, 6, 104) or said transmit transducer (4, 102, 106) being a receive primary transducer (2, 104) or transmit primary transducer (4, 102), respectively, if the optical signal is transmitted via one of said primary fibers, each said receive transducer or said transmit transducer being a receive secondary transducer (6, 104) or transmit secondary transducer (4, 106), respectively, if the signal is transmitted via one of said secondary fibers;

wherein the receive primary transducers (2, 104) and the transmit primary transducers (4, 102) are tuned to two different respective wavelengths;

a single one of said primary fibers (FP1-1) connects each said terminal set (P1-1) to its associated node (N1);

said receive secondary transducers (6, 104) and said transmit secondary transducers (4, 106) are tuned to one of said two different respective wavelengths, said one of said two different respective wavelengths constituting a common wavelength;

a single secondary fiber (FN1-2) interconnects two of said nodes (N1, N2) when said two of said nodes are connected together directly;

said network further including means for preventing interference so that, when a first one of said nodes (N1) transmits an optical signal over a respective one of said secondary fibers (FN1-2, FN1-4), a further optical signal transmitted in response by a second one of said nodes (N2) cannot interfere with the operation of said first one of said nodes.

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**5,497,260**

**METHOD OF APPLYING TIME OFFSET CHROMATIC DISPERSION, DISPERSIVE OPTICAL APPARATUS, AND AN OPTICAL FIBER TRANSMISSION SYSTEM USING THE APPARATUS**

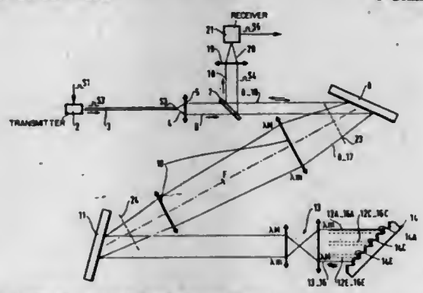
**Marie-Paule Jurek, Noisy le Grand; Jean-Jacques Bernard, Vert le Grand, and José Chesnoy, Paris, all of, France, assignors to Alcatel N.V., Amsterdam, Netherlands**

**Filed Jun. 15, 1994, Ser. No. 260,735**

**Claims priority, application France, Jun. 17, 1993, 93 07316**

**Int. Cl.[6] H04J *14/02***

**U.S. Cl. 359—130** **6 Claims**



1. Dispersive optical apparatus including:

a color-splitting system for receiving a light beam, the light beam constituting a composite beam to be processed and being constituted by light including a plurality of spectrum components modulated by a plurality of unit signals respectively corresponding to the components, the components being superposed in the beam, the system being capable of responding by yielding an incoming split beam propagating in a longitudinal direction of the beam, the split beam being constituted by a plurality of incoming pencils formed by the components and respectively corresponding to the components, the pencils being juxtaposed transversely in the beam, the light of each of the pencils being modulated by said corresponding unit signal;

a stair-shaped mirror having steps constituted by a plurality of reflective areas that are offset from one another in the longitudinal direction, and that respectively correspond to the incoming pencils, one of the areas constituting a reference area, each reflective area being disposed so as to receive and to reflect the corresponding incoming pencil while constraining the light of the pencil to travel along a path having an optical path length and a propagation time that correspond to the area so as to yield an outgoing pencil corresponding to the incoming pencil and to the area, the light of the outgoing pencil being modulated by a unit signal having a delay equal to the propagation time relative to the unit signal which modulated the light of the incoming pencil, a time offset corresponding to the area, to the incoming pencil, and to the outgoing pencil being constituted by the difference between that propagation time and the propagation time corresponding to the reference area, the set of outgoing pencils constituting an outgoing split beam in which the pencils are juxtaposed transversely; and

a color-recombining system for receiving the outgoing split beam and for yielding a processed composite beam in which said components are superposed once more.



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**5,497,261**

**SYNCHRONIZATION APPARATUS FOR AN OPTICAL COMMUNICATIONS NETWORK**

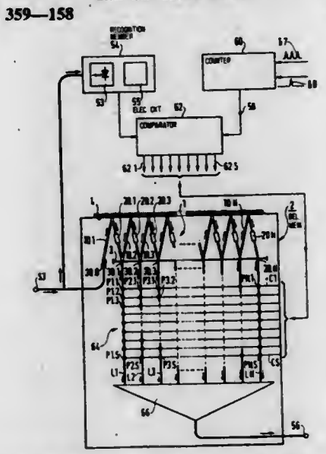
**Francesco Masetti, Paris, France, assignor to Alcatel N.V., Amsterdam, Netherlands**

**Filed Oct. 18, 1994, Ser. No. 324,607**

**Claims priority, application France, Jan. 21, 1993, 93 12571**

**Int. Cl.[6] H04B *10/00***

**U.S. Cl. 359—158** **4 Claims**



1. A synchronization apparatus for an optical communications network, the apparatus comprising:

a comparator receiving, firstly, signals to be synchronized, the signals being received in a optical form, and, secondly, reference instants;

a delay member applying delays to the optical signals to be synchronized, and supplying delayed optical signals via respective outputs; and

a selection member for selecting one of said outputs of said delay member, said comparator controlling the selection member so that the signals supplied by the selected one output are synchronized on the reference instants;

wherein said comparator supplies selection signals in a binary encoded form constituted by a succession of S selection bits that collectively define a value of each signal and that are supplied via respective outputs of the comparator, said selection member being in the form of a matrix having N rows and S columns, each row being constituted by an optical waveguide connecting a respective output of said delay member to the output of said apparatus via a concentrator, each row including, in series, a succession of optical gates, each of which can be opened or closed so that each row is open if all of its gates are open, and each row is closed if at least one of its gates is closed, each of said optical gates being controlled in binary form by receiving a bit and by being adapted to respond to zero bits or to one bits so as to be open only when it receives a zero bit or so as to be open only when it receives a one bit, each column of said matrix being fed via a respective output of said comparator, and feeding, in parallel, a succession of N of said optical gates via one of said selection bits, the succession of N optical gates belonging to respective ones of the N rows, the adaptations of said optical gates showing up a respective correspondence between said rows and the values of said selection signal, each of said rows being the only one to be opened by a selection signal whose value has said correspondence with the row.

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**5,497,262**

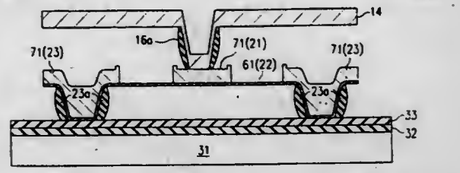
**SUPPORT POSTS FOR MICRO-MECHANICAL DEVICES**

**Toshiyuki Kaeriyama, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.**

**Division of Ser. No. 283,486, Jul. 29, 1994. This application Jun. 7, 1995, Ser. No. 476,961**

**Int. Cl.[6] G02B *26/08***

**U.S. Cl. 359—223** **7 Claims**



1. An improved method of fabricating support posts for a micro-mechanical device, wherein the improvement comprises:

depositing a spacer layer over a substrate;

etching vias into said spacer layer, each via defining the outer surface of a support post;

depositing an oxide layer over said spacer layer and into said vias, such that said oxide layer substantially conformally coats the inside surface of said vias;

etching back said oxide layer to the top surface of said spacer layer, such that a sidewall ring remaining from said oxide layer coats the inside surfaces of each via;

depositing a post metal layer over said spacer layer, such that said post metal layer coats the inside surface of said sidewall rings; and

etching said post metal layer to form said support posts.

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**5,497,263**

**VARIABLE DELAY CIRCUIT AND CLOCK SIGNAL SUPPLY UNIT USING THE SAME**

**Noboru Masuda, Tokorozawa; Kazumichi Yamamoto, Hachioji; Kazunori Nakajima, Kokubunji; Toshihiro Okabe; Akira Yamagiwa, both of Hadano; Mikio Yamagishi, Ome; Kazuo Kolde, Iruma; Bunichi Fujita, and Seiichi Kawashima, both of Hadano, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Sep. 7, 1993, Ser. No. 117,525**

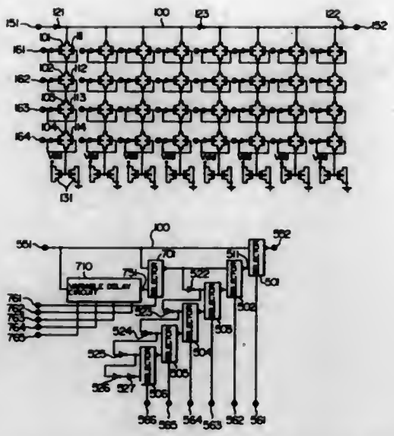
**Claims priority, application Japan, Sep. 10, 1992, 4-241723**

**Int. Cl.[6] H03H *11/26*; H03K *17/296***

**U.S. Cl. 327—278** **14 Claims**

1. A variable delay circuit for transferring an input signal with a variable delay which depends upon a group of binary control signals, comprising:

a plurality of selectors each provided in correspondence to and controlled by one of the binary control signals, each selector having first, second and third inputs and an output, said first and second inputs being supplied with signals to be selected



by said each selector and said third input being supplied with one of the group of binary control signals, said each selector selecting one of the signals to be selected depending upon a value of the one binary control signal, said each selector supplying said output with the selected one signal;

said first input of each selector being connected to receive said input signal;

said plurality of selectors being connected in series in such a manner that the output of an i-th one of said selectors is connected to the second input of an (i − 1)-th one of said selectors, wherein i = 2, 3, . . . n, and Wherein n is the number of selectors;

wherein a first one of said selectors provides a delayed signal of the input signal to said output of said first selector with a delay time which is dependent upon a number of selectors through which the input signal passes in series until said input signal reaches said output of said first selector.

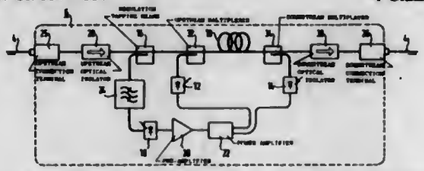
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**5,497,264**

## REGULATED OPTICAL AMPLIFIER

**Dominique Bayart, Clamart; Bertrand Clesca, and José Chesnoy, both of Paris, all of, France, assignors to Alcatel N.V., Rijswijk, Netherlands**

**Filed Jan. 11, 1995, Ser. No. 371,396**
**Claims priority, application France, Jan. 13, 1994, 94 00321**
**Int. Cl.[6] H01S *3/00***
**U.S. Cl. 359—337** **4 Claims**



1. A regulated optical amplifier including an amplifier waveguide and a servo-control loop for servo-controlling the power of an amplified spontaneous emission that is amplified and guided by the amplifier waveguide, wherein the emission whose power is servo-controlled is a "reverse" emission, said amplifier including:

an amplifier waveguide for receiving and guiding light to be amplified propagating from an input to an output of said amplifier waveguide in a forward direction, said amplifier waveguide containing amplifier elements suitable for responding to pump action by applying amplification to said light, the gain of the amplification depending on a controlled characteristic of said pump action;

a pump source performing said pump action;

regulation tapping means for tapping light from said amplifier waveguide, which light is amplified thereby and constitutes regulation light; and

pump drive means receiving said regulation light and responding by driving said pump source so as to cause said controlled characteristic of the pump action to take a value that ensures desired amplification of said light to be amplified;

wherein said regulation tapping means are disposed at the input of said amplifier waveguide, said regulation light being constituted by an amplified spontaneous reverse emission propagating in a backward direction that is opposite from said forward direction.

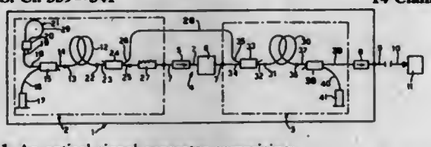
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**5,497,265**

## HIGH-POWER SIGNALS OPTICAL GENERATOR FOR TELECOMMUNICATION SYSTEMS

**Flavio Fontana, Cormano; Aldo Righetti, Milan, and Giorgio Grasso, Monza, all of, Italy, assignors to Pirelli Cavi S.p.A., Italy**

**Filed Dec. 6, 1993, Ser. No. 162,651**
**Claims priority, application Italy, Dec. 23, 1992, MI92A2932**
**Int. Cl.[6] H04B *10/00***
**U.S. Cl. 359—341** **14 Claims**



1. An optical signal generator comprising:

a continuous wave coherent optical signal source and an optical amplifier operatively connected to said source for amplifying optical signals received by said optical amplifier from said source;

said source comprising an optical fiber laser oscillator including a first active optical fiber having a core doped with a fluorescent substance, said fluorescent substance having laser emission at an emission wavelength and light absorption at a pumping wavelength different from said emission wavelength;

said optical amplifier comprising a second active optical fiber having a core doped with a fluorescent substance having laser emission at said emission wavelength and light absorption at said pumping wavelength;

a source of pumping optical power at said pumping wavelength operatively connected to at least one of said first and said second active optical fibers for supplying pumping optical power to said at least one of said first and second active fibers; and

selective transfer means for said pumping optical power, said transfer means being operatively connected to said first and said second active optical fibers to transfer non-absorbed optical power at said pumping wavelength from one of said first and second active optical fibers to the other of said first and second active optical fibers.

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**5,497,266**

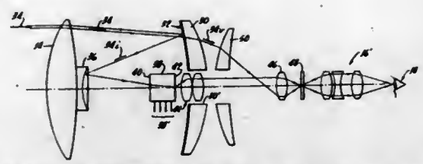
## TELESCOPIC DAY AND NIGHT SIGHT

**Larry D. Owen, Phoenix, Ariz., assignor to Litton Systems, Inc., Woodland Hills, Calif.**

**Filed Jul. 27, 1994, Ser. No. 281,440**
**Int. Cl.[6] G02B *5/08*; H04N *5/33***
**U.S. Cl. 359—353** **29 Claims**

1. A telescopic day/night sight comprising:





an objective lens through which light from a scene to be viewed is received under both day-time and night-time or other low-light conditions;

a dichroic element aft of said objective lens and dividing the received light into a visible-light frequency band and an infrared invisible-light frequency band;

a first optical path extending from said dichroic element to an eyepiece for providing a visible-light image of the scene to a user of said sight;

a second optical path optically coaxial with said first optical path and extending from said dichroic element to means for receiving the invisible light and providing in response thereto a visible image replicating the scene;

a third optical path optically coaxial with said first optical path and extending from said means for receiving the invisible light and providing a visible image in response thereto to provide the visible image from said means to said eyepiece superimposed with the visible-light image and via said eyepiece to a user of said sight.

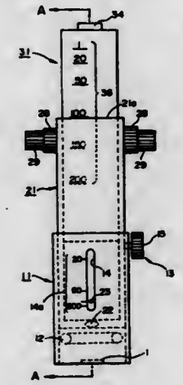
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**5,497,267**

## VIDEO MICROSCOPE

**Seiji Ishikawa, Sagamihara, and Hajime Murakami, Odawara, both of, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan**

**Filed May 21, 1993, Ser. No. 64,444**
**Int. Cl.[6] G02B *21/06;21/36***
**U.S. Cl. 359—390** **5 Claims**



1. A video microscope comprising:

an observation stand forming an elongated enclosure having an inner surface and two open ends, one of said ends facing an observed object;

an illuminating light source positioned on the inner surface of the observation stand to light the observed object;

a lens barrel having a lens system at one end and slidably fitted in said observation stand through an open end of said observation stand opposite said open end facing said object;

said lens system being positioned on an image pickup optical path of the observed object;

said lens barrel having another end opposite said end slidably fitted in said observation stand, being open;

a video signal converting section including a cylinder;

said cylinder of said video signal converting section having a two-dimensional CCD element aligned along said optical path and having a driving circuit for driving said element, said cylinder being slidable through said another open end of said lens barrel;

an objective distance adjusting mechanism arranged between said observation stand and said lens barrel to adjust a distance between the observed object and an objective side of said lens system; and

an enlargement/reduction magnification and focus adjusting mechanism arranged between said lens barrel and said cylinder of said video signal converting section to vary and adjust enlargement/reduction magnification of said lens system and adjust focus of said lens system.

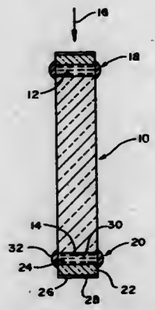
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**5,497,268**

## HERMETICALLY SEALED POLISHED OPTICAL SURFACE

**Chung L. Tang, Ithaca, N.Y., assignor to Ithaca Research Corporation, Ithaca, N.Y.**

**Continuation of Ser. No. 45,760, Apr. 14, 1993, abandoned.**
**This application Dec. 8, 1994, Ser. No. 351,742**
**Int. Cl.[6] G02B *1/10***
**U.S. Cl. 359—513** **15 Claims**



1. Apparatus for protecting a polished optical surface, comprising:

a hygroscopic or nonhygroscopic crystal having a first index of refraction and having at least one polished optical surface to be protected lying in an optical path passing through said crystal;

an optical flat having an outer surface and an inner optically flat surface adjacent said polished optical surface and lying in said optical path, said optical flat having an index of refraction substantially the same as the index of refraction of said crystal, said polished optical surface and said adjacent inner surface being closely spaced to define a protective region between said optical flat and said crystal in said optical path;

a thin film liquid index-matched to said crystal in said protective region between said polished optical surface to be protected and said inner surface of said optical flat, said polished optical surface and adjacent inner surface being spaced sufficiently closely to place said liquid under pressure to thereby produce said thin film liquid and to drive air and moisture out of said thin film liquid; and

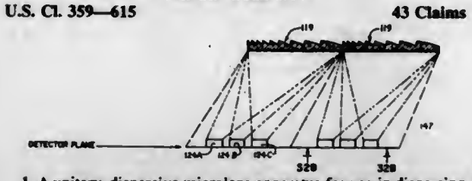
sealing means surrounding said protective region and said optical path and engaging said optical flat and said crystal to secure said optical flat to said crystal to hermetically seal said protective region to prevent the escape of said thin film liquid and to maintain said liquid under sufficient pressure to prevent entry of ambient air or moisture.

5,497,269

## DISPERSIVE MICROLENS

George Gal, Palo Alto, Calif., assignor to Lockheed Missiles and Space Company, Inc., Sunnyvale, Calif.

Filed Jun. 25, 1992, Ser. No. 904,316
Int. Cl.[6] G02B 5/04
U.S. Cl. 359—615 43 Claims




1. A unitary, dispersive microlens apparatus for use in dispersing a bandwidth of light into multiple selected wavelengths or wavebands of light at specified locations in an elongated blur spot so that detectors in the specified locations can detect the multiple wavelengths or wavebands, said microlens apparatus having height dimensions in the order of a few micrometers, said microlens comprising,

a microlens constructed to transmit and to concentrate a selected bandwidth of light existing in a blur spot at the microlens to a smaller blur spot in a detector plane spaced at a selected distance from the microlens, and

dispersion means for producing both a dispersion of the bandwidth of light as the light is transmitted and concentrated to the smaller blur spot and also an elongated shape of the smaller blur spot in which the wavelengths or wavebands are varied from one end of the elongated blur spot to the other so that more than one wavelength can be detected by detectors at specified locations within the elongated blur spot in the detector plane, said dispersive means comprising a grating formed integrally on the microlens and wherein the unitary construction of the grating integrally on the microlens enables one unitary, dispersive microlens apparatus to perform multiple, designed, refraction and dispersion functions while eliminating noise and reflection losses which could otherwise occur across an interface between a separated, non-unitary microlens and grating.

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5,497,270

## APPARATUS AND METHOD FOR INCREASING RESOLUTION AND EXPANDING THE DISPLAYED FIELD OF VIEW

Mayer Rud, Sunnyvale, Calif., assignor to Kaiser Aerospace & Electronics Corporation, Foster City, Calif.

Filed Jul. 13, 1994, Ser. No. 274,891
Int. Cl.[6] G02B 27/14;27/30
U.S. Cl. 359—629 11 Claims



1. An apparatus for displaying an expanded field of view of an image by the spatially aligned combination of two alternatively displayed sets of sequential images from an image source positioned at the front end of the apparatus and emitting a first image beam, the apparatus having an image display plane with an image axis orthogonal to the image display plane and a viewing axis defining the center of a user's perceived field of view, the apparatus comprising:

beam splitting means for dividing said first image beam into second and third identical beams of light directed along different paths;

blocking means for controlling the passage of said second and third beams of light said blocking means alternatively transmitting and blocking images from each of said paths;

a first collimating optical assembly positioned along the image axis between the image source and said beam splitting means;

directing means for applying said second and third beams of light to a user along the viewing axis;

exit optics, for recollimating said second and third beams of light and focusing them at an exit pupil;

wherein a sequence of images displayed by the image source are alternatively directed to first and second portions of a user's field of view.

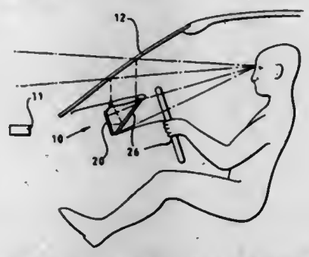
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5,497,271

## HEAD UP DISPLAYS FOR MOTOR VEHICLES

Paul Mulvanny, Braunston, and Malcolm Williams, Crescent, both of, United Kingdom, assignors to Jaguar Cars Limited, Allesley, England

Filed Aug. 2, 1994, Ser. No. 285,022
Claims priority, application United Kingdom, Sep. 7, 1993, 9318520
Int. Cl.[6] G02B 27/14; G09G 5/00
U.S. Cl. 359—631 14 Claims



1. A head up display system for a motor vehicle comprising:

sensor means for determining objects ahead of the vehicle;

means for forming a video image of the objects ahead of the vehicle from the signals received from the sensor means, said means producing a first video image of light wavelengths within a first band of wavelengths

and for generating a second video image of light of wavelengths outside the first band of wavelengths;

means for projecting the first and second video images onto a selectively reflective mirror, said mirror being located between the video image generating means and a driver of the vehicle and directly in front of the driver at a level outside the normal field of view of the driver through the vehicle windscreen, the mirror reflecting light of wavelengths within said first band of wavelengths and transmitting light of wavelengths outside said first band of wavelengths;

the mirror reflecting the first video image of the objects ahead of the vehicle onto the vehicle windscreen where it is viewable by the driver of the vehicle, in a head up display mode; and

the second video image being transmitted through the mirror where it is viewable directly by the driver of the vehicle in a head down display mode.

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5,497,272

## LENS SWITCHING DEVICE FOR MULTI-LENS OPTICAL SCANNERS

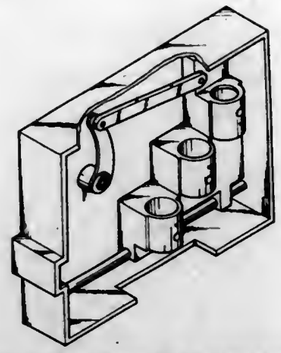
Jeffrey Wun, Hsinchu, Taiwan, Prov. of China, assignor to Umax Data Systems Inc., Hsinchu, Taiwan, Prov. of China

Filed May 26, 1994, Ser. No. 249,893
Int. Cl.[6] G02B 7/02; G05G 1/00
U.S. Cl. 359—821 3 Claims

1. A lens switching device for a multi-lens optical scanner, comprising:

a driving motor and a transmission belt connected to said driving motor to receive power therefrom;





a body casing including a sliding rail, a sliding lens seat, and an aperture, said body casing being able to move in a first direction by said transmission belt;

said sliding lens seat including a plurality of lenses, and a bottom of said sliding lens seat having a round hole for receiving said sliding rail so as to allow said sliding lens seat to freely slide along said sliding rail within said body casting in a second direction perpendicular to said first direction;

a driving mechanism for receiving power from said body casing so as to move said sliding lens seat in said second direction and synchronously with a movement of said body casing;

said driving mechanism including a guide rod, a gear train, a transmission rod pivotably connected to said gear train, and a sub-transmission rod pivotably connected to said transmission rod; said sub-transmission rod being connected to said sliding lens seat so as to enable said sliding lens seat to move in said second direction along said sliding rail upon a rotation of said gear train;

wherein said guide rod is affixed to said body casing in such a manner so as to allow said body casing to move in said first direction, said gear train is affixed to said body casing so as to move therewith, and said guide rod is provided with a plurality of teeth engaged with said gear train so as to drive said gear train and cause said transmission rod and said sub-transmission rod to pivot;

whereby when a user selects a lens from said plurality of lenses, said driving motor will be actuated so as to move said body casing in said first direction to move said body casing containing said sliding lens seat toward a first predetermined position, the movement of said body casing also causes said gear train to rotate via an engagement between said gear train and said guide rod, said rotation of said gear train causes said transmission rod and said sub-transmission rod to pivot said selected lens to move, thus causing said sliding lens seat to move synchronously in said second direction toward a second predetermined position.

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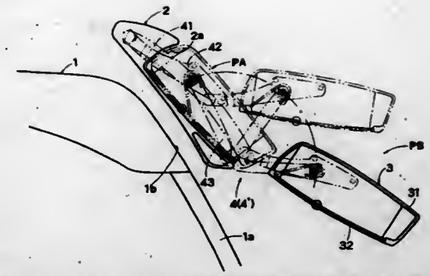
5,497,273

## RETRACTABEL REAR UNDER VIEW MIRROR SYSTEM FOR AN AUTOMOTIVE VEHICLE

Hidekazu Kogita, Kariya; Masumi Nishikawa, Toyoake, and Shoji Okada, Anjo, all of, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Aug. 26, 1993, Ser. No. 111,954
Claims priority, application Japan, Aug. 31, 1992, 4-232145
The portion of the term of this patent subsequent to Aug. 9, 2011, has been disclaimed.
Int. Cl.[6] G02B 7/182
U.S. Cl. 359—843 9 Claims

1. A retractable rear under view mirror system mounted on a rearward portion of an automotive vehicle in which a rear under



field of view from a driver's seat is obscured and which has a rear door hingedly mounted on a body of the vehicle for being opened, comprising:

a base member positioned on a rearward portion of said automotive vehicle, said base member being a deflector mounted on the automotive vehicle in a spaced relationship with respect to the vehicle for deflecting air flow to the rear door of the automotive vehicle;

a mirror assembly movably supported by said base member and selectively positionable from a stored position inside said base member to a use position in which said mirror assembly reflects the rear under field of view of the automotive vehicle;

actuating means for actuating said mirror assembly to be positioned in said stored position or said use position;

detection means for detecting a state of said rear door which is positionable in an open state and a closed state; and

control means for controlling said actuating means in response to an output of said detection means to move said mirror assembly to a position responsive to the state of said rear door detected by said detection means.

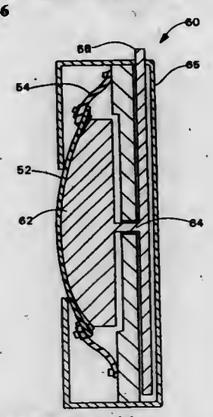
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5,497,274

## VIEWING ASSEMBLY FOR PRODUCING AN OPTICALLY CORRECTED REFLECTED IMAGE

David B. Soll, Rydal, Pa., and Richard E. Feinbloom, New York, N.Y., assignors to Image Optical Corporation, Wilmington, Del.

Filed Sep. 2, 1993, Ser. No. 116,169
Int. Cl.[6] G02B 5/08
U.S. Cl. 359—846 15 Claims



13. A viewing apparatus comprising:

a flexible material having a front surface and a back surface, said front surface being reflective;

a support structure having a first surface receiving said back surface of said flexible material in corresponding facing engagement, said first surface having a contour;

a tensioning device for pulling said flexible material taut over said first surface of said support structure, wherein said flexible material conforms to the contour of said first surface; and

an adjustment mechanism for selectively adjusting said contour of said first surface, thereby altering the shape to which said flexible material conforms and creating a desired optical correction in an image reflected from said flexible material, wherein said contour of said first surface of said support structure is fixed, and said adjustment mechanism rotates said support structure around an axis of rotation, thereby altering the orientation of said fixed contour relative said axis of rotation.

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**5,497,275**

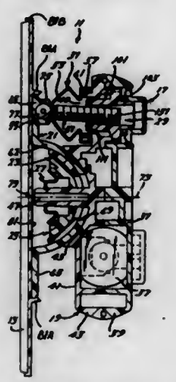
**POWER PACK FOR AN AUTOMOTIVE EXTERIOR MIRROR ASSEMBLY**

**William M. Perry, Palestine, and Kerry L. Helmer, Hollansburg, both of Ohio, assignors to United Technologies Automotive, Inc., Dearborn, Mich.**

**Continuation of Ser. No. 317,720, Oct. 4, 1994, which is a division of Ser. No. 60,268, May 12, 1993, Pat. No. 5,363,246. This application May 25, 1995, Ser. No. 450,852**

**Int. Cl.[6] B60R *1/06***

**U.S. Cl. 359—873** **18 Claims**



1. A power pack for an automotive exterior mirror assembly comprising:

a pivot cup having a partially spherical center portion with a concave top surface;

an upper housing having a centrally located post protruding upward therefrom, said upper housing having a partially spherical depression partially extending below the top plane of a motor contained within said upper housing, said post of said upper housing extending through an aperture within the center of said pivot cup's partially spherical portion;

a pivot sleeve having a partially spherical shape, said pivot sleeve being engaged with said concave top surface of said pivot cup's central partially spherical portion, said pivot sleeve having an orifice in the center thereof such that said upper housing post extends therethrough; and

said pivot cup sliding between said pivot sleeve and said upper housing.

**5,497,276**

**DISK DRIVE ARRAY SYSTEM HAVING INTERNAL SYNCHRONIZATION AND EXTERNAL SYNCHRONIZATION MONITORING**

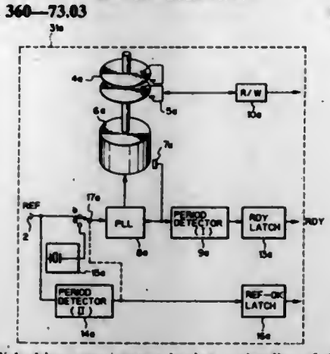
**Masatoshi Kakuda, Kanagawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Jul. 8, 1992, Ser. No. 910,641**

**Claims priority, application Japan, Jul. 11, 1991, 3-171216**

**Int. Cl.[6] G11B *15/46***

**U.S. Cl. 360—73.03** **18 Claims**




1. A disk drive array system having a plurality of disk drives each disk drive of the plurality of disk drives comprising:

at least one disk for recording information;

a first detector having an output, directly receiving an external synchronizing signal, for monitoring the period of the external synchronizing signal that is used for synchronizing rotation of the disk drives, and controlling the output to indicate when the period of the external synchronizing signal lies outside a predetermined range;

a generator for generating an internal synchronizing signal;

a first switch, receiving the internal synchronizing signal, the external synchronizing signal, and the output of the first detector, such that the first switch selects the external synchronizing signal when the output of the first detector indicates that the period of the external synchronizing signal does not lie outside the predetermined range, and selects the internal synchronizing signal when the output of the first detector indicates that the period of the external synchronizing signal lies outside the predetermined range; and

a drive mechanism that is responsive to the signal selected by said first switch for controlling the rotation of the disk.

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**5,497,277**

**SPINDLE SYNCHRONIZATION CONTROLLER USING ADVANCE CALCULATION AND OFFSET VALUES**

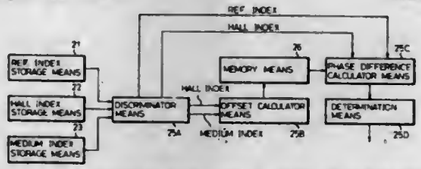
**Eisaku Takahashi, Higashine, Japan, assignor to Fujitsu Limited, Kawasaki, Japan**

**Continuation of Ser. No. 969,417, Oct. 30, 1992, abandoned. This application Nov. 8, 1994, Ser. No. 335,599**

**Claims priority, application Japan, Jan. 31, 1991, 3-285846**

**Int. Cl.[6] G11B *15/46***

**U.S. Cl. 360—73.03** **7 Claims**




1. A spindle synchronization control system for conducting a spindle synchronization control by synchronously rotating spindle motors supporting respective recording media of a plurality of storage units connected in parallel to a host computer having a reference index provided by said host computer as a reference signal, a medium index generated by reproducing each index recorded in each of said recording media, and a Hall index output from a spindle motor, said Hall index being used for detecting a phase change over time, said spindle synchronization control system including:

means for measuring a phase offset value between said Hall index and said medium index before starting said spindle synchronization control;

means for storing said thus measured phase offset value between said Hall index and said medium index;

means for measuring a phase difference between said reference index and said Hall index during said spindle synchronization control; and

means for carrying out said spindle synchronization control, so that said thus measured phase difference between said reference index and said Hall index becomes equal to said thus stored phase offset value between said Hall index and said medium index.



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**5,497,278**

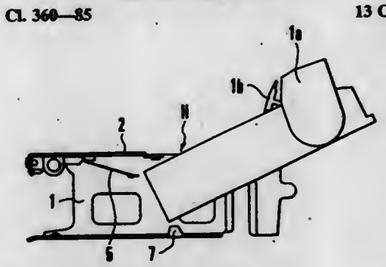
**CASSETTE MOUNTING DEVICE HAVING CASSETTE REMOVAL FACILITY ADDITIONAL TO CUSTOMARY INSERTION/EJECTION APERTURE PART**

**Osamu Nagatsuka, and Kiyoshi Kumagai, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Jul. 28, 1994, Ser. No. 282,052**

**Int. Cl.[6] G11B *5/027***

**U.S. Cl. 360—85** **13 Claims**




1. A cassette mounting device comprising:

a) a holder capable of moving, while holding a cassette in which a recording medium is contained, between a first position where the cassette can be inserted and ejected and a second position where information can be recorded or reproduced on or from the recording medium, said holder including

a first member defining a first aperture part therein where the cassette can be inserted into and ejected from the holder in the first position and defining a second aperture part therein different from said first aperture part, a cassette inserted into said holder being removable from said holder through said second aperture part, and

a second member removably secured to said first member and arranged to close said second aperture part when secured to said first member; and

b) a moving mechanism arranged to move said holder between the first position and the second position.

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**5,497,279**

**TAPE CARTRIDGE AND RECORDING REPRODUCTION APPARATUS FOR THE TAPE CARTRIDGE**

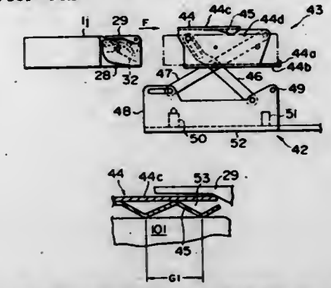
**Tatsumi Nishijima; Hidekazu Takeda, both of Hiratsuka; Kenmei Masuda, Yokohama; Hikaru Mizutani, Minoo; Yoshimi Maehara, Otsu, and Kenji Ogiro, Yokohama, all of, Japan, assignors to Hitachi, Ltd., Tokyo, and Hitachi Maxell Ltd., Osaka, both of, Japan**

**Filed Apr. 8, 1994, Ser. No. 226,263**

**Claims priority, application Japan, Apr. 16, 1993, 5-089687; May 31, 1993, 5-154268; May 27, 1993, 5-151456**

**Int. Cl.[6] G11B *15/60;23/08;* G03B *23/02***

**U.S. Cl. 360—96.5** **4 Claims**




1. A tape recording/reproduction apparatus for performing recording and/or reproduction on and/or from a tape in a tape cartridge including a casing body having in a front portion thereof a pocket for receiving a head of said apparatus when the tape cartridge is loaded in said apparatus, a front lid movably attached to the casing body so as to open and close a front side of the pocket, and an upper lid movably attached to the casing body so as to open and close an upper side of the pocket, in which when the upper lid is in an opening position for opening the upper side of the pocket, the upper lid is positioned above an upper surface of the casing body so that a lower surface of the upper lid faces the upper surface of the casing body through a gap therebetween allowing pressing means for depressing the cartridge to be placed therein, said apparatus comprising:

a recording/reproduction apparatus body having an aperture through which the tape cartridge is inserted; and

cartridge transport means for moving the tape cartridge to a predetermined position in said apparatus body by pressing an upper surface of the cartridge inserted in said apparatus body;

said cartridge transport means having a pressing portion adapted to be placed at least partially in the gap between the lower surface of the upper lid in the opening position above the casing body and the upper surface of the casing body to downwardly press the upper surface of the tape cartridge.

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**5,497,280**

**CASSETTE HOLDER MECHANISM FOR MAGNETIC RECORDING/REPRODUCING APPARATUS**

**Yasuhiro Nemoto, Ibaraki; Kazuto Oyama; Hideharu Ono, both of Katsuta, and Kazuo Sakai, Ibaraki, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

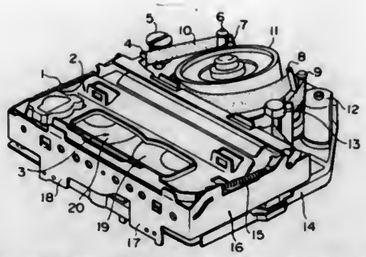
**Filed Sep. 16, 1994, Ser. No. 307,240**

**Claims priority, application Japan, Sep. 17, 1993, 5-231368**

**Int. Cl.[6] G11B *15/675;5/008***

**U.S. Cl. 360—96.5** **12 Claims**

1. A magnetic recording/reproducing apparatus comprising a head assembly including a head for recording/reproducing magnetic signals, a chassis for positioning said head assembly, a cassette holder for positioning a recording cassette on said chassis, the recording cassette including an opening portion through which a recording medium is drawn out from within the recording cassette, a cassette holder supporting member for supporting said cassette holder on said chassis, and a casing containing said head



assembly, said chassis, said cassette holder, and said cassette holder supporting member,

wherein said cassette holder supporting member has a substantially U-shape, so that when a recording cassette is held in said cassette holder, said cassette holder supporting member faces the three side surfaces of the cassette other than the opening portion, and wherein said cassette holder supporting member includes integrally formed fastening portions secured to said casing.

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**5,497,281**

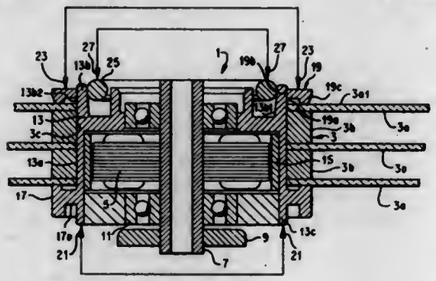
**EXPANDED TUBULAR HUB DISK PACK ASSEMBLY CLAMP**

**Robert W. Jewell, and Gary M. Peter, both of Boise, Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed Oct. 31, 1994, Ser. No. 331,776**

**Int. Cl.[6] G11B** *17/08*

**U.S. Cl. 360—98.08** **10 Claims**



1. A disk pack assembly, comprising:

a. a hub having axially spaced opposite ends;

b. an external flange on said hub adjacent one end of said opposite ends;

c. a flexible tubular section on said hub axially spaced from said one end of said opposite ends of said hub, said tubular section having a substantially cylindrical exterior surface and a substantially cylindrical interior surface;

d. a disk pack comprising at least one disk, said disk pack having a central opening receiving said hub and having opposite annular axial surfaces around said central opening, one annular axial surface of said opposite annular axial surfaces seated on said external flange;

e. a flexible ring clamp having an opening therethrough defined by a wall of said ring clamp, said ring clamp being disposed about said hub at said substantially cylindrical exterior surface, said ring clamp having a circumferential clamp portion seated upon and pressing against the other annular axial surface of said opposite annular axial surfaces of said disk pack, and

f. means for applying a circumferentially distributed radial force against said substantially cylindrical interior surface of said tubular section for radially expanding said tubular section and compressing said substantially cylindrical exterior surface of said tubular section against said wall of said ring clamp, to frictionally secure said ring clamp to said hub.

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**5,497,282**

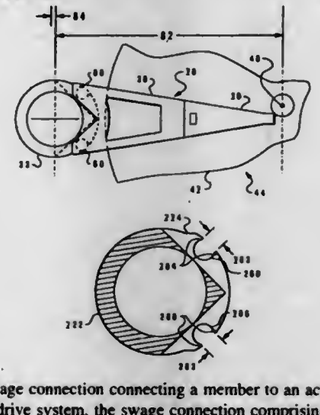
**DISK DRIVE SYSTEM HAVING OPEN SLOT SWAGE CONNECTION**

**Thomas M. Hoffmann, Santa Cruz, and Victor W. C. Shum, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 23, 1993, Ser. No. 173,535**

**Int. Cl.[6] G11B** *21/16;21/08;5/49;5/55*

**U.S. Cl. 360—104** **4 Claims**



1. A swage connection connecting a member to an actuator arm in a disk drive system, the swage connection comprising:

a first open slot located on a perimeter of said actuator arm, said first open slot passing through upper end lower surfaces of said actuator arm and extending into the actuator arm from a periphery thereof;

a boss located on a proximal end of said member for registering with said open slot;

said boss swaged within said first open slot with an outer surface of said boss expanded into an inner surface of said first open slot; and

said first open slot in said actuator arm having an opening that is smaller than a diameter of said boss.

2. A swage connection connecting a member to an actuator arm in a disk drive system, the swoon connection comprising:

a first open slot located on a perimeter of said actuator arm, said first open slot passing through upper and lower surfaces of said actuator arm and extending into the actuator arm from a periphery thereof;

a boss located on a proximal end of said member for registering with said open slot;

said boss swaged within said first open slot with an outer surface of said boss expanded into an inner surface of said first open slot;

a second open slot located on said perimeter of said actuator arm, said second open slot passing through said upper and lower surfaces of said actuator arm and extending into the actuator arm from said periphery thereof;

a second boss located on said proximal end of said member for registering with said second open slot;

said second boss swaged within said second open slot with an outer surface of said second boss expanded into an inner surface of said second open slot; and

said first open slot and said second open slot being angled away from each other, wherein said member is fixedly attached to said actuator arm.



**5,497,283**

**MAGNETIC HEAD HAVING COIL BOBBINS SEPARATED FROM A TERMINAL ASSEMBLY**

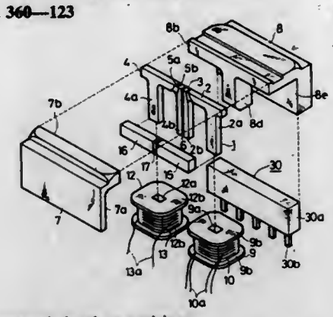
**Minoru Kato, Chichibu, Japan, assignor to Canon Denshi Kabushiki Kaisha, Saitama, Japan**

**Continuation of Ser. No. 649,008, Jan. 25, 1991, abandoned. This application Nov. 16, 1993, Ser. No. 152,926**

**Claims priority, application Japan, Jan. 30, 1990, 2-19759; Nov. 22, 1990, 2-316029**

**Int. Cl.[6] G11B** *5/17;5/265*

**U.S. Cl. 360—123** **9 Claims**



1. A magnetic head, comprising:

a magnetic core having a slidable contact surface and a side face,

a coil bobbin having a height in a direction perpendicular to said slidable contact surface of said magnetic core, said coil bobbin being arranged around said magnetic core,

a coil wound around said coil bobbin,

a slider having a notch and connected to said side face of said magnetic core, said slider together with said magnetic core being in slidable contact with a contact surface of a magnetic recording medium,

a plurality of terminals each of which is connected to an end of said coil, and

a terminal holding member being disposed substantially within a space defined by said notch, said terminal holding member and said coil bobbin being remote from each other in a direction along said slidable contact surface of said magnetic core, said terminal holding member holding said plurality of terminals in a direction perpendicular to said slidable contact surface of said magnetic core, said terminal holding member being disposed within the height of said coil bobbin in the direction perpendicular to said slidable contact surface of said magnetic core so that said terminal holding member does not extend beyond said coil bobbin in the direction perpendicular to said slidable contact surface of said magnetic core.

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**5,497,284**

**METHOD AND DEVICE FOR THE PROTECTION OF A SERIES BUS AGAINST SHORT CIRCUITS**

**Maurice G. Le Van Suu, Romainville, France, assignor to SGS-Thomson Microelectronics S.A., Saint-Genis, France**

**Filed Feb. 17, 1994, Ser. No. 197,723**

**Claims priority, application France, Feb. 18, 1993, 93 01848**

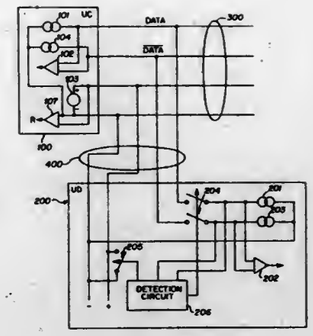
**Int. Cl.[6] H02H** *3/00*

**U.S. Cl. 361—42** **30 Claims**

1. A method for the protection of a series bus against short circuits, comprising the steps of:

detecting a short circuit condition, between at least two data wires within the series bus, wherein the series bus interconnects a centralized processing unit and at least one decentralized processing unit; and

disconnecting, responsive to the step of detecting, a decentralized unit containing the short circuit condition.



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**5,497,285**

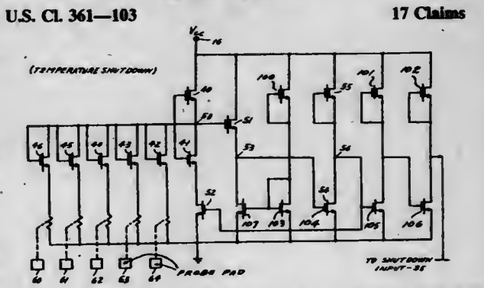
**POWER MOSFET WITH OVERCURRENT AND OVER-TEMPERATURE PROTECTION**

**Bruno C. Nadd, Puyvert, France, assignor to International Rectifier Corporation, El Segundo, Calif.**

**Filed Sep. 14, 1993, Ser. No. 121,288**

**Int. Cl.[6] H02H** *3/08*

**U.S. Cl. 361—103** **17 Claims**



1. A MOSgated semiconductor power device having a fault condition responsive control circuit integrated into the same die which contains a power section for said device; said device comprising a semiconductor die having first and second main electrodes and a gate electrode for controlling the conduction of current between said first and second main electrodes; said device having at least first, second and third connection pins; said first and second pins connected to said first and second main electrodes respectively; said fault condition responsive control circuit being formed in at least one separate well area within said semiconductor die; said fault condition responsive control circuit being operable to turn off a signal to said gate electrode in response to a predetermined fault condition; said fault condition responsive control circuit having an input terminal for a control voltage $V_{cc}$ needed for the biasing and operation of the components of said fault condition responsive control circuit; a first control MOSFET connected between said third connection pin and said gate electrode and a second control MOSFET connected between said gate electrode and one of said first and second main electrodes; said input terminal of said fault condition responsive control circuit being connected to the voltage at the node between said third pin and said first control MOSFET; said first control MOSFET being turned on and said second control MOSFET being turned off during the time that said MOSgated semiconductor power device is in normal conduction; said fault condition responsive control circuit being operable to turn off said first control MOSFET and turn on said second control MOSFET in response to a monitored fault condition.

5,497,286

## OVERLOAD PROTECTIVE APPARATUS UTILIZING A BIMETAL

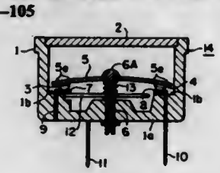
Toshio Shimada, and Wataru Sugawara, both of Tochigi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

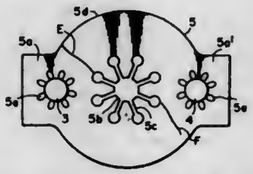
Filed Oct. 13, 1993, Ser. No. 135,727

Claims priority, application Japan, Jan. 16, 1992, 4-278856; May 19, 1993, 5-117311

Int. Cl.[6] H02H 5/04; H01H 37/14

U.S. Cl. 361—105 16 Claims





1. An overload protective apparatus having fixed contacts connected to at least one pair of fixed terminals secured on the bottom of a case, a dish-shaped polymetallic element having movable contacts bonded thereon so as to oppose said fixed contacts, and an adjusting bolt supporting a central portion of said polymetallic element for maintaining said polymetallic element at a position separate from the bottom of said case, said polymetallic element and said adjusting bolt being accommodated in said case, wherein,

said polymetallic element has a plurality of throughholes around bonding portions for said movable contacts.

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5,497,287

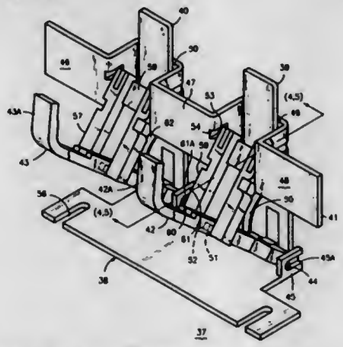
## ELECTRICAL PORT SAFETY GUARD MECHANISM

Edgar Yee, Chapel Hill, N.C.; Richard G. DeTuccio, Milwaukee, Wis.; Kevin F. Nolan, Hillsborough, and Lloyd E. Wentler, Efland, both of N.C., assignors to General Electric Company, New York, N.Y.

Continuation of Ser. No. 339,661, Nov. 14, 1994, abandoned. This application Mar. 10, 1995, Ser. No. 401,646

Int. Cl.[6] H02B 1/14

U.S. Cl. 361—617 7 Claims



1. A motor control center comprising:

an enclosure 11;

a compartment 12 containing an electrical component 31 within said enclosure;

operating means 13 extending from a front of said enclosure providing external control of said electrical component;

indicating means 14 extending from said front of said enclosure providing indication as to an operating state of said electrical component;

a chamber 21 containing said compartment and allowing electrical access to electrical busbars extending within a rear of said enclosure;

an insulating barrier 25 covering said busbars except for electrical access openings 26;

a shutter assembly 37 within said chamber and arranged for providing electrical access to said busbars when said compartment is within said chamber and preventing electrical access to said busbars when said compartment is outside of said enclosure, said shutter assembly including a slidably-mounted shutter 41 arranged for moving in front of said electrical access openings when said compartment is outside of said enclosure, said shutter assembly includes a slide unit 38 fastened to a bottom shelf 23 within said chamber, said shelf including an up-standing plate 39 integrally-formed therewith, said shutter being supported on said plate said shutter comprises a plurality of blocking plates 46–48 integrally-formed thereon, said plates being arranged in front of said electrical access openings when said compartment is outside said chamber to thereby prevent electrical access to said busbars;

a lever 42 pivotally-supported on said slide unit and including a top part 42A inclined toward said compartment when said compartment is outside of said chamber; and

a hinge 58 attached to said lever at one end and to said shutter at an opposite end, whereby said hinge moves said shutter in unison with said lever, said shutter comprises a plurality of blocking plates 46–48 integrally-formed thereon, said plates being arranged in front of said electrical access openings when said compartment is outside said chamber to thereby prevent electrical access to said busbars, said shutter is formed from a continuos plastic plate, said plate being offset to define an off-set folded region 49, said off-set region capturing and supporting said upstanding plate.

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5,497,288

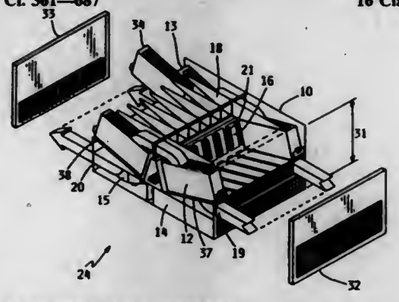
## APPARATUS FOR TILTED SERIAL COOLING IN AN ELECTRONIC SYSTEM

Bruce P. Otis, and Russell E. Dickson, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 31, 1994, Ser. No. 298,986

Int. Cl.[6] H05K 7/20

U.S. Cl. 361—687 16 Claims



1. An electronic device, comprising:

a cabinet having an air inlet, an air outlet, and an air flow path from said air inlet to said air outlet;

a first electronic component assembly having an end closest to said air inlet and an end furthest from said air inlet, said first electronic component assembly being mounted in said air flow path of said cabinet so that said furthest end of said first electronic component assembly is tilted downward, with respect to said closest end of said first electronic component assembly, at an angle of greater than 0 and less than 90 degrees from the horizontal axis of said cabinet;

a second electronic component assembly having an end closest to said air inlet and an end furthest from said air inlet, said second electronic component assembly being mounted serially in said air flow path with respect to said first electronic component assembly so that said closest end of said second electronic component assembly is tilted downward, with respect to said furthest end of said second electronic component assembly, at an angle of between 0 and 90 degrees from the horizontal axis of said cabinet;

means for air pressure balancing disposed in said air flow path above said first electronic component assembly and said second electronic component assembly; and

means for moving air through said air inlet, serially past said first and second electronic component assemblies, and exhausting said air out of said air outlet.



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5,497,289

## INVERTER APPARATUS AND METHOD THEREFOR

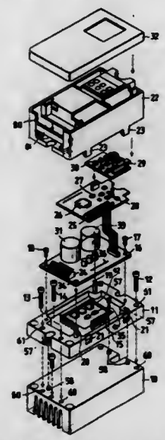
Eiichi Sugishima; Naohiro Hirose; Wataru Ikeshita, and Shinzo Tomonaga, all of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 20, 1993, Ser. No. 123,217

Claims priority, application Japan, Sep. 30, 1992, 4-261504; Jan. 29, 1993, 5-013700

Int. Cl.[6] H05K 7/20

U.S. Cl. 361—709 14 Claims



1. An inverter apparatus having an enclosure and being operative to drive an alternating-current motor, comprising:

a converter circuit for converting an alternating-current input into a direct current and an inverter circuit for converting the direct current into the alternating current;

a power module case supporting a power module including heat generating components comprising said converter circuit and said inverter circuit, said case having pairs of parallel side faces which are sized to constitute part of the enclosure of said inverter apparatus;

a body disposed on said power module case and meeting at a first substantially planar interface, said body having pairs of parallel side faces which are sized to be part of the enclosure of said inverter apparatus and being removably fastened to said power module case by fastening means; and

a heat sink for cooling said heat generating components, said heat sink making contact with said power module case at a second substantially planar interface; and

wherein the surface area of said heat sink at said second substantially planar interface and the surface area of said power module case at said second substantially planar interface are substantially equal.

14. Method for using an inverter apparatus comprising a power module case, containing at least a portion of a converter circuit and an inverter circuit with a adjustable switching frequency, and a heat sink fitted to the cooling surface of said power module case and having a cooling capacity matched to an operating frequency, comprising:

adjusting the switching frequency of said inverter circuits, and

changing said heat sink such that a first heat sink higher in cooling capacity is used when the switching frequency of said inverter circuit is not less than a predetermined value, and a second heat sink lower in cooling capacity is used when the switching frequency of the inverter circuit in said inverter apparatus is less than said predetermined value.

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5,497,290

## HERMETIC CASE FOR ELECTRONIC CIRCUIT EQUIPMENT

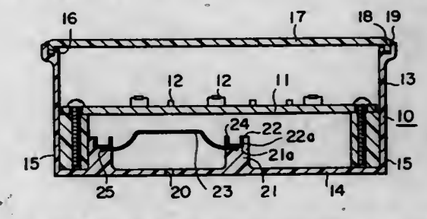
Wataru Fukui; Hideki Umemoto; Yutaka Ohashi, and Haruyuki Matsuo, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 277,305, Jul. 22, 1994, which is a continuation of Ser. No. 124,857, Sep. 22, 1993, which is a continuation of Ser. No. 889,432, May 28, 1992. This application Mar. 27, 1995, Ser. No. 411,331

Claims priority, application Japan, May 29, 1991, 3-038586

Int. Cl.[6] H05K 5/00

U.S. Cl. 361—752 5 Claims



1. A hermetic case for encasing an electronic circuit board having an electronic element thereon, comprising:

a case body for defining a hermetically sealed space for mounting said electronic circuit board therein;

a vent hole formed in said case body for communicating said sealed space with ambient atmosphere; and

cover means, attached to said case body, for protecting said electronic element from moisture and absorbing a pressure fluctuation of said sealed space,

wherein said cover means comprises a flexible diaphragm sealingly attached to said case body around said vent hole.

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5,497,291

## POWER SEMICONDUCTOR DEVICE INCLUDING TERMINAL PLATES LOCATED BETWEEN TWO SUBSTRATES THAT FUNCTIONS AS ELECTRICAL CONNECTORS AND MECHANICAL SUPPORTS

Toru Hosen, Kanagawa, Japan, assignor to Fuji Electric Co., Ltd., Kanagawa, Japan

Division of Ser. No. 407,041, Mar. 17, 1995, which is a continuation of Ser. No. 995,378, Dec. 23, 1992, abandoned. This application Jun. 1, 1995, Ser. No. 456,925

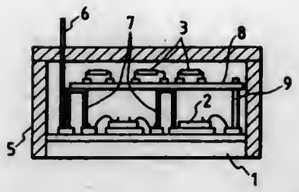
Claims priority, application Japan, Dec. 26, 1991, 3-343755

Int. Cl.[6] H05K 1/11; H01L 23/12; H01R 23/68;23/72

U.S. Cl. 361—804 5 Claims

1. A power semiconductor device comprising:

a first substrate having a planar surface;



a plurality of power chips mounted on said planar surface of first substrate;
an output terminal mounted on said first substrate;
a plurality of terminal plates, separate from said first substrate, for connecting said power chips to said output terminal and to each other, each of said plurality of terminal plates being spaced apart from said first substrate and having at least two ends extending toward and connected to said planar surface of said first substrate;
a second substrate supported apart from said first substrate by said plurality of terminal plates;
a control circuit formed on said second substrate;
a terminal connecting said second substrate to said first substrate;
wiring connecting said control circuit to said power chips through said connecting terminal.

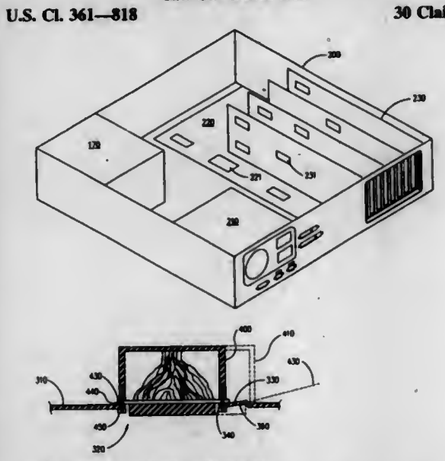
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**5,497,292**

## CONFIGURABLE COMPUTER CHASSIS PORT AND METHOD OF MANUFACTURE THEREFOR

**Jerry D. Gandre, Austin, Tex., assignor to Dell USA, L.P., Austin, Tex.**

**Filed Oct. 14, 1994, Ser. No. 323,298**
**Int. Cl.[6] H05K 9/00**
**U.S. Cl. 361—818** **30 Claims**



1. A computer chassis, comprising:
a chassis wall having a substantially planar portion, said substantially planar portion having a first port therethrough of first predetermined dimensions, said first predetermined dimensions corresponding to external dimensions of a first electrical connector; and
a partially-sheared punchout section defined in said substantially planar portion of said chassis wall, said punchout section removably coupled to said chassis wall and having an edge contiguous with said first port, said edge forming a portion of a perimeter of said first port and substantially coplanar with said substantially planar portion of said chassis wall, said punchout section selectably removable to create an aperture through said chassis wall, said first port and said aperture cooperating to form a second port through said chassis wall of second predetermined dimensions, said second predetermined dimensions corresponding to external dimensions of a second electrical connector, said punchout section thereby yielding a port selectably configurable to accept electrical connectors of different dimension therethrough.

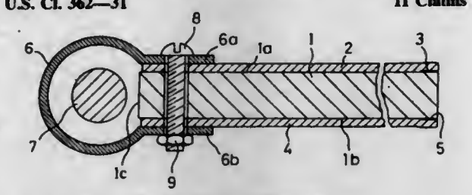
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**5,497,293**

## SURFACE ILLUMINANT DEVICE

**Nobuhisa Noguchi, Ohmiya, and Jun Tamaki, Kawaguchi, both of, Japan, assignors to Enplas Corporation, Japan**

**PCT No. PCT/JP94/00675, § 371 Date Jun. 7, 1994, § 102(e) Date Jun. 7, 1994**
**PCT Filed Apr. 22, 1994, Ser. No. 244,673**
**Int. Cl.[6] F21V 8/00**
**U.S. Cl. 362—31** **11 Claims**



1. A surface illuminant device comprising:
a light source;
a light transmitter having an incident end face disposed in a vicinity of said light source;
a holder accommodating said light source and serving for condensing rays emitted from said light source onto said incident end face of said light transmitter;
a light diffusing sheet mounted on an upper side surface of said light transmitter; and
a reflecting sheet disposed on a lower side surface of said light transmitter,
wherein a layered structure .consisting of said light transmitter, said light diffusing sheet and said reflecting sheet, is integrally fixed by fixing means at a portion of a first end zone of said layered structure opposite to said incident end face, and
wherein said holder is attached to said layered structure by a plurality of attaching means in such a manner that a second end zone of said layered structure opposite to said first end zone and including said incident end face of said light transmitter is enclosed between an upper end portion and a lower end portion of said holder, with end edges of said light diffusing sheet and said reflecting sheet located in said second end zone being laid respectively underneath said upper end portion and said lower end portion, with respective minimum spaces kept between said upper end portion of said holder and said light diffusing sheet and between said lower end portion of said holder and said reflecting sheet for allowing movement of said light diffusing sheet and said reflecting sheet relative to said light transmitter in directions along the upper side and lower side surfaces of said light transmitter except at said portion fixed by said fixing means.

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**5,497,294**

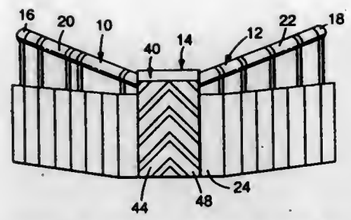
## CONSPICUITY ENHANCER

**John F. Dreyer, Jr., North Oaks, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.**

**Continuation of Ser. No. 926,818, Aug. 7, 1992, abandoned. This application Jul. 15, 1994, Ser. No. 275,938**
**Int. Cl.[6] F21V 8/00**
**U.S. Cl. 362—32** **9 Claims**

1. A conspicuity enhancer comprising:





a case defining an optical cavity having an output optical window; and
first and second linear light sources external to said optical cavity, each capable of emitting light along its length, each of said linear light sources having a first end and a second end, each of said light sources having a partially collimated light emitting means for injecting light into said first end whereby most of said light emitted by said linear light sources is visible only to a viewer looking along said length and each of said linear light sources having said second end attached to said case such that said linear light sources are in optical communication with said optical cavity, said linear light sources being positioned so as to form a V.

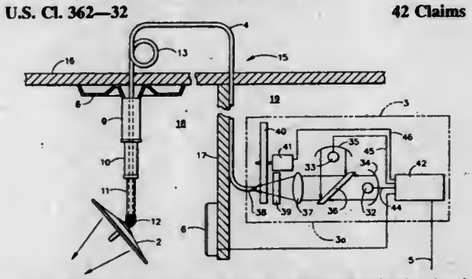
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**5,497,295**

## LIGHTING SYSTEM

**Joel C. Gehly, McKean, Pa., assignor to Lumitek Development, Inc., Girard, Pa.**

**Filed Jun. 14, 1993, Ser. No. 75,996**
**Int. Cl.[6] F21V 7/04**
**U.S. Cl. 362—32** **42 Claims**



1. A lighting assembly for directing a high illumination level light output onto at least one specifically defined task area or site to be illuminated, said lighting assembly comprising at least one lighting system, said at least one lighting system comprising a lighthead, together with a light source module, and an elongated light piping member therefor, said light piping member comprising an elongated sheath containing a single light transmitting strand or a bundle of light transmitting strands of lesser diameter, said light piping member having first and second ends, said light source module and said lighthead being interconnected by said light piping member, said light source module having a light source and means for focusing light from said light source onto said first end of said light piping member, and means in said lighthead to collect, control and direct light from said second end of said light piping member onto said site, a ceiling mounted support assembly for supporting and maintaining said lighthead in a plurality of adjusted positions and at a plurality of adjusted angularities, said light source and said light piping member of said at least one lighting system being fully contained within said support assembly, said light source module of said at least one lighting system being remote from said lighthead thereof, said lighthead and said support assembly being provided with a quick connect and disconnect coupling whereby said lighthead can be easily connected to and released from said support assembly, said second end of said light piping member being located in said support assembly adjacent said quick connect and disconnect coupling.

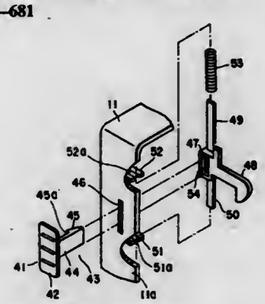
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**5,497,296**

## ELECTRONIC APPARATUS WITH HINGED DISPLAY AND LATCH MECHANISM FOR RELEASABLY LATCHING DISPLAY IN CLOSED POSITION

**Youji Satou, and Katumaru Sasaki, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Tokyo, Japan**

**Continuation of Ser. No. 260,603, Jun. 15, 1994, abandoned, which is a continuation of Ser. No. 158,927, Nov. 29, 1993, abandoned, which is a division of Ser. No. 118,481, Sep. 8, 1993, Pat. No. 5,316,491, which is a continuation of Ser. No. 900,974, Jun. 18, 1992, abandoned. This application Jan. 27, 1995, Ser. No. 379,008**
**Claims priority, application Japan, Jul. 30, 1991, 3-190207**
**Int. Cl.[6] G06F 1/16; H05K 5/03**
**U.S. Cl. 361—681** **16 Claims**



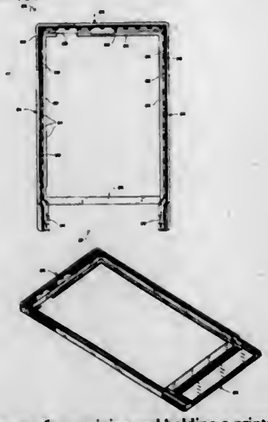
1. An electronic apparatus comprising:
a flat box-like body;
a keyboard arranged on a front portion of an upper surface of the body;
a display having a pivotal portion attached to a rear end portion of the upper surface of the body and rotatable between a closed position where the display covers the keyboard and an opened position where the display exposes the keyboard, the display comprising a main body which includes a substantially rectangular bottom case having a lateral wall erected along a peripheral edge of the bottom case and a cover fitted to the bottom case with a given space therebetween, and a liquid crystal display section arranged within the display main body; and
a latch mechanism for holding the display in the closed position; said latch mechanism comprising:
an operation knob slidably disposed on an outer surface of the lateral wall of the bottom case;
a hook projecting from the operation knob into the bottom case through the lateral wall;
a slider arranged inside the lateral wall so as to oppose the operation knob and movable integrally with the operation knob, the slider including a slider main body having a through hole through which the hook passes, an engaging portion engaged with the hook, and a latch claw projecting from the slider main body through the cover;
a projection protruding from the cover and abutting against the hook, for preventing the hook from moving in a direction for disengaging from the engaging portion; and
a latch portion provided at the body, for engaging the latch claw when the display is rotated to the closed position.

5,497,297

## FRAME AND COVER STRUCTURE FOR INTEGRATED CIRCUIT CARDS

Callen S. Kilmer, Roseville, and James R. Baehne, Placerville, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Jun. 28, 1994, Ser. No. 267,459
Int. Cl.[6] H05K 1/14
U.S. Cl. 361—737 36 Claims



1. An apparatus for receiving and holding a printed circuit board comprising:

a cover having a bottom surface upon which an adhesive is deposited; and

a frame coupled to the cover for receiving the printed circuit board, the frame having a bonding surface that includes a plurality of adhesive thickness control bumps, each of the plurality of adhesive thickness control bumps being of a predefined height for limiting a bondline thickness of the adhesive when the bottom surface of the cover is bonded to the frame.

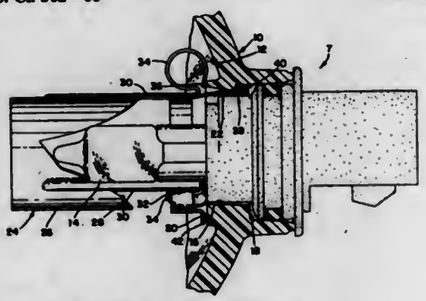
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5,497,298

## HEADLAMP ASSEMBLY WITH COIL SPRING BULB SHIELD

John M. Lualdi; Jan A. Wisler; Joseph C. Ballman, all of Anderson, and David B. Barnes, Carmel, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 12, 1994, Ser. No. 353,592
Int. Cl.[6] B60Q 1/02
U.S. Cl. 362—61 7 Claims



1. A vehicle headlamp assembly comprising:

a light bulb providing a source of illumination;

a reflector housing with a central opening and with a reflector surface for reflecting illumination given by the light bulb, the reflector housing central opening mounting the light bulb, the reflector housing having a first surface opposite the reflector surface adjacent the central opening and a second surface on the same side of the reflector surface generally adjacent the central opening; and

a bulb shield, having a first portion along a first end, the first portion being generally closely adjacent to the light bulb for blocking a portion of illumination provided by the light bulb, the bulb shield having at an end opposite the first end at least one foot penetrating through the central opening with a radially outwardly extending toe engaging the reflector housing first surface, and the bulb shield having a coil spring contacting the reflector second surface urging the first end of the bulb shield away from the first and second surfaces of the reflector housing.

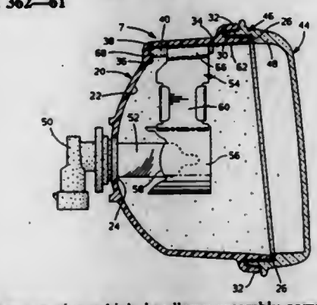
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5,497,299

## HEADLAMP ASSEMBLY WITH HOOK-IN BULB SHIELD

Jan A. Wisler; John M. Lualdin, both of Anderson, Ind.; Duane E. Ormes, Monroe, La.; Randall J. Smith, Anderson, Ind.; Terry L. Coombs, Anderson, Ind., and Ernst K. Werner, Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 12, 1994, Ser. No. 353,593
Int. Cl.[6] B60Q 1/02
U.S. Cl. 362—61 8 Claims



1. An automotive vehicle headlamp assembly comprising:

a reflector housing having a generally open front end, the reflector housing also having a first reflector surface and a second surface projecting generally forward from the first reflector surface defining an intersection therebetween;

a bulb connected to the housing projecting forward from the reflector surface, providing a source of illumination;

a lens covering the open end of the reflector housing; and

a bulb shield having a first portion generally adjacent the bulb, blocking a portion of the illumination given off by the bulb, and the bulb shield having a foot connected by a leg to the first portion, the foot having a front end captured between the lens and the reflector housing and a rear end captured in the intersection between the first reflector surface and the second reflector surface.

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5,497,300

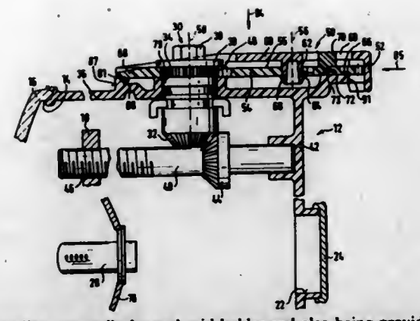
## HEADLIGHT FOR VEHICLES

Kurt Haug, Reutlingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Aug. 29, 1994, Ser. No. 298,228
Claims priority, application Germany, Sep. 30, 1993, 43 33 297.8
Int. Cl.[6] B60Q 1/04
U.S. Cl. 362—66 11 Claims

1. A headlight for a vehicle, comprising a reflector; a holder with which said reflector is displaceably connected; at least one displacing device for displacing said reflector relative to said holder, said displacing device having an adjusting element for its actuation and





extending outwardly beyond said holder and also being provided with a toothing; an indicating device which indicates a deviation of an adjustment of said reflector from a predetermined nominal adjustment and having a toothed wheel which engages with said toothing of said adjusting element, said toothed wheel of said indicating device having an end surface provided with a spiral-shaped groove; and a slider engaging in said groove and displaceably guided in a receptacle in a structural element which is stationary relative to said toothed wheel so as to indicate said deviation of the adjustment of said reflector from said nominal adjustment.

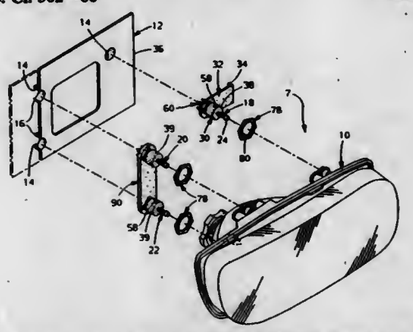
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5,497,301

## HEADLAMP ADJUSTMENT MECHANISM

David R. Mc Mahan, Noblesville; Mark L. Whittemore, New Palestine; Thomas B. Slick, Fishers; Tom Sweetland, Columbus; Steven V. Horsman, Indianapolis; Carey D. Marks; Jan A. Wisler, both of Anderson; Eric S. Donovan, Noblesville, and Brian E. Witte, Anderson, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 13, 1995, Ser. No. 388,259
Int. Cl.[6] B60Q 1/04
U.S. Cl. 362—66 7 Claims



1. An automotive vehicle headlamp mounting arrangement for connecting a reflector body of a headlamp with a panel of an automotive vehicle, the panel having an aperture, the arrangement comprising:

a screw with a first end connecting the reflector body and a second end extending toward the panel aperture;

a retainer body having a base engaged with the vehicle panel in a nonrotative fashion, the retainer body having a head portion extending from the base encircling and mounting the screw, the retainer body having a central aperture generally aligned with the screw and the panel aperture;

a barb piece having a central opening allowing penetration of the screw, the barb piece having a head nonrotatively engaged with the base of the retainer body and at least partially encircled thereby, the barb piece head having an outer threaded periphery, the barb piece also having extending from the head through the panel aperture a plurality of legs with outer gripping surfaces extending radially outwardly with respect to said screw for contacting an edge of the panel aperture generally opposite the headlamp reflector body; and

a nut with a central aperture for passage of the retainer body head portion, the nut having inner threads engaging the outer periphery of the barb piece head, causing the retainer body base to be clamped to the panel and the barb piece to be pulled toward the retainer body head and causing the gripping surfaces of the barb piece to be clamped against the panel aperture edge, thereby affixing the screw to the panel to affix the reflector body to the automotive vehicle.

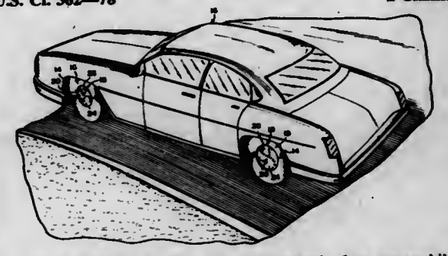
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5,497,302

## LIGHTED HUBCAP

Walter O'Donnell, 953 Spur Dr. North, Bayshore, N.Y. 11706

Filed Dec. 19, 1994, Ser. No. 358,485
Int. Cl.[6] B60Q 1/00
U.S. Cl. 362—78 2 Claims



1. A lighted hubcap for a hub on a wheel of an automobile comprising:

a) a round cover that snaps onto the hub, said round cover being made of metal and having a convex shape and having a plurality of small apertures therethrough;

b) means in said round cover, for illuminating said round cover, said illuminating means being a plurality of lamp units, each lamp unit mounted through one said aperture in said hubcap, each said lamp unit including a ring-shaped frame having a plurality of radial tabs extending therefrom to lock into said apertures in said hubcap's cover, a lens mounted in said frame, a socket on said frame behind said lens, and a light bulb carried in said socket, to provide a source of light therefrom, said lamp units being placed in a specific array on said hubcap for an aesthetic appearance, said specific array of said lamp units being in a triskelion pattern in said hubcap, in which said lamp units are in three curved branch formations radiating from a common center of said hubcap;

c) means in said round cover, for supplying electrical power to said illuminating means only when the automobile moves along and rotates the wheel with said round cover, said electrical power supplying means including a battery, an electric circuit connecting said battery with parallel wiring to all of said sockets with said light bulbs in said lamp units, and a normally opened weight activated switch connected in said electric circuit between said battery and all of said sockets in said lamp units, so that when said hubcap rotates when the automobile moves along, said switch will close by centrifugal force, causing said light bulbs to illuminate; and

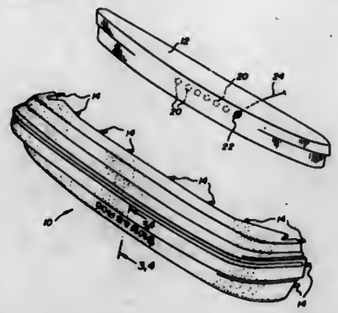
d) a support strut extending diametrically across the back of said hubcap, so as to retain said battery centrally and said switch off center on said hubcap.

5,497,303

## METHOD AND APPARATUS FOR VEHICLE DETAILING

Marco V. Decinti, 9415 Sheridan St., Lanham, Md. 20706, and William A. Murray, 2025 W. Old Liberty Rd., Westminster, Md. 21157

Filed Jun. 10, 1994, Ser. No. 257,564
Int. Cl.[6] G09F 21/04
U.S. Cl. 362—80 7 Claims



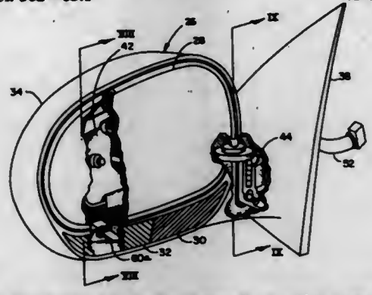
1. A display light in combination with a vehicle, said display light including a light source, mounting means for mounting said light source adjacent an orifice formed in a portion of a vehicle, translucent lens means capable of passing light from said light source through said orifice for providing decorative indicia, and means for mounting said lens means in alignment with said light source for passing light through the vehicle orifice, said portion of a vehicle being of a plastic cover member (10), and said indicia being in the form of letters cut through said plastic cover member.

5,497,305

## REMOTE-ACTUATED EXTERIOR VEHICLE SECURITY LIGHT

Todd W. Pastrick, Grand Haven; Linda K. Molenkamp, Fruitport, and Roger L. Koops, Holland, all of Mich., assignors to Donnelly Corporation, Holland, Mich.

Continuation of Ser. No. 11,947, Feb. 1, 1993, Pat. No. 5,371,659. This application Nov. 2, 1994, Ser. No. 333,412
The portion of the term of this patent subsequent to Dec. 6, 2011, has been disclaimed.
Int. Cl.[6] B60Q 1/26
U.S. Cl. 362—83.1 41 Claims



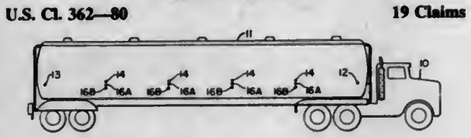
1. A mirror assembly security system for a vehicle comprising:
a first exterior mirror assembly including a first reflective element and a first housing for said first reflective element;
a first security light projecting light from said first housing on at least a first area adjacent a first portion of the vehicle in order to create a first lighted security zone in said first area; and
an actuator for said first security light including a base unit in the vehicle and a remote transmitter, wherein said base unit is responsive to a signal from said remote transmitter in order to actuate said first security light to thereby establish a security zone when approaching the vehicle.

5,497,304

## SIDE WARNING LIGHTS

Harold A. Caine, 484 Kent Ct., Oceanside, N.Y. 11572

Filed Mar. 29, 1995, Ser. No. 412,731
Int. Cl.[6] B60Q 1/26
U.S. Cl. 362—80 19 Claims



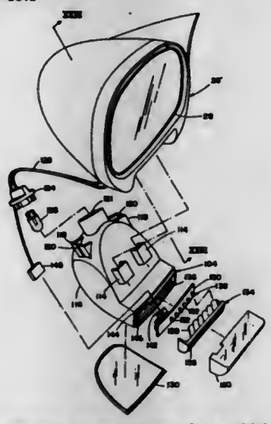
1. Side warning lights for an elongated motor vehicle having running lights comprising:
a first plurality of lights, at least one of each of said first plurality of lights being arranged respectively on opposite sides of said vehicle;
a second plurality of lights, at least one of each of said second plurality of lights being arranged respectively on opposite sides of said vehicle; and
means for selectively energizing said first and second plurality of lights whereby whenever said running lights are energized, said first plurality of lights are energized until said second plurality of lights are energized, at which time said first plurality of lights are deenergized.

5,497,306

## EXTERIOR VEHICLE SECURITY LIGHT

Todd W. Pastrick, Spring Lake, Mich., assignor to Donnelly Corporation, Holland, Mich.

Continuation-in-part of Ser. No. 333,412, Nov. 2, 1994, which is a continuation of Ser. No. 11,947, Feb. 1, 1993, Pat. No. 5,371,659. This application Apr. 21, 1995, Ser. No. 426,591
Int. Cl.[6] B60Q 1/26
U.S. Cl. 362—83.1 106 Claims



1. A mirror assembly security system for a vehicle comprising:



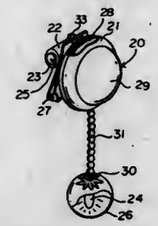
a first exterior mirror assembly including a first reflective element and a first housing for said first reflective element;
a first light module removably positioned substantially within said first housing and wherein a portion of said first light module is positioned behind said first reflective element, said first light module projecting light from said first housing on at least a first area adjacent a first portion of the vehicle in order to create a first lighted security zone in said first area; and
said first light module including a first enclosure, a first light-transmitting opening in said first enclosure facing downwardly and rearwardly of said vehicle, a first cover for said first light-transmitting opening, and a first light source in said first enclosure radiating light through said first light-transmitting opening and wherein said first light module is substantially moisture impervious.

5,497,307

## ILLUMINATING JEWELRY

Tae H. Bae; Sang Y. Bae, and Sang I. Bae, all of 6898 Old Annapolis Rd., Linthicum, Md. 21090

Filed Jun. 28, 1995, Ser. No. 496,007
Int. Cl.[6] F21L 15/08
U.S. Cl. 362—104 8 Claims



1. An illuminating jewelry comprising:
a housing including a mercury battery;
a cap including a light bulb connected to said mercury battery;
an envelope mercury switch connected to said light bulb and said mercury battery through conductive wires; and
clipping means for clipping to a wearer, said clipping means attached to said housing,
whereby anytime said illuminating jewelry is moved, said light bulb is illuminated.

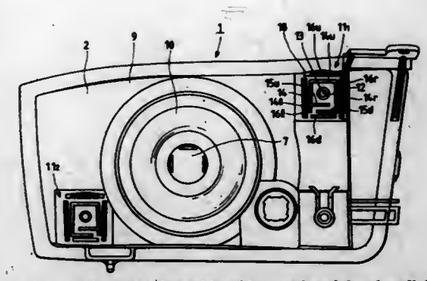
5,497,308

## VEHICULAR LAMP

Yasushi Ohtsuka; Masataka Choji, and Yoshiyuki Fukushima, all of Shizuoka, Japan, assignors to Koito Manufacturing Co., Ltd., Tokyo, Japan

Filed May 2, 1995, Ser. No. 433,208
Claims priority, application Japan, May 9, 1994, 6-117376; Nov. 10, 1994, 6-300207
Int. Cl.[6] F21V 29/00
U.S. Cl. 362—294 10 Claims

1. A vehicular lamp having a ventilation system, comprising
a lamp body having a front opening;
a lens mounted onto said front opening of said lamp body;
a lamp chamber defined by said lamp body and said lens; and
a ventilation system comprising:
a communication hole formed in said lamp body;
a first peripheral wall projecting from a rear surface of said lamp body at a position where said first peripheral wall surrounds said communication hole;
an upper and lower water preventive walls projecting from said first peripheral wall downwardly of said communication hole;
a second peripheral wall surrounding said first peripheral wall, said second peripheral wall projecting from the rear surface of said lamp body;



a lid member engaging with said second peripheral wall for covering said first and second peripheral walls;
a first space defined between said lamp body, said lid member and said first peripheral wall, said first space communicating through said communication hole with said lamp chamber;
a second space defined between said lamp body, said lid member and said upper and lower water preventive walls, said second space communicating with said first space through a first communication passage formed at a first position in the lateral direction; and
a third space defined between said lamp body, said lid member, said lower water preventive wall and said second peripheral wall, said third space communicating with said second space through a second communication passage formed at a second position opposite to said first position, said third space communicating with atmosphere.

5,497,309

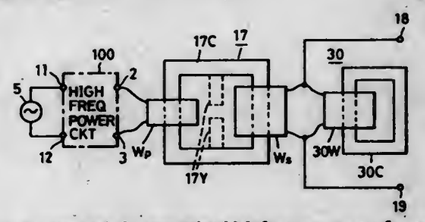
**Patent Not Issued For This Number**

5,497,310

## HIGH-FREQUENCY POWER UNIT FOR NEON TUBES

Makoto Noda, Ibi; Fumio Ichimiya, and Ryoichi Uda, both of Gifu, all of, Japan, assignors to Kabushiki Kaisha Sanyo Denki Seisakusho, Gifu, Japan

Filed Nov. 1, 1993, Ser. No. 143,740
Claims priority, application Japan, Nov. 6, 1992, 4-297245; Nov. 6, 1992, 4-297246; Dec. 18, 1992, 4-338797
Int. Cl.[6] H02M 5/45
U.S. Cl. 363—17 4 Claims




1. A power unit for generating high-frequency power for energizing neon tubes or argon tubes, comprising:
inverter means for converting commercial AC power into high-frequency power;
transformer means which has a magnetic core forming a closed magnetic path and primary and secondary windings wound on said magnetic core and which is supplied at said primary winding with said high-frequency power from said inverter means and outputs high-voltage, high-frequency power to said secondary winding; and
saturable reactor means which is coupled to said transformer means and whose magnetic flux density is saturated when the

output voltage from said secondary winding approaches a predetermined value, thereby preventing the output voltage from said secondary winding from exceeding said predetermined value, said saturable reactor means having a leakage magnetic path provided between said primary and secondary windings of said transformer means, a secondary side magnetic path of said transformer means being magnetically saturated when the output voltage from said secondary winding becomes 1.1 to 2.0 times higher than its rated voltage.

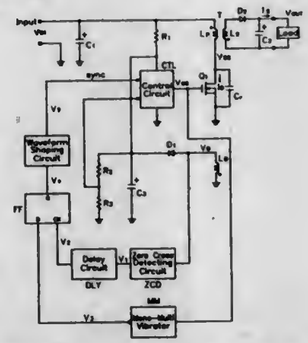
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**5,497,311**

## SWITCHING POWER SOURCE OF THE VOLTAGE RESONANCE TYPE

**Masuo Hanawaka, Tokyo, Japan, assignor to Yokogawa Electric Corporation, Tokyo, Japan**

**Filed Feb. 27, 1995, Ser. No. 394,874**
**Claims priority, application Japan, Mar. 22, 1994, 6-050380**
**Int. Cl.[6] H02M** *3/335*
**U.S. Cl. 363—21** **8 Claims**




1. In a switching power source of a voltage resonance type comprising

a switching element to which a voltage is applied:

detecting means for detecting zero axis crossings of said voltage applied to said switching element and for providing a first signal having a leading edge at one zero crossing and a trailing edge at a subsequent zero crossing;

wave shaping means responsive to a signal for providing a synchronizing signal; and

control means responsive to said synchronizing signal for turning ON said switching means; the improvement comprising

switching means responsive to the turning ON of said switching means by said control means for generating a predetermined timing signal; and

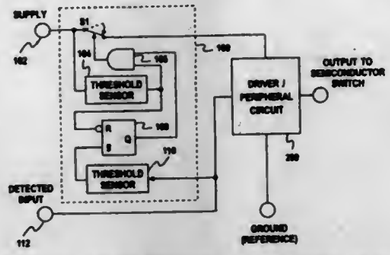
inhibiting means responsive to concurrent receipt of said predetermined timing signal from said switching means and said first signal from said detecting means for providing an inhibit signal to said wave shaping means, said inhibit signal become of one level when said first signal is at a leading edge during a period of inhibition and becoming of another level when said first signal is at another leading edge after said period of inhibition, whereby said wave shaping means responsive to said inhibit signal provides said synchronizing signal to said control means after said period of inhibition so that said switching element is inhibited from being turned ON during said period of inhibition and whereby the switching period of said switching element remains substantially unchanged even with change of load.

**5,497,312**

## DRIVE SIGNAL CONTROLLED UNDERVOLTAGE LOCKOUT CIRCUIT

**Brian P. Erisman, Colorado Springs, Colo., assignor to Toko America, Inc., Mount Prospect, Ill.**

**Filed May 13, 1993, Ser. No. 62,418**
**Int. Cl.[6] H02M** *7/517*
**U.S. Cl. 363—49** **7 Claims**




1. In a power converter employing DC to DC power conversion, said power converter configured to include a semiconductor switch device, a controller for providing a switch signal to control a duty ratio of said semiconductor switch device to thereby regulate the output of the power converter, and a driver coupled between said semiconductor switch device and said controller for receiving said switch signal and for driving said semiconductor switch device in accordance therewith, the improvement comprising an under-voltage lockout circuit for maintaining a standby mode of operation of said power converter when a supply voltage powering both said controller and said driver is below a predetermined threshold level and for enabling a normal mode of operation of said power converter when said supply voltage rises above said predetermined threshold level and said controller has transitioned from a standby mode to a normal mode of operation, said under-voltage lockout circuit comprising:

a first threshold sensor for sensing said supply voltage;

a second threshold sensor for sensing a transition from said standby mode to said normal mode of operation of said controller;

logic means for receiving an output logic signal from each of said first and second threshold sensors; and

switch means, coupled to said logic means, for receiving said output logic signal therefrom and for controlling application of said supply voltage to said driver in response thereto.

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**5,497,313**

## SWITCHING METHOD AND APPARATUS FOR INCREASING EFFICIENCY OF AN INDUCTIVE LOAD AND SWITCHING MEANS SUPPLYING THE LOAD

**Francis Bidaud, DuClair; Sylvain Benoit, Artas; Jacques Plisson, Barentin; Gérard Rilly, Unterkirnach; Gérard Morizot, Villingen, and Harald Roth, Munchweiler, all of, France, assignors to L'Unite Hermetique, La Verpilliere, France**

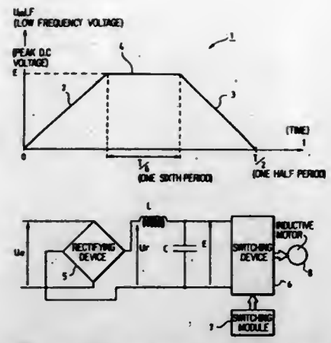
**Filed Dec. 28, 1993, Ser. No. 174,417**
**Claims priority, application France, Dec. 30, 1992, 92 15910**
**Int. Cl.[6] H02M** *7/00*
**U.S. Cl. 363—125** **9 Claims**

1. A switching method for increasing an efficiency of an inductive load and switching means, said switching means including a switching device and supplying the load, from a D.C. voltage E, with a resulting voltage, said method comprising the steps of:

switching said switching device according to a high frequency PWM process for connecting said D.C. voltage E to terminals of the inductive load during a first part of each half period T/2 and for creating a rising low frequency contribution UmLF which rises from 0V to a maximum value of the D.C. voltage E;

maintaining the D.C. voltage E connected to the terminals of the inductive load for at least a sixth of the period T/6 during each






said half period T/2, said maintaining step creating a plateau in said low frequency contribution with the maximum value of the D.C. voltage E applied to the terminals of the inductive load; and

switching said switching device according to a high-frequency PWM process for connecting said D.C. voltage E to the terminals of the inductive load during a remaining part of each said half period T/2 and for creating a declining low frequency contribution UmLF which declines from said maximum value of the D.C. voltage E to 0V.

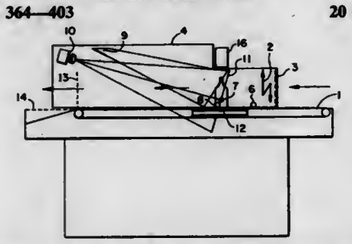
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**5,497,314**

## AUTOMATED APPARATUS AND METHOD FOR OBJECT RECOGNITION AT CHECKOUT COUNTERS

**Jeffrey M. Novak, 4322 Collins Way, Lake Oswego, Oreg. 97035**

**Filed Mar. 7, 1994, Ser. No. 206,955**
**Int. Cl.[6] G06F** *153/00*
**U.S. Cl. 364—403** **20 Claims**




1. A method for automatically recognizing and identifying, without human intervention, a particular object from a set of unknown objects of different sizes, shapes and pictorial characteristics for purposes of customer billing and inventory control, said method comprising:

providing a computerized data base for storage of object data sets for all objects to be identified, the data sets containing information regarding the size and shape of each object and one or more digitized images of pictorial characteristics of each object from various random orientations by which each object can be recognized and identified by the combination of size, shape and pictorial characteristics;

providing an identification station into which each object to be identified can be introduced without regard to its orientation within the station;

viewing each object at the identification station to capture a digital image of the object;

converting the captured image to a digitized signal;

communicating to the computerized data base the digitized signal of the image captured at the identification station;

comparing the digitized signal of the captured image with the stored object data sets within the computerized data base until the highest correlating combination of size, shape and pictorial characteristics extracted from the digitized signal of the captured image is made with one or more of the object data sets contained within the data base of object data sets; and

positively recognizing and identifying the object by said comparison.

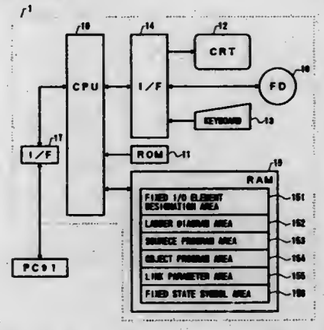
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**5,497,315**

## PROGRAMMING DEVICE FOR PROGRAMMABLE SEQUENCE CONTROLLERS

**Kenro Sugiura, Takahama, and Teiji Uno, Chiryu, both of, Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan**

**Filed Feb. 25, 1994, Ser. No. 201,856**
**Claims priority, application Japan, Feb. 26, 1993, 5-062590; Feb. 26, 1993, 5-062591**
**Int. Cl.[6] G05B** *11/01*
**U.S. Cl. 364—140** **6 Claims**




1. A programming device connectable to a plurality of programmable sequence controllers for preparing a sequence control program to be executed by one of any one of said programmable sequence controllers, said programming device comprising:

first program memory means for storing the sequence control program for said one of any one of said sequence controllers, said sequence control program including I/O elements of said one of any one of said programmable sequence controllers, said sequence control program also including I/O elements of others of said programmable sequence controllers, the states of whose elements are input via a link line connecting all of said programmable sequence controllers;

display means for visibly displaying the control program in the form of a ladder diagram;

program read-out means for reading out the sequence control program from the first program memory means so as to display the sequence control program on the display means;

designation means for enabling an operator to designate an I/O element of said others of said programmable sequence controllers being displayed and to fix the state of the designated I/O element to either ON or OFF state so as to prepare a modified sequence control program; and

second program memory means for storing the modified sequence control program.

5,497,316

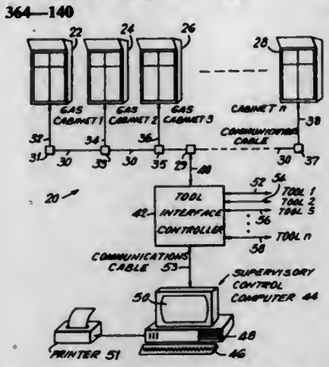
## PROCESS GAS DISTRIBUTION SYSTEM AND METHOD

Dennis A. Sierk; Ronald R. DuRoss, both of Huntsville; Stephen G. Geist, Union Grove, all of Ala., and Gregory L. Hayes, Fayetteville, Tenn., assignors to SCI Systems, Inc., Huntsville, Ala.

Continuation of Ser. No. 242,145, May 13, 1994, abandoned, which is a continuation of Ser. No. 3,554, Jan. 13, 1993, abandoned, which is a division of Ser. No. 576,067, Aug. 31, 1990, Pat. No. 5,220,517. This application Apr. 4, 1995, Ser. No. 416,511

Int. Cl.[6] G05B 11/01; G06F 15/00

U.S. Cl. 364—140 16 Claims




1. A process gas distribution control unit, said control unit comprising, in combination, a cabinet, a plurality of distribution conduit legs and an interconnecting conduit between said distribution conduit legs in said cabinet, means for delivering process gas selectively through at least one of said conduit legs to one or more utilization locations, means responsive to computer control for selectively isolating said legs from said interconnecting conduit and from one another, and for purging said legs by a cycle of alternatingly connecting each of said distribution legs first to a vacuum source to evacuate said legs, and then to a purge gas source to fill said legs with a purge gas, said purging of said legs being accomplished while permitting delivery of process gas to one or more utilization locations through said interconnecting conduit and through those legs which are not being purged at the same time, and computer means for controlling and repeating said cycle a pre-determined number of times, in accordance with stored data representing said pre-determined number.

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5,497,317

## DEVICE AND METHOD FOR IMPROVING THE SPEED AND RELIABILITY OF SECURITY TRADE SETTLEMENTS

John G. Hawkins, Hopkinton; Loni J. Paul, Charlestown; Phillip R. Cardwell, Marblehead; Peter T. Reeves, Needham; Helen B. Dean, Milford; Daniel B. Doherty, V, Scituate, and Paul J. Flaherty, Brighton, all of Mass., assignors to Thomson Trading Services, Inc., Boston, Mass.

Filed Dec. 28, 1993, Ser. No. 174,231

Int. Cl.[6] G06F 17/60

U.S. Cl. 364—408 32 Claims

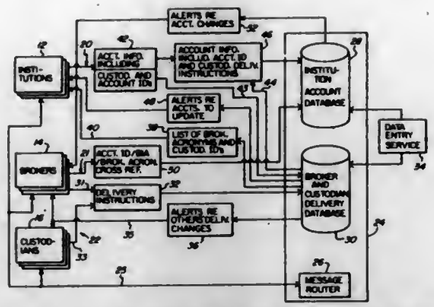
1. A device for communicating security settlement information between an investor, a broker and a custodian, comprising:

first and second databases having software and hardware for storing and retrieving data according to unique identifiers;

a plurality of broker delivery instructions stored on said first database according to broker identifiers;

information about a plurality of investor accounts stored on said second database according to account identifiers;

a broker transmitter for transmitting a broker identifier to a first database receiver;




a first database transmitter for transmitting a broker delivery instruction retrieved from said first database with the received broker identifier to an investor receiver;

an investor transmitter for transmitting the broker delivery instruction received from the first database transmitter, said investor transmitter also for transmitting an account identifier to a second database receiver;

a second database transmitter for transmitting account information retrieved from said second database with the received account identifier;

a broker receiver for allocating traded security shares according to the account information received from said second database transmitter; and

a custodian receiver for initiating an exchange of funds and securities according to the broker delivery instruction received from said first database transmitter to settle the trade.

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5,497,318

## ELECTION TERMINAL APPARATUS

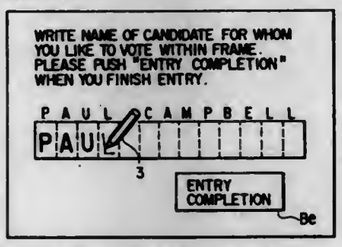
Takayoshi Miyagawa; Shigenori Matsushita; Takayuki Tsuchida; Yoshiyuki Miura; Naoko Shimojima; Katsutoshi Ishikawa, and Kunio Ueda, all of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, and The Center for Political Public Relations, Inc., Tokyo, both of, Japan

Filed Jul. 20, 1993, Ser. No. 93,675

Claims priority, application Japan, Jul. 20, 1992, 4-192192; Jul. 20, 1992, 4-192303; Jul. 20, 1992, 4-192306

Int. Cl.[6] G06F 17/60; G06G 7/48; G07C 13/00

U.S. Cl. 364—409 18 Claims




1. An election terminal apparatus comprising;

first display means for displaying an item of candidates;

selection means for selecting one of the candidates displayed by said first display means;

second display means responsive to said selection means, for displaying an input area for causing a voter to input a plurality of handwritten characters specifying the candidate selected by said selection means;

input means for inputting the plurality of handwritten characters specifying a candidate;

recognition means for recognizing a pattern data corresponding to the handwritten characters input by said input means and outputting a recognized character; and



comparison means for checking whether a candidate specified by the plurality of handwritten characters recognized by said recognition means coincides with a candidate selected by said selection means.

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5,497,319

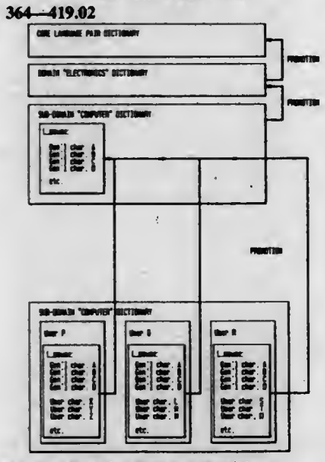
## MACHINE TRANSLATION AND TELECOMMUNICATIONS SYSTEM

Leighton K. Chong, New York, N.Y., and Christine K. Kamprath, Austin, Tex., assignors to Trans-link International Corp., Honolulu, Hi.

Continuation of Ser. No. 920,456, Aug. 12, 1992, abandoned, which is a continuation-in-part of Ser. No. 636,400, Dec. 31, 1990, Pat. No. 5,175,684. This application Sep. 26, 1994, Ser. No. 312,440

Int. Cl.[6] G06F 17/28

U.S. Cl. 364—419.02 6 Claims




1. A machine translation system comprising:

(a) a machine translation module for performing machine translation of an input text in a source language to an output text in a target language using a dictionary database containing entries for words of the target language corresponding to words of the source language;

(b) a dictionary database including a core language dictionary containing entries for generic words of a source/target language pair, a plurality of sublanguage dictionaries each containing entries for specialized words of a respective one of a plurality of sublanguages bandled by the machine translation system for the source/target language pair, and a plurality of user dictionaries each containing entries for individualized words used by a respective one of a plurality of users of the machine translation system for the source/target language pair;

(c) a receiving interface for receiving a particular input text sent by a particular user and accompanying control inputs indicative of a preferred sublanguage applicable to the particular input text out of a plurality of possible sublanguages and indicative of a preferred user dictionary out of the plurality of user dictionaries; and

(d) a dictionary control module responsive to the control inputs received by the receiving interface for causing the machine translation module to use the core language dictionary, and for selecting a preferred sublanguage dictionary and a preferred user dictionary for use by the machine translation module for translation of the input text,

wherein said receiving interface further includes a programmed module for allowing users of the machine translation system to input scratch entries for individualized words into their respective user dictionaries, and wherein said dictionary control module further includes an automated dictionary maintenance utility for automatically assessing whether a word entry has been entered as a scratch word entry in common to a given number or grouping of users through their respective user dictionaries and for thereupon automatically entering said word entry into a higher-level sublanguage dictionary for a sublanguage encompassing those users.

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5,497,320

## TWO-LEVEL DOCUMENT PROCESSING METHOD

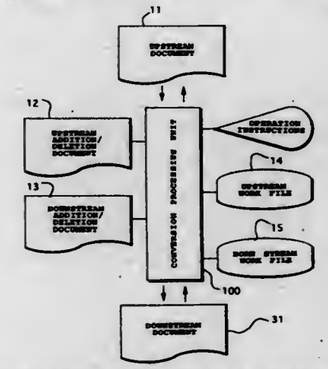
Kenji Uemoto; Tokuji Ohta, and Shigeharu Kawai, all of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Apr. 18, 1994, Ser. No. 229,272

Claims priority, application Japan, Apr. 19, 1993, 5-115343

Int. Cl.[6] G06F 3/14; 17/24

U.S. Cl. 364—419.17 38 Claims




1. A two-level document processing method preparing a downstream document on the basis of an upstream document, said upstream document being a document associated with a product and placed near a user, and said downstream document being a document associated with the product and placed near a maker, said method comprising the steps of:

comparing the upstream document with an upstream deletion document including information which is particular to the upstream document and is unnecessary for the downstream document;

selecting, from the upstream document and based on results of the step of comparing, a deletion candidate to be deleted from the upstream document until no more deletion candidate is found; and

preparing the downstream document by performing deletion or non-deletion of the deletion candidate from the upstream document in accordance with results of the step of selecting.

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5,497,321

## WELL LOGGING METHOD FOR DETERMINING FRACTIONAL FLOW CHARACTERISTICS OF EARTH FORMATIONS

T. S. Ramakrishnan, Bethel, and David J. Wilkinson, Ridgefield, both of Conn., assignors to Schlumberger Technology Corporation, Ridgefield, Conn.

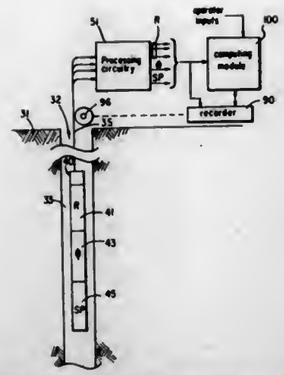
Filed Jan. 11, 1994, Ser. No. 180,083

Int. Cl.[6] G06F 19/00

U.S. Cl. 364—422 21 Claims

1. A method for producing a log of fractional flow characteristics of formations surrounding an earth borehole, comprising the steps of:

a) suspending a logging tool in the borehole;




b) producing several resistivity measurements, having respectively different radial depths of investigation, as said logging tool is moved through said borehole, to obtain several resistivity logs;
c) selecting model fractional flow parameters;
d) determining a formation conductivity model as a function of said model fractional flow parameters;
e) generating several simulated resistivity log values at said respective radial depths of investigation from said, formation conductivity model;
f) comparing said simulated resistivity log values with values from said resistivity logs obtained from said resistivity measurements to obtain an error indication;
g) modifying said model fractional flow parameters;
h) repeating steps (d) through (g) until a predetermined criterion is met; and
i) outputting said modified fractional flow parameters as formation fractional flow characteristics.

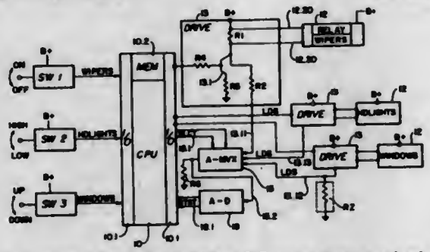
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**5,497,322**

**MONITORING THE CHARACTERISTICS OF A LOAD DRIVER CONTROLLED BY A MICROCONTROLLER**

**Darrell J. Kolomyski, Chesterfield, and John A. Barrs, Clawson, both of Mich., assignors to United Technologies Automotive, Inc., Dearborn, Mich.**

**Continuation of Ser. No. 967,464, Oct. 26, 1992. This application Mar. 20, 1995, Ser. No. 407,562**
**Int. Cl.[6] G12B *1/04***
**U.S. Cl. 364—424.03** **28 Claims**




1. A control system comprising a DC power source, a load, a drive, and a control for activating the drive to provide power to the load, characterized in that:
the drive comprises means in connection with said load and the power source for producing a load test signal with a magnitude that is a function of load resistance;
means for converting said load test voltage into a digital signal equivalent supplied to the control; and
said control comprises signal processing means for receiving said digital signal before said drive is activated, for comparing said digital signal to a stored signal for said load and for preventing activation of said drive if the difference between said digital signal and said stored signal exceeds a stored magnitude.

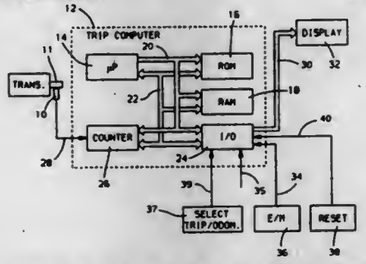
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**5,497,323**

**TRIP COMPUTER WITH RETROACTIVE RESET**

**Clark E. McCall, Ann Arbor; Joseph A. Heller, Brighton; James V. Clore, Howell; Joseph R. Pastorek, Highland, and Jon M. Rathbun, Brighton, all of Mich., assignors to General Motors Corporation, Detroit, Mich.**

**Filed Dec. 16, 1993, Ser. No. 167,101**
**Int. Cl.[6] G06F *13/00***
**U.S. Cl. 364—424.04** **6 Claims**




1. A method of operating an apparatus for maintaining and indicating trip data for a vehicle comprising the step of, responsive to an operator input, retroactively resetting the trip data to indicate data maintained since an ignition on of the vehicle.

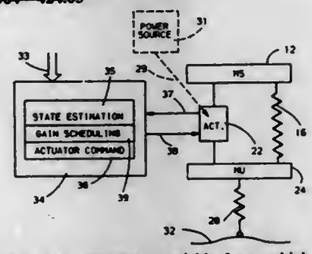
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**5,497,324**

**VEHICLE SUSPENSION SYSTEM WITH GAIN SCHEDULING**

**Rassem R. Henry, Clinton Township, and Michael A. Applebee, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.**

**Continuation-in-part of Ser. No. 762,873, May 20, 1991, Pat. No. 5,276,621, and a continuation-in-part of Ser. No. 702,874, May 20, 1991, and a continuation-in-part of Ser. No. 762,875, May 20, 1991. This application Sep. 3, 1993, Ser. No. 115,604**
**Int. Cl.[6] B60G *17/00***
**U.S. Cl. 364—424.05** **4 Claims**




1. A method of controlling a variable force vehicle suspension system comprising a wheel and a body comprising the steps of:
determining relative velocity between the wheel and the body;
detecting an occurrence of a present change in a sign of the determined relative velocity;
when the present change in the sign of the relative velocity is detected, determining a time lapse between a previous change in the sign and the present change in the sign, which time lapse is representative of a primary frequency component of the relative velocity;
scheduling, from a table in a computer memory, control gains responsive to the time lapse;



determining an actuator force command responsive to the scheduled control gains: and
controlling the suspension system responsive to the actuator force command, wherein the control gains are rapidly scheduled responsive to a road input.

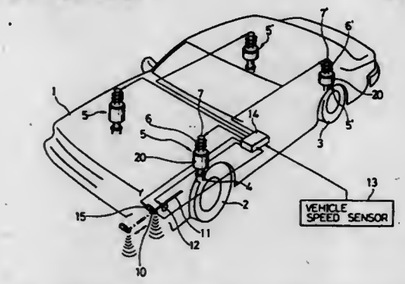
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**5,497,325**

**SUSPENSION CONTROL SYSTEM FOR A VEHICLE**

**Atsushi Mine, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan**

**Continuation-in-part of Ser. No. 97,233, Jul. 27, 1993, abandoned. This application Feb. 8, 1994, Ser. No. 193,552**
**Claims priority, application Japan, Aug. 31, 1992, 4-255581; Sep. 29, 1992, 4-283707**
**Int. Cl.[6] B60G *17/015***
**U.S. Cl. 364—424.05** **6 Claims**




1. A suspension control system for a vehicle comprising:
a vehicle body and a plurality of vehicle wheels, a suspension interposed between said body and said wheels,
a vehicle speed sensor mounted on said vehicle for detecting a speed of said wheels and for generating a vehicle speed signal,
a shock absorber with a spring and a variable attenuation system, and an actuator provided in said shock absorber for controlling an attenuation force,
a road surface sensor mounted under a front side of said vehicle body for detecting roughness of a road surface in front of each of said wheels and for producing a road surface condition signal;
a displacement apparatus connected to said road surface sensor for forwardly and rearwardly moving said road surface sensor;
an angular displacement apparatus engaged with said displacement apparatus for rotatably changing an angle of said road surface sensor against said road surface; and
control means responsive to said vehicle speed signal and said road surface condition signal for processing and outputting an actuating signal selectively to said displacement apparatus and said angular displacement apparatus without delay and for generating an adjusted attenuation signal so as to enable an optimum control of said suspension and a stable attitude control of said vehicle in any driving condition.

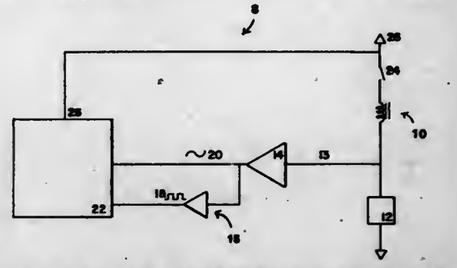
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**5,497,326**

**INTELLIGENT COMMUTATION PULSE DETECTION SYSTEM TO CONTROL ELECTRIC D.C. MOTORS USED WITH AUTOMOBILE ACCESSORIES**

**Kerry Berland, Chicago; Jeff Kaul, Arlington Heights, and Mitchell Budniak, Highland Park, all of Ill., assignors to The Cherry Corporation, Waukegan, Ill.**

**Filed Aug. 3, 1994, Ser. No. 285,310**
**Int. Cl.[6] G05B *23/02*; G05G *5/04***
**U.S. Cl. 364—424.05** **29 Claims**



1. A control system for use with a bidirectional motor connected to a motorized vehicle accessory to move said accessory a distance from a first position to a second position, said control system comprising:
(a) a detector responsive to control signals emitted by said motor during rotation, said control signals indicative of an amount of rotation of said motor;
(b) a memory; and
(c) a controller responsive to said memory and said detector, and providing an output signal to said motor for operation thereof as a function of a relationship between said distance and said control signals, said controller further including:
a routine for applying an adjustment factor to said output signal to correct for inaccuracies in detection of said control signals.

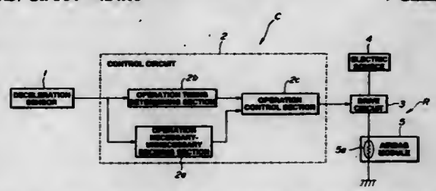
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**5,497,327**

**CONTROL SYSTEM FOR OCCUPANT RESTRAINT SYSTEM**

**Seizi Takaya; Shuzo Fukuzumi, both of Zama; Hiroaki Ohbayashi, Isehara, and Makoto Kimura, Sagamihara, all of, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan**

**Filed Aug. 16, 1994, Ser. No. 288,741**
**Claims priority, application Japan, Sep. 7, 1993, 5-222477**
**Int. Cl.[6] B60R *21/32***
**U.S. Cl. 364—424.05** **7 Claims**




1. A control system for an occupant restraint system on a vehicle, comprising:
means for detecting a deceleration of the vehicle;
means for initiating integration of the deceleration to obtain an integrated value when the deceleration exceeds a predetermined first threshold value;
timing means for determining a time difference between a first point of time at which integration of the deceleration is initiated to a second point of time at which the integrated value of the deceleration exceeds a second threshold value;

means for determining an operation timing of the occupant restraint system in accordance with the time difference determined by said timing means;

means for deciding necessity of operation of the occupant restraint system in accordance with the deceleration detected by said deceleration detecting means; and

means for operating the occupant restraint system at the operation timing determined by said operation timing determining means in response to the necessity of operation decided by said necessity deciding means.

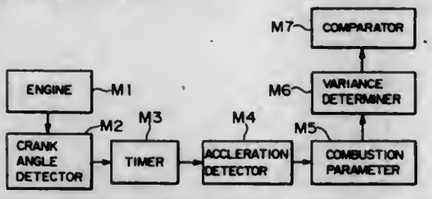
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**5,497,328**

## DEVICE FOR DETECTING CONTINUOUS MISFIRES OF A MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

**Masakazu Sugai, and Akira Demizu, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Oct. 19, 1993, Ser. No. 138,058**
**Claims priority, application Japan, Jan. 20, 1992, 4-281593**
**Int. Cl.[6] G06F** *19/00;* **F02P** *5/14;* **G01L** *3/26*
**U.S. Cl. 364—431.03** **6 Claims**




1. A device for detecting continuous misfires of a multi-cylinder internal combustion engine, comprising:

crank angle detector means for detecting predetermined crank angles of said internal combustion engine corresponding to predetermined phase angles of a plurality of cylinders of said internal combustion engine;

timer means, coupled to said crank angle detector means, for determining lengths of time between said predetermined crank angles of said internal combustion engine;

angular acceleration detector means, coupled to said timer means, for determining angular acceleration of a crankshaft of said internal combustion engine over predetermined phase intervals of said plurality of cylinders;

an acceleration differential calculator for calculating an acceleration differential between an angular acceleration corresponding to each of said plurality of cylinders and a respective other one of said plurality of cylinders;

variance determining means, coupled to said acceleration differential calculator, for determining a variance of levels of said acceleration differential over ignition timings of two cylinders which are separated by a predetermined crank angle; and

comparator means, coupled to said variance determining means, for comparing said variance with predetermined misfire judgment reference level, means for detecting an occurrence of continuous misfires when said variance is less than said misfire judgment reference level.

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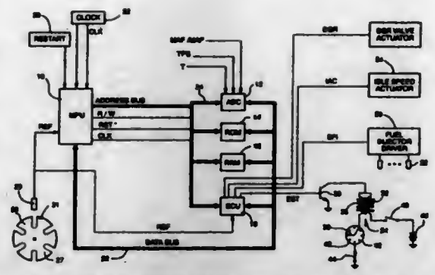
**5,497,329**

## PREDICTION METHOD FOR ENGINE MASS AIR FLOW PER CYLINDER

**Dah-Lain Tang, Canton, Mich., assignor to General Motors Corporation, Detroit, Mich.**

**Filed Sep. 23, 1992, Ser. No. 948,568**
**Int. Cl.[6] F02B** *3/04*
**U.S. Cl. 364—431.05** **10 Claims**

7. In an engine fuel control system having apparatus for measuring values of mass air flow (MAF), absolute manifold pressure




(MAP) and a throttle position signal (TPS) and for detecting values of engine speed, an exhaust gas recirculation valve signal (EGR) and an idle air control signal (IAC) at reference times during each engine revolution, the method of controlling engine fueling by predicting the air flow into an engine cylinder comprising the steps of:

measuring MAF, MAP, TPS, EGR and IAC values at each point of at least one set of points uniformly spaced relative to each dead center;

calculating air mass flow per cylinder MAC from MAF and engine speed at each point;

calculating trends of each of the values MAC, MAP, TPS, EGR, and IAC from a difference of respective values at successive points;

determining a base value of air mass per cylinder;

predicting air mass into said cylinder from the base value and the calculated trends by multiplying each calculated trend by a respective gain to form a series of products and adding said products to the base value;

calculating a desired amount of fuel to be delivered to said cylinder as a predetermined function of the predicted air mass into said cylinder; and

controlling a fuel injector to deliver the desired amount of fuel to said cylinder.

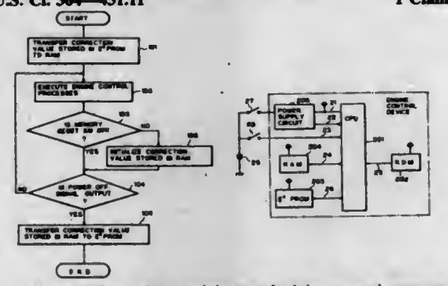
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**5,497,330**

## METHOD FOR RETAINING THE CORRECTION VALUE OF A CONTROL VARIABLE IN AN ENGINE CONTROL DEVICE

**Yasuhiko Ishida, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 838,688, Feb. 21, 1992, abandoned.**
**This application Jun. 7, 1994, Ser. No. 255,898**
**Claims priority, application Japan, Feb. 26, 1991, 3-030586**
**Int. Cl.[6] G06F** *19/00;7/00*
**U.S. Cl. 364—431.11** **1 Claim**




1. A correction value retaining method in an engine control device for controlling an operational state of an engine according to a control variable obtained by detecting the operational state of said engine, finding a correction value for correcting said control variable based on a result of the control of the operational state, and storing said correction value in a volatile memory, comprising the steps of:



transferring said correction value stored in said volatile memory to an electrically rewritable non-volatile memory by serial communication only at a time immediately after power to said engine control device is cut off;

transferring said correction value stored in said non-volatile memory back to said volatile memory again only at a time immediately after the power to said engine control device is turned on; and

initializing said correction value stored in said volatile memory by operating a switch disposed outside said engine control device.

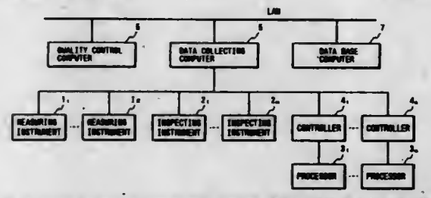
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**5,497,331**

## SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE FABRICATION METHOD AND ITS FABRICATION APPARATUS

**Nobuyuki Iriki; Tsutomu Okabe, both of Kodaira; Kenji Watanabe, Ohme; Hisashi Maejima, Higashiyamato, and Shinji Kuniyoshi, Tokyo, of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Jun. 8, 1994, Ser. No. 257,262**
**Claims priority, application Japan, Jun. 21, 1993, 5-148892**
**Int. Cl.[6] G06F** *19/00;17/60*
**U.S. Cl. 364—468** **8 Claims**




2. A semiconductor integrated circuit device fabrication method for quality control, in semiconductor integrated circuit device fabrication processes, comprising the steps of fuzzy-inferring element quality parameters, adjusting parameters of membership functions of element qualities used in fuzzy inference to minimize inference errors, and controlling the semiconductor integrated circuit device fabrication processes by using the adjusted membership functions as a control standard of the element quality parameters.

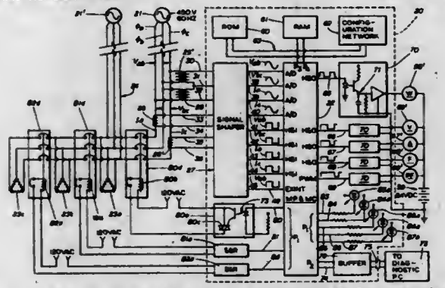
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**5,497,332**

## METHOD AND APPARATUS FOR METERING AND MONITORING AC GENERATORS

**Charles R. Allen, and Robert L. Spaw, both of Houston, Tex., assignors to Automatic Terminal Information Systems, Inc., Houston, Tex.**

**Filed Oct. 1, 1993, Ser. No. 130,437**
**Int. Cl.[6] G01R** *19/00;21/00;21/06*
**U.S. Cl. 364—483** **10 Claims**




1. In a power measuring and control system (**20**) for measuring and controlling the output power of a multiphase AC generator (**21**) and its prime mover; said generator being connected in parallel with another multiphase AC generator (**21'**) through a power bus (**24**) having at least three phase lines $\phi_a,\phi_b,\phi_c$ for feeding power to loads (**23***a*–**23***c*) through connect/disconnect means (**80***d*–**82***d*); each one of said generators having distinct criteria for the nominal output power, the magnitude and sign of the power factor (PF), the RMS voltage $V_{rms}$, the RMS current $I_{rms}$, and their fundamental frequency f; and said criteria having specified, allowable deviation ranges within set trigger points, the improvement comprising:

voltage sensing means (**25**,**25'**) for sensing between said phases $\phi_a,\phi_b$ and $\phi_b,\phi_c$ the instantaneous sinusoidal voltage signals $V_{ab}$,$V_{bc}$ (**30**,**32**), respectively, having a fundamental frequency f;

current sensing means (**26**,**26'**) for sensing the instantaneous sinusoidal current signals $I_a$,$I_c$ (**33**,**35**) in said phases $\phi_a,\phi_c$, respectively;

signal shaper means (**27**,**28**,**29**,**50**,**51**,**54**,**55**) for shifting, band-limiting and attenuating said instantaneous voltage and current signals and for producing therefrom: (a) corresponding attenuated sinusoidal voltage and current signals $V_{ab}$,$V_{bc}$ (**38**,**39**) and $I_a$,$I_c$ (**40**, **41**), (b) corresponding, respective, synchronized, voltage and current square-wave signals $V_{ab}$,$V_{b-c}$,$I_a$,$I_c$ (**42**,**43**,**44**,**45**) containing information on said fundamental frequency f, and (c) a square wave signal $V_{ab}$ (**46**) having a fixed, high-multiple frequency of said fundamental frequency f;

said shaper means (**27**) having two voltage channels (**28**) and two current channels (**29**), each channel having phase-locked loops (PLL) (**51**) for generating from said attenuated sinusoidal signals $V_{ab}$,$V_{bc}$,$I_a$,$I_c$ said square wave signals $V_{ab}$,$V_{bc}$,$I_a$,$I_c$ (**42**–**46**);

micro-processor/micro-controller (M-P/M-C) means (**22**) including: an electronic read-only memory (ROM) (**60**), a random-access memory (RAM) (**61**), analog-to-digital (A/D) converter means, high-speed inputs (HSIs) for receiving said square wave signals $V_{ab}$,$V_{bc}$,$I_a$,$I_c$ (**42**–**45**), an external interrupt (EXINT) input for receiving said high frequency square wave signal $V_{ab}$ (**46**), high-speed outputs (HSOs), and hi-directional input-output (I/O) ports (P1);

a configuration network (**62**) coupled to said ROM (**60**) and to said RAM (**61**) through an address/data bus (**63**) for configuring said micro-processor/micro-controller means (**22**) to control the output power of its associated generator in accordance with said generation's particular criteria values and set points;

said network (**62**) including binary-coded rotary configuration switches, each switch being mechanically adjustable for a particular criterion value and its set points, and each switch acting as a mechanical ROM occupying memory address space in said electronic ROM and being readable as an electronic ROM;

said (A/D) converter means digitizing said attenuated sinusoidal voltage and current signals $V_{ab}$,$V_{b-c}$,$I_a$,$I_c$ (**38**,**39**,**40**,**41**);

said M-P means (**22**) under the control of software

digitizing said square wave signals $V_{ab}$,$V_{b-c}$,$I_a$,$I_c$ (**42**–**45**) into respective digital representations thereof,

sampling, N times per cycle, starting when said high-frequency square wave signal (**46**) transits from low to high, the instantaneous digital values of $v_{ab}$,$v_{bc}$ and of $i_a$,$i_c$, for each sample of said digitized sinusoidal voltage and current signals,

calculating for each sample the instantaneous power $p_{as}$ in said phase $\phi_a$ from $p_{as}=(v_{ab}i_a)$ and the instantaneous power $p_{cs}$ in said phase $\phi_c$ from $p_{cs}=(v_{bc}i_c)$,

calculating the mean power per cycle $p_{am}$/cyc in said phase $\phi_a$ from $p_{am}/cyc=\Sigma p_{as}/N$, the mean power per cycle $p_{cm}$/cyc in said phase $\phi_c$ from $p_{cm}/cyc=\Sigma p_{cs}/N$, and the resultant mean power per cycle of $P_m$/cyc from $P_m/cyc=p_{am}+p_{cm}$,

digitally calculating

1) the root-mean-square RMS value of the voltage per cycle between

(a) said phases $\phi_a$, $\phi_b$ from $v_{abmrms}/cyc=\sqrt{\Sigma v_{ab}{}^2/N}$,

(b) said phases $\phi_b,\phi_c$ from $v_{bcmrms}/cyc=\sqrt{\Sigma v_{bc}{}^2/N}$,

2) the root-mean-square RMS value of the current per cycle in

(a) said phase $\phi_a$ from $i_{amrms}$/cyc=$\sqrt{\Sigma i_a^2}$/N,

(b) said phase $\phi_c$ from $i_{cmrms}$/cyc=$\sqrt{\rho i_c^2}$/N,

3) the mean root-mean-square RMS value of the voltage per cycle on said bus from $V_{mrms}$/cyc=($Y_{abrms+cbrms}$)/2,

4) the mean root-mean-square RMS value of the current per cycle in said bus from $I_{mrms}$/cyc=($i_{armsi}$+$i_{crms}$)/2, and

5) the power factor value per cycle in said bus from PF/cyc=$P_m$/(1.73 $V_{mrms}$×$I_{mrms}$), said PF/cyc being positive (+) when said square wave signals $I_a$,$I_c$ (**40**,**41**) lead said square wave signals $V_{ab}$,$V_{bc}$ (**38**,**39**), respectively, and, conversely, said PF/cyc being negative (−) when said square wave signals $I_a$,$I_c$ (**40**,**41**) lag said square wave signals $V_{ab}$,$V_{bc}$;

said (M-P/M-C) means (**22**) being, in use, under the control of said software and of said settings on said configuration switches for continuously digitally comparing one or more of said measured components of power, including: said instantaneous phase powers $p_a$ and $p_c$, said mean power per cycle $P_m$, said phase RMS voltages per cycle $v_{abrms}$, and $v_{bcrms}$, said mean RMS voltage per cycle $v_{mrms}$, said RMS phase currents per cycle $I_{amrms}$, and $I_{cmrms}$, said mean RMS current per cycle $I_{mrms}$, and said power factor per cycle PF and its sign (+/−), against their corresponding comparable criteria values stored in said electronic ROM, and when the result of such comparison yields a result which is either under or over one of said stored set point values in said ROM, said M-C means is triggered to output from said I/O bi-directional ports a digital control signal tripping, in a timely fashion, one or more of said connect/disconnect means (**80***d*–**82***d*) thereby causing appropriate successive sheddings of said loads from said bus or, if said load sheddings are insufficient, to completely break the tie between the controlled overloaded generator (**21**) and said power bus (**24**) so as to reduce from said overloaded generator a temporary, excessive, high-power load demand, and protecting the remaining generator (**21'**) and its prime mover; and

adjustable delay means for delaying said load sheddings by discrete time intervals before generating said control signals.

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**5,497,333**

## CONTROL SYSTEM FOR INTEGRALLY CONTROLLING OPERATIONS OF ELECTRONIC TORQUE SPLIT SYSTEM AND TRACTION CONTROL SYSTEM FOR AUTOMOTIVE VEHICLE

**Hiroki Sasaki, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan**

**Filed Aug. 16, 1993, Ser. No. 106,559**
**Claims priority, application Japan, Sep. 3, 1992, 4-235879**
**Int. Cl.[6] B60K** *17/348*
**U.S. Cl. 364—426.03** **14 Claims**

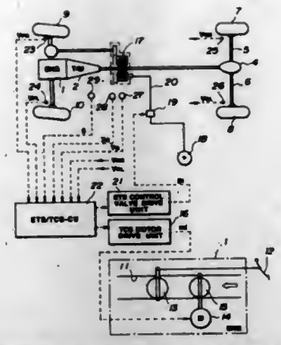
**1.** A combination of a torque split system and a traction control system for an automative vehicle, said vehicle including pairs of front and rear wheels, one of said pairs being a primary driven wheel pair to which engine torque is constantly delivered and the other being an auxiliary driven wheel pair to which the engine torque is variably delivered, comprising:

primary driven wheel slippage detecting means for detecting primary driven wheel slippage and providing a signal indicative thereof;

auxiliary driven wheel slippage detecting means for detecting auxiliary driven wheel slippage and providing a signal indicative thereof;

cornering condition detecting means for detecting a cornering condition of the vehicle and providing a signal indicative thereof; and

controlling means, responsive to the signals from said primary driven wheel slippage detecting means, said auxiliary driven wheel slippage detecting means, and said cornering condition



detecting means, for controlling operations of the torque split control system and the traction control system,

wherein when the auxiliary driven wheel slippage exceeds an auxiliary driven wheel target slippage value which is determined in a preselected relation to the cornering condition detected by said cornering condition detecting means, said controlling means activates the torque split system to modify an amount of engine torque distribution to the auxiliary driven wheel pair so that the auxiliary driven wheel slippage is adjusted toward the auxiliary driven wheel target slippage value, and activates the traction control system to modify driving torque of the primary driven wheel pair for maintaining the primary driven wheel slippage within a preselected allowable range.

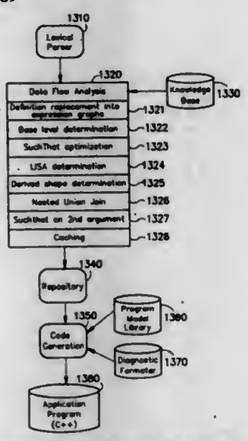
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**5,497,334**

## APPLICATION GENERATOR FOR USE IN VERIFYING A HIERARCHICAL CIRCUIT DESIGN

**Philip J. Russell, Alresford, United Kingdom, and Glenwood S. Weinert, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Feb. 19, 1993, Ser. No. 19,924**
**Int. Cl.[6] G06F** *17/50*
**U.S. Cl. 364—489** **14 Claims**




**1.** A computer-implemented method for design verification of a physical design of a very large scale integrated (VLSI) circuit expressed in the form of hierarchical circuit design data, said method for design verification checking the hierarchical circuit design data in its most nested form and comprising the steps of:



receiving a set of directives to be performed on the hierarchical circuit design data, said directives embodying design rule definitions for use in verifying compliance with design rules of the circuit design;

performing a functional decomposition of the directives into primitive functions to perform the directives;

establishing a primary iteration level for each directive;

determining a data flow dependency for the directives;

organizing the primitive functions based on the data flow dependency;

generating an application program representative of the primitive functions by

grouping together in clusters design rule checks and mask analysis operations that use a same base shape level, and

establishing within each cluster a set of lists of shape instances (LISAs) required to perform design checks, the LISAs representing VLSI design component instances necessary to perform a set of directives on the hierarchical circuit accessing the hierarchical circuit design data;

detecting intrusions between shape instances in the accessed hierarchical circuit design data;

based on intrusions detected, processing LISAs for each checking cluster and dispatching checking functions; and

outputting results of the checking functions indicating errors in the physical design of the VLSI circuit.

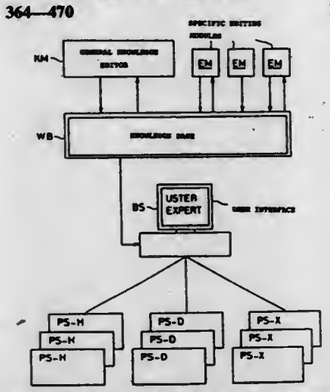
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**5,497,335**

## SYSTEM FOR CREATING A FAULT DIAGNOSIS ON PRODUCTION MACHINES AND APPLICATION OF THE SYSTEM ON TEXTILE MACHINES

**Robert Hoeller, Uster, Switzerland, assignor to Zellweger Luwa AG, Switzerland**

**PCT No. PCT/CH92/00180, § 371 Date May 10, 1993, § 102(e) Date May 10, 1993, PCT Pub. No. WO93/05477, PCT Pub. Date Mar. 18, 1993**
**PCT Filed Sep. 3, 1992, Ser. No. 50,061**
**Claims priority, application Switzerland, Sep. 10, 1991, 02651/91**
**Int. Cl.[6] G06F** *19/00*
**U.S. Cl. 364—470** **15 Claims**




**1.** A system for diagnosing a fault on at least one textile machine for the production of fiber or filament structures, comprising:

means for investigating parameters of the fiber or filament structures and generating spectrograms representing the unevenness of the products produced by said machine,

a first evaluation unit for the detection of characteristic deviations of the spectrograms, which unit generates a fault descriptor for each such deviation,

a knowledge base containing a description of machine parts belonging to said textile machine, in the form of a component hierarchy which is represented by a tree structure and in which each machine part is described by a node in the tree structure,

software units for access to said knowledge base,

a user interface for enabling users to interact with said system, and,

a second evaluation unit which uses the knowledge base to determine possible fault causes for a fault descriptor.

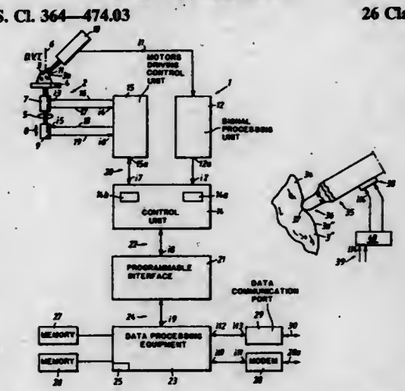
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**5,497,336**

## SCANNING DEVICE FOR USE IN MANUFACTURING IMPLANTS

**Matts Andersson, Lerum, and Lennart Carlsson, Mölndal, both of, Sweden, assignors to Nobelpharma AB, Goteborg, Sweden**

**Filed Oct. 29, 1992, Ser. No. 967,616**
**Claims priority, application Sweden, Nov. 1, 1991, 9103204**
**Int. Cl.[6] G05B** *19/18*
**U.S. Cl. 364—474.03** **26 Claims**




**26.** A scanning apparatus for controlling tool equipment used in production of three-dimensional bodies such as human body restorations, comprising:

sensing means for sensing a contour of a model to obtain selected representation data based on said sensed contour in the form of at least one signal;

processing and controlling means for receiving and processing said representation data signals and for generating sensing control signals used for controlling a sensing function of said sensing means;

computer equipment for obtaining input signals based on said processed representation signals and for generating a controlling signals array to be used in controlling of said tool equipment; and

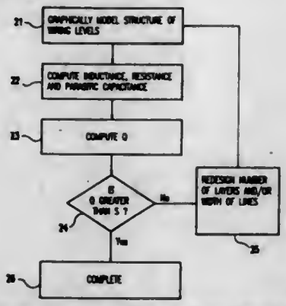
movement effecting means for effecting rotational movement of said model simultaneously with relative displacement movement between said model and said sensing device while simultaneously sensing the contour of the model, said movement effecting means being actuated and controlled by a control unit;

and wherein a first information data referable to the representation is compressed in the computer equipment on formation of a second data information referable to the control of the tool equipment, and wherein at least one of the first and the second information may be storable in a storage means in order to realize a time lag between at least one of the sensing and controlling functions in relation to a transmission of the controlling signals to the computer equipment.

## 5,497,337
## METHOD FOR DESIGNING HIGH-Q INDUCTORS IN SILICON TECHNOLOGY WITHOUT EXPENSIVE METALIZATION

**Saila Ponnapalli, Dutchess County; Mehmet Soyuer, and John F. Ewen, both of Westchester County, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Oct. 21, 1994, Ser. No. 327,252**
**Int. Cl.[6] H03B** *7/14*
**U.S. Cl. 364—489** **5 Claims**




1. A computer implemented method for designing a high-Q spiral inductor as part of an integrated circuit, the spiral inductor being implemented in a plurality of wiring levels in the integrated circuit, the comprising the steps of:

(a) graphically modeling a geometrical structure of the plurality of wiring levels and via holes which connect said wiring levels to implement a plurality of spiral turns of the inductor;

(b) computing an inductance, resistance and parasitic capacitance for the modeled geometrical structure using a method of moments algorithm;

(c) computing a Q factor based on said computed inductance, resistance, and parasitic capacitance; and

(d) determining if the Q factor for the modeled geometric structure is greater than a predetermined value;

(e) redesigning a number of layers or width of lines of the geometric structure if the Q factor is not greater than said predetermined value; and

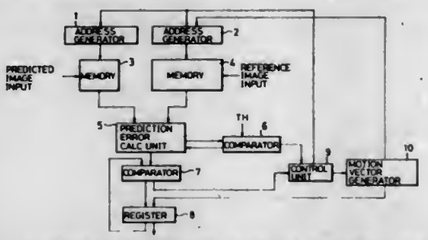
(f) repeating steps (a) through (e) until a sufficiently high Q is obtained.

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## 5,497,338
## MOTION VECTOR DETECTING CIRCUIT

**Toshiyuki Miyake, Tenri; Hiroshi Kusao, Chiba, and Hiroyuki Katata, Ichihara, all of, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Mar. 31, 1994, Ser. No. 221,744**
**Claims priority, application Japan, Apr. 9, 1993, 5-083037; May 21, 1993, 5-119893**
**Int. Cl.[6] H04B** *14/06*
**U.S. Cl. 364—514 A** **15 Claims**




1. A motion vector detecting circuit for detecting a motion vector in moving picture coding using motion compensation prediction in the unit of block composed of L pixels by block matching between a block in a prediction target image and a candidate block in a reference image, comprising:

calculating means for calculating a first prediction error (PE1) between a block in a prediction target image and a candidate block in a reference image using L1 (<L) pixels in block, comparing the first prediction error thus calculated with a threshold (TH), and calculating a second prediction error (PE2) between a block in the prediction target image and a candidate block in the reference image using L2 (L1<L2≦L) pixels in block if a first prediction error of said candidate block is not more than said threshold (TH); and

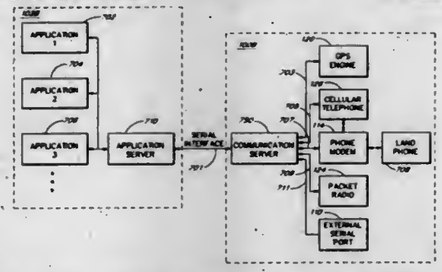
comparing means for comparing said second prediction error with a predetermined value (MIN PE) and, if said second prediction error is smaller than said predetermined value (MIN PE), replacing said predetermined value (MIN PE) with said second prediction error, whereby a motion vector to a candidate block giving a minimum second prediction error is determined as an optimum motion vector.

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## 5,497,339
## PORTABLE APPARATUS FOR PROVIDING MULTIPLE INTEGRATED COMMUNICATION MEDIA

**Marc A. Bernard, San Diego, Calif., assignor to ETE, Inc., San Diego, Calif.**

**Continuation-in-part of Ser. No. 152,492, Nov. 15, 1993, abandoned. This application Aug. 2, 1994, Ser. No. 284,396**
**Int. Cl.[6] G06F** *3/00;13/00*
**U.S. Cl. 364—705.05** **13 Claims**




8. A palm computer communications cradle which provides alternative communication capabilities for a palm computer releasably retained therein, said communications cradle comprising:

a communication server coupled to said palm computer via an interface, wherein said communication server receives data packets generated by said palm computer; and

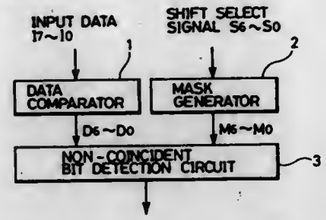
a plurality of integral communications circuits, each of said integral communication circuits coupled to said communication server, wherein said communication server reformats said data packets received from said palm computer in accordance with specific requirements of said communication circuits coupled thereto, and wherein said communication server transfers said reformatted data packets to an appropriate one of said communication circuits.



## 5,497,340
## APPARATUS AND METHOD FOR DETECTING AN OVERFLOW WHEN SHIFTING N BITS OF DATA

**Shinichi Uramoto, and Hideyuki Terane, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 580,039, Sep. 10, 1990, abandoned. This application Jan. 14, 1993, Ser. No. 75,911**
**Claims priority, application Japan, Sep. 14, 1989, 1-238904**
**Int. Cl.[6] G06F** *05/01*
**U.S. Cl. 364—745** **13 Claims**




1. A method of detecting an overflow when shifting bits of n bits of binary coded data in a circuit having a plurality of logical gates, the method comprising the steps of:

inputting n-bits of a first data to said plurality of logical gates;

comparing logical states of all adjacent bits of said n-bits of said first data and outputting n−1 bits of a second data, a respective bit of said n−1 bits of said second data being of a first level when said logical states of two adjacent bits of said n-bits of said first data are the same and a second level when said logical states are different;

masking a predetermined number of bits of n−1 bits of a shift select signal representing a number of bits to be shifted to generate n−1 bits of mask data, a masked bit being set to said first level and said predetermined number being a function of the number to be shifted;

comparing each bit of n−1 bits of said second data with a corresponding bit of said mask data; and

outputting one of an overflow indication when said step of comparing indicates that both a non-masked bit of said mask data and a corresponding bit of said second data are set to said second level and a no overflow indication when said non-masked bit of said mask data and a corresponding bit of said second data are set to said first level.

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## 5,497,341
## SIGN-EXTENSION OF IMMEDIATE CONSTANTS IN AN ALU USING AN ADDER IN AN INTEGER LOGIC UNIT

**Earl T. Cohen, Fremont, Calif., assignor to Exponential Technology, Inc., San Jose, Calif.**

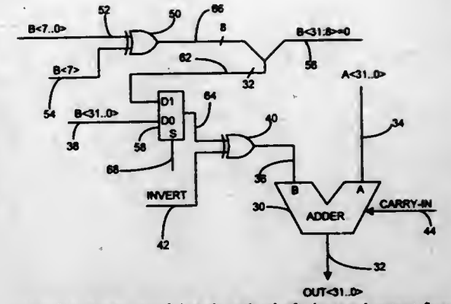
**Division of Ser. No. 207,751, Mar. 8, 1994, Pat. No. 5,442,577. This application May 18, 1995, Ser. No. 444,814**
**Int. Cl.[6] G06F** *7/50*
**U.S. Cl. 364—786** **20 Claims**

1. An arithmetic unit for adding and subtracting binary numbers represented in two's complement format, the unit comprising:

a first operand input, the first operand input having a plurality of binary signals for representing a first operand as a binary number in two's complement format, the first operand having a sign bit for indicating if the first operand is a positive or a negative binary number;

a first inversion control input for enabling inversion of the plurality of binary signals representing the first operand, the first inversion control input receiving the sign bit for the first operand;

first inverting means, responsive to the first inversion control input, for selectively inverting each binary signal in the plurality of binary signals representing the first operand, the first inverting means producing a selectively inverted output;




extension means, receiving the selectively inverted output from the first inverting means, for extending the output with binary signals representing zero, the extension means producing a zero-extended result representing a positive number;

a second inversion control input, for enabling inversion of the zero-extended result;

second inverting means, responsive to the second inversion control input, for selectively inverting the zero-extended result, the second inverting means having an output;

a second operand input, the second operand represented as a binary number in two's complement format;

an adder, receiving the second operand and coupled to the output of the second inverting means, the adder calculating the sum of the second operand and the output of the second inverting means, the adder having a single-bit carry-in input for increasing the sum by one,

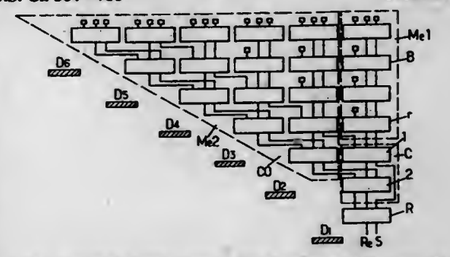
whereby addition and subtraction can be performed on operands without explicit sign extension.

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## 5,497,342
## CELLULAR MULTIPLIER COMPRISING A TREE OF THE OVERTURNED STAIRS TYPE, AND METHOD OF IMPLEMENTATION

**Zhi-Jian Mou, Arcueil, and Francis Jutand, Paris, both of, France, assignors to France Telecom, Paris, France**

**Continuation of Ser. No. 137,517, Oct. 8, 1993, abandoned, which is a continuation of Ser. No. 735,519, Jul. 26, 1991, abandoned. This application Nov. 9, 1994, Ser. No. 338,159**
**Claims priority, application France, Jul. 27, 1990, 90 09629**
**Int. Cl.[6] G06F** *7/50;7/52*
**U.S. Cl. 364—786** **8 Claims**




1. An overturned stairs type cellular structure adder tree for processing a given integer number of N greater than 23 operands and including a plurality of interconnected carry-save adders, said carry-save adders being connected together in a plurality of Q degrees of given horizontal rank q, with $1 \leq q \leq Q$ and given depth, each of said carry-save adders having a sum output, a carry output and three inputs, said carry-save adders receiving one of said N operands as an input for each of said three inputs not receiving an input from another carry-save adder of said adder tree, wherein said cellular structure adder tree of order p and depth n', where p designates a parameter order of summing processing time of the form $N^{1/(p+1)}$ of said multiple operands and n' designates the

maximum number of carry-save adders passed through by each operand for complete processing, at least comprises:

a multiplier root R constituted by a carry-save adder, and

a first multiplier body CO(p,n), of order p, depth n, with n=n'−1, and rank q=1, connected to said multiplier root R, said first multiplier body including:

a five-input connector operator C(n,q) of rank q=1 and including first and second carry-save adders connected in cascade, the carry output of said first carry-save adder being connected to one of the inputs of said second carry-save adder, said five-input connector operator C(n,q) further including three outputs constituted by the sum output of the first carry-save adder, and the sum and the carry outputs of the second carry-save adder, and being connected to said multiplier root R, and

a tree of order p−1, depth n−2 and rank q=1 comprising a plurality of interconnected carry-save adders including a final carry-save adder constituting a tree root r, the sum and the carry outputs of said tree root being connected to respective inputs of the first carry-save adder of said five-input connector operator of rank q=1,

at least four successive sub-multiplier bodies of order p and of decremented depth determined by successively decrementing the depth n=n'−1 by one and incremented rank determined by successively incrementing the rank q by one, with $2 \leqq q \leqq Q-1$, each of said sub-multiplier bodies comprising:

a single five-input connector operator of corresponding incremented rank and corresponding decremented depth and including first and second carry-save adders connected in cascade and connected to the five-input connector operator of the sub-multiplier body of immediately preceding rank,

a tree of order p−1 and successively decremented in depth by 1 with respect to said tree of the sub-multiplier body of immediately preceding rank, said tree being connected to said single five-input connector operator of corresponding rank;

the successive sub-multiplier body of rank q=Q−1 thus consisting of a single five-input connector operator of corresponding rank,

the five-input connector operator of said sub-multiplier bodies of rank 2 being connected to the five-input connector operator of the first multiplier body,

said adder tree further including, forming said degree of rank Q, a carry-save adder of rank q=Q and depth n=1 having carry and sum outputs connected to the first carry-save adder of the five-input connector operator of the submultiplier of the immediately preceding rank Q-1.

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**5,497,343**

**REDUCING THE NUMBER OF CARRY-LOOK-AHEAD ADDER STAGES IN HIGH-SPEED ARITHMETIC UNITS, STRUCTURE AND METHOD**

**Leonard D. Rarick, San Marcos, Calif., assignor to Hyundai Electronics America, Milpitas, Calif.**

**Filed Aug. 5, 1993, Ser. No. 102,663**

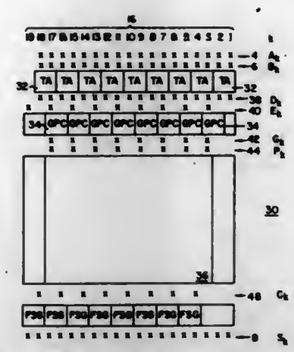
**Int. Cl.[6] G06F** *7/50*

**U.S. Cl. 364—787** **10 Claims**

1. An add circuit for adding an addend and an augend and generating a final sum, the addend, augend, and final sum each being binary numbers having a plurality of bits, the bits of the same order in the addend and the augend forming columns, the add circuit comprising:

at least one data reduction circuit, each data reduction circuit comprising at least one multi-column adder, the at least one data reduction circuit being for using the columns of addend and augend bits to generate a reduced addend and a reduced augend, the reduced augend having fewer bits than the augend; and

a generate/propagate calculation circuit coupled to the at least one data reduction circuit for using the reduced addend and the reduced augend for calculating generate and propagate data, the generate/propagate calculation circuit having a number of stages, the number of stages being fewer than required to calculate generate and propagate data using the addend and the augend.



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**5,497,344**

**DATA FLOW TYPE INFORMATION PROCESSOR**

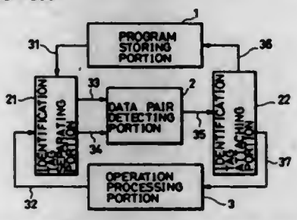
**Toshiya Okamoto, Kyoto, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan**

**Continuation of Ser. No. 490,411, Mar. 8, 1990, abandoned, Continuation-in-part of Ser. No. 301,586, Jan. 26, 1989. This application Jul. 15, 1994, Ser. No. 275,669**

**Claims priority, application Japan, Mar. 14, 1989, 1-62841**

**Int. Cl.[6] G06F** *9/00;15/82*

**U.S. Cl. 395—800** **7 Claims**




6. An information processor for processing data packets in accordance with data flow program including a plurality of pairs of destination information and instruction information, comprising:

program storing means for storing the data flow program, for receiving a first data packet including identification information and destination information, for reading subsequent destination information and instruction information from the data flow program based on the destination information in said first data packet, and for outputting a second data packet including the read out destination information and instruction information and the identification information stored in said first data packet;

operation processing means for receiving a third data packet including identification information, instruction information and one or two data fields, for performing an operation process with respect to the data in said third data packet based on the instruction information in said third data packet, and for outputting a fourth data packet including data indicating a result of an operation process and the identification information stored in said third data packet;

merging means for receiving said second data packet from said program storing means and said fourth data packet from said operation processing means, for merging second and fourth data packets having a same identification information and for outputting a fifth data packet including the destination information and instruction information stored in said second data packet and the data stored in said fourth data packet;



data pair detecting means for receiving an output from said merging means for detecting two fifth data packets having a same destination information and for outputting a sixth data packet including destination information, instruction information and data stored in one of the fifth data packet and data stored in the other fifth data packet; and

branching means for receiving said sixth data packet from said data pair detecting means, and outputting identification information and only the destination information stored in said sixth data packet to said program storing means as the first data packet, and outputting the same identification information and only the instruction information and the data stored in said sixth data packet to said operation processing means as the third data packet, for simultaneously executing process in said program storing means and said operation processing means.

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**5,497,345**

**NONVOLATILE EPROM, EEPROM OF FLASH-EEPROM MEMORY WITH TUNNEL OXIDE PROTECTION**

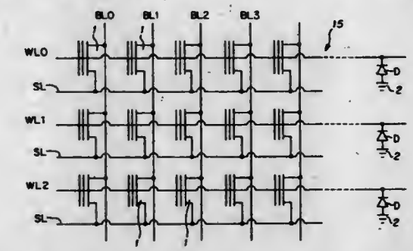
**Paolo G. Cappelletti, Seveso, Italy; assignor to SGS-Thomson Microelpctonics S.r.l., Agrate Brianza, Italy**

**Filed Feb. 15, 1994, Ser. No. 196,572**

**Claims priority, application European Pat. Off., Feb. 17, 1993, 93830058**

**Int. Cl.[6] G11C** *11/34*

**U.S. Cl. 365—185.28** **12 Claims**




1. A nonvolatile memory comprising a number of memory cells having control gate regions capable of reaching an operating potential, floating gate regions, and tunnel oxide layers separating said floating gate regions from a substrate of semiconductor material; said tunnel oxide layers having a breakdown potential; and said control gate and floating gate regions presenting a coupling factor; said memory further comprising selectively-opened conductive paths interposed between said control gate regions and the substrate; said conductive paths being open for arresting a passage of electric charges when said control gate regions are brought to said operating potential, and being closed for permitting the passage of electric charges from said control gate regions to the substrate through the selectively opened conductive paths upon said control gate regions reaching potentials higher than said operating potential and lower than said breakdown potential divided by said coupling factor.

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**5,497,346**

**SEMICONDUCTOR MEMORY DEVICE**

**Noboru Egawa, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan**

**Filed Aug. 19, 1994, Ser. No. 293,519**

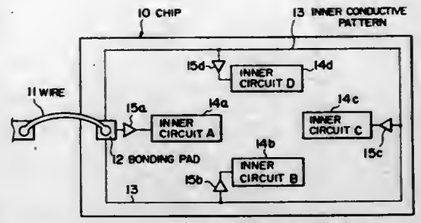
**Claims priority, application Japan, Aug. 26, 1993, 5-234147**

**Int. Cl.[6] G11C** *13/00*

**U.S. Cl. 365—189.01** **23 Claims**

1. A semiconductor memory device having at least one inner circuit, the device comprising:

a chip select terminal for receiving a chip select signal from outside the device;




15a ~ 15d : FIRST INPUT CIRCUIT A ~ D

an inner conductive pattern, directly electrically connected to said chip select terminal, for carrying the chip select signal; and

at least one first input circuit, directly electrically connected to said inner conductive pattern and to said at least one inner circuit, for transmitting the chip select signal carried by said inner conductive pattern to said at least one inner circuit.

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**5,497,347**

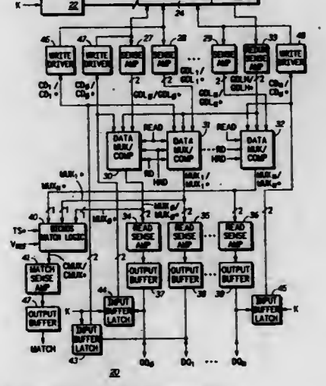
**BICMO CACHE TAG COMPARATOR HAVING REDUNDANCY AND SEPARATE READ AN CO PARE PATHS**

**Taisheng Feng, Austin, Tex., assignor to Motorola Inc., Schaumburg, Ill.**

**Filed Jun. 21, 1994, Ser. No. 264,090**

**Int. Cl.[6] G11C** *15/00*

**U.S. Cl. 365—189.07** **20 Claims**




1. A cache TAG comparator, comprising:

a TAG array of memory cells;

a redundant array of memory cells for replacing defective memory cells of the TAG array;

a plurality of data multiplexers, coupled to the TAG array and to the redundant array, a data multiplexer of the plurality of data multiplexers providing a TAG address bit having a logic state corresponding to the logic state of a selected one of the memory cells of either of the TAG array and the redundant array;

a plurality of comparators, coupled to the plurality of data multiplexers, a comparator of the plurality of comparators coupled to a data multiplexer of the plurality of data multiplexers, the comparator receiving the TAG address bit and an input data bit, and providing a compare signal at an output terminal of a first logic state if the logic state of the TAG address bit is the same as a logic state of the input data bit, and providing the compare signal at a second logic state if the

logic state of the TAG address bit is not the same as the logic state of the input data bit; and

a BICMOS match logic circuit, coupled to the plurality of comparators, the BICMOS match logic circuit providing a match signal having the first logic state if all of the compare signals are a same logic state, and providing the match signal at the second logic state if all of the compare signals are not the same logic state.

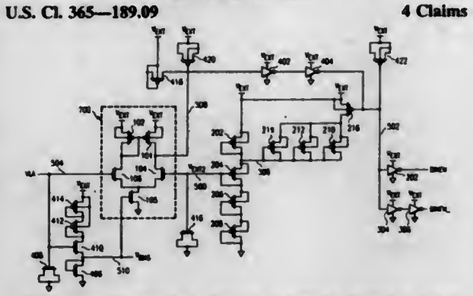
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**5,497,348**

## BURN-IN DETECTION CIRCUIT

**Ching-yuh Tsay, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.**

**Filed May 31, 1994, Ser. No. 250,886**
**Int. Cl.[6] G11C 7/00**
**U.S. Cl. 365—189.09** **4 Claims**



1. A memory device to provide a burn-in detection signal, comprising:

a first reference generator circuit for producing a first reference voltage;

a first voltage divider circuit coupled to said first reference generator circuit to divide said first reference voltage to form a first divided reference voltage;

a second reference generator circuit for producing a second reference voltage;

a comparator coupled to said first voltage divider circuit and said second reference generator circuit for comparing said first divided reference voltage and said second reference voltage and for responding to said comparison of said first divider reference voltage and said second reference voltage to reduce said divided reference voltage, wherein said comparator includes a transistor to switch a second voltage divider circuit in parallel to a portion of said first voltage divider circuit.

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**5,497,349**

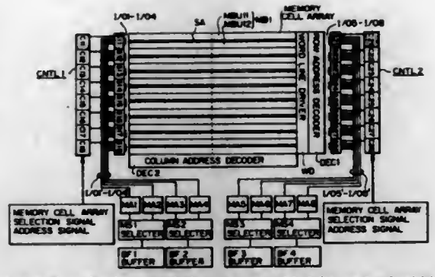
## DYNAMIC RANDOM ACCESS MEMORY DEVICE HAVING FIRST AND SECOND I/O LINE GROUPS ISOLATED FROM EACH OTHER

**Kiyoshi Nakai, Ome; Yukihide Suzuki, Akishima, and Takashi Inui, Tsuchiura, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan, and Texas Instruments Incorporated, Dallas, Tex.**

**Filed Jun. 21, 1994, Ser. No. 267,025**
**Claims priority, application Japan, Jun. 30, 1993, 5-187359**
**Int. Cl.[6] G11C 7/00**
**U.S. Cl. 365—230.03** **6 Claims**

1. A dynamic random access memory device comprising:

a memory cell array including a plurality of memory blocks each having a plurality of memory cells provided at crossing points between word lines and bit lines extending substantially perpendicular to each other, each of said memory blocks including a first memory block part and a second memory block part portioned in a first direction parallel with said bit lines, the bit lines in any one of said memory blocks being isolated from the bit lines in other ones of said memory blocks;



a plurality of column switches, one provided for each of said bit lines in each of said memory blocks;

a predetermined number of first input/output lines provided for each of said first and second memory block parts of each of said memory blocks, each of said predetermined number of first input/output lines being connected to different ones of said bit lines via associated ones of said column switches in each of said memory blocks, said predetermined number of first input/output lines for said first memory block part and said predetermined number of first input/output lines for said second memory block part extending in a second direction parallel with said word lines and being isolated from each other in each of said memory blocks;

a row address decoder for decoding a first portion of an address signal to generate a word line selection signal to be applied to one of said word lines and a column address decoder for decoding a second portion of said address signal to generate a bit line selection signal to be applied to at least one of the column switches for the bit lines in each of said first memory block part and said second memory block part of one of said memory blocks to thereby simultaneously access at least two memory cells in said one memory block with said address signal to transfer data signals between said at least two memory cells and said predetermined number of first input/output lines for the first and second memory block parts of said one memory block, the number of said memory cells to be simultaneously accessed being the same as said predetermined number;

a first input/output gate circuit including a plurality of first input/output gates, one first input/output gate being provided for each of said memory blocks, the first input/output gate associated with each of said memory blocks being connected to said predetermined number of first input/output lines for the first memory block part of the memory block, and a second input/output gate circuit including a plurality of second input/output gates, one second input/output gate being provided for each of said memory blocks, the second input/output gate associated with each of said memory blocks being connected to said predetermined number of first input/output lines for the second memory block part of the memory block;

a switch control circuit for producing, on a basis of said signal address a control signal for controlling said first and second input/output gate circuits, said switch control circuit being electrically connected in common to said first and second input/output gate circuits so that the first input/output gate and the second input/output gate of a respective memory block are simultaneously closed;

a predetermined number of second input/output lines connected in common to said first input/output gates, and a predetermined number of third input/output lines connected in common to said second input/output gates; and

first main amplifiers connected to said second input/output lines and second main amplifiers connected to said third input/output lines, said first and second input/output gates for each of said memory blocks, when simultaneously closed by said control signal, serving to transfer data signals between the first input/output lines for the first memory block part of the memory block and said second input/output lines and transfer data signals between the first input/output lines for the second memory block part of the memory block and said third input/output lines so that said data signals on said second and third input/output lines are amplified by said first and second main amplifiers, respectively.



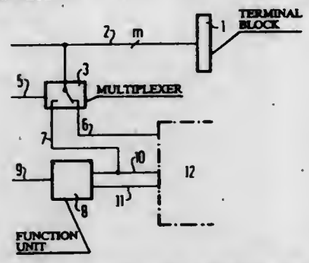
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**5,497,350**

## INTEGRATED SEMICONDUCTOR MEMORY DEVICE CAPABLE OF SWITCHING FROM A MEMORY MODE TO AN INTERNAL TEST MODE

**Peter Muhmenthaler, München, and Hans-Dieter Oberle, Puchheim, both of, Germany, assignors to Siemens Aktiengesellschaft, München, Germany**

**Continuation of Ser. No. 707,639, May 30, 1991, abandoned.**
**This application Dec. 29, 1994, Ser. No. 366,361**
**Claims priority, application European Pat. Off., May 31, 1990, 90110393**
**Int. Cl.[6] G11C 7/00;29/00**
**U.S. Cl. 365—201** **10 Claims**



1. In a semiconductor memory being subdivided into a plurality of function units and having m leads addressable from outside, first internal signal lines leading from the function unite to the m leads, second internal signal lines connecting the function units with one another, and an internal test unit recognizing a test mode from a code word applied to k of said m leads, where k≦m, the improvement comprising

means for switching over from a memory mode to the test mode, the test unit decoupling at least one of the first signal lines leading to the m leads from a respective one of the m leads and connecting the respective one of the m leads to one of the second internal signal lines connecting the function units, for testing one of the function units being connected via the second internal signal with the respective one of the m leads in the test mode.

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**5,497,351**

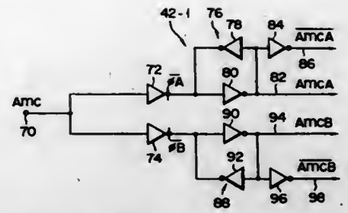
## RANDOM ACCESS MEMORY WITH DIVIDED MEMORY BANKS AND DATA READ/WRITE ARCHITECTURE THEREFOR

**Yukihito Oowaki, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Continuation of Ser. No. 120,221, Sep. 14, 1993, abandoned, which is a continuation of Ser. No. 956,469, Oct. 2, 1992, abandoned, which is a continuation of Ser. No. 704,733, May 20, 1991, abandoned, which is a continuation of Ser. No. 338,157, Apr. 14, 1989, abandoned. This application Oct. 27, 1994, Ser. No. 330,120**
**Claims priority, application Japan, Apr. 18, 1988, 63-93511**
**Int. Cl.[6] G11C 8/00**
**U.S. Cl. 365—230.03** **29 Claims**

1. A serial-access semiconductor memory device comprising:

an array of memory cells, subdivided into a plurality of sections, including first and second sections each of which includes a plurality of subsections each having a preselected number of memory cells, said first and second sections constituting first and second memory banks, respectively;



a first address bus section for said first memory bank, said first address bus section coupled to a first column decoder connected to said first memory bank;

a second address bus section for said second memory bank, said second address bus section coupled to a second column decoder connected to said second memory bank;

a first data transmission line associated with said first memory bank and connected to respective memory cells of each subsection in said first memory bank;

a second data transmission line associated with said second memory bank and connected to respective memory cells of each subsection in said second memory bank; and

a latch circuit, coupled to said first and second address bus sections, for independently latching column select signals for said each memory banks;

wherein said first and second data transmission lines are coupled to read data latches for receiving data bits and transferring the data bits to a data out buffer according to an internal clock associated with an input clock.

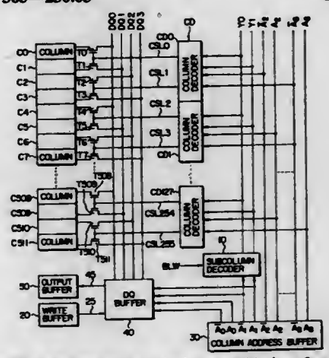
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**5,497,352**

## SEMICONDUCTOR MEMORY DEVICE HAVING DUAL MODE OPERATION

**Koichi Magome, Hiratsuka, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Continuation of Ser. No. 918,030, Jul. 24, 1992, abandoned.**
**This application Jan. 12, 1995, Ser. No. 371,604**
**Claims priority, application Japan, Jul. 24, 1991, 3-184810**
**Int. Cl.[6] G11C 7/00;8/00**
**U.S. Cl. 365—230.03** **21 Claims**



1. A semiconductor memory device operable in a first mode and a second mode, comprising:

a memory cell array having a plurality of memory cells arranged in a matrix form and having a plurality of column lines connected to the memory cells in a same column, said memory cells and said column lines being divided into a plurality of column blocks;

a plurality of data lines;

a plurality of switch means each connected between a corresponding one of the column lines and one of the data lines;

a column address buffer circuit for generating a first group of address signals and a second group of address signals;

a buffer circuit connected to the plurality of data lines, said buffer circuit receiving the first group of address signals and selectively amplifying data on the data lines;
a first column decoder circuit configured to receive the first group of address signals and to generate subaddress signals, said subaddress signals being partially activated in the first mode and being wholly activated in the second mode; and
a second column decoder circuit configured to receive the subaddress signals and the second group of address signals and to generate column selection signals for controlling said plurality of switch means.

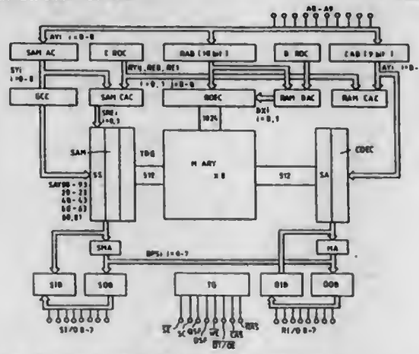
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*5,497,353*

## SEMICONDUCTOR MEMORY DEVICE

**Katsuyuki Sato, Akishima; Miki Matsumoto; Sadayuki Ohkuma, both of Ohme; Masahiro Ogata, Fussa, and Masahiro Yoshida, Tachikawa, all of, Japan, assignors to Hitachi, Ltd., and Hitachi VLSI Engineering Corp., both of Tokyo, Japan**

**Continuation of Ser. No. 283,177, Aug. 3, 1994, which is a continuation of Ser. No. 186,061, Jan. 25, 1994, which is a continuation of Ser. No. 972,913, Nov. 6, 1992, which is a continuation of Ser. No. 754,019, Sep. 3, 1991, which is a continuation of Ser. No. 496,258, Mar. 20, 1990. This application Mar. 30, 1995, Ser. No. 413,411**
**Claims priority, application Japan, Mar. 20, 1989, 1-65843**
**Int. Cl.[6] G11C *13/00***
**U.S. Cl. 365—230.05** **7 Claims**



1. A semiconductor memory device comprising:
a memory array comprising a plurality of word lines, a plurality of data lines and a plurality of memory cells each of which is coupled to a corresponding one of said plurality of word lines and a corresponding one of said plurality of data lines;
a first data transfer line;
a second data transfer line;
a first decoder circuit receiving a plurality of first address signals and selecting at least one of said plurality of word lines based on said plurality of first address signals;
a second decoder circuit receiving a plurality of second address signals and selecting at least one of said plurality of data lines based on said plurality of second address signals;
a plurality of memory circuits each of which stores corresponding read data, where said read data are read out from at least two memory cells of said plurality of memory cells, said at least two memory cells being coupled to a predetermined one of said plurality of word lines, said predetermined one of said plurality of word lines being selected by said first decoder based on said plurality of first address signals;
a data output terminal;
a transfer circuit coupled between said plurality of data lines and said second data transfer line; and
a control circuit controlling said transfer circuit so that said read data stored in said plurality of memory circuits excepting data read out from predetermined one memory cell to be designated by said plurality of first address signals and said plurality of second address signals are outputted to said data output terminal via said second data transfer line in a predetermined sequence after data read out from a predetermined one of said plurality of memory cells designated by said plurality of first address signals and said plurality of second address signals is outputted to said data output terminal via said first data transfer line.

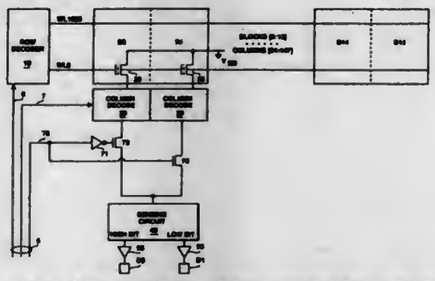
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*5,497,354*

## BIT MAP ADDRESSING SCHEMES FOR FLASH MEMORY

**Sherif Sweha, El Dorado Hills, and Mark E. Bauer, Cameron Park, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.**

**Filed Jun. 2, 1994, Ser. No. 253,902**
**Int. Cl.[6] G11C *8/00***
**U.S. Cl. 365—230.06** **4 Claims**



1. In a flash electrically erasable programmable read-only memory circuit, a sense path circuit for selectively accessing data stored in one of a plurality of data blocks, each data block including at least one memory cell that stores n bits, wherein n is greater than 1, the sense path circuit comprising:
a plurality of n outputs;
a row decoder circuit coupled to the data blocks;
a first column decode circuit coupled to a first memory cell of a first data block for addressing the first memory cell in conjunction with the row decoder circuit in response to an address;
a second column decode circuit coupled to a first memory cell of a second data block for addressing the first memory cell of the second data block in conjunction with the row decoder circuit in response to the address;
a sensing circuit for determining each of the n bits stored in a selected memory cell and for outputting each of the n bits to a corresponding one of the n outputs; and
a selector circuit for selectively coupling either the first memory cell of the first data block or the first memory cell of the second data block to the sensing circuit in response to a select signal.

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*5,497,355*

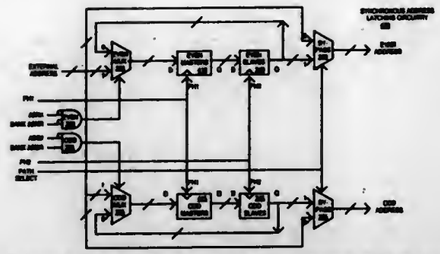
## SYNCHRONOUS ADDRESS LATCHING FOR MEMORY ARRAYS

**Duane R. Mills; Richard Fackenthal, both of Folsom; Rod Rozman, Placerville, and Mamun Rashid, Fairfield, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.**

**Filed Jun. 3, 1994, Ser. No. 253,842**
**Int. Cl.[6] G11C *8/00***
**U.S. Cl. 365—230.08** **22 Claims**

1. Synchronous address latching circuitry for a memory device having at least first and second banks of memory arrays, said latching circuitry comprising:
a first master latch to receive and store an external address if the external address belongs to the first bank;





a first slave latch to receive and store the external address from the first master latch and to provide a first slave output address, if the external address belongs to the first bank, the first slave latch to provide the external address to the first bank as the first slave output address;
a first input multiplexer to receive the external address and to receive the first slave output address from the first slave latch, if the external address belongs to the first bank, the first input multiplexer to provide the external address to the first master latch, if the external address does not belong to the first bank, the first input multiplexer to provide the first slave output address to the first master latch;
a second master latch to receive and store the external address if the external address belongs to the second bank;
a second slave latch to receive and store the external address from the second master latch and to provide a second slave output address, if the external address belongs to the second bank, the second slave latch to provide the external address to the second bank as the second slave output address; and
a second input multiplexer to receive the external address and to receive the second slave output address from the second slave latch, if the external address belongs to the second bank, the second input multiplexer to provide the external address to the second master latch, if the external address does not belong to the second bank, the second input multiplexer to provide the second slave output address to the second master latch.

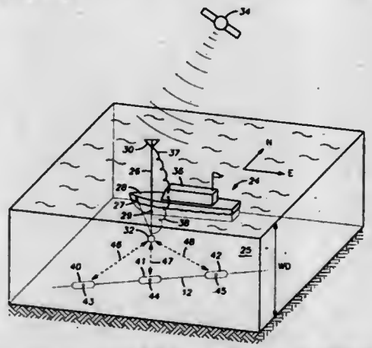
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*5,497,356*

## METHOD AND APPARATUS FOR VERIFYING THE LOCATION OF A SEISMIC BOTTOM CABLE IN REAL TIME

**John P. Norton, Jr., Houston, and William H. Behrens, Rosenberg, both of Tex., assignors to Western Atlas International, Houston, Tex.**

**Filed May 5, 1995, Ser. No. 435,985**
**Int. Cl.[6] G01V *1/38***
**U.S. Cl. 367—6** **7 Claims**



1. A system for estimating the locations of the members of a submerged array of seismic sensors landed on the water bottom, comprising:
a plurality of acoustic slave transponders, each slave transponder being associated with a selected member of the seismic sensor array, each slave transponder including means for emitting a unique encoded reply in response to a master interrogation pulse;
a utility boat;
a vertically-disposed swing pole secured to a gunwale of said utility boat, the top of said swing pole being exposed to the free air, the bottom of said swing pole being submerged;
a navigation means for continuously providing the instantaneous coordinates of said utility boat, said navigation means including a signal-receiving antenna fastened to the top of said swing pole;
a master acoustic transponder fastened to the bottom of said swing pole;
a controller means operatively coupled to the master transponder for causing said master transponder to repeatedly broadcast a master interrogation pulse at timed intervals and for subsequently receiving a uniquely encoded reply in response thereto from said plurality of slave transponders;
means coupled to said controller for measuring the two-way flight times of the interrogation pulse between said master transponder and each of the plurality of slave transponders to provide range gathers during each timed interval;
a range pool means for receiving a plurality of range gathers;
collating means for receiving preplots of desired seismic sensor locations, interconnected with said range pool means, for assigning a desired number of unambiguous range measurements selected from different range gathers to the appropriate slave transponders;
means interconnected with said navigation means and said collating means, for resolving the range measurements assignable to each said slave transducer with the corresponding instantaneous coordinates of said utility boat to provide an estimate of the locations of the respective members of the seismic sensor array with which each of the slave transponders are associated.

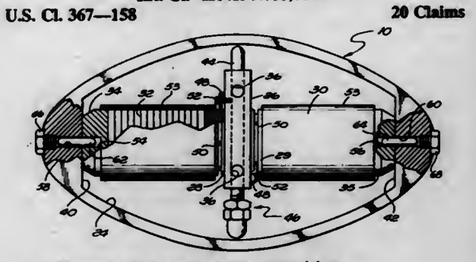
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*5,497,357*

## SHOCK-RESISTANT FLEXTENSIONAL TRANSDUCER

**David K. Dahlstrom, Burbank, and Theodore R. Kazmar, Saugus, both of Calif., assignors to AlliedSignal Inc., Morris Township, N.J.**

**Filed Dec. 23, 1988, Ser. No. 288,329**
**Int. Cl.[6] H04R *17/00;31/00***
**U.S. Cl. 367—158** **20 Claims**



1. A flextensional sonar projector comprising
a one piece elliptical housing with an elliptical interior chamber;
a center support beam extending along the minor axis of said interior chamber,
a limiter rod carried in said center support beam and extending along said minor axis such that said rod does not contact the interior surface of said housing during normal operation of the projector, but which limits inward travel of said housing in the event of exposure to external explosive shock;.
a plurality of transducer stacks in said housing generally positioned along the major axis thereof including an equal number on each side of said center support beam, each stack including a plurality of piezoelectric disks stacked in a column, a transducer head member positioned between said stack and

the end of said housing, a tail member positioned between the opposite end of said stack and said center support beam and end plates closing the ends of said housing.

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**5,497,358**

## ANALOGUE DISPLAY TIMEPIECE EXHIBITING AT LEAST ONE UNIVERSAL TIME DISPLAY MODE

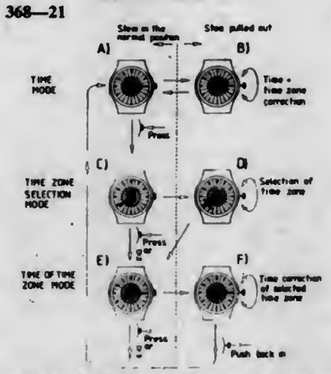
**Daniel Koch, Crémines, Switzerland, assignor to ETA S.A. Fabriques d'Ebauches, Grenchen, Switzerland**

**Filed Sep. 15, 1994, Ser. No. 305,295**

**Claims priority, application Switzerland, Sep. 16, 1993, 02789/93**

**Int. Cl.[6] G04B *19/22***

**U.S. Cl. 368—21** **8 Claims**




1. An analogue display universal timepiece comprising an hour display member, a minute display member, said hour display means and said minute display member forming a time-zone selection member, and means for controlling said hour display, said minute display and said time-zone selection member; said control means being responsive to a manual control signal to drive said selection member so as to select a time zone; wherein said control means superpose said display members in responding to said manual control signal, and wherein said selection member is formed by said superposed display members said control means further being responsive to a time-base signal, and to a signal which is representative of the selected time zone, to drive said minute and said hour display member so that they display time-related information relative to the selected time zone; wherein said control means respond to said manual control signal to drive said selection member to a selected angular position selected from a plurality of twenty-four distinct angular positions, each corresponding to a different time zone.

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**5,497,359**

## OPTICAL DISK DATA STORAGE SYSTEM WITH RADIATION-TRANSPARENT AIR-BEARING SLIDER

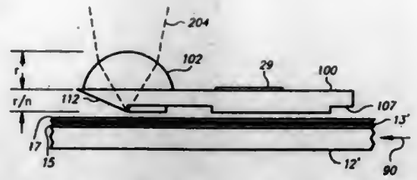
**Harry J. Mamin, Palo Alto; Daniel Rugar, Los Altos, and Bruce D. Terris, Sunnyvale, all of Calif., assignors to National Business Machines Corporation, N.Y.**

**Filed Aug. 30, 1994, Ser. No. 297,994**

**Int. Cl.[6] G11B *7/12***

**U.S. Cl. 369—44.15** **39 Claims**

1. An optical data storage system comprising:
an optical disk having a data layer;
a motor for rotating the disk;
a light source;
a slider made of material transparent to radiation at the wavelength of the light source and having an air-bearing surface on the side of the slider facing the disk for generating an air-bearing between the slider and the disk during rotation of the disk;




an actuator for moving the slider generally radially across the disk;
a suspension connecting the slider to the actuator for maintaining the slider near the disk during rotation of the disk; and
a lens section located on the back side of the slider opposite the side facing the disk, the lens section being in the shape of a partial sphere and made of material transparent to radiation at the wavelength of the light source, and wherein the total thickness of the lens section and the slider is approximately equal to r(1+1/n), where r is the radius of the partial spherical lens section and n is the index of refraction of the lens section.

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**5,497,360**

## OPTICAL DISC APPARATUS WITH ACCESSING USING ONLY REFERENCE VELOCITY DURING ACCELERATION AND REFERENCE AND MOVING VELOCITIES DURING DECELERATION

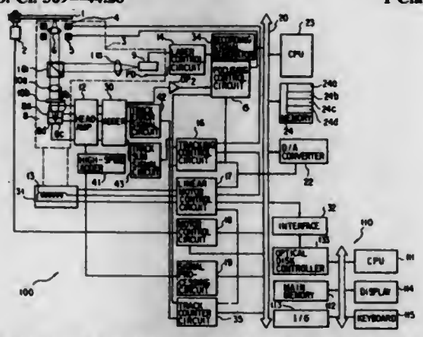
**Tamane Takahara, Tokyo, and Akihiro Kasahara, Chiba, both of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Feb. 25, 1994, Ser. No. 202,134**

**Claims priority, application Japan, Mar. 24, 1993, 5-065255**

**Int. Cl.[6] G11B *7/085***

**U.S. Cl. 369—44.28** **1 Claim**




1. An optical disk apparatus reproducing information recorded along tracks formed on an optical disk by accessing a target track on the optical disk, said apparatus comprising:
spot applying means for applying a light beam spot on an arbitrary track in order to reproduce the information from the track;
determining means for determining the number of remaining tracks located between the target track and a track on which the light beam spot is applied;
moving means for moving the spot applying means to move the light beam spot applied by the spot applying means;
detecting means for detecting an actual moving velocity D of the spot applying means moved by the moving means;
acceleration and deceleration control means for controlling a moving velocity of the spot applying means moved by the moving means, in response to a reference velocity which varies in accordance with the remaining track number, the acceleration and deceleration control means, when the spot applying means is located in a decelaration region in which the number of the remaining tracks is small, controlling the moving velocity of the spot applying means to decelerate in response to the actual moving velocity D of the spot applying means and the reference velocity, and when the spot applying means is located in an acceleration region, in which the remaining tracks number is large, controlling the moving velocity of the spot applying means to accelerate in response to only the reference velocity;
first storing means for storing a velocity trajectory curve B which is determined as an object velocity of the spot applying means in response to the remaining track number;
second storing means for storing a specific value C representing a steady-state velocity deviation wherein the reference velocity is smaller than the velocity trajectory curve B by the specific value C; and
supplying means for supplying to the acceleration and deceleration control means a maximum velocity of the velocity trajectory curve B stored in the first storing means as the reference velocity when the spot applying means is located in the acceleration region, and for supplying to the acceleration and deceleration control means a moving velocity lower than the velocity trajectory curve B by the specific value C stored in the second storing means as the reference velocity, so that the actual moving velocity D of the spot applying means coincides with the velocity trajectory curve B when the spot applying means is located in the deceleration region.



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**5,497,361**

## INFORMATION REPRODUCING APPARATUS WITH A DC LEVEL CORRECTING CAPABILITY

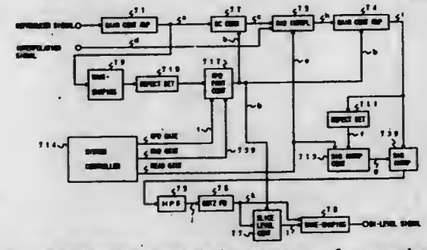
**Seiichi Mita, Kanagawa; Toru Kawashima, Fujisawa; Masanori Matsuzaki, Chigasaki; Toshimitsu Kaku, Sagamihara, and Hiroyuki Tsuchinaga, Kokubunji, all of, Japan, assignors to Hitachi, Ltd., Tokyo, and Hitachi Video and Information System, Inc., Kanagawa, both of, Japan**

**Continuation-in-part of Ser. No. 28,224, Mar. 9, 1993, Pat. No. 5,412,632. This application Nov. 22, 1993, Ser. No. 155,228**

**Claims priority, application Japan, Mar. 13, 1992, 4-054773; Nov. 20, 1992, 4-311682; Jan. 28, 1993, 5-012277; Jan. 28, 1993, 5-012278**

**Int. Cl.[6] G11B *7/00***

**U.S. Cl. 369—48** **12 Claims**



1. An information reproducing apparatus for reproducing recorded information from a recording medium in which each sector of the recording medium has at least one area bearing a specific pattern expressive of a synchronizing signal for phase-locking a clock signal for demodulating data, comprising:
reproduction means for deriving a reproduced signal including said specific pattern from said recording medium;
DC (direct current) level correction means for correcting a DC level of said reproduced signal so that a DC level of a part of said reproduced signal corresponding to said specific pattern as derived by said reproduction means agrees with a predetermined reference level;
means for receiving a read gate signal indicative of a first time period during which said reproduced signal derived by said reproduction means is to be demodulated;
AC (alternating current) signal generation means for generating an AC signal whose average potential is equal to said predetermined reference level; and
signal replacement means for substituting said AC signal for said reproduced signal in a second time period other than said first time period indicated by said read gate signal.

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**5,497,362**

## DRIVE INTERFACE FOR PERFORMING WRITE/READ OF INFORMATION

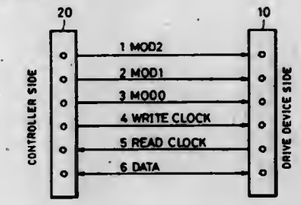
**Takayuki Aizawa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 9,396, Jan. 27, 1993, abandoned, which is a continuation of Ser. No. 375,474, Jul. 5, 1989, abandoned. This application Nov. 15, 1994, Ser. No. 341,044**

**Claims priority, application Japan, Jul. 4, 1988, 63-166540**

**Int. Cl.[6] G11B *7/00***

**U.S. Cl. 369—53** **11 Claims**




1. A drive interface provided between a drive device for writing information on a recording medium or reading information from the recording medium and a controller device for controlling the drive device, said drive interface comprising:
a single bidirectional data signal channel for transmitting a plurality of kinds of data signals bidirectionally between the controller device and the drive device; and
mode signal lines, distinct from said data signal channel, for transmitting mode signals from the controller device to the drive device for identifying kinds of data transmitted by said data signal channel.

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**5,497,363**

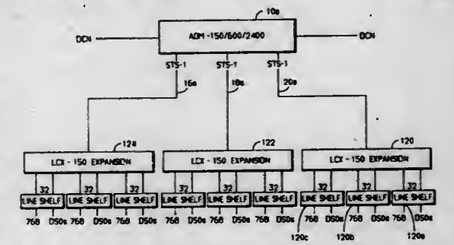
## EXPANSION SHELF FOR ACCESS SYSTEM AND SWITCH BLOCK THEREFOR

**Michael J. Gingell, Raleigh, N.C., assignor to Alcatel Network Systems, Inc., Richardson, Tex.**

**Filed Sep. 29, 1994, Ser. No. 310,934**

**Int. Cl.[6] H04J *3/08***

**U.S. Cl. 370—55** **3 Claims**




1. An improved network element having a cross-connect connected to a plurality of line shelves each line shelf for connection to a first number of subscribers, wherein the improvement comprises at least one expansion shelf substituted for a corresponding at least one of the plurality of line shelves connected to the cross-connect and connected to additional line shelves, each addi-

tional shelf for connection to a number of subscribers equal to said first number, wherein said expansion shelf is for connecting a number of subscribers greater at least by a factor of two than said first number of subscribers to said cross-connect.

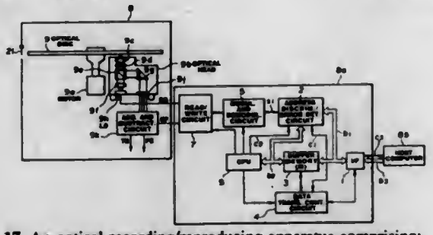
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**5,497,364**

## OPTICAL RECORDING/REPRODUCING APPARATUS IN WHICH DATA WILL NOT BECOME UNABLE TO BE READ OUT IN CASE AN SDL FAILS TO BE RENEWED

**Hitoshi Ichikawa, Machida; Ooso Miyazawa, Hachioji, and Masanobu Nakamura, Hoya, all of, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan**

**Continuation of Ser. No. 661,957, Feb. 27, 1991, Pat. No. 5,351,227. This application Feb. 24, 1994, Ser. No. 201,128**
**Claims priority, application Japan, Feb. 28, 1990, 2-51127**
**Int. Cl.[6] G11B *7/00***
**U.S. Cl. 369—58** **17 Claims**



17. An optical recording/reproducing apparatus comprising:
an optical recording medium having
a recording area in which information is recorded,
an alternating area in which said information is recorded instead of the recording area when said information fails to be recorded in the recording area, and
a plurality of control regions in which position information of the recording area having failed to record information and position information of the alternating area in which the information failed to be recorded is recorded instead of said recording area;
recording means for recording the information in a predetermined information recording area of said optical recording medium;
a reproducing means for reproducing said information which is recorded from said predetermined information recording area;
a collating means for collating said information intended to be recorded with said reproduced information obtained by said reproducing means and judging that said information was not correctly recorded in said predetermined recording area;
an alternating processing means for alternating processing to record said information in said alternating area by said recording means in a case it was judged that the information was not correctly recorded by said collating means; and
a control region renewing means for renewing the contents of said control regions by said recording means, wherein the renewing is carried out by said alternating processing means;
said control region renewing means repetitively recording information linking the position of the recording area having failed to record information and the position of the alternating area in which the information having failed to be recorded is recorded instead of said recording area in one or more of said control regions until the final linking position information linking the recording area having failed to record information and the position information of the alternating area in which the information having failed to be recorded is first successfully recorded, said control region renewing means then renewing the contents of the initially recorded control region with said final linking position information, wherein, if no final linking position information is obtained, the contents of the initially recorded control region is not renewed and error information is generated.

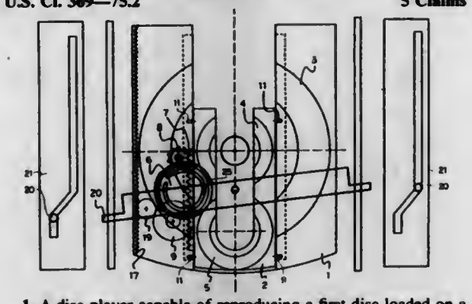
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**5,497,365**

## LASER DISC PLAYER CAPABLE OF PLAYING DIFFERENT TYPES OF DISCS

**Su K. Lee, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea**

**Filed Sep. 8, 1993, Ser. No. 117,620**
**Claims priority, application Rep. of Korea, Sep. 8, 1992, 92-16651**
**Int. Cl.[6] G11B *17/03;17/035***
**U.S. Cl. 369—75.2** **5 Claims**



1. A disc player capable of reproducing a first disc loaded on a main tray, said player comprising:
a sub-tray for supporting at least two second discs, said subtray being slidably mounted on said main tray;
a rack gear mounted on a side of said sub-tray;
a pinion gear meshed with said rack gear;
a cam gear meshed with said pinion gear, rotation of said cam gear causing said sub-tray to slide relative to said main tray, a groove being formed in said cam gear;
a lever pivotally mounted on said main tray;
at least one side plate having a slot formed therein, a portion of said lever being slidably disposed in said slot; and
a pin formed on said lever and engaged in said groove, whereby rotation of said cam gear causes said lever to pivot so that said portion moves along said slot to move said main tray towards or away from a playing position and sequentially slide said main tray and said sub-tray in response to rotation of said cam gear.

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**5,497,366**

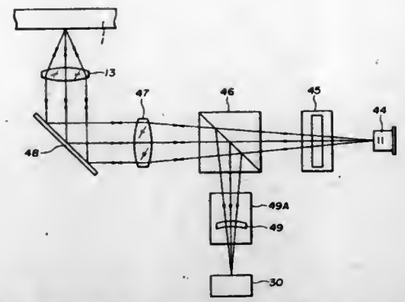
## OPTICAL-PICK UP DEVICE USING MULTI-LENS HOLDER

**Hirotoshi Fujisawa, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Filed Dec. 15, 1994, Ser. No. 357,610**
**Claims priority, application Japan, Dec. 29, 1993, 5-355379**
**Int. Cl.[6] G11B *7/00***
**U.S. Cl. 369—112** **6 Claims**

1. An optical pick-up device comprising;
a light source;
reflecting means for reflecting light emitted from the light source to an object lens;
object lens driving means for driving the object lens in a focusing direction and in a tracking direction;
spectral means for optically separating the light emitted from the light source and reflected light from an optical disc incident through the object lens;
a base member for supporting the light source, the reflecting means, the spectral means and detecting means for detecting the reflected light optically separated by the spectral means;





a multi-lens disposed between the detecting means and the spectral means to shape form of the reflected light optically separated by the spectral means; and
multi-lens holding means for holding the multi-lens movably supported on the base member in a moving direction that crosses a first optical path formed between the light source and the spectral means, and is substantially parallel to a second optical path formed between the spectral means and the detecting means.

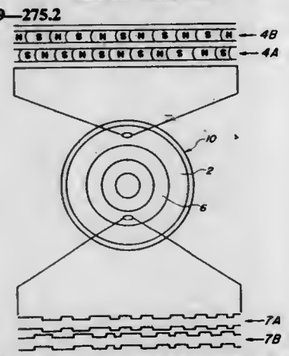
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**5,497,367**

## OPTICAL RECORDING MEDIUM

**Tamotsu Yamagami, Kanagawa, and Yoichiro Sako, Chiba, both of, Japan, assignors to Sony Corporation, Japan**

**Continuation of Ser. No. 568,963, Aug. 17, 1990, abandoned. This application Sep. 1, 1992, Ser. No. 939,031**
**Claims priority, application Japan, Aug. 25, 1989, 1-219415**
**Int. Cl.[6] G11B *7/24***
**U.S. Cl. 369—275.2** **14 Claims**



1. An optical medium for storing a read-write information signal and a read-only information signal that can be read by the same optical means, the medium comprising:
a first area including a means for rewritably storing the read-write information signal, the means including an unmodulated, pre-formed track; and
a second area, radially separated from the first area, the second area including a read-only track along which the read-only information signal is stored, the read-only information signal being stored in a plurality of frames, each frame including a frame sync signal, the read-only track having a track direction and a length in the track direction, the read-only track:
being in a nominal position in a direction lateral to the track direction over first portions of its length, and being in an offset position, offset from the nominal position in a direction lateral to the track direction, over second portions of its length, to represent the read-only information signal, and
being in the offset position over a second portion of its length equal in length to a predetermined length to provide the frame sync signal,
the read-only information signal, when read from the read-only track, generating a read-only signal having a frequency, the read-only information signal being stored on the read-only track such that the frequency of the read-only signal is sufficiently higher than the frequency of tracking error signals produced when the read-only information signal is read from the read-only track.

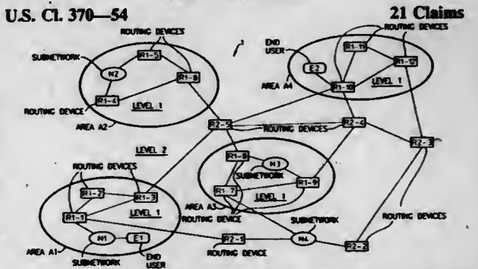
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**5,497,368**

## ROUTING METHOD FOR A HIERARCHICAL COMMUNICATIONS NETWORK, AND A HIERARCHICAL COMMUNICATIONS NETWORK HAVING IMPROVED ROUTING

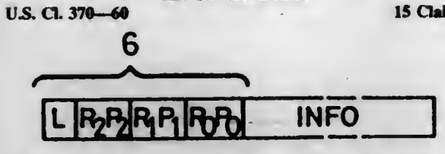
**Adrianus A. L. Reijnierse, Breda, and Daan D. Velthausz, Doetinchem, both of, Netherlands, assignors to Koninklijke PTT Nederland N.V., Groningen, Netherlands**

**Filed Aug. 15, 1994, Ser. No. 290,346**
**Claims priority, application Netherlands, Aug. 18, 1993, 9301428**
**Int. Cl.[6] H04L *12/46***
**U.S. Cl. 370—54** **21 Claims**



1. A method of providing routing information and for selecting routes in a communications network comprising a number of mutually isolated areas (A1, A2, A3, A4) at a first level, said first level areas (A1 A2 A3 A4) being linked at a second level; and routing devices (R1-1, R1-2 . . . , R2-5) provided at both said first and second levels for selecting routes on the basis of a cost function and routing information stored in said first level routing devices (R1-1, R1-2, . . . ); and wherein at least some first level areas (A1, A3, A4) are directly linked to more than one second level routing device (A1: R2-1 and R2-5; A3: R2-1, R2-2, R2-4 and R2-5; A4: R2-3, R2-4 and R2-5);
the method comprising the steps of:
providing to the first level routing devices (e.g., R1-1, R1-2, R1-3) of a given first level area (e.g., A1), routing information relating to said given first level area (A1) and to direct links from said given first level area (A1) to second level routing devices (R2-1, R2-5);
providing additional routing information to first level routing devices (R1-1, R1-2, . . . ) of first level areas (A1, A3, A4) which are directly linked to more than one second level routing device (A1: R2-1 and R2-5; A3: R2-1, R2-2, R2-4 and R2-5; A4: R2-3, R2-4 and R2-5), said additional routing information relating only to routing information of second level routing devices and being provided by second level routing devices (R2-1, R2-5) which are directly linked to said given first level area (A1);
determining costs of alternative communication routes from said first-mentioned routing information and said additional routing information; and
selecting a communication route from said alternative communication routes.

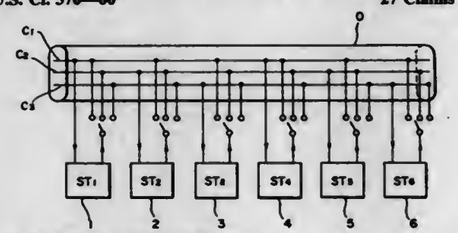
**5,497,369**
**MULTICAST SWITCH CIRCUITS**
**Nicholas J. Wainwright, Bristol, England, assignor to Hewlett-Packard Company, Palo Alto, Calif.**
**PCT No. PCT/GB91/01909, § 371 Date Apr. 8, 1993, § 102(e) Date Apr. 8, 1993, PCT Pub. No. WO92/08306, PCT Pub. Date May 14, 1992**
**PCT Filed Oct. 31, 1991, Ser. No. 30,390**
**Claims priority, application European Pat. Off., Nov. 6, 1990, 90312134**
**Int. Cl.[6] H04L *12/56***
**U.S. Cl. 370—60** **15 Claims**




1. A multicast switch element for connection to a plurality of similar such elements in a matrix to form a multicast switch fabric, said multicast switch element having:
- a plurality of inputs, each of the inputs being responsive to cells containing information and associated instructions, the instructions including a first section indicative of quantity of cell information replication to be performed by the switch element and a second section indicative of whether or not the information is to be replicated fully in any subsequent switch element in the matrix;
- a plurality of outputs; and
- a switch coupled between said plurality of inputs and said plurality of outputs, said switch including means for decoding the first section and the second section of cell instructions received by the switch to obtain decoded instructions and for providing replicated cell information to the outputs in accordance with the decoded instructions.

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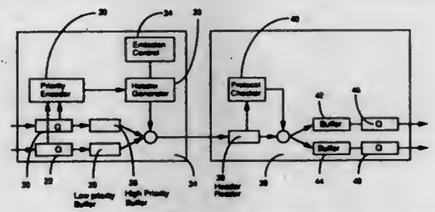
**5,497,370**
**NETWORK SYSTEM**
**Takuji Hamada, Hitachiota; Masakazu Okada, Katsuta, and Hiroshi Tomizawa, Hitachi, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**
**Continuation of Ser. No. 841,777, Mar. 2, 1992, abandoned, which is a continuation of Ser. No. 649,556, Feb. 1, 1991, abandoned, which is a continuation of Ser. No. 436,780, Nov. 15, 1989, abandoned. This application Feb. 16, 1994, Ser. No. 197,535**
**Claims priority, application Japan, Nov. 16, 1988, 63-287701**
**Int. Cl.[6] H04J *3/16*; H04L *12/56***
**U.S. Cl. 370—60** **27 Claims**




21. A network system comprising:
- a transmission line including a plurality of transmission channels; and
- a plurality of transmission equipment connected to said transmission line to transmit and receive information from each other, wherein one of said plurality of transmission channels is fixedly assigned to each of said transmission equipment as a receiving transmission channel, and
- wherein transfer of information between said plurality of transmission equipment is effected such that receiving of information is effected by using one of said plurality of transmission channels fixedly assigned to each transmission equipment as the receiving transmission channel, and sending of information is effected by using one of said plurality of transmission channels fixedly assigned to destination transmission equipment as the receiving transmission channel;
- wherein the transfer of information between said transmission channels in each of said transmission equipment is effected in a manner such that the transmission of information is effected by obtaining transmission right of the receiving transmission channel of the destination transmission equipment.

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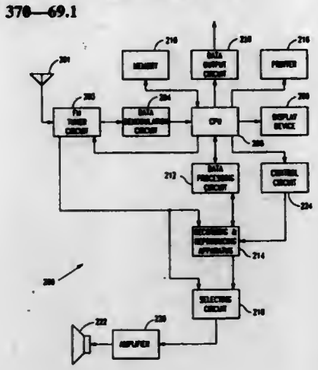
**5,497,371**
**DIGITAL TELECOMMUNICATION LINK FOR EFFICIENTLY TRANSPORTING MIXED CLASSES OF PACKETS**
**John G. Ellis; Keith C. Dysart, both of Kanata, and Douglas N. Commons, Ottawa, all of, Canada, assignors to Northern Telecom Limited, Montreal, Canada**
**Continuation of Ser. No. 141,007, Oct. 26, 1993, abandoned. This application Feb. 16, 1995, Ser. No. 389,449**
**Int. Cl.[6] H04L *12/56***
**U.S. Cl. 370—60** **7 Claims**




1. A digital telecommunication system for serially transmitting in packets of various sizes digital data of two or more different priorities from a source card to a destination card over a link, in transmitting the digital data the digital telecommunication system routinely using frame slips to adjust differences among clocks in the system, comprising:
- the link connecting the cards;
- each of the cards having two or more buffers and two or more queues, each queue and buffer being connected to each other and being assigned with a priority for individually storing packets or fragmented packets of digital data of any number of bytes according to their priority;
- a link controller at the source card serving the buffers for transmission of a packet therein to the destination card according to their priorities so that a packet of higher priority in its assigned buffer is able to interrupt at any time the transmission of a packet of lower priority from its assigned buffer and to fragment it to one or more packet fragments of any number of bytes;
- the link controller adding to each packet and fragmented packet, priority bits, sequence bits, CRC bits and a complete bit to indicate respectively the priority, sequence number, CRC, and completeness of each packet and fragmented packet; and
- a protocol checker at the destination card for monitoring the sequence numbers of packets for skipped or replicated packet fragments which may have been caused by the frame slips.

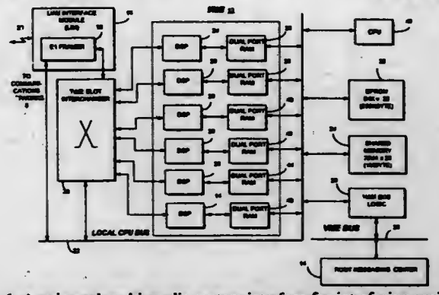


**5,497,372**
**FM MULTIPLEX BROADCASTING AND RECEIVING SYSTEM**
**Mitsuo Nankoh, Osaka; Akio Inoue, Nara; Hitoshi Yokomizo, Hyougo; Yosikazu Tomida, and Tohru Kawabata, both of Osaka, all of, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan**
**Filed Mar. 8, 1994, Ser. No. 207,558**
**Claims priority, application Japan, Mar. 11, 1993, 5-050673**
**Int. Cl.[6] H04J *1/14***
**U.S. Cl. 370—69.1** **10 Claims**




1. An FM multiplex broadcasting apparatus wherein a carrier signal being frequency modulated by a first audio signal and an additional information data is broadcast, the FM multiplex broadcasting apparatus comprising:
- first reproducing means for reproducing, from a recording medium, the first audio signal and a character data associated with the first audio signal as the additional information data;
- multiplex means for frequency multiplexing the first audio signal and the additional information data to provide a multiplex signal;
- frequency modulation means for frequency modulating the carrier signal with the multiplex signal;
- second reproducing means for reproducing a second audio signal;
- database means for storing and retrieving second character data associated with the second audio signal;
- data modulation means for providing the additional information data to the multiplex means;
- first selecting means for selecting and providing to the data modulation means one of the second character data from the database means and the character data from the first reproducing means;
- second selecting means for selecting and providing to the multiplex means one of the second audio signal from the second reproducing means and the first audio signal from the first reproducing means; and
- control data providing means for providing a control data to the data modulation means, the control data designating a starting portion of a selected program,
- the multiplex means further multiplexing the control data with the first audio signal to provide the multiplex signal,
- the first selecting means selecting the second character data from the database means when the second selecting means selects the second audio signal from the second reproducing means, and selecting the character data from the first reproducing means when the second selecting means selects the first audio signal from the first reproducing means.

**5,497,373**
**MULTI-MEDIA INTERFACE**
**John S. Hulen, Gaithersburg, Md., and David Oren, Melville, N.Y., assignors to Ericsson Messaging Systems Inc., Woodbury, N.Y.**
**Filed Mar. 22, 1994, Ser. No. 216,104**
**Int. Cl.[6] H04J *3/16*; G06F *3/00;13/00***
**U.S. Cl. 370—79** **29 Claims**

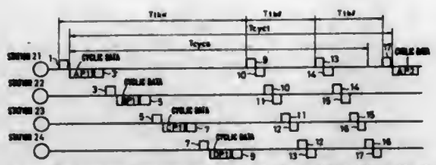



1. A universal multi-media system interface for interfacing various communication networks with a multi-media messaging system that provides communications services to subscribers, comprising:
- parallel signal processors, each processor selectively processing in parallel messages in a particular communication format in accordance with a reconfigurable protocol conversion algorithm;
- a line interface module connecting the multi-media interface to the various communications networks for dividing messages received over multiple communications links in the communications networks into frames, each frame including a plurality of time slots;
- a time slot interchanger for receiving framed messages from the line interface module and selectively routing various time slots of information to one or more of the parallel signal processors; and
- a supervisory processing unit for selectively downloading protocol conversion algorithms from the multi-media messaging system in real time into one or more of the parallel processors while continuing to process messages in another of the parallel processors to reconfigure the one or more of the parallel processors in real time to selectively perform protocol conversions on the selectively routed time slots, wherein the multi-media messaging system provides call processing services to subscribers using different types of communications media.

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**5,497,374**
**DATA TRANSMISSION METHOD AND SYSTEM THEREOF**
**Hisayuki Maruyama, Ebina; Sadao Mizokawa, Katsuta; Seiichi Yasumoto, Hitachi; Ken Onuki, Hitachi; Hisao Ogawa, Hitachi; Junji Fukuzawa, Sagamihara; Toshihiko Uchiyama, Hitachi; Toshiyuki Murakami, Hitachi; Osamu Anbo, Hitachi, and Masato Satake, Naka, all of, Japan, assignors to Hitachi, Ltd., Tokyo, and Hitachi Process Computer Engineering, Inc., Ibaraki, both of, Japan**
**Continuation of Ser. No. 495,750, Mar. 19, 1990, Pat. No. 5,426,638. This application Sep. 2, 1994, Ser. No. 299,634**
**Claims priority, application Japan, Mar. 18, 1989, 1-66595**
**Int. Cl.[6] H04L *12/417***
**U.S. Cl. 370—85.4** **5 Claims**

5. A station suitable for use in a data transmission system of a token passing type, said station comprising:
- means for producing cyclic data;
- means for transmitting said cyclic data to a transmission line upon receipt of a token;



means for transmitting packet data together with said cyclic data or said packet data alone in response to a request-to-send of said packet data;

means for passing the token to a next station immediately after acquisition thereof if the station has no data to be transmitted therefrom; and

means for providing a limit to a quantity of said packet data to be transmitted or a time available to transmit said packet data within a cycle time of production of said cyclic data such that the token is circulated at least once within a cycle time of production of said cyclic data.

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**5,497,375**

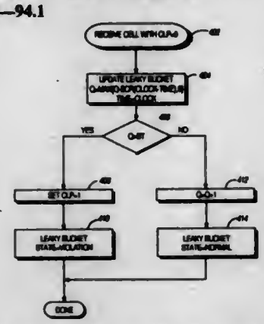
## DEVICE AND METHOD FOR ATM END SYSTEM CELL FLOW REGULATION

**Michael G. Hluchyj, Wellesley, and Nanying Yin, Newton, both of Mass., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Jan. 5, 1994, Ser. No. 176,818**

**Int. Cl.[6] H04J** *3/24*

**U.S. Cl. 370—94.1** **28 Claims**



1. A device for providing cell relay end system cell flow regulation in a communication network by adjusting and monitoring cell flow for cell relay connections emanating from the cell relay end system, comprising:

(A) a congestion state determiner, operably coupled to receive congestion feedback information in the network, for utilizing the congestion feedback information to determine the congestion state,

(B) a cell scheduler, operably coupled to the congestion state determiner, a data source and a leaky bucket monitor, for transmitting a send-cell signal to the data source based on the congestion feedback information, a current cell rate monitored by the leaky bucket monitor, and a data source status,

(C) the data source, operably coupled to the cell scheduler, for transmitting a data source status to the cell scheduler and, upon receiving the send cell signal, sending a cell to the leaky bucket monitor, and

(D) the leaky bucket monitor, operably coupled to the data source, for, upon receiving a cell from the data source, transmitting an updated leaky bucket state to the cell scheduler and sending the cell to the communication network wherein the data source includes:

(E) a cell generator, for generating cells through adaptation Of higher level Protocol Data Units, PDU,

(F) a cell buffer, operably coupled to the cell generator, for storing the generated cell until transmission,

(G) a cell flow switch, operably coupled to the cell buffer and to the cell scheduler, for, where cell buffer has at least one stored cell, upon receiving a send-cell signal from the cell scheduler, sending a cell to the leaky bucket monitor, and

(H) a cell buffer state determiner, operably coupled to the cell buffer, for determining whether the state of the cell buffer is empty or contains cell(s), and for, upon the cell buffer state changing, transmitting the cell buffer state to the cell scheduler,

wherein the leaky bucket monitor monitors a predetermined sustainable cell rate SCR, and an associated predetermined burst tolerance, BT, traffic parameters for network connections,

wherein the leaky bucket monitor further determines whether a cell passing through the leaky bucket monitor is in violation of i.e., is non-conforming with, predetermined negotiated SCR and BT traffic parameters, and

wherein:

where the leaky bucket monitor is non-conforming, the CLP, cell loss priority, field in a cell header is set to 1 and the leaky bucket state is set to violation,

where the leaky bucket is conforming, the CLP is set to 0 and the leaky bucket state is set to normal, and

the leaky bucket monitor signals the leaky bucket state changes to the cell scheduler.

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**5,497,376**

## METHOD AND DEVICE FOR DETECTING AND CORRECTING ERRORS IN MEMORY MODULES

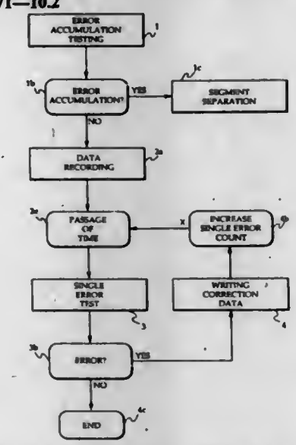
**Dieter Kopp, Hemmingen, Germany, assignor to Alcatel NV, Netherlands**

**Filed Aug. 26, 1994, Ser. No. 301,231**

**Claims priority, application Germany, Aug. 28, 1993, 43 29 012.4**

**Int. Cl.[6] G11C** *29/00*; **G06F** *11/10*

**U.S. Cl. 371—10.2** **9 Claims**



1. A method of detecting and correcting errors in memory modules

wherein each memory module is divided into segments,

wherein before data is written in to a memory module, any accumulation of errors in a segment of the memory module is detected by means of a memory test,

wherein on the occurrence of an accumulation of errors, the segment is no longer used for storing data,

wherein data is written in to the memory module, excluding those segments which are no longer used for storing data,

wherein after expiration of a period of time following the write-in of data, each segment is checked for single errors,



wherein on the occurrence of a single error, correction data is written into the segment, and

wherein said check for single errors is repeated until no single error is detected.

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**5,497,377**

## COMMUNICATION SYSTEM AND METHOD OF DETECTING TRANSMISSION FAULTS THEREIN

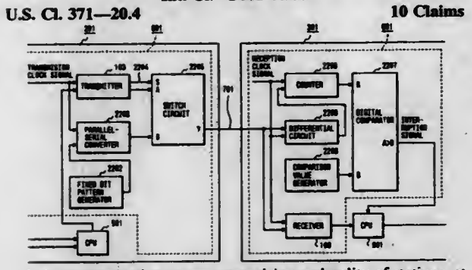
**Minoru Mnto; Masanori Yamazi, and Noriyuki Hattori, all of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, and Mitsubishi Electric Engineering Co., Ltd., both of Toyko, Japan**

**Filed Mar. 31, 1994, Ser. No. 220,664**

**Claims priority, application Japan, Mar. 31, 1993, 5-073277**

**Int. Cl.[6] G06F** *11/00*

**U.S. Cl. 371—20.4** **10 Claims**



1. A communication system comprising a plurality of stations, at least one station being a transmitting station and another station being a receiving station, said stations being connected by a transmission medium and operating on the basis of a signal protocol wherein transmission data has a number of consecutive bits of the same logical level that is less than a first predetermined number,

said transmitting station comprising:

fixed bit pattern output means for repeating an operation in which bits of the same logical level and of a number which is equal to or greater than said first predetermined number are consecutively output, the logical level is then inverted, and in succession, bits of the same logical level and of a number which is equal to or greater than said first predetermined number are consecutively output; and

switch means for conducting a switch operation so that, during an idle time other than a transmission time for transmitting transmission data, an output of said fixed bit pattern output means is transmitted, and

said receiving station comprising:

fault detection means for detecting a fault on the basis of a consecutive reception of bits of the same logical level and of a number which is equal to or greater than the number of the consecutive bits of the same logical level which are output by said fixed bit pattern output means.

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**5,497,378**

## SYSTEM AND METHOD FOR TESTING A CIRCUIT NETWORK HAVING ELEMENTS TESTABLE BY DIFFERENT BOUNDARY SCAN STANDARDS

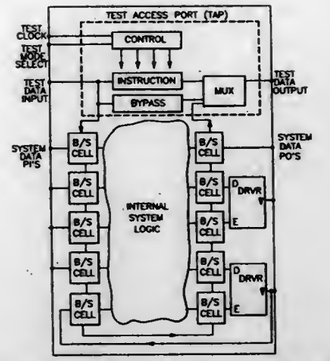
**Ismael Z. Amini, Boca Raton, Fla.; William F. Heybruck, Charlotte, N.C.; Andres M. Molina, Boca Raton, Fla., and Kimberly K. Van Vliet, Charlotte, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Nov. 2, 1993, Ser. No. 146,557**

**Int. Cl.[6] H04B** *1/24*

**U.S. Cl. 371—22.3** **12 Claims**

1. A test fixture for boundary testing a circuit network having at least one first integrated circuit testable by IEEE 1149.1 Standard boundary testing, and at least one second integrated circuit testable by Level Sensitive Scan Design boundary testing but not by IEEE 1149.1 Standard boundary testing, and requiring three clocks for testing; said test fixture comprising a test access port interface comprising:



a. a test access port controller with Test Clock, Test Data In, Test Data Out, Test Mode Select, and Test Reset I/O means;

b. an instruction register;

c. a bypass register;

d. a test clock; and

e. a Level Sensitive Scan Device boundary scan register having the control input signals:

i. LSSD clocks CLK A, CLK B, and CLK C;

ii. boundary scan output BSCO controlling boundary scan cells on the Level Sensitive Scan Device integrated circuit chip associated with drivers;

iii. boundary scan input BSCI controlling boundary scan cells on the Level Sensitive Scan Device integrated circuit chip associated with receivers; and

iv. data inhibit, DI1.

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**5,497,379**

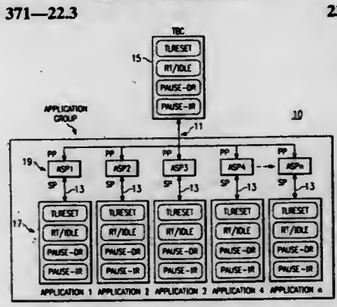
## METHOD AND APPARATUS FOR SELECTABLE PARALLEL EXECUTION OF TEST OPERATIONS

**Lee D. Whetsel, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.**

**Division of Ser. No. 368,248, Jan. 3, 1995, which is a continuation of Ser. No. 101,142, Aug. 2, 1993, abandoned. This application Jan. 26, 1995, Ser. No. 378,343**

**Int. Cl.[6] G01R** *31/28*

**U.S. Cl. 371—22.3** **23 Claims**



1. A method of synchronizing operations of a plurality of logic circuits, comprising the steps of:

providing a plurality of connection ports connected to a control bus for connecting logic circuits to the control bus in response to addresses presented to the connection ports via the control bus;

presenting to the connection ports a first address associated with a first said connection port so that a first logic circuit associ-

ated with the first connection port is connected to the control bus while the remaining logic circuits, whose associated connection ports are not currently addressed, remain disconnected from the control bus, and thereafter withdrawing the first address from the connection ports without addressing any of the connection ports so that the first logic circuit is disconnected from the control bus without connecting any of the remaining logic circuits to the control bus; and

changing a control state of the control bus after said step of withdrawing the first address, so that the control state is changed while the logic circuits are all disconnected from the control bus.

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**5,497,380**

## CONTROL DEVICE FOR THE ACTUATION OF SWITCHGEARS

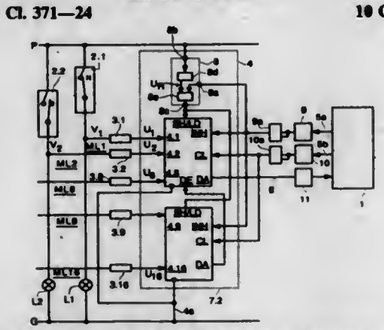
**Klaus Bott, Durmersheim, and Bernd Schukraft, Karlsruhe, both of, Germany, assignors to Landis & Gyr Technology Innovation AG, Zug, Switzerland**

**Filed Dec. 14, 1994, Ser. No. 355,696**

**Claims priority, application European Pat. Off., Dec. 24, 1993, 93810910**

**Int. Cl.[6] G07F 11/00**

**U.S. Cl. 371—24** **10 Claims**



1. A control device for controlling a system comprising,

a timing and control logic unit,

a plurality of switchgears which are actuated by said timing and control logic unit,

a plurality of loads, each of said plurality of loads being connected in series to one of said plurality of switchgears in a low-voltage network between a phase and a zero-point, wherein said loads receive current supply from said switchgears,

a plurality of call circuits, each of said plurality of call circuits having an input connected to one of said loads and one of said switchgears,

a circuit block having a plurality of parallel inputs, each parallel input being connected to one of said call circuits, so that said circuit block detects a state of each of said switchgears, and having a serial data output and

a serial data line connected to said serial data output and an input of said control logic unit,

wherein each of said call circuits comprises a coupling element having an input connected on the series connection of a load and a switchgear and an output connected to said circuit block, and voltage signals are transmitted from said coupling elements to said circuit block, said voltages having a level of said zero-point when one of said plurality of switchgears is in an open state and said voltages are A.C. or D.C. voltages when one of said plurality of switchgears is in a closed state, said voltages being dependent on a timely voltage course of said phase relative to said zero-point, and

wherein said control logic unit causes said detection by said circuit block of said states of said switchgears by carrying out a testing cycle during which testing cycle said voltage signals are detected at said inputs of said circuit block as binary numbers as a function of a predetermined voltage level, each binary number representing one state of said switchgears, and are transmitted via said serial output and said serial data line to said control logic unit.

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**5,497,381**

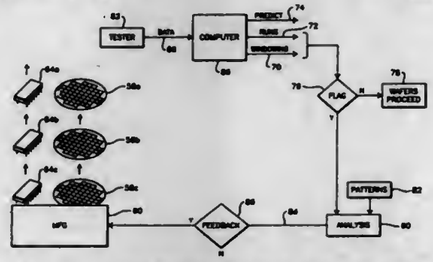
## BITSTREAM DEFECT ANALYSIS METHOD FOR INTEGRATED CIRCUITS

**Geoffrey P. O'Donoghue, Andover, and Gary C. Cheek, Wilmington, both of Mass., assignors to Analog Devices, Inc., Norwood, Mass.**

**Continuation of Ser. No. 137,296, Oct. 15, 1993, abandoned. This application Jun. 1, 1995, Ser. No. 458,020**

**Int. Cl.[6] G06F 11/10**

**U.S. Cl. 371—28** **14 Claims**



1. A method of controlling the fabrication of multiple integrated circuit (IC) dice fabricated on respective IC wafers, with each wafer having multiple dice, comprising:

fabricating an IC wafer having multiple IC dice located at predetermined positions on the wafer,

testing the IC dice on said IC wafer for defects in a sequence that corresponds to the positions of said dice on the wafer,

encoding the results of said testing into an output signal in the form of a serial digital data bitstream with a bit sequence that corresponds to the test sequence and the positions of said dice on said wafer,

operating upon the dice positional information in said data bitstream output signal to categorize defects identified in said dice by said testing, and

modifying the fabrication for subsequent wafers based upon the results of said defect categorization.

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**5,497,382**

## EXTENDED ERROR CORRECTION OF A TRANSMITTED DATA MESSAGE

**Stephen N. Levine, Itasca, and Michael P. Metroka, Algonquin, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.**

**Continuation of Ser. No. 763,464, Sep. 20, 1991, abandoned. This application Jun. 10, 1994, Ser. No. 258,134**

**Int. Cl.[6] H03M 13/00**

**U.S. Cl. 371—35** **3 Claims**

1. A method for error correcting a data message that has been transmitted a plurality of times in a system using a forward error correction process, the data message comprising a plurality of bits, the method comprising the steps of:

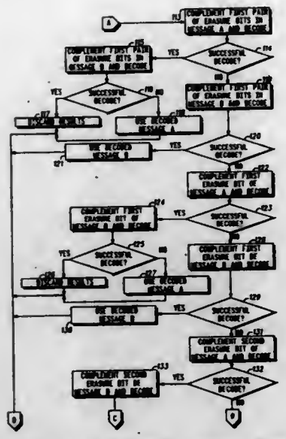
receiving the data message at least a first and a second time;

logically combining the first and second receipts of the data message to form an error indication word;

if the error indication word indicates a first or a second predetermined number of errors, complementing a first error of the first receipt thus forming a first modified message;

if the first receipt has a number of errors correctable by the forward error correction process, decoding the first modified message;





if the first receipt is not decodable, complementing a first error of the second receipt thus forming a second modified message;

if the second receipt has a number of errors correctable by the forward error correction process, decoding the second modified message;

if the error indication word indicates a third or a fourth predetermined number of errors, complementing a first pair of errors of the first receipt thus forming a third modified message;

if the first receipt has a number of errors correctable by the forward error correction process, decoding the third modified message;

if the first receipt is not decodable, complementing a first pair of errors in the second receipt thus forming a fourth modified message;

if the second receipt has a number of errors correctable by the forward error correction process, decoding the fourth modified message;

if both the first and second receipts are not decodable, complementing an error bit in either the first or the second receipts; and

if a successful decode is not accomplished, discarding the first and second receipts.

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**5,497,383**

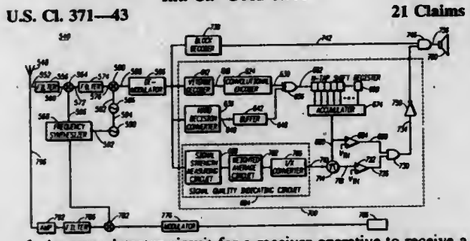
## ERROR DETECTOR CIRCUIT FOR RECEIVER OPERATIVE TO RECEIVE DISCRETELY-ENCODED SIGNALS

**Joseph F. Thome; Arvind S. Arora, and Niels Vinggaard, all of Arlington Heights, Ill., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Jan. 22, 1993, Ser. No. 7,215**

**Int. Cl.[6] G06F 11/10**

**U.S. Cl. 371—43** **21 Claims**



1. An error detector circuit for a receiver operative to receive a discretely-encoded signal at an input thereof, the error detector circuit operative to determine when a sequence of the discretely-encoded signal is comprised of an excessive number of signal portions of erroneous signal values, the error detector circuit comprising:

a first detector coupled to the input to determine when signal portions of the sequence of the discretely-encoded signal received by the receiver are of erroneous signal values and to generate a first error signal of a value representative of the number of signal portions determined to be of the erroneous signal values;

a second detector coupled to the input to determine the signal quality levels of the sequence of the discretely-encoded signal and to generate a signal-quality signal representative of signal quality levels determined thereat;

a combiner coupled to the first and second detectors to combine the first error signal and the signal-quality signal to form thereby a weighted error signal;

a signal generator coupled to the first detector and to the combiner to generate a received-signal sequence error signal when either:

the weighted error signal is of a value beyond a first preselected value; or

the first error signal is of a value beyond a second preselected value;

wherein generation of the received-signal sequence error signal is indicative of when the sequence of the discretely-encoded signal is comprised of the excessive number of signal portions of the erroneous signal values.

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**5,497,384**

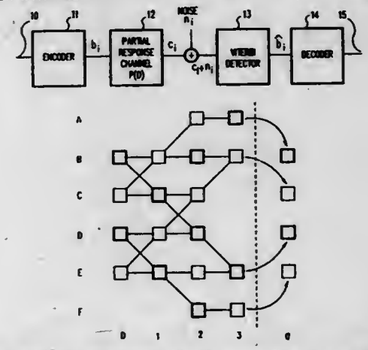
## PERMUTED TRELLIS CODES FOR INPUT RESTRICTED PARTIAL RESPONSE CHANNELS

**Lisa Fredrickson, Sunnyvale; Razmik Karabed, San Jose; Paul H. Siegel, San Jose, and Hemant K. Thapar, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 29, 1993, Ser. No. 174,904**

**Int. Cl.[6] G06F 11/10; H03M 13/12**

**U.S. Cl. 371—43** **23 Claims**

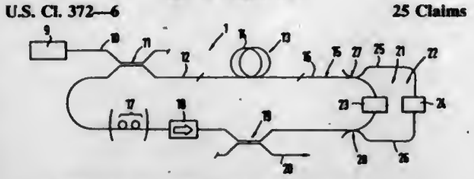


1. A method of maximum likelihood detection of a trellis code, comprising the steps of:

constructing a Viterbi detector from a time-varying trellis structure that is associated with a partial response channel and consists of connected trellises with periodically repeated patterns of nodes and subtrellises of said trellises, each subtrellis having nodes representing a current state of the channel and a value of a predetermined tracked attribute; and

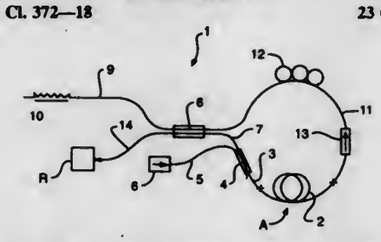
reassigning a survivor metric and a survivor sequence from a node at the end of one subtrellis to a node at the beginning of an adjacent subtrellis having a different value of the tracked attribute for increasing minimum distance between sequences supported by the trellis structure.

5,497,385
**OPTICAL MICROWAVE GENERATOR**
Harald Schmuck, Korntal-Münchingen, Germany, assignor to Alcatel SEL Aktiengesellschaft, Stuttgart, Germany
Filed Jan. 13, 1994, Ser. No. 181,182
Claims priority, application Germany, Jan. 16, 1993, 43 01 031.8
Int. Cl.[6] H01S 3/30
U.S. Cl. 372—6 25 Claims



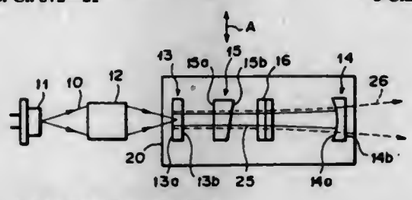
1. A microwave generator, characterized by:
a fiber ring laser (1) which generates light of a plurality of optical frequencies and
an intermediate-frequency device (22), optically connected to said fiber ring laser, said intermediate-frequency device including:
means responsive to said light of a plurality of optical frequencies for selecting light of at least two of said plurality of optical frequencies, and
means for generating an intermediate frequency (Δf) optical signal having a frequency which is the difference between said at least two of said plurality of optical frequencies, the frequency of said intermediate frequency optical signal being a microwave frequency.

5,497,386
**OPTICAL-FIBRE PASSIVELY MODE LOCKED LASER GENERATOR WITH NON-LINEAR POLARIZATION SWITCHING**
Flavio Fontana, Cormano, Italy, assignor to Pirelli Cavi S.p.A., Milan, Italy
Filed Sep. 15, 1994, Ser. No. 306,368
Claims priority, application Italy, Sep. 16, 1993, MI93A1996
Int. Cl.[6] H01S 3/098
U.S. Cl. 372—18 23 Claims



1. An active-fibre passively-mode-locked laser generator comprising:
an active optical fibre doped with a fluorescent dopant;
means for feeding luminous pumping energy to one end of the active fibre to excite the active-fibre fluorescent dopant to a laser emission state, said dopant decaying from said laser emission state to a base state to generate a luminous emission signal at a predetermined wavelength, said emission signal having pulses of different peak powers depending on said pumping energy;
polarization control means for orienting polarization of said emission signal in a predetermined plane;
feedback means optically coupled to ends of said active fibre for passing at least a portion of said emission signal between said ends;
at least one optical component with transmissiveness depending on polarization; and
means for extracting said emission signal from said active fibre, at least the active fibre, polarization control means, feedback means and optical component with transmissiveness depending on polarization comprising an optical fibre path in which said emission signal propagates and in which at least one portion of the emission signal present at one end of the active fibre is sent back to the interior of said fibre, the components of said optical path having an orientation to cause a rotation of the polarization of said emission signal, said rotation having an angle corresponding to extinction of the emission signal within said optical component with transmissiveness depending on polarization and to consequent absence of emission signal in said extracting means for pumping energy lower than a predetermined value, said rotation having an angle corresponding to transmission with low losses within said optical component of pulses of high peak power of the emission signal for pumping energy of higher power than said predetermined value.

5,497,387
**SOLID-STATE LASER USING WEDGE-SHAPED OPTICAL MEMBER, AND METHOD FOR MANUFACTURING THE SAME**
Yoji Okazaki, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Dec. 28, 1994, Ser. No. 365,363
Claims priority, application Japan, Dec. 28, 1993, 5-335471
Int. Cl.[6] H01S 3/10
U.S. Cl. 372—21 8 Claims

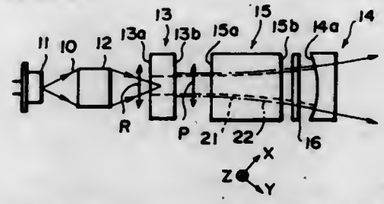


1. A solid-state laser comprising:
a solid-state laser crystal;
a pump source for pumping the solid-state laser crystal;
a resonator;
an etalon disposed in the resonator for selecting an oscillation wavelength;
a nonlinear optical crystal disposed within the resonator for converting the wavelength of a solid-state laser beam;
a wedge-shaped optical member having two light-transmission end faces, which are not parallel to each other, disposed in the resonator, wherein
the wedge-shaped optical member is fixed at the position where a resonator mode is set for obtaining the maximum output of the solid-state laser beam with respect to a resonator temperature in the vicinity of a temperature at which the maximum efficiency of wavelength conversion of the nonlinear optical crystal is obtained.

5. A method for manufacturing a solid-state laser, in which the solid-state laser includes a solid-state laser crystal, a pump source for pumping the solid-state laser crystal, a resonator, an etalon disposed in the resonator for selecting an oscillation wavelength, and a nonlinear optical crystal disposed in the resonator for converting the wavelength of a solid-state laser, the method comprising the steps of:
arranging, in the resonator, a wedge-shaped optical member having two light-transmission end faces which are not parallel to each other;
changing a resonator mode by moving the optical member in the direction in which the length of light transmission of the solid-state laser beam varies; and
fixing the optical member, in the resonator, at the location where the resonator mode is set in such a way that the maximum output of the solid-state laser beam is obtained with respect to the temperature of the resonator in the vicinity of the temperature at which the maximum efficiency of wavelength conversion of the nonlinear optical crystal is obtained.



5,497,388
**LASER DIODE PUMPED SOLID LASER**
Chiaki Goto, and Hiroaki Hyuga, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Mar. 24, 1994, Ser. No. 217,175
Claims priority, application Japan, Mar. 25, 1993, 5-066510
Int. Cl.[6] H01S 3/10
U.S. Cl. 372—22 4 Claims

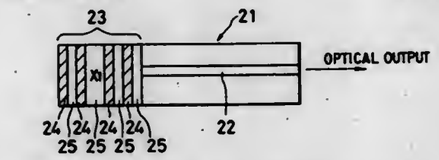


1. A laser diode pumped solid laser for producing a wavelength-converted wave which is high in intensity, comprising:
a solid laser medium;
a semiconductor laser for producing a pumping beam which pumps said solid laser medium in order to produce a solid laser beam; and
a crystal of a nonlinear optical material being impinged by said solid laser beam, thereby converting the wavelength of said solid laser beam into a different wavelength;
said crystal having a nonlinear optical coefficient $d_{IJ}$, where I and J=1, 2, 3 correspond to x, y, and z principal axes, respectively;
said nonlinear optical coefficient being represented by the formula

$$\frac{x^2}{n_x^2}+\frac{y^2}{n_y^2}+\frac{z^2}{n_z^2}=1,$$

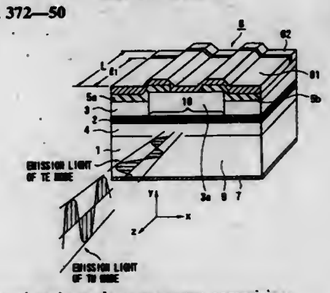
wherein $n_x$, $n_y$, and $n_z$ represent principal refractive indices; and
said pumping beam having a direction of linear polarization in a direction which coincides with a principal axis of an ellipsoid of wave normals when it is viewed from the direction of incidence of said pumping beam.

5,497,389
**SEMICONDUCTOR LASER DEVICE HAVING AN ACTIVE LAYER AND A RESONATOR HAVING A SINGLE REFLECTOR OR PAIR OF REFLECTORS**
Akihiko Kasukawa, and Norihiro Iwai, both of Tokyo, Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan
Filed Jun. 27, 1994, Ser. No. 265,875
Claims priority, application Japan, Jun. 25, 1993, 5-180776
Int. Cl.[6] H01S 3/10
U.S. Cl. 372—49 10 Claims



1. A semiconductor laser device comprising an active layer and a resonator having a single reflector, characterized in that the reflector is disposed at the end opposite to the optical emission end of the resonator and has a reflectivity that increases with wavelength within the oscillation wavelength band between $\lambda_1$ to $\lambda_2$, where $\lambda_1$ is the oscillation wavelength at the lowest operating temperature and $\lambda_2$ is the oscillation wavelength at the highest operating temperature of the device, the reflectivity of said reflector disposed at the end opposite to the optical emission end is 50% or less for the oscillation wavelength of $\lambda_1$ and 70% or more for the oscillation wavelength of $\lambda_2$.

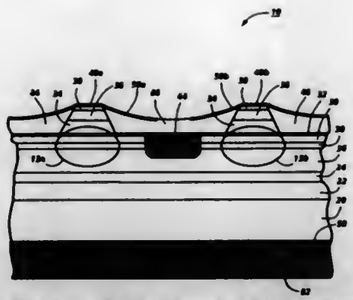
5,497,390
**POLARIZATION MODE SWITCHING SEMICONDUCTOR LASER APPARATUS**
Hidenao Tanaka, Tokyo; Akinori Watabe; Junichi Shimada, both of Saitama; Yoshitada Katagiri, and Yoshio Suzuki, both of Tokyo, all of, Japan, assignors to Nippon Telegraph and Telephone Corporation, Japan
Filed Jan. 27, 1993, Ser. No. 9,930
Claims priority, application Japan, Jan. 31, 1992, 4-042313; Sep. 7, 1992, 4-264237
Int. Cl.[6] H01S 3/19
U.S. Cl. 372—50 5 Claims



1. A semiconductor laser apparatus comprising:
a semiconductor substrate having a first electrode on one surface;
a first cladding layer formed on the other surface of said semiconductor substrate;
an active layer placed on said cladding layer;
a second cladding layer placed on said active layer;
a second electrode placed on said second cladding layer; and
a pair of resonator mirrors placed in a wave guide direction perpendicular to the surfaces of said semiconductor substrate to oppose each other and constituting opposing side surfaces of said wave guide,
wherein said active layer is constituted by a quantum well layer having a tensilely strain, and
said second electrode is separated into portions not less than two portions in a propagating direction of light in said wave guide.

5,497,391
**MONOLITHIC ARRAY OF INDEPENDENTLY ADDRESSABLE DIODE LASERS**
Thomas L. Paoli, Los Altos, Calif., assignor to Xerox Corporation, Stamford, Conn.
Continuation of Ser. No. 49,898, Apr. 20, 1993, abandoned.
This application Sep. 19, 1994, Ser. No. 308,877
Int. Cl.[6] H01S 3/18;3/25
U.S. Cl. 372—50 16 Claims

1. A monolithic semiconductor light emitting array, comprising:
a doped semiconductor substrate having a defined conductivity type, and having first and second surfaces;
a multilayer structure on said first surface of said doped semiconductor substrate, said multilayer structure including a first semiconductor confinement layer having a same conductivity type as said doped semiconductor substrate, a second semiconductor confinement layer having an opposing conductivity



type than the conductivity type of said doped semiconductor substrate, and an etch stop layer, said multilayer structure further including an active semiconductor layer for generating light, said active layer being intervenient to said first and second semiconductor confinement layers and having a smaller bandgap than said first and second confinement layers;

a plurality of mesas, wherein each individual one of said plurality of mesas is disposed adjacent a first side of said etch stop layer;

a plurality of addressing electrodes, wherein each of said addressing electrodes is adjacent and in electrical communication with an associated individual one of said mesas;

an isolation region between two of said mesas, wherein said isolation region extends from the opposite side of said first side of said etch stop layer, and continues to extend through said second confinement layer, said active layer, and at least into said first confinement layer; and

a common electrode on said second surface of said substrate, said common electrode for cooperating with each of said addressing electrodes to enable current flow through the mesa associated with each of said addressing electrodes.

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**5,497,392**

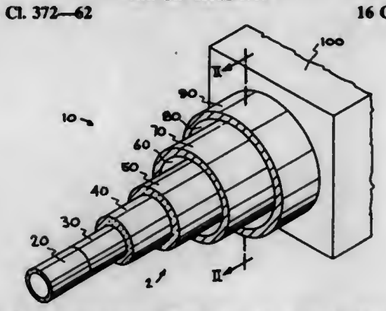
**SEGMENTED LASING TUBE FOR HIGH TEMPERATURE LASER ASSEMBLY**

**Richard H. Sawicki, Danville; Terry W. Alger, Tracy; Raymond G. Finucane, Pleasanton, and Jerome P. Hall, Livermore, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Jan. 26, 1995, Ser. No. 381,479**

**Int. Cl.[6] H01S *3/03***

**U.S. Cl. 372—62** **16 Claims**



1. A high temperature lasing tube for a metal vapor laser comprising:

a plurality of cylindrical ceramic lasing tube segments of the same inner and outer diameters;

means for coupling said segments together in coaxial alignment to form a segmented cylindrical ceramic lasing tube, said means for coupling including adjoining segments having overlapping ends that accommodate thermal expansion anti also inhibit migration of metal vapor from a metal lasant material disposed in said lasing tube through said coupling means during laser operation; and

said overlapping ends having aligned bores to receive a pin to permit said segments to be maintained in circumferential alignment.

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**5,497,393**

**SEMICONDUCTOR LASER WITH SUPER STRUCTURE GRATING DISTRIBUTED BRAGG REFLECTOR**

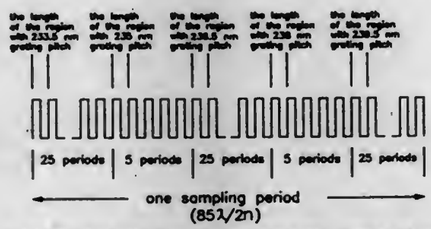
**Kyu-Seok Lee, Daejeon, Rep. of Korea, assignor to Electronics & Telecommunications Research Institute, Daejeon, Rep. of Korea**

**Filed Dec. 19, 1994, Ser. No. 359,186**

**Claims priority, application Rep. of Korea, Dec. 9, 1994, 94-33468**

**Int. Cl.[6] H01S *3/10***

**U.S. Cl. 372—96** **1 Claim**




1. A semiconductor laser with a distributed Bragg reflector having a saturable absorber section, a gain section, a phase control section and an super structure grating distributed Bragg reflector section,

said Bragg reflector section having at least five sampling periods, each of the sampling periods having grating pitches of 233.5 nm, 235 nm, 236.5 nm, 238 nm and 239.5 nm, and

said grating pitches being arranged corresponding to wavelengths of 5837.5 nm, 1175 nm, 5912.5 nm, 1195 nm and 5987.5 nm, respectively.

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**5,497,394**

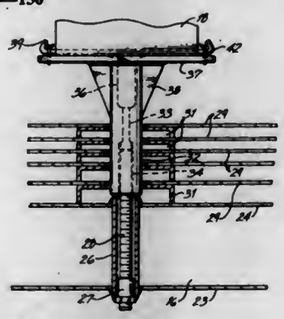
**ELECTRIC HEATER ELEMENT SUPPORT**

**Suresh C. Jhawar, Anaheim Hills; John K. Grier, Walnut, and Brian K. Grier, Chino Hills, all of Calif., assignors to Grier-Jhawar-Mercer, Inc., Walnut, Calif.**

**Filed Sep. 19, 1994, Ser. No. 308,758**

**Int. Cl.[6] H05B *3/66***

**U.S. Cl. 373—130** **36 Claims**



25. A vacuum furnace comprising:

a furnace shell;



a heating chamber in the furnace shell;

at least one metal strip heater element in the heating chamber of the furnace;

means for making electrical contact with each end of the heater element for passing electric current therethrough; and

at least one mechanical support for an intermediate portion of the electric heater element comprising:

a T-shaped ceramic support for an intermediate portion of the heater element having the leg of the T-shaped ceramic support connected to the heating chamber; and

means for compliantly securing the heater element to the crossbar of the T-shaped ceramic support without holes in the heater element.

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**5,497,395**

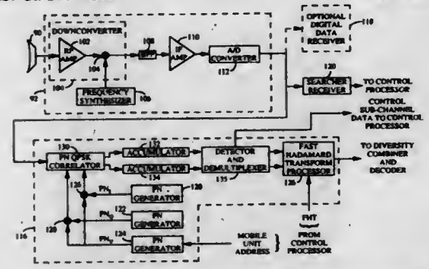
**METHOD AND APPARATUS FOR MODULATING SIGNAL WAVEFORMS IN A CDMA COMMUNICATION SYSTEM**

**Yu-Cheun Jou, San Diego, Calif., assignor to Qualcomm Incorporated, San Diego, Calif.**

**Filed Apr. 4, 1994, Ser. No. 223,076**

**Int. Cl.[6] H04K *1/10***

**U.S. Cl. 375—205** **28 Claims**



1. A modulation system for use in spread spectrum communications, comprising:

means for receiving an input signal and for generating, in accordance with a value of said input signal, a first orthogonal sequence signal corresponding to one of a plurality of orthogonal binary chip sequences, each of said orthogonal binary chip sequences having a selected chip of an identical binary value located at an identical predefined sequence position;

means for combining said first orthogonal sequence signal with a control signal to generate a first punctured sequence signal, said punctured sequence signal including a control chip at said predefined sequence position having a binary value corresponding to said control signal;

means for generating a pseudo-noise (PN) signal corresponding to a predetermined PN binary sequence; and

means for combining said first punctured sequence signal and said PN signal and for providing a resultant first modulation signal.

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**5,497,396**

**METHOD OF TRANSMITTING DATA BETWEEN COMMUNICATION EQUIPMENTS CONNECTED TO A COMMUNICATION INFRASTRUCTURE**

**Marc Delprat, Le Chesnay, France, assignor to Societe Dite Alcatel N.V., Amsterdam, Netherlands**

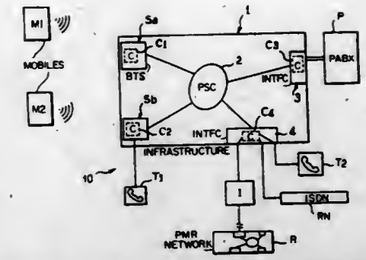
**Filed Dec. 30, 1993, Ser. No. 175,556**

**Claims priority, application France, Dec. 30, 1992, 92 15932**

**Int. Cl.[6] H04B *1/38*; H04L *5/16***

**U.S. Cl. 375—220** **12 Claims**

1. Method of transmitting data between communication equipments connected to a communication infrastructure, at least one of




said equipments being adapted to use a first data coding format different from a second format used within said infrastructure which further comprises at least one data transcoder for converting data coded to said first format into data coded to said second format and vice versa, in which method a transcoder is provided in said infrastructure in the vicinity of the connection to each of the equipments using said first format and said method comprises the following steps for each transmission of data between at least two of said equipments:

determining on the basis of the data format used by each of said equipments between which data is to be transmitted whether it is necessary to use a transcoder on a transmission path connecting said equipments between which data is to be transmitted, and

if so, activating only the transcoder nearest the equipment using said first format so that said data is conveyed in a form coded to said second format in the infrastructure and changes from said first format to said second format or vice versa as close as possible to the equipment using said first format.

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**5,497,397**

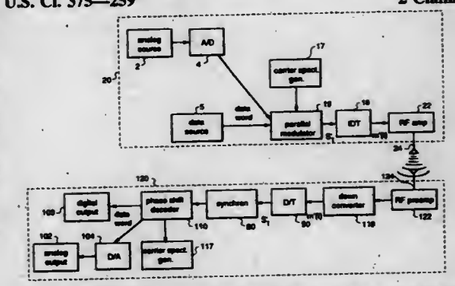
**PARALLEL DATAWORD MODULATION SCHEME**

**John E. Hershey, Ballston Lake, and Gary J. Saulnier, Rexford, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Filed Jun. 29, 1994, Ser. No. 267,346**

**Int. Cl.[6] H04L *27/00***

**U.S. Cl. 375—259** **2 Claims**



1. A method of transmitting digital information over a radio frequency channel comprising the steps of:

a) assembling data to be transmitted into data words each having N bits;

b) transforming a carrier signal into a frequency spectrum in a frequency domain;

c) separating the frequency spectrum of the carrier signal into a plurality of tones, one corresponding to a synchronization reference and the remainder each corresponding to a bit of a data word to be transmitted;

d) shifting tones by a predetermined phase shift if the corresponding bit has a value of '1' for a first data word to be transmitted;

e) inverse transforming the tones into a radio signal;

f) transmitting a radio signal incorporating the phase shifts of the tones for the first data word at time t;
g) repeating steps (d)–(f) for all data words to be transmitted;
h) receiving the radio signal at a receiver;
i) transforming the received radio signal into a received frequency spectrum;
j) synchronizing the received radio signal so as to identify portions of the radio signal corresponding to different data words; and
k) separating the received radio signal into data word intervals each corresponding to data word, and for each data word interval:
1. separating the spectrum of the data word interval into data word tones,
2. identifying the phase shift of each data word tone to identify bit values of the data word, and
3. constructing the data word from the bit values.

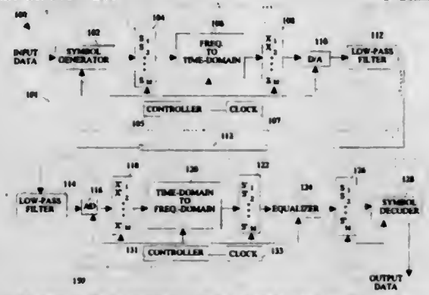
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**5,497,398**

## MULTI-CARRIER TRANSCEIVER

**Michael A. Tzannes, Newton, and Marcos C. Tzannes, Watertown, both of Mass., assignors to Aware, Inc., Cambridge, Mass.**

**Filed Aug. 12, 1993, Ser. No. 105,796**
**Int. Cl.[6] H04K** *1/10;* **H04L** *27/28;5/12*
**U.S. Cl. 375—260** **6 Claims**



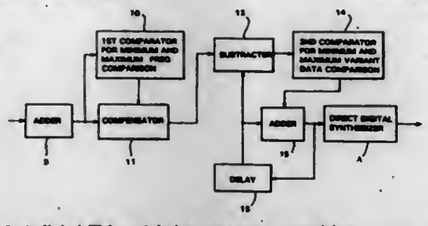

1. A system for communicating information over a communication link, said system comprising:
means for receiving data symbols specifying said information;
means for converting groups of M said data symbols to a plurality of time-domain samples, said convening means comprising means for storing the last W said data symbols received by said receiving means, where W is an integer multiple of M and M and W are greater than I, and first correlation means for computing the correlation of said stored symbols with M vectors 'A, for i= 1, . . . , M, each said vector having W components;
means for sequentially transmitting said time-domain symbols on said communication link, each said time-domain symbol being transmitted as an analog signal on said communication link;
means for receiving said analog signals from said communication link and for convening said analog signals to digital values;
means for storing the digital values corresponding to the last W said analog signals received; and
second correlation means for computing the correlation of said stored digital values with M complex vectors 'B+j'B', to obtain M modified data symbols $S'_i$, for i=1, . . . , M, wherein 'B and 'B' are real valued, and $j=\sqrt{-1}$.

**5,497,399**

## DIGITAL FM MODULATING APPARATUS

**Kenichi Ito, Tokyo, Japan, assignor to NEC Corporation, Japan**

**Filed Sep. 10, 1993, Ser. No. 119,979**
**Claims priority, application Japan, Sep. 10, 1992, 4-241511**
**Int. Cl.[6] H03K** *7/06;9/06*
**U.S. Cl. 375—271** **6 Claims**




1. A digital FM modulating apparatus, comprising:
restricting means for receiving input data and restricting the input data to a data range between a lower limit data value and an upper limit data value, said upper limit data value and said lower limit data value respectively corresponding to a maximum allowable frequency and a minimum allowable frequency of an FM modulated signal to be produced, said restricting means comprising an input data comparator for comparing said input data with said lower limit data value and said upper limit data value add a compensator for replacing said input data with said lower limit data value when said input data is below said lower limit data value and for replacing said input data with said upper limit data value when said input data is above said upper limit data value;
suppressing means for receiving output data from said restricting means, suppressing transitional variance in said output data of said restricting means and outputting modulation data;
a direct digital synthesizer for receiving said modulation data delivered from said suppressing means and producing synthesized data corresponding to said FM modulated signal; and
said suppressing means comprising a delay having an input and an output, said delay receiving said modulation data at the input thereof, a subtractor for receiving output data from said restricting means and connected to the output of said delay for producing variant data representing the difference between said restricting means output data and said modulation data delivered to said delay and a variant data comparator for receiving said variant data from said subtractor and comparing said variant data with a maximum allowable variant data value to prevent an abnormal transition of data to said direct signal synthesizer.

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**5,497,400**

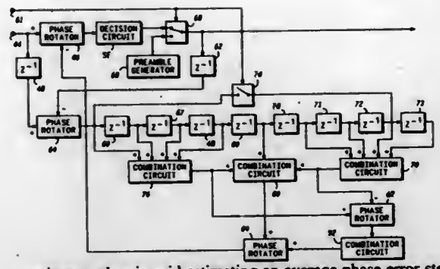
## DECISION FEEDBACK DEMODULATOR WITH PHASE AND FREQUENCY ESTIMATION

**Lansing M. Carson, Chandler, and Robert J. Burdge, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Dec. 6, 1993, Ser. No. 161,845**
**Int. Cl.[6] H04L** *27/14;27/16;27/22*
**U.S. Cl. 375—324** **23 Claims**

1. A method for demodulating a received signal that has been modulated to convey discrete predetermined data codes in a stream of symbols, said method comprising steps of:
estimating a phase error change for said received signal over past symbols;
estimating an average phase error for said received signal over past symbols;
combining said average phase error and said phase error change to form a merged phase error estimate; and
deciding which one of said discrete predetermined data codes is conveyed in said current symbol, said deciding step responding to said received signal and to said merged phase error estimate, wherein said estimating an average phase error step is configured to generate-an average phase error that lags said current symbol by X symbols, where X is a real number, and said estimating a change in phase error step is configured to determine phase change over approximately X symbols.





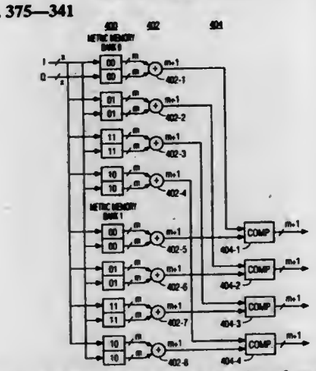

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**5,497,401**

## BRANCH METRIC COMPUTER FOR A VITERBI DECODER OF A PUNCTURED AND PRAGMATIC TRELLIS CODE CONVOLUTIONAL DECODER SUITABLE FOR USE IN A MULTI-CHANNEL RECEIVER OF SATELLITE, TERRESTRIAL AND CABLE TRANSMITTED FEC COMPRESSED-DIGITAL TELEVISION DATA

**Kumar Ramaswamy, and John S. Stewart, both of Indianapolis, Ind., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.**

**Filed Nov. 18, 1994, Ser. No. 342,280**
**Int. Cl.[6] H03M** *13/12*
**U.S. Cl. 375—341** **10 Claims**




1. In a convolutional decoder of a series of convolutionally-encoded symbol packets applied as in-phase (I) and quadrature-phase (Q) digital input signals thereto, wherein said convolutional decoder includes a branch metric computer and a Viterbi decoder; the improvement wherein said branch metric computer comprises:
a memory having an effective depth of $2^x$ storage locations, where x is a first given integer larger than one, each storage location having an effective width sufficient to store an entry of at least one I-defining lookup table and an entry of at least one Q-defining lookup table, wherein each of said entries of an I-defining lookup table and a Q-defining lookup table consists of a group of first, second, third and fourth m-bit metric values, where m is a second given integer larger than one, said memory including a control input for preloading said $2^x$ storage locations with at least one I-defining lookup table and at least one Q-defining lookup table, and $2^x$-bit I and $2^x$-bit Q signal inputs for reading out said one I-defining lookup table entry stored in the storage location defined by the value of a $2^x$-bit signal currently applied to said $2^x$-bit I signal input and said one Q-defining lookup table entry stored in the storage location defined by the value of a $2^x$-bit signal currently applied to said $2^x$-bit Q signal input;
a group of summers including a first summer for adding the first m-bit metric value of the readout one I-defining lookup table entry to the first m-bit metric value of the readout one Q-defining lookup table to derive an (m+1)-bit sum output therefrom, a second summer for adding the second m-bit metric value of the readout one I-defining lookup table entry to the second m-bit metric value of the readout one Q-defining lookup table to derive an (m+1)-bit sum output therefrom, a third summer for adding the third m-bit metric value of the readout one I-defining lookup table entry to the third m-bit metric value of the readout one Q-defining lookup table to derive an (m+1)-bit sum output therefrom, and a fourth summer for adding the fourth m-bit metric value of the readout one I-defining lookup table entry to the fourth m-bit metric value of the readout one Q-defining lookup table to derive an (m+1)-bit sum output therefrom; and
means for forwarding the respective sum outputs from four summers of said group to said Viterbi decoder.

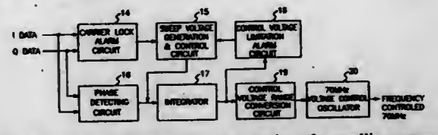
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**5,497,402**

## AUTOMATIC FREQUENCY CONTROL DEVICE FOR SATELLITE COMMUNICATIONS GROUND SYSTEM

**Cheol S. Pyo; Jin H. Jo, and Jae L. Choi, all of Daejeon, Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, and Korea Telecommunications Authorities, both of, Rep. of Korea**

**Filed Dec. 16, 1994, Ser. No. 357,455**
**Claims priority, application Rep. of Korea, Dec. 17, 1993, 1993-28322**
**Int. Cl.[6] H04L** *27/06;* **G01S** *13/00*
**U.S. Cl. 375—344** **2 Claims**




1. An automatic frequency control device of a satellite communications system having a frequency downconverter, a demodulator and a first local oscillator, located at a receiving set of an earth station system, for compensating for frequency error by supplying a second local oscillator of the frequency downconverter with a difference frequency between a carrier frequency received from the demodulator and a first frequency generated by the first local oscillator, comprising;
a phase detecting means for detecting a first phase difference between a central frequency of a signal applied to the demodulator and the first frequency generated by the first local oscillator by using both I(Inphase) data and Q(Quadrature) data applied from the demodulator;
an integrating means connected to said phase detecting means, for generating control voltage by integrating second and third phase differences applied from said phase detecting means and sweep voltage applied from a sweep voltage generation and control means, respectively;
a control voltage range conversion means for adjusting a central voltage of the control voltage as applied to a voltage controlled oscillator by changing the control voltage from said integrating means to be made within a control voltage range of the voltage controlled oscillator;
said voltage controlled oscillator for generating an appropriate second frequency according to the control voltage applied from said control voltage range conversion means;
a carrier lock alarm means for detecting a state of carrier locking from the I and Q data and for generating a first alarm;
a control voltage limitation alarm means for generating a second limitation alarm in order to repeatedly make the sweep voltage in case the control voltage applied from said integrating means is out of a predetermined voltage range; and

a sweep voltage generation and control means for generating the sweep voltage upon receiving the first alarm from said carrier lock alarm means and for controlling the sweep voltage to be repeated within a prescribed automatic frequency control range.

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**5,497,403**

## FEEDBACK CLAMPING CIRCUIT

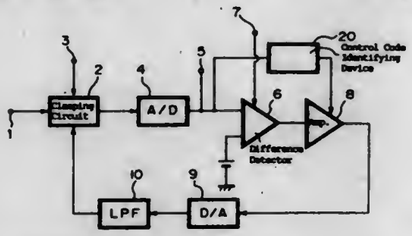
**Shigeru Harada, Tokyo, and Yoshihide Nagatsu, Kanagawa, both of, Japan, assignors to Sony Corporation, Tokyo, Japan**

**PCT No. PCT/JP90/01590, § 371 Date Jul. 29, 1992, § 102(e) Date Jul. 29, 1992, PCT Pub. No. WO92/10877, PCT Pub. Date Jun. 25, 1992**

**PCT Filed Dec. 6, 1990, Ser. No. 916,084**

**Int. Cl.[6] H04L** *27/08*

**U.S. Cl. 375—345** **4 Claims**




1. A feedback clamping circuit comprising:
a clamping circuit receiving an input signal having a noise component contained therein;
a detector circuit responsive to a signal having the noise component contained therein from said clamping circuit for detecting information relating to said noise component and generating an output signal containing said information, wherein said detector circuit comprises a noise detector circuit for detecting the level of noise in said output signal from said clamping circuit; and
a gain control circuit receiving said output signal of said detector circuit for controlling a gain of a feedback loop formed from an output of said gain control circuit fed to a clamping level control input of said clamping circuit in response to a detected level of noise in from said detector circuit, wherein said clamping circuit is responsive to said output of said gain control circuit for clamping said input signal.

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**5,497,404**

## TRANSMISSION ERROR RECOVERY FOR DIGITAL COMMUNICATION SYSTEMS USING VARIABLE LENGTH DATA PACKETS WHERE DATA IS STORED IN HEADER LOCATIONS OF MEMORY

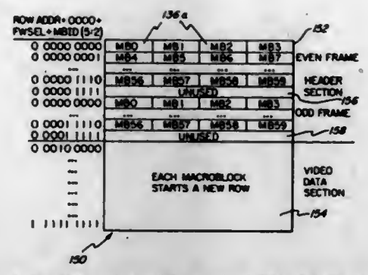
**Glen A. Grover, San Diego, and Paul Moroney, Olivenhain, both of Calif., assignors to General Instrument Corporation, Hatboro, Pa.**

**Filed Jul. 14, 1992, Ser. No. 910,192**

**Int. Cl.[6] H04J** *3/06;* **H04L** *7/00;25/38*

**U.S. Cl. 375—357** **16 Claims**

1. A method for storing data from a succession of variable length data packets containing a header portion and a data portion and received within portions of successive lines of a data multiplex frame, to enable prompt recovery from errors affecting the identified length of a data packet, comprising the steps of:
assigning data packet start addresses to said data packets, each data packet start address designating a location in a data memory for commencing the storage of data contained in a corresponding data packet;
storing the data packet start addresses in designated locations of an address memory;




storing the data portions of the received data packets commencing in data memory locations designated by the corresponding data packet start addresses;
recovering information, from the header portions of data packets being received, indicative of the length of the respective data packet for use in establishing data packet boundaries; and
recovering a plurality of next data packet position indicators from fixed positions in different lines of said data multiplex frame;
said next data packet position indicator reestablishing correct data packet boundaries during the receipt of said data multiplex frame should an error occur in said data packet length information.

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**5,497,405**

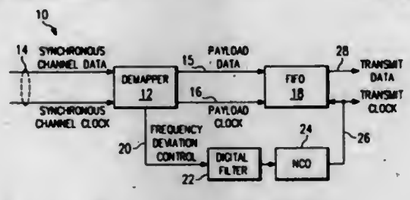
## OPEN LOOP DESYNCHRONIZER

**Paul M. Elliott, Jenner, and Fredrik Nordling, San Rafael, both of Calif., assignors to DSC Communications Corporation, Plano, Tex.**

**Filed Jul. 1, 1993, Ser. No. 87,846**

**Int. Cl.[6] H04L** *7/00*

**U.S. Cl. 375—372** **22 Claims**




1. An open loop desynchronizer, comprising:
a demapper circuit for reading asynchronous data received over a synchronous channel, said synchronous channel having a nominal data rate, said demapper circuit generating a frequency deviation control signal that indicates instantaneous variations in nominal data rate;
a buffer circuit for storing said asynchronous data from said demapper circuit;
a numerically controlled oscillator circuit for generating a clock signal in response to said frequency deviation control signal, said clock signal controlling output of said asynchronous data from said buffer circuit, said numerically controlled oscillator generating said clock signal without feedback input.



**5,497,406**

## MULTI-STANDARD GENERATOR OF PERIODIC SIGNALS

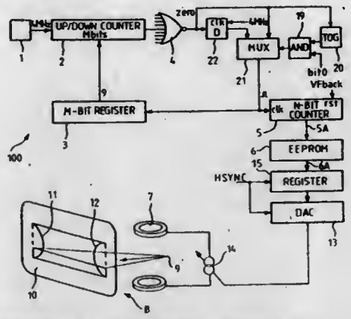
**Jader A. de Lima, Meylan; Yong-Uk Lee, and Pierre J. Nunzi, both of Aix En Provence, all of, France, assignors to SGS-Thomson Microelectronics S.A., Saint-Genis, France**

**Filed Sep. 29, 1994, Ser. No. 314,661**

**Claims priority, application France, Sep. 29, 1993, 93 11563**

**Int. Cl.[6] G06F** *9/00;* **H03K** *21/14;3/64*

**U.S. Cl. 377—44** **16 Claims**




1. A generator of a periodic signal, comprising:
a clock delivering a number A of pulses during a period defined by a control signal, A being smaller than or equal to $2^{N+M}$, N and M being whole numbers,
a first programmable binary M-bit counter, $2^M$ being greater than or equal to a whole number P, receiving the pulses of the clock at a counting input, the first counter having means for counting batches of P pulses of the clock and for delivering a batch signal at each counting of a batch,
a second binary N-bit counter receiving said batch signal at a counting input, and having means for producing an address signal at each counting of said batch signal,
a memory with at least $2^N$ addresses provided with an address input and data output, receiving the address signal at the address input and providing as an output binary signals stored at a memory location corresponding to the address signal produced,
a converter circuit connected to the output of the memory to produce said periodic signal, and
a circuit to produce the whole number P, where P is equal to $A/2^N$ and to program the first programmable binary M-bit counter with the whole number P as a given state.

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**5,497,407**

## CONTAMINATING-ELEMENT ANALYZING METHOD

**Fumio Komatsu, Fuchu; Kunihiro Miyazaki, Tokyo, and Ayako Shimazaki, Yokohama, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Nov. 29, 1993, Ser. No. 158,272**

**Claims priority, application Japan, Dec. 1, 1992, 4-322033**

**Int. Cl.[6] G01N** *23/223*

**U.S. Cl. 378—45** **5 Claims**

1. A contaminating-element analyzing method, comprising the steps of:
irradiating a blank sample plural times with an X-ray beam under a constant condition;
detecting, after each irradiation of the blank sample has terminated, a measured spectrum of fluorescent X-rays having broad scattering peaks caused by Rayleigh scattering and Compton scattering;
averaging plural measured spectra of fluorescent X-rays to obtain a blank spectrum;
irradiating a contaminated sample with the X-ray beam under the same condition as that for the blank sample;
detecting, after irradiation of the contaminated sample has terminated, a measured spectrum of fluorescent X-rays having broad scattering peaks caused by Rayleigh scattering and Compton scattering;
subtracting said blank spectrum from said measured spectrum of the contaminated sample so as to eliminate the broad scattering peaks; and
identifying a contaminating element and obtaining the concentration thereof, on the basis of the spectrum data obtained at said subtracting step.

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**5,497,408**

## X-RAY EXAMINATION APPARATUS

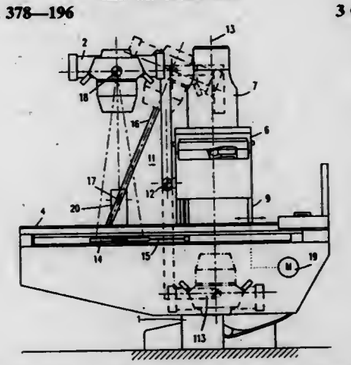
**Harald Kayser, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Oct. 14, 1994, Ser. No. 323,206**

**Claims priority, application Germany, Jan. 16, 1993, 43 35 306.1**

**Int. Cl.[6] A61B** *6/02*

**U.S. Cl. 378—196** **3 Claims**



1. An X-ray examination apparatus, comprising a patient table which is pivotable about a first axis, a spot film device which is arranged over a table top of the patient table, which table top has a longitudinal direction and which spot film device has a center and can be displaced parallel to the table top by means of a transport device, and also comprising an X-ray source which is coupled to the transport device said X-ray source having a focus, wherein the X-ray source is pivotable about a second axis which is connected to the transport device, or to a part rigidly connected thereto, and which extends parallel to the plane of the table top and parallel to the first axis and the focus of the X-ray source and the center of the X-ray spot film device are situated in a plane extending perpendicularly to the longitudinal direction of the table top, the second axis being situated at a distance from this plane.

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**5,497,409**

## RADIOGENIC UNIT

**Hans Jedlitschka, Chatillon, and Vincent Delacroix, Versailles, both of, France, assignors to GE Medical Systems, Buc, France**

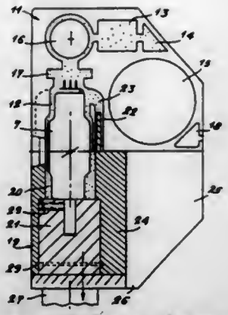
**Division of Ser. No. 180,612, Jan. 13, 1993, Pat. No. 5,384,821. This application Dec. 16, 1994, Ser. No. 357,428**

**Claims priority, application France, Jan. 15, 1993, 93 00356**

**Int. Cl.[6] H05G** *1/10*

**U.S. Cl. 378—201** **18 Claims**

1. A radiogenic unit comprising a casing in which is disposed an X-ray tube having a high-voltage supply circuit in a single-pole mode, said casing further comprising:
a first casing part, said first casing part being made of an electrically insulative material and being metalized on the exterior, said first casing part including a large open cavity in



which is housed said X-ray tube, a first section of said X-ray tube containing an anode supported by a copper cylinder, said anode being electrically connected to said cylinder and said cylinder being electrically connected to an electrical and thermal frame of said unit; and

a second casing part, said second casing part being made of an electrically insulative material and being metalized on the exterior, said second casing part including cavities to house said high-voltage supply circuit of said tube and to house a heating transformer for a cathode;

wherein said first and second casing parts are imperviously sealed against fluids and X-rays and are hermetically sealed to each other.

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**5,497,410**

## X-RAY SOURCE COMPRISING A TEMPERATURE SENSOR

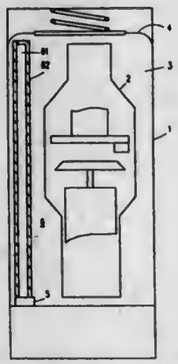
**Rolf Behling, Norderstedt, Germany, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Jan. 5, 1995, Ser. No. 368,825**

**Claims priority, application Germany, Jan. 15, 1994, 44 01 066.4**

**Int. Cl.[6] H05G** *1/26*

**U.S. Cl. 378—202** **6 Claims**



1. An X-ray source, comprising a housing, an X-ray tube which is accommodated therein and which is surrounded by a liquid insulating medium, and a temperature sensor for determining the temperature in the liquid insulating medium, characterized in that the temperature sensor comprises a measuring element which is in thermal contact with a spatial zone in the insulating medium and which assumes a uniform temperature which is dependent on the temperature distribution in the zone during operation of the X-ray source, and also comprises a temperature transducer which is thermally coupled to the measuring element and which generates an electric signal which is dependent on the temperature of the measuring element.

**5,497,411**

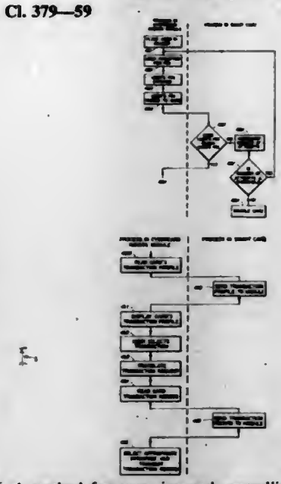
## TELECOMMUNICATIONS CARD-ACCESS SYSTEM

**Joseph C. E. Pellerin, R.R. 2, Belleville, Ontario, Canada**

**Filed Mar. 14, 1994, Ser. No. 209,724**

**Int. Cl.[6] H04Q** *7/38*

**U.S. Cl. 379—59** **18 Claims**



16. A method for accessing and controlling a telecommunications network which connects a serving telecommunications system to a plurality of telecommunications access terminals, comprising the steps of:

writing in a portable memory device card, at an authorized central issuing system, a resident PIN and a transaction profile for a user, said transaction profile being defined by a number of access authorization codes and identification data associated to each of said authorization code;

introducing said card into a means for reading provided at a telecommunications access terminal;

inputting an user's PIN on input means at said telecommunications access terminal and transmitting said users's PIN to said card;

validating said user's PIN, reading said transaction profile from said card and displaying said transaction profile on a display means;

selecting a preferred transaction on said input means;

reading from said card an access authorization code and associated identification data corresponding to said preferred transaction;

transmitting said selected access authorization code and associated identification data for said preferred transaction to said telecommunication network.

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**5,497,412**

## ENHANCED CALL DELIVERY SYSTEM FOR ROAMING CELLULAR SUBSCRIBERS

**Margaret Lannen; Kenneth W. Hammer, both of Tampa, and Edward L. Didion, Brandon, all of Fla., assignors to GTE Telecommunication Services Incorporated, Tampa, Fla.**

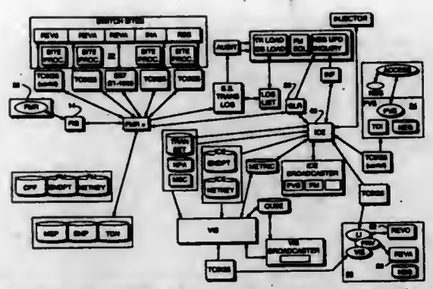
**Filed Apr. 7, 1994, Ser. No. 224,457**

**Int. Cl.[6] H04Q** *7/22*

**U.S. Cl. 379—60** **4 Claims**

1. An enhanced call delivery system, Follow Me Roaming Plus (FMR Plus), for delivering telephone calls to a roaming cellular subscriber, enabling said subscriber to receive calls placed to his MIN in his home system service area, said enhanced system having seamless interoperability with call delivery systems which do not participate in said enhanced call delivery system, comprising:





a central telecommunications system processor capable of handling network applications for said enhanced call delivery system;

a plurality of mobile telephone switches located in the service areas of a plurality of cellular telephone systems which participate in said enhanced call delivery system, each of said mobile telephone switches connected via a direct communications link to said central telecommunications system processor;

a plurality of registers in said central telecommunications system processor for storing data bases of system information, individual switch information, and subscriber information, said registers including:

a general location register in said central telecommunications system processor, said general location register containing a data base of all information necessary for validation of known roamers, whereby validation and registration is accomplished without reference to the home switch;

a home location register within said general location register containing a data base of all information necessary for communication with all cellular switches of all cellular providers in said network;

a visiting location register within said general location register containing a data base of all information necessary for communication with all roaming cellular subscribers registered in said system;

a data base of routing information for location of home carriers in said general location register, whereby end-to-end validation and registration can be accomplished for previously unknown roamers;

an Input/Output Gateway (FIG) to and from said central telecommunications system processor for translation of messages and inter-system communication with the host processor of cellular systems which participate in a second call delivery system, Follow Me Roaming (FMR), having a subset of the features of said enhanced system;

at least one intersystem gateway to and from said central telecommunications system processor for translation of messages and inter-system communication with cellular systems which participate in at least one third call delivery system;

means to enable said central telecommunications system processor of said enhanced call delivery system to communicate with each of said switches of said enhanced system, and through said gateways to the central processors of said second and third call delivery systems, and through said central processors to individual switches of said second and third call delivery systems, to provide to the switches of the home and visited service areas of a roaming cellular subscriber:

(1) the identity of the current visited system switch of a roaming cellular subscriber known to his home system;

(2) the financial responsibility of the roaming cellular subscriber;

(3) a valid roamer service profile in said visited system; and

(4) call delivery to a validated roaming cellular subscriber in the service area of said visited switch.

**5,497,413**

## TELEPHONE SYSTEM WITH MESSAGE RECORDING FUNCTION

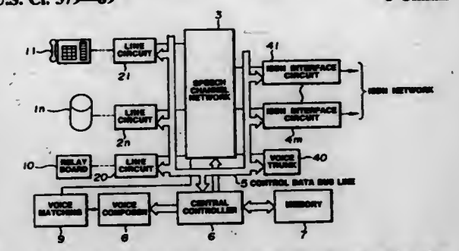
**Kazuo Nakano, Niiza, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Continuation of Ser. No. 95,255, Jul. 22, 1993, abandoned, which is a continuation of Ser. No. 711,131, Jun. 6, 1991, abandoned. This application Jan. 13, 1994, Ser. No. 181,237**

**Claims priority, application Japan, Jun. 8, 1990, 2-148771**

**Int. Cl.[6] H04J** *3/12;* **H04M** *1/57*

**U.S. Cl. 379—89** **8 Claims**



1. A telephone system having a message recording function, comprising:

network interface means connected to a network from which calling party identification data and called party identification data relating to an incoming call are received by the network interface means;

voice mail means having a plurality of memory areas, each associated with different box number, for storing message data;

extracting means for extracting the calling party identification data and the called party identification data transmitted from the network when the network interface means receives the incoming call;

voice synthesizing means for synthesizing a voice signal corresponding at least to a telephone number of the calling party based on the calling party identification data extracted by the extracting means;

table means for storing the box number of the voice mail means corresponding to the called party identification data extracted by the extracting means;

destination designating means for designating the voice mail means as a destination of the incoming call transmitted via the network to the network interface means;

received message storing means for reading out from the table means the box number corresponding to the called party identification data extracted by the extracting means and for storing the voice signal from the voice synthesizing means, together with a voice message transmitted from the calling party via the network, in the memory area associated with the box number of the voice mail means read out from the table means; and

voice reproduction means, responsive to a readout request designating the desired box number, for reading out and reproducing the voice signal and the voice message stored in the memory area associated with the designated box number.

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**5,497,414**

## TELEPHONE SYSTEM PROCESSING OF DESIGNATED CALLER ID PRIVATE CALLS

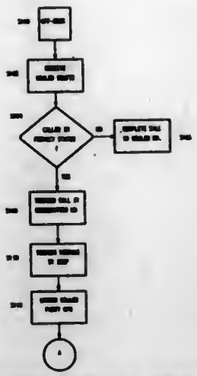
**Dale L. Bartholomew, Vienna, Va., assignor to Bell Atlantic Network Services, Inc., Arlington, Va.**

**Filed May 4, 1994, Ser. No. 237,987**

**Int. Cl.[6] H04M** *1/56;15/06;3/42*

**U.S. Cl. 379—142** **15 Claims**

1. In a telephone communications system including a plurality of subscriber telephone lines, each coupled to an associated telephone switching facility in a communications network, and a service control point remotely located from said telephone lines and asso-



ciated switching facilities, a method for controlling call processing of a telephone call placed from a caller line and addressed to a called line destination comprising the steps of:

(a) determining whether transmission of caller line identification has been designated to be blocked for calls placed from the caller line at a first switch where blocked status of the caller line is detected;

(b) in response to an affirmative block determination in step (a), accessing said service control point to obtain information for processing the call; and

(c) directing the telephone switching facility associated with the caller line to process the call in accordance with the information obtained from the service control point in step (b).

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**5,497,415**

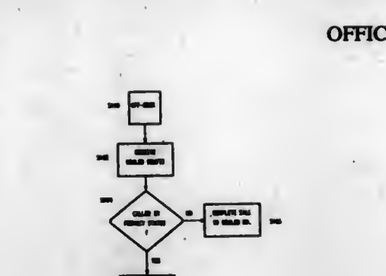
## AUTOMATIC RELEASE DEVICE FOR AUTOMATICALLY RELEASING THE HOLD-ON SETTING OF AN OUTSIDE LINE CALL, AND TRANSFER METHOD FOR AN OUTSIDE LINE CALL

**Ichiro Kagi, Shimane, Japan, assignor to Shimane Sanyo Industrial Co., Ltd., Shimane, Japan**

**Filed Mar. 25, 1993, Ser. No. 37,001**

**Int. Cl.[6] H04M *3/20***

**U.S. Cl. 379—393** **5 Claims**




1. An automatic release device for automatically releasing hold-on setting of an outside line call, the automatic release device being connected between outside line wires and outside line input terminals at a first telephone enabling use of an outside line to receive other calls wherein said first telephone when having an outside line call from a second telephone and set to the hold-on state can be released from the hold-on setting to release the line by use of a sensing circuit detecting signals based on the on-hook at the second telephone side and a release circuit for releasing the first telephone.

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**5,497,416**

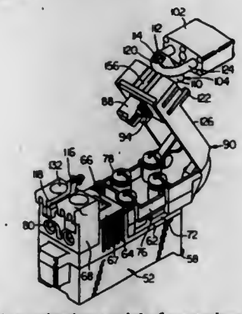
## TELEPHONE INTERFACE SECURITY LOCK

**Walter K. Butler, III, Standish; John J. Naplorkowski, Cape Elizabeth; Thomas W. Kroll, South Portland, and Mark P. Cote, Springvale, all of Me., assignors to Siecor Corporation, Hickory, N.C.**

**Continuation-in-part of Ser. No. 956,144, Oct. 5, 1992, Pat. No. 5,333,193, Ser. No. 956,516, Oct. 5, 1992, Ser. No. 956,531, Oct. 5, 1992, Pat. No. 5,416,837, Ser. No. 956,746, Oct. 5, 1992, and Ser. No. 29,592, Mar. 11, 1993, which is a continuation-in-part of Ser. No. 956,144, Mar. 11, 0, Ser. No. 956,516, Mar. 11, 0, Ser. No. 956,531, Mar. 11, 0, and Ser. No. 956,746, Mar. 11, 0, said Ser. No. 956,144Ser. No. 956,516, Mar. 11, 0, Ser. No. 956,531, Mar. 11, 0, and Ser. No. 956,746, Mar. 11, 0, each , Mar. 11, 0is a continuation-in-part of Ser. No. 523,457, May 15, 1990, Pat. No. 5,153,910. This application Apr. 16, 1993, Ser. No. 47,566**

**Int. Cl.[6] H04M *9/00***

**U.S. Cl. 379—399** **38 Claims**



1. A network termination module for attachment to a telephone network interface apparatus, comprising:

a base structure;

means in said base structure for connecting telco wiring thereto;

means in said base structure for connecting subscriber wiring thereto;

a movable cover adapted to enclose said subscriber wiring connecting means;

means for attaching a padlock to said cover for securing said cover to said base structure;

a locking member mounted on said base structure for movement between a first position and a second position, and

a locking finger on said locking member operative, when said locking member is in said first position, to obstruct said locking member and said padlock and, when said locking member is in said second position, to free said locking member from said padlock.

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**5,497,417**

## SWITCHING DEVICE FOR TRANSMITTING TELECOMMUNICATION SIGNALS

**Martin Brahms; Wolfgang Fritz, both of Hanover, and Werner Klamt, Algermissen, all of, Germany, assignors to ke kommunikations-Elektronik GmbH & Co., Hanover, Germany**

**Filed Mar. 14, 1994, Ser. No. 212,960**

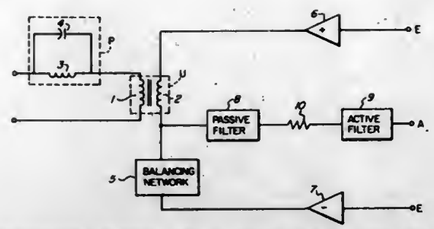
**Claims priority, application Germany, Mar. 19, 1993, 43 08 783.3**

**Int. Cl.[6] H04M *7/00***

**U.S. Cl. 379—399** **8 Claims**

1. A switching device for transmitting telecommunication signals between an exchange of a telephone network and at least one subscriber device with which metering pulses in addition to voice signals are transmitted by the exchange, in which the exchange and the subscriber device are each allocated system units between which the voice signals are transmitted as digital signals via a two-wire line, and in which the system units, in addition to






analog/digital converters, have a hybrid switching unit with a transformer for connecting two-wire line to a four-wire line, and in which the two-wire line containing the primary winding of the transformer is connected to the exchange, while the two wire line leading to the subscriber device is connected to a four-wire line, consisting of a transmitting branch and a receiving branch, and containing the secondary winding of the transformer, characterized in that

the two-wire line contains a parallel resonant circuit (P), which consists of an inductance (3) and a capacitor (4),

a passive filter (8) and an active filter (9) are connected in series in the receiving branch of the hybrid switching unit;

the passive filter (8) is tuned for attenuating the frequency of the metering pulse, and

the active filter (9) is tuned to the passive filter (8), so as to compensate for a decrease in the level of the voice signals caused by the passive filter (8), by generating a corresponding increase in the voice signal.

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**5,497,418**

## DATA PROCESSING SYSTEM HAVING A SET OF MEMORY CARDS

**André Kudelski, Crissier, Switzerland, assignor to Nagra Plus S.A., Cheseaux, Switzerland**

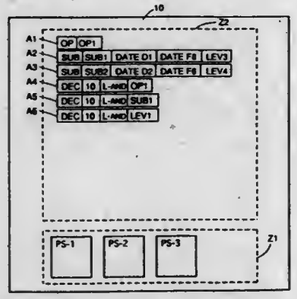
**PCT No. PCT/EP93/02773, § 371 Date Jun. 9, 1994, § 102(e) Date Jun. 9, 1994, PCT Pub. No. WO94/09453, PCT Pub. Date Apr. 28, 1994**

**PCT Filed Oct. 8, 1993, Ser. No. 244,768**

**Claims priority, application France, Jan. 9, 1992, 92 12322**

**Int. Cl.[6] H04N *7/167***

**U.S. Cl. 380—5** **15 Claims**




1. A system for processing the storage of data and for carrying out specific programmes, the system comprising:

at least one data administration and processing unit,

a plurality of memory cards, and

at least one data communication means for communicating data between at least one processing unit and each memory card, in order to transmit a given number of instructions to be stored or to be used in a memory card when this card is connected to a processing unit,

characterized in that:

each memory card comprises a writeable memory for storing at least some of said instructions, and a memory for storing at least one specific programme, and

each memory card connected at any instant to at least one processing unit via a communication means constitutes a relational database, all of the cards which are simultaneously connected also forming a relational database.

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**5,497,419**

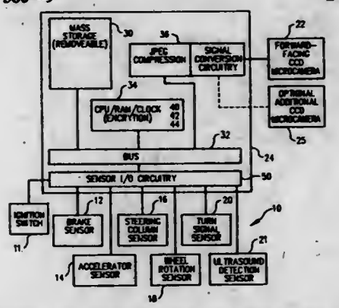
## METHOD AND APPARATUS FOR RECORDING SENSOR DATA

**Brian R. Hill, Los Angeles, Calif., assignor to Prima Facie, Inc., Conshohocken, Pa.**

**Filed Apr. 19, 1994, Ser. No. 229,602**

**Int. Cl.[6] H04L *9/00***

**U.S. Cl. 380—9** **24 Claims**




1. A method for recording sensor data with a video signal to protect the sensor data, the sensor data being contained in signals from one or more sensors, the method comprising the steps of:

a) encrypting the signals from the one or more sensors;

b) combining the video signal and the encrypted signals to produce an output signal; and

c) recording the output signal on a recording medium.

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**5,497,420**

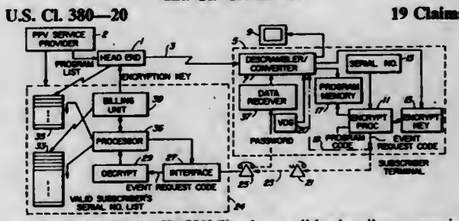
## CABLE TV SYSTEM USING PASSWORDS

**Pierre Garneau, Montreal, and Josée Corriveau, St. Léonard, both of, Canada, assignors to Le Groupe Vidéotron Ltée, Montreal, Canada**

**Filed Feb. 7, 1994, Ser. No. 193,410**

**Int. Cl.[6] H04L *9/00***

**U.S. Cl. 380—20** **19 Claims**




1. A method of distributing signals to valid subscribers comprising:

(a) storing subscriber terminal valid identification codes at a central station,

(b) broadcasting promotions of services available to subscribers, each associated with a specific promotion code,

(c) selecting one of said services and entering a selected service promotion code into a terminal at a subscriber location,

(d) automatically reading an identification number associated with said terminal in response to said entering of a selected promotion code,

(e) processing said identification number and said selected promotion code in accordance with an encryption algorithm, and generating an encrypted event request code therefrom,
(f) providing said event request code to a verification center,
(g) at said verification center, decrypting said event request code, and providing a password unique to said terminal and said selected promotion code,
(h) entering the password into the terminal at the subscriber location, and
(i) providing access to a service utilizing one of said distributed signals corresponding to the selected promotion code to the subscriber in response to said entering of the password.

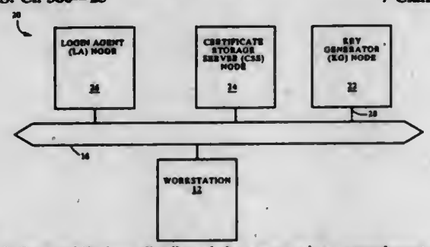
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**5,497,421**

## METHOD AND APPARATUS FOR PROTECTING THE CONFIDENTIALITY OF PASSWORDS IN A DISTRIBUTED DATA PROCESSING SYSTEM

**Charles W. Kaufman, Northboro; Morrie Gasser, Hopkinton; Butler W. Lampson, Cambridge; Joseph J. Tardo, Concord, and Kannan Alagappan, Cambridge, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.**

**Continuation of Ser. No. 875,050, Apr. 28, 1992, Pat. No. 5,418,854. This application Sep. 28, 1994, Ser. No. 314,181**
**Int. Cl.[6] H04K *1/00***
**U.S. Cl. 380—23** **7 Claims**




1. In a public key, distributed data processing network system including a plurality of nodes interconnected by a communications medium, an arrangement for authenticating a user to said network using a password and username entered during a login procedure, and comparing the information indicative of the password with information contained in a doubly-encrypted credential which is stored in a network database, said arrangement comprising:

A. a user node which receives a password and a usernarne during login and computes first and a second hash totals from the password using a first and a second hash algorithm, respectively, and generates a nonce key, and encrypts said second hash total and said nonce key using a first public key to create an encrypted message;

B. a login agent node, comprising

B1. means for receiving and decrypting said encrypted message using a first private key to obtain said second hash total and said nonce key;

B2. means for receiving said d-ably-encrypted credential which contains (i) an encrypted credential formed by encrypting a user private key with a first stored hash total computed from the password, and (ii) a second stored hash total computed from the password, wherein said encrypted credential and said second stored hash total are appended and encrypted by said first public key to form the doubly encrypted credential;

B3. metres for decrypting said doubly-encrypted credential using said first private key to obtain said encrypted credential and said second stored hash total, for comparing said second stored hash total with said second hash total to determine if said password entered by the user is correct, for encrypting said encrypted credential with said nonce key when said second stored hash total and said second hash total match to create a return message, and for forwarding said return message to said user node; and

wherein said user node comprises means responsive to said return message, for decrypting said return message using said nonce key to obtain said encrypted credential, and for decrypting said encrypted credential with said first hash total to obtain said private key.

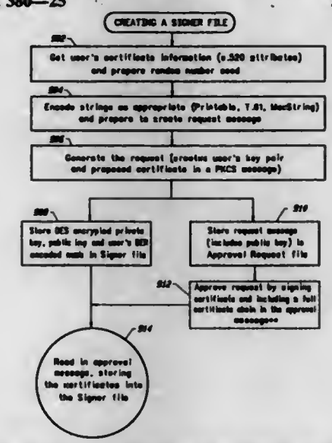
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**5,497,422**

## MESSAGE PROTECTION MECHANISM AND GRAPHICAL USER INTERFACE THEREFOR

**Atticus N. Tysen, San Francisco; Gursharan Sidhu, Menlo Park; C. Victor Chang, Fremont, and Pablo Calamera, San Jose, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.**

**Filed Sep. 30, 1993, Ser. No. 129,941**
**Int. Cl.[6] H04L *9/00***
**U.S. Cl. 380—25** **26 Claims**




1. A method for transferring a first message from a source computer system to a destination using a plurality of protection keys and verification keys, each of said protection keys having a corresponding verification key, said source computer system having an operating system and having a display including a graphic workspace with icons displayed thereon, one of said icons representing said first message and another of said icons representing a second file, said second file having a type field indicating that said second file is a signer file, said second file further identifying a first protection key, comprising the steps of:

said source computer system determining, in response to user input indicating selection of said first message icon in conjunction with said second file icon, that the type field of said second file indicates that said second file is a signer file;

said source computer system invoking a signer routine of said operating system in response to said step of determining, and said source computer system identifying said first message and said second file to said signer routine, said signer routine obtaining said first protection key from said second file and creating a protected message from said first message in accordance with said first protection key; and

transferring via a transmission medium said protected message to said destination in conjunction with a chain of at least two certificates, said chain including a first certificate and there being a respective prior certificate in said chain for each certificate in said chain except said first certificate, each certificate in said chain including a respective verification key protected in accordance with a respective next one of said protection keys, the verification key in each given certificate in said chain except said first certificate corresponding to the protection key according to which the verification key in the prior certificate to said given certificate is protected, and the verification key in said first certificate corresponding to said first protection key.



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**5,497,423**

## METHOD OF IMPLEMENTING ELLIPTIC CURVE CRYPTOSYSTEMS IN DIGITAL SIGNATURES OR VERIFICATION AND PRIVACY COMMUNICATION

**Atsuko Miyaji, Kawachinagano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Jun. 20, 1994, Ser. No. 262,146**
**Claims priority, application Japan, Jun. 18, 1993, 5-147334**
**Int. Cl.[6] H04L *9/30***
**U.S. Cl. 380—30** **64 Claims**

| STEP | ITEMS | PARTIES | PARTICULARS |
|---|---|---|---|
| 1 | INITIAL SETTING | NETWORK PROVIDER | SELECTS E{GF(p)} AND BP |
| 2 | NOTICE (ELLIPTIC CURVE) | NETWORK PROVIDER | NOTIFIES ALL THE USERS OF E{GF(p)} AND BP |
| 3 | SELECTION | ALL USERS | SELECT A SECRET KEY d (USER V SELECTS dv) |
| 4 | CALCULATION | EACH USER | CALUCULATES A PUBRIC KEY Y (USER V GETS Yv=dv · BP) |
| 5 | NOTICE (PUBLIC KEY) | EACH USER | NOTIFIES HIS PUBLIC KEY TO USER U |
| 6 | PRIVACY COMMUNICATION (CIPHERED MESSAGE) | USER U | GENERATES A RANDOM NUMBER rv ENCIPHERS A MESSAGE M $C_1$=rv · BP $C_2$=M+rv(rv · Yv) TRANSMITS C1 AND C2 TO USER V |
| 7 | DECIPHERING | USER V | DECIPHERS THE CIPHERED MESSAGE M = $C_2$ - v(dv · $C_1$) |

33. A method of implementing a privacy communication comprising following procedures:

(1) a network provider provides E{GF(p)} and a basepoint BP to be used for the privacy communication to each user;
(2) each user who received E{GF(p)} and the basepoint BP selects an arbitrary natural number to find a value by adding said basepoint BP the selected natural number of times on E{GF(p)};
(3) each user keeps his arbitrary selected natural number in secret, while notifying the value obtained by adding the BP said natural number of times on E{GF(p)} as his public key to a user to whom he would like to send a message;
(4) two users make an agreement on a method of arithmetic operation for the public key, a random number, and a message to encipher and decipher the message using the notified common key and the random number;
(5) one of the two users who received the public key enciphers the message in accordance with the agreement based on a random number he selected and the public key notified by the other user;
(6) the one of the users sends an enciphered message to the other user who notified the public key; and
(7) the other user deciphers the message enciphered in accordance with the agreement using his integer selected and kept in secret upon receipt of the enciphered message, wherein {E{GF(p)} is defined as follows:

let d be a positive integer such that gives an imaginary quadratic field $Q\{(-d)^{1/2}\}$ a small class number;

let p be a prime number such that a prime factor of $4 \times p - a^2$ is d×square number where a is an integer, such that one of p+1−a and p+1+a is divisible by a prime number of 30 or more digits, and such that is expressed as $2^t \pm \alpha$, where t is a positive integer and α is a small positive integer;

then an elliptic curve E has a finite field GF(p) as a definition field which has a solution modulo p for a class polynomial $H_d(x)=0$ which is determined by d as a j-invariant.

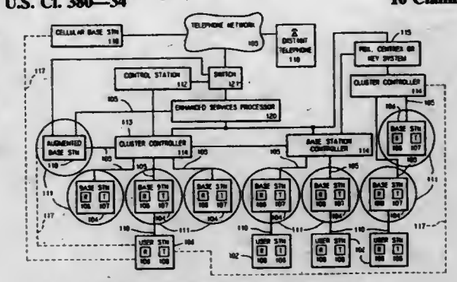
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**5,497,424**

## SPREAD SPECTRUM WIRELESS TELEPHONE SYSTEM

**Jeffrey S. Vanderpool, Colorado Springs, Colo., assignor to Omnipoint Data Company, Boston, Mass.**

**Division of Ser. No. 712,239, Jun. 7, 1991, Pat. No. 5,285,469, which is a continuation-in-part of Ser. No. 709,712, Jun. 3, 1991, abandoned. This application Feb. 7, 1994, Ser. No. 192,707**
**Int. Cl.[6] H04K *1/10***
**U.S. Cl. 380—34** **10 Claims**




1. A wireless communication system, comprising

a first base station coupled to a telephone network and having means for initiating a call on said telephone network and means for receiving a call on said telephone network,

means for establishing a first communication path between a user station and said first base station, said first communication path comprising a first link supporting spread-spectrum communication,

wherein said first communication path is completed between said first base station and said user station when said user station initiates or receives a call on said telephone network, and wherein said user station is capable of being handed-off from said first base station to a second base station,

means for establishing a second communication path between said first base station and said user station over which said user station is capable of initiating or receiving a different call, said second communication path comprising a second link between said user station and an intermediary communication element coupled to said first base station, and

means for transmitting a set of signals to be communicated between said base station and said user station by multiplexing said signals.

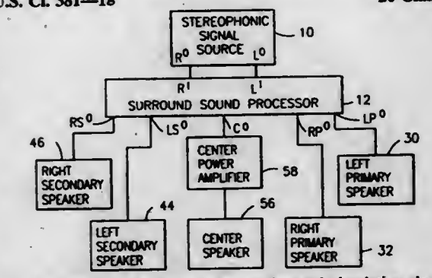
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**5,497,425**

## MULTI CHANNEL SURROUND SOUND SIMULATION DEVICE

**Robert J. Rapoport, 3900 46th Ave. S., St. Petersburg, Fla. 33711**

**Filed Mar. 7, 1994, Ser. No. 207,282**
**Int. Cl.[6] H04R *5/00***
**U.S. Cl. 381—18** **20 Claims**




1. A passive multi channel surround sound simulation device comprising,

input means for receiving a two channel speaker level stereophonic signal,

interfacing means for producing from the two channel speaker level stereophonic signal left and right primary speaker level signals, left and right secondary speaker level signals, a mono center speaker level signal, and a surround signal ground separate from an input ground,

left and right primary speaker level outputs for connecting the left and right primary speaker level signals to left and right primary loudspeakers,

left and right secondary speaker level outputs for connecting the left and right secondary speaker level signals to left and right secondary loudspeakers, the left and right secondary speaker level outputs electrically coupled to the surround signal ground

means for converting the mono center speaker level signal to a mono center line level signal, and

a mono center line level output for connecting the mono center line level signal to a center loudspeaker through a center power amplifier, the mono center line level output electrically coupled to the surround signal ground.

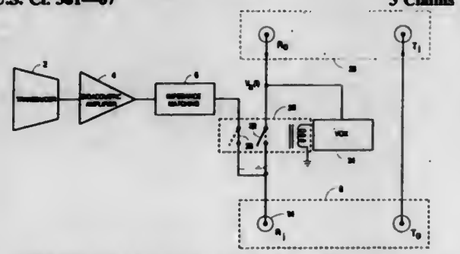
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**5,497,426**

## STETHOSCOPIC SYSTEM FOR HIGH-NOISE ENVIRONMENTS

**Gregory D. Jay, 3 Crossbow Rd., Norfolk, Mass. 02056**

**Filed Nov. 15, 1993, Ser. No. 153,413**
**Int. Cl.[6] A61B 7/04**
**U.S. Cl. 381—67** **3 Claims**



1. A stethoscopic system for use in high-noise environments, comprising:

transducer means for converting body sounds into an electrical output signal;

driver means for converting the electrical output signal of the transducer means into an acoustical pressure signal;

a summing microphone;

an active noise reduction circuit having an input signal received from the transducer means, an output signal transmitted to the driver means, signal received from the summing microphone;

a headset having an input signal, said headset providing an enclosure for the driver means and the summing microphone and forming a close-fitting acoustical seal with a listener's head at points on the listener's skull surrounding the ear so as to substantially attenuate acoustical noise originating external to the headset;

switch means for selecting either the electrical output signal from the transducer means or a voice signal from a vehicular intercom system as the input signal to the headset;

means for causing the switch means to select said voice signal as the input signal to the headset when said voice signal is present; and

an amplifier electrically coupled between the transducer means and the switch means, said amplifier having a positive gain of at least 2000 substantially throughout the audio frequency range of cardiac and pulmonary auscultory sounds.

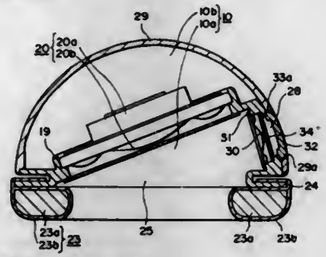
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**5,497,427**

## HEADPHONE

**Koji Nageno, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Continuation of Ser. No. 122,309, Sep. 17, 1993. This application Dec. 8, 1994, Ser. No. 351,738**
**Claims priority, application Japan, Sep. 25, 1992, 4-280635**
**Int. Cl.[6] H04R 25/00**
**U.S. Cl. 381—183** **1 Claim**



1. A headphone comprising:

a housing;

a drive unit contained in said housing;

a first window hole formed in said housing;

a first diaphragm attached to said drive unit and covering said first window hole, whereby acoustic transmissibility between an inside space of said housing and an outside space thereof is provided, wherein said inside space of said housing is divided by partition means including said drive unit and said first diaphragm into a front chamber having a sound emitting opening and a rear chamber and wherein a section of said housing enclosing said front chamber has a second window hole formed therein connecting the front chamber with an exterior of said housing, a second diaphragm covering said second window hole; and

said second window hole being operatively provided with a lid member for opening and shutting said second window hole, whereby said second window hole can be shut by a user of said headphone.

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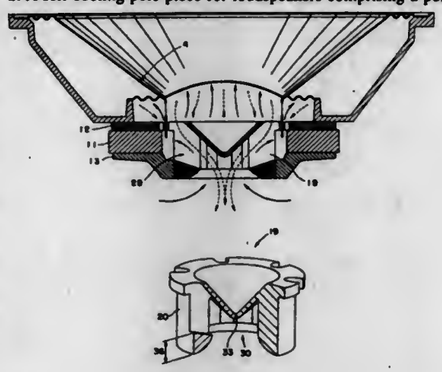
**5,497,428**

## SELF-COOLED MAGNETIC STRUCTURE FOR LOUDSPEAKERS

**Omar E. Rojas, 2527, 481 St., (1896) City Bell, Buenos Aires, Argentina**

**Filed Nov. 1, 1994, Ser. No. 332,891**
**Int. Cl.[6] H04R 25/00**
**U.S. Cl. 381—199** **15 Claims**

1. A self-cooling pole piece for loudspeakers comprising a pole





piece constructed from a material capable of carrying magnetic flux, the pole piece forming part of a magnetic structure of the loudspeaker, the magnetic structure comprising the pole piece and a magnet located between a top and a back plates, the pole piece defining a periphery adjacent a voice coil, wherein the periphery of the pole piece includes at least two channels for circulation of cooling air, the channels continuously extending from an upper face of the pole piece, partially along the periphery of the pole piece and into a central cavity of the pole piece, the cavity being closed at the upper face of the pole piece and open into a lower face of the pole piece.

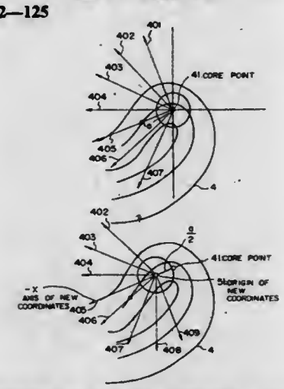
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**5,497,429**

## APPARATUS FOR AUTOMATIC FINGERPRINT CLASSIFICATION

**Tatsuo Shibuya, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Sep. 29, 1994, Ser. No. 313,562**
**Claims priority, application Japan, Jan. 1, 1993, 5-246801**
**Int. Cl.[6] G06K 9/00**
**U.S. Cl. 382—125** **2 Claims**



1. An apparatus for automatic fingerprint classification of a fingerprint image having a finger joint image, a fingertip image, ridge lines and a core point, said core point being used as an origin for original x-y rectangular coordinates, an x-axis of said original x-y rectangular coordinates being parallel to said finger joint image and said fingertip image being in a y>0 direction, said apparatus comprising:

an initialization unit for setting current temporary x-y rectangular coordinates with said original x-y rectangular coordinates;

means for tracing space between two ridge lines starting from said core point in an area where x>0 and in an area where x<0 with respect to said original x-y rectangular coordinates, said means for tracing space including,

a scanning unit for distance measurement, wherein said scanning unit for distance measurement scans said fingerprint image by vectors having a same magnitude, starting from an origin of said current temporary x-y rectangular coordinates and diverging in different directions, for obtaining measured distances from said origin of said current temporary x-y rectangular coordinates to first cross points between said ridge lines in said fingerprint image and said vectors,

a next coordinate determination unit, wherein said next coordinate determination unit selects a nearest vector to one of a −x axis and a +x axis of said current temporary x-y rectangular coordinates among said vectors with said measured distances larger than a predetermined threshold distance, sets said nearest vector as one of a −x axis and a +x axis of next temporary x-y rectangular coordinates, and decides a middle point between said origin of said current temporary x-y rectangular coordinates and said first cross point of said one of said −x axis and said +x axis of said next temporary x-y rectangular coordinates as an origin of said next temporary x-y rectangular coordinates,

a tracing vector memory for storing position coordinates of all origins of said current and next temporary x-y rectangular coordinates with respect to said original x-y rectangular coordinates,

a judgment unit for deciding a termination condition to go back to said scanning unit, and

an update unit for setting said current temporary x-y rectangular coordinates with said next temporary x-y rectangular coordinates; and

a classifier unit for classifying said fingerprint image from data stored in said tracing vector memory, wherein loci of said origins of said next temporary x-y rectangular coordinates stored in said tracing vector memory in −x and +x areas with respect to said original x-y rectangular coordinates are examined and classified as one of a straight line and a semicircle,

a fingerprint pattern with a semicircle in both said −x and +x area with respect to said original x-y rectangular coordinates is classified as a whorl,

a fingerprint pattern with a semicircle in said +x area with respect to said original x-y rectangular coordinates and a straight line in said −x area with respect to said original x-y rectangular coordinates is classified as a left loop,

a fingerprint pattern with a semicircle in said −x area with respect to said original x-y rectangular coordinates and a straight line in said +x area with respect to said original x-y rectangular coordinates is classified as a right loop, and

a fingerprint pattern with straight line in both said −x and +x area with respect to said original x-y rectangular coordinates is classified as an arch.

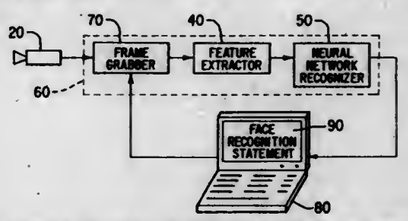
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**5,497,430**

## METHOD AND APPARATUS FOR IMAGE RECOGNITION USING INVARIANT FEATURE SIGNALS

**Lev S. Sadovnik, Los Angeles, and Taiwei Lu, Torrance, both of Calif., assignors to Physical Optics Corporation, Torrance, Calif.**

**Filed Nov. 7, 1994, Ser. No. 335,455**
**Int. Cl.[6] G06K 9/46**
**U.S. Cl. 382—156** **20 Claims**




1. A method of operating an image recognition system comprising:

providing a neural network including a plurality of input neurons, a plurality of output neurons and an interconnection weight matrix;

providing a display including an indicator, said display being electrically connected to said neural network;

initializing the indicator to an initialized state;

obtaining an image of a structure;

digitizing the image so as to obtain a plurality of input intensity cells and thereby define an input object space;

transforming the input object space to a feature vector including a set of n scale-, position- and rotation- invariant feature signals, where n is a positive integer not greater than the plurality of input neurons, by extracting the set of n scale-, position- and rotation- invariant feature signals from the input object space according to a set of relationships $I_i=\int_\Omega I(x,y)h(k,I(x,y))\,dxdy$, where $I_i$ is the set of n scale-, position- and rotation- invariant feature signals, k is a series

of counting numbers from 1 to n inclusive, (x,y) are the coordinates of a given cell of the plurality of input intensity cells, I(x,y) is a function of an intensity of the given cell of the plurality of input intensity cells, Ω is an area of integration of input intensity cells, and h(k,I(x,y)) is a data dependent kernel transform from a set of orthogonal functions, of I(x,y) and k;

transmitting the set of n scale-, position- and rotation- invariant feature signals to the plurality of input neurons of the neural network;

transforming the set of n scale-, position- and rotation- invariant feature signals at the plurality of input neurons to a set of structure recognition output signals at the plurality of output neurons according to a set of relationships defined at least in part by the interconnection weight matrix of the neural network;

transforming the set of structure recognition output signals to a structure classification signal; and

transmitting the structure classification signal to the display so as to perceptively alter the initialized state of the indicator and display the structure recognition signal for the structure.

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**5,497,431**

## METHOD OF EXTRACTING CHARACTERISTIC IMAGE DATA AND COLOR DATA CONVERSION DEVICE FOR IMAGE PROCESSING APPARATUS

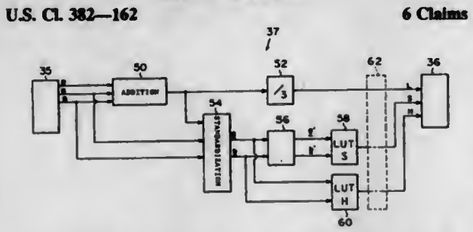
**Hiroaki Nakamura, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Division of Ser. No. 154,118, Nov. 18, 1993. This application Aug. 24, 1994, Ser. No. 294,053**

**Claims priority, application Japan, Nov. 18, 1992, 4-308963; Nov. 18, 1992, 4-308964**

**Int. Cl.[6] G06K** *9/46*

**U.S. Cl. 382—162** **6 Claims**




1. A color data conversion device for an image processing apparatus comprising:

color data outputting means for dividing a color original image into a plurality of pixels, breaking down each of the pixels into three colors of red light, green light and blue light, photometrically measuring the red light, green light and blue light, and outputting color data of the three colors;

calculating means for standardizing at least two color data, and outputting standardized color data;

lightness conversion means for calculating a lightness value on the basis of color data of the three colors, and outputting the lightness value;

saturation conversion means, provided with a saturation table expressing relationships between the standardized color data and saturation values of the pixels, for outputting saturation values corresponding to inputted standardized color data; and

hue conversion means, provided with a hue table expressing relationships between the standardized color data and hue values of the pixels, for outputting hue values corresponding to inputted standardized color data.

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**5,497,432**

## CHARACTER READING METHOD AND APPARATUS EFFECTIVE FOR CONDITION WHERE A PLURALITY OF CHARACTERS HAVE CLOSE RELATIONSHIP WITH ONE ANOTHER

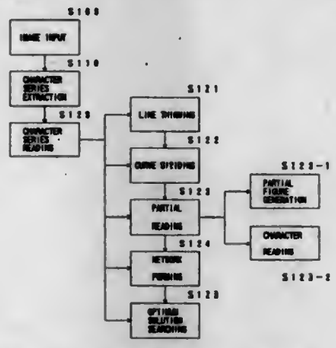
**Hirobumi Nishida, Aizuwakamatsu, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan**

**Filed Aug. 23, 1993, Ser. No. 111,461**

**Claims priority, application Japan, Aug. 25, 1992, 4-226185**

**Int. Cl.[6] G06K** *9/34*

**U.S. Cl. 382—178** **11 Claims**




1. A character reading method comprising steps of:

an inputting step (a-1) for inputting a character line including a plurality of characters which have been written, the inputting of said character line being performed after all of said plurality of characters have been written;

a dividing step (a-2) for dividing into segments said character line;

a partial-figure forming step (b) for forming partial figures by combining segments from among said thus obtained segments;

a character reading step (c) for attempting to read each of said partial figures as a character;

a network forming step (d) for forming a network wherein partial figures, among the partial figures in said character-reading step (c) are used as nodes and said nodes are connected with one another by links, and wherein said links respectively have appropriate weights; and

an optimum-path selecting step (e) for selecting an optimum path from among paths existing in said network so that said optimum path comprises nodes, from among said nodes, which respectively appropriately correspond to said plurality of characters, wherein the optimum-path selecting step includes using a total length of the line segments existing between two adjacent partial figures among said partial figures.



**5,497,433**

## OPTICAL INFORMATION PROCESSING APPARATUS AND METHOD FOR USING COMPUTER GENERATED HOLOGRAM

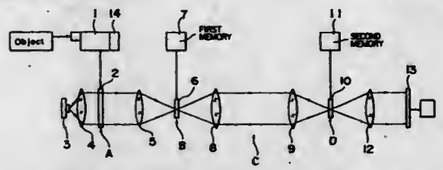
**Masami Itoh, Takarazuka; Kanji Nishii, Osaka; Hiroyuki Kawamura, Kadoma, and Atsushi Fukui, Hirakata, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Continuation of Ser. No. 136,250, Oct. 15, 1993, abandoned, which is a division of Ser. No. 967,739, Oct. 28, 1992, Pat. No. 5,386,378, which is a continuation-in-part of Ser. No. 710,461, Jun. 5, 1991, abandoned. This application May 12, 1995, Ser. No. 440,236**

**Claims priority, application Japan, Jun. 5, 1990, 2-148242**

**Int. Cl.[6] G06K** *9/76; G06E 3/00*

**U.S. Cl. 382—211** **10 Claims**




1. An optical information processing apparatus comprising:

an input means for inputting an image of an object;

a first spatial light modulator for displaying an input image;

a light source for irradiating said first light modulator;

a first lens means arranged so as for its front focal plane to coincide with the plane on which said first spatial light modulator is arranged, said first lens means Fourier-transforming the input image displayed on said first spatial light modulator and irradiated by said light source;

a first memory means for storing a coordinate transforming computer generated hologram for performing a rotation-invariant and scale-invariant coordinate transform:

a second spatial light modulator arranged on the rear focal plane of said first lens for superposing the image Fourier-transformed by said first hens means with said coordinate transforming computer generated hologram having been stored in said first memory;

a second lens means arranged so as for its front focal plane to coincide with the rear focal plane of said first lens means, said second lens means Fourier-transforming the superposed image, thereby obtaining a rotation-invariant and scale-invariant Fourier-transformed image;

a third lens means arranged so as for its front focal plane to coincide with the rear focal plane of said second lens means, said third lens means Fourier-transforming the image Fourier-transformed by said second lens means;

a second memory for Storing computer generated holograms of reference images each obtained by Fourier-transforming a reference image, rotation-invariant and scale-invariant coordinate transforming the Fourier-transformed reference image, calculating an absolute value of the coordinate-transformed image, and Fourier-transforming the absolute value;

a third spatial light modulator arranged on the rear focal plane of said third lens means for superposing the image Fourier-transformed by said third lens means and a complex conjugate of a computer generated hologram having been stored in said second memory;

a fourth lens means arranged so as for its front focal plane to coincide with the plane of said third spatial light modulator, said fourth lens means Fourier-transforming an image obtained by superposing the image Fourier-transformed by said third lens means to said computer generated hologram displayed on said third spatial light modulator; and

a photo detecting means arranged on the rear focal plane of said fourth lens means which receives the image Fourier-transformed by said fourth lens means to detect whether or not the input image coincides with the reference image.

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**5,497,434**

## IMAGE DATA COMPRESSION

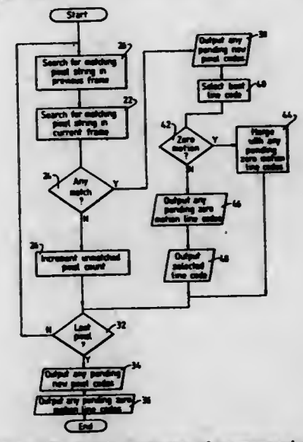
**Alun R. Wilson, Cambridge, United Kingdom, assignor to Acorn Computers Limited, Cambridge, United Kingdom**

**Continuation of Ser. No. 55,197, Apr. 28, 1993, abandoned. This application Sep. 23, 1994, Ser. No. 312,005**

**Claims priority, application United Kingdom, May 5, 1992, 9209646**

**Int. Cl.[6] G06K** *9/36;9/46*

**U.S. Cl. 382—232** **14 Claims**




10. Apparatus for forming a stream of compressed data containing compressed data codes from a sequence of arrays of pixel values, each of said arrays of pixel values representing a frame of a moving image, said pixel display values being encoded in a predetermined sequence of positions within each array of pixel values, each compressed data code representing one or more pixel values extending from a current position within said predetermined sequence of positions, said apparatus comprising:

(i) means for searching through previously compressed pixel values from a preceding frame to identify one or more preceding frame pixel values matching one or more pixel values at a current position within an array of pixel values being compressed and in response to such identification generating a temporal copy code for controlling copying of said preceding frame pixel values to said current position upon subsequent decompression;

(ii) means for searching through previously compressed pixel values from that frame currently being compressed to identify one or more current frame pixel values matching one or more pixel values at a current position within an array of pixel values being compressed and in response to such identification generating a spatial copy code for controlling copying of said current frame pixel values to said current position upon subsequent decompression; and

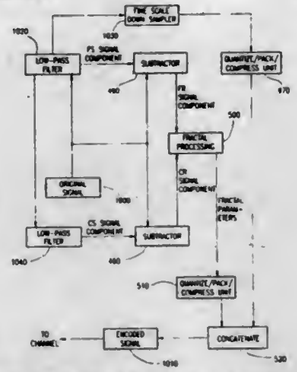
(iii) means for generating a new pixel code representing any non-matching pixel to be compressed that cannot be represented by a temporal copy code and cannot be represented by a spatial copy code, said new pixel code specifying pixel appearance.

**5,497,435**

## APPARATUS AND METHOD FOR ENCODING AND DECODING DIGITAL SIGNALS

**Marc A. Berger, Rehovot, Israel, assignor to Image Compression Technology Ltd., Jerusalem, Israel**

**Filed Feb. 23, 1993, Ser. No. 21,084**
**Claims priority, application Israel, Feb. 7, 1993, 104636**
**Int. Cl.[6] H04N 7/30**
**U.S. Cl. 382—249** **115 Claims**



1. A digital signal encoding method for image compression followed by at least one of storage and transmission thereof, comprising the step of:

defining relatively high frequency and relatively low frequency components of an original digital signal representing an image comprised of segments on each of two scales, said components being defined for each segment;

fractal-processing the two relatively high frequency components by conducting a comparison therebetween;

generating an encoded digital signal comprising a representation of at least one of the relatively low frequency components and a representation of a result of the fractal-processing step for each segment;

utilizing said encoded digital signal to provide at least one of storage and transmission of a compressed image.

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**5,497,436**

## SYSTEM AND METHOD FOR BIT-MASKED COLOR SIGNAL SCALING

**Gavin S. P. Miller, Palo Alto, Calif., assignor to Apple Computer Inc., Cupertino, Calif.**

**Filed Jul. 22, 1994, Ser. No. 278,934**
**Int. Cl.[6] G06K 9/32**
**U.S. Cl. 382—298** **19 Claims**

1. In a computer system having a processing unit and a memory wherein an image memory, a multiplication image memory, and a scaling unit reside, a method for scaling a color signal comprising a first channel signal, a second channel signal, and a third channel signal, the method comprising the steps of:

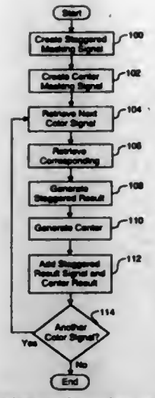
creating a staggered masking signal for masking the first channel signal and the third channel signal of a computer word;

creating a center masking signal for masking the second channel signal of the computer word;

retrieving the color signal;

retrieving a multiplication signal associated with the color signal, the multiplication signal indicating a value by which each of the first, second, and third channel signals are to be multiplied;

generating a staggered result signal via a single multiplication operation, the staggered result signal including a first multiplication result portion corresponding to the multiplication of the first channel signal by the multiplication signal and a




second multiplication result portion corresponding to the multiplication of the third channel signal by the multiplication signal;

generating a center result signal, the center result signal including a third multiplication result portion corresponding to the multiplication of the second channel signal by the multiplication signal; and

adding the staggered result signal and the center result signal to produce a scaled color signal.

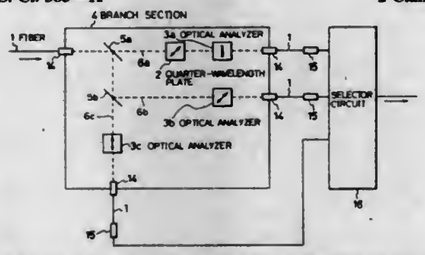
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**5,497,437**

## METHOD AND APPARATUS FOR RECEIVING LIGHT WITH A MODULATED POLARIZATION

**Toshiya Hikami; Shoichi Negami; Shigeaki Nishikawa, and Matsue Murata, all of Tokyo, Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan**

**Filed Dec. 6, 1994, Ser. No. 354,735**
**Claims priority, application Japan, Dec. 6, 1993, 5-339691**
**Int. Cl.[6] G02B 6/126**
**U.S. Cl. 385—11** **2 Claims**




2. An apparatus for receiving light with a modulated polarization comprising a light receiving section (4) including branching devices (5*a* and 5*b*) for dividing the light with a modulated polarization being propagated through an optical fiber (1) into three branched beams of light (6*a*, 6*b* and 6*c*), a $\pi/2$ phase corrector (2) arranged on one of the path of one of the three branched beams of light, an optical analyzer (3*a*) arranged downstream to the $\pi/2$ phase corrector (2), a pair of optical analyzers (3*b* and 3*c*) arranged on the respective paths of the remaining branched beams of light (6*b* and 6*c*), said $\pi/2$ phase corrector (2) and said first optical analyzer (3*a*) forming an angle of 45° therebetween, said second optical analyzer (3*b*) and said third optical analyzer (3*c*) forming an angle of 45° therebetween.

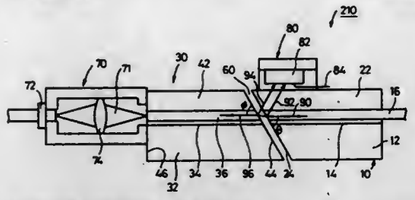


**5,497,438**

## OPTICAL TRANSMISSION AND RECEPTION MODULE HAVING COUPLED OPTICAL WAVEGUIDE CHIPS

**Tadasu Ishikawa, Tokyo; Yoshinari Kozuka, and Yukihisa Osugi, both of Nagoya, all of, Japan, assignors to Nippon Hoso Kyokai, Tokyo, and NGK Insulators, Ltd., Nagoya, both of, Japan**

**Filed Sep. 30, 1994, Ser. No. 316,346**
**Claims priority, application Japan, Jan. 1, 1993, 5-247055**
**Int. Cl.[6] G02B 6/26**
**U.S. Cl. 385—38** **22 Claims**




1. An optical component comprising:

a first optical waveguide chip having a first optical waveguide, first and second end faces at which said first optical waveguide is exposed, and a first guide groove; and

a second optical waveguide chip having a second optical waveguide, third and fourth end faces at which said second optical waveguide is exposed, and a second guide groove;

said second end face being inclined to a direction in which light is propagated through said first optical waveguide;

said third end face being inclined to a direction in which light is propagated through said second optical waveguide;

said first optical waveguide of said first optical waveguide chip and said second optical waveguide of said second optical waveguide chip being optically coupled to each other with reference to pins intimately placed in said first and second guide grooves;

said second and third end faces extending substantially parallel to each other with a layer interposed therebetween which has a refractive index that is different from the refractive index of at least one of said first and second optical waveguides;

the arrangement being such that a portion of light propagated from said first optical waveguide to said second optical waveguide is reflected out of at least one of the first and second optical waveguide chips by at least one of said second end face of said first optical waveguide chip and said third end face of said second optical waveguide chip, the reflected light propagating through a light transmissive portion of at least one of said optical waveguide chips.

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**5,497,439**

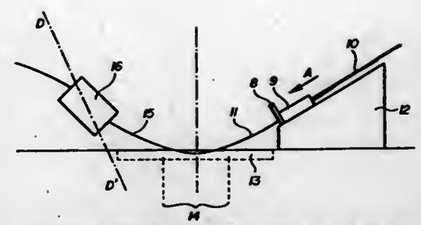
## METHOD FOR ALIGNING FIBER OPTICS

**José Piffaretti, Saint-Blaise, and Bernard Jenzer, La Tour-de-Peilz, both of, Switzerland, assignors to Cabloptic S.A., Cortaillod, Switzerland**

**Filed Sep. 12, 1994, Ser. No. 304,162**
**Claims priority, application France, Sep. 13, 1993, 93 11020**
**Int. Cl.[6] G02B 6/255**
**U.S. Cl. 385—98** **8 Claims**

1. A method for aligning a first fiber optic supported by an inclined support with at least one succeeding fiber optic included within a flat ribbon, said flat ribbon being secured by a gripping device supported by an inclined contact element, said succeeding fiber optic being stripped and split, prior to being supported by said gripping device, and being positioned at a fixed distance from the gripping device in a V-shaped groove which extends substantially horizontally, said method comprising the steps of:

sliding an exposed fiber optic extremity of said succeeding fiber optic in the V-shaped groove in such a way that only said extremity of said succeeding fiber optic contacts said groove, said extremity of said succeeding fiber optic being positioned adjacent a central portion of said groove and, when said




extremity of said succeeding fiber optic is in a final position adjacent the central portion of said groove, a longitudinal axis defined by said extremity of said succeeding fiber optic which contacts said groove forms an angle of less than 1 degree with said groove; and

aligning said first fiber optic with said succeeding fiber optic by sliding an extremity of said first fiber optic in said groove so that said extremity of said first fiber optic is positioned adjacent the central portion of said groove at a distance of less than 50 μm from said extremity of said succeeding fiber optic located in said groove, and, when said extremity of said first fiber optic is in a final position adjacent the central portion of said groove, a longitudinal axis defined by said extremity of said first fiber optic which contacts said groove forms an angle of less than 1 degree with said groove; and

coupling said first fiber optic to said succeeding fiber optic.

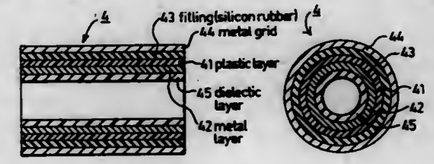
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**5,497,440**

## LASER BEAM WAVEGUIDE AND LASER BEAM DELIVERY SYSTEM INCLUDING SAME

**Nathan Croitoru, Kfar Saba; Jacob Dror, Tel Aviv; Isaac Kaplan, Savion, and Israel Gannot, Ramat Hasharon, all of, Israel, assignors to Ramot University Authority For Applied Research & Industrial Development Ltd., Tel Aviv, Israel**

**Filed Jun. 7, 1994, Ser. No. 255,248**
**Claims priority, application Israel, Jun. 8, 1993, 105956**
**Int. Cl.[6] G02B 6/20**
**U.S. Cl. 385—125** **19 Claims**




1. A laser beam waveguide particularly useful for transmitting infrared laser radiation, comprising:

a flexible, hollow plastic tube;

a metal layer on the inner surface of said hollow plastic tube;

a dielectric film on the inner surface of said metal layer;

a flexible layer over the outer surface of said hollow plastic tube capable of absorbing infrared radiation and preventing kinking of the hollow plastic tube;

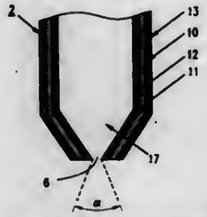
and a flexible metal sheath over the outer surface of said flexible layer.

5,497,441

## HOLLOW WAVEGUIDE TIPS FOR CONTROLLING BEAM DIVERGENCE AND METHOD OF MAKING SUCH TIPS

Nathan Croitoru, Kfar Saba; Jacob Dror, Tel Aviv; Israel Gannot, Ramat Hasharon, and Reuben Dahan, Petach Tikva, all of, Israel, assignors to Ramot University Authority for Applied Research & Industrial Development Ltd., Tel Aviv, Israel

Filed Jul. 6, 1994, Ser. No. 271,152
Claims priority, application Israel, Jul. 9, 1993, 106302
Int. Cl.[6] G02B 6/20
U.S. Cl. 385—125 20 Claims




1. A hollow waveguide for guiding laser energy including a hollow tube, a dielectric layer on the inner surface of the tube, and a metal layer between said tube and said dielectric layer; said hollow waveguide having a proximal end for receiving the laser energy and a distal end terminating in a distal tip for delivering the laser energy to a working area; said distal end of the hollow waveguide including an annular, converging, inner surface converging the laser energy towards said distal tip such as to concentrate the laser energy delivered through the distal tip to the working area.

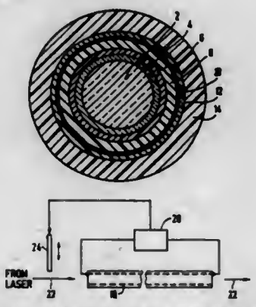
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5,497,442

## ASSEMBLY FOR TRANSMITTING HIGH-POWER LASER RADIATION

Sven-Olov Roos, Hamburg; Reinhold Dinger, Glinde, and Klaus Ludewigt, Oststeinbek, all of, Germany, assignors to Rofin Sinar Laser GmbH, Hamburg, Germany

Filed Aug. 19, 1994, Ser. No. 293,734
Claims priority, application Germany, Feb. 21, 1992, 9202296 U
Int. Cl.[6] G02B 6/02
U.S. Cl. 385—128 9 Claims




1. Assembly for transmitting high-power laser radiation, comprising:

an optical fiber formed of a glass fiber with a fiber core and a fiber cladding surrounding said fiber core, an intermediate layer of polymer disposed on and surrounding said fiber cladding, a metallic coating disposed on said intermediate layer, and protective means for protecting said metallic coating against mechanical destruction; and

monitoring means connected to said metallic coating of said optical fiber for measuring an electrical resistance of said metallic coating for monitoring an operational condition of said optical fiber.

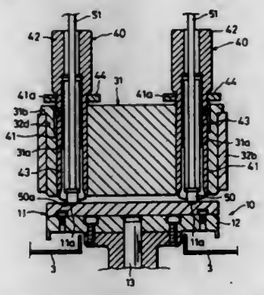
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5,497,443

## END MACHINING APPARATUS AND HOLDING FIXTURES FOR OPTICAL CONNECTORS

Xu Jie; Jun Takahashi, and Kenji Suzuki, all of Tokyo, Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Nov. 28, 1994, Ser. No. 345,133
Claims priority, application Japan, Dec. 14, 1993, 5-313208; Aug. 12, 1994, 6-190394
Int. Cl.[6] G02B 6/00; B23B 5/22
U.S. Cl. 385—134 12 Claims




1. An optical connector end machining apparatus for collectively machining respective end faces of a plurality of optical connectors, comprising:

a removing section for removing an adhesive agent swollen on the end faces of the optical connectors;

a polishing section located adjacent to the removing section and adapted to grind and polish the end faces of the optical connectors cleared of the adhesive agent; and

a switching section including a holding member for holding the optical connectors and adapted collectively to shift the optical connectors held by means of the holding member to the removing section or the polishing section, the holding member releasably holding the optical connectors in a manner such that the end face of each optical connector projects and causing the respective projecting end faces of the optical connectors to move integrally toward and away from the removing section or the polishing section.

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5,497,444

## HIGH-DENSITY FIBER DISTRIBUTION FRAME

Todd A. Wheeler, Savage, Minn., assignor to ADC Telecommunications, Inc., Minneapolis, Minn.

Continuation of Ser. No. 180,970, Jan. 21, 1994, abandoned. This application May 22, 1995, Ser. No. 446,428
Int. Cl.[6] G02B 6/44
U.S. Cl. 385—135 15 Claims

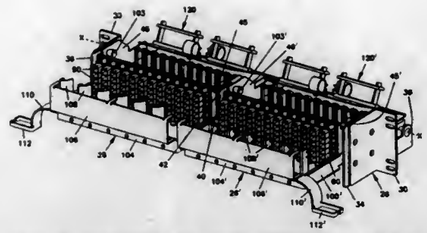
1. A signal transmission cable management system comprising:

a fixture;

a plurality of modules mounted on said fixture with each of said modules movably mounted on said fixture for movement along a line of travel, each one of said modules including a plurality of adaptor means for holding a fiber optic connector, each one of said adaptor means movable with said one of said modules along said line of travel;

releasable lock means for releasably locking each of said modules in any one of a plurality of fixed positions along said line of travel;





means for connecting a first signal transmission cable at a rear side of said module with a second signal transmission cable connected at a front side of said module.

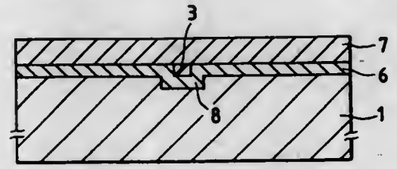
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5,497,445

## POLYMER CORE OPTICAL WAVE-GUIDE AND FABRICATION METHOD THEREOF

Katsuyuki Imoto, Sayama, Japan, assignor to Hitachi Cable, Inc., Japan

Filed Sep. 27, 1994, Ser. No. 313,984
Claims priority, application Japan, Sep. 27, 1993, 5-239747
Int. Cl.[6] G02B 6/13
U.S. Cl. 385—143 16 Claims




1. A polymer core optical wave-guide which comprises a substrate, a buffer layer formed on the surface of the substrate made of a $SiO_xN_yH_z$ film wherein $0.72=x<1$; $0<y\leqq 0.25$; $0<z\leqq 0.03$, of desirable thickness having a refractive index of $n_b$, an approximately rectangle-shaped core formed on the buffer layer made of a polymer material having a refractive index of $n_w$, ($n_w>n_b$), a cladding layer covering the surfaces of the buffer layer and the core having a refractive index of $n_c$, ($n_c<n_w$).

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5,497,446

## SPEECH INFORMATION PROCESSING METHOD AND APPARATUS CONNECTABLE TO A PUBLIC LINE

Takashi Aso, Tama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

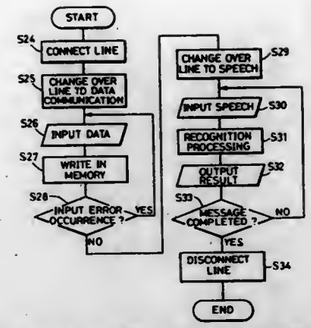
Continuation of Ser. No. 884,458, May 14, 1992, abandoned, which is a continuation of Ser. No. 562,443, Aug. 2, 1990, abandoned, which is a continuation of Ser. No. 211,542, Jun. 24, 1988, abandoned. This application Dec. 29, 1993, Ser. No. 174,172
Claims priority, application Japan, Jun. 26, 1987, 62-157625
Int. Cl.[6] G10L 9/00
U.S. Cl. 395—2.1 14 Claims

1. A speech information processing apparatus comprising:

speech input receiving means for receiving input speech information;

reading means for reading from a recording medium prerecorded speech information for use in recognizing said input speech information;

speech information transmission means for transmitting both the input speech information, received by said speech input receiving means, and the prerecorded speech information, read by said reading means, to a speech recognition device through a public line;




control means for controlling said reading means to read out the prerecorded speech information, and controlling said speech information transmission means to transmit the read out prerecorded speech information to the speech recognition device through the public line, said control means detecting a communication error in the communication of the prerecorded speech information to the speech recognition device through the public line and controlling said speech information transmission means to repeatedly transmit the read out prerecorded speech information when the communication error is detected while maintaining the connection to the public line, said control means confirming the proper completion of transmission of the prerecorded speech information when said speech information transmission means properly completes transmission of the prerecorded speech information;

changeover means for changing over the connection of a public line from being connected to said control means to being connected to said speech input receiving means,

wherein said control means controls said changeover means so that the public line is connected to said control means when said control means determines that the prerecorded speech information is to be transmitted to the public line and when the prerecorded speech information is repeatedly transmitted over the public line and wherein the public line is connected to said speech input receiving means after said speech information transmission means transmits the read out prerecorded speech information and said control confirms proper transmission of the prerecorded speech information.

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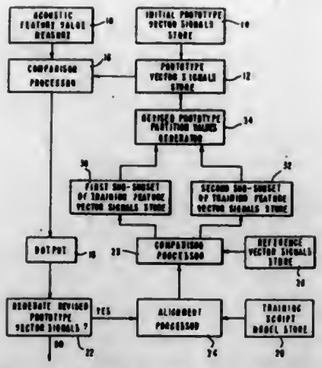
5,497,447

## SPEECH CODING APPARATUS HAVING ACOUSTIC PROTOTYPE VECTORS GENERATED BY TYING TO ELEMENTARY MODELS AND CLUSTERING AROUND REFERENCE VECTORS

Lalit R. Bahl, Amawalk; Ponani S. Gopalakrishnan, Yorktown Heights, and Michael A. Picheny, White Plains, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 8, 1993, Ser. No. 28,028
Int. Cl.[6] G10L 9/00
U.S. Cl. 395—2.54 17 Claims

1. A speech coding apparatus comprising:



means for storing a model of a training script, said training script model comprising a series of elementary models from a finite set of elementary models, each elementary model in the training script having a phonetic context comprising one or more preceding or following models in the training script;

means for measuring the value of at least one feature of a training utterance of the training script over each of a series of successive time intervals for producing a series of training feature vector signals representing feature values;

means for identifying a first set of training feature vector signals corresponding to a first elementary model in the training script model;

means for storing at least a first reference vector signal and a second reference vector signal, each reference vector signal having at least one parameter value, the first reference vector signal comprising the arithmetic mean of the training feature vector signals corresponding to the first elementary model in a first phonetic context of preceding and following phonetic models, the second reference vector signal comprising the arithmetic mean of the training feature vector signals corresponding to the first elementary model in a second phonetic context of preceding and following phonetic models, different from the first context;

means for comparing the feature values of each training feature vector signal in the first set to said at least one parameter value of the first reference vector signal to obtain a first closeness score for each training feature vector signal and the first reference vector signal;

means for comparing the feature values of each training feature vector signal in the first set to said at least one parameter value of the second reference vector signal to obtain a second closeness score for each training feature vector signal and the second reference vector signal;

means for comparing, for each training feature vector signal in the first set, the first closeness score for the training feature vector signal with the second closeness score for the training feature vector signal to obtain a reference match score for each training feature vector signal and the first and second reference vector signals;

means for storing a first subset of the training feature vector signals in the first set having reference match scores greater than a threshold Q, and for storing a second subset of the training feature vector signals in the first set having reference match scores less than the threshold Q; and

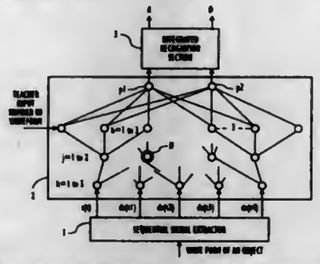
means for generating one or more partition values for a first prototype vector signal from the first subset of training feature vector signals, and for generating one or more additional partition values for the first prototype vector signal from the second subset of training feature vector signals.

**5,497,448**

## LEARNING TYPE WAVEFORM RECOGNIZER

**Susumu Maruno, Osaka; Shigeo Sakaue, Moriguchi, and Yasuharu Shimeki, Suita, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Continuation of Ser. No. 53,444, Apr. 28, 1993, abandoned. This application Mar. 23, 1995, Ser. No. 409,947**
**Claims priority, application Japan, Apr. 30, 1992, 4-111124**
**Int. Cl.[6] G06F *15/18***
**U.S. Cl. 395—22** **8 Claims**



1. A learning type waveform recognizer for recognizing a waveform of a signal comprising:

a sequential signal extractor for receiving input terminals signal and for extracting sequential changes of said input signal at each point on a transition axis;

a learning and recognition section, including an input connected to said sequential signal extractor for receiving extracted sequential changes of said input signal, and a plurality of output terminals, wherein each of said plurality of output terminals corresponds to each one of a plurality of labelled known waveforms, said learning and recognition section performing a learning operation to obtain a relationship between an output terminal and a known waveform by inputting each one of a plurality of labelled known waveforms to said learning and recognition section via said sequential signal extractor, obtaining a signal at an output terminal indicative of the maximum degree of coincidence between an inputted known waveform and an output terminal, and labelling each output terminal to correspond to each inputted known waveform, said learning and recognition section performing a recognition operation by inputting an unknown signal via said sequential signal extractor, and outputting signals from said output terminals indicative of a degree of coincidence between said unknown signal and the labelled output terminals based on said relationship between an output terminal and a known waveform; and

an integrated recognition section for integrating each of said signals output from said plurality of output terminals along a transition axis and recognizing a waveform of said unknown signal based on values obtained by integration.

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**5,497,449**

## FUZZY INFERENCE APPARATUS

**Azuma Miyazawa, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan**

**Continuation of Ser. No. 793,620, Nov. 18, 1991, abandoned. This application Sep. 20, 1993, Ser. No. 124,385**
**Claims priority, application Japan, Nov. 30, 1990, 2-340932**
**Int. Cl.[6] G06G *7/00***
**U.S. Cl. 395—61** **14 Claims**

1. A fuzzy inference apparatus comprising:

rule storing means for storing a plurality of then-part positions respectively corresponding to pairs each of which has one of a plurality of first if-part membership functions and one of a plurality of second if-part membership functions, the plurality of first and second if-part membership functions having shapes of triangles each having a base corresponding to positions of vertices of triangles of two adjacent membership functions, said rule storing means storing the positions of the vertices of the triangles in correspondence with the pairs of first and second if-part membership functions;

rule selecting means for sequentially comparing an input value to the plurality of first if-part membership functions with positions of a plurality of vertices representing the plurality of first if-part membership functions stored in said rule storing means, retrieving two adjacent vertex positions between which a position of the input value is located, calculating first and second differences between the retrieved two vertex positions and the input value, sequentially comparing an input value to the plurality of second if-part membership functions with positions of a plurality of vertices representing the plurality of second if-part membership functions stored in said rule storing means, retrieving two adjacent vertex positions between which a position of the input value is located, and calculating third and fourth differences between the retrieved two vertex positions and the input value;

membership value selecting means for selecting a minimum value of each rule on the basis of magnitudes of the first to fourth differences obtained by said rule selecting means;

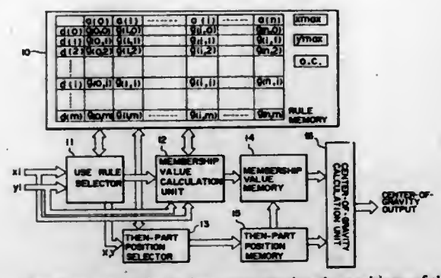
membership value storing means for storing the minimum value selected by said membership value selecting means;

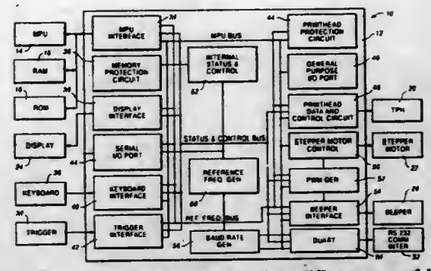
then-part selecting means for selecting then-part positions respectively corresponding to the two vertex positions corresponding to the plurality of first if-part membersbip functions stored in said rule storing means and selected by said rule selecting means and the two vertex positions corresponding to the plurality of second if-part membership functions stored in said rule storing means and selected by said rule selecting means;

then-part position storing means for storing the then-part positions selected by said then-part selecting means; and

center-of-gravity calculating means for calculating a position of a center of gravity on the basis of the minimum values stored in said membership value storing means and the then-part positions stored in said then-part position storing means.







same group of pins communicating via a different type of bus disposed between the controller and a printer processor of the second type. .

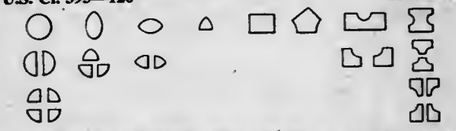
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**5,497,451**

## COMPUTERIZED METHOD FOR DECOMPOSING A GEOMETRIC MODEL OF SURFACE OR VOLUME INTO FINITE ELEMENTS

**David Holmes, Box 308, Uncasvile, Conn. 06382**

**Filed Jan. 22, 1992, Ser. No. 823,109**
**Int. Cl.[6] G06F *15/62***
**U.S. Cl. 395—120** **22 Claims**



1. A method for defining finite elements in a surface for ultimately predicting a physical characteristic of the surface, which method comprises:

providing a computer system having a computer connected to an input device, to an image display screen and to a storage file, the storage file including instructions and data for at least steps (iii) through (xi) of said method;

(i) inputting, through the input device, surface boundary point coordinates of a geometric model of a surface;

(ii) displaying a surface object on the image display screen, the surface object consisting of the geometric model of the surface;

(iii) preparing boundary edges of the surface object by generating piecewise geometrically smooth bezier curves between boundary points and converting the bezier curves to cubic interpolation polynomials and defining evenly spaced points on each cubic interpolation polynomial;

(iv) decomposing the surface object with divider curves, if the surface object is not already 3, 4, or 5 sided, into 3, 4, and 5 sided primitives;

(v) determining a largest acceptable element size;

(vi) determining a number of elements disposed along each edge of each primitive; and

(vii) readjusting one of the divider curves to match closest even element vertices;

(viii) mapping in 3 and 5 sided clusters;

(ix) preparing remaining 4 sided primitives for decomposition into 4 sided elements;

(x) mapping in elements and element patches to develop a mesh from the surface object;

(xi) optimizing the elements in the mesh; and

(xii) writing the mesh having the optimized elements to the storage file.

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**5,497,450**

## UNIVERSAL CONTROLLER INTERFACE FOR BARCODE PRINTERS

**James E. Helmbold, Centerville, Ohio; David N. Long, Cheshire; David W. Riley, Easton, both of Conn., and Mitchell G. Stern, Certerville, Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio**

**Filed Jan. 7, 1994, Ser. No. 178,891**
**Int. Cl.[6] G06K *15/00*; G06F *7/00***
**U.S. Cl. 395—114** **27 Claims**

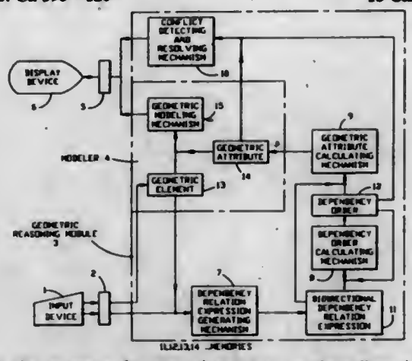
1. A controller interface for use in any one of a plurality of barcode printers between a processor of the printer and a number of the printer's input and output devices including a printhead, said controller comprising: a processor interface for allowing said controller to communicate with a printer processor of a first configuration or a printer processor of a second, different configuration, said processor interface including at least one group of pins for communicating via a first type of bus disposed between the controller and a printer processor of the first configuration and said

5,497,452

## METHOD AND APPARATUS FOR GENERATING A GEOMETRIC MODEL

Shuichi Shimizu, Yokohama, and Masayuki Numao, Kawasaki, both of, Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 2, 1992, Ser. No. 844,345
Claims priority, application Japan, Mar. 14, 1991, 3-103716
Int. Cl.[6] G06F *17/50*
U.S. Cl. 395—120 18 Claims




1. An apparatus for generating a two- or three-dimensional geometric model comprising:

means for generating bidirectional dependency relation expressions from geometric constraints between a plurality of geometric elements;

means for obtaining a dependency condition of said geometric elements using said bidirectional dependency relation expressions;

means for determining an attribute value for each said geometric element from said dependency condition; and

means for generating a two- or three-dimensional model from said geometric elements and said attribute values thereof.

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5,497,453

## METHOD AND APPARATUS FOR DETECTING AND VISUALIZING INTERFERENCES BETWEEN SOLIDS

Abraham E. Megahed, Madison, Wis.; Jarolsaw R. Rossignac, and Bengt-Olaf Schneider, both of Ossining, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

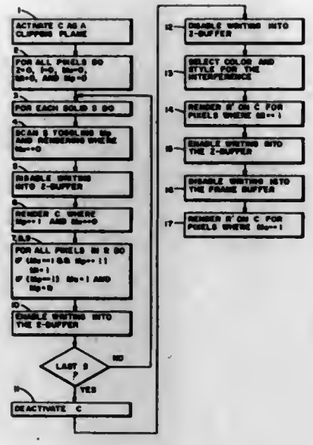
Filed Jan. 5, 1993, Ser. No. 957
Int. Cl.[6] G06F *15/00*
U.S. Cl. 395—122 21 Claims

1. A method for execution by a graphics processing system for detecting an interference between representations of solids, comprising the steps of:

positioning a cross-sectioning plane at locations within representations of at least two solids; and

during the step of positioning, processing the representations of the solids by scan converting the representations to determine displayable faces of the solids and displaying the determined faces of the solids, including portions of the solids that are exposed by a current location of the cross-sectioning plane; wherein

the step of processing includes the steps of detecting a region of interference between the representations of the at least two solids within a recursively subdivided search interval that has a non-zero extent along a depth axis, the step of detecting operating in accordance with a result of a disjointness test performed on projections of the solids within the search interval and, for a detected region of interference, displaying the detected region of interference in a manner that visually emphasizes the detected region of interference.

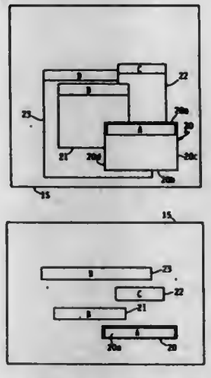


5,497,454

## SYSTEM FOR PRESENTING ALTERNATE VIEWS OF A COMPUTER WINDOW ENVIRONMENT

Cary L. Bates, Rochester, and Jeffrey M. Ryan, Byron, both of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 2, 1994, Ser. No. 333,252
Int. Cl.[6] G06F *3/14*
U.S. Cl. 395—158 23 Claims



2. A computerized system for presenting an alternate view of computer windows on a display device, comprising:

means for presenting on a display device computer windows which represent programs operating on a computer, each of the computer windows having a plurality of edges;

display means for presenting on the display device an alternate view of the computer windows upon selection by a user, the alternate view comprising a plurality of indicators representing corresponding edges of the computer windows displayed in relative position as if the user were looking at the corresponding edges of the computer windows; and

means for allowing the user to manipulate the indicators and for altering a position of the computer windows as determined by the user's manipulation of the computer windows.

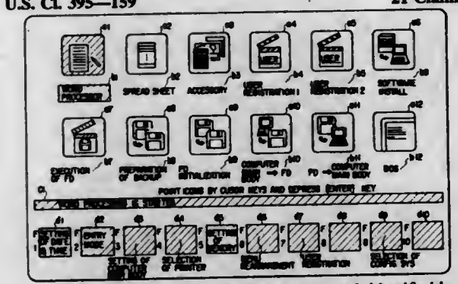


5,497,455

## PORTABLE COMPUTER WHICH HAS A TASK SELECTION MENU ALLOWING EASY SELECTION AND EXECUTION OF ARBITRARY APPLICATION SOFTWARE WITHOUT ENTERING A COMMAND

Masao Suga; Syuzo Nakajima; Tadaaki Inomata; Toshimitsu Saito; Atsuhiro Outake; Yoshiaki Iba; Hidekazu Mihara; Hirofumi Nishikawa; Nobuyuki Nanno, and Shigeru Satake, all of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 25, 1993, Ser. No. 81,408
Claims priority, application Japan, Jun. 26, 1992, 4-169394; Jun. 26, 1992, 4-169495; Jun. 26, 1992, 4-169496
Int. Cl.[6] G06F *3/00;3/14*
U.S. Cl. 395—159 21 Claims



1. A portable computer for executing tasks, each identified by a file name, the portable computer comprising:

display means for displaying a menu screen having a plurality of task-registered icons for task selection at least one user-registration icon for selecting execution of a new task to be registered by a user;

means for selecting the user-registration icon from the menu screen and for setting a file name for the new task corresponding to the user-registration icon;

means for darkening the display of the user-registration icon to indicate that the new task has been registered;

means for storing display data for the menu screen; and

means for, when the user-registration icon is selected on the menu screen, initiating execution of the new task.

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5,497,456

## APPARATUS FOR TRANSFERRING INFORMATION BETWEEN AN INTERRUPT PRODUCER AND AN INTERRUPT SERVICE ENVIRONMENT

James W. Alexander, Hillsboro, Oreg.; Elliot Garbus, Tempe, Ariz.; Lionel S. Smith, Jr., Higley, Ariz., and Douglas D. Yoder, Phoenix, Ariz., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 999,387, Dec. 31, 1992, abandoned.
This application Mar. 13, 1995, Ser. No. 404,136
Int. Cl.[6] G06F *11/34*
U.S. Cl. 395—183.05 15 Claims

1. An emulation processor operable in an interrogation mode and an emulation mode, said micro processor emulator including a test ROM and a memory, said emulation processor comprising:

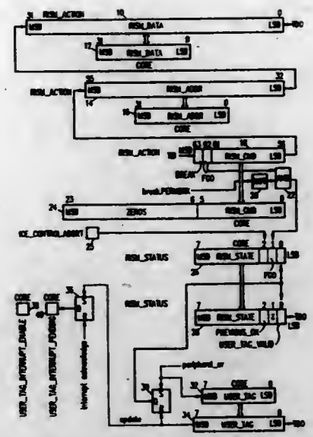
first means for providing code executable starting at a predetermined ROM address of said test ROM, said code including at least a first command and a next command, said first command and said next command being executable in said interrogation mode;

second means for registering serially received information;

said second means including a command register and a status register;

said command register including, a break bit that indicates a break and a fast break go bit that indicates a fast break;

said break bit in said command register when set causing a break during said emulation mode to exit emulation mode to invoke said monitor to enter said interrogation mode;



said second means including third means for registering a jump address to said predetermined ROM address to start execution of said code; and,

a set of processor core registers in said emulation processor;

said processor core registers including a core command register connected to said command register, and a core status register connected to said status register;

said core command register receiving from said command register said jump address pointing to said predetermined ROM address;

said emulation processor executing only said first command upon a first condition that said fast break go bit is set;

said emulation processor executing said first command, modifying a content of said core status register to indicate that said first command has been executed, and executing said next command, upon a second condition that said fast break go bit is not set.

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5,497,457

## REDUNDANT ARRAYS OF INDEPENDENT LIBRARIES OF DISMOUNTABLE MEDIA WITH PARITY LOGGING

Daniel A. Ford, Los Gatos, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 17, 1994, Ser. No. 324,428
Int. Cl.[6] G06F *11/00*
U.S. Cl. 395—182.04 16 Claims

1. A data storage library system for storing data to and retrieving data from media units, the system comprising:

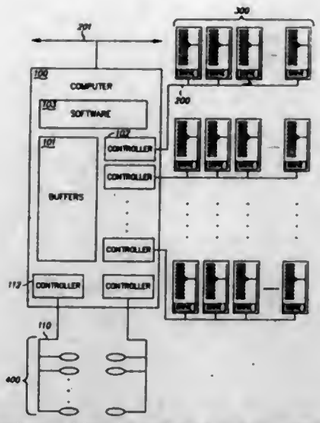
a computer;

a plurality of data storage drives coupled to the computer;

a plurality of media units greater in number than the number of drives and mountable to and dismountable from the drives, the media units being arranged into redundancy groups;

a nonvolatile computer-readable memory;

a computer-readable memory encoded with a computer program for causing the computer to (a) organize the data to be stored into data sets, each data set including data blocks and an associated parity block, the number of data blocks plus the parity block in a set being equal to the number of media units in a redundancy group; (b) write the data by striping the data blocks and the parity block in a set across all of the media units in the redundancy group, and by distributing the parity blocks for different sets among different media units in the redundancy group; (c) log into the nonvolatile memory parity updates computed when the data blocks previously written to the media units in the redundancy group are to be modified; (d) write modified data blocks onto the media units without writing a corresponding new parity block if the media unit containing the corresponding parity block to be updated is not




mounted on a drive; (e) retrieve the parity update from the log; and (f) write a new parity block based on the retrieved parity update to the media unit containing the parity block to be updated when the media unit containing the parity block to be updated is later mounted on a drive.

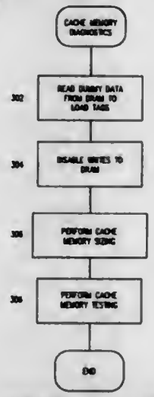
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**5,497,458**

## CACHE TESTABILITY CIRCUIT FOR EMBEDDED DIAGNOSTICS

**Richard Finch; Eric Schieve, and Joseph Vivio, all of Austin, Tex., assignors to Dell USA, L.P., Austin, Tex.**

**Filed Jul. 6, 1993, Ser. No. 87,583**
**Int. Cl.[6] G06F *11/00***
**U.S. Cl. 395—183.06** **12 Claims**




1. An apparatus for disabling writes to, but not reads from, main memory in a computer system during cache memory diagnostics, wherein the computer system comprises a CPU, cache memory coupled to the CPU, a cache controller coupled to the CPU and the cache memory, main memory, and a memory controller coupled to the main memory, the CPU, and the cache controller, the apparatus comprising:

a buffer coupled between the memory controller and the main memory which receives a write signal from the memory controller and provides said write signal to the main memory; and

a signal source coupled to said buffer which asserts a disable signal to said buffer during cache memory diagnostics, wherein said disable signal prevents assertion of said write signal to the main memory during said cache memory diagnostics but does not prevent assertion of read signals to the main memory during said cache memory diagnostics.

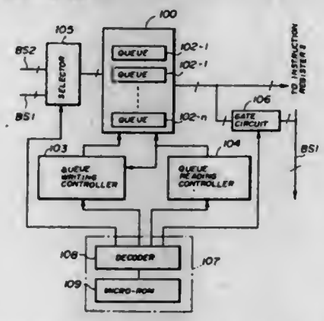
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**5,497,459**

## SYSTEM FOR TESTING INSTRUCTION QUEUE CIRCUIT AND CENTRAL PROCESSING UNIT HAVING THE SYSTEM

**Hisamitsu Tanihira, Iwaki; Renri Nakano, and Kazuo Nagahori, both of Kawasaki, all of, Japan, assignors to Fujitsu Limited, Kanagawa, Japan**

**Continuation of Ser. No. 979,302, Nov. 20, 1992, abandoned.**
**This application Aug. 26, 1994, Ser. No. 297,246**
**Claims priority, application Japan, Nov. 20, 1991, 3-331234**
**Int. Cl.[6] G06F *11/54;1/00;* G11C *29/00***
**U.S. Cl. 395—183.06** **8 Claims**




1. A system for testing an instruction queue circuit provided in a data processor and being connected to an external memory via a bus controller of the processor which further has a microprogram control unit which generates a first instruction, a second instruction and a third instruction prefetched in said processor, an operation unit connected to the microprogram control unit and to the instruction queue circuit via an internal bus wherein the instruction queue circuit includes a plurality of queue buffers for temporarily storing said first and second prefetched instructions, said testing system comprising:

writing means, coupled to the instruction queue circuit and the microprogram control unit, for writing internal bus information transferred via the internal bus and used to test the instruction queue circuit into the instruction queue circuit in response to said first instruction generated by the microprogram control unit;

reading means, coupled to the instruction queue circuit and the microprogram control unit, for reading the internal bus information from the instruction queue circuit in response to said second instruction generated by the microprogram control unit;

gate means, coupled to said microprogram control unit and said instruction queue circuit, for connecting said instruction queue circuit to said internal bus and for outputting the internal bus information read from said instruction queue circuit to the internal bus in response to said third instruction generated by the microprogram control circuit,

the first, second and third instructions and the internal bus information being generated in the microprogram control unit by decoding microinstructions in the microprogram control unit; and

selecting means, coupled directly to the microprogram control unit and the instruction queue circuit and also coupled to said internal bus and an instruction bus, for selecting either the internal bus or the instruction bus to be coupled to the external memory via the bus controller in response to a fourth instruction generated by the microprogram control unit and for connecting a selected bus to the instruction queue circuit so as to switch said instruction queue circuit to an operation mode or a testing mode.

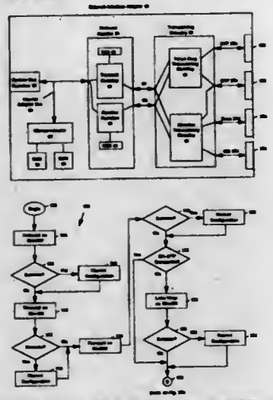


**5,497,460**

## SYSTEM AND METHOD FOR DETERMINING NETWORK CONNECTIVITY

**Warren D. Bailey, Pittsboro; Erik L. Dixon, Durham; Michele M. Ferris, Cary; Henry M. Garrett, Raleigh; Gregory F. Paussa, Cary, and Anthony D. Walker, Durham, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jun. 20, 1994, Ser. No. 262,197**
**Int. Cl.[6] G06F *11/34***
**U.S. Cl. 395—183.15** **21 Claims**



1. A system for use with a processing machine for providing access to one or more networks via one or more ports, each of said networks conforming to a particular networking protocol of a set of networking protocols, said system comprising:

one or more ports for providing connectivity to said one or more networks;

means, connected to said ports, for interrogating each of said one or more ports for determining the connectivity of any of said one or more networks at each of said one or more ports, said interrogating means comprising:

means for successively transmitting an interrogation signal to each of said one or more ports;

means connected to each of said one or more ports for monitoring the status of each interrogation signal transmission;

means, connected to said monitoring means, for determining the connectivity and the particular networking protocol of said set of networking protocols of said one or more networks at eacb of said one or more ports based upon the status of each interrogation signal transmission; and

means, connected to said determining means, for generating an output indicative of said network connectivity and said particular networking protocol.

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**5,497,461**

## DATA TRANSMISSION ERROR CONTROL APPARATUS

**Shigekazu Matsumoto, and Masakazu Furuta, both of Matto, Japan, assignors to Irem Corporation, Osaka, Japan**

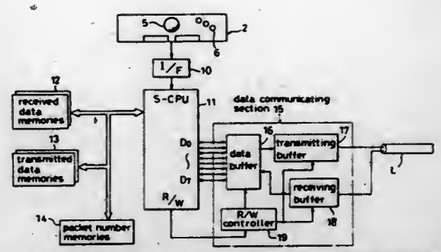
**Filed Jun. 22, 1993, Ser. No. 79,596**
**Int. Cl.[6] G06F *13/14***
**U.S. Cl. 395—185.04** **3 Claims**

1. A data transmission error control apparatus for use in a system for communicating data between a plurality of computers, said data transmission error control apparatus comprising:

a data transmitting section; and

a data receiving section;

said data transmitting section including




first identification number storage means for storing an identification number of a block data including actual information data to be transmitted to said data receiving section,

identification number updating means for updating said identification number only upon confirmation of a completion command transmitted from said data receiving section when said data block is received properly,

transmitted data storage means for storing said actual information data included in said block data, and

transmission control means for dividing said data block into a plurality of data series, for transmitting, as a first data series, a) said identification number stored in said first identification number storage means, b) a data series of said actual information data stored in said transmitted data storage means, and c) a data series of a completion command, for retransmitting any of said data series when a retransmission request therefor is received from said data receiving section, and for retransmitting said data block transmitted previously, i.e. said data block including said data identification number without being updated, said actual information data and said completion command, unless a confirmation of said completion command is received from said data receiving section after said completion command is transmitted to said data receiving section; and

said data receiving section including

received data storage means for temporarily storing an initially received block data,

second identification number storage means for storing an identification number determined identical to said identification number added in said data transmitting section, in order to confirm the identification number of a newly received data block,

identification number recognizing means for determining whether said newly received block data is a retransmission of said initially received block data by comparing said identification number of said newly received block data and said identification number stored in said second identification number storage means,

executing means for processing said initially received block data stored in said received data storage means, and for updating said identification number stored in said second identification number storage means according to a rule used for updating said identification number in said data transmitting section, when said two identification numbers are in agreement, and for discarding said initially received block data stored in said received data storage means when said two identification numbers disagree, and

reception control means for successively checking data series of actual information data of said newly received data block after processing by said executing means, for requesting retransmission of a data series from said data transmitting section if an error is found therein, and for otherwise transmitting a completion command to said data transmitting section upon confirmation of the completion command from said data transmitting section.

**5,497,462**

## METHOD AND CIRCUIT FOR PROTECTING CIRCUIT CONFIGURATIONS HAVING AN ELECTRICALLY PROGRAMMABLE NON-VOLATILE MEMORY

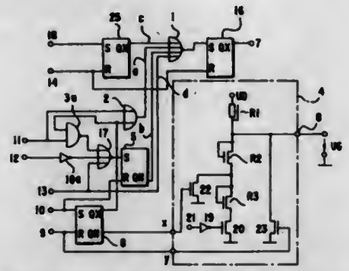
**Hartmut Schrenk, Haar, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany**

**Continuation-in-part of Ser. No. 42,835, Apr. 5, 1993, abandoned, which is a continuation of Ser. No. 381,130, Jul. 14, 1989, abandoned. This application Jul. 15, 1994, Ser. No. 276,166**

**Claims priority, application Germany, Jul. 20, 1988, 38 24 674.0**

**Int. Cl.[6] G06F *11/00***

**U.S. Cl. 395—188.01** **4 Claims**



1. Circuit for protecting circuit configurations having an electrically programmable non-volatile memory divided into a plurality of memory regions, wherein one of said regions is used as a non-volatile error counter for counting error check data, comprising a level flipflop, a level switching device connected to said level flipflop, and a logic circuit connected to said level flipflop; said level switching device having an output connected to a programming control input of said non-volatile memory, and furnishing an evaluation level set between a normal level and a more-critical level as a function of the switching state of said level flipflop; said level flipflop being connected to an output of said non-volatile memory for preventing unwanted manipulation of said error counter by setting a more-critical evaluation level at said output of said level switching device; said logic circuit furnishing a disable signal in dependence on the logical state of the selected memory cell for disabling the performance of the protected function.

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**5,497,463**

## ALLY MECHANISM FOR INTERCONNECTING NON-DISTRIBUTED COMPUTING ENVIRONMENT (DCE) AND DCE SYSTEMS TO OPERATE IN A NETWORK SYSTEM

**Scott A. Stein; Bruce M. Carlson, both of Phoenix, Ariz.; Chung S. Yen, Bedford, Mass., and Kevin M. Farrington, Williamsville, N.Y., assignors to Bull HN Information Systems Inc., Billerica, Mass.**

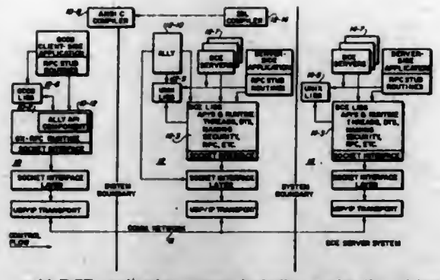
**Filed Sep. 25, 1992, Ser. No. 951,069**

**Int. Cl.[6] G06F *13/00;13/20;15/16***

**U.S. Cl. 395—200.03** **14 Claims**

1. A distributed system including a plurality of computer systems coupled together through a common communication network, a first one of said computer systems corresponding to a non distributed computing environment (DCE) computer system which includes a first type of operating system for running non DCE application programs on said first one of said computer systems and a second one of said systems corresponding to a DCE system including a second type of operating system which is compatible with said DCE system for running application programs compiled on said second system and wherein said distributed system further includes:

an ally component and a distributed computing environment (DCE) application system installed in said second system to run in conjunction with said second type of operating system,



said DCE application system including a plurality of basic distributed services and a remote procedure call (RPC) component for processing remote procedure calls between client and server application programs communicating through a pair of RPC stub components according to a predetermined RPC protocol, said ally component including a plurality of management routines for enabling local requests made by said client application programs running on said first system to be processed by accessing said plurality of distributed service components of said DCE system; and,

an RPC runtime component included in said first computer system, said RPC runtime component including a RPC subcomponent and an application program interface (API) subcomponent operatively coupled to each other, said RPC subcomponent including a minimum number of ported routines responsive to a corresponding number of standard DCE RPC requests for determining when any local client request is to be forwarded to said ally component of said second computer system and said API subcomponent including a plurality of subroutines for enabling transfer of said each local client request received from said RPC subcomponent of said RPC component of said first computer system to said ally component of said second computer system using said predetermined RPC protocol established by said client and server RPC stubs for accessing a designated one of said distributed service components of said DCE application system of said second computer system thereby eliminating the need of having to port said DCE service components to operate on said first computer system.

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**5,497,464**

## ADDRESS MAPPING LOGIC FOR TRANSFERRING DATA BETWEEN A PERIPHERAL DEVICE OF A BASE FUNCTION EXPANDER UNIT AND A PALMTOP COMPUTER AS IF THE PERIPHERAL WAS A PERIPHERAL OF THE COMPUTER

**Keming W. Yeh, 43765 Abeloe Ter., Fremont, Calif. 94539**

**Continuation-in-part of Ser. No. 975,375, Nov. 13, 1992, which is a continuation-in-part of Ser. No. 786,483, Nov. 1, 1991, abandoned. This application Jun. 24, 1993, Ser. No. 82,200**

**Int. Cl.[6] G06F *13/00***

**U.S. Cl. 395—200.01** **29 Claims**

1. An information storage and transfer device for use with a palmtop computer having an IC memory card drive for reading and writing IC memory cards of a proprietary format, an internal address bus and a data bus, said information storage and transfer device comprising:

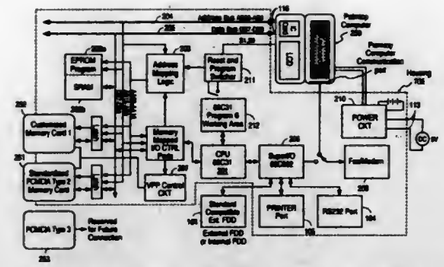
a local address bus including a first plurality of address signals and a second plurality of address signals;

an interface for coupling said second plurality of address signals of said local address bus to said internal address bus and said data bus of said palmtop computer, so as to allow data transfer between said palmtop computer and said information storage and transfer device;

an input and output port for connection to external devices;

a peripheral device; and





an address mapping logic circuit, coupled to said interface and said local address bus, for driving said first plurality of address signals in said local address bus, said address mapping circuit mapping said peripheral device and said input and output port each to an address of said palmtop computer, so as to allow data transfer between said palmtop computer and said peripheral device and said input and output port to occur over said interface as if said peripheral device and said input and output port are a peripheral device and an input and output port of said palmtop computer.

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**5,497,465**

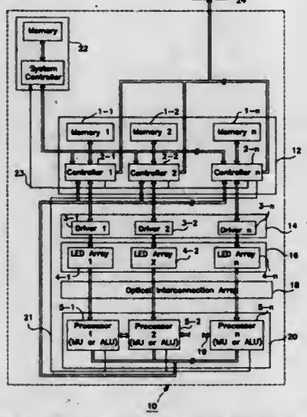
## PARALLEL DIGITAL PROCESSING SYSTEM USING OPTICAL INTERCONNECTION BETWEEN CONTROL SECTIONS AND DATA PROCESSING SECTIONS

**Danny Chin, Robbinsville; Donald J. Sauer, Allentown; Dietrich Meyerhofer, Princeton, all of N.J., and Kazuo Katsuki, Hyogo, Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan**

**Continuation of Ser. No. 857,626, Mar. 25, 1992, abandoned. This application Jan. 3, 1995, Ser. No. 368,242**

**Int. Cl.[6] G06F *13/00***

**U.S. Cl. 395—280** **13 Claims**



1. A parallel computer system for executing data processing in parallel and in a pipeline processing mode, said parallel computer system comprising:

a control section including a plurality of controllers;

a processing section including a plurality of processors, each one of the plurality of processors being associated with a respectively different one of the plurality of controllers;

an optical interconnection section for optically coupling each one of said plurality of controllers to the one of said plurality of processors with which it is associated, wherein said optical interconnection section transmits a plurality of optical signals from said one controller to said one processor, said optical signals comprising at least one of a plurality of optical data signals and a plurality of optical control signals;

a first electrical interconnection section, independent of said optical interconnection section, for coupling each one of said plurality of controllers to at least one of said plurality of processors, wherein said first electrical interconnection section transmits electrical control signals from said control section to said processing section;

a second electrical interconnection section, independent of said optical interconnection section and said first electrical interconnection section, coupled to said plurality of processors, for conveying data among said plurality of processors to the substantial exclusion of any control signals, wherein said second electrical interconnection section includes a plurality of inter-processor data transfer buses which interconnect said plurality of processors, wherein said plurality of inter-processor data transfer buses are controlled by a plurality of control signals provided by said control section.

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**5,497,466**

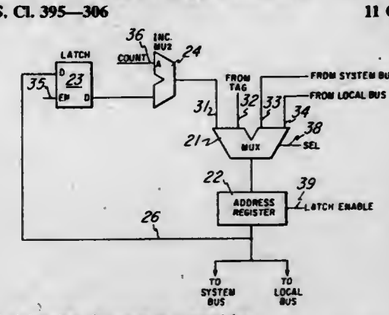
## UNIVERSAL ADDRESS GENERATOR

**Philip Roden, Plano; Brian T. Deng, Richardson, both of Tex., and William Saperstein, San Carlos, Calif., assignors to Texas Instruments Inc., Dallas, Tex.**

**Continuation of Ser. No. 915,150, Jul. 17, 1992, abandoned. This application Mar. 17, 1994, Ser. No. 210,093**

**Int. Cl.[6] G06F *13/00;12/00***

**U.S. Cl. 395—306** **11 Claims**



1. A bus interface system comprising:

a local bus having address leads carrying address signals;

a system bus having address leads carrying address signals;

a cache tag having address leads for carrying address signals;

address circuitry coupled to said local bus, said cache tag, and said system bus for providing selected address signals to said local bus and said system bus; and

said address circuitry comprising:

address register circuitry coupled to said local bus, and said system bus for storing said address signals and for providing selected address signals to said local bus and said system bus;

saving circuitry coupled to said address register circuitry for saving address signals first loaded in said address register circuitry;

incrementing circuitry coupled to said saving circuitry for incrementing saved address signals received from said saving circuitry in accordance with a count input signal; said incrementing circuitry providing said incremented address signal to multiplexing circuitry; and

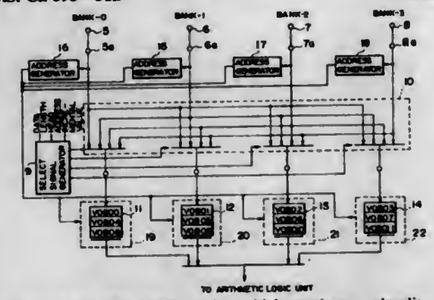
said multiplexing circuitry coupled to and receiving address signals from said local bus, said system bus, said cache tag, and said incrementing circuitry; said multiplexing circuitry selectively loading said address signals into said address register circuitry in response to a select input signal.

5,497,467

## VECTOR DATA BUFFER AND METHOD OF READING DATA ITEMS FROM A BANKED STORAGE WITHOUT CHANGING THE DATA SEQUENCE THEREOF

Fujio Wakui; Hirokatsu Fujiwara, both of Hadano, and Yasutaka Yamada, Takamatsu, all of, Japan, assignors to Hitachi, Ltd., Tokyo, and Hitachi Computer Engineering Co., Ltd., Kanagawa, both of, Japan

Filed Aug. 8, 1991, Ser. No. 742,832
Claims priority, application Japan, Aug. 8, 1990, 2-210759
Int. Cl.[6] G06F *13/10;12/00*
U.S. Cl. 395—312 5 Claims



2. A vector data buffer device which receives a plurality of arrayed data items fetched from a storage, said storage including a plurality of independently operating storage banks and said storage having stored therein the plurality of arrayed data items, comprising:

a vector data buffer which stores therein said arrayed data items fetched from said storage, said vector data buffer includes a plurality of bank memories in a predetermined number, said predetermined number being determined based on a combination of a number of said storage banks, a data width of each of said independently operating storage banks and a data width of each of said plurality of arrayed data items;

switch means for connecting individual bank memories of said plurality of bank memories of said vector data buffer to respective ones of said independently operating storage banks;

switch control means for dynamically changing connection relationships of said switch means on the basis of, at least, a storage address and data intervals of said plurality of arrayed data items wherein any one of said plurality of bank memories which receives data items from one of said plurality of storage banks may not receive data items from another of said plurality of storage banks during processing of a request for fetching said plurality of arrayed data items; and

storing address generation means for generating entry addresses within said plurality of bank memories in which said plurality of arrayed data items fetched are to be stored.

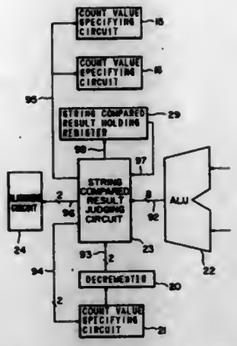
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5,497,468

## DATA PROCESSOR THAT UTILIZES FULL DATA WIDTH WHEN PROCESSING A STRING OPERATION

Kunio Tani; Toyohiko Yoshida, and Yukari Takata, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 752,420, Aug. 29, 1991, abandoned.
This application Oct. 20, 1994, Ser. No. 327,823
Claims priority, application Japan, Aug. 29, 1990, 2-231964
Int. Cl.[6] G06F *7/66;7/20;7/38;9/00*
U.S. Cl. 395—375 3 Claims



1. A data processor, coupled to an external memory and including an ALU and registers for parallel processing of data words including n, where n is an integer greater than or equal to 2, data elements of fixed size, said data processor for executing string processing instructions that include a size field indicating a specified number, less than or equal to n, of data elements forming a string comparison element equal to either the entire data word or a fraction of the data word, said data processor comprising:

instruction decoding means for decoding instructions;

data input/output means for transferring data between said data processor and said external memory;

first and second address registers for holding first and second addresses, respectively, with said first address defining a first memory area and said second address defining a second memory area in said external memory;

a first register for holding a first data word comprising n first data elements, said first data word fetched through said data input/output means from said first memory area of said external memory specified by said first address held by said first address register;

a second register for holding a comparison data word comprising a variable number of repeated copies of a comparison value, each comparison value comprising said specified number of comparison value data elements, with the product of the variable number and the specified number equal to n so that the second register holds n comparison value data elements;

comparing means included in said ALU and connected with said first and second registers and said instruction decoding means for concurrently performing logic operations on all n pairs of corresponding first data elements held in said first register and comparison value data elements held in said second register so that the full width of the ALU is utilized regardless of whether the specified number is less than n, and said comparing means for outputting, in parallel, n compared results, each compared result being a logical value output by said comparing means indicating as the result of said logic operation whether said first data element and said comparison value data elements satisfy a comparison condition with the comparison condition specifying that the first data element is larger than or equal to the second data elements; and

compared result judging means, coupled to said comparing means and said data input/output means, for executing a logical product operation on the compared results of said comparing means resulting from the comparison of the specified number of data elements held in said first register forming a string comparison element and the comparison value data elements held in said second register comprising said comparison value to generate logical products indicating whether said comparison value and said string comparison element satisfy said comparison condition and for executing the logical sum operation on said logical products to determine whether any of the string comparison elements held in said first register and said comparison value satisfy said comparison condition and updates the addresses in said first and second address registers and controls said data input/output means to repeatedly fetch data from said first memory area and store said fetched data in said second memory area until said compared results indicate that a string comparison element and a comparison value satisfy said comparison condition.

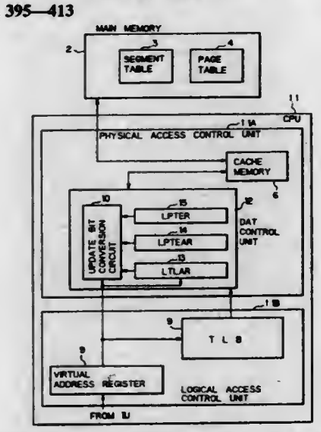


5,497,469

## DYNAMIC ADDRESS TRANSLATION ALLOWING QUICK UPDATE OF THE CHANGE BIT

Hideki Sakata; Tsutomu Tanaka; Takao Kato; Haruhiko Ueno; Akitoshi Ino, and Yoshihiro Kusano, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Sep. 2, 1992, Ser. No. 939,721
Claims priority, application Japan, Sep. 3, 1991, 3-222575
Int. Cl.[6] G06F *12/10*
U.S. Cl. 395—413 4 Claims



1. A virtual memory data processing system comprising:

a main memory for storing an address conversion table; and

a central processing unit for performing a dynamic address translation operation to translate a virtual address to a real address by referring to the address conversion table, said central processing unit comprising:

first storage means for holding a prior translated virtual address;

second storage means for holding a table entry of the address conversion table corresponding to the virtual address held in the first storage means, said table entry having an update bit indicating that the memory has been written to;

third storage means for holding the real address of the table entry held in the second storage means;

comparison means for comparing the prior translated virtual address held in the first storage means with a virtual address to be translated to a real address; and

update means for changing contents of the update bit in the table entry held in the second storage means when the virtual memory has been written to, wherein when the virtual address coincides with the other virtual address in the comparison circuit, the table entry changed by the update means is written into an address of the main memory held in the third storage means.

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5,497,470

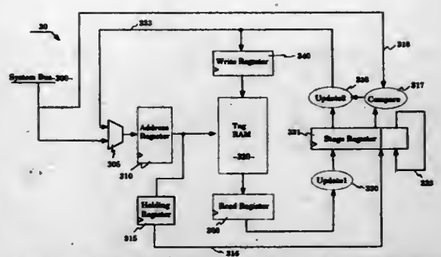
## METHOD AND APPARATUS FOR PROVIDING A HIGH THROUGH PUT CACHE TAG CONTROLLER

Bjorn Liencres, Palo Alto, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.

Filed May 18, 1992, Ser. No. 885,118
Int. Cl.[6] G06F *13/14*
U.S. Cl. 395—403 12 Claims

1. A cache tag controller for a cache tag memory coupled to a system bus for receiving multiple cache tag modify operations to update cache tags in said cache tag memory said cache tag controller comprising:

memory means for storing cache tags;



address register means coupled to said memory means for specifying a cache tag in said memory means, said address register means receiving a first modify operation from said system bus;

read register means coupled to said memory means for reading said cache tag according to said address means;

first update means coupled to said read register means for modifying said cache tag based on said first modify operation;

stage register means coupled to said first update means for storing a once-updated cache tag outputted from said first update means in response to said first modify operation;

compare means coupled to said system bus for determining whether a second modify operation, the second modify operation being received subsequent to the first modify operation being received by the address register means from said system bus, is for the same cache tag in said memory means as said first modify operation, if said second modify operation is transmitted from said system bus before said first modify operation completes writing to said memory means;

second update means coupled to said stage register means and said compare means for modifying said once-updated cache tag in said stage register means according to said second modify operation if said modify operation is for the same cache tag as said first modify operation; and

write register means coupled to said memory means for writing at least one of the once-updated cache tag and a twice-updated cache tag to said memory means as specified by said address from said address register means.

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5,497,471

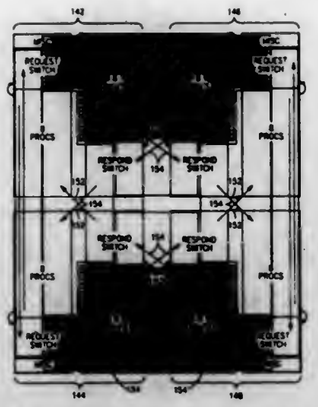
## HIGH PERFORMANCE COMPUTER SYSTEM WHICH MINIMIZES LATENCY BETWEEN MANY HIGH PERFORMANCE PROCESSORS AND A LARGE AMOUNT OF SHARED MEMORY

John B. Gillett, Woodstock, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 675,583, Mar. 26, 1991, abandoned.
This application Nov. 14, 1994, Ser. No. 339,512
Int. Cl.[6] G06F *1/16;* H05K *7/00*
U.S. Cl. 395—425 22 Claims

1. A machine design for a high performance computer system which minimizes latency between many high performance processors and a large amount of shared memory comprising:

a plurality of generally rectangular edge-connected modules, each of said edge connected modules being characterized by signal input/output pads on three edges, first and second opposing edges being referred to as inside connector edges and a third edge being referred to as a global connector edge, said edge-connected modules being configured as processor edge-connected modules, basic storage module edge-connected modules, and request and response switch edge-connected modules;



a group of processor edge-connected modules and a group of request or respond switch edge-connected modules stacked in a first stack, and a group of basic storage module edge-connected modules and a group of respond or request switch edge-connected modules stacked in a second stack;

said first and second stacks being arranged adjacent one another as a subsystem wherein said first stack comprises the group of request or respond switch edge connected modules above or below the group of processor edge-connected modules, and wherein said second stack comprises the group of respond or request switch edge-connected modules below or above the group of basic storage module edge-connected modules, said first and second stacks being further arranged so that the group of respond or request switch edge-connected modules of the second stack are adjacent the group of processor edge-connected modules of the first stack and the group of request or respond switch edge-connected modules of the first stack are adjacent the group of basic storage module edge-connected modules of the second stack to form a first joined pair comprising a joined pair of stacks having processor modules connected to request switch modules connected to basic storage modules connected to respond switch modules connected back to said processor modules in a first loop;

data flow from a processor in said first stack through one of said request switches to an addressed basic storage module in said second stack and through one of said respond switches back to the processor being unidirectional about said first loop defined by connections on the inside edges of the edge-connected modules, parallel delay times within groups being equal, said modules being arranged about said loops so that propagation time of data flow about said first loop is an integral number of processor cycle times;

a second joined pair which is a mirror image of said first joined pair; and

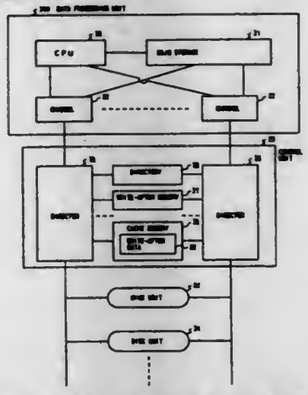
wherein first and second joined pairs are stacked adjacent one another, said machine design further comprising global connectors interconnecting said first and second joined pairs via the third edges of the edge-connected modules via a second loop, the global connectors allowing processors of one joined pair to be connected to request switch modules in either said first or second joined pair, to be connected to basic storage modules of said second joined pair to be connected to respond switch modules in either said second or first joined pair, to be connected back to said processor modules in said first joined pair in said second loop while minimizing connection wiring length.

**5,497,472**

## CACHE CONTROL METHOD AND APPARATUS FOR STORING DATA IN A CACHE MEMORY AND FOR INDICATING COMPLETION OF A WRITE REQUEST IRRESPECTIVE OF WHETHER A RECORD TO BE ACCESSED EXISTS IN AN EXTERNAL STORAGE UNIT

**Akira Yamamoto, Sagamihara; Shigeo Homma, Odawara; Yoshihiro Asaka, Hiratsuka; Yoshiaki Kuwahara, Odawara; Akira Kurano, Odawara; Masafumi Nozawa, Odawara, and Hiroyuki Kitajima, Yokohama, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Continuation of Ser. No. 625,154, Dec. 10, 1990, abandoned.**
**This application Jan. 19, 1995, Ser. No. 375,234**
**Claims priority, application Japan, Dec. 13, 1989, 1-323396**
**Int. Cl.[6] G06F *12/08***
**U.S. Cl. 395—427** **20 Claims**



1. A cache control method executed by a control unit with a cache memory connected with a storage unit for storing records, each record having a respective record number, and said cache memory storing data of frequently-accessed records of the storage unit, comprising the steps of:

(a) receiving from a data processing unit a write request including a record number designating a record to be written;

(b) receiving data to be written in said record from said data processing unit, regardless of whether said record is being stored in said cache memory;

(c) storing said data received in step (b) into said cache memory without accessing said storage unit;

(d) notifying said data processing unit of a completion of said write request;

(e) checking whether a record having said record number included in said write request exists in said storage unit or not; and

(f) if said record having said record number checked in step (e) exists, writing said data stored in said cache memory into said storage unit, and if not, notifying said data processing unit of an error.

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**5,497,473**

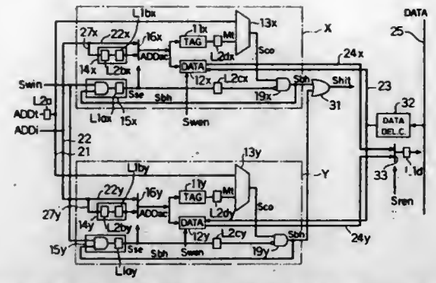
## CONTROL CIRCUIT FOR CONTROLLING A CACHE MEMORY DIVIDED INTO A PLURALITY OF BANKS

**Akira Miyoshi, and Shirou Yoshioka, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Jul. 14, 1993, Ser. No. 90,931**
**Claims priority, application Japan, Jul. 14, 1992, 4-186489**
**Int. Cl.[6] G06F *12/02***
**U.S. Cl. 395—427** **7 Claims**

1. A control circuit for controlling a cache memory which is separated from a main memory and which is divided into a plurality of banks, each bank having a tag memory and a data memory and said tag memory being constituted so as to output a





reference address in response to an access signal, said circuit for controlling a cache memory comprising:

a means for inputting an address signal comprising an index section and tag section in each of said banks via a first signal line for inputting the tag section and a second signal line for inputting the index section;

a branch line for inputting the index section which is branched from said signal line for inputting the index section;

an address delay means intervening in said branch line for inputting the index section so as to delay the output of the index section of the address signal;

a signal switching means included in each of said banks, each of said switching means having the output connected to said tag memory and data memory of the associated bank and the input connected to the output of said second signal line for inputting the index section and to the output of the address delay means intervening in the branch line for inputting the index section, said signal switching means being constituted so as to switch output data between data which is inputted via the second signal line for inputting the index section and delayed data which is inputted via the branch line for inputting the index section;

an address comparing means which is included in each of said banks and which has the input terminal connected to said first signal line for inputting the tag portion and to the output signal line of said tag memory of the associated bank, so as to compare the tag section of said address signal with the reference address output from said tag memory of the associated bank and to output an coincidence signal when there is a coincidence between the two;

a writing-operation control means which fetches, when the coincidence signal is outputted from one of said banks, a memory corresponding to said address from the main memory and controls the writing of data in the data memory of the bank in which said coincidence signal was outputted; and

a means for selectively controlling operations which controls said switching means so that, when the coincidence signal is outputted from said address comparing means in view of the results of comparison which was made by the address comparing means for writing, the delayed data of the index section of the address signal is selected as the access signal for the next comparison to be outputted to said memory tag.

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**5,497,474**

## DATA STREAM ADDRESSING

**Mark Todorovich, Medford Lakes, N.J., assignor to Franklin Electronic Publishers, Incorporated, Mt. Holly, N.J.**

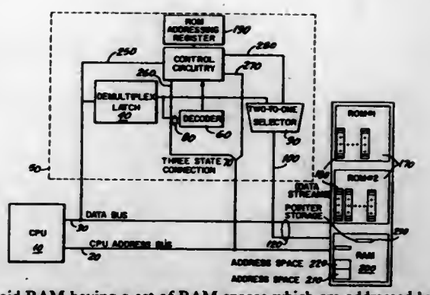
**Filed Feb. 25, 1993, Ser. No. 23,370**
**Int. Cl.[6] G06F *12/02;13/00***
**U.S. Cl. 395—429** **11 Claims**

1. In an electronic book having a system address bus, a database in ROM, a CPU with a data bus and a CPU address bus, the improvement in addressing data streams in the database comprising:

a ROM addressing register coupled to the system address bus,

a RAM coupled to the system address bus,

a first set and a second set of system addresses,



said RAM having a set of RAM spaces which are addressed by said second set of addresses,

each of said set of RAM spaces having a ROM addressing pointer stored therein,

each member of said first set of addresses having a correspondence to a predetermined separate one of said second set of addresses, and

a selector circuit responsive to the addressing of any one of said first set of addresses by the CPU to cause the pointer stored at the RAM space designated by the corresponding one of said second set of addresses to be loaded into said ROM addressing register, if that pointer is not already in said register,

said ROM addressing register addressing the data stream identified by the pointer loaded into said register when the CPU addresses a predetermined address,

the reading of said data stream placing data from said database onto the data bus of said CPU.

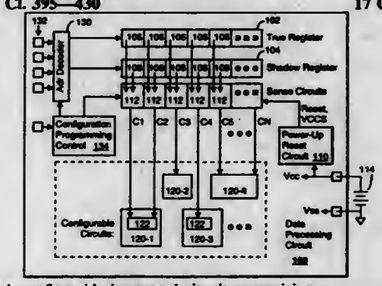
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**5,497,475**

## INTEGRATED CIRCUIT HAVING TRUE AND SHADOW EPROM REGISTERS

**Varkey P. Alapat, Sunnyvale, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.**

**Filed Feb. 5, 1993, Ser. No. 14,311**
**Int. Cl.[6] G06F *13/10***
**U.S. Cl. 395—430** **17 Claims**



1. A configurable integrated circuit, comprising:

a first set of N EPROM cells, where N is a positive integer greater than one, said first set of N EPROM cells for storing N binary configuration values, each of said N binary configuration values having a boolean complement value associated therewith;

a second set of N EPROM cells for storing the boolean complements associated with said N binary configuration values;

N configuration value sensing circuits, each configuration value sensing circuit coupled to one EPROM cell in said first set of N EPROM cells and a corresponding one EPROM cell from said second set of N EPROM cells, each configuration value sensing circuit outputting a configuration signal corresponding to the binary configuration value stored in said one EPROM cell in said first set of N EPROM cells;

a multiplicity of configurable circuits, each configurable circuit having at least one circuit device that receives one of said

configuration signals wherein each of said configurable circuits are configured for operation in accordance with said one of said configuration signals received thereby; and

power connections for coupling said integrated circuit to a supply voltage;

wherein said first and second sets of N EPROM cells together enable said N configuration value sensing circuits to accurately sense said N binary configuration values when said supply voltage is as low as 2.5 volts.

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**5,497,476**

## SCATTER-GATHER IN DATA PROCESSING SYSTEM

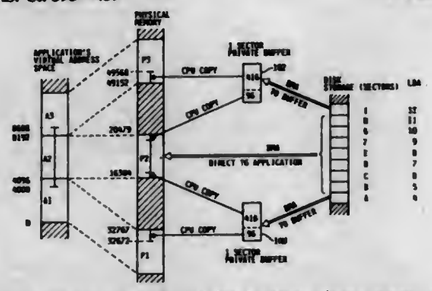
**Clive S. Oldfield, Southampton, and Nicholas Shaylor, Salisbury, both of, England, assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Sep. 21, 1993, Ser. No. 125,051**

**Claims priority, application United Kingdom, Sep. 21, 1992, 9219949**

**Int. Cl.[6] G06F** *13/22*

**U.S. Cl. 395—439** **6 Claims**



1. A method of transferring data between primary storage and secondary storage in a data processing system, said primary storage being divided into pages in both physical and virtual address spaces, comprising:

requesting from a program running on a processor in the data processing system a data transfer comprising a plurality of sectors in the virtual address space;

determining for the data transfer which requested sectors lie completely within a physical page and which requested sectors cross a boundary between first and second discontiguous physical pages;

for those sectors that lie within a physical page, transferring the sectors directly between said secondary storage and said primary storage by DMA; and

for those sectors that cross the boundary between said first and second discontiguous physical pages, transferring each sector between said primary storage and said secondary storage via an intermediate buffer.

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**5,497,477**

## SYSTEM AND METHOD FOR REPLACING A DATA ENTRY IN A CACHE MEMORY

**Jeffrey E. Trull, 3501 S. Stover St., #272, Ft. Collins, Colo. 80525**

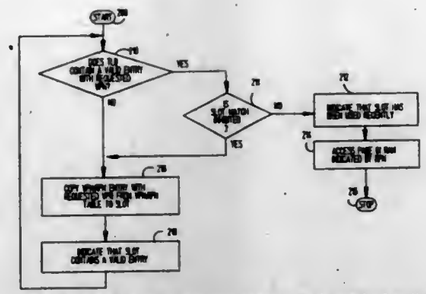
**Continuation of Ser. No. 726,619, Jul. 8, 1991, abandoned. This application Mar. 7, 1994, Ser. No. 206,245**

**Int. Cl.[6] G06F** *12/12*

**U.S. Cl. 395—460** **13 Claims**

1. In a system having a cache memory that provides access to frequently used data by storing the data in slots, a method for selecting one of said slots in which to insert a new data entry, comprising the steps of:

(1) designating one of said slots;



(2) determining whether said designated slot is marked as "used recently," wherein a particular slot is marked as "used recently" when an entry in said particular slot is accessed by a requesting device;

(3) selecting said designated slot if it is not marked as "used recently," and inserting said new data entry into said designated slot if it is selected;

(4) repeating steps (1)–(3) until either all of said slots have been designated by step (1) or until a slot has been selected by step (3); and

(5) marking all of the slots in the cache memory as "not used recently" if no slot was selected.

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**5,497,478**

## MEMORY ACCESS SYSTEM AND METHOD MODIFYING A MEMORY INTERLEAVING SCHEME SO THAT DATA CAN BE READ IN ANY SEQUENCE WITHOUT INSERTING WAIT CYCLES

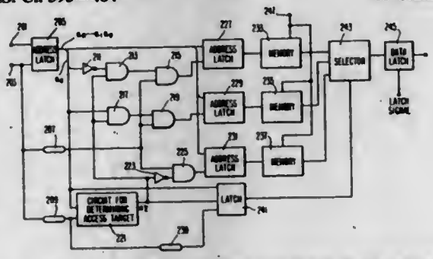
**Kob Murata, Tokyo, Japan, assignor to Hewlett-Packard Company, Palo Alto, Calif.**

**Continuation of Ser. No. 850,590, Mar. 13, 1992, abandoned. This application Jan. 31, 1995, Ser. No. 381,465**

**Claims priority, application Japan, Mar. 20, 1991, 3-081827**

**Int. Cl.[6] G06F** *12/06*

**U.S. Cl. 395—484** **11 Claims**



1. A memory system for outputting a sequence of digital words in response to a sequence of addresses comprising:

a plurality of mutually independently operating memory banks for storing digital words, each said digital word being stored in association with an address of at least one of said plurality of memory banks;

an auxiliary memory bank for storing a copy of at least some of said digital words stored within said plurality of memory banks, each of said at least some of said digital words being stored in association with an address of said auxiliary memory bank;

means for selecting one memory bank from said plurality of memory banks and said auxiliary memory bank by selecting said auxiliary memory bank instead of one of said plurality of memory banks when two consecutive addresses of said sequence of addresses are associated with a single one of said plurality of memory banks; and



access means for accessing a digital word stored in said one memory bank in accordance with a current address of said sequence of addresses.

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**5,497,479**

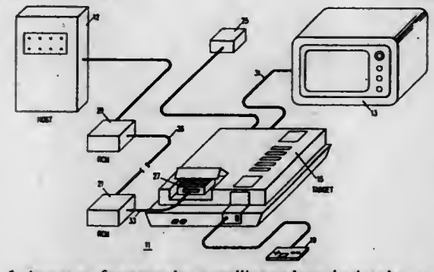
## METHOD AND APPARATUS FOR REMOTELY CONTROLLING AND MONITORING THE USE OF COMPUTER SOFTWARE

**Gary D. Hornbuckle, Pebble Beach, Calif., assignor to SofTel, Inc., So. San Francisco, Calif.**

**Continuation of Ser. No. 509,979, Apr. 20, 1990, abandoned, which is a continuation-in-part of Ser. No. 345,083, Apr. 28, 1989, abandoned. This application Feb. 28, 1995, Ser. No. 395,617**

**Int. Cl.[6] G06F** *13/00*

**U.S. Cl. 395—491** **20 Claims**



1. Apparatus for remotely controlling and monitoring the use of a computer game program comprising:

first and second computers, said first computer having means for storage of a plurality of selectable computer game programs, and having communicating means for communicating with said second computer for downloading said computer game programs to said second computer and for monitoring the use of said computer game programs by said second computer, said first computer remotely controlling said second computer to transmit at predetermined times data indicating elapsed time of use of said downloaded computer game programs;

said communicating means including a first transmitting and receiving means at said first computer, and a second transmitting and receiving means at said second computer;

said first transmitting and receiving means and said second transmitting and receiving means including a microprocessor for control thereof, a program memory for storage of a program executed by said microprocessor, a read/write memory, a real time clock for enabling measurement of elapsed time of use of said downloaded computer game programs, a priority interrupt control circuit coupled to said microprocessor, means for indicating status conditions of said communicating means, and a modem for sending and receiving data;

said first transmitting and receiving means coupled to said first computer for transmitting a program and associated program information from said first computer and for receiving said data indicating elapsed time of use to be supplied to said first computer;

said second transmitting and receiving means coupled to said first transmitting and receiving means and coupled to said second computer by an interface device for receiving the program and associated program information transmitted from said first transmitting and receiving means and for transmitting said data indicating elapsed time of use to said first transmitting and receiving means;

said interface device coupled between said second computer and said second transmitting and receiving means for adapting said second transmitting and receiving means to said second computer, said second computer being provided with a slot for receiving computer game cartridges, said interface device formed as a plug-in adapter that mates with said slot provided in said second computer;

encryption means coupled to said first computer and to said first transmitting and receiving means for encrypting at least one preselected portion of the program and associated program information to be transmitted from said first transmitting and receiving means to form an encrypted information module, said encryption means including a first encryption key for encrypting said encrypted information module, said preselected portion including at least one portion of a computer program essential to the correct execution thereof;

decryption means coupled to said second transmitting and receiving means for decrypting said encrypted information module to form a decrypted information module, said decryption means including a copy of said first encryption key for decrypting said encrypted information module; and

transfer means for transferring said decrypted information module to said second computer for execution by said second computer and for deleting said decrypted information module from said second computer when execution by said second computer of the received program and program information is entirely completed.

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**5,497,480**

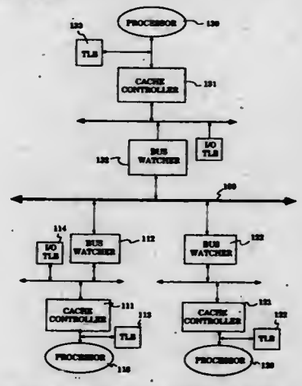
## BROADCAST DEMAP FOR DEALLOCATING MEMORY PAGES IN A MULTIPROCESSOR SYSTEM

**Norman M. Hayes, Sunnyvale; Pradeep Sindhu, Mountain View; Jean-Marc Frailong, Palo Alto, and Sunil Nanda, Los Altos, all of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif., and Xerox Corporation, Stamford, Conn.**

**Continuation of Ser. No. 870,357, Apr. 17, 1992, abandoned, which is a continuation-in-part of Ser. No. 636,446, Dec. 31, 1990, Pat. No. 5,195,089. This application Jul. 29, 1994, Ser. No. 282,170**

**Int. Cl.[6] G06F** *12/12;* **H04J** *3/24*

**U.S. Cl. 395—493** **11 Claims**



7. An apparatus for removing an invalid page table entry from a plurality of translation lookaside buffers (TLBs) in a multiprocessor computer system having at least two processors coupled to a packet-switched bus, said invalid page table entry being specified by a virtual address and a process identification, said apparatus comprising:

a first controller, coupled to said packet switched bus and a first one of said at least two processors, said first controller for broadcasting a demap request packet on said packet-switched bus in response to said first one of said at least two processors requesting that said invalid page table entry be removed from a first TLB controlled by said first controller, wherein said demap request packet comprises data specifying said virtual address and process identification of said invalid page table entry; and

a second controller coupled to said packet-switched bus and a second one of said at least two processors, said second con-

troller for receiving said demap request packet on said packet-switched bus, for sending a first demap reply packet on said packet-switched bus to said first controller to indicate that said second controller has received said demap request packet, for determining whether a second TLB controlled by said second controller contains said invalid page table entry by comparing said virtual address and said process identification to entries contained in said second TLB, for removing said invalid page table entry from said second TLB if said invalid page table entry is contained in said second TLB, and for sending a second demap reply packet on said packet-switched bus to said first controller after removal of said invalid page table entry from said second TLB to indicate that said second controller has processed said demap request packet, said second controller allowing said second one of said at least two processors to complete pending operations before said second controller removes said invalid page table entry from said second TLB.

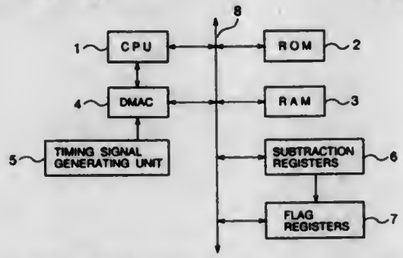
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**5,497,481**

## MICROCOMPUTER COMPUTER SYSTEM HAVING PLURAL PROGRAMMABLE TIMERS AND PREVENTING MEMORY ACCESS OPERATIONS FROM INTERFERING WITH TIMER START REQUESTS

**Hiroshi Maeda, Atsugi, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan**

**Filed Jul. 19, 1994, Ser. No. 275,741**
**Claims priority, application Japan, Jul. 21, 1992, 5-179665**
**Int. Cl.[6] G06F *1/04***
**U.S. Cl. 395—550** **6 Claims**




1. A microcomputer system having a central processing unit (CPU) operating under control of a program stored in a read only memory (ROM), the system comprising:

a) a random access memory (RAM) having a plurality of RAM memory locations for storing respective time setting values;

b) timing signal generating means for providing a timing signal at predetermined intervals;

c) the CPU, including:

1) means for setting initial values into first RAM memory locations; and

2) means for detecting whether time setting values read from the RAM memory locations are equal to zero;

d) subtraction register means, including a plurality of registers corresponding to the plurality of RAM memory locations, each register for decrementing a respective time setting value by one if the CPU detects the time setting value from the RAM memory location to be unequal to zero, to provide a decremented time setting value; and

e) direct memory access (DMA) control means including:

1) means for reading out time setting values from the RAM memory locations in synchrony with the timing signal; and

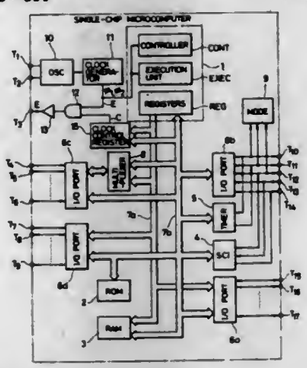
2) means for writing any decremented time setting value from the substraction register means into a corresponding first RAM memory location.

**5,497,482**

## DATA PROCESSOR IN WHICH EXTERNAL SYNC SIGNAL MAY BE SELECTIVELY INHIBITED

**Haruo Keida, Tokorozawa; Takashi Tsukamoto, and Nobutaka Nagasaki, both of Kodaira, all of, Japan, assignors to Hitachi, Ltd., and Hitachi Micro Computer Engineering, Ltd., both of Tokyo, Japan**

**Continuation of Ser. No. 955,447, Oct. 2, 1992, which is a continuation of Ser. No. 577,123, Sep. 4, 1990, Pat. No. 5,179,694, which is a continuation of Ser. No. 230,047, Aug. 9, 1988, Pat. No. 4,967,352, which is a continuation of Ser. No. 894,841, Aug. 8, 1986, abandoned. This application Sep. 7, 1994, Ser. No. 301,740**
**Int. Cl.[6] G06F *13/00;1/04***
**U.S. Cl. 395—550** **20 Claims**




1. A single-chip microcomputer comprising:

a central processing unit;

a plurality of first external terminals for input and output of signals;

a sync signal generation circuit for generating a clock signal as a sync signal;

control storage means coupled to the central processing unit for producing a control signal having a first state when the central processing unit sets into the control storage means data for enabling the supply of the sync signal at one of the plurality of external terminals and having a second state when the central processing unit sets into the control storage means data for inhibiting the supply of the sync signal at the one of the plurality of external terminals; and

a gate circuit coupled between the sync signal generation circuit and the one of the plurality of external terminals and coupled to receive said control signal for coupling the sync signal generation circuit to the one of the plurality of external terminals when the control signal is in the first state, and for uncoupling the sync signal generation circuit from the one of the plurality of external terminals when the control signal is in the second state.

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**5,497,483**

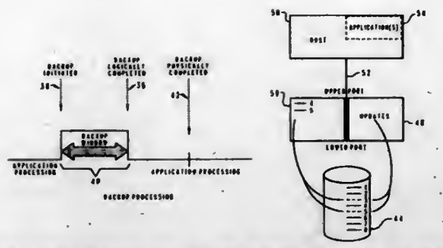
## METHOD AND SYSTEM FOR TRACK TRANSFER CONTROL DURING CONCURRENT COPY OPERATIONS IN A DATA PROCESSING STORAGE SUBSYSTEM

**Brent C. Beardsley; William F. Micka, both of Tucson, Ariz., and Yoram Novick, Haifa, Israel, assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Sep. 23, 1992, Ser. No. 949,664**
**Int. Cl.[6] G06F *11/00***
**U.S. Cl. 395—575** **12 Claims**

1. A method in a data processing system for transferring a backup copy of multiple tracks within designated datasets stored in a plurality of storage subsystems to a host system via a data channel during concurrent execution of an application within said






host system wherein each of said storage subsystems includes storage subsystem memory associated therewith, said method comprising the steps of:

suspending execution of said application in response to a request for generating a backup copy;

forming a dataset logical-to-physical storage subsystem address concordance for said designated datasets;

resuming execution of said application upon completion of said forming of said address concordance;

processing any application initiated updates to tracks affected by said updates within said designated datasets which updates occur prior to generation of a backup copy of said tracks affected by said updates within said designated datasets by buffering said updates, copying said tracks affected by said updates within said designated datasets to said storage subsystem memory, updating said address concordance in response to said copying, and writing said updates to said tracks affected by said updates within said designated datasets within said plurality of storage subsystems;

utilizing said address concordance in response to a request from said host system to transfer a portion of said designated datasets which includes a sequence of selected tracks to determine if said sequence of selected tracks includes tracks affected by said updates which have been previously copied to said storage subsystem memory; and

automatically substituting an artificial track into said sequence of selected tracks in place of each track affected by said updates which has been previously copied to storage subsystem memory during transfer of said portion of said designated datasets to said host system.

7. A data processing system for transferring a backup copy of multiple tracks within designated datasets stored in a plurality of storage subsystems to a host system via a data channel during concurrent execution of an application within said host system wherein each of said storage subsystems includes storage subsystem memory associated therewith, said data processing system comprising:

means for suspending execution of said application in response to a request for generating a backup copy;

means for forming a dataset logical-to-physical storage subsystem address concordance for said designated datasets;

means for resuming execution of said application upon completion of said forming of said address concordance;

means for processing any application initiated updates to tracks affected by said updates within said designated datasets which updates occur prior to generation of a backup copy of said tracks affected by said updates of said designated datasets by buffering said updates, copying said tracks affected by said updates of said designated datasets to said storage subsystem memory, updating said address concordance in response to said copying, and writing said updates to said affected tracks of said designated datasets within said plurality of storage subsystems;

means for utilizing said address concordance in response to a request from said host system to transfer a portion of said designated datasets which includes a sequence of selected tracks to determine if said sequence of selected tracks includes tracks affected by said updates which have been previously copied to said storage subsystem memory; and

means for automatically substituting an artificial track into said sequence of selected tracks in place of each track affected by said updates which has been previously copied to storage subsystem memory during transfer of said portion of said designated datasets to said host system.

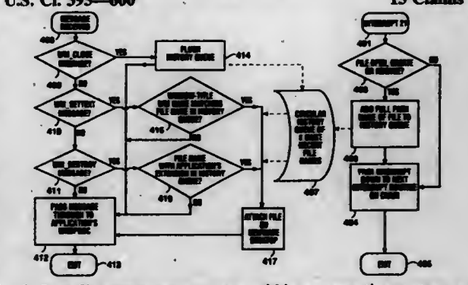
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**5,497,484**

## FILE MENU SUPPORT FOR ENCAPSULATED APPLICATIONS

**Cathy Potter, Los Altos; Brian Harrison, Scotts Valley, and Charles Whelan, Placerville, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed Feb. 24, 1993, Ser. No. 21,933**
**Int. Cl.[6] G06F *17/30;3/03***
**U.S. Cl. 395—600** **13 Claims**



1. In a file management system within a computing system, a method comprising the steps of:

(a) when an operating system for the computing system opens, creates or renames a file, adding a new full path name of the file to a history queue; and,

(b) when the operating system sends a message to a process of an application program indicating a new window title, performing the following substeps:

(b.1) searching the history queue for a matching full path name which includes the new window title, and

(b.2) when the matching full path name which includes the new window title is found within the history queue, displaying on a computer screen an icon which is attached to the matching full name path.

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**5,497,485**

## METHOD AND APPARATUS FOR IMPLEMENTING Q-TREES

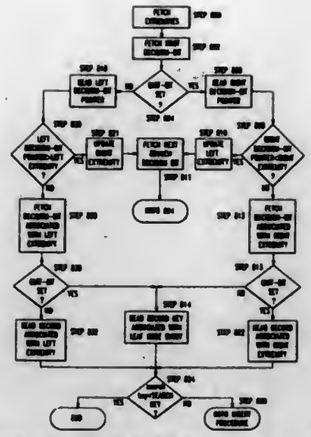
**David E. Ferguson, and Eduardo C. Ross, both of Fawnskin, Calif., assignors to Amalgamated Software of North America, Inc., Big Bear Lake, Calif.**

**Filed May 21, 1993, Ser. No. 65,657**
**Int. Cl.[6] G06F *17/30***
**U.S. Cl. 395—600** **8 Claims**

3. In a computer system including a data processor and a data storage system containing data records, each record having at least a unique search key and a unique location, wherein the records are indexed by means of a bit tree structure having at least one leaf node, each leaf node having a plurality of entries assigned to the leaf node, at least some of the entries having at least a right decision-bit pointer, a left decision-bit pointer, an associated record location reference, and a distinction-bit which in at least some of the entries is decision-bit that locates a quit-bit in a search key, the leaf node further including a prologue having a pointer to a first decision-bit and the location of the first and last distinction-bits of the leaf node, a method of operating the data processor for searching selected leaf nodes for indexing information, comprising the steps of:

(a) defining a search range having a left extremity and a right extremity within a selected leaf node;

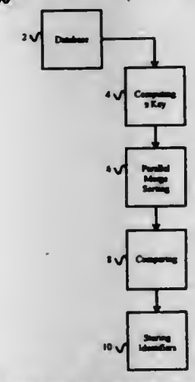
(b) reading a pointer to the root decision-bit of the selected leaf node;



(c) reading the decision-bit at the location indicated by the pointer;
(d) reading a quit-bit of the search key indicated by the last read decision bit and testing whether the quit-bit is set;
(e) if the quit-bit is set, then reading a right decision-bit pointer from the entry containing the last read decision-bit to determine the location of a next decision-bit, otherwise skipping to step (j);
(f) comparing the last read right decision-bit pointer with the right extremity of the search range;
(g) if the last read right decision-bit pointer is less than the right extremity of the current search range, then;
(1) updating the left extremity with the address of the entry contain ing the last read decision-bit;
(2) reading the decision-bit located by the last read right decision bit pointer; and
(3) returning to step (d);
(h) reading the record key associated with the entry located by the right extremity;
(i) if the record key associated with the entry located by the right extremity is equal to the search key, then indicating that the record key is a match for the search key and ending the search, otherwise, skipping to (m);
(j) reading the left decision-bit pointer from the entry containing the last read decision-bit to determine the location of the next decision-bit;
(k) comparing the last read left decision-bit pointer with the left extremity of the search range;
(l) if the left decision-bit is greater than the left extremity of the current search range, then:
(1) updating the right extremity with the location of the last read decision-bit;
(2) reading the decision-bit located by the last read left decision-bit pointer; and
(3) returning to step (d)
(m) reading the record key associated with the entry located by the left extremity;
(n) if the record key associated with the entry located by the left extremity is equal to the search key, then indicating that the record key is a match for the search key and ending the search;
(o) reading the record key associated with the last read decision-bit and comparing the record key with the search key;
(p) if the search key is greater than the record key, then inserting the record associated with the search key to the right of that record key and ending the search;
(q) if the search key is less than the record key, then inserting the record associated with the search key to the left of that record key and ending the search; and
(r) if the search key is equal to the record key, then indicating that the record key is a match for the search key and ending the search.

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**5,497,486**
**METHOD OF MERGING LARGE DATABASES IN PARALLEL**
**Salvatore J. Stolfo, 80 Kenilworth Rd., Ridgewood, N.J. 07450, and Mauricio A. Hernández, New York, N.Y., assignors to Salvatore J. Stolfo, Ridgewood, N.J.**
**Filed Mar. 15, 1994, Ser. No. 213,795**
**Int. Cl.[6] G06F** *7/06;7/14;7/20*
**U.S. Cl. 395—600** **3 Claims**




1. A method of merging two databases of records, each record having a plurality of fields, comprising the steps of:
(a) computing a first key for each record in each database by extracting at least a portion of a first field:
(b) parallel merge sorting the records in each database using the first key;
(c) comparing to each other, on a first group of at least one processor, a predetermined number of sequential records sorted according to the first key to determine if one or more of the records match;
(d) storing identifiers for any matching records;
(e) computing a second key for each record in each database by extracting at least a portion of a second field;
(f) parallel merge sorting the records in each database using the second key;
(g) comparing to each other, on a second group of at least one processor, a predetermined number of sequential records sorted according to the second key to determine if one or more of the records match;
(h) storing identifiers for any matching records;
(i) creating a union of said stored identifiers;
(j) subjecting said union to transitive closure;
(k) wherein, in each group of processors for each database:
(i) N is a number of records;
(ii) P is a number of processors, each processor p, $1 \leq p \leq P$, being able to store M+w records;
(a) w is a size of a merge phase window; and
(b) M is a blocking factor;
(ii) P is less than N;
(iii) MP is less than N; and
(iv) $r_i$ represents record i in a cluster. $0 \leq i \leq MP-1$; and
(l) each said comparing step comprises the steps of:
(i) dividing the sorted database into N/MP clusters;
(ii) processing each of the N/MP clusters in turn by providing each processor p with records $r_{(p-1)M}, \ldots, r_{pM-1}, \ldots, r_{pM+w-2}$, for $1 \leq p \leq P$;
(iii) searching matching records independently at each processor using a window of the size w; and
(iv) repeating the processing step for a next cluster of records.



**5,497,487**
**MERGE, COMMIT RECOVERY PROTOCOL FOR REAL-TIME DATABASE MANAGEMENT SYSTEMS**
**Paul J. Fortier, Portsmouth, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**
**Filed Apr. 28, 1994, Ser. No. 236,900**
**Int. Cl.[6] G06F** *17/30*
**U.S. Cl. 395—600** **5 Claims**

GIVEN: ADS A CONTAINS {a, b, c} AND ADS B CONTAINS {d, e,}

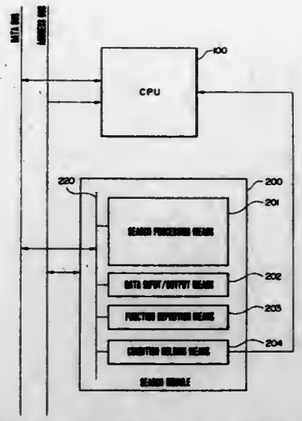
```
Tbegin
S1:   sb(A)              /* CREATE LINK TO πA */
S2:   v1:= r(a)          /* S2 ∈ πA */
S3:   v2:= r(b)          /* S3 ∈ πA */
S4:   v3:= f1(v1,v2)     /* S4 DIRECTLY DEPENDS ON S2 AND S3 */
S5:   w(c,v3)            /* S5 ∈ πA AND S5 DEPENDS ON S4 */
S6:   sb(B)              /* CREATE LINK TO πB */
S7:   v4:= r(d)          /* S7 ∈ πB */
S8:   v4:= f1(v4,v3)     /* S8 DEPENDS ON S7, S2 AND S3 */
S9:   ec(A)              /* PREPARE TO COMMIT πA */
S10:  w(e,v4)            /* S10 ∈ πB AND S10 DEPENDS ON S7, S2 AND S5 */
S11:  ec(B)
Tend
```

1. A computer database method comprising the steps of:
organizing data into atomic data sets;
breaking down transactions containing a plurality of statements operating on said data into projections having statements which operate on only one said atomic data set;
executing statements from one said projection, said statements comprising read commands, write commands, assignment commands, transaction delimiting commands, and projection delimiting commands;
generating a depends on graph during execution of said statements;
storing projection recovery data during execution of said statements;
analyzing said depends on graph upon receipt of a projection commit command to determine if said projection is related to at least one other projection;
committing said projection if said analyzed projection is separate from said other projections;
delaying commit of said analyzed projection until the receipt of a projection commit command of said related projection if said projection is related to another projection;
analyzing said depends on graph if a transaction error is encountered to determine if a currently active projection is related to another projection;
aborting said currently active projection upon a transaction error;
aborting said related projections to said currently active projection if any, after encountering a transaction error; and
recovering from said aborted projection to a consistent database state.

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**5,497,488**
**SYSTEM FOR PARALLEL STRING SEARCH WITH A FUNCTION-DIRECTED PARALLEL COLLATION OF A FIRST PARTITION OF EACH STRING FOLLOWED BY MATCHING OF SECOND PARTITIONS**
**Mitsuru Akizawa, Hachioji; Kouki Noguchi, Kokubunji; Takehisa Hayashi, Sagamihara; Kanji Kato, Tokorozawa, and Hitoshi Matsushima, Tachikawa, all of, Japan, assignors to Hitachi, Ltd., Tokyo, and Hitachi Maxell, Ltd., Osaka, both of, Japan**
**Continuation of Ser. No. 797,346, Nov. 25, 1991, abandoned, which is a continuation-in-part of Ser. No. 537,491, Jun. 12, 1990, abandoned. This application Mar. 13, 1995, Ser. No. 402,560**
**Claims priority, application Japan, Nov. 30, 1990, 2-328893**
**Int. Cl.[6] G06F** *17/30*
**U.S. Cl. 395—600** **29 Claims**

1. A symbol string search apparatus for making a decision of whether or not a symbol string to be searched for exists in a symbol string to be searched, which is composed of symbols represented by codes, in a leading collation processing of a search to be combined with a posterior collation processing of the search, the symbol string search apparatus being connected to a CPU through an address bus and a data bus and comprising:

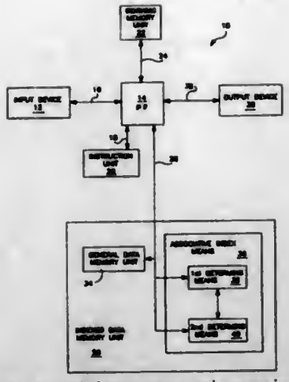



function definition means connected to said data bus, for receiving from said CPU a command defining a function to be performed by the symbol string search apparatus, said function definition means holding said command until it receives a next command from said CPU;
data input/output means for receiving a symbol string to be searched through said data bus and for providing a search result output;
search processing means for performing said leading collation processing based on a function defined by said function definition means by matching the symbol string to be searched for, which is already stored in said search processing means, with the symbol string to be searched which is input to said data input/output means, said leading collation processing being performed plural times for a plurality of symbol strings to be searched while said function definition means is holding said command; and
condition holding means for holding data indicative of an internal condition corresponding to the result of the search, the data held in said condition holding means being accessible by said CPU.

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**5,497,489**
**DATA STORAGE AND RETRIEVAL SYSTEMS HAVING LABELLING FOR DATA**
**David M. Menne, 10 Mayfair Street, Mount Claremont, Western Australia, Australia**
**Continuation of Ser. No. 109,451, Aug. 19, 1993, abandoned, which is a continuation of Ser. No. 427,504, Oct. 27, 1989, abandoned, which is a continuation-in-part of Ser. No. 46,089, May 5, 1987, abandoned. This application Jun. 7, 1995, Ser. No. 479,790**
**Claims priority, application Australia, Jan. 27, 1988, PJ1185**
**Int. Cl.[6] G06F** *17/30*
**U.S. Cl. 395—600** **5 Claims**

1. A data storage and retrieval system for storing and retrieving a plurality of items of data, comprising:
an input device for inputting items of variable data input;
an output device for outputting items of data of said plurality of items;
an indexed data memory unit including a general data memory unit and an associative index means operatively associated with said general data memory unit;



wherein said general data memory unit comprises means for storing said plurality of items of data including a plurality of expressions for interrelating said items of data, said plurality of expressions including at least one mathematical expression and at least one logical expression, said plurality of items of data being arranged in classes of information corresponding to a plurality of levels of specificity and including a major class of information $C_1$ and a plurality of classes of information $C_2, \ldots, C_N$ which are progressively more specific than said major class of information $C_1$ said plurality of classes of information being arranged in a hierarchical structure wherein said major class of information and said plurality of classes of information are arranged in order of increasing specificity, each class of information having a plurality of members $M_1, M_2, \ldots, M_i$, and each member having at least one of said plurality of items of data;

and wherein said associative index means comprises:

(i) a first determining means for determining first indexes from said mathematical expression using said items of variable data input;

(ii) a second determining means for determining second indexes from said logical expression using said items of variable data input and using said first indexes, said second determining means being in operative association with said first determining means, said second indexes determining a location of related items of data which are related to a chosen item of data for which said first and second indexes are determined; and

(iii) means for selecting and retrieving said related items of data from a selected member of a class of information from said general data memory unit; and

a data processing unit connected between said input device, said output device and said indexed data memory unit for controlling communication therebetween.

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**5,497,490**

## AUTOMATIC RECONFIGURATION OF ALTERABLE SYSTEMS

**Naoki Harada, Hiratsuka; Ken Inoue, Yamato, and Masahiko Shinomura, Machida, all of, Japan, assignors to International Business Machines Corporation, Armonk, N.Y.**

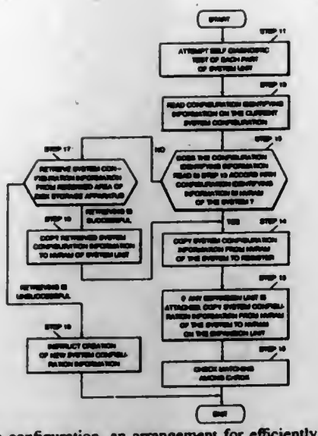
**Filed Jul. 8, 1992, Ser. No. 911,564**

**Claims priority, application Japan, Jan. 11, 1991, 3-290405**

**Int. Cl.[6] G06F *11/08;9/00***

**U.S. Cl. 395—700** **6 Claims**

1. In a data processing system including a system unit and being capable of operating with a variety of I/O adapter units; each I/O adapter unit having an ID associated therewith; said system unit being interconnectable to one or more of said adapter units in a variety of different connection configurations; each connection configuration comprising a distinct system configuration, an arrangement for efficiently initializing the system comprising:



non-volatile storage means retentively storing a system configuration information; said system configuration information comprising IDs of the interconnected I/O adapters forming one of said system configurations;

a backup storage means for storing a plurality of sets of backedup system configuration information corresponding to various different ones of said system configurations; each of said backedup configuration information comprising IDs of the I/O adapters for a corresponding system configuration;

means operative during each initialization of said system for detecting the current configuration of connections between said system unit and said adapter units by determining the IDs of the I/O adapters currently connected to the system unit;

first determination means for determining whether the current configuration matches the configuration stored in the non-volatile storage means;

interrogation means responsive to a determination of a mismatch by said first determination means for interrogating the backedup configuration information by comparing the IDs stored in each set of the backed up system configuration to the IDs of current system configuration;

second determination means for determining whether a backedup system configuration matches the current system configuration

retrieving means responsive to the second determination means for retrieving a backedup system configuration matching the current system configuration; and

means for adding the current system configuration to the backup storage means if no match is found between the current system and the backedup system configurations.

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**5,497,491**

## SYSTEM AND METHOD FOR IMPORTING AND EXPORTING DATA BETWEEN AN OBJECT ORIENTED COMPUTING ENVIRONMENT AND AN EXTERNAL COMPUTING ENVIRONMENT

**Herman Mitchell, Lithonia, Ga.; William L. Rich, Charlotte, N.C., and Floyd W. Shackelford, Beaufort, Ga., assignors to International Business Machines Corporation, Armonk, N.Y.**

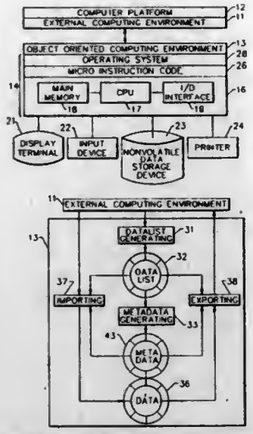
**Filed Jan. 26, 1993, Ser. No. 9,592**

**Int. Cl.[6] G06F *9/44;15/16***

**U.S. Cl. 395—700** **20 Claims**

1. A system for importing and exporting data between an external computing environment operating on one or more computer platforms and an object oriented computing environment operating on one or more computing platforms, said data importing and exporting system comprising:





datalist generating means for generating datalist objects which list an external computing environment data field name, a corresponding object oriented computing environment attribute and a corresponding external data format for each external data field in the external computing environment which is imported and exported between external computing environment and the object oriented computing environment;

metadata generating means for generating a metadata object for each object in said object oriented computing environment which includes one of said corresponding object oriented computing environment attributes, said metadata object including conversion parameters for converting the corresponding object oriented computing environment attribute into said corresponding external data format, said conversion parameters including at least one of default conversion parameters and alternate conversion parameters;

importing means, responsive to a request from said external computing environment to import external data into said object oriented computing environment, for identifying an object oriented computing environment attribute from said datalist objects and for identifying a corresponding metadata object, and for applying the alternate conversion parameters in said corresponding metadata object to said external data if included in said corresponding metadata object, and for applying the default conversion parameters in said corresponding metadata object to said external data in the absence of said alternate conversion parameters in said metadata object, to thereby convert said external data into object oriented data and place said object oriented data into a corresponding data object which is associated with said corresponding metadata object; and

exporting means, responsive to a request from said object oriented computing environment to export object oriented data from an object in said object oriented computing environment to said external computing environment, for identifying a metadata object corresponding to said object and for identifying said external data name corresponding to said metadata object from said datalist, and for applying the alternate conversion parameters in the corresponding metadata object to said object oriented data from said object if included in said corresponding metadata object, and for applying the default conversion parameters in the corresponding metadata object to said object oriented data from said object in the absence of said alternate conversion parameters in said metadata object, to thereby convert object oriented data into external data.

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**5,497,492**

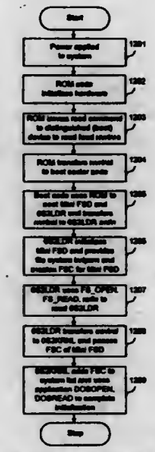
## SYSTEM AND METHOD FOR LOADING AN OPERATING SYSTEM THROUGH USE OF A FIRE SYSTEM

**Mark J. Zbikowski, Woodinville; Alan R. Whitney; Rajen J. Shah, both of Bellevue; Bryan M. Willman, Kirkland, and J. Gordon Letwin, Redmond, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.**

**Continuation of Ser. No. 578,093, Sep. 4, 1990, abandoned. This application Sep. 8, 1993, Ser. No. 118,474**

**Int. Cl.[6] G06F *15/177***

**U.S. Cl. 395—700** **20 Claims**



1. A method for loading an operating system in a computer system, the operating system for controlling computer system processes, the computer system including memory in which code can be stored, the computer system in communication with secondary storage in which code can be stored, the method comprising the steps of:

executing bootstrap program commands from the memory which uses a first file system which is also in the memory, the first file system having an association of operating system files to locations in secondary storage that contain operating system files in order to:

obtain from the association the location in secondary storage of at least one operating system file; and

transfer the operating system file into memory from the obtained location in secondary storage.

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**5,497,493**

## HIGH BYTE RIGHT-SHIFT APPARATUS WITH A REGISTER ALIAS TABLE

**Robert P. Colwell, Portland, and Andrew F. Glew, Hillsboro, both of Oreg., assignors to Intel Corporation, Santa Clara, Calif.**

**Continuation-in-part of Ser. No. 129,867, Sep. 30, 1993. This application Dec. 29, 1993, Ser. No. 174,850**

**Int. Cl.[6] G06F *9/00***

**U.S. Cl. 395—800** **52 Claims**

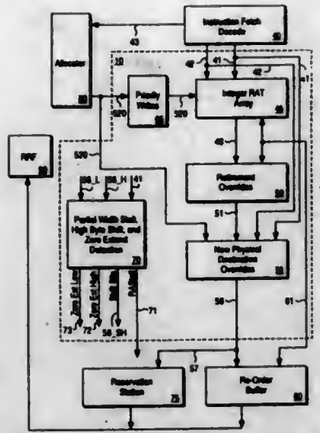
37. A computer system comprising:

bus means for providing a communication interface;

memory means coupled to said bus means for storing instructions and computer data;

interface means coupled to said bus means for providing data input and data output to interlace with a user; and

microprocessor means coupled to said bus means for executing said instructions and processing said computer data, said microprocessor means having a means for renaming a set d



logical registers associated with a current set of operations to a current set of physical registers, said renaming means including,

reservation station means for renaming said logical registers to said physical registers, wherein said reservation station means renames said logical registers to either a non-speculative state or a speculative state type of physical register, wherein said logical registers and said physical registers include larger width registers having partial width registers, wherein said partial width registers may include non right-adjusted partial width registers, said reservation station means renaming a first logical register to a first physical register; and

right-shifting means, coupled to said reservation station means and to said physical registers, for right-shifting a first datum of said first physical register into the least significant position of a second datum when said first logical register is a non right-adjusted partial width register and said first physical register is of said first non-speculative state type.

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**5,497,494**

**METHOD FOR SAVING AND RESTORING THE STATE OF A CPU EXECUTING CODE IN PROTECTED MODE**

**James L. Combs; Dwayne T. Crump, and Steven T. Pancoast, all of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jul. 23, 1993, Ser. No. 97,246**

**Int. Cl.[6] G06F *1/00***

**U.S. Cl. 395—750** **3 Claims**

1. In a computer system having:

system memory for storing memory data;

a non-volatile storage device;

a CPU,

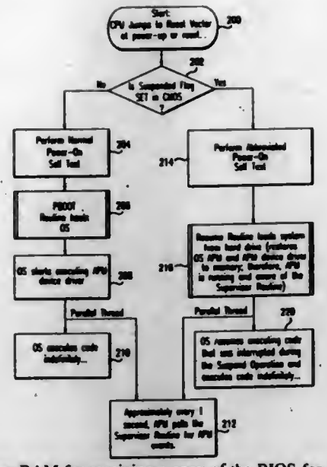
the CPU executing code in a protected mode which causes the CPU to generate a protection fault if an instruction of the code attempts to access an improper area within the system memory or if an instruction attempts to execute a privileged instruction,

the CPU executing code in a non-fault mode which allows writes to selected areas of the system memory and allows execution of privileged instructions without generating a protection fault,

the CPU creating a stack within the system memory, and

the CPU having volatile registers for storing register values in such a manner as to normally be inaccessible externally of the CPU;

a BIOS in ROM;



a shadow RAM for receiving a copy of the BIOS for execution from the shadow RAM;

an operating system for interrupting the execution of code on the CPU and calling a suspend routine in response to a suspend event;

a control routine that generates a suspend event responsive to one or more preselected conditions; and

a suspend routine selectably callable by the operating system and characterized by its ability to: access the register values stored in the CPU volatile registers; transfer the register values from the CPU to either the stack or the shadow RAM without generating a protection fault; place the CPU in a non-fault mode; and transfer the register values from either the stack or the shadow RAM to the non-volatile storage device;

a method of preserving the state of the CPU executing code in protected mode comprising the steps of:

interrupting the execution of the code on the CPU with the operating system in response to a suspend event;

activating the suspend routine;

accessing the register values;

temporarily storing the register values in the shadow RAM or onto the stack;

placing the CPU in a non-fault mode. the non-fault mode characterized in that copying the register values from either the shadow RAM or the stack to the non-volatile storage device will not generate a protection fault within the CPU;

transferring the register values from either the stack or the shadow RAM to the non-volatile storage device; and

synchronizing the continuation of the routine between mouse data packets.

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**5,497,495**

**COMPUTER ELECTRONIC SYSTEM HAVING A COVER FOR EVERY MODULE**

**Tetsuo Ishikawa; Shigeru Oomori; Daijiro Hashimoto; Toshihiro Mochiduki, and Satoshi Takano, all of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan**

**Continuation of Ser. No. 879,024, May 6, 1992, abandoned.**

**This application Jan. 12, 1995, Ser. No. 371,889**

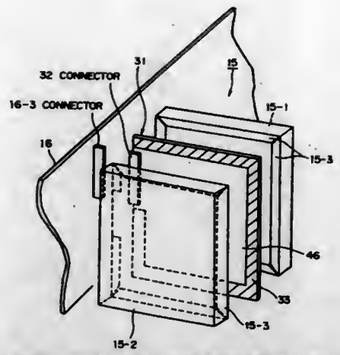
**Claims priority, application Japan, May 7, 1991, 3-101626**

**Int. Cl.[6] G06F *1/26*; H05K *5/04;7/18;7/20***

**U.S. Cl. 395—750** **5 Claims**

5. An enclosed printed circuit board onto which an individual function module of a computer system is mounted, comprising:






a metal-core printed circuit board having at least one internal metal-core for radiating heat, a part of said metal-core being exposed at the circumference of said metal-core printed circuit board,

a case enclosing said metal-core printed circuit board, said case being divided at the center into two parts each being provided with a frame, said frame contacting said part of said exposed metal-core which is exposed by enclosing said metal-core printed circuit board by said two parts at said circumference, said case conducting the heat generated by said function module by radiation, and

a voltage stabilizing means independently added to said function module for stabilizing voltage of rectified power supplied to said function module from a central power source, said central power source including rectification smoothing means for providing said rectified power as said electric power to said function module.

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**5,497,496**

**SUPERSCALAR PROCESSOR CONTROLLING FETCHING OF INSTRUCTIONS BASED UPON NUMBER OF EMPTY INSTRUCTIONS REGISTERS DETECTED FOR EACH CYCLE**

**Hideki Ando, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

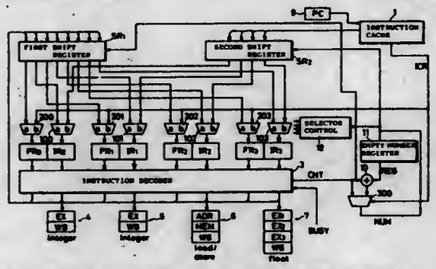
**Continuation of Ser. No. 874,945, Apr. 29, 1992, abandoned.**

**This application Jul. 28, 1994, Ser. No. 281,128**

**Claims priority, application Japan, Jun. 24, 1991, 3-151867**

**Int. Cl.[6] G06F *9/30***

**U.S. Cl. 395—800** **12 Claims**



1. A superscalar processor operating cyclically, comprising:

a plurality of processing units provided in a parallel manner and capable of executing simultaneously provided instructions in a parallel manner;

instruction storage means storing a plurality of instructions to be processed;

fetch means, including a plurality of instruction registers, for reading a predetermined plurality of instructions from said instruction storage means and providing a multiple of the read predetermined plurality of instructions to the plurality of instruction registers;

a decode means for decoding an instruction stored in each instruction register for each cycle and supplying the same to said plurality of processing units, said decoder means also selecting instructions which can be executed in a parallel manner and supplying the same to said plurality of processing units at the same time; and

empty number detection means for detecting the number of empty instruction registers for each cycle,

said fetch means further including control means for controlling providing the multiple of the read predetermined plurality of instructions to said plurality of instruction registers for each cycle in response to the detected number of empty instruction registers.

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**5,497,497**

**METHOD AND APPARATUS FOR RESETTING MULTIPLE PROCESSORS USING A COMMON ROM**

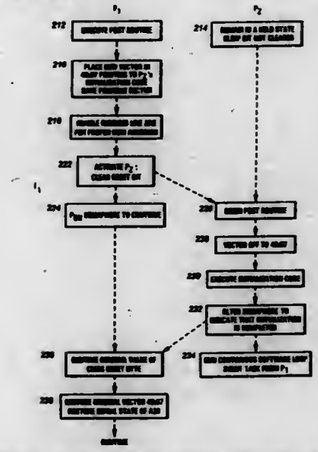
**David A. Miller, Houston; Kenneth A. Jansen; Montgomery C. McGraw, both of Spring, and Darren J. Cepulis, Houston, all of Tex., assignors to Compaq Computer Corp., Houston, Tex.**

**Continuation of Ser. No. 431,743, Nov. 3, 1989, abandoned.**

**This application Apr. 22, 1993, Ser. No. 51,601**

**Int. Cl.[6] G06F *9/40;9/42;11/34***

**U.S. Cl. 395—800** **21 Claims**



1. A method for powering up multiple processors in a computer system that includes a primary processor which commences operation on power-up of said computer system, a secondary processor which enters a hold state on power-up of said computer system, the primary processor and the secondary processor being powered up together, common elements used by both said primary processor and secondary processor, means coupled to said primary processor and said secondary processor for allowing said bold state of said secondary processor to be terminated, means for storing a redirection vector, and means for storing a start-up program which includes as one step determining whether said redirection vector is to be utilized, said start-up program including initialization code used to initialize said secondary processor, the method comprising:

said primary processor commencing said start-up program and not utilizing said stored redirection vector, said start-up program including steps for initializing said primary processor and steps for initializing said common elements of the computer system;

said primary processor completing appropriate initialization of said computer system;

said primary processor placing a redirection vector pointing to said secondary processor initialization code in said redirection vector storing means;

said primary processor activating said secondary processor;

said secondary processor commencing said start-up program and utilizing said stored redirection vector to begin execution of said secondary processor initiation code after said primary processor places said redirection vector, wherein said secondary processor initialization code is only a subset of operations comprised in said start-up program and does not include said steps for initializing said common elements of said computer system; and

said secondary processor executing said secondary processor initialization code.

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**5,497,498**

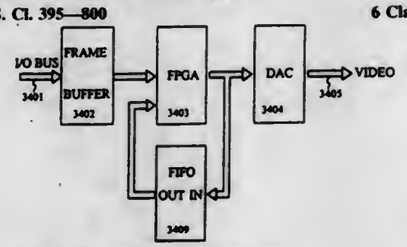
## VIDEO PROCESSING MODULE USING A SECOND PROGRAMMABLE LOGIC DEVICE WHICH RECONFIGURES A FIRST PROGRAMMABLE LOGIC DEVICE FOR DATA TRANSFORMATION

**Brad Taylor, Oakland, Calif., assignor to Giga Operations Corporation, Berkeley, Calif.**

**Continuation-in-part of Ser. No. 69,058, May 28, 1993, abandoned, Continuation-in-part of Ser. No. 972,933, Nov. 5, 1992, abandoned. This application Sep. 28, 1993, Ser. No. 128,494**

**Int. Cl.[6] G06F** *13/00*

**U.S. Cl. 395—800** **6 Claims**




1. A video processing system comprising:

a video input bus, for carrying a stream of video data to the system,

a video output bus, for carrying a stream of modified video data from the system,

a video processing device comprising a first programmable logic device having

an input connecting said first programmable logic device to said video input bus for receiving said stream of video data,

a logic configuration within said first programmable logic device to perform one or more operations on said video data to provide a stream of modified video data, and

an output connecting said first programmable logic device to said video output bus for transmitting said stream of modified video data,

said logic configuration changeable by a second programmable logic device but only at certain times, said first programmable logic device generally configured to operate without any input from the second configurable logic device, and

an external control bus,

said second programmable logic device connected to said external control bus and connected to said first programmable logic device through an interruptable connection for providing, from time to time, configuration information to said first programmable logic device.

**5,497,499**

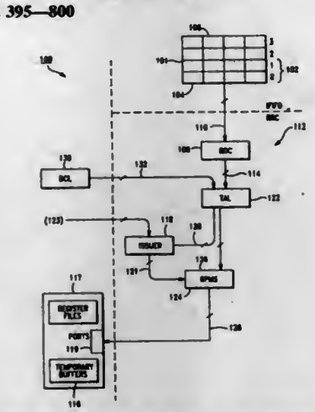
## SUPERSCALAR RISC INSTRUCTION SCHEDULING

**Sanjiv Garg, Fremont; Kevin R. Iadonato, San Jose; Le T. Nguyen, Monte Sereno, and Johannes Wang, Redwood City, all of Calif., assignors to Seiko Epson Corporation, Tokyo, Japan**

**Continuation of Ser. No. 860,719, Mar. 19, 1992, abandoned. This application Mar. 29, 1994, Ser. No. 219,425**

**Int. Cl.[6] G06F** *9/38*

**U.S. Cl. 395—800** **16 Claims**



1. A register renaming method for performing out-of-order execution of a set of computer instructions adapted for use in a computer, the computer comprising an instruction execution unit with a temporary buffer accessed by read address ports and for storing instruction operands, the method comprising the steps of:

(1) determining data dependencies between instructions in an instruction window to produce data dependency results;

(2) storing, in a temporary buffer, out-of-order execution results in storage locations determined by the location of an instruction in said instruction window;

(3) generating one or more tags to specify an address in the temporary buffer at which said out of order results are temporarily stored; and

(4) outputting a tag in place of a register address for an operand of a first instruction if said data dependency results indicate that said first instruction is dependent on a previous instruction in said instruction window, wherein said tag represents an address of said operand in said temporary buffer.

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**5,497,500**

## METHOD AND APPARATUS FOR MORE EFFICIENT FUNCTION SYNCHRONIZATION IN A DATA FLOW PROGRAM

**Steven W. Rogers; Jeffrey L. Kodosky, and Dean A. Luick, all of Travis County, Tex., assignors to National Instruments Corporation, Austin, Tex.**

**Continuation of Ser. No. 125,642, Sep. 22, 1993, which is a continuation-in-part of Ser. No. 979,416, Nov. 19, 1992, Pat. No. 5,291,587, which is a continuation of Ser. No. 376,257, Jul. 6, 1989, abandoned, which is a continuation of Ser. No. 851,569, Apr. 14, 1986, Pat. No. 4,901,221. This application Jun. 6, 1995, Ser. No. 471,247**

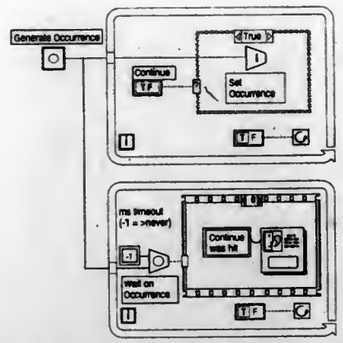
**Int. Cl.[6] G06F** *9/06;9/40*

**U.S. Cl. 395—800** **13 Claims**

1. A method for programming a computer system including a CPU which executes functions, a video display screen and means for creating a data flow diagram, the method comprising the computer-implemented steps of:

displaying on the screen a first input terminal icon, wherein said first input terminal icon references a first input variable;






displaying on the screen a first output terminal icon, wherein said first output terminal icon references a first output variable;

displaying on the screen a first function icon, wherein said first function icon controls a first function, wherein said first function icon generates first data;

displaying on the screen a second input terminal icon, wherein said second input terminal icon references a second input variable;

displaying on the screen a second output terminal icon, wherein said second output terminal icon references a second output variable;

displaying on the screen a second function icon, wherein said second function icon controls a second function, wherein said second function icon requires said first data from said first function icon before beginning operation;

displaying on the screen a set occurrence icon, wherein said set occurrence icon is associated with said first function icon;

displaying on the screen a wait on occurrence icon, wherein said wait on occurrence icon is associated with said second function icon;

assembling on the screen a first data flow diagram including said first input terminal icon, said first output terminal icon, said first function icon, and said set occurrence icon, wherein the first data flow diagram displays a procedure for producing at least one value for said first output terminal icon from at least one value for said first input terminal icon;

assembling on the screen a second data flow diagram including said second input terminal icon, said second output terminal icon, said second function icon, and said wait on occurrence icon, wherein said wait on occurrence icon includes an output coupled to said second function icon, wherein the second data flow diagram displays a procedure for producing at least one value for said second output terminal icon from at least one value for said second input terminal icon;

wherein said set occurrence icon in said first data flow diagram triggers an occurrence when said first function icon generates said first data;

wherein said wait on occurrence icon in said second data flow diagram generates said output to said second function icon when said first data is generated and said occurrence is triggered;

wherein said second function icon in said second data flow diagram begins operation when said wait on occurrence icon output is received; and

wherein said second function icon in said second data flow diagram does not require any CPU time until said first function icon in said first data flow diagram generates said first data.

**5,497,501**

## DMA CONTROLLER USING A PREDETERMINED NUMBER OF TRANSFERS PER REQUEST

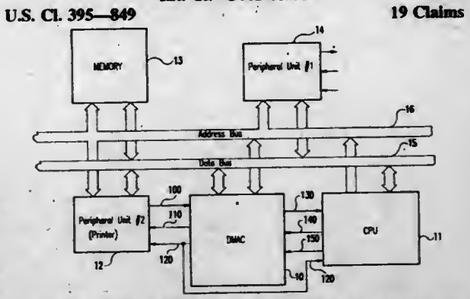
**Ichiro Kohzono, and Tsuyoshi Katayose, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan**

**Continuation of Ser. No. 704,298, May 22, 1991, abandoned. This application Nov. 1, 1993, Ser. No. 147,034**

**Claims priority, application Japan, May 22, 1990, 2-131818**

**Int. Cl.[6] G06F** *13/00*

**U.S. Cl. 395—849** **19 Claims**




1. A data transfer controller for performing a data transfer from a data source to a data destination unit in response to a transfer request signal generated from said data destination unit, said controller comprising:

first register means for storing address information for accessing a source area of said data source, said source area storing a plurality of data units to be transferred, said address information being updated each time a data unit is transferred from said data source to said data destination unit,

second register means for storing a first number indicative of an amount of said data units stored in said source area,

third register means for storing a second number indicative of a number of data transfers to be successively performed from said source area to said data destination unit each time said data destination unit generates said transfer request signal, said second number being smaller than said first number,

data transfer means coupled to said first and third register means for successively performing a plurality of data transfers each time said data destination unit generates said transfer request signal to thereby successively transfer the data stored in said source area to said data destination unit during a number of data transfers designated by the second number in said third register means, and

signaling means, coupled to said second register means and said data transfer means, for generating a transfer completion signal when a total number of data units transferred from said data source to said data destination unit by said plurality of data transfers reaches said first number stored in said second register means,

wherein said data transfer controller is initialized only after said transfer completion signal is generated.

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**5,497,502**

## METHOD AND APPARATUS FOR TRANSMITTING INFORMATION RECORDED ON DIGITAL DISKS FROM A CENTRAL SERVER TO SUBSCRIBERS VIA A HIGH DATA RATE DIGITAL TELECOMMUNICATIONS NETWORK

**Jean-Paul G. Castille, Cavaillon, France, assignor to Genese, Roblon, France**

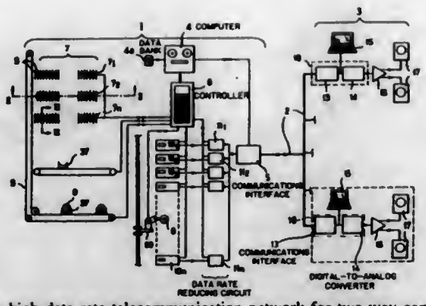
**Continuation of Ser. No. 784,450, Nov. 7, 1991, abandoned. This application Feb. 14, 1994, Ser. No. 196,765**

**Claims priority, application France, Jun. 7, 1989, 89 07759**

**Int. Cl.[6] H04H** *1/08*

**U.S. Cl. 455—5.1** **10 Claims**

1. Apparatus for transmitting information recorded on disks from a central server to subscriber stations, said apparatus comprising:




a high data rate telecommunication network for two-way communication between said central server and said subscriber stations;

said subscriber stations connected to said telecommunication network, each of said subscriber stations comprising

a communication interface connected to said telecommunication network,

computer means connected to said communication interface,

input means for inputting information to said computer means,

output means for outputting information from said computer means,

a module connected to said communication interface for expanding digital signals received from said telecommunication network,

a digital-to-analog converter connected to said module for converting said digital signals into analog signals, and

transducer means connected to said digital-to-analog converter for converting said analog signals into humanly perceptible signals;

said central server comprising

a central communication interface connected to said telecommunication network,

plural data rate reducing circuits connected to said central communication interface,

plural disk players, each of said disk players connected to one of said plural data rate reducing circuits,

a magazine storing said disks,

central memory means for storing titles of said disks together with corresponding addresses of said disks in said magazine,

central computer means connected to said telecommunication network by said central communication interface and connected to said central memory means,

transfer means for automatically transferring said disks between said magazine and said disk players, said transfer means comprising

plural self-propelled carriages disposed beneath said disk magazine,

at least one disk handling device for placing said disks on said disk players, and

a transfer conveyor which conveys said disks between said carriages and said at least one disk handling device,

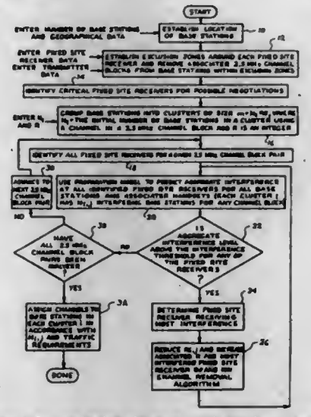
a controller connected to said central computer means, connected to said plural disk players, and connected to said transfer means, wherein in response to instructions from said central computer means, said controller controls said plural self-propelled carriages, said transfer conveyor, and said at least one disk handling device to transfer a selected disk to a selected disk player, controls said selected disk player to retrieve digital signals from said selected disk, controls a selected one of said plural data rate reducing circuits to compress said digital signals output by said disk player, and causes said central communication interface to transmit said compressed digital signals to a selected one of said subscriber stations via said telecommunication network.

**5,497,503**

## METHOD FOR ASSIGNING FREQUENCY CHANNELS IN A CELLULAR COMMUNICATION SYSTEM AND FOR IDENTIFYING CRITICAL EXISTING FIXED MICROWAVE RECEIVERS THAT RESTRICT OPERATION OF SUCH A SYSTEM

**James T. Rydberg, Hoffman Estates, and Kenneth B. Hallman, Arlington Hts., both of Ill., assignors to Ameritech Corporation, Hoffman Estates, Ill.**

**Filed May 28, 1993, Ser. No. 69,128**
**Int. Cl.[6] H04B 7/00**
**U.S. Cl. 455—33.1** **5 Claims**




1. A method for assigning frequency channels to a plurality of base stations in a cellular communication system that coexists with a set of pre-existing fixed site receivers, separate from the cellular communication system, said method comprising the following steps:

a) grouping the base stations into a plurality of clusters, each cluster comprising a set of base stations;

b) grouping a plurality of potential frequency channels into a plurality of channel blocks;

c) assigning a usage parameter to each cluster indicative of how many base stations within the respective cluster are operable within a given channel block;

d) operating a computer model to predict whether aggregate interference from the base stations and associated handsets at the pre-existing fixed site receivers would be excessive;

e) revising the usage parameters for at least some of the clusters to reduce the number of base stations within the respective cluster that are operable within an interfering channel block;

f) repeating steps d) and e) until the predicted aggregate interference from the base stations and associated handsets at the pre-existing fixed site receivers is no longer excessive; and then

g) assigning potential frequency channels to the base stations in accordance with the usage parameters as determined in step e).

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**5,497,504**

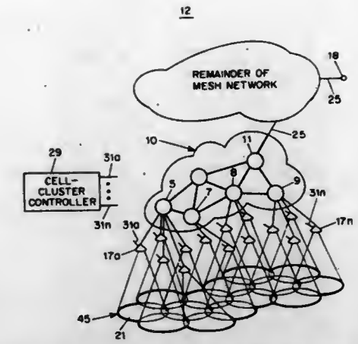
## SYSTEM AND METHOD FOR CONNECTION CONTROL IN MOBILE COMMUNICATIONS

**Anthony S. Acampora, Freehold, N.J., and Mahmoud Naghshineh, Fishkill, N.Y., assignors to The Trustees of Columbia University, New York, N.Y.**

**Filed May 13, 1994, Ser. No. 243,264**
**Int. Cl.[6] H04M 11/00**
**U.S. Cl. 455—33.2** **40 Claims**

1. A cellular mobile communications system for establishing wireless connections in a plurality of cells comprising:






means for receiving call requests from said cells, which are grouped in at least one cell-cluster, said call requests including requests for establishing new wireless connections of different connection types, said connection types indicative of at least priorities of use of wireless channels in said system;

means for providing for each cell-cluster information including at least one combination of maximum numbers of wireless connections of said different connection types in the cell-cluster; and

means for granting a selected call request including a request for establishing a new wireless connection of one of said different connection types, the grant of said selected call request based on a comparison of (a) the at least one combination of maximum connection numbers provided for a particular cell-cluster including the cell from which said selected call request was received, with (b) a combination of numbers of wireless connections of said different connection types currently established in said particular cell-cluster.

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**5,497,505**

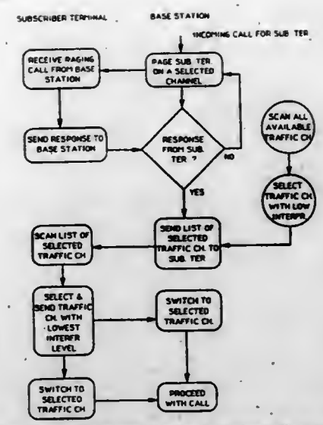
## CALL SET-UP AND SPECTRUM SHARING IN RADIO COMMUNICATION ON SYSTEMS WITH DYNAMIC CHANNEL ALLOCATION

**Mahshad Koohgoli; Sorin Cohn-Sfetcu, both of Ottawa, Canada, and John D. Lockton, Hillsborough, Calif., assignors to Northern Telecom Limited, and Bell Canada International Inc., both of Montreal, Canada**

**Continuation of Ser. No. 603,233, Oct. 25, 1990, Pat. No. 5,276,908. This application Dec. 17, 1993, Ser. No. 168,173**
**Int. Cl.[6] H04Q 7/38**
**U.S. Cl. 455—34.1** **2 Claims**

1. In a radio communication system operating within a specified radio spectrum and having a number of base stations, each communicating with a plurality of subscriber terminals over separate radio channels and each base station having access to each of said plurality of radio channels, a method of selecting a radio traffic channel for completing call set-up of incoming and outgoing calls between a base station, a subscriber terminal and a Public Switched Telephone Network (PSTN), said base stations being located in geographical regions wherein varying portions of the radio spectrum in each geographical region are reserved for fixed radio transmission services, the method comprising the steps of:

registering, at each of said base stations, signalling and radio traffic channels that can be allocated, said signalling and radio traffic channels being selected from radio channels covering a radio spectrum lying outside frequencies reserved for fixed radio transmission services in a geographic region of said each of said base stations;




receiving, at a said base station, an incoming call attempt from a subscriber or from the PSTN;

scanning, at the said base station, said radio traffic channels that can be allocated at the said base station for the presence of radio power levels above a first specified threshold;

measuring at the said base station the power level of a scanned traffic channel;

at the said base station selecting from the scanned traffic channels, traffic channels with radio power levels below said first specified threshold;

sending, to the subscriber terminal, a message indicative of at least one useable traffic channel as determined at the base station;

receiving the message at the subscriber terminal;

switching the said base station and the subscriber terminal to a useable traffic channel indicated in the message; and

proceeding with call connection.

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**5,497,506**

## PORTABLE TELEPHONE

**Shinji Takeyasu, Osaka, Japan, assignor to Kabushiki Kaisha Kaken Corporation, Osaka, Japan**

**Filed May 24, 1994, Ser. No. 248,493**
**Claims priority, application Japan, Feb. 18, 1994, 6-002116 U**
**Int. Cl.[6] H04B 1/38**
**U.S. Cl. 455—89** **4 Claims**

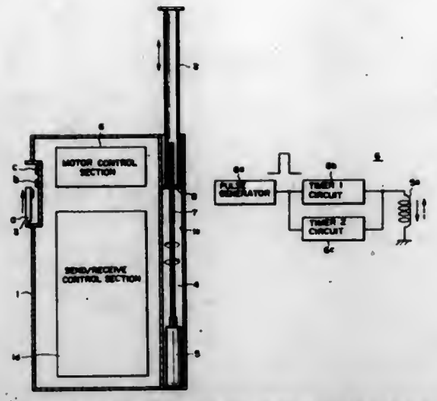
1. A portable telephone comprising a telephone proper in which the front side includes operating buttons and a display thereon, and the back and both sides are hand-held sections, and an antenna which is mounted to be extendable and retractable through the top side of the telephone proper,

wherein one side of said telephone proper is equipped with an operating switch in the upper section of the hand-held sections and the operating switch has three selections: off mode, on (standby) mode, and talk mode;

wherein there is provided an antenna moving mechanism which moves said antenna upwards when the talk mode is selected and moves the antenna downwards when the standby mode is later selected; and

wherein the telephone further comprises a control circuit for controlling the antenna moving mechanism including

a pulse generator, having an output for sending out pulse signals, activated when the operating switch is in the talk position and inactivated when standby is selected,




a first timer circuit connected to the output of the pulse generator for sending an output signal for a first designated period of time for moving the antenna upward to the antenna moving mechanism when the pulse generator is activated; and

a second timer circuit connected to the output of the pulse generator, in parallel with the first timer circuit, for sending a second output signal to the antenna moving mechanism for a second designated period of time for moving the antenna downward when the pulse generator is inactivated.

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**5,497,507**

**PORTABLE WIRELESS TELEPHONE APPARATUS WITH USE SPECIFIC POWER MONITORING**

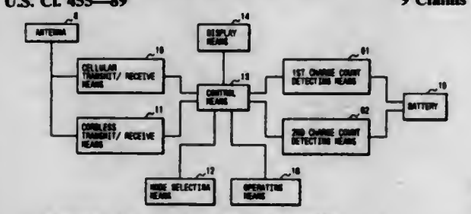
**Norio Komaki, Fukuoka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan**

**Continuation-in-part of Ser. No. 945,874, Sep. 17, 1992, Pat. No. 5,392,462. This application Oct. 20, 1994, Ser. No. 327,791**

**Claims priority, application Japan, Sep. 27, 1991, 3-248996**

**Int. Cl.[6] H04B *1/40*; H04M *11/00***

**U.S. Cl. 455—89** **9 Claims**




1. A portable wireless telephone comprising:

an antenna;

a cellular transmit/receive means connected to said antenna for transmitting data to or receiving data from a cellular base station;

a cordless transmit/receive means connected to said antenna for transmitting data to or receiving data from a base unit of a cordless telephone;

a mode selecting means for selecting an operation mode of the portable wireless telephone between a cellular mode and a cordless mode;

a battery;

a battery condition detecting means connected to said battery for generating a detecting signal if battery condition is not sufficient enough to operate the portable wireless telephone in the cellular mode;

a display means;

a control means; and

said control means controlling said display means to generate a warning, which indicates that the cellular mode is no longer operative, whenever said battery condition detecting means generates the detecting signal when the portable wireless telephone is operated in the cellular mode, and for further controlling said mode selecting means to prevent selection of the cellular mode while permitting selection of the cordless mode as long as said battery condition is sufficient enough to operate the portable wireless telephone in the cordless mode.

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**5,497,508**

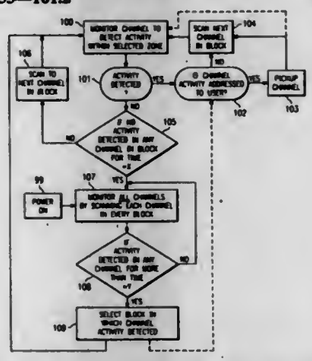
**METHOD AND APPARATUS FOR EFFICIENTLY MONITORING A PLURALITY OF RADIO CHANNELS TO DETECT MESSAGE SIGNALS**

**David L. George, Colleyville, Tex., assignor to Uniden America Corporation, Forth Worth, Tex.**

**Filed Sep. 30, 1992, Ser. No. 954,314**

**Int. Cl.[6] H04B *1/16***

**U.S. Cl. 455—161.2** **12 Claims**




1. A communication system for efficiently detecting message signals on a plurality of radio channels where the plurality of channels are divided into groups of channels, said communication system comprising:

a message transmitting means for transmitting message signals on the plurality of channels; and

at least one message receiving device for scanning channels within a first group of channels defined by zone information stored in the message receiving device to detect any transmitted message signals, said message receiving device switching to scan the plurality of channels when no message signal has been detected on any channel in the first group of channels within a first predetermined time period; wherein said message receiving device, upon detecting a message signal on a channel in a second group of channels for at least a second predetermined time period, switches to scan the second group of channels defined by said stored zone information for message signals.



**5,497,509**

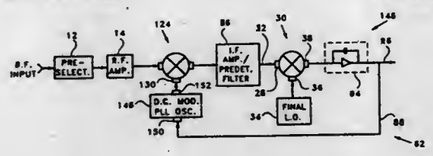
**FM-PM RECEIVERS WITH INCREASED SENSITIVITY**

**Lloyd L. Lautzenhiser, Nobel, Canada, and Wendell E. Miller, Warsaw, Ind., assignors to Emhiser Research Limited, Parry Sound, Canada**

**Continuation-in-part of Ser. No. 528,654, May 24, 1990, Pat. No. 5,091,706, and Ser. No. 598,530, Oct. 16, 1990, Pat. No. 5,097,230. This application Nov. 27, 1991, Ser. No. 799,579**

**Int. Cl.[6] H04B *1/26***

**U.S. Cl. 455—208** **46 Claims**




8. A method which comprises receiving an angularly modulated signal that includes modulation deviations, reducing said deviations subsequent to said receiving step, and producing a demodulated output of said angularly modulated signal subsequent to said reducing step, the improvement in which said reducing step is characterized by:

a) phase locking an output frequency to a reference frequency;

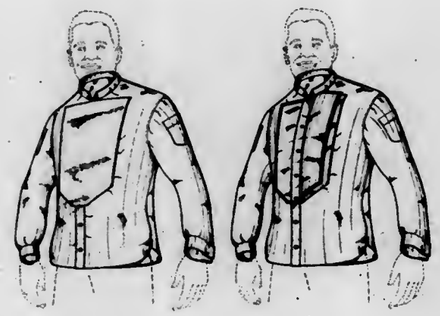
b) D.C. modulating said phase locked output frequency as a function of said demodulated output without varying said reference frequency; and

c) converting said angularly modulated signal as a function of said phase locked output frequency.

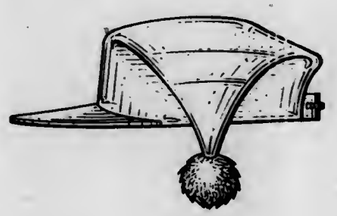
VOL
1184
ISS
1
MR
5
1996
UMI



367,551
**ARCHER'S SHIRT**
Mark D. Chalbeck, 148 Podunk Rd., Candia, N.H. 03034, and Beth A. Chalbeck, 80 Elm St., Goffstown, N.H. 03045-1912
Filed Dec. 2, 1994, Ser. No. 32,086
Term of patent 14 years
U.S. Cl. D2—841



367,552
**NOVELTY HAT**
Alfred T. Newman, 811 West 1th St., #2B, Newport Beach, Calif. 92663
Filed Dec. 2, 1993, Ser. No. 16,055
Term of patent 14 years
U.S. Cl. D2—882



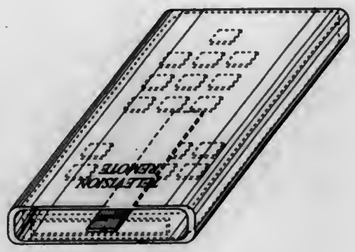
367,553
**SHOE WITH LIGHTS**
John C. Delfel, and Rosemarie A. Delfel, 44 Valencia Rd., both of Orinda, Calif. 94563
Filed Dec. 21, 1994, Ser. No. 32,585
Term of patent 14 years
U.S. Cl. D2—905



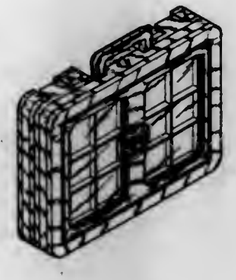
367,554
**SHOE**
Brent James, Manhattan Beach, Calif., assignor to Otomix, Inc., Santa Monica, Calif.
Filed Jun. 13, 1994, Ser. No. 24,352
Term of patent 14 years
U.S. Cl. D2—912



367,555
PROTECTIVE CASE FOR REMOTE ACTUATOR
Harold H. Dutton, Jr., 270 Main St., Warrensburg, N.Y. 12885
Filed Apr. 13, 1995, Ser. No. 37,461
Term of patent 14 years
U.S. Cl. D3—228



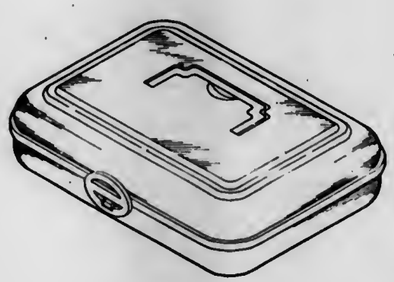
367,557
TOOL BOX
Kenny Chang, 5th Fl., No. 29, Lane 126, Minsheng Rd., Pingho Li, West Dist., Taichung, Taiwan, Prov. of China
Filed Jan. 31, 1995, Ser. No. 34,249
Term of patent 14 years
U.S. Cl. D3—276



367,556
GOLF BAG
Stephen Perrin, Camarillo, Calif., assignor to Illah/California Inc., Oxnard, Calif.
Filed Feb. 8, 1994, Ser. No. 18,487
Term of patent 14 years
U.S. Cl. D3—255

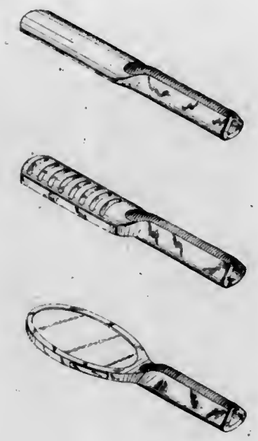


367,558
COSMETIC KIT
Chin-Chun Lai, No. 21, Pu Ting Road, Shinchu Shiang, Taiwan, Prov. of China
Filed Dec. 14, 1993, Ser. No. 16,413
Term of patent 14 years
U.S. Cl. D3—281

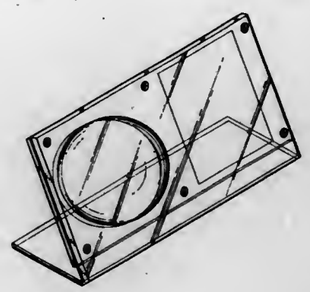




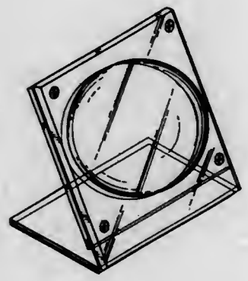
367,559
HANDLE FOR A BRUSH
Stuart M. Leslie, Brooklyn, N.N.Y., assignor to Goody Products, Inc., Kearny, N.J.
Filed Jan. 25, 1995, Ser. No. 34,024
Term of patent 14 years
U.S. Cl. D4—138



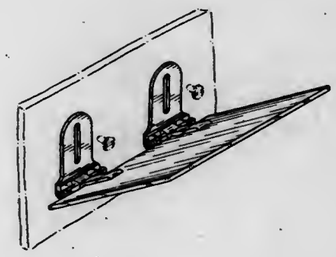
367,561
BASEBALL/CARD HOLDER
Patrick P. Kwan, 18020 - 57th Ave. NE., Seattle, Wash. 98144
Filed Jan. 17, 1995, Ser. No. 33,606
Term of patent 14 years
U.S. Cl. D6—310



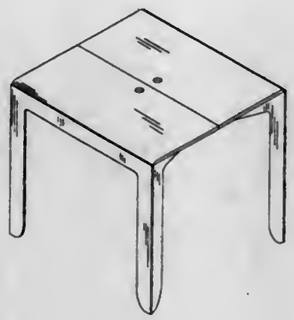
367,560
SPORTS EQUIPMENT HOLDER
Patrick P. Kwan, 18020 - 57th Ave., NE., Seattle, Wash. 98144
Filed Jan. 17, 1995, Ser. No. 33,605
Term of patent 14 years
U.S. Cl. D6—310



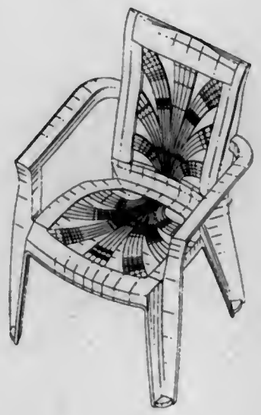
367,562
ADJUSTABLE MIRROR
Leonard Ressegger, R.D. 2, Stonybrook Rd., Oneida, N.Y. 13421, and Bruno Karrer, Venezuela 205, Toluca, Mexico
Filed Dec. 20, 1993, Ser. No. 16,549
Term of patent 14 years
U.S. Cl. D6—312



367,563
FOLDING CHAIR
Hauke Morken, Rathenower Str. 33, 10559 Berlin, Germany
Filed Jun. 16, 1994, Ser. No. 24,597
Term of patent 14 years
U.S. Cl. D6—353



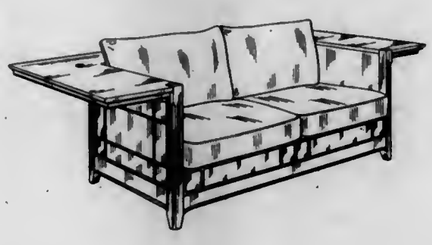
367,564
CHAIR
Drew Maple, Carmel, Ind., assignor to Sunbeam Products, Inc., Fort Lauderdale, Fla.
Filed Jun. 1, 1995, Ser. No. 39,649
Term of patent 14 years
U.S. Cl. D6—379



367,565
DINETTE CHAIR
John Yeh, 660 S. Aberdeen, Anaheim Hills, Calif. 92807
Filed Apr. 3, 1995, Ser. No. 37,013
Term of patent 14 years
U.S. Cl. D6—380

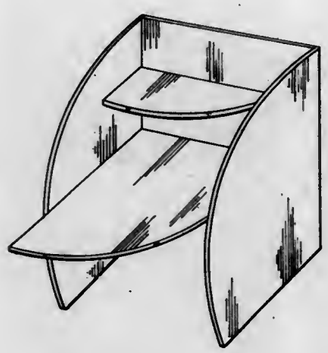


367,566
SEAT
Guy A. Walters, III, High Point, and Avis E. Tobin, Jr., Thomasville, both of N.C., assignors to Thomasville Furniture Industries, Inc., Thomasville, N.C.
Filed Oct. 20, 1994, Ser. No. 29,979
Term of patent 14 years
U.S. Cl. D6—381

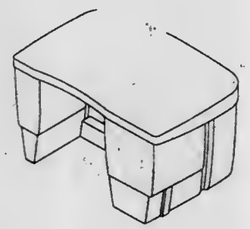




367,567
STUDY CARREL WITH ARCUATE SIDES AND DESK TOPS
Hal Sandy, 4937 Glendale Rd., Shawnee-Mission, Kans. 66205
Filed Oct. 24, 1994, Ser. No. 30,189
Term of patent 14 years
U.S. Cl. D6—421



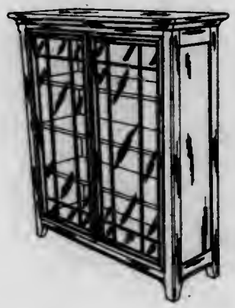
367,568
DESK FOR CHILDREN
Mark A. Strayer, Alliance, Ohio, assignor to The Little Tikes Company, Hudson, Ohio
Filed Jul. 1, 1994, Ser. No. 25,348
Term of patent 14 years
U.S. Cl. D6—422



367,569
MODULAR CABINET
Amelia Sacchi Lodispoto, Piazza Carducci, 7, Bologna, Italy
Filed Apr. 12, 1994, Ser. No. 21,206
Claims priority, application Italy, Jan. 13, 1993, BO9300041
Term of patent 14 years
U.S. Cl. D6—432



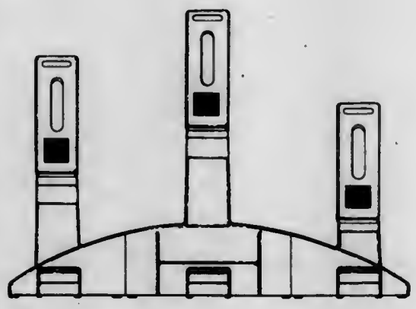
367,570
BOOKCASE
Guy A. Walters, III, High Point, and Avid E. Tobin, Jr., Thomasville, both of N.C., assignors to Thomasville Furniture Industries, Inc., Thomasville, N.C.
Filed Oct. 20, 1994, Ser. No. 30,000
Term of patent 14 years
U.S. Cl. D6—436



367,571
SPECTACLE DISPLAY HOLDER
Jan S. Eanis, 16709 NE. 41st St., Redmond, Wash. 98052
Continuation-in-part of Ser. No. 5,674, Mar. 8, 1993, Pat. No. Des. 351,955. This application Jun. 2, 1994, Ser. No. 23,869
The portion of the term of this patent subsequent to Nov. 1, 2008, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—466

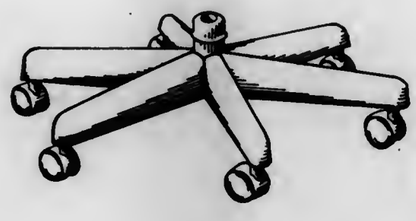


367,572
STAND FOR HOLDING ITEMS
Mark D. Fischer, 548 Elk St., Franklin, Pa. 16323
Filed Sep. 26, 1994, Ser. No. 28,940
Term of patent 14 years
U.S. Cl. D6—468





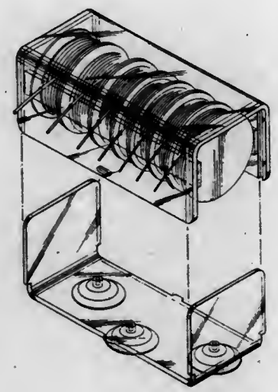
367,573
CHAIR BASE
Robert F. Larkin, 705 Oakland Hills Ct., High Point, N.C. 27265
Filed Jun. 13, 1994, Ser. No. 24,301
Term of patent 14 years
U.S. Cl. D6—498



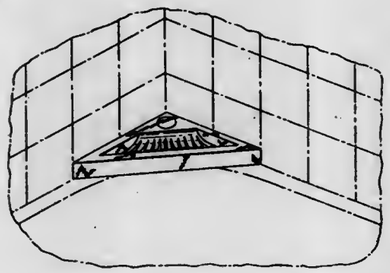
367,574
CLIP STRIP
Theodore J. Werner, Huntington Station, N.Y., assignor to United States Marketing Corporation, Huntington Station, N.Y.
Filed May 9, 1994, Ser. No. 22,602
Term of patent 14 years
U.S. Cl. D6—514



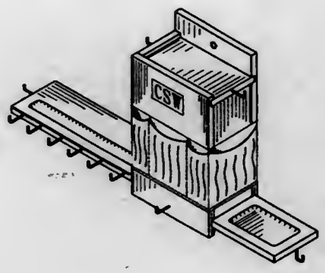
367,575
FISHING LINE DISPENSER AND COILED LINE THEREFOR
David Thompson, 4012 N. 30th Ave., Hollywood, Fla. 33020
Filed Feb. 24, 1995, Ser. No. 35,307
Term of patent 14 years
U.S. Cl. D6—518



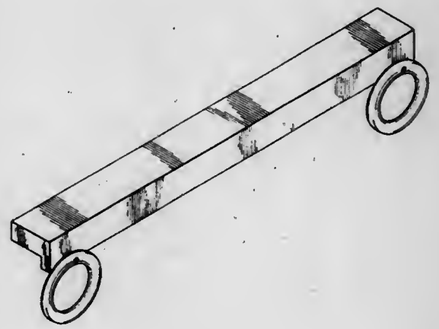
367,576
SOAP DISH
Renee L. Hickey-Niezgoda, 700 E. Chippewa, Mt. Pleasant, Mich. 48858-1872, assignor to Renee L. Hickey-Niezgoda, Mt. Pleasant, Mich.
Filed Jan. 17, 1995, Ser. No. 33,561
Term of patent 14 years
U.S. Cl. D6—536



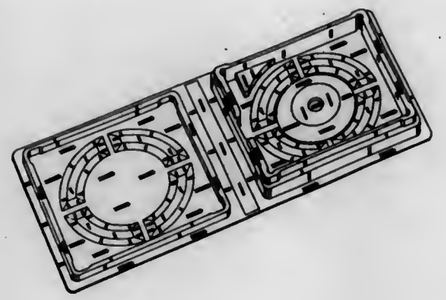
367,577
ORGANIZER FOR PERSONAL ACCESSORIES
Charles S. Willimann, 19823 Edensborough Dr., Katy, Tex. 77449
Filed Aug. 30, 1994, Ser. No. 27,842
Term of patent 14 years
U.S. Cl. D6—569



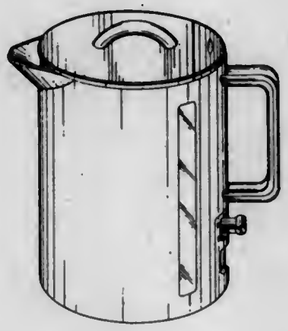
367,578
WINDOW TREATMENT
Peggy J. Locke, 275 Mansfield, Paris, Tex. 75462
Filed Mar. 16, 1995, Ser. No. 36,235
Term of patent 14 years
U.S. Cl. D6—579



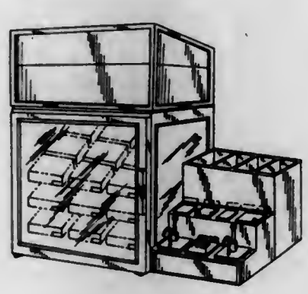
367,579
CASE FOR A REMOVABLE DISK DRIVE CARTRIDGE
Jay B. Nilson, San Jose, Calif., assignor to Syquest Technology, Inc., Fremont, Calif.
Filed Apr. 29, 1993, Ser. No. 7,897
Term of patent 14 years
U.S. Cl. D6—632



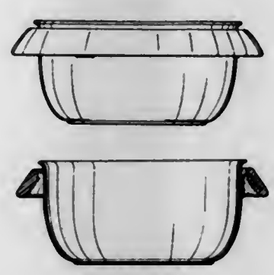
367,580
ELECTRICAL JUG
Carsten Joergensen, Kriens, Switzerland, assignor to PI-Design AG, Triengen, Switzerland
Filed Sep. 3, 1993, Ser. No. 12,475
Claims priority, application Denmark, Mar. 3, 1993, 233/93
Term of patent 14 years
U.S. Cl. D7—318



367,581
COMBINED WARMING AND DISPLAY OVEN AND CONDIMENT SIDE COUNTER
Cindie M. Wells, Cambridge, Wis., assignor to Oscar Mayer Foods Corporation, Madison, Wis.
Division of Ser. No. 50,689, Apr. 20, 1993, which is a division of Ser. No. 691,255, Apr. 25, 1991, Pat. No. 5,203,255. This application Aug. 26, 1994, Ser. No. 27,676
Term of patent 14 years
U.S. Cl. D7—350

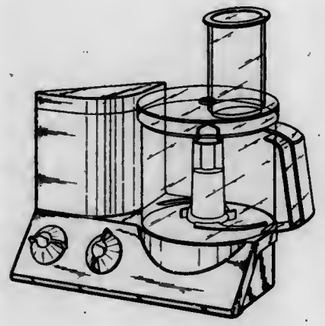


367,582
COOKWARE PAN
Yves Desbarres, Argenton sur Creuse, France, assignor to Sitram, Saint-Benoit-Du-Sault, France
Filed Jun. 8, 1994, Ser. No. 25,472
Claims priority, application France, Dec. 8, 1993, 936430
Term of patent 14 years
U.S. Cl. D7—360

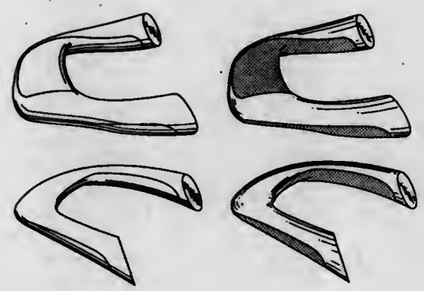




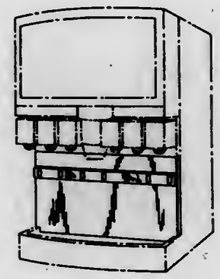
367,583
FOOD PROCESSOR
Ludwig Littmann, Kronberg, Germany, assignor to Braun Aktiengesellschaft, Kronbert/Ts., Germany
Filed Apr. 20, 1995, Ser. No. 37,785
Claims priority, application Germany, Jan. 24, 1994, M 94 08 318.5
Term of patent 14 years
U.S. Cl. D7—384



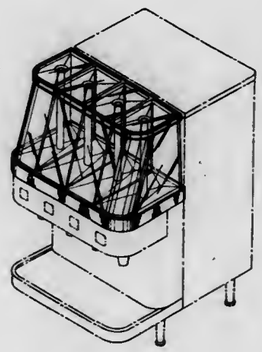
367,584
HANDLE FOR A KITCHEN UTENSIL
Karl-Erich Koch, Cham, Switzerland, assignor to AMC International ALFA Metalcraft Corporation AG, Switzerland
Filed Nov. 24, 1993, Ser. No. 15,720
Claims priority, application Hague Agreement, May 26, 1993, DM/026222
Term of patent 14 years
U.S. Cl. D7—394



367,585
SPLASH PANEL FOR ICE/BEVERAGE DISPENSER
Joseph T. Platnik, Lewisville, Tex.; Robert P. Utter, Lake Villa, and William J. Black, Gurnee, both of Ill., assignors to Scotsman Group, Inc., Vernon Hills, Ill.
Filed May 13, 1994, Ser. No. 22,867
Term of patent 14 years
U.S. Cl. D7—397



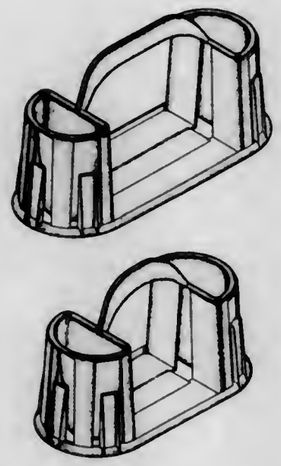
367,586
BOWL FOR A BEVERAGE DISPENSER
Jeffrey P. Mills, Georgetown; Gary F. Sardynski, Medford, and Leonard Jacobs, Chestnut Hill, all of Mass., assignors to Jet Spray Corp., Norwood, Mass.
Filed Nov. 8, 1994, Ser. No. 30,810
Term of patent 14 years
U.S. Cl. D7—397



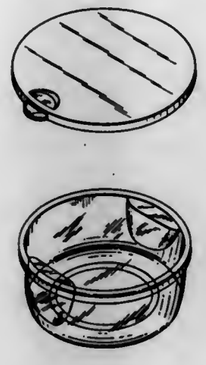
367,587
**BOWL HAVING INTERNAL SHELF**
Mark L. Perlmutter; Lindsay E. Perlmutter, both of 2202 Woodmont Ave., Austin, Tex. 78703, and David W. Douglas, 4401 Edgemont Dr., Austin, Tex. 78731
Filed Nov. 29, 1994, Ser. No. 31,497
Term of patent 14 years
U.S. Cl. D7—555



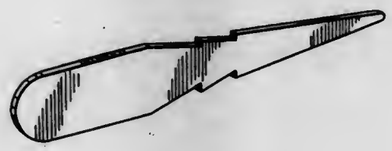
367,588
**TABLE CADDY**
Yaffa Licari, 875 Ocean Ave., Elberon, N.J. 07740
Filed Nov. 28, 1994, Ser. No. 31,460
Term of patent 14 years
U.S. Cl. D7—600



367,589
**ROUNDED STORAGE CONTAINER**
Larry G. Zimmerman, Hollis, N.H., assignor to Sterilite Corporation, Townsend, Mass.
Filed Oct. 4, 1994, Ser. No. 30,010
Term of patent 14 years
U.S. Cl. D7—629

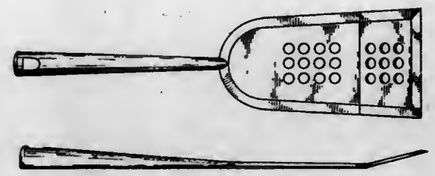


367,590
**CORNCOB HOLDER**
Paul S. Brookhouse, 505 E. 17th St., Cheyenne, Wyo. 82001
Continuation-in-part of Ser. No. 110,729, Aug. 23, 1993, abandoned. This application Sep. 28, 1994, Ser. No. 29,054
Term of patent 14 years
U.S. Cl. D7—683

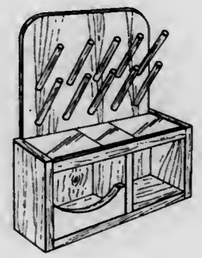




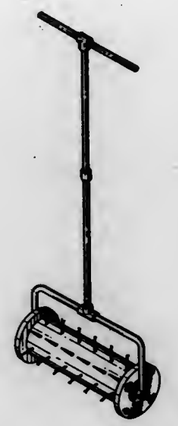
367,591
**SPATULA**
Bruce Ancona, New York, N.Y., assignor to B. Via International Housewares, Inc., Englewood Cliffs, N.J.
Filed Feb. 21, 1995, Ser. No. 35,159
Term of patent 14 years
U.S. Cl. D7—692



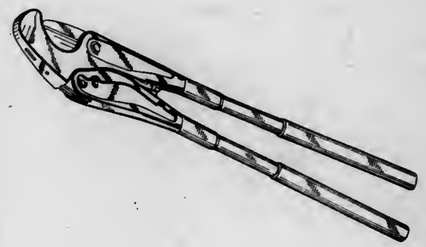
367,592
**HOLDER FOR BABY BOTTLE AND ACCESSORIES**
Ronald F. Newport, 602 E. 11th St., Loveland, Colo. 80537
Filed Dec. 9, 1994, Ser. No. 31,948
Term of patent 14 years
U.S. Cl. D7—701



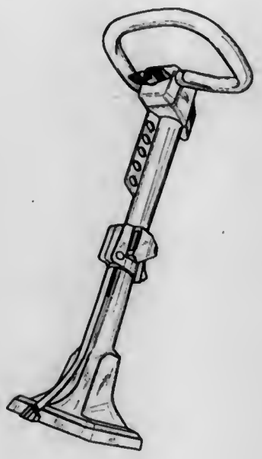
367,593
**LAWN AERATING ROLLER**
John De Larue, 2425 W. Warner Ave., Chicago, Ill. 60618
Filed Sep. 6, 1994, Ser. No. 27,994
Term of patent 14 years
U.S. Cl. D8—1



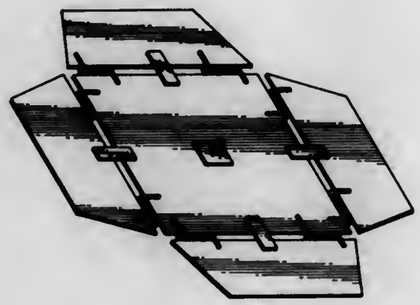
367,594
**ORNAMENTAL DESIGN FOR A CUTTING TOOL**
Johann Hortnagl, Fulpmes, Austria, assignor to E&O Hortnagl-Werkzeuge, Tirol, Austria
Filed Mar. 6, 1995, Ser. No. 35,762
Term of patent 14 years
U.S. Cl. D8—5



367,595
SUSPENSION ATTACHMENT FOR A CLEARING SAW
Göran Dahlberg, Gränna; Mats Svensson; Mikael Nors, both of Jönköping; Göte Karlsson, Huskvarna; Kenneth Karlsson, Huskvarna, and Rolf Janeke, Huskvarna, all of, Sweden, assignors to Aktiebolaget Electrolux, Stockholm, Sweden
Filed Apr. 28, 1994, Ser. No. 22,072
Claims priority, application Sweden, Nov. 2, 1993, 932454
Term of patent 14 years
U.S. Cl. D8—8



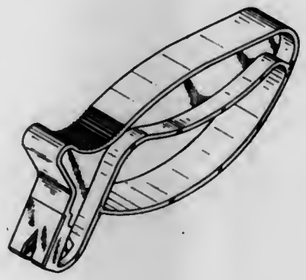
367,596
HOLE PATCHER FOR USE ON WALLBOARD
Thomas C. Russell, 3047 Wendmead Pl., Marietta, Ga. 30062
Filed Aug. 31, 1994, Ser. No. 27,772
Term of patent 14 years
U.S. Cl. D8—14



367,597
ARM EXTENDER
Orville H. Westcott, 101 Albion Pl. #205, Fairmont, Minn. 56031
Filed Dec. 25, 1994, Ser. No. 31,392
Term of patent 14 years
U.S. Cl. D8—14

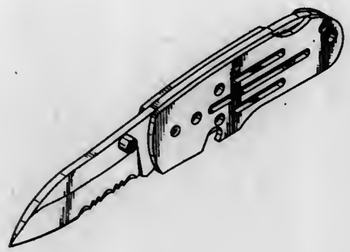


367,598
KNIFE SHARPENER
Roland D. Fortenberry, HC-04, Box 303, Marble Falls, Tex. 78654
Filed Oct. 18, 1994, Ser. No. 29,852
Term of patent 14 years
U.S. Cl. D8—91





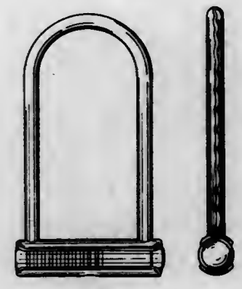
367,599
KNIFE
Kimiyuki Sakai, Seki, Japan, assignor to Gerber, Sakai, Gifu, Japan
Filed Apr. 7, 1994, Ser. No. 21,002
Term of patent 14 years
U.S. Cl. D8—99



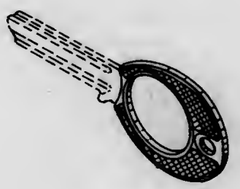
367,600
PULL
Gerald Caugh, Rockford; Deborah Mattson, Plainwell, and Kevin DeWald, Spring Lake, all of Mich., assignors to Belwith International, Grandville, Mich.
Filed Nov. 5, 1993, Ser. No. 15,073
Term of patent 14 years
U.S. Cl. D8—305



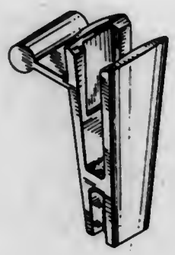
367,601
LOCK FOR A BICYCLE
Fred Brendel, München, Germany, assignor to EASEC-Schloss-Production GmbH & Co. KG., Telgte, Germany
Division of Ser. No. 21,105, Apr. 8, 1994. This application Jun. 7, 1995, Ser. No. 39,922
Term of patent 14 years
U.S. Cl. D8—333



367,602
KEY BOW
Pierre Schweig, Preverenges, Switzerland, assignor to Minit of Canada Ltd., Kitchener, Canada
Filed May 26, 1995, Ser. No. 39,534
Term of patent 14 years
U.S. Cl. D8—347



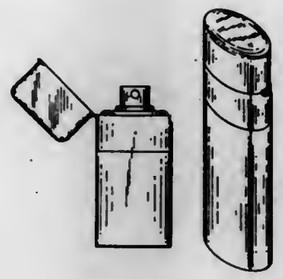
367,603
DECORATION HOLDER
Samuel Ng, Toronto; David A. Parshad, Markham, both of, Canada, and Charles W. Fennessy, Lemont, Ill., assignors to Noma Inc., Toronto, Canada
Filed Dec. 15, 1994, Ser. No. 32,230
Term of patent 14 years
U.S. Cl. D8—373



367,604
STRIP OF CLIPS
Richard J. Howells, Worcester, England, assignor to Glynwed Engineering Limited, Birmingham, England
Filed Dec. 9, 1994, Ser. No. 31,947
Claims priority, application United Kingdom, Jun. 10, 1994, 2 039 603
Term of patent 14 years
U.S. Cl. D8—396



367,605
DISPENSING CONTAINER AND COVER
Kenneth S. Moore, London, England, assignor to Precise Plastics, Ltd., London, England
Filed Oct. 26, 1994, Ser. No. 30,327
Term of patent 14 years
U.S. Cl. D9—300

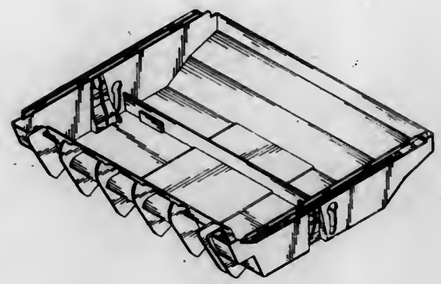


367,606
CONTAINER
Hans Linner, Kalmar, Sweden, assignor to Norden Pac Development AB, Sweden
Division of Ser. No. 18,856, Feb. 16, 1994. This application May 30, 1995, Ser. No. 39,495
Claims priority, application Sweden, Aug. 17, 1993, 93-1854
Term of patent 14 years
U.S. Cl. D9—302

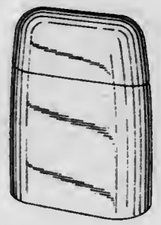




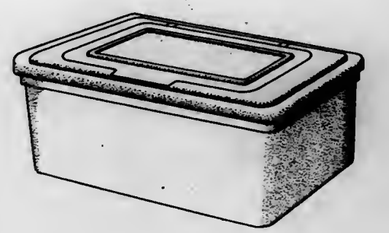
367,607
CASSETTE TRAY
David W. Johnson, Tigard; Brent R. Jones, Tualatin, and John A. Wright, Molalla, all of Oreg., assignors to Tektronix, Inc., Wilsonville, Oreg.
Filed May 12, 1995, Ser. No. 38,862
Term of patent 14 years
U.S. Cl. D9—347



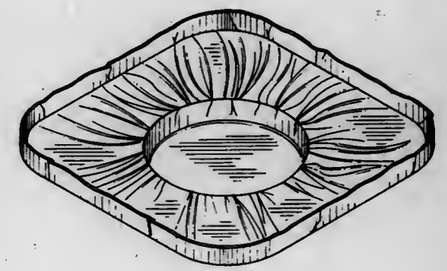
367,608
BOX
Lucas F. Stranders, Alphen Aan Den Rijn, Netherlands, assignor to Ridam Beheer B.V., De Meern, Netherlands
Filed Jan. 21, 1994, Ser. No. 19,002
Claims priority, application WIPO, Jul. 20, 1993, DM/026748
Term of patent 14 years
U.S. Cl. D9—424



367,609
CONTAINER
Martin W. Frank, Frankfurt; Bruce K. Bitowft, Glashutten, and Rainer R. B. Bauer, Weisbaden, all of, Germany, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Feb. 17, 1995, Ser. No. 35,069
Term of patent 14 years
U.S. Cl. D9—425



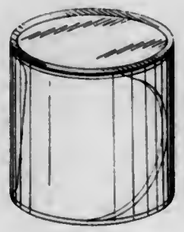
367,610
BAKING PAN
Arnold Gumowitz, Great Neck, and Gary Gumowitz, New York, both of N.Y., assignors to Seymour's Bakery, Inc., New York, N.Y.
Filed Dec. 19, 1994, Ser. No. 32,398
Term of patent 14 years
U.S. Cl. D9—432



367,611
DISPENSING CAP
George J. Wagner, III, 9725 Old 3rd St., Louisville, Ky. 40272, and Gerald Cox, Louisville, Ky., assignors to George J. Wagner, III, Louisville, Ky.
Filed Mar. 1, 1995, Ser. No. 35,525
Term of patent 14 years
U.S. Cl. D9—447



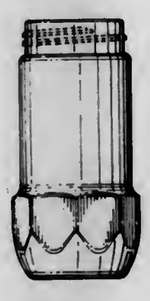
367,612
PAINT CONTAINER
Kathryn H. Shaw; Tony Enoch, and Janice C. Pedley, all of London, England, assignors to Imperial Chemical Industries PLC a British public limited company, London, England
Filed Aug. 3, 1994, Ser. No. 25,221
Claims priority, application United Kingdom, Feb. 8, 1994, 2036995
Term of patent 14 years
U.S. Cl. D9—504



367,613
COMBINED BOTTLE AND CLOSURE
Gerhard H. Weiler, South Barrington, Ill., assignor to Automatic Liquid Packaging, Inc., Woodstock, Ill.
Filed Jun. 2, 1994, Ser. No. 23,846
Term of patent 14 years
U.S. Cl. D9—520

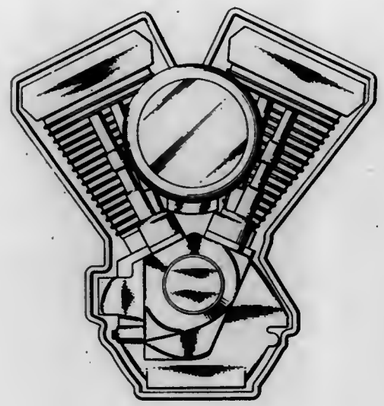


367,614
SPICE JAR
Kishore T. Pagarani, Golders Green, England, assignor to T.Choithram & Sons (London) Limited, Wembley, England
Filed Mar. 29, 1995, Ser. No. 36,853
Claims priority, application United Kingdom, Jan. 26, 1994, 2042841
Term of patent 14 years
U.S. Cl. D9—559





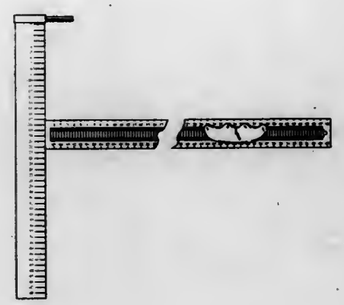
367,615
CLOCK
Walter Kurczynski, 3237 Carter Ave., Marina del Rey, Calif. 90292
Filed Apr. 17, 1995, Ser. No. 37,556
Term of patent 14 years
U.S. Cl. D10—12



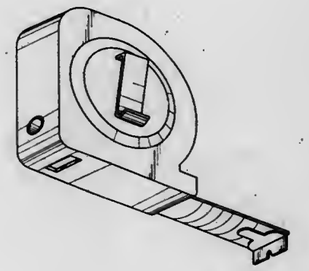
367,616
WATCHCASE
Toshiyuki Dobashi, and Hisao Sato, both of Chiba, Japan, assignors to Seiko Instruments Inc., Japan
Filed Mar. 14, 1995, Ser. No. 36,145
Term of patent 14 years
U.S. Cl. D10—30



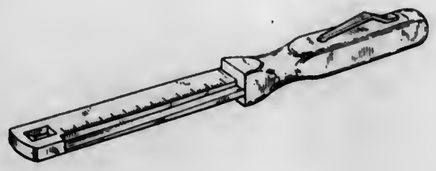
367,617
WALLBOARD MEASURING AND CUTTING SQUARE
Mark c. Wiegman, 1696 Topside, Wharton, N.J. 07885
Filed Nov. 18, 1994, Ser. No. 31,130
Term of patent 14 years
U.S. Cl. D10—65



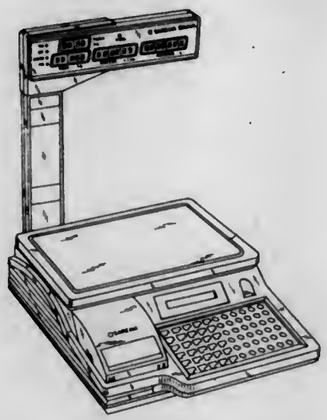
367,618
CARPENTER'S RULE WITH PENCIL SHARPENER
Stephen C. Stewart, and Shirley N. Truex, both of 24430 Nettles Rd., Christmas, Fla. 32709
Filed Apr. 17, 1995, Ser. No. 37,744
Term of patent 14 years
U.S. Cl. D10—72



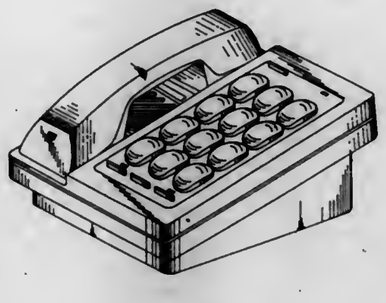
367,619
SPARK PLUG GAUGE WITH CAP ADJUSTER
Thomas W. Burrows, West Allis, Wis., and Richard J. Conway, Jr., Middleburg Heights, Ohio, assignors to A&E Mfg. Co., Inc., Racine, Wis.
Filed Aug. 19, 1994, Ser. No. 27,391
Term of patent 14 years
U.S. Cl. D10—77



367,620
ELECTRONIC COUNTER BALANCE
Riccardo Sassoli, Bologna, Italy, assignor to S.A.R.E.M.A. S.r.l., Bologna, Italy
Filed Oct. 1, 1993, Ser. No. 13,781
Claims priority, application WIPO, Apr. 13, 1993, DM/025810
Term of patent 14 years
U.S. Cl. D10—91



367,621
HOME ALARM CONTROLLER FOR AN EMBERGENCY RESPONSE UNIT
Young K. Lee, 725-13, Yeoksam-dong, Kangnam-ku, Seoul, Rep. of Korea
Filed Apr. 25, 1994, Ser. No. 21,898
Term of patent 14 years
U.S. Cl. D10—104

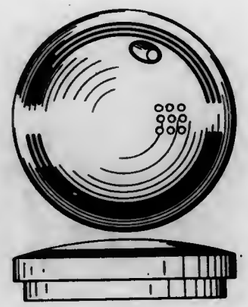


367,622
SMOKE DETECTOR COVER
Kenneth I. DeWitt, Phoenix, Md., assignor to Universal Security Instruments, Inc., Owings Mills, Md.
Filed Jan. 30, 1995, Ser. No. 34,187
Term of patent 14 years
U.S. Cl. D10—106

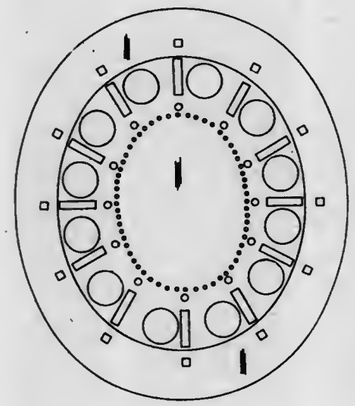




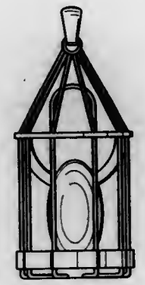
367,623
SMOKE DETECTOR COVER
Kenneth I. DeWitt, Phoenix, Md., assignor to Universal Security Instruments, Inc., Owings Mills, Md.
Filed Jan. 30, 1995, Ser. No. 34,188
Term of patent 14 years
U.S. Cl. D10—106



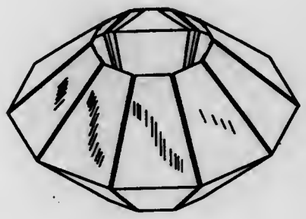
367,624
CLOCK FACE
Geno Svast, 2113 S. Gunderson, Berwyn, Ill. 60402
Filed Mar. 30, 1994, Ser. No. 20,678
Term of patent 14 years
U.S. Cl. D10—126



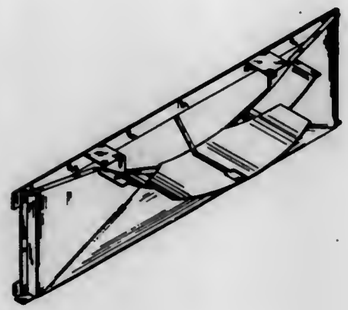
367,625
COMBINED PENDANT AND BIRTHSTONE
Nathan Goldman, Holon, Israel, assignor to Maccabi Jewelry Ltd., Ramat Gan, Israel
Filed Nov. 14, 1994, Ser. No. 30,974
Claims priority, application Israel, May 15, 1994, 22622
Term of patent 14 years
U.S. Cl. D11—79



367,626
FLOWER POT COVER
Jon S. Shryock, Bethany, Okla., assignor to Highland Supply Corporation, Highland, Ill.
Filed Jun. 9, 1993, Ser. No. 9,443
Term of patent 14 years
U.S. Cl. D11—164

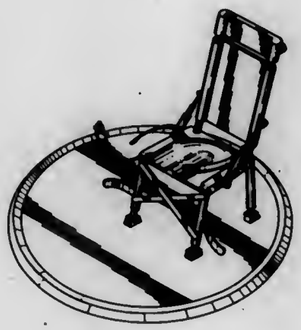


367,627
AIR CHUTE FOR A TEMPERATURE CONTROLLED CONTAINER
Lyle W. Brys, 1174 Weld Co. Rd. 45, Hudson, Colo. 80642
Filed May 3, 1994, Ser. No. 22,265
Term of patent 14 years
U.S. Cl. D12—97

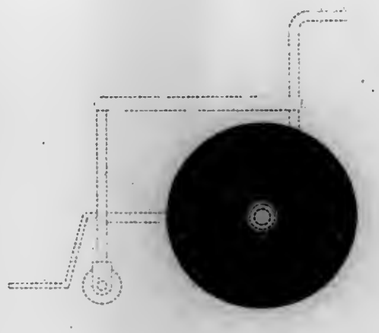


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367,628
COMBINED CHAIR AND CREEPER
Robert Bull, 587 Spearmint, Westland, Mich. 48185
Filed Aug. 22, 1994, Ser. No. 27,416
Term of patent 14 years
U.S. Cl. D12—131

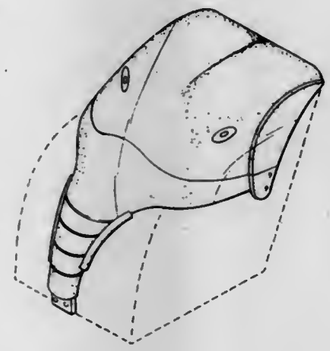


367,629
WHEELCHAIR WHEEL COVER
Charles E. Whitehead, 2414 W. Compton Blvd., Compton, Calif. 90220
Filed Jan. 20, 1995, Ser. No. 33,782
Term of patent 14 years
U.S. Cl. D12—133



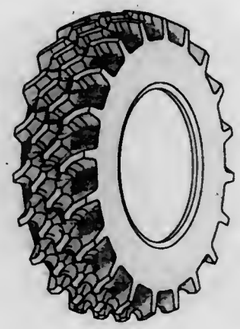
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367,630
CHILD CAR SAFETY SHIELD
Shawn R. McWayne, 24571 Crane La., Watertown, N.Y. 13601
Filed May 5, 1995, Ser. No. 38,429
Term of patent 14 years
U.S. Cl. D12—133



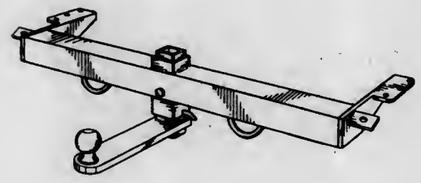


367,631
NON-DIRECTIONAL PNEUMATIC TIRE FOR USE ON AGRICULTURAL TRACTORS AND OTHER LIKE VEHICLES
Mark L. Bonko, Uniontown, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Jun. 20, 1994, Ser. No. 24,713
Term of patent 14 years
U.S. Cl. D12—147



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367,632
FRAME WITH VERTICALLY MOUNTED TRAILER HITCH
Craig S. Grieve, 12075 Combine Ave., Waterford, Calif. 95386
Filed Mar. 13, 1995, Ser. No. 36,080
Term of patent 14 years
U.S. Cl. D12—162

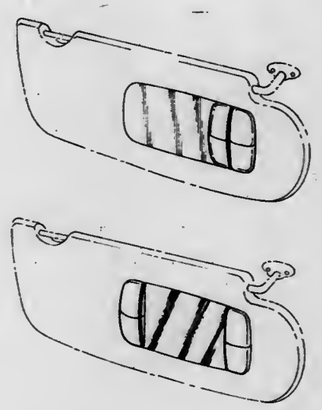


367,633
EXTERIOR SURFACE OF A COMBINED VEHICLE SLIDING DOOR INTERIOR GRAB HANDLE AND THUMB BUTTON DOOR LATCH RELEASE
David G. Monette, Troy; Gary L. Pabst, Redford; Rita Palazzolo, Warren, and Ronald J. Eberline, Commerce Township, all of Mich., assignors to Chrysler Corporation, Highland Park, Ill.
Filed Dec. 29, 1994, Ser. No. 32,835
Term of patent 14 years
U.S. Cl. D12—190



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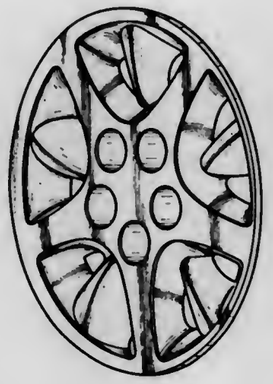
367,634
VANITY MIRROR AND COVER FOR A VEHICULAR SUN VISOR
Jay R. White, Bloomfield Hills, Mich., assignor to Jay Roberts Company, Bloomfield Hills, Mich.
Division of Ser. No. 16,124, Dec. 8, 1993, Pat. No. Des. 356,771. This application Oct. 28, 1994, Ser. No. 30,399
Term of patent 14 years
U.S. Cl. D12—191



367,635
FRONT FACE FOR A VEHICLE WHEEL
Thomas C. Odette, Bloomfield Hills, Mich., assignor to Chrysler Corporation, Highland Park, Mich.
Filed Jun. 23, 1994, Ser. No. 24,902
Term of patent 14 years
U.S. Cl. D12—209



367,636
FRONT FACE FOR A VEHICLE WHEEL
Donald A. Renkert, Royal Oak, Mich., assignor to Chrysler Corporation, Highland Park, Mich.
Filed Jun. 23, 1994, Ser. No. 24,904
Term of patent 14 years
U.S. Cl. D12—209



367,637
FRONT FACE FOR A VEHICLE WHEEL
Mark D. Hall, Rochester Hills, Mich., assignor to Chrysler Corporation, Highland Park, Mich.
Filed Jun. 23, 1994, Ser. No. 24,908
Term of patent 14 years
U.S. Cl. D12—209



367,638
NAUTICAL CRAFT
Ian J. Duncan, 5 Avenue de la Porte Neuve, 17000 La Rochelle, France
Filed Feb. 16, 1994, Ser. No. 18,862
Claims priority, application France, Aug. 16, 1993, 93 4299
Term of patent 14 years
U.S. Cl. D12—300





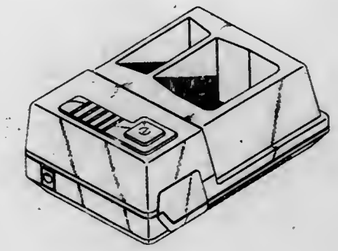
367,639
WEATHER SEAL STRIP
Teresa H. O'Donnell, and Patrick A. O'Donnell, both of 12 Morningside Dr., Billercia, Mass. 01821-1448
Filed Dec. 16, 1994, Ser. No. 32,347
Term of patent 14 years
U.S. Cl. D12—400



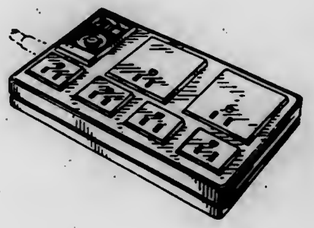
367,640
BATTERY HOUSING FOR A PORTABLE TELEPHONE
Albert L. Nagele, Wilmette, and Leonid Soren, Lincolnwood, both of Ill., assignors to Motorola Inc., Schaumburg, Ill.
Filed Mar. 7, 1994, Ser. No. 19,602
Term of patent 14 years
U.S. Cl. D13—103



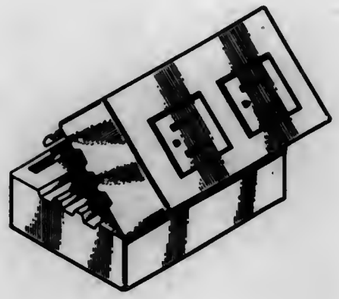
367,641
BATTERY CHARGER FOR PORTABLE TELEPHONE
Chao-Wei Ho, Taipei, Taiwan, Prov. of China, assignor to Toptronic Industrial Co., Ltd., Taipei, Taiwan, Prov. of China
Filed Feb. 27, 1995, Ser. No. 35,422
Term of patent 14 years
U.S. Cl. D13—108



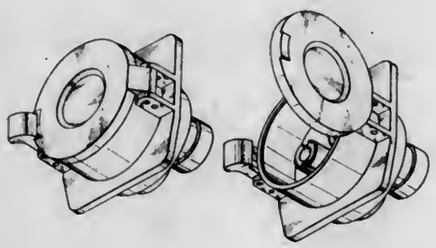
367,642
ELECTRICAL OUTLET BLOCK
George F. W. Boesel, Canton, Mass., and Mark W. Geis, Carmel, Ind., assignors to Woods Industries, Inc., Carmel, Ind.
Filed Feb. 1, 1995, Ser. No. 34,309
Term of patent 14 years
U.S. Cl. D13—142



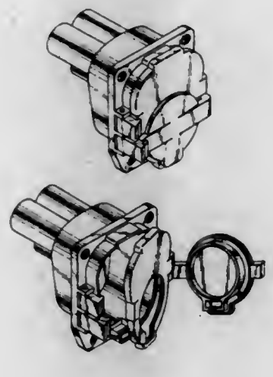
367,643
MULTI-OUTLET ELECTRICAL RECEPTACLE
William A. Vardell, 602 Old Canyon Rd., Jonesboro, Ark. 72401
Filed Feb. 3, 1994, Ser. No. 18,318
Term of patent 14 years
U.S. Cl. D13—143



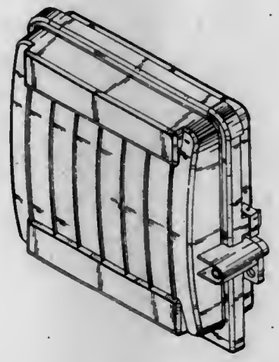
367,644
ELECTRICAL RECEPTACLE FOR CHARGING PLUG
Yasuyoshi Fukao; Toshiyuki Sekimori; Hiromichi Kuno, all of Toyota; Nobuaki Yoshioka, Shizuoka; Toshiaki Hasegawa, Shizuoka, and Shigemitsu Inaba, Shizuoka, all of, Japan, assignors to Yazaki Sogyo K.K., and Toyota Jidosha K.K., Japan
Filed Mar. 18, 1994, Ser. No. 20,085
Claims priority, application Japan, Sep. 20, 1993, 5-28067
Term of patent 14 years
U.S. Cl. D13—146



367,645
HOUSING FOR CONNECTOR OF ELECTRIC SUPPLIER FOR ELECTRIC CAR
Shigemi Hashizawa; Hirotaka Fukushima, and Toshiaki Hasegawa, all of Shizuoka, Japan, assignors to Yazaki Corporation, Japan
Filed Mar. 16, 1995, Ser. No. 36,305
Claims priority, application Japan, Sep. 16, 1994, 6-27845
Term of patent 14 years
U.S. Cl. D13—146



367,646
ENCLOSURE FOR TERMINATING CABLE TELEVISION SERVICE AT THE CUSTOMER'S PREMISES
Pina R. Schneider, Matawan, and Frank S. Siano, Spotswood, both of N.J., assignors to ANTEC Corp., Rolling Meadows, Ill.
Filed Jul. 11, 1994, Ser. No. 25,740
Term of patent 14 years
U.S. Cl. D13—152

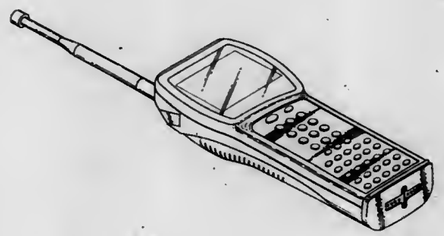




367,647
TERMINAL AND STAND
Joseph Faggard, 33742 Malaga Dr., Dana Point, Calif. 92629, and Ronald Ressel, 416 Riverside Ave., Newport Beach, Calif. 92663
Filed May 2, 1994, Ser. No. 22,252
Term of patent 14 years
U.S. Cl. D14—100



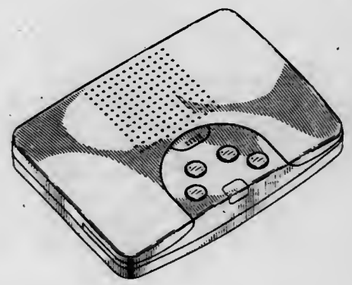
367,648
HAND-HELD COMPUTER UNIT
Brian D. Smith, London; Alun Wilcox, Surrey, and Nigel T. Court, London, all of, England, assignors to Itron, Inc., Spokane, Wash.
Filed Sep. 23, 1994, Ser. No. 28,881
Term of patent 14 years
U.S. Cl. D14—100



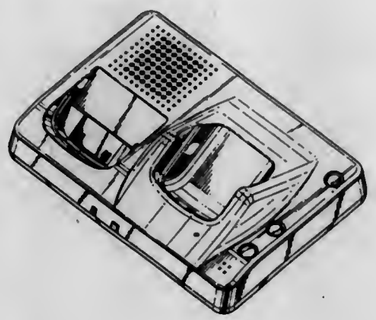
367,649
HOUSING FOR A PORTABLE RADIO/PHONE
Scott H. Richards, Plantation, and Tyler D. Jensen, Sunrise, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Apr. 3, 1995, Ser. No. 37,090
Term of patent 14 years
U.S. Cl. D14—138



367,650
ANSWERING MACHINE
Anthony Solomita, Norwalk, Conn., assignor to Conair Corporation, Stamford, Conn.
Filed Feb. 13, 1995, Ser. No. 34,763
Term of patent 14 years
U.S. Cl. D14—141



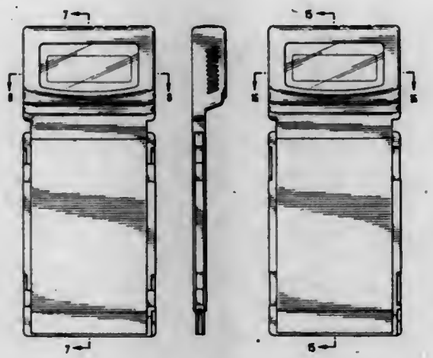
367,651
STAND FOR A PORTBLE TELEPHONE
Robert Heiller, and Tomek Rudkiewicz, both of Turku, Finland, assignors to Nokia Mobile Phones Ltd., Salo, Finland
Filed Jul. 25, 1994, Ser. No. 26,275
Claims priority, application United Kingdom, Feb. 23, 1994, 2037289
The portion of the term of this patent subsequent to May 30, 2009, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—149



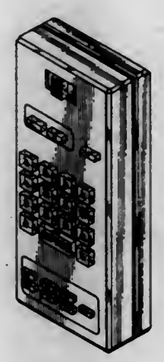
367,652
HOUSING FOR A CELLULAR BASE UNIT
Thomas G. Beaumont, Bedford, Tex., assignor to Motorola, Inc., Schaumburg, Ill.
Continuation-in-part of Ser. No. 35,839, Mar. 7, 1995. This application May 2, 1995, Ser. No. 38,299
Term of patent 14 years
U.S. Cl. D14—149



367,653
MESSAGE DECODER
Kazuaki Tajima, Yokohama, Japan, assignor to Oi Electric Co., Ltd., Kanagawa, Japan
Filed Dec. 8, 1994, Ser. No. 31,876
Claims priority, application Japan, Jun. 8, 1994, 6-16963
Term of patent 14 years
U.S. Cl. D14—191

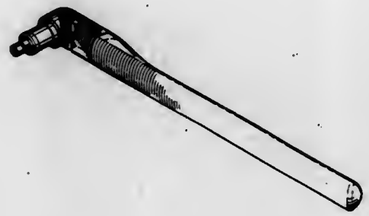


367,654
REMOTE CONTROL WITH ILLUMINATED BUTTONS
Todd D. Hertzfeld, and Beverly J. Hertzfeld, both of 6629 Weckerly Dr., Whitehouse, Ohio 43571
Filed Sep. 26, 1994, Ser. No. 28,598
Term of patent 14 years
U.S. Cl. D14—218





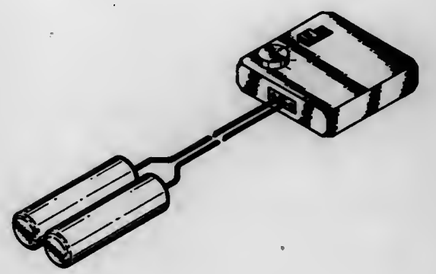
367,655
ANTENNA FOR WIRELESS TRANSCEIVERS
Roman P. Rak, Delta, Canada, assignor to Motorola Inc., Schaumburg, Ill.
Filed Nov. 14, 1994, Ser. No. 30,892
Term of patent 14 years
U.S. Cl. D14—234



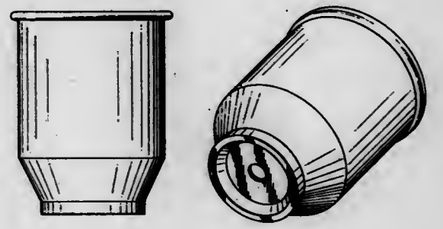
367,656
AUTOMOTIVE RESONATOR
Danny Cacciacarro, Mississauga, and Changize Sadr, North York, both of, Canada, assignors to ABC Group, Rexdale, Canada
Filed Apr. 13, 1995, Ser. No. 37,467
Claims priority, application Canada, Feb. 9, 1995, 1995-0294
Term of patent 14 years
U.S. Cl. D15—5



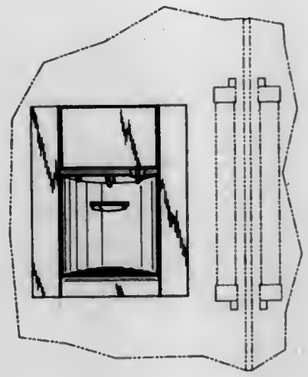
367,657
HEATED HANDLE FOR A SNOWBLOWER
Daniel J. Sayles, and Michael Sayles, both of 24 Frantzen Ter., Cheektowaga, N.Y. 14227
Filed Jun. 30, 1994, Ser. No. 25,373
Term of patent 14 years
U.S. Cl. D15—11



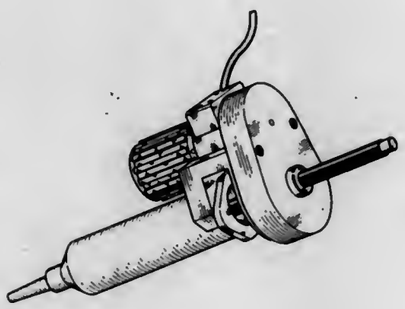
367,658
YARN DRUM
George W. Tucker, and Sybil G. Tucker, both of 240 Dogwood La., Elberton, Ga. 30635
Filed Apr. 11, 1988, Ser. No. 180,253
Term of patent 14 years
U.S. Cl. D15—78



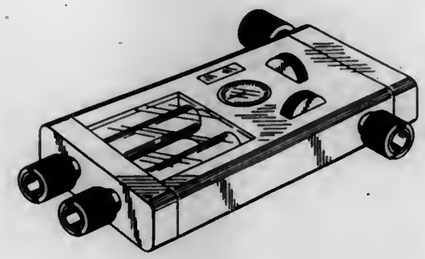
367,659
**REFRIGERATOR DOOR ICE DISPENSER INSERT**
Charles D. Baker, Dublin, and Douglas K. Ritterling, Galloway, both of Ohio, assignors to White Consolidated Industries, Inc., Cleveland, Ohio
Filed Mar. 17, 1993, Ser. No. 5,942
Term of patent 14 years
U.S. Cl. D15—89



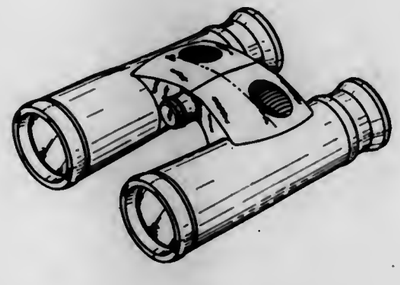
367,660
**DISPENSING DEVICE**
Colin K. Weston, 1204 Dreamcrest Rd., Mississauga, Ontario, Canada
Filed Mar. 27, 1995, Ser. No. 36,722
Term of patent 14 years
U.S. Cl. D15—145



367,661
**HAND HELD TRANSMISSION FLUID CHANGER**
Jeffrey P. Few, Elkhart, Ind., assignor to Flo-Dynamics, Inc., Compton, Calif.
Filed Mar. 13, 1995, Ser. No. 36,061
Term of patent 14 years
U.S. Cl. D15—150

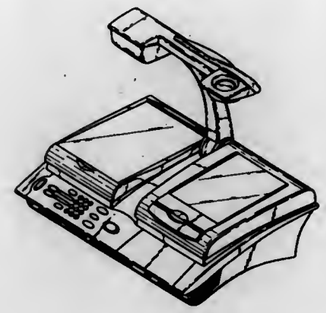


367,662
**BINOCULARS**
Kwong C. Chan, Flat A, 7th Floor, Manning Industrial Building, 118 How Ming Street, Kwun Tong, Kowloon, Hong Kong
Filed Feb. 17, 1995, Ser. No. 35,043
Claims priority, application United Kingdom, Aug. 19, 1994, 2041166
Term of patent 14 years
U.S. Cl. D16—133





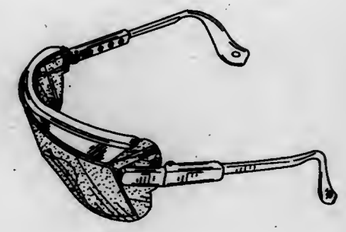
367,663
**REMOTE INTERACTIVE PROJECTOR**
Brian L. Hinman, Los Gatos, Calif., and Scott Wakefield, Andover, Mass., assignors to Polycom, Inc., San Jose, Calif.
Filed Apr. 5, 1995, Ser. No. 37,143
Term of patent 14 years
U.S. Cl. D16—232



367,664
**COMBINED SUNGLASSES AND PROTECTION MASK**
Luciano Simioni, Montebelluna, Italy, assignor to Killer Loop S.p.A., Pederobba, Italy
Filed Jul. 15, 1994, Ser. No. 25,890
Claims priority, application Italy, Jan. 17, 1994, TV940000005
Term of patent 14 years
U.S. Cl. D16—309



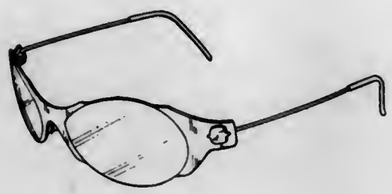
367,665
**EYE-GLASSES**
Tamenobu Yamamoto, Higashi-Osaka, Japan, assignor to Yamamoto Kogaku Co., Ltd., Osaka, Japan
Filed Mar. 30, 1994, Ser. No. 20,715
Claims priority, application Japan, Jan. 8, 1993, 5-30754
Term of patent 14 years
U.S. Cl. D16—314



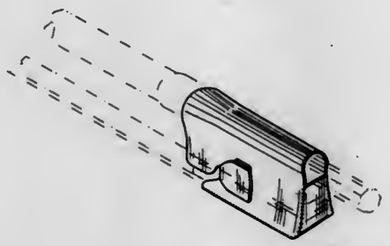
367,666
**EYEWEAR LENS FRONT**
Simon M. Conway, Lima, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed Oct. 28, 1994, Ser. No. 30,419
Term of patent 14 years
U.S. Cl. D16—314



367,667
SUNGLASSES
Luciano Simioni, and Sergio Menegon, both of Montebelluna, Italy, assignors to Killer Loop S.p.A., Pederobba, Italy
Filed Jan. 26, 1995, Ser. No. 34,078
Claims priority, application Italy, Aug. 1, 1994, TV9400045
Term of patent 14 years
U.S. Cl. D16—315



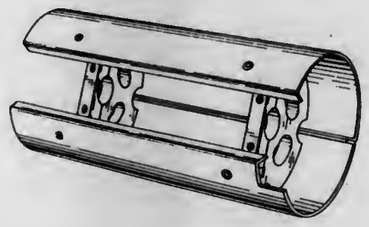
367,668
VIOLIN BOW FROG COVER
Diana E. Lindauer, 1901 Lauderdale Rd., Louisville, Ky. 40205
Filed Mar. 9, 1995, Ser. No. 35,898
Term of patent 14 years
U.S. Cl. D17—20



367,669
COPYING MACHINE CABINET
Raymond W. D'Angelo, 18 Coventry Cir., North Haven, Conn. 06473
Filed Jun. 14, 1994, Ser. No. 24,404
Term of patent 14 years
U.S. Cl. D18—40

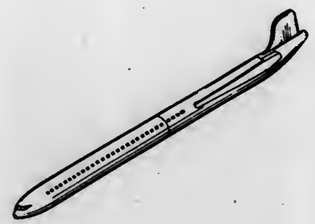


367,670
TRANSFER CYLINDER
James A. Elliott, Euless, Tex., assignor to Howard W. DeMoore, Dallas, Tex.
Filed Apr. 27, 1995, Ser. No. 38,061
Term of patent 14 years
U.S. Cl. D18—58





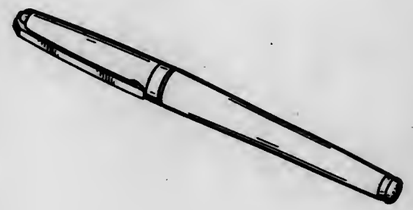
367,671
WRITING PEN IN THE SHAPE OF A PLANE
Ronald P. Pijlman, Queensway, Hong Kong, assignor to ID Traders Limited, Hong Kong, Hong Kong
Filed Jan. 13, 1995, Ser. No. 33,530
Term of patent 14 years
U.S. Cl. D19—42



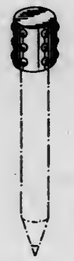
367,672
CHALK
John J. Hahn, N. Reading, Mass., assignor to Walbuck Crayon Company, Wilmington, Mass.
Filed Feb. 8, 1995, Ser. No. 34,607
Term of patent 14 years
U.S. Cl. D19—49



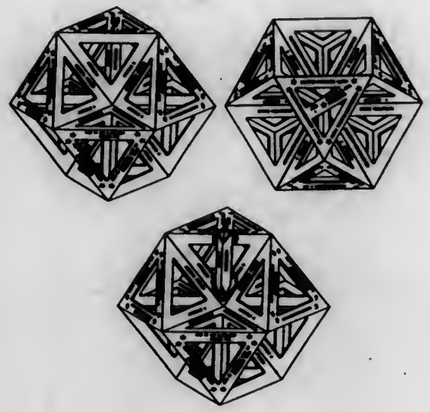
367,673
FOUNTAIN PEN
Philippe Compte, Paris, France, assignor to S. T. Dupont S.A., Paris, France
Filed Sep. 14, 1994, Ser. No. 28,423
Claims priority, application France, Mar. 17, 1994, 94 1562054960489
The portion of the term of this patent subsequent to Sep. 13, 2008, has been disclaimed.
Term of patent 14 years
U.S. Cl. D19—51



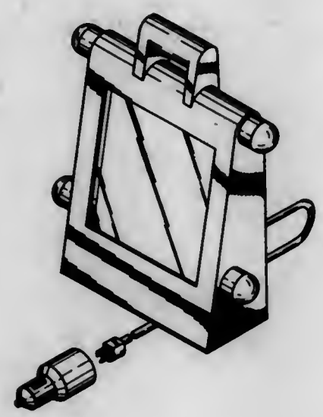
367,674
CYLINDRICAL ERASER
Sean Kitzmiller, Knoxville, Tenn., assignor to Berol Corporation, Brentwood, Tenn.
Filed Mar. 23, 1995, Ser. No. 36,598
Term of patent 14 years
U.S. Cl. D19—53



367,675
EDUCATIONAL MODEL
Robert M. Welch, P.O. Box 4096, Huntington Beach, Calif. 92605-4096
Filed Nov. 13, 1990, Ser. No. 612,899
Term of patent 14 years
U.S. Cl. D19—59



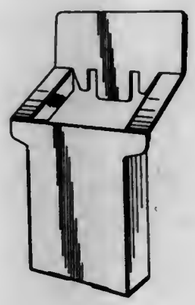
367,676
ILLUMINATED DISPLAY SIGN FOR VEHICLES
Jeffrey Ortiz, 1704 Poplar St., Erie, Pa. 16502
Filed Jan. 5, 1995, Ser. No. 33,122
Term of patent 14 years
U.S. Cl. D20—10



367,677
VERTICAL HOLDER FOR PAPER INSERTS
Robert A. Norelka, Rocky Hill, Conn., assignor to Gastro-Gnomes, Inc., West Hartford, Conn.
Filed Aug. 30, 1994, Ser. No. 27,817
Term of patent 14 years
U.S. Cl. D20—40

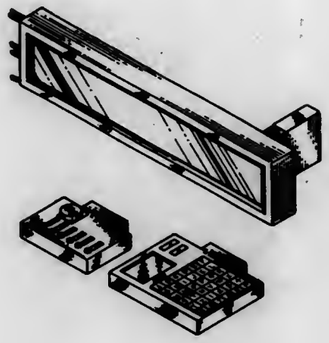


367,678
ADVERTISING DISPLAY FOR STACKED PRODUCTS
Kevin A. Hart, Vent House, Charxing, Ashford, Kent TN27 0HH, England
Filed Nov. 18, 1994, Ser. No. 32,382
Claims priority, application United Kingdom, Sep. 17, 1993, 2033955
Term of patent 14 years
U.S. Cl. D20—40

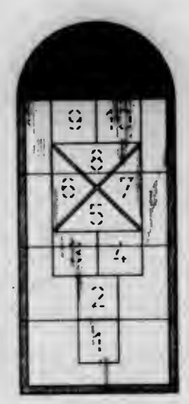




367,679
COMBINED CONTROL PANEL AND VEHICLE SIGNALLING DISPLAY BOARD
Arturo E. Vitali, and Mario De Leon, both of Campeche Y Tamaulipas, 1204 Col Lospinos, Monclova Coahuila, Mexico
Filed Jun. 24, 1993, Ser. No. 9,806
Term of patent 14 years
U.S. Cl. D20—42



367,680
FOLDING HOPSCOTCH GAME
Julie Abbott, 3735 W. 116th Pl., Garden Homes, Ill. 60655
Filed Mar. 11, 1994, Ser. No. 19,782
Term of patent 14 years
U.S. Cl. D21—15



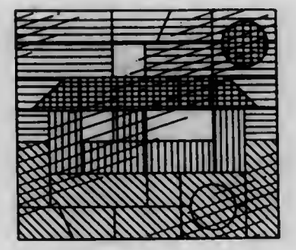
367,681
KITE
William G. Lagadyn, P.O. Box 4385, LCD#1, London, Ontario, Canada
Filed Feb. 16, 1995, Ser. No. 34,969
Term of patent 14 years
U.S. Cl. D21—88



367,682
GUIDE STICK FOR HOOP AND STICK SET
Melvin L. Hermsmeyer, 2134 Prestwick Dr., Discovery Bay, Calif. 94514
Filed Mar. 20, 1995, Ser. No. 36,383
Term of patent 14 years
U.S. Cl. D21—101



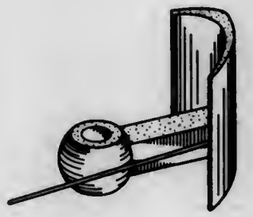
367,683
BUILDING BLOCK TOY
Arvid Hope, Ostre Hopsvei 19C, N-5043 Hop, Norway
Filed Jun. 8, 1993, Ser. No. 9,251
Claims priority, application Norway, Dec. 8, 1992, 920994
Term of patent 14 years
U.S. Cl. D21—108



367,685
TOY WATER GUN
Ka-Shiu Luk, Flat 401 4/F Fo Tan Industrial Centre 26 Au Pui Wan Street, Fo Tan, Hong Kong
Filed Dec. 27, 1993, Ser. No. 16,811
Term of patent 14 years
U.S. Cl. D21—146



367,684
COUPLING KNUCKLE FOR MODEL RAILROAD CARS AND LOCOMOTIVES
Randall B. Wilson, 330 Livingston Ave., Placentia, Calif. 92670-2418
Filed Nov. 21, 1994, Ser. No. 31,170
Term of patent 14 years
U.S. Cl. D21—141

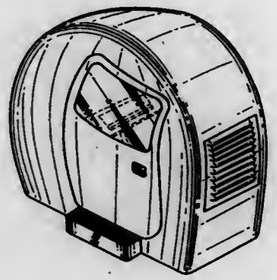


367,686
DOLL
Lolita B. Decanay, 7432 Cottage Ave., North Bergen, N.J. 07047
Filed Apr. 17, 1995, Ser. No. 37,582
Term of patent 14 years
U.S. Cl. D21—155

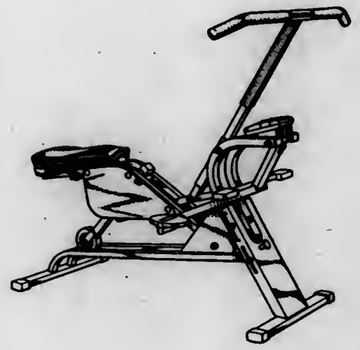




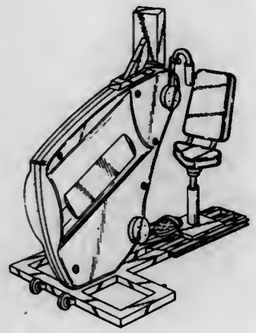
367,687
ENCLOSURE FOR AN AUDIO-VISUAL EXERCISE BICYCLE
James M. Carter, 204 Norwood Ave. - West, Memphis, Tenn. 38109
Filed Jan. 26, 1994, Ser. No. 17,944
Term of patent 14 years
U.S. Cl. D21—194



367,689
EXERCISE MACHINE
Kerry Wilkinson, Phoenix, Ariz., and Gary H. Smith, Salt Lake City, Utah, assignors to ExerHealth, Inc., Salt Lake City, Utah
Filed Apr. 11, 1995, Ser. No. 37,394
Term of patent 14 years
U.S. Cl. D21—195



367,688
EXERCISER
William L. Dixon, Bixby, and James E. Riley, Tulsa, both of Okla., assignors to Sinties Corporation, Tulsa, Okla.
Filed Apr. 25, 1994, Ser. No. 21,883
Term of patent 14 years
U.S. Cl. D21—194



367,690
BASKETBALL GOAL
Stephen Jimick, and Genevieve Jimick, both of 5918 Elna Dr., Holiday, Fla. 34690
Filed Oct. 17, 1994, Ser. No. 29,840
Term of patent 14 years
U.S. Cl. D21—201



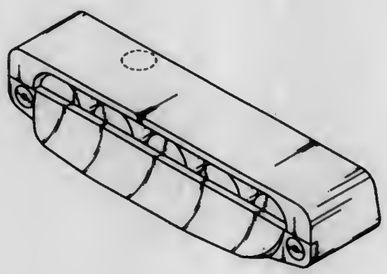
367,691
GOLF PUTTER HEAD
Dennis Lee, St. Charles; Richard Buckles, Buffalo Grove, and Robert Good, Kildeer, all of Ill., assignors to The Clear Difference Co., Lake Zurich, Ill.
Filed Jan. 17, 1995, Ser. No. 33,615
Term of patent 14 years
U.S. Cl. D21—217



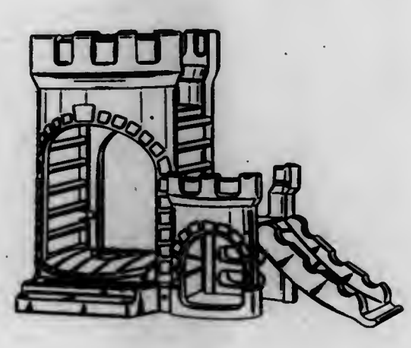
367,693
ROLLER-SKATE
Rong-Tsong Yow, No. 3, Lane 125, Chiao Chung Yi Street, Pan-chiao, Taipei, Taiwan, Prov. of China
Filed Jun. 5, 1995, Ser. No. 39,724
Term of patent 14 years
U.S. Cl. D21—226



367,692
GOLF PUTTER HEAD
Frank Gebhardt, 530 Middle Rd., Kalispell, Mont. 59901
Filed Feb. 16, 1995, Ser. No. 34,945
Term of patent 14 years
U.S. Cl. D21—217

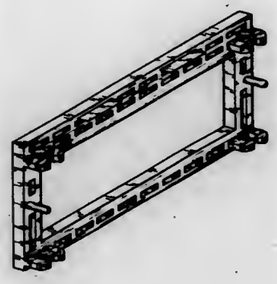


367,694
ACTIVITY SAND CASTLE GYM
Maarten van Huystee, East Aurora, N.Y., assignor to Fisher-Price, Inc., East Aurora, N.Y.
Filed Aug. 19, 1994, Ser. No. 27,334
Term of patent 14 years
U.S. Cl. D21—244

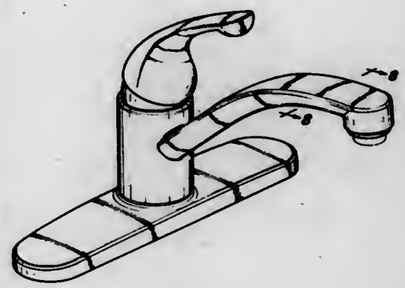




367,695
LOBSTER TRAP ESCAPE VENT
Donald G. Erlandson, R.R. 2, Box 138, Topsham, Me. 04086-9626
Filed Aug. 2, 1993, Ser. No. 11,262
Term of patent 14 years
U.S. Cl. D22—121



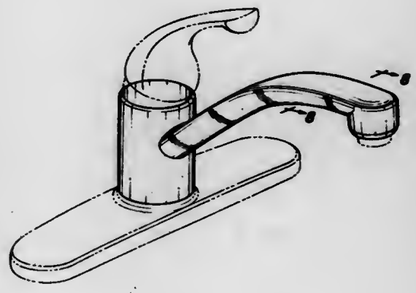
367,697
FAUCET
Andreas Haug, Stuttgart, Germany; Loran R. Hill, Indianapolis, Ind.; Thomas W. Schonherr, Stuttgart, Germany, and Anthony G. Spangler, Sheridan, Ind., assignors to Masco Corporation of Indiana, Taylor, Mich.
Continuation of Ser. No. 14,878, Nov. 2, 1993, abandoned.
This application Nov. 21, 1994, Ser. No. 31,164
Term of patent 14 years
U.S. Cl. D23—238



367,696
HAND HELD SHOWER
Leonard C. Andrus, Bloomfield, Mich., assignor to Brass Craft Manufacturing Company, Novi, Mich.
Filed Aug. 9, 1994, Ser. No. 26,931
Term of patent 14 years
U.S. Cl. D23—223



367,698
FAUCET BODY AND SPOUT
Andreas Haug, Stuttgart, Germany; Loran R. Hill, Indianapolis, Ind.; Thomas W. Schonherr, Stuttgart, Germany, and Anthony G. Spangler, Sheridan, Ind., assignors to Masco Corporation of Indiana, Taylor, Mich.
Continuation of Ser. No. 14,877, Nov. 2, 1993, abandoned.
This application Nov. 21, 1994, Ser. No. 31,165
Term of patent 14 years
U.S. Cl. D23—238



367,699

COMBINED FAUCET BODY, SPOUT AND BASE

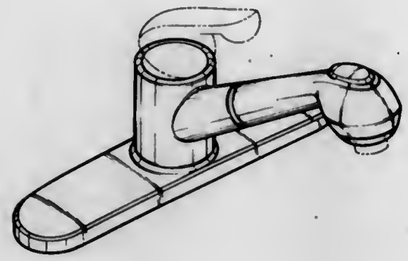
Loran R. Hill, Indianapolis, and Anthony G. Spangler, Sheridan, both of Ind., assignors to Masco Corporation of Indiana, Taylor, Mich.

Continuation of Ser. No. 13,931, Oct. 6, 1993, abandoned.

This application Dec. 13, 1994, Ser. No. 32,046

Term of patent 14 years

U.S. Cl. D23—238



367,700

COMBINED FAUCET BODY AND SPOUT

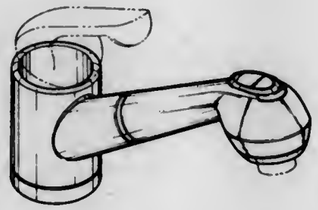
Loran R. Hill, Indianapolis, and Anthony G. Spangler, Sheridan, both of Ind., assignors to Masco Corporation of Indiana, Taylor, Mich.

Continuation of Ser. No. 13,930, Oct. 6, 1993, abandoned.

This application Dec. 13, 1994, Ser. No. 32,198

Term of patent 14 years

U.S. Cl. D23—255



367,701

FAUCET SPOUT

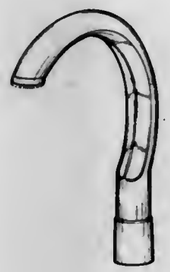
Loran R. Hill, Indianapolis, and Anthony G. Spangler, Sheridan, both of Ind., assignors to Masco Corporation of Indiana, Taylor, Mich.

Continuation of Ser. No. 15,243, Nov. 9, 1993, abandoned.

This application Jan. 18, 1995, Ser. No. 33,664

Term of patent 14 years

U.S. Cl. D23—255



367,702

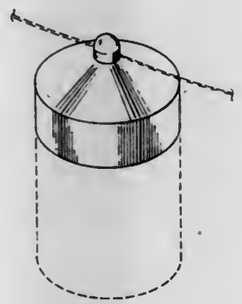
CAP FOR PIPE

Hulin J. Martin, R.R. 1, Box 400, Woodlawn, Ill. 62898

Filed Jul. 29, 1994, Ser. No. 26,509

Term of patent 14 years

U.S. Cl. D23—260





367,703

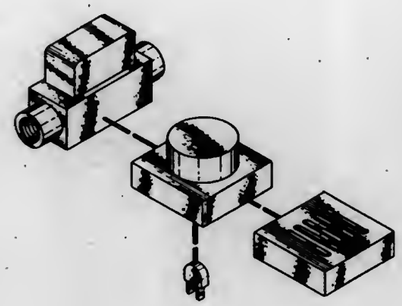
HOT WATER HEATER SHUT OFF VALVE

Kenneth E. Myers, and Alice M. Myers, both of 4301 NW. 34th Way, Lauderdale Lakes, Fla. 33309

Filed Dec. 14, 1994, Ser. No. 32,225

Term of patent 14 years

U.S. Cl. D23—322



367,704

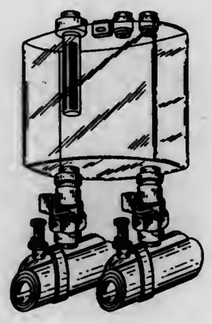
COMBINED BLOOD RECEIVING CONTAINER AND REINFUSION BAGS

Robert F. Cotter, 80 Seabury Point Rd., Duxbury, Mass. 02332

Filed May 19, 1994, Ser. No. 23,762

Term of patent 14 years

U.S. Cl. D24—111



367,705

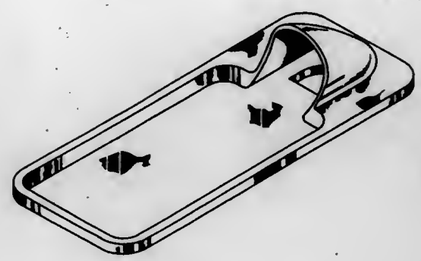
COLONIC ENEMA BOARD

Curtiss D. Williams, 1211 Atlantic Ave., Brooklyn, N.Y. 11216

Filed Aug. 20, 1993, Ser. No. 12,038

Term of patent 14 years

U.S. Cl. D24—132



367,706

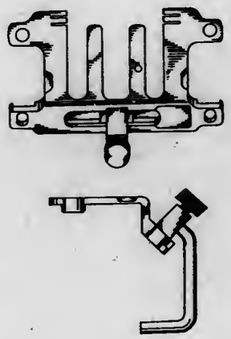
ALIGNMENT GUIDE FOR AN ORTHOPAEDIC BONE CUTTING GUIDE

Gregory C. Stalcup, Columbia City, and Rodney Bays, Pierceton, both of Ind., assignors to Zimmer, Inc., Warsaw, Ind.

Filed May 9, 1994, Ser. No. 22,635

Term of patent 14 years

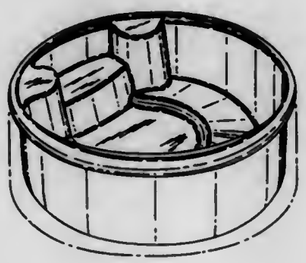
U.S. Cl. D24—140



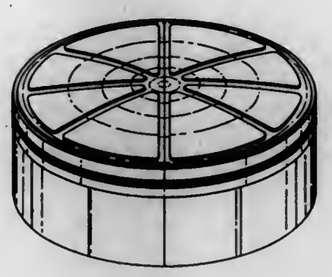
367,707
TONGUE SCRAPER
Stephen K. Baker, Fort Myers, Fla., assignor to Baker Contracting, Inc., Fort Myers, Fla.
Filed Aug. 8, 1994, Ser. No. 26,876
Term of patent 14 years
U.S. Cl. D24—147



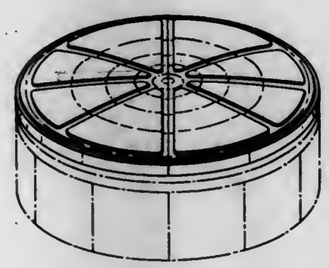
367,708
SPA SHELL
Michael E. Lawing, San Diego; Walter R. Cumiskey, Vista, and Jeffrey K. Watkins, Rancho Santa Fe, all of Calif., assignors to Watkins Manufacturing Corporation, Vista, Calif.
Filed Mar. 3, 1994, Ser. No. 19,456
Term of patent 14 years
U.S. Cl. D24—204



367,709
COMBINED SPA AND COVER
Michael E. Lawing, San Diego; Walter R. Cumiskey, Vista, and Jeffrey K. Watkins, Rancho Santa Fe, all of Calif., assignors to Watkins Manufacturing Corporation, Vista, Calif.
Filed Mar. 3, 1994, Ser. No. 19,501
Term of patent 14 years
U.S. Cl. D24—205



367,710
SPA COVER
Walter R. Cumiskey, Vista, Calif., assignor to Watkins Manufacturing Corporation, Vista, Calif.
Filed Mar. 3, 1994, Ser. No. 19,505
Term of patent 14 years
U.S. Cl. D24—205

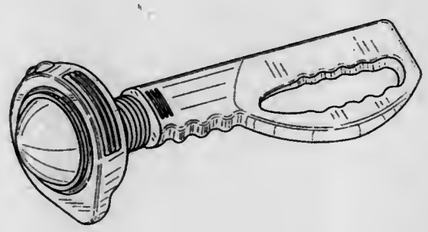




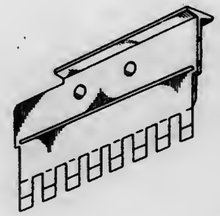
367,711
COMBINED HOT AND COLD PACK VEST AND HARNESS
William J. Simmons, 535 Peach Orchard Pl., Aiken, S.C. 29801
Filed Jul. 18, 1994, Ser. No. 26,029
Term of patent 14 years
U.S. Cl. D24—206



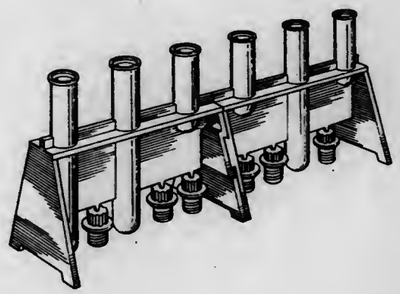
367,712
CORDLESS HAND HELD MASSAGER
James V. Young, University Park, Mo., assignor to General Physiotherapy, Earth City, Mo.
Filed May 22, 1995, Ser. No. 39,125
Term of patent 14 years
U.S. Cl. D24—215



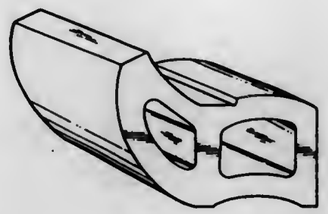
367,713
MANIFOLD DEVICE FOR CHEMICAL SOLID PHASE REACTIONS
Bengt La Motte, Solna, Sweden, assignor to Pharmacia Biotech AB, Uppsala, Sweden
Filed Dec. 23, 1994, Ser. No. 32,683
Claims priority, application Sweden, Jun. 23, 1994, 94-1421
Term of patent 14 years
U.S. Cl. D24—222



367,714
IMMUNOASSAY TEST KIT
Alexander Pennicook, New South Wales, Australia, assignor to Biotech Australia Pty Ltd., New South Wales, Australia
Filed Jan. 7, 1994, Ser. No. 17,237
Claims priority, application Australia, Jul. 9, 1993, 2097/93
Term of patent 14 years
U.S. Cl. D24—223



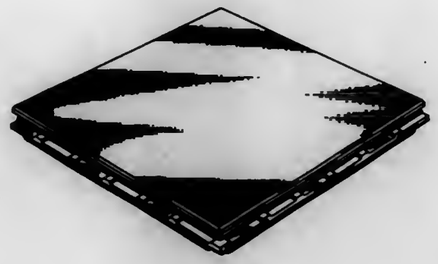
367,715
BUILDING ELEMENT
Johannes W. Joubert, P.O. Box 3685, Pietersburg, 0700, South Africa
Filed Aug. 8, 1994, Ser. No. 26,913
Claims priority, application South Africa, Feb. 10, 1994, 94/0872; Feb. 10, 1994, 94/0873
Term of patent 14 years
U.S. Cl. D25—114



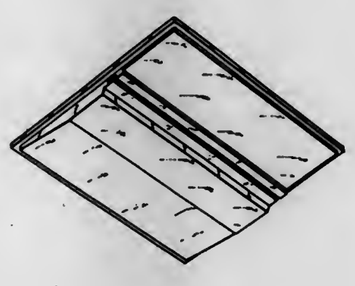
367,716
DECORATIVE EXTRUSION
Peter M. Stagl, Morris Plains, N.J., assignor to Avnet, Inc., Great Neck, N.Y.
Filed Mar. 16, 1995, Ser. No. 36,255
Term of patent 14 years
U.S. Cl. D25—122



367,717
RESILIENT TILE
Benjamin G. Prins, 1702 London Road, Sarnia, Ontario, Canada
Filed May 11, 1995, Ser. No. 38,856
Claims priority, application Canada, Feb. 20, 1995, 1995-0422
Term of patent 14 years
U.S. Cl. D25—140

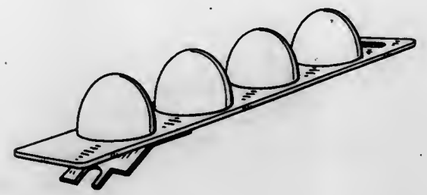


367,718
FIBERGLASS REINFORCED GYPSUM CEILING PANEL
William J. Tinea, Glenview, Ill., assignor to USG Interiors, Inc., Chicago, Ill.
Filed Dec. 16, 1994, Ser. No. 32,338
Term of patent 14 years
U.S. Cl. D25—157

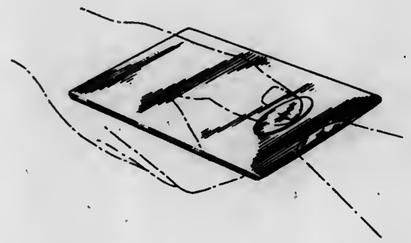




367,719
BRAKE LIGHT ENHANCEMENT PANEL
Carl G. Rasmusen, 3701 S. Monterey Cir., Bountiful, Utah 84010
Filed Jul. 13, 1994, Ser. No. 25,865
Term of patent 14 years
U.S. Cl. D26—28



367,720
THIN PLANAR FLASHLIGHT
Iain Sinclair, P.O. Box 807, Hildersham, Cambridge CB1 6BX, United Kingdom
Filed Jan. 6, 1995, Ser. No. 33,175
Term of patent 14 years
U.S. Cl. D26—46



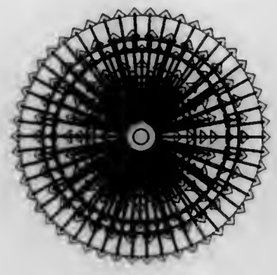
367,721
FLASHLIGHT
Anthony Maglica, Anaheim, Calif., assignor to Mag Instrument, Inc., Ontario, Calif.
Continuation-in-part of Ser. No. 834,497, Feb. 11, 1992, Pat. No. Des. 343,333. This application Dec. 10, 1993, Ser. No. 16,209
The portion of the term of this patent subsequent to Feb. 11, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D26—49



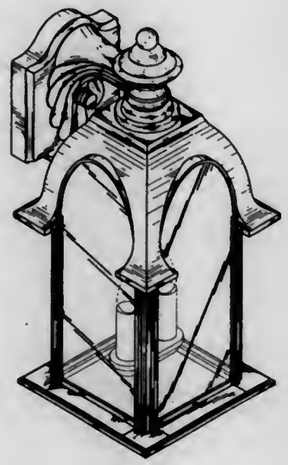
367,722
ADJUSTABLE TABLE LAMP
Se K. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Ltd., Kowloon, Hong Kong
Filed Aug. 25, 1994, Ser. No. 27,624
Claims priority, application United Kingdom, May 3, 1994, 2038820
Term of patent 14 years
U.S. Cl. D26—63



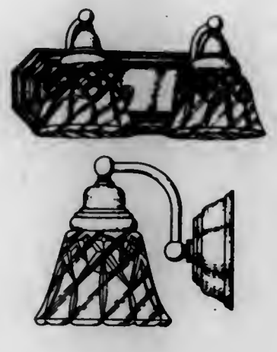
367,723
CHANDELIER
Thomas Chiang, 28 W. 335 Picardy Ct., Winfield, Ill. 60190
Filed Feb. 21, 1995, Ser. No. 34,992
Term of patent 14 years
U.S. Cl. D26—86



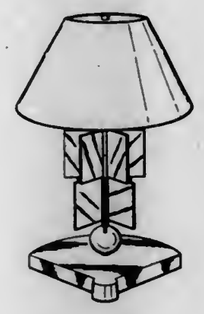
367,724
WALL LANTERN
David H. Porter, Chagrin Falls, Ohio, assignor to The L.D. Kichler Co., Cleveland, Ohio
Filed Jan. 5, 1995, Ser. No. 33,084
Term of patent 14 years
U.S. Cl. D26—87



367,725
SCONCE
Mark E. Segill, Framingham, and Jeffrey H. Pocock, Medfield, both of Mass., assignors to American Lighting Fixture Corp., Taunton, Mass.
Filed Mar. 13, 1995, Ser. No. 36,129
Term of patent 14 years
U.S. Cl. D26—87



367,726
TABLE LAMP
Harold Albrecht, Oakville, and Russell Watters, Pickering, both of, Canada, assignors to Shandel Investments Limited, and Gambol Entertainment, both of Ontario, Canada
Filed Mar. 27, 1995, Ser. No. 36,719
Claims priority, application Canada, Nov. 1, 1994, 1994-2171
Term of patent 14 years
U.S. Cl. D26—106

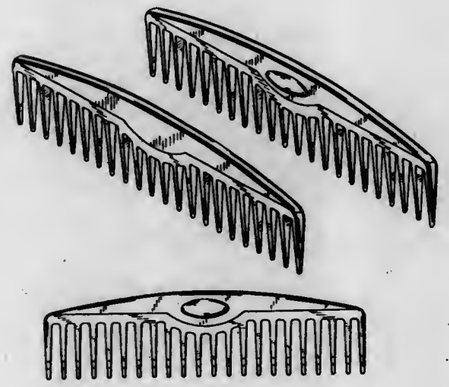




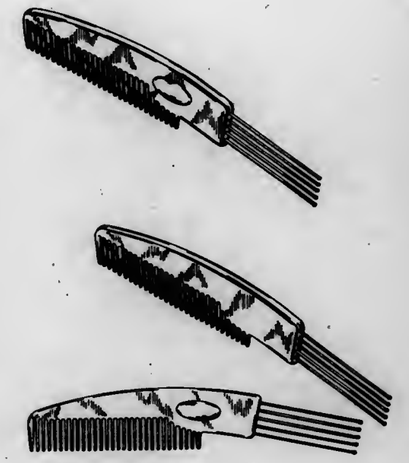
367,727
HAIR DRYER
James M. Rittenhouse, Jr., New Canaan, and H. Roy Taylor, Stratford, both of Conn., assignors to Conair Corporation, Stamford, Conn.
Filed Jan. 12, 1995, Ser. No. 33,407
Term of patent 14 years
U.S. Cl. D28—13



367,728
COMB
John A. Bozak, Brooklyn, N.Y., assignor to Goody Products, Inc., Kearny, N.J.
Filed Dec. 30, 1994, Ser. No. 32,882
Term of patent 14 years
U.S. Cl. D28—21



367,729
COMBINATION COMB/LIFT
John A. Bozak, Brooklyn, N.Y., assignor to Goody Products, Inc., Kearny, N.J.
Filed Dec. 30, 1994, Ser. No. 32,975
Term of patent 14 years
U.S. Cl. D28—28



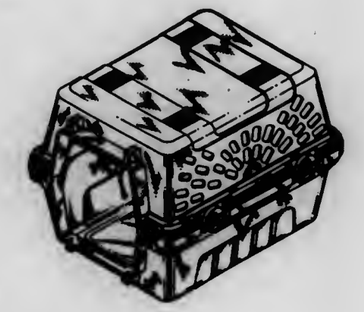
367,730
SHEET OF SUN TATTOOS
Joseph J. Chiavetta, 37 Cranberry Canners Rd., New Egypt, N.J. 08533
Filed Dec. 22, 1994, Ser. No. 32,626
Term of patent 14 years
U.S. Cl. D28—99



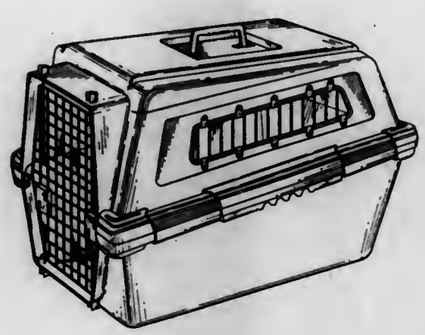
367,731
**HAND WRAP FOR USE IN CONTACT RELATED ACTIVITIES**
Joseph Estwanik, 335 Billingsley Rd., Charlotte, N.C. 28211
Filed May 27, 1994, Ser. No. 23,620
Term of patent 14 years
U.S. Cl. D29—117



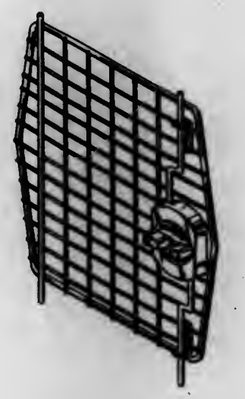
367,732
**VENTED PET KENNEL**
Thomas B. Murphy, Arlington; Melaney L. Northrop, Cleburne, and Richard Nesbitt, Arlington, all of Tex., assignors to Doskocil Manufacturing Company, Inc., Arlington, Tex.
Filed Jun. 1, 1994, Ser. No. 23,823
Term of patent 14 years
U.S. Cl. D30—108



367,733
**PET CARRIER**
Darrell R. Paxman, Corona, and Aurelio F. Barreto, III, Lake Matthews, both of Calif., assignors to Dogloo, Inc., Corona, Calif.
Filed Jan. 18, 1994, Ser. No. 17,619
Term of patent 14 years
U.S. Cl. D30—109

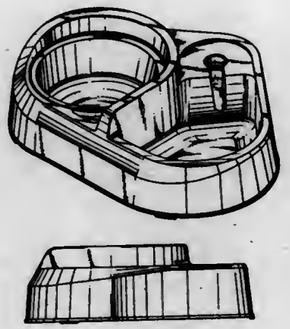


367,734
**COMBINED KENNEL DOOR AND LATCH**
Doug Sharp, Arlington, Tex., assignor to Doskocil Mfg. Co., Arlington, Tex.
Filed Jun. 1, 1994, Ser. No. 23,828
Term of patent 14 years
U.S. Cl. D30—119

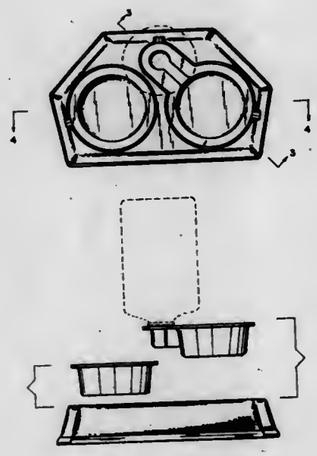




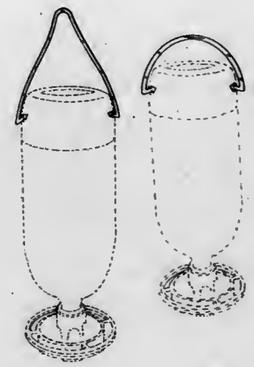
367,735
**COMBINED FEEDER AND WATERER**
Ralph VanSkiver, and Doug Sharp, both of Arlington, Tex., assignors to Doskocil Manufacturing Company, Inc., Arlington, Tex.
Filed Jun. 1, 1994, Ser. No. 23,825
Term of patent 14 years
U.S. Cl. D30—121



367,736
**COMBINED PET FOOD AND LIQUID FEEDER**
Charles R. Goetz, 9 Charter Oak Dr., Carnegie, Pa. 15106
Filed Jan. 27, 1994, Ser. No. 17,992
The portion of the term of this patent subsequent to Jun. 15, 2007, has been disclaimed.
Term of patent 14 years
U.S. Cl. D30—130



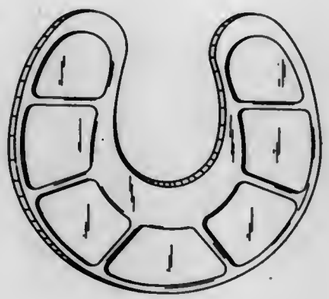
367,737
**HANGER FOR BIRD FEEDER**
Patrick McNaughton, Minneapolis, and Richard Schellbach, Rush City, both of Minn., assignors to McNaughton Incorporated, Minneapolis, Minn.
Filed Oct. 21, 1994, Ser. No. 30,034
Term of patent 14 years
U.S. Cl. D30—133



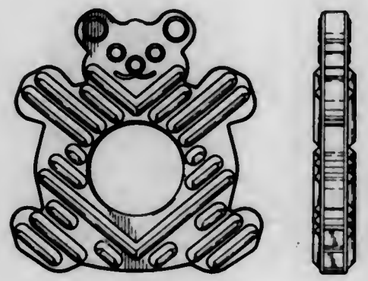
367,738
**SADDLE CINCH**
Robert J. Marshall, 1867 U.S. 60 E., Salem, Ky. 42078
Filed Oct. 6, 1994, Ser. No. 29,447
Term of patent 14 years
U.S. Cl. D30—134



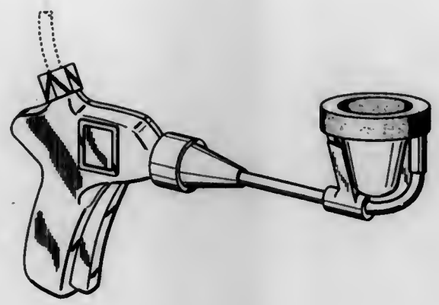
367,739
**HORSESHOE**
Alfred E. Fox, P.O. Box 231, Newton, Mass. 02161, and James B. Boulton, 16 Kingsview Rd., Marlborough, Mass. 01752
Filed Sep. 22, 1989, Ser. No. 410,964
Term of patent 14 years
U.S. Cl. D30—148



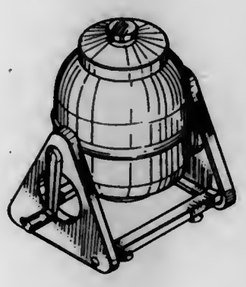
367,740
**CHEW TOY FOR DOGS**
Anthony O'Rourke, Malibu, and Charles Byrne, Mammoth Lakes, both of Calif., assignors to Booda Products, Inc., Gardena, Calif.
Continuation of Ser. No. 9,916, Jun. 24, 1993, abandoned, and a continuation-in-part of Ser. No. 2,042, Nov. 24, 1992, Pat. No. Des. 348,547. This application Aug. 20, 1993, Ser. No. 12,067
Term of patent 14 years
U.S. Cl. D30—160



367,741
**BOVINE TEAT SANITIZER**
Ronald A. Boudreau, 3421 Dragoo Park Dr., Modesto, Calif. 95350
Filed May 26, 1994, Ser. No. 23,575
Term of patent 14 years
U.S. Cl. D30—199

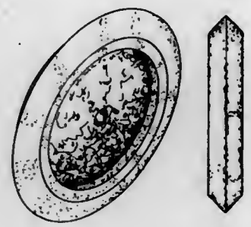


367,742
**WASHING MACHINE**
Elazar Benenson, Mesa, Ariz., assignor to Wonderwash Corp., Mesa, Ariz.
Filed Oct. 13, 1994, Ser. No. 29,671
Term of patent 14 years
U.S. Cl. D32—13





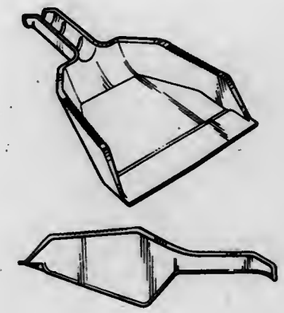
367,743
**FOAM POLISHING PAD**
Aaron C. Krause, and Saul Denenberg, both of 211 Belmont Ave., Bala Cynwyd, Pa. 19004
Filed Feb. 10, 1995, Ser. No. 34,734
Term of patent 14 years
U.S. Cl. D32—35



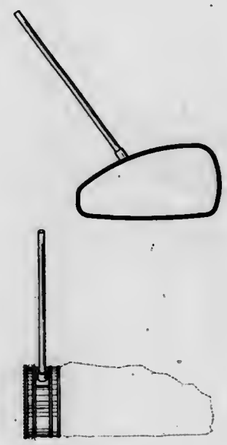
367,744
**SOCK CLIP**
Christopher D. White, 1027 N. Pacific Coast F wy. #5, Laguna Beach, Calif. 92601
Filed Jan. 13, 1995, Ser. No. 33,473
Term of patent 14 years
U.S. Cl. D32—61



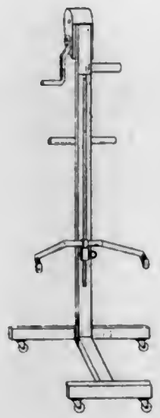
367,745
**DUST PAN**
Alan B. Feldman, Salem, Va., and David B. Joyner, Farmville, N.C., assignors to Rubbermaid Cleaning Products Inc., Greenville, N.C.
Filed Jan. 13, 1995, Ser. No. 33,489
Term of patent 14 years
U.S. Cl. D32—74



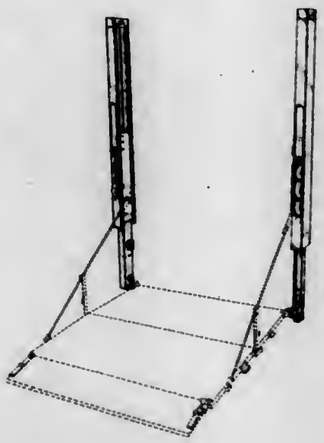
367,746
**HAND HELD BAGGER**
Robert J. Walker, Jr., Rte. 3 Box 814 Hurst Rd., Callahan, Fla. 32011
Continuation of Ser. No. 4,105, Jan. 27, 1993, abandoned. This application Jun. 21, 1994, Ser. No. 24,781
Term of patent 14 years
U.S. Cl. D34—5



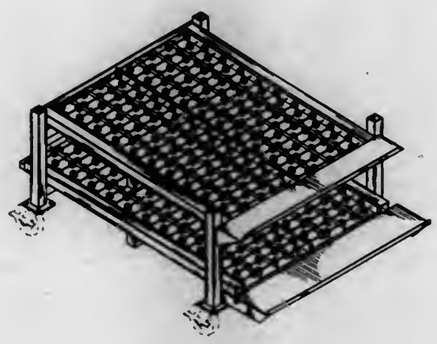
367,747
**THIRTY QUART INSTITUTIONAL MIXER BOWL HOIST**
Berta Poskocil, 903 Pineknot La., and Elmer Redwine, 920 Cooterneck Rd., both of Heber Springs, Ark. 72543
Filed Apr. 18, 1994, Ser. No. 21,449
Term of patent 14 years
U.S. Cl. D34—28



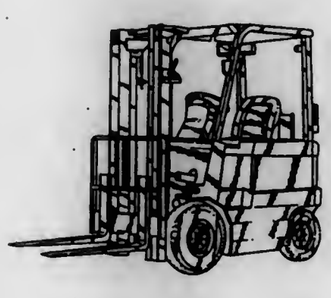
367,748
**SET OF COLUMNAR POWER ASSEMBLIES FOR A LOAD ELEVATOR**
Larry Lugash, Los Angeles, Calif., assignor to Tatcom, Inc., Huntington Park, Calif.
Filed May 16, 1994, Ser. No. 22,981
Term of patent 14 years
U.S. Cl. D34—28



367,749
**SUPPLY RACK**
Louis A. Gibbons, Advance, and John Leonard, Lexington, both of N.C., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.
Filed Dec. 5, 1994, Ser. No. 31,717
Term of patent 14 years
U.S. Cl. D34—28



367,750
**FORK LIFT TRUCK**
Seok-Gon Choi, and Jae-Won Noh, both of Incheon, Rep. of Korea, assignors to Daewoo Heavy Industries Co., Ltd., Incheon, Rep. of Korea
Filed Jun. 27, 1994, Ser. No. 25,009
Claims priority, application Rep. of Korea, Dec. 27, 1993, 93-26734
Term of patent 14 years
U.S. Cl. D34—34



# LIST OF PATENTEES

TO WHOM

## PATENTS WERE ISSUED ON THE 5th DAY OF MARCH, 1996

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Ando, Masahiko; Yamamoto, Yoshihisa; Fukatsu, Akira; Niimi, Mamoru; Kaigawa, Masato; Oba, Hidehiro; Kimura, Hiromichi; Hojo, Yasuo; Tabata, Atsushi; and Iwatsuki, Kunihiro, to Aisin AW Co., Ltd.; and Toyota Jidosha Kabushiki Kaisha. Control system for automatic transmission. 5,496,230, Cl. 477-111.000.

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Viratelle, Henri; and Andre, Michel, 5,496,074, Cl. 285-45.000.

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Hvilsted, Søren; Ramanujam, P. S.; and Andruzzi, Fulvio, 5,496,670, Cl. 430-56.000.

Angadjivand, Seyed A.; Jones, Marvin E.; and Meyer, Daniel E., to Minnesota Mining and Manufacturing Company. Method of charging electret filter media. 5,496,507, Cl. 264-423.000.

Anglade, Gerard: *See—*
Chabanne, Jean-Pierre; Anglade, Gerard; Blanchard, Jean-Marie; and Fourrey, Francois, 5,496,080, Cl. 292-252.000.

Annemaier, Dieter; and Graf, Robert, to Chemische Fabrik Gruenau GmbH. Composition for forming fireproof coatings and caulking and a method of use. 5,496,881, Cl. 524-443.000.

Anninos, Photios; Tsagas, Nicolaos; and Koutsikos, Panayiotis. Electronic device for treating epileptic individuals. 5,496,258, Cl. 600-13.000.

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Anspach, William E., Jr.; and del Rio, Eddy H., 5,496,219, Cl. 464-119.000.

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Lawson, David F.; Antkowiak, Thomas A.; Hall, James E.; Stayer, Mark L., Jr.; and Schreffler, John R., 5,496,940, Cl. 540-450.000.

Anton Steinecker Entwicklungs GmbH & Co.: *See—*
Walla, Günter; and Redl, Simon, 5,496,505, Cl. 261-76.000.

Antonetti, Pierre. Transfusion and perfusion device for drip and/or emergency intervention. 5,496,303, Cl. 604-410.000.

Antonov, Georgi O.: *See—*
Batalianets, Valeri V.; and Antonov, Georgi O., 5,495,929, Cl. 194-207.000.

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Sato, Koichi; and Aoki, Harumi, 5,497,238, Cl. 358-310.000.

Aoki, Norihiro: *See—*
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Aono, Takashi; Sugiyama, Kayoko; and Iijima, Masayuki, to Dai Nippon Printing Co., Ltd. Charge carrier medium and reproduction of electrostatic latent image. 5,497,179, Cl. 347-112.000.

Aoshima, Masashi: *See—*
Kitagawa, Yoshihiko; Jinno, Tadashi; Aoshima, Masashi; Okita, Taisuke; Shinonaga, Hideo; and Kitadono, Kaoru, 5,496,863, Cl. 521-50.500.

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Nagao, Hiromasa; Yoneya, Takashi; Miyake, Toshio; Aoyama, Atsuo; Kai, Ken-ichi; Kidokoro, Shun-ichi; Miki, Yoichiro; Endo, Kimiko; and Wada, Akiyoshi, 5,496,710, Cl. 435-68.100.

Aoyama, Kaori; and Yoshimizu, Toshiyuki, to Sharp Kabushiki Kaisha. Normally black mode liquid crystal display apparatus having liquid crystal cell of the first minimum design. 5,497,256, Cl. 359-73.000.

Apple Computer, Inc.: *See—*
Anderson, Eric C., 5,496,106, Cl. 348-255.000.
Miller, Gavin S. P., 5,497,436, Cl. 382-298.000.
Tysen, Atticus N.; Sidhu, Gursharan; Chang, C. Victor; and Calamera, Pablo, 5,497,422, Cl. 380-25.000.

Applebee, Michael A.: *See—*
Henry, Rassem R.; and Applebee, Michael A., 5,497,324, Cl. 364-424.050.

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Dill, Michael; and Mueller, Mark, 5,496,455, Cl. 204-192.120.

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Fodor, Mark A.; Bercaw, Craig; and Dornfest, Charles, 5,496,142, Cl. 411-544.000.
Uritsky, Yuri S.; and Lee, Harry Q., 5,497,007, Cl. 250-491.100.

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Sackier, Jonathan M.; Jones, Michael L.; and Dolendo, Edward E., 5,496,333, Cl. 606-142.000.
Vandenbroek, Frans; and Tangherlini, Vincent C., 5,496,280, Cl. 604-167.000.

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Bratton, Wesley L.; and Bianchi, J. Christopher, 5,497,091, Cl. 324-348.000.

Apps, William P.; and Kalin, Jonathan A., to Rehrig Pacific Company, Inc. Low depth nestable tray for bottles or the like. 5,495,945, Cl. 206-519.000.

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Knickerbocker, Michael G., 5,495,965, Cl. 222-464.100.

Arachnid, Inc.: *See—*
Zammuto, Samuel N., 5,496,039, Cl. 273-368.000.

Arai, Kenji; Seto, Yoshihiro; and Sugaya, Fumio, to Fuji Photo Film Co., Ltd. Incubator. 5,496,518, Cl. 422-64.000.

Arai, Seiji: *See—*
Ishikawa, Masaaki; Arai, Seiji; and Iguchi, Michihisa, 5,497,224, Cl. 355-301.000.

Araki, Yoshiyuki: *See—*
Saito, Taizo; Nakano, Nobuaki; Watanabe, Hiroto; Ohno, Toshihisa; and Araki, Yoshiyuki, 5,497,184, Cl. 347-257.000.

ARCO Chemical Technology, L.P.: *See—*
Critchfield, Frank E.; Simroth, Donald W.; and Watson, Stuart L., 5,496,894, Cl. 525-53.000.

Arduino, Arduini, to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A. Use of L-carnitine and alkanoyl L-carnitines in the storage of blood for transfusions and stabilizing solutions containing them. 5,496,821, Cl. 514-228.800.

Arens, Joachim: *See—*
Adrian, Willy; Arens, Joachim; and Wente, Gerald, 5,496,086, Cl. 294-65.000.

Aretz, Peter J.: *See—*
Hettinga, Siebolt; and Aretz, Peter J., 5,496,508, Cl. 264-37.000.

Arima, Tadao; and Okamura, Koji, to Fujitsu Limited. Method of manufacturing an optical module for wavelength division multiplex optical transmission with regulation of the coupling ratio and coupling length. 5,496,390, Cl. 65-378.000.

Aritake, Hirokazu; Kato, Masayuki; Ishimoto, Manabu; Sato, Noriko; and Nakashima, Masato, to Fujitsu Limited. Stereoscopic display apparatus. 5,497,189, Cl. 348-51.000.

Aritake, Hirokazu: *See—*
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Arms, Steven W.; and Townsend, Christopher P., to MicroStrain, Company. Differential variable reluctance transducer. 5,497,147, Cl. 340-870.350.

Armstroag, Jay J., to American Home Products Corporation. Method of treating cardiac inflammatory disease. 5,496,832, Cl. 514-291.000.

Arnold, James K.; and Schumacher, Paul R., to Lockheed Corporation. Crane assembly. 5,495,956, Cl. 212-331.000.

Arnold, John E. S.; and Adams, Carl, to J.E.S. Arnold (Domestic Appliances) Limited. Outer decorative door assembly for domestic appliances. 5,496,104, Cl. 312-204.000.

Aro Corporation, The: *See—*
Meloche, Joseph L.; and Smith, Jeffery W., 5,495,871, Cl. 137-884.000.

Arora, Arvind S.: *See—*
Thorne, Joseph F.; Arora, Arvind S.; and Vinggaard, Niels, 5,497,383, Cl. 371-43.000.

Arrondel, Véronique: *See—*
Weill, Jérome; Capogna, Laure; Arrondel, Véronique; and Boumendil, Jean-Jack, 5,496,524, Cl. 422-199.000.

Artistic Glass Products Company: *See—*
Bolton, Nelson; and Smith, W. Novis, 5,496,640, Cl. 428-421.000.

Asada, Ryoji; and Sekimoto, Kunio, to Matsushita Electric Industrial Co., Ltd. Apparatus for processing progressive scanning video signal comprising progressive to interlaced signal converter and interlaced to progressive signal converter. 5,497,199, Cl. 348-446.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Abe, Nobuaki, 5,497,246, Cl. 358-426.000.
Saito, Taizo; Nakano, Nobuaki; Watanabe, Hiroto; Ohno, Toshihisa; and Araki, Yoshiyuki, 5,497,184, Cl. 347-257.000.
Sato, Koichi; and Aoki, Harumi, 5,497,238, Cl. 358-310.000.
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Asahi Kogyosha Co., Ltd.: *See—*
Shibuya, Akira; Hattori, Kazuo; and Ozeki, Masashi, 5,497,024, Cl. 257-410.000.

Asaka, Yoshihiro: *See—*
Yamamoto, Akira; Homma, Shigeo; Asaka, Yoshihiro; Kuwahara, Yoshiaki; Kurano, Akira; Nozawa, Masafumi; and Kitajima, Hiroyuki, 5,497,472, Cl. 395-427.000.

Asakura, Sotoo; Koyama, Yasuto; Kiyota, Youhei; Akashi, Kiyoko; Kagayama, Akira; Murakami, Yoshio; and Nakase, Toshiomi, to Fujisawa Pharmaceutical Co., Ltd. Suspendible composition and process for preparing the same. 5,496,564, Cl. 424-489.000.

Asami, Fumitaka: *See—*
Shimozono, Motoki; Udo, Shinya; and Asami, Fumitaka, 5,497,114, Cl. 327-202.000.

Asami, Osamu: *See—*
Yamada, Yukio; Asami, Osamu; Sugiyama, Hidehiko; Idekoba, Chie; Hoshino, Fumihiko; Hirai, Masana; Kajino, Tsutomu; Imaeda, Takao; and Sarai, Kiyoko, 5,496,719, Cl. 435-233.000.

Asanae, Masumi: *See—*
Saitoh, Tsutomu; and Asanae, Masumi, 5,496,673, Cl. 430-106.600.

Asano, Junichi, to Sony Corporation. Method of and apparatus for optically shaping photo-setting resin. 5,496,683, Cl. 430-269.000.

Ascent Technologies Group, Inc.: *See—*
Fuller, Hadwen C., II; Bell, Anthony H. G.; Biedermann, Lutz; and Rodgers, David M., 5,496,263, Cl. 602-27.000.

Asgaralli, Aslim A.: *See—*
Hawrylko, Roman B.; Lakstigala, Karl; and Asgaralli, Aslim A., 5,496,630, Cl. 428-328.000.

Ashland Oil Company: *See—*
Ward, Irl E.; and Michelotti, Francis W., 5,496,491, Cl. 252-153.000.

Askenbom, Annelie: *See—*
Bostrom, Peter; Askenbom, Annelie; and Gottberg-Klingskog, Eva, 5,496,908, Cl. 528-74.500.

Askin, David; Eng, Kan K.; and Volante, Ralph P., to Merck & Co., Inc. Process for making HIV protease inhibitors. 5,496,948, Cl. 544-368.000.

Aso, Takashi, to Canon Kabushiki Kaisha. Speech information processing method and apparatus connectable to a public line. 5,497,446, Cl. 395-2.100.

Assaf-Biran, Yonit: *See—*
Becker, Yigal; Assaf-Biran, Yonit; and Shvo, Youval, 5,496,955, Cl. 548-334.500.

Astropower, Inc.: *See—*
Hall, Robert B.; Barnett, Allen M.; Collins, Sandra R.; Checchi, Joseph C.; Ford, David H.; Kendall, Christopher L.; Lampo, Steven M.; and Rand, James A., 5,496,416, Cl. 136-258.000.

Asulab S.A.: *See—*
Teres, Yvan; and Klappert, Rolf, 5,497,171, Cl. 345-43.000.

AT&T Corp.: *See—*
Luryi, Serge, 5,496,743, Cl. 437-31.000.

AT&T Global Information Solutions Company: *See—*
Crafts, Harold S., 5,497,027, Cl. 257-528.000.

Atanasyan, Alain A.; and Guipaud, Serge C., to Siemens Automotive S.A. Method and device for detection of ignition failures in an internal combustion engine cylinder. 5,495,757, Cl. 73-35.060.

Atkins, Ernest E.: *See—*
Zabron, Florian S.; Rice, David K.; and Atkins, Ernest E., 5,495,935, Cl. 198-847.000.

Atochem: *See—*
Jacquemin, Jean-Pierre; and Deleens, Gerard, 5,496,876, Cl. 524-155.000.

Atwood, Gregory E.: *See—*
Tedrow, Kerry D.; Keeney, Stephen N.; Fazio, Albert; Atwood, Gregory E.; Javanifard, Johnny; and Woiciechowski, Kenneth, 5,497,119, Cl. 327-540.000.

Audi AG: *See—*
Paul, Michael; Hubschle, Peter; and Hannibal, Wilhelm, 5,495,831, Cl. 123-90.160.

Augst, George W.; and Liberda, Margo A., to Minnesota Mining and Manufacturing Company. Perforated roll of nonwoven surgical tape. 5,496,605, Cl. 428-43.000.

Augst, Rudolf: *See—*
Bareis, Alfred; Abt, Wilfried; Augst, Rudolf; Czapka, Robert; and Pfisterer, Horst, 5,496,124, Cl. 403-15.000.

Aumueller, Alexander; and Trauth, Hubert, to BASF Aktiengesellschaft. Amino compounds as processing stabilizers for thermoplastic materials. 5,496,877, Cl. 524-246.000.

Ausimont S.p.A.: *See—*
Burzio, Fulvio; and Beck, Roland, 5,496,494, Cl. 252-174.170.

Australian Nuclear Science & Technology Organisation: *See—*
Jackson, Timothy W.; Kojima, Masaharu; and Lambrecht, Richard M., 5,496,533, Cl. 424-1.650.

Auto-Shade, Inc.: *See—*
Shikler, Arie, 5,495,884, Cl. 160-120.000.

Automatic Terminal Information Systems, Inc.: *See—*
Allen, Charles R.; and Spaw, Robert L., 5,497,332, Cl. 364-483.000.

Automotive Systems Laboratory, Inc.: *See—*
Behr, Leonard W., 5,496,979, Cl. 200-61.45M.

Avdalovic, Nebojsa: *See—*
Pfost, Robert F.; and Avdalovic, Nebojsa, 5,496,517, Cl. 422-63.000.

Avery Dennison Corporation: *See—*
Deschenes, Charles L.; Jones, Terence J.; and Cooper, William J., 5,495,974, Cl. 227-71.000.

Aviv, Haim; Friedman, Doron; Bar-Ilan, Amir; and Vered, Micha, to Pharmos Corp. Submicron emulsions as ocular drug delivery vehicles. 5,496,811, Cl. 514-78.000.

AVL Medical Instruments AG: *See—*
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Awai, Takashi: *See—*
Yoshida, Takehiro; Terajima, Hisao; Wada, Satoshi; Ono, Takeshi; Kobayashi, Makoto; Ishida, Yasushi; Tomoda, Akihiro; Yokoyama, Minoru; and Awai, Takashi, 5,497,183, Cl. 347-215.000.

Aware, Inc.: *See—*
Tzannes, Michael A.; and Tzannes, Marcos C., 5,497,398, Cl. 375-260.000.

Aydin, Oral; Portugall, Michael; Neutzner, Josef; and Maechtle, Walter, to BASP Aktiengesellschaft. Aqueous polymer dispersion. 5,496,882, Cl. 524-458.000.

Aylsworth, Alonzo C.; and Miller, Gregory R., to Nellcar Puritan Bennett. Monitoring system for delivery of therapeutic gas. 5,495,848, Cl. 128-207.180.

Azyenberg, Mark: *See—*
Griffen, Neil; and Azyenberg, Mark, 5,495,758, Cl. 73-493.000.

Babish, John G.; El-Tom, Sakina; Ma, Xinfang; and Wheelock, Goeffrey, to Cornell Research Foundation, Inc. Indirect immmunoassay for dioxinlike compounds. 5,496,703, Cl. 435-7.210.

Bachmair, Andreas; Finley, Daniel; and Varshavsky, Alexander, to Massachusetts Institute of Technology. Methods of generating desired amino-terminal residues in proteins. 5,496,721, Cl. 435-240.200.

Bacigalupo, Nelson A., to NTN Technical Center (U.S.A.), Inc. Increased retention forces in steel interference FIT assemblies and methods to increase the retention forces. 5,496,646, Cl. 428-472.200.

Back, Dong-cherl, to Samsung Electronics Co., Ltd. Television receiver having video accompaniment functions. 5,496,178, Cl. 434-307.00A.

Badaroux, Thierry: *See—*
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Bae, Sang I.: *See—*
Bae, Tae H.; Bae, Sang Y.; and Bae, Sang I., 5,497,307, Cl. 362-104.000.

Bae, Sang Y.: *See—*
Bae, Tae H.; Bae, Sang Y.; and Bae, Sang I., 5,497,307, Cl. 362-104.000.

Bae, Tae H.; Bae, Sang Y.; and Bae, Sang I. Illuminating jewelry. 5,497,307, Cl. 362-104.000.

Bae, Youn-Kyu: *See—*
Lee, Kyung-Ho; Bae, Youn-Kyu; Pyun, Kwang-Eui; and Kim, Kyung-Soo, 5,496,779, Cl. 437-40.000.

Baehne, James R.: *See—*
Kilmer, Callen S.; and Baehne, James R., 5,497,297, Cl. 361-737.000.

Bagnall, Arthur P., to Spencer Wright Industries, Inc. Tufting machine hook drive. 5,495,815, Cl. 112-80.500.

Bagrodia, Shriram; Phillips, Bobby M.; and Haile, William A., to Eastman Chemical Company. Composite fibrous filters. 5,496,627, Cl. 428-284.000.





Bahl, Lalit R.; Gopalakrishnan, Ponani S.; and Picheny, Michael A., to International Business Machines Corporation. Speech coding apparatus having acoustic prototype vectors generated by tying to elementary models and clustering around reference vectors. 5,497,447, Cl. 395-2.540.

Bailey, Warren D.; Dixon, Erik L.; Ferris, Michele M.; Garrett, Henry M.; Paussa, Gregory F.; and Walker, Anthony D., to International Business Machines Corporation. System and method for determining network connectivity. 5,497,460, Cl. 395-183.150.

Baker Hughes Incorporated: *See—*
Beall, Clifford H.; Rawson, Michael S.; and Hickey, Kurt A., 5,496,044, Cl. 277-1.000.
Pastusek, Paul E.; and Matson, Steve R., 5,495,899, Cl. 175-57.000.

Baker, Reymond; Ladduwahetty, Tamara; Seward, Eileen M.; and Swain, Christopher J., to Merck Sharp & Dohme Limited. Piperidine tachykinin receptor antagonists. 5,496,833, Cl. 514-326.000.

Baker, Rhonda. Motorized hand held scrubber. 5,495,632, Cl. 15-4.000.

Baliga, Shankar; and Rullman, George, to Servo Corporation of America. Pyroelectric crystal element and array mounting method. 5,497,002, Cl. 250-338.300.

Baliga, Shankar B.; and Rullman, George, to Servo Corporation Of America. Pyroelectric detector array with optical filter elements. 5,497,003, Cl. 250-338.300.

Ball, Keith R.; Cahill, Timothy J.; Ellis, Robert P.; Sorenson, Charles W.; and Petersen, Carl M., III, to TRW Vehicle Safety Systems Inc. Inertia sensitive buckle for seat belt pretensioner system. 5,496,068, Cl. 280-806.000.

Ballman, Joseph C.: *See—*
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Balyasny, Marik, to ITT Corporation. Flexible interface IC test clip. 5,497,104, Cl. 324-755.000.

Bambury, Ronald E.: *See—*
Lai, Yu-Chin; and Bambury, Ronald E., 5,496,871, Cl. 523-107.000.

Bange, Donna W.: *See—*
Broberg, David E.; and Bange, Donna W., 5,496,386, Cl. 51-295.000.

Banker, Robert O.; and Yothment, Steven R., to Scientific-Atlanta, Inc. In-band/out-of-band data transmission method and apparatus for a television system. 5,497,187, Cl. 348-6.000.

Bannister, Graham D.: *See—*
Steer, Peter L.; Bannister, Graham D.; and Barrett, Howard, 5,495,858, Cl. 128-885.000.

Banting, John F., to Cooper Industries, Inc. Faulted circuit indictor with three-dimensional display device. 5,497,096, Cl. 324-555.000.

Banyu Pharmaceutical Co., Ltd.: *See—*
Ishikawa, Kiyofumi; Fukami, Takehiro; Hayama, Takashi; Niiyama, Kenji; Nagase, Toshic; Mase, Toshiaki; Fujita, Kagari; Ihara, Masaki; Ikemoto, Fumihiko; Yano, Mitsuo; and Nishikibe, Masaru, 5,496,928, Cl. 530-331.000.

Bara, Isabelle: *See—*
Mellul, Myriam; Lecomte, Sophie; Bara, Isabelle; and DeFossez, Béatrice, 5,496,544, Cl. 424-78.030.

Bareis, Alfred; Abt, Wilfried; Augst, Rudolf; Czapka, Robert; and Pfisterer, Horst, to L. Schuler GmbH. Tensioning assembly. 5,496,124, Cl. 403-15.000.

Bargiotti, Alberto; Caruso, Michele; Faiardi, Daniela; Suarato, Antonino; and Mongelli, Nicola, to Farmitalia Carlo Erba S.R.L. Mono and bis alkylamino-anthracyclines. 5,496,808, Cl. 514-34.000.

Bar-Ilan, Amir: *See—*
Aviv, Haim; Friedman, Doron; Bar-Ilan, Amir; and Vered, Micha, 5,496,811, Cl. 514-78.000.

Barito, Thomas R.; and Keiling, Cheryl M., to Carrier Corporation. Drive for scroll compressor. 5,496,158, Cl. 418-55.500.

Barito, Thomas R.: *See—*
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Barlow, Desmond T., to Csir & Sasol Mining Proprietary Ltd. Operating a continuous miner. 5,496,093, Cl. 299-1.100.

Barnes, David B.: *See—*
Luallin, John M.; Wisler, Jan A.; Ballman, Joseph C.; and Barnes, David B., 5,497,298, Cl. 362-61.000.

Barnes International, Inc.: *See—*
Lenhart, Thomas W., 5,496,470, Cl. 210-222.000.

Barnes, Kenneth F.; and Kong, Hongzhi, to Honeywell Inc. Photoelectric device with capability to change threshold levels in response to changing light intensities. 5,496,996, Cl. 250-223.00B.

Barnes, Milton F., to Zimmer, Inc. Proximal body milling apparatus. 5,496,324, Cl. 606-79.000.

Barnett, Allen M.: *See—*
Hall, Robert B.; Barnett, Allen M.; Collins, Sandra R.; Checchi, Joseph C.; Ford, David H.; Kendall, Christopher L.; Lampo, Steven M.; and Rand, James A., 5,496,416, Cl. 136-258.000.

Barnham, Keith, to Imperial College of Science, Technology and Medicine. Concentrator solar cell having a multi-quantum well system in the depletion region of the cell. 5,496,415, Cl. 136-255.000.

Barr, Bryan M.: *See—*
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Barrel Racking Systems, Inc.: *See—*
Taube, Donald R., 5,496,147, Cl. 414-607.000.

Barrett, David W.: *See—*
Peruggi, Richard E.; McHugh, Thomas M.; Ahigian, Edward E.; Jaminet, Jerome F.; He, Thomas; Kowalczyk, Thomas M.; Kulak, Richard E.; and Barrett, David W., 5,495,918, Cl. 187-316.000.

Barrett, Howard: *See—*
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Barrs, John A.: *See—*
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Barrskogen, Inc.: *See—*
Chow, Flora, 5,496,473, Cl. 210-635.000.

Bartholomew, Dale L., to Bell Atlantic Network Services, Inc. Telephone system processing of designated caller ID private calls. 5,497,414, Cl. 379-142.000.

Bartiromo, Carmine: *See—*
Semple, Harry K.; and Bartiromo, Carmine, 5,495,664, Cl. 29-823.000.

Bartlett, Keith R.; Jenkins, Robert F.; Buss, Christopher; Martin, Timothy J.; Gerber, Andre; and Colarusso, Peter C., to W. R. Grace & Co.-Conn. Waterproofing membrane. 5,496,615, Cl. 428-144.000.

Bartmann, Ekkehard: *See—*
Poetsch, Eike; Meyer, Volker; Stahl, Klaus P.; Reiffenrath, Volker; Finkenzeller, Ulrich; Bartmann, Ekkehard; Hittich, Reinhard; Coates, David; Greenfield, Simon; Smith, Graham; Kurmeier, Hans A.; and Dorsch, Dieter, 5,496,499, Cl. 252-299.660.

Bartos, Andrew L.: *See—*
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BASF Aktiengesellschaft: *See—*
Adel, Joerg; Mronga, Norbert; and Czech, Erwin, 5,496,674, Cl. 430-106.600.
Aumueller, Alexander; and Trauth, Hubert, 5,496,877, Cl. 524-246.000.
Aydin, Oral; Portugall, Michael; Neutzner, Josef; and Maechtle, Walter, 5,496,882, Cl. 524-458.000.
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Dugan, Jeffrey S., 5,496,149, Cl. 415-90.000.

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Alfons, Jung W., 5,496,896, Cl. 525-74.000.

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Gaedcke, Harald; Etzrodt, Guenter; and Liedek, Egon, 5,496,403, Cl. 106-400.000.

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Albelda, David; Moshe, Kafri; and Bat-Genstein, Christian, 5,496,172, Cl. 433-120.000.

Batscher, Robert K. Personal exercise device. 5,496,248, Cl. 482-146.000.

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Wilson, Bary W.; Campbell, James A ; Sasser, Lyle B.; and Hortal, Patricio, 5,496,553, Cl. 424-195.100.

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Bausch & Lomb Incorporated: *See*—
Lai, Yu-Chin; and Bambury, Ronald E., 5,496,871, Cl. 523-107.000.

Baxter International Inc.: *See*—
Cosgrove, Delos M.; and Nguyen, Than, 5,496,336, Cl. 606-148.000.
Dudar, Thomas E.; and Graham, Peter, 5,495,855, Cl. 128-763.000.
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Herrmann, Udo; Oppermann, Günter; Penners, Günther; Flindt, Roland; and Steinbach, Hans-Horst, 5,496,483, Cl. 252-73.000.

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Andree, Roland; Dollinger, Markus; and Santel, Hans-Joachim, 5,496,793, Cl. 504-273.000.
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Bayer Corporation: *See*—
Campos, Margot; Franke, Guenter; and Greene, Michael J., 5,496,405, Cl. 106-495.000.
Farrell, Gregory A.; Hanmann, Kevin J.; Schmitz, Peter; Behringer, Bruce E.; and Mawhirt, James A., 5,496,009, Cl. 251-61.100.

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Rowley, David R., 5,496,800, Cl. 514-12.000.

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Beak, Soon K., to Samsung Electronics Co., Ltd. Connecting device of data cable. 5,496,185, Cl. 439-95.000.

Beakes, John M.; and Newman, Lawrence E., to Globe Products Inc. Stator manufacturing apparatus. 5,495,659, Cl. 29-736.000.

Beall, Clifford H.; Rawson, Michael S.; and Hickey, Kurt A., to Baker Hughes Incorporated. Annular chamber seal. 5,496,044, Cl. 277-1.000.

Bear, John F.: *See*—
Hein, Edward R.; Hudack, Gerald D.; Bear, John F.; and Cronrath, Scott J., 5,496,658, Cl. 429-93.000.

Beardsley, Brent C.; Micka, William F.; and Novick, Yoram, to International Business Machines Corporation. Method and system for track transfer control during concurrent copy operations in a data processing storage subsystem. 5,497,483, Cl. 395-575.000.

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Beaty, Ronald E.: *See*—
Gallagher, James E.; Beaty, Ronald E.; and Lanasa, Paul J., 5,495,872, Cl. 138-44.000.

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Stephany, Joseph F.; Becerra, Juan J.; Courtney, Thomas P.; Kneezel, Gary A.; LaDonna, Richard V.; John, Peter J.; Watrobski, Thomas E.; and Wysocki, Joseph J., 5,497,174, Cl. 347-13.000.

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Beck, Roland: *See*—
Burzio, Fulvio; and Beck, Roland, 5,496,494, Cl. 252-174.170.

Beck, Rudolf; Krause, Frank; and Schoenkaes, Udo, to Chemische Fabrik Stockhausen GmbH. Detergent formulations free of phosphates, zeolites and crystalline layered silicates. 5,496,495, Cl. 252-174.230.

Becker, Willi; and Döpke, Stefan, to Heidelberber Druckmaschinen AG. Leading edge stop for aligning paper sheets on a feeder table. 5,496,023, Cl. 271-245.000.

Becker, Yigal; Assaf-Biran, Yonit; and Shvo, Youval, to Bromine Compounds Limited. Preparation of D-histidine and derivatives thereof from L-histidine. 5,496,955, Cl. 548-334.500.

Beckman Instruments, Inc.: *See*—
Chang, Kuo-Yen, 5,496,255, Cl. 494-20.000.
Pfost, Robert F.; and Avdalovic, Nebojsa, 5,496,517, Cl. 422-63.000.

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Graves, Arlinda; Sweeney, Niall; and Szabo, Sandor, 5,496,274, Cl. 604-86.000.
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Behling, Rolf, to U.S. Philips Corporation. X-ray source comprising a temperature sensor. 5,497,410, Cl. 378-202.000.

Behr, Leonard W., to Automotive Systems Laboratory, Inc. Accelerometer with optical switch. 5,496,979, Cl. 200-61.45M.

Behrens, William H.: *See*—
Norton, John P., Jr.; and Behrens, William H., 5,497,356, Cl. 367-6.000.

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Beiersdorf Aktiengesellschaft: *See*—
Heinze, Friedrich; and Clasen, Martina, 5,496,565, Cl. 424-502.000.

Beisel, Hermann; Blaser, Peter T.; Hauck, Dieter; Hutzenlaub, Rudolf; Jäger, Helmut; Jahn, Hans-Georg; Müller, Robert; Rodi, Anton; and Spiegel, Nikolaus, to Heidelberger Druckmaschinen AG. Device for supplying printing plates to a printing machine. 5,495,805, Cl. 101-477.000.

Beisswanger, Rudolf; and Kustermann, Martin, to J. M. Voith GmbH. Coating device having infrared and suspension drying sections. 5,496,406, Cl. 118-643.000.

Bell, Anthony H. G.: *See*—
Fuller, Hadwen C., II; Bell, Anthony H. G.; Biedermann, Lutz; and Rodgers, David M., 5,496,263, Cl. 602-27.000.

Bell Atlantic Network Services, Inc.: *See*—
Bartholomew, Dale L., 5,497,414, Cl. 379-142.000.

Bell Canada International Inc.: *See*—
Koohgoli, Mahshad; Cohn-Sfetcu, Sorin; and Lockton, John D., 5,497,505, Cl. 455-34.100.

Bell, Cecil R., to Monarch Knitting Machinery Corporation. Inspecting and grading apparatus for hosiery and method of inspecting same. 5,497,235, Cl. 356-430.000.

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Kelton, Arden A.; Bell, Michael L.; and Chung, Roy A., 5,496,520, Cl. 422-64.000.

Bellande, Emmanuel: *See*—
Pasqualini, Roberto; Bellande, Emmanuel; Comazzi, Véronique; and Lainé, Jacques, 5,496,929, Cl. 534-10.000.

Bellet, Dominique: *See*—
Bidart, Jean-Michel; Bellet, Dominique; and Bohuon, Claude, 5,496,551, Cl. 424-185.100.

Bellio, Stephen L.; Bernardon, Edward; Condon, Mark J.; Flory, Robert S.; Fyler, Donald C.; Hansberry, Mitchell L.; Lee, Tommy W.; and Mueller, James F., to Charles Stark Draper Laboratory, Inc., The. Method and apparatus for automated handling of cut material. 5,496,021, Cl. 271-18.300.

BellSouth Corporation: *See*—
Hightower, Neale C.; and O'Neil, Douglas R., 5,496,966, Cl. 174-35.0MS.

Beloit Technologies, Inc.: *See*—
Deshpande, Rajendra D.; and Pulkowski, Jeffrey H., 5,495,679, Cl. 34-117.000.

Ben-David, Ilan, to Scitex Corporation Ltd. Internal drum plotter with multiple focal point holographic optical element. 5,497,252, Cl. 359-17.000.

Benedict, William F.: *See*—
Xu, Hong-Ji; Hu, Shi-Xue; and Benedict, William F., 5,496,731, Cl. 435-320.100.

Bennett, Thomas B., III: *See*—
Mullet, Willis J.; Mitchell, Albert W.; and Bennett, Thomas B., III, 5,495,640, Cl. 16-97.000.

Benning, Michael A.; and Miller, Stephen B., to Scott Specialty Gases, Inc. System for continuous blending of a liquid into a gas. 5,495,875, Cl. 141-83.000.

Benoit, Sylvain: *See*—
Bidaud, Francis; Benoit, Sylvain; Plisson, Jacques; Rilly, Gérard; Morizot, Gérard; and Roth, Harald, 5,497,313, Cl. 363-125.000.

Benteler Industries, Inc.: *See*—
Butkiewicz, Steven J.; Carrier, Samuel H.; Fellows, Donald L., Jr.; Hill, Frederick B., Jr.; Mattson, Earl W.; and Scofield, Terrence L., 5,495,873, Cl. 138-114.000.

Beppu, Masaaki: *See*—
Mori, Seiki; Ohtoh, Yasutoshi; and Beppu, Masaaki, 5,496,463, Cl. 205-109.000.

Bercaw, Craig: *See*—
Fodor, Mark A.; Bercaw, Craig; and Dornfest, Charles, 5,496,142, Cl. 411-544.000.

Bergemont, Albert M.; and Wolstenholme, Graham R., to National Semiconductor Corporation. Method for preventing bit line-to-bit line leakage in the access transistor region of an AMG EPROM. 5,496,754, Cl. 437-43.000.

Berger, Abe: *See*—
Fost, Dennis L.; and Berger, Abe, 5,496,478, Cl. 252-33.600.

Berger, Marc A., to Image Compression Technology Ltd. Apparatus and method for encoding and decoding digital signals. 5,497,435, Cl. 382-249.000.

Bergeron, Raymond J., to University of Florida Research Foundation, Inc. Anti-neoplastic anti-viral and ribonucleotide reductase activity affecting pharmaceutical compositions and methods of treatment. 5,496,837, Cl. 514-374.000.





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Bergeron, Raymond J., to University of Florida Research Foundation, Inc. Anti-neoplastic, anti-viral and ribonucleotide reductase activity affecting pharmaceutical compositions and method of treatment. 5,496,841, Cl. 514-374.000.

Bergman, Mark C. Flossing device with advancing and tensioning mechanisms. 5,495,863, Cl. 132-326.000.

Bergmann, Eva Martina: *See*—
Bergmann, Thorald, 5,496,998, Cl. 250-287.000.

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Bergstresser, William A.: *See*—
Stiehl, Mark A.; Bergstresser, William A.; and Diaz, George E., 5,496,286, Cl. 604-232.000.

Berkhouse, Linda: *See*—
Dill, James E.; and Berkhouse, Linda, 5,495,851, Cl. 128-660.030.

Berland, Kerry; Kaul, Jeff; and Budniak, Mitchell, to Cherry Corporation, The. Intelligent commutation pulse detection system to control electric D.C. motors used with automobile accessories. 5,497,326, Cl. 364-424.050.

Bernard, Jean-Jacques; Pitel, Fabrice; and Comte, Patrice, to Cegelec. Local area network with optical transmission. 5,497,259, Cl. 359-118.000.

Bernard, Jean-Jacques: *See*—
Jurek, Marie-Paule; Bernard, Jean-Jacques; and Chesnoy, José, 5,497,260, Cl. 359-130.000.

Bernard, Marc A., to ETE, Inc. Portable apparatus for providing multiple integrated communication media. 5,497,339, Cl. 364-705.050.

Bernard, Patrice H., to Societe Nationale des Chemins de fer Francais. System for transmission of information between the ground and moving objects, in particular in ground-train communications. 5,496,003, Cl. 246-29.00R.

Bernardon, Edward: *See*—
Bellio, Stephen L.; Bernardon, Edward; Condon, Mark J.; Flory, Robert S.; Fyler, Donald C.; Hansberry, Mitchell L.; Lee, Tommy W.; and Mueller, James F., 5,496,021, Cl. 271-18.300.

Bernhard Steinel Werkzeugmaschinenfabrik GmbH & Co.: *See*—
Buggle, Guenther; and Schuetz, Willi, 5,496,249, Cl. 483-41.000.

Bernstein, Jonathan J.; and Weinberg, Marc S., to Charles Stark Draper Laboratory, Inc., The. Comb drive micromechanical tuniog fork gyro fabrication method. 5,496,436, Cl. 156-628.100.

Berol Nobel AB: *See*—
Bostrom, Peter; Askenbom, Annelie; and Gottberg-Klingskog, Eva, 5,496,908, Cl. 528-74.500.

Berry, Gregory: *See*—
Mobley, Michael J.; Lukacovic, Michael F.; Padolik, Peter A.; and Berry, Gregory, 5,496,539, Cl. 424-49.000.

Bertoldi, Massimo; and Busatto, Vinicio, to Minnesota Mining and Manufacturing Company. Silver halide color photographic light-sensitive material. 5,496,692, Cl. 430-544.000.

Bertrand Faure Automobile "BFA": *See*—
Droulon, Georges, 5,496,225, Cl. 475-177.000.

Bessho, Yoshihiro: *See*—
Itagaki, Minehiro; Okano, Kazuyuki; Kimura, Suzushi; Nakatani, Seiichi; Bessho, Yoshihiro; Yuhaku, Satoru; Hakotani, Yasuhiko; and Miura, Kazuhiro, 5,496,619, Cl. 428-209.000.

Beta Phase, Inc.: *See*—
Yasumura, Gary, 5,496,182, Cl. 439-62.000.

Bettermann, Gerhard; Schimmel, Günther; and Himmrich, Johannes, to Hoechst Aktiengesellschaft. Process for the preparation of alkali metal acetates. 5,496,482, Cl. 252-70.000.

Betz, Walter: *See*—
Goetz, Walter; and Betz, Walter, 5,496,878, Cl. 524-275.000.

Beyert, Thomas: *See*—
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Bianchi, J. Christopher: *See*—
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Bianchini, Eber C.: *See*—
Mallory, William M.; and Bianchini, Eber C., 5,496,649, Cl. 428-518.000.

Biasini, Americole, to Manhasset Speciality Co. Mobile music stand cart and method. 5,495,951, Cl. 211-13.000.

Bickar, David. Solventless protein assay standard. 5,496,737, Cl. 436-86.000.

Bicking, Robert E., to Honeywell Inc. Geartooth sensor with means for selecting a threshold magnitude as a function of the average and minimum values of a signal of magnetic field strength. 5,497,084, Cl. 324-207.250.

Bidart, Jean-Michel; Bellet, Dominique; and Bohuon, Claude, to Lafon Pharma S.A. Peptide structures, immunogens containing them and their uses in the control of fertility. 5,496,551, Cl. 424-185.100.

Bidaud, Francis; Benoit, Sylvain; Plisson, Jacques; Rilly, Gérard; Morizot, Gérard; and Roth, Harald, to L'Unite Hermetique. Switching method and apparatus for increasing efficiency of an inductive load and switching means supplying the load. 5,497,313, Cl. 363-125.000.

Biedermann, Lutz: *See*—
Fuller, Hadwen C., II; Bell, Anthony H. G.; Biedermann, Lutz; and Rodgers, David M., 5,496,263, Cl. 602-27.000.

Bielefeldt, Dietmar: *See*—
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Bienaime, Patrick, to 4 P Emballages France. Closed package for objects. 5,495,943, Cl. 206-427.000.

Biewer, John A.: *See*—
Jensen, Marvin E.; and Biewer, John A., 5,496,357, Cl. 607-108.000.

Biocompatibles Limited: *See*—
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Birkle, Siegfried: *See*—
Fischer, Jürgen; Birkle, Siegfried; Elsel, Werner; Gehring, Johann; Maurer, Arnolf; and Nippe, Waldemar, 5,496,456, Cl. 204-201.000.

Bischel, Wesley T. K.; Greenslade, Joan V.; Hallett, Chester W.; and Stein, Henry G. Decorative elements for subceilings. 5,495,697, Cl. 52-311.300.

Bischoff, Michael: *See*—
Hoffmann, Rainer; Bischoff, Michael; Franz, Joachim; and Thein, Thomas, 5,496,066, Cl. 280-753.000.

Bishop, John F.; and Mauck, Linda A., to Johnson & Johnson Clinical Diagnostics, Inc. Immunoassay elements having stable leuco dye costiogs. 5,496,702, Cl. 435-7.900.

Björck, Bengt; and Carlsson, Lars, to Tetra Laval Holdings & Finance S.A. Opening arrangement and a method of producing same. 5,495,706, Cl. 53-412.000.

Björkengren, Ulf, to Plotcon HB. Compensation for crosstalk between channels of an ink jet printer. 5,497,177, Cl. 347-76.000.

Black, Teresa K.: *See*—
Over, Gary L.; Black, Teresa K.; and Shaffer, David T., 5,496,189, Cl. 439-321.000.

Blackburn, David R.: *See*—
Bush, Stephen F.; Methven, James M.; and Blackburn, David R., 5,496,873, Cl. 523-508.000.

Blackmore, Andrew, to Ceeco Machinery Manufacturing Ltd. Concentric compressed unilay stranded conductors. 5,496,969, Cl. 174-113.00R.

Blaettner, Harald E.; Uhen, Richard F.; Ellis, Robert E.; Cunningham, Eldon R.; Usher, Michael J.; and Miller, Joseph E., to General Electric Company. Vibration reduction system for an electric motor. 5,497,039, Cl. 310-51.000.

Blagdon, Peter A.; and Morgan, Robert D., to Morgan Manufacturing Co., Inc. Method for increasing the production of milk in ruminants. 5,496,571, Cl. 426-2.000.

Blain, David A.; Horodysky, Andrew G.; Poole, Ronald J.; and Wu, Shi-Ming, to Mobil Oil Corporation. Amide/ester heterocyclic derivatives of hydrocarbylsuccinic anhydrides as rust/corrosion inhibiting additives for fuels. 5,496,382, Cl. 44-331.000.

Blanchard, Cheryl; Dearnaley, Geoffrey; and Lankford, James, Jr., to Southwest Research Institute. Ion beam modification of bioactive ceramics to accelerate biointegration of said ceramics. 5,496,374, Cl. 623-16.000.

Blanchard, Jean-Marie: *See*—
Chabanne, Jean-Pierre; Anglade, Gerard; Blanchard, Jean-Marie; and Fourrey, Francois, 5,496,080, Cl. 292-252.000.

Blaser, Peter T.: *See*—
Beisel, Hermann; Blaser, Peter T.; Hauck, Dieter; Hutzenlaub, Rudolf; Jäger, Helmut; Jaha, Hans-Georg; Müller, Robert; Rodi, Anton; and Spiegel, Nikolaus, 5,495,805, Cl. 101-477.000.

Blizzard, Timothy A.; Ratcliffe, Ronald W.; Waddell, Sherman T.; Szumiloski, Sandra P.; Wilkening, Robert R.; and Wildonger, Kenneth J., to Merck & Co., Inc. Carbapenem antibacterial compounds, compositions containing such compounds and methods of treatment. 5,496,816, Cl. 514-210.000.

Block Drug Company Inc.: *See*—
Napolitano, Neil J.; Yeh, Kuo-Chen; Sena, Frank J.; Oths, Phil J.; and Roque, Manuel M., 5,496,558, Cl. 424-435.000.

Block, Randall D., to Momentum Medical Corp. Dual handled cane. 5,495,867, Cl. 135-65.000.

Blomquist, William B.: *See*—
Dawson, Gary D.; and Blomquist, William B., 5,495,749, Cl. 73-49.700.

Bloom, Leonard: *See*—
Abidin, Michael R.; and Lehmbeck, Steven P., 5,496,340, Cl. 606-167.000.

Blough-Wagner Manufacturing Co., Inc.: *See*—
Zeigler, Roger D., Sr.; and Matsko, John F., Jr., 5,495,817, Cl. 112-217.300.

Blount, Inc.: *See*—
Chesnut, M. Gaines; Sweet, Dennis D.; Ulasik, Marc A.; and Watson, James B., 5,495,676, Cl. 33-244.000.

Blumenthal, Robert N.; and Melville, Andreas T. Multiple on-line sensor systems and methods. 5,496,450, Cl. 205-782.000.

BOC Group pcl, The: *See*—
Chapman, Robert D.; and Gredley, Paul A., 5,495,813, Cl. 110-341.000.

Bock, Robert T.; and DeLuca, John P., to Sonex International Corporation. Ultrasonic bone healing device for dental application. 5,496,256, Cl. 601-2.000.

Bodley, Annette L.: *See*—

Shapiro, Theresa A.; Bodley, Annette L.; Wall, Monroe E.; and Wani, Mansukh C., 5,496,830, Cl. 514-283.000.
Boeck, LaVerne D.; Chio, Hang; Eaton, Tom E.; Godfrey, Otis W., Jr.; Michel, Karl H.; Nakatsukasa, Walter M.; and Yao, Raymond C., to DowElanco. Insecticide and miticide A83543 compounds and their method of production by fermentation. 5,496,931, Cl. 536-7.100.
Boezen, Hendrik, to U.S. Philips Corporation. Balanced voltage-to-current converter with quiescent current control. 5,497,074, Cl. 323-316.000.
Bogardus, Joseph B.: *See*—
Venkataram, Ubrani V.; Franchini, Miriam K.; and Bogardus, Joseph B., 5,496,809, Cl. 514-43.000.
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Bohuon, Claude: *See*—
Bidart, Jean-Michel; Bellet, Dominique; and Bohuon, Claude, 5,496,551, Cl. 424-185.100.
Boiko, Genrikh K.: *See*—
Labutin, Viktor N.; Mattis, Alfred R.; Shishaev, Sergei V.; Tsvetkov, Vladimir N.; Tolmachev, Alexandr V.; and Boiko, Genrikh K., 5,495,685, Cl. 37-446.000.
Boitel, Michelle: *See*—
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Boja, Joh W.: *See*—
Kuhar, Michael J.; Carroll, Frank I.; Boja, Joh W.; Lewin, Anita H.; and Abraham, Philip, 5,496,953, Cl. 546-125.000.
Bojar, James A. Adjustable pitch garden hoe tool. 5,495,896, Cl. 172-372.000.
Bolkan, Steven A.: *See*—
Falotico, Anthony J.; Bolkan, Steven A.; and Mazzola, Louis R., 5,496,376, Cl. 252-174.000.
Bolton, Nelson; and Smith, W. Novis, to Artistic Glass Products Company. Fire resistant transparent laminates. 5,496,640, Cl. 428-421.000.
Bonfilio, Ciriaco: *See*—
Röhrle, Dieter; and Bonfilio, Ciriaco, 5,496,216, Cl. 464-66.000.
Bonham, James A.; Rossman, Mitchell A.; and Grant, Richard J., to Minnesota Mining and Manufacturing Company. Halomethyl-1,3,5-triazines containing a monomeric moiety. 5,496,504, Cl. 252-600.000.
Bonutti, Peter M. Suture anchor. 5,496,348, Cl. 606-232.000.
Booher, Benjamin V., to Universal Design Research and Technology. Uniform composite friction units. 5,495,922, Cl. 188-251.00A.
Borgeson, Dale W.: *See*—
Broden, David A.; Orth, Kelly M.; Borgeson, Dale W.; Lanctot, Jane B.; and Voegele, Kevin D., 5,495,769, Cl. 73-718.000.
Bork, Steve: *See*—
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Bormann, Alan R.: *See*—
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Borzatta, Valerio; Scrima, Roberto; and Carrozza, Primo, to Ciba-Geigy Corporation. Derivatives of 2,2,6,6-tetramethyl-4-piperidinol for use as light stabilizers, heat stabilizers and oxidation stabilizers for organic materials. 5,496,875, Cl. 524-99.000.
Bosc, Dominique: *See*—
Foll, Franck; Bosc, Dominique; Liang, Julienne; Rousseau, Alain; and Boutevin, Bernard, 5,496,899, Cl. 525-327.200.
Boston Heart Foundation: *See*—
Stadler, Robert W.; Karl, W. Clem; and Lees, Robert S., 5,495,852, Cl. 128-660.070.
Boston Scientific Corporation: *See*—
Abele, John E.; and Lennox, Charles D., 5,496,311, Cl. 606-28.000.
Bates, James S.; and Tripp, Hugh A., 5,496,330, Cl. 606-127.000.
Bostrom, Peter; Askenbom, Annelie; and Gottberg-Klingskog, Eva, to Berol Nobel AB. Water-soluble polyurethane and use thereof to thicken water-based systems such as water-based paints. 5,496,908, Cl. 528-74.500.
Bott, Kaspar: *See*—
Misslitz, Ulf; Meyer, Norbert; Kast, Juergen; Bott, Kaspar; Walter, Helmut; Westphalen, Karl-Otto; Kardorff, Uwe; and Gerber, Matthias, 5,496,792, Cl. 504-100.000.
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Boudreault, James: *See*—
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Boumendil, Jean-Jack: *See*—
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Boundary Technologies, Inc.: *See*—
Liu, Yanming, 5,496,481, Cl. 252-62.200.
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Bourgeois, Ivan: *See*—
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Boutevin, Bernard: *See*—
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Boutilier, Glenn D.: *See*—
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Bowas-Induplan Chemie Ges.m.b.H.: *See*—
Schulze, Walter, 5,495,812, Cl. 110-237.000.
Bowen, Larry; and Snaidr, Stanislav M., to 1149235 Ontario Inc. Cigarette smoke filter system. 5,495,859, Cl. 131-202.000.
Boyer, Lynn L., III. Anti-missile missiles having means to "blind", and thus render ineffective, precision, seeker guided munitions. 5,495,787, Cl. 89-1.110.
Bradford, Michael P.; and Perrotta, Thomas, to United Technology Corporation. Windshield temperature control system. 5,496,989, Cl. 219-497.000.
Brahler, George R., to Brahler Products, Inc. Coupling means for the drive shaft of prophy angles. 5,496,218, Cl. 464-182.000.
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Brahler, George R., 5,496,218, Cl. 464-182.000.
Brahms, Martin; Fritz, Wolfgang; and Klamt, Werner, to ke kommunikations-Elektronik GmbH & Co. Switching device for transmitting telecommunication signals. 5,497,417, Cl. 379-399.000.
Brand, Reinhold; and Rotgerink, Hans L., to Degussa Aktiengesellschaft. Method for the catalytic reforming of naphtha. 5,496,467, Cl. 208-139.000.
Brandon, Ronald E. Turbine seal rub protection means. 5,496,046, Cl. 277-53.000.
Brandt, Douglas R., to Abbott Laboratories. Stabilized creative kinase MB composition. 5,496,716, Cl. 435-188.000.
Brassard, Jean-Paul: *See*—
Dufresne, Michel; Garneau, Pierre; Milot, Maurice; and Brassard, Jean-Paul, 5,497,185, Cl. 348-2.000.
Bratton, Wesley L.; and Bianchi, J. Christopher, to Applied Research Associates, Inc. Surface mounted pH sensor for cone penetration testing. 5,497,091, Cl. 324-348.000.
Braun, Peter: *See*—
Markert, Helmut; Kretzschmar, Klaus; Schreyer, Michael; Mennig, Günter; Braun, Peter; and Eitel, Oliver, 5,496,892, Cl. 525-528.000.
Braune, Peter, to BASF Aktiengesellschaft. Preparation of thermoplastic polyesters having a low content of terminal carboxyl groups. 5,496,887, Cl. 524-777.000.
Brearley, Malcolm, to Lucas Industries Public Limited Company. Braking in electronic braking systems. 5,496,098, Cl. 303-22.200.
Brede, Uwe; and Kraft, Josef, to Dynamit Nobel Aktiengesellschaft. Gas leakage monitoring of a gas or liquid container. 5,495,748, Cl. 73-40.000.
Bredenfeld, Guido: *See*—
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Breed Automotive Technology, Inc.: *See*—
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Osborne, Scott; Bates, Roger E.; and Burgi, Anthony C., 5,496,065, Cl. 280-740.000.
Brewer, Omer F. Anti-fouling tethering device for displaying flags. 5,495,821, Cl. 116-174.000.
Breyer, Stephen R. Tree and shrub lifting system. 5,496,143, Cl. 414-23.000.
Bridges, Russell P.: *See*—
Hasse, Margaret H.; Bridges, Russell P.; and Miller, Steven W., 5,496,429, Cl. 156-73.300.
Bridgestone Corporation: *See*—
Hamada, Tatsuro, 5,496,883, Cl. 524-492.000.
Hasegawa, Hajime; and Usami, Kazuyoshi, 5,496,868, Cl. 521-155.000.
Lawson, David F.; Antkowiak, Thomas A.; Hall, James E.; Stayer, Mark L., Jr.; and Schreffler, John R., 5,496,940, Cl. 540-450.000.
Bridgestone Sports Co., Ltd.: *See*—
Maruko, Takashi; and Kakiuchi, Shinichi, 5,496,034, Cl. 273-216.000.
Briggs, Jeffrey L.: *See*—
Meier, Sidney K.; and Briggs, Jeffrey L., 5,496,962, Cl. 84-601.000.
Brinkmann, Ralf: *See*—
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Brinson, Edward P.: *See*—
Poteat, William M.; Whittlesey, Thomas E.; Poling, Kim L.; Brinson, Edward P.; and Wilkins, Bryan E., 5,495,701, Cl. 53-138.200.
Brintzinger, Hans: *See*—
Evertz, Kaspar; Schlund, Ruerger; Schweier, Guenther; Brintzinger, Hans; Roell, Werner; Jutzi, Peter; Mieling, Ingrid; and Mengele, Winfried, 5,496,902, Cl. 526-127.000.
Brion, John H.: *See*—
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Bristol-Myers Squibb Co: *See*—
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Bristol-Myers Squibb Co.: *See*—
Catt, John D.; and Mattson, Ronald J., 5,496,847, Cl. 514-452.000.
Watson, Brett T.; and Ortiz, Astrid A., 5,496,826, Cl. 514-303.000.
British Technology Group Ltd: *See*—
Wilde, Colin J.; Peaker, Malcolm; and Addey, Caroline V. P., 5,496,802, Cl. 514-2.000.
Broberg, David E.; and Bange, Donna W., to Minnesota Mining and Manufacturing Company. Coated abrasive article having diluent particles and shaped abrasive particles. 5,496,386, Cl. 51-295.000.
Broden, David A.; Orth, Kelly M.; Borgeson, Dale W.; Lanctot, Jane B.; and Voegele, Kevin D., to Rosemount Inc. Multivariable transmitter. 5,495,769, Cl. 73-718.000.
Bromine Compounds Limited: *See*—



Becker, Yigal; Assaf-Biran, Yonit; and Shvo, Youval, 5,496,955, Cl. 548-334.500.
Brookman, Marc A.: *See*—
Gustafson, Thomas L.; and Brookman, Marc A., 5,496,427, Cl. 156-67.000.
Brooks, J. M., to Micron Semiconductor, Inc. Semiconductor device having ball-bonded pads. 5,496,775, Cl. 437-219.000.
Brooks, Robert P.: *See*—
Coles, Marshall R.; Brooks, Robert P.; and Castagno, Antony J., 5,497,141, Cl. 340-309.150.
Brother Kogyo Kabushiki Kaisha: *See*—
Kawakami, Yasushi; Koie, Kazuaki; Nakahigashi, Sachiyo; Omura, Kengo; Yamada, Shiro; Ooshio, Yasuyo; Ishida, Kazuko; Ueno, Hideo; and Ishida, Minako, 5,496,119, Cl. 400-70.000.
Maeda, Masataka, 5,497,175, Cl. 347-55.000.
Matsuda, Riki; and Taki, Kazunari, 5,496,608, Cl. 428-64.100.
Sawada, Akihiro; Mori, Masaharu; Koie, Kazuaki; and Ishida, Kazuko, 5,496,117, Cl. 400-61.000.
Ueno, Hideo; Ishida, Minako; and Nagase, Sachiyo, 5,496,118, Cl. 400-61.000.
Broussard, Hartwell N. Arrow penetration brake and stop assembly. 5,496,041, Cl. 273-416.000.
Brown, Douglas M.: *See*—
Brown, Rosalie E.; Willis, Geoffrey H.; and Brown, Douglas M., 5,496,204, Cl. 446-236.000.
Brown, Jane M.: *See*—
Goodhart, Robert R.; Brown, Jane M.; and Carnahan, William E., 5,495,654, Cl. 29-527.400.
Brown, Joseph; and Neuberger, Wolfgang. Radial laser delivery device. 5,496,308, Cl. 606-15.000.
Brown, Louis R., to TRW Vehicle Safety Systems Inc. Seat mounted air bag assembly. 5,496,061, Cl. 280-730.200.
Brown, Randall L. Device for gauging suture depth. 5,496,337, Cl. 606-148.000.
Brown, Robert W.: *See*—
Korsunsky, Iosif; Shipe, Joanne E.; Harlan, Tod M.; Foreman, Gerald L.; Klotz, Robert C.; and Brown, Robert W., 5,495,666, Cl. 29-834.000.
Brown, Rosalie E.; Willis, Geoffrey H.; and Brown, Douglas M., to Outside Design Corporation. Rotating jumping apparatus. 5,496,204, Cl. 446-236.000.
Browne, Christopher L., to Moisture Dynamics, Inc. Miniature pan evaporimeter for gauging the difference between evapotranspiration and effective rainfall. 5,496,112, Cl. 374-54.000.
Browning: *See*—
Larson, Marlow W., 5,495,843, Cl. 124-25.600.
Bruce, Daniel E.: *See*—
Herman, Roberta A.; Bruce, Daniel E.; Schneider, Alan A.; and Long, Stephen E., 5,495,747, Cl. 73-23.210.
Brugg Kabel AG: *See*—
Heese, Ulrich; Salvel, Renato; and Neumann, Wolfgang W., 5,496,865, Cl. 521-79.000.
Brundula, Rudolph F.; and Brundula, William P., to Bruns Brush Inc. (Ohio Corporation). Vacuum sweeper roller brush. 5,495,634, Cl. 15-182.000.
Brundula, William P.: *See*—
Brundula, Rudolph F.; and Brundula, William P., 5,495,634, Cl. 15-182.000.
Brunette, Patrick T.: *See*—
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Bruns Brush Inc. (Ohio Corporation): *See*—
Brundula, Rudolph F.; and Brundula, William P., 5,495,634, Cl. 15-182.000.
Bruns, Jeffrey C.: *See*—
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Bruski, Marek; Chmielewski, Andrzej; Kędzior, Józef; Kubicki, Antoni; Milczarski, Kazimierz; Popławski, Wojciech; and Strzyż, Eugeniusz, to Kamax S.A. Fabryke Urządzeń Mechanicznych. Elastomeric shock absorber. 5,495,923, Cl. 188-268.000.
Bruzzese, Tiberio; Guazzi, Giuseppe; Rognoni, Marco; and Marcon, Giuliano, to Solar Chemical S.A. Process for the synthesis of 9-(2-hydroxyethoxy methyl) guanine. 5,496,945, Cl. 544-276.000.
Bucher-Guyer AG, Maschinenfabrik: *See*—
Gresch, Walter, deceased, 5,496,577, Cl. 426-330.500.
Buck, Wilhelm. Process for setting, controlling and monitoring the level in a refrigerant evaporator. 5,495,720, Cl. 62-115.000.
Buckley, Paul J., II, to MagneTek, Inc. Isolated constant wattage lamp ballast. 5,497,052, Cl. 315-276.000.
Buckley, Thomas I., Jr., to Weldun International, Inc. Method and apparatus for pressure filling and sealing a vessel. 5,495,699, Cl. 53-81.000.
Buckner, Stephen C.: *See*—
Heil, Garret G.; Domalewski, John J.; Wear, Frederick C.; Buckner, Stephen C.; Lind, Arthur C.; and Hoyt, Jeffry K., 5,497,098, Cl. 324-637.000.
Budniak, Mitchell: *See*—
Berland, Kerry; Kaul, Jeff; and Budniak, Mitchell, 5,497,326, Cl. 364-424.050.
Buff, Danny. Safety syringe with self-sealing needle retraction and retracted member lock. 5,496,278, Cl. 604-110.000.
Buggle, Guenther; and Schuetz, Willi, to Bernhard Steinel Werkzeugmaschinenfabrik GmbH & Co. Tool changer for a processing center. 5,496,249, Cl. 483-41.000.
Bull HN Information Systems Inc.: *See*—
Stein, Scott A.; Carlson, Bruce M.; Yen, Chung S.; and Farrington, Kevin M., 5,497,463, Cl. 395-200.030.
Bullock, Bobby T., Sr., to Mead. Method of making reinforced corrugated board and product therefrom. 5,496,617, Cl. 428-182.000.
Bultena, Bert P.: *See*—
Dekker, Jan H.; and Bultena, Bert P., 5,495,636, Cl. 15-339.000.
Buonauito, Robert B. Physical therapy apparatus. 5,496,236, Cl. 482-57.000.
Burd, David M. Multiple triangularly shaped concentric annular fluorescent tubes for reflective lamps. 5,497,048, Cl. 313-573.000.
Burdge, Robert J.: *See*—
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Burgi, Anthony C.: *See*—
Osborne, Scott; Bates, Roger E.; and Burgi, Anthony C., 5,496,064, Cl. 280-740.000.
Osborne, Scott; Bates, Roger E.; and Burgi, Anthony C., 5,496,065, Cl. 280-740.000.
Burgio, Paul A.; Simonsen, Richard J.; and Fogle, Donald P., to Minnesota Mining and Manufacturing Company. Electrode and assembly. 5,496,363, Cl. 607-152.000.
Burgoyne, Leigh A., to Flinders Technologies Pty Ltd. Solid medium and method for DNA storage. 5,496,562, Cl. 424-488.000.
Burkhart, Joseph P.: *See*—
Kolb, H. Michael; Burkhart, Joseph P.; Jung, Michel J.; Gerhart, Fritz E., deceased; Giroux, Eugene L.; Neises, Bernhard; and Schirlin, Daniel G., 5,496,927, Cl. 530-328.000.
Burnett, Sibley C.: *See*—
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Burnham, Warren. Catheter with irregular inner and/or outer surfaces to reduce travelling friction. 5,496,292, Cl. 604-282.000.
Burns, Dennis L., to Supreme Corq. Molded styrene block copolymer closure for a wine container. 5,496,862, Cl. 521-50.000.
Burrell, Hugh B.: *See*—
Farrugia, Marvin A.; and Burrell, Hugh B., 5,496,417, Cl. 148-275.000.
Burroughs Wellcome Co.: *See*—
Lerner, Stephen C., 5,495,944, Cl. 206-459.100.
Burrows, John D.; and Mann, Keaneth R., to United Kingdom of Great Britain and Northern Ireland, Canada, Her Majesty the Queen in right of, as represented by the Secretary of State for Defence in Her Britannic Majesty's Government of the. Method and apparatus for detection of liquid incendiaries by changes in capacitance. 5,497,102, Cl. 324-663.000.
Burton, John H.; Cook, Timothy C.; and Tihon, Claude, to American Medical Systems, Inc. Combined hyperthermia and dilation catheter. 5,496,271, Cl. 604-54.000.
Burton, Mark L.: *See*—
Doherty, Donald B.; Gove, Robert J.; Burton, Mark L.; and Miller, Rodney D., 5,497,172, Cl. 345-85.000.
Burzio, Fulvio; and Beck, Roland, to Ausimont S.p.A.; and Cerestar Holding B.V. Process for decreasing the build up of inorganic incrustations on textiles and detergent composition used in such process. 5,496,494, Cl. 252-174.170.
Busatto, Vinicio: *See*—
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Bush, M. Elizabeth: *See*—
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Bush, Stephen F.; Methven, James M.; and Blackburn, David R., to Scott Bader Co., Ltd. Polymeric compositions. 5,496,873, Cl. 523-508.000.
Bushman, Boyd B., to Lockheed Corporation. Towed target. 5,497,156, Cl. 342-9.000.
Buss, Christopher: *See*—
Bartlett, Keith R.; Jenkins, Robert F.; Buss, Christopher; Martin, Timothy J.; Gerber, Andre; and Colarusso, Peter C., 5,496,615, Cl. 428-144.000.
Butkiewicz, Steven J.; Carrier, Samuel H.; Fellows, Donald L., Jr.; Hill, Frederick B., Jr.; Mattson, Earl W.; and Scofield, Terrence L., to Benteler Industries, Inc. Patterned air gap engine exhaust conduit. 5,495,873, Cl. 138-114.000.
Butler, Jennifer M.: *See*—
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Butler, Walter K., III; Napiorkowski, John J.; Kroll, Thomas W.; and Cote, Mark P., to Siecor Corporation. Telephone interface security lock. 5,497,416, Cl. 379-399.000.
Butz, James R.: *See*—
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Byrd, J. Abbott, III: *See*—
Puno, Rolando M.; Mellinger, Philip; and Byrd, J. Abbott, III, 5,496,321, Cl. 600-61.000.
Byrd, Norman R., to McDonnell Douglas Corporation. Chemical resistant coating compositions. 5,496,784, Cl. 502-152.000.
Byrne, James C.: *See*—
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C. A. Greiner & Söhne Gesellschaft m.b.H: *See*—
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C. R. Bard, Inc.: *See—*
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C&W Fabricators, Inc.: *See—*
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Cabestrero, Abelardo, to Compagnie General des Etablissements Michelin - Michelin & Cie. Process and apparatus for stabilizing the oscillations of a vehicle, and vehicle equipped with such an apparatus. 5,495,879, Cl. 152-415.000.
Cabloptic S.A.: *See—*
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Ball, Keith R.; Cahill, Timothy J.; Ellis, Robert P.; Sorenson, Charles W.; and Petersen, Carl M., III, 5,496,068, Cl. 280-806.000.
Caine, Harold A. Side warning lights. 5,497,304, Cl. 362-80.000.
Calamera, Pablo: *See—*
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Camillus Cutlery Co.: *See—*
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Campbell, Dean D.; and Wiley, Robert A., to Physio-Control Corporation. Method and system for automatic or semi-automatic defibrillation using redundant processing. 5,496,349, Cl. 607-5.000.
Campbell, James A.: *See—*
Wilson, Bary W.; Campbell, James A.; Sasser, Lyle B.; and Hortal, Patricio, 5,496,553, Cl. 424-195.100.
Campos, Margot; Franke, Guenter; and Greene, Michael J., to Bayer Corporation. Process for the preparation of organic pigments. 5,496,405, Cl. 106-495.000.
Canadian Downhole Drill Systems Inc.: *See—*
Livingstone, Raymond D.; Kutinsky, David; Wilson, Murray; and Smith, Winston, 5,495,901, Cl. 175-74.000.
Candy, Bruce H., to Halcro Nominees Pty. Ltd. Ultrasonic vibration generator and use of same for cleaning objects in a volume of liquid. 5,496,411, Cl. 134-1.000.
Canon Denshi Kabushiki Kaisha: *See—*
Kato, Minoru, 5,497,283, Cl. 360-123.000.
Canon Kabushiki Kaisha: *See—*
Aizawa, Takayuki, 5,497,362, Cl. 369-53.000.
Aso, Takashi, 5,497,446, Cl. 395-2.100.
Hotta, Yoshio; Hanyu, Yukio; Mihara, Tadashi; Kodera, Yasuto; and Nakamura, Katsutoshi, 5,497,257, Cl. 359-81.000.
Inomata, Mitsugu; and Kojima, Hisayoshi, 5,497,220, Cl. 355-245.000.
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Odaka, Yukio, 5,497,210, Cl. 354-402.000.
Onuki, Kazuhiko; and Ishibe, Yoshihiro, 5,497,216, Cl. 355-45.000.
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Yoshida, Takehiro; Terajima, Hisao; Wada, Satoshi; Ono, Takeshi; Kobayashi, Makoto; Ishida, Yasushi; Tomoda, Akihiro; Yokoyama, Minoru; and Awai, Takashi, 5,497,183, Cl. 347-215.000.
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Canon Staar Co., Inc.: *See—*
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Capcom Coin-Op, Inc.: *See—*
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Capeci, Scott W.; Nassano, David R.; and Welch, Robert G., to Procter & Gamble Company, The. Agglomeration process for making a detergent composition utilizing existing spray drying towers for conditioning detergent agglomerates. 5,496,487, Cl. 252-89.100.
Capogna, Laure: *See—*
Weill, Jérome; Capogna, Laure; Arrondel, Véronique; and Boumendil, Jean-Jack, 5,496,524, Cl. 422-199.000.
Capone, Gary J. Acrylonitrile filament process. 5,496,510, Cl. 264-182.000.
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Barito, Thomas R.; and Keiling, Cheryl M., 5,496,158, Cl. 418-55.500.
Shoulders, Stephen L.; and Barito, Thomas R., 5,496,157, Cl. 418-14.000.
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Hower, James S.; Glass, Maris A.; Carter, Clyde T.; and Robertson, James W., 5,496,192, Cl. 439-409.000.
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Cha, Ellis T.: *See—*
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Chaffin, Ronald W.: *See—*
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Kelkenberg, Heike, 5,496,933, Cl. 536-20.000.
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Chen, Ping I., to United Microelectronics Corporation. Particle contamination apparatus for semiconductor wafer processing. 5,496,409, Cl. 118-715.000.
Chen, Ruey-Zon. Cutting depth setting device for a saw machine. 5,495,784, Cl. 83-471.200.
Chen, Shi-Hiu. Dynamoelectric shoes. 5,495,682, Cl. 36-2.600.
Chen, Tung-Yu. Safety control switch for gas-fired ignition guns. 5,496,169, Cl. 431-153.000.
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Cheo, Bernard R., to Polytechnic University. Active RF cavity including a plurality of solid state transistors. 5,497,050, Cl. 315-5.410.
Cherry Corporation, The: *See—*
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Chesnut, M. Gaines; Sweet, Dennis D.; Ulasik, Marc A.; and Watson, James B., to Blount, Inc. Lens cap assembly and removal method. 5,495,676, Cl. 33-244.000.
Chester, Keith D. Football card boardgame. 5,496,036, Cl. 273-247.000.
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Chin, Danny; Sauer, Donald J.; Meyerhofer, Dietrich; and Katsuki, Kazuo, to Nippon Sheet Glass Co., Ltd. Parallel digital processing system using optical interconnection between control sections and data processing sections. 5,497,465, Cl. 395-280.000.
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Choi, Kwang S., to Goldstar Co., Ltd. Method and apparatus for controlling scale practice of electronic musical instrument. 5,495,786, Cl. 84-470.00R.
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Commonwealth Scientific and Industrial Research Organisation: *See—*
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Conlee, James K.; Rhule, Daniel A.; and Werbelow, Joel M., to General Motors Corporation. Particulate impingement device for air bag. 5,496,063, Cl. 280-739.000.
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Ittah, Jean; and Badaroux, Thierry, 5,496,190, Cl. 439-354.000.
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Connor, Richard C.; and Mitchell, Keith J., to United Kingdom of Great Britaio and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Bridge module. 5,495,631, Cl. 14-2.600.
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Consolidated Metal Products, Inc.: *See—*
Gallagher, Hugh M., Jr., 5,496,425, Cl. 148-651.000.
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Coombs, Terry L.: *See—*
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Cooper Industries, Inc.: *See—*
Banting, John F., 5,497,096, Cl. 324-555.000.
Cooper, William J.: *See—*
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COR Therapeutics, Inc.: *See—*
Scarborough, Robert M.; Wolf, David L.; and Charo, Israel F., 5,496,724, Cl. 435-252.300.
Corbucci, Giorgio: *See—*
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Sierra, Rolando; and Weinstein, Lawrence A., 5,496,332, Cl. 606-139.000.
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Garneau, Pierre; Corriveau, Josée; and Dufresne, Michel, 5,497,420, Cl. 380-20.000.
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Schwartzkopf, Robert A.; and Cone, Richard E., 5,496,094, Cl. 297-45.000.
Cosgrove, Delos M.; and Nguyen, Than, to Baxter International Inc. Flexible suture guide and holder. 5,496,336, Cl. 606-148.000.
Cote, Mark P.: *See—*
Butler, Walter K., III; Napiorkowski, John J.; Kroll, Thomas W.; and Cote, Mark P., 5,497,416, Cl. 379-399.000.
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Kittrell, Carter; Cothren, Robert M., Jr.; and Feld, Michael S., 5,496,305, Cl. 606-15.000.
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Stephany, Joseph F.; Becerra, Juan J.; Courtney, Thomas P.; Kneezel, Gary A.; LaDonna, Richard V.; John, Peter J.; Watroboski, Thomas E.; and Wysocki, Joseph J., 5,497,174, Cl. 347-13.000.

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Craft, William C.; and Craft, Ruth L., 5,496,042, Cl. 273-421.000.

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Scraggs, Charles R.; Creel, Jack R.; and DeCell, Alonzo L., 5,496,469, Cl. 210-177.000.

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Creppy, Edmond. Aspartame for its application as a therapeutically active substance. 5,496,856, Cl. 514-566.000.

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Sussich, Marino, 5,496,234, Cl. 482-37.000.

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Odill, Frank J., 5,496,128, Cl. 404-25.000.

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Gerber, H. Joseph; Croft, Russell F.; and Sullivan, Daniel J., 5,495,803, Cl. 101-401.100.

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Cronin, John E.; Kaanta, Carter W.; Mann, Randy W.; Meulemans, Darrell; and Starkey, Gordon S., to International Business Machines Corporation. Method of making overpass mask/insulator for local interconnects. 5,496,771, Cl. 437-187.000.

Cronrath, Scott J.: *See*—
Hein, Edward R.; Hudack, Gerald D.; Bear, John P.; and Cronrath, Scott J., 5,496,658, Cl. 429-93.000.

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Crosby, Donald P.: *See*—
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Puno, Rolando M.; Mellinger, Philip; and Byrd, J. Abbott, III, 5,496,321, Cl. 600-61.000.

Croucher, Melvin D.; Patel, Raj D.; Kmiecik-Lawrynowicz, Grazyna E.; Hopper, Michael A.; and Grushkin, Bernard, to Xerox Corporation. Toner aggregation processes. 5,496,676, Cl. 430-137.000.

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Csir & Sasol Mining Proprietary Ltd.: *See*—
Barlow, Desmond T., 5,496,093, Cl. 299-1.100.

Culler, Scott R., to Minnesota Mining and Manufacturing Company. Binder precursor dispersion method of making abrasive articles made from reduced viscosity slurries, and method of reducing sedimentation rate of mineral particles. 5,496,387, Cl. 51-295.000.

Cullinan, George J., to Eli Lilly and Company. Methods of inhibiting ulcerative mucositis. 5,496,828, Cl. 514-324.000.

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Cunningham, Eldon R.: *See*—
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Cunningham, Michael: *See*—
Van Dusen, John G.; Cunningham, Michael; and Kelly, Bernard A., 5,496,675, Cl. 430-137.000.

Currie, Richard J. Self-testing device for measuring urinary flow rates. 5,495,854, Cl. 128-760.000.

Cushman, David W.: *See*—
Delaney, Norma G.; Gordon, Eric M.; DeForrest, Jack M.; and Cushman, David W., 5,496,805, Cl. 514-19.000.

Cutler, Edward T., to Pilot Research & Development Co. Tasteful toothpaste and other dental products. 5,496,541, Cl. 424-50.000.

Cwik, Terry T.: *See*—
Queen, Joseph R.; Cwik, Terry T.; and Hellebuyck, Charles G., 5,497,078, Cl. 324-146.000.

Cymara, Hermann K. Retractable canard wing surfaces for airplanes. 5,495,999, Cl. 244-45.00A.

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Czapka, Robert: *See*—
Bareis, Alfred; Abt, Wilfried; Augst, Rudolf; Czapka, Robert; and Pfisterer, Horst, 5,496,124, Cl. 403-15.000.

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Adel, Joerg; Mronga, Norbert; and Czech, Erwin, 5,496,674, Cl. 430-106.600.

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Drouillard, John R.; and Drouillard, James E., 5,497,066, Cl. 320-7.000.

D. V. Automation Limited: *See*—
Dorsett, Michael W., 5,495,742, Cl. 72-450.000.

Dackson, Christopher E.: *See*—
Foltz, Robert S.; Gaither, Ronald A.; Klein, Alfred O.; Wilbert, John J.; Mastalski, Henry T.; Schmitt, Peter J.; Swain, Eugene A.; and Dackson, Christopher E., 5,496,985, Cl. 219-121.670.

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Choi, Young Suk, 5,495,660, Cl. 29-732.000.
Kwon, Oh-Sang, 5,497,239, Cl. 358-335.000.
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Dahl, Roger W.: *See*—
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Dahlheimer, Nichalous: *See*—
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Dai Nippon Insatsu Kabushiki Kaisha: *See*—
Yamauchi, Mineo; Oshima, Katsuyuki; Ando, Jitsuhiko; Torii, Masanori; Fujimura, Hideo; and Iwata, Tamami, 5,496,072, Cl. 283-86.000.

Dai Nippon Printing Co., Ltd.: *See*—
Aono, Takashi; Sugiyama, Kayoko; and Iijima, Masayuki, 5,497,179, Cl. 347-112.000.
Miura, Hideo; Watanabe, Yoshiaki; and Sumimoto, Mitsuhiro, 5,495,705, Cl. 53-411.000.

Dai Nippon Toryo Co., Ltd.: *See*—
Yamamoto, Naotaka; Yagi, Nobuo; Fujii, Satoshi; Yonemochi, Kenji; and Myokei, Mitsutoshi, 5,496,509, Cl. 264-129.000.

Daikuzono, Norio, to S.L.T. Japan Co., Ltd. Laser light irradiation apparatus for medical treatment. 5,496,307, Cl. 606-15.000.

Daimler-Benz Aerospace AG: *See*—
Schmid, Johannes; and Schmitt, Peter, 5,497,158, Cl. 342-90.000.

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Mueller, Hans-Juergen, 5,496,000, Cl. 244-118.100.

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Dalworth Concrete Products, Inc.: *See*—
Elliott, Thomas P., Jr., 5,495,695, Cl. 52-20.000.

Dalziel, John: *See*—
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Damm, Tony E. Arm exercise device. 5,496,240, Cl. 482-93.000.

Dana Corporation: *See*—
Maughan, Garth, 5,496,125, Cl. 403-137.000.
Wall, John H., 5,497,136, Cl. 335-299.000.

Danek Medical Inc.: *See*—
Mathews, Hallett H., 5,496,322, Cl. 606-61.000.



Daniel, Jonathan R. Printing plate with a mesh layer forming pigment storing wells. 5,495,799, Cl. 101-150.000.

Danielson, Craig T.; Kishi, Gregory T.; McIntosh, Michael P.; Mery, Hector E.; and Rockwell, Scott M., to International Business Machines Corporation. Mechanical brake hold circuit for an electric motor. 5,497,057, Cl. 318-371.000.

Dankert, Fred. Pressure-sensitive tacky printing roller for removing printing inks from a printing plate. 5,495,801, Cl. 101-348.000.

Dansac A/S: *See*—
Holmberg, Steen, 5,496,296, Cl. 604-336.000.

DAR Products Corporation: *See*—
Caruthers, Scott, 5,496,244, Cl. 482-108.000.

Das, Satyendranath. High TC superconducting monolithic ferroelectric junable b and pass filter. 5,496,795, Cl. 505-210.000.

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Data, Stanley E., to Onan Corporation. Engine driven generator set system having substantially no roll torque. 5,495,907, Cl. 180-65.200.

Date, Toshinori; and Takasu, Yasuo, to Sega Enterprises, Ltd. Multiple circuit switch with improved multiposition for joypad actuator. 5,496,977, Cl. 200-6.00A.

Daum, Wolfgang: *See*—
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Davenport, Ricky W. Method for providing a fuel mixture. 5,495,986, Cl. 241-21.000.

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Sauer, Donald J., 5,497,127, Cl. 331-17.000.

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Davis, Carl W.: *See*—
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Schaupp, Karin; Polzer, Josef; Kerbl, Johannes; Lanthaler, Kurt; Davis, Stanley S.; and Washington, Clive, 5,496,818, Cl. 514-225.800.

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Day, James F., to Hoechst Celanese Corporation. Preparation of N-acyl taurates. 5,496,959, Cl. 554-69.000.

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Toyne, Kenneth J.; Goodby, John W.; Seed, Alexander; Gray, George W.; McDonnel, Damien G.; Raynes, Edward P.; Day, Sally E.; Harrison, Kenneth J.; and Hird, Michael, 5,496,500, Cl. 252-299.610.

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Gardner, David E.; and Novak, David B., 5,496,221, Cl. 474-135.000.

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Griffin, William A.; and De Almeida, Sextus M., 5,495,903, Cl. 175-424.000.

Dean, Helen B.: *See*—
Hawkins, John G.; Paul, Loni J.; Cardwell, Phillip R.; Reeves, Peter T.; Dean, Helen B.; Doherty, Daniel B., V; and Flaherty, Paul J., 5,497,317, Cl. 364-408.000.

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De Burgh, Benjamin A.; Doyle, Alan; and Kumpel, Belinda M., to National Blood Authority. Human anti-RH(D) monoclonal antibodies, cell lines and methods of use of antibodies in immunoassays. 5,496,548, Cl. 424-142.100.

DeCell, Alonzo L.: *See*—
Scraggs, Charles R.; Creel, Jack R.; and DeCell, Alonzo L., 5,496,469, Cl. 210-177.000.

Decinti, Marco V.; and Murray, William A. Method and apparatus for vehicle detailing. 5,497,303, Cl. 362-80.000.

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Underwood, Mark R.; and Van Nahmen, Alan, 5,496,215, Cl. 460-114.000.

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Delaney, Norma G.; Gordon, Eric M.; DeForrest, Jack M.; and Cushman, David W., 5,496,805, Cl. 514-19.000.

DeFosse, Stephen F.; Phatak, Ganesh V.; and Sauers, Matthew C., to Lexmark International, Inc. Multicolor liquid ink jet print head. 5,497,178, Cl. 347-87.000.

DeFossez, Béatrice: *See*—
Mellul, Myriam; Lecomte, Sophie; Bara, Isabelle; and DeFossez, Béatrice, 5,496,544, Cl. 424-78.030.

Degussa Aktiengesellschaft: *See*—
Brand, Reinhold; and Rotgerink, Hans L., 5,496,467, Cl. 208-139.000.
Domesle, Rainer; Engler, Bernd; Koberstein, Edgar; Lox, Egbert; and Ostgathe, Klaus, 5,496,788, Cl. 502-333.000.

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Jedlitschka, Hans; and Delacroix, Vincent, 5,497,409, Cl. 378-201.000.

Delaney, Norma G.; Gordon, Eric M.; DeForrest, Jack M.; and Cushman, David W., to E. R. Squibb & Sons, Inc. Inhibitors of neutral endopeptidase. 5,496,805, Cl. 514-19.000.

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Poteat, William M.; Whittlesey, Thomas E.; Poling, Kim L.; Brinson, Edward P.; and Wilkins, Bryan E., 5,495,701, Cl. 53-138.200.

Deleens, Gerard: *See*—
Jacquemin, Jean-Pierre; and Deleens, Gerard, 5,496,876, Cl. 524-155.000.

Delfer, Frank W., III; and Stigers, Barry D. Automated remittance system. 5,496,991, Cl. 235-379.000.

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Delisle, France; and Boudreault, James. Insulating multiple layer sealed units and insulating spacer and assembly. 5,496,598, Cl. 428-34.100.

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Finch, Richard; Schieve, Eric; and Vivio, Joseph, 5,497,458, Cl. 395-183.060.
Gandre, Jerry D., 5,497,292, Cl. 361-818.000.

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Anspach, William E., Jr.; and del Rio, Eddy H., 5,496,219, Cl. 464-119.000.

DeLuca, John P.: *See*—
Bock, Robert T.; and DeLuca, John P., 5,496,256, Cl. 601-2.000.

Demar, David A.; Pendleton, Thomas J.; and Weisz, Sandor F., to Pitney Bowes Inc. Articulating weighing scale platform. 5,496,972, Cl. 177-126.000.

Demizu, Akira: *See*—
Sugai, Masakazu; and Demizu, Akira, 5,497,328, Cl. 364-431.030.

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Deng, Jone: *See*—
Dinzburg, Boris; and Deng, Jone, 5,495,772, Cl. 73-832.000.

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Waldenström, Mats G.; Fischer, Udo K. R.; Hillert, Lars H.; and Dennis, Mahlon D., 5,496,638, Cl. 428-408.000.

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Deschenes, Charles L.; Jones, Terence J.; and Cooper, William J., to Avery Dennison Corporation. Fastener attaching tool. 5,495,974, Cl. 227-71.000.

Deshpande, Rajendra D.; and Pulkowski, Jeffrey H., to Beloit Technologies, Inc. Papermaking dryer with multi-roll vacuum chamber. 5,495,679, Cl. 34-117.000.

DeSimone, Joseph M., to University of North Carolina. Method of making fluoropolymers. 5,496,901, Cl. 526-89.000.

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Deutsche Forschungsanstalt fur Luft-und Raumfahrt e.V.: *See*—
Schütze, Rainer, 5,496,002, Cl. 244-123.000.
Devore, Ronald D., to Xerox Corporation. Rotary displacement pump having a separable member that controls the fluid flowpath. 5,496,159, Cl. 418-178.000.
Dewing, Andrew, Barrette. 5,495,862, Cl. 132-279.000.
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Van Gorkom, Gerardus G. P.; Trompenaars, Petrus H. F.; De Zwart, Siebe T.; and Lambert, Nicolaas, 5,497,046, Cl. 313-422.000.
D'Hont, Loek, to Texas Instruments Incorporated. Automatically correcting data detection circuit and method for FSK modulated signals. 5,497,121, Cl. 329-302.000.
Diaz, Antonio P. Vibrating arrangement. 5,496,167, Cl. 425-456.000.
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Dickson, Russell E.: *See*—
Otis, Bruce P.; and Dickson, Russell E., 5,497,288, Cl. 361-687.000.
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Diehl GmbH & Co.: *See*—
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Diem, Bernard; and Michel, France, to Commissariat a l'Energie Atomique. Integrated accelerometer with a sensitive axis parallel to the substrate. 5,495,761, Cl. 73-514.320.
Dieringer, Dale E. Hanger for electrical conduits. 5,496,005, Cl. 248-74.200.
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Kaufman, Charles W.; Gasser, Morrie; Lampson, Butler W.; Tardo, Joseph J.; and Alagappan, Kannan, 5,497,421, Cl. 380-23.000.
Dill, James E.; and Berkhouse, Linda, to Roanoke Gastroenterology, P.C. Use of endoscopic ultrasound and stimulated biliary drainage in the diagnosis of cholecystitis and microlithiasis. 5,495,851, Cl. 128-660.030.
Dill, Michael; and Mueller, Mark, to Applied Material. Sputtering using a plasma-shaping magnet ring. 5,496,455, Cl. 204-192.120.
DiMaiolo, Anthony V.: *See*—
Weigandt, C. Steve; Carter, Jerry J.; and DiMaiolo, Anthony V., 5,496,579, Cl. 426-533.000.
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Dimatteo, Michael A.; Shaw, Schuyler S.; Monahan, Michael B.; Disser, Robert J.; Foust, Jeff A.; Wilkey, Paul D.; and Fulks, Gary C., to General Motors Corporation. Brake system. 5,496,102, Cl. 303-162.000.
DiMucci, Michael V.: *See*—
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DiMucci, Vito A.; and DiMucci, Michael V. Power lifting unit and method for connecting mobile patient transporter. 5,495,914, Cl. 182-141.000.
Dinger, Reinhold: *See*—
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Dinzburg, Boris; and Deng, Jone, to SKF USA Inc. Apparatus and method for measuring the cure state for elastomeric articles. 5,495,772, Cl. 73-832.000.
Di Rocco, Alessandro; Molinari, Susan; and Kaminski, Ram, to City University of New York, Mount Sinai School of Medicine of the. Use of famotidine and related compounds in the treatment of movement disorders. 5,496,836, Cl. 514-370.000.
Disser, Robert J.: *See*—
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Ditzel, Eckhard: *See*—
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Dixon, Alfred R., Jr. Modular battery system comprising individual interconnected modules. 5,496,657, Cl. 429-62.000.
Dixon, Erik L.: *See*—
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Dixon Industries, Inc.: *See*—
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Dixon, Raymond D.: *See*—
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Sandhu, Gurtej S.; Doan, Trung T.; and Cathey, David A., 5,496,762, Cl. 437-60.000.
Dobbelaere, Joris; and Wohlfart, Artur, to Siemens Aktiengesellschaft. Electric plug connector. 5,496,186, Cl. 439-157.000.
Dochniak, Michael J., to H. B. Fuller Licensing & Financing, Inc. Wet adhesion monomers with ureido functionality and polymers prepared therefrom. 5,496,907, Cl. 528-73.000.
Doherty, Daniel B., V: *See*—
Hawkins, John G.; Paul, Loni J.; Cardwell, Phillip R.; Reeves, Peter T.; Dean, Helen B.; Doherty, Daniel B., V; and Flaherty, Paul J., 5,497,317, Cl. 364-408.000.
Doherty, Donald B.; Gove, Robert J.; Burton, Mark L.; and Miller, Rodney D., to Texas Instruments Incorporated. Pulse width modulation for spatial light modulator with split reset addressing. 5,497,172, Cl. 345-85.000.
Doherty, Donald B.: *See*—
Gove, Robert J.; Doherty, Donald B.; Marshall, Stephen W.; Davis, Carl W.; Egan, Joseph G.; Meyer, Richard C.; Sampsell, Jeffrey B.; and Heimbuch, Scott D., 5,497,197, Cl. 348-388.000.
Doi, Roy H.: *See*—
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Doi, Yasutaka: *See*—
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Dolendo, Edward E.: *See*—
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Andree, Roland; Dollinger, Markus; and Santel, Hans-Joachim, 5,496,793, Cl. 504-273.000.
Domalewski, John J.: *See*—
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Dombroski, Michael L. Compact one-handed typing keyboard having keys corresponding to a standard two-handed keyboard. 5,497,151, Cl. 341-22.000.
Domesle, Rainer; Engler, Bernd; Koberstein, Edgar; Lox, Egbert; and Ostgathe, Klaus, to Degussa Aktiengesellschaft. Coating dispersion for exhaust gas catalysts. 5,496,788, Cl. 502-333.000.
Dominique, Cecil G.; Walter, Edward L.; and Franklin, Norman L., to Reelcraft Industries, Inc. Motor driven hose reel. 5,495,995, Cl. 242-390.100.
Dong Wha Pharmaceutical Industrial Co., Ltd.: *See*—
Yoon, Sung-June; Chung, Young-Ho; Lee, Chi-Woo; Oh, Yoon-Seok; Choi, Dong-Rack; and Kim, Nam-Doo, 5,496,947, Cl. 544-362.000.
Donnelly Corporation: *See*—
Pastrick, Todd W.; Molenkamp, Linda K.; and Koops, Roger L., 5,497,305, Cl. 362-83.100.
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Mc Mahan, David R.; Whittemore, Mark L.; Slick, Thomas B.; Sweetland, Tom; Horsman, Steven V.; Marks, Carey D.; Wisler, Jan A.; Donovan, Eric S.; and Witte, Brian E., 5,497,301, Cl. 362-66.000.
Döpke, Stefan: *See*—
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Dorsett, Michael W., to D. V. Automation Limited. Press for hemming panels. 5,495,742, Cl. 72-450.000.
Dorta, Juan F. Combination toy and beverage dispensing device. 5,495,870, Cl. 137-588.000.
Dow Chemical Company, The: *See*—
Mang, Michael N.; White, Jerry E.; and Swanson, Paul E., 5,496,910, Cl. 528-88.000.
DOW-United Technologies Composite Products, Inc.: *See*—
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DowElanco: *See*—
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Doyle, Alan: *See*—
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Doyle, Michael P.; and Stevens, Jimmy L., to Vinzoyl Petroleum Co. Asphalt compositions with improved cross-linking agent. 5,496,400, Cl. 106-220.000.
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Rutschmann, Erwin; and Horlacher, Wolfgang, 5,495,834, Cl. 123-184.310.
Draper, James M.: *See*—
Ericson, Richard J.; and Draper, James M., 5,495,919, Cl. 187-373.000.
Draper, Kenneth G.; and Macejak, Dennis G., to Ribozyme Pharmaceuticals, Inc. Method of isolating ribozyme targets. 5,496,698, Cl. 435-6.000.
Drasler, William J.; Dutcher, Robert G.; Jenson, Mark L.; Thielen, Joseph M.; and Protonotarios, Emmanuil I., to Possis Medical, Inc. Asymmetric water jet atherectomy. 5,496,267, Cl. 604-22.000.
Drew, Sharon M.; Bruns, Jeffrey C.; and Kogel, Jessica E., to Thiele Kaolin Company. Reduction of microorganisms in kaolin clay slurries. 5,496,398, Cl. 106-15.050.
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Dreyer, John F., Jr., to Minnesota Mining and Manufacturing Company. Conspicuity enhancer. 5,497,294, Cl. 362-32.000.
Dror, Jacob: *See*—
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Drori, Mordeki. Duplicating key machine and method of operating same. 5,496,138, Cl. 409-81.000.
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Droulon, Georges, to Bertrand Faure Automobile "BFA". Vehicle seat articulations. 5,496,225, Cl. 475-177.000.
DSC Communications Corporation: *See*—
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Chawla, Chander P.; Ohtaka, Tohru; Iwanaga, Shinichirou; Watanabe, Tsuyoshi; and Igarashi, Katsutoshi, 5,496,870, Cl. 522-90.000.
Dubé, Michael S. Frangible interlocking paving stone. 5,496,129, Cl. 404-29.000.
Dubelloy, Jean-Luc, to GEC Alsthom Transport SA. Cooling device for power electronic components. 5,495,889, Cl. 165-104.330.
Dubinsky, Miles J.: *See*—
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DuBois, Donn A.: *See*—
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Dudar, Thomas E.; and Graham, Peter, to Baxter International Inc. Blood sampling unit with protected needle and a method for sampling blood. 5,495,855, Cl. 128-763.000.
Duffy, Richard L.: *See*—
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Dufresne, Andrew K. Hydrostatic drain testing machine. 5,495,750, Cl. 73-49.100.
Dufresne, Michel; Garneau, Pierre; Milot, Maurice; and Brassard, Jean-Paul, to Le Groupe Videotron Ltee. Remote control system for television audience data gathering. 5,497,185, Cl. 348-2.000.
Dufresne, Michel: *See*—
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Dugan, Jeffrey S., to BASF Corporation. Thin plate turbine. 5,496,149, Cl. 415-90.000.
Dummermuth, Ernst: *See*—
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Dungan, Dennis F.: *See*—
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Sierk, Dennis A.; DuRoss, Ronald R.; Geist, Stephen G.; and Hayes, Gregory L., 5,497,316, Cl. 364-140.000.
Dussault, Lydia; and Caudet, Alain, to L'Oreal. Solid, transparent soap composition based on fatty acid salts and containing isoprene glycol. 5,496,489, Cl. 252-134.000.
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Du Verney, Carlyle J. Upper body exercising apparatus. 5,496,245, Cl. 482-126.000.
Dye, Donald W., to Intermedics Orthopedics, Inc. Orthopedic instrument with quarter-turn disconnect mechanism. 5,496,323, Cl. 606-79.000.
Dyer, David J., to Morton International, Inc. Automotive passenger air bag module cushion fold. 5,496,056, Cl. 280-728.100.
Dyess, William B., to A. C. Horn & Co. Conveyor apparatus for collating bagged food products. 5,495,932, Cl. 198-464.100.
Dykes, Edward R.; and Splichal, William F., Jr., to General Electric Company. Ultrasonic inspection system with improved electrical isolation scheme using step-up transformers. 5,495,765, Cl. 73-632.000.
Dynalogic Corporation: *See*—
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Dynamit Nobel Aktiengesellschaft: *See*—
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Dystar Japan Ltd.: *See*—
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E. R. Squibb & Sons, Inc.: *See*—
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Eastman Chemical Company: *See*—
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Eaton Corporation: *See*—
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Eaton, James R., to General Motors Corporation. Hydraulic control for a multi-speed power transmission. 5,496,231, Cl. 477-126.000.
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Smith, Stuart B., 5,496,911, Cl. 528-77.000.
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Muis, Jan A.; and Edelbroek, Johannes H., 5,495,793, Cl. 99-280.000.
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Esterlis, Moisei, 5,496,459, Cl. 204-298.410.
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Farrugia, Marvin A.; and Burrell, Hugh B., 5,496,417, Cl. 148-275.000.
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Cullinan, George J., 5,496,828, Cl. 514-324.000.
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Ball, Keith R.; Cahill, Timothy J.; Ellis, Robert P.; Sorenson, Charles W.; and Petersen, Carl M., III, 5,496,068, Cl. 280-806.000.

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Cox, Sherri V.; and Emelko, Monica B., 5,496,493, Cl. 252-174.000.

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Zuckerman, Martin, 5,496,082, Cl. 292-336.300.

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Lautzenhiser, Lloyd L.; and Miller, Wendell E., 5,497,509, Cl. 455-208.000.

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Monticello, Daniel J., 5,496,729, Cl. 435-282.000.

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Askin, David; Eng, Kan K.; and Volante, Ralph P., 5,496,948, Cl. 544-368.000.

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Walton, Frank B., 5,497,099, Cl. 324-641.000.

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Lenander, Aage; and Engström, Bertil, 5,495,930, Cl. 194-212.000.

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Enk, Karl-Georg, to Fichtel & Sachs AG. Anti-theft device for a motor vehicle. 5,495,925, Cl. 192-3.630.

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Enplas Corporation: *See—*
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Sims, Bobby H.; and Philipp, Carl T., 5,496,392, Cl. 75-414.000.

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Carson, David R.; Carson, Barry R.; and Brion, John H., 5,495,811, Cl. 108-147.000.

Ericson, Richard J.; and Draper, James M., to Otis Elevator Company. Safety brake apparatus for an elevator car or counterweight. 5,495,919, Cl. 187-373.000.

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Hulen, John S.; and Oren, David, 5,497,373, Cl. 370-79.000.

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Kathnelson, Jerry; and Reid, Michael S. D., 5,495,887, Cl. 165-11.100.

Erisman, Brian P., to Toko America, Inc. Drive signal controlled undervoltage lockout circuit. 5,497,312, Cl. 363-49.000.

Escobedo, Francisco. Variable drive mechanism for cycle type vehicles. 5,496,049, Cl. 280-238.000.

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Viratelle, Henri; and Andre, Michel, 5,496,074, Cl. 285-45.000.

ETE, Inc.: *See—*
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Rollin, Anthony J.; and Valcho, Joseph J., 5,496,480, Cl. 252-51.50A.

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Gaedcke, Harald; Etzrodt, Guenter; and Liedek, Egon, 5,496,403, Cl. 106-400.000.

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Euromold: *See—*
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Evac AB: *See—*
Lindroos, Gunnar; and Wallström, Paul, 5,495,626, Cl. 4-435.000.

Evans, Marcus W.: *See—*
Kacher, Mark L.; Wagner, Julie A.; Schwartz, James R.; Torres, Efrain; Evans, Marcus W.; and Taneri, James E., 5,496,488, Cl. 252-125.000.

Everest & Jennings International Ltd.: *See—*
Geiger, Richard; Robertson, A. Scott; and Page, Neville, 5,496,050, Cl. 280-250.100.

Everett, Craig A.: *See—*
Louwagie, Bennett L.; Lemire, Steven M.; and Everett, Craig A., 5,495,768, Cl. 73-706.000.

Evertz, Kaspar; Schlund, Ruerger; Schweier, Guenther; Brintzinger, Hans; Roell, Werner; Jutzi, Peter; Mieling, Ingrid; and Mengele, Winfried, to BASF Aktiengesellschaft. Catalyst systems for the polymerization of $C_2$-$C_{10}$-alk-1-enes. 5,496,902, Cl. 526-127.000.

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Exide Corporation: *See—*
Hein, Edward R.; Hudack, Gerald D.; Bear, John F.; and Cronrath, Scott J., 5,496,658, Cl. 429-93.000.

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Cohen, Earl T., 5,497,341, Cl. 364-786.000.

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Davis, Stephen M.; Clavenna, LeRoy R.; Say, Geoffrey R.; and Fiato, Rocco A., 5,496,531, Cl. 423-418.200.
Lietz, Arthur A.; Peterson, John R.; and Schlett, Paul E., 5,496,525, Cl. 422-241.000.

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F F Seeley Nominees Pty Ltd.: *See—*
James, Robert W., 5,495,888, Cl. 165-60.000.

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Faass, Judith K.; Jameson, Lee K.; Cohen, Bernard; and Gipson, Lamar H., to Kimberly-Clark Corporation. Moldable hydrodisintegratable material and products formed thereby. 5,496,874, Cl. 524-56.000.

Fabian, David J.; Kocher, Timothy L.; Northcraft, Shane D.; Sarver, Douglas R.; and Thumma, Mark R., to Whitaker Corporation, The. Surface mountable card edge connector. 5,496,180, Cl. 439-60.000.

Fackenthal, Richard: *See—*
Mills, Duane R.; Fackenthal, Richard; Rozman, Rod; and Rashid, Mamun, 5,497,355, Cl. 365-230.080.

Factor, Scott: *See—*
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Faiardi, Daniela: *See—*
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Falgout, Thomas E., Sr. Drill string deflection sub. 5,495,900, Cl. 175-74.000.

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Falotico, Anthony J.; Bolkan, Steven A.; and Mazzola, Louis R., to Church & Dwight Co., Inc. Carbonate built laundry detergent composition containing a delayed release polymer. 5,496,376, Cl. 252-174.000.

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Gunderson, Ernest M., 5,496,121, Cl. 400-692.000.

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Farmos, George T. Apparatus for propelling a manually-powered cycle. 5,496,051, Cl. 280-252.000.

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Hergenrother, Robert; Lim, June; Farnholtz, Roger; Nguyen, Kim; and Snyder, Edward, 5,496,294, Cl. 604-282.000.

Farnworth, Warren M.; Akram, Salman; and Wood, Alan G., to Micron Technology, Inc. Method for forming contact pins for semiconductor dice and interconnects. 5,495,667, Cl. 29-843.000.

Farrell, Gregory A.; Hanmann, Kevin J.; Schmitz, Peter; Behringer, Bruce E.; and Mawhirt, James A., to Bayer Corporation. Valve. 5,496,009, Cl. 251-61.100.

Farrington, Kevin M.: *See—*
Stein, Scott A.; Carlson, Bruce M.; Yen, Chung S.; and Farrington, Kevin M., 5,497,463, Cl. 395-200.030.

Farrugia, Marvin A.; and Burrell, Hugh B., to Electro-Steam Generator Co. Process for steam conversion coating aluminum. 5,496,417, Cl. 148-275.000.

Fast, Ray. Global security system. 5,497,149, Cl. 340-988.000.

Fattori, Joseph E., to Mennen Company, The. Replaceable stick deodorant package. 5,496,122, Cl. 401-98.000.

Fazio, Albert: *See—*
Tedrow, Kerry D.; Keeney, Stephen N.; Fazio, Albert; Atwood, Gregory E.; Javanifard, Johnny; and Woiciechowski, Kenneth, 5,497,119, Cl. 327-540.000.

Fegan, Kevin. Therapeutic enclosure for a patient. 5,495,857, Cl. 128-846.000.

Feijen, Jan; and Esselbrugge, Hilbert, to Akzo N.V. Article for the controlled delivery of an active substance, comprising a hollow space fully enclosed by a wall and filled in full or in part with one or more active substances. 5,496,557, Cl. 424-426.000.

Feinbloom, Richard E.: *See—*
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Feld, Michael S.: *See—*
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Felix, Augustus; and Halick, Gary V., to C. R. Bard, Inc. Suction reservoir. 5,496,299, Cl. 604-319.000.

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Butkiewicz, Steven J.; Carrier, Samuel H.; Fellows, Donald L., Jr.; Hill, Frederick B., Jr.; Mattson, Earl W.; and Scofield, Terrence L., 5,495,873, Cl. 138-114.000.

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Fenstermacher, Brian J.; and Detweiler, James P., to Performance Controls, Inc. Digital pulse-width modulated system for providing current to a load. 5,497,062, Cl. 318-599.000.

Fentress, Philip W., to Tabex Industries, Inc. Moisture barrier for indwelling catheters and the like. 5,495,856, Cl. 128-846.000.

Ferag AG: *See—*
Stauber, Hans-Ulrich; and Van Wegen, Willem F. S. M., 5,495,700, Cl. 53-118.000.

Ferguson, David E.; and Ross, Eduardo C., to Amalgamated Software of North America, Inc. Method and apparatus for implementing Q-trees. 5,497,485, Cl. 395-600.000.

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Sirhan, Motasim M.; and Fernando, Jovito L., 5,496,275, Cl. 604-96.000.

Ferrari, Franco A.: *See—*
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Ferris, Michele M.: *See—*
Bailey, Warren D.; Dixon, Erik L.; Ferris, Michele M.; Garrett, Henry M.; Paussa, Gregory F.; and Walker, Anthony D., 5,497,460, Cl. 395-183.150.

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Enk, Karl-Georg, 5,495,925, Cl. 192-3.630.

Fiedler, Paul; Levine, Robert A.; and Wardlaw, Stephen C. Method for in vitro detection of formed elements in biological samples. 5,496,704, Cl. 435-7.220.

Fielder, Larry D.; and Goelz, Ronald L. Method for forming tray type cartons. 5,496,250, Cl. 493-169.000.

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Jansen, Kai W.; and Fieselmann, Benjamin F., 5,496,583, Cl. 427-109.000.

Fillion, Jean-Claude, to Societe Nationale D'Etude et de Construction de Moteurs D'Aviation "Snecma". Device for effecting dynamic measurement of the distance between the facing faces of the rotor and the stator of a rotary machine. 5,497,101, Cl. 324-662.000.

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Filo, Andrew S., to Dittler Brothers Incorporated; and Simon Marketing, Inc. Flash tube devices. 5,497,001, Cl. 250-316.100.

Finch, Richard; Schieve, Eric; and Vivio, Joseph, to Dell USA, L.P. Cache testability circuit for embedded diagnostics. 5,497,458, Cl. 395-183.060.

Fini, Anthony W., Jr. Modular motor vehicle. 5,495,905, Cl. 180-21.000.

Fink, Randy L.: *See—*
Garrett, Roger L.; Serbin, Bruce J.; and Fink, Randy L., 5,496,184, Cl. 439-79.000.

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Poetsch, Eike; Meyer, Volker; Stahl, Klaus P.; Reiffenrath, Volker; Finkenzeller, Ulrich; Bartmann, Ekkehard; Hittich, Reinhard; Coates, David; Greenfield, Simon; Smith, Graham; Kurmeier, Hans A.; and Dorsch, Dieter, 5,496,499, Cl. 252-299.660.

Finkl, Charles W.; and Underys, Algirdas A., to A. Finkl & Sons Co. Dual purpose steel and products produced therefrom. 5,496,516, Cl. 420-109.000.

Finley, Daniel: *See—*
Bachmair, Andreas; Finley, Daniel; and Varshavsky, Alexander, 5,496,721, Cl. 435-240.200.

Finucane, Raymond G.: *See—*
Sawicki, Richard H.; Alger, Terry W.; Finucane, Raymond G.; and Hall, Jerome P., 5,497,392, Cl. 372-62.000.

Firma Carl Freudenberg: *See—*
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Fischer, Joachim: *See—*
Henn, Rolf; Hahn, Klaus; Hönl, Hans; Heckmann, Walter; Wassmer, Karl-Heinz; Klement, Erich; and Fischer, Joachim, 5,496,864, Cl. 521-59.000.

Fischer, John C.; and Mescher, Kirk T., to Semco Incorporated. Desiccant-coated substrate and method of manufacture. 5,496,397, Cl. 96-154.000.

Fischer, Jürgen; Birkle, Siegfried; Elsel, Werner; Gehring, Johann; Maurer, Arnolf; and Nippe, Waldemar, to Siemens Aktiengesellschaft. Vibrating conveyor device dipping into a liquid with damping of vibration transmission. 5,496,456, Cl. 204-201.000.

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Fischer, Rolf: *See—*
Ritz, Josef; Fischer, Rolf; Schnurr, Werner; Achhammer, Günther; Luyken, Hermann; and Fuchs, Eberhard, 5,496,941, Cl. 540-540.000.

Fischer, Udo K. R.: *See—*
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Fisher & Paykel Limited: *See—*
Zwaan, Paul; and Nyberg, Peter A., 5,495,904, Cl. 180-11.000.

Fisher, Jack. Breast implant with baffles. 5,496,367, Cl. 623-8.000.

Fisk, Spencer: *See—*
Freiermuth, Beat; Werthemann, Dieter; Gaertner, Alfred; and Fisk, Spencer, 5,496,707, Cl. 435-18.000.

Fiskars Inc.: *See—*
Quinn, Charles E., 5,495,670, Cl. 30-162.000.

Fisons plc: *See—*
Pollard-Knight, Denise V., 5,496,701, Cl. 435-7.400.

Fitzgerald, Fergus R.: *See—*
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Fitzpatrick, Greg P.: *See—*
Collia, Sherry S.; Fitzpatrick, Greg P.; and Sterrett, William R., 5,496,177, Cl. 434-118.000.

Flaherty, Paul J.: *See—*
Hawkins, John G.; Paul, Loni J.; Cardwell, Phillip R.; Reeves, Peter T.; Dean, Helen B.; Doherty, Daniel B., V; and Flaherty, Paul J., 5,497,317, Cl. 364-408.000.

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Burgoyne, Leigh A., 5,496,562, Cl. 424-488.000.

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Herrmann, Udo; Oppermann, Günter; Peaners, Günther; Flindt, Roland; and Steinbach, Hans-Horst, 5,496,483, Cl. 252-73.000.

Flory, Robert S.: *See*—
Bellio, Stephen L.; Bernardon, Edward; Condon, Mark J.; Flory, Robert S.; Fyler, Donald C.; Hansberry, Mitchell L.; Lee, Tommy W.; and Mueller, James F., 5,496,021, Cl. 271-18.300.

FMC Corporation: *See*—
Scott, Phillip R.; Orlando, Franklin P.; Warren, Richard K.; and Slates, Larry L., 5,495,708, Cl. 56-329.000.

Fodor, Mark A.; Bercaw, Craig; and Dornfest, Charles, to Applied Materials, Inc. Slotted conical spring washer. 5,496,142, Cl. 411-544.000.

Fogel, William; and Frouin, Laurent, to Rhone-Poulenc Chimie. Aluminum phosphates and binder compositions/ceramic materials comprised thereof. 5,496,529, Cl. 423-305.000.

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Burgio, Paul A.; Simonsen, Richard J.; and Fogle, Donald P., 5,496,363, Cl. 607-152.000.

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Queen, Joseph R.; Cwik, Terry T.; and Hellebuyck, Charles G., 5,497,078, Cl. 324-146.000.

Foreman, Gerald L.: *See*—
Korsunsky, Iosif; Shipe, Joanne E.; Harlan, Tod M.; Foreman, Gerald L.; Klotz, Robert C.; and Brown, Robert W., 5,495,666, Cl. 29-834.000.

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Millar, Bruce; Foss, Richard C.; and Wojcicki, Tomasz, 5,497,115, Cl. 327-211.000.

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Gros, Jean-Pierre; and Foucher, Gérard, 5,495,714, Cl. 60-687.000.

Foundation: The Research Institute of Electric and Magnetic Alloys, The: *See*—
Murakami, Yuetsu; and Masumoto, Katashi, 5,496,419, Cl. 148-312.000.

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Chabanne, Jean-Pierre; Anglade, Gerard; Blanchard, Jean-Marie; and Fourrey, Francois, 5,496,080, Cl. 292-252.000.

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Dimatteo, Michael A.; Shaw, Schuyler S.; Monahan, Michael B.; Disser, Robert J.; Foust, Jeff A.; Wilkey, Paul D.; and Fulks, Gary C., 5,496,102, Cl. 303-162.000.

Fowlkes, Jeffrey C.; and Gilmore, Gary L., to Tecumseh Products Company. Method for making rotor counterweight insert apparatus. 5,495,885, Cl. 164-98.000.

Fox, Sally V., to Natural Cotton Colours, Inc. Naturally flame resistant cotton fiber. 5,496,623, Cl. 428-224.000.

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Hayes, Norman M.; Sindhu, Pradeep; Frailong, Jean-Marc; and Nanda, Sunil, 5,497,480, Cl. 395-493.000.

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Mou, Zhi-Jian; and Jutand, Francis, 5,497,342, Cl. 364-786.000.

Franchini, Miriam K.: *See*—
Venkataram, Ubrani V.; Franchini, Miriam K.; and Bogardus, Joseph B., 5,496,809, Cl. 514-43.000.

Francis, Robert C.; Smolders, Robert R. L.; Walsh, William G.; and Kumar, Ramesh C., to Minnesota Mining and Manufacturing Company. Directly printable coating for olefinic polymer films and articles utilizing such coating. 5,496,635, Cl. 428-352.000.

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Emmett, Frank E.; and Luzaich, Greg, 5,496,090, Cl. 297-240.000.

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Campos, Margot; Franke, Guenter; and Greene, Michael J., 5,496,405, Cl. 106-495.000.

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Franklin, Norman L.: *See*—
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Franz, Joachim: *See*—
Hoffmann, Rainer; Bischoff, Michael; Franz, Joachim; and Thein, Thomas, 5,496,066, Cl. 280-753.000.

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Fraser, Allister F.: *See*—
Harvey, T. Jeffrey; Jones, P. Alan; and Fraser, Allister F., 5,496,414, Cl. 136-245.000.

Fraser, Ronald A., to Ryobi North America, Inc. Shipping and display container for motorized implement. 5,495,937, Cl. 206-45.140.

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Aviv, Haim; Friedman, Doron; Bar-Ilan, Amir; and Vered, Micha, 5,496,811, Cl. 514-78.000.

Friedrich Nettelhoff Kommanditgesellschaft Spezialfabrik fuer Kleinkollektoren: *See*—
Nettelhoff, Friedrich W., 5,497,042, Cl. 310-219.000.

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Brahms, Martin; Fritz, Wolfgang; and Klamt, Werner, 5,497,417, Cl. 379-399.000.

Frolov, George, to Harrow Products, Inc. Swinging electromagnetic lock. 5,496,079, Cl. 292-251.500.

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Hebiguchi, Hiroyuki, 5,497,146, Cl. 340-825.910.

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Fogel, William; and Frouin, Laurent, 5,496,529, Cl. 423-305.000.

Frutschi, Hans U., to ABB Management AG. Air reservoir turbine. 5,495,709, Cl. 60-39.550.

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Ritz, Josef; Fischer, Rolf; Schnurr, Werner; Achhammer, Günther; Luyken, Hermann; and Fuchs, Eberhard, 5,496,941, Cl. 540-540.000.

Fuchs, Hugo: *See*—
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Fuji Electric Co., Ltd.: *See*—
Hosen, Toru, 5,497,291, Cl. 361-804.000.
Ishikawa, Tetsuo; Oomori, Shigeru; Hashimoto, Daijiro; Mochiduki, Toshihiro; and Takano, Satoshi, 5,497,495, Cl. 395-750.000.
Matsuzaki, Kazuo, 5,496,760, Cl. 437-62.000.
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Uemoto, Kenji; Ohta, Tokuji; and Kawai, Shigeharu, 5,497,320, Cl. 364-419.170.
Yamaguchi, Kiyoto; Mamiya, Yukiko; Ueda, Atsushi; and Uwazumi, Hiroyuki, 5,496,632, Cl. 428-332.000.

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Mine, Atsushi, 5,497,325, Cl. 364-424.050.

Fuji Paudal Co., Ltd.: *See*—
Watano, Satoru; Itoh, Yoshihiro; Oda, Nobuhito; Kamata, Tetuo; Kawakami, Noboru; and Moriya, Nobuharu, 5,497,232, Cl. 356-335.000.

Fuji Photo Film Co., Ltd.: *See*—
Arai, Kenji; Seto, Yoshihiro; and Sugaya, Fumio, 5,496,518, Cl. 422-64.000.
Ezoe, Toshihide; and Yasuda, Tomokazu, 5,496,681, Cl. 430-264.000.
Goto, Chiaki; and Hyuga, Hiroaki, 5,497,388, Cl. 372-22.000.
Hirata, Hidetoshi, 5,495,998, Cl. 242-614.000.
Inaba, Hiroo; Ejiri, Kiyomi; Nakamikawa, Jun-ichi; and Miura, Toshihiko, 5,496,607, Cl. 428-65.300.
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Nakamura, Hiroaki, 5,497,431, Cl. 382-162.000.
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Toyama, Tadao; Hagiwara, Hitoshi; and Kita, Nobuyuki, 5,496,677, Cl. 430-162.000.
Yoshida, Futoshi, 5,497,217, Cl. 355-77.000.
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Yoshioka, Yasuhiro; Yamada, Kohzaburoh; and Takeuchi, Kiyoshi, 5,496,693, Cl. 430-545.000.

Fujigaya, Taketoshi, to Koito Manufacturing Co., Ltd. Headlamp cleaning device capable of attaining a constant cleaning capacity. 5,497,058, Cl. 318-446.000.

Fujihara, Yoshimi: *See*—
Iwata, Masayuki; Kimura, Tomio; Inoue, Teruhiko; Fujihara, Yoshimi; and Katsube, Tetsushi, 5,496,951, Cl. 546-13.000.

Fujii, Mutsumasa: *See*—
Miyashita, Akimi; Fujii, Mutsumasa; Kogawa, Kiyonori; and Kyoui, Masayuki, 5,496,433, Cl. 156-358.000.

Fujii, Noriaki; and Ohmura, Ichirou, to Honda Giken Kogyo Kabushiki Kaisha. Valve operating device for internal combustion engine. 5,495,832, Cl. 123-90.160.

Fujii, Satoshi: *See*—
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Fujii, Shozo: *See*—
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Fujiki, Yasuhiro, to Murata Manufacturing Co., Ltd. Chip type transformer. 5,497,137, Cl. 336-200.000.

Fujimura, Hideo: *See*—
Yamauchi, Mineo; Oshima, Katsuyuki; Ando, Jitsuhiko; Torii, Masanori; Fujimura, Hideo; and Iwata, Tamami, 5,496,072, Cl. 283-86.000.

Fujimura, Munenori: *See*—
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Fujinaga, Chikako: *See*—
Kuguminato, Hideo; Kato, Toshikatsu; Fujinaga, Chikako; and Hamahara, Kyoko, 5,496,420, Cl. 148-320.000.

Fujioka, Keiji; Sato, Shigeji; and Takada, Yoshihiro, to Sumitomo Pharmaceuticals Company, Limited. Porous solid formulations containing proteinaceous physiologically active substances. 5,496,559, Cl. 424-435.000.

Fujisawa, Hirotoshi, to Sony Corporation. Optical-pick up device using multi-lens holder. 5,497,366, Cl. 369-112.000.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Asakura, Sotoo; Koyama, Yasuto; Kiyota, Youhei; Akashi, Kiyoko; Kagayama, Akira; Murakami, Yoshio; and Nakate, Toshiomi, 5,496,564, Cl. 424-489.000.
Okuhara, Masakuni; Tanaka, Hirokazu; Goto, Toshio; Kino, Tohru; and Hatanaka, Hiroshi, 5,496,727, Cl. 435-253.500.

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Fujita, Bunichi: *See*—
Masuda, Noboru; Yamamoto, Kazumichi; Nakajima, Kazunori; Okabe, Toshihiro; Yamagiwa, Akira; Yamagishi, Mikio; Koide, Kazuo; Fujita, Bunichi; and Kawashima, Seiichi, 5,497,263, Cl. 327-278.000.

Fujita, Kagari: *See*—
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Fujita, Takashi: *See*—
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Fujitani, Shin; Nakamura, Hiroshi; Watanabe, Hiroshi; Yonezu, Ikuo; and Saito, Toshihiko, to Sanyo Electric Co., Ltd. Hydrogen absorbing alloy and process for preparing same. 5,496,424, Cl. 148-555.000.

Fujitsu Limited: *See*—
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Aritake, Hirokazu; Kato, Masayuki; Ishimoto, Manabu; Sato, Noriko; and Nakashima, Masato, 5,497,189, Cl. 348-51.000.
Ema, Taiji, 5,496,758, Cl. 437-52.000.
Hayashi, Takehiko; Shimura, Takaki; Goto, Takao; and Nakashima, Yoshiyasu, 5,495,849, Cl. 128-653.100.
Kajita, Tatsuya, 5,497,018, Cl. 257-316.000.
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Kato, Masayuki; Aritake, Hirokazu; Matsumoto, Tsuyoshi; Tomita, Junji; Yamagishi, Fumio; Nakashima, Masato; Suzuki, Masao; Fujiwara, Toshiaki; Sugita, Masaya; and Takoa, Koichi, 5,497,170, Cl. 345-9.000.
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Matsuzuki, Masato, 5,497,225, Cl. 355-326.00R.
Moriizumi, Kiyokazu; and Nishihara, Mikio, 5,496,971, Cl. 174-255.000.
Nasu, Yasuhiro; Ichimura, Teruhiko; and Matsumoto, Tomotaka, 5,496,749, Cl. 437-40.000.
Nasu, Yasuhiro; Ichimura, Teruhiko; and Matsumoto, Tomotaka, 5,496,752, Cl. 437-41.000.
Sakata, Hideki; Tanaka, Tsutomu; Kato, Takao; Ueno, Haruhiko; Ino, Akitoshi; and Kusano, Yoshihiro, 5,497,469, Cl. 395-413.000.
Shibuya, Akira; Hattori, Kazuo; and Ozeki, Masashi, 5,497,024, Cl. 257-410.000.
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Tanihira, Hisamitsu; Nakano, Renri; and Nagahori, Kazuo, 5,497,459, Cl. 395-183.060.
Tsuji, Kazuto; Yoneda, Yoshiyuki; Sakoda, Hideharu; Sono, Michio; Yamaguchi, Ichiro; Hamano, Toshio; Kubota, Yoshihiro; Hayakawa, Michio; Ikemoto, Yoshihiko; Saigo, Yukio; and Miyaji, Naomi, 5,497,032, Cl. 257-710.000.

Fujiwara, Atsushi: *See*—
Yamada, Toshio; Fujiwara, Atsushi; Inoue, Michihiro; and Matsuyama, Kazuhiro, 5,497,079, Cl. 324-158.100.

Fujiwara, Goro: *See*—
Matsumoto, Nobuya; Kunisaki, Shinichi; Fujiwara, Goro; Masuda, Mitsunobu; Horie, Hiroshi; and Kawanaka, Asaichi, 5,496,860, Cl. 521-31.000.

Fujiwara, Hirokatsu: *See*—
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Fujiwara, Teiichi: *See*—
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Fujiwara, Toshiaki: *See*—
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Fukamachi, Kazuyuki: *See*—
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Fukami, Hajime: *See*—
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Ishikawa, Kiyofumi; Fukami, Takehiro; Hayama, Takashi; Niiyama, Kenji; Nagase, Toshio; Mase, Toshiaki; Fujita, Kagari; Ihara, Masaki; Ikemoto, Fumihiko; Yano, Mitsuo; and Nishikibe, Masaru, 5,496,928, Cl. 530-331.000.

Fukatsu, Akira: *See*—
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Fukuchi, Masaaki: *See*—
Tsuji, Hiroshi; Saisaka, Hiromasa; Murakami, Hideo; Suzuki, Kaichi; and Fukuchi, Masaaki, 5,496,573, Cl. 426-84.000.

Fukuda, Katsuyoshi; Nakata, Fumio; Shigenaka, Keitaro; and Hirahara, Keijiro, to Kabushiki Kaisha Toshiba. Tin-indium antimonide infrared detector. 5,497,029, Cl. 257-613.000.

Fukuda, Takuya; Ohue, Michio; and Suzuki, Kazuo, to Hitachi, Ltd. Plasma processing apparatus and method of processing substrates by using same apparatus. 5,496,410, Cl. 118-723.0MW.

Fukui, Atsushi: *See*—
Itoh, Masami; Nishii, Kanji; Kawamura, Hiroyuki; and Fukui, Atsushi, 5,497,433, Cl. 382-211.000.

Fukui, Wataru; Umemoto, Hideki; Ohashi, Yutaka; and Matsuo, Haruyuki, to Mitsubishi Denki Kabushiki Kaisha. Hermetic case for elcctronic circuit equipment. 5,497,290, Cl. 361-752.000.

Fukushima, Hirotaka: *See*—
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Fukushima, Yoshiyuki: *See*—
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Fukuzawa, Junji: *See*—
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Fukuzumi, Shuzo: *See*—
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Fulks, Gary C.: *See*—
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Fuller, Hadwen C., II; Bell, Anthony H. G.; Biedermann, Lutz; and Rodgers, David M., to Ascent Technologies Group, Inc. Ankle stabilization system. 5,496,263, Cl. 602-27.000.

Fulmer, Mark T.: *See*—
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Fumakilla Limited: *See*—

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Funato, Kenji: *See*—
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Funk, Larry S.: *See*—
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Furrer, Marc: *See*—
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Furse, David A.: *See*—
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Furukawa Denchi Kabushiki Kaisha: *See*—
Furukawa, Jun, 5,496,665, Cl. 429-232.000.

Furukawa Electric Co., Ltd., The: *See*—
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Hikami, Toshiya; Negami, Shoichi; Nishikawa, Shigeaki; and Murata, Matsue, 5,497,437, Cl. 385-11.000.
Jie, Xu; Takahashi, Jun; and Suzuki, Kenji, 5,497,443, Cl. 385-134.000.
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Nishiguchi, Masaki; and Tokuda, Toshimasa, 5,496,913, Cl. 528-198.000.

Furukawa, Jun, to Furukawa Denchi Kabushiki Kaisha. Hydrogen-occlusion-alloy electrode. 5,496,665, Cl. 429-232.000.

Furukawa, Sachiko: *See*—
Okamoto, Yoshio; Enomoto, Naoki; Furukawa, Sachiko; Ogasawara, Yasushi; Akano, Hirofumi; and Kawamura, Yoshiya, 5,496,937, Cl. 536-124.000.

Furukawa, Yoshiaki: *See*—
Maki, Yoshiro; Nakagawa, Toshiko; Furukawa, Yoshiaki; Outani, Minoru; Haruta, Takashi; Yamanami, Maki; and Nakamura, Sachiko, 5,496,590, Cl. 427-388.100.

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Bellio, Stephen L.; Bernardon, Edward; Condon, Mark J.; Flory, Robert S.; Fyler, Donald C.; Hansberry, Mitchell L.; Lee, Tommy W.; and Mueller, James F., 5,496,021, Cl. 271-18.300.

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Khanna, Yash P.; Slusarz, Kevin R.; Gabriel, Mina K.; Reimschuessel, Annemarie C.; and Sibilia, John P., 5,496,918, Cl. 528-480.000.

Gaebe, Jonathan P. Blade grinding wheel. 5,496,209, Cl. 451-548.000.

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Croitoru, Nathan; Dror, Jacob; Kaplan, Isaac; and Gannot, Israel, 5,497,440, Cl. 385-125.000.
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Whited, Timothy J.; and Gans, Russell S., 5,496,060, Cl. 280-728.300.

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Herb, John A.; Pinneo, John M.; and Gardinier, Clayton F., 5,496,596, Cl. 427-577.000.

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Gaston County Dyeing Machine Company: *See*—
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Weill, Jérome; Capogna, Laure; Arrondel, Véronique; and Boumendil, Jean-Jack, 5,496,524, Cl. 422-199.000.

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Jedlitschka, Hans; and Delacroix, Vincent, 5,497,409, Cl. 378-201.000.

GE Plastics Japan: *See*—
Sakashita, Takeshi; and Shimoda, Tomoaki, 5,496,921, Cl. 528-487.000.

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Hayano, Yuichi; and Kosugi, Susumu, 5,497,088, Cl. 324-309.000.
Uehara, Shoichi; and Morita, Dai, 5,495,846, Cl. 128-660.070.

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Gros, Jean-Pierre; and Foucher, Gérard, 5,495,714, Cl. 60-687.000.

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Thuries, Edmond; Voisin, Gilles; and Tixier, Ren´´, 5,496,965, Cl. 174-24.000.

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Geist, Stephen G.: *See*—
Sierk, Dennis A.; DuRoss, Ronald R.; Geist, Stephen G.; and Hayes, Gregory L., 5,497,316, Cl. 364-140.000.

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Holmes-Farley, Stephen R.; Mandeville, W. Harry, III; and Whitesides, George M., 5,496,545, Cl. 424-78.110.

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Dykes, Edward R.; and Splichal, William F., Jr., 5,495,765, Cl. 73-632.000.
Hershey, John E.; and Saulnier, Gary J., 5,497,397, Cl. 375-259.000.
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Jeram, Edward M.; and Lewis, Larry N., 5,496,906, Cl. 528-15.000.
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Alexander-Bridges, Maria C.; and Zhao, Hui-Fen, 5,496,831, Cl. 514-290.000.

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Grover, Glen A.; and Moroney, Paul, 5,497,404, Cl. 375-357.000.

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Conlee, James K.; Rhule, Daniel A.; and Werbelow, Joel M., 5,496,063, Cl. 280-739.000.
Dimatteo, Michael A.; Shaw, Schuyler S.; Monahan, Michael B.; Disser, Robert J.; Foust, Jeff A.; Wilkey, Paul D.; and Fulks, Gary C., 5,496,102, Cl. 303-162.000.
Eaton, James R., 5,496,231, Cl. 477-126.000.
Garrett, Roger L.; Serbin, Bruce J.; and Fink, Randy L., 5,496,184, Cl. 439-79.000.
Hall, Arthur, III; and Combs, Robert F., 5,496,154, Cl. 417-223.000.
Henry, Rassem R.; and Applebee, Michael A., 5,497,324, Cl. 364-424.050.
Kalkman, Jesse; Heath, Roy W.; and Hammerbacher, David F., 5,495,711, Cl. 60-469.000.
Kulka, Frederick C.; and Wunshel, Michael G., 5,496,006, Cl. 248-231.900.
Luallin, John M.; Wisler, Jan A.; Ballman, Joseph C.; and Barnes, David B., 5,497,298, Cl. 362-61.000.
Mantese, Joseph V.; Micheli, Adolph L.; Dungan, Dennis F.; Schubring, Norman W.; and Callewaert, Clyde M., 5,497,129, Cl. 333-182.000.
Mc Mahan, David R.; Whittemore, Mark L.; Slick, Thomas B.; Sweetland, Tom; Horsman, Steven V.; Marks, Carey D.; Wisler, Jan A.; Donovan, Eric S.; and Witte, Brian E., 5,497,301, Cl. 362-66.000.
McCall, Clark E.; Heller, Joseph A.; Clore, James V.; Pastorek, Joseph R.; and Rathbun, Jon M., 5,497,323, Cl. 364-424.040.
Niederman, Robert R., 5,496,057, Cl. 280-728.200.
Perrow, Scott J.; and Miller, Jon N., 5,496,217, Cl. 464-111.000.
Samie, Farzad; and Bartos, Andrew L., 5,495,927, Cl. 192-70.120.
Schneider, Douglas M.; and Tuggle, Robert E., 5,495,777, Cl. 74-492.000.
Sundeen, Arthur R.; Byrne, James C.; and Cichosz, Vincent A., 5,497,093, Cl. 324-415.000.
Tang, Dah-Lain, 5,497,329, Cl. 364-431.050.
Tiesler, Roy F., 5,495,693, Cl. 49-502.000.
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Kieturakis, Maciej J.; Mollenauer, Kenneth H.; and Monfort, Michelle Y., 5,496,345, Cl. 606-192.000.

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Castille, Jean-Paul G., 5,497,502, Cl. 455-5.100.

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Alford, Bernadette L.; Mao, Jen-I; Moir, Donald T.; Taunton-Rigby, Alison; and Vovis, Gerald F., 5,496,711, Cl. 435-69.100.

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George, David L. Electrical circuit identification means. 5,497,094, Cl. 324-529.000.

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George, John B., to Thomson Consumer Electronics, Inc. Parabolic signal timing loop. 5,497,055, Cl. 315-371.000.

George, Richard: *See*—
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Gerätebau Eppendorf GmbH: *See*—
Keller, Bernd; and Meyer, Matthias, 5,496,254, Cl. 494-7.000.

Gerber, Andre: *See*—
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Gerber, H. Joseph; Croft, Russell F.; and Sullivan, Daniel J., to Gerber Scientific Products, Inc. Method of forming a photomask for a printing plate with an ink jet. 5,495,803, Cl. 101-401.100.

Gerber, Matthias: *See*—
Misslitz, Ulf; Meyer, Norbert; Kast, Juergen; Bott, Kaspar; Walter, Helmut; Westphalen, Karl-Otto; Kardorff, Uwe; and Gerber, Matthias, 5,496,792, Cl. 504-100.000.

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Kolb, H. Michael; Burkhart, Joseph P.; Jung, Michel J.; Gerhart, Fritz E., deceased; Giroux, Eugene L.; Neises, Bernhard; and Schirlin, Daniel G., 5,496,927, Cl. 530-328.000.

Gerhart, Jutta, legal representative: *See*—
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Gesipa Blindniettechnik GmbH: *See*—
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Lees, Wolfgang; and Mörk, Gerold, 5,495,775, Cl. 74-331.000.

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Minshall, Billy W.; Nygard, John E.; Sintim-Damoa, Kwame; Giesler, Richard; Woodworth, Archie; and Purohit, Kailash, 5,496,302, Cl. 604-410.000.

Giga Operations Corporation: *See*—
Taylor, Brad, 5,497,498, Cl. 395-800.000.

Gilbert, Scott R., to Professional Package Company. Method for making a flat trapezoidal container of brightly printed thermally sealable film. 5,496,252, Cl. 493-224.000.

Gilchrist, Herman T.; Welsh, Sue C.; McGowan, Harvey A.; Weller, Gary A.; and Robertson, Richard T., to Abbott Laboratories. Golf ball center. 5,496,035, Cl. 273-231.000.

Gillbrand, Peter; and Tegnelius, Lars, to Saab Automobile Aktiebolag. Device and method of correcting the fuel amount supplied to Otto engines. 5,495,841, Cl. 123-492.000.

Gillett, John B., to International Business Machines Corporation. High performance computer system which minimizes latency between many high performance processors and a large amount of shared memory. 5,497,471, Cl. 395-425.000.

Gillieron, Christian. Versatile locking mechanism for postage meters. 5,496,990, Cl. 235-101.000.

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Kosiec, Jeannie H.; and Gillig, Steven F., 5,497,126, Cl. 331-1.00A.

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Fowlkes, Jeffrey C.; and Gilmore, Gary L., 5,495,885, Cl. 164-98.000.

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Faass, Judith K.; Jameson, Lee K.; Cohen, Bernard; and Gipson, Lamar H., 5,496,874, Cl. 524-56.000.

Girard, Christian: *See*—
Bourdet, Yves; and Girard, Christian, 5,497,075, Cl. 324-72.000.

Girard, Dominique, to Compagnie Generale Des Etablissements Michelin-Michelin & Cie. Sealing ring between the beads of a tire. 5,495,881, Cl. 152-514.000.

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Giunchi, Giovanni: *See*—
Motroni, Giuseppe; Maritano, Mauro; Coassolo, Alfredo; and Giunchi, Giovanni, 5,496,912, Cl. 528-193.000.

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Glew, Andrew F.: *See*—
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Zabron, Florian S.; Rice, David K.; and Atkins, Ernest E., 5,495,935, Cl. 198-847.000.
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Beakes, John M.; and Newman, Lawrence E., 5,495,659, Cl. 29-736.000.
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Gobbels, Heinz-Dieter: *See*—
Raasch, Hans; Gobbels, Heinz-Dieter; and Loers, Wolfgang, 5,495,991, Cl. 242-35.50A.
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Godsey, C. Darrin: *See*—
Penix, C. Wayne, 5,496,135, Cl. 405-179.000.
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Goehner, Siegfried. Sliding skid ring for pipe feedthroughs. 5,496,134, Cl. 405-134.000.
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Fielder, Larry D.; and Goelz, Ronald L., 5,496,250, Cl. 493-169.000.
Goetz, Walter; and Betz, Walter, to BASF Aktiengesellschaft. Thermoplastic molding materials based on polyamides and carboxyl-containing polyethylene waxes. 5,496,878, Cl. 524-275.000.
Going, Patrick E.; and Youmans, William R. Knob turning device and method. 5,495,641, Cl. 16-121.000.
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Golden Technologies Company, Inc.: *See*—
Hamilton, C. Richard; Gustafson, Ross M.; and Marsh, Ralph Z., 5,496,585, Cl. 427-239.000.
Goldstar Co., Ltd.: *See*—
Choi, Kwang S., 5,495,786, Cl. 84-470.00R.
Jeong, Suk D., 5,496,576, Cl. 426-233.000.
Kim, Kyung S., 5,497,198, Cl. 348-445.000.
Yoo, Yong T.; and Lee, Choon, 5,497,191, Cl. 348-208.000.
Goldstein, Marc A.: *See*—
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Goldswain, Ian M.; and Hignett, Martin W. D. B., to John Crane UK Limited. Mechanical seal containing a sealing face with grooved regions which generate hydrodynamic lift between the sealing faces. 5,496,047, Cl. 277-96.100.
Gonzales, Fernando, to Micron Technology, Inc. Dynamic random access memory array having a cross-point layout, tungsten digit lines buried in the substrate, and vertical access transistors. 5,497,017, Cl. 257-306.000.
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Goodhart, Robert R.; Brown, Jane M.; and Carnahan, William E., to Weirton Steel Corporation. Preparing sheet metal and fabricating roofing shingles. 5,495,654, Cl. 29-527.400.
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Gindre, Andre Jean V.; and Rezniguia, Saadane, 5,496,905, Cl. 526-329.200.
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Addison, Danny H.; Carnes, Johnnie M.; Cowardin, Robert L.; Gore, Albert N., III; Lynch, Robert C.; McCray, Charles M.; Narisawa, Shigeji; Talley, William L.; Toyosato, Yoshinair; and Turner, Craig W., 5,496,181, Cl. 439-61.000.
Goris, Gregory A., to Hall Surgical, Div. of Zimmer, Inc. Surgical saw blade and clamp. 5,496,316, Cl. 606-82.000.
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Gorst, John B., to Vickers Shipbuilding and Engineering Limited. Drive devices. 5,495,788, Cl. 89-4.100.
Gosset, Serge: *See*—
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Gottschlich, Bernd; and Lugmayr, Hans, to Messer Griesheim GmbH. Insulated container for storing liquid helium. 5,495,717, Cl. 62-45.100.
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Graham, Edgar E., to Cleveland State University. Elevated temperature metal forming lubrication. 5,495,737, Cl. 72-42.000.
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Luethi, Ernst; and Langenegger, Daniel, 5,496,024, Cl. 271-273.000.
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Gray, Buddy D., to Teledyne Industries, Inc. Portable water purification system with double piston pump. 5,496,466, Cl. 210-137.000.
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Hlavinka, Dennis J.; White, Robert L.; and Green, Todd C., 5,496,301, Cl. 604-409.000.
Greene, Michael J.: *See*—
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Greenfield, Simon: *See*—
Poetsch, Eike; Meyer, Volker; Stahl, Klaus P.; Reiffenrath, Volker; Finkenzeller, Ulrich; Bartmann, Ekkehard; Hittich, Reinhard; Coates, David; Greenfield, Simon; Smith, Graham; Kurmeier, Hans A.; and Dorsch, Dieter, 5,496,499, Cl. 252-299.660.
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Grenier, Wilfred J., to Rovac Corporation. Disengagement tool for use with a pipe joint assembly. 5,496,073, Cl. 285-39.000.



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Nehm, Holger; and Grether, Hermann, 5,495,985, Cl. 239-428.500.
Griebel, Rudolf; Kocherscheid, Karl A.; and Stammen, Klaus, to Siegwerk Druckfarben GmbH & Co. KG. Printing ink. 5,496,879, Cl. 524-320.000.
Grier, Brian K.: *See*—
Jhawar, Suresh C.; Grier, John K.; and Grier, Brian K., 5,497,394, Cl. 373-130.000.
Grier-Jhawar-Mercer, Inc.: *See*—
Jhawar, Suresh C.; Grier, John K.; and Grier, Brian K., 5,497,394, Cl. 373-130.000.
Grier, John K.: *See*—
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Griese, Klaus; Bredenfeld, Guido; and Hesse, Horst, to Robert Bosch GmbH. Gear machine having shaft toothing for driving a gear. 5,496,163, Cl. 418-200.000.
Griffen, Neil; and Azyenberg, Mark, to Lake Shore Cryotronics, Inc. Tachometer assembly with integral internal wrench. 5,495,758, Cl. 73-493.000.
Griffin, William A.; and De Almeida, Sextus M. Pulsation nozzle, for self-excited oscillation of a drilling fluid jet stream. 5,495,903, Cl. 175-424.000.
Grinnell, Brian W., to Eli Lilly and Company. Methods of inhibiting cell-cell adhesion. 5,496,851, Cl. 514-443.000.
Grivet, Michael J. Battery connector assembly. 5,496,197, Cl. 439-726.000.
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Gromer, Kurt; Haan, Franz; Jung, Werner; and Pedall, Friedrich, to Siemens Aktiengesellschaft. Apparatus for equipping printed circuited boards. 5,495,661, Cl. 29-740.000.
Gros, Jean-Pierre; and Foucher, Gérard, to GEC Alsthom Electromecanique SA. Condenser envelope made of concrete for a structurally independent low pressure module. 5,495,714, Cl. 60-687.000.
Groten, Robert: *See*—
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Grover, Glen A.; and Moroney, Paul, to General Instrument Corporation. Transmission error recovery for digital communication systems using variable length data packets where data is stored in header locations of memory. 5,497,404, Cl. 375-357.000.
Gruener, Wilhelm; and Liem, Tiang-Gwan, to Deutsche Aerospace AG. Method of monitoring an area, and a device for carrying out the method. 5,497,157, Cl. 342-36.000.
Grushkin, Bernard: *See*—
Croucher, Melvin D.; Patel, Raj D.; Kmiecik-Lawrynowicz, Grazyna E.; Hopper, Michael A.; and Grushkin, Bernard, 5,496,676, Cl. 430-137.000.
GSE Lining Technology, Inc.: *See*—
Walling, Walter W.; and Brunette, Patrick T., 5,497,097, Cl. 324-555.000.
GTE Telecommunication Services Incorporated: *See*—
Lannen, Margaret; Hammer, Kenneth W.; and Didion, Edward L., 5,497,412, Cl. 379-60.000.
Gu, Fan; and Prudhomme, Cheryl A., to Ideal Tape Co., an American Biltrite Company. Printable self-wound fire retardant pressure-sensitive adhesive tape. 5,496,636, Cl. 428-352.000.
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Gubitosa, Giuseppe; and Casale, Bruno, to Novaol S.r.l. Catalyst for reducing lower polyhydric alcohols by hydrogenolysisal higher polyhydric alcohols and method for preparing catalyst. 5,496,786, Cl. 502-182.000.
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Guipaud, Serge C.: *See*—
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Gunderson, Ernest M., to Fargo Electronics, Inc. Transfer materials supplier. 5,496,121, Cl. 400-692.000.
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Gunze Limited: *See*—
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Gupta, R. B.; and Lees, Robert G., to Cytec Technology Corp. Process for preparing tris-pyrrolidonyl triazine crosslinker. 5,496,944, Cl. 544-198.000.
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Gyger, Jack D., to Roberts Sinto Corporation. Chain driven pallet accumulating over/under chain conveyor. 5,495,933, Cl. 198-465.300.
Gyory, J. Richard: *See*—
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H. B. Fuller Licensing & Financing, Inc.: *See*—
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H. Stoll GmbH & Co.: *See*—
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Ha, Bao; and Turney, Michael A., to Liquid Air Engineering Corporation. High efficiency nitrogen generator. 5,495,716, Cl. 62-24.000.
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Haile, William A.: *See*—
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Hailey, Charles D.; and Beagle, Ronald M. Coil tubing hydraulic jar device. 5,495,902, Cl. 175-296.000.
Haino, Nobuo: *See*—
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Hait, Paul W., to Pyromid, Inc. Compact outdoor cooking unit. 5,495,845, Cl. 126-9.00R.
Hakotani, Yasuhiko: *See*—
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Vannby, Rickard; and Nielsen, Charlotte S., 5,496,530, Cl. 423-418.200.
Halick, Gary V.: *See*—
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Hall, Arthur, III; and Combs, Robert F., to General Motors Corporation. Fan drive with high torque release. 5,496,154, Cl. 417-223.000.
Hall, James E.: *See*—
Lawson, David F.; Antkowiak, Thomas A.; Hall, James E.; Stayer, Mark L., Jr.; and Schreffler, John R., 5,496,940, Cl. 540-450.000.
Hall, Jerome P.: *See*—
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Hall, Kevin P.: *See*—
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Hall, Robert B.; Barnett, Allen M.; Collins, Sandra R.; Checchi, Joseph C.; Ford, David H.; Kendall, Christopher L.; Lampo, Steven M.; and Rand, James A., to Astropower, Inc. Columnar-grained polycrystalline solar cell and process of manufacture. 5,496,416, Cl. 136-258.000.
Hall Surgical, Div. of Zimmer, Inc.: *See*—
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Hallett, Chester W.: *See*—
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Hallman, Kenneth B.: *See*—
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Hamada, Hirokazu; Nakagaki, Kiyoko; and Itabashi, Masaki, to Kao Corporation. Detergent composition. 5,496,492, Cl. 252-170.000.
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Hamada, Tatsuro, to Bridgestone Corporation. Pneumatic tires. 5,496,883, Cl. 524-492.000.
Hamahara, Kyoko: *See*—
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Hamajima, Mitsugu; and Nakanishi, Minoru, to Kao Corporation. Absorbent paper and absorbent article provided therewith. 5,496,626, Cl. 428-284.000.
Hamamoto, Shoichi; Amino, Hirokazu; Ishida, Noriyuki; Tamura, Yasunori; Nishio, Yoichi; and Ichimiya, Masaru, to Kyocera Corporation. Hard tissue prosthesis including porous thin metal sheets. 5,496,372, Cl. 623-16.000.
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Hamas, Robert S., to Hamas, Robert S. Gel-like prosthetic device. 5,496,370, Cl. 623-11.000.
Hamilton, C. Richard; Gustafson, Ross M.; and Marsh, Ralph Z., to Golden Technologies Company, Inc. Method for reducing volatile organic compound emissions. 5,496,585, Cl. 427-239.000.
Hamman, Gary T.: *See*—
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Hamper, Bruce C.: *See*—
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Hanawaka, Masuo, to Yokogawa Electric Corporation. Switching power source of the voltage resonance type. 5,497,311, Cl. 363-21.000.
Hancock, Peter G., to Honeywell Inc. Quadrature detector with a hall effect element and a magnetoresistive element. 5,497,082, Cl. 324-207.140.
Hanig, Harvey: *See*—
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Hansberry, Edmund: *See*—
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Haraichi, Satoshi: *See*—
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Hardy, Frederick E.; Willey, Alan D.; and Scialla, Stefano, to Procter & Gamble Company, The. Encapsulation of liquids in micro-organisms. 5,496,728, Cl. 435-255.100.
Harlan, Tod M.: *See*—
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Haroutel, Jean-Claude; and Moizeau, Gérard, to Neopost Industrie. Print block cassette for franking machine print drum. 5,495,802, Cl. 101-377.000.
Harper, Harold M.; Schmitz, Raymond J., III; and Kandpal, Tara C., to Tecumseh Products Company. Suction muffler. 5,496,156, Cl. 417-312.000.
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Harr, Ewald. Smooth rimmed differential gear. 5,495,779, Cl. 74-650.000.
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Harrison, Brian: *See*—
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Harunari, Takashi: *See*—
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Harvey, T. Jeffrey; Jones, P. Alan; and Fraser, Allister F. Stowable and deployable concentrator for solar cells. 5,496,414, Cl. 136-245.000.
Hasegawa, Hajime; and Usami, Kazuyoshi, to Bridgestone Corporation. Sealing material and method. 5,496,868, Cl. 521-155.000.
Hasegawa, Makoto: *See*—
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Hashida, Koichi, to Sumitomo Electric Industries, Inc. Changeover valve and flow control valve assembly having the same. 5,495,869, Cl. 137-504.000.
Hashiguchi, Toshihiko; Sugai, Toshiya; and Sasaki, Katsumi, to Olympus Optical Co., Ltd. Surgical instrument. 5,496,347, Cl. 606-205.000.
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Masuda, Noboru; Yamamoto, Kazumichi; Nakajima, Kazunori; Okabe, Toshihiro; Yamagiwa, Akira; Yamagishi, Mikio; Koide, Kazuo; Fujita, Bunichi; and Kawashima, Seiichi, 5,497,263, Cl. 327-278.000.
Minowa, Toshimichi; Ohyama, Yoshishige; Kimura, Hiroshi; Ozaki, Naoyuki; Shiraishi, Takashi; Ishii, Junichi; Ibamoto, Masahiko; and Tokuda, Hirootsu, 5,496,227, Cl. 477-62.000.
Mita, Seiichi; Kawashima, Toru; Matsuzaki, Masanori; Kaku, Toshimitsu; and Tsuchinaga, Hiroyuki, 5,497,361, Cl. 369-48.000.
Nakai, Kiyoshi; Suzuki, Yukihide; and Inui, Takashi, 5,497,349, Cl. 365-230.030.
Nakazato, Shinji; Uchida, Hideaki; Saito, Yoshikasu; Yamamura, Masahiro; Kobayashi, Yutaka; Ikeda, Takahide; Hori, Ryoichi; Kitsukawa, Goro; Itoh, Kiyoo; Tanba, Nobuo; Watanabe, Takao; Shimohigashi, Katsuhiro; and Homma, Noriyuki, 5,497,023, Cl. 257-394.000.
Nemoto, Yasuhiro; Oyama, Kazuto; Ono, Hideharu; and Sakai, Kazuo, 5,497,280, Cl. 360-96.500.
Nishi, Hidetoshi; and Kobayashi, Hideo, 5,495,736, Cl. 72-39.000.
Nishijima, Tatsumi; Takeda, Hidekazu; Masuda, Kenmei; Miztani, Hikaru; Machara, Yoshimi; and Ogiro, Kenji, 5,497,279, Cl. 360-96.500.
Nonaka, Youichi; and Sakaue, Shiyuki, 5,497,061, Cl. 318-568.110.
Obara, Sanshiro; Yamada, Hiroyuki; Yoshihara, Shigeyuki; and Matsudaira, Nobunori, 5,495,908, Cl. 180-65.800.
Oyama, Hiroaki; Temma, Tadashi; Maeda, Miyuki; Kusuzaki, Tetsuo; Kimura, Hiromichi; Abe, Kazumi; Kunishi, Naohiko; Kinefuchi, Akira; and Miura, Takahiro, 5,496,175, Cl. 434-118.000.
Sato, Katsuyuki; Matsumoto, Miki; Ohkuma, Sadayuki; Ogata, Masahiro; and Yoshida, Masahiro, 5,497,353, Cl. 365-230.050.
Shimada, Toshio; and Sugawara, Wataru, 5,497,286, Cl. 361-105.000.
Tajima, Fujio; Tanaka, Hideki; Okuyama, Kooetsu; Ishii, Tomokazu; and Toki, Kenji, 5,497,059, Cl. 318-561.000.
Wakui, Fujio; Fujiwara, Hirokatsu; and Yamada, Yasutaka, 5,497,467, Cl. 395-312.000.
Yamaguchi, Hiroshi; Hongo, Mikio; Miyauchi, Tateoki; Shimase, Akira; Haraichi, Satoshi; Takahashi, Takahiko; and Saito, Keiya, 5,497,034, Cl. 257-741.000.
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Hitachi Maxell, Ltd.: *See—*
Akizawa, Mitsuru; Noguchi, Kouki; Hayashi, Takehisa; Kato, Kanji; and Matsushima, Hitoshi, 5,497,488, Cl. 395-600.000.
Kitakami, Osamu; Wakai, Kunio; and Yoshida, Kazuetsu, 5,496,620, Cl. 428-212.000.
Nishijima, Tatsumi; Takeda, Hidekazu; Masuda, Kenmei; Mizutani, Hikaru; Machara, Yoshimi; and Ogiro, Kenji, 5,497,279, Cl. 360-96.500.
Hitachi Metals, Ltd.: *See—*
Saitoh, Tsutomu; and Asanae, Masumi, 5,496,673, Cl. 430-106.600.
Hitachi Micro Computer Engineering, Ltd.: *See—*
Keida, Haruo; Tsukamoto, Takashi; and Nagasaki, Nobutaka, 5,497,482, Cl. 395-550.000.
Hitachi Process Computer Engineering, Inc.: *See—*
Maruyama, Hisayuki; Mizokawa, Sadao; Yasumoto, Seiichi; Onuki, Ken; Ogawa, Hisao; Fukuzawa, Junji; Uchiyama, Toshihiko; Murakami, Toshiyuki; Anbo, Osamu; and Satake, Masato, 5,497,374, Cl. 370-85.400.
Hitachi Techno Engineering Co., Ltd.: *See—*
Miyashita, Akimi; Fujii, Mutsumasa; Kogawa, Kiyonori; and Kyoui, Masayuki, 5,496,433, Cl. 156-358.000.
Hitachi Video and Information System, Inc.: *See—*
Mita, Seiichi; Kawashima, Toru; Matsuzaki, Masanori; Kaku, Toshimitsu; and Tsuchinaga, Hiroyuki, 5,497,361, Cl. 369-48.000.
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Sato, Katsuyuki; Matsumoto, Miki; Ohkuma, Sadayuki; Ogata, Masahiro; and Yoshida, Masahiro, 5,497,353, Cl. 365-230.050.
Hitachi Zosen Corporation: *See—*
Ishida, Michio; Kuwahara, Tsutomu; Kawaguchi, Satoshi; Kono, Tadashi; Aoki, Norihiro; Sekiguchi, Yoshitoshi; Sasaki, Kunio; and Shimotani, Hideo, 5,495,948, Cl. 209-11.000.
Hitaka, Takenori: *See—*
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Poetsch, Eike; Meyer, Volker; Stahl, Klaus P.; Reiffenrath, Volker; Finkenzeller, Ulrich; Bartmann, Ekkehard; Hittich, Reinhard; Coates, David; Greenfield, Simon; Smith, Graham; Kurmeier, Hans A.; and Dorsch, Dieter, 5,496,499, Cl. 252-299.660.
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Hoang, Chinh L., to General Instrument Corporation of Delaware. Power-out reset system. 5,497,112, Cl. 327-143.000.
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Hochiki Corporation: *See—*
Torikoshi, Yasuo; Kosugi, Naoki; and Nagashima, Tetsuya, 5,497,009, Cl. 250-574.000.
Hodges, Robert A.: *See—*
Comb, Donald G.; Perler, Francine B.; Jack, William E.; Xu, Ming-Qun; and Hodges, Robert A., 5,496,714, Cl. 435-69.700.
Hoechst AG: *See—*
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Hoechst Aktiengesellschaft: *See—*
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Fleischer, Dietrich; Strutz, Heinz; Kulpe, Jürgen; and Schleicher, Andreas, 5,496,916, Cl. 528-373.000.
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Habermann, Paul; and Wengenmayer, Friedrich, 5,496,924, Cl. 530-350.000.
Holla, Wolfgang; and Keller, Reinhold, 5,496,930, Cl. 536-1.110.
Peiffer, Herbert; Murschall, Ursula; and Schloegl, Gunter, 5,496,600, Cl. 428-35.700.
Hoechst Celanese Corporation: *See—*
Day, James F., 5,496,959, Cl. 554-69.000.
Krejci, James J.; and Heberger, John M., 5,496,647, Cl. 428-480.000.
Hoechst Japan Limited: *See—*
Morioka, Yuko; and Takano, Mitsuru, 5,496,823, Cl. 514-263.000.
Hoeller, Robert, to Zellweger Luwa AG. System for creating a fault diagnosis on production machines and application of the system on textile machines. 5,497,335, Cl. 364-470.000.
Hoff, Jeffrey H.: *See—*
Slusar, Randall J.; and Hoff, Jeffrey H., 5,495,783, Cl. 81-63.200.
Hoffman, Christine. System for teaching music reading. 5,496,179, Cl. 434-433.000.
Hoffman, Joe G.; and Clark, R. Scot, to Startec Ventures, Inc. Point-of-use ammonia purification for electronic component manufacture. 5,496,778, Cl. 437-250.000.
Hoffmann, Drew A.; and Bush, M. Elizabeth, to Ventritex, Inc. Implantable cardiac electrode with rate controlled drug delivery. 5,496,360, Cl. 607-120.000.
Hoffmann, Kurt: *See—*
Pfaendner, Rudolf; Hoffmann, Kurt; and Herbst, Heinz, 5,496,920, Cl. 528-487.000.
Hoffmann-La Roche Inc.: *See—*
Schacher, Gottlieb, 5,496,519, Cl. 422-64.000.
Hoffmann, Rainer; Bischoff, Michael; Franz, Joachim; and Thein, Thomas, to Pars - Passive Ruckhaltesysteme GmbH. Safety device for the passenger compartment of a motor vehicle body. 5,496,066, Cl. 280-753.000.
Hoffmann, Thomas M.; and Shum, Victor W. C., to International Business Machines Corporation. Disk drive system having open slot swage connection. 5,497,282, Cl. 360-104.000.
Hoffmann, Werner: *See—*
Fischer, Rolf; Hoffmann, Werner; Langguth, Ernst; and Siegel, Hardo, 5,496,958, Cl. 548-552.000.
Hojo, Yasuo: *See—*
Ando, Masahiko; Yamamoto, Yoshihisa; Fukatsu, Akira; Niimi, Mamoru; Kaigawa, Masato; Oba, Hidehiro; Kimura, Hiromichi; Hojo, Yasuo; Tabata, Atsushi; and Iwatsuki, Kunihiro, 5,496,230, Cl. 477-111.000.
Holla, Wolfgang; and Keller, Reinhold, to Hoechst Aktiengesellschaft. Unsaturated sugar compounds. 5,496,930, Cl. 536-1.110.
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Nagao, Hiromasa; Yoneya, Takashi; Miyake, Toshio; Aoyama, Atsuo; Kai, Ken-ichi; Kidokoro, Shun-ichi; Miki, Yoichiro; Endo, Kimiko; and Wada, Akiyoshi, 5,496,710, Cl. 435-68.100.
Holliday, Melba J. Audio cassette holder. 5,495,971, Cl. 224-483.000.
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Jensen, Marvin E.; and Biewer, John A., 5,496,357, Cl. 607-108.000.
Holmberg, Steen, to Dansac A/S. Ostomy appliance with extrudable gasket. 5,496,296, Cl. 604-336.000.
Holmes, David. Computerized method for decomposing a geometric model of surface or volume into finite elements. 5,497,451, Cl. 395-120.000.
Holmes-Farley, Stephen R.; Mandeville, W. Harry, III; and Whitesides, George M., to GelTex Pharmaceuticals, Inc. Phosphate-binding polymers for oral administration. 5,496,545, Cl. 424-78.110.
Holthuis, Josephus J. M.; Mekking, Albert; and Voetman, Alwinus A., to Allelix BioPharmaceuticals Inc. Parathyroid hormone formulation. 5,496,801, Cl. 514-12.000.
Homma, Akira: *See—*

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Homma, Noriyuki: *See*—
Nakazato, Shinji; Uchida, Hideaki; Saito, Yoshikasu; Yamamura, Masahiro; Kobayashi, Yutaka; Ikeda, Takahide; Hori, Ryoichi; Kitsukawa, Goro; Itoh, Kiyoo; Tanba, Nobuo; Watanabe, Takao; Shimohigashi, Katsuhiro; and Homma, Noriyuki, 5,497,023, Cl. 257-394.000.

Homma, Shigeo: *See*—
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Honda Giken Kogyo Kabushiki Kaisha: *See*—
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Ishizaka, Takashi; Nakano, Shinichi; Yasuda, Yukihiro; Shigihara, Akira; Satou, Tomoyasu; Tsubota, Ryushi; Yamura, Hiroshi; and Akamatsu, Tsuneo, 5,495,833, Cl. 123-179.250.
Klober, Martin; and Schwarz, Wolfgang, 5,495,807, Cl. 102-289.000.
Shibahata, Yasuji; and Nakajima, Kiyoshi, 5,496,055, Cl. 280-665.000.
Ueyama, Atsushi; Tsukada, Yoshinari; and Takano, Fumitomo, 5,497,095, Cl. 324-537.000.
Wakabayashi, Shinichi; Masuda, Shoji; Abe, Masahiko; Uchida, Yoshiyasu; and Ishibashi, Yoichi, 5,495,836, Cl. 123-339.130.
Watanabe, Shinichi; Shibayama, Takao; Uzuyama, Kimitake; Fukamachi, Kazuyuki; Maekawa, Keiichiro; and Maruo, Masaru, 5,495,753, Cl. 73-123.000.
Yamanaka, Masayoshi; Sawamura, Kazutomo; Maruyama, Hiroshi; and Seki, Yasunari, 5,495,842, Cl. 123-520.000.

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Barnes, Kenneth F.; and Kong, Hongzhi, 5,496,996, Cl. 250-223.00B.
Bicking, Robert E., 5,497,084, Cl. 324-207.250.
Dawson, Arthur W.; and Malik, Kundan L., 5,497,133, Cl. 335-83.000.
Hancock, Peter G., 5,497,082, Cl. 324-207.140.
Yue, Jerry; Hurst, Allan T.; Yeh, Tangshiun; and Chen, Huang-Joung, 5,496,759, Cl. 437-52.000.

Hong, Gary, to United Microelectronics Corporation. Split-gate process for non-volatile memory. 5,496,747, Cl. 437-35.000.

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Hönl, Hans: *See*—
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Hood, Charles B.: *See*—
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Hopper, Michael A.: *See*—
Croucher, Melvin D.; Patel, Raj D.; Kmiecik-Lawrynowicz, Grazyna E.; Hopper, Michael A.; and Grushkin, Bernard, 5,496,676, Cl. 430-137.000.

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Horie, Hiroshi: *See*—
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Horlacher, Wolfgang: *See*—
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Hornbuckle, Gary D., to SofTel, Inc. Method and apparatus for remotely controlling and monitoring the use of computer software. 5,497,479, Cl. 395-491.000.

Hornung, Friedrich; Günther, Klaus; Upphoff, Bernd; and Pfaundler, Julian, to Robert Bosch GmbH. Orbital disk grinder. 5,496,207, Cl. 451-357.000.

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Blain, David A.; Horodysky, Andrew G.; Poole, Ronald J.; and Wu, Shi-Ming, 5,496,382, Cl. 44-331.000.

Horsky, Thomas N.: *See*—
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Wilson, Bary W.; Campbell, James A.; Sasser, Lyle B.; and Hortal, Patricio, 5,496,553, Cl. 424-195.100.

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Yamada, Yukio; Asami, Osamu; Sugiyama, Hidehiko; Idekoba, Chie; Hoshino, Fumihiko; Hirai, Masana; Kajino, Tsutomu; Imaeda, Takao; and Sarai, Kiyoko, 5,496,719, Cl. 435-233.000.

Hoshino, Hidekazu: *See*—
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Heil, Garret G.; Domalewski, John J.; Wear, Frederick C.; Buckner, Stephen C.; Lind, Arthur C.; and Hoyt, Jeffry K., 5,497,098, Cl. 324-637.000.

Hsu, Kun-Shan. Motorized screw jack assembly. 5,496,014, Cl. 254-122.000.

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HT Maschinenvertrieb GmbH: *See*—
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Xu, Hong-Ji; Hu, Shi-Xue; and Benedict, William F., 5,496,731, Cl. 435-320.100.

Hu, Wei. Survival hood. 5,495,847, Cl. 128-202.260.

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Huang, J. Terry: *See*—
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Hudack, Gerald D.: *See*—
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Thomas, Michael D.; Wolfson, Ronald I.; Glaser, Jerome I.; Smalanskas, Joseph P.; Hunter, Shane H.; and Tran, Allen M., 5,497,168, Cl. 343-834.000.
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Crafts, Harold S., 5,497,027, Cl. 257-528.000.
Rarick, Leonard D., 5,497,343, Cl. 364-787.000.

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Iba, Yoshiaki: *See*—
Suga, Masao; Nakajima, Syuzo; Inomata, Tadaaki; Saito, Toshimitsu; Outake, Atsuhiro; Iba, Yoshiaki; Mihara, Hidekazu; Nishikawa, Hirofumi; Nanno, Nobuyuki; and Satake, Shigeru, 5,497,455, Cl. 395-159.000.

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Noda, Makoto; Ichimiya, Fumio; and Uda, Ryoichi, 5,497,310, Cl. 363-17.000.

Ichimiya, Masaru: *See*—
Hamamoto, Shoichi; Amino, Hirokazu; Ishida, Noriyuki; Tamura, Yasunori; Nishio, Yoichi; and Ichimiya, Masaru, 5,496,372, Cl. 623-16.000.

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Nasu, Yasuhiro; Ichimura, Teruhiko; and Matsumoto, Tomotaka, 5,496,749, Cl. 437-40.000.
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Ogawa, Susumu; Senoh, Hideaki; and Idei, Kouji, 5,496,634, Cl. 428-341.000.

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Yamada, Yukio; Asami, Osamu; Sugiyama, Hidehiko; Idekoba, Chie; Hoshino, Fumihiko; Hirai, Masana; Kajino, Tsutomu; Imaeda, Takao; and Sarai, Kiyoko, 5,496,719, Cl. 435-233.000.

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Nakano, Akikazu, 5,496,919, Cl. 528-481.000.

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Murakami, Yuichi; and Ieda, Kiyokazu, 5,497,165, Cl. 343-700.0MS.

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Chawla, Chander P.; Ohtaka, Tohru; Iwanaga, Shinichirou; Watanabe, Tsuyoshi; and Igarashi, Katsutoshi, 5,496,870, Cl. 522-90.000.

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Ishikawa, Masaaki; Arai, Seiji; and Iguchi, Michihisa, 5,497,224, Cl. 355-301.000.

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Ishikawa, Kiyofumi; Fukami, Takehiro; Hayama, Takashi; Niiyama, Kenji; Nagase, Toshio; Mase, Toshiaki; Fujita, Kagari; Ihara, Masaki; Ikemoto, Fumihiko; Yano, Mitsuo; and Nishikibe, Masaru, 5,496,928, Cl. 530-331.000.

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Toyooka, Takehiro; Iida, Shigeki; and Itoh, Hiroyuki, 5,496,498, Cl. 252-299.010.

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Aono, Takashi; Sugiyama, Kayoko; and Iijima, Masayuki, 5,497,179, Cl. 347-112.000.

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Tamura, Kazuyuki; and Iiyama, Hiroshi, 5,495,762, Cl. 73-519.010.

Ikeda, Takahide: *See*—
Nakazato, Shinji; Uchida, Hideaki; Saito, Yoshikasu; Yamamura, Masahiro; Kobayashi, Yutaka; Ikeda, Takahide; Hori, Ryoichi; Kitsukawa, Goro; Itoh, Kiyoo; Tanba, Nobuo; Watanabe, Takao; Shimohigashi, Katsuhiro; and Homma, Noriyuki, 5,497,023, Cl. 257-394.000.

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Ikeda, Takeshi; and Okamura, Susumu. LC element and semiconductor device having a signal transmission line and LC element manufacturing method. 5,497,028, Cl. 257-531.000.

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Ishikawa, Kiyofumi; Fukami, Takehiro; Hayama, Takashi; Niiyama, Kenji; Nagase, Toshio; Mase, Toshiaki; Fujita, Kagari; Ihara, Masaki; Ikemoto, Fumihiko; Yano, Mitsuo; and Nishikibe, Masaru, 5,496,928, Cl. 530-331.000.

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Tsuji, Kazuto; Yoneda, Yoshiyuki; Sakoda, Hideharu; Sono, Michio; Yamaguchi, Ichiro; Hamano, Toshio; Kubota, Yoshihiro; Hayakawa, Michio; Ikemoto, Yoshihiko; Saigo, Yukio; and Miyaji, Naomi, 5,497,032, Cl. 257-710.000.

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Ilmarinen, Antti; Ilvespää, Heikki; Kuhasalo, Antti; Yli-Kauppila, Jouko; Heikkilä, Pertti; Jokioinen, Iikka; Korpela, Matti; Petterson, Henrik; Karvinen, Mikko; Sailas, Väinö; Taskinen, Pekka; and Parker, Dick, to Valmet Paper Machinery, Inc. Drying module and dryer sections that make use of same, in particular for a high-speed paper machine. 5,495,678, Cl. 34-117.000.

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Yamada, Yukio; Asami, Osamu; Sugiyama, Hidehiko; Idekoba, Chie; Hoshino, Fumihiko; Hirai, Masana; Kajino, Tsutomu; Imaeda, Takao; and Sarai, Kiyoko, 5,496,719, Cl. 435-233.000.

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Berger, Marc A., 5,497,435, Cl. 382-249.000.

Image Optical Corporation: *See*—
Soll, David B.; and Feinbloom, Richard E., 5,497,274, Cl. 359-846.000.

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Imai, Yoshihito: *See*—
Goto, Akihiro; Ozaki, Yoshio; Taneda, Atsushi; Sato, Tatsushi; and Imai, Yoshihito, 5,496,984, Cl. 219-69.180.

Imedex: *See*—
Constancis, Alain; Soula, Gérard; Tayot, Jean-Louis; and Tiollier, Jérôme, 5,496,872, Cl. 523-118.000.

Imoto, Katsuyuki, to Hitachi Cable, Inc. Polymer core optical wave-guide and fabrication method thereof. 5,497,445, Cl. 385-143.000.

Imperial College of Science, Technology and Medicine: *See*—
Barnham, Keith, 5,496,415, Cl. 136-255.000.

Imperial Schrade Corp.: *See*—

Gardiner, Walter A.; Stecyk, Oleh; and Swinden, David A., 5,495,673, Cl. 30-155.000.

Ina Walzlager Schaeffler KG: *See—*
Winkelmann, Ludwig; and Koschmieder, Hartmut, 5,496,113, Cl. 384-13.000.

Inaba, Hiroo; Ejiri, Kiyomi; Nakamikawa, Jun-ichi; and Miura, Toshihiko, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 5,496,607, Cl. 428-65.300.

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Kubo, Keiji; Inada, Yoshiyuki; and Naka, Takehiko, 5,496,835, Cl. 514-361.000.

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Hosokawa, Kyoichi; Owashi, Hitoaki; Yoshizawa, Kazuhiko; Yoshikoshi, Miyoko; Takahashi, Toshiaki; Inagaki, Yasuo; and Okiguchi, Koutaro, 5,497,237, Cl. 358-310.000.

Inai, Masatoshi; Shibutani, Tadanao; Kanaya, Jun; Moritake, Masako; and Tanaka, Akie, to Otsuka Pharmaceutical Factory, Inc. Indole derivatives. 5,496,844, Cl. 514-415.000.

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Inco Limited: *See—*
Hynek, Paul A.; Paserin, Vladimir; and Ambrose, John, 5,497,086, Cl. 324-228.000.

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Cummings, John G., 5,495,868, Cl. 137-315.000.

Indigo N.V.: *See—*
Landa, Benzion; Pinhas, Hanna; and Fenster, Paul, 5,497,222, Cl. 355-279.000.
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Industrial Technology Institute Research: *See—*
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Industrial Technology Research Institute: *See—*
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Infield, Robert M.: *See—*
Geerts, Rolf L.; Palackal, Syriac J.; Pettijohn, Ted M.; and Infield, Robert M., 5,496,781, Cl. 502-104.000.

Inland Steel Company: *See—*
Kolesnichenko, Anatoly F., 5,495,886, Cl. 164-467.000.

Inlet Medical, Inc.: *See—*
Thomason, Rodger; Carter, James E.; Legome, Mark J.; and Naves, Neil H., 5,496,335, Cl. 606-148.000.

Ino, Akitoshi: *See—*
Sakata, Hideki; Tanaka, Tsutomu; Kato, Takao; Ueno, Haruhiko; Ino, Akitoshi; and Kusano, Yoshihiro, 5,497,469, Cl. 395-413.000.

Inomata, Mitsugu; and Kojima, Hisayoshi, to Canon Kabushiki Kaisha. Developing cartridge having support member for rotatably supporting developing device, and developing apparatus. 5,497,220, Cl. 355-245.000.

Inomata, Tadaaki: *See—*
Suga, Masao; Nakajima, Syuzo; Inomata, Tadaaki; Saito, Toshimitsu; Outake, Atsuhiro; Iba, Yoshiaki; Mihara, Hidekazu; Nishikawa, Hirofumi; Nanno, Nobuyuki; and Satake, Shigeru, 5,497,455, Cl. 395-159.000.

Inoue, Akiharu: *See—*
Yamashita, Kazuo; Adachi, Nobuyuki; Nishibe, Masatoyo; Egawa, Masahiko; and Inoue, Akiharu, 5,497,124, Cl. 330-267.000.

Inoue, Akio: *See—*
Nankoh, Mitsuo; Inoue, Akio; Yokomizo, Hitoshi; Tomida, Yosikazu; and Kawabata, Tohru, 5,497,372, Cl. 370-69.100.

Inoue, Ken: *See—*
Harada, Naoki; Inoue, Ken; and Shinomura, Masahiko, 5,497,490, Cl. 395-700.000.

Inoue, Michihiro: *See—*
Yamada, Toshio; Fujiwara, Atsushi; Inoue, Michihiro; and Matsuyama, Kazuhiro, 5,497,079, Cl. 324-158.100.

Inoue, Tadashi: *See—*
Yamauchi, Katsuhisa; Misao, Hitoshi; Inoue, Tadashi; and Okita, Tomoyoshi, 5,496,514, Cl. 420-34.000.

Inoue, Teruhiko: *See—*
Iwata, Masayuki; Kimura, Tomio; Inoue, Teruhiko; Fujihara, Yoshimi; and Katsube, Tetsushi, 5,496,951, Cl. 546-13.000.

Institut Francais du Petrole: *See—*
Chauvin, Yves; Commereuc, Dominique; Hugues, Francois; Olivier, Helene; and Saussine, Lucien, 5,496,783, Cl. 502-125.000.
Weill, Jérome; Capogna, Laure; Arrondel, Véronique; and Boumendil, Jean-Jack, 5,496,524, Cl. 422-199.000.

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Labutin, Viktor N.; Mattis, Alfred R.; Shishaev, Sergei V.; Tsvetkov, Vladimir N.; Tolmachev, Alexandr V.; and Boiko, Genrikh K., 5,495,685, Cl. 37-446.000.

Integrated Packaging Assembly Corporation: *See—*
Ong, EE-Chang, 5,495,780, Cl. 76-101.100.

Integrity Measurement Partners: *See—*
Gallagher, James E.; Beaty, Ronald E.; and Lanasa, Paul J., 5,495,872, Cl. 138-44.000.

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Alexander, James W.; Garbus, Elliot; Smith, Lionel S., Jr.; and Yoder, Douglas D., 5,497,456, Cl. 395-183.050.
Colwell, Robert P.; and Glew, Andrew F., 5,497,493, Cl. 395-800.000.
Kilmer, Callen S.; and Baehne, James R., 5,497,297, Cl. 361-737.000.
Mills, Duane R.; Fackenthal, Richard; Rozman, Rod; and Rashid, Mamun, 5,497,355, Cl. 365-230.080.
Sweha, Sherif; and Bauer, Mark E., 5,497,354, Cl. 365-230.060.
Tedrow, Kerry D.; Keeney, Stephen N.; Fazio, Albert; Atwood, Gregory E.; Javanifard, Johnny; and Woiciechowski, Kenneth, 5,497,119, Cl. 327-540.000.

Intermedics Orthopedics, Inc.: *See—*
Dye, Donald W., 5,496,323, Cl. 606-79.000.

International Business Machines Corporation: *See—*
Addison, Danny H.; Carnes, Johnnie M.; Cowardin, Robert L.; Gore, Albert N., III; Lynch, Robert C.; McCray, Charles M.; Narisawa, Shigeji; Talley, William L.; Toyosato, Yoshinair; and Turner, Craig W., 5,496,181, Cl. 439-61.000.
Amini, Ismael Z.; Heybruck, William F.; Molina, Andres M.; and Van Vliet, Kimberly K., 5,497,378, Cl. 371-22.300.
Bahl, Lalit R.; Gopalakrishnan, Ponani S.; and Picheny, Michael A., 5,497,447, Cl. 395-2.540.
Bailey, Warren D.; Dixon, Erik L.; Ferris, Michele M.; Garrett, Henry M.; Paussa, Gregory F.; and Walker, Anthony D., 5,497,460, Cl. 395-183.150.
Bates, Cary L.; and Ryan, Jeffrey M., 5,497,454, Cl. 395-158.000.
Beardsley, Brent C.; Micka, William F.; and Novick, Yoram, 5,497,483, Cl. 395-575.000.
Carpenter, Richard W.; and Ruane, Robert E., 5,495,665, Cl. 29-830.000.
Collia, Sherry S.; Fitzpatrick, Greg P.; and Sterrett, William R., 5,496,177, Cl. 434-118.000.
Combs, James L.; Crump, Dwayne T.; and Pancoast, Steven T., 5,497,494, Cl. 395-750.000.
Cronin, John E.; Kaanta, Carter W.; Mann, Randy W.; Meulemans, Darrell; and Starkey, Gordon S., 5,496,771, Cl. 437-187.000.
Cunningham, Earl A., 5,497,111, Cl. 327-58.000.
Danielson, Craig T.; Kishi, Gregory T.; McIntosh, Michael P.; Mery, Hector E.; and Rockwell, Scott M., 5,497,057, Cl. 318-371.000.
Ebert, William S.; Engle, David E.; Desai, Kishor V.; and Macek, Thomas G., 5,497,103, Cl. 324-754.000.
Ford, Daniel A., 5,497,457, Cl. 395-182.040.
Fredrickson, Lisa; Karabed, Razmik; Siegel, Paul H.; and Thapar, Hemant K., 5,497,384, Cl. 371-43.000.
Gillett, John B., 5,497,471, Cl. 395-425.000.
Harada, Naoki; Inoue, Ken; and Shinomura, Masahiko, 5,497,490, Cl. 395-700.000.
Hoffmann, Thomas M.; and Shum, Victor W. C., 5,497,282, Cl. 360-104.000.
Megahed, Abraham E.; Rossignac, Jarolsaw R.; and Schneider, Bengt-Olaf, 5,497,453, Cl. 395-122.000.
Mitchell, Herman; Rich, William L.; and Shackelford, Floyd W., 5,497,491, Cl. 395-700.000.
Oldfield, Clive S.; and Shaylor, Nicholas, 5,497,476, Cl. 395-439.000.
Otis, Bruce P.; and Dickson, Russell E., 5,497,288, Cl. 361-687.000.
Ponnapalli, Saila; Soyuer, Mehmet; and Ewen, John F., 5,497,337, Cl. 364-489.000.
Russell, Philip J.; and Weinert, Glenwood S., 5,497,334, Cl. 364-489.000.
Shimizu, Shuichi; and Numao, Masayuki, 5,497,452, Cl. 395-120.000.

International Rectifier Corporation: *See—*
Nadd, Bruno C., 5,497,285, Cl. 361-103.000.

International Superconductivity Technology Center: *See—*
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Interuniversitair Micro-Elektronica Centrum vzw: *See—*
Pforr, Rainer; Wittekoek, Steve; and Seltmann, Rolf, 5,496,669, Cl. 430-22.000.

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Nakai, Kiyoshi; Suzuki, Yukihide; and Inui, Takashi, 5,497,349, Cl. 365-230.030.

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Matsumoto, Shigekazu; and Furuta, Masakazu, 5,497,461, Cl. 395-185.040.

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Ochayon, Moti; and Falk, Arie, 5,496,137, Cl. 408-226.000.

Iseki, Masahiro: *See—*
Iwama, Akifumi; Iseki, Masahiro; and Nakagawa, Azusa, 5,496,451, Cl. 205-790.500.

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Ishibashi, Yoichi: *See—*
Wakabayashi, Shinichi; Masuda, Shoji; Abe, Masahiko; Uchida, Yoshiyasu; and Ishibashi, Yoichi, 5,495,836, Cl. 123-339.130.

Ishibe, Yoshihiro: *See—*
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Ishida, Kazuko: *See—*
Kawakami, Yasushi; Koie, Kazuaki; Nakahigashi, Sachiyo; Omura, Kengo; Yamada, Shiro; Ooshio, Yasuyo; Ishida, Kazuko; Ueno, Hideo; and Ishida, Minako, 5,496,119, Cl. 400-70.000.





Sawada, Akihiro; Mori, Masaharu; Koie, Kazuaki; and Ishida, Kazuko, 5,496,117, Cl. 400-61.000.

Ishida, Michio; Kuwahara, Tsutomu; Kawaguchi, Satoshi; Kono, Tadashi; Aoki, Norihiro; Sekiguchi, Yoshitoshi; Sasaki, Kunio; and Shimotani, Hideo, to Hitachi Zosen Corporation. Ash melting furnace arrangement and method for supplying ash to ash melting furnace. 5,495,948, Cl. 209-11.000.

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Kawakami, Yasushi; Koie, Kazuaki; Nakahigashi, Sachiyo; Omura, Kengo; Yamada, Shiro; Ooshio, Yasuyo; Ishida, Kazuko; Ueno, Hideo; and Ishida, Minako, 5,496,119, Cl. 400-70.000.
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Ishidoshiro, Hiroshi: *See—*
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Ishigami, Haruki: *See—*
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Ishiguro, Toshiaki, to Aisin Seiki Kabushiki Kaisha. Control device and a method for controlling and resetting a lock up hydraulic pressure schedule for subsequent gear shiftings in an automatic transmission. 5,496,233, Cl. 477-169.000.

Ishihara, Koji: *See—*
Samejima, Satoshi; Tsuchida, Hirofumi; and Ishihara, Koji, 5,495,839, Cl. 123-478.000.

Ishii, Junichi: *See—*
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Morishige, Norio; Hirano, Kenji; Ishikawa, Kiyofumi; and Furuya, Shuji, 5,496,422, Cl. 148-525.000.

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Morishige, Norio; Hirano, Kenji; Ishikawa, Kiyofumi; and Furuya, Shuji, 5,496,422, Cl. 148-525.000.

Ishimaru, Kazunari, to Kabushiki Kaisha Toshiba. Method of fabricating complementary poly emitter transistors. 5,496,744, Cl. 437-31.000.

Ishimoto, Manabu: *See—*
Aritake, Hirokazu; Kato, Masayuki; Ishimoto, Manabu; Sato, Noriko; and Nakashima, Masato, 5,497,189, Cl. 348-51.000.

Ishimura, Yoshimasa: *See—*
Monzen, Hiroyuki; Hiromoto, Kazuhiko; Hirayama, Shuji; Kondo, Nobuyuki; Ishigami, Haruki; and Ishimura, Yoshimasa, 5,496,532, Cl. 423-584.000.

Ishino, Yoshizumi: *See—*
Nomura, Yoshiko; Kimizuka, Fusao; Ishino, Yoshizumi; and Kato, Ikunoshin, 5,496,717, Cl. 435-199.000.

Ishizaka, Takashi; Nakano, Shinichi; Yasuda, Yukihiro; Shigihara, Akira; Satou, Tomoyasu; Tsubota, Ryushi; Yamura, Hiroshi; and Akamatsu, Tsuneo, to Honda Giken Kogyo Kabushiki Kaisha. Lubricating oil feeding apparatus and oil feeding structure for starter driven gear bearing in internal combustion engine. 5,495,833, Cl. 123-179.250.

Ishizawa, Yoshiichi: *See—*
Hashizume, Shuji; Minami, Yusuke; and Ishizawa, Yoshiichi, 5,496,421, Cl. 148-326.000.

Ishizawa, Yoshinori; and Tobita, Katsuaki, to Hitachi Koki Co., Ltd. Nail gun having safety device for preventing accidental firings. 5,495,973, Cl. 227-8.000.

Ishizaka, Satoshi: *See—*
Mase, Shoji; Otani, Noboru; Yoshida, Motoaki; Ishizaka, Satoshi; Kayanoki, Hisayuki; and Hirayama, Naoto, 5,496,641, Cl. 428-423.100.

Ishizuka, Shigeki, to Sony Corporation. Video signal processing apparatus for correcting for camera vibrations using CCD imager with a number of lines greater than the NTSC standard. 5,497,192, Cl. 348-208.000.

Isobe, Ryosuke; Yanagita, Takafumi; Saitoh, Akira; and Seki, Akihiko, to Konica Corporation; and TKD Corporation. Magnetic recording medium comprising an underlayer containing αiron oxide powder and a magnetic layer containing ferromagnetic metallic powder. 5,496,622, Cl. 428-216.000.

Ison, Ira C.; Fulmer, Mark T.; Barr, Bryan M.; and Constantz, Brent R., to Norian Corporation. Storage stable calcium phosphate cements. 5,496,399, Cl. 106-35.000.

ISP Chemicals Inc.: *See—*
Merianos, John J., 5,496,842, Cl. 514-389.000.

Isuzu Motors Limited: *See—*
Yamamoto, Naotaka; Yagi, Nobuo; Fujii, Satoshi; Yonemochi, Kenji; and Myokei, Mitsutoshi, 5,496,509, Cl. 264-129.000.

Itabashi, Masaki: *See—*
Hamada, Hirokazu; Nakagaki, Kiyoko; and Itabashi, Masaki, 5,496,492, Cl. 252-170.000.

Itagaki, Mikio: *See—*
Akimoto, Takayuki; Hayashida, Shigeru; Matsui, Megumi; and Itagaki, Mikio, 5,496,672, Cl. 430-78.000.

Itagaki, Minehiro; Okano, Kazuyuki; Kimura, Suzushi; Nakatani, Seiichi; Bessho, Yoshihiro; Yuhaku, Satoru; Hakotani, Yasuhiko; and Miura, Kazuhiro, to Matsushita Electric Industrial Co., Ltd. Assembly formed from conductive paste and insulating paste. 5,496,619, Cl. 428-209.000.

Itagaki, Takashi: *See—*
Takemoto, Takatoshi; Chida, Toshikazu; Kano, Noriaki; Ito, Eiji; Murakami, Koji; Itagaki, Takashi; Sekimoto, Kozo; and Suzuki, Masanori, 5,496,020, Cl. 271-9.010.

Ithaca Research Corporation: *See—*
Tang, Chung L., 5,497,268, Cl. 359-513.000.

Ito, Eiji: *See—*
Takemoto, Takatoshi; Chida, Toshikazu; Kano, Noriaki; Ito, Eiji; Murakami, Koji; Itagaki, Takashi; Sekimoto, Kozo; and Suzuki, Masanori, 5,496,020, Cl. 271-9.010.

Ito, Fusao: *See—*
Machida, Toshinori; Hirokawa, Atsushi; and Ito, Fusao, 5,496,690, Cl. 430-533.000.

Ito, Kenichi, to NEC Corporation. Digital FM modulating apparatus. 5,497,399, Cl. 375-271.000.

Ito, Masao; and Miki, Takahiro, to Mitsubishi Denki Kabushiki Kaisha. Differential amplifier circuit having a bias circuit with a differential amplifier. 5,497,120, Cl. 327-563.000.

Ito, Masumi: *See—*
Hatano, Masakatsu; Murayama, Masayoshi; Shima, Kenji; and Ito, Masumi, 5,496,787, Cl. 502-209.000.

Ito, Nobuei: *See—*
Mizutani, Atsushi; Katayama, Masayuki; Ito, Nobuei; and Hattori, Tadashi, 5,496,582, Cl. 427-66.000.

Ito, Shinichi, to Yamaha Corporation. Electronic musical instrument that assigns a tone control parameter to a selected key range on the basis of a last operating key. 5,496,963, Cl. 84-653.000.

Ito, Tomotaka, to Mitsubishi Denki Kabushiki Kaisha. Inverter operation command process. 5,497,065, Cl. 318-802.000.

Ito, Yoji; and Hirai, Yasuo, to Showa Yakuhin Kako Co., Ltd. Dry gel composition. 5,496,563, Cl. 424-489.000.

Ito, Yoshiharu: *See—*
Ogawa, Akihide; Yamagata, Hiroshi; Takeda, Kazuhiro; and Ito, Yoshiharu, 5,497,201, Cl. 348-525.000.

Itoh, Hiroyuki: *See—*
Toyooka, Takehiro; Iida, Shigeki; and Itoh, Hiroyuki, 5,496,498, Cl. 252-299.010.

Itoh, Kiyoo: *See—*
Nakazato, Shinji; Uchida, Hideaki; Saito, Yoshikasu; Yamamura, Masahiro; Kobayashi, Yutaka; Ikeda, Takahide; Hori, Ryoichi; Kitsukawa, Goro; Itoh, Kiyoo; Tanba, Nobuo; Watanabe, Takao; Shimohigashi, Katsuhiro; and Homma, Noriyuki, 5,497,023, Cl. 257-394.000.

Itoh, Masami; Nishii, Kanji; Kawamura, Hiroyuki; and Fukui, Atsushi, to Matsushita Electric Industrial Co., Ltd. Optical information processing apparatus and method for using computer generated hologram. 5,497,433, Cl. 382-211.000.

Itoh, Yoshihiro: *See—*
Watano, Satoru; Itoh, Yoshihiro; Oda, Nobuhito; Kamata, Teturo; Kawakami, Noboru; and Moriya, Nobuharu, 5,497,232, Cl. 356-335.000.

Itou, Tosio: *See—*

Takagi, Kiyoji; Nishida, Koji; and Itou, Tosio, 5,496,885, Cl. 524-539.000.

Itozaki, Hideo: *See*—
Higaki, Kenjiro; and Itozaki, Hideo, 5,496,797, Cl. 505-210.000.

ITT Corporation: *See*—
Balyasny, Marik, 5,497,104, Cl. 324-755.000.

Ittah, Jean; and Badaroux, Thierry, to Connecteurs Cinch. Electrical connector casings. 5,496,190, Cl. 439-354.000.

Iwai, Akira: *See*—
Ohno, Akihiko; Nishizawa, Takatoshi; and Iwai, Akira, 5,496,790, Cl. 503-227.000.
Ohno, Akihiko; Nishizawa, Takatoshi; Iwai, Akira; and Shibata, Ayako, 5,496,791, Cl. 503-227.000.

Iwai, Norihiro: *See*—
Kasukawa, Akihiko; and Iwai, Norihiro, 5,497,389, Cl. 372-49.000.

Iwama, Akifumi; Iseki, Masahiro; and Nakagawa, Azusa, to Sanyo Electric Co., Ltd. Method for detecting chemical substances. 5,496,451, Cl. 205-790.500.

Iwanaga, Hiroshi: *See*—
Ohkawa, Atsuhiro; Iwanaga, Hiroshi; Naruse, Hideaki; and Tsukase, Masaaki, 5,496,680, Cl. 430-216.000.

Iwanaga, Shinichirou: *See*—
Chawla, Chander P.; Ohtaka, Tohru; Iwanaga, Shinichirou; Watanabe, Tsuyoshi; and Igarashi, Katsutoshi, 5,496,870, Cl. 522-90.000.

Iwane, Toru, to Nikon Corporation. Automatic focusing device and automatic focusing method. 5,497,209, Cl. 354-402.000.

Iwasa, Akira: *See*—
Okada, Minoru; Ono, Kenji; Kasai, Shuichi; and Iwasa, Akira, 5,496,561, Cl. 424-480.000.
Okuyama, Hirohisa; Ikeda, Yasuo; Ohtsuka, Shigenori; Kasai, Shuichi; and Iwasa, Akira, 5,496,819, Cl. 514-226.500.

Iwasa, Susumu: *See*—
Yamazaki, Hiroh; Tanoue, Kenjiro; Iwasa, Susumu; and Kurokawa, Tomofumi, 5,496,549, Cl. 424-158.100.

Iwasaki, Hiroyuki, to Nikon Corporation. Camera photometry system. 5,497,215, Cl. 354-432.000.

Iwasawa, Naozumi: *See*—
Imai, Genji; Iwasawa, Naozumi; and Yamaoka, Tsuguo, 5,496,678, Cl. 430-176.000.

Iwata, Masayuki; Kimura, Tomio; Inoue, Teruhiko; Fujihara, Yoshimi; and Katsube, Tetsushi, to Sankyo Company, Limited; and Ube Industries Limited. 4-oxoquinoline-3-carboxylic acid derivatives their preparation and their use. 5,496,951, Cl. 546-13.000.

Iwata, Michihiro: *See*—
Kawamura, Kunio; Okada, Hiroyuki; Tsuji, Sadafusa; Chikasaki, Masaaki; Iwata, Michihiro; and Izumi, Shuji, 5,497,212, Cl. 354-21.000.

Iwata, Tamami: *See*—
Yamauchi, Mineo; Oshima, Katsuyuki; Ando, Jitsuhiko; Torii, Masanori; Fujimura, Hideo; and Iwata, Tamami, 5,496,072, Cl. 283-86.000.

Iwatani, Shirou; Kusumoto, Katsuhiko; and Komurasaki, Keiichi, to Mitsubishi Denki Kabushiki Kaisha. Output power control device for automotive AC generator. 5,497,071, Cl. 322-28.000.

Iwatsuki, Kunihiro: *See*—
Ando, Masahiko; Yamamoto, Yoshihisa; Fukatsu, Akira; Niimi, Mamoru; Kaigawa, Masato; Oba, Hidehiro; Kimura, Hiromichi; Hojo, Yasuo; Tabata, Atsushi; and Iwatsuki, Kunihiro, 5,496,230, Cl. 477-111.000.

Iwayama, Satoshi: *See*—
Onishi, Tomoyuki; Mukai, Chika; Sekiyama, Takaaki; Tsuji, Takashi; Iwayama, Satoshi; and Okunishi, Masahiko, 5,496,824, Cl. 514-274.000.

Izhak, Allan. Automatic extending member selector. 5,495,942, Cl. 206-372.000.

Izuchi, Syuichi: *See*—
Inamasu, Tokuo; Takeda, Kazunari; Izuchi, Syuichi; and Yoshihisa, Youetsu, 5,496,656, Cl. 429-57.000.

Izuhara, Kunihiko, to Sony Corporation. Analog to digital convertor apparatus having an interpolation. 5,497,155, Cl. 341-156.000.

Izumi, Akira; and Takeuchi, Toshiyuki, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Double acting hydraulic cylinder with improved lubrication and piston rod guides. 5,495,792, Cl. 92-166.000.

Izumi, Shuji: *See*—
Kawamura, Kunio; Okada, Hiroyuki; Tsuji, Sadafusa; Chikasaki, Masaaki; Iwata, Michihiro; and Izumi, Shuji, 5,497,212, Cl. 354-21.000.

J.E.S. Arnold (Domestic Appliances) Limited: *See*—
Arnold, John E. S.; and Adams, Carl, 5,496,104, Cl. 312-204.000.

J. J. Moods, Inc.: *See*—
Ransbottom, Jayne M., 5,496,612, Cl. 428-99.000.

J. M. Voith GmbH: *See*—
Beisswanger, Rudolf; and Kustermann, Martin, 5,496,406, Cl. 118-643.000.

J. Ströbel & Sohne GmbH & Co.: *See*—
Klundt, Kurt; Moll, Philipp; and Schlöndorff, Georg, 5,496,334, Cl. 606-145.000.

Jack, William E.: *See*—
Comb, Donald G.; Perler, Francine B.; Jack, William E.; Xu, Ming-Qun; and Hodges, Robert A., 5,496,714, Cl. 435-69.700.

Jackson, Timothy W.; Kojima, Masaharu; and Lambrecht, Richard M., to Australian Nuclear Science & Technology Organisation. Rhenium complexes. 5,496,533, Cl. 424-1.650.

Jacobs, Robert: *See*—
McConnell, Oliver J.; Saucy, Gabriel; Jacobs, Robert; and Gunasekera, Sarath P., 5,496,950, Cl. 544-408.000.

Jacobson, Nathan S.: *See*—
Lee, Kang N.; Miller, Robert A.; and Jacobson, Nathan S., 5,496,644, Cl. 428-446.000.

Jacquemin, Jean-Pierre; and Deleens, Gerard, to Atochem. Thermoplastic polyetheramide/styrene copolymer compositions. 5,496,876, Cl. 524-155.000.

Jäger, Helmut: *See*—
Beisel, Hermann; Blaser, Peter T.; Hauck, Dieter; Hutzenlaub, Rudolf; Jäger, Helmut; Jahn, Hans-Georg; Müller, Robert; Rodi, Anton; and Spiegel, Nikolaus, 5,495,805, Cl. 101-477.000.

Jaguar Cars Limited: *See*—
Mulvanny, Paul; and Williams, Malcolm, 5,497,271, Cl. 359-631.000.

Jahn, Hans-Georg: *See*—
Beisel, Hermann; Blaser, Peter T.; Hauck, Dieter; Hutzenlaub, Rudolf; Jäger, Helmut; Jahn, Hans-Georg; Müller, Robert; Rodi, Anton; and Spiegel, Nikolaus, 5,495,805, Cl. 101-477.000.

Jain, Vivek: *See*—
Pramanik, Dipankar; Jain, Vivek; and Weling, Milind G., 5,496,774, Cl. 437-195.000.

Jairam, Sarwan A.; and Lin, Frank H. F., to Acco USA, Inc. Stapler with sheath control mechanism. 5,495,975, Cl. 227-123.000.

James River Paper Company, Inc.: *See*—
Moody, John R., 5,495,997, Cl. 242-561.000.

James, Robert W., to F F Seeley Nominees Pty Ltd. Heater control. 5,495,888, Cl. 165-60.000.

Jameson, Lee K.: *See*—
Faass, Judith K.; Jameson, Lee K.; Cohen, Bernard; and Gipson, Lamar H., 5,496,874, Cl. 524-56.000.

Jaminet, Jerome F.: *See*—
Peruggi, Richard E.; McHugh, Thomas M.; Ahigian, Edward E.; Jaminet, Jerome F.; He, Thomas; Kowalczyk, Thomas M.; Kulak, Richard E.; and Barrett, David W., 5,495,918, Cl. 187-316.000.

Jang, Jae D.: *See*—
Park, Myoung G.; Jang, Jae D.; and Kang, Whan K., 5,496,726, Cl. 435-253.400.

Jansen, Kai W.; and Fieselmann, Benjamin F., to Amoco/Enron Solar. Hydrogen fluoride dopant source in the preparation of conductive coated substrate. 5,496,583, Cl. 427-109.000.

Jansen, Kenneth A.: *See*—
Miller, David A.; Jansen, Kenneth A.; McGraw, Montgomery C.; and Cepulis, Darren J., 5,497,497, Cl. 395-800.000.

Jantzi, Lyle: *See*—
Samulak, Zdzislaw; and Jantzi, Lyle, 5,495,921, Cl. 188-202.000.

Japan Radio Co., Ltd.: *See*—
Yamashita, Kazuo; Adachi, Nobuyuki; Nishibe, Masatoyo; Egawa, Masahiko; and Inoue, Akiharu, 5,497,124, Cl. 330-267.000.

Jarchow, Friedrich. Load shift transmission with stepless hydrostatic gearing. 5,496,223, Cl. 475-72.000.

Jason, Inc.: *See*—
Scheider, Alfred F.; and Warner, R. Brown, 5,496,385, Cl. 51-293.000.

Jatco Corporation: *See*—
Mochizuki, Akira, 5,495,778, Cl. 74-606.00R.

Javanifard, Johnny: *See*—
Tedrow, Kerry D.; Keeney, Stephen N.; Fazio, Albert; Atwood, Gregory E.; Javanifard, Johnny; and Woiciechowski, Kenneth, 5,497,119, Cl. 327-540.000.

Javerlhac, Jean-Charles. Plow disk of the type intended to be mounted free in rotation on a shaft integral with the frame of a plow. 5,495,897, Cl. 172-604.000.

Jay, Gregory D. Stethoscopic system for high-noise environments. 5,497,426, Cl. 381-67.000.

Jayaraman, Viswanath; McFadden, David H.; and Hynek, Scott J., to Consolidated Natural Gas Service Company, Inc. Water heater with thermoelectric module and through-chamber heat sink. 5,495,829, Cl. 122-110.000.

Jeco Co., Ltd.: *See*—
Tamura, Kazuyuki; and Iiyama, Hiroshi, 5,495,762, Cl. 73-519.010.

Jedlitschka, Hans; and Delacroix, Vincent, to GE Medical Systems. Radiogenic unit. 5,497,409, Cl. 378-201.000.

Jei Lee Corporation: *See*—
Cheng, Sheng C., 5,496,251, Cl. 493-224.000.

Jelic, Ralph, to Verosol USA Inc. Window shade cord safety shroud. 5,495,883, Cl. 160-84.040.

Jellum, Roger D. Article sorter. 5,495,950, Cl. 209-703.000.

Jenkins, Robert F.: *See*—
Bartlett, Keith R.; Jenkins, Robert F.; Buss, Christopher; Martin, Timothy J.; Gerber, Andre; and Colarusso, Peter C., 5,496,615, Cl. 428-144.000.

Jensen, Marvin E.; and Biewer, John A., to Hollister Inc. Thermal blanket with elastic fit. 5,496,357, Cl. 607-108.000.

Jenson, Mark L.: *See*—
Drasler, William J.; Dutcher, Robert G.; Jenson, Mark L.; Thielen, Joseph M.; and Protonotarios, Emmanuil I., 5,496,267, Cl. 604-22.000.

Jenzer, Bernard: *See*—



Piffaretti, José; and Jenzer, Bernard, 5,497,439, Cl. 385-98.000.

Jeong, Jechang, to Samsung Electronics Co., Ltd. System for variable-length-coding and variable-length-decoding digital data for compressing transmission data. 5,497,153, Cl. 341-67.000.

Jeong, Suk D., to Goldstar Co., Ltd. Method for thawing food in microwave oven. 5,496,576, Cl. 426-233.000.

Jeram, Edward M.; and Lewis, Larry N., to General Electric Company. Production of nitrosamine-free silicone articles. 5,496,906, Cl. 528-15.000.

Jeskey, Brian E.; Sandt, Matthew C.; and Supple, Martin A. Artificial fireplace log. 5,496,384, Cl. 44-535.000.

Jewell, Robert W.; and Peter, Gary M., to Hewlett-Packard Company. Expanded tubular hub disk pack assembly clamp. 5,497,281, Cl. 360-98.080.

Jhawar, Suresh C.; Grier, John K.; and Grier, Brian K., to Grier-Jhawar-Mercer, Inc. Electric heater element support. 5,497,394, Cl. 373-130.000.

Jho, Chang H.; Loh, Yung; and Mueller, Karl F., to Ciba-Geigy Corporation. Low viscosity polar-solvent fire-fighting foam compositions. 5,496,475, Cl. 252-2.000.

Ji, Sung Y., to Samsung Electronics Co., Ltd. Circuit for controlling an audio signal output of a television. 5,497,206, Cl. 348-738.000.

Jie, Xu; Takahashi, Jun; and Suzuki, Kenji, to Furukawa Electric Co., Ltd., The. End machining apparatus and holding fixtures for optical connectors. 5,497,443, Cl. 385-134.000.

Jinno, Tadashi: *See*—
Kitagawa, Yoshihiko; Jinno, Tadashi; Aoshima, Masashi; Okita, Taisuke; Shinonaga, Hideo; and Kitadono, Kaoru, 5,496,863, Cl. 521-50.500.

Jinotti, Walter J. Pulmonary suction catheter. 5,496,287, Cl. 604-249.000.

Jo, Jin H.: *See*—
Pyo, Cheol S.; Jo, Jin H.; and Choi, Jae I., 5,497,402, Cl. 375-344.000.

John Crane UK Limited: *See*—
Goldswain, Ian M.; and Hignett, Martin W. D. B., 5,496,047, Cl. 277-96.100.

John, Peter J.: *See*—
Stephany, Joseph F.; Becerra, Juan J.; Courtney, Thomas P.; Kneezel, Gary A.; LaDonna, Richard V.; John, Peter J.; Watrobski, Thomas E.; and Wysocki, Joseph J., 5,497,174, Cl. 347-13.000.

Johns Hopkins University: *See*—
Shapiro, Theresa A.; Bodley, Annette L.; Wall, Monroe E.; and Wani, Mansukh C., 5,496,830, Cl. 514-283.000.

Johnson & Johnson Clinical Diagnostics, Inc.: *See*—
Bishop, John F.; and Mauck, Linda A., 5,496,702, Cl. 435-7.900.

Johnson, Glenn W., Jr.; McVicker, Henry J.; and McCarthy, Mark J., to Aircast, Inc. Therapeutic intermittent compression system with inflatable compartments of differing pressure from a single source. 5,496,262, Cl. 601-152.000.

Johnson, John L., Jr., to Caterpillar Inc. Compression braking system. 5,495,838, Cl. 123-322.000.

Johnson, Lanny L. Fixation screw and method for ligament reconstruction. 5,496,326, Cl. 606-88.000.

Johnson, Noel L.: *See*—
Pastrone, Giovanni; Johnson, Noel L.; Huang, J. Terry; and Allen, Timothy, 5,496,273, Cl. 604-67.000.

Johnson, Randall K., to Smithkline Beecham Corporation. Method of treating prostatic adenocarcinoma. 5,496,556, Cl. 424-423.000.

Johnston, James J., to Wiremold Company, The. Cord assembly and method for making. 5,496,191, Cl. 439-404.000.

Jokioinen, Iikka: *See*—
Ilmarinen, Antti; Ilvespää, Heikki; Kuhasalo, Antti; Yli-Kauppila, Jouko; Heikkilä, Pertti; Jokioinen, Iikka; Korpela, Matti; Petterson, Henrik; Karvinen, Mikko; Sailas, Väinö; Taskinen, Pekka; and Parker, Dick, 5,495,678, Cl. 34-117.000.

Jones, Joel, to Tri-Way Machine Ltd. Workpiece carrier for transfer machines. 5,496,148, Cl. 414-749.000.

Jones, Marvin E.: *See*—
Angadjivand, Seyed A.; Jones, Marvin E.; and Meyer, Daniel E., 5,496,507, Cl. 264-423.000.

Jones, Michael L.: *See*—
Sackier, Jonathan M.; Jones, Michael L.; and Dolendo, Edward E., 5,496,333, Cl. 606-142.000.

Jones, P. Alan: *See*—
Harvey, T. Jeffrey; Jones, P. Alan; and Fraser, Allister F., 5,496,414, Cl. 136-245.000.

Jones, Terence J.: *See*—
Deschenes, Charles L.; Jones, Terence J.; and Cooper, William J., 5,495,974, Cl. 227-71.000.

Jorgenson, James W.; and Lemmo, Anthony V., to University of North Carolina at Chapel Hill, The. Two dimensional separation system. 5,496,460, Cl. 204-604.000.

Jou, Yu-Cheun, to Qualcomm Incorporated. Method and apparatus for modulating signal waveforms in a CDMA communication system. 5,497,395, Cl. 375-205.000.

Ju, Teh-Hua; Lee, Yung-Cheng; and Lin, Wei, to University of Colorado, The Regents of the. Spatial light modulator including a VLSI chip and using solder for horizontal and vertical component positioning. 5,497,258, Cl. 359-83.000.

Juergens, Albert M., III. Positioning stage. 5,497,060, Cl. 318-563.000.

Juergens, Stanley G.: *See*—
Sageser, David M.; Juergens, Stanley G.; and Midkiff, Mark D., 5,496,428, Cl. 156-73.100.

Juillet, Hubert, to Corep. Method for statically forming rolled lampshade edges. 5,496,511, Cl. 264-314.000.

Jun, Tae-sun, to Samsung Electronics Co., Ltd. Write current control circuit for audio recording. 5,497,242, Cl. 358-341.000.

Jung, Michel J.: *See*—
Kolb, H. Michael; Burkhart, Joseph P.; Jung, Michel J.; Gerhart, Fritz E., deceased; Giroux, Eugene L.; Neises, Bernhard; and Schirlin, Daniel G., 5,496,927, Cl. 530-328.000.

Jung, Werner: *See*—
Gromer, Kurt; Haan, Franz; Jung, Werner; and Pedall, Friedrich, 5,495,661, Cl. 29-740.000.

Junino, Alex: *See*—
Lagrange, Alain; Andrean, Hervé; and Junino, Alex, 5,496,543, Cl. 424-70.700.

Jurek, Marie-Paule; Bernard, Jean-Jacques; and Chesnoy, José, to Alcatel N.V. Method of applying time offset chromatic dispersion, dispersive optical apparatus, and an optical fiber transmission system using the apparatus. 5,497,260, Cl. 359-130.000.

Jutand, Francis: *See*—
Mou, Zhi-Jian; and Jutand, Francis, 5,497,342, Cl. 364-786.000.

Jutzi, Peter: *See*—
Evertz, Kaspar; Schlund, Ruerger; Schweier, Guenther; Brintzinger, Hans; Roell, Werner; Jutzi, Peter; Mieling, Ingrid; and Mengele, Winfried, 5,496,902, Cl. 526-127.000.

Kędzior, Józef: *See*—
Bruski, Marek; Chmielewski, Andrzej; Kędzior, Józef; Kubicki, Antoni; Milczarski, Kazimierz; Popławski, Wojciech; and Strzyż, Eugeniusz, 5,495,923, Cl. 188-268.000.

Kaanta, Carter W.: *See*—
Cronin, John E.; Kaanta, Carter W.; Mann, Randy W.; Meulemans, Darrell; and Starkey, Gordon S., 5,496,771, Cl. 437-187.000.

Kabushiki Kaisha Ace Denken: *See*—
Takemoto, Takatoshi; Chida, Toshikazu; Kano, Noriaki; Ito, Eiji; Murakami, Koji; Itagaki, Takashi; Sekimoto, Kozo; and Suzuki, Masanori, 5,496,020, Cl. 271-9.010.

Kabushiki Kaisha Hara Shokki Seisakusho: *See*—
Katori, Mutsuhiko, 5,495,643, Cl. 19-225.000.

Kabushiki Kaisha Kaken Corporation: *See*—
Takeyasu, Shinji, 5,497,506, Cl. 455-89.000.

Kabushiki Kaisha Kobe Seiko Sho: *See*—
Nishimoto, Hidetoshi; Sugizaki, Yasuaki; Umei, Kenji; Satoh, Hiroshi; Terada, Yoshinori; Yasunaga, Tatsuya; Nakayama, Takenori; Wada, Yasunori; and Ueda, Keiji, 5,496,651, Cl. 428-612.000.

Kabushiki Kaisha N-Tec: *See*—
Nomura, Akichika, 5,495,962, Cl. 222-80.000.

Kabushiki Kaisha Sakamoto Seiki: *See*—
Sakamoto, Koichi, 5,495,895, Cl. 172-22.000.

Kabushiki Kaisha Sanko Seiki Seisakusho: *See*—
Kasuga, Ikuo, 5,496,993, Cl. 250-201.500.

Kabushiki Kaisha Sanyo Denki Seisakusho: *See*—
Noda, Makoto; Ichimiya, Fumio; and Uda, Ryoichi, 5,497,310, Cl. 363-17.000.

Kabushiki Kaisha Sumitomo Kinzoku Ceramics: *See*—
Hashimoto, Shizuki; and Nishijima, Nobuhiro, 5,496,967, Cl. 174-52.400.

Kabushiki Kaisha TEC: *See*—
Senda, Kouji, 5,496,116, Cl. 400-61.000.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Nagae, Kazuaki; and Morikawa, Minoru, 5,495,732, Cl. 70-252.000.

Kabushiki Kaisha Toshiba: *See*—
Fukuda, Katsuyoshi; Nakata, Fumio; Shigenaka, Keitaro; and Hirahara, Keijiro, 5,497,029, Cl. 257-613.000.
Ishikawa, Masaaki; Arai, Seiji; and Iguchi, Michihisa, 5,497,224, Cl. 355-301.000.
Ishimaru, Kazunari, 5,496,744, Cl. 437-31.000.
Kawakami, Haruko; Sekizawa, Hidekazu; and Yamamoto, Naofumi, 5,497,180, Cl. 347-131.000.
Komatsu, Fumio; Miyazaki, Kunihiro; and Shimazaki, Ayako, 5,497,407, Cl. 378-45.000.
Kozono, Hiroyuki, 5,497,031, Cl. 257-700.000.
Magome, Koichi, 5,497,352, Cl. 365-230.030.
Miyagawa, Takayoshi; Matsushita, Shigenori; Tsuchida, Takayuki; Miura, Yoshiyuki; Shimojima, Naoko; Ishikawa, Katsutoshi; and Ueda, Kunio, 5,497,318, Cl. 364-409.000.
Nakajima, Takao; and Nakamura, Kenichi, 5,497,117, Cl. 327-404.000.
Nakano, Kazuo, 5,497,413, Cl. 379-89.000.
Nishimura, Yoichi, 5,495,735, Cl. 72-8.200.
Nukui, Tadashi, 5,497,077, Cl. 324-117.00H.
Oowaki, Yukihito, 5,497,351, Cl. 365-230.030.
Otsuka, Kenichi; and Mori, Kazuya, 5,496,393, Cl. 95-19.000.
Satou, Youji; and Sasaki, Katumaru, 5,497,296, Cl. 361-681.000.
Suga, Masao; Nakajima, Syuzo; Inomata, Tadaaki; Saito, Toshimitsu; Outake, Atsuhiro; Iba, Yoshiaki; Mihara, Hidekazu; Nishikawa, Hirofumi; Nanno, Nobuyuki; and Satake, Shigeru, 5,497,455, Cl. 395-159.000.
Sugano, Mitsuko, 5,496,705, Cl. 435-7.230.
Takahara, Tamane; and Kasahara, Akihiro, 5,497,360, Cl. 369-44.280.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Izumi, Akira; and Takeuchi, Toshiyuki, 5,495,792, Cl. 92-166.000.

Kabushiki Kaisha Toyodynam: *See*—
Teramachi, Kazuo, 5,496,730, Cl. 435-290.200.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—

Yamada, Yukio; Asami, Osamu; Sugiyama, Hidehiko; Idekoba, Chie; Hoshino, Fumihiko; Hirai, Masana; Kajino, Tsutomu; Imaeda, Takao; and Sarai, Kiyoko, 5,496,719, Cl. 435-233.000.
Kabushiki Kaisha Wacom: *See—*
Sasaki, Takeshi, 5,497,176, Cl. 345-173.000.
Kabushiki Kaisha Yaskawa Denki: *See—*
Shibata, Naotake, 5,495,955, Cl. 212-275.000.
Kacher, Mark L.; Wagner, Julie A.; Schwartz, James R.; Torres, Efrain; Evans, Marcus W.; and Taneri, James E., to Procter & Gamble Company, The. Cleansing bar composition containing petrolatum having a specific size range. 5,496,488, Cl. 252-125.000.
Kaeriyama, Toshiyuki, to Texas Instruments Incorporated. Support posts for micro-mechanical devices. 5,497,262, Cl. 359-223.000.
Kagawa, Junichi: *See—*
Matsutani, Wataru; and Kagawa, Junichi, 5,497,045, Cl. 313-141.000.
Kagayama, Akira: *See—*
Asakura, Sotoo; Koyama, Yasuto; Kiyota, Youhei; Akashi, Kiyoko; Kagayama, Akira; Murakami, Yoshio; and Nakate, Toshiomi, 5,496,564, Cl. 424-489.000.
Kageyama, Shigeki: *See—*
Motoda, Takashi; Karakida, Shoichi; Kaneno, Nobuaki; and Kageyama, Shigeki, 5,496,408, Cl. 118-715.000.
Kagi, Ichiro, to Shimane Sanyo Industrial Co., Ltd. Automatic release device for automatically releasing the hold-on setting of an outside line call, and transfer method for an outside line call. 5,497,415, Cl. 379-393.000.
Kai, Ken-ichi: *See—*
Nagao, Hiromasa; Yoneya, Takashi; Miyake, Toshio; Aoyama, Atsuo; Kai, Ken-ichi; Kidokoro, Shun-ichi; Miki, Yoichiro; Endo, Kimiko; and Wada, Akiyoshi, 5,496,710, Cl. 435-68.100.
Kaigawa, Masato: *See—*
Ando, Masahiko; Yamamoto, Yoshihisa; Fukatsu, Akira; Niimi, Mamoru; Kaigawa, Masato; Oba, Hidehiro; Kimura, Hiromichi; Hojo, Yasuo; Tabata, Atsushi; and Iwatsuki, Kunihiro, 5,496,230, Cl. 477-111.000.
Kaino, Toshikuni: *See—*
Kurihara, Takashi; Amano, Michiyuki; Mori, Yuhei; Tomaru, Satoru; and Kaino, Toshikuni, 5,496,503, Cl. 252-582.000.
Kainz, Kurt, to AM System Silkeborg A/S. Shop or exhibition fittings. 5,495,952, Cl. 211-90.000.
Kaiser Aerospace & Electronics Corporation: *See—*
Rud, Mayer, 5,497,270, Cl. 359-629.000.
Kaiser Aluminum & Chemical Corporation: *See—*
Wyatt-Mair, Gavin F.; and Harrington, Donald G., 5,496,423, Cl. 148-551.000.
Kaiser, Stephen G., to Northrop Grumman Corporation. Radar signal selection based upon antenna bearing. 5,497,162, Cl. 342-159.000.
Kajino, Tsutomu: *See—*
Yamada, Yukio; Asami, Osamu; Sugiyama, Hidehiko; Idekoba, Chie; Hoshino, Fumihiko; Hirai, Masana; Kajino, Tsutomu; Imaeda, Takao; and Sarai, Kiyoko, 5,496,719, Cl. 435-233.000.
Kajita, Tatsuya, to Fujitsu Limited. Semiconductor memory device having a floating gate with improved insulation film quality. 5,497,018, Cl. 257-316.000.
Kajita, Yasuyuki; Kubota, Tsutomu; and Kudo, Kenji, to Takeda Chemical Industries, Ltd. Process for producing polyurethane elastomers. 5,496,496, Cl. 252-182.240.
Kakiuchi, Shinichi: *See—*
Maruko, Takashi; and Kakiuchi, Shinichi, 5,496,034, Cl. 273-216.000.
Kaku, Toshimitsu: *See—*
Mita, Seiichi; Kawashima, Toru; Matsuzaki, Masanori; Kaku, Toshimitsu; and Tsuchinaga, Hiroyuki, 5,497,361, Cl. 369-48.000.
Kakuda, Masatoshi, to Mitsubishi Denki Kabushiki Kaisha. Disk drive array system having internal synchronization and external synchronization monitoring. 5,497,276, Cl. 360-73.030.
Kakuguchi, Kazuhiro, to Fujitsu Limited. Drive force transmission mechanism. 5,496,120, Cl. 400-569.000.
Kalin, Jonathan A.: *See—*
Apps, William P.; and Kalin, Jonathan A., 5,495,945, Cl. 206-519.000.
Kalkman, Jesse; Heath, Roy W.; and Hammerbacher, David F., to General Motors Corporation. Tuner hose assembly for power steering system. 5,495,711, Cl. 60-469.000.
Kallman, Robert; Plotnick, Mark; and Weinstein, Burton A. Exercise and ski simulating device. 5,496,239, Cl. 482-71.000.
Kamata, Teturo: *See—*
Watano, Satoru; Itoh, Yoshihiro; Oda, Nobuhito; Kamata, Teturo; Kawakami, Noboru; and Moriya, Nobuharu, 5,497,232, Cl. 356-335.000.
Kamax S.A. Fabryke Urzadzeń Mechanicznych: *See—*
Bruski, Marek; Chmielewski, Andrzej; Kędzior, Józef; Kubicki, Antoni; Milczarski, Kazimierz; Popławski, Wojciech; and Strzyż, Eugeniusz, 5,495,923, Cl. 188-268.000.
Kameyama, Isao, to Yazaki Corporation. Oil interrupting connector. 5,496,193, Cl. 439-589.000.
Kaminski, Ram: *See—*
Di Rocco, Alessandro; Molinari, Susan; and Kaminski, Ram, 5,496,836, Cl. 514-370.000.
Kamprath, Christine K.: *See—*
Chong, Leighton K.; and Kamprath, Christine K., 5,497,319, Cl. 364-419.020.
Kamura, Yutaka: *See—*
Suzuki, Seiichi; and Kamura, Yutaka, 5,495,645, Cl. 24-30.50S.
Kanaya, Jun: *See—*
Inai, Masatoshi; Shibutani, Tadanao; Kanaya, Jun; Moritake, Masako; and Tanaka, Akie, 5,496,844, Cl. 514-415.000.
Kandpal, Tara C.: *See—*
Harper, Harold M.; Schmitz, Raymond J., III; and Kandpal, Tara C., 5,496,156, Cl. 417-312.000.
Kane, Paul A.: *See—*
Thomas, Dennis R.; and Kane, Paul A., 5,496,146, Cl. 414-460.000.
Kaneko, Takayuki: *See—*
Nakamura, Takeshi; Heinouchi, Yoshiaki; and Kaneko, Takayuki, 5,497,044, Cl. 310-348.000.
Kaneko, Tatsushi: *See—*
Shimizu, Takaaki; Ogihara, Tsutomu; Kinsho, Takeshi; Kaneko, Tatsushi; Saito, Ryuichi; and Kurihara, Hideshi, 5,496,501, Cl. 252-299.610.
Känel, Hans-Ruedi: *See—*
Ackermann, Peter; Känel, Hans-Ruedi; and Schaub, Bruno, 5,496,848, Cl. 514-465.000.
Kanemoto, Akihiko: *See—*
Takiguchi, Yasuyuki; Kanemoto, Akihiko; and Matsuki, Yumi, 5,496,497, Cl. 252-299.010.
Kaneno, Nobuaki: *See—*
Motoda, Takashi; Karakida, Shoichi; Kaneno, Nobuaki; and Kageyama, Shigeki, 5,496,408, Cl. 118-715.000.
Kanesaka, Nozomu; and Tashji, George A. Dilator for a ballon catheter. 5,496,344, Cl. 606-191.000.
Kang, Insug: *See—*
Wang, Jui H.; Kang, Insug; and Rahman, Mohammed H., 5,496,546, Cl. 424-78.360.
Kang, Jin-Young: *See—*
Ryum, Byung-Ryul; Han, Tae-Hyeon; Lee, Soo-Min; Cho, Deok-Ho; Lee, Seong-Hearn; and Kang, Jin-Young, 5,496,745, Cl. 437-31.000.
Kang, Whan K.: *See—*
Park, Myoung G.; Jang, Jae D.; and Kang, Whan K., 5,496,726, Cl. 435-253.400.
Kangsanaraks, Adisorn. Card game. 5,496,038, Cl. 273-292.000.
Kano, Hiroshi: *See—*
Ishibashi, Tadaya; Sasaki, Masanori; Obara, Hideto; Kano, Hiroshi; and Yamashita, Shintaro, 5,496,449, Cl. 205-762.000.
Kano, Masatoshi: *See—*
Shiota, Tatsuki; Takeyasu, Takumi; Kataoka, Kenichiro; Mochizuki, Tsutomu; Tanabe, Hirofumi; Ota, Mikio; Kano, Masatoshi; and Yamaguchi, Hisao, 5,496,853, Cl. 514-469.000.
Kano, Noriaki: *See—*
Takemoto, Takatoshi; Chida, Toshikazu; Kano, Noriaki; Ito, Eiji; Murakami, Koji; Itagaki, Takashi; Sekimoto, Kozo; and Suzuki, Masanori, 5,496,020, Cl. 271-9.010.
Kansai Paint Co., Ltd.: *See—*
Imai, Genji; Iwasawa, Naozumi; and Yamaoka, Tsuguo, 5,496,678, Cl. 430-176.000.
Kanzaki Kokyukoki Mfg. Co., Ltd.: *See—*
Yano, Kazuhiko; Sakikawa, Shigenori; and Ohashi, Ryota, 5,495,712, Cl. 60-487.000.
Kanzaki, Takashi: *See—*
Matsuo, Mitsuaki; Kuroki, Yasuo; and Kanzaki, Takashi, 5,497,143, Cl. 340-432.000.
Kao Corporation: *See—*
Hamada, Hirokazu; Nakagaki, Kiyoko; and Itabashi, Masaki, 5,496,492, Cl. 252-170.000.
Hamajima, Mitsugu; and Nakanishi, Minoru, 5,496,626, Cl. 428-284.000.
Yoshimatsu, Akira; Kondo, Akihiro; and Tsushima, Rikio, 5,496,897, Cl. 525-266.000.
Kaplan, Isaac: *See—*
Croitoru, Nathan; Dror, Jacob; Kaplan, Isaac; and Gannot, Israel, 5,497,440, Cl. 385-125.000.
Kaplan, Warren: *See—*
Williams, Steve; Kaplan, Warren; Neill, Paul; and Chapa, Gerardo, 5,496,869, Cl. 521-172.000.
Karabed, Razmik: *See—*
Fredrickson, Lisa; Karabed, Razmik; Siegel, Paul H.; and Thapar, Hemant K., 5,497,384, Cl. 371-43.000.
Karakida, Shoichi: *See—*
Motoda, Takashi; Karakida, Shoichi; Kaneno, Nobuaki; and Kageyama, Shigeki, 5,496,408, Cl. 118-715.000.
Kardorff, Uwe: *See—*
Misslitz, Ulf; Meyer, Norbert; Kast, Juergen; Bott, Kaspar; Walter, Helmut; Westphalen, Karl-Otto; Kardorff, Uwe; and Gerber, Matthias, 5,496,792, Cl. 504-100.000.
Karl, Richard B.; and Hanig, Harvey, to Norix Group, Inc. Chair and grouping thereof. 5,496,091, Cl. 297-248.000.
Karl, W. Clem: *See—*
Stadler, Robert W.; Karl, W. Clem; and Lees, Robert S., 5,495,852, Cl. 128-660.070.
Karvinen, Mikko: *See—*
Ilmarinen, Antti; Ilvespää, Heikki; Kuhasalo, Antti; Yli-Kauppila, Jouko; Heitkilä, Pertti; Jokioinen, Jikka; Korpela, Matti; Petterson, Henrik; Karvinen, Mikko; Sailas, Väinö; Taskinen, Pekka; and Parker, Dick, 5,495,678, Cl. 34-117.000.
Kasahara, Akihiro: *See—*
Takahara, Tamane; and Kasahara, Akihiro, 5,497,360, Cl. 369-44.280.



Kasai, Shuichi: *See—*
Okada, Minoru; Ono, Kenji; Kasai, Shuichi; and Iwasa, Akira, 5,496,561, Cl. 424-480.000.
Okuyama, Hirohisa; Ikeda, Yasuo; Ohtsuka, Shigenori; Kasai, Shuichi; and Iwasa, Akira, 5,496,819, Cl. 514-226.500.
Kasazumi, Kenichi: *See—*
Kato, Makoto; and Kasazumi, Kenichi, 5,496,995, Cl. 250-216.000.
Kast, Juergen: *See—*
Misslitz, Ulf; Meyer, Norbert; Kast, Juergen; Bott, Kaspar; Walter, Helmut; Westphalen, Karl-Otto; Kardorff, Uwe; and Gerber, Matthias, 5,496,792, Cl. 504-100.000.
Kasuga, Ikuo, to Kabushiki Kaisha Sanko Seiki Seisakusho. Optical pickup device with wedge shaped and concave lens for correcting a coma and astigmatism. 5,496,993, Cl. 250-201.500.
Kasukawa, Akihiko; and Iwai, Norihiro, to Furukawa Electric Co., Ltd., The. Semiconductor laser device having an active layer and a resonator having a single reflector or pair of reflectors. 5,497,389, Cl. 372-49.000.
Kaszanics, Arthur J. Apparatus for detecting and displaying engine speed. 5,497,092, Cl. 324-402.000.
Katagiri, Yoshitada: *See—*
Tanaka, Hidenao; Watabe, Akinori; Shimada, Junichi; Katagiri, Yoshitada; and Suzuki, Yoshio, 5,497,390, Cl. 372-50.000.
Kataoka, Kenichiro: *See—*
Shiota, Tatsuki; Takeyasu, Takumi; Kataoka, Kenichiro; Mochizuki, Tsutomu; Tanabe, Hirofumi; Ota, Mikio; Kano, Masatoshi; and Yamaguchi, Hisao, 5,496,853, Cl. 514-469.000.
Katata, Hiroyuki: *See—*
Miyake, Toshiyuki; Kusao, Hiroshi; and Katata, Hiroyuki, 5,497,338, Cl. 364-514.00A.
Katayama, Masato; Fujii, Shozo; Kimoto, Hiroshi; and Kato, Katsuya, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Fluorine-containing β-indolebutyric acid compounds, and regulation of plant growth therewith. 5,496,794, Cl. 504-284.000.
Katayama, Masayuki: *See—*
Mizutani, Atsushi; Katayama, Masayuki; Ito, Nobuei; and Hattori, Tadashi, 5,496,582, Cl. 427-66.000.
Katayama Special Industries, Ltd.: *See—*
Sugikawa, Hirofumi, 5,496,650, Cl. 428-548.000.
Katayose, Tsuyoshi: *See—*
Kohzono, Ichiro; and Katayose, Tsuyoshi, 5,497,501, Cl. 395-849.000.
Kathnelson, Jerry; and Reid, Michael S. D., to Erie Manufacturing (Canada) Co. Limited. Temperature control system and controller therefor. 5,495,887, Cl. 165-11.100.
Kato, Ikunoshin: *See—*
Nomura, Yoshiko; Kimizuka, Fusao; Ishino, Yoshizumi; and Kato, Ikunoshin, 5,496,717, Cl. 435-199.000.
Kato, Kanji: *See—*
Akizawa, Mitsuru; Noguchi, Kouki; Hayashi, Takehisa; Kato, Kanji; and Matsushima, Hitoshi, 5,497,488, Cl. 395-600.000.
Kato, Katsuya: *See—*
Katayama, Masato; Fujii, Shozo; Kimoto, Hiroshi; and Kato, Katsuya, 5,496,794, Cl. 504-284.000.
Kato, Kazutaka: *See—*
Ozawa, Hidenari; Kato, Kazutaka; Ohgi, Keiichi; and Yahagi, Masahiro, 5,496,171, Cl. 431-326.000.
Kato, Makoto; and Kasazumi, Kenichi, to Matsushita Electric Industrial Co., Ltd. Superresolution scanning optical device. 5,496,995, Cl. 250-216.000.
Kato, Masayuki; Aritake, Hirokazu; Matsumoto, Tsuyoshi; Tomita, Junji; Yamagishi, Fumio; Nakashima, Masato; Suzuki, Masao; Fujiwara, Toshiaki; Sugita, Masaya; and Takoa, Koichi, to Yazaki Corporation; and Fujitsu Limited. Headup display apparatus. 5,497,170, Cl. 345-9.000.
Kato, Masayuki: *See—*
Aritake, Hirokazu; Kato, Masayuki; Ishimoto, Manabu; Sato, Noriko; and Nakashima, Masato, 5,497,189, Cl. 348-51.000.
Kato, Minoru, to Canon Denshi Kabushiki Kaisha. Magnetic head having coil bobbins separated from a terminal assembly. 5,497,283, Cl. 360-123.000.
Kato, Takao: *See—*
Sakata, Hideki; Tanaka, Tsutomu; Kato, Takao; Ueno, Haruhiko; Ino, Akitoshi; and Kusano, Yoshihiro, 5,497,469, Cl. 395-413.000.
Kato, Toshikatsu: *See—*
Kuguminato, Hideo; Kato, Toshikatsu; Fujinaga, Chikako; and Hamahara, Kyoko, 5,496,420, Cl. 148-320.000.
Katoh, Hisaharu; and Fukushima, Hirotaka, to Yazaki Corporation. Shielded cable connecting terminal. 5,496,968, Cl. 174-74.00R.
Katoh, Kohtaro: *See—*
Okamoto, Hiroshi; Katoh, Kohtaro; Tomita, Hiroshi; Suzuki, Kenji; and Saitoh, Kazuyoshi, 5,496,688, Cl. 430-500.000.
Katori, Mutsuhiko, to Kabushiki Kaisha Hara Shokki Seisakusho. Method and apparatus for controlling the rocking of a nipper frame in a lap nipping mechanism for a comber. 5,495,643, Cl. 19-225.000.
Katsakoglou, Akis: *See—*
Allan, Andrew M.; and Katsakoglou, Akis, 5,496,396, Cl. 96-135.000.
Katsube, Tetsushi: *See—*
Iwata, Masayuki; Kimura, Tomio; Inoue, Teruhiko; Fujihara, Yoshimi; and Katsube, Tetsushi, 5,496,951, Cl. 546-13.000.
Katsuki, Kazuo: *See—*
Chin, Danny; Sauer, Donald J.; Meyerhofer, Dietrich; and Katsuki, Kazuo, 5,497,465, Cl. 395-280.000.
Kaufman, Charles W.; Gasser, Morrie; Lampson, Butler W.; Tardo, Joseph J.; and Alagappan, Kannan, to Digital Equipment Corporation. Method and apparatus for protecting the confidentiality of passwords in a distributed data processing system. 5,497,421, Cl. 380-23.000.
Kaufman, Harold C. Ventilated hat. 5,495,622, Cl. 2-175.100.
Kaul, Jeff: *See—*
Berland, Kerry; Kaul, Jeff; and Budniak, Mitchell, 5,497,326, Cl. 364-424.050.
Kawabata, Masami: *See—*
Watanabe, Emi; Kawabata, Masami; and Sumiyoshi, Iwao, 5,496,903, Cl. 526-204.000.
Kawabata, Tohru: *See—*
Nankoh, Mitsuo; Inoue, Akio; Yokomizo, Hitoshi; Tomida, Yoeikazu; and Kawabata, Tohru, 5,497,372, Cl. 370-69.100.
Kawaguchi, Satoshi: *See—*
Ishida, Michio; Kuwahara, Tsutomu; Kawaguchi, Satoshi; Kono, Tadashi; Aoki, Norihiro; Sekiguchi, Yoshitoshi; Sasaki, Kunio; and Shimotani, Hideo, 5,495,948, Cl. 209-11.000.
Kawahara, Setsuko: *See—*
Nakano, Yasushi; Kawahara, Setsuko; Shimizu, Yuji; and Miyake, Tohru, 5,496,614, Cl. 428-141.000.
Kawai, Shigeharu: *See—*
Uemoto, Kenji; Ohta, Tokuji; and Kawai, Shigeharu, 5,497,320, Cl. 364-419.170.
Kawakami, Haruko; Sekizawa, Hidekazu; and Yamamoto, Naofumi, to Kabushiki Kaisha Toshiba. Image recording apparatus for representing a halftone by use of a plurality of recorded dots. 5,497,180, Cl. 347-131.000.
Kawakami, Noboru: *See—*
Watano, Satoru; Itoh, Yoshihiro; Oda, Nobuhito; Kamata, Teturo; Kawakami, Noboru; and Moriya, Nobuharu, 5,497,232, Cl. 356-335.000.
Kawakami, Yasushi; Koie, Kazuaki; Nakahigashi, Sachiyo; Omura, Kengo; Yamada, Shiro; Ooshio, Yasuyo; Ishida, Kazuko; Ueno, Hideo; and Ishida, Minako, to Brother Kogyo Kabushiki Kaisha. Tape printer having a display. 5,496,119, Cl. 400-70.000.
Kawamoto, Fumio, to Fuji Photo Film Co., Ltd. Photographic film-incorporated camera. 5,496,687, Cl. 430-496.000.
Kawamura, Hiroyuki: *See—*
Itoh, Masami; Nishii, Kanji; Kawamura, Hiroyuki; and Fukui, Atsushi, 5,497,433, Cl. 382-211.000.
Kawamura, Kunio; Okada, Hiroyuki; Tsuji, Sadafusa; Chikasaki, Masaaki; Iwata, Michihiro; and Izumi, Shuji, to Minolta Camera Kabushiki Kaisha. Rewinding device for cameras. 5,497,212, Cl. 354-21.000.
Kawamura, Yoshiya: *See—*
Okamoto, Yoshio; Enomoto, Naoki; Furukawa, Sachiko; Ogasawara, Yasushi; Akano, Hirofumi; and Kawamura, Yoshiya, 5,496,937, Cl. 536-124.000.
Kawanaka, Asaichi: *See—*
Matsumoto, Nobuya; Kunisaki, Shinichi; Fujiwara, Goro; Masuda, Mitsunobu; Horie, Hiroshi; and Kawanaka, Asaichi, 5,496,860, Cl. 521-31.000.
Kawano, Michiko: *See—*
Koizumi, Taeko; and Kawano, Michiko, 5,497,249, Cl. 358-462.000.
Kawano, Susumu, to Amada Metrecs Company, Limited. Lower tool device for press brake. 5,495,743, Cl. 72-481.900.
Kawasaki Kasei Chemicals Ltd.: *See—*
Maruyama, Kazuhiro, 5,496,939, Cl. 540-139.000.
Kawasaki, Kazuya; Amano, Yoshikazu; Seshimoto, Osamu; and Yamada, Kiyoshi, to Fuji Photo Film Co., Ltd. Reagent composition for quantitative analysis of inorganic phosphorous and dry analysis element utilizing the same. 5,496,708, Cl. 435-28.000.
Kawasaki, Masahiko, to Pioneer Electronic Corporation. CATV system in which message reception can be confirmed by a viewer. 5,497,186, Cl. 348-6.000.
Kawasaki Steel Corporation: *See—*
Kuguminato, Hideo; Kato, Toshikatsu; Fujinaga, Chikako; and Hamahara, Kyoko, 5,496,420, Cl. 148-320.000.
Kawasaki, Yoshiaki: *See—*
Tamura, Hiroshi; Mishima, Naoshi; and Kawasaki, Yoshiaki, 5,496,671, Cl. 430-58.000.
Kawashima, Seiichi: *See—*
Masuda, Noboru; Yamamoto, Kazumichi; Nakajima, Kazunori; Okabe, Toshihiro; Yamagiwa, Akira; Yamagishi, Mikio; Koide, Kazuo; Fujita, Bunichi; and Kawashima, Seiichi, 5,497,263, Cl. 327-278.000.
Kawashima, Toru: *See—*
Mita, Seiichi; Kawashima, Toru; Matsuzaki, Masanori; Kaku, Toshimitsu; and Tsuchinaga, Hiroyuki, 5,497,361, Cl. 369-48.000.
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Dahlstrom, David K.; and Kazmar, Theodore R., 5,497,357, Cl. 367-158.000.

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Tedrow, Kerry D.; Keeney, Stephen N.; Fazio, Albert; Atwood, Gregory E.; Javanifard, Johnny; and Woiciechowski, Kenneth, 5,497,119, Cl. 327-540.000.

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Krauter, Allan I.; Kehoskie, Michael P.; and Vivenzio, Robert L., 5,496,260, Cl. 600-148.000.

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Kenny, Larry A., III, to C&W Fabricators, Inc. Industrial roll-up damper. 5,496,012, Cl. 251-294.000.

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Schaupp, Karin; Polzer, Josef; Kerbl, Johannes; Lanthaler, Kurt; Davis, Stanley S.; and Washington, Clive, 5,496,818, Cl. 514-225.800.

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Heuseveldt, Jan W.; van Helmond, Johannes; and Ketels, Hendrikus H. T. M., 5,496,880, Cl. 524-417.000.

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Harrison, Robert G.; Kim, Bong-Sool; and Lamson, Robert D., 5,495,795, Cl. 99-492.000.

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Kim, Ji-ho, to Samsung Electronics Co., Ltd. Automatic digital frequency control circuit. 5,497,202, Cl. 348-536.000.

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Yoon, Sung-June; Chung, Young-Ho; Lee, Chi-Woo; Oh, Yoon-Seok; Choi, Dong-Rack; and Kim, Nam-Doo, 5,496,947, Cl. 544-362.000.

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Faass, Judith K.; Jameson, Lee K.; Cohen, Bernard; and Gipson, Lamar H., 5,496,874, Cl. 524-56.000.
Kuepper, Rebecca J.; and Rasmussen, Christine A., 5,496,298, Cl. 604-389.000.

Kimizuka, Fusao: *See*—
Nomura, Yoshiko; Kimizuka, Fusao; Ishino, Yoshizumi; and Kato, Ikunoshin, 5,496,717, Cl. 435-199.000.

Kimoto, Hiroshi: *See*—
Katayama, Masato; Fujii, Shozo; Kimoto, Hiroshi; and Kato, Katsuya, 5,496,794, Cl. 504-284.000.

Kimura, Hiromichi: *See*—
Ando, Masahiko; Yamamoto, Yoshihisa; Fukatsu, Akira; Niimi, Mamoru; Kaigawa, Masato; Oba, Hidehiro; Kimura, Hiromichi; Hojo, Yasuo; Tabata, Atsushi; and Iwatsuki, Kunihiro, 5,496,230, Cl. 477-111.000.
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Minowa, Toshimichi; Ohyama, Yoshishige; Kimura, Hiroshi; Ozaki, Naoyuki; Shiraishi, Takashi; Ishii, Junichi; Ibamoto, Masahiko; and Tokuda, Hiroatsu, 5,496,227, Cl. 477-62.000.

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Takaya, Seizi; Fukuzumi, Shuzo; Ohbayashi, Hiroaki; and Kimura, Makoto, 5,497,327, Cl. 364-424.050.

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Itagaki, Minehiro; Okano, Kazuyuki; Kimura, Suzushi; Nakatani, Seiichi; Bessho, Yoshihiro; Yuhaku, Satoru; Hakotani, Yasuhiko; and Miura, Kazuhiro, 5,496,619, Cl. 428-209.000.

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Iwata, Masayuki; Kimura, Tomio; Inoue, Teruhiko; Fujihara, Yoshimi; and Katsube, Tetsushi, 5,496,951, Cl. 546-13.000.

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Imafuku, Hideaki; Fujita, Takashi; Tamiya, Toshikazu; and Kira, Kuniko, 5,496,380, Cl. 8-529.000.

Kirk, Michael D.: *See*—





Linker, Frederick I.; Kirk, Michael D.; Alexander, John D.; Park, Sang-il; Park, Sung-il; Smith, Ian R.; and Swift, Peter R., 5,496,999, Cl. 250-306.000.

Kirk, Richard A.; and Roe, Malcolm D. M., to Crosfield Electronics Limited. Method and apparatus for viewing screened images. 5,497,248, Cl. 358-454.000.

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Sharma, Umesh; Hayden, Jim; and Kirsch, Howard C., 5,496,756, Cl. 437-52.000.

Kishi, Gregory T.: *See*—
Danielson, Craig T.; Kishi, Gregory T.; McIntosh, Michael P.; Mery, Hector E.; and Rockwell, Scott M., 5,497,057, Cl. 318-371.000.

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Kitagawa, Yoshihiko; Jinno, Tadashi; Aoshima, Masashi; Okita, Taisuke; Shinonaga, Hideo; and Kitadono, Kaoru, 5,496,863, Cl. 521-50.500.

Kitagawa, Kenji: *See*—
Sumi, Shigeo; and Kitagawa, Kenji, 5,496,432, Cl. 156-344.000.

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Kitakami, Osamu; Wakai, Kunio; and Yoshida, Kazuetsu, to Hitachi Maxell, Ltd.; and Hitachi Ltd. Magnetic recording medium. 5,496,620, Cl. 428-212.000.

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Asakura, Sotoo; Koyama, Yasuto; Kiyota, Youhei; Akashi, Kiyoko; Kagayama, Akira; Murakami, Yoshio; and Nakate, Toshiomi, 5,496,564, Cl. 424-489.000.

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Teres, Yvan; and Klappert, Rolf, 5,497,171, Cl. 345-43.000.

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Mühlfeld, Horst; Klein, Lieselotte; and Groten, Robert, 5,496,909, Cl. 528-76.000.

Kleinschmidt, Uwe: *See*—
Stellberger, Rudi; Kleinschmidt, Uwe; and Kusch, Hans-Jürgen, 5,495,804, Cl. 101-415.100.

Kleinwort, Rolf: *See*—
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Klement, Erich: *See*—
Henn, Rolf; Hahn, Klaus; Hönl, Hans; Heckmann, Walter; Wassmer, Karl-Heinz; Klement, Erich; and Fischer, Joachim, 5,496,864, Cl. 521-59.000.

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Klicek, Michael S., to Valleylab Inc. Impedance and temperature generator control. 5,496,312, Cl. 606-34.000.

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Klotz, Robert C.: *See*—
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Croucher, Melvin D.; Patel, Raj D.; Kmiecik-Lawrynowicz, Grazyna E.; Hopper, Michael A.; and Grushkin, Bernard, 5,496,676, Cl. 430-137.000.

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Nishi, Hidetoshi; and Kobayashi, Hideo, 5,495,736, Cl. 72-39.000.

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Tamura, Masayuki; Shinohara, Akira; Kobayashi, Koichi; Mackawa, Yasushi; and Yoshida, Minoru, 5,495,990, Cl. 242-18.00R.

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Scrutchfield, Edward D.; and Koch, Drake L., 5,495,646, Cl. 24-500.000.

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Yeoman, Neil; Pinaire, Ronald; Ulowetz, Michael A.; Nace, Timothy P.; and Furse, David A., 5,496,446, Cl. 202-158.000.

Koch, Jürgen: *See*—
Fischer, Christian; Elbl-Weiser, Karin; and Koch, Jürgen, 5,496,915, Cl. 528-353.000.

Kocher, Timothy L.: *See*—
Fabian, David J.; Kocher, Timothy L.; Northcraft, Shane D.; Sarver, Douglas R.; and Thumma, Mark R., 5,496,180, Cl. 439-60.000.

Kocherscheid, Karl A.: *See*—
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Hotta, Yoshio; Hanyu, Yukio; Mihara, Tadashi; Kodera, Yasuto; and Nakamura, Katsutoshi, 5,497,257, Cl. 359-81.000.

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Rogers, Steven W.; Kodosky, Jeffrey L.; and Luick, Dean A., 5,497,500, Cl. 395-800.000.

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Toida, Ichiro; Yamamoto, Setsuko; Watanabe, Nanao; and Ura, Toshikazu, 5,496,949, Cl. 544-406.000.

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Drew, Sharon M.; Bruns, Jeffrey C.; and Kogel, Jessica E., 5,496,398, Cl. 106-15.050.

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Koh, Chao-Ming, to Industrial Technology Institute Research. Stacked dram poly plate capacitor. 5,497,016, Cl. 257-306.000.

Kohn, Elise: *See*—

Reed, Eddie; Kohn, Elise; and Sarosy, Gisele, 5,496,804, Cl. 514-12.000.
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Hattori, Ryo; and Kohno, Yasutaka, 5,496,748, Cl. 437-40.000.
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Koide, Kazuo: *See*—
Masuda, Noboru; Yamamoto, Kazumichi; Nakajima, Kazunori; Okabe, Toshihiro; Yamagiwa, Akira; Yamagishi, Mikio; Koide, Kazuo; Fujita, Bunichi; and Kawashima, Seiichi, 5,497,263, Cl. 327-278.000.
Koide, Tokuo: *See*—
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Koito Manufacturing Co., Ltd.: *See*—
Fujigaya, Taketoshi, 5,497,058, Cl. 318-446.000.
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Inomata, Mitsugu; and Kojima, Hisayoshi, 5,497,220, Cl. 355-245.000.
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Monzen, Hiroyuki; Hiromoto, Kazuhiko; Hirayama, Shuji; Kondo, Nobuyuki; Ishigami, Haruki; and Ishimura, Yoshimasa, 5,496,532, Cl. 423-584.000.
Kondoh, Masatoshi; and Minegishi, Miyoji, to Sumitomo Heavy Industries, Ltd. Low speed geared motor. 5,497,041, Cl. 310-156.000.
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Isobe, Ryosuke; Yanagita, Takafumi; Saitoh, Akira; and Seki, Akihiko, 5,496,622, Cl. 428-216.000.
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König, Udo; van den Berg, Hendrikus; and Tabersky, Ralf, to Widia GmbH. Chemical vapor deposition apparatus and method wherein a corona discharge is generated inside a perforated cage which surrounds the substrate. 5,496,594, Cl. 427-569.000.
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Reijnierse, Adrianus A. L.; and Velthausz, Daan D., 5,497,368, Cl. 370-54.000.
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Koops, Roger L.: *See*—
Pastrick, Todd W.; Molenkamp, Linda K.; and Koops, Roger L., 5,497,305, Cl. 362-83.100.
Kopp, Dieter, to Alcatel NV. Method and device for detecting and correcting errors in memory modules. 5,497,376, Cl. 371-10.200.
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Pyo, Cheol S.; Jo, Jin H.; and Choi, Jae I., 5,497,402, Cl. 375-344.000.
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Korsunsky, Iosif; Shipe, Joanne E.; Harlan, Tod M.; Foreman, Gerald L.; Klotz, Robert C.; and Brown, Robert W., to Whitaker Corporation, The. Method for assembling a connector to the edge of a circuit board. 5,495,666, Cl. 29-834.000.
Korte, Siegfried: *See*—
Sackmann, Günter; Meyer, Rolf-Volker; Korte, Siegfried; and Schapowalow, Sergej, 5,496,890, Cl. 525-329.100.
Koschmieder, Hartmut: *See*—
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Kosiec, Jeannie H.; and Gillig, Steven F., to Motorola, Inc. Phase synchronization circuit and method therefor for a phase locked loop. 5,497,126, Cl. 331-1.00A.
Koster, Helmut. Cooling system. 5,495,724, Cl. 62-259.100.
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Torikoshi, Yasuo; Kosugi, Naoki; and Nagashima, Tetsuya, 5,497,009, Cl. 250-574.000.
Kosugi, Susumu: *See*—
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Kota, Masaharu; and Nakatera, Kazuya, to Murata Manufacturing Co., Ltd. Ultrasonic sensor. 5,495,766, Cl. 73-652.000.
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Kozak, Burton. Product display and storage cabinet. 5,496,103, Cl. 312-118.000.
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Krauter, Allan I.; Kehoskie, Michael P.; and Vivenzio, Robert L., to Welch Allyn, Inc. Torque override knob for endoscopes, borescopes, or guide tubes. 5,496,260, Cl. 600-148.000.
Krebs, Peter. Spinal cannula with transparent grip part. 5,496,281, Cl. 604-168.000.
Kreckel, Karl W.: *See*—
Schwartz, Mark E.; and Kreckel, Karl W., 5,496,599, Cl. 428-35.700.
Krejci, James J.; and Heberger, John M., to Hoechst Celanese Corporation. Primer coating, polyester film having a primer coating, and a process for coating film. 5,496,647, Cl. 428-480.000.
Kress Corporation: *See*—
Thomas, Dennis R.; and Kane, Paul A., 5,496,146, Cl. 414-460.000.
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Rudolph, Bernd; Kellner, Frank; and Kroenert, Uwe, 5,497,004, Cl. 250-372.000.
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Kroll, Thomas W.: *See*—
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Krone Aktiengesellschaft: *See*—
Schachtebeck, Winfried, 5,496,196, Cl. 439-682.000.
Kruit, Jan P.; and Verwey, Nicolaas P., to Heineken Technical Services, B.V. Process and an apparatus for packaging containers in a carrier in two rows of each at least two pieces as well as a blank to be used therein. 5,495,703, Cl. 53-398.000.
Kuberasampath, Thangavel; and Rueger, David C., to Stryker Corporation. Osteogenic devices. 5,496,552, Cl. 424-420.000.
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Bruski, Marek; Chmielewski, Andrzej; Kędzior, Józef; Kubicki, Antoni; Milczarski, Kazimierz; Popławski, Wojciech; and Strzyż, Eugeniusz, 5,495,923, Cl. 188-268.000.
Kubo, Keiji; Inada, Yoshiyuki; and Naka, Takehiko, to Takeda Chemical Industries, Ltd. Heterocyclic compounds having angiotensin II antagonistic activity and use thereof. 5,496,835, Cl. 514-361.000.
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Kubota, Yoshihiro: *See*—
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Kudelski, André, to Nagra Plus S.A. Data processing system having a set of memory cards. 5,497,418, Cl. 380-5.000.
Kudo, Kenji: *See*—
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Kudo, Toshio, to Casio Computer Co., Ltd. Method of manufacturing polycrystalline silicon thin film. 5,496,768, Cl. 437-174.000.
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Kuepper, Rebecca J.; and Rasmussen, Christine A., to Kimberly-Clark Corporation. Elastomeric ears for disposable absorbent article. 5,496,298, Cl. 604-389.000.
Kuguminato, Hideo; Kato, Toshikatsu; Fujinaga, Chikako; and Hamahara, Kyoko, to Kawasaki Steel Corporation. Can-making steel sheet. 5,496,420, Cl. 148-320.000.
Kuhar, Michael J.; Carroll, Frank I.; Boja, Joh W.; Lewin, Anita H.; and Abraham, Philip, to Research Triangle Institute. Cocaine receptor binding ligands. 5,496,953, Cl. 546-125.000.
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Kuhn, Stephen R., to ABC Rail Products Corporation. Direct support frog assembly. 5,496,004, Cl. 246-470.000.
Kuhns, Richard L. Deflector assembly for a rain gutter. 5,495,694, Cl. 52-12.000.
Kulak, Richard E.: *See*—
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Mironesco, Dan; Venkert, Yoav; and Nachon, Beni, 5,495,976, Cl. 228-110.100.
Kulka, Frederick C.; and Wunshel, Michael G., to General Motors Corporation. Fastening device and method of attachment. 5,496,006, Cl. 248-231.900.
Kulpe, Jürgen: *See*—
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Kumagai, Kiyoshi: *See*—
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Kumakhov, Muradin A., to X-Ray Optical Systems, Inc. Use of a Kumakhov lens in analytic instruments. 5,497,008, Cl. 250-505.100.
Kumar, Ramesh C.: *See*—
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Kunisaki, Shinichi: *See*—
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Kuniyoshi, Shinji: *See*—
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Kuo, Arthur T. C.; and Choudhury, Ratan, to LSI Logic Corporation. Determination of failure criteria based upon grain boundary electromigration in metal alloy films. 5,497,076, Cl. 324-158.100.
Kurano, Akira: *See*—
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Kuraray Co., Ltd.: *See*—
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Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Yamazaki, Akira, 5,496,395, Cl. 96-123.000.
Kurihara, Hideshi; Miura, Sadayoshi; and Nagai, Tsuyoshi, to Teijin Limited. Polyester film for magnetic recording media, process for preparation thereof and magnetic recording medium. 5,496,618, Cl. 428-198.000.
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Shimizu, Takaaki; Ogihara, Tsutomu; Kinsho, Takeshi; Kaneko, Tatsushi; Saito, Ryuichi; and Kurihara, Hideshi, 5,496,501, Cl. 252-299.610.
Kurihara, Takashi; Amano, Michiyuki; Mori, Yuhei; Tomaru, Satoru; and Kaino, Toshikuni, to Nippon Telegraph and Telephone. Third-order nonlinear optical main chain polymer material and method for preparing the same. 5,496,503, Cl. 252-582.000.
Kurland, Marvin; Noonan, Thomas J.; Martin, David L.; and Riffl, Eric Z., to Trenton State College. Method and system for controlling a motorized wheelchair using controlled braking and incremental discrete speeds. 5,497,056, Cl. 318-269.000.
Kurmeier, Hans A.: *See*—
Poetsch, Eike; Meyer, Volker; Stahl, Klaus P.; Reiffenrath, Volker; Finkenzeller, Ulrich; Bartmann, Ekkehard; Hittich, Reinhard; Coates, David; Greenfield, Simon; Smith, Graham; Kurmeier, Hans A.; and Dorsch, Dieter, 5,496,499, Cl. 252-299.660.
Kurokawa, Junji; Nojima, Kazuo; and Sekizawa, Masaki, to Ricoh Company, Ltd. Charge rollers having improved layer structure and/or surface characteristics in an image forming apparatus. 5,497,219, Cl. 355-219.000.
Kurokawa, Takashi; Nishii, Michiharu; and Sugisawa, Masakazu, to Aisin Seiki Kabushiki Kaisha. Pressure control apparatus in a vehicle braking system. 5,496,101, Cl. 303-125.000.
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Kuroki, Yasuo: *See*—
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Kuromizu, Yuichi: *See*—
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Kurtz, Robert D., Jr.: *See*—
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Kusano, Yoshihiro: *See*—
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Kusao, Hiroshi: *See*—
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Kusch, Hans-Jürgen: *See*—
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Kustermann, Martin: *See*—
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Kuwabara, Junichi, to Clover Manufacturing Co. Ltd. Device and method for forming and retaining waterdrops. 5,495,936, Cl. 206-1.700.
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Kwon, Oh-Sang, to Daewoo Electronics Co., Ltd. Digital video signal recording/reproducing apparatus having multiple recording and reproducing paths. 5,497,239, Cl. 358-335.000.
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Hamamoto, Shoichi; Amino, Hirokazu; Ishida, Noriyuki; Tamura, Yasunori; Nishio, Yoichi; and Ichimiya, Masaru, 5,496,372, Cl. 623-16.000.
Kyoto Dai-Ichi Kagaku Co., Ltd.: *See*—
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Laapotti, Jorma, to Valmet Paper Machinery Inc. Method and apparatus for opening a nip in an extended-nip press. 5,496,442, Cl. 162-199.000.
Labree, Michael A. Camera mount. 5,497,214, Cl. 354-81.000.
Labutin, Viktor N.; Mattis, Alfred R.; Shishaev, Sergei V.; Tsvetkov, Vladimir N.; Tolmachev, Alexandr V.; and Boiko, Genrikh K., to Institut Gornogo Delsa Sibirskogo Otdelenia Akademii Nauk SSSR; and Proizvodstvennoe Obidinenie Uralmash, Excavator bucket. 5,495,685, Cl. 37-446.000.
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Lagrange, Alain; Andrean, Hervé; and Junino, Alex, to L'Oreal. Product based on inorganic or organic particles bearing an indoline-based product. 5,496,543, Cl. 424-70.700.
Lai, Yu-Chin; and Bambury, Ronald E., to Bausch & Lomb Incorporated. Fumarate and fumaramide siloxane hydrogel compositions. 5,496,871, Cl. 523-107.000.
Lainé, Jacques: *See*—
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Lam, Stephen; and Torkewitz, Nancy, to Ciba-Geigy Corporation. Pseudomonas biocontrol strains. 5,496,547, Cl. 424-93.470.
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Lugmayr, Hans: *See—*
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Luk Farhzeug-Hydraulik GmbH & Co. KG: *See—*
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Lukacovic, Michael F.: *See—*
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L'Unite Hermetique: *See—*
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Lussier, Michel, to Les Systems M.L.G. Inc. Device for moving large and heavy loads. 5,496,013, Cl. 254-105.000.
Lutz, Ronald G.: *See—*
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Luyken, Hermann: *See—*
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Luzaich, Greg: *See—*
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LXE, Inc.: *See—*
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Lynch, Robert C.: *See—*
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MacDonald, Kenneth. Convertible air conditioning unit usable as water heater. 5,495,723, Cl. 62-183.000.
Macejak, Dennis G.: *See—*
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Machida Endoscope Co., Ltd.: *See—*
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Machida, Shigeru; Saitoh, Takashi; and Sakamoto, Susumu, to Tokico Ltd. Scroll fluid apparatus having an inclined wrap surface. 5,496,161, Cl. 418-55.200.
Machida, Toshinori; Hirokawa, Atsushi; and Ito, Fusao, to Toyo Ink Manufacturing Co., Ltd. Base film having dimensional stability and high transparency, and photographic light-sensitive material comprising same. 5,496,690, Cl. 430-533.000.
Macovski, Albert. Bandwidth extension system using periodic switching. 5,497,090, Cl. 324-322.000.
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Madan, Esteban C.; Beebe, Randolph R.; and Stanfield, Teresa H., to LXE, Inc. Dual trigger multiplexed data entry terminal. 5,496,992, Cl. 235-462.000.
Mader, Leopold, to EH-Schrack Components Aktiengesellschaft. Relay. 5,497,132, Cl. 335-78.000.
Maechtle, Walter: *See—*
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Maeda, Eiichi: *See—*
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Maeda, Hiroshi, to Ricoh Company, Ltd. Microcomputer computer system having plural programmable timers and preventing memory access operations from interfering with timer start requests. 5,497,481, Cl. 395-550.000.
Maeda, Kayoko: *See—*
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Maeda, Masataka, to Brother Kogyo Kabushiki Kaisha. Image forming apparatus having aperture electrodes with lubricating layer thereon. 5,497,175, Cl. 347-55.000.
Maeda, Miyuki: *See—*
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Maestre, Federico A. Portable programmable medication alarm device and method and apparatus for programming and using the same. 5,495,961, Cl. 221-3.000.
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Magome, Koichi, to Kabushiki Kaisha Toshiba. Semiconductor memory device having dual mode operation. 5,497,352, Cl. 365-230.030.
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LeComte, Norman E.; Nott, Sepideh H.; Kawate, Keith W.; and Maher, Thomas R., 5,497,072, Cl. 323-289.000.
Mahnad, Ali R. Dual frequency batwing antenna. 5,497,166, Cl. 343-795.000.
Main, W. Eric; and Durec, Jeffrey C., to Motorola, Inc. Amplifier circuit having high linearity for cancelling third order harmonic distortion. 5,497,123, Cl. 330-257.000.
Maitra, Kalyan K.; McInerney, Daniel G.; and Unger, Carl H., to Allied Tube & Conduit Corp. Method and apparatus for galvanizing linear materials. 5,496,588, Cl. 427-309.000.
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Maki, Yoshiro; Nakagawa, Toshiko; Furukawa, Yoshiaki; Outani, Minoru; Haruta, Takashi; Yamanami, Maki; and Nakamura, Sachiko, to MEC Co., Ltd. Composition for treating copper and copper alloy surfaces and method for the surface treatment. 5,496,590, Cl. 427-388.100.
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Makishima, Hideo; Yamada, Keizo; and Tomihari, Yoshinori, to NEC Corporation. Electron beam radiator with cold cathode integral with focusing grid member and process of fabrication thereof. 5,496,199, Cl. 445-4.000.
Makita, Kensuke; Takamatsu, Atsushi; and Tanaka, Katsuto, to Central Glass Company, Limited. Glass pane with reflectance reducing coating and combiner of head-up display system. 5,496,621, Cl. 428-216.000.
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Malpiece, Frédéric; Rousseau, Alain; and Mercier, Dominique, to Soule. Varistor surge arrestors, in particular for high tension. 5,497,138, Cl. 338-21.000.
Mamin, Harry J.; Rugar, Daniel; and Terris, Bruce D., to National Business Machines Corporation. Optical disk data storage system with radiation-transparent air-bearing slider. 5,497,359, Cl. 369-44.150.
Mamiya, Yukiko: *See—*
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Manabe, Katsuhide: *See—*
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Mang, Michael N.; White, Jerry E.; and Swanson, Paul E., to Dow Chemical Company, The. Hydroxyfunctional thermoplastic polyesters. 5,496,910, Cl. 528-88.000.
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Manson, Larry J.; Paustian, John K.; and Glotzbach, Patrick J., to Whirlpool Corporation. Remote control for diagnostics of an air conditioner. 5,495,722, Cl. 62-125.000.
Mantese, Joseph V.; Micheli, Adolph L.; Dungan, Dennis F.; Schubring, Norman W.; and Callewaert, Clyde M., to General Motors Corporation. Filter elements having ferroelectric-ferromagnetic composite materials. 5,497,129, Cl. 333-182.000.
Mao, Huanyu, to Moli Energy (1990) Limited. Simplified preparation of $LiPF_6$ based electolyte for non-aqueous batteries. 5,496,661, Cl. 429-194.000.
Mao, Jen-I: *See—*
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Marchi, Egidio; and Tamagnone, Gianfranco, to Alfa Wassermann S.p.A. Method of treatment of diabetic nephropathy by means of sulodexide of medicines containing it. 5,496,807, Cl. 514-52.000.
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Marhold, Albrecht: *See*—
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Marion, François; and Boitel, Michelle, to Commissariat a l'Energie Atomique. Process for coating electronic components hybridized by bumps on a substrate. 5,496,769, Cl. 437-183.000.
Marion, Frank A. Endothermic gas generator for use in a device propulsion. 5,495,819, Cl. 114-238.000.
Maritano, Mauro: *See*—
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Markert, Helmut; Kretzschmar, Klaus; Schreyer, Michael; Mennig, Günter; Braun, Peter; and Eitel, Oliver, to Siemens Aktiengesellschaft. Oxazolidinone structures-containing prepolymeric epoxy resin mixture. 5,496,892, Cl. 525-528.000.
Marks, Carey D.: *See*—
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Martin, Craig A.; and Schaaf, Mimi Y. C., to American Cyanamid Co. Suspension concentrate compositions of arylpyrrole insecticidal and acaricidal agents. 5,496,845, Cl. 514-427.000.
Martin, David A., to Monsanto Company. Decolorization of polysuccinimide. 5,496,922, Cl. 528-490.000.
Martin, David L.: *See*—
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Maruko, Takashi; and Kakiuchi, Shinichi, to Bridgestone Sports Co., Ltd. Thread wound golf ball. 5,496,034, Cl. 273-216.000.
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Mase, Shoji; Otani, Noboru; Yoshida, Motoaki; Ishizuka, Satoshi; Kayanoki, Hisayuki; and Hirayama, Naoto, to Nippon Sheet Glass Co., Ltd. Plastic lens. 5,496,641, Cl. 428-423.100.
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Fost, Dennis L.; and Berger, Abe, 5,496,478, Cl. 252-33.600.
Monahan, Michael B.: *See*—
Dimatteo, Michael A.; Shaw, Schuyler S.; Monahan, Michael B.; Disser, Robert J.; Foust, Jeff A.; Wilkey, Paul D.; and Fulks, Gary C., 5,496,102, Cl. 303-162.000.
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Bell, Cecil R., 5,497,235, Cl. 356-430.000.
Monarch Marking Systems, Inc.: *See*—
Helmbold, James E.; Long, David N.; Riley, David W.; and Stern, Mitchell G., 5,497,450, Cl. 395-114.000.
Monfort, Michelle Y.: *See*—
Kieturakis, Maciej J.; Mollenauer, Kenneth H.; and Monfort, Michelle Y., 5,496,345, Cl. 606-192.000.
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Bargiotti, Alberto; Caruso, Michele; Faiardi, Daniela; Suarato, Antonino; and Mongelli, Nicola, 5,496,808, Cl. 514-34.000.
Monin, Joseph E., to Agri-Supply Mfg., Inc. Combination round bale feeder. 5,496,145, Cl. 414-24.500.
Monsanto Company: *See*—
Martin, David A., 5,496,922, Cl. 528-490.000.
Woodard, Scott S.; Hamper, Bruce C.; Moedritzer, Kurt; Rogers, Michael D.; Mischke, Deborah A.; and Dutra, Gerard A., 5,496,956, Cl. 548-377.100.
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Schwartz, Edward L., 5,496,810, Cl. 514-50.000.
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Monticello, Daniel J., to Energy BioSystems Corporation. Process for the desulfurization and the desalting of a fossil fuel. 5,496,729, Cl. 435-282.000.
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Moody, John R., to James River Paper Company, Inc. Support apparatus for coreless toilet tissue roll. 5,495,997, Cl. 242-561.000.
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Blagdon, Peter A.; and Morgan, Robert D., 5,496,571, Cl. 426-2.000.
Morgan, Robert D.: *See*—
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Otsuka, Kenichi; and Mori, Kazuya, 5,496,393, Cl. 95-19.000.
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Sawada, Akihiro; Mori, Masaharu; Koie, Kazuaki; and Ishida, Kazuko, 5,496,117, Cl. 400-61.000.
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Morishige, Norio; Hirano, Kenji; Ishikawa, Kiyofumi; and Furuya, Shuji, to Ishikawajima-Harima Heavy Industries Co., Ltd. Corrosion resistant stainless steel. 5,496,422, Cl. 148-525.000.
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Takahashi, Masayuki; Moriwake, Hiroki; Sakoda, Yoko; and Hata, Takuoki, 5,497,139, Cl. 338-22.0SD.
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Watano, Satoru; Itoh, Yoshihiro; Oda, Nobuhito; Kamata, Teturo; Kawakami, Noboru; and Moriya, Nobuharu, 5,497,232, Cl. 356-335.000.
Moriyama, Norio, to Oki Electric Industry Co., Ltd. Method of arranging alignment marks. 5,496,777, Cl. 437-249.000.
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Mörk, Gerold: *See*—
Lees, Wolfgang; and Mörk, Gerold, 5,495,775, Cl. 74-331.000.
Morland, Graeme: *See*—
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Moroney, Paul: *See*—
Grover, Glen A.; and Moroney, Paul, 5,497,404, Cl. 375-357.000.
Morris, Denny W.; and McNutt, David W. Modular playground equipment system. 5,496,232, Cl. 482-35.000.
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Morton International, Inc.: *See*—
Dyer, David J., 5,496,056, Cl. 280-728.100.
Rink, Karl K.; and Clark, Marcus T., 5,496,062, Cl. 280-737.000.
Whited, Timothy J.; and Gans, Russell S., 5,496,060, Cl. 280-728.300.
Mosaid Technologies Incorporated: *See*—
Millar, Bruce; Foss, Richard C.; and Wojcicki, Tomasz, 5,497,115, Cl. 327-211.000.
Moshe, Kafri: *See*—
Albelda, David; Moshe, Kafri; and Bat-Genstein, Christian, 5,496,172, Cl. 433-120.000.
Moskovich, Ronald. Moskovich clamps for interlaminar cervical fixation. 5,496,320, Cl. 606-61.000.
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Popsys, Robert S., 5,496,141, Cl. 411-510.000.
Motoda, Takashi; Karakida, Shoichi; Kaneno, Nobuaki; and Kageyama, Shigeki, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for producing compound semiconductor devices. 5,496,408, Cl. 118-715.000.
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Carson, Lansing M.; and Burdge, Robert J., 5,497,400, Cl. 375-324.000.
Feng, Taisheng, 5,497,347, Cl. 365-189.070.
Hluchyj, Michael G.; and Yin, Nanying, 5,497,375, Cl. 370-94.100.
Koehler, Thomas F.; and Willis, Carl M., 5,497,160, Cl. 342-145.000.
Kosiec, Jeannie H.; and Gillig, Steven F., 5,497,126, Cl. 331-1.00A.
Levine, Stephen N.; and Metroka, Michael P., 5,497,382, Cl. 371-35.000.
Main, W. Eric; and Durec, Jeffrey C., 5,497,123, Cl. 330-257.000.
Raatz, Donovan; Feng, Taisheng; and Bormann, Alan R., 5,497,106, Cl. 326-30.000.
Sharma, Umesh; Hayden, Jim; and Kirsch, Howard C., 5,496,756, Cl. 437-52.000.
Sun, Shih-Wei, 5,496,764, Cl. 437-67.000.
Thome, Joseph F.; Arora, Arvind S.; and Vinggaard, Niels, 5,497,383, Cl. 371-43.000.
Wootton, Phil; Morland, Graeme; Mautz, Karl E.; and Dalziel, John, 5,496,438, Cl. 156-643.100.
Yung, Weng F.; and Ong, Dee N., 5,497,145, Cl. 340-825.440.
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Mou, Zhi-Jian; and Jutand, Francis, to France Telecom. Cellular multiplier comprising a tree of the overturned stairs type, and method of implementation. 5,497,342, Cl. 364-786.000.
Mowrey, Douglas H.: *See*—
Weih, Mark A.; Kucera, Helmut W.; Warren, Patrick A.; and Mowrey, Douglas H., 5,496,884, Cl. 524-503.000.
Mronga, Norbert: *See*—
Adel, Joerg; Mronga, Norbert; and Czech, Erwin, 5,496,674, Cl. 430-106.600.
Muderlak, Kenneth J., to Trek Bicycle, Corp. Seat post bag clip. 5,496,089, Cl. 297-188.120.
Mueller, Dennis M. Apparatus for despining cactus. 5,495,796, Cl. 99-567.000.
Mueller, Hans-Juergen, to Daimler-Benz Aerospace Airbus GmbH. System for storing and transporting food and beverages on board of aircraft. 5,496,000, Cl. 244-118.100.
Mueller, James F.: *See*—
Bellio, Stephen L.; Bernardon, Edward; Condon, Mark J.; Flory, Robert S.; Fyler, Donald C.; Hansberry, Mitchell L.; Lee, Tommy W.; and Mueller, James F., 5,496,021, Cl. 271-18.300.
Mueller, Karl F.: *See*—
Jho, Chang H.; Loh, Yung; and Mueller, Karl F., 5,496,475, Cl. 252-2.000.
Mueller, Mark: *See*—
Dill, Michael; and Mueller, Mark, 5,496,455, Cl. 204-192.120.
Mühlfeld, Horst; Klein, Lieselotte; and Groten, Robert, to Firma Carl Freudenberg. Polyurethane molding compound and biodegradable filaments manufactured from such molding compound. 5,496,909, Cl. 528-76.000.
Muhmenthaler, Peter; and Oberle, Hans-Dieter, to Siemens Aktiengesellschaft. Integrated semiconductor memory device capable of switching from a memory mode to an internal test mode. 5,497,350, Cl. 365-201.000.
Muis, Jan A.; and Edelbroek, Johannes H., to Sara Lee/De N.V. Method and apparatus for preparing a beverage. 5,495,793, Cl. 99-280.000.
Mukai, Chika: *See*—
Onishi, Tomoyuki; Mukai, Chika; Sekiyama, Takaaki; Tsuji, Takashi; Iwayama, Satoshi; and Okunishi, Masahiko, 5,496,824, Cl. 514-274.000.
Muller, Bernardus W.; and Mauro-Vetter, Timothy, to Rykaart, Inc. Stress free dough sheeting process for batch systems. 5,496,578, Cl. 426-502.000.
Müller, Friedrich; and Recktenwald, Jörg, to Stöber Antriebstechnik GmbH & Co. Tensioning device for fastening a part, particularly a hollow shaft, upon a driving shaft. 5,496,127, Cl. 403-371.000.
Müller, Jacques: *See*—
Stoll, Daniel; and Müller, Jacques, 5,496,067, Cl. 280-784.000.
Müller, Robert: *See*—
Beisel, Hermann; Blaser, Peter T.; Hauck, Dieter; Hutzenlaub, Rudolf; Jäger, Helmut; Jahn, Hans-Georg; Müller, Robert; Rodi, Anton; and Spiegel, Nikolaus, 5,495,805, Cl. 101-477.000.
Mullet, Willis J.; Mitchell, Albert W.; and Bennett, Thomas B., III, to Wayne-Dalton Corp. Sectional overhead door. 5,495,640, Cl. 16-97.000.
Mulvanny, Paul; and Williams, Malcolm, to Jaguar Cars Limited. Head up displays for motor vehicles. 5,497,271, Cl. 359-631.000.
Munchbach, George E.: *See*—
Walton, Richard R.; Munchbach, George E.; and Walton, Richard C., 5,495,647, Cl. 26-18.600.
Murai, Mikio: *See*—
Ueda, Hideyuki; Kuwahara, Kenji; Seki, Hiroshi; Takahasi, Kiyosi; Odagiri, Masaru; and Murai, Mikio, 5,496,595, Cl. 427-569.000.
Murakami, Hajime: *See*—
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Murakami, Hideo: *See*—
Tsuji, Hiroshi; Saisaka, Hiromasa; Murakami, Hideo; Suzuki, Kaichi; and Fukuchi, Masaaki, 5,496,573, Cl. 426-84.000.
Murakami, Koji: *See*—
Takemoto, Takatoshi; Chida, Toshikazu; Kano, Noriaki; Ito, Eiji; Murakami, Koji; Itagaki, Takashi; Sekimoto, Kozo; and Suzuki, Masanori, 5,496,020, Cl. 271-9.010.
Murakami, Toshiyuki: *See*—
Maruyama, Hisayuki; Mizokawa, Sadao; Yasumoto, Seiichi; Onuki, Ken; Ogawa, Hisao; Fukuzawa, Junji; Uchiyama, Toshihiko; Murakami, Toshiyuki; Anbo, Osamu; and Satake, Masato, 5,497,374, Cl. 370-85.400.
Murakami, Yoshio: *See*—
Asakura, Sotoo; Koyama, Yasuto; Kiyota, Youhei; Akashi, Kiyoko; Kagayama, Akira; Murakami, Yoshio; and Nakate, Toshiomi, 5,496,564, Cl. 424-489.000.
Murakami, Yuetsu; and Masumoto, Katashi, to Foundation: The Research Institute of Electric and Magnetic Alloys, The. Wear-resistant high permeability magnetic alloy and method of manufacturing the same. 5,496,419, Cl. 148-312.000.
Murakami, Yuichi; and Ieda, Kiyokazu, to Aisin Seiki Kabushiki Kaisha. Microstrip antenna. 5,497,165, Cl. 343-700.0MS.
Murata, Koh, to Hewlett-Packard Company. Memory access system and method modifying a memory interleaving scheme so that data can be read in any sequence without inserting wait cycles. 5,497,478, Cl. 395-484.000.
Murata Manufacturing Co., Ltd.: *See*—
Fujiki, Yasuhiro, 5,497,137, Cl. 336-200.000.
Kota, Masaharu; and Nakatera, Kazuya, 5,495,766, Cl. 73-652.000.
Nakamura, Takeshi, 5,495,759, Cl. 73-504.120.
Nakamura, Takeshi; Heinouchi, Yoshiaki; and Kaneko, Takayuki, 5,497,044, Cl. 310-348.000.
Murata, Matsue: *See*—
Hikami, Toshiya; Negami, Shoichi; Nishikawa, Shigeaki; and Murata, Matsue, 5,497,437, Cl. 385-11.000.
Murayama, Masahiko: *See*—
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Murayama, Masayoshi: *See*—
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Murayama, Mitsuo; and Mori, Takao, to Sanwa Shoyaku Kabushiki Kaisha. Aconitine compounds and analgesic/anti-inflammatory agent containing the same. 5,496,825, Cl. 514-279.000.
Murayama, Shigeki: *See*—
Okamura, Kenji; Murayama, Shigeki; Chishima, Masamitsu; and Noro, Yutaka, 5,496,188, Cl. 439-189.000.
Murray, Robert H. Balloon valve assembly. 5,496,203, Cl. 446-222.000.
Murray, William A.: *See*—
Decinti, Marco V.; and Murray, William A., 5,497,303, Cl. 362-80.000.
Murschall, Ursula: *See*—
Peiffer, Herbert; Murschall, Ursula; and Schloegl, Gunter, 5,496,600, Cl. 428-35.700.
Murtha, Shawn J., to Aluminum Company of America. Aluminum alloy product having good combinations of mechanical and corrosion resistance properties and formability and process for producing such product. 5,496,426, Cl. 148-691.000.
Murzakov, Boris G.; Zaikina, Alexandra I.; Rogacheva, Rufina A.; and Semenova, Elena V., to Murzakov, Boris G. Strains of Acinetobacter species (bicoccum), Arthrobacter species, and Rhodococcus species, and a method for biological purification from oil spills and pollutions, using said strains. 5,496,723, Cl. 435-252.100.
Muth, David L., to Thermacore, Inc. Bonding diverse thermal expansion materials. 5,495,978, Cl. 228-122.100.
Muto, Minoru; Yamazi, Masanori; and Hattori, Noriyuki, to Mitsubishi Denki Kabushiki Kaisha; and Mitsubishi Electric Engineering Co., Ltd. Communication system and method of detecting transmission faults therein. 5,497,377, Cl. 371-20.400.
Mutoh, Masato; Hattori, Masakazu; Nishio, Shintaro; and Ohno, Kiyotaka, to Toray Industries, Inc. Antimetastasis agent of malignant tumors. 5,496,850, Cl. 514-468.000.
Myokei, Mitsutoshi: *See*—
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Nace, Timothy P.: *See*—
Yeoman, Neil; Pinaire, Ronald; Ulowetz, Michael A.; Nace, Timothy P.; and Furse, David A., 5,496,446, Cl. 202-158.000.
Nachon, Beni: *See*—
Mironesco, Dan; Venkert, Yoav; and Nachon, Beni, 5,495,976, Cl. 228-110.100.
Nadd, Bruno C., to International Rectifier Corporation. Power MOSFET with overcurrent and over-temperature protection. 5,497,285, Cl. 361-103.000.
Nagae, Kazuaki; and Morikawa, Minoru, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Steering lock apparatus. 5,495,732, Cl. 70-252.000.
Nagahori, Kazuo: *See*—
Tanihira, Hisamitsu; Nakano, Renri; and Nagahori, Kazuo, 5,497,459, Cl. 395-183.060.
Nagai, Tsuyoshi: *See*—
Kurihara, Hideshi; Miura, Sadayoshi; and Nagai, Tsuyoshi, 5,496,618, Cl. 428-198.000.
Nagao, Hiromasa; Yoneya, Takashi; Miyake, Toshio; Aoyama, Atsuo; Kai, Ken-ichi; Kidokoro, Shun-ichi; Miki, Yoichiro; Endo, Kimiko; and Wada, Akiyoshi, to Sagami Chemical Research Center; and Holland Sweetner Company V.O.F. Protease. 5,496,710, Cl. 435-68.100.
Nagasaki, Nobutaka: *See*—
Keida, Haruo; Tsukamoto, Takashi; and Nagasaki, Nobutaka, 5,497,482, Cl. 395-550.000.
Nagase, Sachiyo: *See*—
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Nagase, Toshio: *See*—
Ishikawa, Kiyofumi; Fukami, Takehiro; Hayama, Takashi; Niiyama, Kenji; Nagase, Toshio; Mase, Toshiaki; Fujita, Kagari; Ihara, Masaki; Ikemoto, Fumihiko; Yano, Mitsuo; and Nishikibe, Masaru, 5,496,928, Cl. 530-331.000.
Nagashima, Tetsuya: *See*—
Torikoshi, Yasuo; Kosugi, Naoki; and Nagashima, Tetsuya, 5,497,009, Cl. 250-574.000.
Nagata, Ryu; Tanno, Norihiko; and Ae, Nobuyuki, to Sumitomo Pharmaceuticals Company, Limited. Tricyclic indole-2-carboxylic acid derivatives. 5,496,843, Cl. 514-411.000.
Nagatsu, Yoshihide: *See*—
Harada, Shigeru; and Nagatsu, Yoshihide, 5,497,403, Cl. 375-345.000.
Nagatsuka, Osamu; and Kumagai, Kiyoshi, to Canon Kabushiki Kaisha. Cassette mounting device having cassette removal facility additional to customary insertion/ejection aperture part. 5,497,278, Cl. 360-85.000.
Nageno, Koji, to Sony Corporation. Headphone. 5,497,427, Cl. 381-183.000.
Naghshineh, Mahmoud: *See*—
Acampora, Anthony S.; and Naghshineh, Mahmoud, 5,497,504, Cl. 455-33.200.
Nagra Plus S.A.: *See*—
Kudelski, André, 5,497,418, Cl. 380-5.000.
Naito, Naokazu: *See*—
Honjo, Masaru; Yoshino, Setsuo; Nakayama, Akira; and Naito, Naokazu, 5,496,713, Cl. 435-69.400.
Naka, Takehiko: *See*—
Kubo, Keiji; Inada, Yoshiyuki; and Naka, Takehiko, 5,496,835, Cl. 514-361.000.
Nakagaki, Kiyoko: *See*—
Hamada, Hirokazu; Nakagaki, Kiyoko; and Itabashi, Masaki, 5,496,492, Cl. 252-170.000.
Nakagawa, Azusa: *See*—
Iwama, Akifumi; Iseki, Masahiro; and Nakagawa, Azusa, 5,496,451, Cl. 205-790.500.
Nakagawa, Shigeru: *See*—
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Nakagawa, Toshiko: *See*—
Maki, Yoshiro; Nakagawa, Toshiko; Furukawa, Yoshiaki; Outani, Minoru; Haruta, Takashi; Yamanami, Maki; and Nakamura, Sachiko, 5,496,590, Cl. 427-388.100.
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Nakahigashi, Sachiyo: *See*—
Kawakami, Yasushi; Koie, Kazuaki; Nakahigashi, Sachiyo; Omura, Kengo; Yamada, Shiro; Ooshio, Yasuyo; Ishida, Kazuko; Ueno, Hideo; and Ishida, Minako, 5,496,119, Cl. 400-70.000.
Nakai, Kiyoshi; Suzuki, Yukihide; and Inui, Takashi, to Hitachi, Ltd.; and Texas Instruments Incorporated. Dynamic random access memory device having first and second I/O line groups isolated from each other. 5,497,349, Cl. 365-230.030.
Nakajima, Kazunori: *See*—
Masuda, Noboru; Yamamoto, Kazumichi; Nakajima, Kazunori; Okabe, Toshihiro; Yamagiwa, Akira; Yamagishi, Mikio; Koide, Kazuo; Fujita, Bunichi; and Kawashima, Seiichi, 5,497,263, Cl. 327-278.000.
Nakajima, Kiyoshi: *See*—
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Nakajima, Masahiro: *See*—
Otaki, Hiroshi; and Nakajima, Masahiro, 5,497,200, Cl. 348-497.000.
Nakajima, Syuzo: *See*—
Suga, Masao; Nakajima, Syuzo; Inomata, Tadaaki; Saito, Toshimitsu; Outake, Atsuhiro; Iba, Yoshiaki; Mihara, Hidekazu; Nishikawa, Hirofumi; Nanno, Nobuyuki; and Satake, Shigeru, 5,497,455, Cl. 395-159.000.
Nakajima, Takao; and Nakamura, Kenichi, to Kabushiki Kaisha Toshiba. Input sense circuit having selectable thresholds. 5,497,117, Cl. 327-404.000.
Nakajima, Toshiyuki; and Kikuchi, Toshikazu, to Canon Staar Co., Inc. Inserting device for deformable intraocular lens. 5,496,328, Cl. 606-107.000.
Nakamikawa, Jun-ichi: *See*—
Inaba, Hiroo; Ejiri, Kiyomi; Nakamikawa, Jun-ichi; and Miura, Toshihiko, 5,496,607, Cl. 428-65.300.
Nakamura, Hiroaki, to Fuji Photo Film Co., Ltd. Method of extracting characteristic image data and color data conversion device for image processing apparatus. 5,497,431, Cl. 382-162.000.
Nakamura, Hiroshi: *See*—
Fujitani, Shin; Nakamura, Hiroshi; Watanabe, Hiroshi; Yonezu, Ikuo; and Saito, Toshihiko, 5,496,424, Cl. 148-555.000.
Nakamura, Katsutoshi: *See*—
Hotta, Yoshio; Hanyu, Yukio; Mihara, Tadashi; Kodera, Yasuto; and Nakamura, Katsutoshi, 5,497,257, Cl. 359-81.000.
Nakamura, Kenichi: *See*—
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Nakamura, Masanobu: *See*—
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Nakamura, Sachiko: *See*—
Maki, Yoshiro; Nakagawa, Toshiko; Furukawa, Yoshiaki; Outani, Minoru; Haruta, Takashi; Yamanami, Maki; and Nakamura, Sachiko, 5,496,590, Cl. 427-388.100.
Nakamura, Takeshi, to Murata Manufacturing Co., Ltd. Detecting circuit which suppresses a drift signal. 5,495,759, Cl. 73-504.120.
Nakamura, Takeshi; Heinouchi, Yoshiaki; and Kaneko, Takayuki, to Murata Manufacturing Co., Ltd. Supporting structure for a vibrator. 5,497,044, Cl. 310-348.000.
Nakane, Kenji; Umeda, Tetsu; and Mohri, Masahide, to Sumitomo Chemical Company, Limited. Preparation method of dense sintered bodies for solid electrolytes. 5,496,513, Cl. 419-19.000.
Nakane, Minoru: *See*—
Miyata, Hiroshi; Chiba, Yoshio; Noguchi, Osamai; Oka, Tsutomu; and Nakane, Minoru, 5,496,986, Cl. 219-125.100.
Nakanishi, Minoru: *See*—
Hamajima, Mitsugu; and Nakanishi, Minoru, 5,496,626, Cl. 428-284.000.
Nakano, Akikazu, to Idemitsu Kosan Co., Ltd. Process for production of styrene-based polymer moldings. 5,496,919, Cl. 528-481.000.
Nakano, Kazuo, to Kabushiki Kaisha Toshiba. Telephone system with message recording function. 5,497,413, Cl. 379-89.000.
Nakano, Nobuaki: *See*—
Saito, Taizo; Nakano, Nobuaki; Watanabe, Hiroto; Ohno, Toshihisa; and Araki, Yoshiyuki, 5,497,184, Cl. 347-257.000.
Nakano, Renri: *See*—
Tanihira, Hisamitsu; Nakano, Renri; and Nagahori, Kazuo, 5,497,459, Cl. 395-183.060.
Nakano, Shinichi: *See*—
Ishizaka, Takashi; Nakano, Shinichi; Yasuda, Yukihiro; Shigihara, Akira; Satou, Tomoyasu; Tsubota, Ryushi; Yamura, Hiroshi; and Akamatsu, Tsuneo, 5,495,833, Cl. 123-179.250.
Nakano Vinegar Co., Ltd.: *See*—

Okamoto, Yoshio; Enomoto, Naoki; Furukawa, Sachiko; Ogasawara, Yasushi; Akano, Hirofumi; and Kawamura, Yoshiya, 5,496,937, Cl. 536-124.000.
Nakano, Yasushi; Kawahara, Setsuko; Shimizu, Yuji; and Miyake, Tohru, to Konica Corporation. Magnetic recording medium. 5,496,614, Cl. 428-141.000.
Nakashima, Masato: *See*—
Aritake, Hirokazu; Kato, Masayuki; Ishimoto, Manabu; Sato, Noriko; and Nakashima, Masato, 5,497,189, Cl. 348-51.000.
Kato, Masayuki; Aritake, Hirokazu; Matsumoto, Tsuyoshi; Tomita, Junji; Yamagishi, Fumio; Nakashima, Masato; Suzuki, Masao; Fujiwara, Toshiaki; Sugita, Masaya; and Takoa, Koichi, 5,497,170, Cl. 345-9.000.
Nakashima, Yoshiyasu: *See*—
Hayashi, Takehiko; Shimura, Takaki; Goto, Takao; and Nakashima, Yoshiyasu, 5,495,849, Cl. 128-653.100.
Nakata, Fumio: *See*—
Fukuda, Katsuyoshi; Nakata, Fumio; Shigenaka, Keitaro; and Hirahara, Keijiro, 5,497,029, Cl. 257-613.000.
Nakata, Hisashi; Yonezawa, Yoshihisa; and Nohara, Yasuhiro, to Futaba Denshi Kogyo K.K. Fluorescent display device. 5,497,047, Cl. 313-493.000.
Nakatani, Seiichi: *See*—
Itagaki, Minehiro; Okano, Kazuyuki; Kimura, Suzushi; Nakatani, Seiichi; Bessho, Yoshihiro; Yuhaku, Satoru; Hakotani, Yasuhiko; and Miura, Kazuhiro, 5,496,619, Cl. 428-209.000.
Nakate, Toshiomi: *See*—
Asakura, Sotoo; Koyama, Yasuto; Kiyota, Youhei; Akashi, Kiyoko; Kagayama, Akira; Murakami, Yoshio; and Nakate, Toshiomi, 5,496,564, Cl. 424-489.000.
Nakatera, Kazuya: *See*—
Kota, Masaharu; and Nakatera, Kazuya, 5,495,766, Cl. 73-652.000.
Nakatsukasa, Walter M.: *See*—
Boeck, LaVerne D.; Chio, Hang; Eaton, Tom E.; Godfrey, Otis W., Jr.; Michel, Karl H.; Nakatsukasa, Walter M.; and Yao, Raymond C., 5,496,931, Cl. 536-7.100.
Nakayama, Akira: *See*—
Honjo, Masaru; Yoshino, Setsuo; Nakayama, Akira; and Naito, Naokazu, 5,496,713, Cl. 435-69.400.
Nakayama, Kiyoshi: *See*—
Sumi, Chikayoshi; and Nakayama, Kiyoshi, 5,495,771, Cl. 73-789.000.
Nakayama, Takenori: *See*—
Nishimoto, Hidetoshi; Sugizaki, Yasuaki; Umei, Kenji; Satoh, Hiroshi; Terada, Yoshinori; Yasunaga, Tatsuya; Nakayama, Takenori; Wada, Yasunori; and Ueda, Keiji, 5,496,651, Cl. 428-612.000.
Nakayama, Toshimasa: *See*—
Sakamoto, Yoshinori; Hagiwara, Yoshio; Tanaka, Hatsuyuki; and Nakayama, Toshimasa, 5,496,402, Cl. 106-287.160.
Nakazato, Masakazu; Shimoura, Youichi; and Sugihara, Masamichi, to Kayaba Kogyo Kabushiki Kaisha. Rod axial position detector including a first scale having equidistant magnetic parts and a second scale having unequally distant parts and differing field strengths. 5,497,083, Cl. 324-207.240.
Nakazato, Shinji; Uchida, Hideaki; Saito, Yoshikasu; Yamamura, Masahiro; Kobayashi, Yutaka; Ikeda, Takahide; Hori, Ryoichi; Kitsukawa, Goro; Itoh, Kiyoo; Tanba, Nobuo; Watanabe, Takao; Shimohigashi, Katsuhiro; and Homma, Noriyuki, to Hitachi, Ltd. Semiconductor memory device having separately biased wells for isolation. 5,497,023, Cl. 257-394.000.
Nanda, Sunil: *See*—
Hayes, Norman M.; Sindhu, Pradeep; Frailong, Jean-Marc; and Nanda, Sunil, 5,497,480, Cl. 395-493.000.
Nankoh, Mitsuo; Inoue, Akio; Yokomizo, Hitoshi; Tomida, Yosikazu; and Kawabata, Tohru, to Sanyo Electric Co., Ltd. FM multiplex broadcasting and receiving system. 5,497,372, Cl. 370-69.100.
Nanno, Nobuyuki: *See*—
Suga, Masao; Nakajima, Syuzo; Inomata, Tadaaki; Saito, Toshimitsu; Outake, Atsuhiro; Iba, Yoshiaki; Mihara, Hidekazu; Nishikawa, Hirofumi; Nanno, Nobuyuki; and Satake, Shigeru, 5,497,455, Cl. 395-159.000.
Napiorkowski, John J.: *See*—
Butler, Walter K., III; Napiorkowski, John J.; Kroll, Thomas W.; and Cote, Mark P., 5,497,416, Cl. 379-399.000.
Napolitano, Neil J.; Yeh, Kuo-Chen; Sena, Frank J.; Oths, Phil J.; and Roque, Manuel M., to Block Drug Company Inc. Solid form xerostomia product. 5,496,558, Cl. 424-435.000.
Nara, Terukazu: *See*—
Goto, Makoto; Nara, Terukazu; Terasawa, Masato; and Yukawa, Hideaki, 5,496,715, Cl. 435-170.000.
Narisawa, Shigeji: *See*—
Addison, Danny H.; Carnes, Johnnie M.; Cowardin, Robert L.; Gore, Albert N., III; Lynch, Robert C.; McCray, Charles M.; Narisawa, Shigeji; Talley, William L.; Toyosato, Yoshinair; and Turner, Craig W., 5,496,181, Cl. 439-61.000.
Naruse, Hideaki: *See*—
Ohkawa, Atsuhiro; Iwanaga, Hiroshi; Naruse, Hideaki; and Tsukase, Masaaki, 5,496,680, Cl. 430-216.000.
Nassano, David R.: *See*—
Capeci, Scott W.; Nassano, David R.; and Welch, Robert G., 5,496,487, Cl. 252-89.100.
Nasu, Yasuhiro; Ichimura, Teruhiko; and Matsumoto, Tomotaka, to Fujitsu Limited. Method of manufacturing thin film transistors in a liquid crystal display apparatus. 5,496,749, Cl. 437-40.000.
Nasu, Yasuhiro; Ichimura, Teruhiko; and Matsumoto, Tomotaka, to Fujitsu Limited. Method of manufacturing thin film transistors in a liquid crystal display apparatus. 5,496,752, Cl. 437-41.000.
National Blood Authority: *See*—
De Burgh, Benjamin A.; Doyle, Alan; and Kumpel, Belinda M., 5,496,548, Cl. 424-142.100.
National Business Machines Corporation: *See*—
Mamin, Harry J.; Rugar, Daniel; and Terris, Bruce D., 5,497,359, Cl. 369-44.150.
National Instruments Corporation: *See*—
Rogers, Steven W.; Kodosky, Jeffrey L.; and Luick, Dean A., 5,497,500, Cl. 395-800.000.
National Power PLC: *See*—
Zito, Ralph, 5,496,659, Cl. 429-105.000.
National Rejectors Inc. GmbH: *See*—
Meyer-Steffens, Klaus; and Gröhlich, Manfred, 5,495,931, Cl. 194-317.000.
Meyer-Weingartner, Heinz-Werner; and Rehfinger, Heinz, 5,496,212, Cl. 453-4.000.
National Science Council: *See*—
Tsai, Wen-Ta; Huang, Chong-Cheng; and Lee, Ju-Tung, 5,496,593, Cl. 427-556.000.
National Semiconductor Corporation: *See*—
Alapat, Varkey P., 5,497,475, Cl. 395-430.000.
Bergemont, Albert M.; and Wolstenholme, Graham R., 5,496,754, Cl. 437-43.000.
National Starch and Chemical Investment Holding Corporation: *See*—
Rouse, William, 3; Valles, Maria; Martino, Gary T.; and Chiu, Chung-Wai, 5,496,861, Cl. 514-778.000.
Natural Cotton Colours, Inc.: *See*—
Fox, Sally V., 5,496,623, Cl. 428-224.000.
Natural Resources Canada: *See*—
Piskorz, Jan; Radlein, Desmond St. A. G.; Majerski, Piotr; and Scott, Donald S., 5,496,464, Cl. 208-108.000.
Nauroth, Michael F.: *See*—
Estein, Kevin M.; and Nauroth, Michael F., 5,495,630, Cl. 7-138.000.
Naves, Neil H.: *See*—
Thomason, Rodger; Carter, James E.; Legome, Mark J.; and Naves, Neil H., 5,496,335, Cl. 606-148.000.
Nawaseikiseisakusho Corporation: *See*—
Kitamura, Masatoshi; and Sakurai, Eitarou, 5,495,652, Cl. 29-243.500.
Neal, John W., Jr.: *See*—
Smigocki, Ann C.; and Neal, John W., Jr., 5,496,732, Cl. 435-320.100.
NEC Corporation: *See*—
Ito, Kenichi, 5,497,399, Cl. 375-271.000.
Kohzono, Ichiro; and Katayose, Tsuyoshi, 5,497,501, Cl. 395-849.000.
Makishima, Hideo; Yamada, Keizo; and Tomihari, Yoshinori, 5,496,199, Cl. 445-4.000.
Momose, Takayuki, 5,497,014, Cl. 257-205.000.
Saito, Yoshiyuki, 5,496,592, Cl. 427-523.000.
Sasaki, Yutaka, 5,497,128, Cl. 331-38.000.
Shibuya, Tatsuo, 5,497,429, Cl. 382-125.000.
Yamada, Manabu, 5,496,742, Cl. 437-10.000.
Neff, Charles E. Grinding wheel. 5,496,208, Cl. 451-541.000.
Neff, Christopher J.: *See*—
Czarnecky, Joseph A.; Neff, Christopher J.; and Strait, Scott L., 5,496,105, Cl. 312-334.400.
Negami, Shoichi: *See*—
Hikami, Toshiya; Negami, Shoichi; Nishikawa, Shigeaki; and Murata, Matsue, 5,497,437, Cl. 385-11.000.
Negele, Michael: *See*—
Sommerfeld, Calus-Dieter; Lamberts, Wilhelm; Bielefeldt, Dietmar; Marhold, Albrecht; and Negele, Michael, 5,496,867, Cl. 521-131.000.
Sommerfeld, Claus-Dieter; Lamberts, Wilhelm; Bielefeldt, Dietmar; Marhold, Albrecht; and Negele, Michael, 5,496,866, Cl. 521-131.000.
Nehm, Holger; and Grether, Hermann, to Dieter Wildfang GmbH. Jet regulator for attachment to sanitary fittings. 5,495,985, Cl. 239-428.500.
Neill, Paul: *See*—
Williams, Steve; Kaplan, Warren; Neill, Paul; and Chapa, Gerardo, 5,496,869, Cl. 521-172.000.
Neises, Bernhard: *See*—
Kolb, H. Michael; Burkhart, Joseph P.; Jung, Michel J.; Gerhart, Fritz E., deceased; Giroux, Eugene L.; Neises, Bernhard; and Schirlin, Daniel G., 5,496,927, Cl. 530-328.000.
Nellcar Puritan Bennett: *See*—
Aylsworth, Alonzo C.; and Miller, Gregory R., 5,495,848, Cl. 128-207.180.
Nemoto, Yasuhiro; Oyama, Kazuto; Ono, Hideharu; and Sakai, Kazuo, to Hitachi, Ltd. Cassette holder mechanism for magnetic recording/reproducing apparatus. 5,497,280, Cl. 360-96.500.
Neopost Industrie: *See*—
Haroutel, Jean-Claude; and Moizeau, Gérard, 5,495,802, Cl. 101-377.000.
Nestec S.A.: *See*—
Rushmore, Dean F.; Chmiel, Oliver; Fürrer, Marc; and Liu, Richard T.-S., 5,496,574, Cl. 426-98.000.
Nettekoven, William S., to MegaDyne Medical Products, Inc. Tri-tubular suction irrigation device. 5,496,270, Cl. 604-30.000.



Nettekoven, William S.: *See*—
Weaver, Drew D.; and Nettekoven, William S., 5,496,315, Cl. 606-41.000.
Nettelhoff, Friedrich W., to Friedrich Nettelhoff Kommanditgesellschaft Spezialfabrik fuer Kleinkollektoren. Collector and reinforced ring therefor. 5,497,042, Cl. 310-219.000.
Neubauer, Gerald: *See*—
Weiss, Franz-Josef; Fuchs, Hugo; Neubauer, Gerald; and Schneider, Heinz-Walter, 5,496,789, Cl. 502-339.000.
Neuberger, Wolfgang: *See*—
Brown, Joseph; and Neuberger, Wolfgang, 5,496,308, Cl. 606-15.000.
Neumann, Harald: *See*—
Hötzel, Gerhard; Neumann, Harald; Strassner, Walter; and Riegel, Johann, 5,496,461, Cl. 204-427.000.
Neumann, Wolfgang W.: *See*—
Heese, Ulrich; Salvel, Renato; and Neumann, Wolfgang W., 5,496,865, Cl. 521-79.000.
Neutzner, Josef: *See*—
Aydin, Oral; Portugall, Michael; Neutzner, Josef; and Maechtle, Walter, 5,496,882, Cl. 524-458.000.
New England Biolabs, Inc.: *See*—
Comb, Donald G.; Perler, Francine B.; Jack, William E.; Xu, Ming-Qun; and Hodges, Robert A., 5,496,714, Cl. 435-69.700.
New Holland North America, Inc.: *See*—
Stauffer, David B.; Kurtz, Robert D., Jr.; and Cease, Herman A., 5,495,910, Cl. 180-69.200.
New York Air Brake: *See*—
Samulak, Zdzislaw; and Jantzi, Lyle, 5,495,921, Cl. 188-202.000.
Newarski, Emil. Single use cereal and milk container. 5,496,575, Cl. 426-115.000.
Newcomer, Kevin L.: *See*—
Edwards, David H.; Newcomer, Kevin L.; and Niehaus, K. Lynn, 5,495,890, Cl. 166-105.000.
Newman, David M.: *See*—
Loescher, Barry R.; Newman, David M.; and Thomson, Rodney D., 5,496,739, Cl. 436-131.000.
Newman, Jeff E.: *See*—
Geier, James W.; and Newman, Jeff E., 5,496,110, Cl. 366-214.000.
Newman, Lawrence E.: *See*—
Beakes, John M.; and Newman, Lawrence E., 5,495,659, Cl. 29-736.000.
NeXstar Pharmaceuticals, Inc.: *See*—
Gold, Larry; and Tuerk, Craig, 5,496,938, Cl. 536-22.100.
NGK Insulators, Ltd.: *See*—
Hirai, Takami; and Yano, Shinsuke, 5,497,130, Cl. 333-204.000.
Ishikawa, Tadasu; Kozuka, Yoshinari; and Osugi, Yukihisa, 5,497,438, Cl. 385-38.000.
Sakai, Hitoshi; and Yoshida, Hitoshi, 5,496,798, Cl. 505-212.000.
Yoshida, Manabu; and Hirabayashi, Izumi, 5,496,799, Cl. 505-450.000.
NGK Spark Plug Co., Ltd.: *See*—
Matsutani, Wataru; and Kagawa, Junichi, 5,497,045, Cl. 313-141.000.
Nguyen, Kim: *See*—
Hergenrother, Robert; Lim, June; Farnholtz, Roger; Nguyen, Kim; and Snyder, Edward, 5,496,294, Cl. 604-282.000.
Nguyen, Le T.: *See*—
Garg, Sanjiv; Iadonato, Kevin R.; Nguyen, Le T.; and Wang, Johannes, 5,497,499, Cl. 395-800.000.
Nguyen, Than: *See*—
Cosgrove, Delos M.; and Nguyen, Than, 5,496,336, Cl. 606-148.000.
Nguyen, Van D.: *See*—
Heise, Manfred; Lauth, Hans J.; Nguyen, Van D.; and Stammler, Erwin, 5,496,152, Cl. 417-87.000.
NHK Spring Co., Ltd.: *See*—
Takeuchi, Itsuo; Hoshino, Hidekazu; and Sasaki, Mutumi, 5,497,227, Cl. 356-71.000.
Nichirei Corporation: *See*—
Oyama, Hiroaki; Temma, Tadashi; Maeda, Miyuki; Kusuzaki, Tetsuo; Kimura, Hiromichi; Abe, Kazumi; Kunishi, Naohiko; Kinefuchi, Akira; and Miura, Takahiro, 5,496,175, Cl. 434-118.000.
Nicholson, Donald T.: *See*—
Parham, Marc E.; Duffy, Richard L.; and Nicholson, Donald T., 5,496,637, Cl. 428-376.000.
Nied, Roland. Cyclone separator. 5,496,394, Cl. 95-271.000.
Niederman, Robert R., to General Motors Corporation. Air bag module cover retainer. 5,496,057, Cl. 280-728.200.
Niehaus, K. Lynn: *See*—
Edwards, David H.; Newcomer, Kevin L.; and Niehaus, K. Lynn, 5,495,890, Cl. 166-105.000.
Nielsen, Charlotte S.: *See*—
Vannby, Rickard; and Nielsen, Charlotte S., 5,496,530, Cl. 423-418.200.
Nielsen, Oivind A., to Tandberg Data A/S. Belt-driven magnetic tape cartridge having a device for applying mechanical tension to the tape in the cartridge. 5,495,992, Cl. 242-346.100.
Nigro, John C.: *See*—
Pojar, Michael G.; and Nigro, John C., 5,496,526, Cl. 423-49.000.
Nihon Parkerizing Co., Ltd.: *See*—
Mori, Seiki; Ohtoh, Yasutoshi; and Beppu, Masaaki, 5,496,463, Cl. 205-109.000.
Niide, Kazuo: *See*—
Takata, Tetsuya; and Niide, Kazuo, 5,496,228, Cl. 477-107.000.
Niimi, Mamoru: *See*—
Ando, Masahiko; Yamamoto, Yoshihisa; Fukatsu, Akira; Niimi, Mamoru; Kaigawa, Masato; Oba, Hidehiro; Kimura, Hiromichi; Hojo, Yasuo; Tabata, Atsushi; and Iwatsuki, Kunihiro, 5,496,230, Cl. 477-111.000.
Niiyama, Kenji: *See*—
Ishikawa, Kiyofumi; Fukami, Takehiro; Hayama, Takashi; Niiyama, Kenji; Nagase, Toshio; Mase, Toshiaki; Fujita, Kagari; Ihara, Masaki; Ikemoto, Fumihiko; Yano, Mitsuo; and Nishikibe, Masaru, 5,496,928, Cl. 530-331.000.
Nikon Corporation: *See*—
Iwane, Toru, 5,497,209, Cl. 354-402.000.
Iwasaki, Hiroyuki, 5,497,215, Cl. 354-432.000.
Ohtake, Motoyuki, 5,496,994, Cl. 250-201.600.
Nippe, Waldemar: *See*—
Fischer, Jürgen; Birkle, Siegfried; Elsel, Werner; Gehring, Johann; Maurer, Arnolf; and Nippe, Waldemar, 5,496,456, Cl. 204-201.000.
Nippon Hoso Kyokai: *See*—
Ishikawa, Tadasu; Kozuka, Yoshinari; and Osugi, Yukihisa, 5,497,438, Cl. 385-38.000.
Nippon Oil Company: *See*—
Toyooka, Takehiro; Iida, Shigeki; and Itoh, Hiroyuki, 5,496,498, Cl. 252-299.010.
Nippon Oil Co., Ltd.: *See*—
Tsubokura, Akira; Yoneda, Hisashi; Takai, Mikihiro; and Kiyota, Takashi, 5,496,709, Cl. 435-67.000.
Nippon Paint Co., Ltd.: *See*—
Tsuge, Otohiko; Hatta, Taizo; Urano, Satoshi; Tsuboniwa, Noriyuki; and Mizuguchi, Ryuzo, 5,496,943, Cl. 544-97.000.
Watanabe, Emi; Kawabata, Masami; and Sumiyoshi, Iwao, 5,496,903, Cl. 526-204.000.
Nippon Sheet Glass Co., Ltd.: *See*—
Chin, Danny; Sauer, Donald J.; Meyerhofer, Dietrich; and Katsuki, Kazuo, 5,497,465, Cl. 395-280.000.
Mase, Shoji; Otani, Noboru; Yoshida, Motoaki; Ishizuka, Satoshi; Kayanoki, Hisayuki; and Hirayama, Naoto, 5,496,641, Cl. 428-423.100.
Nippon Telegraph and Telephone: *See*—
Kurihara, Takashi; Amano, Michiyuki; Mori, Yuhei; Tomaru, Satoru; and Kaino, Toshikuni, 5,496,503, Cl. 252-582.000.
Nippon Telegraph and Telephone Corporation: *See*—
Tanaka, Hidenao; Watabe, Akinori; Shimada, Junichi; Katagiri, Yoshitada; and Suzuki, Yoshio, 5,497,390, Cl. 372-50.000.
Utsumi, Yuichi; and Akazawa, Housei, 5,495,822, Cl. 117-1.000.
Nippondenso Co., Ltd.: *See*—
Mizutani, Atsushi; Katayama, Masayuki; Ito, Nobuei; and Hattori, Tadashi, 5,496,582, Cl. 427-66.000.
Nishi, Hidetoshi; and Kobayashi, Hideo, to Hitachi, Ltd. Method and apparatus for descaling and cold rolling metal strip. 5,495,736, Cl. 72-39.000.
Nishi, Koji: *See*—
Kitajima, Masato; Fukami, Hajime; Soma, Shinji; Nishi, Koji; and Yoshida, Masahiro, 5,495,844, Cl. 125-13.010.
Nishibe, Masatoyo: *See*—
Yamashita, Kazuo; Adachi, Nobuyuki; Nishibe, Masatoyo; Egawa, Masahiko; and Inoue, Akiharu, 5,497,124, Cl. 330-267.000.
Nishida, Hirobumi, to Ricoh Company, Ltd. Character reading method and apparatus effective for condition where a plurality of characters have close relationship with one another. 5,497,432, Cl. 382-178.000.
Nishida, Kazuhito, to Sharp Kabushiki Kaisha. Video camera having an adaptive automatic iris control circuit. 5,497,196, Cl. 348-363.000.
Nishida, Koji: *See*—
Takagi, Kiyoji; Nishida, Koji; and Itou, Tosio, 5,496,885, Cl. 524-539.000.
Nishida, Masaharu; and Ohhama, Tohru, to Sanyo Chemical Industries, Ltd. Resin compositions for electrophotographic toner and process for making the same. 5,496,888, Cl. 525-63.000.
Nishiguchi, Masaki; and Tokuda, Toshimasa, to Furukawa Electric Co., Ltd; and Teijin Chemicals Ltd. Aromatic polycarbonate, a method for producing the same, and a plastic optical waveguide using the same. 5,496,913, Cl. 528-198.000.
Nishihara, Mikio: *See*—
Moriizumi, Kiyokazu; and Nishihara, Mikio, 5,496,971, Cl. 174-255.000.
Nishii, Kanji: *See*—
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Nishii, Michiharu: *See*—
Kurokawa, Takashi; Nishii, Michiharu; and Sugisawa, Masakazu, 5,496,101, Cl. 303-125.000.
Nishijima, Nobuhiro: *See*—
Hashimoto, Shizuki; and Nishijima, Nobuhiro, 5,496,967, Cl. 174-52.400.
Nishijima, Tatsumi; Takeda, Hidekazu; Masuda, Kenmei; Mizutani, Hikaru; Maehara, Yoshimi; and Ogiro, Kenji, to Hitachi, Ltd.; and Hitachi Maxell Ltd. Tape cartridge and recording reproduction apparatus for the tape cartridge. 5,497,279, Cl. 360-96.500.
Nishikawa, Hirofumi: *See*—
Suga, Masao; Nakajima, Syuzo; Inomata, Tadaaki; Saito, Toshimitsu; Outake, Atsuhiro; Iba, Yoshiaki; Mihara, Hidekazu; Nishikawa, Hirofumi; Nanno, Nobuyuki; and Satake, Shigeru, 5,497,455, Cl. 395-159.000.
Nishikawa, Masumi: *See*—

Kogita, Hidekazu; Nishikawa, Masumi; and Okada, Shoji, 5,497,273, Cl. 359-843.000.

Nishikawa, Shigeaki: *See*—
Hikami, Toshiya; Negami, Shoichi; Nishikawa, Shigeaki; and Murata, Matsue, 5,497,437, Cl. 385-11.000.

Nishikibe, Masaru: *See*—
Ishikawa, Kiyofumi; Fukami, Takehiro; Hayama, Takashi; Niiyama, Kenji; Nagase, Toshio; Mase, Toshiaki; Fujita, Kagari; Ihara, Masaki; Ikemoto, Fumihiko; Yano, Mitsuo; and Nishikibe, Masaru, 5,496,928, Cl. 530-331.000.

Nishimoto, Hidetoshi; Sugizaki, Yasuaki; Umei, Kenji; Satoh, Hiroshi; Terada, Yoshinori; Yasunaga, Tatsuya; Nakayama, Takenori; Wada, Yasunori; and Ueda, Keiji, to Kabushiki Kaisha Kobe Seiko Sho. Machine part resistant to rolling friction. 5,496,651, Cl. 428-612.000.

Nishimoto, Naohiro: *See*—
Kojima, Satoru; and Nishimoto, Naohiro, 5,496,222, Cl. 474-80.000.

Nishimura, Seiji: *See*—
Moriya, Makoto; Nishimura, Seiji; and Doi, Yasutaka, 5,496,904, Cl. 526-318.400.

Nishimura, Yoichi, to Kabushiki Kaisha Toshiba. System for controlling strip thickness in rolling mills. 5,495,735, Cl. 72-8.200.

Nishio, Shintaro: *See*—
Mutoh, Masato; Hattori, Masakazu; Nishio, Shintaro; and Ohno, Kiyotaka, 5,496,850, Cl. 514-468.000.
Ohno, Kiyotaka; Ohtake, Atsushi; Nishio, Shintaro; Hoshi, Kazuhiro; and Tsukamoto, Shunji, 5,496,849, Cl. 514-468.000.

Nishio, Yoichi: *See*—
Hamamoto, Shoichi; Amino, Hirokazu; Ishida, Noriyuki; Tamura, Yasunori; Nishio, Yoichi; and Ichimiya, Masaru, 5,496,372, Cl. 623-16.000.

Nishishita, Kunihiko; and Sugita, Takashi, to Zexel Corporation. Method and apparatus for cutting flat tubes. 5,495,972, Cl. 225-2.000.

Nishiyama, Satoshi: *See*—
Ebe, Akinori; Ogata, Kiyoshi; and Nishiyama, Satoshi, 5,496,772, Cl. 437-187.000.

Nishizawa, Takatoshi: *See*—
Ohno, Akihiko; Nishizawa, Takatoshi; and Iwai, Akira, 5,496,790, Cl. 503-227.000.
Ohno, Akihiko; Nishizawa, Takatoshi; Iwai, Akira; and Shibata, Ayako, 5,496,791, Cl. 503-227.000.

Niskanen, Juhani; and Uuttana, Kyösti, to Valmet Paper Machinery, Inc. Adjustable-crown roll. 5,495,798, Cl. 100-162.00B.

Nissan Chemical Industries Ltd.: *See*—
Yanagimoto, Akira; Harunari, Takashi; Konno, Akihiro; and Okamura, Toshiyasu, 5,496,584, Cl. 427-154.000.

Nissan Motor Co., Ltd.: *See*—
Samejima, Satoshi; Tsuchida, Hirofumi; and Ishihara, Koji, 5,495,839, Cl. 123-478.000.
Sasaki, Hiroki, 5,497,333, Cl. 364-426.030.
Takaya, Seizi; Fukuzumi, Shuzo; Ohbayashi, Hiroaki; and Kimura, Makoto, 5,497,327, Cl. 364-424.050.

Nissin Electric Co., Ltd.: *See*—
Ebe, Akinori; Ogata, Kiyoshi; and Nishiyama, Satoshi, 5,496,772, Cl. 437-187.000.

Nitivy Company Limited: *See*—
Matsumoto, Nobuya; Kunisaki, Shinichi; Fujiwara, Goro; Masuda, Mitsunobu; Horie, Hiroshi; and Kawanaka, Asaichi, 5,496,860, Cl. 521-31.000.

Nitta, Yoshio; and Hachino, Sadahiko, to Sumitomo Wiring Systems, Ltd. Cable guide for a terminal crimping apparatus. 5,495,662, Cl. 29-753.000.

NKK Corporation: *See*—
Hashizume, Shuji; Minami, Yusuke; and Ishizawa, Yoshiichi, 5,496,421, Cl. 148-326.000.
Sasaki, Kenichi; Okuma, Toshiyuki; Yamashita, Masaaki; and Watanabe, Toyofumi, 5,496,652, Cl. 428-623.000.
Yamauchi, Katsuhisa; Misao, Hitoshi; Inoue, Tadashi; and Okita, Tomoyoshi, 5,496,514, Cl. 420-34.000.

Noah, Bruce C.; Phillips, Robert S.; and Venable, Frederick D., to TRW Inc. Rotary device having plural mounting orientations and fluid connections. 5,496,155, Cl. 417-310.000.

Nobelpharma AB: *See*—
Andersson, Matts; and Carlsson, Lennart, 5,497,336, Cl. 364-474.030.

Noda, Makoto; Ichimiya, Fumio; and Uda, Ryoichi, to Kabushiki Kaisha Sanyo Denki Seisakusho. High-frequency power unit for neon tubes. 5,497,310, Cl. 363-17.000.

Noel, Léon, to Castolin S.A. Material and a method for forming a protective coating on a substrate of a copper-based alloy. 5,496,391, Cl. 75-255.000.

Noguchi, Hitoshi: *See*—
Saito, Shinji; Yamazaki, Nobuo; and Noguchi, Hitoshi, 5,496,653, Cl. 428-694.00B.

Noguchi, Kouki: *See*—
Akizawa, Mitsuru; Noguchi, Kouki; Hayashi, Takehisa; Kato, Kanji; and Matsushima, Hitoshi, 5,497,488, Cl. 395-600.000.

Noguchi, Nobuhisa; and Tamaki, Jun, to Enplas Corporation. Surface illuminant device. 5,497,293, Cl. 362-31.000.

Noguchi, Osamai: *See*—
Miyata, Hiroshi; Chiba, Yoshio; Noguchi, Osamai; Oka, Tsutomu; and Nakane, Minoru, 5,496,986, Cl. 219-125.100.

Noguchi, Osami: *See*—
Mitsuhashi, Akira; Wakita, Saburo; Oka, Tsutomu; and Noguchi, Osami, 5,495,837, Cl. 123-188.300.

Nohara, Yasuhiro: *See*—
Nakata, Hisashi; Yonezawa, Yoshihisa; and Nohara, Yasuhiro, 5,497,047, Cl. 313-493.000.

Nojima, Kazuo: *See*—
Kurokawa, Junji; Nojima, Kazuo; and Sekizawa, Masaki, 5,497,219, Cl. 355-219.000.

Nokia Mobile Phones Ltd.: *See*—
Rapeli, Juha, 5,497,116, Cl. 327-337.000.

Nolan, Kevin F.: *See*—
Yee, Edgar; DeTuccio, Richard G.; Nolan, Kevin F.; and Wentler, Lloyd E., 5,497,287, Cl. 361-617.000.

Noll Manufacturing Co.: *See*—
Miller, Barry K., 5,496,213, Cl. 454-271.000.

Nomura, Akichika, to Kabushiki Kaisha N-Tec. Constant quantity discharging device for powdered object. 5,495,962, Cl. 222-80.000.

Nomura, Yoshiko; Kimizuka, Fusao; Ishino, Yoshizumi; and Kato, Ikunoshin, to Takara Shuzo Co., Ltd. Restriction endonuclease. 5,496,717, Cl. 435-199.000.

Nonaka, Youichi; and Sakaue, Shiyuki, to Hitachi, Ltd. Method of controlling robot's compliance. 5,497,061, Cl. 318-568.110.

Noonan, Thomas J.: *See*—
Kurland, Marvin; Noonan, Thomas J.; Martin, David L.; and Riffl, Eric Z., 5,497,056, Cl. 318-269.000.

Nordica S.p.A.: *See*—
Miotto, Onorio; and Zorzi, Claudio, 5,495,683, Cl. 36-50.500.

Nordling, Fredrik: *See*—
Elliott, Paul M.; and Nordling, Fredrik, 5,497,405, Cl. 375-372.000.

Nordson Corporation: *See*—
Miller, Scott R.; and Ziecker, Roger A., 5,495,963, Cl. 222-318.000.

Norfab Corporation: *See*—
Lilani, Harish N., 5,496,625, Cl. 428-229.000.

Norfin International, Inc.: *See*—
Snellman, Donald L.; and Tonkin, Dean G., 5,496,253, Cl. 493-320.000.

Norian Corporation: *See*—
Ison, Ira C.; Fulmer, Mark T.; Barr, Bryan M.; and Constantz, Brent R., 5,496,399, Cl. 106-35.000.

Norix Group, Inc.: *See*—
Karl, Richard B.; and Hanig, Harvey, 5,496,091, Cl. 297-248.000.

Noro, Yutaka: *See*—
Okamura, Kenji; Murayama, Shigeki; Chishima, Masamitsu; and Noro, Yutaka, 5,496,188, Cl. 439-189.000.

North Carolina State University: *See*—
Comins, Daniel L., 5,496,952, Cl. 546-116.000.

Northcraft, Shane D.: *See*—
Fabian, David J.; Kocher, Timothy L.; Northcraft, Shane D.; Sarver, Douglas R.; and Thumma, Mark R., 5,496,180, Cl. 439-60.000.

Northern Telecom Limited: *See*—
Ellis, John G.; Dysart, Keith C.; and Commons, Douglas N., 5,497,371, Cl. 370-60.000.
Koohgoli, Mahshad; Cohn-Sfetcu, Sorin; and Lockton, John D., 5,497,505, Cl. 455-34.100.

Northey, David L.: *See*—
Susko-Parrish, Joan L.; Northey, David L.; Leibfried-Rutledge, M. Lorraine; and Stice, Steven L., 5,496,720, Cl. 435-240.200.

Northrop Grumman Corporation: *See*—
Kaiser, Stephen G., 5,497,162, Cl. 342-159.000.
Stoll, Harold M.; and Reis, James J., 5,497,253, Cl. 359-29.000.

Norton, John P., Jr.; and Behrens, William H., to Western Atlas International. Method and apparatus for verifying the location of a seismic bottom cable in real time. 5,497,356, Cl. 367-6.000.

Nott, Sepideh H.: *See*—
LeComte, Norman E.; Nott, Sepideh H.; Kawate, Keith W.; and Maher, Thomas R., 5,497,072, Cl. 323-289.000.

Novak, David B.: *See*—
Gardner, David E.; and Novak, David B., 5,496,221, Cl. 474-135.000.

Novak, Jeffrey M. Automated apparatus and method for object recognition at checkout counters. 5,497,314, Cl. 364-403.000.

Novaol S.r.l.: *See*—
Gubitosa, Giuseppe; and Casale, Bruno, 5,496,786, Cl. 502-182.000.

Novedades Electronicas Internacionales S.A. de C.V.: *See*—
Santarriaga, Juan, 5,495,984, Cl. 236-46.00R.

Novick, Daniela: *See*—
Rubinstein, Menachem; Novick, Daniela; and Tal, Nathan, 5,496,926, Cl. 530-412.000.

Novick, Yoram: *See*—
Beardsley, Brent C.; Micka, William F.; and Novick, Yoram, 5,497,483, Cl. 395-575.000.

Nozawa, Masafumi: *See*—
Yamamoto, Akira; Homma, Shigeo; Asaka, Yoshihiro; Kuwahara, Yoshiaki; Kurano, Akira; Nozawa, Masafumi; and Kitajima, Hiroyuki, 5,497,472, Cl. 395-427.000.

NSK Ltd.: *See*—
Hibata, Ganta, 5,495,993, Cl. 242-382.200.
Matsuzaki, Hiroyuki; and Tadokoro, Hisakazu, 5,495,764, Cl. 73-593.000.

NTN Technical Center (U.S.A.), Inc.: *See*—
Bacigalupo, Nelson A., 5,496,646, Cl. 428-472.200.

Nuber, Adolf: *See*—
Lang, Reinhard; Beck, Erich; Keil, Edmund; Nuber, Adolf; Petersen, Harro; Renz, Hans; Schmidt, Horst; and Weiss, Wolfram, 5,496,591, Cl. 427-520.000.





Nudeshima, Masahiro: *See*—
Xu, Zhongren; and Nudeshima, Masahiro, 5,496,331, Cl. 606-139.000.

Nukui, Tadashi, to Kabushiki Kaisha Toshiba. Power calculating device. 5,497,077, Cl. 324-117.00H.

Numao, Masayuki: *See*—
Shimizu, Shuichi; and Numao, Masayuki, 5,497,452, Cl. 395-120.000.

Nunzi, Pierre J.: *See*—
de Lima, Jader A.; Lee, Yong-Uk; and Nunzi, Pierre J., 5,497,406, Cl. 377-44.000.

Ny, Yoshihide: *See*—
Furutani, Masayuki; and Ny, Yoshihide, 5,497,070, Cl. 322-23.000.

Nyberg, Peter A.: *See*—
Zwaan, Paul; and Nyberg, Peter A., 5,495,904, Cl. 180-11.000.

Nycomed Imaging AS: *See*—
Klaveness, Jo; Ege, Thorfinn; and Rocklage, Scott M., 5,496,534, Cl. 424-9.320.

Nygard, John E.: *See*—
Minshall, Billy W.; Nygard, John E.; Sintim-Damoa, Kwame; Giesler, Richard; Woodworth, Archie; and Purohit, Kailash, 5,496,302, Cl. 604-410.000.

Oba, Hidehiro: *See*—
Ando, Masahiko; Yamamoto, Yoshihisa; Fukatsu, Akira; Niimi, Mamoru; Kaigawa, Masato; Oba, Hidehiro; Kimura, Hiromichi; Hojo, Yasuo; Tabata, Atsushi; and Iwatsuki, Kunihiro, 5,496,230, Cl. 477-111.000.

Obara, Hideto: *See*—
Ishibashi, Tadaya; Sasaki, Masanori; Obara, Hideto; Kano, Hiroshi; and Yamashita, Shintaro, 5,496,449, Cl. 205-762.000.
Ishibashi, Tadaya; Obara, Hideto; and Taue, Satoshi, 5,496,454, Cl. 204-520.000.

Obara, Sanshiro; Yamada, Hiroyuki; Yoshihara, Shigeyuki; and Matsudaira, Nobunori, to Hitachi, Ltd.; and Hitachi Automotive Engineering Co., Ltd. Electric car control system. 5,495,908, Cl. 180-65.800.

Oberle, Hans-Dieter: *See*—
Muhmenthaler, Peter; and Oberle, Hans-Dieter, 5,497,350, Cl. 365-201.000.

O'Brien, Timothy P.: *See*—
Rhodes, Howard E.; O'Brien, Timothy P.; and Langley, Rod C., 5,496,773, Cl. 437-189.000.

Ochayon, Moti; and Falk, Arie, to ISCAR Ltd. Cutting insert. 5,496,137, Cl. 408-226.000.

Oda, Nobuhito: *See*—
Watano, Satoru; Itoh, Yoshihiro; Oda, Nobuhito; Kamata, Teturo; Kawakami, Noboru; and Moriya, Nobuharu, 5,497,232, Cl. 356-335.000.

Odagiri, Masaru: *See*—
Ueda, Hideyuki; Kuwahara, Kenji; Seki, Hiroshi; Takahasi, Kiyosi; Odagiri, Masaru; and Murai, Mikio, 5,496,595, Cl. 427-569.000.

Odaka, Yukio, to Canon Kabushiki Kaisha. Apparatus with focus detection means and sight axis detection means. 5,497,210, Cl. 354-402.000.

Odill, Frank J., to Cretex Companies, Inc. Adjustable fastening band for a manhole chimney seal and method of using. 5,496,128, Cl. 404-25.000.

O'Donnell, Walter. Lighted bubcap. 5,497,302, Cl. 362-78.000.

O'Donoghue, Geoffrey P.; and Cheek, Gary C., to Analog Devices, Inc. Bitstream defect analysis method for integrated circuits. 5,497,381, Cl. 371-28.000.

Ogasawara, Yasushi: *See*—
Okamoto, Yoshio; Enomoto, Naoki; Furukawa, Sachiko; Ogasawara, Yasushi; Akano, Hirofumi; and Kawamura, Yoshiya, 5,496,937, Cl. 536-124.000.

Ogata, Kiyoshi: *See*—
Ebe, Akinori; Ogata, Kiyoshi; and Nishiyama, Satoshi, 5,496,772, Cl. 437-187.000.

Ogata, Masahiro: *See*—
Sato, Katsuyuki; Matsumoto, Miki; Ohkuma, Sadayuki; Ogata, Masahiro; and Yoshida, Masahiro, 5,497,353, Cl. 365-230.050.

Ogawa, Akihide; Yamagata, Hiroshi; Takeda, Kazuhiro; and Ito, Yoshiharu, to Sony Corporation. Sync chip clamping/sync separator circuit. 5,497,201, Cl. 348-525.000.

Ogawa, Hisao: *See*—
Maruyama, Hisayuki; Mizokawa, Sadao; Yasumoto, Seiichi; Onuki, Ken; Ogawa, Hisao; Fukuzawa, Junji; Uchiyama, Toshihiko; Murakami, Toshiyuki; Anbo, Osamu; and Satake, Masato, 5,497,374, Cl. 370-85.400.

Ogawa, Susumu; Senoh, Hideaki; and Idei, Kouji, to Mitsubishi Paper Mills Limited. Ink jet recording sheet. 5,496,634, Cl. 428-341.000.

Ogawa, Tadashi, to Fuji Photo Film Co., Ltd. Silver halide color photographic materials. 5,496,689, Cl. 430-505.000.

Ogihara, Tsutomu: *See*—
Shimizu, Takaaki; Ogihara, Tsutomu; Kinsho, Takeshi; Kaneko, Tatsushi; Saito, Ryuichi; and Kurihara, Hideshi, 5,496,501, Cl. 252-299.610.

Ogiro, Kenji: *See*—
Nishijima, Tatsumi; Takeda, Hidekazu; Masuda, Kenmei; Mizutani, Hikaru; Maehara, Yoshimi; and Ogiro, Kenji, 5,497,279, Cl. 360-96.500.

Ogura, Toshiyuki; Saito, Kenji; Shimizu, Shigemi; and Sakaki, Masakatsu, to Sanden Corporation. Swash plate type compressor with lubricating mechanism between the shoe and swash plate. 5,495,789, Cl. 92-71.000.

Oh, Sung-Hun; and Taylor, Richard M., to VLSI Technology, Inc. Programmable output pad with circuitry for reducing ground bounce noise and power supply noise and method therefor. 5,497,105, Cl. 326-27.000.

Oh, Yoon-Seok: *See*—
Yoon, Sung-June; Chung, Young-Ho; Lee, Chi-Woo; Oh, Yoon-Seok; Choi, Dong-Rack; and Kim, Nam-Doo, 5,496,947, Cl. 544-362.000.

Ohashi, Ryota: *See*—
Yano, Kazuhiko; Sakikawa, Shigenori; and Ohashi, Ryota, 5,495,712, Cl. 60-487.000.

Ohashi, Yutaka: *See*—
Fukui, Wataru; Umemoto, Hideki; Ohashi, Yutaka; and Matsuo, Haruyuki, 5,497,290, Cl. 361-752.000.

Ohbayashi, Hiroaki: *See*—
Takaya, Seizi; Fukuzumi, Shuzo; Ohbayashi, Hiroaki; and Kimura, Makoto, 5,497,327, Cl. 364-424.050.

Ohgi, Keiichi: *See*—
Ozawa, Hidenari; Kato, Kazutaka; Ohgi, Keiichi; and Yahagi, Masahiro, 5,496,171, Cl. 431-326.000.

Ohhama, Tohru: *See*—
Nishida, Masaharu; and Ohhama, Tohru, 5,496,888, Cl. 525-63.000.

Ohkawa, Atsuhiro; Iwanaga, Hiroshi; Naruse, Hideaki; and Tsukase, Masaaki, to Fuji Photo Film Co., Ltd. Color diffusion transfer element with benzenesulfonamide. 5,496,680, Cl. 430-216.000.

Ohkubo, Kazuaki; and Nakagawa, Yasuo, to Matsushita Electric Industrial Co., Ltd. Spectroradiometer. 5,497,230, Cl. 356-328.000.

Ohkuma, Sadayuki: *See*—
Sato, Katsuyuki; Matsumoto, Miki; Ohkuma, Sadayuki; Ogata, Masahiro; and Yoshida, Masahiro, 5,497,353, Cl. 365-230.050.

Ohlinger, Manfred: *See*—
Steuerwald, Manfred; Ohlinger, Manfred; Kovacs, Jenoe; and Schwarz, Dieter, 5,496,633, Cl. 428-336.000.

Ohmori, Junya: *See*—
Ohta, Mitsuaki; Koide, Tokuo; Suzuki, Takeshi; Matsuhisa, Akira; Miyata, Keiji; Ohmori, Junya; and Yanagisawa, Isao, 5,496,942, Cl. 544-31.000.

Ohmura, Ichirou: *See*—
Fujii, Noriaki; and Ohmura, Ichirou, 5,495,832, Cl. 123-90.160.

Ohno, Akihiko; Nishizawa, Takatoshi; and Iwai, Akira, to Oji Yuka Goseishi Co., Ltd. Thermal transfer image-receiving sheet. 5,496,790, Cl. 503-227.000.

Ohno, Akihiko; Nishizawa, Takatoshi; Iwai, Akira; and Shibata, Ayako, to Oji Yuka Goseishi Co., Ltd. Thermal transfer image-receiving sheet. 5,496,791, Cl. 503-227.000.

Ohno, Kiyotaka; Ohtake, Atsushi; Nishio, Shintaro; Hoshi, Kazuhiro; and Tsukamoto, Shunji, to Toray Industries, Inc. Sulfonic acid derivative and its pharmaceutical application. 5,496,849, Cl. 514-468.000.

Ohno, Kiyotaka: *See*—
Mutoh, Masato; Hattori, Masakazu; Nishio, Shintaro; and Ohno, Kiyotaka, 5,496,850, Cl. 514-468.000.

Ohno, Toshihisa: *See*—
Saito, Taizo; Nakano, Nobuaki; Watanabe, Hiroto; Ohno, Toshihisa; and Araki, Yoshiyuki, 5,497,184, Cl. 347-257.000.

Ohta, Mitsuaki; Koide, Tokuo; Suzuki, Takeshi; Matsuhisa, Akira; Miyata, Keiji; Ohmori, Junya; and Yanagisawa, Isao, to Yamanouchi Pharmaceutical Co., Ltd. 5-substituted tetrahydrobenzimidazole compounds. 5,496,942, Cl. 544-31.000.

Ohta, Tokuji: *See*—
Uemoto, Kenji; Ohta, Tokuji; and Kawai, Shigeharu, 5,497,320, Cl. 364-419.170.

Ohtaka, Tohru: *See*—
Chawla, Chander P.; Ohtaka, Tohru; Iwanaga, Shinichirou; Watanabe, Tsuyoshi; and Igarashi, Katsutoshi, 5,496,870, Cl. 522-90.000.

Ohtake, Atsushi: *See*—
Ohno, Kiyotaka; Ohtake, Atsushi; Nishio, Shintaro; Hoshi, Kazuhiro; and Tsukamoto, Shunji, 5,496,849, Cl. 514-468.000.

Ohtake, Motoyuki, to Nikon Corporation. Range detection optical system with light emitter behind projection lens focal point and light receiver behind receiving lens focal point. 5,496,994, Cl. 250-201.600.

Ohtoh, Yasutoshi: *See*—
Mori, Seiki; Ohtoh, Yasutoshi; and Beppu, Masaaki, 5,496,463, Cl. 205-109.000.

Ohtsuka, Kaoru; and Yoshioka, Mamoru, to Toyota Jidosha Kabushiki Kaisha. Fuel injection timing control device for an internal combustion engine. 5,495,840, Cl. 123-478.000.

Ohtsuka, Shigenori: *See*—
Okuyama, Hirohisa; Ikeda, Yasuo; Ohtsuka, Shigenori; Kasai, Shuichi; and Iwasa, Akira, 5,496,819, Cl. 514-226.500.

Ohtsuka, Yasushi; Choji, Masataka; and Fukushima, Yoshiyuki, to Koito Manufacturing Co., Ltd. Vehicular lamp. 5,497,308, Cl. 362-294.000.

Ohue, Michio: *See*—
Fukuda, Takuya; Ohue, Michio; and Suzuki, Kazuo, 5,496,410, Cl. 118-723.0MW.

Ohyama, Yoshishige: *See*—
Minowa, Toshimichi; Ohyama, Yoshishige; Kimura, Hiroshi; Ozaki, Naoyuki; Shiraishi, Takashi; Ishii, Junichi; Ibamoto, Masahiko; and Tokuda, Hiroatsu, 5,496,227, Cl. 477-62.000.

Oi, Satoru: *See*—
Sohda, Takashi; Fujisawa, Yukio; Oi, Satoru; and Mizoguchi, Junji, 5,496,834, Cl. 514-343.000.

Oji Yuka Goseishi Co., Ltd.: *See*—

Ohno, Akihiko; Nishizawa, Takatoshi; and Iwai, Akira, 5,496,790, Cl. 503-227.000.
Ohno, Akihiko; Nishizawa, Takatoshi; Iwai, Akira; and Shibata, Ayako, 5,496,791, Cl. 503-227.000.
Oka, Satoru; Ono, Kazuhisa; Shigeta, Seiko; and Wada, Takeshi, to Fumakilla Limited; and Hiroshima University. Purified mite allergen. 5,496,554, Cl. 424-276.100.
Oka, Tsutomu: *See*—
Mitsuhashi, Akira; Wakita, Saburo; Oka, Tsutomu; and Noguchi, Osami, 5,495,837, Cl. 123-188.300.
Miyata, Hiroshi; Chiba, Yoshio; Noguchi, Osamai; Oka, Tsutomu; and Nakane, Minoru, 5,496,986, Cl. 219-125.100.
Okabe, Toshihiro: *See*—
Masuda, Noboru; Yamamoto, Kazumichi; Nakajima, Kazunori; Okabe, Toshihiro; Yamagiwa, Akira; Yamagishi, Mikio; Koide, Kazuo; Fujita, Bunichi; and Kawashima, Seiichi, 5,497,263, Cl. 327-278.000.
Okabe, Tsutomu: *See*—
Iriki, Nobuyuki; Okabe, Tsutomu; Watanabe, Kenji; Maejima, Hisashi; and Kuniyoshi, Shinji, 5,497,331, Cl. 364-468.000.
Okada, Hiroyuki: *See*—
Kawamura, Kunio; Okada, Hiroyuki; Tsuji, Sadafusa; Chikasaki, Masaaki; Iwata, Michihiro; and Izumi, Shuji, 5,497,212, Cl. 354-21.000.
Okada, Kazuo, to Universal Sales Co., Ltd. Management method for gaming hall. 5,496,032, Cl. 273-138.00A.
Okada, Masakazu: *See*—
Hamada, Takuji; Okada, Masakazu; and Tomizawa, Hiroshi, 5,497,370, Cl. 370-60.000.
Okada, Minoru; Ono, Kenji; Kasai, Shuichi; and Iwasa, Akira, to SS Pharmaceutical Co., Ltd. Controlled release-initiation and controlled release-rate pharmaceutical composition. 5,496,561, Cl. 424-480.000.
Okada, Shoji: *See*—
Kogita, Hidekazu; Nishikawa, Masumi; and Okada, Shoji, 5,497,273, Cl. 359-843.000.
Okamoto, Hiroshi; Katoh, Kohtaro; Tomita, Hiroshi; Suzuki, Kenji; and Saitoh, Kazuyoshi, to Teijin Limited. Base film for photographic film. 5,496,688, Cl. 430-500.000.
Okamoto, Toshiya, to Sharp Kabushiki Kaisha. Data flow type information processor. 5,497,344, Cl. 395-800.000.
Okamoto, Yoshio; Enomoto, Naoki; Furukawa, Sachiko; Ogasawara, Yasushi; Akano, Hirofumi; and Kawamura, Yoshiya, to Nakano Vinegar Co., Ltd. Polysaccharide substances, process for producing them and use of them. 5,496,937, Cl. 536-124.000.
Okamura, Kenji; Murayama, Shigeki; Chishima, Masamitsu; and Noro, Yutaka, to Sumitomo Wiring Systems, Ltd. Connector. 5,496,188, Cl. 439-189.000.
Okamura, Koji: *See*—
Arima, Tadao; and Okamura, Koji, 5,496,390, Cl. 65-378.000.
Okamura, Masahiko, to Matsushita Electric Industrial Co., Ltd. Digital to analog converter arithmetic circuit. 5,497,190, Cl. 348-189.000.
Okamura, Susumu: *See*—
Ikeda, Takeshi; and Okamura, Susumu, 5,497,028, Cl. 257-531.000.
Okamura, Toshiyasu: *See*—
Yanagimoto, Akira; Harunari, Takashi; Konno, Akihiro; and Okamura, Toshiyasu, 5,496,584, Cl. 427-154.000.
Okano, Kazuyuki: *See*—
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Egawa, Noboru, 5,497,346, Cl. 365-189.010.
Moriyama, Norio, 5,496,777, Cl. 437-249.000.
Okiguchi, Koutaro: *See*—
Hosokawa, Kyoichi; Owashi, Hitoaki; Yoshizawa, Kazuhiko; Yoshikoshi, Miyoko; Takahashi, Toshiaki; Inagaki, Yasuo; and Okiguchi, Koutaro, 5,497,237, Cl. 358-310.000.
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Kitagawa, Yoshihiko; Jinno, Tadashi; Aoshima, Masashi; Okita, Taisuke; Shinonaga, Hideo; and Kitadono, Kaoru, 5,496,863, Cl. 521-50.500.
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Yamauchi, Katsuhisa; Misao, Hitoshi; Inoue, Tadashi; and Okita, Tomoyoshi, 5,496,514, Cl. 420-34.000.
Okita, Tsutomu: *See*—
Ishida, Toshio; Satake, Masaki; and Okita, Tsutomu, 5,496,645, Cl. 428-457.000.
Okuda, Hisashi: *See*—
Uenoyama, Harumi; and Okuda, Hisashi, 5,496,453, Cl. 205-777.500.
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Sasaki, Kenichi; Okuma, Toshiyuki; Yamashita, Masaaki; and Watanabe, Toyofumi, 5,496,652, Cl. 428-623.000.
Okunishi, Masahiko: *See*—
Onishi, Tomoyuki; Mukai, Chika; Sekiyama, Takaaki; Tsuji, Takashi; Iwayama, Satoshi; and Okunishi, Masahiko, 5,496,824, Cl. 514-274.000.
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Kikuchi, Makoto; and Okutsu, Tetsuo, 5,496,694, Cl. 430-567.000.
Okuyama, Hirohisa; Ikeda, Yasuo; Ohtsuka, Shigenori; Kasai, Shuichi; and Iwasa, Akira, to SS Pharmaceutical Co., Ltd. Antiphlogistic-analgesic plaster comprising triacetin and piroxicam. 5,496,819, Cl. 514-226.500.
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Tajima, Fujio; Tanaka, Hideki; Okuyama, Kooetsu; Ishii, Tomokazu; and Toki, Kenji, 5,497,059, Cl. 318-561.000.
Okuyama, Shigeru; Otomo, Susumu; Kawashima, Yutaka; and Hatayama, Katsuo, to Taisho Pharmaceutical Co., Ltd. Use of 2-nitroxyethyl (+)apovincaminate. 5,496,829, Cl. 514-283.000.
Oldfield, Clive S.; and Shaylor, Nicholas, to International Business Machines Corporation. Scatter-gather in data processing system. 5,497,476, Cl. 395-439.000.
Olesen, Henry T., to Cimbria Unigrain Ltd. A/S. Apparatus for weighing continuously flowing flowable material. 5,495,773, Cl. 73-861.730.
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Martinez, Michael M.; Malofsky, Adam G.; Chandalia, Kiran B.; and Stuber, Fred A., 5,496,642, Cl. 428-423.100.
Oliva, David C., to Cobra Electronics Corporation. Traffic information warning system. 5,497,148, Cl. 340-905.000.
Oliver, William J., to Charwell Consumer Products, Ltd. Louse repellent. 5,496,852, Cl. 514-463.000.
Olivier, Helene: *See*—
Chauvin, Yves; Commereuc, Dominique; Hugues, Francois; Olivier, Helene; and Saussine, Lucien, 5,496,783, Cl. 502-125.000.
Olivier, Paul A. System for treating solid particles in a medium. 5,495,949, Cl. 209-172.500.
Olsen, Hans, to Coloplast A/S. Ostomy coupling. 5,496,297, Cl. 604-339.000.
Olsen, Lise: *See*—
Primdahl, Ivar I.; Christensen, Thomas S.; and Olsen, Lise, 5,496,170, Cl. 431-187.000.
Olympus Optical Co., Ltd.: *See*—
Hashiguchi, Toshihiko; Sugai, Toshiya; and Sasaki, Katsumi, 5,496,347, Cl. 606-205.000.
Ichikawa, Hitoshi; Miyazawa, Osao; and Nakamura, Masanobu, 5,497,364, Cl. 369-58.000.
Miyazawa, Azuma, 5,497,449, Cl. 395-61.000.
Sato, Yu; Shiratori, Kazutoshi; and Watanabe, Hiroyoshi, 5,497,208, Cl. 354-234.100.
Omnipoint Data Company: *See*—
Vanderpool, Jeffrey S., 5,497,424, Cl. 380-34.000.
Omura, Kengo: *See*—
Kawakami, Yasushi; Koie, Kazuaki; Nakahigashi, Sachiyo; Omura, Kengo; Yamada, Shiro; Ooshio, Yasuyo; Ishida, Kazuko; Ueno, Hideo; and Ishida, Minako, 5,496,119, Cl. 400-70.000.
Onan Corporation: *See*—
Data, Stanley E., 5,495,907, Cl. 180-65.200.
O'Neil, Douglas R.: *See*—
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Ong, Dee N.: *See*—
Yung, Weng F.; and Ong, Dee N., 5,497,145, Cl. 340-825.440.
Ong, EE-Chang, to Integrated Packaging Assembly Corporation. Method for sharpening an IC lead-frame punch. 5,495,780, Cl. 76-101.100.
Onishi, Tomoyuki; Mukai, Chika; Sekiyama, Takaaki; Tsuji, Takashi; Iwayama, Satoshi; and Okunishi, Masahiko, to Ajinomoto Co., Inc. Cyclopropane derivatives and anti-viral agent containing the same. 5,496,824, Cl. 514-274.000.
Ono, Hideharu: *See*—
Nemoto, Yasuhiro; Oyama, Kazuto; Ono, Hideharu; and Sakai, Kazuo, 5,497,280, Cl. 360-96.500.
Ono, Kazuhisa: *See*—
Oka, Satoru; Ono, Kazuhisa; Shigeta, Seiko; and Wada, Takeshi, 5,496,554, Cl. 424-276.100.
Ono, Kenji: *See*—
Okada, Minoru; Ono, Kenji; Kasai, Shuichi; and Iwasa, Akira, 5,496,561, Cl. 424-480.000.
Ono, Takeshi: *See*—
Yoshida, Takehiro; Terajima, Hisao; Wada, Satoshi; Ono, Takeshi; Kobayashi, Makoto; Ishida, Yasushi; Tomoda, Akihiro; Yokoyama, Minoru; and Awai, Takashi, 5,497,183, Cl. 347-215.000.
Onuki, Kazuhiko; and Ishibe, Yoshihiro, to Canon Kabushiki Kaisha. Reader-printer. 5,497,216, Cl. 355-45.000.
Onuki, Ken: *See*—
Maruyama, Hisayuki; Mizokawa, Sadao; Yasumoto, Seiichi; Onuki, Ken; Ogawa, Hisao; Fukuzawa, Junji; Uchiyama, Toshihiko; Murakami, Toshiyuki; Anbo, Osamu; and Satake, Masato, 5,497,374, Cl. 370-85.400.
Oomori, Shigeru: *See*—
Ishikawa, Tetsuo; Oomori, Shigeru; Hashimoto, Daijiro; Mochiduki, Toshihiro; and Takano, Satoshi, 5,497,495, Cl. 395-750.000.
Ooshio, Yasuyo: *See*—
Kawakami, Yasushi; Koie, Kazuaki; Nakahigashi, Sachiyo; Omura, Kengo; Yamada, Shiro; Ooshio, Yasuyo; Ishida, Kazuko; Ueno, Hideo; and Ishida, Minako, 5,496,119, Cl. 400-70.000.
Oowaki, Yukihito, to Kabushiki Kaisha Toshiba. Random access memory with divided memory banks and data read/write architecture therefor. 5,497,351, Cl. 365-230.030.
Oppenlaender, Knut: *See*—



Franz, Lothar; Mohr, Juergen; Schreyer, Peter; Thomas, Juergen; Oppenlaender, Knut; and Guenther, Wolfgang, 5,496,383, Cl. 44-432.000.
Oppermann, Günter: *See*—
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Orimo, Takao: *See*—
Furusawa, Keisuke; Orimo, Takao; and Suzuki, Takuya, 5,495,668, Cl. 29-879.000.
Orlando, Franklin P.: *See*—
Scott, Phillip R.; Orlando, Franklin P.; Warren, Richard K.; and Slates, Larry L., 5,495,708, Cl. 56-329.000.
Orlewicz, Dennis J.; Orlewicz, William P.; and Orlewicz, Lawrence W., to Magnum Manufacturing, Inc. Rubber molding apparatus. 5,496,008, Cl. 249-61.000.
Orlewicz, Lawrence W.: *See*—
Orlewicz, Dennis J.; Orlewicz, William P.; and Orlewicz, Lawrence W., 5,496,008, Cl. 249-61.000.
Orlewicz, William P.: *See*—
Orlewicz, Dennis J.; Orlewicz, William P.; and Orlewicz, Lawrence W., 5,496,008, Cl. 249-61.000.
Ormes, Duane E.: *See*—
Wisler, Jan A.; Luallin, John M.; Ormes, Duane E.; Smith, Randall J.; Coombs, Terry L.; and Werner, Ernst K., 5,497,299, Cl. 362-61.000.
Orth, Kelly M.: *See*—
Broden, David A.; Orth, Kelly M.; Borgeson, Dale W.; Lanctot, Jane B.; and Voegele, Kevin D., 5,495,769, Cl. 73-718.000.
Ortiz, Astrid A.: *See*—
Watson, Brett T.; and Ortiz, Astrid A., 5,496,826, Cl. 514-303.000.
Orzech, Chester E.: *See*—
Gemmill, Frederick O., Jr.; Orzech, Chester E.; and Adelman, Steven J., 5,496,814, Cl. 514-179.000.
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Yonehara, Takao; and Osada, Yoshiyuki, 5,495,824, Cl. 117-8.000.
Osborne, Scott; Bates, Roger E.; and Burgi, Anthony C., to Breed Automotive Technology, Inc. Inflator assembly having partitioning member redirecting gas flow. 5,496,064, Cl. 280-740.000.
Osborne, Scott; Bates, Roger E.; and Burgi, Anthony C., to Breed Automotive Technology, Inc. Inflator assembly. 5,496,065, Cl. 280-740.000.
Osen, Ernst: *See*—
Schumacher, Herbert; Messner, Norbert; Osen, Ernst; and Ecknig, Dirk, 5,496,285, Cl. 604-218.000.
Oshima, Katsuyuki: *See*—
Yamauchi, Mineo; Oshima, Katsuyuki; Ando, Jitsuhiko; Torii, Masanori; Fujimura, Hideo; and Iwata, Tamami, 5,496,072, Cl. 283-86.000.
Ostermann, Juergen W., to VDO Kienzle Comercio E Servicos Ltda. Rotative joint applicable in pneumatic air pressure control assembly. 5,496,075, Cl. 285-62.000.
Ostgathe, Klaus: *See*—
Domesle, Rainer; Engler, Bernd; Koberstein, Edgar; Lox, Egbert; and Ostgathe, Klaus, 5,496,788, Cl. 502-333.000.
Ostrover, Lewis S.; Cookson, Christopher J.; and Lieberfarb, Warren N., to Time Warner Entertainment Co., L.P. System and method for controlling display of motion picture subtitles in a selected language during play of a software carrier. 5,497,241, Cl. 358-341.000.
Osugi, Yukihisa: *See*—
Ishikawa, Tadasu; Kozuka, Yoshinari; and Osugi, Yukihisa, 5,497,438, Cl. 385-38.000.
Ota, Atsutoshi: *See*—
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Ota, Hiroyuki: *See*—
Igarashi, Ichiro; Ota, Hiroyuki; and Mizoguchi, Yoshio, 5,496,589, Cl. 427-331.000.
Ota, Mikio: *See*—
Shiota, Tatsuki; Takeyasu, Takumi; Kataoka, Kenichiro; Mochizuki, Tsutomu; Tanabe, Hirofumi; Ota, Mikio; Kano, Masatoshi; and Yamaguchi, Hisao, 5,496,853, Cl. 514-469.000.
Otaki, Hiroshi; and Nakajima, Masahiro, to Pioneer Video Corporation; and Pioneer Electronic Corporation. Digital time base corrector. 5,497,200, Cl. 348-497.000.
Otani, Noboru: *See*—
Mase, Shoji; Otani, Noboru; Yoshida, Motoaki; Ishizuka, Satoshi; Kayanoki, Hisayuki; and Hirayama, Naoto, 5,496,641, Cl. 428-423.100.
Oths, Phil J.: *See*—
Napolitano, Neil J.; Yeh, Kuo-Chen; Sena, Frank J.; Oths, Phil J.; and Roque, Manuel M., 5,496,558, Cl. 424-435.000.
Otis, Bruce P.; and Dickson, Russell E., to International Business Machines Corporation. Apparatus for tilted serial cooling in an electronic system. 5,497,288, Cl. 361-687.000.
Otis Elevator Company: *See*—
Adrian, Willy; Arens, Joachim; and Wente, Gerald, 5,496,086, Cl. 294-65.000.
Ericson, Richard J.; and Draper, James M., 5,495,919, Cl. 187-373.000.
Peruggi, Richard E.; McHugh, Thomas M.; Ahigian, Edward E.; Jamiet, Jerome F.; He, Thomas; Kowalczyk, Thomas M.; Kulak, Richard E.; and Barrett, David W., 5,495,918, Cl. 187-316.000.
Otomo, Susumu: *See*—
Okuyama, Shigeru; Otomo, Susumu; Kawashima, Yutaka; and Hatayama, Katsuo, 5,496,829, Cl. 514-283.000.
Otsuka, Kenichi; and Mori, Kazuya, to Kabushiki Kaisha Toshiba. Gas purification capability measuring method for gas purification apparatus and gas purification apparatus. 5,496,393, Cl. 95-19.000.
Otsuka Pharmaceutical Factory, Inc.: *See*—
Inai, Masatoshi; Shibutani, Tadanao; Kanaya, Jun; Moritake, Masako; and Tanaka, Akie, 5,496,844, Cl. 514-415.000.
Outake, Atsuhiro: *See*—
Suga, Masao; Nakajima, Syuzo; Inomata, Tadaaki; Saito, Toshimitsu; Outake, Atsuhiro; Iba, Yoshiaki; Mihara, Hidekazu; Nishikawa, Hirofumi; Nanno, Nobuyuki; and Satake, Shigeru, 5,497,455, Cl. 395-159.000.
Outani, Minoru: *See*—
Maki, Yoshiro; Nakagawa, Toshiko; Furukawa, Yoshiaki; Outani, Minoru; Haruta, Takashi; Yamanami, Maki; and Nakamura, Sachiko, 5,496,590, Cl. 427-388.100.
Outek Oy: *See*—
Keisala, Teuvo, 5,495,691, Cl. 43-43.120.
Outside Design Corporation: *See*—
Brown, Rosalie E.; Willis, Geoffrey H.; and Brown, Douglas M., 5,496,204, Cl. 446-236.000.
Over, Gary L.; Black, Teresa K.; and Shaffer, David T., to Whitaker Corporation, The. Electrical connector assembly including improved decoupling retardation mechanism. 5,496,189, Cl. 439-321.000.
Owashi, Hitoaki: *See*—
Hosokawa, Kyoichi; Owashi, Hitoaki; Yoshizawa, Kazuhiko; Yoshikoshi, Miyoko; Takahashi, Toshiaki; Inagaki, Yasuo; and Okiguchi, Koutaro, 5,497,237, Cl. 358-310.000.
Owen, Larry D., to Litton Systems, Inc. Telescopic day and night sight. 5,497,266, Cl. 359-353.000.
Owens-Corning Fiberglas Technology, Inc.: *See*—
Alderman, Robert J.; and Taylor, James E., 5,495,698, Cl. 52-742.120.
Owicki, John C.: *See*—
Parce, John W.; McConnell, Harden M.; Humphries, Gillian M. K.; Kercso, Karen M.; Owicki, John C.; and Kercso, Josef E., 5,496,697, Cl. 435-5.000.
Oyama, Hiroaki; Temma, Tadashi; Maeda, Miyuki; Kusuzaki, Tetsuo; Kimura, Hiromichi; Abe, Kazumi; Kunishi, Naohiko; Kinefuchi, Akira; and Miura, Takahiro, to Hitachi, Ltd.; and Nichirei Corporation. Questionnaire system. 5,496,175, Cl. 434-118.000.
Oyama, Kazuto: *See*—
Nemoto, Yasuhiro; Oyama, Kazuto; Ono, Hideharu; and Sakai, Kazuo, 5,497,280, Cl. 360-96.500.
Ozaki, Naoyuki: *See*—
Minowa, Toshimichi; Ohyama, Yoshishige; Kimura, Hiroshi; Ozaki, Naoyuki; Shiraishi, Takashi; Ishii, Junichi; Ibamoto, Masahiko; and Tokuda, Hiroatsu, 5,496,227, Cl. 477-62.000.
Ozaki, Yoshio: *See*—
Goto, Akihiro; Ozaki, Yoshio; Taneda, Atsushi; Sato, Tatsushi; and Imai, Yoshihito, 5,496,984, Cl. 219-69.180.
Ozawa, Hidenari; Kato, Kazutaka; Ohgi, Keiichi; and Yahagi, Masahiro, to Tokyo Gas Co., Ltd. Surface combustion burner. 5,496,171, Cl. 431-326.000.
Ozeki, Masakatsu; Kodato, Shin-ichi; Yasuda, Kousuke; Kudo, Yukitsuka; and Maeda, Kayoko, to Tanabe Seiyaku Co., Ltd. Thiazine (or oxazine) derivatives and preparation thereof. 5,496,815, Cl. 514-224.200.
Ozeki, Masashi: *See*—
Shibuya, Akira; Hattori, Kazuo; and Ozeki, Masashi, 5,497,024, Cl. 257-410.000.
P.A.&M. S.p.A.: *See*—
DeBellis, Ferruccio, 5,496,354, Cl. 607-37.000.
Pacesetter, Inc.: *See*—
Moberg, Sheldon B.; and Causey, James D., III, 5,496,361, Cl. 607-122.000.
Renger, Herman L., 5,496,352, Cl. 607-19.000.
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Thomson, James, 5,496,502, Cl. 252-301.170.
Padolik, Peter A.: *See*—
Mobley, Michael J.; Lukacovic, Michael F.; Padolik, Peter A.; and Berry, Gregory, 5,496,539, Cl. 424-49.000.
Page, Neville: *See*—
Geiger, Richard; Robertson, A. Scott; and Page, Neville, 5,496,050, Cl. 280-250.100.
Pakanecz, Günther: *See*—
Konrad, Franz; Pakanecz, Günther; and Lederer, Manfred, 5,495,958, Cl. 215-329.000.
Palackal, Syriac J.: *See*—
Geerts, Rolf L.; Palackal, Syriac J.; Pettijohn, Ted M.; and Infield, Robert M., 5,496,781, Cl. 502-104.000.
Pan, Hong-Tsz: *See*—
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Pan, Wei: *See*—
Desu, Seshu B.; Pan, Wei; and Vijay, Dilip P., 5,496,437, Cl. 156-643.100.
Pancoast, Steven T.: *See*—
Combs, James L.; Crump, Dwayne T.; and Pancoast, Steven T., 5,497,494, Cl. 395-750.000.
Paoli, Thomas L., to Xerox Corporation. Dynamic control of individual spot exposure in an optical output device. 5,497,181, Cl. 347-133.000.
Paoli, Thomas L., to Xerox Corporation. Monolithic array of independently addressable diode lasers. 5,497,391, Cl. 372-50.000.

Paradis, André. Pivotable panel for clothes dryer drum. 5,495,681, Cl. 34-602.000.
Parce, John W.; McConnell, Harden M.; Humphries, Gillian M. K.; Kercso, Karen M.; Owicki, John C.; and Kercso, Josef E., to Molecular Devices Corporation. Methods and apparatus for detecting the effect of cell affecting agents on living cells. 5,496,697, Cl. 435-5.000.
Parham, Marc E.; Duffy, Richard L.; and Nicholson, Donald T., to W. R. Grace & Co.-Conn. High efficiency removal of low density lipoprotein-cholesterol from whole blood. 5,496,637, Cl. 428-376.000.
Parisien, Harvey E., to Alcuf Inc. Fence system. 5,496,016, Cl. 256-68.000.
Park, Chun-Geun, to Samsung Electronics Co., Ltd. Method for manufacturing a semiconductor chip bump having improved contact characteristics. 5,496,770, Cl. 437-183.000.
Park, David G.: *See*—
Splittstoesser, Clair D.; Crosby, Donald P.; Park, David G.; and Funk, Larry S., 5,496,226, Cl. 476-24.000.
Park, Moon-bae, to Samsung Electronics Co., Ltd. Printer having a rotating drum. 5,497,182, Cl. 347-197.000.
Park, Myoung G.; Jang, Jae D.; and Kang, Whan K., to Lucky Limited. *Streptococcus zooepidemicus* medium and process for preparing hyaluronic acid. 5,496,726, Cl. 435-253.400.
Park, Sang-il: *See*—
Linker, Frederick I.; Kirk, Michael D.; Alexander, John D.; Park, Sang-il; Park, Sung-il; Smith, Ian R.; and Swift, Peter R., 5,496,999, Cl. 250-306.000.
Park, Sung-il: *See*—
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Parker, Dick: *See*—
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Hoffmann, Rainer; Bischoff, Michael; Franz, Joachim; and Thein, Thomas, 5,496,066, Cl. 280-753.000.
Parton, Katherine E., to Hoosier Investment Company. Unobtrusive carrier having quick release access for protective devices. 5,495,967, Cl. 224-202.000.
Paserin, Vladimir: *See*—
Hynek, Paul A.; Paserin, Vladimir; and Ambrose, John, 5,497,086, Cl. 324-228.000.
Pasqualini, Roberto; Bellande, Emmanuel; Comazzi, Véronique; and Lainé, Jacques, to Cis Bio International. Radiopharmaceutical product having in particular a cerebral tropism comprising a nitruro complex of a transition metal and method for preparing said product. 5,496,929, Cl. 534-10.000.
Pastorek, Joseph R.: *See*—
McCall, Clark E.; Heller, Joseph A.; Clore, James V.; Pastorek, Joseph R.; and Rathbun, Jon M., 5,497,323, Cl. 364-424.040.
Pastrick, Todd W.; Molenkamp, Linda K.; and Koops, Roger L., to Donnelly Corporation. Remote-actuated exterior vehicle security light. 5,497,305, Cl. 362-83.100.
Pastrick, Todd W., to Donnelly Corporation. Exterior vehicle security light. 5,497,306, Cl. 362-83.100.
Pastrone, Giovanni; Johnson, Noel L.; Huang, J. Terry; and Allen, Timothy, to Abbott Laboratories. Automated drug infusion system with autopriming. 5,496,273, Cl. 604-67.000.
Pastusek, Paul E.; and Matson, Steve R., to Baker Hughes Incorporated. Reamer wing with balanced cutting loads. 5,495,899, Cl. 175-57.000.
Patel, Raj D.: *See*—
Croucher, Melvin D.; Patel, Raj D.; Kmiecik-Lawrynowicz, Grazyna E.; Hopper, Michael A.; and Grushkin, Bernard, 5,496,676, Cl. 430-137.000.
Patel, Ranjan C.; and Hall, Kevin P., to Minnesota Mining and Manufacturing Company. Silver halide imaging materials. 5,496,696, Cl. 430-619.000.
Patrick, Jay. Compositions for the transdermal delivery of nutrients. 5,496,827, Cl. 514-310.000.
Patterson Pump Co.: *See*—
Claxton, Ernest J., III; and Poser, Eugene F., 5,496,150, Cl. 415-229.000.
Paul, Loni J.: *See*—
Hawkins, John G.; Paul, Loni J.; Cardwell, Phillip R.; Reeves, Peter T.; Dean, Helen B.; Doherty, Daniel B., V; and Flaherty, Paul J., 5,497,317, Cl. 364-408.000.
Paul, Michael; Hubschle, Peter; and Hannibal, Wilhelm, to Audi AG. Valve actuating mechanism for an internal combustion engine. 5,495,831, Cl. 123-90.160.
Paussa, Gregory F.: *See*—
Bailey, Warren D.; Dixon, Erik L.; Ferris, Michele M.; Garrett, Henry M.; Paussa, Gregory F.; and Walker, Anthony D., 5,497,460, Cl. 395-183.150.
Paustian, John K.: *See*—
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Pawliszyn, Janusz B., to University of Waterloo. Device and process for increasing analyte concentration in a sorbent. 5,496,741, Cl. 436-163.000.
Pax Products, Inc.: *See*—
Pax, Steven J., 5,495,917, Cl. 184-7.400.
Pax, Steven J., to Pax Products, Inc. Liquid distributing apparatus for lubricating parts. 5,495,917, Cl. 184-7.400.
Payne, LeRoy. Structure forming apparatus. 5,496,434, Cl. 156-550.000.
Peacock Limited L.C.: *See*—
Gagliano, Alberto, 5,496,017, Cl. 266-208.000.
Peaker, Malcolm: *See*—
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Pearson, Steve: *See*—
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Pedall, Friedrich: *See*—
Gromer, Kurt; Haan, Franz; Jung, Werner; and Pedall, Friedrich, 5,495,661, Cl. 29-740.000.
Pedarre, Pierre; and Terrien, Pascal, to Ugine Savoie (Societe Anonyme). Ferritic stainless steel with improved machinability. 5,496,515, Cl. 420-41.000.
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DeFosse, Stephen F.; Phatak, Ganesh V.; and Sauers, Matthew C., 5,497,178, Cl. 347-87.000.
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Reis, James J.: *See*—
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Ryum, Byung-Ryul; Han, Tae-Hyeon; Lee, Soo-Min; Cho, Deok-Ho; Lee, Seong-Hearn; and Kang, Jin-Young, to Electronics and Telecommunications Research Institute; and Korea Telecommunications Authority. Method for making bipolar transistor having an enhanced trench isolation. 5,496,745, Cl. 437-31.000.

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Gray, Charles L., Jr.; Hellman, Karl H.; and Safoutin, Michael J., 5,495,912, Cl. 180-165.000.

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Nagao, Hiromasa; Yoneya, Takashi; Miyake, Toshio; Aoyama, Atsuo; Kai, Ken-ichi; Kidokoro, Shun-ichi; Miki, Yoichiro; Endo, Kimiko; and Wada, Akiyoshi, 5,496,710, Cl. 435-68.100.

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Saitoh, Kazuyoshi: *See*—
Okamoto, Hiroshi; Katoh, Kohtaro; Tomita, Hiroshi; Suzuki, Kenji; and Saitoh, Kazuyoshi, 5,496,688, Cl. 430-500.000.

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Nemoto, Yasuhiro; Oyama, Kazuto; Ono, Hideharu; and Sakai, Kazuo, 5,497,280, Cl. 360-96.500.

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Ogura, Toshiyuki; Saito, Kenji; Shimizu, Shigemi; and Sakaki, Masakatsu, 5,495,789, Cl. 92-71.000.

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Sakamoto, Yoshinori; Hagiwara, Yoshio; Tanaka, Hatsuyuki; and Nakayama, Toshimasa, to Tokyo Ohka Kogyo Co, Ltd. Method and liquid coating composition for the formation of silica-based coating film on substrate surface. 5,496,402, Cl. 106-287.160.

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Sakaue, Shiyuki: *See*—
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Sakikawa, Shigenori: *See*—
Yano, Kazuhiko; Sakikawa, Shigenori; and Ohashi, Ryota, 5,495,712, Cl. 60-487.000.
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Sakoda, Hideharu: *See*—
Tsuji, Kazuto; Yoneda, Yoshiyuki; Sakoda, Hideharu; Sono, Michio; Yamaguchi, Ichiro; Hamano, Toshio; Kubota, Yoshihiro; Hayakawa, Michio; Ikemoto, Yoshihiko; Saigo, Yukio; and Miyaji, Naomi, 5,497,032, Cl. 257-710.000.
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Sakurai, Yasuhiro; and Kishi, Toshiyuki, to Citizen Watch, Co., Ltd. Method of fabricating a semiconductor nonvolatile storage device. 5,496,753, Cl. 437-43.000.
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Howland, Robert S.; Salib, Richard M.; and Pettine, Kenneth, 5,496,318, Cl. 606-61.000.
Salisbury, Frederick R. Motor vehicle and suspension linkage. 5,495,913, Cl. 180-227.000.
Salvel, Renato: *See*—
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Samain, Henri; and Sturla, Jean-Michel, to L'Oreal. Process for the direct dyeing of keratinous fibres using water vapor. 5,496,377, Cl. 8-414.000.
Samargo, Daniel L.; and Samargo, Patty S. Container dispensing valve. 5,496,011, Cl. 251-246.000.
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Samie, Farzad; and Bartos, Andrew L., to General Motors Corporation. Controlled cooling apparatus for torque transfer devices. 5,495,927, Cl. 192-70.120.
Sampsell, Jeffrey B.: *See*—
Gove, Robert J.; Doherty, Donald B.; Marshall, Stephen W.; Davis, Carl W.; Egan, Joseph G.; Meyer, Richard C.; Sampsell, Jeffrey B.; and Heimbuch, Scott D., 5,497,197, Cl. 348-388.000.
Samsung Aerospace Industries, Ltd.: *See*—
Kim, Hoo-shik, 5,497,207, Cl. 353-66.000.
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Back, Dong-cherl, 5,496,178, Cl. 434-307.00A.
Beak, Soon K., 5,496,185, Cl. 439-95.000.
Jeong, Jechang, 5,497,153, Cl. 341-67.000.
Ji, Sung Y., 5,497,206, Cl. 348-738.000.
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Kim, Ji-ho, 5,497,202, Cl. 348-536.000.
Kim, Jong-woo, 5,497,080, Cl. 324-175.000.
Ko, Han I., 5,497,204, Cl. 348-715.000.
Lee, Su K., 5,497,365, Cl. 369-75.200.
Park, Chun-Geun, 5,496,770, Cl. 437-183.000.
Park, Moon-bae, 5,497,182, Cl. 347-197.000.
Ryu, Kyeong-keol, 5,497,054, Cl. 315-368.110.
Yang, Jian; and Limberg, Allen L., 5,497,205, Cl. 348-737.000.
Yoo, Jae C., 5,497,240, Cl. 358-335.000.
Samulak, Zdzislaw; and Jantzi, Lyle, to New York Air Brake. Single actuator truck mount brake system. 5,495,921, Cl. 188-202.000.
Sande, Kurt; Heim, Edgar J.; and Staaland, Torbjørn. Actuator for transfer of forward and backward rotational movement. 5,495,791, Cl. 92-120.000.
Sanden Corporation: *See*—
Ogura, Toshiyuki; Saito, Kenji; Shimizu, Shigemi; and Sakaki, Masakatsu, 5,495,789, Cl. 92-71.000.
Teshigawara, Toshiyuki; and Kokubun, Yoshikazu, 5,495,658, Cl. 29-598.000.
Sander, Thomas: *See*—
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Sander, Ulrich, to Carl-Zeiss-Stiftung. Combination of a viewing and/or documenting apparatus and an endoscope as well as a method of operating the combination. 5,496,261, Cl. 600-163.000.
Sandhu, Gurtej S.; Doan, Trung T.; and Cathey, David A., to Micron Semiconductor, Inc. Highly resistive structures for integrated circuits and method of manufacturing the same. 5,496,762, Cl. 437-60.000.
Sando Iron Works Co., Ltd.: *See*—
Sando, Yoshiteru; Ishidoshiro, Hiroshi; and Sando, Koji, 5,495,729, Cl. 68-5.00E.
Sando, Koichiro. Vehicular clutch assisted operation apparatus. 5,495,928, Cl. 192-89.290.
Sando, Koji: *See*—
Sando, Yoshiteru; Ishidoshiro, Hiroshi; and Sando, Koji, 5,495,729, Cl. 68-5.00E.
Sando, Yoshiteru; Ishidoshiro, Hiroshi; and Sando, Koji, to Sando Iron Works Co., Ltd. Method for high temperature and high pressure continuous dyeing of a cloth and an apparatus therefor. 5,495,729, Cl. 68-5.00E.
Sandt, Matthew C.: *See*—
Jeskey, Brian E.; Sandt, Matthew C.; and Supple, Martin A., 5,496,384, Cl. 44-535.000.
Sandvik AB: *See*—
Tibäck, Bo G., 5,496,131, Cl. 299-40.100.
Waldenström, Mats G.; Fischer, Udo K. R.; Hillert, Lars H.; and Dennis, Mahlon D., 5,496,638, Cl. 428-408.000.
Sankyo Company, Limited: *See*—
Iwata, Masayuki; Kimura, Tomio; Inoue, Teruhiko; Fujihara, Yoshimi; and Katsube, Tetsushi, 5,496,951, Cl. 546-13.000.
Miura, Hideo; Watanabe, Yoshiaki; and Sumimoto, Mitsuhiro, 5,495,705, Cl. 53-411.000.
Santagiuliana, Evans, to Taplast SRL. Measuring/dispensing device for granular or powder products. 5,495,964, Cl. 222-455.000.
Santarriaga, Juan, to Novedades Electronicas Internacionales S.A. de C.V. Energy saving optoelectronic code reading access device. 5,495,984, Cl. 236-46.00R.
Santel, Hans-Joachim: *See*—
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Santen Pharmaceutical Co., Ltd.: *See*—
Kawashima, Yoichi; Ota, Atsutoshi; and Mibu, Hiroyuki, 5,496,817, Cl. 514-224.200.
Santex Co. Ltd.: *See*—
Yamada, Toshio, 5,495,741, Cl. 72-387.000.
Sanvito, Roberto; and Marchesi, Franco, to Rimoldi Necchi S.R.L. Multi-needle sewing machine with thread tension control. 5,495,816, Cl. 112-165.000.
Sanwa Shoyaku Kabushiki Kaisha: *See*—
Murayama, Mitsuo; and Mori, Takao, 5,496,825, Cl. 514-279.000.
Sanyo Chemical Industries, Ltd.: *See*—
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Sanyo Electric Co., Ltd.: *See*—
Fujitani, Shin; Nakamura, Hiroshi; Watanabe, Hiroshi; Yonezu, Ikuo; and Saito, Toshihiko, 5,496,424, Cl. 148-555.000.
Iwama, Akifumi; Iseki, Masahiro; and Nakagawa, Azusa, 5,496,451, Cl. 205-790.500.
Nankoh, Mitsuo; Inoue, Akio; Yokomizo, Hitoshi; Tomida, Yosikazu; and Kawabata, Tohru, 5,497,372, Cl. 370-69.100.
Sato, Hironobu, 5,497,040, Cl. 310-67.00R.
Saperstein, William: *See*—
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Sara Lee/De N.V.: *See*—
Muis, Jan A.; and Edelbroek, Johannes H., 5,495,793, Cl. 99-280.000.
Sarai, Kiyoko: *See*—
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Sasai, Akio: *See*—
Kayashima, Hiroshi; Ido, Jun; Hayashi, Naoki; Urasaki, Kenji; and Sasai, Akio, 5,497,203, Cl. 348-699.000.
Sasaki, Hiroki, to Nissan Motor Co., Ltd. Control system for integrally controlling operations of electronic torque split system and traction control system for automotive vehicle. 5,497,333, Cl. 364-426.030.
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Sasaki, Kenichi; Okuma, Toshiyuki; Yamashita, Masaaki; and Watanabe, Toyofumi, to NKK Corporation. Zinc-plated steel plate having resin coating film. 5,496,652, Cl. 428-623.000.
Sasaki, Kunio: *See*—
Ishida, Michio; Kuwahara, Tsutomu; Kawaguchi, Satoshi; Kono, Tadashi; Aoki, Norihiro; Sekiguchi, Yoshitoshi; Sasaki, Kunio; and Shimotani, Hideo, 5,495,948, Cl. 209-11.000.
Sasaki, Masanori: *See*—
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Sasaki, Mutumi: *See*—
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Sasaki, Takeshi, to Kabushiki Kaisha Wacom. Method of transferring detailed data by tablet driver. 5,497,176, Cl. 345-173.000.
Sasaki, Yutaka, to NEC Corporation. Local oscillator system and frequency switching method for minimizing spurious components. 5,497,128, Cl. 331-38.000.
Sashida, Kiyoshi: *See*—
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Sasser, Lyle B.: *See*—
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Sastri, Suri A.; Pemsler, J. Paul; Cooke, Richard A.; Litchfield, John K.; and Smith, Mark B., to Surmet Corporation; and Castle Technology Corporation. Metal-bonded, carbon fiber-reinforced composites. 5,495,979, Cl. 228-124.100.
Satake, Masaki: *See*—
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Satake, Masato: *See*—
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Sato, Hironobu, to Sanyo Electric Co., Ltd. Outer rotor type brusless DC motor. 5,497,040, Cl. 310-67.00R.
Sato, Junichi, to Sony Corporation. Process for removing fine particles. 5,496,506, Cl. 264-400.000.
Sato, Katsuyuki; Matsumoto, Miki; Ohkuma, Sadayuki; Ogata, Masahiro; and Yoshida, Masahiro, to Hitachi, Ltd.; and Hitachi VLSI Engineering Corp. Semiconductor memory device. 5,497,353, Cl. 365-230.050.
Sato, Koichi; and Aoki, Harumi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Controlling erasing of tracks of a recording medium used with a still video apparatus. 5,497,238, Cl. 358-310.000.
Sato, Noriko: *See*—
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Sato, Shigeji: *See*—
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Sato, Tatsushi: *See*—
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Sato, Yu; Shiratori, Kazutoshi; and Watanabe, Hiroyoshi, to Olympus Optical Co., Ltd. Camera having a lens shutter mechanism. 5,497,208, Cl. 354-234.100.
Satoh, Hiroshi: *See*—
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Satou, Youji; and Sasaki, Katumaru, to Kabushiki Kaisha Toshiba. Electronic apparatus with hinged display and latch mechanism for releasably latching display in closed position. 5,497,296, Cl. 361-681.000.
Saucy, Gabriel: *See*—
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Sauer, Donald J., to David Sarnoff Research Center, Inc. Wide frequency range CMOS relaxation oscillator with variable hysteresis. 5,497,127, Cl. 331-17.000.
Sauer, Donald J.: *See*—
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Sauer, Jude S.; Tiberio, Theodore J.; and Greenwald, Roger J., to Lasersurge, Inc. Surgical device to prepare body tissue for anastomosis. 5,496,341, Cl. 606-167.000.
Sauers, Matthew C.: *See*—
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Saulnier, Gary J.: *See*—
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Saussine, Lucien: *See*—
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Sawada, Akihiro; Mori, Masaharu; Koie, Kazuaki; and Ishida, Kazuko, to Brother Kogyo Kabushiki Kaisha. Tape printer. 5,496,117, Cl. 400-61.000.
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Sawicki, Richard H.; Alger, Terry W.; Finucane, Raymond G.; and Hall, Jerome P., to United States of America, Energy. Segmented lasing tube for high temperature laser assembly. 5,497,392, Cl. 372-62.000.
Say, Geoffrey R.: *See*—
Davis, Stephen M.; Clavenna, LeRoy R.; Say, Geoffrey R.; and Fiato, Rocco A., 5,496,531, Cl. 423-418.200.
Sayag, Michel, to Loral Fairchild Corporation. Electronic color snapshot technique and structure using very high resolution monochrome full frame CCD imagers. 5,497,195, Cl. 348-266.000.
Scarborough, Robert M.; Wolf, David L.; and Charo, Israel F., to COR Therapeutics, Inc. Genes encoding platelet aggregation inhibitors. 5,496,724, Cl. 435-252.300.
Schaaf, Mimi Y. C.: *See*—
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Schacher, Gottlieb, to Hoffmann-La Roche Inc. Diagnostic processing station. 5,496,519, Cl. 422-64.000.
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Schapowalow, Sergej: *See*—
Sackmann, Günter; Meyer, Rolf-Volker; Korte, Siegfried; and Schapowalow, Sergej, 5,496,890, Cl. 525-329.100.
Schäppi, Hans-Peter; and Hidber, Arthur, to Cerberus AG. Testing and adjustment of scattered-light smoke detectors. 5,497,144, Cl. 340-630.000.
Schaub, Bruno: *See*—
Ackermann, Peter; Känel, Hans-Ruedi; and Schaub, Bruno, 5,496,848, Cl. 514-465.000.
Schaupp, Karin; Polzer, Josef; Kerbl, Johannes; Lanthaler, Kurt; Davis, Stanley S.; and Washington, Clive, to Knoll Aktiengesellschaft. Stable emulsion suitable for pharmaceutical administration, the production thereof and emulsion for pharmaceutical use. 5,496,818, Cl. 514-225.800.
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Rojdev, Ilija; and Schebler, Will, 5,495,648, Cl. 27-19.000.
Scheider, Alfred F.; and Warner, R. Brown, to Jason, Inc. Internal finishing tool and method of making same. 5,496,385, Cl. 51-293.000.
Scherr, Elliot M.: *See*—
Beagle, Charles A.; Scherr, Elliot M.; and Taha, Riad A., 5,496,490, Cl. 252-135.000.
Schieve, Eric: *See*—
Finch, Richard; Schieve, Eric; and Vivio, Joseph, 5,497,458, Cl. 395-183.060.
Schildt, Juergen: *See*—
Matthes, Eckart; von Janta-Lipinski, Martin; Scholz, Dieter; Gaertner, Klaus; Schildt, Juergen; Lehmann, Christine; Langen, Peter; and Rosenthal, Hans A., 5,496,935, Cl. 536-28.200.
Schimmel, Günther: *See*—
Bettermann, Gerhard; Schimmel, Günther; and Himmrich, Johannes, 5,496,482, Cl. 252-70.000.
Schirlin, Daniel G.: *See*—
Kolb, H. Michael; Burkhart, Joseph P.; Jung, Michel J.; Gerhart, Fritz E., deceased; Giroux, Eugene L.; Neises, Bernhard; and Schirlin, Daniel G., 5,496,927, Cl. 530-328.000.
Schleicher, Andreas: *See*—
Fleischer, Dietrich; Strutz, Heinz; Kulpe, Jürgen; and Schleicher, Andreas, 5,496,916, Cl. 528-373.000.
Fleischer, Dietrich; Strutz, Heinz; Kulpe, Jürgen; and Schleicher, Andreas, 5,496,917, Cl. 528-373.000.
Schlett, Paul E.: *See*—
Lietz, Arthur A.; Peterson, John R.; and Schlett, Paul E., 5,496,525, Cl. 422-241.000.
Schloegl, Gunter: *See*—
Peiffer, Herbert; Murschall, Ursula; and Schloegl, Gunter, 5,496,600, Cl. 428-35.700.
Schlöndorff, Georg: *See*—
Klundt, Kurt; Moll, Philipp; and Schlöndorff, Georg, 5,496,334, Cl. 606-145.000.
Schlumberger Technology Corporation: *See*—
Ramakrishnan, T. S.; and Wilkinson, David J., 5,497,321, Cl. 364-422.000.
Schlund, Bruno; and Bouilloux, Alain, to Elf Atochem S.A. Compatibilized fluoropolymer/aromatic polyester thermoplastic polyblends. 5,496,889, Cl. 525-166.000.
Schlund, Ruerger: *See*—
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Schlüpen, Friedhelm: *See*—
Mauss, Dieter; Pesch, Jürgen; and Schlüpen, Friedhelm, 5,496,570, Cl. 425-83.100.
Schmid, Franz; and Wörnle, Martin, to H. Stoll GmbH & Co. Adjusting device for cam parts of flat knitting machines with motor pinion acting on control sliders. 5,495,728, Cl. 66-78.000.
Schmid, Johannes; and Schmitt, Peter, to Daimler-Benz Aerospace AG. Method of classifying and identifying an object using Doppler radar. 5,497,158, Cl. 342-90.000.
Schmid, Otto, to Robert Bosch GmbH. Pressure limited solenoid valve for a brake system. 5,496,100, Cl. 303-119.200.
Schmidt, Horst: *See*—
Lang, Reinhard; Beck, Erich; Keil, Edmund; Nuber, Adolf; Petersen, Harro; Renz, Hans; Schmidt, Horst; and Weiss, Wolfram, 5,496,591, Cl. 427-520.000.
Schmidt, Roderic H. Artificial bone replacement for cadavers. 5,496,373, Cl. 623-16.000.
Schmidt, Werner. Monochromator having an oscilliating mirror beam-element for spectrometers. 5,497,231, Cl. 356-334.000.
Schmit, Joel A. Modular storage unit kit. 5,495,954, Cl. 211-90.000.
Schmitt, Peter: *See*—
Schmid, Johannes; and Schmitt, Peter, 5,497,158, Cl. 342-90.000.
Schmitt, Peter J., to Meadox Medicals, Inc. Self-supporting woven vascular graft. 5,496,364, Cl. 623-1.000.
Schmitt, Peter J.: *See*—
Foltz, Robert S.; Gaither, Ronald A.; Klein, Alfred O.; Wilbert, John J.; Mastalski, Henry T.; Schmitt, Peter J.; Swain, Eugene A.; and Dackson, Christopher E., 5,496,985, Cl. 219-121.670.

Schmitz, Peter: *See*—
Farrell, Gregory A.; Hanmann, Kevin J.; Schmitz, Peter; Behringer, Bruce E.; and Mawhirt, James A., 5,496,009, Cl. 251-61.100.
Schmitz, Raymond J., III: *See*—
Harper, Harold M.; Schmitz, Raymond J., III; and Kandpal, Tara C., 5,496,156, Cl. 417-312.000.
Schmuck, Harald, to Alcatel SEL Aktiengesellschaft. Optical microwave generator. 5,497,385, Cl. 372-6.000.
Schneider, Alan A.: *See*—
Herman, Roberta A.; Bruce, Daniel E.; Schneider, Alan A.; and Long, Stephen E., 5,495,747, Cl. 73-23.210.
Schneider, Bengt-Olaf: *See*—
Megahed, Abraham E.; Rossignac, Jarolsaw R.; and Schneider, Bengt-Olaf, 5,497,453, Cl. 395-122.000.
Schneider, Douglas M.; and Tuggle, Robert E., to General Motors Corporation. Steering column for motor vehicle. 5,495,777, Cl. 74-492.000.
Schneider, Heinz-Walter: *See*—
Weiss, Franz-Josef; Fuchs, Hugo; Neubauer, Gerald; and Schneider, Heinz-Walter, 5,496,789, Cl. 502-339.000.
Schneider (USA) Inc.: *See*—
Termin, Paul L.; and Porter, Christopher H., 5,496,277, Cl. 604-104.000.
Schnell, Manfred, to Mannesmann Aktiengesellschaft. Air-cooled vane-cell compressor. 5,496,162, Cl. 418-101.000.
Schnurr, Werner: *See*—
Ritz, Josef; Fischer, Rolf; Schnurr, Werner; Achhammer, Günther; Luyken, Hermann; and Fuchs, Eberhard, 5,496,941, Cl. 540-540.000.
Schoenkaes, Udo: *See*—
Beck, Rudolf; Krause, Frank; and Schoenkaes, Udo, 5,496,495, Cl. 252-174.230.
Schoenweiss, Richard W.; and Allen, Cheryl K. Body armor vest and method of manufacture. 5,495,620, Cl. 2-2.500.
Scholl, Rex. Mining machine having vertically movable primary and secondary cutters. 5,496,095, Cl. 299-57.000.
Scholz, Dieter: *See*—
Matthes, Eckart; von Janta-Lipinski, Martin; Scholz, Dieter; Gaertner, Klaus; Schildt, Juergen; Lehmann, Christine; Langen, Peter; and Rosenthal, Hans A., 5,496,935, Cl. 536-28.200.
Schott Glaswerke: *See*—
Mörsen, Ewald; Vogt, Helge; and Segner, Johannes, 5,496,586, Cl. 427-575.000.
Schramm, Michael R. Spill-proof bubble machine. 5,495,876, Cl. 141-98.000.
Schreffler, John R.: *See*—
Lawson, David F.; Antkowiak, Thomas A.; Hall, James E.; Stayer, Mark L., Jr.; and Schreffler, John R., 5,496,940, Cl. 540-450.000.
Schrenk, Hartmut, to Siemens Aktiengesellschaft. Method and circuit for protecting circuit configurations having an electrically programmable non-volatile memory. 5,497,462, Cl. 395-188.010.
Schreyer, Michael: *See*—
Markert, Helmut; Kretzschmar, Klaus; Schreyer, Michael; Mennig, Günter; Braun, Peter; and Eitel, Oliver, 5,496,892, Cl. 525-528.000.
Schreyer, Peter: *See*—
Franz, Lothar; Mohr, Juergen; Schreyer, Peter; Thomas, Juergen; Oppenlaender, Knut; and Guenther, Wolfgang, 5,496,383, Cl. 44-432.000.
Schrock, Lester N.; and George, Richard, to Peerless Chain Company. Apparatus and method for displaying and dispensing chain or the like. 5,495,653, Cl. 29-401.100.
Schrott, Harald: *See*—
Wisskirchen, Michael; and Geser, Bernd, 5,497,135, Cl. 335-253.000.
Schrutchfield, Edward D.: *See*—
Scrutchfield, Edward D.; and Koch, Drake L., 5,495,646, Cl. 24-500.000.
Schubring, Norman W.: *See*—
Mantese, Joseph V.; Micheli, Adolph L.; Dungan, Dennis F.; Schubring, Norman W.; and Callewaert, Clyde M., 5,497,129, Cl. 333-182.000.
Schuetz, Willi: *See*—
Buggle, Guenther; and Schuetz, Willi, 5,496,249, Cl. 483-41.000.
Schukraft, Bernd: *See*—
Bott, Klaus; and Schukraft, Bernd, 5,497,380, Cl. 371-24.000.
Schult, Manfred: *See*—
Petersen, Erwin; and Schult, Manfred, 5,496,096, Cl. 303-3.000.
Schulze, Walter, to Bowas-Induplan Chemie Ges.m.b.H. Plant for incinerating explosive substances. 5,495,812, Cl. 110-237.000.
Schumacher, Herbert; Messner, Norbert; Osen, Ernst; and Ecknig, Dirk, to Firma Carl Freudenberg. Disposable syringe. 5,496,285, Cl. 604-218.000.
Schumacher, Paul R.: *See*—
Arnold, James K.; and Schumacher, Paul R., 5,495,956, Cl. 212-331.000.
Schurb, Francis A., to Minnesota Mining and Manufacturing Company. Extensible flatback adhesive sheet. 5,496,601, Cl. 428-40.000.
Schütze, Rainer, to Deutsche Forschungsanstalt fur Luft-und Raumfahrt e.V. Aircraft wings. 5,496,002, Cl. 244-123.000.
Schwalke, Udo, to Siemens Aktiengesellschaft. Method for manufacturing an insulating trench in a substrate for smart-power technologies. 5,496,765, Cl. 437-67.000.
Schwartz, Edward L., to Montefiore Medical Center. Pyrimidine deoxyribonucleoside potentiation of combination therapy based on 5-fluorouracil and interferon. 5,496,810, Cl. 514-50.000.
Schwartz, James R.: *See*—
Kacher, Mark L.; Wagner, Julie A.; Schwartz, James R.; Torres, Efrain; Evans, Marcus W.; and Taneri, James E., 5,496,488, Cl. 252-125.000.
Schwartz, Mark E.; and Kreckel, Karl W., to Minnesota Mining and Manufacturing Company. Method of unitizing packages by means of a stretchable adhesive tape. 5,496,599, Cl. 428-35.700.
Schwartzkopf, Robert A.; and Cone, Richard E., to Cosco, Inc. Seat with expandable frame. 5,496,094, Cl. 297-45.000.
Schwarz, Dieter: *See*—
Steuerwald, Manfred; Ohlinger, Manfred; Kovacs, Jenoe; and Schwarz, Dieter, 5,496,633, Cl. 428-336.000.
Schwarz, Wolfgang: *See*—
Klober, Martin; and Schwarz, Wolfgang, 5,495,807, Cl. 102-289.000.
Schwarze, Rigobert. Pipe bending machine. 5,495,740, Cl. 72-149.000.
Schweier, Guenther: *See*—
Evertz, Kaspar; Schlund, Ruerger; Schweier, Guenther; Brintzinger, Hans; Roell, Werner; Jutzi, Peter; Mieling, Ingrid; and Mengele, Winfried, 5,496,902, Cl. 526-127.000.
Schwenk, Peter; and Henzler, Christoph, to PMS GmbH Production + Recycling von Bueromaschinenzubehoer. Device, kit, and process for filling of a print cartridge of an ink jet printer. 5,495,877, Cl. 141-370.000.
Schwertner, Harvey A., to United States of America, Air Force. Method for concentration based analysis of lipid fatty acids and its use in determining the likelihood that a patient is at risk for diabetes. 5,496,735, Cl. 436-71.000.
SCI Systems, Inc.: *See*—
Sierk, Dennis A.; DuRoss, Ronald R.; Geist, Stephen G.; and Hayes, Gregory L., 5,497,316, Cl. 364-140.000.
Scialla, Stefano: *See*—
Hardy, Frederick E.; Willey, Alan D.; and Scialla, Stefano, 5,496,728, Cl. 435-255.100.
Sciarretti, Louis. Transport assembly for pump and discharge line. 5,496,133, Cl. 405-52.000.
Scientific-Atlanta, Inc.: *See*—
Banker, Robert O.; and Yothment, Steven R., 5,497,187, Cl. 348-6.000.
Scimed Life Systems, Inc.: *See*—
Wang, Lixiao; and Vickerman, Linda J., 5,496,276, Cl. 604-96.000.
Scitex Corporation Ltd.: *See*—
Ben-David, Ilan, 5,497,252, Cl. 359-17.000.
Scitex Digital Video, Inc.: *See*—
Chargin, James E., Jr.; Hoard, Charles Q.; Wivholm, Dallas B.; Merson, Keith A.; and Carnahan, Shawn V. A., 5,497,244, Cl. 358-335.000.
Scofield, Terrence L.: *See*—
Butkiewicz, Steven J.; Carrier, Samuel H.; Fellows, Donald L., Jr.; Hill, Frederick B., Jr.; Mattson, Earl W.; and Scofield, Terrence L., 5,495,873, Cl. 138-114.000.
Scolaro, Martin S.: *See*—
Ghode, Anil P.; Scolaro, Martin S.; Putney, Gordon A.; and Wente, Steven R., 5,496,139, Cl. 409-182.000.
Scott Bader Co., Ltd.: *See*—
Bush, Stephen F.; Methven, James M.; and Blackburn, David R., 5,496,873, Cl. 523-508.000.
Scott, Donald S.: *See*—
Piskorz, Jan; Radlein, Desmond St. A. G.; Majerski, Piotr; and Scott, Donald S., 5,496,464, Cl. 208-108.000.
Scott, Phillip R.; Orlando, Franklin P.; Warren, Richard K.; and Slates, Larry L., to FMC Corporation. Canopy harvester with force balanced drive. 5,495,708, Cl. 56-329.000.
Scott Specialty Gases, Inc.: *See*—
Benning, Michael A.; and Miller, Stephen B., 5,495,875, Cl. 141-83.000.
Scraggs, Charles R.; Creel, Jack R.; and DeCell, Alonzo L. Apparatus for reducing and separating emulsions and homgeneous components from contaminated water. 5,496,469, Cl. 210-177.000.
Scrima, Roberto: *See*—
Borzatta, Valerio; Scrima, Roberto; and Carrozza, Primo, 5,496,875, Cl. 524-99.000.
Scrutchfield, Edward D.; and Koch, Drake L., to Schrutchfield, Edward D. Seat belt comfort clamp. 5,495,646, Cl. 24-500.000.
Searles, William S.: *See*—
Legrady, Janos; and Searles, William S., 5,495,669, Cl. 29-885.000.
Sebastian, Anthony: *See*—
Morris, R. Curtis, Jr.; and Sebastian, Anthony, 5,496,569, Cl. 424-717.000.
Seed, Alexander: *See*—
Toyne, Kenneth J.; Goodby, John W.; Seed, Alexander; Gray, George W.; McDonnel, Damien G.; Raynes, Edward P.; Day, Sally E.; Harrison, Kenneth J.; and Hird, Michael, 5,496,500, Cl. 252-299.610.
Sega Enterprises, Ltd.: *See*—
Date, Toshinori; and Takasu, Yasuo, 5,496,977, Cl. 200-6.00A.
Segner, Johannes: *See*—
Mörsen, Ewald; Vogt, Helge; and Segner, Johannes, 5,496,586, Cl. 427-575.000.
Seifert, Wolfgang: *See*—
Langhans, Lutz; Seifert, Wolfgang; and Mann, Olaf, 5,497,051, Cl. 315-200.00A.
Seikagaku Kogyo Kabushiki Kaisha (Seikagaku Corporation): *See*—
Hashimoto, Nobukazu; Mochizuki, Hideo; and Hamai, Akio, 5,496,718, Cl. 435-232.000.
Seiko Epson Corporation: *See*—
Amako, Jun; Miura, Hirotsuna; Sonehara, Tomio; and Watanabe, Yoshio, 5,497,254, Cl. 359-53.000.
Garg, Sanjiv; Iadonato, Kevin R.; Nguyen, Le T.; and Wang, Johannes, 5,497,499, Cl. 395-800.000.
Seki, Akihiko: *See*—





Isobe, Ryosuke; Yanagita, Takafumi; Saitoh, Akira; and Seki, Akihiko, 5,496,622, Cl. 428-216.000.
Seki, Hiroshi: *See*—
Ueda, Hideyuki; Kuwahara, Kenji; Seki, Hiroshi; Takahasi, Kiyosi; Odagiri, Masaru; and Murai, Mikio, 5,496,595, Cl. 427-569.000.
Seki, Yasunari: *See*—
Yamanaka, Masayoshi; Sawamura, Kazutomo; Maruyama, Hiroshi; and Seki, Yasunari, 5,495,842, Cl. 123-520.000.
Seki, Yukuharu: *See*—
Hirakawa, Tadashi; Seki, Yukuharu; and Ando, Makoto, 5,496,431, Cl. 156-269.000.
Sekiguchi, Yoshitoshi: *See*—
Ishida, Michio; Kuwahara, Tsutomu; Kawaguchi, Satoshi; Kono, Tadashi; Aoki, Norihiro; Sekiguchi, Yoshitoshi; Sasaki, Kunio; and Shimotani, Hideo, 5,495,948, Cl. 209-11.000.
Sekimoto, Kozo: *See*—
Takemoto, Takatoshi; Chida, Toshikazu; Kano, Noriaki; Ito, Eiji; Murakami, Koji; Itagaki, Takashi; Sekimoto, Kozo; and Suzuki, Masanori, 5,496,020, Cl. 271-9.010.
Sekimoto, Kunio: *See*—
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Sekiyama, Takaaki: *See*—
Onishi, Tomoyuki; Mukai, Chika; Sekiyama, Takaaki; Tsuji, Takashi; Iwayama, Satoshi; and Okunishi, Masahiko, 5,496,824, Cl. 514-274.000.
Sekizawa, Hidekazu: *See*—
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Sekizawa, Masaki: *See*—
Kurokawa, Junji; Nojima, Kazuo; and Sekizawa, Masaki, 5,497,219, Cl. 355-219.000.
Sellers, Tyrone D. Exercise machine. 5,496,241, Cl. 482-51.000.
Seltmann, Rolf: *See*—
Pforr, Rainer; Wittekoek, Steve; and Seltmann, Rolf, 5,496,669, Cl. 430-22.000.
Semco Incorporated: *See*—
Fischer, John C.; and Mescher, Kirk T., 5,496,397, Cl. 96-154.000.
Semenova, Elena V.: *See*—
Murzakov, Boris G.; Zaikina, Alexandra I.; Rogacheva, Rufina A.; and Semenova, Elena V., 5,496,723, Cl. 435-252.100.
Semple, Harry K.; and Bartiromo, Carmine, to A.K. Stamping Co. Inc. Apparatus for making personal computer cards. 5,495,664, Cl. 29-823.000.
Sena, Frank J.: *See*—
Napolitano, Neil J.; Yeh, Kuo-Chen; Sena, Frank J.; Oths, Phil J.; and Roque, Manuel M., 5,496,558, Cl. 424-435.000.
Senda, Kouji, to Kabushiki Kaisha TEC. Article information printer having page and line print modes. 5,496,116, Cl. 400-61.000.
Senoh, Hideaki: *See*—
Ogawa, Susumu; Senoh, Hideaki; and Idei, Kouji, 5,496,634, Cl. 428-341.000.
Sensortech L.P.: *See*—
Klauber, Robert D.; Vigmostad, Erik B.; and Sprague, Frederick P., 5,495,774, Cl. 73-862.333.
Sensui, Takayuki; and Yamamoto, Chikara, to Asahi Kogaku Kogyo Kabushiki Kaisha. Photometering apparatus having a split light receiving device. 5,497,229, Cl. 356-218.000.
Seon, Francoise: *See*—
David, Claire; and Seon, Francoise, 5,496,528, Cl. 423-263.000.
Serbin, Bruce J.: *See*—
Garrett, Roger L.; Serbin, Bruce J.; and Fink, Randy L., 5,496,184, Cl. 439-79.000.
Seron Manufacturing Company: *See*—
Seron, Suren V., 5,495,820, Cl. 116-137.00R.
Seron, Suren V., to Seron Manufacturing Company. Whistle with tone changing rotator. 5,495,820, Cl. 116-137.00R.
Servanty, Guy, to Conception Aeronautique du Sud-Ouest. Dual-flow turbine engine equipped with a thrust reversal system and a device for restricting the annular channel for the ejection of cold gases, and a restriction device equipping such a turbine engine. 5,495,710, Cl. 60-226.200.
Servo Corporation of America: *See*—
Baliga, Shankar; and Rullman, George, 5,497,002, Cl. 250-338.300.
Baliga, Shankar B.; and Rullman, George, 5,497,003, Cl. 250-338.300.
Seshimoto, Osamu: *See*—
Kawasaki, Kazuya; Amano, Yoshikazu; Seshimoto, Osamu; and Yamada, Kiyoshi, 5,496,708, Cl. 435-28.000.
Seto, Yoshihiro: *See*—
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Sevilla, Ernesto G.: *See*—
Gentelia, John S.; and Sevilla, Ernesto G., 5,496,313, Cl. 606-34.000.
Seward, Eileen M.: *See*—
Baker, Reymond; Ladduwahetty, Tamara; Seward, Eileen M.; and Swain, Christopher J., 5,496,833, Cl. 514-326.000.
Sferlazzo, Piero; McIntyre, Edward K., Jr.; Reynolds, William E.; Cloutier, Richard M.; and Horsky, Thomas N., to Eaton Corporation. Ion generating source for use in an ion implanter. 5,497,006, Cl. 250-427.000.
Sgro, Jean-Claude. Autoexpandable vascular endoprosthesis. 5,496,365, Cl. 623-1.000.
SGS-Thomson Microelectronics S.A.: *See*—
Le Van Suu, Maurice G., 5,497,284, Cl. 361-42.000.
de Lima, Jader A.; Lee, Yong-Uk; and Nunzi, Pierre J., 5,497,406, Cl. 377-44.000.
SGS-Thomson Microelectronics S.r.l.: *See*—
Cappelletti, Paolo G., 5,497,345, Cl. 365-185.280.
Ravanelli, Enrico M. A.; and Villa, Flavio, 5,496,761, Cl. 437-60.000.
Shackelford, Floyd W.: *See*—
Mitchell, Herman; Rich, William L.; and Shackelford, Floyd W., 5,497,491, Cl. 395-700.000.
Shackil, Theresa G.: *See*—
Gaffar, Abdul; Robinson, Richard S.; Miller, Jeffrey; Potini, Chimpiramma; Collins, Michael A.; and Shackil, Theresa G., 5,496,540, Cl. 424-49.000.
Shaffer, David T.: *See*—
Over, Gary L.; Black, Teresa K.; and Shaffer, David T., 5,496,189, Cl. 439-321.000.
Shah, Rajen J.: *See*—
Zbikowski, Mark J.; Whitney, Alan R.; Shah, Rajen J.; Willman, Bryan M.; and Letwin, J. Gordon, 5,497,492, Cl. 395-700.000.
Shapiro, Theresa A.: Bodley, Annette L.; Wall, Monroe E.; and Wani, Mansukh C., to Johns Hopkins University; and Research Triangle Institute. Inhibition of hemoflagellates by camptothecin compounds. 5,496,830, Cl. 514-283.000.
Sharma, Umesh; Hayden, Jim; and Kirsch, Howard C., to Motorola Inc. Method for forming a nonvolatile memory device. 5,496,756, Cl. 437-52.000.
Sharp Kabushiki Kaisha: *See*—
Aoyama, Kaori; and Yoshimizu, Toshiyuki, 5,497,256, Cl. 359-73.000.
Desu, Seshu B.; Pan, Wei; and Vijay, Dilip P., 5,496,437, Cl. 156-643.100.
Miyake, Toshiyuki; Kusao, Hiroshi; and Katata, Hiroyuki, 5,497,338, Cl. 364-514.00A.
Nishida, Kazuhito, 5,497,196, Cl. 348-363.000.
Okamoto, Toshiya, 5,497,344, Cl. 395-800.000.
Shaw, Donald E. Battery charger with timer-controlled charging, shut-off and reset operations. 5,497,067, Cl. 320-21.000.
Shaw, Schuyler S.: *See*—
Dimatteo, Michael A.; Shaw, Schuyler S.; Monahan, Michael B.; Disser, Robert J.; Foust, Jeff A.; Wilkey, Paul D.; and Fulks, Gary C., 5,496,102, Cl. 303-162.000.
Shaw, Steven W.; and Lee, Cheng-Tang, to Quiescence Engineering Corp. Half-order centrifugal pendulum vibration absorber system. 5,495,924, Cl. 188-378.000.
Shaylor, Nicholas: *See*—
Oldfield, Clive S.; and Shaylor, Nicholas, 5,497,476, Cl. 395-439.000.
Shell Oil Company: *See*—
Sutherland, Robert J.; and DuBois, Donn A., 5,496,898, Cl. 525-299.000.
Vinegar, Harold J.; Akkurt, Ridvan; and Tutunjian, Pierre, 5,497,087, Cl. 324-303.000.
Shibahata, Yasuji; and Nakajima, Kiyoshi, to Honda Giken Kogyo Kabushiki Kaisha. Suspension system for steered wheel. 5,496,055, Cl. 280-665.000.
Shibata, Ayako: *See*—
Ohno, Akihiko; Nishizawa, Takatoshi; Iwai, Akira; and Shibata, Ayako, 5,496,791, Cl. 503-227.000.
Shibata, Naotake, to Kabushiki Kaisha Yaskawa Denki. Method and apparatus of damping the sway of the hoisting rope of a crane. 5,495,955, Cl. 212-275.000.
Shibayama, Takao: *See*—
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Shibutani, Tadanao: *See*—
Inai, Masatoshi; Shibutani, Tadanao; Kanaya, Jun; Moritake, Masako; and Tanaka, Akie, 5,496,844, Cl. 514-415.000.
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Shigeta, Seiko: *See*—
Oka, Satoru; Ono, Kazuhisa; Shigeta, Seiko; and Wada, Takeshi, 5,496,554, Cl. 424-276.100.
Shigihara, Akira: *See*—
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Shikler, Arie, to Auto-Shade, Inc. Rear window shade with window mounting suction cups. 5,495,884, Cl. 160-120.000.
Shima, Kenji: *See*—
Hatano, Masakatsu; Murayama, Masayoshi; Shima, Kenji; and Ito, Masumi, 5,496,787, Cl. 502-209.000.
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Shimada, Junichi: *See*—
Tanaka, Hidenao; Watabe, Akinori; Shimada, Junichi; Katagiri, Yoshitada; and Suzuki, Yoshio, 5,497,390, Cl. 372-50.000.

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Shimane Sanyo Industrial Co., Ltd.: *See—*
Kagi, Ichiro, 5,497,415, Cl. 379-393.000.
Shimano, Inc.: *See—*
Kojima, Satoru; and Nishimoto, Naohiro, 5,496,222, Cl. 474-80.000.
Tsuyoshi, Sakashita, 5,495,920, Cl. 188-24.220.
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Shimazaki, Ayako: *See—*
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Shimazu, Yukihiko: *See—*
Honda, Nubuhiko; Yoshida, Toyohiko; and Shimazu, Yukihiko, 5,497,109, Cl. 326-93.000.
Shimeki, Yasuharu: *See—*
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Shimizu, Shigemi: *See—*
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Shimoda, Tomoaki: *See—*
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Shimohigashi, Katsuhiro: *See—*
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Shimojima, Naoko: *See—*
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Shimotani, Hideo: *See—*
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Shimozono, Motoki; Udo, Shinya; and Asami, Fumitaka, to Fujitsu Limited; and Kyushu Fujitsu Electronics Limited. Flip-flop circuit. 5,497,114, Cl. 327-202.000.
Shimura, Takaki: *See—*
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Shinagawa Refractories Co., Ltd.: *See—*
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Shinchi, Akira, to Yazaki Corporation. Lever connection type waterproofing connector. 5,496,187, Cl. 439-157.000.
Shinko Electric Industries Co., Ltd.: *See—*
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Shinohara, Akira: *See—*
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Shinonaga, Hideo: *See—*
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Shiojima, Nobuo, to Toshiba Battery Co., Ltd. Secondary battery charging circuit. 5,497,068, Cl. 320-35.000.
Shiota, Tatsuki; Takeyasu, Takumi; Kataoka, Kenichiro; Mochizuki, Tsutomu; Tanabe, Hirofumi; Ota, Mikio; Kano, Masatoshi; and Yamaguchi, Hisao, to Teijin Limited. Benzoxa condensed ring compounds, process for producing the same and pharmaceutical composition comprising the same. 5,496,853, Cl. 514-469.000.
Shipe, Joanne E.: *See—*
Korsunsky, Iosif; Shipe, Joanne E.; Harlan, Tod M.; Foreman, Gerald L.; Klotz, Robert C.; and Brown, Robert W., 5,495,666, Cl. 29-834.000.
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Shiratori, Kazutoshi: *See—*
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Shishaev, Sergei V.: *See—*
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Shober, Robert C., Jr.: *See—*
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Shoseyov, Oded; Shpiegl, Itai; Goldstein, Marc A.; and Doi, Roy H., to Hebrew University of Jerusalem, Yissum Research Development Company of the; and University of California, The Regents of the. Nucleic acids encoding a cellulose binding domain. 5,496,934, Cl. 536-23.700.
Shoulders, Stephen L.; and Barito, Thomas R., to Carrier Corporation. Reverse rotation prevention for scroll compressors. 5,496,157, Cl. 418-14.000.
Shouse, William E., Jr. System for installing automobile baby seats. 5,496,083, Cl. 294-1.100.
Showa Denko K. K.: *See—*
Monzen, Hiroyuki; Hiromoto, Kazuhiko; Hirayama, Shuji; Kondo, Nobuyuki; Ishigami, Haruki; and Ishimura, Yoshimasa, 5,496,532, Cl. 423-584.000.
Showa Yakuhin Kako Co., Ltd.: *See—*
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Shoseyov, Oded; Shpiegl, Itai; Goldstein, Marc A.; and Doi, Roy H., 5,496,934, Cl. 536-23.700.
Shriver, Michael H.; and Helm, Rich A., to Sundstrand Corporation. Shock load stabilization circuit and voltage regulator having same. 5,497,069, Cl. 322-19.000.
Shriver-Lake, Lisa C.: *See—*
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Shum, Victor W. C.: *See—*
Hoffmann, Thomas M.; and Shum, Victor W. C., 5,497,282, Cl. 360-104.000.
Shun-Yi, Wang. Apparatus for multi-shape cutting. 5,495,671, Cl. 30-364.000.
Shvo, Youval: *See—*
Becker, Yigal; Assaf-Biran, Yonit; and Shvo, Youval, 5,496,955, Cl. 548-334.500.
Sibilia, John P.: *See—*
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Siccardi, Alberto: *See—*
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Siccardi, Enrico; Siccardi, Alberto; Lombardi, Roberto; and Lombardi, Luigi. Electric oven, for domestic use, particularly designed to cooking pizzas, cakes and the like. 5,496,987, Cl. 219-386.000.
Sidhu, Gursharan: *See—*
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Siecor Corporation: *See—*
Butler, Walter K., III; Napiorkowski, John J.; Kroll, Thomas W.; and Cote, Mark P., 5,497,416, Cl. 379-399.000.
Siegel, Hardo: *See—*
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Siegel, Paul H.: *See—*
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Siegwerk Druckfarben GmbH & Co. KG: *See—*
Griebel, Rudolf; Kocherscheid, Karl A.; and Stammen, Klaus, 5,496,879, Cl. 524-320.000.
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Charles, Herbert N., 5,495,909, Cl. 180-68.100.
Dobbelaere, Joris; and Wohlfart, Artur, 5,496,186, Cl. 439-157.000.
Fischer, Jürgen; Birkle, Siegfried; Elsel, Werner; Gehring, Johann; Maurer, Arnolf; and Nippe, Waldemar, 5,496,456, Cl. 204-201.000.
Gromer, Kurt; Haan, Franz; Jung, Werner; and Pedall, Friedrich, 5,495,661, Cl. 29-740.000.
Lohninger, Gerhard; and Zimmermann, Walter, 5,497,163, Cl. 342-175.000.
Markert, Helmut; Kretzschmar, Klaus; Schreyer, Michael; Mennig, Günter; Braun, Peter; and Eitel, Oliver, 5,496,892, Cl. 525-528.000.
Muhmenthaler, Peter; and Oberle, Hans-Dieter, 5,497,350, Cl. 365-201.000.
Rösner, Wolfgang, 5,496,757, Cl. 437-52.000.
Schrenk, Hartmut, 5,497,462, Cl. 395-188.010.
Schwalke, Udo, 5,496,765, Cl. 437-67.000.
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Zeisner, Pius; and Adam, Peter, 5,495,657, Cl. 29-597.000.
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Atanasyan, Alain A.; and Guipaud, Serge C., 5,495,757, Cl. 73-35.060.
Siempelkamp GmbH & Co.: *See—*
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Sierk, Dennis A.; DuRoss, Ronald R.; Geist, Stephen G.; and Hayes, Gregory L., to SCI Systems, Inc. Process gas distribution system and method. 5,497,316, Cl. 364-140.000.
Sierra, Rolando; and Weinstein, Lawrence A., to Cordis Corporation. Wound closure apparatus and method for its use. 5,496,332, Cl. 606-139.000.
Sigma-Tau Industrie Farmaceutiche Riunite S.p.A.: *See—*
Arduino, Arduini, 5,496,821, Cl. 514-228.800.
Sigworth, Geoffrey K. Gas analyzer for molten metals. 5,495,746, Cl. 73-19.070.
Simmonds Precision Products, Inc.: *See—*
Hughes, Ivor, 5,495,745, Cl. 73-1.00H.
Simon Marketing, Inc.: *See—*
Filo, Andrew S., 5,497,001, Cl. 250-316.100.
Simonsen, Richard J.: *See—*
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Simpla Plastics Limited: *See—*
Collyer, Graham J., 5,496,010, Cl. 251-78.000.
Simpson, James C.: *See—*
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Simpson, Sharon M.; and Harring, Lori S., to Minnesota Mining and Manufacturing Company. Hydrazide compounds useful as co-developers for black-and-white photothermographic elements. 5,496,695, Cl. 430-619.000.
Simroth, Donald W.: *See—*
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Sims, Bobby H.; and Philipp, Carl T., to Enviroscience. Method of recycling industrial waste. 5,496,392, Cl. 75-414.000.
Sinclair, Colin S.: *See—*
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Sindhu, Pradeep: *See—*
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Sink, John D., to Power Paragon, Inc. Linear motor propulsion drive coil. 5,497,038, Cl. 310-12.000.
Sintim-Damoa, Kwame: *See—*
Minshall, Billy W.; Nygard, John E.; Sintim-Damoa, Kwame; Giesler, Richard; Woodworth, Archie; and Purohit, Kailash, 5,496,302, Cl. 604-410.000.
Sirhan, Motasim M.; and Fernando, Jovito L., to Advanced Cardiovascular Systems, Inc. Low profile dilatation catheter. 5,496,275, Cl. 604-96.000.
Sisk, Billy N.: *See—*
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Sisk, Bruce A.; and Hartz, Alden J., to Zimmer, Inc. Prosthetic implant with circumferential porous pad having interlocking tabs. 5,496,375, Cl. 623-16.000.
SKF USA Inc.: *See—*
Dinzburg, Boris; and Deng, Jone, 5,495,772, Cl. 73-832.000.
Skis Rossignol S.A.: *See—*
Abondance, Roger, 5,496,053, Cl. 280-609.000.
Skow, Andrew. T-38 aircraft modified with an F-5 wing. 5,496,001, Cl. 244-119.000.
Skrobis, Kenneth: *See—*
Guckel, Henry; Christenson, Todd R.; and Skrobis, Kenneth, 5,496,668, Cl. 430-9.000.
Slaby, Kenneth A. Device for slicing ensilage from a compacted ensilage mass. 5,495,987, Cl. 241-27.000.
Slack, David C.; and Ellard, Gregory A., to Tetra Technologies, Inc. Method and apparatus for denitrification of wastewater. 5,496,472, Cl. 210-605.000.
Slates, Larry L.: *See—*
Scott, Phillip R.; Orlando, Franklin P.; Warren, Richard K.; and Slates, Larry L., 5,495,708, Cl. 56-329.000.
Slick, Thomas B.: *See—*
Mc Mahan, David R.; Whittemore, Mark L.; Slick, Thomas B.; Sweetland, Tom; Horsman, Steven V.; Marks, Carey D.; Wisler, Jan A.; Donovan, Eric S.; and Witte, Brian E., 5,497,301, Cl. 362-66.000.
Slusar, Randall J.; and Hoff, Jeffrey H., to Snap-on Incorporated. Reversible ratchet wrench with direction indicia. 5,495,783, Cl. 81-63.200.
Slusarz, Kevin R.: *See—*
Khanna, Yash P.; Slusarz, Kevin R.; Gabriel, Mina K.; Reimschuessel, Annemarie C.; and Sibilia, John P., 5,496,918, Cl. 528-480.000.
Smalanskas, Joseph P.: *See—*
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SMH Management Services AG: *See—*
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Smigocki, Ann C.; and Neal, John W., Jr., to United States of America, Agriculture. Enhanced insect resistance in plants genetically engineered with a plant hormone gene involved in cytokinin biosynthesis. 5,496,732, Cl. 435-320.100.
Smit, Mark H.: *See—*
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Poetsch, Eike; Meyer, Volker; Stahl, Klaus P.; Reiffenrath, Volker; Finkenzeller, Ulrich; Bartmann, Ekkehard; Hittich, Reinhard; Coates, David; Greenfield, Simon; Smith, Graham; Kurmeier, Hans A.; and Dorsch, Dieter, 5,496,499, Cl. 252-299.660.
Smith, Ian R.: *See—*
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Smith, Jeffery W.: *See—*
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Smith, Lionel S., Jr.: *See—*
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Smith, Mark B.: *See—*
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Smith, Ronald T.: *See—*
Wreede, John E.; Virgadamo, Michael J.; Upper, Richard B.; and Smith, Ronald T., 5,497,251, Cl. 359-13.000.
Smith, Stuart B., to ECP Enichem Polimeri Netherlands, B.V. Process for the production of polyurea based articles. 5,496,911, Cl. 528-77.000.
Smith, Winston: *See—*
Livingstone, Raymond D.; Kutinsky, David; Wilson, Murray; and Smith, Winston, 5,495,901, Cl. 175-74.000.
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Johnson, Randall K., 5,496,556, Cl. 424-423.000.
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Snaidr, Stanislav M.: *See—*
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Snap-on Incorporated: *See—*
Ghode, Anil P.; Scolaro, Martin S.; Putney, Gordon A.; and Wente, Steven R., 5,496,139, Cl. 409-182.000.
Slusar, Randall J.; and Hoff, Jeffrey H., 5,495,783, Cl. 81-63.200.
Snellman, Donald L.; and Tonkin, Dean G., to Norfin International, Inc. Method and apparatus for forming bookbinding strips. 5,496,253, Cl. 493-320.000.
Snoke, Phillip J., to Catheter Imaging Systems, Inc. Method of epidural surgery. 5,496,269, Cl. 604-28.000.
Snyder, Edward: *See—*
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Societe d'Etude d'Exploition et d'Algues et Produits Maritimes Setexam: *See—*
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Societe Dite Alcatel N.V.: *See—*
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Societe Materials Vincent Vaillant MVV S.A.: *See—*
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Societe Nationale des Chemins de fer Francais: *See—*
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Societe Nationale D'Etude et de Construction de Moteurs D'Aviation "Snecma": *See—*
Fillion, Jean-Claude, 5,497,101, Cl. 324-662.000.
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Soes, Lucas; and van Dijk, Petrus R. M., to Whitaker Corporation, The. Prestressed shielding plates for electrical connectors. 5,496,183, Cl. 439-79.000.
SofTel, Inc.: *See—*
Hornbuckle, Gary D., 5,497,479, Cl. 395-491.000.
Sohda, Takashi; Fujisawa, Yukio; Oi, Satoru; and Mizoguchi, Junji, to Takeda Chemical Industries, Ltd. Lactol derivatives, their production and use. 5,496,834, Cl. 514-343.000.

Soininen, Erkki; and Leppänen, Marja, to Planar International Ltd. Method for preparing a multilayer structure for electroluminescent components. 5,496,597, Cl. 427-584.000.
Solar Chemical S.A.: *See—*
Bruzzese, Tiberio; Guazzi, Giuseppe; Rognoni, Marco; and Marcon, Giuliano, 5,496,945, Cl. 544-276.000.
Soll, David B.; and Feinbloom, Richard E., to Image Optical Corporation. Viewing assembly for producing an optically corrected reflected image. 5,497,274, Cl. 359-846.000.
Solomon, Irving; and Solomon, Phyllis. Animal boots with detachable, vertically adjustable fastening strap. 5,495,828, Cl. 119-850.000.
Solomon, Phyllis: *See—*
Solomon, Irving; and Solomon, Phyllis, 5,495,828, Cl. 119-850.000.
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Somayajula, Shyam S., to Crystal Semiconductor. Low power class-AB integrated circuit amplifier. 5,497,122, Cl. 330-253.000.
Sommerfeld, Calus-Dieter; Lamberts, Wilhelm; Bielefeldt, Dietmar; Marhold, Albrecht; and Negele, Michael, to Bayer Aktiengesellschaft. $C_3$ to $C_5$ polyfluoroalkanes propellants. 5,496,867, Cl. 521-131.000.
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Amako, Jun; Miura, Hirotsuna; Sonehara, Tomio; and Watanabe, Yoshio, 5,497,254, Cl. 359-53.000.
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Bock, Robert T.; and DeLuca, John P., 5,496,256, Cl. 601-2.000.
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Tsuji, Kazuto; Yoneda, Yoshiyuki; Sakoda, Hideharu; Sono, Michio; Yamaguchi, Ichiro; Hamano, Toshio; Kubota, Yoshihiro; Hayakawa, Michio; Ikemoto, Yoshihiko; Saigo, Yukio; and Miyaji, Naomi, 5,497,032, Cl. 257-710.000.
Sony Corporation: *See—*
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Fujisawa, Hirotoshi, 5,497,366, Cl. 369-112.000.
Harada, Shigeru; and Nagatsu, Yoshihide, 5,497,403, Cl. 375-345.000.
Ishibashi, Akira; Funato, Kenji; and Mori, Yoshifumi, 5,497,015, Cl. 257-287.000.
Ishizuka, Shigeki, 5,497,192, Cl. 348-208.000.
Izuhara, Kunihiko, 5,497,155, Cl. 341-156.000.
Mitsuhashi, Syoji; and Gozu, Satoru, 5,497,193, Cl. 348-231.000.
Nageno, Koji, 5,497,427, Cl. 381-183.000.
Ogawa, Akihide; Yamagata, Hiroshi; Takeda, Kazuhiro; and Ito, Yoshiharu, 5,497,201, Cl. 348-525.000.
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Gazit, Arnona; and Yaniv, Abraham, 5,496,523, Cl. 422-100.000.
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Ball, Keith R.; Cahill, Timothy J.; Ellis, Robert P.; Sorenson, Charles W.; and Petersen, Carl M., III, 5,496,068, Cl. 280-806.000.
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Adams, Jerry L.; Garigipati, Ravi S.; Sorenson, Margaret E.; and Winkler, James D., 5,496,855, Cl. 514-521.000.
Sorenson, Richard W. Electrical switch. 5,496,981, Cl. 200-315.000.
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Plicchi, Gianni; and Corbucci, Giorgio, 5,496,351, Cl. 607-17.000.
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Constancis, Alain; Soula, Gérard; Tayot, Jean-Louis; and Tiollier, Jérôme, 5,496,872, Cl. 523-118.000.
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Malpiece, Frédéric; Rousseau, Alain; and Mercier, Dominique, 5,497,138, Cl. 338-21.000.
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Blanchard, Cheryl; Dearnaley, Geoffrey; and Lankford, James, Jr., 5,496,374, Cl. 623-16.000.
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Ponnapalli, Saila; Soyuer, Mehmet; and Ewen, John F., 5,497,337, Cl. 364-489.000.
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Späth, Michael M. Fire protection filter. 5,495,894, Cl. 169-48.000.
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Goodwin, Thomas J.; Wolf, David A.; Spaulding, Glenn F.; and Prewett, Tacey L., 5,496,722, Cl. 435-240.230.
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Allen, Charles R.; and Spaw, Robert L., 5,497,332, Cl. 364-483.000.
Speer, Kandi L. Portable anti-static device. 5,495,633, Cl. 15-104.940.
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Spencer, Mark S., to W. L. Gore & Associates, Inc. Planar cable array. 5,496,970, Cl. 174-117.00F.
Spencer Wright Industries, Inc.: *See—*
Bagnall, Arthur F., 5,495,815, Cl. 112-80.500.
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Beisel, Hermann; Blaser, Peter T.; Hauck, Dieter; Hutzenlaub, Rudolf; Jäger, Helmut; Jahn, Hans-Georg; Müller, Robert; Rodi, Anton; and Spiegel, Nikolaus, 5,495,805, Cl. 101-477.000.
Splichal, William F., Jr.: *See—*
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Splittstoesser, Clair D.; Crosby, Donald P.; Park, David G.; and Funk, Larry S., to Dixon Industries, Inc. Friction drive unit for riding lawn mowers and the like. 5,496,226, Cl. 476-24.000.
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Sprague, Frederick P.: *See—*
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SRCHEM, Inc.: *See—*
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SS Pharmaceutical Co., Ltd.: *See—*
Okada, Minoru; Ono, Kenji; Kasai, Shuichi; and Iwasa, Akira, 5,496,561, Cl. 424-480.000.
Okuyama, Hirohisa; Ikeda, Yasuo; Ohtsuka, Shigenori; Kasai, Shuichi; and Iwasa, Akira, 5,496,819, Cl. 514-226.500.
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Stadler, Robert W.; Karl, W. Clem; and Lees, Robert S., to Boston Heart Foundation. Method and apparatus for estimating diameter of an artery using B-mode ultrasonic images. 5,495,852, Cl. 128-660.070.
Stahl, Klaus P.: *See—*
Poetsch, Eike; Meyer, Volker; Stahl, Klaus P.; Reiffenrath, Volker; Finkenzeller, Ulrich; Bartmann, Ekkehard; Hittich, Reinhard; Coates, David; Greenfield, Simon; Smith, Graham; Kurmeier, Hans A.; and Dorsch, Dieter, 5,496,499, Cl. 252-299.660.
Staley, David S., to Amway Corporation. Process for increasing liquid surfactant loading in free flowing powder detergents. 5,496,486, Cl. 252-89.100.
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Stammler, Erwin: *See—*
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Gustafson, Thomas L.; and Brookman, Marc A., 5,496,427, Cl. 156-67.000.
Mesnel, Gerard, 5,495,680, Cl. 34-264.000.
Standard Textile Co., Inc.: *See—*
Heiman, Gary L., 5,495,874, Cl. 139-420.00A.
Stanfield, Teresa H.: *See—*
Madan, Esteban C.; Beebe, Randolph R.; and Stanfield, Teresa H., 5,496,992, Cl. 235-462.000.
Stark, Emil, Jr. Device for measuring expansions and compressions. 5,495,770, Cl. 73-774.000.
Starkey, Gordon S.: *See—*
Cronin, John E.; Kaanta, Carter W.; Mann, Randy W.; Meulemans, Darrell; and Starkey, Gordon S., 5,496,771, Cl. 437-187.000.
Starr, Rogers F., Jr.; Pearson, Steve; and Lutz, Ronald G., to Sverdrup Technology, Inc. Environmental wind tunnel. 5,495,754, Cl. 73-147.000.
Startec Ventures, Inc.: *See—*
Hoffman, Joe G.; and Clark, R. Scot, 5,496,778, Cl. 437-250.000.
Stauber, Hans-Ulrich; and Van Wegen, Willem F. S. M., to Ferag AG. Process and apparatus for processing printing products. 5,495,700, Cl. 53-118.000.
Stauffer, David B.; Kurtz, Robert D., Jr.; and Cease, Herman A., to New Holland North America, Inc. Radiator seals for rear hinged tractor hood. 5,495,910, Cl. 180-69.200.
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Lawson, David F.; Antkowiak, Thomas A.; Hall, James E.; Stayer, Mark L., Jr.; and Scheffler, John R., 5,496,940, Cl. 540-450.000.
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Gardiner, Walter A.; Stecyk, Oleh; and Swinden, David A., 5,495,673, Cl. 30-155.000.
Steer, Peter L.; Bannister, Graham D.; and Barrett, Howard, to E. R. Squibb & Sons, Inc. Male incontinence device. 5,495,858, Cl. 128-885.000.
Stein, Henry G.: *See—*
Bischel, Wesley T. K.; Greenslade, Joan V.; Hallett, Chester W.; and Stein, Henry G., 5,495,697, Cl. 52-311.300.



Stein, Scott A.; Carlson, Bruce M.; Yen, Chung S.; and Farrington, Kevin M., to Bull HN Information Systems Inc. Ally mechanism for interconnecting non-distributed computing environment (DCE) and DCE systems to operate in a network system. 5,497,463, Cl. 395-200.030.
Steinbach, Hans-Horst: *See—*
Herrmann, Udo; Oppermann, Günter; Penners, Günther; Flindt, Roland; and Steinbach, Hans-Horst, 5,496,483, Cl. 252-73.000.
Stellberger, Rudi; Kleinschmidt, Uwe; and Kusch, Hans-Jürgen, to Heidelberger Druckmaschinen AG. Device for fastening a flexbile printing plate on a plate cylinder of a rotary printing press. 5,495,804, Cl. 101-415.100.
Stelljes, Michael G., Jr.; Boutilier, Glenn D.; and Trokhan, Paul D., to Procter & Gamble Company, The. Multiple layer papermaking belt providing improved fiber support for cellulosic fibrous structures, and cellulosic fibrous structures produced thereby. 5,496,624, Cl. 428-229.000.
Stepan Company: *See—*
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Stiehl, Mark A.; Bergstresser, William A.; and Diaz, George E., 5,496,286, Cl. 604-232.000.
Stern, Mitchell G.: *See—*
Helmbold, James E.; Long, David N.; Riley, David W.; and Stern, Mitchell G., 5,497,450, Cl. 395-114.000.
Sterr, Gerhard, to Varta Batterie Aktiengesellschaft. Process for producing a positive electrode for lithium secondary batteries. 5,496,664, Cl. 429-224.000.
Sterrett, William R.: *See—*
Collia, Sherry S.; Fitzpatrick, Greg P.; and Sterrett, William R., 5,496,177, Cl. 434-118.000.
Steuerwald, Manfred; Ohlinger, Manfred; Kovacs, Jenoe; and Schwarz, Dieter, to BASF Aktiengesellschaft. Transfer film with magnetic layer. 5,496,633, Cl. 428-336.000.
Stevens, Clive G. Walking exeriser. 5,496,235, Cl. 482-51.000.
Stevens, Jimmy L.: *See—*
Doyle, Michael P.; and Stevens, Jimmy L., 5,496,400, Cl. 106-220.000.
Stevens, Rodney: *See—*
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Stewart, David A. Quick release pedestal seat. 5,496,088, Cl. 296-65.100.
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Stice, Steven L.: *See—*
Susko-Parrish, Joan L.; Northey, David L.; Leibfried-Rutledge, M. Lorraine; and Stice, Steven L., 5,496,720, Cl. 435-240.200.
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Delfer, Frank W., III; and Stigers, Barry D., 5,496,991, Cl. 235-379.000.
Stöber Antriebstechnik GmbH & Co.: *See—*
Müller, Friedrich; and Recktenwald, Jörg, 5,496,127, Cl. 403-371.000.
Stocchiero, Olimpio. Polar element for storage batteries. 5,496,660, Cl. 429-183.000.
Stockel, Ivar H.; and Carlson, Willard E. Method and apparatus for waste paper treatment. 5,496,445, Cl. 162-248.000.
Stockel, Ivar H.: *See—*
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Stolfo, Salvatore J.; and Hernández, Mauricio A., to Stolfo, Salvatore J. Method of merging large databases in parallel. 5,497,486, Cl. 395-600.000.
Stoll, Daniel; and Müller, Jacques, to SMH Management Services AG. Chassis for vehicles notably for motor vehicles. 5,496,067, Cl. 280-784.000.
Stoll, Harold M.; and Reis, James J., to Northrop Grumman Corporation. Multi-layer opto-electronic neural network. 5,497,253, Cl. 359-29.000.
Stone, Marcia J., to HybriVet Systems, Inc. Process for testing for substances in liquids. 5,496,736, Cl. 436-81.000.
Stork, David G.: *See—*
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Strait, Scott L.: *See—*
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Strong, Bryan; and Dahlheimer, Nichalous. Container and expandable cooler. 5,495,727, Cl. 62-529.000.
Strutz, Heinz: *See—*
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Fleischer, Dietrich; Strutz, Heinz; Kulpe, Jürgen; and Schleicher, Andreas, 5,496,917, Cl. 528-373.000.
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Sniber, Fred A.: *See—*
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Studio Hüsler AG: *See—*
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Stueble, Helmut, to LTG Lufttechnishche GmbH. Process for cooling and conditioning air. 5,495,721, Cl. 62-121.000.
Sturla, Jean-Michel: *See—*
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Su, Kai C.: *See—*
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Suga, Masao; Nakajima, Syuzo; Inomata, Tadaaki; Saito, Toshimitsu; Outake, Atsuhiro; Iba, Yoshiaki; Mihara, Hidekazu; Nishikawa, Hirofumi; Nanno, Nobuyuki; and Satake, Shigeru, to Kabushiki Kaisha Toshiba. Portable computer which has a task selection menu allowing easy selection and execution of arbitrary application software without entering a command. 5,497,455, Cl. 395-159.000.
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Hashiguchi, Toshihiko; Sugai, Toshiya; and Sasaki, Katsumi, 5,496,347, Cl. 606-205.000.
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Sugihara, Masamichi: *See—*
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Sugikawa, Hirofumi, to Katayama Special Industries, Ltd. Metallic porous sheet having pores surrounded by a three-dimensional net-shaped framework of metallic layers. 5,496,650, Cl. 428-548.000.
Sugisawa, Masakazu: *See—*
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Sugita, Masaya: *See—*
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Sugita, Takashi: *See—*
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Sugiura, Kenro; and Uno, Teiji, to Toyoda Koki Kabushiki Kaisha. Programming device for programmable sequence controllers. 5,497,315, Cl. 364-140.000.
Sugiyama, Hidehiko: *See—*
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Gerber, H. Joseph; Croft, Russell F.; and Sullivan, Daniel J., 5,495,803, Cl. 101-401.100.
Sullivan, Paul F., to Polaroid Corporation. Quadrature diffractive encoder. 5,497,226, Cl. 356-4.010.
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Sumimoto, Mitsuhiro: *See—*
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Sumitomo Chemical Company, Ltd.: *See—*

Kitagawa, Yoshihiko; Jinno, Tadashi; Aoshima, Masashi; Okita, Taisuke; Shinonaga, Hideo; and Kitadono, Kaoru, 5,496,863, Cl. 521-50.500.
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Sumitomo Electric Industries, Inc.: *See*—
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Sumitomo Electric Industries, Ltd.: *See*—
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Sumitomo Wiring Systems, Ltd.: *See*—
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Okamura, Kenji; Murayama, Shigeki; Chishima, Masamitsu; and Noro, Yutaka, 5,496,188, Cl. 439-189.000.

Sumiyoshi, Iwao: *See*—
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Sun Microsystems, Inc.: *See*—
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Lienores, Bjorn, 5,497,470, Cl. 395-403.000.

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Sunpower, Inc.: *See*—
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Suntory Limited: *See*—
Matsumoto, Nobuya; Kunisaki, Shinichi; Fujiwara, Goro; Masuda, Mitsunobu; Horie, Hiroshi; and Kawanaka, Asaichi, 5,496,860, Cl. 521-31.000.

Supple, Martin A.: *See*—
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Supracor Systems, Inc.: *See*—
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Supreme Corq: *See*—
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Surmet Corporation: *See*—
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Suspa Compart Aktiengesellschaft: *See*—
Bauer, Hans J., 5,496,115, Cl. 384-291.000.

Sussich, Marino, to Creswin Pty. Ltd. Endless rope exercise device. 5,496,234, Cl. 482-37.000.

Sutherland, Robert J.; and DuBois, Donn A., to Shell Oil Company. Star polymers of dienes, vinylarenes and alkyl methacrylates as modified viscosity index improvers. 5,496,898, Cl. 525-299.000.

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Suzuki, Kazuo: *See*—
Fukuda, Takuya; Ohue, Michio; and Suzuki, Kazuo, 5,496,410, Cl. 118-723.0MW.

Suzuki, Kenji: *See*—
Jie, Xu; Takahashi, Jun; and Suzuki, Kenji, 5,497,443, Cl. 385-134.000.
Okamoto, Hiroshi; Katoh, Kohtaro; Tomita, Hiroshi; Suzuki, Kenji; and Saitoh, Kazuyoshi, 5,496,688, Cl. 430-500.000.

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Tachikake, Masahiko; and Suzuki, Masamichi, 5,495,677, Cl. 33-784.000.

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Takemoto, Takatoshi; Chida, Toshikazu; Kano, Noriaki; Ito, Eiji; Murakami, Koji; Itagaki, Takashi; Sekimoto, Kozo; and Suzuki, Masanori, 5,496,020, Cl. 271-9.010.

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Kato, Masayuki; Aritake, Hirokazu; Matsumoto, Tsuyoshi; Tomita, Junji; Yamagishi, Fumio; Nakashima, Masato; Suzuki, Masao; Fujiwara, Toshiaki; Sugita, Masaya; and Takoa, Koichi, 5,497,170, Cl. 345-9.000.

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Furusawa, Keisuke; Orimo, Takao; and Suzuki, Takuya, 5,495,668, Cl. 29-879.000.

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Tanaka, Hidenao; Watabe, Akinori; Shimada, Junichi; Katagiri, Yoshitada; and Suzuki, Yoshio, 5,497,390, Cl. 372-50.000.

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Nakai, Kiyoshi; Suzuki, Yukihide; and Inui, Takashi, 5,497,349, Cl. 365-230.030.

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Starr, Rogers F., Jr.; Pearson, Steve; and Lutz, Ronald G., 5,495,754, Cl. 73-147.000.

Swain, Christopher J.: *See*—
Baker, Reymond; Ladduwahetty, Tamara; Seward, Eileen M.; and Swain, Christopher J., 5,496,833, Cl. 514-326.000.

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Foltz, Robert S.; Gaither, Ronald A.; Klein, Alfred O.; Wilbert, John J.; Mastalski, Henry T.; Schmitt, Peter J.; Swain, Eugene A.; and Dackson, Christopher E., 5,496,985, Cl. 219-121.670.

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KenKnight, Bruce H.; Dahl, Roger W.; and Swanson, David K., 5,496,362, Cl. 607-129.000.

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Swanson, Paul E.: *See*—
Mang, Michael N.; Wlute, Jerry E.; and Swanson, Paul E., 5,496,910, Cl. 528-88.000.

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Graves, Arlinda; Sweeney, Niall; and Szabo, Sandor, 5,496,274, Cl. 604-86.000.

Sweet, Dennis D.: *See*—
Chesnut, M. Gaines; Sweet, Dennis D.; Ulasik, Marc A.; and Watson, James B., 5,495,676, Cl. 33-244.000.

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Mc Mahan, David R.; Whittemore, Mark L.; Slick, Thomas B.; Sweetland, Tom; Horsman, Steven V.; Marks, Carey D.; Wisler, Jan A.; Donovan, Eric S.; and Witte, Brian E., 5,497,301, Cl. 362-66.000.

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Gardiner, Walter A.; Stecyk, Oleh; and Swinden, David A., 5,495,673, Cl. 30-155.000.

Swyden, Thomas A.: *See*—
Tang, Cha-Mei; Ting, Antonio C.; and Swyden, Thomas A., 5,497,053, Cl. 315-366.000.

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Crafts, Harold S., 5,497,027, Cl. 257-528.000.

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Christ, Charles S., Jr.; and Szembrot, Albert R., 5,496,474, Cl. 210-725.000.

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Blizzard, Timothy A.; Ratcliffe, Ronald W.; Waddell, Sherman T.; Szumiloski, Sandra P.; Wilkening, Robert R.; and Wildonger, Kenneth J., 5,496,816, Cl. 514-210.000.

Tabata, Atsushi: *See*—
Ando, Masahiko; Yamamoto, Yoshihisa; Fukatsu, Akira; Niimi, Mamoru; Kaigawa, Masato; Oba, Hidehiro; Kimura, Hiromichi; Hojo, Yasuo; Tabata, Atsushi; and Iwatsuki, Kunihiro, 5,496,230, Cl. 477-111.000.

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König, Udo; van den Berg, Hendrikus; and Tabersky, Ralf, 5,496,594, Cl. 427-569.000.

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Fentress, Philip W., 5,495,856, Cl. 128-846.000.

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Taha, Riad A.: *See*—
Beagle, Charles A.; Scherr, Elliot M.; and Taha, Riad A., 5,496,490, Cl. 252-135.000.

Taisho Pharmaceutical Co., Ltd.: *See*—
Okuyama, Shigeru; Otomo, Susumu; Kawashima, Yutaka; and Hatayama, Katsuo, 5,496,829, Cl. 514-283.000.

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Takagi, Kiyoji; Nishida, Koji; and Itou, Tosio, to Mitsubishi Chemical Corporation. Thermoplastic resin composition and process for preparing the same. 5,496,885, Cl. 524-539.000.

Takagi, Masami; Kenpe, Yukihisa; Tsuge, Hisashi; and Miyake, Yasuo, to Matsushita Electric Works, Ltd. Apparatus for washing and drying discrete parts. 5,495,864, Cl. 134-63.000.

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Suizu, Hiroshi; Takagi, Masatoshi; Ajioka, Masanobu; and Yamaguchi, Akihiro, 5,496,923, Cl. 528-501.000.

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Yokogawa, Hiroshi; Yokoyama, Masaru; Takahama, Koichi; and Uegaki, Yuriko, 5,496,527, Cl. 423-338.000.

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Takahashi, Eisaku, to Fujitsu Limited. Spindle synchronization controller using advance calculation and offset values. 5,497,277, Cl. 360-73.030.

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Yamaguchi, Hiroshi; Hongo, Mikio; Miyauchi, Tateoki; Shimase, Akira; Haraichi, Satoshi; Takahashi, Takahiko; and Saito, Keiya, 5,497,034, Cl. 257-741.000.

Takahashi, Toshiaki: *See*—
Hosokawa, Kyoichi; Owashi, Hitoaki; Yoshizawa, Kazuhiko; Yoshikoshi, Miyoko; Takahashi, Toshiaki; Inagaki, Yasuo; and Okiguchi, Koutaro, 5,497,237, Cl. 358-310.000.

Takahasi, Kiyosi: *See*—
Ueda, Hideyuki; Kuwahara, Kenji; Seki, Hiroshi; Takahasi, Kiyosi; Odagiri, Masaru; and Murai, Mikio, 5,496,595, Cl. 427-569.000.

Takai, Mikihiro: *See*—
Tsubokura, Akira; Yoneda, Hisashi; Takai, Mikihiro; and Kiyota, Takashi, 5,496,709, Cl. 435-67.000.

Takamatsu, Atsushi: *See*—
Makita, Kensuke; Takamatsu, Atsushi; and Tanaka, Katsuto, 5,496,621, Cl. 428-216.000.

Takano, Fumitomo: *See*—
Ueyama, Atsushi; Tsukada, Yoshinari; and Takano, Fumitomo, 5,497,095, Cl. 324-537.000.

Takano, Mitsuru: *See*—
Morioka, Yuko; and Takano, Mitsuru, 5,496,823, Cl. 514-263.000.

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Ishikawa, Tetsuo; Oomori, Shigeru; Hashimoto, Daijiro; Mochiduki, Toshihiro; and Takano, Satoshi, 5,497,495, Cl. 395-750.000.

Takara Shuzo Co., Ltd.: *See*—
Nomura, Yoshiko; Kimizuka, Fusao; Ishino, Yoshizumi; and Kato, Ikunoshin, 5,496,717, Cl. 435-199.000.

Takasago International Corporation: *See*—
Amano, Akira; Tokoro, Kazuhiko; and Uchiumi, Kenichi, 5,496,580, Cl. 426-534.000.

Takasu, Yasuo: *See*—
Date, Toshinori; and Takasu, Yasuo, 5,496,977, Cl. 200-6.00A.

Takata, Tetsuya; and Niide, Kazuo, to Mazda Motor Corporation. Evaporated fuel control system for an internal combustion engine responsive to torque reduction during shifting. 5,496,228, Cl. 477-107.000.

Takata, Yukari: *See*—
Tani, Kunio; Yoshida, Toyohiko; and Takata, Yukari, 5,497,468, Cl. 395-375.000.

Takaya, Seizi; Fukuzumi, Shuzo; Ohbayashi, Hiroaki; and Kimura, Makoto, to Nissan Motor Co., Ltd. Control system for occupant restraint system. 5,497,327, Cl. 364-424.050.

Takeda Chemical Industries, Ltd.: *See*—
Akimoto, Hiroshi; and Hitaka, Takenori, 5,496,822, Cl. 514-258.000.
Akimoto, Hiroshi; Hitaka, Takenori; and Miwa, Tetsuo, 5,496,946, Cl. 544-321.000.
Kajita, Yasuyuki; Kubota, Tsutomu; and Kudo, Kenji, 5,496,496, Cl. 252-182.240.
Kubo, Keiji; Inada, Yoshiyuki; and Naka, Takehiko, 5,496,835, Cl. 514-361.000.
Sohda, Takashi; Fujisawa, Yukio; Oi, Satoru; and Mizoguchi, Junji, 5,496,834, Cl. 514-343.000.
Yamazaki, Hiroh; Tanoue, Kenjiro; Iwasa, Susumu; and Kurokawa, Tomofumi, 5,496,549, Cl. 424-158.100.

Takeda, Hidekazu: *See*—
Nishijima, Tatsumi; Takeda, Hidekazu; Masuda, Kenmei; Mizutani, Hikaru; Maehara, Yoshimi; and Ogiro, Kenji, 5,497,279, Cl. 360-96.500.

Takeda, Kazuhiro: *See*—
Ogawa, Akihide; Yamagata, Hiroshi; Takeda, Kazuhiro; and Ito, Yoshiharu, 5,497,201, Cl. 348-525.000.

Takeda, Kazunari: *See*—
Inamasu, Tokuo; Takeda, Kazunari; Izuchi, Syuichi; and Yoshihisa, Youetsu, 5,496,656, Cl. 429-57.000.

Takeda, Kyoji: *See*—
Suekane, Yoji; and Takeda, Kyoji, 5,496,430, Cl. 156-184.000.

Takemoto, Mitsutoshi, to Mita Industrial Co., Ltd. Method of adjusting image density parameters by repetitively adjusting image density parameter values based upon reference pattern density at standby time intervals. 5,497,221, Cl. 355-246.000.

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Takenaka, Hiromitsu: *See*—
Yamazaki, Tetsuhiro; Takenaka, Hiromitsu; and Kuromizu, Yuichi, 5,497,255, Cl. 359-72.000.

Takeuchi, Itsuo; Hoshino, Hidekazu; and Sasaki, Mutumi, to NHK Spring Co., Ltd. System for determining the authenticity of an object. 5,497,227, Cl. 356-71.000.

Takeuchi, Kiyoshi: *See*—
Yoshioka, Yasuhiro; Yamada, Kohzaburoh; and Takeuchi, Kiyoshi, 5,496,693, Cl. 430-545.000.

Takeuchi, Toshiyuki: *See*—
Izumi, Akira; and Takeuchi, Toshiyuki, 5,495,792, Cl. 92-166.000.

Takeuchi, Yukiharu, to Shinko Electric Industries Co., Ltd. Lead frame and resin-molded-type semiconductor device. 5,497,030, Cl. 257-676.000.

Takeyasu, Shinji, to Kabushiki Kaisha Kaken Corporation. Portable telephone. 5,497,506, Cl. 455-89.000.

Takeyasu, Takumi: *See*—
Shiota, Tatsuki; Takeyasu, Takumi; Kataoka, Kenichiro; Mochizuki, Tsutomu; Tanabe, Hirofumi; Ota, Mikio; Kano, Masatoshi; and Yamaguchi, Hisao, 5,496,853, Cl. 514-469.000.

Taki, Kazunari: *See*—
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Taki, Kensuke: *See*—
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Takigen Manufacturing Co. Ltd.: *See*—
Yasuda, Sachio, 5,496,078, Cl. 292-165.000.

Takiguchi, Yasuyuki; Kanemoto, Akihiko; and Matsuki, Yumi, to Ricoh Company, Ltd. Liquid crystal prepolymer composition and liquid crystal display device using the same. 5,496,497, Cl. 252-299.010.

Takoa, Koichi: *See*—
Kato, Masayuki; Aritake, Hirokazu; Matsumoto, Tsuyoshi; Tomita, Junji; Yamagishi, Fumio; Nakashima, Masato; Suzuki, Masao; Fujiwara, Toshiaki; Sugita, Masaya; and Takoa, Koichi, 5,497,170, Cl. 345-9.000.

Takuma Co., Ltd.: *See*—
Matsumoto, Nobuya; Kunisaki, Shinichi; Fujiwara, Goro; Masuda, Mitsunobu; Horie, Hiroshi; and Kawanaka, Asaichi, 5,496,860, Cl. 521-31.000.

Tal, Nathan: *See*—
Rubinstein, Menachem; Novick, Daniela; and Tal, Nathan, 5,496,926, Cl. 530-412.000.

Tallentire, Alan; and Sinclair, Colin S., to Victoria University of Manchester, The. Modification of porous materials. 5,496,629, Cl. 428-304.400.

Talley, William L.: *See*—
Addison, Danny H.; Carnes, Johnnie M.; Cowardin, Robert L.; Gore, Albert N., III; Lynch, Robert C.; McCray, Charles M.; Narisawa, Shigeji; Talley, William L.; Toyosato, Yoshinair; and Turner, Craig W., 5,496,181, Cl. 439-61.000.

Tamagnone, Gianfranco: *See*—
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Tamaishi, Shigeru, to Miyata Industry Co., Ltd. Damper mechanism of bicycle frame. 5,496,052, Cl. 280-284.000.

Tamaki, Jun: *See*—
Noguchi, Nobuhisa; and Tamaki, Jun, 5,497,293, Cl. 362-31.000.

Tamari, Kousaku, to Toda Kogyo Corporation. Perpendicular magnetic film, multilayered film for perpendicular magnetic film and process for producing perpendicular magnetic film. 5,496,631, Cl. 428-332.000.

Tamiya, Toshikazu: *See*—
Imafuku, Hideaki; Fujita, Takashi; Tamiya, Toshikazu; and Kira, Kuniko, 5,496,380, Cl. 8-529.000.

Tamura, Hiroshi; Mishima, Naoshi; and Kawasaki, Yoshiaki, to Ricoh Company, Ltd. Electrophotographic photoconductor. 5,496,671, Cl. 430-58.000.

Tamura, Kazuyuki; and Iiyama, Hiroshi, to Jeco Co., Ltd. Pendulum acceleration sensor. 5,495,762, Cl. 73-519.010.

Tamura, Masayuki; Shinohara, Akira; Kobayashi, Koichi; Maekawa, Yasushi; and Yoshida, Minoru, to Teijin Limited. Method and apparatus for removing wrapped yarn group on package bobbin end. 5,495,990, Cl. 242-18.00R.
Tamura, Yasunori: *See—*
Hamamoto, Shoichi; Amino, Hirokazu; Ishida, Noriyuki; Tamura, Yasunori; Nishio, Yoichi; and Ichimiya, Masaru, 5,496,372, Cl. 623-16.000.
Tanabe, Hirofumi: *See—*
Shiota, Tatsuki; Takeyasu, Takumi; Kataoka, Kenichiro; Mochizuki, Tsutomu; Tanabe, Hirofumi; Ota, Mikio; Kano, Masatoshi; and Yamaguchi, Hisao, 5,496,853, Cl. 514-469.000.
Tanabe Selyaku Co., Ltd.: *See—*
Ozeki, Masakatsu; Kodato, Shin-ichi; Yasuda, Kousuke; Kudo, Yukitsuka; and Maeda, Kayoko, 5,496,815, Cl. 514-224.200.
Tanaka, Akie: *See—*
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Tanaka, Hatsuyuki: *See—*
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Tanaka, Hideki: *See—*
Tajima, Fujio; Tanaka, Hideki; Okuyama, Kooetsu; Ishii, Tomokazu; and Toki, Kenji, 5,497,059, Cl. 318-561.000.
Tanaka, Hidenao; Watabe, Akinori; Shimada, Junichi; Katagiri, Yoshitada; and Suzuki, Yoshio, to Nippon Telegraph and Telephone Corporation. Polarization mode switching semiconductor laser apparatus. 5,497,390, Cl. 372-50.000.
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Okuhara, Masakuni; Tanaka, Hirokazu; Goto, Toshio; Kino, Tohru; and Hatanaka, Hiroshi, 5,496,727, Cl. 435-253.500.
Tanaka, Katsuto: *See—*
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Tanaka, Masafumi: *See—*
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Tanaka Seiki Co., Ltd.: *See—*
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Tanaka, Toshiyuki: *See—*
Amano, Hiroshi; Akasaki, Isamu; Tanaka, Toshiyuki; Tohma, Teruo; and Manabe, Katsuhide, 5,496,766, Cl. 437-127.000.
Tanaka, Tsutomu: *See—*
Sakata, Hideki; Tanaka, Tsutomu; Kato, Takao; Ueno, Haruhiko; Ino, Akitoshi; and Kusano, Yoshihiro, 5,497,469, Cl. 395-413.000.
Tanba, Nobuo: *See—*
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Tandberg Data A/S: *See—*
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Taneda, Atsushi: *See—*
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Taneri, James E.: *See—*
Kacher, Mark L.; Wagner, Julie A.; Schwartz, James R.; Torres, Efrain; Evans, Marcus W.; and Taneri, James E., 5,496,488, Cl. 252-125.000.
Tang, Cha-Mei; Ting, Antonio C.; and Swyden, Thomas A., to United States of America, Navy. Micro-electron deflector. 5,497,053, Cl. 315-366.000.
Tang, Chung L., to Ithaca Research Corporation. Hermetically sealed polished optical surface. 5,497,268, Cl. 359-513.000.
Tang, Dah-Lain, to General Motors Corporation. Prediction method for engine mass air flow per cylinder. 5,497,329, Cl. 364-431.050.
Tang, Robert H.; and Williams, William A., Jr., to PPG Induststries, Inc. Non-formaldehyde durable press finishing for cellulosic textiles with phosphonoalkylpolycarboxylic acid. 5,496,476, Cl. 252-8.600.
Tang, Robert H.; and Williams, William A., Jr., to PPG Industries, Inc. Non-formaldehyde durable press finishing for cellulosic textiles with phosphinocarboxylic acid. 5,496,477, Cl. 252-8.600.
Tangherlini, Vincent C.: *See—*
Vandenbroek, Frans; and Tangherlini, Vincent C., 5,496,280, Cl. 604-167.000.
Tani, Kunio; Yoshida, Toyohiko; and Takata, Yukari, to Mitsubishi Denki Kabushiki Kaisha. Data processor that utilizes full data width when processing a string operation. 5,497,468, Cl. 395-375.000.
Taniguchi, Masashi: *See—*
Ichikawa, Kenji; Harako, Hisayuki; Fujiwara, Teiichi; and Taniguchi, Masashi, 5,496,780, Cl. 501-133.000.
Tanihira, Hisamitsu; Nakano, Renri; and Nagahori, Kazuo, to Fujitsu Limited. System for testing instruction queue circuit and central processing unit having the system. 5,497,459, Cl. 395-183.060.
Taniyama, Yoshihiko, to Sony Corporation. Storage container for mini-disk cartridges. 5,495,940, Cl. 206-308.100.
Tanno, Norihiko: *See—*
Nagata, Ryu; Tanno, Norihiko; and Ae, Nobuyuki, 5,496,843, Cl. 514-411.000.
Tanoue, Kenjiro: *See—*
Yamazaki, Hiroh; Tanoue, Kenjiro; Iwasa, Susumu; and Kurokawa, Tomofumi, 5,496,549, Cl. 424-158.100.
Tao, Nongjian; and Lindsay, Stuart M., to United States of America, Navy. Method of electrochemical detection/identification of single organic molecules using scanning tunneling microscopy. 5,497,000, Cl. 250-307.000.
Taplast SRL: *See—*
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Tardo, Joseph J.: *See—*
Kaufman, Charles W.; Gasser, Morrie; Lampson, Butler W.; Tardo, Joseph J.; and Alagappan, Kannan, 5,497,421, Cl. 380-23.000.
Target Therapeutics, Inc.: *See—*
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Targosz, Eugene F. Whitefly insecticide. 5,496,857, Cl. 514-617.000.
Tashji, George A.: *See—*
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Taskinen, Pekka: *See—*
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Taube, Donald R., to Barrel Racking Systems, Inc. Barrel handling device. 5,496,147, Cl. 414-607.000.
Taue, Satoshi: *See—*
Ishibashi, Tadaya; Obara, Hideto; and Taue, Satoshi, 5,496,454, Cl. 204-520.000.
Taunton-Rigby, Alison: *See—*
Alford, Bernadette L.; Mao, Jen-I; Moir, Donald T.; Taunton-Rigby, Alison; and Vovis, Gerald F., 5,496,711, Cl. 435-69.100.
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Fowlkes, Jeffrey C.; and Gilmore, Gary L., 5,495,885, Cl. 164-98.000.
Harper, Harold M.; Schmitz, Raymond J., III; and Kandpal, Tara C., 5,496,156, Cl. 417-312.000.
Richardson, Hubert, Jr.; and Herrick, Todd W., 5,496,160, Cl. 418-55.100.
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Kurihara, Hideshi; Miura, Sadayoshi; and Nagai, Tsuyoshi, 5,496,618, Cl. 428-198.000.
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Lu, Richard, 5,496,350, Cl. 607-14.000.
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Gray, Buddy D., 5,496,466, Cl. 210-137.000.
Tellier, Nils E., to Air Liquide America Corporation. System for compressing air and extracting nitrogen from compressed air. 5,496,388, Cl. 55-210.000.
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Böhme, Rolf; Eckstein, Wolfgang; and Wirth, Jens, 5,497,073, Cl. 323-312.000.
Temma, Tadashi: *See—*
Oyama, Hiroaki; Temma, Tadashi; Maeda, Miyuki; Kusuzaki, Tetsuo; Kimura, Hiromichi; Abe, Kazumi; Kunishi, Naohiko; Kinefuchi, Akira; and Miura, Takahiro, 5,496,175, Cl. 434-118.000.
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Yoshida, Takehiro; Terajima, Hisao; Wada, Satoshi; Ono, Takeshi; Kobayashi, Makoto; Ishida, Yasushi; Tomoda, Akihiro; Yokoyama, Minoru; and Awai, Takashi, 5,497,183, Cl. 347-215.000.
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Uramoto, Shinichi; and Terane, Hideyuki, 5,497,340, Cl. 364-745.000.
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Goto, Makoto; Nara, Terukazu; Terasawa, Masato; and Yukawa, Hideaki, 5,496,715, Cl. 435-170.000.
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Termin, Paul L.; and Porter, Christopher H., to Schneider (USA) Inc. Radially expandable body implantable device. 5,496,277, Cl. 604-104.000.
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Terris, Bruce D.: *See—*
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Andersson, Ihorbjörn; and Ackermann, Paul W., 5,496,604, Cl. 428-34.200.
Björck, Bengt; and Carlsson, Lars, 5,495,706, Cl. 53-412.000.
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Teufel, Eberhard; and Willmund, Rolf, to Rhone-Poulenc Rhodia AG. Structures formed from cellulose acetate, use thereof for the manufacture of filter tow, use of the filter tow for the manufacture of a tobacco smoke filter element, as well as a filter tow and a tobacco filter element. 5,495,860, Cl. 131-331.000.
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Vuong, Dinh-Cuong, 5,496,448, Cl. 202-235.000.
Texas Instruments Incorporated: *See—*
Abbott, Donald C., 5,496,435, Cl. 156-556.000.
Bayraktaroglu, Burhan, 5,496,755, Cl. 437-51.000.
D'Hont, Loek, 5,497,121, Cl. 329-302.000.
Doherty, Donald B.; Gove, Robert J.; Burton, Mark L.; and Miller, Rodney D., 5,497,172, Cl. 345-85.000.
Gove, Robert J.; Doherty, Donald B.; Marshall, Stephen W.; Davis, Carl W.; Egan, Joseph G.; Meyer, Richard C.; Sampsell, Jeffrey B.; and Heimbuch, Scott D., 5,497,197, Cl. 348-388.000.
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Roden, Philip; Deng, Brian T.; and Saperstein, William, 5,497,466, Cl. 395-306.000.
Szczepanek, Andre, 5,497,107, Cl. 326-39.000.
Tsay, Ching-yuh, 5,497,348, Cl. 365-189.090.
Whetsel, Lee D., 5,497,379, Cl. 371-22.300.
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Ribbans, Robert C., 5,496,628, Cl. 428-285.000.
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Fredrickson, Lisa; Karabed, Razmik; Siegel, Paul H.; and Thapar, Hemant K., 5,497,384, Cl. 371-43.000.
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Thermacore, Inc.: *See—*
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Thiele Kaolin Company: *See—*
Drew, Sharon M.; Bruns, Jeffrey C.; and Kogel, Jessica E., 5,496,398, Cl. 106-15.050.
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Thomas, Dennis R.; and Kane, Paul A., to Kress Corporation. Steel slab and coil carrier. 5,496,146, Cl. 414-460.000.



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Thomas, Juergen: *See—*
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Thompson, Stephen. Calendar date monitoring system. 5,496,070, Cl. 283-2.000.
Thomson Consumer Electronics, Inc.: *See—*
George, John B., 5,497,055, Cl. 315-371.000.
Ramaswamy, Kumar; and Stewart, John S., 5,497,401, Cl. 375-341.000.
Thomson, James, to Packard Instrument, B.V. Adhesive plastic scintillator. 5,496,502, Cl. 252-301.170.
Thomson, Rodney D.: *See—*
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Thumma, Mark R.: *See—*
Fabian, David J.; Kocher, Timothy L.; Northcraft, Shane D.; Sarver, Douglas R.; and Thumma, Mark R., 5,496,180, Cl. 439-60.000.
Thuries, Edmond; Voisin, Gilles; and Tixier, Ren´´, to GEC Alsthom T & D SA. Line for conveying electrical power. 5,496,965, Cl. 174-24.000.
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Tian, Hong; Lee, Jia-Kuen J.; and Cha, Ellis T., to Conner Peripherals, Inc. Method for determining an outer diameter rolloff in a process for making magnetic disks. 5,497,085, Cl. 324-212.000.
Tibäck, Bo G., to Sandvik AB. Tool for road planing cutter. 5,496,131, Cl. 299-40.100.
Tiberio, Theodore J.: *See—*
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Tihon, Claude: *See—*
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Tire Recycling and Development, Inc.: *See—*
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Tivian Industries, Ltd.: *See—*
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TKD Corporation: *See—*
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Tohma, Teruo: *See—*

Amano, Hiroshi; Akasaki, Isamu; Tanaka, Toshiyuki; Tohma, Teruo; and Manabe, Katsuhide, 5,496,766, Cl. 437-127.000.
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Tokico Ltd.: *See—*
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Toko America, Inc.: *See—*
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Tokuda, Toshimasa: *See—*
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Tokyo Gas Co., Ltd.: *See—*
Ozawa, Hidenari; Kato, Kazutaka; Ohgi, Keiichi; and Yahagi, Masahiro, 5,496,171, Cl. 431-326.000.
Tokyo Metropolitan Institute of Medical Science: *See—*
Yamazaki, Hiroh; Tanoue, Kenjiro; Iwasa, Susumu; and Kurokawa, Tomofumi, 5,496,549, Cl. 424-158.100.
Tokyo Ohka Kogyo Co, Ltd.: *See—*
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Tolmachev, Alexandr V.: *See—*
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Tomaru, Satoru: *See—*
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Tomida, Yosikazu: *See—*
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Tomoda, Akihiro: *See—*
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Tompkins, Stephen S.: *See—*
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Toray Industries, Inc.: *See—*
Mutoh, Masato; Hattori, Masakazu; Nishio, Shintaro; and Ohno, Kiyotaka, 5,496,850, Cl. 514-468.000.
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Torii, Masanori: *See—*
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Torkewitz, Nancy: *See—*
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Tovarischestvo S. Ogranichennoi Otvetstvennostju: *See—*
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Townsend, Christopher P.: *See—*
Arms, Steven W.; and Townsend, Christopher P., 5,497,147, Cl. 340-870.350.
Townsend, Johnnie V. Erosion detector for a feed water steam nozzle. 5,495,752, Cl. 73-86.000.
Toyama, Tadao; Hagiwara, Hitoshi; and Kita, Nobuyuki, to Fuji Photo Film Co., Ltd. Presensitized plate for use in making lithographic printing plate comprising a mat layer and coating layer on the back face of the substrate. 5,496,677, Cl. 430-162.000.
Toyne, Kenneth J.; Goodby, John W.; Seed, Alexander; Gray, George W.; McDonnel, Damien G.; Raynes, Edward P.; Day, Sally E.; Harrison, Kenneth J.; and Hird, Michael, to United Kingdom of Great Britain & Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Naphthyl organic compounds. 5,496,500, Cl. 252-299.610.
Toyo Denso Kabushiki Kaisha: *See—*
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Toyo Ink Manufacturing Co., Ltd.: *See—*
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Toyoda Koki Kabushiki Kaisha: *See—*
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Tran Industrial Research Inc.: *See—*
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Trans-link International Corp.: *See—*
Chong, Leighton K.; and Kamprath, Christine K., 5,497,319, Cl. 364-419.020.
Trant, Carl A., to Tire Recycling and Development, Inc. Tire derimming machine. 5,495,882, Cl. 157-1.210.
Trauth, Hubert: *See—*
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Trek Bicycle, Corp.: *See—*
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Trillium Health Products, Inc.: *See—*
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Trimedyne, Inc.: *See—*
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Trimmer, Mark S.: *See—*
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Tripp, Hugh A.: *See—*
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Van Sistine, Thomas G., to A. O. Smith Corporation. Apparatus for starting a switched reluctance motor. 5,497,064, Cl. 318-701.000.
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Pramanik, Dipankar; Jain, Vivek; and Weling, Milind G., 5,496,774, Cl. 437-195.000.
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Vogel, Matthew T.; Wescoat, David H.; and Chaffin, Ronald W., to R & D Tool and Engineering, Inc. Highly accurate position adjustment mechanism for the mold sections of an injection stretch blow molding machine. 5,496,166, Cl. 425-451.000.
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Volante, Ralph P.: *See*—
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Von Alpen, Ulrich, to Saint-Gobain Vitrage. Bulletproof glass pane of automobiles. 5,496,643, Cl. 428-432.000.
von Haken Spence, Rupert E.: *See*—
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Vovis, Gerald F.: *See*—
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W. L. Gore & Associates, Inc.: *See*—
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W. L. Gore & Associates (UK) Ltd.: *See*—
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W. R. Grace & Co.-Conn.: *See*—
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Wagner, Dane. Plug muffler for aircraft and method of construction thereof. 5,496,975, Cl. 181-269.000.
Wagner, Julie A.: *See*—
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Wai, Martin P., to DOW-United Technologies Composite Products, Inc. Low resin content unidirectional fiber tape. 5,496,602, Cl. 428-40.000.
Wainwright, Nicholas J., to Hewlett-Packard Company. Multicast switch circuits. 5,497,369, Cl. 370-60.000.
Waiser, Shimon. Firearm magazine. 5,495,687, Cl. 42-50.000.
Wakabayashi, Shinichi; Masuda, Shoji; Abe, Masahiko; Uchida, Yoshiyasu; and Ishibashi, Yoichi, to Honda Giken Kogyo Kabushiki Kaisha. Throttle-valve control apparatus for spark-ignition two-cycle engines. 5,495,836, Cl. 123-339.130.
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Wakui, Fujio; Fujiwara, Hirokatsu; and Yamada, Yasutaka, to Hitachi, Ltd.; and Hitachi Computer Engineering Co., Ltd. Vector data buffer and method of reading data items from a banked storage without changing the data sequence thereof. 5,497,467, Cl. 395-312.000.
Walch, Frédéric: *See*—
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Waldenburg, Ottfried. Dual-chamber syringe & method. 5,496,284, Cl. 604-191.000.
Waldenström, Mats G.; Fischer, Udo K. R.; Hillert, Lars H.; and Dennis, Mahlon D., to Sandvik AB. Diamond tools for rock drilling, metal cutting and wear part applications. 5,496,638, Cl. 428-408.000.
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Wall, John H., to Dana Corporation. Locating ring for encapsulating a coil. 5,497,136, Cl. 335-299.000.
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Walla, Günter; and Redl, Simon, to Anton Steinecker Entwicklungs GmbH & Co. Aerating nozzle for aerating liquids containing organic substances. 5,496,505, Cl. 261-76.000.
Wallach, Michael; Pugatsch, Thea; and Mencher, David, to Chilwalner. Method of reducing the output of Eimeria oocysts from a newborn chick. 5,496,550, Cl. 424-184.100.
Walling, John C.: *See*—
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Wang, Leao, to Greenmaster Industrial Corp. Pull-up exercising machine with safety air buffer. 5,496,242, Cl. 482-97.000.
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Wang, Mein-Aing. Paper cup with a straw. 5,495,982, Cl. 229-103.100.
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Wartian, George. Door closing apparatus. 5,495,639, Cl. 16-79.000.
Washington, Clive: *See*—
Schaupp, Karin; Polzer, Josef; Kerbl, Johannes; Lanthaler, Kurt; Davis, Stanley S.; and Washington, Clive, 5,496,818, Cl. 514-225.800.
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Wassmer, Karl-Heinz: *See*—
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Obara, Sanshiro; Yamada, Hiroyuki; Yoshihara, Shigeyuki; and Matsudaira, Nobunori, 5,495,908, Cl. 180-65.800.

Yoshihisa, Youetsu: *See*—
Inamasu, Tokuo; Takeda, Kazunari; Izuchi, Syuichi; and Yoshihisa, Youetsu, 5,496,656, Cl. 429-57.000.

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Yoshikawa, Yoshihiro: *See*—
Yoshida, Yutaka; and Yoshikawa, Yoshihiro, 5,497,213, Cl. 354-21.000.

Yoshikoshi, Miyoko: *See*—
Hosokawa, Kyoichi; Owashi, Hitoaki; Yoshizawa, Kazuhiko; Yoshikoshi, Miyoko; Takahashi, Toshiaki; Inagaki, Yasuo; and Okiguchi, Koutaro, 5,497,237, Cl. 358-310.000.

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Aoyama, Kaori; and Yoshimizu, Toshiyuki, 5,497,256, Cl. 359-73.000.

Yoshino, Setsuo: *See*—
Honjo, Masaru; Yoshino, Setsuo; Nakayama, Akira; and Naito, Naokazu, 5,496,713, Cl. 435-69.400.

Yoshioka, Mamoru: *See*—
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Yoshioka, Nobuyuki: *See*—
Yabe, Hideki; Marumoto, Kenji; and Yoshioka, Nobuyuki, 5,496,667, Cl. 430-5.000.

Yoshioka, Shirou: *See*—
Miyoshi, Akira; and Yoshioka, Shirou, 5,497,473, Cl. 395-427.000.

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Miyagi, Kunihiko; and Yoshizawa, Hidetoshi, 5,496,338, Cl. 606-162.000.

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Hosokawa, Kyoichi; Owashi, Hitoaki; Yoshizawa, Kazuhiko; Yoshikoshi, Miyoko; Takahashi, Toshiaki; Inagaki, Yasuo; and Okiguchi, Koutaro, 5,497,237, Cl. 358-310.000.

Yothment, Steven R.: *See*—
Banker, Robert O.; and Yothment, Steven R., 5,497,187, Cl. 348-6.000.

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Itagaki, Minehiro; Okano, Kazuyuki; Kimura, Suzushi; Nakatani, Seiichi; Bessho, Yoshihiro; Yuhaku, Satoru; Hakotani, Yasuhiko; and Miura, Kazuhiro, 5,496,619, Cl. 428-209.000.

Yukawa, Hideaki: *See*—
Goto, Makoto; Nara, Terukazu; Terasawa, Masato; and Yukawa, Hideaki, 5,496,715, Cl. 435-170.000.

Yung, Weng F.; and Ong, Dee N., to Motorola, Inc. Selective call receiver with battery saving features and method therefor. 5,497,145, Cl. 340-825.440.

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Zachhuber, Kurt. Sweeping unit. 5,495,638, Cl. 15-380.000.

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Murzakov, Boris G.; Zaikina, Alexandra I.; Rogacheva, Rufina A.; and Semenova, Elena V., 5,496,723, Cl. 435-252.100.

Zammuto, Samuel N., to Arachnid, Inc. Dart game apparatus. 5,496,039, Cl. 273-368.000.

Zandona, Nicola, to Solvay (Société Anonyme). Catalyst system, use of this catalyst system for the (co)polymerization of olefins, process for preparing this catalyst system and olefin (co) polymerization process. 5,496,782, Cl. 502-113.000.

Zarske, Donald E. Bingo box. 5,495,947, Cl. 206-579.000.

Zbikowski, Mark J.; Whitney, Alan R.; Shah, Rajen J.; Willman, Bryan M.; and Letwin, J. Gordon, to Microsoft Corporation. System and method for loading an operating system through use of a fire system. 5,497,492, Cl. 395-700.000.

Zeigler, Roger D., Sr.; and Matsko, John F., Jr., to Blough-Wagner Manufacturing Co., Inc. Pedal mechanism for operating presser and motor in sewing machines. 5,495,817, Cl. 112-217.300.

Zeisner, Pius; and Adam, Peter, to Siemens Aktiengesellschaft. Method for producing a commutator motor. 5,495,657, Cl. 29-597.000.

Zellweger Luwa AG: *See*—
Hoeller, Robert, 5,497,335, Cl. 364-470.000.

Zemlicka, Alvin, to Harley-Davidson. Motorcycle terminal box assembly. 5,497,036, Cl. 307-9.100.

Zenon Airport Environmental Inc.: *See*—
Loescher, Barry R.; Newman, David M.; and Thomson, Rodney D., 5,496,739, Cl. 436-131.000.

Zexel Corporation: *See*—
Nishishita, Kunihiko; and Sugita, Takashi, 5,495,972, Cl. 225-2.000.

Zhao, Hui-Fen: *See*—
Alexander-Bridges, Maria C.; and Zhao, Hui-Fen, 5,496,831, Cl. 514-290.000.

Ziecker, Roger A.: *See*—
Miller, Scott R.; and Ziecker, Roger A., 5,495,963, Cl. 222-318.000.

Zierick Manufacturing Corp.: *See*—
Legrady, Janos; and Searles, William S., 5,495,669, Cl. 29-885.000.

Zimmer, Inc.: *See*—
Allard, Randall N.; Price, Gregory G.; Hamman, Gary T.; and Sisk, Billy N., 5,496,319, Cl. 606-56.000.
Barnes, Milton F., 5,496,324, Cl. 606-79.000.
Sisk, Bruce A.; and Hartz, Alden J., 5,496,375, Cl. 623-16.000.

Zimmerman, Amy C.; and Rosser, David A., to Chesebrough-Pond's USA Co., Division of Conopco, Inc. Self-foaming cleanser. 5,496,538, Cl. 424-45.000.

Zimmermann, Gert, to F. Zimmermann & Co. Device for vertically conveying coins. 5,496,211, Cl. 453-3.000.

Zimmermann, Walter: *See*—
Lohninger, Gerhard; and Zimmermann, Walter, 5,497,163, Cl. 342-175.000.

Zito, Ralph, to National Power PLC. Electrochemical apparatus for energy storage and/or power delivery comprising multi-compartment cells. 5,496,659, Cl. 429-105.000.

Zorzi, Claudio: *See*—
Miotto, Onorio; and Zorzi, Claudio, 5,495,683, Cl. 36-50.500.

Zuckerman, Martin, to Emhart Inc. Interconnected lock. 5,496,082, Cl. 292-336.300.

Zuckerman, Ralph. Method for the measurement of oxygen concentration levels by the steady-state determination of fluorescence lifetime. 5,495,850, Cl. 128-634.000.

Zuuring, Pieter H.: *See*—
Middelman, Erik; and Zuuring, Pieter H., 5,496,613, Cl. 428-105.000.

Zwaan, Paul; and Nyberg, Peter A., to Fisher & Paykel Limited. Wheelchair power system. 5,495,904, Cl. 180-11.000.

4 P Emballages France: *See*—
Bieraime, Patrick, 5,495,943, Cl. 206-427.000.

1149235 Ontario Inc.: *See*—
Bowen, Larry; and Snaidr, Stanislav M., 5,495,859, Cl. 131-202.000.

# LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 5th DAY OF MARCH, 1996

NOTE— Arranged in accordance with the first significant character or word if the name (in accordance with city and telephone directory practice).

Andreiko, Craig A.: *See*—
Lemchen, Marc S.; and Andreiko, Craig A., Re. 35,169, Cl. 433-24.000.

Arndt, Wendell V.; and Berendt, Carl J. Ni-Ti orthodontic palatal expansion arch and method of imparting forces on teeth. Re. 35,170, Cl. 433-7.000.

Berendt, Carl J.: *See*—
Arndt, Wendell V.; and Berendt, Carl J., Re. 35,170, Cl. 433-7.000.

Cetus Oncology Corporation: *See*—
McCormick, Francis P.; Koths, Kirston E.; Halenbeck, Robert F.; and Trahey, Mary M., Re. 35,171, Cl. 530-350.000.

Chapple, Paul, to Unilever Patent Holdings B.V. Catalyst. Re. 35,166, Cl. 208-120.000.

Chen, Chao: *See*—
Kindberg, Richard C.; Chen, Chao; Freeman, Lyn; Roshdy, Constance E.; and Hunter, Alastair W., Re. 35,164, Cl. 128-749.000.

Ethicon, Inc.: *See*—
Kindberg, Richard C.; Chen, Chao; Freeman, Lyn; Roshdy, Constance E.; and Hunter, Alastair W., Re. 35,164, Cl. 128-749.000.

Freeman, Lyn: *See*—
Kindberg, Richard C.; Chen, Chao; Freeman, Lyn; Roshdy, Constance E.; and Hunter, Alastair W., Re. 35,164, Cl. 128-749.000.

Golpe, William, to Monroe Auto Equipment Company. Vehicle suspension assembly. Re. 35,168, Cl. 280-666.000.

Halenbeck, Robert F.: *See*—
McCormick, Francis P.; Koths, Kirston E.; Halenbeck, Robert F.; and Trahey, Mary M., Re. 35,171, Cl. 530-350.000.

Hunter, Alastair W.: *See*—
Kindberg, Richard C.; Chen, Chao; Freeman, Lyn; Roshdy, Constance E.; and Hunter, Alastair W., Re. 35,164, Cl. 128-749.000.

Kindberg, Richard C.; Chen, Chao; Freeman, Lyn; Roshdy, Constance E.; and Hunter, Alastair W., to Ethicon, Inc. Surgical device for enclosing an internal organ. Re. 35,164, Cl. 128-749.000.

Koths, Kirston E.: *See*—
McCormick, Francis P.; Koths, Kirston E.; Halenbeck, Robert F.; and Trahey, Mary M., Re. 35,171, Cl. 530-350.000.

Lemchen, Marc S.; and Andreiko, Craig A., to Ormco Corporation. Method for determining orthodontic bracket placement. Re. 35,169, Cl. 433-24.000.

McCormick, Francis P.; Koths, Kirston E.; Halenbeck, Robert F.; and Trahey, Mary M., to Cetus Oncology Corporation. Compositions for detecting ras gene proteins and cancer therapeutics. Re. 35,171, Cl. 530-350.000.

Monroe Auto Equipment Company: *See*—
Golpe, William, Re. 35,168, Cl. 280-666.000.

Mouchawar, Alan E.: *See*—
Mouchawar, Marvin L.; and Mouchawar, Alan E., Re. 35,167, Cl. 215-307.000.

Mouchawar, Marvin L.; and Mouchawar, Alan E. Medicine vial cap for needleless syringe. Re. 35,167, Cl. 215-307.000.

Ormco Corporation: *See*—
Lemchen, Marc S.; and Andreiko, Craig A., Re. 35,169, Cl. 433-24.000.

Roshdy, Constance E.: *See*—
Kindberg, Richard C.; Chen, Chao; Freeman, Lyn; Roshdy, Constance E.; and Hunter, Alastair W., Re. 35,164, Cl. 128-749.000.

Seng, Kong S., to V-Pile Technology Luxembourg. Pile driving apparatus. Re. 35,165, Cl. 173-53.000.

Trahey, Mary M.: *See*—
McCormick, Francis P.; Koths, Kirston E.; Halenbeck, Robert F.; and Trahey, Mary M., Re. 35,171, Cl. 530-350.000.

Unilever Patent Holdings B.V.: *See*—
Chapple, Paul, Re. 35,166, Cl. 208-120.000.

V-Pile Technology Luxembourg: *See*—
Seng, Kong S., Re. 35,165, Cl. 173-53.000.

# LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Cook, Paul J., to HCC Inc. Trailerable earth digging apparatus. B1 4,925,358, Cl. 414-685.000.

Feagle, Hugh B., to Hayes International Corporation. Airborne target for generating an exhaust plume simulating that of a jet powered aircraft. B1 4,428,583, Cl. 273-348.100.

GPAC, Inc.: *See*—
Natale, Anthony, B1 4,604,111, Cl. 95-284.000.

Hayes International Corporation: *See*—
Feagle, Hugh B., B1 4,428,583, Cl. 273-348.100.

HCC Inc.: *See*—
Cook, Paul J., B1 4,925,358, Cl. 414-685.000.

Natale, Anthony, to GPAC, Inc. Particulate contamination control method and filtration device. B1 4,604,111, Cl. 95-284.000.

# LIST OF DESIGN PATENTEES

A&E Mfg. Co., Inc.: *See*—
Burrows, Thomas W.; and Conway, Richard J., Jr., 367,619, Cl. D10-77.000.

Abbott, Julie. Folding hopscotch game. 367,680, Cl. D21-15.000.

ABC Group: *See*—
Cacciacarro, Danny; and Sadr, Changize, 367,656, Cl. D15-5.000.

Aktiebolaget Electrolux: *See*—
Dahlberg, Göran; Svensson, Mats; Nors, Mikael; Karlsson, Göte; Karlsson, Kenneth; and Janeke, Rolf, 367,595, Cl. D8-8.000.

Albrecht, Harold; and Watters, Russell, to Shandel Investments Limited; and Gambol Entertainment. Table lamp. 367,726, Cl. D26-106.000.

AMC International ALFA Metalcraft Corporation AG: *See*—
Koch, Karl-Erich, 367,584, Cl. D7-394.000.

American Lighting Fixture Corp.: *See*—
Segill, Mark E.; and Pocock, Jeffrey H., 367,725, Cl. D26-87.000.

Ancona, Bruce, to B. Via International Housewares, Inc. Spatula. 367,591, Cl. D7-692.000.

Andrus, Leonard C., to Brass Craft Manufacturing Company. Hand held shower. 367,696, Cl. D23-223.000.

ANTEC Corp.: *See*—
Schneider, Pina R.; and Siano, Frank S., 367,646, Cl. D13-152.000.

Automatic Liquid Packaging, Inc.: *See*—
Weiler, Gerhard H., 367,613, Cl. D9-520.000.

Avnet, Inc.: *See*—
Stagl, Peter M., 367,716, Cl. D25-122.000.

B. Via International Housewares, Inc.: *See*—
Ancona, Bruce, 367,591, Cl. D7-692.000.

Baker, Charles D.; and Ritterling, Douglas K., to White Consolidated Industries, Inc. Refrigerator door ice dispenser insert. 367,659, Cl. D15-89.000.

Baker Contracting, Inc.: *See*—
Baker, Stephen K., 367,707, Cl. D24-147.000.

Baker, Stephen K., to Baker Contracting, Inc. Tongue scraper. 367,707, Cl. D24-147.000.

Barreto, Aurelio F., III: *See*—
Paxman, Darrell R.; and Barreto, Aurelio F., III, 367,733, Cl. D30-109.000.

Bauer, Rainer R. B.: *See*—
Frank, Martin W.; Bitowft, Bruce K.; and Bauer, Rainer R. B., 367,609, Cl. D9-425.000.

Bausch & Lomb Incorporated: *See*—
Conway, Simon M., 367,666, Cl. D16-314.000.

Bays, Rodney: *See*—
Stalcup, Gregory C.; and Bays, Rodney, 367,706, Cl. D24-140.000.

Beaumont, Thomas G., to Motorola, Inc. Housing for a cellular base unit. 367,652, Cl. D14-149.000.

Belwith International: *See*—

Caugh, Gerald; Mattson, Deborah; and DeWald, Kevin, 367,600, Cl. D8-305.000.

Benenson, Elazar, to Wonderwash Corp. Washing machine. 367,742, Cl. D32-13.000.

Berol Corporation: *See—*
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Bitowft, Bruce K.: *See—*
Frank, Martin W.; Bitowft, Bruce K.; and Bauer, Rainer R. B., 367,609, Cl. D9-425.000.

Black, William J.: *See—*
Piatnik, Joseph T.; Utter, Robert P.; and Black, William J., 367,585, Cl. D7-397.000.

Boesel, George F. W.; and Geis, Mark W., to Woods Industries, Inc. Electrical outlet block. 367,642, Cl. D13-142.000.

Bonko, Mark L., to Goodyear Tire & Rubber Company, The. Non-directional pneumatic tire for use on agricultural tractors and other like vehicles. 367,631, Cl. D12-147.000.

Booda Products, Inc.: *See—*
O'Rourke, Anthony; and Byrne, Charles, 367,740, Cl. D30-160.000.

Boudreau, Ronald A. Bovine teat sanitizer. 367,741, Cl. D30-199.000.

Boulton, James B.: *See—*
Fox, Alfred E.; and Boulton, James B., 367,739, Cl. D30-148.000.

Bozak, John A., to Goody Products, Inc. Comb. 367,728, Cl. D28-21.000.

Bozak, John A., to Goody Products, Inc. Combination comb/lift. 367,729, Cl. D28-28.000.

Brass Craft Manufacturing Company: *See—*
Andrus, Leonard C., 367,696, Cl. D23-223.000.

Braun Aktiengesellschaft: *See—*
Littmann, Ludwig, 367,583, Cl. D7-384.000.

Brendel, Fred, to EASEC-Schloss-Production GmbH & Co. KG. Lock for a bicycle. 367,601, Cl. D8-333.000.

Brookhouse, Paul S. Corncob holder. 367,590, Cl. D7-683.000.

Brys, Lyle W. Air chute for a temperature controlled container. 367,627, Cl. D12-97.000.

Buckles, Richard: *See—*
Lee, Dennis; Buckles, Richard; and Good, Robert, 367,691, Cl. D21-217.000.

Bull, Robert. Combined chair and creeper. 367,628, Cl. D12-131.000.

Burrows, Thomas W.; and Conway, Richard J., Jr., to A&E Mfg. Co., Inc. Spark plug gauge with cap adjuster. 367,619, Cl. D10-77.000.

Byrne, Charles: *See—*
O'Rourke, Anthony; and Byrne, Charles, 367,740, Cl. D30-160.000.

Cacciacarro, Danny; and Sadr, Changize, to ABC Group. Automotive resonator. 367,656, Cl. D15-5.000.

Carter, James M. Enclosure for an audio-visual exercise bicycle. 367,687, Cl. D21-194.000.

Caugh, Gerald; Mattson, Deborah; and DeWald, Kevin, to Belwith International. Pull. 367,600, Cl. D8-305.000.

Chalbeck, Beth A.: *See—*
Chalbeck, Mark D.; and Chalbeck, Beth A., 367,551, Cl. D2-841.000.

Chalbeck, Mark D.; and Chalbeck, Beth A. Archer's shirt. 367,551, Cl. D2-841.000.

Chan, Kwong C. Binoculars. 367,662, Cl. D16-133.000.

Chang, Kenny. Tool box. 367,557, Cl. D3-276.000.

Chiang, Thomas. Chandelier. 367,723, Cl. D26-86.000.

Chiavetta, Joseph J. Sheet of sun tattoos. 367,730, Cl. D28-99.000.

Choi, Seok-Gon; and Noh, Jae-Won, to Daewoo Heavy Industries Co., Ltd. Fork lift truck. 367,750, Cl. D34-34.000.

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Monette, David G.; Pabst, Gary L.; Palazzolo, Rita; and Eberline, Ronald J., 367,633, Cl. D12-190.000.
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Conair Corporation: *See—*
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Conway, Richard J., Jr.: *See—*
Burrows, Thomas W.; and Conway, Richard J., Jr., 367,619, Cl. D10-77.000.

Conway, Simon M., to Bausch & Lomb Incorporated. Eyewear lens front. 367,666, Cl. D16-314.000.

Cotter, Robert F. Combined blood receiving container and reinfusion bags. 367,704, Cl. D24-111.000.

Court, Nigel T.: *See—*
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Cox, Gerald: *See—*
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Cumiskey, Walter R., to Watkins Manufacturing Corporation. Spa cover. 367,710, Cl. D24-205.000.

Cumiskey, Walter R.: *See—*
Lawing, Michael E.; Cumiskey, Walter R.; and Watkins, Jeffrey K., 367,708, Cl. D24-204.000.

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Daewoo Heavy Industries Co., Ltd.: *See—*
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Dahlberg, Göran; Svensson, Mats; Nors, Mikael; Karlsson, Göte; Karlsson, Kenneth; and Janeke, Rolf, to Aktiebolaget Electrolux. Suspension attachment for a clearing saw. 367,595, Cl. D8-8.000.

D'Angelo, Raymond W. Copying machine cabinet. 367,669, Cl. D18-40.000.

Decanay, Lolita B. Doll. 367,686, Cl. D21-155.000.

De Laruc, John. Lawn aerating roller. 367,593, Cl. D8-1.000.

De Leon, Mario: *See—*
Vitali, Arturo E.; and De Leon, Mario, 367,679, Cl. D20-42.000.

Delfel, John C.; and Delfel, Rosemarie A. Shoe with lights. 367,553, Cl. D2-905.000.

Delfel, Rosemarie A.: *See—*
Delfel, John C.; and Delfel, Rosemarie A., 367,553, Cl. D2-905.000.

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Denenberg, Saul: *See—*
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Desbarres, Yves, to Sitram. Cookware pan. 367,582, Cl. D7-360.000.

DeWald, Kevin: *See—*
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DeWitt, Kenneth I., to Universal Security Instruments, Inc. Smoke detector cover. 367,622, Cl. D10-106.000.

DeWitt, Kenneth I., to Universal Security Instruments, Inc. Smoke detector cover. 367,623, Cl. D10-106.000.

Dixon, William L.; and Riley, James E., to Sinties Corporation. Exerciser. 367,688, Cl. D21-194.000.

Dobashi, Toshiyuki; and Sato, Hisao, to Seiko Instruments Inc. Watchcase. 367,616, Cl. D10-30.000.

Dogloo, Inc.: *See—*
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E&O Hornagl-Werkzeuge: *See—*
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Erlandson, Donald G. Lobster trap escape vent. 367,695, Cl. D22-121.000.

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Albrecht, Harold; and Watters, Russell, 367,726, Cl. D26-106.000.
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Shaw, Kathryn H.; Enoch, Tony; and Pedley, Janice C., to Imperial Chemical Industries PLC a British public limited company. Paint container. 367,612, Cl. D9-504.000.
Shryock, Jon S., to Highland Supply Corporation. Flower pot cover. 367,626, Cl. D11-164.000.
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Stewart, Stephen C.; and Truex, Shirley N. Carpenter's rule with pencil sharpener. 367,618, Cl. D10-72.000.
Stranders, Lucas F., to Ridam Beheer B.V. Box. 367,608, Cl. D9-424.000.
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Zimmerman, Larry G., to Sterilite Corporation. Rounded storage container. 367,589, Cl. D7-629.000.

# LIST OF PLANT PATENTEES

Bridgen, Mark P., to University of Connecticut. Alstroemeria 'Redcoat'. 9,466, Cl. Plt.-87.100.
Challet, Jean-Pierre, to Selection New Plant Sarl. Chrysanthemum plant named 'Chalecat'. 9,463, Cl. Plt.-76.000.
Challet, Jean-Pierre, to Selection New Plant Sarl. Chrysanthemum plant named 'Chaplou'. 9,464, Cl. Plt.-82.300.
Challet, Jean-Pierre, to Selection New Plant Sarl. Chrysanthemum plant named 'Chakara'. 9,465, Cl. Plt.-82.300.
Gentry, Leo E. Barberry plant 'Gentry' cultivar. 9,461, Cl. Plt.-58.000.
Hofstede, J. G.; and Hofstede, W. J. G. Hydrangea plant named 'Hobella'. 9,462, Cl. Plt.-67.100.
Hofstede, W. J. G.: *See*—
Hofstede, J. G.; and Hofstede, W. J. G., 9,462, Cl. Plt.-67.100.
Kent, Jeffrey C., to Kent's Bromeliad Nursery Inc. Bromeliad plant named 'Guz 215'. 9,467, Cl. Plt.-88.800.
Kent's Bromeliad Nursery Inc.: *See*—
Kent, Jeffrey C., 9,467, Cl. Plt.-88.800.
Selection New Plant Sarl: *See*—
Challet, Jean-Pierre, 9,463, Cl. Plt.-76.000.
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Challet, Jean-Pierre, 9,465, Cl. Plt.-82.300.
University of Connecticut: *See*—
Bridgen, Mark P., 9,466, Cl. Plt.-87.100.

# LIST OF STATUTORY INVENTION REGISTRATIONS

APPLICANTS TO WHOM
STATUTORY INVENTION REGISTRATIONS WERE ISSUED ON THE
5th DAY OF MARCH, 1996

Hannula, Anthony E., to United States of America, Air Force. Fuel line squeegee. H1,520, Cl. 100-171.000.
Semple, Charles W., to United States of America, Army. Transparent ceramic composite armor. H1,519, Cl. 89-36.020.
United States of America
Air Force: *See*—
Hannula, Anthony E., H1,520, Cl. 100-171.000.
Army: *See*—
Semple, Charles W., H1,519, Cl. 89-36.020.



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# CLASSIFICATION OF PATENTS

ISSUED MARCH 5, 1996

NOTE—First number, class; second number, subclass; third number, patent number

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527.4 5,495,654
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598 5,495,658
732 5,495,660
736 5,495,659
740 5,495,661
753 5,495,662
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830 5,495,665
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481.9 5,495,743

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593 5,495,764
632 5,495,765
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492 5,495,795
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341 5,495,813

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424 5,495,903

**CLASS 177**

126 5,496,972
229 5,496,973

**CLASS 178**

20 5,496,974

**CLASS 180**

11 5,495,904

| | |
|---|---|
| 21 | 5,495,905 |
| 65.2 | 5,495,906 |
| | 5,495,907 |
| 65.8 | 5,495,908 |
| 68.1 | 5,495,909 |
| 69.2 | 5,495,910 |
| 116 | 5,495,911 |
| 165 | 5,495,912 |
| 227 | 5,495,913 |

**CLASS 181**

| | |
|---|---|
| 269 | 5,496,975 |

**CLASS 182**

| | |
|---|---|
| 141 | 5,495,914 |
| 195 | 5,495,915 |

**CLASS 184**

| | |
|---|---|
| 1.5 | 5,495,916 |
| 7.4 | 5,495,917 |

**CLASS 187**

| | |
|---|---|
| 316 | 5,495,918 |
| 373 | 5,495,919 |

**CLASS 188**

| | |
|---|---|
| 24.22 | 5,495,920 |
| 202 | 5,495,921 |
| 251 A | 5,495,922 |
| 268 | 5,495,923 |
| 378 | 5,495,924 |

**CLASS 192**

| | |
|---|---|
| 3.63 | 5,495,925 |
| 60 | 5,495,926 |
| 70.12 | 5,495,927 |
| 89.29 | 5,495,928 |

**CLASS 194**

| | |
|---|---|
| 207 | 5,495,929 |
| 212 | 5,495,930 |
| 317 | 5,495,931 |

**CLASS 198**

| | |
|---|---|
| 464.1 | 5,495,932 |
| 465.3 | 5,495,933 |
| 731 | 5,495,934 |
| 847 | 5,495,935 |

**CLASS 200**

| | |
|---|---|
| 5 A | 5,496,976 |
| 6 A | 5,496,977 |
| 61.3 | 5,496,978 |
| 61.45 M | 5,496,979 |
| 296 | 5,496,980 |
| 315 | 5,496,981 |
| 345 | 5,496,982 |

**CLASS 202**

| | |
|---|---|
| 158 | 5,496,446 |
| 180 | 5,496,447 |
| 235 | 5,496,448 |

**CLASS 204**

| | |
|---|---|
| 192.12 | 5,496,455 |
| 201 | 5,496,456 |
| 238 | 5,496,457 |
| 272 | 5,496,458 |
| 298.41 | 5,496,459 |
| 427 | 5,496,461 |
| 520 | 5,496,454 |
| 604 | 5,496,460 |

**CLASS 205**

| | |
|---|---|
| 62 | 5,496,462 |
| 109 | 5,496,463 |
| 762 | 5,496,449 |
| 777.5 | 5,496,452 |
| | 5,496,453 |
| 782 | 5,496,450 |
| 790.5 | 5,496,451 |

**CLASS 206**

| | |
|---|---|
| 1.7 | 5,495,936 |
| 45.14 | 5,495,937 |
| | 5,495,938 |
| 307 | 5,495,939 |
| 308.1 | 5,495,940 |
| 366 | 5,495,941 |
| 372 | 5,495,942 |
| 427 | 5,495,943 |
| 459.1 | 5,495,944 |
| 519 | 5,495,945 |
| 534 | 5,495,946 |
| 579 | 5,495,947 |

**CLASS 208**

| | |
|---|---|
| 108 | 5,496,464 |
| 120 | Re.35,166 |
| 139 | 5,496,467 |
| 400 | 5,496,465 |

**CLASS 209**

| | |
|---|---|
| 11 | 5,495,948 |
| 172.5 | 5,495,949 |
| 703 | 5,495,950 |

**CLASS 210**

| | |
|---|---|
| 137 | 5,496,466 |
| 172 | 5,496,468 |
| 177 | 5,496,469 |
| 222 | 5,496,470 |
| 266 | 5,496,471 |
| 605 | 5,496,472 |
| 635 | 5,496,473 |
| 725 | 5,496,474 |

**CLASS 211**

| | |
|---|---|
| 13 | 5,495,951 |
| 40 | 5,495,953 |
| 90 | 5,495,952 |
| | 5,495,954 |

**CLASS 212**

| | |
|---|---|
| 275 | 5,495,955 |
| 331 | 5,495,956 |

**CLASS 213**

| | |
|---|---|
| 32 C | 5,495,957 |

**CLASS 215**

| | |
|---|---|
| 307 | Re.35,167 |
| 329 | 5,495,958 |

**CLASS 216**

| | |
|---|---|
| 12 | 5,495,959 |

**CLASS 219**

| | |
|---|---|
| 69.17 | 5,496,983 |
| 69.18 | 5,496,984 |
| 121.67 | 5,496,985 |
| 125.1 | 5,496,986 |
| 386 | 5,496,987 |
| 388 | 5,496,988 |
| 497 | 5,496,989 |

**CLASS 220**

| | |
|---|---|
| 485 | 5,495,960 |

**CLASS 221**

| | |
|---|---|
| 3 | 5,495,961 |

**CLASS 222**

| | |
|---|---|
| 80 | 5,495,962 |
| 318 | 5,495,963 |
| 455 | 5,495,964 |
| 464.1 | 5,495,963 |
| 508 | 5,495,966 |

**CLASS 224**

| | |
|---|---|
| 202 | 5,495,967 |
| 266 | 5,495,968 |
| 275 | 5,495,969 |
| 314 | 5,495,970 |
| 483 | 5,495,971 |

**CLASS 225**

| | |
|---|---|
| 2 | 5,495,972 |

**CLASS 227**

| | |
|---|---|
| 8 | 5,495,973 |
| 71 | 5,495,974 |
| 123 | 5,495,975 |

**CLASS 228**

| | |
|---|---|
| 110.1 | 5,495,976 |
| 112.1 | 5,495,977 |
| 122.1 | 5,495,978 |
| 124.1 | 5,495,979 |
| 184 | 5,495,980 |

**CLASS 229**

| | |
|---|---|
| 71 | 5,495,981 |
| 103.1 | 5,495,982 |
| 120.13 | 5,495,983 |

**CLASS 235**

| | |
|---|---|
| 101 | 5,496,990 |
| 379 | 5,496,991 |
| 462 | 5,496,992 |

**CLASS 236**

| | |
|---|---|
| 46 R | 5,495,984 |

**CLASS 239**

| | |
|---|---|
| 428.5 | 5,495,985 |

**CLASS 241**

| | |
|---|---|
| 21 | 5,495,986 |
| 27 | 5,495,987 |
| 36 | 5,495,988 |
| 65 | 5,495,989 |

**CLASS 242**

| | |
|---|---|
| 18 R | 5,495,990 |
| 35.5 A | 5,495,991 |
| 346.1 | 5,495,992 |
| 382.2 | 5,495,993 |
| 384.4 | 5,495,994 |
| 390.1 | 5,495,995 |
| 402 | 5,495,996 |
| 561 | 5,495,997 |
| 614 | 5,495,998 |

**CLASS 244**

| | |
|---|---|
| 45 A | 5,495,999 |
| 118.1 | 5,496,000 |
| 119 | 5,496,001 |
| 123 | 5,496,002 |

**CLASS 246**

| | |
|---|---|
| 29 R | 5,496,003 |
| 470 | 5,496,004 |

**CLASS 248**

| | |
|---|---|
| 74.2 | 5,496,005 |
| 231.9 | 5,496,006 |
| 441.1 | 5,496,007 |

**CLASS 249**

| | |
|---|---|
| 61 | 5,496,008 |

**CLASS 250**

| | |
|---|---|
| 201.5 | 5,496,993 |
| 201.6 | 5,496,994 |
| 216 | 5,496,995 |
| 223 B | 5,496,996 |
| 227.21 | 5,496,997 |
| 287 | 5,496,998 |
| 306 | 5,496,999 |
| 307 | 5,497,000 |
| 316.1 | 5,497,001 |
| 338.3 | 5,497,002 |
| | 5,497,003 |
| 372 | 5,497,004 |
| 423 R | 5,497,005 |
| 427 | 5,497,006 |
| 491.1 | 5,497,007 |
| 505.1 | 5,497,008 |
| 574 | 5,497,009 |

**CLASS 251**

| | |
|---|---|
| 61.1 | 5,496,009 |
| 78 | 5,496,010 |
| 246 | 5,496,011 |
| 294 | 5,496,012 |

**CLASS 252**

| | |
|---|---|
| 2 | 5,496,475 |
| 8.6 | 5,496,476 |
| | 5,496,477 |
| 33.6 | 5,496,478 |
| 49.3 | 5,496,479 |
| 51.5 A | 5,496,480 |
| 62.2 | 5,496,481 |
| 70 | 5,496,482 |
| 73 | 5,496,483 |
| 74 | 5,496,484 |
| 79.3 | 5,496,485 |
| 89.1 | 5,496,486 |
| | 5,496,487 |
| 125 | 5,496,488 |
| 134 | 5,496,489 |
| 135 | 5,496,490 |
| 153 | 5,496,491 |
| 170 | 5,496,492 |
| 174 | 5,496,376 |
| | 5,496,493 |
| 174.17 | 5,496,494 |
| 174.23 | 5,496,495 |
| 182.24 | 5,496,496 |
| 299.01 | 5,496,497 |
| | 5,496,498 |
| 299.61 | 5,496,500 |
| | 5,496,501 |
| 299.66 | 5,496,499 |
| 301.17 | 5,496,502 |
| 582 | 5,496,503 |
| 600 | 5,496,504 |

**CLASS 254**

| | |
|---|---|
| 105 | 5,496,013 |
| 122 | 5,496,014 |
| 131.5 | 5,496,015 |

**CLASS 256**

| | |
|---|---|
| 68 | 5,496,016 |

**CLASS 257**

| | |
|---|---|
| 113 | 5,497,010 |
| 147 | 5,497,011 |
| 183 | 5,497,012 |
| 203 | 5,497,013 |
| 205 | 5,497,014 |
| 287 | 5,497,015 |
| 306 | 5,497,016 |
| | 5,497,017 |
| 316 | 5,497,018 |
| 347 | 5,497,019 |
| 356 | 5,497,020 |
| 369 | 5,497,021 |
| 377 | 5,497,022 |
| 394 | 5,497,023 |
| 410 | 5,497,024 |
| 435 | 5,497,025 |
| 487 | 5,497,026 |
| 528 | 5,497,027 |
| 531 | 5,497,028 |
| 613 | 5,497,029 |
| 676 | 5,497,030 |
| 700 | 5,497,031 |
| 710 | 5,497,032 |
| 723 | 5,497,033 |
| 741 | 5,497,034 |

**CLASS 261**

| | |
|---|---|
| 76 | 5,496,505 |

**CLASS 264**

| | |
|---|---|
| 37 | 5,496,508 |
| 129 | 5,496,509 |
| 182 | 5,496,510 |
| 314 | 5,496,511 |
| 400 | 5,496,506 |
| 423 | 5,496,507 |
| 553 | 5,496,512 |

**CLASS 266**

| | |
|---|---|
| 208 | 5,496,017 |

**CLASS 267**

| | |
|---|---|
| 140.12 | 5,496,018 |

**CLASS 271**

| | |
|---|---|
| 3.19 | 5,496,019 |
| 9.01 | 5,496,020 |
| 18.3 | 5,496,021 |
| 114 | 5,496,022 |
| 245 | 5,496,023 |
| 273 | 5,496,024 |

**CLASS 273**

| | |
|---|---|
| 26 D | 5,496,025 |
| 58 R | 5,496,026 |
| 67 A | 5,496,027 |
| 80 B | 5,496,028 |
| 80 D | 5,496,029 |
| 119 R | 5,496,030 |
| 128 A | 5,496,031 |
| 138 A | 5,496,032 |
| 176 R | 5,496,033 |
| 216 | 5,496,034 |
| 231 | 5,496,035 |
| 247 | 5,496,036 |
| 255 | 5,496,037 |
| 292 | 5,496,038 |
| 348.1 | B1 4,428,583 |
| 368 | 5,496,039 |
| 411 | 5,496,040 |
| 416 | 5,496,041 |
| 421 | 5,496,042 |
| 422 | 5,496,043 |

**CLASS 277**

| | |
|---|---|
| 1 | 5,496,044 |
| 53 | 5,496,045 |
| | 5,496,046 |
| 96.1 | 5,496,047 |

**CLASS 280**

| | |
|---|---|
| 42 | 5,496,048 |
| 238 | 5,496,049 |
| 250.1 | 5,496,050 |
| 252 | 5,496,051 |
| 284 | 5,496,052 |
| 609 | 5,496,053 |
| 646 | 5,496,054 |
| 665 | 5,496,055 |
| 666 | Re.35,168 |
| 728.1 | 5,496,056 |
| 728.2 | 5,496,057 |
| | 5,496,058 |
| 728.3 | 5,496,059 |
| | 5,496,060 |
| 730.2 | 5,496,061 |
| 737 | 5,496,062 |
| 739 | 5,496,063 |
| 740 | 5,496,064 |
| | 5,496,065 |
| 753 | 5,496,066 |
| 784 | 5,496,067 |
| 806 | 5,496,068 |
| 830 | 5,496,069 |

**CLASS 283**

| | |
|---|---|
| 2 | 5,496,070 |
| 70 | 5,496,071 |
| 86 | 5,496,072 |

**CLASS 285**

| | |
|---|---|
| 39 | 5,496,073 |
| 45 | 5,496,074 |
| 62 | 5,496,075 |
| 110 | 5,496,076 |

**CLASS 292**

| | |
|---|---|
| 165 | 5,496,078 |
| 251.5 | 5,496,079 |
| 252 | 5,496,080 |
| 259 R | 5,496,081 |
| 336.3 | 5,496,082 |

**CLASS 294**

| | |
|---|---|
| 1.1 | 5,496,083 |
| 1.2 | 5,496,084 |
| 58 | 5,496,085 |
| 65 | 5,496,086 |
| 137 | 5,496,087 |

**CLASS 296**

| | |
|---|---|
| 65.1 | 5,496,088 |

**CLASS 297**

| | |
|---|---|
| 45 | 5,496,094 |
| 188.12 | 5,496,089 |
| 240 | 5,496,090 |
| 248 | 5,496,091 |
| 250.1 | 5,496,092 |

**CLASS 299**

| | |
|---|---|
| 1.1 | 5,496,093 |
| 40.1 | 5,496,131 |
| 57 | 5,496,095 |

**CLASS 303**

| | |
|---|---|
| 3 | 5,496,096 |
| 22.2 | 5,496,098 |
| 114.1 | 5,496,099 |
| 119.2 | 5,496,100 |
| 125 | 5,496,101 |
| 155 | 5,496,097 |
| 162 | 5,496,102 |

**CLASS 307**

| | |
|---|---|
| 9.1 | 5,497,036 |
| 42 | 5,497,037 |

**CLASS 310**

| | |
|---|---|
| 12 | 5,497,038 |
| 51 | 5,497,039 |
| 67 R | 5,497,040 |
| 156 | 5,497,041 |
| 219 | 5,497,042 |
| 328 | 5,497,043 |
| 348 | 5,497,044 |

**CLASS 312**

| | |
|---|---|
| 118 | 5,496,103 |
| 204 | 5,496,104 |
| 334.4 | 5,496,105 |

**CLASS 313**

| | |
|---|---|
| 141 | 5,497,045 |
| 422 | 5,497,046 |
| 493 | 5,497,047 |
| 573 | 5,497,048 |
| 634 | 5,497,049 |

**CLASS 315**

| | |
|---|---|
| 5.41 | 5,497,050 |
| 200 A | 5,497,051 |
| 276 | 5,497,052 |
| 366 | 5,497,053 |
| 368.11 | 5,497,054 |
| 371 | 5,497,055 |

**CLASS 318**

| | |
|---|---|
| 269 | 5,497,056 |
| 371 | 5,497,057 |
| 446 | 5,497,058 |
| 561 | 5,497,059 |
| 563 | 5,497,060 |
| 568.11 | 5,497,061 |
| 599 | 5,497,062 |
| 610 | 5,497,063 |
| 701 | 5,497,064 |
| 802 | 5,497,065 |

**CLASS 320**

| | |
|---|---|
| 7 | 5,497,066 |
| 21 | 5,497,067 |
| 35 | 5,497,068 |

**CLASS 322**

| | |
|---|---|
| 19 | 5,497,069 |
| 23 | 5,497,070 |
| 28 | 5,497,071 |

**CLASS 323**

| | |
|---|---|
| 289 | 5,497,072 |
| 312 | 5,497,073 |
| 316 | 5,497,074 |

**CLASS 324**

| | |
|---|---|
| 72 | 5,497,075 |
| 117 H | 5,497,077 |
| 146 | 5,497,078 |
| 158.1 | 5,497,076 |
| | 5,497,079 |
| 175 | 5,497,080 |
| 207.12 | 5,497,081 |
| 207.14 | 5,497,082 |
| 207.24 | 5,497,083 |
| 207.25 | 5,497,084 |
| 212 | 5,497,085 |
| 228 | 5,497,086 |
| 303 | 5,497,087 |
| 309 | 5,497,088 |
| 318 | 5,497,089 |
| 322 | 5,497,090 |
| 348 | 5,497,091 |
| 402 | 5,497,092 |
| 415 | 5,497,093 |
| 529 | 5,497,094 |
| 537 | 5,497,095 |
| 555 | 5,497,096 |
| | 5,497,097 |
| 637 | 5,497,098 |
| 641 | 5,497,099 |
| 643 | 5,497,100 |
| 662 | 5,497,101 |
| 663 | 5,497,102 |
| 734 | 5,497,103 |
| 755 | 5,497,104 |

**CLASS 326**

| | |
|---|---|
| 27 | 5,497,105 |
| 30 | 5,497,106 |
| 39 | 5,497,107 |
| 84 | 5,497,108 |
| 93 | 5,497,109 |

**CLASS 327**

| | |
|---|---|
| 42 | 5,497,110 |
| 58 | 5,497,111 |
| 143 | 5,497,112 |
| 170 | 5,497,113 |
| 202 | 5,497,114 |
| 211 | 5,497,115 |
| 278 | 5,497,263 |
| 337 | 5,497,116 |
| 404 | 5,497,117 |
| 416 | 5,497,118 |
| 540 | 5,497,119 |
| 563 | 5,497,120 |

**CLASS 329**

| | |
|---|---|
| 302 | 5,497,121 |

**CLASS 330**

| | |
|---|---|
| 253 | 5,497,122 |
| 257 | 5,497,123 |
| 267 | 5,497,124 |
| 290 | 5,497,125 |

**CLASS 331**

| | |
|---|---|
| 1 A | 5,497,126 |
| 17 | 5,497,127 |
| 38 | 5,497,128 |

**CLASS 333**

| | |
|---|---|
| 182 | 5,497,129 |
| 204 | 5,497,130 |
| | 5,497,131 |

**CLASS 335**

| | |
|---|---|
| 78 | 5,497,132 |
| 83 | 5,497,133 |
| 253 | 5,497,135 |
| 299 | 5,497,136 |

**CLASS 336**

| | |
|---|---|
| 200 | 5,497,137 |

**CLASS 338**

| | |
|---|---|
| 21 | 5,497,138 |
| 22 SD | 5,497,139 |

**CLASS 340**

| | |
|---|---|
| 309.15 | 5,497,141 |
| 310.06 | 5,497,142 |
| 432 | 5,497,143 |
| 630 | 5,497,144 |
| 825.44 | 5,497,145 |
| 825.91 | 5,497,146 |
| 870.35 | 5,497,147 |
| 905 | 5,497,148 |
| 988 | 5,497,149 |

**CLASS 341**

| | |
|---|---|
| 1 | 5,497,150 |
| 22 | 5,497,151 |
| 61 | 5,497,152 |
| 67 | 5,497,153 |
| 131 | 5,497,154 |
| 156 | 5,497,155 |



**CLASS 342**

| | |
|---|---|
| 9 | 5,497,156 |
| 36 | 5,497,157 |
| 51 | 5,497,140 |
| 90 | 5,497,158 |
| 96 | 5,497,159 |
| 145 | 5,497,160 |
| 147 | 5,497,161 |
| 159 | 5,497,162 |
| 175 | 5,497,163 |

**CLASS 343**

| | |
|---|---|
| 700 MS | 5,497,164 |
| | 5,497,165 |
| 795 | 5,497,166 |
| 828 | 5,497,167 |
| 834 | 5,497,168 |
| 909 | 5,497,169 |

**CLASS 345**

| | |
|---|---|
| 9 | 5,497,170 |
| 43 | 5,497,171 |
| 85 | 5,497,172 |
| 94 | 5,497,173 |
| 173 | 5,497,176 |

**CLASS 347**

| | |
|---|---|
| 13 | 5,497,174 |
| 55 | 5,497,175 |
| 76 | 5,497,177 |
| 87 | 5,497,178 |
| 112 | 5,497,179 |
| 131 | 5,497,180 |
| 133 | 5,497,181 |
| 197 | 5,497,182 |
| 215 | 5,497,183 |
| 257 | 5,497,184 |

**CLASS 348**

| | |
|---|---|
| 2 | 5,497,185 |
| 6 | 5,497,186 |
| | 5,497,187 |
| 36 | 5,497,188 |
| 51 | 5,497,189 |
| 189 | 5,497,190 |
| 208 | 5,497,191 |
| | 5,497,192 |
| 222 | 5,497,193 |
| 231 | 5,496,106 |
| 255 | 5,497,195 |
| 266 | 5,497,196 |
| 363 | 5,497,197 |
| 388 | 5,497,198 |
| 445 | 5,497,199 |
| 446 | 5,497,200 |
| 497 | 5,497,201 |
| 525 | 5,497,202 |
| 536 | 5,497,203 |
| 699 | 5,497,204 |
| 715 | 5,497,205 |
| 737 | 5,497,206 |
| 738 | 5,497,207 |

**CLASS 351**

| | |
|---|---|
| 52 | 5,497,211 |

**CLASS 353**

| | |
|---|---|
| 66 | 5,497,207 |

**CLASS 354**

| | |
|---|---|
| 21 | 5,497,212 |
| | 5,497,213 |
| 81 | 5,497,214 |
| 234.1 | 5,497,208 |
| 402 | 5,497,209 |
| | 5,497,210 |
| 432 | 5,497,215 |

**CLASS 355**

| | |
|---|---|
| 45 | 5,497,216 |
| 77 | 5,497,217 |
| 208 | 5,497,218 |
| 219 | 5,497,219 |
| 245 | 5,497,220 |
| 246 | 5,497,221 |
| 279 | 5,497,222 |
| 282 | 5,497,223 |
| 301 | 5,497,224 |
| 326 R | 5,497,225 |

**CLASS 356**

| | |
|---|---|
| 4.01 | 5,497,226 |
| 71 | 5,497,227 |
| 154 | 5,497,228 |
| 218 | 5,497,229 |
| 328 | 5,497,230 |
| 334 | 5,497,231 |
| 335 | 5,497,232 |
| 345 | 5,497,233 |
| 371 | 5,497,234 |
| 430 | 5,497,235 |

**CLASS 358**

| | |
|---|---|
| 296 | 5,497,236 |
| 310 | 5,497,237 |
| | 5,497,238 |
| 335 | 5,497,239 |
| | 5,497,240 |
| | 5,497,244 |
| 341 | 5,497,241 |
| | 5,497,242 |
| 342 | 5,497,243 |
| 406 | 5,497,245 |
| 426 | 5,497,246 |
| 436 | 5,497,247 |
| 454 | 5,497,248 |
| 462 | 5,497,249 |
| 498 | 5,497,250 |

**CLASS 359**

| | |
|---|---|
| 13 | 5,497,251 |
| 17 | 5,497,252 |
| 29 | 5,497,253 |
| 53 | 5,497,254 |
| 72 | 5,497,255 |
| 73 | 5,497,256 |
| 81 | 5,497,257 |
| 83 | 5,497,258 |
| 118 | 5,497,259 |
| 130 | 5,497,260 |
| 158 | 5,497,261 |
| 223 | 5,497,262 |
| 337 | 5,497,264 |
| 341 | 5,497,265 |
| 353 | 5,497,266 |
| 390 | 5,497,267 |
| 513 | 5,497,268 |
| 615 | 5,497,269 |
| 629 | 5,497,270 |
| 631 | 5,497,271 |
| 821 | 5,497,272 |
| 843 | 5,497,273 |
| 846 | 5,497,274 |
| 873 | 5,497,275 |

**CLASS 360**

| | |
|---|---|
| 73.03 | 5,497,276 |
| | 5,497,277 |
| 85 | 5,497,278 |
| 96.5 | 5,497,279 |
| | 5,497,280 |
| 98.08 | 5,497,281 |
| 104 | 5,497,282 |
| 123 | 5,497,283 |

**CLASS 361**

| | |
|---|---|
| 42 | 5,497,284 |
| 103 | 5,497,285 |
| 105 | 5,497,286 |
| 617 | 5,497,287 |
| 681 | 5,497,296 |
| 687 | 5,497,288 |
| 709 | 5,497,289 |
| 737 | 5,497,297 |
| 752 | 5,497,290 |
| 804 | 5,497,291 |
| 818 | 5,497,292 |

**CLASS 362**

| | |
|---|---|
| 31 | 5,497,293 |
| 32 | 5,497,294 |
| | 5,497,295 |
| 61 | 5,497,298 |
| | 5,497,299 |
| 66 | 5,497,300 |
| | 5,497,301 |
| 78 | 5,497,302 |
| 80 | 5,497,303 |
| | 5,497,304 |
| 83.1 | 5,497,305 |
| | 5,497,306 |
| 104 | 5,497,307 |
| 294 | 5,497,308 |

**CLASS 363**

| | |
|---|---|
| 17 | 5,497,310 |
| 21 | 5,497,311 |
| 49 | 5,497,312 |
| 125 | 5,497,313 |

**CLASS 364**

| | |
|---|---|
| 140 | 5,497,315 |
| | 5,497,316 |
| 403 | 5,497,314 |
| 408 | 5,497,317 |
| 409 | 5,497,318 |
| 419.02 | 5,497,319 |
| 419.17 | 5,497,320 |
| 422 | 5,497,321 |
| 424.03 | 5,497,322 |
| 424.04 | 5,497,323 |
| 424.05 | 5,497,324 |
| | 5,497,325 |
| | 5,497,326 |
| | 5,497,327 |
| 426.03 | 5,497,333 |
| 431.03 | 5,497,328 |
| 431.05 | 5,497,329 |
| 431.11 | 5,497,330 |
| 468 | 5,497,331 |
| 470 | 5,497,335 |
| 474.03 | 5,497,336 |
| 483 | 5,497,332 |
| 489 | 5,497,334 |
| | 5,497,337 |
| 514 A | 5,497,338 |
| 705.05 | 5,497,339 |
| 745 | 5,497,340 |
| 786 | 5,497,341 |
| | 5,497,342 |
| 787 | 5,497,343 |

**CLASS 365**

| | |
|---|---|
| 185.28 | 5,497,345 |
| 189.01 | 5,497,346 |
| 189.07 | 5,497,347 |
| 189.09 | 5,497,348 |
| 201 | 5,497,350 |
| 230.03 | 5,497,349 |
| | 5,497,351 |
| | 5,497,352 |
| 230.05 | 5,497,353 |
| 230.06 | 5,497,354 |
| 230.08 | 5,497,355 |

**CLASS 366**

| | |
|---|---|
| 91 | 5,496,107 |
| 172.1 | 5,496,108 |
| 198 | 5,496,109 |
| 214 | 5,496,110 |
| 297 | 5,496,111 |

**CLASS 367**

| | |
|---|---|
| 6 | 5,497,356 |
| 158 | 5,497,357 |

**CLASS 368**

| | |
|---|---|
| 21 | 5,497,358 |

**CLASS 369**

| | |
|---|---|
| 44.15 | 5,497,359 |
| 44.28 | 5,497,360 |
| 48 | 5,497,361 |
| 53 | 5,497,362 |
| 58 | 5,497,364 |
| 75.2 | 5,497,365 |
| 112 | 5,497,366 |
| 275.2 | 5,497,367 |

**CLASS 370**

| | |
|---|---|
| 54 | 5,497,368 |
| 55 | 5,497,363 |
| 60 | 5,497,369 |
| | 5,497,370 |
| | 5,497,371 |
| 69.1 | 5,497,372 |
| 79 | 5,497,373 |
| 85.4 | 5,497,374 |
| 94.1 | 5,497,375 |

**CLASS 371**

| | |
|---|---|
| 10.2 | 5,497,376 |
| 20.4 | 5,497,377 |
| 22.3 | 5,497,378 |
| | 5,497,379 |
| 24 | 5,497,380 |
| 28 | 5,497,381 |
| 35 | 5,497,382 |
| 43 | 5,497,383 |
| | 5,497,384 |

**CLASS 372**

| | |
|---|---|
| 6 | 5,497,385 |
| 18 | 5,497,386 |
| 21 | 5,497,387 |
| 22 | 5,497,388 |
| 49 | 5,497,389 |
| 50 | 5,497,390 |
| | 5,497,391 |
| 62 | 5,497,392 |
| 96 | 5,497,393 |

**CLASS 373**

| | |
|---|---|
| 130 | 5,497,394 |

**CLASS 374**

| | |
|---|---|
| 54 | 5,496,112 |

**CLASS 375**

| | |
|---|---|
| 205 | 5,497,395 |
| 220 | 5,497,396 |
| 259 | 5,497,397 |
| 260 | 5,497,398 |
| 271 | 5,497,399 |
| 324 | 5,497,400 |
| 341 | 5,497,401 |
| 344 | 5,497,402 |
| 345 | 5,497,403 |
| 357 | 5,497,404 |
| 372 | 5,497,405 |

**CLASS 377**

| | |
|---|---|
| 44 | 5,497,406 |

**CLASS 378**

| | |
|---|---|
| 45 | 5,497,407 |
| 196 | 5,497,408 |
| 201 | 5,497,409 |
| 202 | 5,497,410 |

**CLASS 379**

| | |
|---|---|
| 59 | 5,497,411 |
| 60 | 5,497,412 |
| 89 | 5,497,413 |
| 142 | 5,497,414 |
| 393 | 5,497,415 |
| 399 | 5,497,416 |
| | 5,497,417 |

**CLASS 380**

| | |
|---|---|
| 5 | 5,497,418 |
| 9 | 5,497,419 |
| 20 | 5,497,420 |
| 23 | 5,497,421 |
| 25 | 5,497,422 |
| 30 | 5,497,423 |
| 34 | 5,497,424 |

**CLASS 381**

| | |
|---|---|
| 18 | 5,497,425 |
| 67 | 5,497,426 |
| 183 | 5,497,427 |
| 199 | 5,497,428 |

**CLASS 382**

| | |
|---|---|
| 125 | 5,497,429 |
| 156 | 5,497,430 |
| 162 | 5,497,431 |
| 178 | 5,497,432 |
| 211 | 5,497,433 |
| 232 | 5,497,434 |
| 249 | 5,497,435 |
| 298 | 5,497,436 |

**CLASS 384**

| | |
|---|---|
| 13 | 5,496,113 |
| 291 | 5,496,115 |
| 458 | 5,496,114 |

**CLASS 385**

| | |
|---|---|
| 11 | 5,497,437 |
| 38 | 5,497,438 |
| 98 | 5,497,439 |
| 125 | 5,497,440 |
| | 5,497,441 |
| 128 | 5,497,442 |
| 134 | 5,497,443 |
| 135 | 5,497,444 |
| 143 | 5,497,445 |

**CLASS 395**

| | |
|---|---|
| 2.1 | 5,497,446 |
| 2.54 | 5,497,447 |
| 22 | 5,497,448 |
| 61 | 5,497,449 |
| 114 | 5,497,450 |
| 120 | 5,497,451 |
| | 5,497,452 |
| 122 | 5,497,453 |
| 158 | 5,497,454 |
| 159 | 5,497,455 |
| 182.04 | 5,497,457 |
| 183.05 | 5,497,456 |
| 183.06 | 5,497,458 |
| | 5,497,459 |
| 183.15 | 5,497,460 |
| 185.04 | 5,497,461 |
| 188.01 | 5,497,462 |
| 200.01 | 5,497,464 |
| 200.03 | 5,497,463 |
| 280 | 5,497,465 |
| 306 | 5,497,466 |
| 312 | 5,497,467 |
| 375 | 5,497,468 |
| 403 | 5,497,470 |
| 413 | 5,497,469 |
| 425 | 5,497,471 |
| 427 | 5,497,472 |
| | 5,497,473 |
| 429 | 5,497,474 |
| 430 | 5,497,475 |
| 439 | 5,497,476 |
| 460 | 5,497,477 |
| 484 | 5,497,478 |
| 491 | 5,497,479 |
| 493 | 5,497,480 |
| 550 | 5,497,481 |
| | 5,497,482 |
| 575 | 5,497,483 |
| 600 | 5,497,484 |
| | 5,497,485 |
| | 5,497,486 |
| | 5,497,487 |
| | 5,497,488 |
| | 5,497,489 |
| 700 | 5,497,490 |
| | 5,497,491 |
| | 5,497,492 |
| 750 | 5,497,494 |
| | 5,497,495 |
| 800 | 5,497,344 |
| | 5,497,493 |
| | 5,497,496 |
| | 5,497,497 |
| | 5,497,498 |
| | 5,497,499 |
| | 5,497,500 |
| 849 | 5,497,501 |

**CLASS 400**

| | |
|---|---|
| 61 | 5,496,116 |
| | 5,496,117 |
| | 5,496,118 |
| 70 | 5,496,119 |
| 569 | 5,496,120 |
| 692 | 5,496,121 |

**CLASS 401**

| | |
|---|---|
| 98 | 5,496,122 |
| 176 | 5,496,123 |

**CLASS 403**

| | |
|---|---|
| 15 | 5,496,124 |
| 137 | 5,496,125 |
| 370 | 5,496,126 |
| 371 | 5,496,127 |

**CLASS 404**

| | |
|---|---|
| 25 | 5,496,128 |
| 29 | 5,496,129 |
| 75 | 5,496,130 |
| 133.05 | 5,496,132 |

**CLASS 405**

| | |
|---|---|
| 52 | 5,496,133 |
| 154 | 5,496,134 |
| 179 | 5,496,135 |
| 186 | 5,496,136 |

**CLASS 406**

| | |
|---|---|
| 226 | 5,496,137 |

**CLASS 409**

| | |
|---|---|
| 81 | 5,496,138 |
| 182 | 5,496,139 |

**CLASS 411**

| | |
|---|---|
| 43 | 5,496,140 |
| 510 | 5,496,141 |
| 544 | 5,496,142 |

**CLASS 414**

| | |
|---|---|
| 23 | 5,496,143 |
| 24.5 | 5,496,144 |
| | 5,496,145 |
| 460 | 5,496,146 |
| 607 | 5,496,147 |
| 685 | B1 4,925,358 |
| 749 | 5,496,148 |

**CLASS 415**

| | |
|---|---|
| 90 | 5,496,149 |
| 229 | 5,496,150 |

**CLASS 416**

| | |
|---|---|
| 97 R | 5,496,151 |

**CLASS 417**

| | |
|---|---|
| 87 | 5,496,152 |
| 212 | 5,496,153 |
| 223 | 5,496,154 |
| 310 | 5,496,155 |
| 312 | 5,496,156 |

**CLASS 418**

| | |
|---|---|
| 14 | 5,496,157 |
| 55.1 | 5,496,160 |
| 55.2 | 5,496,161 |
| 55.5 | 5,496,158 |
| 101 | 5,496,162 |
| 178 | 5,496,159 |
| 200 | 5,496,163 |

**CLASS 419**

| | |
|---|---|
| 19 | 5,496,513 |

**CLASS 420**

| | |
|---|---|
| 34 | 5,496,514 |
| 41 | 5,496,515 |
| 109 | 5,496,516 |

**CLASS 422**

| | |
|---|---|
| 63 | 5,496,517 |
| 64 | 5,496,518 |
| | 5,496,519 |
| | 5,496,520 |
| 82.05 | 5,496,521 |
| | 5,496,522 |
| 100 | 5,496,523 |
| 199 | 5,496,524 |
| 241 | 5,496,525 |

**CLASS 423**

| | |
|---|---|
| 49 | 5,496,526 |
| 263 | 5,496,528 |
| 305 | 5,496,529 |
| 338 | 5,496,527 |
| 418.2 | 5,496,530 |
| | 5,496,531 |
| 584 | 5,496,532 |

**CLASS 424**

| | |
|---|---|
| 1.65 | 5,496,533 |
| 9.32 | 5,496,534 |
| 9.322 | 5,496,536 |
| 9.37 | 5,496,535 |
| 45 | 5,496,537 |
| | 5,496,538 |
| 49 | 5,496,539 |
| | 5,496,540 |
| 50 | 5,496,541 |
| 53 | 5,496,542 |
| 70.7 | 5,496,543 |
| 78.03 | 5,496,544 |
| 78.11 | 5,496,545 |
| 78.36 | 5,496,546 |
| 93.47 | 5,496,547 |
| 142.1 | 5,496,548 |
| 158.1 | 5,496,549 |
| 184.1 | 5,496,550 |
| 185.1 | 5,496,551 |
| 195.1 | 5,496,553 |
| 276.1 | 5,496,554 |
| 405 | 5,496,555 |
| 420 | 5,496,552 |
| 423 | 5,496,556 |
| 426 | 5,496,557 |
| 435 | 5,496,558 |
| | 5,496,559 |
| 449 | 5,496,560 |
| 480 | 5,496,561 |
| 488 | 5,496,562 |
| 489 | 5,496,563 |
| | 5,496,564 |
| 502 | 5,496,565 |
| 687 | 5,496,566 |
| 692 | 5,496,567 |
| 717 | 5,496,568 |
| | 5,496,569 |

**CLASS 425**

| | |
|---|---|
| 2.12 | 5,496,581 |
| 66 | 5,496,582 |
| 109 | 5,496,583 |
| 154 | 5,496,584 |
| 239 | 5,496,585 |
| 258 | 5,496,587 |
| 309 | 5,496,588 |
| 331 | 5,496,589 |
| 388.1 | 5,496,590 |
| 520 | 5,496,591 |
| 523 | 5,496,592 |
| 556 | 5,496,593 |
| 569 | 5,496,594 |
| | 5,496,595 |
| 575 | 5,496,586 |
| 577 | 5,496,596 |
| 584 | 5,496,597 |

**CLASS 428**

| | |
|---|---|
| 34.1 | 5,496,598 |
| 34.2 | 5,496,604 |
| 35.7 | 5,496,599 |
| | 5,496,600 |
| 40 | 5,496,601 |
| | 5,496,602 |
| | 5,496,603 |

43 5,496,605
64.1 5,496,608
65.3 5,496,606
5,496,607
71 5,496,609
73 5,496,610
81 5,496,611
99 5,496,612
105 5,496,613
141 5,496,614
144 5,496,615
172 5,496,616
182 5,496,617
198 5,496,618
209 5,496,619
212 5,496,620
216 5,496,621
5,496,622
224 5,496,623
229 5,496,624
5,496,625
284 5,496,626
5,496,627
285 5,496,628
304.4 5,496,629
328 5,496,630
332 5,496,631
5,496,632
336 5,496,633
341 5,496,634
352 5,496,635
5,496,636
376 5,496,637
408 5,496,638
413 5,496,639
421 5,496,640
423.1 5,496,641
5,496,642
432 5,496,643
446 5,496,644
457 5,496,645
472.2 5,496,646
480 5,496,647
511 5,496,648
518 5,496,649
548 5,496,650
612 5,496,651
623 5,496,652
694 B 5,496,653

**CLASS 429**

1 5,496,654
34 5,496,655
57 5,496,656
62 5,496,657
93 5,496,658
105 5,496,659
183 5,496,660
194 5,496,661
213 5,496,662
218 5,496,663
224 5,496,664
232 5,496,665

**CLASS 430**

5 5,496,666
5,496,667
9 5,496,668
22 5,496,669
56 5,496,670
58 5,496,671
78 5,496,672
106.6 5,496,673
5,496,674
137 5,496,675
5,496,676
162 5,496,677
176 5,496,678
204 5,496,679
216 5,496,680
264 5,496,681
269 5,496,682
5,496,683
306 5,496,684
5,496,685
496 5,496,687
500 5,496,688
505 5,496,689
533 5,496,690
539 5,496,691
544 5,496,692
545 5,496,693
567 5,496,694
619 5,496,695
5,496,696

**CLASS 431**

153 5,496,169
187 5,496,170
326 5,496,171

**CLASS 433**

7 Re.35,170
24 Re.35,169
120 5,496,172
132 5,496,173

**CLASS 434**

114 5,496,174
118 5,496,175
5,496,177
154 5,496,176
307 A 5,496,178
433 5,496,179

**CLASS 435**

5 5,496,697
6 5,496,698
5,496,699
7.1 5,496,700
7.21 5,496,703
7.22 5,496,704
7.23 5,496,705
7.33 5,496,706
7.4 5,496,701
7.9 5,496,702
18 5,496,707
28 5,496,708
67 5,496,709
68.1 5,496,710
69.1 5,496,711
5,496,712
69.4 5,496,713
69.7 5,496,714
170 5,496,715
188 5,496,716
199 5,496,717
232 5,496,718
233 5,496,719
240.2 5,496,720
5,496,721
240.23 5,496,722
252.1 5,496,723
252.3 5,496,724
5,496,725
253.4 5,496,726
253.5 5,496,727
255.1 5,496,728
282 5,496,729
290.2 5,496,730
320.1 5,496,731
5,496,732

**CLASS 436**

52 5,496,733
63 5,496,734
71 5,496,735
81 5,496,736
86 5,496,737
131 5,496,739
132 5,496,740
163 5,496,741

**CLASS 437**

10 5,496,742
31 5,496,743
5,496,744
5,496,745
5,496,746
35 5,496,747
40 5,496,748
5,496,749
5,496,779
41 5,496,750
5,496,751
5,496,752
43 5,496,753
5,496,754
51 5,496,755
52 5,496,756
5,496,757
5,496,758
5,496,759
60 5,496,761
5,496,762
5,496,763
62 5,496,760
67 5,496,764
5,496,765
127 5,496,766
129 5,496,767
174 5,496,768
183 5,496,769
5,496,770
187 5,496,771
5,496,772
189 5,496,773
195 5,496,774
219 5,496,775
231 5,496,776
249 5,496,777
250 5,496,778

**CLASS 439**

60 5,496,180
61 5,496,181
62 5,496,182
79 5,496,183
5,496,184
95 5,496,185
157 5,496,186
5,496,187
189 5,496,188
321 5,496,189
354 5,496,190
404 5,496,191
409 5,496,192
589 5,496,193
595 5,496,194
607 5,496,195
682 5,496,196
726 5,496,197

**CLASS 440**

6 5,496,198

**CLASS 445**

4 5,496,199
25 5,496,200
38 5,496,201

**CLASS 446**

64 5,496,202
222 5,496,203
236 5,496,204

**CLASS 450**

89 5,496,205

**CLASS 451**

260 5,496,206
357 5,496,207
541 5,496,208
548 5,496,209

**CLASS 452**

169 5,496,210

**CLASS 453**

3 5,496,211
4 5,496,212

**CLASS 454**

271 5,496,213
341 5,496,214

**CLASS 455**

5.1 5,497,502
33.1 5,497,503
33.2 5,497,504
34.1 5,497,505
89 5,497,506
5,497,507
161.2 5,497,508
208 5,497,509

**CLASS 460**

114 5,496,215

**CLASS 464**

66 5,496,216
111 5,496,217
119 5,496,219
182 5,496,218

**CLASS 472**

60 5,496,220

**CLASS 474**

80 5,496,222
135 5,496,221

**CLASS 475**

72 5,496,223
91 5,496,224
177 5,496,225

**CLASS 476**

24 5,496,226

**CLASS 477**

62 5,496,227
107 5,496,228
111 5,496,229
5,496,230
126 5,496,231
169 5,496,233

**CLASS 482**

35 5,496,232
37 5,496,234
51 5,496,235
5,496,241
57 5,496,236
5,496,237
63 5,496,238
71 5,496,239
93 5,496,240
97 5,496,242
106 5,496,243
108 5,496,244
126 5,496,245
130 5,496,246
142 5,496,247
146 5,496,248

**CLASS 483**

41 5,496,249

**CLASS 493**

169 5,496,250
224 5,496,251
5,496,252
320 5,496,253

**CLASS 494**

7 5,496,254
20 5,496,255

**CLASS 501**

133 5,496,780

**CLASS 502**

104 5,496,781
113 5,496,782
125 5,496,783
152 5,496,784
180 5,496,785
182 5,496,786
209 5,496,787
333 5,496,788
339 5,496,789

**CLASS 503**

227 5,496,790
5,496,791

**CLASS 504**

100 5,496,792
273 5,496,793
284 5,496,794

**CLASS 505**

210 5,496,795
5,496,796
5,496,797
212 5,496,798
450 5,496,799

**CLASS 514**

2 5,496,802
12 5,496,800
5,496,801
5,496,803
5,496,804
19 5,496,805
26 5,496,806
34 5,496,808
43 5,496,809
50 5,496,810
52 5,496,807
78 5,496,811
171 5,496,812
172 5,496,813
179 5,496,814
210 5,496,816
224.2 5,496,815
5,496,817
225.8 5,496,818
226.5 5,496,819
228.8 5,496,821
236.2 5,496,820
258 5,496,822
263 5,496,823
274 5,496,824
279 5,496,825
283 5,496,829
5,496,830
290 5,496,831
291 5,496,832
303 5,496,826
310 5,496,827
324 5,496,828
326 5,496,833
343 5,496,834
361 5,496,835
370 5,496,836
374 5,496,837
5,496,838
5,496,839
5,496,840
5,496,841
389 5,496,842
411 5,496,843
415 5,496,844
427 5,496,845
443 5,496,851
449 5,496,846
452 5,496,847
463 5,496,852
465 5,496,848
468 5,496,849
469 5,496,853
492 5,496,854
521 5,496,855
566 5,496,856
617 5,496,857
693 5,496,858
778 5,496,861

**CLASS 518**

703 5,496,859

**CLASS 521**

31 5,496,860
50 5,496,862
50.5 5,496,863
59 5,496,864
79 5,496,865
131 5,496,866
5,496,867
155 5,496,868
172 5,496,869

**CLASS 522**

90 5,496,870

**CLASS 523**

107 5,496,871
118 5,496,872
508 5,496,873

**CLASS 524**

56 5,496,874
99 5,496,875
155 5,496,876
246 5,496,877
275 5,496,878
320 5,496,879
417 5,496,880
443 5,496,881
458 5,496,882
492 5,496,883
503 5,496,884
539 5,496,885
540 5,496,886
777 5,496,887

**CLASS 525**

50 5,496,893
53 5,496,894
54.2 5,496,895
63 5,496,888
74 5,496,896
166 5,496,889
266 5,496,897
299 5,496,898
327.2 5,496,899
329.1 5,496,890
330.2 5,496,891
346 5,496,900
528 5,496,892

**CLASS 526**

89 5,496,901
127 5,496,902
204 5,496,903
318.4 5,496,904
329.2 5,496,905

**CLASS 528**

15 5,496,906
73 5,496,907
74.5 5,496,908
76 5,496,909
77 5,496,911
88 5,496,910
193 5,496,912
198 5,496,913
328 5,496,914
353 5,496,915
373 5,496,916
5,496,917
480 5,496,918
481 5,496,919
487 5,496,920
5,496,921
490 5,496,922
501 5,496,923

**CLASS 530**

328 5,496,927
331 5,496,928
350 Re.35,171
5,496,924
5,496,925
412 5,496,926

**CLASS 534**

10 5,496,929

**CLASS 536**

1.11 5,496,930
7.1 5,496,931
18.5 5,496,932
20 5,496,933
22.1 5,496,938
23.7 5,496,934
28.2 5,496,935
124 5,496,936
5,496,937

**CLASS 540**

139 5,496,939
450 5,496,940
540 5,496,941

**CLASS 544**

31 5,496,942
97 5,496,943
198 5,496,944
276 5,496,945
321 5,496,946
362 5,496,947
368 5,496,948
406 5,496,949
408 5,496,950

**CLASS 546**

13 5,496,951
116 5,496,952
125 5,496,953

**CLASS 548**

261 5,496,954
334.5 5,496,955
377.1 5,496,956
491 5,496,957
552 5,496,958

**CLASS 554**

69 5,496,959

**CLASS 556**

8 5,496,960
9 5,496,961

**CLASS 600**

13 5,496,258
61 5,496,321
124 5,496,259
148 5,496,260
163 5,496,261

**CLASS 601**

2 5,496,256
41 5,496,257
152 5,496,262

**CLASS 602**

27 5,496,263
48 5,496,264

**CLASS 604**

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22 5,496,267
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104 5,496,277
110 5,496,278
167 5,496,280
168 5,496,281
179 5,496,282
180 5,496,283
191 5,496,284
208 5,496,293
218 5,496,285
232 5,496,286
249 5,496,287
263 5,496,288
264 5,496,289
268 5,496,290
280 5,496,291
282 5,496,292
5,496,294
319 5,496,299
327 5,496,300
332 5,496,295
336 5,496,296
339 5,496,297
389 5,496,298
409 5,496,301
410 5,496,302
5,496,303

**CLASS 606**

1 5,496,304
15 5,496,305
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5,496,307
5,496,308
5,496,309
82 5,496,316
28 5,496,311
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88 5,496,326
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104 5,496,327
41 5,496,314
107 5,496,328
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5,496,337
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166 5,496,339
167 5,496,340
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169 5,496,342
188 5,496,343
191 5,496,344
192 5,496,345
194 5,496,346
205 5,496,310
232 5,496,347
5,496,348

**CLASS 607**

5 5,496,349
14 5,496,350
17 5,496,351
19 5,496,352
29 5,496,353
37 5,496,354
53 5,496,355
72 5,496,356
108 5,496,357
5,496,358
115 5,496,359
120 5,496,360
122 5,496,361
129 5,496,362
152 5,496,363

**CLASS 623**

1 5,496,364
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5,496,368
10 5,496,369
11 5,496,370
16 5,496,371
5,496,372
5,496,373
5,496,374
5,496,375



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D2— 841 367,551
882 367,552
905 367,553
912 367,554
D3— 228 367,555
255 367,556
276 367,557
281 367,558
D4— 138 367,559
D6— 310 367,560
367,561
312 367,562
353 367,563
379 367,564
380 367,565
381 367,566
421 367,567
422 367,568
432 367,569
436 367,570
466 367,571
468 367,572
498 367,573
514 367,574
518 367,575
536 367,576
569 367,577
579 367,578
632 367,579
D7— 318 367,580
350 367,581
360 367,582
384 367,583
394 367,584
397 367,585
367,586
555 367,587
600 367,588
629 367,589
683 367,590
692 367,591
701 367,592
D8— 1 367,593
5 367,594
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367,597
91 367,598
99 367,599
D9— 300 367,605
302 367,606
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425 367,609
432 367,610
447 367,611
504 367,612
520 367,613
559 367,614
D10— 12 367,615
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104 367,621
106 367,622
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126 367,624
D11— 79 367,625
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D12— 97 367,627
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133 367,629
367,630
147 367,631
162 367,632
190 367,633
D13— 191 367,634
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89 367,659
145 367,660
150 367,661
D16— 133 367,662
232 367,663
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367,666
315 367,667
D17— 20 367,668
D18— 40 367,669
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D20— 10 367,676
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D21— 15 367,680
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108 367,683
141 367,684
146 367,685
155 367,686
194 367,687
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195 367,689
201 367,690
217 367,691
367,692
226 367,693
244 367,694
D22— 121 367,695
D23— 223 367,696
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322 367,703
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D24— 132 367,705
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215 367,712
D25— 222 367,713
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114 367,715
122 367,716
140 367,717
157 367,718
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87 367,724
367,725
D28— 106 367,726
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D30— 108 367,732
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121 367,735
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133 367,737
134 367,738
148 367,739
160 367,740
199 367,741
D32— 13 367,742
35 367,743
61 367,744
74 367,745
D34— 5 367,746
28 367,747
367,748
367,749
34 367,750

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P.— 58 9.461
67.1 9.462
76 9.463
82.3 9.464
87.1 9.465
9.466
88.8 9.467

## STATUTORY INVENTION REGISTRATIONS

89— 36.02 H1519
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# GEOGRAPHICAL INDEX

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| | 5,496,232 | 5,495,960 | 5,496,399 | 5,497,092 | | 5,497,498 | | 5,496,416 |
| | 5,496,510 | 5,495,969 | 5,496,404 | 5,497,100 | | 5,497,499 | | 5,496,566 |
| | 5,497,316 | 5,495,971 | 5,496,407 | 5,497,104 | | 5,497,505 | 11 : | 5,496,846 |
| | 4,428,583 | 5,495,983 | 5,496,414 | 5,497,108 | 7 : | 5,496,317 | 12 : | 5,495,620 |
| 02 : | 5,495,878 | 5,495,997 | 5,496,423 | 5,497,110 | 08 : | 5,495,641 | | 5,495,625 |
| | 5,496,975 | 5,496,001 | 5,496,455 | 5,497,112 | | 5,495,676 | | 5,495,640 |
| 04 : | 5,495,630 | 5,496,007 | 5,496,517 | 5,497,119 | | 5,495,796 | | 5,495,725 |
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| | 5,496,206 | 5,496,083 | 5,496,610 | 5,497,233 | | 5,496,237 | | 5,496,046 |
| | 5,496,284 | 5,496,090 | 5,496,612 | 5,497,236 | | 5,496,265 | | 5,496,070 |
| | 5,496,339 | 5,496,092 | 5,496,616 | 5,497,241 | | 5,496,301 | | 5,496,133 |
| | 5,496,400 | 5,496,106 | 5,496,654 | 5,497,244 | | 5,496,312 | | 5,496,219 |
| | 5,496,623 | 5,496,123 | 5,496,697 | 5,497,251 | | 5,496,350 | | 5,496,236 |
| | 5,496,857 | 5,496,129 | 5,496,707 | 5,497,253 | | 5,496,585 | | 5,496,243 |
| | 5,496,970 | 5,496,136 | 5,496,712 | 5,497,269 | | 5,496,698 | | 5,496,248 |
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| | 5,497,105 | 5,496,159 | 5,496,725 | 5,497,282 | | 5,497,027 | | 5,496,340 |
| | 5,497,123 | 5,496,182 | 5,496,746 | 5,497,297 | | 5,497,159 | | 5,496,439 |
| | 5,497,160 | 5,496,197 | 5,496,750 | 5,497,334 | | 5,497,228 | | 5,496,445 |
| | 5,497,266 | 5,496,204 | 5,496,751 | 5,497,339 | | 5,497,258 | | 5,496,458 |
| | 5,497,400 | 5,496,238 | 5,496,754 | 5,497,341 | | 5,497,312 | | 5,496,472 |
| | 5,497,463 | 5,496,255 | 5,496,763 | 5,497,343 | | 5,497,424 | | 5,496,837 |
| | 5,497,483 | 5,496,266 | 5,496,774 | 5,497,354 | | 5,497,477 | | 5,496,838 |
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| | 5,496,392 | 5,496,275 | 5,496,784 | 5,497,357 | | 5,495,809 | | 5,496,840 |
| | 5,497,052 | 5,496,280 | 5,496,795 | 5,497,359 | | 5,495,918 | | 5,496,841 |
| 06 : | Re.35,167 | 5,496,282 | 5,496,796 | 5,497,384 | | 5,495,919 | | 5,496,950 |
| | Re.35,168 | 5,496,294 | 5,496,812 | 5,497,391 | | 5,496,079 | | 5,496,981 |
| | Re.35,171 | 5,496,302 | 5,496,827 | 5,497,392 | | 5,496,087 | | 5,497,000 |
| | 5,495,627 | 5,496,309 | 5,496,854 | 5,497,394 | | 5,496,191 | | 5,497,378 |
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| | 5,495,692 | 5,496,318 | 5,496,934 | 5,497,404 | | 5,496,538 | | 5,497,425 |
| | 5,495,708 | 5,496,333 | 5,496,991 | 5,497,405 | | 5,496,602 | 13 : | 5,495,674 |
| | 5,495,716 | 5,496,335 | 5,496,997 | 5,497,419 | | 5,496,609 | | 5,495,940 |
| | 5,495,760 | 5,496,342 | 5,496,999 | 5,497,422 | | 5,496,684 | | 5,495,963 |
| | 5,495,765 | 5,496,343 | 5,497,001 | 5,497,430 | | 5,496,685 | | 5,496,110 |
| | 5,495,780 | 5,496,345 | 5,497,007 | 5,497,436 | | 5,496,704 | | 5,496,150 |
| | 5,495,826 | 5,496,346 | 5,497,012 | 5,497,457 | | 5,496,826 | | 5,496,210 |
| | 5,495,863 | 5,496,352 | 5,497,019 | 5,497,464 | | 5,496,847 | | 5,496,250 |
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5,496,911
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5,496,992
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5,497,187
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## STATUTORY INVENTION REGISTRATIONS

12 : H1520 | 25 : H1519 | | | |

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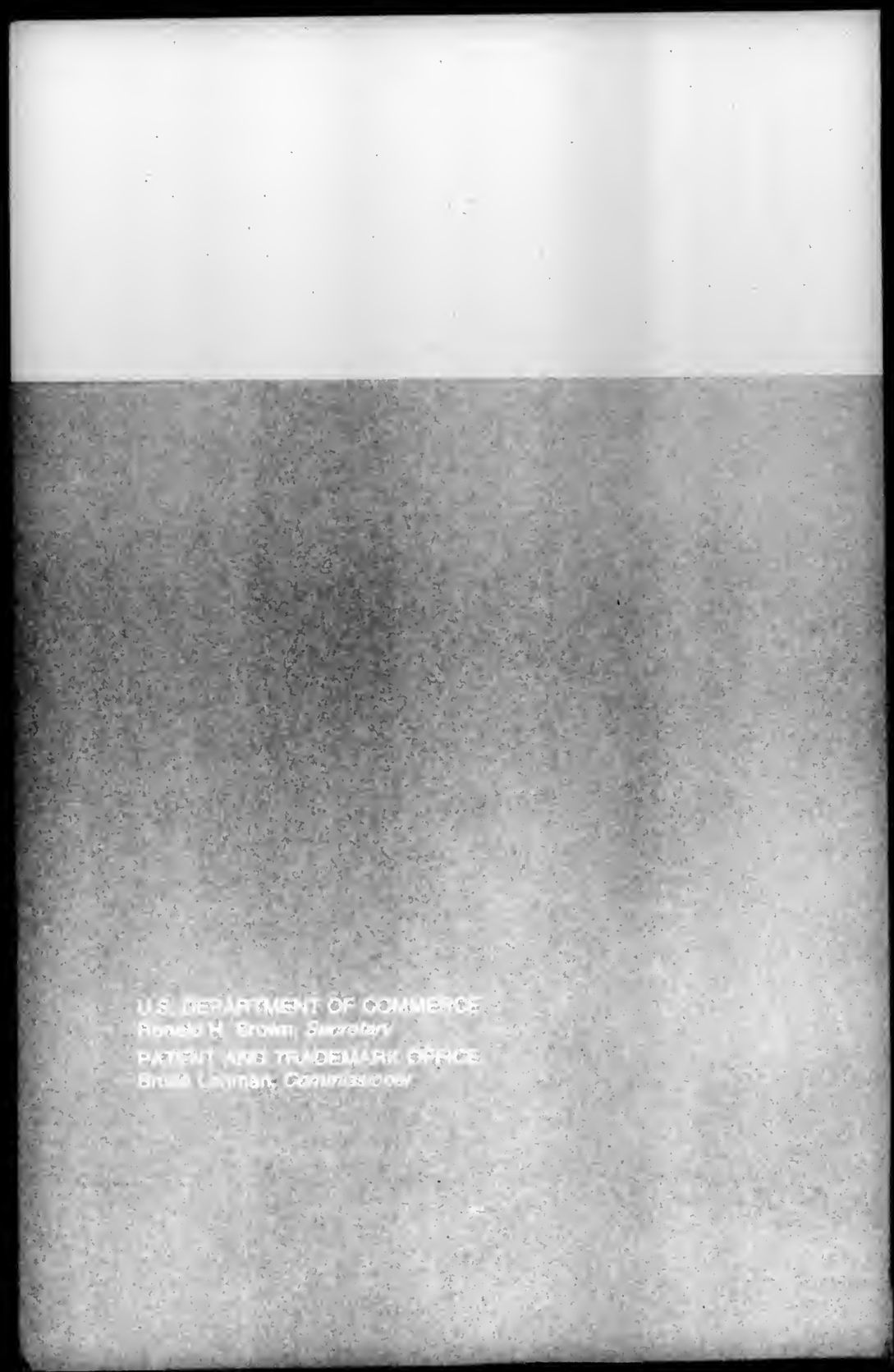
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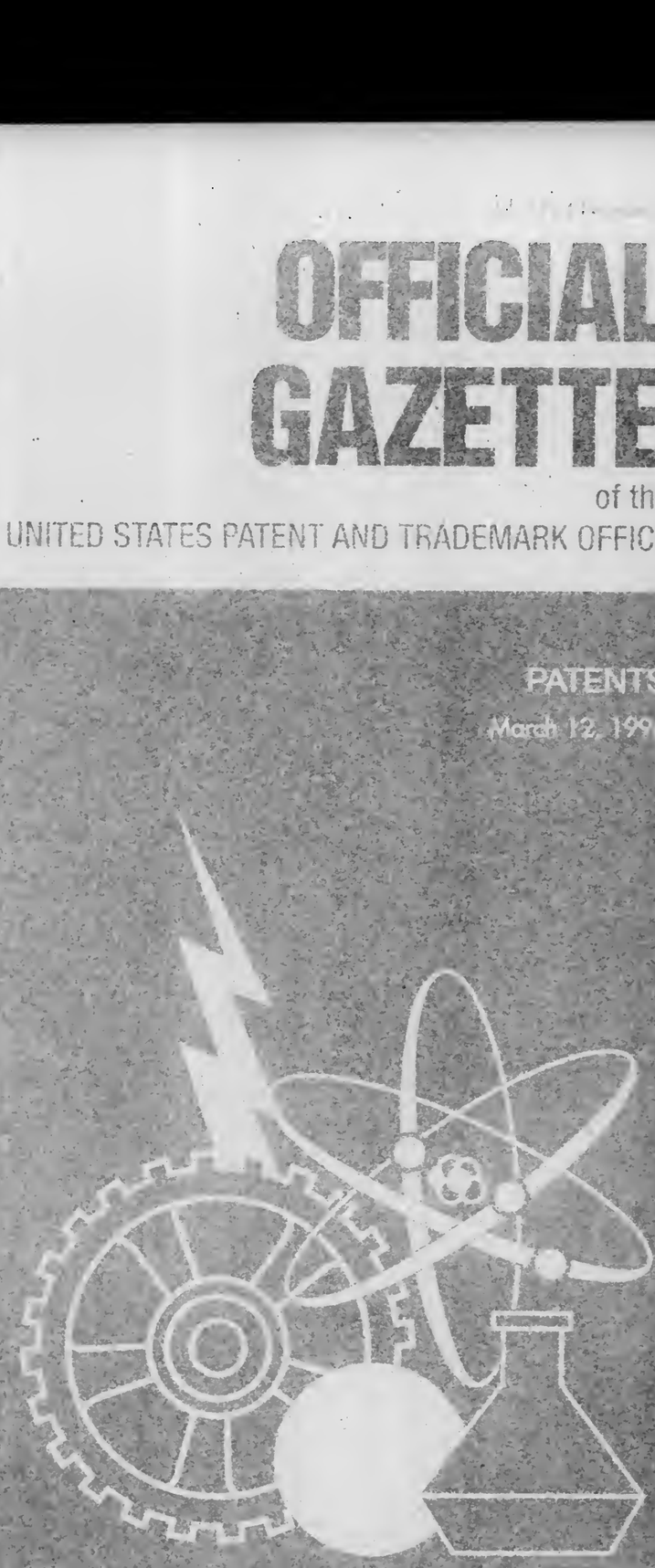
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### Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1181 O.G. 50, on December 19, 1995.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on September 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987, and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed, effective June 20, 1995, due to a change in the exchange rate of the U.S. dollar with regard to the German mark, and was announced in the *Official Gazette* at 1181 O.G. 49, on December 19, 1995.

International fees were changed, effective on January 1, 1996, due to a change in the exchange rate of the U.S. dollar with regard to the Swiss franc, and were announced in the *Official Gazette* at 1181 O.G. 49, on December 19, 1995.

Certain domestic PCT fees and charges for International Search and Preliminary Examination were changed, effective October 1, 1995, and were announced in the *Official Gazette* at 1177 O.G. 171, on August 29, 1995.

The schedule of PCT fees (in U.S. dollars), effective January 1, 1996, is as follows:

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| U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA) | |
| —No corresponding prior U.S. national application filed | 660.00 |
| —Corresponding prior U.S. national application filed | 430.00 |
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| European Patent Office as ISA | 1700.00 |
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| Basic Supplemental fee (for each page over 30) | 13.00 |
| Designation fee per country or region | |
| —For the first 11 national or regional offices designated | 164.00 |
| —For each designation in excess of 11 offices | No Charge |
| Precautionary designation fee and confirmation fee for each precautionary designation confirmed (PCT Rule 15.5) | |
| —Designation fee | 164.00 |
| —Confirmation fee | 82.00 |
| International Application (PCT Chapter II) fees associated with filing a Demand for Preliminary Examination: | |
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| Preliminary examination fee | |
| USPTO as International Preliminary Examining Authority (IPEA) | |
| —USPTO was ISA in PCT Chapter I | 470.00 |
| —Additional examination fee, per additional invention (payable only upon invitation) | 140.00 |
| —USPTO was not ISA in PCT Chapter I | 710.00 |
| —Additional examination fee, per additional invention (payable only upon invitation) | 250.00 |

| U.S. National Stage Fees | Small Entity | Regular |
|---|---|---|
| Basic National fee | | |
| USPTO was IPEA | | |
| —All claims presented satisfied provisions of PCT Article 33(2) to (4) | 47.00 | 94.00 |
| —All claims presented did not satisfy provisions of PCT Article 33(2) to (4) | 340.00 | 680.00 |
| USPTO was ISA but not IPEA | 375.00 | 750.00 |
| USPTO was neither ISA nor IPEA | | |
| —Search report has not been prepared by the European Patent Office or the Japanese Patent Office | 505.00 | 1010.00 |
| —Search report has been prepared by the European Patent Office or the Japanese Patent Office | 440.00 | 880.00 |
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Nov. 27, 1995

BRUCE A. LEHMAN
*Assistant Secretary of Commerce and Commissioner of Patents and Trademarks*

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### Notice of Maintenance Fees Payable

Title 37 Code of Federal Regulations (CFR), Section 1.362(d) provides that maintenance fees may be paid without surcharge for the six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in the patent requiring such payment the patent will expire on the 4th, 8th, or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on March 09, 1993 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,191,658 through 5,193,224
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on March 07, 1989 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,809,364 through 4,811,426
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on March 05, 1985 for which maintenance fees due at 11 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,502,153 through 4,503,564
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after Dec. 12, 1980, but before Aug. 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months, 7 years and six months, and 11 years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1994, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9(f)) ..... $495.00
By other than a small entity ..... $990.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9(f)) ..... $995.00
By other than a small entity ..... $1,990.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§ 1.9(f)) ..... $1,495.00
By other than a small entity ..... $2,990.00

The amount of the surcharge for paying the maintenance fee during the grace period or after expiration of the patent are set forth in 37 CFR 1.20(h), and (i) which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980:

By a small entity (§ 1.9(f)) ..... $65.00
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(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been:

(1) unavoidable ..... $660.00
(2) unintentional ..... $1,550.00

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**Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee**

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

*PATENTS WHICH EXPIRED November 29, 1995 DUE TO FAILURE TO PAY MAINTENANCE FEES*

The following patent numbers are published out of order.

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| 4,650,775 | 06/857,699 | 04/19/86 | 03/17/87 | 01/05/96 |
| 4,658,456 | 06/788,128 | 10/16/85 | 04/21/87 | 12/29/95 |
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| 4,685,331 | 06/721,535 | 04/10/85 | 08/11/87 | 12/29/95 |
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**Patents Reinstated Due to The Acceptance of a Late Maintenance Fee From 01/19/96**

| Patent Number | Serial Number | Filing Date | Issue Date | Granted Date |
|---|---|---|---|---|
| 4,383,752 | 06/222,337 | 01/05/81 | 05/17/83 | 01/24/96 |
| 4,631,812 | 06/705,684 | 02/26/85 | 12/30/86 | 01/25/96 |
| 4,639,024 | 06/557,907 | 12/05/83 | 01/27/87 | 01/25/96 |
| 4,678,028 | 06/820,125 | 01/21/86 | 07/07/87 | 01/23/96 |
| 4,876,976 | 07/247,696 | 09/22/88 | 10/31/89 | 01/22/96 |
| 4,887,074 | 07/145,898 | 01/20/88 | 12/12/89 | 01/22/96 |
| 4,903,465 | 07/390,775 | 08/08/89 | 02/27/90 | 01/23/96 |
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**Patents Reinstated Due to The Acceptance of a Late Maintenance Fee From 01/26/96**

| Patent Number | Serial Number | Filing Date | Issue Date | Granted Date |
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| 4,357,719 | 06/238,511 | 02/26/81 | 11/09/82 | 01/30/96 |
| 4,375,703 | 06/253,513 | 04/15/81 | 03/08/83 | 01/31/96 |
| 4,461,891 | 06/471,395 | 03/02/83 | 07/24/84 | 01/31/96 |
| 4,544,032 | 06/596,021 | 04/02/84 | 10/01/85 | 01/31/96 |
| 4,554,004 | 06/543,488 | 10/19/83 | 11/19/85 | 01/30/96 |
| 4,613,668 | 06/564,515 | 12/22/83 | 09/23/86 | 01/31/96 |
| 4,869,002 | 07/233,893 | 08/15/88 | 09/26/89 | 01/30/96 |
| 4,879,457 | 07/282,586 | 12/12/88 | 11/07/89 | 01/31/96 |
| 4,989,560 | 07/416,496 | 10/03/89 | 02/05/91 | 01/30/96 |
| 5,020,909 | 07/487,041 | 03/02/90 | 06/04/91 | 01/31/96 |
| 5,024,577 | 07/375,438 | 07/05/89 | 06/18/91 | 01/31/96 |
| 5,025,817 | 07/550,576 | 07/10/90 | 06/25/91 | 01/31/96 |
| 5,032,663 | 07/444,025 | 11/30/89 | 07/16/91 | 01/31/96 |
| 5,038,780 | 07/188,337 | 04/29/88 | 08/13/91 | 01/29/96 |
| 5,038,806 | 07/602,039 | 10/19/90 | 08/13/91 | 01/30/96 |
| 5,049,491 | 07/122,985 | 11/19/87 | 09/17/91 | 01/31/96 |
| 5,175,718 | 07/427,020 | 10/25/89 | 12/29/92 | |

**Reissue Applications Filed**

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.12(b)).

**4,537,038**, Re. S.N. 08/565,203, Nov. 29, 1995, Cl. 62/118, METHOD AND APPARATUS FOR CONTROLLING PRESSURE IN A SINGLE COMPRESSOR REFRIGERATION SYSTEM, Richard H. Alsenz, et. al., Owner of Record: *Inventor*, Attorney or Agent: Jeffrey W. Tayon, Ex. Gp.: 3404

**5,253,874**, Re. S.N. 08/541,081, Oct. 11, 1995, Cl. 358/236, TEMPERATURE COMPENSATED COLOR LCD PROJECTOR, Franciscus J. M. Wortel, et. al., Owner of Record: *US Philips Corp., New York, N.Y.*, Attorney or Agent: Norman N. Spain, Ex. Gp.: 2602

**Requests for Reexaminations Filed**

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).



In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

**4,219,880**, Reexam. No. 90/004,119, Jan. 25, 1996, Cl. 364, SIGNAL-PROCESSING AND CONVERSION SYSTEMS, Charles R. Nichols, Owner of Record: *Invest America Counseling Services, Inc., Arnold, Md.*, Attorney or Agent: Steven C. Sereboff, Sereboff & Sereboff, Newport Beach, Calif., Ex. Gp.: 2304, Requester: Owner

**4,551,108**, Reexam. No. 90/004,124, Jan. 24, 1996, Cl. 482/069, EXERCISE DEVISE FOR USE IN TANK CONTAINING WATER, Eric Bass, Owner of Record: *Therapeutic Systems, Inc., Doylestown, Pa.*, Attorney or Agent: Caesar Rivise Bernstein Cohen & Pokotilow Ltd., Philadelphia, Pa., Ex. Gp.: 3302, Requester: Owner

**4,854,263**, Reexam. No. 90/004,123, Dec. 18, 1995, Cl. 118/715, INLET MANIFOLD AND METHODS FOR INCREASING GAS DISSOCIATION AND FOR PECVD OF DIELECTRIC FILMS, Mei Chang, et. al., Owner of Record: *Applied Materials, Inc., Santa Clara, Calif.*, Attorney or Agent: Robert J. Stern, Applied Materials, Santa Clara, Calif, Ex. Gp.: 1109, Requester: Allen A. Sperling, Chevy Chase, Md.

**5,037,522**, Reexam. No. 90/004,125, Feb. 5, 1996, Cl. 204/298.41, ELECTRIC ARC VAPOR DEPOSITION DEVICE, Gary E. Vergason, Owner of Record: *Vergason Technology, Inc., Van Etten, N.Y.*, Attorney or Agent: William A. Blake, Jones, Pullar & Cooper, Arlington, Va., Ex. Gp.: 1109, Requester: Owner

**5,218,995**, Reexam. No. 90/004,122, Oct. 23, 1995, Cl. 137/557, THREE-WAY VALVE ASSEMBLY WITH WATER QUANTITY RECORDING METER FOR A STORAGE TANK OF THE REVERSE OSMOSIS WATER PURIFIER, Shih-Peng Lee, Owner of Record: *Shih-Peng Lee, Taichung Hsien, Taiwan*, Attorney or Agent: Eugene Mar, Bacon & Thomas, Alexandria, Va., Ex. Gp.: 3407, Requester: Specialty Manuf. Co., St. Paul, Minn., c/o Patterson & Keough, Minneapolis, Minn.

**5,280,526**, Reexam. No. 90/004,120, Jan. 29, 1996, Cl. 379/405, TRANFORMER-LESS HYBRID CIRCUIT, Donald R. Lautrell, Owner of Record: *American Telephone & Telegraph Co., New York, N.Y.*, Attorney or Agent: PVD Wilde, AT& T Bell Labs., Murray Hill, N.J., Ex. Gp.: 2601, Requester: Cemetek Microelectronics, Inc., c/o Michael A. Glenn, Menlo Park, Calif.

**5,408,508**, Reexam. No. 90/004,121, Dec. 11, 1995, Cl. 376, SYSTEM AND METHOD FOR SIMULTANEOUSLY TESTING A PLURALITY OF CONTROL RODS, Panfilo A. Frederico, et. al., Owner of Record: *Westinghouse Electric Corp., Pittsburgh, Pa.*, Attorney or Agent: James C. Valentine, Westinghouse Electric Corp., Pittsburgh, Pa., Ex. Gp.: 2204, Requester: Owner

**Notice of Expiration of Trademark Registrations Due To Failure to Renew**

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

TRADEMARK REGISTRATIONS WHICH EXPIRED DECEMBER 04, 1995 DUE TO FAILURE TO RENEW

| Reg. Number | Serial Number | Reg. Date |
|---|---|---|
| 95,999 | 71/073,916 | 03/31/1914 |
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## Patents Available For License or Sale

08/445,104 — OUTDOOR SURVIVAL GARMENTS PHOTOVOLTEC SOLAR ELECTRICALLY HEATED WITH EMERGENCY SIGNAL LIGHTS, AND ETC.

Contact: Mrs. Miriam Kea
114 Barksdale Rd.
Hampton, Va. 23669
(voice): (804) 723-0334
(fax): (804) 727-0329

4,616,738 — DAMPED BORING BAR AND TOOL HOLDER

Contact: Norval E. Shurtliff
910 1st
P.O. Box 122
Haines, Oreg. 97833
(voice): (541) 856-3288

## Patent Term Extended Under 35 U.S.C. § 156

An interim extension of the term of U.S. Patent No. Re. 34,617 has been granted under 35 U.S.C. § 156(e)(2) for a period of one year from the extended expiration date of the patent. The patent has twice been extended for one year under 35 U.S.C. § 156(d)(5). See 1159 OG 77, February 22, 1994, and 1171 OG 32, February 14, 1995. An application for patent term extension was filed, on January 24, 1996, by The Procter and Gamble Company, based on approval of the food additive product "olestra" by the Food and Drug Administration (FDA) on January 24, 1996. The initial PTO review of the application to date indicates that the patent would now be eligible for a maximum extension of the patent term for a period of two years from the date of approval by the FDA (January 24, 1996) under 35 U.S.C. §§ 156(g)(6)(C) and (d)(5)(E)(ii).

## 37 CFR 1.47 Notice by Publication

Notice is hereby given of the filing of an application with a petition under 37 CFR 1.47 requesting acceptance of the application without the signature of all inventors. The petition has been granted. A notice has been sent to the last known address of the non-signing inventor. The inventor whose signature is missing (Nai Hock Lwee) may join in the application by promptly filing an appropriate oath or Declaration complying with 37 CFR 1.63. The international application number is PCT/US93/06677 and was filed on 16 July 1993 in the names of Nai Hock Lwee and Niranjan Kumar Mitra for the invention entitled Flat Black Card Connector. The national stage application number is 08/362,510 and has a 35 U.S.C. 371 date of 27 July 1995.

## Registration To Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office who have been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office until their registration certificates are mailed to them. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before April 28, 1996.

Barry, Chester T., 303 Caroline St., Fredericksburg, Va. 22401

Britts, Ramon S., 11510 Wild Acre Way, Fairfax Station, Va. 22039

Elkin, Jane Williams, P.O. Box 671 - 408 Fortress Way, Occoquan, Va. 22125

Hilliard, Thomas P., 6563 Medinah Ln., Alexandria, Va. 22312

Hollrah, Glennon H., 9802 Squaw Valley Dr., Vienna, Va. 22182-1959

Lerner, Martin D., 1300 Army Navy Dr., #425, Arlington, Va. 22202

Macchione, Alfred A., 3233 Eglinton Ave. East, Suite 2005, Scarborough, Ont., M1J 3N6, Canada

February 13, 1996 — KAREN L. BOVARD, *Director*
Office of Enrollment and Discipline

## Status of Certification Services

On November 28, 1995, the Office published an Official Gazette Notice entitled "Temporary Suspension of At Cost Services for Orders for Certified Copies" (1180 OG 121) to advise practitioners and the public of delays in filling orders for certified copies of PTO documents. This is an update of actual days to mail for orders filled during the month of January 1996:

| Certified Product | Goal | Actual Calendar Days to Mail |
|---|---|---|
| Patent Application-As-Filed, Expedited | 7 | 22 |
| Patent Application-As-Filed, Regular | 17 | 33 |
| Patent Related File Wrapper | 25 | 48 |
| Patent Copy | 10 | 27 |
| Trademark Application-As-Filed, Expedited | 7 | 18 |
| Trademark Application-As-Filed, Regular | 17 | 33 |
| Trademark Related File Wrapper | 25 | 70 |
| Trademark Registration | 10 | 16 |
| Trademark Registration, Expedited | 3* | 7* |

*Business Days

Delivery of any specific copy will vary based on the availability of microfilm products and/or file accessibility. Customers are encouraged to fax orders for copies directly to Certification Division at (703) 308-9759 and to pay by PTO Deposit Account, MasterCard, or Visa to minimize processing time. Information on the status of pending orders may be obtained by calling (703) 308-9726 or 1 (800) 972-6382 (outside the Washington, DC Metro area).

February 13, 1996

WESLEY H. GEWEHR
*Administrator for Information Dissemination*

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### Announcement on the Starting Date of Operations under the Eurasian Patent Convention

The United States Patent and Trademark Office received notification from the World Intellectual Property Organization (WIPO) that:

1. The starting date of operation under the Eurasian Patent Convention* which was done at Moscow on September 9, 1994, is January 1, 1996. As from that date, the Eurasian Patent Office receives Eurasian patent applications and Eurasian patents can be sought** in international applications under the Patent Cooperation Treaty (PCT).

| | |
|---|---|
| Name of the Office: | Evraziiskoe patentnoe vedomstvo (EAPV) Eurasian Patent Office (EAPO) |
| Location and mailing address: | M. Cherkassky per. 2/6, EAPV Moscow Centre, GSP, 103621 Russian Federation |
| Telephone: | (70-95) 206 63 21 |
| Facsimile: | (70-95) 921 24 23 |

The President of the Eurasian Patent Office is Mr. Viktor I. Blinnikov.

2. By December 31, 1995, the following nine States (hereafter referred to as "the Contracting States") have deposited their instruments of accession to, or ratification of, the Eurasian Patent Convention with the Director General of the World Intellectual Property Organization: Armenia, Azerbaijan, Belarus, Kazakstan, Kyrgyzstan, Republic of Moldova, Russian Federation, Tajikistan and Turkmenistan.***

3. The Convention allows anyone—irrespective of nationality or domicile—to obtain a Eurasian patent for invention, having effect in all the Contracting States, by filing a single application with, and making a single payment to, the Eurasian Patent Office in Moscow. The request part of an application for the grant of a Eurasian patent must be in Russian. Other parts of the Eurasian application may, at the moment of the filing of the application, be in Russian or in any other language. For any parts that are not in Russian, a Russian translation must be furnished by the applicant within two months following the date of receipt, by the Eurasian Patent Office, of the Eurasian application. The Eurasian Patent Office accepts the filing of applications by facsimile, but the signed original must reach the Office within 14 days.

4. The procedure in the Eurasian Patent Office follows the usual rules: there is an examination as to form; this is followed by search, publication after the expiry of 18 months from the priority date, substantive examination (which is done on the request of the applicant; such a request must be made before the expiry of six months from the date of publication of the search report), and grant or refusal of grant of the Eurasian patent.

5. If the grant of the Eurasian patent is refused, the applicant may transform his Eurasian application into national applications having the filing date and the priority date, if any, of the Eurasian application, in those Contracting States in which he wishes to obtain a national patent under the national procedure.

6. The granted Eurasian patent is not a bundle of national patents but has, in the Contracting States, a unitary legal effect governed by the Convention and the Patent Regulations adopted by the Administrative Council.

7. Any dispute concerning the validity in a given Contracting State, or an infringement in a given Contracting State, of a Eurasian patent will be decided by the national courts or other competent authorities of that State on the basis of the Convention and the Patent Regulations. Such a decision has legal effect only in the territory of that Contracting State.

8. In the case of a dispute, any national court or other competent authority of a Contracting State in which Russian is not a State language may require that the plaintiff furnish to it a translation of the Eurasian patent in the State language.

9. There is no requirement and no possibility to designate Contracting States in the Eurasian patent application. The Eurasian patent has effect on the territory of all Contracting States from the date of its publication by the Eurasian Patent Office. However, at the time when the annual maintenance fees are due and are paid, the owner of the patent must designate by name those Contracting States in which he wishes the effect of the patent to continue. Designations must be addressed to the Eurasian Patent Office, and the patent maintenance fees must be paid at the same time. A separate fee is payable in respect of each designated Contracting State.

10. Any person who has the right to be a representative before the national Patent Office of a Contracting State and who is registered with the Eurasian Patent Office as a patent agent may act as representative before the Eurasian Patent Office. Where the applicant does not have his residence or principal place of business in the territory of a Contracting State, he is required to be represented by a so registered patent agent.

11. The fee to be paid at the filing of a Eurasian application (so called "unitary procedural fee") is US$ 800, plus US$ 50 for each claim in excess of ten, if any. This fee covers also search and publication. This fee is reduced by 25% when the application, filed via the PCT, enters the regional phase before the Eurasian Patent Office and is accompanied by an international (PCT) search report. A further amount of US$ 800 is payable when examination is requested. Finally, US$ 500 are payable when the Eurasian patent is granted.

12. The list of registered patent agents, the schedule of fees and printed application (and other) forms are available from the Eurasian Patent Office.

* For the text of the Eurasian Patent Convention, see Industrial Property Laws and Treaties, MULTILATERAL TREATIES - Text 2-013. *Industrial Property and Copyright*, July/August 1995.
** For designation of States party to the Eurasian Patent Convention, see PCT Newsletter No. 11/1995, pages 1 and 6.
*** As to the date of entry into force of the Convention for a given State, see the corresponding EAPC Notification issued by WIPO.

February 13, 1996

BRUCE A. LEHMAN
*Assistant Secretary of Commerce and Commissioner of Patents and Trademarks*

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### Certificate of Correction For Week of March 12, 1996

| | | | |
|---|---|---|---|
| B1 4,990,658 | 5,141,599 | 5,366,392 | 5,417,424 |
| B1 5,008,841 | 5,175,718 | 5,367,348 | 5,418,753 |
| P. 09,052 | 5,179,660 | 5,380,688 | 5,419,127 |
| Re. 34,886 | 5,219,758 | 5,381,096 | 5,420,656 |
| Re. 35,062 | 5,221,139 | 5,381,113 | 5,420,975 |
| D. 354,478 | 5,233,181 | 5,383,105 | 5,421,453 |
| D. 358,147 | 5,246,788 | 5,388,730 | 5,422,823 |
| D. 358,817 | 5,248,789 | 5,393,664 | 5,422,996 |
| D. 360,030 | 5,280,078 | 5,395,426 | 5,425,492 |
| D. 361,038 | 5,281,356 | 5,396,736 | 5,426,250 |
| D. 361,400 | 5,284,953 | 5,399,316 | 5,427,159 |
| D. 362,110 | 5,313,250 | 5,406,843 | 5,427,711 |
| D. 362,428 | 5,324,917 | 5,407,020 | 5,427,946 |
| D. 363,467 | 5,327,144 | 5,407,978 | 5,429,577 |
| D. 363,898 | 5,336,803 | 5,409,859 | 5,430,137 |
| D. 364,975 | 5,340,373 | 5,410,083 | 5,430,318 |
| 4,921,951 | 5,348,961 | 5,410,208 | 5,430,393 |
| 5,041,013 | 5,353,089 | 5,411,479 | 5,430,438 |
| 5,106,053 | 5,354,978 | 5,411,989 | 5,430,634 |
| 5,116,305 | 5,356,296 | 5,416,181 | 5,430,848 |
| 5,132,805 | 5,365,398 | | |
| 5,431,574 | 5,448,357 | 5,457,149 | 5,469,288 |
| 5,432,661 | 5,448,380 | 5,457,290 | 5,469,390 |
| 5,433,939 | 5,448,612 | 5,457,549 | 5,469,850 |
| 5,434,328 | 5,448,621 | 5,457,992 | 5,470,414 |
| 5,435,131 | 5,449,462 | 5,458,374 | 5,470,505 |
| 5,436,050 | 5,449,703 | 5,458,613 | 5,470,531 |
| 5,436,649 | 5,450,490 | 5,459,537 | 5,470,962 |
| 5,437,932 | 5,450,707 | 5,459,557 | 5,471,126 |
| 5,438,218 | 5,451,612 | 5,459,581 | 5,471,336 |
| 5,438,408 | 5,451,937 | 5,460,097 | 5,471,493 |
| 5,438,942 | 5,451,984 | 5,460,343 | 5,472,034 |
| 5,439,625 | 5,451,989 | 5,460,771 | 5,472,318 |
| 5,441,250 | 5,452,056 | 5,461,156 | 5,472,437 |
| 5,441,952 | 5,452,073 | 5,461,323 | 5,472,438 |
| 5,442,315 | 5,452,114 | 5,462,045 | 5,472,501 |
| 5,442,705 | 5,452,381 | 5,462,058 | 5,472,529 |
| 5,442,734 | 5,452,430 | 5,462,424 | 5,472,763 |
| 5,443,142 | 5,452,647 | 5,462,734 | 5,472,835 |
| 5,443,251 | 5,453,075 | 5,462,812 | 5,473,954 |
| 5,443,769 | 5,453,235 | 5,463,253 | 5,473,959 |
| 5,443,830 | 5,453,845 | 5,463,361 | 5,474,238 |
| 5,444,258 | 5,453,917 | 5,464,704 | 5,474,520 |
| 5,444,484 | 5,454,199 | 5,464,859 | 5,475,236 |
| 5,444,667 | 5,455,337 | 5,466,346 | 5,475,413 |
| 5,444,973 | 5,455,472 | 5,466,684 | 5,475,453 |
| 5,446,078 | 5,455,647 | 5,467,546 | 5,475,479 |
| 5,446,281 | 5,455,663 | 5,467,570 | 5,476,476 |
| 5,446,577 | 5,455,691 | 5,467,619 | 5,476,507 |
| 5,446,641 | 5,455,944 | 5,467,830 | 5,476,674 |
| 5,446,665 | 5,456,580 | 5,467,865 | 5,478,275 |
| 5,447,784 | 5,456,767 | 5,468,243 | 5,478,390 |
| 5,448,153 | 5,456,870 | 5,468,303 | 5,480,926 |
| 5,448,279 | 5,456,884 | 5,468,587 | 5,484,141 |
| 5,448,298 | 5,457,117 | 5,469,041 | 5,485,528 |

**Summary of Final Decisions Issued by the Trademark Trial and Appeal Board**

**December 4-8, 1995**

| Date Issued | Type of Case[1] | Proceeding or App'n No. | Party/Parties | Issue | TTAB Decision | Opposer's/ Petitioner's Mark and Goods/Services | Applicant's/ Respondent's Mark and Goods/Services | Mark and Goods Cited by Examining Attorney | Recommended for Publication |
|---|---|---|---|---|---|---|---|---|---|
| 12-6 | EX | 74/218,685 | Starmark, Inc. | 2(d) | Refusal Affirmed | | "PARK AVENUE" (fixedly mounted cabinetry for the kitchen and bath) | "PARK AVENUE" [furniture] | No |
| 12-6 | EX | 74/390,995 | Aqua Glass Corp. | 2(d) | Refusal Affirmed | | "AQUA BATH" [bathtubs] | "AQUA JET BATHS" [whirlpool bathtubs] | No |
| 12-6 | CANC | 21,843 | American Chemical Society v. CIBA Corning Diagnostics Corp. | 2(d) | Petition to Cancel Denied | ACS [tradename used in connection with providing to the scientific community scientific and technical information primarily in the field of chemistry and related disciplines]; "ACS SINGLE ARTICLE ANNOUNCEMENT" [scientific magazines containing the tables of contents from journals published by petitioner]; "ACS" (and design) [collection and dissemination of information relating to the chemical industry through publication of periodicals, pamphlets, and books; consultation and advisory service to educational institutions for the improvement of courses in chemistry; etc.] | "ACS:180" [medical instrumentation for use in qualitative and quantitative determination of substances of interest in test samples and, particularly, an automated instrument for in vitro diagnostic immunoassay testing which utilizes chemiluminescent technology] | No |

(1)EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (R)=REQ. FOR RECONSIDERATION



## SPECIAL BOXES FOR PATENT MAIL

Special box designations should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these special boxes. If any documents other than the specified type identified for each special box are addressed to that box, they will be significantly delayed in reaching the appropriate area for which they are intended.

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| Box 313b | Petitions under 37 CFR 1.313(b) to withdraw a patent application from issue after payment of the issue fee and any papers associated with the petition, including papers necessary for filing a continuing application. |
| Box AF | Expedited procedure for processing amendments and other responses after final rejection. |
| Box Comments Patents | Public comments regarding patent related regulations and procedures. |
| Box DAC | Petitions decided by the Office of Petitions including petitions to revive and petitions to accept late payment of issue fees or maintenance fees. |
| Box DD | Disclosure Documents or materials related to the Disclosure Document Program. |
| Box FWC | Requests for File Wrapper Continuation Applications (under 37 CFR 1.62). |
| Box Interference | Communications relating to interferences and applications and patents involved in interference. |
| Box Issue Fee | All communications following the receipt of a PTOL–85, "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments are the exception. Assignments should be submitted in a separate envelope and not be sent to Box Issue Fee. |
| Box M Fee | Correspondence related to a patent that is subject to the payment of a maintenance fee. |
| Box MPEP | Submissions concerning the Manual of Patent Examining Procedures. |
| Box Non-Fee-Amendment | Non-fee amendments to patent applications. (Use Box AF for responses after final rejection). |
| Box PATENT APPLICATION | New patent applications and associated papers and fees. |
| Box Patent Ext. | Applications for patent term extension. |
| Box PCT | Mail related to applications filed under the Patent Cooperation Treaty. |
| Box Provisional Patent Application | The filing of all provisional patent applications and any communications relating thereto. |
| Box Reconstruction | Correspondence pertaining to the reconstruction of lost patent files. |
| Box Reexam | Requests for Reexamination for *original* request papers *only*. |
| Box Sequence | Submission of diskette for biotechnical application. |
| Box SN | For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications *prior* to the Office's standard notification (return postcard or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application"). |

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Please address mail as follows:

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Assistant Commissioner for Trademarks
2900 Crystal Drive
Arlington, Virginia 22202-3513

| Box Designations | Explanation |
|---|---|
| Box NEW APP FEE | New trademark applications and fees. |
| Box ITU FEE | Statements of Use (SOU's), and extension requests. |
| Box TTAB FEE | Oppositions, cancellation petitions, and ex parte appeals. |
| Box TTAB NO FEE | Interferences, motions, and extension requests. |
| Box STATUS NO FEE | Written status inquiries. |
| Box POST REG FEE | Affidavits, renewals, corrections, and amendments. |
| Box RESPONSES NO FEE | Responses to Examining Attorneys' Office actions and Post Registration actions. |

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| Box 3 | Mail for the Office of Personnel from NFC. |
| Box 4 | Mail for the Deputy Assistant Secretary of Commerce and Deputy Commissioner of Patents and Trademarks; Office of Legislative and International Affairs. |
| Box 6 | Mail for the Office of Procurement. |
| Box 8 | All papers for the Office of the Solicitor *except* communications relating to *pending litigation and disciplinary proceedings*; papers relating to pending litigation in court cases shall be mailed only to Office of the Solicitor, P.O. Box 15667, Arlington, Virginia 22215 and papers relating to pending disciplinary proceedings before the Administrative Law Judge or the Commissioner shall be mailed only to the Office of the Solicitor, P.O. Box 16116, Arlington, Virginia 22215. |
| Box 9 | Coupon orders for U.S. patent and trademark copies. |
| Box 10 | Orders for certified copies of PTO documents. |
| Box 11 | Electronic Ordering Service (EOS). |
| Box 13 | Mail for the Employee and Labor Relations Division. |
| Box 14 | Mail directed to the APS Contracts Office. |
| Box 16 | Deposit Account Replenishment Checks. |
| Box 17 | Invoices directed to the Office of Finance. |
| Box 171 | Vacancy Announcement Applications. |
| Box Assignment | All assignment documents except those filed with new applications. |
| Box EEO | Mail for the Office of Civil Rights. |
| Box OED | Mail for the Office of Enrollment and Discipline. |

## Reference Collections of U.S. Patents and Trademarks Available for Public Use in Patent and Trademark Depository Libraries

The following libraries, designated as Patent and Trademark Depository Libraries (PTDLs), receive patent and trademark information in various formats from the U.S. Patent and Trademark Office. Many PTDLs have on file all full-text patents issued since 1790, trademarks published since 1872, and select collections of foreign patents. All PTDLs have both the patent and trademark sections of the *Official Gazette of the U.S. Patent and Trademark Office*. The full-text utility and design patents are distributed numerically on 16 mm microfilm, and plant patents on color microfiche. Patent and trademark search systems on CD-ROM (Compact Disc-Read Only) format are available at all PTDLs to increase utilization of and enhance access to the information found in patents and trademarks. It is through the CD-ROM systems that preliminary patent and trademark searches can be conducted through the numerically arranged collections.

All information is available for use by the public free of charge.

In addition, each PTDL offers reference publications which outline and provide access to the patent and trademark classification systems, as well as other documents and publications which supplement the basic search tools. PTDLs provide technical staff assistance in using all materials. Facilities for making paper copies of patent and trademark information are generally provided for a fee.

Since there are variations in the scope of patent and trademark collections among the PTDLs, and their hours of service to the public vary, anyone contemplating use of these collections at a particular library is urged to contact that library in advance about its collections, services, and hours in order to avert possible inconvenience.

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| Alabama | Auburn University Libraries | (205) 844-1747 |
| | Birmingham Public Library | (205) 226-3620 |
| Alaska | Anchorage: Z.J. Loussac Public Library | (907) 562-7323 |
| Arizona | Tempe: Noble Library, Arizona State University | (602) 965-7010 |
| Arkansas | Little Rock: Arkansas State Library | (501) 682-2053 |
| California | Los Angeles Public Library | (213) 228-7220 |
| | Sacramento: California State Library | (916) 654-0069 |
| | San Diego Public Library | (619) 236-5813 |
| | San Francisco Public Library | (415) 557-4488 |
| | Sunnyvale Patent Clearinghouse | (408) 730-7290 |
| Colorado | Denver Public Library | (303) 640-6249 |
| Connecticut | New Haven: Science Park Library | (203) 786-5447 |
| Delaware | Newark: University of Delaware Library | (302) 831-2965 |
| Dist. of Columbia | Washington: Howard University Libraries | (202) 806-7252 |
| Florida | Fort Lauderdale: Broward County Main Library | (305) 357-7444 |
| | Miami-Dade Public Library | (305) 375-2665 |
| | Orlando: University of Central Florida Libraries | (407) 823-2562 |
| | Tampa Campus Library, University of South Florida | (813) 974-2726 |
| Georgia | Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology | (404) 894-4508 |
| Hawaii | Honolulu: Hawaii State Public Library System | (808) 586-3477 |
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| Illinois | Chicago Public Library | (312) 747-4450 |
| | Springfield: Illinois State Library | (217) 782-5659 |
| Indiana | Indianapolis-Marion County Public Library | (317) 269-1741 |
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| Iowa | Des Moines: State Library of Iowa | (515) 281-4118 |
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| Massachusetts | Amherst: Physical Sciences Library, University of Massachusetts | (413) 545-1370 |
| | Boston Public Library | (617) 536-5400 Ext. 265 |
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| | Big Rapids: Abigail S. Timme Library, Ferris State University | (616) 592-3602 |
| | Detroit: Great Lakes Patent and Trademark Center | (313) 833-1450 |
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| | St. Louis Public Library | (314) 241-2288 Ext. 390 |
| Montana | Butte: Montana College of Mineral Science and Technology Library | (406) 496-4281 |
| Nebraska | Lincoln: Engineering Library, University of Nebraska-Lincoln | (402) 472-3411 |
| Nevada | Reno: University of Nevada, Reno Library | (702) 784-6579 |
| New Hampshire | Durham: University of New Hampshire Library | (603) 862-1777 |
| New Jersey | Newark Public Library | (201) 733-7782 |
| | Piscataway: Library of Science and Medicine, Rutgers University | (908) 445-2895 |
| New Mexico | Albuquerque: University of New Mexico General Library | (505) 277-4412 |
| New York | Albany: New York State Library | (518) 474-5355 |
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| Ohio | Akron: Summit County Public Library | Not Yet Operational |
| | Cincinnati and Hamilton County, Public Library of | (513) 369-6936 |
| | Cleveland Public Library | (216) 623-2870 |
| | Columbus: Ohio State University Libraries | (614) 292-6175 |
| | Toledo/Lucas County Public Library | (419) 259-5212 |
| Oklahoma | Stillwater: Oklahoma State University Center for International Trade Development | (405) 744-7086 |
| Oregon | Portland: Paul L. Boley Law Library, Lewis & Clark College | Not Yet Operational |
| Pennsylvania | Philadelphia, The Free Library of | (215) 686-5331 |
| | Pittsburgh, Carnegie Library of | (412) 622-3138 |
| | University Park: Pattee Library, Pennsylvania State University | (814) 865-4861 |
| Puerto Rico | Mayaquez General Library, University of Puerto Rico | Not Yet Operational |
| Rhode Island | Providence Public Library | (401) 455-8027 |
| South Carolina | Clemson University Libraries | (803) 656-3024 |
| South Dakota | Rapid City: Devereaux Library, South Dakota School of Mines and Technology | (605) 394-6822 |
| Tennessee | Memphis & Shelby County Public Library and Information Center | (901) 725-8877 |
| | Nashville: Stevenson Science Library, Vanderbilt University | (615) 322-2775 |
| Texas | Austin: McKinney Engineering Library, University of Texas at Austin | (512) 495-4500 |
| | College Station: Sterling C. Evans Library, Texas A & M University | (409) 845-3826 |
| | Dallas Public Library | (214) 670-1468 |
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| | Milwaukee Public Library | (414) 286-3051 |
| Wyoming | Casper: Natrona County Public Library | (307) 237-4935 |

## PATENT EXAMINING CORPS

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STEPHEN G. KUNIN, Deputy Assistant Commissioner for Patent Policy
J.O. THOMAS, JR., Deputy Assistant Commissioner for Patent Process Services

| PATENT EXAMINING GROUPS | Phone number Area Code 703 | New Case Date* |
|---|---|---|
| **CHEMICAL EXAMINING GROUPS** | | |
| GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, ENGINEERING AND DESIGNS, GROUP 1100—JOHN E. KITTLE, Director | 308-0661 | 07/28/94 |
| ORGANIC CHEMISTRY, DRUG, BIO-AFFECTING AND BODY TREATING COMPOSITION, GROUP 1200—RICHARD V. FISHER, Director | 308-1235 | 07/03/94 |
| SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300—BARRY S. RICHMAN, Director | 308-0651 | 08/31/94 |
| HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY STOCK MATERIALS AND COMPOSITIONS, GROUP 1500—THEODORE MORRIS, Director | 308-2351 | 10/20/94 |
| BIOTECHNOLOGY, GROUP 1800—JOHN J. DOLL, Director | 308-0196 | 05/06/94 |
| **ELECTRICAL EXAMINING GROUPS** | | |
| INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100—STEWART LEVY, Director | 308-1782 | 03/28/94 |
| SPECIAL LAWS AND ADMINISTRATION, GROUP 2200—ROBERT E. GARRETT, Director | 308-0511 | 08/09/94 |
| COMPUTER SYSTEMS AND COMPUTER APPLICATION, GROUP 2300—BOBBY R. GRAY, Director | 305-9600 | 07/29/93 |
| SPECIAL COMPUTER APPLICATIONS: COMPUTER GRAPHICS, BUSINESS PRACTICES, & DIAGNOSTIC TESTING, GROUP 2400—GERALD GOLDBERG, Director | 305-3800 | 04/06/94 |
| ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500—JANICE A. HOWELL, Director | 308-0956 | 08/02/94 |
| COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 2600—NICHOLAS P. GODICI, Director | 305-4700 | 06/28/94 |
| DESIGN, GROUP 2900—JOHN E. KITTLE, Director | 308-0661 | 08/08/94 |
| **MECHANICAL EXAMINING GROUPS** | | |
| HANDLING AND TRANSPORTATION MEDIA, GROUP 3100—F.R. SCHMIDT, Director | 308-1113 | 05/18/94 |
| MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200—CARLTON R. CROYLE, Director | 308-1148 | 09/21/94 |
| MEDICAL INSTRUMENTS, DIAGNOSTIC EQUIPMENT AND TREATMENT DEVICES; SURGERY AND SURGICAL SUPPLIES; AMUSEMENT AND EXERCISING DEVICES; ANIMAL HUSBANDRY; SPORTING GOODS; TOBACCO PRODUCTS AND MANUFACTURING EQUIPMENT; AND PRINTING, GROUP 3300—J.J. LOVE, Director | 308-0858 | 12/05/94 |
| SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400—DONALD G. KELLY, Director | 308-0861 | 11/03/94 |
| GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500—A.L. SMITH, Director | 308-1021 | 07/26/94 |

*A communication from the examiner should have been received in most applications filed prior to this date.

Patents will Expire as Follows:
(1) The term of any utility or plant patent that is in force on or results from an application filed before June 8, 1995 is the greater of the 20 year term provided in 35 U.S.C. 154(a)(2) or 17 years from grant subject to any terminal disclaimers. 35 U.S.C. 154(c)(1).
(2) All utility and plant patents granted on applications having an actual United States filing date on or after June 8, 1995 are granted for a term which begins on the date on which the patent is granted and ends 20 years from the date on which the application was filed in the United States. If the application contains a specific reference to an earlier application under 35 U.S.C. 120, 121 or 365(c), the patent term ends twenty years from that date on which the earliest application was filed. 35 U.S.C. 154(a)(2).
(3) All design patents are granted for a term of 14 years from the date of the grant.
However, the term of any patent may have been curtailed by disclaimer under the provisions of 35 U.S.C. 153, have lapsed due to failure to pay maintenance fees, or have been extended under the provisions of 35 U.S.C. 154, 155, or 156. Thus, if more reliable information is needed with respect to a particular patent, then the specific patent file should be reviewed to determine the actual date of patent expiration.

## TRADEMARK OPERATION

**Bruce A. Lehman, Commissioner**
**Philip G. Hampton, II, Assistant Commissioner**
**Robert M. Anderson, Deputy Assistant Commissioner**
**David E. Bucher, Director, Trademark Examining Office**
**Condition of Trademark Applications as of February 1, 1996**

| Law Office | Oldest Date New* | Oldest Date Amendment Filed |
|---|---|---|
| Law Office 101—Ron Sussman, Acting Managing Attorney, (703) 308–9101—4th Floor<br>Foods, Beverages, Wines & Spirits—Int. Classes 29, 30, 31, 32, 33<br>Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 06/28/95 | 11/03/95 |
| Law Office 102—Myra Kurzbard, Managing Attorney, (703) 308–9102—5th Floor<br>Scientific Equipment & Furniture—Int. Classes 9, 20<br>Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 08/11/95 | 10/03/95 |
| Law Office 103—Kathryn Erskine, Managing Attorney, (703) 308–9103—5th Floor<br>Scientific Equipment & Furniture—Int. Classes 9, 20<br>Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 07/25/95 | 01/04/96 |
| Law Office 104—Sidney Moskowitz, Managing Attorney, (703) 308–9104—6th Floor<br>Unwrought metals, Industrial Equipment, Tools, Installation, Vehicles, Firearms, Musical Instruments, Building Materials & Floor Coverings—Int. Classes 6, 7, 8, 11, 12, 13, 15, 19, 27 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 07/10/95 | 11/20/95 |
| Law Office 105—Thomas Howell, Managing Attorney, (703) 308–9105—6th Floor<br>Chemicals, Paints, Lubricants, Pharmaceuticals, Medical Apparatus & Tobacco—Int. Classes 1, 2, 4, 5, 10, 34 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 08/17/95 | 08/31/95 |
| Law Office 106—Mary Sparrow, Managing Attorney, (703) 308–9106—7th Floor<br>Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 08/11/95 | 07/25/95 |
| Law Office 107—Thomas Lasmoe, Managing Attorney, (703) 308–9107—7th Floor<br>Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 08/11/95 | 10/18/95 |
| Law Office 108—David Shallant, Managing Attorney, (703) 308–9108—8th Floor<br>Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26<br>Services–Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 08/18/95 | 10/25/95 |
| Law Office 109—Deborah Cohn, Managing Attorney, (703) 308–9109—8th Floor<br>Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26<br>Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 09/18/95 | 11/15/95 |
| **Collective Marks—Class 200<br>**Certification Marks—Classes A & B | | |
| Office of Trademark Services—John Walker, Director, (703) 308-9100<br>Trademark Assistance Center—(703) 308-9000<br>Pre-Examination—Alan Lambert, Supervisor, (703) 308-9401 ext. 188<br>Intent-To-Use—(ITU)—(703) 308-9500<br>Post Registration Section—Mary Bowman, Supervisor, (703) 308-9500 ext. 126 | | |
| Affidavits Under Sections 8 & 15 (All Classes) | 06/05/95 | —0— |
| Renewals (All Classes) | 10/20/95 | —0— |
| Section 12(c) Publications (All Classes) | 08/14/95 | —0— |

1. ** Assigned to all Law Office

2. Applicants with inquiries concerning the status of their applications and a touch telephone should call (703) 305–8747 through (703) 305-9752 from 6:30 a.m. to Midnight EST, Monday through Friday. This automated voice system will provide the current status of your application. Applicants are urged not to file unnecessary inquiries concerning the status of their applications. See SECTION 411 of the TRADEMARK MANUAL OF EXAMINING PROCEDURE.

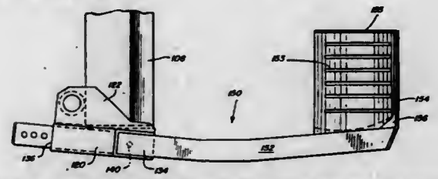
3. * These dates identify the oldest unassigned new case in each Law Office. All cases with earlier dates have either been examined and made the subject of an action or are currently being worked on by the assigned examining attorney.

# REEXAMINATIONS

## MARCH 12, 1996

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

**B1 4,637,623 (2810th)**
**TOWING APPARATUS**
**Leslie Bublik, Ontario, Canada, assignor to Vulcan International, Inc., Jackson, Miss.**
**Reexamination Request No. 90/003,709, Feb. 1, 1995.**
**Reexamination Certificate for Patent 4,637,623, issued Jan. 20, 1987, Ser. No. 752,980, Jul. 8, 1985.**
**Int. Cl.[6] B60P *3/12***
**U.S. Cl. 280—402**



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:
The patentability of claims 9–14 is confirmed.
Claims 1–4, 7 and 8 are determined to be patentable as amended.
Claims 5 and 6, dependent on an amended claim, are determined to be patentable.
New claims 15–22 are added and determined to be patentable.

1. An apparatus for use in lifting and towing a vehicle, comprising:
a support beam positionable below said vehicle;
two wheel support members, each having an elongated arm and a wheel retainer; and
means for mounting said wheel support members to opposing end portions of said support beam such that said arms are in a generally horizontal orientation and for generally horizontally rotating said wheel support members from a laterally remote position spaced outwardly from the sides of the vehicle to a vehicle lifting position immediately adjacent to the outer sides of a pair of wheels on said vehicle, *said mounting means also permitting forward and rearward adjustment of said wheel support members relative to said support beam.*

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**B1 4,701,267 (2811th)**
**METHOD FOR REMOVING LEUKOCYTES**
**Hiroyuki Watanabe, and Hiroshi Rikumaru, both of Oita, Japan, assignors to Asahi Medical Co., Ltd., Tokyo, Japan**
**Reexamination Request No. 90/003,726, Feb. 16, 1995.**
**Reexamination Certificate for Patent 4,701,267, issued Oct. 20, 1987, Ser. No. 711,667, Mar. 14, 1985.**
**Claims priority, application Japan, Mar. 15, 1984, 59-48173; Mar. 27, 1984, 59-57450**
**Int. Cl.[6] B01D *27/02;36/02;39/02;* A61M *37/00***
**U.S. Cl. 604—5**



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:
The patentability of claims 1–2 is confirmed.
New claims 3–6 are added and determined to be patentable.

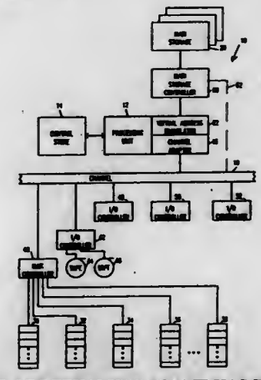
1. A method for removing leukocytes from a leukocyte-containing suspension, comprising the steps of:
passing a leukocyte-containing suspension through a filter unit which comprises:
a container having at least one inlet conduit means and at least one outlet conduit means; and
a main filter packed therein in the form of a non-woven fabrics, said fabrics comprising fibers wherein the average daimeter of all of the fibers in said fabrics is from 0.3 μm to less than 3 μm and said fabric having a bulk density of from 0.01 g/cm$^3$ to 0.7 g/cm$^3$, and wherein the average distance between any two of all adjacent fibers throughout said fabric is 0.5 μm to 7.0 μm and is defined by the following equation (1):

$$y = x\left(\sqrt{\frac{\pi}{2\sqrt{3}}}\cdot\sqrt{\frac{\rho}{D}} - 1\right) \quad (1)$$

wherein y is the average distance between two adjacent fibers in microns; x is the average diameter of fibers in microns; ρ is the density of the fibers in g/cm$^3$; D is the bulk density of the filter in g/cm$^3$; and π is a circular constant; and
obtaining a leukocyte-poor liquid.

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**B1 4,761,785 (2812th)**
**PARITY SPREADING TO ENHANCE STORAGE ACCESS**
**Brian E. Clark, Rochester, Minn.; Francis D. Lawlor, Saugerties; Werner E. Schmidt-Stumpf, Patterson, both of N.Y.; Terrence J. Stewart, and George D. Timms, Jr., both of Rochester, Minn., assignors to International Business Machines Corp., Armonk, N.Y.**
**Reexamination Request No. 90/003,210, Oct. 1, 1993.**
**Reexamination Certificate for Patent 4,761,785, issued Aug. 2, 1988, Ser. No. 873,249, Jun. 12, 1986.**
**Int. Cl.[6] G11C *29/00***
**U.S. Cl. 371—51.1**



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:
The patentability of claims 1–22 is confirmed.

1. A data protection mechanism for a computer system having multiple independently accessible storage devices which store blocks of data, the data protection mechanism comprising:
generator means for generating parity blocks as a function of sets of data blocks, said data blocks in a set corresponding to one parity block being stored on different storage devices;

storage management means for managing the storage of data blocks and parity blocks onto the storage devices; and

spreading means coupled to the storage management means for identifying a storage device to the storage management means on which each parity block is to be stored such that no one storage device contains the parity blocks for all of the groups of data blocks.

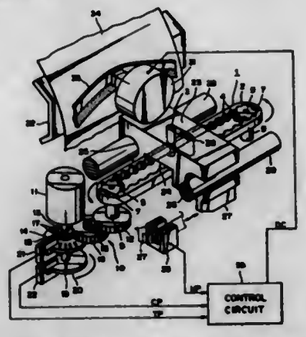
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**B1 5,158,379 (2813th)**

**PRINTING STARTING POSITION CONTROLLER FOR SERIAL PRINTER**

**Mikio Moriya, Saitama, and Junichi Furukawa, Tokyo, both of, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan**

**Reexamination Request No. 90/003,643, Nov. 25, 1994.**
**Reexamination Certificate for Patent 5,158,379, issued Oct. 27, 1992, Ser. No. 557,083, Jul. 19, 1990.**
**Continuation-in-part of Ser. No. 307,285, Feb. 7, 1989, abandoned.**
**Claims priority, application Japan, Feb. 9, 1988, 63-26585**
**Int. Cl.[6] B41J *21/16***
**U.S. Cl. 400—279**




AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim 1 is determined to be patentable as amended.

Claim 2, dependent on an amended claim, is determined to be patentable.

1. A printing controller for a serial printer wherein a carriage having a printing head is reciprocated by a motor via a transmitting means, which includes:

a carriage position detector, including a projection fixed to the carriage and a photo-interrupter provided on a moving locus of said projection at a home position of the carriage, for producing a position detection signal having a first signal level when the carriage is at the home position and a second signal level when the carriage is not at the home position;

a timing signal generator, including a timing disc having plural slits formed at equiangular intervals in its circumferential direction and being fixed to a driving shaft of the motor which rotates in a first direction for moving the carriage in a line direction and a photo-interrupter provided in association with said timing disc, for producing a timing signal containing timing pulses denoting the rotational position of the motor synchronously with the movement of said carraige in the line direction;

a synchronizing signal generator, including a synchronizing disc having one slit and being fixed to the driving shaft of the motor and spaced away from said timing disc in its axial direction and a photo-interrupter provided in association with said synchronizing disc, for producing a synchronizing signal containing one synchronizing pulse per each predetermined plurality of timing pulses synchronously with said timing signal, and

a microcomputer control circuit, including an input/output interface and a memory and a central processor unit, for receiving the position detection signal, the timing signal and the synchronization signal, and for executing a timer indexing processing program in which operational steps are performed every preselected time period and in which a printing initiation signal for initiating a printing operation is generated upon receiving in succession a *first* synchronizing pulse and then a *next* timing pulse after the position detection signal has changed from the first level to the second level, *wherein the printing initiation signal is generated upon receiving said first synchronizing pulse and said next time pulse regardless of a number of timing pulses generated between a time when the position detection signal has changed from the first level to the second level and a time when the first synchronizing pulse is generated.*

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**B1 5,190,568 (2814th)**

**ABRASIVE TOOL WITH CONTOURED SURFACE**

**Naum N. Tselesin, Atlanta, Ga., assignor to Ultimate Abrasive Systems, Inc., Atlanta, Ga.**

**Reexamination Request No. 90/003,407, Apr. 18, 1994.**
**Reexamination Certificate for Patent 5,190,568, issued Mar. 2, 1993, Ser. No. 741,678, Aug. 7, 1991.**
**Continuation-in-part of Ser. No. 712,989, Jun. 10, 1991, and a continuation-in-part of Ser. No. 467,958, Jan. 22, 1990, Pat. No. 5,049,165, which is a continuation-in-part of Ser. No. 303,924, Jan. 30, 1989, Pat. No. 4,925,457.**
**Int. Cl.[6] B24D *3/00;17/00;18/00***
**U.S. Cl. 51—293**



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 2, 14 and 18 are cancelled.

Claims 1, 3–13 and 15–17 are determined to be patentable as amended.

New claims 19–23 are added and determined to be patentable.

1. An abrasive material for grinding or polishing, said abrasive material comprising *a plurality of hard particles*, a carrier for receiving [a] *said* plurality of hard particles, and [means] *a sintered matrix material* for holding said hard particles to said carrier, *said sintered matrix material at least partially surrounding said hard particles and being formed from a sinterable matrix material*, said carrier being contoured for defining *a contoured working surface having* a plurality of peaks which are in contact with a surface being ground, and a plurality of valleys *between said peaks* which are spaced from said surface being ground, said plurality of hard particles *being arranged in a pattern and* substantially uniformly covering *said contoured working surface, said contoured working surface covering* at least a portion of *a surface of* said carrier *that faces the surface being ground*, said portion including both [some of] said peaks and contiguous ones of said valleys, the arrangement being such that said hard particles are adjacent to one another so that said particles laterally support one another *through said sintered matrix material, wherein said hard particles, sinterable matrix material and said carrier are simultaneously shaped, compacted and sintered under pressure to form said abrasive material having said contoured working surface.*



**B1 5,288,887 (2815th)**

**DIAMINE PLATINUM(IV) COMPLEXES HAVING MIXED CARBOXYLATE LIGANDS AS ANTITUMOR AGENTS**

**Abdul R. Khokhar; Zahid H. Siddik, and Salaam Al-Baker, all of Houston, Tex., assignors to Board of Reagents, The University of Texas System, Austin, Tex.**

**Reexamination Request No. 90/003,725, Feb. 15, 1995.**
**Reexamination Certificate for Patent 5,288,887, issued Feb. 22, 1994, Ser. No. 978,788, Nov. 19, 1992.**
**Continuation-in-part of Ser. No. 927,701, Aug. 7, 1992, which is a continuation-in-part of Ser. No. 624,795, Dec. 7, 1990, abandoned, which is a division of Ser. No. 274,824, Nov. 22, 1988, Pat. No. 5,041,578.**
**Int. Cl.[6] C07F *15/00*; A61K *31/28***
**U.S. Cl. 556—137**

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–12 are cancelled.

[

1. A platinum(IV) complex having the formula



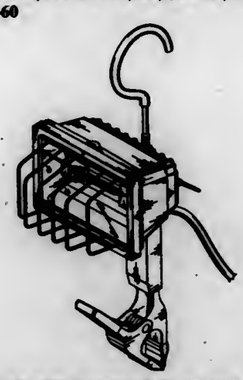

or a stereoisomer thereof, where $X^1$ and $X^2$ are carboxylato or are jointly dicarboxylato, where $Y^1$ and $Y^2$ are carboxylato, and where Z is a bidentate ligand selected from the group consisting of diaminocyclohexane and ethylenediamine.]

**B1 Des. 348,743 (2809th)**

**HALOGEN CLAMP LAMP**

**Monte A. Leen, Bellevue, Wash., and Frank T. Wen-Chung, Yung Her City, Taiwan, Prov. of China, assignors to Leen & Associates, Inc., Bellevue, Wash.**

**Reexamination Request No. 90/003,917, Aug. 7, 1995.**
**Reexamination Certificate for Patent Des. 348,743, issued Jul. 12, 1994, Ser. No. 10,080, Jun. 28, 1993.**
**U.S. Cl. D26—60**



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim 1 is confirmed.

1. The ornamental design for a halogen clamp lamp, as shown and described.

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

## Re. 35,172

## PULSED PISTON-COMPRESSOR JET ENGINE

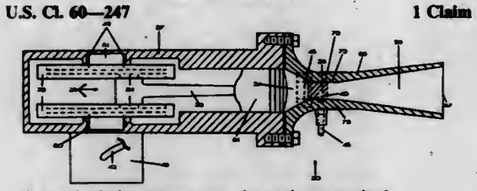

Barre A. M. Clark, P.O. Box 5008, Mammoth Lakes, Calif. 93546



Original No. 5,361,581, dated Nov. 8, 1994, Ser. No. 51,026, Apr. 21, 1993. Application for reissue Jan. 17, 1995, Ser. No. 375,381

Int. Cl.[6] F02K *5/02*

U.S. Cl. 60—247 1 Claim

1. A pulsed piston-compressor jet engine comprised

a. an engine cylinder having two ends [and attached at one of said two ends to a cylinder head],

b. a piston fitted inside said cylinder in a manner allowing said piston to reciprocate [towards and away from said cylinder head] *between said two ends,*

c. said cylinder [head] including a jet nozzle operatively coupled thereto, said jet nozzle having an inner surface and including a nozzle outlet opening [directly] into the atmosphere, said cylinder [head] also including a pressure-actuated nozzle valve having an opened position and a closed position, and which, when in said closed position, closes said jet nozzle between said piston and said nozzle outlet in a substantially sealing manner for a compression of a supply of air,

d. a combustion chamber including a space between said piston and said nozzle valve's closed position,

e. said pressure-actuated nozzle valve having a valve face defining [one] *a* surface of said nozzle valve, said valve face comprising part of said inner surface of said jet nozzle when said nozzle valve is in said opened position, leaving said jet nozzle [substantially unobstructed] *without a substantially detrimental obstruction,* a portion of said valve face facing part of said combustion chamber and *at least partially* blocking [in part] said jet nozzle when said nozzle valve is in said closed position, said nozzle valve having a closing means providing closing forces to move said nozzle valve to said closed position whenever pressures from a combustion within said combustion chamber drop below a [predetermined value] *certain amount,* [said closing means also holding said nozzle valve in said closed position with a holding force adequate to keep said nozzle valve in said closed position during said compression of said supply of air,] said combustion in said combustion chamber generating pressures against said portion of said valve face facing part of said combustion chamber to produce opening forces on said nozzle valve, [said opening forces overcoming said holding force and said closing forces, allowing] *causing* said nozzle valve to retract to said opened position, whereby a gas jet is released substantially unhindered through said jet nozzle into the atmosphere due to a direct action of said combustion on said nozzle valve,

f. means to provide said supply of air into said combustion chamber,

g. means to provide a supply of fuel into said combustion chamber,

h. means to move said piston toward said [cylinder head] *jet nozzle,* causing said compression of said supply of air within said combustion chamber when said nozzle valve is closed,

i. means to cause ignition of said supply of air and said supply of fuel within said combustion chamber after said compression of said supply of air, said ignition means causing said combustion which, in turn, causes said nozzle valve to open and said piston to move away from said [cylinder head] *jet nozzle, and*

j. [means to keep said nozzle valve closed during operation of engine when desired, and k.] means to impart reactive force of said gas jet to said pulsed piston-compressor jet engine, whereby a useful thrust is obtained.

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## Re. 35,173

## CAT SCRATCHING POST FEEDER

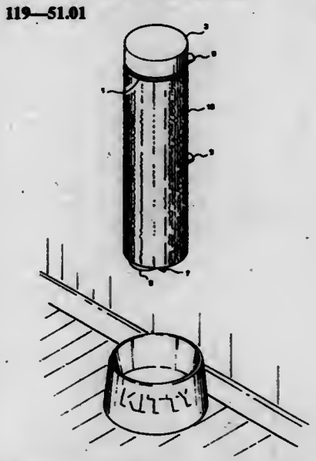

Robert J. Delzio, 9733 Caminito Doha, San Diego, Calif. 92131



Original No. 5,113,795, dated May 19, 1992, Ser. No. 680,933, Apr. 5, 1991. Continuation-in-part of Ser. No. 549,921, Jul. 9, 1990, abandoned. Application for reissue Mar. 15, 1994, Ser. No. 212,988

Int. Cl.[6] A01K *1/10*

U.S. Cl. 119—51.01 12 Claims

1. A [cat] scratching post feeder comprising a wall mountable [dry food fillable inner cylinder] *first shell able to receive food* with a [spring-loaded hinged] *tension-loaded* [lower lid] *door,* [a steel support rod attached to the bottom of *at least one projection protruding from* the lower lid] *door,* and a [carpeted outer cylinder] *second shell with a surface that cats like to scratch* that slides over the [inner cylinder] *first shell* and rests upon the [steel support rod] *at least one projection* thereby creating a dual function device, [cat] scratcher and [pet-activated] feeder, which will dispense [dry cat] food whenever [a cat exerts] downward force *is exerted* on the [support rod] *at least one projection* by scratching the [carpeted outer cylinder] *second shell with a surface that cats like to scratch.*

Re. 35,174

## TOOL SHAFT FOR A TOOL OF THE PERCUSSIVE AND ROTATIVE TYPE

**Karl Wanner, Leinfelden-Echterdingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany**

**PCT No. PCT/DE88/00260, § 371 Date Nov. 20, 1989, § 102(e) Date Nov. 20, 1989, PCT Pub. No. WO88/09245, PCT Pub. Date Dec. 1, 1988**

**Original No. 5,028,057, dated Jul. 2, 1991, Ser. No. 444,150, May 3, 1988. This PCT application May 3, 1988, Ser. No. 87,170**

**Claims priority, application Germany, May 20, 1987, 3716915**

**Int. Cl.[6] B23B** *31/22;51/02*

**U.S. Cl. 279—19.3** **39 Claims**



1. In a device on a hand machine tool for transmitting torque to a percussion and drilling tool having a tool shaft with an end engaged in a tool receptacle of said hand machine tool, in which at least two rotary driving grooves which open out at said end of said tool shaft and in which a plurality of strip-shaped rotary drivers of said tool receptacle engage in said rotary driving grooves and have respective assigned flanks, which are at least approximately planar, and in which at least one locking body is located in said tool receptacle and cooperate with two recesses in said tool shaft which are closed on both ends and are located diametrically opposite one another, said tool receptacle having a receptacle bore hole, the improvement wherein said rotary drivers assigned to said rotary driving grooves in said tool shaft are distributed around said receptacle bore hole circumferentially in such a way that two rotary drivers are never located diametrically opposite one another.

*28. A tool having a tool shaft with an end and having at least two rotary driving grooves which open out at said end of said tool shaft and in which said rotary driving grooves have respective assigned flanks, which are at least approximately planar, said tool shaft having two recesses in said tool shaft which are closed on both ends and are located diametrically opposite one another, and said rotary driving grooves in said tool shaft distributed around said tool shaft in such a way that two rotary driving grooves are never located diametrically opposite one another.*

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Re. 35,175

## TAPE PRINTING DEVICE HAVING TAPE CUT POSITION REGULATOR

**Koshiro Yamaguchi, Kasugai, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan**

**Original No. 5,131,772, dated Jul. 21, 1992, Ser. No. 757,010, Sep. 9, 1991. Application for reissue Jul. 20, 1994, Ser. No. 278,078**

**Claims priority, application Japan, Sep. 12, 1990, 2-242259**

**Int. Cl.[6] B41J** *11/26*

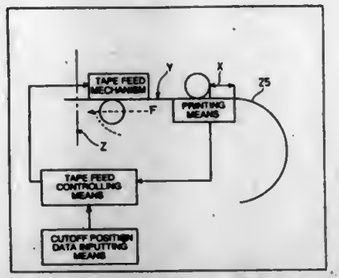
**U.S. Cl. 400—621** **31 Claims**

*25. A tape printing device including:*

*a tape feed mechanism for feeding an elongated tape-like print medium;*

*printing means for printing the tape-like print medium, the printing means providing a print start position;*

*tape cutting means positioned downstream of the printing means with respect to movement of the tape-like print medium for cutting the tape-like print medium, the tape cutting means*




*providing a predetermined tape cutoff execution position at which the tape-like print medium is subjected to cutting;*

*cutoff position data inputting means for inputting a cutoff position with respect to a position in which the tape-like print medium is printed; and*

*tape feed controlling means for controlling the tape feed mechanism to feed the tape-like print medium so that the input cutoff position will reach the tape cutoff execution position.*

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Re. 35,176

## SELF-VENTING BALLOON DILATATION CATHETER AND METHOD

**Philip E. Powell, Palo Alto, Calif., assignor to Advanced Cardiovascular Systems, Inc., Santa Clara, Calif.**

**Original No. 4,638,805, dated Jan. 27, 1987, Ser. No. 760,637, Jul. 30, 1985. Continuation of Ser. No. 303,384, Jan. 27, 1989, abandoned. Application for reissue Jan. 20, 1992, Ser. No. 827,541**

**Int. Cl.[6] A61M** *29/00*

**U.S. Cl. 604—96** **24 Claims**



*11. A self-venting vascular comprising:*

*a) a flexible tubular member having at least one inner lumen extending therethrough to an interior portion of the catheter with means to receive liquid under pressure;*

*b) a venting means with a flow restrictive passageway having a transverse cross-sectional dimension less than about 0.001 inch extending from the interior portion of the catheter to ambient which allows air but no substantial amount of liquid to pass therethrough* while a pressure in excess of **100** psi is maintained in the interior of the catheter.

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Re. 35,177

## N-FLUOROPYRIDINIUM SALT AND PROCESS FOR PREPARING SAME

**Teruo Umemoto; Kyoichi Tomita, both of Sagamihara; Kosuke Kawada, Tokyo, and Ginjiro Tomizawa, Wako, all of, Japan, assignors to Sagami Chemical Research Center, and Chichibu Onoda Cement Corporation, both of Tokyo, Japan**

**Original No. 4,996,320, dated Feb. 26, 1991, Ser. No. 296,411, Jan. 9, 1989. Continuation of Ser. No. 22,275, Mar. 5, 1987, abandoned, which is a continuation-in-part of Ser. No. 870,010, Jun. 3, 1986, abandoned. Application for reissue Feb. 17, 1994, Ser. No. 197,711**

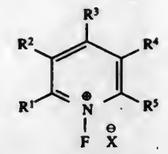
**Claims priority, application Japan, Jun. 3, 1985, 60-118882; Mar. 7, 1986, 61-48450**

**Int. Cl.[6] C07F** *9/58;* **C07D** *491/048;213/55;219/04*

**U.S. Cl. 546—9** **5 Claims**

1. A N-fluoropyridinium salt having the general formula:





wherein:

(a) $R^1$ through $R^5$ are each a group selected from the class consisting of hydrogen, halogen, and methyl;

(b) when at least two of each of $R^1$ through $R^5$ are hydrogen, then the remaining one through three groups of $R^1$ through $R^5$ can each be selected from the class consisting of:

phenylcarbonyloxy substituted methyl,

a mixture of at least one fluoro substituted methyl group and at least one group selected from the class consisting of methyl, trifluoromethyl and halogen, and

tertiary butyl or a mixture of methyl and t-butyl provided that, when at least two of each of $R^1$ through $R^5$ are tertiary butyl, said tertiary butyl groups are not adjacent;

(c) when at least three of each of $R^1$ through $R^5$ are hydrogen, then the remaining one or two groups of $R^1$ through $R^5$ can each be selected from the class consisting of:

phenyl,

acetyl,

alkoxycarbonyl containing a total of 2 through 5 carbon atoms wherein said aklyl substitute contains a total of 1 through 4 carbon atoms,

nitro

cyano,

alkoxy containing 1 through 10 carbon atoms, and acyloxy wherein said acyl group contains 1 through 4 carbon atoms;

(d) when $R^5$ is hydrogen, then $R^1$ and $R^2$ taken together and $R^4$ and $R^5$ taken together can each form a six-membered carbocyclic ring which is inclusive of two adjacent carbon atoms of the pyridine ring; [and] *or*

(e) when $R^3$ and $R^5$ are each hydrogen, then $R^1$ and $R^2$ taken together can form a five-membered heterocyclic ring which contains one oxygen atom, which is inclusive of two carbon atoms of the pyridine ring, and which has an oxo oxygen atom substituted on each ring carbon atom adjacent said ring oxy oxygen atom; and

(f) X is a conjugate base of a [Brøsted] *Brønsted* acid except for halides, *provided that said N-fluoropyridinium salt is not N-fluoropyridinium hexafluoroantimonate, N-fluoropyridinium hexafluoroarsenate, or N-fluoropyridinium hexafluoroiodate.*

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Re. 35,178

## CYCLIC AMINOALKYLSILANES AND THEIR USE AS ADHESION PROMOTERS IN ROOM TEMPERATURE VULCANIZABLE POLYDIORGANOSILOXANE COMPOSITIONS

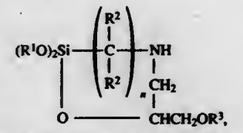
**Judith Stein, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Original No. 4,794,192, dated Dec. 27, 1988, Ser. No. 70,809, Jul. 6, 1987. Application for reissue Jan. 23, 1995, Ser. No. 376,996**

**Int. Cl.[6] C07F** *7/10*

**U.S. Cl. 556—408** **4 Claims**

1. A composition comprising cyclic aminoalkylsilanes having the formula



(I)

wherein $R^1$ is $C_{1-8}$ alkyl, each $R^2$ is independently hydrogen or $C_{1-4}$ primary or secondary alkyl, $R^3$ is methyl or ethyl and n is 2 or 3.

# PLANT PATENTS

## GRANTED MARCH 12, 1996

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

**9,468**

**SHRUB ROSE PLANT NAMED 'MEIROZRUG'**

**Alain A. Meilland, Antibes, France, assignor to The Conard-Pyle Company, West Grove, Pa.**

**Filed Jun. 28, 1995, Ser. No. 495,843**

**Int. Cl.[6] A01H *5/00***

**U.S. Cl. Plt.—1** **1 Claim**

1. A new and distinct variety of Shrub rose plant characterized by the following combination of characteristics:
(a) forms continuously substantially throughout the season attractive blossoms which are Rose Bengal in coloration,
(b) grows well on its own roots,
(c) is well suited for growing in the landscape, and
(d) exhibits very good disease resistance;
substantially as herein shown and described.

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**9,469**

**SHRUB ROSE PLANT NAMED 'MEIBONRIB'**

**Alain A. Meilland, Antibes, France, assignor to The Conard-Pyle Company, West Grove, Pa.**

**Filed Jun. 28, 1995, Ser. No. 496,160**

**Int. Cl.[6] A01H *5/00***

**U.S. Cl. Plt.—1** **1 Claim**

1. A new and distinct variety of Shrub rose plant characterized by the following combination of characteristics:
(a) forms on an abundant basis substantially throughout the season attractive large double blossoms that are Magenta Pink in coloration,
(b) forms attractive dark green glossy foliage,
(c) creeps as a ground cover and is well suited for growing in the landscape, and
(d) exhibits very good disease resistance;
substantially as herein shown and described.

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**9,470**

**PEACH TREE 'SNOW FIRE'**

**Chris F. Zaiger, 929 Grimes Ave.; Leith M. Gardner, 1207 Grimes Ave.; Gary N. Zaiger, 1907 Elm Ave., and Grant G. Zaiger, 4005 California Ave., all of Modesto, Calif. 95358**

**Filed Mar. 17, 1995, Ser. No. 406,133**

**Int. Cl.[6] A01H *5/00***

**U.S. Cl. Plt.—42.1** **1 Claim**

1. A new and distinct variety of peach tree, substantially as illustrated and described, characterized by its large size, vigorous upright growth and by being a regular and productive bearer of large, firm, white flesh, freestone fruit with excellent flavor and eating quality; the fruit is further characterized by having an attractive red skin color, having good handling and shipping quality and in comparison to Giant Babcock Peach (U.S. Plant Pat. No. 1,353) the fruit has firmer flesh, greater red skin color and is approximately 3 weeks later in maturity.

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**9,471**

**CHRYSANTHEMUM PLANT NAMED 'CHASICA'**

**Jean-Pierre Challet, Lafayette, Calif., assignor to Selection New Plant Sarl, Le Cannet des Maures, France**

**Filed Jul. 12, 1994, Ser. No. 274,000**

**Int. Cl.[6] A01H *5/00***

**U.S. Cl. Plt.—76** **1 Claim**

1. A new and distinct cultivar of Chrysanthemum plant named 'Chasica', substantially as herein shown and described, which
(a) exhibits attractive double very large incurved pompom blossoms that are deep red-bronze on the inside and golden-bronze on the outside.
(b) exhibits a flower response period of approximately nine and one-half weeks.
(c) forms attractive green foliage,
(d) achieves a short plant height, and
(e) is particularly suited for pot mum production on a recurrent basis throughout the year.

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**9,472**

**CHRYSANTHEMUM PLANT NAMED 'CHAHALU'**

**Jean-Pierre Challet, Lafayette, Calif., assignor to Selection New Plant Sarl, Le Cannet des Maures**

**Filed Jul. 12, 1994, Ser. No. 273,996**

**Int. Cl.[6] A01H *5/00***

**U.S. Cl. Plt.—78** **1 Claim**

1. A new and distinct cultivar of Chrysanthemum plant named 'Chahalu', substantially as herein shown and described, which
(a) exhibits attractive large double incurved pompon blossoms that are lemon yellow in coloration,
(b) exhibits a flower response period of approximately nine weeks,
(c) forms attractive dark green glossy foliage,
(d) achieves a short to medium plant height, and
(e) is particularly suited for pot mum production on a recurrent basis throughout the year.

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**9,473**

**CHRYSANTHEMUM PLANT NAMED 'CHAPRILA'**

**Jean-Pierre Challet, Lafayette, Calif., assignor to Selection New Plant Sarl, Le Cannet des Maures, France**

**Filed Jul. 12, 1994, Ser. No. 274,001**

**Int. Cl.[6] A01H *5/00***

**U.S. Cl. Plt.—82.2** **1 Claim**

1. A new and distinct cultivar of Chrysanthemum plant named 'Chaprila', substantially as herein shown and described, which
(a) exhibits in profusion attractive large golden yellow anemone blossoms,
(b) exhibits a flower response period of approximately eight weeks,
(c) is highly amenable to branching by pinching,
(d) achieves a short plant height, and
(e) is particularly suited for pot mum production on a recurrent basis throughout the year.

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**9,474**

**POINSETTIA PLANT NAMED 'NOBELSTAR'**

**Eva Dahlqvist-Olsson, Malmoe, Sweden, assignor to Florfis AG, Binningen, Sweden**

**Filed Dec. 19, 1994, Ser. No. 358,881**

**Int. Cl.[6] A01H *5/00***

**U.S. Cl. Plt.—86.4** **1 Claim**

1. A new and distinct poinsettia plant named Nobelstar, as illustrated and described.

9,475

**BROMELIAD PLANT NAMED 'GUZ 211'**

Jeffrey C. Kent, Vista, Calif., assignor to Kent's Bromeliad Nursery, Inc., Vista, Calif.

Filed Oct. 19, 1994, Ser. No. 323,726
Int. Cl.[6] A01H 5/00
U.S. Cl. Plt.—88.8 1 Claim

1. A new and distinct Guzmania plant, named 'Guz 211', as illustrated and described, particularly distinguished by having a more extensively colored spike and by having inflorescence coloration made up of an unusual carmine interestingly suffused with rose.

9,476

**BROMELIAD PLANT NAMED 'GUZ 214'**

Jeffrey C. Kent, Vista, Calif., assignor to Kent's Bromeliad Nursery, Inc., Vista, Calif.

Filed Dec. 27, 1994, Ser. No. 364,596
Int. Cl.[6] A01H 5/00
U.S. Cl. Plt.—88.8 1 Claim

1. A new and distinct Bromelioad plant, substantially as herein shown and described, characterised particularly as to novelty, by the strong amaranth color of the bracts, the long lasting color of the bracts which characteristically lasts for periods up to three months and the striking white variegation of the leaves.

# PATENTS

## GRANTED MAR. 12, 1996

### ERRATA

| For CLASS | See PATENT NO. |
|---|---|
| 043–012 | 5,497,580 |
| 043–042 | 5,497,581 |
| 043–044 | 5,497,582 |
| 108–023 | 5,497,706 |
| 223–074 | 5,497,908 |
| 297–016 | 5,498,054 |
| 297–068 | 5,498,055 |
| 415–173 | 5,498,193 |
| 415–173 | 5,498,193 |
| 477–110 | 5,498,195 |
| 216–020 | 5,498,311 |
| 204–452 | 5,498,324 |
| 252–108 | 5,498,343 |
| 252–404 | 5,498,344 |
| 252–589 | 5,498,345 |
| 419–028 | 5,498,393 |
| 435–007 | 5,498,499 |
| 424–195 | 5,498,637 |
| 422–223 | 5,498,756 |
| 426–520 | 5,498,757 |
| 426–520 | 5,498,757 |
| 427–255 | 5,498,758 |
| 427–353 | 5,498,759 |
| 427–452 | 5,498,760 |
| 427–542 | 5,498,761 |
| 428–001 | 5,498,762 |
| 428–229 | 5,498,763 |
| 429–218 | 5,498,764 |
| 430–323 | 5,498,765 |
| 435–009 | 5,498,766 |
| 437–008 | 5,498,767 |
| 437–192 | 5,498,768 |
| 430–327 | 5,498,769 |
| 502–116 | 5,498,770 |
| 505–210 | 5,498,771 |
| 502–216 | 5,498,772 |

## ERRATA–CONTINUED

| For CLASS | See PATENT NO. |
|---|---|
| 504–103 | 5,498,773 |
| 504–246 | 5,498,774 |
| 514–025 | 5,498,775 |
| 514–183 | 5,498,776 |
| 514–206 | 5,498,777 |
| 514–309 | 5,498,778 |
| 514–309 | 5,498,778 |
| 514–309 | 5,498,779 |
| 514–428 | 5,498,780 |
| 514–492 | 5,498,781 |
| 523–213 | 5,498,782 |
| 525–126 | 5,498,783 |
| 525–162 | 5,498,790 |
| 562–581 | 5,498,719 |
| 548–230 | 5,498,784 |
| 528–337 | 5,498,795 |
| 562–474 | 5,498,819 |
| 514–261 | 5,499,922 |
| 514–261 | 5,499,234 |
| 365–189 | 5,499,263 |
| 320–005 | |

# PATENTS

GRANTED MARCH 12, 1996

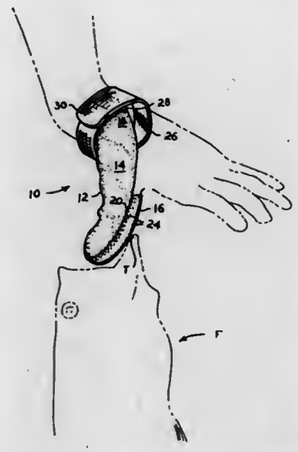
## GENERAL AND MECHANICAL

**5,497,510**

### THUMB PROTECTOR FOR FISHING AND METHOD OF GRIPPING SPORT FISH

Charles E. Knowles, and Karen Knowles, both of 1014 Cabbott La., Richland, Miss. 39218

Filed Mar. 4, 1994, Ser. No. 205,561
Int. Cl.[6] A41D *19/00;13/10*
U.S. Cl. 2—21 8 Claims




1. A thumb protector for fishing, providing for the support and carriage of a fish by teeth of the fish and further providing protection from injury from the fish teeth for a thumb of a wearer of said thumb protector, said thumb protector consisting essentially of:

a thumb enclosure portion including a back surface completely covering the back of a thumb of the wearer thereof and extending from the tip of the thumb to a wrist attachment end terminating at a wrist of a wearer thereof, and a front surface covering the pad of the thumb and extending from the tip of the thumb over the first two joints of the thumb, with said back surface and said front surface having joined common edges to form a protective pocket therebetween for the thumb of the wearer thereof, and;

said back surface of said thumb enclosure portion being formed of a flexible material providing freedom of movement for the thumb of the wearer of said thumb enclosure portion, and said front surface being formed of a material resistant to penetration by the teeth of a fish and further including means providing for direct engagement of the teeth of a fish therewith, whereby;

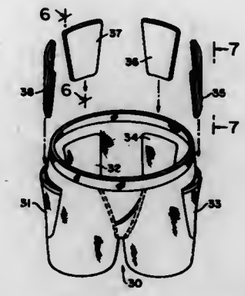
said thumb protector is placed upon the thumb of a wearer thereof with the thumb of the wearer inserted into said protective pocket of said thumb enclosure portion, and said thumb enclosure portion of said thumb protector is inserted into the mouth of the fish and said direct engagement means on said thumb enclosure portion directly engages the teeth of the fish to support a fish directly by said thumb enclosure portion, and said penetration resistant material of said front surface of said thumb enclosure portion precludes the penetration of said front surface by the teeth of the fish, thereby protecting the thumb of a wearer of said thumb protector from injury by the teeth of the fish.

**5,497,511**

### PROTECTIVE PANTS FOR THE HIP

Ismail Y. Zade, 25 Larissa La., Thornwood, N.Y. 10594

Filed Mar. 8, 1994, Ser. No. 207,584
Int. Cl.[6] A41D *13/00;27/26;* A41B *9/04*
U.S. Cl. 2—22 5 Claims




1. A protective device for aiding and preventing injury to the hip and upper femur comprising: pants made from resilient material having body cushioning properties and four pockets, said pockets being positioned with one pocket on each side of the back and one pocket on each side adjacent to the hip, all four pockets positioned in a manner to cover the hip and upper femur area of the wearer; two pairs of rigid pads; a first pair for placement within the pockets located on each side of the back and the second pair for placement within the pockets located on each side adjacent to the hip; the first pair of pads being fitted with reinforcement means spaced apart and running horizontally therein and allowing for flexibility of movement about a horizontal axis; a second pair of pads being fitted with reinforcement means spaced apart and running vertically and allowing for flexibility of movement about a vertical axis, said rigid reinforcement means for said first pair of pads varying in thickness from ¾ inches to ¼ inch from a top portion to a bottom portion of the pad and tapering in length from the top to the bottom of the pad.

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**5,497,512**

### BOW SHOOTING VEST AND BRACE

Thomas Wright, General Delivery, Lethbridge, Alberta, Canada

Filed Aug. 31, 1993, Ser. No. 114,338
Claims priority, application Canada, Mar. 12, 1993, 2092681
Int. Cl.[6] A41D *1/04*
U.S. Cl. 2—102 3 Claims

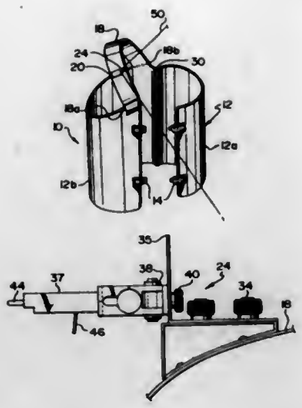
1. An archery vest comprising:

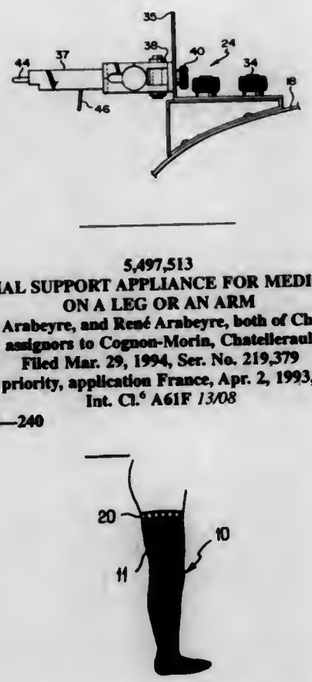
a body portion adapted to be secured around the torso of a person using the vest;

a shoulder strap portion attached to a front and rear of the body portion and adapted to extend over the user's shoulder when in use;

an anchor means located on a front portion of said shoulder strap such that the anchor is located on the front of the user's shoulder when the archery vest is in use; and

a bow string holding and release mechanism mounted on said anchor means and including trigger means which, when actuated, release a bow string held by said bowstring holding and release mechanism.





5,497,513

## REMEDIAL SUPPORT APPLIANCE FOR MEDICAL USE ON A LEG OR AN ARM

Françoise Arabeyre, and René Arabeyre, both of Chatellerault, France, assignors to Cognon-Morin, Chatellerault, France

Filed Mar. 29, 1994, Ser. No. 219,379
Claims priority, application France, Apr. 2, 1993, 93 03904
Int. Cl.[6] A61F 13/08
U.S. Cl. 2—240 12 Claims

1. A remedial support appliance for medical use on a leg or an arm, comprising a main portion of an elasticized knit serving to compress the limb on which the appliance is worn for the purpose of treating venous or lymphatic insufficiency, which main portion is extended upwards by an elasticized garter band, wherein the elasticized garter band is formed by an elasticized braid or an elasticized lace covered on the inside with a pattern made of an antislip material, the fibers constituting the braid or the lace of said garter band being selected in such a manner that said band presents an elongation characteristic of a shallow slope corresponding to a percentage elongation at least equal to 10% per Newton exerted in traction, wherein the elongation characteristic is defined as traction force as a function of percentage elongation and simultaneously exerts pressure on the limb that is less than the pressure exerted by the main portion in the vicinity of the garter band.

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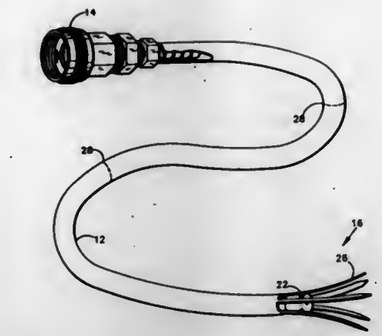
5,497,514

## DRAIN CLEANING DEVICE

Floyd Miller, 9576 Harrodsburg Rd., Harrodsburg, Ind. 47434

Filed Apr. 10, 1995, Ser. No. 419,094
Int. Cl.[6] F03C 1/30
U.S. Cl. 4—255.04 6 Claims

1. Apparatus for cleaning solids obstructing an interior of a drain conduit comprising:



a hollow flexible tube having a proximal end and a distal end and of a length sufficient to reach the solids in the conduit when the distal end is inserted into the conduit;

means for connecting a controllable supply of water under pressure to said proximal end of said tube so that water under pressure can be passed through said tube;

a spraying means mounted at said distal end of said tube, said spraying means for directing water passed through said tube against the solids in the drain conduit when the tube and spraying means are inserted into the drain conduit until said spraying means is in direct proximity to the solids in the drain conduit; and

guiding means mounted at the distal end of said tube for centering and guiding said tube and spraying means through said drain conduit and facilitating the passage of said tube and spraying means around any bends and turns in the drain conduit;

said guiding means comprising a multiplicity of radially outwardly extending fingers mounted at the distal end of said tube; and,

wherein said fingers are formed by cutting longitudinal slits in the distal end of said flexible tube and inserting said spray means into the distal end of said tube to cause portions of said tube between said longitudinal slits to spread radially outwardly.

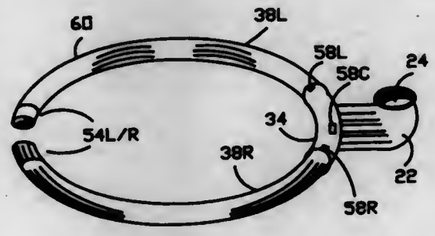
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5,497,515

## TOILET BOWL WATER FLUSH SYSTEM

John H. Mohrman, 301 Village Rd., Orwigsburg, Pa. 17961

Filed Feb. 21, 1995, Ser. No. 391,359
Int. Cl.[6] E03D 11/08
U.S. Cl. 4—420 7 Claims



1. In a water flushing system for a toilet bowl which is normally comprised of an upstanding ovoid-shaped liquid receptacle having sidewalls and including a separable water volume reservoir available upon demand for supplying flushing water, a first water conduit connecting between said reservoir and the uppermost and inner periphery of the toilet bowl sidewalls, a substantially horizontal planar ledge forming an upper seat-support surface of said bowl, and a lowermost centrally located outlet orifice adapted for emptying of the bowl, the improvement comprising:

(a) the first water conduit is provided at a proximal end for projecting into the upper and inner periphery of said bowl sidewalls, and is located proximal to and below a rearmost segment of the planar ledge and normally presents its projecting end in a horizontal direction;

(b) a Tee-shaped conduit having its stem segment adapted to snugly engage the proximal projecting end of said first conduit and having its other open ends oriented outwardly and horizontally from the point of stem union;

(c) an arcuate, first elongate conduit connected fixedly to one of the open ends of said Tee-shaped conduit and configured to conform to the inner ovoid-shaped upper periphery of one lateral side of the bowl sidewalls and an underside of the bowl planar ledge, said conduit extending about substantially to the midpoint of a frontmost sidewall segment of the bowl inner periphery;

(d) an arcuate, second elongate conduit connected fixedly to the other open end of the Tee-shaped conduit and similarly configured to conform to the ovoid-shaped upper periphery of the other lateral side of the bowl sidewalls and the underside of the bowl planar edge and also extending substantially to the midpoint of said frontmost sidewall peripheral segment;

(e) a full closure means provided on the frontmost longitudinal end of each of said arcuate elongate conduits for precluding water egress from the frontmost conduit ends;

(f) a plurality of spaced-apart ports, arrayed axially of said elongate conduits and along a lowermost portion of each of, and further disposed to provide flush water outlets directed upon the sidewalls of said bowl; and

(g) a plurality of inwardly projecting, horizontally-aligned, buttresses integral with and proximal to the bowl upper sidewalls which are also offset sufficiently from the underside of the bowl planar ledge and positioned to provide subjacent support to each of the arcuate elongate conduits when they are in their operational posture.



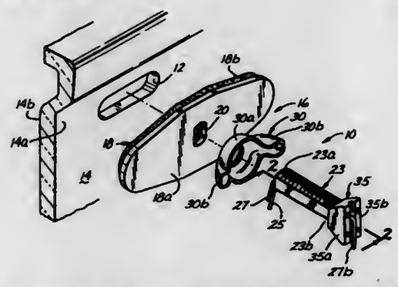
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5,497,516

## DRAIN SEALING APPARATUS

Lawrence F. Irwin, Sylmar, Calif., assignor to Augerscope, Inc., Sylmar, Calif.

Filed Sep. 7, 1994, Ser. No. 301,710
Int. Cl.[6] E03C 1/244
U.S. Cl. 4—694 2 Claims



1. An apparatus for sealably closing an aperture provided in a wall having spaced-apart first and second surface, comprising:

(a) wall engaging means for sealably engaging the first surface of the wall at a location surrounding the aperture, said wall engaging means comprising a sealing member having an aperture therethrough and including a first rigid surface and a second yieldably deformable surface for engagement with said first surface of said wall;

(b) pressure imparting means operably associated with said wall engaging means for moving said sealing surface into sealable engagement with the first surface of the wall, said pressure imparting means comprising:

(i) an elongated threaded tubular member having an internal passageway and first and second ends; said second end including finger-gripping means comprising a finger-gripping member comprising a generally V-shaped member having opposing finger engaging surfaces for gripping engagement by the user to resist rotational movement of said elongated tubular member;

(ii) a first locking element carried within said internal passageway of said tubular member and extending outwardly from the first end thereof for inserting into the aperture provided in the wall;

(iii) an outwardly extending second locking element carried within said internal passageway of said tubular member for insertion into the aperture provided in the wall and for movement from a first position to a second position for engagement with the second surface of the wall; and

(iv) sealing member engagement means threadably connected to said tubular member for rotational movement from a first position to a second position in engagement with said rigid surface of said sealing member to urge said yieldably deformable surface of said sealing member into pressural engagement with the first surface of the wall when said second locking element is in said second position, said sealing member engagement means comprising a nut having an internally threaded hub portion and a pair of oppositely disposed, outwardly extending wings grippable by the user for imparting rotational movement of said hub portion.

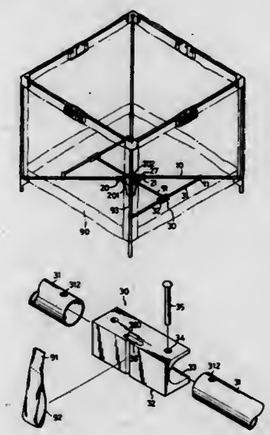
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5,497,517

## CONTROL DEVICE FOR FOLDING AND EXPANDING A BASE PORTION OF A PLAYPEN

Kun Wang, No. 51, Lane 31, Sec. 2, Changping Rd., Taichung, Taiwan, Prov. of China

Filed Aug. 25, 1994, Ser. No. 296,321
Int. Cl.[6] A47D 7/00
U.S. Cl. 5—99.1 4 Claims



1. A control device for folding and expanding a base portion of a playpen which comprises four vertical stands (93) respectively mounted on four corners thereof and a base portion (20) mounted on an underside thereof, four drive posts (10) each having a first end pivotally connected to a lower end of a corresponding one of said four vertical stands (93) and having a second end pivotally connected to said base portion (20), and a flexible casing (90) enclosed around a peripheral portion of said playpen and having an underside engaged with said base portion (20), said control device comprising:

four block members (21) each fixed on said base portion (20) and each pivotally engaged with the second end of a corresponding one of said four drive posts (10);

four fastener members (11) each mounted around a mediate portion of a corresponding one of said four drive posts (10); and

two transmission assemblies (30) each pivotally mounted between two of said four drive posts (10) and arranged opposite to each other, each of said two transmission assemblies (30) comprising:

a bracket member (32) mounted in a mediate portion of said transmission assembly (30), said bracket member (32) including a substantially T-shaped slot (36) having an opening facing said base portion (20) forming two flange portions (360);

a pair of linking rods (31) each having a first end pivotally engaged with a corresponding one of said four fastener members (11) located on associated said drive post (10) and each having a second and pivotally engaged with said bracket member (32); and

a resilient strip (91) having a mediate portion attached to said base portion (20) and having two free ends each formed into a loop (92) which is received by said two flange portions (360) of said bracket member (32).

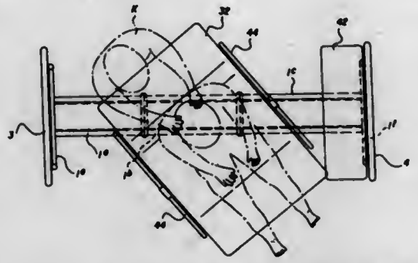
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**5,497,518**
**ROTARY BED**

Tadashi Iura, 172-4 Befucho, Matsuyama-shi, Ehime 791, Japan

PCT No. PCT/JP92/00665, § 371 Date Apr. 28, 1994, § 102(e) Date Apr. 28, 1994, PCT Pub. No. WO93/24087, PCT Pub. Date May 22, 1992
PCT Filed May 22, 1992, Ser. No. 185,919
Int. Cl.[6] A47B 7/02
U.S. Cl. 5—618

1 Claim



1. A rotary-type bed comprising a fixed bed frame having front and rear portions, a rotary bed frame disposed intermediate said front and rear portions of said fixed bed frame, means for rotating said rotary bed frame around a vertical axis, a front screen disposed on the front end and supported by a floor surface; a movable mat support member receiving a mat and being attached to said rotary bed frame, said mat support member including at least a back receiving portion, a waist receiving portion and a leg receiving portion, each of said portions being independently foldable; a leg receiving mat support receiving a mat for receiving legs provided on the rear end of the fixed bed frame; a reversely rotatable motor and a screw cylinder attached to a side of said rotary bed frame; a screw shaft rotatable at a reduced speed by the motor engaging said screw cylinder; a rotation mechanism for rotating the rotary bed frame by about 90° relative to movement of the screw cylinder and an interlocking mechanism operative to effect sequential folding of the back receiving portion, the waist receiving portion and the leg receiving portion, said rotation mechanism and said interlocking mechanisms being both disposed between the screw cylinder and the fixed bed frame, and said interlocking mechanism including means operative prior to starting rotation of the rotary bed frame and simultaneously with raising of the back receiving portion, to raise the leg receiving portion sufficiently to avoid the mat for receiving legs, and at least the front portion of the bed frame having a narrow width sufficient to permit stepping over.

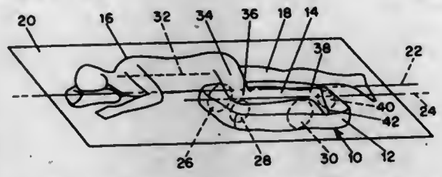
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**5,497,519**
**ORTHOPEDIC BODY PILLOW**

Alan I. Mintz, 21 Sintsink Dr. W, Port Washington, N.Y. 11050

Filed Jun. 28, 1994, Ser. No. 267,807
Int. Cl.[6] A47C 20/00
U.S. Cl. 5—648

10 Claims



1. An inflatable orthopedic pillow for elevating a first leg of a person relative to a second leg, the person resting in a lateral position on a substantially planar supporting surface, the second leg being supported by the substantially planar support surface and disposed in a first plane defined by said substantially planar support surface, said inflatable orthopedic pillow comprising:

a resilient pillow body defining an interior volume selectably positionable underneath the first leg for supporting the first leg of the person in a second plane substantially parallel to the first plane, wherein said interior volume of said resilient pillow body may be selected from the group consisting of down foam, cotton or polyester; and

an inflatable chamber disposed within said interior volume of said pillow body for supporting the first leg of the person, said chamber being selectively inflatable for providing support and for orienting the first leg in the second plane, the first leg being elevated relative to the substantially planar support surface and to the second leg, and for disposing the spine in an orientation substantially parallel to the support surface when the person is oriented in the lateral position.

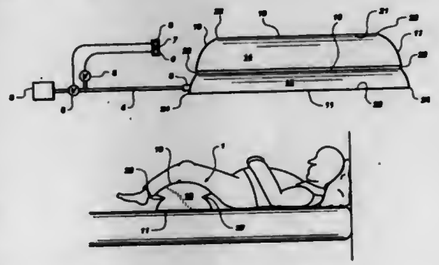
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**5,497,520**
**INFLATABLE LEG AND FOOT SUPPORT**

Richard D. Kunz, 6667 S. 300 West, #4, Murray, Utah 84107; Dale O. Kelsch, 2657 E. Willowbend, Sandy, Utah 84093, and Lamar C. Beynon, 168 S. 300 East, Washington, Utah 84780

Filed Jul. 11, 1994, Ser. No. 272,562
Int. Cl.[6] A47C 20/02; A47G 9/00
U.S. Cl. 5—648

6 Claims



1. An inflatable leg and foot support, comprising:

(a) an air bag comprising:

a top panel having two opposed long edges and two opposed short edges;



a bottom panel having two opposed long edges and two opposed short edges;

two sidewalls connected to the top and bottom panels by respective soft rubber collapse joints along respective long edges thereof, each sidewall comprising an upper panel and a lower panel, each sidewall panel having two opposed long edges and two opposed short edges, one long edge of each sidewall panel being connected together by a soft rubber collapse joint, the other long edge of each sidewall panel being connected to a respective air bag top and bottom panel by respective soft rubber collapse joints; and

two flexible end panels, each connected to a respective air bag top panel short edge, air bag bottom panel short edge, and two sidewall panel short edges;

the air bag top panel short edges and sidewall lower panel short edges being arcuate, and the air bag bottom panel short edges and sidewall upper panel short edges being straight, when the air bag is inflated; and

(b) inflating and deflating means for controlled inflation and deflation of the air bag, the inflating and deflating means comprising:

a pressurized air source;

an air supply hose connecting the pressurized air source and the air bag;

an inflation valve disposed in the air supply hose;

a deflation valve disposed in the air supply hose; and

control means connected to the inflation and deflation valves for controlling inflation and deflation of the air bag.

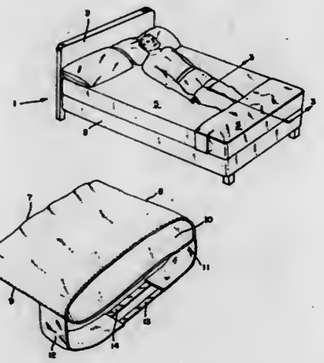
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**5,497,521**
**FOOT WARMER**

Ronald L. Waits, 1122 Whisper Wind Dr., McDonough, Ga. 30253, and Troy A. Craig, 118 Governors Park Dr., Forest Park, Ga. 30050

Filed Jun. 12, 1995, Ser. No. 489,544
Int. Cl.[6] A47C 21/00; A47G 9/00
U.S. Cl. 5—658

2 Claims



1. A foot warmer, adapted to receive a user's feet, in combination with a bed having a mattress overlying a box spring, said foot warmer comprising a pocket, having a width approximately equal to the width of the bed, and a length sufficient to cover the feet portions of a user, the length being substantially smaller than the length of the bed, said pocket having side edges, attachment straps joined respectively to said side edges and extending downwardly therefrom, an expansion strap joined at the ends thereof respectively to the ends of said attachment straps remote from said side edges, and said expansion strap being disposed between said mattress and said box spring.

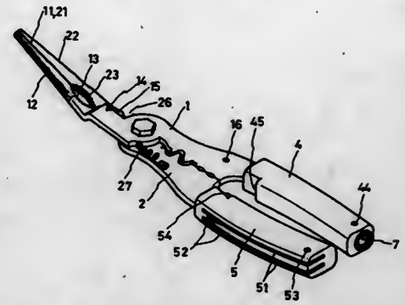
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**5,497,522**
**COMBINATION TOOL**

Chin-Chuan Chen, 7F, No. 13, Lane 364, Sec. 1, Kee Lung Rd., Taipei, Taiwan, Prov. of China

Filed Aug. 2, 1994, Ser. No. 284,825
Int. Cl.[6] B25B 7/22
U.S. Cl. 7—128

4 Claims



1. A combination tool comprising a first blade and a second blade, each blade having a midpoint where the blades are pivoted by a pivot, said first and second blades having a respective long nose at one end adapted for cooperating counteraction against each other and a respective handle at an opposite end, the improvement comprising a rasp longitudinally integrally made on the long nose of said first blade at an outer side, a file longitudinally integrally made on the long nose of said second blade at an outer side, two toothed notches respectively made on said first and second blades and worked together as a socket wrench, a can opener integrally made on said second blade adjacent to said pivot at the front, a corkscrew fixedly fastened to said second blade between said pivot and the handle on said second blade, and a wire hole on said first blade for pulling wires.

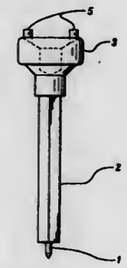
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**5,497,523**
**AUTOMATIC GOLF SPIKE REPLACER**

David Tarnoff, Bainbridge Island, Wash., assignor to The Golf Zone, Inc., Bainbridge Island, Wash.

Continuation of Ser. No. 977,193, Nov. 16, 1992, abandoned.
This application Jun. 30, 1995, Ser. No. 497,531
Int. Cl.[6] B25B 13/00
U.S. Cl. 7—138

4 Claims



1. A tool for use in powered removal of athletic shoe spikes, each spike having a base defining a plurality of tool engaging holes, the tool comprising:

an elongate shaft having a drive end and a tool end, wherein the drive end has a non-circular cross-sectional profile for driven engagement with a power driver;

a tool head secured axially to the tool end of the shaft, the tool head including a plurality of longitudinally projecting pins for engaging the tool engaging holes of the base of an athletic

shoe spike and defining a recess formed between the plurality of pins for receiving the spike; and

a pointed cleaning tip projecting longitudinally from the drive end of the shaft and dimensioned for use in cleaning debris from the tool engaging holes of the base of an athletic shoe spike.

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**5,497,524**

## METHOD FOR CLEANING CONTINUOUSLY ADVANCING WEB-FORM TEXTILE MATERIAL AND DEVICE FOR WORKING THE METHOD

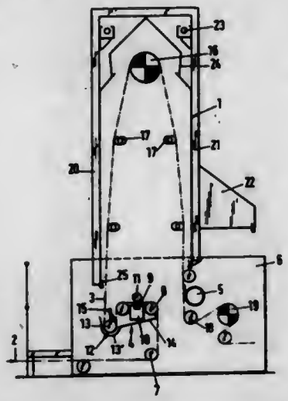
**Gerold Fleissner, Zug, Switzerland, assignor to Fleissner GmbH & Co. KG, Egelsbach, Germany**

**Filed May 13, 1994, Ser. No. 242,349**

**Claims priority, application Germany, May 13, 1993, 43 16 061.1**

**Int. Cl.[6] D06B *3/10***

**U.S. Cl. 8—149.1** **4 Claims**



1. Method for cleaning a continuously advancing web-form textile material treated with a washing-active liquid that contains one or more surfactants and a compound that exhibits a high adsorptivity for contaminants being washed out of the textile material and has a no affinity for fibers of the textile material, and subjected immediately thereafter to a steam treatment, wherein the textile material is saturated with a liquid containing compounds including foaming agents to produce foam in a steam atmosphere, the textile is transported into a steamer to generate a washing-active foam, the textile material is steamed in the steamer under saturated steam conditions, and then the textile material is vacuumed from a visible side of the web after passing through the steamer.

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**5,497,525**

## APPARATUS FOR REMOVING AND COLLECTING COATINGS FROM GAME CARDS

**Daniel E. Woodgate, Austin, Tex., assignor to Gate Mold, Inc., Round Rock, Tex.**

**Filed Oct. 19, 1994, Ser. No. 325,999**

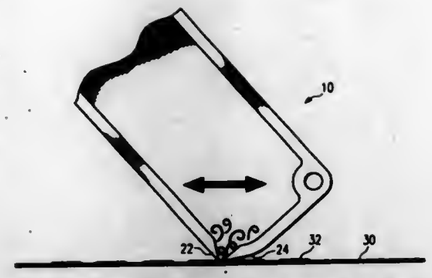
**Int. Cl.[6] A47L *13/02*; B26B *3/00***

**U.S. Cl. 15—104.8** **30 Claims**

1. A device for removing a coating from a card, comprising:

a housing having a cavity for containing scrapings of said coating, and having at least one opening for receiving said scrapings into said cavity;

a first blade connected to said housing, such that said first blade scrapingly engages with said coating when said device is moved in a first direction;



a second blade connected to said housing, such that said second blade scrapingly engages with the coating while the device is moved in a second direction.

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**5,497,526**

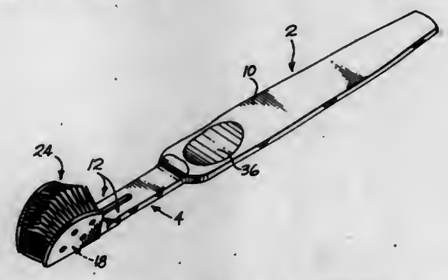
## TOOTH BRUSHING DEVICE

**Ronald W. Klinkhammer, Seattle, Wash., assignor to Oral Logic Inc., Minot, N. Dak.**

**Continuation of Ser. No. 238,144, May 4, 1994, abandoned, which is a continuation of Ser. No. 975,013, Nov. 12, 1993, abandoned, which is a division of Ser. No. 499,022, Mar. 26, 1990, Pat. No. 5,171,066, which is a continuation-in-part of Ser. No. 145,771, Jan. 19, 1988, abandoned, which is a continuation-in-part of Ser. No. 937,554, Dec. 4, 1986. This application Dec. 23, 1994, Ser. No. 363,965**

**Int. Cl.[6] A46B *9/04***

**U.S. Cl. 15—167.2** **16 Claims**



1. A straddle type tooth brushing device comprising:

means including a pair of elongated arms having tooth-brushing means on distal end portions thereof forming a head for straddling about a row of teeth to be cleaned, elongated support means including a handle for supporting the head adjacent the row of teeth, and leveraging means acting on the tooth brushing means from within the head to yieldably bias the tooth-brushing means into engagement with the inside and outside faces of the teeth when the head is straddled about the row thereof,

said support means having a distal end,

said arms having longitudinal axes and being rigidly interconnected with the support means at, the distal end of the support means so as to form relatively rigid longitudinal extensions of the support means which project from the distal end of the support means in generally spaced parallel relationship to one another and have an elongated slot in the space therebetween which is coextensive with the arms and opens to the outside of the device between the distal end of the support means and the distal end portions of the arms in a central plane of the slot extending between the longitudinal axes of the arms generally parallel thereto,

the distal end portions of the arms having pairs of generally laterally inwardly and outwardly directed surfaces thereon, the laterally inwardly directed surfaces of which are relatively



opposed to one another across the central plane of the slot, extend in planes generally parallel to the longitudinal axes of the arms, and have relatively upper, lower and forward edges formed about the peripheries thereof, which are interconnected with one another by the laterally outwardly directed surfaces of the distal end portions of the arms at the outsides thereof, and are disposed relatively remote from, and adjacent to the gum lines of the respective row of teeth being brushed, and forwardly of the surfaces, respectively, when in an operational mode of the device, the head is straddled about the row of teeth so that the central plane of the slot is aligned with the row of teeth, the arms are generally parallel to the row, and the laterally inwardly directed surfaces of the distal end portions of the arms are generally opposed to the inside and outside faces of the teeth in the row,

the tooth brushing means comprising a monolithic cowling of plastic resin material which has an operatively inverted U-shaped body extending crosswise the plane of the slot and is comprised of a pair of relatively endmost sections that are spaced apart from one another and each encircle the distal end portion of a respective one of the arms in intimate contact with the laterally inwardly and outwardly directed surfaces and the relatively upper and lower peripheral edges of the distal end portions of the arms to form brush-forming members thereon that oppose one another across the central plane of the slot and are yieldably biased by the leveraging means to engage the faces of the teeth when the head of the device is straddled about the row of teeth in the operational mode of the device, and a mid-section which is interconnected with and between the endmost sections of the cowling and flexibly interposed in the slot between the relatively upper peripheral edges of the distal end portions of the arms to form an articulated linkage between the brush-forming members which is spaced apart from the distal end of the support means by the openings of the slot to the outside of the device and operable to preserve the bias on the brush forming members when the head adjusts to the varying diameters of the teeth crosswise the central plane of the slot in the operational mode of the device,

the brush-forming members having oppositely disposed fields of bristles thereon, the bristles of which are formed by strands of the plastic resin material that upstand monolithically on the brush forming members and are so individually spaced apart from one another on the brush forming members as to be individually laterally deflectable in relation to one another, yet collectively operable to form brushes for the faces of the teeth.

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**5,497,527**

## PAINT ROLLER HANDLE

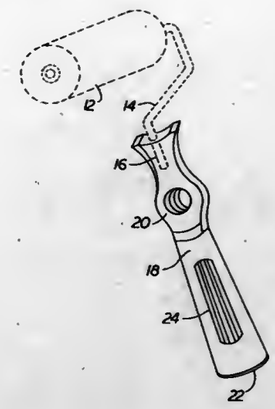
**Bor-Zeng B. Jang, 2076 S. Evergreen Dr., Auburn, Ala. 36830, and Don W. Parker, Rte. 4 Box 37, Enterprise, Ala. 36330**

**Filed Apr. 21, 1994, Ser. No. 230,973**

**Int. Cl.[6] B05C *17/02***

**U.S. Cl. 15—230.11** **5 Claims**

1. A paint roller handle in combination with a paint roller having an axis of rotation, said roller handle having an elongated body, a first end connected to said paint roller, and a second end; said elongated body and said axis of rotation being orthogonal; first means formed in said elongated body intermediate said ends for releasably securing a longitudinal extension member to said elongated body in transverse relation thereto and second means formed in said elongated body at said second end transverse to said first means for releasably securing said longitudinal extension member to said elongated body in coaxial relation thereto.



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**5,497,528**

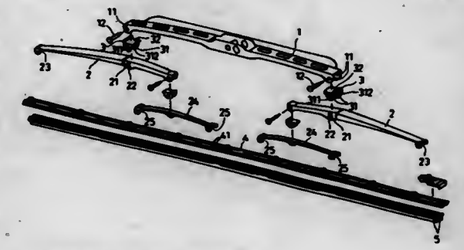
## WINDSHIELD WIPER WITH SLIP JOINT FOR PIVOTING OF ARM ASSEMBLIES

**Wu-Shuan Wu, No. 3, Alley 1, Lane 28, Hou-Kang 1st Rd., Hsin-Chuang City, Taipei County, Taiwan, Prov. of China**

**Filed Jul. 25, 1995, Ser. No. 506,474**

**Int. Cl.[6] B60S *1/38;1/28***

**U.S. Cl. 15—250.46** **1 Claim**



1. A windshield wiper comprising:

an elongated blade holder;

at least one elongated rubber blade coupled with said blade holder;

first and second elongated arm assemblies coupled with said blade holder, each arm assembly comprising at least one elongated arm having a coupling portion thereon intermediate its ends, each coupling portion having a pair of aligned oblong holes therein;

first and second U-shaped friction plates, each friction plate deflating spaced first and second side coupling walls, each side coupling wall has an oblong hole therein, each side coupling wall has an inner and outer surface wherein the inner surfaces face one another, each side coupling wall has a peripheral flange projecting from the inner surface which extends around the oblong hole therein, said first friction plate is coupled with said first arm assembly, wherein said flanges thereof are received within the associated aligned holes, respectively, and the second friction plate is coupled with said second arm assembly, wherein said flanges thereof are received within the associated aligned holes, respectively;

an elongated arm holder having first and second ends, each end having a pair of aligned pivot holes therein:

first and second pivot pins, said first pivot pin passing through the holes in the first arm assembly, the first friction plate and the first end of the arm holder to secure the first arm assembly with the arm holder for both pivotal movement and swingable movement which is different from said pivotal movement, said second pivot pin passing through the holes in the second

arm assembly, the second friction plate and the second end of the arm holder to secure the second arm assembly with the arm holder for both pivotal movement and swingable movement which is different from said pivotal movement.

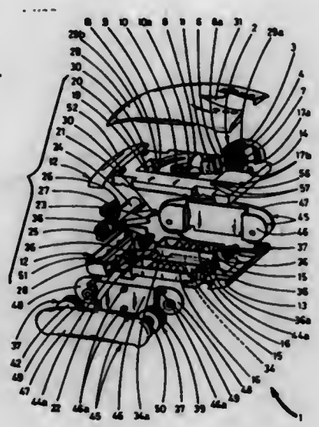
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5,497,529

## ELECTRICAL APPARATUS FOR CLEANING SURFACES BY SUCTION IN DWELLING PREMISES

Anna M. Bocsi, Via Lesbia Cidonia 4/A, 24124 Bergamo (Bergamo), Italy

Filed Jul. 13, 1994, Ser. No. 274,496
Claims priority, application Italy, Jul. 20, 1993, MI93A1591
Int. Cl.[6] A47L 9/28
U.S. Cl. 15—319 15 Claims



1. An electrical apparatus for cleaning surfaces by suction, in dwelling promises comprising a suction unit having:
- a casing exhibiting at least one frontal section opening and delivery slits;
- at least one fan operatively housed in the casing;
- at least one electric driving motor for driving the fan, whereby an air stream admitted through the frontal suction opening and emitted through the delivery slits is produced;
- a collection container for receiving drawn-in material, which is removably engaged, at its one side, to the casing of the suction unit substantially in a sealing manner about said suction opening and is provided with an inlet opening onto a second side opposite with respect the first side engaged to the casing;
- at least one filtering element operatively interposed between said suction opening and the collection container for holding, at the inside of said container, solid matter taken in through said inlet; said apparatus further comprising:
- a support and movement platform carrying said suction unit;
- at least one storage battery accommodated in corresponding seats provided in the platform;
- power-driven movement means for moving said support platform and suction unit on a surface "S" to be cleaned;
- control means acting on the power-driven movement means for selectively causing forward and backward movements and stopping and steering actions of the support platform and the suction unit on the surface "S" to be cleaned,

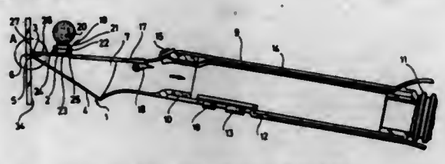
wherein said suction unit is removably housed in a first seat defined in said platform, first and second contact elements being respectively carried by the suction unit and the platform for detachably connecting the suction unit with said at least one storage battery when the suction unit is housed in said first seat.

5,497,530

## WIPER DEVICE FOR HARD SURFACES, IN PARTICULAR A WINDOW WIPER

Roland Kamm, Winnenden; Eberhard Veit, Göppingen; Josef Schneider; Antonio De Filippo, both of Backnang, all of, Germany; Donald W. Murray, Saginaw, Tex.; Michael C. Story, and Carl S. Lammons, both of Arlington, Tex., assignors to Alfred Karcher GmbH & Co., Winnenden, Germany

PCT No. PCT/EP92/01688, § 371 Date Mar. 25, 1994, § 102(e) Date Mar. 25, 1994, PCT Pub. No. WO93/02611, PCT Pub. Date Feb. 18, 1993
PCT Filed Jul. 23, 1992, Ser. No. 185,867
Claims priority, application Germany, Aug. 3, 1991, 41 25 866.5
Int. Cl.[6] A47L 7/00;9/02;5/00;1/08
U.S. Cl. 15—321 37 Claims



1. A wiper device for a hard surface comprising:
- a slit-shaped suction nozzle having a first wall on a first side of the wiper device and an opposite wall on a second side of the wiper device;
- a flexible wiper lip arranged on one of said walls and protruding beyond said suction nozzle;
- a wiper pad extending from one of said first and second sides of said wiper device adjacent to and extending parallel to said suction nozzles, wherein said wiper pad is located to be entirely out of contact with a suction stream drawn through said suction nozzle; and
- a spray nozzle for applying a cleaning liquid to a surface to be cleaned, said spray nozzle being mounted on the same side of said wiper device as said wiper pad but separate from said wiper pad to enable said cleaning liquid to be applied from the spray nozzle to said surface to be cleaned independently of said wiper pad.

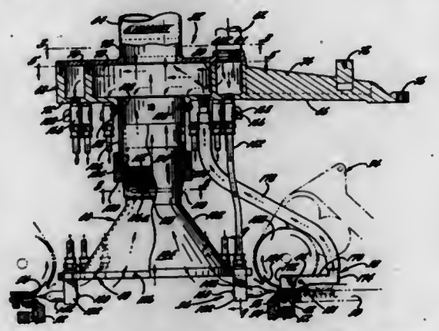
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5,497,531

## MANIFOLD FOR USE WITH A CIRCULAR SLIVER KNITTING MACHINE

Michael K. Kuhrau, Orangeburg, and John C. Knight, Sr, North, both of S.C., assignors to Mayer Industries, Inc., Orangeburg, S.C.

Division of Ser. No. 214,609, Mar. 17, 1994. This application Feb. 7, 1995, Ser. No. 385,119
Int. Cl.[6] D04B 35/32
U.S. Cl. 15—345 4 Claims



1. A manifold for use with a circular sliver knitting machine of the type having a frame for rotatably supporting a needle cylinder, said needle cylinder having a plurality of needles vertically movable along a predetermined path relative thereto, a yarn and sliver fiber feeding station, and a plurality of sinkers cooperating therewith for forming sliver fibers into knitted fabric, and having an air supply and an air discharge unit, said manifold comprising:
- a body defining a first aperture adapted to exhaust fiber waste laden air, a second aperture adapted to receive air from said air supply, and said body defining a cavity and an annular divider for dividing said cavity;
- a cover secured to said body forming a seal therebetween, said cover cooperating with said body and said annular divider for forming therebetween as parts of said cavity a first plenum and a second plenum, said cover defining a first cover aperture adapted to exhaust said fiber waste laden air, and said cover defining a second cover aperture adapted to receive air from the air supply; and
- attachment means for attaching said body to the circular sliver knitting machine.



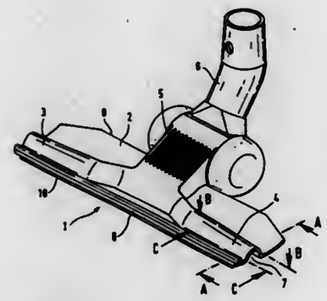
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5,497,532

## VACUUM CLEANER NOZZLE

Dietmar Glatz, Olpe, Germany, assignor to Wessel-Werk GmbH & Co. KG, Reichshof, Germany

Filed Feb. 1, 1994, Ser. No. 190,339
Claims priority, application Germany, Feb. 16, 1993, 43 04 682.7
Int. Cl.[6] A47L 9/02;13/11
U.S. Cl. 15—401 8 Claims



1. Vacuum cleaner nozzle comprising:
- a nozzle body, said nozzle body having:
  - at least one edge,
  - a bottom side,
  - a nozzle, said nozzle having a nozzle bottom,
  - a suction pipe connecting piece to connect a suction pipe to said nozzle body, and
  - a bottom plate, said bottom plate closing off said nozzle bottom towards said bottom side, said bottom plate having at least one flow channel, said flow channel having a bottom directed and opening toward a floor to be cleaned, said flow channel further having a longitudinal axis and a longitudinal cross section, said flow channel further having a second cross section perpendicular to said longitudinal axis, said flow channel further open towards said bottom side, said flow channel leading into a common suction channel connected to said suction pipe connecting piece, said flow channel further having an end on said longitudinal axis away from said suction channel, wherein at least two of said flow channels are placed symmetrically in relation to said suction channel, said flow channels further being substantially parallel to said edge of said nozzle body, said second cross section of said flow channels further being parabolic in shape whereby said second cross-section increases toward said suction channel from said end, said longitudinal cross section of said flow channels being parabolic in shape, said longitudinal cross section extending substantially at a perpendicular to said bottom plate along said longitudinal axis of said flow channels whereby said longitudinal cross-section increases from said bottom of said flow channel towards the floor and from said end of said flow channel towards said suction channel.

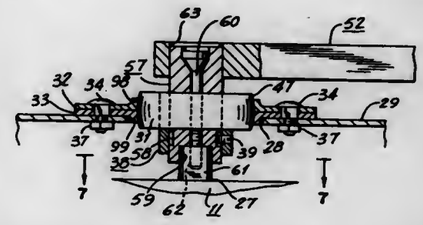
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5,497,533

## SURFACE MOUNTED DOOR CLOSER HOUSING RESISTANT TO VANDALISM

Erik Karlsen, Bronx, N.Y., assignor to Vandal Proof Mfg. Inc., Staten Island, N.Y.

Filed Jul. 28, 1994, Ser. No. 281,845
Int. Cl.[6] E05F 1/00
U.S. Cl. 16—71 19 Claims



1. A housing assembly for a surface mounted apparatus for closing a door that is hinged along a side thereof to a door jamb at an entrance/exit opening in a boundary wall for a restricted area, said housing assembly comprising:
- a main housing defining an enclosure for containing a closer unit having an output shaft;
- a cover secured to said main housing for enclosing said closer unit and its said output shaft within said main housing;
- a bearing unit disposed in an opening in said main housing, and being tiltable with respect to said main housing;
- an arm assembly disposed outside said main housing including:
  - a linkage;
  - a mounting bracket; and
  - a first pivot connection permanently joined to said bracket and to said linkage; and
- a driving connection for joining said output shaft with said linkage, said driving connection including a stub shaft rotatably disposed in said bearing unit and tiltable with respect to said main housing,
- said stub shaft being operatively engageable with said output shaft;
- a first fastener device disposed inside of said main housing for contacting said stub shaft to maintain operative engagement between said stub shaft and said output shaft;
- said first device being accessible only from within said main housing for operation of said first device to a releasing condition wherein operative engagement between said stub shaft and said output shaft may be broken.

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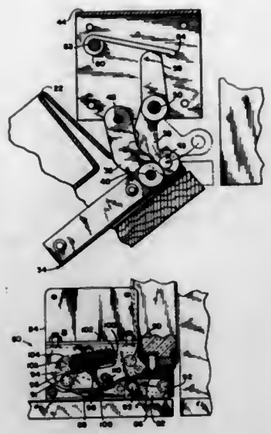
5,497,534

## DOUBLE ARM HINGE FOR A REFRIGERATOR DOOR

Jerome Caruso, Lake Forest, Ill., assignor to Sub-Zero Freezer Company, Inc., Madison, Wis.

Continuation of Ser. No. 4,750, Jan. 14, 1993, abandoned. This application Nov. 14, 1994, Ser. No. 338,415
Int. Cl.[6] E05D 03/06;05/02;11/10
U.S. Cl. 16—288 10 Claims

1. A hinge assembly for pivotally mounting a door in a parallel relation to a refrigerator, said assembly comprising:
- a first bracket mounted on the refrigerator,
- a second bracket mounted on the door, the second bracket having an inner wall,

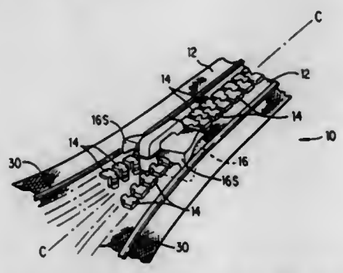


a first link having one end pivotally connected to the first bracket and the other end pivotally connected to the second bracket, and

a second link having one end pivotally connected to the first bracket and the other end pivotally connected to the second bracket, each of the first and second links including a surface which engages the inner wall of the door bracket when the door is in the closed position, and means for directly biasing one of said first or second links in both an opening and closing direction thereby maintaining the parallel relation between the door and the refrigerator, said links being located in different but parallel planes and being of different lengths to determine the course of movement of the door and a pin for limiting the opening motion of said door.

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**5,497,535**
**NON-BINDING ZIPPER**
**Patrick W. Kloor, 2F-7, Ohara 1-5-5, Setagaya-Ku, Tokyo 156, Japan**
**Filed Jun. 6, 1994, Ser. No. 254,883**
**Int. Cl.[6] A44B *19/00***
**U.S. Cl. 24—426** **15 Claims**



1. A slide fastener of the type having two tapes with interconnecting teeth thereon, a slide having a front and rear and including a divider to separate and mesh the teeth in cooperation with a pull tab attached to the slide, comprising:

spaced wing segments formed on said slide in proximity to the front of said slide;

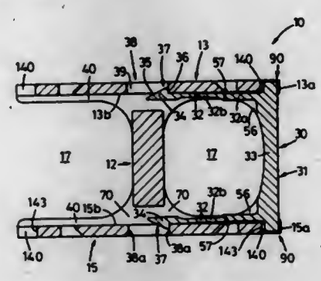
said spaced wing segments presenting a profile at a leading edge of the front of said slide;

wherein said profile is beveled so as to form an angle of 90 degrees or less at the leading edge of said slide, wherein said slide is arranged symmetrically along a central longitudinal axis coinciding with a central longitudinal axis about which said two tapes are arranged; and

bead means cooperating with said profile formed on said tapes running parallel with the central longitudinal axis of the slide located a predetermined distance from said central longitudinal axis of the slide on either side of said slide, whereby extraneous fabric material and thread is prevented from entering the mesh of the teeth of the slide fastener.

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**5,497,536**
**CABLE HOSE HANDLING CHAIN**
**Anthony J. Hart, Nottingham, England, assignor to Mansign Engineering Limited, Nottingham, England**
**Filed Nov. 16, 1994, Ser. No. 340,219**
**Claims priority, application United Kingdom, Nov. 17, 1993, 932372**
**Int. Cl.[6] A44B *21/00*; F16L *3/08***
**U.S. Cl. 24—459** **8 Claims**



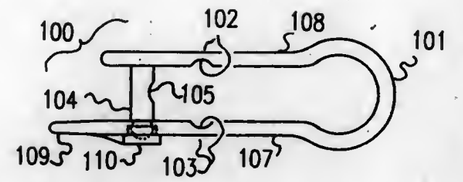
1. In combination, a cable/hose retention clip and a chain link of a cable/hose handling chain, the chain link having a body including a top wall spaced from an opposed bottom wall by a side wall to define a compartment for housing a cable/hose and having an open side opposite said side wall through which the cable/hose may be inserted into the compartment, the clip being insertable into the compartment through said opening to an engaged position whereat the clip releasably engages with the top and bottom walls, wherein the clip is moulded from plastics and has a relatively rigid body portion and a pair of relatively flexible resilient arm portions depending therefrom, the body portion being arranged to extend between the top and bottom walls to close said open side when the clip is in said engaged position, said arm portions having latch formations co-operable with latch formations on the top and bottom walls for restraining withdrawal of the clip through said open side from the engaged position, the rigid body portion being connected to the top wall and bottom wall by inter-engaging formations which co-operate to restrain outward displacement of the top and bottom walls from one another.

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**5,497,537**
**CLIP FOR FABRIC STRUCTURES**
**Michael D. Robinson, School Road, and Barry J. Causton, 63 Waimaukau Station Road, both of Waimaukau, Auckland, New Zealand**
**Filed Jul. 26, 1994, Ser. No. 279,883**
**Int. Cl.[6] A47H *13/00***
**U.S. Cl. 24—716** **7 Claims**

1. A clip for attaching a sheet of material along an edge to an elongated supporting member; the clip being made of a resilient material and comprising a throat region between two arms, a base, and an open end which closes permanently by the passage of a deformable head on a projection from one arm through an aperture in the other arm, the arms including deliberately weakened portions having a controlled strength, said weakened portions having a

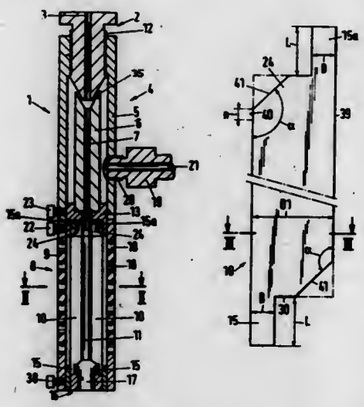




structure such as to give a visual sign that it has been severely loaded yet remains intact.

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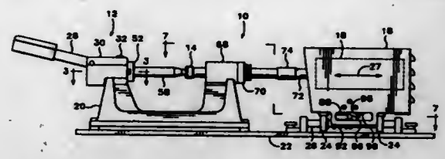
**5,497,538**
**DEVICE FOR TEXTURIZING CONTINUOUS FILAMENT THREADS**
**Felix Graf, Winterthur; Jorg Maier, Frauenfeld; Rudi Wagner, Russikon, and Armin Wirz, Ossingen, all of, Switzerland, assignors to Maschinenfabrik Rieter AG, Winterthur, Switzerland**
**Filed Jul. 1, 1994, Ser. No. 269,780**
**Claims priority, application Switzerland, Jul. 2, 1993, 1993/93**
**Int. Cl.[6] D02G *1/12***
**U.S. Cl. 28—255** **11 Claims**



1. A device for texturizing continuous filament threads by means of heated flowing media, the device including a thread infeed part for taking in the threads, a treatment part connected with the infeed part and having a treatment chamber for heating the threads, and a crimping part, the crimping part containing a slot nozzle, with the crimping part being connected to the treatment part, with the heated threads being stuffed into the crimping part for forming a crimping in the threads, the slot nozzle being provided with plates being inserted in slots, the plates having an essentially rectangular cross section having first and second end faces and being radially arranged with one of said end faces facing the stuffed thread, with every plate taking the form of a flat steel part, with the ends of each plate being provided with a prolongation, with these prolongations having a width smaller than the width of the plate, wherein one prolongation borders directly on one of said end faces of the plate and the other prolongation borders directly on another one of said end faces of the plate.

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**5,497,539**
**CASE TRIMMER**
**Fred B. Blodgett, Chico; Jerry D. Brand, Oroville; Steven J. Koch, Oroville, and Ronald L. Smith, Oroville, all of Calif., assignors to Blount, Inc., Montgomery, Ala.**
**Filed May 26, 1994, Ser. No. 249,900**
**Int. Cl.[6] B21D *51/54***
**U.S. Cl. 29—1.32** **11 Claims**



1. A case trimmer, comprising:

(a) an elongate base defining a longitudinal axis;

(b) a frame connected to the base and longitudinally adjustable relative thereto;

(c) a case holder having a receptacle for selectively receiving and holding a head of an elongate cartridge case such that the cartridge case is longitudinally aligned parallel with the longitudinal axis when held in the receptacle;

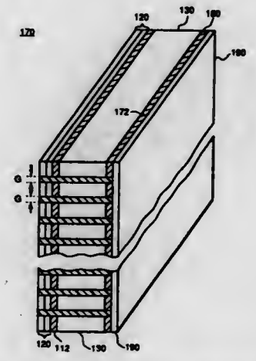
(d) a rotary cutter for trimming a mouth of the cartridge case;

(e) a motor having a drive shaft that is rotatable about an axis parallel with the longitudinal axis and is coupled to the cutter for imparting rotation to the cutter and wherein the motor is slidably connected to the frame for movement along the longitudinal axis; and

(f) a biasing member arranged to urge the motor and cutter along the longitudinal axis toward the case holder.

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**5,497,540**
**METHOD FOR FABRICATING HIGH DENSITY ULTRASOUND ARRAY**
**Subramaniam Venkataramani, Clifton Park; Robert F. Kwasnick, and Peter W. Lorraine, both of Niskayuna, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.**
**Filed Dec. 22, 1994, Ser. No. 362,338**
**Int. Cl.[6] H01L *41/22***
**U.S. Cl. 29—25.35** **13 Claims**



1. A high-yield method of fabricating an ultrasound array having densely packed ultrasound elements with smooth surface finishes, the method comprising the steps of:

applying an acoustic matching material to both a first surface and a second surface of a ceramic block, said first and second surfaces of said block being disposed opposite to one another along a first axis of said block, said block comprising a piezoelectric ceramic material;

cutting said block along a second axis to form a plurality of wafers, said second axis being disposed orthogonal to said first axis such that each wafer cut from said block comprises a portion of said ceramic material extending between said first and second surfaces and the respective associated matching material disposed thereon;

assembling said wafers to form a laminated body, said laminated body comprising a plurality of said wafers disposed to be substantially parallel to one another and such that the respective first and second surfaces and associated matching material disposed thereon of said wafers are aligned, said laminated body further comprising respective layers of a polymeric adhesive material disposed between the parallel faces of said wafers such that said wafers are disposed at a selected array gap distance from immediately adjacent wafers;

cutting said laminated body along a longitudinal axis to form a first laminate body subassembly and a second laminate body subassembly, each of said subassemblies comprising a front surface having said matching material disposed thereon and a back surface comprising a now-exposed face of said ceramic material in each of said wafers and the intermediate portions of said polymeric adhesive material;

applying a backing layer to said back surface of each of said subassemblies; and

removing said polymeric adhesive material disposed between respective portions of said ceramic material in each of said first and second subassemblies, whereby each of said subassemblies comprises an ultrasound array wherein said remaining portions of said ceramic wafers with associated matching material disposed on said front surface comprise respective ultrasound elements in said array.

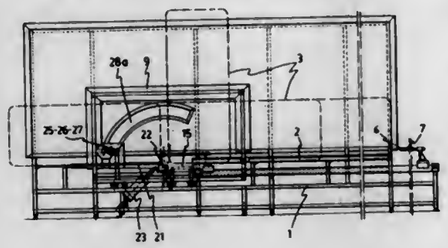
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**5,497,541**

**STAPLING MACHINE FOR SPRING CARCASS FRAMES**

**Jose L. A. Nogueira, Madrid, Spain, assignor to Fabricas Lucia Antonio Betere, S.A. (Flabesa), Madrid, Spain**

**Filed Dec. 9, 1992, Ser. No. 988,223**
**Claims priority, application Spain, Dec. 12, 1991, 9102769; Dec. 12, 1991, 9102770; May 29, 1992, 9201111**
**Int. Cl.[6] B23P *19/00***
**U.S. Cl. 29—33 K** **10 Claims**



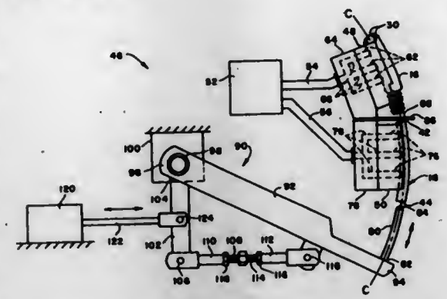
1. A stapling machine for producing its own staples and for stapling spring carcass frames, said stapling machine comprising:
a pair of stapling heads;
an elongate frame;
a bearing having an inner end and being coupled on said inner end thereof to the pair of stapling heads and being fitted on the frame for receiving the spring carcass;
front and rear guides positioned vertically, in parallel relationship with each other and separated by a variably controlled distance, said front and rear guides being positioned on opposing sides of the bearing;
a motor; and
a first thruster driven by the motor and engaged with the bearing for intermittently moving the spring carcass towards the stapling heads.

**5,497,542**

**METHOD OF ASSEMBLING AN INNER TUBE INTO AN OUTER TUBE**

**Robert H. Sengstock, Kaukauna, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.**

**Division of Ser. No. 174,119, Dec. 27, 1993, abandoned. This application Feb. 28, 1995, Ser. No. 395,748**
**Int. Cl.[6] B23P *11/00***
**U.S. Cl. 29—464** **7 Claims**



1. A method of assembling an inner tube into a hollow outer tube, said method comprising the steps of:
a) placing said outer tube onto a first member which is connected to a source of vacuum and supplying a vacuum to retain said outer tube in a desired position;
b) placing said inner tube onto a second member which is connected to a source of vacuum and supplying a vacuum to hold said inner tube in coaxial alignment with said outer tube;
c) using a push rod to insert said inner tube into said outer tube to form an assembly;
d) withdrawing said push rod from said inner tube; and
e) removing said vacuum from said first member to allow said assembly to be removed.

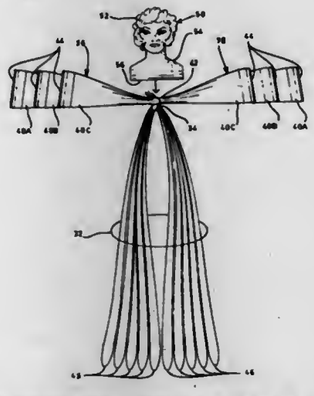
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**5,497,543**

**DOLL MAKING METHOD**

**D. Lea Cavender, 2825 Top Rd., Sevierville, Tenn. 37862, and Tina L. B. Slater, 211 Harmony St., Commerce, Ga. 30529**

**Filed Jun. 1, 1995, Ser. No. 457,625**
**Int. Cl.[6] B23P *21/00*; A63H *3/36***
**U.S. Cl. 29—469** **17 Claims**



1. A doll making method comprising the steps of:
forming a length of ribbon material into a plurality of first loops disposed on opposite sides of a first gathered portion of ribbon material;
folding the ribbon material proximate the first gathered portion whereby the first loops are substantially adjacently disposed so as to define a skirt-like configuration;
forming the ribbon material into a plurality of second loops disposed on opposite sides of a second gathered portion of ribbon material so as to produce first and second oppositely disposed wing-like portions; and
securing a head member to the ribbon material proximate the first and second gathered portions of ribbon material.



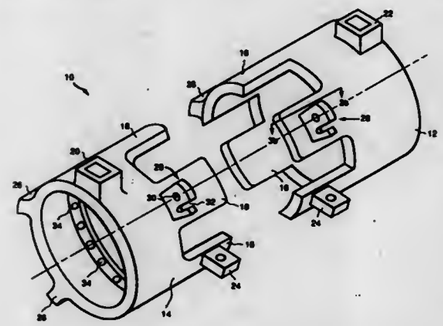
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**5,497,544**

**STATOR FRAME FABRICATION**

**Paul R. Bien, Erie, Pa., and Michael P. Hagle, Mason, Ohio, assignors to General Electric Company, Erie, Pa.**

**Filed May 23, 1994, Ser. No. 247,738**
**Int. Cl.[6] H02K *15/14***
**U.S. Cl. 29—596** **7 Claims**



1. A method for fabricating a stator comprising the steps of:
machining a connection end (CE) casting including a plurality of CE integral partial tie bars extending from an inboard side of the CE casting;
machining a pinion end (PE) casting including a plurality of PE integral partial tie bars extending from an inboard side of the PE casting, each one of the PE partial tie bars corresponding to a respective one of the CE partial tie bars;
stacking a plurality of stator laminations in one of the CE and PE castings; and then
welding each of the PE partial tie bars to a respective one of the CE partial tie bars.

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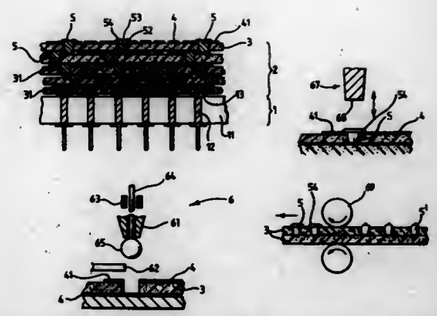
**5,497,545**

**METHOD OF MAKING ELECTRICAL CONNECTIONS IN THE MANUFACTURE OF WIRING SHEET ASSEMBLIES**

**Ryuji Watanabe, Tokai; Osamu Miura; Kunio Miyazaki, both of Hitachi; Yukio Ookoshi, Mito, and Akio Takahashi, Hitachioota, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Mar. 18, 1993, Ser. No. 34,372**
**Claims priority, application Japan, Mar. 19, 1992, 4-063146**
**Int. Cl.[6] H05K *3/36;3/40;3/46*; H01R *9/09***
**U.S. Cl. 29—830** **20 Claims**

1. A method of making an electrical connection in the manufacture of a wiring sheet assembly, comprising:
(a) positioning an insulator sheet between a first conductor and a second conductor;
(b) forming a through-hole through the second conductor and the insulator sheet and overlying the first conductor;
(c) inserting a metallic stud through the through-hole and into contact with the first conductor;
(d) bonding the metallic stud onto the first conductor, while heaving an end of the metallic stud exposed above the second conductor; and
(e) flattening the exposed end of the metallic stud to spread said exposed end in peripheral contact with the second conductor.



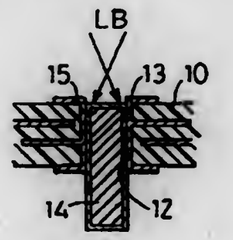
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**5,497,546**

**METHOD FOR MOUNTING LEAD TERMINALS TO CIRCUIT BOARD**

**Masao Kubo; Kazuo Kamada; Masanobu Ogasawara, and Yoshimitsu Nakamura, all of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan**

**Filed Sep. 14, 1993, Ser. No. 120,429**
**Claims priority, application Japan, Sep. 21, 1992, 4-276580**
**Int. Cl.[6] H01R *9/00***
**U.S. Cl. 29—843** **16 Claims**




1. A method for mounting lead terminals to a circuit board, comprising providing a solder layer on each of said lead terminals and on each conductive inner wall surface of respective through holes made in said circuit board, thrusting said lead terminals into respective ones of said through holes, and irradiating contacting portions of said solder layers with an energy beam to weld in a fluxless manner each of the respective lead terminals to said inner wall surfaces of respective ones of the through holes.

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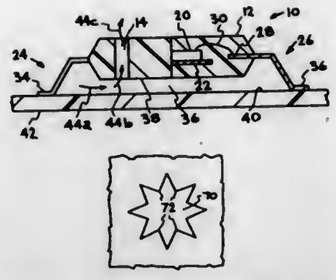
**5,497,547**

**METHOD AND APPARATUS FOR COOLING A MOLDED-PLASTIC INTEGRATED-CIRCUIT PACKAGE**

**Young I. Kwon, San Jose, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.**

**Continuation of Ser. No. 939,216, Sep. 2, 1992, Pat. No. 5,369,550. This application Apr. 6, 1994, Ser. No. 223,745**
**The portion of the term of this patent subsequent to Nov. 29, 2011, has been disclaimed.**
**Int. Cl.[6] B23P *15/26***
**U.S. Cl. 29—890.03** **1 Claim**

1. A method of fabricating a molded-plastic package assembly for an integrated-circuit die, comprising the steps of:



attaching an integrated-circuit die to a die attach paddle of a lead frame;
molding a molded package body around said lead frame and said attached integrated-circuit die;
forming a through-hole extending from a top surface of said molded package body to a bottom surface of said molded package body for passage of air so that air currents can be drawn through said through-hole in said molded package body to cool said integrated-circuit die attached said die-attach paddle, and
forming projecting portions of said molded package body which project into said through-hole to provide cooling fins within said through-hole.

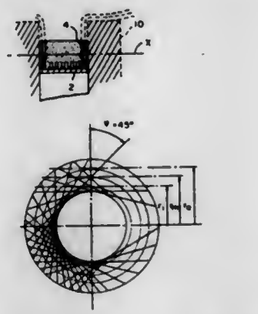
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**5,497,548**

## METHOD OF MAKING RINGS FOR GEARS HAVING INTERNAL OR EXTERNAL TOOTHING

**Manfred Schlenger, Gilching, and Hermann Hald, Leonberg, both of, Germany, assignors to Deutsche Forschungsanstalt für Luft- und Raumfahrt e.V., Cologne, Germany**

**Filed Sep. 24, 1993, Ser. No. 125,757**
**Claims priority, application Germany, Sep. 26, 1992, 42 32 316.9**
**Int. Cl.[6] F16H *55/14***
**U.S. Cl. 29—893** **6 Claims**



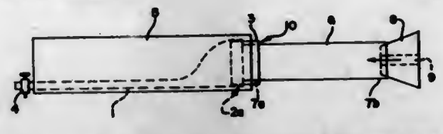
1. A method of making rings for gears having internal or external toothing comprising the steps of:
arranging woven fabric hoses of composite fibrous materials in a plurality of layers in a circumferential direction on a bottom and on side flanks of a U-shaped groove depression of a rotating production device, wherein fiber orientation of the woven fabric hoses is at a ± 45° angle to a longitudinal length of the hoses; and
filling a remaining free space in an interior of the applied plurality of layers with a resin-impregnated fibrous thread wound in one direction, thereby forming an integral ring after hardening of the applied plurality of layers and the wound resin-impregnated fibrous thread.

**5,497,549**

## PROCESS FOR THE PRODUCTION OF WINDING CORE ROLLS

**Horst Rademacher, Ostercappeln, Germany, assignor to Felix Schoeller Jr. Foto- und Spezialpapiere GmbH & Co. KG, Osnabruck, Germany**

**Filed May 13, 1994, Ser. No. 242,533**
**Int. Cl.[6] B23P *11/02***
**U.S. Cl. 29—895.21** **16 Claims**



1. A process for the production of a core roll for the winding of sheet material and in which the core roll includes a core casing with an external coating of an elastically deformable material thereon, comprising:
positioning a tube of the elastically deformable material which is to externally coat the core casing on one end of a guide casing and blocking off the other end of the deformable tube;
positioning the guide casing on a core casing so as to define a narrow annular aperture between said guide casing and core casing;
inserting said deformable tube and guide casing into a mounting tube and closing an end of the core casing with a plug having a bore;
introducing a pressurized fluid through the bore and said core casing into the deformable tube to deform the deformable tube so as to press the deformable tube against the internal wall of said mounting tube;
sliding said core casing into the deformed tube with at least some of said pressurized fluid passing through said annular aperture to define a fluid cushion between said guide casing and core casing; and
relieving the pressure of the pressurized fluid to retract said deformable tube from the internal wall of the mounting tube and cause the deformable tube to adhere to the exterior surface of said core casing.

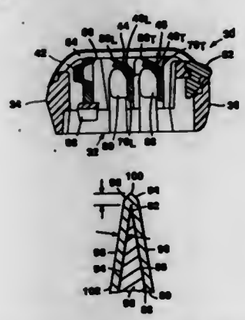
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**5,497,550**

## SHAVING SYSTEM

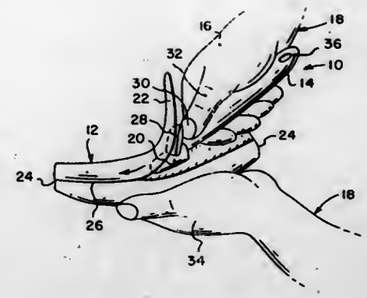
**Robert A. Trotta, Pembroke; Steve S. Hahn, Wellesley; John Madeira, Assonet; Chong-ping P. Chou, Lexington, all of Mass., and Lamar E. Brooks, North Providence, R.I., assignors to The Gillette Company, Boston, Mass.**

**Continuation-in-part of Ser. No. 793,027, Nov. 15, 1991, abandoned. This application Feb. 3, 1994, Ser. No. 192,034**
**Int. Cl.[6] B26B *21/06***
**U.S. Cl. 30—50** **10 Claims**



6. A shaving system comprising support structure that defines spaced skin-engaging surfaces, and razor blade structure secured to said support structure, said razor blade structure including a sharpened tip defined by tip facets that have lengths of about 0.1–0.2 micrometer and define an included angle of at least sixty degrees, and a substrate with a wedge-shaped edge defined by interior and exterior main facets that have an included angle of less than seventeen degrees at a distance of forty micrometers from the wedge-shaped edge, and a layer of strengthening material on said wedge-shaped edge, said layer of strengthening material having a thickness in the range of one thousand to two thousand angstroms from the wedge-shaped edge to a distance of forty micrometers from the wedge-shaped edge, and a hardness of at least twice that of said substrate, said wedge-shaped edge being disposed between said skin-engaging surfaces at a blade tangent angle of less than 20° and said interior main facet being at an angle greater than 150° with respect to its blade tangent angle reference line.





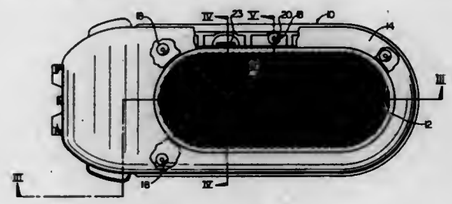
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**5,497,551**

## RAZOR HANDLE ASSEMBLY

**Domenic V. Apprille, Jr., Arlington, Mass., assignor to The Gillette Company, Boston, Mass.**

**Filed Oct. 13, 1994, Ser. No. 322,433**
**Int. Cl.[6] B26B *21/52***
**U.S. Cl. 30—85** **16 Claims**



1. A razor handle assembly comprising:
a substantially flat planar body member to be held in the fingers or palm during use, a top shell member mounted on one surface thereof and a bottom shell member mounted on the opposite surface thereof, each of said shell members covering only the peripheral top and bottom surface of said body member;
said body member comprising a first element formed of substantially flexible material and a second element formed of a more rigid material than said first element,
said first element being formed in its entirety of said substantially flexible material providing a top surface and a bottom surface of said body member and said second element being sandwiched within said first element between said top and bottom surfaces and forming said peripheral top and bottom surface of said body member contacting and covered by said shell members,
said first element having a plurality of fins extending from each of said top and bottom surfaces,
and each said fin having a flexible tip, said fins thereby providing a means for retention of the razor handle by the user.

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**5,497,552**

## GREEN BANANA/PLANTAIN PEELER

**Edwin Rodriguez, 1405 Park Ave. #8E, New York, N.Y. 10029, and George Spector, deceased, late of 233 Broadway Rm 702, New York, N.Y. 10279**

**Filed Jan. 17, 1995, Ser. No. 374,342**
**Int. Cl.[6] A47J *17/02***
**U.S. Cl. 30—123.5** **2 Claims**

1. A device for peeling a green banana and plantain comprising:
a) a handle to be grasped by a first hand of a person;
b) a curved peeling tip extending outwardly from an end of said handle to fit under a skin of the green banana and plantain, in which both ends of the green banana and plantain are cut off and the skin having a plurality of lengthwise slits;
c) a curved shield extending at a rearward angle up from a top surface of said curved peeling tip, so as to protect a nail of a thumb of the first hand grasping said handle when pushing forward to peel the skin off of the green banana and plantain held in a second hand of the person; further including a curved holder having a plurality of prongs and a flexible center slot on an inner surface, whereby said prongs in said curved holder can engage the green banana and plantain when placed and gently squeezed in the second hand of the person, so as to keep the second hand clean while said flexible center slot allows said handle to be stored therein when not in use.

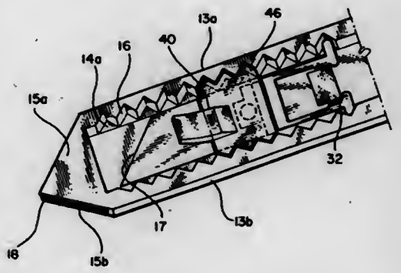
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**5,497,553**

## SAFETY CUTTER

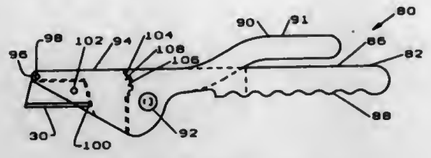
**Sing-Yuen Chong, Chaiwan, Hong Kong, assignor to Twin Base Limited, Hong Kong**

**Filed Aug. 2, 1994, Ser. No. 284,217**
**Int. Cl.[6] B26B *1/08***
**U.S. Cl. 30—162** **4 Claims**



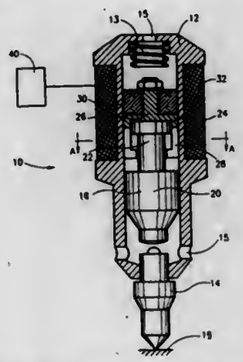
1. A safety cutter, comprising:
a rigid housing with an elongated opening on one surface,
recesses on at least one side of said elongated opening in the form of notches,
a blade slidable inside the housing, said blade being completely retractable within the housing,
sliding means which engages said blade for slidably moving said blade within said housing,
wedging means for engaging said sliding means to limit movement thereof, and
a safety means insertable within said elongated opening, to contact said sliding means and thereby limit its movement, said saftey means comprising a main plate portion, a handle, and at least one protuberance on at least one side of the main plate portion, said at least one protuberance being complementary with said recesses for engagement therein.

5,497,554
**PLIER-TYPE HAND TOOL**
Michael R. Hamlin, Gig Harbor, Wash., assignor to Flexible Technologies, Inc., Abbeville, S.C.
Filed Dec. 28, 1993, Ser. No. 174,251
Int. Cl.[6] B26B 5/00
U.S. Cl. 30—330 7 Claims



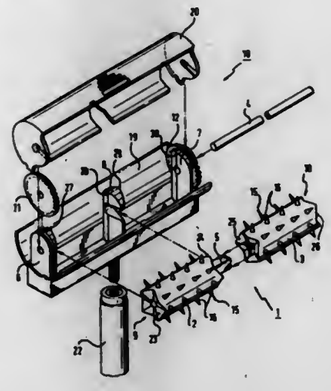

1. A plier-type hand tool comprising:
a first member having a pair of side plates mounted in fixed spaced relation;
a second member pivotally mounted between said side plates, each of said first and second members having a jaw portion and a handle portion; and
a third member pivotally mounted adjacent one end of said first member between said side plates and having a free end moveable between said side plates, said third member being formed with (i) means for receiving and releasably retaining a cutting blade in cooperation with said first member and (ii) a stud projecting from said free end of said third member,
said second member being pivotable between an open position and a closed position with respect to said first member and being formed with a recess mating with said stud and a portion operable when said second member is pivoted to said open position to cam said third member to afford access to said means for receiving and releasably retaining the cutting blade.

5,497,555
**ELECTROMAGNETIC PERCUSSION DEVICE**
Moshe Averbukh, Moshav Gilat, Karavan 85, D.N. Hanegev 85410, Israel
Filed Dec. 19, 1994, Ser. No. 359,149
Int. Cl.[6] B26F 1/00
U.S. Cl. 30—362 16 Claims




1. An electromagnetic percussion device, comprising:
(a) a housing;
(b) an instrument connected to, and extending beyond, said housing;
(c) a piston body reciprocatable within said housing and adapted to impact said instrument, said piston body including an intermediate region of a first diameter and an enlarged posterior head of a second diameter, said second diameter being larger than said first diameter;
(d) a driving member reciprocatable within said housing, said driving member including a coupling element for slidably accommodating said head of said piston body, thereby coupling said driving member and said piston body together, said coupling element including a plurality of leaves which enclose and confine said head of said piston body when said coupling element is within said housing but which can be moved apart when said coupling element is outside said housing to allow said head of said piston body to be inserted into, or removed from, said coupling element;
(e) an electromagnetically active body connected to said driving member; and
(f) an electromagnetic coil connected to said housing, said coil operationally coupled to said electromagnetically active body so as to cause the reciprocation of said driving member.

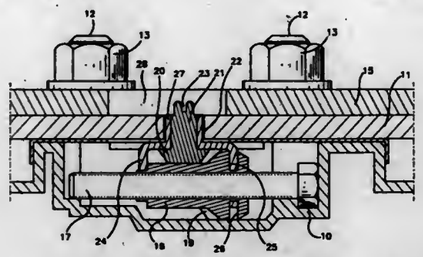
5,497,556
**RIPPING TOOL**
Elias Lebessis, Furfürstenstrasse 16, Germering, Germany
Filed Jul. 6, 1994, Ser. No. 271,139
Claims priority, application Germany, Jul. 14, 1993, 43 23 580.8
Int. Cl.[6] B44C 7/02
U.S. Cl. 30—365 15 Claims




1. A ripping tool comprising:
a handle;
a spiked roller, said spiked roller mounted rotatably along an axis on said handle, said spiked roller constructed and arranged to be passively rotated when said spiked roller is rolled over the surface of a layered material, said spiked roller further being divided into at least one roller pair consisting of two roller elements;
said roller elements of a roller pair capable of axial displacement in relation to each other along said axis of said spiked roller, said roller elements guided in axial displacement by cams;
wherein said roller elements are alternately axially displaced toward and away from each other as said spiked roller is rolled over said surface of said layered material.

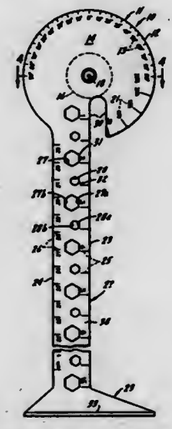


5,497,557
**CHAIN STRETCHING DEVICE FOR A CHAIN SAW**
Pär B. G. Martinsson, Huskvarna, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden
Filed Sep. 27, 1994, Ser. No. 313,014
Claims priority, application Sweden, Jan. 13, 1993, 9303363
Int. Cl.[6] B27B 17/14
U.S. Cl. 30—386 4 Claims



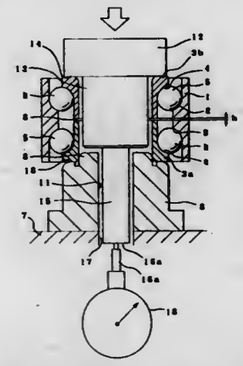

1. A motor saw comprising a housing (10), a guide bar (11) provided with a chain saw (16), said guide bar being releasably attached at one end to the housing and axially slidable relative to said housing, and adjusting means for axially displacing said guide bar relative to said housing to adjust the tension of the chain saw, said adjusting means comprising a screw (17) extending generally parallel to the guide bar and attached at one end in a nonrotatable manner to the housing (10), and a nut (18) engaging the screw and operatively connected to the guide bar to 14 provide an axial displacement of the guide bar by rotation of the nut, and a gear transmission (19, 20) provided with a drive shaft (21) extending through a bore (22) in the guide bar, said nut (18) being rotatably actuatable by the gear transmission (19, 20).

5,497,558
**MULTI-FUNCTION DRAFTING INSTRUMENT**
Michael J. Wagner, Carol Stream, Ill., assignor to Sanford Corporation, Bellwood, Ill.
Continuation-in-part of Ser. No. 60,382, May 11, 1993, abandoned. This application Jan. 24, 1995, Ser. No. 379,374
Int. Cl.[6] B43L 9/04; G01B 3/04
U.S. Cl. 33—27.03 13 Claims



1. A drafting instrument providing compass, protractor, T-square and ruler functions, the instrument comprising:
a circular plate having an outer surface and a undersurface, the circular plate including a suction cup pivotally attached to the undersurface for removably attaching the instrument to a drawing surface, an outer periphery of the outer surface of the circular plate including a plurality of measurement indicia indicating angles, the outer periphery of the outer surface of the circular plate and the plurality of measurement indicia disposed thereon providing protractor functions,
an arm extending outward from the circular plate, the arm terminating at an outwardly turned distal end of the arm, the arm including a plurality of measurement indicia indicating distances, the arm and the plurality of measurement indicia disposed thereon providing ruler functions,
the pivotal attachment of the suction cup to the drawing instrument permitting rotation of the circular plate and the arm about an axis defined by a center of the suction cup, the arm including a plurality of apertures for accommodating a writing instrument, the apertures disposed in the arm and the arm and the pivotal attachment of the circular plate to the suction cup providing compass functions, and
the outwardly turned distal end of the arm and the arm providing T-square functions when the suction cup is removed from the drawing surface and the outer surface of the circular plate is placed downward on the drawing surface and the outwardly turned distal end of the arm engages an outer edge of the drawing surface.

5,497,559
**METHOD OF MEASURING PRELOAD CLEARANCE IN DOUBLE ROW ROLLING BEARING AND APPARATUS THEREFORE**
Kenichi Okumura; Hakaru Fujioka, both of Shiga, and Kazuhiro Oshima, Moriyama, all of, Japan, assignors to NSK Ltd., Tokyo, Japan
Filed Feb. 3, 1995, Ser. No. 383,157
Claims priority, application Japan, Feb. 4, 1994, 6-012973
Int. Cl.[6] G01B 5/02; 5/14
U.S. Cl. 33—517 2 Claims



1. A method of measuring the preload clearance in a double row rolling bearing which comprises an outer ring having outer raceways in double rows on its inner peripheral surface, first and second inner rings each having an inner raceway on its outer peripheral surface and each provided concentric with the outer ring, and a plurality of rolling members provided between the inner raceways and the outer raceways in double rows, respectively, and the rolling members being preloaded in the state where the first and second inner rings are abutted to each other at their inner end edges, and the method comprising the following steps (a) to (c),
(a) the outer end face of the first inner ring is fixed in position while the outer end face of the second inner ring is subjected to a first load in a direction to move the second inner ring toward the first inner ring at a relatively smaller constant amount so as not to reduce the preload clearance to zero, and to obtain the value $H_1$ corresponding to the position of the outer end face of the second inner ring,

(b) the outer end face of the first inner ring is fixed in position while the outer end face of the second inner ring is subjected to a second load in a direction to move the second inner ring toward the first inner ring at a relatively larger, constant amount enough to reduce the preload clearance to zero, and to obtain the value $H_2$ corresponding to the position of the outer end face of the second inner ring,

(c) the difference between the value $H_1$ in the step (a) and the value $H_2$ in the step (b), that is $(H_2-H_1)$, is calculated to provide a displacement amount, and the preload clearance is obtained from the displacement amount based on a predetermined relationship between the displacement amount and the preload clearance.

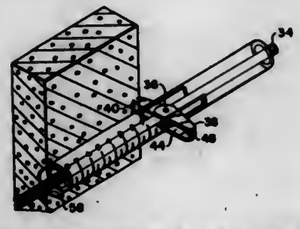
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**5,497,560**

## DEPTH FINDER

**David Pasquerella, 99 Kensington Oval, New Rochelle, N.Y. 10805, and Richard Colbert, 345 Bedford Ave., Mount Vernon, N.Y. 10553**

**Filed Jan. 27, 1995, Ser. No. 379,177**
**Int. Cl.[6] G01B 5/06**
**U.S. Cl. 33—836** **1 Claim**



1. Apparatus for determining the thickness of a slab structure in which a cylindrical bore has been made connecting a remote and near surfaces of said slab said apparatus comprising a cylinder having a distal end and a proximal end, said cylinder having opposed longitudinally oriented lateral openings in the wall of said cylinder, said openings located inwardly from the distal end of said cylinder, said openings having inner and outer edges with an indicia scale of length running longitudinally and visible on the outer surface of said cylinder, the zero point of said indicia scale coincidental with the inner walls of said lateral openings in said cylinder, a shaft within said cylinder, said shaft having a length greater than said cylinder and having a proximal end and distal end, a handle on said proximal end of said shaft, a transverse pin spaced inwardly from the distal end of said shaft, passing through said shaft and mounted thereon a pair of butterfly arms, said butterfly arms spring biased to a spread position so that when said shaft is positioned so said butterfly arms are opposed to said lateral openings they extend outwardly through those openings and the inward surfaces of said butterfly arms are positioned perpendicularly to the inner edge of said openings and engageable with the remote surfaces of said slab when said shaft is moved with respect to said cylinder thereby displaying the depth of said slab and determining the depth of said slab by the position of said indicia with respect to the inner walls said slab.

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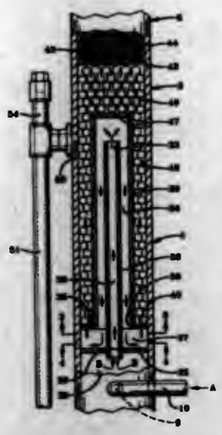
**5,497,561**

## DRYER FOR REMOVING MOISTURE FROM NATURAL GAS

**Curtis W. Murray, Sr., and Curtis W. Murray, Jr., both of Big Prairie, Ohio, assignors to Pride of the Hills Mfg., Inc., Big Prairie, Ohio**

**Filed Feb. 24, 1994, Ser. No. 201,271**
**Int. Cl.[6] E26B 21/06**
**U.S. Cl. 34—80** **14 Claims**

1. A natural gas dryer including:



a hollow pressure vessel having a lower separator section, an intermediate drying section, and an upper drying section;

inlet means formed in the vessel for admitting a gas-moisture mixture into the separator section;

a liquid tray separating the separator section and the intermediate section;

a sparger plate spaced above the liquid tray and formed with a plurality of spaced openings providing a total open area of between 35% and 85% of the total area of said plate;

a down tube extending upwardly from the sparger plate within the intermediate section and having a closed upper end and an open lower end;

an inlet tube extending partially upwardly within the down tube and communicating with the separator section;

packing material located about the down tube in the intermediate section;

perforated support plate means separating the intermediate and upper sections for supporting a desiccant bed; and

gas outlet means for discharging dried gas from the upper drying section.

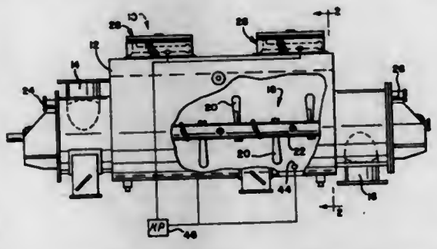
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**5,497,562**

## RADIANT HEATER SYSTEM FOR SOLID PHASE CRYSTALLIZATION AND POLYMERIZATION OF POLYMERS

**Ilya Pikus, Plymouth, Minn., assignor to Hosokawa Bepex Corporation, Minneapolis, Minn.**

**Filed Mar. 3, 1995, Ser. No. 398,065**
**Int. Cl.[6] F26B 3/34; C08J 3/28**
**U.S. Cl. 34—269** **6 Claims**



1. A process for the solid phase polymerization of polyester comprising the steps of providing a crystallizer, introducing cold amorphous polymer to the crystallizer providing a source of infrared radiation, heating said polymer by applying infrared radiation thereto, and controlling the degree of heating whereby said polymer reaches a crystallization temperature without exceeding the polymer melting point.



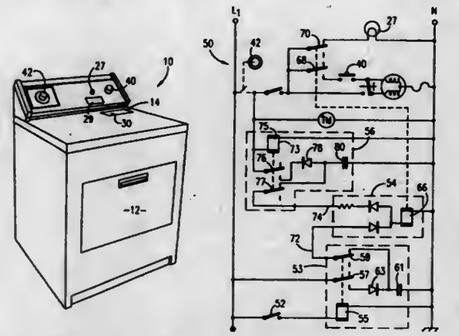
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**5,497,563**

## DRYER APPARATUS

**Alfred B. Mayfield, Halstead, Kans., assignor to Charles D. Johnson, McPherson, Kans.**

**Filed May 5, 1994, Ser. No. 239,257**
**Int. Cl.[6] F26B 21/06**
**U.S. Cl. 34—572** **19 Claims**



1. A clothes dryer comprising:

a laundry compartment for receiving laundry to be dried;

an air passageway coupled to said laundry compartment for circulating heated air generated by the clothes dryer in and out of said laundry compartment;

a lint screen compartment interposed in said air passageway;

a lint screen adapted to be received in said lint screen compartment for filtering the circulated heated air;

a control circuit configured for controlling the operation of the dryer, said control circuit including means for preventing the dryer from operating unless said lint screen is removed from said lint screen compartment and re-inserted after a drying cycle.

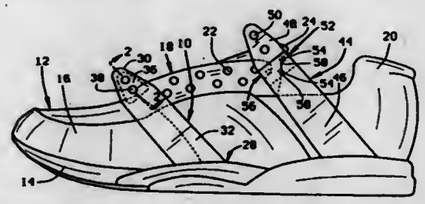
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**5,497,564**

## RIGID/SEMI-RIGID PLASTIC SHOE STRAP CONSTRUCTION

**Bernie Allen, Wayland; Joel Rusnak, Newburyport; Aaron Azevedo, Boston, and Neal Kimball, Framingham, all of Mass., assignors to Converse Inc., North Reading, Mass.**

**Filed Jul. 2, 1993, Ser. No. 86,948**
**Int. Cl.[6] A43C 11/00; 5/00**
**U.S. Cl. 36—50.1** **20 Claims**



1. A shoe having flexible and adjustable closure means, the shoe comprising:

a shoe sole having opposite lateral and medial sides;

a shoe upper secured to the shoe sole along its opposite lateral and medial sides, the upper having an interior surface that defines an interior volume of the shoe configured to receive a foot therein, and the upper having an exterior surface with opposite lateral and medial surfaces;

and at least one strap having an elongated configuration with a length of the strap having opposite proximal and distal ends, the proximal end being connected to one of the lateral and medial sides of the shoe and the strap extending along its length from the shoe at the strap proximal end, to the distal end of the strap, the strap being formed of first and second plastic materials giving different areas of the length of the strap different characteristics of elasticity, flexibility and rigidity, with a first area of the length of the strap adjacent the strap connection to the shoe having greater elasticity and flexibility and lesser rigidity characteristics than elasticity, flexibility and rigidity characteristics of a second area of the length of the strap adjacent the strap distal end; and,

closure means connected to the distal end of the strap for adjustably pulling the length of the strap from its connection to one of the lateral and medial sides of the shoe toward the other of the lateral and medial sides of the shoe.

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**5,497,565**

## SPIKE ASSEMBLY FOR FOOTWEAR

**Lionel G. Balgin, 63 Central Ave., Albany, N.Y. 12206**

**Continuation-in-part of Ser. No. 230,197, Apr. 20, 1994, abandoned. This application Feb. 27, 1995, Ser. No. 395,058**
**Int. Cl.[6] A43C 15/14**
**U.S. Cl. 36—61** **11 Claims**



7. A rotatably projectable and retractable spike system for use in combination with footwear and comprising:

a heel and sole footwear base accommodating therein a spike assembly which effects projection of a spike plurality from out said base and retraction thereinto;

a release-lock, pull-unlock rotatable shaft mechanism coupled to a helically slotted inner cylinder of a dual cylinder means which converts an angular motion of said rotatable shaft mechanism to a reciprocative motion that is effected by a transverse pin-captured bolt, said bolt residing within said helically slotted inner cylinder and which is compelled to reciprocate by passage of ends of said transverse pin through helical slots of said inner cylinder, said rotatable shaft mechanism encased principally in said heel of said base;

transmission means for transferring said reciprocative motion to at least one lever-roller fulcrum-spike component; and

said at least one component connected to said transmission means.

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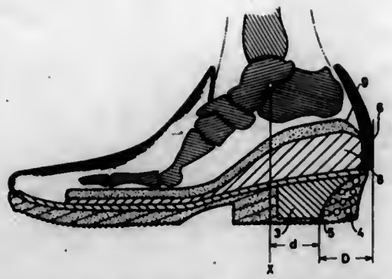
**5,497,566**

## METHOD OF MANUFACTURING ELEVATING SHOES

**Sachiko Kousaka; Mitsuko Kousaka, both of 9-13, Shiroyamadai 3-cho, Sakai-shi, Osaka-fu, and Kumiko Isaka, 41, Kannonjicho, Izumi-shi, Osaka-fu, all of, Japan**

**Continuation-in-part of Ser. No. 76,490, Jun. 14, 1993, abandoned, which is a continuation of Ser. No. 776,933, Oct. 15, 1991, abandoned. This application Nov. 8, 1993, Ser. No. 148,713**
**Int. Cl.[6] A43B 7/16; 13/38; 23/00**
**U.S. Cl. 36—81** **1 Claim**

1. A method of manufacturing a shoe adapted to be worn by a wearer having a tibia bone axis, said shoe having a shoe body with a rear terminating end, a heel having a bottom surface, and an inner



member in the shoe body for raising the height of the wearer, comprising the steps of:

forming the inner member with a top surface positioned to overlie the heel, said top surface being disposed at a vertical height measured from said top surface to said bottom surface of the heel;

forming a heel body having a rear end;

forming a flexible heel configuration part having the configuration of a heel and being disposed rearwardly of said rear end of said heel body;

providing a first horizontal distance between said rear end of said heel body and said rear terminating end of said shoe body;

positioning said rear end of said heel body rearwardly of the tibia bone axis of the wearer at an approximate second horizontal distance extending between said rear end of said heel body and said tibia bone axis of the wearer;

providing said shoe with an elevated vertical height;

utilizing said elevated vertical height for determining said first horizontal distance such that greater first horizontal distances are provided for greater elevated vertical heights; and

providing a substantially constant second horizontal distance for all elevated vertical heights.

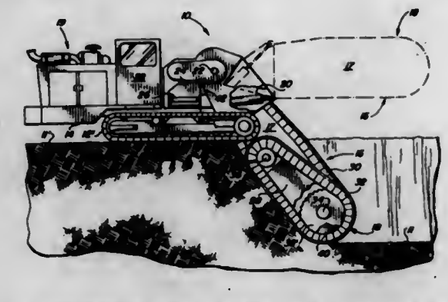
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**5,497,567**

**WIDE TRENCHER WITH PLURALITY OF CHAIN TYPE DIGGERS**

**Jerry F. Gilbert, 1400 E. Highway 26, Grapevine, Tex. 76051**

**Filed May 19, 1994, Ser. No. 245,942**
**Int. Cl.[6] E02F 5/00**
**U.S. Cl. 37—352** **20 Claims**



1. Excavating machine for digging a ditch comprising a main frame, and means including a prime mover and drive train for propelling said machine along the ground;

an elongated digging apparatus that includes a boom having a near end opposed to a tail end, a head shaft at the near end of said boom, a tail shaft at the tail end of the boom, means supporting an intermediate shaft on said boom between said tail shaft and said head shaft;

a plurality of axially spaced sprockets on said head shaft, a plurality of axially spaced sprockets on said tail shaft including innermost and outermost sprockets, a plurality of axially spaced sprockets on said intermediate shaft including innermost and outermost sprockets, means pivotally mounting said boom near end to said main frame;

spaced, parallel, endless chains meshed with said sprockets on said head shaft and with the innermost sprockets on said tail shaft to thereby provide an upper chain run and a lower chain run; digging means for excavating the ground supported by said endless chains forming an endless central digging and conveying member;

means connecting said prime mover for rotating said sprockets on said head shaft and thereby move said endless chains meshed with said sprockets on said head shaft;

an intermediate endless chain meshed with an innermost sprocket on said tail shaft and meshed with an innermost sprocket on said intermediate shaft for rotating said axially spaced sprockets on said intermediate shaft;

spaced endless chains meshed with the outermost sprockets on said tail shaft and with the outermost sprockets on said intermediate shaft to thereby form opposed intermediate outer endless chains; digging means for excavating the ground supported by said opposed intermediate outer endless chains which form opposed endless outer digging and conveying members; and,

conveyor means for receiving excavated material from the endless central digging and conveying member, and from the opposed endless outer digging and conveying members and moving any excavated material from proximity of the digging machine.

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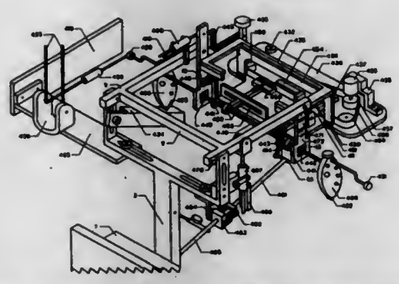
**5,497,568**

**INTEGRATED GROUP OF EXCAVATOR CONTROL ASSEMBLIES**

**William A. Strickland, 1512 North Pebble Beach Blvd., Sun City Center, Fla. 33573**

**Continuation-in-part of Ser. No. 664,981, Mar. 6, 1991, abandoned. This application Aug. 11, 1992, Ser. No. 928,115**
**Int. Cl.[6] E02F 5/02; B25J 3/04**
**U.S. Cl. 37—348** **18 Claims**





1. A control assembly for a hydraulically powered excavator which includes control sets of associated large operating boom, arm and bucket members that are maneuvered in digging operations and small mimicing boom, arm and bucket control members corresponding, respectively, to the large operating members such that said small members are selectively movable into positions equivalent to the positions into which said large members are moved; said control assembly comprising:



an actuator means to activate movement of each control set;

each control set including an associated large member, parallel small member and interconnecting sub-assemblies to provide control, each sub-assembly comprising:

(a) signalling means (448, 446, 443, 450) supported on an associated small member (11, 13, 414) and activated by movement of said actuator means to control the activation of a hydraulic control valve (33, 43, 47);

(b) large hydraulic positioning means (34, 42, 46) to move an associated large member (3, 6, 8) of said set as directed by said hydraulic control valve;

(c) small hydraulic positioning means to maintain the associated small member of an associated set parallel with its associated large member;

(d) fluid conducting means arranged to conduct fluid serially in a reversible manner from said hydraulic control valve to said small hydraulic positioning means and then to said large hydraulic positioning means.

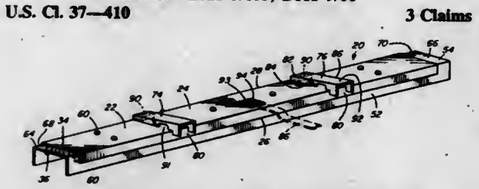
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**5,497,569**

**GROOMER ATTACHMENT FOR FORKLIFTS**

**Lorne Byman, 3865 Royston Road, Royston, British Columbia, Canada**

**Filed Jun. 9, 1994, Ser. No. 257,153**
**Int. Cl.[6] E02F 3/815; B66F 9/06**
**U.S. Cl. 37—410** **3 Claims**



1. A groomer attachment for forklift vehicles, comprising:

an elongated rigid member having a top and a bottom;

a pair of spaced-apart fork receiving pockets connected to the rigid member, the pockets having open rear ends for receiving forks and front ends with resilient internal cushions; and

a flexible blade extending from the bottom of the rigid member.

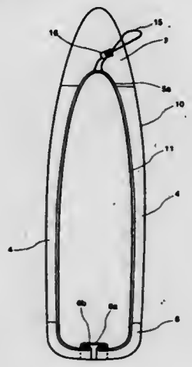
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**5,497,570**

**FITTED IRONING BOARD COVERS WITH PLEATS**

**Ron Burshaw, Hamilton; Hugh Thompson, and Geoff Brownrigg, both of Cambridge, all of, Canada, assignors to The Cambridge Towel Corporation, Cambridge, Canada**

**Filed Jul. 8, 1994, Ser. No. 272,085**
**Int. Cl.[6] D06F 83/00; F16G 11/00**
**U.S. Cl. 38—140** **15 Claims**



1. An ironing board cover for providing a surface upon which to iron, the ironing board cover comprising a front, a rear, two sides, a top and a bottom, said cover including a top sheet, a sewn in flexible pad, a nose segment adjacent the front of the cover, a heel segment adjacent the rear of the cover, and two side segments, said segments being attached to one another at seams, and said flexible pad being sewn into the bottom of the top sheet about the circumference of the top sheet; said nose segment, said side segments and said heel segment being tapered when formed so as to provide when joined with the top sheet a form fit ironing board cover, said heel segment and/or said nose segment including a box pleat for allowing the give of either the heel or the nose segment or both when installing the ironing board cover on an ironing board, wherein said box pleat and said heel, nose and side segments provide for a tight yet flexible fit of the ironing board cover on an ironing board and provides a user with a flexible surface upon which to iron, wherein said side segments, said heel segment, said nose segment, and any box pleat present, include a binding for a draw string integral therewith adjacent the inner distal edges of the segments when assembled with the top sheet, said binding for carrying a draw string and when present said draw string terminating at two ends adjacent the inner distal edge of the nose portion of the ironing board cover.

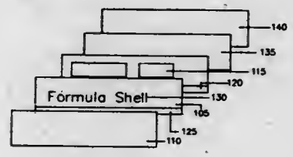
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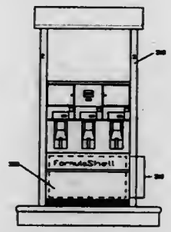
**5,497,571**

**ILLUMINATED DISPENSER**

**John F. Tryon, Houston; James F. Reynolds, Plano, both of Tex., and Ralph R. Buoniconti, Jr., West Springfield, Mass., assignors to Shell Oil Company, Houston, Tex.**

**Filed Oct. 26, 1993, Ser. No. 142,741**
**Int. Cl.[6] G09F 13/22;23/00**
**U.S. Cl. 40—544** **2 Claims**




1. A panel assembly having front and back portions for illumination, said panel assembly comprising:

(a) a translucent panel having front and back portions; and

(b) an electro-luminescent strip layered on the back of said translucent panel for imparting illumination to at least a portion of said translucent panel; and

(c) layer attachment means for layering said electro-luminescent strip on the back of said translucent panel;

(d) a gasoline dispenser pump, having at least two sides and having an upper and having a lower portion having a cavity therein; and said gasoline dispenser pump having a lower door disposed in said lower portion; wherein said panel assembly is removably mounted on said lower door of said gasoline dispenser pump;

(e) attachment means for removably mounting said translucent panel to said lower door of said gasoline dispenser pump; and

(f) wherein said panel assembly is removably mounted on said lower portion of said gasoline dispenser pump, and wherein

said back portion of said panel assembly defines at least a portion of one side of said cavity in said lower portion of said gasoline dispenser pump.

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5,497,572

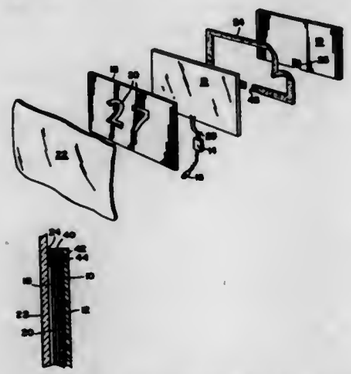
**ILLUMINATED SIGN AND METHOD OF ASSEMBLY**

Peter Hoffman, 452 S. Congress Ave., W. Palm Beach, Fla. 33406

Division of Ser. No. 996,425, Dec. 23, 1992, Pat. No. 5,367,806, which is a division of Ser. No. 868,931, Apr. 16, 1992, Pat. No. 5,339,550. This application Oct. 6, 1994, Ser. No. 318,958

Int. Cl.[6] G09F *13/22*

U.S. Cl. 40—544 3 Claims



1. An illuminated sign for being mounted to one surface of a pane of transparent material so that indicia on the sign are visible through the pane of transparent material, the sign comprising:

a backing panel having a peripheral border portion, at least part of said peripheral border portion including structure configured to define opposed surfaces spaced from one another and one or more channesl between said opposed surfaces;

a planar electroluminescent lamp assembled over said backing panel and having a peripheral edge, said backing panel and said lamp together forming an assembly;

a planar indicia-bearing member disposed over said lamp, said indicia-bearing member being at least partially translucent to define indicia, said indicia-bearing member having a peripheral edge, said channels receiving and retaining one or both of said peripheral edge of said lamp and said peripheral edge of said indicia-bearing member between said opposed surfaces;

a power supply for supplying power to said lamp; and

a number of strips of two-faced adhesive tape having adhesive on opposite faces thereof extending at least partially along said structure, one face of each strip of said tape being bonded by said adhesive to said structure whereby said assembly and said indicia-bearing member may be affixed to one side of a transparent pane by adhesively bonding a second face of each strip of said tape to the pane.

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5,497,573

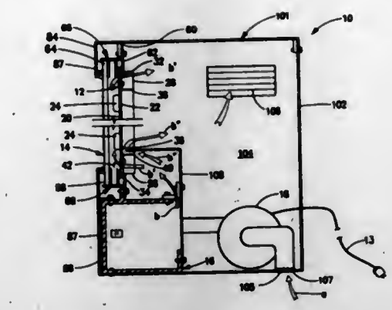
**THERMALLY-PROTECTED DISPLAY WITH A VENTILATION SYSTEM**

Robert C. Stadjuhar, 1210 LaPaloma Way, Colorado Springs, Colo. 80906, and Cecil S. Renfro, 3607 Brentwood Terrace, Colorado Springs, Colo. 80910

Filed Apr. 14, 1994, Ser. No. 224,201

Int. Cl.[6] G09F *13/04*

U.S. Cl. 40—564 35 Claims



1. A thermally-protected display, comprising:

(a) a display panel having a front panel surface and a rear panel surface, said display panel supporting at least one signal element on said front panel surface thereof;

(b) a cover panel disposed in a spaced-apart relationship forwardly of said front panel surface of said display panel to form a plenum chamber therebetween;

(c) a manifold in fluid communication with said plenum chamber; and

(d) a blower mechanism in fluid communication with said manifold and operative to supply an air flow to said plenum chamber whereby said air flow enters an air inlet disposed at one end of said display panel and into said plenum chamber so that said air flow moves across said display panel and said signal element between said front panel surface and said cover panel thereby dissipating heat from said plenum chamber before said air flow exits said plenum chamber through an exhaust outlet disposed at an opposite end of said display panel.

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5,497,574

**Patent Not Issued For This Number**

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5,497,575

**RIFLE SUPPORT APPARATUS**

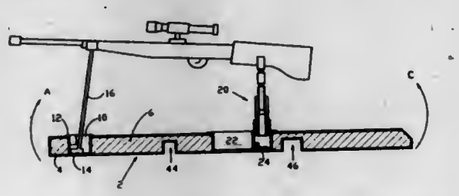
Joseph Fried, Kiryat Ono, Israel, assignor to Yamit Sachar Ltd., Tel Aviv, Israel

Filed Dec. 27, 1994, Ser. No. 364,213

Claims priority, application Israel, Dec. 27, 1993, 108201

Int. Cl.[6] F41A *23/00*

U.S. Cl. 42—94 22 Claims



1. Support apparatus for a rifle having a barrel defining a line of sight, a bipod and a butt, the apparatus comprising:

a ground mat having first and second recesses;

the first recess adapted to secure the rifle bipod and the second recess containing a telescoping member adapted to support the butt of the rifle and wherein the telescoping member when in use is slidable in a direction across the line of sight of the rifle.



5,497,576

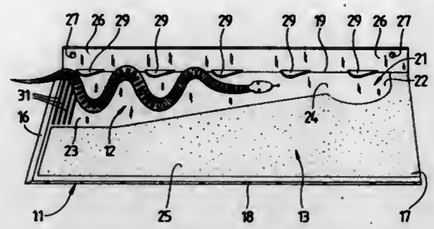
**SNAKE TRAP**

Martin Nowak, 1160 Oak Creek, Birmingham, Ala. 35215

Filed Jun. 15, 1994, Ser. No. 260,006

Int. Cl.[6] A01K *23/00*

U.S. Cl. 43—58 26 Claims



1. An apparatus for trapping a snake, comprising:

(a) a substantially flat base, having an entry edge, a wall edge, a forward area and an outer edge;

(b) means for affixing said base in position such that said wall edge of said base is adjacent a wall;

(c) an adhesive of sufficient strength to hold said snake, said adhesive positioned on a capture area of said base;

(d) a crawling area adjacent said wall edge, defined by the area of said base not included within said capture area, said crawling area generally diminishing in width from said entry edge of said base toward said forward area of said base.

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5,497,577

**ARTIFICIAL STEM, SUPPORT, AND FLORAL PICK DEVICE**

Michael K. Carpenter, 2510 Panama Mall, Philadelphia, Pa. 19103

Filed Mar. 9, 1995, Ser. No. 401,267

Int. Cl.[6] A01G *5/00;* A47G *7/00*

U.S. Cl. 47—41.12 1 Claim



1. An artificial stem device as a means for the lengthening and support of flower stems comprising:

a core rod of water absorbent floral foam through which water is transmitted to a stem, and into which said stem is inserted,

a water impermeable outer shell created with said core rod so that said shell and said core rod commence as a single unit,

a series of perforations through an exterior surface of said outer shell providing a means of air transfer for wetting and wicking of said core rod,

a top end of said unit being open and said rod core thereby exposed, said rod core further being recessed from said top end for ease of insertion of said stem,

and a bottom end opening of said unit being diagonally cut and leaving said core rod exposed, said diagonal cut facilitating the insertion of said unit into floral arrangements.

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5,497,578

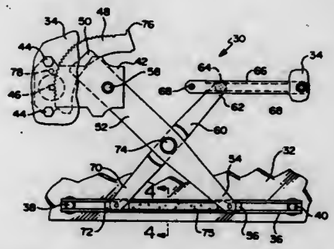
**WINDOW REGULATOR WITH CUSHIONED UP STOP**

René J. Wautelet, Milford; William R. Tacker, Auburn Hills, and John A. Kubiak, Sterling Heights, all of Mich., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Oct. 7, 1994, Ser. No. 319,560

Int. Cl.[6] E05F *11/44*

U.S. Cl. 49—349 20 Claims



1. A window regulator for moving a window between raised and lowered positions in a vehicle door, comprising a lift channel mounted adjacent the lower edge of the window, a slider slidable in the lift channel as the window is moved between positions, a lift arm having one end mounting the slider, a power operator mounted on the door in operative engagement with the lift arm other end for raising and lowering the lift arm to move the window, cooperating stop surfaces on the operator and on the arm which are interengageable to define the window raised position, and spring means located in the lift channel which are increasingly stressed by the slider as the window approaches raised position to cushion the impact of engagement of the stop surfaces as the window reaches raised position.

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5,497,579

**MECHANICAL LINKAGE SASH DISPLACEMENT DEVICE**

Nicholas Walters, Baltimore, Md., assignor to Easy Up Sash Lift, Inc., Baltimore, Md.

Filed Sep. 12, 1994, Ser. No. 304,682

Int. Cl.[6] E05B *1/00*

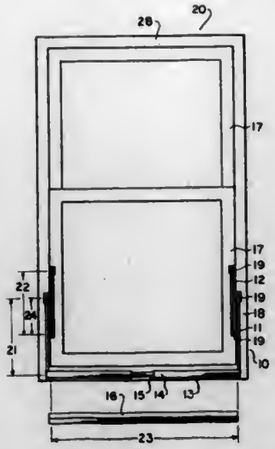
U.S. Cl. 49—460 18 Claims

1. A device facilitating, from a frontal position linear displacement of one sash of a multi-sashed reciprocating closure possessing at least two reciprocating sashes held between two opposed jambs of a fully bounded frame, said device comprising:

a mechanical linkage consisting of a frontal bar rigidly connected to two congruent pair of pivotally connected first and second arms spaced apart from each other and disposed to rotate in planes substantially perpendicular to and proximate either end of said frontal bar;

each said first arm possessing connection to a pivot at a proximate end relative to the closure when properly installed and a rigid connection to said frontal bar at a distal end, each said second arm possessing a connection to a pivot on the proximate end relative to the closure when properly installed and a pivoted connection to said first arm at the distal end, this pivot between first and second arms further being located along said first arm medial to said proximate and distal ends of said first arm;

an effective second arm length is given by the distance between the pivot connecting said proximate second arm end and said pivot between arms, an effective first arm length is given by



the distance between the pivot connected to said proximate first arm end and the connection to said frontal bar and a pivot arc radius is given by the distance between said first arm proximate end and said pivot between arms, each said effective arm length and said pivot arc radius being substantially equivalent between congruent pairs of arms;

each said pivot connected to said proximate first arm end further possessing the capability of being attached to one of said opposed pair of jambs, both said pivots connected to said proximate second arm end further possessing the capability of being attached to one said sash;

all said pivotal connections enabling rotation of all said arms within planes substantially parallel to one another and substantially perpendicular to both said frontal bar and the face of the closure when properly installed whereby the congruent effective distances and said pivotal connections enable movement of said frontal bar through an arc possessing a radius equal to said effective first arm length and movement of each said pivot between arms through a pivot arc possessing said pivot arc radius of a lesser dimension than said effective first arm length;

displacement of both said pivots between arms through said pivot arc thereby effecting linear displacement of said one sash through the transmission of force through both said second arms applied through both said pivots between arms exerted upon said frontal bar from a frontal position with respect to said reciprocating closure with a basic mechanical advantage given by said effective first arm length divided by said pivot arc radius and an overall mechanical advantage given by the inverse of the ratio of the rate of linear sash displacement as a function of arcuate frontal bar displacement.

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**5,497,580**

## COLLAPSIBLE FISHING NET APPARATUS

**Garrett N. Vanderplaats, 390 Wedgewood Ct., Colorado Springs, Colo. 80906**

**Filed Sep. 29, 1994, Ser. No. 314,700**
**Int. Cl.[6] A01K** *77/00*
**U.S. Cl. 43—12** **1 Claim**

1. A collapsible fishing net apparatus, comprising:

a handle assembly which includes a frame-supporting hinge assembly,

a frame assembly connected to said frame-supporting hinge assembly and supported by said handle assembly, said frame assembly including a plurality of flexible and resilient frame members, a plurality of hinge assemblies connected between adjacent flexible and resilient frame members, and a plurality of manually selectable hinge lock assemblies supported by said flexible and resilient frame members, and

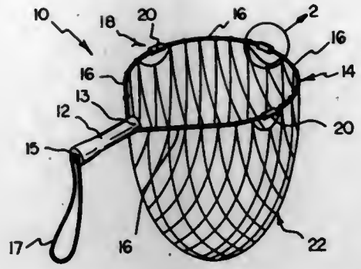
a net assembly supported by said flexible and resilient frame members of said frame assembly,

wherein said hinge lock assemblies include rigid, hollow cylinders having an inner diameter greater than an outer diameter of said flexible and resilient frame members,

wherein, of said flexible and resilient frame members of said frame assembly, two of said flexible and resilient frame members which are connected to said frame-supporting hinge assembly are longer than other flexible and resilient frame members,

wherein said handle assembly includes a housing portion which defines a hollow interior chamber, wherein said handle assembly includes a first longitudinal slot located on a first side of said housing portion and includes a second longitudinal slot located on a second side of said housing portion which is opposite to said first side and said first longitudinal slot, wherein said frame-supporting hinge assembly includes a hinge pin adapted to be partially received in and slide in said first longitudinal slot and said second longitudinal slot, wherein said hinge pin is connected to proximal ends of two of said flexible and resilient frame members, such that when said hinge pin is moved toward a distal end of said housing portion, said two proximal ends of said flexible and resilient frame members are moved distally and partially into said hollow interior chamber and such that when said hinge pin is moved toward a proximal end of said housing portion, said two proximal ends of said flexible and resilient frame members are moved proximally and said two flexible and resilient frame members are moved partially out from said hollow interior chamber,

wherein said housing portion further includes a pair of notches located at said proximal end, said notches adapted to receive the two ends of said flexible and resilient frame members connected to said hinge pin when said frame assembly is in an open orientation.



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**5,497,581**

## AUDIBLE FISHING LURE

**Victor N. Williams, 2913 Peregoy Dr., Kensington, Md. 20895**

**Filed Nov. 1, 1994, Ser. No. 333,314**
**Int. Cl.[6] A01K** *85/00*
**U.S. Cl. 43—42.31** **6 Claims**

1. In a fishing lure:

a rotatable torpedo shaped hollow body having a front end and rear end;

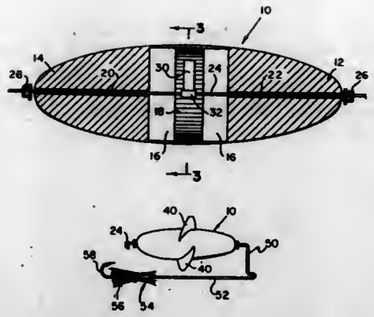
a solid nose portion and a solid tail portion at the from end and rear end of said body respectively;

a cavity in said hollow body between said nose portion and said tail portion, which serves as a chamber for the amplification of sound;

an exterior surface on said body;

a plurality of fins on the exterior surface of said body each having a shape which agitates and produces a stream of bubbles as it advances through a body of water;





a bore in the solid nose and a bore in the solid tail of said body extending from the exterior of said body to said cavity;

a shaft passing through said bores supporting said body for rotation,

an interior surface in said body defining said cavity;

serrations or teeth on a portion of the interior surface of said chamber, and a striker mounted on said shaft, adapted to produce sound when it strikes the teeth on the walls of said chamber as said body rotates,

whereby fish are attracted to said body by a combination of sounds produced by sounding means inside said hollow body and by sounding means on the exterior surface of said hollow body.

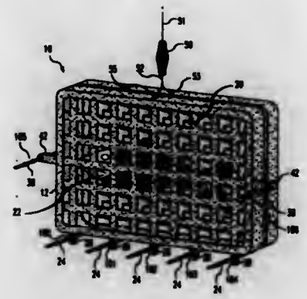
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**5,497,582**

## CRABBING BAIT HOLDER

**Thomas J. Kuhn, 353 Cedar Swamp Rd., Jackson, N.J. 08527**

**Filed May 26, 1995, Ser. No. 450,489**
**Int. Cl.[6] A01K** *69/00;97/02*
**U.S. Cl. 43—44.99** **7 Claims**



1. A crabbing bait holder comprising:

a frame including a pair of joined planar members foldably openable to add a solid bait therebetween and foldably closable to hold the bait in position;

said frame also including a plurality of eyeholes and locking tab lengths oriented about top, bottom and side edges thereof to secure the planar members at a distance varying with the thickness of the bait and with the length of locking tabs inserted through said eyeholes;

said frame being in the general shape of an open grid construction of a rigid material to support the weight of one or more crabs holding onto the frame with their claws while eating at the bait;

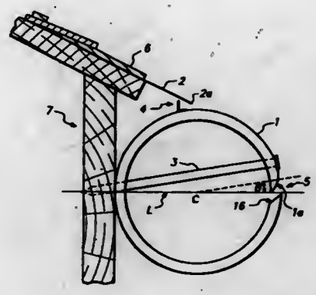
and a drop-line coupled to said frame for raising and lowering said frame into the water.

**5,497,583**

## CYLINDRICAL RAIN GUTTER

**Rodney E. Rhoads, 331 Dead End Rd., Lititz, Pa. 17543**

**Filed Aug. 18, 1994, Ser. No. 292,463**
**Int. Cl.[6] E04D** *13/064*
**U.S. Cl. 52—12** **13 Claims**



1. A device for collecting and channeling water from a roof, comprising:

an elongated first member;

means for operatively connecting the first member to an edge of the roof portion;

means for allowing rainfall from the roof to be collected in said first member, and for substantially preventing other debris from collecting therein;

wherein said first member is substantially cylindrical;

said allowing means comprises a slot defined substantially longitudinally along said first member;

a first edge of said first member defining an upper extent of said slot is tapered substantially inwardly so as to allow fluid flowing along an outer surface of said first member to flow therein;

a second edge of said first member defining a lower extent of said slot is tapered substantially inwardly;

said slot faces substantially outwardly from the roof portion so that rain water flowing from the roof portion flows along an outwardly facing surface of said first member and enters said first member via said slot; and

said first member and said allowing means are integrally connected so as to form a unitary member.

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**5,497,584**

## PLASTER PROTECTIVE COVER FOR FLUSH MOUNTED BATHROOM FITTINGS

**Konrad Bergmann, Wittlich, Germany, assignor to Ideal-Standard GmbH, Bonn, Germany**

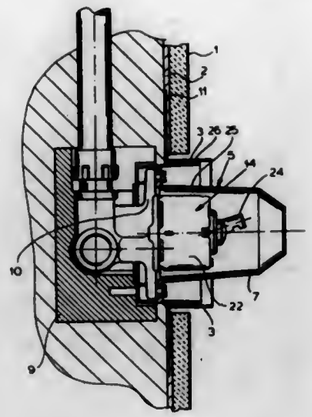
**PCT No. PCT/EP92/01336, § 371 Date Feb. 15, 1994, § 102(e) Date Feb. 15, 1994, PCT Pub. No. WO93/01367, PCT Pub. Date Jan. 21, 1993**
**PCT Filed Jun. 13, 1992, Ser. No. 175,408**
**Claims priority, application Austria, Jul. 5, 1991, 1356/91; Germany, Jan. 8, 1991, 41 33 266.0**
**Int. Cl.[6] E03C** *1/042*
**U.S. Cl. 52—34** **6 Claims**

1. A cover and fitting wall assembly comprising:

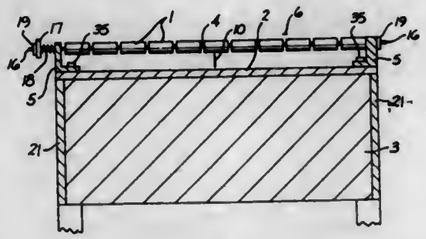
a fitting having a body buried into an opening in a wall;

a plaster protective cover fastened on the buried body of the fitting for building into the wall and for protecting internal fitting parts, said cover having a protective hood; and

a water tight circumferential sealing collar extending outwardly and lying against the wall, the sealing collar having an annular flange embedded in a sealing layer applied to the wall after the buried body has been built in, as any base for a subsequently applied tiling and sealing the edge of an opening in the wall accommodating the buried body of the fitting.

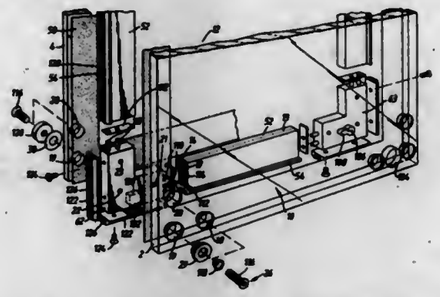


5,497,585
**BIRD ANTI-PERCHING DEVICE**
Carl W. Engler, 1331 Marianna Rd., Pasadena, Calif. 91105-2746
Continuation of Ser. No. 789,929, Nov. 12, 1991, abandoned. This application May 3, 1993, Ser. No. 55,765
Int. Cl.[6] A01K *3/00*
U.S. Cl. 52—101 8 Claims



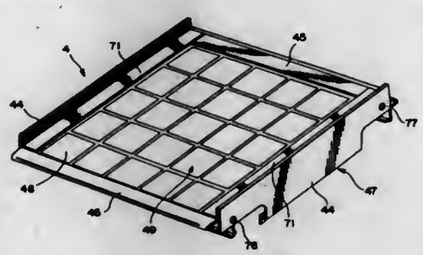
1. A bird anti-perching device for discouraging birds from perching on or adjacent to a horizontally extending perching body, which comprises in combination:
a perching body comprising a longitudinally extending horizontally disposed cable of small diameter, a plurality of cylindrical rings of an internal diameter significantly larger than the cable diameter to balance unstably on the cable, said rings being disposed on said cable in an array adjacent one another along said cable sufficiently close to prevent a bird from landing on the cable but far enough apart from each other to permit uninhibited movement of individual rings about said cable for residence in an unstably balanced posture to permit individual free unstable movement of each ring relative to other rings with respect to its residence posture on the cable in response to the perching of a bird, said rings being of a dimension such that a bird attempting to perch on a ring will tend to unbalance the ring with respect to the cable, thereby to form an unstable perch.

5,497,586
**FRAMED GLAZING UNIT**
Graham S. Dodd, Lymm, United Kingdom, and Mario Marinoni, Magenta, Italy, assignors to Pilkington Glass Limited, United Kingdom, and Societa Italiana Progetti Srl, Italy
Filed Jan. 19, 1994, Ser. No. 183,433
Claims priority, application Germany, Jan. 21, 1993, 43 01 592.1
Int. Cl.[6] E06B *7/12*
U.S. Cl. 52—172 21 Claims



1. A flamed glazing unit for forming a door, window, transom panel or door side panel, the unit comprising two sheets of glazing material arranged in spaced relation beside one another, a peripheral frame bolding the sheets at a distance from one another and enclosing a space between the sheets, the Sheets and the frame having holes lying outside the space enclosed by the frame, screw elements which pass through the holes and press the sheets against the frame so that the frame is covered by the sheets, sealing means for hermetically sealing the space and a dessicant communication with the space, said frame being adapted to support fittings for mounting the unit.

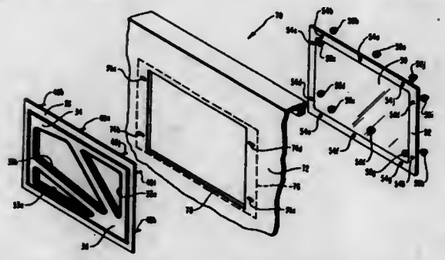
5,497,587
**ROOF SYSTEM UTILIZING A SOLAR CELL**
Takashi Hirai, and Keisuke Hirai, both of Tokyo, Japan, assignors to Hirai Engineering Corporation, Tokyo, Japan
Filed Nov. 19, 1993, Ser. No. 155,306
Claims priority, application Japan, Nov. 19, 1992, 4-332249; Feb. 3, 1993, 5-037278
Int. Cl.[6] E04D *13/18*
U.S. Cl. 52—173.3 9 Claims



1. A roof system utilizing a solar cell comprising:
a first modular roof member composed of a plurality of first light collecting plate segments each of which having a solar cell embedded therein, the first light collecting plate segments being aligned in one direction and in the other direction perpendicular to the one direction; and
a second modular roof member composed of a plurality of second light collecting plate segments each of which is equal in size to the first light collecting plate segment, the second light collecting plate segments being aligned in one direction and in the other direction perpendicular to the one direction, the number of the second light collecting plate segments in one direction being larger by one than that of the first light collecting plate segments, wherein each of said first and said second modular roof members comprises,
a framework body consisting of right and left end jambs, a head beam and a sill beam, each of the end jambs having an internal surface to which a corresponding supporting jamb is mounted, the end jambs and beams being formed into a rectangular shape in plane, and
composite assembly interfitted to an internal periphery of said framework body, said composite assembly having a transparent substrate beneath which a plurality of light collecting plate segments are juxtaposed,
wherein each of the end jambs comprises a vertical wall in which a plurality of flashing protrusions are longitudinally formed at an upper end portion thereof.



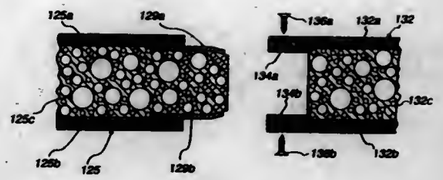
5,497,588
**WINDOW APPARATUS AND METHOD FOR A GARAGE DOOR**
David O. Martin, Salt Lake City, and Robert S. Scott, Provo, both of Utah, assignors to Martin Door Manufacturing, Inc., Salt Lake City, Utah
Filed Apr. 12, 1994, Ser. No. 226,503
Int. Cl.[6] E06B *3/00*
U.S. Cl. 52—208 18 Claims



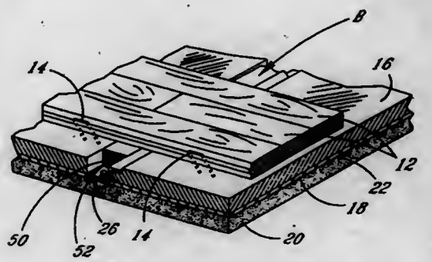
1. A decorative window system in a garage door comprising:
a unitary insert comprising a decorative overlay and an integral framework formed as a continuous element with said decorative overlay, said integral framework having dimensions configured to frame an opening in the garage door;
a plurality of bolt strips mounted to an inner face of said integral framework;
a plurality of bolts mounted to said bolt strips and extending perpendicularly from said integral framework;
a windowpane having a border and a plurality of boles in said border, said holes corresponding to said bolts mounted to said bolt strips; and
a plurality of nuts for threadedly engaging said bolts to secure said windowpane to said unitary insert.

5,497,589
**STRUCTURAL INSULATED PANELS WITH METAL EDGES**
William H. Porter, P.O. Box 249, Saugatuck, Mich. 49453
Filed Jul. 12, 1994, Ser. No. 273,981
Int. Cl.[6] E04C *2/296;2/30*
U.S. Cl. 52—309.7 13 Claims

1. An insulated structural panel comprising: a generally flat insulating core having a peripheral edge portion; first and second outer facings disposed on opposed lateral surfaces of said insulating core each having edge portions, wherein said peripheral edge portion of said insulating core extends beyond adjacent edge portions of said first and second outer facings; first and second thin metal strips disposed over and attached to said peripheral edge portion of said insulating core forming a tongue structure, wherein each of said panels further includes a respective recessed groove on an opposed peripheral edge portion thereof, wherein each recessed groove is adapted to receive the tongue structure of an adjacent panel; and coupling means for securely connecting at least one of said metal strips and said peripheral edge portion of said insulating core to a second insulated structural panel.

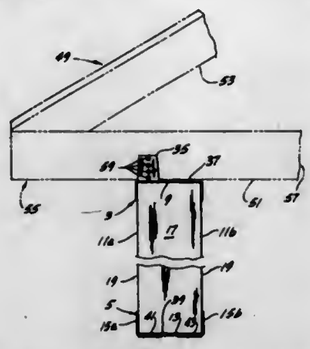


5,497,590
**RESILIENT FLOORING**
James Counihan, 50 Griffin Mill Rd., Piedmont, S.C. 29673
Filed Mar. 6, 1995, Ser. No. 398,993
Int. Cl.[6] E04F *13/08*
U.S. Cl. 52—385 11 Claims

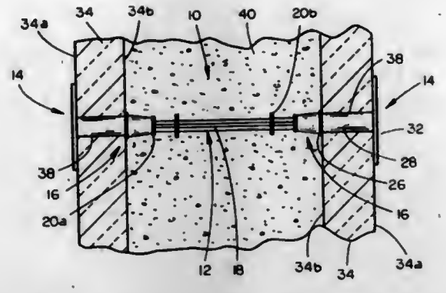


1. A resilient flooring system for assembly on a base surface to provide a resilient floor comprising:
a layer of a resilient material carried on and substantially covering said base surface;
a plurality of elongated sub-floor panels arranged over said resilient material and generally co-extending with said floor in a side-by-side arrangement;
a slot defined between adjacent sub-floor panels having an open top;
a limit bar carried in said slot limiting vertical movement of selected ends of said sub-floor panels in an upward direction while leaving unrestrained other ends of said sub-floor panels, said limit bar permitting vertical movement in an opposite downward direction of said selected sub-floor panels;
a plurality of flooring boards extending transverse to said sub-floor panels bridging said open top of said slot, said flooring boards having an upper floor surface defining an exterior floor and a lower floor surface; and
fasteners attaching said flooring boards to said sub-floor panels joining the remainder of said sub-floor panels with said selected ends of said sub-floor panels; whereby,
said exterior floor and sub-floor panels form an integral flooring capable of vertical movement as limited by said limit bar and base surface.

5,497,591
METAL WALL FRAMING
Thomas E. Nelson, Chesterfield, Mo., assignor to MiTek Holdings, Inc., Wilmington, Del.
Filed Jan. 11, 1994, Ser. No. 180,146
Int. Cl.[6] E04C 2/34
U.S. Cl. 52—481.1 27 Claims



1. A metal wall framing section comprising spaced apart elongate top end bottom members end a plurality of parallel elongate stud means formed of sheet metal extending between the top and bottom members spaced at intervals along the lengths of said members, each of said members being formed of sheet metal having a web end means for stiffening the web, the web of the bottom member being generally horizontal at the bottom of the section in the erected position of the section, each stud means comprising at least one strut extending generally vertically between the webs of said members in the erected position of the framing section, the webs of the top end bottom members having sets of slots spaced at said intervals, each set at each interval comprising at least one pair of slots in the web of the top member extending transversely with respect to the top member end at least one slot in the web of the bottom member extending transversely with respect to the bottom member, each strut having en end edge at one end constituting its upper end generally engaging the bottom face of the web of the top member and having a pair of tongues integral therewith extending from said upper end edge through the slots of the respective set of slots in the top member, said strut having an end edge at its other end constituting its lower end generally engaging the top face of the web of the bottom member and having a tongue integral therewith extending through the slot of the respective set of slots in the bottom member, the tongue at the lower end of each strut being bent over against the bottom face of the web of the bottom member, one of the tongues at the upper end of each strut being bent over against the top face of the web of the top member, and the other tongue at the upper end of each strut extending upwardly from the web of the top member for securement thereto of structure subsequently applied to the top member.

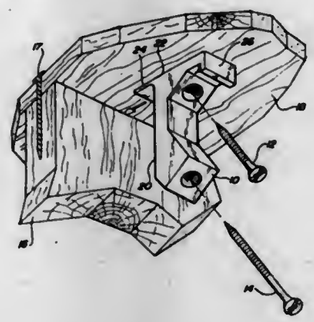


said first means for retaining a first form panel from moving outwardly including:
an elongated body portion having first and second ends;
means on the body portion first end for removably connecting the body portion to the first end of the strap; and
a generally flat retainer panel mounted on the body portion second end, oriented generally orthogonally to a longitudinal axis of the body portion;
said retainer panel including an inner surface attached to the body portion, and an opposing outer surface;
said retainer panel including means for receiving and engaging a tool, for rotating the panel and body portion about the longitudinal axis of the body portion;
said means for receiving and engaging a tool including a socket formed in the outer surface and aligned coaxial with the body portion longitudinal axis.

5,497,592
QUICK RELEASE TIE
Patrick E. Boeshart, P.O. Box 774, Sioux City, Iowa 51102
Filed May 19, 1994, Ser. No. 246,326
Int. Cl.[6] E04B 1/38
U.S. Cl. 52—699 11 Claims

1. A tie for interlocking a pair of spaced apart form panels, comprising:
an elongated strap having first and second opposing outer ends;
first means selectively and removably connected to said first end for retaining a first form panel from moving outwardly away from the strap first end; and second means selectively removably connected to said strap second end for retaining
a second form panel from moving outwardly away from the strap second end;

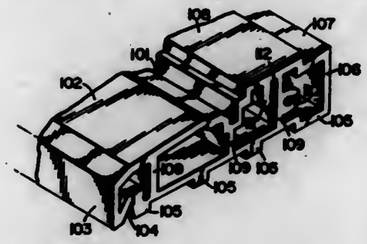
5,497,593
SYSTEM FOR INTERLOCKING PERPENDICULAR MEMBERS
James J. Riesberg, 5873 Patterson Dr., Troy, Mich. 48098
Filed Feb. 9, 1993, Ser. No. 15,418
Int. Cl.[6] E04B 1/38
U.S. Cl. 52—702 19 Claims



1. A system for drawing first and second substantially perpendicular components together, said first component having a top, said first and second components each having a side, said system comprising:
a brace, said brace having a first working surface for mating with the side of the first component and a second working surface for mating with the side of the second component, said first working surface substantially defining a planar surface;
said brace including a flange extending from said first working surface, said flange being disposable between the top of the first component and the side of the second component, said flange having a first working surface, said first working surface of said flange and said second working surface of said brace being substantially coplanar; and
fastening means for attaching said components and said brace together, said fastening means comprising first and second fasteners extending through said brace, said first and second fasteners being substantially parallel.

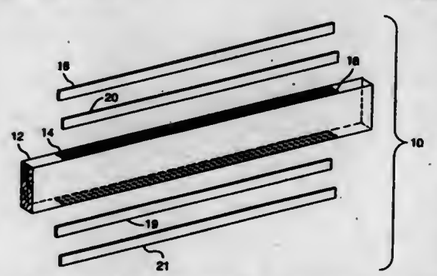


5,497,594
ADVANCED POLYMER AND WOOD FIBER COMPOSITE STRUCTURAL COMPONENT
Puppin Giuseppe, Bayport, Minn.; Michael J. Deaner, Osceola, Wis., and Kurt E. Heikkila, Circle Pines, Minn., assignors to Andersen Corporation, Bayport, Minn.
Continuation of Ser. No. 938,604, Sep. 1, 1992, Pat. No. 5,406,768. This application Oct. 20, 1994, Ser. No. 326,479
The portion of the term of this patent subsequent to Apr. 18, 2012, has been disclaimed.
Int. Cl.[6] E04C 3/46;2/26
U.S. Cl. 52—730.4 16 Claims



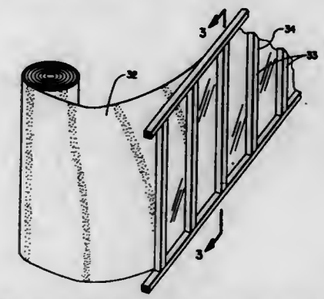
1. A structural member comprising a polymer and wood fiber composite, suitable for use as a structural member in the manufacture of a window or a door, which structural member comprises an extruded or injection molded hollow profile having a defined support direction, wherein the compressive strength of the member in the defined support direction is greater than about 1500 psi, the composite comprising a continuous phase comprising a polyvinyl chloride and an effective amount of a wood fiber dispersed in the continuous phase to provide structural properties similar or superior to those of wooden members, and wherein the polyvinyl chloride phase thoroughly wets and penetrates the wood fiber.

5,497,595
METHOD OF REINFORCING WOOD BEAMS AND WOOD BEAMS MADE THEREFROM
Daniel Kalinin, 1779 Grosvenor Place, Mississauga, Ontario, Canada
Filed Aug. 18, 1994, Ser. No. 292,015
Int. Cl.[6] E04C 3/292
U.S. Cl. 52—737.3 7 Claims



1. A reinforced wood beam having a longitudinally extending upper and a lower surface, said upper and lower surfaces having a plurality of reinforcements bonded therein, said reinforcements each comprising a steel strip bonded within a longitudinally extending kerf, said reinforcements spaced from a midpoint of a width of said wood beam.

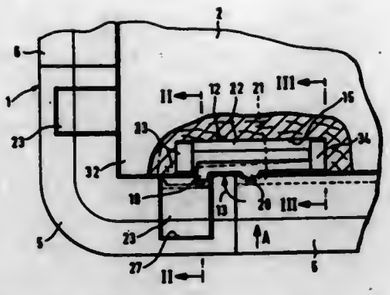
5,497,596
METHOD FOR REDUCING PENETRATION OF LIQUID THROUGH NONWOVEN FILM-FIBRIL SHEETS PIERCED BY FASTENING ELEMENTS
Tony D. Zatkulak, Midlothian, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Jan. 27, 1994, Ser. No. 186,948
Int. Cl.[6] E04B 1/66
U.S. Cl. 52—746.1 4 Claims



1. A method of reducing penetration of liquid through a flexible nonwoven sheet which has been pierced by one or more fastening elements to fasten the sheet and siding to a framing structure having a plurality of fastening element bases, comprising the steps of:
(a) providing a nonwoven sheet having a coating of hydrophobic foam on a surface of the sheet, the foam being spaced in strips in manner corresponding to the plurality of fastening element bases;
(b) positioning the sheet against the framing structure such that the foam aligns with the fastening element bases of the framing structure; and
(c) fastening the sheet to the fastening element bases through the foam with a fastening element in order to provide a resistance to liquid penetration between the sheet and the fastening element.

5,497,597
FRAME WITH INSERTED BOARD
Manfred Elzenbeck, Steinheim/Murr, Germany, assignor to Froscher Aspect GmbH & Co. KG, Steinheim/Murr, Germany
PCT No. PCT/EP92/01126, § 371 Date Dec. 30, 1993, § 102(e) Date Dec. 30, 1993, PCT Pub. No. WO92/20858, PCT Pub. Date Nov. 26, 1992
PCT Filed May 20, 1992, Ser. No. 142,394
Claims priority, application Germany, May 22, 1991, 9106280 U
Int. Cl.[6] A47B 13/08
U.S. Cl. 52—782.24 13 Claims

1. A frame and an inserted board mounted on the frame, wherein said frame includes a circumferential frame edge, a frame receiver corresponding to the shape of said board and a circumferential frame support edge supporting an edge of said board, said support edge extending in the direction toward the interior of said frame, and said board includes a circumferential edge, at least two spring-elastically pivotable blocking members, each blocking member situation at oppositely situated portions of said circumferential edge of said board, each blocking member projecting beneath a



portion of said frame edge, and an adjustable operating element associated with each blocking member for locking and releasing said blocking member.

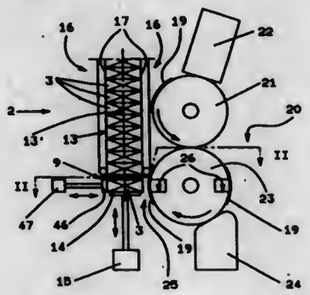
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**5,497,598**

## EQUIPMENT FOR THE APPLICATION OF SEAL LABELS TO CONTAINERS

**Fulvio Baldrini, Ferrara, Italy, assignor to G. D S.p.A., Bologna, Italy**

**Filed Nov. 23, 1994, Ser. No. 346,916**
**Claims priority, application Italy, Nov. 24, 1993, B093A0470**
**Int. Cl.[6] B65B *61/00***
**U.S. Cl. 53—136.1** **4 Claims**



1. Equipment for applying seal labels to containers, comprising:
a rotatable wheel providing a plurality of radial slots proportioned to accommodate a plurality of containers arranged in respective positions in succession along a conveying path;
means for applying an adhesive material to a succession of seal labels;
a roller providing a recess having opposite edges, a fork element having two prongs, and a plurality of holes connected with a source of negative pressure for restraining two opposite end portions of an adhesive-bearing respective said label, said plurality of holes being located adjacent to each of opposite edges of the recess, said roller being arranged to supply adhesive-bearing labels singly in succession to a fixing station sited in close proximity to a part of the conveying path;
first pushing means for displacing each container singly in succession from a respective said slot of the wheel, for directing said container forcibly against a respective adhesive-bearing label supported by said roller, and causing said container to penetrate the respective adhesive-bearing label, at least, in part, together with the respective label in the respective said recess;
second pushing means mounted within the roller, with said fork element being part of said second pushing means, for ejecting the container from the recess and returning the container to its respective said position on the conveying path and for forcibly holding said container in contact with said end portions of the label while said container is translating in concert with said forks, for a duration sufficient to allow an initial drying of the adhesive material applied on the respective label.

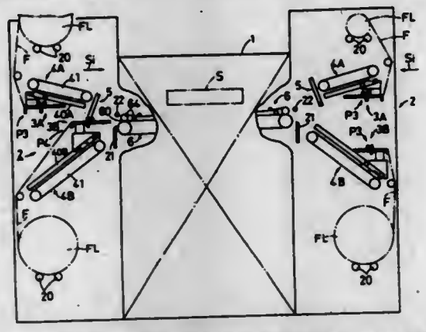
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**5,497,599**

## DEVICE FOR SUPPLYING FILM FOR A PACKAGING MACHINE

**Kenji Hirobe, Shiga, Japan, assignor to Ishida Co., Ltd., Japan**

**Continuation of Ser. No. 165,145, Dec. 10, 1993, abandoned.**
**This application Jan. 10, 1995, Ser. No. 371,062**
**Claims priority, application Japan, Dec. 17, 1993, 4-355583**
**Int. Cl.[6] B65B *91/00***
**U.S. Cl. 53—389.3** **20 Claims**



1. In combination with a packaging machine for causing a film feeder to grip a film and pull the film to a packaging station for packaging a product therewith, a film supplying device comprising:
gripper means for gripping the film; and
gripper transporting means for guiding said film gripped by said gripper means to a film-receiving end of said film feeder by transporting said gripper means to a film-supplying position adjacent said film-receiving end and keeping said gripper means at a retracted position distal from said film feeder while said film is being pulled towards said packaging station by said film feeder, said gripper transporting means including first gripper transporting means for transporting said gripper means between said a film-supplying position and a wait position which are both distal from said film feeder and second gripper transporting means for transporting said gripper means between said wait position and said film-supplying position.

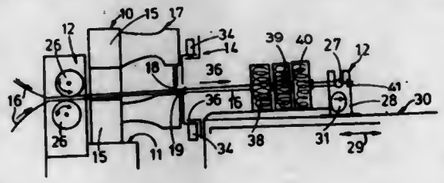
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**5,497,600**

## METHOD OF ENCAPSULATING SPRING UNITS

**Paul Rodgers, Manchester, England, assignor to Slumberland PLC, Oldham, England**

**Division of Ser. No. 870,628, Apr. 17, 1992, Pat. No. 5,303,530.**
**This application Jan. 18, 1994, Ser. No. 183,158**
**Claims priority, application United Kingdom, Jan. 18, 1989, 8923528**
**Int. Cl.[6] B65B *51/07;1/24;9/00***
**U.S. Cl. 53—418** **2 Claims**





1. A method of encapsulating spring units between a pair of webs, comprising the steps of:
(i) moving a pair of superimposed webs in a first longitudinal direction through intermittent steps;
(ii) holding said webs stationary at an insertion station;
(iii) loading an uncompressed spring unit into an insertion device;
(iv) moving said insertion device loaded with the spring unit in a transverse direction normal to said longitudinal direction between the webs from a first withdrawn position to an insertion position to insert the spring unit between the webs at the insertion station;
(v) tightening or tensioning said webs around said insertion unit loaded with the spring unit;
(vi) compressing said spring unit;
(vii) tightening said webs around said compressed spring unit;
(viii) withdrawing said insertion device from said insertion position to said withdrawn position as said webs are tightened around said spring unit to retain the spring unit between said webs; and
(ix) while the spring unit is compressed, connecting the webs together in close proximity to the compressed spring unit at a side of the spring unit along a line parallel to the direction of movement of the insertion unit.

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**5,497,601**

## PACKAGING HAVING DISCRETE RETAINERS FOR A MEDICAL CATHETER AND METHOD

**Rolando J. Gonzalez, Cooper City, Fla., assignor to Cordis Corporation, Miami, Fla.**

**Filed Aug. 19, 1994, Ser. No. 292,910**
**Int. Cl.[6] B65B *11/58***
**U.S. Cl. 53—449** **17 Claims**



14. A method of assembling packaging for a medical catheter, comprising the steps of:
a) placing a catheter onto a mounting card;
b) applying a first and second outer sheet about said catheter and mounting card;
c) sealing said first and second outer sheet together along their respective perimeters, thereby forming an envelope which encloses said mounting card and catheter; and
d) fastening discrete portions of said first outer sheet to said mounting card to form a plurality of retainer elements for restricting movement of the catheter from a desired shape.

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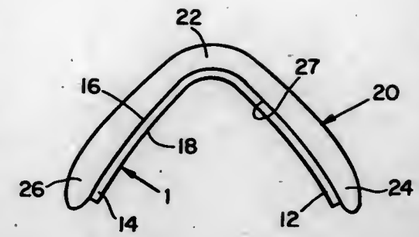
**5,497,602**

## SADDLE CLOTH

**Sidney A. Arnold, Welling, United Kingdom, assignor to Gordon George Baldwin, Kent, United Kingdom**

**PCT No. PCT/GB93/00305, § 371 Date Aug. 9, 1994, § 102(e) Date Aug. 9, 1994, PCT Pub. No. WO93/15998, PCT Pub. Date Aug. 19, 1993**
**PCT Filed Feb. 12, 1993, Ser. No. 284,563**
**Claims priority, application United Kingdom, Feb. 13, 1992, 9202980**
**Int. Cl.[6] B68C *1/12***
**U.S. Cl. 54—44.7** **11 Claims**

1. In combination a mat and a saddle, characterised in that the mat comprises a non-stiffened exposed layer of foamed polyvinylchloride having a first and a second face, at least one of said first and second face having a smooth surface, and said smooth surface being remote from said saddle on installation of said mat and said saddle on a back of an animal whereby said mat forms a saddle cloth, with said smooth surface capable of frictional engagement with said animal's back for preventing substantial slipping of said saddle on said animal's back.



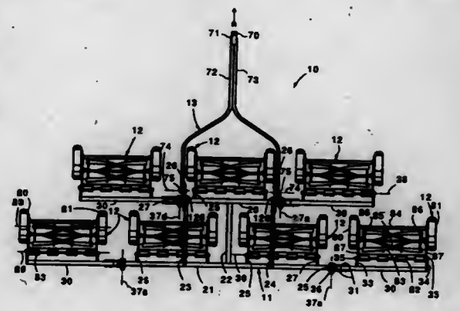
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**5,497,603**

## GANG MOWER

**Doug Short, 12210 Leo Rd., Fort Wayne, Ind. 46825**

**Filed Jan. 10, 1995, Ser. No. 370,664**
**Int. Cl.[6] H01D *75/30***
**U.S. Cl. 56—7** **8 Claims**



1. A gang mower comprising:
a frame having a weight;
a plurality of reel-type mowers each having forward wheels and a rear roller, said forward wheels being rotatable about a forward axis, and said rear roller being rotatable about a rear axis that is substantially parallel to said forward axis;
a hitch attached to and extending forward from said frame;
said frame being attached to each of said reel-type mowers higher than said rear roller, lower than said forward axis and a sufficient distance away from said forward axis toward said rear axis that a majority of said weight is supported by the rollers of said reel-type mowers instead of the forward wheels of said reel-type mowers; and
wherein said frame pushes said reel-type mowers forward when said frame is pulled forward by said hitch.

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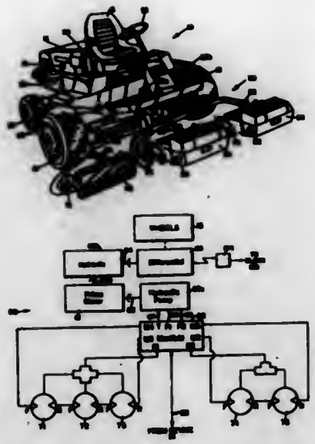
**5,497,604**

## SUPERVISOR SWITCH FOR TURF MOWER

**Dana R. Loun, Minneapolis, Minn., assignor to The Toro Company, Minneapolis, Minn.**

**Filed Feb. 3, 1994, Ser. No. 191,796**
**Int. Cl.[6] A01D *34/50***
**U.S. Cl. 56—10.2 H** **11 Claims**

6. An improved turf mower comprising:
(a) a vehicle including means for determining the ground speed of the vehicle;



(b) a cutting unit supported by the vehicle, the cutting unit including a movable cutting element;
(c) motor means for rotating the cutting element;
(d) control means operatively coupled to the speed determining means and the motor means for establishing a preselected maximum mowing speed, wherein if the vehicle speed, as determined by the ground speed determining means, exceeds the preselected maximum mowing speed, then the motor means is not energized by the control means or is de-energized by the control means if the motor means was previously energized, whereby the rotating cutting element is stopped from rotating; and
(e) reset means, operatively connected to the control means, for providing a reset signal to the control means, wherein if the vehicle ground speed is less than the preselected maximum mowing speed when the reset means are activated, then the control means re-energizes the motor means.

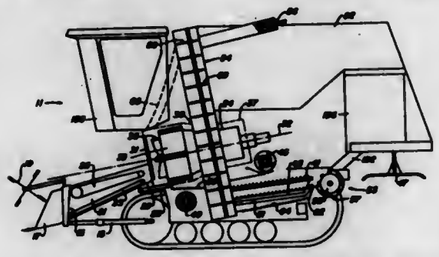
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*5,497,605*

**HEADER AND FEEDER FOR A GRAIN COMBINE**

**Mark R. Underwood, Burr Oak, and Sushil V. Dwyer, Arkansas City, both of Kans., assignors to Deere & Company, Moline, Ill.**

**Filed Nov. 15, 1994, Ser. No. 339,820**
**Int. Cl.[6] A01D *41/06;* A01F *12/20***
**U.S. Cl. 56—14.6** **45 Claims**



1. In a grain combine of the type having a threshing assembly disposed within a central housing for threshing grain from crop, a header housing having outermost ends which extend from the grain combine on opposite lateral sides of the central housing and a header discharge port defined between the outermost ends of the header housing, a feeder for transporting the crop from the header discharge port to the threshing assembly for threshing, a sieve section for receiving threshed crop from the threshing assembly and separating the grain from chaff and tailings, and grain conveyance means for transporting the grain which passes through the sieve section to a storage bin, the improvement comprising:
sickle means movably secured to the header housing and having a central portion, disposed between the outermost ends of the header housing, from which the sickle means laterally extends toward the outermost ends the header housing for moving relative to the header housing to sever the crop from a field;
header drive connecting directly to the central portion of the sickle means for transferring mechanical power from a drive shaft means directly to the central portion of the sickle means to move the sickle means and severe the crop from the field;
transport means movably secured to the header housing and having an intermediate section, disposed between the outermost ends of the header housing, from which the transport means laterally extends toward the outermost ends of the header housing for moving relative to the header housing to transport the crop inward to the header discharge port;
the header drive connecting directly to the intermediate section of the transport means for transferring mechanical power from the drive shaft means directly to the intermediate section of the transport means to move the transport means relative to the header housing and transport the crop.

36. A method for operating a grain combine of the type having a threshing assembly disposed within a central housing for threshing grain from crop, a header for severing crop from a field and directing the crop to flow through a header discharge port, a feeder for transporting the crop from the header discharge port to the threshing assembly for threshing, a sieve section for receiving threshed crop from the threshing assembly and separating the grain from chaff and tailings, and grain conveyance means for transporting the grain which passes through the sieve section to a storage bin, the method comprising the steps of:
providing a centerline header drive means for transferring mechanical power from a drive shaft means extending in a forward direction in relation the combine and directly to an intermediate portion of the header, which is a centrally disposed between outer ends of the header which extend on opposite lateral sides of the drive shaft means;
transferring the mechanical power directly to the intermediate portion of the header, and, from the intermediate portion, to portions of the header which extend toward the outer ends of the header to sever crop from the field on laterally opposite sides of the intermediate portion and to direct the crop to flow from the laterally opposite sides of the header through the header discharge port;
transporting the crop from the header discharge port, through the feeder, and to the threshing assembly;
directing the crop into and through the threshing assembly to thresh grain from the crop;
passing the crop, after threshing, through a sieve section and separating the grain from chaff and tailings; and
transporting the grain which passes through the sieve section to a storage bin.

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*5,497,606*

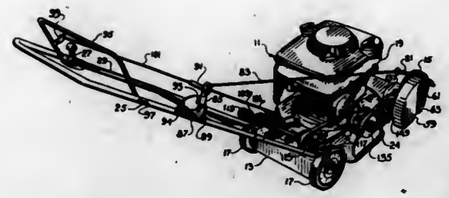
**MOWER WITH FORWARD MOUNTED EDGER**

**Robert H. Baxter, 1507 West Ct., Harrison, Ark. 72601**

**Filed Sep. 30, 1994, Ser. No. 316,567**
**Int. Cl.[6] A01D *34/43;34/47;34/56;34/64***
**U.S. Cl. 56—16.9** **16 Claims**

1. Lawn mowing and edging apparatus comprising:
a generally horizontal mower deck;
at least three ground contacting wheels rotatably mounted to said mower deck;
a prime mover mounted above said mower deck having an output shaft, said output shaft extending vertically below said





mower deck, and a power-take-off shaft having a generally horizontal axis of rotation extending from the side of and driven by said prime mover at a speed ratio of between 2:3 and 1:4 relative to said output shaft;
at least one mowing blade mounted for rotation in a horizontal plane and driven by said output shaft;
an edger blade secured on an edger shaft rotatably mounted on an edger arm pivotally mounted to said mower deck with said edger shaft axis of rotation substantially parallel to that of said power-take-off shaft;
a mechanical drive including a single driven pulley connected to said edger shaft and a single driver pulley on said power-take-off shaft coupled to said driven pulley by a single endless belt; whereby the mowing blade is constantly engaged during operation of the apparatus and the mechanical drive may selectively be activated by lowering said edger arm to perform an edging operation.

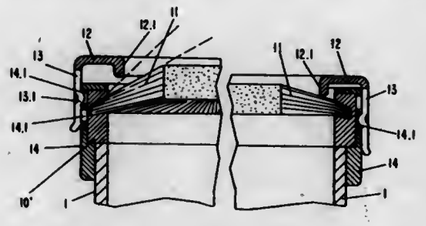
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*5,497,607*

**TWO-FOR-ONE TWISTING SPINDLE WITH BRISTLE RING FOR SMOOTHING AND TENSIONING THREADS**

**Thomas Branson, Thomasville, N.C., assignor to Palitex Project-Company GmbH, Krefeld, Germany**

**Filed May 25, 1994, Ser. No. 249,755**
**Claims priority, application Germany, May 26, 1993, 9307967 U**
**Int. Cl.[6] D01H *1/10;7/86***
**U.S. Cl. 57—58.52** **4 Claims**



1. A two-for-one twisting spindle comprising:
a protective pot having an upper edge;
a bobbin carrier positioned in said protective pot for receiving two bobbins to be placed atop one another;
a thread inlet tube extending axially through said bobbin carrier for receiving a first and a second thread withdrawn overhead from the bobbins;
a thread guide ring rotatable about an axis of said spindle, said thread guide ring having an eye for guiding one of the first and second threads withdrawn from the bobbins to said thread inlet tube, wherein the other of the first and second threads is guided about the periphery of said thread guide ring;
a bristle ring connected to said upper edge of said protective pot, said bristle ring having radially inwardly oriented, elastic bristles positioned at an upward slant, along which bristles the threads pass before entering said thread inlet tube, wherein said upward slant of said bristles is adjustable; and
an annular projection positioned on said bristle ring such that said annular projection rests on said bristles, wherein by adjusting a spacing between said annular projection and said bristle ring said upward slant is adjustable.

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*5,497,608*

**SHORT FIBER AND CONTINUOUS FILAMENT CONTAINING SPUN YARN-LIKE COMPOSITE YARN**

**Mitsuo Matsumoto, Ibaraki; Nobuo Takahashi, Ikoma; Shinji Obwaki, Minoo; Kazushi Fujimoto, Matsumoto, and Koichi Ishara, Matsuyama, all of, Japan, assignors to Teijin Limited, Osaka, Japan**

**Continuation-in-part of Ser. No. 762,888, Sep. 19, 1991, abandoned. This application Feb. 8, 1994, Ser. No. 194,471**
**Claims priority, application Japan, Feb. 22, 1991, 3-48690; Jun. 21, 1991, 3-175840**
**Int. Cl.[6] D02G *3/02;3/06***
**U.S. Cl. 57—207** **9 Claims**



1. A short fiber and continuous filament composite yarn comprising:
(A) a core portion comprising a plurality of evenly cold-drawn, non-crimped continuous filaments extending substantially in parallel to each other; and
(B) a peripheral portion located around the core portion and comprising a plurality of cold draw-cut, non-crimped short fibers provided with tapered end portions thereof and having a smaller latent shrinkage in boiling water than that of the continuous filaments,
said short fibers being intertwined at random portions thereof with the continuous filaments in the core portion and forming a plurality of loops projecting in the form of waves having different wave heights from the core portion toward the outside thereof.

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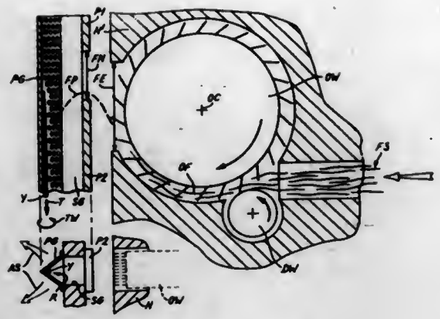
*5,497,609*

**SPINNING OF YARN**

**Carl A. Lawrence, Hebden Bridge, England, and Rong K. Jiang, Shanghai, China, assignors to British Technology Group Ltd., London, England**

**Continuation of Ser. No. 220,578, Mar. 31, 1994, abandoned, which is a continuation of Ser. No. 101,106, Aug. 3, 1993, abandoned, which is a continuation of Ser. No. 914,018, Jul. 15, 1992, abandoned, which is a continuation of Ser. No. 689,789, May 20, 1991, abandoned. This application May 16, 1995, Ser. No. 442,293**
**Claims priority, application United Kingdom, Nov. 23, 1988, 8827367**
**Int. Cl.[6] D01H *4/18;4/38***
**U.S. Cl. 57—400** **22 Claims**

1. A method of spinning fibers into yarn comprising the steps of:
providing a supply of fibers,
providing a yarn-building region including a defined entry,
opening fibers from the supply through an exit into the yarn building region,
defining a path through said entry of the region for open fibers,
restricting said path through said entry by a projection disposed generally transversely with respect to said exit,
bending opened fibers around the projection,
landing opened fibers in said region,
removing energy from landing fibers by straightening said fibers,
building and twisting the fibers landed in the region into a yarn, and
withdrawing the yarn from the region.



5,497,610

## PROCESS AND DEVICE FOR PNEUMATIC FEEDING OF FIBERS TO THE FIBER COLLECTION SURFACE OF AN OPEN-END SPINNING ELEMENT

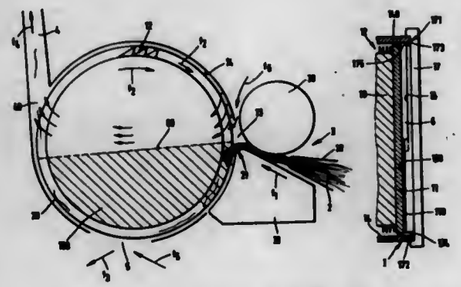
Johann Rottmayr, Reutlingen, Germany, assignor to Rieter Ingolstadt Spinnereimaschinenbau AG, Ingolstadt, Germany

Filed Oct. 31, 1994, Ser. No. 332,257

Claims priority, application Germany, Dec. 4, 1993, 43 41 411.7

Int. Cl.[6] D01H *4/36;4/38*

U.S. Cl. 57—408 17 Claims



1. A process for pneumatic feeding of fibers to a fiber collection surface of an open-end spinning element from an opener roller rotating within a housing, said process comprising the steps of:

feeding a fiber sliver from a feeding point to the opener roller and opening the sliver into individual fibers, and conveying the individual fibers in a circulating airstream in a circumferential space between the opener roller and the housing from the feeding point to an inlet of a fiber feeding channel in the rotational direction of the opener roller, the fiber feeding channel disposed to receive the fibers from the circulating airstream and convey the fibers to the open-end spinning element;

directing the circulating airstream from the inlet of the fiber feeding channel to the area of the fiber sliver feeding point in the rotational direction of the opener roller;

at a circumferential location between said fiber feeding channel and said fiber sliver feeding point in the direction of rotation of the opener roller, directing the circulating airstream longitudinally along the opener roller with respect to a rotational axis of the opener roller to at least one end wall of the opener roller; and

backfeeding the circulating airstream from the end wall of the opener roller to the inlet area of the fiber feeding channel, wherein any fibers remaining in the circulating airstream which were not initially passed into the fiber feeding channel are drawn back to the fiber feeding channel.

5,497,611

## PROCESS FOR THE COOLING OF AN AUTO-IGNITION COMBUSTION CHAMBER

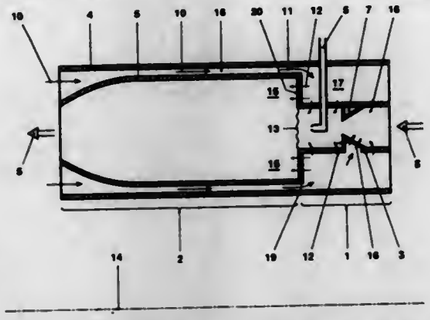
Urs Benz, Gipf-Oberfrick; David Walhood, Nussebaumen, and Burkhard Schulte-Werning, Basel, all of, Switzerland, assignors to ABB Management AB, Baden, Switzerland

Filed Feb. 3, 1995, Ser. No. 383,438

Claims priority, application Switzerland, Feb. 18, 1994, 496/94

Int. Cl.[6] F02C *7/16*

U.S. Cl. 60—39.06 7 Claims



1. A process for cooling an auto-ignition combustion chamber of a gas-turbine set, said combustion chamber having an inflow zone and a combustion zone, the combustion zone having a greater cross-sectional area than the inflow zone with a transition step therebetween and a wall of the inflow zone having a plurality of holes, the process comprising the steps of:

introducing a working gas of temperature sufficiently high for ignition of a fuel into the combustion chamber through the inflow zone;

introducing a fuel into the working gas in the combustion chamber, wherein the fuel and working gas mix in the combustion chamber and auto-ignition of the mixture occurs;

directing cooling air through the holes in the wall of the inflow zone for effusion cooling; and

directing cooling air on a wall of the combustion zone for convective cooling.

5,497,612

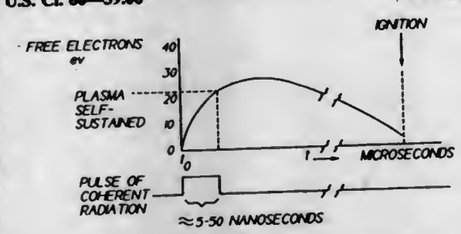
## LASER INITIATED NON-LINEAR FUEL DROPLET IGNITION METHOD

Jimmy D. Few, and James W. L. Lewis, both of Tullahoma, Tenn., assignors to University of Tennessee Research Corporation, Knoxville, Tenn.

Division of Ser. No. 289,184, Aug. 11, 1994, which is a continuation of Ser. No. 957,613, Oct. 6, 1992, Pat. No. 5,404,712. This application May 31, 1995, Ser. No. 454,994

Int. Cl.[6] F02C *7/266*

U.S. Cl. 60—39.06 5 Claims




1. A method of igniting an air/fuel spray comprised of fuel droplets, the method comprising the steps of:

providing an air/fuel spray within a combustion chamber means;



introducing at least one pulse of coherent radiation into the air/fuel spray, the pulse interacting with free electrons and initiating a development of a plasma within the air/fuel spray;

maintaining the pulse of coherent radiation for pumping the developing plasma; and

terminating the pulse of coherent radiation at a time after the plasma has reached a predetermined energy and before a time that an ignition of the air/fuel spray occurs.

5,497,613

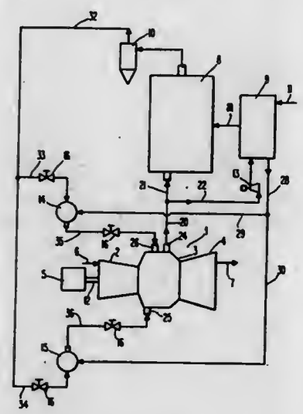
## HOT GAS MANIFOLD SYSTEM FOR A DUAL TOPPING COMBUSTOR GAS TURBINE SYSTEM

Arthur W. McGuigan, and Benjamin C. Wiant, both of Winter Park, Fla., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 3, 1993, Ser. No. 161,026

Int. Cl.[6] F02C *1/00*

U.S. Cl. 60—39.37 16 Claims



1. A gas turbine system, comprising:

a) a first combustor for burning a fuel in a compressed gas so as to produce a first hot gas flow;

b) a second combustor for burning a fuel in a compressed gas so as to produce a second hot gas flow;

c) a turbine having an inlet for receiving said first and second hot gas flows for expansion therein;

d) a first manifold having (i) means for receiving said first hot gas flow from said first combustor and (ii) means for directing first and second portions of said first hot gas flow to first and second outlet ports, said first and second outlet ports in flow communication with first and second portions of said turbine inlet;

e) a second manifold having (i) means for receiving said second hot gas flow from said second combustor and (ii) means for directing first and second portions of said second hot gas flow to third and fourth outlet ports, said third and fourth outlet ports in flow communication with third and fourth portions of said turbine inlet, said third outlet port being disposed between said first and second outlet ports; and

f) wherein each of said first and second manifolds forms a toroidal chamber, said means for directing first and second portions of said second hot gas flow of said first manifold comprises first and second ducts connected to said toroidal chamber of said first manifold, and means for directing first and second portions of said second hot gas flow of said second manifold comprises third and fourth ducts connected to said toroidal chamber of said second manifold.

5,497,614

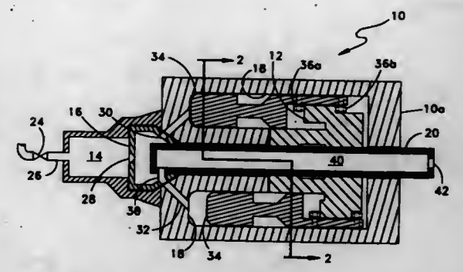
## EXTERNAL COMBUSTION ENGINE HAVING AN ASYMMETRICAL CAM AND METHOD OF OPERATION

Anthony W. Duva, Newport, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 30, 1994, Ser. No. 348,688

Int. Cl.[6] F02G *3/02*

U.S. Cl. 60—39.63 17 Claims



1. An external combustion expander-type engine comprising:

a combustion area for combusting a monopropellant fuel to form an energized gas;

a minimum of two cylinders fluidly connected to the combustion area, each of said minimum of two cylinders having a piston disposed therein, the energized gas being spent in the cylinders to move the pistons;

an asymmetrical cam in contact with the pistons and affixed to a drive shaft, the movement of the pistons causing the rotation of the asymmetrical cam and the drive shaft, the asymmetrical cam having at least one power stroke and at least one exhaust stroke, said at least one power stroke being of greater duration than said at least one exhaust stroke;

an exhaust passage for removing spent gas from the engine; and

a rotary valve for transferring the energized gas from the combustion area to the cylinders and for transferring the spent gas from the cylinders to the exhaust passage.

5,497,615

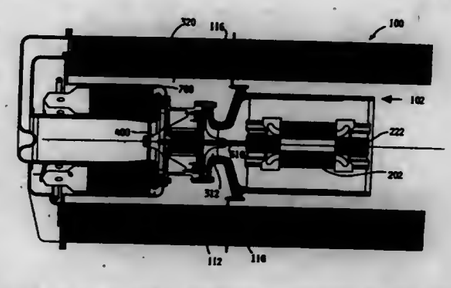
## GAS TURBINE GENERATOR SET

James C. Noe, 23650 Community St., West Hills, Calif. 91304, and Robert D. McKeirnan, Jr., 8300 Manitoba St. #210, Playa del Rey, Calif. 90293

Filed Mar. 21, 1994, Ser. No. 180,881

Int. Cl.[6] F02C *7/10*

U.S. Cl. 60—39.511 4 Claims



1. In an energy source comprising a combustor, turbine, compressor, motor-generator and recuperator, the improvement comprising a recuperator surrounding all of the other said elements so as to provide sound and supplemental centrifugal fly apart protection relative to the ambient space surrounding said energy source; wherein

said recuperator elements comprise a plurality of thin boundary foils, said boundary foils defining a center aperture and a plurality of first ellipsoidal shaped apertures adjacent said central aperture, and a plurality of second ellipsoidal shaped apertures, adjacent to and in-line with said first ellipsoidal shaped apertures, said foils having hemispheric embossments on a first side and are dimpled on the opposite side.

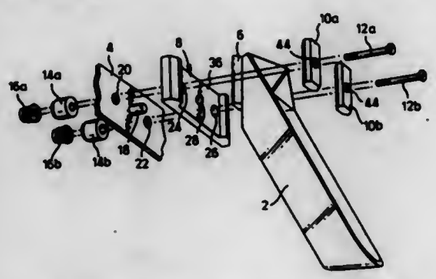
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**5,497,616**

## HIGH TEMPERATURE MOUNTING FOR STRESS RELIEF OF A DOVETAIL

**Martyn G. Roberts, Atlanta, Ga., assignor to Rolls-Royce Inc., Reston, Va.**

**Filed Nov. 16, 1994, Ser. No. 341,990**
**Int. Cl.[6] F02K 3/10**
**U.S. Cl. 60—261** **14 Claims**




1. A component mounting system tolerant to differential thermal expansion, which comprises:

a first component constructed of a first material characterised by first thermal expansion characteristics and formed with a dovetail projection having angled faces which the component may be clamped,

a support structure constructed of a second material characterised by second thermal expansion characteristics substantially different from said first thermal expansion characteristics and to which the first component is to be clamped,

clamp means adapted to engage the angled faces of the dovetail projection of the first component to exert a clamping force whereby to clamp the first component to the support structure, and

an intermediate member constructed of material having the same thermal expansion characteristics as the first component, said intermediate member including means to counterbalance the clamping force exerted on the first component, said means comprising angled faces which are adapted to be engaged by the clamp means, which angled faces are inclined oppositely to the angled faces on the first component, the intermediate member being interposed between said dovetail projection of the first component and the support structure.

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**5,497,617**

## GAS-ENRICHED LIGHT-OFF

**Rodney D. Bagley, Big Flats; Jacqueline L. Brown, and Brent M. Wedding, both of Corning, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.**

**Filed Jul. 2, 1993, Ser. No. 86,732**
**Int. Cl.[6] F01N 3/20**
**U.S. Cl. 60—274** **29 Claims**

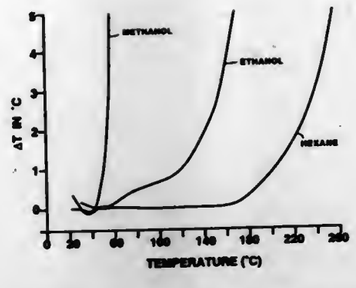
1. A method of purifying an engine exhaust gas stream by:

(a) providing an apparatus comprising a housing having an inlet and outlet end, exhaust pipe connected to the inlet end and connecting the housing to the engine, tail pipe connected to the outlet end, source for introducing fuel and air into the apparatus to form a air/fuel mixture and an electrically heated catalytic converter disposed in the housing for igniting the air/fuel mixture;

(b) applying sufficient energy to the electrically heated catalyst to attain the conversion temperature or ignition of the air/fuel mixture;

(c) introducing the air/fuel mixture into the exhaust pipe until the temperature of the catalytic converter is sufficiently high to convert the exhaust gases; and

(d) starting the engine.



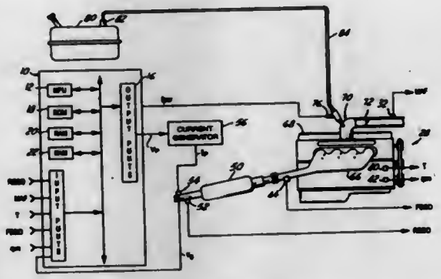

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**5,497,618**

## AIR/FUEL CONTROL SYSTEM WITH CATALYTIC CONVERTER MONITORING

**Alan D. Brailsford, Dearborn; Douglas R. Hamburg, Bloomfield Hills; Eleftherios M. Logothetis, Birmingham, and Mohammed Yussouff, Lincoln Park, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.**

**Filed Sep. 30, 1994, Ser. No. 315,737**
**Int. Cl.[6] F01N 3/20**
**U.S. Cl. 60—274** **14 Claims**




1. A control system for maintaining engine air/fuel ratio within the efficiency window of a catalytic converter coupled to the engine exhaust and concurrently monitoring the converter's efficiency, comprising:

a first exhaust gas oxygen sensor coupled to the engine exhaust upstream of the converter;

an air/fuel controller adjusting fuel delivered to the engine in response to a feedback variable derived at least in part from said first exhaust gas oxygen sensor to maintain the engine air/fuel ratio within the converter's efficiency window;

a second exhaust gas oxygen sensor having a non-catalytic exhaust-side electrode;

a circuit for pumping current into one electrode of said second sensor during a test cycle; and

a monitoring controller monitoring output amplitude of said second sensor during said test cycle to provide an indication of the converter's efficiency.

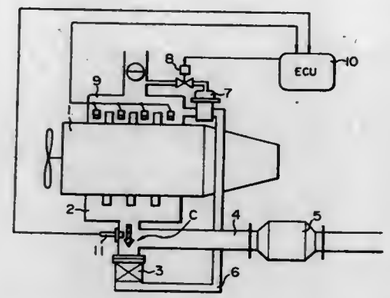


**5,497,619**

## EXHAUST GAS PURIFICATION APPARATUS

**Jun Yamada, Okazaki; Kenji Kanehara, Toyohashi; Toshihiko Igashira, Toyokawa; Shingo Morishima, Aichi; Toshihiro Takada, Susono, and Hiroshi Hirayama, Okazaki, all of, Japan, assignors to Nippon Soken, Inc., Nishio, and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan**

**Filed Jun. 30, 1994, Ser. No. 268,946**
**Claims priority, application Japan, Jul. 6, 1993, 5-166985; Apr. 22, 1994, 6-084781**
**Int. Cl.[6] F02M 5/06; F01N 3/28**
**U.S. Cl. 60—279** **15 Claims**




1. An exhaust gas purification system for purifying at least hydrocarbons (HC) from an exhaust gas emitted by an internal combustion engine, wherein the internal combustion engine is provided with an intake portion and an exhaust gas passage leading away from the internal combustion engine, the exhaust gas passage having an extended portion and a branched portion branching from the extended portion at a location downstream, relative to an exhaust gas flow, from the internal combustion engine, the system comprising:

a catalyst unit provided in the branched portion of the exhaust gas passage;

an HC adsorbent unit provided in the extended portion of the exhaust gas passage downstream from the branched portion of the exhaust gas passage;

an exhaust gas recirculation passage connecting said HC adsorbent unit to the intake portion of the internal combustion engine; and

an exhaust gas recirculation control valve provided in said exhaust gas recirculation passage for selectively opening and closing the exhaust gas recirculation passage.

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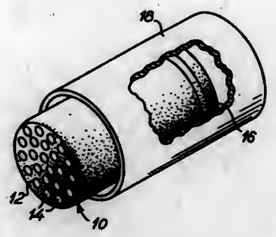
**5,497,620**

## METHOD OF FILTERING PARTICLES FROM A FLUE GAS, A FLUE GAS FILTER MEANS AND A VEHICLE

**Per Stobbe, Nørgaardsvej 6B, 2800 Lyngby, Denmark**

**Continuation of Ser. No. 884,480, May 13, 1992, Pat. No. 5,195,319, which is a continuation of Ser. No. 623,429, Nov. 29, 1990, abandoned. This application Dec. 28, 1992, Ser. No. 997,652**
**Claims priority, application Denmark, Apr. 8, 1988, 1938/88; Aug. 18, 1988, 4650/88**
**Int. Cl.[6] F01N 3/02**
**U.S. Cl. 60—303** **19 Claims**

6. A means for filtering particles from a flue gas, comprising a porous filter body of particulate SiC with a particle size in the range of 75–170 μm bonded together in said porous filter body, said porous filter body having a porosity of 30–90%, a maximum pore size of 10–100 μm, and a thermal conductivity in excess of 5 W/mK.



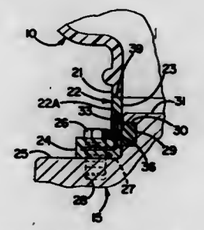

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**5,497,621**

## PLASTIC RESERVOIR

**Dudley C. Mallett, Blackheath, England, assignor to Fenner Fluid Power, a Division of Fenner, Inc., Rockford, Ill.**

**Filed Nov. 10, 1994, Ser. No. 337,106**
**Int. Cl.[6] F16D 31/00; 31/02**
**U.S. Cl. 60—325** **10 Claims**




1. A reservoir adapted to hold a supply of fluid and to be secured to a member, said reservoir comprising a plastic body having an open end portion, a mounting ring having a plastic portion joined to said open end portion, and means for securing said mounting ring to said member, said mounting ring including a metal ring substantially encapsulated in said plastic portion for reinforcing said plastic portion.

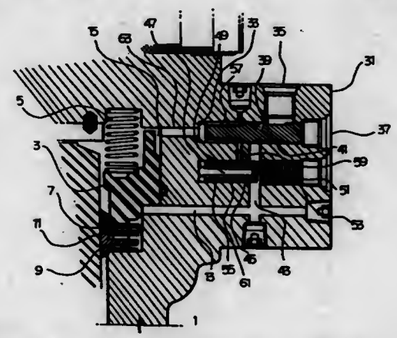
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**5,497,622**

## TIME DELAY VALVE OF A HYDRAULIC MOTOR

**Jung-Jin Nam, Kyung Nam, Rep. of Korea, assignor to Samsung Heavy Industry Co., Ltd., Rep. of Korea**

**Filed Nov. 16, 1994, Ser. No. 340,236**
**Claims priority, application Rep. of Korea, Dec. 30, 1993, 93-31352**
**Int. Cl.[6] F16P 31/02; F15B 15/26**
**U.S. Cl. 60—435** **3 Claims**




1. A time delay valve of a hydraulic motor, comprising:

a time delay valve body incorporated with a housing of the hydraulic motor at one side of the housing;
a first means for defining constant pressure port and a second means for defining a signal pressure port in the time delay valve body;
a spool movably disposed in the time delay valve body in such a manner to be elastically supported by a spring and be moved by a signal pressure applied to the signal pressure port;
a third means for defining a first oil flowing path, one end of which is interconnected to a pressure receiving chamber of a brake spring of a brake piston and the other end of which is interconnected to a spool hole of the spool, the constant pressure port and the pressure receiving chamber being interconnected with each other through the first oil flowing path in the course of an alternating stroke of the spool;
an orifice spool movably disposed in the first oil flowing path with being elastically supported by a spring, at one end of which an orifice opened toward the first oil flowing path is formed, and at both sides of which through holes are formed, the orifice spool being moved by the elastic force of the spring and the pressure difference between a spring chamber of the orifice spool and the first oil flowing path; and
a fourth means for defining a second oil flowing path, one end of which is interconnected to the spool hole of the orifice spool and the other end of which is interconnected to a pressure exhausting chamber, the one end of the second oil flowing path is interconnected to the through holes of the orifice spool in the course of alternating stroke of the orifice spool.

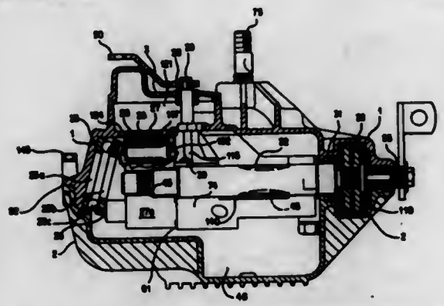
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**5,497,623**

## HYDROSTATIC PUMP AND MOTOR UNIT

**Ray M. Hauser, Decatur, Ill., and Alan W. Johnson, Ames, Iowa, assignors to Hydro-Gear Limited Partnership, Sullivan, Ill.**

**Division of Ser. No. 260,887, Jun. 16, 1994, which is a continuation of Ser. No. 25,272, Mar. 2, 1993, Pat. No. 5,330,394, which is a division of Ser. No. 917,858, Jul. 22, 1992, Pat. No. 5,314,387, which is a continuation-in-part of Ser. No. 727,463, Jul. 9, 1991, Pat. No. 5,201,692. This application Jan. 18, 1995, Ser. No. 386,985**
**Int. Cl.[6] F16D *39/00***
**U.S. Cl. 60—487** **4 Claims**



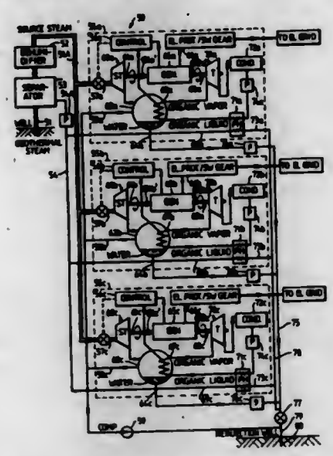
1. A hydrostatic pump unit mounted on a running surface of a hydrostatic transmission, said transmission located in a housing providing a sump for hydraulic fluid, comprising
a) a rotatable cylinder block containing a plurality of chambers for holding reciprocal pistons, and receiving a rotatable input shaft;
b) hydraulic transfer means for containing hydraulic fluid separate from said sump and for sealing high pressure fluid from low pressure fluid;
c) means for mechanically diverting said hydraulic fluid from said hydraulic transfer means to said sump by lifting said cylinder block from said running surface of said hydrostatic transmission to allow said fluid to drain quickly from said porting means to said sump.

**5,497,624**

## METHOD OF AND APPARATUS FOR PRODUCING POWER USING STEAM

**Nadav Amir, Rehovot, and Lucien F. Bronicki, Yavne, both of, Israel, assignors to Ormat, Inc., Sparks, Nev.**

**Continuation of Ser. No. 176,690, Jan. 3, 1994, abandoned, which is a continuation of Ser. No. 989,918, Dec. 11, 1992, abandoned, which is a continuation of Ser. No. 730,526, Jul. 15, 1991, abandoned, which is a continuation of Ser. No. 444,565, Dec. 1, 1989, abandoned. This application Aug. 11, 1994, Ser. No. 288,762**
**Claims priority, application Israel, Dec. 2, 1988, 088571**
**Int. Cl.[6] F03G *7/00***
**U.S. Cl. 60—641.5** **62 Claims**



1. A power plant operating on steam for producing electric power comprising:
a) a plurality of integrated power plant unit modules each having a steam turbine responsive to said steam and producing power and heat depleted steam, a steam condenser associated with each said steam turbine operating at a pressure no less than atmospheric pressure for collecting non-condensable gases and condensing said heat depleted steam and vaporizing organic fluid applied to said condenser, and a closed organic Rankine cycle turbine operating on said organic working fluid for producing power;
b) steam supply means for supplying in parallel said steam to each steam turbine in each said modules;
c) a control valve associated with and positioned before the steam turbine contained in each said power plant module for controlling the amount of steam supplied to said steam turbine via said steam supply means;
d) means for compressing non-condensable gases collected in steam condensers contained in each said power plant module, and means for venting the compressed non-condensable gases into a reinjection well; and
e) wherein the organic fluid is pentane.

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**5,497,625**

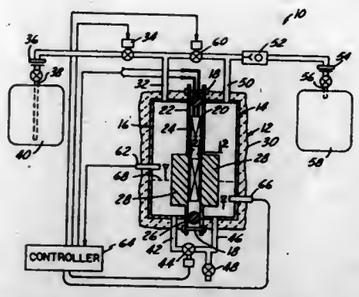
## THERMOELECTRIC REFRIGERANT HANDLING SYSTEM

**Kenneth W. Manz, Paulding, and Ilya Reyzin, Lyndhurst, both of Ohio, assignors to SPX Corporation, Muskegon, Mich.**

**Filed Nov. 3, 1994, Ser. No. 333,750**
**Int. Cl.[6] F25B *21/02***
**U.S. Cl. 62—3.3** **14 Claims**

1. A thermoelectric refrigerant handling system that comprises:
a first chamber having inlet means for receiving refrigerant from a source thereof and an outlet for delivering refrigerant in






vapor phase, said inlet means including valve means for selectively connecting said inlet means to said first chamber,
thermoelectric means operatively disposed between said first chamber and said inlet means, and responsive to application of electrical energy for transferring heat from said inlet means to said first chamber, thereby withdrawing heat from refrigerant in said inlet means and adding heat to refrigerant in said first chamber, and
control means for applying electrical energy to said thermoelectric means for transferring heat energy into said first chamber to vaporize refrigerant contained therein until said first chamber is substantially empty of refrigerant, and then opening said valve means to feed refrigerant from said inlet means to said first chamber.

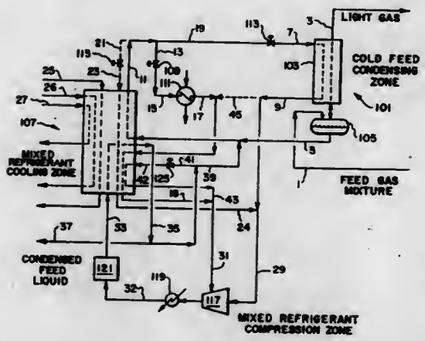
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**5,497,626**

## OPEN LOOP MIXED REFRIGERANT CYCLE FOR ETHYLENE RECOVERY

**Lee J. Howard, Allentown, and Howard C. Rowles, Center Valley, both of Pa., assignors to Air Products and Chemcials, Inc., Allentown, Pa.**

**Continuation-in-part of Ser. No. 192,025, Feb. 4, 1994, Pat. No. 5,377,490. This application Aug. 12, 1994, Ser. No. 289,862**
**Int. Cl.[6] F25J *3/06***
**U.S. Cl. 62—23** **27 Claims**




1. In the recovery of ethylene from a feed gas mixture containing ethylene, hydrogen, and $C_1$ to $C_3$ hydrocarbons, wherein said recovery includes the steps of compressing and cooling said feed gas to condense a portion thereof, fractionating the condensed feed liquids in one or more demethanizer columns to recover a light overhead product comprising chiefly hydrogen and methane, and fractionating the bottoms stream from said one or more demethanizer columns to recover an ethylene product and streams containing $C_2$ and heavier hydrocarbons, refrigeration for said recovery of ethylene is provided in a cycle which comprises:
(a) cooling an ethylene-containing mixed gas stream comprising hydrogen, methane, ethane, and ethylene in a cold feed condensing zone (**101**) to yield at least one feed condensate (**5**) and a light gas stream (**3**);
(b) subcooling said feed condensate (**5**) by indirect heat exchange in a mixed refrigerant cooling zone (**107**) with one or more cold process streams to yield a subcooled condensate (**11**);
(c) flashing a first portion (**13**) of said subcooled condensate (**11**) and using the resulting stream (**15**) to provide overhead condenser refrigeration for at least one of said demethanizer columns by indirect heat exchange, which warms and at least partially vaporizes said resulting stream (**15**) to yield a demethanizer overhead condenser refrigerant outlet stream (**17**); and
(d) flashing a second portion (**19**) of said subcooled condensate (**11**) and using the resulting refrigerant stream (**7**) to provide at least a portion of the refrigeration required to cool said ethylene-containing mixed gas stream and condense a portion thereof by indirect heat exchange in said cold feed condensing zone (**101**), which warms and at least partially vaporizes said second portion (**19**) of said subcooled condensate (**11**) to yield a cold feed condensing zone refrigerant outlet stream (**9**) wherein the said gas feed mixture (**1**) is provided at a pressure of 150 to 400 psia and steps (a) through (d) are operated in the range of 150 to 400 psia.

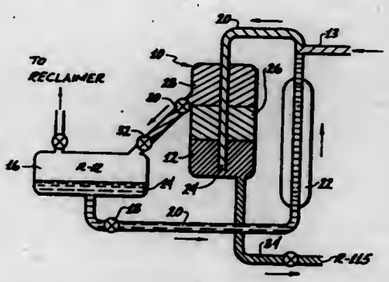
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**5,497,627**

## METHODS FOR PURIFYING REFRIGERANT COMPOSITIONS

**Alan F. Heyduk, Columbus; Robert W. Mouk, Westerville, and Albert E. Abel, Powell, all of Ohio, assignors to Commodore Laboratories, Inc., Columbus, Ohio**

**Filed Dec. 21, 1994, Ser. No. 361,039**
**Int. Cl.[6] F25B *47/00*; B01D *12/00*;*43/00***
**U.S. Cl. 62—85** **20 Claims**



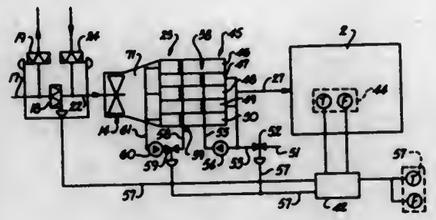

1. A method of purifying refrigerant compositions, which comprises the steps of:
(a) providing a refrigerant composition comprising at least first and second refrigerants in which the first refrigerant has a high water solubility relative to the second refrigerant;
(b) in a closed vessel, contacting the refrigerant composition of step (a) with an aqueous solution at a temperature sufficiently low to enhance the solubility and extraction of the first refrigerant from the refrigerant composition;
(c) allowing the aqueous solution of the extracted first refrigerant to separate into an upper aqueous phase and a lower liquid phase comprising the second refrigerant;
(d) separating said upper aqueous phase from said lower liquid phase, and
(e) recovering the first refrigerant from said aqueous phase.

5,497,628

## AIR CONDITIONING PROCESS AND DEVICE

Helmut Stauble, Spartanburg, S.C., assignor to LTG Lufttechnische GmbH, Stuttgart, Germany

Filed Jul. 29, 1994, Ser. No. 282,967
Int. Cl.[6] F25D 17/06
U.S. Cl. 62—91 15 Claims



1. A process for cooling and conditioning an air stream, comprising:
conveying the air stream through a humidification and conditioning zone, and defining at least two independent regions within the zone wherein at least a portion of the airstream flows through each region;
spraying cooled water into the portion of the air stream conveyed through one of the regions to cool the air stream;
spraying tempered water into the portion of the air stream conveyed through the other region to provide adiabatic humidification of the air stream;
independently controlling the spraying in each of the regions so as to achieve a combined air stream having desired parameters of temperature and relative humidity; and
combining the air stream portions downstream of the regions.

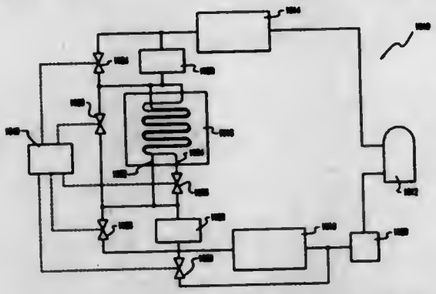
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5,497,629

## HEATING AND COOLING SYSTEMS INCORPORATING THERMAL STORAGE

Alexander P. Rafalovich; Joseph A. Gustin; William J. Lonsgardner; Gilbert P. Keller, and Thomas C. Schmidtor, all of Indianapolis, Ind., assignors to Store Heat and Produce Energy, Inc., Indianapolis, Ind.

Continuation-in-part of Ser. No. 36,041, Mar. 23, 1993, Pat. No. 5,355,688. This application Jan. 24, 1994, Ser. No. 265,451
Int. Cl.[6] F25D 17/02; F25B 41/00
U.S. Cl. 62—98 11 Claims



8. A method for charging a thermal storage device with thermal energy and for discharging the thermal storage device to cool a space, the system including an outside heat exchanger, a first metering device, a first bypass line for selectively bypassing the first metering device, a thermal storage device including a thermal storage medium, a second metering device, an inside heat exchanger, a second bypass line for selectively bypassing the second metering device and the inside heat exchanger, a compressor, and a refrigerant, the method comprising the steps of:
charging the thermal storage device by:
desuperheating and condensing refrigerant from a vapor to a liquid in the outside heat exchanger after the refrigerant is compressed;
flowing the liquid refrigerant through the first metering device;
evaporating the refrigerant in the thermal storage device and simultaneously extracting heat from the refrigerant to the thermal storage medium;
flowing refrigerant vapor through the second bypass line to the compressor;
and compressing the refrigerant vapor in the compressor;
and discharging the thermal storage device by:
desuperheating refrigerant vapor in the outside heat exchanger after the refrigerant is compressed;
flowing the refrigerant through the first bypass line;
extracting heat from the refrigerant in the thermal storage device to condense the refrigerant;
flowing liquid refrigerant through the second metering device;
evaporating the refrigerant in the inside heat exchanger;
and compressing the refrigerant vapor in the compressor.

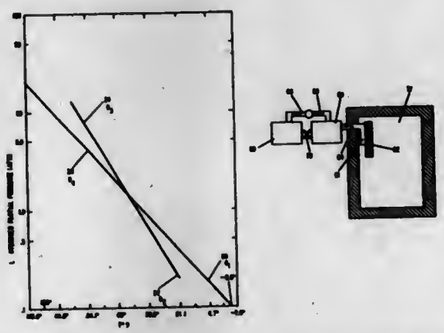
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5,497,630

## METHOD AND APPARATUS FOR HYDRIDE HEAT PUMPS

Charles Stein, and Edward M. Redding, both of Albuquerque, N.M., assignors to Thermal Electric Devices, Inc., Albuquerque, N.M.

Filed Sep. 30, 1992, Ser. No. 955,305
Int. Cl.[6] F25B 17/08
U.S. Cl. 62—112 17 Claims



3. A method of heat pump hydride refrigeration comprising the steps of:
a) providing a refrigerant hydride with a first predetermined van't Hoff curve;
b) providing a regenerator hydride with a second predetermined van't Hoff curve;
c) providing the first van't Hoff curve and the second Van't Hoff curve cross at a preselected temperature and pressure;
d) regenerating the regenerator hydride at a temperature above the crossing of the van't Hoff curves; and
e) providing heat transfer, the heat transfer comprising the substeps of:
1) unidirectional transferring of heat of absorption of the refrigerant hydride to the regenerator hydride which supplies a major fraction of heat required for regeneration of the regenerator hydride; and
2) unidirectional transferring of heat from a cold space to the refrigerant hydride during a refrigerating cycle.

15. A method of heat pump hydride refrigeration comprising the steps of:



a) providing a refrigerant hydride with a first predetermined van't Hoff curve;
b) providing a regenerator hydride with a second predetermined van't Hoff curve;
c) providing the first van't Hoff curve and the second Van't Hoff curve cross at a preselected temperature and pressure;
d) regenerating the regenerator hydride at a temperature above the crossing of the van't Hoff curves; and
e) controlling a lowest temperature of the refrigerant hydride with a phase change material.

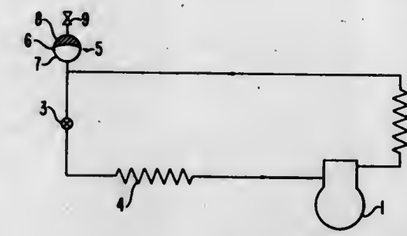
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5,497,631

## TRANSCRITICAL VAPOR COMPRESSION CYCLE DEVICE WITH A VARIABLE HIGH SIDE VOLUME ELEMENT

Gustav Lorentzen, Trondheim, and Jostein Pettersen, Ranheim, both of, Norway, assignors to Sinvent A/S, Trondheim, Norway

PCT No. PCT/NO92/00204, § 371 Date Jun. 27, 1994, § 102(e) Date Jun. 27, 1994, PCT Pub. No. WO93/13370, PCT Pub. Date Jul. 8, 1993
PCT Filed Dec. 22, 1992, Ser. No. 256,181
Claims priority, application Norway, Dec. 27, 1991, 915127
Int. Cl.[6] F25B 41/00
U.S. Cl. 62—115 11 Claims



1. An apparatus for control of the high side pressure in a vapor compression cycle device operating with super-critical high side pressure, comprising a compressor, a heat exchanger, an expansion means and an evaporator connected in series in a flow circuit, said apparatus comprising at least one variable volume element having a compartment connected to and in free communication with the flow circuit at a location between the compressor and the expansion means, a movable partition means defining at least one side of the compartment, the partition means being displaceable between first and second positions, respectively defining first and second volumes of refrigerant within the compartment, and means external to the flow circuit for displacing the partition means between the first and second positions to thereby change and control refrigerant volume within the compartment.

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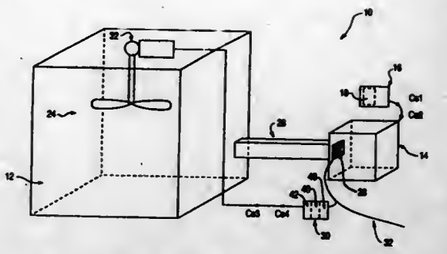
5,497,632

## HEATING SYSTEM HAVING INCREASED AIR CIRCULATION

Kevin R. M. Robinson, 1094 Westminster Blvd., Windsor, Ontario, Canada

Filed May 31, 1994, Ser. No. 250,536
Claims priority, application Canada, May 25, 1994, 2124281
Int. Cl.[6] F24F 7/00
U.S. Cl. 62—180 16 Claims

1. An air conditioning system for heating or cooling a volume of air, said air conditioning system comprising:
air conditioning means activatable to heat or cool the volume of air and operable to receive a first control signal and a second control signal;



control means for controlling the air conditioning means and operable to send the first control signal and the second control signal;
sensing means for sensing when the air conditioning means is active and operable to send a third control signal;
air circulation means located within the volume of air and activatable to circulate the air within the volume of air in response to the third control signal;
wherein the air conditioning means is activated in response, to the first control signal and the air conditioning means is deactivated in response to the second control signal;
wherein the sensing means sends the third control signal substantially simultaneously after sensing activation of the heating means;
wherein the sensing means is operable to send a fourth control signal upon sensing deactivation of the air conditioning means;
wherein the air circulation means is deactivated in response to the fourth control signal;
heater fan means for forcing hot or cool air from the air conditioning means to the volume of air, said heater fan means being supplied electrical power by a power line; and
wherein said sensing means comprises sensing relay means operable to generate the third control signal when in a first position and to generate the fourth control signal when in a second position, said sensing relay means including a coil means operable to move the sensing relay means to the first position from the second position when energized, said coil means being connected in parallel to said power line supplying power to said heater fan means such that activation of the heater fan means energizes the coil means thereby causing the sensing relay means to move to the first position from the second position.

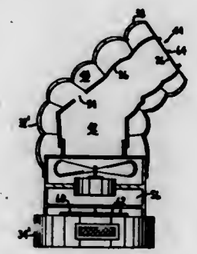
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5,497,633

## EVAPORATIVE COOLING UNIT

Michael Jones, and Mark Hensley, both of Culver City, Calif., assignors to Cool Zone Products & Promotions, Inc., Los Angeles, Calif.

Filed Jun. 17, 1994, Ser. No. 261,474
Int. Cl.[6] F28D 5/00
U.S. Cl. 62—314 17 Claims



1. An evaporative cooling unit comprising:

an inflatable conduit formed of an inner wall and an outer wall cooperatively defining an inflatable enclosure, the conduit having a chamber with an outlet;

a blower forcing air from an inlet of the chamber to the outlet;

at least one spray nozzle attachable to the inflatable conduit and oriented so as emit a liquid coolant into the air;

means for coupling the spray nozzle to a source of the liquid coolant, whereby mixed air and water are discharged from the outlet such that persons can immerse themselves to cool down.

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**5,497,634**

**REFRIGERATOR WITH HEAT EXCHANGER OPTIMALLY CONFIGURED**

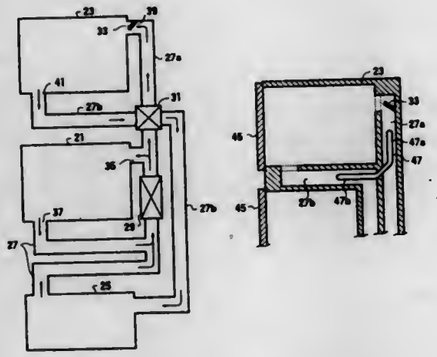
**Takao Kojima, Kanagawa; Minoru Temmyo, Osaka, and Takuya Kishimoto, Kanagawa, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Feb. 17, 1994, Ser. No. 197,973**

**Claims priority, application Japan, Feb. 26, 1993, 5-037219**

**Int. Cl.[6] F25D *11/02***

**U.S. Cl. 62—441** **2 Claims**





1. A refrigerator including an evaporator therein, the refrigerator comprising:

a freezing room connected from the evaporator through a circulating passage, the freezing room having the circulating passage which circulates an air cooled by the evaporator;

a storage room connected to the freezing room, in which a temperature of the storage room is set higher than that of the freezing room;

a flow-in passage connected to the storage room where the air cooled by the evaporator flows into the storage room;

a flow-out passage connected from the storage room where a chilled air flows out of the storage room;

heat exchanging means for exchanging heat between the cooled air flowing through the circulating passage and the chilled air flowing through the flow-out passage; and

a second storage in which a temperature thereof is set higher than that of the storage room, wherein air that is heat-exchanged in the heat exchanging means is fed to the second storage and wherein air flowing out of the second storage is fed to the evaporator.

**5,497,635**

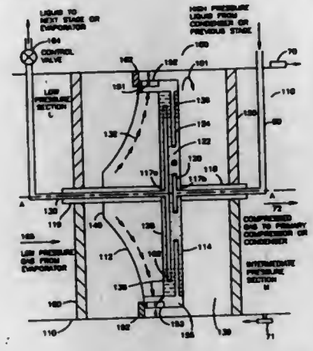
**REFRIGERATION SYSTEM UTILIZING AN ENTHALPY EXPANSION JET COMPRESSOR**

**Richard H. Alsenz, 2402 Creek Meadows, Missouri City, Tex. 77459**

**Division of Ser. No. 919,043, Jul. 23, 1992, Pat. No. 5,347,823, which is a continuation-in-part of Ser. No. 665,028, Mar. 6, 1991, abandoned, which is a continuation-in-part of Ser. No. 505,557, Apr. 6, 1990, Pat. No. 5,115,644. This application Sep. 20, 1994, Ser. No. 309,963**

**Int. Cl.[6] F25B *1/00*; F01D *1/18***

**U.S. Cl. 62—502** **22 Claims**



1. An apparatus for compressing a fluid comprising:

(a) a housing;

(b) a rotatable expansion chamber placed in the housing for expanding therein a portion of a received liquid refrigerant into a gas refrigerant, said chamber separating gas and liquid upon rotation of said chamber; and

(c) an impeller for receiving and compressing the fluid, said impeller having a plurality of jets, said impeller coupled to the expansion chamber for receiving gas and separately removing liquid from the expansion chamber, said received gas causing said jets to rotate said impeller and the expansion chamber; and

(d) said chamber communicating with each said jet of said plurality of jets for supplying gas from said chamber to each said jet.

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**5,497,636**

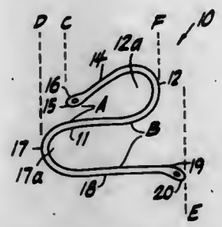
**NECKLACE SHORTENING AND FASTENING APPARATUS AND METHOD**

**Rita Felcher, 3725 Henry Hudson Pky., Riverdale, N.Y. 10463**

**Filed May 11, 1994, Ser. No. 241,381**

**Int. Cl.[6] A44C *25/00***

**U.S. Cl. 63—2** **14 Claims**



1. A device for fastening at least one loop necklace comprising:

a fastener body of rigid construction and having no moving parts, said fastener body comprising first and second fastener ends, said fastener body formed to include



a first fastener curve formed from said fastener body, having a first arm extending to the first fastener end, said first arm arranged to angle toward the fastener body providing for said first fastener end to be a predetermined first distance from said fastener body;

a first fastener holding space bounded by at least said first fastener curve and first arm and having a first opening comprising the first predetermined distance;

a second fastener curve formed from said fastener body, having a second arm extending to the second fastener end, said second arm arranged to extend to a point beyond the position of first curve and remain substantially parallel to said fastener body thereby maintaining a second predetermined distance from said fastener body; and

a second fastener holding space bounded by at least said second fastener curve and second arm and having a second opening comprising the second predetermined distance.

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**5,497,637**

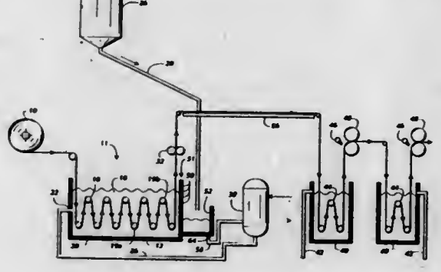
**DYE BATH STRUCTURE AND APPARATUS FOR APPLYING DYE TO TEXTILES**

**B. Franklin Fuller, Ootlewah, and Franklin G. Fuller, Chattanooga, both of Tenn., assignors to Ful-Dye, Inc., Dalton, Ga.**

**Filed Mar. 29, 1994, Ser. No. 219,090**

**Int. Cl.[6] D06B *1/02;3/12;23/14***

**U.S. Cl. 68—4** **11 Claims**



1. A dye application structure for dyeing a textile at atmospheric pressure, comprising:

a. a dye tank for containing or receiving a dye composition and maintaining a volume of the dye composition at a temperature of between 70° C. and 120° C.;

b. a plurality of thread rollers contained within said dye tank for allowing variable threading of the textile through said dye tank;

c. a plurality of dye composition applicators associated with said plurality of thread rollers, with at least one of said plurality of dye composition applicators being associated with a selected quantity of said plurality of thread rollers;

d. a plurality of removable baffles contained within said dye tank for varying the volume of said dye tank, said plurality of removable baffles being separately removable for selecting and maintaining a plurality of different volumes of said dye composition within said dye tank; and

e. means for collecting an overflow of the dye composition from said dye tank.

**5,497,638**

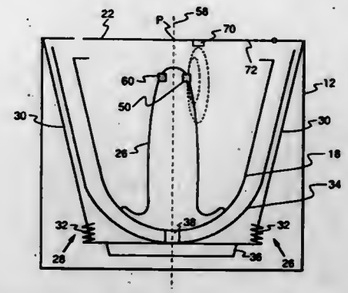
**SYSTEM BASED ON INDUCTIVE COUPLING FOR SENSING LOADS IN A WASHING MACHINE**

**Ertugrul Berkcan, Schenectady, and Kenneth B. Welles, II, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Filed Jun. 19, 1995, Ser. No. 491,776**

**Int. Cl.[6] D06F *37/00***

**U.S. Cl. 68—12.04** **18 Claims**



1. A washing machine comprising:

a cabinet;

a tub being inside said cabinet;

a washer basket for holding articles to be cleansed, said basket being positioned in said tub;

means for rotating said washer basket about a predetermined spin axis;

suspension means for supporting said washer basket so that said washer basket travels along a predetermined travel axis based on the load in said washer basket;

a system comprising:

a magnetic source attached to a lateral section of said washer basket for producing a predetermined magnetic field;

at least one sensor attached at a predetermined height to a predetermined lateral wall of said cabinet, said at least one sensor comprising first and second magnetic sensing elements situated to have a predetermined spacing between one another substantially along said predetermined travel axis, said first and second magnetic sensing elements being electromagnetically coupled to said magnetic source for supplying, respectively, first and second output signals as said washer basket rotates relative to said magnetic sensor; and

a signal processor coupled to said at least one sensor for receiving the first and second output signals supplied by said at least one sensor, said signal processor being adapted for measuring load in said washer basket based on the first and second output signals received from said magnetic sensor.

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**5,497,639**

**NON-CUTTABLE DEVICE FOR ATTACHMENT OF SHOPLIFTING DETECTION TAG**

**Lincoln H. Charlot, Jr., St. Petersburg, Fla., assignor to Link Enterprises, Inc., St. Petersburg, Fla.**

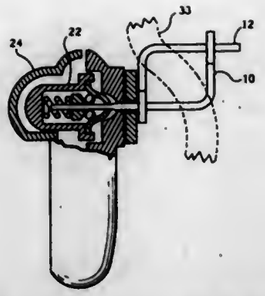
**Filed Nov. 15, 1994, Ser. No. 340,265**

**Int. Cl.[6] E05B *65/00***

**U.S. Cl. 70—57.1** **14 Claims**

1. A method of attaching a shoplifting detection tag to an article to be protected, comprising the steps of:

(a) providing an attachment device including a first attachment rod having an eyelet at one end, a center portion having a bend, and a straight portion at the opposite end from the eyelet suitable for insertion into a clutch mechanism of a shoplifting detection tag; and a second attachment rod having an eyelet at one end, a center portion having a bend, and a straight portion at the opposite end from the eyelet; wherein the first and second attachment rods and the eyelets thereof




are of such relative dimensions that the first and second attachment rods may be fitted together to encompass a portion of the article to be protected by passing the straight portion of the first rod through the eyelet of the second rod and by passing the straight portion of the second rod through the eyelet of the first rod, while allowing the straight portion of the first rod to be inserted into the clutch mechanism of the shoplifting detection tag;

(b) fitting the first and second attachment rods together to encompass said portion of the article to be protected by passing the straight portion of the first rod through the eyelet of the second rod and by passing the straight portion of the second rod through the eyelet of the first rod, while allowing the straight portion of the first rod to be inserted into the clutch mechanism of the shoplifting detection tag; and

(c) inserting the straight portion of the first rod into the clutch mechanism of the shoplifting detection tag.

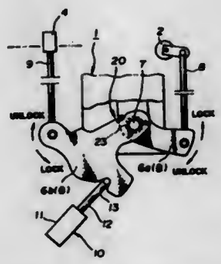
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**5,497,640**

**DOOR LOCKING SYSTEM FOR VEHICLES**

**Yoshiki Kokuryo, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan**

**Filed Jul. 12, 1994, Ser. No. 273,836**
**Claims priority, application Japan, Jul. 15, 1993, 5-175046**
**Int. Cl.[6] E05B *47/00***
**U.S. Cl. 70—237** **7 Claims**




1. A locking system for a door comprising:

a locking mechanism having a rotary shaft, a first locking lever member fixedly attached to said shaft and a second locking lever member rotatable on said shaft, said first locking lever member being rotatable with said shaft between a locking position and an unlocking position for causing said locking mechanism to be locked and unlocked, respectively;

a lock cylinder connected to said first locking lever member and manually operated from the outside of the door to drive said first locking lever member between the locking position and the unlocking position;

a locking button connected to said second locking lever member and manually operated from the inside of the door to drive said second locking lever member between a locking position and an unlocking position;

abutment means for abuttingly engaging said first and second locking lever members with each other and allowing the same to rotate as one body when said locking button is operated to drive said second locking lever member toward the unlocking position thereof or when said lock cylinder is operated to drive said first locking lever member toward the locking position thereof;

spring means for urging said first and second locking lever members in opposite directions to cause said abutment means to abuttingly engage with each other and transmitting therethrough between said first and second locking lever members an operating force applied to said locking button for driving said second locking lever member toward the locking position thereof or an operating force applied to said lock cylinder for driving said first locking lever member toward the unlocking position thereof; and

a safety mechanism electrically or electromagnetically operated, in responsive to an operation of said lock cylinder for locking said locking mechanism, to lock said second locking lever member in the locking position thereof and disable said first locking lever member from being unlocked until said lock cylinder is operated to unlock said locking mechanism.

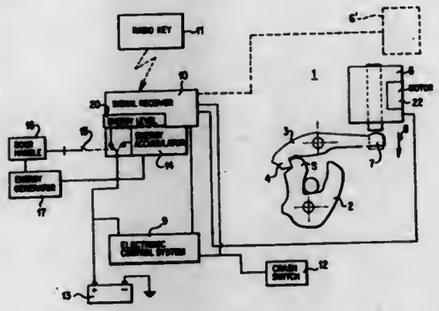
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**5,497,641**

**DOOR LOCK FOR MOTOR VEHICLES**

**Hansjürgen Linde, Coburg; Peter Wolf, Götting; Günter Seeser, München; Manfred Wimmer, Königsbrunn; Walter Weishaupt, München; Martin Wegge, München; Siegmund Schüch, München; Horst Schackmann, Wetzlar; Franz Bauer, Gröbenzell, and Michael Eckrich, München, all of, Germany, assignors to Bayerische Motoren Werke AG, Munich, Germany**

**Filed Aug. 25, 1993, Ser. No. 112,300**
**Claims priority, application Germany, Aug. 25, 1992, 42 28 234.9**
**Int. Cl.[6] E05B *65/20***
**U.S. Cl. 70—257** **9 Claims**




1. In a motor vehicle having wiring and at least one locking element, a door lock comprising:

a control element for operating the locking element;

an electric motor for driving the control element;

a transmitter for emitting a control signal;

a signal receiver for receiving the control signal and being coupled to the control element;

an electronic control system coupled via the wiring of the motor vehicle to the signal receiver and an exterior energy supply to control the control element, the control element being movable into a position which prepares the opening of the locking element, in response to the control signal;

an energy accumulator assigned to the electronic control system, said energy accumulator being directly connectable to the signal receiver independent of the wiring of the motor between the signal receiver, exterior energy supply and electronic control system; and

wherein the energy accumulator is connectable to the signal receiver to allow the signal receiver to activate the control element without said exterior energy supply.

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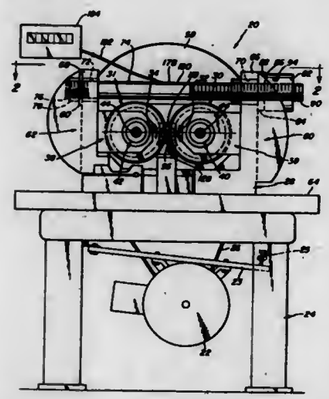


**5,497,642**

**APPARATUS AND METHOD FOR FORMING PRECISION SURFACES ON SHAFT-LIKE COMPONENTS**

**Howard A. Greis, Holden, Mass., assignor to Kinefac Corporation, Worcester, Mass.**

**Continuation of Ser. No. 82,061, Jun. 23, 1993, Pat. No. 5,379,620. This application Jan. 9, 1995, Ser. No. 370,582**
**Int. Cl.[6] B21H *1/00***
**U.S. Cl. 72—19.8** **32 Claims**



the bending arm from the intermediate position to the first position operates the lever to slide the shaft against the force of the biasing means to the unclamped position, and movement of the bending arm from the first position to the intermediate position releases the lever to permit the biasing means to slide the shaft to the unclamped position.

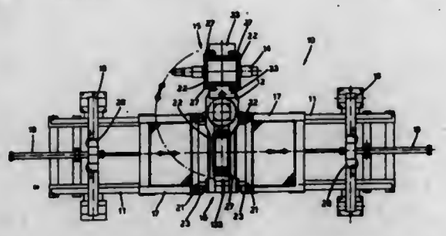
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5,497,644

## DEVICE TO REPLACE ROLLS ON DUAL-PURPOSE UNIVERSAL ROLLING STANDS

Alfredo Poloni, Fogliano di Redipuglia, and Fausto Drigani, Zugliano, both of, Italy, assignors to Danieli & C. Officine Meccaniche SpA, Buttrio, Italy

Filed Mar. 6, 1989, Ser. No. 319,063
Claims priority, application Italy, Mar. 11, 1988, 83341/88
Int. Cl.[6] B21B *31/08*
U.S. Cl. 72—239 9 Claims



1. A device for replacing rolls of rolling stands and for converting said rolling stands from two-high rolling stands to universal rolling stands and vice versa comprising:

(a) a stationary framework;

(b) a movable platform positioned substantially at the center of said framework, said platform having a first station for replacement of rolls and a second station for loading and unloading of rolling stands, said platform being movable to selectively position said first and second stations;

(c) containers for containing rolls disposed on said platform, said containers being adapted to receive rolls arranged for either universal rolling stands or two high rolling stands; and

(d) two movable opposed supports movable towards and away from said movable platform along said framework in cooperation with an at least momentarily stationary standard.

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5,497,645

## U-SHAPED CLOSING STAPLE FOR BAGS AND FLEXIBLE TUBES AND APPARATUS FOR CLOSING THEM

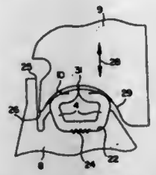
Herbert Niedecker, Am Ellerhang 6, 6240 Königstein 2, Germany

Division of Ser. No. 720,485, Jun. 21, 1991, Pat. No. 5,247,723. This application Jul. 6, 1993, Ser. No. 88,286
Claims priority, application Germany, Dec. 28, 1988, 38 44 052.0; Dec. 6, 1989, 39 40 262.2
Int. Cl.[6] B21D *28/00*
U.S. Cl. 72—330 1 Claim

1. Means for closing a bag or flexible tube by a staple comprising in combination (A) a strip of potentially closing staples and (B) an apparatus for severing a staple from said strip and closing it about a bag or flexible tube,

(A) the staples of the strip consisting of a cross piece and two legs (4) having ends (16) which are outwardly bent and together with leg ends (16) of adjacent staples constitute a severable connecting web (2) having a top surface and having a strip width which is reduced on both sides, wherein the strip width is reduced at the bends of the ends (16) of the legs (4) of the staple as well as in a portion (3) of each leg (4), which





portion (3) adjoins the end (16), and side faces of the ends (16) and the portions (3) of the legs (4) are approximately parallel in the region in which the strip width is reduced, and

(B) the severing and closing apparatus comprising a closing punch, and a die against which the closing punch is movable so that the legs of a staple supported on the die are bent toward each other and forced toward the crosspiece of the staple by the closing punch, the closing punch having in its active surface only a single groove which extends in the peripheral direction of the staple and positively cooperates with the closing staple during the closing operation, the groove (10) in the closing punch (9) having a width corresponding to the reduced width of the staple (30) and having a depth which is smaller than the total thickness.

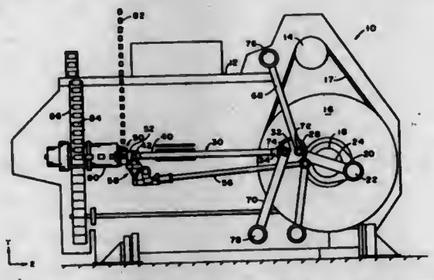
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5,497,646

## AIR STRIPPER FOR CAN BODY MAKER APPARATUS

Stephen C. Roberts, Palmer Lake, and Frank L. O'Brien, Westminster, both of Colo., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jan. 5, 1995, Ser. No. 435,346
Int. Cl.[6] B21D *22/00;45/00;22/21;45/08*
U.S. Cl. 72—345 26 Claims



1. An air strip system in a can body maker apparatus comprising: a can body maker frame, a ram means for the forming of a can body mounted for reciprocal motion within the can body maker frame, said ram means having an exterior surface and a generally, axially disposed passage extending from a first location proximate a first end of the ram means to a second location distal said first end, said second location having means defining at least one passage radiating outwardly from the axially disposed passage to the ram means exterior surface; an air delivery housing defining therein a bore adapted to receive therein the ram means, said housing further defining a cavity in fluid communication with said bore, wherein during a first predetermined portion of the reciprocal motion of the ram means, the at least one passage radiating outwardly to the exterior surface of the ram means is in fluid



communication with the air delivery housing bore to permit fluid flow thereinbetween while during a second predetermined portion of the reciprocal motion of the ram means, the surface of the ram means inhibits fluid flow from the air delivery housing to the axially disposed passage of the ram means.

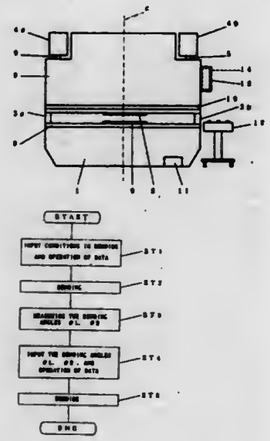
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5,497,647

## METHOD AND AN APPARATUS FOR BENDING

Seiju Nagakura, Aichi, Japan, assignor to Toyokoki Co., Ltd., Aichi, Japan

Filed Jun. 14, 1994, Ser. No. 259,599
Claims priority, application Japan, Jul. 30, 1993, 5-208612
Int. Cl.[6] B21D *5/00*
U.S. Cl. 72—389.3 7 Claims




1. A method of bending a work to an extent of a target bending angle with a ram connected to a right shaft and a left shaft of a two-shaft system which are respectively driven by a a pair of right and left drive mechanisms, comprising the following steps in series:

a first step of bending the work with the ram driven by the two-shaft system in which each shaft thereof is actuated by each drive mechanism to move for a distance corresponding to the target bending angle, said first step of bending including the steps of:

providing a die having a groove of a fixed angle in opposing relation to said ram,

positioning said work between said die and said ram,

driving said ram by the two-shaft system such that said work is forced into said groove and bent therein,

a step of measuring the bending angles at both ends of the work bent in said first step of bending;

a step of correcting the distance of movement for each shaft according to each error between the respective bending angle measured at both ends of the work in said step of measuring and the target bending angle when the measured bending angles and the target bending angle fail to agree with each other; and

a second step of bending the work with the ram driven by the two-shaft system in which each shaft thereof is actuated to move for a distance corrected by said step of correcting.

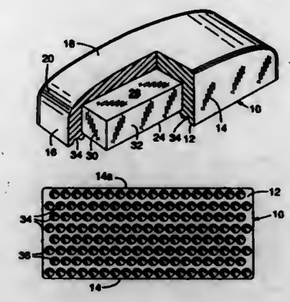
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5,497,648

## DOLLY BLOCK FOR USE IN STRAIGHTENING, SMOOTHING AND COLD SHRINKING OF SHEET METAL PANELS

Roy D. Crossman, 26789 NW. St. Helens Rd., Scappoose, Oreg. 97056

Filed May 15, 1995, Ser. No. 441,056
Int. Cl.[6] B21B *25/00*
U.S. Cl. 72—465 12 Claims



1. A block for serving as an anvil in the process of straightening, smoothing, etc. of thin sheet metal, comprising:

a body member having flat bottom, side and end walls and a convex top wall,

said body member being of equal width throughout its length,

said body member being molded of a plastic having a hardness capable of serving as an anvil but of a cushioning resilience to absorb energy from a hammer that uses the body member as an anvil,

and a core of metal or heavy material embedded fully in said body member,

said core having a flat top, bottom, side and end walls,

said core having a uniform thickness throughout its length whereby the thickness of plastic of said body member will vary between the top surface of said core and the convex top surface of said body member and provide varying cushioning hardness.

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5,497,649

## INTERNALLY DAMPED, SELF-ARRESTING VERTICAL DROP-WEIGHT IMPACT TEST APPARATUS

Damodar R. Ambur; Chunchu B. Prasad, both of Yorktown; William A. Waters, Jr., Virginia Beach; Robert W. Stockum, Poquoson, and Manfred A. Walter, Newport News, all of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 250,141, May 20, 1994, Pat. No. 5,457,984. This application Mar. 31, 1995, Ser. No. 414,253
Int. Cl.[6] G01N *3/00*
U.S. Cl. 73—12.06 3 Claims

1. A method of testing the effect of an impact of a weight dropped through a barrel onto a specimen comprising:

aligning the barrel to accurately deliver a single impact from the weight upon the specimen;

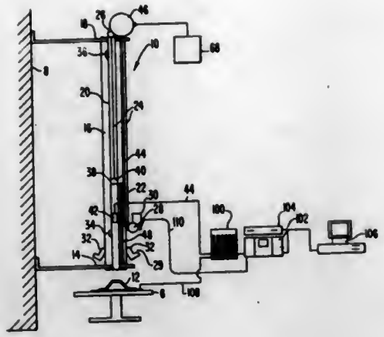
supporting the barrel above the specimen;

dropping the weight upon the specimen;

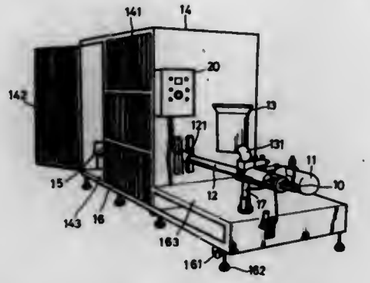
impacting the weight upon the specimen;

mechanically catching the weight on a first rebound from the specimen; and

damping resulting shock of the weight on the means for catching the weight resulting from catching the weight of the first rebound, wherein damping is accomplished by a means internal to the weight.

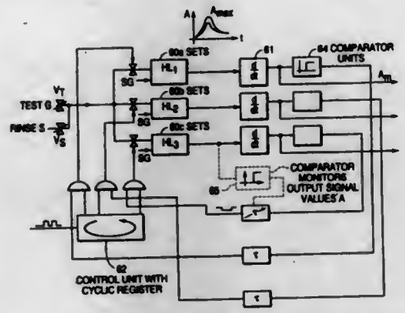


5,497,650
**PNEUMATIC GOLF CLUB TESTING APPARATUS**
Kun-Lin Chien, Nai-Tou, Taiwan, Prov. of China, assignor to Heng-An Co., Ltd., Nai-Tou, Taiwan, Prov. of China
Filed Apr. 19, 1995, Ser. No. 424,169
Int. Cl.[6] G01N *3/00*
U.S. Cl. 73—12.07 5 Claims



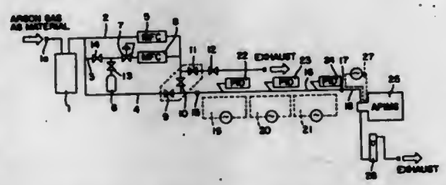
1. A pneumatic golf club testing apparatus comprising:
an air cylinder having a piston and a piston rod disposed therein;
an accumulator to contain pressurized air having an air inlet directing toward said air cylinder;
a barrel having one end connecting with an air exit which has a pair of air flow paths directed respectively to said air cylinder and said accumulator;
a ball bucket disposed above said barrel and having a tube connected to a hollow section formed between said accumulator and said barrel;
a ball cage having one wall connecting with an opening end of said barrel and having a rail wall which has an interval less than the diameter of a golf ball, said rail wall having a door, said ball cage further having a head clamp disposed on a wall in opposite side of the opening of said barrel; and
a frame disposed at one end of said ball cage and having a pillar disposed thereon to support said barrel, said air cylinder, and said accumulator; whereas said air cylinder can trigger the pressurized air in said accumulator to discharge into said barrel to eject a golf ball dropping from said bull bucket out of said barrel at high speed to bit a golf club head held in said head clamps for testing a structural strength, binding strength and lacquer covering density of the golf club head.

5,497,651
**METHOD AND APPARATUS FOR AUTOMATIC SELECTION OF CONTAINERS**
Ulrich Matter, Wohlen; Rene Nuaist, Aarau; Heinz Burtscher, Zurich, all of, Switzerland, and Michael Mukrowsky, Leimen, Germany, assignors to Martin Lehmann, Wohlen, Switzerland
Division of Ser. No. 917,118, Aug. 31, 1992, Pat. No. 5,369,975. This application Sep. 13, 1994, Ser. No. 305,187
Claims priority, application Germany, Dec. 6, 1990, 40 38 993.6
Int. Cl.[6] G01N *27/12;30/02*
U.S. Cl. 73—23.2 18 Claims




9. An analytical system for gas samples that enables shortening of the process cycle time between successive samples, comprising at least two substantially identical sets of semiconductor sensors for detecting at least one parameter that is used to qualify a gas, each of said sets having at least one sensor, lines for supplying gas samples to each of the sets, controllable flow adjusting elements by means of which the gas samples can be fed selectively to the sets through said lines, and a clock unit that controls the flow adjusting elements in such fashion that the sets are charged alternately and sequentially with gas samples that follow one another sequentially so that the individual sensor sets are given time to re-set their output signals to an initial or threshold value without increasing the process cycle time between successive samples to that required for stabilizing an individual sensor set.

5,497,652
**METHOD AND APPARATUS FOR EVALUATING QUANTITIES OF ABSORBED IMPURITIES**
Tadahiro Ohmi, 1-17-301, Komegabukuro 2-chome, Aoba-ku Sendai-shi, Miyagi-ken 980, Japan
PCT No. PCT/JP92/00604, § 371 Date Jan. 31, 1994, § 102(e) Date Jan. 31, 1994, PCT Pub. No. WO92/21956, PCT Pub. Date Dec. 10, 1992
PCT Filed May 13, 1992, Ser. No. 142,466
Claims priority, application Japan, May 30, 1991, 3-155879
Int. Cl.[5] G01N *31/06;* G01D *18/00*
U.S. Cl. 73—31.03 12 Claims

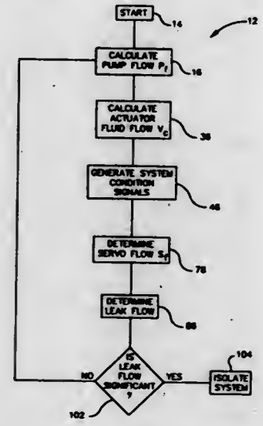


1. A method for evaluating quantities of adsorbed impurities, the method comprising:



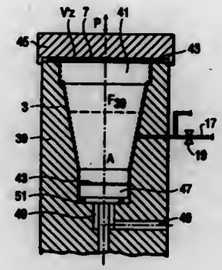
a first step, in which an inert gas of ultra-high purity is caused to flow into a sample-gas pipe,
a second step, in which an interior of said sample-gas pipe is baked to reach at least a level of background purity,
a third step, in which said interior of said sample-gas pipe is placed in an atmosphere having a specified temperature,
a fourth step, in which an inflow of a sample gas having a specified concentration into said sample-gas pipe is initiated, and
a fifth step, in which, when quantities of impurities within said sample gas which adsorb to an inner surface of said sample-gas pipe reach saturation, said inflow of said sample gas is changed to an inflow of an inert gas.

5,497,653
**METHOD AND SYSTEM FOR DETECTING SIGNIFICANT HYDRAULIC LEAKS**
Barton H. Snow, Wyoming, Ohio, assignor to General Electric Company, Cincinnati, Ohio
Filed Sep. 21, 1992, Ser. No. 947,590
Int. Cl.[6] G01M *3/28;* G01F *11/04*
U.S. Cl. 73—40.5 R 14 Claims



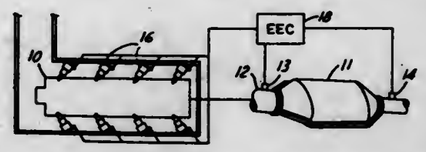

1. A method of detecting hydraulic leaks from a high pressure hydraulic system in which a pump, actuators, and hydraulic lines are filled with fluid at high pressure, the method comprising the steps of:
calculating pump flow;
calculating actuator fluid flow;
generating system condition signals to indicate a core engine RPM related to the pump flow calculation, and quiescence of the actuators;
providing a servo flow value when the systems condition signals are satisfied;
determining leak flow based on the pump flow calculation, the actuator fluid flow calculation, and the servo flow value; and
responding to the leak flow determination.

5,497,654
**METHOD AND APPARATUS FOR LEAK TESTING A CONTAINER**
Martin Lehmann, Obere, Farnbuhlstr. 1, CH-5610 Wohlen, Switzerland
Continuation-in-part of Ser. No. 15,839, Feb. 10, 1993, Pat. No. 5,333,491, which is a continuation of Ser. No. 696,917, May 8, 1991, Pat. No. 5,199,296, which is a continuation-in-part of Ser. No. 469,398, Jan. 24, 1990, Pat. No. 5,042,291.
This application Nov. 18, 1993, Ser. No. 154,079
Claims priority, application Germany, Jan. 27, 1989, 39 02 435.0
Int. Cl.[6] G01M *3/32*
U.S. Cl. 73—49.3 34 Claims



14. A method of leak testing a container with a flexible wall portion comprising the steps of:
introducing the container into a test cavity so that said flexible wall portion of said container is spaced from at least first, relatively recessed portions of an adjacent inner wall of said test cavity with a gap being defined between at least said first, relatively recessed portions of said inner wall of said test cavity and said flexible wall portion of said container;
installing a pressure difference as an initial value between the interior of said container and at least said gap by applying a pressure at least to said gap which is smaller than a pressure inside said container;
mechanically stabilizing said flexible wall portion with respect to outward bending as a result of said pressure difference by supporting said flexible wall portion from its exterior side within said test cavity on second, relatively raised portions of said adjacent inner wall of said test cavity; and
measuring a signal dependent on change of said pressure difference as a leak indicative signal.

5,497,655
**CONTROLLING RESISTANCE HEATERS ON EXHAUST GAS OXYGEN SENSORS**
Thomas S. Gee, Canton; Paul F. Smith, Dearborn Heights, and Michael J. Cullen, Northville, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed Apr. 6, 1995, Ser. No. 418,225
Int. Cl.[6] G01M *19/00*
U.S. Cl. 73—118.2 7 Claims




1. A method of controlling a heater of an exhaust gas oxygen (EGO) sensor used by an electronic engine control system for an

internal combustion engine, operating by use of a sequence of background loops beginning with the start of engine operation, including the steps of:

determining whether a current background loop is a first background loop since the engine was started;

if yes, initializing variables describing the condition of the heater;

inferring the temperature of an exhaust gas oxygen sensor;

comparing the inferred exhaust gas oxygen sensor temperature to a turn on temperature at which to turn on the exhaust gas oxygen sensor heater;

if such inferred temperature is greater than the turn on temperature, turning on the heater of the exhaust gas oxygen sensor;

comparing the inferred exhaust gas oxygen sensor temperature to a turn off temperature at which to turn off the exhaust gas oxygen sensor heater; and

if such inferred temperature is greater than the turn off temperature, turning off the heater of the exhaust gas oxygen sensor.

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**5,497,656**

## METHOD OF MEASURING A SURFACE PROFILE USING AN ATOMIC FORCE MICROSCOPE

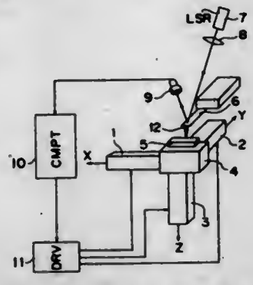
**Hiroyuki Kado, Osaka, and Takao Tohda, Ikoma, both of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Division of Ser. No. 8,483, Jan. 25, 1993, abandoned. This application Feb. 23, 1995, Ser. No. 393,029**

**Claims priority, application Japan, Jul. 24, 1992, 4-198593**

**Int. Cl.[6] G01B *7/34***

**U.S. Cl. 73—105** **10 Claims**




1. A method of measuring a surface profile of a sample using an atomic force microscope which observes a sample surface by making use of forces acting between a probing tip formed on a free end of a cantilever and the sample surface when the probing tip is brought into contact with the sample surface, said method comprising the steps of:

(a) positioning the probing tip above one location of the sample surface;

(b) moving one of the cantilever and the sample surface towards the other by a constant given distance so that the probing tip is brought into contact with the sample surface, said constant given distance being determined in advance so as to be greater than a maximum value of height variations of the sample surface within a range thereof to be measured;

(c) measuring a height of the sample surface with the probing tip held in contact with the sample surface;

(d) imaging said height measured at step (c);

(e) moving said one of the cantilever and the sample surface away from the other by said given distance so that the probing tip is spaced apart from the sample surface;

(f) moving said one of the cantilever and the sample surface relative to the other so that the probing tip is positioned above a next adjacent location of the sample surface spaced apart from said one location;

(g) repeating said steps (b) to (f) at a plurality of succeeding locations of the sample surface so as to image the height variations of the sample surface.

**5,497,657**

## TIRE AIR PRESSURE DETECTING DEVICE

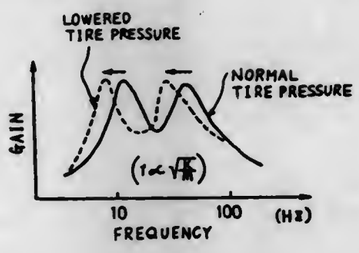
**Takeyasu Taguchi, Obu; Toshiharu Naito, Okazaki; Hiromi Tokuda, Nagoya; Yuuichi Inoue, Tokai; Shusaku Fujimoto, Okazaki, and Kenji Fujiwara, Kariya, all of, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan**

**Continuation-in-part of Ser. No. 87,703, Jul. 9, 1993, abandoned. This application Oct. 8, 1993, Ser. No. 133,440**

**Claims priority, application Japan, Nov. 11, 1991, 3-294622; Feb. 4, 1992, 4-18963; Feb. 10, 1992, 4-57521; Mar. 16, 1992, 4-55942; Apr. 17, 1992, 4-125623; Apr. 17, 1992, 4-125624; Apr. 17, 1992, 4-125624; Apr. 20, 1992, 4-128078; Apr. 20, 1992, 4-128079; May 30, 1992, 4-164186; Jan. 8, 1992, 4-297969; Jan. 9, 1992, 4-297843**

**Int. Cl.[6] B60C *23/00;23/02***

**U.S. Cl. 73—146.2** **24 Claims**




1. A tire air pressure detecting device comprising:

output means being installed on a vehicle, for outputting a signal including a vibration frequency component of a tire while said vehicle is moving;

extracting means for extracting a resonance frequency component from said signal including said tire vibration frequency component; and

detecting means for detecting a tire air pressure condition based on said resonance frequency component.

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**5,497,658**

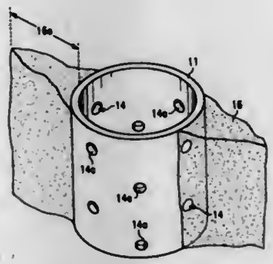
## METHOD FOR FRACTURING A FORMATION TO CONTROL SAND PRODUCTION

**Paul A. Fletcher, Richardson; Carl T. Montgomery, Plano, and Gangerico G. Ramos, Allen, all of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.**

**Filed Mar. 25, 1994, Ser. No. 218,007**

**Int. Cl.[6] E21B *49/00;43/26***

**U.S. Cl. 73—151** **7 Claims**




1. A method for determining the minimum length for a fracture in a fluid-producing formation to control the production of sand therefrom; said method comprising:

measuring the strength of said formation and the fluid properties of the formation fluids;



calculating a plurality of critical drawdown pressures, based on said measured strength and fluid properties which occur at a plurality of different fracture lengths, respectively, in said formation;

selecting a desired, constant flowrate for producing said fluids from said formation;

calculating the respective production drawdown pressures necessary for producing said fluids from said formation at said desired, constant flowrate for a plurality of different respective fracture conductivities and fracture lengths; and

comparing said plurality of critical drawdown pressures with the plurality of said respective production drawdown pressures to thereby determine the length of fracture from those used to calculate said critical drawdown pressures and said production drawdown pressures below which said formation can be produced at said desired, constant flowrate without producing sand from the formation.

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**5,497,659**

## METHOD FOR MEASURING FORCES IN A SUPPLY ROLL

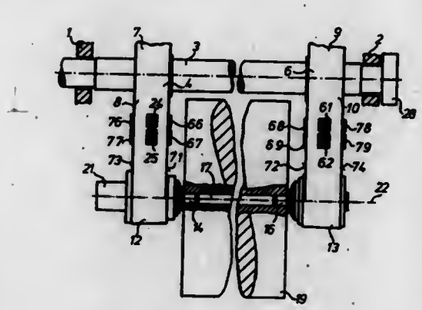
**Klaus W. Röder, Würzburg, Germany, assignor to Koenig & Bauer Aktiengesellschaft, Wurzburg, Germany**

**Filed Dec. 8, 1994, Ser. No. 354,757**

**Claims priority, application Germany, Dec. 8, 1993, 43 41 800.7**

**Int. Cl.[6] B65H *23/00***

**U.S. Cl. 73—159** **1 Claim**




1. A method for determining forces in a web supply roll including the steps of:

providing a roll support having a pair of spaced supply roll support arms;

providing a plurality of strain gauges on each of said support arms;

placing a web supply roll on a shaft;

supporting said web supply roll on said shaft between said support arms;

measuring a bearing force exerted by said supply roll on said support arms while maintaining said supply roll in a static state;

using said strain gauges to provide values;

converting said values from said strain gauges into proportional electrical signals;

supplying said electrical signals to a computer;

supplying said computer with additional values for a width and specific weight of a material web on said supply roll;

using an angle rotation transmitter and measuring an angle position of said support arms;

supplying said angle position to said computer; and

using said computer supplied with said values and said angle position and determining a length of said material web remaining on said supply roll.

**5,497,660**

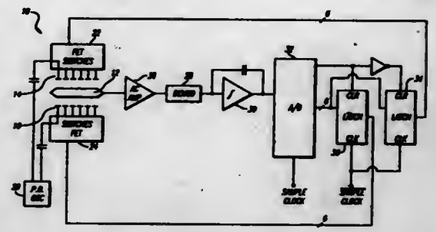
## DIGITAL FORCE BALANCED INSTRUMENT

**Keith O. Warren, Newbury Park, Calif., assignor to Litton Systems, Inc., Woodland Hills, Calif.**

**Filed May 31, 1994, Ser. No. 251,591**

**Int. Cl.[6] G01P *15/00***

**U.S. Cl. 73—514.18** **29 Claims**




29. A digital force balanced instrument for detecting an outside force comprising:

a proofmass, including a centroid, to provide an analog output signal;

a substrate surrounding the proofmass;

a hinge supporting said proofmass on said surrounding substrate; plurality of

electrostatic plates disposed on the surrounding substrate at a predetermined distance from the centroid;

a pickoff voltage oscillator connected to the electrostatic plates;

an integrator receiving the analog output signal and providing a restore signal having an amplitude indicative of a displacement of the proofmass;

an analog to digital converter receiving the restore signal and providing a digital output signal representative of the amplitude of the restore signal;

a plurality of latches corresponding to the electrostatic plates, said latches responding to the digital output signal to selectively provide an output control signal in accordance with the digital output signal, wherein a quantity of activated plates increases proportionally to a value contained in the digital output signal; and

control switches connected to each corresponding electrostatic plate and each respective latch, wherein the output control signal selectively activates the control switches;

whereby the electrostatic plates are individually activated and generate an electrostatic field that restores the proofmass to an initial position.

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**5,497,661**

## METHOD OF MEASURING THE DELAY OF ULTRASOUND IN THE PULSE REFLECTION METHOD

**Helmut Stript, Eggenstein-Leopoldshafen; Thomas Kühner, and Armin Herth, both of Karlsruhe, all of, Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, and Pipetronix GmbH, Stutensee, Germany**

**PCT No. PCT/DE91/00964, § 371 Date Sep. 30, 1992, § 102(e) Date Sep. 30, 1992, PCT Pub. No. WO92/10746, PCT Pub. Date Jun. 25, 1992**

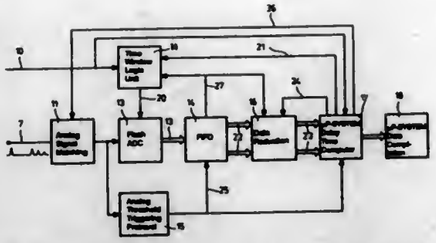
**PCT Filed Dec. 12, 1991, Ser. No. 927,319**

**Claims priority, application Germany, Dec. 15, 1990, 40 40 190.1**

**Int. Cl.[6] G01N *29/04***

**U.S. Cl. 73—611** **4 Claims**

1. A delay time measuring method for ultrasound employing the pulse reflection method, wherein at least one excitation pulse that is as close as possible to the shape of a shock wave is emitted by a testing head and traverses a pretravel path until the excitation pulse reaches an object to be examined which has a front wall and a rear wall, with at least one reflected echo pulse being generated at the front wall of the object and at least two reflecting echo pulses



being generated at the rear wall of the object, and wherein the reflected echo pulses are detected by at least one ultrasound detector and are amplified by analog signal matching, and wherein:

(a) a time window is set for receiving the reflected echo pulses following the excitation pulse, with the width of said window being such that the front wall echo pulse and at least the two rear wall echo pulses lie within the window, and said received reflected echo pulses are digitized; then

(b) the reflected echo pulses lying within the time window are digitally filtered and parametrized, wherein for each one of said reflected echo pulse lying within the time window, the time and amplitude are detected for the maximum and for when a digital threshold value is exceeded and fallen below; whereupon

(c) the times and amplitudes of the filtered and parametrized reflected echo pulses are fed to a computer unit, wherein the parametrized reflected echo pulses are checked with respect to time from the most recently received rear wall echo pulse to the front wall echo pulse, and the parameterized reflected echo pulse being checked is considered to be relevant and is stored when the amplitude of the echo pulse being checked is nearly identical to or greater than the amplitude of the most recently stored echo pulse; and finally

(d) the lead time and the wall thickness delay time of the object are determined and stored when the distance in time between the front wall echo pulse and the first rear wall echo pulse coincides with the distance between the first and second rear wall echo pulses within a tolerance band, and the times and amplitudes of all filtered and parametrized reflected echo pulses belonging to said one excitation pulse are stored when the distance in time between the front wall echo pulse and the first rear wall echo pulse does not coincide with the distance between the first and second rear wall echo pulses within the tolerance band.

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**5,497,662**

## METHOD AND APPARATUS FOR MEASURING AND CONTROLLING REFRACTED ANGLE OF ULTRASONIC WAVES

**Edward R. Dykes, San Jose, Calif., assignor to General Electric Company, San Jose, Calif.**

**Filed Sep. 7, 1993, Ser. No. 117,851**
**Int. Cl.[6] G01N 29/04**
**U.S. Cl. 73—634** **11 Claims**

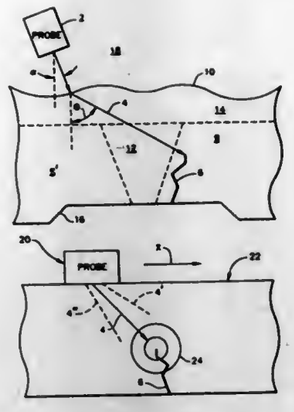
1. A method for measuring an angle of refraction of a pulsed ultrasonic beam propagating through a solid material after said beam has been transmitted by an ultrasonic transducer to impinge on a surface of said solid material with a predetermined angle of incidence, comprising the steps of:

moving said transducer from a first position to a second position;

transmitting a pulsed ultrasonic beam and then receiving an echo pulse from a reflector at each of a plurality of transducer positions along a path from said first position to said second position;

organizing data for the positions of said transducer and data for metal paths corresponding to said position data to represent an echo-dynamic arc;

recognizing said echo-dynamic arc using pattern recognition filtering of said organized data;



retrieving data representing end points of said echo-dynamic arc by applying an edge detection algorithm to said organized data;

computing a slope s of a straight line connecting first and second endpoints of said echo-dynamic arc; and

computing said angle of refraction θ as a function of said slope s.

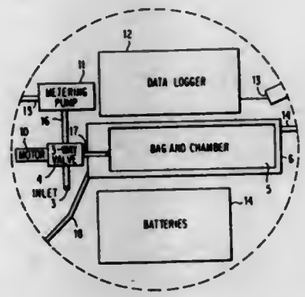
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**5,497,663**

## FLOW RATE LOGGING SEEPAGE METER

**William G. Reay, Bellspring, and Harry G. Walthall, Gloucester Point, both of Va., assignors to The United States of America as represented by the Administrator of National Aeronautics and Space Administration, Washington, D.C.**

**Continuation of Ser. No. 908,077, Dec. 7, 1992, abandoned. This application May 4, 1994, Ser. No. 243,601**
**Int. Cl.[6] G01F 3/38**
**U.S. Cl. 73—861** **2 Claims**



1. An apparatus for determining the flow ram of groundwater seepage, comprising:

a collection inlet and a discharge outlet;

a collection bag, coupled to said collection inlet and said discharge outlet, for collecting ground water through said collection inlet during a collection cycle and discharging groundwater through said discharge outlet during a discharge cycle;

a controller, responsive to first and second signals, for controlling the collection and discharge cycles;

a switching circuit producing said first signal after a predetermined amount of groundwater is collected in said collection bag during said collection cycle and producing said second signal after a predetermined amount of groundwater is discharged during said discharge cycle;



a data logger, responsive to a first output of said controller, for measuring at least one of the amount of groundwater collected and discharged so as to determine the flow rate of groundwater seepage; and

a chamber for housing said collection bag, and wherein said switching circuit comprises a magnet fixed to said collection bag and a proximity switch disposed on an inner surface of said chamber such that when said magnet is within a first predetermined distance from said proximity switch said switching circuit produces said first signal and when said magnet is a second predetermined distance away from said proximity switch said switching circuit produces said second signal.

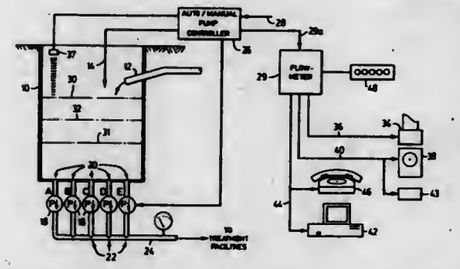
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**5,497,664**

## METHOD AND APPARATUS FOR CALCULATING FLOW RATES THROUGH A PUMPING STATION

**Johannes N. Jorritsma, 15297-6 Yonge Street, Aurora, Ontario, Canada**

**Filed Nov. 14, 1994, Ser. No. 339,746**
**Int. Cl.[6] G01F 1/00**
**U.S. Cl. 73—861** **7 Claims**



5. Apparatus for determining the total flow of a liquid through a liquid-flow system which includes a container for receiving the liquid and pumping means by which the liquid is pumped out of the container during a pumping phase, the pumping means including at least two pumps and a control means adapted to operate the pumps independently or together, and an addressable memory in which the volume pumping rate for at least each combination of pumps is stored, the apparatus comprising:

(a) first means for detecting the arrival of the liquid surface at a predetermined lower limit level as it drops during a pumping phase, and for generating a signal which turns off said pumping means,

(b) second means for detecting the arrival of the liquid surface at a predetermined intermediate level as it rises from the lower limit level, while the pumping means is off,

(c) third means for detecting the arrival of the liquid surface at an upper limit level and for generating a signal which turns on said pumping means utilizing at least one pump sufficient to remove liquid from the container faster than the inflow rate, the liquid volume between the lower and the intermediate levels being substantially the same as the liquid volume between the intermediate and the upper levels, whereby the liquid surface continuously rises and falls between said upper and lower limit levels, and

(d) computing means for calculating an on-going total inflow volume for the liquid by:

(1) if only one pump is required under (c), calculating the inflow rate during the pumping phase by averaging the inflow rate between the intermediate and upper levels just prior to the pumping phase and the inflow rate between the lower and intermediate levels just after the pumping phase, multiplying such calculated averaged inflow rate by the duration of the pumping phase to arrive at the volume of liquid entering during the pumping phase, and adding in the latter volume; then adding in the container volume; then calculating the outflow rate (pump rate) by using the previously established average inflow rate (total volume divide by pumptime plus the average inflow rate), then storing this value in the addressable memory,

(2) or, if a plurality of pumps is required under (c), calculating the liquid volume pumped during the pumping phase by consulting said addressable memory to determine the stored volume pumping rate for the particular plurality of pumps that is operating, multiplying such stored volume pumping rate by the duration of the pumping phase to arrive at a composite volume of liquid equalling the sum of the container volume and the liquid entering during the pumping phase, and adding in said composite volume.

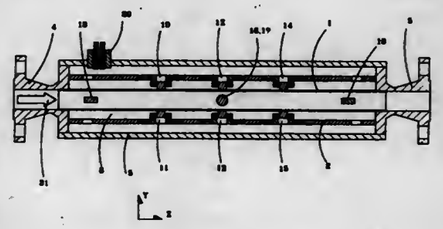
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**5,497,665**

## CORIOLIS MASS FLOW RATE METER HAVING ADJUSTABLE PRESSURE AND DENSITY SENSITIVITY

**Donald R. Cage, Longmont, and Michael N. Schott, Loveland, both of Colo., assignors to Direct Measurement Corporation, Longmont, Colo.**

**Continuation-in-part of Ser. No. 83,975, Jun. 28, 1993, abandoned, which is a continuation-in-part of Ser. No. 843,519, May 8, 1992, abandoned, which is a continuation-in-part of Ser. No. 651,301, Feb. 5, 1991, abandoned. This application Apr. 26, 1994, Ser. No. 233,687**
**Int. Cl.[6] G01F 1/84**
**U.S. Cl. 73—861.38** **54 Claims**



37. A Coriolis mass flow meter, comprising:

a flow conduit for containing a fluid having a pressure and density, said fluid adapted to flow in said conduit at an unknown rate, said flow conduit having a predetermined length, radius and wall thickness;

a drive circuit for creating a vibration in said flow conduit, said fluid altering said vibration as a function of said flow rate, said predetermined length, radius and wall thickness yielding a response curve of said flow conduit that intersects zero at a given working point, said response curve selected from the group consisting of pressure and density, thereby rendering said flow conduit substantially insensitive to one of pressure and density at said working point;

a detector circuit for measuring said altered vibration at said working point and producing a signal representing a partially compensated mass flow rate that, by virtue of said intersection, is rendered substantially independent of effects of said one of pressure and density; and

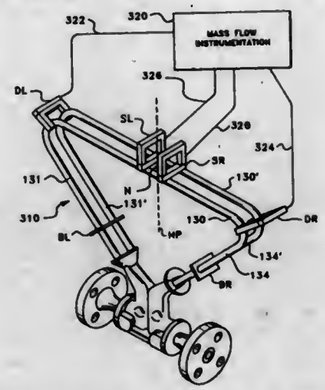
a computation circuit for calculating a compensated mass flow rate of said fluid proportional to said partially compensated rate by $1/\Omega 1^n$, where $\Omega 1$ is a driven natural frequency of said flow conduit and wherein n is an integer or noninteger number chosen as a function of said working point, said compensated rate thereby reduced of effects of both said pressure and density.

**5,497,666**

## INCREASED SENSITIVITY CORIOLIS EFFECT FLOWMETER USING NODAL-PROXIMATE SENSORS

**Andrew T. Patten; Charles P. Stack, both of Louisville, and Andrew K. Levien, Evergreen, all of Colo., assignors to Micro Motion, Inc., Boulder, Colo.**

**Filed Jul. 28, 1994, Ser. No. 277,661**
**Int. Cl.[6] G01F *1/84***
**U.S. Cl. 73—861.38** **22 Claims**




1. A Coriolis flowmeter for measuring the characteristics of process material flowing through said flowmeter, said flowmeter comprising:

flow tube means;

driver means for vibrating said flow tube means to generate at least one node on said flow tube means;

a pair of sensor means each of which is affixed to said flow tube means proximate said at least one node;

said sensor means being responsive to said vibration of said flow tube means and to said flow of said process material to generate sensor output signals representing the movement of said vibrating flow tube means due to the Coriolis forces generated by material flow within said flow tube means;

said sensor means being controllably positioned on said flow tube means with respect to said at least one node so that there is a maximum phase differential between said output signals as well as a signal amplitude adequate to enable said output signals to have a predetermined signal to noise ratio; and

signal processing means responsive to said generation of said output signals for generating information indicative of said material flow in said flow tubes.

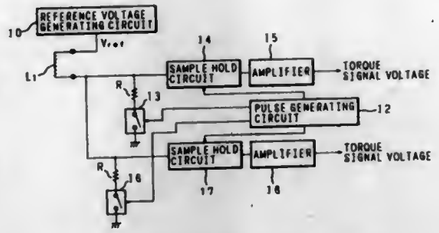
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**5,497,667**

## TORQUE DETECTING APPARATUS

**Shunsuke Nakaura, Gose, Japan, assignor to Koyo Seiko Co., Ltd., Osaka, Japan**

**Filed Mar. 23, 1995, Ser. No. 408,998**
**Claims priority, application Japan, Mar. 25, 1994, 6-056303**
**Int. Cl.[6] G01L *3/02***
**U.S. Cl. 73—862.328** **4 Claims**




1. A torque detecting apparatus, comprising:

a torque detecting coil to which a reference voltage is applied at one end thereof and whose inductance is varied in accordance with torque to be detected;

two switching means for switching between making and breaking the other end of said torque detecting coil;

control means for controlling switching operations of said two switching means;

two sample hold circuits, each for sampling and holding, under control of said control means, a transient voltage value at a time of said switching operation of each of said two switching means; and

two output means, each for converting the voltage value held by each of said two sample hold circuits into a signal corresponding to said torque so as to output said signal,

wherein said control means controls said two switching means so that said two switching means be alternately making and breaking.

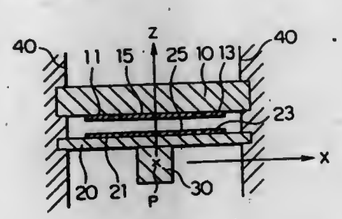
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**5,497,668**

## METHOD OF TESTING THE OPERATION OF AN APPARATUS FOR DETECTING ACCELERATION

**Kazuhiro Okada, 73, Sugaya 4-Chome, Ageo-Shi, Saitama 362, Japan**

**Division of Ser. No. 952,753, Nov. 30, 1992. This application Aug. 31, 1994, Ser. No. 298,924**
**Int. Cl.[6] G01L *1/04***
**U.S. Cl. 73—862.626** **14 Claims**




1. An acceleration sensor to detect a first component of acceleration along an X-axis and a second component of acceleration along a Y-axis in an XYZ three-dimensional coordinate system, the sensor comprising:

a sensor casing;

a flexible substrate arranged parallel with an XY-plane of said coordinate system, said flexible substrate including a working portion to which a force is applied, a fixed portion fixed to said sensor casing, and a flexible portion having flexibility located between said working portion and said fixed portion;

a fixed substrate arranged parallel with the XY-plane so as to face to said flexible substrate with a predetermined distance and fixed to said sensor casing;

a working body attached to said working portion to transmit a force produced by an acceleration to said working portion so that said flexible substrate produces mechanical deformation;

four capacitance elements, each of said capacitance elements being comprised of a displacement electrode fixed to said flexible substrate on a first plane parallel with the XY-plane and a fixed electrode fixed to said fixed substrate on a second plane parallel with the XY-plane, each displacement electrode facing each fixed electrode, the respective electrodes of at least one of the four displacement electrodes and the four fixed electrodes being insulated from each other so that said four capacitance elements are electrically independent from each other, wherein a first capacitance element is located in a positive sector of the X-axis, a second capacitance element is located in a negative sector of the X-axis, a third capacitance element is located in a positive sector of the Y-axis and a fourth capacitance element is located in a negative sector of the Y-axis;

four test electrodes fixed to said fixed substrate on a third plane parallel with the XY-plane, said test electrodes being isolated from each other and from the fixed electrodes, and each of said four test electrodes facing each of the four displacement electrodes;

detection means for detecting the first component of acceleration along the X-axis based on a change of an electrostatic capacitance in the first capacitance element and the second capacitance element and for detecting the second component of acceleration along the Y-axis based on a change of an electrostatic capacitance in the third capacitance element and the fourth capacitance element; and

voltage application means for applying a predetermined voltage across a test electrode and a displacement electrode facing thereto for moving the displacement electrode by a coulomb force so that the flexible substrate produces mechanical deformation.



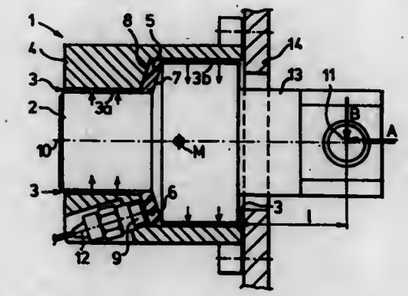
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**5,497,669**

## FORCE MEASURING DEVICE

**Hans W. Häfner, Aichach-Walchshofen, Germany, assignor to Pfister Messtechnik GmbH, Germany**

**Filed Apr. 27, 1993, Ser. No. 53,895**
**Claims priority, application Germany, Apr. 30, 1992, 42 14 291.1**
**Int. Cl.[6] G01L *5/00***
**U.S. Cl. 73—862.636** **18 Claims**




1. A force measuring device, for measuring axially-directed forces and non-axially-directed tilting moments, comprising:

a rigid, piston-type inner element having a central axis and a peripheral surface, and having an external diameter;

a rigid, cylindrical outer element disposed coaxially about the inner element and having an interior surface complementary to and facing the peripheral surface of the inner element, and having an internal diameter;

an annular, axially-aligned gap between the peripheral surface of the inner element and the interior surface of the outer element, said gap having a gap width, said gap width being small as compared with the external diameter of the inner element and the internal diameter of the outer element;

a non-axially aligned ring space formed along the gap, between the peripheral surface of the inner element and the interior surface of the outer element;

an elastomeric, essentially bubble-free material, completely filling said annular gap and said ring space;

at least one pressure sensor, radially offset from the central axis and being in pressure transmission contact to said elastomeric material in said ring space;

wherein:

a one of the inner or outer elements is adapted in use to be fixed to a frame, an other of the inner or outer elements being movable with respect to the frame;

said at least one pressure sensor is disposed remote from the central axis and at an angle thereto for detecting both axially-directed force components and non-axially-directed force components acting upon the force measuring device at a force introduction position;

when the movable element is acted upon by the non-axially-directed force component, a moment pivot axis is formed along and intersecting said central axis in response to said non-axially-directed moments;

the elastomeric material is adhered to the peripheral surface of the inner element and to the interior surface of the outer element, continuously along the gap and the ring space; and

each of said at least one pressure sensors is inserted into the outer element, with an end face of said pressure sensor being in pressure transmission contact to said elastomeric material in said ring space.

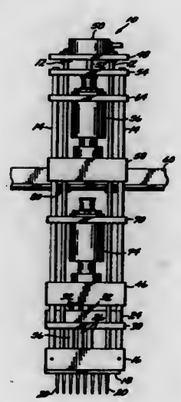
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**5,497,670**

## LIQUID DISPENSING APPARATUS INCLUDING MEANS FOR LOADING PIPETTE TIPS ONTO LIQUID DISPENSING CYLINDERS AND MAINTAINING THE LOADING FORCE DURING THE APPARATUS OPERATION CYCLE

**Richard A. Carl, 30833 Rue Valois, Rancho Palos Verdes, Calif. 90274**

**Filed Mar. 31, 1995, Ser. No. 414,225**
**Int. Cl.[6] G01N *1/14*; B01L *3/02***
**U.S. Cl. 73—863.32** **7 Claims**



1. Apparatus for dispensing predetermined amounts of liquid into receptacles comprising:

first and second sets of vertically extending shafts;

a plate member supported by said first set of shafts and positioned at the uppermost extent thereof;

actuator means positioned on said plate member;

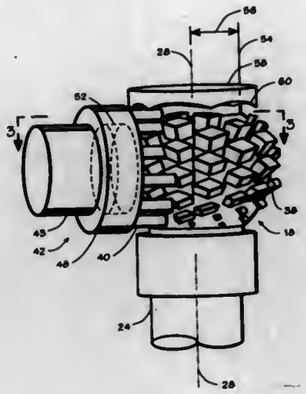
a pipette tip plate for supporting a plurality of pipette tips;

a plate holder for holding said pipette plate, said plate holder being movable along said second set of shafts;

a cylinder mounting plate having a plurality of dispensing cylinders attached thereto, said cylinder mounting plate being fixedly attached to said second set of shafts; and

means to energize said actuator means whereby said plate holder is moved upwardly in a manner such that the pipette tips are positioned into sealing engagement with an associated cylinder.

**5,497,671**
**PINEAPPLE GEAR AND METHOD OF MANUFACTURING THE SAME**
Edward G. Rourke, 20705 Cheney Dr., Topanga, Calif. 90290
Filed Feb. 2, 1994, Ser. No. 190,390
Int. Cl.[6] F16H 1/12
U.S. Cl. 74—416 20 Claims



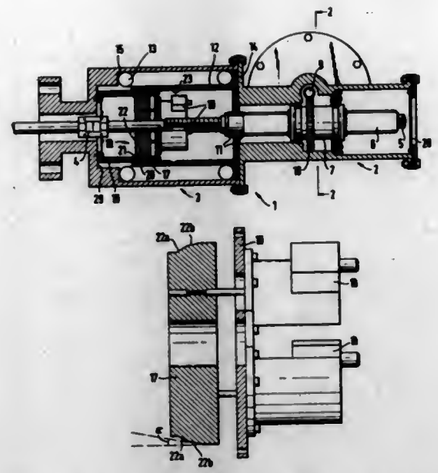
1. A gear combination for rotating a first shaft with respect to rotation of a second shaft, said first and second shafts each having an axis of rotation, said axes of rotation intersecting each other at an angle comprising:
- a pin gear coupled to and rotating about said first shaft, said pin gear having a plurality of pins extending therefrom parallel to said first shaft, said plurality of pins being even in number and symmetrically arranged on said pin gear so that each pin has a corresponding diametrically opposed pin disposed on said pin gear; and
- a spherical gear, which is comprised of an at least partially spherical body, and a plurality of grooves defined in said spherical body, which grooves are arranged and configured for engagement with said plurality of pins of said pin gear, said spherical gear being coupled to said second shaft, said plurality of grooves being curved wherever engagement between said pin gear and spherical gear cause relative rotation therebetween, both of said corresponding diametrically opposed pins being engaged with said grooves of said spherical body when said pin gear and spherical gear are rotating with respect to each other,

whereby a compact gear combination is provided and whereby an arbitrary angle between said first and second shafts may be established.

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**5,497,672**
**VALVE ACTUATOR**
David E. Appleford, Essex, and David Engerran, London, both of, Great Britain, assignors to Alpha Thames Engineering Limited, England
PCT No. PCT/GB92/01164, § 371 Date Dec. 27, 1993, § 102(e) Date Jan. 26, 1994, PCT Pub. No. WO93/00539, PCT Pub. Date Jan. 7, 1993
PCT Filed Jun. 26, 1992, Ser. No. 175,363
Claims priority, application United Kingdom, Jun. 28, 1991, 9113963
Int. Cl.[6] F16K 31/04; G05G 17/00
U.S. Cl. 74—424.8 VA 7 Claims

1. A valve actuator comprising:
- a body;
- an electric motor;
- a stem having a longitudinal axis extending through the body;



- first coupling means for coupling the stem to a valve such that axial movement of the stem opens and closes the valve;
- an outer shaft arranged coaxially around the stem and in threaded engagement therewith;
- second coupling means coupling the shaft to the electric motor to cause rotational and thus axial movement of the shaft relative to the stem;
- a solenoid-actuated latching mechanism including a cylindrical cap which is axially movable and has an internal surface formed with at least one recess, a spring retained by said cap, a plurality of retaining members held in a fixed axial position with the cap being axially movable relative thereto, and a wedge member; and
- at least one solenoid which when activated moves the wedge member to push said retaining members outwardly with respect to said longitudinal axis and to hold them in engagement with said at least one recess, whereby the shaft is releasably retained in a predetermined axial position with the spring held in a compressed state, further rotation of the shaft causing reciprocating axial movement of the stem relative to the shaft to actuate the valve, and de-activation of the at least one solenoid releasing the shaft to allow axial movement of both the shaft and the stem, under action of the spring, in order to close the valve;

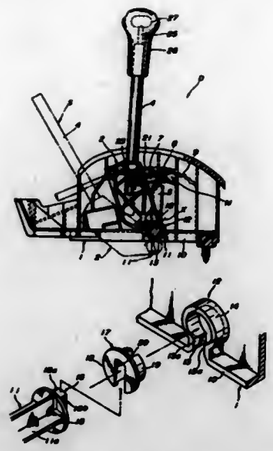
said wedge member and said retaining members being made of a material having a predetermined angle of friction and said wedge member having a face which engages with said retaining members and which is formed at an angle with respect to said longitudinal axis, said angle being substantially close to said angle of friction so as to provide a sufficient mechanical advantage to enable said at least one solenoid to retain the spring in its compressed state.

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**5,497,673**
**AUTOMATIC TRANSMISSION OPERATING DEVICE**
Yoshimasa Katsumi, and Yasuyuki Ikegami, both of Kosai, Japan, assignors to Fuji Kiko Co., Ltd., Tokyo, Japan
Filed Jan. 27, 1994, Ser. No. 186,956
Claims priority, application Japan, Jan. 29, 1993, 5-002073 U
Int. Cl.[6] B60K 41/04;20/00
U.S. Cl. 74—473 R 12 Claims

1. An operating device for an automatic transmission of a vehicle, comprising:
- a base fixedly secured to a floor of the vehicle;
- first and second bearing sections fixedly connected to said base and located apart from each other, each said bearing section

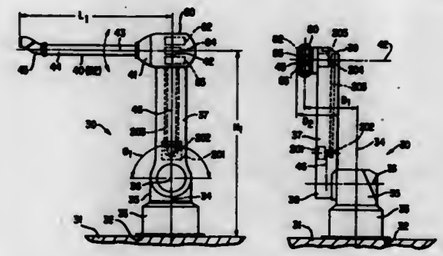




including a generally cylindrical portion having a generally C-shaped cross-section so as to define a cutout groove;
- a shift lever for selecting an operating range of the automatic transmission; and
- a base member to which said shift lever is fixedly connected, said base member including a shift section having first and second ends, and first and second end projections which respectively axially project from the first and second ends, said first and second end projections being rotatably disposed respectively inside the cylindrical portions of said first and second bearing sections, each end projection being generally oval-shaped in cross-section so as to form two opposite end faces and two opposite side faces, said end faces being in sliding contact with an inner surface of the cylindrical portion of said bearing section, a distance between said two opposite end faces being larger than a width of said cutout groove, and the distance between the two side faces of each end projection being generally equal to the width of said cutout groove.

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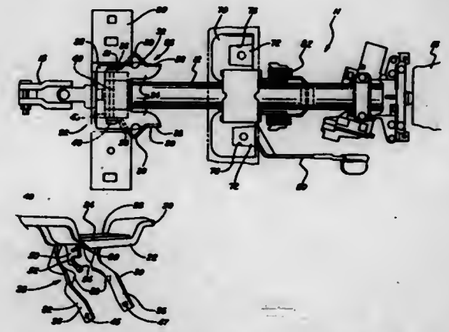
**5,497,674**
**INDUSTRIAL ROBOT**
Takahiro Inada, Kakogawa, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan
Continuation-in-part of Ser. No. 60,045, May 13, 1993, abandoned, which is a continuation-in-part of Ser. No. 710,801, Jun. 4, 1991, abandoned. This application Aug. 17, 1994, Ser. No. 291,503
Int. Cl.[6] B25J 18/00;17/02
U.S. Cl. 74—490.03 4 Claims



1. An industrial robot comprising:
- a base;
- a revolution portion mounted on said base in such a manner as to be revolutionarily drivable about a revolutionary axis for 360 degrees in either of clockwise and counterclockwise directions;
- a lower arm angularly drivable about a fore-and-aft axis perpendicular to said revolutionary axis, a base end portion of said lower arm being mounted on said revolution portion in such a manner as to be offset a specific distance from said revolutionary axis;
- an upper arm rotatably drivable about an up-and-down axis perpendicular to said revolutionary axis and parallel to said fore-and-aft axis, said upper arm being disposed on the opposite side of said lower arm from said revolutionary axis, a base end portion of said upper arm being mounted on a free end portion of said lower arm; and
- a motor casing provided at the base end portion of said upper arm, three motors for three dimensionally driving a wrist provided at a free end of said upper arm being vertically disposed therein with their axes being in parallel in a vertical plane;
- the length of said upper arm being less than the vertical height of said free end of said lower arm when said lower arm is in vertical posture, for enabling said upper arm to rotate for 360 degrees in either of said clockwise and counterclockwise directions so that said upper arm and said lower arm are capable of taking symmetrical postures of right-hand and left-hand systems for any position of work;
- said lower arm having a motor for driving said upper arm about the up-and-down axis at a lower part thereof, a reduction gearbox connected to the upper arm and a power transmission member connected across a shaft of said motor for driving the upper arm and a shaft of said gearbox.

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**5,497,675**
**ENERGY ABSORBER FOR A STEERING COLUMN**
Kiel L. Brown, Troy; E. Judy Jordan-Brunson, Auburn Hills; Timothy A. Petek, Berkley, and Steven F. Snyder, Rochester Hills, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.
Filed Jun. 6, 1994, Ser. No. 254,730
Int. Cl.[6] B62D 1/19
U.S. Cl. 74—492 5 Claims



1. An energy absorbing device for an elongated steering column which extends lengthwise within an automotive vehicle that has vehicle support structure, comprising:
- a bracket secured to the vehicle support structure adjacent to and above the steering column,
- first and second elongated energy absorbing straps made of a relatively stiff, bendable flexible strip material,
- each strap having a first end and a second end,
- said straps being generally U-shaped and each having a first elongated leg, a second elongated leg, and an intermediate portion connecting said first and second legs,

said straps being laterally spaced apart and disposed respectively on opposite sides of the steering column,
means securing the first end of each strap to said bracket,
the first leg of each strap being disposed above the steering column and extending from the first end thereof rearwardly to the rearmost extremity of said first leg and in generally parallel relation to the steering column,
means connecting the second end of each strap to the steering column,
the second leg of each strap being disposed below the first leg thereof and extending from the second end thereof rearwardly to the rearmost extremity of said second leg and in generally parallel relation to the steering column whereby said first and second legs are generally parallel to one another,
said intermediate portion of each strap interconnecting the rearmost extremities of the first and second legs thereof,
said intermediate portion of each of said straps being generally perpendicular to the first and second legs thereof, said intermediate portions of said straps being disposed generally vertically and said second legs of said straps being disposed generally vertically,
said straps in a collision resisting movement of the steering column gradually absorb energy to prevent excessive reaction forces of the steering column against the driver.

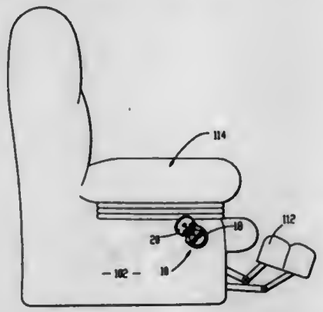
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**5,497,676**

## ACTUATOR CONTROL ASSEMBLY FOR MOTION FURNITURE

**Michael A. Barnard, Wichita, Kans., assignor to Wescon Products Company, Wichita, Kans.**

**Filed Apr. 4, 1994, Ser. No. 222,534**
**Int. Cl.[6] F16C *1/10***
**U.S. Cl. 74—501.5 R** **6 Claims**




1. Motion furniture presenting a panel having opposed front and rear faces, said motion furniture comprising:
structure defining a generally circular opening through said front panel; and
a selectively adjustable cable actuator control assembly, said assembly including:
an apertured based positioned within said opening and including a peripheral flange engaging the front face of said panel adjacent the opening, said base presenting a forward surface and an opposed rearward surface;
attachment structure operable for engaging the rear face of said panel adjacent said opening;
selectively rotatable connection means extending through said base and operably coupled with said attachment structure, said connection means being accessible at said forward surface of said base for selective rotation thereof, said connection means being rotatable in one direction for tightening of the attachment structure against said rear face of said panel in order to secure said base in a selected position, and being rotatable in the other direction for loosening of the attachment structure;
said base being rotatable within said circular opening upon said loosening of said attachment structure for permitting selective alteration of the rotational position of said base within said opening;
a handle pivotally coupled to said base;
an elongated, shiftable cable presenting a first end passing through said base aperture; and
means operably interconnecting said handle and said first end of said cable.

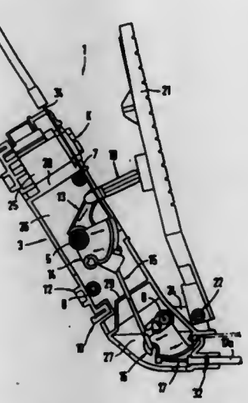
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**5,497,677**

## ACCELERATOR PEDAL DEVICE FOR A MOTOR VEHICLE

**Hans U. Baumann, Stuttgart, and Carsten-Joerg Mertens, Aidlingen, both of, Germany, assignors to Dr. Ing. h.c.F. Porsche AG, Weissach, Germany**

**Filed Dec. 21, 1994, Ser. No. 360,367**
**Claims priority, application Germany, Dec. 21, 1993, 43 43 681.1**
**Int. Cl.[6] G05G *1/14***
**U.S. Cl. 74—513** **18 Claims**



1. Accelerator pedal device for a motor vehicle comprising:
a pedal plate which is swivellably disposed on a pedal holding device, and
an adjusting device connected with the pedal plate,
wherein the pedal holding device includes an oblong housing comprising two half shells fitted together, components of the adjusting device being held on bearing points molded on the interior side of the respective two half shells,
wherein transversely extending catch hook strips are provided on the exterior side of the half shells for engaging with catch hook strips fixed to a vehicle body to hold the housing in an in use position at a vehicle, and
wherein molded-on common centering domes are provided on a lower surface of the half shells facing the vehicle body for the fastening and fixing of the position.

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**5,497,678**

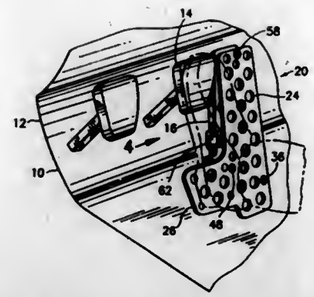
## ADJUSTABLE ADAPTOR ATTACHMENT FOR THE ACCELERATOR PEDAL OF A MANUAL TRANSMISSION VEHICLE USED IN COMPETITIVE DRIVING

**Wayne W. Chou, 25 Hanley Pl., Ridgefield, Conn. 06877**

**Filed Aug. 9, 1994, Ser. No. 287,676**
**Int. Cl.[6] G05G *1/16***
**U.S. Cl. 74—562.5** **8 Claims**

5. An adaptor for a manual transmission vehicle having brake and accelerator pedals, said adaptor adapted to be mounted on said






accelerator pedal for permitting the toe and heel of the same foot to control braking and acceleration, respectively, said adaptor comprising:
an operating plate,
a plurality of mounting means spaced on said operating plate for mounting said operating plate on the accelerator pedal,
a plurality of adjustable means for said plurality of mounting means, each of said plurality of adjustable means being independently adjustable to a plurality of different adjustment positions for capturing and retaining each of said plurality of different adjustment positions for varying the height, pitch and roll of said operating plate with respect to said accelerator pedal for facilitating the positioning of the toe and heel of the same foot of the user on said brake pedal and said operating plate whereby toe and heel control of the braking and acceleration of the vehicle is facilitated.

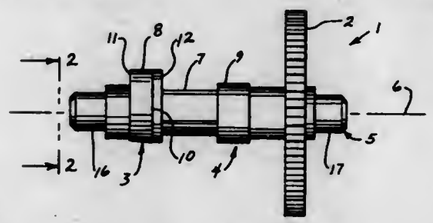
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**5,497,679**

## MOLDED CAMSHAFT ASSEMBLY

**Robert K. Mitchell, Brookfield, Wis., and Leonard G. Miller, Orchard Lake Village, Mich., assignors to Briggs & Stratton Corporation, Wauwatosa, Wis.**

**Division of Ser. No. 444,839, Dec. 4, 1989, Pat. No. 5,320,795, which is a continuation of Ser. No. 168,142, Mar. 14, 1988, abandoned. This application Jun. 9, 1994, Ser. No. 255,665**
**Int. Cl.[6] F16H *53/00***
**U.S. Cl. 74—567** **11 Claims**




1. A camshaft assembly (1) for an internal combustion engine, comprising:
a camshaft (5) defining an axis of rotation (6);
a cam lobe (3, 4) mounted on said shaft (5) for rotation therewith, said cam lobe (3, 4) having
a first axial end (11, 11*a*) that extends a first radial distance (35, 35*a*) from said axis (6);
a second axial end (12, 12*a*) that extends a second radial distance (41, 41*a*) from said axis (6);
a crowned cam profile (8, 9) formed in a peripheral surface of said cam lobe (3, 4), said cam profile (8, 9) including
a shoulder (10, 32) located between said first (11, 11*a*) and second ends (12, 12*a*) which extends a third radial distance (37, 37*a*) from said axis of rotation (6) that is equal to or greater than said first (35, 35*a*) and second (41, 41*a*) radial distances; and
first (13, 13*a*) and second (14, 14*a*) tapered surfaces that extend parallel to one another, said first tapered surface (13, 13*a*) extending axially from said first end (11, 11*a*) to said shoulder (10, 32) and said second tapered surface (14, 14*a*) extending axially from said shoulder (10, 32) to said second end (12, 12*a*).

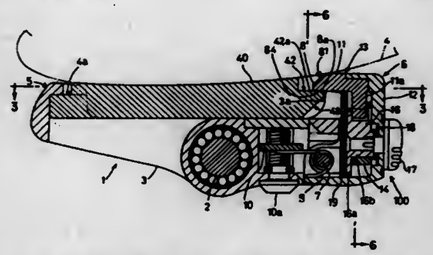
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**5,497,680**

## APPARATUS FOR SECURING A SHOE TO A BICYCLE PEDAL

**Masashi Nagano, Izumi, Japan, assignor to Shimano Inc., Osaka, Japan**

**Continuation of Ser. No. 180,809, Jan. 10, 1994, abandoned, which is a continuation of Ser. No. 74,151, Jun. 9, 1993, abandoned, which is a continuation of Ser. No. 726,284, Jul. 5, 1991, abandoned. This application Oct. 25, 1994, Ser. No. 334,851**
**Claims priority, application Japan, Jul. 9, 1990, 2-182322**
**Int. Cl.[6] G05G *1/14***
**U.S. Cl. 74—594.6** **14 Claims**



1. An apparatus including a bicycle pedal, a pedal shaft for supporting said bicycle pedal, and means for securing a shoe cleat to said bicycle pedal, the apparatus comprising:
first engaging means and second engaging means formed on said pedal with a spacing therebetween in a fore and aft direction of said pedal for engaging said cleat,
said second engaging means including a first split part for engaging said cleat, and a second split part attached to said pedal for supporting said first split part,
pivoting means for allowing said second split part together with said first split part to pivot about an axis between engaging and disengaging positions for engaging and disengaging said cleat, respectively, and
movement means for allowing said first split part to move transversely relative to said second split part in a sideways direction and for allowing said first split part to move together with said cleat within a predetermined range in said sideways direction.

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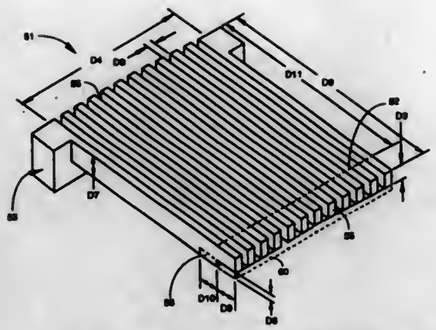
**5,497,681**

## METHOD FOR MAKING AN IC LEAD-FRAME PUNCH

**EE-Chang Ong, Cupertino, Calif., assignor to Integrated Packaging Assembly Corporation, San Jose, Calif.**

**Division of Ser. No. 120,280, Sep. 13, 1993, Pat. No. 5,452,635. This application May 4, 1995, Ser. No. 435,084**
**Int. Cl.[6] B21D *28/10***
**U.S. Cl. 76—101.1** **5 Claims**

1. A method for creating a punch of one piece of contiguous material and having a plurality of spaced-apart teeth, comprising steps of;
forming a substantially rectangular punch body having a first length, a width, and a thickness;
forming a plurality of grooves on a first side of the punch body beginning at a first end, spaced apart across the width, extending in the direction of the first length for a second length equal



to or less than the first length, and having a common depth less than the thickness of the punch body, the grooves providing a spaced-apart array of ribs on the first side; and

forming a step across the first end of the punch body, the step extending across the width on a second side opposite said first side, to a depth greater than the thickness less the common depth of the grooves, the step extending in the direction of the first length for a third length less than the second length, such that said spaced apart array of ribs extends from the punch body at the first end as an array of separate punch teeth.

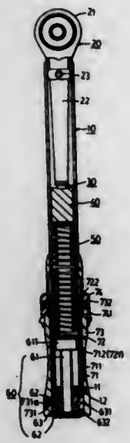
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**5,497,682**

**TORSION WRENCH**

**Frank Hsu, No. 122, 1-Tung Rd., Chien-Kuo Tsun, Tai-Ping Hsiang, Taichung Hsien, Taiwan, Prov. of China**

**Filed Jul. 10, 1995, Ser. No. 499,962**
**Int. Cl.[6] B25B *23/159***
**U.S. Cl. 81—483** **8 Claims**



1. A torsion wrench for tightening or loosening a workpiece, the torsion wrench including

a tubular casing having upper and lower ends,

a drive unit having a head portion which is adapted to engage the workpiece, and a shaft portion which extends into said casing via said upper end and which is mounted pivotally to said casing at said upper end, and

an alarm assembly including a knocker disposed in said casing and connected to a distal end of said shaft portion for knocking on said casing to generate an alarm sound when torsion force applied by said drive unit on the workpiece reaches a predetermined limit, a biasing member disposed in said casing beneath said knocker and having an upper end that abuts against said knocker for biasing said knocker toward said shaft portion to prevent said knocker from knocking on said casing when the torsion force applied by said drive unit has not yet reached the predetermined limit, an adjusting unit for adjusting initial biasing force of said biasing member so as to correspond with the predetermined limit, and a lock unit for locking said adjusting unit to maintain the initial biasing force at an amount corresponding to the predetermined limit,

wherein the improvement comprises:

said adjusting unit including a bolt member with a head section which is disposed within said casing and which abuts against a lower end of said biasing member, and a shaft section which is mounted threadably in said lower end of said casing, said bolt member being rotatable relative to said casing so as to be movable along an axis of said casing;

said lock unit including: a first sleeve member which is sleeved slidably and non-rotatably on said lower end of said casing and which has an upper end formed with a retaining portion, said first sleeve member being movable along said axis of said casing; a second sleeve member which is sleeved slidably and rotatably on said casing and which has a lower end formed with an engaging portion to engage releasably said retaining portion; and a tubular handle member which is sleeved on said first and second sleeve members and which has a lower end connected to said bolt member and an upper end connected to said second sleeve member;

said second sleeve member being movable along said axis of said casing between a first position, in which said engaging portion disengages said retaining portion to permit rotation of said bolt member with said handle member relative to said casing to adjust the initial biasing force of said biasing member, and a second position, in which said engaging portion engages said retaining portion to lock said handle member to said casing so as to prevent rotation of said bolt member relative to said casing.

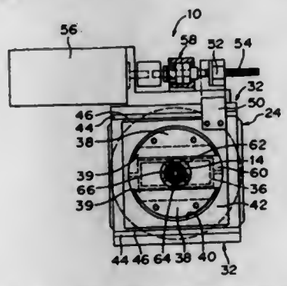
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**5,497,683**

**HOLDING DEVICE FOR CUTTING A TORIC LENS**

**Kenshiro Hattori, and Koichi Inada, both of Seki, Japan, assignors to Menicon Co., Ltd., Nagoya, Japan**

**Filed Feb. 4, 1994, Ser. No. 191,589**
**Claims priority, application Japan, Feb. 8, 1993, 5-043220**
**Int. Cl.[6] B23B *5/22;5/44***
**U.S. Cl. 82—18** **13 Claims**



1. A holding device for cutting a toric lens for holding a lens workpiece in forming a toric lens by cutting the lens workpiece comprising:

a chuck member for holding the lens workpiece and having a chuck member axis;

a guide member having a circular guide hole provided outside of the chuck member;

a chuck support member provided in the circular guide hole of the guide member, said chuck support member rotatable around a rotation major axis and displaceable on a displacement line orthogonal to the rotation major axis, such that said chuck member axis is displaced on the displacement line during rotation of the chuck support member relative to the guide member, said chuck support member including guiding end portions which move along and are guided by contact with an inner peripheral face of the guide hole during rotation of said chuck support member, and wherein said rotation major axis is eccentric to a center axis of the circular guide hole such that during rotation of said chuck support member said chuck member rotates and said chuck member axis moves along said displacement line; and

a control mechanism for controlling a distance of eccentricity between the center axis of the guide hole of the guide member and the rotation major axis by moving the guide member relative to the rotation major axis in a direction orthogonal to the rotation major axis.



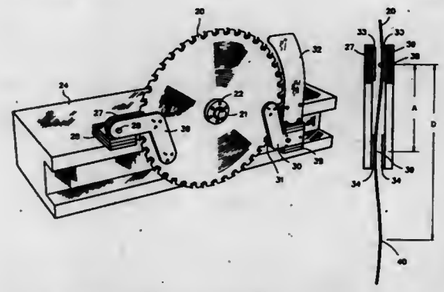
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**5,497,684**

**METHOD FOR REDUCING THE KERF WIDTH MADE BY A CIRCULAR SAW BLADE**

**Richard R. Martin, 29, rue des Pins, Clair, NB E7A 2E6, Canada**

**Filed Feb. 22, 1994, Ser. No. 199,575**
**Int. Cl.[6] B27B *5/00***
**U.S. Cl. 83—13** **4 Claims**



1. A method for reducing a kerf width in a workpiece made by a circular saw blade, said circular saw blade being guided by at least two pairs of guide pads, each of said pairs of guide pads acting on said circular saw blade from opposite sides of the saw blade, said method comprising:

positioning each of said pairs of guide pads along an arc about a center of said circular saw blade and at an angular spacing therebetween equal to about half an angular wavelength of said circular saw blade at an operating speed.

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**5,497,685**

**APPARATUS FOR OPTIMIZING CUTTING OF STACKED SHEETS OF MATERIAL IN A CUTTING MACHINE**

**Wolfgang Mohr, Hundshager Weg 42, D-65719, Hofheim/Taunus, Germany**

**Filed Aug. 27, 1993, Ser. No. 112,892**
**Claims priority, application Germany, Aug. 28, 1992, 42 28 650.6**
**Int. Cl.[6] B26D *7/04***
**U.S. Cl. 83—282** **6 Claims**

1. An arrangement for cutting stacked sheets of material, comprising: a bench with a planar surface for supporting the material to be cut; means for advancing the material to be cut; a hydraulically actuated holdfast beam with a holdfast force and an effective surface descending onto the material to be cut; a cutter traveling perpendicular to the surface of said bench adjacent to said holdfast beam; a sensor operating during a cutting operation in conjunction with a circuit controlling said holdfast beam and emitting when in operation a signal leading to reduction of said holdfast force; said sensor being mounted below a bottom portion of said holdfast beam and spaced from said effective surface, said effective surface coming into contact with the material to be cut; an effective distance between said sensor and said effective surface of said holdfast beam being equal to a distance between a lower edge of said holdfast beam and an upper edge of the stack of material to be cut at which said holdfast force is reduced.

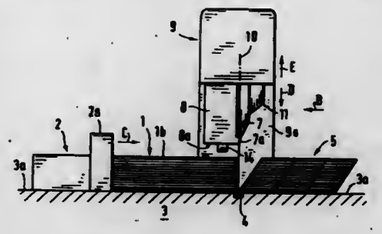
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**5,497,686**

**DEVICE FOR OPTIMIZING THE UNPRODUCTIVE MOTIONS OF THE HOLDFAST BEAM IN A MACHINE THAT CUTS MATERIAL**

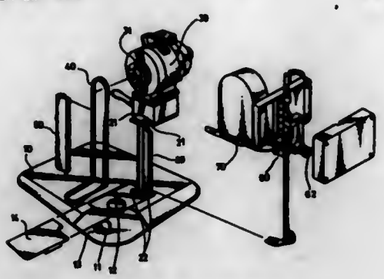
**Wolfgang Mohr, Hundshager Weg 42, D-65719 Hofheim/Taunus, Germany**

**Filed Aug. 27, 1993, Ser. No. 112,899**
**Claims priority, application Germany, Aug. 28, 1992, 42 28 649.2**
**Int. Cl.[6] B26D *7/02***
**U.S. Cl. 83—282** **6 Claims**



1. An arrangement for cutting stacked sheets of material, comprising a bench with a planar surface for the material to be cut to rest on; a hydraulically actuated holdfast beam descending on the material to be cut to hold the material fast; a hydraulic system for actuating said beam; a guillotine blade descending perpendicularly to said planar surface and cutting the material; means for advancing the material to be cut relative to said guillotine blade; a sensor operating in conjunction with circuitry controlling the hydraulic system; said sensor being spaced from the holdfast beam and from an effective surface of said holdfast beam coming into contact with the material being cut, said sensor emitting a signal for terminating rise of said holdfast beam when an effective distance of said sensor from said material is equal to a definite distance.

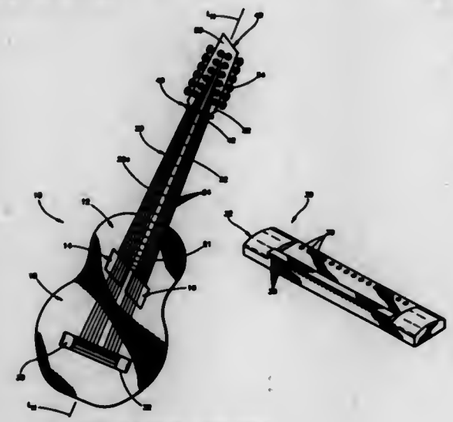
5,497,687
TABLE-TOP CUTTING MACHINE
Hai-su Huang, 5F., No. 10, Lane 234, Chung-ho Street, Peitou, Taipei, Taiwan, Prov. of China
Filed Aug. 2, 1994, Ser. No. 284,237
Int. Cl.[6] B26D 1/46
U.S. Cl. 83—790 6 Claims



3. A table-top cutting machine, comprising:
a base;
an upright support extending from the base;
a motor mounted on the upright support, wherein the motor includes a rotatable shaft;
a wheel provided on the base;
a pulley wheel mounted on the shaft of the motor;
a first rotor provided at a top of the upright support;
a second rotor provided at a bottom of the upright support;
a belt type cutting tool extending 180 degrees around the wheel on the base and 180 degrees around the pulley wheel on the shaft, wherein the belt type cutting tool extends between the first rotor and the second rotor, such that the belt type cutting tool forms a right angle between the wheel on the base and the pulley wheel on the shaft, and
a guard to longitudinally cover the belt type cutting tool at a first side and to permit a cutting edge of the belt type cutting tool to be exposed at a second side for cutting.

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5,497,688
MUSICAL INSTRUMENT
Candido Ruiz-Carrero, Calle Flamboyan #297 Bo. Esperanza, Vieques, Puerto Rico 00765
Filed Jan. 24, 1995, Ser. No. 377,353
Int. Cl.[6] G10D 3/00
U.S. Cl. 84—291 7 Claims



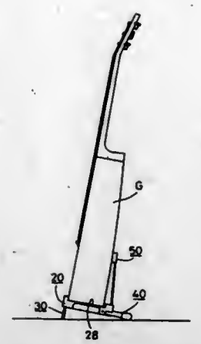
1. A musical instrument comprising;
a resonating body;
a neck fixedly attached to said resonating body;
a plurality of strings;
each string in said plurality of strings comprising a first end and a second end;
a means for attaching the first end of each said string in said plurality of strings to said resonating body, said means for attaching the first end fixedly attached to an upper surface of said resonating body;
a means for spacing said plurality of strings fixedly attached near a distal end of the neck;
a means for attaching the second end of each said string in said plurality of strings to said neck, said means for attaching the second end fixedly attached to the distal end of the neck;
said means for attaching the second end further comprising a means for selectively tuning each attached string;
the first end of each string in said plurality of strings is releasably attachable to said means for attaching the first end in at least one of four replaceable string configurations;
the second end of each string in said plurality of string is releasably attachable to said means for attaching the second end in at least one of four replaceable string configurations;
a first replaceable string configuration of said four replaceable string configurations comprising:
a first portion and a second portion;
said first portion comprising five strings tuned to an open A-minor chord;
said second portion comprising six strings;
five strings of said second portion tuned to an open E-major chord;
one string of said second portion tuned so as to produce an E7 chord; and
said first string configuration allowing a user to play a plurality of chords using one finger;
a second replaceable string configuration of said four replaceable string configurations comprising six strings tuned to allow a user to play the musical instrument as a six string guitar;
a third replaceable string configuration of said four replaceable string configurations comprising twelve strings tuned to allow a user to play the musical instrument as a twelve string guitar; and
a fourth replaceable string configuration of said four replaceable string configurations comprising ten strings tuned to allow a user to play the musical instrument as a Cuatro.

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5,497,689
FOLDABLE GUITAR STAND, PARTICULARLY FOR HOLDING THE NECK AND BODY OF AN ACOUSTIC GUITAR
Yoshiki Hoshino, Aichi, Japan, assignor to Hoshino Gakki Co., Ltd., Japan
Filed Nov. 30, 1994, Ser. No. 346,780
Claims priority, application Japan, May 6, 1994, 6-006110 U
Int. Cl.[6] G10B 3/00; F16M 11/38
U.S. Cl. 84—327 13 Claims

1. A foldable guitar stand comprising:
a main stand body having a front side and an opposite rear side, and having opposite right and left ends;
a right front leg having a first top part which is fixed at the front side toward the right end of the body in a manner permitting rotation and swinging of the right front leg toward the left and the right ends;
a left front leg having a second top part which is fixed at the front side toward the left end of the body in a manner permitting rotation and swinging of the left front leg toward the left and the right ends;
a right rear leg having a third top part which is fixed at the right end toward the rear side of the body in a manner permitting rotation and swinging of the right rear leg in the directions toward the front and the rear sides;

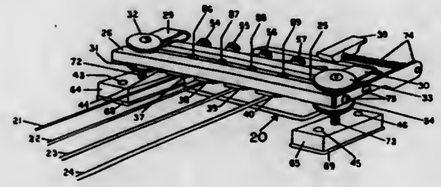




a left rear leg having a fourth top part which is fixed at the left end toward the rear side of the body in a manner permitting rotation and swinging of the left rear leg toward the front and the rear sides;
a right support member for supporting a rear side of a guitar and being located at the rear side of the body, the right support member having a lower part which is fixed to the rear side of the body toward the right end in a manner which permits the right support member to be rotatable toward the left end and toward the right end around a location at which the right support member is fixed to the body, in order for the right support member to be rotatable upward to a guitar supporting position;
a left support member for supporting a rear of the guitar and also located at the rear side of the body, the left support member having a lower part which is fixed to the rear of the body toward the left end in a manner which permits the left support member to be rotatable toward the left end and toward the right end around a location at which the left support member is fixed to the body, in order for the left support member to be rotatable upward to the guitar supporting position.

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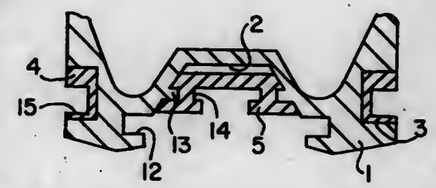
5,497,690
STRING VIBRATION ENHANCER FOR GUITAR-TYPE MUSICAL INSTRUMENTS
Charles C. Souplos, 46 Grace Ave. #LC, Great Neck, N.Y. 11021
Filed Aug. 5, 1993, Ser. No. 102,644
Int. Cl.[6] G10G 7/02; G10D 3/02;3/14
U.S. Cl. 84—453 1 Claim



1. A vibration altering device for astringed instrument including a bridge and a plurality of strings, each having a vibrating parameter, extending over the bridge; said device comprising:
a platform;
means for detachably mounting said platform to the stringed instrument extending over said strings a selected elevation proximate the bridge and for adjusting the selected elevation of the platform over the string;
a plurality of means for contacting a respective one of the plurality of strings and altering the vibrating parameter thereof; each of said contacting means mounted on said platform and comprising a curved surface located in a resiliently biased position for intersecting the respective one of the plurality of strings;
means for adjusting the resiliently biased position of said curved surface of each of said contacting means; said adjusting means comprising a plurality of adjusting screws each of said adjusting screws mounted on said platform adjacent the curved surface of one of said contacting means;
means for raising and lowering the platform for selective engagement of said contacting means with the plurality of strings thereby altering the vibration parameters thereof; said raising and lowering means comprising a cam mechanism.

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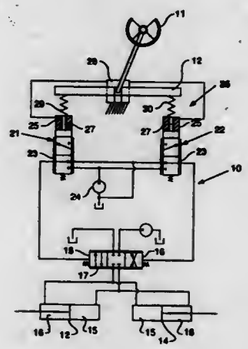
5,497,691
RAIL LAUNCHER FOR AIRBORNE MISSILES
Thomas C. Graham, 117 Fulwell Rd., Teddington, Middlesex, United Kingdom
PCT No. PCT/GB92/01479, § 371 Date Apr. 29, 1994, § 102(e) Date Apr. 29, 1994, PCT Pub. No. WO93/03321, PCT Pub. Date Feb. 18, 1993
PCT Filed Aug. 10, 1992, Ser. No. 193,021
Claims priority, application United Kingdom, Aug. 8, 1991, 9117066
Int. Cl.[6] F41F 3/06; B64D 7/08
U.S. Cl. 89—1.819 16 Claims



1. A method of adapting a rail launcher from a first rail configuration adapted for co-operation with hangers of a first set of airborne missiles to a second rail configuration adapted for co-operation with hangers of a different set of airborne missiles by relocating adaptors for a central longitudinal track and a pair of side tracks of a single fixed rail.

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5,497,692
ELECTROHYDRAULIC STEERING SYSTEM
Tony L. Marcott, Plainfield, Ill., assignor to Caterpillar Inc., Peoria, Ill.
Filed Mar. 2, 1995, Ser. No. 396,808
Int. Cl.[6] F15B 11/00
U.S. Cl. 91—523 3 Claims



1. An electrohydraulic steering system having a manually operated steering control member movable in opposite directions from a neutral position and a pilot operated steering valve having opposite ends comprising:

a pair of solenoid valves individually hydraulically connected to the opposite ends of the steering valve with each solenoid valve including a valving portion, an electromagnetic coil, and an armature disposed within the coil and connected to the valving portion;

a position sensor disposed to energize one of the coils upon movement of the steering control member in a first direction and to energize the other coil upon movement of the steering control member in a second direction; and

means for individually mechanically moving the armatures upon movement of the steering control member in either direction beyond a predetermined operating range thereof so that the solenoid valves can be selectively mechanically actuated to an operating position should an electrical malfunction occur.

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*5,497,693*

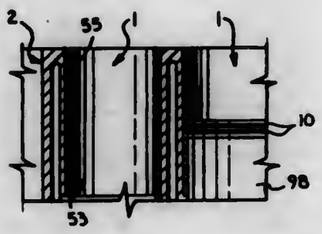
**REPLACEMENT CYLINDER FOR CAST IRON BLOCK ENGINE REMANUFACTURE**

**Michael S. Ward, Liberty, Mo., assignor to Patent Master, Inc., North Kansas City, Mo.**

**Filed May 31, 1994, Ser. No. 251,351**

**Int. Cl.[6] F16J *10/04***

**U.S. Cl. 92—169.1** **12 Claims**




4. An engine cylinder block assembly comprising:

(a) a cast iron engine cylinder block having a bore of a selected diameter formed therein, said bore being defined by a substantially continuous block cylindrical surface;

(b) a flangeless dry liner cylinder sleeve formed of cast iron and having a selected length and a selected outer diameter which is slightly less than said selected bore diameter, said sleeve being formed by a cylindrical wall having a wall thickness between an inner sleeve cylindrical surface and an outer sleeve cylindrical surface, said wall thickness being substantially less than a thickness which would enable said sleeve to withstand engine combustion pressure without external support; and

(c) said cylinder sleeve being positioned and adhesively retained within said block bore by an adhesive applied to substantially the entirety of said block cylindrical surface and said outer sleeve cylindrical surface.

*5,497,694*

**BREWING HOUSE SYSTEM INCLUDING AT LEAST TWO WORT COPPERS**

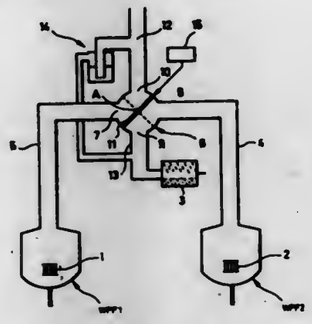
**Martin Klein, Nandlstadt, Germany, assignor to Anton Steinecker Entwicklungs GmbH & Co., Freising/Attaching, Germany**

**Filed Sep. 13, 1994, Ser. No. 304,877**

**Claims priority, application Germany, Sep. 17, 1993, 9314182 U**

**Int. Cl.[6] C12F *3/02***

**U.S. Cl. 99—276** **4 Claims**




1. A brewing house system comprising:

at least two wort coppers connected to a vapor compression system via copper ventilating pipes; and

a first change-over device connected to said copper ventilating pipes and being constructed as a housing having two inlet connections and two outlet connections and having a pivotable flap arranged therein which is adapted to be rotated about an axis between a first and second position; said copper ventilating pipes including two pipe sections which respectively connect said at least two wort coppers to said two inlet connections of said change-over device and said two outlets of said change-over device being respectively connected to said vapor compression system and a discharge means, whereby said flap connects one of said at least two wort coppers to said vapor compression system and connects the other of said at least two wort coppers to said discharge means when in said first position and connects said other of said at least two wort coppers to said vapor compression system and said one of said at least two wort coppers to said discharge means when in said second position.

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*5,497,695*

**FOOD STEAMER WITH AUTOMATIC TIMED STIRRING PADDLE**

**Heriberto Canela, 8027 W. 14 Ave., Hialeah, Fla. 33014**

**Filed Dec. 30, 1994, Ser. No. 366,196**

**Int. Cl.[6] A47J *27/00;36/32;* B01F *7/16;7/20***

**U.S. Cl. 99—335** **2 Claims**

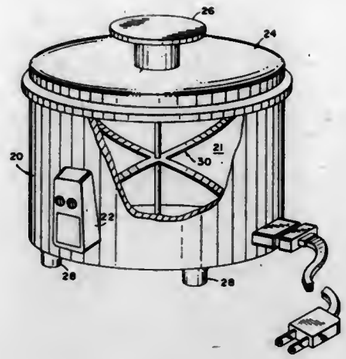
1. A food steamer having a cover that includes an underside, comprising:

A. stirring means rotatably mounted to the underside of said cover wherein said stirring means includes a shaft member and stirring paddle means mounted thereto;

B. gear means mounted to the underside of said cover and said gear means further including spring means for storing mechanical energy so that said energy is releasable to drive said gear means and said gear means being adapted to cause said stirring means to rotate and wherein said gear means includes means for adjusting amount of time said gear means are activated; and

C. timer means including brake means for selectively stopping said gear means over a predetermined amount of time prior to said gear means being activated.






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*5,497,696*

**COOKING VESSEL WITH SUPPRESSED DEFORMATION OF THE BOTTOM**

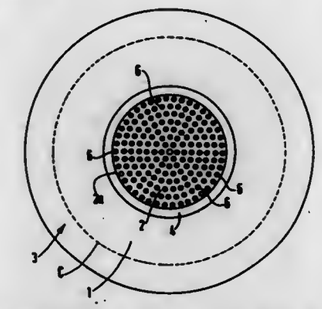
**Alain Coudurier, Albens; Jean-François Brasset, Cran Gevrier; Georges Coissard, Val de Fier, and Philippe Maillard, Moye, all of, France, assignors to Seb S.A., Ecully, France**

**Filed Oct. 13, 1994, Ser. No. 322,617**

**Claims priority, application France, Jan. 13, 1993, 93 12196; Feb. 15, 1994, 94 01710**

**Int. Cl.[6] A47J *27/00;36/02;37/10***

**U.S. Cl. 99—422** **14 Claims**




1. Cooking vessel produced from a deep-drawn sheet of light alloy or metal, comprising a slightly concave bottom including a plate covering only a small portion of said bottom, said plate being made of a metal or alloy and having mechanical, thermal and physical properties different from those of the metal or alloy of said sheet, said plate being at least partially embedded in said bottom.

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*5,497,697*

**TUMBLER BASKET**

**Lech Promny, 2032 Saxon Road, Oakville, Ontario, Canada**

**Filed Jan. 17, 1995, Ser. No. 372,946**

**Claims priority, application Canada, Sep. 19, 1994, 2125271**

**Int. Cl.[6] A47J *37/04;43/18***

**U.S. Cl. 99—427** **4 Claims**

1. A tumble basket for use with rotisseries having a rotisserie motor comprising:

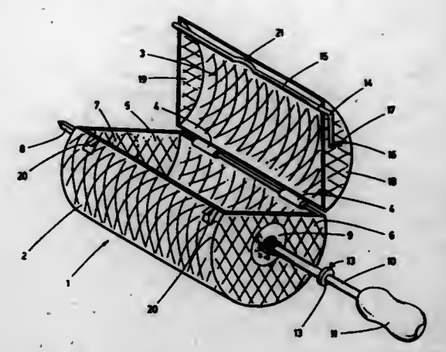
a) a generally cylindrical basket section having first and second ends and a hinged cover;

b) first support means attached to said first end of said basket section to support the basket section and in co-operation with a rotisserie motor cause the basket section to be rotated when in use wherein said first support means comprises a square rod co-axial attached to said first end of the basket section;

c) second support means attached to the second end of said basket section adapted to support the basket section;

d) a handle attached to said second support means to permit removal of the basket from the rotisserie when hot without burning the user's hands wherein said second support means includes a round rod co-axial attached to said second end of the basket section and wherein the distal end of said round rod is slideably engaged within a pipe member wherein said handle is spring mounted to said pipe member; and

e) latch means to keep the cover closed on the basket when in use.




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*5,497,698*

**DEVICE FOR STORING FRUIT, KEPT IN CONTAINERS PLACED ON A PALLET, UNDER CONTROLLED CONDITIONS**

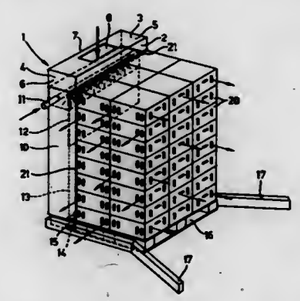
**Cornelis Bolkestein, Rotterdam, Netherlands, assignor to Binair Groep b.v., Moerkapelle, Netherlands**

**Filed Aug. 31, 1994, Ser. No. 298,261**

**Claims priority, application Netherlands, Sep. 1, 1993, 9301514**

**Int. Cl.[6] A23B *7/148;7/152;* A23L *1/00;3/00***

**U.S. Cl. 99—476** **12 Claims**




1. A device for storing fruit in containers on a pallet, under controlled conditions, comprising a cabinet containing a chamber having an intake and an outlet for air, an atomizer for liquid within the cabinet, means for feeding liquid to the atomizer, said air outlet comprising a planar front of the cabinet, said air outlet having dimensions substantially those of the side of a load of fruit placed in containers on a pallet, and an air-permeable filter separating said chamber from the outlet.

5,497,699

## METHOD OF SILK SCREEN PRINTING ON A ROUGH SURFACE SUCH AS A FOOTBALL

Clifford L. Mather, 10865 Jennifer La., Boca Raton, Fla. 33428

Filed Nov. 29, 1994, Ser. No. 346,873
Int. Cl.[6] B41M 1/12
U.S. Cl. 101—129 9 Claims

1. A method of silk screen printing on a rough surface, such as found on a football, for applying a high quality reproduction of a sports image including the steps of:

digitizing an image by scanning the image into a computer memory;

enhancing the digitized image using image processing software;

generating a film positive of the image for each process color and matched color, including magenta, yellow, black, and cyan;

photo-chemically producing high mesh count silk screen stencils for each color, each stencil having a mesh count between 305 and 510, by mounting said silk screen stencils in individual diamond chase frames such that each of the stencils is tensioned within a frame by a force of between 18 and 32 newtons, using photo-setting emulsions exposed to a light source;

preparing at least one work-piece having a rough surface, including vinyl and leather material used to make a sports ball, by applying a solvent;

drying the work-piece for at least 3 hours at ambient conditions;

preparing ink formulations suitable for use with high mesh count silk screen stencils for each process color and matched color including magenta, yellow, black, and cyan, using mixtures of half-tone base and clear base;

loading a silk screen printing machine with one of the prepared ink formulations and one of said diamond chase frames having a silk screen stencil mounted therein;

seasoning the cut work-pieces for at least 12 hours prior to printing;

reproducing said image by applying a selected ink formulation by forcing the ink through the silk screen stencil with a squeegee having a durometer reading between 60 and 90 and a pre-determined sharpness, at a controlled pressure such that said ink formulation coats both raised and recessed portions of the work-piece surface;

repeating the ink application procedure for each color and silk screen stencil combination thereby resulting in a multi-colored reproduction of the image on the work-piece surface;

curing the work-piece in ambient conditions;

trimming the work-piece to a desired geometric configuration and marking the trimmed work-piece for reference;

curing the trimmed work-piece at 180 degrees for at least one minute;

applying a cornstarch free powder to the work-piece surface containing the multi-colored image for functioning as a lubricant;

stitching the work-piece together with other cooperating pieces to form a sports ball;

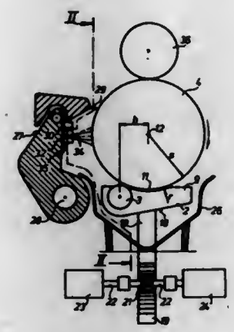
heating the material to soften, thereby allowing the sports ball to be turned inside out without affecting the applied image such that the stitching along the seams is positioned on the ball interior and the multi-colored image is positioned on the ball exterior, resulting in a finished sports ball having a rough exterior surface with a multi-colored reproduction of the image thereon such that the image is unaffected by turning or inflation.

5,497,700

## ROTOGRAVURE INKING SYSTEM

Rudolf Herb, Bobenheim/Roxheim, Germany, assignor to Albert-Frankenthal Aktiengesellschaft, Frankenthal, Germany

Filed Nov. 23, 1994, Ser. No. 347,121
Claims priority, application Germany, Nov. 25, 1993, 43 40 128.7
Int. Cl.[6] B41F 9/10;31/07
U.S. Cl. 101—153 4 Claims



1. A rotogravure inking system for a rotary printing press, said system comprising:

an ink trough adapted to receive a supply of printing ink, said ink trough having a clear overall length;

an ink roller disposed within said ink trough;

a printing cylinder supported for rotation above said ink trough about an axis of rotation and having a jacket surface with a face length and first and second end faces, a portion of said face length of said jacket surface being immersible in said ink in said ink trough, said printing cylinder having a radius of curvature, said face length of said printing cylinder being greater than said clear overall length of said ink trough;

spaced first and second ink trough end faces forming end walls of said ink trough, each of said ink trough end faces having an upper edge;

a recess formed in said upper edge of each of said first and second ink trough end faces, each said ink trough end face recess having a curvature matched to said radius of curvature of said printing cylinder, said jacket surface of said printing cylinder and each of said recesses defining a gap between said ink trough end faces and said printing cylinder, said printing cylinder having first and second end portions extending beyond said first and second ink trough end faces by first and second projecting distances, jacket surfaces of said first and second printing cylinder end portions which extend beyond said ink trough not being immersible in said ink in said ink trough; and

spray nozzles directed toward said first and second projecting end portions of said printing cylinder and being usable to spray said projecting end portions with a solvent for said printing ink.

5,497,701

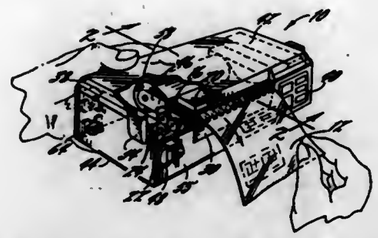
## METHOD AND APPARATUS FOR PRINTING LINERLESS MEDIA HAVING AN ADHESIVE BACKING

David M. Uland, Mecklenburg County, N.C., assignor to Data-South Computer Corporation, Charlotte, N.C.

Filed May 16, 1994, Ser. No. 243,198
The portion of the term of this patent subsequent to Jan. 30, 2013, has been disclaimed.
Int. Cl.[6] B41F 1/08
U.S. Cl. 101—288 25 Claims

1. An apparatus for printing a linerless label strip backed with a tacky adhesive, the printing apparatus comprising:





a would roll of a linerless label strip, the label strip being backed with a tacky adhesive

a support frame;

a bolder mounted to said frame for rotatably supporting the wound roll of the label strip;

a platen roller rotatably mounted to said frame for supporting the label strip;

means for printing indicia on one side of the label strip and including a print head positioned in alignment with said platen roller such that the label strip is adapted to extend between said platen roller and said print head;

means for rotating said platen roller such that the label strip is thereby advanced between said platen roller and said print head; and

a pick, mounted downstream of said print head and immediately adjacent said platen roller, for stripping a leading edge portion of the adhesive backed label strip from said platen roller such that the leading edge portion of the label strip, having indicia imprinted on one side thereof, may be withdrawn from the printing apparatus, wherein said pick has a first edge positioned immediately adjacent the peripheral surface of said platen roller at a location downstream of said print head, and wherein said pick includes a pick surface extending outwardly from said first edge in a direction away from said platen roller for directly contacting the tacky adhesive backing of the label strip and for providing a lifting force thereto to strip the leading edge portion of the adhesive backed label strip from the platen roller.

a doctor blade box having an upper side wall, a lower side wall, end walls, a bottom, a liquid inlet and a liquid outlet;

a liquid chamber formed by said side walls and the bottom of the doctor blade box and located adjacent the cylindrical body;

a device for liquid supply to said liquid chamber;

a device for liquid removal from said liquid chamber; and

an axially extending moulding mounted in the liquid chamber between the liquid inlet and the liquid outlet of the doctor blade box,

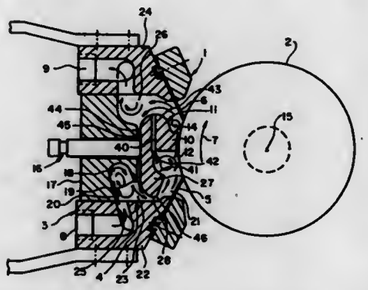
wherein the moulding includes a pressure nozzle, wherein the pressure nozzle is arranged at a distance from a surface of the cylindrical body and forms an axially extended flow gap between the pressure nozzle and the surface of the cylindrical body, wherein the pressure nozzle includes a rebound on a liquid outlet side of the pressure nozzle as defined by a direction of rotation of the cylindrical body, wherein the rebound includes a rounded portion adjacent an outlet of the flow gap and wherein the rebound includes a wall section extending upwards from the rounded portion and substantially tangentially to the surface of the cylindrical body, such that a sudden expansion of a cross section of the flow gap is produced by the rebound to produce a sudden pressure drop in an area of the liquid chamber behind the pressure nozzle as defined in a direction of rotation of the cylindrical body.

5,497,702

## INK CHAMBER DOCTOR BLADE FOR AN INKING UNIT

Cornelis Gorter, Wapenveld, Netherlands, assignor to Namic B.V., Netherlands

PCT No. PCT/EP92/02684, § 371 Date Aug. 16, 1993, § 102(e) Date Aug. 16, 1993, PCT Pub. No. WO93/10975, PCT Pub. Date Jun. 10, 1993
PCT Filed Nov. 21, 1992, Ser. No. 94,003
Claims priority, application Germany, Nov. 26, 1991, 41 38 807.0; Apr. 28, 1992, 9205695 U
Int. Cl.[6] B41F 31/06;31/08
U.S. Cl. 101—366 25 Claims



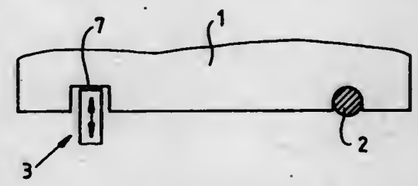
1. A device for coating moving material strips on a cylindrical body, comprising:

5,497,703

## DEVICE FOR ADJUSTING THE OBLIQUE REGISTER IN A CLAMPING DEVICE FOR LOCKING PRINTING PLATES IN AN OFFSET PRINTING MACHINE

Willi Becker, Bammental, Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Germany

Filed Feb. 28, 1994, Ser. No. 203,279
Claims priority, application Germany, Feb. 27, 1993, 43 06 237.7
Int. Cl.[6] B41F 21/00
U.S. Cl. 101—415.1 12 Claims



1. In an offset printing press with a plate cylinder having a jacket surface and a cylinder axis, and a clamping device for locking printing plates in the plate cylinder of the offset printing press, a device for adjusting oblique register of the printing plates, comprising:

a stationary clamping bar oriented parallel to the axis of the plate cylinder on the jacket surface of the plate cylinder and fixed in a circumferentially stationary position relative to the plate cylinder, said clamping bar having a first outer marginal region and a second outer marginal region, and said clamping bar having first and second clamping bar parts defining a gap therebetween for receiving and clamping therein a leading or trailing edge of a printing plate inserted in a given direction of insertion and means for opening and closing the gap;

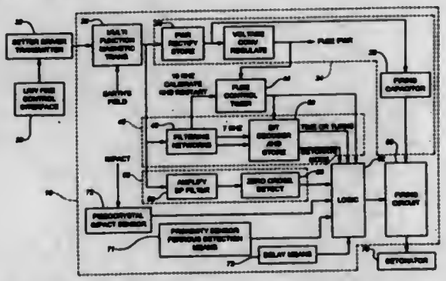
a centering bolt secured in said first outer marginal region of said clamping bar and having a longitudinal axis oriented radially to the plate cylinder and extending into said gap, said centering bolt having a profile corresponding to a profile of a centering groove formed in the edge of the printing plate to be received in said gap;

and adjustable stop means including a stop having a longitudinal axis oriented in circumferential direction of the plate cylinder in said second outer marginal region of said clamping bar, said stop being mounted on said clamping bar and extending

into said gap so as to be movably adjustable in the circumferential direction of the plate cylinder for correcting plate obliqueness; and means for adjusting the position of said stop.

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5,497,704
MULTIFUNCTIONAL MAGNETIC FUZE
Dennis L. Kurschner, Minnetonka; David P. Erdmann, Hopkins, and Scott D. Crist, Minnetonka, all of Minn., assignors to Alliant Techsystems Inc., Hopkins, Minn.
Filed Dec. 30, 1993, Ser. No. 176,355
Int. Cl.[6] F42C *11/04;9/14*
U.S. Cl. 102—264 24 Claims

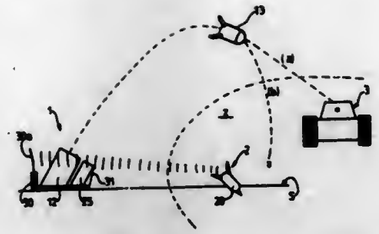


1. Apparatus for counting each rotation of a projectile, after firing the projectile from a firing weapon, the projectile having a longitudinal axis, said apparatus comprising:
(a) counting means for counting each said rotation of the projectile as it rotates around its longitudinal axis, the counting means comprising:
(i) spin signal means for generating a spin signal which varies over time as the projectile rotates about its axis in the earths magnetic field and where the magnitude of the spin signal reaches a predetermined threshold a predetermined number of times for each said rotation of the projectile;
(ii) a counter operatively connected to the spin signal means for counting the number of times the spin signal reaches its predetermined threshold;
(b) spin rate computation means for determining a spin rate of the projectile, wherein the spin rate computation means is comprised of timing means operatively connected to the counter for determining the time for the projectile to rotate a predetermined number of times; and
(c) muzzle velocity computing means for determining actual muzzle velocity based on a barrel pitch constant of the firing weapon and the spin rate of the projectile.

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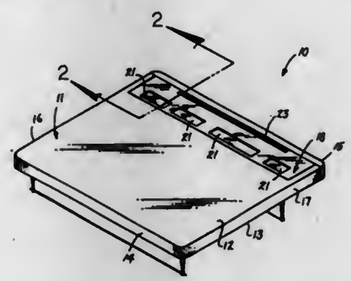
5,497,705
ZONE-DEFENSE WEAPON SYSTEM AND METHOD FOR CONTROLLING SAME
Thierry Bredy, Asnières les Bourges; Hervè Rodriguez, Meneton Salon, and Emmanuel Marchand, Bourges, all of, France, assignors to Giat Industries, Versailles, France
PCT No. PCT/FR94/00346, § 371 Date Nov. 21, 1994, § 102(e) Date Nov. 21, 1994, PCT Pub. No. WO94/24512, PCT Pub. Date Oct. 27, 1994
PCT Filed Mar. 29, 1994, Ser. No. 341,584
Claims priority, application France, Apr. 15, 1993, 93 04429
Int. Cl.[6] F42B *23/16;23/04*
U.S. Cl. 102—427 18 Claims

1. A zone-defense weapon system comprising:
at least one surveillance and target-acquisition device for controlling a surveillance zone to detect an objective target entering into said surveillance zone;
an attack device having at least one main projectile launch tube and at least one auxiliary launch tube, said at least one surveillance and target-acquisition device controlling actuation of the attack device in a direction of the objective target;
wherein the at least one surveillance and target-acquisition device is a remote distance from the attack device, the surveillance zone being located in an action radius of the attack device, and wherein said at least one surveillance and target-acquisition device includes an auxiliary projectile that is fired from said at least one auxiliary launch tube of said attack device and lands within said surveillance zone, and said at least one main projectile is fired from said at least one main projectile launch tube and falls within the surveillance zone adjacent said at least one surveillance and target-acquisition device.



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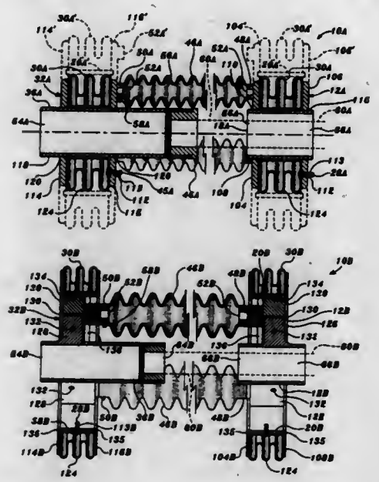
5,497,706
PORTABLE TABLE APPARATUS
Cheong Ah Yong, 817, Jalan Raja Muda, Pasir Pinji, 31650, Ipoh, Perak, Malaysia
Filed Jul. 15, 1994, Ser. No. 275,261
Int. Cl.[6] F21V *33/00*
U.S. Cl. 108—23 5 Claims



1. A portable table apparatus, comprising,
a table plate, having a plate top wall spaced from a plate bottom wall, a first-end wall spaced from a second end wall, a first side wall spaced from a second side wall,
a table plate parallelepiped cavity directed into the table plate through the top wall, and
a polymeric insert block complementarily and removably mounted within the parallelepiped cavity, with the insert block including an insert top wall, with a plurality of recess portions directed into the insert top wall, with each of the recess portions including a sliding door plate arranged for extension and retraction over a respective one of said recess portions, wherein each of the door plates is slidably received within a door plate slot, and each door plate slot is oriented parallel to and in adjacency to the insert top wall.

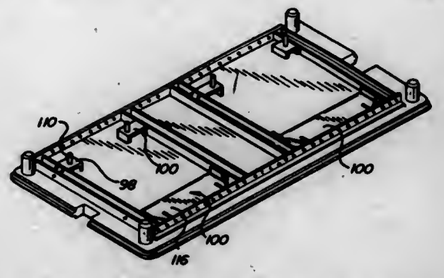


5,497,707
ROBOTIC VEHICLE
W. Donald Box, Oak Ridge, Tenn., assignor to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.
Continuation-in-part of Ser. No. 949,896, Sep. 23, 1992, Pat. No. 5,293,823. This application Jun. 30, 1994, Ser. No. 212,355
Int. Cl.[6] B61B *13/00*
U.S. Cl. 104—138.2 15 Claims



1. A robotic vehicle for travel through a conduit, said robotic vehicle comprising:
a forward housing including a hub portion and forward and rearward retainer members which releasably engage and which are releasably secured to said hub portion in a selectively spaced relationship such that said forward and rearward retainer members define selectively spaced retaining walls extending radially from said hub portion, said forward housing being provided with surface engaging means for selectively engaging at least one wall of said conduit,
whereby said forward housing is selectively held in a stationary position within said conduit by said surface engaging means, said surface engaging means of said forward housing including at least one expandable bladder positioned between said forward and rearward retainer members so as to be releasably held in place by and between said selectively spaced retaining walls of said forward and rearward retainer members, said expandable bladder defining an internal cavity and being expandable upon the injection of gas into said cavity of said expandable bladder whereby said expandable bladder selectively engages walls of said conduit;
at least three selectively extendable members, each said extendable member defining a cavity therein and defining a forward end portion secured to said forward housing and a rear end portion secured to said rear housing; and
means for selectively pressurizing gas into the cavity of a selected one of said extendable members for axially extending said one of said extendable members and increasing the distance between said forward end portion of said one of said extendable members and said rear end portion of said one of said extendable members, and for selectively evacuating gas from the cavity of a selected one of said extendable members for axially retracting said one of said extendable members and decreasing the distance between said forward end portion of said one of said extendable members and said rear end portion of said one of said extendable members.

5,497,708
PALLET WITH ADJUSTABLE ARTICLE MOUNTING HARDWARE AND ARTICLE ATTACHMENT METHOD
Thomas M. Jeruzal, Brighton, Mich., assignor to Chrysler Corporation, Highland Park, Mich.
Filed Sep. 30, 1994, Ser. No. 315,388
Int. Cl.[6] B65D *19/00*
U.S. Cl. 108—54.1 9 Claims

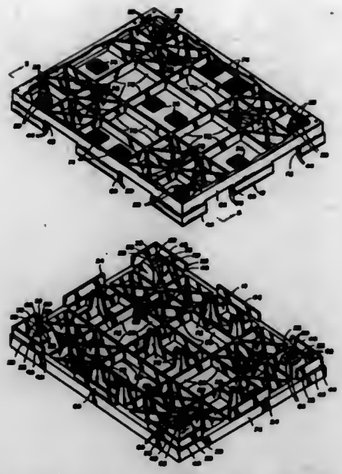


1. A pallet for the attachment and conveyance of a wide range of articles with differing pallet attachment points comprising a primary pallet member having an upper support surface and peripheral edges, elongated front and rear bracket members, fasteners for securing said front and rear bracket members to said upper surface of said primary pallet member so that said bracket members are spaced in general parallel relationship from one another and are adjacent to said peripheral edges of said pallet member, left and right side bracket members, fasteners for securing said left and right bracket members between said front and rear brackets in general spaced parallel relationship to one another, intermediate bracket members disposed between said left and right bracket members, fastener means for adjustably securing said intermediate bracket members between said side bracket members and in general parallel relationship thereto, an article support associated with each of said side and intermediate bracket members for supporting and attaching an article to said primary pallet member, fastener means for adjustably mounting each said article support respectively to said side and intermediate bracket members associated therewith so that said supports can be adjusted to any of a plurality of positions along said left, right and intermediate brackets associated therewith to support the article.

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5,497,709
PLASTIC PALLET ASSEMBLY
Nelson B. Gonzalez, Linden, and Robert M. Wedge, New Baltimore, both of Mich., assignors to Larry Winget, Leonard, Mich.
Filed Oct. 28, 1994, Ser. No. 331,062
Int. Cl.[6] B65D *19/12*
U.S. Cl. 108—56.3 17 Claims

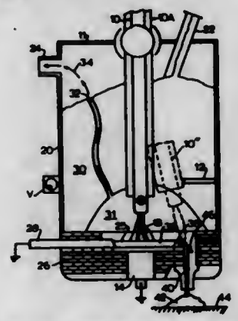
1. A load-bearing, plastic pallet assembly comprising:
a resilient polymeric core having top and bottom halves, the top half including a top support panel having top corners, a flange portion extending about a periphery of the top support panel and projecting downwardly from said panel periphery and at least one tab projecting downwardly from the top panel at each of the top corners, the bottom half including a base having bottom corners, a shoulder portion extending about a base periphery of the base and projecting upwardly from said base periphery and a boss projecting upwardly from the base at each of the bottom corners, each of the bosses having a slot for receiving at least one tab of the top half securing the top and bottom halves together, wherein the bottom half also includes a corner head portion projecting upwardly from the shoulder portion at each of the bottom corners and wherein the top half also includes a corner channel defined by a pair of spaced corner legs extending downwardly from the flange portion at each of the top corner channels receiving a respec-



tive bottom corner head portion, each pair of spaced corner legs being supported on a top surface of the shoulder portion, and wherein each pair of spaced corner legs and the respective corner head portion define a corner joint which encloses and protects a respective boss and tab connection at a corner of the pallet assembly.

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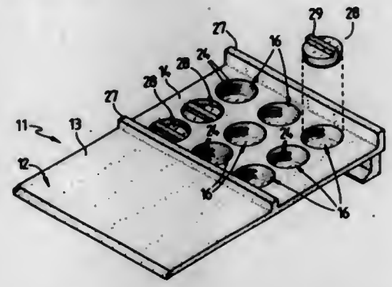
**5,497,710**
**APPARATUS FOR VITRIFICATION OF FINE PARTICULATE MATTER**
Salvador L. Camacho, Raleigh, N.C., assignor to Plasma Technology Corporation, Raleigh, N.C.
Division of Ser. No. 86,005, Jul. 2, 1993, Pat. No. 5,399,833.
This application Dec. 13, 1994, Ser. No. 354,663
Int. Cl.[6] F23G *5/00;5/10;5/12*
U.S. Cl. 110—250 12 Claims



5. A furnace for the vitrification of fine particulate material, comprising:
(a) a housing having a lower portion, an upper portion and a vertical centerline passing therethrough;
(b) a tapping spout mounted in said lower portion of said housing and adapted for supporting a column of said fine particulate material and having an orifice through which a melt of said fine particulate material can flow;
(c) a plasma arc torch mounted to said housing so that a plasma flame of said torch normally resides along said centerline of said housing and impinges said tapping spout;
(d) an inlet chute in communication with the interior of said housing and adapted to introduce fine particulate material so as to submerge said plasma arc flame therewith;
(e) a stack connection in communication with the interior of said housing and adapted to allow a byproduct gas generated therein to flow out from said housing; and
(f) means enabling said byproduct gas generated in said furnace to bypass said fine particulate material and be discharged through said stack connection.

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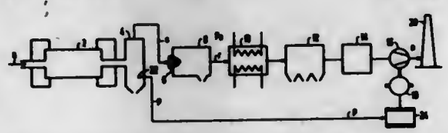
**5,497,711**
**GRATE PLATE**
Billy T. Bobbitt, Sylacauga, Ala., assignor to Southern Alloy Corporation, Sylacauga, Ala.
Filed Apr. 20, 1995, Ser. No. 426,892
Int. Cl.[6] F27D *15/02*
U.S. Cl. 110—278 18 Claims



1. A grate plate for receiving and transporting material precipitated from a kiln or the like, wherein a plurality of grate plates are supported in cooperative relation to a source of air on an open structure, comprising:
(a) an upper surface for receiving material thereon, said upper surface including a first portion and a second portion;
(b) a plurality of wells formed in said upper surface in said second portion, and extending therebelow, said wells tapering from said surface; and,
(c) means for inducing a cyclonic flow of air entering said wells from said source of air.

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**5,497,712**
**LOW-TEMPERATURE CARBONIZATION/COMBUSTION PROCESS AND LOW-TEMPERATURE CARBONIZATION/COMBUSTION PLANT WITH PRESSURE CONTROL**
Karl May, Bad-Vilbel; Hartmut Horn, Dreieich, and Reinhard Mattke, Oberursheusen, all of, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany
Filed Oct. 12, 1993, Ser. No. 135,251
Claims priority, application Germany, Jan. 9, 1992, 42 34 163.9
Int. Cl.[6] C10B *53/02;* F23G *5/027*
U.S. Cl. 110—342 23 Claims



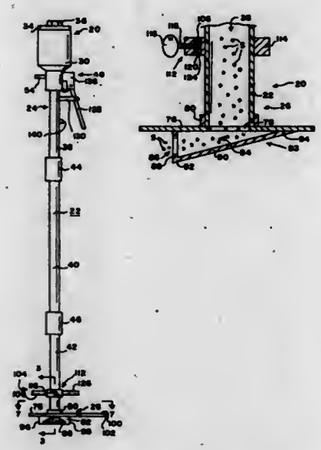
10. A low-temperature carbonization/combustion plant for thermal waste disposal, comprising:
a gas path including:
a pyrolysis drum generating low-temperature carbonization gas,



a combustion chamber having a burner receiving the low-temperature carbonization gas and forming flue gas as a result of combustion,
a cooling device for receiving the flue gas,
a pressure sensor connected in said gas path for sensing a pressure in said gas path,
a gas compressor for receiving the cooled flue gas and for adjusting pressure in said gas path between said pyrolysis drum and said gas compressor relative to the environment, and
an outlet downstream of said gas compressor; and
a control device for controlling a speed of rotation of said gas compressor in relation to the pressure in said gas path, said control device having means connected to said pressure sensor in said gas path for increasing the speed of rotation of the gas compressor when the pressure in the gas path reaches a preset maximum value somewhat below ambient pressure and for decreasing the speed of rotation of the gas compressor when the pressure in the gas path reaches a preset minimum value somewhat above a given critical pressure which the components cannot withstand.

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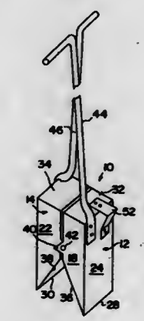
**5,497,713**
**GARDEN SEEDER**
Jesse L. Anderson, 6272 Highway 45 South, Meridian, Miss. 39301, and Joe S. Sodoma, P.O. Box 181, Meridian, Miss. 38301
Filed Aug. 26, 1994, Ser. No. 296,483
Int. Cl.[6] A01C *5/02*
U.S. Cl. 111—92 13 Claims



1. A garden seeder, said garden seeder comprising:
(a) an elongated barrel having an upper end and a lower end, said barrel having an internal bore therethrough extending to said lower end of said barrel;
(b) a seed hopper for holding a quantity of seeds, said seed hopper having an interior;
(c) seed dispensing means, interposed between the interior of said seed hopper and said bore, for dispensing a metered volume of seeds from the interior of said hopper into said bore, said seed dispensing means comprising:
i. an upper blocking plate spanning said bore, said upper blocking plate having a seed collection hole therethrough for passage of seeds therethrough from the interior of said hopper;
ii. a lower blocking plate spanning said bore, said lower blocking plate having a seed dispensing hole therethrough for passage of seeds therethrough and into said bore, said seed dispensing hole being horizontally offset from said seed collection hole and in complete vertical non-alignment therewith;
iii. a sliding plate sandwiched between said upper blocking plate and said lower blocking plate and secured for slidable movement therebetween, said sliding plate having a seed metering hole therethrough with said seed metering hole having an upper end and having a lower end, with said sliding plate being slidable between:
A. a first position, in which said upper end of said seed metering hole is in substantial alignment with said seed collection hole and said lower end of said seed metering hole is blocked by said lower blocking plate, thereby allowing said metered volume of seeds to accumulate within said seed metering hole; and
B. a second position, in which said upper end of said seed metering hole is blocked by said upper blocking plate and said lower end of said seed metering hole is in substantial alignment with said seed dispensing hole, thereby allowing said metered volume of seeds to fall downwardly through said seed dispensing hole into said bore and toward said lower end of said barrel; and
iv. a metering insert removably and closely received within said seed metering hole, said metering insert having a longitudinal hole therethrough and defining said metered volume;
(d) a resting plate, secured substantially transversely to said lower end of said barrel, for abutting placement upon the ground, said resting plate having an opening therethrough in alignment with said bore; and
(e) a dispensing foot secured to said resting plate on the underside thereof, said dispensing foot having a chamber therewithin in communication with said bore through said opening, and said dispensing foot having an egress hole therethrough in communication with said chamber within said dispensing foot.

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**5,497,714**
**PLANTING HOLE DIGGER**
James J. Schlotthauer, 1042 Ruge NW., Salem, Oreg. 97304
Filed Jul. 11, 1994, Ser. No. 272,802
Int. Cl.[6] A01C *11/02*
U.S. Cl. 111—106 11 Claims

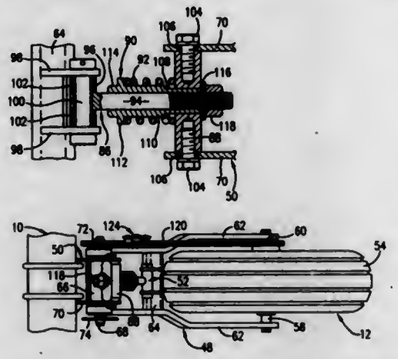


1. A planting hole digger for cutting through earth and for removing earth to produce a planting hole in said earth, said digger comprising:
A) a pair of cutting jaws,
a) said jaws having a generally U-shaped cross-section with matching legs and a bight portion between said matching legs, said jaws having a cutting end, a central portion, and a top portion, an extension from said bight portion at said top portion, said extension being bent with respect to said bight portion to align said bight extension with said matching legs adjacent to said top portion,

b) said cutting end having tapered edges along the legs of said U-shape extending from said central portion toward said cutting end,
c) means joining said cutting jaws at said central portion, said joining means permitting movement of said cutting jaws about said joining means,
d) said matching legs being formed from said central portion to said top portion with parallel sides along said matching legs,
B) separate duplicate operating bars attached to said cutting jaws,
a) one of said duplicate operating bars being attached to each of said cutting jaws,
b) said operating bars exteading from said central portion of said cutting jaws, toward said top end and away from said cutting end,
c) said operating bars being attached to said bight portion so as to move in non-conflicting planes with respect to each other,,
C) and a foot platform on at least one of said cutting jaws,
D) said planting hole digger being adapted to be hand held by said operating bars to be pressed in to an earth area so as to force said cutting jaws into said earth, said matching legs of said cutting jaws at said cutting end being adapted to be closed toward each other about said joining means by movement of said operating bars with respect to each other to close said cutting end about a removable portion of said earth, and said digger being adapted to be movable away from said earth while enclosing said removable portion to create a planting hole in said earth..

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**5,497,715**
**SEED METERING DRIVE MECHANISM FOR SEED PLANTERS AND THE LIKE**
**Roger L. Meek, and J. Michael McClure, both of Salina, Kans., assignors to Great Plains Manufacturing Incorporated, Assaria, Kans.**
**Filed Jul. 19, 1994, Ser. No. 276,945**
**Int. Cl.[6] A01C** *7/16;7/18;7/20*
**U.S. Cl. 111—137** **7 Claims**

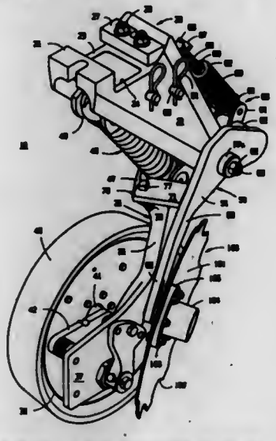


1. A metering drive mechanism for use with a seed depositing implement adapted for movement across the ground, the mechanism comprising:
a gauge wheel adapted to provide driving input to a shaft of the mechanism;
an arm assembly supporting the gauge wheel for rotational movement along the ground;
a mounting bracket for securing the arm assembly to the implement, the arm assembly being mounted on the bracket for relative pivotal movement about a generally horizontal axis;
a movement limiting means for restricting upward pivoting movement of the arm assembly beyond a predetermined position to establish the height of the implement, and for allowing downward movement of the arm assembly; and
a biasing means for exerting a predetermined down pressure on the arm assembly to maintain the gauge wheel in contact with the ground during travel of the implement,
the movement limiting means including a height adjustment means for adjusting the predetermined position of the arm assembly relative to the bracket to vary the height of the implement, wherein operation of the height adjustment means does not alter the predetermined down pressure of the biasing means.

7. A metering drive mechanism for use with a seed depositing implement adapted for movement across the ground, the mechanism comprising:
a gauge wheel adapted to provide driving input to the mechanism;
an arm assembly supporting the gauge wheel for rotational movement along the ground;
a mounting bracket for securing the arm assembly to the implement, the arm assembly being mounted on the bracket for relative pivotal movement about a generally horizontal pivot axis;
a movement limiting means for restricting upward pivoting movement of the arm assembly beyond a predetermined position to establish the height of the implement, and for allowing downward movement of the arm assembly so that the wheel is able to drop relative to the implement; and
a biasing means for exerting a predetermined down pressure on the arm assembly to maintain the gauge wheel in contact with the ground during travel of the implement,
the movement limiting means including an elongated, threaded rod supported on the arm assembly for pivotal movement about a generally horizontal pivot axis, a trunnion supported on the mounting bracket for rotation about a generally horizontal pivot axis extending in a direction parallel to the pivot axis of the rod, and a sleeve received on the rod and supported by the trunnion for relative movement within a limited range in a direction transverse to the pivot axis of the trunnion, the biasing means being retained between the sleeve and the trunnion.

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**5,497,716**
**MECHANISM FOR CLEARING CROP RESIDUE**
**Kenneth E. Shoup, 145 SW. Ave., Kankakee, Ill. 60901**
**Filed Apr. 29, 1994, Ser. No. 236,567**
**Int. Cl.[6] A01B** *5/00*
**U.S. Cl. 111—140** **28 Claims**

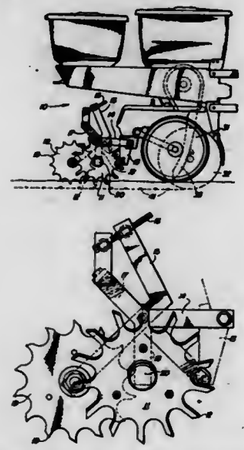


1. In combination, a farm implement including a frame and a plurality of row units mounted on the frame, each row unit including a tool, each row unit having a gauge wheel associated therewith, a trash blade mounted on the frame associated with each gauge wheel ahead of the associated tool, and means urging each gauge wheel and each trash blade toward contact with the soil, the trash blade being angularly displaced from the vertical and from the direction of travel of the associated gauge wheel to move trash from ahead of the tool to form a row of trash between adjacent row units.



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**5,497,717**
**FURROW CLOSING DEVICE**
**Howard Martin, 169 Allegre Rd., Elkton, Ky. 42220**
**Filed Nov. 19, 1993, Ser. No. 154,975**
**Int. Cl.[6] A01C** *5/04*
**U.S. Cl. 111—191** **17 Claims**

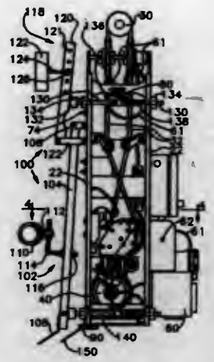


1. In a planting assembly having a furrow forming mechanism, a seed dispensing mechanism for placing seeds in the furrow formed by said furrow forming mechanism, a structure for creating seed soil contact and conditioning the soil for seed germination and emergence comprising:
support structure attached to said planting assembly;
a plurality of wheels having a plurality of teeth on the periphery thereof attached to said support structure rearwardly of said seed dispensing mechanism, and located to the sides of said furrow;
said teeth having sharpened faces to positively penetrate the soil as the wheels rotate;
said wheels attached to said support structure at an angle to the vertical; and
means connected between said support structure and said planting assembly for forcing said teeth of said wheels into the soil to condition the soil and establish positive seed soil contact.

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**5,497,718**
**AIR OPERATED SYSTEM FOR TAPE EDGE MACHINE IN MATTRESS MANUFACTURING**
**David R. Cash, Louisville, Ky., assignor to James Cash Machine Co., Inc., Louisville, Ky.**
**Filed Mar. 16, 1994, Ser. No. 214,407**
**Int. Cl.[6] D05B** *11/00;69/08*
**U.S. Cl. 112—2.1** **14 Claims**

1. A carriage assembly used with a tape edge machine, said carriage assembly comprising:
(a) means for moving Said carriage assembly around said tape edge machine;

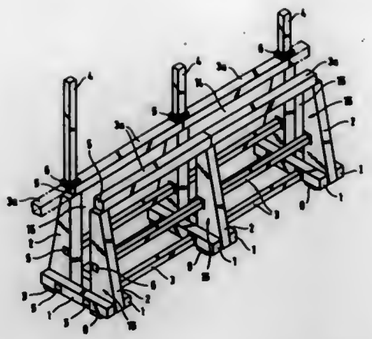


(b) a sewing machine having a sewing needle, said sewing machine attached to said carriage assembly;
(c) means for operating said sewing machine needle;
(d) an air compressor, said air compressor producing compressed air;
(e) means for braking said operating means;
(f) means for idling said moving means; and,
(g) at least a first air switch assembly and a second air switch assembly, where each of said first and said second air switch assemblies has an air switch, said air switch having an input connected to said compressor to receive said compressed air and an output connected to an operable air cylinder, where each of said first and said second air switch assemblies has means for activating said air switch to provide said compressed air to said operable air cylinder thereby activating said braking means and said idling means, where each of said first and said second air switch assemblies has means for deactivating said air switch to not provide said compressed air to said operable air cylinder thereby deactivating said braking means and said idling means; where said activating means of said first air switch assembly is operable by a tape edge machine operator's knee, leg, or foot and where said activating means of said second air switch assembly is operable by said tape edge machine operator's arm.

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**5,497,719**
**STAND FOR AN EMBROIDERING MACHINE**
**Jürg Henz, Amriswil; Hans Abegglen, and Yueliang Yu, both of Arbon, all of, Switzerland, assignors to Saurer Sticksysteme AG, Arbon, Switzerland**
**Filed Nov. 23, 1993, Ser. No. 155,875**
**Claims priority, application Germany, Nov. 26, 1992, 42 39 746.4**
**Int. Cl.[6] D05C** *3/04*
**U.S. Cl. 112—83** **1 Claim**

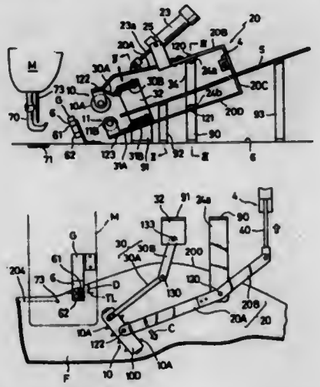
1. An elongated embroidering machine having an arrangement of a plurality of embroidering stations positioned adjacent to each other, each with a needle and embroidering tools, said machine being positioned on a machine stand in partially facing fashion on both sides of a fabric stretching frame, in one row or in several rows positioned vertically with respect to each other,
wherein the machine stand has a frame having a substantially U-shaped cross-section that is open upwardly, said frame comprising at least two spaced apart vertical U-shaped frames (16) that are open upwardly and longitudinal supports (3, 3*a*) connecting said U-shaped frames to form a channel (14) in the lengthwise direction of the machine, said channel being open upwardly and open at ends (15) thereof an in which channel a fabric stretching frame (10) is movably positioned, wherein vertical supports (4) to guide and move the stretching frame are secured to the longitudinal supports (3*a*) connecting the U-shaped frames (16), and



wherein the embroidering machine is self-supporting when standing on the floor.

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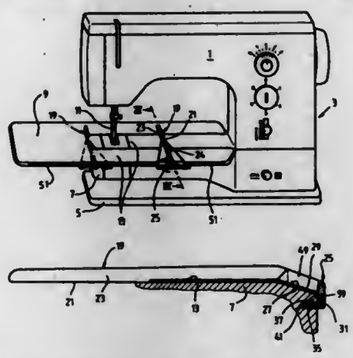
5,497,720
**DEVICE FOR GUIDING A COVER MEMBER TO A SEWING MACHINE**
Kiyoshi Kawasaki, Akishima, Japan, assignor to Tachi-S Co., Ltd., Tokyo, Japan
Filed Mar. 25, 1994, Ser. No. 218,138
Int. Cl.[6] D05B *35/10*
U.S. Cl. 112—153 20 Claims



15. In combination with a sewing machine, a device for guiding a cover member to said sewing machine, comprising:
- a pair of upper and lower guide roller means for retaining said cover member therebetween, while allowing the same to be fed toward said sewing machine, said pair of upper and lower guide roller means being disposed in the vicinity of a sewing portion of said sewing machine;
- a pair of upper and lower control arm means, each having one end connected operatively with said pair of upper and lower guide roller means and another end connected operatively with a control drive mechanism;
- said pair of upper and lower control arm means being pivotally rotatable so that said one end thereof may be rotated, through operation of said control drive mechanism, relative to a pivot point, to thereby cause rotative displacement of said upper and lower guide roller means in reference to a direction in which said cover member is sewn by said sewing machine; and
- a link means including a first link element having one end operatively fixed to said pair of upper and lower guide roller means and a second link element having one base end portion pivotally connected to a table of said sewing machine and another free end portion connected pivotally to another end of said first link element,
- said pair of upper and lower control arm means and said link means cooperating with each other to allow said rotative displacement of said upper and lower roller means to be effected through the operation of said control drive mechanism, whereby said cover member is guided by said upper and lower roller means and fed towards the sewing portion of said sewing machine.

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5,497,721
**SEWING MACHINE FOR GUIDING FABRIC TO BE SEWN AT A PRE-DETERMINED DISTANCE RELATIVE TO A STITCH-FORMING NEEDLE**
René Suiser, and Franz Rapold, both of Steckborn, Switzerland, assignors to Fritz Gegauf Aktiengesellschaft, Steckborn, Switzerland
Filed Apr. 18, 1994, Ser. No. 229,470
Claims priority, application Switzerland, Apr. 29, 1993, 01330/93
Int. Cl.[6] D05B *35/10*
U.S. Cl. 112—153 28 Claims



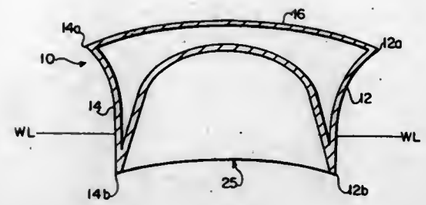
1. A sewing machine having an arrangement for guiding fabric to be sewn at an adjustable distance relative to a stitch-forming needle, said sewing machine comprising:
- a working surface with a slot formed underneath said working surface., the slot of said working surface being arranged in a recess which is open on a front side and runs lengthwise in said working surface;
- a stitch-forming needle;
- a retaining part being C-shaped in its cross-section and having a rib-shaped guide cam, said rib-shaped guide cam engaging the slot formed underneath said working surface;
- a guide rail having beam guide beam said guide rail at a front-side end, being attached to said retaining part at a right angle thereto; and,
- a scale for adjusting a distance between said guide rail and said stitch-forming needle.

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5,497,722
**KEELLESS CONCAVE HULL**
Charles English, Sr., 1507 Heritage Landing Dr., Chattanooga, Tenn. 37405
Filed Sep. 7, 1994, Ser. No. 301,580
Int. Cl.[6] B63B *1/00*
U.S. Cl. 114—62 6 Claims

1. A keelless hydroplane boat hull including:
a bow;

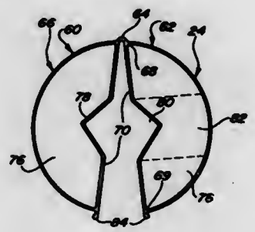




a stern;
opposite, generally symmetrical port and starboard hull sides having substantially parallel port and starboard top edges and substantially parallel port and starboard chines, said sides being steeply outwardly flared above an at-rest water line to said top edges, and said sides being substantially vertical beginning at the at-rest waterline and extending below the at-rest water line to said chines, whereby when said hull is underway so as to have an underway water line and is navigated in a sharp turn, said side opposite the direction of the turn is nearly vertical with respect to the underway water line;
a deck connecting said top edges; and
a continuous, arcuate, concave tunnel connecting said chines and extending the full length of said sides, said tunnel having a decreasing depth towards said stern.

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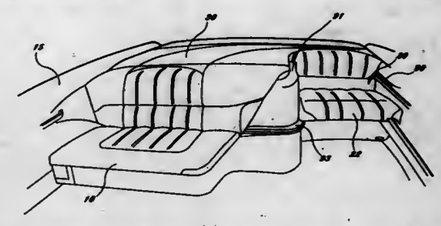
5,497,723
**BOAT BUMPER**
Wylie Chase, 4515 Motorway, Waterford, Mich. 48328
Filed Jun. 17, 1994, Ser. No. 261,404
Int. Cl.[6] B63B *59/02*
U.S. Cl. 114—219 12 Claims



1. A boat bumper device for mounting to a dock having a top surface extending along a longitudinal axis, said bumper device comprising:
- a frame having a cross member having a pair of ends, said cross member extending beneath said top surface normal to said longitudinal axis;
- at least one post extending upwardly from one of said pair of ends;
- a shock absorbing member mounted to said post, said shock absorbing member being spaced apart from said dock;
- means for mounting said cross member to said marine structure.

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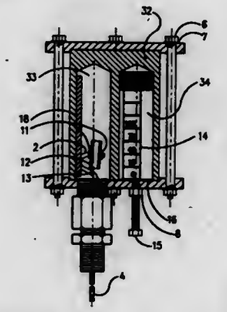
5,497,724
**AFT SEATING**
Charles N. Brown, Mims, and Ronald M. Berman, Merritt Island, both of Fla., assignors to Ray Industries, Inc., Knoxville, Tenn.
Continuation of Ser. No. 302,591, Sep. 8, 1994, abandoned.
This application Nov. 9, 1994, Ser. No. 336,790
Int. Cl.[6] B63B *17/00*
U.S. Cl. 114—343 20 Claims



1. A combination aft seating arrangement, storage units and aft vessel design, comprising:
- sunpad means for providing an area for at least one person to lie;
- bench means for providing a sitting area for at least one person, said bench means operatively associated with said sunpad means and disposed in front of said sundeck means; and
- movable means for providing a single person seat in a low position, said movable means operatively associated with said sunpad means in a high position to provide an extended lying area for a plurality of people.

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5,497,725
**SIGHT INDICATOR**
Terry J. Theisen, 2618 Teague, Houston, Tex. 77041; Joe D. Dumoit, 6507 Northway, Spring, Tex. 77389, and David M. Denning, 19426 Whitewood, Spring, Tex. 77379
Filed Jun. 17, 1994, Ser. No. 261,932
Int. Cl.[6] G01D *21/00*; F16K *37/00*
U.S. Cl. 116—277 5 Claims



1. A device comprising:
a rod for contacting a tank vent pallet at a distal end,
a first magnet affixed to a proximal end of said rod, said rod and said first magnet being slidably mounted within a first chamber in a transparent body to allow linear movement of said rod and first magnet therein in response to movement of said pallet,
a second chamber in said transparent body adjacent to and extending along said first chamber, and
means for mounting a set of vertically positioned rotationally mounted wafers in said second chamber, each of said wafers comprising an individual second magnet having two sides with opposite polarities and distinguishable indices on each side, said set being positioned adjacent to and having a pole of

each second magnet within a magnetically actuatable distance of one pole of said first magnet.

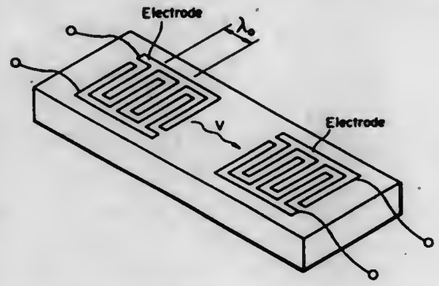
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5,497,726

## METHOD OF MANUFACTURING A SURFACE ACOUSTIC WAVE ELEMENT

Shinichi Shikata; Akihiro Hachigo; Hideaki Nakahata, and Kenjiro Higaki, all of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Division of Ser. No. 117,226, Sep. 3, 1993, Pat. No. 5,343,107. This application May 11, 1994, Ser. No. 240,826
Claims priority, application Japan, Sep. 11, 1992, 4-243319
Int. Cl.[6] C30B *23/04;29/04;29/02*
U.S. Cl. 117—89 16 Claims




1. A method of manufacturing a surface acoustic wave element, comprising the following steps:
epitaxially forming a diamond layer on a substrate; and
selectively epitaxially forming a copper layer on a portion of a surface of said diamond layer to form an electrode of said surface acoustic wave element.

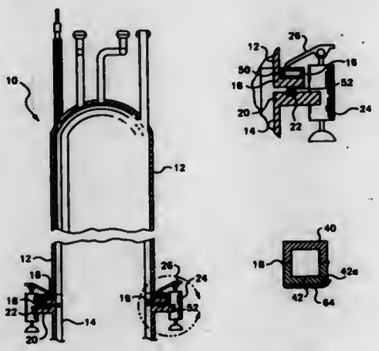
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5,497,727

## COOLING ELEMENT FOR A SEMICONDUCTOR FABRICATION CHAMBER

Mark Mayeda, Cupertino, and Rennie Barber, Milpitas, both of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Filed Sep. 7, 1993, Ser. No. 118,362
Int. Cl.[6] C23C *16/00*
U.S. Cl. 118—733 6 Claims



1. A method for maintaining a seal interface between a flanged glass vessel and a metal vessel, of a semiconductor fabrication chamber the method comprising the steps of:
providing a cooling element having at least one cooling surface; and
providing a thermal contact between said cooling surface and said glass vessel;
wherein the thermal contact is a coating of a thermally conductive material.

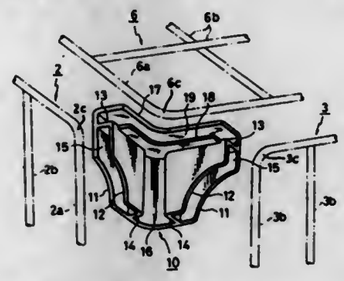
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5,497,728

## PET CAGE

Kenichi Watanabe, Yokohama, Japan, assignor to Tokyo Pet Kabushiki Kaisha, Japan

Filed Jun. 27, 1994, Ser. No. 266,184
Claims priority, application Japan, Jul. 5, 1993, 5-036608 U
Int. Cl.[6] A01K *1/03*
U.S. Cl. 119—17 6 Claims



1. A pet cage comprising:
at least five panels comprising one top panel and four side panels, each of which further comprises a metal wire outer frame, and vertical and horizonal metal wires that crisscross each other in the outer frame;
corners each defined by a common vertex of three abutting panels; and
a one-piece molded corner connector having three engagement grooves in which the metal wires of the outer frames of three of the panels fit to enclose the respective corner.

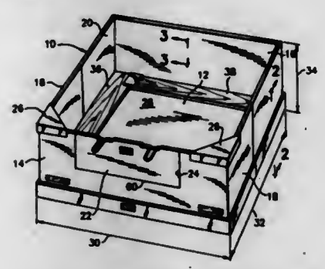
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5,497,729

## COLLAPSIBLE WHELPING BOX

Catherine S. Lord, 1122 Ramapo Valley Rd., Mahwah, N.J. 07430

Filed Oct. 20, 1994, Ser. No. 326,195
Int. Cl.[6] A01K *1/02*
U.S. Cl. 119—20 17 Claims



1. A whelping box having component parts capable of arrangement in a highly compact configuration of prescribed length and width for shipping and storage within a package having dimensions corresponding to said prescribed length and width, and ready erection into an erect configuration having desired dimensions, including height, side-to-side span and front-to-back span, the prescribed length corresponding to said height and the prescribed width corresponding to at least one of said spans, the whelping box comprising:
a bottom wall member including bottom panels, the bottom wall member having dimensions corresponding to the said side-to-side span and said front-to-back span when the bottom wall member is in an erect configuration with the bottom panels extending generally side-by-side in a common plane to establish a peripheral edge along the perimeter of the bottom wall member, the peripheral edge having a peripheral edge contour;
a hinge between the bottom panels, the hinge having a hinge axis such that the bottom panels are foldable about the hinge axis into juxtaposition with one another to place the bottom wall member into a collapsed configuration;
a generally tubular wall member having an upper end and a lower end opposite the upper end, a longitudinal axis extending between the upper end and the lower end, the upper end and the lower end being spaced apart longitudinally a distance corresponding to said height, and wall panels extending essentially parallel to the longitudinal axis between the upper end and the lower end, the wall panels including a front panel, a back panel opposite the front panel, and side panels opposite one another, the front and back panels being spaced apart laterally a distance corresponding to said front-to-back span and the side panels being spaced apart laterally a distance corresponding to said side-to-side span to establish a peripheral edge along the lower end of the tubular wall member, the peripheral edge of the tubular wall member having a peripheral edge contour matching the peripheral edge contour of the bottom wall member when the tubular wall member is in an erect configuration;
further hinges between adjacent panels of the tubular wall member, each further hinge having a longitudinal hinge axis such that corresponding adjacent panels of the tubular wall member are foldable about a corresponding hinge axis into juxtaposition with one another to place the tubular wall member in a collapsed configuration;
the front wall panel, the back wall panel and the bottom wall panels each having a length and width not exceeding said prescribed length and width so that the length and width of the bottom wall member in the collapsed configuration and the length and width of the tubular wall member in the collapsed configuration do not exceed said prescribed length and width;
selectively attachable and detachable fastener elements for selectively securing the tubular wall member, in the erect configuration, to the bottom wall member in the erect configuration thereof, along the matching peripheral edge contours;
at least two rails, each rail having a length and width not exceeding the prescribed length and width of the package, each rail having opposite ends for juxtaposition with opposite panels of the tubular wall member, intermediate the upper and lower ends of the tubular wall member, when the tubular wall member is in the erect configuration; and
selectively attachable and detachable further fastener elements for selectively securing the opposite ends of the rails between the juxtaposed opposite panels, intermediate the upper and lower ends of the tubular wall member, when the tubular wall member is in the erect configuration, to lock the tubular wall member in the erect configuration while establishing a protected space between each rail and the erected bottom wall member.



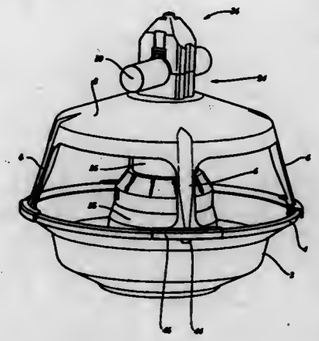
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5,497,730

## FEEDING DEVICE FOR POULTRY

Antoine A. van Daele, and Jean-Paul A. P. Martens, both of Eeklo, Belgium, assignors to Roxell, N.V., Maldegem, Belgium

Filed May 27, 1994, Ser. No. 250,597
Claims priority, application Netherlands, May 28, 1993, 9300921
Int. Cl.[6] A01K *39/01*
U.S. Cl. 119—53 11 Claims



1. A feeding device for poultry for use with a feed supply system having a horizontal feed supply tube, in particular for turkeys, comprising:
a substantially dish-shaped pan having a rim;
a feed drop tube arranged centrally above the pan and having a vertically directed centre line, the upper end of the feed drop tube being adapted to be in open connection with the horizontal feed supply tube of the feed supply system, and the lower end thereof being open and extending above the pan; and
connecting means for connecting the pan with the feed supply tube, which connecting means comprise support arms extending to the pan, wherein the support arms, at their ends directed towards the pan, are each provided with two transverse arms extending in opposite directions, the transverse arms being provided with hook lugs for gripping around the rim of the pan at one side of the pan;
at least one supporting lip for bearing against the pan, said at least one supporting lip carried on a member selected from the group consisting of said support arms and said transverse arms.

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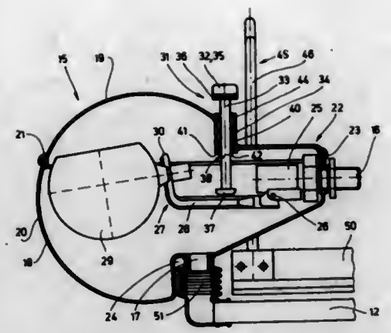
5,497,731

## WATER STORAGE TANK FOR AN ANIMAL WATERING TROUGH

Egon Schumacher, Barnstorf, Germany, assignor to Lubing Maschinenfabrik Ludwig Bening GmbH & Co. KG, Barnstorf, Germany

Filed Sep. 9, 1993, Ser. No. 118,526
Claims priority, application Germany, Sep. 10, 1992, 9212208 U
Int. Cl.[6] A01K *7/00*
U.S. Cl. 119—78 19 Claims

1. A water storage container for an animal watering trough, said container comprising:
a housing having a water inflow aperture formed therein for receiving water into said container supplied thereto at a first water pressure, said housing having a water outflow aperture formed therein for supplying water contained in said container to an animal watering trough at a second water pressure;



regulating means movably mounted in said housing for automatically regulating the amount of water entering said container through the water inflow aperture; and

retaining means movably mounted to said container for retaining said regulating means in an inoperative position to thereby prevent said regulating means from regulating the amount of water entering said container through the water inflow aperture, said retaining means comprising a first portion disposed outside of said container and a second portion, mechanically coupled by a mechanical coupling means to said first portion, disposed inside of said container proximate a portion of said regulating means such that a force applied to said first portion is translated to said regulating means whereby said regulating means is retained in the inoperative position.

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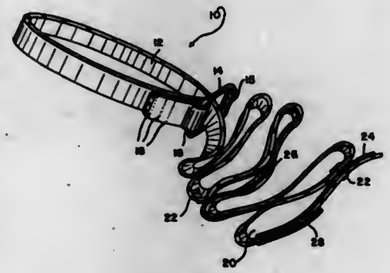
**5,497,732**
**PORTABLE DOG RUN**
**Patrick Moffre, 64 Longwood Dr., Clifton Park, N.Y. 12065, and Douglas Schreiber, 7 Newton Rd., Latham, N.Y. 12110**
**Filed Jun. 21, 1994, Ser. No. 263,194**
**Int. Cl.[6] A01K 27/00**
**U.S. Cl. 119—784** **8 Claims**



1. A portable apparatus for exercising animals comprising:
a spool unit with a rotatable spool located within said spool unit;
a flexible elongate member, wrapped about said spool, said elongate member extends from said spool unit for use as an animal exerciser and retracts into said spool unit for portability;
a first end of said flexible elongate member attached to said spool and a second end of said flexible elongate member attached to a first connector means for releasably attaching said flexible elongate member to a first structure when extended from said spool unit;
a quick release connector means attached to said spool unit, for releasably attaching said spool unit to a second structure; and
a leash having a first leash connector means located at one end of the leash for slidably attaching to said flexible elongate member in a manner to allow the one end of the leash to slide along a longitudinal axis of said flexible elongate member while both the first connector means and the quick release connector means are attached to the first and second structures respectively, said leash having a second leash connector means located at another end of the leash for attaching an animal thereto.

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**5,497,733**
**ANIMAL CONTROL, TRAINING APPARATUS AND METHOD OF USE**
**Harold L. Hull, 401 Canyon Way #43, Sparks, Nev. 89434, and Curt D. Torvick, P.O. Box 8140, Reno, Nev. 89507**
**Filed Jul. 5, 1994, Ser. No. 270,477**
**Int. Cl.[6] A01K 27/00**
**U.S. Cl. 119—793** **14 Claims**

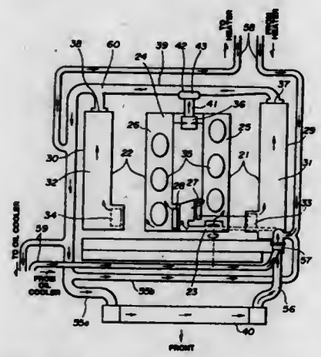


1. An animal control device comprising:
an elongated flexible flat member being of sufficient length to form a collar and a leash, said flexible flat member having first and second opposite surfaces,
said flexible flat member adapted to assume two different position including a first position wherein said flexible flat member is wrapped substantially completely upon itself around an animal's neck to form a collar and a second position wherein said flexible flat member has a generally forward portion thereof forming a choke collar wrapped around an animal's neck and a generally rearward portion thereof forming a leash extending away from the animal's neck to be manually grasped by an individual;
a link member secured to one end portion of said flexible flat member and defining an opening through which said flexible flat member is received;
said flexible flat member constructed and arranged so as to be able to extend from said one end portion thereof around an animal's neck and through said opening in said link member so that a forward portion of said first surface of said flexible flat member between said one end portion and a portion of said flexible flat member that extends through said opening is adapted to be substantially disposed in engagement with said animal's neck,
said flexible flat member constructed and arranged to be folded back on itself generally at the portion thereof that extends through said opening in said link member so that a forward portion of said second surface of said flexible flat member between said one end portion and the portion of the flexible flat member that extends through said opening is engaged by more rearward portions of said second surface than said forward portion of said second surface when said flexible flat member forms said collar in said first position;
a first fastener means disposed on said first surface of said flexible flat member at least at an intermediate portion of said flexible flat member so as to face outwardly away from the animal's neck when the flexible flat member is disposed around the animal's neck and folded back on itself to form the collar in the first position as aforesaid; and
a second fastener means disposed on said second surface of said flexible flat member at least at a portion of said flexible flat member disposed more rearwardly than said first fastener means and adapted to be brought into engagement and secured with said first fastener means when said flexible flat member is completely wrapped around the animal's neck while being folded back on itself to form the collar in the first position as aforesaid,
said flexible flat member being manually movable from said first position to said second position by an individual grasping said rearward portion of the flexible flat member in said first position and unsecuring said second fastener means from said first fastener means and subsequently pulling said rearward portion so that said flexible flat member spins around the animal's neck until it assumes the second position as said leash and choke collar.



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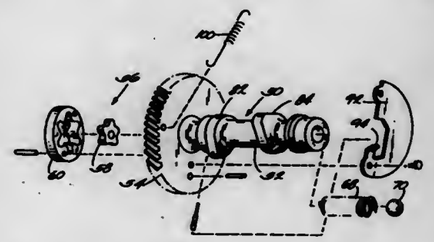
**5,497,734**
**COOLING SYSTEM FOR LIQUID-COOLED ENGINE**
**Hiroshi Okada, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan**
**Filed Dec. 13, 1994, Ser. No. 357,293**
**Claims priority, application Japan, Dec. 22, 1993, 5-324800; Dec. 22, 1993, 5-324801; Dec. 27, 1993, 5-331803**
**Int. Cl.[6] F01P 3/02**
**U.S. Cl. 123—41.1** **10 Claims**



1. A cooling system for a liquid-cooled engine, comprising:
a cylinder head water jacket;
a cylinder block water jacket;
a water pump arranged for forcing cooling water from its pump outlet to each of the water jackets;
a radiator thermostat for restricting circulation of cooling water through a radiator when the engine is cold;
a first return passage for returning cooling water coming from said cylinder head water jacket to a pump inlet of said water pump, said radiator being disposed between said water pump and said first return passage for removing heat from cooling water flowing therethrough;
a second return passage for returning cooling water coming from said cylinder block water jacket to the pump inlet, said second return passage joining said first return passage at a junction so that a flow of cooling water coming from said cylinder block water jacket joins a flow of cooling water coming from said cylinder head water jacket; and
thermostatic valve means disposed in said junction of said first and second return passages for selectively passing through and blocking a flow from said second return passage and having a thermosensitive portion exposed to said first return passage so that a fluid communication between said first and second return passages is established when a temperature of cooling water flowing through said first return passage is above a predetermined temperature.

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**5,497,735**
**INTERNAL COMBUSTION ENGINE FOR PORTABLE POWER GENERATING EQUIPMENT**
**Robert Kern, Waukesha; Gerald Ruehlow, Oconomowoc; Herb Hoenisch, and Mark Sarder, both of Waukesha, all of Wis., assignors to Generac Corporation, Waukesha, Wis.**
**Division of Ser. No. 95,821, Jul. 21, 1993, Pat. No. 5,317,999, which is a continuation of Ser. No. 897,369, Jun. 11, 1992, abandoned. This application Jun. 3, 1994, Ser. No. 254,657**
**Int. Cl.[6] F01L 1/047; F16H 53/00**
**U.S. Cl. 123—90.6** **1 Claim**

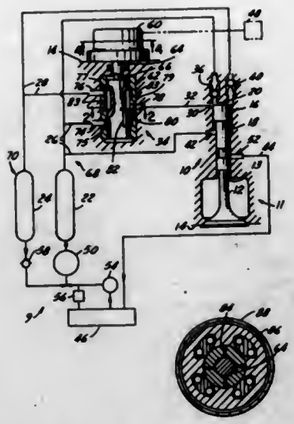


1. In an internal combustion engine having a cylinder, a piston mounted for reciprocation within the cylinder, a crankshaft operatively coupled through a connecting rod to the piston for rotational movement in response to reciprocation of the piston, one or more valves associated with the cylinder, and a camshaft operatively coupled to the crankshaft for actuating the valve, the improvement comprising forming the camshaft in two separate pieces, the first piece being formed of a first material and defining at least one cam lobe, the second piece being formed of a powdered metal and defining a gear for receiving motive power therethrough, said first and second pieces being joined to form a unitary structure having a cam lobe portion formed of said first material and a gear portion formed of said powdered metal.

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**5,497,736**
**ELECTRIC ACTUATOR FOR ROTARY VALVE CONTROL OF ELECTROHYDRAULIC VALVETRAIN**
**John M. Miller, Saline, and Ross M. Stuntz, Birmingham, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.**
**Filed Jan. 6, 1995, Ser. No. 369,640**
**Int. Cl.[6] F01L 9/02**
**U.S. Cl. 123—90.13** **13 Claims**

1. An electrohydraulically operated valve control system for an internal combustion engine, the system comprising:
a high pressure hydraulic branch and a low pressure hydraulic branch, having a high pressure source of fluid and a low pressure source of fluid, respectively;
a cylinder head member adapted to be affixed to the engine and including an enclosed bore and chamber;
an engine valve shiftable between a first and a second position within the cylinder head bore and chamber;
a hydraulic actuator having a valve piston coupled to the engine valve and reciprocates within the enclosed chamber which thereby forms a first and a second cavity which vary in volume as the engine valve moves;
a rotary valve assembly mounted to the cylinder head member including a sleeve and a valve body mounted within the sleeve, with the valve body including at least one high pres-



sure groove and at least one low pressure groove and with the sleeve including three channels and at least one window operatively engaging the third sleeve channel;

the cylinder head member including port means for selectively connecting the high pressure branch and the low pressure branch to the high and low pressure grooves, respectively, and connecting the high and low pressure grooves to the first cavity, with the cylinder head member further including a high pressure line extending between the second cavity and the high pressure branch;

a motor having a single phase, four poles and means for cooperatively engaging the rotary valve; and

an electronic circuit connected to the motor for selectively activating and deactivating the motor in timed relation to the engine operation.

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5,497,737

**INTAKE AND EXHAUST VALVES CONTROL OF INTERNAL COMBUSTION ENGINE**

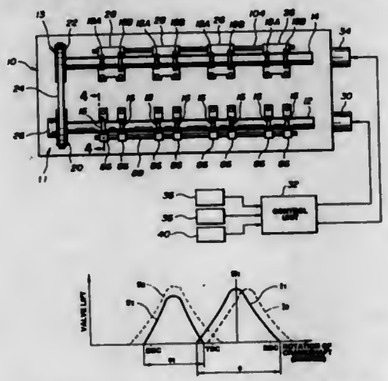
Makoto Nakamura, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 7, 1994, Ser. No. 319,528

Claims priority, application Japan, Jan. 14, 1993, 5-256580

Int. Cl.[6] F01L *1/34*; F02D *13/02*

U.S. Cl. 123—90.15 3 Claims



1. An apparatus for operating an intake valve and an exhaust valve of an internal combustion engine, the apparatus comprising:

sensing means for generating an output distinguishing an engine operation under a cold condition from other engine operations;

an intake valve gear for the intake valve, said intake valve gear incorporating an intake variable valve timing mechanism;

an exhaust valve gear for the exhaust valve, said exhaust valve gear incorporating an exhaust variable valve timing mechanism; and

means operatively responsive to said output of said sensing means to condition said exhaust variable valve timing mechanism for providing an advanced closing timing of the exhaust valve before a top dead center of an engine piston stroke, and at the same time condition said intake variable valve timing mechanism for providing an advanced opening timing of the intake valve which is disposed before the top dead center of the engine piston stroke to provide a predetermined valve overlap between the exhaust and intake valves, whereby hydrocarbon emission via the exhaust valve is reduced remarkably without deteriorating stable operation of the engine.

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5,497,738

**VCT CONTROL WITH A DIRECT ELECTROMECHANICAL ACTUATOR**

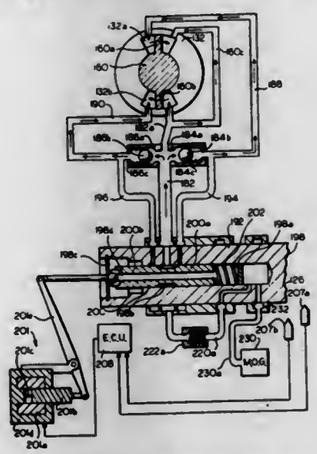
Edward C. Siemon, and Stanley B. Quinn, Jr., both of Ithaca, N.Y., assignors to Borg-Warner Automotive, Inc., Sterling Heights, Mich.

Continuation-in-part of Ser. No. 940,273, Sep. 3, 1992, Pat. No. 5,218,935. This application May 3, 1993, Ser. No. 56,635

The portion of the term of this patent subsequent to Jun. 15, 2010, has been disclaimed.

Int. Cl.[6] F01L *1/34*

U.S. Cl. 123—90.17 13 Claims



1. An internal combustion engine, comprising:

a crankshaft, said crankshaft being rotatable about an axis;

a camshaft (**126**), said camshaft being rotatable about a second axis, said camshaft being subject to torque reversals during rotation thereof;

a vane (**160**), said vane having first and second circumferentially spaced apart lobes (**160***a*, **160***b*), said vane being attached to said camshaft, said vane being rotatable with said camshaft and being non-oscillatable with respect to said camshaft;

a housing (**132**), said housing being rotatable with said camshaft and being oscillatable with respect to said camshaft, said housing having first and second circumferentially spaced apart recesses (**132***a*, **132***b*), each of said first and second recesses receiving one of said first and second lobes and permitting oscillating movement of said one of said first and second lobes therein;

means for transmitting rotary movement from said crankshaft to said housing; and,



means for controlling the oscillation of said housing, said control means being reactive to torque reversals in said camshaft for varying the position of said housing relative to said camshaft, said control means comprising:

a spool valve body (**190**);

a spool (**200**), said spool being reciprocable within said body and having first and second spaced apart lands (**200***a*, **200***b*), said spool further having a vent to atmosphere (**198***d*);

a first return line means (**194**) extending from one of said first recess and said second recess to said spool valve body, one of said first and second lands blocking flow through said first return line means in a first range of positions of said spool within said valve body and permitting flow through said first return line means in a second range of positions of said spool within said valve body;

a second return line means (**196**) extending from the other of said first recess and said second recess to said valve body, the other of said first and second lands blocking flow through said second return line means in said second range of positions of said spool within said valve body, permitting flow through said second return line means in a first portion of said first range of positions of said spool within said valve body, and blocking flow through said second return line means in a second portion of said first range of positions of said spool within said valve body;

an inlet line means (**182**) extending from said valve body to each of said first recess and said second recess, said inlet line means permitting hydraulic fluid to flow from said valve body to said each of said first recess and said second recess regardless of the position of said spool, said inlet line means having check valve means (**184**, **186**) for preventing the flow of hydraulic fluid from each of said first recess and said second recess to said valve body;

means for sensing (**207***a*, **207***b*) the positions of said crankshaft and said camshaft;

an engine control unit (**208**), said engine control unit for receiving information from said sensing means and for calculating a relative phase angle between said crankshaft and said camshaft using said information;

an electromechanical actuator (**201**), said electromechanical actuator comprising a variable force solenoid, said variable force solenoid for controlling the position of said spool in response to a signal issued from said engine control unit; and,

means for biasing (**202**) said spool valve, said biasing means for urging said spool valve to a full advance position during periods when said electromechanical actuator is deenergized.

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5,497,739

**KICK STARTING MEANS**

Werner Müller, Ebekirchener Strasse 16, 86669 Klingsmoos, Germany

Filed Jun. 29, 1994, Ser. No. 268,768

Claims priority, application Germany, Jul. 1, 1993, 43 21 993.4

Int. Cl.[6] F02N *3/04*

U.S. Cl. 123—185.6 10 Claims

1. A kick starting apparatus for a change gear connection in motorcycles, comprising:

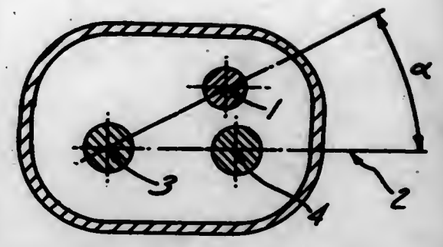
a cover attachable to a change gear connection;

a kick starting shaft which in a mounted state extends to the inside of a cover on a kick starting axis;

a wheel attachable stationary on the kick starting shaft;

a pinion attachable on a gear drive axle in such a way that said pinion runs in mesh with the wheel;

a coupling means which transmits a rotary movement of the kick starting shaft over the wheel and the pinion to a gear drive axle during operation of the kick starting means;



wherein the kick starting axis is located above a gear shaft level formed by the gear drive axle and the gear driven axle at an angle (α) between the gear shaft level and a level of the kick starting axis and the gear drive axle of about 10° to 90°, so that an exhaust pipe assembly of the motorcycle does not interfere with the operation of the kick starting means.

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5,497,740

**CERAMIC VALVE FOR INTERNAL COMBUSTION ENGINES HAVING A REDUCED TENDENCY TO STRESS FRACTURE**

Thomas Thiemeier, Hattersheim am Main, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

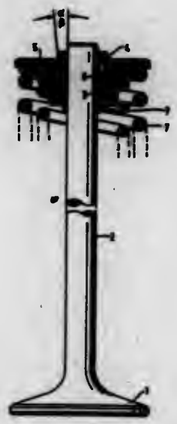
PCT No. PCT/EP93/03331, § 371 Date Sep. 2, 1994, § 102(e) Date Sep. 2, 1994, PCT Pub. No. WO93/18282, PCT Pub. Date Sep. 16, 1993

PCT Filed Feb. 11, 1993, Ser. No. 290,784

Claims priority, application Germany, Mar. 7, 1992, 42 07 213.1

Int. Cl.[6] F01L *3/10*

U.S. Cl. 123—188.13 5 Claims



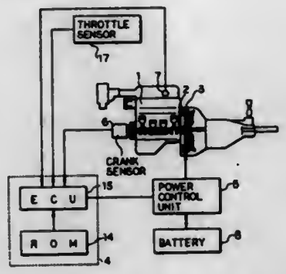
1. A ceramic valve for internal combustion engines having a spring retainer provided with a conical bore frictionally linked to a cylindrical valve stem, wherein said cylindrical valve stem has a constant circular cross section, and is surrounded by a collet having a conical outer profile on which the spring retainer provided with a conical bore rests.

5,497,741

## TORQUE CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Hiroshi Tashiro, Nagoya; Takaji Murakawa, Kariya, and Toyoji Yagi, Anjo, all of, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 18, 1994, Ser. No. 276,456
Claims priority, application Japan, Jul. 19, 1993, 5-177927
Int. Cl.[6] F02B 75/06
U.S. Cl. 123—192.1 31 Claims




1. A torque control system for an engine in which an air-fuel mixture is increased in response to a torque increase command, said system comprising:

torque applying means for applying torque to an engine;

ignition detecting means for detecting ignition timings of said engine;

torque applying start commanding means for issuing a torque application operation start command to said torque applying means in response to said torque increase command; and

torque application stop commanding means for issuing a torque application operation stop command to said torque applying means immediately after detection of an ignition timing of the increased air-fuel mixture so that torque application by said torque applying means is stopped thereby.

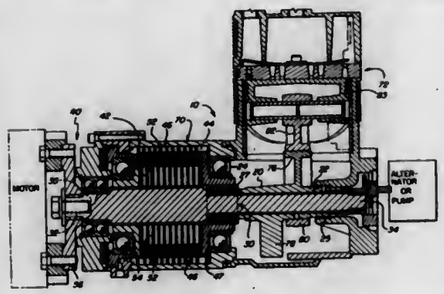
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5,497,742

## DRIVE THROUGH CRANKSHAFT

Ronald S. Plantan, Charlotte, N.C., assignor to Midland Brake, Inc., Kansas City, Mo.

Filed Dec. 19, 1994, Ser. No. 358,859
Int. Cl.[6] F02B 75/32
U.S. Cl. 123—197.5 16 Claims




1. A drive through crankshaft assembly, comprising:

a hollow crankshaft having a cylindrical bore extending axially therethrough;

a drive shaft extending through said cylindrical bore of said crankshaft;

means for connecting said crankshaft to a first device to transmit mechanical power from said crankshaft to said first device;

means for connecting said drive shaft to a second device to transmit mechanical power from said drive shaft to said second device;

a clutch for engaging and disengaging with one of said crankshaft and said drive shaft to selectively provide or remove rotational power thereto;

a means for transmitting rotational power to the other of said crankshaft and said drive shaft.

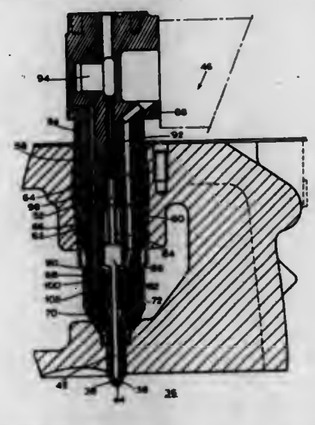
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5,497,743

## INJECTOR FOR SEPARATE CONTROL OF FLOW AND MOMENTUM

John M. Clarke, Chillicothe, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Dec. 27, 1994, Ser. No. 364,485
Int. Cl.[6] F02B 3/00
U.S. Cl. 123—294 30 Claims



1. A fuel injector comprising:

an injector housing having an inlet and an outlet, wherein the inlet is arranged to permit fuel to flow into the injector housing, and wherein the outlet is arranged to permit fuel to flow out of the injector housing into a combustion cylinder;

first flow controlling means for controlling the flow of fuel between the inlet and the outlet; and,

second flow controlling means for controlling the flow of fuel between the inlet and the outlet, and for independently cooperating with the first flow controlling means in order to permit momentum and flow rate of the fuel to be independently controlled.

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5,497,744

## FUEL INJECTOR WITH AN INTEGRATED SPARK PLUG FOR A DIRECT INJECTION TYPE ENGINE

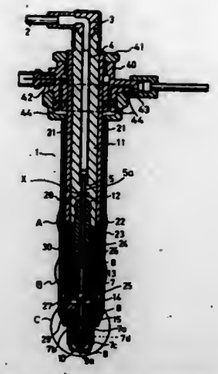
Hideo Nagaosa; Kazuhisa Mogi; Takahiro Kushibe, all of Susono; Norihiko Nakamura, and Kenichi Nomura, both of Mishima, all of, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Nov. 28, 1994, Ser. No. 345,186
Claims priority, application Japan, Nov. 29, 1993, 5-298080; Nov. 29, 1993, 5-298164
Int. Cl.[6] F02M 57/06
U.S. Cl. 123—297 10 Claims

1. A fuel injector with an integrated spark plug for a direct injection type engine, comprising:

an electric conductor disposed along the central axis, said electric conductor being electrically coupled with a cable for supplying electric current for a spark discharge;





a needle valve made of conductive material, said needle valve being electrically coupled to said electric conductor through a return spring made of conductive material, said needle valve being reciprocally moved by a solenoid;

a needle housing made of conductive material, said needle housing receiving said needle valve, said needle housing having a nozzle for injecting fuel and a center electrode at its end;

a grounding electrode disposed to oppose said center electrode;

an insulator disposed outside of said electric conductors;

outer cylinder disposed outside of said insulators, said outer cylinder being composed of an inner wall which adheres to said insulator and an outer wall which is placed outside of said inner wall with a uniform clearance which is used as a fuel passage; and

a connector assembly for connecting a fuel line and an electric cable for supplying an electric current to said solenoid.

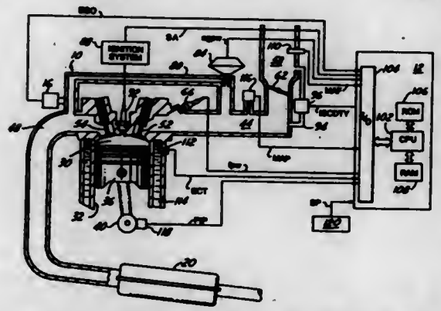
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5,497,745

## ENGINE CONTROL FOR ENHANCED CATALYST WARM UP WHILE MAINTAINING MANIFOLD VACUUM

Michael J. Cullen, Northville, and Alan R. Dona, Huntington Woods, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Feb. 24, 1995, Ser. No. 393,796
Int. Cl.[6] F02D 41/16; F02M 3/06; F02P 5/145
U.S. Cl. 123—339.11 17 Claims




1. A method for controlling an internal combustion engine having an ignition system responsive to an ignition timing signal and an exhaust coupled to a catalytic converter, comprising the steps of:

setting the ignition timing signal to an initial value as a function of engine operating parameters;

advancing the ignition timing signal beyond said initial value when an indication of engine intake manifold vacuum is below a threshold value; and

retarding the ignition timing signal when said manifold vacuum indication is greater than said threshold value.

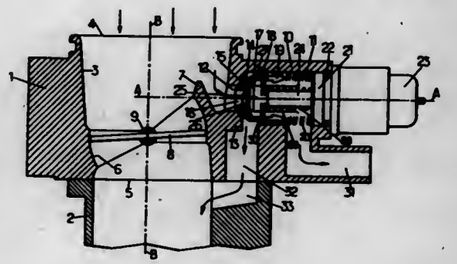
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5,497,746

## TWO-STAGE VALVE FOR FEEDING AIR TO INJECTORS OF AN INTERNAL COMBUSTION ENGINE

Pierre Semence, Chatou, and Jean-Pierre Jolgneau, Maule, both of, France, assignors to Magneti Marelli France, France

Filed Apr. 5, 1995, Ser. No. 416,980
Claims priority, application France, Apr. 6, 1994, 94 04018
Int. Cl.[6] F02M 3/00
U.S. Cl. 123—339.27 10 Claims



1. A two-stage valve for feeding air to at least one air-assisted injector for injecting fuel into an inlet manifold of a fuel injection system for an internal combustion engine, and for bypassing a throttle device which is movable in a duct, for regulating air supply to the inlet manifold, the valve comprising a body including a movable assembly comprising first and second pistons, each of said pistons being returned by resilient means towards a position of application, with minimal leakage, against first and second seats respectively, in order to reduce to a minimum communication between at least one air inlet in the body which is fed with air from upstream from the throttle device, and respective outlets from the body, the movable assembly being movable by an actuator against action of the resilient return means for placing each outlet in communication with the air inlet by spacing the corresponding piston from its corresponding seat, only a first of said pistons being connected to the actuator and moving integrally with first stop means which, after a first stroke of the first piston from a position of application to the first seat, cooperates with second stop means which move integrally with the second piston to entrain the second piston with the first piston over a second stroke, from the position of application of the second piston to the second seat.

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5,497,747

## ENGINE WITH MECHANICAL GOVERNOR

Kelichi Nakane; Kiyoshi Doi; Kiyonobu Iida, and Naoki Inoue, all of Sakai, Japan, assignors to Kubota Corporation, Osaka, Japan

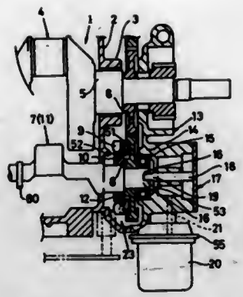
Filed Sep. 16, 1994, Ser. No. 305,958
Claims priority, application Japan, Sep. 17, 1993, 5-230662
Int. Cl.[6] F02D 31/00
U.S. Cl. 123—363 4 Claims

1. An engine with a mechanical governor comprising:

a bearing boss (3) protruding from a front wall (2) of a crankcase (1);

a crankshaft (4) supported at front journal portion (5) by the bearing boss (3);

a crank gear (6) attached to a crankshaft (4) on a side of the front wall (2) opposite the crankcase (1);



an interlocking shaft (7) disposed within the crankcase (1) and extending through said front wall (2) in parallel to the crankshaft (4);

an input gear (8) attached to the interlocking shaft (7) with the crank gear (6) and the input gear (8) arranged coplanarly;

a governor weight (9) mounted to the input gear (8);

a governor sleeve (10) mounted to the interlocking shaft (7);

a balancer shaft (11) being used as the interlocking shaft (7) to which the governor sleeve (10) is mounted, the governor weight (9) being mounted to the rear surface (12) of the input gear (8), and the governor sleeve (10) being located behind the governor weight (9).

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**5,497,748**

## DEVICE FOR RECOGNISING THE ANGULAR POSITION OF A ROTATING PART

**Karl Ott, Markgroeningen; Erwin Schmuck, Waiblingen; Immanuel Krauter, Erbstetten, and Joerg Fuchs, Schwieberdingen, all of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany**

**PCT No. PCT/DE92/00885, § 371 Date Apr. 11, 1994, § 102(e) Date Apr. 11, 1994, PCT Pub. No. WO93/07449, PCT Pub. Date Apr. 15, 1993**

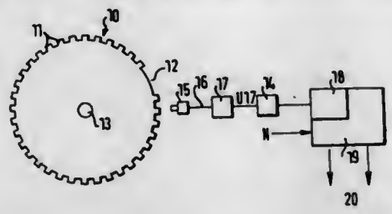
**PCT Filed Sep. 19, 1992, Ser. No. 211,729**

**Claims priority, application Germany, Jan. 10, 1991, 41 33 570.8**

**Int. Cl.[6] F02P 7/06; F02D 41/00; G01D 5/249**

**U.S. Cl. 123—414** **8 Claims**

1. A device for recognizing an angular position of a rotating part



of an internal combustion engine, comprising a rotating element connectable with crankshaft of an internal combustion engine for joint rotation therewith and provided with a plurality of angle marks substantially uniformly distributed around a periphery of said rotating element and also with at least one reference mark; a sensor scanning said angle marks during a rotation of said rotating element together with the crankshaft and producing output signals dependent on said scanned angle marks; and evaluating means receiving said output signals of said sensor and also receiving a signal from a camshaft of the internal combustion engine so as to provide time measurements for recognition of said reference mark and to evaluate a time sequence of said output signals, said evaluating control means being formed so that it provides counting procedures after the recognition of said reference mark, analyzes flanks of voltage pulses, and draws conclusions on a position of individual cylinders from a number of voltage pulses counted the number of said angle marks being n minus m wherein n is equal to 36 and m is equal to 2.

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**5,497,749**

## METHOD FOR CONTROLLING ENGINE IGNITION

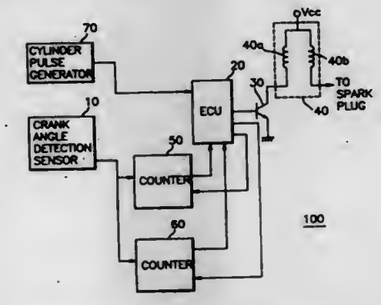
**Chang-Rae Kim, Seoul, Rep. of Korea, assignor to Hyundai Motor Co., Seoul, Rep. of Korea**

**Filed Jan. 3, 1995, Ser. No. 367,866**

**Claims priority, application Rep. of Korea, Dec. 31, 1993, 93-32029**

**Int. Cl.[6] F02P 5/145**

**U.S. Cl. 123—416** **1 Claim**




1. A method for controlling engine ignition for use in a engine system wherein the engine system includes a plurality of cylinders and a crank shaft coupled to the cylinders, comprising the steps of:

detecting a rotation angle of the crank shaft to thereby generate crank angle pulses having a period of 360/N degrees with N being a positive integer;

generating a cylinder pulse for identifying each of the cylinders, the cylinder pulse having a duration represented by an crank angle interval between a rising edge and a falling edge of the cylinder pulse and the cylinder pulse duration for each of the cylinders being different;

detecting the rising edge and the falling edge of each of the cylinder pulses to identify each of the cylinders;

initializing the counting of the number of crank angle pulses, once the falling edge of each of the cylinder pulses is detected;

determining an ignition timing for each of the cylinders in a unit of the period of the crank angle pulses to thereby obtain an integer portion and a decimal portion thereof;

comparing the integer portion with the number of crank angle pulses;

converting the decimal portion into an ignition time; and

generating an ignition signal at the ignition time when the number of crank angle pulses coincides with the integer portion.



**5,497,750**

## FUEL INJECTION DEVICE FOR INTERNAL COMBUSTION ENGINES

**Peter Mueller, Hallein, and Jaroslaw Hlousek, Golling, both of, Austria, assignors to Robert Bosch GmbH, Stuttgart, Germany**

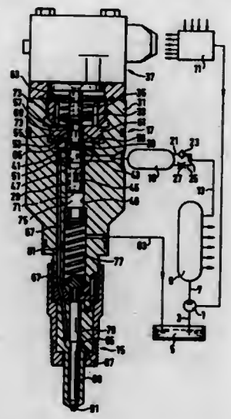
**Filed Nov. 14, 1994, Ser. No. 339,688**

**Claims priority, application Germany, Dec. 7, 1993, 43 41 543.1**

**Int. Cl.[6] F02M 7/00;41/00**

**U.S. Cl. 123—446** **14 Claims**

1. A fuel injection system for internal combustion engines having a high pressure fuel pump (1), which supplies fuel from a low pressure chamber (5) into a high pressure accumulation chamber (9), which communicates via high pressure lines (13) with injection valves (15), each of which include a housing, said injection valves protrude into the combustion chamber of the engine to be fed and whose opening and closing motion is controlled by an electrically triggered control valve (17) in said housing disposed in the high pressure line (13) at each injection valve (15), said control valve (17) has a piston-like valve member (29) with an annular rib (39) which includes transition faces, said transition faces are each embodied as valve sealing faces (41, 45), each of which cooperate with a respective valve seat (43, 59) structurally formed on said housing, said system includes an additional pressure storage chamber (19) at each injection valve (15), which is integrated into the high pressure line (13) between the high pressure accumulation chamber (9) and the injection valve (15), during pauses between injections, the control valve (17) at the injection valve (15) closes a communication between the additional pressure storage chamber (19) and a pressure chamber (87) inside the injection valve (15), which chamber (87) acts upon the valve member (79) of the injection valve (15) in the opening direction, and said control valve (17) opens up a communication between the pressure chamber (87) of the injection valve (15) and a relief chamber (75).



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**5,497,751**

## SAFETY CONTROL APPARATUS FOR RECIPROCATING ENGINE

**Yukio Ohtake, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan**

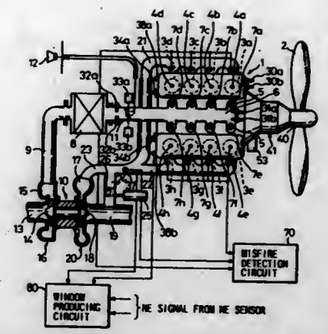
**Filed Feb. 27, 1995, Ser. No. 395,755**

**Claims priority, application Japan, Mar. 4, 1994, 6-034784**

**Int. Cl.[6] F02M 51/00**

**U.S. Cl. 123—479** **15 Claims**

1. A safety control apparatus equipped with a pair of control systems for an operation system and a standby system in order to safely control a multi-cylinder reciprocating engine, the pair of control systems comprising:




a first control unit and a second control unit for controlling the engine;

operation observation circuits for said two control units;

an output change-over circuit which is provided on the output sides of said first control unit and said second control unit, and sends the output of either said first control unit or said second control unit to the engine; and

a false normal state detection circuit for detecting a false normal state in which a normal signal is output to said observation circuits despite the fact that an abnormal control output is fed to the engine as a result of an abnormal operation in either said first control unit or said second control unit; wherein

said operation observation circuit determines that the control system which is now in operation is abnormal by relying upon a false normal state detection signal from said false normal state detection circuit, and works to change the engine control system over to said stand-by system via said output change-over circuit.

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**5,497,752**

## DEVICE FOR CONTROLLING FUEL INJECTION OF AN INTERNAL COMBUSTION ENGINE

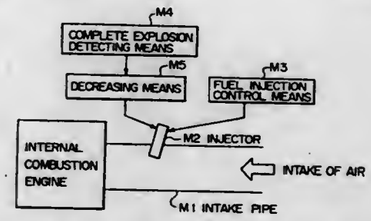
**Yasuo Sagisaka, Komaki; Masakazu Yamada, Nagoya; Masakazu Ninomiya, Kariya, and Kiyonori Sekiguchi, Okazaki, all of, Japan, assignors to Nippondenso Co., Ltd., Kariya, and Nippon Soken, Inc., Nishio, both of, Japan**

**Filed Jan. 21, 1994, Ser. No. 184,142**

**Claims priority, application Japan, Jan. 22, 1993, 5-009538**

**Int. Cl.[6] F02D 41/06**

**U.S. Cl. 123—491** **5 Claims**




1. A device for controlling fuel injection of an internal combustion engine comprising:

an injector that injects fuel into an intake pipe of said internal combustion engine;

fuel injection control means which controls a supplied amount of fuel to be injected through said injector, said supplied amount of fuel corresponding to a running condition of said internal combustion engine;

complete combustion detecting means that detects a complete combustion condition of said internal combustion engine at a start of said internal combustion engine; and

decreasing means that decreases said supplied amount of fuel injected through said injector during a period in which an amount of fuel adhered to wall surfaces of said intake pipe becomes reduced and after said complete combustion condition has been detected by said complete combustion detecting means, said decreasing means including adjusting means which decreases, immediately after said complete combustion condition has been detected, said supplied amount of fuel by an amount by which said amount of fuel that had been adhered to said wall surfaces of said intake pipe before said complete combustion condition is supplied to combustion chambers of said internal combustion engine.

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**5,497,753**

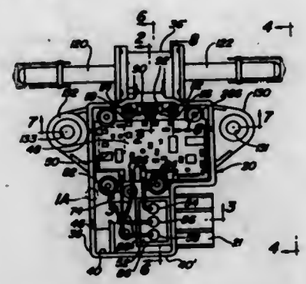
## ALCOHOL CONCENTRATION SENSOR FOR AUTOMOTIVE FUELS

**John J. C. Kopera, Rochester Hills, Mich., assignor to Chrysler Corporation, Highland Park, Mich.**

**Continuation of Ser. No. 125,089, Sep. 21, 1993, Pat. No. 5,408,758, which is a continuation of Ser. No. 844,958, Feb. 26, 1992, Pat. No. 5,255,656, which is a continuation of Ser. No. 722,013, Jun. 27, 1991, abandoned. This application Nov. 9, 1993, Ser. No. 149,432**

**Int. Cl.[6] F02M** *51/00*

**U.S. Cl. 123—494** **1 Claim**



1. A fuel sensor for measuring concentration of an additive to liquid fuel in a fuel system for an internal combustion engine for a vehicle, said vehicle and said engine having a chassis ground, said fuel sensor comprising an electronic oscillator circuit including an inductance coil coated with an electrically insulating, corrosion resistant coating, a fuel sensor signal voltage source connected to said coil and a capacitor element surrounding said coil, said capacitor element being connected to chassis ground;

said circuit having a resonant frequency that is a function of the inductance and the capacitance of the circuit; and

an air fuel mixture controller for said engine, a fuel supply line for said engine communicating with said air/fuel mixture controller;

said fuel sensor communicating with said controller and having a housing defining a fuel chamber in communication with and forming a part of said supply line;

said capacitor element and said coil being exposed to fuel in said chamber and cooperating to develop a capacitance between said capacitor element and said coated coil as said fuel acts as a dielectric, whereby leakage current in the developed capacitance is minimized;

said resonant frequency being a function of changes in the dielectric constant of said fuel due to changes in the concentration of said additive whereby said air/fuel mixture controller receives a control signal from said fuel sensor that indicates a change in fuel composition.

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**5,497,754**

## INTERNAL PRESSURE ADJUSTING SYSTEM FOR A FUEL TANK AND METHOD THEREOF

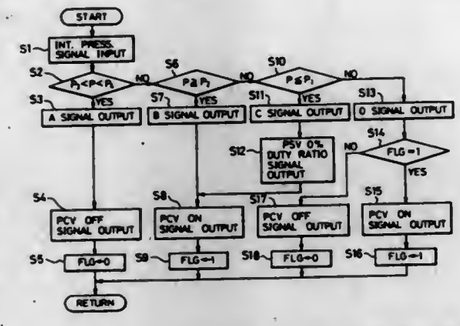
**Takenori Ito, Kawasaki, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Jan. 26, 1995, Ser. No. 378,263**

**Claims priority, application Japan, Jan. 31, 1994, 6-009519**

**Int. Cl.[6] F02M** *33/02*

**U.S. Cl. 123—520** **5 Claims**




1. An internal pressure adjusting device for a fuel tank mounted on a vehicle having, a canister connected to said fuel tank for adsorbing fuel vapor, a pressure sensor mounted on said fuel tank for sensing an internal pressure of an upper portion of said fuel tank and for producing a pressure signal, an air flow meter inserted in an intake passage of an engine for measuring an amount of induced air and for generating an air amount signal, a crank angle sensor mounted on said engine for detecting an engine speed and for producing an engine speed signal, a throttle sensor provided near a throttle valve for sensing an opening degree of said throttle valve and for outputting a throttle signal, coolant temperature sensor mounted on said engine for detecting an engine temperature and for generating a temperature signal, a normally-closed control valve interposed in a fuel vapor passage between said fuel tank and said canister for controlling an amount and pressure of fuel vapor generated in an upper portion of said fuel tank, and a purge solenoid valve connected between said canister and said intake passage for purging said fuel vapor into said intake passage, comprising:

internal pressure judging means responsive to said pressure signal for comparing said internal pressure with four predetermined threshold values of pressure and for generating a pressure signal corresponding to said each value;

purge solenoid valve driving means responsive to said air amount signal, said engine speed signal, said throttle signal, said temperature signal and said pressure signal for opening said purge solenoid valve when said engine is operating in a predetermined condition; and

pressure control valve driving means responsive to said pressure signal for opening and closing said pressure control valve so as to maintain said internal pressure at an optimum value without overflowing said fuel to outside and without damaging said fuel tank.

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**5,497,755**

## ENGINE CRANKCASE VENTILATION

**Ronald P. Maloney, Peoria, Ill., assignor to Caterpillar Inc., Peoria, Ill.**

**Filed May 26, 1995, Ser. No. 451,948**

**Int. Cl.[6] F01M** *13/00*

**U.S. Cl. 123—572** **15 Claims**

1. A crankcase ventilation system adapted for use with an internal combustion engine having a cylinder block defining a crankcase portion with blow-by gas therein and a plurality of cylinders, a piston reciprocally disposed within each of the cylinders and movable between a top dead center position and a bottom dead center position sequentially defining an intake stroke, a compression stroke, an expansion stroke, and an exhaust stroke, a head mounted in closing relation to the cylinder block and forming with the pistons a plurality of combustion chambers, and intake means having an open and a closed position operatively associated with each combustion chamber for permitting a flow of fresh air into each combustion chamber when in the open position, comprising:

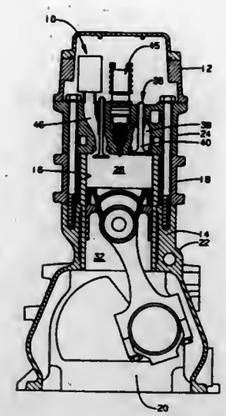
means defining a passage for fluid communication between the crankcase portion and one of the plurality of combustion chambers;

valve means disposed within the fluid communication means for controlling communication between the passage and the one combustion chamber, the valve means being movable between the closed and the open positions;

control means connected to the intake means for closing the intake means during a predetermined intake stroke; and

means for selectively moving the valve means to the open position to permit the blow-by gas to flow out of the crankcase portion and into the one combustion chamber during the predetermined intake stroke.





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**5,497,756**

## IGNITION COIL FOR AN INTERNAL COMBUSTION ENGINE

**Klaus Matthiesen, Blaichach, and Nikolaus Hantmann, Waltenhofen, both of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany**

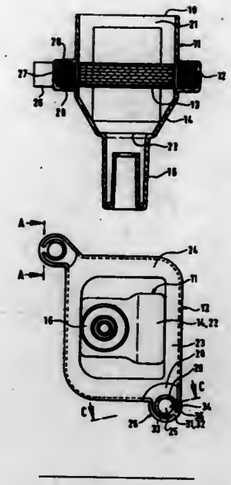
**Filed Jan. 3, 1995, Ser. No. 367,696**

**Claims priority, application Germany, Feb. 17, 1994, 44 04 957.9**

**Int. Cl.[6] F02P** *3/04;* **H01F** *27/00*

**U.S. Cl. 123—634** **8 Claims**

1. An ignition coil for an internal combustion engine, comprising a housing composed of synthetic plastic material; at least one main core provided with coaxial primary and secondary coils; a return flux core surrounding said main core; a dome extending from said housing and having a high voltage connection connected with said secondary coil and associated with a spark plug of an internal combustion engine, said main core and said return flux core being composed of a plurality of coated lamellas, said return flux core being provided with recesses extending through said lamellas for passage of mounting means for the ignition coil, said recesses each being coated with a bushing, said bushings being formed as synthetic plastic injection molded parts which are connected of one-piece with a synthetic plastic jacket of said return flux core.



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**5,497,757**

## APPARATUS FOR CORRECTING AMOUNT OF FUEL INJECTION OF INTERNAL COMBUSTION ENGINE IN ACCORDANCE WITH AMOUNT OF FUEL-VAPOR PURGED FROM CANISTER AND FUEL TANK

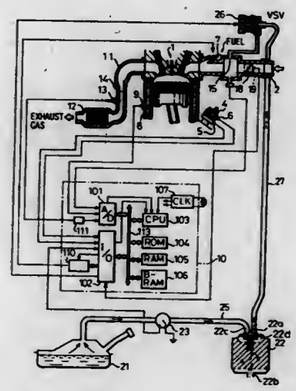
**Akinori Osanai, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan**

**Filed Mar. 13, 1995, Ser. No. 403,097**

**Claims priority, application Japan, Mar. 14, 1994, 6-042603; Mar. 8, 1995, 7-048491**

**Int. Cl.[6] F02D** *41/14;* **F02M** *25/08*

**U.S. Cl. 123—674** **18 Claims**




1. An apparatus for correcting an amount of fuel injection, disposed inside an internal combustion engine the amount of fuel injection of which is calculated by air-fuel ratio feedback control means and the air-fuel ratio of which is controlled by the amount of fuel injection so calculated, for calculating an anticipated correction amount of the amount of fuel injection in accordance with vapor fuel amounts purged from a canister and from a fuel tank and correcting the amount of fuel injection by said anticipated correction amount, comprising:

a canister having a tank port into which a vapor fuel generated in a fuel tank flows through a vapor passage, a purge port for purging the vapor fuel into an intake passage of said internal combustion engine through a purge passage and an atmospheric port communicated with the atmosphere, wherein said

tank port and said purge port are communicated through a relay chamber and a trapping material of said vapor fuel is interposed between said relay chamber and said atmospheric port;

a control valve disposed at an intermediate part of said purge passage, and capable of adjusting the passage area of said purge passage by changing an opening thereof;

tank side correction amount calculation means for calculating a correction amount of the amount of fuel injection for correcting an air-fuel ratio which changes when the vapor fuel generated in said fuel tank is directly supplied to said intake passage through said control valve;

canister side correction amount calculation means for calculating a correction amount of the amount of fuel injection which changes when the vapor fuel emitted from said trapping material of said canister is supplied to said intake passage through said control valve; and

anticipated correction amount calculation means for inputting an opening signal from said control valve and the correction amounts of the amounts of fuel injection from both of said tank side correction amount calculation means and said canister side correction amount calculation means, and anticipating the correction amount of the amount of fuel injection after opening of said control valve changes, on the basis of said correction amount on the tank side and the correction amount on the canister side.

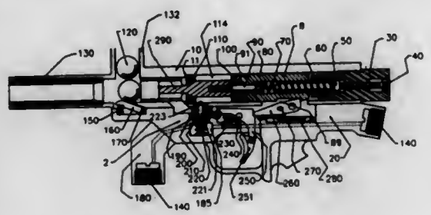
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**5,497,758**

## COMPRESSED GAS POWERED GUN

**Jerrold M. Dobbins, and Joseph M. Dobbins, both of 9000 S. BlackCat Rd., Nampa, Id. 83687**

**Filed Jun. 23, 1994, Ser. No. 264,368**
**Int. Cl.[6] F41B *11/06***
**U.S. Cl. 124—73** **5 Claims**



1. A compressed gas powered gun comprising:

a gun body provided with a barrel and a breech;

a spring biased slider horizontally and reciprocally moveable within said breech between a cocked position and a fired position;

a trigger for releasably holding said slider in said cocked position;

a compressed gas source;

a valve means actuated by said slider for releasing pressurized gas from said gas source independently to the barrel for propelling a projectile and to the breech for recocking said slider; and

a gas control means for controlling gas pressure to the barrel for propelling said projectile at a selected velocity and to the breech for recocking the slider under a selected pressure, wherein said control means comprises:

an annular gas partition sleeve slidably received on said slider for partitioning gas between the breech and the barrel;

a velocity gas release valve communicating with the barrel; and

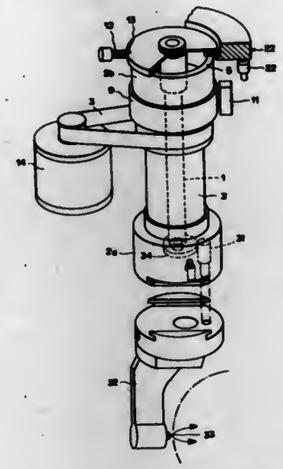
a recock gas release valve communicating with the breech.

**5,497,759**

## DRIVING APPARATUS FOR A DIAMOND TOOLHOLDER

**Maurice Guenin, La Chaux-de-Fonds, Switzerland, assignor to Voumard Machines Co. S.A., Switzerland**

**Filed Dec. 15, 1993, Ser. No. 166,825**
**Claims priority, application European Pat. Off., Dec. 23, 1992, 92811021**
**Int. Cl.[6] B24B *53/065***
**U.S. Cl. 125—11.01** **15 Claims**



1. Apparatus for driving a diamond toolholder, said diamond toolholder moving at least one of angularly and longitudinally, the apparatus comprising:

a rotary main shaft for rotatingly driving said diamond toolholder,

a rotary correction shaft,

a motor,

means for drivingly connecting said motor to said rotary main shaft and said rotary correction shaft,

conversion means for transforming the rotary movement of said rotary correction shaft relative to said rotary main shaft into longitudinal movement of said diamond toolholder, and

clutch means for coupling and uncoupling said rotary main shaft and said rotary correction shaft,

wherein said diamond toolholder executes solely an angular movement when the rotary main shaft and the rotary correction shaft are coupled by said clutch means to rotate simultaneously and executes at least a longitudinal movement when the rotary main shaft by said clutch means.

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**5,497,760**

## CONVECTION OVEN WITH POWER INDUCED BACK DRAFT FLOW

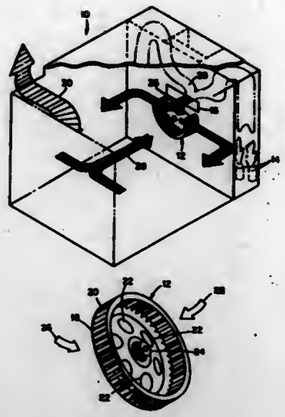
**Lorne B. Alden, Shelburne; J. Timothy Cole, Essex Junction; James A. Kleva, Richmond, and Erin D. Lonergan, Williston, all of Vt., assignors to G. S. Blodgett Corporation, Burlington, Vt.**

**Filed Oct. 17, 1994, Ser. No. 324,193**
**Int. Cl.[6] F24C *15/32***
**U.S. Cl. 126—21 A** **10 Claims**

1. A forced air heating apparatus comprising:

an oven having vertical front and back walls, and right and left side walls, and horizontal top and bottom walls said walls forming an internal heating cavity, said top wall forming a vent communicating with said cavity, one of said vertical walls forming an inlet port and said front wall forming a door;





a plurality of vertically oriented elongated, upwardly opening combustion chambers disposed external to said wall forming an inlet port and adjacent thereto;

a plurality of vertically directed burners disposed in said combustion chambers adjacent said bottom walls;

a single inlet fan means with induced back draft, having an axial front inlet, rotatably mounted within said cavity adjacent the inlet port said fan means comprising a squirrel cage type fan having an open face and a concave back plate said back plate having a plurality of mutually spaced ports therein; and

a vertical baffle plate disposed within said cavity adjacent said fan means having an inlet port in registration with said fan inlet and outlet ports adjacent said walls, so that during operation of said heating apparatus when said burners direct products of combustion upwardly through said chambers said products will be drawn down then through the wall inlet port into said fan as air from within said cavity is drawn through the baffle inlet into said fan which mixes the same and expels the mixture radially through the baffle outlet ports into said cavity.

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**5,497,761**

## HEATING DEVICE FOR SOLID FUELS

**Konrad Mayr, 510 Miranda Dr., Pittsburgh, Pa. 15421**

**Filed Mar. 18, 1994, Ser. No. 210,024**
**Claims priority, application Switzerland, Mar. 22, 1993, 862/93**
**Int. Cl.[6] F24B *1/188***
**U.S. Cl. 126—523** **21 Claims**

1. A heating device for solid fuels comprising

(a) a heat element having side walls and a rear wall,

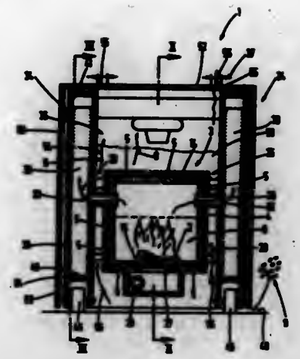
(b) a combustion chamber inside the heating element,

(c) a heat exchange unit arranged in the region of at least one of the side walls at a distance therefrom, the heat exchange unit comprising

(1) a flue gas conduit for guiding flue gases along a path, the flue gas conduit defining an outlet opening at an end of the conduit, and

(2) an inlet opening connected to the interior of the combustion chamber by a discharge channel and to the flue gas conduit, and

(d) a suction device for the flue gases, the suction device being arranged within the path of the flue gases.



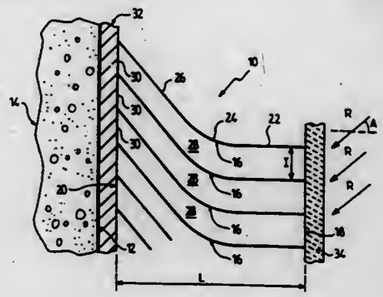
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**5,497,762**

## DEVICE FOR COLLECTING SOLAR ENERGY AND TRANSFERRING IT TO A RECEPTION BODY TO BE HEATED

**Eugeniusz M. Rylewski, 43bis, avenue du Général Leclerc, 78470 Saint Remy Les Chevreuse, France**

**PCT No. PCT/FR93/00326, § 371 Date Sep. 16, 1994, § 102(e) Date Sep. 16, 1994, PCT Pub. No. WO93/20390, PCT Pub. Date Oct. 14, 1993**
**PCT Filed Mar. 31, 1993, Ser. No. 302,843**
**Claims priority, application France, Apr. 1, 1992, 92 03962**
**Int. Cl.[6] F24J *2/00***
**U.S. Cl. 126—702** **17 Claims**



1. A device for collecting solar energy and transferring it to a reception body to be heated, comprising

a plurality of substantially parallel profiled elements spaced apart and superposed in order to form a curtain having an outer face suitable for being exposed to solar radiation and an inner face suitable for being located on the reception body side, the profiled elements having two reflecting faces and a shape such that when the inner face is vertical, the profiled elements slope downwardly from the inner face to the outer face, the profiled elements defining a plurality of air channels directed upwards from the outer face to the inner face when the inner face is vertical, the profiled elements and the two reflecting faces thereof being formed of an insulating material so as not to conduct heat from the outer face to the inner face; and

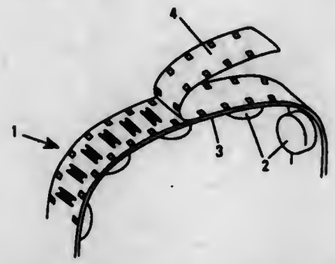
closure means provided on at least one of the inner face and the outer face of the curtain for sealing air contained in the channels.

5,497,763

## DISPOSABLE PACKAGE FOR INTRAPULMONARY DELIVERY OF AEROSOLIZED FORMULATIONS

Lester J. Lloyd, Orinda; Peter M. Lloyd, Oakland, and Reid M. Rubsamen, Berkeley, all of Calif., assignors to Aradigm Corporation, Hayward, Calif.

Continuation-in-part of Ser. No. 65,660, May 21, 1993. This application Dec. 14, 1993, Ser. No. 166,972
Int. Cl.[6] A61M *11/00*
U.S. Cl. 128—200.14 21 Claims




1. A disposable package for use in aerosolized delivery of drugs to the lungs, comprising:

a container having at least one wall which is collapsible by the application of a force and having at least one opening, the container having therein a liquid, flowable formulation which includes a pharmaceutically active drug;

a porous membrane covering the opening wherein the membrane pores have a diameter in the range of from about 0.25 micron to about 6 microns;

wherein the formulation has a viscosity sufficiently low such that the formulation is aerosolized to particles having a diameter of about 0.5 to 12 microns when force is applied to the collapsible wall and moved out of the pores.

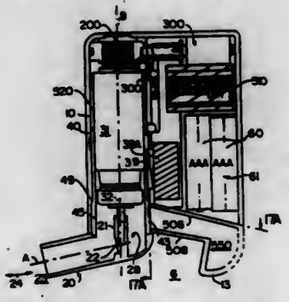
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5,497,764

## MEDICATION CASSETTE FOR AN AUTOMATIC AEROSOL MEDICATION DELIVERY

Carl Ritson, San Jose, and Reid M. Rubsamen, Berkeley, both of Calif., assignors to Aradigm Corporation, Hayward, Calif.

Continuation of Ser. No. 11,245, Jan. 29, 1993, abandoned, which is a continuation of Ser. No. 664,758, Mar. 5, 1991, Pat. No. 5,404,871. This application Mar. 9, 1995, Ser. No. 404,838
Int. Cl.[6] A61M *11/00*
U.S. Cl. 128—200.14 23 Claims




1. A system for treating a patient with aerosolized medication. comprising:

a hand-held device for delivering aerosolized medication comprising a body member with a receiving chamber;

a cassette, insertable into the receiving chamber of the hand-held device, the cassette comprising:

a canister having a body containing an aerosol medication and a valve stem movable in a longitudinal first axis relative to the canister body to release an amount of aerosol from the valve of the canister;

a mouthpiece having a first opening from which a patient can receive aerosolized medication, a second opening from which aerosolized medication released from the valve of the canister is received, a mouthpiece air flow path between the first and second openings, and a valve stem receptacle for receiving and securely seating the valve stem, the valve stem receptacle being located at the second opening;

a cassette housing having a cavity for receiving the canister, the cassette housing having a first opening connected to the second opening of the mouth piece, the cassette housing having a second opening, and a cassette housing air flow path between the first and second openings of the cassette housing, the cassette housing enclosing at least a portion of-the canister and having an outer configuration specifically designed for insertion into the receiving chamber of the hand-held device;

wherein the canister can reciprocate in the first axis relative to the cassette housing to release a dose of medication, and the mouthpiece air flow path and cassette housing flow paths are in open communication;

further wherein the cassette housing has an outer configuration which comprises a protrusion for use in aligning the cassette for insertion into the receiving chamber of the device and for retaining the cassette in the receiving chamber of the device.

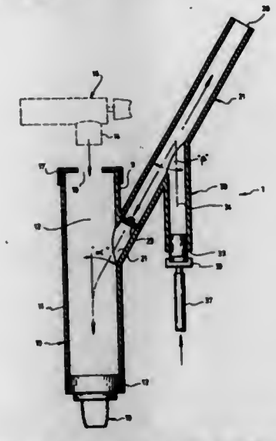
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5,497,765

## DEVICE FOR THE SIMULTANEOUS DELIVERY OF BETA-2 AGONISTS AND OXYGEN TO A PATIENT

Jean-Paul Praud; Sophie Baron, both of Sherbrooke; Mario Geoffroy, Stoke, and Rachel Rouleau, Sacré-Coeur de Marie, all of, Canada, assignors to RD-Chus Inc., Québec, Canada

Filed Jan. 24, 1995, Ser. No. 377,401
Claims priority, application Canada, May 26, 1994, 2124410
Int. Cl.[6] A61M *11/00*
U.S. Cl. 128—200.23 10 Claims



1. A device for the simultaneous delivery of beta 2 agonists and oxygen to a patient, said device comprising:

(a) a main chamber, having a longitudinal axis and a pair of opposite ends;

(b) an adaptor at one end of the said opposite ends of the chamber, hereinafter called "inhalor end", to accomodate a metered dose inhaler;

(c) a respiratory element selected from the group consisting of masks or mouthpieces, said element being detachably mounted at the other end of said opposite ends, hereinafter called "patient end";



(d) a tube of given length, having a longitudinal axis and a pair of opposite ends, one of said opposite ends being connected to and in open communication with said main chamber at a given distance from said inhaler end, the other one of said opposite ends being open to air, said tube including a unidirectional valve at a short distance from the end connected to the main chamber, said unidirectional valve being mounted in such a manner as to allow flow circulation within said tube towards main chamber exclusively;

(e) an auxiliary tube having a longitudinal axis and a pair of opposite ends, one of said opposite ends being connected to and in open communication with said tube, at a given distance from said unidirectional valve away from said main chamber, the other of said opposite ends being able to accomodate an oxygen source;

whereby, in use:

when the patient inhales through said respiratory element, oxygen fed into said tube through said auxiliary tube enters said main chamber through said unidirectional valve and thus can be inhaled by the patient, and when a metered dose of beta 2 agonists is sprayed towards said respiratory element through said main chamber for inhalation by the patient, said metered dose is prevented from escaping through said tube thanks to said unidirectional valve which opens only to permit said metered dose of beta 2 agonists and said oxygen to be mixed and be simultaneously delivered to the patient during inhalation.

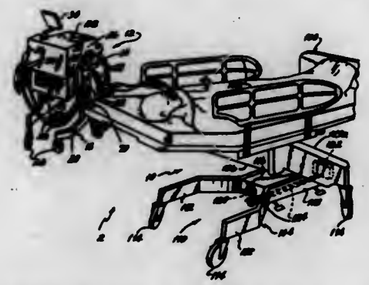
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5,497,766

## VENTILATOR AND CARE CART EACH CAPABLE OF NESTING WITHIN AND DOCKING WITH A HOSPITAL BED BASE

L. Dale Foster, and Ryan A. Reeder, both of Brookville, Ind., assignors to Hill-Rom Company, Inc., Batesville, Ind.

Division of Ser. No. 912,826, Jul. 13, 1992, Pat. No. 5,335,651, which is a continuation-in-part of Ser. No. 874,586, Apr. 24, 1992, Pat. No. 5,370,111, which is a continuation-in-part of Ser. No. 524,838, May 16, 1990, Pat. No. 5,117,521. This application Jun. 21, 1994, Ser. No. 263,192
The portion of the term of this patent subsequent to Dec. 6, 2011, has been disclaimed.
Int. Cl.[6] A61M *16/00*
U.S. Cl. 128—200.24 3 Claims



1. A hospital bed having a ventilator docked to a head end thereof and a care cart docked to a foot end thereof, the ventilator and care cart when docked to said bed being within a footprint defined by said bed, said bed comprising:

a generally Y-shaped bed base having one end defining outspread arms and another end defining a stem, said base having casters thereon;

a patient support surface; and

means supporting said patient support surface above said bed base;

said outspread arms of said base receiving therein a wheeled ventilator, the ventilator when positioned therein being within a footprint of said patient support surface defined by projecting downwardly onto a floor surface therebelow a periphery of said support surface;

said stem of said base being spaced inwardly a sufficient distance from said foot end of said bed receiving thereagainst a wheeled care cart, the cart when positioned thereagainst being within said footprint of said patient support surface.

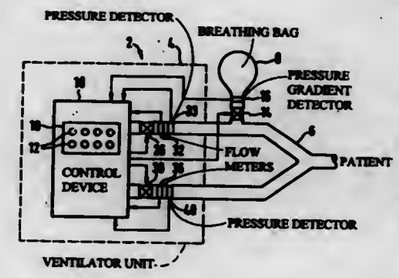
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5,497,767

## METHOD AND APPARATUS FOR SUPPLYING FRESH GAS TO A PATIENT DURING MANUAL VENTILATION

Sven-Gunnar Olsson, Arlöev; Goeran Cewers, Lund, and Goeran Rydgren, Bunkeflostrand, all of, Sweden, assignors to Siemens Elema AB, Solna, Sweden

Filed Jan. 31, 1994, Ser. No. 188,763
Claims priority, application Sweden, Feb. 5, 1993, 9300364
Int. Cl.[6] A61M *16/00*
U.S. Cl. 128—205.13 37 Claims




1. A method for ventilating a patient comprising the steps of:

connecting an automatically operating ventilator end a manually operable breathing bag to airways of a patient;

manually squeezing said breathing bag in an inspiration phase to impose an inspiration on the patient and subsequently manually relaxing squeezing of said breathing bag to permit exhalation by, the patient of a flow of expired gas during an expiration phase;

non-manually feeding fresh gas from said ventilator into said breathing bag during said expiration phase with a flow corresponding to said flow of expired gas; and

conducting said flow of expired gas out of said ventilator system.

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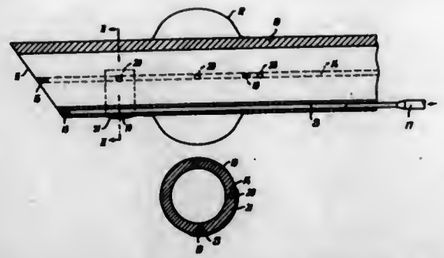
5,497,768

## RESPIRATION CATHETER WITH SEALING CUFF AND GAS INFLATION CUT-OFF VALVE FOR CUFF

Vagn N. F. Lembolt, Lundevej 4, Allerød, Denmark

Continuation of Ser. No. 890,591, Jul. 6, 1992, abandoned. This application Apr. 28, 1994, Ser. No. 234,720
Claims priority, application Denmark, Jan. 12, 1990, 0089/90
Int. Cl.[6] A61M *16/00;29/00;* A62B *9/02;9/06*
U.S. Cl. 128—207.16 5 Claims

1. A respiration catheter tube for insertion into a patient's trachea, said catheter tube including a sealing cuff; said cuff having inflation means comprising a source of presaurized gas and an inflation tube, said inflation tube further comprising a cut-off valve; said cut-off valve having a portion responsive to pressure of respiratory gas downstream of said cuff and a portion interconnecting said pressurized gas in said inflation tube with pressurized gas within said cuff; said cut-off valve positioned at a distal end of said catheter tube; said inflation tube including two parts, a first part connected to said source of pressurized gas, and a second part communicating with said cuff, the two parts being interconnected through said cut-off valve; said cut-off valve having a first position and a second position, said first position comprising an open



position with pressurized gas communicating through said inflation tube to said cuff, said second position comprising a closed position with communication of pressurized gas between said source of pressurized gas and said cuff being interrupted, said cut-off valve assuming said second position responsive to a pressure in the respiratory gas downstream of said cuff exceeding gas pressure in said inflation tube.

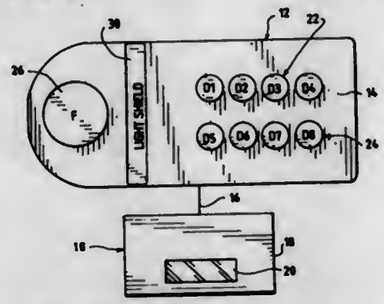
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**5,497,769**

**PHOTOSENSOR WITH MULTIPLE LIGHT SOURCES**

**Enrico Gratton; Sergio Fantini; Maria A. Franceschini, all of Urbana; William Mantulin, and Beniamino Barbieri, both of Champaign, all of Ill., assignors to I.S.S. (USA) Inc., and The Board of Trustees of the University of Illinois, both of Champaign, Ill.**

**Filed Dec. 16, 1993, Ser. No. 168,813**
**Int. Cl.[6] A61B *5/00***
**U.S. Cl. 128—633** **27 Claims**




1. A sensor instrument for use in measuring parameters of a highly scattering medium, which comprises:
- a sensor head having a face for contact with the medium;
- a sensor carried on said head for detecting light striking a portion of said face;
- at least one group of light sources positioned to pass said light to said face through said medium, said light sources being of differing distances from said light sensor; and wherein all sources in each of said at least one group of sources emit light of substantially the same wavelength;
- a timing circuit for causing sequential illumination and shutting off of said light sources;
- a circuit for modulating an intensity of said light sources to provide amplitude modulated light signals at a first frequency;
- circuitry for providing a second signal coherent with said amplitude modulated light signals, at a second frequency, to the light sensor;
- circuitry for modulating the gain of, or for multiplying the output of, said light sensor by said second signal, said second frequency being different from said first frequency; and
- electronics for deriving a resultant signal from said light sensor while receiving said modulated light signals, said resultant signal being at a frequency of the difference between the first and second frequencies, and electronics to compute at least two of phase shift, DC, and AC components of said light signals which pass sequentially from said light sources through the medium to said light sensor.

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**5,497,770**

**TISSUE VIABILITY MONITOR**

**N. Charle Merces, Irvine, and Roger A. Nahas, Marina del Rey, both of Calif., assignors to The Regents of the University of California, Oakland, Calif.**

**Filed Jan. 14, 1994, Ser. No. 182,264**
**Int. Cl.[6] A61B *5/00***
**U.S. Cl. 128—633** **20 Claims**

1. A method of determining the viability of tissue comprising the steps of measuring a characteristic of an intracellular component, infusing a substrate compound and measuring the characteristic of the intracellular component after infusion of the substrate compound.

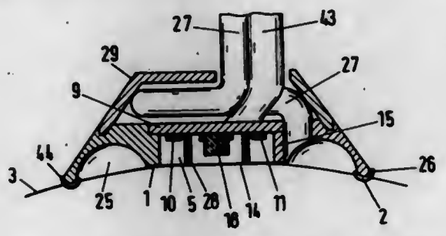
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**5,497,771**

**APPARATUS FOR MEASURING THE OXYGEN SATURATION OF FETUSES DURING CHILDBIRTH**

**Michael N. Rosenheimer, Guenzlhofen, Germany, assignor to MIPM Mammendorfer Institut fuer Physik und Medizin GmbH, Hattenhofen, Germany**

**Filed Mar. 30, 1994, Ser. No. 221,186**
**Claims priority, application Germany, Apr. 2, 1993, 43 10 929.2; Mar. 7, 1994, 44 07 541.3**
**Int. Cl.[6] A61B *5/00***
**U.S. Cl. 128—633** **11 Claims**




1. Apparatus for measuring the oxygen saturation of fetuses during childbirth comprising:
- a probe for attachment to a fetal scalp and being held in position by a partial vacuum, said probe having at least two photodiodes operating at different wavelengths and a photodetector forming parts of an optical reflection measurement portion for determining oxygen saturation in the arterial or pulsating bloodstream of fetuses, oxygen saturation being proportional to the ratio of oxyhemoglobin to the sum of oxyhemoglobin and desoxyhemoglobin, said probe providing output signals to an evaluating pulsoxymeter, wherein said optical reflection measurement portion is arranged on a distal emergence planar surface of said probe which itself is not subjected to a partial vacuum.

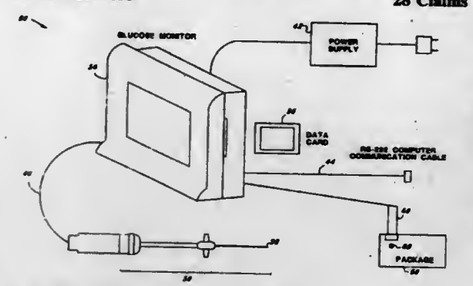


**5,497,772**

**GLUCOSE MONITORING SYSTEM**

**Joseph H. Schulman, Santa Clarita; Orville R. Rule, III; David I. Whitmoyer, both of Los Angeles; Ronald J. Lebel, Sherman Oaks; Joseph Y. Lucisano, Saugus, and Alfred E. Mann, Beverly Hills, all of Calif., assignors to Alfred E. Mann Foundation For Scientific Research, Sylmar, Calif.**

**Filed Nov. 19, 1993, Ser. No. 155,737**
**Int. Cl.[6] A61B *5/05***
**U.S. Cl. 128—635** **28 Claims**




1. A glucose monitoring system comprising:
- an enzymatic glucose sensor adapted to be positioned within a blood stream of a person whose blood glucose concentration is to be measured, said glucose sensor including means for generating a sensor signal that is inversely proportional to the concentration of sensed glucose in the blood stream, said glucose sensor comprising an oxygen detector that detects the amount of oxygen in a region of a prescribed enzyme held within said glucose sensor, and wherein glucose and oxygen in the blood stream react with said prescribed enzyme such that the amount of oxygen is inversely proportional to the glucose concentration, and wherein said oxygen detector comprises
  - a first working electrode (W1), a collector electrode (C), a reference electrode (R), and a second working electrode (W2), all of said first and second working electrodes, reference electrode and collector electrode being enclosed within a first membrane wherein an ionic solution is maintained, and said first membrane being enclosed within a second membrane,
  - said prescribed enzyme being confined to a window region near said first working electrode,
  - electrical means for causing an electrical current to flow between said collector electrode and said first and second working electrodes, and
  - means for measuring how much current flows from said first and second working electrodes when a prescribed trim voltage is maintained across said reference electrode and said first and second working electrodes, the ratio of said currents comprising said sensor signal, which sensor signal provides a measure of oxygen in the blood stream in the vicinity of said glucose sensor; and
- a glucose monitor electrically coupled to the glucose sensor, said monitor comprising
  - means for receiving the sensor signal,
  - means for processing the sensor signal and generating a glucose concentration data signal therefrom,
  - means for storing the glucose concentration data signal,
  - means for monitoring the glucose concentration data signal over a prescribed period of time and generating a rate of change signal that indicates how rapidly the glucose concentration data signal is changing,
  - means for selectively displaying the glucose concentration data signal and the rate of change signal,
  - first alarm means for determining if the glucose concentration data signal exceeds a preset level limit, and if so, generating a first alarm signal,
  - second alarm means for determining if the rate of change signal exceeds a preset trend limit, and if so, generating a second alarm signal,
  - calibration means for periodically calibrating the sensor so that it provides an accurate measure of the glucose concentration in the blood stream, and
  - control means for controlling the monitor so that it performs at least one of a plurality of monitoring functions as selected by a user of said monitor.

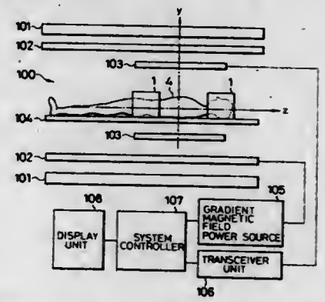
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**5,497,773**

**NUCLEAR MAGNETIC RESONANCE IMAGING WITH PATIENT PROTECTION AGAINST NERVE STIMULATION AND IMAGE QUALITY PROTECTION AGAINST ARTIFACTS**

**Shigehide Kuhara; Kozo Sato, both of Kanagawa, and Shoichi Kanayama, Saitama, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Mar. 14, 1994, Ser. No. 212,145**
**Claims priority, application Japan, Mar. 12, 1993, 5-051832**
**Int. Cl.[6] A61B *5/055***
**U.S. Cl. 128—653.5** **4 Claims**




1. An apparatus for nuclear magnetic resonance imaging (MRI), comprising:
- MRI means for taking an MR image of an imaging region within a patient placed in a static magnetic field, by applying gradient magnetic fields and RF pulses according to a prescribed pulse sequence onto the patient in an imaging space, and acquiring NMR signals from the patient; and
- a shield member, placed inside the imaging space of the MRI means, for shielding a nerve stimulation sensitive portion of the patient located outside of the imaging region from a change of the gradient magnetic fields applied by the MRI means, the shield member comprising a shielding material having a shielding effect to reduce a change of the gradient magnetic fields at the nerve stimulation sensitive portion such that a density of eddy currents induced on the nerve stimulation sensitive portion by the change of the gradient magnetic fields becomes lower than 1 to 4 ($A/m^2$).

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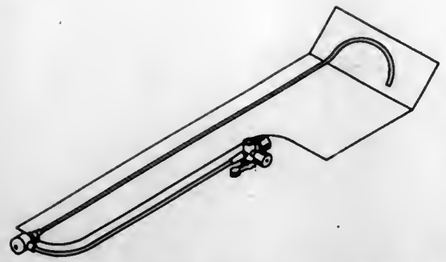
**5,497,774**

**GUIDING INTRODUCER FOR LEFT ATRIUM**

**John F. Swartz, Tulsa, Okla.; John D. Ockuly; John J. Fleischhacker, both of Minnetonka, Minn., and James A. Hassett, Bloomington, Minn., assignors to Daig Corporation, Minnetonka, Minn.**

**Filed Nov. 3, 1993, Ser. No. 147,168**
**Int. Cl.[6] A61M *25/00*; A61B *6/00***
**U.S. Cl. 128—658** **15 Claims**

1. A guiding introducer to be used in the left atrium of a human heart comprised of a first, second and third section wherein the first section is a generally elongated straight section, wherein merged with a distal end of said first section is the second section, wherein the second section is curved in a compound curve, curving in a first longitudinal curve and simultaneously curving in a second longitudinal curve wherein the second section merges with the third



section, wherein said third section is a third longitudinal curve, wherein the third section is angled at an angle of approximately 40 to about 60 degrees from the first section, and wherein substantially all of said third section is coplanar.

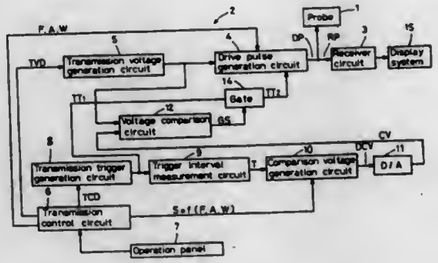
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**5,497,775**

## DRIVE LIMITER IN ULTRASOUND PROBE-DRIVING TRANSMITTER

**Takanori Nonaka, Kyoto, Japan, assignor to Shimadzu Corporation, Kyoto, Japan**

**Filed Sep. 28, 1993, Ser. No. 127,501**
**Claims priority, application Japan, Sep. 30, 1992, 4-261945**
**Int. Cl.[6] A61B 8/00**
**U.S. Cl. 128—660.02** **17 Claims**




1. In an ultrasonic diagnostic system comprising an ultrasonic beam-emitting probe, an ultrasonic probe-driving transmitter circuit assembly for driving the probe to emit an ultrasound beam controllable according to patient diagnostic requirements by input to a transmission control circuit of the assembly defining control parameters, said transmitter circuit assembly comprising:

drive signal output means for generating a drive signal output to said probe, driving said probe to emit ultrasonic energy;

drive voltage determining means for determining drive signal output voltage defined, by said control parameters according to said diagnostic requirements;

limit reference voltage generating means for computing a reference voltage for limiting said drive voltage defined by said control parameters according to the given diagnostic requirements; and

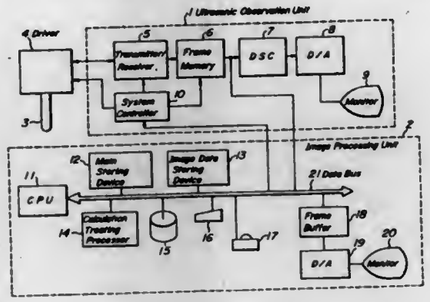
drive signal prohibiting means, comparing said drive signal output voltage with said limit reference voltage, for prohibiting said drive signal output of said drive signal output means to said probe in case said drive signal output voltage is greater than said limit reference voltage.

**5,497,776**

## ULTRASONIC IMAGE DIAGNOSING APPARATUS FOR DISPLAYING THREE-DIMENSIONAL IMAGE

**Tatsuo Yamazaki, Sagamihara, and Tomonao Kawashima, Hachioji, both of, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan**

**Filed Aug. 4, 1994, Ser. No. 285,734**
**Claims priority, application Japan, Aug. 5, 1993, 5-194873; Dec. 3, 1993, 5-304129; Jun. 13, 1994, 6-130474**
**Int. Cl.[6] A61B 8/12**
**U.S. Cl. 128—660.09** **28 Claims**




1. An ultrasonic image diagnosing apparatus comprising:

an ultrasonic probe means for emitting an ultrasonic wave to scan a living body in a three-dimensional manner and receiving an ultrasonic wave reflected by the living body to derive echo data of a three-dimensional region;

a three-dimensional data storing means for storing said echo data of said three-dimensional region derived from the ultrasonic probe means;

a cross sectional position setting means for setting a desired cross sectional position within the echo data to determine a display range of the echo data of said three-dimensional region;

a cross sectional position storing means for storing data representing said cross sectional position set by said cross sectional position setting means;

a surface position extracting means for extracting surface position data representing a surface of an object under inspection from the echo data of said three-dimensional region;

a surface position data storing means for storing said surface position data of said surface;

a three-dimensional image data producing means for producing three-dimensional image data by converting the echo data within the three-dimensional display range at the cross sectional position set by said cross sectional position setting means into two-dimensional perspective image data seen from a given direction;

a shade adding means for adding shade to said surface of the object, indicated by said surface position data, to derive surface image data;

a surface composing means for producing composed three-dimensional image data by composing said three-dimensional image data formed by said three-dimensional image data producing means and the surface image data having said shade added thereto, at a position corresponding to said surface represented by said surface position data; and

a display means for receiving said composed three-dimensional image data to display a three-dimensional image.

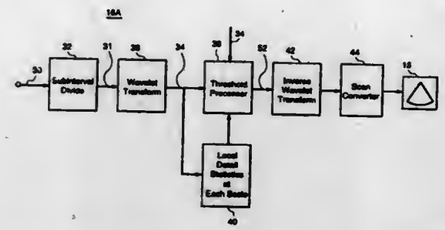


**5,497,777**

## SPECKLE NOISE FILTERING IN ULTRASOUND IMAGING

**Aiman A. Abdel-Malek, Schenectady, N.Y., and Max H. M. Costa, San Gabriel, Calif., assignors to General Electric Company, Schenectady, N.Y.**

**Filed Sep. 23, 1994, Ser. No. 311,698**
**Int. Cl.[6] A61B 8/00**
**U.S. Cl. 128—660.07** **23 Claims**




1. An adaptive method for reducing signal dependent noise including speckle noise mixed with a true signal in a coherent imaging system signals such as medical ultrasound imaging signals comprising:

dividing the imaging system signal into an equal number of subintervals;

transforming each of said subintervals using discrete wavelet transform to provide wavelet transform coefficients;

identifying for each of said transformed subintervals which of said wavelet transform coefficients come from said noise or from said true signal through the use of adaptive non-linear thresbolding;

selecting those wavelet transform coefficients which are identified as related to said true signal; and

passing said true signal wavelet transform coefficients through an inverse discrete wavelet transform to provide an enhanced true signal with reduced noise.

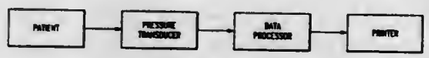
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**5,497,778**

## APPARATUS AND METHOD FOR NONINVASIVE MEASUREMENT OF PERIPHERAL PRESSURE PULSE COMPLIANCE AND SYSTOLIC TIME INTERVALS

**Edward H. Hon, 11 Bradbury Hills Rd., Bradbury, Calif. 91010**

**Filed Jun. 30, 1993, Ser. No. 85,547**
**Int. Cl.[6] A61B 5/021**
**U.S. Cl. 128—672** **4 Claims**




2. Apparatus for measuring compliance of the arteries of a patient consisting of:

a noninvasive pressure transducer for measuring the cutaneous pressure pulse wave of a finger;

means for electronically recording the cutaneous pressure pulse wave;

means for measuring the ECG wave;

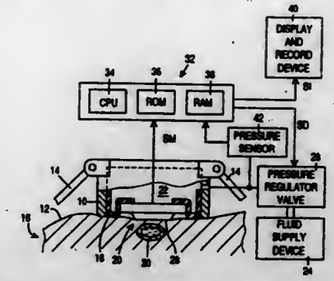
means for electronically recording the ECG wave; and means for measuring the duration of the up slope of the cutaneous pressure pulse wave, said duration being measured from the onset to the peak of said cutaneous pressure pulse wave.

**5,497,779**

## PULSE WAVE DETECTING APPARATUS

**Masami Takaya, Aichi, and Hideo Nishibayashi, Inuyama, both of, Japan, assignors to Colin Corporation, Aichi, Japan**

**Filed Mar. 8, 1994, Ser. No. 207,179**
**Int. Cl.[6] A61B 5/00**
**U.S. Cl. 128—672** **11 Claims**




1. A pulse wave detecting apparatus for detecting a pulse wave from a living subject, the pulse wave comprising a plurality of pulses, each pulse produced from an arterial vessel of the subject in synchronism with a heartbeat of the subject, comprising:

a pulse wave sensor having a press surface and including at least one array of pressure sensing elements provided in said press surface, said press surface of said pulse wave sensor being adapted to be pressed against said arterial vessel of said living subject via a body surface of said subject such that a direction of said array of pressure sensing elements intersects a direction of extension of said arterial vessel, so that each of said pressure sensing elements detects said pulse wave produced from said arterial vessel and generates a pulse wave signal representing the detected pulse wave;

a pressing device which produces a pressing force to press said press surface of said pulse wave sensor against said arterial vessel via said body surface;

regulating means for changing said pressing force of said pressing device applied to said pulse wave sensor, determining an optimum value of said pressing force based on at least one of the pulse wave signals generated from said pressure sensing elements, and holding said pressing force of said pressing device at the thus determined optimum value;

lower-peak variation determining means for determining a lower peak of at least one pulse of each of the respective pulse wave signals from said pressure sensing elements, said lower-peak variation determining means iteratively determining a variation of the respective lower peaks of said pulse wave signals with respect to said array of pressure sensing elements after said pressing force of said pressing device is held at said optimum value; and

judging means for judging whether a pressing condition of said pulse wave sensor on said body surface is stable, based on change of the lower-peak variations determined by said lower-peak variation determining means.

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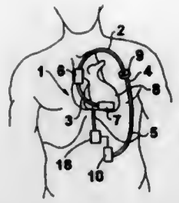
**5,497,780**

## APPARATUS FOR SIGNAL ANALYSIS OF THE ELECTRICAL POTENTIAL CURVE OF HEART EXCITATION

**Manfred Zehender, Schlippehof 8, D-79110 Freiburg, Germany**

**Filed Mar. 30, 1994, Ser. No. 220,062**
**Claims priority, application Germany, Mar. 31, 1993, 43 10 412.6**
**Int. Cl.[6] A61B 5/04; A61N 1/36**
**U.S. Cl. 128—696** **25 Claims**

1. Apparatus for signal analysis in the event of an insufficient blood supply to a heart and/or a cardiac rhythm abnormality, comprising measuring electrode means for detection of electrical potential curves of heart excitation over time including at least




three implantable electrodes, two of which, in their working positions, are adapted for implantation with their poles in the heart and the third of which is adapted for implantation with its pole lying outside of the heart, connecting lines for connecting the three poles to form a triangle that encompasses a portion of the heart, implantable evaluation and control means connected with said electrodes for measurement of an electrical potential between two electrodes connected together at a given time on one hand, and the third electrode on the other hand, whereby a difference in potential at the given time between one of the electrodes and the other two electrodes is measured and a signal representing an electrical potential curve is fed to the evaluation and control means, and memory means, located in the evaluation and control means, for acquisition and storing of the electrical potential curve of a normal heartbeat over time as a reference value, whereby later measurements can be compared with the stored reference value.

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**5,497,781**

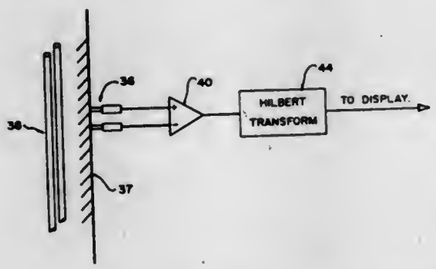
**RECORDING BIOLOGICAL SIGNALS USING HILBERT TRANSFORMS**

**Yunquan Chen, 1000-2725 Melfa Road, Vancouver, British Columbia, V6T 1N4; Charles A. Laszlo, 4750 Belmont Road, Vancouver, British Columbia, V6T 1A9, and Cecil Hershler, 6370 Alma Street, Vancouver, British Columbia, V6N 1Y6, all of, Canada**

**Continuation-in-part of Ser. No. 969,458, Oct. 30, 1992, Pat. No. 5,299,572, and a continuation-in-part of Ser. No. 156,732, Nov. 24, 1993, Pat. No. 5,443,559. This application Mar. 10, 1994, Ser. No. 208,407**

**Int. Cl.[6] A61B *5/0488***

**U.S. Cl. 128—733** **15 Claims**




1. An apparatus for monitoring electrical signals propagating through a living organism, the apparatus comprising:

a bipolar electrode; and

means operatively connected to the electrode for performing a Hilbert transform on a signal from the electrode.

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**5,497,782**

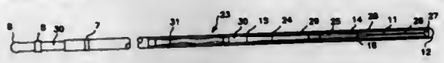
**LOCKABLE GUIDEWIRE**

**Mauricio L. Fugoso, Chula Vista, Calif., assignor to Medtronic, Inc., Minneapolis, Minn.**

**Filed Apr. 28, 1994, Ser. No. 235,115**

**Int. Cl.[6] A61M *25/01***

**U.S. Cl. 128—772** **22 Claims**



1. A lockable guidewire comprising:

(a) a proximal section with a proximal end and a distal end;

(b) a locking section with a proximal end and a distal end;

(c) a distal section with a proximal end and a distal end;

(d) the distal end of the proximal section is contiguous with the proximal end of the locking section, the distal end of the locking section is contiguous with the proximal end of the distal section;

(e) the locking section having a radially expanding means for anchoring the lockable guidewire within a guiding catheter; and

(f) a means for retaining and releasing the radially expanding means within the locking section.

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**5,497,783**

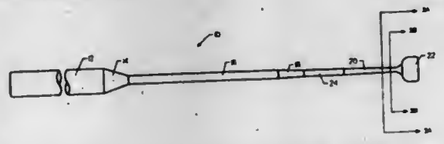
**GUIDEWIRE HAVING RADIOSCOPIC TIP**

**Michael J. Urick; Richard R. Prather, both of Rogers, and John H. Randby, Eagan, all of Minn., assignors to SciMed Life Systems, Inc., Maple Grove, Minn.**

**Filed May 18, 1994, Ser. No. 245,726**

**Int. Cl.[6] A61B *5/00***

**U.S. Cl. 128—772** **11 Claims**



1. A guide wire for use in medical procedures comprising:

a. an elongate core wire having a proximal end and a distal end. the core wire including a tapered ribbon portion; and

b. a distal helix having a proximal end and a distal end wherein said distal end of said distal helix is fixedly attached to said distal end of said core wire and said distal helix includes means for providing a brighter radioscopic image at said distal end of said distal helix than at said proximal end of said distal helix.

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**5,497,784**

**FLEXIBLE ELONGATE DEVICE HAVING STEERABLE DISTAL EXTREMITY**

**Mir Imran, Palo Alto, Calif., assignor to Intelliwire, Inc., Sunnyvale, Calif.**

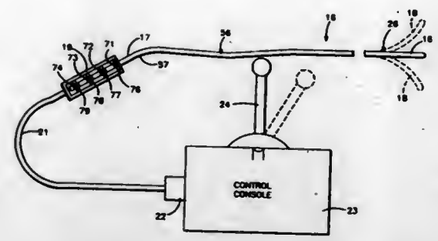
**Continuation of Ser. No. 30,861, Mar. 12, 1993, abandoned, which is a continuation of Ser. No. 793,858, Nov. 11, 1991, Pat. No. 5,238,005. This application Jun. 30, 1994, Ser. No. 268,713**

**Int. Cl.[6] A61B *5/00***

**U.S. Cl. 128—772** **1 Claim**

1. In a method for controlling the distal extremity of a flexible elongate tubular member for movement in a vessel of a patient in accordance with a control member disposed outside of the vessel of the patient and being movable by hand, the distal extremity of the flexible elongate member having slidably disposed therein at least three circumferentially spaced apart flexible elongate pull






elements formed of a material having a negative coefficient of expansion, the method comprising measuring resistance versus temperature characteristics of each of the pull elements outside of the vessel of the patient to provide measured information about each of the pull elements by placing the distal extremity of the flexible elongate tubular member in a constant temperature bath of one predetermined temperature, measuring the resistance of each of the pull elements while at said one predetermined temperature, placing the distal extremity of the flexible elongate tubular member in a constant temperature bath of another predetermined temperature and measuring the resistance of each of the pull elements while at said another predetermined temperature, storing the measured information about each of the pull elements at said one and said another predetermined temperatures and utilizing the stored measured information about each of the pull elements to cause movement of the distal extremity of the flexible elongate member in a proportional manner as the control member is moved.

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**5,497,785**

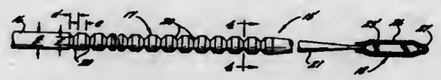
**CATHETER ADVANCING GUIDEWIRE AND METHOD FOR MAKING SAME**

**Fernando M. Viera, Hialeah, Fla., assignor to Cordis Corporation, Miami Lakes, Fla.**

**Filed Jul. 27, 1994, Ser. No. 281,444**

**Int. Cl.[6] A61M *25/01***

**U.S. Cl. 128—772** **32 Claims**



1. A flexible guidewire for use in placing a catheter within a patient, said guidewire comprising:

an elongated flexible unitary body defining a longitudinally extending tip support section, said tip support section having a plurality of axially spaced apart transverse grooves defined in an outer surface thereof for enhancing flexibility while resisting buckling to thereby facilitate placing the guidewire within a patient, said tip support section having a plurality of axially spaced apart longitudinally extending cylindrical outer surface portions between adjacent transverse grooves of constant and uniform circular cross-section and collectively defining an imaginary circular cylinder of constant and uniform diameter, each of said transverse grooves having a pair of opposing outer edges, adjacent respective cylindrical outer surface portions, being rounded over to thereby facilitate positioning of said tip support section within a catheter; and

a distal tip section connected to said tip support section.

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**5,497,786**

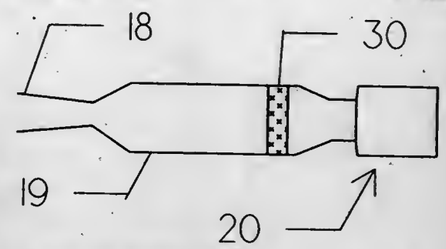
**APPARATUS AND METHOD FOR FORMABLE GUIDE WIRE TIP**

**Michael J. Urick, Rogers, Minn., assignor to SCIMED Life Systems, Inc., Maple Grove, Minn.**

**Filed Aug. 18, 1994, Ser. No. 292,533**

**Int. Cl.[6] A61B *5/00***

**U.S. Cl. 128—772** **9 Claims**




1. A guide wire apparatus comprising:

a. a length of flexible metal wire with proximal and distal ends;

b. a distal tip section at the distal end of the flexible metal wire; and

c. a heat-treated region on the distal tip section which has been heat treated to a temperature above about 850° but less than 1400° F., for providing an easily formable portion of the distal tip section, said heat treated region having an area substantially less than the area of the distal tip section.

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**5,497,787**

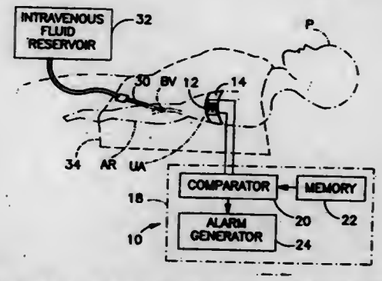
**LIMB MONITORING METHOD AND ASSOCIATED APPARATUS**

**Gabor Nemeedy, 200 E. 16th St., Apt. 20A, New York, N.Y. 10003, and Peter J. Wilk, 185 W. End Ave., New York, N.Y. 10023**

**Filed Aug. 5, 1994, Ser. No. 286,684**

**Int. Cl.[6] A61B *5/103***

**U.S. Cl. 128—774** **19 Claims**




1. A medical device for detecting phlebitis in a leg of a patient, comprising:

monitoring means for monitoring a first linear dimension of one leg of the patient;

detecting means for detecting a second linear dimension of another leg of the patient;

first comparing means operatively connected to said monitoring means for comparing said first linear dimension with a reference value of said first linear dimension;

second comparing means operatively connected to said detecting means for comparing said second linear dimension with a reference value of said second linear dimension;

third comparing means operatively connected to said first comparing means and said second comparing means for comparing an increase in size of said first linear dimension with a change in size of said second linear dimension; and

alarm generating means operatively connected to said third comparing means for generating an alarm signal upon determining that said first linear dimension has increased by an amount greater than an increase in size of said another leg, thereby indicating the presence of phlebitis in said one leg.

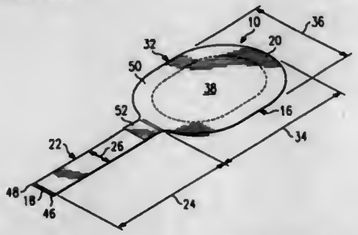
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**5,497,788**

## WOUND CLOSURE DEVICE FOR VIEWING A WOUND AND METHOD

**J. D. Inman, Santa Barbara, Calif., and C. E. Ward, Jr., Grand Prairie, Tex., assignors to Tecnol Medical Products, Inc., Fort Worth, Tex.**

**Continuation of Ser. No. 92,594, Jul. 16, 1993, abandoned. This application Jul. 20, 1994, Ser. No. 278,575**
**Int. Cl.[6] A61F *13/00***
**U.S. Cl. 128—888** **14 Claims**




1. A unitary wound closure device adapted to permit a wound on a patient to be viewed while the closure device is secured to the patient, comprising:

a body having sufficient flexibility for it to be folded against itself, said body including first and second surfaces facing away from one another, a securing portion having a length and width sufficient to secure facing edges of the wound in close juxtaposition with one another, and a viewing portion having a length and width sufficient to circumscribe the wound on the patient;

the first surface forming an integral part of the securing portion;

a first quantity of adhesive substance disposed on the first surface of said body to adhere the securing portion of said body to the patient with the facing edges of the wound in said close juxtaposition; and

a second quantity of adhesive substance disposed on the second surface of said body to adhere the viewing portion to the patient after securing the facing edge of the wound in said close juxtaposition, such that when the viewing portion is folded over and onto the securing portion and the patient, the wound and the securing portion are located beneath the viewing portion.

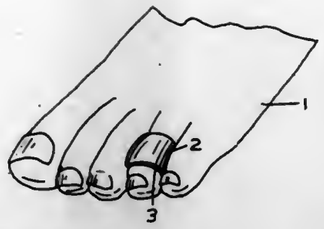
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**5,497,789**

## FOOT PROTECTOR INCORPORATING A VISCOELASTIC GEL

**Gerald P. Zook, 760 E. 29th Ave., Eugene, Oreg. 97405**

**Continuation of Ser. No. 453,150, Dec. 20, 1989, abandoned, which is a continuation-in-part of Ser. No. 273,710, Nov. 17, 1988, abandoned, which is a continuation-in-part of Ser. No. 75,425, Jul. 20, 1987, abandoned. This application Oct. 30, 1992, Ser. No. 969,530**
**Int. Cl.[6] A61F *13/06***
**U.S. Cl. 128—893** **16 Claims**




1. A padding device for the human foot, comprising:

a. a tubular sleeve of elastic fabric fitting about a digit and having an inside surface, an outside surface and opposing ends;

b. said tubular sleeve of elastic fabric being formed of a seamless tubular material which spontaneously rolls inwards about each end of said tubular sleeve to form a cuff thereat; and

c. a pad of viscoelastic gel;

d. said pad of viscoelastic gel being directly impregnated onto said inside surface of said tubular sleeve of elastic fabric.

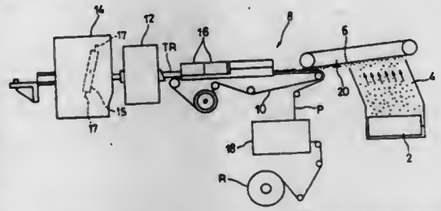
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**5,497,790**

## CUT TOBACCO LAYER TRIMMING APPARATUS FOR A CIGARETTE MANUFACTURING MACHINE

**Masaru Fujishige, Takamatsu, Japan, assignor to Japan Tobacco Inc., Tokyo, Japan**

**Filed Mar. 1, 1994, Ser. No. 203,402**
**Claims priority, application Japan, Mar. 4, 1993, 5-043593**
**Int. Cl.[6] A24C *5/28***
**U.S. Cl. 131—84.4** **4 Claims**




1. A trimming apparatus for a cigarette manufacturing machine providing a cut tobacco layer on a tobacco band which travels with the cut tobacco layer in one direction, and a continuous cigarette rod being formed from the cut tobacco layer and a paper web, said trimming apparatus comprising:

a rotatable trimming disk having a peripheral edge portion and a plurality of pockets on the peripheral edge portion, a cut tobacco layer being receivable in the pockets to form thickened portions in the cut tobacco layer at intervals each corresponding to a length of each cigarette;

means for cutting a cigarette rod into individual cigarettes;

means for outputting cutting signals when the cigarette rod is cut into individual cigarettes by the means for cutting;

drive means for rotating the trimming disk, said drive means including a power transmission line extending up the trimming disk; and

synchronizing means for adjusting a rotational phase of the pockets of the trimming disk to the outputted cutting signals during operation of said cigarette manufacturing machine so that the formed cigarette rod is cut in respective centers of specific portions corresponding individually to the thickened portions of the cut tobacco layer,

wherein said synchronizing means includes an input shaft located in the power transmission line of said drive means and receiving power, an output shaft for delivering the power to said trimming disks, planetary gear means for transmitting a rotational force of the input shaft to the output shaft, and adjusting means for changing a rotational phase of the output shaft with respect to that of the input shaft,

wherein the input and output shafts are arranged on a same axis, and the planetary gear means includes a carrier mounted on the input shaft, a sun gear mounted on the output shaft, a ring gear surrounding the sun gear and supported for rotation, the ring gear having internal teeth, a plurality of gear shafts projecting from the carrier and extending in a space between the sun gear and the ring gear, and a plurality of planetary gears mounted individually on the gear shafts for rotation and in mesh with the sun gear and the internal teeth of the ring gear,

wherein the adjusting means includes second drive means for rotating the ring gear in a forward or reverse direction,

wherein said second drive means includes a reversible servomotor, a second power transmission line for transmitting a rotational force from the servomotor to the ring gear, computing means for computing a distance between each cutting position of the cigarette rod and the central position of each corresponding specific portion, and control means for rotating the servomotor in accordance with the computer distance and adjusting a rotational angle of the ring gear by means of the second power transmission line, and

wherein the second power transmission line includes a gear formed on an outer peripheral surface of the ring gear and a worm in mesh therewith.



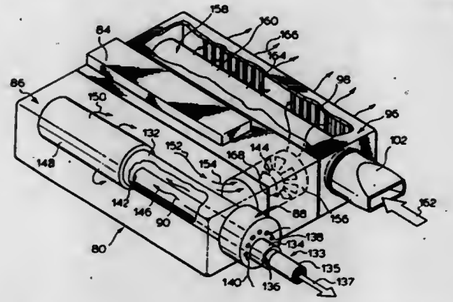
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**5,497,791**

## SMOKER'S ACCESSORY

**Larry Bowen, Orangeville, and Stanislav M. Snaidr, Mississauga, both of, Canada, assignors to 114935 Ontario Inc., Ontario, Canada**

**Filed Apr. 13, 1994, Ser. No. 226,864**
**Claims priority, application United Kingdom, Apr. 14, 1993, 9307710**
**Int. Cl.[6] A24F *13/06***
**U.S. Cl. 131—175** **52 Claims**




52. In a smoker's accessory for filtering sidestream smoke emitted from a burning cigarette, having:

an exhaust fan,

a sidestream smoke filter system having a cigarette tube in which a burning cigarette may be placed, said cigarette tube being at least as long as a cigarette to be smoked,

a sidestream smoke filter element,

a housing for said sidestream smoke filter system, said housing having a support for said exhaust fan with an inlet for said fan being provided in a wall portion of said housing,

the improvement comprising:

said filter element being tubular and having an inlet end for sidestream smoke to enter an inner elongate chamber within said tubular filter, said tubular filter having a closed end opposite said inlet end,

means for connecting a first end of said cigarette tube to said inlet end of said filter element, said cigarette tube being non-porous to sidestream cigarette smoke particles whereby sidestream smoke from a burning cigarette in said cigarette tube flows along said cigarette tube, into said inner chamber and outwardly through said tubular filter element,

said housing having a from end wall with an opening provided therein,

a cigarette holder having a bore extending therethrough to permit insertion of a lit cigarette through said holder, such cigarette being supported in said cigarette tube by said holder, with a tip portion of such a lit cigarette extending outside of said holder to permit a smoker's lips to contact such cigarette tip,

means for mounting said cigarette holder in said housing opening and means for securing a second end of said cigarette tube to said cigarette holder, said bore in said cigarette holder being offset in said holder to position a held cigarette in a lower portion of a cigarette tube, said cigarette holder and said housing opening having cooperating means to register said cigarette holder bore with said lower portion of said cigarette tube, and

a plurality of holes being provided in said cigarette holder to permit fresh air to be drawn by said fan through said holder and into said cigarette tube end along said tube to pick up cigarette sidestream smoke rising from a burning cigarette in said lower portion of said cigarette tube; said exhaust fan further drawing said picked-up sidestream smoke through said filter element via said elongate chamber and through said inlet for said exhaust fan.

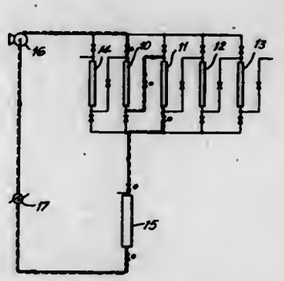
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**5,497,792**

## PROCESS AND APPARATUS FOR THE SEMICONTINUOUS EXTRACTION OF NICOTINE FROM TABACCO

**Ravi Prasad, Midlothian, and Harvey J. Grubbs, Mechanicsville, both of Va., assignors to Philip Morris Incorporated, New York, N.Y.**

**Filed Nov. 19, 1987, Ser. No. 122,760**
**Int. Cl.[6] A24B *15/24***
**U.S. Cl. 131—297** **73 Claims**




1. A method for the extraction of nicotine from tobacco which comprises:

(a) feeding an essentially nicotine-free solvent to a first end of an extraction flow system containing tobacco and withdrawing a nicotine-rich solvent from a second end of the extraction flow system, wherein said solvent is in the supercritical state;

(b) periodically discharging a portion of extracted tobacco from the first end of the extraction flow system; and

(c) charging a portion of unextracted tobacco to the second end of the extraction flow system.

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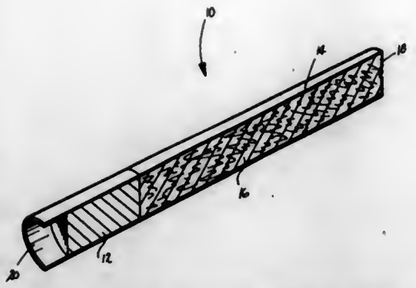
**5,497,793**

## CIGARETTE AND SOLUBLE CIGARETTE FILTER THEREFOR

**Stephen A. Kubica, 1653 S. Shore Dr., Holland, Mich. 49423**

**Filed Sep. 22, 1993, Ser. No. 125,403**
**Int. Cl.[6] A24D *3/00***
**U.S. Cl. 131—331** **7 Claims**

1. A cigarette comprising an outer paper wrapping forming an elongated tube having a forward portion and a rearward portion, the forward portion of the tube containing smokable tobacco, and the rearward portion of the tube containing a filter, the filter



consisting essentially of a porous body formed of a readily water soluble, expanded organic starch material of corn or potato.

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**5,497,794**

## CIGARETTE

**Yutaka Okumoto, Tokyo, Japan, assignor to Japan Tobacco Inc., Tokyo, Japan**

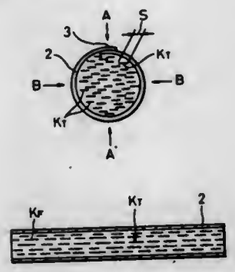
**Continuation-in-part of Ser. No. 175,575, Dec. 30, 1993, Pat. No. 5,337,761. This application May 20, 1994, Ser. No. 246,712**

**Claims priority, application Japan, Mar. 29, 1993, 5-070280; Mar. 28, 1994, 6-057710**

**The portion of the term of this patent subsequent to Aug. 16, 2011, has been disclaimed.**

**Int. Cl.[6] A24D *1/00***

**U.S. Cl. 131—364** **7 Claims**



1. A cigarette in which a filler including tobacco shreds obtained by cutting tobacco leaves is wrapped in a packing member made of paper, the tobacco shreds having a width and length, wherein said tobacco shreds are arranged so that most of said tobacco shreds have the length of their leaf surfaces extending substantially perpendicularly to a longitudinal axis of said cigarette and wherein most of said tobacco shreds are radially arranged around the axis of said cigarette in a cross section intersecting perpendicularly to the axis of said cigarette.

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**5,497,795**

## METHOD AND APPARATUS OF BRAIDING HAIR

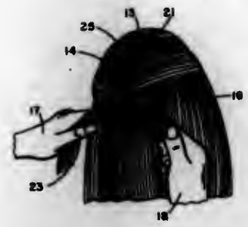
**Lynda D. Hibbard, 3813 N. Lake Orlando Pkwy., Orlando, Fla. 32808**

**Filed Aug. 26, 1994, Ser. No. 296,449**

**Int. Cl.[6] A45D *8/12***

**U.S. Cl. 132—200** **6 Claims**

1. A method of french braiding hair comprising the steps of:
selecting a braiding aid having a plurality of flexible, resilient loops, each loop connected to the next loop in series, and each said loop being individually expandable;



expanding said braiding aid first loop;
passing a first strand of hair through the selected braiding aid first loop in said series;
separating said first strand of hair passing through said first loop into two strands of hair;
releasing said expanded braiding aid first loop;
passing two separate strands of hair through each successive loop of said braiding aid; and
crossing each two separate strands of hair passing through each successive loop one strand over the other; whereby a person's hair is french braided.

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**5,497,796**

## METHOD FOR HAIR JOINING, HAIR USED FOR THE METHOD, AND JOINING HAIR RETAINER

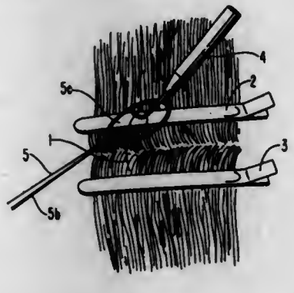
**Kousuke Mochizuki, and Ryuji Teratoko, both of Tokyo, Japan, assignors to Aderans Co., Ltd., Tokyo, Japan**

**Filed Apr. 21, 1994, Ser. No. 230,836**

**Claims priority, application Japan, Apr. 27, 1993, 5-100640; Apr. 27, 1993, 5-100641**

**Int. Cl.[6] A41G *5/00***

**U.S. Cl. 132—201** **11 Claims**



1. A method for joining hair comprising the steps of:
preliminarily forming a reducible loop on one end of a strand of joining hair;
reducing and tightening said preliminarily formed loop after piercing therethrough a strand of stationary hair during a hair joining work; and
weaving and tying together both of said joining hair and stationary hair in a manner said joining hair may be firmly joined to said stationary hair;
wherein said loop formed on one end of said joining hair is curled by heating said looped portion.



**5,497,797**

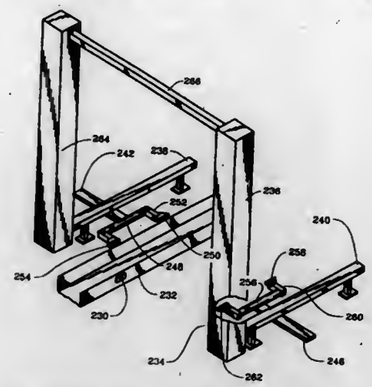
## AUTOMATIC TIRE TREATMENT SYSTEM

**Frank X. Meyer, III, 3120 NE. 57th St., Ft. Lauderdale, Fla. 33308**

**Division of Ser. No. 872,725, Apr. 21, 1992, Pat. No. 5,309,931. This application May 2, 1994, Ser. No. 236,401**

**Int. Cl.[6] B60S *3/04***

**U.S. Cl. 134—57 R** **6 Claims**



1. A tire spraying system for treating the sidewall of a vehicle tire as the vehicle tire follows a prescribed path of travel comprising:
a pneumatic spray nozzle means for treating the sidewalls of the vehicle tire, a supply of treatment chemical communicating with said nozzle means, said spray nozzle including a means for admixing said treatment chemical with air;
means for positioning said nozzle means at a predetermined distance from the sidewall in a corresponding speed equal to the forward movement of the tire;
said means for positioning having an elongated guide track disposed in parallel relation to, and outboard of, said vehicle path of travel, said guide track having a first edge and a second edge;
a carriage having a longitudinal axis with a first end and a second end perpendicular to said guide track and slidably disposed and operatively associated with said guide track;
means for propelling said carriage along said guide track;
means for traversing said carriage from said first end to said second end;
a vending bracket including a rear vending means for treating said tire wall, a front vending means for treating said tire wall, a bracket means for rigidly attaching said front vending means and adjustably attaching said rear vending means to said carriage, and means for positioning said front and rear vending means between a first position transverse to said tire wall vertical plane and a second position transverse and adjacent to said tire wall; and
means for coupling said carriage to said vending bracket.

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**5,497,798**

## CONVEYOR DISHWASHER

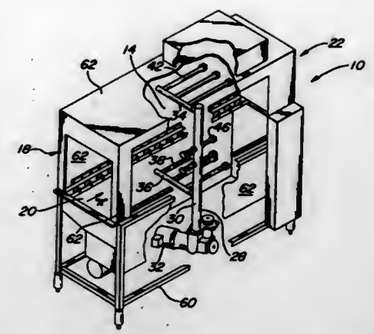
**Herbert D. Fritz, Blue Bell, and Austin H. Rosenblum, Philadelphia, both of Pa., assignors to Insinger Machine Company, Philadelphia, Pa.**

**Filed Nov. 14, 1994, Ser. No. 338,325**

**Int. Cl.[6] A47L *15/00*; B08B *3/02***

**U.S. Cl. 134—151** **18 Claims**

1. A conveyor-type dishwasher for washing dishware, comprising:
means providing a wash chamber having an entrance and an exit between which the dishware is conveyed along a path of travel;



means for supplying a cleaning fluid at a pre-determined temperature under pressure into said wash chamber means;
at least one upper spray manifold located in said wash chamber means for directing said cleaning fluid toward the dishware from above said path of travel;
at least one lower spray manifold located in said wash chamber means for directing said cleaning fluid toward the dishware from below said path of travel; and
side spray means located in said wash chamber means adjacent said path of travel for directing said fluid horizontally toward the dishware from a vertical height which corresponds to the level of the dishware as it advances through said chamber means;
said side spray means having at least one spray nozzle aimed substantially perpendicular to said path of travel;
said at least one spray nozzle providing a fan shaped spray pattern and having an equivalent orifice diameter between about ¼ and 11/32 inches; and
said at least one upper spray manifold, said at least one lower spray manifold, and said side spray means simultaneously directing said cleaning fluid toward the dishware in a manner which provides a temperature inside said wash chamber means approximately equal to said cleaning fluid pre-determined temperature.

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**5,497,799**

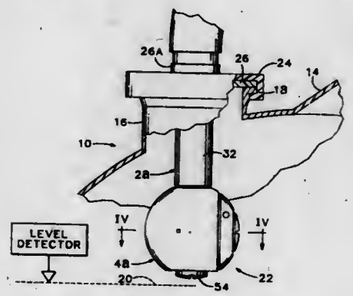
## ROTATING SPRAY NOZZLE

**David R. Shenk, Rockford, Ill., assignor to Envirovac, Inc., Rockford, Ill.**

**Filed Jun. 1, 1994, Ser. No. 252,317**

**Int. Cl.[6] B08B *9/12*; B05B *3/06***

**U.S. Cl. 134—167 R** **11 Claims**




5. A sewage collection apparatus for a vacuum toilet system, comprising:
a tank having a sewage inlet connection for entry of sewage into the tank,

a level detector establishing a maximum filling level for the tank, and

a spray nozzle assembly for distributing cleaning liquid inside the tank, said spray nozzle assembly comprising

a vertical axle member having a first end portion provided with a mechanism attaching the vertical axle member to the tank and a second end portion defining a vertical axis of rotation, said vertical axle member being hollow and defining a passage that extends from said first end portion of the vertical axle member and debouches at an outlet at the second end portion thereof, and

a substantially spherical spray head mounted on the second end portion of the vertical axle member for rotation in sliding relationship with the vertical axle member about said vertical axis of rotation, said spray head being located above the maximum filling level of the tank and comprising at least one nozzle body that defines a nozzle that is connected to the outlet of the passage in the axle member and rotates about both said vertical axis and a horizontal axis to provide a three-dimensional spray pattern of cleaning liquid inside the tank.

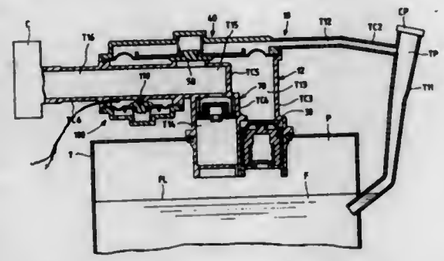
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**5,497,800**

## FUEL VAPOR PROCESSING DEVICE

**Tamiyoshi Ohashi; Joji Kasugai, and Yoshihiro Nagino, all of Aichi, Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan**

**Filed Oct. 11, 1994, Ser. No. 320,653**
**Claims priority, application Japan, Nov. 5, 1993, 5-301242**
**Int. Cl.[6] F16K *24/00***
**U.S. Cl. 137—110** **8 Claims**



1. A fuel vapor processing device for transferring fuel vapor from a fuel tank to a canister when a liquid-phase fuel is fed into the fuel tank through a fuel fill pipe or when the pressure in said fuel tank is raised to a predetermined value, said fuel vapor processing device comprising:

a fuel-tank-side pipe line constructed and arranged to be connected to said fuel tank;

a canister-side pipe line constructed and arranged to be connected to said canister;

a first communicating passage provided between said fuel-tank-side pipe line and said canister-side pipe line;

a first diaphragm valve including a first valve body having one side constructed and arranged to receive pressure in said fuel fill pipe, and another side constructed and arranged to receive pressure in said fuel-tank-side pipe, said first valve body opening and closing said first communicating passage in response to the pressure applied thereto;

a second communicating passage provided between said fuel-tank-side pipe line and said canister-side pipe line; and

a second diaphragm valve including a second valve body having one side constructed and arranged to receive atmospheric pressure, and another side constructed and arranged to receive pressure in said fuel-tank-side pipe line, said second valve body opening and closing said second communicating passage in response to the pressure applied thereto.

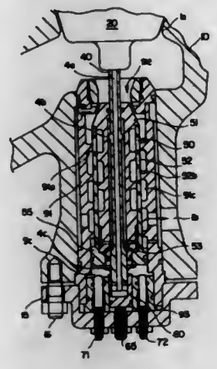
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**5,497,801**

## FLOW CONTROL VALVE

**Masashi Kusunose, Nagasaki; Shoji Mitsui, Yokohama; Hiroei Yanagino, Yokohama, and Chiyuki Sawashima, Yokohama, all of, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Sep. 12, 1994, Ser. No. 302,985**
**Claims priority, application Japan, Sep. 14, 1993, 5-250980**
**Int. Cl.[6] G05D *7/01***
**U.S. Cl. 137—117** **8 Claims**



1. A flow control valve comprising:

a valve housing having a main valve section comprising an inlet, an outlet, a main valve seat between said inlet and said outlet and a main valve element engageable with said main valve seat, and a bypass valve section;

a cylindrical body in said bypass valve section, said cylindrical body having an inner peripheral surface, a bypass valve seat thereon and a plurality of protrusions on said inner peripheral surface forming bypass flow passages therebetween;

a bypass opening and closing body disposed in an axially movable manner in said cylindrical body, said bypass opening and closing body having an outer peripheral surface, a first portion, a bypass valve element on said first portion adapted to butt against said bypass valve seat, a plurality of holes on said outer peripheral surface for opening and closing said bypass flow passages between said protrusions on said inner peripheral surface of said cylindrical body simultaneously with opening and closing of said bypass valve element, and a second portion having an enlarged outer diameter section in contact with said inner peripheral surface of said cylindrical body;

a piston disposed in said bypass opening and closing body in an axially movable manner and extending through said bypass opening and closing body, said piston having a rear portion with an enlarged outer diameter section and a communication hole extending axially through said piston;

a control chamber defined in said bypass valve section adjacent to said second portion of said bypass opening and closing body;

an adjusting means for receiving said rear portion of said piston and applying a resistance force to the flow of fluid between said communication hole in said piston and said control chamber in dependence upon the depth of penetration of said rear portion of said piston therein; and

an adjustment setting means accessible from outside of said valve housing for variably setting an axial position of said adjusting means.



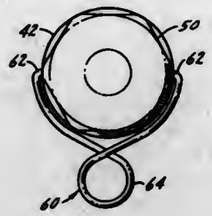
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**5,497,802**

## VANDALPROOF CAP FOR FLUSH VALVE CHECK VALVE

**John F. Whiteside, Franklin Park, Ill., assignor to Sloan Valve Company, Franklin Park, Ill.**

**Filed Jan. 17, 1995, Ser. No. 373,796**
**Int. Cl.[6] F16K *27/08***
**U.S. Cl. 137—377** **4 Claims**



1. A control stop for use in a plumbing supply line including a body, an inlet and outlet in said body, a valve seat in said body and a valve member movable toward and away from said valve seat to control flow from said inlet to said outlet, an opening in said body providing exterior access to said valve member for adjustment thereof, the improvement comprising a vandalproof cap assembly for said opening, said cap assembly including a sleeve threadedly attached to said body about said opening, and a cap mounted on said sleeve for free rotation relative thereto, said cap having an open interior and an interior annular recess adjacent one end of said cap open interior, said recess being defined by an inwardly directed flange, said sleeve having a mating exterior annular projection which fits within said recess, preventing removal of said cap from said sleeve, said sleeve and cap having tool receiving openings therein, which, when in alignment and with a tool inserted therein, will provide for concurrent movement of said sleeve and cap for removal thereof from said body opening.

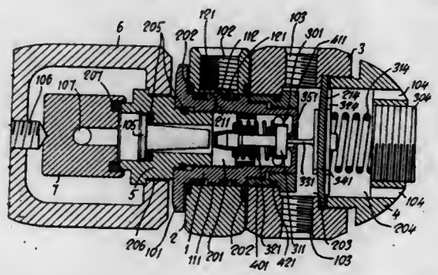
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**5,497,803**

## PRESSURE REGULATOR FOR THE FIRST STAGE OF TWO-STAGE AQUALUNGS

**Michele Ferrante, Serra Riccó, Italy, assignor to A.B. Vitaldado S.p.A., Italy**

**Filed Dec. 6, 1994, Ser. No. 354,073**
**Claims priority, application Italy, Dec. 17, 1993, GE93A0109**
**Int. Cl.[6] F16K *51/00*; G05D *16/06***
**U.S. Cl. 137—505.42** **9 Claims**



1. A pressure regulator for the first stage of two-stage aqualungs, comprising:

a cylindrical body;

a high-pressure gas inlet positioned upstream from said cylindrical body;

a compensating chamber positioned downstream from said cylindrical body;

a first annular body surrounding said cylindrical body and having a plurality of intermediate pressure outlets formed therein, said first annular body being leaktight against the escape of compressed fluid and freely rotatable about the axis of said cylindrical body; and

a high-pressure chamber, an intermediate-pressure chamber and a reducing valve positioned inside said cylindrical body, said reducing valve being interposed between said high-pressure and intermediate pressure chambers and controlled through said compensating chamber, said high-pressure chamber communicating with said high pressure gas inlet, side walls of said intermediate-pressure chamber being formed by said first annular body, said plurality of intermediate pressure outlets being in communication via suitable ports with said intermediate-pressure chamber.

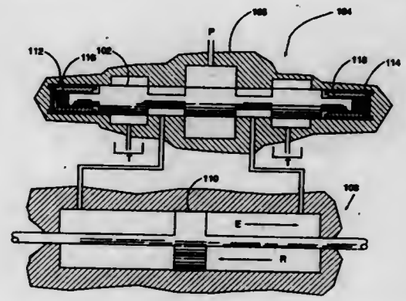
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**5,497,804**

## INTEGRAL POSITION SENSING APPARATUS FOR A HYDRAULIC DIRECTIONAL VALVE

**George Codina, North Hollywood, Calif.; Eldon D. Oestmann, Morton, and Gary J. Shane, Edelstein, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.**

**Filed Jun. 27, 1994, Ser. No. 266,060**
**Int. Cl.[6] F16K *37/00***
**U.S. Cl. 137—554** **9 Claims**



1. An apparatus for determining the spool position of a directional valve, comprising:

a longitudinal valve housing having opposed ends and a plurality of fluid ports;

a spool having reciprocating movement within the valve housing;

a first spring disposed adjacent an end of the spool, the first spring extending and retracting with the reciprocating movement of the spool;

a first oscillator circuit coupled to the first spring and adapted to produce a first position signal in response to the inductance of the first spring; and

logic means for determining the incremental linear position of the spool relative to the housing in response to the frequency of the first position signal.

5,497,805

## DRIVE CONTROL SYSTEM FOR HYDRAULIC MACHINE

Kazuhiro Sunamura; Hidefumi Takegahara, and Toichi Hirata, all of Ibaraki, Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

PCT No. PCT/JP94/00744, § 371 Date Oct. 31, 1994, § 102(e) Date Oct. 31, 1994, PCT Pub. No. WO94/27052, PCT Pub. Date Nov. 24, 1994

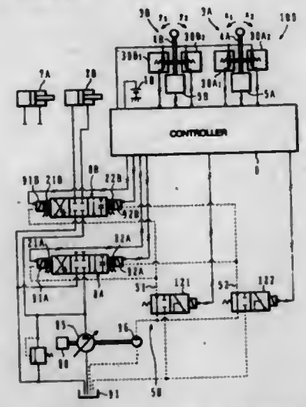
PCT Filed May 6, 1994, Ser. No. 331,527

Claims priority, application Japan, May 7, 1993, 5-106839

Int. Cl.[6] F15B 20/00

U.S. Cl. 137—596.16

7 Claims




1. A drive control system for hydraulic machines comprising an electric lever device (3A, 3B) which includes a control lever (4A, 4B) operable in each of first and second operation areas ($x_1$, $y_1$; $x_2$, $y_2$) with its neutral position therebetween and output means (5A, 5B) for generating an electric signal depending on an input amount of said control lever (4A, 4B), first calculating means (6*a*) for calculating a drive signal corresponding to said electric signal, a pilot circuit (50) including a hydraulic source (96) for generating a primary pilot pressure, and a pilot-operated directional control valve (8A, 8B) provided respectively at opposite ends with electro-hydraulic conversion means (91A, 92A; 91B, 92B) each of which receives the drive signal from said first calculating means (6*a*) and the primary pilot pressure from said pilot circuit (50) and outputs a secondary pilot pressure corresponding to said drive signal, and with pilot operated sections (21A, 22A; 21B, 22B) to which the secondary pilot pressures are applied from said electro-hydraulic conversion means (91A, 92A; 91B, 92B), said directional control valve (8A, 8B) being driven with the secondary pilot pressures applied to said pilot operated sections (21A, 22A; 21B, 22B) for controlling a hydraulic fluid supplied to a hydraulic actuator (7A, 7B), wherein:

said drive control system further comprises operation position detecting means ($30A_1$, $30A_2$, $30B_1$, $30B_2$; 5A, 5B, 6*a*) for detecting in which one of said first and second operation areas ($x_1$, $y_1$; $x_2$, $y_2$) said control lever (4A, 4B) is operated, and pilot pressure control means (121, 122, 51, 52, 6*b*) disposed in said pilot circuit (50) for reducing the primary pilot pressure applied to said electro-hydraulic conversion means (91A, 91B) on the side corresponding to said first operation area ($x_1$, $y_1$) when said operation position detecting means ($30A_1$, $30B_1$; 5A, 5B, 6*a*) does not detect that said control lever (4A, 4B) is operated into said first operation area ($x_1$, $y_1$), holding the primary pilot pressure applied to said electro-hydraulic conversion means (91A, 91B) on the side corresponding to said first operation area ($x_1$, $y_1$) when said operation position detecting means ($30A_1$, $30B_1$; 5A, 5B, 6*a*) detects that said control lever (4A, 4B) is operated into said first operation area ($x_1$, $y_1$), reducing the primary pilot pressure applied to said electro-hydraulic conversion means (92A, 92B) on the side corresponding to said second operation area ($x_2$, $y_2$) when said operation position detecting means ($30A_2$, $30B_2$; 5A, 5B, 6*a*) does not detect that said control lever (4A, 4B) is operated into said second operation area ($x_2$, $y_2$), and holding the primary pilot pressure applied to said electro-hydraulic conversion means (92A, 92B) on the side corresponding to said second operation area ($x_2$, $y_2$) when said operation position detecting means ($30A_2$, $30B_2$; 5A, 5B, 6*a*) detects that said control lever (4A, 4B) is operated into said second operation area ($x_2$, $y_2$).

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5,497,806

## COMPACT PIN-WITHIN-A-SLEEVE THREE-WAY VALVE

Bryan W. Swank; Arpad M. Pataki, both of Columbus, Ind.; Bela Doszpoly, Budapest II, Hungary; Mark S. Cavanagh, Columbus, Ind.; John D. Lane, Columbus, Ind.; Kent V. Shields, Columbus, Ind., and Philip J. G. Dingle, Rochester, Mich., assignors to Cummins Engine Company, Inc., Columbus, Ohio, and Lucas Industries PLC, West Midlands, England

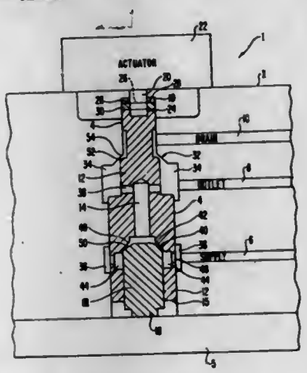
Continuation of Ser. No. 41,424, Mar. 31, 1993, abandoned.

This application Aug. 22, 1994, Ser. No. 293,935

Int. Cl.[6] F15B 13/044; F16K 11/00

U.S. Cl. 137—625.65

5 Claims




1. A three-way valve assembly, comprising:

a valve housing containing a valve chamber and first, second and third valve passages communicating with said valve chamber;

a movable valve member mounted for reciprocal movement within said valve chamber between first and second positions, said movable valve member including a first end and a second end spaced axially along said movable valve member from said first end and a cavity opening into said second end;

a stop means positioned adjacent said second end of said movable valve member for defining one. Of said first and second positions of said movable valve member, said stop means including a floating pin arranged to be telescopingly received within said cavity of said movable valve member adjacent said second end;

a first valve seat associated with said valve housing and movable valve member and positioned between said first and second ends of said movable valve member, said first valve seat being formed between said valve housing and said movable valve member, said first valve seat being positioned to be closed when said movable valve member is in said first position to seal said third valve passage from the said first and second valve passages and allow fluid communication between said first and second valve passage through said valve chamber;

a second valve seat associated with said valve housing and said movable valve member and positioned between said first and said second ends of said movable valve member, said second valve seat being formed between said movable valve member and said floating pin, said second valve seat being positioned to be closed when said movable valve member is in said second position to seal said second valve passage from said first and third valve passages and allow fluid communication between said first and third valve passages; and

an actuating means for advancing said movable valve member toward said first position when energized and for allowing said movable valve member to retract to said second position when de-energized, said actuating means positioned adjacent said first end of said movable member.



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5,497,807

## APPARATUS FOR INTRODUCING SEALANT INTO A CLEARANCE BETWEEN AN EXISTING PIPE AND A REPLACEMENT PIPE

Alan F. Rogers, Southport, United Kingdom, assignor to British Gas PLC, London, United Kingdom

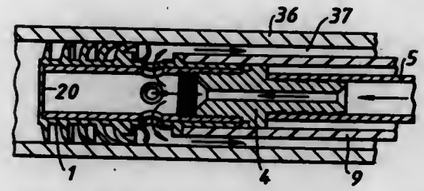
Filed Feb. 28, 1994, Ser. No. 202,453

Claims priority, application United Kingdom, Mar. 10, 1993, 9304877

Int. Cl.[6] F16L 55/18

U.S. Cl. 138—98

28 Claims




1. Apparatus for introducing sealant into a clearance between a replacement pipe and an existing pipe within which in use the replacement pipe is located, the apparatus comprising:

a nose-cone having a tubular body for connection to an upstream end of the replacement pipe, the tubular body having a downstream portion for connection to the replacement pipe and an upstream portion provided with means for sealing the clearance between the pipes when the replacement pipe is located with the existing pipe,

frangible means for sealing the bore of the tubular body, and

at least one non return valve means for permitting the flow of sealant from the bore of the tubular body into the clearance by way of the wall of the tubular body and for resisting return flow from the clearance into the bore.

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5,497,808

## FLUID PRESSURE LINE PATCH

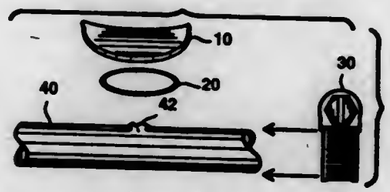
Jim D. Schlund, 230 Bob Barton Rd., Jerome, Id. 83338, and Robert T. Reichel, 2444 Rock Creek Rd., Hansen, Id. 83334

Filed Oct. 31, 1994, Ser. No. 332,118

Int. Cl.[6] F16L 55/16

U.S. Cl. 138—99

4 Claims




1. A device to be applied to a rupture in a fluid-carrying cylindrical pipe to give an effective seal with an outer surface of the pipe to protect against leakage, comprising:

a compression sleeve having inner and outer surfaces, the inner surface curved to generally match the curve of the outer surface of the pipe, the compression sleeve sized to cover less than one half of the pipe circumference wherein the compression sleeve has a lip along its edge protruding inward toward the sleeve's center of curvature and forming an abutment seat for a sealing member;

a sealing member interleaved between said compression sleeve inner surface and the outer surface of said pipe wherein the sealing member is an O-ring abutted and seated against the compression sleeve and lip and extending beyond the lip: and

a screw clamp being sized to encircle said compression sleeve's outer surface and said pipe.

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5,497,809

## VENTED BENDING SLEEVES FOR COAXIAL TUBING SYSTEMS

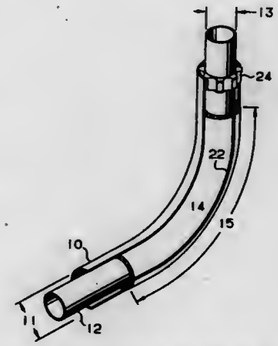
Lawrence W. Wolf, 3901 Dixie Hwy. NE., Unit 505, Palm Bay, Fla. 32905

Filed Jan. 5, 1994, Ser. No. 177,443

Int. Cl.[6] F16L 9/18

U.S. Cl. 138—113

27 Claims




1. A coaxial tubing system, having at least one bend, comprising:

an outer tube having a cross-sectional inner dimension and having a curved portion;

a hollow inner tube suitable for conveying a fluid, said inner tube having a cross-sectional outer dimension, disposed within said outer tube and having a curved portion substantially coextensive with said curved portion of said outer tube; and

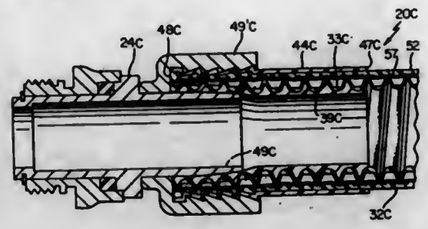
bending sleeve means, disposed between said inner and outer tubes at said bend and having structural continuity over a length at least coextensive with said curved portions of said inner and outer tubes for transmitting bending forces between said outer and inner tubes when said outer tube is subjected to bending, for restricting collapse and limiting deformation of said inner and outer tubes during bending and for maintaining annular spacing between said inner and outer tubes after bending, said bending sleeve means comprising a hollow cylindrical structural member having:

inner means, having a nominal in-use inner dimension incrementally larger than said outer dimension of said inner tube, for enabling said bending sleeve means to be positioned around a to-be-bent portion of said inner tube;

outer means, having a nominal in-use outer dimension incrementally smaller than said inner dimension of said outer tube, for enabling said inner tube with said bending sleeve means positioned around it to be placed within a to-be-bent portion of said outer tube; and

fluid passage means for providing a longitudinal fluid passageway between said inner and outer tubes.

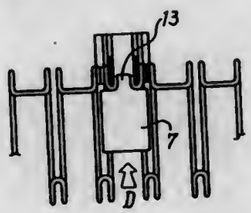
5,497,810
**HOSE ASSEMBLY AND METHOD OF MAKING THE SAME**
Jeffrey M. Berger, Springfield, and Randy C. Foster, Strafford, both of Mo., assignors to Dayco Products, Inc., Dayton, Ohio
Division of Ser. No. 58,625, May 6, 1993, Pat. No. 5,398,977.
This application Dec. 6, 1994, Ser. No. 350,762
Int. Cl.[6] F16L 39/04
U.S. Cl. 138—113 8 Claims




1. In a hose assembly having opposite ends and having a first fluid passage therein for conveying a volatile liquid fuel in one direction from one of said ends thereof to a container adjacent the other of said ends thereof and a second fluid passage therein for returning the vapors of the volatile liquid fuel from the container to said one end thereof, the assembly comprising a flexible inner hose having an outer peripheral surface and defining one of said fluid passages therein, and a flexible outer hose having an inner peripheral surface and an outer peripheral surface and being disposed around said inner hose, said inner peripheral surface of said outer hose and said outer peripheral surface of said inner hose defining the other of said fluid passages therebetween, said outer hose comprising a corrugated tube that has the corrugations thereof extending throughout the entire length thereof, the improvement wherein said outer peripheral surface of said outer hose comprises a substantially straight line tubular layer of polymeric material secured to said corrugations of said corrugated tube throughout the entire length thereof, wherein said inner peripheral surface of said outer hose comprises said corrugated tube and wherein said inner peripheral surface of said outer hose and said outer peripheral surface of said inner hose define said first fluid passage.

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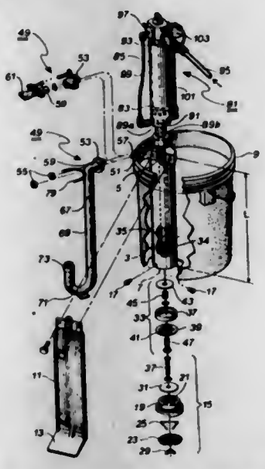
5,497,811
**DEVICE FOR BENDING THE ENDS OF METALLIC BINDING SPIRALS**
Daniele P. Pigna, Bergamo, Italy, assignor to Rilecart S.R.L., Bergamo, Italy
Filed May 12, 1994, Ser. No. 241,533
Claims priority, application Italy, May 31, 1993, M193A1128
Int. Cl.[6] B21F 45/16
U.S. Cl. 140—71 R 7 Claims




1. A device for bending ends (17) which result from cutting to size a length of metallic binding spiral (9), the metallic binding spiral (9) having a longitudinal axis and including prongs (14) having roots (16) with adjacent prongs (14) being separated by lengths (15), characterized in that the device includes a contrast (4) suitable to securely retain the roots (16) of two adjacent prongs (14) of the spiral (9) between which a cut has been performed to form the ends (17), and a pusher (7) adapted for movement orthogonally to the longitudinal axis of the spiral (9) to simultaneously bend the ends (17) parallel to the prongs (14) by interacting with said contrast (4).

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5,497,812
**APPARATUS FOR RAPIDLY FILLING A DRY WALL CEMENT DISPENSING TOOL**
Anthony R. Orosco, 3320 N. Millbrook, Fresno, Calif. 93726, and Alton P. Johnson, 40 Lewis St., Everett, Mass. 02149
Continuation-in-part of Ser. No. 925,874, Aug. 7, 1992, abandoned. This application May 9, 1994, Ser. No. 239,837
Int. Cl.[6] B65B 1/04
U.S. Cl. 141—21 7 Claims

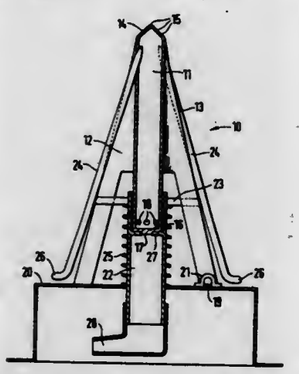


1. Apparatus for rapidly refilling a dry wall cement dispensing tool from a dry wall cement-filled bucket comprising:
a) a thick-walled, heavy metal pump tube having an open bottom end and an apertured top end of a length slightly exceeding the depth of the dry wall cement bucket for submerging into the dry wall cement contained therein;
b) a pump rod axially positioned inside said heavy pump tube and arranged for reciprocal movement therein;
c) a foot valve, located at said open bottom end of said pump tube, including a valve body having formed therethrough a first plurality of apertures through which the viscous cement is pumped, a screen located therebelow for preventing passage of lumps of cement, and a valve disk, of a size sufficient to close over said apertures, spaced above said valve body for movement against and away from said apertures, said foot valve, said valve body and said valve disk of a weight to provide said pump tube with a low center of gravity when set in the bucket of dry wall cement;
d) a cement-moving piston attached to said pump rod for reciprocal motion inside said pump tube and having formed therethrough a second plurality of apertures and a piston disk, slidingly mounted on a sleeve, above said apertures, for reciprocal movement against and away from said apertures for, on an upward stroke of said piston, simultaneously closing over said second apertures, to prevent passage of cement therethrough and to force cement above said piston in said tube out through said apertured top end of said pump tube, and raising from said first apertures for drawing in below said piston an inventory of new cement from the bucket, and on a downward stroke, simultaneously raising said piston disk from said second apertures, to allow passage of cement therethrough, and closing said valve disk against said first apertures to prevent passage of cement therethrough and passing said new cement from below said piston through said second apertures to a position above said piston;
e) thin-walled, light weight transfer means, lighter in weight than said pump tube, extending outward from said apertured top end of said pump tube and in hydraulic communication therewith including nozzle means for conveying the cement from said heavy pump tube into the cement dispensing tool; and,
f) light weight pneumatic rectilinear reciprocating means, lighter in weight than said pump tube, mounted above said tube of a size easily balanced by hand, interconnected to said pump rod and including an actuation valve, for sequentially and rapidly raising and lowering said piston in said heavy pump tube to rapidly fill the dispensing tool;
g) wherein the combination of said heavy pump tube, light weight transfer means and light weight reciprocating means provides a low center of gravity to said apparatus to allow it to be steadied in said bucket of cement.



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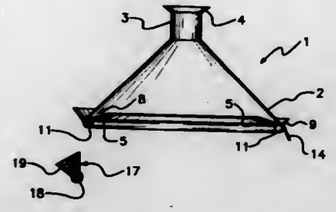
5,497,813
**APPARATUS FOR OPENING SEALED CONTAINERS**
Reinfrid C. Dinnis, Clubworthy Farm, North Petherwin, Launceston, Cornwall, and Samuel T. A. Dinnis, North Moor, Whitstone, Holsworthy, Devon, EX22 6TD, both of, Great Britain
PCT No. PCT/GB91/02072, § 371 Date Jun. 10, 1993, § 102(e) Date Jun. 10, 1993, PCT Pub. No. WO92/09521, PCT Pub. Date Jun. 11, 1992
PCT Filed Nov. 22, 1991, Ser. No. 74,803
Claims priority, application United Kingdom, Nov. 23, 1990, 9025529; Mar. 7, 1991, 9104859
Int. Cl.[6] B65B 1/04;3/04
U.S. Cl. 141—329 16 Claims



1. Apparatus adapted for the opening of a container which contains hazardous liquid material and is sealed with a membrane, the apparatus comprising
a seal rupturing element capable of rupturing the sealing membrane;
a plurality of seal cutting elements capable of cutting the sealing membrane;
support means for supporting said seal rupturing element and said seal cutting elements, said seal cutting elements comprising linear cutting edges inclined away from the seal rupturing element at an angle such that the seal cutting elements generate a cone or frustum on rotation of the apparatus about the longitudinal axis of said support means; and
means for flushing out the interior of the container;
whereby in use the membrane seal is ruptured and cut to form sector-like flaps by said seal rupturing elements and said seal cutting elements, the hazardous liquid contents are allowed to drain therefrom and the interior of the container is flushed out whereby the container is rendered safe for disposal.

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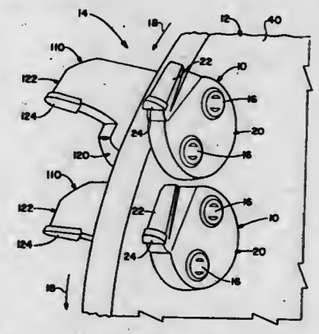
5,497,814
**INVERTIBLE NO WASTE FUNNEL**
John Cannon, P.O. Box 5, St. Elmo, Ala. 36568
Filed Jan. 4, 1994, Ser. No. 177,226
Int. Cl.[6] B65B 39/00
U.S. Cl. 141—331 8 Claims



1. A funnel for inverting over a horizontal surface comprising
(a) at least one wall having a reduced diameter at a first end, an increased diameter at a second end and defining an interior surface and an exterior surface and wherein the second end terminates in a rim;
(b) a barrier means for maintaining oil within the interior surface when the funnel is inverted so that the rim is substantially parallel to the horizontal surface, and wherein the barrier means further comprises a collecting means having at least one raised basin attached to the interior surface and wherein the collecting means further comprises a slanting means for slanting the basin such that a portion of the basin is disposed below the remainder of the basin to form a pooling area within the basin; and
(c) said slanting means comprising a notch extending away from the rim of the funnel approximately opposite the pooling area so that the basin is tilted with respect to a horizontal surface when said funnel rests inverted so that the notch is resting on said horizontal surface such that collected oil drains to the pooling area.

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5,497,815
**CUTTING TOOTH**
John M. Bowling, 9376 Lincoln Way East, Orrville, Ohio 44667
Filed Sep. 15, 1994, Ser. No. 306,571
Int. Cl.[6] B27G 13/04
U.S. Cl. 144—241 18 Claims

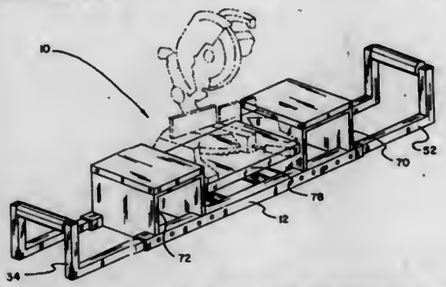


1. A one-piece cutting tooth for direct connection to a cutting wheel of a stump cutting apparatus, said cutting tooth comprising:

a mounting base including at least one substantially flat surface for contacting said cutting wheel, said mounting base having at least one bore formed therethrough to receive a fastener for connecting said cutting tooth to said cutting wheel;
a head portion integral with said mounting base; and
a non-rotatable cutting tip attached to said head portion;
wherein said mounting base and said head portion are made of a one-piece metallic forging.

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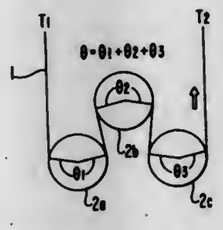
**5,497,816**
**POWER MITER TABLE SAW**
**Richard E. Dariand, 427 W. 13th St., Peru, Ind. 46970**
**Filed Sep. 9, 1994, Ser. No. 303,518**
**Int. Cl.[6] B25N *1/00***
**U.S. Cl. 144—287** **1 Claim**




1. A power mitre saw table for providing an adjustable table for use with a power mitre saw so as to cut prefect joints comprising, in combination:
a hollow base portion having a parallel and spaced apart front tube and a back tube, the front tube and back tube each having an open first end, an open second end, and an intermediate extent therebetween, a plurality of apertures formed in the intermediate extent of both the front tube and the back tube, two support brackets each of which having a first end, a second end, and an intermediate extent therebetween, each first end secured to the intermediate extent of the front tube, each second end secured to the intermediate extent of the back tube;
a hollow left arm portion having a parallel and spaced apart front arm and a back arm, the front arm and the back arm each having a first end and a second end, each first end having a spring biased male detent element therein, each first end telescopically received in the open first end of the front tube and the back tube with the male detent element optionally securing to one of the plurality of apertures along the intermediate extent thereof, each second end having a perpendicularly extending arm therefrom, a roller secured between the perpendicularly extending arm of each second end by a fastening means;
a hollow right arm portion having a parallel and spaced apart front arm and a back arm, the front arm and the back arm each having a first end and a second end, each first end having a spring biased male detent element therein, each first end telescopically received in the open second end of the front tube and the back tube with the male detent element optionally securing to one of the plurality of apertures along the intermediate extent thereof, each second end having a perpendicularly extending arm therefrom, a roller secured between the perpendicularly extending arm of each second end by a fastening means;
a right guide and a left guide each having an upper portion and a lower portion, the lower portion of the right guide secured to a top surface of the hollow base portion inward of the open second end of the front tube and the back tube, the lower portion of the left guide secured to the top surface of the hollow base portion inward of the open first end of the front tube and the back tube;
a platform having an upper surface and a lower surface, the lower surface having an adjustable height securement means theresecured, the securement means secured to the intermediate extent of the two securement brackets of the hollow base portion, the platform situated between the right guide and the left guide.

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**5,497,817**
**METHOD FOR CONTINUOUSLY ANNEALING STEEL STRIP**
**Hiroshi Ikegami, Futtsu, Japan, assignor to Nippon Steel Corporation, Tokyo, Japan**
**Division of Ser. No. 185,825, Jan. 24, 1994, abandoned. This application Jan. 6, 1995, Ser. No. 369,340**
**Claims priority, application Japan, May 25, 1992, 4-156243**
**Int. Cl.[6] C21D *11/00***
**U.S. Cl. 148—500** **3 Claims**




1. A method of continuously annealing a steel strip of a given thickness h, comprising the steps of:
providing a plurality of furnaces operatively coupled together to form a continuous annealing furnace having an inlet and an outlet;
providing a plurality of rolls in said annealing furnace for guiding the steel strip from the inlet to the outlet;
feeding the steel strip around said rolls in said annealing furnace such that the steel strip has a given inlet tension $\sigma_1$ at an inlet side of one of said rolls and a given outlet tension $\sigma_2$ at an outlet side of said one of said rolls;
wherein, in providing said plurality of rolls, said one of said plurality of rolls is selected to have a diameter D which satisfies the equation

$$10\ kPa \leq h(\sigma_1+\sigma_2)D,$$

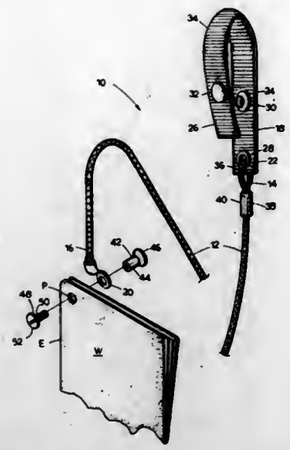
to thereby cause the steel strip to press against said one of said rolls with a surface pressure of at least 10 kPa, so as to thereby prevent longitudinal slippage of the steel strip of thickness h relative to said one of said rolls.

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**5,497,818**
**WALLET TETHER AND WALLET**
**Hawk R. G. Marcarelli, 59610 Aberdeen Dr. #B, Yucca Valley, Calif. 92284**
**Filed Jan. 20, 1995, Ser. No. 375,711**
**Int. Cl.[6] A45C *1/06;13/20;* E05B *73/00***
**U.S. Cl. 150—134** **14 Claims**

1. A wallet in combination with a wallet tether, the combination comprising:
a wallet including a periphery through which passes a tether attachment passage;
a single length of flexible cord having a first end and an opposite second end;
a sleeve capturing said first end of said cord and an adjacent portion of said cord to define a cord loop extending from said sleeve;

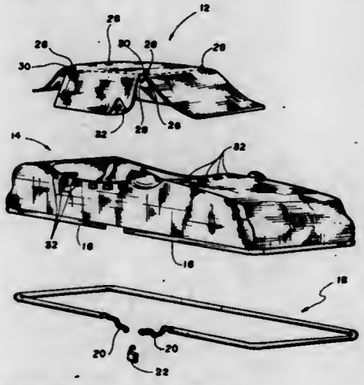





a single length of material having,
a first end including a grommet installed therein, said cord loop permanently secured through said grommet,
an intermediate portion having a first connector portion installed therein, and
an opposite second end having a second connector portion installed therein, said second connector portion selectively connectable to said first connector portion to form an apparel attachment loop between said second end and said intermediate portion with said first end extending therefrom; and
wallet attachment means securing said second end of said cord to the periphery of said wallet at the tether attachment passage.

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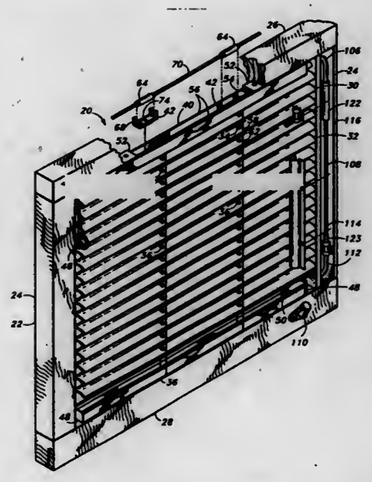
**5,497,819**
**MODULAR CAR COVER**
**Hsi-Ming Chiang, 930 St. Andrews Dr., Malvern, Pa. 19355**
**Continuation-in-part of Ser. No. 136,886, Oct. 18, 1993, Pat. No. 5,435,362. This application Mar. 30, 1995, Ser. No. 413,615**
**Int. Cl.[6] B60J *11/00***
**U.S. Cl. 150—166** **15 Claims**




1. A modular vehicle cover comprising:
a cab covering member having a central panel for covering the roof and front and rear windows of a vehicle cab, said central panel including two side panels for covering vertical surfaces of the vehicle cab, said two side panels attached to and depending from said central panel, said central panel having four holes spaced apart, each of said holes having a permanently attached tether passing therethrough, each said permanently attached tether having two ends, each of said ends having an anchor attached thereto; and
a skirt attachable to said cab covering member for extending said vehicle cover, said skirt having means for manual attachment to said cab covering member.

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**5,497,820**
**BLIND TILT ACTUATOR**
**Frank J. Drake, III, Wausau, Wis., assignor to Springs Window Fashions Division, Inc., Middleton, Wis.**
**Filed Apr. 13, 1994, Ser. No. 227,072**
**Int. Cl.[6] A47H *1/00***
**U.S. Cl. 160—107** **6 Claims**



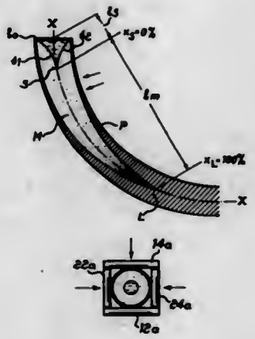

1. A tilt assembly for the tilt adjustment of a venetian blind within a window frame, the assembly comprising:
a) a rotatable actuator;
b) a first flexible cable engaged with the actuator to be rotated thereby, wherein the first flexible cable extends upwardly from the actuator;
c) a rigid rod which is engaged with the first flexible cable to be rotated thereby and which extends substantially vertically upwardly from the first flexible cable, wherein the rod has upwardly extending noncylindrical portions;
d) a second flexible cable which is connected for adjusting the tilt of blinds, wherein the second flexible cable has a downwardly extending fitting connected thereto, the fitting having a generally cylindrical exterior, wherein the fitting has portions defining a noncylindrical cavity which receives the noncylindrical portions of the rigid rod, the rod thereby connecting the first flexible cable to the second flexible cable such that rotation of the actuator causes the rotation of the second flexible cable, and wherein the fitting cavity is of sufficient depth to permit engagement of the rigid rod over a range of rod heights or positioning of the rod; and
e) at least one cable guide which attaches to a vertical stile of a window frame, the cable guide having portions which define a generally vertical channel, and wherein the second flexible cable fitting is engaged within the cable guide channel and thereby restrained from side to side movement.

5,497,821

## MANUFACTURE OF BILLETS AND BLOOMS FROM A CONTINUOUSLY CAST STEEL

Giovanni Arvedi, Via Mercatello, 26, and Giovanni Gosio, both of Cremona, Italy, assignors to Giovanni Arvedi, Cremona, Italy

PCT No. PCT/It92/00113, § 371 Date Feb. 25, 1994, § 102(e) Date Feb. 25, 1994, PCT Pub. No. WO93/04802, PCT Pub. Date Mar. 18, 1993
PCT Filed Sep. 14, 1992, Ser. No. 199,137
Claims priority, application Italy, Sep. 12, 1991, MI91A2414
Int. Cl.[6] B22D *11/04;11/12*
U.S. Cl. 164—476 4 Claims



1. A method for continuously casting steel, the method comprising the steps of:

providing a mold leading to a casting track, the mold having an inlet and the casting track having an outlet;

placing liquid steel in the inlet of the mold, the liquid steel having a temperature above the liquidus temperature value for the steel;

allowing the liquid steel to solidify in the casting track while moving the solidifying liquid steel in a direction toward the outlet of the casting track, the liquid steel solidifying in a predefined manner wherein at a first point along the casting track substantially all of the liquid steel has a liquidus temperature value and a concentration of solid grains of substantially zero percent and wherein at a second point along the casting track all of the liquid steel is substantially solidified and has a concentration of solid grains of substantially 100 percent, the first point being closer to the inlet and the second point being closer to the outlet, the first and second points being generally fixed with respect to the casting track, the length between the first and second points being generally defined by a metallurgical length and each point between the first and second points being a distance from the first point, each point being generally expressible as a percentage, distance×100 / metallurgical length, the solidifying liquid steel at each point along the metalurgical length having a cross-section generally perpendicular to the direction of movement with an area, the cross-section having a perimeter with a length; and

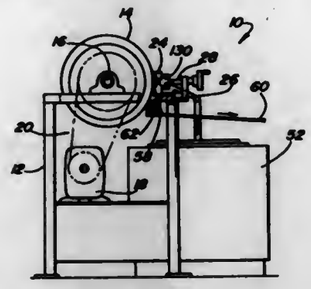
reducing the area of the cross-section of the solidifying liquid steel at a region between about the 10% and about the 80% points while maintaining the length of the perimeter of the reduced cross-section.

5,497,822

## SHOE FOR USE ON CONTINUOUS CASTING MACHINES AND METHOD OF USE

Raymond L. Schenk, 270 Hemlock La., Marysville, Mich. 48040

Filed Jul. 20, 1994, Ser. No. 277,919
Int. Cl.[6] B22D *11/06*
U.S. Cl. 114—479 26 Claims



1. A continuous casting machine comprising:

a rotatable casting component having a continuous mold cavity formed in a surface thereof;

a shoe having an outer surface overlying said mold cavity, an inlet, an outlet, a passageway extending between said inlet and outlet, a discharge slot extending between said passageway and said outer shoe surface, and a heating mechanism disposed within said passageway;

a source of molten casting material;

a supply line interconnecting said source of molten casting material to said inlet;

a return line interconnecting said outlet to said source of molten casting material;

means for rotating said casting component relative to said shoe for continuously moving said mold cavity past said discharge slot in said shoe surface;

means for directing said molten casting material at a desired pressure and flow rate from said source through said supply line and said inlet to said passageway; and

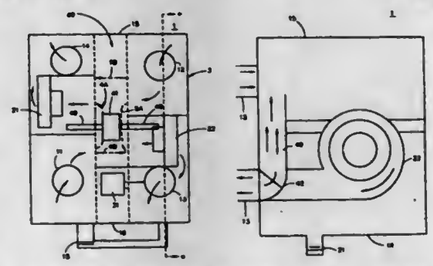
control means for controlling the temperature of said heating mechanism for maintaining said molten casting material flowing through said passageway at a predetermined temperature.

5,497,823

## ENERGY RECOVERY VENTILATOR: MEANS FOR DEFROSTING HEAT EXCHANGER MEDIUM AND DAMPER MOTOR ACTUATION MEANS

George B. Davis, Frederick, Md., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 30, 1993, Ser. No. 176,169
Int. Cl.[6] F24H *3/02*
U.S. Cl. 165—1 24 Claims



1. A method for defrosting an energy recovery ventilator for exchanging indoor air with outdoor air, having a housing including a first and a second input port, a first and a second exhaust port, a heat exchanger core, a first blower for drawing indoor air into said energy recovery ventilator through said first input port, through said heat exchanger core and out said first exhaust port, a second blower for drawing outdoor air into said energy recovery ventilator through said second input port, through said heat exchanger core and out said second exhaust port, a first bypass from said first exhaust port to said first input port, a second bypass from said second exhaust port to said second input port, first and second dampers, said method of defrosting said energy recovery ventilator comprising the steps of:

closing said first exhaust port with said first damper;

closing said second exhaust port with said second damper;

passing said indoor air through said first bypass;

recirculating said indoor air through said heat exchanger core;

passing said outdoor air through said second bypass;

recirculating said outdoor air through said heat exchanger core;

opening said first damper upon said heat exchanger core being defrosted;

opening said second damper upon said heat exchanger being defrosted.

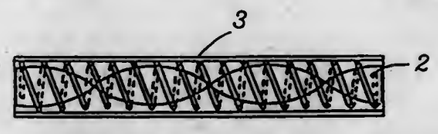


5,497,824

## METHOD OF IMPROVED HEAT TRANSFER

Mohammad A. Rouf, 12 Sierra Dr., Glen Carbon, Ill. 62034

Continuation of Ser. No. 466,861, Jan. 18, 1990, abandoned.
This application Aug. 10, 1994, Ser. No. 288,558
Int. Cl.[6] F28F *13/02*
U.S. Cl. 165—1 10 Claims



1. An improved method of heat transfer between a first fluid passing through the inside of a heat exchange tube, and a second fluid on the outside of the heat exchange tube, the improvement comprising: passing the first fluid through a compound turbulator inside the tube, the compound turbulator comprising a twisted strip surrounded by a helical coil that is either in contact with or closely spaced from the walls of the tube, to generate a high level of turbulence in the first fluid in the region adjacent the tube wall to facilitate heat transfer to the second fluid on the outside of the heat exchange tube.

5. A compound turbulator for heat transfer enhancement for use in combination with a heat exchanger tube, the compound turbulator comprising:

a twisted strip within a helical coil,

wherein the compound turbulator is installed coaxially inside a tube of a heat exchanger, and the helical coil being either in contact with or closely spaced from an inner tube wall surface.

5,497,825

## HEAT-RADIATOR FOR CPU OF A COMPUTER

Chien-Chun Yu, Taipei, Taiwan, Prov. of China, assignor to Symphony Group International Co., Ltd., Taipei, Taiwan, Prov. of China

Filed May 24, 1995, Ser. No. 449,397
Int. Cl.[6] F28F *7/00;* H05K *7/20*
U.S. Cl. 165—11.1 12 Claims

1. A heat-radiator for CPU of a computer, comprising an air exhaust box, a collection funnel means and a bellows connecting said air exhaust box with said collection funnel means, said heat-radiator being characterized in that:

said air exhaust box is disposed with an air exit at a first end and an air incoming pipe at a second end, an air blower being disposed at said first end and a circuit interface board being disposed in said air exhaust box to connect with a detector means and said air blower, said circuit interface board being inserted into an interface socket of the computer for power supply; and

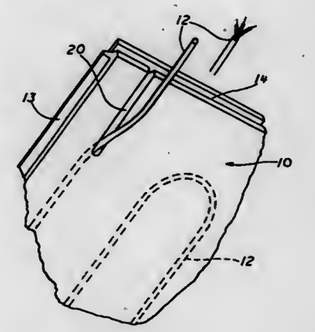
said collection funnel means includes a collection funnel which has a hollow circular tube downward extending from a top portion of said collection funnel for a first spring to fitted therearound so as to abut against a heat-radiating plate, on two lateral sides of said collection funnel being respectively formed two bosses and slide rails located thereunder, on other two lateral sides of said collection funnel being formed two pairs of latch holes, an air outgoing pipe being disposed on one of said lateral sides for said bellows to fit therewith, two opposite symmetric clamping casings being slidably disposed on said slide rails of said collection funnel, said clamping casings respectively having two tenons on outer sides thereof, whereby a second spring is hooked between the tenons to tightly associate said clamping casings together, said clamping casings further respectively having two opposite hooking sections downward extending from bottom ends thereof for hooking/clamping the CPU, a pushing member being pivotally disposed on said bosses of said collection funnel.

5,497,826

## HEATING/COOLING SYSTEMS

Rex A. Ingram, The Old Vicarage, Shute, Axminster, Devon EX 13 7PU, England

Filed Oct. 4, 1993, Ser. No. 131,127
Claims priority, application United Kingdom, Jan. 5, 1992, 9220888
Int. Cl.[6] F24D *3/14*
U.S. Cl. 165—56 3 Claims



1. A solid panel for use in a flooring system, said panel being formed of a solid material and being formed with a serpentine channel within which a heat exchange element is a close fit so as to be in thermal contact with said solid material, said heat exchange element being in the form of plastic tubing through which a

heating or cooling liquid can be passed, said panel being of generally rectangular form in plan view, having spaced upper and lower surfaces and having rigidity characteristics such that it can be used in the construction of flooring laid over joists, said panel being provided with means whereby it can be mechanically interengaged either with similar panels or with standard floor panels not incorporating heat exchange elements, the channel within which the plastic tubing is located extending over a major part of the panel, and being spaced from the upper surface of the panel and the plastic tubing having an external diameter which is not greater than 70% of the spacing between the upper and lower surfaces of the panel, and said tubing being provided with connector means such that, when said panel is assembled side-by-side with another like panel, the plastic tubing in the two panels can be interconnected, the serpentine channel being formed in the lower surface of the panel and the upper surface of the panel being marked to indicate the position of the serpentine channel.

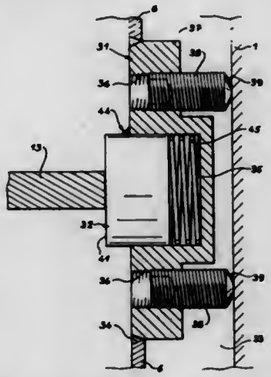
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5,497,827

## DEVICE FOR RADIALLY HOLDING THE BUNDLE ENVELOPE AND SPACER PLATES OF A STEAM GENERATOR BY ELASTICALLY POSITIONED ABUTMENTS

Gil Cornic, De Bruxelles, France, assignor to Framatome, Courbevoie, France

Filed Oct. 14, 1994, Ser. No. 322,516
Claims priority, application France, Jan. 14, 1993, 93 12217
Int. Cl.[6] F28F 9/00
U.S. Cl. 165—162 8 Claims



1. Device for radially holding an envelope of a tube bundle and spacer plates of a steam generator, said steam generator comprising a pressure envelope extending along a given axis, an envelope of said tube bundle extending along a same axis and being contained in said pressure envelope so as to leave an annular space between the two envelopes, said spacer plates being located at given intervals and transversely to said axis within said envelope of said tube bundle in order to support tubes of said bundle, said holding device being constituted by abutments traversing a wall of said envelope of said tube bundle and fixed to said wall level with said spacer plates, said abutments being distributed on a periphery of each said spacer plate in order to radially separate said envelope of said tube bundle from said pressure envelope and so as to exert rigid holding stresses between said spacer plates and said envelope of said tube bundle, each abutment having a first part fixed to said envelope of said tube bundle and incorporating means permitting optional sliding of said abutments on the inner face of said pressure envelope according to said axis and means for varying their radial dimension with respect to said axis, each abutment also having a second part with means for exerting said rigid holding stress on said spacer plate, fixing means being provided for immobilizing said second part with respect to said envelope of said tube bundle after contacting said second part and said spacer plate, wherein said second part is connected to said first part by elastic means so as to make it movable with respect to said first part in a radial direction relative to said axis between a first position corresponding to a first minimum radial dimension of said abutment and a second position corresponding to contact with said spacer plate.

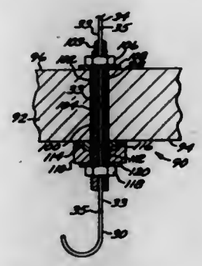
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5,497,828

## SOLID CONDUCTOR THERMAL FEEDTHROUGH

Keith A. Esser, San Diego; Scott W. Riley, Oceanside, and Laurence Warden, San Diego, all of Calif., assignors to Biomagnetic Technologies, Inc., San Diego, Calif.

Division of Ser. No. 80,743, Jun. 21, 1993, Pat. No. 5,441,107.
This application Jun. 7, 1995, Ser. No. 486,516
Int. Cl.[6] F28F 7/00; F25B 19/00
U.S. Cl. 165—185 7 Claims



1. A thermal feedthrough, comprising:
a fiber-reinforced plastic plate having a first surface and a second surface, and further having a threaded plate bore therethrough;
a threaded bolt made of a metallic alloy and engaged to the threaded plate bore, the bolt having an interior bolt bore therethrough;
a first metallic thermal conductor extending through the interior bolt bore and sealed thereto;
a layer of a first adhesive between the threads of the bolt and the bore of the plate;
a first retainer engaged between the bolt and the: plate adjacent to the, first surface of the plate;
a second retainer engaged between the bolt and the plate adjacent to the second surface of the plate, the second retainer including
a volume of a second adhesive contacting the second surface of the plate, and
a nut threadably engaged to the bolt; the first retainer, the second retainer, and the bolt cooperating to place the bolt in tension and the plate in compression;
a second metallic thermal conductor affixed to the first metallic conductor at a first end thereof; and
a third metallic thermal conductor affixed to the first metallic conductor at a second end thereof.

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5,497,829

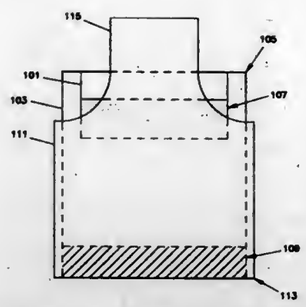
## EXPANSION FOAM BOREHOLE PLUG AND METHOD

Richard A. Rajkovich, Aurora, Minn., assignor to Foam Concepts, Inc., Duluth, Minn.

Filed Nov. 17, 1993, Ser. No. 153,813
Int. Cl.[6] E21B 33/13
U.S. Cl. 166—285 23 Claims

1. A borehole decking plug comprising:
an inner pouch and an outer pouch formed from a liquid-impervious flexible film material, the inner pouch containing a first expansion foam component, the outer pouch containing the inner pouch and a second expansion foam component;





a substantially liquid-impervious open external pouch made from a thin flexible film, the external pouch containing the outer pouch and comprising a top and a bottom edge, having at least one opening substantially near the top edge;
wherein upon breaking the inner pouch, the first and second expansion foam components combine within the outer pouch to form an expansion foam slowly enough to provide sufficient time for the device to be lowered down a borehole to a preselected position, the expansion foam bursting the outer pouch and escaping upward through the at least one opening in the external pouch to form the decking plug at the preselected position.

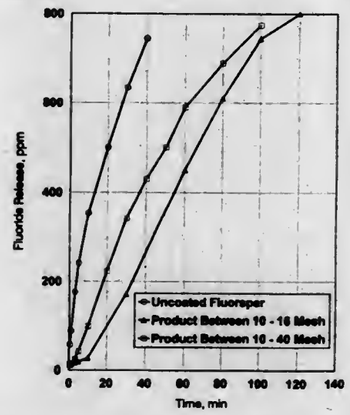
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5,497,830

## COATED BREAKER FOR CROSSLINKED ACID

Joel L. Boles, Spring; Arthur S. Metcalf, Tomball, and Jeffrey C. Dawson, Spring, all of Tex., assignors to BJ Services Company, Houston, Tex.

Filed Apr. 6, 1995, Ser. No. 418,332
Int. Cl.[6] E21B 43/26;43/27
U.S. Cl. 166—300 10 Claims




1. A method of acid fracturing a subterranean formation of an oil or gas well to stimulate production of hydrocarbons, the method comprising the steps of:
providing an aqueous acid fracturing fluid formed from a crosslinked polymer gel which is crosslinked with an organometallic compounds, the gel having an aqueous acid solution and gel breaker particles dispersed throughout, the particles containing complexing materials capable of complexing with the organometallic compounds of the polymer gel so that linkages of the crosslinked polymer gel are broken to thus reduce the viscosity of the gel, the particles having a coating of a water insoluble wood resin which reduces the rate of release of the complexing materials of the particles within the gel;
injecting the fracturing fluid into the formation at high pressure to form fractures within the formation; and
allowing the complexing materials of the particles to be released to complex with the organometallic compounds so that the linkages of the crosslinked polymer gel are broken to reduce the viscosity of the gel.

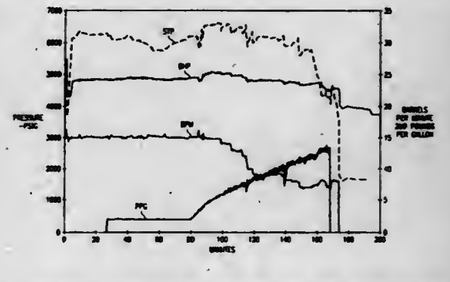
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5,497,831

## HYDRAULIC FRACTURING FROM DEVIATED WELLS

Bryant W. Hainey, Richardson, and Xiaowei Weng, Plano, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Oct. 3, 1994, Ser. No. 316,985
Int. Cl.[6] E21B 43/26
U.S. Cl. 166—308 6 Claims



1. A method of hydraulically fracturing an earth formation from a well penetrating said formation to minimize the creation of multiple fractures in the near-wellbore region of said formation, comprising steps of:
initially injecting a fracturing fluid into said formation through said well at a predetermined rate, said fluid being of a predetermined viscosity;
measuring the instantaneous pressure reduction in said well in the vicinity of said fractures resulting from substantial cessation of injection of said fluid into said formation; and
continuing the injection of fracturing fluid at an reduced rate and a higher fluid viscosity if the near-wellbore friction pressure loss of the fluid being injected as determined from said measurements of pressure reduction is greater than about 1000 psi.

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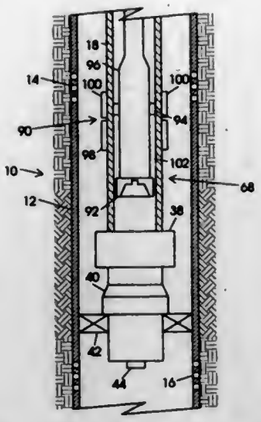
5,497,832

## DUAL ACTION PUMPING SYSTEM

Lon A. Stuebinger, Littleton, Colo.; Kevin R. Bowlin, and Carlos W. Pardo, both of Sugarland, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Aug. 5, 1994, Ser. No. 286,361
Int. Cl.[6] E21B 43/38;43/40
U.S. Cl. 166—369 2 Claims

1. A method to improve the economics of production from a producing oil field by reducing lifting costs, comprising the steps of:
providing a casing string downhole in a producing well and having upper producing perforations and lower injection perforations;
providing a tubing string extending down through said casing forming an annulus therebetween;
providing downhole pumping means having a single piston and connected by a rod string extending through said tubing string toward the surface of the earth and moveable upwardly and




downwardly within said tubing string, said pumping means having upper inlet ports for oil and lower inlet ports for water;

providing valve means in said pumping means for selectively inputting fluid from said annulus through said upper inlet ports on a downstroke of said rod string and through said lower ports on an upstroke of said rod string;

providing packer means between said casing string and said tubing string and separating said annulus between said producing perforations and said injection perforations;

allowing produced fluid comprising oil and water to collect in said annulus above said packer and separate into its oil and water components by gravity therein;

providing at the surface a fluid mixture of primarily oil and a fraction of the produced water on an upstroke of said rod string; and

injecting the produced water input into said lower inlet ports into said injection perforations below said packer means on a downstroke of said rod string.

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**5,497,834**

**SPRINKLER HEAD WITH PLATE FOR ABSORBING AND INDICATING SHOCKS THERETO**

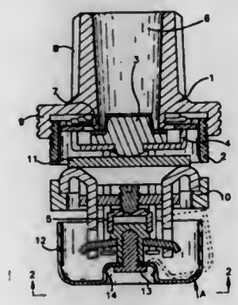
**Hiroshi Onuki, Iwate, Japan, assignor to Senju Sprinkler Company Limited, Tokyo, Japan**

**Continuation of Ser. No. 947,273, Sep. 18, 1992, abandoned. This application Apr. 29, 1994, Ser. No. 235,197**

**Claims priority, application Japan, Sep. 19, 1991, 3-083679 U**

**Int. Cl.[6] A62C *37/12***

**U.S. Cl. 169—37** **15 Claims**




1. A sprinkler head for dispersing a fire extinguishing agent upon occurrence of a temperature increase due to a fire, said sprinkler head comprising:

a fixed portion for connection to a supply of the fire extinguishing agent, said fixed portion having a passage through which the fire extinguishing agent may flow;

a valve for blocking said passage;

a thermally-sensitive assembly for retaining said valve in a position to block said passage prior to occurrence of the temperature increase and for releasing said valve from the position to open said passage in response to the temperature increase;

a heat collection cover for collecting heat from a surrounding atmosphere and for conducting the heat to said thermally-sensitive assembly; and

means for attaching said cover to said thermally-sensitive assembly;

said cover having a general cup shape, and having a bottom and an upper circumferential periphery about an open mouth, said means for attaching said cover to said thermally-sensitive assembly engaging said cover at a location on said bottom, said cover being spaced away from said fixed portion at said upper circumferential periphery a substantial distance for permitting conspicuous deformation of said cover, said cover including a portion having a reduced strength on said bottom for deforming upon impact of an object against said cover to conspicuously deflect another portion of said cover toward said fixed portion a substantial distance relative to an overall size of said cover to indicate the occurrence of the impact.

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**5,497,833**

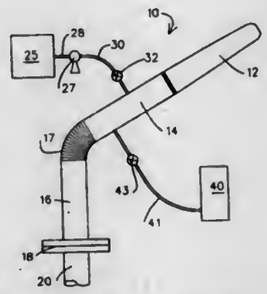
**GAS BOOSTED NOZZLES AND METHODS FOR USE**

**Joseph B. Kaylor, Manassas, Va., assignor to Valkyrie Scientific Proprietary, L.C., Reston, Va.**

**Filed Apr. 8, 1994, Ser. No. 224,698**

**Int. Cl.[6] A62C *3/06***

**U.S. Cl. 169—15** **20 Claims**




1. A method for enhancing the performance of a nozzle employed in directing a stream of water upon a target comprising:

injecting an effective amount of liquified gas into water flowing through said nozzle at a point sufficiently upstream from the outlet of said nozzle to allow essentially complete vaporization and solidification of said liquified gas prior to its exit from the nozzle.



**5,497,835**

**COUPLING HOOK FOR THE LOWER STEERING ARMS OF A THREE-POINT ATTACHING DEVICE OF A TRACTOR**

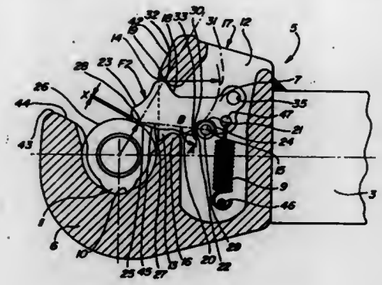
**Joachim Laubner, Ahrweiler; Jürgen Vollmer, Lohmar, and Klaus-Herbert Coenen, Hennef, all of, Germany, assignors to GKN Walterscheid GmbH, Lohmar, Germany**

**Filed May 10, 1994, Ser. No. 240,221**

**Claims priority, application Germany, May 12, 1993, 43 15 811**

**Int. Cl.[6] A01B *51/00***

**U.S. Cl. 172—272** **10 Claims**




1. A coupling hook for lower steering arms of a three-point attaching device of a tractor, comprising:

a hook member, a locking catch coupled with said hook member which is pressurized towards a locking position by a closing spring and which may be moved into an open position by means to be connected thereto, said hook member including a bearing recess which is open on one side and intended to receive a bearing ball of an implement to be attached;

a recess in said hook member for accommodating the locking catch;

an aperture in said hook member for allowing part of the locking catch to pass into the region of the bearing recess;

a first stop face on said hook member, said first stop face provided by said aperture above the locking catch and arranged towards an open end of the bearing recess;

a second supporting stop coupled with said hook member and arranged at a distance from said first stop face;

the locking catch, on its upper side, including a first supporting face cooperating with said first stop face, said first supporting and first stop faces contact one another in a locking position at a contact point; said locking catch, at a front end extending into the bearing recess, including an unlocking face, and a locking face for arresting the bearing ball in the bearing recess; said second supporting stop of the hook member cooperating with said closing spring for securing the locking catch in the locking position;

said locking catch, on its underside, including a recess open towards the underside of the locking catch cooperating with said second supporting stop, said recess including three delimiting faces which form a blocking face, a second supporting face for securing and supporting the locking catch in the locking position, and a stop for limiting the return movement of the locking catch towards the locking position;

said second supporting stop of the hook member including a face which is convex towards the blocking face of the locking catch recess said blocking face of the locking catch recess contacts said convex face of the second supporting stop of the hook member beneath an imaginary connecting line between a possible contact point of the locking face of the locking catch and the outer face of the bearing ball, on the one hand, and the center of the second supporting stop, on the other hand;

said blocking face, extending downwardly from a contact point between itself and the second supporting stop and beyond an imaginary circle whose center is formed by the contact point between the first stop face of the hook member and the first supporting face of the locking catch.

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**5,497,836**

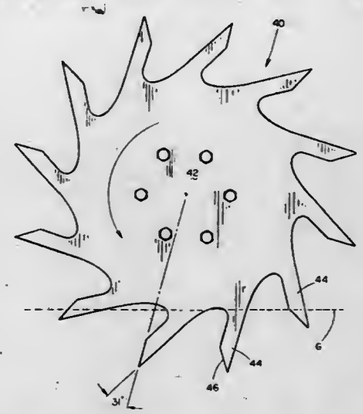
**ROW CLEANER**

**Jerry L. Groff, 1320 Wellington, Imperial, Nebr. 69033**

**Filed Mar. 17, 1994, Ser. No. 210,048**

**Int. Cl.[6] A01B *21/02***

**U.S. Cl. 172—555** **8 Claims**




1. In combination with a farm implement having rearward and forward ends and including at least one planter unit:

a row cleaner device positioned forwardly of at least one planter unit for clearing trash and dirt clods ahead of the planter unit;

said row cleaner device including a pair of ground engageable finger wheels which are angled with respect to each other so they converge forwardly toward the center of their normal path of travel;

each of said finger wheels including a central disc-shaped portion having a plurality of spaced-apart, elongated fingers extending from the circumference thereof;

each of said fingers having a longitudinal axis;

the longitudinal axis of each of said fingers being disposed at an angle with respect to a radius extending from the center of said disc-shaped portion to the outer end of each of said fingers;

each of said fingers being provided with a pointed portion at the outer end;

said pointed portion at the outer end of each of said fingers being defined by a surface which is substantially parallel to a radius extending from the center of said disc-shaped portion to the circumference thereof.

5. In combination with a farm implement having rearward and forward ends and including at least one fertilizer unit:

a row cleaner device positioned forwardly of at least one fertilizer unit for clearing trash and dirt clods ahead of the planter unit;

said row cleaner device including a pair of ground engageable finger wheels which are angled with respect to each so they converge forwardly toward the center of their normal path of travel;

each of said finger wheels including a central disc-shaped portion having a plurality of spaced-apart, elongated fingers extending from the circumference thereof;

each of said fingers having a longitudinal axis;

the longitudinal axis of each of said fingers being disposed at an angle with respect to a radius extending from the center of said disc-shaped portion to the outer end of each of said fingers;

each of said fingers being provided with a pointed portion at the outer end;

said pointed portion at the outer end of each of said fingers being defined by a surface which is substantially parallel to a radius extending from the center of said disc-shaped portion to the circumference thereof.

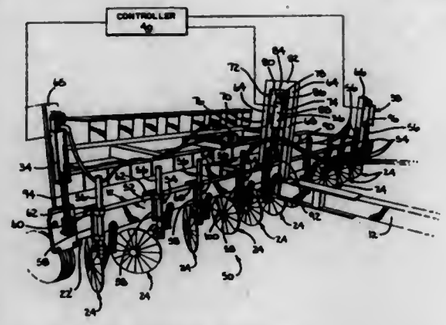
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5,497,837

## APPARATUS FOR CONTROLLING DOWN PRESSURE ON AGRICULTURAL IMPLEMENTS

Barry R. Kehrney, Thamesville, Canada, assignor to Dawn Equipment Company, Sycamore, Ill.

Filed Mar. 31, 1994, Ser. No. 221,250
Int. Cl.[6] A01C 5/06
U.S. Cl. 172—619 20 Claims




1. A soil treatment apparatus comprising:
a main frame to be drawn by a towing vehicle over subjacent soil to be treated;
a subframe;
means for mounting the subframe to the main frame for vertical movement of the subframe relative to the main frame between first and second positions; and
means for attaching a plurality of soil treating implements to the subframe so that the plurality of soil treating implements simultaneously follow movement of the subframe between raised and lowered positions as the subframe moves between the first and second positions,
there being no means structurally connecting between any of the plurality of soil treating implements and the main frame other than through the subframe,
whereby the vertical positions of a plurality of implements on the subframe can be changed simultaneously relative to the main frame.

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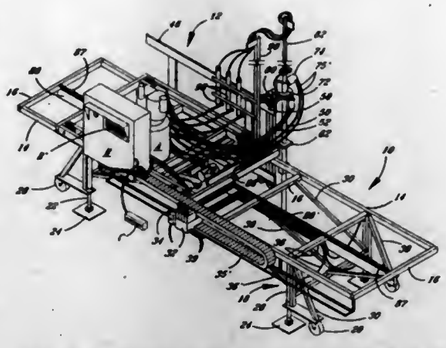
5,497,838

## AUTOMATED ROCK BURNER

W. Allen McCannon, Jr., 2168 Jaudon Rd.; Dan W. Dye, 1619 Calhoun Falls Hwy., and Cecil F. Bond, 1143 Athens Hwy., all of Elberton, Ga. 30635

Filed Apr. 20, 1995, Ser. No. 425,655
Int. Cl.[6] E21B 7/14;19/08;44/00; E21C 37/16
U.S. Cl. 175—27 23 Claims

1. An automated burner system for channeling a mineral body, said system comprising:
a burner staff carrying a burner at one end;
a guide shaft adapted to carry said burner staff for reciprocating motion;
a support shaft adapted to mount said guide shaft for oscillating motion;
a carriage adapted to carry said support shaft;
a carrying frame comprising a pair of spaced parallel rails, said carrying frame being adapted to carry said carriage for longitudinal movement along said rails;



a first drive providing positive reciprocal movement of said burner staff;
a second drive providing positive oscillating movement for said guide shaft and said burner staff;
a third drive providing positive longitudinal movement of said carriage burner staff along said carrying frame; and
an electronic control connected with said first drive, said second drive and said third drive, said electronic control including a repeating program causing said first drive to move said burner staff a desired distance in each direction of reciprocal movement, causing said second drive to oscillate said burner staff at a prescribed angle and through a prescribed length of oscillation, and causing said third drive to move said carriage and said burner staff longitudinally along said carrying frame upon completion of one cycle of movement of said reciprocating and oscillating movements; whereby said burner system operates in an automatic continuous and repetitive manner.

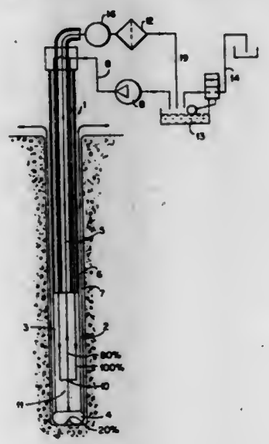
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5,497,839

## LIQUID-DRIVEN DOWNHOLE HAMMER DRILL

Fredrich G. Moir, Melrose Park, Australia, assignor to SDS Pty Ltd., Melrose Park, Australia

PCT No. PCT/AU93/00135, § 371 Date Dec. 16, 1994, § 102(e) Date Dec. 16, 1994, PCT Pub. No. WO93/20322, PCT Pub. Date Oct. 14, 1993
PCT Filed Mar. 31, 1993, Ser. No. 307,848
Claims priority, application Australia, Apr. 1, 1992, PL1641
Int. Cl.[6] E21B 4/14;21/12
U.S. Cl. 175—65 15 Claims





1. A drilling means including:
a drill stem having a cutting end and a liquid supplying end;
a liquid supply passage in the drill stem;
a liquid return passage in the drill stem;
a drill bit at the cutting end of the drill stem;
a hammer motor located in the drill stem such that its distance from the cutting end is less than its distance from the liquid supplying end, the hammer motor being in mechanical communication with the drill bit such that the hammer motor provides a hammer action to the drill bit, the hammer motor being adapted to provide the hammer action due to pressurised liquid supplied along the liquid supply passage to the hammer motor, the liquid then being returned along the liquid return passage and means for diverting a proportion of said liquid from said liquid supply passage for flushing cuttings at the cutting end of the drill stem.

11. A method of drilling including the steps of:
supplying a pressurised liquid down a drill stem to a hammer motor located within the drill stem;
providing a hammer action resulting from the effects of the supplying of the pressurised liquid to the hammer motor;
effecting a drilling action of a drill bit located at the drilling end of the drill bit, the drilling action resulting from the hammer action;
directing the liquid supplied to the hammer motor up the drill stem through a return passage in the drill stem and
diverting a proportion of the liquid away from the return passage and to the face of the drill bit.

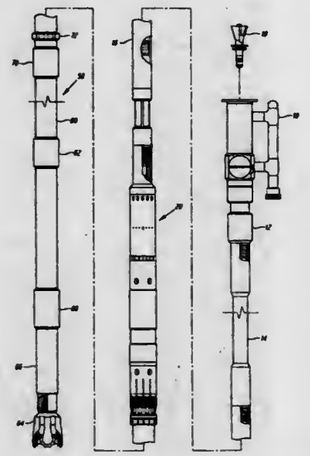
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5,497,840

## PROCESS FOR COMPLETING A WELL

Leo D. Hudson, Bakersfield, Calif., assignor to Bestline Liner Systems, Bakersfield, Calif.

Filed Nov. 15, 1994, Ser. No. 340,109
Int. Cl.[6] C21B 43/00
U.S. Cl. 175—72 5 Claims



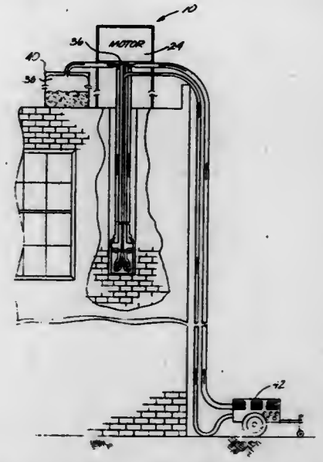
1. A process for finishing a well having a casing, comprising
placing a liner into a well including rotating a drill bit, a liner and a drill string into a desired position extending to below the casing;
introducing cement into the well bore;
voiding the liner interior of cement;
locking the top of the liner to the bottom of the casing;
removing the drill string after locking the top of the liner to the bottom of the casing.

5,497,841

## METHODS FOR CORING A MASONRY WALL

Robert D. Cox, 9562 Peppertree Dr., Huntington Beach, Calif. 92646, and William Mohlenhoff, 17951 Prado Cir., Villa Park, Calif. 92667

Filed Mar. 14, 1991, Ser. No. 669,879
The portion of the term of this patent subsequent to May 14, 2091, has been disclaimed.
Int. Cl.[6] E21B 10/06;21/14; B23B 17/34
U.S. Cl. 175—11 7 Claims




4. A method for reinforcing a structure, comprising the steps of:
cutting a hole in the structure and pulverizing the cut away structural material to form drilling dust with drilling means;
simultaneously forcing air into the hole to draw the drilling dust into a stream of air and withdrawing the dust laden stream from the hole;
collecting the drilling dust;
placing reinforcement in the hole; and
filling the hole with a bonding material.

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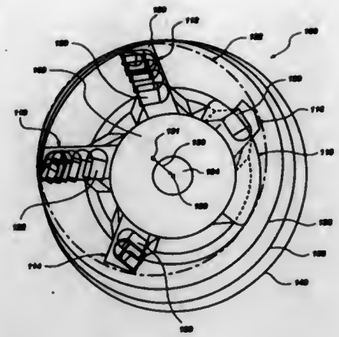
5,497,842

## REAMER WING FOR ENLARGING A BOREHOLE BELOW A SMALLER-DIAMETER PORTION THEROF

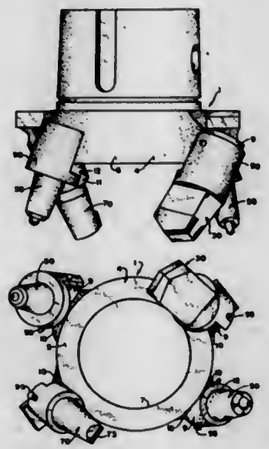
Paul E. Pastusek, Salt Lake City, and Corey S. Thayn, Lehi, both of Utah, assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Apr. 28, 1995, Ser. No. 431,150
Int. Cl.[6] E21B 9/24
U.S. Cl. 175—334 17 Claims

1. A reaming apparatus for expanding a borehole in a subterranean formation to a larger diameter, comprising: a body have a longitudinal bore extending therethrough, a longitudinally extending
rotational axis, and means at the top and bottom thereof for securing said body within a bottom hole assembly;
at least one primary blade for cutting said enlarged borehole diameter upon rotation of said apparatus about said rotational axis, said at least one primary blade having a longitudinal extent, protruding generally radially from said body a fixed distance and defining a cutting profile on an exterior edge thereof; and
a plurality of cutting elements disposed along said primary blade cutting profile from proximate said body for cutting into said formation to expand said borehole to said larger diameter, at least some of said cutting elements being exposed beyond said cutting profile throughout substantially the entire extent of said primary blade cutting profile.

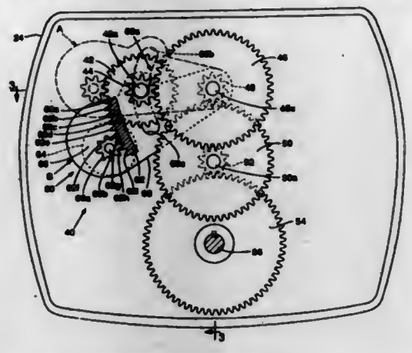


5,497,843
**HOLLOW AUGER HEAD ASSEMBLY**
Raymond W. Burns, Bethalto, Ill., and Kyle Oberlander, Florissant, Mo., assignors to Central Mine Equipment, Earth City, Mo.
Filed Mar. 24, 1995, Ser. No. 410,497
Int. Cl.[6] E21B *10/62;10/46;10/48*
U.S. Cl. 175—403 5 Claims



1. In a hollow earth auger head assembly the improvement comprising a plurality of bit pockets spaced circumferentially from one another around an open mouth of an auger head, said open mouth being defined by an outer edge of a cylindrical side wall, said pockets being arranged around an outer surface of said side wall, each of said pockets having a socket opening toward said outer edge of said cylindrical wall, and bits adapted to be seated in said sockets, said bits having a multiplicity of types of cutting teeth but all of said bits having a shank portion that seats in any of said pocket sockets, each of said pockets having a side wall defining said socket, and passages chordally aligned with one another and chordally offset from the diametric, extending through said side wall to receive pin means for retaining said bits, said bits having complementary pin means retaining means in said shank portion.

5,497,844
**CRAWLER GEAR ASSEMBLY**
Daniel D. Fritzinger, Grabill, Ind., assignor to Mattel, Inc., El Segundo, Calif.
Filed Apr. 17, 1995, Ser. No. 423,298
Int. Cl.[6] B60K *17/14*
U.S. Cl. 180—65.6 10 Claims

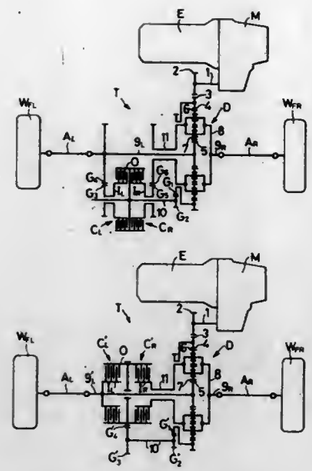


1. A child's riding vehicle comprising:
a frame;
plural wheels rotatably mounted on the frame;
a gear assembly fixed on the frame which includes an output gear non-rotatably connected to at least one of the vehicle's wheels;
an electric motor including a driven motor pinion, the motor being movably mounted on the frame for movement between a first position in which the motor pinion is in driving engagement with the gear assembly for driving the output gear, and a second position in which the motor pinion is disengaged from the gear assembly for allowing the output gear and the vehicle's wheels to freely rotate without driving or back-driving the motor; and
an engagement gear mounted on the frame adjacent the gear assembly for operatively engaging the motor pinion and defining a path of travel for the motor pinion between the first and second positions, whereby when the motor is activated the pinion engages the engagement gear and the motor automatically climbs therealong to the first position, and when deactivated, the motor automatically moves along the engagement gear under the influence of gravity to the second position.

5,497,845
**POWER TRANSMITTING SYSTEM FOR VEHICLE**
Yasuji Shibahata, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 3, 1994, Ser. No. 285,557
Claims priority, application Japan, Aug. 5, 1993, 5-194567
Int. Cl.[6] B60K *17/20*
U.S. Cl. 180—76 3 Claims

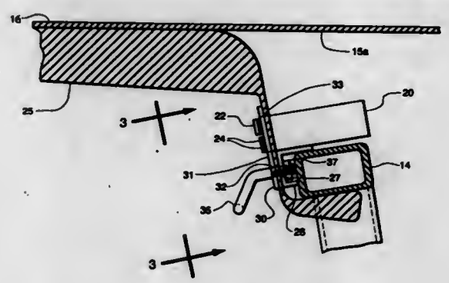
1. A power transmitting system for a vehicle having left and right wheels, comprising
a planetary gear type differential which is comprised of a ring gear connected to an input shaft, a sun gear connected to a first output shaft for driving one of said left and right wheels, and a planetary carrier which rotatably carries planetary gears meshed with said ring gear and said sun gear and which is connected to a second output shaft which drives the other of said left and right wheels;
a first rotatable member disposed closer to said first output shaft than to said differential and connected to said ring gear;
a second rotatable member disposed closer to said first output shaft than to said differential and connected to said planetary carrier;





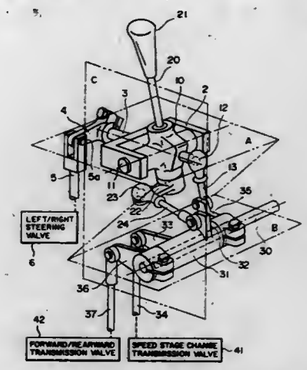
a first clutch for interconnecting said first rotatable member and said first output shaft; and
a second clutch for interconnecting said first rotatable member and said second rotatable member.

5,497,846
**HAND SUPPORT FOR TRACTOR CONTROLS**
Russell W. Strong, Craftsbury, Vt., assignor to New Holland North America, Inc., New Holland, Pa.
Filed Oct. 11, 1994, Ser. No. 321,289
Int. Cl.[6] B60K *26/00*
U.S. Cl. 180—315 10 Claims



1. In a tractor having a wheeled chassis adapted for movement over the ground; an engine supported on said chassis for providing operative power for said tractor; and an operator's station supported on said chassis and containing controls for controlling selected operative functions, at least one of said controls having movable control devices to be manipulated in a predetermined manner to control the corresponding operative function, the improvement comprising:
bracing means formed as a loop mounted on said operator's station adjacent to, yet spaced outwardly from, said at least one control to provide a hand rest for the steady operation of said movable control devices.

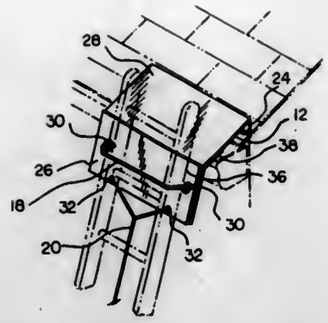
5,497,847
**SINGLE LEVER FOR CONTROLLING MULTIPLE FUNCTIONS**
Singo Ota, and Hiroshi Nakagami, both of Hirakata, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan
Filed Oct. 27, 1994, Ser. No. 330,020
Claims priority, application Japan, Jan. 27, 1993, 5-291238
Int. Cl.[6] B60K *26/00*
U.S. Cl. 180—333 18 Claims

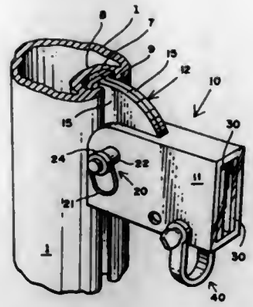



1. An operator lever device employing a single operator lever for operating a plurality of functions, said operator lever device comprising:
a rotary yoke shaft having a longitudinal axis extending in a first direction;
a yoke secured to one end of said rotary yoke shaft so as to be rotatable about the longitudinal axis of said rotary yoke shaft, said yoke having a pair of prongs which extend generally parallel to said first direction;
a cruciform member which is pivotally mounted between said prongs so as to be pivotable about a pivot axis which is generally perpendicular to said first direction; and
an operator lever which is mounted to the cruciform member so as to be rotatable about a longitudinal axis of said operator lever which is generally perpendicular to Said pivot axis;
wherein a first end of a first lever member is fixedly secured to said rotary yoke shaft for rotation of said first lever member with said rotary yoke shaft about the longitudinal axis of said rotary yoke shaft, and
wherein a second end of said first lever member is connected by a first linkage to a first control valve for operating said first control valve.

5,497,848
**LADDER MOUNTED GUTTER PROTECTORS**
Walton L. Travis, 4217 Maple Ave., Fairfax, Va. 22032
Filed Nov. 10, 1994, Ser. No. 337,082
Int. Cl.[6] E06C *7/48*
U.S. Cl. 182—107 2 Claims

1. A new and improved ladder mounted gutter protector comprising, in combination:
a gutter protector fabricated of lightweight metal, the protector being configured in a generally L-shaped orientation, the protector having an upper region, a lower region, and a central region therebetween, the lower region being formed in a planar generally rectangular configuration with parallel short side edges and parallel long side edges, the long side edges being positioned horizontally and the short side edges being positioned vertically in an operative orientation, the lower region having two apertures, one being centrally positioned adjacent to each short side edge, the lower region also having two holes near its lower long side edge and positioned





inwardly with respect to the centrally positioned apertures thereabove, the centrally positioned apertures in the lower region having bolts with ring shaped heads positioned therethrough, the bolts being firmly secured through the apertures with cooperatively coupled nuts;

the central region of the apparatus being formed contiguously with the upper and lower regions and having parallel long side edges and parallel short side edges, the central region having its lower long side edge formed contiguously with the upper long side edge of the lower region, the central region being slanted from the lower region at an angle of approximately one hundred and forty degrees, the upper region of the apparatus being formed in a generally J-shaped orientation, the long portion of the J being formed contiguously with the long side edge of the central region and extending therefrom at approximately a ninety degree angle, the hooked portion of the J being of a generally semi-circular shape and extending upwardly a short distance from its rounded lowermost portion thereof, the upper region of the apparatus adapted to be positioned upon the roofs of houses and buildings, the apparatus permitting the user to lean a ladder against roofs of various structures without damaging adjacent gutters;

the apparatus including a Y-shaped rope with two free ends at an upper extent thereof, the rope having one free end at a lower extent thereof, the rope having a length at least equal to that of the ladder coupled thereto, the holes in the lower region adapted to permit the coupling of both free ends of the upper extent of the Y-shaped rope thereto; and

a flexible tension cord with two free ends, the free ends of the tension cord being coupled to the ring heads of the bolts in the lower region of the apparatus, the tension cord adapted to be positioned around the rungs of a ladder in an operative orientation.

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**5,497,849**

**LUFF GROOVE BRACKET AND METHOD**

**John C. Duffy, 7263 SW. 53rd Ct., Miami, Fla. 33143**

**Filed Aug. 22, 1994, Ser. No. 293,832**
**Int. Cl.[6] A63B 27/02**
**U.S. Cl. 182—136** **7 Claims**

1. A shiftable bracket for securing in a groove in an elongate member comprising, in combination,

a tubular bracket body,

a lock plate assembly having two lock plates motion bodies, and a lock flange along one end of each body motion,

said lock plates having a curvilinear portion,

a rearwardly extending slot in an upper portion of the tubular body for receiving the body portions of the lock plates adjacent to the curvilinear end,

a through bore passing through the tubular body,

a through bore centrally positioned in each lock plate,

and means for pivotally securing the lock plates interiorly of the tubular body.

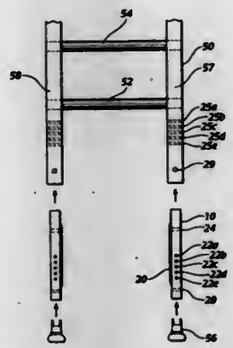
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**5,497,850**

**APPARATUS FOR LEVELING A LADDER**

**Ralph E. Patterson, Rte. 1, Box 317, New Cumberland, W. Va. 26047**

**Filed Jun. 29, 1994, Ser. No. 268,172**
**Int. Cl.[6] E06C 7/00**
**U.S. Cl. 182—204** **14 Claims**



1. An apparatus in combination with a ladder for leveling the ladder on an uneven surface the combination comprising:

a ladder having two hollow side rails connected by a plurality of rungs equally spaced from each other and disposed at increasing height along the side rails, each of the side rails having a front, a back, an outer side, an inner side, a top and a bottom;

at least one leveling leg substantially rectangular in shape and having a front, a back, an inner side, an outer side, a top and a bottom, said at least one leveling leg being inserted into the bottom of at least one of the hollow side rails of the ladder, said top of said at least one leveling leg having a U-shaped cutout with two straight portions and a curved portion, said cutout enabling said at least one leveling leg to be inserted into the side rail of the ladder and fit around the lower most rung of the ladder, said at least one leveling leg having a notch disposed on said outer side of said leveling leg and along said curved portion of said U-shaped cutout, said notch further enabling said at least one leveling leg to fit around the lower most rung of the ladder when inserted into the side rail; and

securing means for securing said at least one leveling leg to the ladder.

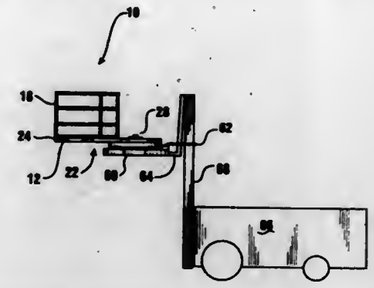


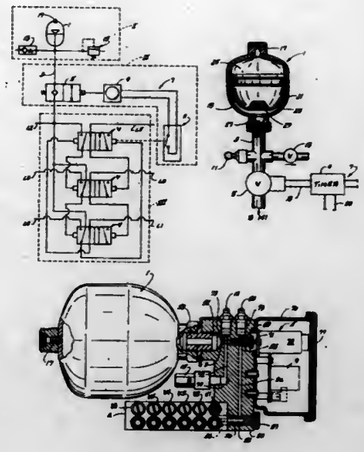
**5,497,851**

**PIVOTING WORK PLATFORM**

**James G. Walcher, Willard, and Arthur C. Herner, Monroeville, both of Ohio, assignors to Safety Equipment Inc., Monroeville, Ohio**

**Filed Jun. 29, 1994, Ser. No. 268,150**
**Int. Cl.[6] E04G 1/00; B66F 11/00**
**U.S. Cl. 182—223** **22 Claims**





1. A rotatable elevated load supporting apparatus, comprising:

a load supporting deck;

a support frame supporting said deck, said support frame including a pair of spaced fork accepting members wherein lifting forks are acceptable in said fork accepting members;

rotating means for rotatably moving said deck relative to said frame, said rotating means interposed between said deck and said support frame;

a cantilever portion extending generally horizontal relative to said deck, said cantilever portion having a first end, said first end supporting said deck;

a disk shaped member having a generally horizontally extending first face, said cantilever portion in supported relation with said first face, said disk shaped member further including a second face extending generally parallel and opposed of said first face;

a tab portion attached to a second end of said cantilever portion, wherein said tab portion is engageable with said second face of said disk shaped member.

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**5,497,852**

**AUTOMATIC LUBRICATION SYSTEM**

**John Little; Jeffrey Kotyk, both of St. Louis, and James B. Grove, Chesterfield, all of Mo., assignors to McNeil Corporation, St. Paul, Minn.**

**Filed Apr. 12, 1995, Ser. No. 421,046**
**Int. Cl.[6] F16N 27/00**
**U.S. Cl. 184—7.4** **17 Claims**

1. An automated self-powered lubrication system for automatic periodic operation through a cycle in which metered charges of lubricant are delivered to a plurality of points of lubrication, said system comprising:

a plurality of lubricant metering devices, each operable by lubricant under pressure, for dispensing metered charges of lubricant to points of lubrication;

a reservoir for holding lubricant under pressure for supplying the metering devices with lubricant under pressure serving as both a power source for the operation of the devices and as a source of the lubricant to be dispensed;

said reservoir being chargeable with the lubricant and adapted to be conditioned for pressurizing the lubricant for a prolonged period of operation of the system;

said reservoir being interconnected with said metering devices for supplying power for operating said devices as well as supplying lubricant to be dispensed thereby;

means controlling delivery of pressurized lubricant from the reservoir to said metering devices; and

closed loop control means for the system comprising a timer operable upon receiving a timing start signal to effect operation of said delivery control means to cut off delivery of the pressurized lubricant from the reservoir to said metering devices and to time out a dwell period during which said delivery control means cuts off said delivery and the system dwells, and operable upon termination of said dwell period to effect operation of said delivery control means to provide for delivery of the pressurized lubricant from the reservoir to the metering devices for operating said devices, and a sensor device responsive to operation of the metering devices through a cycle to send a timing start signal to the timer to effect operation of said delivery control means to cut off delivery of the pressurized lubricant from the reservoir to said metering devices and start the timing of a dwell period;

whereby at the termination of each dwell period the pressurized lubricant is delivered from the reservoir to the metering devices for operation thereof through a cycle, and delivery to the metering devices is cut off and maintained cut off after each cycle until the timer times out the next dwell period.

5. An automatic lubrication system for periodic operation through a cycle in which charges of lubricant are delivered one after another in sequence to a plurality of points of lubrication, said system comprising:

a series of lubricant dispensing valves each having an inlet passage for admission of the lubricant under pressure, transfer passages for interconnection of the valves in the series, at least one outlet passage for delivery of the lubricant to a point of lubrication, and a valve member movable between a first position and a second position for delivery of a charge of the lubricant through the outlet passage thereof;

passaging for interconnecting said transfer passages of said valves;

the valve members being successively movable to deliver charges of the lubricant through the outlet passages in a sequence via delivery of the lubricant under pressure through the inlet passages and interconnections between the valves established by the valve members, said transfer passages and said passaging;

a reservoir for holding a supply of the lubricant under pressure;

a line between the reservoir and the inlet passages of the valves in said series for delivery of the lubricant from the reservoir to said inlet passages;

an on-off control valve in said line for controlling the delivery of the lubricant to said inlet passages;

a timer for controlling said control valve, operable upon receiving a timing start signal to time out a period of closure during which the control valve is maintained closed and operable upon termination of said period to open the control valve and maintain it open until the next timing start signal is received, and

a sensor device responsive to completion of a cycle of operation to send a timing start signal to the timer;

whereby at the termination of each period of closure of the control valve it is opened for delivery of lubricant under pressure from the reservoir to the inlet passages of the lubricant dispensing valves in said series and closed at the end of each cycle and maintained closed until the timer times out the next period of closure of the control valve.

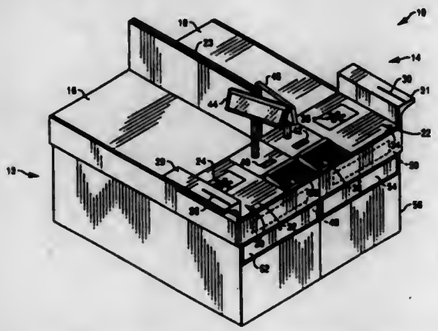
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**5,497,853**

## LABOR-SAVING CONSOLIDATED CHECKOUT SYSTEM

**Donald A. Collins, Jr., and Andrew B. Nye, III, both of Duluth, Ga., assignors to NCR Corporation, Dayton, Ohio**

**Filed Jun. 15, 1992, Ser. No. 898,648**
**Int. Cl.[6] A47F 9/02**
**U.S. Cl. 186—61** **11 Claims**



11. A checkout method employed in an establishment having first and second joined checkout counters including first and second integrated terminals at one end of the first and second checkout counters having first and second optical scanners mounted within the first and second checkout counters and first and second magnetic stripe readers which are accessible to first and second self-service customers and a store employee, wherein the first and second optical scanners are the only optical scanners in the checkout system, the method comprising the steps of:

stationing the store employee at or adjacent the one end of the first and second checkout counters;

independently scanning purchased merchandise items by said first and second self-service customers at the first and second checkout counters to determine the payment amounts due for the purchased merchandise items;

independently paying for the purchased merchandise items using payment cards swiped through the first and second magnetic stripe readers by the first and second self-service customers; and

scrutinizing both the first and second customers by the store employee as the first and second self-service customers perform the steps of scanning and paying to ensure that all of the items are scanned and that payment is received.

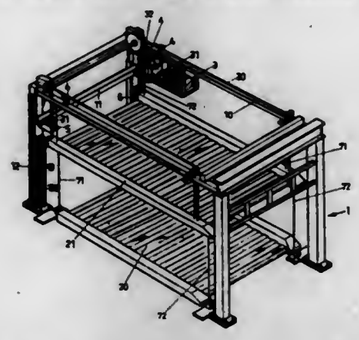
**5,497,854**

## FALLPROOF SAFETY PARKING APPARATUS

**I Liang Fang, No. 67, Huan Kung Road, Yung Kang Industrial Area, Yung Kang City, Tainan County, Taiwan, Prov. of China**

**Filed Sep. 2, 1994, Ser. No. 300,203**
**Int. Cl.[6] B66F 7/00**
**U.S. Cl. 187—213** **1 Claim**

1. The fallproof safety parking apparatus comprising a main



body, an upper and a lower parking platforms disposed thereon, and several chains driven by a motor for ascending/descending said upper parking platform along said main body, said parking apparatus being characterized in that:

said main body has a transverse beam and a lateral beam on which a detector and a detecting means are respectively disposed beside said chains, said detector having a microswitch and a resilient pressing rod pressing against said chains, said detecting means having a resilient pressing post having a front abutting block for abutting against one side of the chains, a driving lever having an inner microswitch being disposed on the other side of the chains opposite to said abutting block;

two fallproof means are disposed respectively on two sides of a rear end of said upper parking platform, each of said fallproof means having a microswitch sensitively connected with said microswitches of said detector and said detecting means, said fallproof means having an inner solenoid having a front post extending into a chamber of a fixing block to fit with a spring, a brake block being disposed at a front end of said front post, on two supports of said main body being disposed fallproof supports having insertion holes corresponding to and for said brake blocks of said fallproof means to insert thereinto; and

on two sides of a bottom of said upper parking platform are respectively disposed two pairs of steel cables, one end of one of one pair of said steel cables being fixed on a base located on a rear right lower side of said main body, while the other end of the steel cable being fixed with a suspending ring located on a front right upper side of said main body, one end of the other steel cable of one pair of said steel cables being fixed with a suspending ring located on a rear right upper side of said main body, while the other end of the steel cable being fixed on a base located on a front right lower side of said main body, the other pair of said steel cables being disposed on a left bottom side of said parking platform corresponding to the right side steel cables in a balance state so as to provide a stabilizing, reinforcing and fallproof effect for said upper parking platform, whereby in case any section of said chains is broken apart, said resilient pressing rod of said detector or said resilient pressing post of said detecting means immediately bounds out from the broken section of said chains to actuate said microswitch of said detector or said detecting means, making said fallproof means powered off and at this time, the attraction of said solenoid suddenly disappears, making said brake block inserted into said insertion hole of said fixing lever of said support and locked therein so as to prevent said upper parking platform from straightly falling down.



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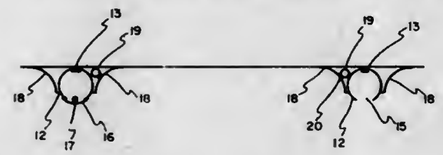
**5,497,855**

## EXTERIOR FIRE FIGHTING AND EVACUATION SYSTEM FOR HIGH RISE BUILDINGS

**Chester G. Moore, 949 Calabash Rd. NW., Calabash, N.C. 28467**

**Filed Sep. 15, 1994, Ser. No. 305,340**
**Int. Cl.[6] B66B 9/00**
**U.S. Cl. 187—239** **9 Claims**

1. An exterior fire fighting and evacuation system for high rise



buildings having a plurality of vertically aligned exits that can be used in an emergency comprising: a pair of tube like vertical trollies attached to said building on opposite sides of said vertically aligned exits, each of said vertical trollies having a longitudinal slot-like opening in one side thereof; an arm assembly means slidably mounted on each of said trollies and outwardly projecting through said longitudinal slot-like opening; a cab means extending between and removably mounted on said arm assembly means; chain drive means operatively connected to a reversible motor operatively connected to each of said arm assemblies within each of said trollies; and built in high pressure lines adjacent at least one of said trollies for making fire retardant fluids available to the occupants of said cab at various locations on said building whereby said cab can be mounted on said arm assemblies when an emergency arises and said motor can drive said chain drives to lift and lower the arm assemblies and their associated cab up and down the exterior of said building and fire retardant fluids are available on the face of said building for fire fighting and to aid in evacuation of such building.

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**5,497,856**

## LOCKING CASTER BRAKE ASSEMBLY

**Vurl D. Block, Waldenburg, and Robert K. Hamilton, Jonesboro, both of Ark., assignors to Colson Caster Corporation, Jonesboro, Ark.**

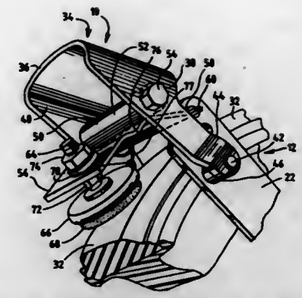
**Filed Aug. 31, 1994, Ser. No. 298,874**
**Int. Cl.[6] B60B 33/00**
**U.S. Cl. 188—1.12** **7 Claims**

1. A positive locking brake mechanism for a caster wheel to prevent its rotation about an axle supported by a wheel fork, the wheel having a cylindrical peripheral surface, comprising:

A. a pair of mounting arms located on opposite sides of the wheel and secured in a fixed position with respect to the wheel fork, said pair of mounting arms extending radially beyond the cylindrical peripheral surface of the wheel,

B. a U-shaped operating member, having a base and a pair of legs, said legs being pivotally supported on said pair of mounting arms, and said base forming a pedal for actuation of the brake mechanism,

C. a cam follower supported by and extending between said pair of legs of said U-shaped operating member,



D. a brake pad support arm having first and second ends located between said pair of mounting arms, and pivotally supported at said first end on said pair of mounting arms, a brake pad supported by said second end of said brake pad support arm, a retaining notch located on said support arm between said first and second ends, pivoting of said U-shaped operating member in a first direction causing said cam follower to engage and pivot said brake pad support arm about said first end to move said second end toward the cylindrical peripheral surface of the wheel such that said brake pad engages the cylindrical peripheral surface, further pivoting of said U-shaped operating member in the first direction causing said brake support arm to resiliently deform, still further pivoting of said U-shaped operating member causing said cam follower to engage and be retained in said retaining notch, thereby positively locking the caster wheel to prevent its rotation.

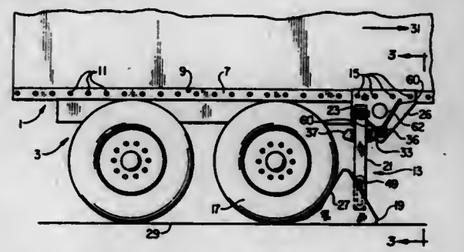
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**5,497,857**

## EMERGENCY BRAKE SYSTEM FOR WHEELED VEHICLES

**Oscar E. Warren; Walter N. Armstrong, and Bob J. Beard, all of San Antonio, Tex., assignors to TransTech Resources, Inc., San Antonio, Tex.**

**Continuation of Ser. No. 996,723, Dec. 24, 1992, abandoned. This application Jul. 29, 1994, Ser. No. 282,415**
**Int. Cl.[6] B60T 1/04**
**U.S. Cl. 188—4 R** **3 Claims**



1. An emergency brake system for a wheeled vehicle comprising:

a deformable brake wedge comprising a tire-receiving surface and a road-engaging surface, said road-engaging surface being provided by a friction pad attached to said brake wedge;

a rear portion of said friction pad having a higher coefficient of friction than that of a forward portion thereof, the forward 20–50 percent of said friction pad being constructed of polyurethane and the rear 50–80 percent being constructed of polyurethane having rubber strips disposed therein, said rubber strips constituting about 40–70 percent of the area of the rear portion of said friction pad;

said brake wedge constructed and arranged to transfer substantially all force generated by said brake wedge during emer-

gency braking from said brake wedge to the vehicle through a vehicle tire contacting said tire-receiving surface; and

said brake wedge being sufficiently deformable to limit vertical motion of said tire to retain said tire in frictional engagement with said tire-receiving surface during emergency braking.

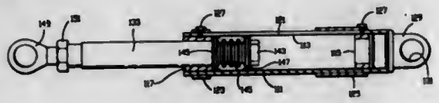
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**5,497,858**

## DYNAMIC MOTION LIMITER

**Robert L. Cloud, Berkeley; James S. M. Leung, Vacaville, and Jason W. Dunham, San Francisco, all of Calif., assignors to Robert L. Cloud & Associates, Inc., Berkeley, Calif.**

**Filed Aug. 7, 1992, Ser. No. 927,118**
**Int. Cl.[6] F16M *1/00***
**U.S. Cl. 188—67** **3 Claims**



1. A dynamic motion limiter for engaging thermal piping to a structure anchor comprising

a hollow body portion having internal threads formed therein at least at the opposite ends thereof,

a compression stop and an extension stop in the form of cylindrical rings having external threads formed thereon for engaging the internal threads of said body portion, said stops being threadably engaged in opposite ends thereof,

means for determining the positioning of said stops in said body portion,

a first pivot mount secured to one end of said cylindrical body portion, and

a piston disposed in and formed for reciprocating internally of said body portion, said piston comprised of

a piston tube having threads formed internally at least at one end thereof, said piston tube projecting out of the opposite end of said body portion from said pivot mount and closely fitting within said extension stop,

a spring guide screw having threads formed at one end thereof threadably engaged into a threaded end of said piston tube, said spring guide screw having a spring mount surface formed at the other end thereof, said spring mount surface terminating at the unthreaded end of the spring guide screw in an abutment stop,

spring retainers mounted on said spring guide screw at opposite ends of said spring mount surface between said abutment stop and the adjacent end of said piston tube,

spring means mounted on said spring mount surface between said spring retainers, said spring means having a variable stiffness which can be preselected, and

a second pivot mount adjustably engaged to the opposite end of said piston tube from said spring guide screw, said mounts adapted for engaging thermal piping to a support anchor.

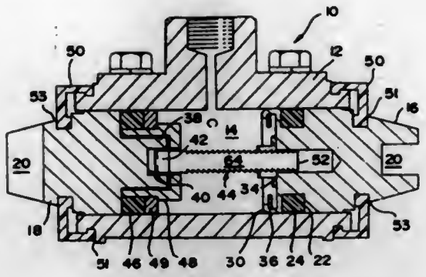
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**5,497,860**

## ELECTROMAGNETIC BRAKE WITH IMPROVED MAGNET STRUCTURE

**Wayne D. Hendricks, Mukwonago, Wis., assignor to Venturedyne Limited, Milwaukee, Wis.**

**Filed Aug. 15, 1994, Ser. No. 290,059**
**Int. Cl.[6] F16D *65/34;55/36***
**U.S. Cl. 188—162** **20 Claims**



1. In a brake apparatus including an electromagnet mounted on a magnet support and having a magnet face, and an armature block mounted for movement with respect to the electromagnet, and wherein the magnet face is generally coincident with a reference plane when the magnet is de-energized, the improvement wherein

the electromagnet is an AC magnet;

the magnet support includes a cantilever supporting the armature block; and

the magnet support bends slightly when the electromagnet is energized,

whereby the magnet face is at an angle to the reference plane when the electromagnet is energized and misalignment between the electromagnet and the block is reduced.

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**5,497,859**

## HYDRAULIC SLACK ADJUSTER

**Johann A. Nowoslelski, 4465 Fox Creek Dr., Marietta, Ga. 30062**

**Filed Sep. 13, 1994, Ser. No. 305,380**
**Claims priority, application South Africa, Sep. 16, 1993, 93/6826**
**Int. Cl.[6] F16D *65/38***
**U.S. Cl. 188—79.62** **4 Claims**

1. A hydraulic slack adjuster comprising:

a cylinder having a bore;

at least a first piston mounted in said bore and movable in said bore in a first direction linearly outwardly from a central portion of said cylinder under the action of a force exerted by pressurized hydraulic fluid in said bore, and rotatable in said bore, said piston having a face oriented in said bore toward said central portion of said bore and having a slot in said face;

an elongated bar having a headed end retained in said slot for limited movement in an axial direction of said bore with respect to said first piston while being rotatable with said first piston, said elongated bar having spaced toothed surfaces separated by spaced arcuate smooth surfaces;

a ratchet retaining device secured in said bore of said cylinder and engageable with said elongated bar. said ratchet retaining device including a spring clip having circumferentially opposed catch formations, said catch formations engaging said toothed surfaces of said elongated bar when said bar and said first piston are in a first, engaged position to permit only said limited movement between said headed end of said bar and said first piston, said circumferentially opposed catch formations allowing movement of said elongated bar and said first piston in said bore with respect to said ratchet retaining device when said first piston and said elongated bar are in a second, disengaged position; and

means on said first piston exterior of said cylinder facilitating rotation of said first piston between said first and second positions.



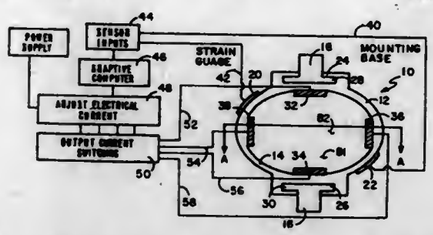
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**5,497,861**

## VARIABLE MOTION DAMPENER

**Gregory R. Brotz, P.O. Box 1322, Sheboygan, Wis. 53081**

**Filed Jun. 27, 1994, Ser. No. 265,957**
**Int. Cl.[6] F16F *15/03***
**U.S. Cl. 188—267** **3 Claims**



1. A motion dampener disposed between a first and second object comprising:

a flexible spheroidal container having a cavity defined therein and an inner wall;

means to interengage said container between said first and second objects;

electrorheological fluid contained within said container;

a plurality of electrodes disposed along said inner wall in contact with said electrorheological fluid; and

means in an on mode to pass current from a selected of said electrodes through said electrorheological fluid to another of said electrodes to cause said electrorheological fluid to become more viscous in a selected particle chain pattern to limit the movement of said container in relation to said first and second objects; means to select different ones of the electrodes to cause said electrorheological fluid to become more viscous in a different selected particle chain pattern and said means in an off mode to maintain the fluid nature of said electrorheological fluid to allow freer movement of said flexible container and said first and second objects interengaged thereto.

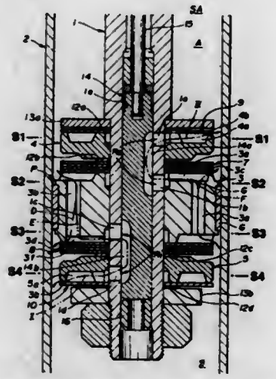
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**5,497,862**

## HYDRAULIC SHOCK ABSORBER HAVING VARIABLE DAMPING FORCE CHARACTERISTIC STRUCTURE

**Hiroshi Hoya, Atsugi, Japan, assignor to Unisia Jecs Corporation, Atsugi, Japan**

**Filed Feb. 21, 1995, Ser. No. 391,683**
**Claims priority, application Japan, Feb. 22, 1994, 6-024122**
**Int. Cl.[6] F16F *9/50***
**U.S. Cl. 188—282** **10 Claims**



1. A hydraulic shock absorber having a variable damping force characteristic structure, comprising:

a) an outer cylinder;

b) a hollow rod;

c) a piston which is so constructed and secured on an outer periphery of said hollow rod as to divide an interior of said cylinder into first and second chambers containing damping fluid and as to slidably move axially of said cylinder in accordance with a road condition, said piston having a piston body member along an axial direction of which extension phase fluid communication hole means and compression phase fluid communication hole means are penetrated for communicating fluid flow between said first and second chambers and said piston body member forming at least both of an extension phase intermediate pressure receiving chamber around an outlet of said extension phase fluid communication hole means and of a compression phase intermediate pressure receiving chamber on an outlet of said compression phase fluid communication hole means;

d) first extension phase disc-shaped damping valve means for restrictively allowing the fluid flow into said second chamber via said extension phase fluid communication hole means and extension phase intermediate pressure receiving chamber so as to generate a relatively high damping force thereat;

e) first compression phase disc-shaped damping valve means for restrictively allowing the fluid flow into said first chamber via said compression phase fluid communication hole means and compression phase intermediate pressure receiving chamber so as to generate the relatively high damping force thereat;

f) a control valve element which is rotatably disposed within said hollow rod and having first and second groove means formed on different positions in an axial direction of said control valve element;

g) at least first, second, third, and fourth radial holes penetrated through an outer wall of said hollow rod radially of said hollow rod;

h) second extension phase disc-shaped damping valve means for restrictively allowing the fluid flow into said second chamber via said extension phase fluid communication hole means, extension phase intermediate pressure receiving chamber, first and second radial holes, and first groove means so as to generate a relatively low damping force thereat;

i) second compression phase disc-shaped damping force valve means for restrictively allowing the fluid flow into said first chamber via said compression phase fluid communication hole means, compression phase intermediate pressure receiving chamber, third and fourth radial holes, and second groove means so as to generate the relatively low damping force thereat;

j) an extension phase one-way passageway bypassing said first extension phase disc-shaped damping valve means, being formed of said extension phase fluid communication hole means, first and second radial holes, and first groove means, and having extension phase variable throttle means formed by said first and second radial holes and by said first groove means and whose flow cross sectional area is varied according to a rotationally displaced position of said control valve element; and

k) a compression phase one-way passageway bypassing said first compression phase disc-shaped damping valve means, being formed of said compression phase fluid communication hole means, third and fourth radial holes, and second groove means, and having compression phase variable throttle means formed by said third and fourth radial holes and by said second groove means and whose flow cross sectional area is varied according to the rotationally displaced position of said control valve element; and wherein said control valve element is in a shape of a grooved rod extended axially in said hollow rod and has a neutral position at which both extension and compression phase one-way passageways are open, both extension and compression phase throttle means taking their large cross sectional areas, said control valve element being angularly displaceable in a first rotational direction from said neutral position to a first displaced position at which one of the throttle openings of said extension phase throttle means indicates a relatively large cross sectional area one of the throttle openings of said compression phase throttle means

indicating a relatively small cross sectional area so as to limit the fluid flow therethrough and being angularly displaceable in a second rotational direction opposite to the first rotational direction from the neutral position to a second displaced position at which the one throttle opening of said extension phase throttle means indicates the relatively small cross sectional area so as to limit the fluid flow therethrough, the one throttle opening of said compression phase throttle means indicating the relatively large cross sectional area.

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**5,497,863**

## ROTARY DAMPER

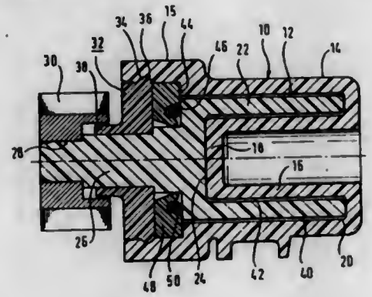
**Klaus Schmidt, Henstedt/Ulzburg, and Roland Klein, Ammersbek, both of, Germany, assignors to ITW-ATECO GmbH, Norderstedt, Germany**

**Filed Sep. 6, 1994, Ser. No. 418,126**

**Claims priority, application Germany, Sep. 3, 1993, 43 29 758.7**

**Int. Cl.[6] F16F 9/30;9/36**

**U.S. Cl. 188—306** **13 Claims**




1. A rotary damper, comprising:

a housing having a radially outer wall and a longitudinal axis;

a cylindrical rotor rotatably supported within said housing and having an annular configuration;

an axially recessed pivot section of said housing extending from an end wall of said housing axially inwardly into said housing toward an opposite open end of said housing and forming with said radially outer wall of said housing an annular space within said housing for accommodating said cylindrical annular rotor;

a viscous flowable material disposed within said annular space defined between said pivot section of said housing and said radially outer wall of said housing such that when said cylindrical rotor is disposed within said annular space, a pair of annular clearances, filled with said viscous material, are defined between said cylindrical rotor and said pivot section of said housing, and between said cylindrical rotor and said radially outer wall of said housing, respectively, such that said viscous material is disposed upon both opposite sides of said cylindrical annular rotor;

first radially extending shoulder means defined upon said radially outer wall of said housing;

second radially extending shoulder means defined upon said cylindrical rotor;

a trunnion integrally formed with said cylindrical rotor and extending axially outwardly from said open end of said housing;

a bearing plate, having an aperture defined therein through which said trunnion of said cylindrical rotor passes, fixedly mounted within said open end of said housing; and

a sealing element compressed between and in contact with said bearing plate and said first and second radially extending shoulder means of said housing and said rotor so as to also sealingly engage said trunnion and said radially outer wall of said housing.

**5,497,864**

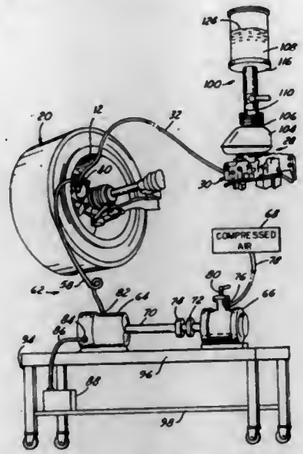
## HYDRAULIC BRAKE BLEEDER APPARATUS

**Gene Olen, Loves Park, Ill., assignor to Chrysler Corporation, Highland Park, Mich.**

**Filed Jun. 20, 1995, Ser. No. 493,226**

**Int. Cl.[6] B60T 11/30**

**U.S. Cl. 188—352** **5 Claims**




1. Hydraulic brake bleeder apparatus for bleeding hydraulic brake fluid from a vehicle hydraulic brake system that includes a hydraulic motor cylinder apparatus hydraulically connected to the hydraulic cylinders of a plurality of hydraulic vehicle brakes and wherein the master cylinder apparatus includes a hydraulic master cylinder having a hydraulic fluid reservoir with inlet opening means thereinto, comprising;

a vacuum pump having an input drive shaft, a pneumatic motor having an output shaft, coupling means connecting the pneumatic motor output shaft to the vacuum pump input drive shaft, a source of compressed air, the pneumatic motor having a compressed air inlet, a flexible tube connecting the source of compressed air to the air inlet for powering the pneumatic motor, the pneumatic motor having a manually actuatable valve for controlling the input of compressed air to the motor, the vacuum pump having a vacuum inlet and a pressure outlet, a first flexible tube attached to the vacuum inlet and a second flexible tube attached to the pressure outlet, the first flexible tube being connected to a brake cylinder bleeder valve for drawing hydraulic brake fluid from the brake cylinder, a hydraulic brake fluid recovery reservoir, the second flexible tube extending to the hydraulic brake fluid recovery reservoir for emptying hydraulic brake fluid therein that is drawn from the brake cylinder, and hydraulic brake fluid supply means attachable to the master cylinder means of a vehicle hydraulic brake system to replenish the hydraulic brake fluid which is drawn from the brake cylinder.

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**5,497,865**

## RETRACTABLE TRAVEL BAG HANDLE ASSEMBLY

**Wu Yun-Pi, 5 Fl., 31, Alley 25, Lane 90, Sec. 6, Min Chuan E. Rd., Taipei, Taiwan, Prov. of China**

**Filed Sep. 19, 1994, Ser. No. 307,460**

**Int. Cl.[6] A45C 5/14;13/04;13/26**

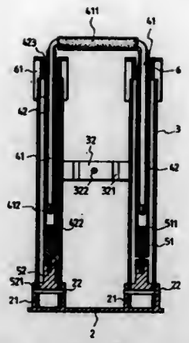
**U.S. Cl. 190—115** **1 Claim**

1. A retractable travel bag handle assembly comprising:

a base frame fixed to an inside wall of a travel bag and having two receptacles, each receptacle having two hollow side wings at two opposite sides;

two cylindrical casings joined by a cross frame and connected to said receptacles of said base frame by connecting means






including locating pins, each cylindrical casing having two hollow side wings at two opposite sides respectively longitudinally aligned with the hollow side wings on said receptacles;

a retractable handle consisting of two sleeves respectively coupled to said cylindrical casings by a respective movable coupling inside said cylindrical casings, and a substantially U-shaped handlebar having two opposite ends dimensioned for movement in and out of said sleeves, said movable coupling comprising a base block having two square projections, each projection disposed at an opposite side and dimensioned for movement in the hollow side wings of said receptacles and said cylindrical casings, and a connecting rod including means for fixedly connecting one end to one sleeve and an opposite end pivotably connected to said base block by a pivot; and

two socket caps each cap having an opening dimensioned to receive one of said sleeves and corresponding connecting rod and including means for fastening to said travel bag and means for connection to one of said cylindrical casings and dimensioned to stop said base block of said movable coupling in each cylindrical casing, each socket cap having a curved top flange covered on said travel bag on the outside.

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**5,497,866**

## CURRENT COLLECTING APPARATUS

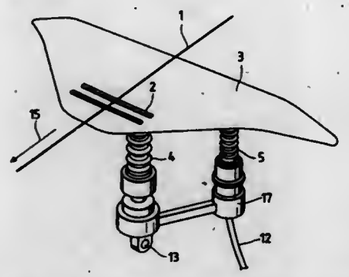
**Kenji Kobayashi, Kudamatsu; Yasushi Takano, Ibaraki; Akiyoshi Iida, Mitsukaido; Masahiro Ikegawa, Ibaraki; Syuya Hagiwara, Mito, and Morishige Hattori, Kudamatsu, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Oct. 26, 1994, Ser. No. 330,086**

**Claims priority, application Japan, Jan. 26, 1993, 5-266891**

**Int. Cl.[6] B60L 5/12**

**U.S. Cl. 191—55** **14 Claims**




1. A current collecting apparatus for a railway vehicle, the apparatus comprising:

a current collector for collecting electric power from a power feeder, an insulator for insulating and supporting the current collector on a vehicle, and a conductor for conducting the power received from the current collector to a load, wherein the conductor and the insulator are disposed a predetermined distance apart in the crosswise direction of the vehicle and are each positioned so as to be exposed to an airflow stream when the apparatus is in use on a running vehicle.

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**5,497,867**

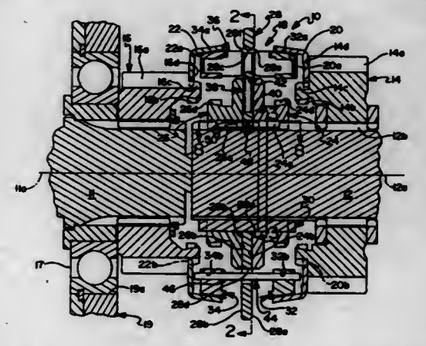
## SYNCHRONIZER WITH CONE CUP LOCATER PINS

**Mark A. Hirsch, Vicksburg; Donald M. Stout, Troy, both of Mich.; Derek P. J. Corns, Swinton, England; Patrick Randrianarison, Nantes, France, and George Skotnicki, Rochdale, England, assignors to Eaton Corporation, Cleveland, Ohio**

**Continuation-in-part of Ser. No. 172,963, Dec. 27, 1993, abandoned. This application Sep. 26, 1994, Ser. No. 311,982**

**Int. Cl.[6] F16D 23/06;21/00**

**U.S. Cl. 192—48.91** **9 Claims**



1. A pin-type synchronizer mechanism selectively operative to frictionally synchronize and positive connect either of first and second axially spaced apart drives mounted for relative rotation about an axis of a shaft and secured against axial movement relative to the shaft; the mechanism comprising:

drive jaw means affixed to each drive and engageable with axially movable jaw means having axially extending internal splines slidably mating continuously with axially extending external splines affixed to the shaft;

first and second cone friction surfaces respectively defined by axially spaced apart first and second members respectively secured by attachment means for fixed rotation with the first and second drives and for limited axial movement away from the space between the gears, and third and fourth cone friction surfaces defined by a pair of axially spaced apart rings concentric to the shaft drives and axially movable between the spaced apart drives for axial movement into engagement respectively with the first and second friction surfaces to synchronize the drives with the shaft;

a flange extending radially between the rings for axially moving the movable rings and jaw means into said engagement in response to an axial bidirectional shift force ($F_o$) applied to the flange, means securing the flange against axial movement relative to the axially movable jaw means;

blocker means for preventing engagement of the jaw means prior to the synchronizing, the blocker means including a plurality of circumferentially spaced apart and axially extending pins rigidly securing the rings together, the pins extending through openings in the flange, each pin having axially spaced apart blocker shoulders engageable with blocker shoulders defined on opposite sides of the flange and about the associated opening;

pre-energizer means for engaging either one of the third and fourth friction surfaces respectively with the first and second friction surfaces in response to initial axial movement of the

flange by the shift force from a neutral position toward one of the drives, for engaging the blocker means in response to engagement of the friction surfaces producing a synchronizing torque transmitted to the flange via the pins, and for transmitting the shift force to the engaged friction surfaces via the engaged blocker means to increase the engaging force of the engaged friction surfaces; characterized by:

the attachment means allowing axial movement of the first and second friction members toward the friction rings; and

a plurality of circumferentially spaced apart rigid members axially interposed between the first and second members for limiting axial movement thereof toward the friction rings.

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**5,497,868**

## VISCOUS FLUID CLUTCH

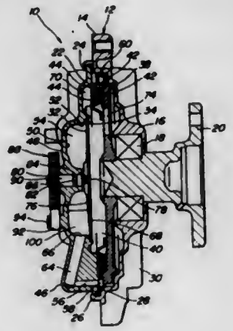
**Kenji Ohhara, Atsugi, Japan, assignor to Unisia Jecs Corporation, Atsugi, Japan**

**Filed Dec. 30, 1994, Ser. No. 367,109**

**Claims priority, application Japan, Dec. 30, 1993, 5-076103 U**

**Int. Cl.[6] F16D *35/02***

**U.S. Cl. 192—58.4** **4 Claims**



1. A viscous fluid clutch comprising:

first and second relatively rotatable drive means, said first drive means containing a fluid medium and having an operating chamber and a reservoir;

fluid shear drive means located in said operating chamber operable with said fluid medium to provide a shear-type fluid drive between said first and second drive means;

said operating chamber having an outlet opening at an outer portion and an inlet opening at an inner portion,

said first drive means having passage means having an inlet connected to said outlet opening and an outlet connected to said reservoir in a zone angularly spaced from and leading said inlet opening with respect to direction of rotation of said first drive means,

pump means for pumping said fluid medium from said operating chamber out of said outlet opening and through said passage means and said outlet thereof to said reservoir; and

means within said reservoir for impeding flow of said fluid medium from said outlet of said passage means to said inlet opening.

**5,497,869**

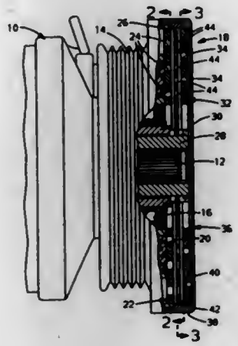
## ELECTROMAGNETIC CLUTCH WITH IMPROVED ENGAGEMENT

**Hugh J. Muirhead, and Richard L. Marker, both of Lockport, N.Y., assignors to General Motors Corporation, Detroit, Mich.**

**Filed Sep. 6, 1994, Ser. No. 301,088**

**Int. Cl.[6] F16D *27/00***

**U.S. Cl. 192—84 B** **3 Claims**



1. An electromagnetic clutch in combination with a fluid pumping apparatus of the type having a central drive shaft, a powered rotor supported for free rotation about said central drive shaft, and a selectively activated electromagnetic field generator located proximate to said rotor, said clutch comprising,

an annular friction disk fixed to said rotor so as to rotate therewith and establishing a planar surface perpendicular to said central drive shaft,

a central hub secured to said central drive shaft,

a resilient spring member having an outer edge fixed to said rotor concentrically with said friction disk and structurally clear of said hub so as to rotate with said rotor without contacting said hub,

an annular armature of magnetic material supported on said spring member so as to be axially spaced from and parallel to said friction disk when said field generator is deactivated and said spring member is in an unstressed condition, said armature having sufficient axial thickness so as to carry sufficient flux from the field produced by said activated field generator to in turn generate sufficient magnetic force to be pulled axially toward said friction disk, thereby stressing said spring member,

a planar, annular drive plate located intermediate and parallel to said friction disk and armature so as to present a flat surface axially spaced from each when said field generator is deactivated, said drive plate being keyed to said hub so as to be axially slidable but circumferentially fixed thereon, said drive plate also being just sufficiently thick to transfer torque to said central hub and central drive shaft,

whereby, when said field generator is activated and said armature is pulled toward said friction disk, said intermediate drive plate is clamped between an already rotating armature and friction disk and torque is transferred to said central drive shaft through said intermediate drive plate.



**5,497,870**

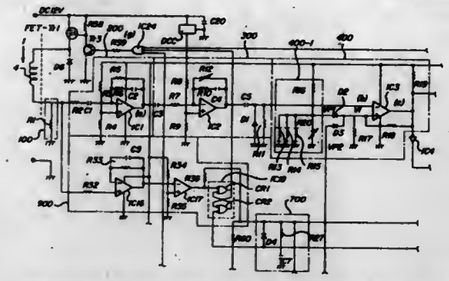
## ELECTROMAGNETIC CLUTCH SLIP PROTECTION SYSTEM

**Ishimaru Takashi, Kiryu, Japan, assignor to Ogura Clutch Co., Ltd., Japan**

**Filed Jun. 10, 1994, Ser. No. 258,077**

**Int. Cl.[6] F16D *48/00*; H01F *7/18***

**U.S. Cl. 192—84 C** **14 Claims**



1. An electromagnetic clutch with a rotor and an armature each having magnetic discontinuities, and an electromagnetic coil, a current source, and a control circuit for connecting the electromagnetic coil to the current source and wherein the rotor and the armature are attracted to each other to form a magnetic circuit when the coil is energized, said control circuit comprising a current detector for detecting a current which flows in the electromagnetic coil and outputting a voltage corresponding to the current; an amplifier for amplifying the voltage outputted from said detector; a bandpass filter for taking out an alternating current component of a predetermined frequency or a lower frequency than a predetermined frequency contained in the voltage amplified by said amplifier; a comparator for comparing a threshold with an instantaneous value of an alternating current component taken out by said bandpass filter and sending out a comparator output while the instantaneous value of the alternating current component exceeds the threshold; a threshold riser for raising the threshold as the rotational speed of the rotor becomes higher; and a slip decision circuit arranged to determine, if a predetermined number of comparison outputs are detected within a predetermined time after a first comparison output has been generated, that a rotation slip has occurred in the state of the rotor and the armature being attracted to each other, said slip decision circuit being also arranged to set, if the predetermined number of comparison outputs are not detected within the predetermined time, a comparison output to be next generated as the first comparison output and repeat the afore said rotation slip decision operation.

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**5,497,871**

## TIRE SINGULATION SYSTEM

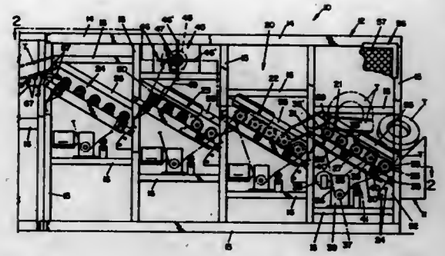
**John T. Ciolkevich, 4807 Hawkins Rd., Richfield, Ohio 44286**

**Filed Mar. 9, 1994, Ser. No. 208,010**

**Int. Cl.[6] B65G *47/12***

**U.S. Cl. 198—443** **20 Claims**

1. Singulation apparatus for upstacking and unscrambling a plurality of randomly oriented tires in an inlet hopper to form a single layer of tires reposing on their sidewalls comprising, a plurality of conveyor stages with substantially planar tire sidewall engaging surfaces which are angularly upwardly inclined in the direction of travel of the tires and discontinuous, means mounting said conveyor stages with said tire sidewall engaging surface input of succeeding of said conveyor stages being spaced a distance vertically below the output of the preceding of said conveyor stages, whereby the tires fall a distance between conveyor stages, and means for driving said tire engaging surfaces of each of said conveyor stages at differing linear velocities, at least one of said conveyor stages having means for producing differing linear velocities of said sidewall engaging surfaces within said one of said conveyor stages by a plurality of rollers and a powered drive chain engaging sprockets attached to each of said rollers, some of said sprockets being of a larger diameter than other of said sprockets.



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**5,497,872**

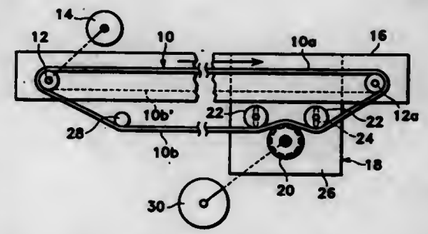
## METHOD AND APPARATUS FOR CLEANING CONVEYOR BELTS

**Frank Pennino, Farmingdale, N.Y., assignor to Pari Industries, Jamaica, N.Y.**

**Filed Jul. 1, 1994, Ser. No. 269,884**

**Int. Cl.[6] B65G *45/14***

**U.S. Cl. 198—498** **14 Claims**



1. Conveyor apparatus having a pair of conveyor-supporting rollers remote from each other, an endless-loop conveyor belt tensioned about said rollers and providing a material-conveying stretch and a return stretch of the belt between said belt-supporting rollers, means for operating said belt at a prescribed surface speed, a cleaning roller having ribs whose edges lie in an imaginary cylinder, said apparatus including a pair of spaced-apart idlers for holding a tensioned portion of said return stretch of the belt against the cleaning roller so as to form a wrap angle of approximately 20° to 45° around the cleaning roller, and means for driving said cleaning roller so that its ribs sweep along said conveyor belt at a surface speed far in excess of the surface speed of said belt.

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**5,497,873**

## APPARATUS AND METHOD EMPLOYING AN INLET EXTENSION FOR TRANSPORTING AND METERING FINE PARTICULATE AND POWDERY MATERIAL

**Andrew G. Hay, Gardena, Calif., assignor to Stamet, Inc., Gardena, Calif.**

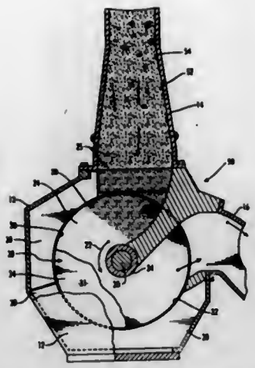
**Filed Dec. 8, 1993, Ser. No. 164,314**

**Int. Cl.[6] B65G *31/04***

**U.S. Cl. 198—642** **32 Claims**

1. An inlet extension for an apparatus for transporting fine or powdery material, wherein the transporting apparatus has a particulate transport channel and an inlet provided in flow communication with the transport channel, the inlet extension comprising:

a generally tubular body defining a longitudinally directed axis and a generally hollow interior having an outlet for arranging



in flow communication with the inlet of the particulate material transporting apparatus;

the generally hollow interior of the tubular body being configured to allow particulate material to pass therethrough by gravity along the longitudinal axis toward the outlet;

the generally tubular body having an axial length suitable for allowing the particulate material to become relatively compacted upon flowing through the hollow interior and into the transport channel of the particulate material transporting apparatus;

wherein the generally hollow interior of the tubular body defines a radial cross-sectional area which diverges in the longitudinal direction toward the outlet.

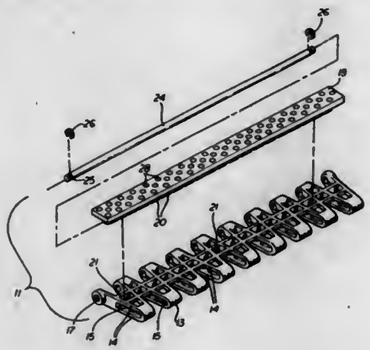
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**5,497,874**

## ARTICLE ENGAGING INSERT FOR MODULAR LINK CONVEYOR

**James L. Layne, Scottsville, Ky., assignor to Span Tech Corporation, Glasgow, Ky.**

**Filed Jun. 20, 1994, Ser. No. 262,415**
**Int. Cl.[6] B65G** *15/44*
**U.S. Cl. 198—698** **21 Claims**



1. A modular link conveyor for moving articles along a path, the improvement comprising:

a plurality of modular links forming a conveying surface including a plurality of laterally disposed repeating links, each of said laterally disposed repeating links further including at least one apex and two legs extending therefrom, said apex further including a slot passing transversely therethrough across substantially the full width of said link, said legs further terminating in a distal end portion, each said end portion including a hole passing transversely therethrough;

a plurality of transverse connecting means, said connecting means passing through said slots and said holes to engage said modular links together;

a plurality of substantially rigid, non-resilient article engaging inserts, each said insert including at least one downwardly extending projection for insertion in a corresponding aperture between said legs of said laterally disposed repeating links; and

retaining means for positively engaging said inserts across substantially the full lateral width of each of said laterally disposed repeating links to securely lock said inserts on said conveyor;

whereby said inserts can be easily installed or removed on said conveyor for selective engagement with said articles to provide a positive conveying force thereto.

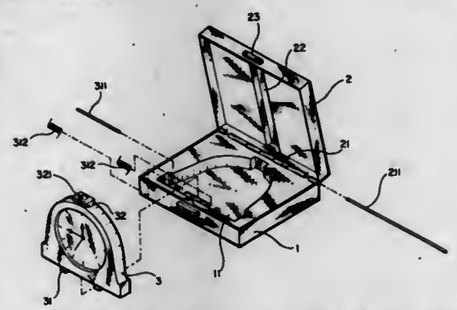
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**5,497,875**

## BOXED TRAVELING ITEM

**Jack C. Kuo, No. 8, Yih Li Street, Pei Tou, Taipei, Taiwan, Prov. of China**

**Filed Feb. 3, 1995, Ser. No. 383,585**
**Int. Cl.[6] G04B** *37/14*
**U.S. Cl. 206—45.13** **3 Claims**



1. A boxed traveling item comprising a casing defining a storage chamber, a cover hinged to one side of said casing, and a traveling item received in said storage chamber, wherein said cover has a sliding groove transversely disposed at an inner side; said traveling item has a bottom side hinged to an inner side of said casing by a hinge and a top side mounted with a hooked retainer rod, said hinge being mounted with torsional springs, which force said traveling item from a horizontal position received inside said storage chamber to a tilted position, said hooked retainer rod being moved along said sliding groove when said cover is moved relative to said casing.

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**5,497,876**

## COMBINATION GIFT BOX, GREETING CARD, WRAPPING AND DECORATION

**Barbara D. Fleming, P.O. Box 1630, Pomona, Calif. 91769-1630**

**Continuation-in-part of Ser. No. 136,262, Oct. 15, 1993, abandoned. This application Mar. 6, 1995, Ser. No. 398,775**
**Int. Cl.[6] B65D** *69/00*
**U.S. Cl. 206—232** **6 Claims**

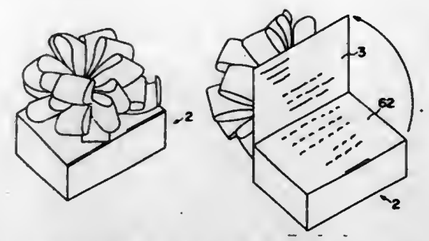
1. A blank for a single-piece combination gift box and greeting card comprising:

a sheet member of rigid material having a first surface and a second surface and containing:

(a) a first side panel containing first and second side edges, a top edge, and a bottom edge, the first side edge being connected to a side tab at a line which is suitable for folding;

(b) a second side panel containing first and second side edges, a top edge, and a bottom edge, the second side edge of the first panel and the first side edge of the second panel abutting at a line which is suitable for folding;





(c) a third side panel containing first and second side edges, a top edge, and a bottom edge, the second side edge of the second side panel and the first side edge of the third side panel abutting at a line which is suitable for folding;

(d) a fourth side panel containing first and second side edges, a top edge, and a bottom edge, the second side edge of the third side panel and the first side edge of the fourth side panel abutting at a line which is suitable for folding;

(e) first, second, third, and fourth bottom panels, each bottom panel containing a top edge which abuts the bottom edge of the first, second, third and fourth side panel, respectively, at a line which is suitable for folding, each of said bottom panels containing a tab or a notch, which tabs and notches are so arranged as to form a sturdy bottom when fitted together;

(f) a second top panel and a third top panel, each panel containing a bottom edge, first and second side edges, and a top edge, the top edge of the second side panel and the top edge of the fourth side panel abutting the bottom edge of the second top panel and the bottom edge of the third top panel, respectively, at lines which are suitable for folding;

(g) a first top panel containing two side edges, a bottom edge, and a top edge, the top edge of the first side panel and the bottom edge of the first top panel abutting at a line which is suitable for folding;

(h) a lower fold section containing first and second side edges, a bottom edge, and a top edge, the bottom edge of the lower fold section abutting the top edge of the first top panel at a line which is suitable for folding;

(i) an upper fold section containing first and second side edges, a bottom edge, and a top edge, the bottom edge of the upper fold section abutting the top edge of the lower fold section at a line which is suitable for folding;

(j) a fourth top panel containing first and second side edges, a top edge, and a bottom edge, the bottom edge of the fourth top panel abutting the top edge of the upper fold section at a line which is suitable for folding; wherein:

the fourth top panel contains at least one tab located on one or more of its side edges or upper edge, and there is a corresponding slit for each tab (a) at the juncture of the first side panel and the first top panel, (b) at the juncture of the second side panel and the second top panel and (c) at the juncture of the fourth side panel and the third top panel; and further:

(i) the first surfaces of the first top panel and the fourth top panel present a greeting card message; and

(ii) the first surfaces of the second and third top panels, each of the side panels, and each of the bottom panels and the second surfaces of the first and fourth top panels and the lower and upper fold sections contain decorative designs.

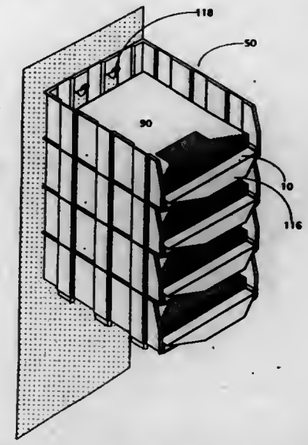
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**5,497,877**

## SINGLE SHEET SANDPAPER DELIVERY SYSTEM AND SANDPAPER SHEET THEREFOR

**Christopher A. Ali, and Terry L. Ali, both of Beavercreek, Ohio, assignors to Ali Industries, Inc., Fairborn, Ohio**

**Division of Ser. No. 178,774, Jan. 7, 1994. This application Sep. 15, 1994, Ser. No. 306,764**
**Int. Cl.[6] B65D** *83/00;85/62*
**U.S. Cl. 206—362** **13 Claims**



1. A single sheet sandpaper delivery system, comprising:

at least one stackable tray having a support surface, at least two sides, wherein one of each said sides is connected an opposing edge portion of said support surface and extends generally normal thereto, and wherein said support surface has an edge portion faterally spacing said sides;

at least one sandpaper package having housing portion of a size and configuration slightly less than said support surface, said portion having at least two first flap portions of a predetermined length of between about ⅛" to ⅝" connected to opposing edge portions of said housing portion, and wherein each said first flap portion has bendably connected thereto a second flap portion of a length and configuration such that when said first flap portions are bent in a common direction generally normal to said housing surface portion, said second flap portions are bent inwardly toward one another generally parallel to a plane formed by a main portion of said housing portion, said second flap portions being interconnectable to one another to form said package, said housing portion further including zipper perforations which extend radially inwardly a predetermined distance from one of said edges of said housing portion and terminate in a common opening defined in said housing portion; and

a plurality of sandpaper sheets disposed in said package.

8. A single sheet sandpaper delivery system, comprising:

at least one stackable tray having a support surface, a first side connected to a first edge of said support surface and extending generally normal thereto, a second side connected to an opposing second edge of said one edge of said support surface and extending generally normal thereto, and third side connected to a third edge and interconnecting said first and second side, said third side extending generally normal to said support surface; and

at least one sandpaper package having housing portion of a size and configuration slightly less than said support surface, said housing portion having four edges, wherein each edge has a first flap portion bendably connected thereto of a predetermined length of between about ⅛" to ⅝" and wherein each said first flap portion has bendably connected thereto a second flap portion of a length and configuration such that when said

first flap portions are bent in a common direction generally normal to said housing surface portion, said second flap portions are bent inwardly toward one another generally parallel to a plane formed by a main portion of said housing portion, said second flap portions being interconnectable to one another to form said package, said housing portion further including zipper perforations which extend diagonally inwardly a predetermined distance from corners of one end of said housing portion and terminate in a common opening defined in said housing portion; and

a plurality of sandpaper sheets disposed in said package.

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**5,497,878**

## WORK SURFACE EXTENSIONS FOR TOOL STORAGE UNITS

**Henry L. Sandonato, 741 Hillview Ct., Lewiston, N.Y. 14092**

**Filed Sep. 27, 1994, Ser. No. 314,042**
**Int. Cl.[6] B65D *85/28*; A47B *77/10***
**U.S. Cl. 206—372** **3 Claims**



1. A new and improved work surface extension in combination with a pair of tool storage units comprising, in combination:

a horizontally disposed housing positionable between a pair of existing tool boxes, the housing being of a rectangular configuration positionable in a generally horizontal plane with a periphery generally corresponding to the periphery of adjacent existing tool boxes above and below;

a pair of apertures on opposing sides of the housing, the apertures being located at varying elevations with respect to each other, with a chamber formed within the housing;

a pair of reciprocable members, the reciprocable members being of a planar configuration in the form of rectangles, each of the members being positioned through one of the apertures, each of the members having a first work surface on one side and a second work surface on the other side;

a locking bracket formed within each member adjacent to its interior edge;

at least one of the reciprocable members being formed with a first surface and a pivotable second surface secured to the first surface through a hinge with an associated bracket securing the second surface at an angle with respect to the first surface as for writing; and

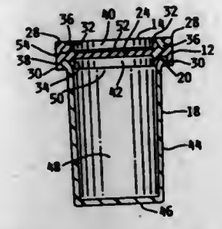
a brace pivotally secured to a point beneath one member and having an upper end secured to the exterior end of the member, the brace being of a linear configuration with telescopic sections and a thumb screw to vary the length thereof and an associated clip to hold the brace in a vertical orientation.

**5,497,879**

## FILM STATUS CAP

**Richard C. Kao, 6244 Fallbrook Rd., Eden Prairie, Minn. 55344**

**Filed Oct. 7, 1994, Ser. No. 320,176**
**Int. Cl.[6] B65D *85/67*; *43/06*; *51/12***
**U.S. Cl. 206—389** **13 Claims**



1. A film canister for containing film rolls, the canister comprising:

a) a body portion with an open interior and an open end for receiving and removing film rolls and further comprised of a edge portion surrounding the open end;

b) a cap for closing the open end, the cap comprised of a first side and a second side, a circular channel located on the first side and an oppositely facing second channel located on the second side, each channel sized to engage the cap with the edge portion of the body portion, whereby the cap is invertibly engageable on the body portion, and

c) indicia disposed on at least one side of the cap indicative of the status of film roll placed in said canister.

13. A film canister comprising:

a) a body portion having an open interior, an open end, a closed end, and an edge portion at the open end;

b) a disk-shaped cap for closing the open end, the cap having a first side, a second side symmetrical to the first side, an engagement member located on the first side and another engagement member on the second side, the engagement members each sized to engage the edge portion and close the open end of the body portion; and

c) indicia indicative of exposed film on one of said sides of the cap.

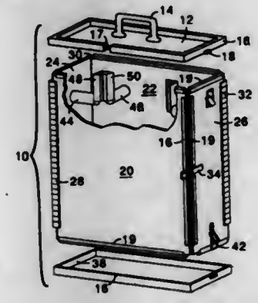
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**5,497,880**

## CABLE TRANSPORT CONTAINER

**Erich A. Dieffenbach, 185 Waite Rd., Boxborough, Mass. 01719**

**Filed Jan. 24, 1995, Ser. No. 377,371**
**Int. Cl.[6] B65D *85/04***
**U.S. Cl. 206—395** **11 Claims**



1. A cable transport container comprising: a box like container having a back wall, front wall, side walls, a top wall and a bottom wall where the back, front and side walls are flexibly connected along three abutting edges forming a rectangle and where the front wall and a side wall are releasably secured along the forth abutting edge, and where the top wall abuts the side walls, the front wall and the back wall and is releasably secured to each side wall, and where the bottom wall abuts the side walls, back and front walls and is releasably secured to each side wall; means affixed to each of said releasably secured walls for forming a mating relation with the next adjacent releasably secured wall; end abutting dowels extending from the interior front wall, back wall and side walls on each end of the rectangular container where said dowels are positioned proximate the top wall of said container and adapted to support coils of wire and cable.



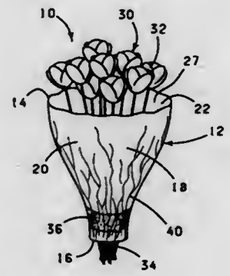
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**5,497,881**

## FLORAL GROUPING WRAPPER AND METHODS

**Donald E. Weder, Highland, Ill., assignor to Highland Supply Corporation, Highland, Ill.**

**Continuation-in-part of Ser. No. 95,331, Jul. 21, 1993, Pat. No. 5,428,939, and Ser. No. 968,798, Oct. 30, 1992, Pat. No. 5,369,934, which is a continuation of Ser. No. 865,563, May 21, 1992, Pat. No. 5,245,814, which is a continuation of Ser. No. 649,379, Jan. 31, 1991, Pat. No. 5,111,638, which is a continuation of Ser. No. 249,761, Sep. 26, 1988, abandoned, said Ser. No. 95,331is a continuation-in-part of Ser. No. 963,882, Oct. 20, 1992, Pat. No. 5,408,832, which is a continuation-in-part of Ser. No. 865,563, Oct. 20, 0, and Ser. No. 893,586, Jun. 2, 1992, Pat. No. 5,181,364, which is a continuation of Ser. No. 707,417, May 28, 1991, abandoned, which is a continuation of Ser. No. 502,358, Mar. 29, 1990, abandoned, which is a continuation-in-part of Ser. No. 249,761, Mar. 29, 0, said Ser. No. 95,331is a continuation-in-part of Ser. No. 923,117, Jul. 30, 1992, Pat. No. 5,307,605, which is a continuation-in-part of Ser. No. 803,318, Dec. 4, 1991, Pat. No. 5,344,016, which is a continuation-in-part of Ser. No. 940,930, Sep. 4, 1992, Pat. No. 5,361,482, which is a continuation-in-part of Ser. No. 926,098, Aug. 5, 1992, which is a continuation-in-part of Ser. No. 803,318, Aug. 5, 0, which is a continuation-in-part of Ser. No. 707,417, Aug. 5, 0. This application Dec. 21, 1993, Ser. No. 171,489**
**Int. Cl.[6] B65D *85/52*; A01G *9/02***
**U.S. Cl. 206—423** **7 Claims**



1. A wrapped floral grouping, comprising:

a floral grouping; and

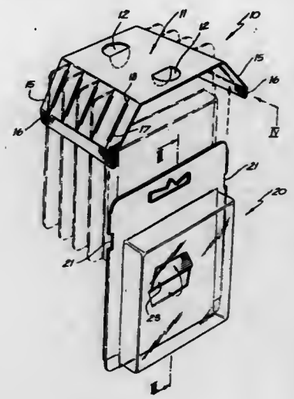
a flexible sleeve having a first end, a second end, an outer surface, and an inner surface, the inner surface defining a floral grouping retaining space, the sleeve being disposed about at least a portion of the floral grouping such that the floral grouping is disposed in the retaining space of the sleeve, the sleeve having a bonding material on one of the outer and inner surfaces and the sleeve being crimped about a portion of the floral grouping along the bonding material such that portions of the sleeve overlap adjacent portions of the sleeve and the overlapping portions bondingly connect so as to secure the crimped portion of the sleeve in a crimped condition about the floral grouping.

**5,497,882**

## MULTIPLE PACKAGE HOLDER

**Robin G. B. Kenyon, Woolloomooloo, Australia, assignor to Calidad Holdings Pty. Ltd., New South Wales, Australia**

**Filed Oct. 25, 1994, Ser. No. 328,704**
**Claims priority, application Australia, Nov. 3, 1993, PM2195**
**Int. Cl.[6] B65D *71/12***
**U.S. Cl. 206—485** **6 Claims**



1. A combination comprising:

a. a multiple package holder comprising:

a top panel,

a pair of receiving panels, each extending from a respective opposed edge of the top panel at an angle thereto, each receiving panel comprising a plurality of essentially parallel slots, each slot in one receiving panel being aligned with a respective slot in the other receiving panel, and

an edge strip extending from each receiving panel, and

b. a plurality of essentially thin or flat packages, each adapted to receive a product, each package having a pair of top corners each received in respective aligned slots of the holder, and each package further comprising a pair of laterally opposed recesses or cut-outs cooperating with a respective edge strip of the holder to allow suspension of the packages from the holder.

4. A combination comprising:

a. a multiple package holder comprising:

a top panel,

a pair of receiving panels, each extending from a respective opposed edge of the top panel at an angle thereto, each receiving panel comprising a plurality of essentially parallel slots, each slot in one receiving panel being aligned with a respective slot in the other receiving panel, and

an edge strip extending from each receiving panel, and

b. a plurality of packages, each package comprising:

a card,

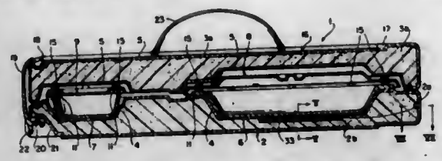
a cover attached to the card or formed as part of the card and cooperating with the card to define a space within which a product is receivable, the cover attached to the card or the cover formed as part of the card having a pair of top corners each received in respective aligned slots of the holder, and each package further comprising a pair of laterally opposed cut-outs, each cut-out cooperating with a respective edge strip of the holder to allow suspension of the packages from the holder.

5,497,883

## WARM FOOD ISOTHERMAL CONTAINER, PARTICULARLY FOR COLLECTIVE CATERING

Giovanni Monetti, Manta di Saluzzo, Italy, assignor to Monetti S.p.A., Cuneo, Italy

Filed Jan. 3, 1995, Ser. No. 368,015
Claims priority, application Italy, Feb. 22, 1994, TO94A0108
Int. Cl.[6] A45C 11/20
U.S. Cl. 206—545 8 Claims



1. A warm food isothermal container, particularly for collective catering, comprising a tray made of a thermally insulating material provided with recesses housing therein respective vessels for containing foodstuffs, at least in part warm, each vessel having a respective rim, and a cover made of a thermally insulating material detachably applied onto the tray, and further comprising, for each of said vessels, a respective covering member and resilient pressing means for providing substantially hermetic closure of said covering member against the rim of the respective food vessel by virtue of the pressure applied by the cover when the latter is placed upon the tray of the container, and wherein each covering member is constituted by a rigid body of moulded plastic material having a perimetral bearing flange with an inner face provided with an annular soft sealing gasket moulded over said rigid body, said annular gasket being formed with integral anchoring projections protruding upon the outer face of said perimetral flange, via axial through holes thereof, and defining said resilient pressing means.

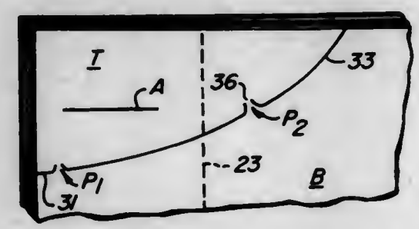
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5,497,884

## SELF OPENING DUAL TAB MERCHANDISING BAG

Robert B. DeMatteis, Colton, and Ralph E. Schlender, Highland, both of Calif., assignors to Polytec Packaging, La Mirada, Calif.

Division of Ser. No. 776,920, Oct. 15, 1991, Pat. No. 5,248,040.
This application Sep. 24, 1993, Ser. No. 126,472
Int. Cl.[6] B65D 27/10
U.S. Cl. 206—554 13 Claims




1. In a packet containing a plurality of dual tab plastic merchandising bags, each said bag including,
a front panel,
a rear panel,
each side of said bag between said front and rear panels including,
a front gusset folded from said front panel,
a rear gusset folded from said rear panel,
said front and rear gussets joined at a common gusset fold to form an endless tube of bag material around the periphery of said bag,
said bags being sealed and severed at the bottom and open and severed at the top,
said bags collapsed and folded one on another so that said gusset sides are folded upon themselves and collapsed under and between the bag front and rear panels,
said front and rear gussets extending partially the width of the front and rear panels of said bag so as to define at the side edge of the bag four overlying bag layers stacked one upon another, said layers including said front panel, said front gusset, said rear gusset, and said rear panel and to define between said gussets at the central portion of said bag two overlying bag layers stacked upon one another, said two layers including said front panel and rear panels,
handle holes provided centrally of said front and rear panels adjacent said open top of the bag;
first and second tabs of such bags adjacent the sides at said top of the bag, said tabs having a first portion overlying said gussets and a second portion overlying said central portion of said bag between said gussets, said tabs fused together to form said packet of bags registered at least at said front and rear panels;
means mounting said packet of bags at said tabs for dispensing said bags;
the improvement to said tabs comprising in combination:
side and center projections, said side projections defined over said front panel, said front gusset, said rear gusset and said rear panel, said center projections defined over said front panel and said rear panel;
said projections each formed by paired cuts separating the body of the bag from tabs, said cuts being arcuate and spaced apart one from another at their respective ends to form between the tabs and the body of the bag severed borders that point away from the body of the bag and to or toward the material of the tab;
said cuts defining therebetween a small and un-severed section of bag material left in place to form the material bridge which joins the body of the bag to the tab until the bag is severed, the un-severed section of bag material being so formed that when said front panel of said bag is pulled over said rear panel of said bag upwardly to and toward said opening of said bag said bag is singulated and dispensed in an open disposition from said tabs.

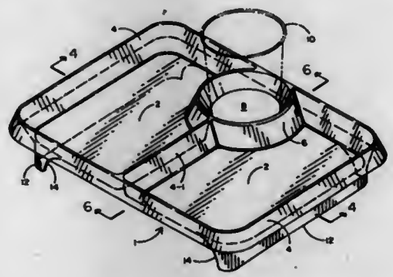
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5,497,885

## LAP TRAY FOR CARRYING FOOD

Sy Sussman, 435 Promontory Dr. West, Newport Beach, Calif. 92661

Filed Nov. 17, 1994, Ser. No. 341,413
Int. Cl.[6] B65D 1/34
U.S. Cl. 206—563 8 Claims



1. A tray for carrying food, said tray having a back, a front, opposite sides, and comprising a flat base on which the food is to be placed, a first raised lip projecting from and extending around the periphery of said base to form a barrier to prevent the food that is placed on said base from sliding off said tray, a hole formed through said base and dimensioned to receive a drinking cup therein, and a pair of legs arranged in parallel alignment with one another and depending downwardly from said base at opposite sides of said tray, said legs projecting below said base by a distance sufficient to rest upon a flat surface and to extend below the lap and along the legs of a user to support said tray against lateral sliding displacement when the user is seated and said flat base is laid upon the user's lap.



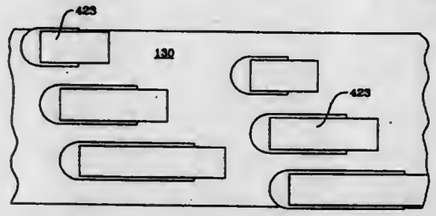
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5,497,886

## SCREENING APPARATUS FOR PAPERMAKING PULP

Douglas L. G. Young, Nashua, and Antoine G. Abdulmassih, Hudson, both of N.H., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Continuation-in-part of Ser. No. 912,462, Jul. 13, 1992, Pat. No. 5,307,939. This application Apr. 15, 1993, Ser. No. 46,319
Int. Cl.[6] B07B 1/22
U.S. Cl. 209—270 30 Claims




1. A hydrodynamic device for generating negative pressure excursions in a pulp slurry during fine screening, comprising:
a plurality of half-foil members disposed on a substantially cylindrical outer surface of a rotor, said rotor being mounted within and co-axial with a substantially cylindrical screen having a circumferentially continuous apertured zone to define an annular screening chamber between said rotor and said screen, at least one said half-foil member having a circumferential extent and a leading edge extending outward from said rotor;
first fence-like means having a leading edge and a trailing edge, said first fence-like means projecting a radial distance outwardly from said rotor and being attached along at least a portion of one or more axial edges of said circumferential extent of at least one half-foil member.

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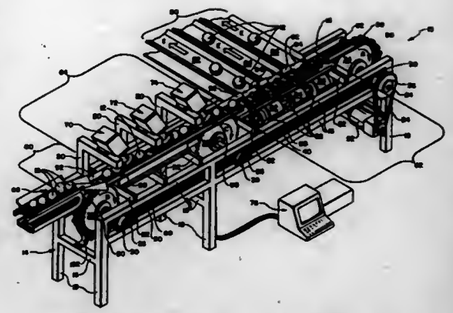
5,497,887

## METHOD AND APPARATUS FOR HANDLING OBJECTS

Jacob F. Hiebert, Reedley, Calif., assignor to Autoline, Inc., Reedley, Calif.

Filed Mar. 15, 1988, Ser. No. 168,260
The portion of the term of this patent subsequent to Dec. 11, 2007, has been disclaimed.
Int. Cl.[6] B07C 5/02
U.S. Cl. 209—538 60 Claims

1. An apparatus for handling objects comprising:
(a) conveying means for rotatably supporting and transporting the objects along a conveying path from an object input station to an object output station, said conveying means comprising a frame, a chain movably suspended from said frame along said conveying path and comprising a plurality of links connected to form an endless loop, and a plurality of chain attachment assemblies releasably secured to said chain, and wherein said chain attachment assemblies are sized and positioned on said chain so that the objects transported by said conveying means are individually supported and rotated between adjacent pairs of said chain attachment assemblies, and wherein each of said chain attachment assemblies comprise:
(b 1) a roller which provides rotating support of objects supported on said conveying means;



(2) a roller mount supporting said roller for rotation on an axis substantially normal to said conveying path., whereby said objects are rotated while being conveyed;
(3) fastening means for releasably securing said roller mount to said chain; and
(4) a discharge plate supported by said roller mount so as to be disposed in a substantially horizontal position between said rollers of adjacent pairs of said chain attachment assemblies sufficiently below an object supported on said conveying means that said object is not substantially contacted by said discharge plate so that the object is freely rotated upon said rollers prior to discharge of the object.

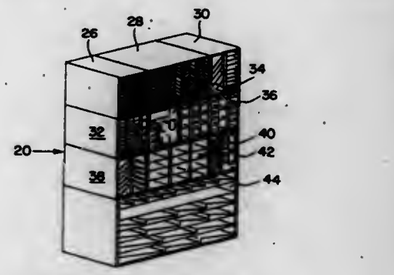
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5,497,888

## MODULAR DISPLAY SYSTEM

Dean Michaels, Vermilion; Steven T. Sheller, Kirtland; Michelle L. Floritto, Geneva; Sharon D. Hughes, Cleveland Heights, and Stephan W. Cole, Moreland Hills, all of Ohio, assignors to American Consumer Products, Inc., Solon, Ohio

Filed Nov. 16, 1994, Ser. No. 340,656
Int. Cl.[6] A47F 5/00
U.S. Cl. 211—10 10 Claims




1. A modular display system for storing and displaying a variety of substantially flat products comprising:
a first display module having a width of a single unit, an open front, a first plurality of internal divider elements separating an internal volume of said first module into a first plurality of volumes, each shaped to receive a predetermined amount of a particular product;
a second display module having a width of two of said units, a second plurality of internal divider elements separating an internal volume of said second module into a second plurality of volumes, each shaped to receive a predetermined amount of a particular product;
strip means extending along said first and second modules for receiving indicia indicative of contents of said first and second volumes; and
means for interconnecting said first and second modules, whereby a plurality of said first and second modules can be

attached to each other and arranged in a plurality of configurations to form display units of different sizes, shapes and footprints to fit a variety of product mix and space requirements.

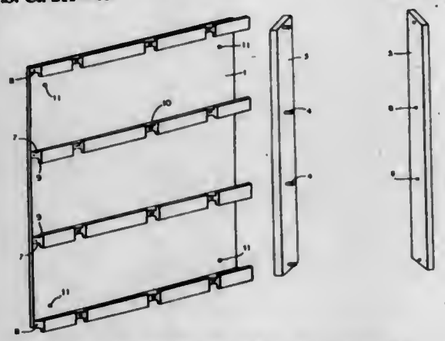
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**5,497,889**

## COMPACT DISC STORAGE CASE DISPLAY RACK

**Arnold J. Genovesi, 144 Split Cedar Dr., Islandia, N.Y. 11722**

**Filed May 20, 1994, Ser. No. 246,961**
**Int. Cl.[6] A47F *7/00***
**U.S. Cl. 211—40** **12 Claims**



**1.** A compact disc storage case display rack comprising:
a back panel;
a plurality of shelves arranged substantially parallel to one another and attached to said back panel at spaced intervals, said shelves having a depth greater than the thickness of a compact disc storage case and having flanges extending slightly above and below said shelves, said flanges having a plurality of spaced apertures which facilitate removal of a compact disc storage case from said rack; and
at least one selectively removable side wall attached to one of said back panel or at least one of said shelves.

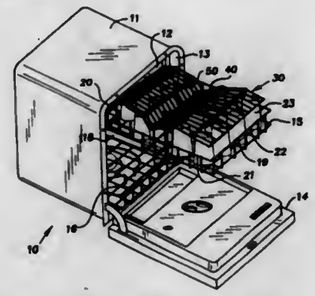
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**5,497,890**

## PLASTICWARE RETAINER FOR USE IN AN AUTOMATIC DISHWASHER

**Gary W. Clark, Lagrange, N.C., assignor to White Consolidated Industries, Inc., Cleveland, Ohio**

**Filed Jan. 7, 1994, Ser. No. 179,486**
**Int. Cl.[6] A47G *19/08***
**U.S. Cl. 211—41** **17 Claims**



**1.** A retainer for holding lightweight articles in a dishwasher rack against a force of upwardly projecting liquid, said retainer comprising a plurality of perforate, generally rigid panel members, and connectors for pivotally interconnecting said panel members to form a generally flexible panel, each of said panel members pivoting about an axis substantially parallel with a side of each of said panel members pivotally connected thereto, wherein said panel members pivot such that said panel generally conforms to and overlies said lightweight articles during washing for retaining said articles in said dishwasher rack against said force of said upwardly projecting liquid.

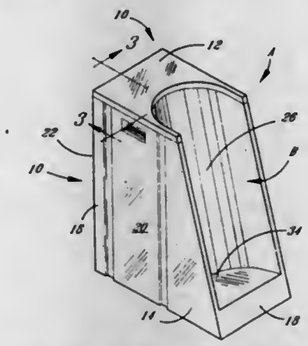
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**5,497,891**

## SUPPORT FOR GOLF BAG

**J. R. Hannon, 1105 Hwy. 8 East, Pelzer, S.C. 29669**

**Filed Sep. 29, 1994, Ser. No. 314,636**
**Int. Cl.[6] A47G *29/00*; B65D *85/20*; A63B *55/00***
**U.S. Cl. 211—71** **20 Claims**



**1.** A portable rack for supporting and displaying golf bags comprising:
a housing having a base, an outer shell and a top, said top being vertically spaced from said base by said outer shell;
a bag support cradle formed within a portion of said outer shell, said cradle having a U-shaped upstanding body portion and a bottom, said body portion being slanted inward of said outer shell and said bottom being arranged perpendicular of said body portion.

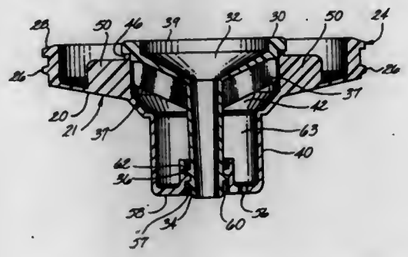
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**5,497,892**

## FILLER CAPS FOR INSULATED URNS AND THERMAL CONTAINERS

**Toyohiko Takatsuki, Nara, Japan, and Nobutaka Kiriu, Los Angeles, Calif., assignors to Zojirushi Corporation, Japan**

**Filed Feb. 24, 1994, Ser. No. 201,178**
**Int. Cl.[6] B65D *61/16***
**U.S. Cl. 215—309** **13 Claims**



**6.** A filler cap useful with an insulated liquids container comprising:



a filling port element substantially in the form of a funnel having a bowl and a hollow open-ended stem connected to a base of the bowl;
a body having an upper exterior surface and a bottom surface, the body being configured for releasable, substantially closing engagement with an opening into the container and for releasably receiving the filling port element therein, the body and the port element being cooperatively configured and arranged to define around a received position or the port element in the body a chamber having a bottom wall and an upper side portion, a first vent opening to the chamber from the exterior of the body through the chamber bottom wall and a second vent opening to the chamber through the chamber upper side portion from the upper exterior surface of the body; and
releasable connection means cooperable between the prot element and the body operable for releasably securing the port element in said received position in the body in which the funnel bowl is open to the upper exterior surface of the body and the funnel stem opens through the bottom surface of the body.

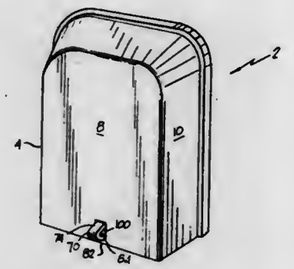
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**5,497,893**

## ENCLOSURE FOR CABLE CONNECTIONS

**Peter G. Mangone, Jr., 28600 Buchanan Dr., Evergreen, Colo. 80439**

**Filed Apr. 25, 1994, Ser. No. 232,495**
**Int. Cl.[6] B65D *43/20***
**U.S. Cl. 220—3.8** **12 Claims**



**1.** An enclosure comprising:
a base plate adapted to be mounted on a wall of a building;
a cover
attaching means on said base plate and on said cover for attaching said cover on said base plate for sliding movement of said cover relative to said base plate;
said cover having a face plate and an integral U-shaped sidewall so as to form a cavity between said base plate and said cover;
a substantially rigid wall integral with said base plate and located to close the open end portion of said U-shaped sidewall;
locking means to resist relative sliding movement between said base plate and said cover;
at least a portion of said locking means comprising said face plate having an opening formed therein;
a relatively stationary projection integral with said substantially rigid wall and passing through said opening to resist relative sliding movement between said cover and said base plate;
said cover being formed from a deformable material so that a portion of said face plate surrounding said opening may be deformed outwardly to permit movement thereof over said projection and then resile so that said projection will pass through said opening; and
said substantially rigid wall resisting movement thereof in the direction of movement of said face plate against the force applied by said face plate as said face plate is being deformed as it moves over said projection.

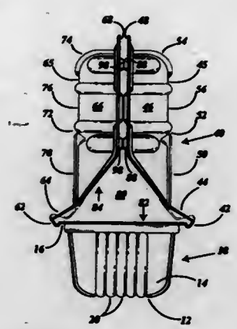
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**5,497,894**

## CLAMSHELL CONTAINER FOR FOOD ITEMS

**Calvin S. Krupa, 750 Navajo Rd., Medina, Minn. 55340, and Robert Knoss, 19081 Hopi St., Anoka, Minn. 55303**

**Filed Feb. 3, 1995, Ser. No. 382,977**
**Int. Cl.[6] B65D *6/28***
**U.S. Cl. 220—4.23** **3 Claims**



**1.** A container, comprising:
a. a base, said base having
1) a bottom wall;
2) an upwardly projecting side wall having a lower end integral with the periphery of said bottom wall and an upper end;
3) a first interior chamber comprising the space defined by said bottom wall and side wall, said first interior chamber having an open top;
b. a cover having first and second cover members each having hinge means for joining said cover member to the base; each cover member being movable between an open position and a closed position about its hinge means; said first cover member having a plurality of male locking members and said second cover member having a plurality of female locking members capable of being aligned and mated with the male locking members of said first cover member to hold said first and second cover members in the closed position; said first and second cover members, when joined together in their closed position, forming (1) a second interior chamber having an open bottom, said open bottom being substantially aligned with the open top of said first interior chamber; and (2) at least one vent open to the exterior of the container; said male locking members have:
(a) a cylindrical side wall;
(b) a flat end wall; and
(c) an insertion member having a conical tip and a concaved center section between the base of the conical tip and the flat end wall.

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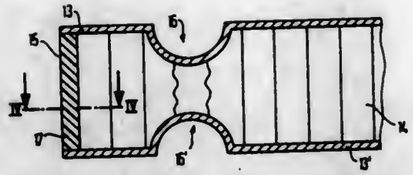
**5,497,895**

## TRANSPORT CONTAINER

**Michael Rudbach, Biwer, Luxembourg, assignor to Euro-Composites S.A., Echternach, Luxembourg**

**PCT No. PCT/EP94/00456, § 371 Date Dec. 20, 1994, § 102(e) Date Dec. 20, 1994, PCT Pub. No. WO94/19261, PCT Pub. Date Sep. 1, 1994**
**PCT Filed Feb. 17, 1994, Ser. No. 318,805**
**Claims priority, application Germany, Feb. 17, 1993, 43 04 845.5**
**Int. Cl.[6] B65D *90/04***
**U.S. Cl. 220—4.33** **19 Claims**

**1.** Transport container, in particular transport container in cuboid form, with walls (**10**, **12**) at least on the sides and with a floor (**11**), wherein at least the walls (**10**) on the sides can be inserted by their edges (**15**) between limbs of frame parts (**20**), characterized in that



the walls (10, 12) consist of sandwich panels comprising at least two outer face layers (13, 13') and a honeycomb core (14) connecting them, such that the cells of the honeycomb core extend perpendicular to the face layers (13, 13'), the walls (10, 12) include grooves (16, 16') recessed into the face layers (13) parallel to the edges (15), and that the frame parts (20) on the insides of their limbs bear ridges (21, 21') shaped to correspond to the grooves (16, 16') and are so constructed that the ridges (21, 21') can be brought into form-fitting engagement with the grooves (16, 16') and disengaged.

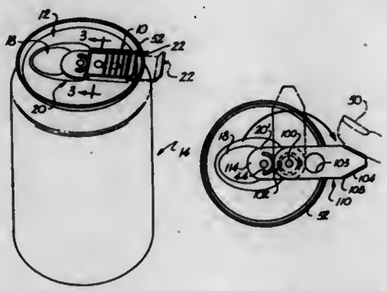
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**5,497,896**

**CONTAINER OPENER WITH EXTENDABLE MEMBER**

**Ronnie A. Shand, 7067 Windward Way, Apt. 195, Cincinnati, Ohio 45241**

**Filed Dec. 12, 1994, Ser. No. 354,362**
**Int. Cl.[6] B65D** *17/34*
**U.S. Cl. 220—269** **19 Claims**



1. An opening device for opening a container closure member, the container having an edge portion, the opening device comprising:

a first longitudinally extending member fixedly attached to the container adjacent the closure member; and

a second longitudinally extending member connected to said first member fore movement relative to said first member; said second member being moveable with respect to said first member between a retracted position, within the edge portion of the container, to an extended position, wherein at least a portion of said second member extends radially outwardly beyond the edge portion of the container such that upon said portion of said second member being lifted, said first member is forced downwardly for opening the container closure member.

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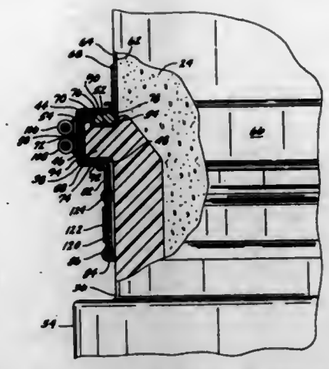
**5,497,897**

**CONTAINER FOR HOLDING FLUENT MATERIAL**

**Charles S. Alack, St. Louis, and Benjamin A. Wanner, Hillsboro, both of Mo., assignors to Semi-Bulk Systems, Inc., St. Louis, Mo.**

**Filed Mar. 31, 1994, Ser. No. 222,083**
**Int. Cl.[6] B65D** *45/32*
**U.S. Cl. 220—320** **21 Claims**

1. A container for holding fluent material comprising,



a bag of flexible sheet material defining a volume for containing a load of the material, said bag having a side wall with an inside face and an outside face, and a bottom margin defining an open lower end of the bag,

a substantially rigid, non-circular base for supporting the bag,

channel means formed in the base and extending at least partially around the base, the bag fitting on the base with the bottom margin of the bag extending down on the outside of the base and with a portion of the bottom margin being received in said channel means,

locking strip means disposed in said channel means and positioned to overlie said portion of the bottom margin of the bag, and

a clamping mechanism securable to the base for holding said locking strip means in said channel means in a position wherein said locking strip means presses said portion of the bottom margin of the bag against one or more surfaces of said channel means thereby to sealingly secure the bag to the base.

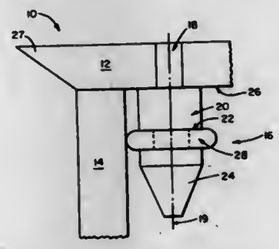
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**5,497,898**

**CONTAINER/CLOSURE ASSEMBLY**

**Antonio Perez, 59-35 160 St., Flushing, N.Y. 11365**

**Filed Jun. 23, 1994, Ser. No. 264,265**
**Int. Cl.[6] B65B** *7/28;* **B65D** *35/44;43/04*
**U.S. Cl. 220—358** **16 Claims**



16. A container/closure assembly comprising:

container means consisting of a bottom portion and a wall portion extending from said bottom portion such that a container volume and an open end is defined by said portions; and

closure means adapted to cover said open end of said container means wherein said closure means comprises:

a lid means having an inner and outer surface and a central vertical axis; and

a plurality of lid extensions having a central longitudinal axis, an outer radial surface, and extending from said inner surface of said lid means and spaced circumferentially about said central vertical axis such that each of said central longitudinal axes of said lid extensions are substantially parallel to said central vertical axis of said lid means and when said lid means covers said open end of said container means, each of said lid extensions is positioned such that a predetermined radial distance exists between the outer radial surface of said lid extension and a surface of said wall portion of said container means; and

pressure means secured to each of said lid extensions and radially extending a distance greater than said predetermined radial distance from said outer radial surface of said lid extension such that when said lid means covers said open end of said container means and said lid extensions are positioned adjacent the wall portion, said pressure means contacts and exerts a force against said surface of said wall portion;

whereby said closure means is secured to said container means when said closure means covers said open end and said pressure means contacts said surface of said wall portion.



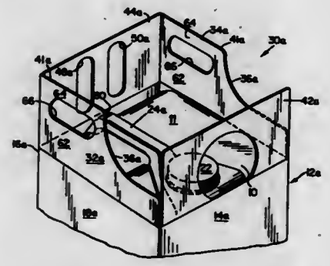
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**5,497,899**

**COMPOSITE PACKAGE**

**Scott P. Wuerfel, Memphis, Tenn., assignor to Ring Can Corporation, Memphis, Tenn.**

**Filed Feb. 2, 1995, Ser. No. 382,633**
**Int. Cl.[6] B65D** *5/462*
**U.S. Cl. 220—465** **2 Claims**



1. Composite package comprising:

an outer, rectangular paperboard box and a thin walled rectangular plastic bottle within said box;

said bottle having vertical front, rear, first and second side walls, and a top wall extending across said vertical walls, a pouring spout formed on said top wall adjacent said front wall, a handle formed on said top wall and extending between said pouring spout and said rear wall;

said paperboard box including front, rear, and first and second sidewalls adjacent the front rear and first and second sidewalls respectively of said bottle, said box having a top flap assembly including first and second side flaps connected to the side walls of said box and folded substantially perpendicular to said side walls, front and rear flaps connected to said front and rear walls of said box and folded over said side flaps, said first and second side flaps having front portions including a cut out section to provide clearance around said spout and rear portions extending rearwardly from said cutout sections to said rear wall of said box, said rear portions having inner edges which extend rearwardly substantially the full length from said cutout sections to said rear wall of said box, said inner edges overlying and resting on said handle to support said side flaps as said front and rear flaps are glued to said side flaps, said rear portions having first hand openings extending generally parallel to said inner edges and arranged alongside said handle, said rear flap having second hand openings which overlie said first hand openings so that said handle may be gripped through said first and second hand openings, and said front flap having an opening overlying said spout.

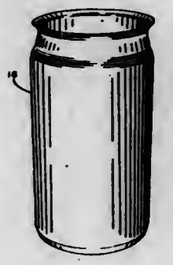
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**5,497,900**

**NECKED CONTAINER BODY**

**Antonio Caleffi, Nogara, Italy; T. William Ames, Park Ridge, Ill.; Edward S. Traczyk, Lockport, Ill., and Dietrich K. Naggert, Oak Forest, Ill., assignors to American National Can Company, Chicago, Ill.**

**Continuation of Ser. No. 957,629, Oct. 6, 1992, abandoned, and a continuation-in-part of Ser. No. 696,322, Jan. 30, 1985, and Ser. No. 725,945, Apr. 22, 1985, each , Apr. 22, 0which is a division of Ser. No. 453,232, Dec. 27, 1982, Pat. No. 4,519,232, said Ser. No. 957,629is a continuation of Ser. No. 730,015, Jul. 12, 1991, abandoned, which is a continuation of Ser. No. 468,706, Jan. 23, 1990, abandoned, which is a continuation of Ser. No. 205,083, Jun. 10, 1988, abandoned, which is a division of Ser. No. 11,760, Feb. 6, 1987, Pat. No. 4,774,839. This application Apr. 28, 1995, Ser. No. 430,745**
**Int. Cl.[6] B65D** *7/42*
**U.S. Cl. 220—656** **10 Claims**



1. A cylindrical can body for a two-piece metal container comprising a cylindrical side wall extending from an integral bottom end wall, a single smooth necked in portion at an end of said cylindrical side wall having a single inwardly tapered annular straight segment extending from a single shoulder between said side wall and a reduced diameter neck portion at an open end of said can body, said inwardly tapered annular straight segment comprising a first radially compressed tapered portion having a single compressed lower segment, and a second further radially compressed tapered portion extending from an upper part of said first tapered portion, said second tapered portion disposed between said first tapered portion and said reduced diameter neck.

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**5,497,901**

**STRUCTURE FOR AUTOMATED STICKING OUT AND RETREATING OF PIPETTE TO A CANTEEN BY TURNING**

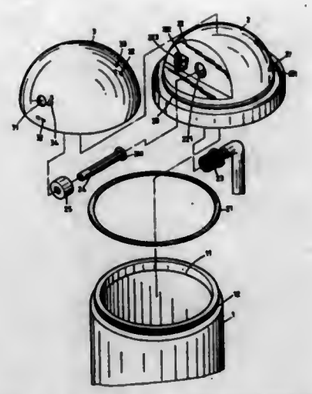
**Cin-Chen Chen, No. 35, Lane 108, Chien Pin S Street, Tainan City, Taiwan, Prov. of China**

**Filed Aug. 4, 1995, Ser. No. 511,368**
**Int. Cl.[6] B65D** *47/12*
**U.S. Cl. 220—708** **1 Claim**

1. A structure for automated sticking out and retreating of pipette to a canteen by turning, comprising a canteen, a canteen cover, and a turning cover:

said canteen cover is a hollow, semi-spherical cover with its bottom circumference inserted a leak-proof washer; a tangent surface is formed at the front end of said canteen cover and a bore penetrating through at said tangent surface to allow a pipette be inserted from within; a sector of hollow snapping base is separately provided by the side to said tangent surface and a ventilation outlet is cut through said snapping base; a snapping chute is provided at the circumference at the bottom of said canteen cover and a guiding rail is provided behind said canteen cover with a positioning recess provided at the end of said guiding rail;

a circular opening is cut into at the proper place on the surface of a turning cover which is a hollow circular cap to accommodate said pipette; protruding tabs facing each other are



provided at the bottom circumference within said turning cover; a pop-up ball is provided in said guiding rail corresponding to said canteen cover while a snapping tab is protruding inside said turning cover at where corresponding to said snapping base of said canteen cover; whereby, said turning cover is snapped with said protruding tab at its bottom circumference to said snapping base in said canteen cover while said pop-up ball of said turning cover is inserted to slide in said guiding rail in said canteen cover;

and said pipette sticks out of said circular opening of said turning cover to allow said canteen cover to engage threads provided on said canteen for closing up by using said leak-proof washer; said pipette completes its second bending as pushed against by said snapping tab in said turning cover when said turning cover is turned to snap said pipette into said snapping base for closing up said ventilation outlet.

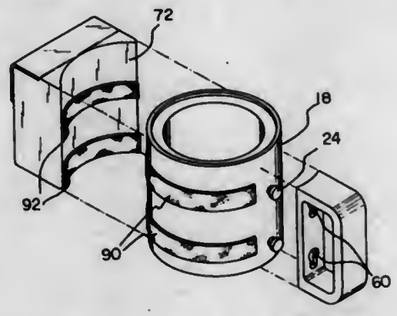
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**5,497,902**

**THERMALLY INSULATED BEVERAGE MUG WITH DETACHABLE POUCH**

**Gary H. Crock, 65 Bond Cres., Richmond Hill, Ontario, Canada**

**Filed Nov. 8, 1994, Ser. No. 335,944**
**Int. Cl.[6] B65D 25/18**
**U.S. Cl. 220—737** **6 Claims**




1. A thermally insulated beverage mug with detachable pouch for holding a standard-sized beverage can while simultaneously holding items such as money, keys, cigarettes and the like in an adjacent location comprising, in combination:

a shell having a circular bottom wall, a tubular side wall coupled to the bottom wall and extended upwards therefrom to define a cylindrical hollow interior and an opening for allowing access thereto and wherein the external diameter of the shell is between about (60+—10)% greater than its axial length, and a pair of spaced and vertically aligned pins each having a shaft extended outwards from the side wall and terminated at a head;

an insulating liner having a circular bottom wall, a tubular side wall coupled to the bottom wall and extended upwards therefrom to define a hollow cylindrical interior having a diameter of 2.6 inches+—10% such that it is adapted for receiving a standard-sized beverage can and an opening for allowing access thereto for placing the beverage can therein and with the liner disposed within the interior of the shell such that their openings are generally aligned;

a rigid plastic handle having a vertical u-shaped exterior segment with a top end and a bottom end, an interior segment integrally coupled between the top end and bottom end of the exterior segment and with the interior segment shaped to conform with the side wall of the shell, a pair of spaced slots disposed along the interior segment of the handle at a location alignable with the pins on the shell, each slot having an upper portion, a lower portion, and a retracted portion therebetween and with the handle positionable upon the pins of the shell when the shafts of the pins are placed within the upper portions of the slots, and with the handle securable to the shell when the shafts of the pins are positioned within the lower portion of the slot;

a pouch having a back wall shaped to conform with the side wall of the shell, a front wall offset from the back wall, a periphery interconnecting the back wall with the front wall to define a hollow interior and an opening for allowing access to the interior and with the periphery formed of a bottom wall and two opposed and spaced side walls, an integral lid coupled to the back wall and side walls with a portion thereof pivotable for allowing access to the interior in one orientation and preventing access to the interior in another orientation, a strip of pile type fastener secured to the lid, and a strip of complimentary pile type fastener secured to the front wall and with the pile type fasteners coupleable together for securing the lid over the opening; and

a pouch coupling mechanism for removably coupling the pouch at a selected location on the periphery of the shell, the pouch coupling mechanism including two spaced horizontal elongated strips of pile type fastener coupled to and wrapped around the side wall of the shell and two spaced horizontal strips of complementary pile type fastener coupled to the back wall of the pouch at locations alignable with and securable to the strips on the shell.

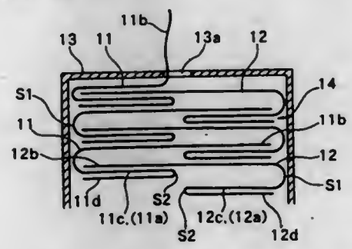
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**5,497,903**

**MULTIPLE FOLDED PAPER FOR CONTINUOUS DISPOSAL**

**Katsu Yoneyama, 413 Mitojima, Fuji-shi, Shizuoka-ken, Japan**

**Filed Jan. 13, 1995, Ser. No. 372,313**
**Claims priority, application Japan, Jan. 26, 1994, 6-023774**
**Int. Cl.[6] A47K 10/24**
**U.S. Cl. 221—48** **4 Claims**




1. A multiple folded paper for continuous disposal, comprising:

a container;

a first group of sheets of paper folded rightwardly; and

a second group of sheets of paper folded leftwardly;



a lower folded-section of each of said first group sheets of paper being interdigitated with an upper folded-section of each of said second group sheets of paper thereunder, thereby forming a multiple folded paper;

said multiple folded paper being received in said container such that a leading end of the upper folded-section, which is in a frictional engagement at the interdigitated area with the uppermost folded sheet of paper, is exposed out of said outlet slit by drawing out the upper folded-section of the uppermost folded sheet of paper through an outlet slit formed in said container, thereby facilitating a continuous disposal of said multiple folded paper;

wherein a tail end of the lower folded-section of each of said first group sheets of paper folded rightwardly and a tail end of the lower folded-section of each of said second group sheets of paper are folded back in an opposite direction with respect to the folding direction of each sheet of paper, thereby forming superimposing ends of a reduced width respectively, the reduced width superimposing end of each of said rightwardly folded sheets of paper being interdigitated with the leading end of said upper folded-section of each of said leftwardly folded sheets of paper and the reduced width superimposing end of each of said leftwardly folded sheets of paper being interdigitated with the leading end of said upper folded-section of each of said rightwardly folded sheets of paper, so that the reduced width superimposing ends of said rightwardly folded sheets of paper and the reduced width superimposing ends of said leftwardly folded sheets of paper will be proportionally distributed to the right side and the left side of said multiple folded paper.

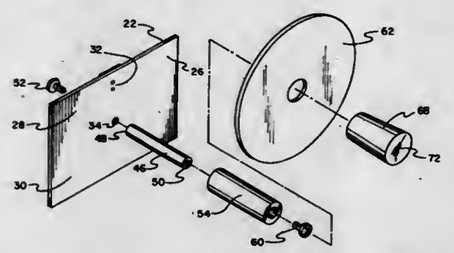
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**5,497,904**

**GUM LABEL DISPENSER**

**Gerald T. Jones, 411 Ocala Dr., Apt. #3, Knoxville, Tenn. 37918**

**Filed Dec. 7, 1994, Ser. No. 350,455**
**Int. Cl.[6] A01C 15/04**
**U.S. Cl. 221—185** **5 Claims**




1. A new and improved portable waist mounted dispenser adapted to carry a roll of gum label comprising, in combination:

a rectangular base plate constructed from polyvinyl chloride, the base plate having a first side, a second side, an upper extent and a lower extent, two minor apertures formed through the upper extent, a major aperture formed through the base plate intermediate the upper and lower extents;

a U-shaped resilient clip having a closed upper end, an open lower end, a first leg and a second leg, two minor apertures formed through the second leg, the two minor apertures of the U-shaped resilient clip adapted for registration with the two minor apertures of the rectangular base, two retaining elements positioned within the two minor apertures of the U-shaped clip and the two minor apertures of the base plate, the two retaining elements functioning to secure the U-shaped clip to the base plate;

an axle constructed from polyvinyl chloride, the axle having a hollow threaded interior, first end, a second end and a cylindrical surface therebetween, the first end of the axle adapted for registration with the major aperture of the base plate, a first screw secured within the major aperture of the base plate and threadably received within the first end of the axle, the first screw functioning to couple the axle to the base plate;

a hollow roller constructed from polyvinyl chloride, the roller having a first end, a second end, and a cylindrical surface therebetween, the roller positioned over the axle, the cylindrical surface of the roller adapted to rotatably carry a roll of gum label, a second screw inserted through the second end of the hollow roller and threadably received within the second end of the axle, the second screw functioning to couple the axle and the roller;

a plurality of end rings, each of the end rings constructed from polyvinyl chloride and having an inside diameter and an outside diameter, each of the end rings having an inside diameter which allows it to be inserted over the cylindrical surface of the hollow roller, each of the end rings having a different outside diameter, the end rings functioning as an end cap for any one of a number of gum label rolls, one of the end rings positioned over the hollow roller; and

a resilient frustroconical end cap, the end cap having a opened first end and a closed second end, the opened first end secured over the second end of the roller.

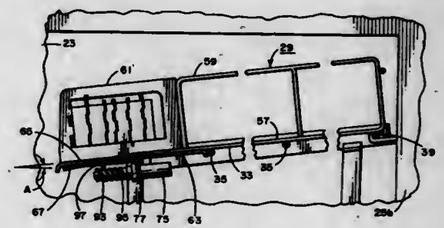
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**5,497,905**

**VENDING MACHINE, AND RELEASE MECHANISM**

**Gregory J. Vogelpohl, and Phillip C. South, both of Orlando, Fla., assignors to ECC International Corp., Orlando, Fla.**

**Filed Jun. 24, 1994, Ser. No. 265,711**
**Int. Cl.[6] G07F 11/16; B65G 59/00**
**U.S. Cl. 221—226** **20 Claims**




1. A vending machine for selectively vending a plurality of vended articles comprising:

a cabinet;

at least one supporting means arranged in said cabinet for slidably receiving the vended articles in row formation thereon and including at least one channel having an open end and a pair of generally opposite sidewalls to slidably guide the vended articles in row formation on said at least one supporting means within said at least one channel toward said open end thereof with adjacent vended articles in the row formation being engaged;

a casing disposed generally in alignment with one of said opposite sidewalls adjacent said open end of said at least one channel and mounted to said at least one supporting means, said casing including a pair of generally opposite faces with one of said opposite faces being disposed at least adjacent some of the vended articles in the row formation thereof in said at least one channel, and an opening in said casing intersecting at least said one opposite face thereof;

a pair of sets of hinged means associated with said casing within said opening and operable generally for movement between a pair of positions, one of said hinged means sets in one of its positions being disposed at least in part within said opening of said casing so as to be disengaged from one of the vended articles disposed in the row formation adjacent said open end of said at least one channel to permit the sliding displacement of the one vended article from said at least one supporting means through said open end of said at least one channel and the other of said, hinged means sets in one of its positions extending at least in part from said opening in said casing

beyond said one opposite face thereof into said at least one channel so as to be engaged with another of the vended articles next adjacent the displaced one vended article in the row formation to retain the remaining vended articles in the row formation against sliding displacement on said at least one supporting means in said at least one channel thereof when said one hinged means set is in its one position, said other hinged means set being movable to the other of its positions disposed at least in part within said opening of said casing so as to be disengaged from the another vended article in the row formation to permit the sliding displacement of the remaining vended articles in the row formation on said at least one supporting means toward said open end of said at least one channel and said one hinged means set being movable to the other of its positions extending at least in part from said opening beyond said one opposite face of said casing into engagement with the another vended article to retain the remaining vended articles in the row formation against sliding displacement from said at least one supporting means through said open end of said at least one channel upon the movement of said other hinged means set to its other position;

a pivot connector reciprocally movable within said opening in said casing between said hinged means sets; and

a pair of hinge pins disposed at least in part within said opening in said casing and pivotally interconnected between said pivot connector and adjacent ones of said hinged means of said hinged means sets, respectively, one of said pivot connector and one of said hinge pins being responsive to opposite forces selectively applied thereto to effect the reciprocal movement of said pivot connector conjointly with the respective movements of said hinged means sets between the one and other positions thereof.

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**5,497,906**

**PLASTIC CLOSURE WITH SECURITY ELEMENT**

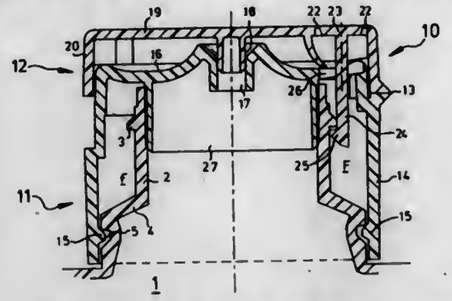
**Werner F. Dubach, Maur, Switzerland, assignor to Createchnic AG, Switzerland**

**Filed Jul. 30, 1993, Ser. No. 101,439**

**Claims priority, application Switzerland, Aug. 6, 1992, 02467/92**

**Int. Cl.[6] B65D** *55/02*

**U.S. Cl. 222—23** **31 Claims**




1. In a one-piece plastic closure for fastening on a container comprising a lower part with a top surface, said top surface forming a pouring opening, a cap pivotally connected to said lower part by a hinge shaft, and a security element integrally connected to the closure, the improvement comprising: at least one said security element disposed on said closure, said at least one said security element being automatically transformed from a secured state into a visually recognizable unsecured state during an initial opening movement of one of said cap away from said lower part of the closure and said entire closure away from said container; and at least one baffle disposed on an underside of said cap which, after initial opening of said closure, during closing presses said at least one said security element into a low position on the lower part of said closure.

**5,497,907**

**MICRO-METERING DEVICE**

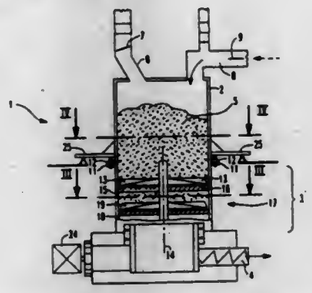
**Bruno Gmuer, St. Gallen, and Peter Naef, Helden, both of, Switzerland, assignors to Buehler AG, Switzerland**

**Continuation of Ser. No. 98,218, Jul. 28, 1993, abandoned, which is a continuation of Ser. No. 768,816, Sep. 30, 1991, abandoned, which is a continuation-in-part of Ser. No. 679,061, May 23, 1991, abandoned. This application Dec. 7, 1994, Ser. No. 350,670**

**Claims priority, application Switzerland, Jan. 9, 1989, 3674/89; Hungary, Jan. 2, 1990, 7616/90**

**Int. Cl.[6] B65G** *65/48*

**U.S. Cl. 222—58** **14 Claims**




1. A micro-metering apparatus for continuous and accurate delivery of small amounts of bulk material comprising:

a weighing container;

a discharge assembly connected to the weighing container and having

(i) an upper horizontal base having an opening therein, the opening being substantially unimpeded for a flow of bulk material from the weighing container;

(ii) a lower horizontal base vertically spaced from the upper base to define a premetering space therebetween, the premetering space being in flow communication with the weighing container through the opening in the upper horizontal base;

(iii) an aperture located between the upper and lower horizontal bases and being in flow communication with the premetering space;

(iv) a rotating cleaning device disposed in said premetering space for transferring bulk material through the aperture; and

(v) a metering screw device disposed to receive bulk material from said aperture and to deliver a metered amount of the bulk material to an output of the discharge assembly;

weighing elements connected to the weighing container to provide continuous signals representative of the weight of the micro-metering apparatus and the bulk material; and

control means responsive to the continuous signals and operatively connected to the rotating cleaning device and the metering screw device for controlling the delivery of bulk material.

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**5,497,908**

**CREASE KEEPER**

**Robert B. Cheek,III, 67 Beacon Hill Ter., Shelton, Conn. 06484, and Albert E. Cheek, 5712 Long Iron Dr. #237, Orlando, Fla. 32839**

**Filed Aug. 19, 1994, Ser. No. 293,044**

**Int. Cl.[6] D06C** *15/00*

**U.S. Cl. 223—74** **5 Claims**

1. A crease keeper for maintaining a crease in trouserlike garments comprising:

two spring loaded wirelike frame members affixed to a spreader bar by a frame member attachment means, wherein each of the spring loaded wirelike frame members comprise a U-shaped frame pair of stiff wirelike composition,

a spring loading means affixed to and providing expansive force to said wirelike frame members, said spring loading means comprising;

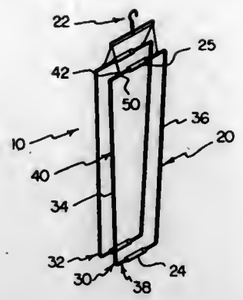
a cartridge housing having an elongated cylindrical member with a first rodlike interface member affixed to a substantially closed bottom portion thereof and a caplike member slidably disposed upon a free end of said first elongated cylindrical member and affixed thereon using a threaded fastener,

a compression spring member disposed within said cartridgelike housing wherein a first free end of said compression spring member engages said elongated cylindrical member and a second free end of said compression spring member engages a cup like member affixed to a second rodlike interface member wherein said second rodlike interface member slidably engages a flanged centrally disposed hole of said caplike member, and

a first interface attachment means for joining said first rodlike interface member and a portion of said wirelike frame member and a second interface attachment means for joining said second interface member and a portion of said wirelike frame member; and

a hooklike hanger pivotably affixed to the spreader bar by a swivel loop attachment, said swivel loop attachment having a ringlike portion and a straightened portion with a free end being peened to form an enlarged head which permanently affixes said swivel loop attachment to said hooklike hanger, said hook like member capable of engaging a rodlike member disposed in a closet with said wirelike frame member being disposed within a leg of a trouserlike garment and suspended therefrom.






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**5,497,909**

**REUSEABLE POUCH FITMENT**

**Ralph C. Wirsig, and John R. Thompson, both of Kingston, Canada, assignors to Du Pont Canada Inc., Mississauga, Canada**

**PCT No. PCT/CA92/00150, § 371 Date May 12, 1994, § 102(e) Date May 12, 1994, PCT Pub. No. WO92/19528, PCT Pub. Date Nov. 12, 1992**

**PCT Filed Apr. 10, 1992, Ser. No. 140,030**

**Claims priority, application United Kingdom, Apr. 29, 1991, 9109168**

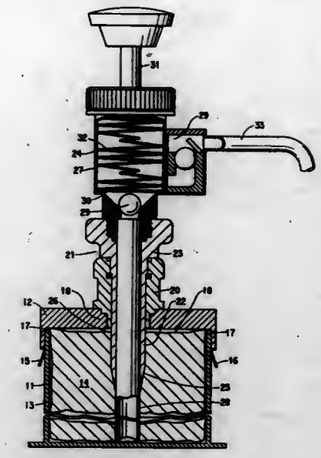
**Int. Cl.[6] B67D** *5/00*

**U.S. Cl. 222—82** **12 Claims**

1. A device for puncturing a sealed plastic pouch containing flowable material, said pouch having a pair of spaced ears at one end of said pouch comprising:

(a) a container having an open end defining a rim and adapted for holding said pouch;

(b) a lid releasably securable to said rim so as to trap said ears of said pouch between said lid and said rim and present a taut portion of said pouch between said ears when said lid is secured to said rim;




(c) a hollow tube slidably moveable relative to said lid, said tube including a first end disposed inwardly of said lid and a second end disposed outwardly of said lid, said first end presenting a circumferential chamfer;

(d) a plunger removably securable to and slidably locatable within said hollow tube, said plunger including a substantially conical first end disposed inwardly of said lid,

said hollow tube and said plunger slidably moveable together relative said lid from a first position spaced from said taut portion of said pouch to a second position puncturing said taut portion of said pouch to form a seal between said punctured portion of said taut portion of said pouch and said tube,

said plunger slidably removable from said tube after puncturing of said taut portion of said pouch without leakage of said flowable material from said pouch.

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**5,497,910**

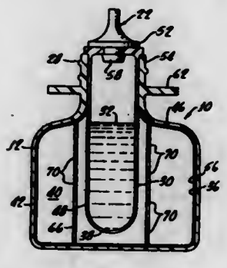
**DROPWISE LIQUID DISPENSING SYSTEM PARTICULARLY SUITABLE FOR LIQUIDS HAVING LOW SURFACE TENSION**

**David L. Meadows, Mission Viejo; Katherine C. Kurjan, Huntington Beach, and Larry E. Branham, San Juan Capistrano, all of Calif., assignors to Allergan, Inc., Irvine, Calif.**

**Filed May 5, 1994, Ser. No. 238,462**

**Int. Cl.[6] B65D** *35/28*

**U.S. Cl. 222—95** **25 Claims**




1. A dropwise liquid dispensing system comprising:

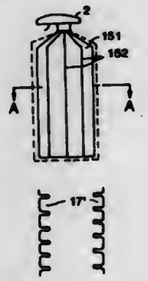
a liquid formulation having a surface tension of less than a specific value;

tip means for dispensing of the liquid formulation in a dropwise fashion;

inner bottle means, in communication with said tip means, for both containing the liquid formulation and forcing the liquid formulation through the tip means upon compression of the inner bottle means;
means, defining a volume of said inner bottle means, for preventing the liquid formulation from flowing out of the inner bottle means through the tip means without compression of the inner bottle means;
outer bottle means, disposed around said inner bottle means, for compressing the inner bottle means; and
cylinder means for preventing contact between the inner and outer bottle means upon compression of the outer bottle means.

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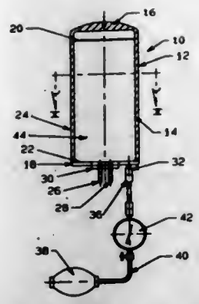
**5,497,911**
**HAND-HELD UNIVERSAL DISPENSING CONTAINER WHICH OPERATES REGARDLESS OF ITS ORIENTATION**
**M. Edmund Ellion, 3660 Woodstock Rd., Santa Ynez, Calif. 93460, and James C. Pfautz, 12360 Hogue La., Bealeton, Va. 22712**
**Filed Sep. 2, 1994, Ser. No. 300,108**
**Int. Cl.[6] B65D** *35/28*
**U.S. Cl. 222—95** **14 Claims**




1. A hand-held dispensing container for dispensing gas-free liquid comprising:
a rigid holder having an internal chamber;
a bladder in said chamber for containing a liquid to be dispensed, said bladder having a flexible wall forming a cavity to receive said liquid;
normally closed valve means to retain said liquid in said bladder when closed, and to permit flow of said liquid from said bladder when open;
means to exert a differential pressure between the inside and outside of said wall; and
said bladder wall having interior facing surface which abut as liquid is withdrawn from the container, said surfaces being surface configured with indentations which overlap one another upon abutment to create a serpentine channel from the inside of the bladder, along the interior facing surfaces, to an outlet from the bladder.

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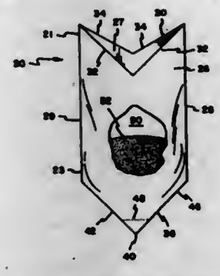
**5,497,912**
**DISPOSABLE SELF-DISPENSING PRESSURIZED PACKAGE FOR DELIVERY OF STERILE FLUIDS**
**Michael W. Hoback, 5954 Pettus Rd., Antioch, Tenn. 37013, and Walter C. Hennessee, 10002 Hogan Dr., Huntsville, Ala. 35803**
**Filed Oct. 20, 1994, Ser. No. 326,257**
**Int. Cl.[6] B65D** *35/28*
**U.S. Cl. 222—95** **23 Claims**




1. A pressurized sterile fluid storage bag having a top and a bottom comprising:
a flexible outer bag having an interior, an exterior exposed to atmosphere, and a first edge located at a side other than a bottom of the outer bag;
a flexible inner bag having an interior capable of receiving a sterile fluid, an exterior, and a second edge located at a side other than a bottom of the inner bag;
a seam joining at least a portion of the first edge and at least a portion of the second edge enabling the inner bag to remain oriented parallel and positionally fixed with respect to the outer bag throughout the useful life of the sterile fluid storage bag and further permitting the sterile fluid within the inner bag to move and collect at a bottom of the inner bag in response to the force of gravity when the storage bag is held supported at the top and preventing sterile fluid from being trapped within the inner bag as the sterile fluid is dispensed therefrom;
an air space between the interior of the outer bag and the exterior of the inner bag;
at least one fluid flow port communicating the exterior of the outer bag with the interior of the inner bag; and
at least one pressure port communicating the exterior of the outer bag and the air space enabling the air space to be pressurized.

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**5,497,913**
**MIXING BAG ARRANGEMENT AND METHOD**
**Denny D. Baker, 1331 Piper Dr., New Brighton, Minn. 55112, assignor to Denny D. Baker, New Brighton; Richard Mrocek, and Sharon Mrocek, both of White Bear Lk., all of Minn.**
**Filed Dec. 15, 1993, Ser. No. 167,780**
**Int. Cl.[6] B65D** *35/28*
**U.S. Cl. 222—102** **12 Claims**

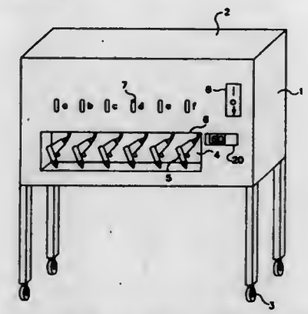



1. A mixing bag arrangement for mixing ingredients comprising:
first and second panels each having an outer peripheral edge;
the first panel interconnected to the second panel along a first portion of each outer peripheral edge of each of the first and second panels to define an enclosed chamber for receiving the ingredients;
the enclosed chamber accessible through an open end defined by a second portion of each outer peripheral edge which is not interconnected to one another;
the first portion of each peripheral edge including a region defining a converging tip disposed on an opposite end of the panel arrangement relative to the open end; and
the first and second panels each including a line of perforations extending across the converging tip of each of the first and second panels permitting a dispensing opening to be formed therein when the line of perforations is torn, to dispense the ingredients from the enclosed chamber, the line of perforations extending across both of the first and second panels which define the enclosed chamber.



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**5,497,914**
**CAR CARE SELF-SERVICE DEVICE**
**Panos Maltsis, Kanalgasse 15, 2502 Biel, Switzerland**
**PCT No. PCT/CH93/00156, § 371 Date Mar. 28, 1994, § 102(e) Date Mar. 28, 1994, PCT Pub. No. WO93/25416, PCT Pub. Date Dec. 23, 1993**
**PCT Filed Jun. 17, 1993, Ser. No. 196,166**
**Claims priority, application Switzerland, Jun. 17, 1992, 1902/92**
**Int. Cl.[6] B67D** *5/52*
**U.S. Cl. 222—135** **1 Claim**

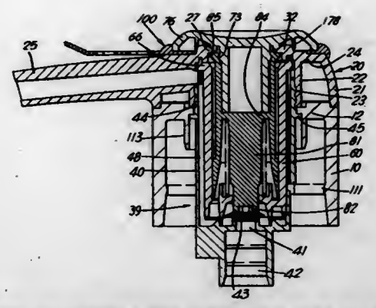



1. A car care self-service device capable of carrying out a plurality of different car care operations comprising a housing defining an internal space, said housing having a front wall having an aperture displaying a plurality of spray devices; a plurality of supply tanks for storing different car care agents, each of said plurality of supply tanks being in fluid communication with a respective one of each of said plurality of spray devices; conduit means for communicating each tank with a respective spray device, said conduit means includes hose means mounted on reel means within said housing for allowing said hose means to be unwound from said reel by pulling on said spray device thereby allowing said spray device to be moved to a work site; a feeding device associated with each conduit and a common motor within said housing internal space for selectively controlling the feed of car care agents from said supply tanks to said spray devices by said feeding device, said common motor having a coupling for selectively connecting said motor to said feeding device.

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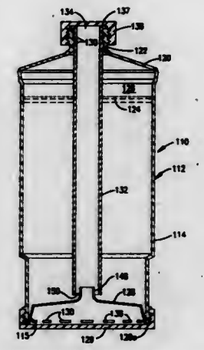
**5,497,915**
**DISPENSER PUMPS**
**Anthony Wass, Lincolnshire, Great Britain, assignor to The English Glass Company Limited, Leicester, Great Britain**
**PCT No. PCT/GB92/01504, § 371 Date Jun. 28, 1994, § 102(e) Date Jun. 28, 1994, PCT Pub. No. WO93/03857, PCT Pub. Date Mar. 4, 1993**
**PCT Filed Aug. 14, 1992, Ser. No. 196,137**
**Claims priority, application United Kingdom, Aug. 16, 1991, 9117717**
**Int. Cl.[6] B67D** *5/00*
**U.S. Cl. 222—153.07** **20 Claims**

1. A dispenser pump having:
a pump body defining a pump chamber, with means for mounting the pump body on the neck of a container with a first end of the pump body directed away from and a second end towards the container, the pump body comprising an outer shell and an inner shell nested together, the inner shell's outer surface fitting against the outer shell's inner surface along the pump body;
a reciprocable plunger extending axially from the first end of the pump body into the pump chamber and operable to alter the pump chamber volume to pump material in use through a valved inlet and out through a valved outlet opening of the pump chamber, exiting the inner shell of the pump body, to a discharge opening exiting the outer shell of the pump body;
the discharge opening being on the pump body nearer the first end thereof than is the outlet opening; and
a circumferentially-localized, axially-extending channel recess defined in at least one of the inner surface of the outer shell and the outer surface of the inner shell to interrupt the fit of said surfaces and thereby define between the nested inner and outer shells a circumferentially-localized axially-extending discharge passage extending in the pump body alongside the pump chamber and connecting the outlet opening to the discharge opening.




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**5,497,916**
**LIQUID DISPENSER FEATURING AUTOMATIC POURING OF MEASURED DOSES**
**Kenneth D. Hester, 4880 W. 215th St., Bucyrus, Kans. 66013**
**Division of Ser. No. 184,203, Jan. 18, 1994, Pat. No. 5,405,055. This application Feb. 6, 1995, Ser. No. 384,667**
**Int. Cl.[6] G01F** *11/28*
**U.S. Cl. 222—456** **11 Claims**




1. A liquid dispenser for dispensing liquid in measured amounts, comprising:
a substantially fluid tight container for holding the liquid, said container having top and bottom portions and an air chamber in said top portion above the liquid level in the container;

a hollow shell disposed in the bottom portion of said container, said shell having an inlet therein for accommodating flow of liquid from the container into said shell;

conduit means providing a flow path for liquid to flow from the shell out of the container for dispensing of the liquid, said conduit means including a dispensing tube extending through said top portion of the container and terminating in a dispensing outlet for discharging liquid from the container;

a flow restriction in said conduit means for restricting the flow therethrough sufficiently to prevent said tube from being filled with liquid when the container is inverted to dispense liquid, thereby leaving an air path in said conduit means for accommodating entry of air to displace the liquid discharged from the container; and

a port in said conduit means located substantially adjacent to said flow restriction in communication with said air path to direct air from said air path into the container to displace the liquid dispensed through said outlet.

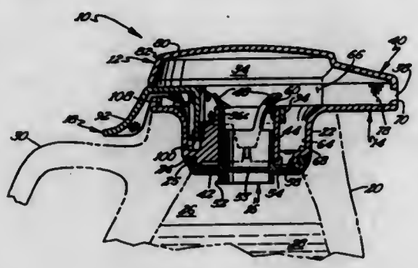
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**5,497,917**

## CAP FOR A BEVERAGE SERVER

**Gary W. Krimmel, Long Lake, Minn.; James L. Miller, Osceola, Wis., and George E. McNamara, Minneapolis, Minn., assignors to Service Ideas, Inc., Lindstrom, Minn.**

**Filed Jul. 28, 1994, Ser. No. 281,848**
**Int. Cl.[6] A47G 19/14**
**U.S. Cl. 222—475.1** **15 Claims**



1. A cap for removable attachment to a pitcher, the pitcher having an interior volume for holding a liquid, said cap comprising:

a cap body defining an interior cavity, said cap body including an entry for the liquid into said cavity and an exit therefrom, wherein liquid held within the pitcher enters the interior cavity through said entry and is poured from the pitcher through said exit;

a valve, said valve being operatively positioned to move between open and closed positions to open and close said entry to selectively allow liquid to flow into said interior cavity;

a plunger attached to said valve, said plunger including a substantially cylindrical side wall;

biasing means for biasing said plunger and said attached valve into a closed position to prevent accidental spillage of the liquid;

means for activating said plunger to move said valve between said open and closed positions;

said cap body comprises top and bottom portions, said bottom portion defining said entry and including collar means for slidably receiving said plunger, whereby said plunger is slidable between upper and lower positions in which said valve respectively closes and opens said entry; and

said biasing means comprises a plurality of flexible, shape memory retentive legs extending outwardly away from said plunger, said legs being received within said collar and engaging said collar such that as said plunger is moved from said upper position to said lower position said legs are forced inwardly by their engagement with said collar and thereby exert a restoring force biasing said plunger to said upper position.

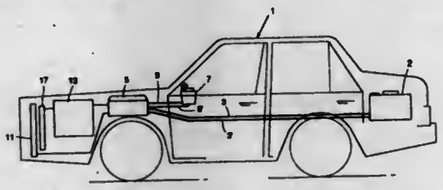
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**5,497,918**

## SYSTEM FOR DISPENSING A THERMALLY MANIPULATED DRINK IN A LAND VEHICLE

**Menachem Brilanchik, 3/1 Hapiaga St., Ariel 44824, Israel**

**Filed Apr. 1, 1994, Ser. No. 222,654**
**Claims priority, application Israel, Mar. 21, 1994, 109057**
**Int. Cl.[6] F04B 17/06**
**U.S. Cl. 222—626** **12 Claims**



1. In a land vehicle with a system for dispensing a thermally manipulated drink comprising:

at least one open dispenser loop assembly including a drink reservoir, an interim drink container, a heat exchanger coupled to said interim drink container, at least one dispenser, ducting coupling said drink reservoir and interim drink container and said interim drink container and dispenser, and

at least one closed thermal manipulation loop assembly for the controlled circulation of a heat carrier fluid through said heat exchanger in indirect heat exchange relationship with the interior of said interim drink container, the improvement comprising:

said drink reservoir being an assembly comprising a detachable canister, a liquid transfer assembly adapted to hold said detachable canister and including a base portion having terminals coupled to said ducting for coupling said reservoir with said interim drink container.

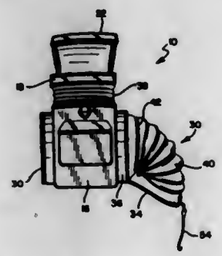
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**5,497,919**

## CARRYING CASE FOR USE WITH A BICYCLE

**Paul D. Klinger, Westminster, Colo., assignor to Schwinn Cycling & Fitness Inc., Boulder, Colo.**

**Filed Sep. 13, 1994, Ser. No. 305,194**
**Int. Cl.[6] B62J 7/02;9/00**
**U.S. Cl. 224—32 R** **9 Claims**



1. A carrying case for use with a bicycle, said case comprising:

a receptacle means adapted to be mounted to the bicycle, said receptacle means including at least one side wall;

at least one pouch having a compartment separate from said receptacle means secured to said one side wall, said pouch



comprising a substantially flexible cover being movable between open and closed positions and having an upper edge substantially adjacent said side wall when said cover is in said closed position and a bottom edge wherein said bottom edge is hingedly secured to said one side wall and a foldable container, said foldable container having a first portion connectable to said one side wall and a second portion connected to said cover proximate said upper edge and being foldable between a folded condition and an unfolded, fully expanded condition corresponding with said closed and open positions, respectively;

wherein upon opening of said cover between said closed and open position through an arc of substantially 180 degrees with respect to said one side wall causes said foldable container to open to said fully expanded condition; and

said cover including a relatively rigid material disposed therein whereby when said foldable container is in said fully, expanded position, said cover will not accidently interfere with operation of the bicycle when mounted thereon.

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**5,497,920**

## QUICKLY REFILLABLE SPLASH RESISTANT SPORTS BOTTLE

**Michael D. Moeller, 5076 Corte Ala Cante, Oceanside, Calif. 92057, and Phillip C. Burke, Temecula, Calif., assignors to Michael D. Moeller, Oceanside, Calif.**

**Filed Oct. 14, 1993, Ser. No. 136,011**
**Int. Cl.[6] B62J 7/06**
**U.S. Cl. 224—36** **7 Claims**



1. For use in receiving, storing and dispensing a liquid, a sports bottle comprising:

a vessel defining an interior storage chamber and an upwardly open mouth;

an antisplash means supported by said vessel proximate said mouth for receiving a flow of liquid through said mouth and into said interior chamber and for inhibiting splashing liquid within said chamber from passing outwardly through said mouth, said antisplash means including a porous member formed of a resilient open-cell porous material formed to define a solid element having a height substantially equal to its width and having a coarse porosity whereby a liquid pours directly therethrough without the need of a center aperture therein;

a suction tube defining an elongated hollow tube having a first end within said interior chamber and a second end extending upwardly beyond said mouth.

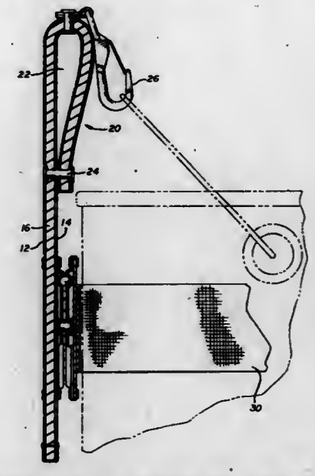
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**5,497,921**

## PAINT CAN HOLDER

**Michael Dancyger, and Larry Litwin, both of 811 W. 58th St., Los Angeles, Calif. 90037**

**Filed Dec. 2, 1994, Ser. No. 349,067**
**Int. Cl.[6] A45F 5/00**
**U.S. Cl. 224—148** **2 Claims**



1. A support device for an object having a handle, the device being worn on a belt of a user, comprising:

a flat base comprised of a first layer of substantially rigid material, a second layer of heavy duty fabric material, and a third layer of cushioning material, which is placed between the first and second layer, said base having a top and a bottom portion, the top portion being folded over the bottom portion and affixed thereto to form a loop having an apex, said loop for receiving the belt of the user, wherein the bottom portion is substantially longer than the top portion and the top portion has an outer surface of said second layer,

pivoting clipping means attached to the base so that it hangs on the outer surface of the second layer of the top portion at or near the apex of the loop for holding the handle of the object so that the object will always be held in a vertical position,

ball bearing swivelling means attached to the first layer of said bottom portion of said base,

strapping means attached to said ball bearing swivelling means for enclosing said object therein,

whereby when the object is placed in the strapping means and the handle thereof is attached to the pivoting clipping means, when the user bends over at an angle, the swivelling means will adjust the object so that it remains substantially upright and level to prevent spillage therefrom.

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**5,497,922**

## COUNTER BALANCE POCKETS WITH FRAME FOR BACKPACKS

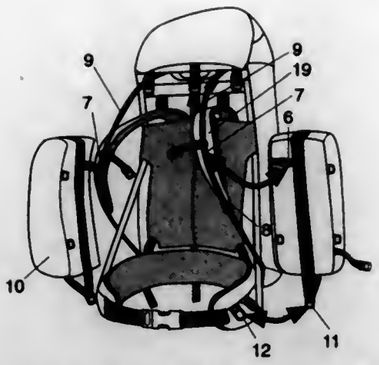
**Aarn Tate, Fairfield, Iowa, assignor to The Natural Balance Design Co., Fairfield, Iowa**

**Filed May 25, 1994, Ser. No. 248,731**
**Int. Cl.[6] A45F 3/04**
**U.S. Cl. 224—209** **20 Claims**

1. A backpack and counter-balance system, comprising:

(a) a backpack having a pair of shoulder straps and hip suspension system for supporting the weight of the backpack on the shoulders and hips of a user, respectively;

(b) at least one pocket system that is worn in front of the user, which system, together with any contents thereof, counterbalances in a non-aqueous environment the weight of said




backpack and the weight of any contents thereof located rearward of the user; each said pocket system comprising:

(i) at least one pocket;

(ii) a lower connection region for connection to said hip suspension system;

(iii) said pocket system being supported in general vertical alignment above said lower connection region by a frame which is at least semi-rigid such that said frame is bendable to match the shape of the user's body and formed of substantially solid material and on which the weight of said pocket system together with any contents thereof rests so as to support at least a majority of the weight of said pocket system together with any contents thereof on said hip suspension system, said frame having one end connected to said shoulder straps and an opposite end connected to said hip suspension system; and

(c) means for securing an upper connection region of said pocket system so as to maintain said general vertical alignment of said pocket system.

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*5,497,923*

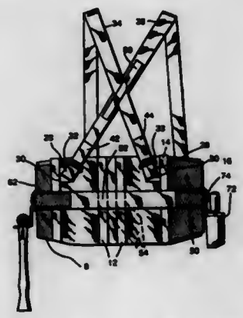
## SUSPENDER SUPPORTED BELT

**David P. Pearson, 861 Boxthorn Ave., Newbury Park, Calif. 91320, and Conrad W. Tanner, 3140 Del Vina St., Pasadena, Calif. 91107**

**Continuation of Ser. No. 103,526, Aug. 9, 1993, abandoned. This application Feb. 15, 1995, Ser. No. 388,727**

**Int. Cl.[6] A45F *5/00***

**U.S. Cl. 224—253** **20 Claims**



1. In a utility belt and back support for providing abdominal and lumbosacral support for the wearer, the improvement comprising:

a first broad longitudinally extended belt member having a width sufficiently broad to engage a substantial portion of the lumbar region of a wearer's back to provide support thereto and having a stretchable rear portion, said rear portion having a plurality of transversely directed rib members secured thereto for aiding in the support of a user's back, said first belt member having a pair of tapered portions on opposing ends thereof, said first belt member having opposing interior and exterior surfaces;

a hook and loop fastener surface disposed on said exterior surface of said pair of tapered portions of said first belt member, said interior surface of one of said pair of tapered portions of said first belt member having a hook and loop fastener secured thereto for releasable coupling with said hook and loop fastener surface of said first belt member exterior surface subsequent to said first belt member being wrapped around a user's waist;

a second belt member encircling said first belt member, said second belt member being narrower than said first belt member, said second belt member having an interior and exterior surface, a portion of at least the interior surface of said second belt having a hook and loop fastener surface for releasable engagement with said hook and loop fastener surface of said first belt member, said second belt member having a configuration adapted to receive and retain bolding means for holding articles in one of a plurality of selected positions relative to said first belt member; and

bolding means for holding articles, said holding means adapted for reception by said second belt member.

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*5,497,924*

## ROOF RACK RAIL SUPPORT FOOT FOR AUTOMOTIVE VEHICLES

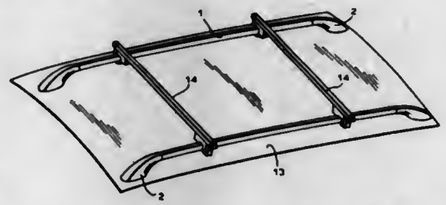
**Fritz Fisch, Wuppertal, and Ulrith Rehm, Hagen, both of, Germany, assignors to Happich Fahrzeug-Dachsysteme GmbH, Germany**

**Filed Jun. 27, 1994, Ser. No. 266,219**

**Claims priority, application Germany, Jun. 29, 1993, 43 21 537.8**

**Int. Cl.[6] B60R *9/04***

**U.S. Cl. 224—326** **10 Claims**



1. A roof rack rail for a vehicle roof or like use comprising:

a rail portion to be supported above the roof, the rail portion having a first end;

a support foot at a first end of the rail portion for supporting the rail above the roof;

the support foot including a body molded of plastic material and having a first end to be placed at the vehicle roof; a fastening bolt at the first end of the body including a first portion inside the body and another portion extending from the body for attachment to the roof;

the body having a second end located proximate the first end of the rail portion; an insertion bolt at the second end of the body also including a first portion inside the body and another portion extending from the body for attachment of the foot to the first end of the rail portion;

a reinforcing element disposed in the body and extending within the body between the first portions of the fastening bolt and the insertion bolt inside the body for connecting the first portions together;

the body enclosing the first portions of the fastening bolt and the insertion bolt in the body and also enclosing the reinforcing element;



said first portions of the respective fastening bolt and the insertion bolt having respective axially directed slit openings therein, and the reinforcing element being entered into the respective slit openings.

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*5,497,925*

## ROOF RAIL FOR MOTOR VEHICLES

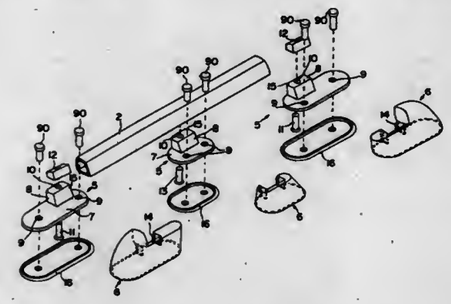
**Karl-Heinz Lampe, and Klaus Kolodziej, both of Wuppertal, Germany, assignors to Happich Fahrzeug-Dachsysteme GmbH, Wuppertal, Germany**

**Filed Jun. 15, 1994, Ser. No. 259,893**

**Claims priority, application Germany, Jul. 10, 1993, 43 23 098.9**

**Int. Cl.[6] B60R *9/04***

**U.S. Cl. 224—326** **10 Claims**



1. A roof rack adapted for attachment to a roof of a motor vehicle comprising:

a roof rail tube having opposite end regions, each end region having a hole; and

a respective support foot at each end region of the roof rail tube for being fastened to the end region of the roof rail tube and to a surface of the roof, each support foot comprising:

a metal adapter connected to the rail tube and to the roof, the metal adapter including:

a fastening plate having passage holes therethrough for receiving roof fastening means for fastening the adapter to the roof;

a support member which extends upward from the fastening plate; and

an additional passage hole extending through the fastening plate and the support member; and

a rail fastening screw extending through the additional passage hole and into one of the holes in the roof rail tube for fastening the adapter to the rail tube;

a threaded plate located in the roof rail tube for receiving the rail fastening screw; and

a plastic covering member shaped and adapted to be clipped onto the metal adapter.

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*5,497,926*

## WHEELCHAIR-ACCESSORY SUPPORT-FRAME

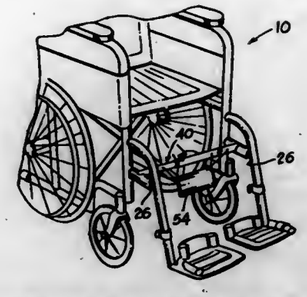
**Donald K. Rittenhouse, 241 Prairie View, Oregon, Wis. 53575-1416**

**Filed May 23, 1994, Ser. No. 247,768**

**Int. Cl.[6] B60R *11/00***

**U.S. Cl. 224—407** **16 Claims**

1. A brace for carrying a utility item below a seat of a wheelchair without interference with normal operation of the wheelchair by a user, said wheelchair being equipped with two hanger brackets that include horizontal members attached to a frame of the wheelchair and disposed at a predetermined distance on the right and left side of the seat, said brace comprising:



(a) a horizontal truss of a length sufficient to span the predetermined distance between said two horizontal members of the hanger brackets; and

(b) means for securely anchoring said horizontal truss to the horizontal members in said hanger brackets;

wherein said means for securely anchoring said horizontal truss to the horizontal members in said hanger brackets consists of a transverse segment of downward-facing semi-circular channel attached to each end of the horizontal truss, said semi-circular channel being made of resilient material and sized to provide a snap-on connection with the horizontal members of the wheelchair's hanger brackets;

thereby enabling said user to hang and carry the utility item below the seat during normal operation of the wheelchair.

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*5,497,927*

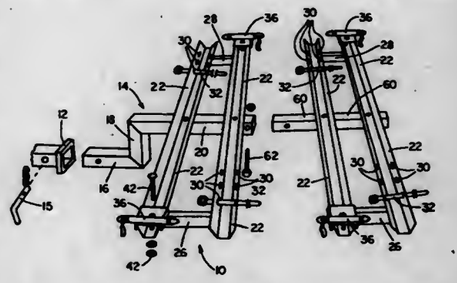
## BICYCLE RACK

**Douglas C. Peterson, 360 Valley View Dr., Richfield, Utah 84701**

**Filed Oct. 28, 1994, Ser. No. 331,205**

**Int. Cl.[6] B60R *9/10***

**U.S. Cl. 224—519** **8 Claims**



1. A bicycle rack adapted to be cantilevered from a trailer hitch receiver at a rear end of a transporting vehicle, said bicycle rack comprising:

an elongate, central support member having a first end that is adapted to be received in said trailer hitch receiver, with the central support member extending rearwardly from the transporting vehicle;

at least two elongate, transverse support members having respective first and second ends, said transverse support members being attached to said central support member so that the transverse support members extend substantially transversely of the central support member and substantially parallel to the rear end of said transporting vehicle, said transverse support members being securely attached to said central support member at spaced apart positions on said central support member, with each transverse support member being attached to said central support member at a position in the central portion of the transverse support member;

a first, elongate, rigid, stabilizer member connected between and securely affixed to each of said transverse support members at a position closely adjacent to respective first ends of said transverse support members;

a second, elongate, rigid, stabilizer member connected between and securely affixed to each of said transverse support members at a position closely adjacent to respective second ends of said transverse support members;

a number of fork mount members equal to the number of transverse support members, each of said fork mount members being adapted to engage and securely hold a fork of a bicycle thereto after the front wheel of the bicycle has been removed from the fork of the bicycle;

attachment means associated with each fork mount member for attaching the fork mount member to an end portion of a respective transverse support member, said attachment means being adapted to position each fork mount member in one of a first position adjacent to the respective transverse support member and a second position spaced upwardly by a distance greater than the first position from the respective transverse support member; and

means associated with each transverse support member for retaining a back wheel of the bicycle to said transverse support member at one end portion thereof which is opposite to said end portion having said fork mount member, so that the fork of the bicycle is retained by the fork mount member, and the back wheel of said bicycle is retained at said one end portion of said transverse support member.

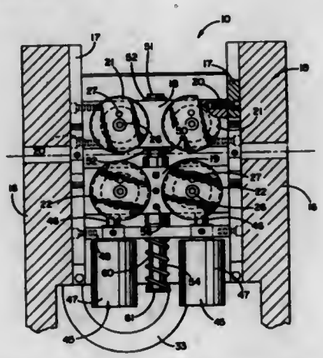
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**5,497,928**

## APPARATUS FOR FEEDING WIRE HAVING A LINEARLY MOVABLE ROLLER PINCH PAIR WITH GUIDE ROD

**Irvin Burns, Walloon Lake, and Patrick Robbins, Petoskey, both of Mich., assignors to Rockford Manufacturing Group, Inc., Roscoe, Ill.**

**Filed May 12, 1994, Ser. No. 242,606**
**Int. Cl.[6] B65H *20/02***
**U.S. Cl. 226—108** **9 Claims**



1. Apparatus for feeding wire along a predetermined path, said apparatus comprising a main support, first and second opposed feed roll pairs located on opposite sides of said wire, first and second subsupports for said first and second feed roll pairs, first and second shaft pairs journaled by said first and second subsupports, respectively, and having free end portions fixed to said first and second feed roll pairs, respectively, means for driving said shafts to cause the feed rolls of said first and second feed roll pairs to rotate in opposite directions whereby wire is advanced along said path when the wire is pinched between said first and second feed roll pairs, said first subsupport being rigidly fixed to said main support whereby said first feed roll pair is prevented from moving bodily toward or away from said second feed roll pair, guiding means supporting said second subsupport for movement substantially perpendicular to said path to enable said second feed roll pair to move bodily toward and away from said first feed roll pair, means offset laterally from said path and operative at spaced locations on said second subsupport for urging said second subsupport toward said path to cause said second feed roll pair to force said wire against said first feed roll pair, said guiding means including a single elongated rod extending substantially perpendicular to said path, said rod being located between the rolls of the roll pairs and offset laterally from said path, said rod having a first end portion supported by said first subsupport, having an intermediate portion supporting said second subsupport and having a second end portion supported by said main support whereby said first and second end portions of said rod react against said first subsupport and said main support, respectively, when said second feed roll pair forces said wire against said first feed roll pair.

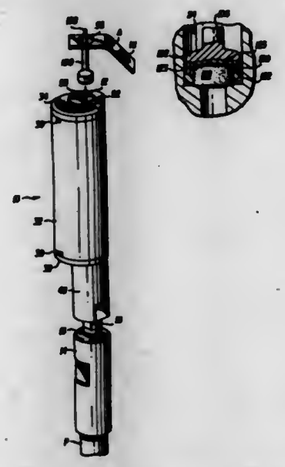
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**5,497,929**

## SELF-POWERED FASTENER SYSTEM

**William D. Armstrong, 5353 Keller Springs Rd. No. 714, Dallas, Tex. 75248**

**Division of Ser. No. 147,577, Nov. 5, 1993, Pat. No. 5,423,469.**
**This application May 26, 1995, Ser. No. 450,882**
**Int. Cl.[6] B25C *1/10***
**U.S. Cl. 227—9** **21 Claims**



5. A system for driving a fastener into a work surface, comprising in combination: a fastener having a penetration end a shaft and a receptacle head end, and a power charge, said receptacle head end having a cavity having an entrance portion and a cavity end portion for receiving said power charge and maintaining a gap between said power charge and the entirety of said cavity end portion;

a tool including: a barrel including a bore having a muzzle for receiving said fastener, a surface for supporting said fastener in a stationary position, a spring-biased firing pin for driving into said power charge to ignite said power charge, and an exhaust chamber connected to said bore for receiving exhaust gases, said supporting surface and said receptacle head end defining a space in which combustion of said power charge takes place,

wherein said fastener penetration end extends out of the end of said tool muzzle and is to be placed in contact with said work surface, whereby said work surface, said fastener penetration end, said fastener receptacle head end, said supporting surface and said firing pin cooperate to ignite said power charge to drive said fastener into said work surface.

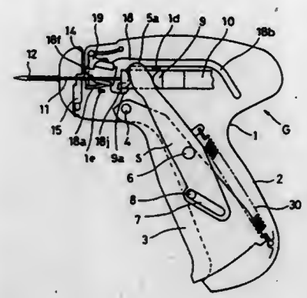


**5,497,930**

## TAG ATTACHER

**Mikio Kubota, Tokyo, Japan, assignor to Toska Co., Ltd., Tokyo, Japan**

**Filed Dec. 6, 1993, Ser. No. 161,424**
**Claims priority, application Japan, Mar. 9, 1993, 5-47970**
**Int. Cl.[6] B25C *1/00***
**U.S. Cl. 227—67** **6 Claims**



6. A tag attacher comprising:

a movable member having a piston at a front portion thereof;

wherein said movable member is moved forward by an intermediate lever;

wherein said intermediate lever is pivoted by a lever supported pivotally so as to project by spring force forward from and retract into a grip, so as to drive a lateral bar portion (b) of a tag pin (t) by said piston into a hollow needle;

wherein said grip is extended downward from a tag attacher body;

a feed member supported pivotally on a tag attacher body and a stopper member, provided on one side of a guide groove in which a tag pin assembly (T) is loaded;

wherein said feed member comprises a head portion, a lever portion extended from said head portion, and a receiving portion, altogether integrally formed from a synthetic resin;

wherein said feed member has a tooth formed at the front end of said head portion so as to project into said guide groove; and

wherein said stopper member is supported pivotally on said tag attacher body and urged toward said guide groove and has a second tooth projecting into said guide groove.

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**5,497,931**

## STAPLER FOR DISPENSING STAPLES OF DIFFERENT SIZES

**Yasuhiko Nakamura, Abiko, Japan, assignor to Maruzen Kabushiki Kaisha, Tokyo, Japan**

**Filed Aug. 23, 1993, Ser. No. 110,440**
**Claims priority, application Japan, Aug. 24, 1992, 4-223746**
**Int. Cl.[6] B25C *5/02;5/16***
**U.S. Cl. 227—109** **6 Claims**

1. A stapler comprising:

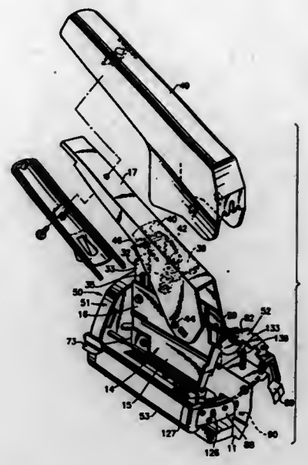
means for containing at least first and second staple strips;

means, operable by a single hand of a user, for permitting rotation of said means for containing to bring a selectable one of said first and second staple strips into an operating location;

means, operable by said single hand, for locking said means for containing into said operating location;

means, operable by said single hand, for unlocking said means for containing to permit rotation thereof; and

said means for permitting rotation, said means for locking, and said means for unlocking all being arranged to permit operation in a single sequence by said single hand of said user.



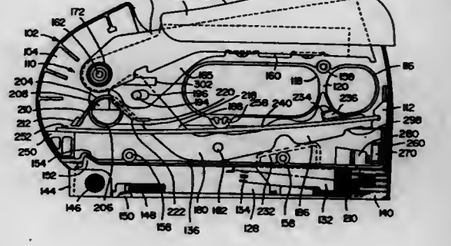
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**5,497,932**

## MANUALLY OPERATED FASTENING DEVICE

**Kevin D. Brewer, Maytown, Pa., and Stephen A. Debelius, Phoenix, Md., assignors to Emhart Inc., Newark, Del.**

**Filed Aug. 12, 1994, Ser. No. 289,213**
**Int. Cl.[6] B25C *5/06***
**U.S. Cl. 227—132** **28 Claims**



1. A fastening device, comprising:

a housing;

an operating lever pivotally mounted on said housing;

a striker located within said housing and oriented to drive a fastener from said housing;

an actuator spring coupled to said striker and adapted to bias said striker for driving the fastener from said housing;

a firing lever pivotally mounted on said housing and operable by said operating lever for raising said striker against the bias of said actuator spring, said firing lever being adapted to shift laterally relative to said striker and being normally located in a rest position;

said firing lever being positioned to engage said striker when said operating lever is actuated to raise said striker, and said firing lever being shifted laterally to release said striker for actuation by said actuator spring after said striker is raised; and

reset means adjacent to said striker for shifting said firing lever laterally into its rest position.

5,497,933

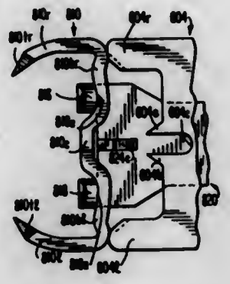
**APPARATUS AND METHOD FOR APPLYING SURGICAL STAPLES TO ATTACH AN OBJECT TO BODY TISSUE**

Stephan A. DeFonzo, Bridgeport, Conn.; Wayne P. Young, Brewster, N.Y.; Samson L. Pennatto, Danbury, and Andrew Komlosi, Fairfield, both of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Continuation-in-part of Ser. No. 950,425, Sep. 23, 1992, Pat. No. 5,356,064, which is a continuation-in-part of Ser. No. 861,065, Mar. 31, 1992, Pat. No. 5,364,002, which is a continuation-in-part of Ser. No. 782,290, Oct. 18, 1991, Pat. No. 5,289,963. This application Oct. 8, 1993, Ser. No. 133,978

Int. Cl.[6] A61B *17/00*

U.S. Cl. 227—175.1 19 Claims



1. Apparatus for endoscopic application of surgical staples which comprises:

a) a frame;

b) a generally elongated endoscopic portion extending distally from the frame and having a generally longitudinal axis and a distal end portion having a base portion;

c) means mounted upon said base portion for storing at least one surgical staple; and

d) a movable staple pusher positioned at least partially within said endoscopic portion for advancing such at least one surgical staple, said staple pusher having at least two outer spaced projections extending distally for engaging and advancing a backspan of such at least one staple for application to body tissue, said staple pusher having a staple pusher surface for engaging the backspan, and at least two spaced inner projections respectively extending distally with respect to the staple pusher surface and positioned between said outer spaced projections for applying force to a central bight portion of the staple to prevent distortion of such at least one staple when the staple is formed about an anvil member.

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5,497,934

**SURGICAL APPARATUS WITH INDICATOR**

Robert H. Brady, Brookfield; Philip D. Calabrese, Danbury, and Timothy O. Van Leeuwen, Brookfield, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Continuation-in-part of Ser. No. 109,134, Aug. 19, 1993. This application Oct. 7, 1993, Ser. No. 133,693

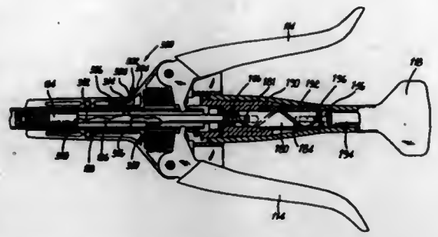
Int. Cl.[6] A61B *17/068*

U.S. Cl. 227—176.1 19 Claims

19. In a surgical stapling apparatus having a housing, an anvil extending from a distal end of said housing, a cartridge containing a plurality of fasteners positioned opposite said anvil, said fasteners disposed in a circular array in said cartridge, and means for relatively moving said anvil and cartridge; the improvement comprising:

means positioned in said housing and responsive to relative movement of said cartridge and anvil for indicating the relative movement of said cartridge and anvil to a predetermined position, said indicating means being connected to a voltage source, wherein at least a portion of said indicating means is at least partially disposed in a proximal end of said housing; and

a safety mechanism associated with said housing for preventing undesired firing of the apparatus, wherein said indicator means is activated upon movement of a portion of the apparatus which releases the safety mechanism.



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5,497,935

**AUTOMATED PRODUCTION LINES FOR ROLLED AND WELDED FERRULES**

Michel Gravier, Aubergenville, France, assignor to Jammes Industrie S.A., Cebazat, France

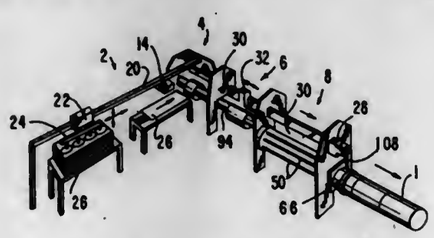
PCT No. PCT/FR93/00152, § 371 Date Jul. 28, 1994, § 102(e) Date Jul. 28, 1994, PCT Pub. No. WO93/15856, PCT Pub. Date Aug. 19, 1993

PCT Filed Feb. 15, 1993, Ser. No. 256,880

Claims priority, application France, Feb. 14, 1992, 92 02060

Int. Cl.[6] B21D *51/26;* B23K *37/04*

U.S. Cl. 228—17.5 10 Claims



1. Machine for the automatic production of cylindrical ferrules by rolling and welding flat metal pieces, said machine comprising

a welding station provided with means enabling the transfer of a rolled blank and with continuous welding means,

at least one transfer station provided with means enabling the transfer, along their longitudinal axis, of rolled blanks and with means simultaneously enabling the progressive constriction of the blank to bring it, when it arrives at the entry of the welding station, into the shape for welding,

a rolling station constituted by a rolling machine with rolls and comprising means for discharging a blank along its axis, and

a rolling machine feeder station, provided with means for picking up flats from a stack one by one and transferring them to the entry of the rolling machine, characterized:

in that one said transfer station comprises fifth means for displacing a blank each time that a previously displaced blank has been introduced into the transfer station, and for keeping its end surfaces in parallel planes, and bringing one end of a blank into axial contact against the end of the blank that has preceded it in the station,

in that one said transfer station for the rolled blanks comprises third means for bringing the blanks to the entry of the welding station, and fourth means for putting the blanks into a butt-joined shape,



in that first means are constituted by a cage supported by the frame of the machine, said cage being composed of two substantially semicylindrical parts, one the lower part and the other the upper part, the lower part being joined to the upper part by resilient means, by means of which it is possible to perform the welding between said butt-joined edges by forming a welded seam since, on the one hand, these edges are butted together and, on the other, there is no space separating the ends of two consecutive ferrules in the welding station.

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5,497,936

**METHOD AND APPARATUS FOR SOLDERING A COIL WINDING WIRE TO A TERMINAL PIN**

Erich Vojta, Hemhofen, and Horst Hendel, Berlin, both of, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Oct. 21, 1994, Ser. No. 327,208

Claims priority, application Germany, Jan. 21, 1993, 43 36 000.9

Int. Cl.[6] H05K *3/34*

U.S. Cl. 228—173.5 18 Claims



1. A method for soldering a wire end to a terminal pin, the method comprising the step of:

wrapping the wire end around the terminal pin with a plurality of turns;

providing an amount of solder to the terminal pin, wherein the solder is brought into contact with the terminal pin free of fluxing agents; and

applying heat to the terminal pin for melting the solder at a soldering temperature with a noncontacting heat source under a protective atmosphere.

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5,497,937

**METHOD FOR BONDING A MEMBER HAVING METAL**

Yoshio Yoshikawa; Yoshiaki Inoue; Isamu Yoshino, and Teruo Takeuchi, all of Tokyo, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Aug. 26, 1994, Ser. No. 297,519

Claims priority, application Japan, Aug. 30, 1993, 5-214033; Sep. 17, 1993, 5-231739

The portion of the term of this patent subsequent to Apr. 26, 2011, has been disclaimed.

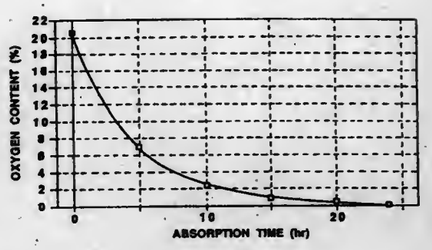
Int. Cl.[6] B23K *1/00;* C23F *11/00*

U.S. Cl. 228—205 29 Claims

1. A flux-free method for bonding a member which is at least partially metallic to another member, comprising:

preserving said at least partially metallic member in a container having a low gas permeability, together with a packet containing a rust-proof composition; and

bonding said at least partially metal lie member with said other member by using a filler material.




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5,497,938

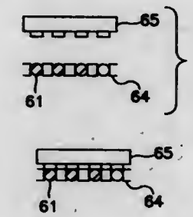
**TAPE WITH SOLDER FORMS AND METHODS FOR TRANSFERRING SOLDER TO CHIP ASSEMBLIES**

John F. McMahon, Phoenix, Ariz., and George Chiu, Palo Alto, Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Sep. 1, 1994, Ser. No. 299,520

Int. Cl.[6] B23K *3/08*

U.S. Cl. 228—253 19 Claims



1. A method of transferring solder forms to electronic components having conductive pads, said method comprising the steps of:

(a) positioning and temporarily attaching a plurality of sets of said solder forms on a transfer carrier that has been coated with a UV sensitive adhesive;

(b) aligning a first set of said solder forms to said conductive pads of a first one of said electronic components;

(c) contacting said first set of said solder forms to said conductive pads of said first one of said electronic components; and

(d) releasing said first set of said solder forms from said transfer carrier by exposing said transfer carrier and said first set of said solder forms to a UV light source.

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5,497,939

**CONTAINER WITH PANEL LOCK**

Ronald E. Heiskell, Tracy, and Ezra E. Theys, San Mateo, both of Calif., assignors to Advanced Container Corporation, Tracy, Calif.

Filed Oct. 21, 1994, Ser. No. 326,942

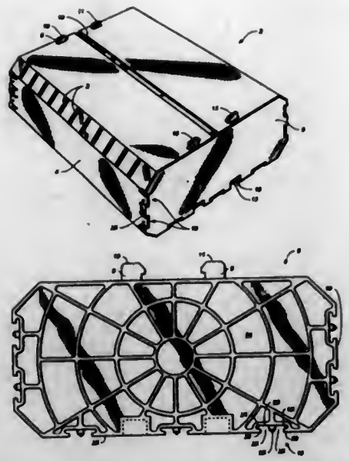
Int. Cl.[6] B65D *5/32*

U.S. Cl. 229—23 R 26 Claims

1. A stackable shipping and storing container, comprising:

a first end plate having a stacking tab extending vertically from a top of the first end plate, having a receiving slot at a bottom of the first end plate for receiving a stacking tab of a substantially identical second stackable container, and having a plurality of first panel locks, at least one first panel lock being on each of a first edge, a third edge, and a second edge of the first end plate, each of said first panel locks not extending beyond a perimeter of the first end plate;

a second end plate having a stacking tab extending vertically from a top of the second end plate, having a receiving slot at a bottom of the second end plate for receiving a stacking tab of a substantially identical second stackable container, and



having a plurality of second panel locks, at least one second panel lock being on each of a first edge, a third edge, and a second edge of the second end plate, each of said second panel locks not extending beyond a perimeter of the second end plate; and

a panel having a plurality of first panel tabs at a first end for attaching the panel to the first end plate with the plurality of first panel locks and a plurality of second panel tabs at a second end for attaching the panel to the second end plate with the plurality of second panel locks, each of said first panel tabs and said second panel tabs being pressed perpendicular to each respective edge of the respective end plates into engagement with each of said respective panel locks.

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**5,497,941**

**SYSTEM FOR CONTROLLING THE TEMPERATURE OF THE AIR IN A CABIN FOR AN ENGINE-ELECTRIC MOTOR HYBRID CAR**

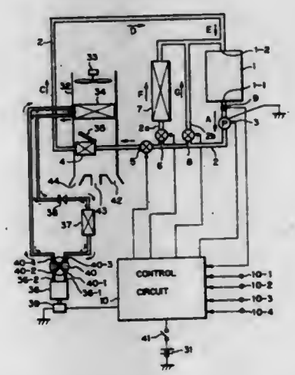
**Shigeo Numazawa, Nagoya, and Takahisa Suzuki, Osaka, both of, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan**

**Continuation of Ser. No. 961,780, Oct. 14, 1992, abandoned. This application Feb. 2, 1994, Ser. No. 190,568**

**Claims priority, application Japan, Jan. 14, 1991, 3-264903; Sep. 28, 1992, 4-258099**

**Int. Cl.[6] G05D *23/00***

**U.S. Cl. 237—2 A** **25 Claims**





said indicating end having a rectangular shape and adapted to fit between said door and said curved wall when said door is in a closed position.

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**5,497,940**

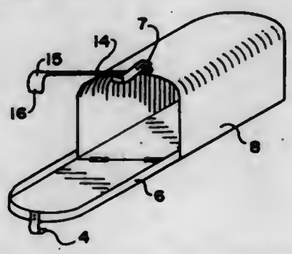
**MAIL BOX SIGNALING DEVICE**

**Michael A. Vogt, 580 Browning Ave. SE., Salem, Oreg. 97302**

**Filed Dec. 22, 1994, Ser. No. 361,651**

**Int. Cl.[6] B65D *91/00***

**U.S. Cl. 232—35** **2 Claims**





1. A combination mail box holder and signaling device comprising: a mail box having a curved wall having side edges and a bottom wall in connection with said side edges so as to form an enclosed space having at least one open end and having a top most portion running along said curved wall on a line midway between said side edges, said mail box further comprising a door pivotally connected to said bottom wall so as to periodically cover said open end, a catch bar connected to said top most portion of said mail box so as to create a narrow opening between said catch bar and said curved wall, an indicator of flexible material having a securing end and an indicating end, said securing end is of doubled construction so as to form two portions parallel to one another, wherein one of said two portions is placed in said narrow opening,

1. A hybrid vehicle selectively powered by either electric power or internal combustion engine power, and having a cabin to be temperature controlled, comprising:

a water cooled internal combustion engine generating a rotational movement for moving the vehicle, said engine being provided with a water recirculation line for heat exchanging between the engine cooling water and outside air for cooling said engine;

a battery for generating electric power;

an electric motor connected to said battery and generating a rotational movement for moving the vehicle during a time when said engine is turned off;

a duct having a first end for introduction of air and a second end opened to the cabin for discharging the air thereinto;

a heat exchanging means arranged in said duct and connected to said engine cooling water recirculation line to guide the engine cooling water into the heat exchanging means for increasing a temperature of the air discharged into the cabin from said second end of the duct, when said electric motor is activated by said battery for driving the vehicle;

temperature detecting means for detecting the temperature of the engine cooling water, and;

recirculating means for recirculating the engine cooling water through said water recirculation line, said engine and said heat exchanging means, said recirculating means being activated by said battery when said engine is turned off and said electric motor is turned on to move the vehicle and the detected temperature of the engine cooling water is higher than a predetermined value, so that the heated engine cooling water from the engine cooling water recirculation line is recirculated to the heat exchanging means when the hybrid vehicle is driven by the electric motor.



**5,497,942**

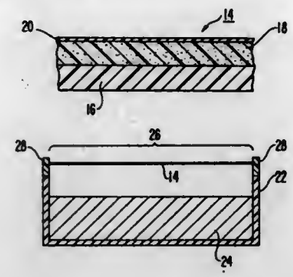
**DISPERSANT DELIVERY SYSTEM AND METHOD FOR PRODUCING AND USING SAME**

**Ralph D. Zingle, Elkton, Md.; Mary W. Tilley, Middletown, and William L. Mead, Wilmington, both of Del., assignors to W. L. Gore & Associates, Inc., Newark, Del.**

**Filed Jan. 21, 1994, Ser. No. 185,092**

**Int. Cl.[6] A61L *9/04***

**U.S. Cl. 239—6** **22 Claims**





1. A method for delivering a dispersant to a surrounding environment which comprises:

providing a receptacle having an interior adapted to contain dispersant emitting substance;

providing as part of the receptacle a composite of a backing material and a permeable membrane, wherein the composite is in communication with both the interior of the receptacle and the surrounding environment, and wherein the permeable membrane is selectively permeable to the dispersant so as to deliver a relatively consistent flow of dispersant release from the receptacle;

treating the composite with a fluoropolymer solution to cause it to be resistant to wetting by low surface tension liquids;

filling the receptacle with dispersant emitting substance; and

sealing the receptacle so that dispersant dissipates from the interior of the receptacle through the composite.

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**5,497,943**

**OXYGEN CUTTING TORCH WITH A LIQUID OXYGEN JET**

**Jean-Christophe Charbonnel, Nimes; Richard Soula, and Serge Suzon, both of Pontoise, all of, France, assignors to L'Air Liquide Societe Anoneyme Pour l'Etude et L'Exploitation des Procedes Georges Claude, Paris, France**

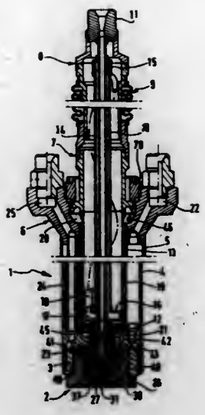
**Filed Mar. 15, 1994, Ser. No. 213,184**

**Claims priority, application France, Mar. 29, 1993, 93 03603**

**Int. Cl.[6] B23K *7/10***

**U.S. Cl. 239—132** **12 Claims**

8. A cutting torch comprising a cutting fluid conduit in heat-exchange relationship with a first coolant conduit, said cutting fluid being liquid oxygen, and at least one gaseous oxygen conduit terminating in a fluid distribution block for mounting a removable cutting head, the cutting head including a first insert having a central passage, a second insert having an inner recess, and a mounting block, the first insert being received within the inner recess of the second insert so as to leave therebetween an annular passage, and the second insert being received within the mounting block, the mounting block carrying connecting means for releasable connection of the cutting head to the distribution block with the central passage of the first insert in fluid flow communication with the cutting fluid conduit.





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**5,497,944**

**ATOMISING DEVICES AND METHODS**

**Terence E. Weston, Woodbridge, and Stephen T. Dunne, Shotley, both of, England, assignors to DMW (Technology) Limited, United Kingdom**

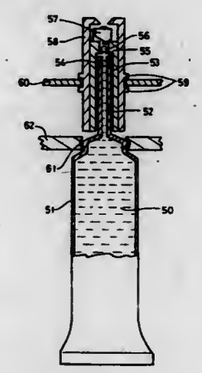
**PCT No. PCT/GB91/00433, § 371 Date Nov. 19, 1992, § 102(e) Date Nov. 19, 1992, PCT Pub. No. WO91/14468, PCT Pub. Date Oct. 3, 1991**

**PCT Filed Mar. 21, 1991, Ser. No. 938,174**

**Claims priority, application United Kingdom, Mar. 21, 1990, 9006340; Nov. 1, 1990, 9023767**

**Int. Cl.[6] A61M *11/00*; B05B *11/00***

**U.S. Cl. 239—321** **76 Claims**





1. A device for dispensing a metered quantity of fluid as a spray of droplets by discharging the metered quantity of fluid under pressure through an atomising means, comprising:

a chamber for containing said metered quantity of fluid at a first pressure;

an energy storage means for retaining and applying a predetermined amount of energy to said chamber so as to subject said metered quantity of fluid to a predetermined increase in pressure from said first pressure to a second pressure of at least 50 bar to permit discharge of said metered quantity of fluid from said chamber at said second pressure; and

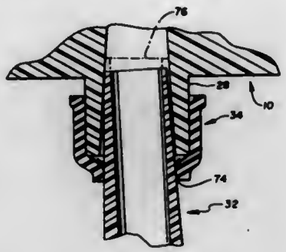
atomising means for atomising said fluid discharged from said chamber, said atomising means comprising an outlet aperture having a hydraulic diameter of 100 micrometers or less, whereby said fluid is atomized into droplets having a mean size suitable for inhalation into the lungs.

5,497,945

## PAINT GUN INLET SUCTION SEAL

Timothy D. Steinberg, Coon Rapids; Mark E. Snetting, Eden Prairie, and John M. Svendsen, Corcoran, all of Minn., assignors to Wagner Spray Tech Corporation, Minneapolis, Minn.

Filed May 23, 1994, Ser. No. 247,698
Int. Cl.[6] B67P 5/60
U.S. Cl. 239—329 18 Claims




1. An improvement for a paint pump having a salient inlet port and suction tube apparatus received therein, the improvement in combination therewith comprising a collar having a radially inwardly flared lip at one end thereof and wherein the collar is formed of a resilient material directly sealing the collar to the suction tube apparatus at the lip when the suction tube apparatus is frictionally interengaged with the salient inlet port.

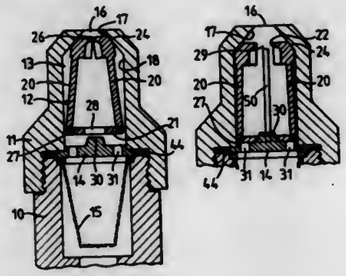
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5,497,946

## SELF-CLEANING/UNBLOCKING SPRAY NOZZLE

Kevin O. Laidler, Stourbridge, United Kingdom, assignor to Incro Limited, Stourbridge, United Kingdom

PCT No. PCT/GB93/02475, § 371 Date Jul. 27, 1994, § 102(e) Date Jul. 27, 1994, PCT Pub. No. WO94/13409, PCT Pub. Date Jun. 23, 1994
PCT Filed Jul. 27, 1994, Ser. No. 281,225
Claims priority, application United Kingdom, Dec. 5, 1992, 9225478; Jul. 5, 1993, 9313869
Int. Cl.[6] B05B 1/32;15/02;1/34
U.S. Cl. 239—452 27 Claims




1. A spray nozzle comprising:
a) a hollow member having an outlet opening located on a front side of the spray nozzle,
b) movable means disposed within the nozzle and rearwardly biased to a normal position for providing a flow of fluid through outlet opening,
c) the movable means being movable under fluid pressure from the normal position in a forward direction toward the outlet opening to obstruct said flow of fluid to the outlet opening and to cause relative movement between separable portions of the movable means to create a spray discharge orifice, smaller than the outlet opening, adjacent the outlet opening, and
d) the movable means including a hub portion resiliently connected to said separable portions to cause said separable portions to separate for providing rearward bias of the movable means toward the normal position.

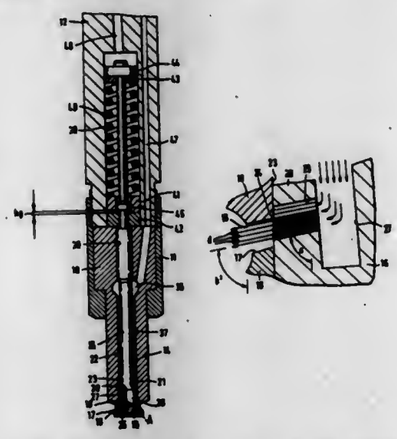
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5,497,947

## FUEL INJECTION NOZZLE FOR INTERNAL COMBUSTION ENGINES

Detlev Potz, Stuttgart; Guenter Lewentz, Hemmingen, and Uwe Gordon, Markgroeningen, all of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Aug. 24, 1994, Ser. No. 294,033
Claims priority, application Germany, Dec. 1, 1993, 43 40 883.4
Int. Cl.[6] F02M 61/08
U.S. Cl. 239—553.12 7 Claims



1. A fuel injection nozzle for internal combustion engines of an outwardly-opening construction comprising a nozzle body, a bore in said nozzle body, a valve member which is moved by fuel pressure acting against a tension of a closing spring, said valve member has a closing head which is directed at a set angle relative to an axis of reciprocation of the valve member, at least one injection port is disposed in said closing head whose discharge point cross section, in the closed position of the valve member, is closed by the nozzle body and upon an opening stroke is continuously opened by a control edge on a combustion chamber end of the nozzle body, a first angle is formed between a longitudinal axis of said at least one injection port and said axis of reciprocation of the valve member, the at least one injection port (25) is divided by at least one thin dividing wall (55) into a plurality of parallel flow conduits (52, 53) whose discharge points on the opening stroke of the valve member (16, 20) are unblocked one after the other, wherein the unblocked partial flows (e, f) unite into one injection stream (g) whose axis forms with said axis of reciprocation of the valve member a second angle which is substantially equal to said first angle.

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5,497,948

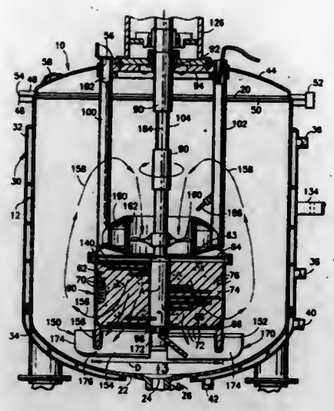
## BASKET MEDIA MILL WITH EXTENDED IMPELLER

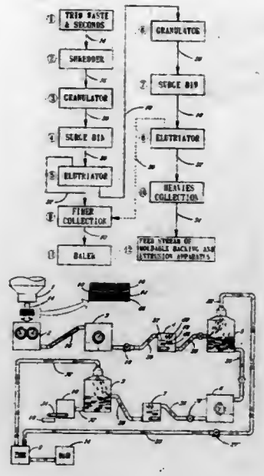
Herman H. Hockmeyer, Saddle River, N.J., assignor to Hockmeyer Equipment Corp., Harrison, N.J.

Filed May 16, 1995, Ser. No. 442,397
Int. Cl.[6] B02C 17/02
U.S. Cl. 241—46.17 28 Claims

1. In a media basket mill for dispersing a selected constituent into a liquid vehicle to produce a mixture of the constituent and the liquid vehicle within a mixing vessel, the media basket mill including a basket extending in an axial direction between a upper end and a lower end, a media bed in the basket, and impeller means, the basket having a wall for retaining the media bed within the basket and openings in the wall for permitting passage of the mixture through the wall in response to operation of the impeller means when the basket is immersed in the mixture in the vessel, the wall including a bottom wall portion at the bottom end and an axially extending side wall portion having an overall diametral dimension, the openings being located at least in the side wall portion, an improvement wherein:
the impeller means includes a rotor for rotation about the axial direction, and impellers on the rotor, the impellers being located radially outwardly beyond the diametral dimension of the side wall portion of the wall of the basket for assisting in the movement of the mixture through the openings in the side wall portion and within the mixing vessel outside the basket in response to rotation of the rotor.







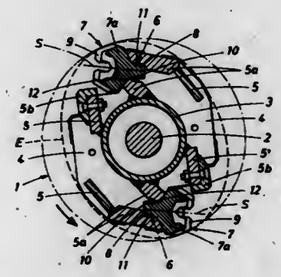

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5,497,950

## ROTOR FOR A DISINTEGRATING MACHINE

Hermann Schrödl, Vornwald 7, A-4713 Gallspach, Austria

Filed Jul. 11, 1994, Ser. No. 273,233
Claims priority, application Austria, Jul. 12, 1993, 1366/93
Int. Cl.[6] B02C 13/28
U.S. Cl. 241—191 14 Claims



1. In a rotor for use in a disintegrating machine, comprising
a rotor body having an axis and a periphery, the rotor body being adapted to be rotated about said axis in a predetermined direction and provided at said periphery with a plurality of receptacles extending parallel to said axis,
a plurality of beater bars, each of which has a bar body, which extends in a direction which is parallel to said axis and has a symmetrical cross-section, the bar body having at least one retaining extension supported in a respective one of said receptacles,
the improvement residing in that
each of said receptacles has on one side an opening facing in said predetermined direction,
each of said bar bodies has a longitudinal plane of symmetry extending in a direction which is substantially parallel to a tangent to a flight circle defined by an outer periphery of the bar bodies of the beater bars upon rotation of the rotor body, and
each of said bar bodies is provided with axially spaced apart knife edges, which protrude at the periphery to be contiguous to said flight circle and are symmetrical to said plane of symmetry and extend in planes which are normal to said axis.

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5,497,949

## APPARATUS FOR RECLAIMING WASTE CARPETING

Paul C. Sharer, Greenville, S.C., assignor to JPS Automotive Products Corp., Greenville, S.C.

Filed Jun. 30, 1994, Ser. No. 268,296
Int. Cl.[6] B02C 21/00;23/10;23/14
U.S. Cl. 241—76 13 Claims

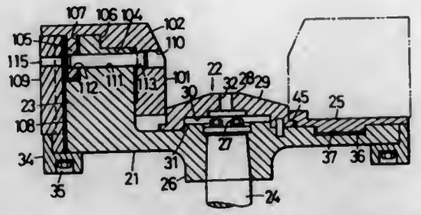
1. A carpet reclamation system for separating and recycling components of waste carpet, said carpet components comprising fibrous materials and backing materials, said system comprising:
a shredder for shredding said carpet into uniform small carpet pieces;
a granulator for grinding said small carpet pieces into fine carpet pieces;
a separator for separating loose ones of said fibrous material from said backing material;
a fiber storage unit for receiving said separated loose fibers;
a backing material storage unit for receiving said backing material;
conveyors connecting said shredder with said granulator, said granulator with said separator, said separator with said fiber storage unit, and said backing material storage unit; and
a delivery apparatus connected with at least one of said fiber storage unit and said backing material storage unit, said delivery apparatus delivering measured amounts of one of said separated fibers and backing material into recycling;
whereby at least a portion of said waste carpet is reintroduced into new carpeting.

5,497,951

## ROTOR BLADE STRUCTURE FOR VERTICAL SHAFT IMPACT CRUSHER

Teruji Watajima, Takeo, Japan, assignor to Nakayama Iron Works, Ltd., Takeo, Japan

Filed Dec. 23, 1993, Ser. No. 172,278
Claims priority, application Japan, Jan. 22, 1993, 5-026029
Int. Cl.[6] B02C *13/14;19/00*
U.S. Cl. 241—300 4 Claims




1. A rotor blade structure for a vertical shaft impact crusher having a rotor (20) rotated at high speed about a vertical axis, a plurality of supports (23) provided on the upper side of an outer periphery of said rotor (20) at a regular angular spacing, and a blade (1) disposed on each of said supports (23) so as to cover a side surface of said support (23) which extends substantially radially of said rotor (20), said rotor blade structure comprising:
a mounting member (52) attached to each of said supports (23) so as to cover said side surface;
a blade member (53) attached to a side of said mounting member (52) which extends substantially radially of said rotor (20);
an accommodating space (58) provided in said side of said mounting member (52) for accommodating a part of said blade member (53);
means (68) for detachably retaining said blade member (53) accommodated in said accommodating space (58); and
a rigid member (65) provided in a portion of said blade member (53) which projects from said accommodating space so that said rigid member (65) extends substantially parallel to said vertical axis, said rigid member (65) being made of a material having a higher hardness than that of a material used for said blade member (53).

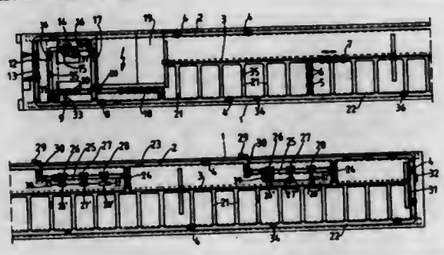
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5,497,952

## AUTOMATIC BOBBIN WINDER HAVING PROCESSORS FOR YARN END PREPARATION INFORMATION

Michael Iding, Geldern, Germany, assignor to W. Schlafhorst AG & Co., Moenchengladbach, Germany

Filed Mar. 14, 1994, Ser. No. 213,495
Claims priority, application Germany, Mar. 24, 1993, 43 09 582.8
Int. Cl.[6] B65H *54/00;9/04*
U.S. Cl. 242—18 R 8 Claims



1. In an automatic bobbin winder having a plurality of transport loops with partially common transport paths for the circulation of a plurality of supported textile yarn packages and having first and second package preparation devices for locating and positioning a yarn end on a package for engagement at a winding station, the improvement comprising:
electronic memory means associated with each package for retaining therein yarn end preparation information for the package with which said memory means is associated;
means for sensing whether a yarn end has been successfully prepared on a package at the first preparation device;
first communication means for communicating said yarn end preparation information for the package associated with said electronic memory means to said electronic memory means for retention thereby;
second communication means associated with said second preparation device for communication with said electronic memory means to determine whether a package has been successively prepared at the first preparation station; and
control means associated with the second preparation device and communicating with said second communication means for deactivation of said second preparation device responsive to information from said memory means indicating a successful package preparation by said first preparation device.

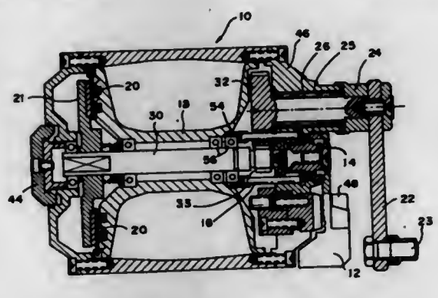
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5,497,953

## DEEP-SEA FISHING REEL WITH FRICTION UNWINDING DEVICE

Massimo Betto; Stefano Betto, and Pietro Betto, all of 20 Vaumbria, Monselice, Italy

Filed Feb. 18, 1994, Ser. No. 198,707
Claims priority, application Italy, Feb. 19, 1993, PD93A0037
Int. Cl.[6] A01K *89/033*
U.S. Cl. 242—270 20 Claims




1. A fishing reel comprising:
a side flange defining an arcuate slot having a central portion and first and second end portions radially offset relative to said central portion;
a drag lever pivotally mounted to said side flange, and a first pin connected to said drag lever and being slidingly received in said arcuate slot;
a plurality of second pins connected to said drag lever;
a winding lever mounted to said side flange and fastened to a first gear;
a shaft including a second gear engaging said first gear;
a spool mounted on said shaft and being resiliently urged against said second pins, said spool having friction material disposed on a face thereof;
a member mounted on said shaft for frictionally engaging said friction material; and
said spool being selectively movable relative to said shaft by operation of said drag lever, said drag lever having a minimum braking condition in which said first pin is received in said first end portion of said arcuate slot and a minimum braking level is applied to said spool so as to be substantially freely rotatable relative to said shaft, and said drag lever having a maximum braking condition in which said first pin is received in said second end portion of said arcuate slot and a maximum braking level is applied to said spool so as to be substantially simultaneously rotatable relative to said winding lever.



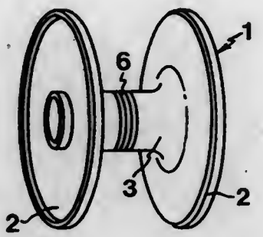
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5,497,954

## LINE SPOOL FOR A FISHING REEL

Arne Johansson, Mörrum, Sweden, assignor to Abu AB, Svängsta, Sweden

Filed Jul. 6, 1994, Ser. No. 268,127
Int. Cl.[6] A01K *89/00*
U.S. Cl. 242—322 7 Claims




1. A fishing reel including a fishing reel spool and a fishing line, the fishing line having a line diameter, the fishing reel spool incorporating a hub and two side plates, the hub being intermediate the two side plates, the hub having a generally cylindrical hub surface;
wherein the improvement comprises:
a helical circumferential groove in the hub surface;
the groove including a pitch sufficiently small that the fishing line having the line diameter is received within the groove;
the groove extending at least one turn around the hub.

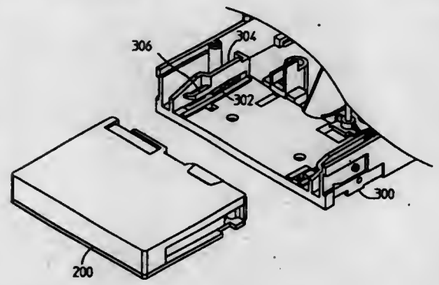
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5,497,955

## MECHANICAL LOCK-OUT FOR PREVENTING TAPE CARTRIDGE INSERTION INTO INCOMPATIBLE DRIVES

Thomas J. Angellotti; Steve C. Jackson, and Devin A. Bloom, all of Loveland, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 16, 1994, Ser. No. 214,884
Int. Cl.[6] G11B *23/087*
U.S. Cl. 242—338.4 7 Claims




1. A guidance channel, in a magnetic tape cartridge, for aligning the magnetic tape cartridge in a compatible tape drive, the magnetic tape cartridge having a cartridge front surface and a cartridge side adjacent to the front surface, the guidance channel located in the cartridge side, the guidance channel comprising:
a first end penetrating the cartridge front surface;
a second end, the guidance channel continuing along the cartridge side from the first end to the second end;
a first channel portion at the first end, the first channel portion having a uniform first width; and
a second channel portion having a uniform second width, the first width being substantially wider than the second width.

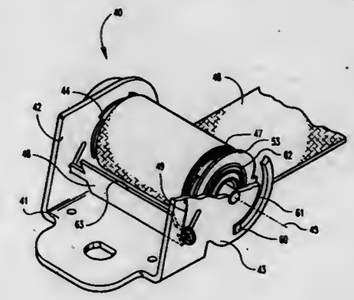
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5,497,956

## ANTI-CINCH AUTOMATIC LOCKING RETRACTOR

James E. Crook, Carmel, Ind., assignor to Indiana Mills & Manufacturing, Inc., Westfield, Ind.

Filed Sep. 16, 1994, Ser. No. 307,528
Int. Cl.[6] B60R *22/353*
U.S. Cl. 242—382.1 6 Claims




1. An anti-cinch automatic locking retractor comprising:
a frame with a pair of upstanding walls;
a web spool rotatably mounted about a longitudinal axis to and between said upstanding walls, said spool including a flange rotatable therewith having at least a first locking tooth and a second locking tooth formed thereon and located apart around said axis by a first included angle;
a first spring mounted to said frame and engaged with said spool operable to urge said spool to rotate to a web retracted position but yieldable to allow said spool to rotate to a maximum web extended position;
a pawl pivotally mounted to said walls and movable into and out of locking engagement with said flange to limit rotation of said spool in a locking position; and, a cam movably mounted to said frame about said axis, said cam including a first lobe area positionable against said pawl to limit pawl locking relative to said flange as said spool is rotated in a first direction from said web retracted position to said maximum web extended position, a second lobe area positionable against said pawl as said spool rotates in a direction opposite of said first direction, and a cam surface extending from said second lobe area to said first lobe area through a second included angle greater than said first included angle with said cam surface positionable against said pawl to limit cinching of said web spool as said spool rotates to and from said locking position through a third angle greater than said first included angle; and wherein:
said first lobe area and said second lobe area are located equidistant from said axis, said cam plate has an indented portion between said first lobe area and said second lobe area to receive said pawl when in said locking position.

5,497,957

## PROCESS AND DEVICE FOR HOMOGENIZING THE WINDING HARDNESS OF A ROLL PROFILE OF A FILM REEL

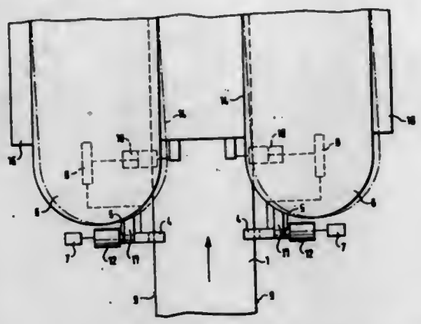
Hartmut Michel, Bruchmuehlbach, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed May 11, 1994, Ser. No. 241,332

Claims priority, application Germany, May 17, 1993, 43 16 383.1

Int. Cl.[6] D06C 3/04

U.S. Cl. 242—534 11 Claims



1. A method for homogenizing the winding hardnesses of a roll profile of a film web rolled on a film reel, comprising the steps of:

producing a prefilm;

transversely stretching the prefilm in a frame device having clip chains bearing clips for grasping the edges of the prefilm, to produce a film web; and

winding the film web on a film reel,

wherein the step of transversely stretching the prefilm includes the steps of introducing lateral movement with respect to the prefilm edges upstream of the frame device, and, in response to said lateral movement with respect to the prefilm edges, adjusting the position of the clip chains for the transverse stretching of the prefilm to modify the grasping depths of the clips for grasping laterally into the edge regions of the prefilm during the transverse stretching; and

wherein the adjusting of the grasping depths of the clips for the edge regions of the film web is controlled as a function of time on both sides.

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5,497,958

## FENCING MATERIAL DISPENSER

Ronald F. Orf, and Sandra L. Orf, both of 111 McJury La., Lafayette, Tenn. 37083

Filed Sep. 15, 1994, Ser. No. 306,627

Int. Cl.[6] B65H 16/04;75/02

U.S. Cl. 242—597.7 5 Claims

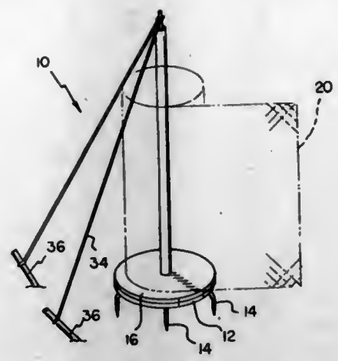
1. A fencing material dispenser comprising:

a base member having an upper surface and a lower surface, said base member including a center aperture extending therethrough;

a plurality of base member stakes projecting downwardly from said lower surface of said base member, said base member stakes being operable to pierce and engage a ground surface to support said base member relative to said ground surface;

a rotatable platform rotatably supported above said base member, said rotatable platform including a center aperture extending therethrough;

a center rod member extending through said center apertures in both said rotatable platform and said base member for engaging said ground surface, said center member having a lower distal end shaped so as to define a center member stake capable of piercing and engaging said ground surface;



a hollow tube concentrically and rotatably disposed about said center member so as to rotate with said rotatable platform;

wherein said hollow tube extends through said center apertures in both said rotatable platform and said base member and is precluded from axial separation therewith by a nut engaged to a threaded end of said tube, said tube further including a flange secured about a portion thereof spaced from said threaded end which limits a passage of said hollow tube through said center aperture of said rotatable platform.

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5,497,959

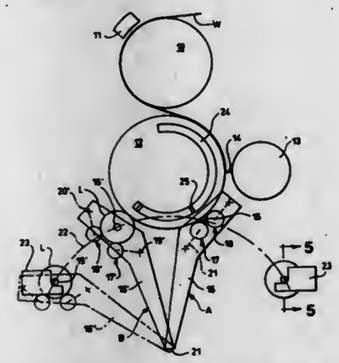
## CORELESS WINDING METHOD AND APPARATUS

Gary E. Johnson; Joseph A. Blume, and Harlie C. Zahn, all of Green Bay, Wis., assignors to Paper Converting Machine Company, Green Bay, Wis.

Continuation-in-part of Ser. No. 36,702, Mar. 26, 1993, abandoned. This application Oct. 20, 1993, Ser. No. 139,545

Int. Cl.[6] B65H 18/14;18/26;19/22

U.S. Cl. 242—542.2 1 Claim



1. A method of coreless rewinding logs from a parent roll comprising the steps of

providing first and second elongated winding mandrels and alternately winding a web directly on one of said mandrels to develop a predetermined diameter log while stripping a previously wound log from the other mandrel,

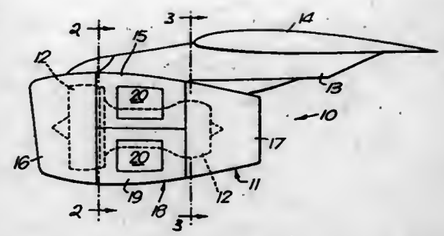
said winding step including providing first arm means associated with said first mandrel and second arm means associated with said second mandrel, each arm means being arranged for carrying its said associated mandrel and supporting its said associated mandrel substantially along the mandrel length while rotating each mandrel by contacting the same with a surface drive,



said stripping step including moving said first mandrel arm means from a winding position to a stripping position and then back to said winding position while said web is being wound on said second mandrel and

transversely severing said log into a plurality of retail-sized products

said step of providing arm means for carrying each mandrel including providing first and second pivotable arms, and a pair of driven rolls rotatably mounted on each of said pivotable arms and forming a cradle therebetween for rotatably supporting one of said mandrels.



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5,497,960

## DEVICE FOR AIRCRAFT AND AIRCRAFT PROVIDED WITH SUCH A DEVICE

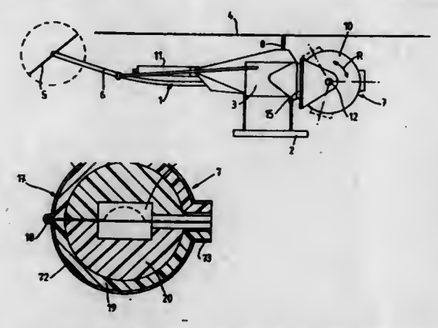
Emmanuel E. Previnaire, Rue du Limbourg, 78, B-4000 Liege, Belgium

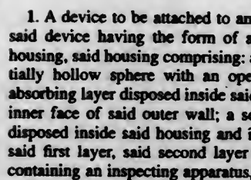
Filed Sep. 14, 1993, Ser. No. 120,463

Claims priority, application Belgium, Sep. 14, 1992, 09200803

Int. Cl.[6] B64C 27/56

U.S. Cl. 244—17.11 14 Claims





1. A device to be attached to an aircraft provided with a motor, said device having the form of a substantially spherical hollow housing, said housing comprising: an outer wall defining a substantially hollow sphere with an opening therein; a first vibration-absorbing layer disposed inside said housing and in contact with an inner face of said outer wall; a second vibration-absorbing layer disposed inside said housing and in contact with an inner face of said first layer, said second layer defining an inner chamber for containing an inspecting apparatus, the first layer absorbing essentially vibrations with a frequency higher than a specific frequency, while the second layer absorbs essentially vibrations with a frequency lower than said specific frequency, said first and second layers being linked together and arranged the one with respect to the other so that vibrations are first absorbed by the first layer before being absorbed by the second layer.

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5,497,961

## GAS TURBINE ENGINE NACELLE ASSEMBLY

Arnold C. Newton, Derby, England, assignor to Rolls-Royce plc, London, England

PCT No. PCT/GB92/00994, § 371 Date Jan. 21, 1994, § 102(e) Date Jan. 21, 1994, PCT Pub. No. WO93/02920, PCT Pub. Date Feb. 18, 1993

PCT Filed Jun. 3, 1992, Ser. No. 185,906

Claims priority, application United Kingdom, Aug. 7, 1991, 9116986

Int. Cl.[6] B64D 29/00

U.S. Cl. 244—54 11 Claims

1. A gas turbine nacelle assembly (10) suitable for mounting on an aircraft comprising a pylon (13) for the attachment of said assembly (10) to said aircraft, a gas turbine engine (12) and a nacelle (11), said nacelle (11) enclosing said gas turbine engine (12) and comprising, in axial flow series, an air intake (16), a mid-portion (15,19) and a final nozzle (17) characterised in that said nacelle mid-portion (15,19) comprises an upper part (15) which is structually integral with said pylon (13) and a lower part (19) which is attached to said upper part (15), said nacelle mid-portion upper part (15) supporting said air intake (16), said final nozzle (17) and at least part of the forward end of said gas turbine engine (12), the rearward end of said gas turbine engine (12) being directly supported by said pylon.

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5,497,962

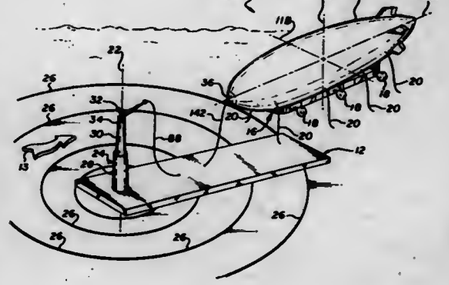
## MOORING TOWER ASSEMBLY FOR A LIGHTER-THAN-AIR VEHICLE

Wilfred L. Wood, Quartz Hill, Calif., assignor to Lockheed Corporation, Calabasas, Calif.

Filed Oct. 11, 1994, Ser. No. 322,457

Int. Cl.[6] B64F 1/12;1/14

U.S. Cl. 244—116 14 Claims



1. A mooring tower for a lighter-than-air vehicle comprising:

a vertical tower having a vertical and lateral axis;

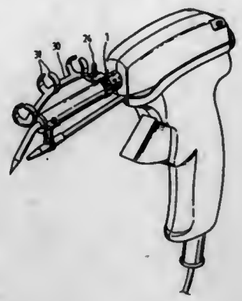
a first support member mounted on the top of said tower, said first support structure rotatable in a horizontal plane about a vertical axis;

a second support member having a first end mounted to said first support member and a telescoping second end, said second support member rotatable in a vertical plane about its first end, said second support member having an aperture extending therethrough from said first end to said second;

a winch mounted to said first support member and rotatable therewith having a mooring line extending through said aperture in said second member from said first end to and out said second end thereof;

such that a vehicle having said mooring line attached to the nose thereof can be winched to said tower.

5,497,963
**INDUCED-DRAFT FAN PIPE MOUNTING DEVICE FOR ELECTRIC SOLDERING IRONS**
A-Ying Lee, No. 19, Lane, 156, Ling-Yun Rd., Sec. 1, Wu-Ku Village, Taipei Hsien, Taiwan, Prov. of China
Filed Jul. 19, 1994, Ser. No. 275,752
Int. Cl.[6] F16L 3/00
U.S. Cl. 248—52 4 Claims

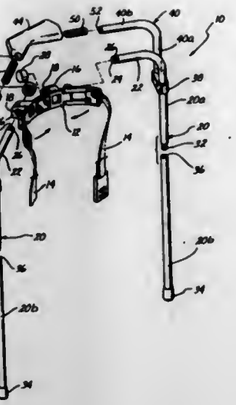


1. The combination of an induced-draft fan pipe mounting device, an induce drafted fan pipe, and an electric soldering iron; the mounting device comprising:
a flat, narrow, elongated mounting strip mounted around a handle of said electric soldering iron and having a series of through holes aligned along the length;
two connecting plates respectively connected together to hold said mounting strip on said handle, each connecting plate comprising a screw hole, into which a screw is threaded to fasten said connecting plates together, a first lug at one side inserted through one of said through holes at one end of said mounting strip and overlapped on a back side of said mounting strip, and two opposite second lugs respectively covered over the back side of said mounting strip; and
an induced-draft fan pipe holder fastened to said mounting strip to hold said induced-draft fan pipe, said induced-draft fan pipe holder comprising a flat frame having a holding means at one end, which receives the induced-draft fan pipe, and two lugs at an opposite end respectively inserted through two of said adjacent through holes on said mounting strip and covered over the back side of said mounting strip.

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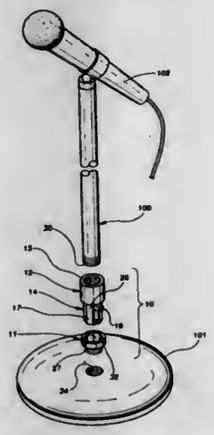
5,497,964
**STAND FOR GOLF BAG**
Sanjiro Hagiwara, Tokyo, Japan, assignor to Velbon International Corporation, Torrance, Calif.
Filed Mar. 15, 1994, Ser. No. 213,169
Int. Cl.[6] A63B 55/00
U.S. Cl. 248—96 25 Claims

1. A stand for a golf bag comprising:
bearing means:
a pair of legs extending below said bearing means and having an upper end pivoted to said bearing means about corresponding first and second leg pivot axes, said leg pivot axes being angled to one another;
actuating rod means attached to each of said legs, said actuating rod means extending above said bearing means;
spring means compressed between upper ends of said actuating rod means for continuously biasing said legs to a retracted position, said legs being deployable in one direction about said pivot axes by manually pivoting said actuating rod means in an opposite direction against the bias of said spring means; and
a hand grip supported between said upper ends of said actuating rod means for use in pivoting said actuating rod means.



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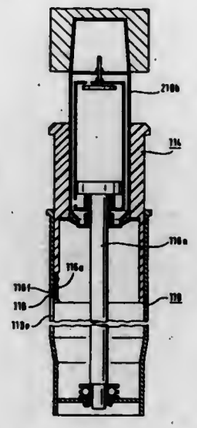
5,497,965
**RELEASABLE MICROPHONE STAND APPARATUS**
Edward F. Mathieu, Jr., 21 Pine Ct., South Elgin, Ill. 60177
Filed May 27, 1994, Ser. No. 250,386
Int. Cl.[6] F16M 13/00
U.S. Cl. 248—159 5 Claims



1. An apparatus for releasably locking a microphone stand tube to a microphone base comprising:
(a) a lock member receiver attached to the microphone base;
(b) a locking coupling having a first end attached to the microphone stand tube; and
(c) a lock member, having a coupling end connected to a second end of the locking coupling and a locking retainer releasably locked into the lock member receiver, comprising:
a locking actuator arm;
a locking arm connected to the locking actuator arm and pivotally connected to the locking retainer;
a securing hook attached to the locking arm;
the securing hook releasably engaging an end of the lock member receiver;
a male exterior surface of the lock member is octagon in shape; and
a female interior surface of the lock member receiver is octagon in shape to receive the male exterior surface of the lock member.

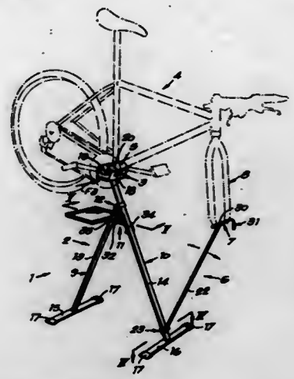


5,497,966
**COLUMN UNIT, IN PARTICULAR A CHAIR COLUMN UNIT**
Castor Fuhrmann, Brachtendorf, Germany, assignor to Stabilus GmbH, Koblenz-Neuendorf, Germany
Continuation of Ser. No. 43,275, Apr. 6, 1993, abandoned.
This application Jan. 31, 1995, Ser. No. 381,300
Claims priority, application Germany, Apr. 11, 1992, 42 12 282.1
Int. Cl.[6] F16M 11/00
U.S. Cl. 248—161 26 Claims



1. A column unit comprising:
a base tube having a base-tube axis, a first base-tube end, a second base-tube end, and guides within the base-tube in the region of the second base-tube end; and
a positioning device having a device axis which substantially coincides with the base-tube axis, comprising a first component-group unit and a second component-group unit, wherein
the first and second component-group units are axially movable relative to each other and are lockable against each other in a plurality of axial relative positions,
the first component-group unit is supported on a support connected to the base tube,
the second component-group unit extends beyond the second base-tube end and is adjustable between an innermost position and an outermost position with respect to the second base-tube end,
an outer section of the second component-group unit, extending beyond the second base-tube end and beyond the guides, is shaped to connect with a column-borne object,
the second component-group unit is in axially sliding engagement with the guides,
the guides are guided along base tube in an axially shiftable manner such that, when the second component-group unit moves outward between its innermost position and its outermost position, the guides are driven on a partial path, and
stop means for restricting the outward movement of the guides with respect to the second base-tube end including jointly acting pullout-restricting stops attached to the guides and to the base tube, the stop means being normally non-releasable by mere application of an axial pullout force upon the guides, but being capable of being rendered inoperative by at least one release operation different from the application of a pullout force.

5,497,967
**BICYCLE REPAIR STAND**
Johan Gantois, Polderstraat 22, 8670 Oostduinkerke-Koksijde, Belgium
Filed Mar. 10, 1994, Ser. No. 208,390
Claims priority, application Belgium, Mar. 10, 1993, 09300229
Int. Cl.[6] A47F 7/00
U.S. Cl. 248—166 17 Claims

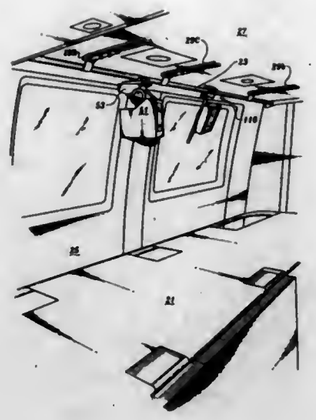


1. A bicycle repair stand comprising:
a first support part erectable from a storage position to a stable support position, said first support part having upper and lower ends and carrying a first holder at the upper end thereof that is adapted to support a bicycle at a crank axle portion thereof, said first support part including first and second support elements each of which includes a foot support member adapted to engage a support surface, said first support element being connected at a hinged connection to said second support element whereby said first and second support elements can be folded together wherein said first support part assumes said storage position and unfolded wherein said first support part assumes said support position; and
a second support part having first and second end portions, the first end portion of said second support part being hingedly connected to the lower end of said first support part so as to be spaced below the hinged connection between the first and second support elements and below said first holder, the second end portion of said second support part carrying a second holder adapted to support a fork portion of a bicycle.

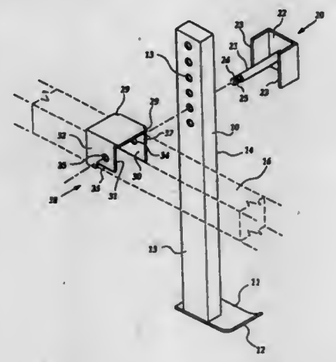
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5,497,968
**EMERGENCY RESPONSE EQUIPMENT SECURING SYSTEM AND ACCESSORIES**
Barry J. Hewko, Sidney, Canada, assignor to Vancouver Island Helicopters Ltd., Sidney, Canada
Filed Oct. 5, 1994, Ser. No. 318,071
Int. Cl.[6] A47B 96/06
U.S. Cl. 248—214 19 Claims

1. An apparatus for positioning and securing equipment relative to a substantially planar surface of an interior of a vehicle, comprising:
(a) a suspension bar secured to the substantially planar surface of the interior of the vehicle, the suspension bar being laterally and longitudinally adjustable with respect to the planar surface; and
(b) an equipment fastener for securing the equipment to the suspension bar, the equipment fastener having an upper end and an equipment fastener end, the upper end being slidably and removably attached to the suspension bar, the equipment fastener end of the equipment fastener being adapted for securing equipment thereto.

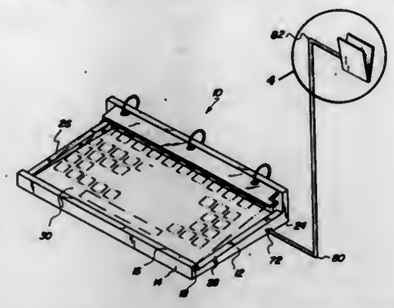


5,497,969
**RELEASABLE LOCKING APPARATUS**
John Broughton, P.O. Box 520, Crows Nest, Australia
PCT No. PCT/AU93/00249, § 371 Date Nov. 16, 1994, § 102(e) Date Nov. 16, 1994, PCT Pub. No. WO93/24350, PCT Pub. Date Dec. 9, 1993
PCT Filed May 25, 1993, Ser. No. 338,453
Claims priority, application Australia, May 27, 1992, PL2685
Int. Cl.[6] A47F 5/00
U.S. Cl. 248—352 10 Claims



1. A support assembly for an apparatus having a drawbar, said support assembly comprising:
a support post for supporting said drawbar in an elevated position, said support post having a plurality of apertures whereby the drawbar may be supported at a selected elevation;
support post mounting means non-rotatably connectable to said support post;
drawbar mounting means non-rotatably connectable to said drawbar; and
interconnection means receivable within a support post aperture for interconnecting and releasably locking together said support post and said drawbar;
said support post mounting means and said drawbar mounting means interengaging when said support post and said drawbar are locked to prevent rotational movement therebetween.

5,497,970
**COMPUTER KEYBOARD AND TEMPLATE HOLDER**
William C. Pursell, Jr., 727 Chesapeake Ave., Hampton, Va. 23661
Filed Oct. 20, 1994, Ser. No. 326,247
Int. Cl.[6] B41J 11/02
U.S. Cl. 248—442.2 1 Claim

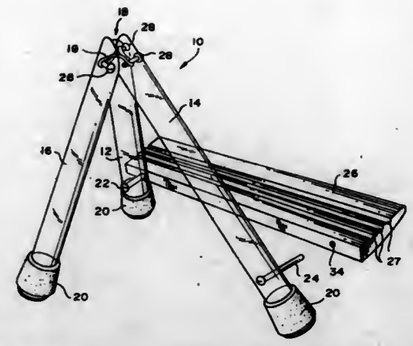


1. A computer keyboard and template holder for holding a computer keyboard and associated templates and working papers in a convenient location for use with a computer comprising, in combination:
a rigid platform having a short upstanding rectangular planar front wall with a top edge and a bottom edge, a long upstanding rectangular planar back wall with a top edge and a bottom edge, and a long generally rectangular bottom plate interconnecting the front wall with the back wall near their bottom edges to define a holding space therebetween and with the bottom plate having an angled supporting surface located below the holding space sized for allowing a computer keyboard to be placed thereon such that the computer keyboard is juxtaposed between the walls;
three spaced parallel axially aligned openable rigid binder rings coupled to the back wall of the platform near the top edge thereof;
a plurality of transparent plastic rectangular sleeves coupled to the binder rings, each sleeve having a top planar surface interconnected with a bottom planar surface to create a space therebetween for holding a computer template, each sleeve further having a front long edge, a rear long edge, opposed short side edges interconnecting the long edges, and three spaced aligned holes disposed therethrough near the rear long edge thereof removably mated with the binder rings, each sleeve additionally having an integral and generally rectangular tab coplanarly projected from one side edge thereof, the sleeves in combination slidably positionable in a registered superposed relation upon the top edge of the back wall such that their tabs are offset and readily accessible; and
an elongated rigid arm having a lower first end pivotally coupled to one side edge of the platform and an upper second end perpendicular to the first end projected upwards to a location above and offset from the platform and terminated at an openable clamp with a spring for removably holding working papers.

5,497,971
**TRIGONAL PYRAMIDAL BOOKSTAND**
Alexander C. Spiro, 4103 38th St. NW., Washington, D.C. 20016
Filed Jun. 6, 1994, Ser. No. 254,868
Int. Cl.[6] A47G 1/24
U.S. Cl. 248—455 15 Claims

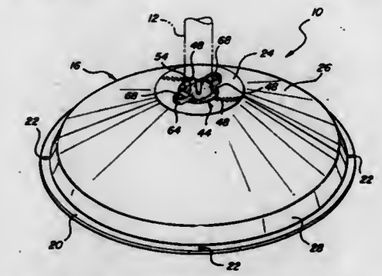
1. A bookstand comprising a pyramidal frame having an apex and a base, said frame comprising at least three tubular legs, means interconnecting one end of said at least three legs in juxtaposition to form said apex of said frame, the legs extending divergently





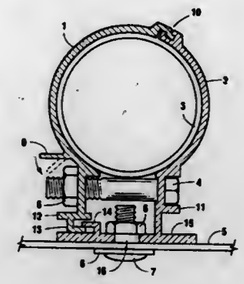
from the apex intersection thereof in a manner such that the other end of each of said legs comprise the base of said frame, catch means extending outwardly from each of said three legs each of said three legs near said one end, wherein said interconnecting means comprises elastic means wound about each of said catch means to interconnect said legs at their apex, and a shelf attached across one side of said frame, said shelf being adjacent to and extending across one side of the base of said frame in a manner to support books thereon in juxtaposition to lean against the side of said frame across which the shelf extends.

5,497,972
**STAND FOR ARTIFICIAL CHRISTMAS TREE OR THE LIKE**
Hugh M. Sofy, Troy, Mich., assignor to HMS Mfg. Co., Troy, Mich.
Filed Oct. 26, 1994, Ser. No. 329,531
Int. Cl.[6] F16M 13/00
U.S. Cl. 248—523 20 Claims



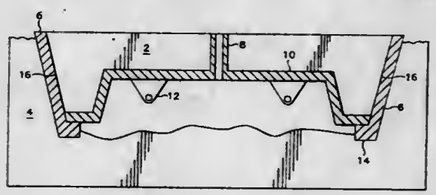
1. A stand assembly (10) for supporting an upright pole (12), said assembly comprising:
a base (16) having a lowermost bearing surface (18); a receptacle (34) formed centrally in said base (16) having an inwardly tapering side wall and a bottom (36) elevated above said bearing surface (18); collet means (44) receivable into said receptacle (34) for surrounding and centering an upright pole (12) seated in the receptacle (34); fastener means (68) for progressively and forcibly urging said collet means (44) into said receptacle (34); and characterized by said collet means (44) including a neck (46) and a plurality of wedge-shaped grippers (48) extending in cantilever fashion from said neck (46), a slit (60) between each of said grippers (48), said wedge-shaped grippers (48) reacting against said inwardly tapering side wall of said receptacle (34) as said fastener means (68) forcibly urges said collet means (44) into said receptacle (34) for gradually and uniformly displacing said grippers (48) inwardly against the upright pole (12) to hold the upright pole (12) in a vertical posture.

5,497,973
**THEFT RESISTANT SIGN CLAMP**
William H. Balzen, and Robert H. Balzen, both of 9518 Anderson Mill Rd., Austin, Tex. 78729
Filed Jan. 31, 1994, Ser. No. 190,780
Int. Cl.[6] F16M 11/00; F16B 9/00
U.S. Cl. 248—551 1 Claim



1. A theft resistant sign clamp comprising:
(a) a first and a second member adapted to be secured about a sign post;
(b) said first and second members adapted to be connected together at one end by an interlocking joint and wherein interlocking means connect said members at the other end of said first and second members,
(c) one of said members being adapted to secure a sign thereto by a smooth bolt and including means which restrict access to said smooth bolt, a fasting nut of which is positioned within said first and second members when they are secured about said post so that access to said fasting nut is restricted by the structure of said members;
(d) said first and second members adapted to be connected together at the end of said members adjacent said sign by nut and bolt means; one of said members having a recess means to restrict access to and motion of the head of said bolt means and wherein said nut and bolt means connecting said members is transverse to and further restricts access to said fasting nut and smooth bolt attaching a sign to said clamp; and
(e) one of said members having tab means adapted to be bent into position to limit access to said nut of said nut and bolt means connecting said members to restrict removal of said nut means and of said members.

5,497,974
**GEODESIC IGLOO CONSTRUCTOR**
Carlos C. Tapang, 5440 NW. Condor Pl., Portland, Oreg. 97229
Filed Mar. 31, 1994, Ser. No. 220,489
Int. Cl.[6] B29C 33/44
U.S. Cl. 249—74 2 Claims



1. A mold for constructing an igloo, comprising:
(a) a set of from three to six walls fastenable together to define a mold cavity therebetween;
(b) a mold floor removably located between said walls to define a bottom of a said cavity;
(c) a handle attached to an outer surface of said floor; and

(d) a pipe attached to an inner surface of said floor at the center of said floor, with the bore of said pipe passing through said floor.

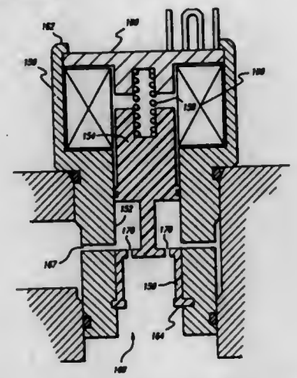
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5,497,975

## SOLENOID PNEUMATIC VALVE

Muchlis Achmad, Santa Clarita, Calif., assignor to HR Textron Inc., Valencia, Calif.

Filed Apr. 29, 1994, Ser. No. 235,759
Int. Cl.[6] F16K 31/02;39/02
U.S. Cl. 251—129.07 6 Claims



1. A pressure balanced solenoid valve comprising:
(a) a housing having an inner surface defining a bore therein and first and second flow ports intersecting said bore said housing inner surface defining a groove therein;
(b) a spool reciprocally disposed within said bore for movement between first and second positions, said spool establishing communication between said first and second flow ports when in said first position and blocking communication therebetween when in said second position;
(c) a ring received within said groove and extending into said bore for limiting travel of said spool to a predetermined position;
(d) one of said first and second flow ports being aligned with an having substantially the same diameter as said bore;
(e) said spool defining an opening therethrough for pressure balancing said spool when said spool is in said second position;
(f) means for reciprocating said spool between said first and second positions including motor means having a core of magnetic material, said spool and said core being constructed of a unitary member, said motor means when energized by an electrical signal moves said spool ton one of said first and second positions, and spring means continuously urging said spool to the other position.

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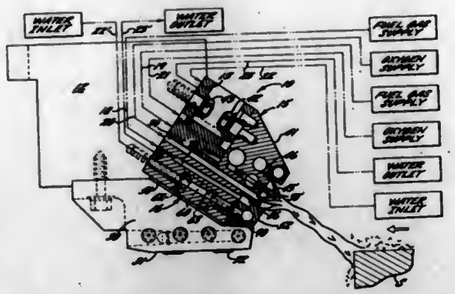
5,497,976

## LOWER BLOCK ASSEMBLY FOR USE IN METAL SCARFING APPARATUS

Michael S. Showalter, Florence; David L. Pierce, Timmonsville; Stephen A. Engel, and Raymond C. Smith, both of Florence, all of S.C., assignors to The ESAB Group, Inc., Florence, S.C.

Filed Jan. 18, 1995, Ser. No. 375,418
Int. Cl.[6] B23K 7/06
U.S. Cl. 266—51 15 Claims

1. A block assembly for directing a continuous stream of a gas across the width of a metal workpiece during a scarfing operation, and comprising




a block of metallic material including opposite front and rear faces, opposite upper and lower faces, and opposite end faces which define a longitudinal direction therebetween,
a continuous slot extending in the longitudinal direction along said front face and extending rearwardly into said block a substantial distance, and so that said slot defines an inner end which is spaced from said rear face,
duct means comprising a plurality of longitudinally spaced apart parallel gas supply ducts extending within the interior of said block and from said rear face of said block into communication with said inner end of said slot, and baffle means positioned in each of said gas supply ducts for imparting turbulence to the gas delivered therethrough, and so that the gas is distributed by said duct means substantially uniformly along the entire longitudinal length of said slot,
whereby a gas may be delivered to said duct means at said rear face of said block and the gas flows outwardly from the entire longitudinal length of said slot at a substantially uniform rate.

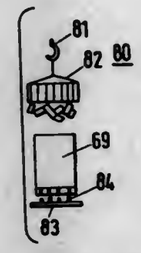
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5,497,977

## PROCESS AND APPARATUS FOR PREHEATING AND INSERTING SCRAP INTO A SMELTING FURNACE

Ralf Schneider, Mettmann, Germany, assignor to Mannesmann Aktiengesellschaft, Düsseldorf, Germany

Filed Jul. 29, 1994, Ser. No. 282,915
Claims priority, application Germany, Jul. 29, 1993, 43 25 958.8
Int. Cl.[6] C21B 7/22; C21C 5/38
U.S. Cl. 266—156 16 Claims




1. An apparatus for preheating scrap with a heating gas prior to insertion of the scrap into a smelting furnace, the heating gas comprising combusted waste-gas from the smelting furnace, said apparatus comprising:
a) a plurality of preheating stations, each preheating station being defined by a gas inlet port and a gas outlet port;
b) a free-position station disposed proximate said plurality of preheating stations;
c) a plurality of receptacles selectively positionable at said stations, each of said receptacles being interposable between the gas inlet ports and gas outlet ports of any preheating stations for establishing fluid communication therebetween; and



d) a plurality of undercarriages for independently moving said receptacles along a circular path to any of said stations, each of said undercarriages being dimensioned and arranged to receive one of said receptacles.

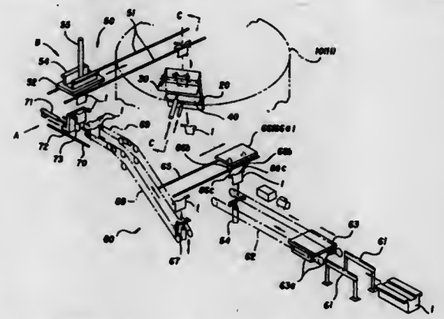
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5,497,978

## APPARATUS FOR CHARGING SCRAP INTO A CONVERTING FURNACE

Akiyoshi Yamashiro; Kiyoshi Fujiwara, and Nobuhiro Oguma, all of Kagawa, Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

Filed Apr. 19, 1994, Ser. No. 229,540
Int. Cl.[6] C21B 7/16
U.S. Cl. 266—176 7 Claims



1. An apparatus for charging scrap into a converting furnace, comprising:
an outer shutter;
a chute having an open first end adjacent to said outer shutter and an open second end extending into an opening provided in the furnace;
an inner shutter positioned between said open first end and said open second end,
said outer shutter operable for movement between a first position exposing said open first end and a second position closing said open first end and,
said inner shutter operable for movement between a first position exposing said open second end and a second position closing said open second end, said first and said second shutter independently operable of each other; and,
a charging means for charging said scrap into said open first end of said chute.

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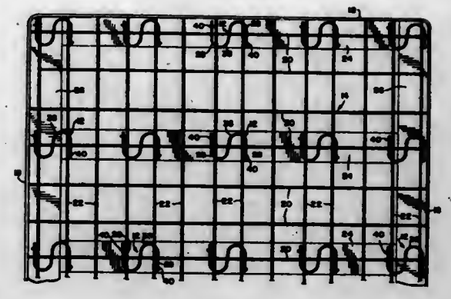
5,497,979

## FOUNDATION UNIT, WIRE ELEMENT FOR THE FOUNDATION UNIT, AND METHOD OF FORMING THE FOUNDATION UNIT

Martin Schulz, Jr.; Billie Pieper, and David Warner, all of Brenham, Tex., assignors to Steadley Company, Carthage, Mo.

Continuation of Ser. No. 123,324, Sep. 17, 1993, abandoned.
This application Mar. 15, 1995, Ser. No. 405,914
Int. Cl.[6] F16F 3/00
U.S. Cl. 267—103 11 Claims

1. A wire support member for a foundation unit of the type having a grid wire top bearing structure and a rigid bottom substructure, the wire support member comprising
a. a segment of serpentine wire comprising a continuous series of smoothly curved portions extending from one another and being bent into three segments, said segments comprising a pair of wire elements and a connecting means,
b. said pair of wire elements arranged in mirror image to one another, said wire elements being located in spaced, parallel planes, and each wire element including



i. a sinuous central segment comprising a series of generally C-shaped curved portions lying in one of said planes, adjacent curved portions being oppositely facing,
ii. an upper attachment segment, and
iii. a lower attachment segment, said sinuous central segment extending between said upper attachment segment and said lower attachment segment,
c. said connecting means extending between and joining said upper attachment segments to form said wire support member as a continuous element, said connecting means comprising a transverse link which is an S-shaped smoothly curved portion connected to said upper attachment segments, and
d. a grid wire engagement location formed in each upper attachment segment, said engagement location comprising a dimple in said upper attachment segment shaped to accommodate and seat a grid wire extending generally perpendicular to said upper attachment segment.

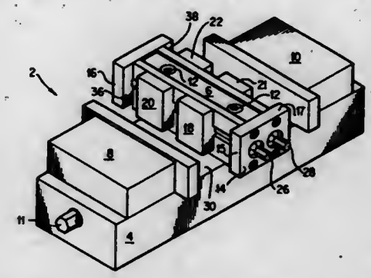
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5,497,980

## ASSEMBLY FOR USE IN PRECISION MACHINING

James P. Chick, Great Belt Rd., Butler, Pa. 16001

Filed May 17, 1993, Ser. No. 62,273
Int. Cl.[6] B25B 1/10
U.S. Cl. 269—43 6 Claims



1. An assembly for use as the fixed central two-sided jaw member of a precision machine vise, said assembly comprising
a body portion adapted to be positioned transversely of said precision machine vise and containing means for securely attaching said assembly thereto,
said body portion possessing at least one side surface adapted to be oriented perpendicularly with respect to the bed surface of said precision machine vise and at the same time also perpendicularly with respect to the longitudinal axis of said precision machine vise, said side surface being provided with a ground and polished planar working face adapted to serve as the bed of an auxiliary vise means,
at least two movable-jaw members, each of which has a ground and polished planar face adapted to be moved transversely with respect to said longitudinal axis of said precision machine vise while in contact with a side surface of said body

portion which is oriented perpendicularly with respect to the bed surface of said precision machine vise and at the same time also perpendicularly with respect to the longitudinal axis of said precision machine vise,

at least one end portion fixedly connected to said body portion and projecting outwardly therefrom in a direction parallel to the longitudinal axis of said precision machine vise, said end portion having a surface facing said movable-jaw members which is planar and provided with a ground and polished surface and oriented perpendicularly with respect to both a planar bed surface of said precision machine vise and said side surface of said body portion, and shaft means journaled for rotation in said end portion and operatively connected to said movable-jaw members for moving same towards or away from said end portion,

said movable-jaw members each having planar ground-and-polished faces facing said end portion which are oriented parallel to said surface of said end portion facing said movable-jaw member,

wherein the assembly comprises two slide members which are on the same side of said body portion and are changed in position by separate shaft means journaled in separate end portions at opposite ends of said body portion.

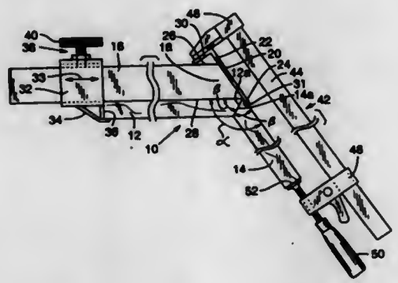
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**5,497,981**

## MITER CLAMP

**Milford D. Case, 14313 French Prairie Rd. NE., Woodburn, Oreg. 97071**

**Filed Jun. 22, 1994, Ser. No. 263,517**
**Int. Cl.[6] B25B *1/20***
**U.S. Cl. 269—37** **18 Claims**



1. A clamping device for use in a clamping system to clamp work pieces together at an oblique angle, comprising:

an elongate support member having a work piece support surface;

an angle element attached to and projecting outwardly at an oblique angle from the work piece support surface;

a clamping projection movable longitudinally along the support member toward and away from the angle element; and

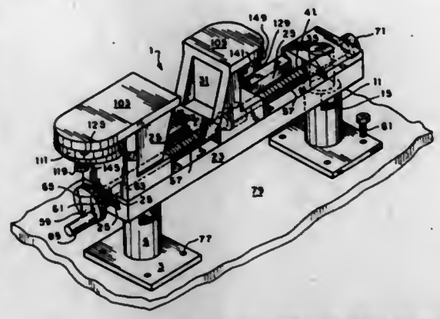
locking means for securing the clamping projection in a selected position on the support member wherein a work piece can be located against the work piece support surface between the clamping projection and the angle element.

**5,497,982**

## UNIVERSAL SKI HOLDING DEVICE

**James V. Stoltz, 3333 NE. 34th St., 115, Ft. Lauderdale, Fla. 33308, and Tony J. Zeeb, 19790 W. Dixie Hwy., Miami, Fla. 33180**

**Filed Feb. 16, 1995, Ser. No. 389,509**
**Int. Cl.[6] B23Q *1/04***
**U.S. Cl. 269—71** **7 Claims**



1. A universal ski holding device for positive and fixed mounting of a conventional snow ski in an inverted position with its major bottom surface uppermost, preparatory to its maintenance and tuning, via its conventional binding, the ski having major top and bottom surfaces and lateral edges, and with the binding having a heel piece and a toe piece; the device comprising an elongated bed having a way, a fixed heel-carriage piece, a longitudinally movable toe-carriage piece, a fixed terminal pillow block, an elongated screw, and two mounting supports for the elongated bed; the heel-carriage piece having a depending pillow-block portion complementally engaging the way, the toe-carriage piece having a depending pillow-block portion freely and complementally engaging the way and being longitudinally movable therewith, the terminal pillow block complementally engaging the way, each mounting support having a combined base and vertically upstanding tubular member of integral, one-piece construction, each base being adapted for fixed mounting on a flat support surface, each base having squared, inner-walled surfaces with opposed and aligned vertical grooves in two of the facing walled surfaces, each mounting support having a cross-sectionally square sliding member whose exterior surfaces complementally engage the tubular-member's inner-walled surfaces, each sliding member having opposite aligned pivot pins complementally engaging the tubular-member's vertical grooves, each sliding member having a male-threaded top portion, the depending pillow-block portion of the heel-carriage piece having a tapped hole, the male-threaded top portion of the sliding member being fixedly engaged with the tapped hole in the depending pillow-block portion of the heel-carriage piece, the terminal pillow block having a tapped hole, the male-threaded top portion of the other sliding member being fixedly engaged with the tapped hole in the terminal pillow block, the depending pillow-block portion of the toe-carriage piece fixedly mounting a longitudinally aligned nut, the elongated screw being operatively engaged with the toe-carriage-piece's nut such that, in one direction of rotation of the elongated screw, the toe-carriage piece moves longitudinally in a direction away from the fixed heel-carriage piece, and, in the opposite direction of rotation of the elongated screw, the toe-carriage piece moves longitudinally in a direction toward the fixed heel-carriage piece, the heel-carriage and toe-carriage pieces constituting a boot portion simulating a ski boot, the heel-carriage and toe-carriage pieces each mounting, in adjustably pivotable relationship, a spatial



accommodating element to spatially accommodate the vertical-height differences that present themselves in the various heel and toe pieces of conventional bindings.

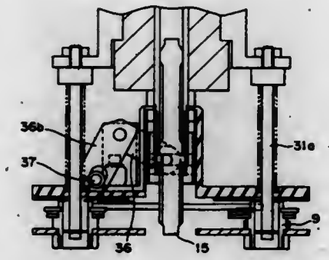
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**5,497,983**

## WORK POSITIONER OF CHIP MOUNTER FOR MONITORING A CHIP-SHAPED ELECTRONIC PART ONTO A SUBSTRATE

**Teruhiko Fujioka, Tokyo, Japan, assignor to Tenryu Technics Co., Ltd., Shizuoka, Japan**

**Continuation-in-part of Ser. No. 845,700, Mar. 4, 1992, abandoned, which is a continuation of Ser. No. 633,476, Dec. 21, 1990, abandoned, which is a continuation-in-part of Ser. No. 257,229, Oct. 13, 1988, abandoned. This application Dec. 28, 1992, Ser. No. 62,501**
**Claims priority, application Japan, Jan. 16, 1987, 62-158360 U**
**Int. Cl.[6] H05K *3/30***
**U.S. Cl. 269—155** **3 Claims**



1. A work positioner for positioning a chip-shaped electronic part comprising:

a guide plate having at least one pair of elongated guide grooves, elongated along a straight line and opposed to each other on said plate;

a positioner block for each said guide groove reciprocally and slidably movable along said guide grooves;

at least one pair of positioner tips connected to respective said positioner blocks such that said guide plate is sandwiched between said positioner tips and said positioner block; and

means for moving said positioner blocks reciprocally and slidably along said guide grooves to cause corresponding movement of said positioner tips such that said positioner tips open or close in operational association with the reciprocal slidable movement of said positioner blocks in said guide grooves so as to enable said positioner tips to clamp said chip-shaped electronic part therebetween or to release it;

a first pair of levers, commonly pivotable about a first pivot and a second pair of levers commonly pivotable about a second pivot, one lever of said first pair of levers being connected to one of said positioner tips via one connecting means, and one lever of said second pair of levers being connected to the other of said positioner tips, via another connecting means;

a pair of spaced and parallel slide bars movable to open or close said positioner tips, one lever of said first pair of levers and one lever of said second pair of levers being connected to one of said slide bars, the other lever of said first pair of levers and the other lever of said second pair of levers being connected to the other said slide bar such that said slide bars are movable in directions parallel to each other, each said pair of levers and each said slide bar form a parallel link as to fulcrums at said first and second pivots, and the distances between one fulcrum and one point of action of one of said levers and between another fulcrum and another point of action of another one of said levers are the same so as to move said positioner tips synchronously by equal amounts such that movement of said slide bars in a first predetermined direction causes said first and second pairs of levers to correspondingly pivot about said respective common pivots,

a spring for biasing said lever pairs apart such that movement of said slide bars in said first predetermined direction causes said positioner tips to be moved by equal amounts toward a predetermined center position;

a plurality of guide posts having lower ends;

a second guide plate provided at the lower ends of said guide posts for reciprocal movement along said guide posts,

biasing means on said guide posts to bias said second guide plate in a first direction;

a slide block mounted onto said second guide plate by a pin for pivotal movement about the pin with respect to said second guide plate, and

a roller pin engageable with said slide block and said guide plate for sliding movement along said second guide plate during pivotal movement of said slide block with respect to said second guide plate.

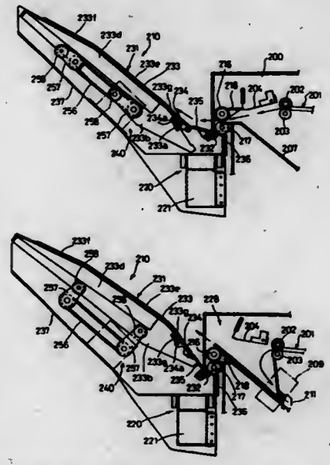
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**5,497,984**

## SHEET POST-PROCESSING APPARATUS

**Susumu Murakami, Ikoma; Naoya Okamura, Nara; Tomonori Ohata, Nara; Kazuya Hamaguchi, Nara; Koji Katamoto, Yamatokoriyama, and Toshiya Mikita, Yao, all of, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Jul. 15, 1994, Ser. No. 275,684**
**Claims priority, application Japan, Jul. 16, 1993, 5-177106; Aug. 6, 1993, 5-196336**
**Int. Cl.[6] B42B *5/00*; B65H *31/04*;*31/10***
**U.S. Cl. 270—53** **35 Claims**



1. A sheet post-processing apparatus, comprising:

a processing tray for stacking thereon sheets to be post-processed;

post-processing means for carrying out a predetermined post-process on sheets stacked on said processing tray;

a discharge tray capable of selectively moving between a first discharge position at which processed sheets can be smoothly discharged and a second discharge position at which discharged non-processed sheets can be desirably aligned;

control means for controlling said discharge tray so as to be set in the first discharge position in a processing mode; and

discharge means for moving the processed sheets along said processing tray to be discharged onto said discharge tray through a sheet discharge section and for discharging the non-processed sheets onto said discharge tray through the sheet discharge section wherein:

said sheet discharge section is composed of a first discharge section formed on a discharge end of said processing tray for discharging therethrough processed sheets and a second discharge section for discharging therethrough non-processed sheets.

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**5,497,985**

## METHOD AND APPARATUS FOR TEMPORARILY STORING AND TRANSPORTING SUCCESSIVE TEXTILE SHEETS

Gaspar A. H. Byttebier, Grote Heerweg 64, B-8791 Waregem-Beveren, and Hendrik Lefebvre, Harelbeke, both of, Belgium, assignors to Gaspar A. H. Byttebier, Waregem-Beveren, Belgium

PCT No. PCT/BE92/00008, § 371 Date Feb. 23, 1994, § 102(e) Date Feb. 23, 1994, PCT Pub. No. WO92/17395, PCT Pub. Date Oct. 15, 1992

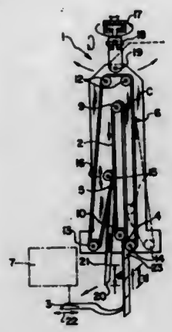
PCT Filed Mar. 24, 1992, Ser. No. 122,483

Claims priority, application Belgium, Mar. 26, 1991, 09100278

Int. Cl.[6] B65H 29/66

U.S. Cl. 271—7

16 Claims



8. A movable collecting apparatus for temporarily storing and conveying a series of successive textile sheets comprising:

a frame;

a sheet carrying assembly having an inlet and a removal point, said assembly being mounted on said frame for carrying sheets to be collected, said assembly including:

a revolving carrier mechanism,

at least one clamping member cooperating with said carrier mechanism so as to define a space for temporarily storing and pressing said sheets over a particular area between said inlet and said removal point, said inlet and said removal point being freely accessible,

a driver for driving said assembly, and

intermediate mechanical means for conveying the sheets between the assembly and another location in a desired position,

said frame being constructed and arranged for movement by one of translation, rotation, and translation combined with rotation around one of a vertical axis and at least one horizontal axis,

wherein said space extends in more than one plane, an entrance plane at said inlet and an exit plane at said removal point forming an angle less than 120°.

**5,497,986**

## AUTOMATIC DOCUMENT FEEDER

Taku Kudo, Sagamihara, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

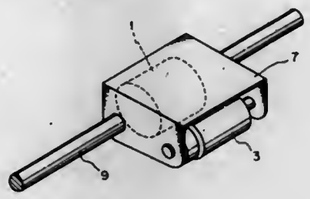
Filed Dec. 28, 1994, Ser. No. 364,992

Claims priority, application Japan, Dec. 28, 1993, 5-338070

Int. Cl.[6] B65H 3/52

U.S. Cl. 271—122

2 Claims



1. An ADF comprising:

a feed roller rotatable in an intended direction of document feed in contact with documents stacked on a document table;

a reverse roller rotatable in a direction opposite to the intended direction of document feed in contact with the documents;

a one-way clutch mounted on a drive shaft, which drives said reverse roller, such that said one-way clutch uncouples when said reverse roller rotates in the direction opposite to the intended direction of document feed or couples when said reverse roller rotates in said intended direction of document feed; and

a shutter rotatably mounted on a body of said ADF and comprising a stop for causing the documents stacked on said document table to abut thereagainst;

wherein when said reverse roller rotates in the direction opposite to the intended direction of document feed, said shutter, receiving power from said one-way clutch, moves in a direction for closing a document inlet, causing said stop to protrude to above said document table at a predetermined position.

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**5,497,987**

## SHEET-GUIDING DEVICE

Manfred Henn, Heidelberg, and Josef Wehle, Schwetzingen, both of, Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Germany

Continuation of Ser. No. 214,965, Mar. 16, 1994, abandoned.

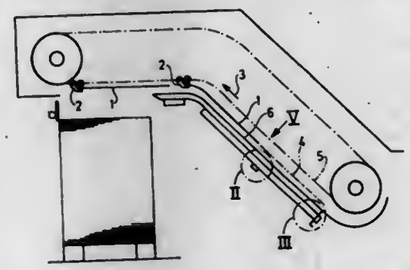
This application Jul. 17, 1995, Ser. No. 501,275

Claims priority, application Germany, Mar. 16, 1993, 43 08 276.9

Int. Cl.[6] B65H 29/04

U.S. Cl. 271—204

6 Claims



1. Device for guiding a sheet having a leading edge which follows an imaginary conducting surface along a sheet-transport direction perpendicular to the leading edge, the sheet-guiding device being formed with a sheet-guiding surface spaced from the imaginary conducting surface, and having means for generating a plurality of air jets for applying an air flow to the sheet between a surface of the sheet and the sheet-guiding surface, the generating means being formed of respective flow channels for the air jets disposed at an angle to and merging with the sheet-guiding surface, comprising an integral guide plate having a surface constituting a predominant part of the sheet-guiding surface, said integral guide plate being formed with perforations, the air-jet generating means being formed of blast-air nozzles having blast-air nozzle end faces constituting a remaining part of the sheet-guiding surface complementing the predominant part of the sheet-guiding surface to form the entire sheet-guiding surface, said blast-air nozzles fitting into the respective perforations formed in said guide plate so that said blast-air nozzle end faces are flush with said surface of said guide plate, said blast-air nozzles, respectively, having the respective flow channels formed thereon, and being formed with a nozzle bore passing therethrough and communicating with the respective flow channel; and including a first assembly comprising said guide plate, and a second assembly comprising a blast air-conducting tube system, said first assembly being connected to said second assembly in a distortion-free manner, said nozzle bores, respectively, of said blast-air nozzles communicating directly with blast air conducted in said conducting tube system, said second assembly being disposed opposite the surface of said guide plate constituting the predominant part of the sheet-guiding surface; a respective one of said blast-air nozzles being form-lockingly integrated in said first assembly; said blast-air conducting tube system having respective openings formed therein opposite respective ones of said perforations; each of said blast-air nozzles projecting through a respective one of said openings formed in said blast-air conducting tube system and defining an annular gap between said opening and said blast-air nozzle; and sealing means disposed in and sealing said annular gap.



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**5,497,988**

## GOLF DISTANCE MARKER

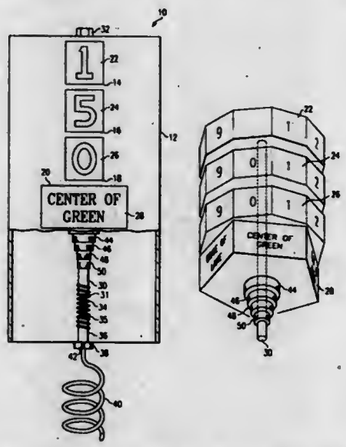
Philip A. Tolley, 4016 Tumbril Rd., Plano, Tex. 75023, and Kraig A. Walker, 2104 Brabant Dr., Plano, Tex. 75025

Filed Apr. 7, 1995, Ser. No. 418,553

Int. Cl.[6] A63B 57/00

U.S. Cl. 273—32 H

4 Claims




1. An adjustable distance marker for use on a golf course, comprising:

a housing including

a plurality of indicator openings;

a plurality of numeric distance indicators, disposed adjacent to the openings in the housing such that distance information on the distance indicators can be viewed through the openings in the housing an information indicator disposed adjacent to one of the openings in the housing so that information on the information indicator may be viewed through one of the openings in the housing; the information specifying a point from which the distance indicated by the numeric distance indicator is measured;

a distance selector dial operable to change the distance information displayed by the distance indicators; and

an information selector dial coupled to the information indicator and operable to change the information displayed by the information indicator.

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**5,497,989**

## BALL TROUGH FOR PINBALL GAMES

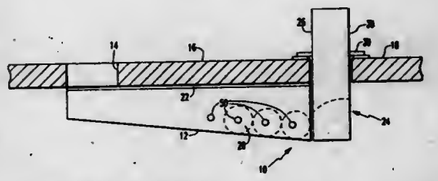
Mark D. Ritchie, Carol Stream; Ming D. Zhang, Des Plaines, and Robert S. Morrison, Elgin, all of Ill., assignors to CAP-COM Coin-Op, Inc., Arlington Heights, Ill.

Filed Feb. 10, 1995, Ser. No. 387,109

Int. Cl.[6] A63F 7/34

U.S. Cl. 273—118 R

5 Claims



1. A pinball game, comprising:

an inclined playfield supporting a rolling ball, a plurality of play features, a shooter lane for putting a ball in play and a drain hole allowing said ball to exit said playfield; and

a ball trough;

wherein said ball trough comprises:

a channel fixed to said playfield and having a first end adjacent said drain hole and a second end proximate to said shooter lane, said channel having a surface for supporting a row of balls thereon and positioned to cause said balls to roll from said first end to said second end by force of gravity; and

a rotatable carrier movable between a first position and a second position for carrying one of said balls from said channel to said shooter lane, said rotatable carrier having a load opening, an exit opening, and a passage therebetwen wherein said load opening is positioned adjacent said second end when said carrier is disposed in said first position and wherein said exit opening is disposed adjacent said shooter lane when said carrier is disposed in said second position.

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**5,497,990**

## METHOD FOR PLAYING A LOTTERY GAME USING CURRENCY BILLS

Liborio F. Nanni, 5707 Emerald Ridge Blvd., Lakeland, Fla. 33813-3296

Filed Nov. 4, 1994, Ser. No. 334,044

Int. Cl.[6] A63B 71/00

U.S. Cl. 273—138 A

9 Claims

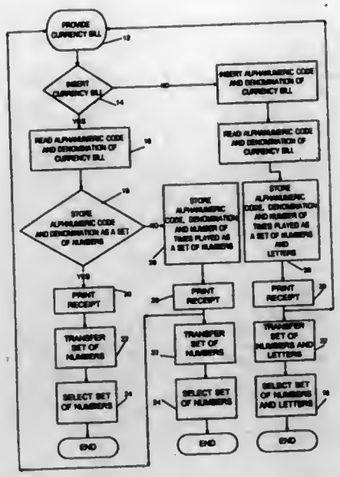
1. A method of playing a lottery game comprising the steps of:

(a) providing a currency bill bearing an alphanumeric code and denomination;

(b) inserting said currency bill into a means for reading the alphanumeric code and denomination of said currency bill;

(c) reading the alphanumeric code and denomination of said currency bill with said reading means of said inserting step;

(d) storing the alphanumeric code and denomination of said currency bill as a set of numbers in a means for storing;




(e) printing a receipt which bears said alphanumeric code and denomination of the currency bill inserted into said reading means with a means for printing a receipt;

(f) transferring the set of numbers from the storing means of said storing step to a means for randomly selecting a set of numbers; and

(g) randomly selecting a set of numbers from said transferred set of numbers in said selecting means of said transferring step, such that said set of numbers selected is the winning set of lottery numbers.

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**5,497,991**

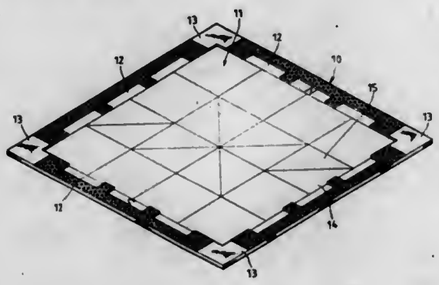
**CHANGEABLE MAZE GAME**

**Hua-Yu Huang, 5F 1, Lane 151 Sec. 3 Chien Kuo N. Road, Taipei, Taiwan, Prov. of China**

**Filed Jan. 25, 1995, Ser. No. 377,993**

**Int. Cl.[6] A63F *9/10***

**U.S. Cl. 273—157 R** **1 Claim**



1. A changeable maze game comprising:

a) a board of flat configuration provided with a square recess formed therein, the square recess being defined by four vertical edges and a bottom surface, the bottom surface being subdivided into a plurality of bottom squares provided with asymmetric light and dark portions;

b) a plurality of cards disposable within the square recess and alignable with the bottom squares, each card including a first surface and a second surface;

c) a plurality of grooves formed in the vertical edges of the square recess for permitting a user to remove cards positioned adjacent the vertical edges from the square recess;

d) the first sides of the cards being provided with different light and dark patterns for representing, respectively, passages and obstacles of a maze, each first side including at least one corner provided with a light pattern for defining an entrance of the maze and at least one light pattern at an opposite corner or a side of the first side for defining an exit of the maze; and

e) each second side of the card being provided with one of three forms of patterns, including a full dark pattern, a full light pattern, or a diagonally divided half dark pattern and half light pattern for forming characters.

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**5,497,992**

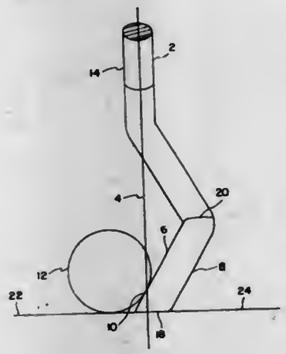
**GOLF CLUB AND SET HAVING SHAFT AXIS EXTENDING THROUGH IMPACT POINT**

**Harold A. Ritke, 1932 S. Kingsway Dr., Aurora, Ill. 60506**

**Filed Sep. 19, 1994, Ser. No. 308,221**

**Int. Cl.[6] A63B *53/02***

**U.S. Cl. 273—167 G** **10 Claims**




1. A golf club comprising a club shaft, a neck member having a first end and a second end, said club shaft having an adjacent end adjacent to said first end of said neck member, said first end of said neck member being connected to the said adjacent end of said club shaft, a club head having a bottom edge, a top edge, a toe end and an opposite heel end, said second end of said neck member being connected to said club head, said neck member extending upward beyond said top edge of said club head, said neck member having an elongated portion, said club head having a substantially planar club face lying in a club face plane for impact with a golf ball, said elongated portion of said neck member having a longitudinal axis extending at a diagonal forwardly from and at an angle to said club face plane, said club face having a preselected preferred impact point thereon which is upward from said bottom edge a vertical distance that is less than half the diameter of a said golf ball when said club face is in an address position adjacent a said golf ball for contact therewith, said club shaft having a longitudinal axis, said longitudinal axis of said club shaft when extended intersects the said longitudinal axis of said elongated portion of said neck member when extended and also intersects said preselected preferred impact point on said club face, wherein said preselected preferred impact point is at a point on said face of said club head substantially midway between said toe end and said heel end thereof.



**5,497,993**

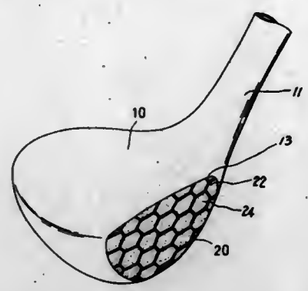
**STRUCTURE OF GOLF CLUB HEAD**

**Shiau S. Shan, 5Fl., No. 412-12, 2 Sec., Chung Shan Rd., Tai Peiping, Taichung, Taiwan, Prov. of China**

**Filed Mar. 14, 1994, Ser. No. 209,319**

**Int. Cl.[6] A63B *53/04***

**U.S. Cl. 273—167 H** **10 Claims**




1. A metal wood golf club head comprising a neck at one end for connecting a shaft and a face panel at one side for hitting a ball, wherein said face panel is comprised of a meshed member made of rigid metal bars defining a plurality of open spaces and a flexible blocking material filling said open spaces, at least a portion of said metal bars and said blocking material forming an exposed ball striking surface.

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**5,497,994**

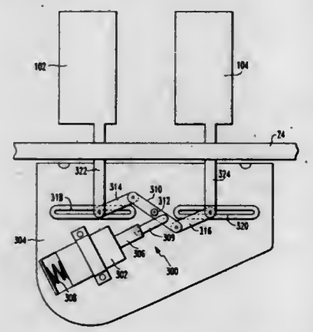
**PINBALL MOVABLE DOORS**

**Bryan P. Hansen, DesPlaines, and Rick Morgan, Arlington Heights, both of Ill., assignors to CAPCOM Coin-Op, Inc., Arlington Heights, Ill.**

**Continuation-in-part of Ser. No. 255,480, Jun. 8, 1994, Pat. No. 5,417,427. This application Feb. 10, 1995, Ser. No. 386,373**

**Int. Cl.[6] A63F *7/22***

**U.S. Cl. 273—121 A** **8 Claims**




1. In an amusement game, a device for moving a pair of movable objects comprising:

a solenoid having a plunger movable between an extended position and a retracted position;

an arm rotatable about a pivot point having first and second ends displaced from said pivot point, said arm being linked to said plunger at a point spaced from said pivot point;

a first link connected to said first end of said arm and adapted to move one of said movable objects; and

a second link connected to said second end of said arm and adapted to move the other of said movable objects;

wherein movement of said plunger between said extended position and said retracted position causes rotation of said arm and simultaneous movement of both of said movable objects.

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**5,497,995**

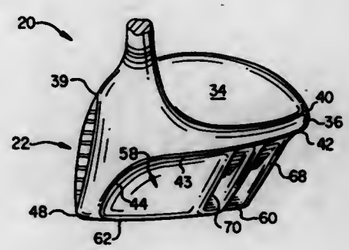
**METALWOOD WITH RAISED SOLE**

**Charles T. Swisshelm, 1422 Ballard La., Tustin, Calif. 92680**

**Filed Jul. 29, 1994, Ser. No. 283,047**

**Int. Cl.[6] A63B *53/04***

**U.S. Cl. 273—172** **17 Claims**




15. A metal wood golf club head, comprising:

a toe portion and a heel portion;

a ball-striking face having a top edge, a bottom edge, and a center of percussion located at an approximate center of the face and having a vertical level thereat, the center of percussion further comprising a first extremity closer to the heel portion and a second extremity closer to the toe portion;

a narrow rear surface having an upper edge and a bottom edge;

a top surface extending from the top edge of the face to the top edge of the narrow rear surface; and

a sole plate comprising a narrow leading edge extending substantially horizontally from the bottom edge of the face, a base extending substantially horizontally from the bottom edge of the narrow rear surface, and a sloped surface extending at an angle to connect the base and the narrow leading edge, wherein the base has substantially the same vertical level as the center of percussion;

two rails extending downwardly from the base of the sole plate, each rail comprising a bottom surface and two substantially vertical side walls connected by the bottom surface, wherein each bottom surface extends substantially horizontally from the narrow leading edge of the sole plate to support the club head when the club head is rested on the ground, and wherein a first rail is positioned behind the face at approximately the first extremity, and a second rail is positioned behind the face at approximately the second extremity.

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**5,497,996**

**GOLF BALL**

**Lauro C. Cadorniga, Piedmont, S.C., assignor to Dunlop Slazenger Corporation, Greenville, S.C.**

**Filed Sep. 30, 1994, Ser. No. 316,258**

**Int. Cl.[6] A63B *37/06;37/12;37/14***

**U.S. Cl. 273—226** **15 Claims**

1. A two-piece golf ball having a core and a cover, said ball having

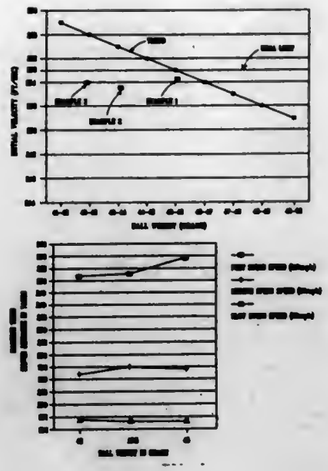
a weight of 41–44.5 grams; and

a diameter of about 1.68 inches;

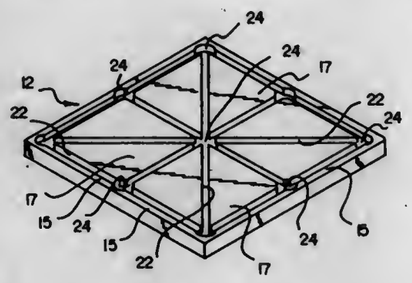
said core having a specific gravity of 1.01–1.09;

said cover having a specific gravity of 0.90–0.98; and

said cover having a Shore D hardness of 40–65.

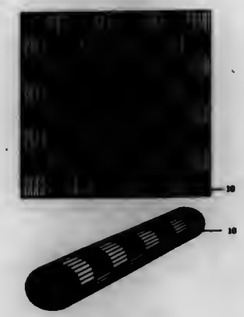


5,497,997
**CAPTIVE-TRACK GAME APPARATUS**
Dimitrios Nikas, 2891 8th Avenue, Port Alberni, British Columbia, Canada, and Harry Jakoncic, 2831 14th Avenue, Port Alberni, British Columbia, Canada
Filed Apr. 13, 1995, Ser. No. 421,527
Int. Cl.[6] A63F *3/00*
U.S. Cl. 273—264 9 Claims




1. An alignment game apparatus, comprising:
a game board assembly which includes a base portion and a plurality of piece-guidance portions located on top of said base portion, wherein said piece-guidance portions include bottom guiding portions supported by said base portion and include top guiding portions supported by said bottom guiding portions, wherein said top guiding portions extend outward beyond said bottom guiding portions, such that grooves are formed by said top guiding portions, said bottom guiding portions, and said base portion, wherein said piece-guidance portions are spaced apart from each other on said base portion so that guidance channels are provided between adjacent piece-guidance portions and so that game-piece-reception areas are provided at selected positions on said base portion, wherein said guidance channels have a smaller width than said game-piece-reception areas, and
a plurality of game pieces adapted to be placed on said base portion, wherein each of said game pieces includes a foot portion, a body portion extending upward from said foot portion, and a head portion supported by said body portion, wherein each foot portion is sized to be received by said game-piece-reception areas and said grooves on said base portion, wherein each body portion is sized to be received by and guided by said guidance channels provided by said piece-guidance portions.

5,497,998
**ROLL UP GAME BOARD AND METHOD FOR MAKING THE SAME**
Walter J. Horton, P.O. Box 2873, Salt Lake City, Utah 84101
Filed Sep. 15, 1994, Ser. No. 306,634
Int. Cl.[6] A63F *3/00*
U.S. Cl. 273—285 9 Claims




1. A game board comprising;
a series of adjacent rectangular segments, each segment having a top and bottom horizontal surface and two side surfaces each being vertical to the top and bottom surfaces,
a sheet of flexible material having the bottom surfaces of said series of segments adhered thereto such that the side surfaces of the segments abut one another in a side by side relationship,
said top surfaces of said segments having game indicia applied thereto,
whereby the game board maintains a rigid existence when supported in one direction and is flexible when supported from another.

5,497,999
**METHOD OF PLAYING A CARD GAME TEACHING GOLF RULES**
Charles P. Stewart, and Constance M. Stewart, both of 141 Brookside Ave., Caldwell, N.J. 07006
Filed Apr. 3, 1995, Ser. No. 415,551
Int. Cl.[6] A63F *1/00*
U.S. Cl. 273—298 20 Claims

17. A method of teaching the rules of the game of golf employing a deck of cards, each of which cards has a front and a back, each card having a golf game playing situation on the front and a corresponding rule or solution to the situation on the back, the method comprising:
dealing the same number of cards to each of a plurality of teams of players, each team receiving the same number of the same par value cards; and
a) drawing a card and reading by one player of a team the situation on the drawn card;
b) causing a player from another team to declare the answer to the situation on the drawn card;
c) assigning a + value to the team of that player declaring the correct answer;
d) discarding that drawn card from the dealt cards of the team drawing the card;
f) repeating steps a–e for each team in sequence until all cards have been played; and
declaring the winner the team with the most + points.



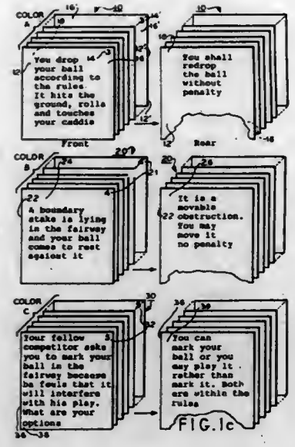
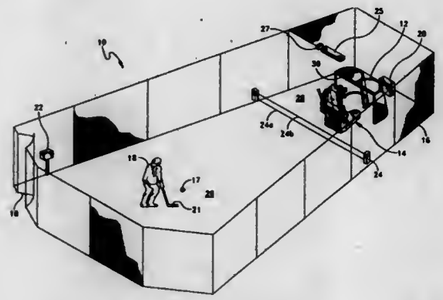


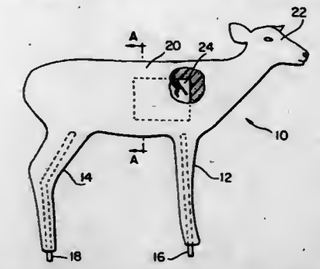
FIG. 1c

5,498,000
**GOALTENDER SIMULATOR SYSTEM**
Gregory Cuneo, 49 Balcom St., Mansfield, Mass. 02048
Filed Apr. 17, 1995, Ser. No. 425,033
Int. Cl.[6] A63B *69/00*
U.S. Cl. 273—354 27 Claims



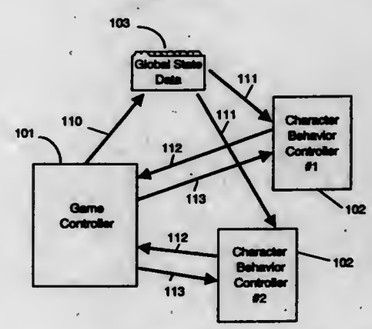
1. A goaltender simulator system, comprising:
a launch area from which an object, having a predetermined color, can be accelerated;
a goal distanced from the launch area in the direction of travel of said object;
a goaltender figure positioned in front of said goal;
said goaltender figure being movable in front of said goal;
a camera positioned to view said travel of said object;
said camera including an output signal;
filter means connected to said output signal for filtering out all colors other than said predetermined color of said object to generate a filtered signal; and
computer control means electrically connected to said digital camera for receiving said filtered signal to generate object trajectory data to move said goaltender figure into the trajectory of said object.

5,498,001
**ARCHERY TARGET**
Johnny D. Franks, 2306 Middle Creek, Kingwood, Tex. 77339, and Richard Kinas, 847 FM 1314 #706, Porter, Tex. 77365
Filed Mar. 10, 1993, Ser. No. 29,387
Int. Cl.[6] F41J *3/00*
U.S. Cl. 273—403 9 Claims




1. A three dimensional archery target simulating an animal comprising a body portion, a head portion and leg portions molded of foam material in a single unit where said body portion has a vertical median plane extending lengthwise of the body and at least one layer of penetration resistant cloth is integrally molded in said body portion with entire surface of said cloth disposed in direct intimate contact with said foam material and disposed in said median plane coextensive with a desired target area with the edges of the cloth spaced from outer surfaces of said body portion.

5,498,002
**INTERACTIVE ELECTRONIC GAMES AND SCREEN SAVERS WITH MULTIPLE CHARACTERS**
Jerry Gechter, Eight Ridge Rd., Lincoln, Mass. 01773
Filed Oct. 7, 1993, Ser. No. 133,644
Int. Cl.[6] A63F *9/22*
U.S. Cl. 273—434 31 Claims




1. Interactive, electronic game apparatus for playing a game in which game characters appearing on a display are responsive to inputs from a game user, said apparatus comprising:
a visual display presenting an observable state of said game and of said game characters to said game user in response to a display signal,
an input device for interactively entering user input signals representative of user interaction with game characters, and
processing means receiving said user input signals from said input device and generating said display signal and outputting said display signal to said visual display, said processing means including

an extensible plurality of independent character behavior controllers for determining the behavior of respective said game characters, each said character behavior controller containing independent behavior logic to determine states and state transistions of its respective game character as represented to said user by said display means, said character behavior controllers being responsive to said user input signals and to game control signals for adjusting the behavior of said respective game characters,

a game controller for coordinating the behavior of said game characters, the game controller containing logic to determine consistent game states for said game and said characters, and communicating said game control signals to said character behavior controllers so that the state of said game and of said game characters is a consistent game state,

an operating system for operation of said character behavior controllers and said game controller on said processing means,

each said character behavior controller including an independent application process as defined by said operating system of said processing means,

said game controller including logic to add new character behavior controllers to said game.

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**5,498,003**

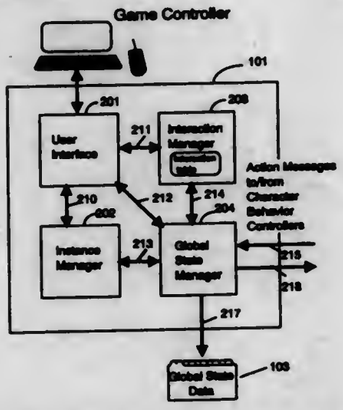
**INTERACTIVE ELECTRONIC GAMES AND SCREEN SAVERS WITH MULTIPLE CHARACTERS**

**Jerry Gechter, Eight Ridge Rd., Lincoln, Mass. 01773**

**Continuation-in-part of Ser. No. 133,644, Oct. 7, 1993. This application Dec. 16, 1993, Ser. No. 168,667**

**Int. Cl.[6] A63F 9/22**

**U.S. Cl. 273—434** **36 Claims**




1. Interactive, electronic game apparatus for playing a game in which game characters appearing on a display are responsive to inputs from a game user, said apparatus comprising:

a visual display presenting an observable state of said game and of said game characters to said game user in response to a display signal,

an input device for interactively entering user input signals representative of user interaction with game characters, and

processing means receiving said user input signals from said input device and generating said display signal and outputting said display signal to said visual display, said processing means including

an extensible plurality of independent character behavior controllers for determining the behavior of respective said game characters, each said character behavior controller containing independent behavior logic to determine states and state transitions of its respective game character as represented to said user by said display means, said character behavior controllers being responsive to said user input signals and to game control signals for adjusting the behavior of said respective game characters,

a game controller for coordinating the behavior of said game characters, said game controller containing logic to determine consistent game states for said game and said characters, and communicating said game control signals to said character behavior controllers so that the state of said game and of said game characters is a consistent game state,

an operating application for operation of said character behavior controllers and said game controller on said processing means,

each said character behavior controller including an independent dynamically-linked procedure invoked by said operating application,

said game controller including logic to add new character behavior controllers to said game.

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**5,498,004**

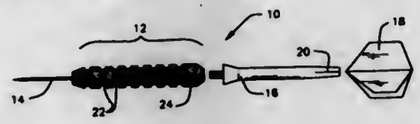
**GAME DART**

**Gaetano Mariella, Wayne; Ronald Kurtz, Englewood, and Henry Utzinger, Ridgewood, all of N.J., assignors to Kulite Tungsten Corporation, East Rutherford, N.J.**

**Continuation of Ser. No. 84,420, Jun. 29, 1993, abandoned, which is a continuation-in-part of Ser. No. 769,287, Sep. 30, 1991, abandoned. This application Jan. 17, 1995, Ser. No. 373,870**

**Int. Cl.[6] A63B 65/02**

**U.S. Cl. 273—416** **14 Claims**




1. A method of manufacturing a dart barrel with a wear resistant textured gripping surface, said method comprising the steps of:

forming a dart barrel from a metallic material of a given hardness;

providing a particulate material;

heating said particulate material into a semi-molten state;

spraying said particulate material in said semi-molten state onto an outer surface of said dart barrel to form a textured porous coating thereon, wherein said textured porous coating removes moisture from a finger-to-dart barrel interface with a wick-type action when a person's fingers grasp said dart barrel; and

heating said dart barrel to diffuse said particulate material into said outer surface thereof to bond said coating of particulate material to said dart barrel at the atomic level.

10. A dart barrel for a dart, comprising:

a metal dart barrel of a given hardness having an outer surface of a given coefficient of friction; and

a textured porous coating of particulate material diffusion bonded to said outer surface of said metal dart barrel, wherein said textured porous coating provides said metal dart barrel with a gripping surface having a greater coefficient of friction than said outer surface and removes moisture from a finger-to-dart barrel interface with a wick-type action when a person's fingers grasp said dart barrel.

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**5,498,005**

**CIRCULAR PEGBOARD STRATEGY GAME**

**Alexander A. Jacques, 5656 Wood St., Port Orange, Fla. 32127**

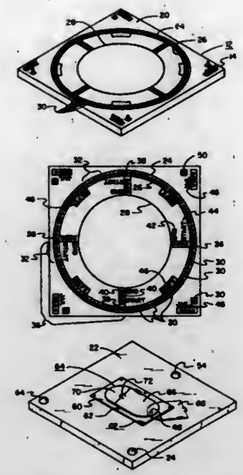
**Filed Nov. 23, 1994, Ser. No. 344,018**

**Int. Cl.[6] A63F 3/00**

**U.S. Cl. 273—248** **5 Claims**

2. A circular pegboard strategy game comprising:





a playing board formed in a generally rectangular configuration with four corners, an upper surface and a lower surface, the board having several large circles of varying diameters imprinted on its upper surface, the area between the two outermost circles including a plurality of generally circular peg holes arranged in one contiguous row, the peg holes being arranged in a plurality of sets, each set having several peg holes, a plurality of start/end blocks being positioned around the board and including several radially extending peg holes arranged in one contiguous row, each of the four corners of the game board including a plurality of peg holes encased within a rectangular structure and positioned in parallel orientation with a side edge of the game board, a plurality of plastic pegs formed in a long generally spherical configuration, the pegs being arranged in four separate color groups, a standard set of playing cards consisting of fifty-two separate cards, a set of written instructions informing the users how to play the game, the ultimate object of the game being to get four pegs out of jail and into the end block; and

the lower surface of the board including a recessed storage area, the storage area being adapted to house accessories of the apparatus, the storage area having a plate covering it, the plate having a plurality of screw holes around its perimeter, the plate having an oval shaped cover split into two separate semicircular shaped pieces, a first piece including an axle to permit rotation of the first piece to an open position, and the first piece also including a coupling means to permit secure fastening of the first piece to the second piece in a closed position.

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**5,498,006**

**PINNED UNITARY BEARING SEAL**

**David C. Orlowski, Milan, Ill., assignor to Inpro Companies, Inc., Rock Island, Ill.**

**Filed May 12, 1995, Ser. No. 439,770**

**Int. Cl.[6] F02F 11/00; F16J 15/48**

**U.S. Cl. 277—53** **8 Claims**

1. A seal between a fixed housing and a rotating shaft comprising:

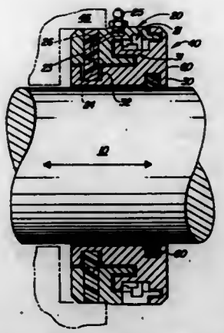
a) a fixed housing;

b) a shaft;

c) a first ring member surrounding said shaft and affixed to said housing;

d) a plurality of annular grooves and flanges extending axially at a first portion of said first ring member;

e) a plurality of radial holes in a second portion axially removed from said first portion of said first ring member;



f) a second ring member rotatable with said shaft;

g) a plurality of annular grooves and flanges extending axially in a first axial portion of said second ring member and mating in a complimentary manner with said flanges and grooves in said first ring member forming a labyrinth channel between said first and second ring members;

h) an annular recess in a second axial portion of said second ring member opposite said holes in said first ring member;

i) a plurality of pins; and

j) said pins inserted in said holes of said first ring member and projecting into said recess of said second ring member.

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**5,498,007**

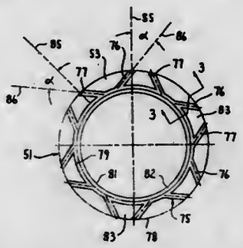
**DOUBLE GAS BARRIER SEAL**

**Sunil B. Kulkarni, Portage, and Randy R. Dingman, Schoolcraft, both of Mich., assignors to Durametallic Corporation, Kalamazoo, Mich.**

**Filed Feb. 1, 1994, Ser. No. 189,794**

**Int. Cl.[6] F16J 15/34**

**U.S. Cl. 277—96.1** **19 Claims**



1. In a gas barrier type double seal arrangement for sealing cooperation between a rotatable shaft and a housing to prevent leakage of product from an equipment chamber into the environment, said seal arrangement including an inner seal assembly coacting between the shaft and housing for preventing leakage of product into an intermediate chamber defined within the housing generally adjacent and partially surrounding the inner seal assembly, an outer seal assembly disposed axially outwardly of the inner seal assembly and coacting between the housing and shaft for preventing leakage from the intermediate chamber into the environment, each seal assembly including stator and rotor rings which are respectively nonrotatably secured to the housing and shaft in substantially concentric relationship relative to the shaft, the stator and rotor rings of each seal assembly having opposed axially-oriented contacting annular seal faces disposed in relatively rotatable sliding and sealing engagement with one another, and an inlet in communication with the intermediate chamber for supplying a pressurized inert barrier gas into said chamber, the improvement wherein the annular seal face on the rotor ring of said outer seal

assembly has a deep groove arrangement therein in communication with the barrier gas of said intermediate chamber for effecting cooling of and minimizing contact pressure between the opposed seal faces of said outer seal assembly, said groove arrangement including a plurality of first straight grooves formed in the respective seal face in substantially uniformly angularly spaced relation therearound, a plurality of second straight grooves formed in the respective seal face in substantially angularly spaced relation therearound, said second grooves being individually positioned between an angularly adjacent pair of first grooves, said first grooves being individually positioned between an angularly adjacent pair of second grooves, said first and second grooves having radially outer ends which communicate with an outer diameter of the respective seal face, each of said first and second grooves projecting radially inwardly of the respective seal face from the respective outer end and having a longitudinally extending centerline which intersects at said outer end with a respective radial direction of said respective seal face so as to define an acute entrance angle therebetween, said first grooves being angled relative to the respective radial direction in one direction circumferentially around the respective seal face, said second grooves being angled relative to the respective radial direction in an opposite direction to said one direction circumferentially around the respective seal face, at least circumferentially adjacent said first and second grooves having radially inner ends which are in communication with one another to define a flow path for said barrier gas when said rotor ring is rotating, one of said circumferentially adjacent first and second grooves defining an upstream portion of said flow path and the other of said circumferentially adjacent first and second grooves defining a downstream portion of said flow path, and said first and second grooves having a depth of at least about 0.04 inch to create a hydrostatic force therein which reduces the contact pressure between the opposed contacting seal faces due to the presence of said barrier gas in said grooves.

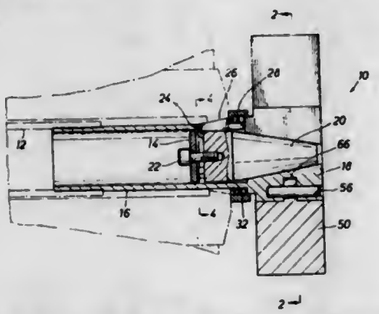
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**5,498,008**

## CHUCK JAW LOCKING APPARATUS FOR ROTATABLE MACHINE TOOL

**R. Lee Chase, 16531 Wilderness, Cypress, Tex. 77429, and Russell C. Chase, 6626 Guhn, Houston, Tex. 77040**

**Filed Aug. 12, 1994, Ser. No. 289,765**
**Int. Cl.[6] B23B *31/20;31/16***
**U.S. Cl. 279—153** **19 Claims**



1. A machine tool chuck jaw mounting system comprising:
(a) a demountable chuck having at least two removable and replaceable master jaws;
(b) at least two soft jaws fixedly anchored with respect to the master jaws to support a work piece; and
(c) a registration means releasably holding the soft jaws with respect to the master jaws in repetitive fashion to assure that the soft jaws, after removal and reinstallation, are returned to a registered position with respect to the master jaws said registration means comprising:
(1) a registration pin on said master jaw and having an external surface defining a first clamping surface;
(2) a spaced registration member and a cooperative receiving surface located to define a second clamping surface;
(3) an alignment area on said master jaws for receiving and fixedly holding said soft jaws;
(4) wherein said first and second clamping surfaces cooperative with a registration pin prevent soft jaw movement after installation;
(5) a tapered point on a set screw to engage a co-acting chamfered surface to force soft jaw registration;
(6) wherein registration is in three dimensions; and
(7) wherein radial jaw movement restrains the work piece.

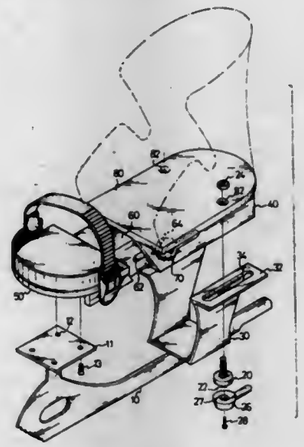
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**5,498,009**

## ICE SKATE WITH AN EXTENDIBLE SOLE PLATE

**Gang Young, No. 19, Lane 90, Chingli St, Tucheng Hsiang, Taipei Hsien, Taiwan, Prov. of China**

**Filed Jun. 14, 1995, Ser. No. 490,244**
**Int. Cl.[6] A63C *1/06***
**U.S. Cl. 280—11.12** **4 Claims**



1. An ice skate comprising:
an extendible sole formed of a front plate and a rear plate having a plurality of straps provided on the front plate and the rear plate for holding a user's foot;
a longitudinal receptacle formed under the rear plate;
a plurality of bores defined in walls of the receptacle;
a plurality of holes defined on the rear plate;
a longitudinal extension member provided under the front plate and protruding out of the front plate so as to be slidably received by the receptacle;
a plurality of longitudinal slots, facing the bores on the walls of the receptacle, formed on the extension member;
a first corresponding number of screws extending through the bores on the walls of the receptacle and the longitudinal slot for slidably adjusting a length of the sole and securing the front plate in place;
a blade integrally formed of a fixation board adhered under the front plate and a stanchion having a plurality of longitudinal grooves facing the boles on the rear plate; and
a second corresponding number of screws extending through the longitudinal grooves and the holes on the rear plate for slidably adjusting the blade in accordance with the length of the sole and securing the blade in place.

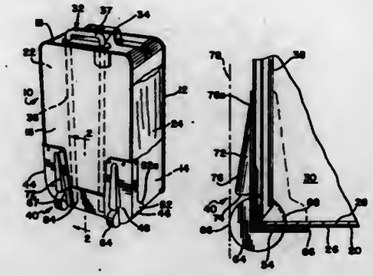


**5,498,010**

## EDGE BUMPER GUARD AND ROLLER WHEEL ASSEMBLY FOR ROLLABLE SUITCASE

**Thomas L. Stube, Iowa Falls, Iowa, assignor to Boyt Limited Partnership, Iowa Falls, Iowa**

**Filed Mar. 22, 1994, Ser. No. 216,650**
**Int. Cl.[6] B62B *1/16***
**U.S. Cl. 280—37** **2 Claims**



1. An edge bumper guard assembly for a rollable suitcase to protect the suitcase from damage by contact with obstructions as the suitcase is rolled along a surface, the suitcase having a body with front and rear panels spaced from each other and interconnected by opposing top and bottom panels and opposing left side and right side panels, the assembly comprising:
a rigid left guard having,
a rear plate portion extending about a portion of the rear panel,
a left wheel rotatably mounted to said rear plate portion in close proximity to the left panel, said left wheel having an outer rim,
a left plate portion extending about a portion of the left panel to protect said left wheel from impacts with the obstructions, a portion of said outer rim of said left wheel extending outward from said rear plate portion,
a bottom plate portion integrally attached to said left plate portion and said rear plate portion of said left guard, said bottom plate portion extending about a portion of said bottom panel, and
a triangular shaped ramp attached to said rear plate portion and extending generally vertically upward from said left wheel, said triangular shaped ramp having a base and ramping surface, said base and ramping surface joined at a ramp edge, wherein said outer rim of said left wheel protrudes beyond said ramp edge;
a rigid right guard having,
a rear plate portion extending about a portion of the rear panel,
a right wheel rotatably mounted to said rear plate portion in close proximity to the right panel, said right wheel having an outer rim,
a right plate portion extending about a portion of the right panel to protect said right wheel from impacts with the obstructions, a portion of said outer rim of said right wheel extending outward from said rear plate portion,
a bottom plate portion integrally attached to said right plate portion and said rear plate portion of said right guard, said bottom plate portion extending about a portion of said bottom panel, and
a triangular shaped ramp attached to said rear plate portion and extending generally vertically upward from said right wheel, said triangular shaped ramp having a base and ramping surface, said base and ramping surface joined at a ramp edge, wherein said outer rim of said right wheel protrudes beyond said ramp edge; and
an extension guard panel separately formed from, but extending between and fixedly connected to said left guard and said right guard, said extension guard panel includes a generally planar rear portion which extends between and is rigidly connected to said rear plate portion of said left guard and said rear plate portion of said right guard, whereby said left guard and said right guard can be adjusted to fit suitcases of various widths.

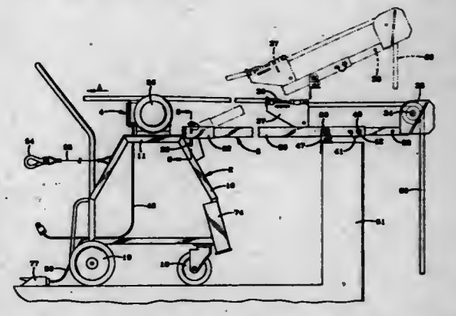
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**5,498,011**

## LIFELINE RETRIEVAL DEVICE

**Ashraf N. Kilada, Malverne, N.Y.; Michael J. Burlingame, E. Liverpool, and Steven D. Belaney, E. Palestine, both of Ohio, assignors to American Safety Products, Inc., Baldwin, N.Y.**

**Filed Feb. 2, 1994, Ser. No. 190,281**
**Int. Cl.[6] A62B *1/10; E04G 3/10***
**U.S. Cl. 280—47.34** **19 Claims**



1. A device for retrieving a lifeline from the side of a building including:
a mobile cart adapted for movement on a roof of a building;
a davit arm pivotally mounted on said cart, said davit arm including a sheave mounted on an extended end of the arm;
take-up drum means mounted on the cart for retrieving a length of lifeline extending from said drum means and along the davit arm and along the side of the building;
a line grab clamp mounted on the davit arm inboard of the shears; and
motor means for rotating the drum means to retrieve the lifeline from along the side of the building.

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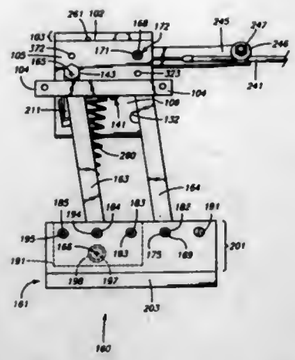
**5,498,012**

## CONVERTIBLE VEHICLE STEP

**Patrick K. McDaniel, and Gale E. McDaniel, both of Richland, Wash., assignors to McDaniel Manufacturing, Inc., Richland, Wash.**

**Continuation-in-part of Ser. No. 80,952, Jun. 21, 1993, Pat. No. 5,375,864. This application Jun. 21, 1994, Ser. No. 263,926**
**Int. Cl.[6] B60R *3/02***
**U.S. Cl. 280—166** **14 Claims**

1. A step assembly for a vehicle, the vehicle having an actuating mechanism for actuating movement of the step assembly between an extended position and a retracted position, the retracted position being located below the lateral underside of the vehicle, the step assembly comprising:
a. a step;
b. a mounting bracket including means suitable for rigidly attaching the mounting bracket to the underside of the vehicle, the means being capable of assembly;
c. at least one swing arm pivotably connected at one end to the mounting bracket and pivotably connected at the other end to the step, to permit the step to be lowered and raised between the extended position and the retracted position, the pivotable connections of the at least one swing arm to the mounting bracket and to the step being capable of assembly;
the pivotable connection of the at least one swing arm to the mounting bracket having an axis of rotation defining a swing



path for the at least one swing arm and the step, the swing path having a generally longitudinal direction relative to the vehicle;

the pivotable connection of the at least one swing arm to the step for positioning the step substantially flush with the lateral underside of the vehicle when the step assembly is in its retracted position;

d. an extension and retraction operator connected to the step assembly and to the actuating mechanism, the operator having first means for responding to the actuating mechanism and having second means for causing the step to travel between the extended position and the retracted position; and

e. multiple complementary mounting apertures in the step assembly for allowing the step assembly to be attached to either the port side or the starboard side of the vehicle, the multiple complementary mounting apertures positioned to cause the step to travel from the extended position to the retracted position in the same longitudinal direction relative to the vehicle when the step assembly is attached to the starboard side of the vehicle, as when the step assembly is attached to the port side of the vehicle.

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**5,498,013**

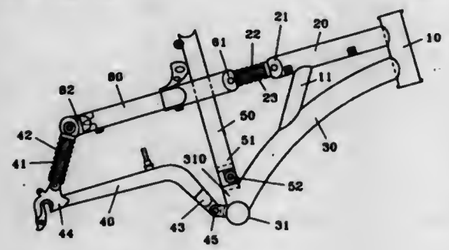
**BICYCLE FRAME HAVING SHOCK ABSORBING DEVICE**

**Chiuon T. Hwang, 5F No. 13 Lane 264, Jing De Road, An Chiuan Village, Shin Juang City, Taipei County, Taiwan, Prov. of China**

**Filed Dec. 12, 1994, Ser. No. 354,253**

**Int. Cl.[6] B62K** *3/02*

**U.S. Cl. 280—283** **3 Claims**



1. A bicycle frame comprising:

a head tube,

a top tube including a first end fixed to said head tube and including a second end,

a down tube including a first end fixed to said head tube and including a second end having a bottom bracket secured thereto,

a seat tube including a lower end pivotally coupled to said bottom bracket at a first pivot axle,

a seat stay including a first end portion fixed to said seat tube so as to form a middle frame, and said seat stay including a second end, said middle frame being rotatable relative to said bottom bracket about said first pivot axle,

a chain stay including a first end pivotally coupled to said bottom bracket at a second pivot axle and including a second end, said chain stay being rotatable relative to said bottom bracket about said second pivot axle,

a first shock absorbing means secured between said second end of said top tube and said middle frame so as to allow said middle frame to rotate relative to said bottom bracket about said first pivot axle and so as to absorb shocks transmitted between said middle frame and said top tube and said down tube, and

a second shock absorbing means secured between said second end of said seat stay and said second end of said chain stay so as to allow relative movement between seat stay and said chain stay and so as to absorb shocks transmitted between said middle frame and said chain stay.

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**5,498,014**

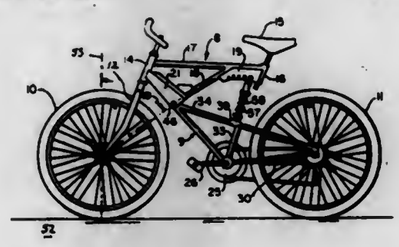
**BICYCLE INCORPORATING BIFURCATED FRAME**

**Joseph E. Kulhawik, 10636 Landale St., North Hollywood, Calif. 91602, and Thomas E. Lee, 11661 Pendleton St., Sun Valley, Calif. 91352**

**Continuation-in-part of Ser. No. 78,351, Jun. 21, 1993. This application Sep. 23, 1994, Ser. No. 311,047**

**Int. Cl.[6] B62K** *3/02*

**U.S. Cl. 280—284** **6 Claims**



1. A bicycle comprising:

(a) a front frame having a steering assembly coupled to a front wheel, a seat for holding a rider, a top tube secured intermediate the seat and steering assembly, a support tube secured to and extending forwardly and downwardly from said top tube, a pivot plate secured intermediate the support tube and steering assembly and having an aperture disposed therethrough forwardly from said support tube to said steering assembly and a gusset having a top and bottom edge, the top edge being secured to the top tube and support tube and including an aligned plurality of spaced apertures disposed therethrough adjacent the bottom edge thereof;

(b) a rear frame having a crank and pedal assembly including a crank housing, said crank and pedal assembly being rotatably coupled to a rear wheel, first and second rear arms extending rearwardly from the crank housing and being disposed on either side of the rear wheel, a front stay secured to and extending upwardly from the crank housing, a pair of rear stays secured to said front stay and extending rearwardly, each of said rear stays being coupled to a respective one of said rear arms at the rear wheel, a center stay secured to the front stay and rear stays and an extension member secured to and extending forwardly from said center stay;

(c) means for pivotally coupling the extension member of said rear frame to said pivot plate at the location of the aperture disposed through said pivot plate; and

(d) resilient means for damping the relative movement between the front frame and rear frame, said resilient means being coupled between the center stay of the rear frame and the gusset of said front frame.



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**5,498,015**

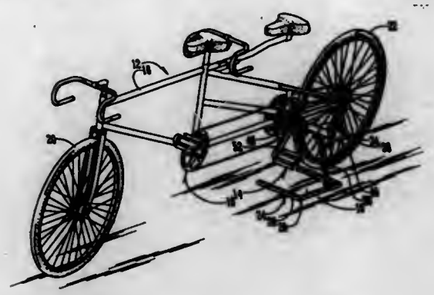
**BICYCLE STAND**

**Jerry J. Trout, 305 N. 9th St., and Paul G. Borthwick, 214 Rainbow Dr., both of Marshalltown, Iowa 50158**

**Filed Mar. 30, 1995, Ser. No. 413,606**

**Int. Cl.[6] B62H** *1/02*

**U.S. Cl. 280—293** **8 Claims**



1. A bicycle stand comprising,

a ground engaging base having an upwardly extending post, said post having upper and lower ends with said lower end connected to said base,

lock means on the upper end of said post for operatively engaging a bicycle crank arm axle on one side of said bicycle only, to support a bicycle wheel off the ground and allow for full rotation of a bicycle crank arm relative to said stand, and

said lock means having first threads adapted to threadably engage dust cover threads in said crank arm when a crank arm dust cover is removed.

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**5,498,016**

**PROCESS FOR MANUFACTURING A SKI INCORPORATING AN INJECTED CORE AND A PERFORATED INTERNAL REINFORCEMENT, AND SKI OBTAINED BY THIS PROCESS**

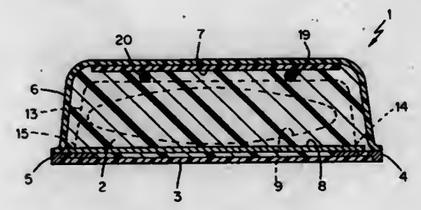
**François Jodelet, Voiron, France, assignor to Skis Rossignol S.A., France**

**Filed Jan. 3, 1994, Ser. No. 176,441**

**Claims priority; application France, Jan. 19, 1993, 93 00685**

**Int. Cl.[6] A63C** *5/14*

**U.S. Cl. 280—602** **16 Claims**



1. A ski comprising:

a core of injected synthetic material;

an internal reinforcement member embedded in said core, said member comprising a largely perforated fabric of fibrous material having a malleable metallic armature of spaced apart metal wires which provide easy, remnant pre-deformation in order to pre-shape said member; and

spacer members embedded in said core for positioning said internal reinforcement member within said core a distance from an upper part of said ski, said upper part including at least an upper shell of said ski, said spacer members comprising one of beads and pellets of a pasty, sticky material.

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**5,498,017**

**MONITORING AND/OR CONTROLLING DEVICE FOR A COUPLING DEVICE BETWEEN A BOOT AND A PIECE OF SPORTS APPARATUS IN PARTICULAR SKI BINDING**

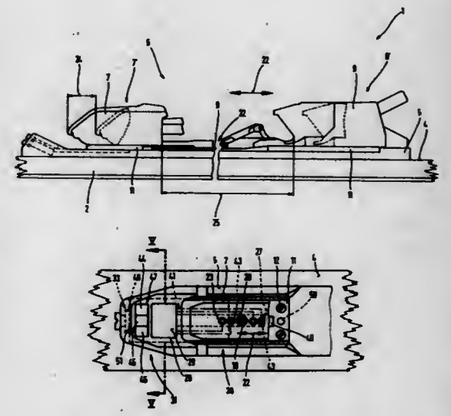
**Alois Rohrmoser, Wagrain, Austria, assignor to Varpat Patentverwertungs AG, Littau, Switzerland**

**Filed Aug. 13, 1993, Ser. No. 106,430**

**Claims priority, application Austria, Aug. 19, 1992, 1674/92**

**Int. Cl.[6] A63C** *9/088;11/00*

**U.S. Cl. 280—633** **27 Claims**



1. An adjustable coupling device for coupling a boot having a toe and a heel to a sports apparatus, which comprises

(a) a toe clamp,

(b) a heel clamp,

(c) guiding elements connected to the sports apparatus and defining a guideway for the toe and heel clamps for displacement of the clamps in a longitudinal direction,

(d) a longitudinally adjustable band-shaped connecting element connecting the toe and heel clamps to each other for common displacement along the guideway,

(e) an adjusting device for lengthwise adjustment of the connecting element to maintain the toe and heel clamps at an adjusted distance from each other,

(f) a fixing device including

(1) a stopping element and

(2) several longitudinally spaced openings in one of the guiding elements, each of the openings defining a preset fixed position of one of the clamps upon engagement of the stopping element with a respective one of the openings, and

(g) a monitoring device indicating a zero position and including

(1) a display device,

(2) an electric energy source, and

(3) a measuring device adjacent each one of the openings and generating a signal upon engagement by the stopping element in the respective opening, the measuring device being electrically connected to the energy source and the display device whereby the signal is transmited to the display device to display a respective one of the fixed positions and the fixed position in relation to the indicated zero position.

**5,498,018**

## WHEEL SUSPENSION

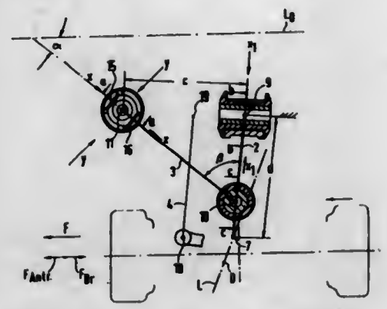
George Wahl, Pforzheim; Matthias Dietz, Bietigheim-Bissingen; Norbert Schote, Ammerbuch; Robert Klosterhuber, Stuttgart; Karl Sommerer, Wiernsheim, and Reinhard Kunert, Weissach, all of, Germany, assignors to Dr. Ing. h.c.F. Porsche AG, Weissach, Germany

Filed Nov. 29, 1994, Ser. No. 350,040

Claims priority, application Germany, Nov. 29, 1993, 43 40 557.6

Int. Cl.[6] B62D 7/16

U.S. Cl. 280—673 21 Claims



1. Wheel suspension for a motor vehicle comprising:
a wheel carrier for carrying a wheel rotatable about a wheel spin axis,
a McPherson spring strut springingly supporting the wheel carrier at a vehicle body,
a steering gear tie rod extending below the wheel spin axis and connected to the wheel carrier,
a transverse control arm connected to the wheel carrier by a first joint connection and connected to a vehicle frame part by a second joint connection, and
a tension strut connected pivotably to the transverse control arm by a third joint connection and to a vehicle frame part by a fourth joint connection,
wherein the transverse control arm with the connected tension strut is arranged in an approximately horizontal plane and extends below the wheel spin axis approximately in a wheel center transverse plane, the tension strut extending at an angle diagonally with respect to a vehicle longitudinal center axis,
wherein the transverse control arm is spaced longitudinally and vertically with respect to the tie rod and is disposed longitudinally behind the tie rod with respect to the vehicle forward driving direction, and
wherein the third joint connection bearing allows a movement between the tension strut and the transverse control arm and has a softer characteristic in the radial direction than the second joint connection bearing.

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**5,498,019**

## SUSPENSION SYSTEM FOR CONTROLLING LATERAL DISPLACEMENT OF A WHEEL

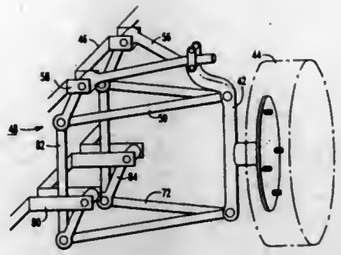
Henri Adato, 6 Fanton Hill Rd., Weston, Conn. 06883

Filed Dec. 15, 1994, Ser. No. 356,579

Int. Cl.[6] B60G 3/26

U.S. Cl. 280—675 22 Claims

1. A wheel suspension system comprising:
a wheel support for rotatably supporting a wheel spaced laterally a predetermined distance from a vehicle chassis;
a wishbone assembly for pivotally connecting said wheel support to said vehicle chassis, said wishbone assembly including:
a wishbone having a first end pivotally connected to said wheel support and second ends opposite said first end;



a lever extending between said wheel support and each of said second ends, said lever slidably engaged with said wheel support and pivotally connected to said second ends; and
a bracket mounted on said chassis for pivotally supporting said lever between said wheel support and each of said second ends;
whereby said wishbone assembly controls lateral displacement of said wheel in response to movement of said wheel.

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**5,498,020**

## VEHICLE SUSPENSION SYSTEM FOR A STEERABLE DRIVE WHEEL

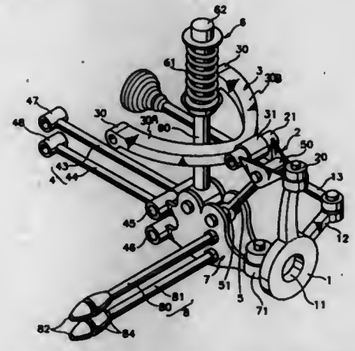
Unkoo Lee, Kyungki, Rep. of Korea, assignor to Hyundai Motor Company, Seoul, Rep. of Korea

Division of Ser. No. 174,017, Dec. 28, 1993. This application Jun. 7, 1995, Ser. No. 478,540

Claims priority, application Rep. of Korea, Dec. 30, 1992, 92-26741; Dec. 30, 1992, 92-26742

Int. Cl.[6] B60G 3/00

U.S. Cl. 280—675 8 Claims



1. A vehicle suspension system for a steerable wheel comprising:
a wheel carrier for rotatably supporting a wheel and including a projection portion at a rear part connected with a tie rod by a ball joint to be steered by said tie rod;
a connecting arm having a wheel side end connection part connected to an upper end of said wheel carrier;
an upper control arm having two vehicle body side connection parts diverged into a front branch and a rear branch, and connecting said connecting arm to a vehicle body;
a link carrier having a wheel side end connection part connected to a lower part of said wheel carrier;
a pair of lower control arms including upper and lower arms for connecting said link carrier to said vehicle body;
a connecting link pivotally connecting a middle point of said connecting arm and said link carrier;
a strut assembly including a shock absorber and a spring, having an upper end supported to said vehicle body by an insulator



connection part and a lower end connected to said link carrier adjacent to a lower end connection part of said connecting arm; and
a longitudinal member including a pair of arms, disposed longitudinally with respect to said vehicle body and connecting said link carrier to said vehicle body.

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**5,498,021**

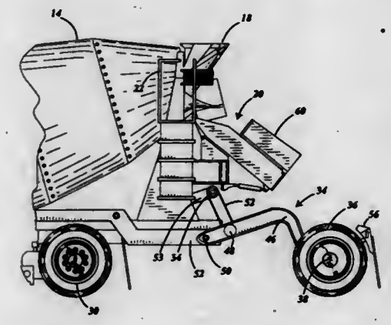
## TAG AXLE MOUNTING SYSTEM

Ronald E. Christenson, Parsons, Tenn., assignor to McNeilus Truck and Manufacturing Co., Dodge Center, Minn.

Filed Mar. 16, 1995, Ser. No. 405,798

Int. Cl.[6] B60G 11/26

U.S. Cl. 280—704 13 Claims



1. An auxiliary axle system for mounting on a wheeled vehicle of interest comprising:
(a) an auxiliary axle frame including a pair of spaced parallel axle arms having inner and outer ends, said axle arms being connected by a pair of spaced parallel transverse frame members including an inner and an outer transverse frame member, said outer transverse member carrying a pair of spaced wheels mounted near the ends thereof, said inner transverse frame member being connected a distance from the inner ends of said axle arms, said axle arms having end housings with openings therein;
(b) a pair of inner stabilizing housing members fixed to said inner transverse frame member and spaced inward from said axle arms, each of said inner housing members having an opening aligned with and spaced from the opening in a corresponding one of said end housings of said axle arms;
(c) a pair of mounting pivot pin means each designed for insertion through the opening in an end housing of one of said axle arms and corresponding aligned opening in the adjacent inner stabilizing housing member each of said pivot pins being further designed to extend through a corresponding auxiliary axle mounting opening in a structural frame member of said vehicle of interest located between said axle arm and said inner stabilizing housing member for mounting said auxiliary axle system;
(d) bearing means allowing each of said axle arms to pivot relative to a corresponding one of said structural frame members of said vehicle of interest when said auxiliary axle system is mounted thereto.

**5,498,022**

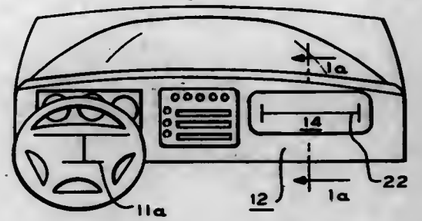
## VEHICLE INTERIOR WITH COLOR COORDINATED SUBSTRATE

John Papandreou, and Shigeo Numata, both of Patchogue, N.Y., assignors to Izumi Corporation, Yaphank, N.Y.

Continuation of Ser. No. 266,269, Jun. 27, 1994, abandoned. This application Apr. 20, 1995, Ser. No. 425,725

Int. Cl.[6] B60R 21/16

U.S. Cl. 280—728.1 6 Claims



1. A color coordinated dash board assembly for a motor vehicle comprising:
a) a dash board in a passenger compartment of said motor vehicle said dash board fabricated from a material having a first unfinished surface having a predetermined visible color said predetermined visible color defined by one or more wave lengths of light in a range of wave lengths of light from 400 nanometers to 700 nanometers;
b) said dash board including an air bag assembly means mounted in said dash board;
c) said air bag assembly means including an air bag means, and an air bag container means for storing said air bag means in a deflated condition, said air bag container means including an air bag gate means for covering said air bag means, when said air bag means is deflated and for providing an opening in said dash board for emitting said air bag means, when said air bag means is inflated, said air bag gate means fabricated from a material having a second unfinished surface having said predetermined visible color; and
d) a surface finishing means having said predetermined visible color, for color finishing said dash board so that the color of a finished surface of said dash board is the same color as said first unfinished surface and said second unfinished surface.

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**5,498,023**

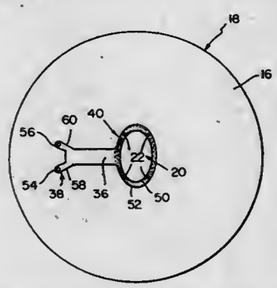
## PACKAGING TETHER FOR DRIVER SIDE AIR BAG CUSHION

Stephen L. Adams, Liberty, and Daniel C. Vine, Layton, both of Utah, assignors to Morton International, Inc., Chicago, Ill.

Filed Dec. 2, 1994, Ser. No. 348,627

Int. Cl.[6] B60R 21/20

U.S. Cl. 280—728.2 10 Claims



1. An air bag subassembly for installation in an air bag cushion module comprising:

an inflatable air bag and annular retainer ring coupled with said air bag, said air bag having a portion defining a fluid opening, said retainer ring being coupled with the portion of the air bag defining the fluid opening to form a mouth of the air bag, said bag being folded to provide ends of two portions each having multiple folds with ends of the folds being generally parallel, each of said portions being on an opposite side of an imaginary line which divides the ring into substantially equal parts, so that the folded bag is essentially the size of the retainer ring and has a predetermined deployment pattern;

a tether having first and second ends, means for securing the first end to the bag at one side of the retainer ring and means for attaching the tether second end to the retainer ring at an opposite side of the retainer, said tether extending in a direction substantially perpendicular to adjacent ends of the folds at said imaginary line to said opposite side of the retainer ring, said tether being made of fabric material, the second end of which is removably attached to a portion extending from the face of the retainer ring on said opposite side of said retained ring thereby to bridge across and retain the folded air bag in its folded condition against the retainer ring, said tether having a central body portion effective width that is sufficient to hold the folded air bag against the retainer ring during initial assembly and subsequent servicing of the air bag cushion module when removed from its installed position; and

said tether having a portion which releases due to inflation gas pressure during cushion deployment at a time and in a manner such that said predetermined deployment pattern remains essentially unchanged.

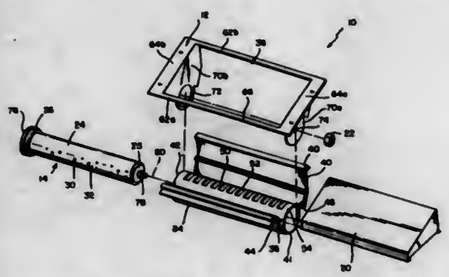
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**5,498,024**

## INFLATABLE RESTRAINT ASSEMBLY

**Charles P. Caruso, Jr., Bountiful, and Michael J. Ward, Liberty, both of Utah, assignors to Morton International, Inc., Chicago, Ill.**

**Filed Aug. 17, 1995, Ser. No. 516,366**
**Int. Cl.[6] B60R *21/16***
**U.S. Cl. 280—728.2** **17 Claims**



1. An inflatable restraint system reaction canister comprising:

a one-piece trough shaped reaction canister body part having a base portion, first and second opposite ends, and first and second opposite side walls continuously extending from the base portion, each of the side walls having a first end at the base portion and a second end having a frame retaining notch extending along at least a portion thereof, and

a one-piece reaction canister frame structure including opposed lateral first and second side flanges, opposed first and second end flanges each continuous with each of the first and second side flanges, and first and second opposed end caps angularly extending from the first and second end flanges, respectively,

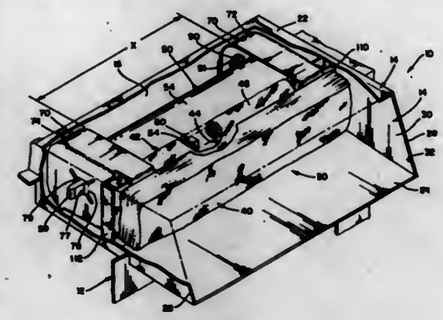
wherein in the assembly of said body part with said frame structure, the frame retaining notch of each of the body part side walls is in mating engagement with a mating portion of the frame structure side flanges, securing said frame structure with said body part.

**5,498,025**

## AIR BAG MODULE

**Kenneth M. Easter, Dayton; John A. Lotspih, Englewood, and Michael W. Donegan, Bellbrook, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.**

**Continuation of Ser. No. 233,187, Apr. 26, 1994, abandoned. This application Jan. 15, 1995, Ser. No. 482,959**
**Int. Cl.[6] B60R *21/16***
**U.S. Cl. 280—728.2** **13 Claims**



1. A method of assembling an air bag assembly which includes a housing having walls defining a contained housing interior and a rearward housing opening through which an air bag deploys, and an air bag module subassembly comprising an air bag, an inflator, an air bag retainer, and a subassembly retainer comprising a pair of axially spaced apart end supports each including an insertion slot, comprising the steps of:

a. securing the air bag to the air bag retainer,

b. axially capturing the air bag retainer between the end supports by sliding opposing ends of the air bag retainer into respective insertion slots of the end supports,

c. nonreleasably capturing the inflator between the end supports to form the air bag module subassembly,

d. inserting the air bag module subassembly into the housing by forwardly unidirectional insertion therein via the housing opening such that said end supports proximately abut the housing interior thereby restraining movement of the end supports relative the air bag retainer to prevent release of the air bag retainer, and

e. securing the subassembly retainer to the housing.

2. An air bag assembly comprising:

an air bag housing defining a contained housing interior, the housing having a rearward housing opening and axially spaced apart opposing end walls; and

an air bag module subassembly for forwardly unidirectional insertion into the housing via the housing opening, the air bag module subassembly including

an air bag for deployment through the housing opening,

first and second opposing end supports being separate and independent from each other and being axially spaced apart, the first and second end supports each proximately abutting the respective end walls of the housing when the air bag module subassembly is inserted in the housing to restrain outward axial movement of the end supports away from each other, the first and second end supports each having an axially inwardly facing insertion slot therein, and

an axially elongated air bag retainer secured to the air bag and having a first end seated in the insertion slot of the first end support and having a second end seated in the insertion slot of the second end support such that the air bag retainer is axially captured between the first and second end supports and held in position relative to the housing thereby.

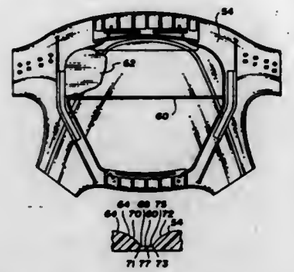


**5,498,026**

## AIR BAG COVER HAVING A HIDDEN BREAK SEAM

**Thomas L. Eckhout, Waterford, Mich., assignor to Larry J. Winget, Leonard, Mich.**

**Continuation of Ser. No. 140,768, Oct. 20, 1993, abandoned, which is a continuation-in-part of Ser. No. 984,326, Dec. 2, 1992, abandoned. This application Mar. 24, 1995, Ser. No. 410,559**
**Int. Cl.[6] B60R *21/20***
**U.S. Cl. 280—728.3** **16 Claims**



1. (Amended) A homogeneous thermoplastic air bag cover for use in an automobile, said air bag cover comprising:

a front cover adapted to enclose an uninflated automotive air bag, the front cover having inner and outer surfaces defining a first thickness therebetween; and

a break seam defined in said inner surface of said front cover for permitting the air bag to inflate and exit the front cover, said break seam further defining a break pattern and having a first convex wall, a second convex wall and a substantially planar break wall connecting said first and second walls and having a width of at least 0.3 millimeters, said break wall having inner and outer surfaces defining a second thickness therebetween, wherein said second thickness is less than said first thickness, said break pattern being visually imperceptible when viewing from the front cover outer surface.

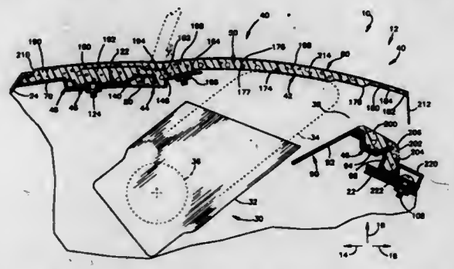
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**5,498,027**

## SEAMLESS DOOR FOR AIR BAG MODULE

**Scott A. Kelley, Algonac, and Andrew J. Smydra, Rochester, both of Mich., assignors to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio**

**Filed Nov. 3, 1994, Ser. No. 333,711**
**Int. Cl.[6] B60R *21/20***
**U.S. Cl. 280—728.3** **13 Claims**



1. An apparatus for covering an opening through which an inflatable vehicle occupant restraint is deployed, said apparatus comprising:

a body of foam material;

a skin covering said body of foam material;

support means for supporting said body of foam material and said skin in a first position covering said opening;

hinge means at a first side of said body of foam material for supporting a first portion of said body of foam material for pivoting movement from the first position in response to deployment of the inflatable restraint;

said skin having a terminal end portion at a second side of said body of foam material opposite said first side;

said terminal end portion of said skin having an inner side surface which is in engagement with and which is releasably bonded to an outer side surface of a second portion of said body of foam material; and

means for peeling said inner side surface of said terminal end portion of said skin out of engagement with and away from said outer side surface of said second portion of said body of foam material upon deployment of the inflatable restraint.

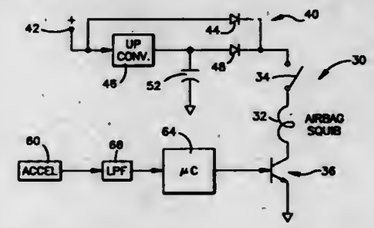
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**5,498,028**

## METHOD AND APPARATUS FOR CONTROLLING AN ACTUATABLE RESTRAINING DEVICE

**Mark Carlin, Hermosa Beach; James G. McCuskey, Lakewood, both of Calif., and Koichi Sugiyama, Nagoya, Japan, assignors to TRW Inc., Lyndhurst, Ohio, and Toyota Jidosha Kabushiki Kaisha, Toyota, Japan**

**Filed Jan. 4, 1994, Ser. No. 177,232**
**Int. Cl.[6] B60R *21/32***
**U.S. Cl. 280—735** **42 Claims**




1. An apparatus for controlling an actuatable restraining device of a vehicle, said apparatus comprising:

means for providing an electrical deceleration signal having a characteristic indicative of deceleration of the vehicle;

determining means for determining from said deceleration signal a value indicative of a change in vehicle crash velocity to crash distance; and

control means for actuating the actuatable restraining means when said determined value exceeds a predetermined threshold value.

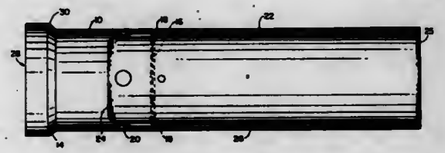
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**5,498,029**

## TOOTHED INFLATOR ADAPTER FOR AN AIRBAG ASSEMBLY

**G. Dean Mossi, Roy, and Bryan P. Crowell, Hooper, both of Utah, assignors to Morton International, Inc., Chicago, Ill.**

**Filed Jan. 19, 1995, Ser. No. 375,355**
**Int. Cl.[6] B60R *21/28***
**U.S. Cl. 280—741** **20 Claims**



1. An inflator adapter for mounting a generally cylindrical inflator of an airbag assembly in an airbag module, said inflator adapter comprising:

a hollow cylindrical housing with first and second ends;

mounting means on said first end for mounting said inflator adapter in an airbag module;

said second end having an inside diameter slightly larger than an outside diameter of an inflator which is to be mounted therein; and

a plurality of internal, axially inclined and radially inwardly protruding teeth located around a circumference of said second end of said adapter housing whereby when the second end of the adapter housing is pressed on to the inflator the inwardly protruding teeth grip an exterior surface of the inflator mounted therein, locking the inflator in the inflator adapter.

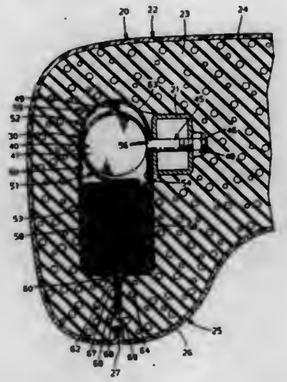
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**5,498,030**

## AIR BAG MODULE

**Timothy W. Hill, Troy; Mark A. Oleszko, Warren, both of Mich.; Graham T. Spencer, Tipp City, and John P. Sparkman, Dayton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.**

**Filed Mar. 28, 1995, Ser. No. 413,706**
**Int. Cl.[6] B60R *21/20***
**U.S. Cl. 280—743.1** **13 Claims**



13. An air bag module for attachment to a vehicle, the module comprising:

an inflator for generating gas;

an air bag coupled to the inflator and deployable upon generation of gas by the inflator; and

a housing for housing the air bag and inflator, the housing being the outermost portion of the air bag module, the housing consisting of a pouch made of flexible fabric material, the pouch having wall portions surrounding the air bag and inflator, the wall portions defining a pouch interior containing the inflator and the air bag substantially therein, the pouch including a frangible seam being breakable to define a pouch deployment opening;

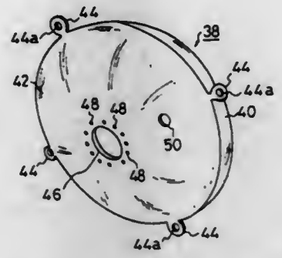
whereby upon air bag deployment, the air bag breaks open the frangible seam of the pouch to permit deployment of the air bag out through the pouch deployment opening such that the pouch guides the air bag during deployment.

**5,498,031**

## AIR BAG DEVICE WITH INFLATION REGULATION LUG

**Noriyuki Kosugi, Shiga, Japan, assignor to Takata Corporation, Tokyo, Japan**

**Filed Feb. 22, 1995, Ser. No. 392,176**
**Claims priority, application Japan, Apr. 5, 1994, 6-067007**
**Int. Cl.[6] B60R *21/20***
**U.S. Cl. 280—743.2** **15 Claims**



1. An air bag device to be mounted in a steering wheel of a vehicle comprising,

an air bag having a peripheral border;

an inflator for generating gas to deploy said air bag;

a retainer to which said air bag and said inflator are attached;

a cover attached to said retainer to cover said air bag; and

at least one lug provided on the peripheral border of said air bag and projecting outwardly from the air bag, said lug being connected to said retainer at an outside of the air bag when the air bag device is assembled,

said lug having tear strength to be torn by tensile force applied to said air bag after said air bag is deployed in front of said retainer in the process of the deployment of said air bag.

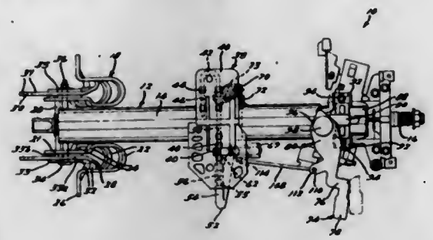
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**5,498,032**

## STEERING COLUMN ASSEMBLY

**Robert M. Thomas, South Lyon, Mich., assignor to Chrysler Corporation, Highland Park, Mich.**

**Filed May 18, 1994, Ser. No. 245,277**
**Int. Cl.[6] B62D *1/18***
**U.S. Cl. 280—777** **11 Claims**



1. A steering column assembly for a collapsible energy absorbing vehicle steering column comprising:

a lower support bracket for pivotally attaching a lower portion of the steering column to vehicle support structure;

an upper mounting mechanism for attaching an upper portion of the steering column to vehicle support structure; and

said upper mounting mechanism including means for guiding movement of the steering column along an arcuate path during a collision, said upper mounting mechanism comprising a housing attached to vehicle support structure and a torque bar attached to said housing.

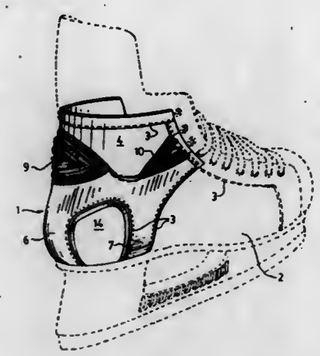


**5,498,033**

## SKATE BOOT WITH MOLDED PLASTIC OVERLAY

**T. Blaine Hoshizaki, Montreal West; Jeffrey J. Acheson, Weston, and Gerald Black, Cambridge, all of, Canada, assignors to Canstar Sports Group Inc., Ville Mont-Royal, Canada**

**Filed Nov. 30, 1993, Ser. No. 159,134**
**Claims priority, application Canada, Dec. 8, 1992, 2084829**
**Int. Cl.[6] A43B *7/14***
**U.S. Cl. 280—841** **8 Claims**



1. A skate boot having an upper with a back and medial and lateral sides, comprising a plastic overlay secured to said upper, said plastic overlay wrapping around a substantial portion of the back and adjacent portions of the medial and lateral sides of the boot, said plastic overlay having at least three portions cut-out therefrom so as not to inhibit flexion in said cut-out portions, said cut-out portions comprising a first cut-out portion across the back of the boot at approximately the level of the malleoli of a person wearing the boot, and second and third cut-out portions on each of the medial and lateral sides of the boot extending forwardly from just forward of the area of the malleoli to a forward edge of said overlay.

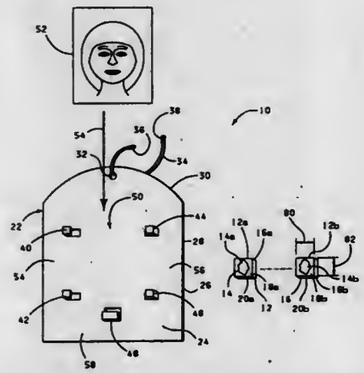
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**5,498,034**

## PATIENT CARE INFORMATION SYSTEM

**Betheline Ford, 19300 N. Portland, Edmond, Okla. 73003**

**Filed Oct. 15, 1993, Ser. No. 137,642**
**Int. Cl.[6] G09F *3/00*; A61B *5/00***
**U.S. Cl. 253—67** **27 Claims**



1. A method for improving the delivery of individualized nursing care for patients, the method comprising:

(a) providing a plurality of patient care block assemblies, each patient care block assembly having a different patient care pictorial symbol thereon indicating a single patient care information relating to the providing of individualized nursing care for a patient;

(b) selecting a plurality of the patient care block assemblies having different patient care pictorial symbols thereon related to the individualized nursing care of a selected patient and designating the ones of the patient care block assemblies so selected as selected patient care block assemblies;

(c) displaying the selected patient care block assemblies in the vicinity of the selected patient where the patient care pictorial symbols on the selected patient care block assemblies are visible to a care provider;

(d) viewing by the care provider, the selected patient care block assemblies so that the patient care pictorial symbols alone provide immediate information to the care provider; and

(e) rendering individualized nursing care to the selected patient in accordance with the selected patient care block assemblies.

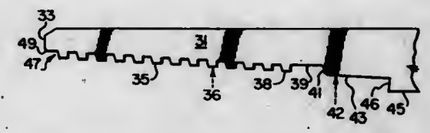
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**5,498,035**

## PIPE COUPLING

**Thomas L. Blose, 1243 Kingsbridge, Houston, Tex. 77073, and David L. Britten, 292 Queen Alexandra Road, S.E., Calgary, Alberta, Canada**

**Continuation-in-part of Ser. No. 770,567, Oct. 3, 1991, Pat. No. 5,348,350, and Ser. No. 467,620, Jan. 19, 1990, abandoned. This application Jul. 14, 1994, Ser. No. 274,904**
**Int. Cl.[6] F16L *25/00***
**U.S. Cl. 285—94** **36 Claims**



1. A pipe connection of the type having a female component and a mating male component, each matingly threaded for connection therebetween, and each provided with a sealing area adjacent the threaded area, the sealing area of the coupling components being formed as mating frusto-conical surfaces, at least one of said frusto-conical surfaces having controlled surface roughness; the respective effective sealing areas of the components being in axially aligned sealing engagement when the pipe connection has been assembled; characterized in that:

(a) the slopes of the frusto-conical sealing surfaces are each relatively shallow;

(b) the slope of the frusto-conical sealing surface of the male component is slightly less than that of the frusto-conical sealing surface of the female component;

(c) the sealing bearing load relative to axial distance of the contacting sealing surfaces of the assembled components being selected to lie above a preselected design minimum but below force levels at which galling occurs, said bearing load of the assembled components qualitatively simulating that of a pair of mating shrunk-fit circular cylindrical sealing surfaces; and

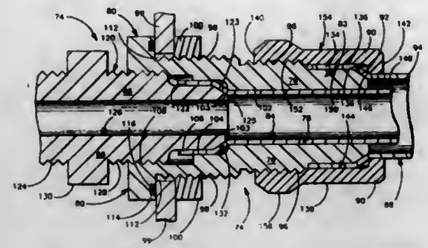
(d) load thread interference and manufacturing tolerances are selected to generate over the effective sealing areas of the components a sealing force at least equal to a designed minimum value, and selected such that the effective sealing area for each of said components is at least about ⅓ of the available sealing surface on such component.

**5,498,036**

## DUAL CONTAINMENT FITTING

**Kenji A. Kingsford, Devore, Calif., assignor to Furon Company, Laguna Niguel, Calif.**

**Filed Sep. 9, 1994, Ser. No. 303,539**
**Int. Cl.[6] F16L *21/00***
**U.S. Cl. 285—138** **21 Claims**



1. A dual containment fitting for sealingly joining together the flared ends of concentric inner and outer tubes, the dual containment fitting comprising:

an intermediate annular body with first and second ends and having a bore therethrough;

an annular fitting body with first and second ends and having a bore therethrough, wherein the fitting body is threadably engaged at its first end within the bore at the first end of the intermediate body, and wherein the flared end portion of the inner tube is compressively engaged between the fitting body and the intermediate body to form a first air- and water-tight seal therebetween; and

an annular nut having first and second ends and a bore therethrough, wherein the nut is threadably engaged at its second end about the second end of the intermediate body, and wherein the flared portion of the outer tube is compressively engaged between the intermediate body and the nut to form a second air- and water-tight seal therebetween.

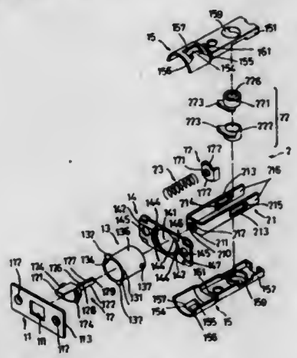
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**5,498,037**

## DOOR LOCK ASSEMBLY

**Ho-Tzu Fan Lai, No.186, Min-Kuo Rd., Chia-Yi City, Taiwan, Prov. of China**

**Filed Jan. 13, 1995, Ser. No. 372,339**
**Int. Cl.[6] E05C *1/00***
**U.S. Cl. 292—1.5** **3 Claims**



1. A door lock assembly, comprising:

an elongated latch bolt having an enlarged front end portion and a cylindrical rear end portion which is formed with axially spaced and aligned first and second protrusions that cooperatively define a rear engaging groove therebetween, said first protrusion and said front end portion cooperatively defining a front engaging groove therebetween; and

a driving unit including a movable member having a vertical end plate transverse to said latch bolt and formed therethrough with an engaging through-hole through which said rear end portion of said latch bolt extends fittingly and rotatably, said end plate having an annular inner wall which defines said engaging through-hole and which is formed with a radially extending notch that is sized to permit extension of said protrusions therethrough, said inner wall of said end plate being engaged selectively within one of said front and rear engaging grooves in a manner such that said notch is deflected from said protrusions of said latch bolt, so as to prevent axial movement of said movable member relative to said latch bolt, said latch bolt being rotatable for aligning said protrusions of said latch bolt with said notch of said movable member so as to disengage said inner wall of said movable member from said one of said front and rear engaging grooves and to permit axial movement of said movable member relative to said latch bolt in order to engage said inner wall of said movable member within the other one of said front and rear engaging grooves of said latch bolt.

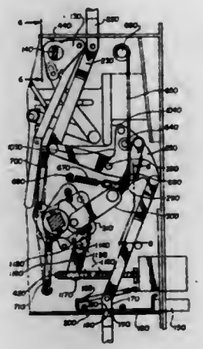
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**5,498,038**

## MULTI-POINT DOOR LOCK SYSTEM

**Ira J. Simon, Long Beach; George W. Curtis, Rowland Heights, and Andrew B. Campbell, San Marino, all of Calif., assignors to Marvin Lumber and Cedar Co., Warroad, Minn.**

**Filed Feb. 16, 1993, Ser. No. 19,160**
**Int. Cl.[6] E05C *1/12***
**U.S. Cl. 292—36** **2 Claims**



1. A door latch mechanism for installation on the vertical free edge of an active door mounted in a door frame comprising:

a case having a surface for mounting essentially flush with the vertical free edge of the active door;

a shoot bolt rotor pivotally mounted to said case;

a pin rotor pivotally mounted to said case and offset from and operatively linked to said shoot bolt rotor, said pin rotor is biased toward a first position by a pair of springs each spring of said pair being affixed to the pin rotor; and

an upper and a lower shoot bolt activation link operatively linked to said shoot bolt rotor, said upper and said lower shoot bolt activation links capable of movement between extended and retracted shoot bolt activation link positions, rotation of said pin rotor capable of controlling movement of said upper and said lower shoot bolt activation links between said extended and said retracted shoot bolt activation link positions.

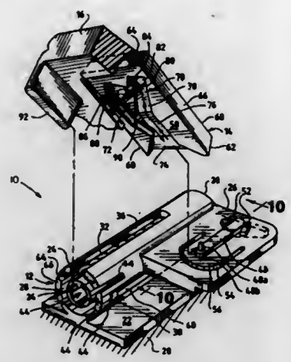


**5,498,039**

## SPRING LOADED LATCH ASSEMBLY

**Steven L. Bivens, Kankakee, Ill., assignor to Illinois Tool Works Inc., Glenview, Ill.**

**Filed Apr. 20, 1994, Ser. No. 230,315**
**Int. Cl.[6] E05C *19/02***
**U.S. Cl. 292—145** **16 Claims**



1. A push-push latch mechanism, comprising:

a first member having a latch arm movably secured by a first end thereof upon a first portion of said first member, and a latch member mounted upon a second end of said latch arm wherein said second end of said latch arm is movably supported upon a second portion of said first member;

a second track member operably connected to said latch member of said latch arm of said first member and comprising a path formed therein for guiding said latch member of said latch arm upon reciprocating sliding movement of said first and second members with respect to each other between a first closed position and a second opened position;

a spring mounted upon said first member and interposed between said first and second members for providing a biasing force between said first and second members so as to relatively bias said first and second members toward said opened position;

means defined upon said second member for retaining said latch member of said latch arm at a predetermined position, along said path, corresponding to said closed position defined between said first and second members when said first and second members are moved with respect to each other from said opened position to said closed position under the influence of a first push force in a first direction opposite to said biasing force of said spring, and yet permitting release of said latch member from said retaining means, so as to permit said first and second members to move with respect to each other from said closed position to said opened position, under the influence of a second push force in said first direction against said biasing force of said spring while said first and second members are retained at said closed position as a result of said latch member being retained by said retaining means; and

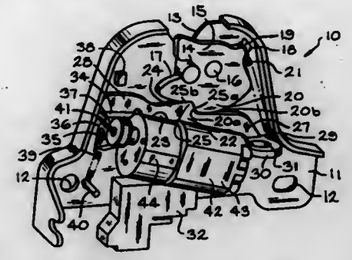
means mounting said second portion of said first member upon said first member for permitting movement of said second portion of said first member and said latch member with respect to said first member for enabling disengagement of said latch member of said latch arm from said retaining means of said second track member when said first and second members are positioned at said first closed position and subjected to a pulling force in a second opposite direction so as to permit said first member and said second track member to be moved with respect to each other to said opened position without causing damage to said first and second members.

**5,498,040**

## DECK LID LATCH AND ACTUATOR

**Ronald P. Silye, Livonia, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.**

**Filed Jul. 28, 1994, Ser. No. 282,131**
**Int. Cl.[6] E05C *3/04***
**U.S. Cl. 292—201** **17 Claims**



8. An electrically operated latch device comprising:

a base;

a striker moveable relative to said base;

a latch fork rotatably mounted on said base and having a notch formed therein, said latch fork being rotatable between first and second positions, said latch fork capturing said striker in said notch when said latch fork is in said first position;

a pawl rotatably mounted on said base and moveable between a blocking position in which said pawl engages said latch fork to prevent said latch fork from rotating from said first position, said pawl being moveable to a release position to permit said latch fork to move to said second position, said pawl being prevented from rotating to said blocking position when said latch fork is in said second position;

a spring urging said pawl to said blocking position; and

an electric actuator including an electric motor having an external housing, said external housing being fixed relative to said base, said actuator also including a gear head reduction unit having a separate housing mounted to said motor external housing, said gear head reduction gear unit also having an output shaft having a drive member fixed thereto, said drive member being movable between an actuated position and an unactuated position, said drive member directly engaging and urging said pawl to said release position when said drive member is moved to said actuated position, said drive member permitting from said pawl to move to said blocking position when said drive member is—was in said unactuated position.

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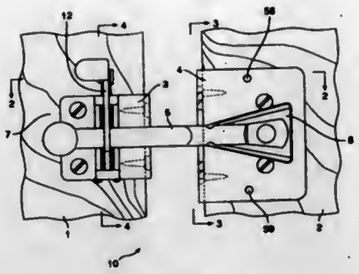
**5,498,041**

## GATE LATCH ASSEMBLY

**James Bezzerides, 1643 Gamay St., Santa Rosa, Calif. 95403, and Oscar W. Lux, III, 1635 Tahoe Dr., Santa Rosa, Calif. 95405, assignors to James Bezzerides; Oscar W. Lux, III, and Clyde Wiggins, all of Santa Rosa, Calif.**

**Filed Jul. 26, 1993, Ser. No. 97,559**
**Int. Cl.[6] E05C *3/16***
**U.S. Cl. 292—225** **8 Claims**

1. In a gate latch assembly for releasably holding a gate in a closed position relative to a gate post, said latch assembly, comprising a latch bar, connecting means adopted to connect the latch bar to said gate so that the latch bar extends beyond a free edge of said gate, a latch frame, including connecting means adapted to connect said latch frame to said gate post, said latch frame, including an outwardly opening slot into which said latch bar is received when said gate is closed, a pawl pivotally connected to said latch frame and including an outwardly facing cam surface to be engaged by said latch bar, causing said pawl to pivot upwardly when the gate is closed, said pawl, including a recess opening to receive the latch bar as the pawl is pivoted upwardly upon move-



ment of the latch bar into the outwardly opening slot in the latch frame, the recess opening of the pawl being defined along one side by a wall surface thereof traversing the slot in the latch frame when the gate is closed to trap the latch bar in the slot, the improvement wherein spring means is provided in contact with said latch bar such that said latch bar, although being capable of deviating from a horizontal orientation, is biased to assume such an orientation.

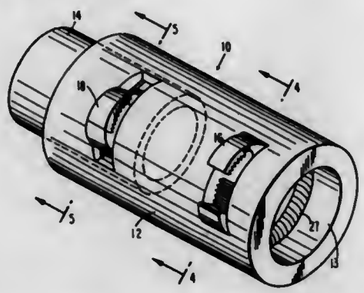
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**5,498,042**

## QUICK CONNECT CONNECTOR FOR GROOVED PIPE

**Douglas R. Dole, Whitehouse Station, N.J., assignor to Victaulic Company of America, Easton, Pa.**

**Filed Jun. 20, 1994, Ser. No. 262,583**
**Int. Cl.[6] F16L** *25/00*
**U.S. Cl. 285—177** **9 Claims**



1. A quick connector for a circular pipe of a constant single outer diameter having a circumferential groove in an outer surface of said pipe, positioned adjacent an axial end of said pipe and spaced from said axial end, said connector including:

a body having a circular bore, said body having an axial length sufficient to engage said pipe on opposite sides of said groove in said pipe, said bore having a diameter slightly exceeding that of said outer diameter of said pipe;

a first annular groove in said body encircling said bore and communicating directly with said bore at a position aligned with a said groove of a said grooved pipe when said grooved pipe is inserted into said bore of said body;

an abutment within said bore for limiting the extent of axial insertion of said pipe into said bore and for axially aligning said groove in said pipe exterior with said first groove in said bore:

a circlip positioned within said first annular groove in said body, said circlip engaging opposite sides of said groove, and having an inner diameter at least equal to the diameter of said bore, and having an outer diameter substantially greater than the diameter of said bore; and

means for contracting and locking said circlip to an inner diameter less than said outer diameter of said pipe and an outer diameter greater than said diameter of said bore;

whereby, said circlip provides a stop member prohibiting removal of said pipe from said connector when said circlip is in said contracted and locked condition;

further including a second annular groove in said body encircling said bore at a position aligned with said outer surface of said pipe at a position remote from said circumferential groove in said outer surface; and,

an O-ring positioned in said second annular groove and engageable with said pipe outer surface and said second annular groove in sealing engagement therewith when said pipe is inserted into said bore of said body.

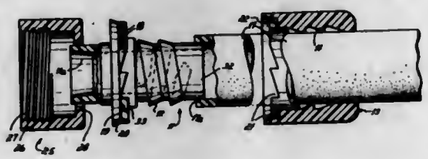
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**5,498,043**

## HOSE FITTING HAVING FERRULE ANTI-ROTATION RATCHET TEETH

**Joseph M. Goldenberg, Upper Saddle River, N.J., assignor to Plastic Specialties and Technologies, Inc., Ridgefield, N.J.**

**Filed Jan. 25, 1995, Ser. No. 377,858**
**Int. Cl.[6] F16L** *33/24*
**U.S. Cl. 285—242** **19 Claims**



1. A hose fitting adapted to be coupled to an open end of a flexible hose, said fitting comprising:

a tubular member having an outer surface, said outer surface having a helical barb thereon for deforming said hose when said tubular member is inserted into the open end of said hose, said tubular member further including ratchet teeth extending outwardly from said outer surface; and

a ferrule having a helical groove on an inner surface thereof for allowing said ferrule to be threaded onto deformations in said hose created by said helical protrusion of said tubular member, said ferrule further including ratchet teeth for engaging said ratchet teeth of said tubular member and locking said ferrule to said tubular member when said ferrule is threaded onto the deformations in said hose.

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**5,498,044**

## ENERGY ABSORBENT BUMPER FOR MOTOR VEHICLES

**Kent Bovellan, and Pär Braun, both of Trollhättan, Sweden, assignors to Saab Automobile Aktiebolag, Sweden**

**Filed Dec. 16, 1993, Ser. No. 168,540**
**Claims priority, application Sweden, Dec. 21, 1992, 9203837**
**Int. Cl.[6] B60R** *19/18*
**U.S. Cl. 293—120** **6 Claims**

6. A bumper for a motor vehicle, comprising:

a support which extends horizontally across and is attached to an end of the vehicle, the support including first and second vertically spaced apart sections extending generally horizontally and away from the end of the vehicle and an intermediate section extending between and supporting the first and second sections; the first and second sections having respectively a first and second flange thereon, the first and second flanges extending generally in the vertical direction;

a cover at least in part covering the support from the side of the support that is outward of the vehicle end; a locking mechanism for locking the cover to the support;

the cover including a third wall section extending generally vertically and at the side of the first flange outward of the end of the vehicle and including a fourth wall section also extending generally vertically and at the side of the second flange outward of the end of the vehicle, wherein the third wall section is engageable with the first flange and the fourth wall section is engageable with the second flange, the third and fourth wall sections being outwards with respect to the end of the vehicle of the first and second flanges, respectively; the cover also having an outward part outward of the third and fourth sections with respect to the end of the vehicle, at least partially covering the support;

an energy absorbing mechanism arranged between the outward part of the cover and the support, the energy absorbing mechanism being deformable when subject to at least predetermined force; the energy absorbing mechanism being so shaped and located that when the outer part of the cover has at least the predetermined force applied to it, the cover moves the energy absorbing mechanism to press against the side of the third and fourth sections which is outward of the first and second flanges with respect to the end of the vehicle, for pressing the third and fourth sections against the first and second flanges of the support, respectively, for preventing the third and fourth sections and the cover from being released and separated from the support upon the application of at least the predetermined force to the cover;

the support being generally U-shaped with the vertically separated generally horizontally first and second extending sections defining the legs of the U, and the legs of the U having respective inwardly facing, opposed surfaces;

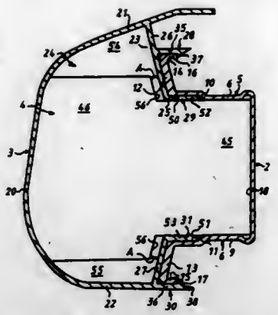
respective extensions from the third and fourth sections of the cover extending along the inwardly facing surfaces of the first and second sections of the support;

the energy absorbing mechanism including a part extending past and in engagement with the extensions from the third and fourth sections of the cover and the energy absorbing mechanism is so shaped that in the event of a shock absorbing deformation of the energy absorbing mechanism, the energy absorbing mechanism presses at least one of the extensions of the third and fourth sections of the cover against the respective inwardly facing surface of the first and second sections;

each of the first and second flanges being directed outwardly away from the other flange and includes an end portion which is directed toward the end of the vehicle and defining part of the locking mechanism; and

the locking mechanism further comprising a respective locking means defined on each of the third and fourth sections of the cover for engaging the end portion of the respective first and second flanges and for locking the cover on the support.





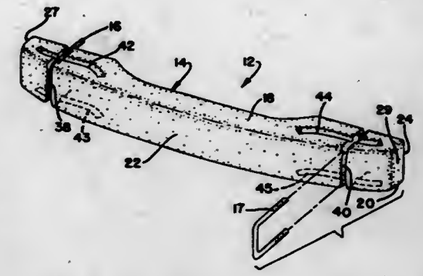
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**5,498,045**

## BLOW MOLDED BUMPER BEAM AND U-BOLT ATTACHMENT

**Terry B. Morgan, Lansing, and Joseph J. Sedlock, Okemos, both of Mich., assignors to General Motors Corporation, Detroit, Mich.**

**Filed Dec. 14, 1994, Ser. No. 356,069**
**Int. Cl.[6] B60R** *19/24*
**U.S. Cl. 293—122** **5 Claims**



1. A bumper beam comprising a one-piece molded assembly having a substantially vertical front wall, at least one substantially horizontal wall that includes at least one crush initiator formed integrally with the substantially horizontal wall providing an inward offset in the outer surface of the substantially horizontal wall such that upon impact at the substantially vertical front wall initial deflection of the substantially horizontal wall occurs into the bumper beam, and further comprising at least one groove in the substantially horizontal wall substantially perpendicular to, and intersecting, the crush initiator.

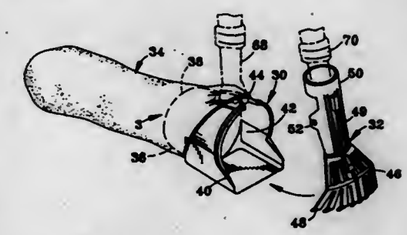
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**5,498,046**

## MANUAL SCOOP AND RAKE SYSTEM FOR COLLECTING LEAVES AND OTHER LIGHT DEBRIS

**Andre T. Ridley, Sr., .; Andrea Ridley, and Andre Ridley, Jr., all of 154 Needham St., Newton, Mass. 02164**

**Filed Apr. 28, 1994, Ser. No. 234,428**
**Int. Cl.[6] B65B** *67/04*
**U.S. Cl. 294—1.1** **1 Claim**



1. A collector for the collection of leaves and other light debris, said collector integrally including:

(a) a generally conical body portion that rearwardly converges along an axis from a medial plane having a generally circular cross-section to an egress having a generally circular cross-section, said egress cross-section having a smaller diameter than said medial cross-section;

(b) a forwardly projecting scoop portion that defines with said body portion a frustro-circular ingress;

(c) said scoop portion including a substantially planar blade portion and a pair of substantially planar wall portions on opposite sides thereof;
(d) said blade portion being disposed tangentially with respect to said body portion;
(e) said wall portions being disposed tangentially with respect to said body portion;
(f) the forward edge of said body portion having a rim that helps to establish the rigidity of said body portion;
(g) a generally rectangular mount attached to said body portion in a location diametrically opposed to said scoop portion with respect to said axis;
(h) a handle portion that adjoins said mount by webbing along said axis;
(i) said handle being of plastic and having an I-beam construction large enough to accommodate different hand sizes;
(j) said forward edge of said body portion having a notch aligned with and adjacent to said mount and said handle portion;
(k) said webbing including a riser at the bight of said notch and a pair of risers that straddle said notch; and
(l) said webbing including two conjunctive risers at the end of said handle opposite said notch, said risers joining together at said handle at their upper extremities and attaching separately to said mount at their lower extremities.

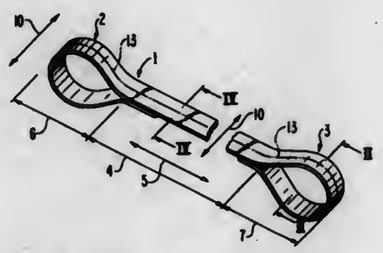
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**5,498,047**

**TEXTILE LIFTING SLING WITH REINFORCEMENT**

**Walter Treuling, Gelleukirchen, Germany, assignor to Spanset Inter AG, Oetwil am See, Switzerland**

**PCT No. PCT/DE94/00499, § 371 Date Mar. 21, 1995, § 102(e) Date Mar. 21, 1995, PCT Pub. No. WO94/26648, PCT Pub. Date Nov. 24, 1994**
**PCT Filed May 4, 1994, Ser. No. 367,126**
**Claims priority, application Germany, May 6, 1993, 9306743 U**
**Int. Cl.[6] B66C 1/18**
**U.S. Cl. 294—74** **9 Claims**



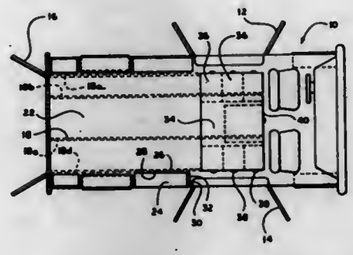
1. A lifting sling assembly comprising:
a textile lifting sling having edges and surfaces thereon and defining a longitudinal direction and a webbed direction perpendicular to the longitudinal direction, the lifting sling further comprising a work surface region and a loop region; and
a reinforcement disposed on at least one of the edges and the surfaces of the lifting sling for protecting the lifting sling from abrasion, the reinforcement comprising a textile overlay at least partially surrounding the lifting sling at least one of the work surface region and the loop region thereof, said textile overlay including a woven strip having first zones and second zones located side-by-side in the webbed direction of the lifting sling, the first zones having a higher wear resistance than the second zones, the first zones further covering at least one of the edges and the surfaces of the lifting sling, and the second zones being firmly bonded to the lifting sling.

**5,498,048**

**CARGO VAN WITH STORAGE AREAS FOR WORK TOOLS, EQUIPMENT AND SUPPLIES**

**Wilbert Shelby, Jr., 709 Emile Ave,, Westwego, La. 70094-4009**

**Filed May 2, 1994, Ser. No. 235,908**
**Int. Cl.[6] B60P 3/03**
**U.S. Cl. 296—24.1** **16 Claims**



1. A kit for adapting a cargo van to provide storage areas for work tools, equipment and supplies, said cargo van having a floor, rear door, side door, and left and right wheel wells with top portions protruding above said floor, the kit comprising:
at least one base member positionable on the van floor between said wheel wells;
a platform positionable on the base member to create a raised floor above said van floor at a lower elevation than said top portions of said wheel wells and define longitudinally extending compartments between said platform and said van floor that are accessible through said rear door;
a storage unit having a plurality of drawers and being accessible through said side door; and
means for mounting said storage unit atop said platform.

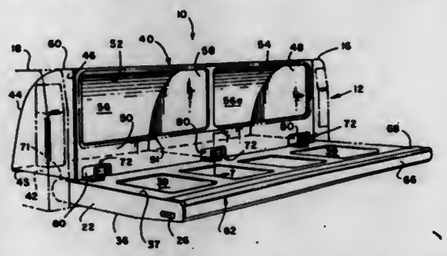
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**5,498,049**

**HINGED SECURITY TRUNK FOR VEHICLE TAILGATE**

**Bradley S. Schlachter, 6211 W. Northwest Hwy., Ste. 253D, Dallas, Tex. 75225**

**Filed Feb. 3, 1995, Ser. No. 383,107**
**Int. Cl.[6] B60R 9/06**
**U.S. Cl. 296—37.6** **19 Claims**



1. A security enclosure for a motor vehicle having a load deck, opposed side panels and a tailgate, said tailgate being coupled to said vehicle for movement to and from open and closed positions relative to the load deck and side panels, said security enclosure comprising:
enclosure wall means defining a storage compartment having an access opening; and
means interconnecting said enclosure wall means and said tailgate thereby permitting movement of the enclosure wall means to a resting position on the load deck with the access opening being covered by the tailgate when the tailgate is in a closed position relative to the load deck and side panels, said enclosure wall means being movable to a resting position on said tailgate when said tailgate is in an open position relative to the load deck and side panels, with the access opening of the storage compartment being covered by the tailgate when the tailgate is in the open position, and said enclosure wall means being movable relative to said tailgate to the load deck resting position wherein the access opening of said storage compartment is uncovered when said tailgate is in the open position.



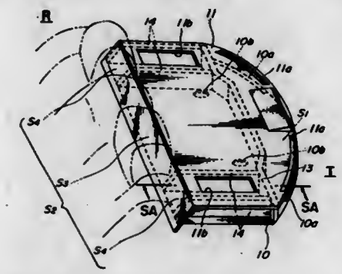
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**5,498,050**

**STRUCTURE OF REAR WINDOW SHELF PORTION TO PARTITION VEHICULAR PASSENGER COMPARTMENT AND REAR TRUNK**

**Shinichi Maruyama, and Akihiko Hasegawa, both of Yokosuka, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan**

**Filed Dec. 19, 1994, Ser. No. 359,138**
**Claims priority, application Japan, Dec. 27, 1993, 5-330121**
**Int. Cl.[6] B60R 27/00**
**U.S. Cl. 296—39.3** **23 Claims**



1. A structure of a rear window shelf portion arranged on a vehicular body, comprising:
a) a rear window shelf panel formed on the vehicular body;
b) a rear window shelf trim mounted on said rear window shelf panel with a space provided against said rear window shelf panel;
c) primary openings formed on said rear window shelf panel and having a first ventilating opening and another opening;
d) secondary openings formed on said rear window shelf trim and having a second ventilating opening faced against the first ventilating opening of said primary openings and another opening; and
e) at least one partition wall installed in said space between said rear window shelf panel and said rear window shelf trim so as to partition said space between said rear window shelf panel and said rear window shelf trim into a primary space having a secondary space having the openings of said primary and secondary openings other than both of the first and second ventilating openings.

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**5,498,051**

**TUMBLE FORWARD SEAT**

**Karl G. Sponsler, Plymouth; Kurt A. Selbold, Dearborn Heights, and Mark A. Pattok, Plymouth, all of Mich., assignors to Hoover Universal, Inc., Plymouth, Mich.**

**Filed Mar. 7, 1994, Ser. No. 206,629**
**Int. Cl.[6] B60N 2/10**
**U.S. Cl. 296—65.1** **23 Claims**

1. A seat for a vehicle, the vehicle having a body with a fore and aft longitudinal direction and a side to side lateral direction and the vehicle body including first and second elongated front mounting pins, the front mounting pins extending in the lateral direction and being longitudinally spaced from one another and a third elongated rear mounting pin, the rear mounting pin also extending in the lateral direction and being spaced longitudinally rearward from the front mounting pins, said seat comprising:
a seat frame having front and rear ends;
a support frame pivotally coupled to said seat frame adjacent said front end for rotation of said seat frame relative to said support frame about a transverse axis extending in the lateral direction;
mounting means for rigidly, nonrotatably and releasably attaching said support frame to the first and second mounting pins in the vehicle body to fix the position of said transverse axis relative to the vehicle body and to prevent rotation of said support frame relative to the vehicle-body whereby said seat frame can be rotated relative to said support frame and the vehicle body about said transverse axis; and
rear latch means at said rear end of said seat frame for releasably attaching said seat frame to said third mounting pin to hold said seat frame stationary relative to the vehicle body about said transverse axis.

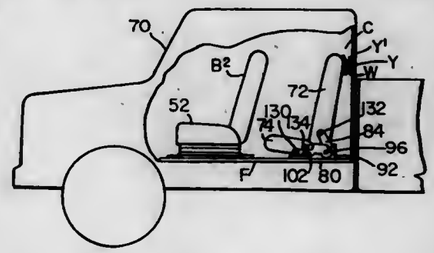
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**5,498,052**

**SEAT HINGE AND LATCH ASSEMBLY WITH BI-DIRECTIONAL RELEASE**

**Joseph A. Severini, Holland Landing; Daniel C. L. Yee, Richmond Hill, both of, Canada; Omar D. Tame, West Bloomfield, Mich.; Shelly M. Plaza, Fraser, Mich.; Noel P. Gravenstruter, Clarkston, Mich.; Dragi Jovan, Farmington Hills, Mich.; Thomas J. Susko, Eastpoint, Mich., and Steven A. Schulte, Novi, Mich., assignors to Atoma International, Inc., Newmarket, Canada; Chrysler Corporation, Auburn Hill, and Lear Seating Corporation, Southfield, both of Mich.**

**Continuation of Ser. No. 958,748, Oct. 9, 1992, abandoned.**
**This application Jan. 6, 1995, Ser. No. 368,818**
**Claims priority, application Japan, Feb. 25, 1994, 6-27881**
**Int. Cl.[6] B60N 1/02**
**U.S. Cl. 296—65.1** **23 Claims**



2. A vehicle seat comprising:
a seat back cushion assembly having a lower end and an upper end;
a seat cushion assembly having one end adjacent the lower end of said seat back assembly and an opposite end;

a mounting structure constructed and arranged with respect to said upper end of said seat back cushion assembly to mount the same so that said upper end does not move appreciably in a horizontal direction but can have limited vertical movement;
a releasably lockable mounting assembly constructed and arranged to be mounted on a floor of a vehicle and to be connected with said seat cushion and seat back cushion assemblies in a relationship which retains the one end of said seat cushion assembly adjacent the lower end of said seat back cushion assembly while enabling said assemblies to be selectively releasably moved between two locked positions consisting of (1) a sitting position wherein said seat cushion assembly extends generally horizontally from said one end thereof to the opposite end thereof to support a user sitting thereon and said seat back cushion assembly extends upwardly from the lower end thereof to the upper end thereof to support the back of a user sitting on said seat cushion assembly and (2) a storage position wherein said seat back cushion assembly and said seat cushion assembly extend generally vertically in adjacent relation alongside one another; and
a cable assembly operable remote from said releasably lockable mounting assembly to release said releasably lockable mounting assembly to permit movement thereof between said sitting and storage positions.

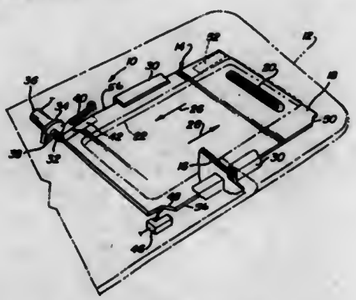
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**5,498,053**

## RECIPROCATING PLATE MECHANISM

**Paul Gebauer, St. Clair Shores, and Jay R. White, Bloomfield Hills, both of Mich., assignors to Jay Roberts Company, Bloomfield Hills, Mich.**

**Filed Mar. 25, 1994, Ser. No. 217,983**
**Int. Cl.[6] B60J *3/00*; F16H *19/02*;*19/04***
**U.S. Cl. 296—97.5** **14 Claims**



1. A reciprocating mechanism comprising:
a motor;
a drive wheel rotated by said motor;
an element having a front and rear surface; and
a resilient member biasingly maintaining said drive wheel in resilient contact with said front surface for moving said element in a forward direction and for maintaining said drive wheel in resilient contact with said rear surface for moving said element in a reverse direction.

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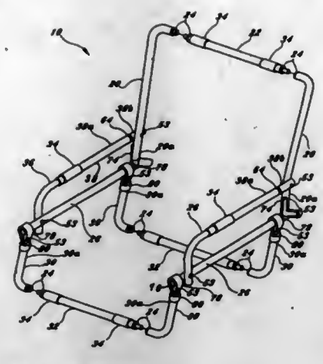
**5,498,054**

## ADJUSTABLE KNOCK DOWN CHAIR

**Richard S. Tomlinson, 1189 Hillsboro Mile #2, Hillsboro Beach, Fla. 33062**

**Filed Feb. 23, 1995, Ser. No. 393,202**
**Int. Cl.[6] A47C *4/00***
**U.S. Cl. 297—16.2** **6 Claims**

1. A knock down chair comprising:
a flexible seatrest and a flexible backrest;



a folding first side assembly;
a folding second side assembly;
three removable elongate transverse members, each transverse member having a long axis and two ends, each end provided with a connector element;
a plurality of connector members attached to the first and second side assemblies;
each connector element adapted for engaging one of said connector members by axial movement therebetween including means for locking securely together with said connector member when engaged by rotation of the transverse member about said long axis;
the transverse members, when securely locked to the two side assemblies, thereby holding the side assemblies in fixed, spaced apart relationship and forming a complete folding chair frame including a back frame supporting the backrest a seat frame supporting the seatrest and two leg frames;
in which the side assemblies must be pulled away from one another after the transverse members have been unlocked by rotation to knock down the chair.

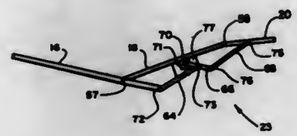
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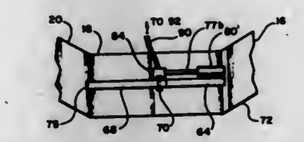
**5,498,055**

## RECLINER: APPARATUS AND METHOD

**Paul R. Goldman, 8 Joyce Ter., Andover, Mass. 01810**

**Filed Nov. 16, 1993, Ser. No. 153,665**
**Int. Cl.[6] A47C *1/035***
**U.S. Cl. 297—68** **13 Claims**





1. A swinging recliner structure, comprising
a frame structure, having a first and secood side member,
a connector for pivotally connecting a chair structure to said frame structure for swinging movement, said chair structure having
a back portion,
a footrest,



a seat portion connected between said back portion and said footrest such that said footrest may pivot relative to said seat portion and said back portion may pivot relative to said seat portion, and
an adjustment device attached to said back portion, said seat portion, and said footrest and comprising
an assembly having one end coupled to said back portion and another end coupled to said footrest, said assembly being responsive to the pivoting of said back portion from an upright sitting position to a maximum fully reclined position, for effecting movement of said footrest from a fully tucked-in position to an extended position, whereby in the fully reclined position of said chair structure, the feet of an occupant of the recliner can be positioned above an occupant's heart,
a rigid guide member attached to an underside of said seat;
a rigid member having one end coupled to said back portion and another end coupled to said guide member, said rigid member being adapted to move in a plane generally parallel to the assembly when an occupant pivots the back portion with respect to said seat portion, said guide member resisting movement of the rigid member to cause said back portion to pivot in a controlled fashion.

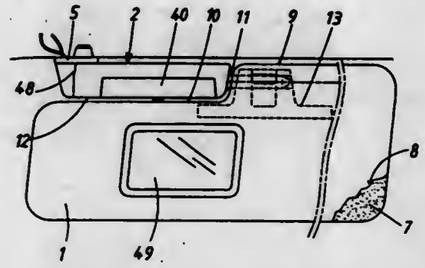
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**5,498,056**

## SUN VISOR FOR MOTOR VEHICLES

**Lothar Viertel, Altforweiler, Germany, and Patrick Welter, La Chambre, France, assignors to Gebr. Happich GmbH, Germany**

**Filed Nov. 1, 1994, Ser. No. 333,047**
**Claims priority, application Germany, Nov. 5, 1993, 43 37 808.0**
**Int. Cl.[6] B60J *3/00***
**U.S. Cl. 296—97.5** **18 Claims**



1. A sun visor for motor vehicles comprising:
a sun visor body, the body having a first longitudinal edge, a mounting hole in the sun visor body and extending generally parallel to the longitudinal edge of the visor body;
at the first longitudinal edge, the sun visor body including a step offset, so that the portion of the visor body in which the mounting hole is disposed extends less than the entire length of the first longitudinal edge of the visor body, for defining a free space at the offset which communicates to the mounting hole in the visor body;
an L-shaped support shaft for the visor body, the shaft including a first shaft arm which is insertable into a mounting bracket on the body of the vehicle and a second shaft arm which meets the first shaft arm, the second shaft arm being of sufficient length that it extends across the free space defined by the step offset of the first longitudinal edge of the visor body, and the second shaft arm having a free end region which extends into the mounting hole of the visor body;
an illuminating device disposed at the second shaft arm in the free space defined by the step offset of the first longitudinal edge of the visor body.

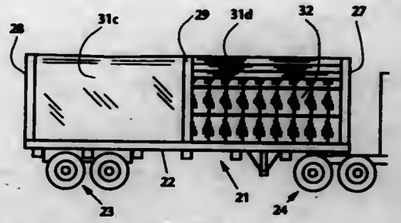
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**5,498,057**

## AUTOMATIC VEHICLE LOAD COVER

**Arthur Reina, and Pete Dozier, both of P.O. Box 1104, Ceres, Calif. 95307**

**Filed May 31, 1994, Ser. No. 251,088**
**Int. Cl.[6] B60J *5/06***
**U.S. Cl. 296—100** **13 Claims**



1. An automatic load covering system for a transportable load bed, including;
at least one tarp cover disposed to extend over and cover a portion of the transportable load bed, said tarp cover including opposed side edges, an upper edge, and a lower edge;
a pair of spaced apart channel assemblies associated with each tarp cover, each channel assembly including a first channel dimensioned to receive one of said side edges of said tarp cover in freely translating fashion, said first channel extending upwardly from said load bed;
each channel assembly including an endless loop web having a drive portion extending through said first channel, and motor means for translating said endless loop web in reversible fashion;
means for securing each of said side edges of said tarp cover to said drive portion of said endless loop drive web to translate said tarp cover edges reversibly in said pair of channel assemblies, whereby said tarp cover may be raised and lowered with respect to said load bed;
said means for securing said side edges of said tarp cover including a plurality of stays extending generally horizontally and secured to said tarp cover in spaced apart relationship, each of said stays having opposed ends extending laterally outwardly from said tarp cover;
means for joining said opposed ends of said stays to a respective one of said drive portions of said endless loop webs, including a plurality of slipper blocks, each secured to a respective opposed end of one of said plurality of stays, each slipper block including means to frictionally engage said respective drive portion of said endless loop webs to translate said plurality of stays simultaneously; and,
said plurality of stays includes a lowermost stay disposed adjacent to said lower edge of said tarp cover, and means for connecting each of said opposed ends of said lowermost stay to said respective drive portion of said endless loop webs.

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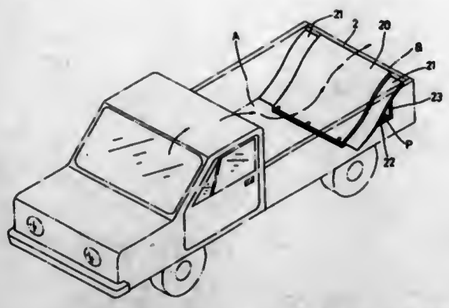
**5,498,058**

## AIR CURRENT GUIDING DEVICE A PICKUP

**Chen-Hsiung Kuo, 93 Chung-Chen Road, Tainan, Taiwan, Prov. of China**

**Filed Jul. 12, 1994, Ser. No. 274,033**
**Int. Cl.[6] B62D *35/00***
**U.S. Cl. 296—180.1** **3 Claims**

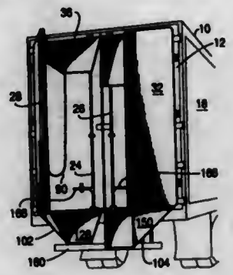
1. An air current guiding device for a pickup comprising:
(a) a main curved guiding plate having an upper smooth curved surface and two opposite sliding straight grooves provided horizontally behind to align with each other;
(b) two extension plates respectively having an upper smooth curved surface as that of said main curved guiding plate and including a block at an intermediate portion to fit and move in a respective said sliding straight groove for said two extension plates to move laterally inwardly or outwardly;



(c) two adjusting members combining with said blocks to stabilize said extension plates and said main curved guiding plate;
(d) a locking plate located below the air current guiding device and lain on a bed floor of the pickup; and
(e) a rear cover plate connecting with the rear edge of said main curved guiding plate and said locking plate by two pivots for said rear cover plate to be pulled open;
(f) said two extension plates being moved laterally inwardly or outwardly relative to said air current guiding device to conform to a width of the pickup which this device is applied to.

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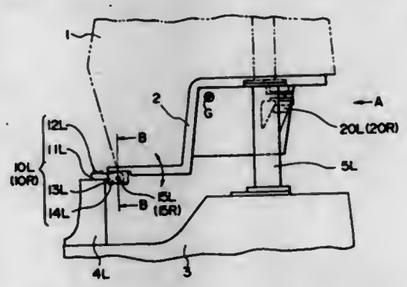
**5,498,059**
**APPARATUS FOR DEDUCING DRAG**
**Stanley Switlik, 33 E. Welling Ave., Pennington, N.J. 08534**
**Filed Sep. 28, 1994, Ser. No. 314,020**
**Int. Cl.[6] B62D *35/00***
**U.S. Cl. 296—180.1** **57 Claims**



1. An improved apparatus for reducing drag at the trailing end of a moving body having a top surface, a first side surface, a second side surface and a trailing end, said improved apparatus comprising:
A. a first vertical panel means pivotally attached with respect to the trailing end of the body, said first vertical panel means extending generally vertically along the trailing end of the body and being pivotally movable to a deployed position extending generally outwardly therefrom approximately parallel with respect to the first side surface of the body;
B. a second vertical panel means pivotally attached with respect to the trailing end of the body at a position spatially disposed from said first vertical panel means to define a dead space area therebetween, said second vertical panel means extending generally vertically along the trailing end of the body and being pivotally movable to a deployed position extending generally outwardly therefrom approximately parallel with respect to the second side surface of the body;
C. a first horizontal panel means pivotally movably attached with respect to the trailing end of a body and with respect to said first vertical panel means to be automatically deployed responsive to deployment of said first vertical panel means, said first horizontal panel means being pivotally moveable to a deployed position extending outwardly from the trailing edge of the body approximately parallel with respect to the top surface and between said first vertical panel means and said second vertical panel means to define a dead space area therebelow, said first horizontal panel means comprising:
(1) a first frame means pivotally mounted with respect to the trailing end of a body and comprising:
(a) a first inner rib means pivotally attached with respect to the trailing end of the body and extendable outwardly therefrom to a deployed position approximately perpendicularly thereto;
(b) a first outer rib means pivotally attached with respect to the trailing end of the body at a position spatially disposed from said first inner rib means, said first outer rib means being extendable outwardly to a deployed position angularly oriented with respect to the trailing end of the body being angled toward said first inner rib means;
(c) a first cross strut means secured to said first inner rib means and extending laterally outwardly therefrom toward said first outer rib means and being secured thereto;
(2) a first link means pivotally attached with respect to said first vertical panel means and pivotally secured to said first frame means to facilitate movement of said first frame means to the deployed position;
(3) a first covering means attached with respect to said first vertical panel means and the trailing end of the body and being attached to and extending over said first frame means to extend approximately horizontally responsive to said first horizontal panel means being in the deployed position; and
D. a second horizontal panel means positionable extending between said first vertical panel means and said second vertical panel means at a position below said first horizontal panel means to define a dead space area therebetween.

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**5,498,060**
**FLOOR FRAME SUPPORTING STRUCTURE FOR CONSTRUCTION MACHINES**
**Takeshi Satomi, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan**
**Filed Jun. 8, 1994, Ser. No. 255,405**
**Claims priority, application Japan, Jun. 11, 1993, 5-036823 U**
**Int. Cl.[6] B62D *24/00***
**U.S. Cl. 296—190** **24 Claims**



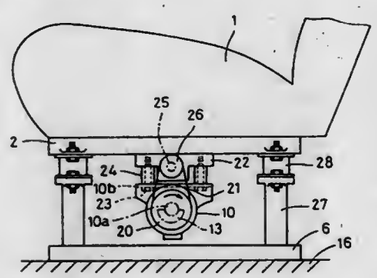
1. A structure for supporting a cabin on a vehicle body and for absorbing and dampening vibrations traveling from the vehicle body to the cabin, wherein the traveling from the vehicle body to the cabin, wherein the cabin has a floor frame and the vehicle body has a vehicle body frame on which the cabin is to be supported, said structure comprising:
a left pivotable buffer support member having a first pivot shaft for pivotally coupling a left front portion of the floor frame to the vehicle body frame,



a right pivotable buffer support member having a second pivot shaft for pivotally coupling a right front portion of the floor frame to the vehicle body frame,
a left rear shock absorbing support member for supporting a left rear portion of the floor frame on the vehicle body frame, and
a right rear shock absorbing support member for supporting a right rear portion of the floor frame on the vehicle body frame,
wherein said left and right rear shock absorbing support members are located at positions which are approximately as high as the height of the center of gravity of the cabin,
wherein each of said left rear sbock absorbing support member and said right rear shock absorbing support member is a damping plate shock absorber and comprises a guide shaft joined to a case through an elastic material, said guide shaft having first and second ends, one of the case and the first end of the guide shaft being secured to the vehicle body frame with the other of the case and the first end of the guide shaft being secured to the cabin, the second end of the guide shaft having a damper plate attached thereto, the damper plate being contained in a highly viscous fluid in a fluid enclosing chamber in the case, and
wherein said left buffer support member, said right buffer support member, said left rear shock absorbing support member, and said right rear shock absorbing support first and second pivot shafts while said left rear shock absorbing support member and said right rear shock absorbing support member absorb such pitching movement.

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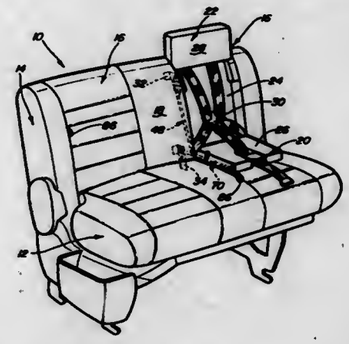
**5,498,061**
**APPARATUS FOR VIBRATING SEATS**
**Masahiro Fukuoka, Aichi, Japan, assignor to Fukuoka Kagaku Ltd., Nishikamo, Japan**
**Division of Ser. No. 194,356, Feb. 10, 1994, which is a continuation-in-part of Ser. No. 987,481, Dec. 4, 1992, Pat. No. 5,348,370. This application Dec. 19, 1994, Ser. No. 358,312**
**Int. Cl.[6] A47C *31/00***
**U.S. Cl. 297—217.7** **2 Claims**



1. An apparatus for vibrating a seat comprising:
a driver's seat;
means for vibrating said driver's seat;
means for controlling the vibration of said means for vibrating the driver's seat,
wherein said means for vibrating said driver's seat comprises a vibrating motor elastically connected to said driver's seat, a power transmission shaft and a belt operably connecting an output shaft of said vibrating motor and said power transmission shaft,
wherein said means for vibrating said seat further comprises an eccentric load mounted on said output shaft and extending along at least a portion of a length thereof;
a pulley base mounted beneath a seat base attached beneath said driver's seat, said power transmission shaft being operably coupled to walls of said pulley base, wherein said vibrating motor is mounted beneath said pulley base; and
a plurality of elastic insulator means, coupled to said pulley base and said vibrating motor, for receiving vibration of said vibrating motor.

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**5,498,062**
**CHILD RESTRAINT SEAT**
**Carl J. Holdampf, Farmington Hills, Mich., assignor to Douglas & Lomason Company, Farmington Hills, Mich.**
**Filed Oct. 18, 1993, Ser. No. 138,738**
**Int. Cl.[6] A47C *15/00***
**U.S. Cl. 297—238** **29 Claims**

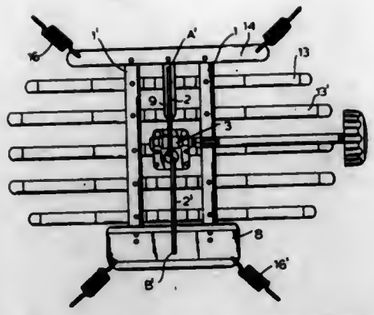


13. A retractable child seat that is movable between a stowed position and a deployed position, comprising:
a back support member;
a head support member pivotally interconnected to said back support member for rotational movement between a lowered storage position and an elevated exposed position;
a seat member interconnected to said back support member for movement between a raised storage position and a lowered exposed position; and
movement coordinating means interconnecting said head support member to said seat member for automatic rotational elevation of said head support member to said elevated exposed position in coordination with movement of said seat member to said lowered exposed position for establishing said deployed child seat position, and for automatically rotating said head support member to said lowered storage position in coordination with movement of said seat member to said raised storage position for establishing said stowed child seat position.

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**5,498,063**
**ARCHING MECHANISM**
**Wilhelm Schuster, Neubauzeile 87, A-4030 Linz, and Wilhelm Schuster, Gallneukirchen, both of, Austria, assignors to Wilhelm Schuster, Linz, Austria**
**Division of Ser. No. 820,870, Jan. 17, 1992, Pat. No. 5,397,164. This application Dec. 8, 1994, Ser. No. 352,374**
**Int. Cl.[6] A47C *3/00***
**U.S. Cl. 297—284.1** **9 Claims**

1. An arching mechanism, comprising:
a structure having a pair of opposite members movable toward and away from one another and a pair of parallel flexible resilient pressure members anchored to said structure and adapted to flex upon displacement of said opposite members toward one another to form an arch having an apex;
a multiplicity of elongated mutually parallel but mutually spaced apart transverse connection members spanning across said pressure members and forming ribs assuming a configuration of said arch;



traction means including at least one traction element interconnecting said opposite members for selectively drawing said opposite members toward one another; and

means forming a tension lock connected to said traction means and located between said opposite members and between said pressure members, said tension lock including

means for actuating said traction element by application of arching force thereto to draw both said opposite members simultaneously toward said tension lock and enable both said opposite members to recede from said tension lock simultaneously, thereby selectively controlling convexity of said arch so that said apex remains substantially stationary for all convexities of said arch, and

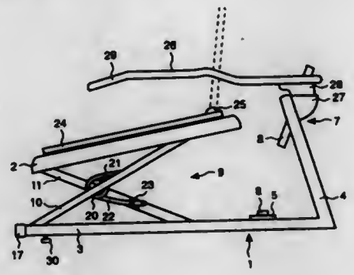
means for locking said traction means in selected positions to retain a selected convexity of the arch, said traction means comprising a respective traction rod connected to each of said opposite members, and a lever connecting said rods.

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**5,498,064**
**SEAT UNIT**

**John A. Hooker, deceased, 135 Magna Road, late of Bear Wood, Dorset, BH11 9NE, and by Christopher J. Hooker, legal representative, 53 Francis Avenue, West Howe, Bournemouth, Dorset, both of, England**

**Filed Sep. 14, 1994, Ser. No. 305,697**
**Claims priority, application United Kingdom, Sep. 14, 1993, 9319024**
**Int. Cl.[6] A61G *15/00***
**U.S. Cl. 297—339** **15 Claims**



1. A seat unit, comprising:

a frame structure;

a seat portion for a person using the seat unit to sit upon;

a linkage means interconnecting said frame structure and said seat portion for displacement of said seat portion relative to said frame structure between a first position with said seat portion lowered into a sitting position for the person using the seat unit, and a second position in which said seat portion is raised to provide assistance for the person using the seat unit to stand up therefrom, said linkage means being operable to cause a rearward part of said seat portion to be raised by a greater distance than a front part of said seat portion when moving from said first position into said second position, whereby said seat portion, in lifting from said first position towards said second position, also tilting forwardly;

a first spring means urging said seat portion towards said second position; and

a second spring means urging said seat portion towards said second position, said first and second spring means being operable in combination to produce an overall spring force urging said seat portion from said first position towards said second position with a spring force value which is of a desired magnitude in each part of a range movement of said seat portion towards said second position;

said linkage means comprising a scissor-type assembly having legs constituting said assembly being of respective lengths such as to produce said tilting of said seat portion;

said legs comprising a first pair of legs and a second pair of legs, with said first and second pairs of legs being in crossed relationship;

means pivotally connecting said pairs of legs together in such a way that leg portions of each pair of legs at one side of the respective said pivotal connecting means are shorter than leg portions of each pair at its other side of said pivotal connecting means, thereby to produce said forward tilting movement of said seat portion as said seat portion moves towards said second position;

said first spring means comprising a torsion spring disposed at said pivotal connecting means, said torsion spring having leg portions urging said seat portion towards said second position; and

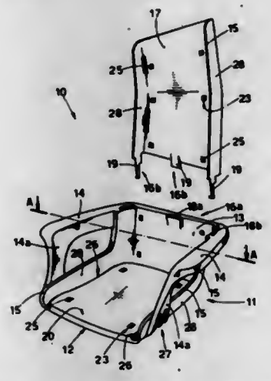
said second spring means comprising at least one tension spring having an effective spring force acting on a respective said leg wherein the effective spring force of said tension spring increases by a change in position of the said pairs of legs when producing said forward tilting movement of said seat portion as said seat portion moves towards said second position.

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**5,498,065**
**OFFICE ARMCHAIR BODY WHICH CAN BE DISMANTLED**

**Isidoro Tosoni, Manzano, Italy, assignor to Effezeta Srl, Italy**

**Filed May 25, 1994, Ser. No. 248,722**
**Claims priority, application Italy, Jun. 28, 1993, UD93A0123**
**Int. Cl.[6] A47C *7/00***
**U.S. Cl. 297—440.21** **12 Claims**



1. An armchair body which can be readily assembled or dismantled comprising (1) a first one-piece rigid plastic unit comprising a base serving as a seat, an upstanding rear portion serving as a base of a seatback, and first and second upstanding side portions each serving as an arm, wherein a top surface of the base of the seatback and a top surface of each arm are continuous with respect to each other and are substantially present in a common plane, and wherein a plurality of aligning and anchoring means are integrally present in the top surface of the base of the seatback and/or the top surface of each arm, and (2) a second one-piece unit removably attached to said first one-piece unit at least the top surface of said base of the seatback, said second one-piece unit comprising an upper part of a seatback complementary to the base of the seatback so as to provide a continuous substantially vertical surface when the first one-piece unit is attached to said second one-piece unit, wherein the second one-piece unit has a bottom surface with a plurality of aligning and anchoring means integral therewith and having a mating structure to the plurality of aligning and anchoring means of said first one-piece unit so as to anchor said second one-piece unit to said first one-piece unit in absence of separate hardware components when the first one-piece unit is connected to said second one-piece unit, wherein when said plurality of aligning and anchoring means of said second one-piece unit are matingly joined with said plurality of aligning and anchoring means of said first one-piece unit, said base of the seatback and the upper part of the seatback are joined in a continuous manner to provide a unitary seatback without gaps between the first one-piece unit and the second one-piece unit, and wherein the second one-piece unit is of a size so that when said second one-piece unit is detached from said first one-piece unit, said second one-piece unit is able to at least in part lie substantially flat upon the seat of the first one-piece unit while lying below the top surface of said base of the seatback and the top surface of each arm thereby allowing for ease in transport and storage of the first one-piece unit and the second one-piece unit.

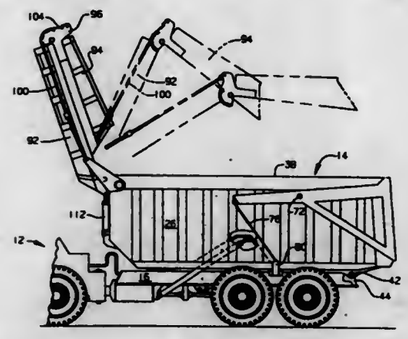


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**5,498,066**
**ARTICULATED COVER FOR A TOP LOADING HAULING BODY**

**Robert A. Cuthbertson, Sunderland; Barry E. James, Hartlepool, both of, England; Carlos E. Magalhaes, Decatur, Ill., and Jerry F. Smith, Biddick Washington, England, assignors to Caterpillar Inc., Peoria, Ill.**

**Filed Sep. 9, 1994, Ser. No. 303,807**
**Int. Cl.[6] B60P *1/26***
**U.S. Cl. 298—23 C** **18 Claims**



14. An articulated cover for mounting on a top loading, hauling body and for pivotal movement between open and closed positions, comprising:

a forward portion having a rearward edge;

a rearward portion having a forward edge, the forward edge having a bracket and being connected by a pivotal connection to the rearward edge of the forward portion;

a tie member having forward and rearward ends and a flexible portion, the rearward end being connected to the bracket at a location spaced from the pivotal connection of the rearward and forward portions of the cover, said forward end being connectable to said hauling body; and

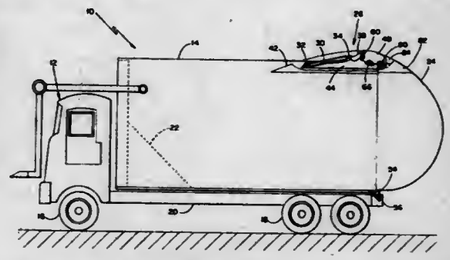
a guide member mounted on the rearward portion and being elevationally below the flexible portion of the tie member when the cover is in the closed position; the guide member and flexible portion of the tie member being in engagement when the cover is in the open position, said flexible portion wrapping at least partially around the guide member in the open position of the cover.

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**5,498,067**
**LIFTING LATCH HINGE FOR TAILGATE ON REFUSE HAULER/COMPACTOR**

**Ronald E. Christenson, Kasson, Minn., assignor to McNeilus Truck and Manufacturing, Inc., Dodge Center, Minn.**

**Filed Jan. 14, 1994, Ser. No. 182,714**
**Int. Cl.[6] B65F *03/28***
**U.S. Cl. 298—23 MD** **12 Claims**



1. A refuse truck body, comprising:

(a) a storage body for storing refuse;

(b) a tailgate coupled to the storage body for pivotal movement between an open and closed position, said tailgate forming a closure with said storage body in its closed position; and

(c) means located on a top surface of said storage body for hinging and moving said tailgate between the open and closed position, comprising:

(i) an arm having a midsection pivotably attached to an upper portion of said storage body to define a pivot point, said arm having a proximal end and distal end disposed on opposite sides of said pivot point, said arm distal end pivotably connected to an upper portion of said tailgate;

(ii) means connected to said storage body and said arm proximal end for pivoting said arm about said pivot point to move the tailgate between the open and closed position; and

(iii) an over-center locking means for securing said tailgate in the-closed position.

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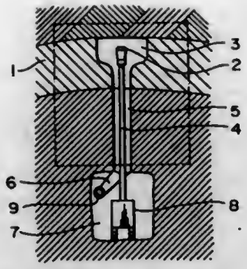
**5,498,068**
**NON-ENTRY MINING METHOD EQUIPMENT**

**Rüdiger Putzer, Ahornweg, Germany, and Jean L. Narcy, Saskatoon, Canada, assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.**

**Filed Feb. 14, 1995, Ser. No. 388,338**
**Int. Cl.[6] F21C *25/60;45/00***
**U.S. Cl. 299—17** **18 Claims**

1. A jet boring pre-assembly, for assembly and use in excavating an underground area susceptible to disaggregation by high pressure fluid jet and for control from a working gallery below said area, comprising:

a cutting head for a top of the assembly, said head having a jet boring fluid conduit for delivery of high pressure jet boring fluid to at least one high pressure fluid nozzle, and a flushing fluid conduit for delivery of low pressure flushing fluid to at least one flushing fluid nozzle;



a dual conduit drilling rod for locating in a borehole beneath said cutting head, said rod having a jet boring fluid conduit for delivery of said jet boring fluid to the jet boring fluid conduit of said cutting head, and a flushing fluid conduit for delivery of said low pressure flushing fluid to the flushing fluid conduit of said cutting head; and

a preventor box for sealing a lower end of said borehole and having a passage therethrough for said drilling rod, said preventor box including sealing means for between an inner wall of the preventor box and an outer wall of said drilling rod whereby said drilling rod may be operated while maintaining a seal of said sealing means, means for receiving a slurry of excavated material and flushing fluid exiting a bottom of the borehole, and an outlet for said slurry.

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**5,498,069**

**BIT HOLDER WITH A DETACHABLY FIXED BIT BUSHING**

**Gottfried Siebenhofer, Fohnsdorf; Alfred Zitz, and Roman Gerer, both of Zeltweg, all of, Austria, assignors to Voest-Alpine Bergtechnik Gesellschaft m.b.H, Zeltweg, Austria**

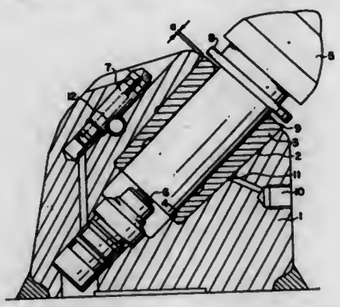
**Filed Nov. 9, 1994, Ser. No. 351,179**

**Claims priority, application Austria, Dec. 1, 1993, 2434/93**

**Int. Cl.[6] B23B *31/10***

**U.S. Cl. 299—81.3** **3 Claims**

1. A bit holder provided with a bit bushing for receiving a bit for



cutting tools, the bushing being fixed in a receiving bore and having an axial length that exceeds the axial length of the receiving bore, and a hydraulic line which discharges into the gap between an inner surface of the receiving bore and an outer surface of the bushing, wherein said outer surface of the bushing is conical with rectilinear generatrices, and the inner surface of the receiving bore is a hollow conical surface, the bushing during operation being inserted with a pressure per unit of surface area >100N/mm$^2$ against the hollow-conical inner surface face of the receiving bore against a stop on the bottom of the receiving bore, a portion of the bit bushing protruding beyond an edge at the top of the receiving bore having an outer diameter that is equivalent to the inner diameter of the edge of the receiving bore with the tolerance predetermined by the conicity of the outer surface of the bushing.

**5,498,070**

**FLUID PRESSURE BOOSTING TYPE BRAKE SYSTEM**

**Shinichi Inagawa, and Shohei Matsuda, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**

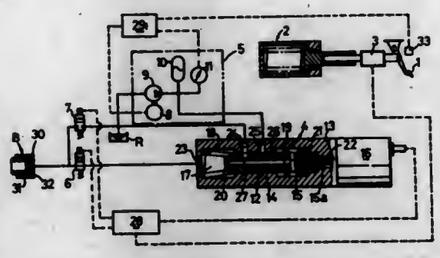
**Division of Ser. No. 208,263, Mar. 9, 1994, Pat. No. 5,445,411.**

**This application Jun. 1, 1995, Ser. No. 457,572**

**Claims priority, application Japan, Apr. 14, 1993, 5-87609**

**Int. Cl.[6] B60T *13/74***

**U.S. Cl. 303—3** **2 Claims**



1. A fluid pressure boosting type brake system, comprising a fluid pressure source including a fluid pump and a pressure tank connected to said pump, and a control valve capable of controlling an output pressure from said fluid pressure source to a fluid pressure corresponding to a brake operation quantity to output the same, wherein

said brake system further includes

a brake operation detecting means for detecting a brake operation,

a motion parameter detecting means for detecting a longitudinal motion parameter of a vehicle, and

a driving means capable of outputting a driving signal indicative of a command to drive the fluid pump for a time determined on the basis of the motion parameter during braking.

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**5,498,071**

**SPLIT ANTI-SKID CONTROL APPARATUS**

**Hirotaka Oikawa, and Toshio Takayama, both of Yamanashi, Japan, assignors to Tokico, Ltd., Kanagawa, Japan**

**Continuation of Ser. No. 789,254, Nov. 7, 1991, abandoned.**

**This application Apr. 28, 1994, Ser. No. 234,639**

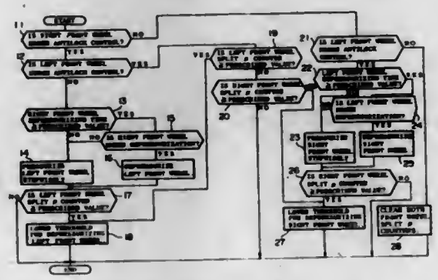
**Claims priority, application Japan, Nov. 9, 1990, 2-304928**

**The portion of the term of this patent subsequent to Jul. 6, 2010, has been disclaimed.**

**Int. Cl.[6] B60T *8/32***

**U.S. Cl. 303—149** **11 Claims**

1. An anti-skid control apparatus for a vehicle braking system



having front wheels, rear wheels, and a brake system for optionally exerting braking force on the wheels wherein brake fluid is employed to transmit the braking force, the anti-skid control apparatus comprising:



(a) wheel speed sensors for measuring speed of the wheels respectively;

(b) a modulator for selecting a mode for each of the wheels, the mode being selected out of an increase pressure mode, and at least one of a decrease pressure mode and a hold mode; the increase pressure mode is for increasing brake fluid pressure, the decrease pressure mode is for decreasing the brake fluid pressure, and the hold mode is for maintaining the pressure;

(c) a controller for judging, with reference to threshold values, whether or not a wheel is about to lock based on wheel speeds; and when a wheel is about to lock, activating antiskid control for the wheel which is about to lock by controlling the selection of modes at the modulator so that one of the hold mode and the pressure decrease mode is selected for the wheel which is about to lock; the controller having:

a pressure suppression means for stepwisely increasing in pressure increments the brake fluid pressure of a first front wheel which is not under the antiskid control in condition that a second front wheel is under antiskid control,

a split μ detection means for counting the number of said pressure increments, and judging that split μ state occurs when the number of increments exceeds a prescribed value, the split μ state being defined as a condition when the difference between the friction coefficients of the surface beneath the right and left wheels exceeds a predetermined value, and

a threshold value changing means for decreasing a threshold value corresponding to the first front wheel, during the antiskid control of the second front wheel and in the split μ state, so as to facilitate an activation of either one of the pressure decrease mode and the hold mode for the first front wheel.

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**5,498,072**

**ANTI-SKID CONTROL SYSTEM FOR AUTOMOTIVE VEHICLES**

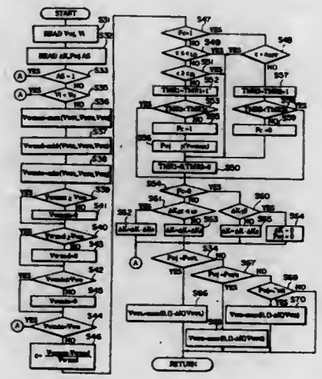
**Kouichi Shimizu, Sagamihara, Japan, assignor to Nissan Motor. Co., Ltd., Kanagawa, Japan**

**Filed May 23, 1996, Ser. No. 447,586**

**Claims priority, application Japan, May 24, 1994, 6-109957**

**Int. Cl.[6] B60T *8/58***

**U.S. Cl. 303—191** **9 Claims**



1. An anti-skid control system for an automotive vehicle, comprising:

sensor means for detecting a wheel speed of each road wheel of the vehicle;

control means for controlling a wheel-brake cylinder pressure of each road wheel;

compensation means for compensating a different-diameter wheel speed of a different-diameter road wheel with a small-sized tire in case that one of the road wheels is the different-diameter road wheel; and

error rate calculation means for calculating an error rate of the different-diameter wheel speed with respect to the detected wheel speed of the other road wheel with a usual tire on the basis of a maximum wheel speed corresponding to the different-diameter wheel speed and the detected wheel speed of the other road wheel, except at least during anti-skid control;

wherein said compensation means compensates the different-diameter wheel speed by said error rate;

wherein a first calculation means is provided for deriving a compensated vehicle speed from the compensated different-diameter wheel speed, and a second calculation means is provided for deriving a slip ratio of the different-diameter road wheel from the compensated vehicle speed and the compensated different-diameter wheel speed and deriving a slip ratio of the other road wheel from the compensated vehicle speed and the detected wheel speed of the other road wheel,

wherein said control means controls each wheel-brake cylinder pressure so that the slip ratio is adjusted to a predetermined reference slip ratio.

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**5,498,073**

**CORNER JUNCTION FOR CABINET, AND ELECTRICAL CABINET COMPRISING SUCH JUNCTIONS**

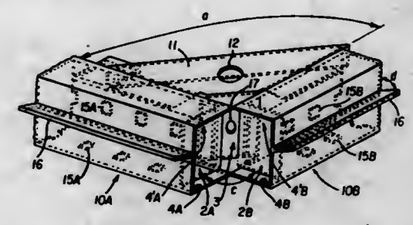
**Michel Charbonneau, Bresson; Edmond Bonnan, St. Marcellin; Kazimir Laboch, Meylan, and Jean-Pierre Pin, St. Etienne De St. Geoirs, all of, France, assignors to Schneider Electric SA, France**

**Filed Oct. 5, 1994, Ser. No. 318,440**

**Claims priority, application France, Jan. 18, 1993, 93 12480**

**Int. Cl.[6] A47B *43/00***

**U.S. Cl. 312—257.1** **31 Claims**



1. A corner junction for a cabinet, comprising:

a gusset plate having two profile sections secured thereto, the profile sections extending along a plane and forming a first angle therebetween, said gusset plate including two adjacent joining surfaces extending perpendicularly to the plane of the profile sections and symmetrically with respect to a plane bisecting the first angle;

a foot having a longitudinal axis perpendicular to the plane of the profile sections, said foot having two adjacent complementary joining surfaces which extend parallel to the longitudinal axis and which are respectively received by and abut against the joining surfaces of the gusset plate, wherein the complementary joining surfaces form a second angle, and the joining surfaces of the gusset plate form a third angle which is not greater than about 360°—the second angle;

at least one protruding portion extending from the foot and having opposed locking surfaces which extend substantially perpendicularly to the longitudinal axis;

at least one complementary notch formed in at least one of the gusset plate and the profile sections for receiving said at least one protruding portion, said at least one complementary notch having complementary opposed locking surfaces which abut against the opposed locking surfaces of said at least one protruding portion; and

securing means for securing the foot to the gusset plate by clamping the foot between the joining surfaces, wherein said foot is adapted to engage the gusset plate by translation along a direction parallel to the plane of the profile sections.

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**5,498,074**

## MACHINE FOR KNEADING DOUGH INCLUDING A ROTATABLE CONTAINER AND KNEADING TOOLS ROTATABLE IN THE CONTAINER

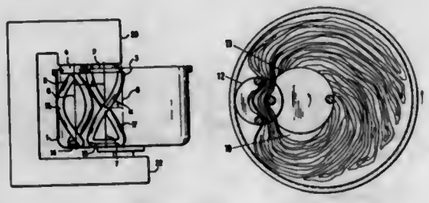
**Dieter Möller, Osnabrück; Konrad Thies, Neuenkirchen; Willi Schmidt, Burgdorf; Daniel Gerbel, and Joachim Etzenbach, both of Osnabrück, all of, Germany, assignors to Dierks & Soehne GmbH & Co. KG, Osnabrueck, Germany**

**Filed Jul. 5, 1994, Ser. No. 270,703**

**Claims priority, application Germany, Jan. 7, 1993, 43 34 121.7**

**Int. Cl.[6] B29B *7/20*; B01F *9/16***

**U.S. Cl. 366—94** **10 Claims**





1. A dough kneading machine comprising a rotating tub, means for rotating said tub about a tub axis, said rotating tub having a generally flat bottom and a cylindrical side wall, two kneading tools rotatable in said tub, means for rotating said two kneading tools in opposite directions about separate kneading tool axes which are parallel to said tub axis, said kneading tool axes and said tub axis being disposed in a common plane, each of said kneading tools having a pair of longitudinal legs which are symmetrically disposed with respect to the respective kneading tool axis, each of said pairs of longitudinal legs having a bottom and a top, bottom connecting means connecting the bottoms of each respective pair of longitudinal legs, supporting hub means supporting the tops of each respective pair of longitudinal legs, each of said pair of longitudinal legs having a generally belical configuration with the belical configuration of the pair of longitudinal legs of one kneading tool being offset from the belical configuration of the pair of longitudinal legs of the other kneading tool, one of said kneading tools being juxtaposed to said tub cylindrical side wall and the other of said kneading tools being disposed radially inwardly of said one kneading tool, said one kneading tool which is juxtaposed to said tub cylindrical side wall rotating in a direction opposite to the direction of rotation of said tub, each of said kneading tools having a working area diameter determined by the space transcribed by each respective kneading tool as each respective kneading tool rotates, said other kneading tool which is disposed radially inwardly of said one kneading tool being designated an inner kneading tool, said inner kneading tool being disposed in a position in said tub such that when said inner kneading tool rotates, said inner kneading tool overlaps said tub axis, said inner kneading tool having a larger working area diameter than the working area diameter of said one kneading tool juxtaposed to the tub cylindrical side wall, the distance between the kneading tool axes being about 15% to 25% less than the working area diameter of said inner kneading tool.

**5,498,075**

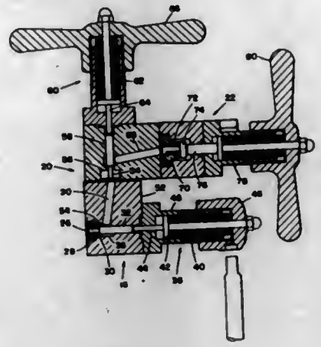
## PREMIX HOMOGENIZING SYSTEM

**Michael Jarchau, and Steffen Jahnke, both of Lubeck, Germany, assignors to APV Gaulin GmbH, Lubeck, Germany**

**Filed Apr. 11, 1994, Ser. No. 226,196**

**Int. Cl.[6] B01F *5/06***

**U.S. Cl. 366—176.2** **26 Claims**



1. A homogenizing system comprising:

a liquid pump; and

first, second and third stage homogenizing valves connected in series to receive successively liquid from the pump, homogenize the liquid in each of the first, second and third stages and deliver the homogenized product from the third stage to a product output, the pressure drop across the third stage being within the range of 20–200 bar.

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**5,498,076**

## STIRRER LID FOR A PAINT STIRRING MACHINE

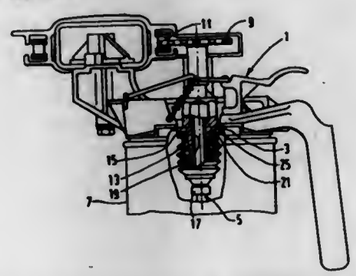
**Alain Krzywdziak, Orleans, France, assignor to F.A.S., Orleans Cedex, France**

**Filed Jun. 28, 1994, Ser. No. 267,480**

**Claims priority, application France, Jul. 5, 1993, 93 08194**

**Int. Cl.[6] B01F *7/16***

**U.S. Cl. 366—245** **7 Claims**



1. Stirrer lid for mounting on a tin containing a stirrable fluid substance, said lid including a hub; a stirrer rod having an upper collar bearing on the hub of said lid; a bellows-shaped sealing gaiter extending about said stirrer rod; a bearing washer for the stirrer rod, said washer being positioned between said lid hub and said collar, said washer having a surface for receiving a complementary surface of the collar; and an opposite surface for contacting the lid hub, at least three latching snugs on said surface for receiving the collar, said latching snugs being spaced about the periphery of said collar, uniformly angularly arranged such that the periphery of said collar is inhibited from moving laterally relative to said lid hub, each of said snugs including a catch for latchingly engaging said collar, said washer being rotatable while maintained laterally engaged on the collar through said catches, and said washer engages the lid hub responsive to a biasing force exerted upon the gaiter rotation of the hub relative to immobilizing means formed on the lid.



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**5,498,077**

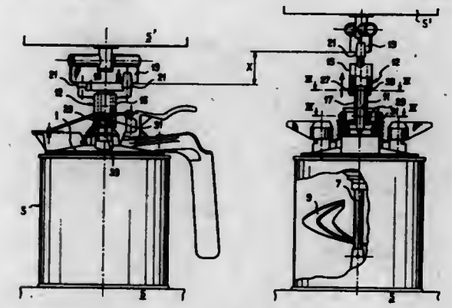
## ADJUSTABLE COUPLING DEVICE FOR DRIVING THE STIRRER ROD SHANK OF STIRRING DEVICES, IN PAINT STIRRING MACHINES

**Alain Krzywdzjak, and Benoit Beulin, both of Orleans, France, assignors to F.A.S., Orleans Cedex, France**

**Filed Nov. 3, 1993, Ser. No. 147,869**

**Int. Cl.[6] B01F *7/16;15/00***

**U.S. Cl. 366—247** **4 Claims**



1. Adjustable coupling device for driving a stirrer rod shank of devices including a stirrer lid positioned on a tin of paint located in a paint stirring machine, said coupling device comprising a first tube having a body and upper fork for coupling with a sbelf drive plate of the stirring machine, a second tube having a body and a height equivalent to that of the first tube and being of a reduced diameter with respect to the first tube, said second tube being slidably mounted at a clearance within said first tube, said stirrer rod shank projecting from the stirrer lid so as to be slidable at a clearance in said second tube, means for fastening the second tube to the stirrer rod shank and for fastening the second tube relative to the first tube in rotational connection and at a projecting height enabling coupling of said fork to the machine shelf drive plate, said fastening means including two set screws, a first of one said screws engaging the body of the second tube at a base thereof and being tightened against the stirrer rod shank, and said second screw engaging the body of the first tube at the base thereof and being tightened against the second tube.

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**5,498,078**

## MIXER FOR DOUBLE DISPENSING CARTRIDGES OR DISPENSING APPLIANCES

**Wilhelm A. Keller, Obstgartenweg 9, CH-6402 Merlischachen, Switzerland**

**Filed Jan. 13, 1995, Ser. No. 372,916**

**Claims priority, application European Pat. Off., Jan. 19, 1994, 94810031**

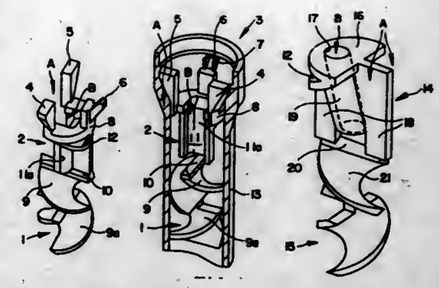
**Int. Cl.[6] B01F *5/06***

**U.S. Cl. 366—339** **10 Claims**

1. A mixer for double dispensing cartridges or dispensing appliances having at least two storage cylinders whose volumetric ratio is different from 1:1 and whose components are dispensed side by side, comprising:

a mixer housing which is attachable to a dispensing appliance having components dispensed side by side, and

a mixer element group arranged in said mixer housing and having an inlet portion with side by side inlets adapted to communicate with two contiguous dispensing openings of a dispensing appliance,



wherein the inlet portion of the mixer element group is divided into a larger inlet chamber for a first component having a greater dispensing volume and into a smaller inlet chamber for a second component having a smaller dispensing volume, and

wherein the smaller inlet chamber is arranged and designed in such a manner that the first component envelops the second component at an outlet of the smaller inlet chamber and that a first inlet edge of a first helix cuts both the first and the second component in half as said first and second components exit said inlet chambers.

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**5,498,079**

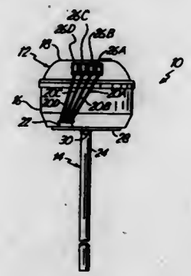
## TEMPERATURE TRANSMITTER

**Timothy D. Price, Chichester, England, assignor to Rosemount Inc., Eden Prairie, Minn.**

**Filed Dec. 23, 1994, Ser. No. 363,249**

**Int. Cl.[6] G01K *1/00*; H01L *1/02***

**U.S. Cl. 374—208** **8 Claims**



1. A temperature transmitter, comprising:

a temperature probe for sensing a temperature, said probe having probe wires connected to a temperature responsive element;

electrical circuitry coupled to the probe wires and providing an output related to sensed temperature;

a housing which contains the electrical circuitry and has a first side coupled to the temperature probe and a second side carrying a plurality of electrical terminals connected to the electrical circuitry; and

an elongated recess in an outer surface of the first side of the housing adjacent the probe and extending in a direction away from the probe, the elongated recess receiving the probe wires and channeling the probe wires along the outer surface in a direction away from the probe and to the plurality of electrical terminals on the second side of the housing the coupling between the electrical circuitry and the probe wires being through the electrical terminals.

**5,498,080**
**EASILY EXPANDABLE, FLEXIBLE PAPER POPCORN PACKAGE**
**Lisa M. Dalea, Maple Grove; Robert L. Esse, Monticello, and Francis M. Shee, Brooklyn Park, all of Minn., assignors to General Mills, Inc., Minneapolis, Minn.**
**Filed Apr. 16, 1994, Ser. No. 307,126**
**Int. Cl.[6] B65D *30/20***
**U.S. Cl. 383—120** **9 Claims**

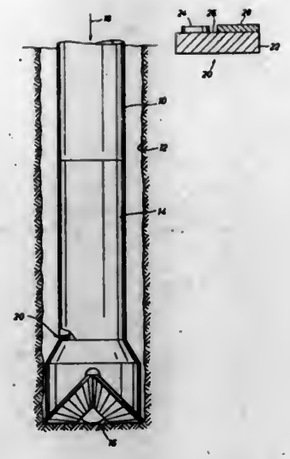


1. Expandable, paper, popcorn package for holding popcorn kernels for popping in a microwave oven comprising, in combination: a bag having a folded condition and an expanded condition and including first and second ends, a bottom wall, a top wall, and at least a first side wall defining an interior, with the first side wall including first and second pleats, with the first pleat having first and second edges, an inside surface and an outside surface, with the second pleat having first and third edges, an inside surface and an outside surface, with the first edges of the first and second pleats being connected together, with the second edge being connected to the bottom wall, with the third edge being connected to the top wall, with the inside surface of the first pleat abutting with the bottom wall, the inside surface of the second pleat abutting with the top wall, and the outside surface of the second pleat abutting with the outside surface of the first pleat in the folded condition; means for sealing the first end including means for securing the inside surface of the first pleat to the bottom wall and for securing the inside surface of the second pleat to the top wall; and means for bonding the outside surface of the second pleat to the outside surface of the first pleat adjacent to the first end but spaced from the second and third edges for ensuring that the first end of the bag does not vent by releasing the first end sealing means while the popcorn kernels are popping in the microwave oven and for allowing unfolding of the first and second pleats from each other at the first end.

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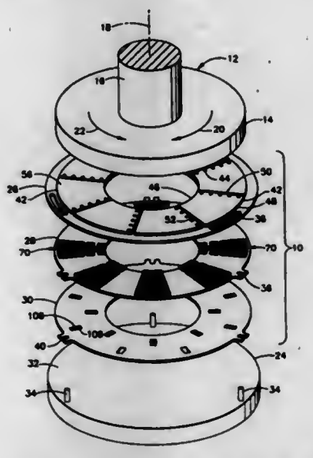
**5,498,081**
**BEARING ASSEMBLY INCORPORATING SHIELD RING PRECLUDING EROSION**
**Mahlon Dennis, Kingwood, and Thomas M. Dennis, Houston, both of Tex., assignors to Dennis Tool Company, Houston, Tex.**
**Filed Dec. 17, 1993, Ser. No. 168,949**
**Int. Cl.[6] F16C *17/04*; E21B *10/22***
**U.S. Cl. 384—95** **20 Claims**

1. A mud motor bearing assembly comprising:
(a) a circular support ring of cemented carbide having an exposed upper face;
(b) a plurality of similar PCD surfaces brazed to the face of said ring wherein said exposed PCD surfaces define a bearing support plane; and
(c) a deflector ring above said support ring to deflect drilling fluid flow so that erosion damage to said bearing support plane is reduced.



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**5,498,082**
**BI-DIRECTIONAL FOIL THRUST BEARING**
**Robert H. Nadjafi, San Pedro, Calif., assignor to AlliedSignal Inc., Morris Township, Morris Co., N.J.**
**Filed Jun. 20, 1995, Ser. No. 493,848**
**Int. Cl.[6] F16C *32/06***
**U.S. Cl. 384—105** **17 Claims**



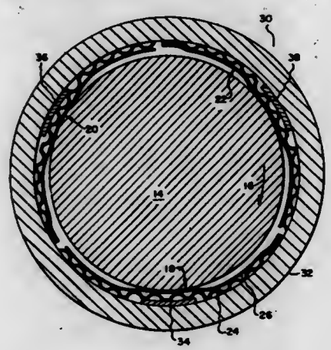
1. A bi-directional foil thrust bearing for use in an apparatus having a first member rotatable about a centerline axis and a second, stationary member, said thrust bearing disposed between said rotatable and said stationary members, said bi-directional foil thrust bearing comprising:
an annular spring cluster disk disposed coaxially about the centerline axis;
a plurality of circumferentially spaced, generally trapezoidal spring sets attached to said spring cluster disk;



wherein each of said spring sets includes a radially extending central portion attached to said spring cluster disk and a plurality of radially spaced spring members attached to said central portion; and
wherein each of said spring members includes a first portion attached to and extending generally circumferentially away from a first side of said central portion and further includes a second portion attached to and extending generally circumferentially away from an opposite side of said central portion.

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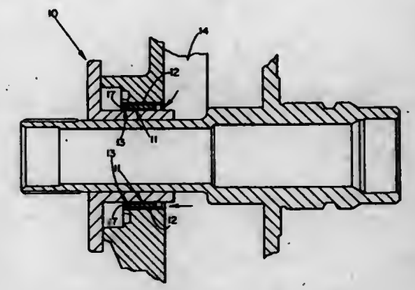
**5,498,083**
**SHIMMED THREE LOBE COMPLIANT FOIL GAS BEARING**
**William R. Brown, Slatington, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.**
**Filed Dec. 15, 1994, Ser. No. 356,426**
**Int. Cl.[6] F16C *32/06***
**U.S. Cl. 384—106** **9 Claims**



1. In a compliant foil gas bearing of the type consisting of a generally cylindrical journal sleeve housing having at least three bump foil assemblies disposed at locations approximately 120° C. apart on an inner surface of said housing each of said bump foil assemblies having an end fixed to said sleeve and a free end extending to a location proximate a fixed end of an adjacent bump foil assembly, the improvement comprising:
means to create pressure forces from each bump foil assembly said means placed under a portion of each of said bump foil assemblies proximate said fixed end of each bump foil assembly, whereby said bearing provides three gas pressure forces acting at approximately 120° C. from one another to stabilize and center a shaft installed in said bearing during high speed rotation of said shaft.

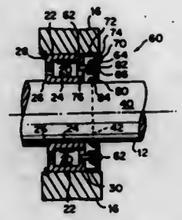
8. A method for increasing the load capacity and dampening characteristics of a three pad compliant foil gas beading, which is disposed on inner surface a generally cylindrical journal sleeve housing, used to support a shaft for rotation at high speed, comprising:
establishing three gas pressure forces one hundred and twenty degrees apart acting between each pad of said gas bearing and said shaft, where in said pressure force is established by inserting a thio metal shim between each pad and said sleeve housing.

**5,498,084**
**AUTOMATIC TRANSMISSION FRONT-BEARING OIL-FLOW CONTROL AND METHOD OF CONTROLLING SAME**
**Richard M. Boyd, St. Louis Park, Minn., assignor to Quadion Corporation, Minneapolis, Minn.**
**Filed Dec. 14, 1994, Ser. No. 355,624**
**Int. Cl.[6] F16C *17/12***
**U.S. Cl. 384—130** **15 Claims**



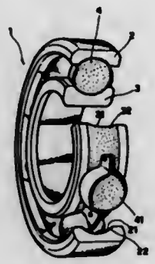
1. In an automatic transmission for motorized vehicles,
(a) a rotatable main shaft rotatably carried by the transmission;
(b) a front bearing having an inner bearing surface surrounding said main shaft in closely spaced relation thereto and defining a narrow annular oil-flow passage therebetween and having a downstream end;
(c) a housing closely surrounding said front bearing in fixed relation thereto and having an inner surface facing said shaft in spaced relation thereto;
(d) said housing having an annular gland formed in the inner surface thereof adjacent to and axially beyond the downstream end of said bearing and surrounding said shaft in spaced but close proximity thereto and having a downstream wall surface extending radially relative to said shaft opposite to and spaced axially of said downstream end of said front bearing;
(e) a split thermoplastic ring positioned within said gland and surrounding said main shaft and partially restricting the flow of oil between said bearing and said shaft, said ring being made of plastic material having pressure velocity value of at least 20,000 at 100 feet/minute surface speed;
(f) said ring having an inner diameter only slightly less than the outer diameter of said main shaft so as to fit tightly around said main shaft and having overlapping circumferentially extending free end portions with circumferentially extending open gaps disposed between said end portions when said ring is so disposed around said main shaft;
(g) at least one of said gaps communicating between said oil-flow passage at the downstream end of said front bearing and the area between said main shaft and said housing at a point downstream of said front bearing and of said ring and extending circumferentially of said ring a distance within the range of about 0.006"–0.300", and having axial dimensions within the range of 0.006"–0.150";
(h) said gland being partially defined in said housing by a wall structure extending axially of said shaft between said downstream wall surface of said housing and said bearing and being radially aligned with, but spaced from, the outer circumference of said ring a distance of at least 0.0005".

5,498,085
**SHAFT SEALING SYSTEMS**
Thomas L. Kiser, Farmington Hills, and Lawrence C. Boczar, Warren, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.
Filed Dec. 15, 1994, Ser. No. 357,571
Int. Cl.[6] F16C 33/46
U.S. Cl. 384—484 13 Claims



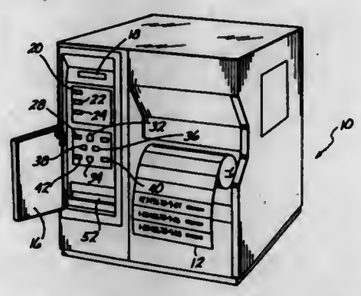
1. In a shaft seal system including a shaft, a bearing having an inner race and an outer race with rolling bearing elements disposed between the inner race and outer race and held in spaced relation with respect to one another by a bearing cage, the improvement comprising:
an outer sealing surface on the bearing cage;
an outer seal having an outer end fixed with respect to both the shaft and the bearing cage, the outer seal having a sealing surface in contact with the sealing surface of the bearing cage; and
an inner seal having an outer end fixed to the bearing cage for rotation therewith and a sealing surface for sealing with the surface of the rotating shaft, wherein the contact velocity between the sealing surface of the outer seal and the shaft and the contact velocity between the inner seal and bearing cage are less than a preselected standard velocity for seals used to seal rotating shafts.

5,498,086
**OIL FILM-DEPOSIT BEARING**
Chin-Sung Ou, P.O. Box 22765, Taipei, Taiwan, Prov. of China
Filed Jan. 31, 1995, Ser. No. 381,313
Int. Cl.[6] F16C 33/32
U.S. Cl. 384—491 3 Claims



1. An oil film-deposit bearing comprising:
an outer ring, the inner circumference of said outer ring having at least one or more arc groove, on the surface of said arc groove having a plurality of capillary holes;
an inner ring, the inner circumference of said inner ring having at least one or more arc groove, on the surface of said arc groove having a plurality of capillary holes;
a plurality of rolling means, the outer surface of each said rolling means having a plurality of capillary holes, said rolling means being installed between said arc grooves of said outer ring and said inner ring and can roll freely between said arc grooves; the oil film-deposit bearing characterized in that:
the oil or grease added on the contacting surface between said rolling means and said arc grooves would be deposited in said capillary holes of said rolling means and said capillary holes of said outer ring and said inner ring, once the oil film-deposit bearing rotating with shaft, the oil or grease deposited in the capillary holes flowing out to form an oil film on said contacting surface between said rolling means and said arc grooves, thus the oil film-deposit bearing can lubricate itself and prevent the oil or grease from throwing out in high speed rotation.

5,498,087
**WIDE WEB COMPATIBLE PRINTER**
Geoffrey A. Wey, Foothill Ranch; Kenneth A. McCrimmon, Claremont, and Robert S. Crum, Hacienda Heights, all of Calif., assignors to Printronix, Inc., Irvine, Calif.
Filed Aug. 10, 1994, Ser. No. 288,492
Int. Cl.[6] B41J 05/00
U.S. Cl. 400—68 25 Claims

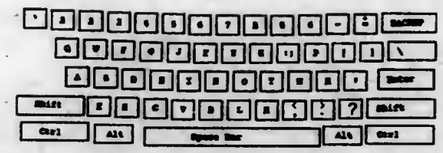


1. Apparatus for printing data on a web of material from data adapted to be printed on a wider web than that to be printed on comprising:
a printer having a paper output of a narrower web than the web related to the data that is to be printed;
means for providing data as to the narrow web width of said printer;
means for providing data as to the wide web width data that is to be printed;
means for establishing the difference between the narrow web width of the printer and the wide web width;
means for calculating the number of pages of said narrow web width to be printed derived from said wide web width data; and,
means to provide a raster output from the difference between the narrow web width and the wide web width so as to establish the width for printing by said printer printing the narrower web width of said printer.

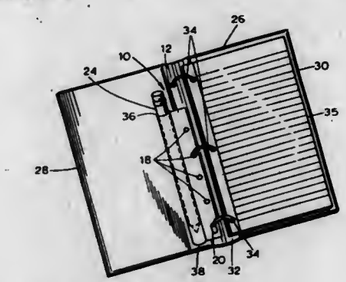
5,498,088
**KEYBOARD ARRANGEMENT TO MAXIMIZE TYPING SPEED AND EASE OF TRANSITION FROM A QWERTY KEYBOARD**
John I. M. Choate, P.O. Box 65, Seminole, Okla. 74818-0065
Continuation-in-part of Ser. No. 918,767, Jul. 27, 1992, Pat. No. 5,352,050. This application Jul. 11, 1994, Ser. No. 273,205
Int. Cl.[6] B41J 5/10
U.S. Cl. 400—486 17 Claims

2. A keyboard having, a complete alphabet, in at least three rows, each row having nine or more keys; comprising:
a home row having the key corresponding to the letter E; wherein at least two of the remaining keys, selected from the group consisting of the letters A, S, D, H and L, have the same location as in the home row of the conventional QWERTY keyboard;
an upper row, adjacent to said home row; having at least four keys corresponding to the letters selected from the group consisting of the letters Q, W, T, Y, U, O and P; wherein at least four of the keys corresponding to the letters Q, W, T, Y, U, O, and P have the same location as in the upper row of the QWERTY keyboard; and
a lower row, adjacent to said home row, having at least five keys corresponding to the letters selected from the group consisting of Z, X, C, V, B, N, M, the period, the comma, and the question mark; wherein at least five of the selected keys have the same location as in the lower row of the QWERTY keyboard.





5,498,089
**HOLDER FOR PEN-LIKE ARTICLES**
Kenneth J. Motyka, Mt. Prospect, Ill., assignor to Deluxe Craft Manufacturing Co., Chicago, Ill.
Filed Dec. 7, 1994, Ser. No. 360,800
Int. Cl.[6] B42F 3/00
U.S. Cl. 402—4 12 Claims

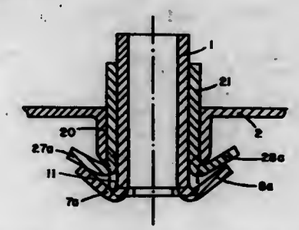


1. A holder for a pen-like article comprising:
a sheet of resilient material, said sheet having a first elongate edge and a second elongate edge;
a plurality of spaced apart holes formed in said sheet along the length of and adjacent to the first edge; and
a curved portion formed in said sheet intermediate said first and second edge and along the length of and adjacent to said second edge to define a substantially cylindrical passage, said passage being adapted to releasably securely retain a pen-like article.

5,498,090
**APPARATUS FOR COMBINING PERFORATED PAPERS INTO STACKS**
Kurt Lorber, Schurwaldstrasse 114, D-73773 Aichwald, Germany
Filed Jun. 24, 1994, Ser. No. 265,328
Claims priority, application Germany, Jun. 26, 1993, 43 21 317.0
Int. Cl.[6] B42F 13/02
U.S. Cl. 402—57 9 Claims

1. An apparatus for combining perforated papers into stacks comprising a pin member providing a head, a tip member and a shank and defining a longitudinal pin axis, said shank having an external round shank thread, and a nut member, said nut member having an internal nut thread corresponding to said external round shank thread and defining a nut thread axis, wherein said pin member and said nut member are made from a flexible plastic and are manufactured by injection molding in a mold having two mold halves and split along a parting plane.

5,498,091
**CONNECTING ASSEMBLY FOR FIXING THE TUBULAR STEM/STUD OF A PORTABLE LAMP TO THE BASE OF THE SAME**
Kam-Hoi Chan, Kowloon, Hong Kong, assignor to Go-Gro Industries Ltd., Kowloon, Hong Kong
Continuation of Ser. No. 9,783, Jan. 27, 1993, abandoned.
This application Feb. 21, 1995, Ser. No. 391,614
Claims priority, application Hong Kong, Jan. 27, 1992, 92201856.1; Jun. 22, 1992, 92225228.9
Int. Cl.[6] H01R 33/46; F16B 21/02
U.S. Cl. 403—3 3 Claims



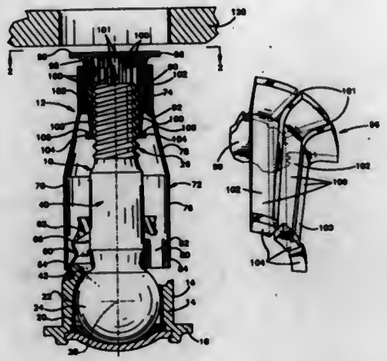
3. A connecting assembly for attaching a stem/stud of a portable lamp to a base of the same, comprising:
a tubular stem/stud having two or more tabs extending from and equally spaced about a lower portion of said stem/stud, said tabs defining recesses therebetween;
a base having a first recessed tubular portion formed therein having an inner diameter made in the inch system of measurement; a second recessed tubular portion being concentrically formed at the end of said first tubular portion having an inner diameter made in the metric system of measurement; said first and second tubular portions receiving either an inch system stem/stud or a metric system stem/stud; said second tubular portion having a hole formed at its end concentric with said first and second tubular portions, said hole having shoulders corresponding to said recesses of said stem/stud; and
said tabs of said stem/stud extending through said hole in said base such that top edges of said recesses abut top surfaces of said shoulders, said tabs being folded outwardly to clamp said base between said top edges of said recesses and said folded tabs.

5,498,092

## PROTECTIVE COVER FOR A BALL JOINT ASSEMBLY

Russell T. Fellows, Harrison Township, Mich., assignor to TRW Inc., Lyndhurst, Ohio

Filed Jun. 23, 1994, Ser. No. 264,477
Int. Cl.[6] B65D 59/00
U.S. Cl. 403—12 13 Claims



1. A protective cover for a ball joint assembly having a socket with a ball stud and a seal between the socket and the ball stud, said cover comprising:

a generally cylindrical side wall defining a generally cylindrical chamber for enclosing the stud;

retaining means for engaging a shaft of the ball stud to prevent removal of said cover from the ball joint; and

cam surface means for engaging said retaining means and moving said retaining means toward the stud upon movement of said retaining means relative to said cam surface means.

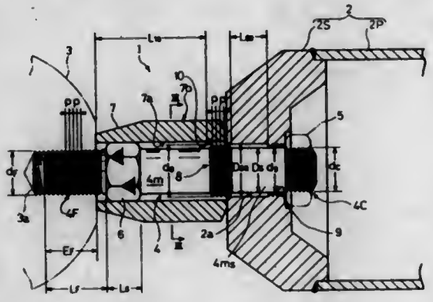
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5,498,093

## JOINT DEVICE FOR A STRUCTURAL MEMBER OF A TRUSS

Katsuhiko Imai, Ashiya, Japan, assignor to Kawatetsu Kenzai Kogyo Kabushiki Kaisha, Hyogo, Japan

Filed May 18, 1994, Ser. No. 245,332
Claims priority, application Japan, May 19, 1993, 5-141464
Int. Cl.[6] F16B 7/04; E04C 3/04
U.S. Cl. 403—171 18 Claims



1. A joint device for joining or connecting a structural member to a connector node having a screw hole comprising:

a fastening bolt with an external threaded portion at a first end thereof for engaging the screw hole of the node and a second end, opposite said first end, for communicating with said structural member;

a sleeve having first and second end faces at opposite ends thereof for engaging said node and said structural member, respectively, and said sleeve defining a sleeve hole;

said fastening bolt having a polygonal boss disposed between said external threaded portion and said second end;

said fastening bolt slidably engaging said sleeve hole of said sleeve with said polygonal boss, said fastening bolt having an orientation having said first end nearest said first end face of said sleeve and said second end nearest said second end face of said sleeve;

a stopper, disposed on an inner face of said sleeve hole in said sleeve, sufficient in size to contact a peripheral portion of said polygonal boss closest to said second end and prevent sliding movement of said polygonal boss of said fastening bolt past said stopper and thereby prevent complete passage of said sleeve over said first end of said fastening bolt; and

said stopper being located a distance from said first end face of said sleeve greater than a length from said first end to said peripheral portion of said polygonal boss nearest said second end permitting said external threaded portion to be fully retracted within said sleeve hole.

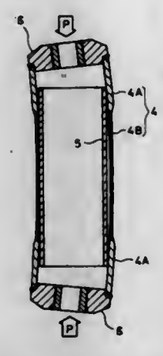
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5,498,094

## DOUBLE STEEL PIPE STRUCTURAL MEMBER

Katsuhiko Imai, Ashiya, Japan, assignor to Kawatetsu Kenzai Kogyo Kabushiki Kaisha, Hyogo, Japan

Filed May 25, 1994, Ser. No. 248,931
Claims priority, application Japan, Jun. 4, 1993, 5-160443
Int. Cl.[6] E04B 1/34; 1/38
U.S. Cl. 403—171 4 Claims



1. A double steel pipe structural member provided with an internal pipe for suppressing elastic and plastic buckling of an external pipe in response to axial compressive forces, said structural member comprising:

said external pipe comprising an elongated thin steel pipe part having a thick steel pipe part integrated with each end of said thin steel pipe part, said external pipe having an open end cap on at least one end thereof;

the thickness of said thick steel pipe part is 1.5 to 1.7 times the thickness of said thin steel pipe part;

the clearance between the outer surface of said internal pipe and the inner surface of said external pipe is as small as possible; said external pipe and said internal pipe are affixed to each other at an intermediate portion of each pipe in the longitudinal direction thereof;

the length of a space between an end face of said internal pipe and an inner face of said end cap is defined by a half of the predetermined axial compressive deformation allowable for said external pipe; and

overlapped length of said thick steel pipe part with said internal pipe being one to two times the outer diameter of said external pipe.

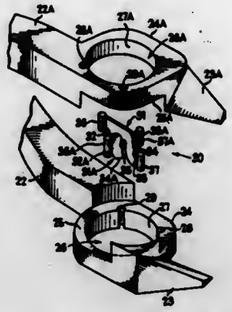


5,498,095

## PRESS FITTED FLEXURAL PIVOT JOINT

Bert Krivec, Waukesha, Wis., assignor to Snap-on Incorporated, Kenosha, Wis.

Filed May 19, 1994, Ser. No. 246,152
Int. Cl.[6] B25B 7/06; B26B 13/28
U.S. Cl. 403—291 23 Claims



15. A flexural pivot joint comprising: first and second pivoting members respectively defining first and second cylindrical surface portions coaxial with a common pivot axis for relative pivotal movement about said axis, and four spaced-apart flexible elements respectively defining planes each including said axis, each of said flexible elements having opposed end portions respectively connected to said first and second pivoting members at opposite sides of said axis.

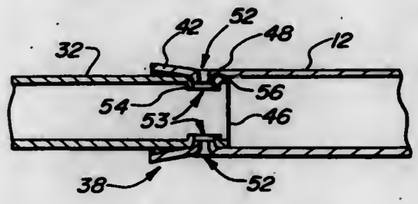
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5,498,096

## TUBE JOINT FORMED WITH ADHESIVE AND METAL FORMING PROCESS

James A. Johnson, Brighton, Mich., assignor to Hoover Universal, Inc., Plymouth, Mich.

Filed Oct. 28, 1994, Ser. No. 330,967
Int. Cl.[6] F16L 13/14
U.S. Cl. 403—267 13 Claims



1. A tube joint comprising:

an outer tube having a flared end formed by a flare;

an inner tube having two ends and an outside diameter sized to fit within said outer tube, one end of said inner tube being disposed within said flared end of said outer tube with an end portion of said inner tube extending into said outer tube beyond said flare, forming a telescoping tube portion in which said outer tube overlaps said inner tube immediately adjacent said flare, said flare forming a clearance between said inner and outer tubes;

an adhesive disposed in said clearance between said inner and outer tubes formed by said flare; and

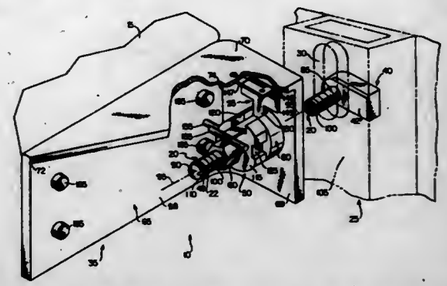
said tubes having concentric apertures extending radially through said inner and outer tubes at said telescoping tube portion, said aperture in said outer tube being surrounded by an inwardly directed flange which extends into said aperture in said inner tube.

5,498,097

## GENERATOR SET MOUNTING CLAMP

Robert P. Shapess, Cato, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 27, 1993, Ser. No. 173,037
Int. Cl.[6] B25G 3/38
U.S. Cl. 403—322 4 Claims



1. A mounting clamp for mounting a power supply to a thermal freight container, comprising:

(a) a longitudinally extending shaft having first and second ends;

(b) a base means for supporting said shaft in a manner allowing longitudinal movement of said shaft thereof to an extended position, and, away from the extended position, and also allowing rotational movement of said shaft between a clamping and an unclamping position;

(c) a stop attached to said first end of said shaft, said stop being configured to clampingly engage cooperating structure on the container when said shaft is rotated to its clamping position, and is moved away from its extended position;

(d) a fastening means for governing longitudinal movement of said shaft to the extended position and away from the extended position;

(e) handle means operatively engaging said longitudinally extending shaft for causing said shaft to rotate between its clamping position and its unclamping position, said handle means having a clamp position slot and an unclamp position slot; and

(f) locking means for locking the rotational movement of said shaft in its clamping position and its unclamping position, said locking means comprising a hinge attached to said base means, a hinge arm locking the rotational motion of said handle means by cooperating with said clamp position slot and said unclamp position slot of said handle means, and a lock bar for cooperation with said fastening means.

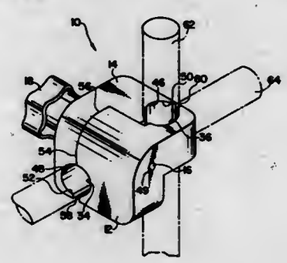
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5,498,098

## TWO-PIECE CLAMPING ASSEMBLY

James W. Cairns, Westchester, Pa., assignor to Nolu Plastics, Inc., Aston, Pa.

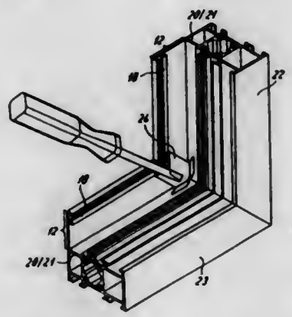
Filed Nov. 10, 1994, Ser. No. 339,276
Int. Cl.[6] F16B 7/04
U.S. Cl. 403—400 9 Claims



1. A clamping assembly comprising:
a first clamp member having a first core portion and first and second arms extending from the first core portion in directions generally transverse to each other, said first core portion including a first bore therethrough extending in a direction generally transverse to a longitudinal axis of said first arm, at least a portion of said first bore defining screw threads, each said first and second arm having a recess therein,
a second clamp member having a second core portion and first and second arms extending from the second core portion in a direction generally transverse to each other, said second core portion including a second bore therethrough extending generally parallel to a longitudinal axis of said first arm thereof, each said first and second arm of said second clamp member having a recess therein,
said first and second clamp members being constructed and arranged to cooperate such that said first bore aligns with said second bore to define an axial bore, said recess of said first arm of said first clamp member and said recess of said second arm of said second clamp member cooperate to define a first pin holding bore and said recess of said second arm of said first clamp member and said recess of said first arm of said second clamp member cooperate to define a second pin holding bore disposed generally transverse with respect to said first pin holding bore,
a rod having first and second ends and a portion thereof defining screw threads, said rod being threaded into said portion of said first bore and extending through said axial bore and beyond an end surface of said second core portion; and
a control knob coupled to said second end of said rod, said control knob including a seating surface constructed and arranged to engage said end surface of said second core portion,
whereby, manual movement of said control knob such that said seating surface contacts said end surface, clamps the second clamp member between the first clamp member and the control knob so as to clamp associated pins in said pin holding bores.

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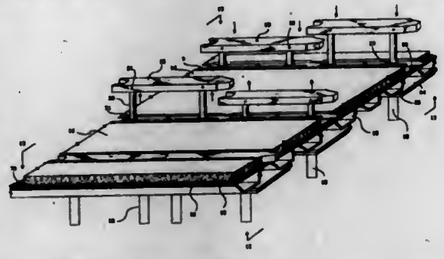
**5,498,099**
**BUTT JOINT**
**Helmuth Scheuer, Enger, Germany, assignor to Schüco International KG, Bielefeld, Germany**
**Filed Mar. 17, 1994, Ser. No. 214,941**
**Claims priority, application Germany, Mar. 17, 1993, 43 08 540.7**
**Int. Cl.[6] E06B *3/96*; F16B *12/50***
**U.S. Cl. 403—403** **13 Claims**



1. A butt joint comprising:
a first hollow profile member having an interior surface, and exterior surface an a projecting first stop, said first stop comprising a first web and a groove-bounding web;
a second hollow profile member being connected to said first hollow profile member to form an inside corner, said second profile member having a interior surface, an exterior surface and a projecting second stop, said second stop comprising a first web and a groove-bounding web; and
a reinforcement part being disposed adjacent to said inside corner, said reinforcement part being elastically deformable and being supported by said first stop and said second stop such that said reinforcement part is disposed solely on the interior surface of the first hollow profile member and the interior surface of the second hollow profile member.

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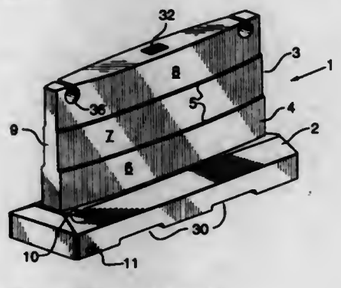
**5,498,100**
**RETRACTABLE DELINEATOR SYSTEM FOR SUSPENSION SPAN & TRUSS BRIDGES**
**Robert M. Guernsey, 46 Elm Ave., San Anselmo, Calif. 94960**
**Filed Oct. 7, 1994, Ser. No. 329,008**
**Int. Cl.[6] E01F *13/00***
**U.S. Cl. 404—6** **5 Claims**



1. A delineator system comprising:
a barrier member connected to and supported on a set of lifting ram units which are fixed in a road surface of a roadway, wherein said barrier member is a beam supported between a set of at least two of said set of lifting ram units,
wherein when said ram units are extended said barrier member prevents vehicles traveling on said roadway from passing between a set of at least two of said set of lifting ram units from one side of said barrier member to a second side of said barrier member,
wherein when said ram units are retracted said barrier member is also retracted into a recess in said roadway such that a top of said barrier member forms part of said road surface across which vehicles may travel.

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**5,498,101**
**ROAD BARRIER**
**Josef J. Braverman, 32 Loma Vista Drive, Thornhill, Ontario, Canada**
**Filed Nov. 2, 1994, Ser. No. 332,800**
**Int. Cl.[6] E01F *13/00***
**U.S. Cl. 404—6** **10 Claims**



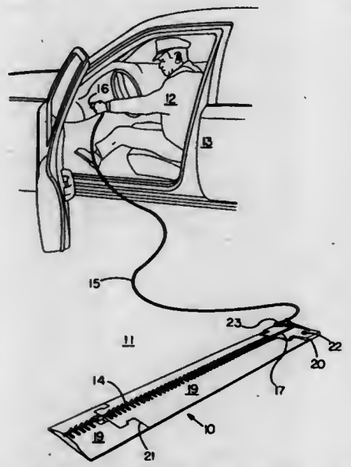
1. A plastic road barrier, comprising:



an elongated base portion having an open center portion and a hollow peripheral portion surrounding said open center portion, said hollow peripheral portion having an inlet into an upper area thereof for receiving ballast means and an outlet from a lower area thereof for draining said ballast means; and
an elongated hollow upper portion with an open bottom, said upper portion extending upwardly from said base portion and having all horizontal dimensions reducing from bottom to top;
said barriers being stackable by virtue of said upper portion of one barrier being insertable a substantial distance into the upper portion of another barrier, via said open center of said base portion.

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**5,498,102**
**ELECTROMECHANICAL TIRE DEFLATING SPIKE STRIP**
**Sheldon Bissell, P.O. Box 135, Mt. Ranch, Calif. 95246**
**Filed Feb. 21, 1995, Ser. No. 391,593**
**Int. Cl.[6] E01F *13/00***
**U.S. Cl. 404—6** **11 Claims**

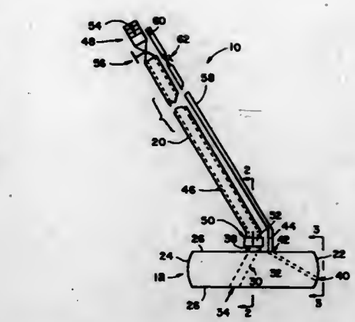


1. A vehicle tire deflating spike strip for deployment and use upon a road surface, comprising:
(a) essentially rectangular solid modular frame units of low height but length greater than width and ends having means for rapid interlocking of the units together by hand to form and extend the spike strip to various desired lengths across a roadway;
(b) a plurality of hollow spikes with slits along their sides;
(c) means for releaseably retaining the spikes in the strip;
(d) means for raising and lowering the spikes;
(e) means for protecting a user while handling the spike strip;
(f) means for alerting a user when the spikes are raised in an up position wherein the means for alerting a user is an illuminated red light when a solenoid, which is used for raising the spikes, is energized.

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**5,498,103**
**APPLICATOR APPARATUS FOR DISPENSING A SEALANT**
**Andrew J. Bauer, III, 5501 Decker Rd., Louisville, Ky. 40258**
**Filed Feb. 22, 1994, Ser. No. 199,058**
**Int. Cl.[6] E01C *23/02***
**U.S. Cl. 404—107** **9 Claims**

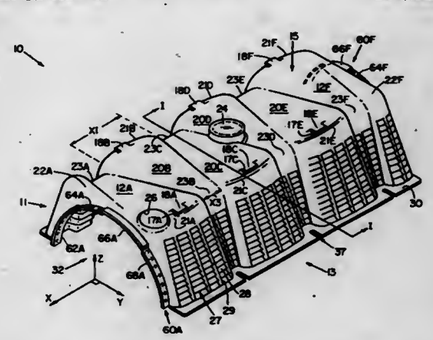
1. An applicator apparatus for dispensing and shaping a sealant material into a groove to be filled with the sealant material comprising:



a. a dispensing head having a front end, a back end, a top side and a convex bottom surface for shaping the sealant material deposited in the groove as the dispensing head is moved along the length of the groove, and the convex bottom surface having a width dimension greater than the width of the groove so that when in use the dispensing head remains in contact with the opposite side edges of the groove and so that a portion of the convex surface protrudes into the groove for shaping the upper surface of the sealant material deposited in the groove;
b. a sealant dispensing passage having a sealant outlet opening at the bottom surface of the dispensing head, and a sealant inlet opening located in the top side of the dispensing head; and,
c. an air passage having an air outlet opening located in the bottom surface of the dispensing head between the sealant outlet opening of the sealant dispensing passage and the front end of the dispensing head.

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**5,498,104**
**LEACHING CHAMBER**
**Terrance H. Gray, 28 Webber Ave., Bath, Me. 04530**
**Continuation-in-part of Ser. No. 236,449, Apr. 29, 1994, Pat. No. 5,441,363. This application Oct. 7, 1994, Ser. No. 320,496**
**Int. Cl.[6] E02B *13/00***
**U.S. Cl. 405—43** **54 Claims**



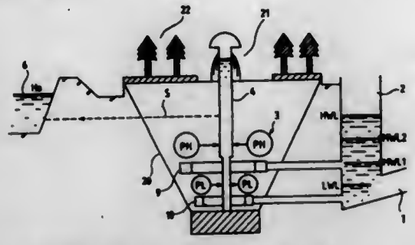
1. A hollow load bearing structure having a height and a longitudinal axis, the structure comprising a locking flange at a longitudinal end of the structure for locking the structure to a like structure, the locking flange including a series of flange members alternating about a common reference curve which defines a matable surface boundary of each flange member.

5,498,105

## DRAINAGE WATER PUMPING STATION AND METHOD FOR OPERATING THE SAME

Kunio Takada, Iwama; Kenji Otani, Tsuchiura, and Sadashi Tanaka, Chiyoda, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 900,418, Jun. 28, 1992, Pat. No. 5,360,289. This application Nov. 1, 1994, Ser. No. 332,089
Claims priority, application Japan, Jun. 20, 1991, 3-148557
The portion of the term of this patent subsequent to Nov. 1, 2011, has been disclaimed.
Int. Cl.[6] E03F 1/00
U.S. Cl. 405—52 15 Claims



1. A drainage water pumping station comprising:
a pump well into which drainage water can flow through an underground inflow mainpipe line, and
a plurality of drainage pumps within said pump well for discharging drainage water in said pump well to a discharge destination,
wherein a first portion of said plurality of drainage pumps is installed at a lower installation level and a second portion of said plurality of drainage pumps is installed at a higher installation level.

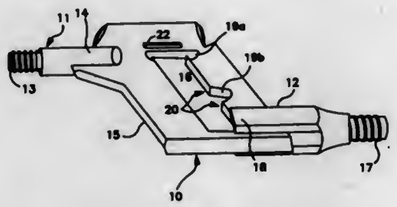
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5,498,106

## CORING ROD REALIGNMENT TOOL

David M. Brown, 81 Lowson Crescent, Winnipeg, Manitoba, Canada

Filed Dec. 2, 1994, Ser. No. 348,477
Int. Cl.[6] F16L 1/10
U.S. Cl. 405—184 6 Claims



1. A coring rod realignment tool comprised of:
(a) a stationary arm that has a first end, and a second end, wherein the first end is coupleable to a coring rod;
(b) a cutting body, the front face of which is shaped to facilitate it being pulled or pushed through solid ground, that is rigidly attached to the second end of the stationary arm, such that the first end of the stationary arm and the front face of the cutting body will both travel through the ground in the same direction;
(c) a moveable arm that has a first end, and a second end, wherein the first end is coupleable to a coring rod, and the second end is moveably coupled with the cutting body, wherein the moveable arm, can be moved, while coupled with the cutting body, so that its first end is in alignment with the first end of the stationary arm, and wherein the moveable arm can be moved, while coupled with the cutting body, so that its first end is out of alignment with, and substantially parallel to, the first end of the stationary arm.

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5,498,107

## APPARATUS AND METHOD FOR INSTALLING CABLED GUYED CAISSONS

Conrad J. Schatzle, Jr., Rte. 3, Box 70, Hidden Hills Lake, Arnaudville, La. 70512

Filed Nov. 21, 1994, Ser. No. 342,910
Int. Cl.[6] E02B 17/00
U.S. Cl. 405—224 26 Claims



1. An apparatus for supporting an offshore well located at a desired location in a depth of water above a water bottom that has been installed by a moveable drilling rig, after said drilling rig has been removed from said well location, said well having a conductor pipe, access platforms, a wellhead and wellhead equipment, where said movable drilling rig is used to drive said conductor pipe into the mudline of said water bottom and temporarily support said conductor pipe while said offshore well is drilled and completed with a wellhead, through said conductor pipe, comprising:
(a) means for holding said conductor pipe in tension from said drilling rig;
(b) a caisson driven into said mudline adjacent to said conductor pipe;
(c) a plurality of at least three anchor piles driven into said mudline around said caisson;
(d) a plurality of anchor cables, each of said cables having first and second ends;
(e) means for attaching said first end of said anchor cables to said anchor piles;
(f) means for attaching said second end of said cables to said caisson;
(g) means for tightening said cables to a desired degree of tension;
(h) a plurality of conductor braces mounted to said caisson between said caisson and said conductor pipe for supporting said conductor pipe at intervals along its length above said mudline; and
(i) wellhead access means mounted to said caisson for access to said wellhead.

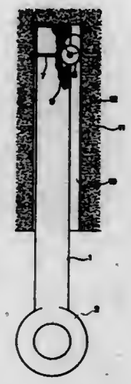


5,498,108

## ANCHORING DEVICE

Lars Fründberg, Gyttorp, S-713 82 Nora, Sweden

PCT No. PCT/SE91/00168, § 371 Date Nov. 3, 1992, § 102(e) Date Nov. 3, 1992, PCT Pub. No. WO91/14106, PCT Pub. Date Sep. 19, 1991
PCT Filed Mar. 4, 1991, Ser. No. 941,126
Claims priority, application Sweden, Mar. 5, 1990, 9000764
Int. Cl.[6] F21D 21/00; F16B 2/02
U.S. Cl. 405—259.1 18 Claims



1. An anchoring device comprising an elongated element (1) having a longitudinal axis and adapted for insertion into a hole (10) by movement along the longitudinal axis and securing means for securing the element against withdrawal from the hole, characterized in that said securing means comprises at least one part (5, 13, 16) movably connected by a resilient member to the elongated element (1) such that the resilient member serves to connect the movable part to the elongated element and also facilitates both the anchoring of the device in the hole and the release of the device from the hole, the movable part being adapted to protrude laterally, relative to a transverse axis, beyond the periphery of the element to be movable into contact with a wall (12) of the hole, and further adapted to move, along the longitudinal axis and relative to the element (1) in response to a retractive force exerted on the element (1) and a frictional force exerted between the part and the wall (12) of the hole while increasing the transverse dimension of the device and thereby securing the element within the hole and further adapted to retract relative to the element in response to an impact force applied to the element along the longitudinal axis, thereby permitting release of the device from the hole.

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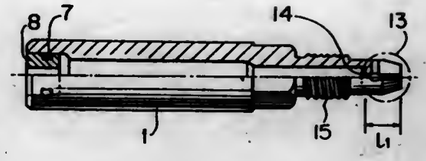
5,498,109

## DRILLING APPARATUS OF HARD BRITTLE MATERIAL AND METHOD THEREOF

Toshihiro Mine; Shinichi Kazui, both of Hadano; Kenji Morita, Isehara; Hiroyuki Ogino; Takeji Shiokawa, both of Kanagawa, and Hideaki Sasaki, Hadano, all of, Japan, assignors to Hitachi, Ltd.

Filed Mar. 21, 1994, Ser. No. 215,054
Claims priority, application Japan, Mar. 25, 1993, 5-066426
Int. Cl.[6] B23B 35/00;39/00
U.S. Cl. 408—1 R 19 Claims

1. A collet chuck for holding a tubular core drill, comprising:
a chuck main body of an integral shape which is hollow to allow lubricant to flow inside of the chuck main body;
a seal joint provided on the chuck at the inlet side of the lubricant;
a slit portion provided on the chuck at the outlet side of the lubricant for holding said core drill; and
a seal portion provided axially inside of said slit portion, which seal portion has an inner diameter substantially equal to an outer diameter of said core drill applied to the seal portion; and
a threaded portion formed on the outer periphery of a portion further axially inside of the seal portion,
wherein after inserting said core drill into said seal portion, a fastening nut is engaged with and tightened on said threaded portion to thereby fix and seal said core drill, and that the lubricant at a high pressure can be supplied into a central space of said core drill during machining.



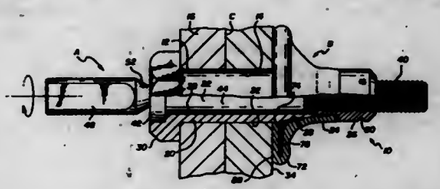
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5,498,110

## BLIND FASTENER WITH DEFORMABLE SLEEVE

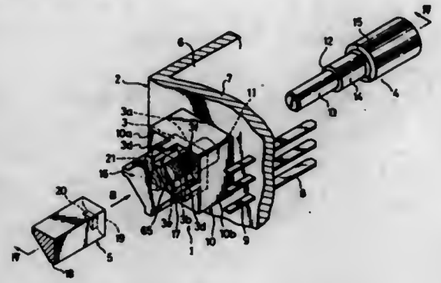
Edgar L. Stencel, Alta Loma, and Paul P. Krawiec, Hacienda Heights, both of Calif., assignors to Monogram Aerospace Fasteners, Los Angeles, Calif.

Filed Feb. 25, 1994, Ser. No. 201,759
Int. Cl.[6] F16B 13/04
U.S. Cl. 411—43 23 Claims



1. A blind fastener for inserting in aligned openings of first and second overlapping panels to secure them together, the overlapping panels defining a shear plane between them, the blind fastener comprising:
a body having an axial bore therethrough, a head at an outer end thereof for engaging an outer one of said first and second overlapping panels, a conically shaped inner end, and an external cylindrical surface between the head and the conically shaped inner end, the external cylindrical surface to be positioned inside the aligned openings and across the shear plane of the overlapping panels upon setting of the fastener;
a core bolt configured to pass through the axial bore of the body having a bolt head at an outer end thereof, an externally threaded portion at an inner end thereof, and an intermediate unthreaded portion between the bolt head and the threaded portion, the intermediate unthreaded portion to be positioned across the shear plane upon setting of the fastener;
a nut having a threaded bore for engaging the threaded portion of the core bolt, the nut further having an enlarged head at an inner end thereof, a stem at an outer end thereof, and an annular shoulder between the enlarged head and the stem, the enlarged head having a greater diameter than the diameter of the stem; and
a sleeve configured to fit around the core bolt having an outer end portion adjacent the conically shaped inner portion of the body and an inner end portion that is fixed around the stem of the nut, the outer end portion of the sleeve being sufficiently deformable such that movement of the nut toward the body during setting of the fastener deforms the sleeve to a fully set condition in overlying contact with an inner one of said first and second overlapping panels.

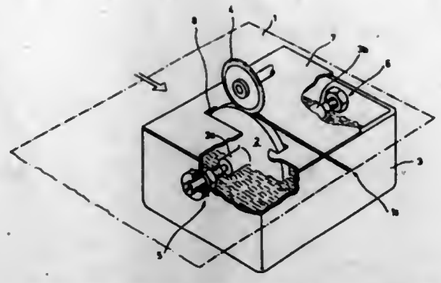
5,498,111
SCREW CONNECTOR
Shigemitsu Inaba, and Masayuki Yamamoto, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan
Filed Nov. 24, 1993, Ser. No. 156,845
Claims priority, application Japan, Nov. 24, 1992, 4-080793 U
Int. Cl.[6] F16B *37/08;37/14*
U.S. Cl. 411—432 7 Claims



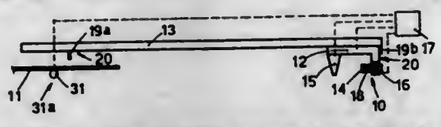
1. A screw connector, comprising:
a connector main body formed by an injection molded product; and
a nut embedded in said connector main body, an axis of said nut extending in a forward and rearward direction of said connector main body;
said connector main body having:
a first opening extending forwardly from a front end face of said nut to an exterior of said connector main body, a internal diameter of said first opening being larger than a thread diameter of said nut, said first opening for receiving a projection portion of a metal mold to prevent said nut from moving forwardly;
a first columnar space extending backwardly from a rear end face of said nut, an internal diameter of said first columnar space equal to said thread diameter of said nut, said first columnar space being closed at a distal end thereof; and
a second opening extending from a part of an outer circumference of a rear end portion of said nut to said exterior of said connector main body, said second opening for receiving a projection portion of a metal mold to prevent said nut from moving rearwardly and sidewardly.

5,498,112
METHOD OF AND APPARATUS FOR APPLYING PROTECTIVE JACKETS TO BOOKS
Dietmar Schwettmann, Rahden, and Siemen Garlichs, Espelkamp, both of, Germany, assignors to Kolbus GmbH & Co. KG, Rahden, Germany
Filed Jul. 8, 1993, Ser. No. 88,812
Claims priority, application Germany, Jan. 31, 1992, 9214801 U
Int. Cl.[6] B42C *11/00*
U.S. Cl. 412—1 12 Claims

1. An apparatus for wrapping protective jackets around books, the jackets comprising fibrous sheet material and being supplied to the apparatus via a sheet conveyor, the jacket sheets having projecting side portions which are to be folded around the longitudinal edge of the covers of a book after the covers have been at least partly opened away from the book block, the book being closed after the folding of the jacket sheet to define jacket retention flaps disposed on the inside of the covers, the improvement comprising:
a reservoir containing a liquid which will interact with the fibers comprising the jacket sheet to reduce the flexural strength thereof; and
an applicator disc which extends partly into said reservoir, said applicator disc intersecting the path of movement of jacket sheets being conveyed to the wrapping apparatus and contacting a first side of the jacket sheet in a defined fold area.



5,498,113
METHOD TO BUTT BARS, AND BAR BUTTING ASSEMBLY THAT EMPLOYS SUCH METHOD
Giorgio Del Fabro, Cassacco-Fraz.Montegnacco, and Marcello Del Fabro, Udine, both of, Italy, assignors to M.E.P. Macchine Elettroniche Piegatrici SpA, Reana Del Rojale, Italy
Filed May 27, 1994, Ser. No. 250,428
Claims priority, application Italy, Jun. 25, 1993, UD93A0122
Int. Cl.[6] B23Q *5/00*
U.S. Cl. 414—14 3 Claims

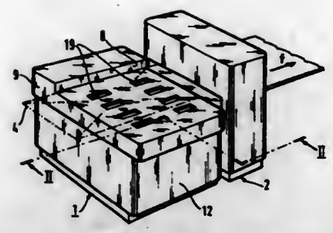


1. A butting assembly to butt a single bar or to butt a bundle of bars by butting single bars of which the bundle is comprised, the assembly being installed upstream of a processing machine, the bars being fed one by one to the butting assembly, which comprises a guide extending lengthwise along the axis of the bar and having upstream and downstream end of travel stops; a trolley capable of to-and-fro alternating motion and able to move along the guide, the trolley comprising a gripper positioned at the upstream end of the trolley and an abutment plate positioned on resilient means at the downstream end of the trolley, the gripper and abutment plate being on the same axis as the bar; a position detector operably connected to the abutment plate; and an assembly for managing and controlling the butting assembly, the abutment plate being kept resiliently in an inactive position and cooperating directly with the position detector which is operably connected with the assembly that manages and controls the butting assembly, the extreme positions of the trolley being defined on the guide by the upstream end-of-travel stop and the downstream end-of-travel stop, respectively, the downstream end-of-travel stop actuating the gripper for opening and release.

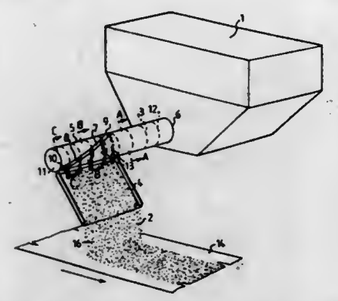
5,498,114
ENVELOPE FEED DEVICE INCORPORATING SCALES
Jean-Pierre Gregoire, Brie Comte Robert, and Olivier Van Lierde, La Celle Saint Cloud, both of, France, assignors to Neopost Industrie, Bagneux, France
Filed Nov. 9, 1994, Ser. No. 337,521
Claims priority, application France, Nov. 10, 1993, 93 13441
Int. Cl.[6] G01G *13/00*
U.S. Cl. 414—21 8 Claims

1. A device for feeding mail items to a franking machine, including a platform adapted to receive at least one mail item laid flat on said platform and a plurality of rollers, said rollers each having a flat portion and being mounted to rotate under the platform to occupy alternately a first position in which said rollers remain below the platform and a second position in which said rollers project above the platform, said device comprising at least one weight sensor mounted under the platform, said sensor being responsive to vertical displacement of the platform to deliver a signal indicative of a load applied to the platform when the rollers are all substantially in said first position.



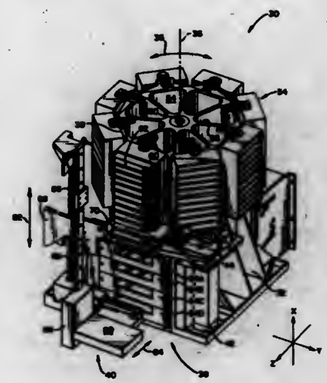


5,498,115
DISTRIBUTOR FOR PARTICULATE MATERIAL
Robert Perneborn, Göteborg, Sweden, assignor to Mölnlycke AB, Göteborg, Sweden
PCT No. PCT/SE92/00270, § 371 Date Nov. 3, 1993, § 102(e) Date Nov. 3, 1993, PCT Pub. No. WO92/19388, PCT Pub. Date Nov. 12, 1992
PCT Filed Apr. 24, 1992, Ser. No. 140,001
Claims priority, application Sweden, Apr. 24, 1991, 9101238
Int. Cl.[6] B65G *65/46*
U.S. Cl. 414—326 24 Claims



1. A distributor for particulate material, comprising:
a nonrotating hollow cylinder having an inlet and an outlet therein, said inlet being located at a first end of said cylinder, said cylinder having a closed second end,
means for supplying particulate material to said inlet, said means for supplying being fixedly mounted to said nonrotating hollow cylinder,
a feeder screw disposed in said cylinder for conveying particulate material in the cylinder from said inlet solely to said outlet, and
drive means for rotating the feeder screw in the cylinder,
said outlet comprising an elongated opening in a lateral wall of the cylinder,
said outlet opening extends in a longitudinal direction of the cylinder and is inclined relative to a generatrix of a cylinder wall with a highest end of the outlet opening directed towards said first end of the cylinder,
whereby the particulate material is distributed through the outlet in a plurality of vertical flows spaced along the outlet and moving along the outlet as the feeder screw rotates so as to obtain an even distribution of discharged material along the cylinder.

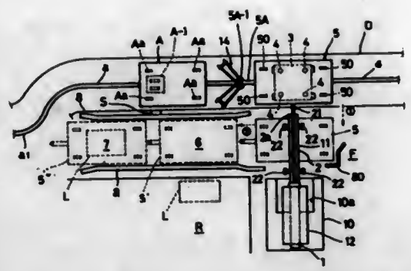
5,498,116
ENTRY-EXIT PORT FOR CARTRIDGE LIBRARY
Daniel J. Woodruff, Lyons; Daniel W. Hoekstra, Louisville; Christopher L. Scott, Englewood; Thomas W. Volckhausen, Boulder; Thomas J. Studebaker, Boulder, and Bruce L. Younglove, Boulder, all of Colo., assignors to Exabyte Corporation, Boulder, Colo.
Filed Aug. 26, 1993, Ser. No. 112,259
Int. Cl.[6] G11B *15/68*
U.S. Cl. 414—331 41 Claims



32. An automated data storage library comprising:
a frame having a plurality of cells for accommodating a data storage unit, the data storage unit having a major dimension thereof lying in a plane parallel to a unit orientation plane;
an I/O drive for performing input/output operations with respect to a data storage unit inserted therein, the drive being mounted on the frame;
a unit engagement device for engaging and transporting a data storage unit whereby the data storage unit is transportable between the drive and the storage receptacle;
a cabinet substantially enclosing the frame, the I/O drive, and the unit engagement device, the cabinet having an entry/exit port formed therein;
wherein the storage receptacle and the I/O drive are aligned along a first axis, the first axis being perpendicular to the unit orientation plane;
an entry/exit transport device for transporting a selected data storage unit in an entry/exit transport plane parallel to the unit orientation plane between a predetermined position in the cabinet and the entry/exit port, the selected data storage unit being engagable by the unit engagement device in the predetermined position in the cabinet, the entry/exit transport device being substantially housed within the cabinet, the entry/exit transport device pivoting about a second axis to transport the selected data storage unit between the entry/exit port and the predetermined position in the cabinet, the second axis being perpendicular to the unit orientation plane and spaced apart from the plurality of cells in a direction perpendicular to the first axis and the second axis.

5,498,117
DEVICE FOR SIDETRACKING A TRUCK
Takashi Nezu, Akishima, Japan, assignor to Tachi-S Co., Ltd., Tokyo, Japan
Filed Aug. 29, 1994, Ser. No. 294,833
Int. Cl.[6] B65G *37/00*
U.S. Cl. 414—355 12 Claims

1. In combination, a truck and a device for sidetracking a truck, in which the truck has a caster, comprising:
a movable actuator means operable in a direction to and from said truck;



a carriage means connected to said movable actuator means, on which carriage means said truck is to be placed, said carriage means being provided, on an upper side thereof, with a lifting means for raising said truck so that the caster of said truck may be raised away from a floor; and

a stationary actuator means connected to said movable actuator means, said stationary actuator means being extendable and retractable in a direction along the direction wherein said movable actuator means is operated with respect to said truck;

wherein, in operation, said stationary actuator means is extended and retracted to move said movable actuator means to and from an operative position in which extension and retraction of said movable actuator means sets said carriage under said truck for sidetracking said truck, with said lifting means of said carriage raising said truck from the floor.

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**5,498,118**

**APPARATUS FOR AND METHOD OF CARRYING A SUBSTRATE**

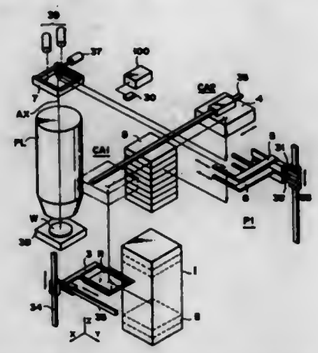
**Kazufumi Nakahara, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan**

**Continuation of Ser. No. 12,749, Feb. 3, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 486,507**

**Claims priority, application Japan, Feb. 7, 1992, 4-022618**

**Int. Cl.[6] B65G *47/91***

**U.S. Cl. 414—416** **8 Claims**



1. An apparatus for carrying a substrate comprising;

a substrate storage part for storing a plurality of substrate casings capable of encasing a plurality of substrates, respectively;

a substrate stage for holding a substrate by a suction vacuum;

a first carrier system capable of taking a substrate from, or into, one of said plurality of substrate casings stored in said substrate storage part, and of carrying a taken substrate between said substrate storage part and a substrate carry position;

a temporary storage unit provided on a substrate carrying path between said substrate carry position and said substrate stage, and having a plurality of sucking mechanisms for concurrently holding a plurality of substrates by a suction vacuum; and

a second carrier system for carrying a substrate between said substrate carry position or said temporary storage part and said substrate stage while holding a carried substrate by a suction vacuum.

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**5,498,119**

**TURRET FOR MATERIALS TRANSPORT VEHICLES AND TELESCOPIC CONVEYOR MOUNTED THEREON**

**Jacques Faivre, 14, rue Octave-Voyer, F-85100 Les-Sables-d'Olonne, France**

**PCT No. PCT/FR92/00918, § 371 Date Apr. 7, 1994, § 102(e) Date Apr. 7, 1994, PCT Pub. No. WO93/01207, PCT Pub. Date Apr. 15, 1993**

**PCT Filed Oct. 2, 1992, Ser. No. 211,441**

**Claims priority, application France, Jan. 8, 1991, 91 12490**

**Int. Cl.[6] B60P *1/36***

**U.S. Cl. 414—528** **20 Claims**



1. A turret deck for securing a telescopically extendible conveyor to a chassis of a materials transport vehicle, said turret deck being moveable from a transport position to at least one materials unloading position, said turret deck comprising:

a platform, adapted to be integral with the chassis of the vehicle;

an orientation crown mounted on said platform, said orientation crown comprising an upper part and a lower part;

said lower part comprising a base plate moveable with respect to said platform;

said upper part comprising a first supporting yoke for pivotally supporting the conveyor on a tilting shaft;

a second yoke journaled to said tilting shaft;

a first actuation element interposed between said base plate and said second yoke, said first actuation element being connected to said second yoke at a first side of said tilting shaft, and a second actuation element interposed between said second yoke and said conveyor, said second actuation element being connected to said second yoke at a second side of said tilting shaft; and

said base plate, said first and second supporting yokes and said first and second actuation elements being constructed and arranged to impart first and second types of tilting to said conveyor, said first type of tilting comprising movement of said conveyor into the transport position, and said second type of tilting comprising movement of said conveyor into the at least one material unloading position.

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**5,498,120**

**MUD PAN APPARATUS**

**Daniel B. Adams, 3082 Cady Dr., Brighton, Mich. 48116**

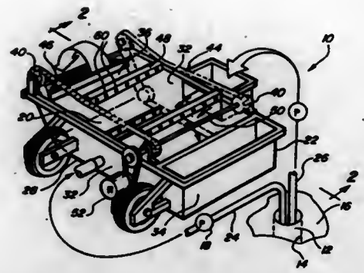
**Filed Dec. 23, 1994, Ser. No. 363,531**

**Int. Cl.[6] B65G *19/02***

**U.S. Cl. 414—528** **7 Claims**

1. In combination with a mud pan apparatus a well drilling apparatus for drilling a well hole comprising:





a housing having a bottom, opposed sidewalls and opposed end walls which, together, define a reservoir,

said reservoir having an inlet adapted to receive slurry laden with earth deposits via means from the well hole and a fluid outlet for recycling the slurry, via second means back to the well hole,

means attached to said housing for automatically removing the earth deposits from the bottom of said housing, wherein said removing means comprises

a pair of endless members,

means for movably mounting said endless members to said opposed sidewalls of said housing so that said endless members are spaced apart and parallel to each other,

a plurality of scrapers secured between said endless members at spaced intervals therealong,

means for movably driving said endless members so that said scrapers engage the earth deposits along the bottom of said housing and dump the earth deposits exteriorly of said housing adjacent one of said housing end walls.

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**5,498,121**

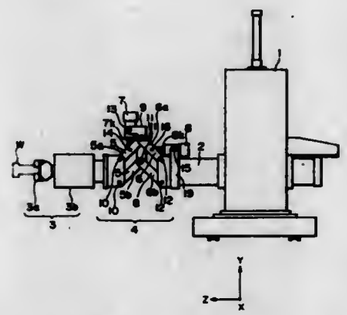
**ROBOT WHICH IS CAPABLE OF RECEIVING IMPACT LOAD**

**Yoshinori Todo; Masami Sakamoto; Noriaki Ushijima; Akira Sonoda; Yukio Miura, and Kyousuke Araki, all of Nagasaki, Japan, assignors to Director-General of Agency of Industrial Science and Technology, Tokyo, Japan**

**Filed May 16, 1994, Ser. No. 243,320**

**Int. Cl.[6] B66C *23/72***

**U.S. Cl. 414—719** **1 Claim**



1. A robot for holding a workpiece to which an impact load is to be applied, said robot comprising a main body member; an arm extending from said main body member; a grip member, for holding a workpiece; and a buffer mechanism linking said arm and said grip member, for relaxing an impact applied to said arm and said grip member when an impact load is applied to the workpiece with the workpiece held by the said grip member, wherein:

said buffer mechanism includes:

(a) a plurality of pins;

(b) a grip side parallel link mechanism mounted on one end of said grip member, on the side of said grip member toward said arm, said grip side parallel link mechanism including four grip side link members linked with each other by at least some of said plurality of pins to form a parallelogram;

(c) an arm side parallel link mechanism mounted on one end of said arm, on the side of said arm toward said grip member, said arm side parallel link mechanism including four arm side link members linked with each other by at least some of said plurality of pins to form a parallelogram;

(d) a grip side hydraulic actuator mechanism for restraining movement of said plurality of grip side link members as said grip member abruptly moves when the impact load is applied to the workpiece with the workpiece held by said grip member;

(e) an arm side hydraulic actuator mechanism for restraining movement of said plurality of arm side link members as said grip member abruptly moves when the impact load is applied to the workpiece with the workpiece held by said grip member; and

(f) one of said grip side link members being common with one of said arm side link members; one of said grip side link members being parallel with said common link member and being formed of one end of said grip member on the side of said grip member toward said arm; one of said arm side link members being parallel with said common link member and being formed of one end of said arm on the side of said arm toward said grip member;

each of said grip side hydraulic actuator mechanism and said arm side hydraulic actuator mechanism includes:

(a) a front piston, a front piston rod extending in a forward direction from said front piston, a front piston actuating end secured to the forward end of said front piston rod, a rear piston positioned rearwardly of said front piston, a rear piston rod extending in the forward direction from said rear piston, and a casing positioning said front piston and said rear piston to allow reciprocal forward-and-rearward movements thereof and permitting said rear piston rod to contact said front piston;

(b) a fluid supply source;

(c) a fluid line connected to said fluid supply source; and

(d) an accumulator connected with said fluid line for temporarily holding fluid discharged from said casing upon movement of said pistons to suppress fluctuations in pressure of fluid in said casing and said fluid line;

said front piston and said rear piston divide the interior of said casing into a front chamber forward of said front piston, an intermediate chamber between said front piston and said rear piston, and a rear chamber rearward of said rear piston;

said casing has an atmosphere opening communicating said intermediate chamber with the exterior of said casing, a first fluid connection coupling said front chamber to said fluid line, and a rear fluid connection coupling said rear chamber to said fluid line so that fluid from said fluid supply source is supplied to said front chamber and said rear chamber;

said fluid supply source is adapted to normally supply said front chamber and said rear chamber with fluid at a given pressure so that said pistons are returned to given positions prior to application of the impact load to the workpiece, even if the impact load is applied to the workpiece to actuate said link mechanisms so that said pistons are moved in said casing;

said grip side hydraulic actuator mechanism actuating end is linked by one of said pins with a first one of said grip side link members, and said grip side hydraulic actuator mechanism casing is linked by one of said pins with a second one of said grip side link members; and

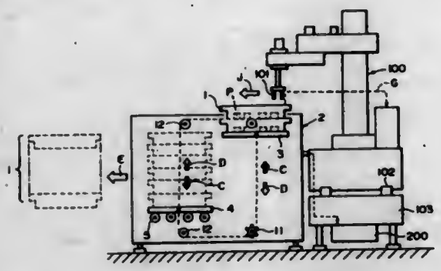
said arm side hydraulic actuator mechanism actuating end is linked by one of said pins with a first one of said arm side link members, and said arm side hydraulic actuator mechanism casing is linked by one of said pins with a second one of said arm side link members.

5,498,122

## WORK SUPPLY METHOD AND APPARATUS THEREFOR

Toshihiko Miura, and Ryohei Inaba, both of Kawasaki, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 987,998, Dec. 9, 1992, abandoned, which is a continuation of Ser. No. 634,495, Dec. 27, 1990, abandoned. This application Jun. 29, 1994, Ser. No. 267,304
Claims priority, application Japan, Dec. 29, 1989, 1-341985
Int. Cl.[6] B65G 60/00
U.S. Cl. 414—786 1 Claim



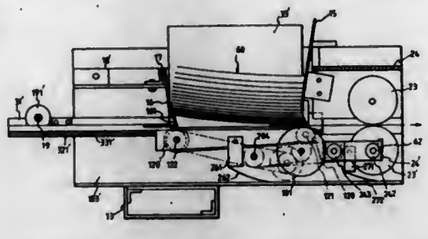
1. A work supply method of supplying works for a work supply apparatus, said apparatus comprising:
a robot for effecting an assembling or a working operation on the works;
a first table on which a pallet containing the works is stacked, said first table being movable upward and downward relative to a work supply position;
a second table for stacking an empty pallet, said second table being movable upward and downward;
a first driving means for moving the first and second tables;
engaging means, including a pair of members, which form a single unit in a continuous plane from the work supply position to a pallet discharge position, for engaging with a protruding portion of the pallet and having a track on which a pallet containing the works is maintained at the work supply position and on which an empty pallet is moved by the robot from the work supply position to the pallet discharge position; and
a second driving means for driving said engaging means to permit the pair of engaging members to move so as to engage with or disengage from the protruding portion of the pallet,
said method comprising the steps of:
(a) moving the engaging members by the second driving means in a direction of disengaging from the protruding portion of the pallet;
(b) moving the first table upward by the first driving means such that the protruding portion of the pallet is located above the engaging members;
(c) moving the engaging members by the second driving means so as to engage with the protruding portion;
(d) moving the first table downward by the first driving means such that a pallet containing the works on the first table is placed on the track of the engaging means;
(e) picking up the works by the robot while holding the pallet containing the works by the engaging means at the work supply position;
(f) transferring, when the pallet at the work supply position has been emptied, the empty pallet to the pallet discharge position on the track by the robot;
(g) moving the engaging members by the second driving means so as to disengage from the protruding portion of the empty pallet to place the empty pallet on the second table; and
(h) positioning a next pallet containing the works on the track of the engaging means by effecting steps (a) to (d), with said step (a) for the next pallet containing the works being executed at the same time that said step (g) for the empty pallet is executed.

5,498,123

## BOTTOM FEEDING MECHANISM

Carlos Alicea, Ronkonkoma, N.Y., assignor to Macro Technology International, Inc., Ronkankoma, N.Y.

Filed Oct. 24, 1994, Ser. No. 328,145
Int. Cl.[6] B65G 59/06
U.S. Cl. 414—797.7 11 Claims



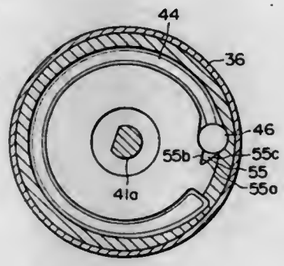
1. A bottom feeding mechanism for feeding a stack of media comprising:
a pair of spaced feeding bases;
a feed roller assembly including a pair of feed rollers fixed on a feed roller shaft rotatably mounted on the feeding bases;
a pair of guard plates situated between the feeding bases;
a conveyor belt assembly including a leading shaft and a trailing shaft rotatably mounted on the guard plates, and a conveyor belt trained over the leading shaft and the trailing shaft and situated between the guard plates;
a gate directly positioned above the belt near its leading edge;
a bidirectionally controlled driving device;
a first transmitting means for transmitting a rotation from the driving device to the feed roller shaft; and
a second transmitting means for transmitting a rotation from the first transmitting means to the trailing shaft of the conveyor belt assembly;
whereby the feed rollers and the conveyor belt are independently driven and move unidirectionally to feed one piece of medium at a time.

5,498,124

## REGENERATIVE PUMP AND CASING THEREOF

Motoya Ito, Anjo; Minoru Yasuda, Chiryu, and Atsushige Kobayashi, Nagoya, all of, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Feb. 2, 1994, Ser. No. 190,466
Claims priority, application Japan, Feb. 4, 1993, 5-017281; Dec. 22, 1993, 5-324067
Int. Cl.[6] F04D 17/06
U.S. Cl. 415—55.1 21 Claims




1. A regenerative pump comprising:
a casing which a recessed fluid flow passage interconnecting a suction port and a discharge port is formed in an arcuate shape; and



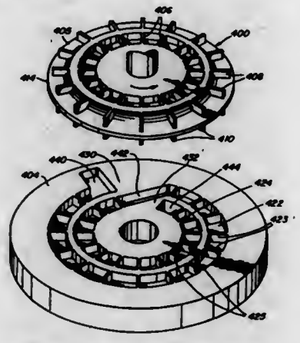
an impeller provided rotatably with respect to said casing and formed with a plurality of vane members which face said recessed fluid flow passage, wherein a recessed damping portion is formed in a terminal end portion of said recessed fluid flow passage on a discharge port side thereof to begin at a position corresponding to the discharge port and extend along a rotating direction of said impeller, and said recessed damping portion has a depth which is smaller than that of a main depth of said recessed fluid flow passage and substantially constant.

5,498,125

## HIGH PERFORMANCE TURBOMOLECULAR VACUUM PUMPS

Marsbed Hablanian, 42 Longfellow Rd., Wellesley, Mass. 02181

Division of Ser. No. 875,891, Apr. 29, 1992, Pat. No. 5,358,373. This application Jun. 6, 1995, Ser. No. 467,500
Int. Cl.[6] F03B 5/00
U.S. Cl. 415—90 3 Claims



1. A turbomolecular vacuum pump comprising:
a housing having an inlet port and an exhaust port;
a plurality of vacuum pumping stages located within said housing and disposed between said inlet port and said exhaust port, each of said vacuum pumping stages including a rotor and a stator;
means for rotating said rotors such that gas is pumped from said inlet port to said exhaust port; and
one or more of said vacuum pumping stages comprising a regenerative stage including a rotor, comprising a disk having spaced-apart rotor ribs formed on at least one surface at or near an outer periphery thereof, said disk constituting a regenerative impeller, said regenerative stage further including a stator that defines an annular channel in opposed relationship to said rotor ribs, the stator of said regenerative stage including fixed, spaced-apart stator ribs in said annular channel.

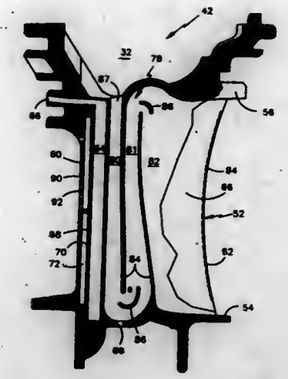
5,498,126

## AIRFOIL WITH DUAL SOURCE COOLING

Annette M. Pighetti, Andover, and Lawrence A. Seidel, Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 28, 1994, Ser. No. 234,488
Int. Cl.[6] F01D 9/06
U.S. Cl. 415—115 6 Claims

1. An airfoil for gas turbine engines having an airfoil-shaped portion flanged by an inner diameter platform and an outer diameter platform, said airfoil-shaped portion having a leading edge and a trailing edge, said airfoil having a leading edge internal cooling passage and a trailing edge internal cooling passage, said airfoil characterized by:



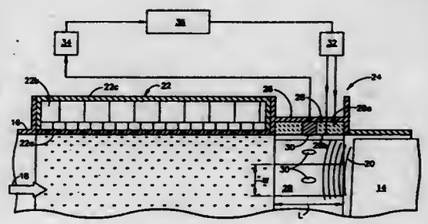
a first inlet for providing cooling air to said leading edge cooling passage, said first inlet being in communication with a first plenum;
a second inlet for providing cooling air to said trailing edge cooling passage, said second inlet being in communication with a second plenum independent from said first plenum;
said first plenum being adopted for communication with compressor discharge air at a first, higher pressure; and
said second plenum being adopted for communication with compressor discharge air at a second, lower pressure.

5,498,127

## ACTIVE ACOUSTIC LINER

Robert E. Kraft, Cincinnati, and Karen B. Kontos, Loveland, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Nov. 14, 1994, Ser. No. 340,091
Int. Cl.[6] F01D 25/04
U.S. Cl. 415—119 10 Claims



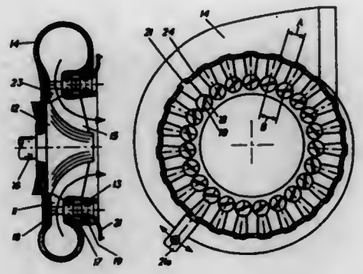
1. An active liner for attenuating noise comprising:
a rigid backplate;
a piezoelectric panel having a back surface fixedly joined to said backplate, and an opposite face surface for directly facing said noise;
a pressure transducer disposed in said panel for sensing acoustic pressure of said noise being propagated against said panel face surface;
means for electrically driving said panel to effect piezoelectric displacement thereof in a direction normal to said panel face surface; and
means operatively joined to said pressure transducer and said driving means for controlling displacement of said panel face surface, said controlling means including a predetermined schedule of acoustic impedance for controlling said driving means to effect a velocity of said panel face surface for said acoustic pressure for obtaining said predetermined acoustic impedance to attenuate said noise.

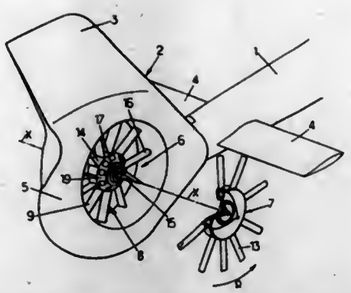
5,498,128

## RADIAL-FLOW EXHAUST GAS TURBOCHARGER TURBINE WITH ADJUSTABLE GUIDE VANES

Jozef Baets, Baden, and Marcel Zehnder, Niederwil, both of, Switzerland, assignors to ABB Management AG, Baden, Switzerland

Filed Mar. 15, 1994, Ser. No. 212,823
Claims priority, application Germany, Mar. 25, 1993, 43 09 637.9
Int. Cl.[6] F01D 7/00
U.S. Cl. 415—164 7 Claims





1. In a radial-flow exhaust gas turbocharger turbine:
a row of individually adjustable guide vanes disposed in a flow duct of the turbine;
a plurality of rotatable adjusting shafts supported in a casing, each guide vane mounted on an adjusting shaft, wherein a chord of each guide vane is not greater than a largest diameter of an associated adjusting shaft, and, when viewed in the axial direction, a vane profile of each guide vane lies completely within a radially outer contour of the associated adjusting shaft;
a like plurality of pivoting levers, each attached to an adjusting shaft to actuate rotation thereof;
a plurality of connecting elements, each connected to two adjacent pivoting levers to couple said adjacent pivoting levers, the connecting elements each having a pivot at a point of attachment to each pivoting lever, and a distance between the pivots of each connecting element being substantially equal to a center to center distance between two adjacent adjusting shafts;
wherein each guide vane, associated adjusting shaft and pivoting lever forms an adjustable unit of one-piece design that is removable from the turbine as a unit and each adjustable unit is axially displaceable and
spring means to bias each unit against a duct wall of the casing.

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5,498,129

## COUNTER-TORQUE DEVICE WITH DUCTED TAIL ROTOR AND DUCTED FLOW-STRAIGHTENING STATOR, FOR HELICOPTERS

Andre-Michel L. Dequin; Louis J. Daldosa, both of Aix en Provence, and Henri F. Barquet, Chateauneuf les Martigues, all of, France, assignors to Eurocopter France, Marignane Cedex, France

Filed Sep. 1, 1994, Ser. No. 298,953
Claims priority, application France, May 4, 1994, 94 05481
Int. Cl.[6] B64C 27/82
U.S. Cl. 415—209.3 24 Claims

1. Ducted counter-torque device for a rotary-wing aircraft comprising:
a substantially axisymmetric duct of axis substantially transverse to the longitudinal axis of the aircraft, and passing through a fairing in the rear part of the aircraft,
a multi-blade rotor mounted substantially coaxially in the duct and driven by a rotational-drive mechanism fixed substantially coaxially in the duct, so that the rotation of the rotor generates an airflow in the duct, and
a flow-straightening stator, fixed in the duct downstream of the rotor, with respect to the direction of the airflow, and including an annular central body surrounding the rotational-drive mechanism, as well as stationary vanes each exhibiting, between a vane root and a vane tip, a main vane section with aerodynamic profile straightening out the airflow downstream of the rotor towards the axis of the duct, and extending between the annular central body and an annular wall of the duct, to which body and wall they are each linked respectively by their vane root and by their vane tip, so as to support the rotational-drive mechanism and the rotor within the duct, wherein the said rotational-drive mechanism is encased in a casing equipped with substantially radial rigidifying arms connected to one another by a rim extending in a circumferential direction around at least a part of the casing, the rigidifying arms bearing, at their external radial end, removable fastening means interacting with complementary fastening means formed on an internal radial flange for fastening and centering of the annular central body of the flow-straightener, so as rigidly to fasten the flow-straightener and the casing to one another, and both into the duct.

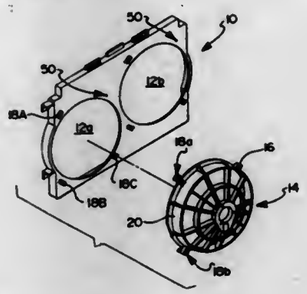
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5,498,130

## COOLING FAN MOUNTING SYSTEM

Ronald J. Wakley, Centerville, and Michael E. Rutt, Springboro, both of Ohio, assignors to ITT Automotive Electrical Systems Inc., Auburn Hills, Mich.

Filed Oct. 18, 1994, Ser. No. 324,547
Int. Cl.[6] F04D 29/64;29/52
U.S. Cl. 415—213.1 8 Claims



1. A fan mounting system, comprising a shroud having a first twist lock coupler, and a bracket having a second twist lock coupler, wherein said first and second twist lock couplers include a first and a second cantilevers, respectively, said first and second cantilevers including rib portions, and wherein said first and sec-



ond twist lock couplers are adapted to matingly engage and retain said shroud to said bracket when said first and second cantilevers are placed adjacent to each other and are twisted relative to each other to have said ribs gone beyond each other.

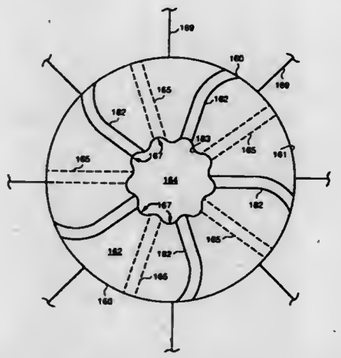
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5,498,131

## STEAM TURBINE WITH THERMAL STRESS REDUCTION SYSTEM

Karl D. Minto, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 2, 1995, Ser. No. 398,183
Int. Cl.[6] F01D 19/00
U.S. Cl. 415—216.1 12 Claims



1. A steam turbine with a thermal stress reduction system, the turbine comprising:
a rotor core having a rotor bore disposed therein, said rotor bore being disposed along the longitudinal axis of said rotor core and having a boundary defined by an interior surface of said rotor core; and
a rotor-stress reducing steam system coupled to said rotor bore so as to introduce steam into said rotor bore via a bore steam supply apparatus.

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5,498,132

## IMPROVED HOLLOW CAST PRODUCTS SUCH AS GAS-COOLED GAS TURBINE ENGINE BLADES

Eugene J. Carozza, Wilton, Conn.; Gregory R. Frank, Muskegon, Mich.; Charles F. Caccavale, Wharton, and Ronald R. Robb, Randolph, both of N.J., assignors to Howmet Corporation, Greenwich, Conn.

Division of Ser. No. 831,528, Feb. 2, 1992, which is a continuation-in-part of Ser. No. 821,817, Jan. 17, 1992, abandoned. This application Oct. 31, 1994, Ser. No. 331,747
Int. Cl.[6] F01D 5/18
U.S. Cl. 416—97 R 9 Claims

1. A hollow cast product of the type having a portion with a small cavity size relative to that of another product portion, said product being manufactured by a casting process including the step of providing a leachable composite casting core, the core comprising:
a first core part determinative of the cavity size and shape of the small cavity product portion and formed from a first ceramic material having a characteristic grain size; and
a second core part determinative of the cavity size and shape of the other product portion, formed from a second ceramic material, and joined to said first core part, said second ceramic material having a characteristic grain size greater than that of said first ceramic material.

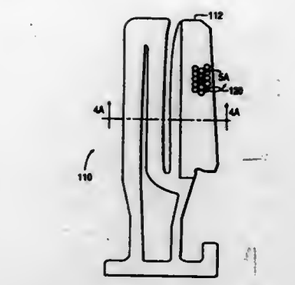
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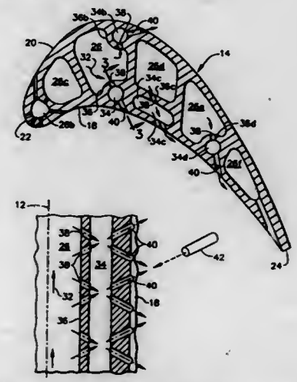
5,498,133

## PRESSURE REGULATED FILM COOLING

Ching-Pang Lee, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Jun. 6, 1995, Ser. No. 471,291
Int. Cl.[6] F01O 5/18
U.S. Cl. 416—97 R 11 Claims





1. A gas turbine engine airfoil comprising:
first and second sidewalls joined together at opposite leading and trailing edges and spaced apart from each other therebetween to define at least one internal flow channel extending longitudinally from a root to a tip of said airfoil for channeling cooling air therein to cool said airfoil;
a plenum defined by an inner surface of said first sidewall and by an internal wall adjoining said flow channel;
a pair of injection holes extending through said internal wall to feed said cooling air into said plenum;
a plurality of film cooling holes extending through said first sidewall in flow communication with said plenum for channeling said cooling air in a film along an outer surface of said first sidewall to effect film cooling; and
said injection holes being aligned to converge toward each other so that cooling air jets discharged therefrom collide with each other inside said plenum to reduce pressure thereof.

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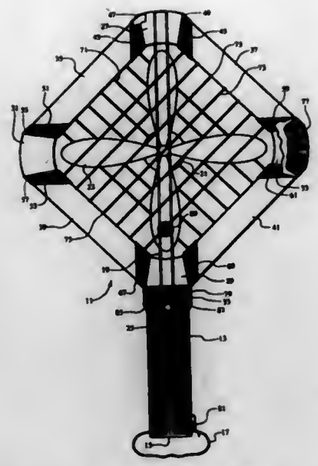
5,498,134

## HAND-HELD ELECTRIC FAN

Sam Ibekwe, 3332 Harrison St., Baker, La. 70714

Filed May 16, 1994, Ser. No. 243,329
Int. Cl.[6] F04D 29/18
U.S. Cl. 416—142 13 Claims

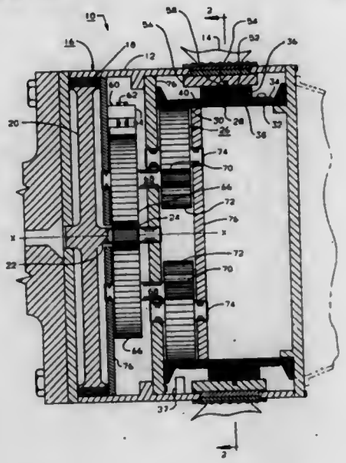
1. A hand-held electric fan, comprising:
a handle;



a shank, extending upward from the handle;
an electric motor connected to the shank;
a fan blade attached to the electric motor;
a cover assembly having a top corner, a bottom corner, two side corners, four sides connecting the four corners, and a plurality of cross guards extending from one side to the opposite side in front of the fan blade, wherein the bottom corner of the cover assembly can slide along the handle, so that sliding the bottom corner away from the top corner of the cover assembly draws the side corners inward toward the shank to close the fan, and sliding the bottom corner toward the top corner pushes the side corners outward away from the shank to open the fan.

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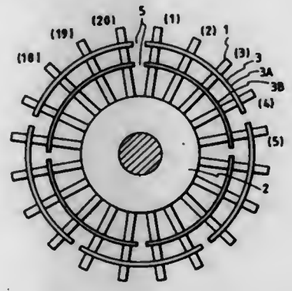
**5,498,135**
**ACTUATOR FOR A VARIABLE PITCH PROPELLER**
**Clinton W. Stallard, III, Hampton, Va., assignor to Newport News Shipbuilding and Dry Dock Company, Newport News, Va.**
**Filed Jan. 17, 1995, Ser. No. 373,051**
**Int. Cl.[6] B63H** *3/02;3/06*
**U.S. Cl. 416—155** **26 Claims**



1. An actuator for a plurality of variable pitch propeller blades mounted on a housing having a center axis, the actuator comprising:
an electric motor for driving a drive gear;
means for transforming rotary movement of the drive gear to translational movement of a pitch ring comprising a reduction gear set rotatably driven by the drive gear, a drive spool rotatably driven by the reduction gear set, and the pitch ring located by the housing and driven by the drive spool, wherein the drive spool is externally threaded and the pitch ring is internally threaded such that rotation of the drive spool causes translational movement of the pitch ring; and
means for converting the translational movement of the transforming means to rotational movement of each of the plurality of propeller blades.

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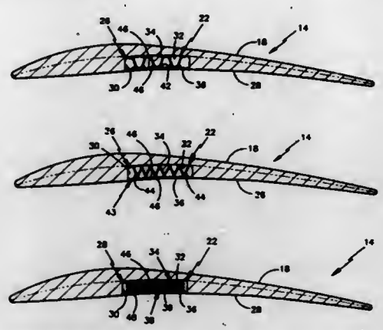
**5,498,136**
**FLUID MACHINERY HAVING BLADE APPARATUS AND BLADE APPARATUS FOR FLUID MACHINERY**
**Kiyoshi Namura, Toukai; Eiji Saito, Hitachi; Masakazu Takasumi, Jyuou, and Kazuo Ikeuchi, Hitachi, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**
**Filed Sep. 19, 1994, Ser. No. 307,463**
**Claims priority, application Japan, Sep. 17, 1993, 5-231184**
**Int. Cl.[6] F01D** *5/22;5/24*
**U.S. Cl. 416—190** **12 Claims**



1. A blade apparatus for fluid machinery comprising: plural blades formed at spaced locations on an outer periphery of a blade wheel, said plural blades being divided into a plurality of predetermined blade groups, said plural blades of said divided blade groups being connected within each group to each other by plural connecting members, and said plural connecting members being formed in plural stages including at least first stage connecting members and second stage connecting members, wherein:
the total number (M) of said plural blades is selected so as not to be either a prime number or a power multiplier of a prime number;
said plural blades are divided into at least first blade groups in which each first blade group has blades of a first integer number ($N_1$) and second blade groups in which each second blade group has blades of a second integer number ($N_2$);
the first integer number ($N_1$) and the second integer number ($N_2$) having no common divisor except 1;
the total number (M) of said plural blades is the product of the first integer number ($N_1$) and the second integer number ($N_2$);
the blades of each first integer number ($N_1$) blade group are connected by one of said first stage connecting members; and
the blades of each second integer number ($N_2$) blade group are connected by one of said second stage connecting members.



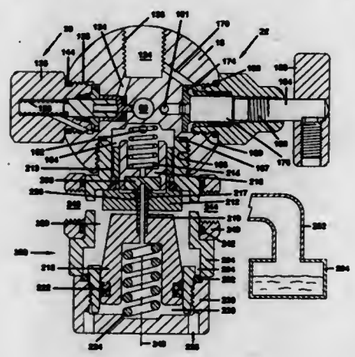
**5,498,137**
**TURBINE ENGINE ROTOR BLADE VIBRATION DAMPING DEVICE**
**Yehia M. El-Aini, Jupiter; Joseph C. Burge, Palm Beach Gardens, and Carl E. Meece, Jupiter, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.**
**Filed Feb. 17, 1995, Ser. No. 390,347**
**Int. Cl.[6] F01D** *5/14*
**U.S. Cl. 416—229 A** **12 Claims**



1. A rotor blade for a turbine engine rotor assembly, comprising:
a root, for attaching said blade to a disk of the rotor assembly;
an airfoil, having a pocket formed in a chordwise surface, said pocket open to said surface;
a platform, extending outward from said blade in a transition area between said root and said airfoil; and
means for damping vibrations in said blade, said means including
a damper; and
a pocket lid;
wherein said damper is received within said pocket and biased between an inner surface of said pocket and said pocket lid, said pocket lid attached to said airfoil by attachment means and contoured to match the curvature of said airfoil.

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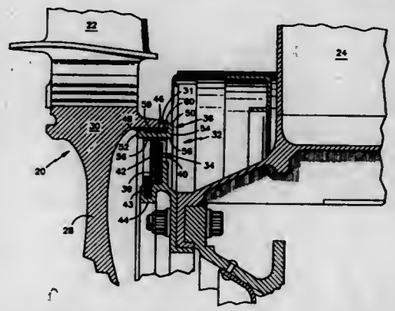
**5,498,138**
**SAMPLING PUMP HAVING A FLUID MOTOR PRESSURE REGULATOR**
**Spencer M. Nimberger, Houston, and Robert L. Ward, Missouri City, both of Tex., assignors to PGI International, Ltd., Houston, Tex.**
**Continuation-in-part of Ser. No. 33,567, Mar. 18, 1993. This application May 16, 1994, Ser. No. 243,844**
**Int. Cl.[6] F04B** *49/00;* **F16D** *31/02*
**U.S. Cl. 417—46** **20 Claims**



1. A sampling pump for withdrawing fluid from a pressurized source and outputting fluid to a container, the pump comprising:
a pump body having a pump body inlet for fluid-tight communication with the pressurized source, and a pump body outlet for fluid-tight communication with the container;
a plunger axially reciprocal within the pump body for varying the volume of a fluid receiving chamber within the pump body to receive fluid from the pressurized source and discharge fluid to the container during a complete pumping cycle;
a pump inlet check valve for preventing fluid flow from the fluid receiving chamber to the pump body inlet;
a discharge check valve for preventing fluid flow from the container to the fluid receiving chamber;
an operator unit for reciprocating the plunger;
a side body port within the pump body and in fluid communication with the pump body inlet, the side body port extending radially outward from the pump body to an outer surface of the pump body;
a pressure regulator having a regulator housing structurally secured to the pump body, the pressure regulator having a regulator inlet within the side body port of the pump body and a regulator outlet port in fluid communication with the operator unit for supplying pressurized fluid under a controlled pressure to the operator unit, and a collar positioned about and sealingly rotatable with respect to the regulator housing, the collar having a low pressure fluid discharge port therein for hydraulically interconnecting the regulator and the operator unit.

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**5,498,139**
**BRUSH SEAL**
**Christopher C. Williams, Lake Worth, Fla., assignor to United Technologies Corporation, Hartford, Conn.**
**Filed Nov. 9, 1994, Ser. No. 336,890**
**Int. Cl.[6] F01D** *11/02*
**U.S. Cl. 415—173.70** **12 Claims**



1. A brush seal for an apparatus having a stationary member and a rotating member, comprising:
a seal element, having a plurality of bristles, said seal element attached to one of the stationary or rotating members; and
a seal ring, detachably attached to the other of the stationary or rotating members, aligned with said seal element, said seal ring including
a body, having a first edge, a second edge, and a seal surface;
a first shoulder, extending radially outward adjacent said first edge; and
a second shoulder, extending radially outward adjacent said second edge;
wherein said shoulders prevent axial displacement of said seal ring relative to the stationary or rotating member to which said seal ring is attached after attachment of said seal ring;
wherein said seal ring may be readily detached from the stationary or rotating member and replaced in the event of mechanical damage to said seal ring; and

wherein said seal ring isolates the stationary or rotating member to which said seal ring is attached from mechanical damage caused by said seal element.

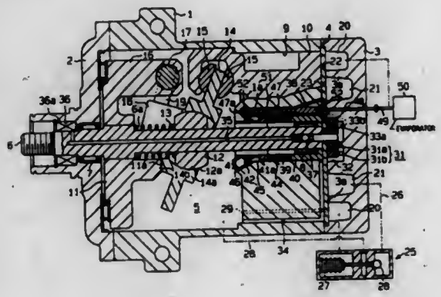
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5,498,140

## VARIABLE DISPLACEMENT COMPRESSOR

Masahiro Kawaguchi; Masanori Sonobe; Shigeki Kanzaki, and Tomohiko Yokono, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

PCT No. PCT/JP94/00416, § 371 Date Oct. 28, 1994, § 102(e) Date Oct. 28, 1994, PCT Pub. No. WO95/25225, PCT Pub. Date Sep. 21, 1995
PCT Filed Mar. 16, 1994, Ser. No. 325,460
Int. Cl.[6] F04B 23/08
U.S. Cl. 417—199.1 13 Claims



1. A variable displacement compressor comprising a swash plate tiltably supported on a rotary drive shaft in a crank chamber in a housing, said swash plate being arranged to move in the axial direction of said drive shaft to tilt within a range defined between a maximum inclined position and an upright position, said swash plate being coupled to a piston which is capable of reciprocating in a cylinder bore in accordance with an undulating movement of said swash plate, whereby gas supplied to said cylinder bore from an evaporator through a suction chamber is compressed hy said piston and discharged to a discharge chamber, and the volume of the gas discharged to said discharge chamber is determined by the inclined position of the swash plate which inclined position is a function of a cooling load on the compressor, said tilting range of said swash plate including a predetermined minimum inclined position adjacent to the upright position where the volume of discharged gas to said discharge chamber from said cylinder bore is a predetermined minimum above zero;

a rotor secured to said drive shaft;

hinge means for connecting said swash plate with said rotor;

means for controlling the pressure in said crank chamber whereby the inclined position of said swash plate is altered in accordance with the difference between the pressures in said suction chamber and said crank chamber;

means for preventing said swash plate from tilting beyond said predetermined minimum inclined position to said upright position when said cooling load is minimum, said preventing means being constructed and arranged to bear against said swash plate for limiting the tilting movement of the swash plate when the pressures in said evaporator and said crank chamber are balanced with respect to each other; and

means for applying hydraulic pressure to said preventing means for withdrawing said preventing means from bearing against said swash plate whereby said swash plate is enabled to tilt between said maximum inclined position and said upright position.

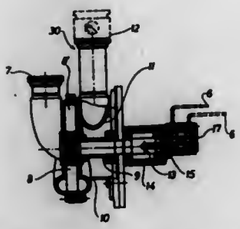
5,498,141

## HYGIENIC TANK LORRY PUMP AND TANK TRUCK

Frode Agger, Rye, Denmark, assignor to APV Rosista A/S, Horsens, Denmark

Filed Oct. 20, 1994, Ser. No. 326,429
Claims priority, application Denmark, Nov. 2, 1993, 9300484
Int. Cl.[6] F04B 17/06
U.S. Cl. 417—231 6 Claims





1. Hygienic tank truck pump for pumping liquid articles of food, such as milk, between a tank (2) of a tank truck and one of a stationary tank (20) and a trailer tank, comprising:

a self priming side channel pump (30),

a hydraulic motor (17) for driving the side channel pump (30),

a hydraulic system (6) of the tank truck (1) for supplying hydraulic fluid to the hydraulic motor, wherein the side channel pump (30) includes a central shaft (9), a bearing housing (14), and a countershaft (13) mounted in the bearing housing (14) and on which the central shaft (9) is mounted, and wherein the hydraulic motor (17) includes a drive shaft (15) to which the countershaft (13) is connected.

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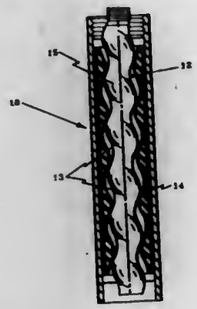
5,498,142

## HARDFACING FOR PROGRESSING CAVITY PUMP ROTORS

Robert A. R. Mills, Bragg Creek, Canada, assignor to Kudu Industries, Inc., Canada

Filed May 30, 1995, Ser. No. 454,589
Int. Cl.[6] F01C 1/10;21/00
U.S. Cl. 418—48 9 Claims

1. A pump rotor for a progressing cavity pump, comprising



a rotor body made of a ferrous metal;

a layer of a metal carbide plasma sprayed onto the body, the metal carbide layer having a grainy surface with a plurality of peaks and intermediate depressions, the peaks being formed by metal carbide grains at the surface of the metal carbide layer; and

a top layer of metallic material bonded to the metal carbide layer, the thickness of the top layer being adjusted such that the depressions between the peaks of the metal carbide layer are completely filled while a majority of the peaks are exposed at the surface of the rotor, thereby providing the rotor with a metal carbide hardfacing of significantly reduced surface roughness.



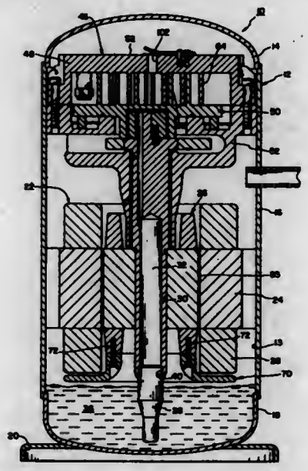
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5,498,143

## SCROLL COMPRESSOR WITH FLYWHEEL

Neilk I. Dreiman, Tipton, and Hubert Richardson, Jr., Brooklyn, both of Mich., assignors to Tecumseh Products Company, Tecumseh, Mich.

Filed Dec. 15, 1994, Ser. No. 356,145
Int. Cl.[6] F04B 35/04; F04C 18/04;29/02
U.S. Cl. 418—55.1 16 Claims



1. A compressor comprising:

a housing;

a motor-scroll compressor unit including a fixed scroll, an orbiting scroll member interfit with said fixed scroll, a motor comprising a rotor and a stator, and a crankshaft driven by and connected to said rotor to form a crankshaft/rotor assembly, said motor-scroll compressor unit disposed within said housing, said crankshaft/rotor assembly drivingly connected to said orbiting scroll member, said orbiting scroll member having a particular orbiting direction during operation; and

a flywheel attached to said crankshaft/rotor assembly, said flywheel preventing said orbiting scroll member from orbiting in a direction opposite to said particular orbiting direction during compressor shutdown.

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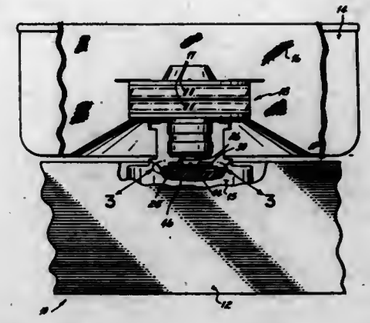
5,498,144

## COTTON CANDY MACHINE AND SUGAR CONTROLLER

Kurt M. Francis, Cincinnati, Ohio, and Leroy Hubbard, Independence, Ky., assignors to Gold Medal Products Co., Cincinnati, Ohio

Filed Apr. 7, 1994, Ser. No. 224,266
Int. Cl.[6] B28B 1/54
U.S. Cl. 425—9 26 Claims

1. A machine for spinning granular sugar into filaments comprising:



a rotatable shaft;

a spinner head mounted on said shaft for rotation therewith and for melting granular sugar introduced thereinto, said spinner head when rotating being operable to direct molten sugar filaments radially outwardly therefrom;

bearings rotatably supporting said rotatable shaft below said spinner head; and

an impeller mounted on said shaft for rotation therewith and being disposed between said spinner head and said bearings, said impeller when rotating urging nonmolten sugar granules which have escaped from said spinner head radially away from said bearings at said impeller.

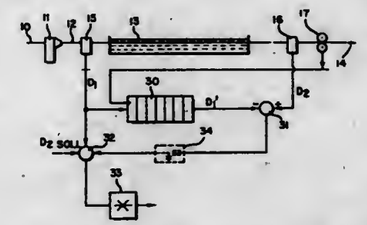
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5,498,145

## CONTROL SYSTEM FOR CONTROLLING THE OUTER DIAMETER OF A STRAND OF PLASTIC MATERIAL, IN PARTICULAR OF A CABLE

Harald Sikora, and Ulrich Gwinner, both of Bremen, Germany, assignors to Sikora Industrieelktronik GmbH, Bremen, Germany

Continuation of Ser. No. 529,139, May 25, 1990, Pat. No. 5,169,649. This application Jul. 8, 1992, Ser. No. 910,662
Claims priority, application Germany, May 31, 1989, 39 17 657.6
The portion of the term of this patent subsequent to Dec. 8, 2009, has been disclaimed.
Int. Cl.[6] B29C 47/92
U.S. Cl. 425—71 4 Claims



1. A control system for controlling the cold outer diameter of a strand of plastic material formed by an extruder, the strand having a speed at which it is withdrawn from the extruder, the control system comprising a measuring device for measuring an actual outer diameter of the strand emerging from the extruder and generating a signal representative of the actual outer diameter of the strand at the measuring device and comparing it with a reference diameter signal representative of a reference diameter value and deriving a difference signal, a computing unit configured for receiving the difference signal and providing a modulated comparison signal, the difference signal being modulated either with the actual diameter signal or the reference diameter signal, and a control unit receiving said modulated comparison signal and

responding thereto for the control of either the rotational speed of the extruder, or the speed by which the strand is withdrawn from the extruder, or both.

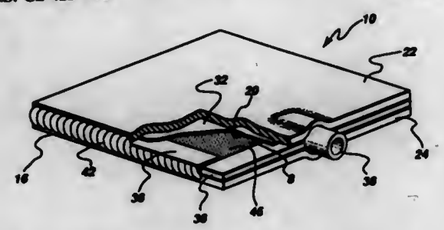
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**5,498,146**

## APPARATUS FOR MAKING METAL ALLOY FOILS

**Ann M. Ritter, Albany; Paul L. Dupree, Scotia, and Donald N. Wemple, Jr., Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Filed Apr. 5, 1994, Ser. No. 223,347**
**Int. Cl.[6] B22F *3/00***
**U.S. Cl. 425—78** **20 Claims**



1. An apparatus for forming a metal alloy foil, comprising:
means for pressing a metal alloy powder, comprising an upper pressing member and a lower pressing member, each having a pressing surface, said pressing surfaces positioned opposite one another;
means for separating in touching contact with the pressing surfaces, said means for separating and the pressing surfaces together defining a cavity having a near-net shape of a foil;
means for sealably joining said means for pressing and said means for separating;
means for evacuating the cavity, said means integrally formed into the means for pressing; and
means for inhibiting interdiffusion attached to and covering the pressing surfaces, said means for inhibiting interdiffusion comprising an upper metal foil and a lower metal foil attached to the pressing surfaces of the upper pressing member and the lower pressing member, respectively.

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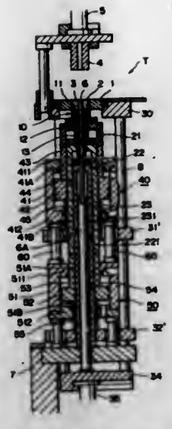
**5,498,147**

## POWDER MOLDING PRESS

**Takeshi Katagiri, Machida; Masao Yamamoto; Tukasa Tajima, both of Kawasaki, and Siro Shirasaki, Yokohama, all of, Japan, assignors to Yoshizuka Seiki Co., Ltd., Kawasaki, Japan**

**Division of Ser. No. 744,182, Aug. 9, 1991, Pat. No. 5,326,242.**
**This application Jun. 29, 1994, Ser. No. 267,651**
**Claims priority, application Japan, Aug. 10, 1990, 2-213508; Aug. 7, 1991, 3-222198**
**Int. Cl.[6] B22F *3/02***
**U.S. Cl. 425—78** **3 Claims**

2. A powder molding press comprising:
a die plate provided with a die having a die hole;
a punch means including a pair of cooperating punch devices to be inserted into the die hole, at least one of said punch devices comprising a plurality of cylindrical punches arranged coaxially in series;
a plurality of hydraulic cylinder assemblies including one hydraulic cylinder assembly for driving each of said cylindrical punches,
at least two of said hydraulic cylinder assemblies including an outer cylinder tube having opposed end walls, a rod shaft hole formed through one said end wall, a guide shaft hole formed through the other said end wall,
a movable member axially slidable and hydraulically operated in a reciprocal motion internally of said cylinder tube,



a rod secured at one end to the movable member and slidably extending through said rod shaft hole,
a guide shaft secured to said movable member and extending through said guide shaft hole,
a through hole formed to extend through said movable member, said guide shaft and said rod,
an elongate element secured at a first end for movement by said rod and operatively connected at a second end for driving one of said punches,
each of said at least two hydraulic cylinder assemblies being axially and vertically aligned relative to the other said hydraulic cylinder assemblies with said element of each succeeding hydraulic cylinder assembly extending through and axially movable along an inner peripheral surface of the through hole of a directly preceding hydraulic cylinder assembly,
each of said at least two hydraulic cylinder assemblies being connected to a succeeding hydraulic assembly by a plurality of columnar members, and
a plate secured to said guide shaft of each preceding hydraulic cylinder assembly and having a plurality of apertures permitting sliding movement along said plurality of columnar members and limiting rotation of said movable member and said rod of said preceding hydraulic cylinder assembly.

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**5,498,148**

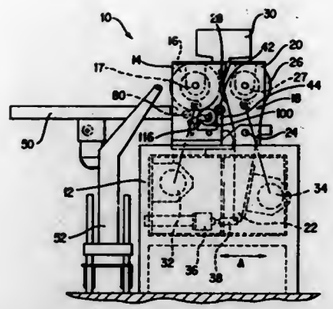
## APPARATUS FOR FORMING SHEETS OF MATERIAL HAVING A UNIFORM THICKNESS AND CUTTING INDIVIDUAL PORTIONS THEREFROM

**Edward L. Ouellette, Corinth; Carolyn E. Broyles, McKinney, both of Tex., and Barry F. Wilson, Santa Monica, Calif., assignors to Recot, Inc., Plano, Tex.**

**Filed Aug. 10, 1994, Ser. No. 292,816**
**Int. Cl.[6] A21C *5/00*; A23P *1/00***
**U.S. Cl. 425—294** **12 Claims**

1. An apparatus for forming a sheet of material from a supply of the material, and for cutting portions of the material from the sheet of material, the apparatus comprising:
a support;
first and second rotatable rollers positioned adjacent each other to form a gap therebetween for receiving the material from the supply and outputting a sheet of the material;
a drive for rotating the rollers;
the first roller being movable toward and away from the second roller to adjust the size of the gap formed between the rollers;
the first roller being secured to a frame member having first and second ends, the frame member being pivotally mounted to the support with the pivot point of the frame member being located between the first and second ends thereof, and the first roller being secured to the frame member between the pivot point and the first end of the frame member;





a drive device disposed adjacent the second end of the frame member for pivoting the frame member about said pivot point to adjust the position of the first roller with respect to the second roller so as to control the size of the said gap; and
a cutter secured to the support and pressed against one of the rollers for engaging the sheet of material and cutting individual portions from the sheet;
whereby the material is fed into the gap with the rollers rotating to form a sheet of material which is output from the gap by the rollers and cut into individual portions by the cutter.

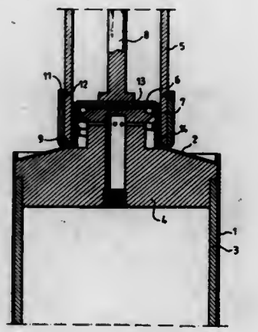
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**5,498,149**

## DEVICE FOR THERMOFORMING A POURING SPOUT

**Jörgen Bengtsson, Lund, Sweden, assignor to Tetra Laval Holdings & Finance S.A., Pully, Switzerland**

**Filed Jul. 18, 1994, Ser. No. 274,721**
**Claims priority, application Sweden, Aug. 31, 1993, 9302810**
**Int. Cl.[6] B29C *43/18***
**U.S. Cl. 425—387.1** **12 Claims**



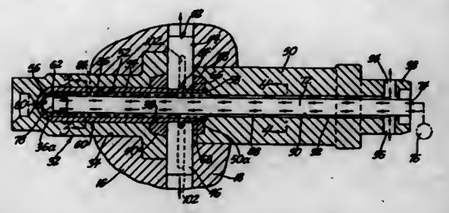
11. A device for thermoforming a pouring spout from a thermoplastic sheet comprising:
a forming tool having a molding surface for engaging a first side of the thermoplastic sheet;
a tube for surrounding a closure member, said closure member having an inner surface which defines a molding surface for engaging a second side of the thermoplastic sheet; and
an external spacer ring provided on an outside surface of an end of said tube, said spacer ring including a cylindrical portion positioned outside said tube for advancing the closure member.

**5,498,150**

## HIGH THERMAL CAPACITY MOLD ASSEMBLY

**John M. Check, 3212 Wabanaki Trail, Traverse City, Mich. 49684**

**Filed Jan. 9, 1995, Ser. No. 370,408**
**Int. Cl.[6] B29C *49/06***
**U.S. Cl. 425—526** **8 Claims**



1. In a core assembly for connection between spaced, moveable mold parts one of which has a hollow cavity formed therein and the other of which carries a core insert the improvement comprising:
a core element supported within one of said mold parts and spaced from the hollow cavity therein; said core element having an open end and a closed end defining a hemispherical surface;
said core element further including an outer surface spaced from said hollow cavity for forming the inner surface of a molded part cavity for receiving molten material to be molded to the shape of the molded part cavity and the core element further including an inner surface having a plurality of circumferentially spaced longitudinally directed ribs for reinforcing the core element radially inwardly of the molded part cavity and along the length of said core element against pressure within the molded part cavity.

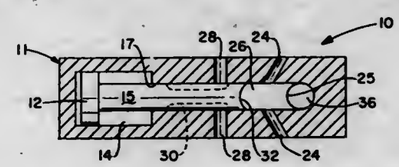
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**5,498,151**

## MIXING HEAD FOR MOLDING MACHINE

**Gunter H. Nennecker, 358 Smith Dr., Tallmadge, Ohio 44278**

**Continuation-in-part of Ser. No. 57,313, May 5, 1993, abandoned. This application Oct. 13, 1994, Ser. No. 322,693**
**Int. Cl.[6] B29C *44/02;45/53*; B01F *5/02***
**U.S. Cl. 425—4 R** **12 Claims**

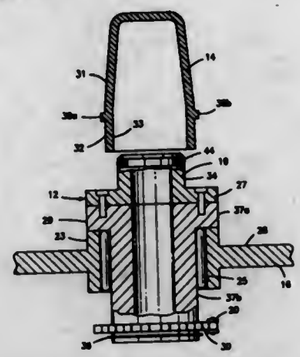


1. A mixing head comprising:
a body;
at least one movable piston;
a mixing chamber having two ends located within said body, one end of said chamber being closed by a piston movable through said chamber, the other end opening into a passage way through which contents of said chamber are discharged;
at least two injection nozzles entering said chamber at points of communication therewith, located on a common circumference of said chamber, each of said injection nozzles being adapted to inject reactive material into said chamber in the direction of said closed end and at an acute angle of from about 30° to 65° relative to the chamber's longitudinal axis, the apex of said angle lying toward said closed end, said nozzles being positioned so that material injected therefrom impacts together at a point within said chamber, being forced to exit said chamber through said point of impact, and

wherein the ratio of said chamber's length as measured along its longitudinal axis from said points of communication on said circumference, to said closed end, to the chamber's diameter, is from about 1:1 to about 4:1.

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**5,498,152**
**PREFORM ORIENTATION APPARATUS**
**Richard M. Unterlander, Holland Landing; Ronald W. Ingram, Toronto; Lou L. Flor, Caledon East; Peter Kamka, Palgrave; Marc J. Jaspar, Bolton; Sam S. Baron, North York, and Kevin T. Yang, Waterloo, all of, Canada, assignors to Husky Injection Molding Systems Ltd., Canada**
**Filed May 2, 1994, Ser. No. 235,977**
**Int. Cl.[6] B29C *49/42***
**U.S. Cl. 425—534** **34 Claims**



27. An orientation system for orientating an object movable on a moving carrier, wherein said object has a ridge extending therefrom for assisting the orientation operation, comprising:

rotating support means for guiding said object on said carrier and allowing said object to rotate, said rotating support means positioned adjacent said carrier and movable in the direction of said carrier; and

orientation means located adjacent said carrier for engaging said ridge and stopping the rotation of said object so that said object is stopped at a desired orientation, said orientation means being immobile during the positioning of said object into said desired orientation.

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**5,498,153**
**GAS FLARE**
**Wendyle Jones, R.R. #2, Rocky Mountain House, Alberta, Canada**
**Filed Jul. 25, 1994, Ser. No. 279,397**
**Int. Cl.[6] F23D *14/00***
**U.S. Cl. 431—202** **10 Claims**

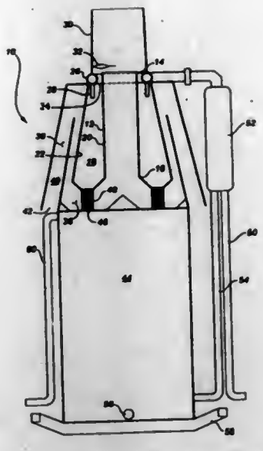
1. A gas flare, comprising:

a. a vent stack for combustion air having a first end and a second end;

b. a gaseous fuel cyclone chamber surrounding the vent stack and having an interior wall conterminous with the vent stack and an exterior wall spaced from the vent stack, the cyclone chamber having a narrowing defining an access opening adjacent the first end of the vent stack;

c. a gaseous fuel injection ring surrounding the first end of the vent stack with fuel nozzles extending into the access opening of the cyclone chamber, whereby gaseous fuel is fed under pressure into the cyclone chamber for thorough mixing prior to combustion;

d. an igniter positioned above the first end of the vent stack, such that gaseous fuel flowing under pressure from the cyclone

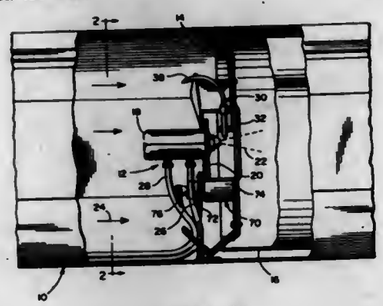


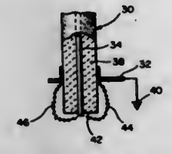
chamber creates a venturi effect drawing air from the vent stack to form a mixture of air and gaseous fuel which is ignited by the igniter; and

e. a combustion air passage communicating with the second end of the vent stack, the combustion air passage following a circuitous route passing along the exterior wall of the cyclone chamber adjacent the first end of the vent stack such that cool combustion air passing through the combustion air passage draws heat from cyclone chamber to reduce heat buildup adjacent the first end of the vent stack.

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**5,498,154**
**BURNER WITH OVER SURFACE IGNITOR AND HIGH LIMIT CONTROL**
**Wallace W. Velie, Alta Loma, and Donald C. Haney, Rancho Cucamonga, both of Calif., assignors to Leland C. Scheu, Upland, Calif.**
**Filed Apr. 22, 1994, Ser. No. 231,514**
**Int. Cl.[6] F23Q *3/00***
**U.S. Cl. 431—264** **15 Claims**





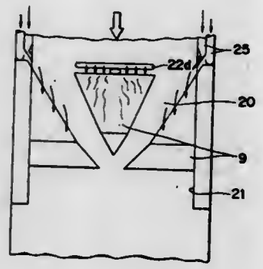
1. A burner producing a combustible mixture and a spark device for igniting the combustible mixture, said spark device comprising an electrically conducting electrode connected to a high voltage source of electrical energy and a grounded electrically conductor



portion positioned in spaced relation to the conducting electrode and a nonelectrically conducting electrode encapsulation positioned to intercept the shortest distance between the electrode and the grounded portion whereby spark emanating from the electrode is intercepted by the nonelectrically conductive encapsulation requiring the spark to pass over the surface of said encapsulation.

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**5,498,155**
**MIXING AND FLAME STABILIZATION APPLIANCE IN A COMBUSTION CHAMBER WITH PREMIXED COMBUSTION**
**Yau-Pin Chyou, Taipei, Taiwan, Prov. of China, and Adnan Eroglu, Untersiggenthal, Switzerland, assignors to ABB Management AG, Baden, Switzerland**
**Filed Apr. 8, 1994, Ser. No. 225,390**
**Claims priority, application Switzerland, Apr. 8, 1993, 01 087/93**
**Int. Cl.[6] F23D *14/46***
**U.S. Cl. 431—350** **15 Claims**



1. A mixing and flame stabilization appliance in a combustion chamber with premixed combustion in which at least one of a gaseous and liquid fuel is introduced into the combustion air, comprising:

a plurality of vortex generators disposed adjacent to one another over the width or the periphery of a combustion chamber duct through which flow takes place; and

means for introducing a fuel into the duct in an immediate region of the vortex generators,

wherein each vortex generator has three surfaces projecting into the duct around which flow can take place freely, which surfaces have a longitudinal dimension extending in a flow direction of the duct, one surface forming a top surface and the two others forming side surfaces,

wherein the side surfaces abut a duct wall and are mutually oriented at a V-angle which varies in the flow direction,

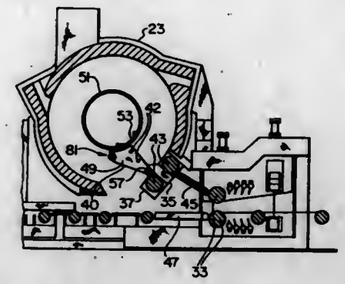
wherein a top surface edge extends transversely to the duct through which flow takes place and is in contact with the same duct wall as the side surfaces,

wherein longitudinally directed top surface edges abut longitudinally directed side surface edges protruding into the flow duct, and extend at an angle of incidence to the duct wall, which angle varies in the flow direction, and

wherein the two side surfaces are joined at a connecting edge which, together with the longitudinally directed edges of the top surface, forms a point.

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**5,498,156**
**DUAL-PURPOSE GUIDE AND DRUM CLEANER FOR STECKEL MILL COILER FURNACE**
**Olan R. Smith, Saskatchewan, Canada, assignor to Ipsco Enterprises Inc., Wilmington, Del.**
**Filed Sep. 2, 1994, Ser. No. 300,014**
**Int. Cl.[6] F27D *23/00***
**U.S. Cl. 432—75** **7 Claims**

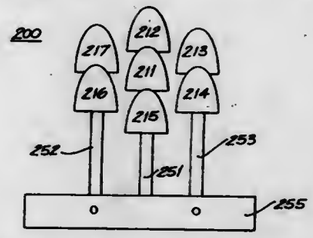


1. In a coiler furnace of the type used in conjunction with a reversing rolling mill, said furnace having a transversely rotatably mounted winding drum for steel strip to be coiled within the furnace and an entrance/exit port for passage of steel strip into or out of the coiler furnace;

a dual-purpose strip guide provided with a cleaning element fixed thereto for cleaning the exterior cylindrical surface of the winding drum when the cleaning element is brought into engagement with scale or debris on the said surface; said guide being pivotally mounted about a transverse pivotal axis located in the vicinity of the entrance/exit port of the coiler furnace, thereby permitting the guide to pivot from a rest position at the bottom of the coiler furnace out of the way of the steel strip wound upon the winding drum into a selectable one of two operating positions, namely a strip guiding operating position in which the distal end of the guide relative to the pivotal axis is positioned adjacent the surface of the winding drum for the coiler furnace so as to guide the leading edge of incoming steel strip into engagement with the winding drum, and a drum cleaning operating position in which the cleaning element fixed to the guide is brought into engagement with scale or debris on the exterior cylindrical surface of the winding drum.

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**5,498,157**
**DENTAL COLOR MIXTURE INDICATOR DEVICE**
**Neil R. Hall, 14 Kintore Street, Wahroonga, New South Wales 2076, Australia**
**Filed Sep. 24, 1993, Ser. No. 127,265**
**Claims priority, application Australia, Jan. 7, 1992, PL5165**
**Int. Cl.[6] A61C *19/10;13/08***
**U.S. Cl. 433—26** **24 Claims**

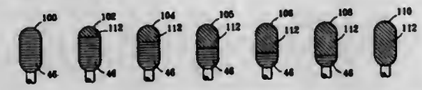


1. A set of dental color mixture indicator devices comprising a plurality of component indicator devices, each said component

indicator device having a plurality of color samples located in an array and arranged about a central one of the color samples with each sample spaced apart from samples adjacent thereto, the colors of said samples being representative of colors of a predetermined color system having a co-ordinate system aligned with said array wherein the color of each of said samples corresponds to the color of the corresponding location in said co-ordinate system, the colors of the samples of each said component device being located on a plane of said co-ordinate system and the plane corresponding to each device being substantially parallel to, and spaced from, the planes of the other ones of said component devices and such that the central color samples of adjacent planes are offset with respect to the co-ordinate system, and whereby, in use of the said set, a patient's tooth can be compared against any one of said component devices and a desired dental color intermediate a selected pair of said color samples can be mixed for fabrication by a mixture of the coloring materials used to fabricate said selected pair.

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**5,498,158**
**COLOR-CODED ENDODONTIC CUTTING INSTRUMENTS AND COLOR-CODE SYSTEM AND METHOD**
**Nelson J. Wong, 2101 Midway Rd., Suite 250, Carrollton, Tex. 75006**
**Filed Feb. 14, 1994, Ser. No. 197,644**
**Int. Cl.[6] A61C 5/02**
**U.S. Cl. 433—102** **26 Claims**




1. A set of endodontic cutting instruments, each having handles and each having a different working tip diameter incrementally increasing in size from one instrument to the next, said set comprising:

(a) a first smaller standard size endodontic cutting instrument having a grasping end with a first color according to a standard color code;

(b) a second larger standard size endodontic cutting instrument having a grasping end with a second color according to said standard color code; and

(c) a non-standard intermediate size endodontic instrument having a size between said first smaller standard size and said second larger standard size and having a grasping end with a color combination including a first portion having said first standard color corresponding to said first smaller standard size and a second portion having said second standard color corresponding to said second larger standard size.

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**5,498,159**
**DENTAL TOOL COUPLING FOR DISPOSABLE TOOTH POLISHER**
**Ronald G. Coss, Newport Beach, Calif., assignor to Micro Motors, Inc., Santa Ana, Calif.**
**Filed Jul. 29, 1994, Ser. No. 282,971**
**Int. Cl.[6] A61C 1/08**
**U.S. Cl. 433—126** **10 Claims**

1. A dental tool, comprising:

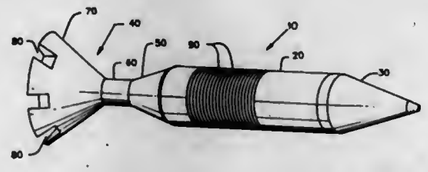
a disposable tool head including an outer sleeve and a shaft rotatably mounted within the sleeve to rotate an element to be applied against a patient's teeth, an input end of said shaft being concentrically positioned in an input end of said sleeve; and a housing having a nose on one end which mates with the input end of said sleeve to support the tool head, an output shaft rotatably mounted in said housing, said output shaft having a tubular end which fits over the input end of said tool head shaft, a plurality of circumferentially spaced balls supported within said nose, said balls being supported with their




radially inner surfaces protruding beyond an inner wall of said tubular end, said balls and said input end of said head shaft being arranged and dimensioned so that the input end of said head shaft can be inserted into a space defined by radially inner surfaces of said balls in frictional engagement therewith, said head shaft input end being made of material which is deformable by said balls, and the space defined by said balls is smaller than the diameter of the input end of said bead shaft so that a plurality of axially extending grooves are formed in the input end of said shaft when the, input end of said head shaft is inserted into said space, thereby placing said output shaft in driving relation with respect to said head shaft.

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**5,498,160**
**TRAINING PROJECTILE**
**Anthony Farina, Hackettstown, and Mark Young, Wharton, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.**
**Filed Jul. 7, 1994, Ser. No. 273,032**
**Int. Cl.[6] F42B 8/00**
**U.S. Cl. 434—12** **5 Claims**




1. A training projectile adapted to fly through the air with limited range, comprising:

a main cylindrical body having a front end and a rear end and a predetermined diameter,

a generally conical nose cone at the front end of said main body,

a tail portion at and extending from the rear end of said main body,

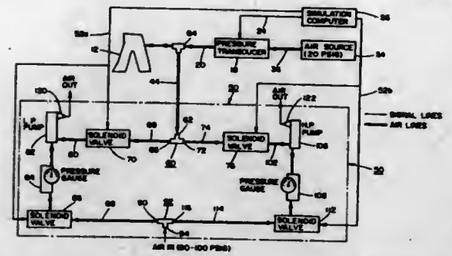
said tail portion comprising a flared member which flares outwardly from said rear end of said main body to a tail portion end and provides drag in flight to limit the length of the flight, and

means to impart spin to said projectile and thereby impart stability in flight, said means including a plurality of slots in said flared member at said tail portion end, said slots being disposed at an angle to the longitudinal axis thereof to impart spin to the projectile and thereby

said projectile having its center of gravity closer to said nose than to said tail portion.



**5,498,161**
**ANTI-G SUIT SIMULATOR**
**Walter E. Noble, Jr., Levittown, N.Y., assignor to Northrop Grumman Corporation, Los Angeles, Calif.**
**Filed Sep. 23, 1994, Ser. No. 311,178**
**Int. Cl.[6] G09B 9/08**
**U.S. Cl. 434—59** **5 Claims**




1. A system for the controlled pressurization and evacuation of an anti-G suit in an aircraft flight simulator responsive to simulated maneuvers implemented by a simulator pilot; said system comprising:

means for supplying a controlled flow of pressurized air to said anti-G suit in dependence upon simulated G-forces generated by said simulated aircraft maneuvers so as to impart a specified internal pressure to said anti-G suit, said means for supplying said controlled flow of pressurized air to said anti-G suit including a pressure transducer for regulating a specified flow of said pressurized air from a source of a pressure-regulated air supply to said anti-G soit responsive to outputted signals from a simulation computer;

means for evacuating said anti-G suit responsive to simulated aircraft maneuvers indicative of a reduction in said simulated G-forces, said evacuating means including means for selectively controlling the rate of evacuation of said anti-G suit in correlation with the level of previously generated G-forces pressurizing said anti-G suit so as to closely approximate actual conditions encountered by a pilot of a high-performance aircraft, said evacuating means including a further transducer outputting signals to said simulation computer responsive to changing G-forces effecting pressurization of said anti-G suit, said means for selectively controlling the rate of evacuation of said anti-G suit being responsive to signals outputted from said simulation computer for selective actuation of means for discharging pressurized air evacuated from said anti-G suit, said selective controlling means including first valve means actuating first pump means for evacuating said anti-G suit responsive to a first signal from said simulation computer indicative of reductions in G-forces from a first range of said G-forces, second valve means actuating second pump means for evacuating said anti-G suit responsive to a second signal indicative of a reduction in G-forces from a second range of said G-forces, and a third signal from said simulation computer indicative of a reduction in G-forces from a third range of said G-forces simultaneous actuating said first and second valve means and said first and second pump means for effectuating an accelerated evacuation of said anti-G suit, said first valve means including a first solenoid valve operatively connected to said pressure transducer, said first pump means being a low-pressure pump connected to said first solenoid valve, a second solenoid valve connected to a source of high-pressure operating air, said first pump means being operatively connected to said second solenoid valve, whereby said first signal from said simulation computer actuates said first solenoid valve to conduct pressurized air from said anti-G suit to said first pump means, and said signal actuates said second solenoid valve to conduct a flow of said operating air to said first pump means so as to open said first pump means and concurrently vent said air from said anti-G suit and operating air from said first valve means, said second valve means including a third solenoid valve operatively connected to said pressure transducer, said second pump means being a high-pressure pump connected to said third solenoid valve, a fourth solenoid valve connected to said source of high-pressure operating air, said second pump means being operatively connected to said fourth solenoid valve whereby said second signal from said simulation computer actuates said third solenoid valve to conduct pressurized air from said anti-G suit to said second pump means, and said signal actuates said fourth solenoid valve to conduct a flow of said operating air to said second pump means so as to open said second pump means and concurrently vent air from said anti-G suit and operating air from said second valve means.

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**5,498,162**
**METHOD FOR DEMONSTRATING A LIFTING TECHNIQUE**
**Michael J. Schaefer, Paynesville, Minn., assignor to Risk Management, Consultant, Inc., Paynesville, Minn.**
**Filed Sep. 6, 1994, Ser. No. 301,353**
**Int. Cl.[6] G09B 19/00**
**U.S. Cl. 434—258** **12 Claims**



1. A process for demonstrating a lifting technique to a person, the process comprising the steps of:

providing a substantially rectangular box in a first stationary position on a ground surface, the box having an internal storage area means for receiving a plurality of weights therein, the internal storage area means formed by a top wall, a bottom wall, a front wall, a back wall, and first and second opposed side walls, the first and second side walls each having handles thereon adjacent the top wall, the bottom wall contacting the ground surface in the first stationary position, the bottom wall being movable to provide access to the internal storage area means;

inserting at least one weight into the internal storage area means, wherein the internal storage area means receives said plurality of weights therein to selectively change the weight of the box and the resistance one's body perceives when raising and lower the box from the first stationary position and to the first stationary position, the bottom wall having a securing means such that the at least weight is contained within the box when the box is lifted;

approaching two perpendicular sides of the box, wherein one of the perpendicular sides is one of the front or back walls, in the first stationary position at approximately a 45° angle such that one's feet are wider than shoulder distance apart when one is adjacent the box;

bending one's knees such that one's body is close to the box;

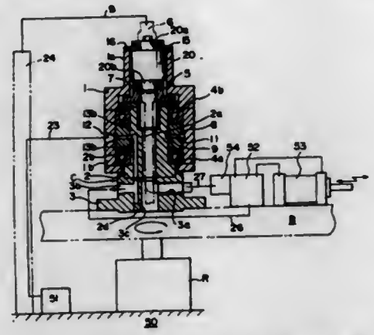
lifting the box from the first stationary position using the handles; and

returning the box to the first stationary position.

## 5,498,163
### FLUID/ELECTRICAL ROTARY JOINT

Zenichi Takamura; Yuji Yano, both of Futtu, and Yasuo Sato, Kashiwa, all of, Japan, assignors to Kuroda Precision Industries, Ltd., Japan

Filed Apr. 29, 1994, Ser. No. 235,940
Claims priority, application Japan, Apr. 30, 1993, 5-28544 U
Int. Cl.[6] H01R 39/00
U.S. Cl. 439—13 7 Claims



1. A rotary joint device for accommodating both fluid and electrical connections between relative rotating apparatus, comprising:

a housing having a fluid supply port connecting to a fluid passageway through said housing;

a rotary shaft disposed within said housing, said rotary shaft having a fluid handling passageway extending along at least a portion of its length and connecting to a fluid exit port of said rotary shaft, said rotary shaft further including a center passageway extending along at least a portion of its length, said fluid handling passageway of said rotary shaft fluidly connecting said fluid passageway of said housing with said fluid exit port of said rotary shaft;

a shaft support mechanism supporting said housing on said rotary shaft for allowing relative rotation between said housing and said rotary shaft;

a shaft sealing arrangement for sealing said passageway through said housing with said fluid handling passageway of said rotary shaft for allowing relative rotation between said housing and said rotary shaft; and

a rotary electrical connection provided in said housing for connecting a lead in electrical cable stationary relative to said housing to a lead out electrical cable rotating relative to said housing and received within said center passageway of said rotary shaft for allowing rotation between said housing and said rotary shaft, said rotary electrical connection having a rotational axis aligned with an axis of rotation between said housing and said rotary shaft.

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## 5,498,164
### AUTOMOTIVE STEERING COLUMN ELECTRICAL CONNECTOR

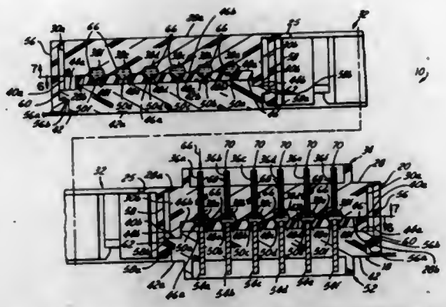
Mark C. Ward, 1061 Troon, St. Clair, Mich. 48079, and Roger A. Hodder, 32312 Farmersville, Farmington Hills, Mich. 48334

Filed May 9, 1994, Ser. No. 240,006
Int. Cl.[6] H01R 39/00
U.S. Cl. 439—15 16 Claims

1. An electrical connector for providing electrical continuity between a first wiring and a second wiring, wherein the first wiring is rotatable with respect to the second wiring, said electrical connector comprising:

annular channel means for providing at least one sealed annular channel;

an electrically conductive liquid located in said at least one annular channel;



base bus terminal means connected With said annular channel means for selectively connecting a first wiring with said electrically conductive liquid, said base bus terminal means comprising at least one base terminal located at a discrete point location of said base bus terminal means;

rotor bus terminal means connected with said annular channel means for selectively connecting a second wiring with said electrically conductive liquid, said rotor bus terminal means being spaced from said base bus terminal means, said rotor bus terminal means comprising at least one rotor terminal located at a discrete point location with respect to said rotor bus terminal means; and

means for providing relative rotatability between said base bus terminal means and said rotor bus terminal means;

wherein the first wiring is electrically connected to the second wiring via selective discrete point contact of said at least one base terminal and said at least one rotor terminal with said electrically conductive liquid irrespective of relative rotation between said rotor bus terminal means and said base bus terminal means.

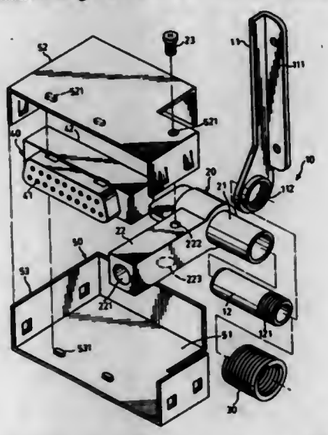
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## 5,498,165
### COMBINED HINGE AND ELECTRICAL CONNECTOR FOR PORTABLE COMPUTER

Lyre Tseng, Hsin-Chuang, Taiwan, Prov. of China, assignor to Chiahuan Spring Co., Ltd., Taipei Hsien, Taiwan, Prov. of China

Filed Jul. 8, 1994, Ser. No. 272,008
Int. Cl.[6] H01R 35/00
U.S. Cl. 439—31 4 Claims

1. A combined hinge and electrical connector assembly for a



portable computer, said portable computer including an upper housing for receiving a monitor thereon and a lower housing connected pivotally to said upper housing for receiving a computer processing unit thereon, said combined hinge and electrical connector assembly comprising:

a connector unit including an electrical connector which has input terminals adapted to connect electrically with said computer processing unit and output terminals provided with conducting wires adapted to connect electrically with said monitor; and

a hinge assembly interconnecting pivotally said upper and lower housing and including:

a first hinge unit including a hollow pivot shaft and a first coupling member which extends radially from said hollow pivot shaft for connection with said upper housing; and

a second hinge unit including a sleeve portion which is sleeved rotatably on said hollow pivot shaft and a second coupling member which extends radially from said sleeve portion for connection with said lower housing, said hollow pivot shaft and said sleeve portion cooperatively defining a space for passage of said conducting wires from said electrical connector to said upper housing, said sleeve portion of said second hinge unit having an inner surface which is in friction contact with an outer surface of said hollow pivot shaft of said first hinge unit, a cylindrical spring coil sleeved around an outer surface of said sleeve portion of said second hinge unit for pinching said sleeve portion against said hollow pivot shaft so as to provide friction between said inner surface of said sleeve portion and said outer surface of said hollow pivot shaft so that said upper housing can be held at a certain angular position relative to said lower housing by means of friction between said inner surface of said sleeve portion and said outer surface of said hollow pivot shaft.

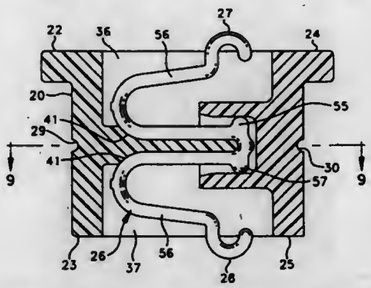


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## 5,498,166
### INTERCONNECT SYSTEM

Richard E. Rothenberger, Harrisburg, Pa., assignor to The Whitaker Corporation, Wilmington, Del.

Filed Jun. 30, 1994, Ser. No. 269,256
Int. Cl.[6] H01R 23/72
U.S. Cl. 439—66 10 Claims



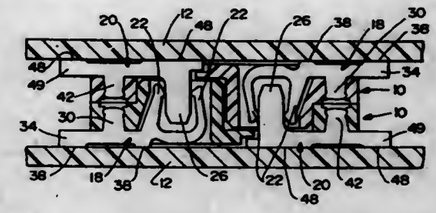
1. An environmentally sealed interconnect system for use between two parallel substrates and for use with an assembly having an environmentally sealed portion and a window permitting access to electrical contacts, the interconnect system comprising a non-electrically conducting male connector housing and a non-electrically conducting female connector housing, a plurality of spaced-apart insulating ribs being formed in the male connector housing, a plurality of electrically conducting interposer contacts disposed in the male connector housing, each interposer contact being disposed adjacent to a respective insulating rib, wherein each interposer contact is electrically insulated from each adjacent interposer contact, the female connector housing having a plurality of spaced-apart rib sealing areas formed therein, the male connector housing being mated with the female connector housing, wherein the respective insulating ribs are received in the respective rib sealing areas and form a seal therebetween and with the interposer contacts to prevent passage of environmental contaminants from one side of the interconnect system to an opposite side thereof.

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## 5,498,167
### BOARD TO BOARD ELECTRICAL CONNECTORS

Masashi Seto, Zama; Shinichi Aihara, Atsugi, and Kouichi Inoue, Yokohama, all of, Japan, assignors to Molex Incorporated, Lisle, Ill.

Filed Sep. 22, 1994, Ser. No. 310,533
Claims priority, application Japan, Apr. 13, 1994, 6-10505
Int. Cl.[6] H01R 9/09
U.S. Cl. 439—74 12 Claims



1. A low profile hermaphroditic electrical connector mounted on a surface of a first printed circuit board and adapted to mate with an identical second hermaphroditic connector mounted on a surface of a second printed circuit board to electrically and mechanically couple the first printed circuit board to the second printed circuit board, each connector including:

a housing,

a plurality of stamped female and male terminals held in said housing, each terminal having a surface mounting portion for electrically engaging the respective printed circuit board, a mating portion adapted to mate with the mating portion of the terminal of the opposite gender of the identical second hermaphroditic connector, and means for holding each of said terminals in said housing,

the improvement comprising:

the mating portion of said female terminal including two opposed, spaced apart contact arms, said contact arms and a means for holding said female terminal both projecting from the surface mounting portion of said female terminal with the contact arms laterally adjacent the means for holding the female terminal; and

the mating portion of said male terminal including a contact post adapted to be received between and make contact with the contact arms of the female terminal, said post and means for holding said male terminal both projecting from the surface mounting portion of said male terminal with the post laterally adjacent the means for holding said male terminal.

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## 5,498,168
### EARTHING MECHANICS FOR SHIELDED CABLES

Annette G. Wedin, Huddinge; Lars-Erik Hallenfur, Älvsjö; Lars Y. Bertilsson, Stockholm, and Jan-Erik Karlsson, Farsta, all of, Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

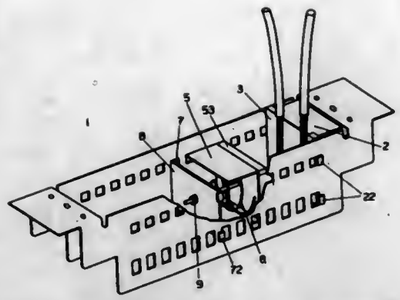
Filed May 18, 1994, Ser. No. 245,636
Claims priority, application Sweden, May 19, 1993, 9301737
Int. Cl.[6] H01R 21/20
U.S. Cl. 439—95 5 Claims

1. An earthing device for earthing a shielded cable for protection against high frequency electromagnetic interference comprising:

a rectangular metal collar in electrical contact with equipment to which or from which the shielded cable runs, wherein the collar includes pair-forming openings in each of two mutually opposing sides of the collar;

an electrically conductive base plate in contact with the collar and an exposed shield of the cable, wherein the base plate has pairs of outwardly projecting fingers for insertion in some of the pair-forming openings; and

a spring unit comprising a pressure plate, a spring, a locking plate having pairs of projecting fingers, a counter-pressure plate, and a holder device;



wherein the locking plate's projecting fingers facilitate inserting the spring unit in the pair-forming openings at a distance from the base plate; the spring, prior to installation of the cable, is held in a substantially compressed state between the pressure plate and the counter-pressure plate with the aid of the holder device; and after installation, the holder device is loosened so that the spring extends and applies a constant pressure on the cable installed between the base plate and the pressure plate.

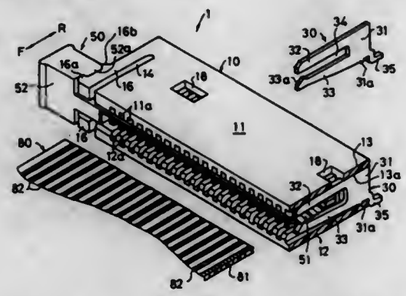
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**5,498,169**

## FLEXIBLE CABLE CONNECTOR

**Shinichi Ikemoto, Tokyo, Japan, assignor to Kel Corporation, Tokyo, Japan**

**Filed May 10, 1994, Ser. No. 241,027**
**Claims priority, application Japan, May 10, 1993, 5-132686**
**Int. Cl.[6] H01R *13/00***
**U.S. Cl. 439—260** **13 Claims**



1. A flexible cable connector for effecting electrical connection to respective conductive paths on an end portion of a flexible cable comprising:

an elongate insulating housing having a first cable receiving face and formed with an elongate, cable receiving cavity with a cable receiving mouth opening to the cable receiving face;

a plurality of electrical contacts each having two elongate portions which extend in side by side relation, spaced a predetermined distance apart to provide between them a cable receiving gap, at least one elongate portion of each contact being formed with a protuberance protruding towards a respective other elongate portion of a respective contact, the contacts being mounted in the housing in a row with respective elongate portions extending adjacent respective opposite sides of the cable receiving cavity and with respective gaps opening towards the cable receiving mouth and with at least the protuberance of each contact protruding into the cavity adjacent the mouth;

an elongate slider having a central pressing portion and actuating portions at respective opposite ends thereof and retaining means mounting the slider in the housing with the pressing portion extending along the cable receiving cavity through the gaps between respective elongate portions of each contact for reciprocal sliding movement towards and away from the cable receiving mouth between an open, cable admitting position in which the pressing portion is spaced inwardly, remote from the mouth and contact protuberance to permit a flexible cable to be inserted through the mouth into the cable receiving cavity and gaps between the respective elongate portions, and a closed, cable connecting position in which the pressing portion is adjacent the mouth to press respective conductive paths of the inserted cable into engagement with respective protuberances to effect electrical connection therewith, the central pressing portion of the slider remaining wholly within the housing cavity in both the cable admitting and cable pressing positions and throughout the sliding movement therebetween.

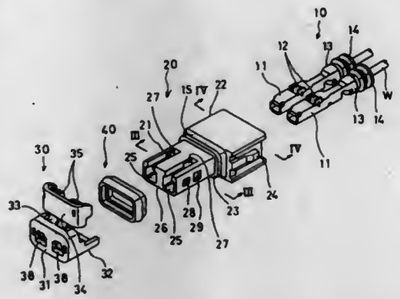
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**5,498,170**

## WATERPROOF ELECTRICAL CONNECTOR

**Tsutomu Tanaka, Yokkaichi, Japan, assignor to Sumitomo Wiring Systems, Ltd., Mie Pref., Japan**

**Filed Nov. 10, 1993, Ser. No. 149,723**
**Claims priority, application Japan, Nov. 11, 1992, 4-084217 U**
**Int. Cl.[6] H01R *13/52***
**U.S. Cl. 439—271** **21 Claims**



1. A waterproof electrical connector comprising:

a housing to be inserted into a cavity defined in a counterpart of the connector, the outer surface of the housing having a step such that a rear portion of the housing, in the direction in which the housing is to be inserted into the cavity of the counterpart, is provided on one side of the step and a front portion of the housing is provided on the other side of the step, said rear portion having a larger outer contour than that of said front portion;

a generally annular sealing member fitted to and extending around the front portion of said housing, said sealing member having opposite ends in the direction in which the housing is to be inserted into the cavity of the counterpart, one of said ends of said sealing member abutting the step of said housing, and said sealing member being configured to establish a seal between the housing and an inner peripheral surface of the counterpart defining the cavity; and

an engagement member engaging an outer periphery of the front portion of said housing and abutting the other of said ends of the sealing member, said engagement member having an outer contour that is also larger than that of the front portion of said housing.

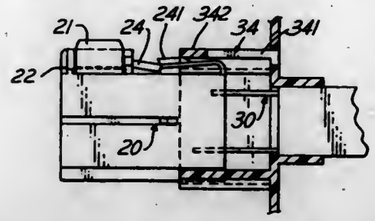


**5,498,171**

## CONNECTOR LOCKING AND UNLOCKING CONFIGURATION

**Joseph E. Semaan, Novi, Mich., assignor to Ford Motor Company, Dearborn, Mich.**

**Filed Jul. 5, 1994, Ser. No. 270,557**
**Int. Cl.[6] H01R *13/627***
**U.S. Cl. 439—352** **5 Claims**



1. An electrical connector having first and second connector bodies which are coupled and locked together by a deflectable lock member of said first connector body which engages a lock opening of the second connector body, wherein said electrical connector further includes:

said deflectable lock member having an elongated arm attached to said first connector body at a front mating end thereof and a rigid catch extending from said arm, and

a coupling assurance device coupled to said first connector body so as to reduce movement of said elongated arm so that said lock member can deflect sufficiently to couple said first and second connector bodies and deflection is substantially reduced in response to an uncoupling force thereby preventing unintentional decoupling and providing for coupling of the first and second connector bodies when the coupling assurance device is in a seated position and providing for uncoupling when the coupling assurance device is removed, wherein said elongated arm has a forward length of reduced thickness, including said rigid catch positioned thereon, an intermediate length of intermediate thickness greater than the thickness of said forward length and a rearward length of greater thickness than the thickness of said intermediate length to facilitate bending of said lock member.

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**5,498,172**

## ELECTRICAL CONNECTOR FOR INTERCONNECTING PARALLEL MULTICONDUCTOR CABLES

**Sadao Noda, Iwakura, Japan, assignor to Sunx Kabushiki Kaisha, Tokyo, Japan**

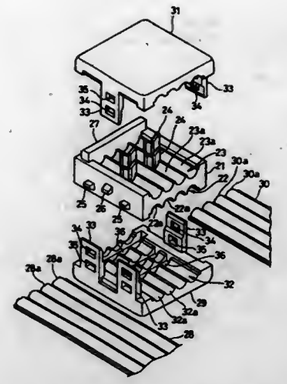
**Filed Jun. 29, 1994, Ser. No. 267,362**
**Claims priority, application Japan, Jul. 30, 1993, 5-042049 U; Sep. 10, 1993, 5-049345 U; Sep. 10, 1993, 5-225573**
**Int. Cl.[6] H01R *4/24***
**U.S. Cl. 439—404** **22 Claims**

1. An electrical connector for interconnecting parallel multiconductor cables, comprising:

a) a housing with opposite sides having a first cable receiving section for receiving a parallel multiconductor main cable and a second cable receiving section for receiving a parallel multiconductor branch cable respectively;

b) a plurality of contact members each extending through the housing, each contact member having terminal portions projecting from the first and second cable receiving sections so that the main and branch cables are press fitted into the terminal portions in an electrically conductive state respectively;

c) a pair of covers attached to the housing, the covers having cable receiving sections pressing the main and branch cables against the first and second cable receiving sections respectively when the covers are attached to the housing; and



d) engagement means for engaging the housing with each cover when each cover has been attached to the housing, the engagement means holding each cover in a provisional engagement state wherein each cover is away from the housing by a predetermined distance when the covers are attached to the housing.

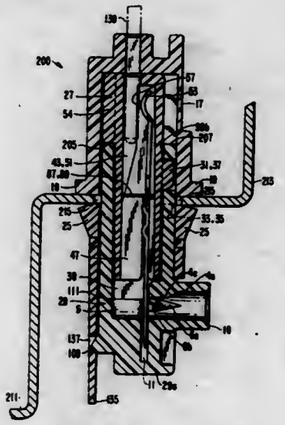
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**5,498,173**

## ELECTRICAL CONNECTING DEVICE

**Andreas Drewanz, Mundelein; Robert L. Holmes, Mt. Prospect, both of Ill.; Edward Key, Hummelstown, Pa., and Allan J. Reinken, Skokie, Ill., assignors to North American Philips Corporation, Tarrytown, N.Y.**

**Division of Ser. No. 919,473, Jul. 24, 1992, Pat. No. 5,364,288.**
**This application Oct. 25, 1994, Ser. No. 328,997**
**Int. Cl.[6] H01R *4/24***
**U.S. Cl. 439—404** **8 Claims**



1. An electrical connecting device, comprising:

a plug including first locking means; and

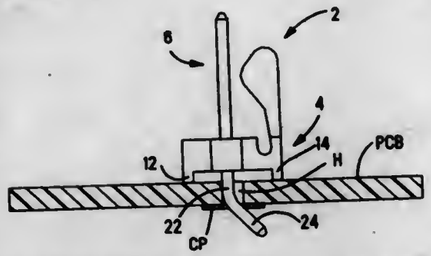
a receptacle including resilient shroud means for covering a portion of said receptacle, said shroud means including second locking means;

wherein one of said first locking means and second locking means extends in a first direction and wherein said first locking means and said second locking means are operable for detachable engagement with each other to secure said receptacle to said plug as said plug is inserted into said

receptacle in a second direction extending substantially perpendicular to said first direction;
said shroud means extending beyond said plug in the second direction when the plug is fully inserted in the second direction in the receptacle.

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5,498,174
**ELECTRICAL CONNECTOR WITH SPRING LEG RETENTION FEATURE**
**Richard W. Speer, and Edward W. Belles, both of Kernersville, N.C., assignors to The Whitaker Corporation, Wilmington, Del.**
**Filed Oct. 18, 1994, Ser. No. 324,555**
**Int. Cl.[6] H01R** *13/73*
**U.S. Cl. 439—567** **17 Claims**

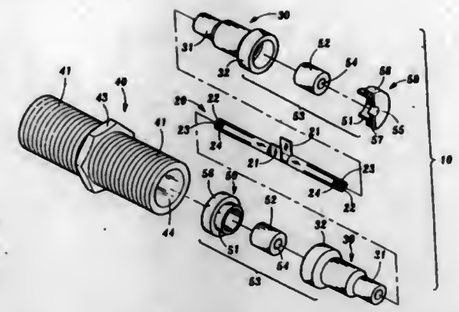



1. An electrical connector for retention on a circuit board having first and second opposite sides, the connector comprising an insulating housing supporting a plurality of electrical terminals having solder tails extending from the housing for insertion through in the circuit board from the first side thereof, the solder tails each being formed as a spring leg having a first abutment portion extending from the housing for engaging an internal wall of the hole and a second abutment portion connected to the first abutment portion by a bight so as to be obtusely angled with respect to the first abutment portion, for engaging an edge of the hole defined by the second side of the circuit board, the solder tail being elastically deformable about the bight by rotational motion of the housing on the circuit board, to urge the first abutment portion against the internal wall of the hole and the second abutment portion against said edge, the second abutment portions of the solder tails of the terminals all extending in the same direction.

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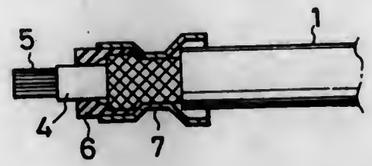
5,498,175
**COAXIAL CABLE CONNECTOR**
**Ming-Hwa Yeh, and Shen-Chia Wong, both of No. 10, Lane 121, Li-Der Rd., Peito District, Taipei, Taiwan, Prov. of China**
**Filed Jan. 6, 1994, Ser. No. 177,949**
**Int. Cl.[6] H01R** *9/05*
**U.S. Cl. 439—578** **3 Claims**

1. A coaxial cable connector comprising:
a main body formed with inner passage;
a contact member received in said main body, having a symmetrical structure, a pair of projecting wings being formed on a middle section of said contact member, four slots being formed on each sleeve-like end of said contact member, said slots dividing said sleeve-like end of said contact member into four contacting portions, an inward projecting section being formed near a tail end of each contact portion;
an insulating member fitted with said contact member, said insulating member being composed of an insulating sleeve, a resilient member and an insulating cap, wherein said insulating sleeve is a three-stage hollow cylindric member, and said resilient member is made of silicone material and is sleeve-shaped, a central axial through hole being formed on said resilient member, said insulating cap being a two-stage hollow cylindric member and formed with a central axial opening, an inner flange being formed on inner side of said opening, whereby said resilient member is placed into said insulating cap with one side of said resilient member abutting against said inner flange, and then the assembled insulating cap and resilient member are placed into a larger diameter end of said insulating sleeve in such a manner that a smaller diameter end of said insulating cap is placed into said larger diameter end of said insulating sleeve to form a combination.




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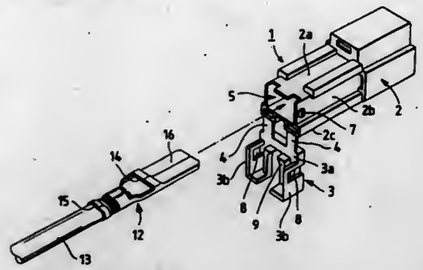
5,498,176
**SYSTEM FOR CONNECTING SHIELDING WIRE AND TERMINAL**
**Shigemi Hashizawa, and Shigemitsu Inaba, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan**
**Filed Jun. 1, 1994, Ser. No. 252,235**
**Claims priority, application Japan, Jun. 8, 1993, 5-137390**
**Int. Cl.[6] H01R** *9/05*
**U.S. Cl. 439—585** **11 Claims**




1. A system for connecting a connector terminal and a shielding wire having core wires, an internal sheath for covering said core wires, a shielding layer for covering said internal sheath and an external sheath for covering said shielding layer in a shielding connector, said system comprising:
a connector housing having a containing chamber for containing said shielding wire and a terminal; and
means which has a tubular member having an inner diameter equal to or slightly smaller than the outer diameter of said internal sheath of said shielding wire, which is fitted to an end portion of said shielding layer exposed by stripping a terminal portion of said external sheath of said shielding wire and is slid toward the remaining external sheath to contract the exposed portion of said shielding layer, said means being brought into contact with said shielding layer by caulking the contracted portion of said shielding layer portion, and one end-of said means being brought into contact with the inner surface of said connector housing to create continuity between said shielding layer and said connector housing.



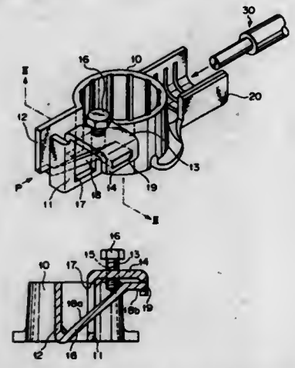
5,498,177
**STRUCTURE FOR THIN-WALLED HINGE**
**Masanori Tsuji, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan**
**Continuation of Ser. No. 200,498, Feb. 23, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 478,837**
**Claims priority, application Japan, Feb. 23, 1993, 5-056377**
**Int. Cl.[6] H01R** *13/40*
**U.S. Cl. 439—596** **6 Claims**




1. A connector comprising:
a housing including an accommodating chamber for accommodating a terminal and a housing body, continuously formed to the accommodating chamber, for receiving another connector;
an engagement member for engaging the terminal with the housing, the engagement member being detachably engagable with an opening portion of the housing, said engagement member having a cutout portion, said cutout portion engaging and securing cable of the terminal when the terminal is inserted into said accommodating chamber and said engagement member is engaged with said opening portion;
a thin-walled hinge for connecting the housing to the engagement member, the thin-walled hinge being gradually reduced in width, wherein the hinge has a constant thickness and is rotated within 180 degrees to form an arc shape.

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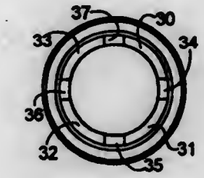
5,498,178
**ELECTRICAL WIRE CONNECTING FIXTURE**
**Masaaki Tabata, Yokkaichi, Japan, assignor to Sumitomo Wiring Systems, Ltd., Japan**
**Filed Oct. 27, 1994, Ser. No. 330,332**
**Claims priority, application Japan, Nov. 17, 1993, 5-066466 U**
**Int. Cl.[6] H01R** *4/42*
**U.S. Cl. 439—762** **7 Claims**




1. An electrical wire connecting fixture for a battery, comprising:
an electrode holder formed by bending a metal strip into a cylindrical body with open upper and lower ends;
a pair of clamping pieces being extended in parallel to each other outwardly from the opposite ends of said electrode holder;
a fastening bolt screwed in a given position of a bolt support piece adjustably in a vertical direction, said bolt support piece being extended from one of said clamping pieces; and
a slanting plate for bearing a lower end of said fastening bolt so as to approach said clamping pieces toward each other when said fastening bolt is screwed down, said slanting plate being diagonally extended from the other of said clamping pieces in a direction perpendicular to the extending direction of said clamping pieces.

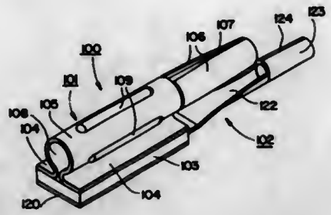
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5,498,179
**ELECTRICAL CONNECTOR**
**Roger W. Byczek, Lake in the Hills, Ill., assignor to Woodhead Industries, Inc., Northbrook, Ill.**
**Filed May 4, 1994, Ser. No. 238,246**
**Int. Cl.[6] H01R** *11/22*
**U.S. Cl. 439—843** **12 Claims**




1. An improved multiple-pole female electrical connector for assembly with a male electric connector having a plurality of pins, said female connector having a plurality of female connector elements embedded in a connector insert body and adapted to receive and establish electrical continuity with associated ones of said pins, each female connector element comprising: an integral conductive metal connector having a base, at lest four flexible fingers arranged in diametrically opposed pairs to form a cylindrical socket, for receiving an associated pin for making an electrical connector, each finger extending from said base in cantilever and being flexible in a direction radial of said socket and independently of the other fingers, each finger having a distal free end adapted to engage an associated pin and establish electrical contact therewith; and a protective metal sleeve coaxial with the axis of said socket and surrounding said fingers to limit the outward flexing of said fingers, said sleeve having an inwardly turned annular lip at the inlet end thereof, said lip defining an insertion opening substantially equally coextending with the insertion opening defined by said distal free ends of said fingers of said female connector element, said lip forming a guide for an associated pin during insertion of said pin in said socket, said lip extending to an axial location adjacent to, but spaced slightly outwardly of, the distal free ends of said fingers, whereby said lip of said sleeve receives and guides a pin during insertion in said socket and limits the size of pin that may be received in said socket, and the cylindrical wall of said sleeve limits the outward deflection of said fingers to preclude overstressing said fingers, and characterized in that said fingers do not normally engage said sleeve and are free to move upon insertion of a pin in said socket.

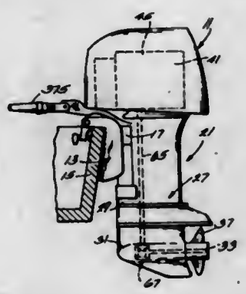
5,498,180
**DIODE/FILTER CONNECTOR**
Leonard A. Krantz, Sidney; Joseph D. Magnan, South Kortright, and Stephen Punako, Bainbridge, all of N.Y., assignors to Amphenol Corporation, Wallingford, Conn.
Filed Oct. 5, 1992, Ser. No. 956,416
Int. Cl.[6] H01R 11/22
U.S. Cl. 439—851 61 Claims




1. A component adapted to be electrically connected between a feedthrough contact and ground in an electrical connector, comprising:
a component body;
a ground lead adapted to removably engage and electrically connect the component body to ground; and
a live lead adapted to removably engage an exterior surface of a connector contact;
wherein said leads are integrally and fixedly connected to the component body such that said leads and component body are removable as a unit from both the connector and the contact, and
wherein said live lead includes a projection extending in a direction transverse to a principal plane of said component body, said projection including a semi-cylindrical recess for engaging said contact.

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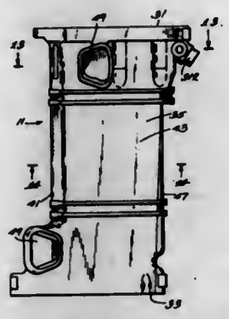
5,498,181
**OUTBOARD MOTOR POWER HEAD ASSEMBLY**
Michael C. Anselm, Fort Myers, Fla., and James S. Nerstrom, Green Oaks, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.
Filed Jun. 7, 1994, Ser. No. 254,999
Int. Cl.[6] B63H 5/12
U.S. Cl. 440—53 20 Claims




1. An outboard motor including a fore and aft center plane and comprising a powerhead assembly including a two stroke internal combustion engine including a cylinder block including a port side, a starboard side, a plurality of vertically aligned cylinders arranged in only a single bank and each including an axis extending at an angle to said center plane and to one of said port and starboard sides, and an exhaust port on the other of said port and starboard sides, and an exhaust gas passage including a main portion extending vertically adjacent said center plane, and a like plurality of elbow portions connecting said exhaust ports to said main portion.

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5,498,182
**OUTBOARD MOTOR EXHAUST HOUSING AND LOST FOAM PATTERN THEREFOR**
Michael C. Anselm, Fort Myers, Fla.; Clarence E. Blanchard, Kenosha, Wis., and James S. Nerstrom, Green Oaks, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.
Filed Jun. 7, 1994, Ser. No. 255,096
Int. Cl.[6] B63H 21/24
U.S. Cl. 440—76 14 Claims



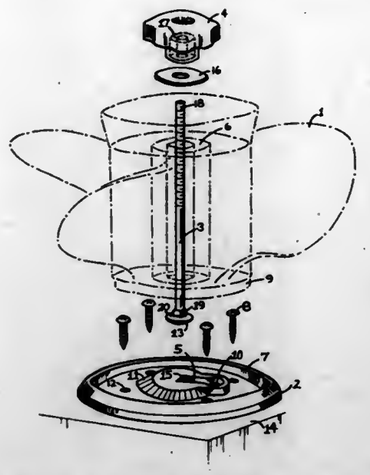
1. A one piece drive shaft housing comprising an outer surface having an upper end surface, a lower end surface, and an endless side surface extending from and between said upper and lower end surfaces and defined in part by opposed and spaced side walls, an internal cavity extending from and between said upper and lower end surfaces, defined, in part, by a barrier wall extending from and between said opposed and spaced side walls, and adapted to receive a drive shaft and a clutch operating linkage, and an internal exhaust gas passage extending from and between said upper and lower end surfaces and located in spaced relation to said cavity.

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5,498,183
**SIDEWAYS LOADABLE MARINE SPARE PROPELLER MOUNT**
Donald J. Riviera, 15248 Englewood, Allen Park, Mich. 48101
Filed Sep. 16, 1994, Ser. No. 307,342
Int. Cl.[6] B63B 17/00
U.S. Cl. 440—113 1 Claim

1. A sideways loadable marine propeller fixation device for fastening a marine propeller to a plastic base plate comprising; a center axial shaft, said center axial shaft having a first end and a second end, said center axial shaft having a threaded portion extending to said first end, said second end of said center axial shaft having a head, said head having a flat surface, said flat surface being perpendicular to the centerline of said center axial shaft and adjoining said head, said center axial shaft having a square neck adjoining said flat surface and opposite of said head, a retaining know having a brass threaded insert so as to mate with said threaded portion of said center axial shaft, a plastic base plate having a plurality of screw clearance holes for fastening said plastic base plate to a mounting surface, said plastic base plate having a raised retaining ring circular in shape with an open inside diameter protruding on top of and perpendicular to said plastic base plate, said raised retaining ring having said open inside diameter dimensionally sized for locating and nesting a marine propeller by means of the marine propeller's exhaust flange outside diameter, said plastic base plate having a reinforced center axial shaft mounting area being an elevated area protruding from said plastic base plate adding increased thickness and strength to said plastic base plate and housing a center axial shaft mounting slot



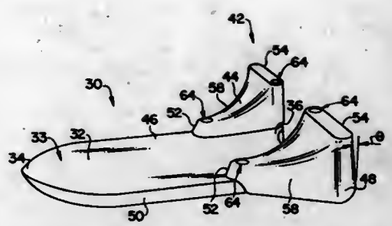



entrance and a center axial shaft mounting slot, said center axial shaft mounting slot entrance comprises an opening in said reinforced center axial shaft mounting area which is open through said plastic base plate to said mounting surface, said center axial shaft mounting slot entrance being open to and adjoining said center axial shaft mounting slot, said center axial shaft mounting slot having a square end, said square end of said center axial shaft mounting slot having two parallel sides formed by said center axial shaft mounting slot and a side opposite of said center axial shaft mounting slot entrance being perpendicular to said tow parallel sides, said square neck of said center axial shaft having any two opposing sides being dimensionally correct for sliding along said two parallel sides of said center axial shaft mounting slot, whereby said center axial shaft may be loaded into said center axial shaft mounting slot entrance in any axial rotated position about said centerline of said center axial shaft, said square neck of said center axial shaft may enter said center axial shaft mounting slot in any of four axial rotated positions about said centerline of said center axial shaft after said plastic base is mounted, whereby said head of said center axial shaft being in close proximity to the base plate and said mounting surface, and said flat surface of said center axial shaft traveling under said center axial shaft mounting slot, said square neck of said center axial shaft by means of contact with said square end of said center axial shaft mounting slot centering said center axial shaft in relation to said raised retaining ring and preventing said center axial shaft from rotation, said flat surface of said center axial shaft preventing said head of said center axial shaft from pulling through said center axial shaft mounting slot, a thrust washer to protect said retaining knob and the marine propeller from damage when tightening said retaining knob.

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5,498,184
**BODY BOARD HAVING A HYDRODYNAMIC PROPULSION SURFACE**
Abdolhamid Saghri, 8207 Stone Trail Dr., Bethesda, Md. 20817
Filed Mar. 15, 1995, Ser. No. 404,719
Int. Cl.[6] A63C 15/00
U.S. Cl. 441—65 20 Claims

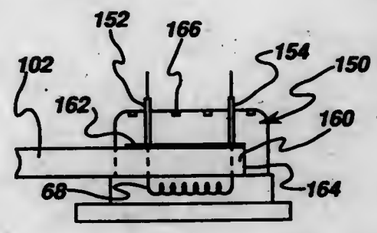
1. A body board comprising:
a body member having a bow and a stern providing a substantially flat surface capable of supporting a person lying thereon; and
a pair of extensions coupled to said body member such that an entirety of each extension in said pair of extensions is maintained in a substantially fixed position relative to said body member, each extension in said pair of extensions providing a rearward-facing surface generally facing away from said stern




of said body member so that fluid delivered in a direction generally from said stern toward said bow of said body member exerts a force against said rearward-facing surface to propel said body board, each extension being shaped so that an area defined by said rearward-facing surface is substantially equivalent to a maximum cross-sectional area of said extension, wherein a cross-sectional area of said extension is defined by a plane generally perpendicular to a longitudinal axis of said body member, and each extension being shaped so that said maximum cross-sectional area is only located proximate to said stern of said body member.

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5,498,185
**METHODS OF MAKING AN IMPROVED X-RAY TUBE CATHODE CUP ASSEMBLY**
Bruce A. Knudsen, Amsterdam, N.Y., and Clyde L. Briant, Barrington, R.I., assignors to General Electric Company, Schenectady, N.Y.
Filed Sep. 26, 1994, Ser. No. 311,988
Int. Cl.[6] H01J 9/02;9/18
U.S. Cl. 445—28 5 Claims



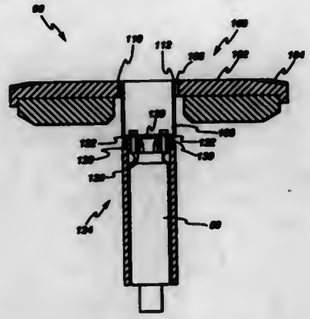

1. A method of assembling at least one filament having legs to a cathode cup for use in an x-ray tube, the method comprising the steps of:
providing a one piece insulator structure;
providing a cathode cup structure;
operatively connecting the one piece insulator structure to the cathode cup structure;
then positioning at least one filament in the combination insulator structure/cathode cup structure; and
securing the at least one filament in the combination insulator structure/cathode cup structure such that the filament is properly aligned.

5,498,186

**METHOD OF MAKING AN IMPROVED TARGET/STEM CONNECTION FOR X-RAY TUBE ANODE ASSEMBLIES**

Mark G. Benz, Burnt Hills; Melvin R. Jackson, Niskayuna; Robert J. Zabala, Schenectady; Marshall G. Jones, Scotia; Herman A. Nied, Ballston Lake, and Michael R. Eggleston, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 6, 1994, Ser. No. 321,022
Int. Cl.[6] H01J 9/18
U.S. Cl. 445—28 24 Claims



1. A method for bonding a target to a tubular stem for use in a rotating x-ray tube, comprising the steps of:
pressing and sintering the target;
forging the target at a temperature of about 1400° C. to about 1700° C.;
providing a machined insert;
inserting the insert into the target;
stress relief annealing the combined target insert from a temperature of about 1500° C. to about 1900° C.;
machining the combined target insert;
providing a tubular stem;
providing a bottom plate;
connecting the bottom plate to the tubular stem;
inserting the tubular stem into the target/insert combination;
final heat treating the stem/target combinstion from about 1200° C. to about 1600° C. for a time sufficient to diffusion bond the insert into the target and into the tubular stem wherein the coefficient of thermal expansion of the stem material is greater than the coefficient of thermal expansion of the insert material which is in turn greater than the coefficient of thermal expansion of the target material; and
connecting the target/stem assembly to a rotor body assembly.

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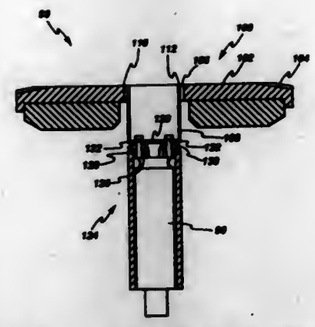
5,498,187

**METHOD OF MAKING AN IMPROVED TARGET/STEM ASSEMBLY - ROTOR BODY ASSEMBLY CONNECTION FOR X-RAY TUBES**

Michael R. Eggleston, Scotia; Mark G. Benz, Burnt Hills; Melvin R. Jackson, Niskayuna, and Robert J. Zabala, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 6, 1994, Ser. No. 321,837
Int. Cl.[6] H01J 9/18
U.S. Cl. 445—28 19 Claims

1. A method for connecting a target/stem assembly to a rotor body assembly for use in a rotating x-ray tube, comprising the steps of:
providing a target;
providing a large bore, thin-walled tubular stem;
providing a bottom plate;
connecting the bottom plate to the tubular stem;
connecting the tubular stem/bottom plate combination to the target;



machining the bottom plate to obtain proper target/stem assembly balance and proper alignment between the bottom plate and the target/stem assembly;
providing at least one thermal washer;
machining the thermal washer to exact tolerances;
positioning the target/stem assembly proximate a rotor body assembly;
positioning the thermal washer between the target/stem assembly and the rotor body assembly; and
connecting the target/stem assembly to the rotor body assembly with a plurality of fasteners to form an anode assembly.

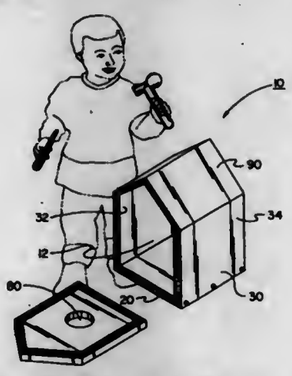
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5,498,188

**CHILD-CONSTRUCTABLE TOYS THAT ARE ASSEMBLED USING A SYSTEM OF COLOR-COORDINATED COMPONENTS AND TOOLS**

Christine M. Deahr, W6415 Kreghville Rd., Waterloo, Wis. 53594

Filed Jan. 5, 1995, Ser. No. 369,103
Int. Cl.[6] A63H 33/04;33/12;3/52
U.S. Cl. 446—75 6 Claims



2. A child-constructable toy comprising:
a set of components, each component having a characteristic color, each component further having a plurality of edges bearing other characteristic colors;
coupling means having a same characteristic color as that of a color on an edge of one component and a color on an edge of another component, the coupling means being for coupling like colored edges of the components together and with such coupling allowing at least a portion of a toy to be created,
wherein the coupling means comprises a first strip of pile-type fastener of the characteristic color secured to each edge of the one component, said coupling means extending along that length as defined by that associated edge, and a second strip of pile-type fastener of the characteristic color secured to the edge of the another component, whereby contacting of the same characteristic color pile-type fasteners will couple at least two of the components together.
tool-actuateable coupling means having the same characteristic color as that of the color on the edge of the one component and the color on the edge of the another component for further coupling the like colored edges of the components together and with such coupling allowing at least a portion of a toy to be created,
wherein the tool-actuateable coupling means comprises a plurality of fasteners extendable between the edges of the one component and the another component; and
at least one tool operatively associated with the fasteners of the tool-actuateable coupling means for facilitating the coupling of the components together.



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5,498,189

**ANIMATED FINGER PUPPET**

Charles P. Townsend, Frinton-on-Sea, United Kingdom, assignor to Townsend Croquet Limited, Essex, United Kingdom

Filed Jun. 20, 1994, Ser. No. 262,299
Claims priority, application United Kingdom, Jun. 22, 1993, 9312805
Int. Cl.[6] A63H 3/16
U.S. Cl. 446—100 18 Claims



1. A finger puppet comprising:
a finger stall formed of a resilient material and including an axis and a digit accommodating bore adapted to receive a tubular digit therein;
a base area extending generally parallel to the finger stall axis on the outer surface thereof, the base area including a plurality of bores disposed therein;
a plurality of interchangeable head parts, each comprising a facial portion and including a spigot protruding from a rear surface thereof, each of said plurality of bores being adapted to accommodate a cooperating spigot extending from the rear surface of a selected head part;
means for animating the facial portion when articulating the finger stall, said animating means including abutment of at least some of the head parts with a portion of an adjacent head part; and
a cranial portion disposed on the finger stall adjacent to the base area and including means for releasably securing a hair piece thereto, the hair piece comprising a shell interfittable with the cranial portion, the shell being provided with a plurality of generally arcuate resilient slots, each slot including a resilient tongue portion capable of receiving and retaining at least one thread between the tongue portion and the cranial portion.

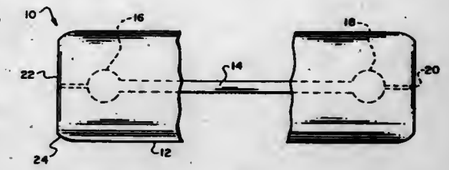
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5,498,190

**FLEXIBLE FOAM CONSTRUCTION TOY AND METHOD OF MANUFACTURING SAME**

Arthur M. Ganson, Somerville, Mass., assignor to HandsOn-Toys, Inc., Woburn, Mass.

Filed Jun. 27, 1994, Ser. No. 265,809
Int. Cl.[6] A63H 33/04;33/08;33/00
U.S. Cl. 446—107 12 Claims



1. A flexible foam construction toy set including a number of elongated bendable tubular toy pieces that are interconnectable by wrapping around one another, at least one said toy piece comprising:
an elongated regularly-shaped foam body having ends, with a length to width ratio of at least about thirty six, and having a central full-length aperture with first diameter;
a flexible wire with a second diameter, said second diameter essentially equal to said first diameter, wherein said wire has two enlarged ends, is shorter than said foam body, and is located completely within, and along said central aperture of, said foam body; and
an adhesive substance between said wire and said foam body to anchor said wire within said foam body;
wherein said foam body ends are closed around said central aperture to fully encapsulate said wire.

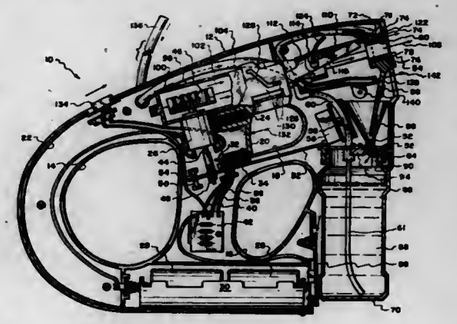
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5,498,191

**BUBBLE PRODUCING TOY**

Robert A. DeMars, 5000 N. Parkway Calabasas- Suite 233, Calabasas, Calif. 91302

Filed Feb. 21, 1995, Ser. No. 391,104
Int. Cl.[6] A63H 33/28;33/40
U.S. Cl. 446—015 15 Claims



1. A bubble producing toy comprising:
a bousing having an internal chamber;
a dispensing opening connecting with said internal chamber, said dispensing opening connecting to the ambient, a sleeve mounted within said dispensing opening, said sleeve having a central opening and a dispensing surface;
a reservoir mounted on said housing, said reservoir to contain a liquid, said liquid being capable of producing air bubbles;
a pump mounted within said housing, said pump connected to said reservoir by a tube to supply said liquid to said pump;

a source of blown air originated from within said internal chamber, said source to be dispensed into said central opening of said sleeve into the ambient;

a film producing mechanism mounted on said housing, said film producing mechanism including an applicating bar, said applicating bar being located against said dispensing surface, said applicating bar being movable across said dispensing surface, said liquid from said reservoir to be moved by said pump to said dispensing surface, whereby said applicating bar locates a thin film of said liquid across said dispensing surface as said applicating bar is moved across said dispensing surface which creates an air bubble upon said source flowing through said thin film mounted across said central opening.

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**5,498,192**

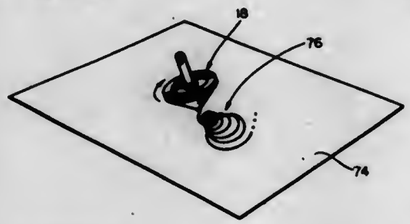
**TOP WITH PRECESSION TRACING POINT FOR TRACING UNIQUE SPIRALS**

**Christopher B. McKay, and Stephen deZordo, both of Carmel, Calif., assignors to DoodleTop, Sand City, Calif.**

**Continuation of Ser. No. 770,513, Oct. 2, 1991, Pat. No. 5,324,226, which is a continuation-in-part of Ser. No. 615,682, Nov. 19, 1990, abandoned. This application Jun. 27, 1994, Ser. No. 266,971**

**Int. Cl.[6] A63H *1/00***

**U.S. Cl. 446—264** **1 Claim**




1. In combination:

a top having a conical body with 40° to 50° truncated cone with respect to the horizontal and having a rotational moment of inertia for retaining dynamically imparted angular momentum to said top during a spin time of said top when said top is spun, the conical body including a central shaft having a bore;

a writing surface for permitting passage of a writing point over said surface, said writing surface providing a frictional engagement between said writing point and said writing surface and receiving a track from said point;

a writing point comprising a porous plastic tip having a generally parabolic vertical cross-section and providing non-slipping rotational contact with a writing surface, said porous tip in communication with an ink source at least partially positioned within said bore and leaving a trace in the wake of said non slipping rotational contact on said writing surface whereby said point leaves on said writing surface spiral tracks having the characteristic of initial large diameter traced spirals, intermediate narrow spirals, and terminal large diameter traced spirals relative to a spin time of said top.

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**5,498,193**

**MANUALLY ACTUATED TOY DINOSAUR STRUCTURE AND METHOD**

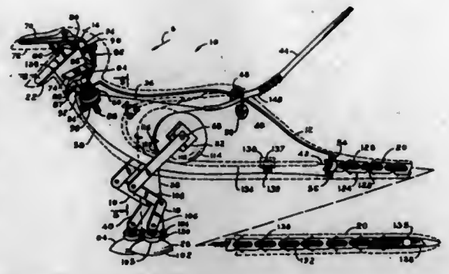
**Salvatore Locricchio, 2569 Tarry, Sterling Height, Mich. 48310**

**Continuation-in-part of Ser. No. 307,540, Feb. 8, 1989, Pat. No. 5,306,199. This application Feb. 25, 1994, Ser. No. 202,083**

**Int. Cl.[6] A63H *3/20***

**U.S. Cl. 446—361** **2 Claims**

1. Toy structure having a pulley and a tail with a free end and an other end, said tail including a plurality of separate hollow tubular



tail portions, pivot means extending substantially vertically of the structure connecting each portion of the tail with an adjacent portion for pivotal movement with respect thereto horizontally of the tail structure, a single coil spring extending through all of the tail portions for biasing the separate portions of the tail into an aligned position wherein the tail is substantially straight; and means for causing the tail to move horizontally from one side of the aligned position to the other, selectively, comprising trigger structure, a cable tube extending from the trigger structure to the structure which is substantially rigid longitudinally and is flexible transversely, at least one cable extending from the trigger structure at one end of the cable through the cable tube around the pulley, and through the tail centrally thereof, a weight positioned in the free end of the tail, and means securing the other end of the cable to the weight, whereby on tensioning of the cable by pulling on the trigger structure and releasing the trigger structure to release the cable, the tail is caused to appear to wag from side to side horizontally over center.

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**5,498,194**

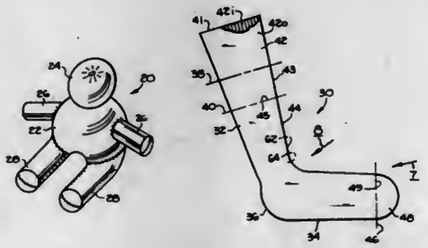
**STUFFED DOLL FORMED FROM A SINGLE SOCK**

**Sandra Altier, 7140 S. Thomas, Bridgeview, Ill. 60455**

**Filed Sep. 21, 1994, Ser. No. 309,651**

**Int. Cl.[6] A63H *3/02***

**U.S. Cl. 446—369** **2 Claims**



1. A stuffed doll having a head, a trunk, and legs, together having a skin that is continuous and of one piece and made up of a continuous and one piece part of a single sock,

the doll including arms with skins that are made up of a piece of the same single sock, and secured to the trunk,

the sock including a foot portion with an open toe end, a heel portion, an ankle portion, and a top portion,

the skin of the head and the trunk of the doll together being made up of the foot portion and the heel portion together, of the sock,

the head Of the doll being made up of the foot portion of the sock with the open toe end sewn closed, and the sock including a cincture operable for shaping the stuffed foot portion into the head and trunk,

the skin of the legs being made up of respective halves of the ankle portion of the suck on opposite sides of a longitudinal split, but connected to the foot portion, and



the foot portion and the ankle portion, of the sock, are disposed at an angle therebetween of greater than 90°, and

the doll includes a tuck therein at the juncture of the portion and the ankle portion at the inside angle therebetween, made up of an element of the skin of the sock, that is extended into the inside angle and securement of that element to the skin of the sock at a point displaced from the juncture, resulting in foreshortening the skin from the front of the trunk to the legs and consequently pulling the skin and thereby reducing said angle to approximately 90° and producing a more upright position in the sitting attitude of the doll.

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**5,498,195**

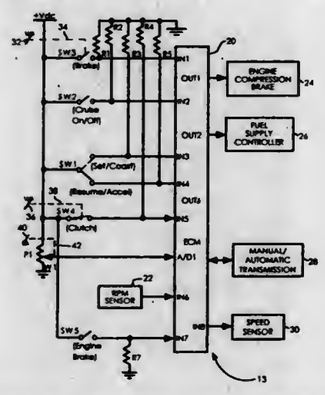
**APPARATUS AND METHOD FOR VERIFYING GEAR ENGAGEMENT IN CONTROLLING THE AUTOMATIC SHIFTING OF A MANUAL-AUTOMATIC TRANSMISSION**

**Gregory R. White, Columbus; Bryan S. Gatewood, Westport; Mark L. Wilson, Columbus, all of Ind.; Peter J. Griffen, Richmond, United Kingdom; Jon A. Steeby, Schoolcraft, Mich.; Dean S. Anderson, Cedar Falls, Iowa, and Larry R. Webber, Columbus, Ind., assignors to Cummins Electronics Company, Inc., Columbus, Ind.**

**Filed Nov. 10, 1994, Ser. No. 337,545**

**Int. Cl.[6] B60K *41/04***

**U.S. Cl. 477—110** **39 Claims**




1. A method for verifying gear engagement after detecting gear disengagement in a vehicle having an engine with a throttle capable of being enabled for driver control and of being inhibited from driver control, and a manual/automatic transmission including manually selectable gears and at least two automatically selectable gears, the method comprising the steps of:

(1) calculating a synchronous RPM value corresponding to a desired engine speed at which an ensuing automatic gear shift will take place;

(2) inhibiting the throttle from driver control and fueling the engine to achieve an engine speed within a first RPM range of said synchronous RPM;

(3) commanding the transmission to engage a desired one of the automatically selectable gears;

(4) allowing any engine RPM overshoot from step (2) to settle for a first predetermined time period;

(5) fueling the engine to achieve a first predetermined torque output from the engine;

(6) calculating an updated synchronous RPM value corresponding to a desired engine speed at which the ensuing automatic gear shift will take place;

(7) testing whether the engine speed is within a first predetermined synchronous RPM window;

(8) repeating steps (5)–(7) and returning throttle control to the driver if the engine RPM was within said first synchronous RPM window for a second predetermined period of time;

(9) performing steps (10)–(12) if throttle control is not returned to the driver after step (8) is completed;

(10) fueling the engine to achieve a second predetermined torque output from the engine, based upon the speed-torque fueling characteristics of the engine;

(11) calculating an updated synchronous RPM value corresponding to a desired engine speed at which the ensuing automatic gear shift will take place;

(12) testing whether the engine speed is within a second predetermined synchronous RPM window;

(13) repeating steps (10)–(12) and returning throttle control to the driver if the engine RPM was within said second synchronous RPM window for a third predetermined period of time.

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**5,498,196**

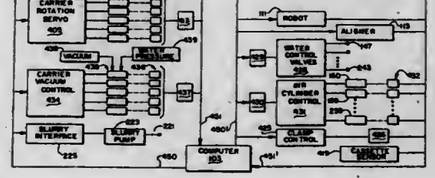
**WAFER POLISHING METHOD AND APPARATUS**

**Chris E. Karlsrud; Anthony G. Van Woerkom, both of Chandler, Ariz.; Shigeru Odagiri, Yokohama, and Isao Nagahashi, Fujisawa, both of, Japan, assignors to Speedfam Corporation, Des Plaines, Ill.**

**Division of Ser. No. 898,876, Jun. 15, 1992, Pat. No. 5,329,732. This application May 18, 1994, Ser. No. 245,458**

**Int. Cl.[6] B24B *37/04;7/22***

**U.S. Cl. 451—11** **3 Claims**



1. Computer controlled apparatus for polishing a surface of a thin wafer material comprising:

a rotating polishing surface;

means for measuring the rotation rate of said polishing surface;

a wafer carrier for securing a thin wafer of material to a surface thereof;

air cylinder means for pressing a wafer secured to said wafer carrier against said polishing surface;

pressure sensing means for measuring the pressure applied by said wafer carrier to said polishing surface;

means for rotating said wafer carrier while said wafer of material is being pressed against said polishing surface;

means for measuring the rotation rate of said carrier;

means for establishing ranges of wafer carrier pressure, polishing table rotation rate and wafer carrier rotation rate; and

computer means responsive to said pressure sensing means, said means for sensing the polishing surface rotation rate and said means for sensing wafer carrier rotation rate for substantially continuously maintaining the pressure, polishing surface rotation rate and wafer carrier rotation rate within the ranges established by the means for establishing.

**5,498,197**

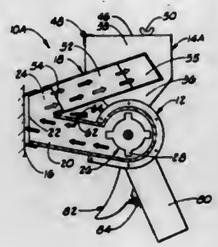
## HAND-HELD BLAST CLEANING MACHINE

**Jerry W. Roberts, Oklahoma City; James E. Riley; Richard L. Goswick, both of Tulsa, and Scott T. Jednacz, Bixby, all of Okla., assignors to Nelco Manufacturing Corp., Oklahoma City, Okla.**

**Continuation-in-part of Ser. No. 86,284, Jul. 1, 1993, abandoned. This application Nov. 12, 1993, Ser. No. 152,644**

**Int. Cl.[6] B24C *5/00***

**U.S. Cl. 451—94** **4 Claims**



1. A hand-held apparatus for blast cleaning a surface, the apparatus comprising:

a housing having a blast corridor, a rebound corridor and a blast opening communicating with the blast corridor and the rebound corridor;

a blast wheel mounted within said housing, said blast wheel being adapted for rotating and propelling abrasive material through the blast corridor and blast opening against a surface to be cleaned;

a hopper attached to said housing and having a return corridor, said hopper communicating with the blast corridor to provide abrasive material to said blast wheel and the return corridor of said hopper communicating with the rebound corridor of said housing to receive spent abrasive material;

drive means for rotating said blast wheel, said drive means being sized and shaped to be hand-held by an operator of the apparatus;

a shut-off plate mounted within said housing and having a feed opening therethrough, said shut-off plate being pivotable between a shut-off position, wherein said shut-off plate keeps abrasive material from passing from said hopper to said blast wheel, and a feed position, wherein the feed opening of said shut-off plate allows abrasive material to pass from said hopper to said blast wheel;

a shoe mounted to said housing at the blast opening and being shaped to define a frame around the blast opening, said shoe being pivotable between a safety position, wherein at least a portion of said shoe protrudes from said housing beyond the blast opening, and an operating position, wherein the blast opening extends through the frame defined by said shoe;

a link member operatively connected to said shoe and said shut-off plate to dispose said shut-off plate in the shut-off position while said shoe is in the safety position and to dispose said shut-off plate in the feed position while said shoe is in the operating position; and

means for biasing said shoe into the safety position;

wherein said shut-off plate is moved from the shut-off position into the feed position in response to placing said shoe against a surface to be blast cleaned and urging said housing to dispose the blast opening against the surface through the frame defined by said shoe.

**5,498,198**

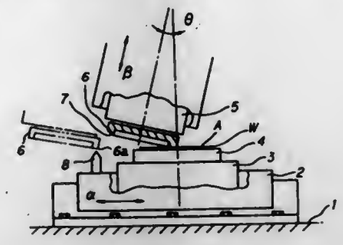
## GRINDING MACHINE

**Toshiharu Kogure, Narashino, Japan, assignor to Seiko Seiki Kabushiki Kaisha, Japan**

**Filed Jul. 27, 1993, Ser. No. 97,713**

**Int. Cl.[6] B24B *3/46***

**U.S. Cl. 451—146** **20 Claims**



1. A grinding machine for grinding a workpiece, comprising: first driving means for rotationally driving a workpiece having a work surface about a first axis; moving means for reciprocally moving the workpiece along a reciprocating axis perpendicular to the first axis; and second driving means for rotationally driving a grinder having a grinding surface about a second axis extending at an inclination angle to the first axis, and for moving the grinding surface of the grinder towards and away from the work surface of the workpiece along the second axis.

**5,498,199**

## WAFER POLISHING METHOD AND APPARATUS

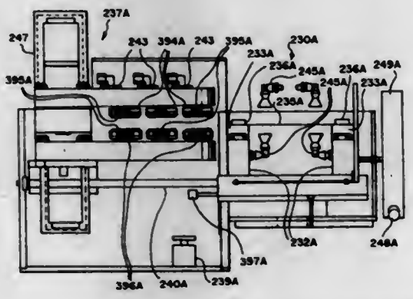
**Chris E. Karlsrud; Anthony G. Van Woerkom, both of Chandler, Ariz.; Shigeru Odagiri, Yokohama; Isao Nagahashi, Fujisawa, both of, Japan, and Spencer Preston, Chandler, Ariz., assignors to Speedfam Corporation, Des Plaines, Ill.**

**Continuation-in-part of Ser. No. 898,876, Jun. 15, 1992, Pat. No. 5,329,732. This application Jul. 15, 1994, Ser. No. 276,158**

**The portion of the term of this patent subsequent to Jul. 19, 2011, has been disclaimed.**

**Int. Cl.[6] B24B *7/22***

**U.S. Cl. 451—289** **5 Claims**



1. Apparatus for polishing the surface of a thin wafer of material comprising:

a polishing surface;

a polishing assembly comprising a plurality of wafer carriers each for holding a wafer in polishing contact with said polishing surface;

index apparatus comprising a plurality equal to the number of said wafer carriers of unload means for receiving a plurality of polished wafers from said wafer carriers;



means for moving said polishing assembly from a position at said polishing surface to a position at said index apparatus;

means for substantially simultaneously placing wafers held by said wafer carriers into individual ones of said unload means; and

means for further polishing a wafer after removal from said unload means.

**5,498,200**

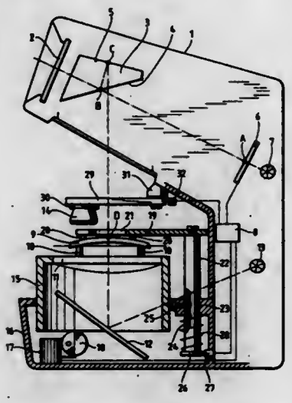
## DEVICE FOR PARALLEX-FREE CENTERING OF A BLANK FOR A GLASS LENS FOR SPECTACLES AND FOR PROVIDING MARKINGS AND/OR ATTACHING A HOLDER BEFORE INSERTING THE BLANK INTO A GRINDING MACHINE FOR BLANKS FOR GLASS LENSES

**Ralf Werner, Hilden, Germany, assignor to Wernicke & Co. GmbH, Düsseldorf, Germany**

**Filed Aug. 12, 1994, Ser. No. 289,388**

**Int. Cl.[6] B24B *13/005***

**U.S. Cl. 451—460** **6 Claims**



1. A device for parallax-free centering of an eyeglass lens blank and for application of markings and for aligning a holder on a lens blank before insertion of the eyeglass lens blank into an eyeglass edge grinding machine, said device comprising:

a stage for the eyeglass lens blank;

an electric drive connected to said stage, said stage moveable in an upward and downward direction by said electric drive;

a depressor for holding the eyeglass lens blank on said stage, said depressor allowing lateral movement of the eyeglass lens blank in a support plane of said stage;

said depressor moveable in the upward and downward direction;

a first proximity detector operatively connected with said electric drive and with said depressor for positioning at a predetermined height the eyeglass lens blank held between said depressor and said stage; and

a light divider positioned between the eyeglass lens blank and the eye of an operator of said device for superimposing a scale and an image, selected from the group of a template image and an eyeglass frame opening image, onto the image of the eyeglass lens blank.

**5,498,201**

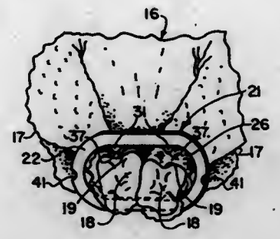
## RETAINER FOR POULTRY HOCKS

**Daniel J. Volk, Alpharetta, Ga., assignor to Volk Enterprises, Inc., Turlock, Calif.**

**Filed Jun. 6, 1994, Ser. No. 254,247**

**Int. Cl.[6] A22C *21/00***

**U.S. Cl. 452—174** **18 Claims**



1. A retainer for use with a body of eviscerated fowl having legs with hocks, comprising a unitary substantially planar thin plastic member which mounts about the hocks, the plastic member having an outer portion defining an opening which is generally oblong in shape and of sufficient size to permit the hocks to pass therethrough, a plurality of prong portions extending inwardly into the oblong opening from the outer portion for engaging the legs so as to hold the hocks in juxtaposition.

**5,498,202**

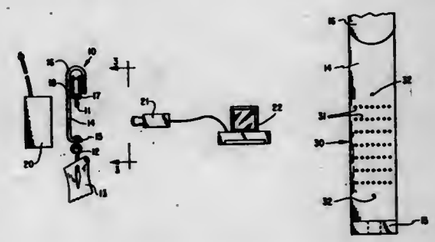
## IDENTIFYING SYSTEM FOR CARRIER TROLLEY

**David M. Vande Berg, Sioux Center, Iowa, assignor to Vande Berg Scales Co., Sioux Center, Iowa**

**Filed Dec. 4, 1992, Ser. No. 985,963**

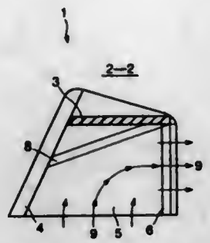
**Int. Cl.[6] A22C *18/00*; B03B *1/00***

**U.S. Cl. 452—184** **5 Claims**



1. A system for providing positive identification of a carrying device comprising a plurality of holes formed in said carrying device to form a matrix of holes, light transmitting means on one side of said carrying device and a receptor on the opposite side of said carrying device whereby light from said transmitting means passing through said holes forms a pattern received by said receptor, said receptor being electrically connected to computer means whereby said pattern is translated to positive identification, said matrix being a rectangular pattern of rows and columns, each of said holes falling on the intersection of one of said rows with one of said columns, at least two additional orientation holes formed in said carrying device and outside of said matrix to provide for electronic orientation of said matrix regardless of the position of said carrying device.

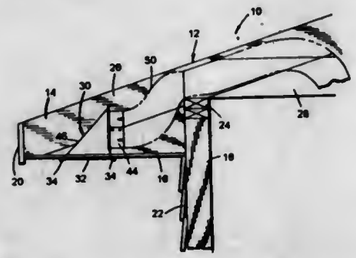
5,498,203
**MANUALLY ADJUSTABLE FORCED AIR-FLOW DEFLECTOR**
Gottfried Reichert, 1155 Grey Owl Point, Mississauga, Ontario, Canada
Filed Apr. 14, 1995, Ser. No. 421,978
Int. Cl.[6] F24F 13/06
U.S. Cl. 454—289 10 Claims




1. A manually adjustable forced air-flow deflector comprising:
a back plate having a first end and a second end;
first and second end plates secured to the respective first and second ends of said back plate so as to project forwardly in generally transverse relation with respect to said back plate;
a movable air-flow guiding plate and retaining means therefor, said movable air-flow guiding plate being retained in selectively movable relation by said retaining means for movement between a first distinct :position whereat said air-flow guiding plate is oriented in generally upstanding relation at the front of said end plates, a second distinct position whereat said air-flow guiding plate is oriented in angled relation, upwardly directed away from said back plate at a central portion of said end plates, and a third distinct position whereat said air-flow guiding plate is oriented in generally horizontal relation at the top of said end plates.

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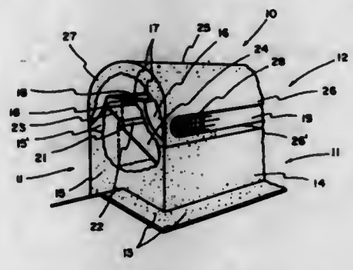
5,498,204
**EAVE VENT**
Charles R. Anderson, Jacksonville, Tex., and Charles B. Kenrick, Spring Lake, Mich., assignors to Builder's Best, Inc., Jacksonville, Tex.
Filed Feb. 21, 1995, Ser. No. 391,539
Int. Cl.[6] F23L 17/02
U.S. Cl. 454—359 5 Claims



1. An eave vent for discharge of gases from a dwelling, comprising:
a housing having a lower horizontal peripheral mounting rim having fastener receiving openings therein, and defining an air flow outlet from said housing, a vertical wall normal to said rim and having a top portion, a hose connector extending from said vertical wall and defining a gas flow inlet to said housing, a diagonal wall having a juncture with and extending from said vertical wall top portion to said horizontal rim, and a pair of triangular opposite end walls joining said vertical wall, said horizontal rim and said diagonal wall to enclose said housing; and
a closure flapper pivotally mounted on a horizontal pivot axis at said juncture, depending over said air flow outlet, and pivotal out against said diagonal wall with air flow out said outlet.

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5,498,205
**ROOF VENTILATOR**
James A. Knowles, 608 S. Cumberland St., Wallace, N.C. 28466; Larry M. Knowles, and Joseph Knowles, both of 1254 Cornwallis Rd., Rose Hill, N.C. 28458
Filed Aug. 4, 1994, Ser. No. 285,711
Int. Cl.[6] F24F 7/02
U.S. Cl. 454—363 7 Claims



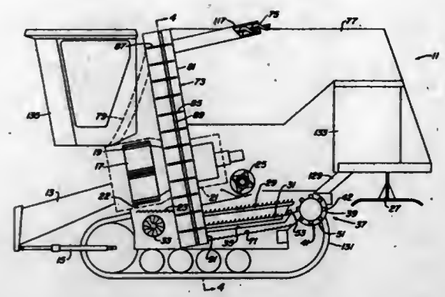
1. A ventilator for mounting on the roof of a livestock building and other buildings wherein noxious, corrosive fumes are produced comprising: an enclosed corrosion-resistant housing being defined by a pair of generally vertical sidewalls and a pair of generally vertical end walls disposed therebetween and including an upper portion and a lower portion; said upper portion of said housing being dome-shaped in cross-section having a concavely curved interior surface; a peripheral flange outwardly projecting from the lower portion of said housing for lying juxtaposed to said roof; a pair of exhaust ports in each of said pair of generally vertical sidewalls of said housing; a pair of concavely curved in cross-section interior deflecting baffles integrally formed in said lower portion extending upwardly and interiorly from below each of said pair of exhaust ports to above and in spaced relationship to said ports, an open area interior of said baffles communicating with the interior of said building whereby the concavely curved interior surface of said upper portion of said housing and said concavely curved interior deflecting baffles function together to direct air flow carrying noxious, corrosive fumes from the interior of said building, through said exhaust ports, and outwardly away from said roof to prevent degradation thereof by said noxious, corrosive fumes.

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5,498,206
**RETHRESHING ROTOR FOR GRAIN COMBINE**
Mark R. Underwood, Burr Oak, and Sushil V. Dwyer, Arkansas City, both of Kans., assignors to Deere & Company, Moline, Ill.
Filed Aug. 8, 1994, Ser. No. 287,138
Int. Cl.[6] A01F 12/52
U.S. Cl. 460—14 19 Claims

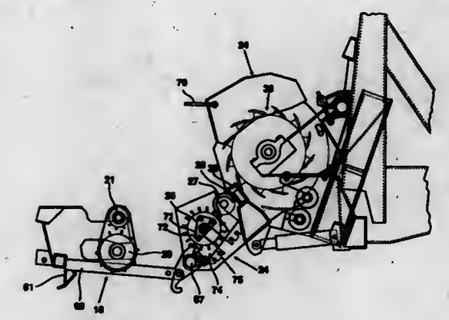
1. In a grain combine having a primary threshing rotor which rotates to thresh grain from crop, a sieve section which separates chaff and tailings from the grain received from the primary threshing rotor, a storage bin, and a clean grain conveyor means for transporting clean grain which passes through the sieve section to the storage bin, the improvement comprising:
a rethreshing rotor for rotating about an axis of rotation which extends substantially parallel to a rearward end of the sieve section, the rethreshing rotor having a length which substantially extends completely across the rearward end of the sieve section and is adjacent to the rearward end of the sieve section for receiving the tailings from the rearward end of the sieve section;
a rethreshing pan substantially extending completely across the rearward end of the sieve section, and having a concave portion against which the rethreshing rotor presses the tailings to rethresh the tailings; and
a discharge section for passing the tailings from the rethreshing pan after rethreshing.





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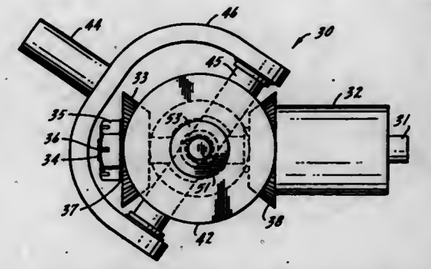
5,498,207
**FRONT UNIT FOR A FORAGE HARVESTER**
Wilfried J. M. Cappon, Zedelgem; Pierre E. Teetaert, Koekelare, both of, Belgium; Adrianus Naaktgeboren, Varsenare, and Cornelis G. M. Muijs, Merelbeke, both of, Netherlands, assignors to New Holland North America, Inc., New Holland, Pa.
Filed Dec. 1, 1994, Ser. No. 348,660
Claims priority, application European Pat. Off., Dec. 4, 1993, 93203409
Int. Cl.[6] A01F 12/10
U.S. Cl. 460—119 21 Claims



1. A forage harvester, comprising
a main frame (1);
a cutterhead frame (34) mounted thereto and enclosing a rotatable cutterhead (36), operable to comminute crop material; and
upper feeder means (20, 21) and lower feeder means (26, 27), operable to convey crop material therebetween towards said cutterhead (36), said lower feeder means (26, 27) being mounted in a lower feeder frame (24), attached to said cutterhead frame (34) and said upper feeder means (20, 21) being mounted in an upper feeder frame (18), attached to said lower feeder frame (24) characterized in that:
said upper feeder frame (18) is movable between an operative position in which said upper feeder means (20, 21) lie immediately above said lower feeder means (26, 27) and a service position in which said upper feeder means (22, 21) lie remote from the foremost portion (26) of said lower feeder means (26, 27).

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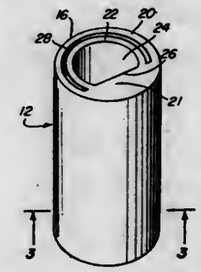
5,498,208
**SPEED REDUCING UNIVERSAL JOINT USING PLANETARY GEARS**
Eric E. Braun, Neenah, Wis., assignor to Oshkosh Truck Corporation, Wis.
Filed Nov. 12, 1993, Ser. No. 151,221
Int. Cl.[6] F16D 3/16
U.S. Cl. 464—109 17 Claims



1. A universal joint for rotatably transmitting power from an input shaft to an output shaft, the input and output shaft being pivotal with respect to one another, the universal joint comprising:
a drive gear mounted on a distal end of the input shaft,
a fixed gear mounted on a distal end of a housing,
the input shaft passing through the housing and through the fixed gear,
the fixed gear being disposed along the input shaft in a spaced relationship with the drive gear,
a planetary gear axle passing through two opposing planetary gears,
means for connecting the planetary gear axle to the output shaft,
the two opposing planetary gears being disposed between and simultaneously meshing with both the fixed and drive gears,
rotation of the input shaft resulting in rotation of the drive gear thereby resulting in rotation of the opposing planetary gears about the fixed gear thereby resulting in rotation of the planetary gear axle and the output shaft.

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5,498,209
**AUTO-ADJUSTING FINGER INSERTS FOR A BOWLING BALL**
Tom Arutunian, 16291 Sundancer La., Huntington Beach, Calif. 92649
Filed May 19, 1995, Ser. No. 444,441
Int. Cl.[6] A63B 43/02
U.S. Cl. 473—128 13 Claims



1. A deformable insert for a bowling ball, sized to fit within a finger hole of the ball and sized to receive a bowler's finger placed within the insert, the insert comprising:
an outer hollow cylinder of a deformable elastomer, an outer surface of the cylinder disposed to contact the bowling ball within the finger hole;
an inner hollow cylinder also of deformable elastomer, the inner cylinder coaxial with the outer cylinder and disposed within the outer cylinder, a central aperture of the inner cylinder sized to receive the bowler's finger;
an air space separating the inner cylinder from the outer cylinder, the air space serving to accept an increase of volume of the inner cylinder when the inner cylinder is deformed by insertion of the bowler's finger; and
a juncture between the inner cylinder and the outer cylinder, the juncture serving to prevent separation of the inner cylinder from the outer cylinder when the bowler's finger is inserted into and pulled from the central aperture.

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**5,498,210**

**Patent Not Issued For This Number**

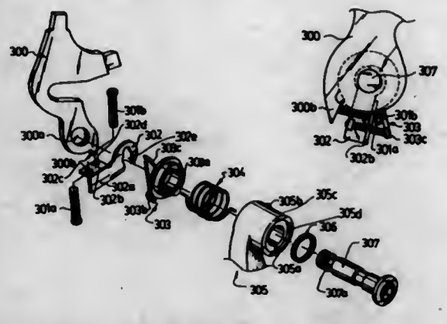
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**5,498,211**

**BICYCLE SPEED CHANGE MECHANISMS**

**Yi-Hsung Hsu, No. 9, Lane 130, Sec. 1, Kuang Fu Rd., Sanchung Taipei Hsien, Taiwan, Prov. of China**

**Filed Nov. 29, 1994, Ser. No. 350,091**
**Int. Cl.[6] F16H *59/04***
**U.S. Cl. 474—80** **4 Claims**



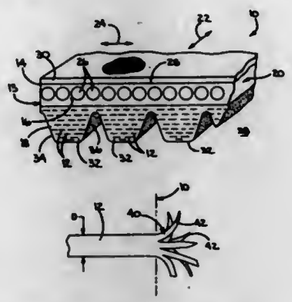
1. A speed change mechanism for a bicycle having a bicycle frame with a tapped hole and a flange adjacent to said tapped hole, comprising: a support body having a hollow tube portion inside of the hollow tube portion being mounted an O-type ring, having a rim in which is formed a first guide hole, a chain guider being fixed to a side of the support body; a stop ring positioned on an end of the hollow tube portion of the support body, a second guide hole formed on a first side of the stop ring, and a V-shaped positioning plate connected on a second side; a torsion spring mounted inside the hollow tube portion of the support body, a first end of the torsion spring being inserted into the first guide hole formed on the O-type ring, and a second end of the torsion spring being inserted in the second guide hole formed on the stop ring; a C-type snap ring having an outwardly extending portion to form a handle, on which a plate is formed, the plate having two tapped holes engaged by two bolts, one bolt bearing against the flange and the other bolt bearing against the plate of the outwardly extending portion; and a support shaft having a threaded part extending through the hollow tube portion of the support body, the torsion spring, the stop ring, and the hollow portion of the C-type snap ring, and engaging the tapped hole located on the bicycle frame.

**5,498,212**

**POWER TRANSMISSION BELT WITH REINFORCING FIBERS**

**Toshimi Kumazaki, Hyogo, Japan, assignor to Mitsuboshi Belting Ltd., Nagata, Japan**

**Filed Oct. 5, 1994, Ser. No. 318,476**
**Claims priority, application Japan, Jan. 6, 1993, 5-276103**
**Int. Cl.[6] F16G *1/08***
**U.S. Cl. 474—263** **22 Claims**



1. A power transmission belt comprising:
a body having a length and laterally oppositely facing pulley engaging surfaces,
said body having at least a portion thereof that is made from rubber,
there being a plurality of aramid fibers embedded in the rubber portion of the body in an amount of 5–20 parts by weight of aramid fiber per 100 parts by weight of rubber,
wherein a plurality of the fibers each have a portion embedded in the rubber portion of the body and a portion projecting from the laterally oppositely facing pulley engaging surfaces on the body,
wherein only the projecting portions of the plurality of fibers are treated to define discrete fibrils.

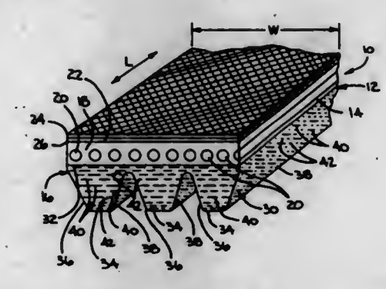
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**5,498,213**

**POWER TRANSMISSION BELT**

**Kyoichi Mishima, Suzuranadaihigashi, Japan, assignor to Mitsuboshi Belting Ltd., Kobe, Japan**

**Filed Dec. 15, 1994, Ser. No. 356,143**
**Int. Cl.[6] F16G *5/08***
**U.S. Cl. 474—263** **22 Claims**



1. A power transmission belt comprising:
a body having a length and laterally spaced side surfaces;
a first plurality of laterally extending discrete fibers embedded in the body and having portions projecting from the side surfaces; and
a second plurality of discrete pulp-like fibers intermixed with the first plurality of laterally extending discrete fibers,



wherein the fibers in the first plurality of laterally extending discrete fibers have at least one of a) a different composition and b) a different texture than the fibers in the second plurality of discrete fibers.

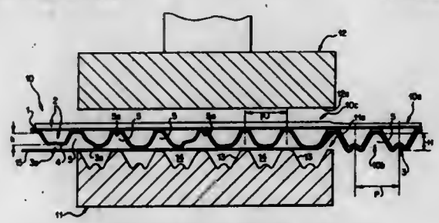
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**5,498,214**

**PROCESS FOR MANUFACTURING TOOTHED BELTS OF ELASTOMERIC MATERIAL AND TOOTHED BELT MADE BY SAID PROCESS**

**Vincenzo Macchiarulo, Pescara; Tommaso Di Giacomo, Guardiagrele; Danilo Di Cesare, Chieti, and Marino Petaccia, Lettomanoppello, all of, Italy, assignors to Pirella Transmissioni Industriali S.p.A., Chieti, Italy**

**Division of Ser. No. 983,171, Nov. 30, 1992, Pat. No. 5,421,927. This application May 11, 1995, Ser. No. 439,569**
**Claims priority, application Italy, Nov. 29, 1991, MI91A03195**
**Int. Cl.[6] F16G *5/08***
**U.S. Cl. 474—268** **6 Claims**



1. A toothed belt of elastomeric material, comprising:
at least a reinforced cord layer of annular configuration;
at least a layer of elastomeric material incorporating said reinforced cord layer and supporting a plurality of spaced apart teeth extending radially inwardly relative to the circumferential extension of the belt;
said reinforced cord layer structured in the form of a continuous strip helically wrapped in several loops, said strips disposed in a side-by-side relation and mating at respective opposite edges;
said toothed belt further comprising at least a covering fabric applied to said elastomeric layer, said covering fabric being structured in the form of a continuous strip having the same width as the belt.

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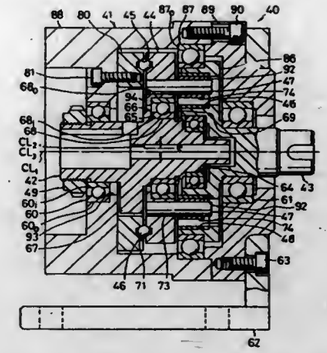
**5,498,215**

**REDUCTION GEAR ASSEMBLY**

**Toshihiro Hosokawa, 16-2 Kamitanabe-cho, Takatsuki-shi, Osaka-fu; Hitoshi Ohara, 557 Bundo-cho, Kamigyo-ku, Kyoto-shi, Kyoto-fu; Takahiro Nishikawa, 2-2-9 Aomadani-nishi, Mino-shi, Osaka-fu, and Eiji Ishimoto, 2-4 Hachijogaoka, Nagaokakyo-shi, Kyoto-fu, all of, Japan**

**Filed Oct. 15, 1993, Ser. No. 138,471**
**Claims priority, application Japan, Jan. 16, 1992, 4-078154 U; May 26, 1993, 5-032509 U**
**Int. Cl.[6] F16H *1/32***
**U.S. Cl. 475—162** **9 Claims**

1. A pin-ball type reduction gear comprising
a casing rotatably supporting an input shaft and an output shaft in a manner wherein said input shaft opposes said output shaft with an interval;
a disk eccentrically and rotatably supported on said input shaft by a first rolling bearing, said input shaft supported on a casing by a second roller bearing;
a wave-shaped epitrochoid curve groove disposed on a side of said casing and a plurality of balls of a number greater than that of the waves of said epitrochoid curve groove disposed between said side of said casing and said disk as to engage each other;



an output disk operatively connected to said output shaft;
a plurality of pins provided between said disk and said output disk so as to be parallel to said input shaft and said output shaft, and pin insertion holes each inserted with said pins, said pins and said pin insertion holes disposed on a circular locus on both said disks around the axis of both said disks;
means defining gaps formed between said pin insertion holes of said output disk and said pins allowing eccentric motion of said output disk relative to said output shaft;
a snap ring engaged with said input shaft outside of said first rolling bearing;
a fastening nut engaged with said input shaft outside said second rolling bearing.

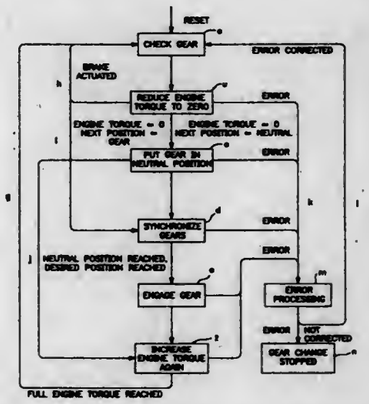
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**5,498,216**

**DRIVE ARRANGEMENT FOR AN ELECTRIC MOTOR VEHICLE AND PROCESS FOR SHIFTING GEARS**

**Otmar Bitsche, and Erwin Schneeberfer, both of Graz, Austria, assignors to Steyr-Daimler-Puch AG, Vienna, Austria**

**Filed Feb. 17, 1994, Ser. No. 197,685**
**Claims priority, application Germany, Feb. 18, 1993, 43 05 054.9**
**Int. Cl.[6] B60K *41/04*; H02P *15/00***
**U.S. Cl. 477—20** **12 Claims**




4. A process for shifting gears in a drive arrangement for an electric motor vehicle, said drive arrangement comprising an electric motor the output of which is controlled by a control rectifier, a gear box having at least first and second gears, first and second couplings associated with said first and second gears, and a mov-

able actuator which causes said first and second couplings to engage said first and second gears, said process comprising

(a) verifying whether an actually engaged gear is a desired gear, wherein said desired gear is calculated automatically from signals indicative of the rotational speed at an output side of said gear box, and the torque produced by said electric motor,

(b) if not, issuing a shift command signal which lowers the torque being produced by said electric motor to zero along a defined lowering torque path,

(c) bringing said actuator into a neutral position,

(d) by means of said control rectifier, changing the output of said electric motor until it is rotating at a target rotational speed,

(e) by means of said actuator and one of said couplings, causing said desired gear to become engaged when said electric motor reaches said target rotational speed, and

(f) increasing the torque produced by said electric motor to a desired torque along a defined increasing torque path.

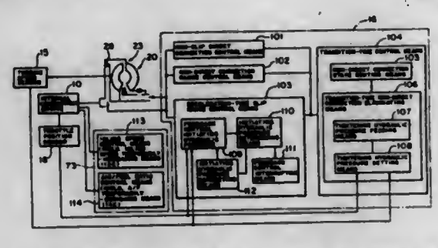
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**5,498,217**

**CONTROL METHOD OF VEHICLE ENGINE ARRANGED IN ASSOCIATION WITH FLUID COUPLING HAVING CLUTCH**

**Ikuo Maruyama, Kameoka; Yoshimasa Nagayoshi, Kyoto; Hisaji Nakamura, Kyoto; Akio Takada, Kyoto; Koichi Kato, Yokohama; Sadamu Oyaide, Okazaki; Tatsuya Shimazaki, and Yoshihiro Kouno, both of Kyoto, all of, Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Sep. 13, 1994, Ser. No. 305,096**
**Claims priority, application Japan, Sep. 17, 1993, 5-232011**
**Int. Cl.[6] B60F *41/02***
**U.S. Cl. 477—169** **7 Claims**



1. A control method of an engine for a vehicle, said engine being arranged in association with a fluid coupling having a clutch, comprising the following steps:

detecting the state of engagement of said clutch;

determining whether or not the vehicle is in a predetermined decelerated operation state; and

increasing an output of said engine when said clutch has been detected to be in a predetermined state of engagement in the clutch engagement state detection step and said vehicle has been determined to be in said predetermined decelerated operation state in said decelerated operation state determination step.

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**5,498,218**

**NECK EXERCISING METHOD**

**Richard I. Proctor, 2175 Danberry, San Rafael, Calif. 94903, and Robert Fuller, 885 Gravenstein Hwy. North, Sebastopol, Calif. 95472**

**Filed Aug. 10, 1994, Ser. No. 288,547**
**Int. Cl.[6] A63B *23/025***
**U.S. Cl. 482—10** **7 Claims**

1. A method used by a human user, for stimulating or increasing the intrinsic range of motion in rotation of the user's neck and relative rotation between adjacent intervertebral joints, comprising:



placing around the back of the neck of the human user, at a selected level of the cervical spine below the base of the skull, a strap with gripping means on each end for gripping by the hands of a user, the length of the strap being such that when placed around the back of the neck the user engages the ends of the strap in two hands with the forearms generally upright, and the strap having a high friction engagement surface in a central portion positioned to engage against the back of the neck,

rotating the neck alternately left and right with the guidance and assistance of the strap by alternately pulling one way and then the other with the hands while applying some pressure by the strap against the back of the neck using the hands, to move the neck through the rotational range of motion of the intervertebral joint and to stimulate the intervertebral joint at the left and right extremes of its range of motion.

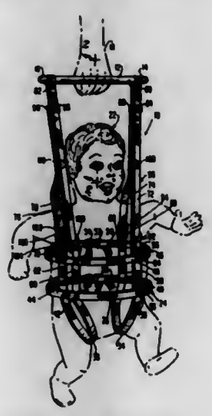
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**5,498,219**

**INFANT WALKING TRAINER**

**Abdouli K. Souli, 30-61 82nd St., East Elmhurst, N.Y. 11370-1916**

**Filed Aug. 18, 1994, Ser. No. 292,570**
**Int. Cl.[6] A63B *22/00***
**U.S. Cl. 482—69** **1 Claim**



1. An infant walking trainer, comprising:

A) an elongated handle having opposite end regions; and

B) body harness means suspended from the handle, for supporting an infant in an upright walking stance when the handle is held overhead the infant, said body harness means including

i) an adjustable and closeable waist strap for encircling the infant's waist,

ii) an adjustable and closeable chest strap for encircling the infant's chest, said chest strap having a front portion and a back portion,

iii) side straps for connecting the chest and waist straps,

iv) leg straps for encircling the infant's thighs, each leg strap having opposite ends permanently attached to the waist strap, and an intermediate looped leg portion for encircling the infant's thighs, both intermediate looped leg portions being spaced apart from and unconnected to each other,

v) two left adjustable suspension straps, one left strap extending from one of the end regions of the handle directly to the front portion of the chest strap, and another left strap extending from said one of the end regions of the handle directly to the back portion of the chest strap,

vi) two right adjustable suspension straps, one right strap extending from the other of the end regions of the handle to the front portion of the chest strap, and another fight strap extending frown said other end region of the handle to the back portion of the chest strap,

vii) means for selectively fastening together the left suspension straps,

viii) means for selectively fastening together the right suspension straps, and

ix) means for selectively removing the handle from the body harness means, including a quick connect-disconnect fastener on each right and left suspension strap for disconnecting all the suspension straps and the handle from the chest strap.



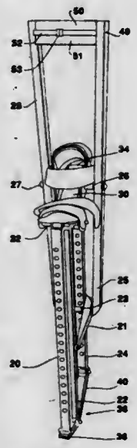
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**5,498,220**

**TOE-ARTICULATED STILT**

**Gary Ensmenger, 7111 Gardner St. #7, Winter Park, Fla. 32792**

**Filed Jun. 15, 1994, Ser. No. 261,908**
**Int. Cl.[6] A63B *25/00***
**U.S. Cl. 482—76** **8 Claims**



1. A toe-articulated stilt comprising:

a toeholder means,

a heelholder means hinged with a first hinge means to said toeholder means such that the combination of said toeholder means and said heelholder means fit the sole of the foot of the wearer when said stilt is worn,

a heelbase means,

a toebase means hinged with a second hinge means to said heelbase means,

a toecolumn, one end of which is hinged with a third hinge means to the forward end of said toeholder means, the other end of which is hinged with a fourth hinge means to the forward end of said toebase means,

a solecolumn, one end of which is hinged with a fifth hinge means to the forward end of said heelholder means, the other end of which is hinged with a sixth hinge means to the forward end of said heelbase means,

a heelcolumn one end of which is hinged with a seventh hinge means to the rear end of said heel base means, the other end of which is hinged with an eighth hinge means attached to the rear end of said heelholder means,

two oppositely disposed bracket means one end of each of which is hinged with a ninth hinge mean to the said heel column intermediate its ends and the other ends each of which is hinged with a tenth hinge means to the said sole column intermediate its ends, said brackets being positioned to be substantially parallel to the heel holder and the heel base,

a vertical upstanding column means extending from said each bracket to above a position substantially above said heel holder means wherein the lower one end of each is hinged with a eleventh hinge means to one of the said brackets, and each of said vertical upstanding columns are also hinged at an intermediate point with a twelfth hinge means to said heel holder,

the vertically upstanding column means extending above said heel holder terminating in calf leg engaging flexible band adapted and constructed to engage the calf of the user of the stilt.

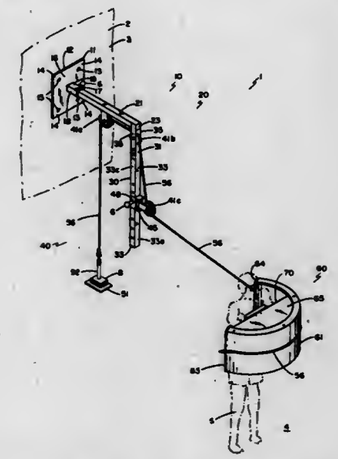
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**5,498,221**

**HIP-TURNING EXERCISE MACHINE**

**Clifford Blair, Jr., 129 Longmeadow Dr., Holbrook, Mass. 02343**

**Filed Oct. 31, 1994, Ser. No. 332,129**
**Int. Cl.[6] A63B *21/06***
**U.S. Cl. 482—99** **8 Claims**



1. An improved hip strengthening exercise apparatus, comprising:

a frame assembly adapted for attachment to a vertical structure;

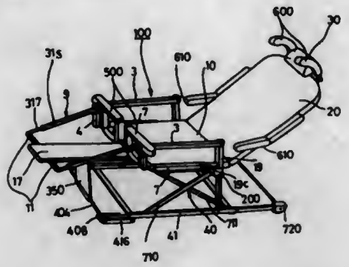
a pulley-controlled variable weight structure including a cable attached to said frame assembly; and

hand-held, hollow yoke assembly engaging said weight structure wherein said yoke assembly has an interior, a horizontally curved vertical front, an open rear, a vertical side defined as the leading edge, a vertical side defined as the lagging edge, a horizontal top and a horizontal bottom, said curved front having a top rim joining the top with the front, and a bottom rim joining the bottom with the front, said top and bottom being solid and having circle segment shapes with each having a straight edge, said top and bottom straight edges beginning at junctions formed by the leading edge side and the top and bottom rims, and extending along a chord line to top rim and bottom rim points a measured circumferential distance from the lagging edge side, said leading edge side having an eye bolt fixedly attached at a vertical midpoint of the edge side; wherein a cable ring engagement hook is attached to said

eye bolt and said cable is positioned about the yoke front, past the lagging edge and to said pulley controlled variable weight structure.

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**5,498,222**
**EXERCISE DEVICE**
**Young B. Hur, 615-34, Jayang-Dong, Seongdong-Ku, Seoul, Rep. of Korea**
**Filed Feb. 19, 1993, Ser. No. 20,323**
**Int. Cl.[6] A63B *21/008***
**U.S. Cl. 482—112** **13 Claims**

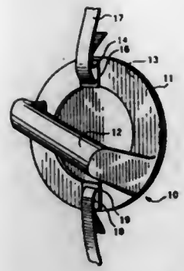



1. In an exercise device for performing an exercise in a desired direction comprising body support means, said body support means being adapted for supporting the body of the user and including a seat plate, a back plate and a leg unit, an improvement comprising:
exercise loading means comprising:
a lever for transmitting an exercise load;
a turning support for causing said lever to turn in the same direction as that of the exercise, said turning support being provided at an end of said lever and rotatably supporting said lever; and
a load generator for generating said exercise load, said load generator being provided at an end part of said lever;
leg support means for supporting the legs of the user, said leg supporting means cooperating with said exercise loading means and having a foothold unit; and
wherein said leg support means comprises:
a connection unit being provided between a front end of said lever and said foothold unit; and
a foothold support unit being provided at a front part of said seat plate of the body support means and being adapted for sliding said foothold unit thereon.

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**5,498,223**
**SHOULDER EXERCISER**
**John F. Iams, Poway, and Robson L. Splane, Jr., Granada Hills, both of Calif., assignors to Superspine, Inc., Poway, Calif.**
**Filed Jun. 11, 1993, Ser. No. 76,551**
**Int. Cl.[6] A63B *21/04;69/22***
**U.S. Cl. 482—129** **6 Claims**

1. A shoulder exerciser comprising:
a handpiece having a flat bottom portion having a pad thereon for sliding on a surface of a door and an upper portion for receiving one or both hands of a user in a position adjacent to said surface of the door;
one or more resilient members attached to said handpiece and adapted to be connected to said door; said handpiece moveable in any direction along said surface of said door by a user to exercise the shoulder against the resistance of the resilient member; and
means on said hand piece for adjusting the resistance of said resilient members.



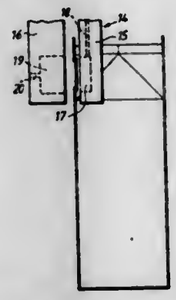

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**5,498,224**
**STARCH BASED HOT MELT ADHESIVES FOR CIGARETTES**
**Thomas F. Kauffman, Easton, Pa.; Joseph Wieczorek, Jr., Flemington, and Stephen F. Hatfield, Somerville, both of N.J., assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.**
**Filed Jul. 20, 1994, Ser. No. 277,829**
**Int. Cl.[6] A24C *5/46***
**U.S. Cl. 493—39** **9 Claims**

1. In a process for manufacturing degradable cigarette filters wherein bloomed tow in the form of a tube and containing triacetin is wrapped in plug wrap paper, adhesive is applied to at least one longitudinal edge of the plug wrap paper, a bond is made while the adhesive is molten and the resultant bond is held in compression for sufficient time to prevent bond movement, the improvement which comprises, using as the adhesive, a water sensitive hot melt adhesive comprising 20 to 60% by weight of an intermediate or high DS starch ester having from about 2 to 18 carbon atoms in the ester component and a DS (degree of substitution) of from about 0.3 to 2.5, 5 to 40% by weight of a polar wax, 5 to 50% by weight of a plasticizing diluent, 0 to 25% by weight of a comptabile tackifier and 0 to 3% by weight of an antioxidant; characterized in that the resulting cigarette filter will open when exposed to water.

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**5,498,225**
**OPENING DEVICE FOR A PACKAGING CONTAINER AND METHOD OF MANUFACTURING THE SAME**
**Ulf Nedstedt, Eslöv, Sweden, assignor to Tetra Laval Holdings & Finance S.A., Pully, Switzerland**
**Filed Mar. 16, 1992, Ser. No. 851,799**
**Claims priority, application Sweden, Mar. 27, 1991, 9100921**
**Int. Cl.[6] B31B *1/84***
**U.S. Cl. 493—87** **21 Claims**



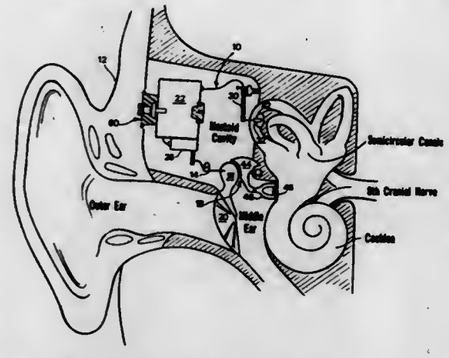

1. Method of manufacturing an opening device for a packaging container, comprising the steps of:
aligning an open end of a prefabricated part of the opening device with a thermoplastic layer of material; and



exposing the thermoplastic material to a pressure difference such that the thermoplastic material is shaped according to an interior area of the prefabricated part of the opening device.

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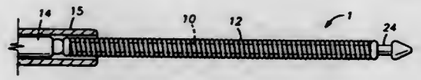
**5,498,226**
**TOTALLY IMPLANTED HEARING DEVICE**
**Edmundas Lenkauskas, 2444 Madison Rd. Ste. 1404, Cincinnati, Ohio 45208**
**Filed Mar. 5, 1990, Ser. No. 488,303**
**Int. Cl.[6] H04R *25/00***
**U.S. Cl. 600—25** **6 Claims**




1. A totally implantable hearing device for bypassing the ossicular chain of the human ear comprising;
means for sensing the vibrations of a tympanic membrane of an ear and establishing a mechanical signal indicative thereof;
electronic means for converting said signal from said sensing means into an electrical signal; and
oscillating means driven by the electrical signal of said electronic means for directly vibrating the parilymph fluid of the inner ear wherein said oscillating means is mountable proximate to a vestibule formed between the posterior and lateral semicircular canals of the inner ear to be in communication with the parilymph fluid thereof and being covered with a cover over the vestibule and wherein said oscillating means includes a vibrator having a piston adapted to be mounted against said cover to vibrate said cover in response to said electrical signal of said electronic means.

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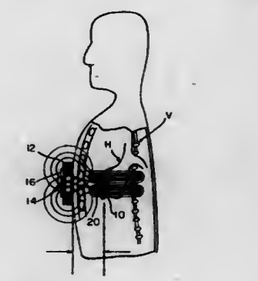
**5,498,227**
**RETRIEVABLE, SHIELDED RADIOTHERAPY IMPLANT**
**Michel E. Mawad, 6434 Auden, Houston, Tex. 77005**
**Filed Sep. 15, 1993, Ser. No. 122,199**
**Int. Cl.[6] A61N *5/00***
**U.S. Cl. 600—3** **13 Claims**




1. A radiotherapy device, comprising:
a wire, of preselected length and diameter, of radioactive material forming an inner core, said wire being adapted for permanent implantation in a selected body tissue site and for delivering a predetermined dosage of radiation to said body tissue site; and
and outer layer disposed about said inner core for attenuating the radiation provided by said inner core and facilitating delivery of said predetermined dosage of radiation;
said outer layer substantially maintaining it axial relationship to said wire during and after implantation.

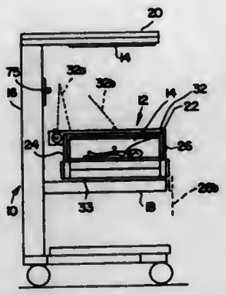
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**5,498,228**
**ELECTROMAGNETIC BI-VENTRICULAR ASSIST DEVICE**
**John W. Royalty, 6151 N. Suncoast Blvd., Suite 1F, Crystal River, Fla. 34428; James M. B. Royalty, Carrollton, Tex., and Lawrence A. Lynn, Worthington, Ohio, assignors to John W. Royalty, Crystal River, Fla.**
**Filed Aug. 8, 1994, Ser. No. 287,254**
**Int. Cl.[6] A61M *1/12***
**U.S. Cl. 600—16** **19 Claims**




1. An electromagnetic cardiac assembly adapted to assist ventricular output in a human heart comprising:
a magnetic mat adapted for mounting inside a human body adjacent the heart, said mat being made from a material responsive to application of an electromagnetic field so as to be movable into compressive relation with the heart in response to application of the electromagnetic field thereto and movable out of said compressive relation to permit the heart to relax when application of said electromagnetic field is discontinued;
electromagnetic assembly means adapted for mounting on the human body in functionally cooperative relation with respect to said mat, and for alternately generating and discontinuing said electromagnetic field so that said mat alternately moves into and out of said compressive relation with the heart;
a transducer for evaluating compressive resistance of the heart during movement of said mat into compressive relation with the heart and for generating an electrical signal as a function of said compressive resistance of the heart; and
control circuit means for receiving said signal generated by said transducer and for controlling an intensity level of the electromagnetic field generated by said electromagnetic assembly means as a function of said signal to thereby control a degree to which said mat compresses the heart.

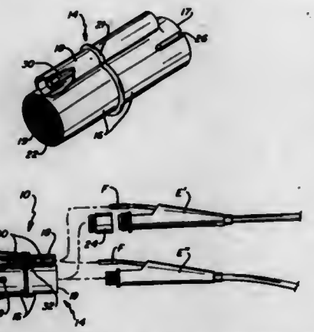
5,498,229
**INFANT RADIANT WARMER**
Barry E. Barsky, Huntingdon Valley, and Joseph J. Lessard, Horsham, both of Pa., assignors to Air-Shields, Inc., Hatboro, Pa.
Filed Sep. 9, 1994, Ser. No. 303,413
Int. Cl.[6] A61G *11/00*
U.S. Cl. 600—22 19 Claims



1. An infant radiant warmer comprising:
a base;
a bassinet assembly supported by said base and including:
(a) a mattress assembly upon which an infant can be placed,
(b) a plurality of vertically disposed optically transparent electrothermal side panels surrounding said mattress assembly, and
(c) an optically transparent draft shield assembly disposed over said mattress assembly and movable between a completely closed position and a completely open position; and
an overhead infrared heater supported by said base and disposed above said bassinet assembly to radiate heat through said optically transparent draft shield assembly to an infant placed on said mattress assembly.

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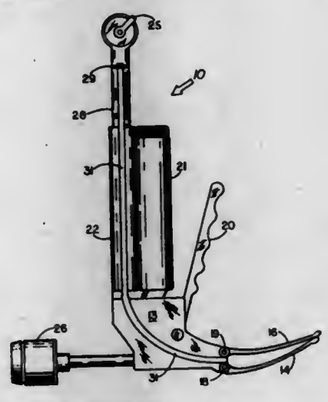
5,498,230
**STERILE CONNECTOR AND VIDEO CAMERA COVER FOR STERILE ENDOSCOPE**
Edwin L. Adair, 317 Paragon Way, Castle Pines Village, Colo. 80104
Filed Oct. 3, 1994, Ser. No. 317,199
Int. Cl.[6] A61B *1/04*
U.S. Cl. 600—112 11 Claims



1. An apparatus for enclosing an unsterile, miniature video camera and its trailing cables and a light fiber cable in a sterile cover and for connecting the camera and the light fiber cable to a sterile endoscope having a separable light guide fitting, said apparatus comprising:
a connector assembly for attachment of the camera to the endoscope and for attachment of the light fiber cable to the light guide fitting, said connector assembly including:
a generally cylindrical coupling having a first end for receiving the camera and a second end for receiving the sterile endoscope;
a transparent window positionable between said first and second ends of said coupling for providing a sterile and optically clear barrier between the camera and endoscope;
means for aligning the camera within said first end of said coupling in a fixed position; and
light fiber connecting means mounted to said coupling, said connecting means having a first end for receiving the light fiber cable, and a second end for receiving the light guide fitting of the sterile endoscope; and
a flexible sterile cover attachable to said connector assembly and extendable over the camera, the trailing camera cables and the light fiber cable.

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5,498,231
**INTUBATING LARYNGOSCOPE**
Klaus Frankcevic, 1531 SE. 12th St., Deerfield Beach, Fla. 33441
Filed Mar. 7, 1994, Ser. No. 206,404
Int. Cl.[6] A61B *1/267*
U.S. Cl. 600—190 8 Claims



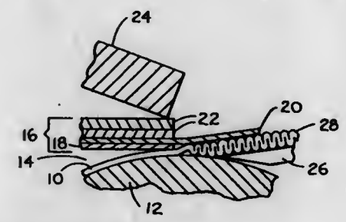
1. A laryngoscope, comprising,
an elongate body consisting of two hollow tubes, having a proximal and a distal end,
two blades pivotally mounted to the distal end of said elongate body, in an angle of 90° degrees, in opposing relationship to each other,
means for pivotally moving said two blades in opposing direction from each other,
an elongate, flexible and steerable, tube introducing means disposed within the elongate hollow body and between the opposed blades,
an endotracheal tube longitudinally disposed within said elongate hollow body and riding on said elongate, flexible and steerable tube introducing means,
means for extending the tube introducing means from said elongate hollow body into the larynx and trachea, and
means for introducing said endotracheal tube from said elongate hollow body into the trachea.

8. A method of inserting said endotracheal tube, comprising the steps of,
introducing a pair of opposed, juxtapositioned blades into the pharingeal region through a patient's partially opened mouth,
increasing the spacing between said two blades only after said two blades are correctly positioned in the pharyngeal region,
illuminating the patient's pharyngeal and laryngeal region,
viewing the illuminated laryngeal region through said objective means,
advancing said elongate, flexible and steerable tube introducing means forwardly relative to the opened blades so that the same enters the larynx,
holding said endotracheal tube when the same is correctly positioned,
returning said blades to their initial position,
withdrawing said blades and said tube introducing means,
releasing said endotracheal tube in desired position.



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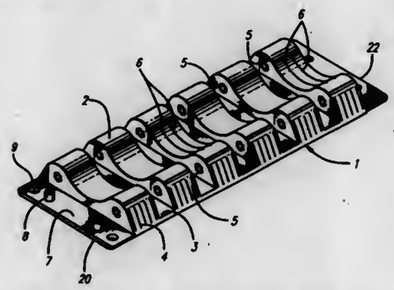
5,498,232
**MICROCREPING OF FABRICS FOR ORTHOPEDIC CASTING TAPES**
Matthew T. Scholz, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Division of Ser. No. 8,751, Jan. 25, 1993. This application Sep. 1, 1994, Ser. No. 299,551
Int. Cl.[6] A61F *13/00*
U.S. Cl. 602—8 19 Claims



1. An article, comprising:
a microcreped fibrous fabric sheet; and
a curable liquid resin coated onto said fabric sheet, wherein said article further comprises a microfiber filler associated with said resin, wherein said microfiber filler has an aspect ratio between about 5:1 and 200:1.

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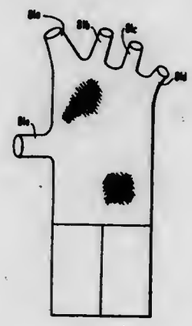
5,498,233
**DEVICE FOR THERAPEUTIC TREATMENT OF SPINE SYSTEM**
Branislav Stojanović, D. Stojanovića 6, 21000 Novi Sad, Yugoslavia
Continuation of Ser. No. 855,772, Mar. 23, 1992, abandoned. This application Oct. 12, 1994, Ser. No. 322,060
Claims priority, application Yugoslavia, Mar. 22, 1991, 505/91
Int. Cl.[6] A61F *5/02*
U.S. Cl. 602—19 7 Claims



1. A therapeutic device for being positioned about a user's spine comprising:
a plurality of linkable segments wherein each segment comprises:
a linking means for optionally linking together segments with each other;
a discrete mounting structure elongated in a longitudinal direction wherein said linking means is located on at least one end of the mounting structure in the longitudinal direction; and
a plurality of elements protruding from and fixedly attached to the mounting structure wherein each of the elements has a top face opposite the mounting surface, said top face has an undulating shape with a plurality of peaks, each peak having a summit and downwardly aloping sides, and wherein the elements are longitudinally spaced apart from each other on the mounting structure.

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5,498,234
**HAND AND ARM SUPPORT**
Stephen J. Martel; Scott A. Clark, both of Cornwall, and Susan Hannan, Cornwall-on-Hudson, all of N.Y., assignors to American Orthopedic Appliance Group, Inc., Cornwall, N.Y.
Continuation-in-part of Ser. No. 131,027, Oct. 4, 1993, Pat. No. 5,370,606, which is a continuation of Ser. No. 928,134, Aug. 11, 1992, abandoned, which is a continuation of Ser. No. 708,355, May 31, 1991, abandoned. This application Sep. 16, 1994, Ser. No. 307,255
Int. Cl.[6] A61F *5/00*
U.S. Cl. 602—64 18 Claims

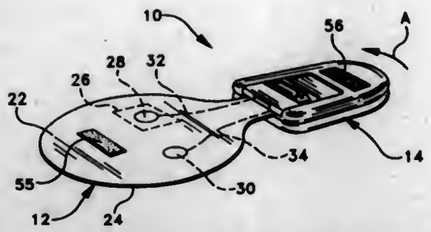


1. A hand and arm support for prevention and treatment of cramping, fatigue and ailments such as tendinitis, arthritis and Carpal Tunnel Syndrome, consisting essentially of:
a glove body of a material having uniform thickness throughout the glove body and forming a fingerless glove, the glove body having a front edge and a rear edge, the front edge including a plurality of finger holes spaced along the front edge, the rear edge defining an opening for a hand, the glove body made solely from a thin lightweight elastic spandex and nylon material and sized to provide a snug fit around a wearer's hand, the hand and arm support defining a cylindrical forearm extension attached to the rear edge for supplying support to at least a portion of the wearer's forearm.

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5,498,235
**IONTOPHORESIS ASSEMBLY INCLUDING PATCH/CONTROLLER ATTACHMENT**
Ronald J. Flower, Vernon, N.J., assignor to Becton Dickinson and Company, Franklin Lakes, N.J.
Filed Sep. 30, 1994, Ser. No. 315,378
Int. Cl.[6] A61N *1/30*
U.S. Cl. 604—20 11 Claims

1. In combination:




a medicament-containing disposable patch removably positionable on the skin of a patient for permitting iontophoretic delivery of medicament transcutaneously; and

a controller including electronic components for electrically controlling said medicament delivery;

the patch including a flexible planar patch body having a medicament-containing first surface, an opposed second surface and an extending planar tab for insertable electrical accommodation in said controller, said first surface of said planar patch body being supportable on the skin of said patient;

said opposed second surface of said patch body and said controller including co-operative removable fastening means for removably fastening said controller to said patch and for maintaining said controller in a fastened condition with respect to said patch with said tab electrically accommodated in said controller.

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**5,498,236**

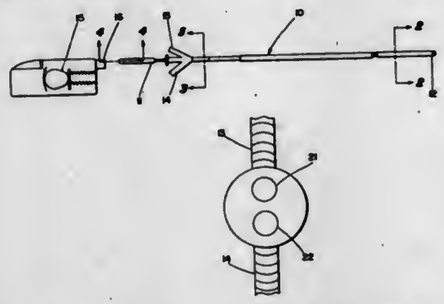
**VIBRATING CATHETER**

**Will R. Dubrul, P.O. Box 246, Redwood City, Calif. 94064, and Michael A. Evans, 637 Webster St., Palo Alto, Calif. 94301**

**Continuation of Ser. No. 65,470, May 19, 1993, Pat. No. 5,380,273, which is a continuation of Ser. No. 885,665, May 19, 1992, abandoned. This application Oct. 7, 1994, Ser. No. 320,184**

**Int. Cl.[6] A61B** *17/32*

**U.S. Cl. 604—22** **4 Claims**



1. An apparatus for the removal of an obstruction in tubular tissue of a patient comprising an elongate tubular catheter having a proximal end and a distal end and a body portion therebetween, said body portion having at least two lumens and an outer tissue-contacting surface substantially coextensive therewith, said outer tissue-contacting surface being dimensioned to fit within said tubular tissue and said tissue-contacting surface having at least one lysing agent dispensing opening therein, the proximal end of the catheter being bifurcated to form first and second projections, the first projection being in material vibratory communication with said tissue-contacting surface and adapted to receive and matingly engage a vibrating element; the second projection providing a lysing agent injection port which is in fluid communication with at least one lysing agent dispensing opening; and wherein said vibrating element produces translational and/or rotational mechanical vibrations between 1–1000 Hz.

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**5,498,237**

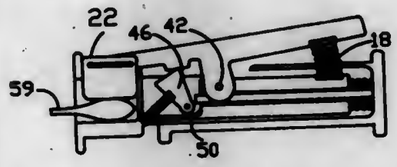
**SQUEEZE-ACTUATED MEDICINAL FLUID APPLICATOR**

**Richard D. Keller, 6416 -Fourth Ave., Takoma Park, Md. 20912**

**Filed Jan. 31, 1995, Ser. No. 381,565**

**Int. Cl.[6] A61M** *5/178*

**U.S. Cl. 604—438** **10 Claims**




1. A squeeze-activated, medicinal fluid applicator adapted to receive a compressible ampule and so selectively inject its contents into an adjacent orifice located in a firm body comprising:

a) an elongate member having an essentially uniform diameter and barrel-like configuration with a first and distal longitudinal end having an integral bottom wall and the other proximal longitudinal end being open;

b) a first aperture located nearer the proximal open end sidewalls;

c) an elongate cylindrical member sized to axially and slidingly engage said barrel-like member through said proximal open end;

d) a first chamber located adjacent the proximal surface of said cylindrical member having one access port located in the proximal longitudinal end thereof and having its second connecting access port located in the sidewall periphery thereof;

e) a second separate chamber located intermediate the longitudinal ends of said cylindrical member and having a second access port located in the sidewall periphery thereof and coincidentally aligned with said first chamber;

f) a cantilever member of a length substantially equivalent to that of said two elongate members when assembled, and the assembled barrel member and cylindrical member;

g) a depending piston means operatively connected to the proximal longitudinal segment of said cantilever member and aligned and sized to travel within the second access port into said first chamber of said cylindrical member;

h) a depending integral lug located intermediate of the pivot axis of the cantilever member and of the proximal lever connection point for said piston means;

i) a first biasing means interposed between the distal ends of the opposing cylindrical member and cantilever member adapted to exert an upward force upon the distal cantilever longitudinal end;

j) a first recess on the distal end of said cantilever member adapted to receive one free end of the lever arm biasing means;

k) an elongate rod located in an axial passage provided in said cylindrical member serving as a push rod and length-sized to extend between the bottom wall of the barrel member and an aperture connecting with the intermediate second chamber of the cylindrical member;

l) a second biasing means located in the distal open space within said barrel member, serving to a maintain separation bias between the barrel member bottom wall and the distal annular-shaped end of the enclosed cylindrical member;

m) a lever means pivotally secured within the intermediate second chamber of said cylindrical member and adapted to provide an arrest function to the proximal section of said cantilever member so long as it is in contact with the integral lug element thereof; and



n) a third biasing means also disposed in said intermediate chamber and positioned to maintain said lever means in its upward lever arrest mode until an opposing bias imposed upon said lever means from said push rod means, exceeds the inherent lever support bias of said third biasing means and is sufficient to dislodge said second lever means from its arrest position.

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**5,498,238**

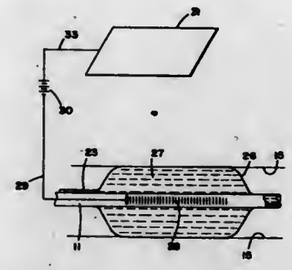
**SIMULTANEOUS ANGIOPLASTY AND PHORETIC DRUG DELIVERY**

**James E. Shapland; Mark B. Knudson, both of Shoreview; Jin Shimada, Falcon Heights, and Joel R. Racchini, Edina, all of Minn., assignors to CorTrak Medical, Inc., Minneapolis, Minn.**

**Continuation of Ser. No. 937,464, Aug. 28, 1992, Pat. No. 5,286,254, which is a continuation-in-part of Ser. No. 705,731, May 24, 1991, abandoned, which is a continuation-in-part of Ser. No. 637,299, Jan. 3, 1991, abandoned, which is a continuation-in-part of Ser. No. 538,961, Jun. 15, 1990, abandoned. This application Aug. 27, 1993, Ser. No. 113,273**

**Int. Cl.[6] A61N** *1/30*

**U.S. Cl. 604—53** **16 Claims**




1. A method for simultaneously performing percutaneous translumenal coronary angioplasty and delivering a drug to a localized area of a passageway with a catheter having a proximal end, a distal end, and a balloon operably connected to the distal end, wherein the balloon has a single chamber and a plurality of pores having a diameter of about 1 μor less, the method comprising the steps of:

a) advancing the catheter through the passageway until the balloon is adjacent to the localized area;

b) injecting a fluid through an injection lumen in the catheter and into the single chamber of the balloon causing the balloon to inflate to a pressure of about 2 atmospheres or more and apply a pressure against the localized area of the passageway thereby dilating the localized area of the passageway; and

c) phoretically transporting the drug to the localized area while simultaneously dilating the localized area of the passageway.

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**5,498,239**

**CATHETER PLACEMENT BY PRESSURIZABLE TUBULAR GUIDING CORE**

**Zev Galel, Los Altos Hills, and Yi Yang, San Francisco, both of Calif., assignors to Guided Medical Systems, Inc., Mountain View, Calif.**

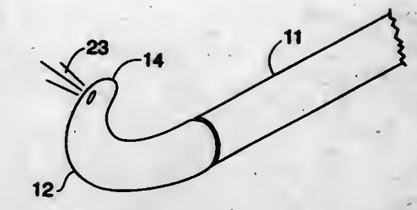
**Filed Apr. 17, 1995, Ser. No. 423,615**

**Int. Cl.[6] A61M** *37/00*

**U.S. Cl. 604—95** **13 Claims**

1. A combination catheter body and guiding member, said combination comprising:

a catheter body with distal and proximal ends and a catheter body lumen open at both said distal and proximal ends;




a tubular member having distal and proximal ends and a longitudinal axis and sized to be received in said catheter body lumen, said tubular member having at least one tubular member lumen and a distal segment formed of elastic material inflatable from a relaxed condition in which said tubular member fits loosely in said catheter body lumen to an inflated condition in which said tubular member seizes said catheter body, said tubular member being closed at said distal end and having at least one port within approximately 1 cm of said distal end, said at least one port shaped and arranged to eject a stream of fluid in a direction transverse to said longitudinal axis upon pressurization of said tubular member.

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**5,498,240**

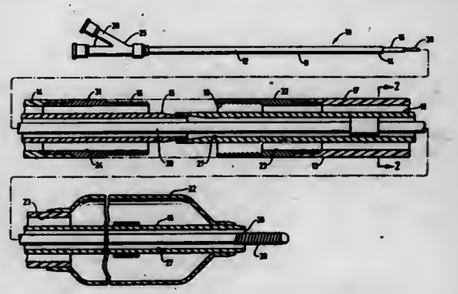
**INTRAVASCULAR CATHETER WITH A REPLACEABLE SHAFT SECTION**

**Celso S. J. Bagaoisan, Union City, Calif.; John P. Shanahan, Cobham Surrey, England; Ketan P. Muni, San Jose, Calif.; Elizabeth N. Hammack, Los Altos Hills, Calif.; Robert M. Abrams, Carlsbad, Calif.; James C. Peacock, III, Saratoga, Calif., and William S. Tremulis, Redwood City, Calif., assignors to Advanced Cardiovascular Systems, Inc., Santa Clara, Calif.**

**Filed May 27, 1994, Ser. No. 250,785**

**Int. Cl.[6] A61M** *29/00;25/00*

**U.S. Cl. 604—96** **23 Claims**



1. An intravascular catheter with an exchangeable shaft section, comprising:

a) an elongated tubular proximal shaft section having proximal and distal ends and a first inner lumen extending therein;

b) an elongated distal shaft section having proximal and distal ends, a port in the distal end of the distal shaft section, a second inner lumen extending therein in fluid communication with the first inner lumen in the proximal shaft section and a third inner lumen which is configured to slidably receive a guidewire and which extends therein to the port in the distal end of the distal shaft section; and

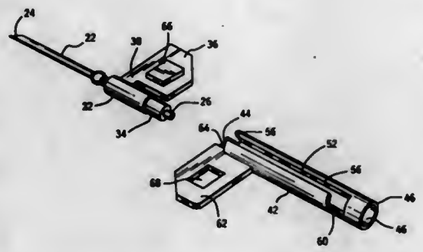
c) means to releasably interconnect the distal end of the proximal shaft section and the proximal end of the distal shaft section to effect fluid communication between the first and second inner lumens.

**5,498,241**

## WINGED NEEDLE ASSEMBLY WITH PROTECTIVE MEMBER

**Richard C. Fabozzi, Sligo, Ireland, assignor to Abbott Laboratories, Abbott Park, Ill.**

**Filed Dec. 8, 1994, Ser. No. 351,844**
**Int. Cl.[6] A61M 5/32**
**U.S. Cl. 604—177** **12 Claims**



1. An intravenous needle assembly, comprising:
a hollow needle having a front portion with a sharp end and a rear portion;
a cylindrical hub for securing the rear portion of the needle so that the front portion of the needle projects axially forward from the hub;
a first wing radially attached to the hub and extending longitudinally parallel to the needle;
a hollow, longitudinally extending tubular member having a front end, a rear end, and an axial bore for axial movement of the cylindrical hub within the bore;
a longitudinal slot in the hollow tubular member extending from the front end to a lock-out position, the first wing engagable in the slot for longitudinal movement of the first wing in the slot to control the axially movement of the hub within the bore of the hollow tubular member; and
a second wing extending longitudinally outward from the front end of the hollow tubular member, the second wing being radially perpendicular to the longitudinal slot.

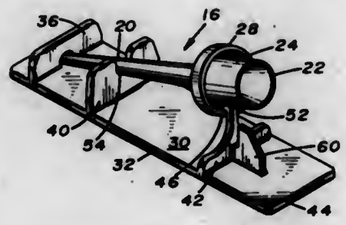
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**5,498,242**

## MEDICAL NEEDLE SHEATH AND STAND FOR ONE-HANDED USE

**Thomas H. Cooke, 651 Strander Blvd. No. 100, Seattle, Wash. 98188**

**Filed Apr. 24, 1995, Ser. No. 427,670**
**Int. Cl.[6] A61M 5/32**
**U.S. Cl. 604—192** **8 Claims**



1. In a combination comprising:
(1) a medical needle of a type to be disposed after a single use;
(2) an elongate sheath for said needle in which the needle is retained before and after use, said sheath having a distal end and an open, proximal end through which the needle is removable for use and insertable after use, said needle also having a hub portion extending slightly beyond the extent of the sheath when the needle is seated in the sheath so as to be readily graspable by the user for withdrawal of the needle from the sheath and reinsertion of the needle into the sheath; and
(3) a sheath receiving stand attachable at a fixed location at a user's work station and in which the sheath is installable and removable in the course of use of the needle by the user;
the improvement wherein said stand comprises a generally flat base, an aperture on said base near the distal end thereof into which the distal end of said sheath can snugly seat; and an upright member on said base near the proximal end thereof with a distally facing hook means located in the upper central portion of said upright panel, said sheath near the proximal end thereof comprising a generally circularly arranged collar including a proximately facing lip engageable with the said hook means when the proximate end of said sheath is in engagement with and supported by said upright member with the sheath distal end in engagement with said aperture, said hook means in engagement with said collar and said aperture in engagement with said sheath distal end cooperatively acting to positively retain the said sheath in fixed position on said stand.

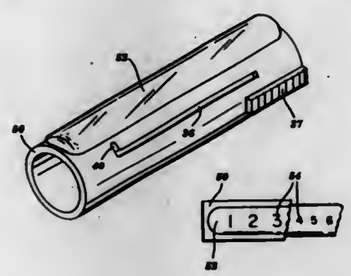
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**5,498,243**

## APPARATUS FOR SHIELDING A SYRINGE NEEDLE

**Anthony J. Vallelunga, Albany, and Brian Crawford, Valatie, both of N.Y., assignors to Unique Management Enterprises, Inc., Albany, N.Y.**

**Filed Jan. 31, 1995, Ser. No. 381,193**
**Int. Cl.[6] A61M 5/32**
**U.S. Cl. 604—197** **1 Claim**



1. A magnifying syringe assembly comprising:
a syringe including a needle and a housing having dosage indicia thereon, said needle extending from an end of said housing;
a shielding apparatus for preventing multiple uses of said syringe, said shielding apparatus including a magnifying arrangement for magnifying the dosage indicia on said syringe housing, said magnifying arrangement extending longitudinally along substantially an entire length of said shielding apparatus and having a convex shape for enlarging said dosage indicia when said magnifying arrangement is positioned thereover, said magnifying arrangement and said shielding apparatus being molded as a single unit from a clear material; and,
means for movably positioning said shielding apparatus about said syringe housing, said shielding apparatus being movable between a retracted position in which said magnifying arrangement is disposed over said dosage indicia and said syringe needle is exposed for use, and an extended position surrounding and shielding said syringe needle to prevent multiple uses of said syringe needle, said magnifying arrangement enlarging said dosage indicia when said shielding apparatus is in said retracted position.

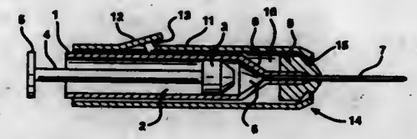


**5,498,244**

## SAFETY GUARD FOR MEDICAL INSTRUMENTS

**Steven R. Eck, Broomall, Pa., assignor to American Home Products Corporation, Madison, N.J.**

**Continuation-in-part of Ser. No. 125,069, Sep. 22, 1993, abandoned. This application Sep. 24, 1993, Ser. No. 125,900**
**Int. Cl.[6] A61M 5/00**
**U.S. Cl. 604—198** **18 Claims**



1. A sanitary guard for a medical device subject to contamination, the medical device having a recess in its external surface, the guard comprising:
(a) an elongate, hollow guard body having an internal chamber, an internal surface, an external surface, a first opening, and a second opening, the first and second openings being located at opposite ends of the guard body, the first opening being sufficient to allow at least a portion of the medical device to enter into the internal chamber and the second opening being sufficient to allow a portion of the medical device to extend from the internal chamber through the second opening;
(b) a passage extending through the guard body between the internal and external surfaces;
(c) a biasing arm connected by hinging means to the guard body;
(d) an intrusion tab secured to the biasing arm such that the biasing arm projects the intrusion tab through the passage into the internal chamber of the guard body;
(e) locking means secured to the guard body such that the locking means are antagonistically disposed to the biasing arm, the biasing arm being movable between a first position in which contact between the intrusion tab and a medical device disposed within the internal chamber forces the biasing arm in an arcing direction away from the guard body, a second position in which the biasing arm is releasably located in close proximity to the locking means, and a third position in which the biasing arm is irreversibly secured by the locking means.

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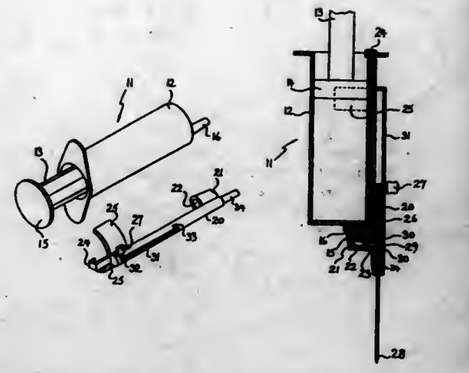
**5,498,245**

## ATTACHMENT FOR A PARENTERAL DEVICE

**Maxwell E. Whisson, Nedlands, Australia, assignor to Eastland Technology Australia PTY LTD, Mount Lawley, Australia**

**PCT No. PCT/AU92/00622, § 371 Date May 19, 1994, § 102(e) Date May 19, 1994, PCT Pub. No. WO93/09824, PCT Pub. Date May 27, 1993**
**PCT Filed Nov. 20, 1992, Ser. No. 244,119**
**Claims priority, application Australia, Nov. 20, 1991, PK9593**
**Int. Cl.[6] A61M 5/32**
**U.S. Cl. 604—198** **21 Claims**

1. An attachment to a parenteral device where the parenteral device comprises a body having a duct which is to convey a parenteral fluid, said duct having an opening at an outer end; said attachment comprising a housing adapted to be removably engagable with the body and when in engagement with the body to be rigidly supported thereby; a passageway provided within the housing; a needle body comprising a hollow needle having a free end; said needle body being movable between a first position at which the free end is received within the housing and a second position at which the free end extends from the housing; said needle body being movable from the second position to the first position; a retaining means provided to retain the needle body in the first or second position; said needle having a first aperture provided at or adjacent the free end, and a second aperture provided in the needle body spaced form the free end, said housing having a flow path extending between a second opening formed in the housing having a flow path extending between a second opening formed in the housing and the passage way; said second aperture adapted to be in communication with the flow path when the needle body is in the second position; said second opening being adapted to be sealingly engaged with the first opening on the body of the parenteral device when the housing is supported by the body.



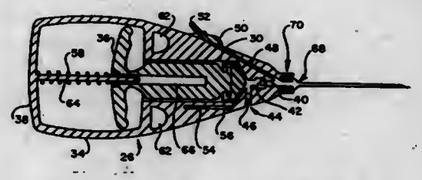
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**5,498,246**

## ASPIRATOR/INJECTOR DEVICE WITH PALM ENGAGING HANDLE

**Mark E. Deutchman, 1609 Oak Hill Rd., Memphis, Tenn. 38138, and Arnold H. Deutchman, 2200 Lane Rd., Columbus, Ohio 43220**

**Division of Ser. No. 94,703, Jul. 22, 1993, Pat. No. 5,395,379. This application Jan. 30, 1995, Ser. No. 380,281**
**Int. Cl.[6] A61M 5/315**
**U.S. Cl. 604—227** **20 Claims**



1. A manually operable medical device comprising,
means forming a cylinder with an axis,
a medical tool attached to said cylinder means, said medical tool comprises a hollow needle for the passage of fluid through said needle,
means forming a duct leading from said medical tool to one end of said cylinder means to provide fluid communication between said tool and said one end of said cylinder means by way of said duct means,
a piston having an axis being mounted to reciprocate coaxially in said cylinder means and configured to reciprocate in said cylinder means in response to manually applied force to an end of said piston most remote from said one end of said cylinder means, said piston including a handle at said remote end, said handle extending transverse to said axes,
a rigid closed loop connected to said cylinder means and circumscribing said handle, said loop including a surface for palm contact by an operator of said device upon said operator moving said piston to draw a vacuum in said cylinder means by engagement of said handle by the fingers of said operator, and

guide means secured to said loop for guiding the piston in its reciprocating movement.

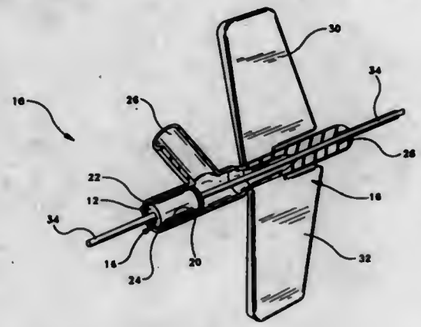
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5,498,247

## ELASTIC PLUG ASSEMBLY FOR MEDICAL DEVICE

Greg L. Brimhall, West Jordan, Utah, assignor to Becton Dickinson and Company, Franklin Lakes

Filed Dec. 27, 1994, Ser. No. 364,636
Int. Cl.[6] A61M 5/00
U.S. Cl. 604—244 3 Claims



1. A medical device, comprising:
an inlet formed from an elastic material;
a rigid plug retainer disposed in the inlet, the rigid plug retainer being radially compressed and surrounded by the elastic material of the inlet to prevent longitudinal movement of the rigid plug retainer; and
a compressible elastic plug disposed in the rigid plug retainer, the compressible elastic plug being radially compressed and surrounded by the rigid plug retainer to ensure that any hole in the compressible elastic plug caused by a needle being inserted therein is substantially closed after the needle is withdrawn.

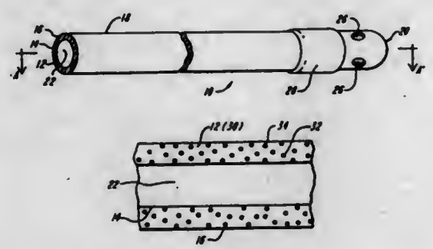
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5,498,248

## IONTOPHORETIC STRUCTURE FOR MEDICAL DEVICES

Fredric L. Milder, Brookline, Mass., assignor to Implemed, Inc., Brookline, Mass.

Division of Ser. No. 975,597, Nov. 12, 1992, Pat. No. 5,322,520. This application Mar. 14, 1994, Ser. No. 212,157
Int. Cl.[6] A61M 5/32;25/00
U.S. Cl. 604—265 15 Claims



1. An iontophoretic structure comprising:
a first material having a first galvanic electrical potential;
a second material having a second galvanic electrical potential and a conductive polymer separating said first material from said second material, said conductive polymer having a predetermined resistivity and controlling a current flow produced between said first material and said second material when said iontophoretic structure is in contact with an electrolytic fluid.

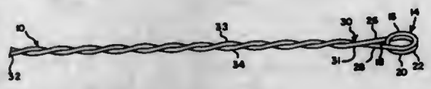
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5,498,249

## CATHETER STYLET

Kathryn A. Quinn, Grayslake, Ill., assignor to Radius International, Inc., Grayslake, Ill.

Filed Mar. 24, 1994, Ser. No. 217,447
Int. Cl.[6] A61M 25/00
U.S. Cl. 604—280 15 Claims



1. A catheter tube assembly, comprising:
a) a catheter tube having a passage therein and a stylet disposed in said passage;
b) said stylet including an elongate body portion and an insertion end;
c) said insertion end including a loop and a pair of connecting legs separate from said loop and connecting said loop to said body portion;
d) said loop including a terminal portion, opposed top and bottom portions and a proximal portion opposite said terminal portion;
e) said connecting legs extending between said top and bottom portions of said loop and said elongate body portion, and converging toward said body portion;
f) said terminal portion and said top and bottom portions of said loop forming a terminal end on said stylet;
g) said proximal portion of said loop comprising a support portion for said insertion end of said stylet which is effective to prevent deformation of said loop and said connecting legs, said proximal portion being separate from said connecting legs.

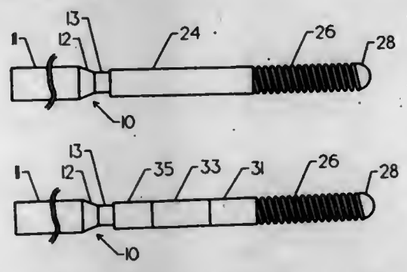
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5,498,250

## CATHETER GUIDE WIRE WITH MULTIPLE RADIOPACITY

Richard R. Prather, Rogers, Minn., assignor to SciMed Life Systems, Inc., Maple Grove, Minn.

Filed May 18, 1994, Ser. No. 245,339
Int. Cl.[6] A61B 5/00
U.S. Cl. 604—280 15 Claims



1. In a guide wire apparatus having a length of flexible wire with proximal and distal ends, a tip at the distal end of the guide wire, a first wire covering adjacent the tip and having a first radiopacity, and further wire coverings including at least a second wire covering placed intermediate the first wire covering and the proximal end of the guide wire, the improvement comprising:



a. the second wire covering including a sleeve, the sleeve including a mixture of a polymer and a radiopaque metal loading the second wire covering having a second radiopacity; and
b. the second radiopacity being unequal to the first radiopacity.

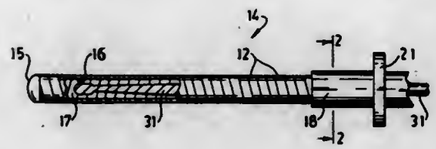
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5,498,251

## TISSUE PERFUSION CATHETER

Michael J. Dalton, 7350 N. Ridgeway, Skokie, Ill. 60076

Filed Nov. 29, 1994, Ser. No. 350,095
Int. Cl.[6] A61M 25/00
U.S. Cl. 604—282 20 Claims



1. A tissue perfusion catheter comprising
(a) an elongated, flexible, tightly wound, normally compressed helical coil spring having a proximal end to receive therapeutic fluid from a source and a distal portion terminating in a sealed distal tip, said helical coil spring defining a fluid-pervious side wall encircling an interior, fluid-conducting lumen; and
(b) an inert, flexible sleeve, impervious to the therapeutic fluid, exteriorly covering and sealing that part of the side wall from the proximal end to, but not including, the distal portion of said spring;
whereby therapeutic fluid entering the proximal end of the catheter is conducted to the distal portion of said spring, where it oozes from the catheter, perfusing the tissue region.

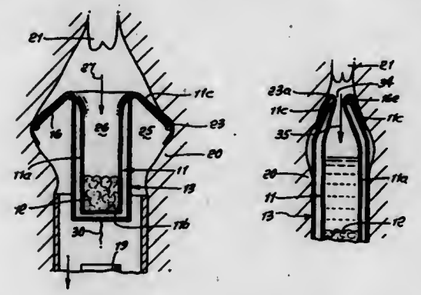
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5,498,252

## TOXICITY RESISTANT, SELF-FITTING AND ADJUSTABLE, SELF-CLOSING TAMPON STRUCTURE

Arthur L. Silber, 543 Dobbins Dr., San Gabriel, Calif. 91775

Continuation-in-part of Ser. No. 228,503, Apr. 15, 1994, Pat. No. 5,476,455, which is a continuation-in-part of Ser. No. 2,642, Jan. 11, 1993, Pat. No. 5,342,331. This application Dec. 27, 1994, Ser. No. 363,920
Int. Cl.[6] A61F 13/24;13/34
U.S. Cl. 604—330 24 Claims



15. A flow-controlling tampon comprising, in combination:
a) a generally upright insertion tube having upper and lower ends, and a plunger within said tube, and manipulable proximate the tube lower end,
b) flow-receiving means positioned within the tube to be bodily displaced and to protrude from said upper end of the tube in response to said manipulation of the plunger,
c) said flow-receiving means, including a thin sheath, and having a deployable upper portion configured to self distend from a collapsed position to a deployed condition to extend into engagement with vaginal walls associated with the cervix, in response to upward bodily displacement of said flow-receiving means effected by the plunger,
d) and removal means associated with said receiving means to effect withdrawal thereof away from the cervix, whereby upper extent of the flow-receiving means self collapses to retain flow in said flow-receiving means during said withdrawal;
e) said flow-receiving means upper portion being in downwardly collapsed condition about the sheath prior to said upward bodily displacement thereof.

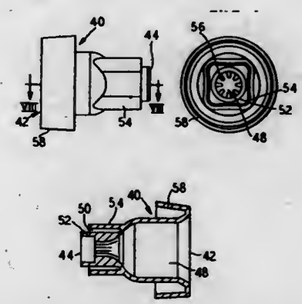
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5,498,253

## PORT ADAPTOR AND PROTECTOR AND CONTAINER HAVING SAME

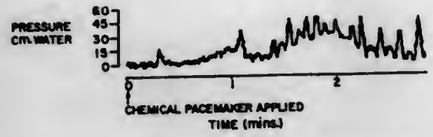
Andrew D. Aswad, Mundelein; Dale Severs, Gurnee; Joyce Silvestri, Antioch, all of Ill.; Hugh M. Forman, Waukesha, Wis.; Lecon Woo, Libertyville, Ill.; Thomas D. Hiller, Vernon Hills, Ill.; Lisa S. Walsh, Wonder Lake, Ill.; Sandra Wade, Highland Park, Ill.; Eddie Chan, Mundelein, Ill.; Patrick Balteau, Namur, Belgium; Franco Peluso, Heverlee, Belgium, and Eric Henaut, Nivelles, Belgium, assignors to Baxter International Inc., Deerfield, Ill.

Filed Nov. 23, 1993, Ser. No. 156,486
Int. Cl.[6] A61B 19/00
U.S. Cl. 604—403 21 Claims



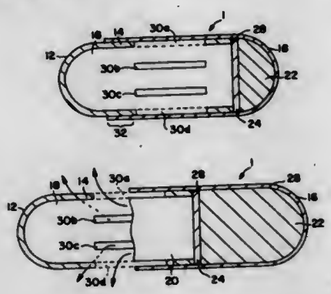
1. An adaptor securable to an end of a tubular member defining a port of a container, the adaptor comprising:
an upper end having an interior diameter defining a first end of a passageway capable of receiving a cannula;
a lower end having an interior diameter defining a second end of the passage, the lower end capable of receiving an injection site wherein the diameter at the first end is larger than the diameter at the second end;
a middle portion intermediate the first end and the second end having a tapering interior diameter, the middle portion directing the cannula to the injection site and further having an exterior surface with gripping surfaces wherein the tapering interior diameter of the middle portion includes spaced guiding members extending inwardly from an inner periphery of the tapering interior diameters of the middle portion in a substantially perpendicular direction from the inner periphery of the tapering interior diameter.

5,498,254
SMOOTH MUSCLE CHEMICAL PACEMAKER
Michael Hoey, Shoreview, and Peter Gehlbach, Minneapolis, both of Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.
Division of Ser. No. 967,748, Dec. 9, 1992, Pat. No. 5,383,873.
This application Jan. 13, 1995, Ser. No. 372,587
Int. Cl.[6] A61K 9/22
U.S. Cl. 604—891.1 19 Claims



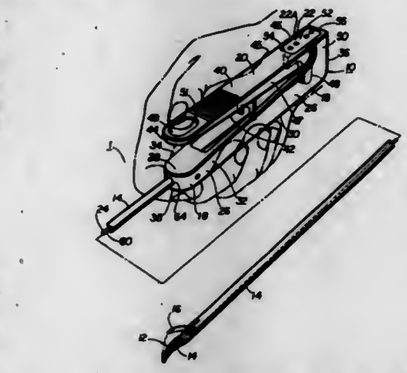

1. An article of manufacture comprising packaging material and a treatment element within said packaging material, wherein said treatment element comprises a means for controlled, localized delivery of at least one neuroactive substance having a therapeutic effect on a disorder associated with smooth muscle function in an organ peripheral to the central nervous system in combination with said at least one neuroactive substance, and wherein said packaging material comprises instructions that indicate that said treatment element can be used for treating a disorder associated with smooth muscle function in an organ by attaching said treatment element to a selected portion of said organ in a manner to accomplish said therapeutic effect.

5,498,255
OSMOTIC DEVICE FOR PROTRACTED PULSATILE DELIVERY OF AGENT
Patrick S.-L. Wong, Palo Alto, Calif., assignor to ALZA Corporation, Palo Alto, Calif.
Continuation of Ser. No. 108,094, Aug. 17, 1993, abandoned.
This application May 15, 1995, Ser. No. 442,716
Int. Cl.[6] A61K 9/22
U.S. Cl. 604—892.1 10 Claims




1. A fluid-imbibing delivery device for dispensing an active agent to a fluid environment of use for an extended period of time following an initial delayed startup of delivery, wherein the device comprises:
a) a housing comprising a first wall section and a second wall section in reversibly sliding telescopic arrangement with each other, the first wall section having an open end adapted to fit within the second wall section and the second wall section comprising in at least a portion a semipermeable composition, which housing maintains its integrity in the environment of use;
b) an internal compartment surrounded and defined by the first and second wall sections of the housing;
c) at least one active agent formulation comprising a drug in a portion of the compartment defined by the first wall section;
d) at least one opening in the side wall of the first wall section, each opening extending longitudinally along a portion of the side wall of the first wall section and beinq covered by said second wall section prior to exposure to the environment of use, for releasing the active agent formulation comprising the drug followinfi separation of the first and second wall sections upon exposure to the environment of use; and
e) expansion means comprising an osmopolymer in a portion of the compartment defined by the second wall section, for separating apart the first and second wall sections of the housing after exposure to the environment of use.

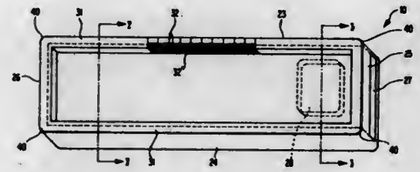
5,498,256
SURGICAL INSTRUMENT HANDLE
Greg Furnish, Lawrenceville, Ga., assignor to Snowden-Pencer, Inc., Tucker, Ga.
Filed May 28, 1993, Ser. No. 69,715
Int. Cl.[6] A61B 17/00
U.S. Cl. 606—1 14 Claims



1. A hand-held surgical instrument comprising a handle and a tool with a body member having at least one articulated member thereon, the handle comprising:
a) an elongated base having a body portion, a top surface, opposite bottom surface, a first side and an opposite second side, a proximal end and a distal end;
b) an elongated lever having a first surface, an opposite second surface, a front end, a rear end and an actuator arm downwardly and non-pivotally projecting from said rear end;
c) unitary means for connecting the rear end of said lever to the proximal end of said base and for normally biasing said lever in an open position, said unitary connecting and biasing means defining a horizontal pivot axis such that said lever pivots about said axis between an open position and a closed position, wherein said base and said lever are juxtaposed to each other along their length, with said lever extending forward from said unitary connecting and biasing means toward the distal end of said base, such that the second surface of said lever is adjacent to the top surface of said body portion and the actuator arm of said lever projects into the body portion of said base adjacent the proximal end thereof; and
d) means for actuating the articulated member of said tool connected to the actuator arm of said lever, whereby movement of said lever from an open position to a closed position causes movement of the articulated member, wherein said actuating means comprises an actuator rod having a first end and a second end the second end of said rod being connected to the articulated member of said tool and the first end of said rod being connected to the downwardly and nonpivotally projecting actuator arm of said lever, wherein said rod is disposed through the body portion of said base such that movement of said lever form the open to the closed position causes the first end of said rod to be displaced toward the proximal end of the body portion of said base; thereby moving the articulated member of said tool.

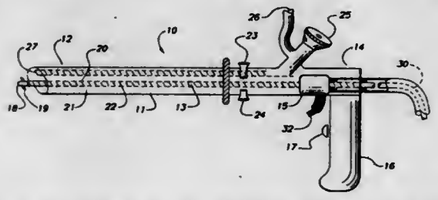


5,498,257
CARTILAGE AND GRAFT PALETTE
John B. Tebbetts, 1928 W. Colorado, Dallas, Tex. 75208
Filed Aug. 11, 1993, Ser. No. 104,544
Int. Cl.[6] A61B 19/00
U.S. Cl. 606—1 39 Claims



1. A cartilage and graft palette structure of a size to fit within a hand of a surgeon during surgical procedures, comprising bottom means extending over the full width and length of the palette structure, upwardly extending front, rear and lateral walls interconnecting said front and rear walls to form together with said bottom means a generally rectangular tray-like structure, as viewed in plan view on said palette structure, said bottom means, said front and rear walls as well as said lateral walls forming a frame for the palette structure, said walls being of such thickness as to assure structural stability of the palette structure and provide by such thickness a shelf-like peripheral rim having a sufficient width, as viewed in plan view on the palette structure, to accommodate indicia along the shelf-like rim of at least one of said walls, the bottom means having an upper non-metallic surface which minimizes unsatisfactory tactile feedback to the surgeon by way of a surgical instrument and reduces the risk of slippage as cartilage or graft is cut, and further means to assure sufficient fluid-tightness on the inside of the tray-like structure to enable maintenance of moisture of any graft or cartilage.

5,498,258
LASER RESECTOSCOPE WITH LASER INDUCED MECHANICAL CUTTING MEANS
Said I. Hakky, 8547 Merrimoor Blvd., E, Largo, Fla. 34647-3145, and Perry B. Hudson, 2225 Park St., North, St. Petersburg, Fla. 33710
Filed Sep. 13, 1994, Ser. No. 306,186
Int. Cl.[6] A61B 17/36
U.S. Cl. 606—15 12 Claims



1. A laser resectoscope for coagulating, lasing, resecting and removing tissue from a patient, said device comprising:
a) an elongated cylinder, said cylinder having at the distal end a means for introduction into said patient;
b) rotatable means for directinq a beam of laser radiation within said cylinder from a source of laser radiation;
c) a laser beam contacting head at the distal end of said laser directing means and rotating therewith, said contact laser head having cutting blades for cutting away tissue;
d) motor means at the proximal end of said cylinder for rotating said laser directing means; and
e) means within said cylinder for removing resected tissue, whereby said laser beam heats said laser beam contacting head and said cutting blades.

5,498,259
METHOD FOR FUSING BONE
Judith R. Mourant, Los Alamos; Gerhard D. Anderson, Velarde; Irving J. Bigio, and Tamara M. Johnson, both of Los Alamos, all of N.M., assignors to The Regents of the University of California, Alameda, Calif.
Filed Mar. 31, 1994, Ser. No. 221,422
Int. Cl.[6] A61F 2/28; A61B 17/36
U.S. Cl. 606—8 8 Claims

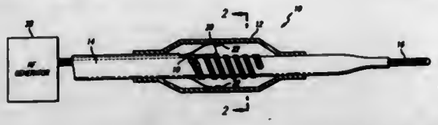
1. A method for joining bones at a chosen location, which comprises the steps of:
a. chemically removing the mineral matrix from a thin layer of each bone to be joined at the chosen location, thereby exposing collagen;
b. placing the bones to be joined in contact at the locations so treated; and
c. heating the contact using electromagnetic radiation.

5,498,260
INTERNAL REFLECTANCE ANGLE FIRING FIBER OPTIC LASER DELIVERY DEVICE AND METHOD OF USE
John L. Rink, San Francisco, and Marilyn M. Chou, Piedmont, both of Calif., assignors to Xintec Corporation, Oakland, Calif.
Continuation-in-part of Ser. No. 14,814, Feb. 8, 1993. This application May 26, 1993, Ser. No. 67,566
Int. Cl.[6] A61N 5/06
U.S. Cl. 606—16 28 Claims



1. An internal reflectance angle firing fiber optic laser scalpel, said scalpel comprising a fiber optic waveguide having:
a receiving end;
a central axis; and
a firing tip, said firing tip comprising:
an end surface, said end surface lying at an operative angle to said central axis of said waveguide, said end surface of said optical fiber having a concave shape; and
a reflective coating applied to said end surface such that the reflective coating provides a convex reflective surface.

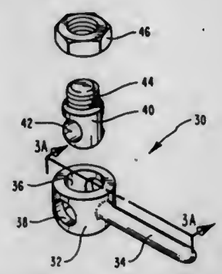
**5,498,261**
**THERMAL ANGIOPLASTY SYSTEM**
**Bruno Strul, Palo Alto, Calif., assignor to Advanced Cardiovascular Systems, Inc., Santa Clara, Calif.**
**Filed Dec. 20, 1991, Ser. No. 811,024**
**Int. Cl.[6] A61B 5/00**
**U.S. Cl. 606—29** **18 Claims**



1. A power generator for providing electrical power to a heating element of a catheter, the heating element having a temperature, the power generator comprising:
a temperature sensor for providing a temperature signal representative of the temperature at the heating element;
comparator means for comparing the temperature signal to signals representative of a predetermined temperature range and for providing a fault signal when the temperature signal indicates a temperature outside the range;
power source means for providing power to the heating element and for interrupting the power to the heating element in response to the fault signal;
alarm generator means for providing an alarm in response to the fault signal;
first isolation means for providing a first ground in the power generator for electrically interconnecting components of the power generator and for isolating the first ground from earth ground; and
second isolation means for isolating the temperature signal from both the first ground and earth ground.

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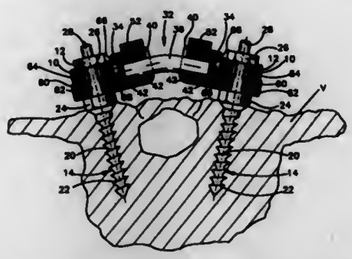
**5,498,262**
**SPINAL FIXATION APPARATUS AND METHOD**
**Donald W. Bryan, 6151 S. Woodland Dr., Ogden, Utah 84403**
**Continuation-in-part of Ser. No. 999,005, Dec. 31, 1992, Pat. No. 5,306,275. This application Apr. 25, 1994, Ser. No. 232,371**
**Int. Cl.[6] A61B 17/00**
**U.S. Cl. 606—61** **19 Claims**



1. An implantable device for spinal fixation comprising:
first and second longitudinal rods for placement longitudinally along the spine with said first longitudinal rod on one side of the spinous process and said second longitudinal rod on the other side of the spinous process, said first and second longitudinal rods bridging one or more vertebral segments requiring fixation;
first side arm clamp means selectively mounted to at least one of said first and second longitudinal rods, said first side arm clamp means having a first side arm said first side arm clamp means comprising a plurality of first side arm clamps, each of said first side arm clamps including a clamp body having a cylindrical bore and a cylindrical anchor body in said cylindrical bore, said clamp body including a transverse throughbore through said clamp body and said anchor body, said anchor body including a coaxial threaded boss and a nut threadedly engaged to said threaded boss, a lateral rod extending outwardly from said clamp body in a plane orthogonal to the axis of said transverse throughbore;
clamp means mountable to said first side arm of said first side arm clamp means;
cross link plate means extending between said first longitudinal rod and said second longitudinal rod; and
bone screw means for securing said clamp means to the bone of the spine.

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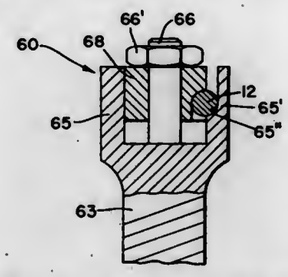
**5,498,263**
**TRANSVERSE CONNECTOR FOR SPINAL COLUMN CORRECTIVE DEVICES**
**Alexandre M. DiNello, Shaker Heights; Bryan D. Hildebrand, Cleveland Heights, and Hoyt D. White, Mentor, all of Ohio, assignors to AcroMed Corporation, Cleveland, Ohio**
**Filed Jun. 28, 1994, Ser. No. 267,871**
**Int. Cl.[6] A61B 17/70;17/80;17/86**
**U.S. Cl. 606—61** **19 Claims**



1. An apparatus for interconnecting a pair of longitudinal members extending substantially parallel to each other and connected with vertebrae of a spinal column by a plurality of fasteners for retaining vertebrae in a desired spatial relationship, said apparatus comprising:
a first connector member connectable with one longitudinal member;
a second connector member connectable with the other longitudinal member; and
a rod extendable transverse to the longitudinal members and extending between said first and second connector members to interconnect said first and second connector members;
said first connector member including a recess for receiving said rod, means for clamping said rod in said recess, said means for clamping said rod in said recess engaging said rod to press said rod into said recess, an opening through which one of the fasteners for connecting the one longitudinal member to the spinal column is extendable, the opening being spaced from said clamping means, and means for cooperating with the fastener to connect said first connector member with the one longitudinal member.

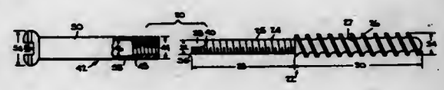


**5,498,264**
**CLAMP CONNECTION FOR CONNECTING TWO CONSTRUCTION COMPONENTS FOR A SETTING DEVICE, PARTICULARLY AN OSTEOSYNTHETIC SETTING DEVICE**
**Johannes F. Schlapfer, Glarus; Martin Hess, Holstein; Roland Woreth, Arlesheim; Peter Tanner, Bubendorf, and Hans Weigum, Niederdorf, all of, Switzerland, assignors to Synthes (U.S.A.), Paoli, Pa.**
**Continuation of Ser. No. 915,606, Jul. 21, 1992, abandoned. This application Dec. 23, 1994, Ser. No. 363,588**
**Int. Cl.[6] A61B 17/56**
**U.S. Cl. 606—72** **13 Claims**



1. A clamp for securing a support rod comprising a clamping component having a cylindrical through hole and a socket adapted to receive a support rod, a connecting component having a base section and a cylindrical leg integrally formed with said base section and having a central axis extending from said base section into said through bole, and loading means mounted in said leg, said connecting component and said clamping component having curved surfaces in contact with each other, said curved surfaces being cylindrical about a central axis coinciding with the central axis of said leg, said loading means being positioned to bear against said clamping component to cause said clamping component to press a rod inserted in the socket of said clamping component against the base section of said connecting component and to press the curved surface of said clamping component against the curved surface of said connecting component.

**5,498,265**
**SCREW AND DRIVER**
**Stanley E. Asnis, Port Washington, N.Y., and John S. Crombie, Newark, N.J., assignors to Howmedica Inc., New York, N.Y.**
**Continuation-in-part of Ser. No. 21,815, Feb. 24, 1993, abandoned, which is a continuation of Ser. No. 664,905, Mar. 5, 1991, Pat. No. 5,217,462. This application Apr. 1, 1994, Ser. No. 222,517**
**Int. Cl.[6] A61F 5/00**
**U.S. Cl. 606—73** **2 Claims**



1. A variable length implant comprising in a connected relationship:
(a) a threaded shank having:
(1) a distal threaded shank portion having a bone thread and having a distal end and
(2) a proximal threaded shank portion having a machine thread and having a proximal end,
wherein said bone thread and said machine thread are of opposite hand
(b) a sleeve having a head and having an inner threading which threads with said proximal threaded shank portion, so as to result in an implant having a maximum implant length and a minimum implant length; and
(c) a connector means which connects said sleeve near said distal end of said sleeve with said proximal threaded shank portion near said proximal end of said proximal threaded shank portion but which permits said sleeve to move longitudinally with respect to said distal threaded shank portion after said maximum implant length is reached.

5,498,266

## METHOD OF WASHING AND DRYING CLOTHES

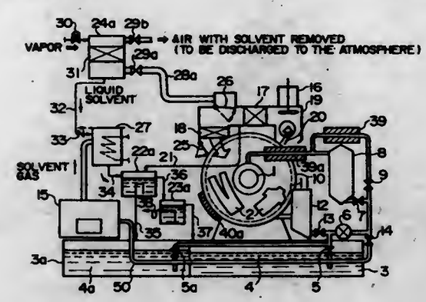
Hiroyuki Takagawa; Yasuhiro Tsubaki; Yoshio Miyairi; Toshio Hattori, and Haruo Hagiwara, all of Nagoya, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 9, 1994, Ser. No. 257,295

Claims priority, application Japan, Jun. 11, 1993, 5-164985; Jan. 28, 1993, 5-270312; Apr. 14, 1994, 6-075557

Int. Cl.[6] D06F *43/00*

U.S. Cl. 8—142 6 Claims




1. A method of washing and drying clothes in a dry cleaner, comprising the steps of:

washing clothes in a high-boiling point combustible solvent;

dissolving the solvent contained in the washed clothes into a liquid perfluorocarbon being heated at its boiling point or thereabout in order to remove the solvent; and

drying the clothes by evaporating the liquid perfluorocarbon contained in the clothes.

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5,498,267

## PROCESS AND USE OF REACTIVE DISPERSE DYES FOR DYEING AND PRINTING AMINATED, TEXTILE COTTON AND COTTON-POLYESTER BLEND FABRICS

Werner H. Russ, Flörsheim; Andreas Schrell, and Andreas von der Eltz, both of Frankfurt am Main, all of, Germany, assignors to Hoechst AG, Germany

Filed Aug. 11, 1994, Ser. No. 288,839

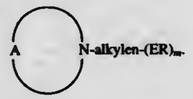
Claims priority, application Germany, Aug. 13, 1993, 43 27 301.7

Int. Cl.[6] D06P *1/38;1/16;3/66;3/854*

U.S. Cl. 8—532 11 Claims

1. A process for dyeing materials composed of hydroxyl-containing fibers or blends of hydroxyl-containing fibers with polyester fibers, which comprises applying to a hydroxyl-containing fiber material that is a fiber material which has been modified with an amino-containing compound that is selected from the group consisting of

(A) a compound of the formula




where

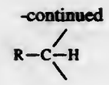
ER is an ester group;

A and N together with 1 or 2 alkylene groups of 1 to 4 carbon atoms form the bivalent radical of a heterocyclic ring wherein A is an oxygen atom or a group of the formula (a), (b) or (c)

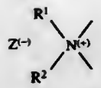


(a)

-continued



(b)



(c)

where

R is a hydrogen atom or an amino group or an alkyl group of 1 to 6 carbon atoms which are optionally substituted by 1 or 2 substituents selected from the group consisting of amino, sulfo, hydroxyl, sulfato, phosphato and carboxyl, or an alkyl group of 3 to 8 carbon atoms which is interrupted by 1 or 2 hetero groups selected from —O— and —NH— and are optionally substituted by an amino, sulfo, hydroxyl, sulfato or carboxyl group,

$R^1$ is hydrogen, methyl or ethyl

$R^2$ is hydrogen, methyl or ethyl, and

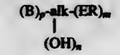
$Z^{(-)}$ is an anion;

alkylen is a straight-chain or branched alkylene radical of 2 to 6 carbon atoms which are optionally substituted by 1 or 2 hydroxy groups or is a straight-chain or branched alkylene radical of 3 to 8 carbon atoms which is interrupted by 1 or 2 hetero groups selected from —O— and —NH—;

m is 1 or 2;

the amino, hydroxyl and ester groups can be attached to a primary, secondary or tertiary carbon atom of the alkylene radical,

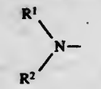
(B) compound of the formula



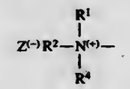

where

ER is an ester group;

B is an amino group of the formula $H_2N$— or an amino or ammonium group of the formula (d) or (e)



(d)



(e)

where

$R^1$, $R^2$ and $Z^{(-)}$ are each as defined above,

$R^3$ is methyl or ethyl, and

$R^4$ is hydrogen, methyl or ethyl;

p is 1 or 2;

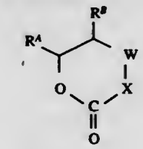
alk is a straight-chain or branched alkylene radical of 2 to 6 carbon atoms or is a straight-chain or branched alkylene radical of 3 to 8 carbon atoms which is interrupted by 1 or 2 hetero groups selected from —O— and —NH—

m is 1 or 2;

n is from 1 to 4;

the amino, hydroxyl and ester groups can be attached to a primary, secondary or tertiary carbon atom of the alkylene radical and

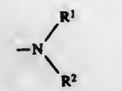
(C) a compound of formula (1)



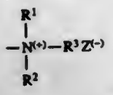
(1)

where

$R^A$ is hydrogen or alkyl of 1 to 3 carbon atoms which is optionally substituted by hydroxyl or a group of the formula (2) or (3)



(2)



(3)

where

$R^1$ is hydrogen, methyl or ethyl,

$R^2$ is hydrogen, methyl or ethyl, and

$R^3$ is hydrogen, methyl or ethyl, or

$R^1$ and $R^2$ together with the nitrogen atom are a saturated heterocyclic radical formed from an alkylene radical of 5 to 8 carbon atoms or two alkylene radicals of 1 to 4 carbon atoms and an oxygen atom or an amino group of the formula —NH—, and

$Z^{(-)}$ is an anion,

$R^B$ has one of the meanings specified for $R^A$;

W is a direct bond or a group of the formula $—CHR^C—$ where $R^C$ has one of the meanings specified for $R^A$;

X is —O— or —NH—,

with the proviso that in the case X is —O— at least one group of the formula (2) or (3) must be present,

a fiber-reactive disperse dye and dyeing in an aqueous, low electrolyte or completely electrolyte-free medium and in the absence of an alkaline or alkali-donating agent, at a temperature between 100° and 210° C.

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**5,498,268**

**ABRASIVE ARTICLES AND METHOD OF MAKING ABRASIVE ARTICLES**

**John J. Gagliardi, and Jason A. Chesley, both of Hudson, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Filed Mar. 16, 1994, Ser. No. 213,550**

**Int. Cl.[6] B24D *3/00***

**U.S. Cl. 51—294** **23 Claims**

1. An abrasive article having a surface adapted to contact and abrade a workpiece, the abrasive article comprising

(a) a plurality of abrasive particles,

(b) a plurality of erodible agglomerates comprising a plurality of grinding aid particles adhered together with a lignosulfonate binder, and

(c) a binder in which said abrasive particles and said erodible agglomerates are dispersed.

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**5,498,269**

**ABRASIVE GRAIN HAVING RARE EARTH OXIDE THEREIN**

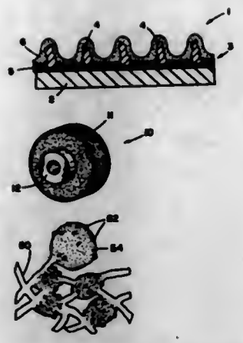
**Henry A. Larmie, Oakdale, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Continuation of Ser. No. 186,821, Jan. 26, 1994, abandoned, which is a continuation of Ser. No. 951,671, Sep. 25, 1992, abandoned. This application May 26, 1995, Ser. No. 453,572**

**Int. Cl.[6] B24D *11/00;11/02***

**U.S. Cl. 51—295** **22 Claims**

1. A ceramic abrasive grain comprising at least about 70 percent by weight alumina, at least about 0.1 percent by weight zirconia, and at least about 0.1 percent by weight metal oxide selected from the group consisting of: (a) yttria; (b) a rare earth oxide selected from the group of consisting of oxides of: ytterbium, neodymium, lanthanum, praseodymium, samarium, gadolinium, cerium, dysprosium, erbium, and mixtures thereof; and (c) mixtures thereof, based



on the total weight of said abrasive grain, wherein said alumina is present as one of alpha alumina, at least one alumina reaction product, or a combination thereof, said zirconia is present as one of zirconia, at least one zirconia reaction product, or a combination thereof, and said metal oxide is present as one of a metal oxide, at least one metal oxide reaction product, or a combination thereof, and wherein said abrasive grain has an average hardness of at least about 21 GPa and an average toughness of at least about 4 $MPa \cdot m^{1/2}$.

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**5,498,270**

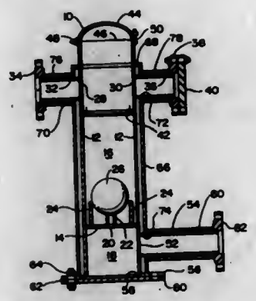
**SULFUR TRAP**

**Strom W. Smith, 18502 Cherrytree Grove Dr., Houston, Tex. 77084**

**Filed Sep. 12, 1994, Ser. No. 304,757**

**Int. Cl.[6] B01D *35/18***

**U.S. Cl. 55—216** **16 Claims**



1. A sulfur trap for separating liquid sulfur from a gas stream comprising:

a vertically-extending body, having a wall that defines a generally vertical chamber;

a segregating wall disposed in said chamber;

said segregating wall defining an upper chamber and a lower chamber;

a first inlet in said upper chamber;

a circular orifice through said segregating wall;

a cylindrical member having a hollow cavity extending lengthwise therethrough;

said cylindrical member extending upwardly from said segregating wall into said upper chamber;

said cavity aligned with said orifice; and

said cavity and said orifice providing fluid communication between said upper chamber and said lower chamber; and

a sealing means for selectively allowing or preventing flow through said circular orifice.



**5,498,271**

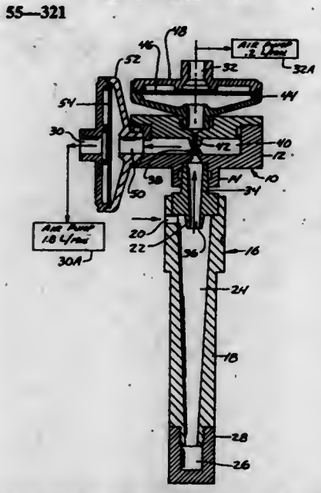
**DIESEL PARTICLE VIRTUAL IMPACTOR SAMPLER**

**Virgil A. Marple, Maple Plain; Bernard A. Olson, Lauderdale, and Kenneth L. Rubow, Plymouth, all of Minn., assignors to MSP Corporation, Minneapolis, Minn.**

**Filed Oct. 7, 1994, Ser. No. 320,006**

**Int. Cl.[6] B01D *45/06***

**U.S. Cl. 55—321** **3 Claims**



1. A virtual impactor sampler of size to be carried on a person comprising a virtual compactor having an inlet passage having a first axis defining an axis of flow and a housing having a chamber into which the flow from the inlet passage passes, the inlet passage terminating in an inlet nozzle coaxial with the first axis, the inlet nozzle opening to the chamber in the housing;

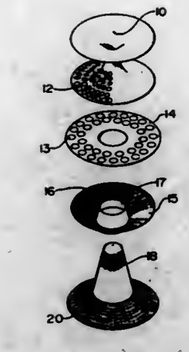
an outlet nozzle providing an outlet from the chamber coaxial with the inlet nozzle and spaced from the inlet nozzle to form a virtual impactor section within the chamber of the housing;

a first pump for providing a major flow of air through the inlet nozzle and then laterally of the axis through a first outlet from the chamber;

a first filter for filtering the major flow of air from the first outlet, said first filter having a flat filter member defining a plane positioned parallel to the first axis, and positioned laterally of the housing;

a second filter having an inlet connected to the outlet nozzle and centered on the first axis;

a second pump establishing a minor flow of air through the outlet nozzle and the second filter, the second filter having a flat filter member with a plane perpendicular to the first axis, the first and second filters overlapping in direction along the first axis, the major and minor flows being set for determining particle concentration above and below a particle size cutout point selected to separate and collect diesel exhaust particles.



having an opening of size adapted to fit over said capstan, said frusto-conical member placed over said capstan so that a portion of said upper half of said capstan will protrude above said inner wall, an hourglass member having an upper and a lower half that form an hourglass shape and having a plurality of holes in said lower half of said hourglass member, said lower half of said hourglass member placed in connection with said frusto-conical member so that said lower half of said hourglass member is in close connection with said primary apertures, a means for creating a vacuum, said means for creating a vacuum placed above said hourglass member so as to create a suction effect through said capstan.

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**5,498,272**

**CAPSULE VACUUM CLEANER ASSEMBLY**

**Marty G. Leon, 18416 N. 31 St. Ave., Phoenix, Ariz. 85023-1124**

**Filed May 6, 1994, Ser. No. 238,845**

**Int. Cl.[6] B01D *46/02***

**U.S. Cl. 55—363** **3 Claims**

1. An improved vacuum cleaner assembly for a vacuum cleaner, said assembly comprising: a capstan of conical shape and having an upper half and a lower half and having a plurality of secondary apertures in said bottom half of said capstan, said upper half of said capstan having a plurality of primary apertures, said primary apertures larger than said secondary apertures, a frusto-conical member having an outer wall of curved construction and an inner wall, said outer wall having a plurality of apertures, said inner wall

**5,498,273**

**PARTICLE SEPARATION**

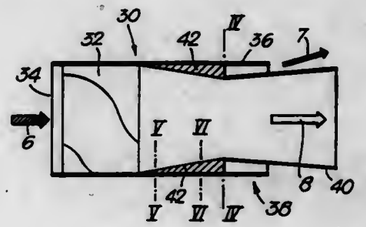
**Darrell L. Mann, Bristol, England, assignor to Rolls-Royce, plc, London, England**

**Filed Nov. 10, 1994, Ser. No. 339,206**

**Claims priority, application United Kingdom, Nov. 16, 1993, 9323623**

**Int. Cl.[6] B01D *45/00***

**U.S. Cl. 55—396** **5 Claims**



1. A vortex separator for separating particulate matter from a gas stream, the separator comprising:

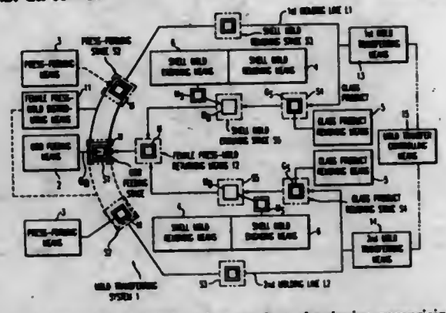
a first tube defining a gas flow passage having an upstream inlet section and a downstream outlet section,

at least one vane disposed in the region of the upstream section of the tube for imparting vorticular motion on a gas flow entering the tube,

flow dividing means formed by an exit tube disposed co-axially with the downstream outlet section of the first tube and spaced radially inwards thereof to form an outer annular scavenge duct and inwardly thereof a co-axial clean flow outlet, and

a plurality of elongate tapering occluding members located against the wall of the first tube and extending upstream of the annular scavenge duct so as to partially obstruct gas flow entering said annular scavenge duct.

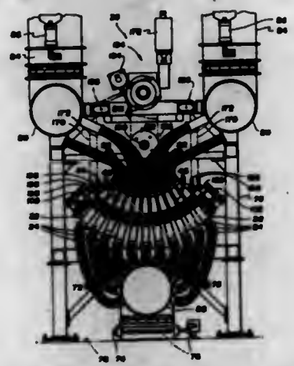
5,498,274
**METHOD AND DEVICE FOR FORMING A GLASS PRODUCT**
Itsuo Matsumoto; Yuji Furui, and Yoshihiro Tsuchimoto, all of Funabashi, Japan, assignors to Asahi Glass Company, Tokyo, Japan
Filed Dec. 9, 1993, Ser. No. 163,758
Claims priority, application Japan, Dec. 14, 1992, 4-353577; Aug. 13, 1993, 5-222242
Int. Cl.[6] C03B 9/193;9/30;11/00
U.S. Cl. 65—90 6 Claims



1. A device for forming a glass product, the device comprising:
female press-molds and a mold transferring system for transferring the female press-molds to a plurality of processing stages, said plurality of processing stages comprising a gob feeding stage, a plurality of press-forming stages, and a plurality of glass product removing stages, wherein the mold transferring system transfers the female press-molds to each of said plurality of processing stages;
a gob feeding means for successively feeding the female press-molds transferred to the gob feeding stage with a gob at predetermined intervals;
a press-forming means for press-forming the gob in each of the female press-molds, wherein the female press-mold fed with the gob is transferred to one of the press-forming stages;
a glass product removing means for removing a glass product from the female press-molds at one of the glass product removing stages; and
a plurality of closed loop molding lines, wherein said mold transferring system is provided along said plurality of closed loop molding lines and said plurality of press-forming stages are provided to surround the gob feeding stage and which include said plurality of glass product removing stages corresponding to the plurality of the press-forming stages;
said mold transferring system comprising:
a female press-mold distributing means for successively distributing the female press-molds fed with the gob in the gob feeding stage to the plurality of press-forming stages;
a female press-mold returning means for successively returning the female press-molds to the gob feeding stage from the plurality of closed loop molding lines in cooperation with the female press-mold distributing means;
a plurality of mold transferring means for transferring the female press-molds from the plurality of press-forming stages and each of said processing stages through the plurality of closed loop molding lines; and
a mold transfer controlling means for controlling the plurality of mold transferring means in cooperation with a distribution of the female press-molds by the female press-mold distributing means, whereby at least a transferring of the female press-molds from the press-forming stage by one of the mold transferring means on one of the closed loop molding lines to which the female press-molds have been previously distributed at a is stopped and the press-forming by the press-forming means is performed;
wherein the female press-mold returning means is attached to the female press-mold distributing means such that the female press-mold returning means moves in a direction different from a moving direction of the female press-mold distributing means whereby a first one of the female press-molds returns to the gob feeding stage from a first one of the closed loop molding lines when a second one of the female press-molds from a second one of the closed loop molding lines is being distributed to the press-forming stage.

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5,498,275
**GLASS SHEET BENDING APPARATUS**
Paull T. Reunamaki, Perrysburg, Ohio, assignor to Glasstech, Inc., Perrysburg, Ohio
Filed Oct. 18, 1993, Ser. No. 138,739
Int. Cl.[6] C03B 23/023
U.S. Cl. 65—268 21 Claims



1. Glass sheet bending apparatus comprising: a first deformable mold for engaging a heated glass sheet to be bent; said first deformable mold including a plurality of mold members that are movable with respect to each other to bend the glass sheet; a linkage that extends between the mold members to control movement thereof with respect to each other; the linkage including connector links that are fixedly connected to the mold members and that have pivotal connections to each other about axes that extend parallel to the glass sheet throughout the bending thereof; the linkage also including control links that have respective pivotal connections to the connector links about axes that extend perpendicular to the glass sheet throughout the bending thereof; the control links having universal connections to each other; and an actuating mechanism that moves the linkage such that the linkage moves the mold members of the deformable mold to bend the glass sheet with a constant radius of curvature.

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5,498,276
**IRON-BASED POWDER COMPOSITIONS CONTAINING GREEN STRENGH ENHANCING LUBRICANTS**
Sydney Luk, Lafayette Hill, Pa., assignor to Hoeganaes Corporation, Riverton, N.J.
Filed Sep. 14, 1994, Ser. No. 306,209
Int. Cl.[6] B22F 1/00
U.S. Cl. 75—252 24 Claims

1. An improved metallurgical powder composition, comprising:
(a) a major amount of a metal-based powder having a weight average particle size in the range of about 25–350 microns; and
(b) a minor amount of a solid compaction lubricant comprising at least about 10 percent by weight of a solid, particulate polyether having the formula:

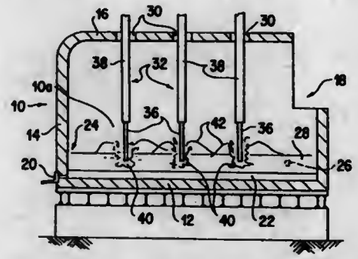
$$H—\{O(CH_2)_q\}_n—OH$$

where q is from about 1 to about 7, and n is selected such that the polyether has a weight average molecular weight between about 10,000 and about 4,000,000, wherein said polyether has a weight average particle size between about 25 and 150 microns.



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5,498,277
**PROCESS FOR PRODUCTION OF IRON**
John M. Floyd, Upper Beaconsfield; Ian L. Chard, Cranbourne, and Brian R. Baldock, Skye, all of, Australia, assignors to Ausmelt Limited, Victoria, Australia
PCT No. PCT/AU92/00489, § 371 Date Apr. 19, 1994, § 102(e) Date Apr. 19, 1992, PCT Pub. No. WO93/06251, PCT Pub. Date Apr. 1, 1993
PCT Filed Sep. 17, 1992, Ser. No. 199,121
Claims priority, application Australia, Sep. 20, 1991, PK8456
Int. Cl.[6] C21B 11/08
U.S. Cl. 75—385 31 Claims

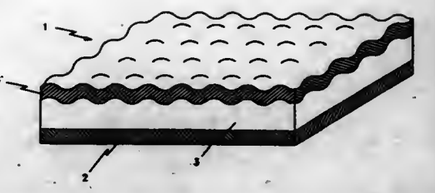


1. A process for producing iron metal and slag by smelting iron-containing source material in a reactor containing a molten bath comprising slag or having a slag layer, wherein the process comprises the steps of:
(a) injecting fuel/reductant and oxygen-containing gas into the slag, by at least one top-submerged lance, to generate heating and reducing conditions in at least one reducing region in the bath;
(b) feeding the source material to the reactor, together with additional reductant comprising coal and with flux, at or adjacent to the at least one reducing region, whereby the source material is subjected to smelting reduction which generates combustion gases comprising CO and $H_2$;
(c) controlling the rates of injection of the oxygen-containing gas and fuel/reductant by said at least one lance to achieve required, sufficient reducing conditions; and
(d) post-combusting, in the reactor above the bath, the combustion gases generated by the smelting;
wherein the controlling of step (c) is conducted to result in the injected oxygen-containing gas having an oxygen content of from about 40 volume % to about 100 volume % and sufficient for a degree of combustion of from about 40 weight % to about 50 weight % of the fuel/reductant injected by the at least one lance.

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5,498,278
**COMPOSITE HYDROGEN SEPARATION ELEMENT AND MODULE**
David J. Edlund, Redmond, Oreg., assignor to Bend Research, Inc., Bend, Oreg.
Continuation-in-part of Ser. No. 148,999, Nov. 8, 1993, Pat. No. 5,393,325, which is a continuation-in-part of Ser. No. 986,692, Dec. 7, 1992, Pat. No. 5,259,870, which is a continuation-in-part of Ser. No. 566,092, Aug. 10, 1990, abandoned. This application Dec. 19, 1994, Ser. No. 359,917
Int. Cl.[6] B01D 53/22
U.S. Cl. 96—11 34 Claims

1. A composite hydrogen separation element comprising, after fabrication, a nonporous hydrogen-permeable coating metal layer supported by a rigid support matrix, a flexible, porous, non-sintered, non-metallic intermediate layer between said coating metal layer and said support matrix, wherein, at a temperature of from about 200° C. to about 1000° C.,
said intermediate layer does not chemically react with hydrogen or with said coating metal layer or with said support matrix to form a hydrogen-impermeable layer, and said support matrix does not react with hydrogen or with said intermediate layer to substantially reduce the tensile strength of said support matrix.



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5,498,279
**HIGH SPEED GAS CHROMATOGRAPHY SYSTEM FOR ANALYSIS OF POLAR ORGANIC COMPOUNDS**
Mark A. Klemp, Swartz Creek, Mich., assignor to Chromatofast, Ann Arbor, Mich.
Filed May 13, 1994, Ser. No. 242,348
Int. Cl.[6] B01D 15/08
U.S. Cl. 96—104 17 Claims



1. A gas chromatography system for the separation and analysis of polar compounds of interest from a sample containing both polar compounds and non-polar compounds, comprising:
an inlet system for injection of said sample,
a first analytical separation column having a polar stationary phase material which retards at least some of said polar compounds relative to at least some of said non-polar compounds,
a second analytical separation column having a non-polar stationary phase material which retards at least some of said non-polar compounds relative to said polar compounds of interest,
a detector for providing an output in response to the elution of said polar compounds and said non-polar compounds of said sample,
vent means for venting fluids,
first conduit circuit means for defining a fluid flow path from said inlet system first into said first column, into said second column and thereafter to said detector,
second conduit circuit means for defining a fluid flow path from said first conduit circuit means between said first and second columns and said vent means, and
valve means placed in said second conduit circuit means for controlling the flow of fluids through said first conduit circuit means wherein upon injection of said sample by said inlet system said polar compounds of interest are retarded on said first column relative to at least some portion of said non-polar compounds, and wherein said portion of said non-polar compounds are vented through said second conduit circuit means and said vent means and upon elution of said polar compounds of interest from said first column, causing said polar

compounds of interest to pass into said second column and thereafter said polar compounds of interest are evaluated by said detector.

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**5,498,280**

## PHOSPHORESCENT AND FLUORESCENT MARKING COMPOSITION

David C. Fistner, and Colin M. Snedeker, both of Bethlehem, Pa., assignors to Binney & Smith Inc., Easton, Pa.

Filed Nov. 14, 1994, Ser. No. 338,694
Int. Cl.[6] C09D *13/00*
U.S. Cl. 106—19 B 27 Claims

1. A marking composition comprising
(a) a high molecular weight polyethylene glycol having a molecular weight of at least about 10,000;
(b) a low molecular weight polyethylene glycol having a molecular weight ranging from about 100 to about 1,000;
(c) a phosphorescent pigment; and
(d) a fluorescent pigment.

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**5,498,281**

## RECORDING MATERIAL CONTAINING CARBONACEOUS POWDER WHOSE SURFACE IS MODIFIED WITH FLUORINE GAS

Hiroyuki Idogawa, Kyoto; Atsushi Wakata, Fujioka; Nobuatsu Watanabe, Nagaokakyo, and Yong-Bo Cheng, Kyoto, all of, Japan, assignors to Mitsubishi Pencil Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 101,177, Aug. 3, 1993, Pat. No. 5,437,715. This application Jan. 31, 1995, Ser. No. 381,122
Claims priority, application Japan, Aug. 31, 1992, 4-253449
Int. Cl.[6] C09D *11/00*
U.S. Cl. 106—20 R 5 Claims

1. A recording material comprising 3–30% by weight of a carbonaceous powder whose surfaces are modified with a fluorine gas, 40–80% by weight of a solvent 1–20% by weight of a binder.

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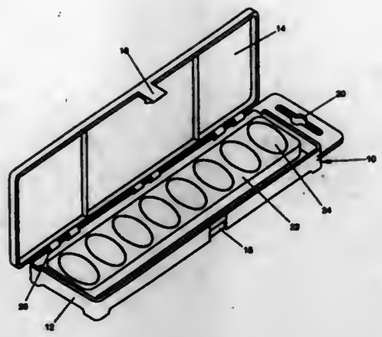
**5,498,282**

## COLOR CHANGING PAN PAINT COMPOSITIONS

Richard E. Miller, Nazareth, and Robert C. Dereamus, Tatamy, both of Pa., assignors to Binney & Smith Inc., Easton, Pa.

Continuation-in-part of Ser. No. 270,454, Jul. 5, 1994, Ser. No. 270,485, Jul. 5, 1994, Ser. No. 270,940, Jul. 5, 1994, Ser. No. 270,998, Jul. 5, 1994, and Ser. No. 78,722, Jun. 16, 1993, Pat. No. 5,352,282, which is a continuation of Ser. No. 923,308, Jul. 31, 1992, Pat. No. 5,232,494, said Ser. No. 270,454Ser. No. 270,485, Jul. 31, 0, Ser. No. 270,940, Jul. 31, 0, and Ser. No. 270,998, Jul. 31, 0, each , Jul. 31, 0is a continuation-in-part of Ser. No. 89,503, Jul. 16, 1993, Pat. No. 5,326,388, which is a continuation-in-part of Ser. No. 923,308, Jul. 16, 0. This application Oct. 3, 1994, Ser. No. 317,212
Int. Cl.[6] C09D *11/02*
U.S. Cl. 106—22 B 57 Claims

1. A pan paint composition comprising by weight:
from about 20% to about 99.9% of a water-soluble resin; and
from about 0.1% to about 20% of a water-soluble dye selected from the group consisting of dyes whose coloring ability is destroyed or modified in the presence of a pH of about 10 or more; dyes whose coloring ability is destroyed or modified in the presence of a reducing agent; and dyes whose coloring ability is destroyed or modified in the presence of a pH of about 10 or more and in the presence of a reducing agent.



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**5,498,283**

## WATERFAST SECURITY INKS

Raouf Botros, and Sunita Chavan, both of Dayton, Ohio, assignors to Scitex Digital Printing, Inc., Dayton, Ohio

Filed Aug. 23, 1994, Ser. No. 294,888
Int. Cl.[6] C09D *11/02*
U.S. Cl. 106—22 H 12 Claims

1. An ink jet ink composition comprising a security component present in an amount from about 0.3 to about 3 percent by weight, a liquid vehicle, a dye, and an N-hydroxyalkyl imine substituted at about 80% of the available nitrogens present in an amount of approximately 3 percent by weight.

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**5,498,284**

## CHEMICALLY BONDED INORGANIC POLYMER COATINGS AND CROSS-LINKING HARDENERS THEREFOR

James E. Neely, Jr., Butler, Pa., assignor to Neely Industries, Inc., Butler, Pa.

Filed Jul. 22, 1994, Ser. No. 277,313
Int. Cl.[6] C04B *12/04*
U.S. Cl. 106—629 15 Claims

1. An aqueous inorganic heat-curable coating composition which comprises at least one water soluble alkali silicate and a cross-linking effective amount of a cross-linking agent which is a product produced by a process which comprises mixing, at room temperature, an aqueous solution of an alkali hydroxide with an aqueous solution of aluminum phosphate, allowing the mixture to react to form a precipitate, isolating and drying the precipitate, and heating the dried precipitate at a temperature of about 400° to 800° C. for from several seconds to several hours.

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**5,498,285**

## PROCESS FOR THE SYNTHESIS OF A LAYERED, CLAY-LIKE MATERIAL AS WELL AS ITS USE

Carel W. J. Hooykaas, Rotterdam, Netherlands, assignor to Pelt & Hooykaas B.V., Rotterdam, Netherlands

Filed Dec. 9, 1993, Ser. No. 163,510
Claims priority, application Netherlands, Dec. 29, 1992, 9202277
Int. Cl.[6] C04B *33/02*; C01B *33/26;33/32*
U.S. Cl. 106—486 13 Claims

1. A process for the preparation of a layered, synthetic clay material starting from a silicon oxide containing material in a finely divided state, wherein a glass phase containing material is reacted at a pH from 5 to 8, in the presence of water, with a source of layer-forming metal ions and a transition metal compound as an activator for the formation of clay, under atmospheric conditions to obtain a material having a stable structure.

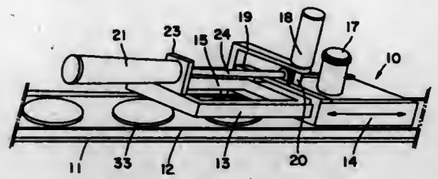


**5,498,286**

## APPARATUS FOR DOSING A PUMPABLE FLUID

Slobodan Milohanic, Aengelholm, Sweden, assignor to Nestec S.A., Vevey, Switzerland

Filed Mar. 21, 1994, Ser. No. 215,268
Claims priority, application European Pat. Off., Mar. 26, 1993, 93105000
Int. Cl.[6] A21C *9/04*
U.S. Cl. 118—13 4 Claims



1. A dosing apparatus comprising:
a tap member having opposing planar surfaces which extend between opposing sides and having an aperture which extends through the tap member from one opposing surface to the other; and
a housing member having a base plate which has opposing planar surfaces and an opening which extends through the base plate from one opposing base plate surface to the other for forming a mold and having two opposing sidewalls which each extend from the base plate and which each have a groove which slidably engages two opposing sides of the tap member so that the tap member is positioned between the sidewalls so that one tap member planar surface faces one base plate planar surface and so that the housing member is slidably reciprocative in two opposing directions along the tap member opposing sides;
wherein the tap member aperture and base plate opening are positioned so that upon sliding of the housing member in one direction of reciprocation, the base plate opening is positioned in communication with the tap member aperture for receiving a pumpable fluid to be molded on a substrate; and
means connected to the tap member for vertically reciprocating the tap and housing members; and
means connected to the tap member for feeding a pumpable fluid to the tap member aperture for feeding the fluid to the tap member aperture and the base plate opening for molding.

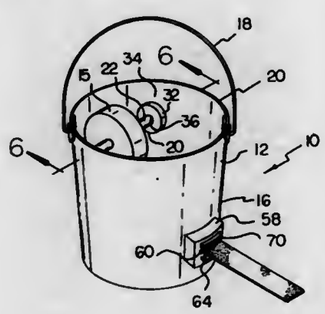
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**5,498,287**

## APPARATUS FOR SUPPORTING A FLUID AND TAPE TO BE DISPENSED FOR SEALING SEAMS OF WALLBOARD PANELS

Ronald Barnfield, 11B Karen La., Londonderry, N.H. 03053

Filed Jun. 9, 1994, Ser. No. 257,171
Int. Cl.[6] B05C *3/172*
U.S. Cl. 118—43 1 Claim



1. An apparatus for supporting a fluid and tape to be dispensed for sealing seams of wallboard panels comprising, in combination:
a bucket having a lower flat base and an upstanding generally cylindrical side wall with an upper edge, the bucket having a front portion and a rear portion, a handle being rotatably secured with respect to the upper edge thereof;
a roll of tape to be dispensed from the bucket;
mechanisms for supporting the roll of tape located in the rear portion of the bucket, such support mechanisms including a central shaft having opposed ends formed of two co-axial parts a first co-axial part including a bore with a spring housed therein, a second co-axial part being positioned within the bore abutting the spring, a pair of upper bosses secured to the interior surface of the side wall of the bucket adjacent to the upper edge thereof with apertures receiving the opposed ends of the central shaft, in an operative orientation the spring urging the parts axially outward within the bosses, the roll of tape being supported at the central extent of the central shaft, in an inoperative the user uncoupling the parts from the bosses by compressing the parts axially inward;
a guide rod located in the front portion of the bucket and rotatably secured in a lower extent thereof, the guide rod having opposed ends, a pair of lower bosses secured to the interior surface of the side wall of the bucket adjacent to the lower edge thereof with apertures receiving the opposed ends of the guide rod, the guide rod positioned to receive and guide tape extending from the central shaft;
a quantity of a blending fluid in the bucket to an elevation between the guide rod and roll of tape; and
a slot in a generally horizontal orientation positioned through a lower extent of the side wall, the slot being at an elevational location essentially the same as that of the lower most edge of the guide rod, the slot having a support block with an aperture formed as an extension of the slot and secured to the bucket on the exterior surface thereof, the block having exteriorly thereof a finger formed with a cutting edge extending upwardly from beneath the aperture into the lower surface of the path of travel of tape being fed through the slot and aperture, the block also having a brush extending downwardly and contactable with the upper surface of the path of travel of the tape being fed through the slot for smoothing the blending fluid thereon.

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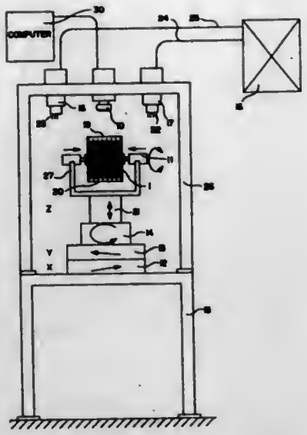
**5,498,288**

## APPARATUS FOR PRODUCING A FILTER IN THE FORM OF A MONOLITHIC HONEYCOMB BODY

Werner Noky, Mainz-Gonsenheim, Germany, assignor to Schott Glaswerke, Mainz, Germany

Division of Ser. No. 46,865, Apr. 8, 1993, Pat. No. 5,364,573. This application Mar. 18, 1994, Ser. No. 214,515
Claims priority, application Germany, Apr. 8, 1992, 42 11 787.9
Int. Cl.[6] B05B *13/02*
U.S. Cl. 118—305 4 Claims

1. An apparatus for selectively charging channels of a honeycomb filter with a plugging compound, the apparatus comprising:
a slide means movable in a motorized fashion in three orthogonal axes, the slide means comprising a clamping and turning device swivelable in motorized fashion by a swiveling device about a vertical axis, a honeycomb filter being fixable by clamping in the clamping and turning device to be pivotable about a horizontal axis intersecting the vertical axis,
an image recorder connected to a computer and arranged above the clamping and turning device to scan a first end face of the honeycomb filter clamped into the clamping and turning device, and to feed image information to a computer memory of the computer,
at least two metering heads with a respectively differing number of nozzles connected via conduits with a metering facility containing the viscous plugging compound, the filter being movable toward the metering heads by activation of the slide means as well as of the clamping and turning device in



accordance with a determination of a processing route by the computer, for introducing the plugging compound into end regions of ducts of the filter.

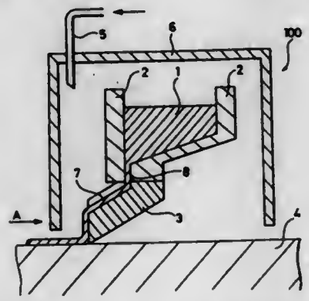
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**5,498,289**

**APPARATUS FOR APPLYING NARROW METAL ELECTRODE**

**Takashi Itagaki, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Division of Ser. No. 948,441, Sep. 22, 1992, Pat. No. 5,328,520. This application Mar. 21, 1994, Ser. No. 216,018**
**Claims priority, application Japan, Feb. 24, 1992, 4-75308**
**Int. Cl.[6] B05C *5/02***
**U.S. Cl. 118—401** **4 Claims**



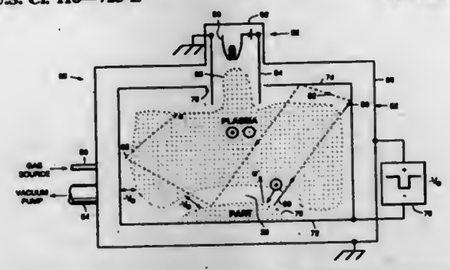
1. An apparatus for producing a linear pattern having a width less than 100 microns and a resistivity of the order of $10^{-6}\Omega$-cm on a substrate comprising:
- a tank containing a metal in a fused state and having a passage for flow of the fused metal; and
- at least one drawing head comprising a rod having a substantially planar end surface, a groove disposed at one side of said substantially planar end surface, extended therefrom and connected to the passage of said tank, and a tip at an opposite side of said substantially planar end surface from the groove for positioning close to or in contact with a surface a substrate, the fused metal flowing to the tip of said drawing head through said groove by capillary action and across said substantially planar end surface of said rod for application to the surface of the substrate.

**5,498,290**

**CONFINEMENT OF SECONDARY ELECTRONS IN PLASMA ION PROCESSING**

**Jesse N. Matossian, Canoga Park, and John D. Williams, Agoura Hills, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.**

**Filed Aug. 27, 1993, Ser. No. 113,552**
**Int. Cl.[6] C23C *16/00***
**U.S. Cl. 118—723 E** **16 Claims**



1. Plasma ion implantation apparatus for plasma ion implanting an object, comprising:
- a vacuum chamber adapted for receiving the object within a wall of the vacuum chamber;
- a plasma source positioned so as to create a plasma in the vicinity of the object, the plasma source having
  - a plasma source cathode, and
  - a plasma source anode operating at a selected plasma source anode potential;
- an enclosure positioned between the object and the wall of the vacuum chamber, the enclosure being made of an electrically conductive material;
- first electrical biasing means for electrically biasing the object to an object potential relative to the plasma source anode potential; and
- second electrical biasing means for electrically biasing the enclosure to an enclosure potential that is a positive multiple of the object potential.

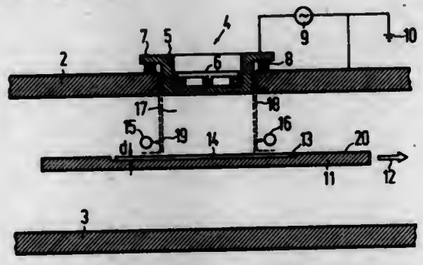
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**5,498,291**

**ARRANGEMENT FOR COATING OR ETCHING SUBSTRATES**

**Manfred Arnold, Mechenkbeuren; Guido Biang, Nauheim; Rainer Gegenwart, Rödermark; Jochen Ritter, Laubach, and Helmut Stoll, Sulzbach, all of, Germany, assignors to Leybold Aktiengesellschaft, Hanau, Germany**

**Continuation of Ser. No. 179,398, Jan. 10, 1994, abandoned. This application Mar. 17, 1995, Ser. No. 407,783**
**Claims priority, application Germany, Jan. 19, 1993, 43 01 188.8**
**Int. Cl.[6] C23C *16/00*; C23F *1/02***
**U.S. Cl. 118—723 E** **11 Claims**



1. Arrangement for coating or etching substrates with a process chamber comprising at least one upper limiting wall and one lower limiting wall;
- a carrier disposed between the upper and the lower limiting walls;
- a substrate disposed on the upper side of the carrier (11);
- a plasma-generating arrangement near the upper limiting wall (2) of the process chamber, characterized in
  - that the carrier is displaceable relative to the limiting walls,
  - that between carrier (11) and upper limiting wall at least one gas feed is disposed,
  - that the volume between the plasma-generating arrangement and the immediate proximity over the substrate or the carrier is enclosed by a bias voltage pot,
  - wherein the volume enclosed by the bias voltage pot comprises only plasma, and
  - wherein the distance between the lower edge of the bias voltage pot and the surface of the substrate or the carrier is smaller than the dark space distance,
  - that a voltage source is provided which is electrically connected with the bias voltage pot.



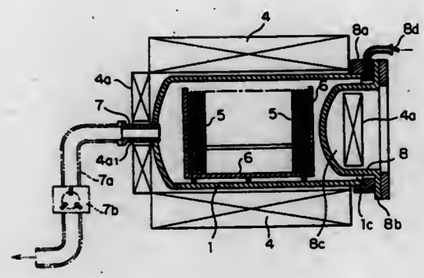
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**5,498,292**

**HEATING DEVICE USED FOR A GAS PHASE GROWING MECHANISM OR HEAT TREATMENT MECHANISM**

**Yasushi Ozaki, Sagamihara, Japan, assignor to Kishimoto Sangyo Co., Ltd., Osaka, Japan**

**Filed Jan. 19, 1995, Ser. No. 374,828**
**Claims priority, application Japan, Jun. 16, 1994, 6-158039**
**Int. Cl.[6] C23C *16/00*; F27B *1/09*; *5/04***
**U.S. Cl. 118—724** **4 Claims**



1. A heating device used for a gas phase growing mechanism or a heat treatment mechanism comprising:
- a tubular reactor (1) made of a heat resistant and chemically inert material incorporating a support (6) having a plurality of workpieces (5) set and arranged thereon to be put to a gas phase growing or heat treatment,
- a cylindrically formed main heating furnace body (4) having open opposite ends, said cylindrical main heating furnace body being disposed so as to surround the outer circumferential surface of said tubular reactor (1) along substantially the entire length thereof,
- a pair of auxiliary heating furnace bodies separate from said main heating furnace body and each closing the respective longitudinal open ends of said cylindrical main heating body (4), whereby
- said cylindrical main heating furnace body and said pair of auxiliary heating furnace bodies cooperate to form a heating furnace confining said tubular reactor (1) therein.

**5,498,293**

**CLEANING WAFER SUBSTRATES OF METAL CONTAMINATION WHILE MAINTAINING WAFER SMOOTHNESS**

**Joseph M. Ilardi, Sparta, and George Schwartzkopf, Franklin Township, both of N.J., assignors to Mallinckrodt Baker, Inc., Phillipsburg, N.J.**

**Filed Jun. 23, 1994, Ser. No. 264,858**
**Int. Cl.[6] C23G *1/02***
**U.S. Cl. 134—3** **18 Claims**

1. A process for cleaning a microelectronics wafer substrate surface to remove metal contamination and obtain an essentially oxide-free wafer surface while maintaining wafer smoothness without requiring an acid treatment step to remove oxides from the wafer substrate surface, said process comprising contacting the wafer substrate surface with an alkaline cleaning solution for a time and at a temperature sufficient to clean the wafer substrate surface, said cleaning composition comprising an aqueous, metal ion-free base and an amphoteric surfactant.

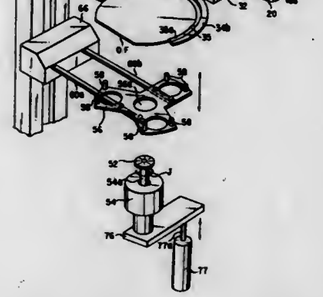
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**5,498,294**

**APPARATUS AND METHOD FOR WASHING SUBSTRATES**

**Michiaki Matsushita, Yatsushiro, and Yutaka Yamashira, Kumamoto, both of, Japan, assignors to Tokyo Electron Limited, and Tokyo Electron Kyushu Limited, both of, Japan**

**Filed Nov. 19, 1993, Ser. No. 154,964**
**Claims priority, application Japan, Nov. 20, 1992, 4-335414**
**Int. Cl.[6] B08B *7/04*; *11/00***
**U.S. Cl. 134—6** **10 Claims**



1. An apparatus for washing a substrate, comprising:
- scrubber means for scrubbing a single surface of the substrate;
- a first unit having the scrubber means disposed therein;
- turning means, having a horizontal holding shaft for holding a substrate substantially horizontal, for turning the substrate about the horizontal holding shaft to cause front and back surfaces of the substrate to face upward alternately;
- a second unit having the turning means disposed therein;
- carrier means for carrying the substrate between the first and second units; and
- a stage for mounting a substrate thereon, the stage being movable in a vertical direction within the second unit, thus enabling the substrate to be transferred between the carrier means and the turning means via the stage, wherein the front surface of the substrate is scrubbed by the scrubber means, the substrate is carried by the carrier means from the first unit to the second unit, the substrate is turned upside down by the turning means, the substrate is carried by the carrier means from the second unit to the first unit, and the back surface of the substrate is then scrubbed by the scrubber means.

### 5,498,295
### CLEANING METHODS AND COMPOSITIONS FOR PRODUCE

**Bruce P. Murch, Cincinnati; Brian J. Roselle, Fairfield, and Kyle D. Jones, West Chester, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio**

**Continuation-in-part of Ser. No. 146,663, Nov. 1, 1993, abandoned, and a continuation-in-part of Ser. No. 224,937, Apr. 8, 1994, abandoned. This application Jul. 5, 1994, Ser. No. 270,706**

**Int. Cl.[6] B08B** *9/20*

**U.S. Cl. 134—16** **13 Claims**

1. A concentrated, alkaline cleaning method for cleaning surfaces of produce having soils and other unwanted residues clinging thereto, comprising (1) contacting the surfaces of said produce with a cleaning solution containing from about 0.5% to about 15% detergent surfactant, said cleaning solution having a pH of from 9.5 to about 12.5, and (2) rinsing, wiping off, or rinsing and wiping off said solution to remove said soils and said unwanted residues from the surfaces of said produce.

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### 5,498,296
### THERMOCOUPLE

**Kazuo Sawada; Shinji Inazawa, and Kouichi Yamada, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan**

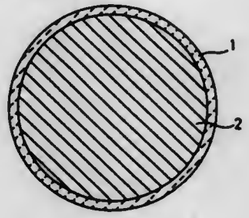
**PCT No. PCT/JP91/01057, § 371 Date Apr. 7, 1992, § 102(e) Date Apr. 7, 1992, PCT Pub. No. WO92/02960, PCT Pub. Date Feb. 20, 1992**

**Continuation-in-part of Ser. No. 839,754, Apr. 7, 1992, abandoned. This PCT application Aug. 7, 1991, Ser. No. 325,536**

**Claims priority, application Japan, Aug. 9, 1990, 2-213366; Jul. 22, 1991, 3-181096; Jul. 23, 1991, 3-182604**

**Int. Cl.[6] H01L** *35/12*

**U.S. Cl. 136—236.1** **13 Claims**




1. A thermocouple comprising a thermocouple element having an oxidized surface, and comprising an insulating layer arranged in contact with said oxidized surface, wherein said insulating layer consists of at least one metal oxide selected from the group consisting of silicon oxide, aluminum oxide, zirconium oxide and magnesium oxide, and trace amounts of impurities, wherein said thermocouple element consists of a material having a lower melting temperature than does said insulating layer, and wherein said insulating layer has a thickness of from 2 μm to about 10 μm and maintains electrical insulability even when said thermocouple element together with said insulating layer is bent with a diameter of curvature from 1 mm to 100 mm.

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### 5,498,297
### PHOTOVOLTAIC RECEIVER

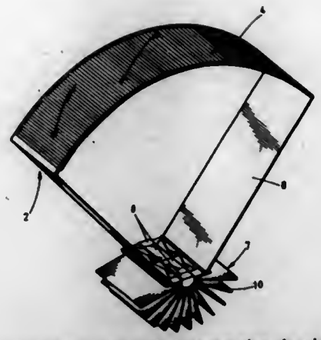
**Mark J. O'Neill, and Almus J. McDanal, both of Keller, Tex., assignors to Entech, Inc., Airport, Tex.**

**Filed Sep. 15, 1994, Ser. No. 306,773**

**Int. Cl.[6] H01L** *31/052;31/18*

**U.S. Cl. 136—246** **22 Claims**

1. A photovoltaic receiver comprising:




one or more photovoltaic cells for generating electrical power in response to electromagnetic radiation, where said cells each define a from surface and a back surface, where said cells are adapted to be coupled to an electrical load by means of electrical conductors;

one or more bypass diodes coupled to said cells and said conductors, the combination forming a cell package;

a transparent front cover having a predetermined refractive index and having from and back surfaces, where said from cover is positioned over said cells;

said photovoltaic cells being secured at their back surfaces to a heat sink via the use of a dielectric film layer provided with an adhesive on both its upper and lower surfaces, where the photovoltaic cells define a shorter width and length relative to said film layer such that the application of said cells to said layer defines an exposed adhesive border around said cells; and

a second dielectric film layer of a size similar to that of said first layer, where said top layer is positioned over said cell package and said front cover and secured to said first layer so as to encapsulate said cells from moisture.

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### 5,498,298
### METHOD FOR PREPARING A STRUCTURE HAVING ENHANCED MAGNETORESISTANCE, AND USE OF THE STRUCTURE

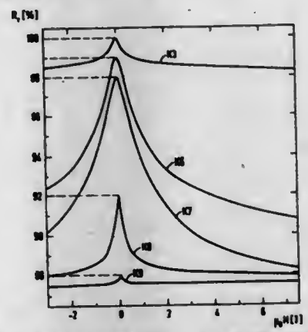
**Joachim Wecker, and Rittmar Von Helmolt, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, München, Germany**

**Continuation of Ser. No. 129,218, Sep. 29, 1993, abandoned. This application Apr. 27, 1995, Ser. No. 430,118**

**Claims priority, application Germany, Sep. 29, 1992, 42 32 682.6; Apr. 7, 1993, 42 11 516.0**

**Int. Cl.[6] H01F** *41/02*

**U.S. Cl. 148—105** **20 Claims**




1. A process for preparing a Cu—Co granular structure having enhanced magnetoresistance, comprising steps of:

initially forming a melt containing Cu and Co components having very small mutual solubility, and then forming an intermediate of the structure by means of a rapid-solidification technique on said initially formed melt, said intermediate containing an alloy having Cu mixed crystals supersaturated with Co; and

converting of the formed intermediate by means of a heat treatment into an end product of the granular structure having enhanced magnetoresistance, the end product of the granular structure having precipitates of or including Co in a Cu matrix.



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### 5,498,299
### PROCESS FOR AVOIDING SURFACE OXIDATION IN THE CARBURIZATION OF STEELS

**Hans-Peter Schmidt, Mettmann, Germany, assignor to Messer Griesheim GmbH, Frankfurt, Germany**

**Filed Oct. 6, 1994, Ser. No. 319,166**

**Claims priority, application Germany, Jan. 9, 1994, 44 00 391.9**

**Int. Cl.[6] C21D** *9/00;1/74*

**U.S. Cl. 148—210** **11 Claims**

1. A process for avoiding internal oxidation in the carburization of steels with alloy elements under a carbon-containing gas mixture at the carburization temperature at atmospheric pressure, which comprises heating the steels to the carburization temperature under a hydrogen containing gas selected from the group consisting of a nitrogen/hydrogen gas mixture and a pure hydrogen gas, and carburizing with a hydrogen/hydrocarbon-containing gas mixture having an oxygen activity smaller than that required for the formation of manganese (II) oxide or chromium (III) oxide by controlling the amount of oxygen containing molecules, whereby the hydrogen/hydrocarbon-containing gas mixture makes available carbon which diffuses into the steel.

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### 5,498,300
### COMPOSITION AND PROCESS FOR TREATING TINPLATE

**Tomoyuki Aoki, and Masayuki Yoshida, both of Kanagawa, Japan, assignors to Henkel Corporation, Plymouth Meeting, Pa.**

**PCT No. PCT/US93/11435, § 371 Date Jun. 9, 1995, § 102(e) Date Jun. 9, 1995, PCT Pub. No. WO94/13855, PCT Pub. Date Jun. 23, 1994**

**PCT Filed Dec. 1, 1993, Ser. No. 454,205**

**Claims priority, application Japan, Dec. 9, 1992, 4-351518**

**Int. Cl.[6] C23C** *22/10;22/23*

**U.S. Cl. 148—261** **20 Claims**

1. An aqueous liquid composition suitable for treating tinplate surfaces, said composition having a pH in the range from 2.0 to 4.5 and an oxidation- reduction potential not greater than 450 mV more oxidizing than a silver-saturated silver chloride reference electrode, and consisting essentially of water and:

(A) from 1 to 30 g/L of phosphate ions,

(B) from 0.1 to 5.0 g/L of chelating agent, and

(C) from 0.01 to 2.0 g/L of tin ions.

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### 5,498,301
### AGENT FOR TREATING SURFACES OF COPPER AND COPPER ALLOYS

**Hirohiko Hirao; Yoshimasa Kikukawa; Toshihiro Okamoto; Takayuki Murai; Seiji Sogabe; Miya Tanioka; Rie Nakayama, and Takashi Yoshioka, all of Marugame, Japan, assignors to Shikoku Chemicals Corporation, Marugame, Japan**

**Filed May 9, 1994, Ser. No. 239,557**

**Claims priority, application Japan, May 10, 1993, 5-132998; Mar. 8, 1994, 6-065502**

**Int. Cl.[6] C23C** *22/06*

**U.S. Cl. 148—269** **9 Claims**

1. A composition for forming a chemical layer on surfaces of copper and copper alloys consisting essentially of from 0.01 to 5% by weight of a 2-arylimidazole compound selected from the group consisting of 2,4-diphenylimidazole, 2,4-diphenyl-5 -methylimidazole and 2-phenyl-4-benzyl-5-methylimidazole, 1 to 20% by weight of an aliphatic carboxylic acid having not more than 4 carbon atoms, 0.01 to 10% by weight of a copper compound effective for increasing the rate of forming said chemical layer on the copper or copper alloy, up to 10% by weight of a zinc compound effective for improving the heat resistance of said chemical layer, a pH stabilizing effective amount of ammonia or an amine compound, and an aqueous solvent consisting essentially of water.

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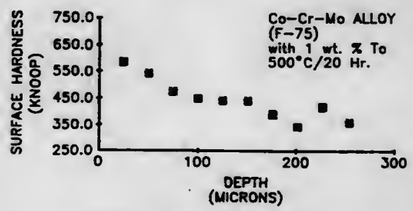
### 5,498,302
### SURFACE HARDENED BIOCOMPATIBLE METALLIC MEDICAL IMPLANTS

**James A. Davidson, Germantown, Tenn., assignor to Smith & Nephew Richards, Inc., Memphis, Tenn.**

**Division of Ser. No. 120,287, Sep. 13, 1993, Pat. No. 5,415,704, which is a continuation of Ser. No. 832,735, Feb. 7, 1992, abandoned. This application Nov. 9, 1994, Ser. No. 337,665**

**Int. Cl.[6] C23C** *8/24*

**U.S. Cl. 148—317** **6 Claims**




1. A surface hardened metallic medical implant, the implant comprising:

a surface hardened metallic alloy implant body with surface hardness greater than about 40 Rockwell C, the hardened surface produced by a process comprising:

(i) selecting a metallic alloy containing less than about 2 wt. % of a metal solute different from and more readily nitridable than other elements of the metallic alloy implant body;

(ii) hardening the surface of the implant body by internal nitridation of a substantial proportion of the more readily nitridable solute at the surface of the implant while maintaining a metallic luster on the surface of the implant.

5,498,303

## PROPELLANT FORMULATIONS BASED ON DINITRAMIDE SALTS AND ENERGETIC BINDERS

Carol J. Hinshaw, Ogden; Robert B. Wardle, Logan, and Tom K. Highsmith, North Ogden, all of Utah, assignors to Thiokol Corporation, Ogden, Utah

Filed Apr. 21, 1993, Ser. No. 52,035
Int. Cl.[6] C06B 45/10
U.S. Cl. 149—19.6 9 Claims

1. A composite propellant formulation which does not contain chlorine comprising:

poly(glycidyl nitrate) binder having a concentration in the propellant formulation in the range from about 10% to about 35% by weight;

a dinitramide salt oxidizer in the range from about 50% to about 70% by weight;

a reactive metal selected from aluminum, magnesium aluminum-magnesium alloys, and boron, said reactive metal having a concentration in the propellant formulation in the range from about 2% to about 25% by weight; and

a polyfunctional curative.

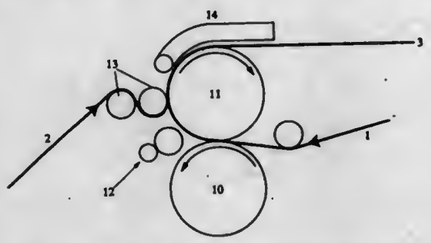
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5,498,304

## METHOD OF MANUFACTURING CORRUGATED BOARD USING A THERMAL RADIANT ENERGY SOURCE

Neil W. Shaw, Ivanhoe; Zsolt V. Padanyi, Nunawading, and Frederick J. Mutimer, Lower Plenty, all of, Australia, assignors to Amcor Ltd., South Melbourne, Australia

PCT No. PCT/AU92/00439, § 371 Date Feb. 4, 1994, § 102(e) Date Feb. 4, 1994, PCT Pub. No. WO93/03913, PCT Pub. Date Mar. 4, 1993
PCT Filed Aug. 18, 1992, Ser. No. 190,146
Claims priority, application Australia, Aug. 19, 1991, PK 7849; Dec. 10, 1991, PK 9949
Int. Cl.[6] B31F 1/24; B32B 31/26
U.S. Cl. 156—210 9 Claims



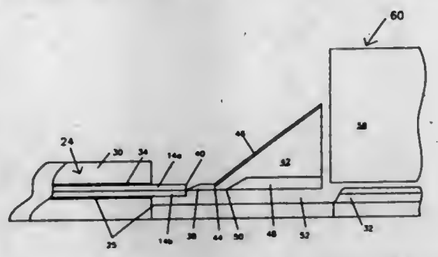

1. A method of forming a corrugated paperboard laminate in which at least one paperboard liner is applied to a corrugated paperboard medium, consisting essentially of applying an adhesive to at least said liner and said corrugated paperboard medium wherein said adhesive and paperboard have a low absorption coefficient for thermal radiant energy ranging from 1100° to 2300° C. and emitting a dominant wavelength between 2.1 and 1.0 microns, bringing together said liner and said corrugated paperboard medium, exposing said liner and said corrugated paperboard medium to a thermal radiant energy source ranging from 1100° to 2300° C. and emitting a dominant wavelength between 2.1 and 1.0 microns to render the adhesive effective, whereby the speed of bond development between said corrugated paperboard medium and said liner is improved and bonding is achieved at low mechanical pressure.

5,498,305

## APPARATUS AND PROCESS FOR SEPARATION OF LAMINAE

Dennis R. Mailloux, Westminster, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 158,644, Nov. 29, 1993, Pat. No. 5,466,324. This application Jun. 1, 1995, Ser. No. 456,688
Int. Cl.[6] B32B 31/00
U.S. Cl. 156—249 8 Claims




1. A process for preparing a series of pouches capable of being used as the outer layers of identification devices, the process comprising:

providing a first sheet of material, at least part of this first sheet being substantially transparent;

superposing a second sheet of material on the first sheet of material;

securing the first and second sheets together at at least one point;

severing the first and second sheets along a periphery to form at least one pouch blank, said pouch blank comprising a portion of the first sheet, at least part of this portion being transparent, a portion of the second sheet of substantially the same size and shape as the portion of the first sheet, and at least one point at which the first and second sheets are joined together, this point lying adjacent a first edge of the pouch blank, the portions of the first and second sheets in the pouch blank adhering to each other along at least a second edge of the blank;

providing a channel member having walls defining a channel having a thickness not substantially greater than the thickness of the pouch blank, the channel having an outlet opening at one end;

providing cutter means adjacent the outlet opening; and

providing wedge means disposed adjacent the cutter means on the opposed side thereof from the outlet opening, the cross-section of the wedge means increasing with distance from the cutter means;

impelling the pouch blanks in succession through the channel, through the outlet opening, past the cutter means and over the wedge means, the cutter means contacting the second edge of the pouch blank adjacent the line of adhesion between the portions of the first and second sheets thereof, thereby separating the portions of the first and second sheets from each other and causing the separated portions to pass on opposed sides of the wedge means, thereby causing the separation between the separated portions to increase as they pass the wedge means;

after each pouch blank has passed the wedge means, contacting the edge of the portion of the first sheet remote from the first edge thereof with a first guide means, while the edge of the portion of the second sheet remote from the secured edge thereof contacts a second guide means, the first and second guide means holding the first and second laminae at an angle of at least about 30° to each other; and

while the portions of the first and second sheets are in contact with the first and second guide means respectively, printing, on at least one of the faces of the portions of the first and second sheets which were in contact prior to the severing of the first and second sheets, an identifying indicium, a different indicium being printed on each of the pouch blanks.

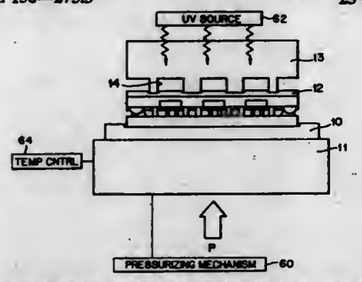


5,498,306

## METHOD AND APPARATUS FOR MANUFACTURING INK JET RECORDING HEAD

Makoto Shibata, and Hitoshi Itoh, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 868,646, Apr. 15, 1992, abandoned. This application Jul. 19, 1994, Ser. No. 275,743
Claims priority, application Japan, Apr. 16, 1991, 3-109536
Int. Cl.[6] B32B 31/04;31/20;31/28;35/00
U.S. Cl. 156—275.3 23 Claims




1. A manufacturing method for an ink jet head, said method comprising the steps of:

providing a pattern for forming a wall of a flow passage communicating with a discharge opening for discharging ink therefrom and a wall of a common chamber communicating with the flow passage, on a substrate provided with an energy generating member for generating energy used for discharging the ink;

bonding a ceiling plate to the pattern formed on the substrate via an ultraviolet ray curable adhesive agent; and

exposing and curing the ultraviolet ray curable adhesive while pressing the ceiling plate toward the substrate except for a portion of the ceiling plate located above the common chamber.

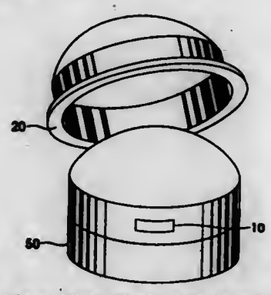
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5,498,307

## IN-MOLD LABELING USING AN ADHESIVE

John D. Stevenson, 96 Charleston Park, Conroe, Tex. 77302

Filed Aug. 30, 1994, Ser. No. 298,381
Int. Cl.[6] B29C 45/14
U.S. Cl. 156—277 4 Claims




1. A method for molding a plastic part in a mold having a mold cavity, the mold cavity having an interior surface, the plastic part made from a specific plastic material, the method comprising

forming a pattern structure by applying indicia to a first layer made from the specific plastic material and then applying a clear second layer made from the specific plastic material over the indicia and over the first layer, and then bonding the first layer to the second layer,

applying the pattern structure to the interior surface of the mold cavity,

charging the mold cavity with an amount of the specific plastic material,

heating the pattern structure and the amount of specific plastic material in the mold cavity and disbursing the amount of specific plastic material therein to render the amount of specific plastic material molten to form a shape of the plastic part,

allowing the part to cool,

removing the part from the mold cavity with the pattern structure therein as an integral part thereof,

applying adhesive to a portion of the interior of the mold cavity onto which the pattern structure is applied to hold the pattern structure in place, and

the adhesive comprising a mixture of vegetable oil and micronized plastic pellets ranging in size between about 10 microns to about 100 microns.

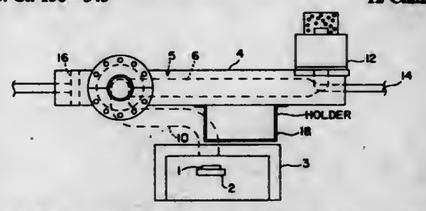
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5,498,308

## PLASMA ASHER WITH MICROWAVE TRAP

Mohammad Kamarehi, No. Potomac, and James E. Simpson, Gaithersburg, both of Md., assignors to Fusion Systems Corp., Rockville, Md.

Filed Feb. 25, 1994, Ser. No. 202,187
Int. Cl.[6] H05H 1/00
U.S. Cl. 156—345 12 Claims




1. An asher for stripping a photoresist from a substrate, comprising,

means for holding said substrate which bears said photoresist,

a microwave enclosure,

means for providing microwave energy to said microwave enclosure,

a plasma tube running through said microwave enclosure and exiting said enclosure through an opening, said tube thereafter extending to a region near said photoresist to be stripped,

means for feeding excitable gas through said plasma tube, and

a microwave trap located outside said microwave enclosure proximate said opening through which said plasma tube exits for trapping microwave energy which has escaped through said opening, wherein said microwave trap comprises a resonant circuit.

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5,498,309

## APPARATUS FOR CONTINUOUSLY PRODUCING PLATES HAVING A STRUCTURED SURFACE

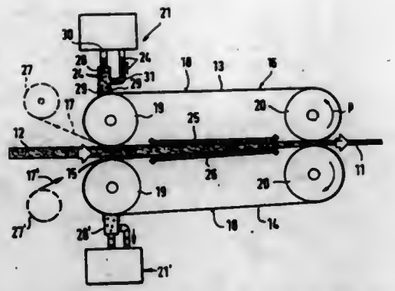
Berndt Greten; Günter Seeger, and Klaus Poppelreuter, all of Springe, Germany, assignors to Bison-Werke Baehre & Greten GmbH & Co. KG, Springe, Germany

Division of Ser. No. 987,478, Dec. 7, 1992, Pat. No. 5,322,577. This application Apr. 28, 1994, Ser. No. 234,898
Claims priority, application Germany, Dec. 12, 1991, 41 40 982.5; Aug. 8, 1992, 42 27 224.6; Sep. 2, 1992, 42 29 284.0
Int. Cl.[6] B30B 5/04
U.S. Cl. 156—347 15 Claims

1. Pressing apparatus for embossing an untextured mat of lignocellulose and/or cellulose bound with a binding agent to produce a particle board with a structured surface, the apparatus comprising;

a continuously operating band press having at least one endless metallic press band and a pressing gap;

means for heating at least one endless metallic press band during pressing by said endless metallic press band on said mat while said continuously operating band press operates;



means for feeding said mat together with at least one resin impregnated paper web contacting at least one face of said mat through said pressing gap of said continuously operating band press;

said endless metallic press band having an irregular surface confronting said at least one resin impregnated paper web and said irregular surface having been formed by its having been blasted with glass beads: and,

a glass sphere blasting device mounted to direct glass spheres on said irregular surface of said at least one endless metallic press band.

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**5,498,310**

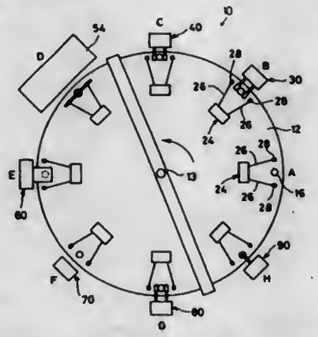
**APPLICATION SYSTEM FOR APPLICATION STRIP ATTACHED CONDOMS**

**Taiji Nishizono, Kuki, Japan, assignor to K. K. Chibaminato Shoji, Chiba, Japan**

**Filed Jul. 15, 1994, Ser. No. 276,175**

**Int. Cl.[6] B65B *61/14*; A61F *6/04***

**U.S. Cl. 156—513** **20 Claims**



1. An apparatus for manufacturing condom assemblies including a rolled condom and application strips entwined within the condom, the apparatus comprising:

a rotatable turntable indexed to stop at a plurality of predetermined stations for a predetermined time interval;

a vertically extending mandrel attached to the turntable and adapted to receive on a distal end thereof a rolled condom;

manipulating means attached to the turntable at a position radially inward from and corresponding to the mandrel;

unrolling means for unrolling the rolled condom over the mandrel and thereby defining a first end portion having a semen-storing receptacle and a cylindrical condom portion;

application strip fabricating means for forming the application strip by cutting a tape, the application strip having two distal ends and a central portion having a slit, and cooperating with the manipulating means for placing the application strip on the first end portion of the condom;

pressing means for pressing the strip onto the first end of the condom and for forcing the semen-storing receptacle of the condom to protrude through the slit of the application strip;

application strip pressing means for attaching the distal ends of the strip to opposite sides of the cylindrical portion of the condom;

rolling means for rolling the cylindrical portion of the condom and for entwining the distal ends of the application strip therein; and

removing means for removing the rolled condom and application strip assembly from the mandrel.

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**5,498,311**

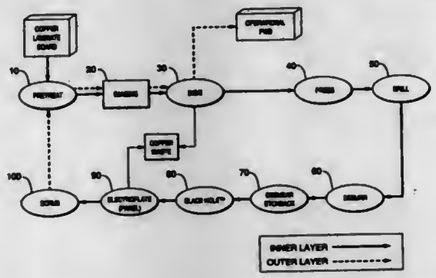
**PROCESS FOR MANUFACTURE OF PRINTED CIRCUIT BOARDS**

**David L. Durgin; Robert J. Malins, and Richard T. Hoke, all of Albuquerque, N.M., assignors to Quatro Corporation, Albuquerque, N.M.**

**Filed Jan. 15, 1994, Ser. No. 260,746**

**Int. Cl.[6] B44C *1/22*; C23F *1/00*; B29C *37/00***

**U.S. Cl. 216—20** **16 Claims**




1. A method of making printed wiring boards comprising the steps of:

initiating the process with a copper laminated board that has been coated with an organic surface protectant;

imaging said board by applying a photoresist and by photographically exposing said board;

developing, etching, and stripping said board;

adding at least one copper laminated board to said board to form a layered circuit board;

pressing said layered circuit board together;

drilling holes at locations in said layered circuit board;

deburring the drilled holes by mechanical means to remove copper particulate;

preforming a desmear/etchback process by means of a plasma desmear/etchback process;

covering exposed surfaces of said circuit board with a non-metallic less resistive/more conductive material;

panel plating said circuit board, copper surfaces and said surfaces which are covered with the non-metallic less resistive/more conductive material;

pre-treating said panel plated circuit board by abrading the copper surfaces of said panel plated boards;

imaging said panel plated board by applying a photoresist and by photographically exposing said board; and

developing, etching, and stripping of said panel plated board.



**5,498,312**

**METHOD FOR ANISOTROPIC PLASMA ETCHING OF SUBSTRATES**

**Franz Laermer, Stuttgart, and Andrea Schilp, Schwaebisch Gmuend, both of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany**

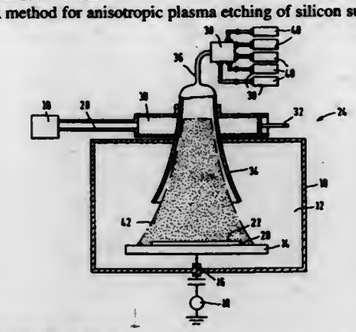
**Filed May 17, 1994, Ser. No. 243,783**

**Claims priority, application Germany, May 27, 1993, 43 17 623.2**

**Int. Cl.[6] H01L *21/00*; H05H *1/00***

**U.S. Cl. 156—643.1** **10 Claims**

1. A method for anisotropic plasma etching of silicon substrates,



comprising the steps of:

a. positioning a substrate having a surface to be depleted by etching within a processing chamber and in communication with an electrode;

b. introducing a gas mixture comprised of an etching gas and a passivating gas into the processing chamber, which gas mixture is essentially free of chlorine, bromine and iodine, which etching gas comprises at least one fluorine or fluorine compound, and which passivating gas comprises at least one polymer-generating monomer;

c. exciting the gas mixture with electromagnetic radiation effective to produce a plasma containing ions and having a plasma density of at least $10^{12}$ ions/cm$^3$; and

d. applying a voltage to one of the substrate or the electrode to accelerate the ions toward the substrate and provide the ions with an energy ranging from about 1 to about 40 eV when the ions impinge on the surface of the substrate.

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**5,498,313**

**SYMMETRICAL ETCHING RING WITH GAS CONTROL**

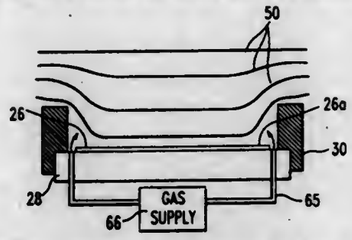
**Michael E. Bailey, Northfield; Dinh Dang, Essex Junction; James G. Michael, Burlington; Timothy E. Neary; Paul W. Pastel, both of Essex Junction; Sylvia R. R. Tousley, South Burlington, and Arthur C. Winslow, Essex Junction, all of Vt., assignors to International Business Machines Corp., Armonk, N.Y.**

**Continuation-in-part of Ser. No. 109,793, Aug. 20, 1993. This application Nov. 3, 1993, Ser. No. 147,653**

**Int. Cl.[6] H01L *21/00***

**U.S. Cl. 156—643.1** **3 Claims**

1. A method of altering the electric field lines impinging on a




workpiece in a plasma etch tool, comprising the steps of:

mounting a circular pedestal, of a selected diameter, on an electrode in said tool;

supporting a wafer with a periphery to be etched on said pedestal;

mounting an annulus made from an electrically insulative material on the pedestal and around the wafer to cause all the electric field lines between the plasma and the wafer to be substantially perpendicular to the wafer surface and to control the direction of the ions extracted from the plasma such that features formed in all regions of the wafer by the ions are substantially symmetrical around an axis extending perpendicular to the surface of the wafer at the center of the feature;

introducing a selection of gases into said tool and forming a plasma from said gases; and

introducing a constituent gas of said selection of gases around the periphery of the wafer adjacent said annulus to compensate for any depletion of said constituent gas adjacent to and within said annulus.

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**5,498,314**

**PROCESS FOR MAKING A PAPER BASED PRODUCT CONTAINING A BINDER**

**Homan B. Kinsley, Jr., Powhatan, Va., assignor to CPG Holdings Inc., Richmond, Va.**

**Continuation-in-part of Ser. No. 833,165, Feb. 10, 1992, Pat. No. 5,328,567. This application Aug. 9, 1993, Ser. No. 103,134**

**Int. Cl.[6] D21H *17/10***

**U.S. Cl. 162—158** **33 Claims**

1. A process for making a paper based product which comprises

(i) preparing a slurry comprised of a cellulosic pulp, a peel strength enhancing amount of a particulate binder sticky at the temperature of drying, and an emulsion comprised of lecithin and a $C_8$ to $C_{20}$ fatty acid or derivative thereof, with the amount of lecithin being sufficient to provide a stable emulsion with the fatty acid or derivative thereof;

(ii) draining the liquid from the slurry to form a web; and

(iii) drying the web.

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**5,498,315**

**METHOD OF MODIFYING THE OPACITY OF PAPER AND PAPER PRODUCED THEREBY**

**Louis R. Dragner, and Bernard F. North, both of Rock Hill, S.C., assignors to Sequa Chemicals, Inc., Chester, S.C.**

**Division of Ser. No. 265,402, Jun. 24, 1994. This application May 12, 1995, Ser. No. 439,950**

**Int. Cl.[6] D21H *17/07;17/00;17/21***

**U.S. Cl. 162—164.6** **13 Claims**

1. A method of producing a paper with enhanced opacity comprising the steps of:

providing a pulp slurry of cellulose fibers;

adding to said slurry a composition wherein said composition comprises the reaction products formed from the reaction of a dimerized acid and an alkanol amine and wherein said composition further includes a surfactant; and

forming said slurry into said paper.

**5,498,316**

## TWIN WIRE FORMER FOR A PAPER MAKING MACHINE

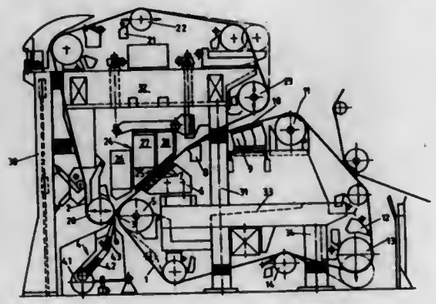
Wilfried Kraft, Heidenheim, Germany, assignor to J. M. Voith GmbH, Germany

Continuation of Ser. No. 889,677, May 28, 1992, Pat. No. 5,300,196. This application Jan. 25, 1994, Ser. No. 186,325

Claims priority, application Germany, May 29, 1991, 41 17 597.2

Int. Cl.[6] D21F *1/00*

U.S. Cl. 162—301 18 Claims



1. A twin wire former for a paper making machine including:

a support frame;

lower wire support means supported on the frame, and an endless loop lower wire supported on the lower wire support means for movement along a path that defines a lower loop;

upper wire support means supported on the frame, and an endless loop upper wire supported on the upper wire support means for movement along a path that defines an upper loop;

the lower wire support means including a forming roll disposed in the lower loop and the upper wire support means including a breast roll disposed in the upper loop;

the upper and lower wire support means being operatively positioned and cooperating to form a generally wedge shaped entrance slot for pulp suspension between upwardly moving portions of both the lower and upper wires, and said entrance slot extending upstream from the breast and forming rolls;

a headbox for supplying a pulp suspension to said entrance slot;

the lower and upper wire support means being operatively positioned and cooperating to define a forming zone between the lower and upper wires, said forming zone extending downstream from the entrance slot, and the upper and lower wire support means directing the wires to separate downstream of the forming zone;

an upper water removal device including a suction portion in said upper loop to receive water from said upper wire as it moves through said forming zone;

a lower water removal device in said lower loop to receive water from said lower wire as it moves through said forming zone;

said lower water removal device being in proximity to said forming roll and downstream thereof, without any portions of said lower support means being interposed between said lower water removal device and said forming roller;

said frame including an inverted U-shaped portion that defines an area;

said headbox being disposed within said area and said forming zone being located in a central region of said area.

**5,498,317**

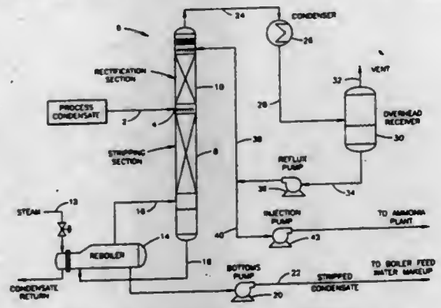
## APPARATUS FOR TREATING CHEMICAL PRODUCTION PLANT PROCESS CONDENSATE

Allan D. Holliday, Overland Park, Kans., assignor to Farmland Industries, Inc., Kansas City, Mo.

Division of Ser. No. 116,863, Sep. 3, 1993, Pat. No. 5,385,646. This application Oct. 17, 1994, Ser. No. 323,855

Int. Cl.[6] B01D *3/26;* B01J *8/00*

U.S. Cl. 202—154 34 Claims




1. An apparatus for treating the process condensate of an ammonia or methanol chemical production plant, said apparatus comprising:

a stripping section having a top and a closed bottom;

a feed supply line from said chemical production plant to said stripping section;

a stripping vapor delivery line for delivering stripping vapor to the bottom of the stripping section;

a stripping bottoms removal line for removing bottoms liquid from said bottom of said stripping section;

a rectification section having a closed top and a bottom in fluid flow contact with said stripping section;

a condenser;

a rectification overhead withdraw line from said rectification section to said condenser;

a reflux line from said condenser to said rectification section; and

a concentrated condensate removal line from said reflux line to a reformer within said chemical production plant.

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**5,498,318**

## REACTION-DISTILLATION APPARATUS AND ITS USE

Jacques Alagy, Charbonnieres; Alain Forestiere, Vernaison; Jean-Francois Le Page, Rueil Malmaison; Marie-Claire Marion, Villeurbanne, and Jean-Charles Viltard, Marly Le Roi, all of, France, assignors to Institut Francais du Petrole, Rueil Malmaison, France

Division of Ser. No. 848,584, Mar. 9, 1992, Pat. No. 5,236,663. This application Aug. 2, 1993, Ser. No. 100,801

Claims priority, application France, Mar. 8, 1991, 91 02938; Apr. 12, 1991, 91 04611

Int. Cl.[6] B01D *3/14*

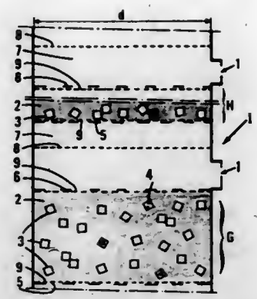
U.S. Cl. 203—29 14 Claims

1. In a method of reacting at least one olefin having 3–8 C atoms with at least one alcohol having 1–6 C atoms and concomitantly fractionating the reaction mixture to obtain at least one ether product, the improvement comprising:

introducing said at least one olefin and said at least one alcohol into at least one reaction-distillation zone containing at least one bed of solid elements disposed on a fluid-permeable, perforated support having perforations sufficiently small to retain said solid elements, passing a gas and a liquid through said at least one bed of solid elements and through said support,

said bed of solid elements comprising loose solid catalytic particles and a plurality of receptacles having external jackets





permeable to fluids and impermeable to said solid catalytic particles whereby said receptacles cause disruption of said gas and said liquid passing through said at least one bed,

said receptacles having sufficient mechanical properties to withstand the load of said loose solid catalytic particles, and

1–100% of said receptacles containing at least one distillation packing body, concomitantly reacting said at least one olefin and said at least one alcohol, fractionating said reaction mixture at a reflux ratio relative to distillate of 0.1:1–20:1, a temperature of 10°–200° C., and a pressure of 100–3000 kPa, and continuously recovering at least one ether product.

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**5,498,319**

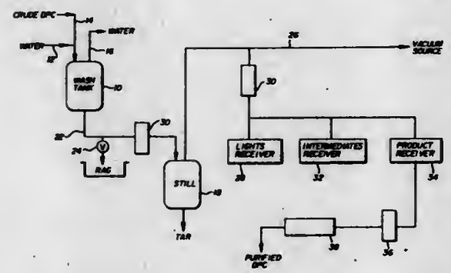
## PROCESS FOR PURIFYING DIARYL CARBONATES

Robert B. Ehlinger, Waterford, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Jun. 29, 1993, Ser. No. 84,647

Int. Cl.[6] B01D *3/14;* C07C *69/96*

U.S. Cl. 203—39 8 Claims




1. A process for the purification of diphenyl carbonate contaminated with compounds affecting color or reactivity of the carbonate in polymerizations, which comprises;

1) washing a molten form of the diphenyl carbonate a plurality of times, with water at a temperature to maintain the molten form; and

2) fractionally distilling the washed diphenyl carbonate so as to separate from the washed diphenyl carbonate,

(a) a first, phenol cut;

(b) a second, partially purified diphenyl carbonate cut; and

(c) a third, purified dipbenyl carbonate cut.

**5,498,320**

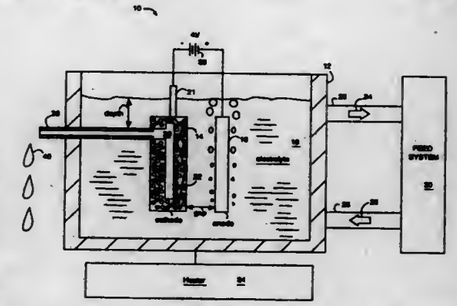
## METHOD AND APPARATUS FOR ELECTROLYTIC REDUCTION OF FINE-PARTICLE ALUMINA WITH POROUS-CATHODE CELLS

John S. Rendall, Albuquerque, N.M., assignor to Solv-Ex Corporation, Albuquerque, N.M.

Filed Dec. 15, 1994, Ser. No. 356,149

Int. Cl.[6] C25C *3/06;3/14;3/08*

U.S. Cl. 205—385 15 Claims




11. A method of smelting aluminum by electrolysis in a cell comprises:

combining into a mixture, a basic double salt of $KAlSO_4$ with a first eutectic electrolyte that is molten at 590° C.;

heating said mixture at 800° C. for twenty minutes to produce an out-gas of $SO_3$ and a liquid second electrolyte of $K_2SO_4$ with fine-particles of $Al_2O_3$ in suspension having a mean size of six to eight microns;

feeding said second electrolyte of $K_2SO_4$ with said $Al_2O_3$ to a cell with an anode and a porous cathode of open-cell ceramic foam material and that is maintained at 660° C. with four volts of electricity applied between said anode and said cathode, wherein oxygen bubbles at said anode and liquid aluminum forms in said porous cathode; and

channeling said liquid aluminum within the porous cathode, and setting said porous cathode itself, deep enough within said cell electrolyte that a pressure head of electrolyte is provided to overcome a difference in density between said liquid aluminum and said electrolyte to pump molten aluminum from said channel out of the side of said cell.

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**5,498,321**

## ELECTROLYSIS CELL DIAPHRAGM RECLAMATION

Mark L. Arnold, Chagrin Falls; James R. Brannan, Perry; Richard A. Kus, and Richard L. Romine, both of Concord, all of Ohio, assignors to Oxytech Systems, Inc., Chardon, Ohio

Filed Jul. 28, 1994, Ser. No. 281,723

Int. Cl.[6] C25B *15/00;11/20;* C23G *1/02;* B08B *3/00*

U.S. Cl. 205—525 34 Claims

20. The method of restoring a used cathode-plus-diaphragm assembly of a chlor-alkali cell, which assembly contains a cathode coated with a synthetic diaphragm separator and which restoration provides for reduced hydrogen in chlorine gas evolved by the cell, which method comprises:

(A) removing from service said cathode-plus-diaphragm assembly without separating the cathode from the diaphragm;

(B) soaking said assembly for a time of at least about 5 minutes in a liquid soaking medium containing at least about 3 weight percent of HCl plus at least about 0.1 volume percent of corrosion inhibitor, by:

(i) immersing said assembly in said liquid soaking medium, and

(ii) flowing said liquid soaking medium through said diaphragm;

(C) separating said assembly from said solution and flushing the assembly with aqueous medium; and

(D) returning said assembly to service in said electrochemical cell.

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5,498,322

## ALUMINUM ALLOY CATHODE PLATE FOR ELECTROWINNING OF ZINC

Stephen C. Byrne, Monroeville, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Aug. 1, 1994, Ser. No. 283,597
Int. Cl.[6] C25C 1/16
U.S. Cl. 205—603 8 Claims

1. In a method of electrowinning zinc by electrolysis in an electrolyte containing sulfuric acid and zinc sulfate wherein zinc is recovered from an aluminum cathode plate wherein the improvement comprises providing said aluminum cathode plate as an alloy selected from the group consisting of:

(a) an alloy consisting essentially of, by weight, about 0.2 to 0.5% magnesium, 0.15% maximum silicon, 0.1% maximum iron, 0.05% maximum copper, and 0.05% maximum zinc, the balance substantially aluminum and incidental elements and impurities, said aluminum amounting to at least 99.1% of said aluminum alloy; or

(b) an alloy consisting essentially of, by weight, about 0.08 to 0.25% silicon, 0.1% maximum iron, 0.05% maximum copper, 0.05% maximum magnesium, 0.05% maximum zinc, the balance substantially aluminum and incidental elements and impurities, said aluminum being at least 99.5% of said alloy, said alloy having a minimum electrical conductivity of at least 57% IACS.

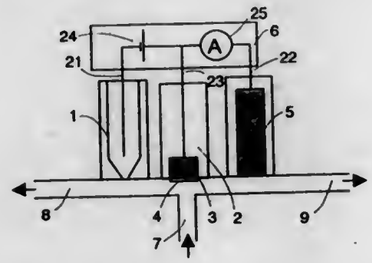
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5,498,323

## PROCEDURE AND APPARATUS FOR THE DETERMINATION OF CONCENTRATION OF AMMONIA, AND A PROCEDURE FOR THE MANUFACTURING OF A DETECTOR

Andrzej Lewenstam, Helsinki, Finland; Wojciech Matuszewski, and Marek Trojanowicz, both of Varsova, Poland, assignors to Kone Oy, Helsinki, Finland

Filed Feb. 7, 1994, Ser. No. 193,396
Claims priority, application Finland, Mar. 3, 1993, 930955
Int. Cl.[6] G01N 27/26
U.S. Cl. 205—780.5 5 Claims




1. A procedure for determination of a concentration of dissolved ammonia using a three-electrode system, the procedure comprising the steps of:

placing a polypyrrole electrode, a reference electrode and an auxiliary electrode in a liquid to be analyzed;

applying a potential between the polypyrrole electrode and the reference electrode;

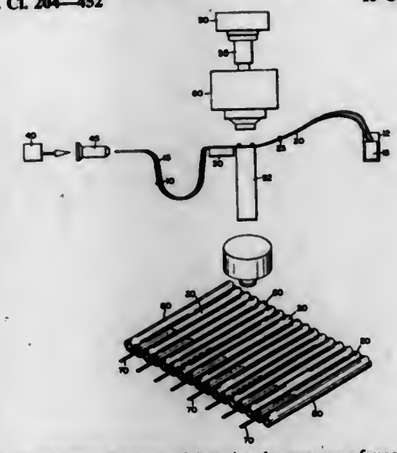
measuring a current flowing between the polypyrrole electrode and the auxiliary electrode as an indication of the concentration of dissolved ammonia in the liquid.

5,498,324

## MULTIPLEXED FLUORESCENCE DETECTOR SYSTEM FOR CAPILLARY ELECTROPHORESIS

Edward S. Yeung, Ames, and John A. Taylor, Nevada, both of Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Continuation of Ser. No. 13,960, Feb. 5, 1993, Pat. No. 5,324,401. This application Apr. 6, 1994, Ser. No. 223,864
Int. Cl.[6] G01N 27/26;27/447
U.S. Cl. 204—452 15 Claims




1. A multiplexed method of detecting the presence of macromolecules in samples present in a plurality of capillaries in capillary electrophoresis comprising:

(a) providing a buffer solution containing a fluorophore;

(b) introducing samples into a plurality of capillaries in a capillary electrophoresis system, each capillary containing the buffer; and

(c) substantially simultaneously irradiating the samples in the capillaries with coherent light to cause fluorescence.

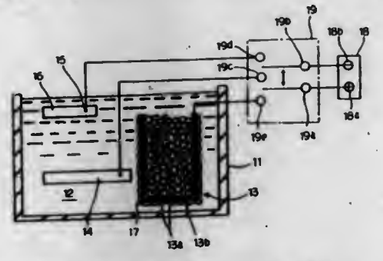
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5,498,325

## METHOD OF ELECTROPLATING

Seiya Nishimura; Yoshihisa Maejima, and Tokuyoshi Ohta, all of Shizuoka, Japan, assignors to Yamaha Corporation, Japan

Division of Ser. No. 192,425, Feb. 7, 1994, Pat. No. 5,441,620. This application Jan. 13, 1995, Ser. No. 372,552
Claims priority, application Japan, Feb. 10, 1993, 5-23046
Int. Cl.[6] C25D 21/06;21/12
U.S. Cl. 205—96 2 Claims




1. A method of electroplating comprising the steps of:

a) preparing an electrolysis vessel filled with an electrolyte containing an ionized substance, a soluble conductive member located in said electrolyte and containing a substance to be ionized, an insoluble conductive member spaced apart from said soluble conductive member in said electrolyte, and a cathode retaining a work in said electrolyte in spaced relation to said insoluble conductive member;

b) causing current to flow between said soluble conductive member and said insoluble conductive member for depositing said substance on said insoluble conductive member during a make-up phase of said method; and

c) causing current to flow between said insoluble conductive member and said work for depositing said substance on said work.



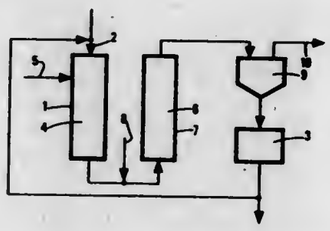
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5,498,326

## PROCESS FOR AND APPARATUS FOR CATALYTIC CRACKING IN TWO SUCCESSIVE REACTION ZONES

Pierre Galtier, Vienne; Régis Bonifay, Asnieres; Sigismond Franckowiak, Vienne; Thierry Gauthier, Saint Genis Laval, and Renaud Pontier, Luzinay Vienne, all of, France, assignors to Institut Francais du Petrole, Rueil Malmaison, France

Filed May 7, 1993, Ser. No. 57,795
Claims priority, application France, May 7, 1992, 92 05714
Int. Cl.[6] C10G 51/02
U.S. Cl. 208—74 19 Claims




1. A process for cracking a hydrocarbon load, comprising:

contacting a hydrocarbon load with catalyst particles in a moving or fluidized bed,

separating said catalyst particles after a cracking reaction from a gaseous phase,

regenerating said catalyst particles, and

at least partly recycling said catalyst particles,

wherein said cracking reaction is conducted in two substantially vertical and successive reaction zones, in the first reaction zone, having a top portion and a bottom portion, said hydrocarbon load and said catalyst particles are introduced into said top portion, and said load flows from said top portion to said bottom portion of said first reaction zone, and at least a portion of the resultant product discharged from said bottom portion of said first zone is introduced as a reaction medium into the second reaction zone, wherein product flows upwardly, and

wherein the descending flow rate of catalyst and entrained load in said first reaction zone is 0.5–50 m/s and wherein the ascending flow rate of reaction medium in said second reaction zone is 2–50 m/s.

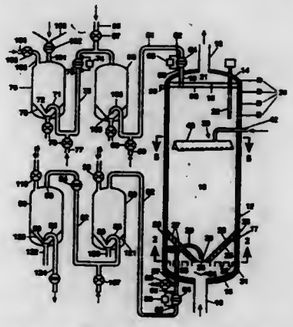
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5,498,327

## CATALYST, METHOD AND APPARATUS FOR AN ON-STREAM PARTICLE REPLACEMENT SYSTEM FOR COUNTERCURRENT CONTACT OF A GAS AND LIQUID FEED STREAM WITH A PACKED BED

Bruce E. Stangeland, 691 Cragmont Ave., Berkeley, Calif. 94708; David C. Kramer, 54 Brookside Dr., San Anselmo, Calif. 94960; David S. Smith, 5902 Autumn Dogwood Way, Kingwood, Tex. 77345; James T. McCall, 22 Newport Cir., Colorado Springs, Colo. 80906; Georgieanne L. Scheuerman, 1155 Sanders Dr., Moraga, Calif. 94556; Robert W. Bachtel, 5480 Barrett Ave., El Cerrito, Calif. 94530, and David R. Johnson, 7 Azalea Ct., Petaluma, Calif. 94954

Continuation of Ser. No. 235,043, Apr. 29, 1994, abandoned, which is a continuation-in-part of Ser. No. 215,254, Mar. 21, 1994, Pat. No. 5,409,598, which is a continuation of Ser. No. 14,847, Feb. 8, 1993, Pat. No. 5,302,357, which is a continuation of Ser. No. 727,656, Jul. 9, 1991, abandoned, which is a division of Ser. No. 381,948, Jul. 19, 1989, Pat. No. 5,076,908. This application Jun. 6, 1995, Ser. No. 466,655
Int. Cl.[6] C10G 11/18
U.S. Cl. 208—148 72 Claims



1. A method for producing an essentially downwandly plug-flowing substantially packed bed of hydroprocessing catalyst within a hydroconversion reaction zone comprising the steps of:

(a) forming a plurality of annular mixture zones under a hydroconversion reaction zone having a substantially packed bed of hydroprocessing catalyst such that each of said annular mixture zones contains a hydrocarbon feed stream having a liquid component and a hydrogen-containing gas component and wherein said annular mixture zones are concentric with respect to each other and are coaxial with respect to said hydroconversion reaction zone, said hydroprocessing catalyst comprising a plurality of catalytic particulates having a mean diameter ranging from about 35 Tyler mesh to about 3 Tyler mesh and a size distribution such that at least about 90% by weight of said catalytic particulates have an aspect ratio of less than about 2.0 and a diameter ranging from $R_1$ to $R_2$, wherein:

(1) $R_1$ has a value ranging from about 1/64 inch to about ¼ inch,

(2) $R_2$ has a value ranging from about 1/64 inch to about ¼ inch,

(3) a value of a ratio $R_2/R_1$ ranges from about 1.0 to about 1.4; and wherein:

said catalytic particulates have a size distribution such that a maximum of about 2.0% by weight of said catalytic particulates have a diameter less than $R_1$ and a maximum of about 0.4% by weight of said catalytic particulates have a diameter less than $R_3$, wherein $R_3$ is less than $R_1$ and the value of the ratio $R_1/R_3$ is about 1.4;

(b) introducing said hydrocarbon feed stream from each of said annular mixture zones of step (a) into said substantially packed bed of hydroprocessing catalyst to commence upflowing of said hydrocarbon feed stream from each of said annular mixture zones through said substantially packed bed of hydroprocessing catalyst; and

(c) withdrawing a volume of particulate catalyst from said hydroconversion reaction zone to produce an essentially downwardly plug-flowing substantially packed bed of hydroprocessing catalyst within said hydroconversion reaction zone.

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**5,498,328**

## APPARATUS FOR SELECTIVELY SAMPLING FILTER BACKWASH FLUID

**William F. Smith-Haddon, Chepstow, United Kingdom, assignor to Cross Manufacturing Company (1938) Limited, Bath, United Kingdom**

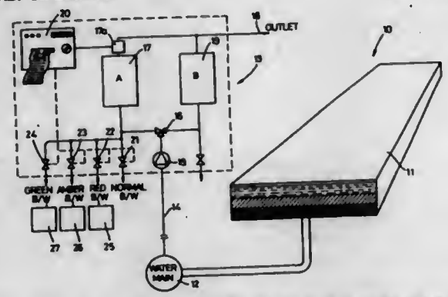
**PCT No. PCT/GB92/01081, § 371 Date Dec. 7, 1993, § 102(e) Date Dec. 7, 1993, PCT Pub. No. WO92/22373, PCT Pub. Date Dec. 23, 1992**

**PCT Filed Jun. 17, 1992, Ser. No. 157,139**

**Claims priority, application United Kingdom, Jun. 18, 1991, 9113150**

**Int. Cl.[6] B01D** *35/143*

**U.S. Cl. 210—85** **8 Claims**




1. Apparatus operable for monitoring the level of solids in a fluid flow, comprising means for monitoring the level of contamination of a filter in the flow and for developing an output signal if the level falls outside a predetermined range, means responsive to the output signal for sampling a sample residue in the filter whenever an output signal is received, means for backwashing the filter with a backwashing fluid, and a backwash outlet, said sampling means including a backwash sample reservoir and valve means, responsive to the presence of the output signal, for selectively directing backwash fluid that has backwashed the filter to either the backwash sample reservoir or the backwash outlet respectively in dependence on the presence or absence of the output signal.

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**5,498,329**

## VEHICLE WASH APPARATUS USING RECLAIMED WATER

**Olli Lamminen, and P. Mikael Kaipainen, both of Ann Arbor, Mich., assignors to Interclean Equipment, Inc., Ann Arbor, Mich.**

**Filed Sep. 12, 1994, Ser. No. 304,115**

**Int. Cl.[6] B01D** *17/12;17/038*

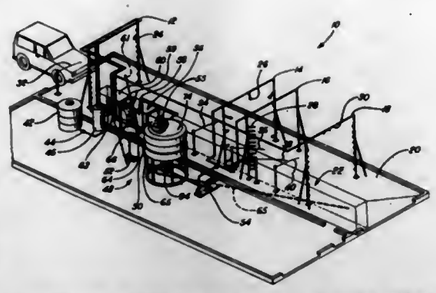
**U.S. Cl. 210—86** **8 Claims**

1. Vehicle wash system comprising:

a settling pit arranged for receiving and collecting therein wash water and solids removed from a vehicle;

separator means for at least partially separating the solids from the wash water, said separator means having an inlet for receiving the wash water from said settling pit, a water outlet through which the at least partially cleaned wash water is discharged from said separator means and a solids outlet through which solids separated from the water are discharged;

first pump means for selectively withdrawing the wash water from said settling pit and pumping the wash water into and through said separator means;



a clarifier tank having an upper portion, an inlet in said upper portion in communication with said separator means water outlet whereby water pumped through said separator means by said pump means is received into said tank, said inlet directing wash water in a substantially tangential direction within said tank, said tank further having a conically tapered base portion beneath said upper portion, said base portion providing an outlet at a bottom end thereof;

an outlet fitting provided in sealing engagement with said tank outlet, said fitting coaxially supporting an outlet tube therein which extends vertically upward through said bottom end of said tank and having an open end for receiving cleaned water from an elevated central portion of said tank, said outlet tube further mating with a fill line for expelling cleaned water therethrough from said tank;

a solids purge tube provided in a base portion of said outlet fitting through which solids in the wash water are removed from said tank;

flow regulating means for providing a continuous flow of wash water and solids from said tank through said solids purge tube whereby the solids are not permitted to accumulate in said outlet fitting or tank base portion;

second pump means for drawing cleaned water from said tank through said outlet tube;

spray means for receiving the cleaned water from said second pump means and delivering the cleaned water to a vehicle to be washed whereby said clarifier tank serves as a reservoir for cleaned water to be used washing vehicles;

and further comprising means for regulating and maintaining the water level in said clarifier tank at a level above said open end of said outlet tube whereby cleaned water is always available for pumping by said second pump means to said spray means.

3. The vehicle wash system of claim 1 wherein said means for regulating the water level in said clarifier tank includes a pair of vertically spaced water level sensors in said clarifier tank.

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**5,498,330**

## GRAY WATER RECLAMATION SYSTEM INCLUDING PLURAL FILTRATION STEPS

**Steven F. Delle Cave, 1145 Whippoorwill La., Naples, Fla. 33999**

**Filed Nov. 15, 1993, Ser. No. 152,829**

**Int. Cl.[6] B01D** *29/60*

**U.S. Cl. 210—103** **19 Claims**

1. A gray water reclamation system comprising:

a water filter;

gray water conduit means for receiving exclusively gray water from at least one household source and passively delivering said gray water through said water filter to remove impurities therefrom;

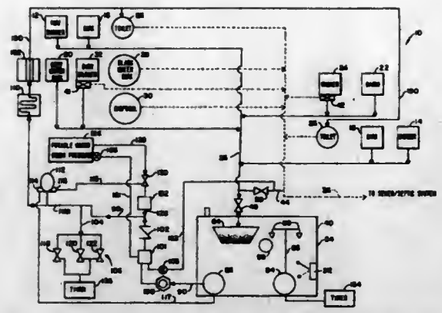
means for temporarily storing said filtered gray water;

an appliance that utilizes filtered gray water;

means for sensing that said appliance is in need of filtered gray water;

means, responsive to said means for sensing, for directing said filtered gray water to said appliance in need of filtered gray water;





said means for directing including means, communicably interconnected between said means for storing and said appliance, for transmitting filtered gray water therethrough and recycling pump means, operably engaged with said means for transmitting, for selectively pumping filtered gray water through said means for transmitting from said means for storing to said appliance;

outside irrigation means;

irrigation valve means, communicably joined to said means for transmitting at a selected location, for interconnecting said outside irrigation means and said means for transmitting;

irrigation valve control means for opening and closing said irrigation valve means to respectively introduce gray water into and restrict gray water from said outside irrigation means;

means for sensing rainfall and directing said control means to close said irrigation valve means when a predetermined level of rainfall is sensed; and

means, disposed in said means for transmitting downstream of said selected location at which said irrigation valve means is communicably joined to said means for transmitting, for additionally filtering the water being transmitted to said appliance.

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**5,498,331**

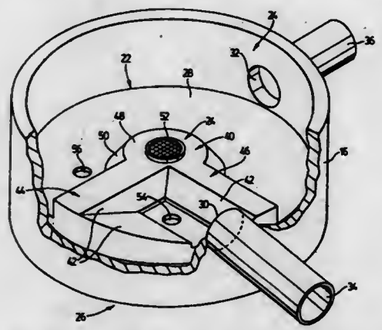
## TANK INTERCEPTOR

**Joseph G. Monteith, Mississauga, Canada, assignor to 1137361 Ontario Limited, Ontario, Canada**

**Filed Nov. 8, 1994, Ser. No. 337,393**

**Int. Cl.[6] B01D** *21/02*

**U.S. Cl. 210—170** **5 Claims**



1. A tank interceptor for rainwater and waste-water, comprising:

a container including a bottom wall, a side wall and a top wall, said walls defining an internal chamber,

a partition dividing the chamber into a by-pass compartment above the partition and a treatment compartment below the partition, the partition having a top wall,

an inlet through the side wall adjacently above the top wall of the partition, the inlet being adapted to permit liquid to flow into the by-pass compartment,

an outlet through the side wall adjacently above the top wall and spaced away from the inlet, the outlet being adapted to permit liquid to flow out of said by-pass compartment,

the top wall of the partition being configured to include a raised portion which isolates the inlet from the outlet, while being spaced from the top wall of the container to provide means such that liquid entering through the inlet and seeking to reach the outlet through the by-pass compartment must overflow the raised portion in order to do so, and

first and second openings through the partition on the inlet side and the outlet side, respectively, of the raised portion, both openings communicating the by-pass compartment with the treatment compartment, the openings being such that liquid, without having to overflow said raised portion, can travel from the inlet to the outlet by passing through the first opening into the treatment compartment, thence through the treatment compartment, thence through the second opening into the by-pass compartment, thence to the outlet.

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**5,498,332**

## PRECOATING HEAD

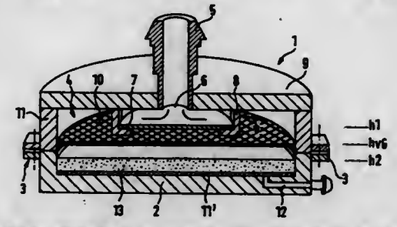
**Thomas Handtmann, Hugo-Häring-Strasse 60, Biberach, Germany**

**Filed Mar. 16, 1994, Ser. No. 214,822**

**Claims priority, application Germany, Mar. 23, 1993, 9304391 U**

**Int. Cl.[6] B01D** *37/02;24/40*

**U.S. Cl. 210—193** **5 Claims**




1. A precoating head assembly for forming a filter cake from a filter aid in a filter carrier, comprising:

a precoating head having a peripheral inner wall;

inlet nozzle means connected to said precoating head for introducing a filter aid into said precoating head, said inlet nozzle means including an opening;

a source of filter aid in communication with said inlet nozzle means;

deflector means located below said opening for deflecting said filter aid; and

distributor grid means arranged below said deflector element means for distributing said filter aid to form a substantially uniform filter cake in a filter carrier, said filter carrier being sized to retain said filter aid in the form of a filter cake.

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**5,498,333**

## COVER AND LID WITH SEALABLY ENCLOSED GASKET FOR SWIMMING POOL

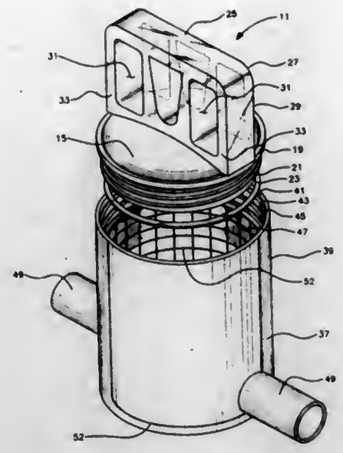
**David M. Canther, P.O. Box 1238, Eustis, Fla. 32727**

**Continuation-in-part of Ser. No. 258,481, Jun. 10, 1994, and a continuation-in-part of Ser. No. 23,901, Jun. 2, 1994, Pat. No. Des. 355,022. This application Apr. 10, 1995, Ser. No. 419,277**

**Int. Cl.[6] C02F** *1/76;* **B65D** *39/08;39/16*

**U.S. Cl. 210—198.1** **17 Claims**

1. A manually removable transparent plastic cover or lid for a container having side walls with a top flat surface and an open top providing an interior comprising



said cover in combination with a pool water circulating chlorinator cannister container and said lid in combination with a pool water circulating filtering cannister container,

the cover or lid having unitary construction molded from transparent plastic provided with a circular base and an integrally formed handle bar assembly projecting upwardly therefrom,

the circular base provided with an exterior upper surface with a circumferential outer rim and a continuous flange extending perpendicularly beneath the outer rim, the flange for sealably engaging the open top of the cannister container and providing a gasket means sealably enclosed between the cover or lid and said top flat surface and sealing said gasket from said cannister container interior,

the handle bar assembly providing a rectangular shaped block element with a terminal gripping bar formed at each end thereof, the block element extending longitudinally across the upper surface of the circular base, the terminal gripping bars formed from open slots provided in the block element, whereby the terminal gripping bars are adapted for gripping with the fingers of a person to turn the cover on or off the open end of the cannister container.

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**5,498,334**

**FILTER FOR A PLASTIC (SYNTHETIC RESIN) MELT**

**Detlef Gneuss, Bad Oeynhausen, Germany, assignor to Gneuss Kunststofftechnik GmbH, Bad Oeynhausen, Germany**

**Filed Dec. 1, 1993, Ser. No. 160,511**

**Claims priority, application Germany, Dec. 2, 1992, 42 40 461.4**

**Int. Cl.[6] B01D** *29/96*

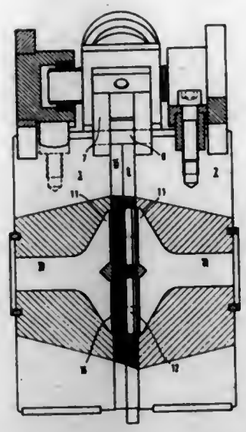
**U.S. Cl. 210—236** **16 Claims**

1. A filter for a synthetic resin melt comprising:

a housing formed by two blocks and having a melt channel extending through the blocks from an upstream side to a downstream side which conducts a melt for filtering one of said blocks at said upstream side being an upstream block, the other of said blocks at said downstream side being a downstream block;

a screen plate positioned between said blocks, said screen plate being provided with a plurality of recesses provided in the screen plate and disposed on a circular path;

means for rotating said screen plate to successively position said recesses along said channel;



respective replaceable filter elements received in said recesses so that the screen plate can transport at least one of the filter elements into the melt channel whereby the melt must flow through the filter element; and

a stationary perforated plate situated in the melt channel downstream of said screen plate to support each filter element transported into the melt channel.

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**5,498,335**

**PROCESS FOR FORMING POROUS POLMYERIC PRODUCT FROM A NONPOROUS POLYMERIC COMPOSITION AND PRODUCT**

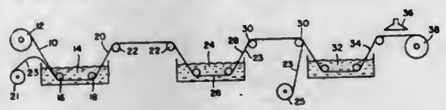
**Wilson Moya, Derry, N.H., assignor to Millipore Corporation, Bedford, Mass.**

**Division of Ser. No. 868,619, Apr. 14, 1992, Pat. No. 5,277,811. This application Jul. 21, 1993, Ser. No. 95,138**

**Int. Cl.[6] B01D** *67/00*

**U.S. Cl. 210—490** **29 Claims**

15. A porous polymeric structure derived from a solid nonporous



homogeneous polymeric structure wherein said solid nonporous homogeneous polymeric structure comprises a plurality of nonporous polymeric sheets, said porous structure comprises a plurality of porous polymeric sheets laminated together and having at least a portion of one surface of said porous polymeric sheets exposed, said porous polymeric structure being derived directly from said nonporous homogeneous polymeric structure and having pores formed of nondirectional tortuous pathways.



**5,498,336**

**LEUKOCYTE-REMOVING FILTER AND LEUKOCYTE-REMOVING APPARATUS FURNISHED THEREWITH**

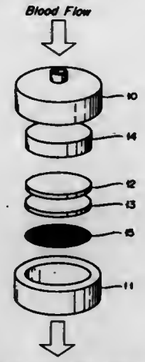
**Naoki Katsurada, Ashigarakami; Sobei Wakabayashi; Tomoko Hashimukai, both of Fukui, and Yoshitaka Omura, Kanagawa, all of, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan**

**Continuation-in-part of Ser. No. 841,666, Feb. 21, 1992, abandoned. This application Feb. 10, 1993, Ser. No. 15,837**

**Claims priority, application Japan, Feb. 22, 1991, 3-048645**

**Int. Cl.[6] B01D** *39/00;27/00;29/00*

**U.S. Cl. 210—496** **5 Claims**




1. A filter apparatus for removing leukocytes and platelets from a solution containing blood components, said apparatus comprising:

a container having an inlet for introducing said solution containing blood components into the interior thereof, and an outlet for discharging a filtrate to the exterior; and

a filter housed within said container, said filter comprising a filter material having a first surface on the side of said inlet, and a second surface on the side of said outlet, said second surface having a zeta potential greater than that of said first surface at a pH value of 5.0 to 7.0, said first surface having a zeta potential not greater than zero and said second surface having a positive zeta potential, and wherein said filter material is an organic or inorganic foam having continuous pores.

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**5,498,337**

**PROCEDURE FOR BIODEGRADATION OF WASTE MATERIALS FROM CRUDE OIL**

**Apolinar León-Betanzos, and Jose L. M. Cortina, both of Cuauhtemoc, Mexico, assignors to Grupo Internacional Marc S.A. de C.V., Cuauhtemoc, Mexico**

**Filed Feb. 10, 1995, Ser. No. 387,285**

**Claims priority, application Mexico, Nov. 14, 1994, 59857**

**Int. Cl.[6] C02F** *11/02*

**U.S. Cl. 210—610** **7 Claims**

1. A process for biodegradation of crude oil wastes and for recovery of contaminated land comprising the steps of:

extracting sludges containing the wastes;

collecting said sludges into a container;

mixing an alkaline salt with said sludges so as to react said salt with said sludges under a generally constant degree of humidity;

adding black earth to the mixed alkaline sludges so as to neutralize the alkaline sludges and to degrade the oil wastes through chemical reactions;

adding a material to the neutralized sludges so as to enrich the sludges, and material selected from the group consisting of: sawdust, rice husks, sugar cane bagasse, and animal excrement, said step of adding a material being in a high humidity condition;

forming a humus of the neutralized sludges by the organic degradation of such neutralized sludges by fermentation or putrefaction.

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**5,498,338**

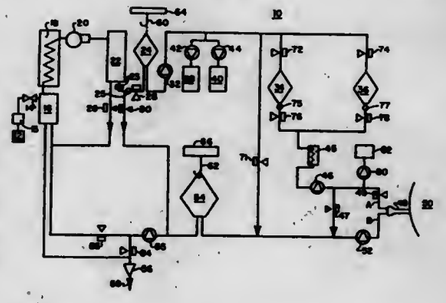
**PERITONEAL DIALYSIS SYSTEM USING REVERSE OSMOSIS PURIFICATION DEVICE**

**Robert J. Kruger, Arlington Heights; Warren P. Frederick, Wonder Lake; R. Hayes Helgren, Mundelein; Mark E. Larkin, Lindenhurst; Joaquin Mayoral, Mundelein, all of Ill.; Brad A. Schmolesky, Appleton, Wis.; Roman W. Siczek, Lindenhurst, Ill., and Kenneth J. Timmons, Highland Park, Ill., assignors to Abbott Laboratories, Abbott Park, Ill.**

**Division of Ser. No. 990,580, Dec. 15, 1992, Pat. No. 5,352,364, which is a division of Ser. No. 570,660, Aug. 20, 1990, abandoned. This application Jun. 3, 1994, Ser. No. 254,014**

**Int. Cl.[6] B01D** *61/08*

**U.S. Cl. 210—641** **98 Claims**



38. Method for treating a patient comprising:

a. purifying water from a source with a reverse osmosis device having:

1. input means for coupling to the source of water;

2. first reverse osmosis means being in spiral flow fluid communication with said input means for purification of at least a first portion of the water from the source, said first reverse osmosis means constructed and arranged to provide at least a first reverse osmosis multilayer assembly spirally rolled about a first axis so as to provide a generally spiral flow path for the water from the source; and

3. second reverse osmosis means being in spiral flow fluid communication with said first reverse osmosis means to receive the purified first portion of water for further purification of at least a second portion of the water, said second reverse osmosis means constructed and arranged to provide at least a second reverse osmosis multilayer assembly spirally rolled about a second axis so as to provide a generally spiral flow path for at least some of the purified portion of water from the first reverse osmosis means;

b. means for supplying a predetermined amount of drug;

c. means for mixing the purified second portion of the water with the drug to provide a dialysate solution; and

d. means for delivering the dialysate solution to the peritoneal cavity of the patient.

5,498,339

**PROCESS AND DEVICE FOR THE SEPARATION OF AN UNSATURATED HYDROCARBON FROM A FLUID MIXTURE WITH OTHER HYDROCARBONS**

Raimond J. M. Creusen, Amersfoort; Everardus C. A. Hendriks, Utrecht, and Jan H. Hanemaaijer, Oosterbeek, all of, Netherlands, assignors to DSM N.V., and Nederlandse Organisatie Voor Toegepast Natuurwetenschappelijk Onderzoek Tno, both of, Netherlands

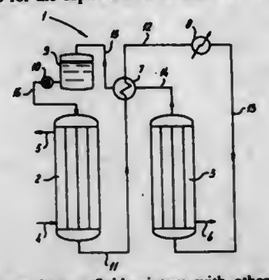
Filed Jul. 15, 1994, Ser. No. 276,673

Claims priority, application Netherlands, Jul. 15, 1993, 9301245

Int. Cl.[6] B01D *61/00;11/04*

U.S. Cl. 210—644 7 Claims

1. A process for the separation of at least one specific unsaturated hydrocarbon from a fluid mixture with other hydrocarbons which comprises:



a first stage comprising (i) passing the fluid mixture containing said unsaturated hydrocarbon at superatmospheric pressure to one side of a first semiselective gas separation membrane with a non-porous active layer which is permeable to unsaturated hydrocarbons, and (ii) passing a stream comprising a liquid complexing agent on the other side of said first semiselective gas separation membrane, whereby the unsaturated hydrocarbon migrates through said first semiselective gas separation membrane with said non-porous active layer to the liquid, wherein said at least one specific unsaturated hydrocarbon is bound through complexation in the interface of the membrane and said liquid complexing agent; and

a second stage which comprises (i) separating and removing the unsaturated hydrocarbon from the complexing agent, wherein in the second stage said unsaturated hydrocarbon is dissociated from the complexing agent by increasing the temperature, and (ii) the complexing agent is recycled.

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5,498,340

**PROCESSING OF PROTEIN-CONTAINING BODY FLUIDS**

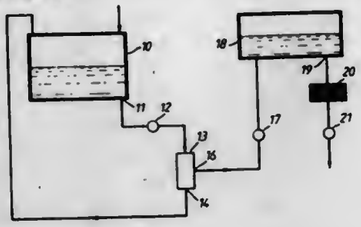
Carol A. Granger, Fareham; Gary B. Smith, Portchester, and Bruce L. Taylor, Rowlands Castle, all of, United Kingdom, assignors to Pall Corporation, East Hills, N.Y.

Filed Aug. 27, 1993, Ser. No. 112,798

Claims priority, application United Kingdom, Aug. 27, 1992, 9218239

Int. Cl.[6] B01D *61/00;61/14*

U.S. Cl. 210—645 13 Claims



11. A method for processing ascites fluid containing plasma proteins and cells comprising:

filtering the ascites fluid to separate plasma protein-containing fluid from cell-containing fluid;

removing a pyrogenic substance from the separated plasma protein-containing fluid by passing the fluid through a skinless positively charged microporous hydrophilic membrane.

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5,498,341

**PROCESS FOR ULTRAFILTRATION OF STABILIZED EMULSIONS**

Aurelle Yves, Aucamville, France; Belkacem Mohamed, Alger, Algeria; Hadjiev Dimitri, Toulouse, France; Edmond Julien, Saint Jean, France, and Cotteret Jacques, Millery, France, assignors to Elf Antar France, Courbevoie, France

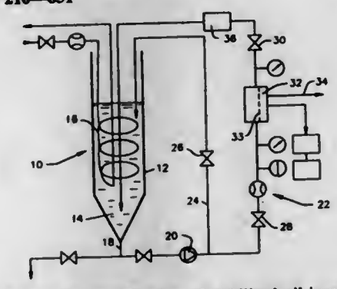
PCT No. PCT/FR93/00577, § 371 Date Apr. 18, 1994, § 102(e) Date Apr. 18, 1994, PCT Pub. No. WO93/25298, PCT Pub. Date Dec. 23, 1993

PCT Filed Jun. 15, 1993, Ser. No. 193,207

Claims priority, application France, Jun. 16, 1992, 92 07262

Int. Cl.[6] B01D *61/00*

U.S. Cl. 210—651 5 Claims



1. A process for ultrafiltration of stabilized oil-in-water emulsions, comprising circulating the emulsion through a chamber separated by a porous membrane, wherein before the emulsion enters said chamber, alkaline earth metal halide salt is introduced into said chamber in an amount corresponding to a weight ratio of salt/oil present in the emulsion of between 0.01 to 0.2.

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5,498,342

**DETERGENT COMPOSITION CONTAINING ZEOLITE MAP AND ORGANIC PEROXYACID**

Andrew P. Chapple, Clwyd, Great Britain, assignor to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 162,743, Dec. 6, 1993, abandoned.

This application Apr. 25, 1995, Ser. No. 428,510

Claims priority, application United Kingdom, Dec. 8, 1992, 9225609

Int. Cl.[6] C11D *3/12;3/39;3/395;17/06*

U.S. Cl. 252—95 12 Claims

1. A particulate bleaching detergent composition which comprises:

(a) from 5 to 60 wt % of one or more detergent-active compounds,

(b) from 15 to 80 wt % of one or more detergency builders comprising zeolite MAP having a silicon to aluminum ratio not greater than 1.33 wherein said zeolite MAP is present in an amount of at least 15 wt % of the detergent composition and wherein said zeolite MAP has a particle size $d_{50}$ within the range of from 0.1 to 5.0 micrometres,

(c) a bleach system comprising from 2 to 10 wt % of an organic peroxyacid, selected from the group consisting of 1,12-diperoxydodecanedioic acid and N,N'-phthaloylaminoperoxy caproic acid; and

(d) optionally other detergent ingredients to 100 wt %,



all percentages being based on the detergent composition.

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5,498,343

**BINARY ACTIVE TOILET BAR COMPOSITION COMPRISING SOAP AND ALDOBIONAMIDES**

Terence Farrell, Guttenburg, N.J., and Michael Massaro, Congers, N.Y., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Continuation of Ser. No. 260,142, Jun. 15, 1994, abandoned.

This application Mar. 24, 1995, Ser. No. 410,554

Int. Cl.[6] C11D *9/30;3/26;7/32*

U.S. Cl. 252—108 7 Claims

1. A toilet bar composition comprising:

(1) 75% to 95% by weight of a binary active system; and

(2) 5% to 20% by weight water; wherein said binary active system consists of

(a) 55% to 95% soap; and

(b) 5% to 45% aldobionamide.

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5,498,344

**LOW-TEMPERATURE-STABILIZED ISOTHIAZOLINONE CONCENTRATES**

Nuno M. Rei, Boxford, and Roger G. Hamel, Methuen, both of Mass., assignors to Morton International, Inc., Chicago, Ill.

Filed Feb. 2, 1995, Ser. No. 382,729

Int. Cl.[6] A01N *43/80;* C07D *275/03;* C09K *15/30*

U.S. Cl. 252—404 9 Claims

1. A liquid concentrate comprising between about 4 and about 25 wt % of an isothiazolinone compound or mixture of isothiazolinone compounds, between about 25 and about 88 wt % of a plasticizer in which said isothiazolinone compound or mixture of isothiazolinone compounds is soluble and between about 8 and about 50 wt % of a $C_6$-$C_{12}$ monoalkylphenol(s).

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5,498,345

**AQUEOUS DISPERSION OF SPARINGLY SOLUBLE UV ABSORBERS**

Martin Jöllenbeck, Freiburg, Germany, and Alfred J. Neukom, Augst, Switzerland, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

Continuation of Ser. No. 805,431, Dec. 11, 1991, abandoned.

This application Feb. 22, 1994, Ser. No. 200,892

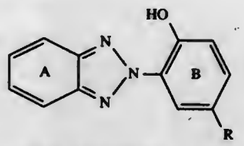
Claims priority, application Switzerland, Dec. 13, 1990, 3945/90

Int. Cl.[6] F21V *9/04;* D06P *5/02*

U.S. Cl. 252—589 25 Claims

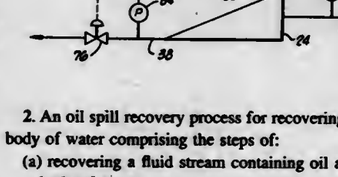
1. An aqueous dispersion of a mixture of sparingly soluble UV absorbers, which comprises

(a) 5 to 50% by weight of a mixture of a benzotriazole of formula



(1)

and a 2-hydroxybenzophenone of formula



(2)

wherein R is halogen, $C_1$-$C_{12}$alkyl, lower alkoxy, lower alkoxycarbonyl, cycloalkyl, aryl, $C_1$-$C_{12}$alkylaryl or aralkyl, and the rings A and B, each independently of the other, may be further substituted by halogen, hydroxy, lower alkyl, lower alkoxy or lower alkoxycarbonyl,

$R_1$ is hydrogen, hydroxy, $C_1$-$C_{14}$alkoxy or phenoxy,

$R_2$ is hydrogen, halogen or lower alkyl,

$R_3$ is hydrogen, hydroxy or lower alkoxy, and

$R_4$ is hydrogen or hydroxy,

(b) 2 to 18% by weight of an anionic compound, and

(c) 0 to 10% by weight of a nonionic compound.

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5,498,346

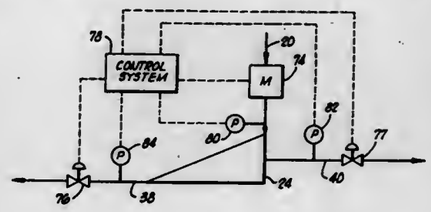
**HYDROCYCLONES FOR OIL SPILL CLEANUP HAVING A CONTROLLED SPLIT RATIO**

David A. Hadfield, and Mark F. Schubert, both of Houston, Tex., assignors to Conoco Specialty Products, Inc., Houston, Tex.

Division of Ser. No. 971,901, Dec. 21, 1992, Pat. No. 5,366,641. This application Sep. 6, 1994, Ser. No. 300,986

Int. Cl.[6] B01D *17/038;17/12*

U.S. Cl. 210—739 2 Claims




2. An oil spill recovery process for recovering spilled oil from a body of water comprising the steps of:

(a) recovering a fluid stream containing oil and water from the body of water;

(b) monitoring the makeup of the recovered fluid stream;

(c) separating the monitored fluid stream into a first more dense stream and a first less dense stream in a first hydrocyclone;

(d) controlling the split ratio between the first more dense stream and the first less dense stream in response to only the monitoring of step (b);

(e) storing at least a majority portion of the first less dense stream in a storage zone;

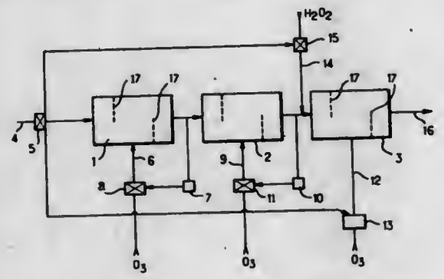
(f) separating the first more dense stream into a second more dense stream and a second less dense stream in a second hydrocyclone; and

(g) returning at least a majority portion of the second more dense stream to the body of water.

## 5,498,347
### REACTOR FOR THE OZONIZATION OF WATER

Yves R. Richard, Marly le Roi, France, assignor to Degremont, Rueil Malmaison Cedex, France

Continuation of Ser. No. 174,360, Dec. 28, 1993, abandoned.
This application Jan. 25, 1995, Ser. No. 377,684
Claims priority, application France, Dec. 28, 1992, 92 15787
Int. Cl.[6] C02F 1/72; 1/78
U.S. Cl. 210—739 2 Claims




1. A method for achieving ozonation of water for human consumption, utilizing at least three treatment zones implemented by corresponding serially connected contact tanks and comprising the steps:

introducing a regulated quantity of ozone directly into the water received in the first contact tank, thereby achieving rapid oxidizing action by the ozone;

sensing residual ozone concentration (C) in the water as it passes between the first and second contact tanks;

regulating the quantity of ozone introduced into the first contact tank, in response to sensed residual ozone concentration, to achieve a level necessary for disinfection of the water;

sensing the residual ozone concentration in the water as it passes between the second and third contact tanks;

introducing a regulated quantity of ozone directly into the water received in the second contact tank, in response to the residual ozone concentration (C) sensed in the water flowing between the second and third tanks, the concentration ((2) being sufficient to disinfect the water;

the contact time (T) of the ozone and water in the second contact tank being determined so that the product C×T is equal to a predetermined value necessary to achieve the disinfection;

measuring the flow rate of water introduced into the first contact tank;

introducing a regulated additional quantity of ozone directly into the water received in the third contact tank, in response to the measured flow rate, and in sufficient quantity to sustain residual ozone concentration necessary for the disinfection of the water, the ozone introduced in a flow direction orthogonal to the flow of water received in the third tank;

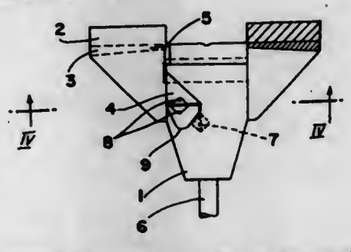
regulating a quantity of hydrogen peroxide introduced into the third contact tank, in response to the measured flow rate introduced prior to the ozone introduced to the third tank, and having a flow direction coincident with the water introduced into the third tank, the hydrogen peroxide increasing the quantity of OH radicals available for reaction with pollutants to be oxidized, wherein the mass ratio of hydrogen peroxide/ozone is maintained at a preselected value; and

discharging the water as finally treated in the third contact tank.

## 5,498,348
### MOBILE FLOATING SURFACE SKIMMER

Max R. Plink, 154 Fowler Road; Robbert W. Plink, 2 McCriedy, both of Guildford, New South Wales, Australia, and Dennis Plink, 27 Inconstant Street, Blackheath, New South Wales, Australia

PCT No. PCT/AU92/00544, § 371 Date Apr. 13, 1994, § 102(e) Date Apr. 13, 1994, PCT Pub. No. WO93/08351, PCT Pub. Date Apr. 29, 1993
PCT Filed Oct. 13, 1992, Ser. No. 211,688
Claims priority, application Australia, Jan. 14, 1991, PK8850
Int. Cl.[6] E02B 15/04
U.S. Cl. 210—776 20 Claims




17. A method of skimming debris from the surface of a liquid and/or skimming an upper layer of liquid, said method comprising the steps of:

1. floating a buoyant skimming device in said liquid, said device comprising a vessel having an interior with an inlet located higher than a valve means located higher than an outlet, said valve means being for a closable opening located in the wall of said device, said inlet being located substantially near the surface of said liquid, said valve means being provided with buoyancy means located within said vessel, which, when acted on by liquid within the vessel, produces a buoyancy force which tends to close said valve, and said valve also being acted on by the external pressure of liquid outside the vessel which tends to open said valve;
2. applying suction to said outlet to remove from said interior liquid which has flowed into said interior via said inlet to thereby increase the buoyancy of said device;
3. opening said valve means, in response to a decrease in said buoyancy force, when the level of liquid in said interior decreases to a particular level to permit said liquid to flow into said interior through both said inlet and said closable opening to thereby reduce the buoyancy of said device thus skimming the liquid's surface;
4. closing said valve means, in response to an increase in said buoyancy force, when the level of liquid in said interior increases to a predetermined level; and
5. repeating steps 3 and 4, with an appropriate time delay between each step due to the time taken for the necessary changes in said buoyancy force to occur, to cause the skimming device to oscillate vertically in said body of liquid so that debris is prevented from becoming lodged at the inlet.

## 5,498,349
### FILTRATION CONCENTRATION APPARATUS AND METHOD

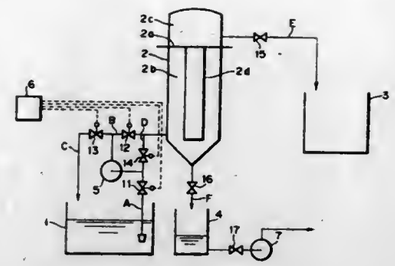
Yoichi Kurahashi, Aichi; Yoshifumi Usui, Gifu; Kazuhiko Yagishita, and Aisaburo Yagishita, both of Aichi, all of, Japan, assignors to Kabushiki Kaisha Sanshin Seisakusho, Aichi, Japan

Filed Feb. 4, 1994, Ser. No. 191,695
Claims priority, application Japan, Feb. 8, 1993, 5-019990; Feb. 8, 1993, 5-019991
Int. Cl.[6] B01D 29/66
U.S. Cl. 210—798 5 Claims

1. A filtration apparatus comprising:

a liquid storage tank;






a filter housing having a liquid chamber and a filtrate chamber partitioned by a filter element;

a filtrate storage tank;

a waste liquid tank;

a liquid pump;

a liquid intake path interconnecting a primary side of said liquid pump and said liquid storage tank;

a liquid supply path interconnecting a secondary side of said liquid pump and said liquid chamber;

a liquid return path interconnecting the secondary side of said liquid pump and said liquid storage tank;

a liquid recovery path interconnecting said liquid chamber and the primary side of said liquid pump;

a filtrate recovery path interconnecting said filtrate chamber and said filtrate storage tank;

a liquid discharge path interconnecting a bottom portion of said liquid chamber and said waste liquid tank; and

means for closing, while the liquid pump is in operation, said liquid recovery path and opening said liquid intake path and said liquid supply path for filtering the liquid, and closing said liquid intake path and said liquid supply path and opening said liquid recovery path and said liquid return path for backwashing the filter element.

## 5,498,350
### LIQUID SOFTENER COMPOSITION

Yushi Sakata; Yumiko Tamura, and Junichi Inokoshi, all of Wakayama, Japan, assignors to Kao Corporation, Tokyo, Japan

PCT No. PCT/JP94/00977, § 371 Date Jan. 13, 1995, § 102(e) Date Jan. 13, 1995, PCT Pub. No. WO95/00614, PCT Pub. Date Jan. 5, 1995
PCT Filed Jun. 16, 1994, Ser. No. 374,507
Claims priority, application Japan, Jun. 18, 1993, 5-147506
Int. Cl.[6] D06M 13/144
U.S. Cl. 252—8.6 20 Claims

1. A liquid softener composition, comprising:

(A) a polyhydric alcohol ester represented by the formula (I)

$$G(-OH)_p(-(OA)_m-OH)_q(-OCR)_r(-(OA)_n-OCR)_s \quad (I)$$

wherein

G represents a residue obtained by removing all alcoholic hydroxyl groups from a polyhydric alcohol;

(the $(-OH)$, $(-(OA)_m-OH)$, $(-OCR)$ and $(-(OA)_n-OCR)$ groups each bind to G at a removed alcoholic hydroxyl group, wherein

A represents an alkylene group having 2 or 3 carbon atoms, each alkylene group being the same or different from one another, R represents a linear or branched alkyl or alkenyl group having 7 to 23 carbon atoms, each alkyl or alkenyl group being the same or different from one another, and m and n are each a number of from 0 to 100; and

p, q, r and s each represent a number of 0 or higher, with the provisos that p+q+r+s represents the total number of the alcoholic hydroxyl groups in G and that neither p+q nor r+s equals 0; and

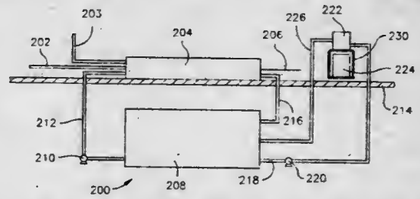
(B) a cationized cellulose having a nitrogen content of from 0.1 to 4% by weight as determined by the Kjeldahl method;

wherein the weight ratio of (B) to (A) ranges from 0.01 to 0.5 and the total content of (A) and (B) ranges from 1 to 30% by weight, based on the total weight of the composition.

## 5,498,351
### ANTI-SEIZING LUBRICANT COMPOSITION, AND METHOD OF MAKING THE SAME

Jerry P. Hefling, Overland Park, Kans., assignor to Loctite Corporation, Hartford, Conn.

Filed May 12, 1994, Ser. No. 241,521
Int. Cl.[6] C10M 125/02; 125/04
U.S. Cl. 252—26 20 Claims




1. A process for making a lubricious composition useful for preventing seizing of threaded fasteners in application to the threaded surface(s) thereof, said process comprising:

(a) forming metal wire by drawing of metal source material through a wire drawing die;

(b) lubricating the wire drawing die with an oil lubricant in forming the metal wire, to produce as a by-product thereof a metal flake/oil mixture;

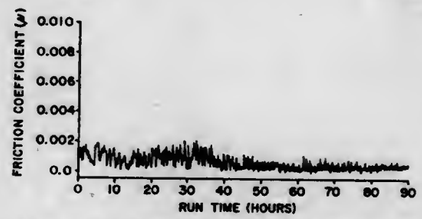
(c) separating the metal flake/oil mixture to recover a metal flake/oil suspension; and

(d) formulating the metal flake/oil suspension in a metal flake-containing lubricant composition.

## 5,498,352
### BEARING LUBRICATION MEANS HAVING WIDE TEMPERATURE UTILIZATION

Edgar E. Graham, Lyndhurst, and Nelson H. Forster, Dayton, both of Ohio, assignors to Cleveland State University, Cleveland, Ohio

Filed Nov. 17, 1994, Ser. No. 341,633
Int. Cl.[6] C10M 105/74
U.S. Cl. 252—32.5 9 Claims




1. A method of reducing mechanical wear between a pair of moving bearing surfaces constructed of a material selected from the group consisting of metals, ceramics and combinations thereof.

said bearing surfaces being operated in dynamic physical contact at elevated temperatures up to at least 500° C. comprising:

(a) providing a blended mixture containing an aryl phosphate ester suspended in a liquid alphaolefin oligomer,

(b) heating the blended mixture sufficiently to cause its vaporization, and

(c) treating the bearing surfaces during operation at elevated temperatures of at least 300° C. with the vaporized blended mixture causing the vaporized aryl phosphate ester to polymerize in the vapor phase while in contact with the operating bearing surfaces and form a vapor-deposited adherent polymer lubricating coating in-situ on at least one of the treated bearing surfaces.

1. A method of reducing mechanical wear between a pair of moving bearing surfaces constructed of material selected from the group consisting of metals, ceramics, and combinations thereof said bearing surfaces being operated in dynamic physical contact at elevated temperatures of at least 300° C. comprising:

(a) heating a supply of a vaporizable polyphenyl thioether sufficiently to cause its vaporization, and

(b) treating the bearing surfaces during operation at elevated temperatures of at least 300° C. with the vaporized polyphenyl thioether causing it to polymerize in the vapor phase while in contact with the operating bearing surfaces and form a vapor-deposited adherent polymer lubricating coating in-situ on at least one of the treated bearing surfaces.

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**5,498,353**

## SEMI-SYNTHETIC TWO-STROKE ENGINE OIL FORMULATION

**Ron-Sheng Lin; Chen-Yi Lin; Tsae-Shycm Lee; Chi-Chung Chen; Su-Terng Chang, and Kuo-Min Wei, all of Chia-Yi, Taiwan, Prov. of China, assignors to Chinese Petroleum Corp., Taiwan, Prov. of China**

**Filed Nov. 22, 1994, Ser. No. 343,345**

**Int. Cl.[6] C10M** *141/06;141/12*

**U.S. Cl. 252—33.4** **3 Claims**

1. A semi-synthetic two-stroke engine oil comprising the following components:

a mineral base oil selected from the group consisting of a medium-viscosity mineral oil (MN) having a viscosity of about 4–8 cSt at 100° C., a high-viscosity mineral oil (HN) having a viscosity of about 10–15 cSt at 100° C., and a mixture of said medium-viscosity mineral oil and said high-viscosity mineral oil;

wherein the amount of the high-viscosity mineral oil is from about 0 to 20% and the medium-viscosity mineral oil is from about 10 to 50%.

5–30% by weight of kerosene as the solvent;

2–12% by weight of detergents and dispersants; and

a mixture of three polyisobutylenes comprising, based on the total weight of the two-stroke engine oil, 5–30% by weight of a first polyisobutylene with a molecular weight of from 900 to 1000, 5–30% by weight of a second polyisobutylene with a molecular weight of from 400 to 500 and 2–10% by weight of a third polyisobutylene with a molecular weight of from 1200 to 1400.

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**5,498,354**

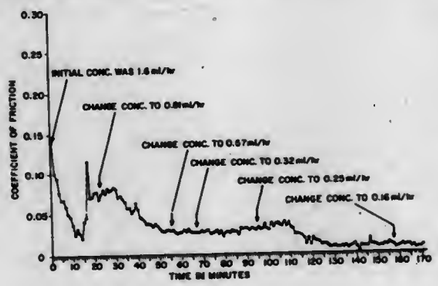
## HIGH TEMPERATURE LUBRICATION METHOD FOR METAL AND CERAMIC BEARINGS

**Edgar E. Graham, Lyndhurst, and Wilfredo Morales, Lorain, both of Ohio, assignors to Cleveland State University, Cleveland, Ohio**

**Filed Oct. 5, 1994, Ser. No. 318,445**

**Int. Cl.[6] C10M** *105/72*

**U.S. Cl. 252—48.2** **7 Claims**




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**5,498,355**

## LUBRICANT COMPOSITIONS OF ENHANCED PERFORMANCE CAPABILITIES

**Edmund F. Perozzi, Glen Allen, and Charles A. Passut, Midlothian, both of Va., assignors to Ethyl Corporation, Richmond, Va.**

**Filed Sep. 20, 1994, Ser. No. 309,976**

**Int. Cl.[6] C10M** *133/44*

**U.S. Cl. 252—49.6** **40 Claims**

1. A dispersant composition which comprises:

a) a first succinic derivative dispersant produced by reacting (i) a substituted succinic acylating agent in which the substituent is an aliphatic group derived from polyalkene having a GPC number average molecular weight in the range of about 700 to about 2500 with (ii) alkylene polyamine having an average of about 3 to about 6 nitrogen atoms per molecule, wherein the mole ratio of (i) to (ii) in said first succinic derivative dispersant is below about 1.85; and

b) a second succinic derivative dispersant produced by reacting (iii) a substituted succinic acylating agent in which the substituent is an aliphatic group derived from polyalkene having a GPC number average molecular weight in the range of about 1100 to about 2800 with (iv) hydroxypropylated alkylene diamine having an average of 2 to about 12 carbon atoms per molecule and an average of about 2.5 to about 3.5 hydroxypropyl groups per molecule, wherein the mole ratio of (iii) to (iv) in said second succinic derivative dispersant is in the range of 1.0 to about 1.5;

the weight ratio of a) to b) being such that on an active ingredient basis there are from about 0.25 to about 10 parts by weight of a) per part by weight of b).

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**5,498,356**

## REFRIGERANT COMPOSITION CONTAINING CARBODIIMIDE

**Tamiji Kamakura; Noriyoshi Tanaka; Kimiyoshi Namiwa; Yukio Tatsumi; Masato Namiki, and Hideo Yokobori, all of Tokyo, Japan, assignors to Asahi Denka Kogyo K.K., Tokyo, Japan**

**Filed Nov. 18, 1994, Ser. No. 338,552**

**Claims priority, application Japan, Mar. 25, 1993, 5-066939**

**Int. Cl.[6] C09K** *5/00;* **C10M** *133/16*

**U.S. Cl. 252—50** **17 Claims**

1. A lubricated refrigerant comprising hydrofluorocarbon coolant, synthetic oil and at least one carbodiimide compound represented by the following formula:

$$R_1—N{=}C{=}N—R_2$$

wherein $R_1$ and $R_2$ each represent a moiety selected from the group consisting of a hydrogen atom, a hydrocarbyl group, a nitrogen containing hydrocarbyl group, and an oxygen containing hydrocarbyl group, and $R_1$ and $R_2$ may each be the same moiety.



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**5,498,357**

## GREASE COMPOSITION FOR HIGH-TEMPERATURE, HIGH-SPEED AND HIGH-LOAD BEARINGS

**Michiharu Naka, Odawara; Hideki Koizumi, Chigasaki; Yuzo Takahashi, Fujisawa; Koici Goto, Okazaki; Toshiaki Endo, Fujisawa, and Yoichi Suzuki, Chigasaki, all of, Japan, assignors to NSK Ltd., and Kyodo Yushi Co., Ltd., Tokyo, Japan**

**Continuation of Ser. No. 875,466, Apr. 29, 1992, abandoned, which is a continuation of Ser. No. 827,035, Jan. 29, 1992, abandoned. This application Dec. 27, 1993, Ser. No. 173,607**

**Claims priority, application Japan, Jan. 4, 1991, 3-257855**

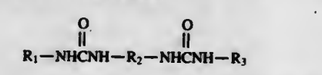
**Int. Cl.[6] C10M** *133/20*

**U.S. Cl. 252—51.5 R** **10 Claims**

1. A grease composition for high-temperature, high-speed and high-load bearings, comprising:

(i) a lubricating base oil composed of an alkyldiphenyl ether lubricant as an essential ingredient and having a kinematic viscosity of 90–160 cSt at 40° C., and

(ii) 22–30 wt. %, based on the grease composition, of a diurea compound as a thickener, said diurea compound being represented by the following formula:



wherein $R_2$ means an aromatic hydrocarbon group having 6–15 carbon atoms, $R_1$ and $R_3$ denote an aromatic hydrocarbon group having 6–12 carbon atoms or a linear alkyl group having 8–20 carbon atoms, and the proportion of aromatic hydrocarbon groups in $R_1$ and $R_3$ is 70–95 mole %; and

the NLGI thickness grade of said composition being in a range of from No. 1 to No. 3.

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**5,498,358**

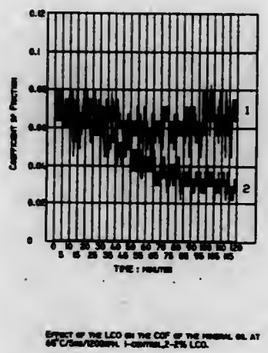
## LUBRICANT CONTAINING OLIGOMER WITH FLEXIBLE AND MESOGENIC SEGMENTS

**Ki-Soo Kim, Katonah, N.Y.; Sophia Dashevsky, Fair Lawn, N.J., and Johst H. Burk, Mohegan Lake, N.Y., assignors to Akzo Nobel N.V., Arnhem, Netherlands**

**Filed Apr. 29, 1994, Ser. No. 235,779**

**Int. Cl.[6] C10M** *129/16*

**U.S. Cl. 252—51.005 A** **18 Claims**




EFFECT OF THE LCO ON THE COF OF THE MINERAL OIL AT 60°C/5m/1200N/A. 1–CONTROL,2–2% LCO.

1. A lubricant composition for an internal combustion engine which comprises a lubricant basestock and an effective amount for antiwear properties of an oligomer containing at least one mesogenic segment and at least one flexible segment.

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**5,498,359**

## LUBRICANT

**Sayaka Shinomoto, Kyoto; Kenji Kohno; Yuko Uetani, both of Ibaraki; Noboru Isoe, Shiga, and Kazushi Miyata, Osaka, all of, Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan**

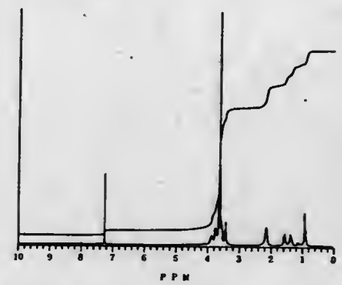
**PCT No. PCT/JP94/00279, § 371 Date Oct. 24, 1994, § 102(e) Date Oct. 24, 1994, PCT Pub. No. WO94/19433, PCT Pub. Date Sep. 1, 1994**

**PCT Filed Feb. 23, 1994, Ser. No. 325,258**

**Claims priority, application Japan, Feb. 24, 1993, 5-061059; Nov. 25, 1993, 5-321133; Dec. 7, 1993, 5-340466**

**Int. Cl.[6] C10M** *107/38*

**U.S. Cl. 252—54** **5 Claims**




1. A lubricant compound which comprises carbon, hydrogen, fluorine, etheric oxygen atoms, and at least one perfluoropolyether chain of the formula (A):

$$—(C_nF_{2n}O_m)— \quad (A)$$

wherein n is an integer of 1 to 10 and m is an integer of at least 1, a perfluoroalkyl chain of the formula (B):

$$—C_nF_{2n}— \quad (B)$$

wherein n is an integer of 1 to 15, and a polyether chain of the formula (C):

$$—(C_nH_{2n}O)_m— \quad (C)$$

wherein n is an integer of 1 to 6 and m is an integer of at least 1, in a combination of (C)-(A)-(C) in which said chains (A) and (C) are bonded through a linkage comprising a $—CH_2—$ group, a combination of (B)-(C) in which said chains (B) and (C) are bonded through a linkage comprising a $—CH_2—$ group, or combinations of (A)-(C) and (B)-(C) in which said chains (A) and (C), and said chains (B) and (C) are each bonded through a linkage comprising a $—CH_2—$ group in a molecule.

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**5,498,360**

## PROCESS FOR RECYCLING USED-UP DRY CELLS, AND FERRITE PRODUCTION PROCESS

**Takashi Kanemaru, Chiba; Takaaki Iwasaki, Hokkaido; Toshio Saito; Shigeaki Suda, both of Akita, and Takeo Kitagawa, Chiba, all of, Japan, assignors to Nomura Kohsan Co., Ltd., and TDK Corporation, both of Tokyo, Japan**

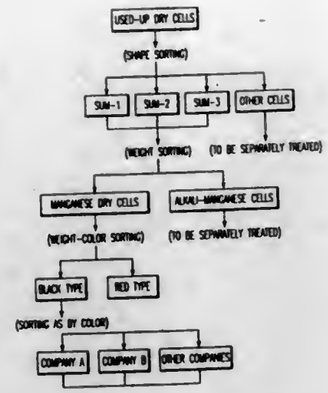
**Filed Jun. 30, 1994, Ser. No. 269,212**

**Claims priority, application Japan, Jun. 30, 1993, 5-187294; Jun. 30, 1993, 5-187295**

**Int. Cl.[6] B09B** *5/00*

**U.S. Cl. 252—62.56** **14 Claims**

1. A process for recycling used-up dry cells by sorting manganese dry cells out of said used-up dry cells, crushing the thus sorted manganese dry cells, sieving the thus crushed manganese dry cells to obtain a mixture that is composed predominantly of anodic substances, washing said mixture with water, and calcining




the thus washed mixture at a temperature of 700° to 950° C. for about 1 to 5 hours to obtain manganese and zinc oxides.

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**5,498,361**

**MANGANESE-ZINC SYSTEM FERRITE**

**Atsuhito Matsukawa, and Shoji Inoue, both of Chiba, Japan, assignors to TDK Corporation, Tokyo, Japan**

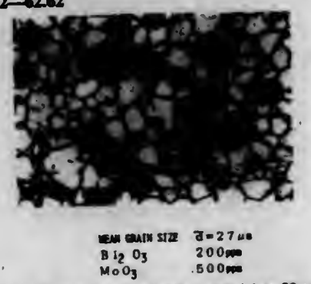
**PCT No. PCT/JP93/01920, § 371 Date Aug. 8, 1994, § 102(e) Date Aug. 8, 1994, PCT Pub. No. WO94/14723, PCT Pub. Date Jul. 7, 1994**

**PCT Filed Dec. 28, 1993, Ser. No. 256,903**

**Claims priority, application Japan, Dec. 28, 1992, 4-361378**

**Int. Cl.[6] C04B *35/38***

**U.S. Cl. 252—62.62** **7 Claims**




**1**. A manganese-zinc system ferrite comprising 50 to 56 mol % calculated as $Fe_2O_3$ of iron oxide, 22 to 39 mol % calculated as MnO of manganese oxide, and 8 to 25 mol % calculated as ZnO of zinc oxide,

said manganese-zinc system ferrite having been sintered after adding thereto 150 to 800 ppm calculated as $Bi_2O_3$ of a bismuth oxide component and 100 to 1,200 ppm calculated as $MoO_3$ of a molybdenum oxide component.

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**5,498,362**

**PROCESS FOR THE PRODUCTION OF ROAD DEICERS FROM WATER PLANT RESIDUALS**

**Alexander P. Mathews, Manhattan, Kans., assignor to Kansas State University Research Foundation, Manhattan, Kans.**

**Filed Mar. 21, 1995, Ser. No. 407,678**

**Int. Cl.[6] C09K *3/18***

**U.S. Cl. 252—70** **9 Claims**

**1**. A process for the production of a road deicer comprising the steps of:

providing a quantity of a water plant residual sludge which contains at least about 50% by weight on a dry basis of compounds selected from the group consisting of calcium carbonate, calcium hydroxide, magnesium hydroxide and mixtures thereof;

reacting said sludge with a sufficient quantity of acetic acid to form a reaction product containing acetate salts of said compounds; and

recovering a road deicer product containing said acetate salts.

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**5,498,363**

**ELECTRORHEOLOGICAL FLUID**

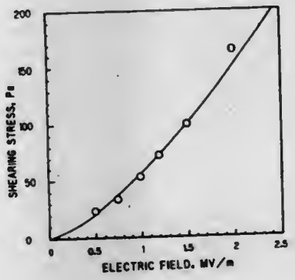
**Ryoichi Kishi; Hisao Ichijo; Takeshi Kitano, and Masatoshi Iguchi, all of Tsukuba, Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan**

**Filed Nov. 9, 1994, Ser. No. 338,734**

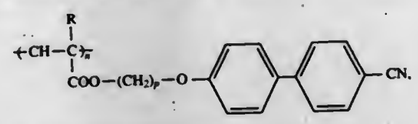
**Claims priority, application Japan, Nov. 30, 1993, 5-326104**

**Int. Cl.[6] C09K *19/44;3/00***

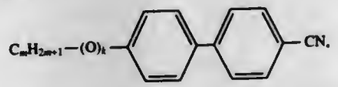
**U.S. Cl. 252—79** **5 Claims**




**1**. An electrorheological fluid which is a uniform mixture consisting essentially of a thermotropic uncrosslinked polymeric liquid crystal compound which is a poly[4'-cyano-4-biphenyloxyalkyl(meth)acrylate] represented by the formula



in which R is a hydrogen atom or a methyl group, the subscript p is a positive integer in the range from 2 to 12, and the subscript n is a positive integer of at least 10, and a thermotropic low-molecular liquid crystal compound which is a 4-cyano-4'-alkyl biphenyl or a 4-cyano-4'-alkoxy biphenyl represented by the general formula



in which the subscript k is zero or 1 and the subscript m is a positive integer in the range from 4 to 12, and wherein the thermotropic polymeric liquid crystal compound and the thermotropic low-molecular liquid crystal compound are mixed in a molar ratio in the range from 5:5 to 1:9, the molar amount of the polymeric liquid crystal compound referring to the monomeric units therein.



**5,498,364**

**METHODS AND COMPOSITIONS FOR OXYGEN SCAVENGING BY A RIGID SEMI-RIGID ARTICLE**

**Drew V. Speer; William P. Roberts, both of Columbia, and Charles R. Morgan, Brookeville, all of Md., assignors to W.R. Grace & Co.-Conn., New York, N.Y.**

**Continuation of Ser. No. 44,350, Apr. 7, 1993, Pat. No. 5,425,896, which is a division of Ser. No. 722,067, Jun. 27, 1991, Pat. No. 5,211,875. This application Jun. 22, 1994, Ser. No. 263,596**

**Int. Cl.[6] C09K *15/02;* G09K *15/04;* B29D *22/00***

**U.S. Cl. 252—188.28** **15 Claims**

**1**. A method of scavenging oxygen by a rigid or semi-rigid article having a wall thickness of 100 to 1000 micrometers, the wall comprising an oxidizable organic polymer and a transition metal catalyst, wherein the method comprises initiating the oxygen scavenging by exposing the article to actinic radiation having a wavelength of less than about 750 nm at an intensity of at least 1.6 $mW/cm^2$ or an electron beam at a dose of at least about 0.2 megarads, wherein after initiation and in the presence of oxygen, the oxygen scavenging rate is at least about 0.05 cc oxygen per day per gram of oxidizable organic compound for at least two days after oxygen scavenging is initiated, with the proviso that said oxidizable organic polymer is the material which scavenges oxygen.

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**5,498,365**

**ELECTROOPTICAL LIQUID CRYSTAL SYSTEM**

**Patrick Nolan, Poole, and David Coates, Wimborne, both of, Great Britain, assignors to Merck Patent Gesellschaft MIT Beschrankter Haftung, Darmstadt, Germany**

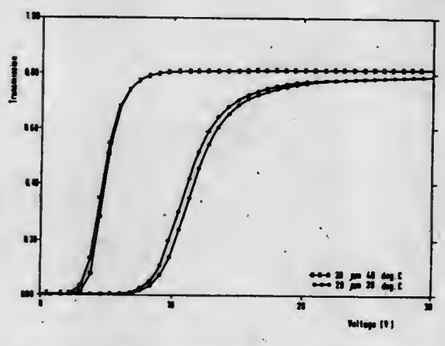
**PCT No. PCT/EP93/01378, § 371 Date Aug. 13, 1993, § 102(e) Date Aug. 13, 1993, PCT Pub. No. WO93/24589, PCT Pub. Date Dec. 9, 1993**

**PCT Filed Jun. 2, 1993, Ser. No. 104,121**

**Claims priority, application United Kingdom, Jun. 3, 1992, 9211731**

**Int. Cl.[6] C09K *19/52;* G02F *1/13***

**U.S. Cl. 252—299.01** **24 Claims**




**1**. An electrooptical system

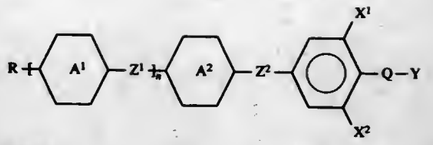
which between 2 electrode layers contains a PDLC film comprising a liquid crystal mixture forming microdroplets in an optically isotropic, transparent polymer matrix,

in which one of the refractive indices of the liquid crystal mixture is essentially matched to the refractive index of the polymer matrix, and

in which one of the two switching states has reduced transmission compared with the other switching state essentially independent of the polarization of the incident light, and

wherein the precursor of the PDLC film comprises

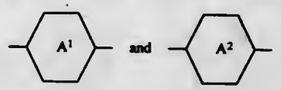
a) 50–90 wt. % of a liquid crystal mixture containing one or more compounds of the formula I



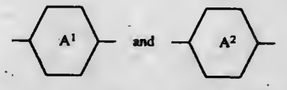
I

in which

$Z^1$ and $Z^2$ independently of one another, are a single bond, $—CH_2CH_2—$, —COO—, —OCO— or —C≡C—,



independently of one another, are a trans-1,4-cyclohexylene, 1,4-phenylene, 2-fluoro-1,4-phenylene, 3-fluoro- 1,4-phenylene, 2,3-, 3,5-, 2,5- or 2,6-di-fluoro-1,4-phenylene and one of



can be pyrimidine- 2,5-diyl, pyridine-2,5-diyl or trans-1,3-dioxane-2,5-diyl,

$X^1$ and $X^2$ independently of one another, are H or F,

Q is $—(O)_m—C_rF_pH_{2r-p}—$ or a single bond,

Y is F, Cl or CN,

m is 0 or 1,

r is 1, 2, 3 or 4,

p is 0, 1, 2, . . . 2r,

n is 0, 1 or 2 and

R is alkyl having 1 to 13 C atoms, in which one or two non-adjacent $CH_2$ groups can also be replaced by —O— and/or —CH=CH—,

b) 15–49 wt. % of the precursor of the polymer matrix comprising

a component A containing between 40–95 wt. % of one or more monofunctional monomers of the ene-type,

a component B containing between 1–13 wt. % of one or more at least difunctional monomers of the ene-type, and

a component C containing between 1–30 wt. % of one or more mono-, di- or multifunctional oligomers of the ene-type, and

c) 0.01–5 wt. % of a radical photoinitiator, with the mass ratios given under a), b) and c) based on the mass of the precursor of the PDLC film and the mass ratios of the components A, B and C based on the mass of the precursor of the polymer matrix.

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**5,498,366**

**LIQUID CRYSTAL THIOL COMPOUNDS**

**Damien G. McDonnell; Sally E. Day, both of Malvern; David Coates, Poole; John A. Jenner, Dorset; Michael Hird, and Kenneth J. Toyne, both of Hull, all of, England, assignors to The Secretary of State for Defence in her Britannic Majesty's Government of the U.K. of Gt. Britain and Northern Ireland, London, England**

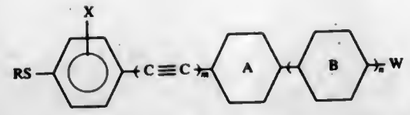
**Division of Ser. No. 867,739, Apr. 13, 1992, Pat. No. 5,352,381. This application Jun. 14, 1994, Ser. No. 260,401**

**Claims priority, application United Kingdom, Jun. 11, 1990, 9012968**

**Int. Cl.[6] C09K *19/06;19/12;19/34;* G02F *1/13***

**U.S. Cl. 252—299.6** **11 Claims**

**1**. A liquid crystal mixture including at least one compound of formula I:



wherein R is $C_{1-15}$ alkyl, X is hydrogen, fluorine or chlorine, m and n are independently 1 or 0, W is $C_{1-15}$ alkyl or alkoxy, CN or halogen, rings A and B are independently selected from phenyl, laterally fluoro- or chloro-substituted phenyl, trans-cyclohexyl, pyridyl, pyrimidyl or dioxanyl; provided A or B is not pyrimidine when m=0, X=H, W=alkyl or alkoxy and whichever of A or B is not pyrimidine is phenyl; and excluding m=1 when n=0, A=phenyl, W=alkyl, X=H.

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**5,498,367**

## OPTICALLY ACTIVE TOLANES

**Richard Buchecker, Zurich, Switzerland; Guy Marck, Lutterbach, France, and Martin Schadt, Seltisberg, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.**

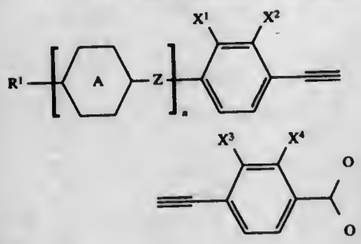
**Filed Feb. 17, 1995, Ser. No. 390,609**

**Claims priority, application Switzerland, Mar. 30, 1994, 952/94**

**Int. Cl.[6] C09K** *19/34;49/30;* **C07B** *317/10*

**U.S. Cl. 252—299.61** **8 Claims**

1. An optically active compound of the formula:



wherein

ring A is 1,4-phenylene which is optionally substituted with one or more fluorine atoms, chlorine atoms, bromine atoms, cyano groups or methyl groups, and in which one or two CH groups can be replaced by nitrogen, or is trans-1,4-cyclohexylene;

Z is a single covalent bond, $—CH_2CH_2—$, $—CH_2O—$ or $—OCH_2—$;

$X^1$,$X^2$,$X^3$,$X^4$ each independently are hydrogen or fluorine;

$R^1$ is hydrogen, is alkyl with 1 to 12 carbon atoms which is optionally substituted with one or more fluorine or chlorine atoms and in which one or two non-adjacent $CH_2$ groups can be replaced by —O—, is alkenyl with 2 to 12 carbon atoms which is optionally substituted with one or more fluorine or chlorine atoms and in which one or two non-adjacent $CH_2$ groups can be replaced by —O—, and when $R^1$ is bonded to an aromatic ring, can also be fluorine, chlorine, cyano, $CF_3$, $OCHF_2$ or $—OCF_3$;

$R^2$,$R^3$,$R^4$,$R^5$ are alkyl with 1 to 8 carbon atoms or alkenyl with 2 to 8 carbon atoms;

n is 0 or 1; and

* is a center of chirality.

**5,498,368**

## LIQUID CRYSTAL DEVICES

**Harry J. Coles, Stockport, United Kingdom, assignor to Dow Corning Limited, Bary, United Kingdom**

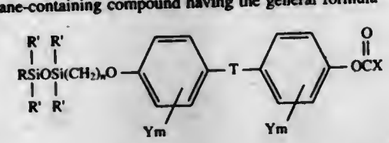
**Filed Sep. 8, 1994, Ser. No. 302,289**

**Claims priority, application United Kingdom, Sep. 10, 1993, 9318776**

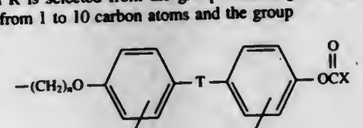
**Int. Cl.[6] C09K** *19/20;* **G02F** *1/13*

**U.S. Cl. 252—294.67** **9 Claims**

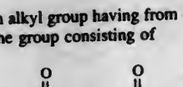
1. A liquid crystal device wherein the liquid crystal material is a siloxane-containing compound having the general formula



wherein R is selected from the group consisting of alkyl groups having from 1 to 10 carbon atoms and the group



each R' represents an alkyl group having from 1 to 4 carbon atoms, T is selected from the group consisting of



X is selected from the group consisting of alkyl groups having at least one chiral centre and halogen-substituted alkyl groups having at least one chiral centre, Y represents a fluorine atom, m has a value of 0, 1 or 2 and n has a value of 10, 11 or 12.

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**5,498,369**

## METHOD OF MANUFACTURING ZNS PARTICLES

**Michael Bredol; Jacqueline Merikhi, and Cornelis Ronda, all of Aachen, Germany, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Jul. 20, 1994, Ser. No. 278,476**

**Claims priority, application Germany, Jul. 22, 1993, 43 24 594.3**

**Int. Cl.[6] C09K** *11/54;11/56;* **C01G** *9/08*

**U.S. Cl. 252—301.65** **9 Claims**

1. A method of manufacturing ZnS particles precipitated on nuclei, said method comprising:

a) adding nuclei-forming reactants to an organic solvent to thereby form a water-soluble organosol containing said nuclei,

b) dissolving said organosol in an aqueous solution of a zinc salt and

c) introducing $H_2S$ into said solution to hereby precipate ZnS particles on said nuclei.

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**5,498,370**

## PROCESS FOR HYDROSHIFTING DIMETHYL ETHER

**Alakananda Bhattacharyya, Wheaton, and Arunabha Basu, Naperville, both of Ill., assignors to Amoco Corporation, Chicago, Ill.**

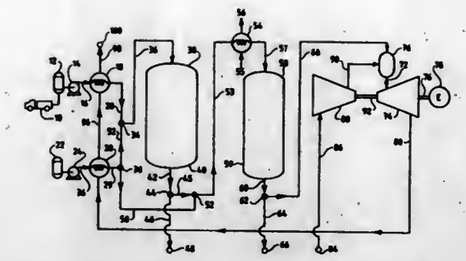
**Filed Dec. 15, 1994, Ser. No. 356,492**

**Int. Cl.[6] C07C** *1/00;1/02*

**U.S. Cl. 252—373** **20 Claims**

1. A process for hydroshifting dimethyl ether, which comprises:





passing a feed stream which includes about one to about six molar parts steam and one molar part dimethyl ether at a temperature of about 150 to about 800 degrees C. to a hydroshifting reaction zone including an essentially alkali metal-free catalytic composition substantially composed of copper or nickel in elemental form to produce a product stream which is relatively rich in hydrogen, carbon monoxide and carbon dioxide as compared to the feed stream.

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**5,498,371**

## PROCESS FOR THE PRODUCTION OF AN ASSEMBLY CONDUCTING ARTICLE

**Ronald M. A. M. Schellekens, Meersen, Netherlands, and Hans K. Van Dijk, Santa Barbara, Calif., assignors to DSM N.V., Heerlen, Netherlands**

**Continuation of Ser. No. 998,296, Dec. 30, 1992, abandoned. This application Sep. 21, 1994, Ser. No. 309,609**

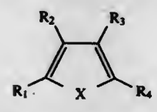
**Claims priority, application Netherlands, Dec. 30, 1991, 9102188**

**Int. Cl.[6] H01B** *1/00;1/12*

**U.S. Cl. 252—500** **11 Claims**

1. A process for producing an electrically conducting stretched article comprising:

providing a composition comprising (i) a stretchable carrier polymer which is selected from the group consisting of polyethylene, polypropylene, polyvinyl alcohol, polyvinyl chloride, polyvinyl acetate, polyalkene terephthalate, polystyrene, polyethylene oxide, polyamide, polyvinylidene chloride and mixtures thereof, (ii) precursors to monomers which are polymerizable to a conjugated polymer in the presence of a polymerization catalyst, and (iii) a polymerization catalyst for the monomers, wherein a said precursor monomer is a compound represented by formula (I):



wherein in formula (I) X represents,



—S— or —O—,

$R_1$ represents hydrogen, —C(O)OH, —C(O)C(O)OH, $—SO_3H$, —C(O)H, —I or —Br,

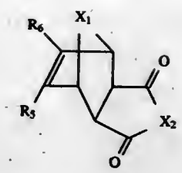
$R_2$ represents hydrogen, an alkyl group having 1–10 carbon atoms, —C(O)OH or a halogen,

$R_3$ represents hydrogen, an alkyl group having 1–10 carbon atoms, —C(O)OH or a halogen, and

$R_4$ represents hydrogen, —C(O)OH, —C(O)C(O)OH, $—SO_3H$, —C(O)H, —I or —Br,

wherein $R_1$ and $R_4$ are not both simultaneously hydrogen;

a compound represented by formula (II)



wherein in formula (II)

$X_1$ and $X_2$ are identical or different and are

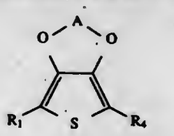


—S— or —O—,

$R_5$ and $R_6$ are identical or different and represent hydrogen or an alkyl group having 1–10 carbon atoms, and

$R_7$ represents hydrogen or an alkyl, aryl or alkoxy group;

a compound represented by formula III



wherein in formula (III) A represents a substituted or unsubstituted $C_1$–$C_4$ alkyl chain, wherein $R_1$ and $R_4$ are not both simultaneously hydrogen; or

a benzoic acid selected from the group consisting of 2-aminobenzoic acid and 4-aminobenzoic acid; and

stretching the composition while activating the precursors whereby the monomers form and polymerize in the presence of the catalyst; and, optionally, doping to increase the electrical conductivity thereof.

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**5,498,372**

## ELECTRICALLY CONDUCTIVE POLYMERIC COMPOSITIONS

**Winston L. Hedges, Livermore, Calif., assignor to Hexcel Corporation, Pleasanton, Calif.**

**Continuation-in-part of Ser. No. 930,738, Aug. 14, 1992, and a continuation-in-part of Ser. No. 972,574, Nov. 6, 1992. This application Feb. 14, 1994, Ser. No. 195,399**

**Int. Cl.[6] H01B** *1/12;1/24*

**U.S. Cl. 252—511** **12 Claims**

1. An electrically conductive polymeric composition comprising:

at least one nonconductive matrix polymer and incorporated in said matrix polymer an electrically conductive filler material in an amount of 0.5 wt % to 60 wt % of the electrically conductive polymeric composition sufficient to provide said polymeric composition with an electrical conductivity of at least $10^{-10}$ S/cm, said electrically conductive filler material comprising carbon black having an aspect ratio of about 1 coated with an intrinsically electrically conductive polymer.

5,498,373

## PROCESS FOR REDUCING THE LEVELS OF NITRITE CONTAMINANTS IN AMINE OXIDE SURFACTANTS

Larry E. Miller, Cincinnati; Gene P. Hawkins, Oregonia, and Bernard G. Durham, Mason, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 286,844, Aug. 5, 1994, which is a continuation-in-part of Ser. No. 145,257, Oct. 29, 1993, abandoned. This application Jan. 7, 1995, Ser. No. 472,793

Int. Cl.[6] C07C 291/04; C11D 1/75

U.S. Cl. 252—546 1 Claim

1. A stable detergent composition comprising an amine oxide surfactant of the formula R $R^1R^2N\rightarrow O$ wherein R is a $C_8$ to $C_{18}$ alkyl or alkenyl substituent and $R^1$ and $R^2$ are each $C_1$–$C_4$ alkyl or hydroxyalkyl substituents, prepared by; the oxidation, using hydrogen peroxide or a source of hydrogen peroxide, of the corresponding amine of the formula R $R^1R^2N$, which comprises conducting said oxidation in the presence of a chelating compound comprising a chelating active selected from the group consisting of water-soluble ethylenediaminetetraacetates, diethylenetriaminepentaacetates, nitriloacetates, and mixtures thereof, and a chelating co-active selected from the group consisting of malates, maleates, succinates, and mixtures thereof, wherein said process is carried out at a pH of from 6 to 8, whereby contamination of said amine oxide surfactant by nitrites is substantially decreased for at least about 4 weeks.

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5,498,374

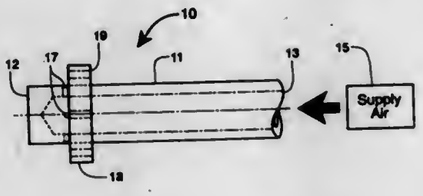
## LASKIN NOZZLE PARTICLE GENERATOR

Kelly R. Sabrooke, Kettering, Ohio; Donald A. Hoying, Brighton, Mass., and Douglas C. Rabe, Dayton, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 9, 1995, Ser. No. 370,589

Int. Cl.[6] B01F 3/04

U.S. Cl. 261—77 14 Claims




1. A particle generating system, comprising:
(a) a substantially closed tank having an outlet, said tank configured for containing a liquid;
(b) a source of pressurized air;
(c) a plurality of nozzles for immersion into a liquid contained within said tank; and
(d) wherein each of said nozzles comprises a tubular member closed at a first end thereof and operatively connected at a second end thereof to said source of pressurized air, a plurality of radial holes defined through and spaced around the wall of said tubular member near said first end thereof, and an annular collar on said tubular member near said first end thereof, said collar having a plurality of axial holes therethrough equal in number to said plurality of radial holes and disposed adjacent respective said radial holes in a paired relationship therewith, whereby an air jet is produced at each radial hole by passage of pressurized air therethrough and draws a stream of said liquid through the adjacent axial hole and atomizes said liquid by impact of said air jet on said stream thereby generating particles of said liquid for discharge through said outlet of said tank.

5,498,375

**Patent Not Issued For This Number**

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5,498,376

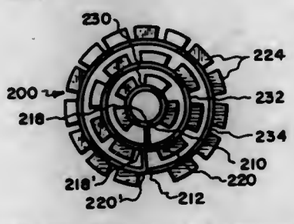
## PACKING

Daniel M. St. Louis, West Bloomfield, Mich., and Ko C. Lang, Westlake Village, Calif., assignors to Lantec Products, Inc., Agoura Hills, Calif.

Filed Nov. 3, 1993, Ser. No. 147,806

Int. Cl.[6] B01D 47/00; F02M 29/04

U.S. Cl. 261—113 5 Claims




1. A packing body for use for fluid contact comprising in combination:
an elongated strip having a surface and a first end wall and a second end wall, said strip being in the form of a coil having a plurality of convolutions with said first end wall being part of a first curved portion of the strip and being disposed within the interior of the coil and the second end wall being part of a second curved portion of the strip and forming the exterior of the coil;
spacer means for maintaining separation between adjacent convolutions;
baffle elements that project away from the surface of the strip;
the strip having perforations providing at least 30% open space; and
said strip containing regions for forming said convolutions separated by segments for forming said spacer means and the convolutions in said coiled strip are formed by said regions bent in the form of concentric polygons, adjacent polygons being joined by said segments bent upwardly from the end of a polygon to form said spacer means.

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5,498,377

## PRODUCTION OF THERMOPLASTIC POLYURETHANE ELASTOMER TUBE

Hidenori Ozaki; Minoru Fuchimoto, and Tamotsu Kaide, all of Amagasaki, Japan, assignors to Mitsubishi Cable Industries, Ltd., Amagasaki, Japan

Filed Nov. 21, 1994, Ser. No. 345,740

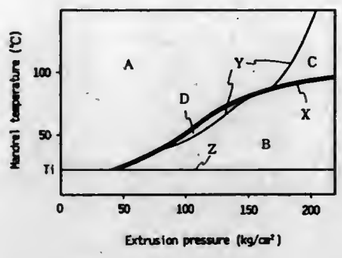
Claims priority, application Japan, Nov. 22, 1993, 5-291833

Int. Cl.[6] B29C 47/92

U.S. Cl. 264—40.1 7 Claims

1. A method for producing a thermoplastic polyurethane elastomer tube, comprising:
(a) determining a first range for mandrel temperature and extrusion pressure that provides a preform tube having a surface free of bubbles and a second range for mandrel temperature and extrusion pressure that permits hot drawing of said preform tube,
(b) extruding a thermoplastic polyurethane elastomer on the periphery of a heated mandrel under pressure, while maintaining said mandrel and said pressure respectively at a temperature and at an extrusion pressure where said first and second ranges overlap,
(c) pulling out the mandrel to give said tube preform, and
(d) hot drawing the obtained tube preform to produce a tube having a desired outer diameter.






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5,498,378

## PROCESS FOR PREPARING CAPSULES WITH STRUCTURING AGENTS

Liang S. Tsaur, Norwood; Michael Slayton, Lodi, both of N.J., and Michael P. Aronson, West Nyack, N.Y., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Filed Nov. 12, 1993, Ser. No. 152,114

Int. Cl.[6] B01J 13/04; B05D 7/00

U.S. Cl. 264—4.4 9 Claims

1. A process for preparing wax capsules comprising the steps of:
a) selecting a wax coating from a group consisting of petroleum wax, a natural wax, a synthetic wax and mixtures thereof.
b) choosing 0.5 wt. % to about 8 wt. % of a structuring agent which is hydrophobic and readily mixable with the wax selected in step (a) at a temperature higher than a melting point of the wax, the structuring agent selected from the group consisting of a hydrophobic silica, an organophilic clay and a hydrocarbon material;
c) heating the wax selected in step (a) and the structuring agent chosen in step (b) together at a temperature higher than the melting point of the wax to form a molten mixture;
d) selecting an active material which is water soluble or water dispersible;
e) dispersing the active material selected in step (d) into the molten mixture formed in step (c) with shear until a homogeneous molten mixture is formed to prevent phase separation of the active material from the homogeneous molten mixture and to maintain stability of the active material in the homogeneous molten mixture at a temperature higher than the melting point of the wax; and
f) atomizing and cooling the homogeneous molten mixture to form wax capsules.

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5,498,379

## METHOD OF FORMING SHAPED HYDROGEL ARTICLES INCLUDING CONTACT LENSES USING INERT, DISPLACEABLE DILUENTS

Ivan M. Nunez, Jacksonville; Frank F. Molock, Orange Park; Laura D. Elliott, Jacksonville, and James D. Ford, Orange Park, all of Fla., assignors to Johnson & Johnson Vision Products, Inc., Jacksonville, Fla.

Division of Ser. No. 96,145, Jul. 22, 1993, Pat. No. 5,457,140. This application May 31, 1995, Ser. No. 455,357

Int. Cl.[6] B29D 11/00; C08J 7/02; C08K 5/12; C08L 101/14

U.S. Cl. 264—2.6 2 Claims

1. A process for producing shaped hydrogel articles which comprises the steps of:
(1) molding or casting a polymerization mixture comprising:
(a) a monomer mixture comprising a major proportion of one or more hydrophilic monomers, and one or more crosslinking monomers; and
(b) an inert, displaceable, non-aqueous diluent comprising an adduct of e-caprolactone and an alkanediol or triol;
under conditions to polymerize said monomer mixture to produce a shaped gel of a copolymer of said monomers and said diluent; and
(2) thereafter replacing said diluent with water, provided that said inert, displaceable, non-aqueous diluent is selected such that when said polymerization mixture is polymerized in a photo differential scanning calorimeter wherein said polymerization is induced by ultraviolet irradiation at a light intensity of from about 2.5 to 3 $mW/cm^2$, the time to maximum exotherm of said polymerization is within the range of from about 0.2 to about 3.5 minutes and the percent conversion to polymer of the monomer mixture at maximum exotherm is at least 40 percent.

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5,498,380

## PLASTIC RESIN KNEADING/EXTRUDING METHOD AND APPARATUS BY ALTERNATE EXTRUSIONS OF CYLINDERS

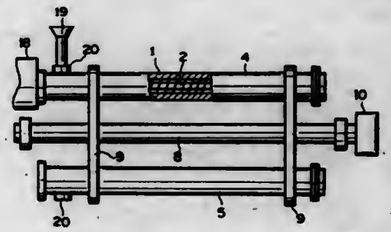
Beji Sasaki, Tokyo, Japan, assignor to Friends of Freesia Co., Ltd., Tokyo, Japan

Filed Jan. 27, 1995, Ser. No. 373,276

Claims priority, application Japan, Aug. 10, 1992, 4-253392; Jan. 25, 1993, 5-043135; Apr. 15, 1993, 5-126479

Int. Cl.[6] B29C 47/50; 47/56

U.S. Cl. 264—39 6 Claims




1. A plastic resin kneading/extruding method, the method comprising the steps of:
supplying a resin to a first extruding unit of a plurality of extruding units through a resin feed hopper, said first extruding unit being located at an extruding position, each of said extruding units including a cylinder with a feed opening and a screw;
extruding and kneading the supplied resin through the first extruding unit at said extruding position by rotating the screw of the first extruding unit;
rotating said first extruding unit after said extrusion step to a cleaning position while rotating a second extruding unit of said plurality of extruding units to said extruding position;
supplying a resin to said second extruding unit at said extruding position; and
extruding and kneading the supplied resin through the second extruding unit at said extruding position by rotating the screw of the second extruding unit, and cleaning the first extruding unit at the cleaning position.

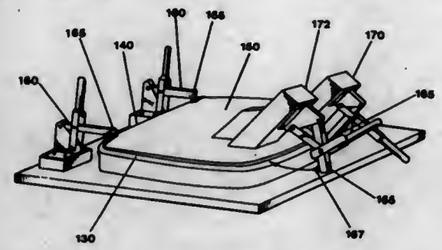
2. A plastic resin kneading/extruding apparatus, the apparatus comprising:
a plurality of extruding units rotatably mounted around a revolver shaft, each of the extruding units comprising a feed opening;
rotating means for rotating said revolver shaft and thereby rotating said plurality of extruding units so as to position a feed opening of one of said plurality of extruding units adjacent to a resin feed hopper for feeding a resin to said one of said plurality of extruding units, and position a second one of said plurality of extruding units at a cleaning position where said second one of said plurality of extruding units is cleaned, wherein when said one of said plurality of extruding units is extruding a resin, said second one of said plurality of extruding units is being cleaned.

**5,498,381**

## METHOD OF FORMING AND PIERCING A THERMOPLASTIC STRIP IN ONE STEP

**James R. Lorbiecki, Milwaukee, and Susan J. Lutz, Waukesha, both of Wis., assignors to Milsco Manufacturing Company, Milwaukee, Wis.**

**Filed Dec. 21, 1994, Ser. No. 360,377**
**Int. Cl.[6] B29C 65/56**
**U.S. Cl. 264—46.4** **21 Claims**




1. A method comprising:
providing a clamping mold with i) a surface having at least one die space and ii) at least one clamp having at least one punch tip located in a punch body;
providing a strip of thermoplastic material having a softening temperature and a melting temperature;
heating said strip of thermoplastic material to a working temperature higher than said softening temperature and lower than said melting temperature;
placing said strip of thermoplastic material in said clamping mold and against said surface and over said at least one die space;
forming said strip of thermoplastic material by closing said at least one clamp so as to a) form said strip of thermoplastic material with said at least one clamp and b) pierce said strip of thermoplastic material with said at least one punch tip, in one step;
cooling said strip of thermoplastic material to a removal temperature lower than said softening temperature;
opening said at least one clamp; and
removing said strip of thermoplastic material from said clamping mold.

14. A method comprising:
providing a clamping mold with i) a surface having at least one die space and ii) at least one clamp having at least one punch tip located in a punch body;
providing a strip of thermoplastic material having a softening temperature and a melting temperature;
heating said strip of thermoplastic material to a working temperature higher than said softening temperature and lower than said melting temperature;
placing said strip of thermoplastic material in said clamping mold and against said surface and over said at least one die space;
forming said strip of thermoplastic material by closing said at least one clamp so as to a) form said strip of thermoplastic material with said at least one clamp and b) pierce said strip of thermoplastic material with said at least one punch tip, in one step, said at least one punch tip penetrating into said at least one die space;
cooling said strip of thermoplastic material to a removal temperature lower than said softening temperature;
opening said at least one clamp so as to withdraw said at least one punch tip from said at least one die space;
removing said strip of thermoplastic material from said clamping mold;
providing a foaming mold;
placing said strip of thermoplastic material in said foaming mold;
generating foam in said foaming mold to form a cushion that includes said strip of thermoplastic material;
removing said cushion from said foaming mold;
providing a flexible seat shell with a plurality of frame sockets and a plurality of frame slots;
attaching said cushion to said flexible seat shell;
providing a frame with a plurality of hooks and a plurality of protrusions;
inserting said plurality of protrusions into said plurality of frame sockets so as to engage said plurality of frame sockets with said plurality of projections;
inserting said plurality of hooks into said plurality of frame slots; and
displacing said flexible seat shell so as to engage said plurality of frame slots with said plurality of hooks.

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**5,498,382**

## PROCESS FOR CONVERTING WATER SENSITIVE CERAMIC POWDERS INTO A FREE FLOWING GRANULATED POWDER

**Katherina Seitz, Frankfurt am Main; Hans-Michael Güther, Kelkheim/Taunus; Friedrich Hessel, Mainz; Frank Schröder, Hürth; Christine Kästler, Bad Soden am Taunus; Andreas Roosen, Hofheim/Taunus, and Christian May, Erftstadt, all of, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany**

**Filed Sep. 8, 1993, Ser. No. 117,830**
**Claims priority, application Germany, Sep. 8, 1992, 42 30 016.9**
**Int. Cl.[6] C04B 35/622; B29B 9/00**
**U.S. Cl. 264—56** **17 Claims**

1. A process for converting water sensitive ceramic powders into a free flowing granulated powder, comprising:
(a) providing the water sensitive ceramic powder with a hydrophobic coating;
(b) dispersing said water sensitive ceramic powder of step (a) in water with addition of a binder and a nonionic surfactant selected from the group consisting of alkylphenol polyglycol ethers, fatty alcohol polyglycol ethers, fatty acid polyglycol esters and mixtures thereof with an HLB value within the range from 10 to 14 in an amount sufficient to form a monomolecular layer on the powder; and
(c) converting the product of step (b) into a free flowing granulated powder by spray drying.

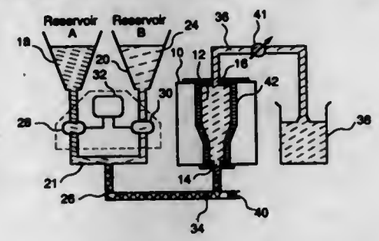
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**5,498,383**

## SLIP CASTING PROCESS AND APPARATUS FOR PRODUCING GRADED MATERIALS

**Basil Marple, and Jean Boulanger, both of Boucherville, Canada, assignors to National Research Council of Canada, Ottawa, Canada**

**Filed May 18, 1994, Ser. No. 245,003**
**Int. Cl.[6] B28B 1/26; 13/02**
**U.S. Cl. 264—87** **16 Claims**




1. A process for making bodies with graded properties, comprising a particulate material, the process comprising the steps of:
a) providing at least two sources of at least two dissimilar feedstocks including at least one source of a slip comprising said particulate material,



b) combining said at least two dissimilar feedstocks in a predetermined manner to obtain a combined stream thereof,
c) passing said combined stream substantially continuously through a slip casting mold having absorbent walls and an inlet and an outlet allowing for flow of said combined stream through said mold from said inlet to said outlet, whereby a first portion of said combined stream is absorbed by said walls thus forming a layer of said particulate material on said walls of said mold, said layer of particulate material having graded properties,
d) collecting a second portion of said combined stream at said outlet of said mold, and
e) separating said layer from said mold to provide said body of particulate material having graded properties.

10. A slip casting apparatus for making bodies of particulate material having graded properties, the apparatus comprising
at least two sources of at least two dissimilar feedstocks including at least one source of a slip comprising said particulate material,
mixing means associated with said sources of said feedstocks for mixing said feedstocks in a predetermined ratio to obtain a combined stream thereof,
a slip-casting mold having absorbent walls and an inlet and an outlet for allowing flow of said combined stream through said mold from said inlet to said outlet, whereby a first portion of said combined stream is absorbed by said walls to form a layer of said particulate material having graded properties on said walls of said mold,
supply means associated with said mixing means and connected to said inlet of said mold for passing said combined stream substantially continuously through said mold from said inlet to said outlet, and
collection means at said outlet of said mold for collecting a second portion of said combined stream.

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**5,498,384**

## METHOD FOR THE PRODUCTION OF EXTRUDATES FROM REGENERABLE RAW MATERIALS

**Juergen Volk, Berlin, and Detlef Kropp, Potsdam, both of, Germany, assignors to Institut fuer Getreideverarbeitung GmbH, Berholz-Rehbruecke, Germany**

**Filed Jun. 14, 1994, Ser. No. 259,597**
**Claims priority, application Germany, Jun. 24, 1993, 43 21 627.7**
**Int. Cl.[6] B29C 47/00**
**U.S. Cl. 264—122** **18 Claims**

1. A method for the production of extrudates from regenerable raw materials comprising mixing biopolymeric and mineral raw materials, adding a hydrophobizing agent to the mixture and processing in an extruder.

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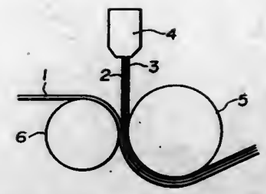
**5,498,385**

## METHOD FOR THE MANUFACTURE OF A COMPOSITE LAMINATE

**Kazuya Yabusa; Takeo Kato; Tetsuo Aizawa, and Masayuki Taniguchi, all of Tokyo, Japan, assignors to Toppan Printing Co., Ltd., Tokyo, Japan**

**Division of Ser. No. 950,495, Sep. 25, 1992, Pat. No. 5,409,772. This application Oct. 26, 1994, Ser. No. 329,337**
**Claims priority, application Japan, Sep. 27, 1991, 3-249106; Jul. 2, 1992, 4-197463**
**Int. Cl.[6] B29C 47/02**
**U.S. Cl. 264—171.23** **14 Claims**

1. A method for the manufacture of a composite laminate, said method comprising the steps of:
(a) co-extrusion coating a straight-chain, biodegradable 3-hydroxybutyric acid/3-hydroxyvaleric acid copolyester thin film and a polyolefin on at least one surface of a sheet-like substrate, the copolyester thin film/polyolefin being coated on the substrate with the copolyester thin film facing the substrate; and
(b) stripping the polyolefin layer from the copolyester thin film after step (a).



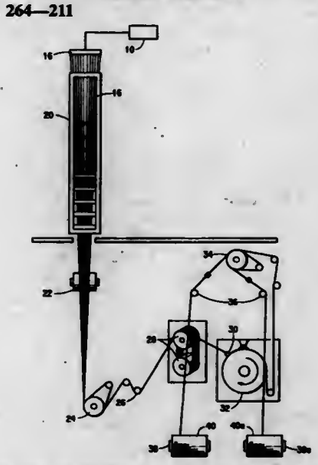

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**5,498,386**

## METHOD FOR PREPARING COLORED POLYAMIDE FIBERS WHICH CONTAIN POLYCARBONATES

**Perry H. Lin, Seaford, and Yanhui Sun, Greenville, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Mar. 16, 1994, Ser. No. 214,335**
**Int. Cl.[6] D01F 1/04**
**U.S. Cl. 264—211** **7 Claims**




1. A process for producing colored nylon fiber, comprising the steps of:
a) forming a fiber-spinnable melt blend comprising nylon polymer, pigment, and about 0.2 to about 0.8 weight percent polycarbonate based on the weight of the melt blend, and
b) extruding the melt blend through a spinneret to form colored nylon fiber.

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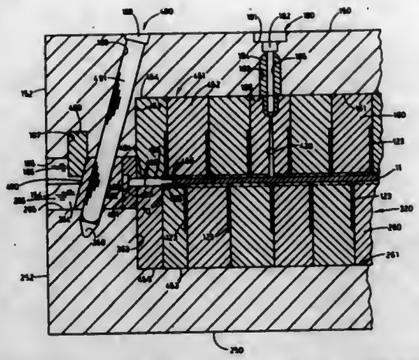
**5,498,387**

## METHOD OF MANUFACTURING A HELICAL STRUCTURE

**Daniel S. Carter, Sandy Hook, Conn.; Dennis M. Rupp, and David O. Bess, both of Chico, Calif., assignors to The Vendo Company, and Wrex Products, Inc., a part interest**

**Filed Jun. 29, 1993, Ser. No. 83,168**
**Int. Cl.[6] B29C 45/44**
**U.S. Cl. 264—219** **7 Claims**

1. A method for manufacturing a helical structure having a central shaft, comprising the steps of:



producing a mold having a mold cavity defining a configuration for said helical structure having a substantially helical flight extending about a shaft and to a peripheral edge and substantially defining an axis of rotation for the helical structure and wherein said helical flight is composed of a plurality of sections having segments disposed in substantially right angular relation to said axis of rotation of the helical structure and said segments being of a substantially constant thickness from the shaft to said peripheral edge;

introducing a moldable substance into the mold cavity to form said helical structure in said configuration; and

removing the helical structure from the mold cavity by separating the mold along a path substantially aligned with said segments.

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**5,498,388**

**PRODUCTION METHOD FOR AN IC CARD**

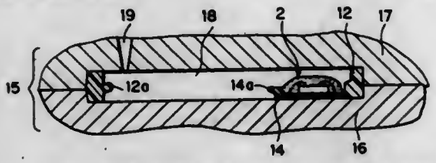
**Syojiro Kodai; Katsunori Ochi, both of Itami, and Osamu Murakami, Asamagasaki-Hyogo, all of, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Feb. 6, 1995, Ser. No. 384,218**

**Claims priority, application Japan, Jul. 25, 1990, 2-200706**

**Int. Cl.[6] B29C** *45/14;70/70*

**U.S. Cl. 264—263** **4 Claims**



1. A method for producing an IC card, comprising the steps of:

providing a lower molding die having a flat surface;

providing an upper molding die have an aperture;

providing an IC card frame having a through hole between a first IC card frame major surface and a second IC card frame major surface, wherein the first IC card frame major surface is wide and flat, wherein the through hole is defined by IC card frame side surfaces that are between the first and second IC card frame major surfaces and said side surfaces define a first shape;

providing a semiconductor module having a first semiconductor module face containing an electrode terminal and having side surfaces defining a second shape conforming to the first shape of the through hole;

mounting the IC card frame on the lower molding die flat surface so the IC card frame major surface is adjacent the lower molding die flat surface;

mounting the semiconductor module in the through hole such that the side surfaces of the semiconductor module oppose the side surfaces of the IC card frame defining the through hole and the semiconductor module first face contacts the flat surface of the lower molding die;

placing the upper molding die onto the lower molding die; and

injecting resin through the aperture in the upper molding die into said IC card frame such that said resin contacts a back surface of the semiconductor module which is on an opposite side of the semiconductor module from the semiconductor module first face and contacts surfaces of the IC card frame, thereby securing, when dry, the semiconductor module to the IC card frame.

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**5,498,389**

**METHOD AND APPARATUS FOR LINING A BRANCH PIPE**

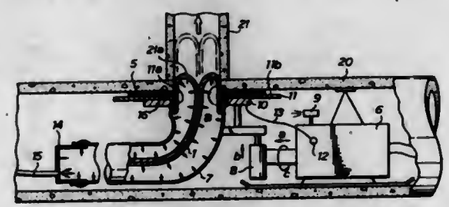
**Takao Kamiyama, Hiratsuka; Yasuhiro Yokoshima, Ibaraki, and Shigeru Endoh, Kasukabe, all of, Japan, assignors to Shonan Gosei-Jushi Seisakusho K.K., Japan**

**Filed Mar. 15, 1994, Ser. No. 212,777**

**Claims priority, application Japan, Mar. 23, 1993, 5-063595**

**Int. Cl.[6] B29C** *63/36*

**U.S. Cl. 264—516** **5 Claims**



1. A method for lining a branch pipe branching off a main pipe comprising the steps of:

(a) attaching an open end of a pressure bag to a set nozzle provided in a work robot movably introduced in said main pipe, said set nozzle including an electromagnet, said electromagnet being adapted to be turned on and off by remote control;

(b) placing in said pressure bag a branch pipe liner bag impregnated with a thermosetting resin and having a flange at one end thereof, said flange comprising an magnetic plate made of a material capable of being attracted by a magnet embedded therein;

(c) pulling out one end of said branch pipe liner bag at the flange side from said pressure bag and everting said branch pipe liner bag;

(d) electromagnetically attracting said magnetic plate embedded in said flange toward said set nozzle by turning on said electromagnet to tightly connect said flange to said set nozzle;

(e) supplying a pressurized fluid into said pressure bag with said flange being closely contacted to the inner wall of the main pipe around the perimeter of a branch pipe opening to evert and insert said branch pipe liner bag into the branch pipe;

(f) curing the thermosetting resin impregnated in said branch pipe liner bag, said branch pipe liner bag being left pressed against the inner wall of the branch pipe until said thermosetting resin is cured; and

(g) disengaging said flange from said set nozzle by turning off said magnet and removing said work robot and said pressure bag from said branch pipe liner bag.



**5,498,390**

**PRODUCTION OF HOLLOW ARTICLES FROM THERMOPLASTICS**

**Hans-Josef Sterzel, Dannstadt-Schauernheim, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Germany**

**Filed Jan. 11, 1994, Ser. No. 179,697**

**Claims priority, application Germany, Jan. 13, 1993, 43 00 597.7**

**Int. Cl.[6] B29C** *49/12;49/64*

**U.S. Cl. 264—532** **3 Claims**

1. In a process for the production of hollow articles by (a) forming of an amorphous parison by the injection molding of a thermoplastic material into a first mold, which is cooled, and (b) removing the parison from said first mold, heating the parison to a temperature of about 20° to about 80° above the glass transition temperature of the thermoplastic, and placing it into a second mold where it is stretch blow molded to produce the hollow article,

the improvement wherein

during the stretch blowing a liquid coolant is metered in along with the blowing gas such that the temperature of the parison remains approximately constant such that the heat liberated by crystallization is compensated by the heat of evaporation.

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**5,498,391**

**PROCESS OF MAKING A PANEL UNIT**

**Toshikazu Ito, and Yoshihiro Saita, both of Obu, Japan, assignors to Tokai Kogyo, KK, Obu, Japan**

**Continuation of Ser. No. 88,520, Jul. 1, 1993, Pat. No. 5,411,696, which is a continuation-in-part of Ser. No. 727,945, Jul. 10, 1991, abandoned. This application Jan. 13, 1995, Ser. No. 372,296**

**Claims priority, application Japan, Dec. 27, 1990, 2-415994**

**Int. Cl.[6] B29C** *47/02*

**U.S. Cl. 264—252** **3 Claims**

1. A method of manufacturing a panel unit including a window glass panel, and a frame mounted on a peripheral edge of said window glass panel, said method comprising the steps of:

providing a window glass panel;

preparing molding die means having an extrusion port for extruding a molding material forming said frame, said extrusion port having an inner circumferential surface configured to a cross section of a frame to be mounted on the peripheral edge of said window glass panel, and an open side surface shaped to externally receive the peripheral edge of said window glass panel;

inserting a part of the peripheral edge of said window glass panel into said open side surface of said extrusion port to form a molding space defined by the peripheral edge of said window glass panel and the inner circumferential surface of said extrusion port, said molding space corresponding to the cross section of said frame;

extruding said molding material from said extrusion port of said molding die means into said molding space;

controllably tilting said window glass panel such that the peripheral edge inserted into said open side surface maintains a constant angle to said molding die means; and

providing continuous movement of said window glass panel relative to said molding die means so that the extrusion port of said molding die means is virtually moved around the peripheral edge of said window glass panel, thereby forming said frame extending along the peripheral edge of said window glass panel, to form said panel unit.

**5,498,392**

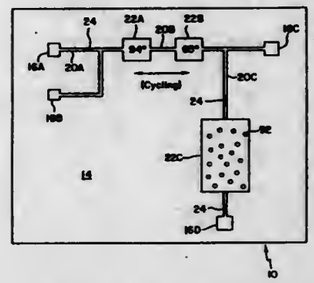
**MESOSCALE POLYNUCLEOTIDE AMPLIFICATION DEVICE AND METHOD**

**Peter Wilding, Paoli, and Larry J. Kricka, Berwyn, both of Pa., assignors to Trustees of the University of Pennsylvania, Philadelphia, Pa.**

**Continuation of Ser. No. 877,662, May 1, 1992, abandoned. This application Sep. 19, 1994, Ser. No. 308,199**

**Int. Cl.[6] G01N** *25/00;33/50;* **C12P** *19/34*

**U.S. Cl. 422—68.1** **27 Claims**



1. A device for amplifying a preselected polynucleotide in a sample by conducting a polynucleotide amplification reaction, the device comprising:

a solid substrate which is microfabricated to define:

a sample inlet port;

a mesoscale flow system comprising:

a sample flow channel extending from said inlet port; and

a polynucleotide amplification reaction chamber, in fluid communication with said flow channel;

said sample flow channel and said reaction chamber having at least one cross-sectional dimension of width or depth which is about 0.1 to 500 μm, said chamber and said channel being of dissimilar dimension; and

a fluid exit port in fluid communication with said flow system; and

means for thermally cycling the contents of said chamber whereby in each cycle the temperature is controlled to dehybridize double stranded polynucleotide and to permit the in vitro amplification of a preselected polynucleotide.

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**5,498,393**

**POWDER FORGING METHOD OF ALUMINUM ALLOY POWDER HAVING HIGH PROOF STRESS AND TOUGHNESS**

**Hiroyuki Horimura; Kenji Okamoto; Masahiko Minemi, all of Saitama; Toshihiko Kaji, Hyogo; Yoshishige Takano, Hyogo, and Yoshinobu Takeda, Hyogo, all of, Japan, assignors to Honda Giken Kogyo Kabushikikaisha, Tokyo, and Sumitomo Electric Industries, Ltd., Osaka, both of, Japan**

**Filed Jul. 26, 1994, Ser. No. 280,386**

**Claims priority, application Japan, Aug. 9, 1993, 5-197553**

**Int. Cl.[6] B22F** *3/17*

**U.S. Cl. 419—28** **24 Claims**

1. A powder forging method for forming an aluminum alloy of high proof stress and high toughness, comprising:

(a) preparing an aluminum alloy powder, wherein the general formula of the composition of said powder is $Al_{100-a-b}Fe_aX_b$, where a and b in atomic % are in the ranges $4.0 \leqq a \leqq 6.0$ and $1.0 \leqq b \leqq 4.0$, and where X is at least one alloy element selected from Y (yttrium) and Mm (mish metal), and wherein said powder contains at least 1% by volume of an amorphous phase;

(b) heating said aluminum alloy powder at a temperature that increases at a rate of at least 80° C. per minute to a predetermined temperature of at least 560° C. and not more than a temperature at which 10% by volume of a liquid phase is

present, wherein said heating is carried out until at least some liquid phase is present; and

(c) powder forging said aluminum alloy powder at said predetermined temperature to form said aluminum alloy.

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**5,498,394**

## APPARATUS AND METHOD FOR A BIO-CONDITIONING GERMICIDAL DRYER

**Arthur L. Matschke, Bethel, Conn., assignor to Molecucare, Inc., Southport, Conn.**

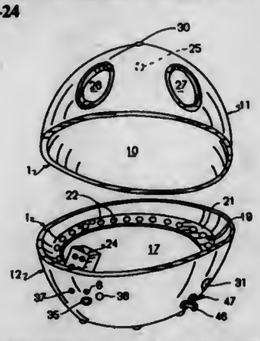
**PCT No. PCT/US92/09201, § 371 Date Jun. 15, 1994, § 102(e) Date Jun. 15, 1994, PCT Pub. No. WO93/08588, PCT Pub. Date Apr. 29, 1993**

**PCT Filed Oct. 16, 1992, Ser. No. 211,796**

**The portion of the term of this patent subsequent to Jun. 1, 2010, has been disclaimed.**

**Int. Cl.[6] A61L *2/10*; F26B *21/06***

**U.S. Cl. 422—24** **35 Claims**



1. An ultraviolet germicidal chamber comprising:

a housing having an internal wall defining a working chamber and a second chamber;

at least one portal in said housing communicating directly between said working chamber and outside of said housing;

a first ultraviolet light source positioned in the second chamber; and

an ultraviolet light diffuser positioned between the ultraviolet light source and the working chamber.

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**5,498,395**

## LIQUID COLLECTION AND SEPERATION APPARATUS

**Glenn A. Moore, Jr., 1473 Dartmouth Dr., Clearwater, Fla. 34616, and Christopher J. Mannari, 12760 Indian Rocks Rd. #113, Largo, Fla. 34644**

**Filed Sep. 14, 1993, Ser. No. 120,811**

**Int. Cl.[6] B01L *3/02***

**U.S. Cl. 422—100** **4 Claims**

1. An apparatus for collecting a liquid specimen, comprising:

a funnel wall having a rim at a first end thereof, said rim having a first predetermined diameter;

said funnel wall being exposed to an ambient environment so that it may receive a stream of liquid specimen directed thereinto;

said funnel wall having a pair of openings at a second end thereof, each opening of said pair of openings having a second predetermined diameter less than said first predetermined diameter;

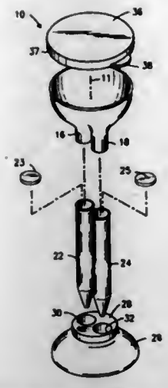
a pair of downspouts formed integrally with each opening of said pair of openings;

each of said downspouts having a free end;

each of said downspouts having a common uniform diameter and being disposed in parallel relation to one another;

said apparatus having a longitudinal axis of symmetry;

each of said downspouts having imperforate sidewalls;



said openings being disposed on opposite sides of said longitudinal axis of symmetry, in equidistant relation thereto;

a divider wall, bisected by said longitudinal axis of symmetry, being disposed between said openings so that at least some of the liquid introduced into the funnel is diverted by said divider wall into both of said openings;

said divider wall being integral with said funnel wall;

a plurality of centrifuge tubes, each having an open end and a closed end, said open end releasably connected to each of said free ends of said downspouts; and

a stand for releasably engaging respective closed ends of centrifuge tubes connected to said respective downspouts;

whereby contamination of a liquid specimen is substantially avoided during division of the liquid specimen into separate parts.

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**5,498,396**

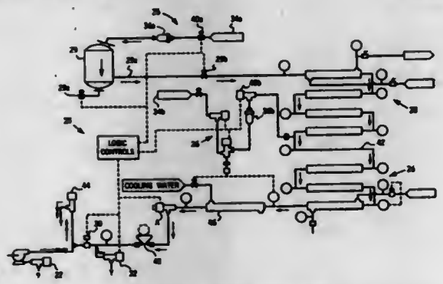
## SOLUTION STERILIZATION SYSTEM

**Albert J. Alkus, Lake Villa, Ill., and James T. Renick, Bristol, Wis., assignors to Abbott Laboratories, Abbott Park, Ill.**

**Filed Oct. 31, 1994, Ser. No. 332,006**

**Int. Cl.[6] A61L *2/00*; G05D *7/00*;*23/00***

**U.S. Cl. 422—109** **12 Claims**



10. A solution sterilization system comprising:

first heat-exchanger means having a capacity to receive a solution, to increase a temperature of said solution, and to sterilize said solution by heat sterilization;

supply means for supplying said solution to said first heat-exchanger means, said supply means being in fluid communication with said first heat-exchanger means;

second heat-exchanger means in fluid communication with said first heat-exchanger means at a position distal said supply means, said second heat-exchanger means having a capacity to decrease said temperature of said solution after said temperature of said solution is elevated by said first heat-exchanger means;



valve means for selectively releasing said solution from said system, said valve means being positioned within said supply means;

first means for pressurizing said system in fluid communication with said system at a position downstream of both of said first and second heat-exchanger means; and

second means for pressurizing said system in fluid communication with said system at a point intermediate said first heat-exchanger means and said second heat-exchanger means;

said first means for pressurizing said system being operable to pressurize said system prior to supplying said solution from said supply means to said first heat-exchanger means, said first means for pressurizing said system having a capacity to force liquids and gases within said system through said valve means; and

said second means for pressurizing said system being operable during shut-down of said system, said second pressurizing means having a capacity to backflow said solution from said first heat-exchanger means to said supply means.

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**5,498,397**

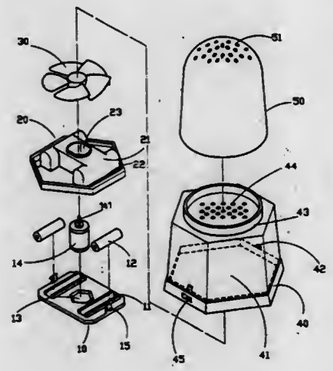
## AIR FRESHENER

**Chin-Fu Horng, #30 Lane 161, Hua Cheng Rd., Hsin Chuaing City, Taipei Shien, Taiwan, Prov. of China**

**Filed May 9, 1995, Ser. No. 437,663**

**Int. Cl.[6] A61L *9/12***

**U.S. Cl. 422—124** **3 Claims**



1. An air freshener, comprising:

a base, said base including a pair of symmetrical battery chambers, said base having a centrally disposed recess formed between said pair of battery chambers and a pair of hooks disposed on opposing sides thereof;

a pair of battery cells respectively mounted within said pair of battery chambers;

a motor cover covering said base and secured thereto by said pair of hooks, said motor cover having a motor mounting hole formed therethrough;

a fan motor mounted within said centrally disposed recess of said base and disposed within said motor mounting hole of said motor cover, said fan motor having an output shaft extending from said motor cover through said motor mounting hole;

a fan blade coupled to said output shaft external said motor cover;

a shell over laying and coupled to said motor cover, said shell having a bottom chamber for receiving said combined base, motor cover, fan motor and fan blade, said shell having an open top chamber for holding spices therein, said open top chamber having a bottom wall with a plurality of air vents formed therethrough and in open communication with said bottom chamber;

a transparent shade having an open bottom end covering said open top chamber of said shell and the spices therein, said transparent shade having a closed upper end with a plurality of through openings formed therein; and,

a power switch mounted on said shell and electrically coupled in series relation between said battery cells and said fan motor for controlling operation of said fan motor, whereby operation of said fan motor causes said fan blade to produce air currents through said plurality of air vents for carrying an aroma of the spices from said plurality of through openings of said transparent shade.

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**5,498,398**

## METHOD OF TREATING SPENT ELECTROLYTIC SOLUTION FROM ELECTROLYTIC COPPER PRODUCTION

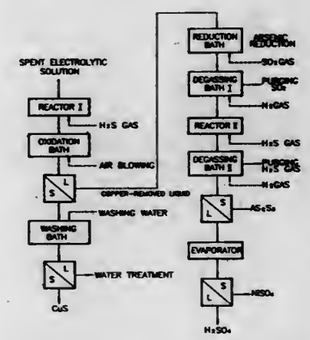
**Seong W. Kang, and Yong H. Lee, both of Kyungsangnam-do, Rep. of Korea, assignors to Lucky Metals Corporation, Rep. of Korea**

**Filed Nov. 4, 1994, Ser. No. 334,245**

**Claims priority, application Rep. of Korea, Nov. 8, 1993, 23619**

**Int. Cl.[6] C01G *3/12***

**U.S. Cl. 423—37** **5 Claims**




1. A method for treating a spent copper-refining electrolyte to remove impurities including copper, arsenic, antimony, bismuth, and nickel by using a hydrogen sulfide gas, characterized in that which comprises the steps of:

(a) blowing a hydrogen sulfide gas into the spent electrolyte to precipitate copper sulfide;

(b) blowing air into the precipitate solution obtained in the above step (a) to oxidize arsenic, bismuth and antimony thereby redissolving them into the solution, and subjecting the solution to solid-liquid separation to separate copper sulfide from the liquid;

(c) blowing a sulfur dioxide gas ($SO_2$) into the copper-depleted liquid to reduce arsenic, bismuth and antimony and blowing a nitrogen gas to purge the remaining sulfur dioxide gas;

(d) blowing a hydrogen sulfide gas to precipitate arsenic, bismuth and antimony in the form of sulfides and blowing a nitrogen gas to purge the remaining hydrogen sulfide gas and separating arsenic sulfide from the liquid; and

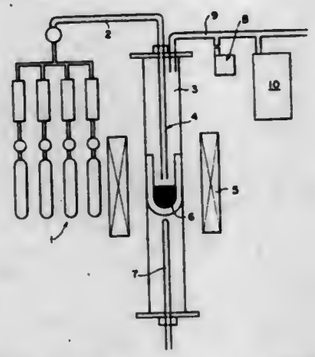
(e) concentrating the liquid to separate crude nickel sulfate and sulfuric acid.

**5,498,399**

## PROCESS FOR REMOVING NITROGEN OXIDES

**Shoji Shirouchi; Takeshi Sugiyama, and Kouichi Morioka, all of Kakogawa, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan**

**Division of Ser. No. 86,204, Jul. 6, 1993, Pat. No. 5,366,950. This application Aug. 1, 1994, Ser. No. 283,741**
**Claims priority, application Japan, Jul. 6, 1992, 4-178442**
**Int. Cl.[6] C01B *21/00***
**U.S. Cl. 423—239.1** **11 Claims**



1. A process for removing nitrogen oxides comprising the step of:

contacting exhaust gas with a CaO—$Fe_2O$ complex oxide comprising 5–50 wt.% CaO and at least 50 wt % $Fe_2O$ at a temperature greater than 500° C.

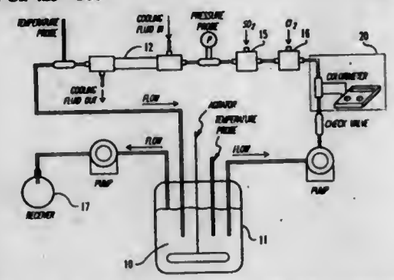
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**5,498,400**

## PREPARATION OF THIONYL CHLORIDE AND PHOSPHORUS OXYHLORIDE FROM SULFUR DIOXIDE

**John E. Hill, West Lafayette, Ind., assignor to Great Lakes Chemical Corporation, West Lafayette, Ind.**

**Filed Jan. 28, 1994, Ser. No. 188,308**
**Int. Cl.[6] C01B *17/45;25/10***
**U.S. Cl. 423—300** **15 Claims**



10. A process for preparing sulfuryl chloride, comprising the steps of:

(a) recirculating sulfuryl chloride through a reaction loop, said reaction loop including a reservoir and a catalyst for promoting the formation of sulfuryl chloride;

(b) dissolving chlorine into the sulfuryl chloride being recirculated through the reaction loop;

(c) dissolving sulfur dioxide into the sulfuryl chloride being recirculated through the reaction loop; and

(d) continuously circulating the sulfuryl chloride containing dissolved chlorine and dissolved sulfur dioxide through the reaction loop for a time and at a temperature effective to convert substantially all of the sulfur dioxide and chlorine to sulfuryl chloride.

13. A process for preparing thionyl chloride and phosphorus oxychloride, comprising the steps of:

(a) recirculating thionyl chloride and phosphorus oxychloride through a reaction loop, said reaction loop including a reservoir and a reaction zone;

(b) dissolving a fluctuating amount of sulfur dioxide into the thionyl chloride and phosphorus oxychloride being recirculated through the reaction loop;

(c) introducing phosphorus trichloride and chlorine into the thionyl chloride and phosphorus oxychloride being recirculated through the reaction loop, said phosphorus trichloride and chlorine introduced in about stoichiometric amounts for reaction with the sulfur dioxide present from step (b); and (d) recirculating the reaction mixture through the reaction loop for a time and at a temperature effective to convert the phosphorus trichloride, chlorine, and sulfur dioxide to phosphorus oxychloride or thionyl chloride.

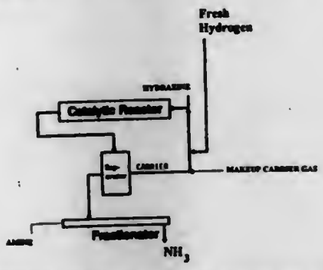
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**5,498,401**

## DISPOSAL OF HYDRAZINE PROPELLANTS

**Russell W. Johnson, Elmhurst, Ill.; Brent S. DeFeo, Sparta, N.J.; Francis S. Lupton, Evanston, and Mark B. Koch, Mt. Prospect, both of Ill., assignors to AlliedSignal Inc., Morris Township, Morris County, N.J.**

**Division of Ser. No. 140,589, Oct. 21, 1993, Pat. No. 5,437,853. This application Apr. 11, 1995, Ser. No. 419,795**
**Int. Cl.[6] C01C *1/00; C07C 211/00***
**U.S. Cl. 423—352** **8 Claims**




1. A method of converting hydrazines to ammonia or ammonia and the corresponding amines comprising:

(a) evaporating the hydrazine into a suitable carder gas;

(b) passing said evaporated hydrazine of (a) over a supported metal from Group VIII at a temperature of 0° to 250° C. in the presence of at least 0.1 mols of hydrogen for each mol of hydrazine, so as to produce by hydrogenolysis ammonia or ammonia and or ammonia the corresponding amine;

(c) recovering the ammonia and amine from the product of (b).

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**5,498,402**

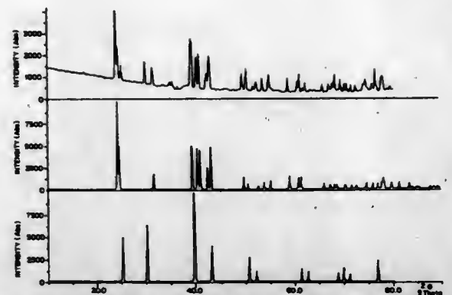
## METAL-MAGNESIUM COMPOUNDS

**Borislav Bogdanovic, and Ursula Wilczok, both of Mülheim/Ruhr, Germany, assignors to Studiengesellschaft Kohle mbH, Mulheim/Ruhr, Germany**

**Division of Ser. No. 734,365, Jul. 22, 1991, Pat. No. 5,385,716. This application Oct. 13, 1994, Ser. No. 322,254**
**Claims priority, application Germany, Jul. 31, 1990, 40 24 205.6**
**Int. Cl.[6] C01B *9/00***
**U.S. Cl. 423—463** **3 Claims**

1. The method for the production of a soluble metal-magnesium compound of the formula $M^1$-Mg-halide or $M^1$-hydride-Mg halide in which $M^1$ is a metal of Group III A-VA, VB-VIIB, VIII, IB or IIB of the Periodic Table, comprising by in a first step reacting the metal $M^1$ or a halide or hydride thereof in an organic solvent with at least one magnesium-containing member selected from the





group consisting of magnesium hydride ($MgH_2$), a hydridemagnesium halide (HMgX), an organomagnesium compound and metallic magnesium, at least one of the $M^1$-component or the magnesium component containing a halide ion, optionally in the presence of at least one activator selected from the group consisting of anthracene or a derivative thereof, magnesium· 3 THF (MgA) or a derivative thereof, a magnesium halide, an organic halide and quinuclidine, and in a second step reacting such compound with an $M^1$ halide.

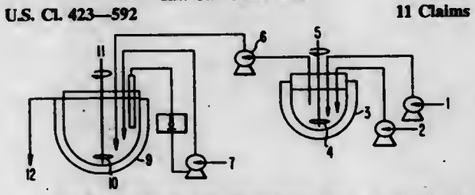
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**5,498,403**

## METHOD FOR PREPARING HIGH DENSITY NICKEL HYDROXIDE USED FOR ALKALI RECHARGEABLE BATTERIES

**Dong-Yup Shin, Kyunki, Rep. of Korea, assignor to Hyundai Motor Company, Rep. of Korea**

**Filed Feb. 21, 1995, Ser. No. 390,963**
**Claims priority, application Rep. of Korea, May 20, 1994, 94-11023**
**Int. Cl.[6] C01B *13/36***
**U.S. Cl. 423—592** **11 Claims**



1. A method for preparing high density nickel hydroxide in which a nickel sulfate solution and ammonium hydroxide are continuously mixed in a premixing vessel to form a mixed solution containing a nickel ammonium complex, and then the mixed solution containing the nickel ammonium complex and a sodium hydroxide solution are continuously supplied to a reactor to obtain nickel hydroxide.

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**5,498,404**

## PROCESS FOR THE STEAM REFORMING OF HYDROCARBONS

**Jens-Henrik B. Hansen, Charlottenlund; Leif Storgaard, Herlev, and Poul E. Jensen, Allerod, all of, Denmark, assignors to Haldor Topsøe A/S, Denmark**

**Filed Aug. 24, 1994, Ser. No. 295,285**
**Claims priority, application Denmark, Aug. 27, 1993, 0974/93**
**Int. Cl.[6] C01B *3/40;3/26***
**U.S. Cl. 423—654** **4 Claims**

1. Process for catalytic steam reforming of a nitrogen-containing hydrocarbon feedstock to produce hydrogen- and carbon monoxide-rich gasses with reduced formation of ammonia, wherein the feedstock is contacted with a support nickel catalyst further including copper in an amount of 0.01–10% by weight calculated on the amount of nickel in the catalyst, the copper being present to suppress the production of ammonia.

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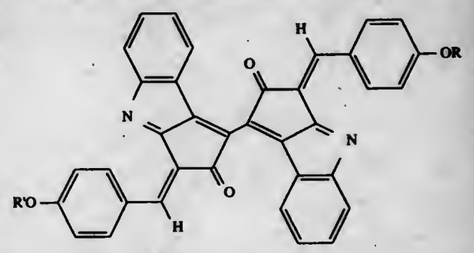
**5,498,405**

## INDOLE ALKALOIDS USEFUL AS UV PROTECTIVE AND ANTI-INFLAMMATORY AGENTS

**William H. Gerwick, Corvallis, Oreg.; Robert S. Jacobs, Santa Barbara, Calif.; Richard Castenholz, Elmira, Oreg.; Ferran Garcia-Pichel, Bremen, Germany; Krista J. S. Grace, Goleta, Calif.; Philip J. Proteau, Murray, Utah, and James Rossi, Corvallis, Oreg., assignors to The Regents of the University of California, Oakland, Calif.**

**Division of Ser. No. 297,022, Aug. 29, 1994, Pat. No. 5,461,070. This application Jul. 17, 1995, Ser. No. 503,384**
**Int. Cl.[6] A61K *31/40; C07D 209/94***
**U.S. Cl. 424—59** **13 Claims**

1. An indole alkaloid compound having the formula



where R and R' are an alkyl group having up to 5 carbon atoms or —CO—$(CH_2)_n$—$CH_3$ where n=0to16.

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**5,498,406**

## TITANIUM DIOXIDE-BASED SUNSCREEN COMPOSITIONS

**Malcolm R. Nearn, 3 Riverview Road, Kentlyn NSW 2560; Sandra J. Redshaw, 2 Bellevue Avenue, Georges Hall NSW 2198, and Graham Burgess, 36 Dowland Street, Bonnyrigg NSW 2177, all of, Australia**

**Filed Apr. 30, 1993, Ser. No. 56,050**
**Int. Cl.[6] A61K *7/42;7/44;7/48;9/12***
**U.S. Cl. 424—59** **7 Claims**

1. A sunscreen composition in oil-in-water emulsion form having cosmetically acceptable properties and having substantially uniformly suspended therein from about 0.5% to about 5%, by weight, of microfine $TiO_2$ having a particle size of less than about 100 nm, said composition further comprising a dispersing agent in an amount sufficient to stabilize said emulsion, said dispersing agent comprising a long chain saturated primary alcohol, having an average of from about 25 to about 45 carbon atoms in the long chain, ethoxylated or unethoxylated.

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**5,498,407**

## POLY(2-HYDROXYETHYL METHACRYLATE) AND ALL COPOLYMERS OF POLY-HEMA FIBERS AND COSMETIC COMPOSITIONS CONTAINING SAME

**Sheldon M. Atlas, 211 Central Park West, New York, N.Y. 10024**

**Filed Oct. 24, 1994, Ser. No. 328,091**
**Int. Cl.[6] A61K *7/035;7/04;7/027***
**U.S. Cl. 424—70.7** **5 Claims**

1. A lipstick composition consisting of (a)polyHema fibers or copolymer of polyHema fibers wherein the monomer is selected from the group consisting of acrylic acid, methacrylic acid, cro-

tonic acid, hydroxyethylmethacrylate, hydroxyethylacrylate, hydroxypropylacrylate, hydroxypropyl methacrylate, hydroxybutyl methacrylate, N-Vinyl-2-Pyrolidone, and neopentyl glycol dimethacrylate in a weight ratio of 0.5 to 15% of weight

| | | |
|---|---|---|
| b. | Carnauba wax | 10% |
| c. | Beeswax | 15% |
| d. | Cetyl Alcohol | 5% |
| e. | Ethyl Alcohol | 2% |
| f. | Water | 2% |
| g. | Protein Hydrolysate | 2% |
| h. | Castor Oil | 57%. |

2. A liquid make-up composition comprising:

I. A Powder Phase Consisting of:

a. PolyHema fibers or compolymer of polyHema fibers wherein the monomer is selected from the group consisting of acrylic acid, methacrylic acid, crotonic acid, hydroxyethylmethacrylate, hydroxyethylacrylate, hydroxypropylacrylate, hydroxypropyl methacrylate, hydroxybutyl methacrylate, N-Vinyl-2-Pyrolidone, and neopentyl glycol dimethacrylate in a weight ratio of 0.5 to 15% of weight

| | | |
|---|---|---|
| b. | Titanium Dioxide | 7.0% |
| c. | Talc | 7.0% |
| d. | Inorganic Color | 1.0% |

II. An Oil Phase Consisting of:

| | | |
|---|---|---|
| e. | Stearic Acid | 2.0% |
| f. | Propylparaben | 0.1% |
| g. | Mineral Oil | 10.0% |
| h. | Glyceryl Monostearate | 2.0% |
| i. | Landin | 1.0% |

III. And a Water Phase Consisting of:

| | | |
|---|---|---|
| j. | Water | 60.5% |
| k. | Methyl paraben | 0.15% |
| l. | Triethanolamine | 1.0% |
| m. | Propylene Glycol | 3.0% |
| n. | Sodium Carboxymethyl Cellulose | 0.25%. |

3. A Face Powder Composition Consisting of:

a. Polyhema fibers or copolymer of polyHema fibers wherein the monomer is selected from the group consisting of acrylic acid; methacrylic acid, crotonic acid, hydroxyethylmethacrylate, hydroxyethyl acrylate, hydroxypropylacrylate, hydroxypropyl methacrylate, hydroxybutyl methacrylate, N-Vinyl-2-Pyrolidone, and neopentyl glycol dimethacrylate in a weight ratio of 0.5 to 15% of weight

| | | |
|---|---|---|
| b. | Titanium Dioxide | 10% |
| c. | Talc | 68% |
| d. | Zinc Stearate | 5% |
| e. | Magnesium Carbonate | 2% |
| f. | Precipitated Chalk | 3% |
| g. | Kaolin | 10% |
| h. | Color and Perfume q.s. | |

4. A Nail Polish Composition Consisting of:

a. Polyhema Fibers or copolymer of polyHema fibers wherein the monomer is selected from the group consisting of acrylic acid, methacrylic acid, crotonic acid, hydroxyethylmethacrylate, hydroxyethyl acrylate, hydroxypropylacrylate, hydroxypropyl methacrylate, hydroxybutyl methacrylate, N-Vinyl-2-Pyrolidone, and neopentyl glycol dimethacrylate in a weight ratio of 0.5 to 15% of weight

| | | |
|---|---|---|
| b. | Nitrocellulose ½ sec. | 15.5% |
| c. | Alcohol Anhydrous | 8.3% |
| d. | Santolite Resin | 7.4% |
| e. | Camphor | 2.5% |
| f. | Dibutylphthalate | 5.0% |
| g. | n-Butylacetate | 26.9% |
| h. | Ethyl Acetate | 8.0% |
| i. | Toluene | 25.4%. |

5. A Mascara Composition Consisting of:

a. Polyhema fibers or copolymer of polyHema fibers wherein the monomer is selected from the group consisting of acrylic acid, methacrylic acid, crotonic acid, hydroxyethylmethacrylate, hydroxyethyl acrylate, hydroxypropylacrylate, hydroxypropyl methacrylate, hydroxybutyl methacrylate, N-Vinyl-2-Pyrolidone, and neopentyl glycol dimethacrylate in a weight ratio of 0.5 to 15% of weight

| | | |
|---|---|---|
| b. | Oleic Acid | 4.75% |
| c. | Glyceryl Monostearate | 1.25% |
| d. | Beeswax, Yellow | 8.0% |
| e. | Carnauba Wax | 6.5% |
| f. | Cellulose (H.V.) | 1.5% |
| g. | Pigments | 5–8% |
| h. | Triethanol Amine | 2.5% |
| i. | Preservative q.s. | |
| j. | Antioxidant q.s. | |
| k. | Water q.s. | |

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**5,498,408**

## ORAL REHYDRATION COMPOSITION

**Maria T. B. Oltra, Barcelona, Spain; Wolfgang Ernstberger, Laupen, Switzerland, and Montserrat B. i Molas, Barcelona, Spain, assignors to Sandoz Nutrition Ltd., Berne, Switzerland**

**Continuation of Ser. No. 948,376, Sep. 21, 1992, abandoned. This application Apr. 4, 1994, Ser. No. 223,070**

**Int. Cl.[6] A61K** *35/78*

**U.S. Cl. 424—78.01** **12 Claims**

1. A formulated rehydration composition in powder form for oral administration consisting essentially of carbohydrates from rice flour, carrot powder, and conventional carbohydrates selected from the group consisting of maltodextrines, glucose polymers or mixtures thereof and electrolytes, wherein the weight ratio of rice flour to carrot powder in said composition ranges from 5:1 to 1:5, and the weight ratio of carbohydrates originating from rice flour and carrot powder to conventional carbohydrates ranges from 1:1 to 1:7, and wherein said composition supplies after dissolution in water a total amount per liter of from 30 to 90 g carbohydrates,

from 30 to 90 m Equivalents of $Na^+$,

from 18 to 42 m Equivalents of $K^+$,

from 25 to 35 m Equivalents of citrate ions from trisodium citrate dihydrate,

from 30 to 90 m Equivalents of $Cl^-$, and

from 120 to 360 kcal/liter and has an osmolarity of from 210 to 290 mOsm/liter.



**5,498,409**

## MATERIAL FOR ADSORBING PYROGEN

**Chuichi Hirayama, 373-12, Shimonabe-machi, Kumamoto-shi, Kumamoto-ken; Keijun Hiraoka, and Sunao Morimoto, both of Yatsushiro, all of, Japan, assignors to Chuichi Hirayama, Kumamoto, and Kohjin Co., Ltd., Tokyo, both of, Japan**

**Continuation of Ser. No. 675,003, Mar. 26, 1991, abandoned. This application Feb. 10, 1993, Ser. No. 15,883**

**Claims priority, application Japan, Mar. 27, 1990, 2-80095**

**Int. Cl.[6] A61K** *31/785;* **C08L** *79/00*

**U.S. Cl. 424—78.36** **27 Claims**

1. An insoluble adsorbent for adsorbing a pyrogen from a liquid containing said pyrogen comprising an article which is substantially insoluble in said liquid under adsorption conditions, which article consists essentially of a mixture of polymer of an aziridine compound consisting essentially of a sufficient amount of an aziridine constituent to adsorb pyrogen from said liquid, in admixture with another polymer that is compatible with said aziridine polymer.

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**5,498,410**

## METHOD FOR THE TREATMENT OF EOSINOPHIL-ASSOCIATED CONDITIONS WITH ANIONIC POLYMERS

**Gerald J. Gleich, 799 SW. Third St., Rochester, Minn. 55902**

**Continuation-in-part of Ser. No. 120,125, Sep. 10, 1993, which is a continuation-in-part of Ser. No. 689,154, Apr. 22, 1991, Pat. No. 5,250,293. This application Sep. 30, 1993, Ser. No. 129,439**

**Int. Cl.[6] A61K** *31/785;9/06;9/12;9/20*

**U.S. Cl. 424—78.36** **11 Claims**

1. A method for treating bronchial asthma comprising enterally or parentally administering to a human afflicted with such a disease an amount of anionic polynucleotide in combination with a pharmaceutically acceptable carrier effective to counteract the symptoms of bronchial asthma by neutralizing the effect of at least one cationic toxin released by the eosinophils of said human.

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**5,498,411**

## METHOD FOR PREPARING A FOOD CONTAINING NONSAPONIFIABLE MATTER OF AVOCADO OIL CONTAINING AN INCREASED AMOUNT OF FRACTION H

**Alain Rancurel, Mainvilliers, France, assignor to Laboratoires Pharmascience, Courbevoie, France**

**Continuation of Ser. No. 109,769, Aug. 20, 1993, abandoned, which is a division of Ser. No. 759,268, Sep. 13, 1991, Pat. No. 5,262,163. This application Sep. 27, 1994, Ser. No. 314,118**

**Claims priority, application France, Jul. 3, 1991, 91 0831**

**Int. Cl.[6] A61K** *35/78*

**U.S. Cl. 424—195.1** **5 Claims**

1. A method for preparing a food preparation including nonsaponifiable matter of avocado oil containing 30 to 60% of fraction H, comprising:

heat treating avocado fruit at a temperature of 80 degrees C. to 120 degrees C. for not less than four hours;

extracting avocado oil from the heat-treated avocado fruit;

separating nonsaponifiable matter from the avocado oil;

recovering the nonsaponifiable matter; and

introducing the nonsaponifiable matter into a food preparation.

**5,498,412**

## ANTIOXIDANT COMPOSITION AND METHOD FOR THE SAME

**Hisanao Fujie, Kobe, Japan, assignor to A.O.A. Japan Co., Ltd., Hyogo, Japan**

**Continuation-in-part of Ser. No. 164,551, Dec. 10, 1993, abandoned. This application Oct. 11, 1994, Ser. No. 322,013**

**Int. Cl.[6] A61K** *35/78*

**U.S. Cl. 424—195.1** **5 Claims**

1. A method for producing a natural antioxidant composition made from a plurality of fermented and milled materials of edible grains and pulses and embryos or brans thereof, comprising the steps of:

separately parching a plurality of members selected from the group consisting of at least one edible grain, at least one edible pulse, at least one embryo of an edible grain, at least one embryo of an edible pulse, at least one bran of an edible grain and at least one bran of an edible pulse at a temperature between 80 and 90 degrees centigrade for between 5 and 6 hours;

milling each of the parched resultants separately;

steaming each of the milled resultants separately;

malting each of the steamed resultants separately with fermentation at an aging temperature between 35 and 36 degrees centigrade for between 3 and 14 days;

adding alcohol to each of the malted resultants separately to restrict the fermentation;

drying each of the resultants separately to remove the alcohol at a drying temperature of 100 degrees centigrade or less and separately milling each at about 400 mesh of Tyler Standard screen scale;

mixing all of the resultants to make a fermented mixture;

separately parching an edible seed, green tea leaves and at least one member selected from the group consisting of young leaves of radish and spinach;

milling each of the parched seed, the parched green tea leaves and the parched radish and/or spinach leaves separately;

squeezing at least one member selected from the group consisting of lemon, Yuzu orange and citron, and recovering a juice;

mixing the milled parched seed, the parched green tea leaves, and the radish and/or spinach leaves and the juice to make a mash;

mixing said fermented mixture and said mash to form a complete material; and

granulating the complete material to granules.

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**5,498,413**

## RECOMBINANT SUBUNIT VACCINE AGAINST PORCINE PARVOVIRUS

**Jose I. Casal Alvarez; Elena Cortes Valdes; Ana I. Ranz Casares; Carmen Vela Olmo, and Kristian Dalsgaard, all of Madrid, Spain, assignors to Inmunologia Y Genetica, S.A., Madrid, Spain**

**PCT No. PCT/ES92/00032, § 371 Date Jan. 27, 1993, § 102(e) Date Jan. 27, 1993, PCT Pub. No. WO92/17589, PCT Pub. Date Oct. 15, 1992**

**PCT Filed Mar. 26, 1992, Ser. No. 969,213**

**Claims priority, application Spain, Mar. 26, 1991, 9100845**

**Int. Cl.[6] A61K** *39/23;* **C12N** *15/35;15/63;* **C07K** *14/015*

**U.S. Cl. 424—233.1** **6 Claims**

1. A recombinant subunit vaccine to protect pigs against PPV infection consisting essentially of:

an immunizing quantity of empty VP2 capsids formed by autoassembly of only PPV recombinant VP2 protein; and

a diluent and an adjuvant, being immunologically acceptable.

5,498,414

## ATTENUATED STRAINS OF *AEROMONAS SALMONICIDA* USEFUL AS FISH VACCINES

Julian C. Thornton, Brentwood Bay, and William W. Kay, Victoria, both of, Canada, assignors to University of Victoria, Victoria, Canada

Filed Oct. 5, 1992, Ser. No. 957,531
Int. Cl.[6] A61K *39/02*; C12N *1/36;1/20*
U.S. Cl. 424—234.1 34 Claims

1. A live vaccine for the immunization of fish wherein the vaccine comprises live microorganisms selected from the group consisting of: *Aeromonas salmonicida* strain 10SR or mutants thereof that are capable of inducing protective immunity in a susceptible fish against infection by virulent *Aeromonas salmonicida; Aeromonas salmonicida* strain 10SR-3 or mutants thereof that are capable of inducing protective immunity in a susceptible fish against infection by virulent *Aeromonas salmonicida*; and *Aeromonas salmonicida* strain A450-3 or mutants thereof that are capable of inducing protective immunity against infection by virulent *Aeromonas salmonicida* in susceptible fish.

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5,498,415

## DISINFECTANT FOR THE TREATMENT OF WATER SYSTEMS

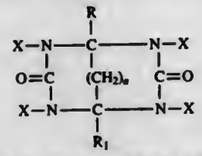
Ronald L. Jones, Norcross, Ga., assignor to Bio-Lab, Inc., Decatur, Ga.

Continuation of Ser. No. 898,293, Jun. 15, 1993, abandoned, which is a continuation of Ser. No. 652,983, Feb. 11, 1991, abandoned. This application Apr. 28, 1994, Ser. No. 234,638
Int. Cl.[6] A01N *25/08*
U.S. Cl. 424—409 14 Claims

1. A solid disinfecting composition in the form of a tablet, stick or puck consisting essentially of a mixture of:

a. 50–99% by weight of trichloro-s-triazinetrione;

b. 0.01–50% by weight of glycolurils having the structure:



(II)

in which R and $R_1$ are independently selected from the group consisting of hydrogen, lower alkyl radicals of from 1 to 4 carbon atoms, and phenyl; each X is hydrogen; and a is either 0 or 1; and

c. about 5–20% by weight of an alkali bromide salt selected from the group consisting of sodium bromide and potassium bromide,

said composition providing a controlled and uniform rate of release of hypobromous or hypochlorous ion to a water system.

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5,498,416

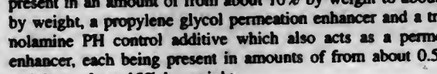
## PROCESS FOR THE PROTECTION OF PROSTHESES AND OF TEMPORARILY OR PERMANENTLY IMPLANTABLE MATERIAL AGAINST BACTERIAL COLONIZATION AND INFECTION

Helene J. Carsenti-Etesse, and Pierre L. Dellamonica, both of 101 Chemin du Col de Bast, Nice, France

PCT No. PCT/FR92/00694, § 371 Date Jan. 18, 1994, § 102(e) Date Jan. 18, 1994, PCT Pub. No. WO93/01842, PCT Pub. Date Feb. 4, 1993
PCT Filed Jul. 17, 1992, Ser. No. 182,090
Claims priority, application France, Jul. 18, 1991, 91 09069
Int. Cl.[6] B05D *3/00;1/36;* A61F *2/00;* A61M *5/32*
U.S. Cl. 424—422 9 Claims

1. In a process for the protection of prostheses, implants and/or catheters, of temporary or permanent implantable materials, against bacterial colonization and infection in which there is applied to a material to be protected, a solution of an antibacterial agent capable of being progressively released into aqueous medium, the improvement which comprises: successively impregnating said material to ensure the adhesion of the antibacterial agent to the material to be protected:

a) with a solution in aqueous or organic solvent of a biguanide of the general formula:



in which $R_1$ represents an alkyl radical, aminoalkyl, phenyl possibly substituted (with a halogen atom or a hydroxy, alkyl, alkoxy or carboxy radical), naphthyl or cyano, $R_2$ represents a hydrogen atom or an alkyl radical and n is a whole number from 1 to 6, wherein the alkyl portions and radicals are a straight chain or branched and contain 1 to 4 carbon atoms, then

b) with the solution of antibacterial agent capable of being progressively released into aqueous medium, and drying the thus-impregnated material.

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5,498,417

## TRANSDERMAL DELIVERY OF APPETITE SUPPRESSANT DRUG

Ramesh Lhila, South Windsor; Stuart Ganslaw, Simsbury, both of Conn., and Eleanor Serra, West Springfield, Mass., assignors to Coating Sciences, Inc., Bloomfield, Conn.

Filed May 12, 1994, Ser. No. 241,649
Int. Cl.[6] A61F *13/00*
U.S. Cl. 424—448 2 Claims



1. An adhesive/drug mixture for use in a transdermal patch, said adhesive/drug mixture comprising a pressure-sensitive acrylic adhesive, present in an amount of from about 25% by weight to about 90% by weight, an indirect-acting phenyl propanolamine, present in an amount of from about 10% by weight to about 60% by weight, a propylene glycol permeation enhancer and a triethanolamine PH control additive which also acts as a permeation enhancer, each being present in amounts of from about 0.5% by weight to about 15% by weight.

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5,498,418

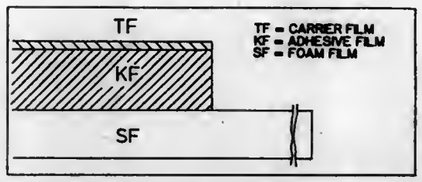
## NITROGLYCERINE PLASTER AND PROCESS FOR ITS PRODUCTION

Dieter Beutner, Monheim; Henning von Knobelsdorff, Bonn; Hans-Michael Wolff, Monheim; Rainer Hoffmann, Neuwied; Reinhold Meconi, Neuwied, and Robert P. Klein, Neuwied, all of, Germany, assignors to Schwarz Pharma AG, Monheim, and LTS Lohmann Therapie-Systeme GmbH & Co. KG, Neuwied, both of, Germany

PCT No. PCT/EP92/01169, § 371 Date Mar. 14, 1994, § 102(e) Date Mar. 14, 1994, PCT Pub. No. WO92/22292, PCT Pub. Date Dec. 23, 1992
PCT Filed May 25, 1992, Ser. No. 142,316
Claims priority, application Germany, Jun. 10, 1991, 41 18 891.8
Int. Cl.[6] A61F *13/00*
U.S. Cl. 424—448 6 Claims

1. A dermal plaster for the transdermal administration of nitroglycerine, comprising a carrier film, a nitroglycerine-containing adhesive body formed from an acrylate-vinyl acetate copolymer, and a removable protective film, said adhesive body, being produced by:






1) subjecting a mixture of monomers consisting essentially of 21 to 40% by weight vinyl acetate, 55 to 70% by weight 2-ethylhexyl acrylate, and 3 to 10% by weight hydroxyethyl acrylate in an organic solvent to radical polymerization, said weight percentages being based on 100% by weight of said monomers.

2) admixing into said mixture of monomers a crosslinking agent and said nitroglycerine and

3) causing said monomers to crosslink while heating and removing said solvent.

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5,498,419

## FUMARATE SALT OF 4-(DIETHYL-3-(1-METHYLOCTYL)-7,8,9,10-TETRAHYDRO-6,6,9-TRIMETHYL-6H-DIBENZO[B,D]PYRAN-1-OL, 4-(DIETHYL-AMINO) BUTYRIC

Harry G. Pars, P.O. Box 541, Concord, Mass. 02741

Filed Jun. 3, 1994, Ser. No. 253,849
Int. Cl.[6] A61F *13/00;* A61K *9/14*
U.S. Cl. 424—449 14 Claims

1. A method of treating glaucoma comprising administering to a mammal suffering from or susceptible to glaucoma about 0.01 to 10 mg a fumarate salt of 4-(diethyl-3-(1-methyloctyl)-7,8,9,10 -tetrahydro-6,6,9-trimethyl-6H-dibenzo[b,d]pyran-1-ol, 4-diethylamino)butyric acid ester.

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5,498,420

## STABLE SMALL PARTICLE LIPOSOME PREPARATIONS, THEIR PRODUCTION AND USE IN TOPICAL COSMETIC, AND PHARMACEUTICAL COMPOSITIONS

Meutrup Edgar, Frankfurt; Christoph Michel, Obertshausen, and Thomas Purmann, Aschaffenburg, all of, Germany, assignors to Merz & Co. GmbH & Co., Frankfurt am Main, Germany

Continuation of Ser. No. 133,674, Oct. 8, 1993, abandoned, which is a continuation-in-part of Ser. No. 863,989, Apr. 6, 1992, abandoned. This application Apr. 27, 1995, Ser. No. 430,687
Claims priority, application Germany, Apr. 12, 1991, 41 11 982.7
Int. Cl.[6] A61K *9/127*
U.S. Cl. 424—450 18 Claims

1. A liposome preparation wherein the vesicles are impermeable, non-aggregating, and have a dimensionally-stable small particle size of about 20 to 150 nm and a unilamellar vesicle membrane which consists essentially of a mixture of 84 to 10% by weight of a phosphatidyl choline having a saturated or unsaturated C16–C20 fatty acid chain, and 16 to 90% by weight of a lipoaminoacid or lipopeptide wherein the esterifying fatty acid in the lipoaminoacid or lipopeptide is a C8–C24 carboxylic acid, prepared by dispersing the aforesaid mixture in an aqueous phase at a pH of about 5 to 7 in the presence of a buffer which is effective in this pH range and subjecting the dispersion to high-pressure homogenization or by injecting the aforesaid mixture together with ethanol into an aqueous phase at a pH of about 5 to 7 in the presence of a buffer which is effective in this pH range to form said liposome preparation, said liposomes having incorporated therein a therapeutic or cosmetic agent.

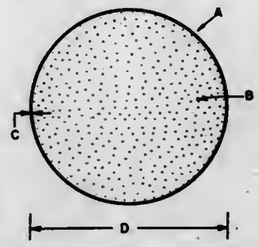
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5,498,421

## COMPOSITION USEFUL FOR IN VIVO DELIVERY OF BIOLOGICS AND METHODS EMPLOYING SAME

Mark W. Grinstaff, Pasadena; Patrick Soon-Shiong, Los Angeles, both of Calif.; Michael Wong, Champaign, Ill.; Paul A. Sandford, Los Angeles, Calif.; Kenneth S. Suslick, Champaign, Ill., and Neil P. Desai, Los Angeles, Calif., assignors to Vivorx Pharmaceuticals, Inc., Santa Monica, Calif.

Continuation-in-part of Ser. No. 23,698, Feb. 22, 1993, Pat. No. 5,439,686, and a continuation-in-part of Ser. No. 35,150, Mar. 26, 1993, Pat. No. 5,362,478. This application Feb. 22, 1994, Ser. No. 200,235
Int. Cl.[6] A61K *37/22;9/127*
U.S. Cl. 424—450 30 Claims




1. A composition for in vivo delivery of a biologic, wherein said biologic is selected from:

a solid, optionally dispersed in a biocompatible dispersing agent, substantially completely contained within a polymeric shell,

a liquid, optionally dispersed in a biocompatible dispersing agent, substantially completely contained within a polymeric shell,

a gas, optionally dispersed in a biocompatible dispersing agent, substantially completely contained within a polymeric shell,

a gas associated with a polymeric shell, or combinations of any two or more thereof,

wherein the largest cross-sectional dimension of said shell is no greater than about 10 microns,

wherein said polymeric shell comprises a biocompatible material which is substantially crosslinked by way of disulfide bonds, and

wherein said polymeric shell is optionally modified by a suitable agent, wherein said agent is optionally associated with said polymeric shell through an optional covalent linkage.

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5,498,422

## SUSTAINED RELEASE CAPSULE

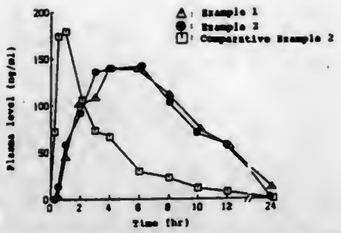
Koufchi Nakamichi, Shiga; Shogo Izumi, and Hiroshi Fukui, both of Kyoto, all of, Japan, assignors to Nippon Shinyaku Company Limited, Japan

PCT No. PCT/JP92/00423, § 371 Date Oct. 7, 1993, § 102(e) Date Oct. 7, 1993, PCT Pub. No. WO92/17166, PCT Pub. Date Oct. 15, 1993
PCT Filed Apr. 6, 1992, Ser. No. 129,187
Claims priority, application Japan, Apr. 8, 1991, 3-103846
Int. Cl.[6] A61K *9/52*
U.S. Cl. 424—451 22 Claims

1. A capsule which contains a sustained release preparation in the form of a dispersion comprising:

(a) a first water soluble polymer, selected from the group consisting of carboxyvinyl polymers and sodium polyacrylate that is capable of dispersing in a liquid substance selected from the group consisting of lipids, fats and oils in the form of solid particles and showing instantaneous adhesion upon hydration;

(b) a second water-soluble polymer that is capable of dispersing in a liquid substance selected from the group consisting of




lipids, fats and oils in the form of solid particles, and is capable of showing instantaneous adhesion upon hydration but retains the state of gel;

(c) a physiologically active substance; and

(d) a liquid substance selected from the group consisting of lipids, fats and oils;

wherein the first polymer and the second polymer are dispersed in said liquid substance, the first polymer and the second polymer are in the ratio of 1:9 to 9:1, the physiologically active substance is dispersed or dissolved in the liquid substance, and the total water content in the preparation is not more than 2%.

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**5,498,423**

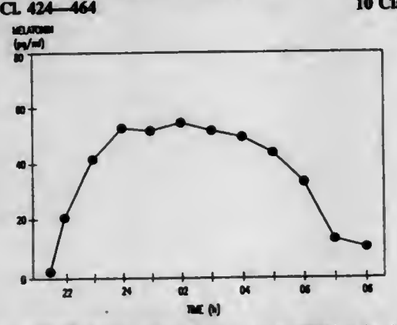
## METHOD FOR CORRECTING PLASMA MELATONIN LEVELS AND PHARMACEUTICAL FORMULATION COMPRISING MELATONIN

**Nava Zisapel, Tel Aviv, Israel, assignor to Neurim Pharmaceuticals (1991) Ltd., Israel**

**Continuation of Ser. No. 697,714, May 9, 1991, abandoned. This application Feb. 14, 1994, Ser. No. 195,577**

**Int. Cl.[6] A61K** *9/20*

**U.S. Cl. 424—464** **10 Claims**




1. A pharmaceutical controlled-release formulation in dosage form which consists essentially of melatonin in combination with at least one pharmaceutical carrier, diluent or polymeric coating, which formulation contains 1 ng to 80 mg melatonin per dosage unit and releases melatonin in the plasma following administration to a human patient according to a profile which simulates that of the endogenous melatonin profile depicted in FIG. 1 herein.

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**5,498,424**

## METHOD OF TREATING OBESITY

**Ira Klein, 5 Windermere, Houston, Tex. 77063**

**Filed Nov. 30, 1994, Ser. No. 348,366**

**Int. Cl.[6] A61K** *9/20*

**U.S. Cl. 424—464** **2 Claims**

1. A method for stimulating weight loss in a human comprising:

administering to said human a weight loss stimulating dose of clarithromycin, said dose being taken orally and ranging between 1250 mg/day and 6,000 mg/day.

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**5,498,425**

## PHOSPHOSODA BUFFERED SALINE LAXATIVE

**Thomas G. Wood, Morris Plains; Frederick A. Curro, Emerson, both of N.J., and Demetra E. Parashos, Flushing, N.Y., assignors to Block Drug Company, Inc., Jersey City, N.J.**

**Filed Mar. 17, 1995, Ser. No. 405,959**

**Int. Cl.[6] A61K** *31/74*

**U.S. Cl. 424—464** **5 Claims**

1. A laxative composition comprising sodium bicarbonate, monobasic sodium phosphate and a pineapple flavoring, the monobasic sodium phosphate being present in stoichiometric excess, and said pineapple flavoring comprising pineapple flavor, glycyrrhizic acid and sodium saccharin.

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**5,498,426**

## LIQUID ANTACID COMPOSITIONS

**Robert L. Wilson, Mason; Sara A. Ubelhor, and William A. Cruz, both of Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio**

**Filed Oct. 3, 1994, Ser. No. 316,981**

**Int. Cl.[6] A61K** *33/42;33/10*

**U.S. Cl. 424—602** **12 Claims**

1. A liquid antacid composition being pH stable during its shelf life consisting essentially of:

a) from about 5% to about 40% of an alkaline earth carbonate salt;

b) from about 0.1% to about 20% of an alkali metal phosphate salt;

c) from about 0.05% to about 2% of an alkali metal bicarbonate salt;

d) the remainder other excipients.

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**5,498,427**

## SOLUTIONS FOR THE PERFUSION, PRESERVATION AND REPERFUSION OF ORGANS

**Philippe Menasche, Paris, France, assignor to Pasteur Merieux Serums et Vaccines, Lyon, France**

**Continuation of Ser. No. 946,073, Sep. 18, 1992, abandoned, which is a continuation-in-part of Ser. No. 794,878, Nov. 19, 1991, abandoned. This application Aug. 18, 1994, Ser. No. 300,210**

**Claims priority, application France, Nov. 20, 1990, 90 14424; Jul. 17, 1991, 91 09027**

**Int. Cl.[6] A61K** *33/14;33/06;38/00;31/70;31/415;31/95*

**U.S. Cl. 424—678** **7 Claims**

1. In the perfusion, preservation or reperfusion of the heart by delivering to the heart a perfusion, preservation or reperfusion solution, the improvement comprising employing as said solution a solution consisting essentially of the following formulation:

| Constituent | Concentration g/l | Concentration mmol/liter |
|---|---|---|
| K+ | | 15 ± 5% |
| Na+ | | 100 ± 10% |
| Mg++ | | 13 ± 5% |
| Ca++ | | 0.25 ± 5% |
| Chlorides | | 41.5 ± 5% |
| calcium chloride $2H_2O$ | 0.037 | |
| potassium chloride | 1.118 | ± 5% |
| magnesium chloride | 2.642 | |
| Histadine base form | 4.650 | 30 ± 10 |
| Mannitol | 10.930 | 60 ± 5% |
| Lactobionate base form | 28.664 | 80 ± 5% |
| Glutamate acid form | 2.942 | 20 ± 10% |



-continued

| Constituent | Concentration g/l | Concentration mmol/liter |
|---|---|---|
| GSH | | 3 ± 10% |
| Histidine | | 0.15 ± 10% |

Water quantity for 1 liter adjusted at pH 7.30 ± 0.10 at +20° C.

wherein said solution optionally has a maximum concentration of dissolved oxygen of 0.1 ppm or less.

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**5,498,428**

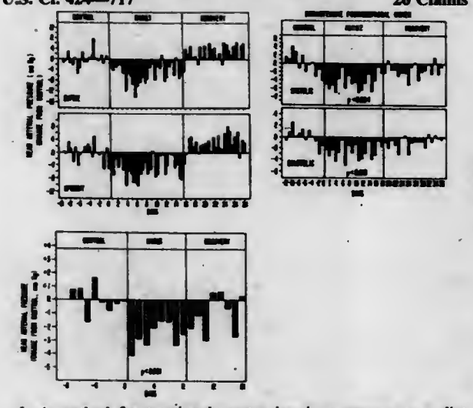
## TREATMENT OF HYPERTENSION BY ORAL ADMINISTRATION OF POTASSIUM BICARBONATE

**R. Curtis Morris, Jr., and Anthony Sebastian, both of San Francisco, Calif., assignors to The Regents of the University of California, Oakland, Calif.**

**Continuation of Ser. No. 708,827, May 29, 1991, abandoned, which is a continuation of Ser. No. 577,846, Aug. 31, 1990, abandoned, which is a continuation of Ser. No. 420,596, Oct. 17, 1989, abandoned, which is a continuation-in-part of Ser. No. 260,856, Oct. 21, 1988, abandoned. This application Jan. 10, 1994, Ser. No. 186,257**

**Int. Cl.[6] A01N** *59/00;* **A61K** *33/00*

**U.S. Cl. 424—717** **26 Claims**



1. A method for treating hypertension in a person on a diet having a normal range of salt content, which comprises:

orally administering to such a person a composition containing at least one active ingredient for treating hypertension, a principal active ingredient being potassium bicarbonate and the composition being substantially free of potassium chloride, the potassium bicarbonate being administered in an amount sufficient to have a measurable blood pressure lowering effect on the person treated due to the presence of potassium bicarbonate but not in an amount sufficient to induce undesirable toxic effects.

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**5,498,429**

## FRUIT JUICE CENTER-FILLED CHEWING GUM

**Daniel A. Orlandi, Long Valley; Lucy L. Wong, Lake Hiawatha; Hector Olaya, Parsippany, all of N.J., and Kenneth P. Bilka, Floral Park, N.Y., assignors to Warner-Lambert Company, Morris Plains, N.J.**

**Filed Oct. 12, 1994, Ser. No. 321,499**

**Int. Cl.[6] A23G** *3/30*

**U.S. Cl. 426—5** **17 Claims**

1. A center-filled chewing gum comprising an outer chewing gum shell enclosing a cavity and a liquid center-fill within said cavity, wherein said liquid center-fill comprises a fruit juice concentrate and an acid/buffer system wherein said acid/buffer system is a food acceptable acid and its buffer and is present in an amount sufficient to maintain the pH of said center-fill at from about 2 to about 4.

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**5,498,430**

## METHOD OF CONTROLLING SEASONING OF KIMCHI IN REFRIGERATOR

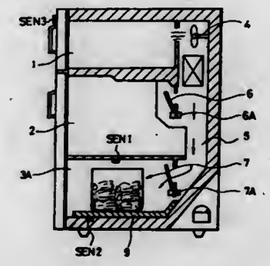
**Ki C. Woo, Kyungsangnam-Do, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea**

**Division of Ser. No. 102,812, Aug. 6, 1993, Pat. No. 5,398,599. This application Dec. 21, 1994, Ser. No. 360,598**

**Claims priority, application Rep. of Korea, Aug. 19, 1992, 14918/1992; Dec. 4, 1992, 23292/1992**

**Int. Cl.[6] A23L** *3/00*

**U.S. Cl. 426—231** **15 Claims**




1. A method of controlling seasoning of kimchi in a refrigerator equipped with a kimchi seasoning chamber having damper means for controlling flow of cold air into the kimchi seasoning chamber and a heater for heating the kimchi seasoning chamber, the method comprising the steps of:

controlling the damper means to prevent the flow of cold air into the kimchi seasoning chamber and activating the heater for a predetermined time to heat the kimchi seasoning chamber, when a kimchi seasoning mode is selected;

determining a load of kimchi to be seasoned, from a difference between a peripheral temperature of the heater and an internal temperature of the kimchi seasoning chamber after the seasoning chamber is heated;

determining a seasoning condition for the kimchi, based on the determined kimchi load; and

seasoning the kimchi according to the determined seasoning condition.

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**5,498,431**

## DECONTAMINATION AND DETOXIFICATION OF CEREALS CONTAMINATED WITH MYCOTOXINS

**Wolfgang Lindner, St. Veiter-Anger 22, Graz, Austria**

**PCT No. PCT/EP92/00579, § 371 Date Sep. 16, 1993, § 102(e) Date Sep. 16, 1993, PCT Pub. No. WO92/16116, PCT Pub. Date Oct. 1, 1992**

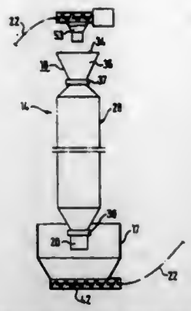
**PCT Filed Mar. 17, 1992, Ser. No. 119,086**

**Claims priority, application Germany, Mar. 18, 1991, 41 08 746.1**

**Int. Cl.[6] A23B** *9/00;* **A23L** *3/00*

**U.S. Cl. 426—238** **53 Claims**

26. Method for the decontamination or detoxification of a material contaminated with at least one mycotoxin, wherein said material is selected from the group consisting of foodstuffs, feedstuffs, aqueous solutions contaminated with said mycotoxin and aqueous suspensions contaminated with said mycotoxin, the method comprising the step of subjecting said mycotoxin contaminated material while in a liquid to ultrasonic energy of a frequency and for a



period of time sufficient to induce microcavitation in the liquid medium and sono-chemically induced reactions of the mycotoxins.

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5,498,432

**METHOD FOR PREPARING PRE-COOKED MEAT**

**Romeo J. Leu, Houston, Tex., assignor to Minh Food Corporation, Pasadena, Tex.**

**Continuation-in-part of Ser. No. 128,899, Sep. 29, 1993, Pat. No. 5,415,883. This application Mar. 2, 1995, Ser. No. 397,404**

**Int. Cl.[6] A23L** *1/314;1/315;1/325*

**U.S. Cl. 426—293** **14 Claims**

1. A low temperature method of preparing a pre-cooked meat consisting essentially of:

a. coating a meat with a liquid marinade in an initial coating;

b. coating the meat from a. with a dry marinade consisting essentially of:

i) a farinaceous material and

ii) salt in a second coating to give a coated meat;

c. cooking the coated meat from b. in a single cooking step at a temperature of about 200° F. to 275° F. until the internal temperature of the coated meat is at least about 148° F.; and

d. freezing the coated meat after the cooking step.

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5,498,433

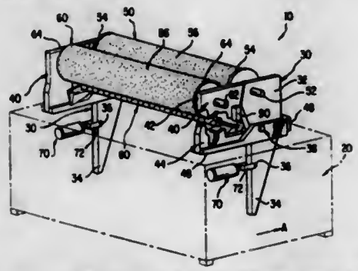
**APPARATUS AND PROCESS FOR FORMING SHEETS OF MATERIAL HAVING A UNIFORM THICKNESS**

**Edward L. Ouellette, Corinth, Tex., assignor to Recot, Inc., Pleasanton, Calif.**

**Filed Apr. 18, 1995, Ser. No. 423,733**

**Int. Cl.[6] A21C** *3/00;* **A21D** *6/00;* **A23P** *1/00*

**U.S. Cl. 426—502** **17 Claims**



16. A process of forming a sheet of dough material having a substantially uniform thickness from a supply of the dough material, the process comprising steps of:

providing a sheerer apparatus including first and second rotatable rolls which define a gap between the rolls into which the dough material is fed, the first roll being fixed on the apparatus;

selecting the size of the gap to form a sheet of material having a desired thickness;

applying a preselected amount of force to the second roll to bias the second roll toward the first roll, the amount of force being sufficient to overcome forces exerted on the apparatus during sheeting of the dough material due to variations in the consistency of the dough material which cause relative movement between the first and second rolls and alter the size of the gap located between the rolls; and

feeding the dough material from the supply into the gap located between the rotating rolls;

whereby the thickness of the formed sheet of dough material is substantially uniform despite variations in the consistency of the dough material.

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5,498,434

**SYNERGISTIC COMPOSITIONS FOR EXTENDING ANIMAL FEED SHELF LIFE**

**John D. Johnston, Jeffersonville, Ind., assignor to Geo. Pfau's Sons Company, Inc., Jeffersonville, Ind.**

**Continuation of Ser. No. 838,869, Feb. 21, 1992, abandoned. This application May 2, 1995, Ser. No. 432,764**

**Int. Cl.[6] A23D** *7/00*

**U.S. Cl. 426—541** **25 Claims**

1. An antioxidant composition which is composed of completely natural ingredients and which is synergistically effective and economically feasible for increasing shelf life of animal feed, containing animal (mammal or poultry) fat normally found in animal feed, when in admixture with 100 parts by weight of the animal fat,

the composition comprising a combination of at least two non-synthetic members selected from the group consisting of:

a) from 0.01 to 2.0 parts by weight of lecithin,

b) from 0.0035 to 0.2 part by weight tocopherol, and

c) from 0.01 to 0.20 part by weight oil of rosemary.

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5,498,435

**RICE GRAIN-LIKE LOW-CALORIE FOOD**

**Shinya Hosoda; Yukie Hosoda, and Eishin Kato, all of Fukui, Japan, assignors to Sugiyo Co., Ltd., Ishikawa, Japan**

**Filed Dec. 14, 1993, Ser. No. 165,855**

**Claims priority, application Japan, Dec. 17, 1992, 4-336912; Nov. 18, 1993, 5-289529**

**Int. Cl.[6] A23L** *1/05*

**U.S. Cl. 426—573** **12 Claims**

1. A low-calorie food in the shape and size of grains of cooked rice consisting essentially of an aqueous dispersion of particles of gel whose dispersoids are:

glucomannan,

0.1 to 3 parts by weight, per part of glucomannan, of starch, dietary fiber and

at least one thickening polysaccharide selected from the group consisting of alginates, carrageenan and mixture thereof.

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5,498,436

**COPROCESSED GALACTOMANNAN-GLUCOMANNAN**

**James J. Modliszewski, Brick, N.J., and Arthur D. Ballard, Friendship, Me., assignors to FMC Corporation, Philadelphia, Pa.**

**Filed Dec. 30, 1993, Ser. No. 176,163**

**Int. Cl.[6] A23L** *1/0526;1/0528*

**U.S. Cl. 426—573** **31 Claims**

1. A composition comprising:

(A) a coprecipitate consisting essentially of:

(a) a galactomannan, with

(b) a glucomannan; and

(B) optionally, a gelling agent admixed with said coprecipitate.



5,498,437

**PROCESS FOR THE REMOVAL OF CHOLESTEROL DERIVATIVES FROM EGG YOLK**

**Utz Kohlrausch, Trostberg; Jan Cully, Garching, and Bruno Schmid, Engelsberg, all of, Germany, assignors to SKW Trostberg, Trostberg, Germany**

**Continuation of Ser. No. 106,545, Aug. 16, 1993, abandoned. This application Aug. 25, 1994, Ser. No. 296,895**

**Claims priority, application Germany, Apr. 28, 1993, 43 13 919.1**

**Int. Cl.[6] A23L** *1/32*

**U.S. Cl. 426—614** **20 Claims**

1. A process for the removal of cholesterol and cholesterol esters from egg yolk comprising:

diluting the egg yolk with an aqueous solution of at least one water-soluble salt to form a diluted egg yolk wherein said least one water-soluble salt comprises at least one cation selected from the group consisting of potassium and calcium and at least one anion selected from the group consisting of chloride, sulfate and an organic anion having a molecular weight of ≦150;

adding β-cyclodextrin to the diluted egg yolk to form a complex with the cholesterol and the cholesterol esters;

separating the formed complex from the egg yolk; and

removing the added salt from the egg yolk.

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5,498,438

**NUT BASED SNACK PRODUCTS AND PROCESS OF MAKING**

**David R. Strong, Denville, N.J., and Kristberg Kristbergsson, Njardvik, Iceland, assignors to Nabisco, Inc., Parsippany, N.J.**

**Continuation-in-part of Ser. No. 415,457, Sep. 29, 1989, abandoned. This application Sep. 6, 1991, Ser. No. 755,971**

**Int. Cl.[6] A23L** *1/36*

**U.S. Cl. 426—632** **20 Claims**

1. A high protein, low fat, nut-based snack product, said product comprising individual pieces derived by cooking corresponding pieces of dough comprised of a defatted, roasted nut meal, a starch component and water, said cooked individual pieces having a nut content of at least about 40 percent by weight based on total weight of the dough base, said nut-meal being derived from roasted partially defatted nuts which have been comminuted into particles, the particles separated into a relatively coarse fraction which passes through a 12 US mesh screen but not through a 16 US mesh screen and a relatively fine fraction which passes through a 16 US mesh screen, and combined in a weight ratio of relatively fine to relatively coarse particles in the range of about 6:1 to about 2:1.

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5,498,439

**PROCESS FOR ENCAPSULATING THE FLAVOR WITH COLLOID GEL MATRIX**

**Michael J. Bonner, Westfield, N.J., assignor to Arnhem, Inc., Cranford, N.J.**

**Continuation of Ser. No. 208,894, Mar. 4, 1994, abandoned. This application Dec. 21, 1994, Ser. No. 361,445**

**Int. Cl.[6] A23L** *1/221;1/222;1/05;1/318*

**U.S. Cl. 426—650** **7 Claims**

1. A method for preparing a uniform suspension of an encapsulated flavor oil, oleoresin or spice liquified in a gel matrix comprising:

forming a gel matrix by high shear mixing a colloidal gelling agent in water for a sufficient time at a temperature of about 15° C. to form a gel matrix;

dispersing said flavor oils, oleoresin or spices into said gel matrix during mixing to thereby form a stable gel matrix structure containing microencapsulated flavor oils, oleoresin or spices.

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5,498,440

**ADHESION OF ELECTROLESS COATING TO RESINOUS ARTICLES**

**Herbert S. Chao, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Filed Jan. 21, 1992, Ser. No. 822,771**

**Int. Cl.[6] B05D** *3/04*

**U.S. Cl. 427—304** **14 Claims**

1. A method for depositing an adherent metal layer on the surface of a resinous substrate comprising a major proportion of aromatic polycarbonate and a minor proportion of at least one addition copolymer comprising structural groups derived from an olefinic nitrile and a conjugated diene, said method comprising the steps of:

contacting at least a portion of said surface with an aqueous alkali metal hydroxide solution having an alkali metal hydroxide concentration of at least about 30% by weight,

contacting said surface with concentrated nitric acid alone, and

depositing an electroless metal layer on said surface.

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5,498,441

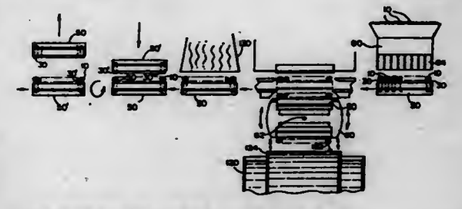
**METHOD AND APPARATUS FOR CREATING A GELATIN COATING ON A TABLET**

**Norbert I. Berta, Devon, Pa., assignor to McNeil-PPC, Milltown, N.J.**

**Continuation-in-part of Ser. No. 609,482, Nov. 5, 1990, Pat. No. 5,228,916. This application Jan. 12, 1993, Ser. No. 3,349**

**Int. Cl.[6] B05C** *11/00;3/02;13/02;* **B05D** *1/18*

**U.S. Cl. 427—2.14** **15 Claims**



1. An apparatus for coating a product comprising:

(a) a plurality of product carrier plate means for holding at least one product, a first coating section, a second coating section and means for transferring products from said first section to said second section;

(b) said first coating section comprising:

(i) feeding and loading means for depositing products onto a first of said plurality of product carrier plate means such that a first portion of said product is exposed;

(ii) first dipping means for positioning and lowering said first product carrier plate means received from said feeding and loading means such that at least said first portion of said product is immersed in a coating material for applying a coating thereto, said first dipping means having first vacuum chamber means for engaging said first product carrier plate means and said first vacuum chamber means having a plurality of vacuum tubes for engaging and retaining said product;

(iii) first rotating means for rotating said first product carrier plate means received from said first dipping means at least one revolution;

(iv) first dryer means for curing the coating applied to said product, said first dryer means including means for transporting said first product carrier plate means received from said first rotating means through said dryer means;

(c) said transferring means comprising means for transferring said product to a second of said plurality of product carrier plate means and for transferring said second product carrier plate means to said second coating section such that a second portion of said product is exposed in said second product carrier plate means;

(d) said second coating section comprising:

(i) second dipping means for positioning and lowering said second product carrier plate means received from said transferring means such that at least said second portion of said product is immersed in a coating material for applying a coating thereto;

(ii) second rotating means for rotating said second product carrier plate means received from said second dipping means at least one revolution;

(iii) second dryer means for curing the coating applied to said product by said second dipping means, said second dryer means including means for transporting said second product carrier plate means received from said second rotating means through said dryer means; and

(iv) means for unloading said coated product from said second product carrier plate means.

15. A method for coating a product comprising:

advancing a plurality of product carrier plate means on a first conveyor to a feeding and loading station;

depositing products onto holders in a first of said plurality of product carrier plate means at said feeding and loading station such that a first portion of said product is exposed;

advancing said first product carrier plate means on said first conveyor to a first dipping station having a vacuum means;

engaging and retaining said product with said vacuum means while dipping said first portion of said product into a coating material for applying a coating thereto at said first dipping station;

advancing said first product carrier plate means on said first conveyor to a first rotating station;

rotating said first product carrier plate means at least one revolution at said first rotating station;

transferring said first product carrier plate means from said first rotating station to a first dryer means;

drying said first coating by transporting said first product carrier plate means through said first dryer means;

transferring said first product carrier plate means from said first dryer means to a transfer station;

transferring said product to a second of said plurality of product carrier plate means and then transferring said second product carrier plate means to a second conveyor such that a second portion of said product is exposed;

advancing said second product carrier plate means on said second conveyor to a second dipping station;

dipping said second portion of said product into a coating material for applying a coating thereto at said second dipping station;

advancing said second product carrier plate means on said second conveyor to a second rotating station;

rotating said second product carrier plate means at least one revolution at said second rotating station;

transferring said second product carrier plate means from said second rotating station to a second dryer means;

drying said coating applied at said second dipping station by transporting said second product carrier plate means through said second dryer means;

transferring said second product carrier plate means from said second dryer to an unloading station;

discharging and collecting said coated product at said unloading station thereby emptying said second product carrier plate means of said product; and

advancing said empty second product carrier plate means to said transfer station for reuse in said method.

**5,498,442**

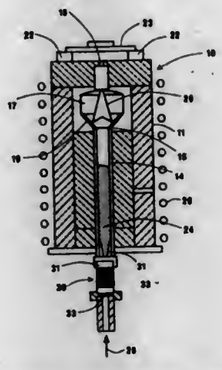
## FLUIDIZED BED REACTOR AND METHOD FOR FORMING A METAL CARBIDE COATING ON A SUBSTRATE CONTAINING GRAPHITE OR CARBON

**Jeffery W. Lennartz, Cleveland, Ohio, assignor to Advanced Ceramics Corporation, Lakewood, Ohio**

**Continuation of Ser. No. 69,801, Jun. 1, 1993, abandoned. This application Mar. 1, 1995, Ser. No. 396,875**

**Int. Cl.[6] G21C 3/06; B05D 7/00**

**U.S. Cl. 427—6** **5 Claims**



1. A method for forming a metal carbide coating on a carbon or graphite containing substrate in a fluidized bed furnace having a coating chamber in which the coating reaction occurs comprising the steps of:

(a) feeding a fluidizing gas into said furnace to fluidize a bed of particles inclusive of said carbon or graphite containing substrate;

(b) forming a metal halide vapor by reacting a halide gas with a carbide forming metal M selected from Group IVb through VIIb of the periodic table;

(c) combining said metal halide vapor with said fluidizing gas;

(d) maintaining said metal halide vapor in said chamber with said metal halide vapor at a partial pressure which is subatmospheric; and

(e) maintaining the temperature of said fluidized bed at a temperature above 1500° C. and at the halide vapor partial pressure of step (d) so that said temperature and pressure cause said metal halide vapor to favor a chemical reaction with said carbon or graphite containing substrate in accordance with the following overall chemical equation:

$$2MX+2C \rightarrow 2MC+X_2,$$

wherein M is selected as defined above and X is a halide gas for forming said metal carbide coating.

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**5,498,443**

## PARTICLE LOADING OF FLEXIBLE THREE-DIMENSIONAL NON-WOVEN FABRICS

**Thomas J. Sobol, 23800 Albers, Woodland Hills, Calif. 91364**

**Filed Jul. 26, 1994, Ser. No. 280,779**

**Int. Cl.[6] B05D 5/12**

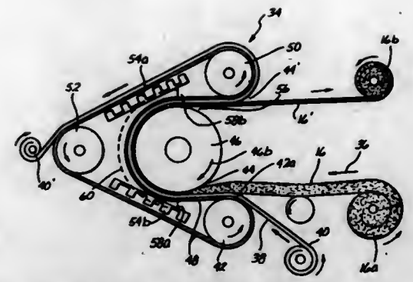
**U.S. Cl. 427—122** **8 Claims**

1. The method of fabricating a flexible conductive fabric, said method comprising the steps of:

a) applying by a spray gun to at least one side of a non-woven fabric consisting of entangled staple fibers a metallic conductive coating in which micro sized metallic particles are entrained in a liquid carrier comprising a solvent with a compatible binder, thereby to constitute low volatile particles;

b) allowing the sprayed fabric to dry at room temperature for approximately one hour;





c) conditioning the sprayed fabric in an air circulating over for an additional period of approximately one hour to ensure the removal of all solvent and low volatile particles; and

d) passing the fabric through a rotocure to apply simultaneously heat of approximately 280 degrees and pressure in the order of 500 psi to the sprayed and dried fabric for a period in the order of five minutes to collapse the fabric to greatly reduce its thickness and to bring the metallic particles of the conductive coating applied to the fabric into intimate contact with each other, thereby to render the coated fabric conductive.

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**5,498,444**

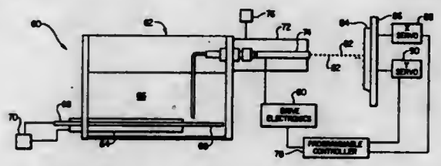
## METHOD FOR PRODUCING MICRO-OPTICAL COMPONENTS

**Donald J. Hayes, Plano, Tex., assignor to Microfab Technologies, Inc., Plano, Tex.**

**Filed Feb. 28, 1994, Ser. No. 202,939**

**Int. Cl.[6] B05D 6/06**

**U.S. Cl. 427—162** **27 Claims**



1. A method for producing micro-optical components, comprising the steps of:

(a) maintaining an optical element forming material in a liquid state in an ejection chamber;

(b) transferring said liquid optical element forming material from said ejection chamber to an ejection device; and

(c) ejecting drops of said liquid optical element forming material from said ejection device to a substrate to be wetted.

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**5,498,445**

## MANUFACTURING PROCESS FOR GROOVED SUBSTRATES AND MULTILAYER STRUCTURE

**Werner Steiner, Boeblingen, and Gerhard Trippel, Sindelfingen, both of, Germany, assignors to International Business Machines Inc., Armonk, N.Y.**

**Division of Ser. No. 152,262, Nov. 12, 1993, abandoned, which is a continuation of Ser. No. 745,037, Aug. 14, 1991, abandoned. This application Sep. 23, 1994, Ser. No. 311,296**

**Claims priority, application European Pat. Off., Aug. 17, 1990, 9011578.6**

**Int. Cl.[6] B05D 5/06**

**U.S. Cl. 427—162** **15 Claims**

1. A process for manufacturing a grooved substrate comprising the steps of:

spin coating a supporting plate with dissolved material forming a soft layer on said supported plate;

stamping grooves into said soft layer with a stamp wherein said stamp shows a negative image of a structure to be transmitted to said soft layer thus forming a structured soft layer;

hardening said structured soft layer to transform said structured soft layer into a hard structured layer wherein said hardening is accomplished by thermal treatment; and

characterized in that said dissolved material contains polymeric organometal compounds.

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**5,498,446**

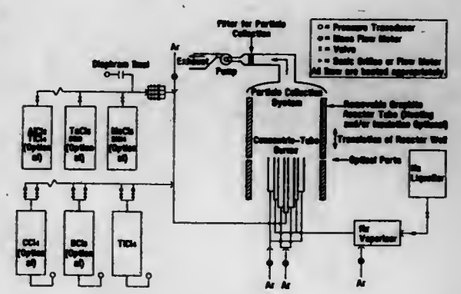
## METHOD AND APPARATUS FOR PRODUCING HIGH PURITY AND UNAGGLOMERATED SUBMICRON PARTICLES

**Richard L. Axelbaum, and Douglas P. DuFaux, both of St. Louis, Mo., assignors to Washington University, St. Louis, Mo.**

**Filed May 25, 1994, Ser. No. 248,655**

**Int. Cl.[6] B05D 7/00**

**U.S. Cl. 427—212** **46 Claims**



1. A method for producing coated submicron particles comprising the steps of:

combustion reacting a vaporized metal composition with a vaporized halide composition in an environment of inert gas, said reaction producing a condensable by-product, and

controlling the pressure and temperature of said environment to be within a range of heterogeneous nucleation so that said condensable by-product condenses on any particles nucleated by said reaction as they reach a size within the range of approximately 1 to 100 nanometers.

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**5,498,447**

## COATING METHOD

**Hiroyuki Nishii; Masaru Kobayashi, both of Takatsuki; Kazutoshi Toya, Nagaokakyo, and Nobuo Uchiyama, Toyonaka, all of, Japan, assignors to Sumitomo Pharmaceuticals Company, Limited, Osaka, Japan**

**PCT No. PCT/JP93/00543, § 371 Date Nov. 4, 1994, § 102(e) Date Nov. 4, 1994, PCT Pub. No. W093/21893, PCT Pub. Date Nov. 11, 1993**

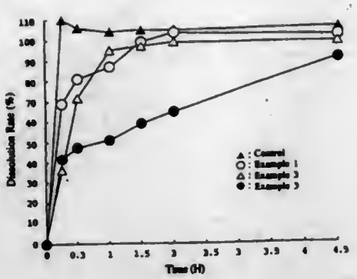
**PCT Filed Apr. 27, 1993, Ser. No. 331,482**

**Claims priority, application Japan, May 7, 1992, 4-143362**

**Int. Cl.[6] B05D 7/00**

**U.S. Cl. 437—213** **9 Claims**

1. A coating method for spray-coating the surfaces of solid particles with a thermally melted wax, which comprises ejecting a mixture of a thermally melted wax and a heating gas from one of the flow passages of a two-fluid nozzle and, simultaneously, ejecting heating gas from the other flow passage of said two-fluid nozzle, the diameter of spray ports of said two-fluid nozzle being in the range of 1.5 to 5.8 mm, and said two-fluid nozzle having no needle valve.




**5,498,448**

**METHOD FOR PROCESSING WOOD WITH VAPOR**

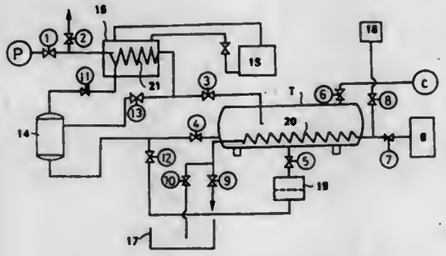
**Yotaro Hashimoto, Shiga, Japan, assignor to Elwa Co., Ltd., Shiga, Japan**

**Filed Jul. 19, 1994, Ser. No. 277,440**

**Claims priority, application Japan, Jul. 20, 1993, 5-179397**

**Int. Cl.[6] C23C *16/00***

**U.S. Cl. 427—255.6** **6 Claims**



1. A method for processing wood with vapor, comprising the steps of:

(a) introducing methylene chloride liquid, water, and surfactant liquid into a treatment chamber at a weight ratio of approximately 5:4:1 respectively, wherein said methylene chloride liquid and water are not substantially miscible, and a layer of said methylene chloride liquid is under that of said water and surfactant liquid;

(b) placing wood inside said chamber in such a way that said wood does not touch said methylene chloride liquid;

(c) heating said methylene chloride liquid, water and surfactant liquid to a temperature not lower than the boiling point of said methylene chloride but not higher than 80° C. so as to fill said chamber under hermetic conditions with the vapors of said methylene chloride, water and surfactant under, wherein the vapor of said methylene chloride generated from said layer of said methylene chloride liquid passes through the overlying layer of water and surfactant liquid;

(d) exposing said wood to the vapors of said methylene chloride, water and surfactant in said chamber for a time sufficient to dissolve oils and resin from said wood in said vapors; and

(e) cooling the inside of said chamber to a temperature below the boiling point of said methylene chloride.

**5,498,449**

**PHOTORESIST FILM COATING METHOD**

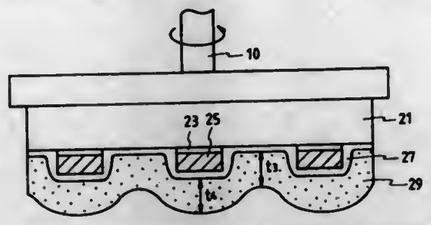
**Sang M. Bae, Ichon, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Kyoungki, Rep. of Korea**

**Filed Feb. 2, 1995, Ser. No. 382,756**

**Claims priority, application Rep. of Korea, Feb. 3, 1994, 94-1941**

**Int. Cl.[6] G05D *3/12***

**U.S. Cl. 427—240** **3 Claims**




1. A method for the formation of photoresist film, comprising the steps of:

feeding a photoresist solution onto a rugged surface of a wafer, to form a photoresist coating having a smooth surface;

turning the wafer over, so that the photoresist film having a smooth surface faces downward; and

rotating the wafer to form a photoresist film having a rugged surface along the topology of the wafer by the action of gravity and rotation so that the thickness of the photoresist film can become almost the same at all positions.

**5,498,450**

**LIQUID CRYSTAL-POLYMER COMPOSITE FILM, ELECTRO-OPTICAL ELEMENT USING THE SAME, AND PROCESS FOR PRODUCING ELECTRO-OPTICAL ELEMENT**

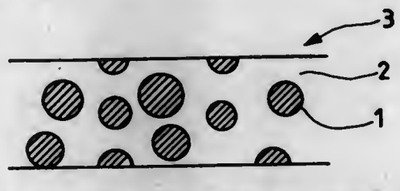
**Ryojiro Akashi, and Masanobu Ninomiya, both of Minami Ashigara, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan**

**Filed Nov. 12, 1993, Ser. No. 151,193**

**Claims priority, application Japan, Nov. 18, 1992, 4-331190; Dec. 1, 1992, 4-343575**

**Int. Cl.[6] C09K *19/52***

**U.S. Cl. 428—1** **15 Claims**




1. A liquid crystal-polymer composite film comprising (1) a compound containing monomer units providing a liquid crystal side chain and monomer units providing a non-liquid crystal side chain and (2) a liquid crystal, said compound (1) and said liquid crystal (2) being in separate phases, and said monomer units providing a non-liquid crystal side chain being crosslinked, wherein

(A) the molar ratio of said monomer units providing a liquid crystal side chain to said monomer units providing a non-liquid crystal side chain in said compound (1) is from 0.1/100 to 100/1,

(B) the weight ratio of said liquid crystal (2) to said compound (1) is from 1/10 to 50/1, and

(C) the molar percentage of said monomer units providing a non-liquid crystal side chain that are crosslinked is from 1 to 100 mol %.



**5,498,451**

**METAL SPACER FOR INSULATED GLASS ASSEMBLIES**

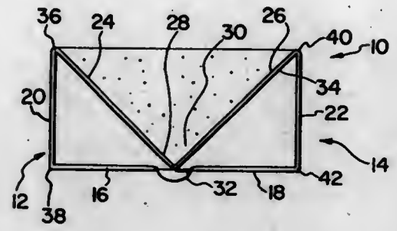
**Luc Lafond, 23 Woodvalley Dr., Etobicoke, Ontario, Canada**

**Continuation-in-part of Ser. No. 964,051, Oct. 21, 1992, Pat. No. 5,443,871. This application Apr. 6, 1995, Ser. No. 417,896**

**Claims priority, application Canada, Jan. 25, 1991, 2054272; Apr. 2, 1992, 2064988**

**Int. Cl.[6] E06B *3/24***

**U.S. Cl. 428—34** **22 Claims**




21. An insulated glass assembly comprising a pair of glass substrates;

a metal spacer body between said glass substrates, said body including a pair of generally triangular members, each member including a base, a glass substrate engaging surface, each said engaging surface engaged with a glass substrate, each said triangular member including a diagonally and inwardly directed integral support member;

a segment of reduced thickness integral with said spacer and joining said triangular members in spaced relation, said segment for reducing thermal transmission between said substrates engaged with said spacer.

**5,498,452**

**DUAL OVENABLE FOOD CONTAINER**

**Thomas J. Powers, West Monroe, La., assignor to J.D. Cahill Company, Inc., Hampton, N.H.**

**Continuation of Ser. No. 919,017, Jul. 23, 1992, abandoned. This application Mar. 28, 1994, Ser. No. 219,731**

**Int. Cl.[6] B32B *27/10***

**U.S. Cl. 428—34.2** **15 Claims**

1. A dual ovenable food product container, consisting essentially of:

a paperboard substrate;

a precoat, disposed over a surface of the substrate, consisting of a copolymerized aqueous emulsion formed from an aliphatic vinyl monomer or an aromatic vinyl monomer and one or more comonomers selected from the group consisting of acrylic esters, vinyl nitriles, and olefins having from 1–8 carbon atoms wherein the $T_g$ of the copolymerized aqueous emulsion is in the range of 0° C.–25° C.;

an overcoat, food contacting layer, disposed on the precoat layer, comprising one or a mixture of crosslinked styrenated acrylic copolymers formed from an aqueous emulsion, wherein the $T_g$ of the overcoat layer is in the range of 10° C. to 60° C. and the combined thickness of the precoat and overcoat layers is less than or equal to 0.5 mil;

the container, precoat and overcoat layers disposed thereon being able to resist browning at temperatures up to above 232° C. and to resist charring at temperatures in the range of about 232° C. to 260° C.

**5,498,453**

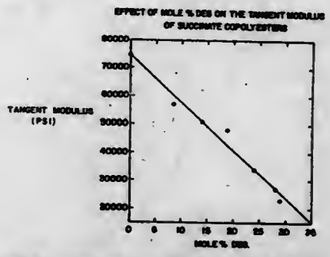
**COPOLYESTERS HAVING REPEAT UNITS DERIVED FROM SUCCINIC ACID**

**Alan W. White, Kingsport; Barry G. Pearcy, Mount Carmel; Allan S. Jones, Church Hill; Charles M. Buchanan, Bluff City, and Robert M. Gardner, Gray, all of Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.**

**Division of Ser. No. 209,500, Mar. 7, 1994, abandoned, which is a division of Ser. No. 96,752, Jul. 22, 1993, abandoned. This application Jun. 2, 1995, Ser. No. 459,442**

**Int. Cl.[6] B32B *1/08*; B65D *1/00***

**U.S. Cl. 428—35.7** **13 Claims**




1. An aliphatic copolyester having an inherent viscosity of about 1.0 to about 2.0 dL/g as measured at 250° C. for a 60/40 parts by weight solution of phenol/tetrachloroethane wherein said aliphatic copolyester is poly(tetramethylene succinate-co-glutarate) and wherein the mole % of the glutarate is in the range of 5 to about 35 mole %.

**5,498,454**

**POLYESTER FILM, LAMINATED METAL SHEET AND METAL CONTAINER**

**Katsuaki Kuze; Hiroshi Nagano; Saburoh Ohta; Kuniharu Mori, all of Inuyama, and Tsutomu Isaka, Osaka, all of, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan**

**Filed Aug. 10, 1994, Ser. No. 288,477**

**Claims priority, application Japan, Aug. 10, 1993, 5-198512; Jan. 27, 1993, 5-269228; Nov. 9, 1993, 5-279791; Nov. 9, 1993, 5-279796**

**Int. Cl.[6] B29D *22/00*; B32B *15/08***

**U.S. Cl. 428—35.9** **18 ClaimsM**

1. A polyester film adapted to be laminated to a tin-free steel, said film having a coefficient of dynamic friction between the film and tin-free steel at 80° C, of not more than 0.45.

**5,498,455**

**PRECISION ADHESIVE MOUNT APPARATUS AND METHOD EMPLOYING RELEASE SHEET**

**Stuart W. Roberts, M.P.O. Box 4321, Vancouver, B.C., Canada**

**Filed May 24, 1993, Ser. No. 35,931**

**Int. Cl.[6] G09F *1/10***

**U.S. Cl. 428—40** **29 Claims**

1. A mount for mounting an object, said mount comprising:



(a) a surface;
(b) a pressure-sensitive adhesive distributed on said surface;
(d) a flexible release sheet having a first portion detachably affixed to and covering said adhesive, said first portion being bounded by a peripheral edge and a fold line, said release sheet having a second portion comprising a free end, said free end doubled back along said fold line toward said peripheral edge over said first portion of said release sheet; and
(e) a member connected to said free end and extending from said free end entirely across said first portion and crossing said peripheral edge at a point opposed to said fold line, said member having a graspable end extending beyond said peripheral edge;
whereby said first portion of said release sheet may be peeled off from said adhesive by pulling on said graspable end of said member in a direction away from said fold line and said peripheral edge and generally parallel to said surface.

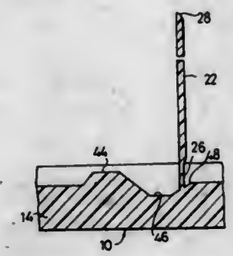
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**5,498,456**

## DISC CARTRIDGE

**Masaru Ikebe, Saku; Haruo Shiba, Komoro; Yukio Miyazaki, Saku; Morimasa Sasaki, Saku, and Hisao Katoh, Saku, all of, Japan, assignors to TDK Corporation, Tokyo, Japan**

**Continuation-in-part of Ser. No. 901,380, Jun. 19, 1992, Pat. No. 5,326,608. This application Jan. 18, 1994, Ser. No. 182,854**
**Claims priority, application Japan, Jun. 21, 1991, 3-55227; Feb. 5, 1993, 5-042295**
**The portion of the term of this patent subsequent to Jul. 5, 2011, has been disclaimed.**
**Int. Cl.[6] G11B *23/033***
**U.S. Cl. 428—66.6** **19 Claims**



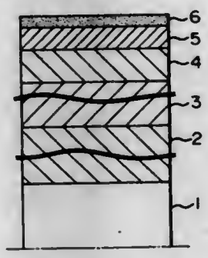

1. A disc cartridge comprising:
a casing made of a synthetic resin material;
a disc medium rotatably arranged in said casing; and
a lifter means having a plate-like shape arranged on an inner surface of said casing so as to press said disc medium;
said casing being formed on said inner surface thereof with a level different portion in a manner to be recessed from said inner surface of said casing and defining a closed bottom beneath said lifter means;
said lifter means and said closed bottom being formed integrally with said casing by molding in such a manner that a proximal end of said lifter means is connected to said level different portion of said inner surface of said casing and a distal end thereof is rendered free, the lifter means extends vertically from said inner surface and is inclined at a predetermined angle with respect to said inner surface of said casing so as to permit said distal end of said lifter means to be positioned in proximity to said inner surface of said casing.

**5,498,457**

## MAGNETIC RECORDING MEDIUM HAVING A LUBRICANT LAYER COMPRISING IONICALLY INTERBONDED FLUOROPOLYETHERS WITH ACIDIC AND BASIC TERMINAL GROUPS

**Heigo Ishihara, Tokyo, and Takanori Kudo, Sayama, both of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Continuation of Ser. No. 9,620, Jan. 27, 1993, abandoned. This application Jul. 5, 1994, Ser. No. 270,536**
**Claims priority, application Japan, Jan. 27, 1992, 4-012145**
**Int. Cl.[6] G11B *5/00***
**U.S. Cl. 428—65.4** **18 Claims**




1. A magnetic disk comprising:
a substrate; a magnetic layer provided on the substrate; and a lubricating film layer provided on the magnetic layer, the lubricating film layer comprising first fluoropolyethers each having at least two acidic terminal groups as functional groups and second fluoropolyethers each having at least two basic terminal groups as functional groups, wherein the first and second fluoropolyethers are ionically bonded to one another to form an ionically interbonded molecular chain structure when the first and second fluoropolyethers each have two functional groups or to form a molecular network structure when either the first or second fluoropolyethers each have at least three functional groups, while one or more of the remaining functional groups of the first and second fluoropolyethers function as adsorbable groups on the surface of the magnetic disk.

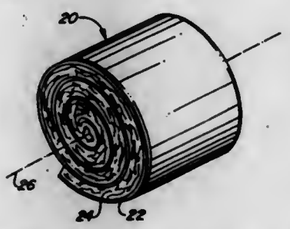
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**5,498,458**

## SPIRAL CORES FOR STRESS SKIN STRUCTURES AND THE LIKE AND THE METHOD OF MAKING THE SAME

**Kenneth E. Kleinke, Toledo, Ohio, assignor to Schuller International, Inc., Denver, Colo.**

**Filed Jan. 6, 1994, Ser. No. 178,197**
**Int. Cl.[6] B32B *1/00***
**U.S. Cl. 428—68** **23 Claims**




1. A spiral Support core for supporting a facing sheet of a structure, comprising:
a spiral rigidifying layer having successive convolutions spaced with respect to each other; the spiral rigidifying layer comprising a sheet material;
a spiral insulation layer having convolutions intermediate the convolutions of the rigidifying layer and forming a laminate with the rigidifying layer;



the rigidifying layer being more rigid than the insulation layer in a direction parallel to an axis of the spiral core; and
means maintaining the successive convolutions of the spiral rigidifying layer and the spiral insulation layer spirally wound comprising a bonding material bonding the spiral rigidifying layer and the spiral insulation layer together.

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**5,498,459**

## METHOD AND APPARATUS FOR MAKING A PILE ARTICLE AND THE PRODUCTS THEREOF

**Ahmed M. Mokhtar, Laquey, Mo.; Peter Popper; William C. Walker, both of Wilmington, Del., and Paul W. Yngve, Chapin, S.C., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Continuation of Ser. No. 331,074, Oct. 28, 1994, which is a continuation of Ser. No. 298,264, Aug. 31, 1994, abandoned, which is a continuation-in-part of Ser. No. 17,162, Feb. 22, 1993. This application May 17, 1995, Ser. No. 443,302**
**Int. Cl.[6] B32B *3/16;5/08;7/06;33/00***
**U.S. Cl. 428—85** **15 Claims**

1. A pile article comprising:
a support strand; and a plurality of bundles of filaments, each bundle defining loop pile-forming tufts, each of said bundles having a dense portion of filaments bonded together and secured to said support strand; each of said bundles of filaments having a frangible portion adjacent the dense portion wherein the strength of the frangible portion is less than the strength of the bundle of filaments before bonding.

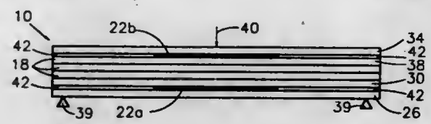
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**5,498,460**

## SURFACE TREATED SYNTHETIC REINFORCEMENT FOR STRUCTURAL WOOD MEMBERS

**Daniel A. Tingley, 3310 SW. Willamette Ave., Corvallis, Oreg. 97333**

**Continuation-in-part of Ser. No. 37,580, Mar. 24, 1993, Pat. No. 5,362,545. This application Sep. 16, 1994, Ser. No. 307,315**
**Int. Cl.[6] B32B *3/06;3/30;5/08;* E04C *3/12;3/29***
**U.S. Cl. 428—96** **20 Claims**




1. A synthetic reinforcement to be adhered to a wood structural member for increasing a load-carrying capacity of the wood structural member, said reinforcement comprising:
a plurality of continuous fibers, a substantial majority of which are continuous along the length of the synthetic reinforcement and are arranged substantially parallel to one another and are substantially aligned so as to be aligned with a longitudinal direction of the structural member when the synthetic reinforcement is adhered to said structural member; and
a resin encasement for including substantially all of said continuous fibers therein, a surface of said resin encasement defining a plurality of recesses located in a generally random pattern and having protruding therefrom ends of a plurality of said fibers for the purpose of facilitating adhesion of the synthetic reinforcement to the wood structural member.

**5,498,461**

## PROTECTIVE METALLIZED LOOP LAMINATE

**Douglas L. Rockney, Naperville, Ill., assignor to Safe-T-Quip Corporation, Chicago, Ill.**

**Filed Jun. 25, 1993, Ser. No. 83,049**
**Int. Cl.[6] B32B *3/06***
**U.S. Cl. 428—100** **22 Claims**




1. A removable and flexible protective laminate wrapping, comprising:
a strip of hook material having a plurality of spaced hooks;
a flexible sheet of loop material having one surface including a plurality of spaced loops and an opposite flexible polymeric surface, said flexible sheet of loop material being bendable and generally conformable, said plurality of spaced loops being sized and shaped for mating and securing engagement with said plurality of spaced hooks, said mating and securing engagement being such that said loops and said hooks are manually disengageable from each other, said spaced hooks of the strip are attached to the loops along two generally opposite edges of said sheet of loop material;
a sheet of metallized flexible foil sheeting;
said sheet of metallized flexible foil sheeting being laminated with and directly onto substantially the entirety of the opposite flexible polymeric surface of said flexible sheet of loop material such that the loop material is coextensive with the metallized flexible foil sheeting, the loop material and the metallized flexible foil sheeting facing in opposing directions away from one another to form a protective laminate wrapping having an engagement surface of the loop material and an outside reflective surface of the metallized foil sheeting; and
the protective laminate wrapping is flexible and pliable and has a wrapped condition at which it generally conforms to a desired shape, said engagement surface of the loop material removably secures the protective laminate wrapping in cooperation with said strip of hook material, and said outside reflective surface of the metallized foil sheeting provides a heat reflective barrier that is manually removable from and manually re-securable to its said wrapped condition.

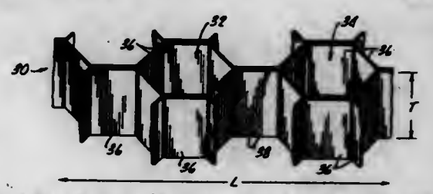
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**5,498,462**

## HIGH THERMAL CONDUCTIVITY NON-METALLIC HONEYCOMB

**Stephen C. Darfler, Castro Valley, Calif., assignor to Hexcel Corporation, Pleasanton, Calif.**

**Filed Apr. 1, 1994, Ser. No. 221,833**
**Int. Cl.[6] B32B *3/12***
**U.S. Cl. 428—116** **7 Claims**




1. A high thermal conductivity non-metallic honeycomb structure comprising:
a plurality of interconnected walls which define a plurality of interconnected honeycomb cells having a lengthwise direction which extends transversely relative to said walls and a thickness direction which extends parallel relative to said walls, said cell walls comprising:
at least one reinforcement layer having low thermal conductivity, said reinforcement layer comprising a plurality of

non-metallic fibers having low thermal conductivity and a resin matrix in which said low thermal conductivity fibers are impregnated; and

at least one thermal conductance layer, said thermal conductance layer comprising a plurality of non-metallic fibers having high thermal conductivity and a resin matrix in which said high thermal conductivity fibers are impregnated, said high thermal conductivity fibers being oriented in said thermal conductance layer to provide directionally controlled heat conductance through said honeycomb structure.

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**5,498,463**

**POLYETHYLENE MELTBLOWN FABRIC WITH BARRIER PROPERTIES**

**Debra J. McDowall; Lawrence H. Sawyer, both of Roswell; David C. Strack, Canton, and Terry K. Timmons, Marietta, all of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.**

**Filed Mar. 21, 1994, Ser. No. 215,220**
**Int. Cl.[6] B32B *5/18;5/26;31/20;* D04H *3/14;3/16***
**U.S. Cl. 428—198** **17 Claims**

1. A process of producing a soft nonwoven barrier fabric comprising the steps of;

melting at least one thermoplastic polyethylene polymer, said polymer having a deasity in the range of about 0.86 to about 0.97 grams/cc;

extruding said polymer through fine openings;

drawing said polymer to produce fibers, and;

depositing said fiberized polymer on a collecting surface to form a layer of meltblown disbursed fibers as a web, wherein said web has a hydrohead of at least 40 centimeters, and a cup crush peak load value of less than 40 grams.

2. The nonwoven fabric produced according to the method of claim 1 wherein said web has a Frazier Porosity of less than 300 $ft^3/ft^2/min$.

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**5,498,464**

**HEAT-SENSITIVE STENCIL SHEETS AND PROCESS**

**Shoichi Ikejima; Tetsu Yamanaka; Takeshi Koishihara; Kenichi Shibuya, and Satoshi Chonan, all of Tokyo, Japan, assignors to Riso Kagaku Corporation, Tokyo, Japan**

**Continuation of Ser. No. 134,177, Oct. 8, 1993, abandoned.**
**This application Aug. 25, 1994, Ser. No. 296,128**
**Claims priority, application Japan, Jan. 9, 1992, 4-271647; Mar. 31, 1993, 5-73913; Apr. 12, 1993, 5-84597**
**Int. Cl.[6] B32B *3/00***
**U.S. Cl. 428—195** **6 Claims**

1. A heat-sensitive stencil sheet consisting of a porous substrate and a thermoplastic resin film adhered to said substrate, wherein said porous substrate comprises a screen cloth wholly or partially consisting of conjugate fibers comprised of at least two components having different melting points, one exposed component of which has an affinity with and a lower melting point than said thermoplastic resin film, and wherein the screen cloth is adhered to the thermoplastic resin film through said exposed component.

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**5,498,465**

**Patent Not Issued For This Number**

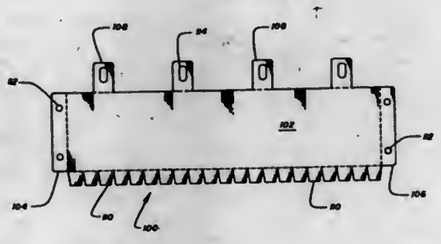
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**5,498,466**

**INTUMESCENT COMPOSITE**

**Mario Navarro, New Tripoli, and Gabe DiMarino, Chalfont, both of Pa., assignors to International Protective Coatings Corp., Ocean, N.J., and Pyro-Tech Industries, Inc., Hatfield, Pa.**

**Filed Mar. 12, 1993, Ser. No. 30,691**
**Int. Cl.[6] B32B *9/00***
**U.S. Cl. 428—406** **7 Claims**



1. An intumescent composite, comprising:

(a) a first intumescent component;

(b) a second intumescent component, wherein said first intumescent component inmmesces at a first temperature and said second intumescent component intumesces at a second temperature, wherein said second temperature is different from said first temperature, wherein:

said first intumesCent component comprises graphite; and

said second intumescent component comprises a polyhydric alcohol and a melamine/uninhibited formaldehyde syrup.

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**5,498,467**

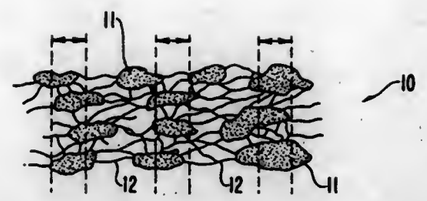
**PROCESS FOR PREPARING SELECTIVELY CONDUCTIVE MATERIALS BY ELECTROLESS METAL DEPOSITION AND PRODUCT MADE THEREFROM**

**Carmine G. Meola, Elkton, Md., assignor to W. L. Gore & Associates, Inc., Newark, Del.**

**Filed Jul. 26, 1994, Ser. No. 281,779**
**Int. Cl.[6] B32B *27/14;15/00***
**U.S. Cl. 428—198** **4 Claims**

1. An electrically conductive member comprising a planar flexible material having an X, Y and Z axis and having a number of irregularly shaped pores extending through the material in the Z axis, said material having a series of adjacent vertically defined cross-section areas extending from one side to the other through the Z axis width of the material, each area being defined so that the material defining the pores within said area extends from said one side to the other, said material within alternating vertically defined cross-section areas being covered with conductive metal, and said





material in adjacent cross-section areas not being so covered, so that said adjacent areas are not conducive; and wherein the planer flexible material is selected from the class consisting of stretched porous polytetrafluoroethylene having a microstructure of nodes interconnected by fibrils, which define the pores, and polyester fabric.

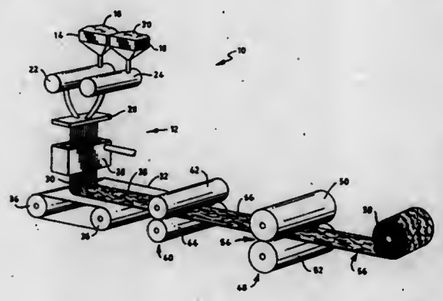
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**5,498,468**

**FABRICS COMPOSED OF RIBBON-LIKE FIBROUS MATERIAL AND METHOD TO MAKE THE SAME**

**Carol A. Blaney, Roswell, Ga., assignor to Kimberly-Clark Corporation, Neenah, Wis.**

**Filed Sep. 23, 1994, Ser. No. 311,664**
**Int. Cl.[6] B32B *27/14***
**U.S. Cl. 428—198** **56 Claims**



1. A method of making a flexible fabric comprising a fibrous matrix of ribbon-like, conjugate, spun filaments, the method comprising the following steps:

providing a fibrous matrix comprising individual, spun filaments bonded at spaced-apart bond locations, the filaments comprising:

a core composed of at least one low-softening point thermoplastic component, and

a sheath composed of at least one high-softening point component;

applying a flattening force to the fibrous matrix to durably distort the core of individual filaments into a ribbon-like configuration having a width greater than its height so that:

the individual filaments are substantially unattached between the spaced-apart bond locations, and

the width of individual filaments is oriented substantially in the planar dimension of the fabric.

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**5,498,469**

**THIN PANELS OF NON-WOODY LIGNOCELLULOSIC MATERIAL**

**Robert E. Howard, 2400 Mission Ave., Eugene, Oreg. 97403, and Karl E. Kaser, 37675 Elizabeth Dr., Lebanon, Oreg. 97355**

**Filed Dec. 2, 1994, Ser. No. 348,344**
**Int. Cl.[6] B32B *5/12;23/08***
**U.S. Cl. 428—218** **16 Claims**

1. Core stock for plywood comprising a thin panel consisting essentially of a compressed non-woody lignocellulosic material and a binder, said thin panel having a thickness of about 0.1 inch or less.

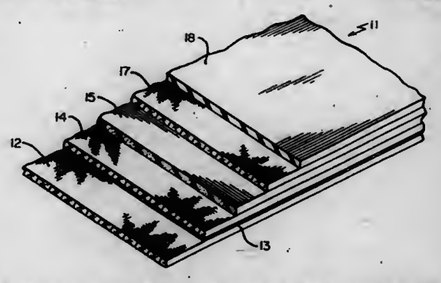
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**5,498,470**

**PRINTING BLANKET HAVING IMPROVED DYNAMIC THICKNESS STABILITY AND METHOD OF MAKING**

**Michael E. McLean, Waynesville; Melvin D. Pinkston, Hendersonville; Noel D. Arrington, Waynesville, all of N.C.; Dennis R. Wolters, Dayton, Ohio; Allen T. Shannon, Lake Junaluska; Thomas G. Ferguson, Waynesville, both of N.C.; Graham Macfarlane, Reutlingen; Chris Baldermann, Hohenstein, both of, Germany, and John Dolan, Tayside, Scotland, assignors to Day International, Inc., Dayton, Ohio**

**Filed Jul. 23, 1992, Ser. No. 919,175**
**Int. Cl.[6] B32B *7/00***
**U.S. Cl. 428—246** **11 Claims**



1. A printing blanket having improved gauge stability, said blanket including a printing surface layer and more than one reinforcing woven fabric ply, each of said fabric plies being impregnated with from about 6 to about 125 $gm/m^2$ of an elastomeric compound prior to assembly into said printing blanket, said elastomeric compound at least partially penetrating into air spaces of individual fiber bundles in said woven fabric plies and fixing said fibers against relative movement, said blanket resisting permanent deformation when subjected to printing nip pressures, said blanket retaining at least 95% of its original gauge throughout the useful life of said printing blanket.

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**5,498,471**

**FLAME-RESISTANT SUBSTRATE FOR FLEXIBLE CIRCUIT BOARDS**

**Jorg Hausdorf, Morlenbach; Thomas Kuhlmann, Heidelberg; Rolf Schneider, Bensheim-Zell; Steffen Kosack, Hassloch; Werner Schafer, Birkenau, and Volker Siekermann, Furth, all of, Germany, assignors to Firma Carl Freudenberg, Weinheim, Germany**

**Continuation of Ser. No. 748,623, Aug. 21, 1991, abandoned.**
**This application Jun. 6, 1995, Ser. No. 467,325**
**Claims priority, application Germany, Aug. 21, 1990, 40 26 354.1**
**Int. Cl.[6] B32B *5/16***
**U.S. Cl. 428—283** **14 Claims**

14. A flame-resistant flexible printed circuit board comprising:

a conductive layer,

an aqueous, halogen-free polymeric composition applied in an amount of about 30 to 60 g/m$^2$ (dry) to a substrate, wherein said substrate comprises a nonwoven fabric having the following specifications: area weight: 49 g/m$^2$, thickness: 0.071 mm, maximum tensile strength: 134 N, extensibility: 24%, and air permeability: 207 dm$^3$/s/m$^2$, and said polymeric adhesive comprises a cross-linked product of:

(a) about a 50% aqueous dispersion of a thermally cross-linkable of acrylic acid esters and styrene copolymerizate having a glass transition temperature of about +31° C.

(b) about a 60% aqueous solution including hydroxymethyl groups, selected from the group consisting of aminoplastics and phenoplastics,

where the ratio of (a) to (b) (dry) is about 10.0: 0.8 to 10.0:2.0,

(c) red phosphorus with a grain size of 0.045 to 0.10 mm, and

(d) ammonium polyphosphate with a grain size of 0.025 to 0.075 mm are added, where the ratio of (c): (d) is about 1.0:10.0, and the ratio of ((a)+ (b)) to ((c)+ (d)) is about 1.0:0.9, and

said conductive layer is adhered to said substrate under heat and pressure.

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**5,498,472**

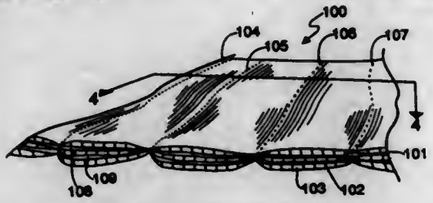
**NON-LAMINATED DIFFERENTIAL WIND BARRIER FABRICS AND GARMENTS**

**Danny Gold, Hong Kong, Hong Kong, assignor to Kombi Ltd., Essex Junction, Vt.**

**Filed Jun. 22, 1993, Ser. No. 81,400**

**Int. Cl.$^6$ A41D *19/00*; B32B *3/06;27/40***

**U.S. Cl. 428—284** **35 Claims**




1. A wind blocking hand covering comprising:

a back portion of the hand covering formed of a sandwich of three layers of material, the first layer being an outer fleece layer, the second layer being a waterproof and breathable layer and a third, inner layer;

sole means in the form of stitching for joining the three layers together along at least one seam.

a front portion of the hand covering formed of at least one layer of material adapted to cooperatively form a hand covering with the back portion of the hand covering when attached;

securing means for securing the back portion of the hand covering to the front portion of the hand covering to form a hand covering which is suitable for blocking wind from reaching at least the back portion of a wearer's hand.

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**5,498,473**

**POLYMERIC FILMS**

**David Williamson, Swindon, England, assignor to Courtaulds Films (Holdings) Limited, Somerset, England**

**Continuation of Ser. No. 35,964, Mar. 23, 1993, abandoned. This application Oct. 31, 1994, Ser. No. 332,454**

**Int. Cl.$^6$ B32B *5/18;27/20***

**U.S. Cl. 428—317.3** **20 Claims**

1. A biaxially oriented puncture resistant polymeric film for heat sealing onto a substrate comprising a first layer of a propylene homopolymer having on one side thereof and coextensive therewith a second layer of a non-voided propylene homopolymer and on the other side thereof and coextensive therewith a third layer of a voided propylene homopolymer, said third layer including 14%–25% by weight of chalk as a voiding agent; the said second layer having a heat sealable layer thereon and coextensive therewith whereby said film is capable of providing evidence of tampering when said film is peeled from said substrate after said film has been heat sealed thereto.

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**5,498,474**

**HEAT-SEALABLE, OPAQUE, BIAXIALLY ORIENTED, MULTILAYER POLYPROPYLENE FILM, PROCESS FOR THE PRODUCTION THEREOF, AND THE USE THEREOF**

**Detlef E. Schuhmann, Kiedrich; Thomas Dries, Schwabenheim; Adolf Wilhelm, Wiesbaden; Dieter Scheidecker, Eltville, and Harald Lohmann, Neunkirchen, all of, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany**

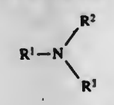
**Filed May 6, 1994, Ser. No. 238,935**

**Claims priority, application Germany, May 6, 1993, 43 15 006.3**

**Int. Cl.$^6$ B32B *5/16***

**U.S. Cl. 428—323** **18 Claims**

1. A heat-sealable, biaxially oriented, opaque, multilayer polypropylene film comprising a base layer which comprises a propylene polymer or a propylene polymer mixture and filler; at least one interlayer arranged thereon; and at least one heat-sealable outer layer arranged on the interlayer, wherein the outer layer comprises a combination of about 2 to 8% by weight based on the weight of the outer layer of inorganic and/or organic particles and a tertiary aliphatic amine of the formula I:



in which

$R^1$ is an alkyl radical having at least 18 carbon atoms and less than about 10% of shorter chain lengths based on the total amount of amine or an essentially fully saturated alkyl radical having 8 to 26 carbon atoms, and

$R^2$ and $R^3$ are identical or different and are $R^4$-$CH_2OH$, in which $R^4$ is an essentially saturated $C_1$–$C_6$-alkyl radical,

and wherein the interlayer comprises a propylene polymer or a propylene polymer mixture and pigments.

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**5,498,475**

**COATED PLASTIC MOLDED ARTICLES**

**Akio Takigawa, Nishinomiya; Naoto Hirayama, Takarazuka, and Masaki Kitaoka, Toyonaka, all of, Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan**

**Continuation of Ser. No. 708,739, May 31, 1991, abandoned. This application Dec. 2, 1993, Ser. No. 160,327**

**Claims priority, application Japan, May 31, 1990, 2-142661; Mar. 27, 1991, 3-087474**

**Int. Cl.$^6$ B32B *27/30;27/36***

**U.S. Cl. 428—334** **9 Claims**

1. A coated plastic molded article consisting essentially of a plastic article onto at least one surface of which are laminated:

(a) at least one first layer having a thickness ranging from 1 to 100 μm, and comprising a cured composition containing at least one hydrolyzate of at least one silicon compound which is represented by the formula:

$$R^1Si(R^2)_3$$

wherein $R^1$ is selected from the group consisting of a $C_1$–$C_4$ hydrocarbon group, an epoxy group-containing organic group and a fluorine atom-containing organic group, and $R^2$ is selected from the group consisting of alkoxy, alkoxyalkoxy, and acetoxy groups and chlorine atoms, provided that said $R^2$s are the same or different from each other;



(b) at least one second layer, on a surface of said first layer, having a thickness ranging from about 1 to 100 nm, but less than 100 nm, and comprising at least one cured hydrolyzate of at least one silicon compound represented by the formula:

$$(R^3)_nSi(R^4)_{4-n}$$

wherein $R^3$ is selected from the group consisting of an acryloxy group-containing organic group, a methacryloxy group-containing organic group and a chlorine-containing organic group, and $R^4$ is selected from the group consisting of alkoxy, alkoxyalkoxy and acetoxy groups, and n is 0 or 1, said at least one second layer which makes said at least one second layer and said at least one third layer adhere uniformly together; and

(c) at least one third layer, on a surface of said second layer, which is formed by immersing said plastic article, with said at least one first layer and said at least one second layer thereon, into an aqueous hydrosilicofluoric acid solution supersaturated with silicon dioxide, forming, on a surface of said at least one second layer, said at least one third layer which is abrasion resistant, weather resistant, chemical resistant and impervious to water;

said at least one first layer, said at least one second layer and said at least one third layer being arranged on said at least one surface of said plastic article in the order of, initially, said at least one first layer, followed by said at least one second layer, and then followed by said at least one third layer.

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**5,498,476**

**ELECTRICALLY INSULATING FILM BACKING**

**Pamela S. Tucker, and Eumi Pyun, both of Austin, Tex., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Filed Oct. 8, 1993, Ser. No. 133,435**

**Int. Cl.$^6$ B32B *7/10*; C09K *21/12***

**U.S. Cl. 428—343** **11 Claims**

1. A halogen-free, electrically insulating film having a thickness of from about 150 μm to about 200 μm, said film comprising a resin component containing:

a) from 0 to about 40 parts of a rubber selected from EP or EPDM rubber,

b) correspondingly, from about 60 to about 100 parts of an ethylene vinyl acetate polymer,

c) from about 40 parts to about 150 parts of ethylene diamine phosphate per 100 parts of said resin component, and

d) from about 0.5 part to about 5 parts of an amino-functional silane coupling agent, per 100 parts of said resin component,

wherein a nonoriented film self-extinguishes in less than about 5 seconds, has an elongation at break of at least about 200%, a dielectric strength of at least about 1200 V/Mil, and stress-strain behavior such that a curve showing a first derivative of stress-strain is positive over the entire curve, and a curve showing a second derivative of stress-strain is negative over more than 50% of said curve.

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**5,498,477**

**N-PHENYLHYDROXYLAMINE POLYMERS, AND ASSOCIATED METHODS OF PREPARATION AND USE**

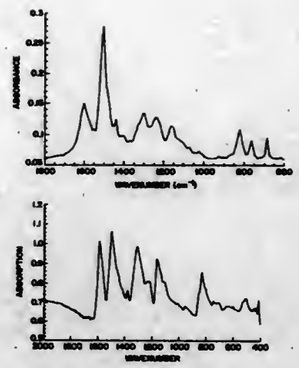
**Floyd Klavetter, Santa Barbara, Calif., assignor to Neste Oy, Keilaniemi, Finland**

**Division of Ser. No. 927,917, Aug. 11, 1992, abandoned. This application Jan. 31, 1994, Ser. No. 189,148**

**Int. Cl.$^6$ D02G *3/00***

**U.S. Cl. 428—364** **35 Claims**

1. A conjugated, electroactive polymer comprising a backbone of alternating phenyl rings and nitrogen atoms, and containing both quinoid mer units and benzenoid mer units, wherein the polymer is substantially free of cross-links and irreducible moieties.




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**5,498,478**

**POLYETHYLENE GLYCOL AS A BINDER MATERIAL FOR FIBERS**

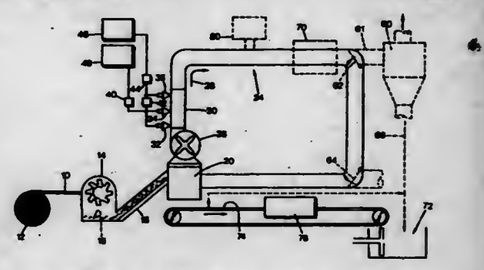
**Michael R. Hansen, Seattle, and David W. Park, Puyallup, both of Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.**

**Continuation of Ser. No. 919,156, Jul. 22, 1992, abandoned, which is a continuation-in-part of Ser. No. 326,188, Mar. 20, 1989, Pat. No. 5,230,959, Ser. No. 326,181, Mar. 20, 1989, abandoned, and Ser. No. 326,196, Mar. 20, 1989, abandoned, and a continuation of Ser. No. 673,899, Mar. 22, 1991. This application Mar. 17, 1994, Ser. No. 210,114**

**The portion of the term of this patent subsequent to Jul. 27, 2010, has been disclaimed.**

**Int. Cl.$^6$ D02G *3/00***

**U.S. Cl. 428—372** **29 Claims**



1. A fiber product which comprises discontinuous fibers having a polyethylene glycol binder material on at least a portion of the fibers and superabsorbent particulate material adhered to the fibers in particulate form by the binder material.

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**5,498,479**

**POWDER COATING**

**Kiyoshi Nishida; Tsutomu Sugiyama; Katsuro Funato, and Kenzi Hattori, all of Shizuoka, Japan, assignors to Tomoegawa Paper Co., Ltd., Tokyo, Japan**

**Filed Apr. 21, 1995, Ser. No. 426,609**

**Claims priority, application Japan, Apr. 22, 1994, 6-107949; Apr. 6, 1995, 7-106994**

**Int. Cl.$^6$ B32B *5/16***

**U.S. Cl. 428—403** **5 Claims**

1. A powder coating, comprising a particulate material made of at least a binder resin and a hardener,

said particulate material has a particle diameter satisfying the following requirements:

(a) the volume 50% diameter be from 7 to 15 μm;

(b) the proportion by volume of the particles having a particle diameter of not less than 20 μm and those having a particle diameter of not less than 30 μm in the particulate material be not more than 10% and 0%, respectively; and

(c) the proportion by population of the particles having a particle diameter of not more than 5 μm in the particulate material be not more than 50%, and

has an external additive attached to the surface thereof, the percent coverage by the external additive determined by the following equation being from 30 to 100%:

$$X = \frac{dt}{da} \cdot \frac{\rho t}{\rho a} \cdot W[\%]$$

wherein dt represents the population 50% diameter of the particulate material; da represents the primary particle diameter of the external additive; ρt represents the true specific gravity of the particulate material; ρa represents the true specific gravity of the external additive; and W represents the percent proportion by weight of the external additive in the sum of the weight of the particulate material and the external additive.

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**5,498,480**

**COMPOSITE DIAMOND ABRASIVE COMPACT**

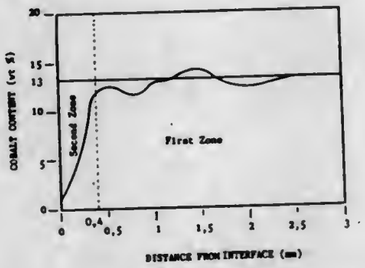
**Klaus Tank, 9 Warbleton Avenue, Essexwold, Johannesburg, Transvaal; Peter N. Tomlinson, 315 Enford Road, Mondeor, Johannesburg, Transvaal; Trevor J. Martell, 10 Kingfisher Road, Tableview, Cape Town, Cape Province; Andrew L. Lloyd, 52 15th Street, Parkhurst, Johannesburg, Transvaal, and Bruce R. Olmstead, 130 Ormonde Drive, Mondeor, Johannesburg, Transvaal, all of, South Africa**

**Continuation of Ser. No. 895,523, Jun. 2, 1992, abandoned. This application May 5, 1994, Ser. No. 238,964**

**Claims priority, application South Africa, Jun. 4, 1991, 91/4229**

**Int. Cl.[6] B32B *27/14***

**U.S. Cl. 428—408** **7 Claims**




1. A composite diamond abrasive compact comprising a diamond compact layer bonded entirely across the surface of a cemented carbide support along a compact/carbide interface, the carbide support comprising at least two zones, a first zone containing a binder metal content of a predetermined amount, and a second zone extending from the interface to the first zone and having a binder metal content at the interface of from 15 to 30% of the binder metal content of the first zone, the binder metal content of the second zone increasing to at least 90% of the binder metal content of the first zone in the region whereat the second zone changes to the first zone, the second zone having a depth or thickness of at least 0.2 mm to no more than 0.75 mm.

**5,498,481**

**METAL SUBSTRATE WITH ENHANCED CORROSION RESISTANCE AND IMPROVED PAINT ADHESION**

**Wim J. van Ooij, Fairfield, Ohio, assignor to Armco Inc., Middletown, Ohio**

**Division of Ser. No. 259,754, Jun. 10, 1994, Pat. No. 5,455,080, and a continuation of Ser. No. 936,197, Aug. 26, 1992, abandoned. This application Jul. 7, 1995, Ser. No. 499,585**

**Int. Cl.[6] B05D *1/06*; B32B *27/38***

**U.S. Cl. 428—413** **6 Claims**

1. A metal having a corrosion resistant coating, comprising:

a crosslinked layer coupled to a metal substrate, said crosslinked layer being the reaction product formed by curing a powder, said powder being a blended mixture of a thermosetting resin and a solid, non-hydrolyzed organosilane from the group consisting of monomeric, dimeric or oligomeric molecules, said organosilane including one organofunctional group and one silicon containing group consisting of trialkoxysilyl or trichlorosilane, said organosilane being a solid at ambient temperature and having a melting point no greater than the curing temperature of said resin, said crosslinked layer being coupled to said substrate by said organosilane.

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**5,498,482**

**POLYMER-CONTAINING MIXTURE**

**Klaus Büchner, Schaffhausen, Switzerland, assignor to Alusuisse-Lonza Services Ltd., Switzerland**

**Filed Mar. 13, 1995, Ser. No. 403,073**

**Claims priority, application Switzerland, Mar. 24, 1994, 888/94-8**

**Int. Cl.[6] B32B *15/08*; C08L *51/08***

**U.S. Cl. 428—461** **12 Claims**

1. Polymer-containing mixture, which comprises a polymer containing mixture including (a) 50 to 75 wt. % filler and (b) 50 to 25 wt. % of a polymer mixture, wherein the polymer mixture contains

a) 50 to 70 wt. % copolymer of ethylene and acrylic or methacrylic acid or vinyl-acetate,

b) 15 to 25 wt. % terpolymer of ethylene, n-butylacrylate and carbon monoxide, and

c) 15 to 25 wt. % grafted polymer of a terpolymer of ethylene, n-butylacrylate and carbon monoxide with maleic-anhydride, said polymer-containing mixture exhibiting resistance to flow under the influence of heat.

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**5,498,483**

**WEAR-RESISTANT SINTERED FERROUS ALLOY FOR VALVE SEAT**

**Kozo Ito, and Yoshishige Takano, both of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan**

**Filed Apr. 28, 1995, Ser. No. 430,383**

**Claims priority, application Japan, Nov. 9, 1994, 6-274891**

**Int. Cl.[6] B22F *7/00***

**U.S. Cl. 428—552** **9 Claims**

1. A wear-resistant sintered ferrous alloy for use as a valve seat, said alloy comprising

an iron-based matrix having a sorbite or pearlite structure consisting of 0.5 to 1.5% by weight of C, 0.5 to 3% by weight of Ni, 0.5 to 2% by weight of Mo, 0.1 to 8% by weight of Co, 0.05 to 1% by weight of Mn, and the balance of Fe, with unavoidable impurities, and having a Vickers hardness of from 300 to 450;

hard particles A consisting of 1.5 to 2.5% by weight of C, 38 to 45% by weight of Cr, 18 to 30% by weight of W, 5 to 15% by weight of Co, 0.5 to 3% by weight of Mo, 0.03 to 0.5% by weight of Ti, and the balance of Fe, with unavoidable impurities, and having an average particle diameter of from 30 to 80μm; and



hard particles B consisting of 60 to 70% by weight of Mo, 0.5 to 2% by weight of Si, and the balance of Fe, with unavoidable impurities, and having an average particle diameter of from 30 to 80μm,

said hard particles A and said hard particles B being uniformly dispersed in said iron-based matrix in a total amount of from 10 to 25% by weight based on the total weight of said iron-based matrix, said hard particles A, and said hard particles B.

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**5,498,484**

**THERMAL BARRIER COATING SYSTEM WITH HARDENABLE BOND COAT**

**Edward C. Duderstadt, Fairfield, Ohio, assignor to General Electric Company, Cincinnati, Ohio**

**Filed May 7, 1990, Ser. No. 520,013**

**Int. Cl.[6] C03C *27/02***

**U.S. Cl. 428—633** **27 Claims**



1. A superalloy article having a thermal barrier coating thereon, comprising:

a substrate made of a first superalloy; and

a thermal barrier coating on the substrate, the thermal barrier coating including

a metallic bond coat upon the substrate, the bond coat being a layer of a nickel-base superalloy that is hardened by gamma/gamma prime precipitation, and

a ceramic topcoat upon the bond coat.

24. A process for depositing a thermal barrier coating on a metallic substrate, comprising:

depositing upon a substrate a bond coat of a heat treatable second superalloy, the second superalloy being a gamma/gamma prime hardenable superalloy;

heat treating the substrate and bond coat to effect precipitation of strengthening precipitates in the bond coat by the gamma/gamma prime reaction; and

depositing a ceramic topcoat overlying the bond coat.

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**5,498,485**

**MAGNETO-OPTICAL RECORDING MEDIUM AND MANUFACTURING METHOD THEREOF**

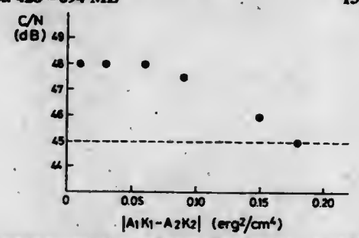
**Junichiro Nakayama; Hiroyuki Katayama; Junji Hirokane, and Michinobu Mieda, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Continuation-in-part of Ser. No. 3,723, Jan. 13, 1993, abandoned. This application Mar. 8, 1994, Ser. No. 207,054**

**Claims priority, application Japan, Jan. 21, 1992, 4-008498**

**Int. Cl.[6] G11B *5/66*; *11/00***

**U.S. Cl. 428—694 ML** **15 Claims**




1. A magneto-optical recording medium having a recording layer including two magnetic layers, satisfying a condition of $|A_1.K_1-A_2.K_2| \leq 0.18$ ($erg^2/cm^4$) wherein $A_1$, $K_1$, $A_2$, and $K_2$ respectively represent an exchange constant of a first magnetic layer, a perpendicular magnetic anisotropy of said first magnetic layer, an exchange constant of a second magnetic layer, and a perpendicular magnetic anisotropy of said second magnetic layer.

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**5,498,486**

**SECURITY BATTERIES FOR AUTOMOTIVE VEHICLES**

**Peter P. Gatehouse, Lancashire, Great Britain, assignor to B.I.G. Batteries Limited, Gwent, United Kingdom**

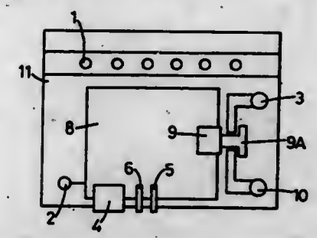
**PCT No. PCT/GB93/01345, § 371 Date Feb. 1, 1995, § 102(e) Date Feb. 1, 1995, PCT Pub. No. WO94/01894, PCT Pub. Date Jan. 20, 1994**

**PCT Filed Jun. 25, 1993, Ser. No. 360,817**

**Claims priority, application United Kingdom, Jul. 1, 1992, 9214014; Jan. 20, 1993, 9301734**

**Int. Cl.[6] H01M *2/06*; *2/30***

**U.S. Cl. 429—7** **11 Claims**




1. A starter battery for an automotive vehicle, the battery having the usual negative and positive terminals but incorporating a control circuit sealed within the battery, including a heavy duty switch between the positive terminal and a dummy terminal, the positive terminal being inaccessible from the exterior of the battery whilst the negative terminal and the dummy terminal are accessible from the exterior of the battery as terminal posts for connection to the starter motor of the vehicle, the control circuit having an input for connection to an external code-controlled operating device for controlling the enabling of said heavy duty switch.

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**5,498,487**

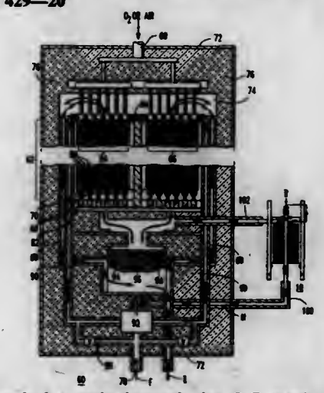
**OXYGEN SENSOR FOR MONITORING GAS MIXTURES CONTAINING HYDROCARBONS**

**Roswell J. Ruka, and Richard A. Basel, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Filed Aug. 11, 1994, Ser. No. 288,850**

**Int. Cl.[6] H01M *8/18***

**U.S. Cl. 429—20** **9 Claims**



8. A method to assist in monitoring O:C atomic ratios of a reformable fuel mixture to be conditioned prior to entering a

generator chamber of a high temperature, solid oxide electrolyte fuel cell generator, comprising:

(a) providing a reformable fuel mixture (F) comprising hydrocarbons and $H_2O$ and/or $CO_2$;

(b) passing the reformable fuel mixture (F) as a monitored gas (M) through an oxygen gas sensor (10), said oxygen gas sensor comprising a housing (12) positioned within or exterior to a monitored gas environment having an inlet (14) to monitor a gas containing hydrocarbons and oxygen species to enter said housing, a catalytic hydrocarbon reforming chamber (50) containing a reforming catalyst (54) positioned within said housing having an inlet (52) for said monitored gas to enter said reforming chamber and an outlet (56) for said monitored gas to exit said reforming chamber, a tubular, close ended, solid electrolyte, electrochemical, gas sensor cell (20) positioned within said housing at said reforming chamber outlet, said solid electrolyte, electrochemical, gas sensor cell (20) including a solid electrolyte (22) disposed between a sensor electrode (26) exposed to said monitored gas environment and a reference electrode (30) isolated from said monitored gas environment and exposed to a reference gas environment (R), heating means (34) in heat communication with the reforming chamber and electrochemical cell, and, circuit means (38) connected between said sensor electrode and said reference electrode to process an electrical signal between the electrodes, the electrical signal providing a measure of the partial pressure of oxygen said monitored gas;

(c) providing an oxygen reference gas (R) at a known partial pressure of oxygen to the reference electrode; and,

(d) measuring the EMF as a function of the ratio of the partial pressure of oxygen of the reformable fuel mixture to that of the reference gas.

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**5,498,488**

## CONTAINER FOR RAPID CHARGE ACCUMULATOR HAVING CHANNELS MOLDED IN THE LID FOR DISTRIBUTING THE ELECTROLYTE

**Olimpio Stocchiero, via Kennedy, 4 - 36050 Montorso Vicentino (VI), Italy**

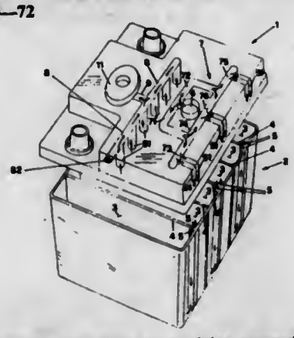
**PCT No. PCT/EP94/01823, § 371 Date Jan. 25, 1995, § 102(e) Date Jan. 25, 1995, PCT Pub. No. WO94/29907, PCT Pub. Date Dec. 22, 1994**

**PCT Filed Jun. 6, 1994, Ser. No. 374,704**

**Claims priority, application Italy, Jun. 9, 1993, VI93A0099**

**Int. Cl.[6] H01M** *2/36*

**U.S. Cl. 429—72** **9 Claims**



1. An accumulator container for receiving accumulator components therein formed of moldable plastic material adapted for rapid filling with a first charge of electrolyte, comprising:

a box; and a lid, the box having an outer wall and at least one intermediate partition forming one or more cells for receiving the accumulator components to be immersed in the electrolyte, each of said cells having at least one inlet tube for receiving the first charge of electrolyte, and the lid having channels for communicating with each inlet tube, each of said tubes being arranged in a substantially vertical orientation, having an upper end communicating with the corresponding channel in the lid and a lower end arranged near the bottom of the box, said lid having at least one first inlet opening for each channel, commonly connected to the channels for the distribution of the electrolyte, and a level tube for each cell, each level tube having an inlet communicating with an upper end of the corresponding channel and at least one second outlet opening formed therein and commonly connected with the level tubes.

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**5,498,489**

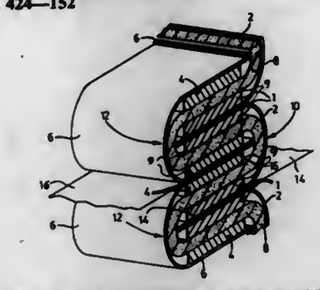
## RECHARGEABLE NON-AQUEOUS LITHIUM BATTERY HAVING STACKED ELECTROCHEMICAL CELLS

**Sankar Dasgupta, c/o The Electrofuel Manufacturing Company Ltd. 21 Hanna Avenue, Toronto, Ontario, Canada, and James K. Jacobs, 69 Albany Avenue, Toronto, Ontario, Canada**

**Filed Apr. 14, 1995, Ser. No. 421,935**

**Int. Cl.[6] H01M** *10/38;2/12;4/70*

**U.S. Cl. 424—152** **15 Claims**



1. In a lithium battery constructed of a multiplicity of lithium containing stacked electrochemical cells packed in a battery case, the stacked electrochemical cells having a continuous, flexible, folded, mobile lithium ion containing polymer electrolyte, first and second polarity electrodes, and first and second polarity electrode current collectors, the improvement comprising that the stacked electrochemical cells are assembled of laminates consisting of:

i) a first electrical current conducting continuous, flexible, foldable electrode support laminate having first and second faces, a multiplicity of discrete first polarity electrode plates, each first polarity electrode plate having opposing major sides, a platelength and a first platewidth, one of the major sides of each of said discrete first polarity electrode plates being conductively affixed to said first face of said first electrical current conducting continuous, flexible, foldable electrode support laminate at spaced intervals predetermined by said platelength,

ii) a continuous, flexible, foldable mobile lithium ion containing polymer laminate electrolyte having first and second faces, a laminate width and a pair of laminate edges, said continuous, flexible, foldable polymer laminate electrolyte being conductive of lithium ions and non-conductive of electrical current,

iii) a second electrical current conducting continuous, flexible, foldable electrode support laminate having first and second faces, a multiplicity of discrete second polarity electrode plates, each second polarity electrode plate having opposing major sides, a platelength that is similar to the platelength of said first polarity electrode plates, and a second platewidth, one of the major sides of each of said discrete second polarity electrode plates being conductively affixed to said first face of said second electrical current conducting continuous, flexible, foldable electrode support laminate at said predetermined spaced intervals; the other of said opposing major sides of said discrete first polarity electrode plates being in contact with said first face of said continuous, flexible, foldable mobile lithium ion containing polymer laminate electrolyte at said predetermined spaced intervals, and the other of said opposing major sides of said discrete second polarity electrode plates being in contact with said second face of said continuous, flexible, foldable mobile lithium ion containing polymer laminate electrolyte at said predetermined spaced intervals, said major side of each of said discrete first polarity electrode plates contacting said first face of said polymer laminate electrolyte corresponding to the respective major side of one of said discrete second polarity electrode plates contacting said second face of said polymer laminate electrolyte;

said assembled laminates being fan-folded such that they comprise stacked parallel sections enfolding said discrete first and second polarity electrode plates, and flexible elbow sections devoid of discrete first and second polarity electrode plates, thereby providing a multiplicity of lithium containing folded and stacked electrochemical cells;

a first polarity electrode current collector in electrical contact with said first electrical current conducting continuous, flexible, foldable electrode support laminate;

a second polarity electrode current collector in electrical contact with said second electrical current conducting continuous, flexible, foldable electrode support laminate; and

a battery case having electrical leads containing said fan-folded stack of electrochemical cells.



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**5,498,490**

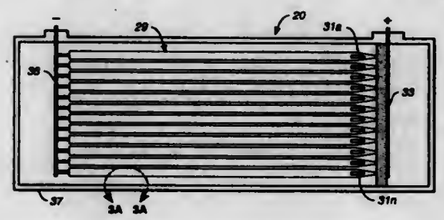
## EQUALIZING CHARGE RATES OF INDIVIDUAL BATTERY CELLS

**Ralph J. Brodd, 15845 LaPrenda Ct., Morgan Hill, Calif. 95037**

**Continuation of Ser. No. 190,625, Feb. 2, 1994, abandoned. This application Apr. 20, 1995, Ser. No. 426,481**

**Int. Cl.[6] H01M** *6/18*

**U.S. Cl. 429—149** **30 Claims**



1. A battery comprising:

a plurality of electrochemical bi-fold cells each comprising:

a layer of anode material; and

a layer of cathode material separated from said anode layer by an interposing solid electrolyte layer, thereby forming a cell laminate with said electrolyte layer and said anode layer, said cell laminate being folded at a fold;

a cathode current collector strip; and

a resistive adhesive polymer layer attaching said cathode current collector strip at a contact area thereof to each of said bi-fold cells at said fold;

said resistive layer having a resistivity R controlled so as to be substantially equal to $(P \times V_{oc})/I_{dr}$ where $V_{oc}$ is an open-circuit voltage of said battery in volts, $I_{dr}$ is a nominal discharge rate of said battery in amperes-cm$^2$, and P is a percentage voltage drop.

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**5,498,491**

## SOLID ELECTROLYTES DERIVED BY POLYMERIZATION OF VINYL SULFONATE DERIVATIVES

**Milton N. Golovin, 145 Manton Dr., San Jose, Calif. 95123**

**PCT No. PCT/US93/06854, § 371 Date Feb. 4, 1994, § 102(e) Date Feb. 4, 1994, PCT Pub. No. WO94/02454, PCT Pub. Date Feb. 3, 1994**

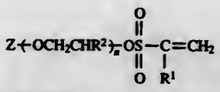
**PCT Filed Jul. 22, 1993, Ser. No. 193,046**

**Int. Cl.[6] H01M** *10/40*

**U.S. Cl. 429—192** **24 Claims**

1. A compound selected from the group consisting of the compounds set forth in formulas A, B, C, D and E below:

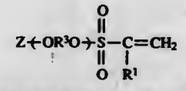
i



A

where $R^1$ is selected from the group consisting of hydrogen and alkyl of from 1 to 6 carbon atoms; $R^2$ is selected from the group consisting of hydrogen and an alkyl group of from 1 to 3 carbon atoms; Z is selected from the group consisting of a hydrocarbyl group of from 1 to 30 carbon atoms and a compatible ethylenically unsaturated moiety of from 2 to 6 carbon atoms; and n is an integer from about 2 to 50;

ii



B

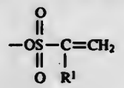
wherein $R^3$ is an alkylene group of from 2 to 10 carbon atoms, $R^1$ is selected from the group consisting of hydrogen and alkyl of from 1 to 6 carbon atoms; and Z is selected from the group consisting of a hydrocarbyl group of from 1 to 30 carbon atoms and a compatible ethylenically unsaturated moiety of from 2 to 6 carbon atoms;

iii

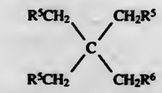


C

wherein each $R^4$ is independently selected from the group consisting of $-(OCH_2CHR^2)-_mOZ'$ where $R^2$ is hydrogen or an alkyl group of from 1 to 3 carbon atoms, Z' is a compatible ethylenic unsaturated moiety of from 2 to 6 carbon atoms, and m is an integer from 0 to 50, with the proviso that at least one Z' is



wherein $R^1$ is selected from the group consisting of hydrogen and alkyl of from 1 to 6 carbon atoms;

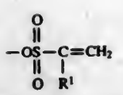


D

wherein $R^1$ is selected from the group consisting of consisting of $-(OCH_2CHR^2)-_mOZ'$ where $R^2$ is hydrogen or an alkyl group of from 1 to 3 carbon atoms, Z' is a compatible ethylenic unsaturated moiety of from 2 to 6 carbon atoms, and m is an integer from 0 to 50, and

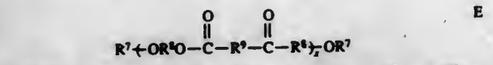
$R^6$ is selected from the group consisting of hydrogen, alkyl of from 1 to 3 carbon atoms, and $-(OCH_2CHR^2)-_mOZ'$ where $R^2$, Z' and m are as defined above

with the proviso that at least one Z' is



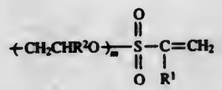
wherein $R^1$ is selected from the group consisting of hydrogen and alkyl of from 1 to 6 carbon atoms; and

v



E

wherein x is an integer of from 1 to 50; each $R^5$ and $R^9$ is independently an alkylene group of from 2 to 10 carbon atoms; each $R^7$ is independently selected from the group consisting of a hydrocarbyl group of from 1 to 30 carbon atoms and $-(CH_2CHR^2O)_m-Z'$ where $R^2$ is selected from the group consisting of hydrogen and alkyl of from to 3 carbon atoms, m is an integer from 0 to 50, and Z' is a compatible ethylenic unsaturated moiety of from to 6 carbon atoms, with the proviso that at least one of $R^7$ is:



wherein $R^1$ is selected from the group consisting of hydrogen and alkyl of from 1 to 6 carbon atoms; and $R^2$ and m are as defined above.

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**5,498,492**

**LITHIUM SECONDARY BATTERY**

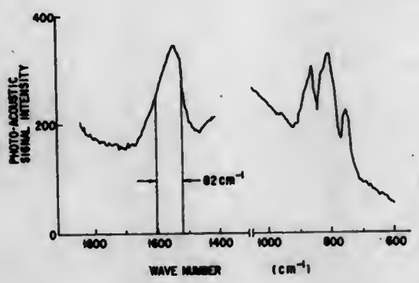
**Michikazu Hara; Asako Satoh; Norio Takami, and Takahisa Ohsaki, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Sep. 15, 1994, Ser. No. 305,336**

**Claims priority, application Japan, Sep. 17, 1993, 5-231282; Dec. 29, 1993, 5-351325**

**Int. Cl.[6] H01M 4/60**

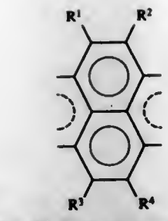
**U.S. Cl. 429—212** **23 Claims**




1. A lithium secondary battery comprising:

a case;

a negative electrode accommodated in said case and containing a polymeric material which absorbs and desorbs lithium ions and which has been formed by heat-treating a polymer in a non-oxidizing atmosphere at 500° to 1000° C., the polymer having as a main repeating unit a structure represented by formula (I) below:



(I)

wherein $R^1$ to $R^4$ may be the same or different and represent hydrogen, an alkyl group, a phenyl group, or a naphthyl group;

a positive electrode accommodated in said case and so arranged as to oppose said negative electrode with a separator sandwiched therebetween; and

a nonaqueous electrolyte contained in said case.

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**5,498,493**

**ELECTRON ACCEPTOR SUBSTITUTED CARBONS FOR USE AS ANODES IN RECHARGEABLE LITHIUM BATTERIES**

**Jeffrey R. Dahn, Surrey, and Brian M. Way, Coquitlam, both of, Canada, assignors to Moli Energy (1990) Limited, Canada**

**Filed Sep. 9, 1993, Ser. No. 118,942**

**Claims priority, application Canada, Jun. 11, 1993, 2098248**

**Int. Cl.[6] H01M 4/02**

**U.S. Cl. 429—218** **9 Claims**




1. A lithium ion battery comprising a carbonaceous anode, a cathode and an electrolyte wherein the electroactive material of the anode has an electroactive graphite or disordered graphite structure wherein boron atoms have been substituted for corresponding carbon atoms in said structure, said material having the form $B_zC_{1-z}$, wherein z is a number in the range from greater than 0 and less than or equal to about 0.17.

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**5,498,494**

**PREPARATION OF SILVER VANADIUM OXIDE CATHODES USING AG20 AND V205 AS STARTING MATERIALS**

**Esther S. Takeuchi, Williamsville, and William C. Thiebolt, III, Tonawanda, both of N.Y., assignors to Wilson Greatbatch Ltd., Clarence, N.Y.**

**Continuation of Ser. No. 66,982, May 25, 1993, abandoned. This application Feb. 14, 1995, Ser. No. 385,991**

**Int. Cl.[6] H01M 4/04;4/06**

**U.S. Cl. 429—219** **63 Claims**

31. A nonaqueous electrochemical cell comprising a cathode containing an active material comprising silver vanadium oxide prepared from a silver-containing component and a vanadium-containing compound by chemical addition or reaction to provide the silver vanadium oxide as a mixed metal oxide having amorphous characteristics wherein the amorphous characteristics are provided by heating to an elevated temperature with a dopant material to provide a molten state followed by quenching and wherein dopant material is a non-metallic oxide salt that helps to provide the amorphous characteristics to the mixed metal oxide, the cell further comprising an alkali metal anode; a nonaqueous electrolyte comprising a combination of an organic solvent and a lithium salt; and a separator material, electrically insulating the anode from the cathode, and of a porosity to allow for electrolyte flow.



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**5,498,495**

**ALLOY FOR NEGATIVE ELECTRODE OF LITHIUM SECONDARY BATTERY AND LITHIUM SECONDARY BATTERY**

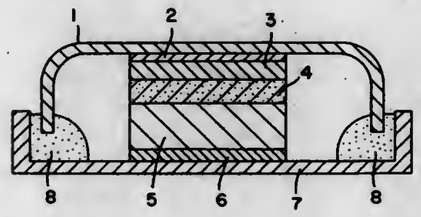
**Yoshinori Takada; Mitsuhiro Marumoto, both of Amagasaki, and Kouzou Sasaki, Tokyo, all of, Japan, assignors to Mitsubishi Cable Industries, Ltd., Hyogo, Japan**

**Filed Feb. 22, 1995, Ser. No. 392,217**

**Claims priority, application Japan, Feb. 22, 1994, 6-049869; Apr. 28, 1994, 6-113683**

**Int. Cl.[6] H01M 4/40**

**U.S. Cl. 429—219** **8 Claims**




1. An alloy for a negative electrode of a lithium secondary battery, comprising an Li-Ag-Te alloy having an atomic ratio of Li:Ag:Te=15–120:1–20:0.001–2.

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**5,498,496**

**LEAD ACID BATTERY**

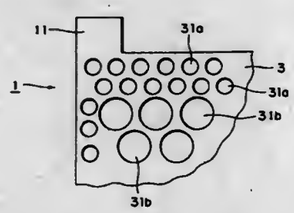
**Masaaki Sasaki; Tohru Horii; Masahiro Arakawa, and Kazuo Murata, all of Takatsuki, Japan, assignors to Yuasa Corporation, Osaka, Japan**

**Filed Dec. 14, 1994, Ser. No. 355,907**

**Claims priority, application Japan, Dec. 14, 1993, 5-313092; Jan. 27, 1994, 6-007398**

**Int. Cl.[6] H01M 4/14**

**U.S. Cl. 429—233** **9 Claims**




1. A lead acid battery equipped with a positive electrode comprising an acid-resistant and oxidation-resistant resin sheet, a current collecting metal sheet, and an active material;

the resin sheet and the metal sheet are laminated each other,

a plurality of through holes are made at least on the resin sheet, and

the active material is filled in the through holes.

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**5,498,497**

**METHOD FOR MANUFACTURING A PHASE SHIFT MASK**

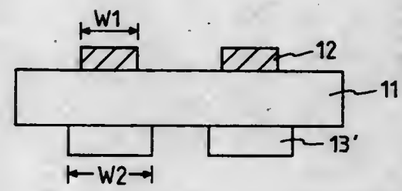
**Young S. Kim, Seoul; Young M. Ham, Kyoungki-do; Ik B. Huh, Seoul, and Hung E. Kim, Kyoungki-do, all of, Rep. of Korea, assignors to Hyundai Electronics Industries, Co., Ltd., Kyoungki-do, Rep. of Korea**

**Continuation of Ser. No. 110,358, Aug. 23, 1993, abandoned. This application Aug. 29, 1994, Ser. No. 297,666**

**Claims priority, application Rep. of Korea, Aug. 24, 1992, 92-15166**

**Int. Cl.[6] G03F 9/00**

**U.S. Cl. 430—5** **6 Claims**




1. A method of forming a phase shift mask on a transparent glass during a lithographic process comprising the steps of:

forming a Cr pattern on the transparent glass;

forming a phase shift layer on the rear surface of said transparent glass on which said Cr pattern is formed;

coating a positive resist layer over said phase shift layer;

forming a positive resist pattern by removing an exposed portion of said positive resist layer through an exposing process; and

forming a phase shift layer pattern by removing an exposed portion of said phase shift layer through an etching process using said resist positive pattern as a mask.

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**5,498,498**

**PHOTOSENSITIVE RESIN COMPOSITION USED IN A METHOD FOR FORMING A LIGHT-SHIELDING FILM**

**Kiyoshi Uchikawa; Hiroshi Komano; Toshiasi Aoyama, and Katsuyuki Ohta, all of Kanagawa, Japan, assignors to Tokyo Ohka Kogyo Co., Ltd., Kanagawa, Japan**

**Division of Ser. No. 94,214, Jul. 21, 1993, Pat. No. 5,368,991. This application Aug. 1, 1994, Ser. No. 282,464**

**Claims priority, application Japan, Jul. 29, 1992, 4-221991**

**Int. Cl.[6] G03F 7/38;7/022;7/008**

**U.S. Cl. 430—7** **10 Claims**

1. A process for preparing a light-shielding film, wherein the process comprises:

(a) coating a photosensitive resin composition on a substrate, said photosensitive resin comprising a photosensitive resin and a light-shielding coloring material in admixture, wherein the light-shielding coloring material comprises pigments selected from the group consisting of (i) yellow, red, and blue pigments, (ii) orange and blue pigments, (iii) yellow and violet pigments, and (iv) green and red pigments;

(b) drying the photosensitive resin composition;

(c) exposing the photosensitive resin composition to light; and

(d) developing the photosensitive resin composition,

wherein light transmission properties after formation of the light-shielding film are controlled by the light-shielding coloring material so that

(i) the light transmission through the light-shielding film is 1% or more in at least one wavelength of a light wavelength region of from 330 nm to less than 425 nm, and

(ii) the light transmission through the light-shielding film is 2% or less in a light wavelength region of from 425 nm to 650 nm.

**5,498,499**

## PEPTIDES AND ANTIBODIES THAT INHIBIT PLATELET ADHESION

**Edward F. Plow; Mark H. Ginsberg, both of San Diego, and Joseph C. Loftus, Carlsbad, all of Calif., assignors to The Scripps Research Institute, La Jolla, Calif.**

**Continuation-in-part of Ser. No. 70,953, Jul. 8, 1987, abandoned, and a continuation of Ser. No. 175,342, Mar. 31, 1988, Pat. No. 5,114,842. This application May 15, 1992, Ser. No. 883,669**

**The portion of the term of this patent subsequent to Jul. 8, 2007, has been disclaimed.**

**Int. Cl.[6] A61K** *49/00;39/00;* **G01N** *33/53*

**U.S. Cl. 435—7.21** **4 Claims**

1. A method of detecting in vivo the presence of a receptor-ligand complex wherein said complex contains a GPIIb-IIIa receptor and a ligand that are specifically bound, which comprises the steps of:

(a) intravenously administering to a human subject an effective amount of a monoclonal antibody composition comprising a physiologically tolerable diluent and antibody molecules that immunoreact with said GPIIb-IIIa receptor-ligand complex but do not immunoreact with the GPIIb-IIIa receptor or the ligand when either is in non-bound form, wherein said antibody molecules are linked to an in vivo indicating means;

(b) maintaining the administered subject for a predetermined time period sufficient for said antibody molecules to immunoreact with said receptor-ligand complex in vivo and form an immunoreaction product; and

(c) assaying for the presence of any in vivo immunoreaction product formed in step b and thereby the presence of said complex in said subject.

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**5,498,500**

## OVERLAY MEASUREMENT MARK AND METHOD OF MEASURING AN OVERLAY ERROR BETWEEN MULTI PATTERNS IN A SEMICONDUCTOR DEVICE USING THE MEASUREMENT MARK

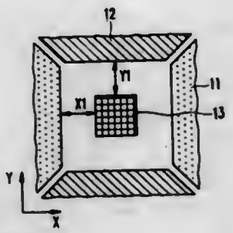
**Sang M. Bae, Seoul, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Rep. of Korea**

**Filed Dec. 27, 1994, Ser. No. 364,047**

**Claims priority, application Rep. of Korea, Dec. 27, 1993, 93-29789**

**Int. Cl.[6] G03F** *9/00*

**U.S. Cl. 430—22** **8 Claims**




1. An overlay measurement mark comprising:

first overlay measurement patterns formed on the Y-axis of a scribe line, with said first overlay measurement patterns including two patterns spaced from one another and parallel to each other;

second overlay measurement patterns formed on the X-axis of said scribe line, with said second overlay measurement patterns including two patterns spaced from one another and parallel to each other, so that said first and second overlay patterns create a rectangular exterior box; and

a third overlay measurement pattern formed on said scribe line, with said third overlay mark formed inside said rectangular exterior box formed by said first and second overlay marks.

**5,498,501**

## EXPOSURE METHOD

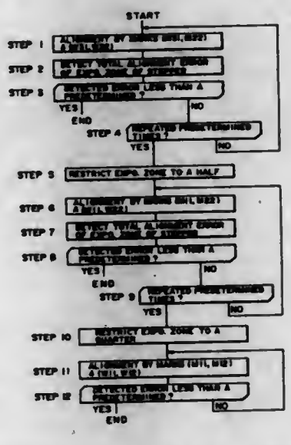
**Isamu Shimoda, Zama; Takao Kariya, Hino; Nobutoshi Mizusawa, Yamato; Kunitaka Ozawa, Isehara, and Shunichi Uzawa, Nakamachi, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 161,670, Dec. 6, 1993, abandoned, which is a continuation of Ser. No. 648,991, Jan. 31, 1991, abandoned. This application Apr. 4, 1995, Ser. No. 416,503**

**Claims priority, application Japan, Feb. 2, 1990, 2-022269; Feb. 6, 1990, 2-025071**

**Int. Cl.[6] G03F** *9/00*

**U.S. Cl. 430—22** **25 Claims**




1. A semiconductor device manufacturing method, comprising the steps of:

providing an optical exposure apparatus having a first exposure field, the optical exposure apparatus being operable to transfer a pattern of a first mask onto different shot areas of a semiconductor substrate in sequence and on a reduced scale;

providing an X-ray exposure apparatus having a second exposure field larger than the first exposure field, the X-ray exposure apparatus being operable to transfer a pattern of a second mask onto different shot areas, within the second exposure field, of a semiconductor substrate simultaneously and in a unit magnification;

transferring, through the optical exposure apparatus, the pattern of the first mask onto plural shot areas of a particular semiconductor substrate;

placing, after said transferring step, the particular semiconductor substrate in the X-ray exposure apparatus;

detecting positional errors of those shot areas covered by the second exposure field with respect to the pattern of the second mask;

calculating an overall positional error within the range of the second exposure field, on the basis of the detected positional errors;

reducing the second exposure field when the calculated overall positional error is not less than a predetermined error, so as to reduce the number of shot areas to be covered by the second exposure field; and

transferring, through the X-ray exposure apparatus, the pattern of the second mask onto those shot areas to which the pattern of the first mask has been transferred.



**5,498,502**

## NEGATIVE CHARGING TYPE PRINTING PHOTOSENSITIVE RESIN COMPOSITION

**Hisaichi Muramoto, Hirakata; Kazunori Kanda, Yao, and Yutaka Kanoi, Suita, all of, Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan**

**Filed Jan. 13, 1995, Ser. No. 372,303**

**Claims priority, application Japan, Jan. 17, 1994, 6-003088**

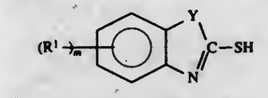
**Int. Cl.[6] G03G** *5/66;5/09;13/28*

**U.S. Cl. 430—49** **9 Claims**

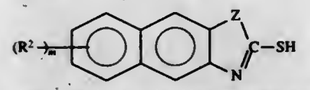
1. A negative charging type printing photosensitive resin composition comprising:

(a) a phthalocyanine compound;

(b) at least one compound represented by the formula (I) or (II):




(I)




(II)

wherein Y and Z respectively indicate an imino group or a sulfur atom; $R^1$ and $R^2$ are the same or different and indicate a hydroxyl group, an alkyl group having 1 to 4 carbon atoms and a halogen atom; and m is an integer of 0 to 2; and

(c) a alkali soluble binder resin.

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**5,498,503**

## ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

**Eiichi Kato, and Kazuo Ishii, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Sep. 28, 1993, Ser. No. 119,220**

**Claims priority, application Japan, Apr. 15, 1991, 3-108238; Apr. 17, 1991, 3-110852; Jun. 7, 1991, 3-162322; Jul. 22, 1991, 3-204556; Jul. 31, 1991, 3-213048; Nov. 20, 1991, 3-329620; Feb. 13, 1992, 4-058854; Mar. 19, 1992, 4-092403**

**Int. Cl.[6] G03G** *5/05*

**U.S. Cl. 430—96** **11 Claims**

1. An electrophotographic light-sensitive material having a photoconductive layer containing at least an inorganic photoconductive substance, a spectral sensitizing dye, and a binder resin, wherein the binder resin comprises at least one resin (A) shown below and at least one resin (B) shown below:

Resin (A):

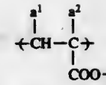
a resin having a weight average molecular weight of from $1\times10^3$ to $2\times10^4$ and containing not less than 30% by weight of a polymer component corresponding to a repeating unit represented by the general formula (I) described below and from 0.5 to 15% by weight of a polymer component containing at least one polar group selected from the group consisting of $-PO_3H_2$, $-SO_3H$, $-COOH$,




wherein $R^1$ represents a hydrocarbon group or $-OR^2$, and wherein $R^2$ represents a hydrocarbon group, and a cyclic acid anhydride-containing group;

Formula (I):

-continued




wherein $a^1$ and $a^2$ each represents a hydrogen atom, a halogen atom, a cyano group, a hydrocarbon group, $-COOR^4$ or $-COOR^4$ bonded via a hydrocarbon group, wherein $R^4$ represents a hydrocarbon group, and $R^3$ represents a hydrocarbon group;

Resin (B):

a linear AB block copolymer having a weight average molecular weight of from $3\times10^4$ to $1\times10^6$ and comprising an A block comprising a polymer component containing at least one polar group selected from the group consisting of specific polar groups as described in the resin (A) above and a B block comprising a polymer component represented by the general formula (I) as described in the resin (A) above, wherein the A block contains the polymer component containing the polar group in an amount of from 0.05 to 10% by weight based on the copolymer and the B block contains the polymer component represented by the general formula (I) in an amount not less than 30% by weight based on the copolymer.

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**5,498,504**

## PROCESS FOR THE PREPARATION OF AN IMAGE USING ONLY DRY STEPS

**Luc Leenders, and Eddie Daems, both of Herentals, Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium**

**Filed Nov. 21, 1994, Ser. No. 346,161**

**Claims priority, application European Pat. Off., Dec. 20, 1993, 93203596**

**Int. Cl.[6] G03C** *8/04;8/06;11/12*

**U.S. Cl. 430—199** **16 Claims**

1. Process for forming an image comprising following steps:

(1) providing a photosensitive element comprising:

(a) a support,

(b) a contiguous layer 1, contiguous to said support,

(c) a photosensitive layer or layer pack comprising, divided over one or more layers, a polymeric binder, an organic metal salt, a photoinitiator, and a polymerisable monomer,

(2) laminating a cover sheet bearing a contiguous layer 2, contiguous to said cover sheet, onto said photosensitive element, so that said contiguous layer 2 faces said photosensitive layer or layer pack, said support or said cover sheet being transparent to actinic radiation,

(3) exposing information-wise by actinic radiation said photosensitive element before or after performing said lamination step (2), thereby inducing photopolymerisation of said polymerisable monomer,

(4) peeling apart said support, and said cover sheet whereby either the exposed or the unexposed regions of said photosensitive layer adhere to said contiguous layer 1, and whereby the other regions adhere to contiguous layer 2, thus forming an imaged element A and an imaged element B,

(5) providing a donor element comprising a support ($S_D$) and a donor layer containing a binder and a reducing agent, capable of becoming diffusable under the influence of heat,

(6) bringing in contact said donor element with its donor layer side onto one of said elements A or B, thereby transferring reducing agent to said element A or B, and inducing reduction of the organic metal salt thus forming a metal image, and finally peeling apart said donor element from said metal image.

### 5,498,505
### DYE FIXING ELEMENT

Jiro Tsukahara, and Hiroshi Arakatsu, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 913,058, Jul. 14, 1992, abandoned.
This application Dec. 21, 1994, Ser. No. 361,154
Claims priority, application Japan, Jul. 15, 1991, 3-198279
Int. Cl.[6] G03C 8/00;1/06;1/815/825
U.S. Cl. 430—213 12 Claims

1. A dye fixing element for mordanting a dye, comprising a support and a dye fixing layer comprising a dye fixing polymer mordant, said polymer mordant containing at least one ethylenic monomeric unit represented by formula (I):



(I)

wherein $R^1$ represents a hydrogen atom or an alkyl group containing 1 to 6 carbon atoms; $L_1$ and $L_2$, which may be the same or different, each represents a divalent linkage group, wherein $L_2$ is selected from the group consisting of an ether linkage, a carbonyl group, an alkylene group, an arylene group, an alkyleneoxy group, an aryleneoxy group and a combination thereof; m and n each represents 0 or 1; Q represents at least one quaternary ammonium group; and ALFA represents at least one group selected from the group consisting of tertiary amines, aromatic 5-membered heterocyclic rings, hydrazides, hydrazones and polyarylphenols.

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### 5,498,506
### POSITIVE-ACTING RADIATION-SENSITIVE MIXTURE AND RECORDING MATERIAL PRODUCED THEREWITH

Horst Wengenroth, Westerburg; Horst Roeschert, Ober-Hilbersheim; Walter Spiess, Dieburg; Gerhard Buhr, Koenigstein, all of, Germany, and Georg Pawlowski, Tokyo, Japan, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

PCT No. PCT/EP93/01430, § 371 Date Jan. 9, 1995, § 102(e) Date Apr. 9, 1995, PCT Pub. No. WO94/01805, PCT Pub. Date Jan. 20, 1994
PCT Filed Jun. 7, 1993, Ser. No. 362,491
Claims priority, application Germany, Jul. 13, 1992, 42 22 968.5
Int. Cl.[6] G03C 1/492
U.S. Cl. 430—270.14 19 Claims

1. A radiation-sensitive mixture comprising

a) a binder which is insoluble in water but soluble or at least swellable in aqueous alkaline solution,

b) a compound which forms an acid under the action of actinic radiation and

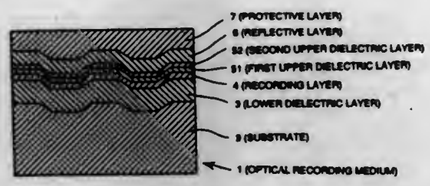
c) a compound which contains at least one C-O-C or C-O-Si bond which can be cleaved by an acid,

wherein said mixture additionally contains 0.1 to 70 mol %, based on the maximum amount of acid which can theoretically be produced from the compound b), of at least one compound d) having at least one amine or amide bond, this compound being 1,4-diazabicyclo[ 2.2.2]octane, polymeric 2,2,4-trimethyl-1,2-dihydroquinoline, a terpolymer of α-methylstyrene, N-octadecylmaleimide, and N-(2,2,6,6-tetramethylpiperidin- 4-yl)-maleimide, dodecylamine, bis(2,2,6,6-tetramethylpiperidin-4-yl) decanedioate, bis-(1,2,2,6,6-pentamethylpiperidin-4-yl) decanedioate or 8-acetyl-3-dodecyl-7,7,9,9-tetramethyl- 1,3,8-triazaspiro[4.5]decane-2,4-dione.

### 5,498,507
### OPTICAL RECORDING MEDIA

Tokuhiko Handa; Ryo Inaba; Susumu Haratani, and Junji Tominaga, all of Nagano, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Feb. 27, 1995, Ser. No. 394,817
Claims priority, application Japan, Mar. 29, 1994, 6-082235
Int. Cl.[6] G11B 7/24
U.S. Cl. 430—273.1 9 Claims




1. An optical recording medium comprising a substrate, a lower dielectric layer, a recording layer, a first upper dielectric layer contiguous to said recording layer, a second upper dielectric layer and a reflective layer in the order mentioned above, wherein information is recorded or erased by irradiating said recording layer with a light beam to change the crystallographic state thereof,

said recording layer comprising a recording material containing an element A that represents silver and/or gold, an element B that represents antimony and/or bismuth, an element C that represents tellurium and/or selenium, an element indium, and an element M that represents at least one element selected from the group consisting of titanium, zirconium, hafnium, vanadium, niobium, tantalum, manganese, tungsten and molybdenum, with the atomic ratio of the elements in said recording material having the following formula:

$$\{(A_aB_bC_{1-a-b})_x(In_{0.5}C_{0.5})_yB_{1-x-y}\}_{1-z}M_z$$

wherein:

$0.10 \leq a \leq 0.40$
$0.10 \leq b \leq 0.40$
$0.20 \leq x \leq 0.80$
$0.01 \leq y \leq 0.60$
$0.001 \leq z \leq 0.20$

said first upper dielectric layer containing at least one compound selected from the group consisting of aluminum nitride, silicon nitride and aluminum oxide, and

said second upper dielectric layer being made up of a material that has a thermal conductivity lower than that of said first upper dielectric layer and said second upper dielectric layer is 50 Å to 500 Å in thickness.

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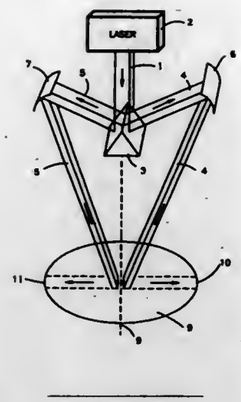
### 5,498,508
### SYMMETRIC SCANNING TECHNIQUE FOR LASER ABLATION

Eric Chan, Austin, Tex., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Continuation of Ser. No. 954,858, Sep. 29, 1992, abandoned.
This application Jun. 16, 1994, Ser. No. 260,628
The portion of the term of this patent subsequent to Jul. 19, 2011, has been disclaimed.
Int. Cl.[6] B23K 26/10
U.S. Cl. 430—321 10 Claims

1. A method for photoablating a target surface comprising the steps of a) directing at least two beams of pulsed UV radiation at the portion of the target surface requiring the least amount of material removal; and b) scanning the individual beams toward portions of the target surface requiring the greatest amount of material removal.

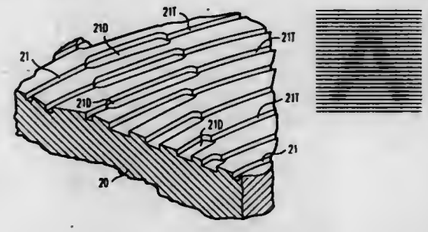





### 5,498,509
### METHOD OF MAKING AN OPTICAL INFORMATION RECORDING SUBSTRATE

Yuaki Shin; Takashi Ishiguro; Emiko Hamada, and Kelichi Kagawa, all of Tokyo, Japan, assignors to Taiyo Yuden Co., Ltd., Tokyo, Japan

Division of Ser. No. 792,591, Nov. 15, 1991, Pat. No. 5,398,231. This application Nov. 9, 1994, Ser. No. 338,178
Claims priority, application Japan, Nov. 17, 1990, 2-312067; Aug. 10, 1991, 3-224623
Int. Cl.[6] G11B 7/26
U.S. Cl. 430—321 2 Claims




1. A method of making an optical information recording substrate, which comprises

forming a photo resist on a primary disc;

forming one of a plurality of continuous grooves and a plurality of pit arrays on an area of the primary disc by irradiating a laser beam on the primary disc;

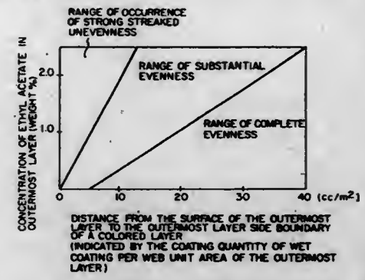
producing legible matter on said area of the primary disc by partially changing at least one of a power density of a beam spot of the laser beam, a size of the beam spot of the laser beam; a shape of the beam spot of the laser beam, and a location of the laser beam in a radial direction on the primary disc; and

using the primary disc with said legible matter thereon as a stamper to produce the optical information substrate, said substrate having the legible matter formed thereon.

### 5,498,510
### METHOD FOR SIMULTANEOUSLY COATING AT LEAST TWO LAYERS TO MAKE A PHOTOGRAPHIC LIGHT-SENSITIVE ELEMENT

Kenji Ogawa, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 962,718, Oct. 19, 1992, abandoned.
This application Feb. 24, 1994, Ser. No. 201,319
Claims priority, application Japan, Jan. 17, 1991, 3-296681
Int. Cl.[6] G03C 1/00;3/00;1/76;1/005
U.S. Cl. 430—496 3 Claims




1. A multi-layer simultaneous coating method for producing a photographic light-sensitive element, said method comprising the step of simultaneously applying at least two layers to one side of a support, wherein the outermost of the at least two layers contains a low boiling point solvent, in which the following relationship is satisfied:

$$C<0.2L$$

where C(wt %) is the concentration of a low boiling point solvent in a coating composition forming said outermost of said at least two layers, and L (cc/m²) is the quantity of wet coating per web unit area in a thickness of outer layer(s) above a silver halide layer from the inner surface of the outer layer which is adjacent to the outermost surface of the silver halide layer to the outer surface of said outermost of said at least two layers, and wherein a low boiling point solvent is present in the inner layer next to said outermost layer in a range of 0.5 to 7 wt %.

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### 5,498,511
### SILVER HALIDE PHOTOGRAPHIC MATERIAL

Seiji Yamashita; Mitsuo Saitou; Tomoyuki Ozeki, and Tatsuya Ishizaka, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 21, 1994, Ser. No. 325,167
Claims priority, application Japan, Jan. 25, 1993, 5-287226; Jan. 28, 1993, 5-271057; Jan. 29, 1993, 5-272346; Dec. 16, 1993, 5-316677
Int. Cl.[6] G03C 1/035;5/16;5/30
U.S. Cl. 430—496 12 Claims

1. A silver halide photographic material comprising a support having thereon at least one silver halide emulsion layer, wherein the swelling amount of the hydrophilic colloid layers including the light-sensitive silver halide emulsion layer and a protective layer coated on at least one side of the support is not more than 10 μm in thickness, wherein at least 60% of the total projected area of the total silver halide grains in at least one silver halide emulsion layer includes tabular silver halide grains having a $Cl^-$ content of at least 20 mole %, a {100} plane as the major plane, a thickness of 0.35 μm or less, an aspect ratio (diameter/thickness) of at least 2, and a sum total of projected areas of twin silver halide grains is not more than 10% of the total projected area of the tabular silver halide grains, and wherein the tabular silver halide grains in the silver halide emulsion have a layer containing at least one silver salt comprising at least one of silverhalobromide and silver haloiodide and at least one of silver thiocyanate and silver selenocyanate.

**5,498,512**

## PHOTOGRAPHIC ELEMENT HAVING A TRANSPARENT MAGNETIC RECORDING LAYER

**Robert O. James; Lawrence A. Rowley, and George L. Oltean, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Mar. 10, 1995, Ser. No. 402,265**
**Int. Cl.[6] G03C 1/76; G11B 5/708**
**U.S. Cl. 430—496** **19 Claims**

1. A photographic element having a light-sensitive layer and a transparent magnetic recording layer, the transparent magnetic recording layer comprising ferromagnetic particles having a ferromagnetic core and a shell of tin oxide or metal antimonate in a binder.

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**5,498,513**

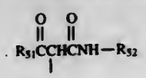
## SILVER HALIDE COLOR PHOTOGRAPHIC PHOTOSENSITIVE MATERIALS

**Keiji Mihayashi, and Atsuhiro Ohkawa, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

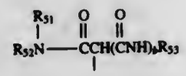
**Continuation of Ser. No. 55,755, May 3, 1993, abandoned, which is a continuation of Ser. No. 668,913, Mar. 13, 1991, abandoned. This application Jul. 6, 1994, Ser. No. 267,926**
**Claims priority, application Japan, Mar. 13, 1990, 2-62180**
**Int. Cl.[6] G03C 1/46**
**U.S. Cl. 430—505** **21 Claims**

1. A silver halide color photographic material comprising a support having thereon at least one photosensitive emulsion layer comprising a DIR coupler that is represented by Formula (I) below and a compound that is represented by Formula (R-I) below;

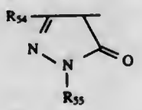
Formula (Cp-1)



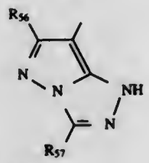
Formula (Cp-2)



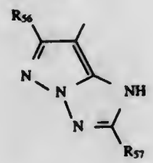
Formula (Cp-3)



Formula (Cp-4)

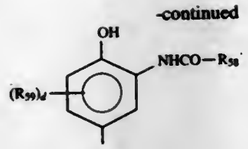


Formula (Cp-5)

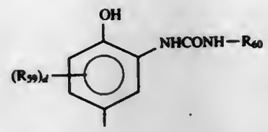


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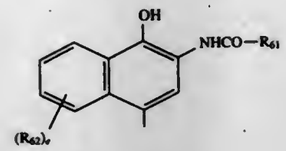
Formula (Cp-6)



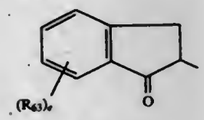
Formula (Cp-7)



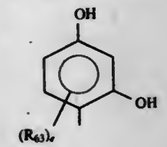
Formula (Cp-8)



Formula (Cp-9)



Formula (Cp-10)



wherein,

A represents a coupler residual group,

n represents an integer of 0 or 1, provided that (i) when A represents a phenol type or naphthol type coupler residual group then n is 1 and (ii) when A represents some other coupler residual group then n is 0, and

R represents an alkyl group that has from 1 to 4 carbon atoms or a pyridyl group, and

wherein the DIR coupler of Formula (I) is present in the emulsion layer in an amount of $3\times10^{-7}$ to $1\times10^{-3}$ mol/m$^2$;

Formula (R-I)

$$A\text{-}(L_1)_v\text{-}B\text{-}(L_2)_w\text{-INH-HYD}$$

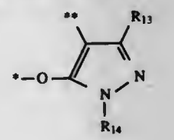
wherein,

A represents a group that reacts with the oxidized form of a developing agent and cleaves $(L_1)_v$-B-$(L_2)_w$-INH-HYD,

$L_1$ represents a group that cleaves the bond with B after cleavage of the bond with A,

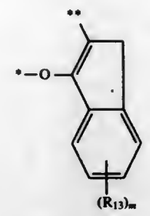
B is a group that reduces the oxidized form of a developing agent or undergoes a coupling reaction with the oxidized form of a developing agent, produces essentially colorless compounds, cleaves $(L_2)_w$-INH-HYD, and is selected from the group consisting of:

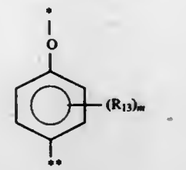
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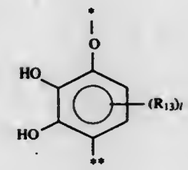


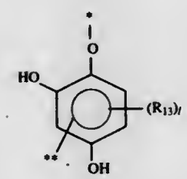


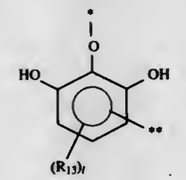
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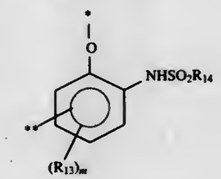


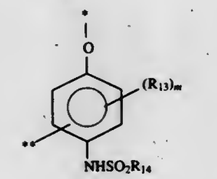






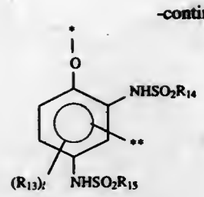




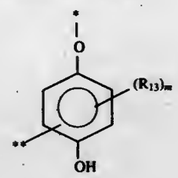


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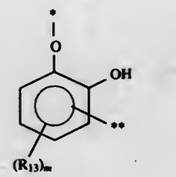
(B-22)



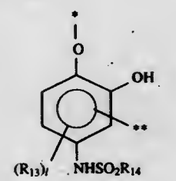
(B-23)



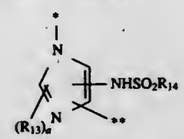
(B-1)



(B-2)



(B-3)



(B-4)

(B-5)

(B-6)

(B-7)

(B-8)

(B-9)

(B-10)

wherein,

* denotes the position which is bonded to A-$(L_1)_v$, ** denotes the position which is bonded to $(L_2)_w$-INH-HYD, $R_{13}$ is a substitutent group, $R_{14}$ and $R_{15}$ are the same or different and are selected from the group consisting of an aliphatic group, an aromatic group and a heterocyclic group, l represents an integer of from 0 to 2, m represents an integer of from 0 to 3, and the letter "a" represents an integer of 0 or 1,

$L_2$ represents a group that cleaves INH-HYD after cleavage of the bond with B,

INH represents a group that has a development inhibiting capacity,

HYD represents an alkoxycarbonyl group or a group that contains an alkoxycarbonyl group,

v and w each represent an integer having a value of from 0 to 2, and when they each represent 2, the two $L_1$ and the two $L_2$ groups may be the same or different, and

wherein the DIR coupler of Formula (R-I) is present in the emulsion layer in an amount of $1\times10^{-6}$ to $1\times10^{-3}$ mol/m$^2$.

5,498,514

## LITHOGRAPHIC DOUBLE-COATED PATTERNING PLATE WITH UNDERCOAT LEVELLING LAYER

Taku Nakao; Hiroyuki Yamazaki; Nobuo Tokutake, all of Kanagawa; Masato Saito, Fukushima; Hidekatsu Kohara, and Toshimasa Nakayama, both of Kanagawa, all of, Japan, assignors to Tokyo Ohka Kogyo Co., Ltd., Tokyo, Japan

Filed Aug. 9, 1994, Ser. No. 287,895
Int. Cl.[6] G03C 1/815
U.S. Cl. 430—512 3 Claims

1. A double-coated patterning plate which comprises, as an integral body:

(a) a substrate;

(b) an undercoat levelling layer formed on the surface of the substrate; and

(c) an overcoat layer of a positive-working photosensitive resist composition formed on the surface of the undercoat levelling layer,

the undercoat levelling layer being formed from a thermoplastic resin composition comprising (1) a copolymer of glycidyl methacrylate and methyl methacrylate in a copolymerization ratio in the range from 2:8 to 8:2 by weight and having a weight-average molecular weight in the range from 10,000 to 200,000 and (2) 2,2',4,4'-tetrahydroxybenzophenone.

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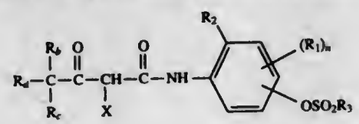
5,498,515

## PHOTOGRAPHIC ELEMENT CONTAINING A CERTAIN SULFONATED ACYLACETANILIDE COUPLER IN COMBINATION WITH LOW- OR NON-CHLORIDE EMULSIONS

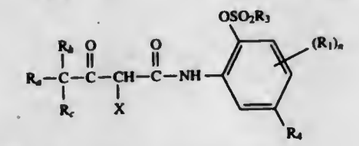
Paul B. Merkel; Jerrold N. Poslusny, both of Rochester, N.Y.; Hugh M. Williamson, Hanwell, United Kingdom; Bernard A. Clark, Maidenhead, United Kingdom, and Paul L. R. Stanley, Harrow, United Kingdom, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 17, 1994, Ser. No. 214,866
Int. Cl.[6] G03C 1/035;7/36
U.S. Cl. 430—556 24 Claims

1. A photographic element comprising a support bearing a blue-light sensitive silver halide emulsion layer containing an acylacetanilide yellow image dye-forming coupler having formula I or II:



I



II

wherein:

$R_a$ is an alkyl, alkoxy, or aryloxy group;

$R_b$ is an alkyl or aryl group;

$R_c$ is hydrogen or an alkyl group;

$R_1$ is a substituent;

n is an integer from 0 to 2;

$R_2$ is selected from the group consisting of halogen, trifluoromethyl, and substituted or unsubstituted alkoxy and aryloxy;

$R_3$ is an alkyl group;

$R_4$ is hydrogen, halogen, alkoxy carbonyl, carbamoyl, carbonamido, sulfonamido or trifluoromethyl;

X is hydrogen or a coupling-off group; wherein said blue-light sensitive silver halide emulsion layer is a low-chloride silver halide emulsion;

provided that each substituent $R_1$ is selected from the group consisting of and each $R_a$, $R_b$, $R_c$, $R_2$, $R_3$, $R_4$, and X having a substitutable hydrogen may be substituted with a substituent selected from the group consisting of halogen, nitro; hydroxyl; cyano; and carboxyl; alkyl; alkenyl; alkoxy; aryl; aryloxy; carbonamido; sulfonamido; sulfamoyl; carbamoyl; acyl; sulfonyl; sulfonyloxy; sulfinyl; thio; acyloxy; amine; imino; phosphate; phosphite; heterocyclic group, heterocyclic oxy group, or heterocyclic thio group each of which may be substituted and which contain a 3 to 7 membered heterocyclic ring composed of carbon atoms and at least one hetero atom selected from the group consisting of oxygen, nitrogen and sulfur; quaternary ammonium; and silyloxy. wherein said substituents may themselves be substituted with any of the above groups.

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5,498,516

## SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Makoto Kikuchi, and Hisashi Okamura, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 12, 1993, Ser. No. 59,667
Claims priority, application Japan, May 14, 1992, 4-146738
Int. Cl.[6] G03C 1/005;1/015;1/035
U.S. Cl. 430—567 22 Claims

1. A silver halide photographic light-sensitive material having a silver halide emulsion layer on a support, wherein said silver halide emulsion layer contains a silver halide emulsion in which silver halide tabular grains, which have an aspect ratio of 2 to 40 and in which dislocation lines are localized essentially to only fringe portions, occupy 100% to 80% of a total projected area of all grains, said silver halide tabular grains are formed while iodide ions are rapidly being generated, said iodide ions are rapidly generated from an iodide ion-releasing agent represented by Formula (I) below:



(I)

where R represents a monovalent organic residue which releases the iodine atom, I, in the form of ions upon reacting with a base and/or a nucleophilic reagent.

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5,498,517

## PROCESS FOR THE PREPARATION OF A HYBRID DIRECT POSITIVE EMULSION AND PHOTOGRAPHIC MATERIAL CONTAINING SUCH AN EMULSION

Ann Verbeeck, Begijnendijk, and Kris Vlaene, Bonheiden, both of, Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Sep. 30, 1994, Ser. No. 315,449
Claims priority, application European Pat. Off., Jan. 15, 1993, 93202899
Int. Cl.[6] G03C 1/015;1/005;1/035
U.S. Cl. 430—569 6 Claims

1. Process for the preparation of a direct positive silver halide emulsion comprising the following steps:

(1) forming an essentially cubic host grain emulsion consisting of silver bromide and silver iodobromide, with a iodide content between 0 and 10 mole %, by a balanced double jet precipitation of silver ion and halide ion solutions at a pAg between 7 and 9;

(2) depositing epitaxially on the corners of said formed essentially cubic host grains a silver iodide crystallographic phase wherein said silver iodide contains at most 5% of the total crystal silver halide, either by, (2.1) performing a second balanced double jet precipitation of a silver ion solution and a chloride ion solution at a pAg between 7 and 9, and then adding an amount of iodide ions at least equimolar to said chloride ions, in this way converting the formed epitaxial silver chloride phase into an epitaxial silver iodide phase;

or,



(2.2) adding a silver ion solution and a solution of an organic iodide releasing compound represented by formula (R) to said essentially cubic host grain emulsion formed according to step (1);



(R)

wherein A represents a group with a positive Hammett $\sigma_p$ value, and L is a divalent linking group;

(3) externally fogging said emulsion crystals;

(4) adding an electron-accepting dye which adsorbs to said fogged surface of said emulsion crystals.

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5,498,518

## CHLORIDE RICH TABULAR GRAIN EMULSION WITH (100) MAJOR FACES

Detlef Brennecke, Leichlingen, Belgium, assignor to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Nov. 14, 1994, Ser. No. 339,701
Claims priority, application European Pat. Off., Nov. 16, 1993, 93203203
Int. Cl.[6] G03C 1/015;1/035
U.S. Cl. 430—569 4 Claims

1. Process for the preparation of a silver halide tabular grain emulsion, containing at least 50 mole % chloride, wherein at least 50% of the total projected area of all the grains is provided by said tabular grains, and wherein said tabular grains exhibit an average aspect ratio of at least 2:1, an average thickness not greater than 0.5 micron, an average equivalent sphere diameter of at least 0.2 micron, and wherein said tabular grains have (100) major faces, characterized in that a precipitation is performed in preparing the tabular grain emulsion in presence of a phenylmercaptotetrazole compound wherein said precipitation comprises a nucleation step and a growth step wherein said growth step is performed at a pCl between 1.0 and 2.0.

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5,498,519

## HYPOTHERMIC PRESERVATION OF MAMMALIAN HEARTS BY BLOCKING THE $NA^+/K^+/CL^-$ CO-TRANSPORTER USING THE CO-TRANSPORTER BLOCKER, FUROSEMIDE

Yoram Rubin, Tel Aviv, and Gil Navon, Ramat Gan, both of, Israel, assignors to Ramot-University Authority for Applied Research and Industrial Development Ltd., Tel Aviv, Israel

Continuation of Ser. No. 99,711, Jul. 29, 1993, abandoned.
This application Sep. 22, 1994, Ser. No. 310,371
Int. Cl.[6] A01N 1/02;43/38;43/08;41/02
U.S. Cl. 435—1.2 2 Claims

1. A process for preserving mammalian hearts prior to transplantation comprising the steps of:

a) perfusing the heart with a preservation solution comprising furosemide in a concentration of about 100 μM;

b) perfusing the heart with a cardioplegic solution comprising furosemide in a concentration of about 100 μM at about 4° C.;

c) storing the heart by bathing it ex vivo in a cardioplegic solution comprising furosemide in a concentration of about 100 μM at about 4° C.; and

d) perfusing the heart with a preservation solution at about 37° C. in order to remove the cardioplegic solution.

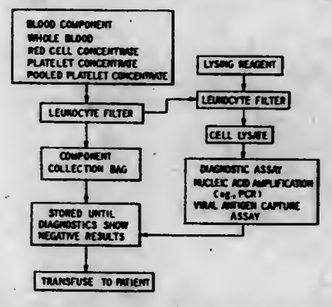
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5,498,520

## METHOD FOR TESTING BLOOD UNITS FOR VIRAL CONTAMINATION

John R. Chapman, Lake Villa, Ill., assignor to Baxter International Inc., Deerfield, Ill.

Continuation of Ser. No. 833,285, Feb. 10, 1992, abandoned.
This application Mar. 24, 1993, Ser. No. 37,525
Int. Cl.[6] C12Q 1/70;1/68; C12P 19/34
U.S. Cl. 435—5 19 Claims




1. A method for providing a blood component to a recipient comprising the steps of:

removing and collecting, using a leukocyte filter, from a blood unit a majority of leukocytes present therein;

using the leukocytes that have been collected in and on the filter to test the blood unit for viral contamination; and

administering the blood unit to the recipient if the test demonstrates that the blood unit does not include viral contamination.

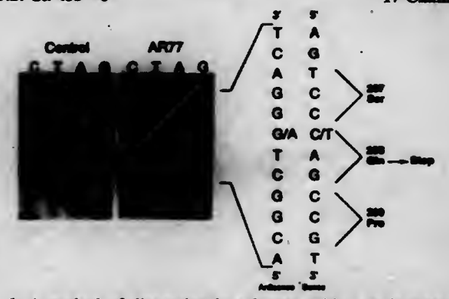
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5,498,521

## DIAGNOSIS OF HEREDITARY RETINAL DEGENERATIVE DISEASES

Thaddeus P. Dryja, Milton, and Eliot L. Berson, Boston, both of Mass., assignors to President and Fellows of Harvard College, Cambridge, Mass.

Continuation-in-part of Ser. No. 805,123, Dec. 11, 1991, Pat. No. 5,262,529, which is a continuation-in-part of Ser. No. 469,215, Jan. 24, 1990, Pat. No. 5,225,546. This application Mar. 11, 1993, Ser. No. 33,081
Int. Cl.[6] C07H 21/04; C12P 19/34; C12Q 1/68
U.S. Cl. 435—6 17 Claims




1. A method of diagnosing in a human subject an increased likelihood of developing or transmitting to future generations a disease in which a mutant form of a human photoreceptor protein is a causative agent, said method comprising,

analyzing the DNA of said human subject to determine the presence or absence of a mutation in a gene for a protein selected from the group consisting of rhodopsin, retinal degeneration slow (RDS) protein, and the β-subunit of retinal rod cGMP phosphodiesterase, the presence of such a mutation indicating an increased likelihood of developing or transmit-

ting to future generations a disease in which a mutant form of a human photoreceptor protein is a causative agent.

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**5,498,522**

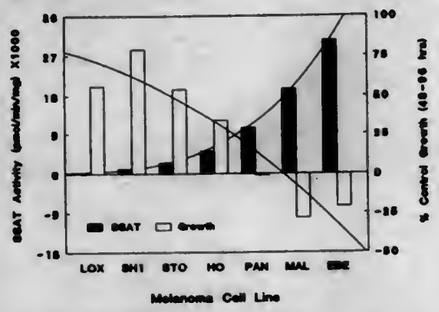
**METHODS FOR THE USE OF SPERMIDINE/SPERMINE N¹-ACETYLTRANSFERASE AS A PROGNOSTIC INDICATOR AND/OR A TUMOR RESPONSE MARKER**

**Carl W. Porter, East Aurora, N.Y., assignor to Health Research, Inc., Buffalo, N.Y.**

**Continuation-in-part of Ser. No. 875,091, Apr. 28, 1992, abandoned. This application Nov. 16, 1993, Ser. No. 153,300**

**Int. Cl.⁶ A61K** *49/00;* **C12Q** *1/02;1/48;1/68;* **G01N** *33/573*

**U.S. Cl. 435—6** **35 Claims**




1. An in vitro method for evaluating the potential responsiveness of a human malignant solid tumor type selected from the group consisting of melanoma, ovarian carcinoma, and lung carcinoma to chemotherapy in vivo with an anticancer agent consisting of a polyamine analog selected from the group consisting of spermine analogs and spermidine analogs that induces spermidine/spermine N¹-acetyltransferase in said tumor, which comprises the steps of:

(a) performing a biopsy to obtain tumor cells;

(b) introducing cells of said tumor in culture;

(c) administering a therapeutically effective amount of the polyamine analog to the culture; and

(d) detecting the level of induction of spermidine/spermine N¹-acetyltransferase in the tumor cells exposed to the polyamine analog in vitro;

wherein tumors potentially responsive to polyamine analog chemotherapy are tumors which when exposed to the polyamine analog in vitro show at least a 10 fold induction of spermidine/spermine N¹-acetyltransferase relative to untreated tumor of the same clonal line.

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**5,498,523**

**DNA SEQUENCING WITH PYROPHOSPHATASE**

**Stanley Tabor, Cambridge, and Charles C. Richardson, Chestnut Hill, both of Mass., assignors to President and Fellows of Harvard College, Cambridge, Mass.**

**Continuation of Ser. No. 37,475, Mar. 24, 1993, abandoned, which is a continuation of Ser. No. 922,355, Jul. 29, 1992, abandoned, which is a continuation of Ser. No. 808,055, Dec. 12, 1991, abandoned, which is a continuation of Ser. No. 336,751, Apr. 12, 1989, abandoned, which is a continuation-in-part of Ser. No. 218,103, Jul. 12, 1988, Pat. No. 4,962,020. This application Jul. 14, 1994, Ser. No. 275,339**

**Int. Cl.⁶ C12Q** *1/68;* **C12P** *19/34;* **G01N** *33/50;* **C12N** *9/14*

**U.S. Cl. 435—6** **7 Claims**

3. An improved method for performing DNA sequencing reactions, including providing a DNA polymerase, the improvement comprising:

performing the DNA sequencing reaction in the presence of an added pyrophosphatase and DNA polymerase.

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**5,498,524**

**METHOD OF TESTING FOR HEART FAILURE RISK**

**Christian Hall, Snarøya, Norway, assignor to Medinnova S.F., Oslo, Norway**

**Filed Jan. 25, 1994, Ser. No. 186,680**

**Claims priority, application United Kingdom, Mar. 12, 1993, 9305142**

**Int. Cl.⁶ G01N** *33/68*

**U.S. Cl. 435—7.1** **11 Claims**

1. A method of testing for heart failure risk in an asymptomatic patient, which comprises contacting a body fluid sample from the asymptomatic patient with an antibody which specifically binds to N-terminal Pro-ANF and detecting the formation of an immune complex by immunoassay, and comparing the peptide level thus obtained to control levels as an indication of said risk.

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**5,498,525**

**METHODS FOR RAPID MICROBIAL DETECTION**

**Catherine E. D. Rees; Katalin Rostas-Mulligan, both of Nottingham; Simon F. Park, Macclesfield; Stephen P. Denyer, Lewes; Gordon S. A. B. Stewart, Leicester, and Sabah A. A. Jassim, Nottingham, all of, Great Britain, assignors to Amersham International plc, United Kingdom**

**PCT No. PCT/GB91/01354, § 371 Date Apr. 9, 1992, § 102(e) Date Apr. 9, 1992, PCT Pub. No. WO92/02633, PCT Pub. Date Feb. 20, 1992**

**PCT Filed Aug. 8, 1991, Ser. No. 839,766**

**Claims priority, application United Kingdom, Aug. 9, 1990, 9017443**

**Int. Cl.⁶ C12Q** *1/02;1/66;1/68;1/70*

**U.S. Cl. 435—29** **7 Claims**

1. The method of testing for the presence or concentration of a target bacteria in a fluid sample by the steps of:

a) adding to the sample bacteriophage capable of infecting the target bacteria under conditions to cause it to infect any target bacteria present.

b) destroying, removing, neutralizing or inactivating extracellular bacteriophage in the sample,

c) incubating the sample to complete infection and cause the target bacteria to release the bacteriophage, and

d) assaying the bacteriophage as an indication of the presence or concentration of the target bacteria in the sample.

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**5,498,526**

**BACILLUS CIRCULANS BASED BIOLOGICAL INDICATOR FOR GASEOUS STERILANTS**

**Ross A. Caputo, Long Grove, Ill., and Phillip A. Martens, Fremont, Calif., assignors to Abtox, Inc., Mundelein, Ill.**

**Filed Aug. 25, 1993, Ser. No. 111,989**

**Int. Cl.⁶ C12Q** *1/02;1/22*

**U.S. Cl. 435—31** **13 Claims**

1. A method for monitoring a sterilizing process, comprising:

disposing a biological indicator in a sterilizing chamber, the biological indicator including a selected number of viable *Bacillus circulans* spores inoculated onto a carrier;

exposing the biological indicator to at least one sterilant being in gaseous form;

removing the biological indicator from the sterilizing chamber;

analyzing or having the carrier analyzed for spore growth wherein the analysis is by incubating the carrier spores under spore growth conditions; and determining a number of surviving spores, if any.



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**5,498,527**

**PHOSPHORYLCHOLINE-CONTAINING GLYCEROGLYCOLIPID**

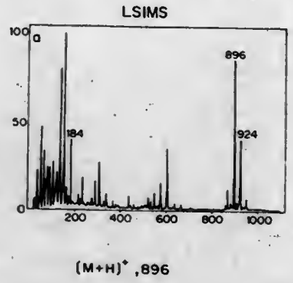
**Naoki Yamamoto, and Kazuhiro Matsuda, both of Tokyo, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan**

**Filed May 31, 1994, Ser. No. 251,479**

**Claims priority, application Japan, Feb. 18, 1994, 6-021429**

**Int. Cl.⁶ C12Q** *1/04;1/00;* **C12P** *9/00;7/64*

**U.S. Cl. 435—34** **1 Claim**




1. 1'-[2,3-Bis(hexadecanoyloxy)propyl]-d-glycopyranos- 6'-yl-2"-(trimethylammonium) ethylphosphate.

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**5,498,528**

**DETECTION OF HELICOBACTER PYLORI**

**Wing King, 641 48th Ave., San Francisco, Calif. 94121**

**Filed Jun. 10, 1994, Ser. No. 257,862**

**Int. Cl.⁶ C12Q** *1/04;1/02;* **G01N** *33/48;33/20*

**U.S. Cl. 435—34** **14 Claims**

1. A method for detection of a *Helicobacter pylori* strain comprising the steps of:

contacting a saliva sample suspected of containing *H. pylori* directly with a medium selective for growth of *H. pylori*, said medium having a pH of about 5.5 to 7.5; and

incubating the sample for a time sufficient for detection of *H. pylori* growth wherein the method provides for detection of *H. pylori* growth in at least 80% of true positive samples.

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**5,498,529**

**PROTEIN PROTEASE INHIBITORS FROM STREPTOMYCES**

**Thomas R. Berka, Wyncote; James A. Fornwald, Norristown; Joselina G. Gorniak, Willow Grove; Martin Rosenberg, Royersford; James E. Strickler, Havertown, and Dean P. Taylor, King of Prussia, all of Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.**

**Continuation of Ser. No. 894,167, Jun. 3, 1992, Pat. No. 5,279,939, which is a continuation of Ser. No. 346,119, Feb. 16, 1989, abandoned, which is a continuation-in-part of Ser. No. 897,245, Aug. 18, 1986, abandoned. This application Dec. 3, 1993, Ser. No. 162,506**

**Int. Cl.⁶ C12P** *21/00*

**U.S. Cl. 435—69.1** **1 Claim**

1. A process for producing a heterologous polypeptide in Streptomyces which comprises transforming a Streptomyces organism with a recombinant DNA molecule comprising an LEP-10 or LTI sequence selected from the group consisting of a sequence encoding a gene expression unit, a promoter sequence or an export control encoding sequence operatively linked to a heterologous coding sequence and then culturing the transformed Streptomyces such that the heterologous polypeptide is expressed.

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**5,498,530**

**PEPTIDE LIBRARY AND SCREENING METHOD**

**Peter J. Schatz, Mountain View; Millard G. Cull, Oakland; Jeff F. Miller, Los Angeles, and Willem P. C. Stemmer, Los Gatos, all of Calif., assignors to Affymax Technologies, N.V., Netherlands**

**Continuation of Ser. No. 963,321, Oct. 15, 1992, Pat. No. 5,338,665, which is a continuation-in-part of Ser. No. 778,233, Oct. 16, 1991, Pat. No. 5,270,170. This application Aug. 15, 1994, Ser. No. 290,641**

**Int. Cl.⁶ C12P** *21/02;* **C12N** *15/72;15/74;15/79*

**U.S. Cl. 435—69.1** **21 Claims**

1. A method of constructing a random peptide library of at least $10^6$ members, said method comprising the steps of:

(a) constructing a recombinant DNA vector that:

encodes a DNA binding protein that binds to a specific DNA sequence with a dissociation half-life of at least one hour, and contains the specific DNA Sequence;

(b) inserting into the coding sequence of the DNA binding protein in at least $10^6$ vectors of step (a) a coding sequence for a random peptide such that the resulting vectors encode at least $10^6$ different fusion proteins, each of which is composed of the DNA binding protein and a random peptide, and is capable of binding to the specific DNA sequence;

(c) transforming host cells with the vectors of step (b); and

(d) culturing the host cells transformed in step (c) under conditions suitable for expression of the fusion proteins.

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**5,498,531**

**INTRON-MEDIATED RECOMBINANT TECHNIQUES AND REAGENTS**

**Kevin A. Jarrell, Arlington, Mass., assignor to President and Fellows of Harvard College, Cambridge, Mass.**

**Filed Sep. 10, 1993, Ser. No. 119,512**

**Int. Cl.⁶ C12N** *15/11;15/13;* **C12P** *19/34*

**U.S. Cl. 435—91.31** **37 Claims**

1. A combinatorial method for generating a variegated population of ribonucleic acids encoding chimeric gene products, comprising admixing a variegated set of splicing constructs under trans-splicing reaction conditions, each splicing construct comprising a ribonucleic acid represented by the general formula (3'TVS)-EX-(5'TVS), wherein

EX represents an exon which is intended to be present in a chimeric ribonucleic acid, said exon having a 5' exon end and a 3' exon end,

(3'TVS) is absent or represents a 3' fragment of an intron, which 3' intron fragment is covalently attached to the 5' exon end of said exon by a phosphodiester bond, and

(5'TVS) is absent or represents a 5' fragment of an intron, which 5' intron fragment is covalently attached to the 3' exon end of said exon by a phosphodiester bond,

with the proviso that at least a portion of said splicing constructs comprise internal exons having both of said 3' and 5' intron fragments; wherein said exons of said set of splicing constructs comprise a variegated population of ribonucleic acids, and said trans-splicing reaction conditions comprise conditions in which 3' and 5' intron fragments of different splicing constructs reconstitute a functional intron through intermolecular complementation and ligate said exons to generate a variegated population of ribonucleic acids encoding chimeric gene products.

5,498,532

## PROCESS FOR PRODUCING AMINO ACIDS

Ryoichi Katsumata, Machida, Japan; Yasuhiro Kikuchi, Salt Lake City, Utah, and Keiko Nakanishi, Machida, Japan, assignors to Kyowa Hakko Kogyo, Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 131,985, Dec. 11, 1987, abandoned. This application Dec. 28, 1990, Ser. No. 633,169

Claims priority, application Japan, Dec. 13, 1986, 61-296991; Jun. 26, 1987, 61-159015

Int. Cl.[6] C12P *13/04;* C12M *15/77*

U.S. Cl. 435—106 5 Claims

1. A process for producing amino acids which comprises:

providing a microorganism belonging to the genus *Corynbacterium* or *Brevibacterium* and carrying a recombinant DNA which confers the ability to assimilate lactose on microorganisms incapable of assimilating lactose, said recombinant DNA comprising:

(a) an EcoRI-SalI-cleaved DNA fragment of 3.2 kb containing the structural gene lacy which is obtained from *Escherichia coli* lactose operon,

(b) an EcoRI-cleaved DNA fragment of 3.0 kb containing the structural gene lacZ which is obtained from pMC1871, and

(c) a DNA fragment containing a promoter derived from a microorganism belonging to the genus *Corynbacterium* or *Brevibacterium*, which is positioned upstream of the said DNA fragments,

culturing said microorganism in a medium containing lactose as a main carbon source to form an amino acid and,

recovering said amino acid accumulated in the culture medium.

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5,498,533

## CONTROL OF GROWTH AND DEVELOPMENT OF POTATO PLANTS

Bachettira W. Poovaiah, Pullman, Wash.; Daisuke Takezawa, Osaka, Japan; Tae-Jin Han, Kyung Ki Do, Rep. of Korea, and Gynheung H. An, Pullman, Wash., assignors to Washington State University Research Foundation, Pullman, Wash.

Filed Jul. 30, 1993, Ser. No. 100,874

Int. Cl.[6] C12N *15/00;* A01H *1/04*

U.S. Cl. 435—172.3 6 Claims

1. A method for increasing stem and tuber elongation in a potato plant relative to a control plant, comprising the steps of introducing a nucleic acid construct into a potato plant cell and growing the cell into a plant, wherein the nucleic acid construct comprises a nucleotide sequence that encodes the protein of Sequence Listing ID No. 2.

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5,498,534

## METHOD OF REMOVING COLOR FROM WOOD PULP USING XYLANASE FROM *STREPTOMYCES ROSEISCLEROTICUS* NRRL B-11019

Thomas W. Jeffries; Anthony C. Grabski, both of Madison, Wis.; Rajesh N. Patel, Louisville, Ky.; Graziano Elegir, Milan, Italy, and George Szakacs, Dayka Gabor, Hungary, assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation of Ser. No. 257,965, Jun. 8, 1994, abandoned, which is a continuation-in-part of Ser. No. 857,060, Mar. 25, 1992, Pat. No. 5,369,024. This application May 30, 1995, Ser. No. 453,289

Int. Cl.[6] D21C *3/00;* C12N *9/24;1/20;* C12P *19/14*

U.S. Cl. 435—278 6 Claims

1. A method of removing color from wood pulp comprising the steps of:

(a) preparing a wood pulp;

(b) treating the wood pulp with xylanase wherein the xylanase is capable of releasing chromophores from the pulp; and

(c) extracting the wood pulp to remove chromophores said xylanase being isolated xyl 3 obtained from *Streptomyces roseiscleroticus* NRRL B-11019, wherein xyl 3 has a molecular weight of approximately 21 kD as determined by SDS-gel electrophoresis and a pH optima of pH 5.0—7.0.

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5,498,535

## METHOD FOR DIRECT CLONING OF NUCLEASE GENES IN *E. COLI*

Aleksei Fomenkov, Beverly; Deborah K. Dila, Boston; Elisabeth A. Raleigh, Somerville, and Shuang-Yong Xu, Lexington, all of Mass., assignors to New England Biolabs, Inc., Beverly, Mass.

Filed May 24, 1994, Ser. No. 247,990

Int. Cl.[6] C12N *15/55;15/70;9/22*

U.S. Cl. 435—172.3 12 Claims

1. A method for isolating DNA coding for a nuclease comprising the steps of:

(a) forming a DNA library from a source coding for the nuclease;

(b) ligating the DNA of step (a) into an appropriate cloning vector;

(c) transforming the host cell which (i) contains a DNA damage-inducing promoter fused to an indicator/reporter gene, and (ii) is deficient in one or more methylation-dependent restriction systems with the cloning vector of step (b);

(d) plating and incubating the transformed host cells of step (c) on indicator plates containing a substrate which reacts with the expression product of the indicator/reporter gene and appropriate antibiotics;

(e) selecting appropriate colonies from the plated transformed host cells of step (d) and growing said cells in an appropriate medium;

(f) harvesting and breaking open the cells of step (e) followed by removal of all debris and other insoluble components to produce a supernatant; and

(g) assaying the supernatant of step (f) for nuclease activity on appropriate DNA substrates in an appropriate buffer.

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5,498,536

## CHONDROITINASE II FROM *PROTEUS VULGARIS*

Kiran M. Khandke, Nanuet, N.Y., assignor to American Cyanamid Company, Wayne, N.J.

Filed Apr. 22, 1994, Ser. No. 232,540

Int. Cl.[6] C12N *9/24;1/12;9/26;9/28*

U.S. Cl. 435—200 1 Claim

1. A purified chondroitinase II protein having the amino acid sequence of SEQ ID NO:2.

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5,498,537

## SERUM-FREE PRODUCTION OF PACKAGED VIRAL VECTOR

Herbert S. Bresler, Silver Spring, and Richard A. Knazek, Mount Airy, both of Md., assignors to Cellco, Inc., Germantown, Md.

Filed Mar. 9, 1994, Ser. No. 208,520

Int. Cl.[6] C12N *5/10;7/00;7/01*

U.S. Cl. 435—235.1 6 Claims

1. A method for the production of packaged retroviral vectors, comprising:

(a) inoculating PA-317 derived packaging cells which produce packaged and infectious retroviral vectors into an artificial capillary system (ACS) cartridge;

(b) culturing said packaging cells in the presence of bovine serum-containing culture medium;

(c) replacing said bovine serum-containing culture medium with bovine serum-free culture medium; and

(d) culturing said packaging cells in the presence of said bovine serum-free culture medium to achieve packaged and infectious retroviral vectors.



5,498,538

## TOTALLY SYNTHETIC AFFINITY REAGENTS

Brian K. Kay, and Dana M. Fowlkes, both of Chapel Hill, N.C., assignors to The University of North Carolina at Chapel Hill, Chapel Hill, N.C.

Continuation of Ser. No. 13,416, Feb. 1, 1993, abandoned, which is a continuation-in-part of Ser. No. 854,133, Mar. 19, 1992, abandoned, which is a continuation of Ser. No. 480,420, Feb. 15, 1990, abandoned. This application Dec. 30, 1993, Ser. No. 176,500

Int. Cl.[6] C12N *15/09;15/62*

U.S. Cl. 435—69.1 26 Claims

1. A method for identifying a protein, polypeptide and/or peptide which binds to a ligand of choice, comprising: screening a library of recombinant vectors in which each vector encodes one of a plurality of heterofunctional fusion proteins containing

(a) a binding domain encoded by a double stranded oligonucleotide assembled by annealing a first nucleotide sequence of the formula 5' X (NNB)$_n$ J Z 3' with a second nucleotide sequence of the formula

3'Z'O U (NNV)$_m$Y5'

where

X and Y are restriction enzyme recognition sites, such that X≠Y;

N is A, C, G or T;

B is G, T or C;

V is G, A or C;

n is an integer, such that 10≦n≦100;

m is an integer, such that 10≦m≦100;

Z and Z' are each a sequence of 6, 9 or 12 nucleotides, such that Z and Z' are complementary to each other; and

J is A, C, G, T or nothing;

O is A, C, G, T or nothing; and

U is G, A, C or nothing; provided, however, if any one of J, O or U is nothing then J, O and U are all nothing, and converting the annealed oligonucleotides to a double stranded oligonucleotide, and

(b) an effector domain encoded by an oligonucleotide sequence encoding a protein or peptide that enhances expression or detection of the binding domain, by contacting the plurality of heterofunctional fusion proteins with said ligand of choice under conditions conducive to ligand binding and isolating any fusion prosthesis which bind said ligand.

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5,498,539

## BOVINE ENDOTHELIAL NITRIC OXIDE SYNTHASE NUCLEIC ACIDS

David G. Harrison; R. Wayne Alexander; Murphy T. J., all of Atlanta, and Ken'ichi Nishida, Chamblee, all of Ga., assignors to Daiichi Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Jul. 2, 1992, Ser. No. 908,245

Int. Cl.[6] C12N *5/10;1/21;* C07H *21/04*

U.S. Cl. 435—240.2 8 Claims

1. An isolated nucleic acid molecule having a sequence encoding bo[001b]vine endothelial nitric oxide synthase wherein the sequence encodes a protein having the amino acid sequence set forth in SEQ ID NO: 2.

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5,498,540

## METHOD FOR CULTURING INSECT CELLS IN A MEDIUM CONTAINING FISH SERUM

Evelyn S. Sawyer, and Philip J. Sawyer, both of Kennebunkport, Me., assignors to Sea Run Holdings, Inc., Kennebunkport, Me.

Continuation-in-part of Ser. No. 209,639, Feb. 23, 1994, Pat. No. 5,401,653. This application Dec. 22, 1994, Ser. No. 362,236

Int. Cl.[6] C12N *5/00;* A61K *35/56;35/60*

U.S. Cl. 435—240.2 14 Claims

1. A method of culturing insect cells comprising:

a. seeding live insect cells in a vessel containing a defined culture medium plus 10% fetal bovine serum;

b. incubating the cells and medium;

c. allowing the cells to grow and increase in numbers;

d. subculturing the cells;

e. removing the defined culture medium and fetal bovine serum from the vessel and adding defined culture medium with a lower concentration of fetal bovine serum;

f. harvesting the cells;

g. washing the cells with the defined culture medium;

h. centrifuging the cells at 300 g for about 3.5 minutes at room temperature;

i. resuspending the cells in a second vessel containing defined culture medium;

j. seeding at least a portion of the cells in a third vessel containing defined culture medium and fish serum in a concentration of about 2.5% to about 5%; and

k. incubating the cells and medium.

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5,498,541

## METHOD FOR PRODUCING POTATO MICROTUBERS

Ichiro Oka, Iwata, Japan, and Carolyn Sluis, Davis, Calif., assignors to Japan Tobacco Inc., Tokyo, Japan

Filed Nov. 30, 1993, Ser. No. 159,491

Int. Cl.[6] C12N *5/04;* A01C *1/00*

U.S. Cl. 435—240.45 20 Claims

1. A method for producing potato microtubers, said method comprising culturing potato plants in a medium containing low sugar under illumination, followed by culture in a medium containing high sugar in the dark, wherein the improvement comprises:

(a) culturing potato plants in a medium containing 0.5–5% w/v sugar under an illumination regimen of about 12 to about 24 hours per day for about 3 to about 6 weeks; and

(b) culturing the resulting potato plants in a medium containing 6–10% w/v sugar for about 1 to about 4 weeks under an illumination regimen of either about 6 to about 12 hours per day or about 12 to about 24 hours per day prior to culturing said plants in the dark to produce said microtubers.

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5,498,542

## ELECTRODE MEDIATORS FOR REGENERATION OF NADH AND NADPH

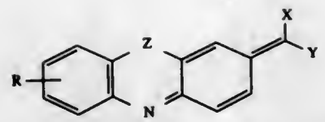
Paul F. Corey, Elkhart, and Matthew K. Musho, Granger, both of Ind., assignors to Bayer Corporation, Elkart, Ind.

Filed Sep. 29, 1994, Ser. No. 314,718

Int. Cl.[6] C12M *1/40;* G01N *27/00;* C07D *279/18;265/38*

U.S. Cl. 435—283.1 15 Claims

1. An electrode for the electrochemical regeneration of the coenzymes dihydronicotinamide adenine dinucleotide (NADH), dihydronicotinamide adenine dinucleotide phosphate (NADPH) or analogs thereof wherein there has been imparted to the electrode surface a mediator comprising one or more mediator compounds selected from the group consisting of substituted or unsubstituted 3-methylene-3H-phenothiazine and 3-methylene-3H-phenoxazine compounds represented by the formula:



wherein Z is oxygen or sulfur, R is hydrogen, substituted or unsubstituted aryl, alkoxy, aryloxy, halo, nitro, substituted or unsubstituted amino, keto, carboxy or alkoxycarbonyl and X and Y are electron withdrawing groups.

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**5,498,543**

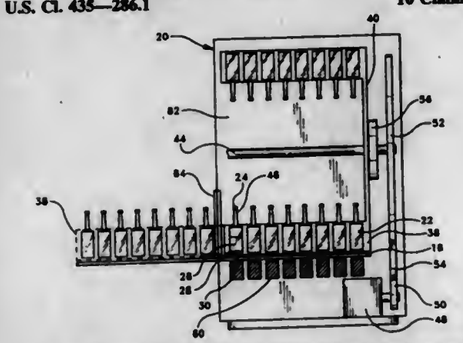
**SUB-COMPACT BLOOD CULTURE APPARATUS**

**Klaus W. Berndt, Stewartstown, Pa., assignor to Becton Dickinson and Company, Franklin Lakes, N.J.**

**Filed Jun. 7, 1994, Ser. No. 255,195**

**Int. Cl.[6] C12M *1/34***

**U.S. Cl. 435—286.1** **10 Claims**



1. A sub-compact blood culture apparatus having an incubator comprising:

a drum rotatable about a horizontal axis having a plurality of drawers, each of said plurality of drawers including a top surface having a plurality of openings in which a corresponding plurality of vials are arranged;

a mechanism for rotating said drum about said axis;

at least one sensor station for detecting microorganisms within the plurality of vials received within said drum;

means for determining when one of said plurality of drawers is at a predetermined removal position; and

means for removing said drawer at said predetermined removal position out of said drum so that said plurality of vials may be loaded into and unloaded from said plurality of openings in said top surface of said removed drawer.

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**5,498,544**

**METHOD AND AN ACETYL COA CARBOXYLASE GENE FOR CONFERRING HERBICIDE TOLERANCE**

**Burle G. Gengenbach, St. Paul; David A. Somers, Roseville; Donald L. Wyse, Wyoming; John W. Gronwald, Shoreview; Margaret A. Egli, Roseville, and Sheila M. Lutz, St. Paul, all of Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.**

**Continuation-in-part of Ser. No. 917,462, Jul. 21, 1992, Pat. No. 5,290,696, which is a division of Ser. No. 538,674, Jun. 18, 1990, Pat. No. 5,162,602, which is a continuation of Ser. No. 269,584, Nov. 10, 1988, abandoned. This application Feb. 5, 1993, Ser. No. 14,326**

**Int. Cl.[6] C12N *15/82***

**U.S. Cl. 435—320.1** **6 Claims**

1. An expression cassette comprising: a DNA molecule comprising DNA SEQ. ID NO:1 coding for a maize acetyl CoA carboxylase enzyme operably linked to a promoter functional in a host cell.

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**5,498,545**

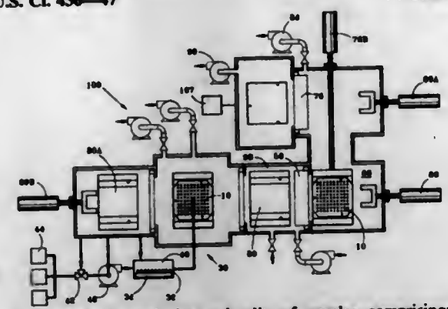
**MASS SPECTROMETER SYSTEM AND METHOD FOR MATRIX-ASSISTED LASER DESORPTION MEASUREMENTS**

**Marvin L. Vestal, 7851 Chinon Cir., Houston, Tex. 77071**

**Filed Jul. 21, 1994, Ser. No. 278,405**

**Int. Cl.[6] G01N *24/00;35/02;* H01J *49/04***

**U.S. Cl. 436—47** **74 Claims**



1. A system for analyzing a plurality of samples, comprising:

a plurality of portable sample supports each having a sample receiving surface thereon for accommodating a plurality of samples each at a fixed location on each sample support;

identification means for identifying each sample location of each of the plurality of samples on each of the plurality of sample supports;

a mass spectrometer for analyzing each of the plurality of samples on each sample support, the mass spectrometer having a sample receiving chamber therein for receiving each sample support;

a laser source for striking each sample on each sample support while within the receiving chamber with a laser pulse to desorb and ionize sample molecules;

support transfer mechanism for automatically inputting and outputting each of the sample supports from the sample receiving chamber of the mass spectrometer;

a powered mechanism movable in both an x direction and a y direction perpendicular to the x direction within the sample receiving chamber for supporting a respective sample support thereon;

a vacuum lock chamber connected to the sample receiving chamber of the mass spectrometer for receiving the sample supports and for maintaining one or more of the sample supports within a vacuum controlled environment while the plurality of samples on another of the sample supports are struck by laser pulses; and

computer means for recording test data from the mass spectrometer for each of the plurality of samples on the sample supports as a function of the identification means.

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**5,498,546**

**WASHING PROCESS**

**Werner Kuhlmann, Monheim, and Hans-Willi Kling, Wuppertal, both of, Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany**

**Filed Feb. 24, 1995, Ser. No. 392,757**

**Claims priority, application Germany, Aug. 24, 1992, 42 28 021.4**

**Int. Cl.[6] G01N *31/00;33/00;35/08;1/00***

**U.S. Cl. 436—55** **10 Claims**

1. A process for determining the concentration of a detergent composition in a wash liquor comprising:

(a) preparing a wash liquor containing a detergent composition;

(b) adding a reducing sugar to said wash liquor in an amount proportional to the amount of said a detergent composition present in said wash liquor; and

(c) photometrically measuring the content of reducing sugar present in said wash liquor by adding a color-forming reagent to said wash liquor wherein said color-forming reagent reacts with said reducing sugar present in said wash liquor.



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**5,498,547**

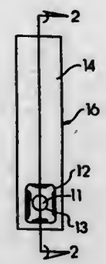
**METHOD AND DEVICE FOR THE DETERMINATION OF POLYMERIC BIGUANIDES IN AQUEOUS FLUIDS**

**Kenneth A. Blake; Chauncey O. Rupe, both of Elkhart, Ind., and Carol A. Terry, Cassopolis, Mich., assignors to Environmental Test Systems, Inc., Elkhart, Ind.**

**Continuation-in-part of Ser. No. 53,782, Apr. 28, 1993, abandoned. This application May 24, 1994, Ser. No. 248,296**

**Int. Cl.[6] G01N *33/00***

**U.S. Cl. 436—111** **13 Claims**



1. A method for the determination of polymeric biguanides in aqueous test fluids comprising:

A. contacting an aqueous test fluid with a matrix incorporated with a test reagent composition comprising a pH sensitive indicator material which changes from one color to another over a normal range of pH values which normal range is shifted to a measurably different range in the presence of and proportional to the amount of polymeric biguanide present in the aqueous test fluid, and a buffer for maintaining the aqueous test fluid contacting the test reagent composition in the matrix at a constant defined pH value substantially within the normal range of pH values for the indicator material;

B. measuring the color exhibited by the indicator material in the matrix as a result of the presence and amount of polymeric biguanide in the aqueous test fluid; and,

C. converting the color exhibited to concentration of polymeric biguanide present in the aqueous test fluid.

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**5,498,548**

**THERMIONIC IONIZATION DETECTOR WITH RADIANT HEATER ASSEMBLY**

**Richard P. White, West Chester; Bruce W. Hermann, Kennett Square, both of Pa., and Raymond D. Worden, Houston, Tex., assignors to Hewlett-Packard Co., Palo Alto, Calif.**

**Filed Jul. 27, 1994, Ser. No. 280,905**

**Int. Cl.[6] G01N *27/00***

**U.S. Cl. 436—149** **17 Claims**

17. A method for detecting the presence of a constituent component of a sample in a first fluid, comprising the steps of:

providing a thermionic source having a matrix including an alkali metal compound which is capable of ionization of the constituent component to produce an ion current when operated at an elevated temperature;

directing radiant energy from a radiant heater having a radiant energy source to the thermionic source, the radiant energy being sufficient to effect said elevated temperature in the thermionic source;

providing a fluid mixture flow that includes the first fluid to the thermionic source;

receiving the ion current at a collector electrode; and

measuring the received ion current and, in response, indicating the presence of the constituent component.

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**5,498,549**

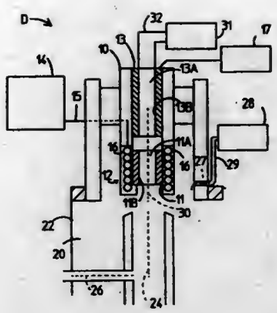
**SENSORS AND METHODS FOR SENSING**

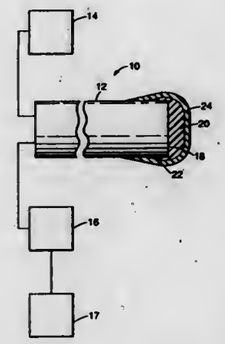
**Colleen C. Nagel, Arden Hills; James G. Bentsen, North St. Paul, both of Minn.; Masao Yafuso, Lake Forest, Calif.; Alan R. Katritzky, Gainesville, Fla.; John L. Dektar, Laguna Hills, Calif., and Cary A. Kipke, Woodbury, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Division of Ser. No. 137,289, Oct. 14, 1993, Pat. No. 5,409,666, which is a continuation-in-part of Ser. No. 786,189, Oct. 31, 1991, abandoned, and Ser. No. 786,014, Oct. 31, 1991, abandoned, which is a continuation-in-part of Ser. No. 740,790, Aug. 8, 1991, abandoned, and Ser. No. 742,002, Aug. 8, 1991, Pat. No. 5,296,381. This application Jan. 18, 1995, Ser. No. 373,855**

**Int. Cl.[6] G01N *21/64;21/77***

**U.S. Cl. 436—172** **31 Claims**





1. A method for sensing the concentration of an analyte in a medium comprising the steps of:

exposing a sensing element to said medium, said sensing element comprising an analyte permeable matrix material and an indicator component in said matrix material comprising at least two monomeric components in enforced association, at least one of which is a monomeric indicator component which provides a first emitted signal or signals in response to being exposed to a first excitation signal, said sensing element further comprising, when exposed to said first excitation signal, an excited state complex produced from said at least two monomeric components, said excited state complex providing a second emitted signal which is dependent on the concentration of said analyte in said medium;

causing said sensing element to provide said first emitted signal or signals and said second emitted signal; and

analyzing said second emitted signal in determining the concentration of said analyte in said medium.

5,498,550

**DEVICE FOR COLLECTING OR PREPARING SPECIMENS USING MAGNETIC MICRO-PARTICLES**

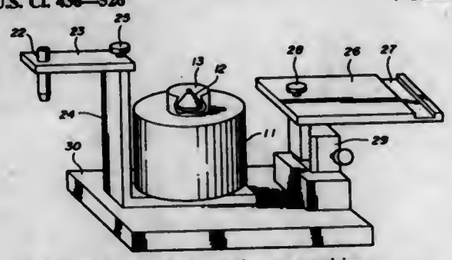
Koichi Fujiwara, Mito, and Hiromichi Mizutani, deceased, late of Tokyo, Japan, assignors to Nippon Telegraph & Telephone Corporation, Tokyo, Japan

Division of Ser. No. 991,507, Dec. 17, 1992, Pat. No. 5,340,749, which is a continuation of Ser. No. 344,239, Apr. 26, 1989, abandoned. This application May 25, 1994, Ser. No. 249,152

Claims priority, application Japan, Apr. 26, 1988, 63-102919; Jun. 24, 1988, 63-156519; Jan. 28, 1988, 63-272106; Dec. 5, 1988, 63-307579; Mar. 27, 1989, 1-74245

Int. Cl.[6] G01N *33/553*

U.S. Cl. 436—526 7 Claims



4. A device for preparing a specimen, comprising:

(a) a vessel for containing a solution having an immunocomplex, wherein said immunocomplex is a result of an antigen-antibody reaction between a specimen and a magnetic-labeled antibody comprising a magnetic micro-particle and an antibody fixed to the magnetic micro-particle;

(b) an external magnetic field generating device, for generating a gradient magnetic field and applying said gradient magnetic field to the solution in the test vessel to cause local concentration of the immunocomplex to a predetermined position, wherein said magnetic field generating device includes an electromagnet having an iron core, a movable first pole piece, and a yoke, such that the magnetic flux from the electromagnet passes through the test vessel, is gathered by the first pole piece, and returns to the electromagnet via the yoke, thereby forming a magnetic circuit;

(c) a recovery mechanism for recovering the immunocomplex, wherein said recovery mechanism comprises a capillary tube removably positioned in a lengthwise hole through the center of the first pole piece;

(d) a guide mechanism, for guiding the immunocomplex onto the surface of a grid for use in electron microscopic observation and for holding the grid while fixing the immunocomplex on the grid, wherein said guide mechanism comprises a second pole piece for mounting onto the iron core of the electromagnet and a grid stage for mounting onto the second pole piece.

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5,498,551

**METHOD FOR THE DETECTION OF SPECIFIC BINDING AGENTS AND THEIR CORRESPONDING BINDABLE SUBSTANCES**

Nikolaas C. J. de Jaeger, Hove; Marcel J. Monballiu, Mortsel; Marcus J. M. Noppe, Kalmthout, and Frank J. Konings, Antwerpen, all of, Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Continuation of Ser. No. 8,858, Jan. 25, 1993, abandoned, which is a continuation of Ser. No. 345,755, May 1, 1989, abandoned, which is a continuation of Ser. No. 941,446, Dec. 15, 1986, Pat. No. 4,837,168, which is a continuation-in-part of Ser. No. 812,586, Dec. 23, 1985, abandoned. This application May 16, 1994, Ser. No. 243,425

Int. Cl.[6] G01N *33/546*

U.S. Cl. 436—533 12 Claims

1. A method of qualitatively or quantitatively determining a component of a complex formed between at least one specific binding protein and its corresponding bindable substance which comprises labeling at least one component of said complex with a marker characterized in that the marker used consists of colored latex particles which comprise recurrent units of monomer carrying a moiety which is oxidatively coupled with an amino compound to form a dye and the determination is based on the color characteristics of the colored particles derived therefrom.

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5,498,552

**Patent Not Issued For This Number**

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5,498,553

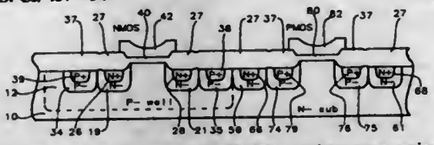
**METHOD OF MAKING A METAL GATE HIGH VOLTAGE INTEGRATED CIRCUIT**

Sheng-Hsing Yang, Hsinchu, Taiwan, Prov. of China, assignor to United Microelectronics Corporation, Hsinchu, Taiwan, Prov. of China

Filed Nov. 1, 1993, Ser. No. 144,261

Int. Cl.[6] H01L *21/8238*

U.S. Cl. 437—34 14 Claims



2. A method of fabrication of a NMOS transistor on a semiconductor substrate doped with a N conductivity type dopant comprising the steps in the sequential order of:

forming a p-well in a region of said semiconductor substrate;

implanting, in a first ion implantation step, N conductivity type dopant into regions in said p-well to form two N– drift regions on opposite sides of a central region;

implanting N conductivity type dopant, in a second ion implantation step, into said N– drift regions to form N+ source/drain regions within said N– drift regions;

forming a field oxide layer over said N– and N+ regions;

implanting P conductivity type dopant, in a third ion implantation step, into said p-well to form two P– drift regions adjacent to said N– drift regions on opposite sides of said central region;

implanting P conductivity type dopant, in a fourth ion implantation step, to form P+ regions within said P– drift regions;

forming a field oxide layer over said P– drift regions and said P+ regions;

forming a gate oxide layer over said central region; and

forming a conductive gate for said NMOS transistor over said gate oxide layer.

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5,498,554

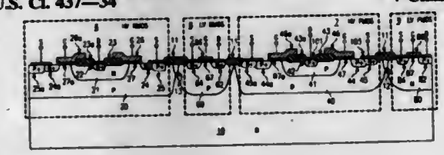
**METHOD OF MAKING EXTENDED DRAIN RESURF LATERAL DMOS DEVICES**

Chia-Cu P. Mei, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 8, 1994, Ser. No. 224,948

Int. Cl.[6] H01L *21/8238*

U.S. Cl. 437—34 7 Claims





1. A method for making an integrated circuit having a low voltage device and a high voltage device, comprising the steps of:

patterning a semiconductive substrate into a low voltage portion and a high voltage portion;

simultaneously implanting an impurity concentration using an n-type impurity to form an impurity concentration of about 2.0 e 16/cm$^3$ after diffusion into the low voltage portion and the high voltage portion; and

simultaneously diffusing the impurity concentration into the low voltage portion and the high voltage portion to a depth of about 8 um in the semiconductive substrate to form a high voltage well and a low voltage well in the semiconductive substrate such that a high voltage transistor can be formed in the high voltage well and be isolated from the substrate and such that a low voltage transistor can be formed in the low voltage well and be isolated from the substrate.

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5,498,555

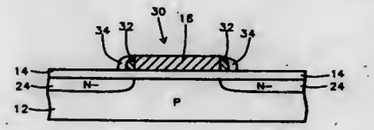
**METHOD OF MAKING LDD WITH POLYSILICON AND DIELECTRIC SPACERS**

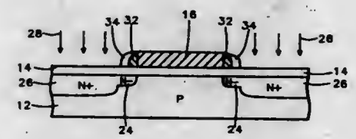
Jenping Lin, Taoyuan, Taiwan, Prov. of China, assignor to United Microelectronics Corporation, Hsinchu, Taiwan, Prov. of China

Filed Nov. 7, 1994, Ser. No. 334,955

Int. Cl.[6] H01L *21/8242*

U.S. Cl. 437—35 16 Claims





1. A method of manufacturing an FET semiconductor device on a semiconductor substrate, comprising the steps of:

comprising a first conductivity type dopant,

forming a polycrystalline silicon gate electrode having vertical sidewalls on said gate insulating layer,

forming shallow low concentration impurity regions of a second conductivity type dopant in said substrate using the gate electrode as a mask,

forming a silicon oxide film on the sidewall surfaces and top surface of said gate electrode,

depositing a layer of polycrystalline silicon over the substrate and gate electrode,

reactive ion etching the polycrystalline layer to form polycrystalline silicon spacers on the sidewalls of the gate electrode,

depositing a conformal layer of dielectric material over the substrate and gate electrode,

reactive ion etching the conformal layer of dielectric material to form dielectric spacers on the sidewalls of the gate electrode and over the polycrystalline silicon spacers,

forming deep high concentration source and drain regions of said second conductivity type dopant using the gate electrode and said polycrystalline silicon spacers and said dielectric spacers as a mask, wherein the top portion of the $SiO_2$ film between the gate electrode sidewall and the polycrystalline silicon spacers is damaged to make it conductive enough to keep the gate electrode and the polycrystalline silicon spacers at the same potential, and

annealing the substrate to remove crystalline damage.

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5,498,556

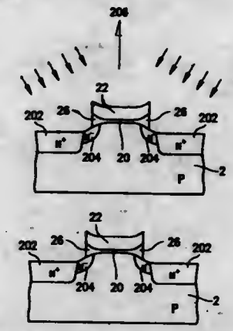
**METAL-OXIDE-SEMICONDUCTOR FIELD-EFFECT TRANSISTOR AND ITS METHOD OF FABRICATION**

Gary Hong, Hsinchu, and Chen-Chung Hsu, Taichung, both of, Taiwan, Prov. of China, assignors to United Microelectronics Corp., Hsinchu, Taiwan, Prov. of China

Filed Jan. 10, 1995, Ser. No. 370,617

Int. Cl.[6] H01C *21/8234*

U.S. Cl. 437—35 9 Claims



1. A process for fabricating a metal-oxide semiconductor field-effect transistor on a semiconductor substrate, comprising the steps of:

forming an oxide layer on said semiconductor substrate;

sequentially forming a polysilicon layer and a mask layer on said oxide layer to form a channel mask;

utilizing said mask layer as a mask in forming field oxide layers at opposite ends of said channel mask by oxidizing said oxide layer, wherein each of said field oxide layers encroach into the region under a side edge of said mask layer and wherein oxides of polysilicon are formed on sidewalls of said polysilicon layer;

removing those portions of said field oxide layers not covered by said mask layer;

utilizing said mask layer as masking while implanting impurities into said substrate to thereby form heavily-doped drain/source regions;

removing said mask layer;

removing said oxide of polysilicon and portions of said field oxide layer not covered by said polysilicon layer; and

utilizing said polysilicon layer as masking while implanting impurities into said substrate to thereby form lightly-doped drain/source regions beneath said field oxide layers.

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5,498,557

**METHOD OF MAKING SRAM TO IMPROVE INTERFACE STATE DENSITY UTILIZING PMOS TFT**

Michio Negishi; Ihachi Naiki, both of Kanagawa; Masayoshi Sasaki, Tokyo, and Tadayuki Kimura, Kanagawa, all of, Japan, assignors to Sony Corporation, Tokyo, Japan

Division of Ser. No. 78,835, Jun. 18, 1993, abandoned. This application Apr. 14, 1994, Ser. No. 227,343

Claims priority, application Japan, Jun. 20, 1992, 4-185797; Jun. 29, 1992, 4-194869

Int. Cl.[6] H01L *21/84*

U.S. Cl. 437—40 1 Claim

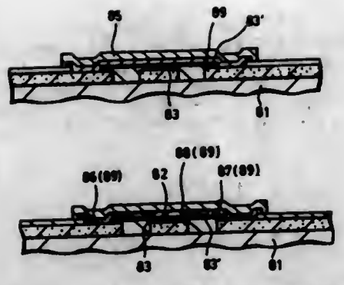
1. A method of forming a SRAM memory cell comprising the steps of:

forming a polysilicon film on a silicon oxide substrate by chemical vapor deposition;

removing portions of the polysilicon film to form holes;

implanting boron difluoride ions into the remaining portions of the polysilicon film to form a gate electrode and source and drain electrodes;

forming a first silicon oxide insulation film on the gate electrode and source and drain electrodes by chemical vapor deposition;



removing portions of the first silicon oxide film on the source and drain electrodes by photolithography and eaching to form contact holes;

forming an amorphous silicon film on the inside of the contact holes and the surface of the first silicon oxide insulation film;

performing annealing treatment on said amorphous silicon film to conevrt said amorphous silicon film into a polysilicon film;

removing portions of the polysilicon film with the remaining portions serving as an active region;

oxidizing the active region at 850° C. to form a second silicon oxide film on the active region and simultaneously form a gate oxide film at the interface between the active region and the first silicon oxide film;

forming source and drain regions adjacent opposing sides of the gate electrode by ion implantation of a p-conductivity type dopant;

forming an interlayer insulation film on the surface of the second silicon oxide film;

forming contact holes in the interlayer insulation film;

implanting boron difluoride into the interlayer insulation film after formation of the contact holes;

forming a metal wiring film on the inside of the contact holes and the surface of the interlayer insulation film;

removing portions of the metal film; and

depositing silicon nitride film by plasma enhanced chemical vapor deposition.

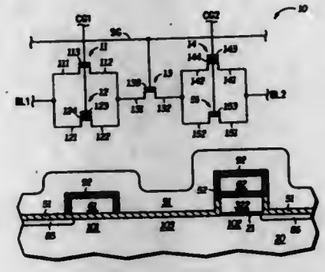
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**5,498,559**

**METHOD OF MAKING A NONVOLATILE MEMORY DEVICE WITH FIVE TRANSISTORS**

**Kuo-Tung Chang, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.**

**Filed Jun. 20, 1994, Ser. No. 262,167**
**Int. Cl.[6] H01L *21/8247***
**U.S. Cl. 437—43** **19 Claims**



c) heating said structure sufficiently to cause all of said silicide-forming metal to react with said underlying first polysilicon layer to form metal silicide and to cause said metal silicide to coalesce into a discontinuous phase on the underlying surface of said first polysilicon layer;

d) forming an first insulation layer over said structure;

e) forming a second polysilicon layer over said first insulation layer;

f) then forming a second insulation layer over said second polysilicon layer;

g) then patterning said structure to form a dual gate electrode structure with a floating gate electrode and a control gate electrode;

h) doping said substrate to form source and drain regions;

i) forming a third insulation layer over said entire structure; and

j) then forming contact openings through said third insulation layer to said

source and drain regions and said control gate electrode; to thereby form an EPROM device with a floating gate electrode having a discontinuous phase of metal silicide on the surface of said floating gate facing said control gate electrode.

9. A process for forming a nonvolatile memory structure for storing a plurality of bits of data comprising the steps of:

forming an active region within a semiconductor substrate;

forming a first floating gate and a second floating gate overlying the active region, wherein the first and second floating gates are spaced-apart from each other;

forming a first conductive member and a second conductive member, wherein:

the first conductive member lies adjacent to the first floating gate, is a gate for a first transistor, and is a control gate for a second transistor;

the second conductive member lies adjacent to the second floating gate, is a control gate for a third transistor and, is a gate for a fourth transistor; and

the first and second conductive members are spaced apart from each other;

forming a first doped region and a second doped region within the active region thereby defining a channel region between the first and second doped regions, wherein each of the first and second floating gates does not cross all of the channel region in any direction; and

forming a third conductive member overlying a portion of the channel region that is not covered by the first and second conductive members wherein the third conductive member is a select gate for the memory structure.

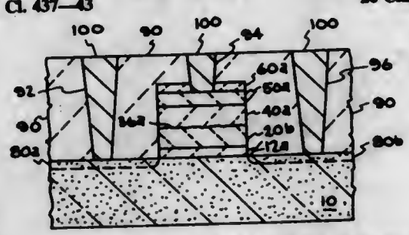
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**5,498,558**

**INTEGRATED CIRCUIT STRUCTURE HAVING FLOATING ELECTRODE WITH DISCONTINUOUS PHASE OF METAL SILICIDE FORMED ON A SURFACE THEREOF AND PROCESS FOR MAKING SAME**

**Ashok K. Kapoor, Palo Alto, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.**

**Filed May 6, 1994, Ser. No. 239,422**
**Int. Cl.[6] H01L *21/283;21/336;21/8247***
**U.S. Cl. 437—43** **20 Claims**



11. A process for forming an EPROM integrated circuit structure with a floating gate electrode having a discontinuous phase of metal silicide form on a surface thereof which includes the steps of:

a) depositing a first polysilicon layer over an oxide layer on a substrate capable of functioning as a gate oxide;

b) then forming a very thin layer of a silicide-forming metal over said first polysilicon layer;

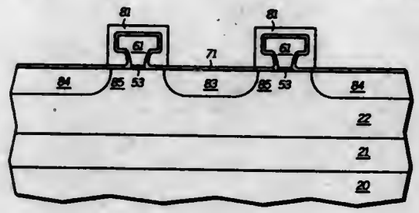


**5,498,560**

**PROCESS FOR FORMING AN ELECTRICALLY PROGRAMMABLE READ-ONLY MEMORY CELL**

**Umesh Sharma, and Michael P. Woo, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Sep. 16, 1994, Ser. No. 311,162**
**Int. Cl.[6] H01L *21/8247***
**U.S. Cl. 437—43** **22 Claims**



1. A process for forming an electrically programmable read-only memory cell comprising the steps of:

forming a first layer over a semiconductor substrate;

forming an opening through the first layer;

forming a spacer adjacent to the opening in the first layer;

forming a floating gate overlying the substrate, wherein the floating gate has a T-shape and is formed after the step of forming the spacer;

removing the first layer and spacer after the step of forming the floating gate; forming an intergate dielectric layer lying adjacent to the floating gate, wherein the intergate dielectric layer has a uniform thickness adjacent to the floating gate; and

forming a control gate lying adjacent to the intergate dielectric layer, wherein a portion of the control gate underlies a portion of the floating gate.

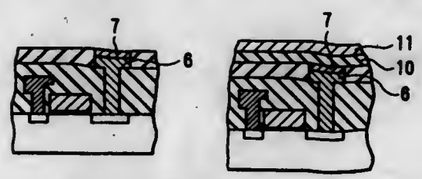
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**5,498,561**

**METHOD OF FABRICATING MEMORY CELL FOR SEMICONDUCTOR INTEGRATED CIRCUIT**

**Toshiyuki Sakuma, and Yoichi Miyasaka, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan**

**Continuation of Ser. No. 798,895, Nov. 27, 1991, abandoned.**
**This application Jul. 15, 1992, Ser. No. 914,023**
**Claims priority, application Japan, Nov. 30, 1990, 2-329690**
**Int. Cl.[6] H01L *21/8242***
**U.S. Cl. 437—52** **13 Claims**



1. A method of fabricating a capacitor of a memory cell, including an MOS transistor and the capacitor, for a semiconductor integrated circuit, comprising the steps of:

forming a lower electrode on an insulating layer;

forming a first insulating interlayer on the entire surface of said insulating layer and said lower electrode;

forming a photoresist on the entire surface of said first insulating interlayer;

etching said photoresist and said first insulating interlayer such that only the top surface of said lower electrode is exposed;

forming a strontium titanium dielectric on said lower electrode and on said first insulating interlayer; and

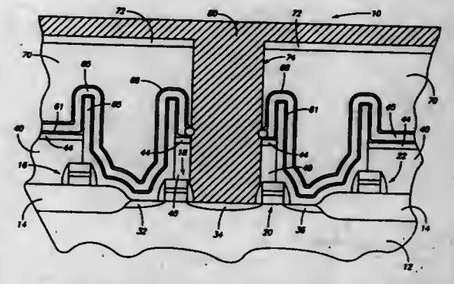
forming an upper electrode on said dielectric, said upper electrode constituting the capacitor with said lower electrode through said dielectric.

**5,498,562**

**SEMICONDUCTOR PROCESSING METHODS OF FORMING STACKED CAPACITORS**

**Charles H. Dennison, and Michael A. Walker, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.**

**Continuation of Ser. No. 44,824, Apr. 7, 1993, abandoned.**
**This application Apr. 29, 1994, Ser. No. 237,371**
**Int. Cl.[6] H01L *21/8242***
**U.S. Cl. 437—52** **17 Claims**



1. A semiconductor processing method of forming a memory cell having a stacked container capacitor on a semiconductor wafer, the method comprising the following steps:

providing a word line and a pair of adjacent source/drain areas, the word line having sidewalls and a top, the sidewalls and top being covered by a first insulating material;

providing a planarized underlying layer of insulating material atop the wafer over the word line and source/drain areas, the planarized underlying layer having a planar upper surface which is elevationally above the first insulating material;

providing a combination etch stop and oxidation barrier insulative layer over the planar upper surface of the underlying insulating layer, the combination layer being different in composition from the insulating material of the underlying layer;

providing an intermediate layer of insulating material over the combination layer, the insulating material of the intermediate layer being different in composition from the insulating material of the combination layer with the insulating material of the intermediate layer being selectively etchable relative to the insulating material of the combination layer;

etching a capacitor contact/container opening through the intermediate, combination and underlying insulating layers to one of the source/drain areas, the capacitor contact/container opening having a first open width;

providing a first layer of conductive material above the intermediate layer and within the first contact/container opening over the one source/drain area, the first layer of conductive material being provided to a thickness which is less than one half the first open width leaving a second outward opening having a second open width which is less than the first open width, the first layer of conductive material being selected such that the intermediate and underlying insulating layers are selectively etchable relative to the first layer of conductive material;

removing the first layer conductive material from above the intermediate insulating layer to define an isolated capacitor storage node container, the isolated capacitor storage node having sidewalls having inner surfaces and outer surfaces;

etching the intermediate insulating layer selectively relative to the isolated capacitor storage node and combination layer, and using the combination layer as an etch stop during such etching to expose only a portion of the outer surfaces of the isolated capacitor storage node sidewalls;

providing a capacitor dielectric layer over exposed inner and outer sidewall surfaces of the isolated capacitor storage node;

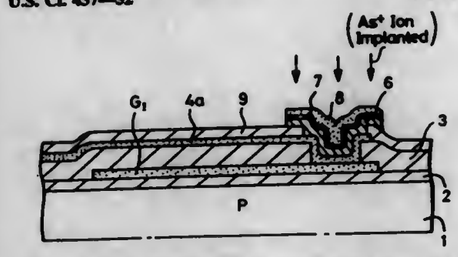
providing a cell polysilicon layer over the capacitor dielectric layer, the cell polysilicon layer having an outer surface;

providing an electrically insulative nitride oxidation barrier layer over the cell polysilicon layer to a thickness of at least about 150 Angstroms;

providing an overlying layer of insulating material above the nitride oxidation barrier layer, the insulating material of the overlying layer comprising the insulating material of the underlying layer;
providing a masking layer above the overlying layer, the masking layer being selected such that material of the overlying and underlying layers is selectively etchable relative to the masking layer;
etching a bit line contact/container opening over the other source/drain area through the masking, overlying, nitride oxidation barrier and cell polysilicon layers, and using the combination layer as an etch stop during such bit line contact/container opening etching, the bit line contact/container opening having sidewalls, the bit line contact/container opening sidewalls including an exposed edge of the cell polysilicon layer;
exposing the wafer having the bit line contact/container opening to an oxidizing ambient to oxidize the cell polysilicon exposed edge, the nitride oxidation barrier layer during such oxidation exposure inhibiting oxidation of the outer surface of the cell polysilicon layer, the combination layer during such oxidation exposure inhibiting oxidation of the isolated capacitor storage node;
etching the combination layer from within the bit line contact/container opening;
etching the underlying layer from within the bit line contact/container opening to outwardly expose the other source/drain area; and
depositing a conductive material atop the wafer and within the bit line contact/container opening over the exposed other source/drain area, and patterning such conductive material to form a bit line.

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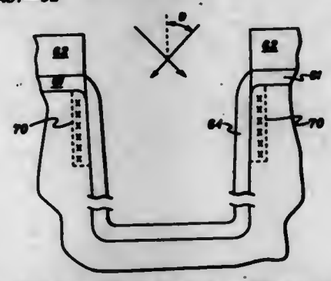
**5,498,563**
**METHOD OF MANUFACTURING A STATIC RANDOM ACCESS MEMORY DEVICE INCLUDING A COUPLING CAPACITOR BETWEEN A PAIR OF STORAGE NODES**
Yutaka Okamoto, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Continuation of Ser. No. 992,825, Dec. 17, 1992, abandoned. This application Nov. 21, 1994, Ser. No. 345,335
Claims priority, application Japan, Dec. 17, 1991, 3-333665
Int. Cl.[6] H01L 21/70;27/00
U.S. Cl. 437—52 4 Claims




1. A method of manufacturing a semiconductor memory device having a static memory cell comprising a flip-flop composed of a pair of driver transistors having respective storage nodes, and a pair of resistance loads disposed on and connected to said storage nodes, respectively, a pair of access transistors connected to said storage nodes, and a non-grounded capacitive element connected through a dielectric film between said storage nodes, said method comprising the steps of:
forming and interlayer insulating film around a region including a junction between a gate electrode of each of said driver transistors and a polycrystalline silicon layer of each of said resistance loads;
introducing an impurity into said junction to reduce the resistance thereof;
forming a dielectric film on an entire surface formed so far;
thereafter forming a polycrystalline film on an entire surface formed so far, to form said nongrounded capactive element;
patterning said polycrystalline film and said dielectric film to cover at least said junction.

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**5,498,564**
**STRUCTURE AND METHOD FOR REDUCING PARASITIC LEAKAGE IN A MEMORY ARRAY WITH MERGED ISOLATION AND NODE TRENCH CONSTRUCTION**
Stephen F. Gelsinger, Underhill; David K. Lloyd, South Burlington, and Matthew Paggi, Shelburne, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.
Division of Ser. No. 285,400, Aug. 3, 1994, Pat. No. 5,448,090. This application Mar. 24, 1995, Ser. No. 409,790
Int. Cl.[6] H01L 21/8242
U.S. Cl. 437—52 10 Claims



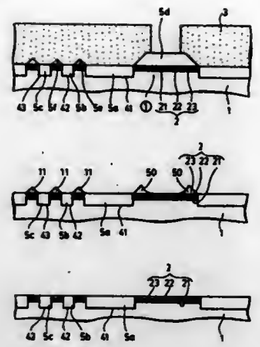

1. A method for fabricating a memory structure, said method comprising the steps of:
(a) forming a treach in a semiconductor substrate, said treach having a trench sidewall surface area and being formed so as to be near a field isolation region in the semiconductor substrate;
(b) selectively implanting dopant into the sidewall of the trench near an upper surface of the semiconductor substrate to define an isolation implant layer in the semiconductor substrate, said implanting encompassing a trench sidewall implant area comprising a fraction of the treach sidewall surface area;
(c) forming a capacitor node in said treach; and
(d) forming a first diffusion region and a second diffusion region in said semiconductor substrate, said first diffusion region and its said second diffusion region being separated by the field isolation region proximate to the capacitor node formed in said trench, and wherein said isolation implant layer is disposed and has dopant concentration sufficient to restrict formation of an inversion layer within the field isolation region adjacent to the capacitor node and extending between the first diffusion region and the second diffusion region.

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**5,498,565**
**METHOD OF FORMING TRENCH ISOLATION HAVING POLISHING STEP AND METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE**
Tetsuo Gocho, and Hideaki Hayakawa, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Nov. 25, 1992, Ser. No. 981,831
Claims priority, application Japan, Nov. 29, 1991, 3-340268; Nov. 29, 1991, 3-340269; Dec. 30, 1991, 3-360530; Jan. 27, 1992, 4-035676; Sep. 30, 1992, 4-285052
Int. Cl.[6] H01L 21/76
U.S. Cl. 437—67 2 Claims

1. A method for manufacturing a semiconductor device having trench isolation structures in trenches in a substrate having wide and narrow protrusions between the treaches, comprising the steps of:

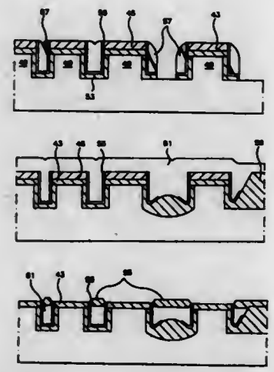





burying the trenches by a deposition means by conducting etching and deposition of a burying material simultaneously on the substrate resulting in narrow build-up of burying material on the narrow protrusions and wide build-up of burying material on the wide protrusions;
applying a resist on the substrate;
forming a resist pattern in the resist to expose a surface of the burying material only on the wide protrusions while leaving the burying material on the narrow protrusions covered by the resist;
after said step of forming, at least an isotropic etching step for isotropically etching through openings in the resist; and
a polishing step for flattening the and any remaining portions of the the burying material on the wide protrusions by polishing.

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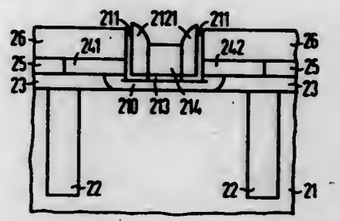
**5,498,566**
**ISOLATION REGION STRUCTURE OF SEMICONDUCTOR DEVICE AND METHOD FOR FABRICATING THE SAME**
Chang J. Lee, Chungcheongbuk, Rep. of Korea, assignor to LG Semicon Co., Ltd., Seoul, Rep. of Korea
Continuation of Ser. No. 152,976, Nov. 15, 1993, abandoned. This application Jun. 26, 1995, Ser. No. 494,938
Int. Cl.[6] H01L 21/76
U.S. Cl. 437—67 11 Claims




1. A method for fabricating an isolation region structure in a semiconductor device, comprising the steps of:
sequentially forming a first pad oxide film and a first nitride film over a silicon substrate;
patterning said first nitride film and said first pad oxide film to expose said silicon substrate at its portion not disposed at active region;
etching said exposed portion of the silicon substrate to form a plurality of trenches including narrow ones and wide ones;
forming a second pad oxide film on a bottom surface and opposite side surfaces of each of said trenches;
forming a second nitride film over the entire exposed surface of the resulting structure;
depositing an oxide film over said second nitride film and etching back said oxide film such that said oxide film remains to fill said narrow trenches and form spacers respectively on side walls of said wide trenches;
removing said second pad oxide film and said second nitride film using said spacer as a mask in the wide trenches;
removing said spacer;
growing a first field oxide film over said exposed portions of the silicon substrate in the wide trenches by use of a primary field oxidation process;
forming a polysilicon film to fill the narrow and wide trenches;
forming a second field oxide film, which is thicker than said first pad oxide film, on said polysilicon film by carrying out a secondary field oxidation process, wherein said first nitride film serves as an oxidation mask; and
removing said first nitride film remaining the first pad oxide film at said active regions.

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**5,498,567**
**METHOD FOR MANUFACTURING A LATERALLY LIMITED, SINGLE-CRYSTAL REGION ON A SUBSTRATE AND THE EMPLOYMENT THEREOF FOR THE MANUFACTURE OF AN MOS TRANSISTOR AND A BIPOLAR TRANSISTOR**
Helmut Klose, Munich; Thomas Meister, TAufkirchen; Hans-Willi Meul, Bruckmuehl, and Reinhard Stengl, Stadtbergen, all of, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany
Division of Ser. No. 185,514, Jan. 24, 1994, Pat. No. 5,422,303, which is a division of Ser. No. 950,068, Sep. 23, 1992, Pat. No. 5,326,718. This application Apr. 3, 1995, Ser. No. 379,861
Claims priority, application Germany, Sep. 23, 1991, 41 31 619.3
Int. Cl.[6] H01L 21/20
U.S. Cl. 437—89 7 Claims




1. A method for manufacturing a MOS transistor comprising the steps of:
a) providing a substrate made of a single crystal material;
b) forming a first layer on a surface of the substrate, said first layer being selectively etchable with respect to the substrate;
c) forming a second layer on the first layer, the second layer being selectively etchable with respect to the first layer;
d) providing an opening in the first and second layers so as to expose an area on the surface of the substrate;
e) selectively etching the first layer with respect to the substrate and the second layer so as to provide an undercut between the second layer and the surface of the substrate;
f) forming a single crystal region on the exposed surface of the substrate by selective epitaxy;
g) doping the second layer such that parts of the second layer adjoining the single-crystal region acting as a channel region form a source region and a drain region;

h) producing a gate dielectric at a surface of the single-crystal region; and

i) forming a gate electrode that is insulated from the source and drain regions on the gate dielectric.

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**5,498,568**

## METHOD OF PRODUCING A COMPOUND SEMICONDUCTOR CRYSTAL LAYER WITH A STEEP HETEROINTERFACE

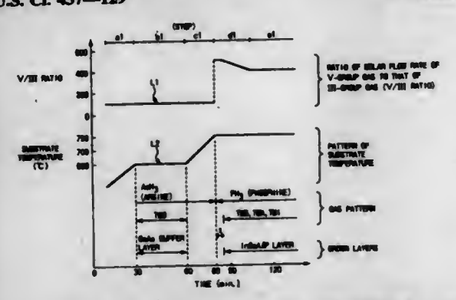
**Hiroyuki Hosoba, Souraku; Junichi Nakamura, Tenri, and Masanori Watanabe, Nara, all of, Japan, assignors to Sharp Kabushiki Kaisha, Japan**

**Filed Jun. 1, 1995, Ser. No. 456,870**

**Claims priority, application Japan, Jun. 30, 1994, 6-149095; Nov. 25, 1994, 6-290978; Apr. 14, 1995, 7-089597**

**Int. Cl.[6] H01L *21/20***

**U.S. Cl. 437—129** **17 Claims**




1. A method of producing a compound semiconductor crystal layer wherein an $In_y(Ga_{1-x}Al_x)_{1-y}P$ layer ($0 \leq x \leq 1$, $0 \leq y \leq 1$) is grown on a GaAs substrate directly or via a buffer layer by way of a metal organic chemical vapor deposition method with the use of a III-group material gas including a III-group element or elements and a V-group material gas including a V-group element or elements, which comprises the steps of:

(a) introducing a gas including an arsenic-based material as the V-group material gas into a reaction container for formation of crystals; and

(b) switching the V-group material gas from the gas including the arsenic-based material to a gas including a phosphorus-based material, and introducing the III-group material gas into the reaction container, thereby forming an $In_y(Ga_{1-x}Al_x)_{1-y}P$ layer,

said step (b) consisting of a first period including a time when the $In_y(Ga_{1-x}Al_x)_{1-y}P$ layer is started to grow and a second period following the first period,

wherein in said first period a $Q_V/Q_{III}$ ratio of a molar flow rate $Q_V$ of the V-group material gas to a molar flow rate $Q_{III}$ of the III-group material gas is set to a value higher than a predetermined value, and in said second period the $Q_V/Q_{III}$ ratio is lowered from said higher value to the first value and then maintained at a second value.

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**5,498,569**

## LAYERED LOCAL INTERCONNECT COMPATIBLE WITH INTEGRATED CIRCUIT FERROELECTRIC CAPACITORS

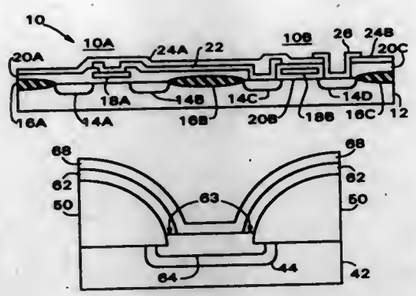
**Brian Eastep, Black Forest, Colo., assignor to Ramtron International Corporation, Colorado Springs, Colo.**

**Filed Aug. 22, 1994, Ser. No. 294,077**

**Int. Cl.[6] H01L *21/44***

**U.S. Cl. 437—187** **20 Claims**

1. A method of forming a local interconnect for a partially processed ferroelectric memory cell, the method comprising the steps of:




simultaneously opening top electrode and source/drain contacts to the ferroelectric memory cell;

forming a first blanket metal layer comprised of platinum or palladium on a top surface of the ferroelectric memory cell;

annealing the ferroelectric memory cell to simultaneously recover damage in a ferroelectric capacitor dielectric of the memory cell, and to silicidize the first metal layer in the source/drain contact, whereby a portion of the first metal layer that is silicidized in the source/drain contact becomes physically discontinuous with and electrically isolated from a remaining portion of the first metal layer;

forming a second blanket metal layer comprised of titanium nitride on a top surface of the first metal layer; and

selectively etching the first and second metal layers to form the local interconnect between the top electrode and source/drain contacts of the ferroelectric memory cell.

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**5,498,570**

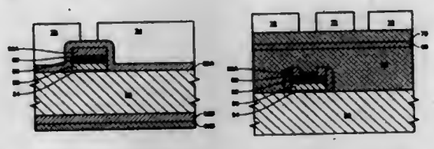
## METHOD OF REDUCING OVERETCH DURING THE FORMATION OF A SEMICONDUCTOR DEVICE

**David S. Becker, Boise, Id., assignor to Micron Technology Inc., Boise, Id.**

**Filed Sep. 15, 1994, Ser. No. 306,907**

**Int. Cl.[6] H01L *21/44***

**U.S. Cl. 437—187** **20 Claims**



1. A method of forming a semiconductor device comprising a semiconductor wafer, the wafer having a front and a back and a layer over the front and back, the method comprising the following steps:

a) forming a first patterned mask over the from of the wafer such that a portion of said layer on said front of said wafer is exposed;

b) etching said exposed portion of said layer to form a preetched portion of said layer and simultaneously removing said layer from said back of said wafer;

c) subsequent to said step of etching, forming a second pattered mask over the front of the wafer such that said preetched portion of said layer is exposed;

d) subsequent to forming; said second mask, further etching said preetched portion of said layer.



**5,498,571**

## METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE HAVING RELIABLE MULTI-LAYERED WIRING

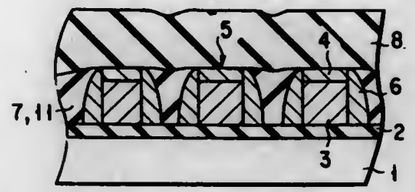
**Kazuya Mori, Yokohama, and Kenichi Otsuka, Kawasaki, both of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Division of Ser. No. 198,779, Feb. 18, 1994, abandoned. This application Jun. 1, 1995, Ser. No. 457,484**

**Claims priority, application Japan, Apr. 13, 1993, 5-086082**

**Int. Cl.[6] H01L *21/283***

**U.S. Cl. 437—189** **4 Claims**




1. A method of manufacturing a semiconductor device, comprising the steps of:

depositing a conductive layer above a semiconductor substrate;

forming a first carbon layer on the conductive layer;

patterning the first carbon layer and the conductive layer, thereby forming a first interconnection layer which comprises the first carbon layer and the conductive layer;

forming a second carbon layer on side surfaces of the first interconnection layer; and

depositing an interlayer insulating layer on the second carbon layer and the first interconnection layer.

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**5,498,572**

## METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE

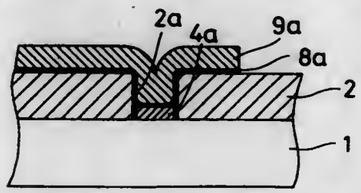
**Toshihiko Shiga; Ryo Hattori, and Tomoki Oku, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Division of Ser. No. 150,885, Nov. 12, 1993, abandoned. This application Sep. 30, 1994, Ser. No. 312,960**

**Claims priority, application Japan, Jun. 25, 1993, 5-154642**

**Int. Cl.[6] H01L *21/44;21/28***

**U.S. Cl. 437—190** **8 Claims**




1. A method for manufacturing a semiconductor device including:

depositing an insulating film on a GaAs substrate and forming a resist pattern having an aperture on the insulating film;

using the resist pattern as a mask, anisotropically etching the insulating film to form an aperture having a side surface and exposing a part of the GaAs substrate;

depositing a first metal film including an Au layer on the surface of the GaAs substrate and removing the resist pattern and portions of the first metal film on the resist pattern to form an electrode on the GaAs substrate in the aperture in the insulating film;

forming a WSiN barrier metal layer on and in contact with the Au layer of the electrode in the aperture, on the internal side surface of the aperture, and on the insulating film; and

depositing a second metal film including Al on the WSiN barrier metal layer and patterning the second metal film and the barrier metal layer to form a wiring layer.

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**5,498,573**

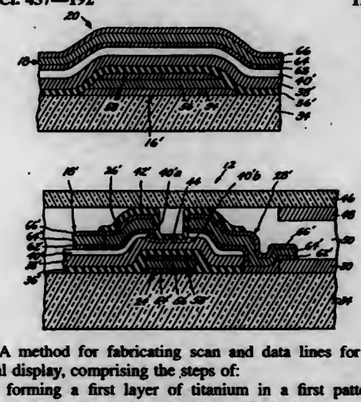
## METHOD OF MAKING MULTI-LAYER ADDRESS LINES FOR AMORPHOUS SILICON LIQUID CRYSTAL DISPLAY DEVICES

**Nathan R. Whetten, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Division of Ser. No. 442,864, Nov. 29, 1989, Pat. No. 5,153,754. This application Jun. 12, 1992, Ser. No. 897,634**

**Int. Cl.[6] H01L *21/441***

**U.S. Cl. 437—192** **12 Claims**



1. A method for fabricating scan and data lines for a liquid crystal display, comprising the steps of:

(a) forming a first layer of titanium in a first pattern on a substrate surface of the liquid crystal display;

(b) forming at least a second layer selected from the group consisting of molybdenum and aluminum, on the first titanium layer to form a multi-layer scan line;

(c) forming at least one layer of material on the multi-layer scan line to insulate the scan line from all data lines; and

(d) forming at least a third layer selected from the group consisting of molybdenum and aluminum, in a second pattern and on the at least one insulation layer to form each of the data lines.

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**5,498,574**

## PROCESS OF FABRICATING SEMICONDUCTOR DEVICE HAVING FLATTENING STAGE FOR INTER-LEVEL INSULATING LAYER WITHOUT DETERIORATION OF DEVICE CHARACTERISTICS

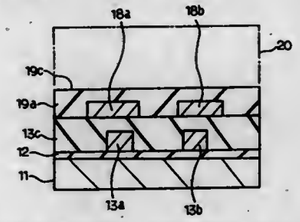
**Shuuzou Sasaki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Apr. 24, 1995, Ser. No. 427,216**

**Claims priority, application Japan, Apr. 22, 1994, 6-084228**

**Int. Cl.[6] H01L *21/302***

**U.S. Cl. 437—195** **11 Claims**




1. A process of fabricating a semiconductor device comprising the steps of:

a) preparing a semiconductor substrate having an insulating layer formed over said semiconductor substrate;
b) preparing a conductive layer on said insulating layer by patterning said conductive layer into at least one conductive wiring extending on said insulating layer;
c) forming a multi-layer insulating film structure having a silicon oxide layer on said at least one conductive wiring and said insulating layer and a silicon nitride layer on said silicon oxide layer;
d) grinding said multi-layer insulating film structure in such a manner as to leave said silicon nitride layer which is at least 200 nanometers thick in said multi-layer insulating film structure, thereby creating a grinded flat surface of said multi-layer insulating film structure;
e) cleaning said grinded flat surface with a cleaner corrosive against said conductive layer;
f) etching said multi-layer insulating film structure under etching conditions having a selectivity equal between silicon oxide and silicon nitride for removing said silicon nitride layer; and
g) forming upper wirings on an etched surface of said silicon oxide layer.

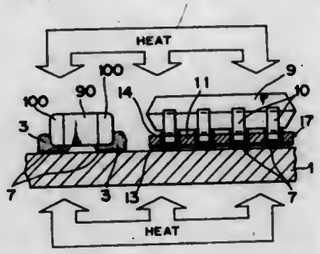
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**5,498,575**

**BONDING FILM MEMBER AND MOUNTING METHOD OF ELECTRONIC COMPONENT**

**Hiroaki Onishi, Higashiosaka, and Kenichiro Suetsugu, Nishinomiya, both of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Jun. 22, 1994, Ser. No. 263,382**
**Claims priority, application Japan, Jun. 23, 1993, 5-151677**
**Int. Cl.[6] H01L *21/60***
**U.S. Cl. 437—209** **16 Claims**



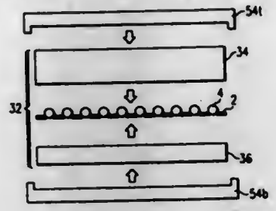

1. A method of mounting electronic components on circuit boards, which comprises the steps of:
obtaining a bonding film member by filling bonding material into openings of an electrically-insulating and heat-proof film and holding the bonding material in the openings by providing a flux layer laminated on one surface of the film;
overlaying the bonding material of the bonding film member onto conductive layers of a circuit board by supplying, onto the circuit board, the bonding film member having said film with said openings thereof filled with said bonding material and having said flux layer laminated on said one surface of said film;
superposing electrodes of electronic components onto the bonding material of the bonding film member by supplying the electronic components onto the bonding film member; and
melting the bonding material by heating the circuit board.

**5,498,576**

**METHOD AND APPARATUS FOR AFFIXING SPHERES TO A FOIL MATRIX**

**Gregory Hotchkiss, Richardson; Jules D. Levine, Dallas, and Paul R. Sharrock, Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Jul. 22, 1994, Ser. No. 279,320**
**Int. Cl.[6] H01L *21/60***
**U.S. Cl. 437—209** **32 Claims**




1. A method of affixing semiconductor members to a foil matrix comprising the steps of:
preparing a cell sandwich having semiconductor members mounted in apertures on said foil matrix inside upper and lower pressure pads:
disposing said cell sandwich within a clamshell prior to affixing said semiconductor members to said foil matrix;
heating said cell sandwich; and
affixing said semiconductor members to said foil matrix by directing said cell sandwich within said clamshell through a roll press thereby compressing said cell sandwich.

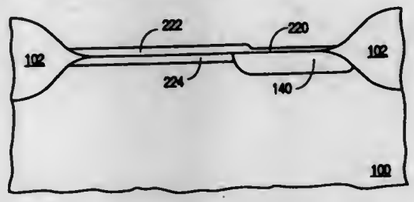
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**5,498,577**

**METHOD FOR FABRICATING THIN OXIDES FOR A SEMICONDUCTOR TECHNOLOGY**

**H. Jim Fulford, Jr., Austin, and Mark I. Gardner, Cedar Creek, both of Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.**

**Filed Jul. 26, 1994, Ser. No. 280,416**
**Int. Cl.[6] H01L *21/02***
**U.S. Cl. 437—228** **33 Claims**




1. In an integrated circuit fabrication process, a method for forming a first oxide layer upon a first surface region of a semiconductor body, and further for forming a second oxide layer, of greater thickness than the first oxide layer, upon a second surface region of the semiconductor body, comprising the steps of:
forming an initial oxide layer upon the first and second surface regions of the semiconductor body;
removing at least a portion of the initial oxide layer in a region disposed above the first surface region of the semiconductor body;
exposing, subsequent to the removing step, the semiconductor body to an environment suitable for oxide formation, to form a first oxide layer disposed above the first surface region of the semiconductor body and to thicken the initial oxide layer disposed above the second surface region, thus forming the second oxide layer; and



introducing, subsequent to the commencement of the exposing step, the semiconductor body to a source of nitrogen, to form a concentration of nitrogen in both the first and second oxide layers.

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**5,498,578**

**METHOD FOR SELECTIVELY FORMING SEMICONDUCTOR REGIONS**

**John W. Steele, Chandler; Edouard de Frésart, Tempe, and N. David Theodore, Mesa, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed May 2, 1994, Ser. No. 236,054**
**Int. Cl.[6] H01L *21/02***
**U.S. Cl. 437—235** **20 Claims**

1. A method for selectively forming semiconductor regions comprising the steps of:
forming a blanket semiconductor layer on a substrate having a first region of exposed semiconductor material and a second region of exposed oxide, wherein the blanket semiconductor layer is formed over the exposed semiconductor material and the exposed oxide, and wherein the blanket semiconductor layer formed over the exposed oxide comprises polycrystalline semiconductor material; and
thereafter exposing the substrate to an elevated temperature in a range from about 900° C. to about 1200° C. and hydrogen to selectively remove the polycrystalline semiconductor material formed over the exposed oxide while leaving a remaining portion of the blanket semiconductor layer formed over the exposed semiconductor material.

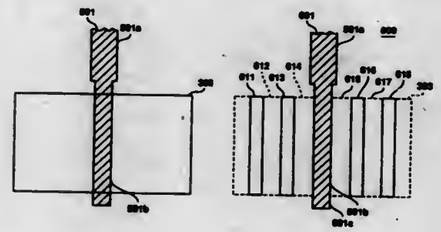
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**5,498,579**

**METHOD OF PRODUCING SEMICONDUCTOR DEVICE LAYER LAYOUT**

**Yan A. Borodovsky, Portland, and Ananda G. Sarangi, Beaverton, both of Oreg., assignors to Intel Corporation, Santa Clara, Calif.**

**Division of Ser. No. 165,395, Dec. 10, 1993, Pat. No. 5,424,154. This application Jun. 8, 1994, Ser. No. 255,655**
**Int. Cl.[6] H01L *21/00***
**U.S. Cl. 437—250** **20 Claims**




1. A method of modifying a semiconductor device layer layout of a semiconductor device layer comprising the steps of:
a) providing data that defines said semiconductor device layer layout in a database;
b) identifying a portion of said semiconductor device layer layout, said portion comprising an active feature of said semiconductor device layer;
c) downsizing said portion by a first amount to form a downsized portion; and
d) placing a complementary feature proximate said downsized portion to form said modified device layer layout in said database.

**5,498,580**

**CERAMIC SUBSTRATE AND A METHOD FOR PRODUCING THE SAME**

**Yoshiaki Yamade, and Yoichi Moriya, both of Hyogo, Japan, assignors to Sumitomo Metal Industries Ltd., Osaka, Japan**

**Filed Mar. 29, 1994, Ser. No. 219,549**
**Claims priority, application Japan, Mar. 30, 1993, 5-071613; Jul. 15, 1993, 5-175517; Jan. 18, 1993, 5-259884; Nov. 29, 1993, 5-298616**
**Int. Cl.[6] C03C *10/08;14/00***
**U.S. Cl. 501—9** **15 Claims**

1. A ceramic substrate, comprising a crystallized MgO—$Al_2O_3$—$SiO_2$—$B_2O_3$—$R_2O$-base glass (R:alkali metal) containing $2MgO.2Al_2O_3.5SiO_2$ crystal, the ceramic substrate being obtained by sintering a mixture of glass powder and a crystal grain filler of $Al_2O_3$ at a temperature of more than 800° C. to below 1000° C. wherein a proportion of the glass powder is 65–80 wt % and that of the crystal grain filler of $Al_2O_3$ is 35–20 wt %.

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**5,498,581**

**METHOD FOR MAKING AND USING A SUPPORTED METALLOCENE CATALYST SYSTEM**

**M. Bruce Welch, Bartlesville, Okla.; Helmut G. Alt; Bernd Peifer, both of Bayreuth, Germany; Syriac J. Palackal, Bartlesville, Okla.; Gary L. Glass, Dewey, Okla.; Ted M. Pettijohn, Bartlesville, Okla.; Gil R. Hawley, Dewey, Okla., and Darryl R. Fahey, Dewey, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed Jun. 1, 1994, Ser. No. 252,611**
**Int. Cl.[6] B01J *31/00***
**U.S. Cl. 502—102** **38 Claims**

1. A method for preparing a solid metallocene-containing catalyst system comprising (a) combining in a liquid an organoaluminoxane and at least one metallocene having at least one cyclopentadienyl, indenyl, tetrahydroindenyl, octahydrofluorenyl, or fluorenyl ligand having at least one olefinically unsaturated substituent to form a liquid catalyst system, (b) conducting prepolymerization of at least one olefin in the presence of said catalyst system to produce a prepolymerized solid catalyst containing no more than about 95 weight percent prepolymer, and (c) separating the resulting solid from the liquid and components dissolved in said liquid.

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**5,498,582**

**SUPPORTED METALLOCENE CATALYSTS FOR THE PRODUCTION OF POLYOLEFINS**

**Michael J. Krause, Milltown; Frederick Y. Lo, Edison, both of N.J., and Steven M. Chramowski, Friendswood, Tex., assignors to Mobil Oil Corporation, Fairfax, Va.**

**Filed Dec. 6, 1993, Ser. No. 161,849**
**Int. Cl.[6] B01J *31/14;37/02***
**U.S. Cl. 502—103** **40 Claims**

1. A catalyst comprising particles of a crosslinked polymer, having an average particle diameter of about 1 to about 300 microns, a porosity of about 0.001 to about 10 cc/gm, and a surface area of about 1 to about 1,000 $m^2$/gm, and a metallocene having an empirical formula

$$Cp_mMAB;$$

wherein Cp comprises a cyclopentadienyl group, M is zirconium or hafnium; m is 1, 2, or 3 and each of A and B is an anion of boron, hydrogen or an alkyl group, wherein at least one of A or B is a borate anion and wherein the molar ratio of M:boron is 1:1.

5,498,583

## POLYURETHANE FOAM-SUPPORTED DOUBLE METAL CYANIDE CATALYSTS FOR POLYOL SYNTHESIS

Bi Le-Khac, West Chester, Pa., assignor to ARCO Chemical Technology, Inc., Greenville, Del.

Continuation-in-part of Ser. No. 173,298, Dec. 23, 1993, Pat. No. 5,426,081. This application Dec. 1, 1994, Ser. No. 345,644

Int. Cl.[6] B01J 31/00;31/02;31/06

U.S. Cl. 502—154 24 Claims

1. A polyurethane foam-supported DMC catalyst, wherein the DMC catalyst comprises at least about 70 wt. % of a substantially amorphous DMC complex.

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5,498,584

## PROCESS FOR THE SELECTIVE HYDROGENATION OF EPOXYALKENES TO EPOXYALKANES

Thomas A. Puckette, Longview, Tex., assignor to Eastman Chemical Company, Kingsport, Tenn.

Division of Ser. No. 262,122, Jun. 17, 1994. This application Sep. 23, 1994, Ser. No. 311,628

Int. Cl.[6] B01J 31/00

U.S. Cl. 502—162 7 Claims

1. A catalyst solution comprising (A) an inert, organic solvent and (B) catalyst components dissolved in said solvent comprising (i) rhodium, (ii) an organophosphorus compound selected from trihydrocarbylphosphines and trihydrocarbylphosphites, and (iii) a poly-unsat-urated hydrocarbon selected from alkadienes, cycloalkadienes, alkatrienes and cycloalkatrienes;

wherein

the ratio of moles of component (ii) to gram atoms of rhodium is about 3:1 to 50:1; and

the ratio of moles of component (iii) to gram atoms of rhodium is about 2:1 to 150:1.

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5,498,585

## SULPHIDIZED CATALYST WHICH CONTAINS PLATINUM ON ACTIVATED CARBON

Karin Bartels, Hanau; Klaus Deller, Hainburg, both of, Germany; Bertrand Despeyroux, Fourquez, France, and Jochen Simon, Freigericht, Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Germany

Filed Jun. 13, 1994, Ser. No. 259,677

Claims priority, application Germany, Jun. 14, 1993, 43 19 648.9; Apr. 26, 1994, 44 14 491.1

Int. Cl.[6] B01J 27/045

U.S. Cl. 502—185 12 Claims

1. A sulphidized catalyst which contains platinum on activated carbon, having a platinum content of 0.1 to 5 wt % and a sulphur content of 0.1 to 2 moles per mole of platinum, produced by a method comprising contacting an aqueous solution of a platinum compound containing an oxidizing agent with activated carbon, heating the resulting product to a temperature between 0° and 100° C., precipitating the platinum compound with a base in the form of hydroxide and reducing the hydroxide with a reducing agent while keeping the temperature constant, filtering off and washing the catalyst obtained in this way, treating said catalyst with a sulphidizing agent and washing again, wherein the activated carbon has an average particle diameter of 10 to 40 μm, a specific surface area greater than 500 $m^2/g$, a total pore volume greater than 0.5 ml/g, a residual ash content of less than 5 wt. % and a pH higher than 5.

5,498,586

## CATALYST WITH SPECIFIED PORE SIZE DISTRIBUTION

Pei-Shing E. Dai, Port Arthur, and David E. Sherwood, Jr., Beaumont, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 19,495, Feb. 19, 1993, Pat. No. 5,397,456. This application Nov. 3, 1994, Ser. No. 334,648

Int. Cl.[6] B01J 23/85;21/04

U.S. Cl. 502—313 7 Claims

1. A catalyst comprising a porous alumina support bearing 3–6 wt% of a Group VIII metal oxide, 14.5–24 wt% of a group VI–B metal oxide, and 0–6 wt.% of a phosphorus oxide, said catalyst having a Total Surface Area of 240–310 $m^2/g$, a Total Pore Volume of 0.5–0.75 cc/g, and a Pore Diameter Distribution whereby 63–78% of the Total Pore Volume is present as micropores of diameter 55–115 Å, 11–18% of the Total Pore Volume is present as macropores of diameter greater than 250 Å, and 0.12–0.16 cc/g of the Total Pore Volume is present as pores with diameters greater than 160 Å.

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5,498,587

## HYDROGENATION CATALYST, A PROCESS FOR ITS PREPARATION, AND USE THEREOF

Gregor Deckers, Xanten; Gerhard Diekhaus, Oberhausen; Bernad Dorsch, Bottrop; Carl D. Frohning, Wesel; Gerhardt Horn, and Horst B. Herrig, both of Oberhausen, all of, Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Mar. 24, 1994, Ser. No. 217,151

Claims priority, application Germany, Mar. 27, 1993, 43 10 053.8

Int. Cl.[6] B01J 21/10;23/04;23/78

U.S. Cl. 502—328 11 Claims

1. A hydrogenation catalyst consisting essentially of in the reduced state

25% to 50% by weight of metallic nickel

10% to 35% by weight of nickel oxide

4% to 12% by weight of magnesium oxide

1% to 5% by weight of sodium oxide

the remainder being a water insoluble support material, wherein the total of said nickel and said nickel oxide is 40% to 70% by weight based on said catalyst, said catalyst having a total BET surface area of 80 to 200 $m^2/g$ and a total pore volume, determined by mercury porosimetry, of 0.35 to 0.6 ml/g,

said total volume consisting of 30% to 60% of said volume from pores having pore radii equal to or less than 40 Å, 4% to 10% of said volume from pores having pore radii from more than 40 Å to 300 Å, and 30% to 60% of said volume from pores having pore radii from more than 300 Å to 5000 Å.

8. A process for the preparation of the hydrogenation catalyst of claim 1 comprising mixing solutions of a nickel salt, a magnesium salt, sodium carbonate in water to cause precipitation, adding said support material to the mixed solutions and forming a green catalyst in a mother liquor, separating said green catalyst from said mother liquor, partial washing of said

green catalyst with water, slurrying said green catalyst in an aqueous alkali solution to form an alkali treated catalyst, separating said alkali-treated catalyst from said slurry, drying said alkali-treated catalyst to form a dried green catalyst, reducing said dried catalyst with hydrogen until 48% to 86% by weight based on a total of said nickel and said nickel oxide is said metallic nickel.



5,498,588

## SURFACE MODIFICATION AND PROMOTION OF VANADIUM ANTIMONY OXIDE CATALYSTS

James F. Brazdil, Highland Heights, and Fernando A. P. Cavalcanti, South Euclid, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Sep. 9, 1994, Ser. No. 304,029

Int. Cl.[6] B01J 23/16

U.S. Cl. 502—353 13 Claims

1. A process for the manufacture of a catalyst having the following empirical formula:

$$VSb_mA_aD_dO_x$$

where A is one or more of Ti, Sn, Fe, Cr, Ga, Li, Mg, Ca, Sr, Ba, Co, Ni, Zn, Ge, Nb, Zr, Mo, W, Cu, Te, Ta, Se, Bi, Ce, In, As, B and Mn,

D is one or more of Li, Ag, Fe, Co, Cu, Cr, Mn, $(VO)^{2+}$, $(PW_{12}O_{40})^{3-}$ and $(PMo_{12}O_{40})^{3-}$

m is from about 0.5 to 10

a is 0.01 to 10

d is 0.0001 to 2.0, preferably 0.0001 to 0.1;

x= number of oxygen ions necessary to satisfy the valency requirement

comprising forming a calcined catalyst precursor having the formula VSbmAaOx wherein m, A, a and x are defined above, adding at least one D element to the surface of said catalyst precursor and calcining the surface modified catalyst precursor to produce said catalyst.

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5,498,589

## PROCESS FOR THE PRODUCTION OF CARBON MOLECULAR SIEVES

Hans-Jürgen Schröter, Mühlheim/Ruhr; Heinrich Heimbach, Duisburg; Klaus-Dirk Henning; Karl Knoblauch, both of Essen; Alfons S.-S. Berndt, Bad Bentheim, and Ferdinand Tarnow, Duisburg, all of, Germany, assignors to Bergwerksverband GmbH, Essen, Germany

PCT No. PCT/EP92/02275, § 371 Date Mar. 21, 1994, § 102(e) Date Mar. 21, 1994, PCT Pub. No. WO93/06928, PCT Pub. Date Apr. 15, 1993

PCT Filed Oct. 1, 1992, Ser. No. 211,207

Claims priority, application Germany, Jan. 4, 1991, 41 32 971.6

Int. Cl.[6] B01J 20/20

U.S. Cl. 502—416 2 Claims

1. A process for preparing a carbon molecular sieve used for the separation of oxygen from nitrogen, which comprises the steps of:

(a) milling hard coal to a grain size of 95%<20μm;

(b) oxidizing the finely milled hard coal with air in a fluidized bed;

(c) adding water and coal tar pitch as a binder and molding the finely milled hard coal into shape;

(d) carbonizing the finely milled hard coal molded into shape in a rotary kiln at a temperature of 500° to 850° C., with a dwelling time of 55 to 65 minutes, in order to obtain a carbonization product with a bulk density of 530 to 560 g/l;

(e) activating the carbonization product with steam at to 900° C. for 165 to 195 minutes to obtain a sintered carbonaceous product having a bulk density of 590 to 650 g/l; and

(f) treating the sintered carbonaceous product at 750° to 850° C. with carbon-splitting hydrocarbons to obtain said carbon molecular sieve.

5,498,590

## PROCESS FOR UNIFORM AND REPRODUCIBLE SHELL IMPREGNATION OF FIXED BED CATALYST SUPPORTS IN THE FORM OF LOOSE PARTICLES

Roland Burmeister, Hanau; Klaus Deller, Hainburg, both of, Germany, and Bertrand Despeyroux, Fourqueux, France, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Germany

Filed Nov. 24, 1993, Ser. No. 157,233

Claims priority, application Germany, Nov. 27, 1992, 42 39 876.2

Int. Cl.[6] B01J 37/02

U.S. Cl. 502—439 7 Claims

1. A process for the uniform and reproducible impregnation of catalyst supports in the form of loose particles with a desired shell volume, consisting essentially of applying an atomized impregnating solution of a precursor of the catalytically active component in a solvent onto the circulating catalyst inorganic support in a circulation zone, the quantity of precursor of the catalytically active component necessary for the desired loading of the catalyst support is dissolved in a volume of said solvent corresponding to 30 to 100% of solvent absorption capacity provided by the desired shell; and on each circulation of the catalyst support, 0.01 to 2% of this impregnating solution is atomized into droplets with an average diameter of 10 to 90 μm and are applied onto at least 10% of the surface of the catalyst particles without pressure and without support gas wherein at least 60%, of the impregnating solution is atomized into droplets with diameters which are no greater than double the average droplet diameter and whereby the desired thickness of said shell is obtained.

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5,498,591

## WEED CONTROL COMPOSITIONS CONTAINING *DRECHSLERA MONOCERAS* AND ADDITIONAL HERBICIDAL AGENTS

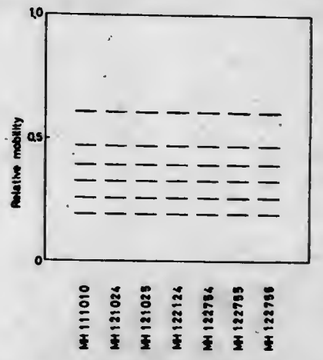
Masatoshi Gohbara, Meguro; Kenichi Yamaguchi, Mobara; Tatsuo Shimmi, Mobara; Emi Shimmi, Mobara; Kazunori Takanaka, Mobara, and Tomoko Hiruta, Mobara, all of, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Division of Ser. No. 214,585, Mar. 18, 1994, Pat. No. 5,434,121. This application Mar. 31, 1995, Ser. No. 414,321

Claims priority, application Japan, Mar. 25, 1993, 5-066398

Int. Cl.[6] A01N 63/04

U.S. Cl. 504—117 18 Claims



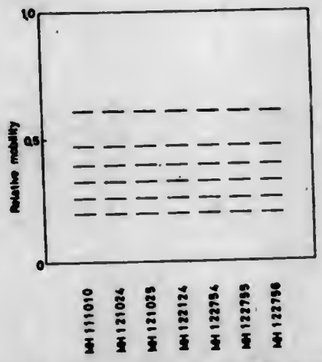

1. A weed control composition comprising at least one strain of *Drechslera monoceras* var. *microsporus*, an effective amount of at least one chemical herbicide and an agriculturally-acceptable carrier or diluent, said strain being free of pathogenicity against crops but having pathogenicity against barnyard grass and having the zymogrammatic pattern of esterases shown in FIG. 1 and being contained in an amount sufficient to provide weed control effects.

**5,498,592**

**VARIETY OF DRECHSLERA MONOCERAS EFFECTIVE FOR CONTROL OF BARNYARD GRASS**

Masatoshi Gohbara, Meguro; Kenichi Yamaguchi, Mobara; Tatsuo Shimai, Mobara; Emi Shimai, Mobara; Kazunori Takanaka, Mobara, and Tomoko Hirata, Mobara, all of, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Division of Ser. No. 214,585, Mar. 18, 1994, Pat. No. 5,434,121. This application Mar. 31, 1995, Ser. No. 414,789
Claims priority, application Japan, Mar. 25, 1993, 5-066398
Int. Cl.[6] A01N *63/04;* C12N *1/14*
U.S. Cl. 504—117 2 Claims




1. A biologically pure strain of *Drechslera monoceras* var. *microsporus*, which is free of pathogenicity against crops but has pathogenicity against barnyard grass and has the zymogrammatic pattern of esterases shown in FIG. 1.

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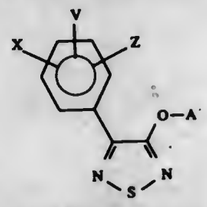
**5,498,593**

**THIADIAZOLE DERIVATIVES AND HERBICIDE COMPOSITIONS CONTAINING THE SAME**

Yasuaki Hanasaki; Kazuaki Tsukada; Hiroyuki Watanabe; Kenji Tsuzuki; Mitsuyuki Murakami, and Noritoshi Nihei, all of Shinnanyo, Japan, assignors to TOSOH Corporation, Yamaguchi, Japan

Division of Ser. No. 27,579, Mar. 5, 1993, which is a continuation of Ser. No. 633,348, Dec. 27, 1990, abandoned, which is a continuation-in-part of Ser. No. 570,638, Aug. 22, 1990, abandoned. This application Mar. 10, 1995, Ser. No. 401,771
Claims priority, application Japan, Aug. 22, 1989, 1-215489; Jan. 30, 1989, 1-279725; Nov. 22, 1989, 1-302258; Dec. 25, 1989, 1-332875
Int. Cl.[6] A01N *43/72;* C07D *285/10*
U.S. Cl. 504—264 8 Claims

1. A thiadiazole compound of the formula:




wherein X, V and Z, which may be the same or different, each represent hydrogen, halogen, $C_1$–$C_6$ alkyl, $C_{1-4}$ haloalkyl, $C_1$–$C_4$ alkoxy, hydroxy or nitro, with the proviso that two or three of them cannot simultaneously be hydrogen; A represents hydrogen atom, allyl or propargyl.

**5,498,594**

**(HG OR PB)-PR-TL-SR-CU-O BASED SUPERCONDUCTORS**

Zhengzhi Sheng; John Meason, and Ying Xin, all of Fayetteville, Ark., assignors to University of Arkansas, Little Rock, Ark.

Continuation of Ser. No. 865,669, Apr. 8, 1992, abandoned, which is a continuation of Ser. No. 581,324, Sep. 12, 1990, abandoned. This application Feb. 17, 1994, Ser. No. 198,214
Int. Cl.[6] H01L *39/12;* C04B *35/45;35/50*
U.S. Cl. 505—120 2 Claims

1. A superconducting composition comprising a composition having the nominal composition $Pb_{0.5}Pr_2Tl_2Sr_3Cu_3O_{13}$, said composition having a superconducting phase having an onset temperature of at least about 90° K.

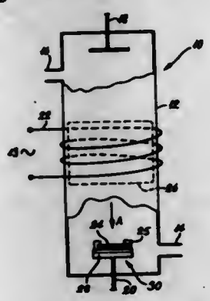
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**5,498,595**

**METHOD OF ACTIVATION OF SUPERCONDUCTORS AND DEVICES PRODUCED THEREBY**

William Eccleston, Liverpool, England, assignee to British Technology Group Limited, London, England

Continuation of Ser. No. 35,899, Mar. 23, 1993, abandoned, which is a continuation of Ser. No. 634,861, Jan. 2, 1991, abandoned. This application Aug. 16, 1994, Ser. No. 291,578
Claims priority, application United Kingdom, Jul. 2, 1988, 8815781; Jul. 2, 1988, 8815783
Int. Cl.[6] C30B *1/10*
U.S. Cl. 505—235 6 Claims




1. A method for activating superconducting material comprising the steps of:
forming a first material on a substrate of semiconductor material, wherein said first material is epitaxially grown on said semiconductor material;
forming a superconductor material on said first material defining a layered structure;
generating a species of oxygen ions in a plasma;
heating said layered structure; and
introducing said oxygen ions to said layered structure by the application of a drift field between a source of said oxygen ions and a substrate including said layered structure while maintaining said layered structure outside said plasma so as to actuate said superconductor material and produce an insulated region in said first material.

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**5,498,596**

**NON TOXIC, BIODEGRADABLE WELL FLUIDS**

Henry Ashjian, East Brunswick, N.J.; Larry C. Peel, Aberdeen, Scotland; Thomas J. Shoerin, Woodbridge, N.J., and Robert S. Williamson, St. Cyrus, Scotland, assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Sep. 29, 1993, Ser. No. 128,186
Int. Cl.[6] C09K *7/00;7/06*
U.S. Cl. 507—103 34 Claims

1. A well fluid which comprises a hydrocarbon blend of:



(i) a poly alpha-olefin (PAO) component having a viscosity of 1 to 6 cS and:
(ii) a paraffinic hydrocarbon component of petroleum origin in the $C_{10}$–$C_{18}$ range comprising at least 98 weight percent n-paraffins and less than 1 weight percent monocyclic aromatics, and
(iii) an olefinic hydrocarbon component in the $C_{12-C18}$ range, the proportions of the PAO component, the paraffinic hydrocarbon component and the olefinic hydrocarbon component being such that the blend has the following properties:

| | |
|---|---|
| Viscosity at 100° C. | 0.5 to 4 cS |
| Viscosity at 40° C. | 1.0 to 30 cS |
| Pour point | not above +5° C. |
| Flash point | not less than 70° C. |

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**5,498,597**

**FKBP-13, AN FK506-BINDING IMMUNOPHILIN**

Steven J. Burakoff, W. Newton; Stuart L. Schreiber, Boston, and Barbara E. Bierer, Chestnut Hill, all of Mass., assignors to Dana-Farber Cancer Institute, Inc., Boston, and President and Fellows of Harvard College, Cambridge, both of Mass.

Filed Jan. 17, 1992, Ser. No. 822,966
Int. Cl.[6] C07K *14/47;* A61K *38/17*
U.S. Cl. 514—2 17 Claims

1. A substantially purified mammalian FKBP-13, which (1) has the sequence of an FK506-binding immunophilin naturally expressed in lymphocytes, (2) has an actual molecular weight between 10 and 15 kDa, and (3) has at least 80% sequence identity with residues 1 to 120 or residues –21 to 120 of human FKBP-13 (SEQ ID NO:6).

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**5,498,598**

**COMPOSITION FOR NASAL ADMINISTRATION OF DESMOPRESSIN**

Alan Harris, Malmo, Sweden, assignor to Ferring AB, Malmo, Sweden

Continuation of Ser. No. 84,894, Jun. 29, 1993, abandoned. This application Apr. 25, 1995, Ser. No. 430,131
Int. Cl.[6] A61K *38/16;38/21*
U.S. Cl. 514—11 10 Claims

1. An aqueous composition for intra-nasal administration of desmopressin, comprising between about 2.5 and about 7.5 μg desmopressin acetate per 100 μl of said aqueous composition.

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**5,498,599**

**METHODS FOR STIMULATING PLATELET PRODUCTION**

Esther S. Choi, Santa Barbara; Martha M. Hokom, Thousand Oaks; Pamela Hunt, Thousand Oaks, and Janet L. Nichol, Oxnard, all of Calif., assignors to AMGEN Inc., Thousand Oaks, Calif.

Filed Jan. 21, 1994, Ser. No. 184,327
Int. Cl.[6] C12N *15/18;15/19;* A61K *38/18;38/19*
U.S. Cl. 514—12 6 Claims

1. A method for increasing the number of platelets in a mammal, which comprises administering to the mammal a platelet number increasing effective amount of a soluble MPL receptor, wherein said soluble MPL receptor has an amino acid sequence of SEQ ID NO: 2 that begins at an amino acid residue of from 9 to 29 and ends at an amino acid residue of from 473 to 493.

**5,498,600**

**BIOLOGICALLY ACTIVE MOSAIC PROTEINS**

Mark J. Murray, and James D. Kelly, both of Seattle, Wash., assignors to ZymoGenetics, Inc., Seattle, Wash.

Continuation of Ser. No. 926,149, Aug. 5, 1992, abandoned, which is a continuation of Ser. No. 379,239, Jul. 11, 1989, abandoned, which is a division of Ser. No. 941,970, Dec. 15, 1986, Pat. No. 4,849,407, which is a continuation-in-part of Ser. No. 896,485, Aug. 13, 1986, Pat. No. 4,766,073, which is a continuation-in-part of Ser. No. 705,175, Feb. 25, 1985, Pat. No. 4,801,542, which is a continuation-in-part of Ser. No. 660,496, Oct. 12, 1984, Pat. No. 4,769,328. This application Oct. 7, 1994, Ser. No. 319,776
The portion of the term of this patent subsequent to Jul. 18, 2006, has been disclaimed.
Int. Cl.[6] A61K *38/22;* C07K *14/49*
U.S. Cl. 514—12 41 Claims

1. A recombinant protein having first and second non-identical polypeptide chains, said first chain being substantially identical to either the A- or B-chain of PDGF (platelet-derived growth factor) and being a mosaic of amimo acid sequences substantially identical to portions of the A- and B-chains of PDGF, said second chain being substantially identical to the A-chain of PDGF, wherein each of said chains includes a substitution of one or more of the cysteine residues corresponding to residues 37, 43, 46 or 47 of the PDGF A-chain, wherein said chains are disulfide bonded together, and wherein said first chain differs from the A- and B-chains of PDGF in at least one amino acid residue substitution, said protein being chemotactic or mitogenic for fibroblasts.

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**5,498,601**

**PLATELET AGGREGATION-INHIBITING PEPTIDES**

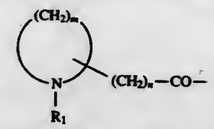
Yoshimi Sato; Yoshio Hayashi, and Jun Kataoka, all of Kawasaki, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

PCT No. PCT/JP93/01262, § 371 Date May 6, 1994, § 102(e) Date May 6, 1994, PCT Pub. No. WO94/05696, PCT Pub. Date Mar. 17, 1994
PCT Filed Sep. 7, 1993, Ser. No. 232,261
Claims priority, application Japan, Jul. 9, 1992, 4-238624; Aug. 18, 1993, 5-203962
Int. Cl.[6] A61K *38/04;* C07K *7/00*
U.S. Cl. 514—17 36 Claims

1. A peptide, a peptide derivative or a salt thereof, that is represented by the following general formula:

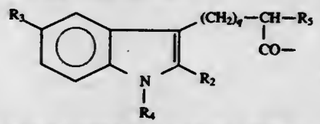
A—B—Arg—Gly—Asp—C—D (I)

wherein A is proline, thioproline, hydroxyproline, dehydroproline, 2-oxo-4-thiazolidine carboxylic acid, N-alkyl glycine or an imino acid derivative represented by the following general formula:




(II)

wherein $R_1$ is a hydrogen atom, $—(CH_2)_p CH_3$ or $—CO—(CH_2)_p CH_3$ group (p is an integer of 0–5), m is an integer of 2–5, n is an integer of 0–2, tryptophan or a tryptophan derivative represented by the following general formula:




(III)

wherein $R_2$ is a hydrogen atom or an alkyl group, $R_3$ is a hydrogen atom or an O-alkyl group, $R_4$ is a hydrogen atom or an alkyl group,

$R_5$ is a hydrogen atom, an amino or amino acyl group, and q is an integer of 0–3, pyroglutamic acid or 2-azetidinone- 4-carboxylic acid, B is serine, glycine, valine, alanine, threonine or β-alanine, C is an amino acid group having a hydrophobic functional group, and D is a hydroxy or amino group.

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**5,498,602**

## OLIGOSACCHARIDE AROMATIC GLYCOSIDE AND SULFATE THEREOF

**Tadao Shoji, Sakura; Naboko Takahashi, Chiba; Naoya Ikushima, Sakura; Toshiyuki Uryu, Tokyo; Takashi Yoshida, Tokyo; Naoki Yamamoto, Tokyo; Hideki Nakashima, Tokyo; Kaname Katsuraya, Sakura; Koichiro Adachi, Kashiwa, and Fusayo Katsuka, Narashino, all of, Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan**

**Filed Sep. 11, 1992, Ser. No. 944,077**

**Claims priority, application Japan, Sep. 13, 1991, 3-234728; Jan. 16, 1991, 3-267611; Feb. 5, 1992, 4-019972**

**The portion of the term of this patent subsequent to Oct. 17, 2012, has been disclaimed.**

**Int. Cl.[6] A61K *31/70*; C07G *3/00*; C07H *11/00***

**U.S. Cl. 514—25** **3 Claims**

1. A sulfated oligosaccharide aromatic glycoside of the formula:

$$(Z)_m\text{—W—Y—(O)}_n\text{—R}$$

wherein R is a straight or branched alkyl group having 1–18 carbon atoms;

n is 0 or 1;

Y is a phenylene group;

W is glucose bonded to Y by an ether bond through the hydroxyl group at the 1-position of the glucose;

$(Z)_m$—W is an oligosaccharide bonded by means of β(1→3) glycoside bonds, wherein Z is glucose and m is an integer from 1 to 19; and

wherein at least 10% of the remaining hydroxyl groups of the oligosaccharide are substituted with sulfate groups; or a pharmaceutically acceptable salt thereof.

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**5,498,603**

## METHOD FOR THE STIMULATION OF HAIR GROWTH

**Percy B. Clodman, 209 Searle Ave., Downsview, Ontario, Canada, and Ossie Clodman, 65 Sunnycrest Rd., Willowdale, Ontario, Canada**

**Continuation-in-part of Ser. No. 86,994, Jul. 7, 1993, Pat. No. 5,420,114. This application Dec. 21, 1993, Ser. No. 170,772**

**Int. Cl.[6] A61K *7/06***

**U.S. Cl. 514—25** **1 Claim**

1. A method of stimulating hair growth on the scalp of a man having male pattern baldness, said method comprising applying to the scalp a pharmaceutically acceptable and effective amount of a composition comprising tannic acid, a debriding agent, and a pharmaceutically acceptable carrier therefore, wherein at least a slight growth of fine hair is present on the scalp at the time of said application.

**5,498,604**

## LEWIS-TYPE SUGAR CHAIN DERIVATIVE

**Akira Hasegawa, 1735-160 Okurayama, Kano, Gifu-shi, Gifu 500; Makoto Kiso, Gifu, and Yoshiaki Yoshikuni, Kyoto, all of, Japan, assignors to Nippon Shinyaku Company, Limited, and Akira Hasegawa, both of, Japan**

**PCT No. PCT/JP93/00106, § 371 Date Nov. 17, 1994, § 102(e) Date Nov. 17, 1994, PCT Pub. No. WO93/15098, PCT Pub. Date Aug. 5, 1993**

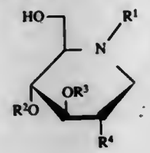
**PCT Filed Jan. 29, 1993, Ser. No. 256,991**

**Claims priority, application Japan, Jan. 31, 1992, 4-046081; Mar. 18, 1992, 4-093431; Sep. 16, 1992, 4-273615**

**Int. Cl.[6] A61K *31/70***

**U.S. Cl. 514—27** **10 Claims**

1. A Lewis-type sugar chain derivative represented by the following formula: wherein $R^1$ represents hydrogen, a lower alkyl, a lower alkenyl or a lower alkynyl; $R^2$ and $R^3$ differ from each other and represent a galactosyl, sialylgalactosyl or fucosyl group; and $R^4$ represents a hydroxyl group or an acetamido group:




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**5,498,605**

## SULFO-DERIVATIVES OF ADENOSINE

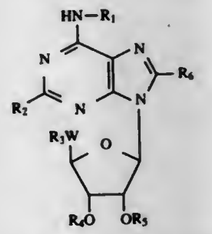
**Kenneth A. Jacobson, Silver Spring, and Michel G. Maillard, Gaithersburg, both of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.**

**Continuation of Ser. No. 914,428, Jul. 15, 1992, abandoned. This application Jul. 21, 1994, Ser. No. 278,704**

**Int. Cl.[6] A61K *31/70***

**U.S. Cl. 514—46** **21 Claims**

1. A compound of the formula:




wherein one or two of the R groups is a sulfohydrocarbon radical of the formula —Z—$SO_3$—Y, wherein Z is a hydrocarbon radical selected from the group consisting of $C_1$–$C_{10}$ aliphatic, phenyl, and $C_1$–$C_4$ alkyl-substituted phenyl radicals and Y is a monovalent cation, the remaining R groups are non-sulfur-containing $C_1$–$C_6$ hydrocarbon radicals or hydrogen, and W is —$OCH_2$—, —$NHCH_2$—, —$SCH_2$—, or NH(C=O)—, wherein the carbon atom of the W moiety is linked to the ribose, with the proviso that when (i) only one of the R groups is a sulfohydrocarbon radical and that R group is $R_1$, (ii) Z is —$CH_2$—$CH_2$—$CH_2$—, and (iii) W is —$OCH_2$— then at least one of $R_2$, $R_3$, $R_4$, or $R_5$ is not hydrogen.

19. A method of treating ischemia in mammals, which method comprises administering to a mammal in need of such treatment a therapeutically effective amount of the compound of claim 1.



**5,498,606**

## PROTECTION OF HUMAN AND ANIMAL CELLS

**David B. Soll, 5001 Frankford Ave., Philadelphia, Pa. 19124, and Sol E. Harrison, 1627 Buck Hill Dr., Huntingdon Valley, Pa. 19006**

**Continuation of Ser. No. 602,973, Oct. 24, 1990, abandoned, which is a division of Ser. No. 162,940, Mar. 2, 1988, Pat. No. 4,971,955, which is a division of Ser. No. 677,130, Dec. 3, 1984, abandoned, which is a continuation-in-part of Ser. No. 239,791, Mar. 2, 1981, Pat. No. 4,486,416. This application Aug. 19, 1993, Ser. No. 109,206**

**Int. Cl.[6] A61K *31/70***

**U.S. Cl. 514—54** **9 Claims**

1. A method of protecting a human or animal joint cavity subject to exposure to trauma, which comprises administering chondroitin sulfate by intraarticular injection into the join cavity, in an amount effective to protect the joint cavity from the effects of the trauma, such that chondroitin sulfate is present during exposure to said trauma.

4. A method for ameliorating the degeneration of human or animal joints caused by trauma, comprising administering by intraarticular injection to the affected joint an effective amount of chondroitin sulfate to reduce inflammation and to protect joint cartilage against degeneration.

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**5,498,607**

## TREATMENT FOR HYPERCHOLESTEROLEMIA

**Sung L. Hsia, and Jin L. He, both of Miami, Fla., assignors to University of Miami, Miami, Fla.**

**Continuation-in-part of Ser. No. 559,932, Jul. 30, 1990, Pat. No. 5,231,090. This application Apr. 23, 1993, Ser. No. 51,684**

**Int. Cl.[6] A61K *31/685***

**U.S. Cl. 514—77** **4 Claims**

1. A method of lowering triglyceride content and lowering the ratio of total cholesterol to HDL in the serum of a mammal which comprises topically administering to the mammal an effective amount of a phospholipid.

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**5,498,608**

## USE OF 2-HYDROXY-5-PHENYLAZOBENZOIC ACID DERIVATIVES AS COLON CANCER CHEMOPREVENTATIVE AND CHEMOTHERAPEUTIC AGENTS

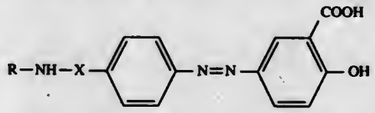
**Lorin K. Johnson, Pleasanton, and Marvin H. Sleisenger, Kentfield, both of Calif., assignors to Salix Pharmaceuticals, Palo Alto, Calif.**

**Filed Jan. 7, 1994, Ser. No. 178,578**

**Int. Cl.[6] A61K *31/655;31/615***

**U.S. Cl. 514—150** **5 Claims**

1. A method of treating an individual suffering from colon cancer or at risk to develop colon cancer comprising adminstering to human in need thereof an effective amount of a pharmaceutical composition comprising a 2-hydroxy-5=phenylazobenzoic acid derivative of the general formula:




wherein X is an —$SO_2$— or —CO— group and R is either a phenyl or carboxymenthylpbenyl radical or is a radical of the formula —$(CH_2)_n$—Y, in which Y is a hydroxyl group, an amino group, a monoalkyl- dialkyl-amino group, the alkyl moieties of which contain up to 6 carbon atoms, or a carboxylic or sulphonic acid group, and n is a whole number of from 1 to 6, and in which one or more of the hydrogen atoms in the alkylene radical can be replaced by amino groups, monoalkyl- or dialkyl-amino groups, the alkyl moieties of which contain up to 6 carbon atoms, or alkyl radicals, and in which the —$(CH_2)_n$—Y radical is either attached directly to the nitrogeno atom or via a benzene ring, with the proviso that R—NH—X— is other than a —CO—NH— $CH_2$—COOH radical; or an ester or its active metabolite 5-ASA, or a non-toxic, pharmacologically acceptable salt of the 2-hydroxy-5-phenylazobenzoic acid derivative or ester or its active metabolite 5-ASA.

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**5,498,609**

## BENZOAZEPINYL COMPOUNDS AS OXYTOCIN AND VASOPRESSIN ANTAGONISTS

**Hidenori Ogawa; Kazumi Kondo; Hiroshi Yamashita; Keizo Kan; Michiaki Tominaga, and Yoichi Yabuuchi, all of Tokushima, Japan, assignors to Otsuka Pharmaceutical Company, Limited, Tokyo, Japan**

**PCT No. PCT/JP93/01082, § 371 Date Apr. 20, 1994, § 102(e) Date Apr. 20, 1994, PCT Pub. No. WO94/04525, PCT Pub. Date Mar. 3, 1994**

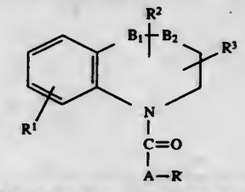
**PCT Filed Aug. 3, 1993, Ser. No. 211,887**

**Claims priority, application Japan, Aug. 20, 1992, 221359**

**Int. Cl.[6] C07D *223/16*; A61K *31/55***

**U.S. Cl. 514—213** **29 Claims**

1. A benzoheterocyclic compound of the formula (1):

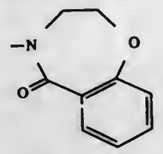



(1)

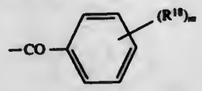
wherein $R^1$ is hydrogen atom or a halogen atom,

$R^2$ is hydrogen atom, oxo group, a lower alkylidene group, hydroxy group, a lower alkoxy group, a lower alkenyloxy group, a hydroxy-substituted lower alkoxy group, a lower alkoxycarbonyl-substituted lower alkoxy group, a carboxy-substituted lower alkoxy group, a lower alkylsulfonyloxy-substituted lower alkoxy group, a phthalimide-substituted lower alkoxy group, a hydroxy-substituted lower alkyl group, a group of the formula: —O—D—$(CO)_i NR^4R^5$ (wherein D is a lower alkylene group, l is 0 or 1, $R^4$ and $R^5$ are the same or different and are hydrogen atom, a lower alkyl group, a lower alkanoyl group, a cycloalkyl group, or an amino-substituted lower alkyl group which may optionally have a lower alkyl substituent, or $R^4$ and $R^5$ may combine together with the nitrogen atom to which they bond to form a 5- or 6-membered saturated heterocyclic group which may be intervened or not with a nitrogen atom, an oxygen atom or a sulfur atom, wherein said heterocyclic group may optionally be substituted by a lower alkyl group or a lower alkanoyl group), a group of the formula: —E—$(CO)_i NR^6R^7$ (wherein l is the same as defined above, E is a lower alkylene group, $R^6$ and $R^7$ are the same or different and are hydrogen atom, a lower alkyl group, an amino-substituted lower alkyl group which may optionally have a lower alkyl substituent, or a lower alkanoyl group, or $R^6$ and $R^7$ may combine together with the nitrogen atom to which they bond to form a 5- or 6-membered saturated heterocyclic group which may be intervened or not with a nitrogen atom, an oxygen atom or a sulfur atom, wherein said heterocyclic group may optionally be substituted by a lower alkyl group, a lower alkanoyl group or a lower alkoxycarbonyl group), a lower alkanoyloxy-substituted lower alkyl group, a lower alkoxycarbonyl-substituted lower alkyl group, an amino which may optionally be substituted by a lower alkyl group or a cycloalkyl group, a carboxy-substituted lower alkyl group, a lower alkylsulfonyloxy-substituted lower alkyl group, a phthalimide-substituted lower alkyl group, an imidazolyl-substituted lower alkyl group, a 1,2,4-triazolyl-substituted lower alkyl group, an amino-substituted lower

alkanoyloxy group which may optionally have a lower alkyl substituent, or an imidazolyl-substituted lower alkoxy group,
$R^3$ is hydrogen atom, a lower alkoxy group or a hydroxy-substituted lower alkyl group,
$B_1$ and $B_2$ are each methylene group
A is a 5- or 6-membered unsaturated heterocyclic residue having 1 to 2 heteroatoms selected from an oxygen atom, a nitrogen atom and a sulfur atom, and
R is a group of the formula: —$NHR^4$ or a group of the formula:

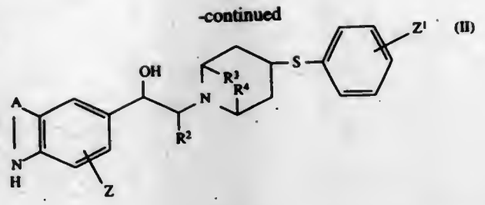


wherein $R^4$ is a group of the formula:



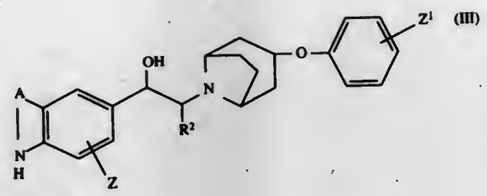
wherein m is an integer of 1 to 3, $R^{18}$ is hydrogen atom, a lower alkyl group, a lower alkoxy group, a halogen atom, nitro group, a lower alkoxycarbonyl group, carboxy group, a lower alkoxycarbonyl-substituted lower alkoxy group, a hydroxy-substituted lower alkoxy group, a carboxy-substituted lower alkoxy group, a lower alkylsulfonyloxy-substituted lower alkoxy group, a phthalimide-substituted lower alkoxy group, or a group of the formula: —O—E—$(CO)_lNR^{19}R^{20}$ (wherein E and l are the same as defined above, $R^{19}$ and $R^{20}$ are the same or different and are hydrogen atom or a lower alkyl group, or $R^{19}$ and $R^{20}$ may combine together with the nitrogen atom to which they bond to form a 5- or 6-membered saturated heterocyclic group which may be intervened or not with a nitrogen atom or an oxygen atom, wherein said heterocyclic group may optionally be substituted by a lower alkyl group, or an amino group which may optionally be substituted by a lower alkanoyl group), thienylcarbonyl group, a cycloalkylcarbonyl group or a phenyl-lower alkanoyl group which may optionally have a lower alkyl substituent on the phenyl ring, or a salt thereof.

-continued



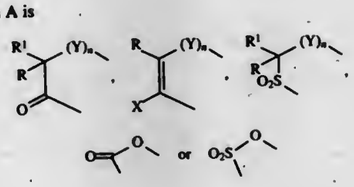
(II)

or



(III)

wherein A is



n is 0 or 1;
m is 0 or an integer from 1–6;
R, $R^1$ and $R^2$ are each independently hydrogen or ($C_1$–$C_3$)alkyl;
$R^3$ and $R^4$ are taken separately and are each hydrogen, or $R^3$ and $R^4$ are taken together and are ethylene;
X is hydrogen, ($C_1$–$C_3$)alkoxy or [($C_1$–$C_3$)alkoxy]-carbonyl;
Y is $CH_2$ or oxygen;
Z and $Z^1$ are each independently hydrogen, ($C_1$–$C_3$)alkyl, ($C_1$–$C_3$)alkoxy, fluoro, chloro or bromo;
or a pharmaceutically-acceptable acid addition salt thereof.

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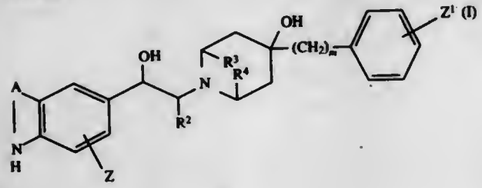
**5,498,610**

## NEUROPROTECTIVE INDOLONE AND RELATED DERIVATIVES

**Bertrand L. Chenard, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.**

**Continuation-in-part of Ser. No. 941,118, Nov. 6, 1992, Pat. No. 5,306,723. This application Feb. 1, 1994, Ser. No. 189,622**
**Int. Cl.[6] C07D *215/16***
**U.S. Cl. 514—222.8** **7 Claims**

1. A method of blocking NMDA receptor sites in a mammal in need of said blocking comprising administering to said mammal an effective amount of a racemic or optically active compound of the formula



(I)

or

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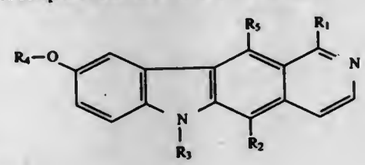
**5,498,611**

## ELLIPTICINE COMPOUNDS

**E. Bisagni, Orsay; R. Jaszfold-Howorko, Wroclaw; G. Atassi, Saint-Cloud, and A. Pierre, Marly-le-Roi, all of, France, assignors to Adir et Compagnie, Courbevoie, France**

**Division of Ser. No. 130,627, Oct. 1, 1993, Pat. No. 5,407,940. This application Jul. 21, 1994, Ser. No. 278,269**
**Claims priority, application France, Jan. 2, 1992, 92.11672**
**Int. Cl.[6] C07D *471/04*; A61K *31/435***
**U.S. Cl. 514—232.8** **7 Claims**

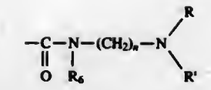
1. A compound selected from those of formula (I):



(I)

wherein:
$R_1$ represents the group





in which:
n is an integer of 1 to 6 inclusive,
$R_6$ is selected from hydrogen and straight-chain or branched alkyl having 1 to 6 carbon atoms inclusive optionally substituted by one or more hydroxy,
R and R', together with the nitrogen atom to which they are attached, form a 5- or 6-membered heterocycle optionally containing an oxygen atom, which heterocycle may be substituted by one or more straight-chain or branched alkyl having 1 to 6 carbon atoms inclusive,
$R_2$ represents straight-chain or branched alkyl having 1 to 6 carbon atoms inclusive,
$R_3$, $R_4$ and $R_5$, which are the same or different, are selected, independently of one another, from hydrogen and straight-chain or branched alkyl having 1 to 6 carbon atoms inclusive,
its optical isomers, its possible N-oxides, and pharmaceutically-acceptable addition salts thereof with an acid or base.

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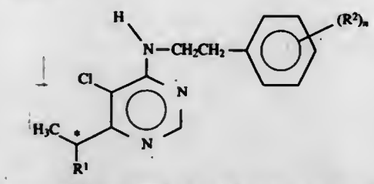
**5,498,612**

## 4-PHENETHYLAMINOPYRIMIDINE DERIVATIVE, AND AGRICULTURAL AND HORTICULTURAL CHEMICAL FOR CONTROLLING NOXIOUS ORGANISMS CONTAINING THE SAME

**Tokio Obata; Katsutoshi Fujii; Akira Ooka, and Yoshinori Yamanaka, all of Ube, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan**

**Filed Jan. 30, 1995, Ser. No. 380,717**
**Claims priority, application Japan, Feb. 1, 1994, 6-010688**
**Int. Cl.[6] C07D *239/30;239/42;* A01N *43/54***
**U.S. Cl. 514—256** **8 Claims**

1. A 4-phenethylaminopyrimidine compound represented by the formula (I):



(I)

wherein $R^1$ represents a halogen atom, a hydroxyl group, an acyloxy group having 2 to 5 carbon atoms, an alkoxy group having 1 to 4 carbon atoms, a haloalkoxy group having 1 to 4 carbon atoms, an alkylthio group having 1 to 4 carbon atoms, a benzyloxycarbonyloxy group, an alkyloxycarbonyloxy group having 2 to 5 carbon atoms, an alkylsulfonyloxy group having 1 to 4 carbon atoms, a tri($C_{1-4}$ alkyl)silyloxy group or an alkyloxycarbonylalkyloxy group having 3 to 6 carbon atoms;
$R^2$ represents a hydrogen atom, an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms, a halogen atom, a haloalkyl group having 1 to 4 carbon atoms, a haloalkoxy group having 1 to 4 carbon atoms, a benzoyl group which is unsubstituted or substituted by at least one of a halogen atom, an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms, a haloalkyl group having 1 to 4 carbon atoms and an alkylthio group having 1 to 4 carbon atoms,
a hydroxyl group, a haloalkylcarbonyl group having 2 to 5 carbon atoms, an alkylsulfonyloxy group having 1 to 4 carbon atoms, a haloalkylsulfonyloxy group having 1 to 4 carbon atoms, an alkylsulfonyl group having 1 to 4 carbon atoms, an alkylsulfinyl group having 1 to 4 carbon atoms, a haloalkylsulfinyl group having 1 to 4 carbon atoms, a tri($C_{1-4}$ alkyl)silylalkoxy group having 1 to 4 alkoxy carbon atoms, an alkylthio group having 1 to 4 carbon atoms,
a pyridyloxy group which is unsubstituted or substituted by at least one of a halogen atom and a haloalkyl group having 1 to 4 carbon atoms,
a phenoxy group which is unsubstituted or substituted by at least one of a halogen atom and a haloalkyl group having 1 to 4 carbon atoms,
an alkenyloxy group having 2 to 5 carbon atoms, a haloalkenyloxy group having 2 to 5 carbon atoms,
a benzyl group which is unsubstituted or substituted by at least one of a halogen atom and a hydroxyl group,
a 2-phenyl-2-1,3-dioxolanyl group, an alkoxyimino-benzyl group, a dialkylhydrazonobenzyl group, a nitro group, a haloalkylthio group having 1 to 4 carbon atoms, or an alkynyloxy group having 2 to 5 carbon atoms;
n is an integer of 1 to 5; and
* represents an asymmetric carbon atom.

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**5,498,613**

## DIPYRIDAMOLE AND ANALOGS THEREOF IN PREVENTING ADHESION FORMATION

**Kathleen E. Rodgers, Long Beach, and Gere S. Dizerega, Pasadena, both of Calif., assignors to The University of Southern California, Los Angeles, Calif.**

**Filed Jun. 7, 1994, Ser. No. 253,437**
**Int. Cl.[6] A61K *31/505***
**U.S. Cl. 514—258** **15 Claims**

1. A method for prevention in mammals of formation of adhesions between organ surfaces at a location in need thereof, comprising:
administering an effective amount of at least one compound selected from the group consisting of dipyridamole, RA 233, R-E 244 and RX-RA85 as active agent to provide an effective local concentration at the location for a period of time sufficient to permit tissue repair.

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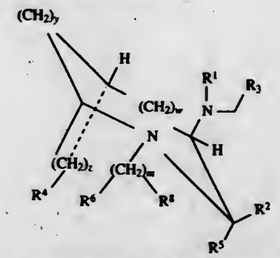
**5,498,614**

## BRIDGED AZA-BICYCLIC DERIVATIVES AS SUBSTANCE P ANTAGONIST

**Manoj C. Desai, Emeryville, Calif., assignor to Pfizer Inc., New York, N.Y.**

**PCT No. PCT/US93/01429, § 371 Date Nov. 7, 1994, § 102(e) Date Nov. 7, 1994, PCT Pub. No. WO93/23380, PCT Pub. Date Nov. 25, 1993**
**Continuation of Ser. No. 885,110, May 18, 1992, abandoned. This PCT application Feb. 23, 1993, Ser. No. 335,726**
**Int. Cl.[6] A61K *31/44*; C07D *221/22***
**U.S. Cl. 514—299** **14 Claims**

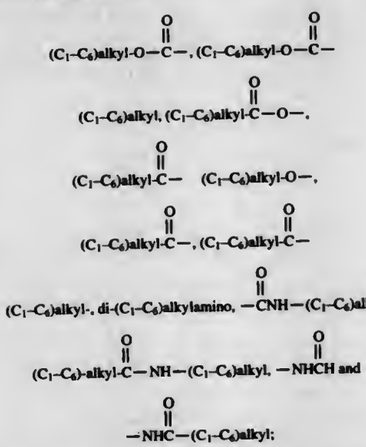
1. A compound of the formula



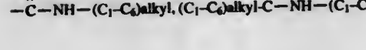
I

wherein m is an integer from 0 to 8, and any one of the carbon-carbon single bonds of $(CH_2)_m$ may optionally be replaced by a carbon-carbon double bond or a carbon-carbon triple bond, and any one of the carbon atoms of said $(CH_2)_m$ may optionally be substituted with $R^8$;

w is an integer from 0 to 2;
y is an integer from 1 to 4;
z is an integer from 1 to 4, and wherein any one of the carbon atoms of said $(CH_2)_z$ may optionally be substituted with $R^4$;
$R^1$ is hydrogen or $(C_1–C_6)$ alkyl optionally substituted with hydroxy, alkoxy or fluoro;
$R^2$ is a group selected from hydrogen, $(C_1–C_6)$ straight or branched alkyl, $(C_3–C_7)$cycloalkyl wherein one of the carbon atoms may optionally be replaced by nitrogen, oxygen or sulfur; aryl selected from phenyl, indanyl, and naphthyl; heteroaryl selected from thienyl, furyl, pyridyl, thiazolyl, isothiazolyl, oxazolyl, isoxazolyl, triazolyl, tetrazolyl and quinolyl; phenyl$(C_2–C_6)$ alkyl, benzhydryl and benzyl,
wherein one of the phenyl moieties of said benzhydryl may optionally be replaced by naphthyl, thienyl, furyl or pyridyl, and wherein each of said aryl and heteroaryl groups and the phenyl moieties of said benzyl, phenyl$(C_2–C_6)$alkyl and benzhydryl may optionally be substituted with one or more substituents independently selected from halo, nitro, $(C_1–C_6)$alkyl, $(C_1–C_6)$alkoxy, trifluoromethyl, amino, $(C_1–C_6)$-alkylamino,



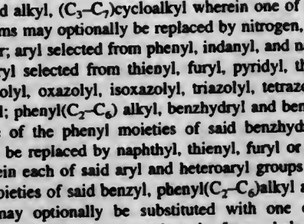

and wherein one of the phenyl moieties of said benzhydryl may optionally be replaced by naphthyl, thienyl, furyl or pyridyl;
$R^3$ is hydrogen, phenyl or $(C_1–C_6)$alkyl;
or $R^2$ and $R^3$, together with the carbon to which they are attached, form a saturated carbocyclic ring having from 3 to 7 carbon atoms wherein one of said carbon atoms may optionally be replaced by oxygen, nitrogen or sulfur;
$R^3$ is aryl selected from phenyl, indanyl, and naphthyl; heteroaryl selected from thienyl, furyl, pyridyl, thiazolyl, isothiazolyl, oxazolyl, isoxazolyl, triazolyl, tetrazolyl and quinolyl; or cycloalkyl having 3 to 7 carbon atoms wherein one of said carbon atoms may optionally be replaced by nitrogen, oxygen or sulfur; wherein each of said aryl and heteroaryl groups may optionally be substituted with one or more substituents, and said $(C_3–C_7)$cycloalkyl may optionally be substituted with one or two substituents, each of said substituents being independently selected from halo, nitro, $(C_1–C_6)$alkyl optionally substituted with from one to three fluorine atoms, $(C_1–C_6)$alkoxy optionally substituted with from one to three fluorine atoms, phenyl, amino, $(C_1–C_6)$alkylamino, $(C_1–C_6)$ dialkylamino,




-continued




$R^4$ is independently selected from hydrogen, hydroxy, halo, amino, oxo (=O), nitrile, $(C_1–C_6)$alkylamino, di-$(C_1–C_6)$alkylamino, $(C_1–C_6)$alkoxy,




and the groups set forth in the definition of $R^2$;
$R^6$ is




$NHCH_2R^9$, $NHSO_2R^9$ or one of the groups set forth in any of the definitions of $R^2$ and $R^4$;
$R^8$ is oximino (=NOH) or one of the groups set forth in any of the definitions of $R^2$ and $R^4$;
$R^9$ is $(C_1–C_6)$alkyl, hydrogen, phenyl or phenyl $(C_1–C_6)$alkyl;
with the proviso that (a) when m is 0, $R^8$ is absent, (b) neither $R^4$, $R^6$, nor $R^8$ can form, together with the carbon to which it is attached, a ring with $R^5$, and (c) the sum of y and z must be less than 7.

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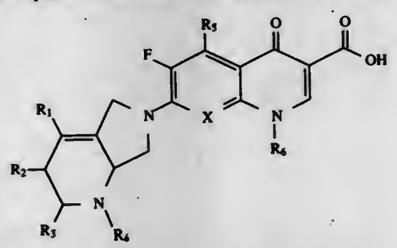
**5,498,615**

## QUINOLONE CARBOXYLIC ACID DERIVATIVES AND PROCESS FOR PREPARING THE SAME

**Wan J. Kim; Tae H. Park; Moon H. Kim; Tae S. Lee, and Keun S. Nam, all of Daejeon, Rep. of Korea, assignors to Korea Research Institute of Chemical Technology, Daejeon, Rep. of Korea**

**Continuation-in-part of Ser. No. 52,711, Apr. 26, 1993, abandoned. This application Jul. 20, 1994, Ser. No. 277,602**
**Int. Cl.[6] A61K** *31/405*; **C07D** *471/02*
**U.S. Cl. 514—300** **6 Claims**

1. A quinolone carboxylic acid derivative of formula (I):




wherein,
$R_1$, $R_2$, and $R_3$, which may be the same or different, are each hydrogen or a halogen atom, or a lower alkyl group optionally substituted with an amino or a hydroxy group;
$R_4$ is hydrogen atom, a lower alkyl, benzyl, t-butoxycarbonyl or ethoxycarbonyl group;
$R_5$ is hydrogen, chlorine atom, methyl or an amino group;
$R_6$ is a lower alkyl group, or a cyclopropyl or a phenyl group optionally substituted with a halogen atom; and



X is a methyne group optionally substituted with a lower alkyl, a lower alkyloxy group or a halogen atom, and pharmaceutically acceptable salts thereof.

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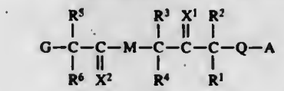
**5,498,616**

## CYSTEINE PROTEASE AND SERINE PROTEASE INHIBITORS

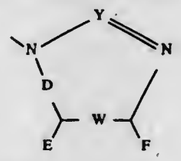
**John P. Mallamo, Glenmore; Ron Bihovsky; Sankar Chatterjee, both of Wynnewood, all of Pa., and Rabindranath Tripathy, Pennsville, N.J., assignors to Cephalon, Inc., West Chester, Pa.**

**Filed Nov. 4, 1994, Ser. No. 334,249**
**Int. Cl.[6] A61K** *31/41;31/415;31/44*; **C07D** *249/04*
**U.S. Cl. 514—300** **18 Claims**

1. A compound represented by the formula:




wherein:
M is selected from the group consisting of O, $NR^7$ and $CR^1R^2$;
$X^1$ is selected from the group consisting of O, S and $NR^7$;
$X^2$ is selected from the group consisting of O, S, $NR^7$ and two hydrogen atoms;
Q is selected from the group consisting of O, S and $NR^1$;
$R^1$ and $R^2$ are each independently selected from the group consisting of H, alkyl having from 1 to 10 carbons, heteroaryl having from 1 to 10 carbons, alkanoyl having from 1 to 10 carbons, and aroyl, wherein said alkyl, heteroaryl, alkanoyl and aroyl groups are optionally substituted with J;
$R^3$, $R^4$, $R^5$ and $R^6$ are each independently selected from the group consisting of H, alkyl having from 1 to 10 carbons, aryl, and heteroaryl, wherein said alkyl, aryl and heteroaryl groups are optionally substituted with J;
$R^7$ and $R^8$ are each independently selected from the group consisting of H, alkyl having from 1 to 10 carbons, aryl, and heteroaryl, wherein said alkyl, aryl and heteroaryl groups are optionally substituted with J;
J is selected from the group consisting of halogen, $COOR^7$, $R^7OCO$, $R^7OCONH$, OH, CN, $NO_2$, $NR^7R^8$, $N{=}C(R^7)R^8$, $N{=}C(NR^7R^8)_2$, $SR^7$, $OR^7$, phenyl, naphthyl, heteroaryl, and a cycloalkyl group having from 3 to 8 carbons;
G is selected from the group consisting of $NH_2$, $NHR^1$, $CH_2R^1$, $CH_2C(O)B$, carbobenzyloxy-NH, succinyl-NH, $R^7O$-succinyl-NH, $R^7OC(O)NH$, $CH_2C(O)$-(xanthen-9-yl), $CH_2COR^9$ wherein $R^9$ is selected from the group consisting of alkyl, aryl, and arylalkyl group of up to 13 carbons, and $AA^1NHC(O)OCH_2C_6H_5$ wherein $AA^1$ is selected from the group consisting of one of the 20 natural amino acids and an opposite antipode of said amino acid;
B is selected from the group consisting of alkyl having from 1 to 10 carbons, aralkyl having from 1 to 10 carbons, aryl having 1 to 3 carbocyclic rings, and heteroaryl having 1 to 3 rings, wherein said alkyl, aralkyl, aryl and heteroaryl groups are optionally substituted with J; and
A is represented by the structure:




wherein:
Y is selected from the group consisting of N and $CR^1$;
W is selected from the group consisting of a double bond and a single bond;
D is a single bond;
E and F are each independently selected from the group consisting of $R^1$, $R^2$, J, and when E and F comprise a joined moiety, said moiety is selected from the group consisting of an aliphatic carbocyclic ring having from 5 to 7 carbons, an aromatic carbocyclic ring having from 5 to 7 carbons, an aliphatic heterocyclic ring having from 5 to 7 atoms, and an aromatic heterocyclic ring having from 5 to 7 atoms; wherein:
said aliphatic heterocyclic ring and said aromatic heterocyclic ring each have from 1 to 4 heteroatoms; and said aliphatic carbocyclic ring, said aromatic carbocyclic ring, said aliphatic heterocyclic ring, and said aromatic heterocyclic ring are each optionally substituted with J.

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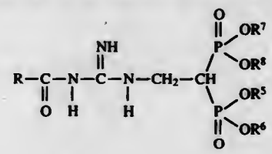
**5,498,617**

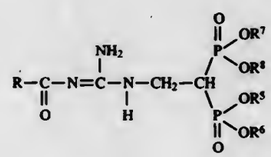
## GUANIDINEALKYL-1,1-BISPHOSPHONIC ACID DERIVATIVES PROCESS FOR THEIR PREPARATION AND THEIR USE

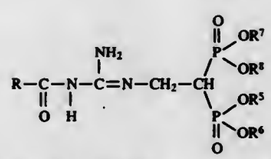
**Christoph Naumann, Niederhausen; Hans-Jochen Lang, Hofheim/Taunus; Jürgen Sandow, Glashütten, all of, Germany, and Anne-Marie Moura, Paris, France, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany**

**Division of Ser. No. 159,119, Nov. 30, 1993, Pat. No. 5,395,826. This application Nov. 23, 1994, Ser. No. 346,239**
**Claims priority, application Germany, Dec. 2, 1992, 42 40 422.3; May 13, 1993, 43 16 019.8; Sep. 23, 1993, 43 32 362.6**
**Int. Cl.[6] A61K** *31/445*; **C07D** *211/10*
**U.S. Cl. 514—315** **6 Claims**

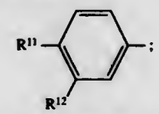
1. A compound of the tautomeric formula Ia, Ib or Ic



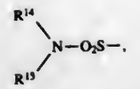




or a physiologically tolerated salt of said compound wherein R has the following meaning:
a radical of the formula V




wherein one of $R^{11}$ or $R^{12}$ has the following meaning:



wherein $R^{14}$ and $R^{15}$ together form a straight-chain or branched chain of 5 carbon atoms, and the other substituent $R^{11}$ or $R^{12}$ in each case means



wherein $R^{14}$ and $R^{15}$ have the above-mentioned meaning, and $R^9$, $R^6$, $R^7$ and $R^8$ are identical or different and independently of one another are

1) hydrogen,
2) ($C_1$–$C_5$)-alkyl, straight-chain or branched, or
3) phenyl.

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**5,498,618**

**4-AMINO-N-(4-METHYL-4-PIPERIDINYL)-2-METHOXYBENZAMIDES FOR TREATING SMOOTH MUSCLE CONTRACTION DISORDERS**

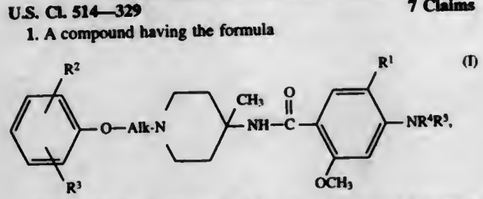
**Josepha E. M. F. Leysen, and Georges H. P. Van Daele, both of Turnhout, Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium**

**Continuation-in-part of Ser. No. 914,306, Jul. 17, 1992, abandoned. This application Jan. 6, 1995, Ser. No. 367,111**

**Int. Cl.[6] A61K** *31/445;* **C07D** *211/56*

**U.S. Cl. 514—329** **7 Claims**

1. A compound having the formula



(I)

a pharmaceutically acceptable acid addition salt thereof or a stereoisomeric form thereof, wherein

$R^1$ represents hydrogen or halo;

$R^2$ represents halo;

$R^3$ represents hydrogen or halo;

$R^4$ and $R^5$ each independently represent hydrogen, $C_{1-4}$alkyl or halo$C_{1-4}$alkyl;

the group $NR^4R^5$ may also be azido, and

Alk represents $C_{2-4}$alkanediyl.

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**5,498,619**

**AMINOKETONE DERIVATIVE AND USE THEREOF**

**Hideki Tanada; Kazuya Sakai; Seitaro Kajiya; Norio Ohto; Kazutoshi Horikomi, all of Chiba; Akira Matsubara; Hideshi Shimizu, both of Kanagawa, and Akira Mizuchi, Chiba, all of, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan**

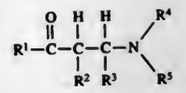
**Division of Ser. No. 839,434, Feb. 24, 1992, Pat. No. 5,338,857. This application May 16, 1994, Ser. No. 243,235**

**Claims priority, application Japan, Aug. 4, 1989, 1-201410; Feb. 26, 1991, 3-30739**

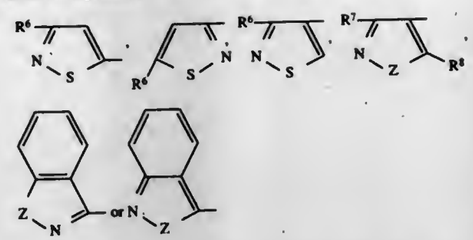
**Int. Cl.[6] A61K** *31/435;* **C07D** *213/34*

**U.S. Cl. 514—338** **6 Claims**

1. An aminoketone compound represented by the following formula (I):



wherein $R^1$ represents



where $R^6$ is a halogen atom, a lower alkyl group, a benzyl group, a benzoyl group, a pyridyl group, a furyl group optionally substituted by one or more lower alkyl groups, a thienyl group optionally substituted by one or more lower alkyl groups, a phenyl group optionally substituted by one or more halogen atoms and/or one or more lower alkoxy, lower alkyl, trifluoromethyl cyano, nitro, amino, dimethylamino, acetamido, methanesulfonylamido, acetyl and/or lower alkoxycarbonyl groups, or a naphthyl group, $R^7$ and $R^8$ being independently a phenyl or lower alkyl group; and

z being an oxygen or sulfur atom;

$R^2$ represents a hydrogen atom, a lower alkyl, benzyl, methoxy, phenyl, allyl trifluoromethyl- or lower-alkoxy-substituted lower alkyl, or cyclopropylmethyl group and $R^3$ represents a hydrogen atom or a lower alkyl group, provided that $R^2$ and $R^3$ are not both hydrogen atoms and if one of $R^2$ and $R^3$ is H, the other is $C_{2-C4}$ alkyl, or $R^2$ and $R^3$ are coupled together to form a five or six-membered alicyclic group, and $R^4$ and $R^5$ independently represent saturated or unsaturated lower alkyl groups,or $R^4$ and $R^5$ are coupled together into a pyrrolidine structure, said pyrrolidine structure being optionally substituted by one or more methyl, acetyl and benzyl groups.

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**5,498,620**

**SIGNAL TRANSDUCTION INHIBITOR 1,2,3-TRIAZOLO COMPOUNDS**

**Elise C. Kohn, Olney; Lance A. Liotta, Potomac, and Christian C. Felder, Bethesda, all of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.**

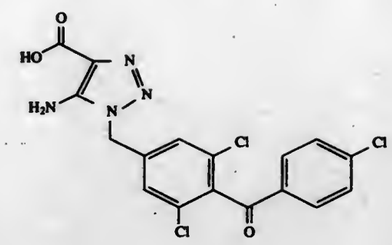
**Continuation-in-part of Ser. No. 894,891, Jun. 8, 1992, abandoned, and a continuation of Ser. No. 270,181, Jul. 1, 1994, which is a division of Ser. No. 985,402, Dec. 4, 1992, Pat. No. 5,359,078, which is a continuation-in-part of Ser. No. 355,744, May 19, 1989, Pat. No. 5,132,315, and a continuation-in-part of Ser. No. 944,009, Sep. 11, 1992, abandoned, which is a continuation of Ser. No. 637,145, Jan. 3, 1991, abandoned. This application May 31, 1995, Ser. No. 455,761**

**Int. Cl.[6] A61K** *31/41;* **C07D** *249/06*

**U.S. Cl. 514—359** **2 Claims**

1. A compound having the formula:





and pharmaceutically acceptable salts thereof.

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**5,498,621**

**OXAZOLIDINEDIONE HYPOGLYCEMIC AGENTS**

**Robert L. Dow, Waterford; Bernard Hulin, Essex, and David A. Clark, East Lyme, all of Conn., assignors to Pfizer Inc., New York, N.Y.**

**Continuation of Ser. No. 855,838, May 1, 1992, abandoned. This application Aug. 12, 1994, Ser. No. 289,612**

**Int. Cl.[6] A61K** *31/42*

**U.S. Cl. 514—369** **18 Claims**

1. Compounds of the formulae

(I)



or

(II)



or a pharmaceutically acceptable salt thereof wherein the dotted line represents a bond or no bond, R is cycloalkyl having three to seven carbon atoms, naphthyl, thienyl, furyl, phenyl or subetituted phenyl wherein said substituent is alkyl having one to three carbon atoms, alkoxy having one to three carbon atoms, trifluoromethyl, chloro, fluoro or bis(trifluoromethyl); $R_1$ is alkyl having one to three carbon atoms; X is O or C=O; A is O or S; and B is N or CH.

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**5,498,622**

**ANTI-NEOPLASTIC, ANTI-VIRAL AND RIBONUCLEOTIDE REDUCTASE ACTIVITY AFFECTING PHARMACEUTICAL COMPOSITIONS AND METHODS OF TREATMENT**

**Raymond J. Bergeron, Gainesville, Fla., assignor to University of Florida Research Foundation, Inc., Gainesville, Fla.**

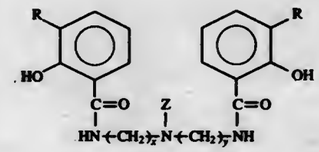
**Division of Ser. No. 376,889, Jan. 20, 1995, which is a division of Ser. No. 299,126, Sep. 2, 1994, which is a division of Ser. No. 124,557, Sep. 22, 1993, Pat. No. 5,391,563, which is a division of Ser. No. 993,620, Dec. 21, 1992, Pat. No. 5,292,775, which is a division of Ser. No. 645,644, Jan. 25, 1991, Pat. No. 5,173,505, which is a division of Ser. No. 313,734, Feb. 22, 1989, Pat. No. 5,128,353, which is a continuation-in-part of Ser. No. 746,672, Jun. 20, 1985, abandoned. This application Jun. 7, 1995, Ser. No. 474,919**

**Int. Cl.[6] A61K** *31/40;* **A01N** *43/36;43/38;43/76*

**U.S. Cl. 514—374** **2 Claims**

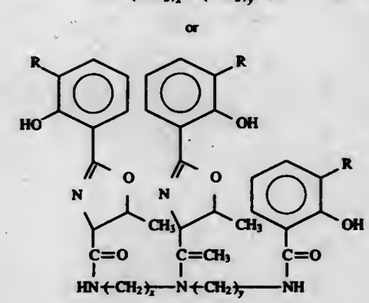
1. A method for treating a human or non-human animal afflicted with malaria comprising administering to a human or non-human animal in need thereof an effective antimalarial amount of a compound of the formula

(I)

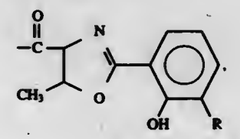


or

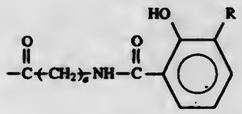
(II)



or



or



a pharmaceutically acceptable salt or complex and b) a pharmaceutically acceptable carrier therefor.

## 5,498,623

### 4(5) SUBSTITUTED IMIDAZOLES AND THEIR PREPARATION AND USE

Arto J. Karjalainen, Oulu; Raimo E. Virtanen, Ruske; Arja L. Karjalainen; Maire M. Eloranta, both of Oulu; Jarmo S. Salonen, Turku; Hannu T. Sipila, Turku, and Antti S. Haapalinna, Turku, all of, Finland, assignors to Orion-yhtyma Oy, Espoo, Finland

PCT No. PCT/FI92/00349, § 371 Date Sep. 19, 1994, § 102(e) Date Sep. 19, 1994, PCT Pub. No. WO93/13074, PCT Pub. Date Jul. 8, 1993

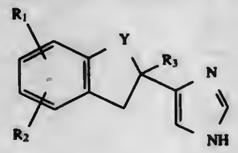
PCT Filed Dec. 18, 1992, Ser. No. 244,932

Claims priority, application United Kingdom, Dec. 12, 1991, 9127050

Int. Cl.[6] C07D *233/54;* A61K *31/415*

U.S. Cl. 514—396 25 Claims

1. A substituted imidazole according to the formula



I

wherein

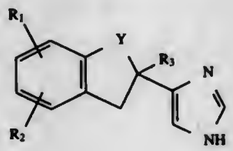
Y is —$CH_2$— or —CO—;

$R_1$ is F, Cl or OH;

$R_2$ is H, F or Cl; and

$R_3$ is H, $CH_3$ or $CH_2CH_3$, excluding 4-(5-chloro-2,3-dihydro-1H-inden- 2-yl)-1H-imidazole and 4-(4-chloro-2,3-dihydro-1H-inden-2-yl)- 1H-imidazole; or a pharmaceutically acceptable salt thereof.

16. A method for the preparation of a compound according to the formula I



I

wherein

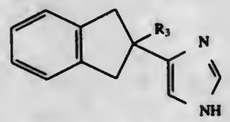
Y is —$CH_2$—;

$R_1$ is F or Cl;

$R_2$ is H and

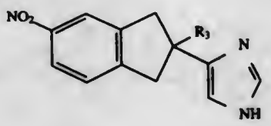
$R_3$ is H, $CH_3$ or $CH_2CH_3$;

comprising nitrating a compound of formula (II)



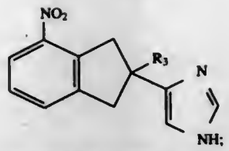
(II)

where $R_3$ is as defined above to give the compounds of formulae (III) and (IV)



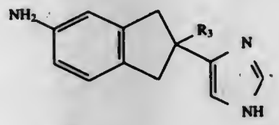
(III)

-continued

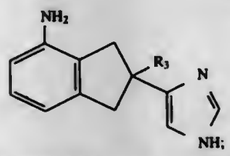


(IV)

reducing the compounds of formula (III) and formula (IV) to the corresponding amino substituted compounds of formulae (V) and (VI)

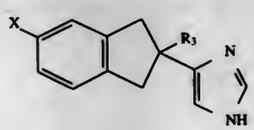


(V)

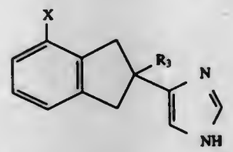


(VI)

converting the amino substituted compounds of formula (V) and formula (VI) to their corresponding diazonium salts and replacing the diazonium groups with halogen to yield the compounds of formulae (VII) and (VIII)



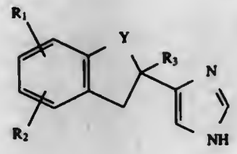
(VII)



(VIII)

where X is F or Cl.

25. A method of treatment of cognitive disorders comprising administering to a subject an effective amount of a substituted imidazole according to the formula



I

wherein

Y is —$CH_2$— or —CO—

$R_1$ is F, Cl or OH;

$R_2$ is H, F or Cl; and

$R_3$ is H, or a pharmaceutically acceptable salt thereof.



## 5,498,624

### SELECTED PYRAZOLYL DERIVATIVES

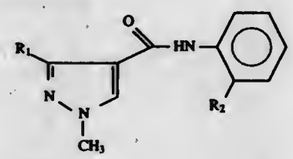
Jim I. McLoughlin, St. Louis; Deborah A. Mischke, Defiance; Maria J. Williams, St. Louis, and Suzanne Metz, Chesterfield, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed May 3, 1995, Ser. No. 434,432

Int. Cl.[6] A01N *43/56;* C07D *231/14*

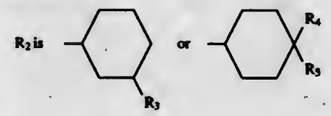
U.S. Cl. 514—406 7 Claims

1. Compounds of the formula:



wherein:

$R_1$ is $CHF_2$ and



wherein

$R_3$ is $CF_3$;

$R_4$ is $CF_3$; and

$R_5$ is H or $CH_3$.

## 5,498,625

### SUBSTANTIALLY PURE ENANTIENERS OF 2-AZABICYCLO(2.2.1)HEPT-5-EN-3-ONE

Christopher T. Evans, Heydon, and Stanley M. Roberts, Kenton, both of, England, assignors to Chirescience Limited, Cambridge, England

Continuation of Ser. No. 35,236, Mar. 22, 1993, abandoned, which is a division of Ser. No. 596,306, Oct. 19, 1990, Pat. No. 5,284,769. This application Nov. 8, 1994, Ser. No. 336,754

Claims priority, application United Kingdom, Jan. 16, 1989, 8923278; Jan. 27, 1989, 8924289; Jan. 17, 1990, 9000995

Int. Cl.[6] A01N *43/38;* C07C *7/00;* C12N *9/78;* C07D *207/12*

U.S. Cl. 514—412 19 Claims

1. 2-Azabicyclo(2 2 1)hept-5-en-3-one, comprising predominantly the (+) enantiomer and a residual amount of the (–) enantiomer, wherein the (+) enantiomer is present in an enantiomeric excess of at least about 88% over the (–) enantiomer.

## 5,498,626

### ACYLAMINOINDOLE DERIVATIVES AS 5-HT1 AGONISTS

John E. Macor, Salem, Conn., assignor to Pfizer Inc., New York, N.Y.

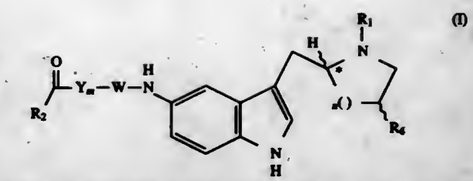
PCT No. PCT/US93/01807, § 371 Date Sep. 14, 1994, § 102(e) Date Sep. 14, 1994, PCT Pub. No. WO93/21180, PCT Pub. Date Oct. 25, 1993

Continuation-in-part of Ser. No. 866,382, Apr. 10, 1992, abandoned. This PCT application Mar. 4, 1993, Ser. No. 295,792

Int. Cl.[6] C07D *403/06;403/14;* A61K *31/40*

U.S. Cl. 514—414 23 Claims

1. A compound of the formula



(I)

wherein n is 0, 1, or 2; m is 0 or 1; Y and W are each an amino acid residue; $R_1$ is hydrogen, $C_1$–$C_6$ alkyl, $C_3$–$C_6$ alkenyl, $C_3$–$C_6$ alkynyl, aryl, $C_1$–$C_3$ alkylaryl, or $C_1$–$C_3$ alkylheteroaryl, and —$(CH_2)_pR_3$; $R_2$ is $CF_3$, $C_1$–$C_6$ alkyl, aryl, $C_1$–$C_3$ alkylaryl, and —$OR_3$; $R_3$ is cyano, trifluoromethyl, or —$OR_4$; $R_4$ is hydrogen, $C_1$–$C_6$ alkyl, $C_1$–$C_3$ alkylaryl, or aryl; $R_5$ is $C_1$–$C_6$ alkyl, $C_1$–$C_3$ alkylaryl, or aryl; $R_6$ is hydrogen, —$OR_7$, or —$NHCOR_7$; $R_7$ is hydrogen, $C_1$ to $C_6$ alkyl, aryl, or $C_1$ to $C_3$ alkyl-aryl; p is 1, 2, or 3; a chiral carbon is designated by an asterisk; and the above aryl groups and the aryl moieties of the above alkyl-aryl groups are independently selected from phenyl and substituted phenyl, wherein said substituted phenyl may be substituted with one to three groups selected from $C_1$ to $C_4$ alkyl, halogen, hydroxy, cyano, carboxamide, nitro, and $C_1$ to $C_4$ alkoxy and the pharmaceutically acceptable salts thereof.

## 5,498,627

### OCTAHYDRO-2-NAPHTHALENECARBOXYLIC ACID DERIVATIVE, ITS PRODUCTION AND USE

Takafumi Ishii, Ibaraki; Tsuneaki Hida, Tsukuba; Yukimasa Nozaki, Ikeda, and Koichiro Ootsu, Mishima, all of, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

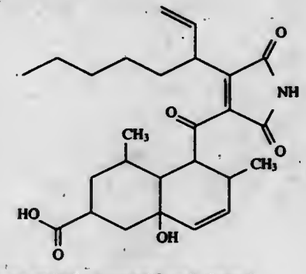
Filed Apr. 14, 1995, Ser. No. 421,921

Claims priority, application Japan, Apr. 15, 1994, 6-077225; Nov. 29, 1994, 6-295048

Int. Cl.[6] A61K *31/40;* C07D *207/24*

U.S. Cl. 514—423 4 Claims

1. A compound of the formula (I):



(I)

or a pharmaceutically acceptable salt thereof.

## 5,498,628

### NAPHTHAMIDE DERIVATIVES

Didier Rognan, Saint Louis; Andre Mann, Ostwald; Camille-Georges Wermuth, Strasbourg; Marie-Pascale Martres, Paris; Bruno Giros, Chatillon; Pierre Sokoloff, Le Plessis Bouchard; Jean-Charles Schwartz; Jeanne-Marie LeComte, both of Paris, and Fabrice Garrido, Strasbourg, all of, France, assignors to Institut National de la Sante et de la Recherche Medicale, Paris, France

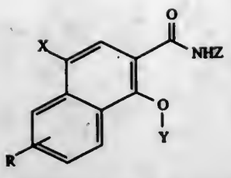
Filed Oct. 23, 1992, Ser. No. 965,927

Claims priority, application France, Jan. 23, 1991, 91 13103

Int. Cl.[6] A61K *31/40;* C07D *207/09*

U.S. Cl. 514—428 7 Claims

1. Naphthamide derivatives of the general formula (I),



(I)

where

X: represents either a hydrogen atom, or a chlorine or bromine atom, or an amino or aminoalkyl group a sulphamoyl group, thiocyanate, alkylthio, alkylsulphinyl or alkylsulphonyl, or a methoxy group, or a nitro group, or a cyano group,;

Y: represents an alkyl or alkenyl residue;

Z: represents 2 methyl-N-alkyl-pyrrolidine or 2-ethylpyrrolidine;

R: a hydrogen or $OCH_3$ substituent.

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**5,498,629**

## ANTICONVULSANT PSEUDOFRUCTOPYRANOSE SULFAMATES

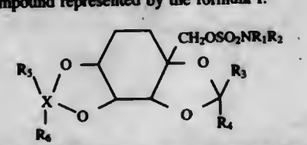
**Michael J. Costanzo, Ivyland; Bruce E. Maryanoff, New Hope; David F. McComsey, Warminster, and Samuel O. Nortey, LaMott, all of Pa., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.**

**Continuation of Ser. No. 173,399, Dec. 23, 1993, abandoned. This application Nov. 10, 1994, Ser. No. 337,597**

**Int. Cl.[6] A61K** *31/385;31/335;* **C07D** *327/04;317/70*

**U.S. Cl. 514—439** **9 Claims**

1. A compound represented by the formula I:



I

wherein $R_1$ and $R_2$ are the same or different and are selected from any of hydrogen, alkyl ($C_1$ to $C_6$), cycloalkyl ($C_3$–$C_7$), allyl, or benzyl;

$R_3$ and $R_4$ are the same or different and selected from hydrogen or lower alkyl;

X may be chosen from carbon (C) or sulfur (S), with the stipulation that when X is carbon $R_5$ and $R_6$ are the same or different and are selected from hydrogen or lower alkyl, whereas when X is sulfur one of $R_5$ and $R_6$ is oxygen and the other is a lone pair of electrons or both are oxygen; or

the pharmaceutically acceptable salt, hydrate, anomer, diastereomer, or enanantiomer thereof.

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**5,498,630**

## FUNGICIDES FOR THE CONTROL OF TAKE-ALL DISEASE OF PLANTS

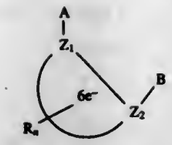
**Dennis P. Phillion, St. Charles, Mo.; Diane S. Braccolino, Copley, Ohio; Matthew J. Granato, St. Louis, Mo.; Wendell G. Phillips, Glencoe, Mo.; Karey A. Van Sant, St. Charles, Mo.; Daniel M. Walker, Maryland Heights, Mo., and Sai C. Wong, Chesterfield, Mo., assignors to Monsanto Company, St. Louis, Mo.**

**Division of Ser. No. 238,182, May 4, 1994, which is a continuation of Ser. No. 951,997, Oct. 2, 1992, abandoned, which is a continuation-in-part of Ser. No. 780,683, Oct. 18, 1991, abandoned. This application Nov. 16, 1994, Ser. No. 340,573**

**Int. Cl.[6] A01N** *43/12;* **C07D** *333/56;333/58;333/62*

**U.S. Cl. 514—443** **42 Claims**

1. A method of controlling disease in a plant caused by Gaeumannomyces sp. comprising applying to the plant locus a fungicidally effective amount of a fungicide of the formula



wherein $Z_1$ and $Z_2$ are C and are part of an aromatic ring which is benzothiophene; and

A is selected from —C(X)-amine wherein the amine is an unsubstituted, monosubstituted or disubstituted nonheterocyclic amino radical, —C(O)—$SR_3$, —NH—C(X)$R_4$, and —C(=$NR_3$)—$XR_7$;

B is —$W_m$—$Q(R_2)_3$ or selected from o-tolyl, 1-naphthyl, 2-naphthyl, and 9-phenanthryl, each optionally substituted with halogen or $R_4$;

Q is C, Si, Ge, or Sn;

W is —$C(R_3)_pH_{(2-p)}$—; or when Q is C, W is selected from —$C(R_3)_pH_{(2-p)}$, —$N(R_3)mH_{(1-m)}$, —S(O)p—, and —O—;

X is O or S;

n is 0, 1, 2, or 3;

m is 0 or 1;

p is 0, 1, or 2;

each R is independently selected from

a) halo, formyl, cyano, amino, nitro, thiocyanato, isothiocyanato, trimethylsilyl, and hydroxy;

b) C1–C4 alkyl, alkenyl, alkynyl, C3–C6 cycloalkyl, and cycloalkenyl, each optionally substituted with halo, hydroxy, thio, amino, nitro, cyano, formyl, phenyl, C1–C4 alkoxy, alkylcarbonyl, alkylthio, alkylamino, dialkylamino, alkoxycarbonyl, (alkylthio )carbonyl, alkylaminocarbonyl, dialkylaminocarbonyl, alkylsulfinyl, or alkylsulfonyl;

c) phenyl, furyl, thienyl, pyrrolyl, each optionally substituted with halo, formyl, cyano, amino, nitro, C1–C4 alkyl, alkenyl, alkynyl, alkoxy, alkylthio, alkylamino, dialkylamino, haloalkyl, and haloalkenyl;

d) C1–C4 alkoxy, alkenoxy, alkynoxy, C3–C6 cycloalkyloxy, cycloalkenyloxy, alkylthio, alkylsulfinyl, alkylsulfonyl, alkylamino, dialkylamino, alkylcarbonylamino, aminocarbonyl, alkylaminocarbonyl, dialkylaminocarbonyl, alkylcarbonyl, alkylcarbonyloxy, alkoxycarbonyl, (alkylthio)carbonyl, phenylcarbonylamino, phenylamino, each optionally substituted with halo;

each $R_2$ is independently selected from alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl and phenyl, each optionally substituted with $R_4$ or halogen; and wherein, when Q is C, $R_2$ may also be selected from halo, alkoxy, alkylthio, alkylamino, and dialkylamino; or

wherein two $R_2$ groups may be combined to form a cyclo group with Q which is 1-methylcyclopropyl, 1-methylcyclobutyl, 1-methylcyclopentyl, or 1-methylcyclohexyl;

$R_3$ is C1–C4 alkyl;

$R_4$ is C1–C4 alkyl, haloalkyl, alkoxy, alkylthio, alkylamino, or dialkylamino; and

$R_7$ is C1–C4 alkyl, haloalkyl, or phenyl, optionally substituted with halo, nitro,

or $R_4$;

or an agronomic salt thereof.



**5,498,631**

## METHOD FOR TREATMENT OF MENOPAUSAL AND PREMENSTRUAL SYMPTOMS

**Sherwood L. Gorbach, Chestnut Hill; Barry R. Goldin, West Newton, both of Mass., and Herman Adlercreutz, Helsinki, Finland, assignors to Tufts University School of Medicine, Boston, Mass.**

**Continuation of Ser. No. 49,006, Apr. 16, 1993, abandoned. This application Aug. 1, 1994, Ser. No. 283,678**

**Int. Cl.[6] A61K** *31/35*

**U.S. Cl. 514—456** **12 Claims**

1. A method of treating a medical condition in a woman caused by reduced or altered levels of endogenous estrogen, said method comprising administering to the woman an effective amount of an isoflavonoid selected from the group consisting of genistein, daidzein, Biochanin A, formononetin, o-desmethylangolensin and equol, wherein administration of the isoflavonoid increases excretion of phyto-estrogens.

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**5,498,632**

## ESTERS OF ACYL CARNITINES WITH LONG-CHAIN ALIPHATIC ALCOHOLS AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME HAVING ANTIBACTERIAL ACTIVITY

**Moeè Santaniello, Casoria; Marie O. Tinti; Domenico Misiti, both of Rome, and Piero Foresta, Pomezia, all of, Italy, assignors to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A., Rome, Italy**

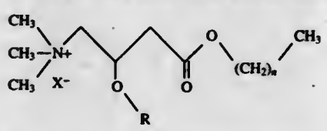
**Continuation of Ser. No. 710, Jan. 5, 1993, abandoned. This application May 26, 1994, Ser. No. 250,107**

**Claims priority, application Italy, Jan. 16, 1992, RM92A0027**

**Int. Cl.[6] A61K** *31/225*

**U.S. Cl. 514—547** **12 Claims**

1. An ester of acyl L-carnitine of the general formula



(I)

wherein:

R is a straight or branched saturated aliphatic hydrocarbon carboxylic acyl group having 2–16 carbon atoms,

n is an integer from 7 to 15, and

$X^-$ is the anion of a pharmacologically acceptable acid.

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**5,498,633**

## ESTERS OF ACYL CARNITINES WITH LONG-CHAIN ALIPHATIC ALCOHOLS AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME HAVING ANTIBACTERIAL ACTIVITY

**Moeè Santaniello, Casoria; Maria O. Tinti; Domenico Misiti, both of Rome, and Piero Foresta, Pomezia, all of, Italy, assignors to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A., Rome, Italy**

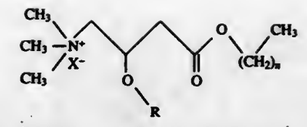
**Division of Ser. No. 250,107, May 26, 1994, which is a continuation of Ser. No. 710, Jan. 5, 1993, abandoned. This application Mar. 22, 1995, Ser. No. 408,394**

**Claims priority, application Italy, Jan. 16, 1992, RM92A0027**

**Int. Cl.[6] A61K** *31/225*

**U.S. Cl. 514—547** **11 Claims**

1. The process for treating a bacterial infection in a human or animal which comprises administering to the human or animal an antibacterially effective amount of an ester of acyl L-carnitine of the general formula



(I)

wherein:

R is a straight or branched saturated aliphatic hydrocarbon carboxylic acyl group having 2–16 carbon atoms,

n is an integer from 7 to 15, and

$X^-$ is the anion of a pharmacologically acceptable acid.

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**5,498,634**

## THIOFORMAMIDE DERIVATIVES

**Yasuhiro Kabasawa; Fumihiro Ozaki; Keiji Ishiboshi; Takashi Hasegawa; Hitoshi Oinuma; Toshiaki Ogawa; Hideyuki Adachi; Hiroshi Katoh; Kohtaroo Kodama; Hideto Ohara; Nobuyuki Mori, and Norio Minami, all of Ibaraki, Japan, assignors to Eisai Co., Ltd., Tokyo, Japan**

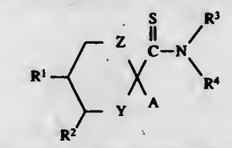
**Division of Ser. No. 211,701, Apr. 13, 1994, Pat. No. 5,444,066. This application Jan. 30, 1995, Ser. No. 380,589**

**Claims priority, application Japan, Jan. 14, 1991, 3-264622; Jan. 6, 1992, 4-197**

**Int. Cl.[6] A61K** *31/35;* **C07D** *309/08*

**U.S. Cl. 514—459** **6 Claims**

1. A thioformamide derivative represented by the general formula (I) or a pharmacologically acceptable salt thereof:



(I)

wherein Y represents a group represented by formula



wherein $R^7$ represents a group represented by formula —$OR^8$ wherein $R^8$ represents optionally substituted arylalkyl,

Z represents a group represented by formula —O—,

$R^1$ and $R^2$ may be the same or different from each other and each represents hydrogen, lower alkyl, optionally substituted arylalkyl or optionally substituted heteroarylalkyl, or alternatively $R^1$ and $R^2$ may together represent a benzene ring;

and

$R^3$ and $R^4$ may be the same or different from each other and each represents hydrogen, lower alkyl, cycloalkyl, lower alkoxy, hydroxyl, aryl, arylalkyl, heteroaryl or heteroarylalkyl, or alternatively $R^3$ and $R^4$ may represent, together with the nitrogen atom to which they are bonded, a cyclic group which may further contain an oxygen or sulfur atom.

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**5,498,635**

## TRI(LOWER ALKOXY) BENZENE DERIVATIVES

**Hiromu Hara, Abiko; Tatsuya Maruyama; Munetoshi Saito, both of Tsukuba, and Toshiyasu Mase, Matsudo, all of, Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan**

**Division of Ser. No. 50,002, Dec. 22, 1993, Pat. No. 5,401,775. This application Sep. 28, 1994, Ser. No. 314,057**

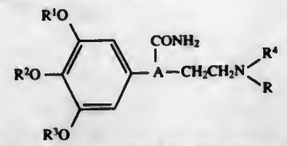
**Claims priority, application Japan, Jan. 25, 1990, 2-287973**

**Int. Cl.[6] A61K** *31/165*

**U.S. Cl. 514—620** **4 Claims**

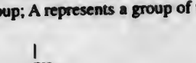
1. A method of treating or preventing respiratory ailments in a patient which comprises administering to the patient a therapeuti-

cally effective amount of compound of general formula (I) or pharmaceutically acceptable salt thereof:



(I)

wherein $R^1$, $R^2$ and $R^3$, which are the same or different, each represents a lower alkyl group; A represents a group of the formula



and $R^4$ and $R^5$, which are the same or different, each represents a lower alkyl group, an aralkyl group or an aryl group.

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**5,498,636**

**TREATMENT OF ANGINA PECTORIS**

**Arthur H. Goldberg, Montclair, N.J., and Leonard Lachman, Fort Salonga, N.Y., assignors to RiboGene, Inc., Hayward, Calif.**

**Continuation of Ser. No. 53,440, Apr. 28, 1993, abandoned, which is a continuation of Ser. No. 850,494, Mar. 13, 1992, abandoned. This application Dec. 2, 1994, Ser. No. 349,149**

**Int. Cl.[6] A61K** *31/535;31/405;31/165;31/135*

**U.S. Cl. 514—652** **18 Claims**

1. A method for the acute treatment of a person having angina pectoris comprising nasally or intravenously administering a β-adrenergic-blocking agent systemically to provide an essentially immediate, therapeutically effective amount of blocking agent to a person while said person is experiencing an attack of angina pectoris in a single dose range of about 2.5 to 30 mg.

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**5,498,637**

**SUN RISE LOTION**

**Ronald E. Timmermeyer, Sr., P.O. Box 2547, Van Nuys, Calif. 91404, and Susan K. Zarp, 6549 Balcom Ave., Reseda, Calif. 91335**

**Filed Oct. 12, 1994, Ser. No. 321,544**

**Int. Cl.[6] A61K** *7/40;7/48*

**U.S. Cl. 424—195.1** **1 Claim**

1. A method of moisturizing the skin by spraying or splashing an effective amount of a body lotion consisting of

Fresh squeezed lemon juice ½ oz.

Extra virgin olive oil 1 and ⅜ ozs.

Tap water 17 and ⅛ ozs.

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**5,498,638**

**STAGED HYDROCARBON SYNTHESIS PROCESS**

**David C. Long, Boonton, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.**

**Filed Apr. 29, 1994, Ser. No. 236,905**

**Int. Cl.[6] C07C** *27/00;1/00*

**U.S. Cl. 518—706** **9 Claims**

1. A once through hydrocarbon synthesis process which comprises reacting in a first stage or stages, a feed comprising hydrogen and carbon monoxide, and optionally $CO_2$, in the presence of a non-shifting hydrocarbon synthesis catalyst containing cobalt or ruthenium, recovering the product therefrom, condensing liquids from the product and reacting the remaining gases in a subsequent stage or stages in the presence of a hydrocarbon synthesis catalyst having shifting activity, and recovering the products therefrom.

**5,498,639**

**TRIFLUOROSTYRENE AND SUBSTITUTED TRIFLUOROSTYRENE COPOLYMERIC ION-EXCHANGE MEMBRANES**

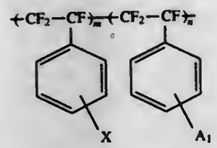
**Jinzhu Wei, Burnaby; Charles Stone, Vancouver, and Alfred E. Steck, West Vancouver, all of, Canada, assignors to Ballard Power Systems Inc., North Vancouver, Canada**

**Continuation of Ser. No. 124,924, Sep. 21, 1993, Pat. No. 5,422,411. This application May 16, 1995, Ser. No. 442,206**

**Int. Cl.[6] C08J** *5/22;* **C08F** *14/18*

**U.S. Cl. 521—27** **6 Claims**

1. A polymeric membrane comprising:



where m is an integer greater than zero, n is an integer greater than zero, $A_1$ is selected from the group consisting of fluorine and $CF_3$, and X is $SO_3H$.

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**5,498,640**

**EXPANDABLE THERMOPLASTIC POLYMERS CONTAINING ORGANIC BORON-SILICON COMPOUNDS, AND A PROCESS FOR THEIR PREPARATION**

**Michael Witt, Ludwigshafen, and Rolf Henn, Ketsch, both of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany**

**Filed Feb. 1, 1995, Ser. No. 379,527**

**Claims priority, application Germany, Sep. 21, 1992, 42 31 512**

**Int. Cl.[6] C08J** *9/16*

**U.S. Cl. 521—59** **12 Claims**

1. An expandable thermoplastic polymer in particle form, comprising a) at least one boron-siloxane elastomer, b) at least one thermoplastic polymer, and c) a blowing agent.

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**5,498,641**

**POLYMERIZABLE COMPOSITION CONTAINING PYRROMETHENE TYPE COLORING MATTER AND TITANOCENE COMPOUND**

**Toshiyuki Urano, Chiba; Hideki Nagasaka, Yamato; Masaaki Tsuchiyama, Machida, and Hiroshi Ide, Sagamihara, all of, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan**

**Filed Apr. 8, 1994, Ser. No. 224,879**

**Claims priority, application Japan, Apr. 9, 1993, 5-083587; Feb. 4, 1994, 6-012949; Feb. 16, 1994, 6-019240**

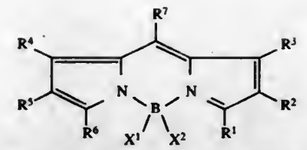
**Int. Cl.[6] C08F** *2/50;4/14;4/649*

**U.S. Cl. 522—26** **12 Claims**

1. A photopolymerizable composition comprising at least an addition polymerizable compound and a photopolymerization initiator system, wherein the addition polymerizable compound has at least one ethylenically unsaturated double bond, and the photopolymerization initiator system comprises:

(a) a sensitizer of the following formula (I):





(I)

wherein each of $R^1$, $R^3$, $R^4$ and $R^6$ is a hydrogen atom or an alkyl group having from 1 to 6 carbon atoms, each of $R^2$ and $R^5$ is a hydrocarbon atom, an alkyl group having from 1 to 6 carbon atoms, an alkoxycarbonyl group having from 1 to 3 carbon atoms in its carbon chain, $—SO_2C_2H_5$ or $—SO_3—R^8$, wherein $R^8$ is $—I^+(Ph)_2$, $—CH_2PhCO_2C_2H_5$, an alkali metal atom or a quaternary ammonium group, wherein Ph is phenyl group, $R^7$ is a hydrogen atom, an alkyl group having from 1 to 20 carbon atoms, and each of $X^1$ and $X^2$ is a halogen atom, and

(b) a titanocene compound capable of generating radicals when irradiated in the presence of the sensitizer.

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**5,498,642**

**RADIATION SURFACE-CURABLE, ROOM TEMPERATURE VULCANIZING SILICONE COMPOSITIONS**

**Hsien-Kun Chu, Wethersfield, and Robert P. Cross, Simsbury, both of Conn., assignors to Loctite Corporation, Hartford, Conn.**

**Continuation-in-part of Ser. No. 218,452, Mar. 25, 1994, abandoned, which is a division of Ser. No. 14,143, Feb. 19, 1993, Pat. No. 5,300,608, which is a continuation-in-part of Ser. No. 861,143, Mar. 31, 1992, abandoned. This application Jul. 15, 1994, Ser. No. 276,019**

**Int. Cl.[6] C08F** *2/46*

**U.S. Cl. 522—99** **13 Claims**

1. A liquid-phase radiation surface-curable RTV silicone composition which in exposure to radiation forms a solid skin layer overlying uncured liquid of said composition, and which subsequent to radiation surface curing thereof, is interiorly moisture-curable in character in said uncured liquid overlaid by said solid skin layer formed by said exposure to radiation, said radiation surface-curable, subsequently interiorly moisture-curable RTV silicone composition comprising:

an unsaturated functional group endcapped silicone wherein said endcapped silicone is formed by reacting a silanol-terminated silicone with a non-mercapto-group containing silane cross-linker for the silicone, such cross-linker having the formula:

$$R_aSiX_b$$

wherein:

R is selected from the group consisting of monovalent ethylenically unsaturated radicals selected from the group consisting of vinyl, propenyl, butenyl, pentenyl, hexenyl, octenyl, allyl, alkenyloxy, alkenylamino, allyloxy, and allylamino; $C_1$–$C_8$ alkyl, $C_6$–$C_{12}$ aryl, $C_7$–$C_{18}$arylalkyl, $C_7$–$C_{18}$ alkylaryl, and X;

X is a monovalent functionality imparting moisture-curability to the functional group endcapped silicone;

a has a value of 1 or 2;

b has a value of 2 or 3; and

a+b=4;

with the proviso that when a is 1, R is a monovalent ethylenically unsaturated radical, and that when a is 2, at least one R is a monovalent ethylenically unsaturated radical;

and said endcapped silicone has a number average molecular weight of at least about 5000 as determined by nuclear magnetic resonance; and

a photoinitiator effective for radiation surface curing of the silicone composition.

**5,498,643**

**METHOD AND COMPOSITION FOR PROMOTING IMPROVED ADHESION TO SUBSTRATES**

**Joseph M. Antonucci, Kensington, and Patricia A. Bennett, Germantown, both of Md., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.**

**Filed Feb. 1, 1994, Ser. No. 189,709**

**Int. Cl.[6] A61K** *6/08;* **A61C** *5/00*

**U.S. Cl. 523—118** **25 Claims**

1. An etchant/primer/adhesive monomer composition comprising:

a compound having the formula

$$RN(CH_2YCO_2M)_2 \quad \text{(I)}$$

wherein R=$R^1$ or $R^2$;

$R^1$=an aromatic group;

$R^2$=a conjugated aliphatic group;

Y=a single bond, $CH_2$, $CHCH_3$ or $C{=}CH_2$; and

each M is independently H, an alkali metal, an alkaline earth metal, aluminum, a transition or redox metal or an alkyl group having 1 to 18 carbon atoms, with the proviso that when both M groups are alkyl groups, the compound corresponding to formula I be capable of being easily hydrolyzed, displaced, or exchanged with other reagents present in the etchant/primer composition;

a polar solvent; and

an adhesive monomer system.

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**5,498,644**

**SILICONE ELASTOMER INCORPORATING ELECTRICALLY CONDUCTIVE MICROBALLOONS AND METHOD FOR PRODUCING SAME**

**Ned J. Reo, Scotia, N.Y., assignor to Specialty Silicone Products, Inc., Ballston Spa, N.Y.**

**Filed Sep. 10, 1993, Ser. No. 119,997**

**Int. Cl.[6] C08J** *9/32;* **C08K** *3/08;* **H01B** *1/06;* **H01F** *1/26*

**U.S. Cl. 523—218** **14 Claims**

1. A method for making a silicone rubber composition moldable to an electromagnetic interference shielding material having substantially uniform electrical conductivity, which method comprises: blending (A) a heat curable silicone rubber composition comprising vinylmethylsiloxane, an effective amount of an inhibited platinum catalyst, and methylhydrogensiloxane, with (B) a slurry comprising (I) nonconductive microballoons surface coated with a magnetic electrically conductive material, and (II) a room temperature vulcanizable silicone rubber comprising, vinylmethylsiloxane, an effective amount of a platinum catalyst, and a methylhydrogensiloxane, where the microballoons of (B) have a specific gravity is in the range of 0.2 to 2.0 and are utilized in an amount sufficient to produce an electromagnetic interference shielding material having a specific gravity of less than 1.5.

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**5,498,645**

**MODELING DOUGH**

**Karen M. Mariano; Thomas Kauffman, both of Easton, and Stacey A. Gregor, Allentown, assignors to Binney & Smith Inc., Easton, Pa.**

**Continuation-in-part of Ser. No. 990,599, Dec. 14, 1992, Pat. No. 5,364,892, which is a continuation-in-part of Ser. No. 734,951, Jul. 24, 1991, Pat. No. 5,171,766. This application Oct. 11, 1994, Ser. No. 320,880**

**Int. Cl.[6] C08K** *3/26;3/34;5/01;* **C08L** *29/04*

**U.S. Cl. 523—218** **16 Claims**

1. A moldable modeling dough composition comprising a polar polymeric resin, water, a gellant, and a filler, wherein said polar polymeric resin is selected from the group consisting of fully hydrolyzed copolymers of vinyl alcohol and methacrylic acid and fully hydrolyzed copolymers of vinyl alcohol and acrylic acid.

5,498,646

## PRODUCTION OF BLOCK POLYMER ADHESIVES

Glenn C. Heuer, Forest Lake, and George F. Bateson, Fridley, both of Minn., assignors to H. B. Fuller Licensing & Financing, Inc., Arden Hills, Minn.

Continuation-in-part of Ser. No. 996,830, Dec. 23, 1992, Pat. No. 5,403,874. This application Sep. 6, 1994, Ser. No. 301,905

Int. Cl.[6] C08J 3/205

U.S. Cl. 523—344 13 Claims

1. A method of preparing pressure sensitive adhesive compositions comprising: forming a mixture comprised of oil, resin and block polymer, subjecting the mixture to mixing in an emulsifier/disperser accompanied by shearing and smearing for mechanically deforming and dispersing the block polymer throughout the mixture at a mixing speed such as to provide a smooth mixture in about one hour or less.

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5,498,647

## RESORCINOL GLUTARALDEHYDE RESIN AS AN ACCELERATOR FOR CURING PHENOLIC FORMALDEHYDE RESINS

David W. Shiau; William D. Detlefsen, both of Eugene, and Earl K. Phillips, Springfield, all of Oreg., assignors to Borden, Inc., Columbus, Ohio

Division of Ser. No. 269,111, Jun. 30, 1994, Pat. No. 5,446,089, which is a division of Ser. No. 991,228, Dec. 15, 1992, Pat. No. 5,364,902. This application Jun. 7, 1995, Ser. No. 487,337

Int. Cl.[6] C08K 11/00

U.S. Cl. 524—14 3 Claims

1. A composition for the production of cellulosic board comprising

(a) separate cellulosic components, and

(b) an effective amount of binder

wherein said binder comprises an aqueous solution of a alkaline phenol-formaldehyde resole resin; wherein said binder when mixed with the separate cellulosic components is capable of consolidating the components together to form cellulosic board when placed under sufficient heat and pressure to effect curing of said binder, and

wherein said binder further comprises resorcinol-glutaraldehyde resin as an accelerator for curing said phenol-formaldehyde resin and wherein the amount of said accelerator in said binder is in the range of from about 1% to about 33% by weight based on the weight said phenol-formaldehyde resin.

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5,498,648

## PAPER SIZE MIXTURES

Arnold de Clercq, Dirmstein; Roland Ettl, Hassloch; Carlos A. Goncalves, Ludwigshafen; Lothar Hoehr, Worms; Andreas Hohmann, Ludwigshafen, and Ulrich Riebeling, Schifferstadt, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP93/02259, § 371 Date Mar. 1, 1995, § 102(e) Date Mar. 1, 1995, PCT Pub. No. WO94/05855, PCT Pub. Date Mar. 17, 1994

PCT Filed Aug. 23, 1993, Ser. No. 393,001

Claims priority, application Germany, Sep. 1, 1992, 42 29 142.9

Int. Cl.[6] C08L 3/00;89/00; C09D 4/00

U.S. Cl. 524—47 5 Claims

1. A paper size mixture which is prepared by mixing an aqueous suspension of a digested cationic starch with a finely divided, aqueous 0.5–5% strength by weight polymer dispersion which is a paper size and emulsifying a $C_{14}$–$C_{22}$-alkyldiketene in this mixture at not less than 70° C.

5,498,649

## LOW DENSITY THERMOPLASTIC ELASTOMERIC INSULATION FOR ROCKET MOTORS

David G. Guillot, Tremonton, Utah, assignor to Thiokol Corporation, Ogden, Utah

Filed May 18, 1993, Ser. No. 63,511

Int. Cl.[6] C08K 5/52;5/3477;3/32;3/02

U.S. Cl. 524—100 19 Claims

1. A low density thermoplastic elastomeric ablative insulation comprising:

a thermoplastic elastomeric polymer resin containing a polyamide polymer and a maleic anhydride modified ethylene-propylene-diene terpolymer polymer, wherein the weight ratio of polyamide polymer to maleic anhydride modified ethylene-propylene-diene terpolymer is in the range from about 20:80 to about 30:70; and

a phosphorus-containing compound selected from ammonium polyphosphates, phosphazenes, elemental (red) phosphorous, melamine amylphosphate, and mixtures thereof present in the insulation from about 20 phr to about 30 phr.

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5,498,650

## POLY(LACTIC ACID) COMPOSITION HAVING IMPROVED PHYSICAL PROPERTIES

Edmund A. Flexman, and William E. Kelly, Jr., both of Wilmington, Del., assignors to Ecological Chemical Products, Wilmington, Del.

Filed Feb. 24, 1995, Ser. No. 393,773

Int. Cl.[6] C08K 5/15

U.S. Cl. 524—114 8 Claims

1. A poly(lactic acid) composition which is a homogeneous solid solution comprising

(a) A polymer having a number average molecular weight of 3,000–200,000 selected from the group consisting of (1) poly-(lactic acid), (2) copolymers of lactic acid containing at least 50 mole % lactic acid units, and (3) mixtures thereof, and

(b) 7–25% wt., basis total composition weight, of an epoxidized oil plasticizer selected from the group consisting of (1) epoxidized soy bean oil, (2) epoxidized linseed oil and (3) mixtures thereof.

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5,498,651

## METHOD FOR POLYMERIZING MACROCYCLIC POLYESTER OLIGOMERS

Daniel J. Brunelle, Burnt Hills, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 19, 1995, Ser. No. 497,694

Int. Cl.[6] C08K 5/00

U.S. Cl. 524—176 12 Claims

1. A method for polymerizing macrocyclic polyester oligomers comprising the step of contacting in the presence of at least one compound selected from the group consisting of epoxides and episulfides:

(a) macrocyclic polyester oligomers; and

(b) polymerization catalysts.

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5,498,652

## OMEGA-ACETOXY N-SUBSTITUTED AMIDES AND THEIR USE IN POLYOLEFINS

Bing-Lin Chen, Germantown, Tenn., assignor to Witco Corporation, Greenwich, Conn.

Filed Aug. 18, 1994, Ser. No. 292,526

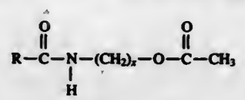
Int. Cl.[6] C08K 5/20

U.S. Cl. 524—219 7 Claims

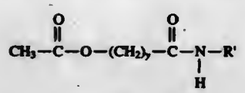
1. A composition of matter comprising a film forming polyolefin, a finely divided inorganic material and an omega-acetoxy



N-substituted carbonamide selected from the group consisting of (1) an N-(omega-acetoxyalkyl) carbonamide having the formula of:



wherein x is 1 to 6, R is alkenyl or alkyl group of 11 to 23 carbon atoms and (2) an N-alkenyl omega acetoxycarbonamide of the formula:



wherein y is 1 to 15, R' is alkenyl group of 12 to 24 carbon atoms, and the finely divided organic material and acetoxy carbonamide are present in effective amounts to improve the slip or printability or adhesion to water-based inks of films of the composition.

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5,498,653

## ROSIN CARBOXYPYRROLIDINONE ADDUCTS

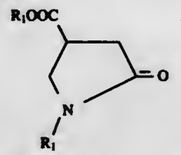
G. Frederick Hutter, Charleston, S.C., assignor to Westvaco Corporation, New York, N.Y.

Division of Ser. No. 419,920, Apr. 11, 1995, which is a continuation-in-part of Ser. No. 352,385, Dec. 8, 1994, abandoned. This application Jul. 5, 1995, Ser. No. 498,220

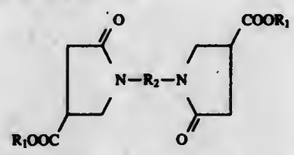
Int. Cl.[6] C08L 93/04; C08F 2/24

U.S. Cl. 524—272 6 Claims

1. An acrylic latex composition comprising the composition produced by polymerizing a monomer in the presence of a water-soluble resin reaction product of a rosin modified sequentially by reaction first with a member selected from the group consisting of fumaric acid, maleic acid, maleic anhydride, itaconic acid, and itaconic anhydride and, second, with a hydroxyl-containing carboxypyrrolidinone derivative having a chemical structure selected from the group consisting of



where $R_1$, independently, is a H, a $C_1$–$C_{20}$ hydrocarbyl, or a $C_1$–$C_{20}$ hydroxyl-substituted hydrocarbyl; and at least one $R_1$ contains a hydroxyl group, and



where $R_1$, independently, is a H, a $C_1$–$C_{20}$ hydrocarbyl, or a $C_1$–$C_{20}$ hydroxyl-substituted hydrocarbyl; and at least one $R_1$ contains a hydroxyl group, and $R_2$ is a $C_1$–$C_{36}$ hydrocarbyl or a $C_1$–$C_{36}$ hydroxyl-substituted hydrocarbyl.

5,498,654

## SLIDING BEARING MATERIAL

Kelichi Shimasaki; Hiroshi Ito; Yasushi Yamaguchi, and Hiroaki Hayakawa, all of Aichi, Japan, assignors to Taiho Kogyo Co., Ltd., Toyota, Japan

PCT No. PCT/JP93/00754, § 371 Date Feb. 2, 1994, § 102(e) Date Feb. 2, 1994

PCT Filed Jun. 4, 1993, Ser. No. 182,174

Claims priority, application Japan, Jun. 5, 1992, 4-169968

Int. Cl.[6] C08K 3/22;3/04; C08L 67/03;27/12

U.S. Cl. 524—432 7 Claims

1. Sliding bearing material comprising aromatic polyester-resin particles, or at least one of spherical-carbon particles and zinc-oxide whisker, dispersed in a matrix consisting of polytetrafluoroethylene.

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5,498,655

## AQUEOUS POLYMER DISPERSION

Oral Aydin, Mannheim; Michael Portugall, Wachenheim; Josef Neutzner, Neustadt, and Walter Maechtle, Ludwigshafen, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Division of Ser. No. 149,796, Dec. 22, 1993, Pat. No. 5,426,146, which is a division of Ser. No. 51,555, Apr. 23, 1993, abandoned. This application Jun. 17, 1995, Ser. No. 373,870

Claims priority, application Germany, Apr. 29, 1992, 42 13 969.4

Int. Cl.[6] C08L 3/08

U.S. Cl. 524—458 28 Claims

1. A process for preparing an aqueous polymer dispersion having a solids volume concentration of at least 50% by volume, which comprises polymerizing at least one radical polymerizable monomer other than a vinyl or vinylidene halide with the addition of at least one aqueous starting polymer dispersion I in a polymerization vessel by the method of free radical aqueous emulsion polymerization in the presence of dispersants and free radical polymerization initiators with the proviso that

A) the mass of polymer contained in the at least one aqueous starting polymer dispersion I added relative to the total mass comprising the mass of the at least one radical polymerizable monomer and the mass of polymer added in the form of the aqueous starting polymer dispersion I is from 1 to 10%,

B) the at least one aqueous starting polymer dispersion I added is constituted like an aqueous polymer dispersion obtained by adding together n aqueous starting polymer dispersions II with the proviso that

a) n is an integer > 2,

b) the weight average particle diameter of the starting polymer particles present in dispersion in the respective aqueous starting polymer dispersions II is for every aqueous starting polymer dispersion II within the range > 0 to 400 nm,

c) the weight average particle diameter of the starting polymer particles of at least one aqueous starting polymer dispersion II is within the range > 0 to 100 nm,

d) the aqueous starting polymer dispersions II have a monomodal distribution of the diameters of the starting polymer particles they contain such that, if $d_x$ defines the diameter below which is the particle diameter of X % by weight of all the starting polymer particles present in the particular aqueous starting dispersion II, the ratio $(d_{90}-d_{10})/d_{50}$ is from 0.1 to 0.6,

e) the relation between the volume $V_i$, obtained by dividing the mass of the i-th starting polymer II present in the i-th aqueous starting polymer dispersion II by the mass density of the i-th starting polymer II, and the similarly determined volume $V_j$, providing that not only the weight average particle diameter ($\bar{d}_{w,i}$) of the starting polymer particles present in the i-th aqueous starting polymer dispersion II but also $\bar{d}_{w,j}$ is above 100 nm, satisfies equation 1

$$V_i = V_j \cdot k \cdot \left( \frac{\bar{d}_{w,i}}{\bar{d}_{w,j}} \right)^2$$

where k is from 1/1.5 to 1.5,

f) the relation between the weight average particle diameter ( $\bar{d}_{w,\leq 100}$) of the starting polymer particles determined over the total amount of all the aqueous starting polymer dispersions II that have a weight average particle diameter of the starting polymer particles they contain within the range >0 to ≦100 nm, and the weight average particle diameter $\bar{d}_{w,i}$ of the starting polymer particles present in the i-th aqueous starting polymer dispersion II, providing that $\bar{d}_{w,i}$ is > 100 nm, satisfies equation 2

$$V_i = V_{\leq 100} \cdot k' \left( \frac{\bar{d}_{w,i}}{\bar{d}_{w,\leq 100}} \right)^2$$

where k' is from 0.5 to 5, $V_i$ is the mass of the starting polymer present in the i-th aqueous starting polymer dispersion II divided by the mass density of the starting polymer, $V_{\leq 100}$ is the mass of the starting polymer present in the total amount of all aqueous starting polymer dispersions II that have a weight average particle diameter of the starting polymer particles they contain within the range >0 to ≦100 nm, divided by the mass density of the starting polymer,

g) $V_{\leq 100}$ is from 0.3 to 10% by volume, based on the sum of all $V_i$, and

h) the difference between the smallest and the largest weight average particle diameter $\bar{d}_{w,i}$ of the aqueous starting polymer dispersions II present in the aqueous starting polymer dispersion I is at least 150 nm,

C) the total amount of the at least one aqueous starting polymer dispersion I to be added is introduced into the polymerization vessel as initial charge prior to the start of the free radical aqueous emulsion polymerization, and

D) the free radical aqueous emulsion polymerization of the at least one radical polymerizable monomer is effected by the stream addition method with the proviso that

from the start of the free radical aqueous emulsion polymerization the addition of the at least one radical polymerizable monomer to the polymerization vessel is effected in such a way that at any time of the addition the polymerization conversion of the total monomers already added previously to the polymerization vessel is at least 80 mol %, and

the amount of dispersant present in the polymerization vessel is at any time from the start of the free radical aqueous emulsion polymerization from 0.5 to 5% by weight, based on the sum of the masses of starting polymer I and the monomers to be polymerized already added to the polymerization vessel.

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**5,498,656**

## POLYVINYL ALCOHOL MOLDING RESIN COMPOSITION

**Yusuke Morita; Masami Fukushima, both of Saitama; Fumio Getou, and Shigeo Aoki, both of Tokyo, all of, Japan, assignors to Shin-Etsu Polymer Co., Ltd., and Akishima Chemical Industries Co., Ltd., both of Tokyo, Japan**

**Filed Mar. 31, 1995, Ser. No. 414,296**

**Claims priority, application Japan, Mar. 31, 1994, 6-063224**

**Int. Cl.[6] C08K** *5/52;5/42*

**U.S. Cl. 524—140** **6 Claims**

1. A polyvinyl alcohol molding resin composition which comprises, as a uniform blend:

(a) 100 parts by weight of a polyvinyl alcohol resin; and

(b) from 0.01 to 30 parts by weight of an additive ingredient selected from the group consisting of:

(b1) a metal salt of an organic sulfonic acid represented by the general formula

$(R^1SO_3)_xM$,

in which $R^1$ is an alkyl group, alkoxy group, diaryl ether group or alkaryl group having from 10 to 24 carbon atoms, M is an atom of an alkali metal or an alkaline earth metal and the subscript x is 1, when M is an atom of an alkali metal, or 2, when M is an atom of an alkaline earth metal;

(b2) a polyoxyethylene phosphoric acid ester represented by the general formula

$R^2O(CH_2CH_2O)_nPO\{O(CH_2CH_2O)_mR^3\}_{2-y}(OH)_y$,

in which $R^2$ and $R^3$ are each, independently from the other, an alkyl or alkaryl group having 4 to 24 carbon atoms, the subscript y is 1 or 2 and the subscripts n and m are each, independently from the other, a positive integer not exceeding 100;

and a combination of (b1) and (b2).

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**5,498,657**

## FLUORINE-CONTAINING POLYMER COMPOSITION

**Norihide Sugiyama, Tokyo; Atsushi Watakabe; Shunsuke Yokotsuka, both of Yokohama; Atsuo Hirol, Funabashi; Masaki Naritomi, Tokyo; Naoko Shirota, Yokohama; Ko Aosaki, Tokyo, and Masaru Nakamura, Yokohama, all of, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan, and Iwaki Glass Company Ltd., Funabashi, Japan**

**Filed Aug. 26, 1994, Ser. No. 296,469**

**Claims priority, application Japan, Aug. 27, 1993, 5-235671; Aug. 27, 1993, 5-235673; Dec. 15, 1993, 5-315072; Mar. 11, 1994, 6-041465; Mar. 31, 1994, 6-063949; Apr. 26, 1994, 6-088941**

**Int. Cl.[6] C08J** *5/00;* **C08F** *14/18;14/26;* **B32B** *27/00*

**U.S. Cl. 524—463** **14 Claims**

1. A fluorine-containing polymer composition comprising a polymer having a functional group and a fluorine-containing aliphatic cyclic structure dissolved in a solvent mixture of an aprotic fluorine-containing solvent and a protic fluorine-containing solvent.

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**5,498,658**

## FORMALDEHYDE-FREE LATEX FOR USE AS A BINDER OR COATING

**Naser Pourahmady, Solon; Gary A. Anderle, North Olmsted, and Alex S. Williamson, Brecksville, all of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio**

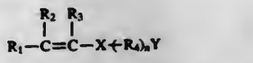
**Filed Nov. 17, 1994, Ser. No. 340,985**

**Int. Cl.[6] C08L** *33/14;31/06;33/24*

**U.S. Cl. 524—502** **13 Claims**

1. A formaldehyde-free, self-curing interpolymer comprising repeating units derived from

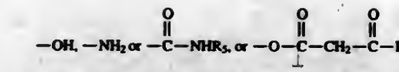
a) about 4 to about 30 percent by weight of at least one functional monomer comprising an olefinically unsaturated monomer containing a nucleophile group represented by the following formula:



where $R_1$, $R_2$ and $R_3$ are hydrogen or a methyl group, $R_4$ is an alkyl containing 1 to 4 carbon atoms, n is 0 or 1, X is selected from the group consisting of carboxyl, phenyl, aryl, alkyl or alkaryl groups containing 1 to 30 atoms,

and Y is a nucleophilic group selected from —$NH_2$





wherein $R_5$ is selected from the group consisting of a hydrogen, an alkyl containing 1–20 carbon atoms, or an aryl group;

b) about 4 to about 40 percent by weight of an olefinically unsaturated dicarboxylic acid;

c) about 1 to about 60 percent by weight of (meth)acrylonitrile;

d) about 0 to about 80 percent by weight of at least one monomer comprising a (meth)acrylic acid ester of an alcohol containing 1 to 30 carbon atoms; and

e) about 0 to about 80 percent by weight of at least one monomer selected from the group consisting of styrene, vinyl acetate, and vinyl halides, wherein at least one of the monomers d) or e) are present in an amount of from about 0.1 percent by weight.

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**5,498,659**

## CROSSLINKABLE SURFACE COATINGS

**Richard J. Esser, Aarlanderveen, Netherlands, assignor to S. C. Johnson & Son, Inc., Racine, Wis.**

**Continuation of Ser. No. 833,250, Feb. 10, 1992, abandoned. This application Oct. 7, 1994, Ser. No. 320,795**

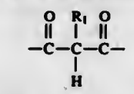
**Int. Cl.[6] C08L** *37/00*

**U.S. Cl. 524—549** **20 Claims**

1. A single-package aqueous polymeric formulation that is stable for extended periods of time consisting essentially of:

an evaporable aqueous carrier;

at least one polymeric ingredient contained within the aqueous carrier and consisting essentially of both acid-functional pendant moieties and pendant moieties having the ability to form stable enamine structures by reaction with amines which contain a divalent group of the structure



wherein $R_1$ is either H, a $C_1$ to $C_{10}$ alkyl group, or phenyl wherein each polymeric ingredient has an acid number in the range of from about 30 to about 300,

a non-polymeric polyfunctional amine also contained within the aqueous carrier and having a least two amine functional moieties; and

an effective amount of base, in the aqueous carrier, for inhibiting gelation, which would otherwise occur as a result of crosslinking to the point of gelation between the pendant moieties having the ability to form stable enamine structures and the amine-functional moieties while both are contained within the aqueous carrier; wherein the formulation is stable for at least 12 months at 20° C. and wherein the only mutually reactive pendant moieties present in the composition which crosslink are the pendant moieties having the ability to form stable enamine structures and the amine-functional moieties.

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**5,498,660**

## SILICONE RUBBER COMPOSITIONS AND METHOD FOR MAKING

**Masaharu Takahashi, and Manabu Narumi, both of Usui, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan**

**Filed Dec. 20, 1994, Ser. No. 360,094**

**Claims priority, application Japan, Dec. 21, 1993, 5-345208**

**Int. Cl.[6] C08K** *5/04*

**U.S. Cl. 524—730** **5 Claims**

1. A method for preparing a silicone rubber composition which can be cured without foaming, said method comprising the steps of:

mixing and milling 100 parts by weight of (A) diorganopolysiloxane of the following average compositional formula (1):

$$R_1{}^1SiO_{4-a/2} \quad (1)$$

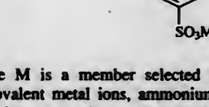
wherein $R^1$ is a substituted or unsubstituted monovalent hydrocarbon group, 0.01 to 15 mol % of the $R^1$ groups being an aliphatic unsaturated hydrocarbon group, and letter a is a positive number in the range of 1.95 to 2.05, and 5 to 200 parts by weight of (E) a reinforcing filler to form a base compound, and

simultaneously mixing into the base compound

(B) an organohydrogenpolysiloxane having at least two SiH groups in a molecule in such an amount that 0.5 to 10 mol of the SiH group is present per mol of the aliphatic unsaturated hydrocarbon group of component (A),

a catalytic amount of (C) a platinum group metal catalyst, and

0.1 to 20 parts by weight of (D) an organic silicon compound of the following general formula (2):



(2)

wherein $R^2$, $R^5$, and $R^6$ are independently selected from substituted or unsubstituted monovalent hydrocarbon groups free of an aliphatic unsaturated bond, $R^3$ is a substituted or unsubstituted monovalent hydrocarbon group, $R^4$ is a hydrogen atom or methyl group, and letter n is an integer of 0 to 3.

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**5,498,661**

## BINDER FOR CHEMICAL-RESISTANT INKS

**G. Frederick Hutter, Charleston, S.C., assignor to Westvaco Corporation, New York, N.Y.**

**Continuation-in-part of Ser. No. 299,161, Aug. 29, 1994, abandoned. This application May 9, 1995, Ser. No. 437,626**

**Int. Cl.[6] C08K** *5/15*

**U.S. Cl. 524—753** **4 Claims**

1. A binder composition for use in formulating chemical-resistant aqueous printing inks, wherein said binder composition is prepared by a process comprising reacting in an addition emulsion polymerization reaction:

(a) 100.0 parts by total weight of the binder composition of a monomer mixture comprising:

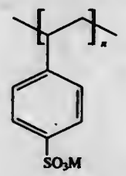
(1) 2.0 to 10.0% by total weight of the monomer mixture of an epoxy-containing monomer,

(2) 2.0 to 10.0% by total weight of the monomer mixture of acetoacetoxyethyl methacrylate, and

(3) 80.0 to 96.0% by total weight of the monomer mixture of a member selected from the group consisting of styrene, α-methylstyrene, alkyl acrylates wherein the alkyl group contains from 1 to 18 carbon atoms, methacrylates wherein the alkyl group contains from 1 to 18 carbon atoms, and combinations thereof;

(b) 10.0 to 30.0 parts by total weight of the binder composition of a water-soluble acrylic support resin having a number average molecular weight of about 3,000 to about 10,000 and an acid number of about 160 to about 240; and

(c) 0.5 to 4.0 parts by total weight of the binder composition of a sulfonated polystyrene salt of the structure



where M is a member selected from the group consisting of monovalent metal ions, ammonium ions, and substituted ammonium ions, to produce a latex; then add to the latex

(d) 0.5 to 5.0 parts by total weight of the binder composition of an amine selected from the group consisting of amines containing at least 1 primary amine group and at least 1 secondary amine group, amines containing at least 2 primary amine groups, amines containing at least 2 secondary amine groups, and combinations thereof; thereby crosslinking the epoxy groups of said epoxy-containing monomer to produce said binder composition.

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**5,498,662**

**GAS BARRIER FILM AND PRODUCTION PROCESS THEREOF**

**Hideaki Tanaka; Hiroyuki Oba; Tomoaki Sato, and Tomohisa Hasegawa, all of Ibaraki, Japan, assignors to Kureha Kagaku Kogyo K.K., Tokyo, Japan**

**Filed Oct. 18, 1994, Ser. No. 324,541**

**Claims priority, application Japan, Jan. 20, 1993, 5-285739; Jul. 27, 1994, 6-194940**

**Int. Cl.[6] C08L** *3/00;5/00;33/02*

**U.S. Cl. 525—54.2** **13 Claims**

1. A gas barrier film formed from a mixture containing (A) at least one poly(meth)acrylic acid polymer selected from the group consisting of poly(meth)acrylic acid and partially neutralized products of poly(meth)-acrylic acid and (B) a saccharide in a weight ratio of 95:5 to 20:80, and having an oxygen gas permeability coefficient of $5.00\times10^{-3}$ ml(STP).cm/m

L . h.atm{Pa} or lower as measured under conditions of 30° C. and 80% relative humidity.

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**5,498,663**

**POWDER COATING MATERIALS FOR PRODUCING CREPE-LIKE COATINGS, PREPARATION AND USE THEREOF**

**Eiji Shimada; Kenzo Maeda, both of Yokohama, and Shingo Okamoto, Fujisawa, all of, Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan**

**Division of Ser. No. 885,479, May 19, 1992, Pat. No. 5,321,063. This application Mar. 9, 1994, Ser. No. 208,608**

**Claims priority, application Japan, May 28, 1991, 3-124857; Mar. 31, 1992, 4-77834**

**Int. Cl.[6] C09D** *5/00;5/28*

**U.S. Cl. 525—54.3** **6 Claims**

1. A power coating material for providing a crepe-like pattern coating, comprising a co-milled pulverous mass with particle sizes not higher than 105 μm, which is composed of

(A) 95–99.5 parts by weight of a first pelletized resin component comprising a first thermosetting resin which is a solid at room temperature, for the powder coating material and

(B) 5–0.5 parts by weight of a second pelletized resin component comprising a second thermosetting resin which is a solid at room temperature and contains 3–8% by weight of a cellulose ester, for the powder coating material, said second pelletized resin component being distributed uniformly over said first pelletized resin component.

**5,498,664**

**METHOD FOR COMPATIBILIZING RESINS WITH EACH OTHER AND RESIN COMPOSITION COMPRISING RESINS COMPATIBILIZED WITH EACH OTHER, OBTAINED BY SAID METHOD**

**Keso Kotani, Toyonaka; Toshio Kawakita, Ibaraki; Taiichi Sakaya, Takatsuki, and Ryuma Kuroda, Ibaraki, all of, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan**

**Filed Oct. 7, 1993, Ser. No. 132,899**

**Claims priority, application Japan, Jan. 8, 1992, 4-270086**

**Int. Cl.[6] C08L** *29/02;29/04*

**U.S. Cl. 525—56** **9 Claims**

1. A method for compatibilizing at least two different thermoplastic resins with each other, each said thermoplastic resin having hydroxyl group(s), wherein said at least two thermoplastic resins are selected from the group consisting of an ethylene-vinyl alcohol copolymer and a polyvinyl alcohol, wherein one of the at least two thermoplastic resins has 20–60% by weight of hydroxyl group(s) and the other is a thermoplastic resin having 0.01–5% by weight of hydroxyl group(s), which method comprises reacting at least one of said thermoplastic resins with a boron compound simultaneously with or before mixing of said resins, to form a boric acid ester at least at the boundary of said resin; and removing water formed during said reaction under kneading conditions.

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**5,498,665**

**USE OF POLYPROPYLENE GLYCOL AS A SHRINKAGE-REDUCING ADDITIVE IN DISPERSION POWDER COMPOSITIONS FOR CONSTRUCTION MATERIALS**

**Joachim Schulze, Burghausen, and Rainer Figge, Ampfing, both of, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany**

**Continuation of Ser. No. 74,027, Jun. 4, 1993, abandoned. This application Nov. 23, 1994, Ser. No. 344,401**

**Claims priority, application Germany, Jun. 4, 1992, 42 18 493.2**

**Int. Cl.[6] C08L** *61/10;33/04;29/04;25/06*

**U.S. Cl. 525—57** **11 Claims**

1. A redispersible dispersion powder composition for construction materials, said composition consisting essentially of

a) a base polymer selected from the group consisting of vinyl ester homopolymers, vinyl ester copolymers of vinyl acetate, or vinyl ester copolymers of saturated $C_3$–$C_8$ alkyl-carboxylic acids with other vinyl ester, vinyl ester/ethylene copolymers; vinyl ester/ethylene/vinyl chloride copolymers; vinyl ester/vinyl chloride copolymers; vinyl ester/maleic acid ester copolymers; vinyl ester/fumaric acid ester copolymers, homopolymers of methacrylic acid esters, homopolymers of acrylic acid esters, homopolymers of styrene, copolymers of styrene and acrylic acid esters, copolymers of styrene and methacrylic acid esters and copolymers of vinyl chloride and ethylene,

b) either

b1) 2 to 20% by weight, based on the base polymer, of polyvinyl alcohol having a degree of hydrolysis of 85 to 94 mol % and a Hoppler viscosity of 2 to 40 mPa.s or

b2) 2 to 20% by weight, based on the base polymer, of alkali metal salts or alkaline earth metal salts of phenolsulfonic acidformaldehyde condensation products, and

c) 3 to 30% by weight, based on the total weight of polymeric components, of antiblocking agents, and

d) 2 to 20% by weight, based on the base polymer of polypropylene glycol.



**5,498,666**

**CURABLE COMPOSITION SUITABLE AS TOP COAT**

**Toshiro Nambu; Masaharu Inoue; Seigo Nakamura, and Hisao Furukawa, all of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan**

**Filed Jul. 21, 1994, Ser. No. 278,340**

**Claims priority, application Japan, Jul. 22, 1993, 5-181597**

**Int. Cl.[6] C04L** *83/06*

**U.S. Cl. 525—100** **13 Claims**

1. A curable composition suitable as a top coat which comprises:

(A) a vinyl copolymer having a main chain consisting essentially of a vinyl copolymer and having in its molecule both at least one alcoholic hydroxyl group and at least one hydrolyzable silyl group, bonded to a carbon atom, of the formula (I):

$$(R^1O)_{3-a}-\underset{\displaystyle R^2}{\overset{\displaystyle |}{Si}}-$$

wherein $R^1$ is an alkyl group having 1 to 10 carbon atoms or an aryl group, $R^2$ is hydrogen atom or a monovalent hydrocarbon group selected from the group consisting of an alkyl group having 1 to 10 carbon atoms, an aryl group and an aralkyl group, and a is 0, 1 or 2, said copolymer having an alcoholic hydroxyl equivalent of 400 to 2,000 g where said alcoholic hydroxyl equivalent is the weight of said copolymer containing one gram equivalent of an alcoholic hydroxyl group,

(B) 1 to 200 parts of a silanol group-containing organopolysiloxane having at least one silanol group, and

(C) 0.001 to 10 parts of a curing catalyst, said parts of (B) and (C) being parts by weight per 100 parts by weight of said vinyl copolymer (A).

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**5,498,667**

**THERMOPLASTIC COMPOSITION AND METHOD FOR PRODUCING THERMOPLASTIC COMPOSITION BY MELT BLENDING CARPET**

**Donald J. David, Amherst, Mass.; Jerauld L. Dickerson, Pensacola, Fla.; Thomas F. Sincock, Westogue, Conn., and Susan R. Williams, Pace, Fla., assignors to Monsanto Company, St. Louis, Mo.**

**Continuation-in-part of Ser. No. 132,332, Oct. 6, 1993, abandoned, which is a division of Ser. No. 37,140, Mar. 25, 1993, Pat. No. 5,294,384. This application Mar. 2, 1995, Ser. No. 397,687**

**Int. Cl.[6] B29B** *17/00;* **B29C** *47/00*

**U.S. Cl. 525—166** **9 Claims**

1. A process for forming a thermoplastic composition from at least one carpet sample comprising a plurality of polymeric components, said sample including a plurality of polyester or polypropylene tufts, at least one polyolefin backing, and styrene-butadiene rubber adhesive, said process comprising the steps of:

(a) providing at least one unseparated carpet sample; and

(b) melt blending said unseparated carpet sample under conditions of temperature, pressure and intensive mixing sufficient to produce a thermoplastic composition wherein all of said polymeric components are reduced to a flowable liquid form.

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**5,498,668**

**BLENDS OF CERTAIN POLYESTERS WITH ACRYLICS**

**Christopher E. Scott, Watertown, Mass., assignor to Eastman Chemical Company, Kingsport, Tenn.**

**Filed Oct. 31, 1994, Ser. No. 336,131**

**Int. Cl.[6] C08L** *67/02*

**U.S. Cl. 525—173** **14 Claims**

1. A two-phase blend comprising:

(A) from 99% to 1% by weight of cycloaliphatic polyester or copolyester, and

(B) from 1% to 99% by weight of an acrylic polymer or copolymer,

wherein components (A) and (B) of said blend are selected from one of the following combinations:

(1) (A) a polyester consisting of 1,4-cyclohexanedicarboxylic acid and 90–50 mole % of 2,2,4,4-tetramethyl-1,3-cyclobutanediol, and 10–50 mole % of 1,4-cyclohexanedimethanol; and
(B) poly(methyl methacrylate);

(2) (A) a polyester consisting of 1,4-cyclohexanedicarboxylic acid and 40-1 mole % of 2,2,4,4-tetramethyl-1,3-cyclobutanediol, and 60–99 mole % of 1,4-cyclohexanedimethanol; and
(B) poly(cyclohexylmethacrylate);

(3) (A) a polyester consisting of 1,4-cyclohexanedicarboxylic acid and a glycol selected from the group consisting of neopentyl glycol and ethylene glycol; and
(B) poly(methyl methacrylate);

(4) (A) a polyester consisting of 1,4-cyclohexanedicarboxylic acid and 40–60 mole % 1,6-hexanediol and 60–40 mole % 1,8-octanediol; and
(B) poly(methyl methacrylate);

(5) (A) a polyester consisting of 40–60 mole % trans-1,4-cyclohexanedicarboxylic acid and 60–40 mole % cis-1,4-cyclohexanedicarboxylic acid and 2,2,4,4-tetramethyl-1,3-cyclobutanediol; and
(B) poly(methyl methacrylate);

(6) (A) a polyester consisting of 40–60 mole % trans-1,4-cyclohexanedicarboxylic acid and 60–40 mole % cis-1,4-cyclohexanedicarboxylic acid and 2,2,4,4-tetramethyl-1,3-cyclobutanediol; and
(B) poly(methyl methacrylate) and methyl acrylate;

(7) (A) a polyester consisting of 40–60 mole % trans-1,4-cyclohexanedicarboxylic acid and 60–40 mole % cis-1,4-cyclohexanedicarboxylic acid and 2,2,4,4-tetramethyl-1,3-cyclobutanediol; and
(B) 65–85 mole % methyl acrylate and 35–15 mole % cyclohexyl methacrylate; and

(8) (A) a polyester consisting of 40–60 mole % trans-1,4-cyclohexanedicarboxylic acid and 60–40 mole % cis-1,4-cyclohexanedicarboxylic acid and 2,2,4,4-tetramethyl-1,3-cyclobutanediol; and
(B) 70–90 mole % butyl acrylate and 30–10 mole % styrene, and

further wherein an article prepared from said blend is visually clear having a diffuse transmittance value of 40% or greater as determined by ASTM Method D1003.

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**5,498,669**

**CURABLE ETHYLENE COPOLYMER BLEND COMPOSITION**

**Clive I. Williams, Hemel Hempstead, United Kingdom, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Division of Ser. No. 246,208, May 19, 1994. This application Jun. 6, 1995, Ser. No. 465,302**

**Int. Cl.[6] C08L** *23/26;31/04;33/02;33/04*

**U.S. Cl. 525—195** **10 Claims**

1. A process for preparation of a curable ethylene copolymer composition which comprises compounding together

a) a dipolymer having copolymerized units of ethylene and a monomer selected from the group consisting of $C_1$–$C_8$ alkyl acrylates, $C_1$–$C_8$ alkyl methacrylates, and vinyl esters of $C_2$–$C_8$ carboxylic acids wherein the copolymerized ethylene units are present in an amount of from 20– 85 weight percent;

b) a copolymer comprising copolymerized units of i) 25–70 weight percent ethylene, ii) 25–70 weight percent of a comonomer selected from the group consisting of $C_1$–$C_8$ alkyl acrylates, $C_1$–$C_8$ alkyl methacrylates, and vinyl esters of $C_2$–$C_8$ carboxylic acids, and iii) at least one 3–12 carbon atom carboxylic acid selected from the group consisting of alpha, beta-unsaturated monocarboxylic acids, alpha, beta-unsaturated dicarboxylic acids, and monoesters of alpha, beta-unsaturated dicarboxylic acids, wherein the carboxylic acid is

present in an amount sufficient to provide 0.1–10 weight percent of carboxylic acid groups;

c) 0.5–6 parts per hundred parts combined component a) and component b) of an organic peroxide; and

d) 1–50 parts per hundred parts combined component a) and component b) of a metal compound capable of reacting with carboxylic acid groups to form carboxylates

wherein the weight ratio of component a) to component b) is 99:1 to 70:30 and the curable ethylene copolymer composition is substantially free of foaming agents.

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**5,498,670**

## COATING COMPOSITIONS CONTAINING CROSSLINKED SPHERICAL FINE PARTICLES

Takahiro Aoyama, Osaka; Mitsuo Nakazaki, Takatsuki; Akikazu Bamba, Ibaraki; Masatoshi Yoshida, Osaka; Toshiaki Matsunaga, Suita, and Tsuneo Tsubakimoto, Toyonaka, all of, Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Division of Ser. No. 94,458, Jul. 21, 1993, abandoned, which is a division of Ser. No. 866,385, Apr. 13, 1992, abandoned, which is a continuation of Ser. No. 613,682, Nov. 20, 1990, abandoned. This application Oct. 17, 1994, Ser. No. 325,105

Claims priority, application Japan, Mar. 23, 1989, 1-69339; Jun. 1, 1989, 1-137477; Jun. 1, 1989, 1-137478

Int. Cl.[6] C08L 39/00;33/06;29/02

U.S. Cl. 525—217 30 Claims

1. A coating composition which comprises (1) crosslinked spherical fine particles which are formed by radical polymerization of a component (M) capable of radical polymerization containing as an essential component a vinyl group-containing compound (V) capable of radical polymerization which is obtained by the reaction of:

one or more than one kind of polyol (a) containing polyester polyol and/or polyether polyol,

one or more than one kind of compound (b) containing two or more isocyanate groups in the molecule, and

one or more than one kind of active hydrogen-containing vinyl monomer (c) capable of radical polymerization,

and (2) a binder resin.

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**5,498,671**

## POLYOLEFIN COMPOSITIONS CONTAINING HIGH AND LOW MOLECULAR WEIGHT EPDM RUBBERS

Satchit Srinivasan, Carrollton, Tex., assignor to D & S Plastic International, Grand Prairie, Tex.

Continuation of Ser. No. 16,586, Feb. 10, 1993, abandoned. This application Sep. 23, 1994, Ser. No. 311,843

Int. Cl.[6] C08L 23/10;23/04;23/16

U.S. Cl. 525—240 9 Claims

1. A polymer composition having improved adhesion for coating materials consisting essentially of about 40–90% of an olefin component of polypropylene, polyethylene, a copolymer of propylene and ethylene, or a mixture thereof, about 10% to 50% by weight of the composition of a first rubber component of an ethylene-propylene diene rubber having a weight average molecular weight of between about 50,000 and 300,000 and about 1 to 20% by weight of a second rubber component of an ethylene-propylene diene rubber having a number average molecular weight of about 2,000 to 10,000.

**5,498,672**

## PROCESS FOR PRODUCING HIGH 1,2-ENRICHED POLYBUTADIENE LATICES

Dwain M. White, Schenectady, and Janet L. Gordon, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 119,689, Sep. 13, 1993, abandoned. This application Dec. 7, 1994, Ser. No. 352,271

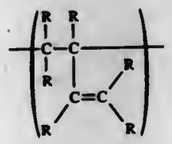
Int. Cl.[6] C08F 279/02

U.S. Cl. 525—314 4 Claims

1. A polymer latex having:

(a) an atactic polymer backbone with structural units of the formulae

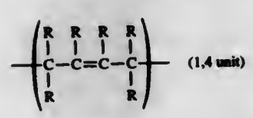
I



(1,2 unit).

and

II

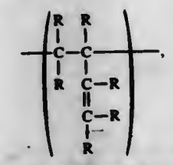


(1,4 unit)

wherein about 25% to about 75% by weight of all 1,2 units are present in the polymer backbone and about 75% by weight to about 25% by weight of all 1,2 units are blocks grafted to said polymer backbone and each R is independently a hydrogen, $C_1$–$C_5$ hydrocarbon, halogen or substituted or unsubstituted aromatic radical; and

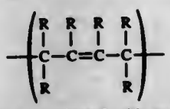
(b) polydiene blocks grafted onto said polymer backbone with structural units of the formula

III



with or without randomly distributed structural units of the formula

IV



wherein each block is terminated with end groups and each end group is independently a hydrogen, $C_1$–$C_5$ alkanol, halogen carboxylic acid group, hydroxy group, nitride group, nitro group, sulfonate group or an ester group and the degree of polymerization of the structural unit represented by formula III is greater than about 5 and the degree of polymerization of the structural unit represented by formula IV is from 0 to about 0.25 the degree of polymerization of the structural unit represented by said formula III.



**5,498,673**

## FUNCTIONAL PARA ALKYLSTYRENE POLYMERS AND COPOLYMERS

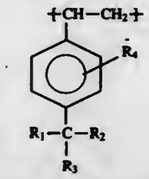
Abhimanyu O. Patil, Westfield, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Nov. 29, 1994, Ser. No. 346,972

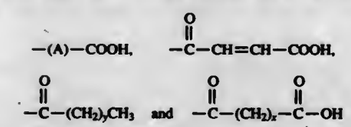
Int. Cl.[6] C08F 8/00

U.S. Cl. 525—333.3 8 Claims

1. A functionalized para-alkylstyrene polymer or copolymer which contains randomly located in the polymeric chain monomeric units of the formula:



wherein $R_1$, $R_2$, and $R_3$ are independently selected from the group consisting of hydrogen alkyl, and primary and secondary halo alkyl, and $R_4$ is selected from the group consisting of



wherein x is an integer of from 2 to about 10, y is an integer of from 0 to about 20 and A is a linear hydrocarbyl group of from 2 to about 10 carbon atoms or a branched hydrocarbyl group of from 3 to about 10 carbon atoms.

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**5,498,674**

## COLORED POLYMERIC DIELECTRIC PARTICLES AND METHOD OF MANUFACTURE

Wei-Hsin Hou; Thomas B. Lloyd, both of Bethlehem, Pa., and Frederic E. Schubert, Shoreham, N.Y., assignors to Copytele, Inc., Huntington Station, N.Y.

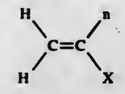
Division of Ser. No. 65,572, May 21, 1993, Pat. No. 5,360,689. This application May 11, 1994, Ser. No. 241,349

Int. Cl.[6] C08F 2/14

U.S. Cl. 525—369 16 Claims

1. A process for forming dielectric particles used in electrophoretic fluid, comprising:

polymerizing a monomer selected from the group consisting of vinyl halide monomers and vinyl monomers having the formula



where X is selected from the group consisting of a halide, carboxyl, ether trialkylammonio, acetate, diazoniodialkylsulfonio, cyano, and oxyl imino using dispersion polymerization to form irregularly-shaped crystalline polymer particles, and where n is selected as H or X; wherein said step of polymerizing includes:

(a) admixing said monomer and a crosslinker in a dispersion medium to form a first mixture;

(b) preparing a second mixture of an initiator and a dispersion stabilizer for retarding the coagulation of said particles during said polymerization;

(c) adding said first mixture to said second mixture to form a third mixture and allowing said monomer to polymerize to form said irregularly-shaped crystalline polymer particles; and

(d) sonifying said third mixture after polymerizing to make said irregularly-shaped crystalline polymer particles uniform in size.

13. The process of claim 1, further including the step of coloring said polymer particles by exposing said particles to a dehydrohalogenation reagent.

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**5,498,675**

## BLOCK COPOLYMERS CONTAINING LATENT THIOL MERCAPTAN CHAIN TRANSFER AGENTS AND THE METHOD OF MAKING THESE BLOCK COPOLYMERS

William D. Emmons, Huntingdon Valley, and Andrew W. Gross, Hatboro, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

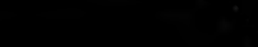
Division of Ser. No. 166,531, Dec. 13, 1993, Pat. No. 5,399,642, which is a division of Ser. No. 787,280, Nov. 4, 1991, Pat. No. 5,294,728. This application Dec. 9, 1994, Ser. No. 353,011

Int. Cl.[6] C08F 283/00

U.S. Cl. 525—537 21 Claims

1. A block copolymer comprising:

a) at least one first block of polymerized units of at least one first ethylenically unsaturated monomer and at least one latent thiol mercaptan chain transfer agent wherein the latent thiol mercaptan chain transfer agent has the general formula;



wherein A is a polyvalent organic radical;

x and y are positive integers such that x+y equals the valence of A;

B is an organic acyl radical; and

n and m are integers from 1 to 6; and

b) at least one second block of polymerized units of at least one second ethylenically unsaturated monomer,

wherein said at least one second block is attached to said at least one first block by reacting with terminal thiol functional groups contained on said at least one first block.

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**5,498,676**

## PROCESS FOR OLEFIN POLYMERIZATION

Stanley E. Wilson, Houston, and Richard A. Kemp, Stafford, both of Tex., assignors to Shell Polypropylene Company, Houston, Tex.

Division of Ser. No. 193,302, Feb. 8, 1994, Pat. No. 5,411,926, which is a continuation of Ser. No. 969,652, Oct. 30, 1992, abandoned. This application Jan. 3, 1995, Ser. No. 367,651

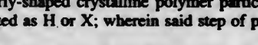
Int. Cl.[6] C08F 4/44; B01J 31/38

U.S. Cl. 526—122 10 Claims

1. A process of polymerizing one or more α-olefins by contacting the one or more α-olefins under polymerization conditions with a catalyst produced by contacting:

(a) an olefin polymerization procatalyst obtained by contacting

(i) a procatalyst precursor wherein the procatalyst is formed by contacting at an elevated temperature from about 40° C. to about 150° C., a carbonated magnesium alkoxide of the general formula



wherein R is a hydrocarbyl group having up to 12 carbon atoms and x is a number from about 0.1 to about 2; and at least one halogenating compound selected from the group

consisting of non-transition metal halogenated compounds which are aluminum trichloride, diethylaluminum chloride, and tin tetrachloride and non-metallic halogenated compounds which are thionyl chloride, hydrogen chloride, oxayl chloride, carbonyl chloride, boron trichloride, phosphorous oxychloride and carbon tetrachloride;

(ii) a tetravalent titanium halide, and

(iii) an electron donor;

b) organoaluminum cocatalyst; and

(c) a selectivity control agent.

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**5,498,677**

## PROCESS FOR PREPARATION AND PURIFICATION OF MATERIAL OF A CYCLOOLEFIN COPOLYMER

**Thomas Weller, Mainz; Michael-Joachim Brekner, Frankfurt, and Frank Osan, Kelkheim, all of, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany**

**Filed Feb. 14, 1994, Ser. No. 195,876**

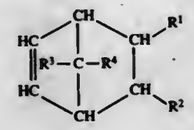
**Claims priority, application Germany, Feb. 12, 1993, 43 04 311.9**

**Int. Cl.[6] C08F 4/649;232/04;232/08**

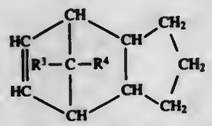
**U.S. Cl. 526—133** **12 Claims**

1. A process for the preparation of a cycloolefin copolymer comprising the step of polymerization, without ring opening, of 0.1 to 100% by weight, based on the total amount of monomers, of at least one cycloolefin monomer of the formulae I, II, III, IV, V, or VI

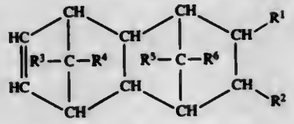
(I)



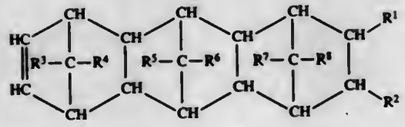
(II)



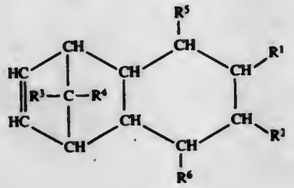
(III)



(IV)

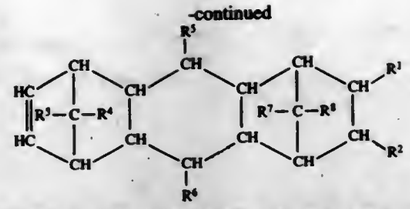


(V)



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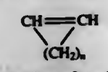
(VI)



in which $R^1$, $R^2$, $R^3$, $R^4$, $R^5$, $R^6$, $R^7$ and $R^8$ are identical or different and are a hydrogen atom or a $C_1C_8$-alkyl radical, it being possible for the same radicals in the various formulae to have a different meaning,

0 to 99.9% by weight, based on the total amount of monomers, of a cycloolefin of the formula VII

(VII)



in which n is an integer from 2 to 10, inclusive, and

0.1 to 99.9% by weight, based on the total amount of monomers, of at least one open-chain olefin

at temperatures of −78° to 150° C. under a pressure of 0.01 to 64 bar in the presence of a catalyst system comprising a metallocene and one or both of an aluminoxane or salt-like compound, wherein a portion of the metallocene catalyst is preactivated with a salt-like compound,

in a cyclic olefin solution saturated with acyclic olefin by use of pressure, thereby forming a reaction solution comprising said cycloolefin copolymer and

wherein the reaction solution is purified by a process comprising

pouring the reaction solution into a liquid of a ketone, alcohol or ester,

filtering the resulting mixture to give a filter cake,

mixing the filter cake with decahydronaphthalene and diatomaceous earth to form a suspension,

heating the suspension to dissolve said cycloolefin polymer, and

filtering the resulting solution over a pressure filter with down to 0.3 μm pore width to give a clear solution of said cycloolefin polymer.

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**5,498,678**

## SUSPENSION POLYMERIZATION PROCESS FOR WATER-SOLUBLE MONOMERS

**Larry W. Steffler, Cherry Hill, N.J., assignor to Rohm and Haas Company, Philadelphia, Pa.**

**Filed Dec. 21, 1992, Ser. No. 994,246**

**Int. Cl.[6] C08F 2/10;2/00;20/60**

**U.S. Cl. 526—200** **15 Claims**

1. A process for preparing spherical, crosslinked copolymer beads from water-soluble monomers which comprises forming a suspension of a mixture of monomers, which mixture includes a major amount of at least one water-soluble monomer having a water solubility of at least about 10 grams per 100 grams of water, and from 0.1 to about 50 weight percent, based on the total monomer weight, of a crosslinking monomer, in an aqueous medium containing from about 5 weight percent to saturation of a water-soluble, non-reactive inorganic salt in the presence of a free-radical initiator and from about 0.01 to about 4 weight percent of a dispersant having a hydroxyalkylcellulose backbone, a molecular weight of from about 30,000 to 2,000,000, a hydrophobic alkyl side chain containing from 1 to about 24 carbon atoms, the alkyl side chains being present at a level of from about 0.1 to about 10 alkyl side chains per 100 repeating units of the polymer backbone, and an average of from about 1 to about 8 ethylene oxide groups substituting each repeating unit of the polymer backbone, wherein the dispersant is a nonionic surfactant and wherein the alkyl group in the hydroxyalkylcellulose backbone is from $C_1$ to $C_{24}$, establishing polymerization conditions in the suspension, and allowing the monomers to polymerize until they have formed water-insoluble particles.



**5,498,679**

## PROCESS FOR PRODUCING TELECHELIC, BRANCHED AND STAR THERMOPLASTIC RESIN POLYMERS

**Karen A. Moffat, Brantford; Peter M. Kazmaier; Gordon K. Hamer, both of Mississauga, and Michael K. Georges, Guelph, all of, Canada, assignors to Xerox Corporation, Stamford, Conn.**

**Filed Mar. 30, 1995, Ser. No. 413,753**

**Int. Cl.[6] C08F 2/38**

**U.S. Cl. 526—204** **18 Claims**

1. A free radical polymerization process for the preparation of a thermoplastic resin or resins, comprising:

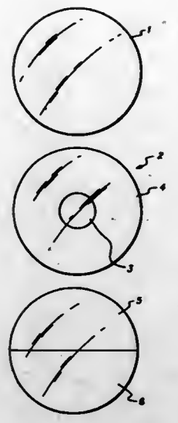
forming a multifunctional nitroxide compound by reacting a stable free radical agent and a compound having two or more halide functional groups;

heating a mixture of said multifunctional nitroxide compound and at least one polymerizable monomer compound to form said thermoplastic resin or resins;

cooling said mixture;

optionally isolating said thermoplastic resin or resins; and

optionally washing and drying said thermoplastic resin or resins.



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**5,498,680**

## POLYMERIZATION PROCESS IN AQUEOUS EMULSION OF FULUORINATED OLEFINIC MONOMERS

**Julio A. Abusleme, Saronno, and Patrizia Maccone, Milan, both of, Italy, assignors to Ausimont S.p.A., Milan, Italy**

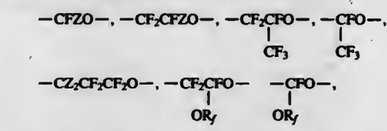
**Continuation of Ser. No. 243,316, May 16, 1994, abandoned. This application May 23, 1995, Ser. No. 447,636**

**Claims priority, application Italy, May 18, 1993, MI93A1007**

**Int. Cl.[6] C08F 2/00**

**U.S. Cl. 526—209** **4 Claims**

1. A process of radical (co)polymerization in an aqueous emulsion of one or more fluorinated olefinic monomers, optionally in association with one or more non-fluorinated olefins, wherein said process is operated in the presence of fluoropolyoxyalkylenes having hydrogenated end groups and/or hydrogenated repetitive units added to the reaction medium in the form of an aqueous microemulsion, said fluoropolyoxyalkylenes comprising repetitive units, randomly distributed along the chain, selected from the group consisting of



and by hydrogenated end groups selected from the group consisting of $-CF_2H$, $-CF_2CF_2H$, $-CFH-CF_3$, and $-CFH-OR_f$, where $R_f$ is defined as above, or perfluorinated end groups selected from the group consisting of $-CF_3$, $-C_2F_5$ and $-C_3F_7$, at least one of the end groups being hydrogenated.

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**5,498,681**

## MATERIAL FOR USE IN THE MANUFACTURE OF POLYMERIC ARTICLES

**Syed H. Askari, Santa Clara; Hermann H. Neidlinger, San Jose, and Khushroo Gandhi, Sunnyvale, all of Calif., assignors to Pilkington Barnes Hind, Inc., Sunnyvale, Calif.**

**Continuation of Ser. No. 177,451, Jan. 5, 1994, abandoned, which is a continuation-in-part of Ser. No. 10,183, Jan. 28, 1993, abandoned. This application Feb. 21, 1995, Ser. No. 391,265**

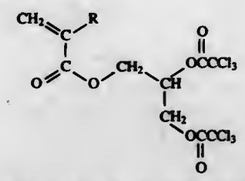
**Int. Cl.[6] C08F 246/00;18/20**

**U.S. Cl. 526—246** **14 Claims**

1. A hydrogel copolymer composition having a water content of from about 45 to about 56 weight percent, which hydrogel is formed from a xerogel which is a copolymer system that can be solvolyzed and hydrated and which, during solvolysis and hydration, said xerogel composition will undergo a linear expansion of between about −7 and about +7 percent, wherein said composition, prior to solvolysis and hydration, comprises:

(a) from about 90 to about 97 weight percent of a single trichloroacetate ester as the only solvolyzable monomer employed which trichloroacetate ester is selected from the group consisting of glyceryl acrylate, methacrylate and ethacrylate of formula I:

I



wherein R is selected from the group consisting of hydrogen, methyl and ethyl; and

(b) from about 0.5 to 10 weight percent of at least one compatible ethylenically unsaturated monomer wherein said monomer is free of solvolyzable leaving groups

wherein the weight percent of each of these components is based on the total weight of the composition.

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**5,498,682**

## PERFLUORODIOXOLES, THE PREPARATION PROCESS THEREOF, AND HOMOPOLYMERS AND COPOLYMERS OBTAINED THEREFROM

**Walter Navarrini; Vito Tortelli; Pasqua Colaianna, all of Milan, and Julio A. Abusleme, Saronno, all of, Italy, assignors to Ausimont, S.p.A., Milan, Italy**

**Filed Jul. 1, 1994, Ser. No. 270,149**

**Claims priority, application Italy, Jul. 5, 1993, MI93A1445**

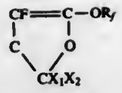
**Int. Cl.[6] C08F 14/18**

**U.S. Cl. 526—247** **3 Claims**

1. Thermoprocessable copolymers of tetrafluoroethylene having the following monomers:

(a) from 0.5 to 13% by weight of perfluoromethylvinylether;

(b) from 0.05 to 3% by weight of one or more fluorinated dioxoles of formula:



wherein: $R_f$ is a perfluoroalkyl radical having from 1 to 5 carbon atoms, and $X_1$ and $X_2$, equal or different from each other, are F or $CF_3$; and

(c) tetrafluoroethylene, in such amount the the sum of the percentages of the various monomers is equal to 100% by weight.

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**5,498,683**

**POLYMER CONCRETE COMPOSITIONS AND METHOD OF USE**

**Chung S. Kim, 1955 Santa Maria Way, Sacramento, Calif. 95864**

**Filed Mar. 15, 1994, Ser. No. 210,057**

**Int. Cl.[6] C08F** *20/26;265/04*

**U.S. Cl. 526—320** **2 Claims**

1. A primer or binder premix composition that is polymerizable into a polymeric concrete, comprising a mixture of:

a) a vinyl ester having characteristic, —COO—$CH_2$—CHOH—$CH_2O$—, linkages in an amount between about 10 to about 90 weight % that polymerizes upon promotion by an initiator and cures in a temperature range of between about 4° C. and about 60° C.;

b) styrene in an amount between about 10 to about 70 weight %; and

c. hydroxyethylmethacrylate in an amount between about 0.1 and about 60 weight %.

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**5,498,684**

**SELF-GELLING BINDER RESINS FOR OFFSET-PRINTING INKS HAVING IMPROVED STORAGE STABILITY**

**Albert Bender, Mainz, Germany, assignor to Hoechst Aktiengesellschaft, Germany**

**Filed Oct. 14, 1994, Ser. No. 323,513**

**Claims priority, application Germany, Jan. 18, 1993, 43 35 426.2**

**Int. Cl.[6] C09F** *1/04;* **C08G** *8/34;8/32*

**U.S. Cl. 528—40** **6 Claims**

1. An oil-soluble, natural resin acid ester, modified with phenolic resin, which after storage for at least three months as a solid in air, still forms a nonturbid, self-gelling solution in mineral oil (boiling range 240° to 270° C., aniline point 73° C.) which ester consists of the reaction product of at least one compound from each of the following groups

A) natural resins or natural resin acids,

B) monocyclic or polycyclic phenols which are monofunctional or polyfunctional with respect to oxo compounds,

C) aldehydes or aldehyde acetals,

D) aliphatic, cycloaliphatic or aromatic-aliphatic alcohols having at least two hydroxyl groups,

E) α,β-ethylenically unsaturated carboxylic acids or their anhydrides,

F) aliphatic $C_3$–$C_{30}$ carboxylic acids or carboxylic esters having an iodine number of less than 15 g of iodine per 100 g or carboxylic acid or carboxylic ester,

H) magnesium compounds, and optionally further compounds from the group of substances consisting of

G) ethylenically unsaturated hydrocarbon resins, which ester is prepared by reacting the components at a temperature in the range from 100° to 300° C. with continuous azetropic distillation of the water of reaction using an entraining agent.

**5,498,685**

**CARBOXYLIC-ACID FUNCTIONAL POLYURETHANE POLYMERS AND THEIR USE IN MAGNETIC RECORDING MEDIA**

**James G. Carlson, Lake Elmo; Jack G. Truong, Minneapolis; Jeffrey T. Anderson, Lake Elmo, and Nelson T. Rotto, North St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.**

**Filed Apr. 27, 1993, Ser. No. 54,511**

**Int. Cl.[6] C08G** *18/34*

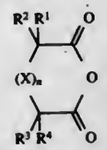
**U.S. Cl. 528—71** **12 Claims**

1. A carboxylic acid functional polyurethane polymer comprising the reaction product of:

(a) one or more polyisocyanates;

(b) one or more polyols;

(c) one or more compounds selected from the group consisting of cyclic dicarboxylic acid anhydrides bearing at least one additional polar group in addition to its polar anhydride group; said cyclic dicarboxylic acid anhydride represented by the formula



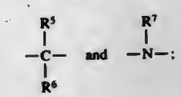
wherein $R^1$, $R^2$, $R^3$, and $R^4$ are independently selected from the group consisting of —H, —OH, —COOM, $—SO_3M$, —SH, $—CH_2COOM$, $—SCH_2COOM$, $—P(=O)(OM)_2$, $—OP(=O)(OM)_2$, and —Y, wherein at least one of $R^1$, $R^2$, $R^3$, and $R^4$ comprises a moiety other than —H or —Y;

Y is selected from the group consisting of linear alkyl groups comprising from about 1 to about 10 carbon atoms, branched alkyl groups comprising from about 1 to about 10 carbon atoms, and aryl groups comprising from about 6 to about 10 carbon atoms;

M is a cation selected from the group consisting of alkali metal cations, , $H^+$ and ammonium cations;

$R^1$ and $R^2$ together or $R^3$ and $R^4$ together can optionally comprise =CHCOOH;

X is a divalent moiety independently selected from the group consisting of



n represents an integer selected from the group consisting of 0 and 1;

$R^5$ and $R^6$ are independently selected from the group consisting of —H, —OH, —COOM, $—SO_3M$, —SH, $—CH_2COOM$, $—SCH_2COOM$, $—P(=O)(OM)_2$, $—OP(—O)(OM)_2$, and —Y, wherein M and Y are as defined above; and

$R^7$ is a monovalent moiety independently selected from the group consisting of $—CH_2COOH$, $—CH_2CH_2COOH$, $—CH_2CH_2N(CH_2COOH)_2$, $—(CH_2)_6N(CH_2COOH)_2$, $—(CH_2CH_2O)_2CH_2CH_2N(CH_2COOH)_2$, and $—CH_2CH_2N(CH_2COOH)CH_2CH_2OH$;

and mixtures thereof;

wherein the ratio of polyisocyanate to polyol is typically such that the resulting polyurethane is not crosslinked and the ratio of —NCO groups to —OH group is less than about 1:1.



**5,498,686**

**OPTICALLY TRANSPARENT PHOTOCHROMIC PLASTIC MATERIAL**

**Erhard Effer, Pöcking; Manfred Melzig, Wessling; Herbert Schuster, Emmering, and Guiseppe Martinuzzi, Eichenau, all of, Germany, assignors to Optische Werke G. Rodenstock, Munich, Germany**

**Continuation-in-part of Ser. No. 50,005, Apr. 22, 1993, abandoned. This application Dec. 9, 1994, Ser. No. 352,627**

**Claims priority, application Germany, Aug. 21, 1993, 41 27 810.043**

**Int. Cl.[6] C07D** *265/02;265/04;265/12*

**U.S. Cl. 528—76** **6 Claims**

1. Optically transparent polythiourethane photochromic plastic material comprising;

a solid photochromic organic compound having at least two ring systems linked via a spiro carbon atom, wherein a photochromic tint occurs due to reversible bond rupture to the spiro carbon atom, and

a copolymerized sulfur containing compound, containing of at least one polyisocyanate monomer selected from the group of m-xylylene diisocyanate, mesitylene triisocyanate, tolylene isocyanate and norbornane diisocyanate and at least one polythiol monomer selected from the group of pentaerythrite tetracis-3-mercaptopropionate, triethanolamine tris-3mercaptopropionate and 4-mercaptomethyl-3,6-dithia-1,8octanedithiol.

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**5,498,687**

**UNSATURATED IMIDE COMPOUNDS CONTAINING ALICYCLIC STRUCTURE, PROCESS FOR PRODUCING THE SAME AND INTERMEDIATE THEREFOR**

**Yasuhiro Hirano; Yasuhiro Endo; Kazuo Takebe; Mitsuhiro Shibata, all of Tsukuba; Shuichi Kanagawa, Tsuchiura; Yutaka Shiomi, Tsukuba; Masatsugu Akiba, Tsukuba, and Shinichiro Kitayama, Tsukuba, all of, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan**

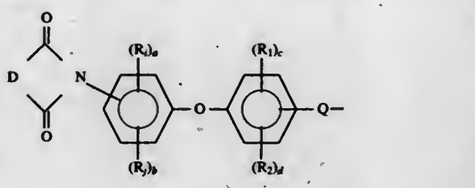
**Division of Ser. No. 202,068, Feb. 25, 1994, Pat. No. 5,444,165, which is a division of Ser. No. 142,578, Oct. 28, 1993, Pat. No. 5,326,881. This application Mar. 28, 1995, Ser. No. 411,880**

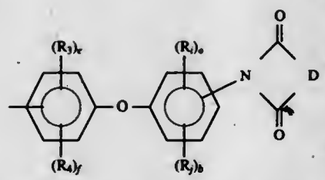
**Claims priority, application Japan, Jan. 28, 1992, 4-290036; Nov. 13, 1992, 4-303616; Nov. 19, 1992, 4-310247; May 24, 1993, 5-121136; May 27, 1993, 5-125888**

**Int. Cl.[6] C08G** *59/18*

**U.S. Cl. 528—96** **15 Claims**

1. A thermosetting resin composition comprising, as the essential components, (a) an unsaturated imide compound represented by formula (1):





wherein Q represents an alicyclic structure-containing hydrocarbon having 4 to 20 carbon atoms; each of $R_1$, $R_2$, $R_3$, $R_4$, $R_i$ and $R_j$ represents a hydrogen atom, a halogen atom, a hydrocarbon group having 1–6 carbon atoms or a halogen-containing hydrocarbon group having 1–6 carbon atoms; and each of a, b, c, d, e and f represents an integer of 0–4 satisfying a+b≦4, c+d≦4 and e+f≦4; and D represents a divalent organic group having 2–24 carbon atoms and having an ethylenically unsaturated double bond, and (b) a curing accelerator.

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**5,498,688**

**TWO-STEP PROCESS FOR THE PREPARATION OF A (CO)POLYCARBONATE BY TRANSESTERIFICATION**

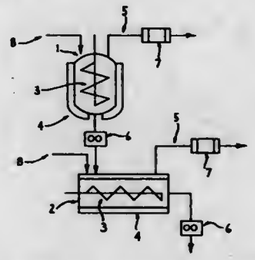
**Yasuhiro Oshino, Hiroshima, and Tatsuya Kanno, Hyogo, both of, Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan**

**Division of Ser. No. 229,292, Apr. 18, 1994, which is a continuation-in-part of Ser. No. 222,478, Apr. 1, 1994, abandoned. This application Jan. 25, 1995, Ser. No. 377,847**

**Claims priority, application Japan, Apr. 16, 1993, 5-89917**

**Int. Cl.[6] C08G** *64/00*

**U.S. Cl. 528—198** **3 Claims**



1. In a process for the preparation of (co)polycarbonate by polycondensing a dihydroxy compound with a carbonic diester, the improvement which comprises (1) a first step conducted by feeding said dihydroxy compound, carbonic diester and a transesterification catalyst into a first reactor, the surface area which is made of a material containing iron in an amount of 20% by weight or less, wherein the temperature is maintained from 60° to 300° C. and the pressure is maintained at normal pressure to 0.1 Torr; and the molar ratio of carbonic diester to dihydroxy compound is 1.01 to 1.05 mol, to form a prepolymer; (2) a second step which comprises melt-polycondensing said prepolymer in a second reactor, the surface area which is made of a material containing iron in an amount greater than 20% by weight, in the presence of a catalyst selected from the group consisting of a boric acid salt or a nitrogen containing basic compound, wherein the second step is conducted at a temperature of from 200° to 310° C., a pressure of up to 10 Torr and such as to limit the phenols to 10,000 ppm or below.

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**5,498,689**

**MODIFIED POLYPHENYLENE ETHER, PROCESS FOR PREPARING THE SAME AND THERMOPLASTIC RESIN COMPOSITION COMPRISING THE SAME**

**Motonobu Furuta, Chiba; Takanari Yamaguchi, and Kazutoshi Ohashi, both of Tsukuba, all of, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan**

**PCT No. PCT/JP93/01050, § 371 Date Apr. 29, 1994, § 102(e) Date Apr. 29, 1994, PCT Pub. No. WO94/03524, PCT Pub. Date Feb. 17, 1994**

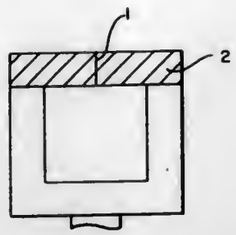
**PCT Filed Jul. 27, 1993, Ser. No. 211,240**

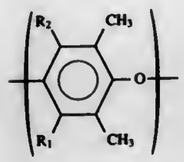
**Claims priority, application Japan, Jul. 29, 1992, 4-202337; Aug. 31, 1992, 4-231132**

**Int. Cl.[6] C08G** *65/38*

**U.S. Cl. 528—214** **11 Claims**

1. A modified polyphenylene ether comprising repeating units of the formula (1):




wherein $R_1$ and $R_2$ are, independently from each other, a hydrogen atom or a hydrocarbon group having 1 to 20 carbon atoms and having a number average polymerization degree of 20 to 12,000, in which 0.02/X to 1/X of methyl groups at the 2- and/or 6-positions of phenylene group are substituted by an aminomethyl group wherein X is a number average polymerization degree.

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**5,498,690**

**USE OF POLYCONDENSATION PRODUCTS, AND NOVEL POLYCONDENSATION PRODUCTS**

Son N. Kim, Hemsbach; Axel Sanner, Frankenthal, and Karin Sperling-Vietmeier, Neustadt, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP93/01887, § 371 Date Jan. 27, 1995, § 102(e) Date Jan. 27, 1995, PCT Pub. No. WO94/02110, PCT Pub. Date Feb. 3, 1994

PCT Filed Jul. 17, 1993, Ser. No. 373,275

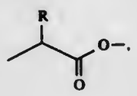
Claims priority, application Germany, Jul. 27, 1992, 42 24 761.6

Int. Cl.[6] C08G *63/12;* A61K *7/06*

U.S. Cl. 528—296 8 Claims

1. A carboxyl-containing polycondensation product comprising

a) structural units of the formula




b) radicals derived from tricarboxylic or tetracarboxylic acids capable of anhydride formation and

c) structural units derived from diols, diamines or amino alcohols, where

R is hydrogen, $C_1$- to $C_8$-alkyl or phenyl.

**5,498,691**

**BIS-M-BENZOTRIFLUORIDE COMPOUNDS**

Jeffrey S. Stults; Henry C. Lin; Robert A. Buchanan, all of Grand Island, and Robert L. Ostrozynski, Williamsville, all of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

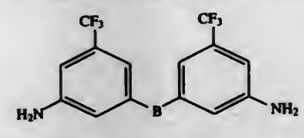
Continuation-in-part of Ser. No. 394,990, Aug. 17, 1989, abandoned. This application Oct. 9, 1990, Ser. No. 594,479

The portion of the term of this patent subsequent to Jan. 16, 2013, has been disclaimed.

Int. Cl.[6] G08G *73/10;69/26*

U.S. Cl. 528—353 14 Claims

(I) 1. A polyimide comprising the reaction product of a bis-meta-benzotrifluoride compound having the general formula




where B is selected from the group consisting of O, CO, S, SO, and $SO_2$, with a tetrafunctional compound selected from the group consisting of dianhydrides, tetracarboxylic acids, and mixtures thereof.

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**5,498,692**

**BIODEGRADABLE COPOLYMERS AND PLASTIC ARTICLES COMPRISING BIODEGRADABLE COPOLYMERS**

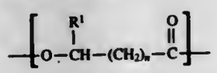
Isao Noda, Fairfield, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 371,665, Jan. 12, 1995, which is a continuation of Ser. No. 306,349, Sep. 15, 1994, abandoned, which is a division of Ser. No. 247,539, May 23, 1994, abandoned, and a continuation-in-part of Ser. No. 247,539, May 23, 1994, abandoned, which is a continuation of Ser. No. 187,969, Jan. 28, 1994, abandoned. This application Apr. 13, 1995, Ser. No. 422,008

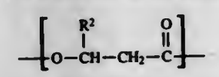
Int. Cl.[6] C08G *63/06;63/66*

U.S. Cl. 528—361 16 Claims

1. A plastic article other than a foam comprising a biodegradable copolymer which has been processed to form the plastic article, wherein the biodegradable copolymer comprises at least two randomly repeating monomer units wherein the first randomly repeating monomer unit has the structure




wherein R' is H, or $C_1$ or $C_2$ alkyl, and n is 1 or 2; the second randomly repeating monomer unit has the structure




wherein $R^2$ is a $C_4$—$C_{19}$ alkyl or alkenyl; and wherein at least 50% of the randomly repeating monomer units have the structure of the first randomly repeating monomer unit.



**5,498,693**

**METHOD OF REDUCING THE RESIDUAL UNSATURATED MONOMER CONTENT OF AN AQUEOUS DISPERSION OF A SATURATED POLYMER**

Richard A. Marshall, Akron; Dane K. Parker, Massillon, and James W. Hershberger, Oxford, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 26, 1994, Ser. No. 313,584

Int. Cl.[6] C08F *6/24;6/14;6/16*

U.S. Cl. 528—483 16 Claims

1. A method for reducing the residual unsaturated monomer content of an aqueous dispersion of a saturated polymer, comprising:

contacting the aqueous dispersion with a gas containing ozone, and

reacting the residual unsaturated monomer with said ozone.

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**5,498,694**

**PEPTIDES OF THE CYTOPLASMIC DOMAIN OF INTEGRIN**

Erkki I. Ruoslahti, Rancho Santa Fe, Calif., assignor to La Jolla Cancer Research Foundation, La Jolla, Calif.

Continuation of Ser. No. 973,547, Nov. 9, 1992, abandoned, which is a continuation of Ser. No. 357,024, May 25, 1989, abandoned. This application May 10, 1994, Ser. No. 240,967

Int. Cl.[6] C07K *7/08;14/00*

U.S. Cl. 530—324 3 Claims

1. A peptide consisting of the amino acid sequence of the cytoplasmic domain of integrin subunit $\beta_3$', KFEEERARAKWDTVRDGAGRFLKSLV.

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**5,498,695**

**PARANITROANILINE PEPTIDES**

Gaston O. Daumy, Gales Ferry, and Lawrence A. Reiter, Mystic, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Continuation of Ser. No. 981,153, Nov. 24, 1992, abandoned. This application Dec. 12, 1994, Ser. No. 354,685

Int. Cl.[6] C07K *5/08*

U.S. Cl. 530—331 5 Claims

1. $PhCH_2CH_2COValAlaAsp$-p-nitroanilide.

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**5,498,696**

**STEROL REGULATORY ELEMENT BINDING PROTEINS AND THEIR USE IN SCREENING ASSAYS**

Michael R. Briggs, Carrollton; Michael S. Brown, Dallas; Joseph L. Goldstein, Dallas, and Xiaodong Wang, Dallas, all of Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Filed May 13, 1993, Ser. No. 61,697

Int. Cl.[6] C07K *14/47*

U.S. Cl. 530—350 4 Claims

1. An isolated protein which exhibits a molecular weight of between about 59 kD and about 68 kD in sodium dodecyl sulfate polyacrylamide gels and binds with sequence specificity to the sterol regulatory element SRE-1 (SEQ ID NO:27).

**5,498,697**

**PROTEIN POSSESSING METASTASIS-INHIBITORY ACTIVITY**

Kanso Iwaki; Tsunetaka Ohta, and Masashi Kurimoto, all of Okayama, Japan, assignors to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Okayama, Japan

Filed Sep. 27, 1993, Ser. No. 127,278

Claims priority, application Japan, Sep. 28, 1992, 4-281136

Int. Cl.[6] C07K *1/00;2/00;* C07H *19/00;21/00*

U.S. Cl. 530—350 2 Claims

1. A highly purified protein which has the following physicochemical properties:

(1) Molecular weight

45,000±5,000;

(2) Isoelectric point

pI=5.7±0.5;

(3) Partial amino acid sequence

Possessing a partial amino acid sequence of Asp-Ser-Glu-Gly-Tyr-Ile-Tyr-Ala-Arg-Gly-Ala-Gln-Asp-Met-Lys (SEQ ID NO:1) or Glu-His-Trp-Ser-His-Asp-Pro-Phe-Glu (SEQ ID NO:2);

(4) Solubility in solvent

Soluble in water, physiological saline and phosphate buffer;

(5) Biological activity

Exhibiting metastasis-inhibitory activity on RPMI 4788 cell (FERM BP-2429), an established cell line derived from human colon cancer;

(6) Stability

Inactivated in water at pH 7.2 and 100° C. for 30 minutes;

Stable in water at pH 7.2 and 4° C. for one month; and

(7) Acute toxicity

Exhibiting an $LD_{50}$ of 50 mg/kg or higher in mouse when intravenously administered to the mouse.

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**5,498,698**

**MEGAKARYOCYTE POTENTIATOR**

Nozomi Yamaguchi, Kyoto; Masayoshi Oh-Eda, and Kunihiro Hattori, both of Shizuoka, all of, Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Japan

PCT No. PCT/JP92/01689, § 371 Date Jun. 27, 1994, § 102(e) Date Jun. 27, 1994, PCT Pub. No. WO93/13132, PCT Pub. Date Jul. 8, 1994

PCT Filed Dec. 24, 1992, Ser. No. 256,133

Claims priority, application Japan, Dec. 27, 1991, 3-361522; Mar. 31, 1992, 4-122518

Int. Cl.[6] C07K *14/47;14/475*

U.S. Cl. 530—399 1 Claim

1. A megakaryocyte potentiator having the following properties:

(1) dose-dependently increasing the number of megakaryocyte colonies in the presence of IL-3 in vitro;

(2) showing a single band at an approximate molecular weight of 32,000 as measured by SDS-polyacrylamide gel electrophoresis;

(3) eluting in a fraction corresponding to an acetonitrile concentration of 40–45% in 0.1% trifluoroacetic acid in reverse phase high-performance liquid chromatography; and,

(4) containing the amino acid sequence of SEQ. I.D. No.: 1 in its molecule.

5,498,699

**COMPLEXES AND CHELATES OF AZITHROMYCIN WITH BIVALENT AND/OR TRIVALENT METALS AND THEIR USE AS ANTIULCER**

Slobodan Djakic; Zlatko Vajtner; Hrvoje Krajevic; Nevenka Lepotar, and Lidija Kolacny-Babic, all of Zagreb, Yugoslavia, assignors to PLIVA Farmaceutska kemijska, prehrambena i kozmeticka industrija s.p.o., Croatia

Filed Mar. 6, 1991, Ser. No. 22,398

Claims priority, application Yugoslavia, Mar. 7, 1990, 455/90

Int. Cl.[6] C07F 5/00; A01N 43/04

U.S. Cl. 534—15 23 Claims

1. A method for treating a patient suffering from ulcers which comprises administering to said patient a pharmaceutical preparation containing an amount effective for treating ulcers of a complex or chelate of an azithromycin with bivalent or trivalent metals or both.

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5,498,700

**NAPHTHYLAZONAPHTHOL DYES WHICH CONTAIN A 5-CHLORO-6-FLUOROPYRIMIDIN-4-YL REACTIVE GROUP**

Hermann Henk, Köln, and Wilfried Hansmann, Leverkusen, both of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

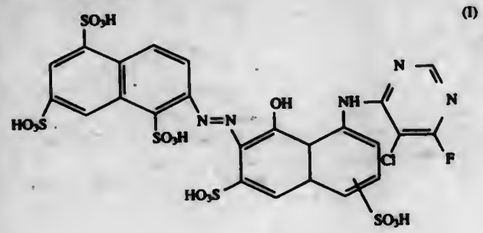
Filed Sep. 1, 1994, Ser. No. 299,723

Claims priority, application Germany, Sep. 8, 1993, 43 30 376.5

Int. Cl.[6] C09B 62/245; D06P 1/382

U.S. Cl. 534—638 6 Claims

1. Reactive dyestuff which, in the form of the free acid, has the following formula



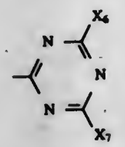
(I)

which is in an internal and/or external salt form, in which

each of $R_1$ to $R_4$ is independently hydrogen, halogen, hydroxy, $C_{1-4}$alkyl, $C_{1-4}$alkoxy, —$NHCOC_{1-4}$alkyl or—$NHCONH_2$,

each of $X_1$ to $X_4$ is independently an aliphatic, cycloaliphatic or heterocyclic amino group containing at least two nitrogen atoms, with the proviso that each of these amino groups bears a protonatable nitrogen atom or quaternary ammonium ion, and at least one of these amino groups bears a primary amino group, and

$X_5$ is an aliphatic, cycloaliphatic or heterocyclic amino group containing at least two nitrogen atoms one of which is a protonatable nitrogen atom or quaternary ammonium ion, or an aromatic diamino group of which the terminal amino group is substituted by



in which each $X_6$ and $X_7$ is independently an aliphatic, cycloaliphatic or heterocyclic amino group which contains at least two nitrogen atoms one of which is a protonatable nitrogen atom or a quaternary ammonium ion, with the proviso that the sum of the protonatable amino groups and quaternary ammonium groups present in $X_1$ to $X_5$ exceeds the number of the sulpho groups by at least one and further with the proviso that at least two of $X_1$ to $X_4$ contain a primary amino group.

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5,498,701

**BASIC DISAZO COMPOUNDS CONTAINING SULPHONIC ACID GROUPS**

Reinhard Pedrazzi, Allschwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 60,386, May 11, 1993, abandoned.

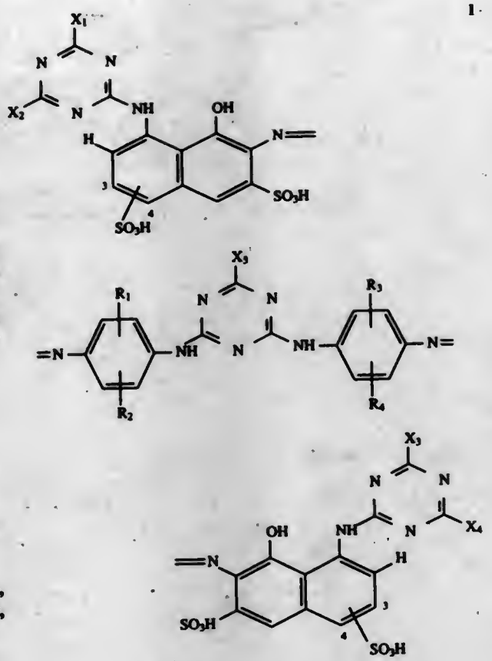
This application Dec. 22, 1994, Ser. No. 363,672

Claims priority, application Germany, May 13, 1992, 42 15 679.3

Int. Cl.[6] C09B 35/037;35/029;67/34; D21H 21/28

U.S. Cl. 534—797 15 Claims

1. A compound of formula I





5,498,702

**TREATED PECTINIC ACID PROCESS AND PRODUCT**

Cheryl R. Mitchell, and Pat R. Mitchell, both of Stockton, Calif., assignors to California Natural Products, Lathrop, Calif.

Filed Dec. 16, 1993, Ser. No. 169,377

Int. Cl.[6] C08B 37/06;37/04

U.S. Cl. 536—2 19 Claims

1. A process for manufacturing a treated polyuronic acid, the process comprising the steps of:

A. heating an aqueous dispersion of a polyuronic acid at a temperature above about 100° C. and for an amount of time sufficient to obtain a separation of the dispersion into two phases upon cooling, the two phases being a treated polyuronic acid solution and a precipitate; and

B. recovering the treated polyuronic acid mixture, including at least 2.5 percent polymers of the polyuronic acid having a degree of polymerization DP in the range of about DP1 to about DP20.

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5,498,703

**SILANOL BASED GLYCOSIDES**

Anthony J. O'Lenick, Jr., Lilburn, Ga., assignor to Siltech Inc., Norcross, Ga.

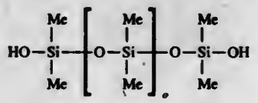
Continuation-in-part of Ser. No. 138,189, Oct. 20, 1993, Pat. No. 5,428,142. This application Mar. 24, 1995, Ser. No. 410,501

Int. Cl.[6] C07H 23/00;15/04; C07G 3/00; C08B 31/00

U.S. Cl. 536—4.1 6 Claims

1. A silicone glycoside which is prepared by the reaction of

(a) a silanol compound conforming to the following structure;



wherein;

Me is methyl;

R is alkyl having one to twenty carbon atoms;

o is an integer ranging from 1 to 2,000; with

(b) a saccharide or saccharide source;

(c) an acid catalyst;

said reaction is carried out at temperature of between 100° C. and 120° C. for between 5 and 15 hours.

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5,498,704

**PREPARATION OF ALKYL GLYCOSIDES**

Gerhard Wolf, Mannheim; Alfred Oftring, Bad Duerkheim; Guenter Oetter, Frankenthal; Richard R. Schmidt, and Wolfgang Klotz, both of Konstanz, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP93/00875, § 371 Date Sep. 21, 1994, § 102(e) Date Sep. 21, 1994, PCT Pub. No. WO93/21197, PCT Pub. Date Oct. 28, 1993

PCT Filed Apr. 8, 1993, Ser. No. 302,779

Claims priority, application Germany, Apr. 21, 1992, 42 13 016.6

Int. Cl.[6] C07H 17/00

U.S. Cl. 536—18.6 16 Claims

1. A process for preparing alkyl glycosides comprising the step of:

alkylating reducing saccharides in the presence of a base and a solvent, with an alkylating agent,

wherein said alkylating agent is a dialkyl sulfate whose alkyl groups contain at least six carbon atoms, and the molar ratio of said saccharides to said dialkyl sulfate being from 1:1 to 1:5.

5,498,705

**MODIFIED POLYSACCHARIDES HAVING IMPROVED ABSORBENT PROPERTIES AND PROCESS FOR THE PREPARATION THEREOF**

Jian Qin, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Feb. 22, 1995, Ser. No. 392,439

Int. Cl.[6] C08B 7/00; A61L 15/28

U.S. Cl. 536—20 34 Claims

1. A crosslinked, modified polysaccharide formed by a method comprising the following steps:

forming a mixture comprising water and a crosslinking agent wherein the crosslinking agent is water soluble and comprises a compound having at least two functional groups or functionalities capable of reacting in an aqueous solution with a carboxyl, hydroxyl, or amino groups of a modified polysaccharide;

adding to said mixture an amount of a water-soluble, modified polysaccharide, that is free from a substantial degree of crosslinking, such that the weight ratio of water-soluble, modified polysaccharide to water in said mixture is from about 1:2 to about 1:40, wherein said water-soluble, modified polysaccharide becomes crosslinked, and wherein said crosslinked, modified polysaccharide comprises a substantially non-crosslinked, water-soluble, modified polysaccharide core and a crosslinked, water-insoluble, modified polysaccharide shell at least partially surrounding said core, said crosslinked, modified polysaccharide being swellable in said mixture; and

drying said crosslinked, modified polysaccharide, wherein said crosslinked, modified polysaccharide has an initial Absorbency Under Load at least about 200 percent greater than said water-soluble, modified polysaccharide.

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5,498,706

**WATER-RESISTANT STARCH MATERIALS FOR THE PRODUCTION OF CAST SHEETS AND THERMOPLASTIC MATERIALS**

Rainer Frische, Frankfurt am Main; Renate Gross-Lannert, Dietzenbach; Klaus Wollmann, Eschenhofen; Bernd Best, Moerfelden, all of, Germany; Eduard Schmid, Bonaduz, and Fritz Buehler, Thusis, both of, Switzerland, assignors to EMS Inventa AG, Zurich, Switzerland

Division of Ser. No. 958,103, Mar. 1, 1993, Pat. No. 5,367,067. This application Sep. 9, 1994, Ser. No. 302,012

Claims priority, application Germany, Apr. 30, 1992, 41 14 185.7

Int. Cl.[6] C08L 3/06; C08K 5/10; C08J 5/18

U.S. Cl. 536—45 14 Claims

1. A process for the production of water-resistant, thermoplastic starch material processable into environmentally safe, thermoplastically produced products and cast sheets, said process comprising simultaneously or successively reacting an acylation agent which is a free acid or chloride or anhydride of at least one fatty acid with high amylose starch having an amylose content of greater than or equal to 70% in a one-pot reaction without isolation of the intermediate products and then precipitating the resulting acyl modified starch from the reaction product by adding methanol, wherein the resulting acyl modified starch has a degree of substitution of at least 1.86.

5,498,707
**HYDROGEN SULFIDE CONVERTER**
Larry W. Gatlin, Rte. 2, P.O. Box 181A, Hwy. 1301, Floresville, Tex. 78114
Division of Ser. No. 51,185, Apr. 22, 1993, abandoned. This application May 6, 1994, Ser. No. 239,370
The portion of the term of this patent subsequent to Jan. 23, 2013, has been disclaimed.
Int. Cl.[6] C07H *5/04;1/00;* C07C *45/00*
U.S. Cl. 536—55.2 12 Claims

1. A composition useful for converting hydrogen sulfide and organic sulfides in aqueous or hydrocarbon-containing liquid or gaseous streams to water soluble, nontoxic polymers, the composition comprising the reaction product of: a first component comprising sterically hindered alkyl diamines selected from the group consisting of aminomethylcyclopentylamine; 1,2-cyclohexanediamine; 1,5-pentanediamine,2-methyl; 1,6-hexanediamine; 1H-azepine, hexahydro; 1,4-butanediamine; and mixtures thereof; and a second component comprising an aldehyde donor selected from the group consisting of hydantoin; hexamethylenetetramine; hexamethylolmelamine; 2-ethanol; 5,5-dimethylhydantoin; tris(hydroxymethyl)nitromethane; 2-nitro-2-methyl-1-propanol; 2-nitro- 2-ethyl-1,3-propanediol; 2-nitro-1-butanol; and acetaldehyde ammonia.

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5,498,708
**METHOD OF SYNTHESIZING POLYESTERS**
Iraj Lalezari, Scarsdale, N.Y., assignor to Montefiore Medical Center, Bronx, N.Y.
Filed Jul. 18, 1989, Ser. No. 381,288
Int. Cl.[6] C07H *1/00;13/02;15/04*
U.S. Cl. 536—115 15 Claims

1. A process for the preparation of an ester which comprises contacting an acid with an alkyl chloroformate in an aqueous medium that is 100% water to form an anhydride and thereafter contacting said anhydride with a polyol to form said ester.

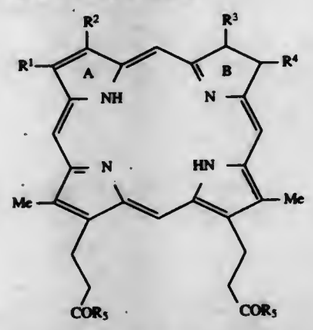
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5,498,709
**PRODUCTION OF SUCRALOSE WITHOUT INTERMEDIATE ISOLATION OF CRYSTALLINE SUCRALOSE-6-ESTER**
Juan L. Navia, Athens; Robert E. Walkup; Nicholas M. Vernon, both of Watkinsville, and David S. Neidlich, Athens, all of Ga., assignors to McNeil-PPC, Inc., Milltown, N.J.
Continuation-in-part of Ser. No. 323,954, Oct. 17, 1994, abandoned. This application May 24, 1995, Ser. No. 448,710
Int. Cl.[6] C07G *17/00;* C07H *1/00;3/00*
U.S. Cl. 536—124 15 Claims

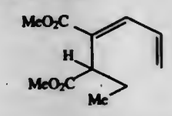
1. A process for producing sucralose from a feed mixture of (a) 6-O-acyl-4,1',6'-trichloro-4,1',6'-trideoxygalactosucrose, (b) salt including alkali metal or alkaline earth metal chloride, (c) water, and (d) other chlorinated sucrose by-products, in a reaction medium comprising a tertiary amide, wherein said process comprises:
(i) deacylating the 6-O-acyl-4,1',6'-trichloro-4,1',6'-trideoxygalactosucrose by raising the pH of the aqueous solution of (a), (b), (c) and (d) to about 11 (±1) at a temperature and for a period of time sufficient to effect said deacylation, to produce an aqueous solution comprising sucralose, salt including alkali metal or alkaline earth metal chloride, and other chlorinated sucrose by-products, in a reaction medium comprising a tertiary amide;
(ii) removing said tertiary amide; and
(iii) recovering sucralose from the product of step (ii).

5,498,710
**ALKYL ETHER ANALOGUES OF BENZOPORPHYRIN DERIVATIVES**
Ravindra K. Pandey, Williamsville, N.Y.; Thomas J. Dougherty, Grand Island, both of N.Y.; Kevin M. Smith, Davis, Calif., and Isabelle Mesnier, Tourcoing, France, assignors to Health Research, Inc., Buffalo, N.Y., and The Regents of the University of California, Oakland, Calif.
Filed Apr. 22, 1994, Ser. No. 231,113
Int. Cl.[6] C07D *487/22*
U.S. Cl. 540—145 4 Claims

1. The compound having the formula:



having R groups $R^1$, $R^2$, $R^3$, and $R^4$, wherein $R^1$ and $R^2$ are methyl or —CH(O—$(CH_2)_n$$CH_3$)$CH_3$ or are joined together to form the group D and wherein $R^3$ and $R^4$ are methyl or —CH(O—$(CH_2)_n$$CH_3$)$CH_3$ or are joined together to form the group D; provided that one of $R^1$ and $R^2$ or $R^3$ and $R^3$ are joined together to form the group D wherein one of the remaining R groups is methyl and one of the remaining R groups is —CH(O—$(CH_2)_n$$CH_3$)$CH_3$, where n is an integer of 5 through 7 and group D is:



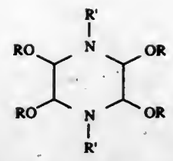
and $R_5$ is independently at each occurrence —$OR_6$ where $R_6$ is lower alkyl of 1 through 7 carbon atoms or $R_6$ is an amino acid residue.

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5,498,711
**SYNTHESIS OF 4,10-DINITRO-2,6,8,12-TETRAOXA-4,10-DIAZATETRACYCLO[5.5.0.05,903,11]DODECANE**
Thomas K. Highsmith, North Ogden; W. Wayne Edwards, Tremonton, and Robert B. Wardle, Logan, all of Utah, assignors to Thiokol Corporation, Ogden, Utah
Continuation-in-part of Ser. No. 13,634, Feb. 3, 1993. This application Aug. 2, 1993, Ser. No. 101,458
Int. Cl.[6] C07D *498/22*
U.S. Cl. 540—546 43 Claims

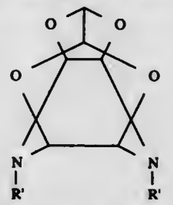
1. A process for preparing 4,10-dinitro-2,6,8,12-tetraoxa- 4,10-diazatetracyclo-[5.5.0.$0^{5,9}0^{3,11}$]dodecane comprising the steps of:
(a) reacting a mixture of a hexa-substituted piperazine derivative, a strong acid, and a nitrate source, such that an exothermic reaction occurs which proceeds at a reaction temperature substantially above ambient temperature, said hexa-substituted piperazine derivative having the following structure:





Where —OR is a good leaving group and R is H, R", —COR", —COOR", —$SO_3$R", —NO, —$NO_2$, acetal (including aliphatic, cycloaliphatic, or branched acetals), or cycloacetal; R' is a nitrolysable group selected from —COR", —$SO_2$R", —$SO_3$M, —$NO_2$, —NO, —COOR", t-butyl, cyclohexyl, and isopropyl; M is an alkali metal; R" is H, $C_1$ to $C_{10}$ alkyl, branched alkyl, cycloalkyl or phenyl, substituted phenyl, or a monocyclic heterocyclic radical;
(b) precipitating a reaction product from the reaction mixture; and
(c) purifying the reaction product.

30. A process for preparing 4,10-dinitro-2,6,8,12-tetraoxa-4,10-diazatetracyclo-[5.5.0.$0^{5,9}0^{3,11}$]dodecane comprising the steps of:
(a) reacting a mixture of a tetraoxadiazaisowurtzitane derivative, a strong acid, and a nitrate source, such that an exothermic reaction occurs which proceeds at a reaction temperature substantially above ambient temperature, said tetraoxadiazaisowurtzitane derivative having the following structure:

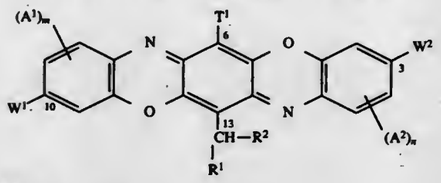


Where R' is a nitrolysable group selected from —COR", —$SO_2$R", —$NO_2$, —NO, —COOR", t-butyl, cyclohexyl, and isopropyl; R" is H, $C_1$ to $C_{10}$ alkyl, branched alkyl, cycloalkyl, or phenyl, substituted phenyl, or a monocyclic heterocyclic radical;
(b) precipitating a reaction product from the reaction mixture; and
(c) purifying the reaction product.

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5,498,712
**TRIPHENODIOXAZINE DYES**
Gordon A. Thomson, Bolton, England, assignor to Zeneca Limited, London, England
Filed May 13, 1993, Ser. No. 60,049
Claims priority, application United Kingdom, May 26, 1992, 9211110
Int. Cl.[6] C07D *498/04;* C09B *19/00;62/04;62/503*
U.S. Cl. 544—76 11 Claims

1. A water-soluble dye of the Formula (2) or salt thereof:



(2)

wherein:
$T^1$ is Cl or Br;
each $A^1$ and $A^2$ independently is alkyl, alkoxy, Cl, Br, carboxy, or —$SO_2$—Y;
each Y independently is —$OR^3$, —$NR^3R^4$, vinyl a group convertible to vinyl on treatment with aqueous alkali, or alkyl;
each $R^3$ and $R^4$ independently is hydrogen or aryl;
m and n are each independently 0, 1, 2 or 3;
$W^1$ and $W^2$ are each independently a fibre-reactive group of the formula —$X^1$—($B^2$—$X^2$)$_p$—Z;
$X^1$ and $X^2$ are —$NR^5$— wherein $R^5$ is H or $C_{1-4}$-alkyl;
$B^2$ is a divalent organic linking group;
p is 0 or 1;
Z is a heterocyclic reactive group;
$R^1$ is H, OH or $CH_3$; and
$R^2$ is $C_{1-3}$-alkyl, hydroxy-$C_{1-3}$-alkyl or —$CH_2$O—($C_{1-4}$-alkyl).

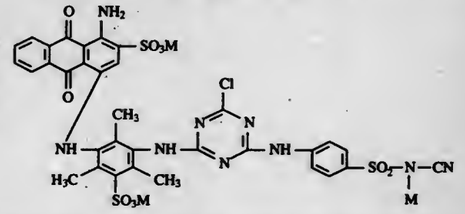
7. A process for colouring a textile comprising applying thereto a dye according to claim 1.

8. A liquid dye formulation which contains less than 30% inorganic salts, comprising at least five parts of a reactive dye according to claim 1 dissolved in 100 parts of water.

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5,498,713
**WATER-SOLUBLE ANTHRAQUINONE COMPOUNDS**
Jörg Dannheim, Frankfurt am Main; Werner H. Russ, Flörsheim am Main, and Hartmut Springer, deceased, late of Königstein/Ts, Germany, assignors to Hoechst Aktiengesellschaft, Germany
Filed Dec. 16, 1993, Ser. No. 168,451
Claims priority, application Germany, Dec. 18, 1992, 42 42 970.6; Jun. 23, 1993, 43 20 733.2
Int. Cl.[6] C07D *251/50*
U.S. Cl. 544—189 1 Claim

1. An anthraquinone compound of the formula



where M is hydrogen or an alkali metal or the mole equivalent of an alkaline earth metal.

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5,498,714
**PROCESS FOR PRODUCTION OF TRIS (TRIBROMOPHENOXY)-S-TRIAZINE**
Setsuo Nishibori, Shiga, and Hideto Kondo, Kyoto, both of, Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan
Filed Jun. 23, 1994, Ser. No. 264,385
Claims priority, application Japan, Jul. 8, 1993, 5-168833; Jul. 9, 1993, 5-170285
Int. Cl.[6] C07D *251/34*
U.S. Cl. 544—219 2 Claims

1. A process for producing tris(tribromophenoxy)-s-triazine which comprises causing an aqueous tribromophenolate solution of not less than 50 weight % concentration containing a reducing agent to react on cyanuric chloride in the presence of a phase transfer catalyst.

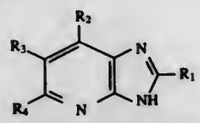
## 5,498,715
## PROCESS FOR PREPARING IMIDAZOPYRIDINE DERIVATIVES

David L. Kuo, Brig; Martin Eyer, Glis; Jean-Paul Roduit, Grone, and Alain Wellig, Ried-Morel, all of, Switzerland, assignors to Lonza Ltd., Gampel/Valais, Switzerland

Filed Nov. 29, 1994, Ser. No. 350,083
Claims priority, application Switzerland, Dec. 1, 1993, 3580/93
Int. Cl.[6] C07D 471/04
U.S. Cl. 546—118 15 Claims

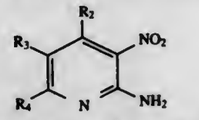
1. A process for preparing a imidazopyridine derivative of the formula:

I



wherein $R_1$ is hydrogen or an alkyl group, and $R_2$, $R_3$ and R4 are identical or different and are hydrogen, an alkyl group, a cycloalkyl group, an aryl group, an aralkyl group or a halogen atom, comprising hydrogenating a 2-amino-3-nitropyridine of the formula:

II



wherein $R_2$, $R_3$ and $R_4$ are as defined above, with hydrogen in the presence of (i) a carboxylic acid of the formula:

$R_1COOH$ III

wherein $R_1$ is as defined above, (ii) a hydrogenation catalyst, and (iii) a catalytic amount of acid other than the carboxylic acid of the formula III, with the hydrogenation product formed being condensed with the carboxylic acid of the formula III to give the imidapopyridine derivative of the formula I.

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## 5,498,716
## 2-AMINO NAPHTHYRIDINE DERIVATIVE, ITS PREPARATION AND ITS USE

Marie-Thérèse David-Comte, Chevilly-Larue, and Gérard Roussel, Soisy-sur-Seine, both of, France, assignors to Rhone-Poulenc Rorer S.A., Antony, France

Filed Jan. 12, 1994, Ser. No. 181,641
Int. Cl.[6] C07D 471/04
U.S. Cl. 546—122 16 Claims

1. A 2-amino naphthyridine compound of formula (I):

(I)



optical isomers of the 2-amino naphthyridine compound or a salt thereof.

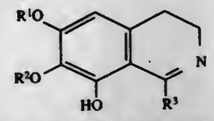
## 5,498,717
## 6,7-DIALKOXY-3,4-DIYDROISOQUINOLIN-8-YL COMPOUNDS

Kiyofumi Ishikawa, and Takashi Hayama, both of Tsukuba, Japan, assignors to Banyu Pharmaceutical Co., Ltd., Tokyo, Japan

Division of Ser. No. 199,691, Feb. 22, 1994, Pat. No. 5,446,164. This application Aug. 10, 1994, Ser. No. 288,551
Claims priority, application Japan, Feb. 25, 1993, 5-060846
Int. Cl.[6] C07D 217/14;217/16
U.S. Cl. 546—139 1 Claim

1. A compound represented by the following formula or a salt thereof;

[I]



wherein $R^1$ and $R^2$ are independently a lower alkyl or benzyl group, or are combined together to form a methylene group; and

$R^3$ is a hydrogen atom or a lower alkyl group, a benzyl group wherein 1 to 3 optional hydrogen atom(s) on the benzene ring may be replaced by an substituent(s) selected from the group consisting of a lower alkoxy group, a benzyloxy group, a halogen atom, a nitro group and a lower alkoxycarbonylmethyl group, a phenethyl group wherein 1 to 3 optional hydrogen atom(s) on the benzene ring may be replaced by a lower alkoxy or benzyloxy group, or a heteroarylmethyl or heteroarylethyl group,

provided that when $R^3$ is a methyl group, $R^1$ and $R^2$ are not simultaneously methyl groups.

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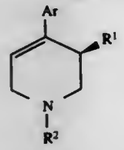
## 5,498,718
## PREPARATION OF SUBSTITUTED TETRAHYDROPYRIDINES

John A. Werner, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 867,631, Apr. 13, 1992, abandoned, which is a division of Ser. No. 661,276, Feb. 26, 1991, Pat. No. 5,136,040. This application Dec. 20, 1994, Ser. No. 359,498
Int. Cl.[6] C07D 211/70;211/44
U.S. Cl. 546—348 7 Claims

1. A method for preparing a compound of Formula I

I



wherein

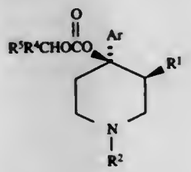
$R^1$ is $C_1$–$C_5$ alkyl or aryl;

$R^2$ is $C_1$–$C_{10}$ alkyl, benzyl or $CH_2R^3$;

$R^3$ is $C_2$–$C_7$ alkenyl or $C_3$–$C_6$ cycloalkyl; and

Ar is a cyclic $C_6$–$C_{10}$ aromatic group said method comprising (a) providing a 4-carbonate- 1,3,4-substituted-piperidine compound of Formula II

II



wherein

$R^4$ is hydrogen or $C_1$–$C_{10}$ alkyl and



$R^5$ is $C_1$–$C_{10}$ alkyl or $R^4$ and $R^5$ together are $C_5$–$C_6$ cycloalkyl, and (b) heating said compound at a temperature in the range of about 150° C. to about 250° C.

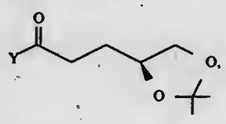
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## 5,498,719
## DIASTEREOSELECTIVE PROCESS LEADING TO A KEY INTERMEDIATE FOR THE PREPARATION OF FLUORINATED REVERSE TRANSCRIPTASE INHIBITORS

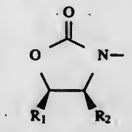
Victor E. Marquez, Gaithersburg; John S. Driscoll, and Magbool A. Siddiqui, both of Rockville, all of Md., assignors to The United States of America as represented by the Secretary of the Department of Health & Human Services, Washington, D.C.

Filed Jan. 31, 1994, Ser. No. 189,095
Int. Cl.[6] C07D 413/06
U.S. Cl. 548—230 4 Claims

1. A compound of the formula



in which Y is an oxazolidinone group of the formula:



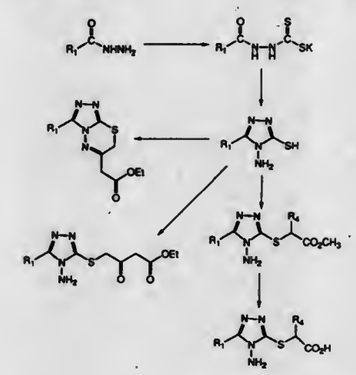
in which $R_1$ is H methyl, ethyl, propyl, isopropyl, butyl, sec. butyl, tert. butyl, phenyl, or benzyl and $R_2$ is methyl, ethyl, propyl, isopropyl, butyl, sec. butyl, tert. butyl, phenyl or benzyl.

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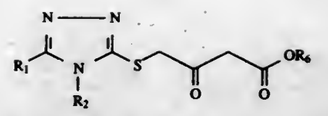
## 5,498,720
## CERTAIN TRIAZOLE COMPOUNDS AND THEIR PHARMACEUTICAL USES

An-rong Lee, 24, Alley 5, Lane 24, Sec.3, Tin-Chou Rd., Taipei, Taiwan, Prov. of China

Filed Aug. 26, 1993, Ser. No. 112,716
Int. Cl.[6] C07D 401/04;403/04
U.S. Cl. 546—276 3 Claims



1. A compound of formula III



wherein $R_1$ represents a phenyl group which is optionally substituted by one or more halogens, or methoxy group, or $C_{1-4}$ alkyl, or represents a pyridyl group which is optionally substituted by one or more halogens, or methoxyl group, or $C_{1-4}$ alkyl, or represents a 3-isoxazole group which is optionally substituted by one or more halogens, or methoxyl group, or $C_{1-4}$ alkyl,

$R_2$ represents a $C_{1-4}$ alkyl group, or an amino group, or represents a phenyl group which is optionally substituted by one or more halogens, or methoxyl group, or $C_{1-4}$ alkyl,

$R_6$ represents a hydrogen, or $C_{1-4}$ alkyl group, or salts thereof.

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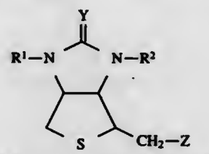
## 5,498,721
## PROCESS FOR PRODUCING THIOPHENE DERIVATIVES

Masahiko Mizuno, Ibaraki; Isao Kurimoto, Oita; Norihiko Hirata, Suita; Toshiya Takahashi, Ibaraki; Masayoshi Minai, Moriyama; Takahiro Yamamoto, Oita; Tadashi Mizuno, Ibaraki, and Yasunobu Miyamoto, Takatsuki, all of, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jul. 7, 1994, Ser. No. 271,657
Claims priority, application Japan, Jul. 8, 1993, 5-168985; Jul. 12, 1993, 5-171490; Jul. 14, 1993, 5-174440; Dec. 27, 1993, 5-333797
Int. Cl.[6] C07D 495/04
U.S. Cl. 548—303.7 24 Claims

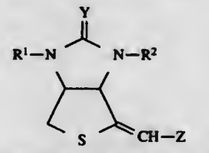
1. A process for producing a thiophene derivative expressed by the general formula (2):

(2)



wherein $R^1$ and $R^2$ represent independently hydrogen, an alkyl group, a phenyl group, a substituted phenyl group, an acyl group, an alkenylmethyl group, a benzyl group, or a substituted benzyl group, Y represents an oxygen atom or a sulfur atom, and Z represents an alkyl group having a terminal carboxyl group or a terminal alkoxy group, comprising catalytically reducing a compound having the general formula (1):

(1)



wherein $R^1$, $R^2$, Y, and Z are as defined above, with hydrogen in a solvent mixture of at least one alcohol and water using a palladium catalyst soluble in organic solvents, wherein the palladium catalyst is one selected from the group consisting of palladium acetate, palladium propionate, dichlorobis (triphenylphosphine) palladium, di-μ-chlorobis (η-aryl) palladium, dichloro (η-1,5-cyclooctadiene) palladium, dichlorobis (η-2,5-norbornadiene) palladium, dichlorobis (acetonitrile) palladium, dichlorobis (benzonitrile) palladium, dichlorobis (N,N-dimethylformamide) palladium, bis (acetylacetonato) palladium and bis (dimethyl-glyoximato) palladium.

**5,498,722**

## BENZOFURAN DERIVATIVES

**Barry C. Ross; David Middlemiss; David I. C. Scopes; Torquil I. M. Jack; Kevin S. Cardwell; Michael D. Dowle; Duncan B. Judd, and Stephen P. Watson, all of Ware, Great Britain, assignors to Glaxo Group, London, England**

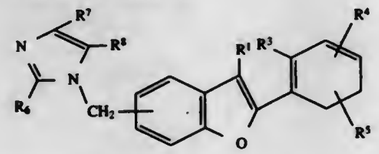
**Division of Ser. No. 883,378, May 15, 1992, Pat. No. 5,332,831. This application Mar. 31, 1994, Ser. No. 220,698**

**Claims priority, application United Kingdom, May 16, 1991, 9110636**

**Int. Cl.[6] C07D *407/12;407/14;* A61K *31/415***

**U.S. Cl. 548—315.4** **16 Claims**

1. A compound of formula (I):



or a physiologically acceptable salt or hydrate thereof wherein:

$R^1$ represents a hydrogen atom, a halogen atom, $C_{1-6}$alkyl, $C_{2-6}$alkenyl, fluoro$C_{1-6}$alkyl, $C_{1-6}$alkoxy, —CHO, —$CO_2H$ or —$COR^2$;

$R^2$ represents $C_{1-6}$alkyl, $C_{2-6}$alkenyl, $C_{1-6}$alkoxy or —$NR^{13}R^{14}$;

$R^3$ represents —$CO_2H$, —$NHSO_2CF_3$ or a C-linked tetrazolyl group;

$R^4$ and $R^5$ which may be the same or different each independently represent a hydrogen atom or a halogen atom or a $C_{1-6}$alkyl group;

$R^6$ represents a $C_{1-5}$alkyl group;

$R^7$ represents a cyclopropyl, cyclobutyl or cyclopropylmethyl group;

$R^8$ represents —$CH_2OH$, —CHO, —$CH_2OCH_3$, —$CO_2H$, —$CO_2CH_3$, —$CO_2CH_2CH_3$, —$CONH_2$, —$CONHCH_3$ or —$CONHCH_2CH_3$; and

$R^{13}$ and $R^{14}$, which may be the same or different, each independently represent a hydrogen atom or a $C_{1-4}$alkyl group, or —$NR^{13}R^{14}$ forms a saturated heterocyclic ring which has 5 or 6 ring members.

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**5,498,723**

## PROCESS FOR THE PREPARATION OF ALKYLIMIDAZOLIDONE (METH)-ACRYLATES

**Alain Riondel, Forbach; Gilles Herbst, Spicheren, and Marc Esch, Freyming-Merlebach, all of, France, assignors to Elf Atochem S.A., Puteaux, France**

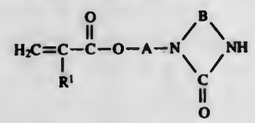
**Filed Oct. 27, 1994, Ser. No. 329,964**

**Claims priority, application France, Jan. 27, 1993, 93 12833**

**Int. Cl.[6] C07D *233/32;233/70;233/04***

**U.S. Cl. 548—324.1** **14 Claims**

1. A process for the production of a compound of formula:



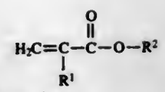
(I)

in which:

$R^1$ represents hydrogen or methyl; and

A and B each independently represent a straight or branched hydrocarbon chain having from 2 to 5 carbon atoms,

by reaction of at least one (meth)acrylate of formula:



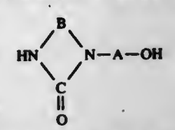
(II)

in which:

$R^1$ has the above meaning; and

$R^2$ represents a $C_1$–$C_4$ alkyl group,

with a heterocyclic alcohol of formula:



(III)

in which A and B have the above meanings, in the presence of a catalytic quantity of at least one magnesium alkoxide.

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**5,498,724**

## PYRAZOLEAMIDINE COMPOUNDS

**Jan-Erik Nyström, Kista, and Hans F. Sjöbom, Södertälje, both of, Sweden, assignors to Aktiebolaget Astra, Sodertalje, Sweden**

**Division of Ser. No. 244,924, Jun. 28, 1994. This application May 26, 1995, Ser. No. 451,957**

**Int. Cl.[6] C07D *231/12***

**U.S. Cl. 548—375.1** **2 Claims**

1. N-Benzyloxycarbonyl-1-formamidine.

2. N-t-butoxycarbonyl-1-(3,5-dimethylpyrazolyl)-formamidine.

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**5,498,725**

## PROCESS FOR PREPARING 5-AMINODIHYDROPYRROLE INTERMEDIATE THEREOF AND PROCESS FOR PREPARING SAID INTERMEDIATE

**Misuhiro Matsumoto, Osaka, and Kunihiko Fujita, Aomori, both of, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan**

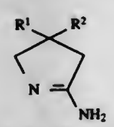
**Filed Dec. 13, 1994, Ser. No. 354,804**

**Claims priority, application Japan, Dec. 15, 1993, 5-315504; Dec. 15, 1993, 5-315505**

**Int. Cl.[6] C07D *207/32***

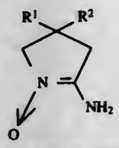
**U.S. Cl. 548—408** **16 Claims**

1. A process for preparing a 5-aminodihydropyrrole of the formula (1):



(1)

wherein $R^1$ and $R^2$ are the same or different and represent a hydrogen atom, a lower alkyl group or a lower haloalkyl group, or together form a $C_2$–$C_{10}$ alkylene group which may be substituted with a halogen comprising reducing an oxidepyrrole of the formula (2):



(2)

wherein $R^1$ and $R^2$ are the same as defined above with hydrogen in the presence of a catalyst.



**5,498,726**

## PREPARATION OF PHYSOSTIGMINE CARBAMATE DERIVATIVES FROM PHYSOSTIGMINE

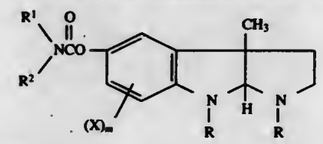
**George E. Lee, Somerville; Thomas B. K. Lee, Whitehouse Station, and Donna M. Borek, Clifton, all of N.J., assignors to Hoechst-Roussel Pharmaceuticals Incorporated, Somerville, N.J.**

**Continuation of Ser. No. 918,719, Jul. 21, 1992, abandoned. This application Mar. 22, 1994, Ser. No. 216,238**

**Int. Cl.[6] C07D *487/00***

**U.S. Cl. 548—429** **25 Claims**

1. A process for the preparation of a product of the formula



(I)

wherein

R is loweralkyl;

$R^1$ is hydrogen, loweralkyl, lowercycloalkyl, lowercycloalkyl-loweralkyl, lowerbicycloalkyl, aryl or aryloweralkyl;

$R^2$ is loweralkyl, lowercycloalkyl, lowercycloalkylloweralkyl, lowerbicycloalkyl, aryl or aryloweralkyl; or

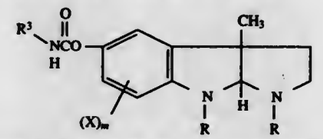
$R^1$ and $R^2$ taken together with the nitrogen atom to which they are attached from a 3,4-dihydro- 2(1H)-isoquinoline group;

X is loweralkyl, loweralkoxy, halogen or trifluoromethyl; and

m is 0, 1 or 2;

which process comprises

(a) contacting a compound of formula II

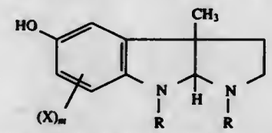


(II)

wherein R, X and m are as defined above and $R^3$ is loweralkyl, with base followed by a carboxylic acid of formula

$R^5COOH$

wherein $R^5$ is loweralkyl to afford a compound of formula III



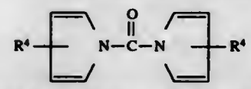
(III)

wherein R, X and m are as defined above;

(b) contacting, without isolating the compound of Formula III, the reaction mixture from step (a) either

(1) with an isocyanate of the formula $R^2NCO$ and obtaining a product of the formula I wherein $R^1$ is hydrogen; or

(2) with a compound of formula IV

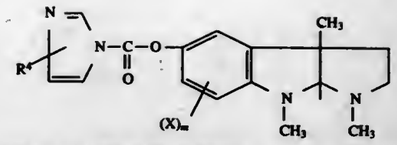


(IV)

wherein $R^4$ is hydrogen or loweralkyl in the presence of a carboxylic acid of the formula

$R^5COOH$

wherein $R^5$ is as above to afford a compound of Formula V



(V)

wherein R, $R^4$, X and m are as above;

contacting the reaction mixture containing the compound of Formula V with a compound of the formula

$R^1R^2NH$

wherein $R^1$ and $R^2$ are as above; and isolating the product of Formula I.

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**5,498,727**

## PREPARATION OF BENZINDOLE COMPOUNDS FROM NAPHTHALENE COMPOUNDS

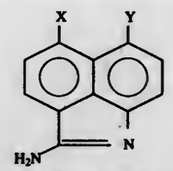
**Michael D. Varney, Carlsbad; Cindy L. Palmer, La Mesa, and Judy G. Deal, Temecula, all of Calif., assignors to Agouron Pharmaceuticals, Inc., La Jolla, Calif.**

**Filed Jul. 19, 1994, Ser. No. 276,929**

**Int. Cl.[6] C07D *209/62***

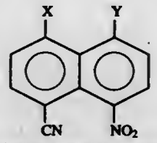
**U.S. Cl. 548—436** **17 Claims**

1. A process for preparing a 2-amino-benzindole of the Formula I:



(I)

wherein X is a hydrogen atom, a halogen atom, an alkyl group or a thioether group, and Y is an amine group, a thioether group or an alkyl group, comprising reducing a nitro compound of the Formula B:



(B)

under acidic conditions to form the 2-amino-benzindole.

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**5,498,728**

## DERIVATIVES OF L-TRYPTOPHANAL AND THEIR USE AS MEDICINALS

**Takashi Sohda, Osaka; Yukio Fujisawa, Kobe; Tsuneo Yasuma; Junji Mizoguchi, both of Osaka; Masakuni Kori, Miki, and Masayuki Takizawa, Kobe, all of, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan**

**Filed Feb. 4, 1994, Ser. No. 192,038**

**Claims priority, application Japan, Feb. 19, 1993, 5-030182; Aug. 9, 1993, 5-197305**

**Int. Cl.[6] C07D *209/14;* A61K *31/40***

**U.S. Cl. 548—493** **6 Claims**

1. N-(1-naphthalenesulfonyl)-L-isoleucyl-L-tryptophanal or a pharmaceutically acceptable salt thereof.

5,498,729

## PRODRUG COMPOSITIONS

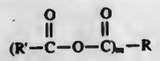
Abraham J. Domb, 16 Gogdol Eder Street, Efrat 90435, Israel

Continuation of Ser. No. 456,376, Dec. 26, 1989, abandoned. This application Feb. 22, 1993, Ser. No. 20,168

Int. Cl.[6] C07D 209/26

U.S. Cl. 548—500 11 Claims

1. A mixed anhydride having the formula



wherein R is selected from the group consisting of $C_{2-24}$ alkenyl; $C_{3-6}$ cycloalkyl; $C_{2-8}$ cycloalkenyl; aryl $C_{1-6}$ alkyl; $C_{1-6}$alkyl-aryl; $CH_3$ $(CH_2—CH_2—O)$n, where n is between 1 and 50; $CH_3$ $(CH_2CHCH_3O)$n, where n is between 1 and 50; lactic and glycolic oligomers of Mn<3,000; caprolactone oligomers of Mn<3,000; amino acids; peptides; saccharides; and heterocyclic compounds, selected from the group consisting of nicotinic acid, and hydroxy, carboxy and halogen substituted nicotinic acids;

R' is derived from a compound selected from the group consisting of acetylsalicylic acid; salicylic acid; indomethacin; sulindac; naproxen; fenoprofen; ibuprofen, ketoprofen; diflunisal; tolmetin; flurbiprofen; mefenamic acid; suprofen; and tolfenamic acid;

m is an integer of between 1 and 3; and

wherein R and R' are different.

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5,498,730

## FLUORINATED ALKYL COMPOUND DERIVATIVES AND PROCESS FOR PREPARING SAME

Kwang-Yun Cho; Bum-Tae Kim; Young-Sup Kim; Yong-Ki Min; No-Kyun Park, all of Daejeon, and In-Hwa Jeong, Wonju, all of, Rep. of Korea, assignors to Korea Research Institute of Chemical Technology, Daejeon, Rep. of Korea

Filed Jul. 26, 1994, Ser. No. 280,477

Claims priority, application Rep. of Korea, Aug. 2, 1993, 93-14927

Int. Cl.[6] C07D 333/16

U.S. Cl. 549—78 1 Claim

1. A Fluorinated alkyl compound derivative represented by the formula:



(I)

wherein:

R is cyclohexyl, thiophene or phenyl substituted with alkoxy; and,

$R_f$ is fluorinated $C_{1-3}$ lower alkyl.

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5,498,731

## OXIDE CATALYST AND PROCESS FOR PRODUCING MALEIC ANHYDRIDE BY USING OXIDE CATALYST

Yasushi Tsurita, Kurashiki; Masumi Ito, Yokohama, and Ken Shiraga, Yokkaichi, all of, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Filed Jun. 27, 1994, Ser. No. 266,510

Claims priority, application Japan, Jun. 29, 1993, 5-158760

Int. Cl.[6] B01J 27/198

U.S. Cl. 549—259 16 Claims

1. An oxide catalyst for producing maleic anhydride by vapor phase oxidation of a hydrocarbon having 4 carbon atoms, obtainable by

(1) reacting a pentavalent vanadium compound and a pentavalent phosphorus compound in an organic solvent in the presence of a reducing agent capable of reducing the pentavalent vanadium to the tetravalent state to produce the crystalline composite oxide particles containing tetravalent vanadium and pentavalent phosphorus,

(2) dry-pulverizing the obtained crystalline composite oxide particles in a high-speed gas flow,

(3) mixing the pulverized particles with an aqueous solution containing tetravalent vanadium and pentavalent phosphorus to form a slurry, and

(4) spray-drying the slurry and then calcining.

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5,498,732

## PROCESS FOR THE STEREOSPECIFIC PREPARATION OF 5-(1-HYDROXY-2-URETHANETHYLIDENE)-2,-DIMETHYL-1,3-DIOXANE-4,6-DIONE DERIVATIVES, WHICH ARE PRECURSORS OF CHIRAL TETRAMIC ACID DERIVATIVES

Albert Loffet, Paris; Jean-Alain Fehrentz, Saint Nazaire de Pezan; Jean Martinez, Saussan, and Philippe-François Winternitz, Montpellier, all of, France, assignors to Propeptide, Vert le Petit, France

Filed Sep. 15, 1994, Ser. No. 305,305

Claims priority, application France, Sep. 15, 1993, 93 10965

Int. Cl.[6] C07D 319/06

U.S. Cl. 549—274 10 Claims

1. Process for the preparation of 5-(1-hydroxy-2-urethanethylidene)- 2,2-dimethyl-1,3-dioxane-4,6-dione derivatives, wherein an N-urethane-protected α-amino acid N-carboxy-anhydride is reacted with Meldrum's acid, in an inert organic solvent medium, in the presence of an amount greater than 2 equivalents relative to the N-carboxy-anhydride of at least one tertiary amine chosen from tertiary amines in which at least one radical is aliphatic or cycloaliphatic.

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5,498,733

## SYNTHESIS OF NYLON-11 MONOMER

Folahan O. Ayorinde, Kettering, and Chukwuma P. Nwaoncha, Adelphi, both of Md., assignors to Howard University, Washington, D.C.

Filed Jul. 19, 1993, Ser. No. 93,029

Int. Cl.[6] C11B 1/00; C11C 1/02

U.S. Cl. 554—132 4 Claims

1. A process for making 11-aminoundecanoic acid comprising:

(a) a hydrolysis of 12-oxododecanoic acid oxime to form 11-carbamoylundecanoic acid; and

(b) a Hofmann degradation of 11-carbamoylundecanoic acid.

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5,498,734

## PREPARATION AND USE OF (2-BUTENE-1,4-DIYL)MAGNESIUM COMPLEXES IN ORGANIC SYNTHESIS

Reuben D. Rieke, Lincoln, Nebr., assignor to University of Nebraska, Lincoln, Nebr.

Continuation-in-part of Ser. No. 949,864, Sep. 22, 1992, abandoned, which is a continuation-in-part of Ser. No. 763,629, Sep. 23, 1991, Pat. No. 5,231,205. This application Jul. 30, 1993, Ser. No. 100,058

Int. Cl.[6] C07F 7/08;7/22;7/24;7/30

U.S. Cl. 556—87 28 Claims

1. A method for the preparation of carbocycles comprising:

(a) contacting a magnesium(II) salt in an ethereal, polyethereal, or hydrocarbon solvent with a reducing agent having a reduction potential of about −1.5 volts, or more negative, relative to SCE, to form a highly reactive magnesium species;

(b) contacting the highly reactive magnesium species with a cyclic hydrocarbon containing at least two conjugated exocyclic double bonds to form a (2-butene-1,4-dyl)magnesium complex; and



(c) contacting the (2-butene-1,4-diyl)magnesium complex with an electrophile to form a carbocycle.

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5,498,735

## PROCESS OF PRODUCING ALPHA-OLEFIN

Kunio Takeuchi, Shinnanyo; Takao Tamura, Sodegaura, and Hironori Tashiro, Tokuyama, all of, Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Filed Jul. 18, 1994, Ser. No. 276,267

Claims priority, application Japan, Aug. 5, 1993, 5-212163; Sep. 22, 1993, 5-257535

Int. Cl.[6] C07F 5/06; C07C 2/02

U.S. Cl. 556—187 13 Claims

1. A process of producing an α-olefin which comprises carrying out separately the growth of ethylene with triethyl aluminum and the growth of ethylene with tributyl aluminum, displacing the resulting higher trialkyl aluminum with ethylene, thereby forming triethyl aluminum and an α-olefin, and displacing at least part of the resulting triethyl aluminum with butene contained in the resulting α-olefin, thereby forming tributyl aluminum.

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5,498,736

## 2,5-REACTIVE SUBSTITUENT GROUP-CONTAINING SILOLES, SILOLE POLYCONDENSATES AND PREPARATION THEREOF

Kohei Tamao, Kyoto, and Shigehiro Yamaguchi, Uji, both of, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

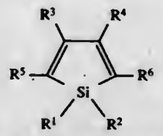
Filed Dec. 20, 1994, Ser. No. 360,006

Claims priority, application Japan, Dec. 21, 1993, 5-345214; Mar. 11, 1994, 6-067988

Int. Cl.[6] C07F 7/08

U.S. Cl. 556—406 31 Claims

1. A 2,5-reactive substituent group-containing silole of the following general formula (1)



(1)

wherein $R^1$ to $R^4$ may be the same or different and independently represent a monovalent hydrocarbon group having from 1 to 12 carbon atoms or a hydrogen atom, and $R^5$ and $R^6$ may be the same or different and independently represent a group selected from monovalent hydrocarbon-substituted sulfur, selenium, silicon, germanium tin and phosphorus, or a halogen atom.

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5,498,737

## SILACYCLOHEXANE COMPOUND, A METHOD OF PREPARING IT AND A LIQUID CRYSTAL COMPOSITION CONTAINING IT

Tsutomu Ogihara; Takaaki Shimizu; Takeshi Kinsho; Tatsushi Kaneko; Ryuichi Saito, all of Kubiki, and Hideshi Kurihara, Kawasaki, all of, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

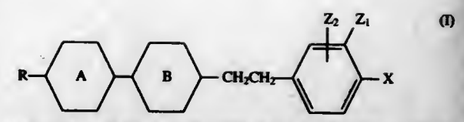
Filed Jan. 25, 1995, Ser. No. 377,961

Claims priority, application Japan, Jan. 28, 1994, 6-024991

Int. Cl.[6] C07F 7/08

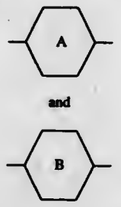
U.S. Cl. 556—406 7 Claims

1. A silacyclohexane compound represented by the following general formula (1):



(I)

wherein R denotes a linear-chain alkyl group with a carbon number of 1–10, a mono- or di-fluoroalkyl group with a carbon number of 1–10, a branched-chain alkyl group with a carbon number of 3–8, an alkoxyalkyl group with a carbon number of 2–7, or an alkenyl group with a carbon number of 2–8, and at least one of



denotes a trans-1-sila-1,4-cyclohexylene or a trans-4-sila-1,4-cyclohexylene group whose silicon at position 1 or position 4 has a substitutional group(s) of H, F, Cl or $CH_3$ and the other is a trans-1,4-cyclohexylene group. X denotes a CN, F, Cl, $CF_3$, $OCF_3$, $OCHF_2$, $OCHFCl$, $CF_2Cl$, $OCF_2Cl$, R or OR group, $Z_1$ denotes H, F or Cl, and $Z_2$ denotes H or F.

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5,498,738

## METHOD FOR THE PREPARATION OF A NOVEL A-RING PRECURSOR FOR TAXOIDS AND NOVEL INTERMEDIATES

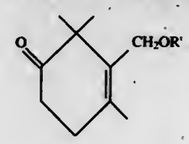
Esko Karvinen, Järvitie 4 E 43, FIN-90550 Oulu, Finland, and Ari Koskinen, Lepikkotie 2 A 1,, FIN-90460 Oulunsalo, Finland

Filed Jun. 28, 1994, Ser. No. 266,557

Int. Cl.[6] C07F 7/08;7/18

U.S. Cl. 556—441 12 Claims

1. A process for the preparation of a compound of the formula (X) useful as precursor for the A-ring in taxanes



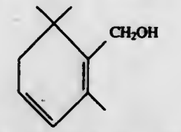
(X)

wherein R' is



in which R" is a linear, branched or cyclic alkyl group of 1 to 10 carbon atoms, which process comprises the steps of

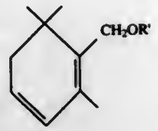
a) reacting the alcohol of the formula (VI)



(VI)

with the acid chloride R"COCl, wherein R" is a linear, branched or cyclic alkyl group of 1 to 10 carbon atoms, in pyridine and a chlorinated hydrocarbon solvent, preferably

dichloromethane, chloroform or carbon tetrachloride, to give the corresponding ester (VII)



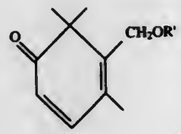
(VII)

wherein R' is



and R" is the same before,

b) oxidizing the ester (VII) with selenium dioxide in dioxane to give the corresponding enone (VIII)

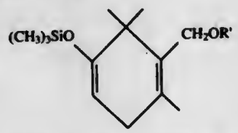


(VIII)

and

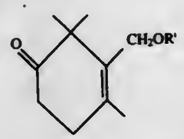
c) reducing the enone (VIII)

i) either by treating said enone (VIII) with a mixture comprising cuprous iodide, tributyl tinhydride ($(C_4H_9)_3SnH$), lithium chloride and trimethylsilylchloride (TMSCl) to give the compound (IX)



(IX)

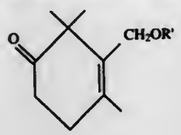
and hydrolysing the compound (IX) to a compound of formula (X)



(X)

or

ii) by catalytical hydrogenation of said enone (VIII) over a supported Pd catalyst to give the compound of formula (X)



(X)

5,498,739

**METHOD FOR INTRODUCING HYDROCARBONS INTO CHLOROSILANES**

(VII) Masaki Takeuchi; Akira Yamamoto, and Mikio Endo, all of Niigata, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Dec. 20, 1994, Ser. No. 360,020

Claims priority, application Japan, Dec. 21, 1993, 5-345212; Feb. 15, 1994, 6-040500; Jun. 7, 1994, 6-148660

Int. Cl.[6] C07F 7/08

U.S. Cl. 556—478 21 Claims

1. A method for introducing a hydrocarbon into a chlorosilane, comprising the step of reacting a chlorosilane of the general formula (1) or (2):

$$R_mSiCl_{4-m} \quad (1)$$

$$R_nSi_2Cl_{6-n} \quad (2)$$

wherein R is a hydrogen atom or monovalent hydrocarbon group, a plurality of R groups may be identical or different, letter m is an integer of 0 to 3, and n is an integer of 0 to 5, with a halogenated hydrocarbon of the general formula (3):

$$R'X \quad (3)$$

wherein R' is a monovalent hydrocarbon group and X is a halogen atom, in a liquid phase at a temperature of 20° to 150° C. in the presence of metallic aluminum or an aluminum alloy, thereby substituting the hydrocarbon group R' for at least one chlorine atom of the chlorosilane.

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5,498,740

**COMPOSITIONS COMPRISING REACTION PRODUCTS OF PHOSPHITES, QUINONES AND ISOCYANATES**

Salman Dermelik, Augsburg; Martina Wanner, Neusäss; Karl-Heinz Lemmer, Augsburg, and Reinhold Braun, Schwabmünchen, all of, Germany, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

Filed Mar. 5, 1993, Ser. No. 26,963

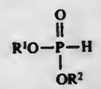
Claims priority, application Germany, Mar. 14, 1992, 42 08 235.8

Int. Cl.[6] C07F 9/02; C07C 261/00

U.S. Cl. 558—89 9 Claims

1. A composition made by the process comprising

a) reacting a phosphite or a mixture of phosphites of the formula (I)

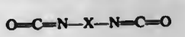


(I)

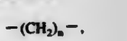
in which $R^1$ and $R^2$ independently of one another represent an alkyl radical having 1 to 8 C atoms or a phenyl radical, which alkyl or phenyl radicals are unsubstituted or substituted by one or more halogen atoms,

with a benzoquinone which is unsubstituted or substituted by one or more chlorine or bromine atoms, a naphthoquinone which is unsubstituted or substituted by one or more chlorine or bromine atoms, or an anthraquinone which is unsubstituted or substituted by one or more chlorine or bromine atoms, or a mixture of such quinones, then

b) reacting the product obtained in process step a) with a diisocyanate selected from the group consisting of isophorone diisocyanate and diisocyanates of the formula

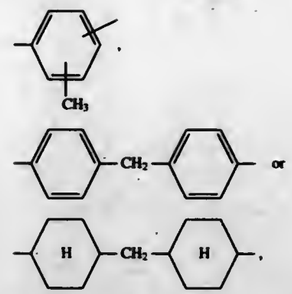


in which X is





-continued



wherein n is a number from 3 to 8,

or a polyisocyanate or a mixture of such isocyanates.

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5,498,741

**ALKYL ARYL ARYLPHOSPHONITES, PROCESS FOR THE PREPARATION THEREOF AND USE THEREOF**

Hans-Jerg Kleiner, Kronberg/Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Germany

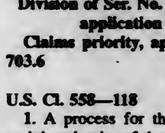
Division of Ser. No. 159,727, Dec. 1, 1993, abandoned. This application Dec. 27, 1994, Ser. No. 364,118

Claims priority, application Germany, Dec. 3, 1992, 42 40 703.6

Int. Cl.[6] C07F 9/48

U.S. Cl. 558—118 4 Claims

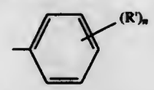
1. A process for the preparation of the monoalkyl monoaryl arylphosphonite of the formula (I)



(I)

in which

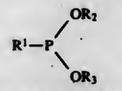
$R_1$ is the radical



in which R' is identical or different and is ($C_1$–$C_6$)-alkyl, ($C_1$–$C_6$)-alkoxy, ($C_1$–$C_6$)-alkylthio, or halogen, and n is an integer from 0 to 3, or is the naphthyl radical which can be unsubstituted or bear 1 to 3 substituents R',

$R_2$ is a ($C_1$–$C_6$)-alkyl radical, and

$R_3$ is as $R_1$, where $R_1$ and $R_3$ can be identical or different with respect to one another, which comprises transesterifying dialkyl arylphosphonies of the formula (II)



(I)

in which the radicals $R_1$ and $R_2$ have the above meaning, where the radicals $R_2$ within this meaning can be identical or different, with a phenol of the formula (III)

$$HOR_3 \quad (III)$$

in which $R_3$ has the above meaning, with elimination of the alcohols of the formula (IV)

$$HOR_2 \quad (IV)$$

in the absence of catalysts.

5,498,742

**PROCESS FOR THE CONTINUOUS PREPARATION OF DIARYL CARBONATES**

Hans-Josef Buysch; Carsten Hesse; Johann Rechner, all of Krefeld; Reinhard Schoenlicker, Leverkusen; Paul Wagner, Düsseldorf, and Dieter Kaufmann, Genlac, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 27, 1995, Ser. No. 379,384

Claims priority, application Germany, Feb. 2, 1994, 44 03 075.4

Int. Cl.[6] C07C 68/00

U.S. Cl. 558—274 20 Claims

1. A process for the preparation of an organic carbonate of the formula (I)

$$R—O—CO—O—R \quad (I)$$

in which

R denotes an unsubstituted or substituted $C_6$–$C_{12}$-aryl,

by reacting an aromatic hydroxyl compound of the formula (II),

$$R—O—H \quad (II),$$

in which

R has the meaning given above, with carbon monoxide and oxygen in the presence of an activated noble metal catalyst which was prepared from a compound of a noble metal of group VIIIb of the Periodic Table of the Elements (Mendeleev) in the presence of a quaternary salt by treatment with carbon monoxide in liquid phase at elevated temperature, a cocatalyst, a quaternary salt and a base, wherein the reaction water is removed from the reaction mixture by excess reaction gas.

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5,498,743

**PROCESS FOR PRODUCING DIALKYLCARBONATES**

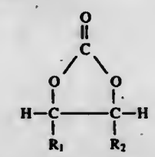
Stuart S. Shih, Cherry Hill; Margaret M. Wu, Skillman, both of N.J., and Tsoung Y. Yan, Philadelphia, Pa., assignors to Mobil Oil Corp., Fairfax, Va.

Filed Oct. 20, 1994, Ser. No. 325,919

Int. Cl.[6] C07C 69/96

U.S. Cl. 558—277 22 Claims

1. A process for synthesis of dialkylcarbonate which comprises reacting an alcohol of the formula ROH, wherein R is alkyl of from 1 to 10 carbon atoms or mixtures thereof, with a cyclic carbonate of the formula



wherein $R_1$ and $R_2$ are hydrogen, alkyl of from 1 to 10 carbon atoms, alkoxy of from 1 to 5 carboll atoms, or a combination thereof, in the presence of a catalyst comprising an alkaline earth metal halide supported on a solid support having a surface area of greater than about 10 $m^2/g$ and a surface hydroxyl concentration of from about 0.1 m mole/g to about 5.0 m mole/g, at reaction conditions including a temperature of from about 50° C. to about 300° C., a pressure of from about 50 psig to about 2000 psig and a liquid hourly space velocity of from about 0.1 $hr^{-1}$ to about 10 $hr^{-1}$ to provide a product comprising $(RO)_2C=0$.

5,498,744

## PROCESS FOR THE PREPARATION OF DIMETHYL-CARBONATE

Joerg-Dietrich Jentsch, Mülheim; Alexander Klausener, Köln; Heinz Landscheidt, Duisburg; Bernd Lenders, Krefeld; Bernd Pennemann, Köln; Erich Wolters, Köln, and Eberhard Zirngiebl, Köln, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jul. 11, 1994, Ser. No. 273,547

Claims priority, application Germany, Jul. 15, 1993, 43 23 679.0; Jul. 15, 1993, 43 23 678.2; Jul. 15, 1993, 43 23 680.4

Int. Cl.[6] C07C 69/96

U.S. Cl. 558—277 21 Claims

1. A process for the continuous preparation of dimethyl carbonate by reacting carbon monoxide with methyl nitrite in the presence of an inert gas, in the presence of methanol and in the presence or absence of nitric oxide on a supported palladium catalyst at elevated temperature in the gas phase, which is carried out at a volume ratio methyl nitrite:carbon monoxide of 0.1:1 to 10:1, a pressure of 0.5 to 6 bar and a temperature of 50°–200° C., the catalyst having been prepared by the application to a suitable support of one or more palladium compounds of the general formula

$$[Pd(N(R^1, R^2, R^3))_n]X^1_2 \quad (I),$$

in which

$R^1$, $R^2$ and $R^3$ independently of one another are hydrogen, $C_1$–$C_4$-alkyl, phonyl or $C_7$–$C_{10}$-aralkyl and $R^3$ can additionally be —$A^1$-N($R^4$, $R^5$), wherein —$A^1$— is linear or branched $C_1$–$C_8$-alkylene, $C_2$–$C_8$-alkylene interrupted by —O— or —$NR^6$—, or phenylene, it being possible for $R^2$ and $R^3$ or $R^4$ and $R^5$, in each case together with the N atom which they substitute, to form the imidazoline, piperidine or morpholine system, and $R^4$, $R^5$ and $R^6$ independently of one another being hydrogen or $C_1$–$C_4$- alkyl, and $R^1$, $R^2$ and $R^3$, $R^2$, $R^3$ and $A^1$ or $A^1$, $R^4$ and $R^5$, in each case together with the N atom which they substitute, can be the pyridine or quinoline system, provided however that $R^1$, $R^2$ and $R^3$ are not hydrogen at the same time, indicates the total number of Pd-oriented N atoms in the ligands and is 2, 3 or 4, and

$X^1$ is one equivalent of fluoride, chloride, bromide, cyanide, nitrate, sulphate, phosphate or $C_1$–$C_6$-carboxylate.

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5,498,745

## SUBSTITUTED DI-T-BUTYLPHENOLS

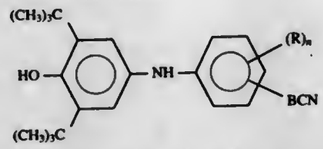
Robert A. Scherrer, White Bear, Minn., assignor to Riker Laboratories, Inc., St. Paul, Minn.

Division of Ser. No. 263,390, Jun. 22, 1994, Pat. No. 5,416,113, which is a continuation-in-part of Ser. No. 757,358, Jul. 22, 1985, abandoned. This application May 5, 1995, Ser. No. 435,582

Int. Cl.[6] C07C 255/42

U.S. Cl. 558—408 1 Claim

1. A compound of the formula



wherein R is hydrogen, lower alkyl, lower alkoxy, lower alkylthio, hydroxy or halogen; n is 0, 1 or 2, with the proviso that when n is 2, the R substituents combined contain no more than 6 carbon atoms; and B is a carbon-carbon bond, lower alkylene, lower alkenylene, lower alkylene containing one ether or thioether link in the alkylene chain, or



—CNHCH$_2$—.

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5,498,746

## PROCESS FOR THE PREPARATION OF 5,6-DIHYDROXYINDOLE AND INTERMEDIATE COMPOUNDS

Alex Junino, Livry-Gargan; Jean J. Vandenbossche, Aulnay-sous-Bois, and Gerard Lang, Saint-Gratien, all of, France, assignors to L'Oreal, Paris, France

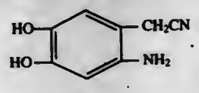
Division of Ser. No. 339,236, Nov. 10, 1994, which is a continuation of Ser. No. 921,097, Jul. 29, 1992, Pat. No. 5,410,867, which is a continuation of Ser. No. 475,906, Feb. 5, 1990, abandoned, which is a continuation of Ser. No. 337,863, Apr. 14, 1989, abandoned, which is a continuation of Ser. No. 172,246, Mar. 23, 1988, abandoned, which is a continuation of Ser. No. 927,723, Nov. 7, 1986, abandoned. This application Jun. 5, 1995, Ser. No. 462,667

Int. Cl.[6] C07C 255/33

U.S. Cl. 558—406 1 Claim

1. A compound having the formula

(III)



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5,498,747

## CARBODIIMIDES AND/OR OLIGOMERIC POLYCARBODIIMIDES BASED ON 1,3-BIS (1-METHYL-1-ISOCYANATOETHYL)BENZENE, THEIR PREPARATION, AND THEIR USE AS HYDROLYSIS STABILIZERS

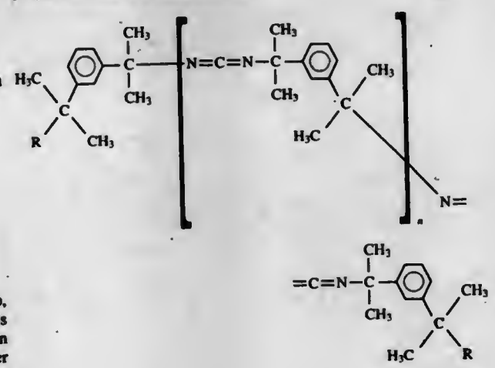
Siegmund Pohl, Ludwigshafen; Friedhelm Lehrich, Lemfoerde; Manfred Genz, Damme; Bernd Bruchmann, Ludwigshafen; Helmut Teach, Roedersheim-Gronau; Roland Minges, Gruenstadt, and Joachim Streu, Dachau, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Division of Ser. No. 241,912, May 12, 1994, abandoned. This application Mar. 7, 1995, Ser. No. 400,406

Int. Cl.[6] C07C 269/02;273/10

U.S. Cl. 560—25 4 Claims

1. A process for the preparation of a carbodiimide or oligomeric polycarbodiimide of the formula;







where the R radicals are identical or different and are selected from the group consisting of —NCONHR$^1$, —NHCONR$^1$R$^2$—, and —NHCOOR$^3$—,

where

$R^1$ and $R^2$ may be identical or different and are alkyl, cycloalkyl, or aralkyl, and

$R^3$ is identical to $R^1$ or is alkoxypolyoxyalkylene, and

n is an integer from 0 to 10,

which comprises

a) condeasing 1,3-bis(1-methylisocyanatoethyl)benzene in the presence of catalysts with elimination of carbon dioxide, subeequently reacting all or some of the free terminal isocyanate groups of the resultant (poly)carbodiimide with at least one aliphatic, cycloaliphatic or araliphatic amine, alcohol and/or alkoxypolyoxyalkylene alcohol, and then removing or deactivating the catalysts, or

b) reacting up to 50% of the isocyanate groups of 1,3-bis(1-methyl-1-isocyanatoethyl)benzeae with at least one aliphatic, cycloaliphatic or araliphatic amine, alcohol and/or alkoxypolyoxyalkylene alcohol, subeequently condensing all or some of the free isocyanate groups in the presence of catalyst with elimination of carbon dioxide, and then removing or deactivating the catalysts.

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5,498,748

## ANTHRACENE DERIVATIVES

Fumiyoshi Urano; Keiji Oono, and Hiroshi Matsuda, all of Kawagoe, Japan, assignors to Wako Pure Chemical Industries, Ltd., Osaka, Japan

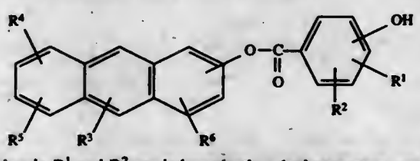
Filed Jul. 11, 1994, Ser. No. 272,753

Claims priority, application Japan, Jul. 20, 1993, 5-200364

Int. Cl.[6] C07C 69/88

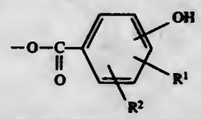
U.S. Cl. 560—67 5 Claims

1. An anthracene derivative of the formula:



[I]

wherein $R^1$ and $R^2$ are independently a hydrogen atom, an alkyl group, an alkoxy group, a halogen atom or a hydroxyl group; $R^3$, $R^4$, $R^5$ and $R^6$ are independently a hydrogen atom, an alkyl group, an alkoxy group, a halogen atom, or a group of the formula:



[II]

wherein $R^1$ and $R^2$ are as defined above, provided that at least one of $R^3$ through $R^6$ is the group of the formula [II], and the group of the formula [II] in number of 3 cannot be positioned at the 1, 8 and 9 positions of the anthracene ring at the same time.

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5,498,749

## PROCESS FOR SEPARATING CYCLOHEXANE DIMETHANOL FROM DIMETHYL TEREPHTHALATE

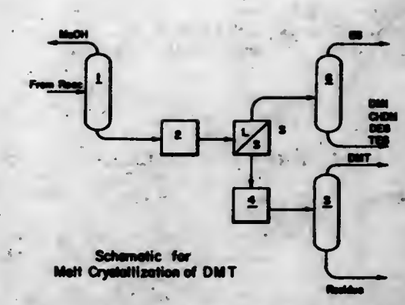
William H. Heise; Daniel P. Folk; Cheuk C. Yau, and Chester W. Sink, all of Kingsport, Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.

Filed Oct. 22, 1993, Ser. No. 139,672

Int. Cl.[6] C07C 67/54

U.S. Cl. 560—78 15 Claims

1. A method for purifying dimethyl terephthalate in a product stream from the methanolysis of polyesters comprised of residues of terephthalic acid, which comprises the steps:




Schematic for Melt Crystallization of DMT

(a) subjecting said product stream to distillation, thereby removing excess methanol;

(b) crystallizing crude dimethyl terephthalate to form a solid/liquid mixture;

(c) separating said solid from the solid/liquid mixture, remelting said solid to form a melt; and optionally

(d) subjecting said melt to distillation and isolating dimethyl terephthalate as a vapor.

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5,498,750

## PROCESS FOR THE PREPARATION OF 1-FLUORO-CYCLOPROPANE-1-CARBOXYLIC ACID

Stefan Böhm, and Albrecht Marhold, both of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

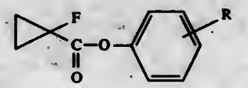
Division of Ser. No. 158,088, Nov. 24, 1993, Pat. No. 5,434,303, which is a continuation of Ser. No. 942,564, Sep. 9, 1992, abandoned. This application Mar. 15, 1995, Ser. No. 404,784

Claims priority, application Germany, Sep. 19, 1991, 41 31 139.6

Int. Cl.[6] C07C 69/74

U.S. Cl. 560—124 3 Claims

1. A 1-fluoro-cyclopropane-1-carboxylate of the formula



in which

R represents hydrogen, halogen, methyl, methoxy, phenyl or phenoxy.

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5,498,751

## ORGANOTIN CATALYZED TRANSESTERIFICATION

Louis E. Trapasso, West Long Branch; Stanley J. Padegimas, Sayreville; Peter F. Epstein, Neptune City; Paul L. K. Hung, Watchung; Purnendu Mukhopadhyay, Sayreville, and Philip L. Meisel, Greenbrook, all of N.J., assignors to CPS Chemical Company, Inc., Old Bridge, N.J.

Filed Sep. 3, 1993, Ser. No. 116,448

Int. Cl.[6] C07C 67/02

U.S. Cl. 560—217 67 Claims

1. A method for transesterifying esters of carboxylic acids with 1,2- and 1,3-polyols comprising the steps of:

providing a reaction mixture comprising:

(1) a 1,2- or 1,3-polyol selected from the group consisting of aralkyl, aliphatic and cycloaliphatic polyols; and

(2) a methyl or ethyl ester of a monocarboxylic acid in stoichiometric excess of said polyol; and

reacting said mixture at a temperature at which both said polyol and said monocarboxylic acid are liquid, and in the presence of an effective amount of a catalyst system consisting essen-

tially of about a 1:1 ratio of a dialkyltin oxide blended with a dialkyltin dichloride, so that a polyol ester of said monocarboxylic acid and methanol or ethanol are formed.

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**5,498,752**

**PROCESS FOR RECOVERING OPTICAL ISOMERS AND SOLVENT, PROCESS FOR USING SOLVENT BY CIRCULATION AND PROCESS FOR REUSING OPTICAL ISOMERS IN OPTICAL RESOLUTION**

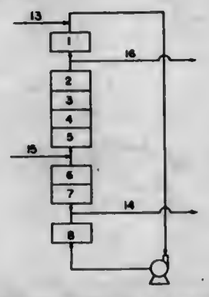
**Masakazu Negawa, and Fumihiko Shoji, both of Hyogo, Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan**

**Continuation-in-part of Ser. No. 156,264, Nov. 22, 1993, Pat. No. 5,434,299, which is a division of Ser. No. 30,863, Mar. 12, 1993, Pat. No. 5,434,298. This application Feb. 28, 1994, Ser. No. 202,970**

**Claims priority, application Japan, Aug. 22, 1991, 3-210565**

**Int. Cl.[6] B01D *15/08***

**U.S. Cl. 560—249** **12 Claims**




1. A process for separating optical isomers from a mixture containing the same comprising the steps of: introducing a liquid containing an optical isomer mixture and an eluent into a packed bed column containing packings for optical resolution, said column having its ends connected to each other through a fluid passage so that liquid may be circulated therethrough in endless, one-way flow relationship, an inlet for the eluent, an outlet for a liquid extract containing a strongly adsorbable isomer, an inlet for the liquid containing the optical isomer mixture and an outlet for a liquid raffinate containing a weakly adsorbable optical isomer arranged in that order in the liquid flow direction along the packed bed column; circulating said liquid containing the optical isomer mixture and eluent in one-way flow through the column; simultaneously removing a liquid containing one optical isomer and a liquid containing another optical isomer from the column; intermittently and successively moving the inlets and outlets in the direction of liquid flow along the column; and maintaining a pressure drop of no higher than 10 kgf/cm$^2$ through the packed bed column, the packing in said packed bed having an average particle size of from 1 to 100 μm.

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**5,498,753**

**PROCESS FOR PREPARING ISETHIONATE ETHOXYLATES**

**Upali Weerasooriya, Austin; John Lin, Cedar Park, and Janet L. Watson, Austin, all of Tex., assignors to Vista Chemical Company, Houston, Tex.**

**Filed Apr. 25, 1994, Ser. No. 232,679**

**Int. Cl.[6] C07C *41/00***

**U.S. Cl. 562—110** **13 Claims**

1. A process for the production of alkali metal isethionate ethoxylates comprising:

reacting an alkali metal isethionate and a liquid polyol having from 2 to 6 carbon atoms in the presence of an alkali metal hydroxide catalyst and under reflux conditions to remove water, the mole ratio of said polyol to said alkali metal isethionate being greater than about 7:1, to produce a reaction mixture containing the alkali metal isethionate ethoxylate,

neutralizing the reaction mixture to a pH of from 7 to about 8 with hydrochloric acid to produce a neutralized reaction mixture, and

recovering the alkali metal isethionate ethoxylate from said neutralized reaction mixture.

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**5,498,754**

**PROCESS FOR REFINING CRUDE FLUOROALKYLSULFONIC ACID WITH THE USE OF WATER**

**Tamio Nakamura; Takashi Yokoyama, both of Ube, and Yoshiyuki Kobayashi, Yokohama, all of, Japan, assignors to Central Glass Co., Ltd., Yamaguchi, Japan**

**Filed Apr. 18, 1994, Ser. No. 228,872**

**Claims priority, application Japan, Apr. 19, 1993, 5-091040**

**Int. Cl.[6] C07C *309/04***

**U.S. Cl. 562—113** **24 Claims**

1. A process for refining a fluoroalkylsulfonic acid in a crude state which is represented by the general formula $RfSO_3H$, with Rf being a fluoroalkyl group having 1 to 4 carbon atoms, into a highly refined fluoroalkylsulfonic acid substantially free of impurities, said process comprising the steps of:

(a) providing said fluoroalkylsulfonic acid in a crude state,

(b) mixing said fluoroalkylsulfonic acid in a crude state with water in an amount of 0.1 wt. % to 30 wt. % versus the total amount of said fluoroalkylsulfonic acid and said water to obtain a mixture,

(c) stirring said mixture while maintaining said mixture at a temperature which is higher than room temperature, and

(d) subjecting the mixture treated in said step (c) to distillation.

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**5,498,755**

**DISUBSTITUTED ARYL AND HETEROARYL IMINES HAVING RETINOID-LIKE BIOLOGICAL ACTIVITY**

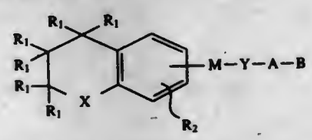
**Roshantha A. Chandraratna, 25841 Empresa, Mission Viejo, Calif. 92691, and Min Teng, 133 Southbrook, Irvine, Calif. 92714**

**Filed Aug. 23, 1994, Ser. No. 294,901**

**Int. Cl.[6] C07C *251/24***

**U.S. Cl. 564—272** **7 Claims**

1. A compound of the formula




wherein the $R_1$ groups independently are hydrogen, lower alkyl of 1 to 6 carbons, or two geminal $R_1$ groups jointly represent an oxo (=O) or a thio (=S) group;

$R_2$ is hydrogen or lower alkyl of 1 to 6 carbons, or halogen;

M is —N=CR$_4$— where $R_4$ is hydrogen or lower alkyl of 1–6 carbons;

X is $C(R_1)_2$;

Y is a 1,4 phenyl group optionally substituted with an $R_3$ group which is lower alkyl of 1 to 6 carbons or halogen;

A is $(CH_2)_n$, where n is 0–5, lower branched chain alkyl having 3–6 carbons, cycloalkyl having 3–6 carbons, alkenyl having 2–6 carbons and 1 or 2 double bonds, alkynyl having 2–6 carbons and 1 or 2 triple bonds;

B is COOH or a pharmaceutically acceptable salt thereof, $COOR_8$, $CONR_9R_{10}$, —$CH_2$Oh, $CH_2OR_{11}$, $CH_2OCOR_{11}$, CHO, $CH(OR_{12})_2$, $CHOR_{13}O$, —$COR_7$, $CR_7(OR_{12})_2$, or $CR_7OR_{13}O$, where $R_7$ is an alkyl, cycloalkyl or alkenyl group containing 1 to 5 carbons, $R_8$ is an alkyl group of 1 to 10 carbons, or a cycloalkyl group of 5 to 10 carbons, or $R_8$ is phenyl or lower alkylphenyl, $R_9$ and $R_{10}$ independently are hydrogen, an alkyl group of 1 to 10 carbons, or a cycloalkyl group of 5–10 carbons, or phenyl or lower alkylphenyl, $R_{11}$ is lower alkyl, phenyl or lower alkylphenyl, $R_{12}$ is lower alkyl, and $R_{13}$ is divalent alkyl radical of 2–5 carbons.



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**5,498,756**

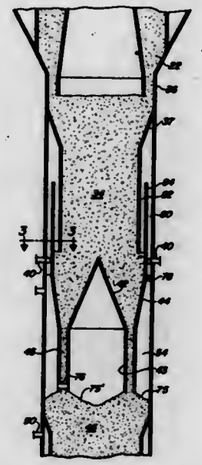
**MOVING BED REGENERATION PROCESS WITH INTERNALLY MIXED CHLORIDE GAS**

**Frank T. Micklich, Joliet, and Paul A. Sechrist, Des Plaines, both of Ill., assignors to UOP, Des Plaines, Ill.**

**Division of Ser. No. 173,237, Dec. 27, 1993, Pat. No. 5,397,458. This application Jan. 3, 1995, Ser. No. 367,542**

**Int. Cl.[6] B01J *38/44***

**U.S. Cl. 422—223** **9 Claims**



1. An apparatus for regenerating chloride containing catalyst particles, said apparatus comprising:

a) a vertical regeneration vessel having an outer vessel wall;

b) a combustion section defined by an upper portion of said regeneration vessel;

c) means for adding deactivated catalyst particles to said combustion section and contacting deactivated catalyst particles with combustion gas in said combustion section to produce coke depleted catalyst particles and spent regeneration gas;

d) an upper chamber defined by an upper portion of said regeneration vessel for collecting spent regeneration gas and means for withdrawing spent regeneration gas from said chamber;

e) a chlorination section in said regeneration vessel containing a chlorination chamber, defined in part by an inner chlorination baffle, and means for receiving coke depleted catalyst particles from said combustion section in said chlorination chamber to produce chlorided catalyst particles and communicating gas from said chlorination section to said upper chamber;

f) an outer chlorination baffle extending within said regeneration vessel parallel to and partially overlapping said inner chlorination baffle to define an outer mixing chamber between said vessel wall and said outer chlorination baffle and a inner mixing chamber located between said outer chlorination baffle and said inner chlorination baffle, said chlorination section having means for communicating a chlorination gas from said outer mixing chamber through said inner mixing chamber to said chlorination chamber;

g) a drying section defined by said regeneration vessel and located below said chlorination chamber for contacting chlorided catalyst particles with a drying gas;

h) means for passing said drying gas and introducing a chlorine compound containing stream into said outer mixing chamber to produce said chlorination gas;

i) means for passing chlorided catalyst particles from said chlorination chamber into said drying section to produce dried catalyst particles; and,

j) means for withdrawing dried catalyst particles from said regeneration vessel.

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**5,498,757**

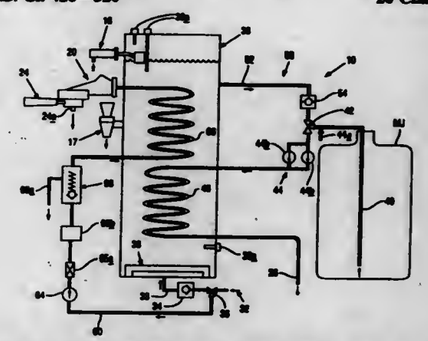
**MILK FROTHING AND HEATING SYSTEM**

**Michael W. Johnson, St. Helens, and Christopher J. Engler, Portland, both of Oreg., assignors to Boyd Coffee Company, Portland, Oreg.**

**Filed Apr. 4, 1995, Ser. No. 417,872**

**Int. Cl.[6] A23C *3/00*; A47J *31/00***

**U.S. Cl. 426—520** **20 Claims**



16. A method for frothing and heating milk for use in coffee/espresso drinks, said method comprising the steps of:

providing a cold milk supply;

drawing cold milk from the cold milk supply via a milk conduit configured to pass the cold milk along a milk flow path;

frothing the cold milk by controlled introduction of air into the milk flow path;

passing frothed milk through an ambient pressure hot water tank via a coiled frothed milk conduit, thereby heating the frothed milk for discharge.

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**5,498,758**

**METHOD FOR THE COLD END COATING OF GLASSWARE USING A VAPORIZER HAVING AN INTERNAL FLOW PATH FROM A RESERVOIR OF LIQUID COATING MATERIAL TO A VAPOR DEPOSITION CHAMBER**

**Addison B. Scholes; Joseph Lamirand, both of Muncie, and Duane Saltsgaver, Noblesville, all of Ind., assignors to Alltrista Corporation, Muncie, Ind.**

**Filed May 20, 1994, Ser. No. 246,835**

**Int. Cl.[6] C23C *16/44*; C03C *17/42***

**U.S. Cl. 427—255** **14 Claims**

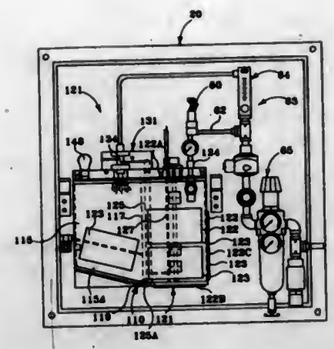
9. A method of forming a coating on glassware articles, the method comprising the steps of:

enclosing and thermally isolating a conveyer portion to provide a coating zone,

conveying a series of glassware articles to be coated at elevated temperature through said coating zone,

heating said coating zone to provide an elevated temperature along said conveyer portion,

liquefying coating material by elevating its temperature in a heated tank, said tank including a heated reservoir and a heated vapor chamber separated by an internal wall, said coating material being located in the reservoir,



producing and directing at least one controlled flow of the liquified coating material at elevated temperature to at least one heated vaporizer positioned on the tank adjacent the reservoir and vapor chamber,

producing and directing at least one controlled flow of pressurized air to said at least one vaporizer,

atomizing said at least one controlled flow of liquified coating material into vaporous particles with said at least one controlled flow of pressurized air and entraining the vaporous particles in the at least one flow of air,

directing the at least one flow of air and entrained vaporous particles into the heated vapor chamber,

directing the at least one flow of air and entrained vaporous particles from the heated vapor chamber to the enclosed and thermally isolated coating zone,

introducing said at least one flow of air and entrained vaporous particles into the enclosed and thermally isolated coating zone,

coating said series of glassware articles by impingement of the vaporous particles on the glassware articles in the coating zone; and

cooling said glassware articles to form a solid coating thereon.

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**5,498,759**

**SURFACE TREATMENT METHOD FOR ALUMINUM**

**Kazuya Nakada, Hiratsuka, and Masayuki Yoshida, Yokohama, both of, Japan, assignors to Henkel Corporation, Plymouth Meeting, Pa.**

**PCT No. PCT/US92/04698, § 371 Date Dec. 27, 1993, § 102(e) Date Dec. 27, 1993, PCT Pub. No. WO93/00457, PCT Pub. Date Jan. 7, 1993**

**PCT Filed Jun. 11, 1992, Ser. No. 170,246**

**Claims priority, application Japan, Jun. 26, 1991, 3-180563**

**Int. Cl.[6] B32B** *7/12*

**U.S. Cl. 427—353** **17 Claims**

1. A method for treating an aluminum surface to provide thereon a corrosion protective and paint adherence promoting layer by spraying the surface for 0.5 to not more than 3 seconds with a chromating solution at a temperature of 40° to 60° C. and a pH of 1.0 to 3.0, said chromating solution consisting essentially of:

(A) from 0.1 to 3.0 g/L of ions selected from the group consisting of tungstate ions, molybdate ions and both tungstate and molybdate ions;

(B) from 0.5 to 4.0 g/L, measured as hexavalent chromium, of ions containing hexavalent chromium;

(C) from 5.0 to 30.0 g/L of phosphate ions; and

(D) from 0.05 to 2.0 g/L of free fluoride ions wherein the areal density of chromium in said corrosion protective and paint adherence promoting layer is at least 20 mg/m$^2$.

**5,498,760**

**PROCESS AND SYSTEM FOR PROTECTING AN OXIDIZABLE MATERIAL AGAINST OXIDATION**

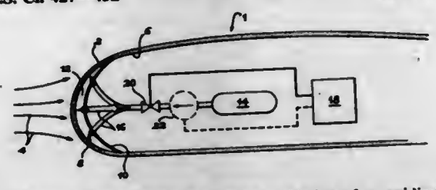
**Laurence Piketty-Leydier, Croissy/Seine; Jean-Marc Dorvaux, Ruell, and Gérard Rousseau, St. Aubin de Medoc, all of, France, assignors to Aerospatiale Societe Nationale Industrielle, France**

**Filed Nov. 2, 1993, Ser. No. 146,988**

**Claims priority, application France, Nov. 2, 1992, 92 13094**

**Int. Cl.[6] C23C** *4/04;* **B05D** *3/02*

**U.S. Cl. 427—452** **20 Claims**



1. Process for the protection against oxidation of an oxidizable material having open pores making it permeable to gases and having a first surface intended to come into contact with an oxidizing gaseous flow able to oxidize it and a second surface opposite to the first, characterized in that it consists of injecting by means of an injection system an oxygen-free protective gas through said second surface, said protective gas being able to limit the access of the oxygen to the interior of the pores of the material and block the active sites of said material.

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**5,498,761**

**PROCESS FOR PRODUCING THIN LAYERS OF CONDUCTIVE POLYMERS**

**Bernhard Wessling, Wiesenweg 38, D-2072 Bargteheide, and Holger Merkle, Wulfsdorfer Str. 88, D-2070 Ahrensburg, both of, Germany**

**Continuation of Ser. No. 108,003, Aug. 18, 1993, abandoned, which is a continuation of Ser. No. 543,830, Aug. 3, 1990, abandoned. This application Oct. 7, 1994, Ser. No. 320,839**

**Claims priority, application Germany, Jan. 11, 1988, 38 34 526.9; Feb. 3, 1989, 39 03 200.8; Mar. 9, 1989, 39 07 603.2**

**Int. Cl.[6] B29C** *71/02;* **B05D** *3/06;3/02;* **H01B** *1/06*

**U.S. Cl. 427—542** **27 Claims**

1. Process for the production of at least one conductive layer of insoluble intrinsically conductive polymers, said polymers being polyaniline polymers, which are insoluble in solvents consisting of organic solvents or solvents with a solubility parameter of <11 $(cal/cm^3)^{1/2}$, on a substrate wherein the conductive layer has a specific conductivity of $>10^{-2}$ S/cm, comprising the steps of:

depositing on the substrate said at least one layer of the conductive polymers from a metastable dispersion of the insoluble intrinsically conductive polymers in a dispersion, having concentration of said polymers in said dispersion from $10^{-3}$% to 5% by weight in said solvents;

heating said substrate; and

drying said substrate.

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**5,498,762**

**FERROELECTRIC LIQUID CRYSTAL DEVICE**

**Ken Eguchi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 296,930, Aug. 31, 1994, abandoned. This application May 17, 1995, Ser. No. 442,987**

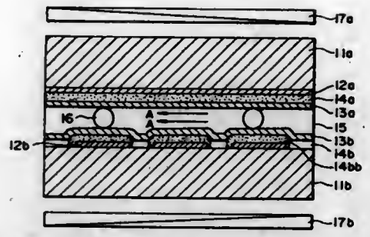
**Claims priority, application Japan, Aug. 31, 1993, 5-237211**

**Int. Cl.[6] G02F** *1/1337*

**U.S. Cl. 428—1** **25 Claims**

1. A ferroelectric liquid crystal device, comprising: a pair of substrates each having thereon an electrode and an alignment film, and a ferroelectric liquid crystal disposed between the substrates;





wherein the alignment film on at least one substrate comprises laminated layers of at least two species of electroconductive polymers having mutually different optical band gaps $Eq^{opt}$.

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**5,498,763**

**POLYESTER-FLEXIBLE POLYMER BLOCK COPOLYMER COATED FIBER STRUCTURES**

**Frederick J. McGarry, Weston, Mass.; and Douglas S. McBain, Norton, Ohio, assignors to GenCorp Inc., Fairlawn, Ohio**

**Division of Ser. No. 828,081, Jan. 30, 1992, Pat. No. 5,334,441. This application Mar. 24, 1994, Ser. No. 217,041**

**Int. Cl.[6] D03D** *3/00;* **B32B** *7/00;* **D04H** *1/58;* **D02G** *3/00*

**U.S. Cl. 428—229** **13 Claims**

1. A matrix reinforcement structure for distribution in a matrix resin, comprising:

a fiber structure coated with a layer of a block copolymer of the formula AB or A(BA)$_n$ where A is an unsaturated polyester having a molecular weight of from 100 to 5000, B is a flexible polymer having a Tg of 0° C. or less, and n is from 1 to 5 and wherein said fiber structure is substantially coated with said block copolymer prior to being distributed in a matrix.

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**5,498,764**

**NEGATIVE ELECTRODE FOR LITHIUM SECONDARY CELLS AND LITHIUM SECONDARY CELLS USING THE SAME**

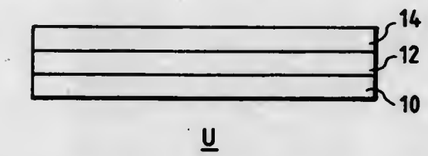
**Jun Hasegawa, Hekinan, and Katsuhiko Suzuki, Aichi, both of, Japan, assignors to Nippondenso Co., Ltd., Karita, Japan**

**Filed Sep. 21, 1994, Ser. No. 308,491**

**Claims priority, application Japan, Sep. 22, 1993, 5-236257**

**Int. Cl.[6] H01M** *4/38;4/02;4/36*

**U.S. Cl. 429—218** **18 Claims**



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1. A negative electrode for lithium secondary cells comprising:

a substrate, at least a surface portion of said substrate comprising a metallic lithium matrix, and

an element dispersed and doped in said metallic lithium matrix, said element having an electronegativity greater than that of metallic lithium, said concentration of said element within said lithium matrix being between $5\times10^{19}$ atoms/cm$^3$ and $5\times10^{15}$ atoms/cm$^3$, said element serving as a site for formation of multiple crystal metallic lithium nuclei when a lithium secondary cell using said negative electrode is charged, whereby metallic lithium crystals are deposited on an entire surface of said metallic lithium matrix through said site to form a metallic lithium layer.

**5,498,765**

**POSITIVE PHOTORESIST COMPOSITION CONTAINING PHOTOACID GENERATOR AND USE THEREOF**

**Burton J. Carpenter, Jr.; Michael G. McMaster; Joseph LaTorre, all of Austin, Tex., and Logan L. Simpson, Apalachin, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Division of Ser. No. 41,460, Apr. 2, 1993, Pat. No. 5,374,500. This application Sep. 26, 1994, Ser. No. 311,027**

**Int. Cl.[6] G03F** *7/30;7/40*

**U.S. Cl. 430—323** **13 Claims**

1. A process for forming a pattern in a copper containing layer which comprises coating said copper containing layer with a photosensitive resist composition comprising:

a film forming reactive polymer containing groups which react upon acid catalysis;

an iodonium initiator which generates acid or a non-ionic photoacid generator that generates triflic acid upon exposure to radiation; and

further comprising about 0.1 to about 5% by weight of citric acid based upon the weight of solids in the resist composition;

exposing selected areas of said composition to radiation, developing said composition by dissolving the exposed areas in a basic aqueous developing solution; thereby exposing areas of the copper containing layer; etching the areas of copper containing layer that are exposed; and then removing by stripping unexposed photoresist.

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**5,498,766**

**TREATMENT METHOD FOR FIBROUS LIGNOCELLULOSIC BIOMASS USING FIXED STATOR DEVICE HAVING NOZZLE TOOL WITH OPPOSING COAXIAL TOOTHED RINGS TO MAKE THE BIOMASS MORE SUSCEPTIBLE TO HYDROLYSIS**

**Earnest D. Stuart, and Vivian M. Latimer, both of Austin, Tex., assignors to Colorado State University Research Foundation, Fort Collins, Colo.**

**Continuation-in-part of Ser. No. 991,745, Dec. 17, 1992, Pat. No. 5,370,999. This application Dec. 2, 1994, Ser. No. 348,453**

**Int. Cl.[6] C12P** *19/14;19/02;* **D21C** *1/00*

**U.S. Cl. 435—99** **30 Claims**

1. A method of treating a fibrous lignocellulosic biomass to make it more susceptible to hydrolysis, comprising the following steps:

a) providing a ground fibrous lignocellulosic biomass;

b) mixing said ground biomass with water to produce a slurry; and

c) subjecting said slurry to high-shear forces by injecting said slurry cross-currently into a turbulent Couette flow created in a high-frequency, rotor-stator device under conditions to microcavitate the slurry to shatter the fibrous structure of the biomass in the slurry creating a sheared slurry, said device comprising a chamber containing a fixed stator equipped with a nozzle tool containing concentric rings having bore holes meshing, with opposing coaxial toothed rings coupled to a rotor that is coupled to a rotatable shaft.

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**5,498,767**

**METHOD FOR POSITIONING BOND PADS IN A SEMICONDUCTOR DIE LAYOUT**

**Wyatt A. Huddleston, and James J. Casto, both of Austin, Tex., assignors to Motorola, Inc., Schumburg, Ill.**

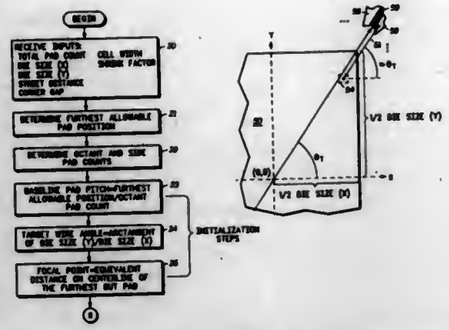
**Filed Oct. 11, 1994, Ser. No. 321,643**

**Int. Cl.[6] H01L** *21/28;21/60*

**U.S. Cl. 437—8** **23 Claims**

1. A method for positioning bond pads along an edge of a semiconductor die in a semiconductor die layout, the method comprising the steps of:

setting a baseline pad pitch to a first value, a cell width to a second value, and a focal point to a third value;




setting a first pad position equal to a first pad value;

determining a first angle between a first line through a center of the first pad position and the focal point and a second line through a center of the semiconductor die and normal to the edge;

determining a pad spacing increment value equal to the first value divided by a cosine of the first angle;

setting a second pad position equal to a second pad value, wherein the second pad value equals one of:

a) the first pad value plus the second value; and

b) the first pad value plus the pad spacing increment value; whichever is greater; and

using the first and second pad values to respectively position a first bond pad and a second bond pad in the semiconductor die layout.

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**5,498,768**

**PROCESS FOR FORMING MULTILAYER WIRING**

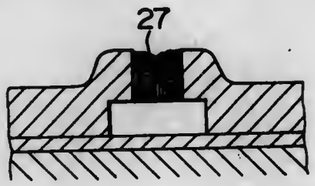
**Eisuke Nishitani, Yokohama; Susumu Tsuzuku, Tokyo; Shigeru Kobayashi, Hiratsuka; Osamu Kasahara; Hiroki Nezu, both of Tokyo; Masakazu Ishino, Yokohama, and Tsuyoshi Tamaru, Ome, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Continuation of Ser. No. 742,447, Aug. 5, 1991, abandoned, and a continuation of Ser. No. 384,735, Jul. 24, 1989, abandoned. This application Jul. 6, 1993, Ser. No. 87,027**

**Claims priority, application Japan, Jul. 27, 1988, 63-185598**

**Int. Cl.[6] H01L** *21/441*

**U.S. Cl. 437—192** **18 Claims**




1. A process for forming a multilayer wiring in a fabricated wafer, said multilayer wiring comprising a plurality of wirings stacked via silicon and oxygen-containing insulating layers each provided between one and another of said wirings, one of said wirings being electrically connected to another wiring through via-holes, which comprises the steps of:

(a) introducing into a pretreatment chamber said fabricated wafer having the wirings, one of which is covered thereon by the insulating layers except said via-holes, the surfaces of the wiring exposed at the via-holes being covered by a native oxide of the wiring;

(b) introducing a rare gas into said pretreatment chamber and then forming a plasma in said chamber by electric discharge to physically remove an amount of said oxide from the exposed surfaces due to the collision of plasma particles against the surfaces;

(c) introducing an etching gas into said chamber, then forming a plasma in said pretreatment chamber by electric discharge and introducing said fabricated wafer from step (b) into said plasma, thereby increasing the oxygen content of the surface of said insulating layers as reduced during the physical removal of the oxide in step (b) to restore the reduced oxygen/silicon ratio of the surface of the insulating layers, to that before the pretreatment of step (b);

(d) ceasing the introduction of both the rare gas and etching gas in said pretreatment chamber and then evacuating said pretreatment chamber;

(e) subjecting the exposed surfaces of the wiring to a treatment for corrosion prevention and transferring said fabricated wafer to an evacuated deposition chamber; and,

(f) introducing a deposition material gas into said deposition chamber containing the corrosion-prevention treated wafer placed therein, and selectively depositing said material only on said exposed surfaces of the wiring in said via-holes to fill said via-holes with the deposited material; and,

(g) preparing another wiring on said insulating layers.

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**5,498,769**

**METHOD FOR THERMALLY TREATING RESIST FILM AND FORMING UNDERCUT PATTERN**

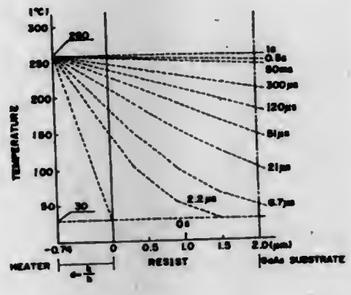
**Norihiko Samoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Continuation of Ser. No. 170,870, Dec. 21, 1993, abandoned. This application Dec. 6, 1994, Ser. No. 353,990**

**Claims priority, application Japan, Dec. 21, 1992, 4-340072**

**Int. Cl.[6] G03F** *7/00*

**U.S. Cl. 430—327** **8 Claims**




1. A method for thermally treating a resist film with a first surface formed on a substrate, said method comprising the steps of:

placing a heat source over a second surface of said resist film whereby a small space is left between said heat source and said second surface; and

forming internally in said resist film a distribution of temperatures whereby the temperature in said resist film gradually decreases between said second surface of said resist film and a surface of said substrate.



**5,498,770**

**CATALYST FOR THE POLYMERIZATION OF OLEFINS AND PROCESS FOR THE POLYMERIZATION OF OLEFINS**

**Motoki Hosaka; Kenji Goto, and Masahiko Matsuo, all of Kanagawa, Japan, assignors to Toho Titanium Co., Ltd., Chigasaki, Japan**

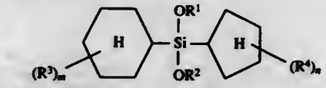
**Filed Sep. 20, 1994, Ser. No. 309,885**

**Claims priority, application Japan, Apr. 28, 1994, 6-113754**

**Int. Cl.[6] C08F** *4/656*

**U.S. Cl. 502—116** **9 Claims**

1. A catalyst for the polymerization of olefins comprising (A) a solid catalyst comprising magnesium, titanium, an electron donor compound, and a halogen which is prepared by bringing metallic magnesium or a magnesium compound, a titanium halide compound, and an electron donor compound into contact, (B) an organoaluminum compound, and (C) an organosilicon compound represented by formula (I):




(I)

wherein $R^1$ and $R^2$, which may be the same or different, each represents an alkyl group having from 1 to 3 carbon atoms; $R^3$ and $R^4$, which may be the same or different, each represents an alkyl group having from 1 to 3 carbon atoms, or a halogen atom; and m and n each represents 0 or an integer of 1 or 2.

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**5,498,771**

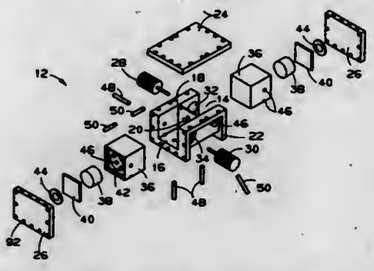
**MINIATURIZED DIELECTRIC RESONATOR FILTERS AND METHOD OF OPERATION THEREOF AT CRYOGENIC TEMPERATURES**

**Raafat R. Mansour, Waterloo, and Van Dokas, Cambridge, both of, Canada, assignors to Com Dev Ltd., Cambridge, Canada**

**Filed Dec. 3, 1993, Ser. No. 161,256**

**Int. Cl.[6] H01P** *7/10;1/20;* **H01B** *12/06*

**U.S. Cl. 505—210** **28 Claims**




1. A microwave filter comprising in combination:

(a) at least one cavity having a at least one dielectric block disposed therein, with at least one dielectric resonator and associated shorting plate connected thereto being located within said block, said block having a size and shape relative to said cavity so that said block fits tightly within said cavity, said block having an interior with a size and shape to hold said dielectric resonator and said shorting plate within said block in a fixed position;

(b) said cavity resonating in at least one mode at the resonant frequency of said cavity, there being a respective tuning screw for each mode and for each resonator within said cavity, and one coupling screw for every two modes that are coupled within said cavity, said block having suitable openings to accommodate said screws;

(c) said filter having an input and an output operatively connected thereto.

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**5,498,772**

**REVERSIBLE HEAT-SENSITIVE RECORDING MATERIAL**

**Jun Maruyama; Kazuyuki Iida; Keichi Toriizuka; Shoji Hiraate; Hidekazu Sano, and Mitsuhiro Ikeda, all of Tokyo, Japan, assignors to Mitsubishi Paper Mills Limited, Tokyo, Japan**

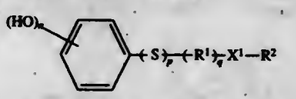
**Filed Oct. 12, 1994, Ser. No. 321,523**

**Claims priority, application Japan, Jan. 14, 1993, 5-256825; Dec. 17, 1993, 5-317555; Dec. 24, 1993, 5-328101; Feb. 1, 1994, 6-010310; Feb. 1, 1994, 6-010313; Mar. 23, 1994, 6-051749**

**Int. Cl.[6] B41M** *5/30*

**U.S. Cl. 503—216** **7 Claims**

1. Reversible heat-sensitive recording material comprising a substrate and a recording layer formed thereon, said recording layer comprising a colorless or light-colored, electron-donating dye precursor and an electron-accepting compound represented by the following general formula which causes a reversible color tone change of the dye precursor on heating:




I

wherein n is an integer of 1 to 3, each of p and q is zero or 1, $R^1$ is a divalent hydrocarbon group having 1 to 18 carbon atoms, $R^2$ is a hydrocarbon group having 1 to 24 carbon atoms, and $X^1$ is a divalent group having at least one amide bond, $X^1$ not including a mere amide and a urea bond in the case of p being zero, and q being 1 in the case of p being 1.

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**5,498,773**

**HERBICIDAL COMPOSITIONS WITH INCREASED CROP SAFETY**

**Robert L. Noveroske, Indianapolis, and Ronald W. McCormick, Noblesville, both of Ind., assignors to DowElanco, Indianapolis, Ind.**

**Continuation-in-part of Ser. No. 976,113, Nov. 13, 1992, abandoned, which is a continuation of Ser. No. 695,195, May 3, 1991, abandoned. This application Mar. 30, 1994, Ser. No. 220,138**

**Int. Cl.[6] A01N** *25/32*

**U.S. Cl. 504—103** **84 Claims**

1. A herbicidal formulation concentrate composition comprising, as the active material, a herbicidally effective amount of from about 0.5 to about 90 percent by weight of a sulfonamide or sulfonylurea herbicide from the group consisting of

Chlorimuron-ethyl,

Chlorsulfuron,

Metsulfuron-methyl,

Tribenuron-methyl,

Thifensulfuron,

N-(2,6-dichloro-3-methylphenyl)-B,7-dimethoxy-1,2,4-triazolo(1,5-a)pyrimidine-2-sulfonamide,

N-(2,6-dichlorophenyl)-5-ethoxy-7-fluoro-1,2,4-triazolo-(1,5-c)pyrimidine-2-sulfonamide,

N-(2-chloro-6-fluorophenyl)-5-ethoxy-7-fluoro-1,2,4-triazolo-(1,5-c)pyrimidine-2-sulfonamide,

N-(2,6-difluorophenyl)-8-chloro 5-methoxy-1,2,4-triazolo-(1,5-c)pyrimidine-2-sulfonamide,

N-(2,6-difluorophenyl)-5-methyl-1,2,4-triazolo-(1,5-a)pyrimidine-2-sulfonamide,

N-(2,6-difluorophenyl)-5-methoxy-8-fluoro-1,2,4-triazolo-(1,5-c)pyrimidine-2-sulfonamide, and

2-(((7-fluoro-5-ethoxy-1,2,4-triazolo(1,5-c)pyrimidin-2-yl)sulfonyl)amino)-3-fluorobenzoic acid, methyl ester,

or mixtures of said compounds, in admixture with from about 0.5 to about 80 percent of said concentrate of a non-herbicidal acidic material from the group consisting of non-herbicidal organic or inorganic acids or the non-herbicidal acid salts of said inorganic acids or mixtures thereof, said acidic material being present in an amount sufficient to insure that during post-emergent agricultural

uses of said formulation in water diluted form, the pH of the water diluted mixture is below about 5.

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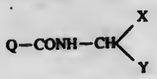
5,498,774

## CONDENSED HETEROCYCLIC COMPOUNDS, THEIR PRODUCTION AND USE

Hiroyuki Mitsudera, Toyonaka; Masato Kenobe; Yasuo Ishida, both of Suita, and Kazuho Matsuura, Kyoto, all of, Japan, assignors to Takeda Chemical Industries, Ltd. Osaka, Japan

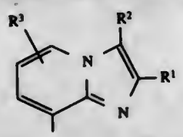
Continuation of Ser. No. 542,876, Jun. 22, 1990, abandoned.
This application Oct. 25, 1993, Ser. No. 140,984
Claims priority, application Japan, Jun. 23, 1989, 1-161507; Jan. 27, 1989, 1-288358; Apr. 27, 1990, 2-114318
Int. Cl.[6] C07D 471/08; A01N 43/48
U.S. Cl. 504—246 7 Claims

1. A condensed heterocyclic compound of the formula:



or an agriculturally acceptable salt thereof, wherein:

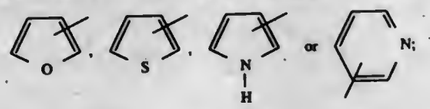
Q is a condensed heterocyclic group having the formula:



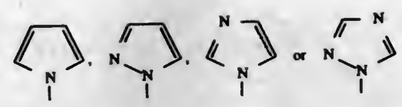
in which $R^1$ is a $C_{1-6}$ alkyl, halogen, $C_{1-4}$ alkoxy, $C_{1-4}$ alkylthio, $C_{6-10}$ aryloxy, $C_{6-10}$ arylthio, alkoxycarbonyl, phenyl, mono-, di-, tri-, or tetra-halogen-substituted phenyl, mono-, di-, tri-, or tetra-$C_{1-4}$ alkyl substituted phenyl, mono-, di-, tri-, or tetra $C_{1-4}$ alkoxy-substituted phenyl, mono-, di-, tri-, or tetra-$C_{1-4}$ alkylthio-substituted phenyl, 2-chloro-4-nitrophenyl, 4-nitrophenyl, 2-methyl-4-aminophenyl, 2-bromo-4-nitrophenyl, 2-nitro-4-methylphenyl, pyridyl, furyl, thienyl, or thiazolyl;

$R^2$ and $R^3$ are hydrogen, $C_{1-6}$ alkyl, halogen, nitro, amino, sulfo, mono- or dialkylsulfamoyl, alkoxycarbonyl, formyl, cyano, phenyl, mono-, di-, tri-, or tetra-halogen-substituted phenyl, mono-, di-, tri-, or tetra-$C_{1-4}$ alkyl-substituted phenyl, mono-, di-, tri-, or tetra-$C_{1-4}$ alkoxy-substituted phenyl, mono-, di-, tri-, or tetra-$C_{1-4}$ alkylthio-substituted phenyl, 2-chloro-4-nitrophenyl, 4-nitrophenyl, 2-methyl-4-aminophenyl, 2-bromo-4-nitrophenyl, or 2-nitro-4-methylphenyl, or a 5 or 6 membered heterocyclic group selected from the group consisting of pyridyl, furyl, thienyl, and thiazolyl;

X is hydrogen; a group attached through a carbon atom selected from the group consisting of $C_{1-10}$ alkyl, $C_{2-4}$ alkenyl, $C_{1-10}$ haloalkyl, $C_{3-6}$ cycloalkyl, $C_{3-6}$ cycloalkenyl, $C_{6-10}$ aryl, $C_{7-10}$ aralkyl and a heterocyclic ring of the formula:



a group attached through an oxygen atom selected from the group consisting of $C_{1-10}$ alkoxy, $C_{6-10}$ aryloxy, and $C_{7-10}$ aralkyloxy; a group attached through a sulfur atom selected from the group consisting of $C_{1-10}$ alkylthio, $C_{6-10}$ arylthio, and $C_{7-10}$ aralkylthio; a group attached through a nitrogen atom selected from the group consisting of $C_{1-10}$ alkylamino, $C_{6-10}$ arylamino, $C_{7-10}$ aralkylamino, and a group of the formula:



wherein each of said groups attached through a carbon atom, an oxygen atom, a sulfur atom or a nitrogen atom is unsubstituted or substituted with one to four substituents selected from the group consisting of nitro, amino, hydroxy, cyano, carboxyl, sulfonyl, halogen, $C_{1-4}$ alkoxy, $C_{1-4}$ alkylthio, phenylthio, and benzylthio; and

Y is cyano, carbamoyl, thiocarbamoyl, or trichloromethyl.

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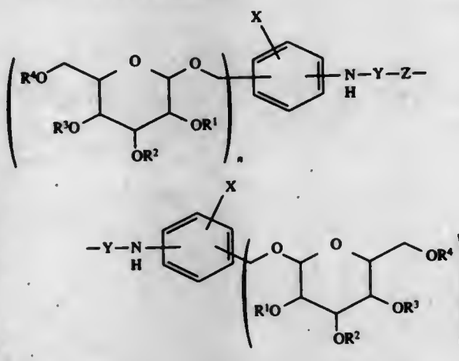
5,498,775

## POLYANIONIC BENZYLGLYCOSIDES AS INHIBITORS OF SMOOTH MUSCLE CELL PROLIFERATION

Sarah T. A. Novak, Cary, N.C.; Richard M. Soll, Lawrenceville; John W. Ellingboe, Princeton, both of N.J., and Thomas T. Nguyen, Philadelphia, Pa., assignors to American Home Products Corporation, Madison, N.J.

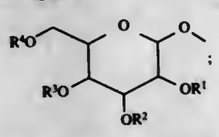
Filed Nov. 7, 1994, Ser. No. 335,278
Int. Cl.[6] A61K 31/70; C07H 15/00
U.S. Cl. 514—25 23 Claims

1. A compound of formula I

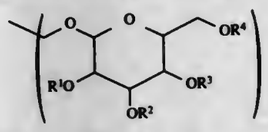


wherein

each of $R^1$, $R^2$, $R^3$, and $R^4$ are, independently, H, $SO_3M$, or a sugar group having the structure:



and each oligosaccharide group of the structure



contains from 1 to 3 sugar groups;

M is lithium, sodium, potassium, or ammonium;

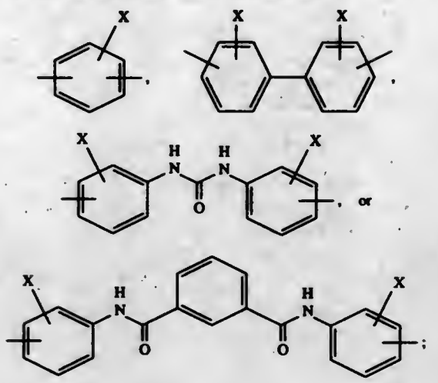
n is 1 or 2;

X is a hydrogen, halogen, lower alkyl having 1 to 6 carbon atoms, or lower alkoxy having 1 to 6 carbon atoms;

Y is carbonyl or sulfonyl;



Z is alkyl having from 1 to 12 carbon atoms,



and X is as defined above;

or a pharmaceutically acceptable salt thereof.

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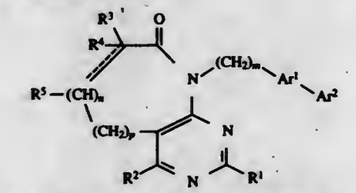
5,498,776

## SUBSTITUTED PYRROLOPYRIMIDINES AND PYRIDOPYRIMIDINES USEFUL AS ANGIOTENSIN II ANTAGONISTS

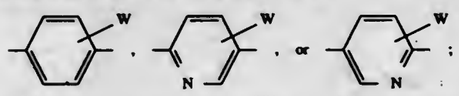
John W. Ellingboe, Princeton; Madeleine Nikaido, Plainsboro, and Jehan Bagli, Princeton, all of N.J., assignors to American Home Products Corporation, Madison, N.J.

Continuation of Ser. No. 44,448, Apr. 6, 1993, abandoned, which is a division of Ser. No. 901,485, Jun. 25, 1992, Pat. No. 5,256,654, which is a continuation-in-part of Ser. No. 782,025, Oct. 24, 1991, Pat. No. 5,149,699. This application Aug. 8, 1994, Ser. No. 287,032
Int. Cl.[6] C07D 487/04;471/04; A61K 31/55;31/505
U.S. Cl. 514—183 7 Claims

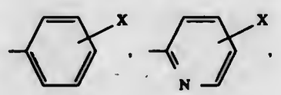
1. A compound of formula I



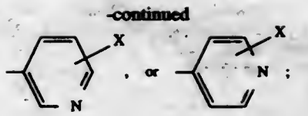
wherein $R^1$, $R^2$, $R^3$, and $R^4$ are independently H, lower alkyl containing 1 to 6 carbon atoms, or perfluoroalkyl containing 1 to 6 carbon atoms; $R^5$ is H or $R^5$ taken together with $R^3$ comprises a double bond, n is 1, p is 2, m is 0 to 3; $Ar^1$ is



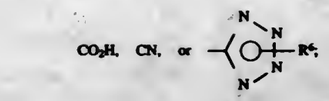
wherein W is H, lower alkyl containing 1 to 6 carbon atoms, halogen, hydroxy, or lower alkoxy containing 1 to 6 carbon atoms; and



-continued



wherein X is



wherein $R^6$ is H, tert-butyl, tri-n-butylstannyl, or triphenylmethyl; and the pharmaceutically acceptable salts thereof.

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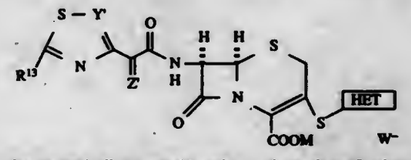
5,498,777

## 3-THIOHETEROARYL CEPHALOSPORIN COMPOUNDS, COMPOSITIONS AND METHODS OF USE

Lovji D. Cama, Teaneck; Mary F. Sasor, East Windsor, and Milton L. Hammond, Somerville, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jul. 20, 1994, Ser. No. 277,731
Int. Cl.[6] C07D 501/36; A61K 31/545
U.S. Cl. 514—206 23 Claims

1. A compound represented by formula I:



or a pharmaceutically acceptable salt or solvate thereof, wherein:

Y' represents CH or N;

M represents hydrogen, a negative charge, a biolabile ester forming group or a carboxyl protecting group;

$R^{13}$ represents $R^1$ or $N(R^1)_2$;

W — is present or absent, and when present, represents a negatively charged counterion;

Z' represents (a) $CR^nR^o$ wherein $R^n$ and $R^o$ independently represent H, $C_{1-6}$ alkyl or $C_{3-8}$ cycloalkyl, each optionally substituted with 1–3 groups selected from $R^q$, or (b) N substituted with $OR^1$ with $R^1$ equal to H, $C_{1-6}$ alkyl or $C_{1-6}$ alkyl substituted with from 1–3 groups selected from $R^q$; $C_{3-8}$ cycloalkyl; $C_{3-8}$ cycloalkenyl; $C_{3-8}$ cycloalkyl substituted with 1–3 groups selected from $R^q$, or $C_{3-8}$ cycloalkenyl substituted with 1–3 groups selected from $R^q$;

$R^q$ represents a member selected from the group consisting of:

a) $—CF_3$;

b) a halogen atom selected from the group consisting of —Br, —Cl, —F and —I;

c) —OC 1–4 alkyl, wherein the alkyl portion thereof is optionally substituted by 1–3 groups selected from $R^q$. $R^q$ is selected from the group consisting of hydroxy, methoxy, cyano, $—C(O)NH_2$, $—C(O)NHC_{1-4}$ alkyl, $—C(O)N(C_{1-4}$ alkyl$)_2$, $—OC(O)NH_2$, —CHO, $—OC(O)NHC_{1-4}$ alkyl, $—OC(O)N(C_{1-4}$ alkyl$)_2$, $—SO_2NH_2$, $—SO_2N(C_{1-4}$ alkyl$)_2$, $—S(O)C_{1-4}$ alkyl, $—SO_2C_{1-4}$ alkyl, —F, $—CF_3$, $—SO_3M^p$ with $M^p$ representing H or an alkali metal, and $—CO_2M^o$, where $M^o$ is H, alkali metal, methyl or phenyl; tetrazolyl (where the point of attachment is the carbon atom of the tetrazole ring and one of the nitrogen atoms is optionally substituted by 1–3 of the other $R^q$ groups as defined above);

d) —OH;

e) $—OC(O)R^r$, where $R^r$ is $C_{1-4}$ alkyl or phenyl, each of which is optionally substituted by 1–3 groups $R^q$ as defined above;

f) —OC(O)N($R^{z''}$)$R^{z''}$, where $R^{z''}$ and $R^{z''}$ are independently H, $C_{1-4}$ alkyl, (optionally substituted by 1–3 $R^q$ groups as defined above), or are taken together to represent a 3- to 5-membered alkylidene radical which forms a ring (optionally substituted with $R^q$ as defined above), or a 2- to 4-membered alkylidene radical interrupted by —O—, —S—, —S(O)— or —$S(O)_2$— which forms a ring, said ring being optionally substituted with 1–3 groups $R^q$ as defined above;

g) —S(O)n-$R^z$, where n=0–2, and $R^z$ is defined above;

h) —$SO_2N(R^{z''})R^{z''}$, where $R^{z''}$ and $R^{z''}$ are as defined above;

i) —$N_3$;

j) —$NR^z_{(0-1)}R^yR^z$ wherein $R^z$, $R^y$ and $R^z$ independently represent H, $C_{1-4}$ alkyl or $C_{1-4}$ alkyl substituted with from 1–3 $R^q$ groups, or $R^z$, $R^y$ and $R^z$ are taken together to represent either a 3- to 7- membered heterocyclic or heteroaryl ring, optionally substituted with 1–3 $R^q$ groups, or a 2- to 4-membered alkylidene radical interrupted by N, O or S(O)x with x equal to 0, 1 or 2, to form a ring, said alkylidene being optionally substituted with from 1 to 3 $R^q$ groups, such that when $R^z$, $R^y$ and $R^z$ are present, $NR^zR^yR^z$ is a quaternary nitrogen containing group which may be part of a ring,

or $R^z$, $R^y$ and $R^z$ are taken in combination to represent a $C_4$ to $C_{10}$ alkanetriyl group, optionally substituted with 1–3 $R^q$ groups, said alkanetriyl group being optionally interrupted with 1–3 heteroatoms selected from N+$R^f$, O and S(O)$_x$ with x and $R^f$ as defined above;

k) —N($R^f$)C(O)H, where $R^f$ is H or $C_{1-4}$ alkyl, said alkyl group being optionally substituted with 1–3 groups $R^q$ as defined above;

l) —N($R^f$)C(O)$C_{1-4}$ alkyl, wherein $R^f$ is as defined above;

m) —N($R^f$)C(O)O$C_{1-4}$ alkyl, wherein $R^f$ is as defined above;

n) —N($R^f$)C(O)N($R^y$)$R^z$ where $R^f$, $R^y$ and $R^z$ are defined above;

o) —N($R^f$)$SO_2R^z$, where $R^z$ and $R^f$ are as defined above;

p) —CN;

q) a formyl or acetalized formyl radical which is —C(O)H or —$CH(OCH_3)_2$;

r) —$C(OCH_3)_2$ $C_{1-4}$ alkyl, where the alkyl is optionally substituted by 1–3 groups $R^q$ as defined above;

s) —C(O)$R^{z'}$ where $R^z$ is as defined above;

t) —(C=NO$R^{z''}$)$R^{z''}$ where $R^{z''}$ and $R^{z''}$ are as defined above, except they may not be joined together to form a ring;

u) —C(O)O$C_{1-4}$ alkyl, where the alkyl is optionally substituted by 1–3 groups $R^q$ as defined above;

v) —C(O)N($R^{z''}$)$R^{z''}$, where $R^{z''}$ and $R^{z''}$ are as defined above;

w) —C(O)N(O$R^{z''}$)$R^{z''}$, where $R^{z''}$ and $R^{z''}$ are as defined above, except they may not be joined together to form a ring;

x) —C(S)N($R^{z''}$)$R^{z''}$ where $R^{z''}$ and $R^{z''}$ are as defined above;

y) —COO$M^a$ where $M^a$ represents H, $C_{1-4}$ alkyl, phenyl or an alkali metal;

z) —SCN;

aa) —$SCF_5$;

ab) tetrazolyl, where the point of attachment is the carbon atom of the tetrazole ring and one of the nitrogen atoms is substituted by hydrogen, an alkali metal or a $C_{1-4}$ alkyl optionally substituted by $R^q$ as defined above;

ac) an anionic function which is selected from the group consisting of: P=O($OM^a$)$_2$; P=O($OM^a$)-; P=O($OM^a$)-($C_{1-4}$ alkyl); p=O($OM^a$)N($R^{z''}$)$R^{z''}$; P=O($OM^a$)NH$R^{z''}$; $SO_2M^a$; $SO_3M^a$; $SO_2NM^aCON(R^{z''})R^{z''}$, and $SO_2NM^aCN$, where $R^{z''}$ is phenyl or heteroaryl, said heteroaryl group being a monocyclic, aromatic hydrocarbon group having 5 or 6 ting atoms, in which a carbon atom is the point of attachment, one of the carbon atoms has been replaced by a nitrogen atom, one carbon atom is optionally replaced by a heteroatom selected from O or S, and from 1 to 3 additional carbon atoms are optionally replaced by nitrogen heteroatoms, and where the phenyl and heteroaryl are optionally substituted by 1–3 groups $R^q$, said $R^q$, $M^a$, $R^{z''}$ and $R^{z''}$ are as defined above;

ad) a $C_{3-7}$ cycloalkyl group;

ae) a $C_{5-7}$ cycloalkyl group in which one of the carbon atoms in the ring is replaced by a heteroatom selected from O, S, NH, or N($C_{1-4}$ alkyl) and in which one additional carbon may be replaced by the NH or N($C_{1-4}$ alkyl), and in which at least one carbon atom adjacent to each nitrogen heteroatom has both of its attached hydrogen atoms replaced by one oxygen thus forming a carbonyl moiety and there are one or two carbonyl moleties present in the ring;

af) a $C_{2-4}$ alkenyl radical, optionally substituted by 1–3 of the substituents a) to ac) above and phenyl which is optionally substituted by $R^q$ as defined above;

ag) a $C_{2-4}$ alkynyl radical, optionally substituted by 1–3 of the substituents a) to ac) above;

ah) a $C_{1-4}$ alkyl radical;

ai) a $C_{1-4}$ alkyl group substituted by 1–3 of the substituents a) – aa) above;

aj) a $C_{1-4}$ alkyl radical substituted with 1–3 groups selected from aryl, oxime, heteroaryl, $C_{3-7}$ cycloalkyl and heterocycloalkyl, each of which is unsubstituted or substituted with 1 to 3 $R^q$ groups;

ak) a $C_{3-7}$ cycloalkyl radical substituted with 1–3 of the substituents a) aa) above;

al) a $C_{3-7}$ heterocycloalkyl radical substituted with 1–3 of the substituents a) – aa) above;

am) a $C_{6-10}$ aryl radical;

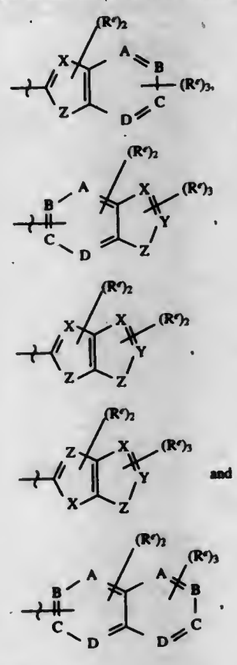
an) a $C_{6-10}$ aryl radical substituted with 1–3 of the substituents a) – aa) above;

ao) a 6–10 membered heteroaryl radical; and

ap) a 6–10 membered heteroaryl radical substituted with 1–3 of the substituents a) – aa) above;

HET

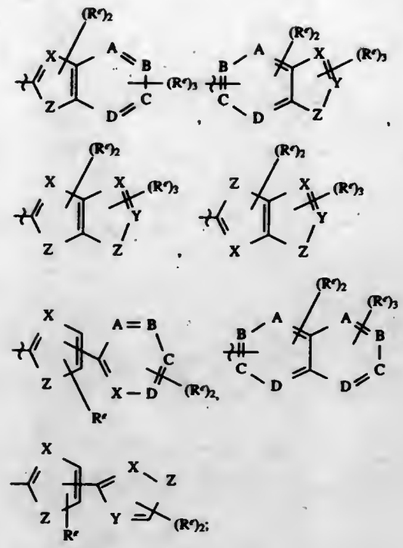
represents a heterocyclic group with from one to three positively charged atoms, and is selected from the group consisting of:



and

wherein:





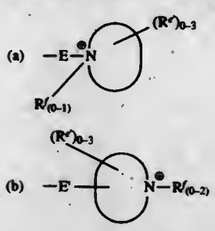
represents the point of attachment to S;

A, B, C, D, X and Y independently represents C or N;

X, Y and Z represent C, O, S or N, such that at least one of A, B, C and D represents N or at least one of X, Y and Z represents O, S or N;

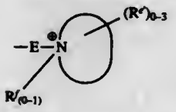
one $R^e$ represents —R* and the others represent H, $R^{e'}$ or $R^f$;

—R* represents one of the groups (a) through (c):



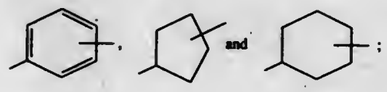
and (c) —$E_p$—N+$R^{10}R^{11}R^{12}_{(0+1)}$;

when —R* represents (a)



E represents —$(CR^3R^4)_r$—Q—$(CR^3R^4)_s$—wherein r is 0–6, s is 1–6;

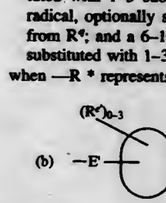
Q represents a member selected from the group consisting of: a covalent bond, —O—, —S(O)$_x$— with x equal to 0, 1 or 2, —$NR_3$—, —$SO_2NR_3$—, —$NR_3$ $SO_2$—, —$C(O)NR_3$—, —$NR_3C(O)$—, —$CR_3$ =$CR_4$ —C(O)—, —OC(O)—, —(O)CO—,



and



;



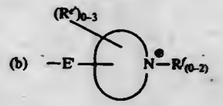
in which $R^3$ and $R^4$ independently represent H or $C_{1-4}$ lower alkyl, and $(CR_3R_4)_r$— is attached to the ring nitrogen;



represents a 5 or 6 membered monocyclic heterocycle or an 8–10 membered bicyclic heterocycle, bonded to E through the ring nitrogen and having a substituent group $R^f$ optionally attached to the ring nitrogen, and having 0–3 $R^{e'}$ groups attached to other atoms of the heterocyclic group, said ring nitrogen being tertiary or quaternary by virtue of E, the ring bonds and the optional $R^f$ which may be attached, said heterocyclic group being aromatic, partially aromatic or non-aromatic, said heterocycle further containing 0–3 additional nitrogen atoms and 0– 1 oxygen or sulfur atom;

each $R^f$ independently represents hydrogen, —$NH_2$, —O—, —$C_{1-4}$ alkyl, optionally substituted with 1–3 groups selected from $R^q$; —$C_{3-7}$ cycloalkyl, optionally substituted with 1–3 groups selected from $R^q$; —$C_{5-7}$ cycloalkyl group in which one of the carbon atoms in the ring is replaced by a heteroatom selected from O, S, NH, or N($C_{1-4}$ alkyl) and in which one additional carbon may be replaced by the NH or N($C_{1-4}$ alkyl), and in which at least one carbon atom adjacent to each nitrogen heteroatom has both of its attached hydrogen atoms replaced by one oxygen thus forming a carbonyl moiety and there are one or two carbonyl moieties present in the ring; a $C_{2-4}$ alkenyl radical, optionally substituted by 1–3 substituents selected from $R^q$; a $C_{2-4}$ alkynyl radical, optionally substituted by 1–3 substituents selected from $R^q$; a $C_{1-4}$ alkyl radical substituted with 1–3 groups selected from aryl, oxime, heteroaryl, $C_{3-7}$ cycloalkyl and heterocycloalkyl, each of which is unsubstituted or substituted with 1 to 3 groups selected from $R^q$; a $C_{3-7}$ cycloalkyl radical optionally substituted with 1–3 substituents selected from $R^q$; a $C_{6-10}$ aryl radical, optionally substituted with 1–3 substituents selected from $R^q$; and a 6–10 membered heteroaryl group, optionally substituted with 1–3 substituents selected from $R^q$;

when —R * represents



E' represents —$(CR^3R^4)m'$—Q—$(CR^3R^4)m'$ with each m' independently equal to 0–6, and Q, $R^3$ and $R^4$ as defined above, except that when each m' is O, Q is not a covalent bond, and —$(CR^3R^4)m'$ attached to the heterocyclic ring;



represents a 5 or 6 membered monocyclic heterocycle or an 8–10 membered bicyclic heterocycle, said heterocycle being aromatic, partially aromatic or non-aromatic, bonded to E' through an atom other than the ring nitrogen, and having 0–2 $R^f$ groups attached to the ring nitrogen, said nitrogen in the heterocycle being tertiary or quaternary by virtue of the ring bonds and the optional $R^f$ groups which may be attached, said heterocycle further containing 0–1 oxygen or sulfur atom and 0–2 additional nitrogen atoms therein;

$R^{e'}$ and $R^f$ are as defined above;

when —R * represents

(c) —$E_p$—N+$R^{10}R^{11}R^{12}_{(0-1)}$,

E is as defined above and p is an integer 0 or 1;

$R^{10}$, $R^{11}$ and when present, $R^{12}$, are independently H, $C_{1-4}$ alkyl or $C_{1-4}$ alkyl substituted with 1–3 $R^q$ groups;

or $R^{10}$ and $R^{11}$ may be taken together to represent a $C_3$–$C_5$ alkylidene radical to form a ring (optionally substituted with 1–3 $R^q$ groups as defined below), uninterrupted or interrupted by O, S, S(O), $SO_2$, N(O)$R^m$ or N+($R^m$)1–2 ,where $R^m$ is as previously defined,

or $R^{10}$, $R^{11}$ and $R^{12}$ may be taken in combination to represent a $C_4$ to $C_{10}$ alkanetriyl group, optionally substituted with 1–3 $R^m$ groups, said alkanetriyl group being optionally interrupted with 1–3 heteroatoms selected from N+$R^m$, N+$R^r$, O and S(O)$_z$ with x, $R^m$ and $R^r$ as defined above.

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**5,498,778**

## CYCLIC NITRONE COMPOUNDS USEFUL IN TREATING STROKE

**Albert A. Carr, Cincinnati; Craig E. Thomas, West Chester; Ronald C. Bernotas, Cincinnati, and George Ku, West Chester, all of Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio**

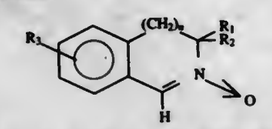
**Division of Ser. No. 170,543, Dec. 20, 1993, Pat. No. 5,397,789, which is a division of Ser. No. 926,109, Aug. 5, 1992, Pat. No. 5,292,746, which is a continuation-in-part of Ser. No. 828,075, Jan. 30, 1992, abandoned, which is a continuation-in-part of Ser. No. 758,063, Sep. 12, 1991, abandoned. This application Dec. 9, 1994, Ser. No. 352,470**

**Int. Cl.[6] A61K *31/47***

**U.S. Cl. 514—309** **25 Claims**

1. A method for the treatment of stroke comprising administering to a patient in need thereof, an effective amount of a compound of the formula:

Formula I



in which $R_1$ and $R_2$ are each independently represented by a $C_{1-3}$ alkyl or $R_1$ and $R_2$ together form a $C_{2-7}$ alkylene chain; n is represented by an integer from 0–2; and $R_3$ is represented by a substituent selected from the group consisting of hydrogen, halogen, $C_{1-4}$ alkyl, $C_{1-4}$ alkoxy, —$CF_3$, —$OCF_3$ and —OH.

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**5,498,779**

## THROMBIN INHIBITORS

**Bernhard Neises, Offenburg-Griesheim, Germany; Axel Ganzhorn, Lingolsheim; Céline Tarnus, Strasbourg, both of, France, and Robert J. Broersma, Jr., Noblesville, Ind., assignors to Merrell Pharmaceuticals Inc., Cincinnati, Ohio**

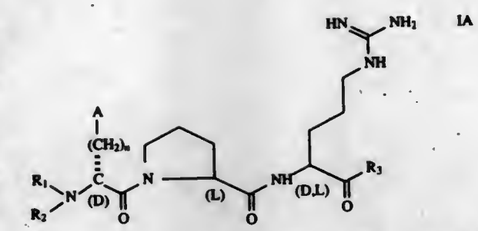
**Continuation of Ser. No. 321,290, Oct. 11, 1994, abandoned, which is a division of Ser. No. 199,839, Feb. 18, 1994, Pat. No. 5,391,705, which is a continuation of Ser. No. 8,253, Jan. 25, 1993, abandoned, which is a continuation of Ser. No. 848,444, Mar. 9, 1992, abandoned. This application May 22, 1995, Ser. No. 447,151**

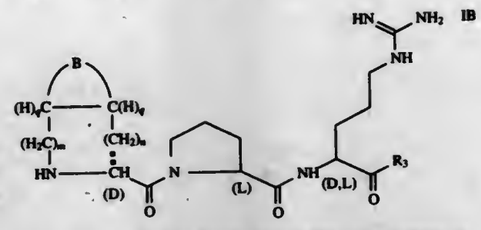
**Claims priority, application European Pat. Off., Mar. 15, 1991, 91400713**

**Int. Cl.[6] A61K *31/40***

**U.S. Cl. 514—428** **2 Claims**

1. A pharmaceutical composition comprising a compound of the formulae





their isomers or mixtures thereof, the hydrates or the pharmaceutically acceptable salts thereof, with the proviso that when $R_1$ and $R_2$ are both H or when A is phenyl, then $R_3$ is other than —$CF_3$ or —$CF_2CF_3$, wherein

m is zero, one or two, n is zero or one, with the proviso that the sum of m and n is less than three and greater than zero, q is zero or one with the proviso that the sum of both q's is zero or 2,

$R_1$ is H or $C_{1-7}$ alkyl,

$R_2$ is H or $C_{1-7}$ alkyl, or $R_1$ and $R_2$ taken together with the nitrogen atom to which they are attached form pyrrolidinyl or piperidinyl,

$R_3$ is —$CF_3$, —$CF_2CF_3$, —$CF_2(CH_2)_vCH_3$, —$CF_2(CH_2)_vCOOR_4$, —$CF_2(CH_2)_vCONHR_4$, —$CF_2(CH_2)_vCH_2OR_4$ or —$CF_2(CH_2)_vCH{=}CH_2$, with t being 2, 3 or 4, and v is 1, 2 or 3,

$R_4$ is H or $C_{1-6}$ alkyl,

A is phenyl or cyclohexyl,

B is $(CH)_4$ or $(CH_2)_4$ which, when taken together with the two carbon atoms to which it is attached, forms a phenyl or cyclohexyl moiety;

and a pharmaceutically acceptable carrier.

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**5,498,780**

## PLATINUM COMPLEX AND MALIGNANT TUMOR TREATING DRUG CONTAINING THE SAME

**Koichi Yokoi; Kinichi Mogi; Hidehiko Kohya; Mari Ohtsuka; Hiroyuki Mizuno; Susumu Sato, and Tadayuki Kuraishi, all of Chiba, Japan, assignors to SS Pharmaceutical Co., Ltd., Tokyo, Japan**

**Filed May 31, 1995, Ser. No. 454,825**

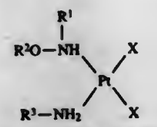
**Claims priority, application Japan, Jun. 3, 1994, 6-122209**

**Int. Cl.[6] A61K *31/28*; C07F *15/00***

**U.S. Cl. 514—492** **9 Claims**

1. A diamine-platinum complex represented by the following formula (1):

(I)



wherein $R^1$, $R^2$ and $R^3$ may be the same or different from one another, and each represents a hydrogen atom, a straight-chain or branched alkyl group, a cycloalkyl group or an aralkyl group, and X is a halogen atom, or two X groups bind to each other to form a



malonic acid residue which may have a substituent, with the proviso that $R^1$, $R^2$ and $R^3$ are not hydrogen atoms at the same time.

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**5,498,781**

## PASSIFICATION OF OPTICALLY VARIABLE PIGMENT AND WATERBORNE COATING COMPOSITIONS CONTAING THE SAME

**Jon R. Hall, Howell; Clint W. Carpenter, Royal Oak, and Stuart K. Scott, Allen Park, all of Mich., assignors to BASF Corporation, Southfield, Mich.**

**Filed May 23, 1994, Ser. No. 247,803**

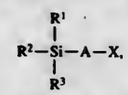
**Int. Cl.[6] C08K *9/06***

**U.S. Cl. 523—213** **8 Claims**

1. A composition comprising an optically variable pigment modified with

a) a silane functional compound having the formula

(I)



where $R^1$, $R^2$, and $R^3$ may be the same or different and are selected from alkyl of from one to ten carbon atoms, alkoxyl of from one to ten carbon atoms, alkoxyalkoxyl of from two to ten carbon atoms, alkanoyloxy of from two to ten carbon atoms, or halogen, with the proviso that $R^1$, $R^2$, and $R^3$ may not all be alkyl, the group "A" is a divalent radical selected from straight or branched alkylene of from one to twelve carbon atoms, phenylene or phenylene substituted with halogen, or alkyl or alkoxyl of from one to four carbon atoms, the group "X" is selected from the group consisting of —OH—, —SH, —$NHR_4$, —NCO—, epoxy, phenol, anhydride and carbonate and mixtures thereof, wherein $R^4$ is hydrogen or alkyl of from 1 to 12 carbon atoms and

b) a copolymer which is a polymeric backbone having a reactive functionality thereon, wherein the

functionality is selected from the group consisting of isocyanate, epoxy, anhydride, primary or secondary amine, hydroxy or carbonate functionalities and mixtures thereof.

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**5,498,782**

## DISTORTION CONTROL ADDITIVES FOR ULTRAVIOLET-CURABLE COMPOSITIONS

**Gary C. Rex, Cross Lanes, W. Va., assignor to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.**

**Filed Sep. 8, 1993, Ser. No. 118,014**

**Int. Cl.[6] C08F *8/30*; C08L *75/04*;*75/06***

**U.S. Cl. 525—126** **15 Claims**

1. In an ultraviolet-curable liquid composition comprising;

(i) an unsaturated polymeric resin having an average molecular weight of at least 500 grams per gram mole;

(ii) a monomer suitable for crosslinking with the unsaturated polymeric resin; and

(iii) a distortion control additive; the improvement wherein the distortion control additive comprises the reaction product of:

(a) from about 1 to 10 weight percent of a polyisocyanate;

(b) from about 30 to 60 weight percent of a polyol or polyol blend having a hydroxyl functionality of 2 to 3 hydroxyl groups per molecule and an average molecular weight of about 500 to 10,000 grams per gram mole;

(c) from about 0.2 to 6 weight percent of a diol chain extender having between 2 and 32 carbon atoms per molecule; and

(d) from about 20 to 90 weight percent of an acrylate or methacrylate having a acrylate functionality of from 2 to 5 acrylate groups per molecule.

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**5,498,783**

## POWDER COATING COMPOSITION RESISTANT TO OVERSPRAY INCOMPATIBILITY DEFECTS

**Richard J. Foukes, Utica, and Cynthia A. Stants, Pinckney, both of Mich., assignors to BASF Corporation, Southfield, Mich.**

**Filed Aug. 22, 1994, Ser. No. 294,123**

**Int. Cl.[6] C08L *67/02***

**U.S. Cl. 525—165** **12 Claims**

1. A thermosetting powder coating composition resistant to overspray incompatibility defects, comprising solid particulates of a uniform mixture of

(a) a polyester resin having an average of two or more carboxyl groups,

(b) a first crosslinker, reactive toward the carboxyl groups of the polyester resin, selected from the group consisting of epoxy-functional compounds, polyoxazolines, and polydioxanes,

(c) from 1% to 20% of an acrylic copolymer having reactive functionality selected from the group consisting of hydroxyl functionality, isocyanate functionality, epoxy functionality, and amine functionality, and

(d) a second crosslinker that is reactive toward the reactive functionality of the acrylic copolymer,

wherein the acrylic copolymer has a weight average molecular weight of from 10,000 to 40,000.

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**5,498,784**

## PHOSPHONIC ACID-PENDENT BENZOXAZOLE COPOLYMERS

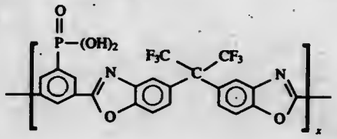
**Fred E. Arnold, Centerville, and Jom P. Chen, Hilliard, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Wright-Patterson Air Force Base, Ohio**

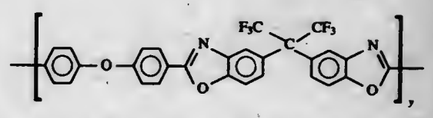
**Filed Feb. 21, 1995, Ser. No. 393,586**

**Int. Cl.[6] C08G *79/02***

**U.S. Cl. 528—337** **8 Claims**

1. An aromatic heterocyclic copolymer having repeating units of the formula:





wherein x has a value of 0.05 to 0.50 and y has a value of 1.0–x.

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**5,498,785**

## CONTINUOUS PROCESS FOR THE AMINOLYSIS OF ETHYLENE COPOLYMERS

**James H. Wang, Appleton, Wis.; Victor P. Kurkov, San Rafael, Calif.; Leslie P. Theard, Houston, and David Rosendale, Orange, both of Tex., assignors to Chevron Chemical Company, San Ramon, Calif.**

**Filed Jan. 14, 1994, Ser. No. 181,827**

**Int. Cl.[6] C08F *8/32***

**U.S. Cl. 525—371** **28 Claims**

1. A continuous process for the production of polymers containing acrylamide structural units comprising contacting in a reaction vessel,

(a) a molten polymer containing structural units produced from alpha-olefins having from 2 to 8 carbons atoms, and α,β-ethylenically-unsaturated carboxylic acids or derivatives thereof; and
(b) a liquid phase comprising an amine-containing compound selected from among alkylamines having an alkyl group containing 1–30 carbon atoms, aromatic amines, ammonia, and derivatives thereof, in the presence of
(c) a catalytically effective amount of at least one catalyst selected from among metallic lead, metallic zinc, inorganic metal-containing solutions, organic and inorganic amides, alkyl ammonium salts, hydroxy-substituted nitrogen-containing heterocyclic compounds, polyethylene glycol and crown ethers, for a period of time effective to produce a polymer containing acrylamide structural units, wherein the period of time is less than about 1 hour.

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**5,498,786**

## SYNTHESIS OF INTERMEDIATES IN THE PREPARATION OF ACAT INHIBITORS

**Sarah E. Kelly, Mystic, and George Chang, Ivoryton, both of Conn., assignors to Pfizer Inc., New York, N.Y.**

**PCT No. PCT/US91/08758, § 371 Date Sep. 13, 1993, § 102(e) Date Sep. 13, 1993, PCT Pub. No. WO92/13843, PCT Pub. Date Aug. 20, 1992**
**Continuation-in-part of Ser. No. 648,243, Jan. 31, 1991, abandoned. This PCT application Nov. 27, 1991, Ser. No. 117,109**
**Int. Cl.[6] C07C 231/00**
**U.S. Cl. 554—67** **6 Claims**

1. A process of preparing (S)-methyl-2-hexylthiodecanoate or (R)-methyl-2-hexylthiodecanoate, comprising: (a) reacting (S)-methyl-2-hydroxydecanoate or (R)-methyl-2-hydroxydecanoate, respectively, with methanesulfonic acid, diisopropyl azodicarboxylate, triphenylphosphine, and a base to form (R)-methyl-2-methanesulfonatedecanoate or (S)-methyl-2-methanesulfonatedecanoate, respectively; and (b) reacting the (R)-methyl-2-methanesulfonate-decanoate or (S)-methyl-2-methanesulfonate-decanoate so formed with hexanethiol in the presence of a base.

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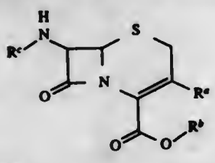
**5,498,787**

## METHOD FOR PREPARING CEPHALOSPORIN DERIVATIVES

**Hui-Po Wang, and Jia-Shuni Lee, both of Taipei, Taiwan, Prov. of China, assignors to Standard Chemical & Pharmaceutical Co., Ltd., Taiwan, Prov. of China**

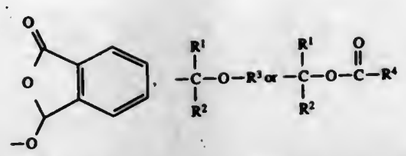
**Filed Apr. 20, 1994, Ser. No. 230,475**
**Int. Cl.[6] C07D 501/04**
**U.S. Cl. 540—222** **17 Claims**

1. A method for preparing a compound of the formula (I)

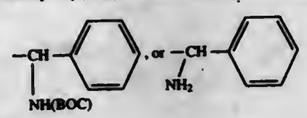


(I)

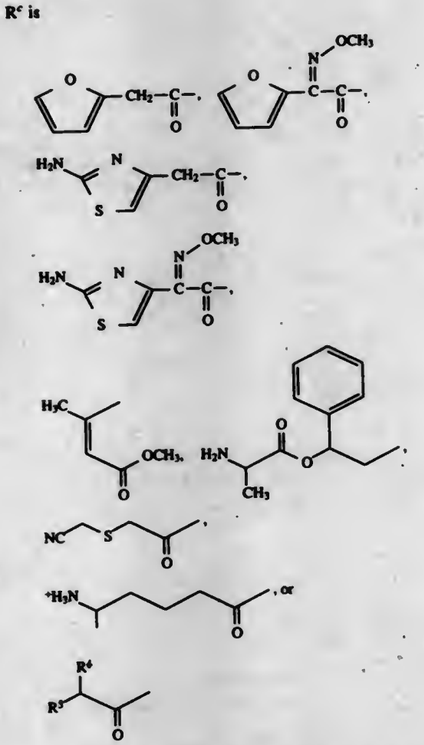
wherein
$R^a$ is $C_{1-4}$ alkyl, $C_{2-5}$ alkoxymethyl, $C_{2-5}$ alkylthiomethyl, $C_{3-6}$ alkylcarboxylmethyl, $—CH_2—O—CO—NH_2$, Ar, $—CH_2—Ar$, $—CH_2—O—Ar$, $—CH_2—S—Ar$ or $CH_2—O—CO—Ar$ wherein Ar is a 5 or 6 membered heterocyclic ring containing up to 4 or 5 heteroatoms, respectively, selected from oxygen, sulphur and nitrogen, of which the ring may be substituted by halogen, hydroxy, $C_{1-4}$ alkyl, $C_{1-4}$ alkoxy, $C_{1-4}$ alkylamino or $C_{1-4}$ alkylamido;
$R^b$ is $C_{1-4}$ alkyl, $C_{2-4}$ alkenyl, $C_{2-4}$ alkynyl, phenyl, $C_{7-10}$ phenylalkyl, $C_{7-10}$ alkylphenyl, (1-amino) phenyl methyl,



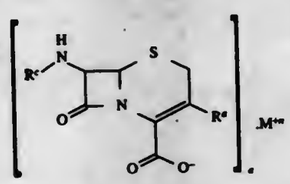
wherein each of $R^1$ and $R^2$ is independently H or $C_{1-4}$ alkyl, $R^3$ is $C_{1-4}$ alkyl, and $R^4$ is $C_{1-4}$ alkyl, $C_{3-6}$ cycloalkyl, $C_{1-4}$ alkoxy, $C_{4-6}$ cycloalkoxy, $C_{1-4}$ alkylamino or $C_{3-6}$ cycloalkylamino,



$R^c$ is



wherein $R^5$ and $R^6$ are the same or different and each is independently hydrogen, $C_{1-4}$ alkyl, hydroxy, phenyl, hydroxy phenyl, amino, thiophene, or tetrazole; and a pharmaceutically acceptable salt thereof; which comprises reacting a compound of the formula (II)



(II)

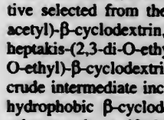


wherein n is 1 or 2, and $M^+n$ is alkaline metal ion when n=1 or alkaline earth metal ion when n=2, and $R^a$ and $R^c$ are as defined above with a compound of the formula (III)



(III)

wherein X is halogen, $R^b$ is as defined above, in the presence of a quaternary ammonium or quaternary phosphofium salt catalyst of the formula



(IV)

wherein Y is nitrogen or phosphorous and Z–is $HSO_4$–or $H_2PO_4$– and each of $R^e$, $R^f$, $R^g$ and $R^h$ is independently $C_{1-4}$ alkyl, $C_{3-6}$ cycloalkyl, $C_{6-12}$ aryl, $C_{7-16}$ arylalkyl, or $C_{7-16}$ alkylaryl.

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**5,498,788**

## INCLUSION COMPLEXES OF CLAVULANIC ACID AND OF POTASSIUM SALTS THEREOF WITH HYDROPHOBIC β-CYCLODEXTRIN DERIVATIVES A PROCESS FOR THE PREPARATION THEREOF

**Janko Zmitek; Darja Fercej-Temeljotov, both of Ljubljana; Katarina Verhnjak, Ptuj; Sonja Kotnik, and Mateja Kovacic, both of Ljubljana, all of, Slovenia, assignors to LEK, tovarna farmacevtskih, Slovenia**

**Continuation of Ser. No. 84,951, Jul. 2, 1993, abandoned. This application Jan. 6, 1995, Ser. No. 369,301**
**Claims priority, application Slovenia, Jul. 8, 1992, P-9200139**
**Int. Cl.[6] C07D 487/04; A01K 9/26**
**U.S. Cl. 540—349** **6 Claims**

1. A process for the preparation of clavulanic acid or of potassium salt thereof from a concentrate of a clear aqueous solution of crude clavulanic acid in the form of a sodium salt obtained after the fermentation with a clavulanic-acid-producing microorganism, which is acidified with sulfuric acid to a pH value between 1 and 3, wherein acidified solution of crude clavulanic acid is immediately extracted with a solution of a hydrophobic β-cyclodextrin derivative selected from the group consisting of heptakis-(2,3,6-tri-O-acetyl)-β-cyclodextrin, heptakis-(2,6 -di-O-ethyl)-β-cyclodextrin, heptakis-(2,3-di-O-ethyl)-β-cyclodextrin and heptakis-(2,3,6 -tri-O-ethyl)-β-cyclodextrin in an inert organic solvent, the so formed crude intermediate inclusion complex of clavulanic acid with said hydrophobic β-cyclodextrin is isolated from the organic phase, subsequently purified with water and the purified said inclusion complex is then converted with potassium 2-ethyl hexanoate to potassium clavulanate, which is then isolated.

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**5,498,789**

## METHOD OF PRODUCING AROMATIC CARBONATE

**Masatoshi Takagi; Hidekazu Miyagi; Yuji Ohgomori, and Hiroshi Iwane, all of Inashiki, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan**

**Filed Nov. 28, 1994, Ser. No. 348,116**
**Claims priority, application Japan, Jan. 12, 1994, 6-001715; Jul. 25, 1994, 6-172695; Aug. 3, 1994, 6-182601**
**Int. Cl.[6] C07C 69/96**
**U.S. Cl. 558—270** **18 Claims**

1. A method of producing an aromatic carbonate by reacting an aromatic hydroxy compound, carbon monoxide and oxygen, wherein reaction is effected in a reaction system in the presence of catalyst system consisting essentially of:
(A) at least one selected from palladium or palladium compounds;
(B) at least one selected from lead compounds; and
(C) at least one halide selected from quaternary ammonium halides or quaternary phosphonium halides.

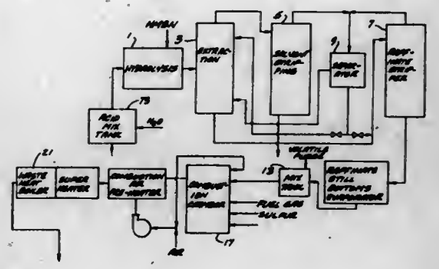
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**5,498,790**

## REGENERATION OF SULFURIC ACID FROM SULFATE BY-PRODUCTS OF 2-HYDROXY-4-(METHYLTHIO)BUTYRIC ACID MANUFACTURE

**Robert W. Grendel, Ballwin; Jeffrey B. Klopfenstein, Chesterfield, both of Mo.; Robin K. Prokop, League City, Tex.; Stanley L. Reid, Jonesville, Mich., and J. Michael Willock, Ballwin, Mo., assignors to Novus International, Inc., St. Louis, Mo.**

**Filed Jun. 9, 1993, Ser. No. 73,877**
**Int. Cl.[6] C07J 7/00; C01B 17/90;17/74**
**U.S. Cl. 562—581** **38 Claims**



1. A process for the manufacture of feed grade 2-hydroxy-4-methylthiobutyric acid in a facility for said process using sulfuric acid recycled from a spent acid recovery unit that is associated with said facility, the process comprising:
hydrolyzing 2-hydroxy-4-methylthiobutyronitrile with sulfuric acid, thereby producing 2-hydroxy-4-methylthiobutyric acid and by-products selected from the group consisting of ammonium sulfate, ammonium bisulfate, sulfuric acid, and mixtures thereof;
introducing into a combustion zone of said spent acid recovery unit a feed mixture comprising a sulfate feed solution containing a sulfate source comprised of said by products;
burning a fuel and oxidizable components of said feed solution in a combustion zone with a gas comprising oxygen to produce a combustion gas containing sulfur dioxide, carbon dioxide, nitrogen, and water vapor, said feed solution being contacted in a first stage of said combustion zone with a reducing flame in which ammonia, nitriles and any amines released from the solution are oxidized to produce nitrogen gas and any oxides of nitrogen are reduced to nitrogen gas, thereby producing a partial combustion gas substantially free of oxides of nitrogen, said partial combustion gas being contacted with additional gas containing oxygen to oxidize unburned fuel and any carbon monoxide in the partial combustion gas, thereby producing said combustion gas;
cooling said combustion gas to condense water and sulfuric acid therefrom, producing a liquid phase comprising a weak sulfuric acid;
separating said weak sulfuric acid from said cooled combustion gas;
introducing oxygen into said combustion gas to produce a feed gas containing sulfur dioxide and at least about 0.9 moles of oxygen per mole of sulfur dioxide; and
passing said feed gas over a catalyst for the conversion of sulfur dioxide to sulfur trioxide at a temperature effective for said conversion; thereafter contacting the gas that has been passed over said catalyst with concentrated sulfuric acid for the absorption of sulfur trioxide and the formation of sulfuric acid;
recycling sulfuric acid formed by said absorption to said facility for the manufacture of 2-hydroxy-4-methylthiobutyric acid; and
contacting said recycled sulfuric acid with 2-hydroxy-4-(methylthio)butyronitrile for the preparation of feed grade 2-hydroxy-4-(methylthio)butyric acid.

5,498,791

## NITROSAMINE & NITRITE INHIBITION

Michael Blezard; Glyn R. Jones, both of Whitehaven, and Moharam Ghadimi, Milton Keynes, all of, England, assignors to Albright & Wilson, Limited, Warley, England

Division of Ser. No. 11,976, Feb. 1, 1993, Pat. No. 5,442,113.
This application Jan. 20, 1995, Ser. No. 376,040
Claims priority, application United Kingdom, Jan. 31, 1992, 9202057
Int. Cl.[6] C07C 209/90
U.S. Cl. 564—2 20 Claims

1. A composition comprising an amine oxide and a synergistic stabiliser therefore wherein

said stabiliser comprises:

(i) from 0.05% to 20% by weight based on the weight of the amine oxide of a material selected from the group consisting of bicarbonates, carbonates and mixtures of said bicarbonates and said carbonates; together with

(ii) from 0.005% to 5% by weight based on the weight of the amine oxide of a phosphonate; and

said amine oxide is an oxide of an amine of formula $R^1R^2R^3N$ wherein $R^1$, $R^2$ and $R^3$ are each selected from the group consisting of straight or branched chain alkyl, straight or branched chain alkenyl, aralkyl, $C_{6-24}$ alkyl polyalkleneoxy, $C_{6-24}$ alkenyl polyalkyleneoxy, $C_{6-23}$ esteralkyl and $C_{6-23}$ esteralkenyl groups and wherein $R^1$ and $R^2$ can form a heterocyclic ring.

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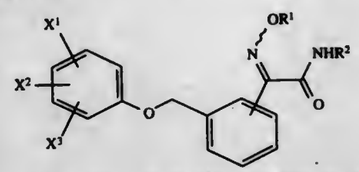
5,498,792

## PROCESS OF PRODUCING N-ALKYLACETAMIDES

Katuhisa Masumoto, Ibaraki; Akihiko Nakamura, Takatsuki; Yujiro Kiyoshima, Oita; Mikio Sasaki, and Asako Tanahashi, both of Ibaraki, all of, Japan, assignors to Shionogi & Co., Ltd., and Sumitomo Chemical Co., Ltd., both of Osaka, Japan

Filed Sep. 16, 1994, Ser. No. 305,923
Claims priority, application Japan, Sep. 16, 1993, 5-230002
Int. Cl.[6] C07C 233/05;231/06
U.S. Cl. 564—164 12 Claims

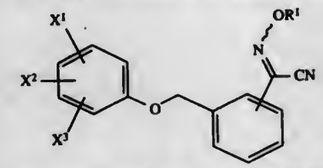
1. A process of producing an N-alkylacetamide of the general formula (III):



(III)

wherein $X_1$, $X_2$ and $X_3$ are the same or different and are independently hydrogen, lower alkyl, lower alkoxy, lower alkenyl, halogen or trifluoromethyl; $R^1$ and $R^2$ are the same or different and are independently lower alkyl; and ⁓ represents a chemical bond of E- or Z-configuration, or a mixture of these configurations, which comprises the steps of:

(a) reacting an acetonitrile of the general formula (I):



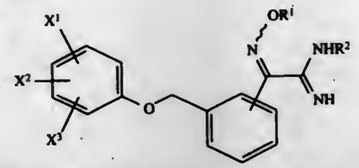
(I)

wherein $X^1$, $X^2$, $X^3$, $R^1$ and ⁓ are each as defined above, with an alkylamine of the general formula (IV):



(IV)

wherein $R^2$ is as defined above, and wherein the reaction of the acetontrile (I) with the alkylamine (IV) is effected in the presence of a catalyst selected from the group consisting of metal alkoxides and organic bases, to give an N-alkylacetamidine of the general formula (II):



(II)

wherein $X^1$, $X^2$, $X^3$, $R^1$ and ⁓ are each as defined above; and

(b) reacting the N-alkylacetamidine (II) with a nitrite derivative in the presence of an acid.

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5,498,793

## CATALYTIC PROCESS FOR THE PRODUCTION OF OXIMES

Maria A. Mantegazza, Monza, and Guido Petrini, Galliate, both of, Italy, assignors to Enichem S.p.A., Milan, Italy

Filed Jun. 5, 1995, Ser. No. 463,554
Claims priority, application Italy, Jun. 9, 1994, MI94A1208
Int. Cl.[6] C07C 249/04
U.S. Cl. 564—265 10 Claims

1. Process for the production of oximes which comprises ammoximation of a carbonylic compound selected from acetophenone and cyclododecanone with $H_2O_2$ and $NH_3$ in the presence of a catalyst based on silicon, titanium and oxygen and a cocatalyst consisting of amorphous silica.

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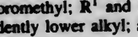
5,498,794

## PROCESS FOR PREPARING FLUOROANILINES

Thomas Schach, Gernsheim, and Theodor Papenfuhs, Frankfurt, both of, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

Filed Feb. 9, 1995, Ser. No. 386,370
Claims priority, application Germany, Feb. 11, 1994, 44 04 342.2; Dec. 16, 1994, 44 44 903.8
Int. Cl.[6] C07C 209/22
U.S. Cl. 564—417 32 Claims

1. A process for preparing a fluoroaniline of the formula (I)



(I)

in which n is 1, 2, 3 or 4, Ar is phenyl, naphthyl or pyridyl, and the remaining substituents on the Ar radical are identical or different and are, independently of each other, hydrogen, halogen, $(C_1–C_4)$-alkyl, phenyl, $NR_2$, OR, CN, CHO, or COR, where R is hydrogen or $(C_1–C_6)$-alkyl, wherein fluoronitrobenzenes of the formula (II)



(II)

in which n, Ar and the remaining substituents on the Ar radical have the abovementioned meaning, X is chlorine or bromine and m is 1, 2, 3 or 4, are reacted with hydrogen in the presence of a palladium catalyst, of an amine which is not soluble in water and which also does not form water-soluble hydrohalides, and, where appropriate, of an inert solvent.



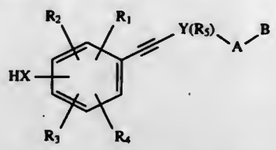
5,498,795

## ACETYLENES DISUBSTITUTED WITH HYDROXYARYL AND ARYL OR HETEROARYL GROUPS HAVING RETINOID-LIKE BIOLOGICAL ACTIVITY

Tae K. Song, Long Beach, and Roshantha A. Chandraratna, Missio Viejo, both of Calif., assignors to Allergan, Inc., Irvine, Calif.

Filed Dec. 29, 1994, Ser. No. 366,170
Int. Cl.[6] C02C 65/00
U.S. Cl. 562—474 34 Claims

1. A compound of the formula



wherein $R_1$–$R_3$ and $R_5$ independently are hydrogen, lower alkyl of 1 to 6 carbons, branched chain alkyl or cycloalkyl of 3 to 15 carbons, lower alkyl substituted cycloalkyl of 3 to 15 carbons;

$R_4$ is lower alkyl of 1 to 6 carbons, branched chain alkyl or cycloalkyl of 3 to 15 carbons or lower alkyl substituted cycloalkyl of 3 to 15 carbons;

X is S or O;

Y is a phenyl group, or heteroaryl selected from a group consisting of pyridyl, thienyl, furyl, pyridazinyl, pirimidinyl, pyrazinyl, thiazolyl, imidazolyl and oxazolyl, said groups being substituted with the $R_5$ group defined above;

A is $(CH_2)_n$ where n is 0–5, lower branched chain alkyl having 3–6 carbons, cycloalkyl having 3–6 carbons, alkenyl having 2–6 carbons and 1 or 2 double bonds, alkynyl having 2–6 carbons and 1 or 2 triple bonds;

B is hydrogen, COOH or a pharmaceutically acceptable salt thereof, $COOR_8$, $CONR_9R_{10}$, $—CH_2OH$, $CH_2OR_{11}$, $CH_2OCOR_{11}$, CHO, $CH(OR_{12})_2$, $CHOR_{13}O$, $—COR_7$, $CR_7(OR_{12})_2$, or $CR_7OR_{13}O$, where $R_7$ is an alkyl cycloalkyl or alkenyl group containing 1 to 5 carbons, $R_8$ is an alkyl group of 1 to 10 carbons, or a cycloalkyl group of 5 to 10 carbons, or $R_8$ is phenyl or lower alkylphenyl, $R_9$ and $R_{10}$ independently are hydrogen, an alkyl group of 1 to 10 carbons, or a cycloalkyl group of 5–10 carbons, or phenyl or lower alkylphenyl, $R_{11}$ is lower alkyl, phenyl or lower alkylphenyl, $R_{12}$ is lower alkyl, and $R_{13}$ is divalent alkyl radical of 2–5 carbons.

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5,498,796

## PROCESS FOR THE PREPARATION OF AMINES BY CATALYTIC HYDROGENATION OF NITRILES

Gregor Deckers, Xanten, and Dieter Frohning, Wesel, both of, Germany, assignors to Hoechst Aktiengesellschaft, Germany

Continuation of Ser. No. 259,117, Jun. 10, 1994, abandoned, which is a continuation of Ser. No. 990,730, Dec. 15, 1992, abandoned. This application Apr. 19, 1995, Ser. No. 426,142
Claims priority, application Germany, Dec. 18, 1991, 41 41 771.2
Int. Cl.[6] C07C 209/48
U.S. Cl. 564—493 30 Claims

1. A process for the preparation of amines by catalytic hydrogenation of nitriles comprising the reaction of said nitriles with hydrogen at elevated temperatures in the presence of a supported catalyst containing coprecipitated Mg and Ni in a molar ratio of 0.015–0.060 to 1, and 17.0 to 60.0 g of a water-insoluble support per tool of Ni, said Ni having an active nickel metal surface of said catalyst of 110 to 180 $m^2/g$ of said Ni, and 65% to 97% of the BET surface area of said catalyst being formed by pores having a radius $r_p \geq 2.5$ nm.

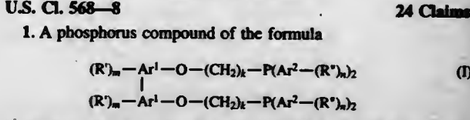
5,498,797

## BIS(PHOSPHINOZLKOXY)BIARYL COMPOUNDS AND A PROCESS FOR THEIR PREPARATION

Dieter Regnat, Frankfurt, and Hans-Jerg Kleiner, Kronberg, both of, Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Nov. 14, 1994, Ser. No. 338,033
Claims priority, application Germany, Nov. 13, 1993, 43 38 825.6
Int. Cl.[6] C07F 9/02
U.S. Cl. 568—8 24 Claims

1. A phosphorus compound of the formula



(I)

in the (RS), (R) or (S) forms or a combination, in which $Ar^1$—$Ar^1$ is a biphenyl radical, 1-phenylnaphthyl radical or 1,1'-binaphthyl radical, each R', if present, independently of the others, is F, an alkyl or alkoxy radical each having 1 to 8 carbon atoms, m is an integer from 0 to 4, k is an integer from 1 to 4, $Ar^2$ is a phenyl or naphthyl radical, each R", if present, is, independently of the others, F, Cl, $CF_3$, $SO_3H$, $SO_3Me$ (Me is Li, Na, K), a dialkylamino radical having 2 to 8 carbon atoms, an alkyl or alkoxy radical each having 1 to 8 carbon atoms and n is an integer from 0 to 5.

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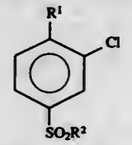
5,498,798

## 4-ALKYL-3-CHLOROBENZENESULFINIC ACIDS, 4-ALKYL-3-CHLOROBENZENESULFONYLCARBOXYLIC ACIDS, 4-ALKYL-3-CHLOROALKYLSULFONYLBENZENES AND PREPARATION THEREOF

Georg Folz, and Theodor Papenfuhs, both of Frankfurt am Main, Germany, assignors to Hoechst AG, Germany

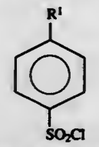
Filed Mar. 31, 1994, Ser. No. 220,791
Claims priority, application Germany, Apr. 3, 1993, 43 11 079.7
Int. Cl.[6] C07C 315/04
U.S. Cl. 568—28 18 Claims

1. A process for preparing 4-alkyl-3-chloroalkylsulfonylbenzenes of the formula (1)



(1)

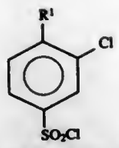
in which $R^1$ and $R^2$ are identical or different and are each $(C_1–C_4)$-alkyl, which comprises chlorinating a p-alkylbenzenesulfonyl chloride of the formula (2)



(2)

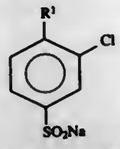
in which $R^1$ is as defined above, with at least 1 mol of chlorine per mole of said chloride of the formula (2) in the presence of a chlorine transferrer at a temperature ranging from about 50° to about 100° C. to form a compound of the formula (3)

(3)



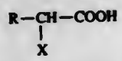
in which $R^1$ is as defined above, subsequently reducing this compound in aqueous medium with sodium sulfite or bisulfite at a temperature ranging from about 40° to about 90° C. to a compound of the formula (4)

(4)



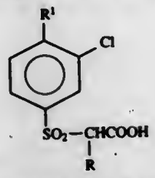
in which $R^1$ is as defined above, condensing this compound with an α-halocarboxylic acid of the formula (5)

(5)



in which R is hydrogen or $(C_1–C_3)$-alkyl and X is bromine or chlorine, or a salt thereof, to form a 4-alkyl-3-chlorobenzenesulfonylcarboxylic acid of the formula (6), in which $R^1$ and R are as defined above, or a salt thereof

(6)



and subsequently decarboxylating it by heating.

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**5,498,799**

**PROCESS FOR PRODUCING OPTICALLY ACTIVE 2-NORBORNANONE**

**Masahiro Torihara, and Yoshio Tamai, both of Niigata, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan**

**Filed Aug. 19, 1994, Ser. No. 293,215**

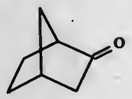
**Claims priority, application Japan, Aug. 26, 1993, 5-235773; Aug. 26, 1993, 5-235775**

**Int. Cl.[6] C07C *45/41***

**U.S. Cl. 568—354** **7 Claims**

1. A process for producing an optically active 2-norbornanone represented by Formula (1a) or (1b):

(1a)



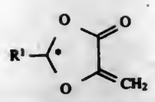
(1b)



said process comprising the steps of;

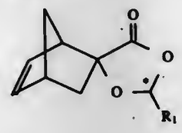
a) allowing an optically active dioxolan-4-one derivative represented by the Formula (2*)

(2*)

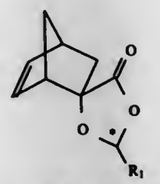


wherein $R^1$ represents a substituted or unsubstituted alkyl group or aryl group, and * represents an asymmetric carbon atom; to react with cyclopentadiene to form a compound represented by formula (3a) or (3b):

(3a)



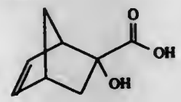
(3b)



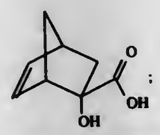
wherein $R^1$ and * are as defined in Formula (2*);

b) hydrolyzing the compound of Formula (3a) or (3b) obtained in the step a), to convert it into an optically active 2-hydroxynorbornene-2-carboxylic acid represented by Formula (4a) or (4b):

(4a)

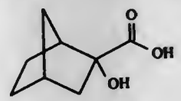


(4b)

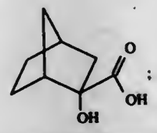


c) subjecting the compound of Formula (4a) or (4b) obtained in the step b), to catalytic hydrogenation to form a compound represented by the Formula (5a) or (5b):

(5a)



(5b)



d) subjecting the compound of Formula (5a) or (5b) obtained in the step c), to oxidative decarboxylation with a hypohalogenite to form the optically active 2-norbornanone of Formula (1a) or (1b).



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**5,498,800**

**ULTRASONIC PROCESS**

**Thanikavelu Manimaran, Baton Rouge, La., assignor to Albemarle Corporation, Richmond, Va.**

**Filed Jan. 9, 1995, Ser. No. 370,857**

**Int. Cl.[6] C07C *45/43;1/00***

**U.S. Cl. 568—437** **12 Claims**

1. A process for preparing a compound of the following formula:

Ar-Z II

where Ar is phenyl, naphthyl, substituted phenyl or substituted naphthyl; Z is the group $C(R_3)=CH_2$ or $CH(R_3)CHO$ where $R_3$ is hydrogen or alkyl which comprises treating an anhydrous solution of an aliphatic halide of the following formula:

I



where $R_1$ and $R_2$ are hydrogen, alkyl, cycloalkyl, alkyl-substituted cycloalkyl, phenyl or naphthyl either substituted or unsubstituted, alkoxy, alkylthio, heteroaryl either substituted or unsubstituted, alkanoyl, benzoyl or naphthanoyl either substituted or unsubstituted, heteroarylcarbonyl either substituted or unsubstituted, alkoxycarbonyl, aryloxycarbonyl, trifluoromethyl or halo; X is halo with an alkaline earth or alkali metal at an ultrasonic frequency for a time and at a temperature sufficient to produce said compound.

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**5,498,801**

**PROCESS FOR THE CATALYTIC HYDROFORMYLATION OF ALKENES**

**Raghunath V. Chaudhari; Bhalchandra M. Bhanage; Sunil S. Divekar, and Raj M. Deshpande, all of Maharashtra, Ind., assignors to Council of Scientific & Industrial Interest, New Delhi, Ind.**

**Filed Dec. 30, 1994, Ser. No. 366,612**

**Int. Cl.[6] C07C *45/50***

**U.S. Cl. 568—454** **20 Claims**

1. In the process for the hydroformylation of alkenes comprising reacting alkenes with carbon monoxide and hydrogen using water soluble catalyst in a biphasic media comprising water and an organic medium to produce aldehydes wherein the improvement comprises inducing an interfacial reaction by addition of water immiscible promoters in the organic phase giving significant enhancement in the rate of reaction as compared to the conventional biphasic catalysts.

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**5,498,802**

**PROCESS FOR PREPARING OMEGA-HALO-KETONES**

**Diane E. Allen, and Ramakrishnan Chidambaram, both of Corpus Christi, Tex., assignors to Hoechst Celanese Corporation, Sommerville, N.J.**

**Filed Feb. 28, 1995, Ser. No. 395,333**

**Int. Cl.[6] C07C *49/16***

**U.S. Cl. 568—495** **31 Claims**

1. A process for preparing 6-chloro-2-hexanone which comprises the steps of (a) dehydrating cyclohexanol in the presence of a silica catalyst and at a temperature of at least about 150° C. and for a period of time in excess of about one minute to form cyclohexene; (b) rearranging said cyclohexene, at a higher temperature than in step (a), in the presence of a silica catalyst and for a period of time in excess of about one minute to form 1-methylcyclopentene; (c) hydrating said 1-methylcyclopentene, at a temperature lower than step (b) and in the presence of a resin catalyst for a period of time in excess of about one minute to form 1-methylcyclopentanol; (d) reacting said 1-methylcyclopentanol with an alkali metal hypochlorite in the presence of a carboxylic acid to form 1-methylcyclopentyl hypochlorite; and (e) heating said 1-methylcyclopentyl hypochlorite for a period of time in excess of about one minute to form 6-chloro-2-hexanone.

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**5,498,803**

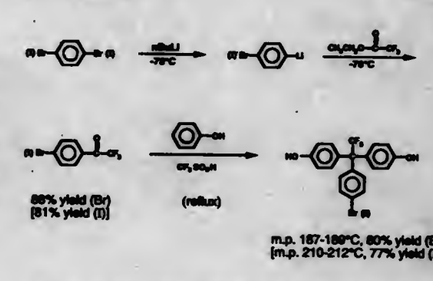
**POLY(ARYLENE ETHER)S CONTAINING PENDENT ETHYNYL GROUPS**

**Paul M. Hergenrother, Yorktown, and Brian J. Jensen, Williamsburg, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.**

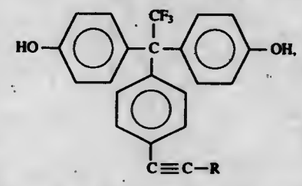
**Filed Mar. 7, 1994, Ser. No. 209,504**

**Int. Cl.[6] C07C *43/215;43/225***

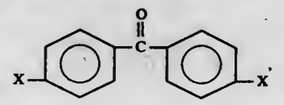
**U.S. Cl. 568—646** **2 Claims**




1. A poly(arylene ether) containing pendent ethynyl or substituted ethynyl groups prepared by reacting a bisphenol containing an ethynyl or substituted ethynyl group and having the structure



wherein R is selected from the group consisting of hydrogen, $n\text{-}C_4H_9$ and $C_6H_5$, with



wherein X is a halogen.

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**5,498,804**

**PROCESS FOR PREPARING 4-HYDROXYPHENYLMETHYLCARBINOL**

**James R. Sounik; Graham N. Mott, and Charles B. Hilton, all of Corpus Christi, Tex., assignors to Hoechst Celanese Corporation, Sommerville, N.J.**

**Filed Mar. 17, 1995, Ser. No. 406,266**

**Int. Cl.[6] C07C *39/10***

**U.S. Cl. 568—764** **12 Claims**

1. A process for preparing 4-hydroxyphenylmethylcarbinol which comprises the step of heating 4-hydroxyacetophenone in the presence of hydrogen and a catalyst selected from the group consisting of Pd/C, $Pd/Al_2O_3$, $Pd/SiO_2$, and $Pd/CaCO_3$ at a temperature of at least about 20° C. for a sufficient period of time to form said carbinol.

5,498,805
**HIGH TEMPERATURE FLASHPOINT, STABLE CLEANING COMPOSITION**

A. Richard Koetzle, 32 Lucinda Ln., Rochester, N.Y. 14626

Division of Ser. No. 243,734, May 17, 1994, Pat. No. 5,393,451, which is a continuation of Ser. No. 881,251, May 11, 1992, abandoned, which is a continuation-in-part of Ser. No. 640,219, Jan. 11, 1991, Pat. No. 5,112,516. This application Feb. 27, 1995, Ser. No. 394,887
Int. Cl.[6] C07C 13/00
U.S. Cl. 568—827 9 Claims

1. A terpene hydrocarbon composition, comprising:
a) at least 95 percent of a terpene alcohol containing no significant amount of alpha pinene and beta pinene, with the balance being impurities so that the flashpoint of said alcohol is at least about 212° F.

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5,498,806
**PROCESS FOR PREPARING 1-CHLORO-1,2,2-TRIFLUOROETHYLENE OR 1,2,2-TRIFLUOROETHYLENE**

Masaru Ichikawa; Ryuichiro Ohnishi, and Hisao Suzuki, all of Sapporo, Japan, assignors to Daikin Industries Ltd., Osaka, Japan

Continuation of Ser. No. 74,153, Jun. 9, 1993, abandoned, which is a continuation of Ser. No. 938,682, Sep. 1, 1992, abandoned, which is a continuation of Ser. No. 707,831, May 29, 1991, abandoned. This application Jan. 5, 1995, Ser. No. 369,259
Claims priority, application Japan, May 31, 1990, 2-143053; May 31, 1990, 2-143054; Sep. 11, 1990, 2-241691; Sep. 11, 1990, 2-241692
Int. Cl.[6] C07C 17/25;21/18
U.S. Cl. 570—156 7 Claims

1. A process for preparing 1-chloro-1,2,2-trifluoroethylene or 1,2,2-trifluoroethylene comprising reacting 1,1,2-trichloro-1,2,2-trifluoroethane and hydrogen in the presence of a catalyst which comprises at least one basic metal selected from the group consisting of palladium, rhodium and ruthenium and at least one additive metal selected from the group consisting of mercury, lead, cadmium, tin, indium, copper, bismuth, thallium and silver and a carrier selected from the group consisting of $Al_2O_3$, $SiO_2$ and activated carbon.

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5,498,807
**PROCESS FOR THE PREPARATION OF AROMATIC FLUORO COMPOUNDS**

Thomas Schach, Gernsheim, and Theodor Papenfuhs, Frankfurt, both of, Germany, assignors to Hoechst Aktiengesellschaft, Germany

Continuation-in-part of Ser. No. 154,257, Nov. 18, 1993, abandoned. This application Nov. 9, 1994, Ser. No. 336,474
Claims priority, application Germany, Nov. 18, 1992, 42 38 864.3; Feb. 11, 1994, 44 04 343.0
Int. Cl.[6] C07C 25/13
U.S. Cl. 570—127 25 Claims

1. A process for the preparation of aromatic fluoro compounds of the formula I

$$R_nArR^1R^2R^3 \quad (I)$$

in which
Ar is phenyl, naphthyl or pyridyl, $R^1$, $R^2$ and $R^3$ independently of one another are hydrogen, halide, $(C_1–C_4)$-alkyl, phenyl, $NR_2$, OR, CN, COH or COR, where R is hydrogen or $(C_1–C_6)$-alkyl, and n=1, 2, 3, 4 or 5,
which comprises reacting aromatic fluoro compounds of the formula II

$$X_mF_nArR^1R^2R^3 \quad (II)$$

in which Ar, $R^1$, $R^2$, $R^3$ and n have the above-mentioned meaning, each X is a chlorine or bromine atom and m=1, 2, 3, 4 or 5, with hydrogen in the presence of a palladium catalyst, a water-insoluble amine which also does not form water-soluble hydrohalides, and if desired an inert solvent.

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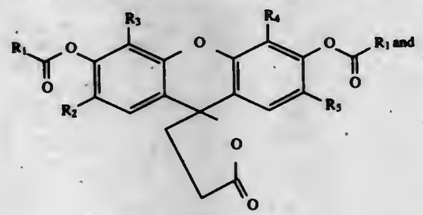
5,498,808
**FLUORESCENT PETROLEUM MARKERS**

Michael J. Smith, Newtown, Pa., assignor to United Color Manufacturing, Inc., Newtown, Pa.

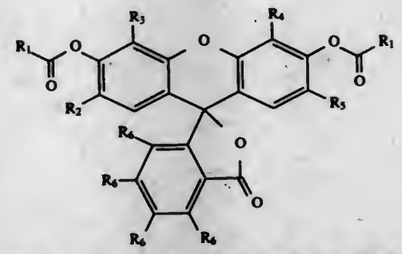
Filed Jan. 20, 1995, Ser. No. 375,310
Int. Cl.[6] C10L 1/10; C07C 7/20
U.S. Cl. 585—3 32 Claims

1. A composition comprising a petroleum product and a detectable level of a marker selected from the group consisting of:

I.



II.



wherein $R_1$ is $C_1–C_{18}$ alkyl group, or an aryl group, and $R_2$, $R_3$, $R_4$, and $R_5$ are hydrogen, chlorine, bromine or $C_1–C_{12}$ alkyl and $R_6$ is hydrogen, chlorine, or bromine; wherein said marker develops color or fluorescence upon contact with a developing reagent that converts said marker into a dianion.

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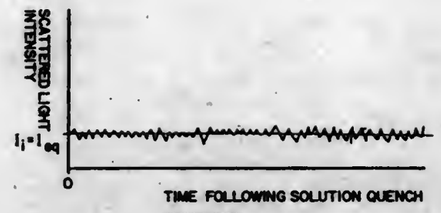
5,498,809
**POLYMERS DERIVED FROM ETHYLENE AND 1-BUTENE FOR USE IN THE PREPARATION OF LUBRICANT DISPERSANT ADDITIVES**

Jacob Emert, Brooklyn, N.Y.; Albert Rossi, Warren, N.J.; Salvatore Rea, Franklin Square, N.Y.; Jeffrey W. Frederick, Morris Plains, and Maha W. Kiss, Califon, both of N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Continuation of Ser. No. 992,192, Dec. 17, 1992, abandoned. This application May 22, 1995, Ser. No. 445,574
Int. Cl.[6] C10M 107/08
U.S. Cl. 585—13 26 Claims

1. Oil soluble copolymer comprising from 1 to about 50 weight percent monomer units derived from ethylene and from about 99 to about 50 weight percent monomer units derived from 1-butene, based on the total polymer weight, and having a number average molecular weight between about 1,500 and 7,500, ethylvinylidene groups terminating at least about 30 percent of all copolymer chains, and an absence of aggregation in solution with mineral oil as determined by having an $S_f$ value of about zero.






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5,498,810
**SELECTIVE ISOPARAFFIN SYNTHESIS FROM NAPHTHA**

Paula L. Bogdan, Mount Prospect; R. Joe Lawson, Arlington Heights; J. W. Adriaan Sachtler, Des Plaines, and Robert J. Schmidt, Barrington, all of Ill., assignors to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 77,587, Jun. 18, 1993, abandoned, which is a continuation-in-part of Ser. No. 796,562, Nov. 21, 1991, Pat. No. 5,235,120. This application Aug. 19, 1994, Ser. No. 293,530
Int. Cl.[6] C07C 6/00
U.S. Cl. 585—310 15 Claims

1. A process combination for selectively upgrading a naphtha feedstock distilling within the range of about 80° to 200° C. to obtain lower-boiling hydrocarbons comprising the steps of:
(a) contacting the naphtha feedstock in a hydrogenation zone with a hydrogenation catalyst in the presence of hydrogen at hydrogenation conditions including a pressure of about 10 to 100 atmospheres, a temperature of 30° to 120° C. and a liquid hourly space velocity of from about 1 to 8 to produce a saturated intermediate; and,
(b) converting the saturated intermediate in a selective-isoparaffin-synthesis zone maintained at selective-isoparaffin-synthesis conditions including a pressure of from about 10 to 100 atmospheres, a synthesis temperature of between about 50° and 350° C. and a liquid hourly space velocity of between about 0.5 and 20 with a solid acid selective isoparaffin-synthesis catalyst in the presence of hydrogen to yield at least 8 volume % relative to the quantity of saturated intermediate of butanes containing isobutane in a higher proportion than could be obtained by isomerization at the synthesis temperature and pentanes containing isopentane in a higher proportion than could be obtained by isomerization at the synthesis temperature and to obtain a synthesis product having a reduced end point relative to the naphtha feedstock.

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5,498,811
**PROCESS FOR PRODUCING GASOLINES AND JET FUEL FROM N-BUTANE**

Carlo Perego, Carnate, and Stefano Peratelo, Nova Milanese, both of, Italy, assignors to Enitricerche S.p.A., Milan, and Enichem Synthesis S.p.A., Palermo, both of, Italy

Filed Apr. 8, 1994, Ser. No. 224,873
Claims priority, application Italy, Apr. 8, 1993, MI93A0702
Int. Cl.[6] C07C 2/08;5/373
U.S. Cl. 585—324 20 Claims

1. A method of producing polymeric fuels from saturated $C_4$ hydrocarbons, comprising:
(A) dehydroisomerizing a gas mixture comprising predominantly n-butane and hydrogen in a catalytic reactor containing a catalyst (a) comprising alumina, on the surface of which platinum is deposited in an amount within the range of from 0.1 to 1% by wt. and silica deposited thereon in an amount within the range of from 0.5 to 5% by wt. and, optionally, a solid acidic catalyst (b) selected from the group consisting of alumina, whose surface is coated with silica, and Boralite B, with an effluent being obtained which comprises a mixture of olefins and paraffins predominantly containing unreacted n-butane, butenes and isobutene, all of which components of the mixture have a carbon atom content less than 5;
(B) separating the mixture of olefins and paraffins from hydrogen and aromatic byproducts; and
(C) oligomerizing said mixture in the presence of a catalyst consisting of silica-alumina gel, amorphous as determined by X-rays, having a silica:alumina molar ratio within the range of 30:1 to 500:1, with a surface area of from 500 to 1000 $m^2/g$, and a pore diameter substantially within the range of from 1 to 3 nm, thereby producing a gasoline fraction boiling within the range of 80° to 175° C., a jet fuel boiling within the range of 175°–300° C. and a gas oil boiling at temperatures greater than 300° C.

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5,498,812
**TWO-STAGE PROCESS FOR PRODUCING DIAMONDOID HYDROCARBONS**

Robert A. Bradway, Voorhees; Larry A. Green, Mickleton, and L. Deane Rollmann, Moorestown, all of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Aug. 4, 1994, Ser. No. 285,675
Int. Cl.[6] C07C 13/28
U.S. Cl. 585—352 12 Claims

1. A two-stage hydrogenation process for producing diamondoid compounds from a petroleum feedstream containing multiple ring naphthenes comprising the steps of:
(a) converting multiple ring naphthenes to alkyl substituted adamantanes in the presence of a zeolite having a Constraint Index of less than 1 in a first stage to form an intermediate product stream; and
(b) selectively cracking non-diamondoid components of said intermediate product stream in the presence of a zeolite having a Constraint Index of less than or equal to about 2 to evolve a final product stream enriched in alkyl substituted adamantanes.

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5,498,813
**IN SITU FORMATION OF CORROSION INHIBITORS**

Theodore C. Arnst, Bellaire, Tex., assignor to Nalco Chemical Company, Naperville, Ill.

Filed Jan. 9, 1995, Ser. No. 369,948
Int. Cl.[6] C07C 2/70
U.S. Cl. 585—466 8 Claims

1. A method for the prevention of corrosion occurring downstream of a hydrocarbon alkylation reactor employing a phosphoric acid based catalyst which corrosion is caused by phosphoric acid in the hydrocarbon stream, which comprises adding to the hydrocarbon stream at a point downstream of said reactor from 1.0–4.0 moles of a $C_6–C_{22}$ alkyl alcohol per each mole of phosphoric acid present in the hydrocarbon stream.

5,498,814

## REGIOSELECTIVE METHYLATION OF TOLUENE TO PARA-XYLENE

Clarence D. Chang, Princeton, and Paul G. Rodewald, Rocky Hill, both of N.J., assignors to Mobil Oil Corp., Fairfax, Va.

Continuation of Ser. No. 24,972, Mar. 2, 1993, abandoned, which is a continuation-in-part of Ser. No. 858,105, Mar. 12, 1992, abandoned. This application Apr. 5, 1994, Ser. No. 223,383

Int. Cl.[6] C07C 5/52

U.S. Cl. 585—475 14 Claims

1. A toluene conversion process comprising:

contacting a reaction stream comprising toluene, hydrogen and an organosilicon compound with a catalytic molecular sieve at reaction conditions to provide a single pass para-xylene product of at least about 90% based on the $C_8$ products and concurrently therewith a toluene conversion of at least about 15.

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5,498,815

## PREPARATION OF SYNTHETIC OILS FROM VINYLIDENE OLEFINS AND ALPHA-OLEFINS

Robert A. Schnerll, Jr.; Ali M. Dadgar, both of Baton Rouge, and Carroll W. Lanier, Baker, all of La., assignors to Albemarle Corporation, Richmond, Va.

Filed Dec. 13, 1991, Ser. No. 806,383

Int. Cl.[6] C07C 2/08

U.S. Cl. 585—512 6 Claims

1. A process for making a synthetic oil, said process comprising the steps of (a) reacting a vinylidene olefin, which is a dimer of a vinyl olefin monomer containing about 4 to 30 carbon atoms, in the presence of a catalyst to form an intermediate mixture which contains at least about 50 weight percent dimer of said vinylidene olefin, and (b) adding a vinyl olefin, which contains about 4 to 30 carbon atoms, to said intermediate mixture and reacting said intermediate mixture and said vinyl olefin in the presence of a catalyst so as to form a product mixture which contains said dimer of said vinylidene olefin and a co-dimer of said added vinyl olefin with said vinylidene olefin.

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5,498,816

## PROCESS FOR THE DEHYDROGENATION OF HYDROCARBONS

Poul E. H. Nielsen, Fredensborg, and Peter Lehrmann, Birkerod, both of, Denmark, assignors to Haldor Topsøe A/S, Denmark

Filed Nov. 30, 1994, Ser. No. 346,781

Claims priority, application Denmark, Nov. 30, 1993, 1337/93

Int. Cl.[6] C07C 5/327;5/333

U.S. Cl. 585—658 4 Claims

1. In a process for the dehydrogenation of a hydrocarbon feed stream comprising the steps of:

contacting the feed stream with a dehydrogenation catalyst in at least one dehydrogenation zone and reacting the feed stream to produce a hydrogen-containing effluent stream;

admixing to the effluent stream an oxygen-containing atmosphere in at least one mixing zone;

removing hydrogen from the effluent stream by reaction with oxygen in the oxygen-containing atmosphere by contact with a hydrogen oxidation catalyst in at least one hydrogen removal zone,

the improvement of which comprises employing unsupported forms of noble metals or alloys thereof as catalyst in the at least one hydrogen removal zone.

5,498,817

## ISOPARAFFIN/OLEFIN ALKYLATION OVER VACANCY-CONTAINING TITANOMETALLATE MOLECULAR SIEVES

Tracy J. Huang, Lawrenceville, N.J., and Charles T. Kresge, West Chester, Pa., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Sep. 20, 1994, Ser. No. 308,898

Int. Cl.[6] C07C 2/58

U.S. Cl. 585—709 2 Claims

1. A process for alkylating an olefin with an isoparaffin comprising contacting an olefin-containing feed in the presence of a thermally stable composition comprising layered metal oxide, wherein each layer of the metal oxide has the general formula

$$[M_x\square_yZ_{2-(x+y)}O_4]^{q-}$$

wherein M is at least one metal of valence n wherein n is an interger between 0 and 7, $\square$ represents a vacancy site, Z is titanium, and wherein

$$q=4y-x(n-4),$$

and

$$0<x+y<2$$

under process conditions of temperature from about 0° C. to about 500° C., pressure from about 0 to about 2000 psig, and olefin weight hourly space velocity (WHSV) sufficient to convert about 99 percent by weight of fresh olefin to alkylate product.

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5,498,818

## METHOD FOR SUPPRESSING THE EVAPORATION OF HYDROGEN FLUORIDE FROM A MIXING OF HYDROGEN FLOURIDE AND SULFONE

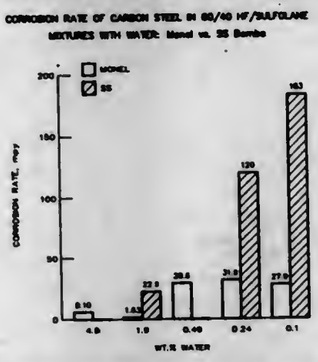
Bruce B. Randolph, Bartlesville, Okla., and Ronald G. Abbott, Kingwood, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 877,336, May 1, 1992, abandoned. This application Apr. 28, 1994, Ser. No. 234,200

Int. Cl.[6] C07C 2/62

U.S. Cl. 585—723 14 Claims

1. A method for suppressing the evaporation of hydrogen fluoride from a mixture containing hydrogen fluoride and sulfone when said mixture is exposed to atmospheric conditions comprising adding to said mixture a hydrogen fluoride evaporation suppressing amount of water to thereby suppress the evaporation of HF from said mixture upon its exposure to the atmosphere.






5,498,819

## GRISEOLIC ACID DERIVATIVES, THEIR PREPARATION AND THEIR USE

Masakatsu Kaneko; Yoshinobu Murofushi; Misako Kimura; Mitsuo Yamazaki, and Yasuteru Iijima, all of Tokyo, Japan, assignors to Sankyo Company, Limited, Tokyo, Japan

Continuation of Ser. No. 916,794, Jul. 17, 1992, abandoned, which is a continuation of Ser. No. 742,287, Aug. 8, 1991, abandoned, which is a continuation of Ser. No. 616,763, Nov. 19, 1990, abandoned, which is a continuation of Ser. No. 361,806, May 30, 1989, abandoned, which is a continuation of Ser. No. 157,112, Feb. 10, 1988, abandoned, which is a continuation of Ser. No. 854,418, Apr. 21, 1986, abandoned. This application Sep. 30, 1993, Ser. No. 130,154

Claims priority, application Japan, Apr. 19, 1985, 60-82132; Apr. 27, 1985, 60-91987; Apr. 27, 1985, 60-91989

Int. Cl.[6] C07D 473/34; A61K 31/52

U.S. Cl. 514—261 55 Claims

1. A compound selected from the group consisting of 2-acetylamino-6-desamino-6-hydroxy-4',5'-dihydrogriseolic acid, 2-amino-6-desamino-6-hydroxy-4', 5'-dihydrogriseoiic acid, 2-acetylamino-6-desamino-6-hydroxy-4',5'-dihydro-7'-desoxygriseolic acid, 2-amino-6-desamino-6-hydroxy-4',5'-dihydro-7'-desoxygriseolic acid, 2,6-dichloro-6-desamino-4',5=-dihydrogriseolic acid, 2-chloro-4',5'-dihydrogriseolic acid, 6-desamino-6-hydroxy-2-amino-2-dihydro-4',5'-dihydrogriseloic acid, and pharmaceutically acceptable salts and esters thereof.

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5,498,820

## ALKYLATION PROCESS

Sven I. Hommeltoft, Hillerod, Denmark, assignor to Haldor Topsøe A/S, Denmark

Filed Aug. 9, 1994, Ser. No. 287,871

Claims priority, application Denmark, Aug. 13, 1993, 0931/93

Int. Cl.[6] C07C 2/62;2/70

U.S. Cl. 585—730 4 Claims

1. Process for the alkylation of a hydrocarbon feedstock with an olefinic alkylating agent comprising the steps of contacting the hydrocarbon feedstock and the olefinic alkylating agent with a fluorinated alkoxy alkane sulphonic acid catalyst for a sufficient time and recovering a product stream of alkylated hydrocarbons.

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5,498,821

## CARBON DIOXIDE ADDITION IN HYDROCRACKING/HYDROISOMERIZATION PROCESSES TO CONTROL METHANE PRODUCTION

Daniel F. Ryan, and Robert J. Wittenbrink, both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Oct. 13, 1994, Ser. No. 293,362

Int. Cl.[6] C07C 5/13

U.S. Cl. 585—750 11 Claims

1. A hydroisomerization process in which $C_1$ yields are suppressed without substantial effect on other light gas yields which comprises reacting at hydroisomerization reaction conditions a $C_5$+ paraffinic feedstock in the presence of hydrogen and at least about 0.2 mole % carbon dioxide based on feed and a catalyst comprising a Group VIII non-noble metal and a Group VI metal supported on alumina or silica-alumina.

5,498,822

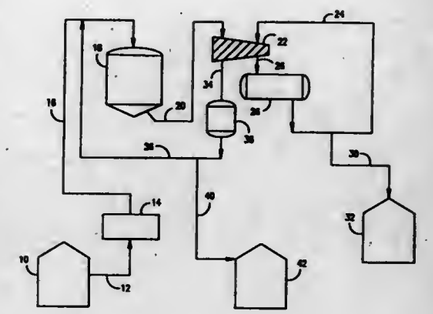
## SINGLE TEMPERATURE STAGE CRYSTALLIZATION OF PARAXYLENE

William D. Eccli, Princeton Junction, N.J., and Alexander D. S. Fremuth, Langhorne, Pa., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Apr. 4, 1994, Ser. No. 223,063

Int. Cl.[6] C07C 7/14

U.S. Cl. 585—816 10 Claims




1. A single temperature crystallization process to recover p-xylene from a feed rich in p-xylene which comprises:

contacting said feed rich in p-xylene in a single temperature crystallization stage at a temperature in the range of from about −20° to about 50° F.;

withdrawing a slurry comprising p-xylene crystals from said single temperature crystallization stage;

passing said slurry to a separation means to form a cake and washing said cake with p-xylene;

passing said cake to a melt drum to form p-xylene product and withdrawing said p-xylene product;

recycling a portion of reject filtrate from said separation means to said single temperature crystallization stage; and

withdrawing the remaining reject filtrate as mother liquor product, wherein said feed rich in p-xylene comprises at least about 97 wt. % p-xylene.

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5,498,823

## ION-EXCHANGE SUPPORTS FOR FACILITATED TRANSPORT MEMBRANES WITH ENHANCED SELECTIVITY

Richard D. Noble; Paul M. Thoen, both of Boulder, and Carl A. Koval, Golden, all of Colo., assignors to Regents of the University of Colorado, Boulder, Colo.

Filed Feb. 1, 1994, Ser. No. 189,563

Int. Cl.[6] C07C 7/144;7/10

U.S. Cl. 585—818 20 Claims

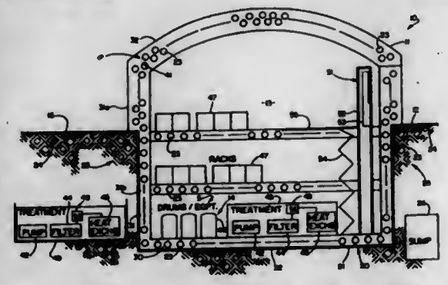
1. A method for effectively separating an unsaturated hydrocarbon from a liquid hydrocarbon feedstock containing at least two unsaturated hydrocarbons which vary in molecular size and save substantially the same equilibrium constants comprising passing said feedstock over one side of an ionopore membrane having incorporated therein a facilitater, which has an affinity for each of said at least two unsaturated hydrocarbons, and recovering from a second side of said membrane a permeate containing predominantly an unsaturated hydrocarbon having a smaller molecular size than the remaining unsaturated hydrocarbons, wherein said unsaturated hydrocarbons are selected from the group consisting essentially of aromatic, alkene, and diene hydrocarbons.

5,498,824
**METHODS OF PREPARING CUPROUS AND CUPRIC CARBOXYLATES**
Marvin M. Johnson; Gerhard P. Nowack, both of Bartlesville, Okla., and Ted H. Cymbaluk, Seabrook, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Division of Ser. No. 815,692, Dec. 31, 1991, Pat. No. 5,371,258. This application Nov. 1, 1994, Ser. No. 333,153
Int. Cl.[6] C07F 1/08; C07C 7/156
U.S. Cl. 985—848 3 Claims

1. An olefin complexing reagent which consists essentially of a solution of a branched copper (I) carboxylate having about 8 to about 16 carbon atoms in an aromatic solvent.

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5,498,825
**PLUTONIUM AND NUCLEAR TOXIC WASTE STORAGE DEPOT AND METHOD**
Joel S. Stahl, 530 E. Central Blvd., Apt. 1504, Orlando, Fla. 32801
Filed Jan. 21, 1994, Ser. No. 184,859
Int. Cl.[6] G21F 9/00
U.S. Cl. 588—16 27 Claims




12. A method of removing radioactivity from the interior of a building by transporting radioactive material within a slurry and filtering out the then contaminated material outside the building, thus removing it in a continuous fluid recirculation system.

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5,498,826
**PLASMATRON WITH STEAM AS THE PLASMA GAS AND PROCESS FOR STABLE OPERATION OF THE PLASMATRON**
Hans-Ulrich Dummersdorf, Leverkusen; Dietrich Hebecker, Leipzig; Dirk von Langerken, Halle; Carsten Winter, deceased, late of Grimma; Walter Winter, heir, and Renate Winter, heir, both of Furstenwalde, all of, Germany, assignors to Maschinen- und Anlagenbau Grimma GmbH (MAG), Grimma, Germany
Continuation of Ser. No. 920,475, Aug. 19, 1992, abandoned. This application Oct. 17, 1994, Ser. No. 323,590
Claims priority, application German Dem. Rep., Feb. 26, 1990, 338 1454
Int. Cl.[6] A62D 3/00
U.S. Cl. 588—210 7 Claims

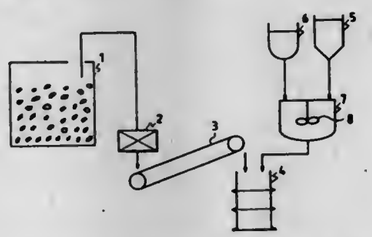
1. A process for stable operation of a plasmatron for annihilating toxic waste products including chlorinated or fluorinated hydrocarbons whereby said products are chemically converted in a steam plasma gas atmosphere, wherein the improvement comprises cooling electrodes of the plasmatron which are subject to high thermal loads by a plasma generating arc by forcibly flowing water coolant having a temperature of at least approximately 80° C. through said electrodes to maintain a surface temperature of said electrodes which is higher than a condensation temperature of the steam plasma gas atmosphere, said surface temperature being determined by the entry temperature of said water coolant.

5,498,827
**HYDROTHERMAL TREATMENT AND PARTIAL OXIDATION OF PLASTIC MATERIALS**
Motasimur R. Khan, Wappinger Falls; Christine C. Albert, Peekskill, and Stephen J. DeCanio, Montgomery, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.
Filed Oct. 4, 1993, Ser. No. 131,366
Int. Cl.[6] A62D 3/00
U.S. Cl. 588—213 12 Claims

1. A partial oxidation process for the environmentally safe disposal of scrap plastic material containing inorganic filler or reinforcement material, comprising:
(1) grinding the plastic material;
(2) mixing the plastic from (1) with water to produce a sludge having a solids content in the range of about 60 to 80 wt. %;
(3) heating the sludge from (2) for a period in the range of about 5 minutes to 1 hour at a temperature in the range of about 350° F. to 475° F. in the absence of air in a closed system;
(4) hydrothermally treating the heated sludge from (3) in a closed vessel in the absence of air for a residence time in the range of about 15 to 90 minutes, a temperature in the range of about 450° F. to 680° F., a pressure in the range of about 100 to 1200 psig and above the vapor pressure of water at that temperature;
(5) cooling the hydrothermally treated sludge from (4) to a temperature in the range of about 100° F. to 200° F., and separating the gases generated from said sludge, said gases containing at least one member selected from the group consisting of $CO_2$, CO, $H_2S$, $NH_3$, and light hydrocarbon gases;
(6) mixing the cooled sludge from (5) with ground solid carbonaceous fuel and water to produce a pumpable aqueous slurry having a solids content in the range of about 40 to 60 wt. % and a weight ratio of solid carbonaceous fuel to said sludge in the range of about 1 to 5 parts by wt. of solid carbonaceous fuel for each part by weight of said sludge; and
(7) reacting by partial oxidation with a free-oxygen containing gas said pumpable aqueous slurry from (6) to produce a gas containing $H_2$ and CO.

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5,498,828
**SOLIDIFICATION AGENTS FOR RADIOACTIVE WASTE AND A METHOD FOR PROCESSING RADIOACTIVE WASTE**
Masami Matsuda; Takashi Nishi; Makoto Kikuchi, all of Hitachi; Tatsuo Izumida, Katsuta; Shin Tamata, Ooarai, and Yoshinasa Kiuchi, Katsuta, all of, Japan, assignors to Hitachi, Ltd., Tokyo, and Hitachi Engineering & Services Co., Ltd., Ibaraki, both of, Japan
Filed Mar. 19, 1993, Ser. No. 34,885
Claims priority, application Japan, Mar. 19, 1992, 4-063141
Int. Cl.[6] A62D 3/00; G21F 9/00
U.S. Cl. 588—252 23 Claims




1. A composition for solidification treatment of radioactive wastes comprising a solidification agent and at least one compound which yields a water insoluble precipitate by a reaction with a carbonic ion, selected from the group consisting of water soluble alkaline earth metal compounds, water soluble transition metal compounds and organic silane compounds, said at least one compound being present in a granular state or a water-repelling treated state.

10. A method of solidification treatment of radioactive wastes comprising mixing in a vessel to form a mixture radioactive wastes and at least one compound yielding a water insoluble precipitate by a reaction with a carbonic ion, selected from the group consisting of water soluble alkaline earth metal compounds, water soluble transition metal compounds and organic silane compounds in a granular state or a water-repelling treated state; and solidifying the mixture with a solidification agent.

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5,498,829
**G1323 HARD WHITE WINTER WHEAT**
Kenneth Goertzen, and Betty Goertzen, both of Haven, Kans., assignors to Cargill, Incorporated, Wayzata, Minn.
Filed Jun. 30, 1994, Ser. No. 269,003
Int. Cl.[6] A01H 5/00;4/00;1/00; C12N 5/04
U.S. Cl. 800—200 6 Claims

1. A hard white winter wheat seed designated G1323, having ATCC Accession No. 97217.

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5,498,830
**DECREASED OIL CONTENT IN PLANT SEEDS**
Gerard F. Barry, St. Louis; Ganesh M. Kishore, Chesterfield, and David M. Stark, Fenton, all of Mo., assignors to Monsanto Company, St. Louis, Mo.
Continuation-in-part of Ser. No. 709,663, Jun. 7, 1991, abandoned, which is a continuation-in-part of Ser. No. 539,763, Jun. 18, 1990, abandoned. This application Jul. 12, 1993, Ser. No. 90,523
Int. Cl.[6] A01H 1/06; C12N 9/12;15/54; C12P 7/64
U.S. Cl. 800—205 5 Claims

1. A method of producing plant seeds having decreased oil content comprising providing increased levels of ADPglucose pyrophosphorylase within said seeds by transforming a seed-bearing plant using the following steps:
(a) inserting into the genome of a plant cell a recombinant, double-stranded DNA molecule comprising
(i) a promoter which functions in plants to cause the production of an RNA sequence in plant seeds,
(ii) a structural DNA sequence that causes the production of an RNA sequence which encodes a fusion polypeptide comprising an amino-terminal plastid transit peptide and a foreign ADPglucose pyrophosphorylase enzyme,
(iii) a 3' non-translated DNA sequence which functions in plant cells to cause transcriptional termination and the addition of polyadenylated nucleotides to the 3' end of the RNA sequence;
(b) obtaining transformed plant cells; and
(c) regenerating from the transformed plant cells genetically transformed plants which produce seeds having a decreased oil content.

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5,498,831
**PEA ADP-GLUCOSE PYROPHOSPHORYLASE SUBUNIT GENES AND THEIR USES**
Diane G. Burgess, Berkeley, and Hugo K. Dooner, Walnut Creek, both of Calif., assignors to DNA Plant Technology Corporation, Oakland, Calif.
Filed Jul. 23, 1993, Ser. No. 97,829
Int. Cl.[6] A01H 1/04;4/00;5/00; C07H 21/04
U.S. Cl. 800—205 23 Claims

1. An isolated polynucleotide having the sequence of Seq. I.D. No. 1, Seq. I.D. No. 3, Seq. I.D. No. 5, Seq. I.D. No. 7, Seq. I.D. No. 8, or Seq. I.D. No. 9.

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5,498,832
**POTATO α-AMYLASE GENES**
Kirsten Gausing, Skødstrup, and Jette D. Kreiberg, Brabrand, both of, Denmark, assignors to A/S De Danske Spritfabrikker, Copenhagen, Denmark
Continuation of Ser. No. 651,408, Feb. 25, 1991, abandoned. This application Oct. 5, 1993, Ser. No. 131,931
Claims priority, application Denmark, Apr. 24, 1989, 1980/89
Int. Cl.[6] C12N 15/56;1/21;15/84; A01H 5/00
U.S. Cl. 800—205 31 Claims

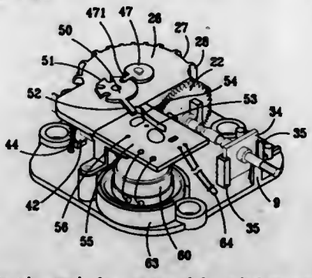
1. An isolated and purified DNA molecule comprising a nucleotide sequence that encodes a polypeptide encoded by an nucleotide sequence selected from the group consisting of:
(a) nucleotides 541 to 1761 of FIG. 1,
(b) nucleotides 595 to 1761 of FIG. 1,
(c) nucleotides 2 to 1219 of FIG. 2,
(d) nucleotides 53 to 1219 of FIG. 2,
(e) nucleotides 6 to 1052 of FIG. 3, and
(f) nucleotides 3 to 647 of FIG. 4,
wherein said DNA molecule encodes α-amylase.

5,498,833

## ELECTRIC MUSIC BOX POWERED BY WIND-UP

Lung H. Huang, Taichung Hsien, Taiwan, Prov. of China, assignor to Kyooh Precision Industry Co., Ltd., Taipei, Taiwan, Prov. of China

Filed Jul. 12, 1995, Ser. No. 501,619
Int. Cl.[6] G10F 1/06
U.S. Cl. 84—94.1 10 Claims




1. An electric music box powered by wind-up comprising a housing having a wind-up mechanism thereof, said wind-up mechanism including a ratchet shaft, a bevel gear and a winds, said winds being enclosed at said ratchet shaft and being enclosed by a wind cap, when said winds being rotated to tighten and release its potential energy, said ratchet shaft and said bevel gear being rotated therefrom, said bevel gear being meshed with a damping shaft to decrease the rotating speed of said ratchet shaft; said ratchet shaft being extended above said wind cap and being interconnected with a cam, said cam being provided with a shank which can be interfered with a controlling plate having an extension thereof, said controlling plate being provided with a plurality of teeth thereof, when said cam rotates one round, said tooth of said controlling plate moves one step, said extension of said controlling plate being prevented from contact with the contact of a circuit board, when said cam is moved, said extension of said controlling plate being contacted with said contact of said circuit board, said circuit board being provided with music IC and being electrically connected with a power source and a speaker, said speaker being powered to broadcast music, a cover lid being used to enclose the winds cap and output shaft.

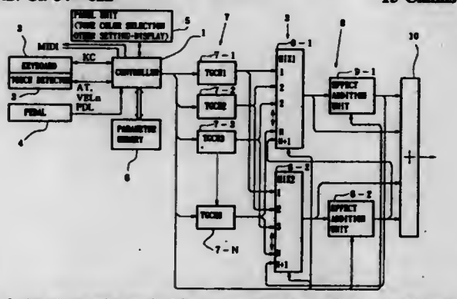
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5,498,834

## ELECTRONIC MUSICAL INSTRUMENT CAPABLE OF GENERATING A RESONANCE TONE TOGETHER WITH A MUSICAL TONE

Yoshihiro Inagaki, and Kazuo Masaki, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Japan

Filed Nov. 27, 1991, Ser. No. 799,558
Claims priority, application Japan, Nov. 30, 1990, 2-330140
Int. Cl.[6] G10H 1/08
U.S. Cl. 84—622 15 Claims




1. An electronic musical instrument for generating a plurality of resonance tones along with a designated musical tone in order to simulate resonance effects of an acoustic musical instrument, comprising:

pitch designation means for designating a pitch of a musical tone to be generated;

operation means for detecting an operation state of the electronic musical instrument in addition to pitch designation and for outputting operation data according to the operation state;

storage means for storing a plurality of groups of musical tone parameters of a plurality of musical tones, each group corresponding to a combination of pitch and operation data;

musical tone parameter control means for reading out a first group of musical tone parameters for said designated musical tone from said storage means in accordance with the pitch designated by said pitch designation means and the operation data output from said operation means and for reading out a second group of musical tone parameters for said plurality of resonance tones from said storage means in accordance with the pitch designated by said pitch designation means and the operation data output from said operation means;

musical tone signal generation means for generating a first musical tone signal having said designated pitch in accordance with the first group of musical tone parameters and for generating a plurality of second musical tone signals corresponding to said plurality of resonance tones in accordance with the second group of musical tone parameters; and

mixing means for mixing said first and second musical tone signals, thereby enabling generation of said resonance tones and said musical tone, wherein each of said plurality of resonance tones is controlled independently in accordance with said operation data output from said operation means.

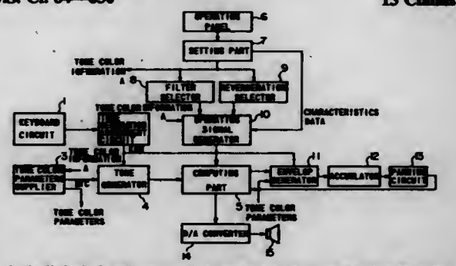
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5,498,835

## DIGITAL SIGNAL PROCESSING APPARATUS FOR APPLYING EFFECTS TO A MUSICAL TONE SIGNAL

Tetsuji Ichiki, Hamamatsu, Japan, assignor to Yamaha Corporation, Japan

Filed Mar. 10, 1993, Ser. No. 28,843
Claims priority, application Japan, Mar. 10, 1992, 4-051898; Feb. 24, 1993, 5-035862
Int. Cl.[6] G10H 1/02;7/00
U.S. Cl. 84—630 13 Claims




1. A digital signal processing apparatus for conducting filtering and applying reverberation with respect to a generated musical tone signal, comprising:

designating means for generating filtering designation data designating characteristics of said filtering, reverberating designation data designating characteristics of said reverberation, and combination data designating combined characteristics of said filtering and said reverberation,

parameter generating means for generating filtering parameters in accordance with said filtering designation data, and for generating reverberating parameters in accordance with said reverberating designation data and said combination data,

memory means for storing a plurality of operating algorithms,

readout means for reading first and second operating algorithms from said memory means,

computing means for filtering said musical tone signal in accordance with said filtering parameters based on said first operating algorithm, and for imparting reverberation characteristics to said musical tone signal in accordance with said reverberating parameters based on said second operating algo-

rithm, said computing means processing said first and said second operating algorithms simultaneously during a single sampling period.

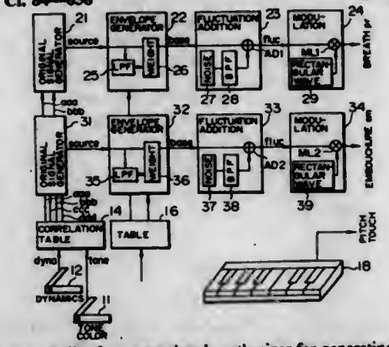
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**5,498,836**

## CONTROLLER FOR TONE SIGNAL SYNTHESIZER OF ELECTRONIC MUSICAL INSTRUMENT

**Tetsuo Okamoto, and Satoshi Usa, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Japan**

**Continuation of Ser. No. 988,181, Dec. 9, 1992, abandoned.**
**This application Apr. 7, 1995, Ser. No. 418,869**
**Claims priority, application Japan, Dec. 13, 1991, 3-352290**
**Int. Cl.[6] G01P *3/00*; G10H *5/00***
**U.S. Cl. 84—658** **17 Claims**




1. A controller for a tone signal synthesizer for generating a tone signal in accordance with a plurality of parameters, comprising:

first and second manipulators responsive to a player performance which generate first and second manipulator signals, respectively, representing an amount of operation thereof;

first and second table means for receiving said first manipulator signal and outputting first and second table signals, respectively;

third and fourth table means for receiving said second manipulator signal and outputting third and fourth table signals, respectively;

first processor means for generating a time varying first parameter based on said first and third table signals;

second processor means for generating a time varying second parameter signal based on said second and fourth table signals; and

tone signal controlling means for controlling and varying a tone signal depending on time, based on said first and second parameters.

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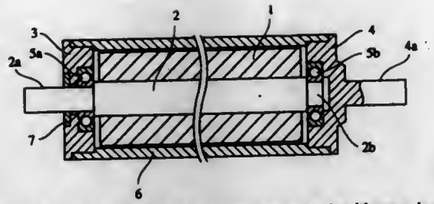
**5,498,837**

## SLEEVE FOR DEVELOPING ROLL MEMBER

**Keitaro Yamashita, Saitama, Japan, assignor to Hitachi Metals, Ltd., Tokyo, Japan**

**Continuation of Ser. No. 103,960, Aug. 10, 1993, abandoned.**
**This application Jun. 7, 1995, Ser. No. 479,842**
**Claims priority, application Japan, Aug. 13, 1992, 4-215812**
**Int. Cl.[6] G03G *15/09*; B25F *5/02*; F16C *13/00***
**U.S. Cl. 118—658** **1 Claim**

1. A sleeve for a developing roll member for use in developing an electrostatic latent image on an amorphous silicon photosensitive drum, said sleeve receiving therein a stationary hollow cylindrical permanent magnet member having on an outer surface a plurality of axially extending magnetic poles and being rotatable around said stationary hollow cylindrical permanent magnet member, said sleeve comprising an inner layer made of an aluminum alloy having enough malleability for cold drawing and an outer layer made of an austenitic stainless steel having enough malleability for cold drawing, and said inner layer and said outer layer being integrated together by cold drawing.



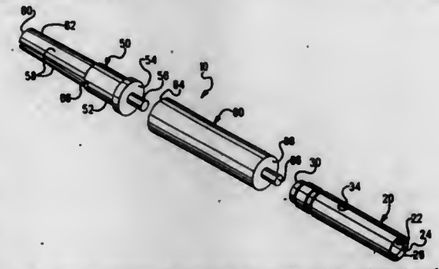

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**5,498,838**

## MODULAR ELECTRICAL CONTACT ASSEMBLIES

**Lev B. Furman, Santa Ana, Calif., assignor to The Whitaker Corporation, Wilmington, Del.**

**Continuation of Ser. No. 122,865, Sep. 16, 1993, abandoned.**
**This application Aug. 9, 1995, Ser. No. 514,343**
**Int. Cl.[6] H02G *15/02*; H01R *4/00*;*4/10*;*9/24***
**U.S. Cl. 174—74 R** **15 Claims**




1. A contact assembly for electrically connecting a first electrical article and a second electrical article to define a discrete electrical circuit therebetween, comprising:

a conductive first member and a conductive second member and a conductive intermediate member to be disposed therebetween,

said first member having a first assembly face with a securing section and further defining at an opposed face thereof a first connection section for forming an electrical connection with a complementary connection section of said first electrical article,

said second member having a second assembly face with a securing section and further defining at an opposed face thereof a second connection section for forming an electrical connection with a complementary connection section of said second electrical article, and

said intermediate member being of selected length and having opposed first and second mounting faces each associated with a respective one of said first and second members at first and second assembly interfaces and having a respective securing section;

one of said first assembly face and said first mounting face having its securing section defined by a small diameter bore extending thereinto, and the other thereof having its securing section defined by a cylindrical embossment extending therefrom;

one of said second assembly face and said second mounting face having its securing section defined by a small diameter bore extending thereinto, and the other thereof having its securing section defined by a cylindrical embossment extending therefrom; and

each said cylindrical embossment being of solid material and having a diameter slightly larger than the diameter of said small diameter bore of said one member, and each said small diameter bore being defined into otherwise solid material of the respective said securing face, wherein said first and second members are affixable to said intermediate member by a said cylindrical embossment being force fitted into a said small diameter bore under sufficient insertion force, and with the dimensions of said small diameter bores and said cylindrical embossments preselected to define a substantial desired retention force upon assembly sufficient to define durable joints to enable the assembly to be manipulated as a unit during subsequent electrical connection with the first and second electrical articles,

whereby an elongate contact assembly is defined upon assembly of said first, intermediate and second members.



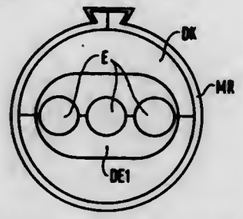
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**5,498,839**

## CABLE SLEEVE COMPOSED OF A PIPE SECTION AND SEAL MEMBERS AT THE FACE END

**Martin Behrendt, Hagen; Adolf Franz; Roland Hunke, both of Iserlohn, and Roland Roether, Hagen, all of, Germany, assignors to RXS Schrumpftechnik-Garnituren GmbH, Hagen, Germany**

**Filed May 6, 1994, Ser. No. 239,120**
**Claims priority, application Germany, May 27, 1993, 43 17 723.9**
**Int. Cl.[6] H02G *15/113***
**U.S. Cl. 174—92** **17 Claims**




1. A cable enclosure having a cable sleeve and an end-face seal member with an introduction opening arranged in the seal member, further comprising:

a seal member insert fitted to said introduction opening of the seal member, said seal member insert having at least one cable opening matched to a diameter of a cable to be introduced therein, wherein the seal member insert is a cylindrical sealing plug that is introduced into the introduction opening, said cylindrical sealing plug having outwardly projecting edges at the two ends thereof forming a detente from both sides to be fixed in longitudinal direction with respect to the seal member.

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**5,498,840**

## TRANSDUCER SIGNAL TERMINATOR

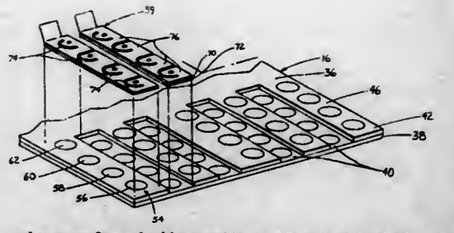
**Mark S. Maggio, Bethany; David S. Allsup, Oklahoma City; Alvin E. Cox, Yukon; Tom Metzner; Steven Eckerd, both of Oklahoma City, and Loren Skarky, Bethany, all of Okla., assignors to Seagate Technology, Inc., Scotts Valley, Calif.**

**Filed Apr. 20, 1994, Ser. No. 230,395**
**Int. Cl.[6] H05K *1/18***
**U.S. Cl. 174—260** **24 Claims**

1. A transducer signal terminator for electrically connecting to an element located on a substrate a plurality of lead wires extending from a device located elsewhere than on the substrate, said transducer signal terminator comprising:

a substrate having a plurality of layers, wherein said substrate includes a first layer having an outer surface and a second layer having a surface closest to said first layer, said first layer having a plurality of openings therein, each of which exposes a portion of said closest surface of said second layer, said substrate having said element provided thereon; and

a plurality of interconnection points located on both said outer surface of said first layer and the exposed portions of said closest surface of said second layer, wherein each of said lead wires can be electrically connected to one of said interconnection points, and wherein said interconnection points are electrically connected to said element.



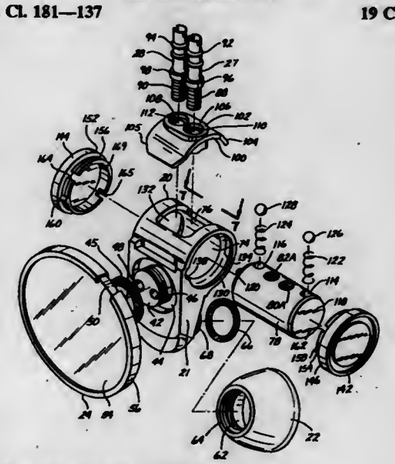

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**5,498,841**

## DUAL ACOUSTICAL PASSAGE STETHOSCOPE

**Derek R. Allen, 1801 Santiago Dr., Newport Beach, Calif. 92660**

**Filed Mar. 10, 1995, Ser. No. 401,956**
**Int. Cl.[6] H04R *25/00***
**U.S. Cl. 181—137** **19 Claims**



1. A stethoscope head comprising:

a low frequency sound receiving bell;

a high frequency sound receiving diaphragm;

a selectively movable valve assembly comprising a valve housing having a cylindrical bore valve seat having an axis and an interior surface;

said bell and said diaphragm being offset at an angle from each other;

a substantially cylindrical valve plug having an axis, two ends, and an exterior surface, said valve being seated within said cylindrical bore valve seat;

a first pair of acoustical passages within said valve housing which open into said interior surface of said cylindrical bore for sound communication with said bell;

a second pair of acoustical passages within said valve housing which open into said interior surface of said cylindrical bore for sound communication with said diaphragm;

a third pair of acoustical passages within said valve plug for selective alignment and sound communication with said first pair of acoustical passages and with said second pair of acoustical passages upon rotation of said cylindrical valve plug within said cylindrical bore;

a pair of sound tubes connected to said third pair of acoustical passages whereby one acoustical passage of said first pair of acoustical passages or one acoustical passage of said second

pair of acoustical passages, one acoustical passage of said third pair of acoustical passages, and one of said sound tubes forms a continuous sound passageway for conducting sound from said bell or from said diaphragm, through said housing, through said valve plug, and through said sound tube to one ear of a user; and,

wherein the other one of said first pair of acoustical passages or the other one of said second pair of acoustical passages, the other one of said third pair of acoustical passages, and the other one of said sound tubes forms a continuous sound passageway for conducting sound from said bell or from said diaphragm, through said housing, though said valve plug, through said sound tube to the other ear of a user.

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**5,498,842**

**MUFFLER FOR AN INTERNAL COMBUSTION ENGINE**

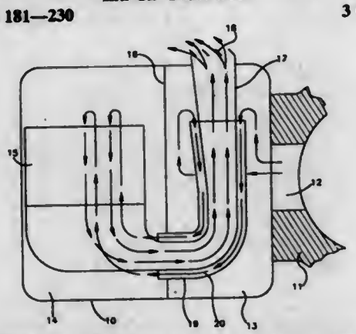
**Tord E. R. Karlsson, Huskvarna, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden**

**Filed Oct. 27, 1994, Ser. No. 329,995**

**Claims priority, application Sweden, Nov. 19, 1993, 9303843**

**Int. Cl.[6] F01N *3/02***

**U.S. Cl. 181—230** **3 Claims**




1. A muffler for an internal combustion engine, comprising a housing (**10**) having first and second chambers (**13**, **14**), said chambers being separated by a partition wall (**16**), said first chamber being adapted to receive exhaust gas discharged from the engine, said second chamber (**14**) having a catalyzer element (**15**) for treating exhaust gas, whereby exhaust gas passes from said second chamber to said catalyzer element, a discharge pipe (**17**) connecting said catalyzer element to atmosphere, said discharge pipe extending through said first chamber (**13**) and conducting exhaust gas from said catalyzer element to atmosphere, and an outer pipe (**19**) surrounding said discharge pipe (**17**) and cooperating with said discharge pipe to define a passage (**20**), whereby exhaust gas passes through said passage as it flows from said first chamber to said second chamber and is heated by said discharge pipe as it flows through said passage and is thereby pre-heated prior to reaching said catalyzer element.

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**5,498,843**

**CONTROL KEY MULTIPLE ELECTRICAL CONTACT SWITCHING DEVICE**

**Toshinori Date, and Yasuo Takase, both of Tokyo, Japan, assignors to Sega Enterprises, Ltd., Tokyo, Japan**

**Continuation-in-part of Ser. No. 83,670, Jun. 28, 1993. This application May 17, 1994, Ser. No. 245,446**

**Claims priority, application Japan, Jun. 30, 1992, 4-173020**

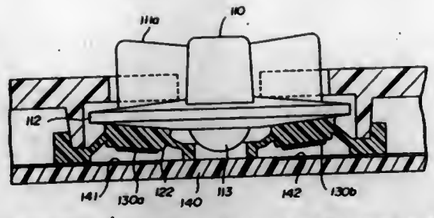
**Int. Cl.[6] H01H *25/04***

**U.S. Cl. 200—6 A** **34 Claims**

27. A multi-directional switch assembly comprising:

a printed circuit board having a plurality of switch terminals;

a plurality of movable electrical contact elements supported by resiliently deformable means on said printed circuit board




with said contact elements superimposed with respect to and spaced apart from said switch terminals;

a manually engageable input member mounted proximate said printed circuit board and movably supported by said resiliently deformable means;

a guiding member mounted under said input member in spaced relation with said printed circuit board so as to substantially isolate said printed circuit board from forces applied to said input member, said guiding member and said input member having mating surfaces to allow said input member to tilt thereabout for the displacement of said resiliently deformable means by an amount sufficient to move said contact elements into engagement with said switch terminals; and

a supporting member mounted under said printed circuit board for supporting portions of said printed circuit board at which said plurality of electrical switch terminals are formed.

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**5,498,844**

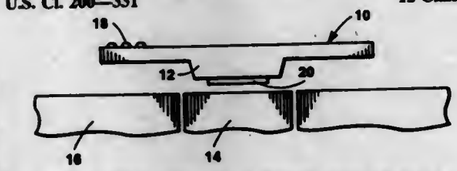
**STEERING WHEEL WITH HORN BUTTON OVERLAY**

**Joning C. Chan, 181 Littleton Rd., Bldg. 5, Ste. 337, Chelmsford, Mass. 01824**

**Filed Mar. 8, 1994, Ser. No. 208,634**

**Int. Cl.[6] H01H *3/20***

**U.S. Cl. 200—331** **12 Claims**




1. A horn button overlay for a steering wheel having a horn button with a horn button actuator surface, said horn button overlay comprising:

a substrate having a first substantially planar surface larger than said horn button actuation surface;

said substrate having a second surface opposite said first substantially planar surface, said second aurface having a protruding portion having a second substantially planar surface smaller than said horn button actuation surface; and

an adhesive disposed on said second substantially planar surface, said adhesive securable to said horn button actuation surface.

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**5,498,845**

**LIGHT SWITCH EXTENSION**

**William E. Browning, 128 Timberridge Dr., Staten Island, N.Y. 10306**

**Filed Dec. 8, 1994, Ser. No. 353,493**

**Int. Cl.[6] H01H *3/20***

**U.S. Cl. 200—331** **2 Claims**

1. A light switch extension comprising:

an elongated planar member;

a handle means defined at a lower end of said elongated planar member for permitting grasping and manipulating of said planar member by an individual;






an engaging means defined at an upper end of said planar member for engaging and manipulating a toggle member of a light switch;

wherein said planar member includes a front face spaced from and parallel to a rear face, with opposed and parallel side walls extending orthogonally between said front and rear faces, said elongated planar member further including a top wall spaced from a bottom wall, with said top and bottom walls extending substantially orthogonally from both said front and rear faces and said opposed parallel side walls to define a substantially elongated rectangular shape of said planar member;

wherein said handle means comprises a pair of semi-circular cut-outs directed into said elongated planar member, with a first one of said semi-circular cut-outs being directed into a first one of said opposed parallel side walls, and a second one of said semi-circular cut-outs being directed into a second one of said opposed parallel side walls;

wherein said engaging means comprises a rectangular aperture directed through said elongated planar member proximal to said upper end thereof, said aperture extending from said front face through said planar member to said rear face thereof; and,

a magnetic plate means for removably retaining said elongated planar member relative to said light switch.

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**5,498,846**

**TOGGLE SWITCHES**

**Kun-San Chiu, No. 200, Jung-Yu St., E. Dist., Tainan, Taiwan, Prov. of China**

**Filed Nov. 7, 1994, Ser. No. 336,084**

**Int. Cl.[6] H01H *21/24***

**U.S. Cl. 200—557** **3 Claims**

1. A switch comprising:

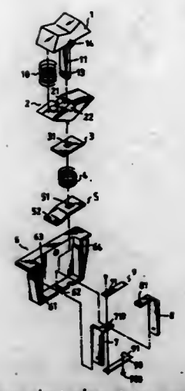
a housing having a pair of opposing end walls, a pair of opposing side walls and a bottom wall, two slots disposed in said bottom wall, two transverse steps disposed on said respective opposing end walls and two aligned holes disposed in said respective side walls;

a first contact plate and a second contact plate respectively extending out of said housing through said slots, each contact plate having a respective top end disposed inside said housing;

a bimetallic strip having one end fixed to an upper surface of said top end of said first contact plate;

a stop plate spring having one end fixed to a lower surface of said top end of said first contact plate;

a substantially T-shaped switch handle having a head, and a stem extended from said head and suspended in said housing, said



head having two pivot pins at two opposite sides thereof pivotally mounted in respective said aligned holes such that said handle is movable between first and second positions, said stem having a neck portion near a bottom end thereof;

a control block mounted around said stem and supported on said transverse steps, said control block having a transverse groove, which pivotally receives said handle;

a conductive connecting plate fastened to said neck portion of said stem;

a cushion mounted around said stem;

a first spring retained between said conductive connecting plate and said cushion; and

a second spring supported between said control block and said head of said switch handle;

wherein when said switch handle is pivoted about said pivot pins from said first position to said second position, said handle stem is forced against said stop plate spring and said conductive connecting plate contacts said first and second contact plates and, when the switch is overloaded, said bimetallic strip is deformed to force said stop plate spring away from said handle stem, thereby permitting said switch handle to be forced by said second spring back to said first position wherein said conductive connecting plate is forced out of contact with said first and second contact plates.

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**5,498,847**

**ARC STACK FOR A CIRCUIT BREAKER**

**Dale W. Bennett, Cedar Rapids, Iowa; James V. Fitzemer, Denton, Nebr.; Teresa L. Hood, Coralville, Iowa; Randall L. Siebels, Cedar Rapids, Iowa, and Douglas Van Woert, Anamosa, Iowa, assignors to Square D Company, Palatine, Ill.**

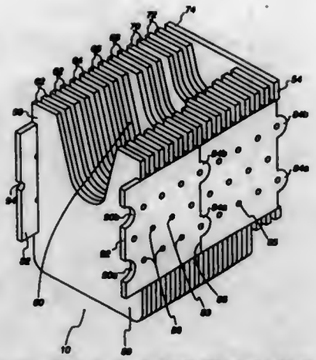
**Filed Jan. 13, 1994, Ser. No. 181,288**

**Int. Cl.[6] H01H *33/08***

**U.S. Cl. 218—81** **16 Claims**

1. An arc stack for receiving a circuit breaker blade moveable between a closed position and an open position, comprising:

a plurality of arc plates positioned substantially parallel to one another and forming a generally rectangular body, said plurality of arc plates being arranged in groups including one or more of said arc plates having substantially similar respective arc throats formed therein, said respective arc throats progres



sively decreasing in depth from group to group along the length of the arc stack in a direction extending away from the closed position of the blade so as to form a curved passageway extending through said arc throats following the radius of the blade moving between the closed and open positions, said arc throats extending inwardly from respective arc-throat forming edges of said arc plates, said respective arc-throat forming edges being substantially coplanar with each other; and

a connecting support for maintaining said plurality of arc plates substantially parallel to one another.

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**5,498,848**

**METHOD AND APPARATUS FOR ELECTRIC DISCHARGE MACHINING**

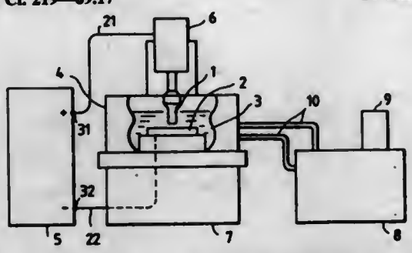
**Kimihiro Wakabayashi, and Noriyuki Nebashi, both of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan**

**Continuation of Ser. No. 827,218, Jan. 30, 1992, abandoned. This application Mar. 28, 1994, Ser. No. 218,845**

**Claims priority, application Japan, Jan. 31, 1991, 3-031688**

**Int. Cl.[6] B23H *1/00***

**U.S. Cl. 219—69.17** **14 Claims**



5. In a method for electric discharge machining that machines a workpiece by causing electric discharge between an electroconductive working electrode and said workpiece via a dielectric fluid, the improvement wherein said workpiece is made of a Mn—Zn ferrite and subjected to electric discharge machining with said electroconductive working electrode being connected to positive polarity whereas said workpiece is connected to negative polarity.

**5,498,849**

**STRUCTURE OF METAL CONTAINER HAVING TRUNK PIPE AND BRANCH PIPE, AND MANUFACTURING METHOD AND APPARATUS THEREFOR**

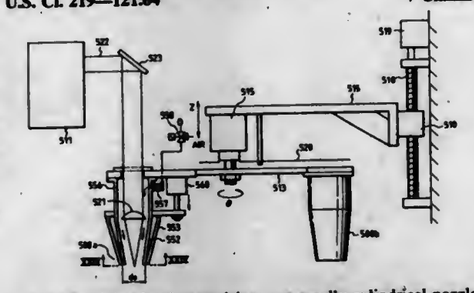
**Osamu Ishiki; Masaki Murashita, both of Hitachi; Osamu Matsushima, Hitachiota; Sadao Nakagawa, Hitachi; Seizo Nakano, Mito; Koji Goto, Hitachi; Masayoshi Hashiura, Hitachi; Yutaka Kobayashi, Hitachi; Takashi Satoh, Hitachi; Katsuro Ota, Hitachi; Hideaki Kikuchi, Hitachi; Takashi Sato, Kitaibaraki, and Shinji Fukuda, Hitachi, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Division of Ser. No. 760,890, Sep. 17, 1991, Pat. No. 5,444,206. This application Jul. 29, 1994, Ser. No. 282,306**

**Claims priority, application Japan, Sep. 17, 1990, 2-243995; Sep. 17, 1990, 2-243996; Sep. 17, 1990, 2-246987; Sep. 19, 1990, 2-247010; Sep. 19, 1990, 2-247509; Jan. 16, 1990, 2-290169; Jan. 26, 1990, 2-290168; Nov. 30, 1990, 2-329013**

**Int. Cl.[6] B23K *26/00***

**U.S. Cl. 219—121.64** **7 Claims**



1. A machining head comprising: a generally cylindrical nozzle for guiding a laser beam from a laser oscillator in the vicinity of a workpiece to be machined; a condensing lens disposed midway in said nozzle for condensing said laser beam to irradiate said workpiece with the condensed laser beam; and shield gas introducing means for introducing a shield gas which is used to shield the laser beam in said nozzle against a wall surface and which is to be sprayed to said workpiece while guiding said laser beam, wherein said nozzle has its tip divided circumferentially such that divided sectors thereof are radially extendible and contractible.

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**5,498,850**

**SEMICONDUCTOR ELECTRICAL HEATER AND METHOD FOR MAKING SAME**

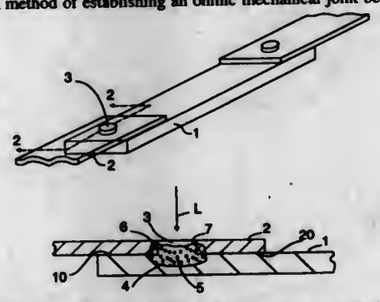
**Amitabh Das, Midlothian, Va., assignor to Philip Morris Incorporated, New York, N.Y.**

**Continuation-in-part of Ser. No. 943,505, Sep. 11, 1992. This application Jun. 8, 1993, Ser. No. 73,539**

**Int. Cl.[6] B23K *26/00;26/02***

**U.S. Cl. 219—121.66** **51 Claims**

1. A method of establishing an ohmic mechanical joint between



a metallic element and a semiconductor element comprising the steps of:



superposing at least a portion of a metallic element with at least a portion of a semiconductor element;

directing a controlled amount of heat at said superposed portion of said semiconductor element through a hole in said superposed portion of said metallic element so as to cause an amount of semiconductor material to melt and flow into the hole and react with metallic material of said metallic element to form reacted materials, said melting, flowing and reacting steps including the step of at least partially filling said hole with said reacted materials; and

allowing the reacted materials to solidify in the hole to provide a joint having a substantially ohmic electrical resistance between the metallic element and the semiconductor element.

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**5,498,851**

**LASER MACHINING APPARATUS AND METHOD**

**Eiichi Hayashi, and Ryuichi Fujimoto, both of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

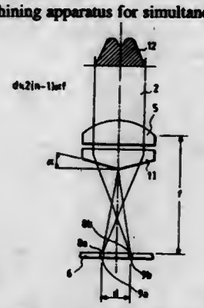
**Filed Aug. 24, 1993, Ser. No. 110,969**

**Claims priority, application Japan, Aug. 27, 1992, 4-228550; Jul. 26, 1993, 5-183940**

**Int. Cl.[6] B23K *26/06***

**U.S. Cl. 219—121.7** **41 Claims**

20. A laser machining apparatus for simultaneously machining a



workpiece in a plurality of locations with energy from a single laser beam, comprising:

a laser oscillator outputting a first laser beam in an energy distribution mode having a plurality of energy distribution peaks;

beam splitting means for dividing said first laser beam into a plurality of second laser beams, each one of said plurality of second laser beams corresponding to a respective one of said plurality of energy distribution peaks; and

condenser means for concentrating said second laser beams for producing a plurality of beam condensed spots on the workpiece.

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**5,498,852**

**OVAL TOP LOADING KILN HAVING REMOVABLE SHELVES**

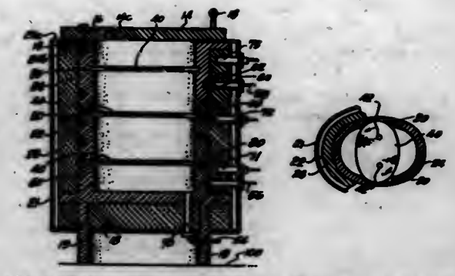
**Steven B. Cress, 31 Lakefront Dr. - Box 30, Glenbrook, Nev. 89413**

**Filed Mar. 7, 1994, Ser. No. 209,861**

**Int. Cl.[6] F27B *9/00***

**U.S. Cl. 219—390** **4 Claims**

1. The method of constructing a kiln comprising: forming an elongated oval cylindrical kiln chamber, having a wall thickness, of material which will withstand higher temperatures than those which will be used in curing material placed within the chamber, and having a first end closed and a second end open; forming grooves within the narrow sides of the oval chamber on the interior thereof; providing heating means exterior of said chamber; providing oval shaped shelves suitable to be inserted into said chamber



with the longer ends of said shelves in alignment with the longer interior dimensions of the oval chamber in such manner that the shelves may be turned so that their longer ends will be held within the grooves in the narrower sides of the interior of the oval chamber intermediate its first closed end and its second open end; and providing insulation means exterior said heating means.

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**5,498,853**

**HEATER, PARTICULARLY FOR KITCHEN APPLIANCES**

**Martin Gross, Kämpfelbach, and Werner Renz, Sternenfels, both of, Germany, assignors to E.G.O. Elektro-Gerate Blanc u. Fischer, Germany**

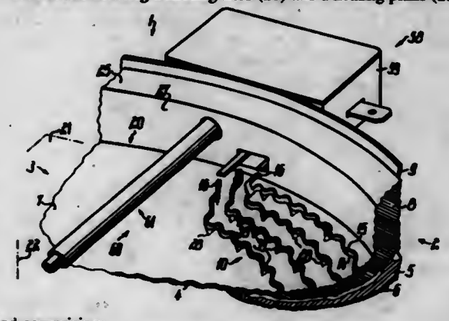
**Filed Sep. 3, 1993, Ser. No. 117,519**

**Claims priority, application Germany, Sep. 3, 1992, 42 29 375.8**

**Int. Cl.[6] H05B *3/68***

**U.S. Cl. 219—463** **29 Claims**

1. A heater defining a heating field (20) and a heating plane (21)



and comprising:

a plurality of assembling members (2,10) defining an assembled state for heating operation and a non-assembled state, said assembling members (2,10) including a base (2) including at least one counter face (19) in the vicinity of said heating field (20),

at least one structural member (10), and

a supporting structure (17) including at least one individual support leg (28) having remote side faces (12,13), lateral edge faces and a vertex end (37), said lateral edge faces of said individual support leg (28) defining lateral edge planes and median leg planes being defined between said side faces (12,13), in the assembled state, said vertex end (37) being provided at an end of an overall linear longitudinal leg extension of said support leg (28) defining a longitudinal leg direction,

at least one of said structural member (10), said supporting structure (17) and said support leg (28) defining first length sections (38) repeatedly followed by second length sections (39),

at least one of said structural member (10), said supporting structure (17), said support leg (28), said first length section (38) and said second length section (39) defining a length extension transverse to said longitudinal leg direction,

cross-sections being defined including at least one longitudinal cross-section parallel to said longitudinal leg direction and at least one transverse cross-section transverse to said longitudinal leg direction, in at least one of said cross-sections, at least one of said support leg (28) and said structural member (10), said supporting structure (17), said support leg (28), said first length section (38) and said second length section (39) defining a material thickness (32) between said side faces (12,13), at least one of said side faces (12,13) including a support flank (43,44) for supporting said support leg (28) against said counter face (19) in a supporting area provided at a distance from said vertex end (37) of at least said material thickness, and

wherein in the non-assembled state of said support leg a pre-manufactured profile provides at least one of said support flank (43,44), said profile extending along said longitudinal leg extension and substantially between said lateral edge planes of said individual support leg (28), said profile including profile sections, in at least one of said transverse cross-section of said individual support leg (28), at least one of said profile sections extending transverse to at least one of said median leg planes, in one of said transverse cross-sections of said individual support leg (28), at least one of said support flank (43,44) being uninterrupted over said support leg (28), at least one of said support flank (43,44) being curved substantially parallel to said heating plane (21), thereby within said support leg (28) said profile being at least partly an inherently stiff pre-curved profile having at least one profile arc (23) and at least one profile leg (24) connecting to said at least one profile arc (23) in one part, said at least one profile leg (24) supportingly engaging said at least one counter face (19), at least one of said support leg (28) extending only over a partial section (33) of said length extension of at least one of said structural member (10), said supporting structure (17), said first length section (38) and said second length section (39).

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**5,498,854**

**RADIANT ELECTRIC HEATER**

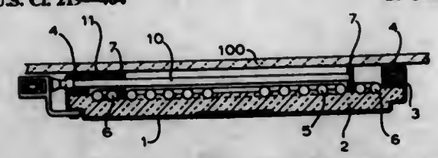
Kevin R. McWilliams, Stratford-on-Avon, United Kingdom, assignor to Ceramaspeed Limited, United Kingdom

Filed May 19, 1994, Ser. No. 246,325

Claims priority, application United Kingdom, May 21, 1993, 9310514

Int. Cl.[6] H05B 3/68

U.S. Cl. 219—464 20 Claims




1. A radiant electric heater for use in a smooth top cooker, the heater comprising a base of electrical and thermal insulating material; at least two heating elements supported on the base, at least one of which heating elements is energisable independently of the other element or elements; a peripheral wall of thermal insulating material extending laterally around the heating elements; and at least one dividing wall arranged between the heating elements such that, in use, separate and distinct heating zones are formed on the smooth top of the cooker, wherein the at least one dividing wall is received in the base of electrical and thermal insulating material and is retained therein by friction.

**5,498,855**

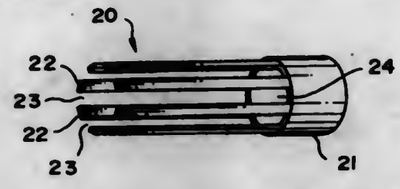
**ELECTRICALLY POWERED CERAMIC COMPOSITE HEATER**

Seetharama C. Deevi, Midlothian, and A. Clifton Lilly, Jr., Chesterfield, both of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 224,848, Apr. 8, 1994, which is a continuation-in-part of Ser. No. 118,665, Sep. 10, 1993, Pat. No. 5,388,594, which is a continuation-in-part of Ser. No. 943,504, Sep. 11, 1992. This application Aug. 16, 1994, Ser. No. 291,690

Int. Cl.[6] H05B 3/10; A24F 1/22

U.S. Cl. 219—553 49 Claims




1. An electrically powered ceramic composite heater for use in an electric cigarette lighter, comprising:

an annular hub, with a central axis; and

a plurality of electrically conductive blades, attached to the hub and extending from its perimeter in one direction parallel to the hub's central axis, each of the blades having a free end remote from the hub, the hub and the blades forming a hollow cylinder, the hub and blades comprising a monolithic electrically resistance heating ceramic material.

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**5,498,856**

**MICROWAVE OVEN FOR HEATING OF BEVERAGES**

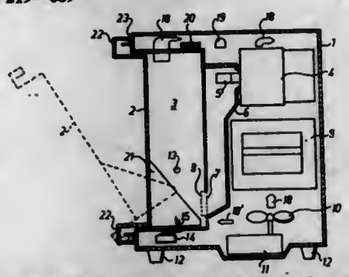
Hakan Carlsson, Norrkoping, Sweden, assignor to Whirlpool Europe B.V., Veldhoven, Netherlands

Filed Jan. 17, 1994, Ser. No. 261,499

Claims priority, application Sweden, Jun. 18, 1993, 9302128

Int. Cl.[6] H05B 6/80

U.S. Cl. 219—689 19 Claims




1. A method of the heating of foodstuffs in fluid form to a target temperature, the foodstuff being contained in a container of defined exterior shape and which is manufactured from a microwave permeable material, comprising the steps of placing the container in a microwave oven door, moving the door to a closed position to form an oven cavity with the container therein, shape and dimension corresponding to the defined exterior shape of the container, the cavity being substantially completely filled in two dimensions by the container and substantially or completely filled in its third dimension, supplying microwave energy to a lower portion of the container by inputting microwaves via an input aperture in the lower portion of the package-adapted cavity, and the ceasing said microwave energy when the target temperature is reached.



**5,498,857**

**MICROWAVE HEATING DEVICE WITH DEFLECTORS FOR SIMULTANEOUSLY TREATING PLURAL SAMPLES**

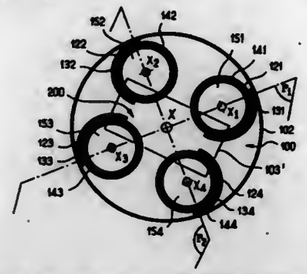
Patrick Jacquault, Sevres, France, assignor to Societe Prolabo, Fontenay-Sous-Bois, France

Filed Dec. 23, 1994, Ser. No. 363,741

Claims priority, application France, Dec. 28, 1993, 93 15735

Int. Cl.[6] H05B 6/80

U.S. Cl. 219—745 12 Claims




1. A microwave device for simultaneously treating in a wet medium a plurality of samples in a plurality of flasks, wherein each sample is contained in a respective flask, each flask having a length, an axis, and an outside surface, the device comprising:

a) an application cavity having a central axis of symmetry (X), said application cavity further including

i) a top wall, the top wall of the application cavity including a plurality of openings, the openings being disposed in symmetrical opposite pairs about the central axis of symmetry (X),

ii) a plurality of support means disposed in the application cavity for supporting the flasks, wherein each flask is received into a respective support means through a respective opening, and

iii) a plurality of deflectors disposed inside the application cavity for evenly distributing microwaves in the application cavity, wherein each deflector is formed by a cylindrical body that surrounds a fraction of the outside surface of the respective flask, said cylindrical body having a concave surface, and wherein the deflectors are disposed symmetrically in pairs about the central axis of symmetry (X) and wherein a substantial portion of the deflectors are disposed on opposite sides of a plane containing the central axis of symmetry and the two axes of the corresponding flasks, wherein the concave surfaces of the deflectors of each pair are opposed to each other, and

b) means coupled to the application cavity for emitting microwaves into the application cavity.

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**5,498,858**

**METHOD FOR CONTROLLING A VENTILATION MOTOR OF A MICROWAVE OVEN**

Suk D. Jeong, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed May 26, 1994, Ser. No. 249,596

Claims priority, application Rep. of Korea, May 26, 1993, 1993-9175

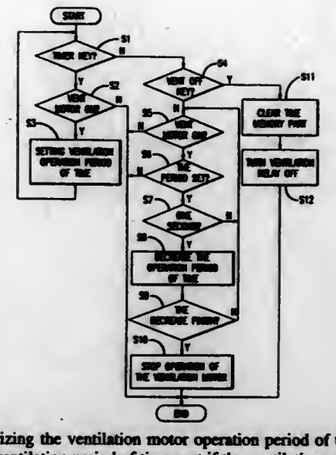
Int. Cl.[6] H05B 6/64

U.S. Cl. 219—757 3 Claims

1. A method of controlling a ventilation motor of a microwave oven, said microwave oven has ventilation turn on/off keys for turning on/off the ventilation motor, timer key is for setting operation period of time of the ventilation motor and a ventilation period of time memory part for memorizing the set operation period of time, comprising steps of:

searching for presence of the timer key input;

checking the present condition of operation of the ventilation motor if there was the timer key input;




memorizing the ventilation motor operation period of time into the ventilation period of time part if the ventilation motor was under operation;

checking the present condition of operation of the ventilation motor if there was no timer input;

checking up memories of the ventilation period of time memory part on a setting of the ventilation motor operation period of time, if the ventilation motor was under operation;

checking that a decrease of the preset operation time data of ventilation motor is completed while decreasing the preset data in the ventilation period of time memory means in every second if the operation period of time of the ventilation motor has been set;

turning off the ventilation motor in case that the decrease of the preset operation time data of ventilation motor is completed from the checking result of said completion of decrease step; and

ventilation controlling in which the ventilation motor is turned off irrespective of the preset operation period of time of the ventilation motor if the ventilation motor turn off key is pressed while the ventilation motor is in operation.

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**5,498,859**

**PARKING CARD FOR THE CHARGE-RELATED ACTUATION OF A PARKING BARRIER**

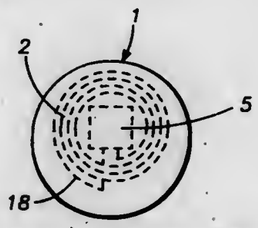
Johann Farmont, Dusseldorf, Germany, assignor to Farmont Technik GmbH & Co., Dusseldorf, Germany

Continuation-in-part of Ser. No. 84,545, Jun. 29, 1993, abandoned. This application Jan. 3, 1994, Ser. No. 177,007

Claims priority, application Germany, Feb. 20, 1993, 9302481 U; European Pat. Off., Jun. 30, 1993, 93110433

Int. Cl.[6] G07B 15/02

U.S. Cl. 235—384 13 Claims




1. A parking token for the charge-related actuation of a parking barrier and is in the form of a round plastic piece having an integrated electronic machine-readable identification and communication component comprising a chip for storing a token code for

multiple use of said parking token, and said component further comprising a data transmission device which emits electronic waves in a substantially omnidirectional pattern to read out a card code in a contactless and position-independent manner.

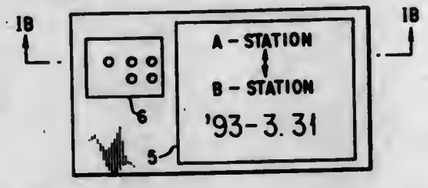
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**5,498,860**

## PORTABLE STORAGE MEDIUM AND PROCESSING APPARATUS THEREFOR

**Tadayoshi Ohno; Takashi Yamaguchi; Shinichi Itoh, and Hisatoshi Tanaka, all of Kawasaki, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Mar. 9, 1994, Ser. No. 207,694**
**Claims priority, application Japan, Mar. 11, 1993, 5-050290**
**Int. Cl.[6] G07B *15/02***
**U.S. Cl. 235—384** **5 Claims**




1. An apparatus for recording information on a portable storage medium adapted to be used a plurality of times and having a first storage means for storing a first balance, comprising:
- recording means for recording information on said portable storage medium;
- reading means for reading said first balance stored in said first storage means each time said portable storage medium is used;
- calculation means for performing a predetermined calculation based on said first balance read by said reading means and providing a second balance;
- update means for writing said second balance to said first storage means and charging said first balance stored in said first storage means to said second balance;
- second storage means in which a third balance having a predetermined value is stored in advance;
- comparing means for comparing said second balance with said third balance; and
- control means for controlling said recording means in order to record information based on said second balance in braille on said portable storage medium when said comparing means detects that said second balance is smaller than said third balance.

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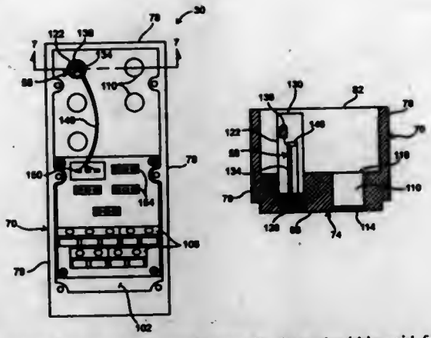
**5,498,861**

## SENSING HEAD FOR CODE READING HAVING MULTIPLE REPLACEABLE SENSORS

**Paul D. Collins, Wendell, N.C., assignor to Square D Company, Palatine, Ill.**

**Filed Oct. 8, 1992, Ser. No. 958,149**
**Int. Cl.[6] G06F *19/00*; G06K *7/00***
**U.S. Cl. 235—440** **1 Claim**

1. A sensing head, of the type used in a code reading device of a flexible automation assembly line, adapted to house a plurality of sensors for sensing the position of a target carried by a code storing device of a flexible automation assembly line, and generating a corresponding output signal, the sensing head comprising:
- a plurality of sensors, each comprising sensor electronics and a sensor enclosure which supports said sensor electronics;
- an enclosure having a plurality of pockets defined in a front portion of said enclosure, each of said pockets being dimensioned for securely yet removably receiving said sensor enclosure of one of said plurality of sensors in a preselected alignment;



each of said pockets being integrally formed within said front portion of said enclosure and dimensioned such that a sensor can be removably positioned therein by frictional engagement between said sensor enclosure and said pocket.

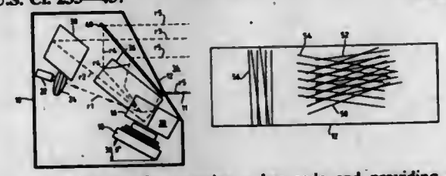
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**5,498,862**

## SIDE SCANNING BAR CODE READER WITH VERTICAL AND HORIZONTAL SCAN PATTERNS

**Peter A. Edler, Saratoga, Calif., assignor to International Computers Limited, London, England**

**Continuation-in-part of Ser. No. 57,542, May 6, 1993, abandoned. This application Apr. 18, 1994, Ser. No. 228,676**
**Int. Cl.[6] G06K *7/10***
**U.S. Cl. 235—457** **7 Claims**



1. An apparatus for scanning a bar code and providing an electrical signal indicative of the scanned bar code, comprising:
- (a) a housing having an optically transmissive window in a side wall of the housing, said window defining a scanning region horizontally adjacent to said window;
- (b) means mounted within said housing for generating a coherent beam of light;
- (c) first redirection means mounted within said housing for redirecting said coherent beam of light into a plurality of substantially parallel spaced apart scanning beams of light;
- (d) second redirection means, comprising a single mirror mounted within said housing, for redirecting a first portion of each of said scanning beams of light for generating a first scan pattern comprising a plurality of substantially parallel spaced apart light scan lines, wherein said first scan pattern scan lines each enter said scanning region through said window at planes each at a first predetermined angle from horizontal;
- (e) third redirection means, comprising a single mirror mounted within said housing, for redirecting a second portion of each of said scanning beams of light for generating a second scan pattern comprising a plurality of substantially parallel spaced apart light scan lines, wherein said second scan pattern scan lines each enter said scanning region through said window at planes each at a second predetermined angle from horizontal;
- (f) fourth redirection means, comprising a single mirror and a holographic optical element mounted within said housing, for redirecting a third portion of each of said scanning beams of light for generating a third scan pattern comprising a plurality of substantially parallel spaced apart light scan lines, wherein said third scan pattern scan lines each enter said scanning region through said window at planes each substantially vertical, and said third scan pattern scan lines each enter said scanning region substantially at one side of and substantially not between said first and second scan lines;
- (g) means for detecting light reflected back through said window from a bar code being scanned within said scanning region;
- (h) means for directing said reflected light from said bar code being scanned to said means for detecting light; and
- (i) means for providing an electrical signal in response to said means for detecting light.



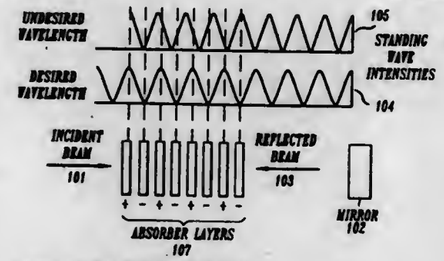
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**5,498,863**

## WAVELENGTH-SENSITIVE DETECTORS BASED ON ABSORBERS IN STANDING WAVES

**David A. B. Miller, Fair Haven, N.J., assignor to AT&T Corp., Murray Hill, N.J.**

**Filed Apr. 30, 1993, Ser. No. 55,487**
**Int. Cl.[6] H01L *31/04*;*29/205***
**U.S. Cl. 250—214.1** **6 Claims**




1. An optical detector comprising:
- a transmissive medium supporting a standing wave of electromagnetic energy:
- at least one absorptive element in the medium:
- means for measuring an amount of said electromagnetic energy absorbed in the at least one absorptive element; and
- means for applying weighting factors to various levels of intensity of said electromagnetic energy absorbed by the at least one absorptive element to set at least one wavelength at which the detector is sensitive.

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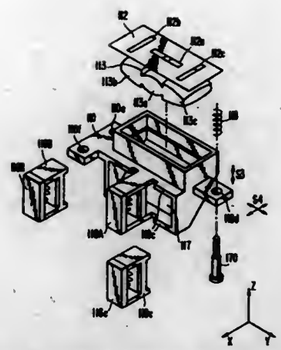
**5,498,864**

## CAMERA FOCUS DETECTION APPARATUS DETECTING FOCUS CONDITIONS AMONG MULTIPLE AREAS WITHIN A PHOTOGRAPHIC SCENE

**Keiji Osawa, Tokyo, Japan, assignor to Nikon Corporation, Tokyo, Japan**

**Continuation of Ser. No. 166,628, Dec. 15, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 469,774**
**Claims priority, application Japan, Dec. 15, 1992, 4-334197; Dec. 10, 1993, 5-310480**
**Int. Cl.[6] G01J *1/20*; G03B *13/18***
**U.S. Cl. 250—201.8** **6 Claims**

1. A focus detection apparatus for detecting focus points for at least two areas of a field of view, the apparatus adaptable to be used with a camera having a lens for taking in light, said focus detection apparatus comprising:
- at least two field lenses positioned near an imaging plane of said lens, said at least two field lenses being used to condense the light flux corresponding to said at least two areas;
- at least two pairs of reimaging lenses, each pair of said at least two pairs of reimaging lenses separately receiving the light coming through each field lens of said at least two field lenses in such a manner that the light flux corresponding to the at least two areas forms a pair of subject images for each area;
- at least two pairs of aperture masks that are positioned near each pair of reimaging lenses to regulate the light coming through each pair of reimaging lenses of said at least two pairs of reimaging lenses; and
- at least two pairs of photosensors that are positioned near a secondary imaging plane of said lens, each pair of photosensors of said at least two pairs of photosensors receiving said pair of subject images formed from light coming through each pair of reimaging lenses of said at least two pairs of reimaging lenses;
- a primary unit for housing said at least two field lenses;
- a secondary unit for housing a first pair of reimaging lenses of said at least two pairs of reimaging lenses and a first pair of aperture masks of said at least two pairs of aperture masks, said first pair of reimaging lenses and said first pair of aperture masks corresponding to a first focus detection area; and
- a third unit for housing a second pair of reimaging lenses of said at least two pairs of reimaging lenses and a second pair of aperture masks of said at least two pairs of aperture masks, said second pair of reimaging lenses and said second pair of aperture masks corresponding to a second focus detection area.



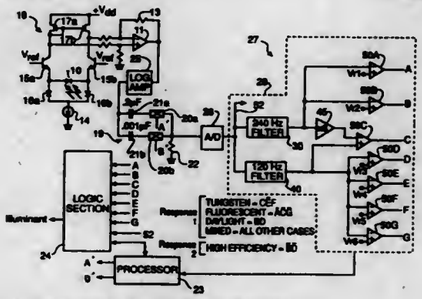
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**5,498,865**

## PHOTODIODE AMPLIFIER CIRCUIT WITH IMPROVED SENSITIVITY TO HIGH EFFICIENCY ILLUMINATION

**Michael J. Gaboury, Burnsville, Minn., and Todd A. Jackson, Pittsford, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Dec. 16, 1994, Ser. No. 357,817**
**Int. Cl.[6] H01J *40/14***
**U.S. Cl. 250—214 A** **12 Claims**




1. An illuminant discriminator comprising:
- a photodiode amplifier for converting an impinging illuminant into an analog signal, said photodiode amplifier comprising (a) an input stage including a first pair of transistors connected as a differential pair to have a low input impedance, a current source connected into the input stage to bias the first pair of transistors, and an output taken from at least one of the

transistors; (b) a photodiode connected into the input stage to have a differential effect upon current flowing through the transistors; and (c) an amplifier stage having an input connected to the output of the input stage;

a high pass filter section coupled to said photodiode amplifier, said filter section having a plurality of frequency responses that are selected to separate signal components due to high efficiency light from signal components due to other types of lighting; and

means coupled to said high pass filter section for detecting the presence of signal components due to high efficiency lighting.

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**5,498,866**

## OPTOELECTRONIC SENSOR FOR DETECTING MOISTURE ON A WINDSHIELD WITH MEANS TO COMPENSATE FOR A METALLIC LAYER IN THE WINDSHIELD

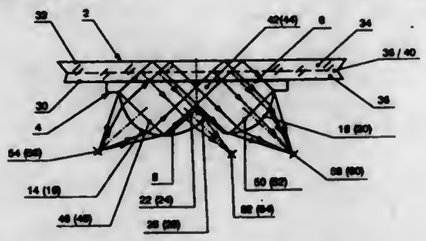
**Norbert Bendicks, Hemer, and Ralf Bartling, Dortmund, both of, Germany, assignors to Leopold Kostal GmbH & Co. KG, Ludenscheid, Germany**

**Filed Feb. 10, 1994, Ser. No. 194,254**

**Claims priority, application Germany, Dec. 7, 1993, 43 18 114.7**

**Int. Cl.[6] H01J *5/16***

**U.S. Cl. 250—227.25** **13 Claims**



1. An optoelectronic sensor device for detecting the degree of wetting of a multi-layer transparent pane by drop-shaped precipitation, the sensor device comprising:

a beam guide element having a front surface connected to an inner surface of the pane not exposed to the precipitation in a region of a wiping area covered by a motor driven windscreen wiper device, the beam guide element having at least one measuring path with a beam entry window and first and second beam exit windows;

a beam transmitter associated with the beam entry window;

a first beam detector associated with the first beam exit window in such a manner that beams emitted by the beam transmitter are reflected in dependence upon the precipitation present on the pane and directed to the first beam detector, which provides a first signal dependent upon the associated quantity of precipitation;

a second beam detector associated with the second beam exit window in such a manner that only spurious beams reflected at a partially transparent metallic intermediate layer located in the pane are detected by the second beam detector, which provides a second signal representative of a quantity of the spurious beams; and

compensating means for correcting the first signal supplied by the first beam detector and representative of a quantity of mixed beams including useful beams and spurious beams, the correction being dependent upon the second signal supplied by the second beam detector.

**5,498,867**

## WAVELENGTH-DIVISION MULTIPLEX DIGITAL OPTICAL POSITION SENSOR

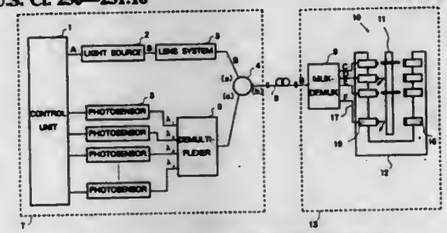
**Takeo Senuma, Akishima; Shinichiro Ina, Hadano; Hiroshi Nakazawa, Hachioji; Yasuaki Tamura, Tokyo; Kunihiko Mano, Tokyo; Fumio Nakamura, Tokyo; Munenori Ishikawa, Gifu, and Yoshiharu Kubo, Kakamigahara, all of, Japan, assignors to Sachio Uehara, Tokyo; Kawasaki Jukogyo Kabushiki Kaisha, Kobe, and Oki Electric Industry Co., Ltd., Tokyo, all of, Japan**

**Filed Nov. 21, 1994, Ser. No. 345,413**

**Claims priority, application Japan, Nov. 22, 1993, 5-291579; Nov. 22, 1993, 5-291580**

**Int. Cl.[6] G01D *5/34***

**U.S. Cl. 250—231.18** **22 Claims**




1. A position-sensing method, comprising the steps of:

mounting, in a support, a plurality of collimators and a like plurality of reflectors, having optic axes aligned so that light emitted from each collimator will be reflected by a corresponding reflector and return to the same collimator;

interposing between said collimators and said reflectors, in a plane aligned at a non-perpendicular angle to said optic axes, a movable code plate having slots for passage of light between said collimators and said reflectors, said slots being disposed so that, as said code plate moves, light emitted from each said collimator is alternately passed and blocked;

generating a broadband light pulse;

transmitting said broadband light pulse through an optical fiber;

demultiplexing said broadband light pulse into a plurality of narrowband light pulses of different wavelengths;

transmitting said narrowband light pulses to said collimators for emission toward respective reflectors;

receiving, at said collimators, those narrowband light pulses that are reflected by said reflectors and not blocked by said code plate;

multiplexing the narrowband light pulses thus received into a returning broadband light pulse;

transmitting said returning broadband light pulse through said optical fiber;

demultiplexing said returning broadband light pulse into a plurality of returning narrowband light pulses of different wavelengths; and

converting said returning narrowband light pulses to electrical signals.

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**5,498,868**

## OPTICAL DATA READER CAPABLE OF QUICKLY CHANGING A CONDENSING POSITION OF A LIGHT BEAM

**Hideaki Nishikawa, Obu; Takasa Koumura, Toyota, and Michio Hisanaga, Nagoya, all of, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan**

**Filed Sep. 1, 1994, Ser. No. 299,365**

**Claims priority, application Japan, Sep. 2, 1993, 5-218453**

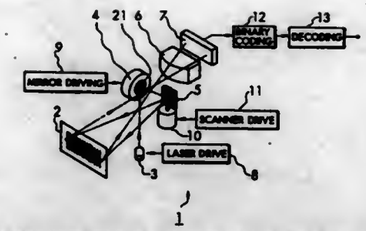
**Int. Cl.[6] H01J *3/14***

**U.S. Cl. 250—234** **6 Claims**

1. An optical data reader comprising:

a light beam source that produces a light beam having directionality;






a variable focus mirror for condensing said light beam from said light beam source to a designated position and cyclically and continuously altering the designated position by changing a curvature of a reflecting surface of said variable focus mirror;

a drive electrode disposed to face a surface opposite to said reflecting surface of said variable focus mirror with space therebetween, actuation of said drive electrode causing said curvature of said reflecting surface to change by an electrostatic attraction;

at least one hole formed in said drive electrode to adjust pressure within said space;

scanning means for scanning a target with said light beam from said variable focus mirror; and

means for receiving a reflected light beam from said target and converting said reflected light beam into an electrical signal representative of said target.

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**5,498,869**

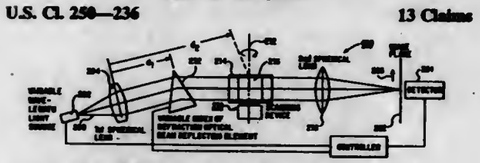
## APPARATUS FOR WOBBLE CORRECTION USING AN AGILE BEAM POLYGON ROS AND ALL-SPHERICAL OPTICS

**James J. Appel, Brighton, N.Y., and Thomas L. Paoli, Los Altos, Calif., assignors to Xerox Corporation, Stamford, Conn.**

**Continuation of Ser. No. 169,696, Dec. 20, 1993, abandoned. This application Jun. 1, 1995, Ser. No. 457,686**

**Int. Cl.[6] H01J *3/14***

**U.S. Cl. 250—236** **13 Claims**




1. A polygon ROS image forming apparatus, comprising:

light source means for emitting a light beam;

pre-polygon lens means for collimating the emitted light beam, the pre-polygon lens means being composed solely of spherical optics;

a semiconductor variable index of refraction prism for refracting the collimated light beam;

a multifaceted, reflective polygon having a plurality of reflective facets and reflecting the refracted light beam;

post-polygon lens means for focusing the reflected light beam onto an image area of a photoreceptor, the post-polygon lens means being composed solely of spherical optics;

sensor means for detecting a position of the focused light beam on the photoreceptor, the sensor means positioned before a leading edge of the image area; and

control means for controlling at least one of the variable index of refraction prism and the light source means in response to the detected position to move the focused light on the photoreceptor to a desired position.

**5,498,870**

## ROTATION INFORMATION DETECTION APPARATUS

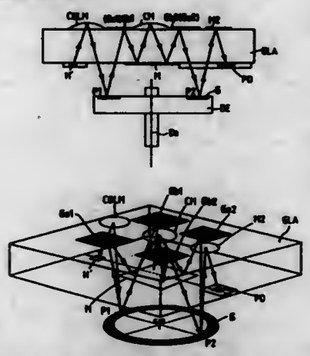
**Koh Ishizuka, Ohmiya, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 125,237, Sep. 23, 1993, abandoned. This application Jan. 31, 1995, Ser. No. 380,934**

**Claims priority, application Japan, Sep. 25, 1992, 4-280681; Sep. 7, 1993, 5-247587**

**Int. Cl.[6] H01J *3/14*; G01D *5/34***

**U.S. Cl. 250—237 G** **11 Claims**



1. An apparatus for detecting information as for a rotation of a scale having a diffraction grating arranged thereon along a direction of detection of the rotation comprising:

light source unit for irradiating a light beam onto a first point on the diffraction grating of said scale;

said diffraction grating emitting two diffracted lights having a predetermined order from the first point by the irradiation of the light beam;

a transparent substrate to be almost parallelly arranged in a vicinity of a surface of said scale and having a plurality of optical elements arranged thereon;

said plurality of optical elements directing the two diffracted lights of the predetermined order to a second point other than said first point on the diffraction grating of said scale through an inside of said transparent substrate by effecting multiple deflection between surfaces of said transparent substrate arranged almost in parallel with the surface of said scale; and

a photo-detector for detecting an interference light beam of diffracted lights generated out of said second point on which the two diffracted lights of the predetermined order are incident;

whereby the information on the rotation of said scale relative to the photo-detector is detected by the photo-detection by said photo-detector.

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**5,498,871**

## METHOD FOR ANALYZING THE DEFECTIVENESS OF SEMICONDUCTOR DEVICE

**Jeong H. Koo; Chung T. Kim, and Seog K. Ju, all of Ichoenkun, Rep. of Korea, assignors to Hyundai Electronics Industries Co., Ltd., Rep. of Korea**

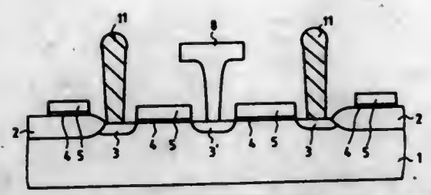
**Filed Dec. 28, 1993, Ser. No. 175,778**

**Claims priority, application Rep. of Korea, Dec. 30, 1992, 1992-26869**

**Int. Cl.[6] G01N *23/225***

**U.S. Cl. 250—307** **5 Claims**

1. A method for analyzing defects in a semiconductor device at an analysis objective portion in a testing sample, said semiconductor device having layers of silicon oxide film and a layer of polysilicon film, said layer of polysilicon film being an upper layer covering said analysis objective portion, said layers of silicon oxide film including neighboring layers of oxide film surrounding said analysis objective portio, comprising the steps of:



removing said upper layer of polysilicon film covering said analysis objective portion in the testing sample;

etching said neighboring layers of oxide film surrounding said analysis objective portion to expose said analysis objective portion;

observing said sample relating to said analysis objective portion with a scanning electron microscope, said sample being set on a holder of said scanning electron microscope and being change in tilt and rotational angle,

whereby during said observing step, said sample can be examined in three dimensions.

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**5,498,872**

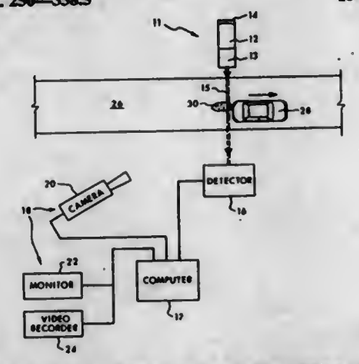
## APPARATUS FOR REMOTE ANALYSIS OF VEHICLE EMISSIONS

**Donald H. Stedman, Denver; Gary Bishop, Louisville, and Scott McLaren, Denver, all of Colo., assignors to Colorado Seminary, Denver, Colo.**

**Continuation of Ser. No. 275,950, Jul. 15, 1994, abandoned, which is a continuation of Ser. No. 253,749, Jun. 3, 1994, Pat. No. 5,401,967, which is a continuation-in-part of Ser. No. 895,342, Jun. 8, 1992, Pat. No. 5,319,199, which is a continuation-in-part of Ser. No. 633,952, Dec. 26, 1990, Pat. No. 5,210,702. This application Apr. 21, 1995, Ser. No. 426,910**

**Int. Cl.[6] G01N *21/00;21/17***

**U.S. Cl. 250—338.5** **18 Claims**




1. A gas analysis system for detecting and measuring concentrations of gases in the exhaust of a moving motor vehicle comprising:

a source for producing and transmitting a beam of infrared radiation through at least a portion of said exhaust;

a detector having a plurality of infrared sensors for receiving at least a portion of said beam, each infrared sensor generating a signal indicative of the absorption of said infrared beam by said exhaust in a corresponding wavelength band; said infrared sensors including at least a first sensor for carbon monoxide, a second sensor for carbon dioxide, and a third sensor for hydrocarbons; and

means responsive to said signals from said infrared sensors for:

(a) computing the ratio of carbon monoxide to carbon dioxide ($Q_{CO}$) and the ratio of hydrocarbons to carbon dioxide ($Q_{HC}$) from said infrared sensor signals; and

(b) computing the concentrations of said carbon monoxide, carbon dioxide, and hydrocarbons in the path of said beam through said exhaust from $Q_{CO}$ and $Q_{HC}$ based on the chemical composition of fuel for said motor vehicle.

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**5,498,873**

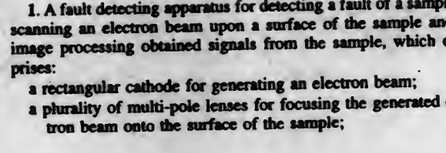
## REFRIGERANT IMPURITY ANALYZER

**Leonard Liebermann, La Jolla, and Philip Salzmann, Cardiff, both of Calif., assignors to TIF Instruments, Inc., Miami, Fla.**

**Filed Nov. 15, 1994, Ser. No. 340,266**

**Int. Cl.[6] G01J *5/44;5/46;* G01N *21/61***

**U.S. Cl. 250—343** **4 Claims**



1. A non-dispersive spectroscopic gaseous impurity analyzer including a flashing incandescent lamp light source and a narrow band infrared absorption sensor comprising:

(a) a chamber sealed at one end by a window which is substantially transparent to infrared light, and

(b) a ceramic piezoelectric disk sealing the other end of said chamber, and

(c) a reflecting disk located in front of, but not contacting said piezoelectric disk, and

(d) a hollow shield covering the external face of said piezoelectric disk whereby atmospheric pressure changes are excluded from acting on said piezoelectric disk.

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**5,498,874**

## DEFECT DETECTING APPARATUS AND METHOD

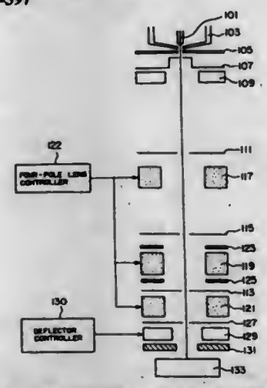
**Motosuke Miyoshi, Tokyo, Japan, and Katsuya Okumura, Poughkeepsie, N.Y., assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Dec. 23, 1994, Ser. No. 362,942**

**Claims priority, application Japan, Dec. 24, 1993, 5-328078**

**Int. Cl.[6] H01J *37/04***

**U.S. Cl. 250—397** **4 Claims**




1. A fault detecting apparatus for detecting a fault of a sample by scanning an electron beam upon a surface of the sample and by image processing obtained signals from the sample, which comprises:

a rectangular cathode for generating an electron beam;

a plurality of multi-pole lenses for focusing the generated electron beam onto the surface of the sample;



first control means for controlling a plurality of said multi-pole lenses to obtain such a rectangular beam that a ratio of a reduction ratio at the sample surface of an electron beam locus along a longitudinal direction of said rectangular cathode to a reduction ratio at the sample surface of an electron beam locus along a lateral direction of said rectangular cathode becomes equal to a ratio of a length to a width of said rectangular cathode and in addition a width of the rectangular beam is equal to a required minimum fault detection width;

a deflector for scanning the rectangular beam upon the sample surface; and

second control means for controlling said deflecting means in such a way that the rectangular beam can be scanned on the sample surface by moving the rectangular beam at every scanning stroke corresponding to the minimum fault detection width in both the longitudinal and lateral directions of the rectangular beam.

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**5,498,875**

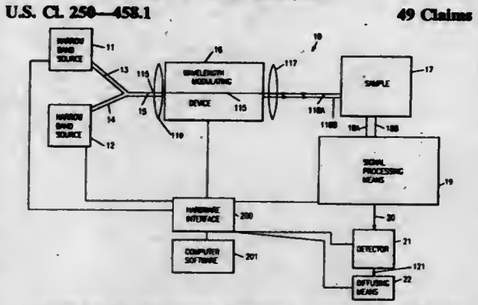
## SIGNAL PROCESSING FOR CHEMICAL ANALYSIS OF SAMPLES

**Robert J. Obremski, Yorba Linda, and John W. Sibel, Orange, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.**

**Filed Aug. 17, 1994, Ser. No. 292,798**

**Int. Cl.[6] G01N *21/64;21/65***

**U.S. Cl. 250—458.1** **49 Claims**




1. Apparatus for determining the analyte content of a sample, the apparatus comprising:

(a) a signal generator for generating a first input signal having a first wavelength, and a second input signal having a second wavelength, the two wavelengths differing by at least about 3 nanometers;

(b) a means for directing the first and second input signals to a sample containing an analyte to generate, respectively, a first output signal and a second output signal due to interactions between the input signals and the analyte,

wherein the first output signal comprises: (i) a first resonant output signal whose peak wavelength is substantially independent of the wavelength of the first input signal and (ii) a first non-resonant output signal whose peak wavelength is dependent upon the wavelength of the first input signal, and

wherein the second output signal comprises: (i) a second resonant output signal whose peak wavelength is substantially independent of the wavelength of the second input signal, and (ii) a second non-resonant output signal whose peak wavelength is dependent on the wavelength of the second input signal;

(c) a detector for detecting the first and second output signals; and

(d) means for distinguishing the resonant output signals from the non-resonant output signals to obtain data about the analyte content of the sample.

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**5,498,876**

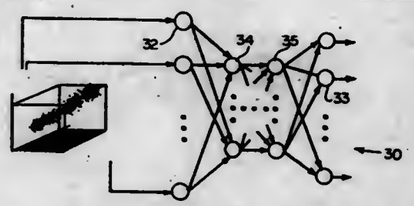
## NEUTRON SPECTROMETER, REAL-TIME DOSIMETER AND METHODOLOGY USING THREE-DIMENSIONAL OPTICAL MEMORY

**Marko Moscovitch, Potomac, Md., assignor to Georgetown University, Washington, D.C.**

**Continuation-in-part of Ser. No. 974,207, Nov. 10, 1992, Pat. No. 5,319,210. This application May 10, 1994, Ser. No. 240,933**

**Int. Cl.[6] G01T *1/00***

**U.S. Cl. 250—474.1** **17 Claims**




1. A high LET radiation dosimetry method comprising the steps of

storing information in a three dimensional optical memory element having a plurality of memory locations by exciting the memory locations from a first energy state to a second energy state,

exposing the optical memory element to high LET radiation to alter the information stored in the optical memory element as a function of the radiation to which the optical memory element is exposed, the excited memory locations reverting from their second energy state to their first energy state through localized interactions between the radiation and molecules composing the optical memory element,

retrieving the altered information from the optical memory element for subsequent analysis by reading the memory locations to determine the spatial distribution of the memory locations that have reverted to their first energy state,

analyzing the altered information retrieved from the optical memory element to extract radiation dose information therefrom, said analyzing step including using a neural network computer apparatus for determining the radiation energy as a function of the spatial distribution of the memory locations that have reverted to their first energy state.

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**5,498,877**

## METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE USING MEASUREMENT MARK PATTERN

**Seiichi Shiraki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

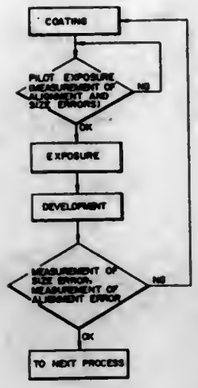
**Filed Nov. 30, 1994, Ser. No. 351,174**

**Claims priority, application Japan, Nov. 30, 1993, 5-323335**

**Int. Cl.[6] H01J *37/00***

**U.S. Cl. 250—491.1** **5 Claims**

1. A method of manufacturing a semiconductor device, comprising the steps of forming a measurement mark of a lower layer on a semiconductor substrate by a photolithography process, forming a measurement mark of an upper layer to be superposed on said measurement mark of the lower layer by the photolithography process, measuring relative sizes between said measurement marks of the lower and upper layers in X and Y directions on a plane, and calculating relative alignment error between said measurement marks and a size error of said measurement mark with respect to a reference value on the basis of the measured values, wherein a result of the photolithography process is determined on the basis of the calculated error sizes.

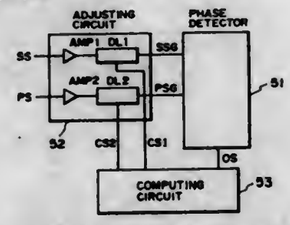



**5,498,878**

**METHOD AND APPARATUS FOR DETECTING POSITIONAL DEVIATION BY USING DIFFRACTION GRATINGS WITH A COMPENSATION DELAY DETERMINING UNIT**

**Noriyasu Hasegawa, Utsunomiya, and Tetsuzo Mori, Atsugi, both of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Dec. 2, 1994, Ser. No. 353,236**
**Claims priority, application Japan, Dec. 3, 1993, 5-339344**
**Int. Cl.[6] G01N *21/86***
**U.S. Cl. 250—548** **8 Claims**




1. A deviation measuring system for measuring relative positional deviation between first and second diffraction gratings formed on an object, said system comprising:

signal detecting means for detecting a position deviation signal corresponding to the relative positional deviation between the first and second diffraction gratings, said signal detecting means including (i) projecting means for projecting first and second coherent light beams onto the first and second diffraction gratings, (ii) first photoelectric converting means for photoelectrically converting into a first output signal interference light produced as a result of interference between diffraction light of the first coherent light beam and diffraction light of the second coherent light beam being diffracted by the first diffraction grating, (iii) second photoelectric converting means for photoelectrically converting into a second output signal interference light produced as a result of interference between diffraction light of the first coherent light beam and diffraction light of the second coherent light beam being diffracted by the second diffraction grating, (iv) delay means for applying a delay to at least one of said first and second output signals of said first and second photoelectric converting means, and (v) position deviation signal output means for outputting a position deviation signal corresponding to a relative positional deviation on the basis of said at least one output signal delayed by said delay means and the other output signal;

compensation delay determining means for causing said signal detecting means to produce a position deviation signal corresponding to a relative positional deviation between third and fourth diffraction gratings formed on the object and having a predetected relative positional deviation, and for determining a compensation amount of delay to be applied by said delay means; and

measuring means for causing said delay means to apply a compensation amount of delay determined by said compensation delay determining means, and for causing said signal detecting means to produce a positional deviation signal corresponding to the relative positional deviation between the first and second diffraction gratings on the basis of the position deviation signal produced by said signal detecting means in accordance with the compensation amount of delay determined by said compensation delay determining means.

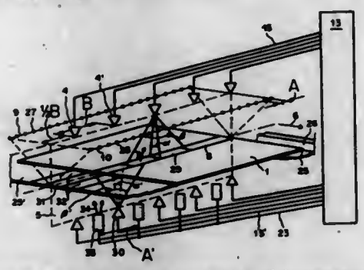
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**5,498,879**

**APPARATUS FOR THE OPTICAL RECOGNITION OF DOCUMENTS BY PHOTOELECTRIC ELEMENTS HAVING VISION ANGLES WITH DIFFERENT LENGTH AND WIDTH**

**Ivo De Man, Gland, Switzerland, assignor to Mars Incorporated, McLean, Va.**

**Continuation of Ser. No. 957,222, Oct. 6, 1992, Pat. No. 5,304,813. This application Apr. 19, 1994, Ser. No. 229,922**
**Claims priority, application Switzerland, Jan. 14, 1991, 03005/91**
**The portion of the term of this patent subsequent to Apr. 19, 2011, has been disclaimed.**
**Int. Cl.[6] G06K *5/00***
**U.S. Cl. 250—556** **23 Claims**




1. Apparatus for the optical recognition of documents comprising:

a transport system for transferring a document having a document transfer plane on which said document is placed, said transfer plane geometrically dividing the space in which it is contained into a first semi-space and a second semi-space;

a first plurality of photoelectric elements in said first semi-space arranged in a spaced apart arrangement to sense light reflected from a zone across said transfer plane;

a plurality of light sources in said first semi-space arranged for illuminating said zone, said plurality of light sources being subdivided according to their emission spectra into different color groups;

a second plurality of photoelectric elements in said second semi-space arranged in a spaced apart arrangement to sense light transmitted through a zone across said transfer plane from said plurality of light sources;

an energizing circuit for energizing said light sources; and

an evaluation unit for processing sensor signals received from said photoelectric elements;

wherein light reflected from said document to said first plurality of photoelectric elements is gathered under a first vision angle ($\alpha$) which determines the width of said zone, and is gathered under a second vision angle ($\beta$) which determines the length within said zone seen by each photoelectric element and further wherein light from a region of said zone at least partially overlaps at least one other region of said zone from which light is sensed by another photoelectric element.



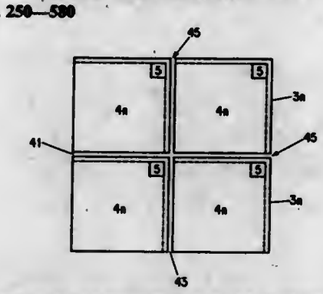
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**5,498,880**

**IMAGE CAPTURE PANEL USING A SOLID STATE DEVICE**

**Denny L. Y. Lee, West Chester, Pa.; Lothar S. Jeromin, Newark, and William Bindloss, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Jan. 12, 1995, Ser. No. 371,904**
**Int. Cl.[6] G01N *23/04*; H01L *27/14***
**U.S. Cl. 250—580** **8 Claims**




1. In an image capture panel, including a substrate layer of dielectric material having a top surface and a bottom surface, and a plurality of sensors arrayed in a matrix of rows and columns adjacent the top surface of said substrate layer, each of said sensors having a switching device and a sensing element, the improvement comprising a portion of said sensing element areally covering the switching device so as to be substantially coextensive therewith.

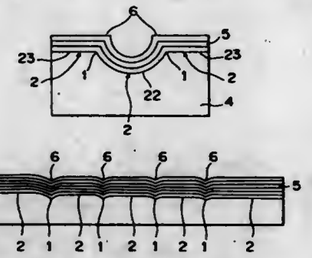
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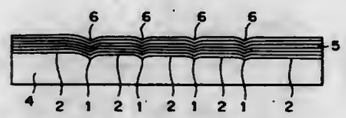
**5,498,881**

**SUPERCONDUCTING DEVICE HAVING A SINGLE JUNCTION STRUCTURE APPROPRIATE FOR INTEGRATION**

**Manabu Fujimoto, Kashiwa; Keiichi Yamaguchi, Chiba; Youichi Enomoto, Tokyo; Tsutomu Mitsuzuka, Yokohama, and Katsumi Suzuki, Kodaira, all of, Japan, assignors to International Superconductivity Technology Ctr., Tokyo, and Sharp Kabushiki Kaisha, Osaka, both of, Japan**

**Filed Sep. 20, 1994, Ser. No. 309,188**
**Claims priority, application Japan, Sep. 21, 1993, 5-233963**
**Int. Cl.[6] H01L *29/06;39/22*; H01B *12/00***
**U.S. Cl. 257—35** **10 Claims**




1. A superconducting device, comprising:

a substrate with a surface having a first surface portion with a non-zero curvature, a second surface portion with a curvature, said first and second surface portions meeting at a junction portion, where the curvatures of said first and second surface portions become discontinuous; and

a superconducting film formed on said surface of the substrate and having a grain boundary serving as a junction only at said junction portion.

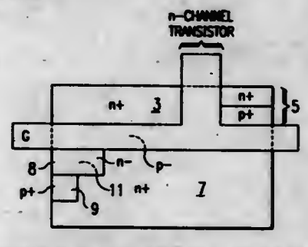
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**5,498,882**

**EFFICIENT CONTROL OF THE BODY VOLTAGE OF A FIELD EFFECT TRANSISTOR**

**Theodore W. Houston, Richardson, Tex., assignor to Texas Instruments Incroporated, Dallas, Tex.**

**Continuation of Ser. No. 213,789, Mar. 16, 1994, abandoned.**
**This application Jan. 20, 1995, Ser. No. 376,465**
**Int. Cl.[6] H01L *29/04;31/036;31/0376;31/20***
**U.S. Cl. 257—57** **12 Claims**




1. A semiconductor device comprising a first field effect transistor and a second field effect transistor wherein:

the first field effect transistor and the second field effect transistor have a common drain,

a single polysilicon line forms both the gate electrode of the second field effect transistor and the gate electrode of the first field effect transistor such that the gate electrode of the second field effect transistor is an extension of the gate electrode of the first field effect transistor,

the source of the second field effect transistor is connected to a body of the first field effect transistor by a first contact,

the source of the second transistor is of a first conductivity type,

the body of the first transistor is of a second conductivity type, and

the source of the second transistor is connected to a region of said second conductivity type.

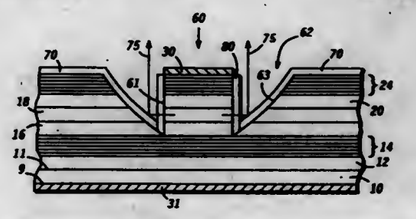
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**5,498,883**

**SUPERLUMINESCENT EDGE EMITTING DEVICE WITH APPARENT VERTICAL LIGHT EMISSION AND METHOD OF MAKING**

**Michael S. Lebby, Chandler, and Donald E. Ackley, Paradise Valley, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.**

**Continuation of Ser. No. 925,853, Aug. 5, 1992, abandoned.**
**This application Oct. 3, 1994, Ser. No. 317,110**
**Int. Cl.[6] H01L *33/00;29/78***
**U.S. Cl. 257—95** **25 Claims**




1. A superluminescent light emitting device, comprising:

a semiconductor supporting structure comprised of a first mirror stack comprised of a plurality of layers of semiconductor materials having matching crystal structures having a major surface;

a light emitting portion formed above a first portion of the major surface, wherein the light emitting portion is comprised of an active layer comprised of at least one light emitting region formed above a portion of the first mirror stack and a second mirror stack comprised of a plurality of layers of semiconductor materials having matching crystal structures formed above the active layer, and is configured in a substantially circular shape to suppress lasing and has sidewalls, and wherein a light is emitted from the sidewalls of the light emitting portion;

a non-emitting portion formed above a second portion of the major surface and adjacent to the light emitting portion, wherein the non-emitting portion has sidewalls, and wherein the sidewalls of the light emitting portion and the sidewalls of the non-emitting portion are configured to direct the light emitted from the light emitting portion substantially perpendicular to the major surface.

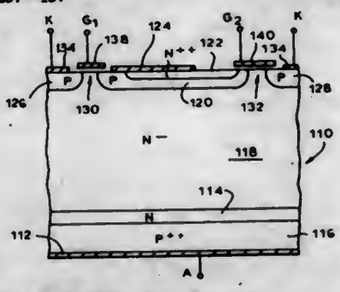
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**5,498,884**

**MOS-CONTROLLED THYRISTOR WITH CURRENT SATURATION CHARACTERISTICS**

**Jayarathnam S. Ajit, Redondo Beach, Calif., assignor to International Rectifier Corporation, El Segundo, Calif.**

**Filed Jun. 24, 1994, Ser. No. 265,397**
**Int. Cl.[6] H01L** *29/74;31/111*
**U.S. Cl. 257—137** **24 Claims**




1. A MOS-controlled thyristor, comprising:

a wafer of semiconductor material having first and second spaced, parallel planar surfaces, at least a portion of the thickness of the wafer which extends from said first semiconductor surface comprising a relatively lightly doped N-type layer for receiving junctions, at least a portion of the thickness of said wafer which extends from said second semiconductor surface comprising a relatively highly doped P-type layer;

a P-type base formed in said relatively lightly doped N-type epitaxially deposited layer and extending from said first semiconductor surface to a first depth beneath said first semiconductor surface;

an N-type emitter region formed in said P-type base and extending from said first semiconductor surface to a second depth beneath said semiconductor surface which is shallower than said first depth to create an N-type emitter/P-type base junction, said N-type emitter region being radially inwardly spaced along said first semiconductor surface along edges of said P-type base, such that said edges of said P-type base extend to said first semiconductor surface, thereby defining a first channel region along a first of said edges, a metal strap being disposed on said first semiconductor surface and connecting said emitter region to said P-type base along a second of said edges;

first and second P-type regions formed in said relatively lightly doped N-type layer and extending from said first surface of said wafer, said first and second P-type regions being laterally spaced from said second and first edges of said P-type base, respectively, to form second and third channel regions in said relatively lightly doped N-type epitaxial layer;

first gate insulation layer means on said first semiconductor surface disposed at least on said second channel region;

first gate electrode means on said first gate insulation layer means and overlying said second channel region;

second gate insulation layer means on said first semiconductor surface disposed at least on said first and third channel regions;

second gate electrode means on said second gate insulation layer means and overlying said first and third channel regions;

anode electrode means connected to said P-type layer disposed on said second semiconductor surface; and

cathode electrode means connected to said first and second P-type regions on said first semiconductor surface.

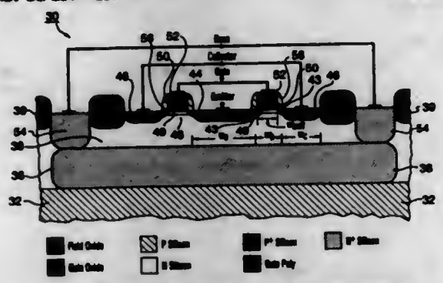
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**5,498,885**

**MODULATION CIRCUIT**

**M. Jamal Deen, Coquitlam; Duljit S. Malhi, Kanata; Zhixin Yan, Burnaby, and Robert A. Hadaway, Dunrobin, all of, Canada, assignors to Northern Telecom Limited, Montreal, Canada**

**Filed Sep. 26, 1994, Ser. No. 313,575**
**Int. Cl.[6] H01L** *29/74;* **H03F** *3/38;* **H03C** *3/00*
**U.S. Cl. 257—139** **11 Claims**




1. A integrated circuit for modulating signals comprising:

a four terminal gate controlled lateral bipolar junction transistor (GCLBJT) formed on semiconductor substrate, comprising an emitter region, a collector region, a base region extending laterally therebetween, and a gate electrode extending over the base region between the emitter and collector, said four terminals being provided to the emitter, base, collector and gate respectively,

means for providing a first input signal to the one of the emitter and base terminals, the other said terminal being grounded, and means for providing a second input signal to the gate terminal, whereby during operation of the device, an output signal is generated at the collector terminal which is a result of the gate voltage controlled modulation of the first input signal and the second input signal.

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**5,498,886**

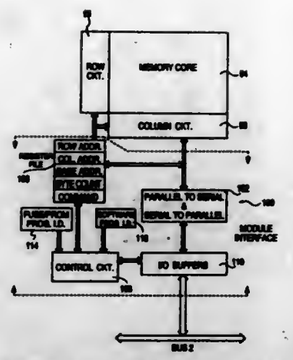
**CIRCUIT MODULE REDUNDANCY ARCHITECTURE**

**Fu-Chieh Hsu, Saratoga, and Wingyu Leung, Cupertino, both of Calif., assignors to Monolithic System Technology, Inc., San Jose, Calif.**

**Continuation of Ser. No. 865,410, Apr. 8, 1992, abandoned, which is a continuation-in-part of Ser. No. 787,984, Nov. 5, 1991, abandoned. This application May 20, 1994, Ser. No. 246,396**
**Int. Cl.[6] H02L** *29/00*
**U.S. Cl. 257—213** **13 Claims**

1. A semiconductor circuit on a substrate comprising:






at least one circuit block which includes a plurality of replaceable circuit modules, each including a software programmable identification circuit with a unique preset address code; and

at least one redundant circuit module in the at least one circuit block, the redundant circuit module including a software programmable identification circuit programmable with a unique preset address code.

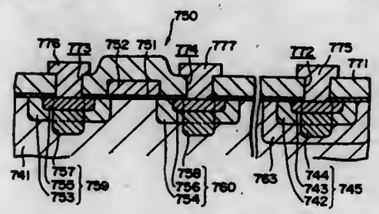
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**5,498,887**

**OUTPUT CIRCUIT DEVICE FOR A CHARGE TRANSFER ELEMENT HAVING TRIPARTITE DIFFUSION LAYER**

**Hiroaki Ohki, Tokyo; Osamu Nishima, Kanagawa; Hiroyuki Mori, Kanagawa, and Junya Suzuki, Kanagawa, all of, Japan, assignors to Sony Corporation, Tokyo, Japan**

**Division of Ser. No. 180,283, Jan. 12, 1994, Pat. No. 5,432,364. This application Feb. 24, 1995, Ser. No. 393,827**
**Claims priority, application Japan, Jan. 12, 1993, 5-020549; Mar. 31, 1993, 5-097722**
**Int. Cl.[6] H01L** *27/148;29/768*
**U.S. Cl. 257—239** **13 Claims**




1. An output circuit device for a charge transfer element, comprising:

a semiconductor body;

a wiring line layer formed on an upper surface of the semiconductor body; and

a diffusion layer formed in the semiconductor body underneath the wiring line layer, the diffusion layer comprising first, second and third diffusion regions, the first diffusion region comprising a diffusion of a low concentration of an impurity having a high diffusion coefficient, the second diffusion region positioned within an upper surface portion of the first diffusion region in self-alignment with the first diffusion region and comprising a diffusion of a high concentration of an impurity having a low diffusion coefficient, the third diffusion region positioned in self-alignment with the first and second diffusion regions and extending from the upper surface where said wiring line layer contacts the upper surface of the semiconductor body and through the first and second regions to beneath the first diffusion region and having a diffusion of a high concentration of an impurity having a high diffusion coefficient, the high and low diffusion coefficients being high and low relative to one another, the high and low concentrations being high and low relative to one another.

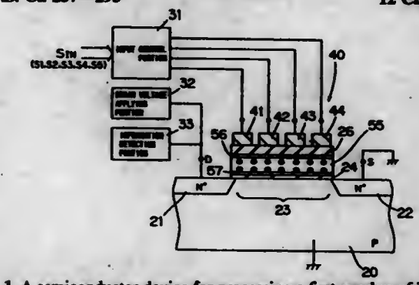
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**5,498,888**

**SEMICONDUCTOR DEVICE AND METHOD FOR PROCESSING MULTIPLE INPUT SIGNALS**

**Takanori Ozawa, Kyoge, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan**

**Filed Mar. 14, 1994, Ser. No. 212,719**
**Claims priority, application Japan, Mar. 19, 1993, 5-060625**
**Int. Cl.[6] H01L** *29/76*
**U.S. Cl. 257—295** **12 Claims**




1. A semiconductor device for processing a first number of input signals, the first number being equal to at least three, the semiconductor device comprising:

a source region formed in a semiconductor substrate;

a drain region formed in said semiconductor substrate;

a channel region between said source region and said drain region in said semiconductor substrate;

a gate above said channel region, said gate including a second number of input electrodes, the second number being one less than the first number;

a potential modulating film between said channel region and said gate, said potential modulating film being formed of ferromagnetic material and being capable of assuming and holding at least two potential modulating states for modulating the potential of said channel region to different values;

a metal layer provided on a surface of said potential modulating film;

an interlayer insulating film provided between said metal layer and said gate;

state setting means for setting the potential modulating states of said potential modulating film into any one of said at least two potential modulating states based on a predetermined one of said first number of input signals;

input controlling means for supplying to said second number of input electrodes input voltages respectively corresponding to the first number of input signals other than said predetermined one of said first number of input signals; and

means for detecting the presence or absence of conduction between said source region and said drain region while the input voltages are supplied to said input electrodes.

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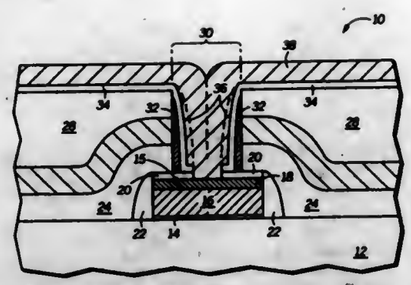
**5,498,889**

**SEMICONDUCTOR DEVICE HAVING INCREASED CAPACITANCE AND METHOD FOR MAKING THE SAME**

**James D. Hayden, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.**

**Continuation of Ser. No. 158,552, Nov. 29, 1993, abandoned. This application Dec. 12, 1994, Ser. No. 353,737**
**Int. Cl.[6] H01L** *27/108;29/76;29/94;31/119*
**U.S. Cl. 257—301** **10 Claims**

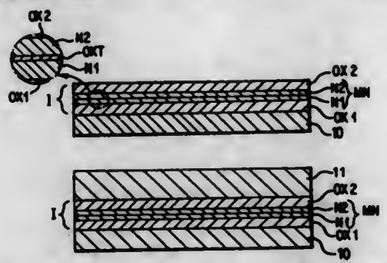
1. A semiconductor device having a capacitor structure comprising:



a semiconductor substrate;
a first dielectric layer overlying the semiconductor substrate;
a first conductive layer stacked on the first dielectric layer, wherein the first conductive layer is a constant reference voltage supply layer;
a second dielectric layer stacked on the first conductive layer;
an opening extending through the first dielectric layer, the first conductive layer, and the second conductive layer, the opening having a bottom portion and sidewalls;
conductive spacers formed on the sidewalls of the opening and in electrical contact with the first conductive layer along the sidewalls of the opening;
a third dielectric layer covering the conductive spacers within the opening; and
a second conductive layer adjacent the third dielectric layer within the opening;
wherein the first conductive layer and the conductive spacers together form a first electrode of the capacitor structure, the third dielectric layer forms a capacitor dielectric, and the second conductive layer forms a second electrode of the capacitor structure; and
wherein the conductive spacers, the third dielectric layer, and the second conductive layer together substantially fill the opening.

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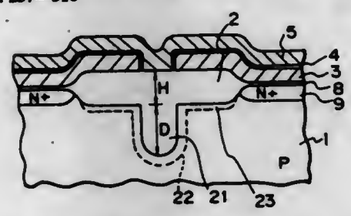
**5,498,890**
**SEMICONDUCTOR DEVICE HAVING A MULTI-LAYERED DIELECTRIC STRUCTURE AND MANUFACTURING METHOD THEREOF**
**Sungtae Kim, Seoul, and Soohan Choi, Kyungi-do, both of, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Rep. of Korea**
**Division of Ser. No. 799,989, Nov. 26, 1991, abandoned, which is a continuation of Ser. No. 485,961, Feb. 27, 1990, abandoned. This application Jul. 6, 1992, Ser. No. 908,998**
**Claims priority, application Rep. of Korea, Nov. 8, 1989, 89-16179**
**Int. Cl.[6] H01L** *27/108;29/792;29/76;29/94*
**U.S. Cl. 257—310** **3 Claims**



1. A semiconductor device comprising a first electrical conductive layer formed on a semiconductor substrate; a first silicon oxide layer formed on said first electrical conductive layer; at least two silicon nitride sublayers formed on said first silicon oxide layer; a second silicon oxide layer formed on said silicon nitride sublayers; and a second electrical conductive layer formed on said second silicon oxide layer, wherein an ultra-thin silicon oxide layer is disposed between said silicon nitride sublayers.

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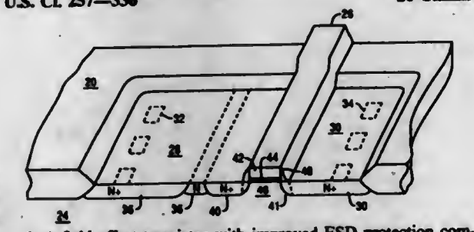
**5,498,891**
**EPROM WITH TRENCH IN THICK FIELD OXIDE**
**Noriaki Sato, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan**
**Continuation of Ser. No. 810,408, Dec. 20, 1991, abandoned. This application May 12, 1994, Ser. No. 241,389**
**Claims priority, application Japan, Dec. 20, 1990, 2-404246**
**Int. Cl.[6] H01L** *29/788*
**U.S. Cl. 257—316** **7 Claims**



1. An erasable-programmable read only memory (EPROM) comprising:
a semiconductor substrate;
a field insulating layer defining a device formation region of said semiconductor substrate, wherein the device formation region includes a source region and a drain region;
a gate insulating layer formed on said device formation region;
a floating gate formed on said gate insulating layer and said field insulating layer, wherein the floating gate does not substantially extend above the source region and the drain region;
a trench insulating layer extending into said semiconductor substrate at a center portion of said field insulating layer, one of side walls of said trench insulating layer being partially self-aligned with an end face of said floating gate;
a first interlaminar insulating layer covering said floating gate;
a control gate formed on said first interlaminar insulating layer and located above said floating gate;
a second interlaminar insulating layer formed over said control gate; and
a bit line formed on said second interlaminar insulating layer and traversing said floating gate and control gate,
wherein the control gate is a word line arranged in a perpendicular direction to the bit line, and to a carrier flow direction between the source region and the drain region.

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**5,498,892**
**LIGHTLY DOPED DRAIN BALLAST RESISTOR**
**John D. Walker, and Samuel C. Gioia, both of Colorado Springs, Colo., assignors to NCR Corporation, Dayton, Ohio**
**Filed Sep. 29, 1993, Ser. No. 129,231**
**Int. Cl.[6] H01L** *29/68;21/265*
**U.S. Cl. 257—336** **20 Claims**



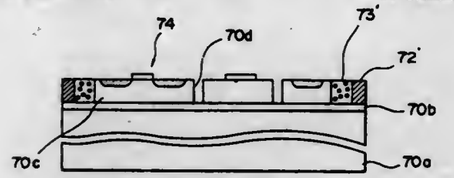
1. A field effect transistor with improved ESD protection comprising:



a source region of a first dopant type;
a channel region of a second dopant type underlying a gate electrode; and
a drain region of the first dopant type separated from the source region by the channel region;
wherein the drain region includes a ballast region separating second and third drain sub-regions, the second drain sub-region being located between the ballast region and the channel, the third drain sub-region being connected to a device exterior to the transistor; and
wherein the ballast region has a resistance greater than that of the first and second drain regions, thereby laterally distributing current flowing between the channel region and signal connection points.

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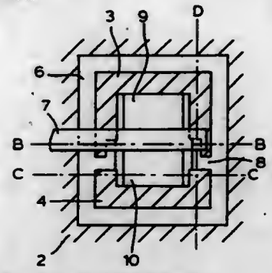
**5,498,893**
**SEMICONDUCTOR DEVICE HAVING SOI SUBSTRATE AND FABRICATION METHOD THEREOF**
**Shouji Usui, Tokyo; Taketoshi Inagaki, Kawasaki; Kiyomasa Kamei, Tokyo; Takeshi Matsutani, Machida, and Kazunori Imaoka, Komae, all of, Japan, assignors to Fujitsu Limited, Kawasaki, Japan**
**Continuation of Ser. No. 131,557, Oct. 4, 1993, abandoned, which is a continuation of Ser. No. 887,835, Jun. 10, 1992, abandoned, which is a division of Ser. No. 606,956, Oct. 31, 1990, Pat. No. 5,162,254. This application Jun. 7, 1995, Ser. No. 487,537**
**Claims priority, application Japan, Jan. 31, 1989, 1-283514**
**Int. Cl.[6] H01L** *27/01;27/12;31/0392*
**U.S. Cl. 257—347** **10 Claims**



1. A semiconductor device comprising:
a support substrate of a semiconductor material having a hardness;
an insulator chip provided on said support substrate, said insulator chip being defined by an upper major surface and a lower major surface;
an active region formed of the semiconductor material identically as used in said support substrate, said active region having an upper major surface and a lower major surface contacting with the upper major surface of said insulator chip, said active region having a side wall;
a first material region including an inorganic material having a hardness exceeding the hardness of the semiconductor material forming said active region, said first material region having an upper major surface and a lower major surface contacting with the upper major surface of said insulator chip, the first material region having a side wall opposing the side wall of said active region to define a gap therebetween;
a second material region including polysilicon and having a hardness substantially equal to the hardness of the semiconductor material forming said active region, said second material region having an upper major surface and a lower major surface contacting with the upper major surface of said insulator chip, said second material region having a first side wall contacting with the side wall of said active region and a second side wall contacting with the side wall of said first material region; and
at least one active device formed in said active region, the upper major surfaces of said active region, said first material region and said second material region being substantially level due to polishing of the upper major surfaces of said active region and said second material region until the polishing is impeded by the upper major surface of said first material region.

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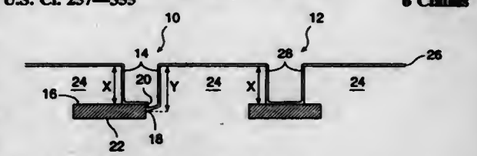
**5,498,894**
**SEMICONDUCTOR DEVICE**
**Tetsuya Kokubun, Tokyo, Japan, assignor to NEC Corporation, Japan**
**Filed Oct. 5, 1994, Ser. No. 318,135**
**Claims priority, application Japan, Jan. 8, 1993, 5-253008**
**Int. Cl.[6] H01L** *27/01;27/12;31/0392;29/76*
**U.S. Cl. 257—349** **3 Claims**



1. A semiconductor device comprising:
a device area formed on a semiconductor substrate consisting of a gate insulating film, source-drain areas and a gate electrode having opposed ends; and
a device separation area composed of a thick insulating film, a first thin insulating film with film thickness almost equal to that of said gate insulating film and a first high-concentration impurity layer provided under said first thin insulating film;
a second thin insulating film that partially overlaps said gate electrode at each end of said gate electrode and is connected with said first thin insulating film; and
a second high-concentration impurity layer that is provided under said second thin insulating film so as to be separated from said source-drain areas.

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**5,498,895**
**PROCESS ESD PROTECTION DEVICES FOR USE WITH ANTIFUSES**
**Wenn-Jei Chen, Sunnyvale, Calif., assignor to Actel Corporation, Sunnyvale, Calif.**
**Continuation-in-part of Ser. No. 277,673, Jul. 19, 1994, which is a continuation of Ser. No. 87,942, Jul. 7, 1993, Pat. No. 5,369,054. This application Aug. 12, 1994, Ser. No. 290,029**
**Int. Cl.[6] H01L** *27/01;29/00*
**U.S. Cl. 257—355** **6 Claims**



1. An integrated circuit comprising:
at least one antifuse including a bottom electrode, an interlayer dielectric layer disposed over said bottom electrode, a cell opening of a first areal size and a first maximum depth extending through said interlayer dielectric layer and exposing said bottom electrode, and an antifuse material layer disposed in said cell opening and having a first minimum thickness within said cell opening, said at least one antifuse being programmable at a first minimum voltage; and
a process ESD protection device including a bottom ESD electrode, said interlayer dielectric layer disposed over said bottom ESD electrode, an ESD cell opening of said first areal size and a second maximum depth greater than said first maximum depth and extending through said interlayer dielectric layer and exposing said bottom ESD electrode, said antifuse material layer disposed in said ESD cell opening and having a second minimum thickness within said ESD cell

opening, said second minimum thickness being less than said first minimum thickness, wherein said process ESD protection device is programmable at a second minimum voltage less than said first minimum voltage.

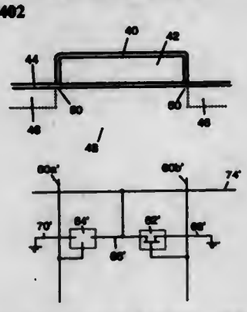
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**5,498,896**

**HIGH THRESHOLD METAL OXIDE SILICON READ-ONLY-MEMORY TRANSISTORS**

**Alex Gyure, Sunnyvale, Calif.; John Berg, Boise, Id.; Damian Carver, Boise, Id., and Pete Manos, Boise, Id., assignors to Zilog, Inc., Campbell, Calif.**

**Division of Ser. No. 179,492, Jan. 7, 1994, Pat. No. 5,389,565.**
**This application Oct. 7, 1994, Ser. No. 319,941**
**Int. Cl.[6] H01L *29/76***
**U.S. Cl. 257—402** **14 Claims**



1. A read-only-memory circuit including a plurality of memory cells on a silicon substrate comprising:

polysilicon lines;

barrier layers on top of and contacting the polysilicon lines;

doped regions in the silicon substrate on either side of at least some of the polysilicon lines, the doped regions comprising source and drain regions each including a lightly doped region with donor atoms in the substrate that extends beneath the barrier layer on the at least some of the polysilicon lines and a heavily doped region with donor atoms that does not extend beneath the at least some of the polysilicon lines wherein the heavily doped region is aligned with the barrier layer on the polysilicon line wherein the at least some of the polysilicon lines act as the gate of a pass transistor and wherein the gate and the source and drain regions comprise a memory cell of a first type such that when a signal voltage is applied to the gate, the cell of the first type conducts between the source and drain;

additional doped regions in the silicon substrate on either side of at least some others of the polysilicon lines, each additional doped region including an additional heavily doped region with donor atoms in the substrate that does not extend beneath the at least some others of the polysilicon lines; and

isolation regions in the silicon substrate beneath the barrier layers on both sides of the at least some others of the polysilicon lines, the isolation regions do not contain substantially more donor atoms than acceptor atoms;

wherein the additional doped regions, the isolation regions and the at least some others of the polysilicon lines form memory cells of a second type, the memory cells of the second type are such that when the signal voltage is applied to one of the at least some others of the polysilicon lines, the cell of the second type does not significantly conduct between the additional doped regions.

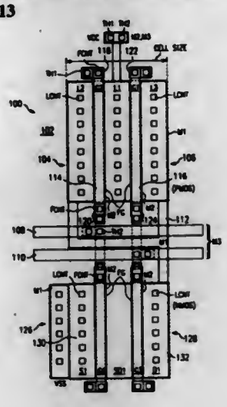
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**5,498,897**

**TRANSISTOR LAYOUT FOR SEMICONDUCTOR INTEGRATED CIRCUIT**

**Katsuo Komatsuzaki, Iharaki; Masayasu Kawamura, Kodaira, and Hidetoshi Iwai, Ohme, all of, Japan, assignors to Texas Instruments Incorporated, Dallas, Tex., and Hitachi Ltd.**

**Filed Jul. 1, 1994, Ser. No. 270,085**
**Int. Cl.[6] H01L *27/11;29/772***
**U.S. Cl. 257—413** **8 Claims**



1. A transistor layout for a semiconductor integrated circuit comprising:

A. a substrate of semiconductor material;

B. MOS field effect transistor formed in and on the substrate including:

i. a source region having a defined periphery formed in the substrate;

ii. a drain region having a defined periphery formed in the substrate;

iii. a channel region having a defined periphery formed in the substrate between and abutting the peripheries of the source region and drain region; and

iv. a gate having a defined periphery formed over the channel region and the periphery of the gate being substantially superimposed over the periphery of the channel region, the gate being formed of polysilicon having a certain resistance and the gate having two ends;

C. a first metal layer formed over selected areas of the semiconductor substrate and insulated from the gate, the first metal layer including a first part formed over one of the source and drain regions and connected to the one of the source and drain regions by at least one vertically extending via, and the first metal layer including second parts, separate from one another, formed over parts of the gate and connected to the gate by vertically extending vias, the first and second parts of the first metal layer being insulated from one another;

D. a second metal layer formed over selected areas of the semiconductor substrate and insulated from the first metal layer and gate, the second metal layer including a first part formed over the gate and over the second parts of the first metal layer and connected to the second parts of the first metal layer by vertically extending vias, and the second metal layer having a certain resistance less than the gate to conduct a control signal applied to the first part of the second metal layer to the gate.

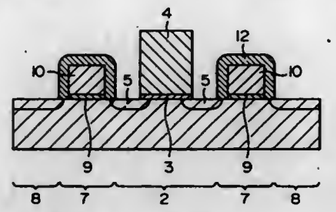


**5,498,898**

**SEMICONDUCTOR DEVICE USING ELEMENT ISOLATION BY FIELD SHIELD**

**Koichiro Kawamura, Tokyo, Japan, assignor to Nippon Steel Corporation, Tokyo, Japan**

**Filed Dec. 23, 1994, Ser. No. 362,784**
**Claims priority, application Japan, Dec. 28, 1993, 5-351920**
**Int. Cl.[6] H01L *29/00***
**U.S. Cl. 257—503** **4 Claims**



1. A semiconductor device comprising:

a semiconductor substrate;

a field-shield electrode made of a thin film of at least one of polysilicon and amorphous silicon and formed on a surface of an element-isolation region of the substrate with an insulating film interposed therebetween for defining an active region in said substrate; and

a transistor having a gate electrode formed on a surface of said active region of said substrate with a gate insulating film interposed between said substrate and said gate electrode;

wherein said field-shield electrode is connected to a predetermined potential and said insulating film has a thickness of 5 nm–10 nm which is less than a thickness of the gate insulating film of said transistor.

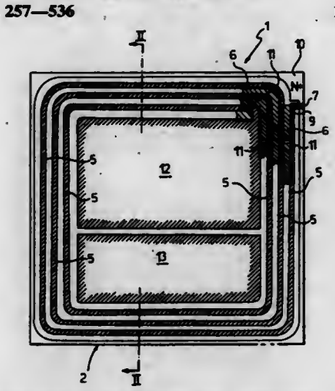
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**5,498,899**

**SPIRAL RESISTOR INTEGRATED ON A SEMICONDUCTOR SUBSTRATE**

**Sergio Palara, Acitrezza, Italy, assignor to Co.Ri.M.Me., Catania, Italy**

**Continuation of Ser. No. 67,666, May 26, 1993, abandoned.**
**This application Aug. 8, 1994, Ser. No. 287,109**
**Claims priority, application European Pat. Off., May 28, 1992, 92830271**
**Int. Cl.[6] H01L *29/00***
**U.S. Cl. 257—536** **12 Claims**



1. A semiconductor substrate structure comprising:

a semiconductor substrate having a plurality of resistive regions of a first conductivity type diffused therein, the resistive regions being adjacent each other and spaced from each other by a substrate region;

a first field-plate layer contacting a first of said resistive regions and extending from said first resistive region to cover substantially all of the substrate region between said first resistive region and a second of the resistive regions adjacent the first resistive region; and

an electrical contact between said first resistive region and the first field-plate layer wherein said first field-plate overlaps a portion of said first resistive region, extends to completely cover the substrate region between the first and second resistive regions, and overlaps at least a portion of the second resistive region.

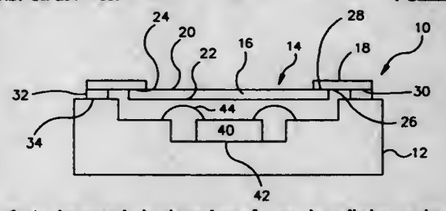
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**5,498,900**

**SEMICONDUCTOR PACKAGE WITH WELDABLE CERAMIC LID**

**Thomas J. Dunaway, New Hope, and Richard K. Spielberger, Maple Grove, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.**

**Filed Dec. 22, 1993, Ser. No. 171,958**
**Int. Cl.[6] H01L *23/552***
**U.S. Cl. 257—659** **4 Claims**



1. An integrated circuit package for use in radiation environments comprising:

a base formed from an electrically insulative material, said base having a recessed central portion for receiving an integrated circuit die and a peripheral portion;

a metal seal ring secured to said peripheral portion of said base;

a central lid portion formed from an electrically insulative material, said central lid portion having a periphery;

an outwardly extending metal flange secured to said periphery portion of said central lid portion, said flange for complementary receipt on said metal seal ring with said flange and said seal ring connected by a solder-free welded bond.

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**5,498,901**

**LEAD FRAME HAVING LAYERED CONDUCTIVE PLANES**

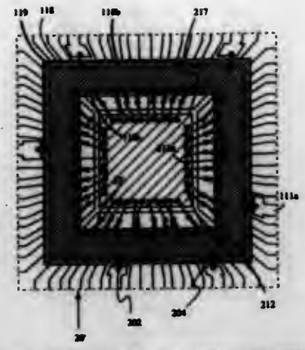
**Satya Chillara, and Shahram Mostafazadeh, both of San Jose, Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.**

**Filed Aug. 23, 1994, Ser. No. 294,323**
**Int. Cl.[6] H01L *23/495***
**U.S. Cl. 257—666** **25 Claims**

1. A lead frame comprising:

a plurality of leads including a plurality of long leads each having a lead tip facing a die area and a plurality of short leads each ending in a lead pad suitable for bonding, the lead pads being further from the die area than the lead tips;

a first electrically conductive layer positioned between the lead pads and the lead tips and continuously extending over a plurality of the long leads, the lead tips being exposed on a first side of the first electrically conductive layer so that the lead tips are positioned suitably for being electrically coupled to a plurality of bonding pads on a die received in the die area by wire bonding and the lead pads being exposed on a second side of the first electrically conductive layer so that the lead pads are positioned suitably for being electrically coupled to the first electrically conductive layer;



a first electrically insulating layer sandwiched between the electrically conductive layer and the long leads for electrically insulating the long leads from the conductive layer;

whereby a first set of the short leads are positioned suitably for being electrically coupled to a first set of bonding pads of the plurality of bonding pads on the die by wire bonding the first set of short leads to the first conductive layer, and wire bonding the first conductive layer to the first set of bonding pads.

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**5,498,902**

**SEMICONDUCTOR DEVICE AND ITS MANUFACTURING METHOD**

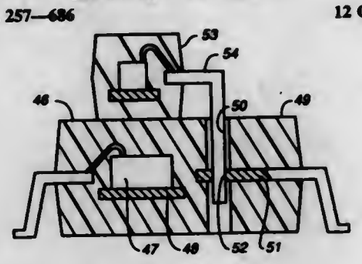
**Akitoshi Hara, Suwa, Japan, assignor to Seiko Epson Corporation, Japan**

**Filed Aug. 24, 1994, Ser. No. 296,855**

**Claims priority, application Japan, Aug. 25, 1993, 5-210696; Jun. 27, 1994, 6-165840**

**Int. Cl.[6] H01L** *23/02;23/495*

**U.S. Cl. 257—686** **12 Claims**



1. A semiconductor device comprising:

at least one semiconductor element arranged on a semiconductor element mounting area, said semiconductor element mounting area comprising a connection area for connecting to an external structure;

inner and outer leads electrically connected to said semiconductor element; and

a package encapsulating said semiconductor element and said inner leads, said package comprising linking holes leading to said connection area of said semiconductor element mounting area.

**5,498,903**

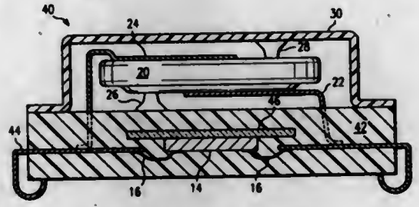
**SURFACE MOUNTABLE INTEGRATED CIRCUIT PACKAGE WITH INTEGRATED BATTERY MOUNT**

**D. Craig Dixon, Lewisville, and Michael J. Hundt, Double Oak, both of Tex., assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.**

**Division of Ser. No. 995,665, Dec. 21, 1992, Pat. No. 5,403,782. This application Nov. 30, 1994, Ser. No. 346,760**

**Int. Cl.[6] H01L** *23/02*

**U.S. Cl. 257—690** **11 Claims**



1. A packaged integrated circuit, comprising:

an integrated circuit mounted within a package body;

a plurality of electrical connections at a first side of said package body;

a lower battery lead extending from a second side of said package body, and electrically coupled to said integrated circuit;

an upper battery lead extending from said second side of said package body, and electrically coupled to said integrated circuit;

a battery disposed between lower and upper battery leads so that a lower gap is present between said battery and said package body so that no portion of said battery is in contact with said package body; and

a housing covering said battery and attached to said package body.

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**5,498,904**

**POLYCRYSTALLINE SEMICONDUCTIVE FILM, SEMICONDUCTOR DEVICE USING THE SAME AND METHOD OF MANUFACTURING THE SAME**

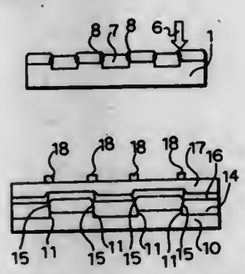
**Yasuki Harata; Masaaki Kameda; Kelichi Sano, and Yoichiro Aya, all of Osaka, Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan**

**Filed Sep. 27, 1994, Ser. No. 312,610**

**Claims priority, application Japan, Feb. 22, 1994, 6-024329**

**Int. Cl.[6] H01L** *29/06;21/469*

**U.S. Cl. 257—62.3** **19 Claims**



1. A polycrystalline semi,conductive film comprising

a substrate having a surface with a plurality of spaced indentations defining plane regions and an elevated step difference portion having side walls between the adjacent plane regions; and

a polycrystalline semiconductive film with grain boundaries being formed on said plane regions and step difference portion of said substrate, the grain boundaries of the film being position-controlled by said step difference portion side walls of the substrate surface.



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**5,498,905**

**LAYERED FEATURES FOR CO-FIRED MODULE INTEGRATION**

**Brian D. Young, Austin, Tex., assignor to Hughes Aircraft Company, Los Angeles, Calif.**

**Filed Aug. 26, 1994, Ser. No. 296,392**

**Int. Cl.[6] H01L** *23/32;* **H05K** *1/14*

**U.S. Cl. 257—700** **4 Claims**



1. A unitized multilayer circuit structure comprising:

a plurality of planar dielectric insulating layers stacked in laminar fashion and integrally fused to form a unitized multilayer substrate having sides formed by edges of the dielectric insulating layers; and

a recess formed respectively in one side of and opposite side of said substrate and extending partially into said substrate;

whereby the unitized multilayer circuit structure is secured to a higher level assembly by engagement of said recess by a fastener.

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**5,498,906**

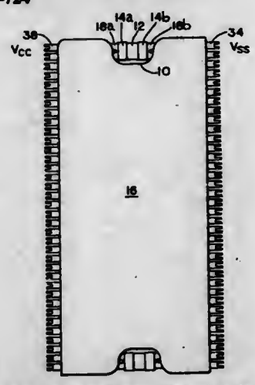
**CAPACITIVE COUPLING CONFIGURATION FOR AN INTERGRATED CIRCUIT PACKAGE**

**Jerry M. Roane, and Carmen D. Burns, both of Austin, Tex., assignors to Staktek Corporation, Austin, Tex.**

**Filed Nov. 17, 1993, Ser. No. 153,511**

**Int. Cl.[6] H01L** *23/02;23/34*

**U.S. Cl. 257—724** **37 Claims**



1. An integrated circuit package adapted to include capacitive decoupling, said package comprising:

(a) an integrated circuit element contained within an integrated circuit casing; wherein said casing has an upper surface, a lower surface and a perimeter wall;

(b) said casing having an aperture formed therein, the aperture extending completely through said casing upper and lower surface and being adapted to partially receive a discrete electrical circuit element; and

(c) a first and second electrical lead, each extending from said integrated circuit element through a portion of said casing and into said aperture.

**5,498,907**

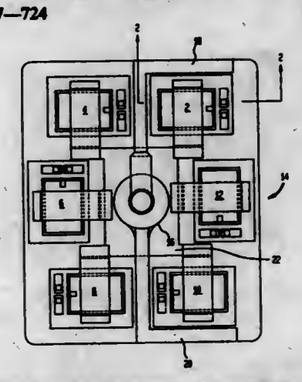
**INTERCONNECTION ARRANGEMENT FOR POWER SEMICONDUCTOR SWITCHING DEVICES**

**John J. Tumpey, Oakhurst; Sampat Shekhawat, Middletown; Gayton L. Silvestro, Brick, and John J. Bregle, Lawrenceville, all of N.J., assignors to Allied Signal Inc., Morris Township, N.J.**

**Continuation of Ser. No. 53,747, Apr. 29, 1993, abandoned. This application Sep. 12, 1994, Ser. No. 304,620**

**Int. Cl.[6] H01L** *23/34*

**U.S. Cl. 257—724** **11 Claims**



1. An interconnection arrangement for power semiconductor switching devices, comprising:

a plurality of power semiconductor switching devices mounted to a substrate and the substrate mounted to a case to provide a circuit module, said case being effective for enhancing heat dissipation from each of the plurality of semiconductor switching devices;

the plurality of power semiconductor switching devices mounted to the substrate in a pattern so as to minimize a length of interconnecting leads for said devices;

module circuitry having an origin and an input and an output at the center of the pattern; and

said pattern being such that mechanical and electrical symmetry of the power semiconductor switching devices are maintained from the origin of the circuitry to the circuit module output, said pattern being effective as means whereby current sharing between each of said plurality of semiconductor switching devices is optimized when said switching devices are paralleled during switch-on, switch-off and steady state conditions.

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**5,498,908**

**SEMICONDUCTOR APPARATUS HAVING AN N-CHANNEL MOS TRANSISTOR AND A P-CHANNEL MOS TRANSISTOR AND METHOD FOR MANUFACTURING THE SEMICONDUCTOR APPARATUS**

**Takashi Nakabayashi; Takashi Uehara, and Akihira Shinohara, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

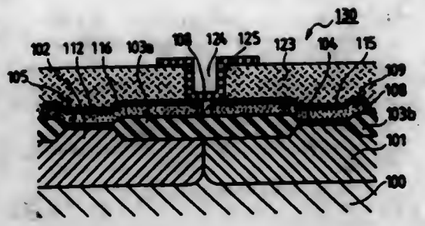
**Continuation of Ser. No. 976,839, Nov. 16, 1992, abandoned. This application Jan. 30, 1995, Ser. No. 380,460**

**Claims priority, application Japan, Nov. 22, 1991, 3-307332**

**Int. Cl.[6] H01L** *29/76;23/48*

**U.S. Cl. 257—751** **8 Claims**

1. A semiconductor apparatus with metal-oxide-semiconductor (MOS) transistors for transmitting electrons through a first channel region from an n the source layer adjacent to a side of the first channel region to an n type drain layer adjacent to an opposite side of the first channel region in an n-channel MOS transistor and




transmitting holes through a second channel region from a p type source layer adjacent to a side of the second channel region to a p type drain layer adjacent to an opposite side of the second channel region in a p-channel MOS transistor, comprising:

a field oxide layer arranged on a boundary region between the n-channel MOS transistor and the p-channel MOS transistor for electrically insulating the n-channel MOS transistor from the p-channel MOS transistor;

a first gate oxide film arranged on the first channel region of the n-channel MOS transistor in contact with the field oxide layer;

a second gate oxide film arranged on the second channel region of the p-channel MOS transistor in contact with the field oxide layer;

an n type polycrystalline silicon film arranged on the first gate oxide and the field oxide layer, the n type polycrystalline silicon film functioning as an n type gate electrode;

a first silicide metal film with a high melting point arranged on the n type polycrystalline silicon film;

a p type polycrystalline silicon film arranged on both the second gate oxide and the field oxide layer , one end of the p type polycrystalline silicon film and one end of the n type polycrystalline silicon film being spaced apart and having an insulating material therebetween, and the p type polycrystalline silicon film functioning as a p type gate electrode;

a second silicide metal film with a high melting point arranged on the p type polycrystalline silicon film and facing one end of the first silicide metal film through the insulating material, an upper level of the insulating material being lower than those of the first and second silicide metal films;

an insulating film arranged on both the first and second silicide metal films, a single gate contact hole being formed within the insulating film and reaching one end of the first silicide metal film and one end of the second silicide metal film which face each other through the insulating material, and the single gate contact hole being placed on the insulating material; and

a gate metal wiring arranged in the gate contact hole for electrically connecting the first silicide metal film and the second silicide metal film to provide a gate signal to both the n type and p type polycrystalline silicon films through both the first and second silicide metal films, the gate metal wiring being in contact with not only upper surfaces of the first and second silicide metal films but also side surfaces of the first and second silicide metal films to widen a contact surface of the gate metal wiring with each of the first and second silicide metal films, the electrons which transmit through the first channel region from the n type source layer to the n type drain layer being controlled by the gate signal provided to the n type polycrystalline silicon film positioned above the first channel region, and the holes which transmit through the second channel region from the p type source layer to the p type drain layer being controlled by the gate signal provided to the p type polycrystalline silicon film positioned above the second channel region.

**5,498,909**

## SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING SUCH SEMICONDUCTOR DEVICE

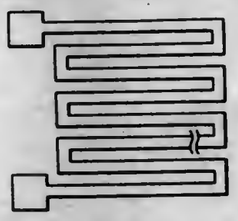
Masahiko Hasunuma, Yokohama; Hiroshi Kaneko, Fujisawa; Atsuhito Sawabe, Yokosuka; Takashi Kawanoue, Yokohama; Yoshiko Kohanawa, Yokohama, and Shuichi Komatsu, Yokohama, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 545,870, Jun. 29, 1990. This application Aug. 31, 1992, Ser. No. 937,398

Claims priority, application Japan, Jul. 1, 1989, 1-168308; Sep. 26, 1989, 1-247938; Sep. 26, 1989, 1-247941; Sep. 26, 1989, 1-247944; Sep. 26, 1989, 1-247946; Sep. 27, 1989, 1-251355; Sep. 27, 1989, 1-251356; Sep. 27, 1989, 1-251357; Sep. 27, 1989, 1-251358; Sep. 27, 1989, 1-251360; Sep. 27, 1989, 1-251361

Int. Cl.[6] H01L *23/48;23/52;29/40;23/28*

U.S. Cl. 257—754 13 Claims



1. A semiconductor device comprising:

a semiconductor substrate having active regions electrically isolated from each other on a predetermined surface thereof, and

an electrode line arranged on said semiconductor substrate through an insulator,

wherein at least one layer of said electrode line comprises a first electrode line layer and a second electrode line layer,

said first electrode layer is made of a metal single crystal layer of a metal selected from the group consisting of Au, Ag, Cu, Al and alloys thereof, and said second electrode line layer is made of a metal polycrystal layer of a metal selected from the group consisting of Au, Ag, Cu, Al and alloys thereof.

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**5,498,910**

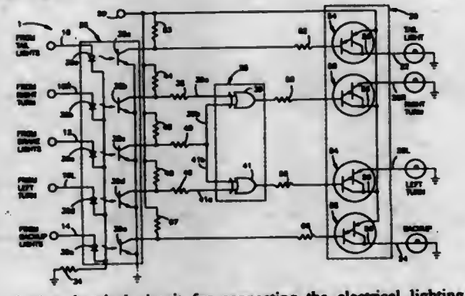
## BRAKE TURN SIGNAL ADAPTOR FOR TRAILERS

Evan L. Hopkins, and Gregory A. Yotz, both of Emporia, Kans., assignors to Hopkins Manufacturing Corporation, Emporia, Kans.

Division of Ser. No. 909,127, Jul. 6, 1992, Pat. No. 5,389,823, which is a continuation-in-part of Ser. No. 579,151, Sep. 6, 1990, abandoned. This application Sep. 22, 1994, Ser. No. 310,649

Int. Cl.[6] B60L *1/00*

U.S. Cl. 307—10.1 33 Claims



1. An electrical circuit for connecting the electrical lighting system of a towing vehicle to the electrical lighting system of a trailer, said circuit comprising:



receiving means for receiving electrical input pulses from the electrical lighting system of the towing vehicle;

an electrical isolation network including means for receiving said electrical input impulses and responding thereto for providing first and second isolated output pulses; and

means for receiving said first and second output pulses and applying said first and second isolated output pulses to the electrical lighting system of the trailer to activate lights thereof,

said isolation network including means for isolating the electrical lighting system brake light connections and turn light connections on the towing vehicle from the electrical lighting system of the trailer.

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**5,498,911**

## APPARATUS FOR TRANSMITTING ELECTRIC POWER AND DATA IN MOTOR VEHICLES

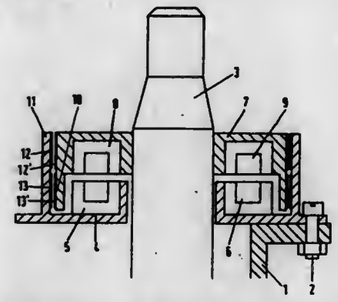
Hans J. Bossler, Münster, and Martin Kreuzer, Kleinwallstadt, both of, Germany, assignors to Kolbenschmidt Aktiengesellschaft, Neckarsulm, Germany

Continuation of Ser. No. 202,716, Feb. 23, 1994, abandoned, which is a continuation of Ser. No. 900,578, Jun. 18, 1992, abandoned. This application Dec. 13, 1994, Ser. No. 355,422

Claims priority, application Germany, Jun. 22, 1991, 41 20 650.9

Int. Cl.[6] H04B *9/00*

U.S. Cl. 307—10.1 1 Claim



1. In an apparatus for transmitting electric power and data between the vehicle side and the steering wheel side of a motor vehicle by means of a bipartite transformer, which is coaxial to a steering shaft and comprises a stationary first and second shell cores, which is provided on a vehicle core and surrounds a steering column and is U-shaped in section and extends around a primary coil, and first and second shell cores, which are U-shaped in section and are provided on the steering wheel side and surrounds and is non-rotatably connected to the steering shaft and extends around a secondary coil, an air gap being provided between said shell cores, the improvement which comprises a capacitor coaxial to the bipartite transformer and comprising stationary conductor strips (12, 13, 15, 16), which are provided on the vehicle side and surround the steering column, and conductor strips (12', 13', 15', 16'), which are provided on the steering wheel side and define an air gap with said stationary conductor strips and said stationary conductor strips surround the steering shaft and are non-rotatably connected to the steering shaft (3), the air gap between the shell cores (5,8) of the capacitors having a width of 0.3 to 1 mm, the air gap between at least two said conductor strips (12, 12', 13, 13', 15, 15', 16, 16') of the capacitors having a width of 0.2 to 0.5 mm, the conductor strips (12, 12', 13' 13') being concentrically arranged cylindrical sleeves or the conductor strips (15, 15', 16, 16') comprising annular disks arranged in a row, the capacitor comprising at least four conductor strips (12, 12', 13, 13', 15, 15', 16, 16') which are arranged in pairs of registering strips, the capacitor comprising sleeves which surround the transformer, the shell cores (5,8) comprising ferrite, and the transformer and the capacitor being provided with shielding means made of steel.

**5,498,912**

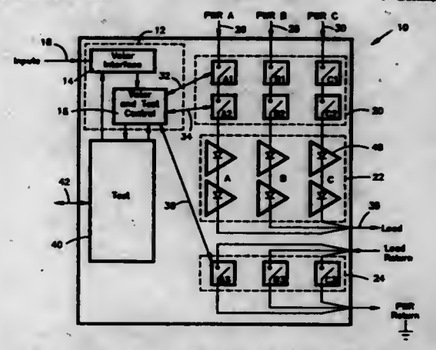
## MAJORITY VOTED TWO FAULT TOLERANT POWER SWITCH

Douglas D. Templeman, Riverside, and Melvyn Weiss, Thousand Oaks, both of Calif., assignors to Rockwell International Corporation, Seal Beach, Calif.

Filed Oct. 4, 1993, Ser. No. 131,184

Int. Cl.[6] G06F *11/08*

U.S. Cl. 307—115 7 Claims



1. A majority voted two fault tolerant power switch for delivering power from a system to an intended load, comprising;

a) a voter, comprising:

i) a command interface for receiving voter input commands from said system, and,

ii) two fault tolerant voting logic means for selecting a voter output as determined from a majority of said voter input commands;

b) two fault tolerant power switching means for receiving power input from said system, said power switching means being controlled by said voter output, an output from said power switching means being connected to said intended load; and,

c) testing means for receiving test signals from said system and providing test status outputs to said system of said voter and said power switching means, said testing means providing test status of specific conditions within said voter and two fault tolerant power switching means so as to monitor the status of said two fault tolerant power switch.

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**5,498,913**

## POWER SUPPLY CONTROL APPARATUS WITH A MANUALLY OPERABLE CONTROL SWITCH

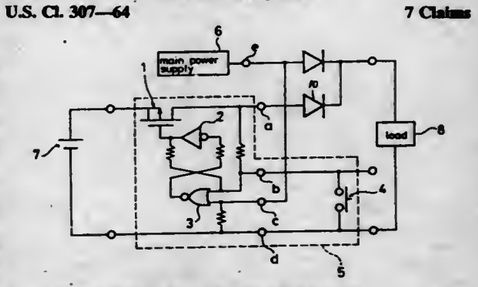
Nakanobu Moritani, Tokyo, Japan, assignor to Seikosha Co., Ltd., Tokyo, Japan

Filed Aug. 24, 1992, Ser. No. 935,077

Claims priority, application Japan, Aug. 27, 1991, 3-215412

Int. Cl.[6] H02J *7/34*

U.S. Cl. 307—64 7 Claims



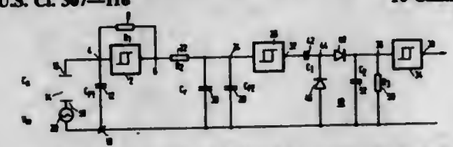

1. A power supply control apparatus comprising:

a first terminal connection for connection to a backup power supply,

a second terminal connection for connection to a main power supply,
a third terminal connection for connection to a load,
a manually operable control switch means connected between the first terminal connection and the third terminal connection,
switching means for connecting said first terminal connection to said third terminal connection, and
means for controlling said switching means to:
inhibit connection of said first terminal connection to said third terminal connection in response to operation of said manually operable control switch means in the absence of a voltage at said second terminal connection, and
connect said first terminal connection to said third terminal connection in response to the presence of a voltage at said second terminal connection, regardless of actuation of said manually operable control switch means,
said means for controlling being connected to the second terminal connection, the manually operable control switch means and the switching means.

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**5,498,914**
**CAPACITIVE SENSOR CIRCUIT**
**Jan R. De Boer, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**
**Filed Jun. 30, 1994, Ser. No. 269,795**
**Claims priority, application Belgium, Jul. 1, 1993, 09300680**
**Int. Cl.[6] H01H *36/00***
**U.S. Cl. 307—116** **10 Claims**

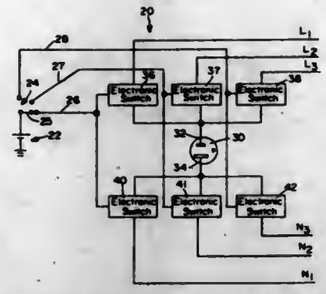


1. A capacitive sensor circuit comprising: a sensor electrode (16) forming a first plate of a sensing capacitor (14); a first inverting amplifier (2), having an input (4) connected to the sensor electrode (16) and having an output (6); a second amplifier (26), having an input (24) coupled to the output (6) of the first inverting amplifier (2) and having an output (32); a feedback resistor (8) connected between the output (6) and the input (4) of the first inverting amplifier (2), wherein a series resistor (22) is connected between the output (6) of the first inverting amplifier (2) and the input (24) of the second amplifier (26), which series resistor (22) has a resistance value substantially equal to the resistance value of the feedback resistor (8); a reference capacitor (30) is connected between the input (24) of the second amplifier (26) and a reference terminal (10), which reference capacitor (30) has a capacitance value substantially equal to a predetermined value of the capacitance of the capacitive sensor electrode (16) relative to the reference terminal (10); and wherein the first inverting amplifier (2) and the second amplifier (26) are constructed as Schmitt triggers having substantially the same low and high input threshold voltages.

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**5,498,915**
**ELECTRONICALLY SWITCHED POWER RECEPTACLE**
**Burke J. Crane, Lombard, Ill., assignor to Molex Incorporated, Lisle, Ill.**
**Filed Jun. 13, 1991, Ser. No. 714,485**
**Int. Cl.[6] H03K *17/72***
**U.S. Cl. 307—139** **14 Claims**

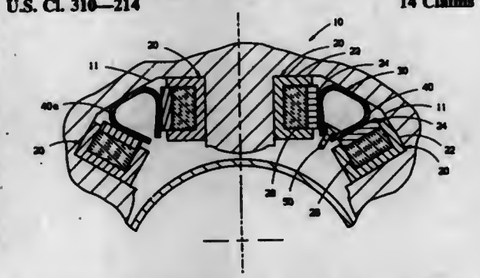
1. A power switching circuit for selectively connecting an electrical load having first and second input connections to any one of a plurality of branch power circuits, each branch circuit including a first and a second conductor defining a voltage difference therebetween, comprising:
actuating means for selecting which of said branch circuits is to be connected to said load;



first switch means electrically connected to the first conductor of each branch circuit and to said first input connection of said load for selectively electrically connecting one of said first conductors to said first input connection;
second switch means electrically connected to the second conductor of each branch circuit and to said second input connection of said load for selectively electrically connecting one of said second conductors to said second input connection; and
control means operated by said actuating means for controlling said first switch means and said second switch means to connect the respective first and second conductor of the selected branch circuit to said load first and second input connections.

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**5,498,916**
**WEDGE AND SPRING ASSEMBLY FOR SECURING COILS IN ELECTROMAGNETS AND DYNAMOELECTRIC MACHINES**
**Melvin Lindner, Huntington, and James G. Cottingham, Center Moriches, both of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.**
**Filed Feb. 23, 1994, Ser. No. 200,340**
**Int. Cl.[6] H02K *3/487***
**U.S. Cl. 310—214** **14 Claims**



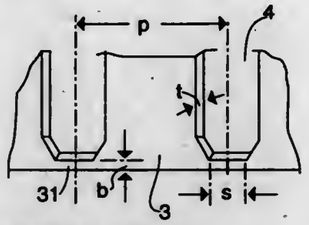
1. A wedge and spring assembly for use in electromagnets or dynamoelectric machines having a housing with an axis therethrough and a plurality of coils supported on salient poles that extend radially inward from the housing toward the housing axis to define a plurality of interpole spaces, respectively between the housing and adjacent coils, the interpole spaces each extending in a direction generally parallel to the housing axis, comprising:
at least one nonmagnetic retainer spring formed to fit into one of the interpole spaces, said retainer spring having juxtaposed ends defining between them a slit extending in a direction generally parallel to the housing axis;
at least one nonmagnetic wedge for insertion into said slit to provide an outwardly directed force on respective portions of said juxtaposed ends defining said slit to expand said slit, deforming said spring, so that respective portions of said retainer spring engage areas of the coils adjacent thereto,



thereby to resiliently hold the coils against their respective salient poles and where said deformed spring holds said wedge in place.

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**5,498,917**
**STATOR FOR MOTOR**
**Yuji Ninomiya, and Kenji Ueyama, both of Saitama, Japan, assignors to Kabushiki Kaisha Yaskawa Denki, Fukuoka, Japan**
**PCT No. PCT/JP93/01040, § 371 Date Jun. 7, 1994, § 102(e) Date Jun. 7, 1994, PCT Pub. No. WO94/02982, PCT Pub. Date Feb. 3, 1994**
**PCT Filed Jul. 26, 1993, Ser. No. 211,391**
**Claims priority, application Japan, Jul. 27, 1992, 4-220797**
**Int. Cl.[6] H02K *1/00***
**U.S. Cl. 310—216** **17 Claims**

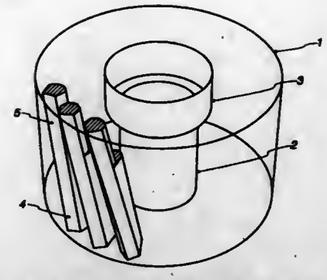


1. A stator for a motor, comprising:
a ring-shaped yoke portion iron core;
tooth portion iron cores arranged at equal intervals on an inner circumferential side of the yoke portion iron core;
stator coils fitted into slots formed between respective adjacent tooth portion iron cores;
bridging portions connecting the inner circumferential sides of the respective adjacent tooth portion iron cores; and
a rotor oppositely disposed through a gap on the inner circumferential sides of the tooth portion iron cores,
said bridging portions being substantially continuous in circumferential and axial directions and having a region of substantially uniform thickness in a radial direction,
a ratio of a length in a circumferential direction of the region to a pitch in the circumferential direction of the tooth portion iron cores being within a range of 0.01 to 0.20.

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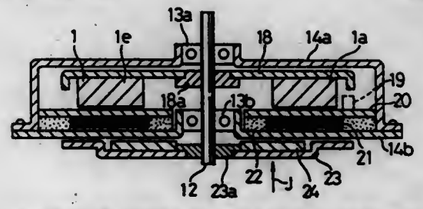
**5,498,918**
**ROTOR FOR AN ELECTRIC MACHINE**
**Niels C. Welhrauch, Lindewitt, Germany, assignor to Danfoss A/S, Nordberg, Denmark**
**PCT No. PCT/DK92/00262, § 371 Date Mar. 2, 1994, § 102(e) Date Mar. 2, 1994, PCT Pub. No. WO93/05563, PCT Pub. Date Mar. 18, 1993**
**PCT Filed Sep. 3, 1992, Ser. No. 204,219**
**Claims priority, application Denmark, Sep. 9, 1991, 1573/91**
**Int. Cl.[6] H02K *1/22***
**U.S. Cl. 310—261** **7 Claims**

1. A rotor for an electric machine, especially for a motor for a hermetical refrigerating compressor, the rotor including a core of magnetically conductive material having a central spindle hole and having a number of axially extended slots filed with an electrically conductive material for formation of electric conductors in the rotor, and including short-circuiting rings for short-circuiting the conductors, the spindle hole having at least two different internal diameters, the improvement comprising the axially extended slots having varying profiles in their longitudinal direction with a sectional area of the slots being smaller where the sectional area of the spindle hole is larger, and being larger where the sectional area of the spindle hole is smaller, and said slots having a width in a direction towards center which is reduced in a part of the rotor where the spindle hole has a larger internal diameter.



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**5,498,919**
**FLAT CORE-LESS DIRECT-CURRENT MOTOR**
**Itsuki Bahn, Tokyo, Japan, assignor to Secoh Giken Inc., Tokyo, Japan**
**Filed Feb. 10, 1993, Ser. No. 971,985**
**Claims priority, application Japan, Jul. 11, 1991, 3-264265; Aug. 16, 1991, 3-289062; Aug. 20, 1991, 3-291021; Nov. 19, 1991, 3-354145; Dec. 5, 1991, 3-357475**
**Int. Cl.[6] H02K *1/22***
**U.S. Cl. 310—268** **5 Claims**



1. A 3 phase flat brushless and core-less direct-current motor of axial gap type comprising a plane stationary armature, a magnetic rotor including an annular field magnet with 2n N and S poles where n is even number and an armature current control device for controlling armature current by detecting the positions of field magnet poles of the magnetic rotor characterized in that
plural fan-shaped and flatly-wound armature coils in which an included angle are constituted by each of their coil portions effective for producing a torque is nearly equal to that of the poles of magnetic rotor,
a flat annular magnet body made of silicon steel of about 0.1 mm or less in thickness rolled thinly and coiled spirally,
an annular stationary armature constituted by the (½) n armature coils arranged at equal pitches with their outside surfaces made radial and so that they do not lap over each other, the annular magnetic body to which the armature coils are fixed, wirings among the armature coils with their terminals lead out and plastic in which they are buried,
a means for connecting a wiring to the said annular stationary armature after fixing it on a printed board of a steel base with wirings, and
a shaft which is supported by bearings set in a central portion of a stationary rotor so that it rotates freely and fixed to the magnetic rotor with its pole surface facing the armature coils with a small gap therebetween, first, second and third Hall elements set on contact surfaces and near circumferences of the armature coils arranged in contact with the stationary armature and a pole position detection device for obtaining the first position detection signals of rectangular wave of 180 degrees in electrical angle in breadth at intervals of equal angle followed by second position detection signals of the same wave with a phase delay of 120 degrees in electrical

angle from first ones at intervals of equal angle in turn and next by third position detection signals of the same wave with a phase delay of 120 degrees in electrical angle from second ones at intervals of equal angle in turn through the detection of the positions of the magnetic rotor poles by the first, the second and the third Hall elements.

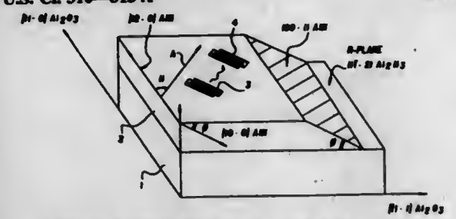
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**5,498,920**

## ACOUSTIC WAVE DEVICE AND PROCESS FOR PRODUCING SAME

**Hiroshi Okano; Naoki Tanaka; Kenichi Shibata, and Yusuke Takahashi, all of Moriguchi, Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan**

**Filed May 5, 1994, Ser. No. 238,653**
**Claims priority, application Japan, May 18, 1993, 5-115834**
**Int. Cl.[6] H01L *41/08***
**U.S. Cl. 310—313 A** **4 Claims**



1. A surface acoustic wave device, comprising:
a sapphire substrate having an R-plane; and
an aluminum nitride thin film,
wherein said aluminum nitride thin film is formed on the R-plane of said sapphire substrate,
wherein the [00.1] axis of the aluminum nitride thin film is tilted with respect to a normal to the substrate, and
wherein a propagation direction of surface acoustic waves is tilted with respect to the [11.0] axis of the sapphire substrate.

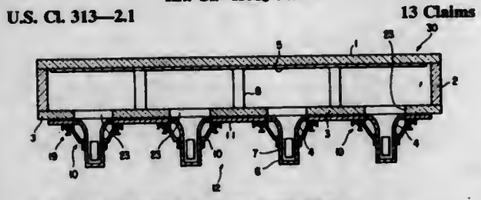
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**5,498,921**

## CATHODE RAY TUBE APPARATUS AND METHOD OF MANUFACTURING THE SAME

**Takashi Nishimura; Kazuyuki Seino; Yuuji Haraguchi, and Eiji Kamohara, all of Fukaya, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Continuation of Ser. No. 49,316, Apr. 21, 1993, abandoned. This application Apr. 13, 1995, Ser. No. 421,282**
**Claims priority, application Japan, Apr. 21, 1992, 4-100023; Mar. 16, 1993, 5-056182**
**Int. Cl.[6] H01J *31/00***
**U.S. Cl. 313—2.1** **13 Claims**



1. A cathode ray tube apparatus comprising:
a vacuum envelope having a substantially rectangular first plate and a substantially rectangular second plate, said second plate located substantially parallel to said first plate;
a phosphor screen formed on an inner surface at said first plate;
a plurality of electron gun assemblies, each for emitting at least one electron beam to said phosphor screen; and
deflecting means attached to said vacuum envelope for deflecting said electron beams emitted from said electron gun assemblies, said deflecting means including:
a plurality of elemental deflection units, each of which corresponds to one electron gun assembly in said plurality of electron gun assemblies for deflecting said at least one electron beam emitted by that electron gun assembly so that said plurality of electron gun assemblies in conjunction with said plurality of elemental deflection using scan said electron beams across said phosphor screen dividedly, and
coupling means for coupling at least two of said elemental deflection units associated with separate electron gun assemblies to one another.

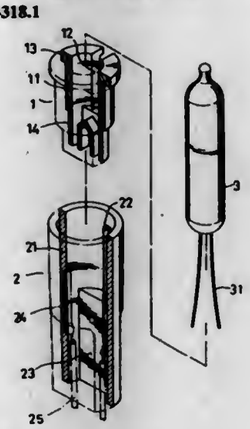
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**5,498,922**

## UNLOOSABLE AND UNTURNABLE ELECTRIC LAMP BASE SYSTEM

**Chiang-Hsi Chang, No. 24-2, Ta-I Li, Chu-Pei Shih, Hsin-Chu Hsien, Taiwan, Prov. of China**

**Filed Oct. 25, 1994, Ser. No. 328,440**
**Int. Cl.[6] H01R *33/00***
**U.S. Cl. 313—318.1** **1 Claim**



1. A lamp base system, comprising:
a longitudinally extended lamp base member having an upper cylindrically shaped wall defining a longitudinally directed central cavity, said cylindrical wall having a predetermined outer diameter and an annular flange extending around said central cavity formed at an upper edge thereof, said lamp base member having a plurality of radially equidistantly spaced slotted openings formed through said cylindrical wall, each of said plurality of slotted openings extending longitudinally through said annular flange to define elastic wall portions extending between said plurality of slotted openings;
a lamp disposed within said cavity; and,
a socket member having a cylindrical wall defining a central longitudinally directed opening for receiving said lamp base member therein, said cylindrical wall of said socket member having a plurality of radially equidistantly spaced ribs extending inwardly from an inner surface thereof for engaging respective elastic wall portions, said plurality of inwardly extending ribs defining opening having a diameter less than said predetermined outer diameter of said lamp base member cylindrical wall for displacing said elastic wall portions to clampingly secure said lamp within said cavity of said lamp base member and to secure said lamp base member within said central opening of said socket member.

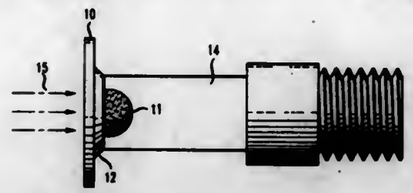


**5,498,923**

## FLUORESCENCE IMAGING

**Bruno M. La Fontaine, East Quogue, N.Y.; Donald L. White, Morris Plains, and Obert R. Wood, II, Little Silver, both of N.J., assignors to AT&T Corp., Murray Hill, N.J.**

**Filed Jan. 5, 1994, Ser. No. 177,500**
**Int. Cl.[6] H01J *29/20***
**U.S. Cl. 313—467** **14 Claims**



1. Apparatus providing for conversion of an initial image, defined by electromagnetic radiation of energy greater than that of electromagnetic radiation of a wavelength of 0.26 μm, into a converted image defined by electromagnetic radiation of wavelength longer than 0.26 μm, in which the initial image is made incident on a first surface of a fluorescent element, so as to produce a converted image by fluorescence, and in which the convened image is focused by a first lens element,
CHARACTERIZED IN THAT
the fluorescent element is a single crystal of an inorganic composition containing a fluorescent substituent atom and in that the fluorescent element is refractive-index-matched to the first lens element.

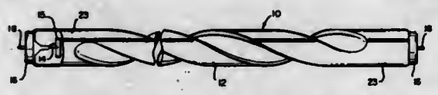
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**5,498,924**

## FLUORESCENT LAMP CAPABLE OF OPERATING ON MULTIPLE BALLAST SYSTEM

**Donald P. Northrop, Glen Rock, N.J., assignor to Duro-Test corp., Fairfield, N.J.**

**Continuation of Ser. No. 87,518, Jul. 2, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 486,742**
**Int. Cl.[6] H01J *63/04***
**U.S. Cl. 313—486** **17 Claims**



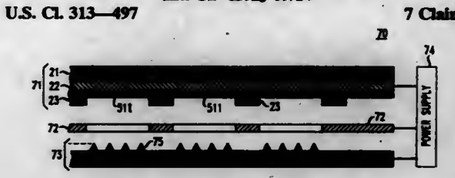
1. A single fluorescent lamp having electrical voltages and wattage characteristics making it suitable for operation with both T8 and T12 electronic ballasts and T8 electromagnetic ballasts comprising:
an elongated envelope of T10 diameter dimension with an electrode at each end having an energizing voltage from the ballast,
at least one groove in said envelope to reduce its overall cross-sectional dimension in the area where the groove exists and to react with the lamp arc stream discharge to increase the T10 envelope wattage loading and lamp voltage,
a quantity of mercury within said envelope,
a fill gas of neon and argon within said envelope with the quantity of neon being sufficient to further raise the operating voltage of the T10 envelope, and
a blend of phosphors on the internal wall of said envelope reacting with the arc stream discharge of the ionized mercury for producing visible light as the lamp operates on any one of a T8 or T12 electronic ballast or T8 electromagnetic ballast.

**5,498,925**

## FLAT PANEL DISPLAY APPARATUS, AND METHOD OF MAKING SAME

**Randall F. Bell, Phillipsburg; Gregory P. Kochanski, Dunellen, and John Thomson, Jr., Spring Lake, all of N.J., assignors to AT&T Corp., Murray Hill, N.J.**

**Continuation of Ser. No. 57,946, May 5, 1993, abandoned. This application May 19, 1995, Ser. No. 446,095**
**Int. Cl.[6] H01J *19/24***
**U.S. Cl. 313—497** **7 Claims**



1. Multi-pixel flat panel field emission cathodoluminescent display means comprising
a) spaced apart first and second electrode means;
b) means for selectively applying an electrical signal to said electrode means;
c) gate means between said first and second electrode means; wherein the display means further comprise
d) a patterned layer of a first solid material in contact with one of said first and second electrode means, said patterned layer comprising a multiplicity of apertures, said first solid material being consolidated slurry material comprising conductive particles; and
e) a quantity of a second solid material disposed in at least one of said apertures, said second solid material being cathodoluminescence material.

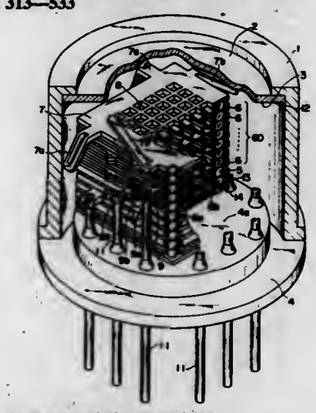
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**5,498,926**

## ELECTRON MULTIPLIER FOR FORMING A PHOTOMULTIPLIER AND CASCADE MULTIPLYING AN INCIDENT ELECTRON FLOW USING MULTILAYERD DYNODES

**Hiroyuki Kyushima; Koji Nagura; Yutaka Hasegawa; Eiichiro Kawano; Tomihiko Kuroyanagi; Akira Atsumi, and Masuya Mizukle, all of Hamamatsu, Japan, assignors to Hamamatsu Photonics K.K., Hamamatsu, Japan**

**Filed Apr. 28, 1994, Ser. No. 234,142**
**Claims priority, application Japan, Apr. 28, 1993, 5-102898**
**Int. Cl.[6] H01J *43/22;43/04***
**U.S. Cl. 313—533** **51 Claims**



1. An electron multiplier comprising:
an anode plate for supporting at least one anode;
a dynode unit provided in front of said anode plate through insulating members and formed by stacking a plurality of

stages of dynode plates, spaced apart from each other at predetermined intervals through insulating members in an incident direction of electrons such that a last-stage dynode plate of said dynode unit opposes in parallel said anode plate, each dynode plate adapted to support at least one dynode for cascade-multiplying the incident electrons; and

a plurality of connecting pins, each adapted to be connected to one of said dynode plates for applying a desired potential thereto, wherein

each of said dynode plates having an engaging member adapted to be engaged with a corresponding one of said connecting pins and projecting from a predetermined portion of a side surface thereof in parallel to the incident direction of said electrons, and said predetermined portions of said dynode plates adjacent to each other do not cause said engaging members to overlap each other in a stacking direction of said dynode plates.

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**5,498,927**

## LOW-PRESSURE SODIUM DISCHARGE LAMP HAVING SEALED CURRENT CONDUCTORS WITH FIRST AND SECOND GLASS COATING

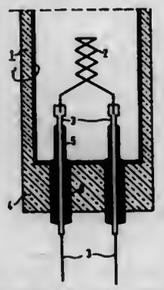
**Karel R. Vervecken, Turnhout, Belgium, and Petrus M. G. Van Gennip, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Apr. 28, 1994, Ser. No. 233,907**

**Claims priority, application European Pat. Off., May 3, 1993, 93201256**

**Int. Cl.[6] H01J** *17/18*

**U.S. Cl. 313—623** **11 Claims**



1. A low-pressure sodium discharge lamp, comprising:

a lime glass discharge vessel which is sealed in a vacuumtight manner and has a filling comprising sodium and rare gas;

electrodes arranged in the discharge vessel and each connected to at least one respective current conductor which issues to the exterior through a respective pinched seal, wherein the current conductors each have a first coating of borate glass which extends from the relevant pinched seal to inside the discharge vessel, and in contact with said coating a second, lime glass coating which extends to outside the discharge vessel; and

an outer bulb which surrounds the discharge vessel,

characterized in that the first coating extends through the entire pinched seal and is enveloped by the second coating in the pinched seal.

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**5,498,928**

## ELECTRODELESS HIGH INTENSITY DISCHARGE LAMP ENERGIZED BY A ROTATING ELECTRIC FIELD

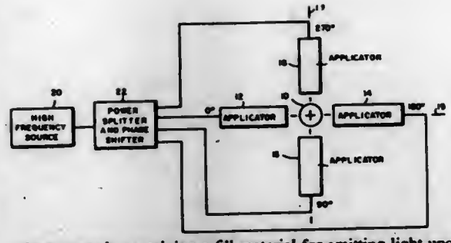
**Walter P. Lapatovich, Marlborough; Scott J. Butler, North Oxford, both of Mass., and Jason R. Bochinski, Springfield, Oreg., assignors to Osram Sylvania Inc., Danvers, Mass.**

**Filed May 24, 1994, Ser. No. 248,921**

**Int. Cl.[6] H05B** *41/24*

**U.S. Cl. 315—39** **21 Claims**

21. An electrodeless high intensity discharge lamp comprising:




a lamp capsule containing a fill material for emitting light upon excitation by high frequency electromagnetic energy, said fill material comprising a starting gas at a pressure in the range of 1 to 760 torr and a volatilizable material for producing a light emitting discharge;

four electric field applicators positioned adjacent to said lamp capsule and equally spaced at 90° intervals with respect to a center of said lamp capsule for nonresonant coupling of said high frequency electromagnetic energy to said lamp capsule; and

a power splitter and phase shifter for receiving said high frequency electromagnetic energy from a source and for coupling said high frequency electromagnetic energy to said applicators, said power splitter and phase shifter including means for supplying said high frequency electromagnetic energy to those of said applicators on opposite sides of said lamp capsule at 180° out of phase and for supplying said high frequency electromagnetic energy to adjacent ones of said applicators at 90° out of phase such that a non-propagating net electric field applied to said lamp capsule by said applicators in response to said high frequency electromagnetic energy rotates at the frequency of said high frequency electromagnetic energy.

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**5,498,929**

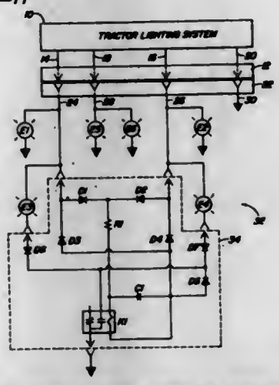
## VEHICLE LIGHTING ENHANCEMENT SYSTEM

**Charles W. Formwalt, Jr., Janesville, Iowa, assignor to Deere & Company, Moline, Ill.**

**Filed Jul. 10, 1995, Ser. No. 500,292**

**Int. Cl.[6] B60Q** *1/00*

**U.S. Cl. 315—77** **8 Claims**




1. A towed vehicle lighting system for enhancing a lighting system of a towed machine, the towed machine lighting system having a first conductor for connecting to a left turn signal lamp conductor of a towing vehicle, a second conductor for connecting to a right turn signal lamp conductor of a towing vehicle, a left brake lamp connected to the first conductor and for mounting on a left portion of the towed machine, a right brake lamp connecting to the second conductor and for mounting on a right portion of the towed machine, and a control circuit comprising:



a first diode having an anode connected to the first conductor;

a second diode having an anode connected to the second conductor and having a cathode connected to a cathode of the first diode;

a third diode having a cathode connected to the anode of the first diode;

a fourth diode having a cathode connected to the anode of the second diode and having a cathode connected to an anode of the third diode;

a fifth diode having an anode and a cathode;

a sixth diode having a cathode connected to the cathode of the fifth diode and having an anode connected to the left brake lamp;

a seventh diode having a cathode connected to the cathodes of the fifth and sixth diodes and having an anode connected to the right brake lamp; and

a relay having a pair of normally open contacts, one of which is grounded and the other of which is connected to the cathodes of the fifth, sixth and seventh diodes and having a relay coil connected between the cathodes of the first and second diodes and the anodes of the third, fourth and fifth diodes, the control circuit having a transport operational mode wherein both amber lamps are simultaneously flash on and off at a certain rate while the brake lamps are off, and the control circuit having a turning operational mode wherein the brake lamp indicative of a turning direction flashes at a rate which is faster than said certain rate and wherein the brake lamp not indicative of the turning direction remains steadily on.

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**5,498,930**

## METHOD OF DIMENSIONING AND OPERATING A LOW PRESSURE DISCHARGE LAMP

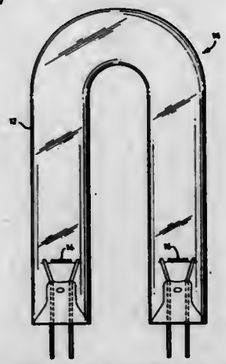
**Helmut M. Loy, Torreglia, Italy; Sigurd Kohler, Höchstadt, and Armin Eich, Erlangen, both of, Germany, assignors to GTE Products Corporation, Danvers, Mass.**

**PCT No. PCT/EP89/00063, § 371 Date Jun. 10, 1993, § 102(e) Date Jun. 10, 1993, PCT Pub. No. WO90/08399, PCT Pub. Date Jul. 26, 1990**

**PCT Filed Jan. 20, 1989, Ser. No. 730,951**

**Int. Cl.[6] H05B** *39/00*

**U.S. Cl. 315—97** **3 Claims**



1. Method of dimensioning and operating by A.C. or D.C. at a predetermined external heater power a low pressure discharge lamp, particularly a fluorescent lamp having two electrodes between which the discharge is formed, at least one of the electrodes being alkaline earth oxide coated and adapted to form a permanently heated cathode, characterized in that an external heater current is used which is approximately 1.5 to 5 times higher than the discharge current, that the heater voltage is approximately 33.33% to 80% lower than that of a conventionally operated cathode or electrode, respectively, and that the wattage of the heater circuit is maintained.

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**5,498,931**

## METHOD FOR AUTOMATIC SWITCHING AND CONTROL OF LIGHTING

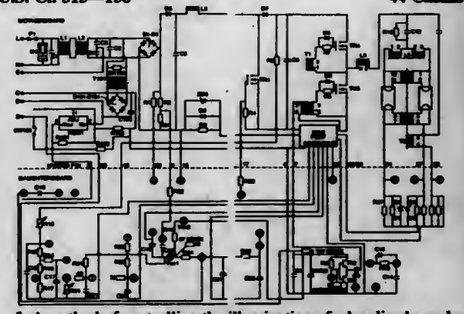
**Lou Bedocs, Hertfordshire, England, assignor to TLG plc, Borehamwood, England**

**Continuation-in-part of Ser. No. 899,598, Jun. 18, 1992, abandoned, which is a continuation of Ser. No. 668,269, Mar. 11, 1991, abandoned. This application Oct. 3, 1994, Ser. No. 316,963**

**Claims priority, application United Kingdom, Mar. 10, 1990, 9005454**

**Int. Cl.[6] H05B** *37/02*

**U.S. Cl. 315—158** **44 Claims**



1. A method of controlling the illumination of a localized area by a light source in a self-contained light fitting proximally located to said localized area, comprising the steps of:

sensing from the fitting for the presence of a living being, such as a person, in the localized area;

sensing from the fitting the light intensity in said localized area; and

automatically controlling said light source by:

switching said light source from a first low luminous condition to a high luminous condition when a presence is sensed in the localized area and the sensed light intensity in the localized area is less than a predetermined turn-on intensity;

adjusting said light source when in the high luminous condition between minimum and maximum light output levels in response to the light intensity sensed in said localized area to maintain a substantially constant target light intensity in the localized area; and

switching said light source from the high to the first low luminous condition when no presence is seased in said localized area for a first predetermined amount of time, or to a second low luminous condition when the sensed light intensity increases to at least a predetermined turn-off intensity for a second predetermined amount of time of at least about two minutes.

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**5,498,932**

## DRIVE VOLTAGE GENERATING CIRCUIT HAVING A CONTRAST CONTROL FUNCTION

**Yasuhiro Shin, and Takashi Hamamoto, both of Tokyo, Japan, assignors to OKI Electric Industry Co., Ltd., Tokyo, Japan**

**Filed Aug. 29, 1994, Ser. No. 297,120**

**Claims priority, application Japan, Sep. 3, 1993, 5-219858**

**Int. Cl.[6] G09G** *3/10*

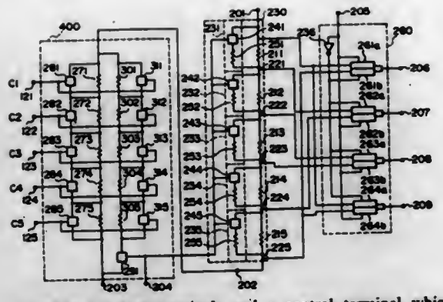
**U.S. Cl. 315—169.3** **22 Claims**

1. A drive voltage generating circuit comprising:

a plurality of drive output terminals for outputting drive signals having a plurality of drive voltage levels respectively;

a bias circuit having a first voltage terminal to be applied to a first voltage and a second voltage terminal to be applied to a second voltage, said bias circuit producing a plurality of voltage signals having the drive voltage levels respectively;

a switching circuit having a plurality of input terminals coupled to said bias circuit, a plurality of output terminals coupled to



said drive output terminals and a control terminal which receives a first control signal; and

a bias potential control circuit coupled between the second voltage terminal and a third voltage terminal to be applied to a third voltage, said bias potential control circuit including,

a first voltage control circuit controlling a resistance value between the second and third voltage terminals in response to a plurality of contrast data signals, and

a second voltage control circuit controlling the resistance value between the second and third voltage terminals in response to a second control signal.

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**5,498,933**

**LIGHTING DEVICE AND METHOD APPLYING A RELATIVELY HIGHER POTENTIAL TO LIGHT SOURCE SURROUNDINGS**

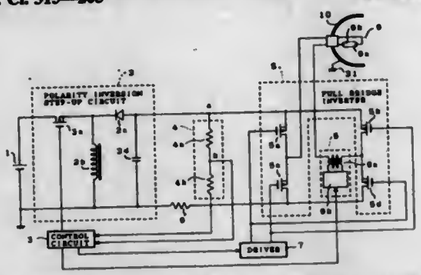
**Kenji Nakamura, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 176,227, Jan. 3, 1994, abandoned. This application Jan. 15, 1995, Ser. No. 483,837**

**Claims priority, application Japan, Jan. 5, 1993, 5-015932**

**Int. Cl.[6] H05B *41/14*; B60Q *1/02***

**U.S. Cl. 315—205** **24 Claims**



1. A lighting device of a discharge lamp for vehicles, comprising:

step-up means for enlarging an absolute value of an input DC voltage and outputting a DC voltage;

voltage conversion means for inputting the DC voltage from said step-up means and converting the DC voltage into an AC voltage to light the discharge lamp with an AC lighting potential and supplying the AC lighting potential to the discharge lamp which is enclosed in a lighting tool;

starting discharge means for generating a high voltage pulse to start said discharge lamp, and

potential setting means for setting a potential of the lighting tool to a prescribed value, wherein said step-up means outputs the input DC voltage so that a mean lighting potential of the discharge lamp becomes less than said prescribed value.

**5,498,934**

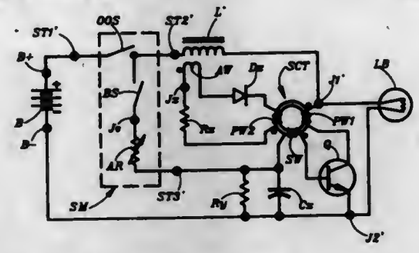
**ELECTRONIC FLASHLIGHT**

**Ole K. Nilssen, 408 Caesar Dr., Barrington, Ill. 60010**

**Continuation of Ser. No. 652,378, Feb. 7, 1991, abandoned, which is a continuation of Ser. No. 410,745, Sep. 22, 1989, abandoned. This application Sep. 7, 1994, Ser. No. 301,731**

**Int. Cl.[6] H05B *37/02***

**U.S. Cl. 315—224** **11 Claims**



1. A flashlight comprising:

battery means;

lamp means; and

control means connected in circuit between the battery means and the lamp means; the control means having a manual adjust means via which it is functional to cause the lamp means to be controllably powered from the battery means; the manual adjust means being characterized by having at least three manually setable positions: (i) an OFF-position in which substantially no power is supplied to the lamp means, (ii) an ON-position in which an ordinary level of power is supplied to the lamp means, and (iii) a BOOST-position in which an extraordinary high level of power is supplied to the lamp means; the BOOST-position being characterized by automatically reverting to the ON-position or the OFF-position, except if continuously being provided with an input to hold it in the BOOST-position.

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**5,498,935**

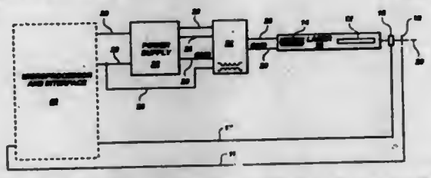
**LASER FLASH LAMP CONTROL SYSTEM**

**William H. McMahan, P.O. Box 636, 14966 State Hwy. 410, Robertson, Wyo. 82944, and Kevin W. Gordon, American Fork, Utah, assignors to William H. McMahan, Robertson, Wyo.**

**Filed Nov. 12, 1993, Ser. No. 152,180**

**Int. Cl.[6] H05B *37/00***

**U.S. Cl. 315—241 P** **38 Claims**



1. An apparatus for controlling the current delivered to a flash lamp, the apparatus comprising:

supply means for providing a first voltage, the first voltage being at least as great as 200 volts and for supplying a firing voltage, the firing voltage being at least as great as 400 volts DC;

capacitive means, connected to the supply means, for storing electrons;

means for stepping up the firing voltage to a voltage at least as great as 10,000 volts DC;

control means for determining when the flash lamp should be turned on and turned off, the control means generating a control signal; and



switching means for electrically connecting the capacitive means to the flash lamp, the switching means providing an output which is substantially a square wave having a plateau voltage, the switching means limiting the value of the current passing through the flash lamp to substantially a predetermined value and the length of the square wave being adjustable in accordance with the control signal such that the length of the time which the flash lamp is illuminated can be precisely adjusted and the current passing through the flash lamp is limited to a desired value.

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**5,498,936**

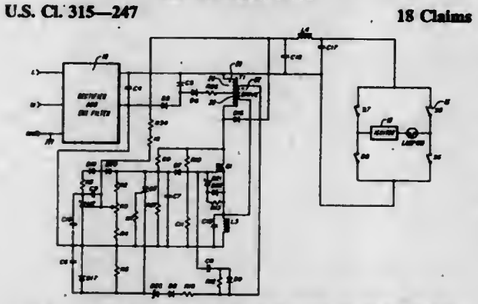
**POWER SYSTEM WITH SIMPLIFIED, LOW COST SELF-STARTING SELF OSCILLATOR, POWER FACTOR CORRECTION, POWER REGULATION AND OUTPUT OPEN CIRCUIT VOLTAGE REGULATION, OVERLOAD AND SHORT CIRCUIT PROTECTION**

**Jerry J. Smith, 99 Brainard Rd., Westbrook, Conn. 06498**

**Filed Mar. 31, 1995, Ser. No. 414,284**

**Int. Cl.[6] H05B *37/02***

**U.S. Cl. 315—247** **18 Claims**



1. A power system receiving an input signal including an alternating input line voltage and alternating input line current and having a filter and rectifier filtering and rectifying said alternating input line voltage and said alternating input line current to generate a filtered rectified signal, said power system processing said filtered rectified signal to provide a substantially constant power output to a load, said system comprising:

oscillator circuitry receiving said filtered rectified signal, said oscillator circuitry including a first charge device, a second charge device, a switching device and an inductive device having a primary portion and a drive portion, said primary portion including a first inductive portion and a second inductive portion, said first charging device storing energy from said filtered rectified signal and controlling said switching device to alternately turn said switching device on and off, with said switching device in an on state power output to said load is provided by said second charge device and with said switching device in an off state power output to said load is provided by said primary portion of said inductive device while said first charge device and said second charge device recharge; and

power factor correction circuitry including a storage device (C5) providing energy to said oscillator circuitry during a portion of said alternating input line voltage, said storage device receiving energy during another portion of the alternating input line voltage in accordance with a ratio of windings of said first inductive portion and said second inductive portion of said primary portion of said inductive device,

energy stored by said storage device and available to said oscillator circuitry is optimizable for a different range of said alternating input line voltage by adjusting said ratio of windings of said first inductive portion and said second inductive portion of said primary portion of said inductive device in accordance with said different range of said alternating input line voltage.

**5,498,937**

**ELECTRODELESS HIGH-PRESSURE DISCHARGE LAMP HAVING COIL SUPPORTS OF ALUMINUM NITRIDE SUPPORTING INDIVIDUAL COIL TURNS**

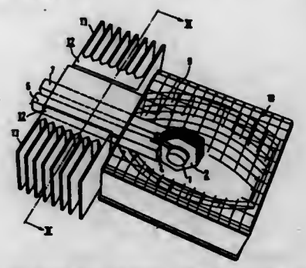
**Achim Körber, Kerkrade, and Johannes A. J. M. Van Vliet, Eindhoven, both of, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Feb. 9, 1994, Ser. No. 193,971**

**Claims priority, application European Pat. Off., Feb. 16, 1993, 93200429.4**

**Int. Cl.[6] H05B *41/16***

**U.S. Cl. 315—248** **28 Claims**



1. An electrodeless high-pressure discharge lamp, comprising:

a light-transmitting lamp vessel closed in a vacuum tight manner and having an ionizable filling;

an electric coil disposed around the lamp vessel, and having turns along a plane through the lamp vessel, said coil having end portions;

current conductors electrically connected to said end portions; and

a coil support supporting each of said coil turns, said coil support comprising aluminum nitride and being in thermal contact with each of said coil turns.

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**5,498,938**

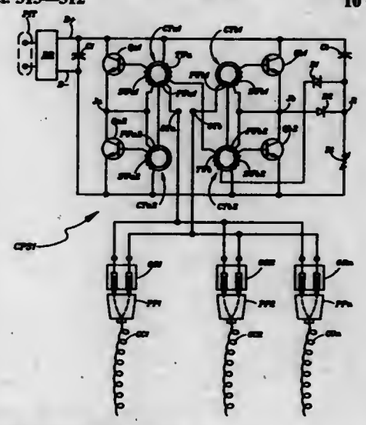
**HIGH-EFFICACY INCANDESCENT LIGHTING SYSTEM**

**Ole K. Nilssen, 408 Caesar Dr., Barrington, Ill. 60010**

**Continuation of Ser. No. 832,642, Feb. 25, 1986. This application Feb. 9, 1995, Ser. No. 386,186**

**Int. Cl.[6] H05B *37/02***

**U.S. Cl. 315—312** **10 Claims**



1. An arrangement comprising:

plural frequency-converting central power supplies mounted some distance apart on a ceiling, the plural central power supplies being supplied by a single branch circuit of an ordinary electric utility power line; each power supply having

plural separate power output receptacles and being operative to provide a high-frequency AC voltage at each of said plural separate power output receptacles;

for each one central power supply, a group of lighting fixtures mounted in supported relationship to the ceiling and located proximate to the one central power supply, each one fixture being connected with one of the power output receptacles of the most proximate central power supply in such manner that only a single fixture is connected with each separate power output receptacle;

such that each lighting fixture is powered individually and separately directly from a given output receptacle of the nearest central power supply, thereby minimizing the distances that power has to be transmitted from each central power supply; each of which distances is substantially shorter than 100 feet.

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**5,498,939**

## DEFLECTION YOKE AND CATHODE RAY TUBE HAVING THE SAME

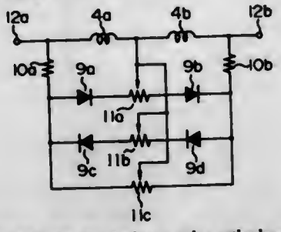
**Kooji Fukuma; Soichi Sakurai; Nobutaka Okuyama, all of Yokohama; Yoshio Satoh, Ichinomiyamachi, and Yoshihiro Obara, Mizusawa, all of, Japan, assignors to Hitachi, Ltd., and Hitachi Mizusawa Electronics Co., Ltd., both of, Japan**

**Filed Jan. 9, 1995, Ser. No. 370,313**

**Claims priority, application Japan, Jan. 19, 1994, 6-003861**

**Int. Cl.[6] H01J** *29/56*

**U.S. Cl. 315—370** **4 Claims**




1. A deflection yoke attached to a color cathode ray tube which forms multiple electron beams arranged in line, said deflection yoke comprising:

a first terminal;

a second terminal;

a pair of vertical deflection coils respectively disposed on a left side and a right side of said color cathode ray tube so as to sandwich said color cathode ray tube, said pair of vertical deflection coils being connected in series between said first terminal and said second terminal;

a first variable resistor having a variable terminal connected to a junction between said pair of vertical deflection coils;

a first diode connected between said first terminal and a first end of said first variable resistor;

a second diode connected between a second end of said first variable resistor and said second terminal, a series combination of said first diode, said first variable resistor and said second diode being connected between said first terminal and said second terminal so as to have a same polarity in said first diode and said second diode;

a second variable resistor having a variable terminal connected to the junction between said pair of vertical deflection coils;

a third diode connected between said first terminal and a first end of said second variable resistor;

a fourth diode connected between a second end of said second variable resistor and said second terminal, a series combination of said third diode, said second variable resistor and said fourth diode being connected between said first terminal and said second terminal so as to be parallel with said series combination of said first diode, said first variable resistor and said second diode and so as to have polarity directions opposite to those of said first and second diodes as polarity directions of said third and fourth diodes;

a first resistor having a first end connected to said first terminal and having a second end connected to a junction between said first diode and said third diode;

a second resistor having a first end connected to said second terminal and having a second end connected to a junction between said second diode and said fourth diode;

a third variable resistor having a variable terminal connected to the junction between said pair of vertical deflection coils, said third variable resistor being connected between said second end of said first resistor and said second end of said second resistor, in parallel with said series combination of said first diode, said first variable resistor and said second diode, and with said series combination of said third diode, said second variable resistor and said fourth diode; and

a vertical deflection current being let flow from said first terminal to said second terminal in order to deflect said electron beams to an upper part of a screen and let flow from said second terminal to said first terminal in order to deflect said electron beams to a lower part of a screen.

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**5,498,940**

## METHODS AND APPARATUS FOR MAINTAINING A CONSTANT TENSION ON AN ELECTRICAL CORD OF A ROBOT

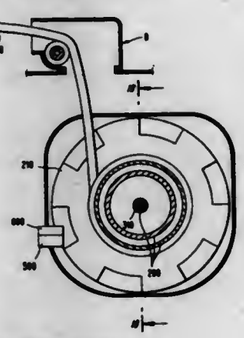
**Ji-Hyun Kim, Seoul; Suk-Jin Han, Suwon, and Jae-Bong Lee, Seoul, all of, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea**

**Filed Dec. 30, 1993, Ser. No. 175,536**

**Claims priority, application Rep. of Korea, Dec. 30, 1992, 92-26640; Feb. 18, 1993, 93-2233**

**Int. Cl.[6] B65H** *59/38*

**U.S. Cl. 318—6** **10 Claims**




1. A self-propelled member, comprising:

a body;

a spool mounted on said body for rotation;

an electric power cord wound on said spool for extension and retraction in response to rotation of said spool in respective directions;

a spring connected to said spool biasing said spool for rotation in a direction for retracting said cord;

sensor means for sensing whether said cord is being extended or retracted and the extent of such extension or retraction;

motor means connected to said spring and operated by said sensor for displacing said spring in a spring-tightening direction and a spring-relaxing direction in response to retraction and extension, respectively, of said cord by an amount proportional to the sensed extent of cord extension or retraction for maintaining a generally constant tension on said cord; and

a shaft arranged coaxially with respect to an axis of rotation of said spool, said spring comprising a spiral plate having an inner end affixed to said shaft and an outer end affixed to said spool, said motor connected to said shaft for rotating said shaft to relax or tighten said spring.



**5,498,941**

## SPEED CONTROL DEVICE USED FOR ELECTRIC AUTOMOBILES AND METHOD THEREFOR

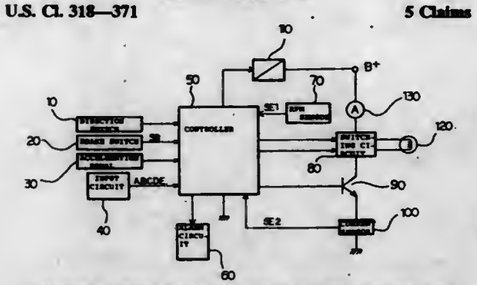
**Chang-Soo Kim, Seo-Ku, Rep. of Korea, assignor to Samsung Heavy Industry Co., Ltd., Rep. of Korea**

**Filed Oct. 14, 1994, Ser. No. 323,145**

**Claims priority, application Rep. of Korea, Dec. 22, 1993, 1993-29100**

**Int. Cl.[6] H02P** *3/16*

**U.S. Cl. 318—371** **5 Claims**




1. A speed control device having a mechanical brake and a motor, comprising:

an input circuit for setting an electric brake request value associated with the RPM (revolution per minute) of said motor, a maximum speed value, an electric brake limit value and a maximum current value of said motor;

an RPM sensing circuit for sensing the current RPM of said motor to generate an RPM sensing signal;

a current sensing circuit for sensing the current flow in said motor to generate a current sensing signal; and

a controller for comparing the input values set by said input circuit with said RPM sensing signal and said current sensing signal to provide a motor driving means with a control signal;

whereby said controller performs an electric auxiliary brake in addition to the mechanical brake.

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**5,498,942**

## ELECTRONIC PACKAGING APPARATUS

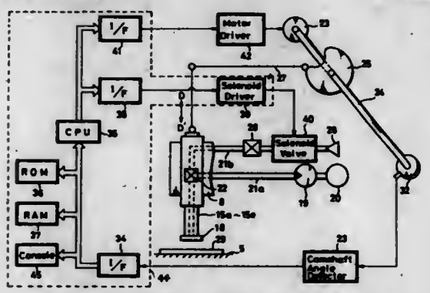
**Kenichi Ijuin, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Filed May 31, 1994, Ser. No. 251,377**

**Claims priority, application Japan, May 31, 1993, 5-129800**

**Int. Cl.[6] H05K** *13/04*

**U.S. Cl. 318—567** **14 Claims**




1. A packaging apparatus for mounting a component on a component support medium, comprising:

component mounting means for holding and placing a component on a component support medium in a predetermined mounting cycle;

positional information detecting means for detecting drive position information of said component mounting means when or after the component is placed on the component support medium;

variable time adjusting means for adjusting a time until said component mounting means starts releasing the component or starts holding the component based on the drive position information detected by said positional information detecting means; and

a camshaft for actuating said component mounting means, said drive position information comprising angular displacement information of said camshaft.

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**5,498,943**

## FEEDBACK CONTROL DEVICE

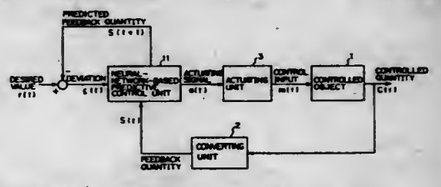
**Takashi Kimoto; Daiki Masumoto; Hiroshi Yamakawa, and Shigemi Nagata, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Filed Aug. 30, 1993, Ser. No. 113,110**

**Claims priority, application Japan, Jan. 20, 1992, 4-281284**

**Int. Cl.[6] G05B** *13/02*

**U.S. Cl. 318—601** **13 Claims**




1. A feedback control device comprising:

converting means for converting a controlled quantity output from a controlled object to a feedback quantity at a first control time comparable with a desired value;

predictive control means comprising a layered neural network and responsive to said feedback quantity, for generating a predicted feedback quantity at a second control time, back propagating a difference between said predicted feedback quantity and said desired value toward an input side of said layered neural network using a relaxation algorithm, and producing an actuating signal that decreases the difference; and

actuating means responsive to said actuating signal for providing a corresponding control input to said controlled object.

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**5,498,944**

## AUTOMATIC FOCUSING APPARATUS

**Masahiro Nakata, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Sep. 13, 1993, Ser. No. 119,842**

**Claims priority, application Japan, Sep. 11, 1992, 4-243437**

**Int. Cl.[6] G03B** *3/10;* **H02P** *3/12*

**U.S. Cl. 318—640** **30 Claims**

1. A motor control apparatus, comprising:

speed detecting means for detecting a rotational speed of a motor;

a first motor operation mode including a dc operation mode;

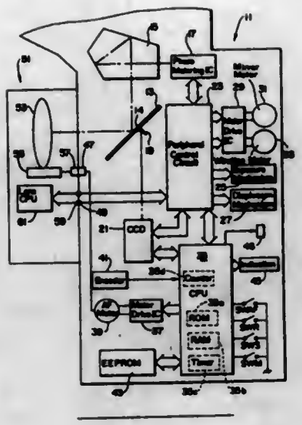
a second motor operation mode including a pulse width modulation operation mode;

means for applying a reverse brake for a duration of time in accordance with said detected rotational speed of the motor, when the motor is operating in said first operation mode, to operate the motor in said second operation mode;

wherein application of said reverse brake reduces the detected rotational speed of the motor to control a timing of transition between said first motor operation mode and said second motor operation mode;

said means for applying including means for reversing an electric current supplied to said motor; and

short-circuit means for stopping said motor.

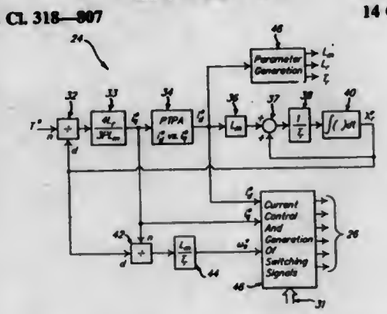


5,498,945

## PEAK-TORQUE-PER-AMPERE (PTPA) CONTROL METHOD FOR AN INDUCTION MOTOR

Rajiva Prakash, Westland, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 8, 1994, Ser. No. 225,275
Int. Cl.[6] H02P 5/40
U.S. Cl. 318—807 14 Claims



1. A method for field-oriented control of an induction motor, said method comprising the steps of:

choosing a desired quadrature-axis current $i_q^*$; and

choosing a desired direct-axis current $i_d^*$ as a function of said desired quadrature-axis current $i_q^*$ and of a magnetizing inductance of said induction motor;

wherein said desired quadrature-axis current $i_q^*$ and said desired direct-axis current $i_d^*$ are related by the following relationship:

$$\left[\frac{\frac{dL_m}{di_d^e}(L_m+2L_{lr})}{(L_m+L_{lr})}i_d^e+L_m\right]i_q^{e2}=L_m i_d^{e2},$$

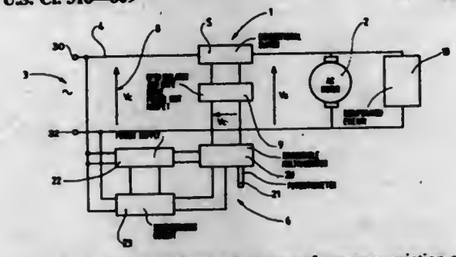
where $L_m$ is said magnetizing inductance of said induction motor and $L_{lr}$ is a leakage inductance of the rotor of said induction motor.

5,498,946

## DEVICE FOR CONTROLLING THE VARIATION OF THE POWER AND/OR THE SPEED OF A LOAD

Louis Plumer, Belfort; Michel Abignoli, Villers-les-Nancy; Abdelkader Mansouri, Vandoeuvre, and Michel Jacob, Hennebont, all of, France, assignors to Plumer (Societe Anonyme), Saint Louis, France

Filed May 3, 1994, Ser. No. 237,172
Claims priority, application France, May 5, 1993, 93 05548
Int. Cl.[6] H02P 7/42; H02M 5/02
U.S. Cl. 318—809 20 Claims



1. A device for controlling at least one of a power variation and a speed variation of a load connected to an alternating-current supply, comprising:

means for switching a phase of said alternating-current supply;

first means for controlling a cyclic ratio $\alpha/T$ of said phase of said alternating-current supply, wherein $\alpha$ is equal to one of a time of opening or a time of closing of said alternating-current supply by said switching means, and T is equal to a period of said phase; and

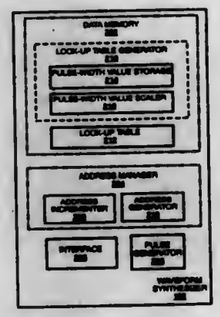
second means for controlling an extending of the switching time at said closing of said alternating-current supply to be within a range of approximately 10 microseconds to 1 millisecond, wherein said first controlling means further controls an opening of said alternating-current supply when approaching a coercive force of a magnetic circuit of said load upon reversal of a current direction, corresponding to approximately one fourth of a half-period as long as said magnetic circuit is below a nominal-current triggering threshold corresponding to one-third of a value of a maximum nominal current.

5,498,947

## FREQUENCY AND AMPLITUDE VARIABLE WAVEFORM SYNTHESIZER

John Z. Wang, Stockton; Timothy S. T. Lee, Santa Cruz, and Bairu L. Wong, Stockton, all of Calif., assignors to FORTIS CO., Stockton, Calif.

Filed May 5, 1994, Ser. No. 239,402
Int. Cl.[6] H02D 05/28
U.S. Cl. 318—811 4 Claims



1. A waveform synthesizer comprising:



a look-up table for storing pulse-width values, said look-up table having serialized addresses, said addresses corresponding to respective discrete phases of a periodic waveform;

address generator means for generating a series of address codes for selectively accessing said serialized addresses;

address incrementer means for determining an address increment between successive address codes in said series of address codes in response to a requested frequency, said address increments being at least in part a function of said requested frequency so that said address generator means generates said series of address codes at the determined address increment for selectively accessing said serialized addresses, said address incrementer means having an input for receiving said requested frequency;

look-up table generator means, said look-up table generator means generating said look-up table as a function of a requested current, said look-up table generator means having an input for receiving said requested current; said look-up table generator means including:

storage means for storing unscaled values for pulse-widths as a function of the phase of said waveform for a given current, and

scaling means for scaling said unscaled values as a function of the ratio of the amplitude of said requested current to the amplitude of said given current; and

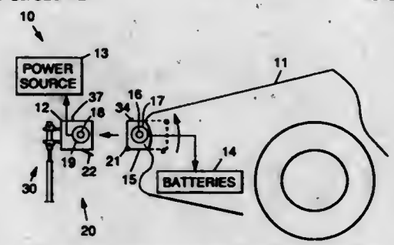
pulse generator means for generating at least one pulse train, said pulse train consisting of a series of pulses, said series of pulses having a corresponding series of pulse-widths, said series of pulse-widths corresponding to the pulse-width values addressed by said series of address codes.

5,498,948

## SELF-ALIGNING INDUCTIVE CHARGER

Michael F. Brunl, Redondo Beach, and Edward F. Davenport, Rancho Palos Verdes, both of Calif., assignors to Delco Electronics

Filed Oct. 14, 1994, Ser. No. 323,287
Int. Cl.[6] H01M 10/46
U.S. Cl. 320—2 8 Claims



1. A self-aligning inductive charging system comprising:

a charge station comprising:

a power source;

a charge probe that comprises:

a primary core;

a primary winding electrically connected to the power source that provides charging power; and

a plurality of aligning plates disposed at predetermined locations around the periphery of the charge probe;

a slidable alignment mechanism comprising:

a plurality of vertical slide mechanisms;

a plurality of horizontal slide mechanisms coupled between the plurality of vertical slide mechanisms; and

a plurality of lateral slide mechanisms coupled to the plurality of horizontal slide mechanisms and to the charge probe; and

a charge port that comprises:

a secondary core;

a secondary winding; and

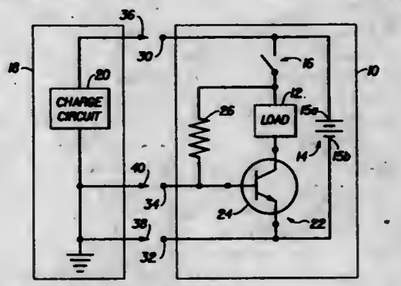
a plurality of rollers disposed adjacent a front surface of the charge port that contact corresponding ones of the aligning plates when the probe is inserted into the charge port.

5,498,949

## RECHARGEABLE DEVICE WITH OPERATIONAL INHIBIT DURING RECHARGING

David R. Dowe, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 16, 1993, Ser. No. 107,397
Int. Cl.[6] H01M 10/46
U.S. Cl. 320—5 2 Claims



1. A rechargeable device comprising:

a device electrical load;

a battery circuit that receives electrical energy from a secondary battery of the device;

a power storage circuit that stores electrical energy from the battery circuit and provides it to the device electrical load, the power storage circuit including an energy storage device in which the electrical energy is stored and at least one transistor switching means for providing the electrical energy to the energy storage device;

a recharging connector adapted to mate with a charging device and thereby receive electrical energy from the charging device; and

a power switch selectively operable between an "on" position and an "off" position such that the power switch directs electrical energy from the battery circuit to the power storage circuit when the power switch is in the "on" position and directs electrical energy from the recharging connector to the battery circuit when the power switch is in the "off" position; wherein:

the power storage circuit further includes biasing means for placing the transistor switching means into a non-conducting condition in response to the electrical energy received from the battery circuit when the power switch is in the "on" position and the recharging connector is mated with the charging device, thereby placing the power storage circuit in an inoperative condition and preventing the power storage circuit from providing electrical energy to the device electrical load.

5,498,950

## BATTERY MONITORING, CHARGING AND BALANCING APPARATUS

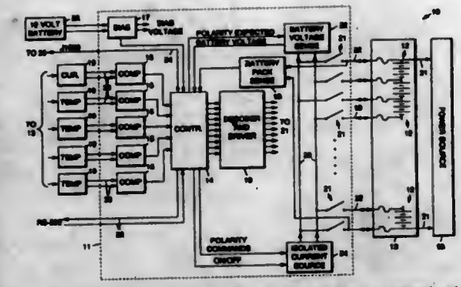
David B. Ouwerkerk, Torrance, Calif., assignor to Delco Electronics Corp.

Filed Apr. 29, 1994, Ser. No. 237,565
Int. Cl.[6] H01M 10/46
U.S. Cl. 320—18 6 Claims

1. Apparatus for monitoring, charging and balancing a plurality of serially connected batteries, said apparatus comprising:

a power source means coupled across the plurality of serially connected batteries for providing charging power thereto;

a plurality of sensors coupled to the plurality of batteries for monitoring conditions thereof;



a controller coupled to the power source for communicating therewith to control the operation thereof to charge the plurality of serially connected batteries, and coupled to the plurality of sensors for monitoring the predetermined conditions of the plurality of serially connected batteries;

a plurality of controlled switches wherein adjacent pairs of controlled switches are coupled to respective positive and negative terminals of respective ones of the plurality of batteries, and wherein the controlled switches are coupled to the controller for providing activation control signals thereto;

a monitoring bus coupled to the plurality of controlled switches;

a battery voltage sensor coupled to each of the the plurality of controlled switches by way of the monitoring bus, and coupled to the controller, for selectively sensing the voltage of each of the plurality of batteries under control of the controller; and

a current source coupled to the plurality of controlled switches by way of the monitoring bus, and coupled to the controller, for supplying current to a selected battery under control of the controller.

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**5,498,951**

**METHOD AND APPARATUS FOR CHARGING ELECTRIC DOUBLE LAYER CAPACITOR**

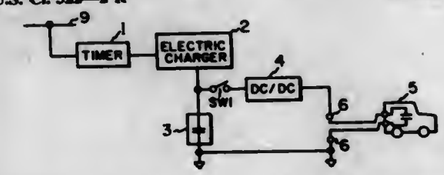
**Michio Okamura; Takeshi Morimoto, and Kazuya Hiratsuka, all of Kanagawa, Japan, assignors to JEOL Ltd., Tokyo, Japan**

**Filed Jun. 30, 1994, Ser. No. 269,010**

**Claims priority, application Japan, Jun. 30, 1993, 5-187539; Jun. 30, 1993, 5-187542; Aug. 18, 1993, 5-225206**

**Int. Cl.[6] H02N *1/00*; H02J *7/00***

**U.S. Cl. 322—2 R** **11 Claims**




3. An apparatus for charging an electric double layer capacitor, comprising:

an electric power storage device to store electric energy from an external power line; and

a DC/DC converter for converting output electric power from said electric power storage device into a substantially constant-current output, said storage device supplying said substantially constant-current output to said electric double layer capacitor which acts as a load.

**5,498,952**

**PRECISE CURRENT GENERATOR**

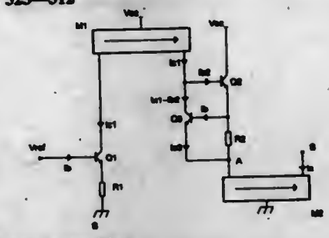
**Marc Ryat, Grenoble, France, assignor to SGS-Thomson Microelectronics, S.A., Gentilly Cedex, France**

**Filed Sep. 23, 1992, Ser. No. 950,091**

**Claims priority, application France, Sep. 30, 1991, 91 12278**

**Int. Cl.[6] G05F *3/16***

**U.S. Cl. 323—312** **60 Claims**



1. A circuit, comprising:

a connection for receiving a reference voltage;

a first bipolar transistor connected to be controlled by said reference voltage, and to pass a first current accordingly:

a first resistor connected in series with said first transistor;

a first current mirror circuit, connected to receive said first current as an input, and to provide a second current, which is exactly proportional to said first current, as an output;

a second bipolar transistor connected to pass said second current and to add a base current component thereto;

a second resistor connected between the base and emitter of said second transistor;

and a second current mirror circuit, operatively connected to said second transistor and said second resistor, and configured to provide a third current, as output, which is exactly proportional to the sum of the currents passed by said second resistor and second transistor;

whereby said third current provides a stable reference current output.

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**5,498,953**

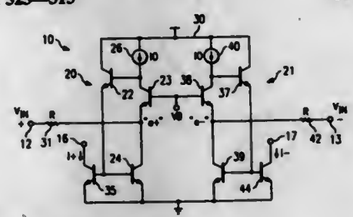
**HCM BASED TRANSCONDUCTOR CIRCUITS**

**Marc H. Ryat, Santa Clara, Calif., assignor to SGS-THOMSON Microelectronics, Inc., Carrollton, Tex.**

**Continuation-in-part of Ser. No. 70,274, Jun. 1, 1993, which is a continuation-in-part of Ser. No. 31,647, Mar. 15, 1993, which is a continuation-in-part of Ser. No. 950,091, Sep. 23, 1992. This application Nov. 30, 1993, Ser. No. 160,579**

**Int. Cl.[6] G05F *3/26***

**U.S. Cl. 323—315** **36 Claims**



1. A transconductor circuit comprising:

a first half cascode mirror circuit, comprising:

first, second, and third transistors;

a first reference current source having a connection at one side to a supply voltage and at another side to said first transistor;

said first and second transistors being connected in series between said first reference current source and a first reference voltage, said first transistor having a current control element connected to a second reference voltage;



said third transistor being connected between the supply voltage and a current control element of said second transistor, and having a current control element connected between said first reference current source and said first transistor;

a first input signal receiving node being provided between said first and second transistors;

and a first output circuit arranged to provide an output signal proportional to a current flowing in said second transistor;

a second half cascode mirror circuit, comprising:

fourth, fifth, and sixth transistors;

a second reference current source having a connection at one side to a supply voltage and at another side to said fourth transistor;

said fourth and fifth transistors being connected in series between said second reference current source and the first reference voltage, said fourth transistor having a current control element connected to the second reference voltage;

said sixth transistor being connected between the supply voltage and a current control element of said fifth transistor, and having a current control element connected between said second reference current source and said fourth transistor;

a second input signal receiving node being provided between said fourth and fifth transistors;

and a second output circuit arranged to provide an output signal proportional to a current flowing in said fifth transistor.

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**5,498,954**

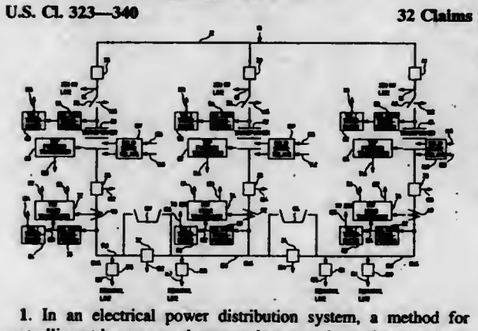
**CONTROL SYSTEM AND METHOD FOR THE PARALLEL OPERATION OF VOLTAGE REGULATORS**

**David L. Bassett, Macungie, and Dan E. Weatherly, Whitehall, both of Pa., assignors to Pennsylvania Power & Light Company, Allentown, Pa.**

**Continuation of Ser. No. 866,899, Apr. 1, 1992, abandoned. This application Sep. 7, 1994, Ser. No. 301,477**

**Int. Cl.[6] G05F *1/14***

**U.S. Cl. 323—340** **32 Claims**



1. In an electrical power distribution system, a method for controlling at least two voltage regulators, each regulator having a tap changer for varying tap positions, comprising the steps of:

operating the voltage regulators in parallel;

determining an output voltage of each regulator;

determining a reactive power of each regulator;

determining, as a function of the output voltage and the reactive power of the regulators, whether each regulator is operating within an allowable error voltage bandwidth; and

determining a tap position for each regulator and performing calculations for each regulator using the determined tap position;

varying, based on the calculations, the tap position of each regulator which is operating outside the allowable error voltage bandwidth to change the regulator output voltage in a direction towards the allowable error voltage bandwidth.

**5,498,955**

**APPARATUS FOR DETECTING THE AMPLITUDE AND PHASE OF AN A.C. SIGNAL**

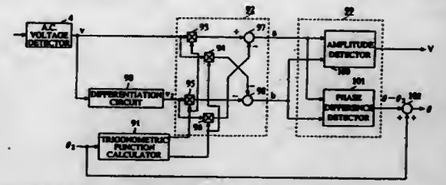
**Toshiyuki Fujii; Shinzo Tamai; Hatsuhiko Naitoh, and Naohiro Toki, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Oct. 27, 1994, Ser. No. 331,366**

**Claims priority, application Japan, Feb. 10, 1994, 6-016607**

**Int. Cl.[6] G01R *25/00***

**U.S. Cl. 324—76.77** **3 Claims**




1. An apparatus for detecting the amplitude and phase of an a.c. signal in an object system, said apparatus comprising:

a.c. signal detection means for detecting the a.c. signal of said object system;

differentiation means for differentiating the detected a.c. signal;

conversion means for converting the outputs of said signal detection means and differentiation means into cosine and sine wave components of the a.c. signal through the rotational transformation based on a reference phase of the a.c. signal;

amplitude and phase difference detection means which implements the polar coordinate transformation for the converted cosine and sine wave components of the a.c. signal thereby to detect the amplitude of the a.c. signal, and detects the phase difference between the phase of the a.c. signal and the reference phase; and

adding means for adding the reference phase to the detected phase difference.

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**5,498,956**

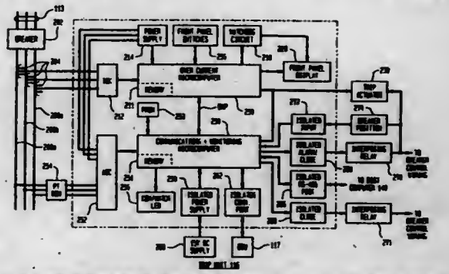
**DISTRIBUTED CURRENT AND VOLTAGE SAMPLING FUNCTION FOR AN ELECTRIC POWER MONITORING UNIT**

**Michael A. Kinney, Raleigh, N.C.; James T. Cronvich, Harahan, La., and Wayne M. Zavis, Raleigh, N.C., assignors to Siemens Energy & Automation, Inc., Alpharetta, Ga.**

**Division of Ser. No. 73,913, Jun. 8, 1993, Pat. No. 5,369,356, which is a continuation of Ser. No. 753,261, Aug. 30, 1991, abandoned. This application Aug. 26, 1994, Ser. No. 296,828**

**Int. Cl.[6] G01R *21/06*; G11C *27/02*; H02H *3/18***

**U.S. Cl. 324—142** **5 Claims**



1. A controller system for monitoring electric power lines which transmit alternating current electric power, including a periodic voltage component and a periodic current component, to a load, comprising:

an analog to digital converter, coupled to the power lines and responsive to first and second control signals for generating digital samples representing the respective current and voltage components of the electric power;

a programmed processor for generating the first and second control signals and for calculating, from the digital sample values provided by the analog to digital converter, respective values representing magnitudes of the current and voltage components, wherein the programmed processor includes:

a clock signal generator;

a first interrupt service routine, responsive to a clock signal provided by the clock signal generator, to cause the programmed processor to apply one of the first and second control signals to the analog to digital converter to store the digital samples provided by the analog to digital converter, to schedule a next invocation of the first interrupt service routine to store further ones of the digital samples of the current and voltage components of the power, and to schedule an invocation of a second interrupt service routine to process the stored digital samples;

wherein, the second interrupt service routine squares each of the stored current and voltage sample values and accumulates respective sums of successive ones of the squared current and voltage values.

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**5,498,957**

## APPLIANCE AND METHOD FOR THE COULOMETRIC MEASUREMENT OF THE THICKNESS OF METALLIC COATINGS

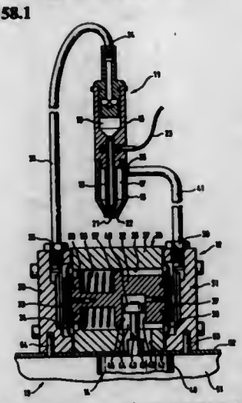
**Helmut Fischer, Institestrasse 21, 71069 Sindelfingen, Germany**

**Filed Nov. 3, 1994, Ser. No. 333,953**

**Claims priority, application Germany, Nov. 10, 1993, 43 38 211.8**

**Int. Cl.[6] G01R** *27/02*

**U.S. Cl. 324—158.1** **7 Claims**



1. Appliance for the coulometric measurement of the thickness of metallic coatings, comprising a measuring probe, a reversing pump device and a support device for mounting a measurement object, guiding the measuring probe relative to the measurement object and bearing arrangement for a pump drive, the measuring probe having a measuring chamber and a reservoir chamber which communicates therewith via a cathode pipe and has a first hose connection, the measuring chamber having an outlet orifice, which can be placed onto the measurement object, and a second hose connection, and furthermore the reversing pump device having a third hose connection at which positive pressure or negative pressure relative to the pressure prevailing in the region of the second hose connection in the measuring chamber can be generated, and the first and third hose connections, finally, being connected via an air line, characterized in that the measuring probe (11), connected via the air line (36) to the reversing pump device (12), constitutes a functional unit which is designed so as to be readily detachable from the pump drive (14) and the support device (13).

**5,498,958**

## INDUCTIVE PROXIMITY SENSOR WITH PERIODIC SWITCHING FOR SENSING THE PRESENCE OF OBJECTS

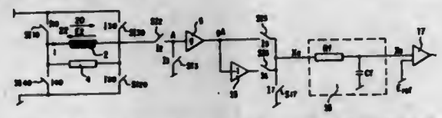
**Mai X. Tu, and Michel Schwab, both of Biel-Bienne, Switzerland, assignors to Detra SA, Bienne, Switzerland**

**Continuation-in-part of Ser. No. 808,614, Dec. 17, 1991, abandoned. This application Nov. 3, 1993, Ser. No. 145,180**

**Claims priority, application European Pat. Off., Dec. 21, 1990, 90811020**

**Int. Cl.[6] G01B** *7/00;* **G01V** *3/10;* **H03K** *17/95*

**U.S. Cl. 324—207.16** **20 Claims**



1. An inductive proximity sensor for sensing the presence of objects in close proximity to the sensor, comprising:

an inductor;

a current directing means for supplying a first voltage to the inductor to produce a current in the inductor to induce a magnetic field in the object during a first period, and for supplying a second voltage to the inductor in a direction opposite to the first voltage during a second period which begins upon conclusion of the first period and terminates upon establishing a substantially zero current in the inductor;

determining means connectable to the inductor for determining when the object is within a predetermined proximity to the inductor, the determining means measuring an induced voltage in the inductor generated by a decaying magnetic field in the object during a third period that begins shortly after the termination of the second period, and comparing the measured induced voltage with a predetermined value.

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**5,498,959**

## METAL DETECTOR WITH MULTIPOLAR WINDINGS SHAPED SO AS TO ELIMINATE THE NEUTRALIZING EFFECTS WHEN SEVERAL METAL MASSES ARE PASSING THROUGH SIMULTANEOUSLY

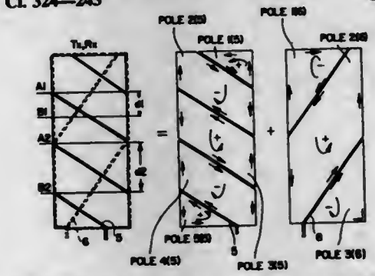
**Alessandro Manneschi, Arezzo, Italy, assignor to C.E.I.A. - Costruzioni Elettroniche Industriali Automatismi - S.p.A., Civitella in Val di Chiana, Italy**

**Filed Apr. 20, 1993, Ser. No. 49,703**

**Claims priority, application Italy, Nov. 11, 1992, AR92A0026**

**Int. Cl.[6] G01R** *33/12;* **G08B** *13/24*

**U.S. Cl. 324—243** **8 Claims**




1. Metal detector with multipolar windings comprising at least two pairs of transmitter-receiver multipolar windings, said metal detector having a configuration wherein at least one pair of transmitter-receiver windings has a different number of poles than remaining pairs of windings, thus ensuring that two like metal bodies in simultaneous transit through said metal detector that are placed at a minimum signal pitch d produce a signal sufficient to activate an alarm in at least one of the pairs of the transmitter-receiving windings, wherein said at least two pairs of transmitter-receiver multipolar windings with different number of poles have two different minimum signal pitches d1 and d2 so that an inequality:

$$d1 \times K1 \neq d2 \times K2$$

holds, where K1 and K2 are whole, odd numbers, said configuration ensuring a detection of said metal bodies in simultaneous transit through said metal detector irrespective of a distance between said metal bodies.



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**5,498,960**

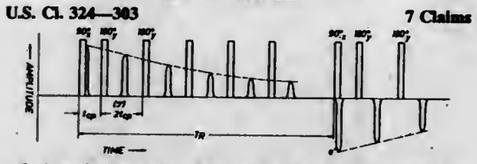
## NMR LOGGING OF NATURAL GAS IN RESERVOIRS

**Harold J. Vinegar, Houston, Tex.; Ridvan Akkurt, Mandeville, La., and Pierre N. Tutunjian, Houston, Tex., assignors to Shell Oil Company, Houston, Tex.**

**Filed Oct. 20, 1994, Ser. No. 326,561**

**Int. Cl.[6] G01R** *33/44*

**U.S. Cl. 324—303** **7 Claims**



1. A method to estimate the pore volume that is occupied by hydrocarbon gas in a subterranean formation penetrated by a wellbore, the hydrocarbon gas having a longitudinal relaxation time, the method comprising the steps of:

obtaining a pulsed NMR log using a recovery time that is equal to or greater than the longitudinal relaxation time of the hydrocarbon gas;

determining, from the NMR log using a recovery time that equal to or greater than the longitudinal relaxation time of the hydrocarbon gas, a distribution of transverse relaxation times that includes transverse relaxation times attributable to the hydrocarbon gas; and

estimating the pore volume that is occupied by hydrocarbon gas from the distribution of transverse relaxation times obtained from the NMR log.

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**5,498,961**

## MR METHOD FOR TWO-DIMENSIONAL OR THREE-DIMENSIONAL IMAGING OF AN EXAMINATION ZONE, AND APPARATUS FOR CARRYING OUT THE METHOD

**Michael H. Kuhn; Volker Rasche, and Roland Proksa, all of Hamburg, Germany, assignors to U.S. Philips Corporation, New York, N.Y.**

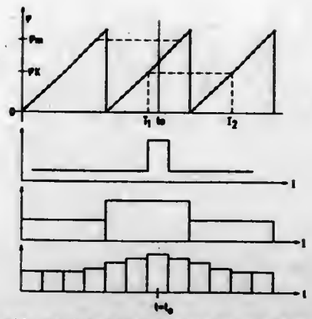
**Filed Mar. 7, 1994, Ser. No. 207,529**

**Claims priority, application Germany, Mar. 6, 1993, 43 07 150.3; Jun. 12, 1993, 43 19 538.5**

**Int. Cl.[6] G01V** *3/14*

**U.S. Cl. 324—309** **9 Claims**

1. An MR method for two-dimensional or three-dimensional imaging of an examination zone, in which sets of raw data are successively measured with the same measurement parameters but at different instants ($T_1$, $T_2$) or with measurement parameters derived for different measurement slices, each set having sufficient information that an image of the examination zone can be reconstructed therefrom, wherein in order to produce an image representing the examination zone at a selectable instant ($t_0$), or in a selectable slice, a set of auxiliary data ($H(\phi_k, t_0)$) is generated by interpolation from at least two of the sets of raw data ($R(\phi_k, t_1)$, $R(\phi_k, t_2)$) with a weight ($g_k$) applied to the raw data entering the interpolation being greater as a time interval between the associated measurement instant and the selectable instant, or between the measurement slice and the selectable slice, is smaller, and an image of the examination zone is reconstructed from the set of auxiliary data.



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**5,498,962**

## IMAGING METHOD

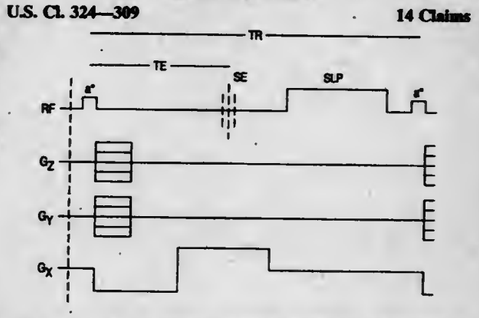
**Raimo E. Sepponen, Helsinki, Finland, assignor to Picker Nordstar Inc., Helsinki, Finland**

**Filed Mar. 10, 1994, Ser. No. 209,427**

**Claims priority, application Finland, Mar. 10, 1993, 931051**

**Int. Cl.[6] G01V** *3/14*

**U.S. Cl. 324—309** **14 Claims**




1. A method for the magnetic resonance imaging examination of an object using one of the known magnetic resonance imaging techniques, said method comprising the steps of:

a. applying a radio frequency pulse to the object to tilt the nuclear magnetization from the direction of the polarizing magnetic field;

b. allowing the tilted nuclear magnetization in the object to relax along the magnetic component of the radio frequency pulse for a locking period;

c. orienting the nuclear magnetization parallel to the polarizing magnetic field; and

d. applying a magnetic resonance imaging sequence to the object, said imaging sequence comprising:

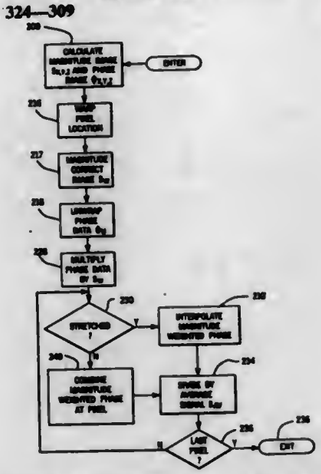
applying at least one excitation pulse to the object to generate transverse magnetization in the object such that after each of said at least one excitation pulse the angle between the nuclear magnetization and the polarizing magnetic field is less than 90°.

5,498,963

## CORRECTION OF GEOMETRIC DISTORTION IN MRI PHASE AND PHASE DIFFERENCE IMAGES

Erika Schneider, Brookfield; Xiguang Zang, Waukesha, and Michael R. Hartley, Pewaukee, all of Wis., assignors to General Electric Company, Waukesha, Wis.

Filed Aug. 5, 1994, Ser. No. 286,365
Int. Cl.[6] G01V 3/14
U.S. Cl. 324—309 14 Claims




1. A method for correcting phase information in NMR data acquired with a non-linear gradient magnetic field, the steps comprising:

a) acquiring the NMR data in the presence of the non-linear gradient magnetic field;

b) reconstructing an NMR image using the acquired NMR data, the NMR image including data located at discrete pixel locations extending along an axis defined by the direction of the non-linear gradient magnetic field;

c) producing a magnitude image from the NMR image indicating spin signal magnitude at the discrete pixel locations;

d) producing a phase image from the NMR image indicating spin phase information at the discrete pixel locations;

e) producing a magnitude-weighted phase image comprised of values formed by multiplying a factor determined by the spin signal magnitude at each discrete pixel location by the corresponding phase information;

f) producing a warped magnitude-weighted phase image in which the values therein are displaced from the discrete pixel locations to account for the geometric distortion caused by the non-linearity of the non-linear gradient magnetic field; and

g) remapping the warped magnitude-weighted phase image by combining values therein to calculate phase values at each discrete pixel location.

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5,498,964

## CAPACITIVE ELECTRODE SYSTEM FOR DETECTING OPEN SOLDER JOINTS IN PRINTED CIRCUIT ASSEMBLIES

Ronald K. Kerschner; David T. Crook, and Lisa M. Kent, all of Loveland, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 981,665, Nov. 25, 1992, Pat. No. 5,420,500. This application Sep. 19, 1994, Ser. No. 308,236
Int. Cl.[6] G01R 31/08
U.S. Cl. 324—530 10 Claims

1. A test probe for testing an electrical component to determine whether a connector lead of said electrical component is conductively connected to a trace of a printed circuit board, wherein said test probe is placed in close proximity with a top surface of said electrical component such that when a signal is supplied to said trace of said printed circuit board, a measuring device attached to said test probe to indicate an error if said measuring device fails to detect a predetermined capacitively sensed signal level, said test probe comprising:

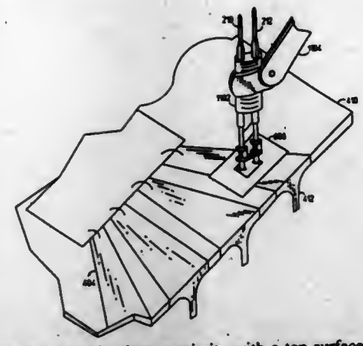
conductive plate means for capacitively detecting an electrical field generated by said connector lead of said electrical component whenever said connector lead is conductively connected to said trace producing a test signal;

shielding means for providing shielding from electrical noise;

signal amplification means electrically coupled to said conductive plate said test signal to increase the signal to noise ratio, said signal amplification means and said shielding means being disposed on said test probe in sufficient proximity to said conductive plate means to achieve a sufficient signal to noise ratio of said test signal to electrical noise so that said measuring device can determine whether said connector lead of said electrical component is conductively connected to said trace;

at least one connector means electrically connected to said amplification means for connecting at least one test pin to said test probe; and

at least one test pin electrically and mechanically connected to said at least one connector means,said at least one test pin providing said test probe with travel along the z axis, such that said test probe is capable of conforming to an outer surface of said electrical component when brought into close proximity therewith.



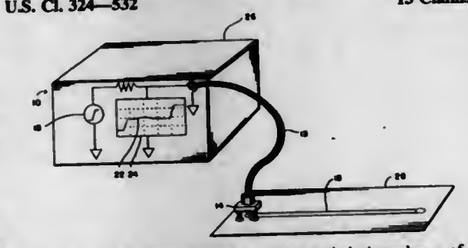
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5,498,965

## DRIVING POINT REFERENCE PLANE TIME DOMAIN REFLECTOMETRY METHOD FOR MEASURING CHARACTERISTIC IMPEDANCE

Richard I. Mellitz, Pepperell, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Dec. 15, 1993, Ser. No. 167,381
Int. Cl.[6] G01R 31/08
U.S. Cl. 324—532 13 Claims



1. A method for determining the characteristic impedance of a transmission line using time domain reflectometry on a printed wiring board comprising the steps of:



(a) selecting a driving point, the step of selecting a driving point further comprising determining an instant in time on a time domain reflectometry (TDR) waveform established while probing an open signal launch, the driving point being the instant in time and corresponds to a physical location denoting end of the signal launch;

(b) measuring the amplitude of an incident voltage step at the driving point;

(c) measuring the amplitude of a voltage step caused by a referee impedance standard of known characteristic impedance at the driving point;

(d) selecting an undisturbed interval on a time domain reflectometry (TDR) waveform established while probing a transmission line;

(e) measuring voltage at predetermined time intervals across the undisturbed interval;

(f) determining from the measured voltages a curve representative of such voltages;

(g) determining a voltage on the representative curve at the driving point;

(h) calculating the characteristic impedance of the transmission line by substituting the voltage determined in step (g) in the following equation:

$$Z_0 = Z_{reference}\frac{V_{incident} + V_{line} - V_{reference}}{V_{incident} + V_{line} + V_{reference}}$$

where $V_{incident}$ the voltage measured in step (b) , $V_{line}$ is the voltage determined in step (g), $V_{reference}$ is the voltage measured in step (c), $Z_{reference}$ is the characteristic impedance of the referee impedance standard.

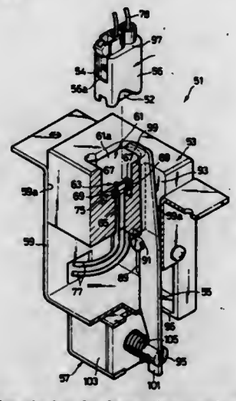
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5,498,966

## INSPECTION DEVICE FOR INSPECTING CONTINUITY OF TERMINAL IN A CONNECTOR

Yoshikazu Yamamoto, Shizuoka, Japan, assignor to Yazaki Corporation, Japan

Filed Apr. 6, 1993, Ser. No. 43,771
Claims priority, application Japan, Apr. 7, 1992, 4-085532
Int. Cl.[6] G01R 31/02
U.S. Cl. 324—538 6 Claims



1. An inspection device for inspecting continuity of terminals connected to ends of wires in a connector comprising:

a body having a connector insertion opening for inserting said connector therein;

a continuity inspector held by said body for inspecting the continuity of said terminals in contact relation therewith when said connector is inserted into said connector insertion opening, said continuity inspector including continuity detecting members which are slidably supported by said body and which have disk-like ends to be brought into contact with respective ones of said terminals of the connector;

a connector retaining member supported along a length dimension thereof by said body, said connector retaining member including at a first end thereof an engaging portion for engaging and holding said connector when said connector is present in said connector insertion opening such that said terminals press against said disk-like ends of said continuity detecting members;

first urging means for urging said connector retaining member in the direction to engage said engaging portion with said connector;

second urging means for urging said continuity detecting members toward said terminals, and

activating means for moving said connector retaining member at a second end thereof against the urging force of said first urging means in the direction to release the engagement of said engaging portion with said connector, after inspecting the continuity of said terminals;

whereby said connector after inspection is discharged from said connector opening by an urging force of said second urging means.

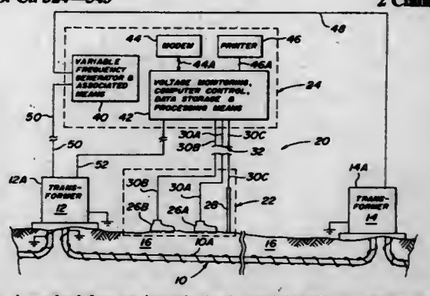
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5,498,967

## SYSTEM AND METHODS OF USE FOR CONDUCTING A NEUTRAL CORROSION SURVEY

Craig D. Bass, Kansas City, Mo.; Richard D. Valenti, Jr., Fayetteville, N.Y., and Emer C. Flounders, Jr., Abington, Pa., assignors to Henkels & McCoy, Inc., Blue Bell, Pa.

Continuation of Ser. No. 258,388, Jun. 10, 1994, Pat. No. 5,451,862, which is a continuation of Ser. No. 942,688, Sep. 9, 1992, Pat. No. 5,347,212. This application Mar. 23, 1995, Ser. No. 410,437
The portion of the term of this patent subsequent to Sep. 13, 2011, has been disclaimed.
Int. Cl.[6] G01R 31/02
U.S. Cl. 324—543 2 Claims




1. A method for non-intrusively determining the condition of a neutral conductor of an underground electrical cable forming a portion of an electrical power system, the cable additionally comprising at least one primary conductor carrying AC current therethrough when the cable is in service providing normal electrical power to the power system, the neutral conductor of the cable surrounding the at least one primary conductor and being connected between a pair of electrically grounded structures forming a portion of the electrical power system, said method for determining the condition of the neutral conductor being accomplished while leaving the cable in normal operation and comprising the steps of:

(a) impressing an electrical test signal of a predetermined frequency across the grounded structures, while the cable is in service providing normal electrical power to the power system via the primary conductor, to impress said test signal on the neutral conductor along the length of the neutral conductor between the grounded structures while leaving the neutral conductor connected to the grounded structures so that the neutral conductor remains grounded,

(b) measuring the voltage across the neutral conductor between the grounded structures, said voltage being produced by said test signal while the primary conductor is carrying the AC current therethrough, and

(c) measuring the current of said test signal through the neutral conductor while the primary conductor is carrying the AC current therethrough.

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**5,498,968**

**METHOD AND A DEVICE TO MEASURE ELECTROMAGNETIC RADIATION FROM OR RECEPTION OF FROM OUTSIDE COMING ELECTROMAGNETIC RADIATION IN A CIRCUIT CARD**

Fredrik E. Kjebon, Stockholm, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

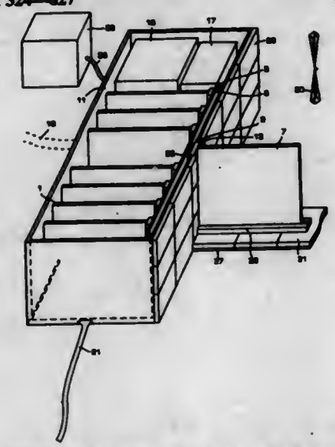
PCT No. PCT/SE93/00876, § 371 Date Aug. 16, 1994, § 102(e) Date Aug. 16, 1994, PCT Pub. No. WO94/10825, PCT Pub. Date May 11, 1994

PCT Filed Oct. 26, 1993, Ser. No. 244,852

Claims priority, application Sweden, Jan. 27, 1992, 9203145

Int. Cl.[6] G01R 27/28

U.S. Cl. 324—627 20 Claims



1. A method of facilitating measurement of electromagnetic emission from or reception of electromagnetic radiation by an individual circuit board in an electronic device to be tested, wherein the individual circuit board is arranged in parallel to other circuit boards, and the boards all have electric connections arranged at the same side of a backplane common to the boards, comprising the steps of:

producing a connection to a backplane which is electrically equivalent to a backplane normally used in the electronic device to be tested, with the exception that the produced connection which is to be used for the individual circuit board is located on a side of the produced backplane which is opposite to a side where all other connections to the other circuit boards are located;

placing all circuit boards in their connections in the produced backplane, whereby an electronic device is obtained, which in the functioning thereof is equivalent to the electronic device to be tested;

arranging an electric shielding around the other circuit boards in the obtained electronic device except the individual circuit board to be tested; and

starting the obtained electronic device modified in this way and measuring electromagnetic emission from or reception of electromagnetic radiation coming from outside the electronic device.

**5,498,969**

**DEVICE FOR THE VECTOR MEASUREMENT OF ULTRA-HIGH FREQUENCY SIGNALS OF THE SAME ANGULAR FREQUENCY OF THE SIX PORT JUNCTION TYPE**

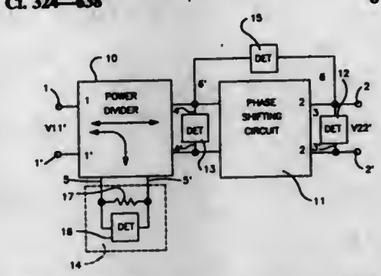
Bernard Huyart, Lognes, France, and Frank Wiedmann, Vaihingen, Germany, assignors to France Telecom Etablissement Autonome De Droit Public, Paris, France

Filed Jul. 5, 1994, Ser. No. 270,428

Claims priority, application France, Jul. 9, 1993, 93 08465

Int. Cl.[6] G01R 27/04

U.S. Cl. 324—638 8 Claims




1. Device for the vector measurement of ultra-high frequency signals of the same angular frequency, of the six port junction type, comprising a power divider and a phase shifting circuit, wherein two of the six ports of said device are measurement ports connectable to two sources of signals to be characterized, the four other ports being connected to four detectors, one of the latter being a matched detector and the three others being unmatched detectors.

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**5,498,970**

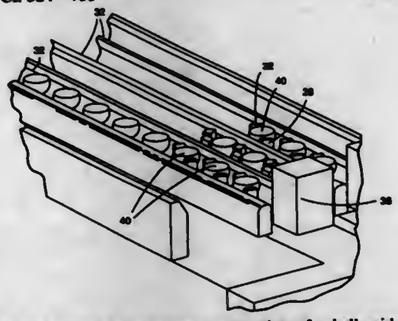
**TOP LOAD SOCKET FOR BALL GRID ARRAY DEVICES**

Kurt H. Petersen, Austin, Tex., assignor to Minnesota Mining and Manufacturing, St. Paul, Minn.

Filed Feb. 6, 1995, Ser. No. 384,663

Int. Cl.[6] G01R 1/04; H01R 13/629;13/62

U.S. Cl. 324—755 6 Claims




1. A test socket for temporary connection of a ball grid array integrated circuit device to a test circuit, the test socket comprising:

a base of electrically insulating material;

an array of contacts supported by said base, said array at least including a pattern of contacts corresponding to the ball grid array of the integrated circuit device, each contact including a set of two cantilever arms biased toward each other and terminating in tips adapted to capture one ball of the ball grid array integrated circuit device;

means for simultaneously separating each of said sets of said array of contacts so that the balls of the ball grid array device maybe inserted one within each of said set of contact arms.



**5,498,971**

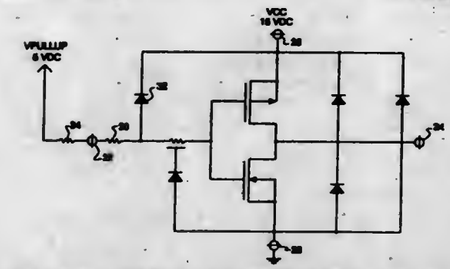
**METHOD AND CONTROL CIRCUIT FOR MEASURING THE TEMPERATURE OF AN INTEGRATED CIRCUIT**

Robert R. Turnbull, Buchanan; David J. DeLisle, Berrien Springs, and Robert A. Kohtz, St. Joseph, all of Mich., assignors to Zenith Data Systems Corporation, Buffalo Grove, Ill.

Continuation of Ser. No. 192,703, Feb. 7, 1994, abandoned. This application Jun. 6, 1995, Ser. No. 470,639

Int. Cl.[6] G01R 31/00

U.S. Cl. 324—760 17 Claims




1. A control circuit for measuring the internal die temperature of an integrated circuit (IC) having a predetermined internal circuit element whose voltage varies with temperature connected between predetermined output pins of said IC, said control circuit comprising:

first means for generating a predetermined first voltage at one of said predetermined output pins;

second means for generating a second predetermined voltage at the other of said predetermined output pins;

means for measuring the voltage difference between said first predetermined voltage and said second predetermined voltage to generate a signal representative of the internal die temperature of said IC and

means for controlling the clock frequency of said IC as a function of said die temperature representative signal.

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**5,498,972**

**DEVICE FOR MONITORING THE SUPPLY VOLTAGE ON INTEGRATED CIRCUITS**

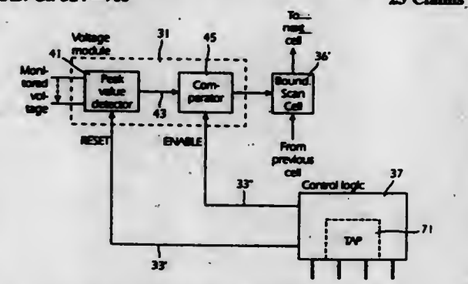
Tord Haulin, Uppsala, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Continuation-in-part of Ser. No. 745,411, Aug. 15, 1991, abandoned. This application Jan. 24, 1994, Ser. No. 185,145

Claims priority, application Sweden, Aug. 15, 1990, 9002665

Int. Cl.[6] G01R 31/28;19/04;31/40

U.S. Cl. 324—765 23 Claims




1. An electronic component comprising:

contact pins for supplying a Supply voltage to the electronic component including a combination of at least two voltage carrying pins and at least one ground pin or a combination of at least two ground pins and at least one voltage carrying pin;

a local voltage carrying line and a local ground line inside the electronic component connected to at least one voltage carrying pin and to at least one ground pin, respectively;

a plurality of signal communication contact pins for communicating signals:

signal carrying leads inside the electronic component, each of said plurality of signal communication pins being connected to at least one signal carrying lead; and

at least one device for locally monitoring the supply voltage, the device including at least one voltage monitor having an extreme value detector connected to one of the local voltage carrying line and the local ground line at a voltage monitoring position inside the electronic component.

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**5,498,973**

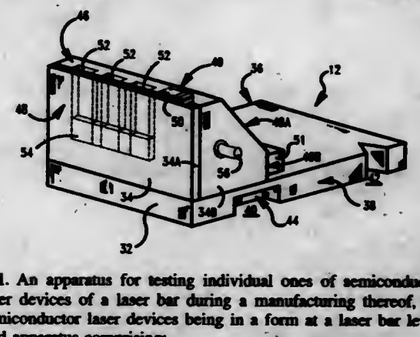
**APPARATUS FOR TESTING SEMICONDUCTOR LASER DEVICES**

William A. Cavaliere, Verbank, N.Y.; John S. Ferraris, Waterbury, Vt.; Howard E. Ferris, Wappingers Falls, N.Y.; Raymond C. Schuler, South Burlington, Vt., and Ronald L. Strijek, Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 22, 1994, Ser. No. 362,682

Int. Cl.[6] G01B 9/02; G01R 31/02

U.S. Cl. 324—765 29 Claims




1. An apparatus for testing individual ones of semiconductor laser devices of a laser bar during a manufacturing thereof, the semiconductor laser devices being in a form at a laser bar level, said apparatus comprising:

a) means for securing the laser bar in a first manner and orientation, wherein said laser bar securing means comprises a laser bar chuck, the laser bar chuck comprising (i) a base member having a first thermal conductivity, and (ii) an upper portion member having an uppermost surface and a front facet alignment reference surface, wherein the uppermost surface constitutes a laser bar receiving surface and wherein the front facet alignment reference surface is perpendicular to the laser bar receiving surface and provides a reference surface for use in the alignment of a front facet surface of the laser bar therewith, the upper portion member further having a second thermal conductivity, the second thermal conductivity being greater than the first thermal conductivity, the upper portion member still further characterized by a vacuum port for securing the laser bar to the receiving surface upon application of a vacuum source at the vacuum port;

b) means for probing a laser device of the laser bar;

c) means for receiving said laser bar securing means and said probing means in a second and third manner and orientation, respectively, said receiving means characterized by a lateral (X-axis, Z-axis) frame of reference, said receiving means further comprising means for translationally positioning said laser bar securing means and said probing means independently in a fourth and fifth controlled manner along respective (X, Z) axes, wherein said receiving means is controllable in the fourth manner for translating said securing means in the X-axis direction to a desired X-axis position, and said receiving means is further controllable in the fifth manner for

translating said probing means in the Z-axis direction to a desired Z-axis position;

d) means for energizing said probing means in a sixth controlled manner;

e) means for detecting a lasing of a probed laser device, said detecting means providing a characteristic output signal representative of a testing characteristic of the probed laser device; and

f) means for controlling said receiving means and said energizing means in the following manner: (i) in preparation for a testing of a desired one of the laser devices of the laser bar, controlling said receiving means to translate said securing means along the X-axis to an X-axis position for X-axis alignment of the desired one of the laser devices with said probing means; (ii) during a testing of a desired one of the laser devices of the laser bar, ($ii_1$) controlling said receiving means to translate said probing means along the Z-axis from a non-contact Z-axis position to a probing contact Z-axis position to thereby probe and electrically contact the corresponding desired one of the laser devices, ($ii_2$) controlling said energizing means to energize said probing mean i in the sixth controlled manner, wherein the probed laser device is caused to lase, and ($ii_3$) monitor and store the characteristic output signal from said detecting means; and (iii) upon a completion of the testing of the desired one of the laser devices, controlling said receiving means to translate said probing means along the Z-axis from the probing contact Z-axis position to the non-contact Z-axis position.

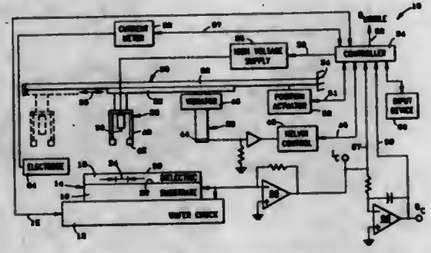
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**5,498,974**

## CONTACTLESS CORONA-OXIDE-SEMICONDUCTOR Q-V MOBILE CHARGE MEASUREMENT METHOD AND APPARATUS

**Roger L. Verkuil, Wappingers Falls, and Min-Su Fung, LaGrangeville, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 30, 1994, Ser. No. 366,861**
**Int. Cl.[6] G01R** *31/26;31/28*
**U.S. Cl. 324—767** **12 Claims**



1. A contactless corona-oxide-semiconductor mobile ionic charge measurement method for measuring an amount of mobile ionic species in a dielectric layer of a semiconductor wafer, the dielectric layer disposed upon a substrate of the wafer, the wafer further characterized by an air/dielectric interface and a dielectric/substrate interface, said method comprising the steps of:

(a) heating the wafer to a temperature sufficient to temperature stress the wafer and enable an ion motion;

(b) initializing a measurement region of the wafer with a non-contact corona discharge of a first polarity until an initial surface voltage potential $E_0$ is obtained on the dielectric layer, whereby any mobile ions present in the dielectric layer or at the air/dielectric interface are caused to move to the dielectric/substrate interface;

(c) applying a non-contact pulsed corona discharge of a second polarity, opposite from the first polarity, to the wafer at the top surface of the dielectric layer in the measurement region until the surface voltage potential in the measurement region is reduced from $E_0$ to a first surface voltage potential $E_1$;

(d) continuing to apply a non-contact pulsed corona discharge of the second polarity to the wafer at the top surface of the dielectric layer in the measurement region until the surface voltage potential in the measurement region is further reduced from $E_1$ to a second surface voltage potential $E_2$, said step further including monitoring a cumulative amount of corona charge deposited on the surface of the dielectric during the reduction of the surface voltage potential from $E_1$ to $E_2$, wherein the cumulative monitored charge corresponds to a measured amount of corona charge $Q_{MEASURED}$ necessary to change a dielectric field of the dielectric layer by a desired amount corresponding to the change in surface voltage potential from $E_1$ to $E_2$ in the presence of any mobile ions, whereby any mobile ions present at the dielectric/substrate interface are caused to move to the air/dielectric interface;

(e) establishing an ideal amount of charge $Q_{IDEAL}$ corresponding to an amount of charge necessary to change a dielectric field of the dielectric layer, in an absence of any mobile ions, from a third dielectric field corresponding to the second surface voltage potential $E_2$ to a fourth dielectric field corresponding to the first surface voltage potential $E_1$; and

(f) comparing the measured amount of corona charge, $Q_{MEASURED}$, to the ideal amount of corona charge, $Q_{IDEAL}$, wherein a quantitative difference between $Q_{MEASURED}$ and $Q_{IDEAL}$ is indicative of an amount of mobile charge $Q_{MOBILE}$, $Q_{MOBILE}$ being representative of the amount mobile ionic species in the dielectric layer.

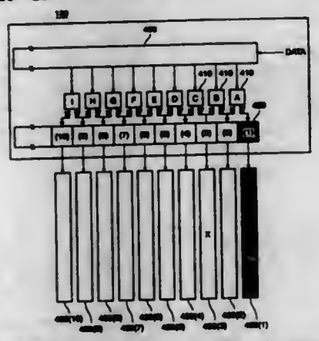
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**5,498,975**

## IMPLEMENTATION OF REDUNDANCY ON A PROGRAMMABLE LOGIC DEVICE

**Richard G. Cliff, Milpitas; Rina Raman, Fremont, and Srinivas T. Reddy, Santa Clara, all of Calif., assignors to Altera Corporation, San Jose, Calif.**

**Continuation of Ser. No. 979,003, Nov. 19, 1992, Pat. No. 5,434,514. This application Nov. 4, 1993, Ser. No. 147,601**
**Int. Cl.[6] H03K** *19/177*
**U.S. Cl. 326—10** **15 Claims**



1. A programmable logic device capable of remedying logic block defects, said programmable logic device comprising:

a plurality of logic blocks disposed in an array format forming rows and columns, each block performing user-specified logic functions;

a programmable interconnect for selectively connecting said logic blocks; and

at least one of said columns of logic blocks replacing a selected column of logic blocks when a logic block in said selected column is defective.

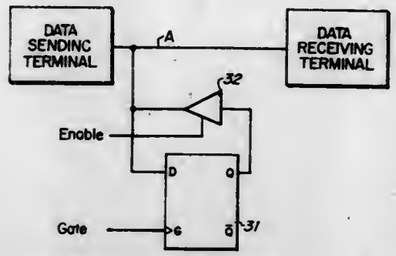


**5,498,976**

## PARALLEL BUFFER/DRIVER CONFIGURATION BETWEEN DATA SENDING TERMINAL AND DATA RECEIVING TERMINAL

**Ching-Tung Hwang, Taoyuan, Taiwan, Prov. of China, assignor to Acer Incorporated, Hsinchu, Taiwan, Prov. of China**

**Continuation of Ser. No. 604,586, Oct. 26, 1990, abandoned. This application Dec. 13, 1994, Ser. No. 355,420**
**Int. Cl.[6] H03K** *17/16*
**U.S. Cl. 326—30** **10 Claims**




1. A data transmission system comprising:

a first data transceiver having a first mode and a second mode wherein said first data transceiver is a data sending terminal when operating in said first mode and a data receiving terminal when operating in said second mode;

a second data transceiver having a first mode and a second mode, wherein said second data transceiver is a data receiving terminal when operating in said first mode and a data sending terminal when operating in said second mode;

a bidirectional bus interposed between said first data transceiver and said second data transceiver; and

latching means coupled to said bidirectional bus for latching a data signal on the bidirectional bus and transmitting said latched data signal back to said bidirectional bus for a predetermined amount of time, wherein said data signal is output to said bidirectional bus from either said first data transceiver operating in said first mode or said second data transceiver operating in said second mode, and wherein said latching means causes said data signal to continuously remain on said bidirectional bus for a period of time beginning contemporaneous with the output of said data signal to said bidirectional bus and ending after either said first data transceiver operating in said first mode or said second data transceiver operating in said second mode completes its output to said bidirectional bus.

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**5,498,977**

## OUTPUT DRIVER HAVING PROCESS, VOLTAGE AND TEMPERATURE COMPENSATION FOR DELAY AND RISETIME

**Ray L. Pickup, Brush Prairie, Wash., assignor to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed Mar. 3, 1995, Ser. No. 397,812**
**Int. Cl.[6] H03R** *17/14*
**U.S. Cl. 326—31** **18 Claims**

1. In an integrated circuit (IC) having an output transistor supplying a signal to an external load, a method for compensating variations in signal time delay and risetime of the output transistor, wherein the variations result from factors affecting the IC, including manufacturing process, supply voltage, and temperature, the method comprising the steps of:

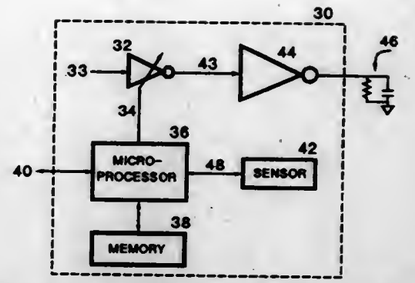
generating, with a sensing circuit responsive to the factors affecting the IC, sense numbers corresponding to points in the range of those factors;

determining, for each point in the generating step, the gain, of a predriver driving the output transistor, required to maintain the output signal time delay and risetime substantially at predetermined values;

storing, in a memory circuit, a relationship incorporating the results of the determining step;

selecting, by referring to a sense number and the stored relationship, an appropriate value of gain for the predriver; and

modifying the gain of the predriver in accordance with the value selected in the selecting step.




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**5,498,978**

## FIELD PROGRAMMABLE GATE ARRAY

**Makoto Takahashi, Yokohama; Fumitoshi Hatori, Tachikawa; Kazutaka Nogami, Palo Alto, and Masanori Uchida, Chino, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan**

**Filed May 4, 1994, Ser. No. 237,851**
**Claims priority, application Japan, May 7, 1993, 5-106999**
**Int. Cl.[6] H01H** *37/76;* **H03K** *17/687*
**U.S. Cl. 326—38** **8 Claims**

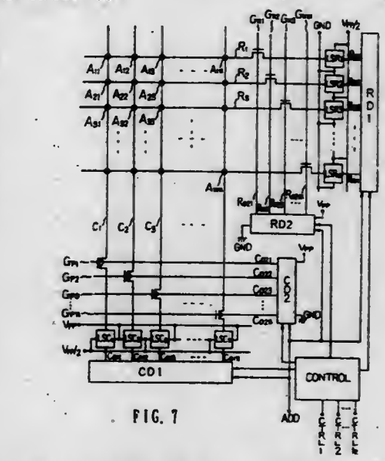



FIG. 7

1. A field programmable gate array, comprising:

a first wiring group composed of a plurality of first wirings;

a second wiring group composed of a plurality of second wirings;

a plurality of programmable elements arranged into an array pattern at intersections between the first wirings and the second wirings, each of said programmable elements being connected to one of the first wirings at one end thereof and to one of the second wirings at the other end thereof and being programmed by a programming voltage applied between the first wiring and second wiring to switch connection between the first and second wirings to disconnection between the two wirings or vice versa; and

voltage supplying means for applying programming voltages to the first and second wirings between which a programmable element to be programmed is connected and intermediate voltages to the first and second wirings between which a programmable element not to be programmed is connected, the intermediate voltage being lower than the programming voltage to such an extent as not to affect a programming state of said programmable elements,

wherein during programming and subsequent to said voltage supplying means applying intermediate voltages to the first and second wirings between which said programmable element not to be programmed is connected, said voltage supplying means isolates the first and second wirings between which said programmable element not to be programmed is connected from a voltage source within the voltage supplying means so that a voltage present on the first and second wirings between which said programmable element not to be programmed is connected floats with respect to the voltage source.

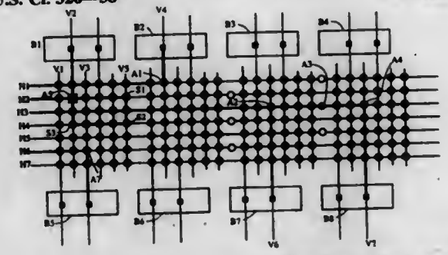
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**5,498,979**

## ADAPTIVE PROGRAMMING METHOD FOR ANTIFUSE TECHNOLOGY

**David B. Parlour, Pittsburgh, Pa.; F. Erich Goetting, Cupertino, Calif.; Stephen M. Trimberger, San Jose, Calif., and Edel M. Young, Palo Alto, Calif., assignors to Xilinx, Inc., San Jose, Calif.**

**Division of Ser. No. 940,125, Sep. 3, 1992, Pat. No. 5,349,248.**
**This application Sep. 20, 1994, Ser. No. 310,111**
**Int. Cl.[6] H03K** *19/177*; **H01H** *37/76*
**U.S. Cl. 326—38** **14 Claims**



1. A method of programming a programmable device having interconnect wiring segments and programmable elements which programmably connect said wiring segments to each other, said method comprising the steps of:

providing a design in machine readable form, said design comprising connections between selected nodes in said device;

for each of said connections, selecting active wiring segments and active programmable elements in said programmable device to implement said connection, thereby to form a route for said connection;

programming at least some of said active programmable elements;

if during programming any of said active programmable elements fails to become conductive, selecting from those programmable elements not yet programmed an alternative set of programmable elements to complete said connections;

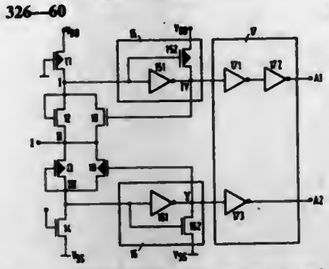
programming said alternative set of programmable elements, thereby to form an implementation of said design.

**5,498,980**

## TERNARY/BINARY CONVERTER CIRCUIT

**Gary-Alexander Bowles, München, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany**

**Filed Sep. 24, 1993, Ser. No. 126,333**
**Claims priority, application Germany, Sep. 24, 1992, 42 32 049**
**Int. Cl.[6] H03K** *19/02*
**U.S. Cl. 326—60** **10 Claims**



1. An integrated semiconductor circuit configuration, comprising:

one input of the semiconductor circuit configuration for receiving a ternary input signal, and two outputs of the semiconductor circuit configuration for supplying two binary output signals;

first, second, third and fourth resistors being connected in series between an operating voltage potential and a reference potential, defining a first connecting node between said first and said second resistors, a second connecting node between said second and said third resistors, and a third connecting node between said third and said fourth resistors, the second connecting node forming the input of the semiconductor circuit configuration;

a first threshold value decision circuit having a first. CMOS inverter, an input connected to the first connecting node, and having an output;

a second threshold value decision circuit having a second CMOS inverter, an input connected to the third connecting node, and having an output; and

a logic circuit being connected to the outputs of said threshold value decision circuits, and having outputs forming the outputs of the semiconductor circuit configuration.

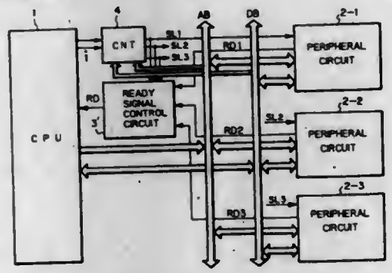
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**5,498,981**

## READY SIGNAL CONTROL APPARATUS CAPABLE OF AUTOMATICALLY DEACTIVATING READY SIGNAL

**Minoru Fukushige, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Jan. 31, 1995, Ser. No. 381,327**
**Int. Cl.[6] H03K** *19/02*
**U.S. Cl. 326—93** **3 Claims**




1. A ready signal control apparatus, connected between a CPU and a plurality of peripheral circuits whose operation requires a wait state of said CPU, for receiving a ready signal from one of said peripheral circuits and transmitting said ready signal to said CPU, comprising:

first detecting means for detecting whether or not a selection signal is generated and transmitted to one of said peripheral circuits;

counting mans for counting a certain time period after said selection signal is detected;

second detecting means for detecting whether or not one of said peripheral circuits generates a ready signal; and

transmitting means for transmitting said ready signal from a timing when said selection signal is generated to a timing when said certain time period has passed, wherein said transmitting means includes

a first gate, controlled by said counting means, for passing said ready signal therethrough when said certain time period has not passed yet, and

a second gate, connected to an output of said first gate and controlled by said first detecting means, for passing an output signal of said first gate when said selection signal is generated.



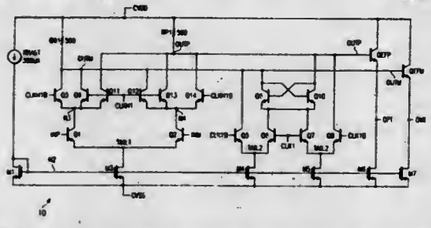
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**5,498,982**

## HIGH SPEED COMPARATOR WITH A PRECISE SAMPLING INSTANT

**Venugopal Gopinathan, and Martin J. Izzard, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Continuation-in-part of Ser. No. 282,686, Jul. 29, 1994, abandoned. This application Jan. 19, 1995, Ser. No. 374,866**
**Int. Cl.[6] H03K** *19/086*
**U.S. Cl. 326—126** **11 Claims**



8. A method for reducing aperture uncertainty and kick-back noise in a comparator for comparing a first signal and a second signal and having both a track and a regenerative mode of operation. comprising the steps of:

switching a first input current representing the first signal through a first output node during the track mode;

switching a second input current representing the second signal through a second output node during the track mode;

switching approximately half of the first input current through the first output node and approximately balf of the first input current through the second output node during the regenerative mode; and

switching approximately half of the second input current through the first output node and approximately half of the second input current through the second output node during the regenerative mode.

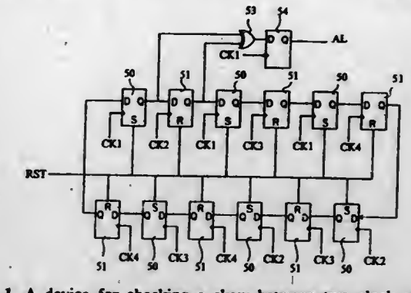
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**5,498,983**

## DEVICE FOR CHECKING THE SKEW BETWEEN TWO CLOCK SIGNALS

**Jean-Pierre Schoellkopf, Grenoble, France, assignor to SGS-Thomson Microelectronics S.A., Saint-Genis, France**

**Filed Sep. 19, 1994, Ser. No. 308,080**
**Claims priority, application France, Jan. 11, 1993, 93 12451**
**Int. Cl.[6] G01R** *25/00*
**U.S. Cl. 327—3** **26 Claims**




1. A device for checking a skew between two clock signals among a plurality of clock signals having the same frequency, the device comprising:

a plurality of flip-flops coupled in a looped shift register configuration, wherein each flip-flop has a signal input, a clock input that receives one of the plurality of clock signals, and a signal output coupled to a signal input of another flip-flop, wherein each of a plurality of pairs of the plurality of clock signals respectively enables two successive flip-flops, and wherein each flip-flop is initially set to a predetermined state; and

an Exclusive-OR gate having inputs coupled to the signal outputs of a pair of the plurality of flip-flops coupled in the looped shift register configuration, and an output that provides an alarm signal indicative of the skew between the two clock signals among the plurality of clock signals.

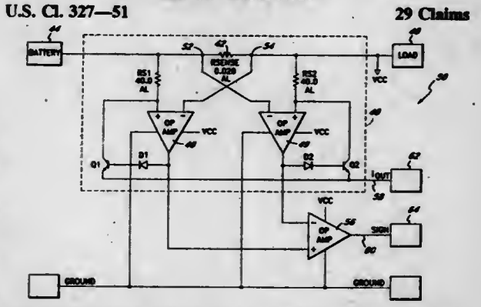
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**5,498,984**

## HIGH SIDE, CURRENT SENSE AMPLIFIER USING A SYMMETRIC AMPLIFIER

**Gregory L. Schaffer, Cupertino, Calif., assignor to Maxim Integrated Products, Sunnyvale, Calif.**

**Filed Sep. 30, 1994, Ser. No. 316,125**
**Int. Cl.[6] H03K** *19/20*
**U.S. Cl. 327—51** **29 Claims**




1. A bidirectional current sense amplifier comprising: first and second terminals for connection to a current sense resistor to sense the magnitude and polarity of the potential difference between the first and second terminals;

a first circuit coupled to the first and second terminals for providing an output on a first output terminal, responsive to the magnitude of the potential difference between the first and second terminals; and

a second circuit for providing a two-state signal on a second output terminal responsive to the polarity of the potential difference between the first and second terminals.

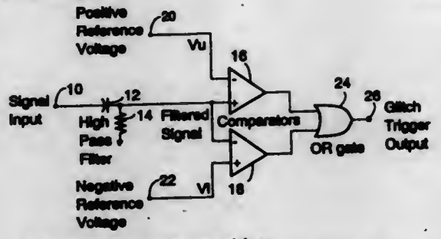
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**5,498,985**

## DUAL COMPARATOR TRIGGER CIRCUIT FOR GLITCH CAPTURE

**Jonathan J. Parle, Seattle, and Martins Skele, Langley, both of Wash., assignors to Fluke Corporation, Everett, Wash.**

**Filed Feb. 17, 1994, Ser. No. 199,034**
**Int. Cl.[6] H03K** *5/153;12/00*
**U.S. Cl. 327—74** **3 Claims**




1. A glitch trigger circuit comprising:
(a) a high-pass filter for receiving an input signal and providing a filtered signal;
(b) a fast voltage source for providing an upper limit voltage wherein said upper limit voltage is positive with respect to ground;
(c) a second voltage source for providing a lower limit voltage wherein said lower limit voltage is negative with respect to ground;
(d) a fast comparator having a fast input coupled to said first voltage source and a second input coupled to said high-pass filter to produce an upper limit signal at an output when the voltage of said filtered signal is above said upper limit voltage;
(e) a second comparator having a first input coupled to said second voltage source and a second input coupled to said high-pass filter to produce a lower limit signal at an output when the voltage of said filtered signal is below said lower limit voltage; and
(f) a logical OR circuit having a first input coupled to said first comparator output and a second input coupled to said second comparator output, said logical OR circuit responsive to said upper limit signal and said lower limit signal to provide a trigger signal.

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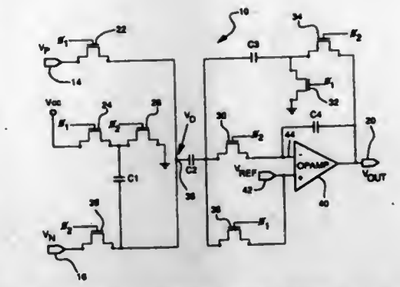
**5,498,986**

## OXYGEN SENSOR INTERFACE CIRCUIT WITH SIMPLIFIED AMPLIFIER REQUIREMENTS

**Gregory J. Manlove, Kokomo, Ind., assignor to Delco Electronics Corporation, Kokomo, Ind.**

**Filed Apr. 29, 1994, Ser. No. 235,741**
**Int. Cl.[6] H03K** *5/153;5/22*
**U.S. Cl. 327—77** **10 Claims**

1. A sensor interface circuit for amplifying and processing sensor output signals and rejecting common mode signals, said circuit comprising:
first and second inputs for receiving an output signal from a sensor;
means for joining the first and second inputs so as to provide a differential voltage representative of a voltage potential between said first and second inputs;
an amplifier having a first input for receiving the differential voltage, a second input and an output for providing an amplified output signal;




a non-zero positive reference voltage supplied to the second input of the amplifier; and
an output coupled to the amplifier output and means for referencing the output of said amplifier to a reference ground so as to provide an analog output signal referenced to the reference ground.

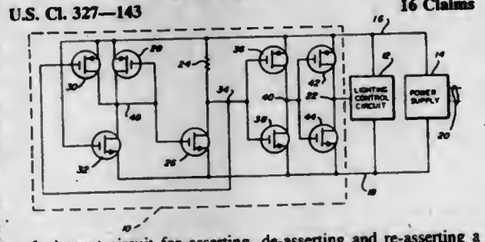
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**5,498,987**

## INTEGRATABLE SOLID STATE RESET CIRCUIT OPERABLE OVER A WIDE TEMPERATURE RANGE

**Richard E. Nelson, Meridian, Id., assignor to Beacon Light Products, Inc., Meridian, Id.**

**Filed Jun. 20, 1994, Ser. No. 262,765**
**Int. Cl.[6] H03K** *17/22*
**U.S. Cl. 327—143** **16 Claims**




1. A reset circuit for asserting, de-asserting and re-asserting a reset signal in response to a variable application voltage applied between two nodes to which the reset circuit is connected, comprising:
a resistive element connected to a first one of the nodes to which the reset circuit is connected;
a first switch connected to a second one of the nodes to which the reset circuit is connected, the first switch also connected to the resistive element at a third node which is separate from the first and second nodes, the first switch having a control terminal to which the application of a first bias signal of one characteristic causes the first switch to exhibit an open or substantially nonconductive state and to which the application of the first bias signal of another characteristic causes the first switch to exhibit a closed or substantially conductive state;
the voltage at the third node constituting the reset signal;
a voltage divider connected between the first and second nodes, the voltage divider having a fourth node which is separate from the first, second and third nodes, the voltage divider establishing a voltage at the fourth node which is intermediate of said variable application voltage;
the control terminal of the first switch is connected to the fourth node;
the fourth node supplying the first bias signal to the first switch;
a second switch connected between the first node and the fourth node and also connected in parallel with a portion of the voltage divider between the first and fourth nodes, the second switch having a control terminal to which the application of a second bias signal of one characteristic causes the second switch to exhibit an open or substantially nonconductive state and to which the application of the second bias signal of another characteristic causes the second switch to exhibit a closed or substantially conductive state;
the control terminal of the second switch is connected to the third node;
the third node supplying the second bias signal to the second switch;
wherein the resistive element applies the voltage from the first node to the third node when said variable application voltage is below a first predetermined level, the voltage at the third node constituting an asserted reset signal until the first predetermined level of said variable application voltage is reached;
the first predetermined level of said variable application voltage develops the first bias signal at the fourth node to close the first switch, the closed first switch causing current to flow through the resistive element and thereby decrease the voltage at the third node and de-assert the reset signal;
the decrease in voltage at the third node when the reset signal is de-asserted establishing the second bias signal at the control terminal of the second switch to close the second switch, the closed second switch causing the voltage at the fourth node to create the first bias signal at the control terminal of the first switch to close the first switch;
a decrease in said variable application voltage after the reset signal has been de-asserted resulting in maintenance of the de-asserted reset signal until said variable application voltage reaches a second predetermined level which is less than the first predetermined level;
the second predetermined level of said variable application voltage causing the voltage at the fourth node to attain a level approaching the voltage established by the voltage divider at the fourth node and to thereby create the first bias signal at the control terminal of the first switch to open the first switch and cause the voltage at the third node to increase and re-assert the reset signal after the reset signal has previously been de-asserted;
the re-assertion of the reset signal creating the first bias signal at the control terminal of the first switch to open the first switch and to further increase the voltage at the third node;
the reset signal remaining asserted as said variable application voltage increases from the second predetermined level to the first predetermined level;
the reset signal remaining de-asserted as said variable application voltage decreases from the first predetermined level to the second predetermined level; and
the connection of the control terminal of the first switch to the fourth node and the connection of the control terminal of the second switch to the third node establishing positive feedback for de-asserting and asserting the reset signal.

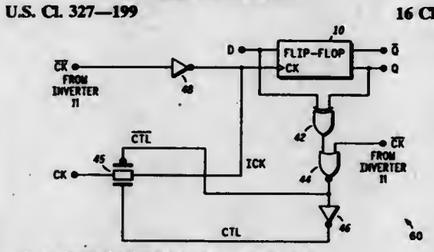
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**5,498,988**

## LOW POWER FLIP-FLOP CIRCUIT AND METHOD THEREOF

**Alberto J. Reyes, Phoenix; Steven D. Millman, Mesa, and Sean C. Tyler, Chandler, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Nov. 25, 1994, Ser. No. 345,655**
**Int. Cl.[6] H03K** *3/037*
**U.S. Cl. 327—199** **16 Claims**




1. A circuit for latching data, comprising:



a flip-flop having a data input coupled for receiving a data input signal, and a data output for providing a data output signal; and
circuit means having first and second inputs coupled to said data input of said flip-flop and said data output of said flip-flop respectively for monitoring said data input signal and said data output signal and blocking a clock signal to a clock input of said flip-flop when said data input signal and said data output signal agree at a clocking edge of said clock signal.

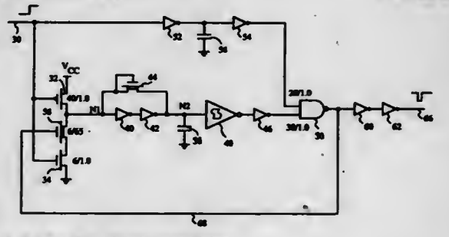
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**5,498,989**

## INTEGRATED CIRCUIT ONE SHOT WITH EXTENDED LENGTH OUTPUT PULSE

**Sholeh Diba, San Jose, Calif., assignor to Xilinx, Inc., San Jose, Calif.**

**Filed Apr. 19, 1994, Ser. No. 230,045**
**Int. Cl.[6] H03K** *3/033;3/355*
**U.S. Cl. 327—230** **13 Claims**




1. A one shot circuit comprising:
an input terminal;
a logic gate having a first logic gate input terminal connected to the input terminal thereby providing an unlatched signal from the input terminal to the logic gate;
a pull-up device and a pull-down device each connected to the input terminal;
a latch having an input terminal connected to the pull-up device and having an output terminal connected, by a buffering device, to a second logic gate input terminal of the logic gate thereby holding an output signal of the pull-up device; and
a capacitor connected to the output terminal of the latch; wherein a one-shot output signal is provided at an output terminal of the logic gate.

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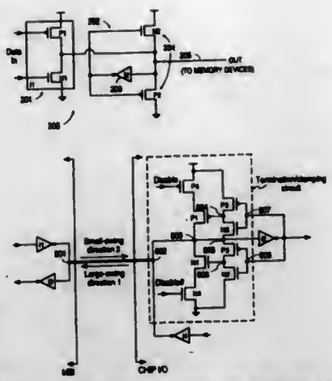
**5,498,990**

## REDUCED CMOS-SWING CLAMPING CIRCUIT FOR BUS LINES

**Wingyu Leung, Cupertino; Winston Lee, San Francisco, and Fu-Chieh Hsu, Saratoga, all of Calif., assignors to Monolithic System Technology, Inc., San Jose, Calif.**

**Continuation of Ser. No. 156,186, Nov. 22, 1993, abandoned, which is a continuation-in-part of Ser. No. 927,564, Aug. 10, 1992, abandoned, which is a continuation-in-part of Ser. No. 865,410, Apr. 8, 1992, abandoned, which is a continuation-in-part of Ser. No. 787,984, Nov. 5, 1991, abandoned. This application Apr. 5, 1995, Ser. No. 417,511**
**Int. Cl.[6] H03K** *5/08*
**U.S. Cl. 327—323** **21 Claims**

1. A circuit on a semiconductor device for limiting signal swing on a bus to a reduced CMOS-swing, said bus including a plurality of bus lines, said circuit comprising a clamping circuit for each bus line, wherein said clamping circuit comprises:



a feedback circuit sensing a signal on said bus line and in response generating at least one feedback signal; and

a complementary source follower responsive to said at least one feedback signal, wherein the source follower restricts said signal on said bus line and provides said reduced CMOS-swing.

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**5,498,991**

## LEVEL SHIFTER CIRCUIT

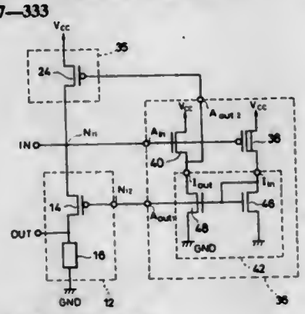
**Satoru Tanoi, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan**

**Division of Ser. No. 170,070, Dec. 20, 1993. This application Jun. 1, 1995, Ser. No. 457,842**

**Claims priority, application Japan, Dec. 28, 1992, 4-349645; Dec. 28, 1992, 4-349646; Dec. 28, 1992, 4-359742**

**Int. Cl.[6] H03L** *5/00*

**U.S. Cl. 327—333** **3 Claims**



1. A level shifter, comprising:

an input terminal;

an output terminal;

a depletion-mode field-effect transistor of a first channel type with a source coupled to receive a first fixed potential, a gate coupled to said input terminal, and a drain;

an enhancement-mode field-effect transistor of a second channel type with a source coupled to said output terminal, a gate coupled to said input terminal, and a drain coupled to receive said first fixed potential; and

a current mirror coupled to allow a current flow between the source of said enhancement-mode field-effect transistor and a second fixed potential, responsive to a current flow between the drain of said depletion-mode field-effect transistor and said second fixed potential.

**5,498,992**

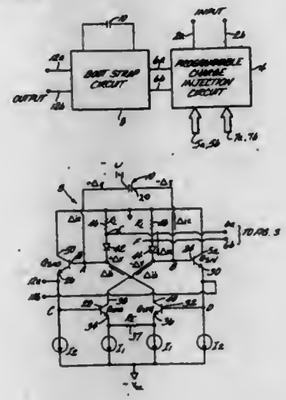
## UNITY GAIN POSITIVE FEEDBACK INTEGRATOR WITH PROGRAMMABLE CHARGING CURRENTS AND POLARITIES

**Benny W. H. Lai, San Jose, and Richard C. Walker, Palo Alto, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.**

**Continuation of Ser. No. 877,449, Apr. 30, 1992, abandoned. This application Dec. 14, 1994, Ser. No. 358,031**

**Int. Cl.[6] H03K** *4/58;4/56;4/52*

**U.S. Cl. 327—345** **3 Claims**



1. An integrator circuit comprising:

a storage capacitor coupled to an input and output for storing charge, the charge on the capacitor representing the time integral of the current flowing from the input through the capacitor to the output; and

circuit means connected to the capacitor for detecting leaking charge from the capacitor, thereby maintaining the charge stored in the capacitor, wherein the circuit means comprises means for providing positive feedback in response to the leaking charge,

the circuit means further comprising first and second transistors for sensing the leakage charge and having first and second bases, respectively, the first and second bases being connected to opposite sides of the capacitor,

the means for providing positive feedback comprising third and fourth transistors having third and fourth bases, respectively, the first and second transistors having first and second emitters and first and second collectors, respectively, and the third and fourth transistors having third and fourth collectors, respectively, the first and second emitters being connected to the third and fourth bases, respectively, the first and second collectors being connected to the first and second bases, respectively, and the third and fourth collectors being cross-connected to the second and first bases, respectively,

the circuit means further comprising a first load resistor and a first diode connected between the first collector and base of the first transistor, and a second load resistor and a second diode connected between the second collector and base of the second transistor.



**5,498,993**

## PULSE LIGHT-RECEIVING CIRCUIT WITH MEANS TO MINIMIZE POWER SOURCE NOISE

**Yoshihiro Ohtsuka, Nara, and Yoshifumi Masuda, Kashihara, both of, Japan, assignors to Sharp Kabushiki Kaisha, Japan**

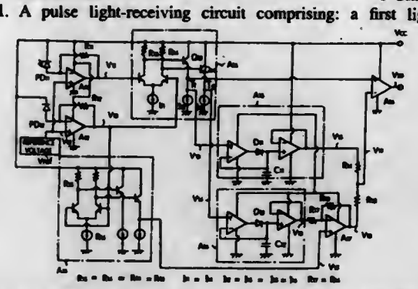
**Filed Jan. 12, 1994, Ser. No. 180,335**

**Claims priority, application Japan, Jan. 27, 1993, 5-011815; Jun. 22, 1993, 5-150071**

**Int. Cl.[6] H03K** *3/42;17/78*

**U.S. Cl. 327—514** **6 Claims**

1. A pulse light-receiving circuit comprising: a first light-



receiving element photoelectrically converting a pulse light into an electrical current;

a first preamplifier amplifying the electrical current from said first light-receiving element;

a second light-receiving element shielded from light;

a second preamplifier, connected to said second light-receiving element and made up of a circuit eqnivalent to that of said first preamplifier for amplifying an output from said second light-receiving element;

a primary difference amplifier amplifying a light-receiving element difference between output signals from said first preamplifier and said second preamplifier;

an auxiliary difference amplifier for outputting a reference voltage, made up of a circuit equivalent to that of said primary difference amplifier, with both input terminals thereof being commonly connected to an output terminal of said second preamplifier;

a first peak value-detecting circuit for obtaining a first peak value of an output from a first difference output terminal of said primary difference amplifier, said first difference output terminal being connected to said first peak value-detecting circuit;

a second peak value-detecting circuit for obtaining a second peak value of an output from a second difference output terminal of said primary difference amplifier, said second difference output terminal being connected to said second peak value-detecting circuit;

a median value calculator for calculating a median value between maximum and minimum values of the output from said first difference output terminal based on the reference voltage, the first peak value, and the second peak value; and

a comparator comparing the median value to the output from said first difference output terminal.

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**5,498,994**

## ACTIVE FILTER DEVICE

**Michihiro Furuta, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Aug. 24, 1994, Ser. No. 294,048**

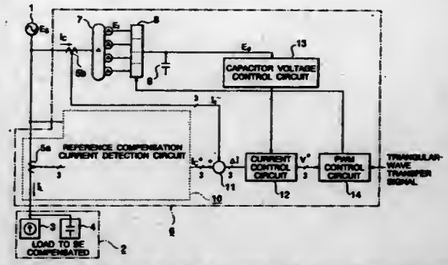
**Claims priority, application Japan, Sep. 7, 1993, 5-222415**

**Int. Cl.[6] H02M** *5/40;* **G05F** *1/70;* **H03K** *5/00*

**U.S. Cl. 327—532** **10 Claims**

1. An active filter device for filtering harmonic current components in a power line of a system including a power supply source coupled to a load, said active filter comprising:

a current detector coupled to said power line for detecting a load current



a frequency detection circuit coupled to said power line for detecting each of a first to an n-th frequency components contained in said load current so as to output them, wherein n is an integer greater than 1;

a first to an n-th reference compensation current processing circuits each of which performs the phase compensation for the corresponding frequency component detected by said current detector so as to determine a reference compensation current for corresponding frequency component, said first to n-th compensation current processing circuits being connected to said current detector and to said frequency detection circuit;

an adder for adding the output from each of said processing circuits so as to generate a resultant reference compensation current;

a control section connected to said adder for generating a control signal based on the output from said synthesizer;

an inverter circuit coupled to said control section driven by the control signal output from said control section; and

an inverter transformer coupled between said power line and said inverter circuit for sending out to said system a compensation current for suppressing a higher harmonic contained in said load current on the basis of the output from said inverter circuit.

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**5,498,995**

## SHORT CIRCUIT FREQUENCY SHIFT CIRCUIT FOR SWITCHING REGULATORS

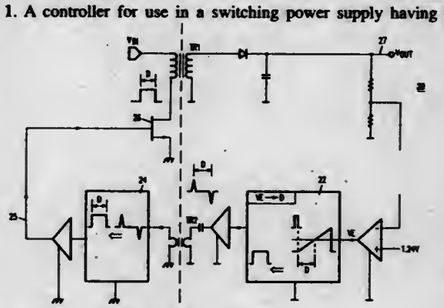
**Thomas Szepesi, San Jose, and Hendrik Santo, Milpitas, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.**

**Continuation of Ser. No. 32,501, Mar. 17, 1993, abandoned. This application Dec. 13, 1994, Ser. No. 355,427**

**Int. Cl.[6] H02M** *3/335;* **G05F** *1/10*

**U.S. Cl. 327—538** **4 Claims**

1. A controller for use in a switching power supply having a



power switch, the controller comprising:

an oscillator for generating pulse width modulation (PWM) pulses having a predetermined frequency for activating the power switch in the switching power supply, the oscillator including a first capacitor which is charged and discharged in order to generate the PWM pulses, the first capacitor being charged at a charging rate by a first current;

frequency shift means for gradually shifting the frequency of the PWM pulses at a shift rate in response to an output voltage of the switching power supply decreasing to below a threshold level, the frequency shift means including circuitry which diverts a portion of the first current away from the first capacitor in order to reduce the charging rate of the first capacitor in order to shift the frequency of the PWM pulses; and

programming circuitry for programming the shift rate at which the frequency of the PWM pulses is shifted;

wherein the circuitry which diverts a portion of the first current away from the first capacitor includes:

a first transistor for conducting the portion of the first current; and

current mirror circuitry for switching the first transistor into a conducting state;

wherein the frequency shift means further includes:

a reference voltage source; and

a second transistor having its base connected to the reference voltage source and its collector connected to the current mirror circuitry;

wherein the programming circuitry further includes:

a first resistor for setting the shift rate at which the frequency of the PWM pulses is shifted, the first resistor being connected between the emitter of the second transistor and the output of the switching power supply;

wherein, the second transistor is switched into a conducting state when the output voltage of the switching power supply decreases below the threshold level.

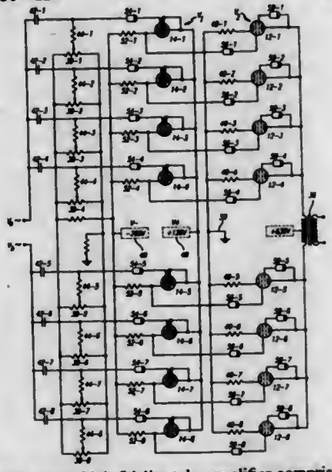
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**5,498,996**

## HIGH-POWER, HIGH-FIDELITY TUBE AMPLIFIER

**Scott G. Frankland, San Jose, Calif., assignor to Wavestream Kinetics, Los Angeles, Calif.**

**Filed Nov. 21, 1994, Ser. No. 342,832**
**Int. Cl.[6] H03F *3/28***
**U.S. Cl. 330—118** **50 Claims**



1. A high-power, high-fidelity tube amplifier comprising:

a plurality of output tubes including a cathode, a control grid, a screen grid and a plate, said screen grid and said plate of each output tube being electrically coupled together, and said output tubes being connected in parallel to provide an output signal;

a plurality of high transconductance driver tubes including a cathode, a control grid, a screen grid, a suppressor grid and a plate, said screen grid, said suppressor grid and said plate of each driver tube being electrically coupled together, and said cathode of each driver tube being electrically coupled to said control grid of a corresponding output tube such that an output impedance of said driver tube decreases as a grid current of said corresponding output tube increases; and

a plurality of parasitic suppression components including a first group, a second group and a third group, said first group being electrically coupled to said control grids of said driver tubes, said second group being electrically coupled between said cathode of each driver tube and said control grid of said corresponding output tube, and said third group being electrically coupled to said screen grids of said output tubes.

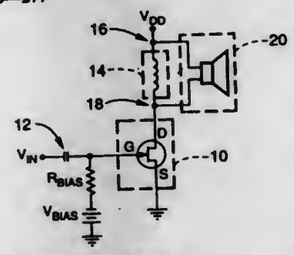
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**5,498,997**

## TRANSFORMERLESS AUDIO AMPLIFIER

**Cristopher F. Schiebold, 480 Palo Alto Ave., Palo Alto, Calif. 94301**

**Filed Dec. 23, 1994, Ser. No. 372,808**
**Int. Cl.[6] H03F *3/16;3/185***
**U.S. Cl. 330—277** **12 Claims**




1. An audio amplifier, comprising:

(a) a transistor, said transistor having gate, drain and source terminals, said transistor having an output impedance between approximately two and sixteen ohms;

(b) a signal input terminal electrically connected to said gate terminal;

(c) a DC voltage source terminal electrically connected to said drain terminal;

(d) a choke electrically connected in series with said DC voltage source terminal and said drain terminal; and

(e) a first speaker output terminal electrically connected to said drain terminal and a second speaker output terminal electrically connected to said DC voltage source terminal;

(f) wherein said amplifier has an output impedance as measured across said speaker output terminals between approximately two and sixteen ohms, and wherein said output impedance matches the drive impedance of a high fidelity speaker without the need for an impedance matching transformer.

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**5,498,998**

## METHOD FOR ADJUSTING THE OUTPUT FREQUENCY OF A FREQUENCY SYNTHESIZER

**James K. Gehrke, 17 Hilltop Dr., Lake in the Hills, Ill. 60102, and Robert J. Sarocka, 736 Hammerschmit, Lombard, Ill. 60148**

**Filed Nov. 16, 1992, Ser. No. 976,768**
**Int. Cl.[6] H04B *1/40*; H03L *7/00***
**U.S. Cl. 331—17** **7 Claims**

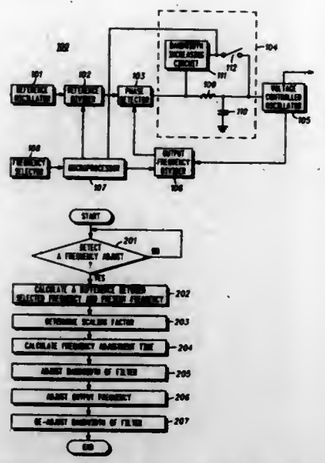
1. In a frequency synthesizer that includes a reference oscillator, a reference divider, a phase detector, an output frequency divider, a voltage control oscillator, and a multi-bandwidth filter, a method for adjusting output frequency of the frequency synthesizer, the method comprises the steps of:

a) detecting a frequency adjustment request, wherein the frequency adjustment request indicates a selected frequency;

b) calculating a difference between the selected frequency and a present frequency to produce a frequency difference;

c) determining a frequency scaling factor;





d) calculating a frequency adjustment time based on a proportional relationship between the frequency difference and the frequency scaling factor, wherein the proportional relationship is based on time required to charge or discharge a capacitor of the multi-bandwidth filter to produce an optimum pull-back for the frequency difference;

e) adjusting bandwidth of the multi-bandwidth filter from a first bandwidth to at least a second bandwidth for a duration of the frequency adjustment time;

f) adjusting the output frequency of the frequency synthesizer from the present frequency to the selected frequency prior to expiration of the frequency adjustment time; and

g) upon expiration of the frequency adjustment time, adjusting the bandwidth of the multi-bandwidth filter from the second bandwidth to the first bandwidth.

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**5,498,999**

## HIGH-FREQUENCY USE NON-RECIPROCAL CIRCUIT ELEMENT

**Hiroshi Marusawa; Takashi Kawanami; Takehiro Konoike, and Kunisaburo Tomono, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan**

**Filed Oct. 11, 1994, Ser. No. 320,675**
**Claims priority, application Japan, Jan. 12, 1993, 5-254490**
**Int. Cl.[6] H01P *1/387***
**U.S. Cl. 333—1.1** **8 Claims**

1. A high-frequency use non-reciprocal circuit element comprising:

at least one insulator layer;

a plurality of central electrodes being separated through said insulator layer to be electrically insulated from each other while being arranged to intersect with each other;

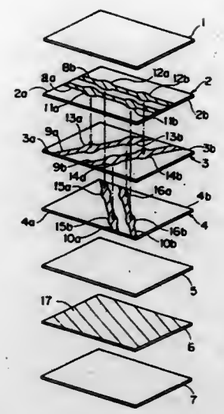
a high-frequency use magnetic body being arranged on an intersectional portion of said central electrodes; and

impedance-matching capacitance being connected to said central electrodes,

a dc magnetic field being applied to said intersectional portion by a permanent magnet,

said insulator layer and a dielectric portion for said impedance-matching capacitance being integrally formed by the same magnetic layer as said high-frequency use magnetic body,

said high-frequency use non-reciprocal circuit element further comprising at least a pair of electrodes for deriving said impedance-matching capacitance, being formed to overlap with each other through said high-frequency use magnetic layer.



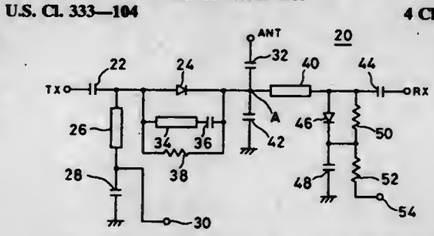
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**5,499,000**

## HIGH-FREQUENCY SWITCH

**Takehiko Morikawa, Takefu, and Kazuhiro Iida, Fukui, both of, Japan, assignors to Murata Manufacturing Co., Ltd., Japan**

**Filed May 16, 1995, Ser. No. 442,324**
**Claims priority, application Japan, May 17, 1994, 6-128397**
**Int. Cl.[6] H01P *1/15***
**U.S. Cl. 333—104** **4 Claims**




1. A high-frequency switch connected to a transmitting circuit, a receiving circuit and an antenna, for switching a connection between said transmitting circuit and said antenna and a connection between said receiving circuit and said antenna, comprising:

a first diode whose anode is connected to said transmitting circuit and whose cathode is connected to said antenna;

a strip line connected between said antenna and said receiving circuit;

a second diode whose anode is connected to said receiving circuit and whose cathode is connected to a ground; and

a capacitor connected between ground and a connecting point of said strip line and said antenna.

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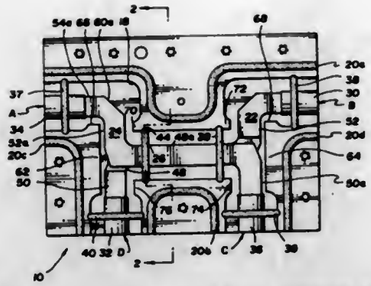
**5,499,001**

## CAVITY MATCHED HYBRID COUPLER

**Joginder S. Degun, 15903 Prairie Ave., #15, Lawndale, Calif. 90260, and Robert Ahulii, 1023 Teri Ave., Torrance, Calif. 90503**

**Filed Feb. 24, 1994, Ser. No. 209,749**
**Int. Cl.[6] H01P *5/18***
**U.S. Cl. 333—115** **15 Claims**

1. A 3 dB hybrid coupler comprising a housing forming a cavity with upper and lower ground planes, first and second conductors supported within said cavity, each conductor having a central portion which is a multiple of a quarter-wave length and second and third portions extending from said central portion in opposite directions forming substantially 90 degree bends in said conduc-



tors, said central portion of each conductor overlapping the other for its entire length to form a generally H shaped configuration with a coupling region for coupling electromagnetic energy between the two conductors, said housing including an inner wall having capacitive tuning portions integrally formed therewith in the vicinity of the coupling region adjacent the conductor bends, said capacitive tuning portions cooperating with the first and second conductors to create an increase in capacitance to compensate for discontinuities introduced by said bends.

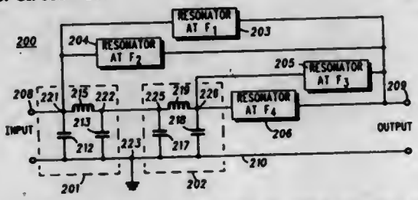
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5,499,002

## RESONATOR FILTER UTILIZING CASCADED IMPEDANCE INVERTERS

Robert G. Kinsman, 1129 N. Loomis St., Naperville, Ill. 60563

Filed Apr. 28, 1994, Ser. No. 234,748
Int. Cl.[6] H03H 9/00
U.S. Cl. 333—187 18 Claims




1. A filter having an input terminal, an output terminal, and a common terminal, comprising:

a first impedance inverter that is coupled to the common terminal at a common node, wherein the first impedance inverter includes a first input node and a first output node, wherein the first input node is coupled to the input terminal, and wherein the first impedance inverter provides a first 90 degree phase shift between the first input node and the first output node at a center frequency of the filter;

a second impedance inverter that is coupled to the common terminal at the common node, wherein the second impedance inverter includes a second input node and a second output node, wherein the second input node is coupled to the first output node-and wherein the second impedance inverter provides a second 90 degree phase shift between the second input node and the second output node at the center frequency of the filter, such that the first impedance inverter and the second impedance inverter cascaded together provide 180 degrees of phase shift at the center frequency of the filter; and

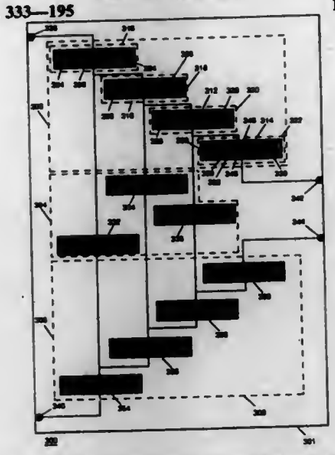
a first resonator, operably coupled between the input terminal and the output terminal, having a first resonant frequency.

5,499,003

## DIFFERENTIAL SAW FILTER INCLUDING SERIES COUPLED RESONANT/ANTIRESONANT TRACKS

Roger A. Davenport, Ft. Lauderdale, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 3, 1994, Ser. No. 317,052
Int. Cl.[6] H03H 9/64
U.S. Cl. 333—195 12 Claims



1. A balanced differential surface acoustic wave (SAW) filter for operation over a frequency passband, comprising:

a piezoelectric substrate having a first, second, and third acoustic tracks;

a first set of transducers electrically connected in series on the first acoustic track and having geometries tuned to operate at resonant frequency in the passband;

a second set of transducers electrically connected in series on the third acoustic track and having identical geometries to the first set of resonators;

a third set of transducers located on the second acoustic track, each electrically coupled in series between each of the series connections of the first and second sets of transducers and tuned for anti-resonant frequency in the passband;

a differential input connected to the first and third acoustic tracks; and

a differential output connected to the first and third acoustic tracks.

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5,499,004

## DIELECTRIC FILTER HAVING INTERSTAGE COUPLING USING ADJACENT ELECTRODES

Toshiharu Noguchi; Kazuhiro Eguchi, and Hiroshi Ohno, all of Miyazaki, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Feb. 25, 1994, Ser. No. 202,073
Claims priority, application Japan, Mar. 12, 1993, 5-051945; Dec. 1, 1993, 5-301565
Int. Cl.[6] H01P 1/205
U.S. Cl. 333—202 5 Claims

1. A dielectric filter comprising:

at least two dielectric resonators, each dielectric resonator including:

a dielectric base body including first, second, third and fourth side surfaces and first and second end surfaces, wherein a through hole is provided to extend from the first end surface to the second end surface, along a central axis of the dielectric base body, to define an inner surface thereof;

an outer conductor located on the first, second, third and fourth side surfaces, wherein the outer conductor covers the entire first and second side surfaces and covers a portion of the third and fourth side surfaces, thereby leaving an uncovered portion of the third side surface that is adjacent to an uncovered portion of the fourth side surface, and wherein the uncovered portions of the third and fourth side surfaces are adjacent to the first end surface and respectively extend across a corresponding width of the third and fourth side surfaces;

an inner conductor located on the inner surface of the dielectric base body;

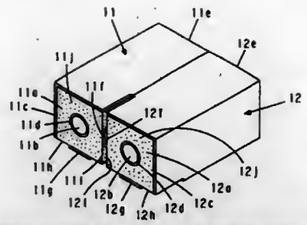
a connection conductor located on the second end surface of the dielectric base body, wherein the connection conductor connects the inner conductor to the outer conductor;

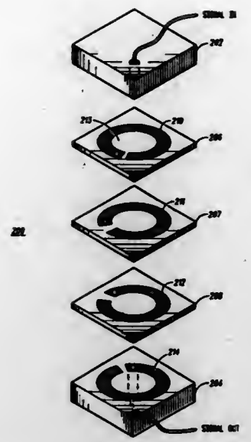
an interstage coupling electrode located on the uncovered portion of the third side surface, wherein an area of the uncovered portion of the third side surface extends in three directions from the interstage coupling electrode and separates the interstage coupling electrode from the outer conductor and the second and fourth side surfaces; and

an input/output coupling electrode located on the uncovered portion of the fourth Side surface, wherein an area of the uncovered portion of the fourth side surface extends in three directions from the input/output coupling electrode and separates the input/output coupling electrode from the outer conductor and the first and third side surfaces;

wherein the dielectric resonators are connected with each other in such a manner that the outer conductor of a first one of the dielectric resonators is electrically connected to the outer conductor of a second one of the dielectric resonators.







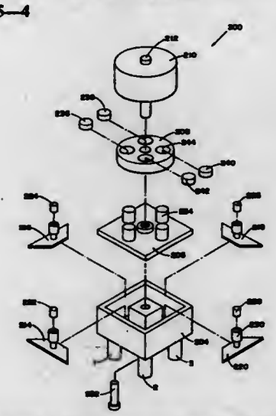
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5,499,006

## RADIO FREQUENCY SWITCH AND METHOD OF OPERATION THEREFOR

Klaus G. Engel, Waterloo, and Regina Kwiatkowska, Kitchener, both of, Canada, assignors to Com Dev Ltd., Cambridge, Canada

Filed May 5, 1994, Ser. No. 238,484
Claims priority, application Canada, Jun. 25, 1993, 2099147
Int. Cl.[6] H01M 33/00
U.S. Cl. 335—4 36 Claims



1. A radio frequency switch comprising a radio frequency cavity containing at least one conductor that is reciprocatable between a closed position and an open position, said cavity having an input and output, an actuator located adjacent to said cavity, said actuator supporting a first permanent magnet, said actuator being rotatably mounted with a mover being located to rotate the actuator both clockwise and counterclockwise by activating said mover, said actuator having a first position whereby said conductor is moved between the closed position and the open position, said actuator having a second position located within 40° of said first position, with a second permanent magnet arranged relative to said cavity to move said conductor between the closed position and the open position when said actuator is in said second position, the conductor moving in one direction when the actuator is in the first position and the conductor moving in the opposite direction when the actuator is in the second position.

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5,499,005

## TRANSMISSION LINE DEVICE USING STACKED CONDUCTIVE LAYERS

Wang-Chang A. Gu, 9508 San Gabriel, NE., Albuquerque, N.M. 87111; Richard S. Kommrusch, 938 Bobcat Blvd., NE., Albuquerque, N.M. 87122, and Rong-Fong Huang, 8216 Tina Dr., NE., Albuquerque, N.M. 87109

Filed Jan. 28, 1994, Ser. No. 187,951
Int. Cl.[6] H01P 5/00
U.S. Cl. 333—246 2 Claims

1. A transmission line device that includes a plurality of stacked dielectric substrates, comprising:

a first ground plane disposed on a first of the plurality of stacked dielectric substrates;

a first non-grounded conductive annulus, having a first end electrically connected to an input port for the transmission line device and a second end, that at least partially encloses a first area on a second of the plurality of stacked dielectric substrates

a second conductive annulus, electrically connected at a first end to the second end of the first non-grounded conductive layer, that substantially encloses a second area corresponding to the first area on a first major surface of a third of the plurality of stacked dielectric substrates;

a third conductive annulus disposed on a fourth of the plurality of stacked dielectric substrates, and

second conductive means for connecting the second conductive annulus to the third conductive annulus;

wherein a vertically-stacked multiple-turn coil is formed using the first conductive annulus, the second conductive annulus and the third conductive annulus.

**5,499,007**

## CIRCUIT BREAKER

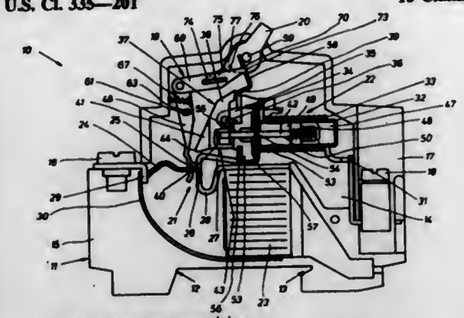
**Peter Flohr, Kahl/Main, Germany, assignor to Heinrich Kopp AG, Kahl/Main, Germany**

**Filed Apr. 18, 1994, Ser. No. 228,627**

**Claims priority, application Germany, Apr. 22, 1993, 43 13 207.3**

**Int. Cl.[6] H01H *9/30***

**U.S. Cl. 335—201** **13 Claims**



1. A circuit breaker comprising:

high-duty arc-quenching means and a latching mechanism,

said latching mechanism adapted to be electromagnetically and thermoelectrically unlatched by a snap-action bimetal element to open contacting means in response to an overload,

said snap-action bimetal element mounted in a carrying body,

said body having a high thermal conductivity and carrying an electromagnetic exciter coil, said body further containing an associated plunger,

said plunger adapted to be actuated by said snap-action bimetal element and electromagnetically,

said latching mechanism adapted to be unlatched by a first arm of a pivoted two-armed lever in response to an actuation of said plunger, wherein

the second arm of the lever is adapted to strike open said contacting means, and the second arm is provided with a baffle wall for urging toward the arc-quenching means a plasma or arc column which is generated as the contacting means are struck open.

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**5,499,008**

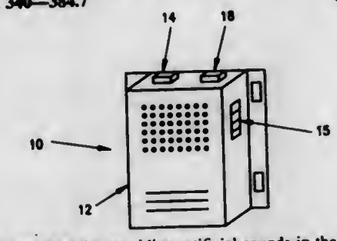
## APPARATUS FOR PROVIDING ARTIFICIAL SOUNDS IN THE VICINITY OF A TOILET AND METHOD THEREOF

**Evelyn Rosenkrantz, 4915 Tyrone Ave. #203, Sherman Oaks, Calif. 91423, and Richard Wu, Fullerton, Calif., assignors to Evelyn Rosenkrantz, Sherman Oaks, Calif.**

**Filed Apr. 11, 1994, Ser. No. 226,127**

**Int. Cl.[6] G08B *3/00***

**U.S. Cl. 340—384.7** **12 Claims**



1. An apparatus for providing artificial sounds in the vicinity of a toilet, comprising:

a housing attachable in a vicinity of a toilet; and

an electronic sound system which is contained within said housing and is activatable by a user of said toilet so as to block out the noise of eliminating, said sound system comprising:

a) a speech processing microprocessor for providing an electronic signal representing a desired sound;

b) a memory storage device connected to said speech processing microprocessor, for electronically storing a digital representation of said desired sound to be processed by said speech processing microprocessor;

c) a counter connected to said memory storage device, said counter having a clock for generating an address for said speech processing microprocessor;

d) resistance means comprising a variable resistor attached to said speech processing microprocessor for controlling a rate of said clock and thereby controlling the quality of said desired sound;

e) a manual switch connected to said speech processing microprocessor for turning on said desired sound;

f) an amplification system connected to said speech processing microprocessor for amplifying said electronic signal;

g) power source means for providing the necessary power to said amplification system, speech processing microprocessor, memory storage device, and counter; and

h) a speaker system connected to said amplification system for providing said desired sound being of a type so as to block out the noise of eliminating.

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**5,499,009**

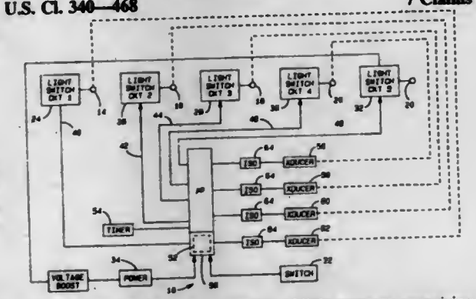
## LIGHT FLASHING SYSTEM

**Kevin A. Davis, Brighton, Mich., assignor to Microflash, Inc., Brighton, Mich.**

**Filed Mar. 8, 1994, Ser. No. 207,944**

**Int. Cl.[6] B60Q *1/00***

**U.S. Cl. 340—468** **7 Claims**



1. A system for flashing a plurality of light sources comprising:

a plurality of light switching circuits, one light switching circuit being associated with each of said light sources and responsive to a predetermined input signal to switch its associated light source between an on and an off condition,

a microprocessor having a plurality of output signal lines, each of said output signal lines being electrically connected with each light switching circuit,

means for programming said microprocessor for generating said predetermined input signal on said output signal lines in a predetermined sequence.

means tier determining the ON/OFF condition of at least one of said light sources and for generating a status signal representative thereof, and means for electrically coupling said ON/OFF condition signal as an input signal to said microprocessor, wherein said coupling means comprises an optical isolator.



**5,499,010**

## BRAKING LIGHT SYSTEM FOR A VEHICLE

**Theodore E. Cohn, Kensington, Calif., assignor to The Regents of the University of California, Oakland, Calif.**

**Filed Apr. 25, 1994, Ser. No. 232,486**

**Int. Cl.[6] B60Q *1/44***

**U.S. Cl. 340—479** **12 Claims**



1. A braking light system for a vehicle, comprising:

first and second pairs of spaced-apart lights disposed on said vehicle, each of said pairs including an innermost light and an outermost light;

means, coupled to a brake switch of said vehicle and to said lights, for activating at the onset of braking said innermost light of each of said pairs for a time T1, wherein 1 μs≦T1≦50 ms; for then extinguishing said innermost light of each light pair and after a time T2, wherein 0≦T2≦100 ms, then activating said outermost light of each of said pairs for the duration of braking.

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**5,499,011**

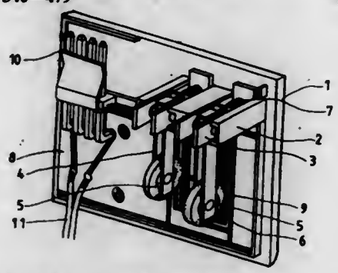
## BRAKE PROPORTIONING DISPLAY THIRD BRAKELIGHT

**Hsien-Fong Young, No. 1, 9 Lin, Lu-Min-Li, Hsin-Pu, Hsin-Chu, Taiwan, Prov. of China**

**Filed Sep. 15, 1994, Ser. No. 306,587**

**Int. Cl.[6] B60Q *1/44***

**U.S. Cl. 340—479** **3 Claims**



1. A brakelight for a vehicle comprising:

a plurality of lighting elements;

a brake proportioning component including a plurality of pendula and a like number of silicon controlled rectifiers and resistors,

said pendula each include a cylindrical body encircled by a conductive rubber ring, an arm of each of said pendula is supported by a movable frame which slides on a rail of a suspending beam fixed on a brake proportioning component main frame;

each said arm of said pendula differs in length from each of the other arms of said pendula, each said pendula being otherwise identical in construction;

a screw with a coil spring is mounted between said movable frame and said brake proportioning component main frame to enable a user to adjust a supporting point of each said pendula;

a controlling circuit on a printed circuit board including a plurality of comb type open circuits, said comb type circuits being equal in number to the number of pendula, said comb type open circuits are connected to said silicon controlled rectifiers and said resistors; wherein

when a braking force is applied to said vehicle, at least one of said pendula swings so that said conductive rubber ring contacts said comb type open circuit, thereby causing said controlling circuit to activate at least one of said lighting elements, the number of pendula that swing and therefore the number of lighting elements activated is proportional to the magnitude of said braking force.

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**5,499,012**

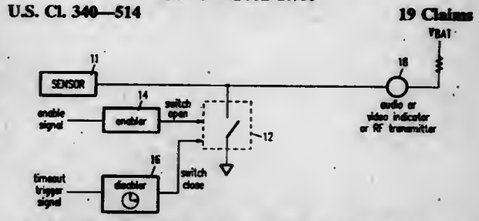
## INTRUSION DETECTOR TEST CIRCUIT WHICH AUTOMATICALLY DISABLES A DETECTED-EVENT INDICATOR

**Lawrence Tracy, Auburn; Dale Dorando, Cameron Park, and Frederick Eggers, Dixon, all of Calif., assignors to C & K Systems, Inc., Calif.**

**Filed Mar. 30, 1994, Ser. No. 219,783**

**Int. Cl.[6] G08B *29/00***

**U.S. Cl. 340—514** **19 Claims**



1. An intrusion detector test circuit for testing an intrusion detector, comprising:

sensing means for generating a sensing signal in response to a detection of an installer testing the intrusion detector;

indicating means for receiving said sensing signal and for generating a detected-event indication in response thereto;

switch means interposed between said sensing means and said indicating means for receiving said sensing signal and, in a first state, for supplying said sensing signal to said indicating means, and, in a second state, for not supplying said sensing signal to said indicating means;

first state setting means for setting said switch means to said first state; and

second state setting means for automatically setting said switch means to said second state after a lapse of a predetermined time period.

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**5,499,013**

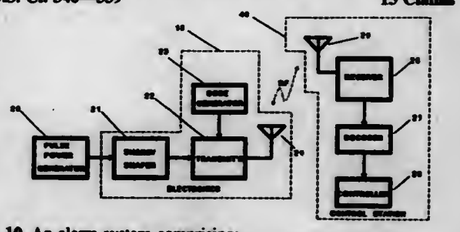
## PULSE POWER GENERATOR

**John A. Konotchick, 3116 Mercer La., San Diego, Calif. 92122**

**Continuation-in-part of Ser. No. 851,068, Mar. 13, 1992, abandoned. This application May 4, 1994, Ser. No. 238,160**

**Int. Cl.[6] G08B *1/08;13/08***

**U.S. Cl. 340—539** **13 Claims**



10. An alarm system comprising:

(a) a pulse power generator for generating an electrical pulse from mechanical energy comprising:

a coil of conductive wire,

a rare earth magnet positioned to produce lines of magnetic flux passing through said coil,

a jerk action means for assuring that at least a portion of said mechanical energy is expressed in a jerking motion which is sometimes in a first direction and sometimes in a second direction so as to cause in either case a rapid change in the distribution of said lines of magnetic flux,

a pulse shaping circuit means electrically connected to said coil for producing an electrical pulse from said rapid change in the distribution of said lines of flux, said pulse having a peak power of at least 0.1 Watt, a duration of at least 30 milliseconds, and at least 0,001 joules of electrical energy.

(b) a transmitter means for transmitting a radio signal upon the occurrence of said jerking motion, and

(c) a receiver means for receiving said radio signal.

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**5,499,014**

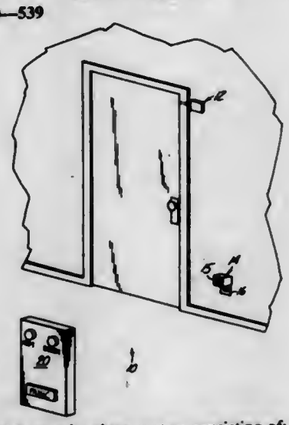
**SECURITY ALARM SYSTEM**

**Gordon E. Greenwaldt, 6300 82nd Pl. North, Brooklyn Park, Minn. 55445**

**Filed Jul. 1, 1994, Ser. No. 270,145**

**Int. Cl.[6] G08B *1/08***

**U.S. Cl. 340—539** **9 Claims**



1. A portable security alarm system consisting of:

a portable wireless transmitter unit including:

sensor means for detecting the opening of a door or window in a protected area;

alarm signal generating means for providing an alarm signal, the alarm signal generating means being controlled by the sensor means;

mounting means for removably attaching the transmitter unit to a door or window so that the transmitter is portable;

a portable wireless control unit which provides the exclusive means for arming and disarming the alarm system, the control unit including:

emergency panic signal generating means including a panic button for providing and transmitting an emergency panic signal;

arm signal generating means including an arm button for providing and transmitting an arm signal;

disarm signal generating means including a disarm button for providing and transmitting a disarm signal; and

a portable wireless receiver unit operable stand alone and when connected to an external power source, the receiver unit does not have any control indicators thereon such that the receiver unit can be located in an out-of-the-way or hidden location, the receiver unit including:

an audible alarm for indicating unauthorized opening of the door or window in the protected area;

first circuit means for receiving the alarm signal directly from the transmitter unit and activating the alarm when the alarm is armed via a direct electrical connection to the alarm;

second circuit means for receiving the arm signal from the control unit and arming the alarm;

third circuit means for receiving the disarm signal from the control unit and disarming the alarm and for turning the alarm off when the alarm is activated; and

fourth circuit means for receiving the emergency panic signal from the control unit and activating the alarm whether or not the alarm is armed.

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**5,499,015**

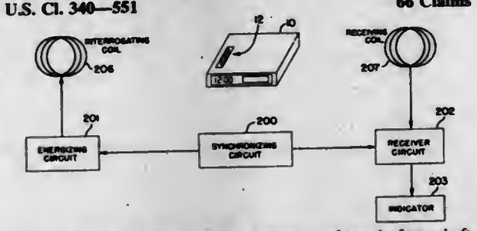
**MAGNETOMECHANICAL EAS COMPONENTS INTEGRATED WITH A RETAIL PRODUCT OR PRODUCT PACKAGING**

**Stephen Winkler, Boca Raton; Hans Witzky, Pompano Beach, and Alan Willard, Wellington, all of Fla., assignors to Sensormatic Electronics Corp., Deerfield Beach, Fla.**

**Filed Sep. 28, 1994, Ser. No. 314,087**

**Int. Cl.[6] G08B *13/187***

**U.S. Cl. 340—551** **66 Claims**




1. A method of protecting an inventory of goods from theft, comprising the steps of:

(a) forming at least some items of said inventory such that each of said at least some items has a member having a cavity integrally formed in said member;

(b) housing a respective magnetostrictive element in each said cavity;

(c) providing a respective biasing element located adjacent to and outside of each said cavity, said biasing element for providing a magnetic field to bias the respective magnetostrictive element in each said cavity;

(d) generating an alternating electromagnetic field at a selected frequency, said biased magnetostrictive element being mechanically resonant when exposed to said alternating electromagnetic field; and

(e) detecting said mechanical resonance of said magnetostrictive element;

each said cavity being sized and shaped to house the respective magnetostrictive element without constraining the mechanical resonance of the magnetostrictive element.

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**5,499,016**

**INTRUSION ALARM SYSTEM**

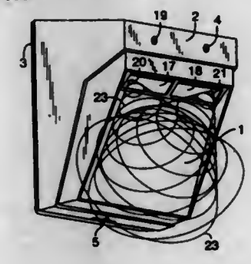
**Mathias M. J. Pantus, Brunssum, Netherlands, assignor to Aritech B.V., Roermond, Netherlands**

**Filed Feb. 17, 1993, Ser. No. 19,480**

**Claims priority, application Netherlands, Feb. 17, 1992, 9200283**

**Int. Cl.[6] G08B *13/18***

**U.S. Cl. 340—555** **10 Claims**






1. An obstruction resistant alarm system for detecting the presence of an intruder in a location being monitored, comprising:

a housing including a selectively transmissive window that transmits radiation within a first wavelength range and scatters radiation within a second wavelength range;

an intrusion sensor positioned to receive from an intruder radiation of wavelengths within the first wavelength range passing through the window, the intrusion sensor producing in response to the radiation within the first wavelength range a presence signal indicative of the presence of the intruder in proximal location to the intrusion sensor;

a radiation source emitting and a radiation detector detecting radiation within the second wavelength range, the radiation source positioned to direct the radiation within the second wavelength range to strike and then be scattered by the window and the radiation detector positioned to detect the radiation within the second wavelength range striking and scattered by the window, such that the radiation within the second wavelength range emitted by the radiation source and scattered by the window forms a normal radiation pattern having a normal intensity detected by the radiation detector whenever the window is unobstructed and an abnormal radiation pattern having an abnormal intensity detected by the radiation detector whenever the window is obstructed; and

an alarm circuit operatively connected to the radiation detector to produce an alarm signal in response to detection by the radiation detector of radiation intensity corresponding to an abnormal radiation pattern to indicate an obstruction of the window and a consequent compromise to the reliability of the presence signal produced by the intrusion sensor.

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**5,499,017**

**MULTI-MEMORY ELECTRONIC IDENTIFICATION TAG**

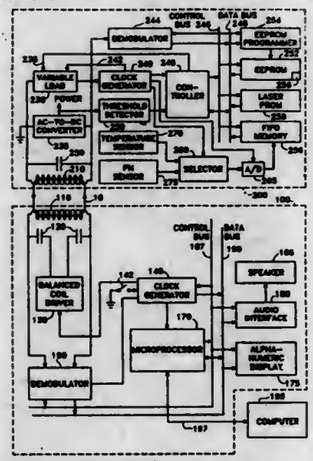
**Michael L. Beigel, Corona, Calif., assignor to Avid, Norco, Calif.**

**PCT No. PCT/US92/10398, § 371 Date Jun. 3, 1994, § 102(e) Date Jun. 3, 1994, PCT Pub. No. WO93/11517, PCT Pub. Date Jun. 10, 1993**

**PCT Filed Dec. 2, 1992, Ser. No. 244,583**

**Int. Cl.[6] G08B *13/00***

**U.S. Cl. 340—572** **20 Claims**




1. An electronic identification tag comprising:

a means for permanently storing data in an unalterable fashion, said data being known as unalterable data;

a means for permanently storing data in an alterable fashion, said data being known as alterable data;

means for detecting an interrogation signal;

means for discriminating between a non-modulated signal and a modulated interrogation signal; and

a means for communicating said unalterable data and said alterable data to an electronic identification reader upon detection of a non-modulated signal.

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**5,499,018**

**LOCAL COMMUNICATION BUS SYSTEM AND APPARATUS FOR USE IN SUCH A SYSTEM**

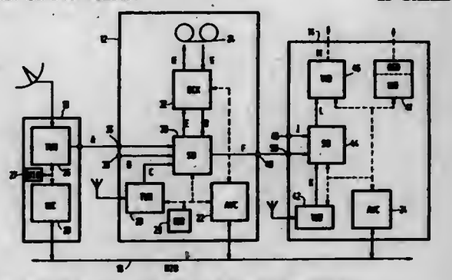
**Harm J. Welmer, Sutton, United Kingdom, assignor to D2B Systems Company, Redhill, England**

**Continuation of Ser. No. 213,363, Mar. 15, 1994, abandoned, which is a continuation of Ser. No. 853,368, Mar. 18, 1992, abandoned. This application May 22, 1995, Ser. No. 445,981**

**Claims priority, application United Kingdom, Mar. 22, 1991, 9106113**

**Int. Cl.[6] H04Q *1/00***

**U.S. Cl. 340—825.07** **13 Claims**



1. A local communication bus system comprising:

a serial control bus coupled to a plurality of addressable devices, each addressable device comprising at least one respective subdevice which is addressable using said bus;

a user output subdevice for displaying status information to a user;

a first addressable device comprising a first control subdevice for initiating the display of said status information;

a second addressable device comprising a second control subdevice;

wherein said first control subdevice comprises means for generating and formatting a device information request message which comprises a first device address for addressing said second addressable device;

wherein said second control subdevice which is responsive to said device information request message and which composes and formats a user-readable message which comprises a further device address and transmits said user-readable message to said user output subdevice for display;

said device information request message including a field specifying a format for the user-readable message and wherein the second control subdevice is responsive to said field to compose said user-readable message in accordance with the specified format.

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**5,499,019**

**METHOD AND APPARATUS FOR PROVIDING A DEMONSTRATION MODE IN A DATA COMMUNICATION RECEIVER**

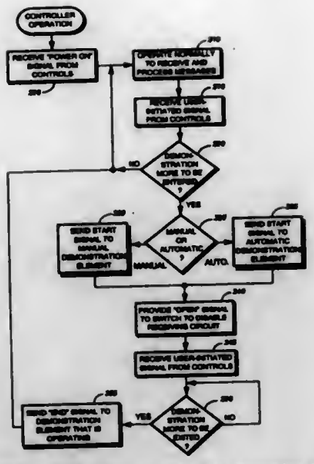
**John M. Burgan, N. Palm Beach; George W. McClurg, Boynton Beach, and Kenneth S. Lerner, Boca Raton, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Aug. 11, 1994, Ser. No. 288,859**

**Int. Cl.[6] H04Q *1/00***

**U.S. Cl. 340—825.22** **19 Claims**

1. A method for providing a demonstration mode in a data communication receiver including a receiving circuit for receiving




radio frequency signals and a display for presenting information, the method comprising the steps of:

disabling the receiving circuit;

presenting, subsequent to the disabling step, a first predetermined screen of information on the display; and

displaying, subsequent to the presenting step, a second predetermined screen of information on the display.

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**5,499,020**

## DATA DISPLAY RADIO PAGER

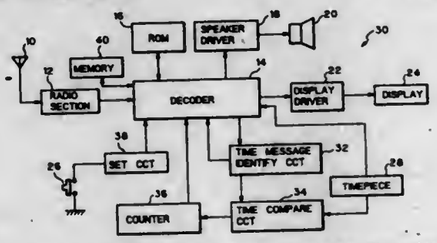
**Teruyuki Motohashi, Tokyo, and Kazumori Yamada, Shizuoka, both of, Japan, assignors to NEC Corporation, Tokyo, Japan**

**Filed Aug. 14, 1992, Ser. No. 929,383**

**Claims priority, application Japan, Aug. 15, 1991, 3-229491**

**Int. Cl.[6] G08B 5/22**

**U.S. Cl. 340—825.44** **6 Claims**




1. A pager capable of generating an alert signal and displaying a message received by said pager, comprising:

a time message identifying circuit connected to receive said message and determine whether said message contains time data, said time message identifying circuit outputting a time data signal indicating that time data is present in said message and extracting said time date from said message;

a memory connected to receive and store said message as a realert message when said time message identifying circuit indicates that time data is present;

a display coupled to receive said time data signal and including a time data message portion for indicating to a user of said pager that said message includes time data in response to said time data signal;

a time comparing circuit coupled to said time message identifying circuit, said time comparing circuit comparing a current time with said time data extracted by said time message identifying circuit and calculating a time interval between said current time and a time indicated by said time data;

a counter connected to receive said time interval from said comparing circuit, said counter counting a period of time to produce a realert signal, said period of time being less than said time interval by a predetermined amount of time; and

realert means responsive to said realert signal for displaying said realert message stored in said memory and for generating an alert to said user.

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**5,499,021**

## PAGING RECEIVER WITH A DISPLAY FUNCTION THAT INHIBITS DISPLAY OF A RECEIVED COMMAND SIGNAL

**Toshifumi Sato, Tokyo, Japan, assignor to NEC Corporation, Japan**

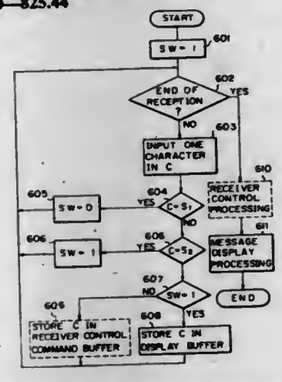
**Continuation of Ser. No. 57,445, May 5, 1993, abandoned, which is a continuation of Ser. No. 588,040, Sep. 24, 1990, abandoned, which is a division of Ser. No. 242,063, Sep. 8, 1988, Pat. No. 4,959,644. This application Oct. 7, 1994, Ser. No. 320,596**

**Claims priority, application Japan, Sep. 14, 1987, 62-228276**

**The portion of the term of this patent subsequent to Sep. 8, 2018, has been disclaimed.**

**Int. Cl.[6] H04Q 7/14**

**U.S. Cl. 340—825.44** **6 Claims**




1. A radio pager having a message displaying function, said pager comprising:

means for receiving a radio signal including a message signal transmitted from a base station, said receiving means having an output;

first detecting means having an input coupled to receive signals from said output of said receiving means, said first detecting means detecting a message identification signal included in said radio signal received from said base station, said message identification signal representing a beginning of said message signal, and said first detecting means outputting a message detection signal responsive to a detection of said received message identification signal;

second detecting means having an input coupled to receive signals from said first detecting means, said second detecting means detecting a first character signal included in said message, and detecting a second character signal included in said message and following said first character signal, said second detecting means outputting a first and a second character detection signal responsive to said detection of said first and second character signals, respectively; and

first storing means for starting a storage of said message in response to said message detection signal, for interrupting storage of said message in response to said first character detection signal, and for resuming the storage of said message in response to said second character detection signal.



**5,499,022**

## REMOTE CONTROL SYSTEM FOR LOCKING AND UNLOCKING DOORS AND OTHER OPENINGS IN A PASSENGER SPACE, IN PARTICULAR IN A MOTOR VEHICLE

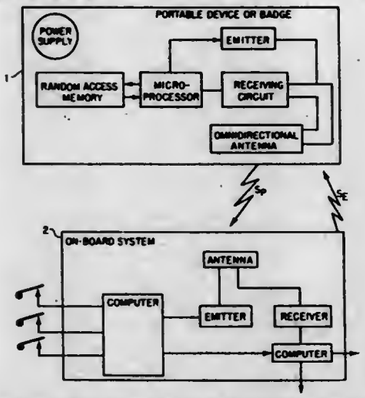
**Alain Boschini, Nanterre, France, assignor to Valeo Electronique, Creteil, France**

**Filed Nov. 4, 1993, Ser. No. 147,944**

**Claims priority, application France, Nov. 6, 1992, 92 13421**

**Int. Cl.[6] G08C 19/00**

**U.S. Cl. 340—825.69** **7 Claims**




1. A remote control system for locking and unlocking a passenger space, in particular in a motor vehicle, comprising an on-board unit for emitting signals $S_E$ including a first signal $S_{EI}$ for emission in response to an unlocked passanger space and a second signal $S_{Ever}$ for emission in response to a locked passenger space, said on-board unit having a receiver of signals $S_P$; a portable device having a receiver for said on-board unit first signal $S_{EI}$ and said on-board unit second signal $S_{Ever}$ and an emitter for said portable device for one of said $S_P$ signals, including a signal $S_{Pi}$ that identifies said specific portable device, said portable device having a memory for recording the level $M_1$ of said on-board unit first signal $S_{EI}$ and the level $M_2$ of said on-board unit first signal $S_{Ever}$ detected by said portable device receiver, said portable device having a computer for generating a signal for activating an emission sequence from said portable device signals $S_P$ said emission sequence being a second type signal $S_{pforgotten}$ corresponding to the detection of said portable device in which the difference between said two levels $M_1$, $M_2$ is less than a predetermined value M.

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**5,499,023**

## METHOD OF AND APPARATUS FOR AUTOMATED SENSOR DIAGNOSIS THROUGH QUANTITATIVE MEASUREMENT OF ONE OF SENSOR-TO-EARTH CONDUCTANCE OR LOOP RESISTANCE

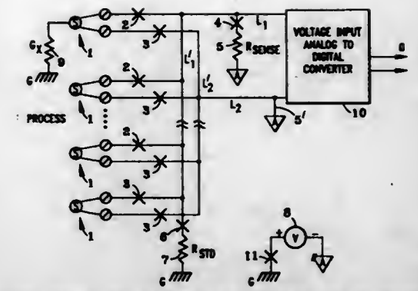
**Robert E. Goldschmidt, Needham, Mass., assignor to Kaye Instruments, Inc., Bedford, Mass.**

**Filed May 27, 1992, Ser. No. 890,019**

**Int. Cl.[6] B08C 9/10**

**U.S. Cl. 340—870.37** **20 Claims**

1. Apparatus for automated sensor validation diagnosis during and before operation of a plurality of sensors connected in a loop with voltage measurement apparatus and multiplexed by switching along loop lines to provide successive voltage measurements from the successive sensors to validate a process being monitored at different regions by the sensors, said apparatus having, in combination with voltage measurement apparatus connected to the plurality of process sensors in a loop by a switching multiplexer, an internal voltage source and a sensing impedance connected to earth and to the voltage measurement apparatus, respectively, that provide multiplexed measurements of sensor-to-earth conductance for successive sensors before and during their parameter sensing of the process, thereby providing the determination that the measured conductance still has those values required of properly operating sensors, thus checking the viability of such sensors to validate the process monitored by the sensors.




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**5,499,024**

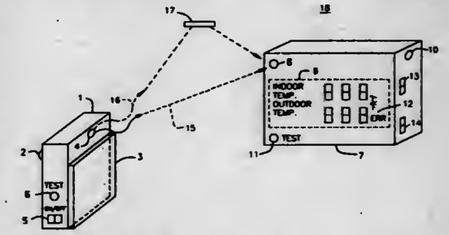
## INFRARED INDOOR/OUTDOOR THERMOMETER SYSTEM

**Damon Germanton, Kinnelon, and Steven P. Petrucelli, Cranbury, both of N.J., assignors to Measurement Specialties, Inc., Fairfield, N.J.**

**Filed May 6, 1994, Ser. No. 238,895**

**Int. Cl.[6] G08C 19/12**

**U.S. Cl. 340—870.17** **20 Claims**




1. A thermometer system comprising:

a first unit which is capable of being mounted in proximity to an exterior window surface, said first unit including: temperature transducing means to provide a measurement of

a first temperature at a first location;

first conversion means coupled to said transducing means to convert said temperature measurement to binary coded data;

modulation means, coupled to said first conversion means, to modulate said binary coded data to provide modulated binary coded data; and

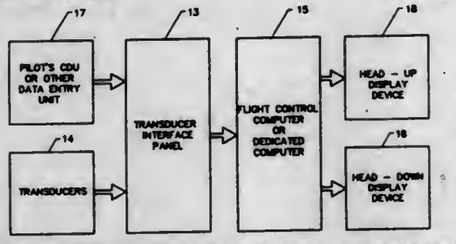
interval infrared transmission means, coupled to said modulation means to transmit binary coded infrared energy corresponding to said modulated binary coded pulses only at predetermined periodic time intervals, wherein said interval transmission at predetermined periodic time intervals reduces operating power consumption of said thermometer system and said binary coded data provides immunity from noise;

a second unit positioned at a second location, having an infrared detector, second conversion means coupled to said detector, and having display means coupled to said second conversion means, whereby said detector detects said transmitted binary coded infrared energy and provides detected data pulses indicative of said first temperature to said second conversion means, said second conversion means converts said detected data pulses to numerical data representative of said first temperature and provides said numerical data to said display means for displaying said first temperature.

## 5,499,025
## AIRPLANE TAKEOFF AND LANDING PERFORMANCE MONITORING SYSTEM

David B. Middleton; Raghavachari Srivatsan, and Lee H. Person, Jr., all of Yorktown, Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation of Ser. No. 45,337, Apr. 6, 1993, Pat. No. 5,353,022, which is a continuation of Ser. No. 755,248, Sep. 5, 1991, abandoned, which is a continuation-in-part of Ser. No. 192,562, May 11, 1988, Pat. No. 5,047,942, which is a continuation-in-part of Ser. No. 82,766, Aug. 6, 1987, Pat. No. 4,843,554. This application Jul. 21, 1994, Ser. No. 281,799
The portion of the term of this patent subsequent to Sep. 10, 2008, has been disclaimed.
Int. Cl.[6] G08B 21/00
U.S. Cl. 340—959 10 Claims




1. In an airplane takeoff and landing performance monitoring system with a display means for graphically and continuously depicting the position of an airplane on a runway, the improvement comprising:

means for generating a value indicative of a rotation speed of the airplane necessary to achieve take-off;

means for continuously displaying both a stationary symbol indicative of an initial prediction of a position where the rotation speed should occur and a movable symbol indicative of a current prediction of a position where the airplane should reach the rotation speed on the runway wherein the movable symbol is superimposed on the stationary symbol when there is no difference between the initially predicted position of the airplane and currently predicted position of where the airplane should reach the rotation speed and wherein the movable symbol is spatially distanced from the stationary symbol along the runway when there is a difference between the initially predicted position and the currently predicted position; and

means for displaying an abort symbol when an acceleration error of the airplane exceeds a specified tolerance band, wherein the acceleration error is defined by a difference in a measured acceleration and an initially predicted acceleration of the airplane.

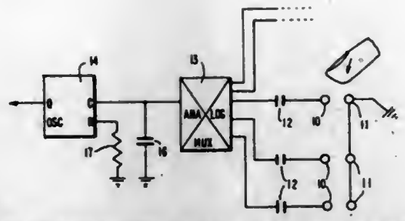
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## 5,499,026
## CONDUCTIVE TOUCH PAD WITH CAPACITIVE BLOCKING FILTER

York Liao, and Michael Y. S. Chan, both of Kowloon, Hong Kong, assignors to Varitronix Limited, Kowloon, Hong Kong

Continuation of Ser. No. 910,086, Aug. 28, 1992, abandoned.
This application Sep. 30, 1994, Ser. No. 316,070
Claims priority, application United Kingdom, Jan. 11, 1990, 9000624; Sep. 24, 1990, 9020766
Int. Cl.[6] G06F 3/14
U.S. Cl. 341—33 6 Claims

1. A touch sensing device comprising a conductive touch pad supported on an insulating substrate, and detecting means electrically connected to the touch pad via a capacitive blocking filter to prevent static electrical charges being applied to the detecting means by a user, wherein the detecting means detects a change in the impedance at the touch pad caused by the user directly touching the touch pad to connect the touch pad to ground, in which the detecting means includes an oscillator whose output frequency varies with the change in input impedance whenever the touch pad is connected to ground through the touch of the user.

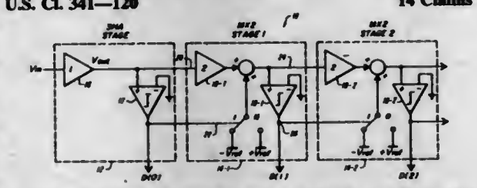



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## 5,499,027
## DIGITALLY SELF-CALIBRATING PIPELINE ANALOG-TO-DIGITAL CONVERTER

Andrew N. Karanicolas, Cambridge, and Hae-Seung Lee, Arlington, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Feb. 24, 1994, Ser. No. 201,250
Int. Cl.[6] H03M 1/10
U.S. Cl. 341—120 14 Claims




1. A self-calibrating pipeline analog-to-digital converter, said converter having a plurality of analog-to-digital conversion units and including a recursive calibrating section operable for calibrating errors associated with an immediately preceding first conversion unit, said recursive calibrating section comprising:

means for receiving an analog output signal generated from said first conversion unit in response to an analog input signal provided to said first conversion unit;

means for receiving a digital output signal generated from said first conversion unit in response to a digital input signal provided to said first conversion unit;

means for generating a conversion signal corresponding to a quantized representation of said analog output signal; and

means for generating a calibration signal having a value equal to said conversion signal in response to said digital input signal being a first digital value and having a value equal to the sum of said conversion signal and a calibration value in response to said digital input signal being a second digital value.

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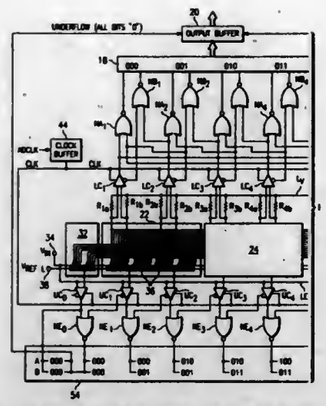
## 5,499,028
## ANALOG/DIGITAL CONVERTER

Hiromichi Kuwano, Yokohama, and Hisashi Tahara, Narashimo, both of, Japan, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 9, 1993, Ser. No. 164,185
Claims priority, application Japan, Dec. 9, 1992, 4-351531
Int. Cl.[6] H03M 1/36
U.S. Cl. 341—159 4 Claims

1. An analog/digital converter comprising:






reference voltage generation means having multiple taps from which different comparison voltages of fixed voltage values are applied in a stepped manner;

a first comparator section including

a plurality of comparators having first and second sets of input terminals and non-inverting and inverting outputs, each of said plurality of comparators included in said first comparator section generating a complementary binary output with the first set of input terminals connected in a one-to-one relationship with the taps on said reference voltage generation means and with the second set of input terminals connected to common analog signal inputs, said plurality of comparators included in said first comparator section being arranged in one or a plurality of blocks, with each block being divided into a first set of comparators and a second set of comparators;

a second comparator section including

a plurality of comparators having first and second sets of input terminals and non-inverting outputs and inverting outputs, each of said first input terminals belonging to the comparators included in said first set of each block of said first comparator section being connected in a one-to-one relationship to the non-inverting outputs of the comparators included in said first comparator section and being simultaneously connected in a one-to-one relationship to the inverting output terminals of the plurality of comparators of said first comparator section belonging to the second set of each block, and each of the second set of input terminals being connected in a one-to-one relationship with the inverting outputs of the comparators belonging to the first set of each block of said first comparator section, and at the same time being connected in a one-to-one relationship to the inverting output terminals of the comparators belonging to the first set of each block of said first comparator section;

an adding section having first and second adding means,

said first adding means being disposed between said first comparator section and said second comparator section and adding the comparator output of said first comparator section connected together with the first set of input terminals of the comparators of said second comparator section, and

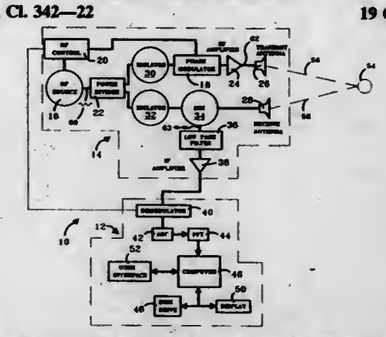
said second adding means logically adding the outputs of the comparators of said first comparator section connected together with the second set of input terminals of each comparator of said second comparator section; and

encoding means connected to the outputs of the comparators in said second comparator section for combining and encoding the binary logical outputs obtained at each of the outputs of the comparators included in said second comparator section to a digital signal having a selected number of bits.

## 5,499,029
## WIDE BAND STEPPED FREQUENCY GROUND PENETRATING RADAR

Michael B. Bashforth, Buellton; Duane Gardner; Douglas Patrick, both of Santa Maria; Tricia A. Lewallen, Ventura; Sharyn R. Nammath, Santa Barbara; Kelly D. Painter, Goleta, all of Calif., and Kenneth G. Vadnais, Alexandria, Va., assignors to EG&G Energy Measurements, Inc., Las Vegas, Nev.

Continuation-in-part of Ser. No. 913,494, Jul. 14, 1992, Pat. No. 5,325,095. This application Apr. 28, 1994, Ser. No. 234,441
Int. Cl.[6] G01S 13/24; 13/04
U.S. Cl. 342—22 19 Claims




1. A method for determining the presence of an object, comprising:

producing signal pulses of varying frequencies;

transmitting said signal pulses from a transmit antenna and receiving said signal pulses which are reflected from the object at a receive antenna; and

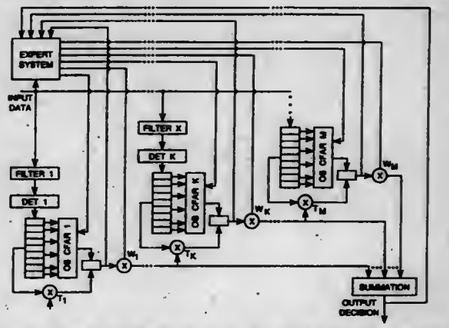
recombining each of said signal pulses as received at said receive antenna with itself as originally produced to produce a direct current voltage indicative of any phase difference between said signal pulses as received at said receive antenna and as originally produced.

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## 5,499,030
## EXPERT SYSTEM CONSTANT FALSE ALARM RATE (CFAR) PROCESSOR

Michael C. Wicks, Utica; William J. Baldygo, Jr., Rome, and Russell D. Brown, Holland Patent, all of N.Y., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 18, 1994, Ser. No. 215,073
Int. Cl.[6] G01S 13/00
U.S. Cl. 342—93 2 Claims




1. An artificial intelligence system for suppressing false alarms in data of interest, and which comprises:

a stored library of CFAR models; wherein said stored library of CFAR models comprises an electronic memory containing: a group of CFAR algorithms each with a set of varied parameters defining a set of cell averaging CFAR models (CA CFAR); a set of greatest of CFAR models (GO FARS); and a set of ordered statistic CFAR models (OS CFARS);

a sensor system which collects both said data of interest and environmental data;

a means for processing said environmental data from the sensor system to select a CFAR analysis model from said stored library of CFAR models; and

a means for processing the data of interest from the sensor system with the CFAR analysis model to yield a set of CFAR processed data of interest in which false alarms are suppressed.

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**5,499,031**

## DISTRIBUTED RECEIVER SYSTEM FOR ANTENNA ARRAY

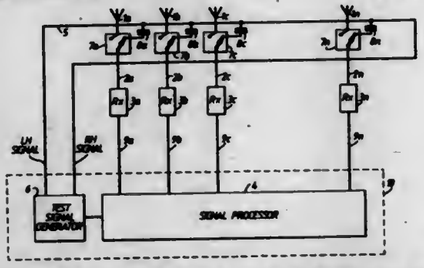
**Janos Bodonyi, Bicknacre, United Kingdom, assignor to The Marconi Company Limited, United Kingdom**

**Filed Aug. 14, 1990, Ser. No. 578,519**

**Claims priority, application United Kingdom, Sep. 28, 1989, 8921917**

**Int. Cl.[6] G01S 7/40**

**U.S. Cl. 342—174** **8 Claims**




1. Apparatus for calibrating receivers for an antenna array, each antenna of the array being coupled to a respective receiver, the calibration apparatus comprising means for selectively disconnecting each receiver from the corresponding antenna and for connecting that receiver to a respective tapping of a loop, and means for feeding an rf signal along the loop in each direction in turn and for detecting the resulting amplitude and phase of said rf signal at each receiver in each case.

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**5,499,032**

## NAVIGATION AND POSITIONING SYSTEM AND METHOD USING UNCOORDINATED BEACON SIGNALS

**David C. Kelley, Orange; Joseph Cisneros, Glendora, and Louis A. Greenbaum, Redondo Beach, all of Calif., assignors to Terrapin Corporation, Garden Grove, Calif.**

**Continuation-in-part of Ser. No. 994,670, Dec. 22, 1992, Pat. No. 5,280,295. This application Dec. 15, 1993, Ser. No. 168,851**

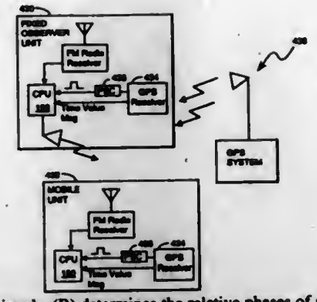
**Int. Cl.[6] H04B 7/185; G01S 5/02**

**U.S. Cl. 342—357** **13 Claims**

1. In a positioning system that makes use of a multiplicity of transmitters, at known fixed locations, each of which transmits a beacon signal having a phase that is un-synchronized with the phases of the beacon signals of the other transmitters; each of said beacon signals having a frequency that is approximately equal to a predetermined target frequency;

the combination comprising:

a first receiver, at a known location relative to the locations of said multiplicity of transmitters, which (A) receives said beacon signals, (B) determines the relative phases of said beacon signals, and (C) broadcasts data representing said relative phases;




a second receiver, at an unknown location, which receives said broadcast data from said first receiver and at least three of said beacon signals, said second receiver including phase detection circuitry for detecting the phases of said beacon signals at the location of said second receiver, and computation means for computing the location of said second receiver based on said broadcast values and said detected phases; and

initialization means for providing a common timing signal to said first and second receivers in order to establish a common time basis therebetween, said initialization means including means for determining an initial estimate of said unknown location using said common time basis.

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**5,499,033**

## POLARISATION DIVERSITY ANTENNA

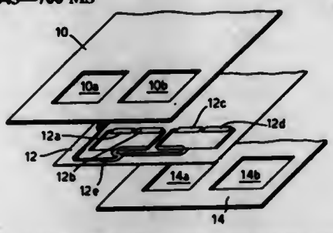
**Martin S. Smith, Chelmsford, United Kingdom, assignor to Northern Telecom Limited, Montreal, Canada**

**Filed Jun. 23, 1994, Ser. No. 264,629**

**Claims priority, application United Kingdom, Jul. 2, 1993, 9313676**

**Int. Cl.[6] H01Q 1/30;13/10**

**U.S. Cl. 343—700 MS** **6 Claims**




1. A dual polarised flat plate antenna arrangement comprising a pair of apertures each aperture having a first pair of colinear probes extending into the aperture, the first pair of probes having a first orientation parallel to an axis about which the apertures are disposed, a second pair of colinear probes extending into the aperture, the second pair of probes having a second orientation orthogonal to that of the first pair of probes, first feed network means arranged to feed signals to the first pair of probes and a second feed network means arranged to feed signals to the second pair of probes, wherein in each aperture the respective probes for each orientation are fed as two pairs and each pair is fed in a balanced antiphase manner, characterised in that for the two pairs in at least one orientation the respective feed network means is arranged to introduce an unbalance between the balanced pairs.



**5,499,034**

## GLASS ANTENNA FOR AUTOMOTIVE VEHICLES

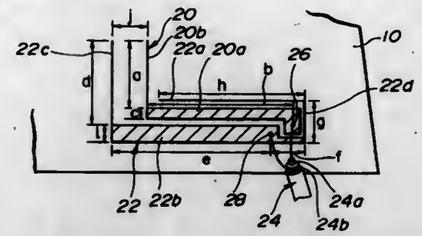
**Hiroyuki Fujii, and Junichiro Ieiri, both of Matsusaka, Japan, assignors to Central Glass Company, Limited, Ube, Japan**

**Filed Apr. 26, 1994, Ser. No. 233,656**

**Claims priority, application Japan, Apr. 30, 1993, 5-104712; Jan. 22, 1993, 5-265122**

**Int. Cl.[6] H01Q 1/32**

**U.S. Cl. 343—713** **32 Claims**




1. An antenna attached to a vehicle window glass, comprising:

a first element including a vertical conductive strip and a horizontal conductive strip connected to an end of said vertical conductive strip;

a second element including a vertical conductive strip and a pair of horizontal conductive strips connected to each other, one of said horizontal conductive strips of said second element being connected at an end thereof to an end of said vertical conductive strip of said second element, said horizontal conductive strips of said second element being disposed adjacently above and under said horizontal conductive strip of said first element, respectively, so that said second element wraps around an end portion of said first element; and

a coaxial cable having an inner conductor and an outer conductor, said horizontal conductive strip of said first element having a portion serving as a feed point and connected at said portion serving as the feed point to one of said inner conductor and said outer conductor of said coaxial cable whilst one of said horizontal conductive strips of said second element has a portion serving as the feed point to the other of said inner conductor and said outer conductor of said coaxial cable.

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**5,499,035**

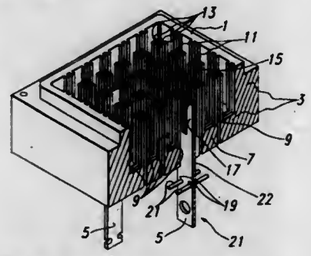
## PHASED ARRAY ANTENNA APERTURE AND METHOD

**Richard G. Smith, Jr., Marietta, Ga., and Calvin L. Gee, Buda, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Jul. 21, 1993, Ser. No. 95,776**

**Int. Cl.[6] H01Q 1/12**

**U.S. Cl. 343—789** **12 Claims**




1. A phased array antenna which comprises:

(a) an electrically conductive faceplate having a bottom surface and a plurality of electrically conductive posts extending in a direction normal to said bottom surface and disposed on said bottom surface, said posts disposed in a predetermined configuration, said bottom surface having a plurality of slots therein;

(b) each of said posts having a plurality of grooves extending in a direction normal to said bottom surface, each of said grooves aligned with a groove from a different one of said posts and with a said slot in said bottom surface, whereby said aligned grooves and said slot in said bottom surface lie in a single plane; and

(c) a plurality of antenna array elements, each of said antenna array elements having an electrically conductive pattern disposed thereon, each of said antenna array elements being secured within an aligned pair of said grooves in a pair of said posts and a said slot aligned with said aligned pair of said grooves.

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**5,499,036**

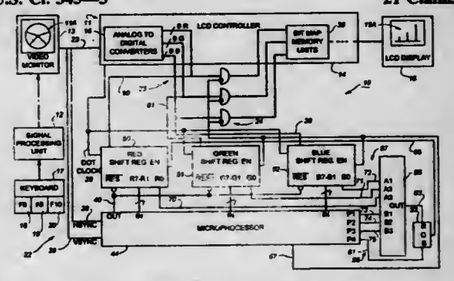
## DISPLAY CONTROL APPARATUS AND METHOD OF USING SAME

**Lane T. Hauck, San Diego, Calif., assignor to Proxima Corporation, San Diego, Calif.**

**Continuation-in-part of Ser. No. 823,301, Jan. 21, 1992, abandoned, which is a continuation of Ser. No. 546,238, Jun. 29, 1990, abandoned, and a continuation-in-part of Ser. No. 506,621, Apr. 9, 1990, abandoned, which is a continuation-in-part of Ser. No. 472,668, Jan. 30, 1990, abandoned, which is a continuation-in-part of Ser. No. 222,144, Jul. 21, 1988, abandoned. This application Sep. 1, 1993, Ser. No. 115,310**

**Int. Cl.[6] G09G 5/00;3/36**

**U.S. Cl. 345—3** **21 Claims**




1. In combination with a liquid crystal display unit and means for producing video signals, a data display control apparatus, comprising:

discriminating means responsive to a predetermined sequence of the video signals for decoding them and generating a data command signal so that the liquid crystal display unit using the video signals can respond thereto for display utilization purposes;

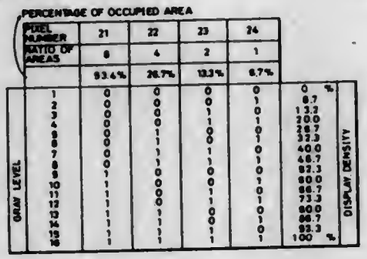
means responsive to said data command signal for enabling the liquid crystal display unit to receive selectively the video signals generated by the means for producing video signals for display utilization purposes; and

wherein said discrimination means is differential comparator means for establishing a video information signal and for generating a clock signal to sample said information signal to facilitate the generation of said data command signal.

## 5,499,037
## LIQUID CRYSTAL DISPLAY DEVICE FOR DISPLAY WITH GRAY LEVELS

**Kenichi Nakagawa, and Takaji Numao, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Continuation of Ser. No. 863,467, Apr. 1, 1992, abandoned, which is a continuation of Ser. No. 410,306, Sep. 21, 1989, abandoned. This application Jun. 14, 1994, Ser. No. 261,234**
**Claims priority, application Japan, Sep. 30, 1988, 63-248800**
**Int. Cl.[6] G09G *3/36***
**U.S. Cl. 345—89** **2 Claims**




1. A liquid crystal display apparatus, comprising:
a plurality of scan electrodes arranged in parallel in a first direction;
a plurality of data electrodes arranged in parallel in a second direction perpendicular to said plurality of scan electrodes,
said plurality of scan electrodes and said plurality of data electrodes being utilized in a set of three electrodes each, thereby defining a 3×3 matrix of rows and columns of picture elements, said matrix of picture elements further comprising,
a first group of pixels consisting of corner pixels of said matrix,
a second group of pixels consisting of first and third pixels of a second row of said matrix,
a third group of pixels consisting of first and third pixels of a second column of said matrix,
a fourth pixel group consisting of a center pixel of said matrix,
drive means for driving selected ones of said scan and data electrodes to display picture elements selected based upon a desired gray level display,
wherein said first and second groups of pixels comprise mutually equal sized pixels of a first size and said third and fourth groups of pixels comprise mutually equal sized pixels of a second size, said first size being greater than said second size, and
wherein the ratio of the sums of the areas of the pixels of said first, second, third and fourth groups of pixels is defined by the expression:

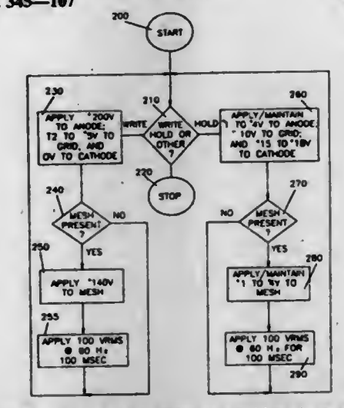
A:B:C:D=8:4:2:1

where A is the area of the first group of pixels, B is the area of the second group of pixels, C is the area of the third group of pixels, and D is the area of the fourth pixel group, thereby effecting a display having 16 gray levels.

## 5,499,038
## METHOD OF OPERATION FOR REDUCING POWER, INCREASING LIFE AND IMPROVING PERFORMANCE OF EPIDS

**Frank J. DiSanto, North Hills, and Denis A. Krusos, Lloyd Harbor, both of N.Y., assignors to Copytele, Inc., Huntington Station, N.Y.**

**Continuation of Ser. No. 12,739, Feb. 3, 1993, abandoned, which is a division of Ser. No. 795,659, Nov. 21, 1991, Pat. No. 5,247,290. This application Jan. 11, 1994, Ser. No. 180,197**
**The portion of the term of this patent subsequent to Sep. 21, 2010, has been disclaimed.**
**Int. Cl.[6] G09G *3/34***
**U.S. Cl. 345—107** **9 Claims**

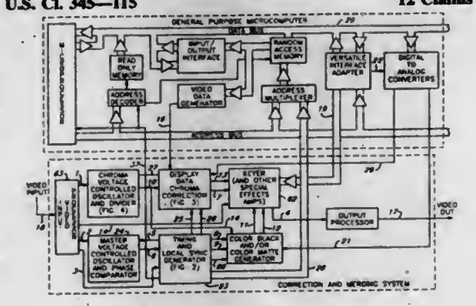



1. A method of holding an image in a hold mode on an electrophoretic display panel having at least one anode electrode and a plurality of cathode and grid electrodes after the image was written by applying a first positive voltage to said at least one anode electrode, the method comprising the steps of:
applying a second positive voltage to the anode electrode;
applying a third positive voltage to a cathode electrode; and
applying a negative voltage to a grid electrode; wherein said first positive voltage is at least 50 times greater than said second positive voltage.

## 5,499,039
## MICROKEYER: A MICROCOMPUTER BROADCAST VIDEO OVERLAY DEVICE AND METHOD

**Henry B. Mistrot, 2304 Hancock, Suite 1-F, Austin, Tex. 78756**

**Continuation of Ser. No. 692,053, Jan. 15, 1985, which is a continuation of Ser. No. 336,679, Jan. 4, 1982. This application Aug. 4, 1992, Ser. No. 924,892**
**The portion of the term of this patent subsequent to Apr. 12, 2012, has been disclaimed.**
**Int. Cl.[6] G09G *1/06***
**U.S. Cl. 345—115** **12 Claims**



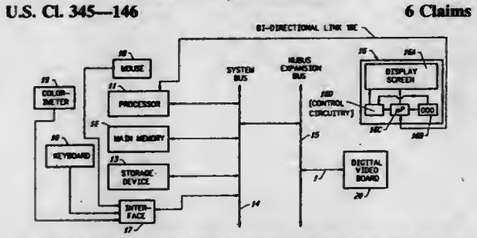



1. A system connected to a computer for combining a computer video signal with an external video signal to form a composite video signal, comprising:
input video processor means for processing the external video signal to obtain color burst, vertical drive synchronization, horizontal drive synchronization, and direct current restored video signal components;
control circuit means for generating control signals for the system in dependence upon the external video signal;
synchronization circuit means for synchronizing the computer video signal with the horizontal drive synchronization component and the vertical drive synchronization component of the external video signal;
graphics video processor means for processing the computer video signal into a chroma component and a luminance component;
keyer control circuit means for controlling the display of colors in the computer video signal, comprising:
means for phase locking the chroma component of the computer video display signal to the color burst component of the external video signal to form a corrected computer chroma component;
means for merging the corrected computer chroma component with the computer luminance component to form a corrected computer video output signal; and
video combining means for combining the corrected computer video output signal with the external video signal producing a combined video signal.

## 5,499,040
## METHOD AND APPARATUS FOR DISPLAY CALIBRATION AND CONTROL

**Michael D. McLaughlin, San Jose; John C. Signa, Sunnyvale; Richard K. Greicar, Moss Beach, all of Calif., and John M. Taylor, London, England, assignors to Radius Inc., Sunnyvale, Calif.**

**Filed Jun. 27, 1994, Ser. No. 266,950**
**Int. Cl.[6] G09G *5/02;5/10***
**U.S. Cl. 345—146** **6 Claims**

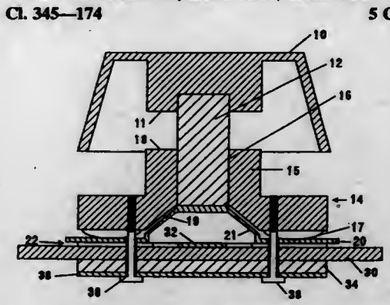



1. A method for controlling a display having mechanical controls, said display being interfaced with a processor programmed with display control software for controlling the display in response to signals from an input device interfaced with the processor, said method including the steps of:
(a) in response to a user-entered command, executing a locking operation to disable the mechanical controls; and
(b) also in response to the user-entered command, executing the display control software to display virtual controls, where the virtual controls are selectable by manipulating the input device, and where selection of each one of the virtual controls triggers execution of a display control operation.

## 5,499,041
## KEYBOARD INTEGRATED POINTING DEVICE

**Eric L. Brandenburg, Lake Oswego; Patrick J. Franz, Portland, and David H. Straayer, Colton, all of Oreg., assignors to InControl Solutions, Inc., Lake Oswego, Oreg.**

**Continuation of Ser. No. 96,485, Jul. 22, 1993, abandoned, which is a division of Ser. No. 557,546, Jul. 24, 1990, Pat. No. 5,231,386. This application Oct. 13, 1994, Ser. No. 322,956**
**Int. Cl.[6] G06F *3/14*; H01C *10/10*; H01H *9/26***
**U.S. Cl. 345—174** **5 Claims**



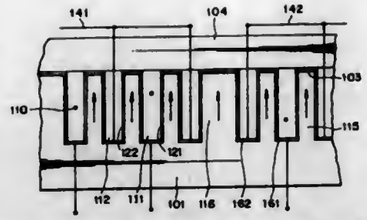

1. A pointing device for cursor control comprising:
an actuator assembly having an elongate plunger along a central vertical axis and having at one end a plurality of co-planar actuator surfaces arrayed initially in a horizontal plane;
a generally flat, rigid base located opposite the actuator surfaces;
generally planar force sensing means sandwiched between the base plate and the actuator surfaces, the force sensing means including at least three force sensing elements symmetrically disposed about the central vertical axis of the plunger and substantially registered with the actuator surfaces, each force sensing element responsive to a generally perpendicular force and each having a respective near-linear region of operation;
pre-load means including a compressed resiliently elastic member for urging the actuator assembly and the force sensing means together, thereby maintaining the actuator surfaces in constant contact with all of the force sensing elements to provide a common pre-load force on each force sensing element;
the pre-load means arranged to provide adequate compression so as to drive each of the force sensing elements into its respective near-linear region of operation;
fastener means connecting the actuator means and base plate together, said fastener means arranged to allow slight lateral movement of the actuator surfaces in a horizontal plane and corresponding tilting of the co-planar actuator surfaces from the initial horizontal position in response to a lateral external force imparted to the actuator assembly so as to impart an increasing force on at least one of the force sensing elements adjacent a downwardly tilting actuator surface and a decreasing force on at least one other of the force sensing elements adjacent an upwardly tilting actuator surface, thereby providing a differential signal to increase sensitivity of the pointing device.

## 5,499,042
## INK JET HEAD HAVING DUMMY PRESSURE CHAMBERS AND INCLINED GROUPS OF EJECTION NOZZLES

**Yoshihiko Yanagawa, Tokyo, Japan, assignor to Citizens Watch Co. Ltd., Tokyo, Japan**

**Continuation of Ser. No. 11,769, Feb. 1, 1993, abandoned. This application Jun. 27, 1994, Ser. No. 266,298**
**Claims priority, application Japan, Jan. 31, 1992, 4-040621**
**Int. Cl.[6] B41J *2/045;2/055***
**U.S. Cl. 347—69** **6 Claims**

1. An ink jet head of a printer, said ink jet head comprising:



a plurality of pressure chambers juxtaposed and aligned in a first direction on a substrate, said plurality of pressure chambers defined by a plurality of piezoelectric deformable channels juxtaposed and aligned in said first direction and a nozzle plate covering an opening of each of said plurality of piezoelectric deformable channels, said nozzle plate having a plurality of ejection holes formed therein;

a supply channel which supplies ink to said plurality of piezoelectric deformable channels; and,

electrodes coupled to said plurality of piezoelectric deformable channels, said electrodes for selectively applying drive voltages to said plurality of piezoelectric deformable channels to selectively deform said plurality of piezoelectric deformable channels so as to selectively alter a volume of said plurality of pressure chambers;

wherein said plurality of pressure chambers are separated into n groups, where n is an integer greater than 1, each of said groups being formed by a plurality of ejection pressure chambers which eject ink through a corresponding ejection hole in said nozzle plate and a plurality of dummy pressure chambers which do not eject ink, said ejection pressure chambers and said dummy pressure chambers alternately arranged in each of said n groups such that a dummy pressure chamber is interposed between adjacent ejection pressure chambers within each of said n groups and such that a dummy pressure chamber is located at each opposite end of each of said n groups;

wherein a separating barrier is located between each said dummy pressure chamber located at the opposite ends of each adjacent pair of said n groups;

wherein said electrodes include a plurality of common electrodes respectively coupled to the piezoelectric deformable channels of the dummy pressure chambers of each of said n groups;

wherein, within each of said n groups, the ejection holes of said nozzle plate are aligned in a second direction which extends at an angle θ relative to a horizontal print direction of said printer, where $0<\theta<90°$;

wherein a spacing between adjacent ejection holes of said nozzle plate, along an entirety of said n groups, relative to a vertical print direction of said printer is a constant distance p,

wherein a spacing between adjacent ejection holes of said nozzle plate, within each of said n groups, relative to the horizontal print direction of said printer is kp, where k is a constant; and

wherein adjacent pairs of ejection holes located at the opposite ends of adjacent pairs of said n groups are spaced apart relative to the horizontal print direction of said printer by a distance kp+(g+1/n), where g is an integer.

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**5,499,043**

**PORTABLE RECORDING APPARATUS WITH INCLUDED RECORDING UNIT**

**Tsutomu Osaka, Machida, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

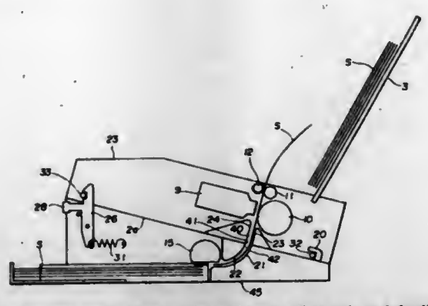
**Filed Sep. 10, 1992, Ser. No. 942,803**

**Claims priority, application Japan, Sep. 19, 1991, 3-266932**

**Int. Cl.[6] B65H 29/00**

**U.S. Cl. 347—108** **21 Claims**

1. A recording apparatus comprising a recording unit for recording on a sheet, with an upper surface and a lower surface for a



sheet feeding unit for supporting said recording unit and feeding the sheet to said recording unit, said recording unit comprising:

a conveying path substantially orthogonal to the lower surface and the upper surface of said recording unit;

conveying means for conveying the sheet received from said sheet feeding unit along said sheet conveying path;

recording means disposed along said sheet conveying path for performing recording on the sheet; and

a tray for mounting the sheet conveyed by said conveying means, and

said sheet feeding unit comprising:

feeding means for feeding the sheet from said sheet feeding unit to said sheet conveying path in said recording unit; and

supporting means for supporting said recording unit so as to incline the upper surface of said recording unit during operation of the recording apparatus.

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**5,499,044**

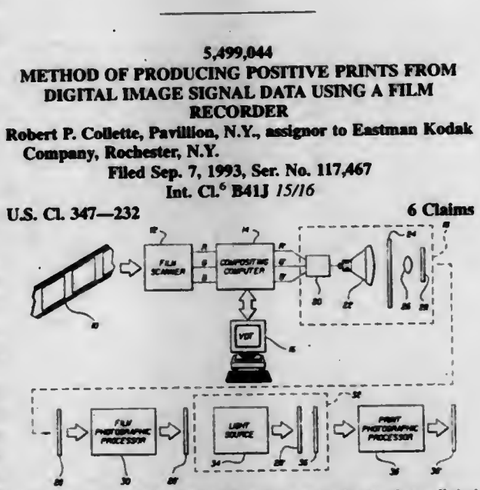
**METHOD OF PRODUCING POSITIVE PRINTS FROM DIGITAL IMAGE SIGNAL DATA USING A FILM RECORDER**

**Robert P. Collette, Pavillion, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Sep. 7, 1993, Ser. No. 117,467**

**Int. Cl.[6] B41J 15/16**

**U.S. Cl. 347—232** **6 Claims**




1. A method of producing a positive print image from digital image signal data representative of the positive image to be produced, the method comprising the steps of:

modifying said digital image signal data to incorporate therein data values related to an orange mask effect on negative film;

applying said modified digital image signal data to a digital film recorder to produce an exposure image;

exposing the exposure image in the film recorder onto high gamma transparency three color film;

photographically processing the transparency film to produce a negative image with said orange mask effect incorporated therein;

exposing the transparency film image onto a negative-working print paper; and

photographically processing the print paper to produce a positive print image.



**5,499,045**

**IMAGE FORMING APPARATUS WITH OPTICAL ELEMENT SUPPORT STRUCTURE**

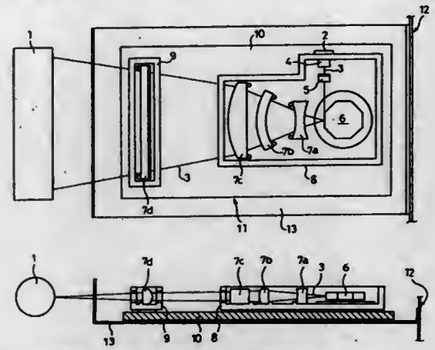
**Kenji Takeshita; Nobuo Kanai, both of Toyohashi, and Hitoshi Kageyama, Kawasaki, all of, Japan, assignors to Minolta Co., Ltd., Osaka, Japan**

**Filed Sep. 23, 1993, Ser. No. 125,583**

**Claims priority, application Japan, Sep. 30, 1992, 4-261014**

**Int. Cl.[6] B41J 2/47**

**U.S. Cl. 347—257** **15 Claims**



1. An image forming apparatus, comprising:

a light source for generating a beam;

deflecting means for deflecting a beam emitted from the light source and scanning an image forming surface;

a plurality of lenses provided between the deflecting means and an image forming surface on an optical path of a beam for forming an image of the beam on the image forming surface;

a first member on which a lens positioned closest to the image forming surface among said plurality of lenses is fixed;

a second member on which a lens positioned closest to the deflecting means among said plurality of lenses is fixed; and

a base member for connecting the first member with the second member, the rigidity of the base member being higher than that of the first member and second member.

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**5,499,046**

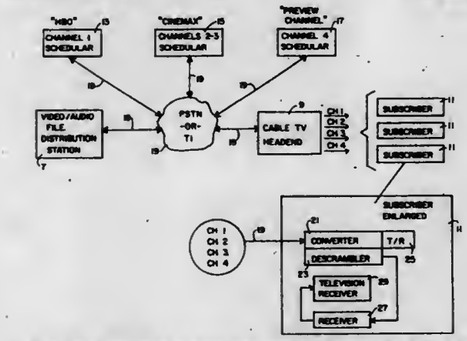
**CATV DISTRIBUTION SYSTEM WITH EACH CHANNEL HAVING ITS OWN REMOTE SCHEDULER**

**Jay B. Schiller, and Richard A. Schmelzer, both of Boulder, Colo., assignors to Cable Services Technologies, Inc., Boulder, Colo.**

**Filed May 23, 1994, Ser. No. 247,967**

**Int. Cl.[6] H04N 7/16;7/173**

**U.S. Cl. 348—6** **11 Claims**




1. A cable television system with remote channel scheduling, the system comprising:

a cable headend including a headend server for outputting first and second CATV channels to a plurality of subscribers, said first and second CATV channels carrying different video/audio programs for distribution to said plurality of subscribers in accordance with predetermined playlist schedules, wherein each said subscriber has a receiver for allowing said subscriber to choose between one of said first and second channels for view;

a video/audio file distribution station having a transmitter server for transmitting digital video/audio files in non-real time to said cable headend, said cable headend subsequently storing said received files for later distribution to said plurality of subscribers;

a first and a second scheduling station for generating said playlist schedules for said first and second channels by way of controlling the content, order, and time that said video/audio programs are output to said subscribers over each of said first and second channels, said first scheduling station controlling the playlist schedule of said first channel and said second scheduling station controlling the playlist schedule of said second channel so as to allow the video/audio output of said first and second channels to be controlled separately; and

computer means at each of said first and second scheduling stations for modifying said playlist schedules of said first and second channels respectively, said computer means also accessing said transmitter server at said file distribution station and requesting transmission of files listed on said playlist schedules from said distribution station to said cable headend whereby said headend is supplied with said files to be output via said first and second channels in accordance with said playlists generated by said first and second scheduling stations.

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**5,499,047**

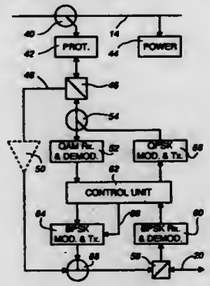
**DISTRIBUTION NETWORK COMPRISING COAX AND OPTICAL FIBER PATHS FOR TRANSMISSION OF TELEVISION AND ADDITIONAL SIGNALS**

**John B. Terry, Carp; Alastair A. Warwick, Ottawa, and Carl W. C. Anderson, Kanata, all of, Canada, assignors to Northern Telecom Limited, Montreal, Canada**

**Continuation-in-part of Ser. No. 175,455, Dec. 30, 1993, Pat. No. 5,408,259. This application Nov. 28, 1994, Ser. No. 348,850**

**Int. Cl.[6] H04N 7/173**

**U.S. Cl. 348—6** **17 Claims**




1. A cable television signal distribution network in which television signals on a distribution cable are supplied to customer premises via respective customer taps and drop cables, comprising:

an optical fiber path and a fiber termination unit for supplying digital signals to the distribution cable modulated at higher frequencies than the television signals, the digital signals including signals addressed to particular customer premises; and

a drop unit coupled in the drop cable of a particular customer premises, the drop unit comprising:

a receiver for receiving and demodulating the digital signals;

a control unit responsive to the addressed signals for identifying digital signals addressed to the particular customer premises; and

a transmitter for modulating the identified digital signals addressed to the particular customer premises and for forwarding the modulated signals to the customer premises with the television signals.

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**5,499,048**

## MULTI-VIDEO/AUDIO SYSTEM AND METHOD OF CONTROLLING THE SAME

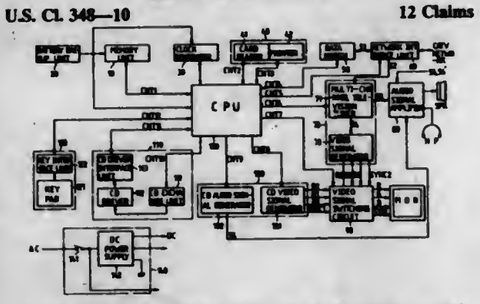
**Ho I. Seo, Kyounggi-do, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Rep. of Korea**

**Filed Sep. 27, 1994, Ser. No. 312,996**

**Claims priority, application Rep. of Korea, Dec. 29, 1993, 1993-30580**

**Int. Cl.[6] H04N** *7/14;7/16*

**U.S. Cl. 348—10** **12 Claims**




1. A method of controlling a multi-video/audio system, comprising the steps of:

(a) initializing the system when a power switch is turned on;

(b) outputting guide information and a sound regarding basic video/audio services;

(c) discriminating whether a service desired by the user is charged or free;

(d) providing information corresponding to a free service for the user if it is discriminated at said step (c) that the desired service is free and then checking whether the user continues to desire a service if the present service is ended;

(e) reading a user's card through a card reader if it is discriminated at said step (c) that the desired service is charged and interfacing a data modem and a cable television network through a network interface unit to transmit and receive a modem signal to/from a data base connected to the cable television network, so as to ascertain a card identification number, a card private number and deposit balance of the user;

(f) checking whether the charged service is a compact disk service;

(g) performing a compact disk service operation if it is checked at said step (f) that the charged service is the compact disk service;

(h) checking whether the charged service is a cable television service if it is checked at said step (f) that the charged service is not the compact disk service; and

(i) performing a cable television service operation if it is checked at said step (h) that the charged service is the cable television service.

**5,499,049**

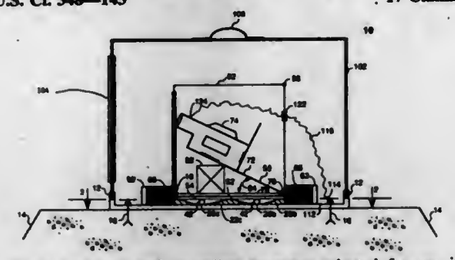
## ENVIRONMENTAL RECORDING APPARATUS

**Sohrab Esfandiari, 7 Blade Ct., Walnut Creek, Calif. 94595, and Mohamadreza Zarringhalam, 303 Starfish La., Redwood City, Calif. 94065**

**Filed Aug. 22, 1994, Ser. No. 293,452**

**Int. Cl.[6] H04N** *7/18*

**U.S. Cl. 348—143** **17 Claims**



1. An environmental recording apparatus adapted for use in photographically recording a seismic event, said environmental recording apparatus comprising:

a base adapted for being securely fastened to a mounting surface;

a seismic isolation structure disposed upon said base in a statically stable position whereby while a seismic event does not occur said seismic isolation structure does not move with respect to the mounting surface, said seismic isolation structure being adapted for insulating an apparatus secured thereon from movement in response to movement of said mounting surface during the seismic event;

a camera mount which is adapted for receiving a camera and which is secured on said seismic isolation structure so said seismic isolation structure insulates said camera mount from movement of said mounting surface during a seismic event;

a motion sensing switch which is secured to the mounting surface and which is adapted for activating a camera in response to a seismic acceleration if such an acceleration exceeds a preestablished threshold; and

an electrical signal cable having a first end which is coupled to said motion sensing switch and having a second end which is adapted for being coupled to a camera secured on said camera mount, said electrical signal cable coupling an electrical signal from said motion sensing switch to a camera for activating said camera during a seismic event, said electrical signal cable having sufficient length and having that length of electrical signal cable disposed such that said electrical signal cable does not restrain a camera from moving with respect to the mounting surface upon the occurrence of a seismic event having an acceleration that exceeds the preestablished threshold to which said motion sensing switch responds.

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**5,499,050**

## METHOD AND APPARATUS FOR MONITORING VIDEO COMPRESSION PROCESSING

**Gary C. Baldes, Hillsboro; Ben Echols, Aloha, and Arlene Kasai, Beaverton, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.**

**Filed Nov. 1, 1993, Ser. No. 147,678**

**Int. Cl.[6] H04N** *7/12;17/00*

**U.S. Cl. 348—180** **14 Claims**

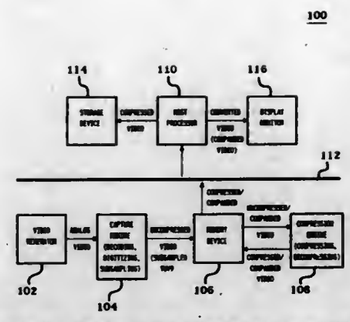
1. A method for processing a video stream, comprising the steps of:

(a) providing uncompressed video data corresponding to said video stream;

(b) compressing said uncompressed video data with a compression engine;

(c) decompressing said compressed video data with said compression engine to generate companded video data used in compressing said uncompressed video data;






(d) storing said companded video data as one or more bitmaps in a memory device;

(e) accessing said bitmaps in said memory device with a host processor; and

(f) displaying said companded video data on a display monitor.

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**5,499,051**

## MULTI-LENS IMAGE PICKUP APPARATUS HAVING UNSHARPNESS CORRECTING MECHANISM

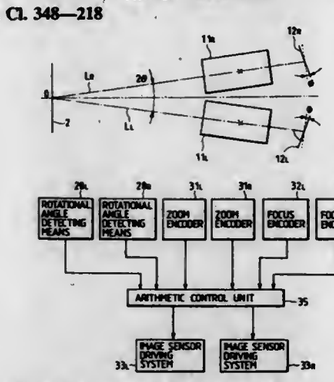
**Shigeyuki Suda, Yokohama; Yukichi Niwa, Narashino, and Tatsushi Katayama, Kawasaki, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 34,361, Mar. 19, 1993, abandoned. This application Jun. 30, 1995, Ser. No. 498,042**

**Claims priority, application Japan, Mar. 23, 1992, 4-065169**

**Int. Cl.[6] H04N** *5/225*

**U.S. Cl. 348—218** **7 Claims**




1. A multi-lens imaging apparatus comprising:

a first imaging optical system;

a second imaging optical system;

a convergence angle changing mechanism for changing a convergence angle between said first and second imaging optical systems;

wherein said convergence angle is changed according to whether a plane of an object lies at a near distance or at a far distance,

a first image sensor provided for said first imaging optical system;

wherein a plane of sensor of said first image sensor is disposed obliquely with respect to a plane normal to an optical axis of said first imaging optical system,

a first sensor angle is an angle between a first near distance angle and a first far distance angle,

wherein said first sensor angle is an angle made by said plane of said sensor of said first image sensor and said plane normal to said optical axis of said first imaging optical system,

said first near distance angle is an angle made by a near distance imaging plane in conjugation with said plane of said object lying at said near distance by way of said first imaging optical system and said plane normal to said optical axis of said first optical system,

said first far distance angle is an angle made by a far distance imagining plane in conjugation with said plane of said object lying at said far distance by way of said first imaging optical system and said plane normal to said optical axis of said first optical system,

a second image sensor provided for said second imaging optical system;

wherein a plane of sensor of said second image sensor is disposed obliquely with respect to a plane normal to an optical axis of said second imaging optical system,

a second sensor angle is an angle between a second near distance angle and a second far distance angle,

wherein said second sensor angle is an angle made by said plane of said sensor of said second image sensor and said plane normal to said optical axis of said second imaging optical system,

said second near distance angle is an angle made by a near distance imaging plane in conjugation with said plane of said object lying at said near distance by way of said second imaging optical system and said plane normal to said optical axis of said second optical system,

said second far distance angle is an angle made by a far distance imaging plane in conjugation with said plane of said object lying at said far distance by way of said second imaging optical system and said plane normal to said optical axis of said second optical system; and

an angle changing mechanism for changing at least one of said first and second sensor angles,

wherein said angle changing mechanism changes at least one of said first and second angles according to a change of said convergence angle by said convergence angle changing mechanism; and

wherein said angle changing mechanism adjust said sensor angles so that the plane in conjugation with said object is substantially consistent with the plane of said sensor.

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**5,499,052**

## SINGLE-UNIT VIDEO CAMERA-RECORDER WITH SELECTIVELY ILLUMINATED FUNCTION KEYS

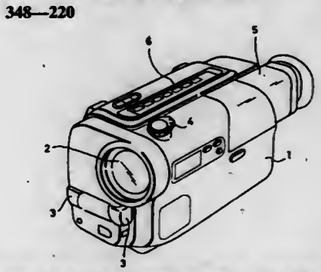
**Atsushi Nakanishi, Tokyo, and Yukihiro Kato, Kanagawa, both of, Japan, assignors to Sony Corporation, Tokyo, Japan**

**Filed Aug. 24, 1994, Ser. No. 294,947**

**Claims priority, application Japan, Aug. 25, 1993, 5-210692**

**Int. Cl.[6] H04N** *5/225*

**U.S. Cl. 348—220** **5 Claims**




1. A single-unit video camera recorder operable either in a camera or a video mode, comprising:

a mode switch for setting said single-unit video camera-recorder in a selected one of said camera mode and said video mode;

a set of function keys for instructing functions of said single-unit video camera-recorder only in a first one of said camera mode and said video mode;

a light source for illuminating said function keys; and

a controller for controlling said light source to illuminate said set of function keys only when said mode switch has switched said single-unit video camera-recorder to said first one of said camera mode and said video mode.

5,499,053

## ELECTRONIC FINDER WITH REDUCED REFLECTION CAUSED BY INCOMING LIGHT

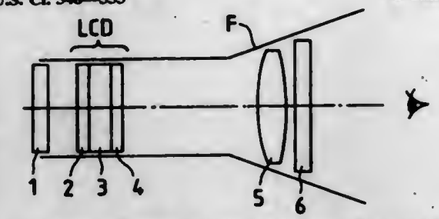
Kazumi Itoh, Mitaka, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1993, Ser. No. 171,621

Claims priority, application Japan, Dec. 25, 1992, 4-346463; Mar. 25, 1993, 5-066735

Int. Cl.[6] H04N 5/225

U.S. Cl. 348—333 8 Claims




1. A finder comprising, in order from a side of incident light along an optical axis:

a liquid crystal display element including, in order along the optical axis:

a first polarizing element; and

a liquid crystal cell;

a lens unit that causes an image produced by said liquid crystal display element to enter an observer's eye; and

a second polarizing element disposed between the observer's eye and said lens unit for reducing reflected light incident on said lens unit from a side of said lens unit opposite said liquid crystal display element.

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5,499,054

## CHARACTER AND PATTERN MIXING APPARATUS FOR USE IN A VIDEO EQUIPMENT

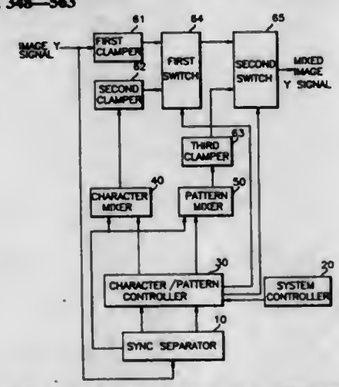
Han-Sub Lim, Incheon, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Dec. 29, 1994, Ser. No. 366,141

Claims priority, application Rep. of Korea, Dec. 29, 1993, 93-31086

Int. Cl.[6] H04N 5/262;5/272;5/265;5/445

U.S. Cl. 348—563 1 Claim




1. A video mixing apparatus for use in a video equipment for providing a mixed image luminance signal, wherein an input video signal of the video equipment includes an image luminance signal, which comprises,

a synchronization ("sync") separator for providing inverted horizontal sync, inverted vertical sync and inverted composite sync signals from the image luminance signal;

means for generating a character and pattern selection signal;

a character/pattern controller, responsive to the inverted horizontal and vertical sync signals, for generating a character and a pattern luminance signals, and a character control signal and a pattern control signal corresponding to the character and pattern selection signal;

a character mixer for mixing the inverted composite sync signal with the character luminance signal to produce a mixed character signal;

a pattern mixer for mixing the inverted composite sync signal with the pattern luminance signal to produce a mixed pattern signal; and

means for mixing the mixed character signal and the mixed pattern signal with the image luminance signal in response to the character control signal and the pattern control signal to thereby provide the mixed image luminance signal.

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5,499,055

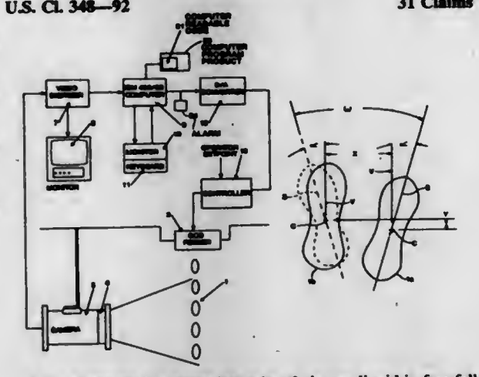
## GOB MEASURING APPARATUS

Steven J. Anger, Guelph; William J. Devonshire, Orton, and Philip W. Annis, Oakville, all of, Canada, assignors to Erin Technologies, Inc., Canada

Continuation-in-part of Ser. No. 49,501, Apr. 21, 1993, Pat. No. 5,434,616. This application Jan. 12, 1995, Ser. No. 371,883

Int. Cl.[6] H04N 7/18

U.S. Cl. 348—92 31 Claims



1. An apparatus for measuring gobs of viscous liquid in free fall from a gob feeder, comprising:

means for capturing a complete two dimensional, frozen video image of a plurality of gobs at a point in time during free fall, wherein said frozen image is acquired via a single operation of said means for capturing;

means for digitizing said video image to produce a first digitized image of at least a first gob of said plurality of gobs with n x n pixel arrays for comparison with a second digitized image of a second gob with n x n pixel arrays; and

an image analyzing means for analyzing at least said first digitized image for relatively comparing said first digitized image with said second digitized image for determining any physical differences between said first and second gobs represented by said digitized images.



5,499,056

## BANDSWITCHABLE DOUBLE TUNED RF CIRCUIT WITH BALANCED SECONDARY

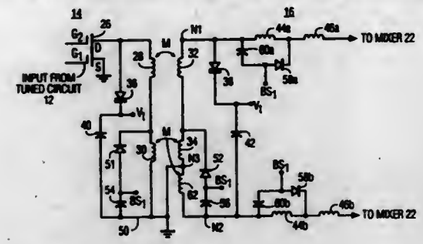
Michael A. Pugel, Nobelsville, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Aug. 8, 1994, Ser. No. 287,521

Int. Cl.[6] H03J 5/02

U.S. Cl. 348—73 6 Claims

1. In a television tuner, a band switchable double tuned circuit




having a balanced secondary comprising:

a signal source for providing an RF signal at a signal terminal with respect to a signal reference potential and DC reference potential;

a primary tank circuit comprising a first capacitor coupled in parallel with a first series circuit of a first and a second primary inductances for resonating at a first predetermined frequency, the primary tank circuit being coupled to the signal terminal of the signal source in an unbalanced configuration;

a secondary tank circuit comprising a second capacitor coupled in parallel with a second series circuit for resonating at the first predetermined frequency, the second series circuit comprising in the order named a first, second and third secondary inductances, said first primary inductance and said first secondary inductance having a first coefficient of mutual inductance therebetween, said second primary inductance and at least one of said second and third secondary inductances having a second coefficient of mutual inductance therebetween, the DC reference potential being coupled to a junction of the second and third secondary inductances so that the first and second secondary inductances operate together in combination with the third secondary inductance for providing a balanced signal at a pair of balanced secondary output terminals;

a first bandswitch means responsive to a bandswitch control signal coupled across the second primary inductance, and a second bandswitch means responsive to the bandswitch control signal coupled across the second and third secondary inductances for causing the tuning of the primary and secondary tuned circuits to be switched from the first predetermined frequency to a second predetermined frequency;

a first and second constant bandwidth means coupled in series with one of the balanced secondary output terminals for coupling the signal to one input terminal of a balanced load, and third and fourth constant bandwidth means coupled in series to the other balanced secondary output terminal for coupling the signal to another input terminal of the balanced load, and

third and fourth bandswitch switch means responsive to the bandswitching control signal, each being coupled across one a respective first and third constant bandwidth means, for changing the value of respective constant bandwidth means for each of the balanced output signals when the primary and secondary tuned circuits are bandswitched between the first predetermined frequency and the second predetermined frequency.

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5,499,057

## APPARATUS FOR PRODUCING A NOISE-REDUCDED IMAGE SIGNAL FROM AN INPUT IMAGE SIGNAL

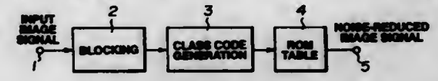
Tetsujiro Kondo; Takashi Horishi; Yasuhiro Fujimori, all of Kanagawa, and Takeharu Nishikata, Chiba, all of, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 22, 1994, Ser. No. 293,918

Claims priority, application Japan, Aug. 27, 1993, 5-213209

Int. Cl.[6] H04N 5/21

U.S. Cl. 348—607 15 Claims




1. An apparatus for producing a noise-reduced image signal from an input image signal having relatively more noise than the noise-reduced image signal, comprising:

block producing means for producing a plurality of noise-containing block signals from the input image signal, each of the noise-containing block signals representing a portion of an image represented by the input image signal;

class code producing means for producing a class code for each of the plurality of noise-containing block signals, each class code identifying low noise image data corresponding with an image portion and having a noise level lower than that of a noise-containing block for which the class code was produced; and

noise-reduced image signal producing means for producing the noise-reduced image signal based on the class codes produced by the class code producing means.

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5,499,058

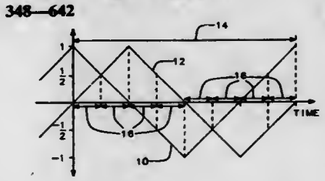
## DIGITAL COLOR ENCODER USING TRIANGULAR WAVE MODULATION

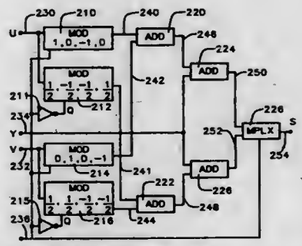
Chun-Hsien Horng, Taipei, and Guang-Nan Tzeng, Taichung, both of, Taiwan, Prov. of China, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan, Prov. of China

Filed Feb. 27, 1995, Ser. No. 394,589

Int. Cl.[6] H04N 9/65

U.S. Cl. 348—642 14 Claims




1. A digital color encoder, comprising:

red, green, and blue primary color signals having a carrier frequency;

a luminance signal wherein said luminance signal is equal to 0.299 multiplied by said red primary color signal plus 0.587 multiplied by said green primary color signal plus 0.114 multiplied by said blue primary color signal;

means for producing a first color difference signal from said luminance signal and said red primary color signal wherein said first color difference signal is equal to said luminance signal divided by 1.14 subtracted from said red primary color signal divided by 1.14;

means for producing a second color difference signal from said luminance signal and said blue primary color signal wherein said second color difference signal is equal to said luminance signal divided by 2.03 subtracted from said blue primary color signal divided by 2.03;

a sampling frequency equal to eight times said carrier frequency;

a sampling period equal to the inverse of said sampling frequency;

a carrier period equal to the inverse of said carrier frequency wherein each said carrier period contains eight said sampling periods;

a control signal wherein said control signal is equal to a logical 1 during the first, third, fifth, and seventh sampling period of each said carrier period and a logical 0 during the second, fourth, sixth, and eighth sampling period of each said carrier period;

an inverse control signal wherein said inverse control signal is equal to a logical 0 during the first, third, fifth, and seventh sampling period of each said carrier period and a logical 1 during the second, fourth, sixth, and eighth sampling period of each said carrier period;

means for sampling said luminance signal, said first color difference signal, and said second color difference signal at said sampling frequency thereby producing quantized levels of said luminance signal, said first color difference signal and said second color difference signal for each said sampling period;

means for producing a first intermediate signal wherein said first intermediate signal is equal to said quantized first color difference signal during the first sampling period of each said carrier period, zero during the second, third, and fourth sampling periods of each said carrier period, said quantized first color difference signal multiplied by minus one during the fifth sampling period of each said carrier period, and zero during the sixth, seventh, and eighth sampling periods of each said carrier period;

means for producing a second intermediate signal wherein said second intermediate signal is equal to said quantized first color difference signal multiplied by one half during the second and eighth sampling periods of each said carrier period, said quantized first color difference signal multiplied by minus one half during the fourth and sixth sampling periods of each said carrier period, and zero during the first, third, fifth, and seventh sampling periods of each said carrier period;

means for producing a third intermediate signal wherein said third intermediate signal is equal to zero during the first, second, fourth, fifth, sixth, and eighth sampling periods of each said carrier period, said quantized second color difference signal during the third sampling period of each said carrier period, and said quantized second color difference signal multiplied by minus one during the seventh sampling period of each said carrier period;

means for producing a fourth intermediate signal wherein said fourth intermediate signal is equal to said quantized second color difference signal multiplied by one half during the second and fourth sampling periods of each said carrier period, said quantized second color difference signal multiplied by minus one half during the sixth and eighth sampling periods of each said carrier period, and zero during the first, third, fifth, and seventh sampling periods of each said carrier period;

means for producing a fifth intermediate signal wherein said fifth intermediate signal is equal to the sum of said quantized luminance signal, said first intermediate signal and said third intermediate signal;

means for producing a sixth intermediate signal wherein said sixth intermediate signal is equal to the sum of said quantized luminance signal, said second intermediate signal and said fourth intermediate signal; and

means for producing a digitized color signal wherein said digitized color signal is equal to said fifth intermediate signal during the first, third, fifth, and seventh sampling period of each said carrier period and said sixth intermediate signal during the second, fourth, sixth, and eighth sampling period of each said carrier period.

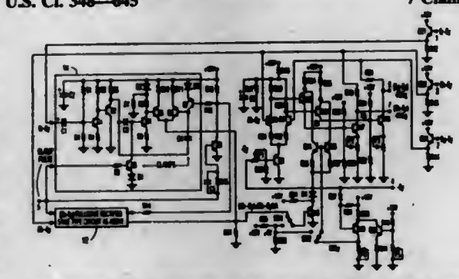
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**5,499,059**

## METHOD AND APPARATUS FOR EFFECTING DYNAMIC COLOR SHIFT IN A TELEVISION RECEIVER

**Kenneth R. Skinner, Ossining, N.Y., assignor to Philips Electronics North America Corporation, New York, N.Y.**

**Filed Jun. 22, 1994, Ser. No. 263,699**
**Int. Cl.[6] H04N** *9/73;9/64*
**U.S. Cl. 348—645** **7 Claims**



1. A method for correcting color errors in displaying a color video signal on the display of a color television receiver, said color television receiver having drive circuits for each of the colors red, green and blue, for forming respective color drive signals, in response to color signal components present in said color video signal, for the display, the method comprising the steps:

setting up the color drive circuits of the color television receiver for conversion of said color signal components in said color video signal to the color drive signals to a ratio for producing a white color temperature higher than that specified in a television standard;

detecting the presence and amount of color in the color video signal to be displayed on the display of the color television receiver; and

reducing the color drive signals for at least two of the colors in dependence on the detected amount of color in the color video signal, whereby the resulting chromaticity of the displayed colors is the same as that when the color drive circuits are set up for the standard white color temperature, while displayed white regions are at said higher than standard color temperature.

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**5,499,060**

## SYSTEM AND METHOD FOR PROCESSING VIDEO DATA

**Robert J. Gove; Richard C. Meyer, both of Plano, and Vishal Markandey, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Jan. 4, 1994, Ser. No. 177,013**
**Int. Cl.[6] H04N** *9/64*
**U.S. Cl. 348—651** **19 Claims**

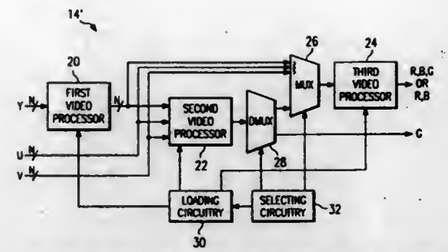
1. A system for processing pixel data, each pixel having a selectable number of bits, said system comprising:

a first video processor for receiving and processing pixel data, wherein said pixel data is of a selectable number of bits, said number being dependent upon the dynamic range of said system, of a first input video signal, generating an output video signal;

a second video processor responsive to the output video signal of said first video processor and a second input video signal, said second video processor operable to process pixel data of said second input video signal and operable to generate one of a first, second and third output video signals; and

a third video processor responsive to at least one of said first and second video processors, said third video processor operable to process said second input video signal and operable to generate at least two of said first, second and third output video signals.





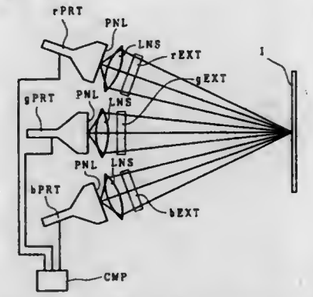

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**5,499,061**

## PROJECTION SYSTEM AND DISPLAY APPARATUS FOR COMPRESSING AND EXPANDING ASPECT RATIO OF A PICTURE

**Kentaro Oku, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan**

**Continuation of Ser. No. 873,011, Apr. 24, 1992, Pat. No. 5,386,252. This application Jan. 24, 1995, Ser. No. 377,224**
**Claims priority, application Japan, Aug. 27, 1991, 3-215032**
**Int. Cl.[6] H04N** *5/74;9/31*
**U.S. Cl. 348—746** **16 Claims**




1. A projection system for a picture comprising means for generating source pictures, projection optical system means for magnifying the source pictures formed in said means for generating source pictures and for projecting the magnified source pictures, and a projection means for receiving the magnified and projected source pictures from the projection optical system means, the means for generating source pictures generating source pictures so that an aspect ratio of an original picture is varied so as to become closer to 1 as compared with the original picture, and the projection system for magnifying and projecting the source pictures onto the projection means including means for expanding the source pictures so as to expand the aspect ratio of the source pictures projected onto the projection means to an aspect ratio substantially corresponding to the aspect ratio of the original picture.

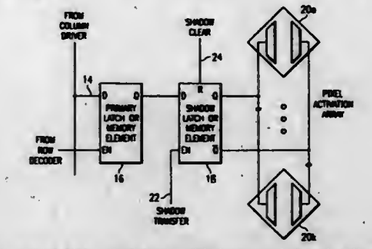
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**5,499,062**

## MULTIPLEXED MEMORY TIMING WITH BLOCK RESET AND SECONDARY MEMORY

**Paul M. Urbanus, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Jun. 23, 1994, Ser. No. 264,387**
**Int. Cl.[6] H04N** *5/74*
**U.S. Cl. 348—771** **7 Claims**




1. A spatial light modulator with improved data loading, comprising:

a. an array of individually addressable pixels, each pixel consisting of:

i. an active area; and

ii. activation circuitry, where said activation circuitry receives data, said data causing said active area to assume one of two states;

b. memory cells in electrical connection with said pixels, wherein at least two unique pixels are in dedicated connection with each one of each memory cell;

c. additional circuitry between said memory cell and said pixels such that said additional circuitry receives said data from a memory cell before said activation circuitry and allows said memory cell to receive new data, wherein said additional circuitry is capable of receiving independent control signals.

7. A method for improved data loading of a spatial light modulator, comprising:

a. sending a first data signal to an array of first memory cells, wherein each said first memory cell is assigned at least two unique, individually addressable pixels of said spatial light modulator;

b. receiving said first data signal at said array of first memory cells;

c. sending a transfer control signal to said array of first memory cells causing each of said first memory cells to transfer said first data signal to a second memory cell;

d. sending said first data signal from said second memory cell to activation circuitry in each of said pixels;

e. sending a second control signal causing said pixels to respond to said first data signal;

f. selectively sending a third control signal, causing selected ones of said pixels to stop responding to said first data signal, while receiving a second data signal at each of said first memory cells of said selective ones of said pixels.

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**5,499,063**

## MULTIFOCAL TRIAL FRAME SYSTEM

**E. Dean Butler, Cincinnati, Ohio, and Craig H. Risk, Tucson, Ariz., assignors to Vision Express Group Limited, Nottingham, England**

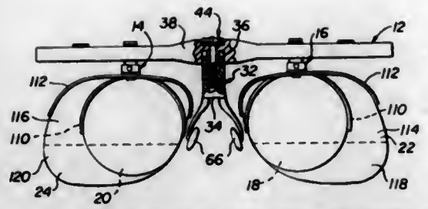
**Filed Apr. 25, 1994, Ser. No. 232,735**
**Int. Cl.[6] G02C** *7/06*
**U.S. Cl. 351—54** **42 Claims**

1. A multifocal trial frame system comprising:

a trial frame shaped to engage the head of a wearer;

a pair of distance prescription lenses attached to said frame;

a pair of multifocal lenses attached to said frame and positioned adjacent to said distance lenses, each of said multifocal lenses including a neutral portion and an insert portion having a close-viewing power, said insert portion being incorporated



into said neutral portion to form a continuous, unitary lens unit with said neutral portion, whereby said lenses cooperate to simulate multifocal eyeglasses of a predetermined prescription and configuration.

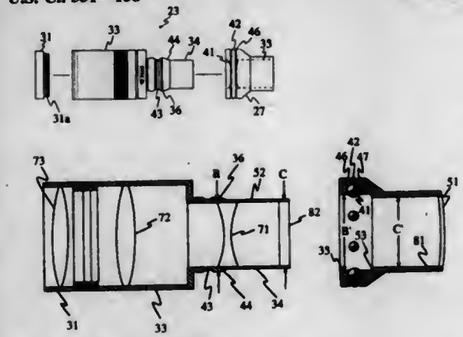
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**5,499,064**

## VISUAL AID DEVICE HAVING A LOCKING DEVICE

**Ronald E. Vansaghi, Arlington, Tex., assignor to Paralax, Inc., Scarsdale, N.Y.**

**Filed Jan. 28, 1994, Ser. No. 188,307**
**Int. Cl.[6] G02C *1/00***
**U.S. Cl. 351—158** **23 Claims**





1. A visual aid, comprising:
a mounting adapter, having an opening;
means for supporting said mounting adapter within a line of sight of a user;
an optical device having an insertion shank at an end thereof;
said insertion shank being insertable in said mounting adapter;
means for engaging said insertion shank in said mounting adapter upon application of an insertion force to said insertion shank while said insertion shank is inserted in said opening;
said means for engaging including means for disengaging said insertion shank upon application of an extraction force to said insertion shank while said insertion shank is inserted in said opening; and
said means for engaging including means for requiring that said insertion force is lower in magnitude than said extraction force.

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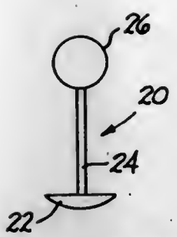
**5,499,065**

## DEVICE FOR PREVENTING EYE DROPS FROM ENTERING THE NASOLACRIMAL DUCT SYSTEM

**Thom J. Zimmerman, 389 Mockingbird Valley Rd., Louisville, Ky. 40207**

**Filed Jun. 20, 1995, Ser. No. 492,623**
**Int. Cl.[6] A61B *3/00*; A61M *35/00***
**U.S. Cl. 351—200** **3 Claims**

1. A device for preventing eye drops disposed in the human eye from entering the nasolacrimal system comprising
a rod comprising compression biasing means acting along the axis of the rod;



pad means mounted to one end of said rod and sized and configured to cover the exterior surface of the medial corner of an eye covering the juncture of the upper and lower eyelids of the eye in the area of the nasolacrimal ducts located on the inner surfaces of the upper and lower eyelids of the eye for occluding the nasolacrimal ducts when the pad means is positioned over the juncture of the upper and lower eyelids; and
a handle attached to the opposite end of said rod.

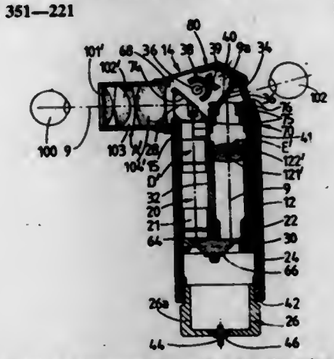
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**5,499,066**

## AN OPTICAL INSTRUMENT WITH A CONTINUOUSLY ADJUSTABLE ZOOM

**John W. Farmer, Drouin; George Smith, Mt. Waverley; Malcolm Gin, Wonthaggi; John F. H. Brook, College Park; Daryl R. White; Brian A. See, both of Technology Park, all of, Australia, and Ian Powell, Gloucester, Canada, assignors to Remraf Pty. Ltd., Australia**

**PCT No. PCT/AU91/00387, § 371 Date Apr. 21, 1993, § 102(e) Date Apr. 21, 1993, PCT Pub. No. WO92/03085, PCT Pub. Date Mar. 5, 1992**
**PCT Filed Aug. 26, 1991, Ser. No. 975,929**
**Claims priority, application Australia, Aug. 24, 1990, PK1934/90**
**Int. Cl.[6] A61B *3/12; G02B 15/00***
**U.S. Cl. 351—221** **21 Claims**



1. An optical instrument for indirectly observing an object, comprising a first lens system for producing a first image of the object, and an adjustable second lens system for producing a second image of the object, said second lens system being continuously adjustable between a first position wherein the second image has maximum magnification and/or a minimum area of view and a second position wherein the second image is of a minimum magnification and/or a maximum area of view, wherein said second lens system is a zoom lens system having two substantially fixed conjugates.

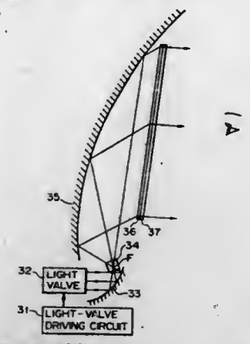


**5,499,067**

## PROJECTOR

**Shigeru Shibazaki, Chiba, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan**

**Division of Ser. No. 245,899, May 19, 1994. This application Apr. 17, 1995, Ser. No. 422,934**
**Claims priority, application Japan, Jun. 23, 1993, 5-151893**
**Int. Cl.[6] G03B *21/28***
**U.S. Cl. 353—99** **2 Claims**




1. A projector, comprising:
a light valve emitting a parallel beam of light;
a first parabolic mirror causing the rays of the parallel beam of light to converge at its focal point;
a projection lens disposed at the focal point of the first parabolic mirror; and
a second parabolic mirror that reflects the rays of the beam of light from the projection lens to produce a parallel beam of light, whereby the rays of the parallel beam of light reflected by the second parabolic mirror are collected to form an image.

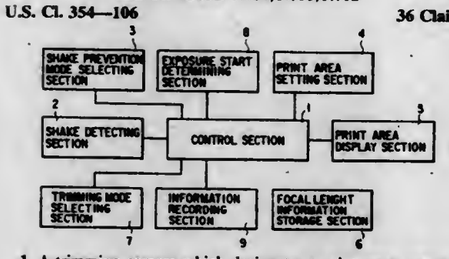
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**5,499,068**

## CAMERA HAVING HAND SHAKE DETECTING FUNCTION AND TRIMMING MODE SELECTING FUNCTION

**Tatsuya Satoh, and Masaki Nagao, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan**

**Filed Sep. 30, 1993, Ser. No. 129,779**
**Claims priority, application Japan, Jan. 6, 1992, 4-267387; Jan. 20, 1992, 4-281455; Aug. 5, 1993, 5-194797**
**Int. Cl.[6] G03B *17/24;17/00;17/02***
**U.S. Cl. 354—106** **36 Claims**




1. A trimming camera which designates a print range narrower than a normal photographic frame and records the print range, comprising:
print area setting means for manually setting the print range;
focal length detecting means for detecting a focal length of said trimming camera;
equivalent focal length calculating means for calculating an equivalent focal length on the basis of the focal length of said trimming camera, detected by said focal length detecting means, and the print range set by said print area setting means;
shake amount detecting means for detecting a value associated with a shake amount of said trimming camera;
image blur calculating means for calculating an image blur amount at the equivalent focal length on the basis of the equivalent focal length calculated by said equivalent focal length calculating means and the value associated with the shake amount, detected by said shake amount detecting means;
determining means for determining whether the image blur amount calculated by said image blur amount calculation means falls within a predetermined range;
limiting means for limiting the print range set by said print area setting means when said determining means determines that the image blur amount falls outside the predetermined range; and
display means for displaying the print range limited by said limiting means.

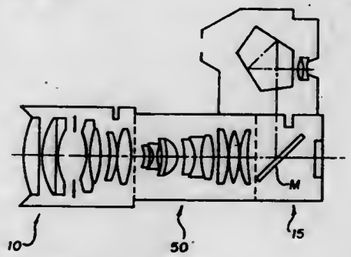
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**5,499,069**

## CAMERA SYSTEM AND AN OPTICAL ADAPTER TO REDUCE IMAGE FORMAT SIZE

**John D. Griffith, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed May 24, 1994, Ser. No. 248,275**
**Int. Cl.[6] G03B *19/12;17/00;* G02B *15/02***
**U.S. Cl. 354—152** **12 Claims**



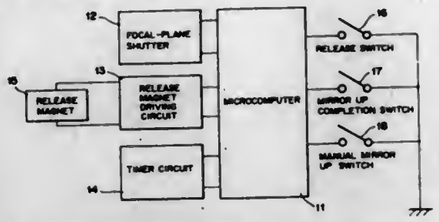
1. A camera system comprising:
a) an SLR camera body adapted to carry a photosensitive medium at an image plane, said camera body including a mirror that is in an optical path of the camera in a viewing mode;
b) a lens barrel located in front of said camera body and including an objective lens system that is adapted to image an object at the image plane when the lens barrel is mounted directly to the camera body; and
c) an optical adapter located between said lens barrel and said camera body for providing a smaller size image than said objective lens system provides when mounted directly to the camera body, said optical adapter including a lens attachment optical system, a front lens element of which is located in front of an image formed by said objective lens system exclusive of the lens attachment optical system, said lens attachment optical system having a plurality of lens elements which have radii of curvature and spacings sufficient to create a back focal distance to clear the SLR camera body mirror.

**5,499,070**

## SHUTTER CONTROL DEVICE

**Kosho Miura, Funabashi, Japan, assignor to Nikon Corporation, Tokyo, Japan**

**Continuation of Ser. No. 90,572, Jul. 12, 1993, abandoned. This application Nov. 30, 1994, Ser. No. 351,141**
**Claims priority, application Japan, Jul. 29, 1992, 4-222043**
**Int. Cl.[6] G03B *19/12***
**U.S. Cl. 354—152** **12 Claims**




1. A shutter control device comprising:
a shutter having a leading curtain and a trailing curtain;
a release signal generator;
a mirror for reflecting light of a subject toward a viewing optical system;
a mirror driving member for shifting said mirror from a first position on a photographing light path to a second position off said photographing light path;
a position detector disposed to detect that said mirror reaches the vicinity of said second position, and generating a position signal;
a timer which starts measuring a predetermined time substantially upon generation of said release signal by said release signal generator and which generates a time measurement end signal when said predetermined time elapses; and
a controller which actuates said leading curtain in response to receiving both of said time measurement end signal and said position signal.

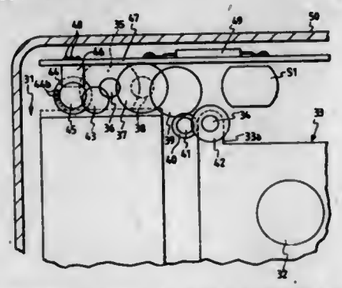
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**5,499,071**

## APPARATUS FOR DETECTING ROTATION OF MOTOR FOR CAMERA

**Hiroshi Wakabayashi, Yokohama; Hidenori Miyamoto, Urayasu, and Isao Soshi, Tokyo, all of, Japan, assignors to Nikon Corporation, Tokyo, Japan**

**Continuation of Ser. No. 144,351, Nov. 1, 1993, abandoned. This application Mar. 8, 1995, Ser. No. 400,476**
**Claims priority, application Japan, Nov. 2, 1992, 4-294469**
**Int. Cl.[6] G03B *1/18***
**U.S. Cl. 354—173.1** **10 Claims**



6. An apparatus for detecting rotation of a motor for a camera, comprising:
an encoder rotatable in synchronism with the motor;
a photointerrupter for detecting said encoder and outputting pulse signals; and
a circuit board having disposed thereon a control device to which the pulse signals from said photointerrupter are input;
said photointerrupter being mounted directly on said circuit board.

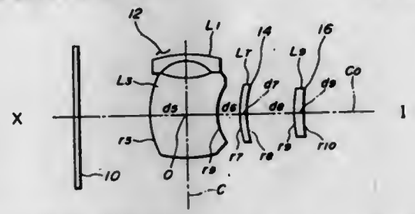
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**5,499,072**

## VARIABLE MAGNIFICATION FINDER

**Yusuke Nanjo, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Filed Jun. 24, 1994, Ser. No. 265,589**
**Claims priority, application Japan, Jul. 6, 1993, 5-165829**
**Int. Cl.[6] G03B *13/10*; G02B *15/00***
**U.S. Cl. 354—222** **20 Claims**



1. A variable magnification finder having an object side and an image side comprising:
in succession from said object side,
a first lens component, said first lens component including a four-surface lens having a first surface opposite a second surface and a third surface opposite a fourth surface, said first and second surfaces having a first optical axis in common, said third and fourth surfaces having a second optical axis in common, said first optical axis being substantially perpendicular to said second optical axis;
a second lens component having a convex surface facing said object side; and
a third lens component having a convex surface facing the object side;
wherein magnification of said finder is changed by rotating said four-surface lens about a third optical axis which is substantially perpendicular to said first and second optical axes.

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**5,499,073**

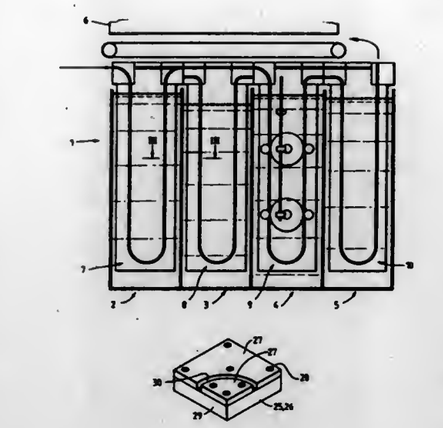
## PROCESSING APPARATUS

**Leslie J. H. Pummell, Rickmansworth, England, assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Feb. 17, 1995, Ser. No. 390,330**
**Claims priority, application United Kingdom, Feb. 23, 1994, 94003416**
**Int. Cl.[6] G03D *3/08;13/08***
**U.S. Cl. 354—320** **10 Claims**

1. A processing apparatus for processing a web-like item, said apparatus comprising a plurality of processing stations and means for conveying the web-like item through the apparatus along a predetermined path between the processing stations, the apparatus having opposed regions defining channels which receive opposed longitudinal edges of the web-like item, the channels defining said predetermined path, part of each channel being defined by elements releasably mountable upon the apparatus, the releasable mounting of the elements on the apparatus permitting ready removal of one set of elements and replacement by a different set of elements which define a different, predetermined path along which the web-like item is conveyed as it passes through the apparatus.





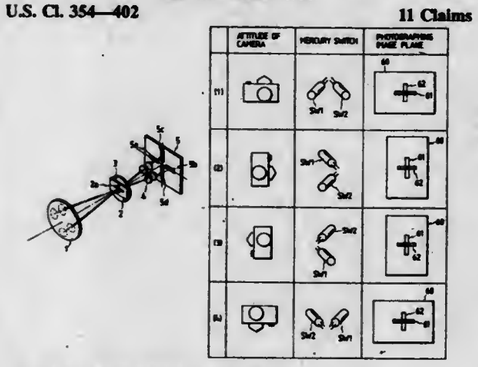
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**5,499,074**

## AUTOFOCUS CAMERA

**Keiji Ohsawa, Yokohama; Nobuo Matsukawa; Sunao Nishioka, both of Tokyo; Ryuichi Mori, Yokohama, and Yoshiyuki Nakano, Tokyo, all of, Japan, assignors to Nikon Corporation, Tokyo, Japan**

**Continuation of Ser. No. 357,092, Dec. 15, 1994, abandoned, which is a continuation of Ser. No. 185,167, Jan. 24, 1994, abandoned, which is a continuation of Ser. No. 786,606, Nov. 1, 1991, abandoned. This application May 30, 1995, Ser. No. 453,462**
**Claims priority, application Japan, Nov. 9, 1990, 2-304693**
**Int. Cl.[6] G03B *13/36***
**U.S. Cl. 354—402** **11 Claims**




1. An autofocus camera comprising:
a first photoelectric conversion unit to receive subject light from a detecting region extended in one direction of a photographic image plane and to perform photoelectric conversion;
a second photoelectric conversion unit to receive subject light from a detecting region extended in a direction different from said one direction of said photographic image plane and to perform photoelectric conversion;
an attitude detector to detect attitude of the camera;
a focus detector which selects one of said first and second photoelectric conversion units corresponding to a predetermined priority direction in the detected attitude of the camera and which conducts a focus detection operation using the selected photoelectric conversion unit, said focus detector discriminating based on a result of said focus detection operation whether focus can be detected using the selected photoelectric conversion unit, and, if it is discriminated that focus cannot be detected using the selected photoelectric conversion unit, conducting a focus detection operation using the other of said first and second photoelectric conversion units, said focus detector further providing a focus detection result to be used for focus control; and
a lens driving unit to drive and focus a photographic lens in accordance with the focus detection result from said focus detector.

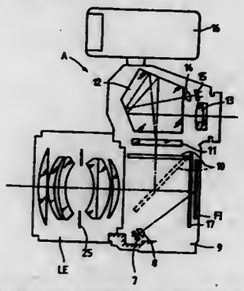
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**5,499,075**

## PHOTOMETRIC APPARATUS FOR A CAMERA

**Toshihiro Sato, Tokyo; Tadao Takagi, Yokohama, and Seiichi Yasukawa, Kawasaki, all of, Japan, assignors to Nikon Corporation, Tokyo, Japan**

**Division of Ser. No. 47,478, Apr. 19, 1993, Pat. No. 5,400,112, which is a division of Ser. No. 560,745, Jul. 31, 1990, Pat. No. 5,231,448. This application Jan. 10, 1995, Ser. No. 370,741**
**Claims priority, application Japan, Aug. 7, 1989, 1-204300; Aug. 8, 1989, 1-203735; Sep. 1, 1989, 1-227221; Jan. 20, 1989, 1-273576; Nov. 9, 1989, 1-291459**
**Int. Cl.[6] G03B *15/05***
**U.S. Cl. 354—415** **7 Claims**



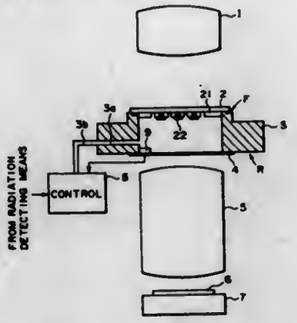
1. Auto light adjusting apparatus of a camera having a focal plane shutter which is disposed on an object side in the vicinity of a film and which shields or passes light from an object, comprising:
a flash apparatus which emits a preliminary flash and a main flash;
a flash control circuit for causing said flash apparatus to emit a preliminary flash before an opening operation of said focal plane shutter, for causing said flash apparatus to emit a main flash after the opening of the focal plane shutter, and for causing flash emission of said flash apparatus to stop;
a plurality of photometric elements being disposed at positions at which light reflected by a surface of said film may be received, and being segmented so as to respectively correspond to a plurality of regions obtained by segmenting an object field which corresponds to said film surface;
a detector for respectively detecting outputs of said plurality of photometric elements;
a weighting amount calculator for detecting reflection rate distributions of said object field based on outputs of said detector at the time of a preliminary flash operation of said flash apparatus, and for determining weights for electrical outputs of said plurality of photometric elements at the time of a main flash operation; and
a light adjusting device for outputting to said flash control circuit an emission stop signal for said flash apparatus upon a detection at the time of the main flash operation of said flash apparatus of the fact that the total of the outputs of the said plurality of photometric elements to which weights are assigned by said weighting amount calculator has reached a predetermined level.

5,499,076

## EXPOSURE METHOD AND APPARATUS

Masato Muraki, Inagi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 64,655, May 21, 1993, abandoned.
This application May 25, 1995, Ser. No. 449,918
Claims priority, application Japan, May 21, 1992, 4-154500; Feb. 24, 1993, 5-061034
Int. Cl.[6] G03B 27/42;27/52
U.S. Cl. 355—53 4 Claims




1. A projection exposure apparatus for projecting a pattern of a reticle using phase shift means onto a substrate, said apparatus comprising:
an optical system for projecting the pattern of the reticle onto the substrate;
control means for adjusting a refractive index of the phase shift means to control the quantity of phase shift provided by the phase shift means.

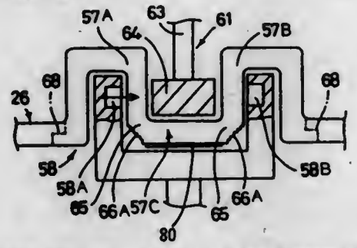
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5,499,077

## TONER LEVEL DETECTING DEVICE

Yoshinori Endo, Toyota, and Kazuhito Ishida, Nagoya, both of, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed May 2, 1995, Ser. No. 434,337
Claims priority, application Japan, May 17, 1994, 6-102769; Jul. 18, 1994, 6-165265
Int. Cl.[6] G03G 15/08
U.S. Cl. 355—203 21 Claims



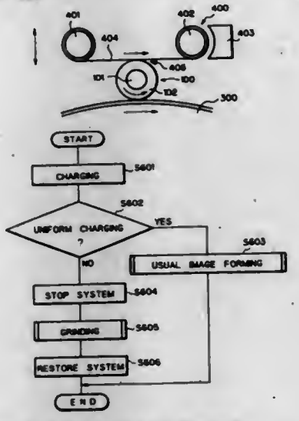

1. A toner level detecting device on a toner storage box, comprising:
first and second toner detecting portions formed of a light transmissive material; and
a connecting portion connecting the first and second toner detecting portions, the connecting portion having means for attenuating light passing through the connecting portion, wherein the first and second toner detecting portions and the connecting portion are formed such that toner in the toner storage box can fill an aperture between the first and second toner detecting portions.

5,499,078

## CHARGE ROLLER AND IMAGE FORMING APPARATUS USING THE SAME

Junji Kurokawa, Yokohama; Kazuo Nojima, Chiba, and Norimasa Sohmiya, Souka, all of, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 9, 1994, Ser. No. 303,744
Claims priority, application Japan, Sep. 10, 1993, 5-250039; Jul. 28, 1994, 6-177333
Int. Cl.[6] G03G 21/00
U.S. Cl. 355—206 24 Claims




1. An image forming apparatus comprising:
a charger roller for charging said photoconductive element; and
a cleaner having a hardness higher than a predetermined hardness for removing a toner and other impurities deposited on a surface of said charge roller, wherein said cleaner comprises an abrasive paper.

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5,499,079

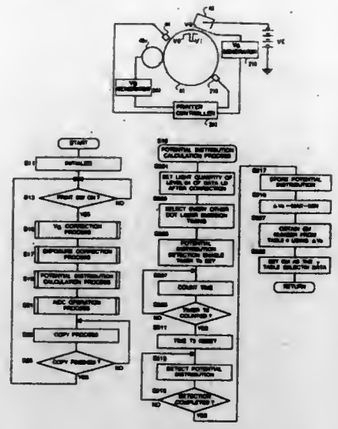
## IMAGE DENSITY CONTROL APPARATUS AND METHOD FOR CONTROLLING IMAGE DENSITY ON A PHOTOCONDUCTOR SURFACE

Takeru Kinoshita, and Takanobu Yamada, both of Toyokawa, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 9, 1993, Ser. No. 163,827
Claims priority, application Japan, Dec. 10, 1992, 4-353161; Nov. 26, 1993, 5-321067
Int. Cl.[6] G03G 15/02;21/00
U.S. Cl. 355—208 9 Claims

2. An image density control apparatus for controlling an image density on a photoconductor surface, comprising.
charging means for charging said photoconductor surface uniformly;
forming means, by a scanning of a laser beam from a laser source, for forming a standard latent image having an electric potential distribution on said photoconductor surface;
first detection means for detecting an electric potential distribution of said standard latent image;
developing means for developing a standard toner image from said standard latent image;
second detection means for detecting a density of said standard toner image; and
selection means for selecting a gradation correction table in accordance with the detected electric potential distribution and the detected density.






5,499,080

## IMAGE FORMING APPARATUS HAVING A VOLTAGE CONTROLLED CONTACT CHARGER

Tadashi Furuya; Junji Araya; Hideyuki Yano, all of Yokohama, and Harumi Kugoh, Kawasaki, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1993, Ser. No. 172,108
Claims priority, application Japan, Dec. 24, 1992, 4-359139
Int. Cl.[6] G03G 15/02
U.S. Cl. 355—208 27 Claims




1. A charging apparatus comprising:
a charging member for charging a member to be charged;
a power source for supplying electric power to said charging member;
means for supplying a constant small Dc current to said charging member; and
means for determining a voltage to be applied to said charging member;
wherein while the constant small DC current is supplied to said charging member, a voltage supplied to said charging member is detected and in response to said detected voltage, said voltage determining means determines the voltage to be applied to said charging member.

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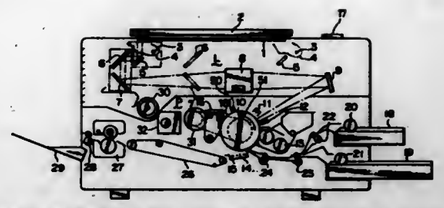
5,499,081

## HIGH SPEED IMAGE FORMING APPARATUS

Kazuhiro Mizude; Hideki Ishida; Hisahiro Kato, and Tomohiro Tsutano, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Aug. 23, 1994, Ser. No. 294,524
Claims priority, application Japan, Aug. 25, 1993, 5-210723
Int. Cl.[6] G03G 21/00;15/045
U.S. Cl. 355—208 8 Claims

1. An image forming apparatus comprising:
a photosensitive drum rotatable in a specified direction;




a photosensitive drum driver for rotating the photosensitive drum at either a first speed or a second speed faster than the first speed;
a charger for charging the photosensitive drum;
an image formation portion including:
a light image projector for projecting a light image onto a charged surface of the photosensitive drum to form an electrostatic latent image;
a developer for developing the electrostatic latent image into a toner image; and
a transfer for transferring the toner image onto copy paper;
a charge remover, disposed downstream of the charger, for removing residual charges on the photosensitive drum surface after the toner image is transferred;
a starter for instructing a start of an image forming operation; and
a controller responsive to the starter for,
upon the starter being turned on,
driving the charger and the charge remover to remove charges from the photosensitive drum charged by the charger,
controlling the photosensitive drum driver to rotate the photosensitive drum at the second speed, and
suspending the image formation portion; and
after the photosensitive drum completes an initial one turn,
driving the image formation portion together with the charger and the charge remover, and
controlling the photosensitive drum driver to rotate the photosensitive drum at the first speed.

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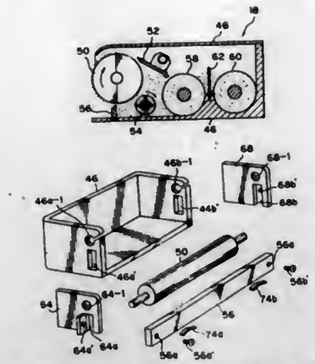
5,499,082

## DEVELOPING DEVICE USING TWO-COMPONENT TYPE DEVELOPER HAVING DOCTOR BLADE RESILIENTLY ABUTTED AGAINST OPENINGS IN VESSEL AND AN OUTLET PORTION IN VESSEL TO DISCHARGE THE DEVELOPER

Mamoru Watanabe, Kawasaki; Michihiro Fujii, Hyogo, and Nobuo Fujita, Kawasaki, all of, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 21, 1992, Ser. No. 994,281
Claims priority, application Japan, Dec. 20, 1991, 3-105143 U; Jan. 30, 1992, 4-014691; Apr. 7, 1992, 4-085165
Int. Cl.[6] G03G 15/06
U.S. Cl. 355—245 20 Claims

1. A developing device using a two-component developer, comprising:
vessel means for holding the two-component developer, said vessel means including two opposing side walls, each of which has a first opening and a second opening formed therein, said first and second openings arranged to establish a predetermined positional relationship therebetween;
magnetic roller means, rotatably provided within said vessel means and supported by inserting end portions of said magnetic roller means into the first openings in the two side walls of said vessel means, respectively, for entraining and bringing the two-component developer to a developing zone for a development of an electrostatic latent image;
doctor blade means, provided within said vessel means, for uniformly regulating an amount of the two-component developer entrained by said magnetic roller means, said doctor blade means having two end portions movably inserted into



the second openings in the two side walls of said vessel means, respectively; and

resilient means for resiliently abutting each of the end portions of said doctor blade means against an end edge of each of the second openings formed in the corresponding side wall of said vessel means, to position said doctor blade means at a predetermined and fixed clearance amount from said magnetic roller means based on said predetermined positional relationship, for a uniform regulation of an amount of the developer entrained by said magnetic roller means.

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**5,499,083**

## DEVELOPING METHOD USING A DEVELOPING AGENT CONVEYING SLEEVE OF A SMALL DIAMETER AND TONER FOR THE DEVELOPING AGENT USED THEREFOR

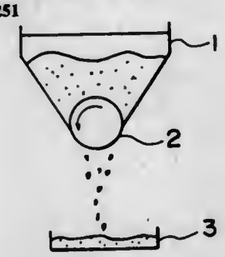
**Masahide Inoue; Mamoru Kato; Koichi Tsuyama; Koji Murata, and Yutaka Aso, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan**

**Filed Oct. 6, 1994, Ser. No. 319,250**

**Claims priority, application Japan, Jan. 8, 1993, 5-253314**

**Int. Cl.[6] G03G *15/00***

**U.S. Cl. 355—251** **6 Claims**



1. A developing method which uses a photosensitive drum of a small diameter, a developing agent conveying sleeve of a small diameter and a two component-type magnetic developing agent, wherein the developing agent conveying sleeve has a curvature ($mm^{-1}$) of from 0.2 to 0.05, and a toner in the two component-type magnetic developing agent is one that is obtained by externally adding magnetic fine particles having a saturation magnetization of not smaller than 70 emu/g and hydrophobic fine silica particles to fixing resin particles that contain at least a coloring agent.

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**5,499,084**

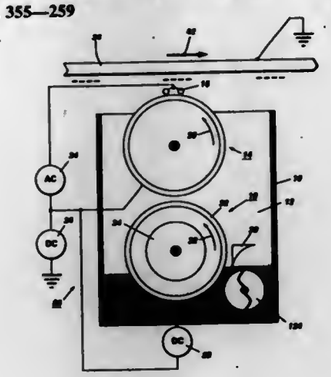
## DEVELOPMENT SYSTEM FOR USE IN A COLOR PRINTER

**Jeffrey J. Folkins; Daniel M. Bray, both of Rochester, and Alexander J. Fioravanti, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Mar. 14, 1994, Ser. No. 212,531**

**Int. Cl.[6] G03G *15/08;15/01***

**U.S. Cl. 355—259** **10 Claims**



1. An apparatus for developing a latent image comprising:

a donor member adapted to transport toner;

an electrode;

means for electrically biasing said donor member;

means for electrically biasing said electrode to detach toner particles from said donor member to develop the latent image;

a controller, associated with said donor biasing means and said electrode biasing means to said set electrode biasing means to an electrode development voltage and said donor biasing means to a donor development voltage in a development mode, and to set said electrode biasing means to an electrode non-development voltage and said donor biasing means to a donor non-development voltage in a non-development mode;

a transport member adapted to advance toners to said donor member; and

means for electrically biasing said transport member, said controller being associated with said transport biasing means to set said transport biasing means at a transport development voltage in the development mode and to set said transport biasing means to a transport non-development voltage in the non-development mode so as to attract toner from said transport member to said donor member in the development mode and to attract toner from said donor to said transport member in the non-development mode, said controller adjusts the difference between the donor development voltage and the transport development voltage to a first voltage and the difference between the donor non-development voltage and the transport non-development voltage to a second voltage, said controller sets the first voltage and the second voltage to be substantially equal to one another.



**5,499,085**

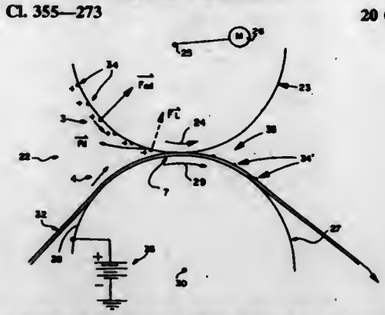
## TRAILING EDGE DUST CONTROL

**Orrin D. Christy, North Tonawanda; Kevin J. Hook, Grand Island; David Hargreaves, North Tonawanda; Mark E. Ruchalski, West Seneca, and Michael D. Akins, North Tonawanda, all of N.Y., assignors to Moore Business Forms, Inc., Grand Island, N.Y.**

**Filed Jun. 6, 1995, Ser. No. 470,707**

**Int. Cl.[6] G03G *15/09***

**U.S. Cl. 355—273** **20 Claims**



1. A method of transferring charged toner from an image member to a web of imagable material using a conductive impression cylinder, comprising the steps of:

(a) applying toner having a first polarity to the image member;

(b) moving the web of imagable material by contact with the conductive impression cylinder into contact with the image member so that toner transfers from the image member to the web; and

(c) substantially preventing toner back scatter by applying an electrical bias of said first polarity to the impression cylinder so as to impose an electric force field on the toner particles of sufficient intensity to overcome aerodynamic drag forces which would separate the particles from image areas between the impression cylinder and image member.

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**5,499,086**

## BELT TYPE TRANSFER DEVICE FOR ELECTROPHOTOGRAPHIC APPARATUS

**Junichi Matsuno, Toride; Shigeru Obata, Ishioka; Yasuo Takuma, Hitachi; Masato Miwa, and Kazuo Uno, both of Katsuta, all of, Japan, assignors to Hitachi, Ltd., and Hitachi Koki Co., Ltd., both of Tokyo, Japan**

**Filed Jul. 13, 1993, Ser. No. 91,181**

**Claims priority, application Japan, Jul. 17, 1992, 4-190469; Jan. 5, 1992, 4-265772**

**Int. Cl.[6] G03G *15/16***

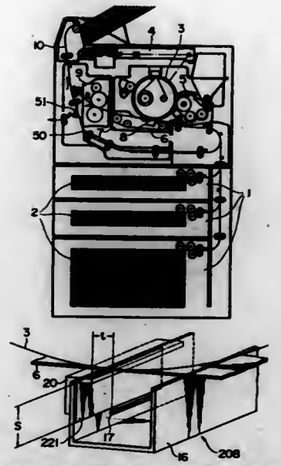
**U.S. Cl. 355—274** **22 Claims**

8. A belt-type transfer device for an electrophotographic apparatus in which a toner image is formed on a photosensitive body and is electrostatically transferred and adhered to a recording medium, the device comprising:

an endless belt formed of an elastic material having a high electric resistance;

means for driving said endless belt for rotation, said endless belt being moved in contact with the photosensitive body over a certain distance;

means for electrically charging said endless belt in a region of contact between said belt and the photosensitive body, said belt electrostatically attracting the recording medium, due to an electric charge by said means for electrically charging, carrying the recording medium to said region of contact, and transferring the toner image on the photosensitive body to the recording medium; and



means for reducing the electric charge by said means for electrically charging in the vicinity of a terminal end of said region of contact, and

wherein said electrical charge reducing means comprises a position where said means for electrically charging is provided, and said position is set to be near an inlet of said region of contact with respect to a center of said region of contact between the photosensitive body and said endless belt in a stationary state.

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**5,499,087**

## HEAT FIXING DEVICE AND ELECTROPHOTOGRAPHIC APPARATUS INCORPORATING THE SAME HAVING A PTC HEATING ELEMENT RECEIVED IN A RECESS OF A HOLDER

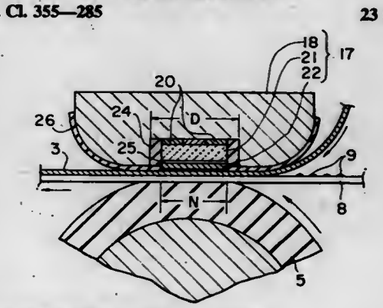
**Chikara Hiraoka, Ibaraki; Junichi Matsuno, Toride; Masao Mitani, Mito; Hiroshi Oda, Ube, and Toshikazu Tsumura, Kure, all of, Japan, assignors to Hitachi, Ltd., Tokyo; Ube Industries, Ltd., Ube, and Hitachi Koki Co., Ltd., Tokyo, all of, Japan**

**Continuation-in-part of Ser. No. 870,297, Apr. 17, 1992, Pat. No. 5,351,114. This application May 7, 1993, Ser. No. 57,637**

**Claims priority, application Japan, Apr. 22, 1991, 3-090552; Jun. 26, 1991, 3-154350; May 11, 1992, 4-117167**

**Int. Cl.[6] G03G *15/20***

**U.S. Cl. 355—285** **23 Claims**



1. A heating fixing device, comprising:

an endless heat resistant belt;

a driving roller for rotating said heat resistant belt; and

a holder contactable with said heat resistant belt and having a recess; and

a PTC heating element having a positive temperature coefficient characteristic and received in the recess in said holder with an elastic member interposed therebetween.

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**5,499,088**

## COLOR TONER IMAGE FIXING APPARATUS HAVING A BACK-UP MEMBER, HEATER AND FILM WITH A DEFORMABLE SURFACE LAYER

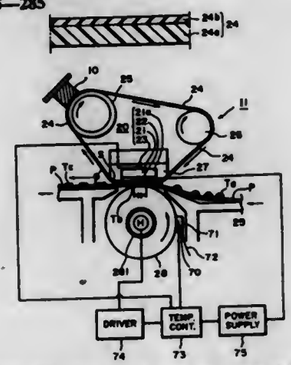
**Takeshi Menjo, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 824,585, Jan. 23, 1992, abandoned. This application Sep. 13, 1994, Ser. No. 305,803**

**Claims priority, application Japan, Jan. 25, 1991, 3-025401; May 7, 1991, 3-101380**

**Int. Cl.[6] G03G *15/20***

**U.S. Cl. 355—285** **18 Claims**




1. A heating and color-mixing apparatus, comprising:

a heater;

a film disposed adjacent to said heater and slidably movable relative thereto together with a recording material supporting a multi-layer unfixed toner image; and

a pressing member cooperative with said film to form a nip therebetween;

wherein the recording material is passed through the nip with said toner image contacted to said film, so that different color toners of the toner image are mixed by heat from said heater and pressure applied by the nip,

wherein a sliding surface of said film is formed of a layer of heat resistive resin,

wherein at least a recording material side of said film is composed of a layer of silicone rubber, and

wherein said silicone rubber layer is thinner than said heat resistive resin layer.

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**5,499,089**

## TONER IMAGE FIXING DEVICE WITH DEFORMABLE CYLINDER

**Kimihide Tsukamoto, Yamatokooriyama, and Masaru Tsuji, Nara, both of, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Sep. 28, 1994, Ser. No. 314,245**

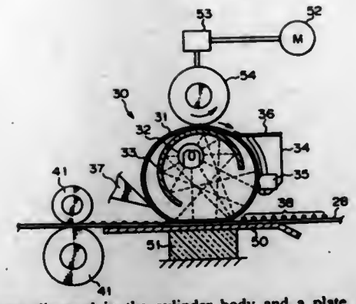
**Claims priority, application Japan, Nov. 19, 1993, 5-290272**

**Int. Cl.[6] G03G *15/20***

**U.S. Cl. 355—290** **8 Claims**

1. A toner image fixing device for fixing, by heating, a toner image developed on a sheet of recording paper, comprising

a rotatable cylinder body made of heat-resistant and heat-conducting material, which has a wall elastically deformable in radial direction to form a nip having a width necessary for fixing the toner image on the recording paper;




a heater disposed in the cylinder body and a plate, partially surrounding the heater, which has a first surface, which reflects heat from the heater toward the cylinder body, and a second surface which provides support to the cylinder body; and

a paper guiding member, abutting on an external cylindrical surface of the cylinder body, to elastically deform said cylinder body in radial direction to form said nip between the paper guiding member and the cylinder body and to support a reverse side of the recording paper bearing, on its upper side, the toner image.

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**5,499,090**

## IMAGE FORMING APPARATUS HAVING A TONER RECYCLING MECHANISM

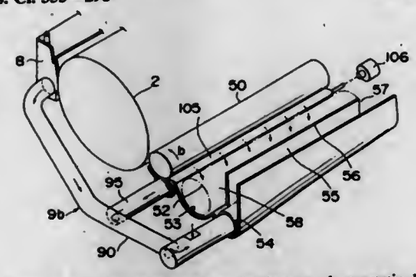
**Noboru Ito, Kawanishi; Hiroshi Murasaki, Ibaraki; Hirokazu Yoshida, Ashiya, and Fumio Masuda, Sakai, all of, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan**

**Filed Jun. 10, 1993, Ser. No. 74,451**

**Claims priority, application Japan, Jun. 15, 1992, 4-154782; Dec. 7, 1992, 4-326740; Jan. 12, 1993, 5-003220; Apr. 19, 1993, 5-091182**

**Int. Cl.[6] G03G *21/00***

**U.S. Cl. 355—298** **24 Claims**




2. An image forming apparatus having an electrostatic latent image support member rotatably mounted therein comprising:

a developing unit accommodating developer for developing an electrostatic latent image formed on a surface of the electrostatic latent image support member;

a cleaning unit for recovering developer remaining on the surface of the electrostatic latent image support member after development;

a developer conveyor unit, connected to said developing unit and to said cleaning unit, for conveying the developer recovered by said cleaning unit to said developing unit, said developer conveyor unit including a conveyor pipe and a coil rotatably mounted therein; and

a developer supply means, connected to said developer conveyor unit and to said developing unit, for supplying the developer from said developing unit to the recovered developer which is on the way to be conveyed to the developing unit.



**5,499,091**

## IMAGE FORMING APPARATUS HAVING A COUNTING DEVICE TO FACILITATE TWO-SIDED COPYING

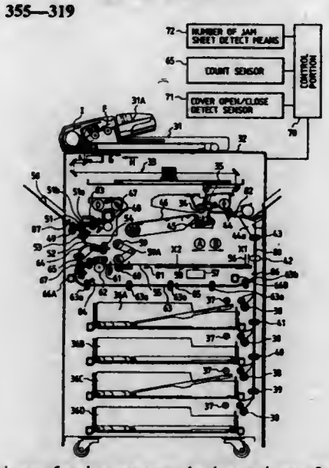
**Akihiro Kasiwabara, Tokyo, and Mitsuhiro Mukasa, Kawasaki, both of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Apr. 15, 1994, Ser. No. 228,399**

**Claims priority, application Japan, Apr. 19, 1993, 5-115391**

**Int. Cl.[6] G03G *21/00***

**U.S. Cl. 355—319** **33 Claims**




1. An image forming apparatus having an image forming portion, said image forming apparatus comprising:

an intermediate tray for containing sheets on which image formation has been effected, for another image formation, the sheets then being re-fed to the image forming portion to thereby effect plural times of image formation on the sheets; and

counting means for counting the sheets contained in said intermediate tray, said counting means comprising a circulation path for returning the sheets fed out from said intermediate tray to said intermediate tray without passing the sheets through the image forming portion, and a counter for counting the sheets passing through said circulation path.

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**5,499,092**

## METHOD AND A COLOR IMAGE FORMING APPARATUS FORMING A POSITIONING MARK

**Eiichi Sasaki, Sagamihara, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan**

**Filed Mar. 29, 1994, Ser. No. 219,352**

**Claims priority, application Japan, Apr. 5, 1993, 5-077956**

**Int. Cl.[6] G03G *15/01***

**U.S. Cl. 355—326 R** **9 Claims**

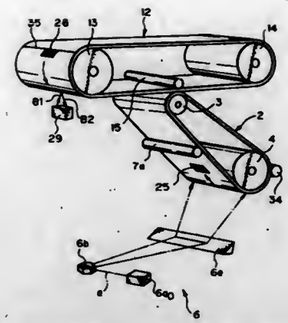
1. A color image forming apparatus comprising:

a photoconductive element;

latent image forming means for selectively forming on said photoconductive element latent images respectively corresponding to images of particular colors and a position mark latent image representative of position information;

a developing unit developing said latent images with developers of respective colors to thereby produce corresponding color images, and developing said position mark latent image to thereby produce a position mark;

an intermediate transfer belt for causing the color images to be transferred thereto one above another and then transferred therefrom to a recording medium, and causing said position mark to be transferred thereto to form a position information portion;



a position information detecting unit generating a detection signal on detecting said position information portion formed on said intermediate transfer belt; and

starting means for starting the operation of the latent image forming means for forming a latent image on said photoconductive element in response to said detection signal fed from said position information detecting unit.

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**5,499,093**

## ELECTROSTATOGRAPHIC SINGLE-PASS MULTIPLE STATION PRINTER WITH REGISTER CONTROL

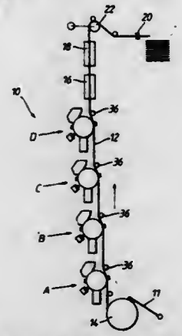
**Ronny J. V. Aerens, Belsele; Etienne M. De Cock; Lucien A. De Schamphelaere, both of Edegem; Peter A. R. Steylaerts, Lier, and Erik G. G. Van Weverberg, Mortsel, all of, Belgium, assignors to Xeikon NV, Mortsel, Belgium**

**Filed Jun. 8, 1994, Ser. No. 257,111**

**Claims priority, application European Pat. Off., Jun. 18, 1993, 93304773**

**Int. Cl.[6] G03G *15/00***

**U.S. Cl. 355—326 R** **17 Claims**



1. An electrostatographic single-pass multiple station printer for forming an image onto a web, which comprises:

(i) a plurality of toner image-printing electrostatographic stations each having

(ia) rotatable endless surface means onto which a toner image can be formed;

(ib) means for line-wise forming an electrostatic toner image on each said rotatable endless surface means with a predetermined line distance; and

(ic) means for transferring said electrostatic toner image onto a web;

(ii) means for conveying said web along a web path in succession past said stations in synchronism with said rotatable endless surface means; and

(iii) register control means for controlling operation of each of said stations in timed relationship thereby to obtain correct

registering of the electrostatic toner image on said web; wherein said register control means comprises

(iiia) encoder means driven by rotation of said endless surface means at one of said toner image-printing electrostatographic stations for producing pulses indicative of web displacement, and

(iiib) delay means for initiating the operation of subsequent image-printing stations after a predetermined web displacement, as measured by said encoder means, has occurred, wherein said encoder means comprises an encoder sensor and electronic multiplier means for multiplying pulse frequency by a whole number factor, such that the web displacement that generates a single pulse at an output of said electronic multiplier means is smaller than the line distance.

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**5,499,094**

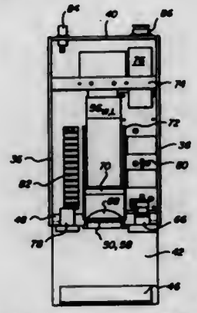
## APPARATUS AND METHOD FOR MEASURING THE LENGTH AND WIDTH OF A SPOT OF LIGHT UTILIZING TWO DIFFERENT MASKS

**Stephen A. Swierczek, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Dec. 21, 1994, Ser. No. 361,090**

**Int. Cl.[6] G01J *1/00;1/42;* G01N *21/84***

**U.S. Cl. 356—121** **14 Claims**



1. Apparatus for real time measurement of length and width of a spot of light, comprising:

a first mask having a plurality of transparent slits, each slit having a slit length at least as long as an expected maximum spot length, the slits having widths increasing incrementally from a fraction of an expected maximum spot width to at least the expected maximum spot width, and adjacent slits being spaced sufficiently to minimize illumination of more than one slit at a time;

a second mask having a plurality of transparent windows having lengths a fraction of an expected maximum spot length and widths sufficient to provide a window for transmitting a measurable pulse of light, the windows being positioned along a line and adjacent windows being spaced sufficiently to minimize illumination of more than one window at a time;

a member supporting the first and second masks transverse to a path of relative movement between the spot and the masks, with the slits transverse to the path and the line of windows arranged at an angle to the path to provide, transverse to the path, a center-to center window spacing of a fraction of the expected spot length;

at least one photodetector for detecting pulses of light passing through the slits and producing first signals whose amplitudes are proportional to the power of the pulses of light and for detecting pulses of light passing through the windows and producing second signals whose amplitudes are proportional to an irradiance of the pulses of light;

a first comparator for determining if the amplitude of each first signal exceeds a predetermined value and producing a first digital pulse signal;

a first counter for counting the first digital pulse signals as a measure of spot width;

a second comparator for determining if the amplitude of each second signal exceeds a predetermined value and producing a second digital pulse signal; and

a second counter for counting the second digital pulse signals as a measure of spot length.

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**5,499,095**

## FOURIER SPECTROMETER WITH EXCHANGEABLE ENTRANCE AND EXIT PORTS ALLOWING FOR BOTH INTERNAL AND EXTERNAL RADIATION SOURCES

**Jürgen Gast, Rheinstetten, and Arno Simon, Karlsruhe, both of, Germany, assignors to Bruker Analytische MeBtechnik GmbH, Germany**

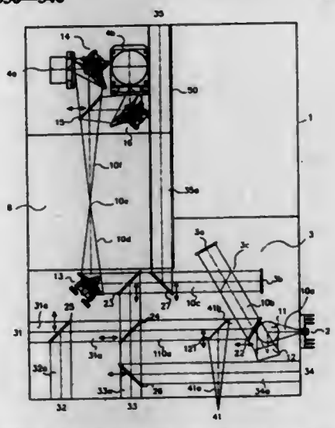
**Continuation of Ser. No. 130,015, Sep. 30, 1993, abandoned.**

**This application Mar. 27, 1995, Ser. No. 410,934**

**Claims priority, application Germany, Jan. 2, 1992, 42 33 192.7**

**Int. Cl.[6] G01B *9/02;* G01N *21/01***

**U.S. Cl. 356—346** **17 Claims**



1. An optical Fourier transform spectrometer comprising:

a spectrometer housing having an exit;

an internal radiation source disposed within the housing and producing an internal radiation beam;

an interferometer disposed within the housing;

an external radiation source disposed outside of the housing and producing an external radiation beam;

detector means disposed within the housing; and

optical guiding means comprising stationary optical elements and movable optical elements, the movable optical elements having a first and a second position to effect an optical path reversal in the Fourier transform spectrometer, the movable optical elements, in the first position, guiding the internal radiation along a first optical path from the internal radiation source, through the interferometer, and through the exit out of the housing, the movable optical elements, in the second position, guiding the external radiation beam from the external radiation source through the exit into the housing, through the interferometer, and onto the detector means, wherein the first and second optical paths are reversed relative to each other along an optical path segment.



**5,499,096**

## OPTICAL INSTRUMENT AND MEASUREMENT FOR MEASURING DISPLACEMENT OF SCALE USING DIFFERENT ORDER DIFFRACTION OF A DIFFRACTION GRATING

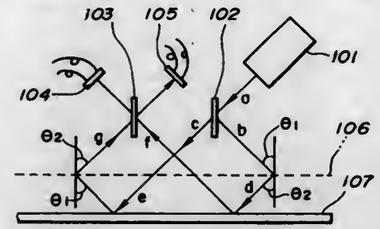
**Hideaki Tamiya, Yamato, Japan, assignor to Sony Magnescale Inc., Tokyo, Japan**

**Filed Apr. 13, 1994, Ser. No. 227,128**

**Claims priority, application Japan, Apr. 13, 1993, 5-086362**

**Int. Cl.[6] G01B *9/02***

**U.S. Cl. 356—356** **13 Claims**



1. An instrument for optically measuring a displacement of a scale, comprising:

a) a coherent light source;

b) a transmission type diffraction grating satisfying a bragg diffraction condition;

c) first beam splitting means for receiving a light flux radiated from the light source, for transmitting a part of said light flux as a first light flux, and for reflecting the remaining part of said light flux as a second light flux, said first beam splitting means being arranged such that the first and second light fluxes are incident on said diffraction grating through approximately equal angles in their absolute values;

d) light reflecting means arranged such that both the first and second light fluxes transmitted through the diffraction grating are again incident on the diffraction grating, said light reflecting means and said diffraction grating comprising the scale;

e) second beam splitting means, arranged in a vicinity of a point at which the first and second light fluxes intersect, for combining the first and second light fluxes; and

f) photo-electric transducing means for detecting an interference state of both the first and second light fluxes combined by said second beam splitting means and outputting a signal indicative of the interference state,

wherein,

both the first and second light fluxes pass through the diffraction grating a first and second time from a time when the light flux radiated from said coherent light source is split by the first splitting means to a time when the first and second light fluxes are combined by said second beam splitting means,

light paths of the first and second light fluxes are such that one of the first and second light fluxes is transmitted through the diffraction grating the first time it passes through the diffraction grating and is diffracted through the diffraction grating in an m order (m denotes an integer of 1 or larger) the second time it passes through the diffraction grating while the other of the first and second light fluxes is diffracted through the diffraction grating in the m order the first time it passes through the diffraction grating and is transmitted through the diffraction grating the second time it passes through the diffraction grating,

the light paths through which the first and second light fluxes have passed are approximately equal in length,

a relationship between a grating pitch p of the diffraction grating, a wavelength $\lambda$ of the coherent light, and each incident angle of the coherent light on the diffraction grating is established as $2p \sin\theta = n\lambda$ (n denotes an integer),

the first and second light fluxes do not intersect on the diffraction grating, and

light fluxes are incident on and reflected by the light reflecting means along independent light paths.

**5,499,097**

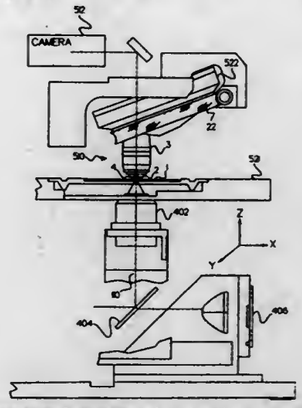
## METHOD AND APPARATUS FOR CHECKING AUTOMATED OPTICAL SYSTEM PERFORMANCE REPEATABILITY

**William E. Ortyn, Devall, and Joseph Arnone, Bainbridge Island, both of Wash., assignors to NeoPath, Inc., Redmond, Wash.**

**Filed Sep. 19, 1994, Ser. No. 308,140**

**Int. Cl.[6] G01B *11/00;11/14***

**U.S. Cl. 356—372** **17 Claims**



13. An automated apparatus for checking stage performance repeatability in an automated optical system having an automated microscope positioned to view an object on a stage along an optical path, where the optical path includes an optical axis therethrough, the automated apparatus comprising:

a) a lens having a first magnification characteristic;

b) a calibration plate inserted into the optical path, where the calibration plate includes a fiducial having a fiducial center, wherein the fiducial is located and centered in a field of view;

c) means, coupled to the stage, for grossly positioning the stage in a vicinity of the fiducial;

d) means, coupled to the automated microscope, for performing a focus pan;

e) means, coupled to the stage, for determining a location of a center of the fiducial with respect to an optical axis;

f) means, coupled to the stage, for translating the stage in an X, Y plane so as to center the fiducial in the field of view, where the X, Y plane is defined by a top surface of the stage;

g) means, coupled to the stage, for recording the location of the fiducial center; and

h) means, coupled to the stage, for incrementally moving the stage in a star pattern so as to repeatedly move the fiducial out of the optical axis and then back into line with the optical axis for a predetermined number of repetitions, where each time the stage returns the fiducial to an original position, an image of the fiducial is captured and processed so as to determine a lateral position of a fiducial center in the X,Y plane with respect to the optical axis.

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**5,499,098**

## OPTICAL POSITION DETECTING UNIT AND OPTICAL COORDINATE INPUT UNIT UTILIZING A SUB-PORTION OF A M-SEQUENCE PATTERN

**Yasuji Ogawa, Saitama, Japan, assignor to Wacom Co., Ltd., Saitama, Japan**

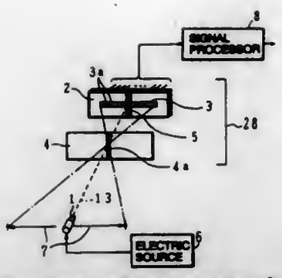
**Filed Mar. 22, 1994, Ser. No. 215,761**

**Claims priority, application Japan, Mar. 23, 1993, 5-087940**

**Int. Cl.[6] G01B *11/14;* H01J *40/14***

**U.S. Cl. 356—375** **24 Claims**

1. An optical position detecting unit comprising:




a light-receiving means including a pixel array forming a light-receiving region for outputting signals through pixels of said pixel array which detect light;

a pattern member disposed in front of said pixel array having a pattern with a specific characteristic such that an arbitrary sub-portion of said pattern contains a digital code indicating coordinate information concerning a position of the arbitrary sub-portion in said pattern, wherein when a sub-portion of said pattern is projected onto said light-receiving region by an incident light beam, direction of incidence of said light can be determined by a use of the digital codes contained in an image of said sub-portion formed on said light-receiving region; and

a signal processing means for processing the signals outputted from the pixels and thereby extracting information concerning the direction of incidence of said light beam, the processing of the signals including a process of extracting bits forming said digital code contained in the image of said sub-portion from the signals outputted from the pixels.

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**5,499,099**

**ALIGNMENT METHOD AND ALIGNMENT SYSTEM**

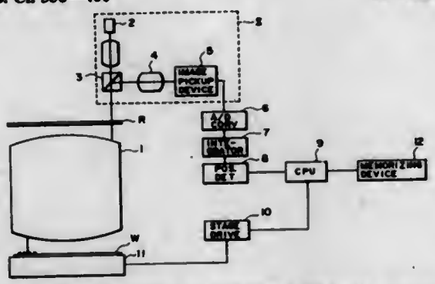
**Makoto Sato, Tokyo, and Shigeyuki Uzawa, Utsunomiya, both of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Feb. 25, 1994, Ser. No. 202,064**

**Claims priority, application Japan, Feb. 25, 1993, 5-059330**

**Int. Cl.[6] G01B *11/00***

**U.S. Cl. 356—400** **20 Claims**




1. An alignment method for sequentially supplying substrates, each having zones, to be aligned, and being disposed in accordance with a predetermined array, and for aligning the zones in each substrate with a predetermined reference position sequentially, said method comprising:

a first step for measuring in sequence deviations in the positions of zones of a first substrate with respect to positions determined in accordance with the predetermined array, and for detecting the actual array of the zones through the measurement;

a second step for determining, in terms of a predetermined transformation parameter, the relationship between the predetermined array and the actual array detected in said first step, and for determining a transformation parameter for the first substrate effective to minimize an error between the predetermined array and the detected actual array;

a third step for detecting and storing the error between the actual array and an array determined in accordance with the transformation parameter of the first substrate; and

a fourth step for aligning, with respect to the predetermined reference position, a second substrate having zones of substantially the same array as the first substrate, by using the stored error as an alignment correction value.

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**5,499,100**

**PHOTO-LITHOGRAPHY APPARATUS AND METHOD OF CORRECTING OFF-TELECENTRICITY OF THE APPARATUS CAUSED BY SHIFT OF EFFECTIVE ILLUMINATION SOURCE**

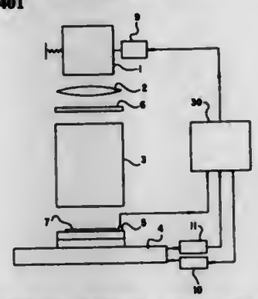
**Hiroyuki Tanaka, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan**

**Filed Nov. 30, 1994, Ser. No. 350,172**

**Claims priority, application Japan, Mar. 15, 1994, 6-043566**

**Int. Cl.[6] G01B *11/00***

**U.S. Cl. 356—401** **13 Claims**



1. A photo-lithography apparatus comprising an effective illumination source, a condenser lens, a reticle, a projection lens, and an XYZ stage, these elements being aligned in a Z axis-direction in an XYZ-axes orthogonal coordinate system, wherein a reduced image of pattern on the reticle is formed on a substrate disposed on the XYZ stage, and wherein the effective illumination source comprises an aperture stop which is mechanically changeable depending on an illumination mode, said apparatus further comprising:

photo-detector disposed on said XYZ stage for detecting a specific pattern in said image, the photo-detector being movable in X, Y, and Z axis-directions by a drive mechanism of the XYZ stage,

means for moving said effective illumination source in X, Y, and Z axis-directions, and

detecting/outputting means for detecting an off-telecentricity amount of said photo-lithography apparatus and outputting adjustment data to said means for moving the effective illumination source, said detecting/outputting means being coupled with said photo-detector, said XYZ stage through said drive mechanism and an interference meter, and said means for moving the effective illumination source, thereby misalignment of said effective illumination source causing said off-telecentricity being corrected.

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**5,499,101**

**IMAGE FORMING APPARATUS WHICH AVOIDS COPYING INSIGNIFICANT INFORMATION**

**Yoshio Watanabe, Hiratsuka, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Feb. 25, 1993, Ser. No. 22,088**

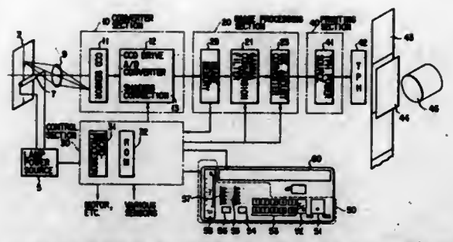
**Claims priority, application Japan, Mar. 4, 1992, 4-047220**

**Int. Cl.[6] H04N *1/387;1/38;* G03G *21/00;* G06K *9/00***

**U.S. Cl. 358—296** **8 Claims**

1. An image forming apparatus, comprising:





means for scanning an original document in a document scanning direction to output a plurality of image signals, said image signals corresponding to a plurality of portions of the original document and representing image density levels at said portions, respectively;

means for forming an image on a medium on the basis of the image signals received from the scanning means;

means for computing a variation rate E of the image signals from the scanning means, said variation rate E being a variation rate of the image density levels represented by the image signals obtained by subtracting image density level values of nearby pixels from one another;

means for determining that an image forming operation should be interrupted when the variation rate E computed by the computing means is lower than a threshold value T, said threshold value T being a reference value used for determining whether or not the original has an image thereon; and

means for informing an operator of a determination made by the determining means.

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**5,499,102**

**DISPLAY DEVICE FOR VIDEOCASSETTE RECORDER RECORDING RESERVATIONS**

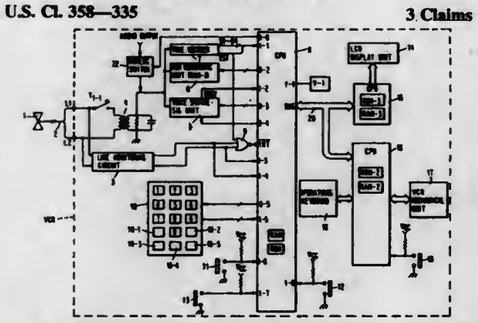
**Kazuo Hashimoto, Tokyo, Japan, assignor to Hashimoto Corporation, Tokyo, Japan**

**Filed Jul. 23, 1993, Ser. No. 95,441**

**Claims priority, application Japan, Jul. 27, 1992, 4-218716**

**Int. Cl.[6] H04N *5/76***

**U.S. Cl. 358—335** **3 Claims**



1. A display device for videocassette recorder recording TV program reservation data comprising:

means for storing reservation data in memory of a videocassette recorder;

means for storing in said memory a recording sequence number with corresponding reservation data when said videocassette recorder is operated in recording mode based on said reservation data;

means for copying said reservation data from said memory to a videotape in said recording mode;

means for playing back copied reservation data when a TV program already recorded on the said videotape is played back;

means for decrementing said recording sequence number of corresponding reservation data in said memory based on said copied reservation data from said video tape; and

means for displaying said reservation data and the current value of said recording sequence number which are stored in said memory.

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**5,499,103**

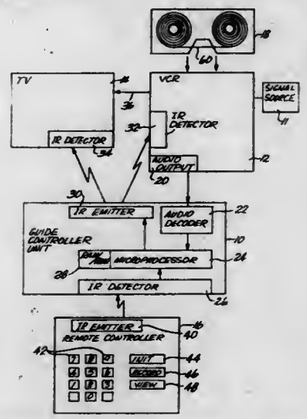
**APPARATUS FOR AN ELECTRONIC GUIDE WITH VIDEO CLIPS**

**Roy J. Mankovitz, Encino, Calif., assignor to E Guide, Inc., Beverly Hills, Calif.**

**Filed Oct. 20, 1993, Ser. No. 139,590**

**Int. Cl.[6] H04N *5/76;5/91;5/78;* G11B *5/02***

**U.S. Cl. 358—335** **10 Claims**




1. An apparatus for an electronic guide with video clips, the apparatus comprising:

a video cassette recorder having an audio output;

means for decoding audio signals on the audio output;

means for commanding the video cassette recorder to freeze a video frame in response to the decoded audio signals; and

means for displaying the video frame coupled to the video cassette recorder.

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**5,499,104**

**APPARATUS FOR RECORDING A VIDEO SIGNAL AND STEREOPHONIC AUDIO SIGNALS**

**Hidenori Hoshi, Yokohama, and Yasuyuki Tanaka, Tokyo, both of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 798,945, Nov. 27, 1991, abandoned.**

**This application Jun. 16, 1993, Ser. No. 77,406**

**Claims priority, application Japan, Nov. 29, 1990, 2-326019**

**Int. Cl.[6] H04N *5/76;5/91;* G11B *5/02***

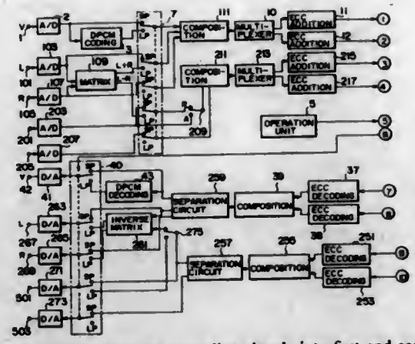
**U.S. Cl. 358—341** **34 Claims**

1. A signal recording apparatus comprising:

(a) video input means for inputting a video signal;

(b) audio input means for inputting a right signal and a left signal of a stereophonic audio signal, a sum signal of said right and left signals, and a difference signal of said right and left signals;

(c) video signal processing means, including compressing means for compressing an information amount of the input video signal, for receiving the input video signal and selectively outputting one of a first video signal having an information amount compressed by said compressing means and a second video signal having an information amount greater than that of the first video signal;



(d) recording means for recording signals into first and second areas on a recording medium; and

(e) mode switching means for switching a mode of said apparatus among a plurality of modes,

wherein said plurality of modes includes

a first mode in which the recording means records the first video signal and the sum signal into the first area and records the difference signal into the second area, and

a second mode in which the recording means records the second video signal and the right and left signals into the first area.

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**5,499,105**

**MAXIMIZING THE QUALITY OF A SIGNAL REPRODUCED FROM A RECORDING DISK**

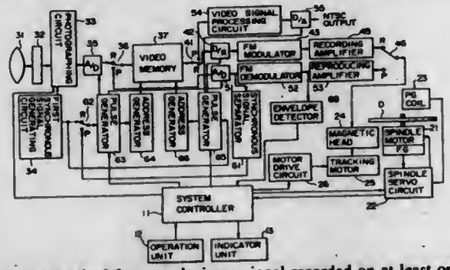
**Yoshio Wakui, Saitama, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 996,004, Dec. 23, 1992, abandoned. This application Aug. 19, 1994, Ser. No. 293,196**

**Claims priority, application Japan, Dec. 24, 1991, 3-361253**

**Int. Cl.[6] H04N *5/781*; G11B *5/596*;*7/00***

**U.S. Cl. 358—342** **20 Claims**



14. A method for reproducing a signal recorded on at least one track of a plurality of tracks of a storage medium, comprising the steps of:

(a) positioning a head member at a predetermined track of the storage medium containing the recorded signal, the head member being positioned so as to maximize an envelope of at least a portion of the recorded signal to enable at least the portion of the recorded signal to be reproduced;

(b) storing the reproduced recorded signal in a memory;

(c) comparing an amplitude of the envelope with a threshold value to determine which portions of the recorded signal should be re-read; and

(d) repeating steps (a) to (c) for remaining portions of the recorded signal for which envelopes are not maximized, portions of the reproduced recorded signal stored in the memory being replaced with new portions in which the envelope is maximized, until an envelope for all portions of the reproduced recorded signal are maximized.

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**5,499,106**

**DIGITAL SIGNAL RECORDING METHOD AND DIGITAL VIDEO TAPE RECORDER**

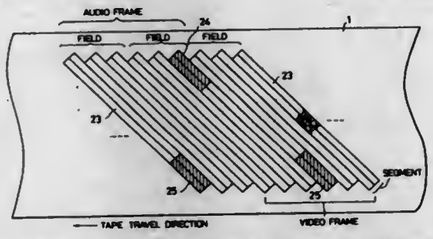
**Yukari Arano, and Ken Onishi, both of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Division of Ser. No. 972,730, Nov. 6, 1992, Pat. No. 5,355,229, which is a continuation of Ser. No. 362,243, Jun. 6, 1989, abandoned. This application Apr. 4, 1994, Ser. No. 222,610**

**Claims priority, application Japan, Jun. 7, 1988, 63-139811; Jun. 10, 1988, 63-144464; Jul. 19, 1988, 63-179889**

**Int. Cl.[6] H04N *5/782*;*5/928***

**U.S. Cl. 358—343** **43 Claims**



1. A method of digitally recording audio and video information on a tape, comprising the steps of:

(a) recording the video information as video signals on track across the tape, individual video images being stored in video frames, each video frame having a first number of tracks, the first number being more than one; and

(b) recording the audio information as audio signals on a second number of tracks making up the video frame, the second number being less than the first number, the audio signal being recorded on only a portion of each track;

the tracks including a first group of tracks, each track of said first group of tracks having the audio information recorded thereon, and a second group of tracks, each track of said second group of tracks having only video information recorded thereon; and

each of said second group of tracks each having at least a portion of the video information recorded at a location positionally corresponding to a position of said audio information recorded on said first group of tracks.

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**5,499,107**

**LASER BEAM OPTICAL SCANNING SYSTEM**

**Muneo Kuroda, Toyohashi, Japan, assignor to Minolta Co., Ltd., Osaka, Japan**

**Filed Apr. 29, 1992, Ser. No. 875,688**

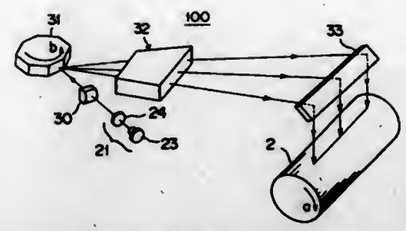
**Claims priority, application Japan, Apr. 30, 1991, 3-097816; Dec. 13, 1991, 3-330949**

**Int. Cl.[6] H04N *5/84***

**U.S. Cl. 358—347** **25 Claims**

1. A laser beam optical scanning system which deflects a laser beam modulated in accordance with image data by using a deflector to scan the laser beam on a scanning surface, the laser beam optical scanning system comprising:





a laser source unit which converges a laser beam to emit a substantially parallel pencil of rays, the laser source unit changing the convergence of the laser beam in accordance with a change in temperature;

first imaging means for imaging the laser beam emitted from the laser source unit on a reflective facet of the deflector in a linear form extending in a plane of deflection to be made by the deflector;

second imaging means for imaging the laser beam deflected by the deflector on the scanning surface; and

a resin lens which is provided in the first and/or the second imaging means, the refracting power of the resin lens changing according to a change in temperature so as to offset the change in the converging performance of the laser unit, wherein the resin lens meets a condition indicated by an expression

$$f_s/f_1 > 1.8$$

in which, $f_1$ denotes a focal length of the resin lens in respect to a direction parallel to the plane of deflection; and

$f_s$ denotes a focal length of the second imaging means in respect to a direction parallel to the plane of deflection.

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**5,499,108**

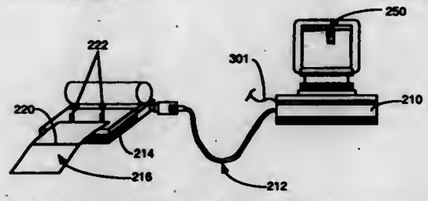
**DOCUMENT-DRIVEN SCANNING INPUT DEVICE COMMUNICATING WITH A COMPUTER**

**Pierre Cotte, Paris, France, and Ronald C. Fish, Morgan Hill, Calif., assignors to Visioneer Communications, Inc., Palo Alto, Calif.**

**Continuation-in-part of Ser. No. 922,169, Jul. 29, 1992. This application Dec. 9, 1992, Ser. No. 988,404**

**Int. Cl.[6] H04N *1/00*; G05B *13/02***

**U.S. Cl. 358—400** **50 Claims**



1. A system comprising a document-driven scanning input device communicating with a computer,

said input device comprising

scanning means for generating image data representing the image of a document, and

means, responsive to placement of a document by a user, for drawing the document into scanning relationship with said scanning means so that said scanning means generates image data representing the image of said document, wherein said placement alone is sufficient to initiate said drawing, and said computer comprising

means for displaying, in response to said placement, a plurality of user-selectable options for processing said image data.

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**5,499,109**

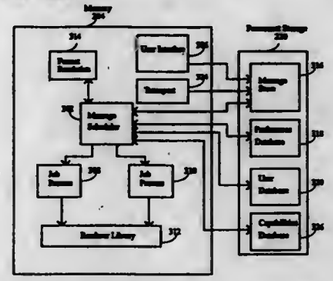
**SYSTEM FOR TRANSFERRING MESSAGES BETWEEN INPUT AND OUTPUT DEVICES IN A COMMUNICATION DEVICE**

**Sharad Mathur, Redmond; Arul Menezes, Bellevue; Michael R. VanBuskirk, and Kevin T. Gallo, both of Redmond, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.**

**Filed Feb. 18, 1994, Ser. No. 198,364**

**Int. Cl.[6] H04N *1/00***

**U.S. Cl. 358—400** **4 Claims**



1. In a communication device for use by a user, the communication device having a message source, a message sink, a database, a format resolution module, and a message scheduler for processing messages, wherein each message sink has capabilities for the format of data acceptable to that message sink, wherein the user has preferences and wherein the message has an attachment, a method for processing messages comprising the steps of:

under the control of the communication device,

receiving user input;

creating a message in response to receiving the user input wherein the created message has a message source and a message sink;

storing the message in a message store;

determining when a message has arrived in the message store;

processing new messages in the message store by the message scheduler to create schedulable messages;

when a message is a schedulable message,

spawning a job process by the message scheduler to send data in the message from the message source to the message sink; and

when the message is a source message,

determining the message sink by the message scheduler by accessing a database;

invoking a format resolution module by the message scheduler to determine a method for converting data within the message from a format acceptable to the message source to a format acceptable to the message sink; and

under the control of the format resolution module,

determining capabilities of the message sink;

determining preferences of the user;

creating a topology list of renderers for each attachment in the message for converting data in the message from a format acceptable to the message source to a format acceptable to the message sink using the preferences of the user; and

creating a target message for each message sink for the message.

**5,499,110**

## IMAGE PROCESSING APPARATUS FOR SYNTHESIZING DIFFERENT INPUT DATA WITHOUT USING HARD COPY

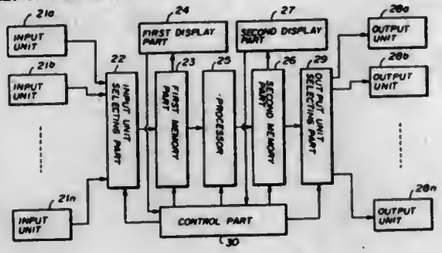
**Takashi Hosogai, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan**

**Filed Feb. 25, 1993, Ser. No. 22,093**

**Claims priority, application Japan, Feb. 28, 1992, 4-043636**

**Int. Cl.[6] H04N *1/387;1/32;1/46;* G06K *1/00***

**U.S. Cl. 358—450** **7 Claims**




1. An image processing apparatus comprising:

a) a plurality of input units for supplying a plurality of input data of different image information;

b) input unit selecting means for selecting one input unit from the plurality of input units;

c) first memory means for storing the input data supplied from said input unit selected by said input unit selecting means;

d) first display means for displaying the input data stored in said first memory means;

e) processing means for processing the input data in said first memory means to produce first processed data;

f) second memory means for storing the processed data, the stored processed data stored in said second memory means having less than a one-page storage size;

g) second display means for displaying the stored processed data stored in said second memory means;

h) a plurality of output units for outputting the stored processed data of said second memory means to a recording medium or an external unit;

i) output unit selection means for selecting one output unit from the plurality of output units; and

j) control means, including:

1) means for repeating said selecting one input unit by said input unit selecting means and said storing of the input data by said first memory means, so that said processing means produces second or more processed data;

2) means for allowing said second or more processed data to be stored in said second memory means so that a composite image containing said first and said second or more processed data from said second memory means is supplied to said output unit selected by said output unit selecting means;

3) means for receiving from said second display means an output range setting data which specifies start and end addresses of each of said first and said second or more processed data in said second memory means, wherein said output range setting data is input by an operator on said second display means and is stored in said control means; and

4) means for allowing each of said first and said second or more processed data to be stored in said second memory means in accordance with the received output range setting data.

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**5,499,111**

## IMAGE SIGNAL PROCESSING APPARATUS

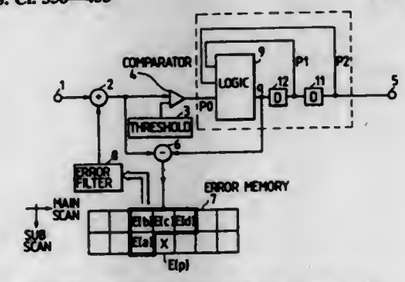
**Shinichi Sato, Yokohama; Kazuto Kobayashi, Tokyo, and Takenobu Ikeuchi, Kawasaki, all of, Japan, assignors to Matsushita Graphic Communication Systems, Inc., Tokyo, Japan**

**Filed Aug. 4, 1992, Ser. No. 924,705**

**Claims priority, application Japan, Aug. 6, 1991, 3-196435; Aug. 28, 1991, 3-217494; Feb. 14, 1992, 4-027688; Feb. 14, 1992, 4-027691; Feb. 19, 1992, 4-031708**

**Int. Cl.[6] H04N *1/40***

**U.S. Cl. 358—455** **29 Claims**




1. An image signal processing apparatus comprising:

correcting means for correcting a multi-level image signal of a pixel of interest in accordance with corrective data;

binarizing means for binarizing an output signal of the correcting means;

logic means receiving an output signal of the binarizing means;

feedback means for feeding an output signal of the logic means, which corresponds to at least two feedback pixels immediately preceding the pixel of interest in a scanning direction, back to an input side of the logic means;

calculating means for derived a difference between an output signal of the logic means and the output signal of the correcting means, and generating the corrective data on the basis of the derive difference; and

output means for outputting an output signal of the logic means as a pseudo halftone image signal;

wherein the logic means comprises:

means for outputting a black-level signal as a signal of the pixel of interest when the output signal of the logic means which corresponds to the feedback pixel closest to the pixel of interest is black and the output signal of the logic means which corresponds to the other feedback pixel is white, for outputting a signal equal to the output signal of the binarizing means as a signal of the pixel of interest in other cases; and

means for outputting a white-level signal as a signal of the pixel of interest when the output signal of the logic means which corresponds to the feedback pixel closest to the pixel of interest is white and the output signal of the logic means which corresponds to the other feedback pixel is black, and for outputting a signal equal to the output signal of the binarizing means as a signal of the pixel of interest in other cases.



**5,499,112**

## LIGHT GUIDE, ILLUMINATING DEVICE HAVING THE LIGHT GUIDE, AND IMAGE READING DEVICE AND INFORMATION PROCESSING APPARATUS HAVING THE ILLUMINATING DEVICE

**Tatsundo Kawai, Hadano; Osamu Hamamoto; Shinichi Takeda, both of Hiratsuka; Satoshi Itabashi, Chigasaki, and Toshimitsu Iso, Hiratsuka, all of, Japan, assignors to Cannon Kabushiki Kaisha, Tokyo, Japan**

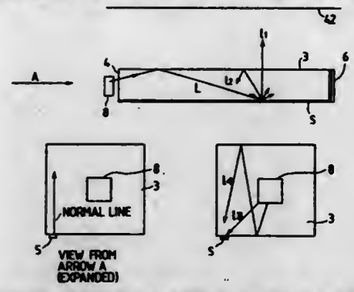
**Filed Jan. 19, 1994, Ser. No. 183,367**

**Claims priority, application Japan, Jan. 19, 1993, 5-006925; Apr. 9, 1993, 5-105983**

**Int. Cl.[6] H04N *1/04***

**U.S. Cl. 358—475** **65 Claims**

1. A light guide comprising a light transparent member provided,




on an end portion thereof, with a light entrance face and, on a face along the longitudinal direction, different from said end portion, with a light exit face for emitting the introduced light, comprising an area provided along said longitudinal direction in a part of the side opposite to said light exit face and adapted to reflect and/or diffuse the light introduced into said light transparent member, said area being arranged so that a normal line passing through a center of a width of said area is shifted from a center of an edge and a surface parallel to the edge of said light guide.

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**5,499,113**

## IMAGE DATA PROCESSING SYSTEM WITH STILL VIDEO CAMERA AND DIGITAL IMAGE FORMING APPARATUS

**Toshio Tsuboi, N.J.; Munehiro Nakatani, Toyohashi, Japan; Hirokazu Yamada, Kobe, Japan, and Kunihiko Omura, Toyokawa, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan**

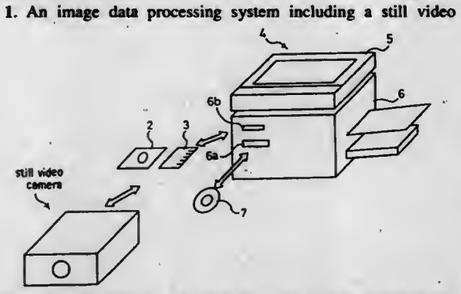
**Continuation of Ser. No. 846,832, Mar. 6, 1992, abandoned. This application Jan. 4, 1995, Ser. No. 368,751**

**Claims priority, application Japan, Mar. 19, 1991, 3-081956; Mar. 22, 1991, 3-083305; Jun. 19, 1991, 3-081957**

**Int. Cl.[6] H04N *5/76***

**U.S. Cl. 358—479** **25 Claims**

1. An image data processing system including a still video




camera which carries out a photographing operation and stores photographed data in a first data form, and a digital image forming apparatus which is distinct from said still video camera, said digital image forming apparatus comprising:

an image reader which reads an image of an original document and generates image data which have a second data form different from said first data form;

a processor which receives the image data generated by the image reader and which transforms the image data generated by the image reader from said second data form to said first data form so as to be in a form usable by said still video camera;

a storing circuit which stores the image data transformed by said processor to be in said first data form on a storing medium of the still video camera for use by said still video camera; and

an image forming device which forms an image on a paper based on the image data of the image reader.

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**5,499,114**

## DIGITAL IMAGE SCANNING APPARATUS WITH PIXEL DATA COMPENSATION FOR BAD PHOTOSITES

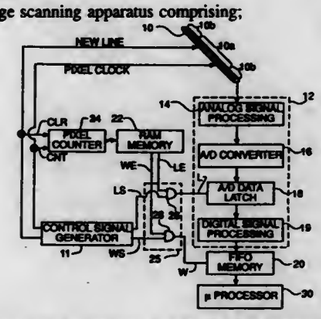
**John T. Compton, LeRoy, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Oct. 31, 1994, Ser. No. 331,790**

**Int. Cl.[6] H04N *1/04;9/64;* H01L *27/00***

**U.S. Cl. 358—483** **3 Claims**

1. Image scanning apparatus comprising;




an imaging device having a plurality of photosites defining an image scan line;

signal processing means for converting image signals from each of said photosites into digital image pixel data representative of the response of each photosite to image light;

data memory means for accumulating pixel data transferred from the signal processing means;

photosite memory means for storing attribute data indicating good and bad photosites in said imaging device including a number of one or more successive bad photosites at the beginning of said image scan line;

means for retrieving said attribute data from said memory means in synchronism with processing of individual photosites in said imaging device; and

data transfer means responsive to said retrieved attribute data for inhibiting transfer to the data memory of pixel data from said number of successive bad photosites at the beginning of said image scan line and for continuing to transfer to said data memory pixel data corresponding to the last good photosite in the image scan line for a number of photosite periods required to provide a full scan line complement of pixel data.

**5,499,115**

## TELEVISION RECEIVING APPARATUS HAVING A VIDEO TAPE RECORDER UNIT THEREIN WITH A FUNCTION FOR PREVENTING AN ELECTRIC SHOCK

**Kazunobu Kojima, Tsuzuki; Takashi Kagawa, Suita, and Yuichi Matsuoka, Takatsuki, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

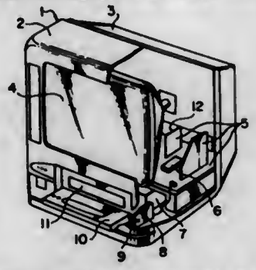
**Filed Aug. 3, 1994, Ser. No. 285,141**

**Claims priority, application Japan, Aug. 17, 1993, 5-203050**

**Int. Cl.[6] H04N *5/64***

**U.S. Cl. 348—836** **16 Claims**

**10.** A television receiving apparatus having a video tape recorder




unit therein with a function for preventing an electric shock, comprising:

a cabinet;

an independent television receiver housed in said cabinet and including a tuner device and an audio system;

a video tape recorder unit detachably accommodated in said cabinet, connected to said television receiver, and having an opening portion through which a video tape cassette is inserted or discharged;

a controller door panel provided on said cabinet and positioned to open or close relative to said cabinet in front of the opening portion of said video tape recorder unit;

an opening or closing mechanism for opening or closing the controller door panel relative to said cabinet;

first detection means for detecting absence of said video tape recorder unit in said cabinet;

second detection means for detecting that said controller door panel is opened at more than a predetermined angle relative to said cabinet; and

means for interrupting supply of electric power to said television receiver when said first detection means detects the absence of the video tape recorder unit in said cabinet and said second detection means detects that said controller door panel is opened at more than the predetermined angle relative to said cabinet.

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**5,499,116**

## ENCODED HOLOGRAM FOR PRODUCING A MACHINE READABLE IMAGE AND A HUMAN READABLE IMAGE

**John E. Wreede, Azusa; John E. Gunther, Torrance; Michael J. Virgadamo, Pasadena; Kevin Yu, Temple City; Lillian Yin, Alhambra; Jerry L. Mulder, Arcadia; Richard B. Upper, Sherman Oaks, and James E. Scott, Hermosa Beach, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.**

**Filed Aug. 31, 1993, Ser. No. 114,538**

**Int. Cl.[6] G03H *1/00; B42D 15/00***

**U.S. Cl. 359—2** **33 Claims**

**21.** An exposure system for exposing a holographic recording layer having a first side and a second side that is opposite the first side, comprising:

object beam means for illuminating the first side of the holographic recording layer with an object beam that produces an optical image of a first object at a first optical image location and an optical image of a second object at a second optical

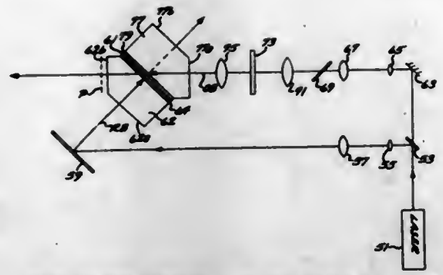



image location displaced from the holographic recording layer, said object beam means including:

(a) diffuser means for providing a diffuse light output;

(b) first and second imaging lenses responsive to said diffuse light output for directing imaging illumination to the first side of said holographic recording layer, said imaging illumination producing an optical image of said diffuser means at a diffuser means optical image position located at the holographic recording layer;

(c) masking means interposed between said first and second imaging lenses;

(d) said second imaging lens configured such that said imaging illumination further produces an optical image of said masking means at a masking means optical image position displaced from the holographic recording layer; and

means for illuminating the second side of the holographic recording layer with a reference beam.

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**5,499,117**

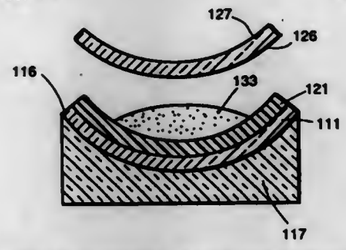
## TRANSFER OF PHOTOPOLYMER HOLOGRAM FROM A CURVE SURFACE TO ANOTHER CURVE SURFACE

**Khin S. Yin, Alhambra, and Kevin H. Yu, Temple City, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.**

**Filed Aug. 31, 1994, Ser. No. 298,626**

**Int. Cl.[6] G03H *1/04;1/02***

**U.S. Cl. 359—3** **8 Claims**




1. A method for transferring a photopolymer hologram (21, 121) from a curved exposure surface (16, 116) of an exposure substrate (17, 117) to a curved application surface (27, 127) of a final substrate (27, 127), comprising the steps of:

forming a release layer (11, 111) on the curved exposure surface including applying a polyvinyl alcohol solution to the curved exposure surface;

forming a photopolymer layer (21, 121) on the release layer;

forming a protective layer (31,131) on the photopolymer layer;

recording a hologram in the photopolymer layer;

removing the protective layer;



attaching the assembly comprised of the exposure substrate, the release layer, and the photopolymer layer to the curved application surface of the final substrate with an optical adhesive layer (33*a*, 133*a*) located between the photopolymer layer and the curved application surface, wherein the curved exposure surface of the exposure substrate is substantially matched to the curved application surface such that the exposure surface and the application surface are uniformly spaced with a predetermined spacing that accommodates the thickness of the release layer, the thickness of the protective layer, and the thickness of the optical adhesive layer; and

removing the release layer and the exposure substrate from the photopolymer layer.

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**5,499,118**

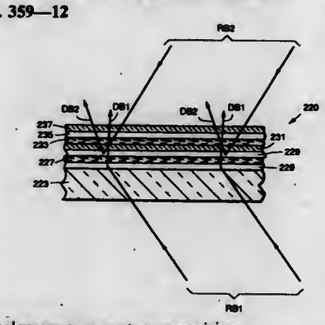
## SYSTEM FOR COPYING MULTIPLE HOLOGRAMS

**John E. Wreede, Azusa; James E. Scott, Hermosa Beach, and David D. Tanaka, Downey, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.**

**Filed Aug. 31, 1994, Ser. No. 298,811**

**Int. Cl.[6] G03H *1/20;1/26;1/28***

**U.S. Cl. 359—12** **8 Claims**




1. A hologram copy system comprising:

a first hologram layer containing a first hologram having Bragg angle and a color associated therewith;

a second hologram layer laminarly adjacent said first hologram and containing a second hologram having a Bragg angle and a color associated therewith, wherein said first hologram and said second hologram are sufficiently separated in Bragg angle or color such that light diffracted by one of the holograms is not substantially diffracted by the other hologram;

a first reconstruction beam for illuminating the first hologram which produces a first diffracted beam that is coherent relative to said first reconstruction beam and is of the same polarization as said first reconstruction beam;

a second reconstruction beam that is orthogonally polarized relative to said first reconstruction beam for illuminating the second hologram which produces a second diffracted beam that is coherent relative to said second reconstruction beam and is of the same polarization as said second reconstruction beam; and

a single hologram recording layer responsive to said first and second reconstruction beams and said first and second diffracted beams, whereby said first reconstruction beam and said first diffracted beam interfere in said single hologram recording layer to construct a copy of the first hologram, and said second reconstruction beam and said second diffracted beam interfere in said single hologram recording layer to construct a copy of the second hologram.

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**5,499,119**

**Patent Not Issued For This Number**

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**5,499,120**

## LIQUID CRYSTAL DEVICE HAVING LEDS OF A WIDE POLAR LIGHTING ANGLE, THE POLAR ANGLE DETERMINING THE LEDS SPACING

**Ingolf G. Hansen, Tollose, Denmark, assignor to Motorola, Inc., Schaumburg, Ill.**

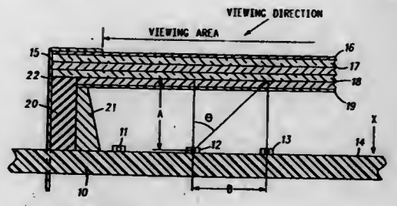
**PCT No. PCT/EP93/01398, § 371 Date Dec. 22, 1994, § 102(e) Date Dec. 22, 1994, PCT Pub. No. WO94/00793, PCT Pub. Date Jan. 6, 1994**

**PCT Filed Jun. 3, 1993, Ser. No. 362,587**

**Claims priority, application United Kingdom, Jun. 26, 1992, 9213646**

**Int. Cl.[6] G02F *1/1335***

**U.S. Cl. 359—48** **19 Claims**




1. A display comprising:

a semi-transparent display element;

a backlight sub-assembly; and

mounting means mounting the display element over and directly adjacent to the backlight sub-assembly wherein the backlight sub-assembly comprises a two-dimensional array of light emitting diodes mounted on a circuit board, characterized in that:

there is no diffuser between the light emitting diodes and the display element,

the light emitting diodes have a wide polar lighting angle, and the spacing between the light emitting diodes is determined by the polar lighting angle such that overlapping of light from one light emitting diode to another provides the display, when viewed from the front of the display element, with substantially evenly dispersed brightness across the array.

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**5,499,121**

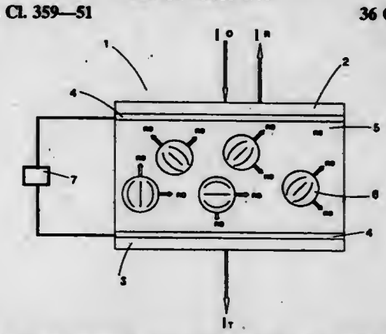
## COLOR VARIANCE POLYMER MATRIX DISPLAY HAVING TWO SCATTERING STATES OR $N_P$ <OR> BOTH $N_E$ AND $N_O$

**Donald R. Brewer, Vigo County, Ind., assignor to Boit Inc., San Diego, Calif.**

**Filed Mar. 18, 1993, Ser. No. 33,494**

**Int. Cl.[6] G02F *1/13***

**U.S. Cl. 359—51** **36 Claims**




1. A color variance polymer dispersed liquid crystal display comprising:

a polymer matrix;

droplets of liquid crystal material dispersed in said polymer matrix, said liquid crystal material having optic axes uniformly aligned in one direction upon application of an electric field of sufficient magnitude to said polymer matrix;

a mixture of dyes incorporated in said liquid crystal droplets such that the polymer matrix exhibits color changes ranging between a first color and a second color in response to changes in the magnitude of the electric field to said polymer matrix;

wherein each index of refraction of said liquid crystal droplets is greater or less than the index of refraction of said polymer matrix;

whereby said display will produce said first color in the absence of an electric field to said polymer matrix and said second color when an electric field of sufficient magnitude is applied to said polymer matrix; and

whereby said display will produce shades of color between said first and second colors upon application of an electric field having a magnitude above zero and less than said sufficient magnitude to said polymer matrix.

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**5,499,122**

## PLASMA-ADDRESSED LIQUID CRYSTAL DISPLAY DEVICE HAVING A TRANSPARENT DIELECTRIC SHEET WITH A POROUS LAYER CONTAINING AN IMPREGNATED LIQUID CRYSTAL

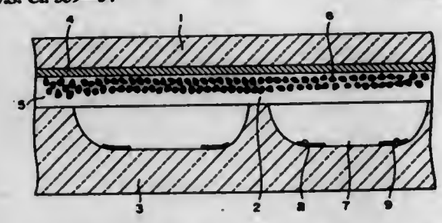
**Tomoya Yano, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Filed May 4, 1994, Ser. No. 238,052**

**Claims priority, application Japan, May 7, 1993, 5-131459**

**Int. Cl.[6] G02F 1/1353**

**U.S. Cl. 359—54** **5 Claims**




1. A plasma-addressed liquid crystal display device, comprising:

a first substrate having a plurality of data electrodes formed substantially in parallel on an inner surface thereof;

a transparent dielectric sheet being in contact with the first substrate, the dielectric sheet having a porous liquid crystal layer which is an integral part of said dielectric sheet impregnated with a liquid crystal in an upper portion thereof, a center of said porous liquid crystal layer being shifted upwardly of a center of said dielectric sheet so that no liquid crystal is present in a lower portion of said dielectric sheet below said porous liquid crystal layer; and

a second substrate having a plurality of discharge channels, the first and second substrates being disposed spaced-apart with a direction of the channels transverse to that of the data electrodes, the second substrate and a lower side of the transparent dielectric sheet being disposed in direct face-to-face contact.

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**5,499,123**

## ACTIVE MATRIX LIQUID CRYSTAL DISPLAY CELL WITH LIGHT BLOCKING CAPACITOR ELECTRODE ABOVE INSULATING LAYER

**Hiroaki Mikoshiba, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

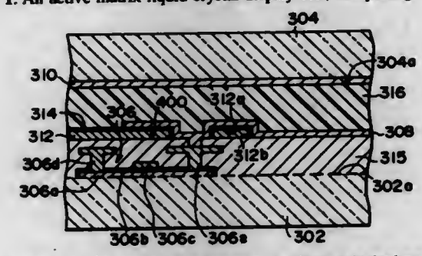
**Filed Oct. 27, 1993, Ser. No. 141,880**

**Claims priority, application Japan, Jan. 27, 1992, 4-288039**

**Int. Cl.[6] G02F 1/1336;1/1345;1/1343**

**U.S. Cl. 359—59** **14 Claims**

1. An active matrix liquid crystal display cell, comprising:




a principal transparent glass substrate having a principal surface;

an opposite transparent glass substrate having an opposite surface opposite to said principal surface with a space therebetween;

an active switching element formed on said principal surface, said active switching element having a plurality of electrodes;

an inter-electrode insulating layer formed on said principal surface for insulating said plurality of electrodes from each other;

a shading layer made of a conductive material and formed on said inter-electrode insulating layer;

a first transparent electrode formed on said inter-electrode insulation layer, said first transparent electrode having an overlapping portion overlapping a part of said shading layer and being connected to one of said plurality of electrodes;

an insulating layer interposed between said shading layer and said overlapping portion, wherein a capacitance element is defined by said shading layer, said overlapping portion, and said insulating layer interposed therebetween;

a second transparent electrode formed on said opposite surface positioned opposite to said first transparent electrode; and

a liquid crystal disposed between said first transparent electrode and said second transparent electrode, wherein said active switching element is a thin-film, top-gate transistor and said plurality of electrodes are a gate, a drain, and a source, said thin-film transistor further comprising:

a polycrystalline silicon layer formed on said principal surface to which said drain and said source are connected; and

a gate insulating layer overlaid on said polycrystalline silicon layer on which said gate is formed, whereby said gate is insulated from said polycrystalline silicon layer.



**5,499,124**

## POLYSILICON TRANSISTORS FORMED ON AN INSULATION LAYER WHICH IS ADJACENT TO A LIQUID CRYSTAL MATERIAL

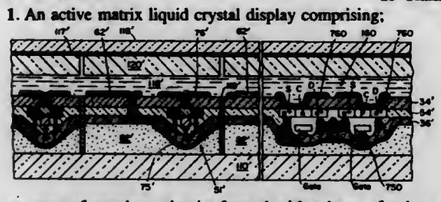
**Duy-Phach Vu, 1559 Bay St. - Apt. 55, Taunton, Mass. 02780; Brenda D. Dingle; Jason E. Dingle, both of 142 Lawndale Rd., Mansfield, Mass. 02048, and Ngwe Cheong, 348 Tremont St., Boston, Mass. 02116**

**Continuation of Ser. No. 310,886, Sep. 22, 1994, abandoned, which is a continuation of Ser. No. 108,528, Aug. 18, 1993, Pat. No. 5,377,031, which is a division of Ser. No. 970,675, Nov. 4, 1992, Pat. No. 5,256,562, which is a continuation-in-part of Ser. No. 874,588, Apr. 24, 1992, Pat. No. 5,376,561, which is a continuation-in-part of Ser. No. 834,849, Feb. 13, 1992, Pat. No. 5,258,325, which is a continuation-in-part of Ser. No. 636,602, Dec. 31, 1990, Pat. No. 5,206,749, and a continuation-in-part of Ser. No. 643,552, Jan. 18, 1991, Pat. No. 5,300,788. This application May 8, 1995, Ser. No. 437,034**

**Int. Cl.[6] G02F 1/136;1/1333; H01L 21/60**

**U.S. Cl. 359—59** **18 Claims**

1. An active matrix liquid crystal display comprising;




an array of transistor circuits formed with a layer of polycrystalline silicon over an insulating layer, the insulating layer being positioned on a first side of the polycrystalline layer;

an optically transmissive substrate bonded to the array of transistor circuits on a second side of the polycrystalline layer with an adhesive;

a light source that is optically coupled to the optically transmissive substrate such that light from the source is directed through the adhesive; and

a liquid crystal material positioned between the insulating layer and a counterelectrode.

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**5,499,125**

## LIQUID CRYSTAL DISPLAY WITH A SMOOTHING FILM IN A TREACHED SUBSTRATE AND METHOD FOR FORMING THE SAME

**Hyeon-tae Kim, and Jin-kyu Kang, both of Kyunggi-do, Rep. of Korea, assignors to Samsung Display Devices Co., Ltd., Kyunggi-do, Rep. of Korea**

**Filed Nov. 15, 1994, Ser. No. 339,549**

**Claims priority, application Rep. of Korea, Jun. 2, 1994, 94-12352**

**Int. Cl.[6] G02F 1/1335;1/1333**

**U.S. Cl. 359—67** **5 Claims**

1. A method for forming a liquid crystal display including a front

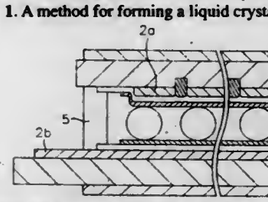



plate and a rear plate stuck to each other by a sealing material spread along the edges to form a predetermined closed space where liquid crystal is injected, comprising the steps of:

forming a group of electrodes having a predetermined pattern inside a front plate;

forming a trench having a predetermined depth by etching the front plate by using the pattern of the electrodes as a mask;

filling the said trench with a smoothing film having about the same height as that of the patterns of the electrodes in the upper portion of the trench front plate; and

forming an insulating layer and an alignment film respectively on the upper portion of the smoothing film and the pattern of the electrodes.

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**5,499,126**

## LIQUID CRYSTAL DISPLAY WITH PATTERNED RETARDATION FILMS

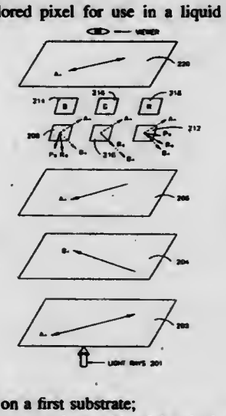
**Adiel Abileah, Farmington Hills; Gang Xu, Royal Oak, and Patrick F. Brinkley, Bloomfield, all of Mich., assignors to OIS Optical Imaging Systems, Inc., Northville, Mich.**

**Filed Dec. 2, 1993, Ser. No. 160,731**

**Int. Cl.[6] G02F 1/1335**

**U.S. Cl. 359—68** **51 Claims**

24. A multi-colored pixel for use in a liquid crystal display,




comprising:

a first polarizer on a first substrate;

a second polarizer on a viewer side of the pixel, and on a second substrate;

a liquid crystal layer disposed between said first and second polarizers;

first and second subpixels each having a different color optical filter therein for transmitting a different predetermined color or wavelength of optical radiation; and

wherein said first subpixel includes a first retardation means having a first predetermined retardation value, and said second subpixel includes a second retardation means having a second predetermined retardation value different than said first predetermined retardation value, and wherein said first and second retardation means are disposed between said first and second substrates.

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**5,499,127**

## LIQUID CRYSTAL DISPLAY DEVICE HAVING A LARGER GAP BETWEEN THE SUBSTRATES IN THE DISPLAY AREA THAN IN THE SEALANT AREA

**Koujiro Tsubota, Nara; Kazuyoshi Fujioka, Higashiosaka; Yohji Yoshimura, Nara; Hiroyuki Obgami, Tenri; Yutaka Takafuji, Nara; Katsumi Nomura, Tenri; Masumi Kubo, Nara, and Hirokazu Kamei, Kashihara, all of, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

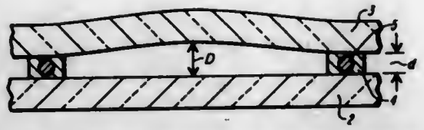
**Filed May 25, 1993, Ser. No. 67,466**

**Claims priority, application Japan, May 25, 1992, 4-132870; Jul. 3, 1992, 4-177155**

**Int. Cl.[6] G02F 1/1339;1/1333**

**U.S. Cl. 359—80** **3 Claims**

1. A cell used for a liquid crystal display device including a first substrate, a second substrate, and a sealing member for bonding the first and the second substrates,



wherein a spacer for determining a gap between the first and the second substrates is included only in the sealing member, the spacer not existing in a display area which is substantially enclosed by the sealing member, and said gap being substantially uniform throughout said display area and

wherein a relationship between the gap in the display area and a distance between the first and second substrates spaced by the sealing member is substantially uniform and d<D, where D is a substantially uniform distance between the first and second substrates in the entirety of the display area, and d is the distance between the first and second substrates spaced by the sealing member.

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**5,499,128**

**LIQUID CRYSTAL DISPLAY DEVICE WITH ACRYLIC POLYMER SPACERS AND METHOD OF MANUFACTURING THE SAME**

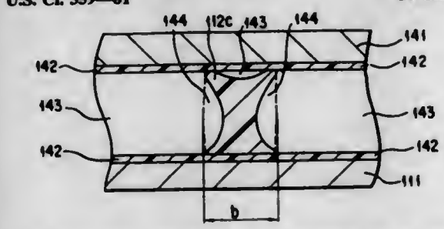
**Rei Hasegawa, and Miki Mori, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Mar. 15, 1994, Ser. No. 213,074**

**Claims priority, application Japan, Mar. 15, 1993, 5-053473**

**Int. Cl.[6] G02F *1/1339***

**U.S. Cl. 359—81** **20 Claims**



13. A liquid crystal display device, comprising: first and second substrates facing each other;

means for spacing said first and second substrates, said spacing means being columnar and made of a photosensitive resin selected from the group consisting of acrylic polymers and acrylic copolymers, and said photosensitive resin having at least one side chain selected from the group consisting of an epoxy group, an imide bond, an ether bond, and ester bond and a urethane bond;

a light transmission control layer positioned in a space between said first and second substrates held apart from each other by said spacing means; and

control means for controlling said light transmission control layer so as to turn light on or off,

wherein said acrylic polymer is a polymer of at least one monomer selected from the group consisting of monomethoxy 1,6-hexanediol monoacrylate, monomethoxy tripropyleneglycol monoacrylate, monomethoxy neobenzylglycol alkoxyl monoacrylate, monomethoxy trimethylolpropane alkoxy diacrylate, and cardoepoxyacrylate.

**5,499,129**

**ELECTRONIC APPARATUS HAVING A RIB INTEGRAL WITH THE DISPLAY HOUSING FOR PROTECTING THE FLUORESCENT LAMP**

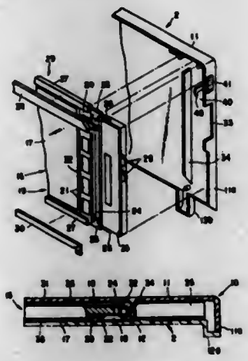
**Youji Satou, and Katumaru Sasaki, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Tokyo, Japan**

**Division of Ser. No. 118,481, Sep. 8, 1993, Pat. No. 5,316,491, which is a continuation of Ser. No. 900,974, Jun. 18, 1992, abandoned. This application Nov. 29, 1993, Ser. No. 159,201**

**Claims priority, application Japan, Jul. 19, 1991, 3-056489 U; Jul. 29, 1991, 3-059508 U; Jul. 29, 1991, 3-187988; Jul. 30, 1991, 3-190207; Sep. 6, 1991, 3-226832; Nov. 28, 1991, 3-314830; Nov. 30, 1991, 3-317177; Jan. 10, 1992, 4-3371; Jun. 11, 1992, 4-152421**

**Int. Cl.[6] G02F *1/1333***

**U.S. Cl. 359—83** **7 Claims**



1. An electronic apparatus comprising:

a body; and

a display rotatably mounted on the body said display including:

a display main-body having a bottom case, and a cover attached to the bottom case with a given space therebetween and having an opening;

a flat plate-like liquid crystal display section arranged within the display main-body and opposite to the opening;

an elongated fluorescent lamp for illuminating the liquid display section, the fluorescent lamp being arranged within the display main-body and extending along a lateral edge of the display section; and

a lamp drive unit, to drive the fluorescent lamp, arranged within the display main-body and extending along the fluorescent lamp,

said display main-body including protection means for protecting the fluorescent lamp and the lamp drive unit from being damaged, the protection means being arranged within the main-body between the fluorescent lamp and the lamp drive unit so as to prevent the bottom case and the cover from interfering with the fluorescent lamp and the lamp drive unit when external force is applied to the main-body.

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**5,499,130**

**METHOD OF MAKING LIQUID CRYSTAL DEVICE HAVING PLURAL STRIPE-SHAPED RIBS ON ONE SUBSTRATE**

**Shinjiro Okada, Isehara, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 113,821, Aug. 31, 1993, abandoned, which is a division of Ser. No. 836,914, Feb. 19, 1992, Pat. No. 5,264,954. This application Jun. 5, 1995, Ser. No. 465,567**

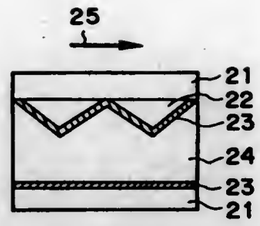
**Claims priority, application Japan, Feb. 20, 1991, 3-045626**

**Int. Cl.[6] G02F *1/1343;1/13***

**U.S. Cl. 359—87** **3 Claims**

1. A method for producing a liquid crystal element, comprising the steps of:





selecting a pair of electrode substrates;

forming a configuration of periodic stripe-like ribs on at least one of the pair of electrode substrates;

subjecting each of said pair of electrode substrates to a rubbing processing in which the rubbing of the lower substrate is made in a direction at an angle rotating in a clockwise direction from a rubbing direction of the upper substrate;

selecting a chiral smectic liquid crystal which changes state between isotropic phase, cholesteric phase and smectic A phase according to temperature;

injecting said chiral smectic liquid crystal between said pair of electrode substrates;

providing means for applying a voltage between said pair of electrode substrates, said voltage forming a transmittance in said liquid crystal according to a gradation :

wherein a normal line with respect to plural layers arranged in a uniform direction composed of plural molecules projected onto the surface of said electrode with said stripe-like ribs crosses said stripe-like ribs.

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**5,499,131**

**LIQUID CRYSTAL DISPLAY**

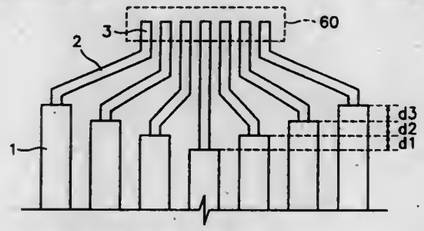
**Young-whan Kim, Kyunggi-do, Rep. of Korea, assignor to Samsung Display Devices Co., Ltd., Kyunggi-do, Rep. of Korea**

**Filed Mar. 1, 1994, Ser. No. 205,017**

**Claims priority, application Rep. of Korea, Jun. 21, 1993, 1993-10977**

**Int. Cl.[6] G02F *1/1343***

**U.S. Cl. 359—88** **3 Claims**



1. A liquid crystal display comprising:

a pair of panels having a segment electrode and a common electrode respectively;

a liquid crystal between said panels;

a frit seal for sealing said panels;

a pair of polarizers each attached to an outer surface of a different end of said panels; and

lead patterns connected to the electrodes, wherein the lead patterns are of equal length to ensure that resistances of the lead patterns are uniform, and wherein the electrodes are adapted to accommodate the lead patterns.

**5,499,132**

**OPTICAL PASSIVE COMPONENTS**

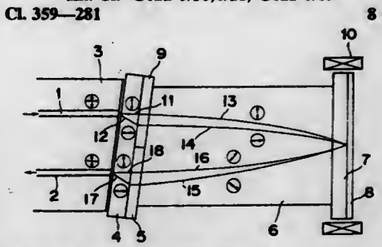
**Masaaki Tojo, Nara; Noboru Kurata, Ikoma, and Hironori Souda, Hirakata, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed May 12, 1993, Ser. No. 59,762**

**Claims priority, application Japan, May 13, 1992, 4-120242; Aug. 20, 1992, 4-221541**

**Int. Cl.[6] G02B *5/30;6/28;* G02F *1/09***

**U.S. Cl. 359—281** **8 Claims**



1. An optical component comprising:

first and second optical fibers;

a reflector;

a birefringent crystal disposed between said reflector and said first and second optical fibers;

a lens disposed between said reflector and said birefringent crystal;

a magnetooptical crystal disposed between said reflector and said lens;

a half-wave plate disposed between said lens and said birefringent crystal in a location between said lens and said second optical fiber, no half-wave plate being disposed between said lens and said first optical fiber;

wherein said lens is operable to substantially collimate light rays input thereinto; and

wherein said magnetooptical crystal is operable to receive a magnetic field and to rotate polarization directions of light rays input thereinto by $\pi/8+N\pi/4$, (N=0, 1, . . . ).

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**5,499,133**

**Patent Not Issued For This Number**

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**5,499,134**

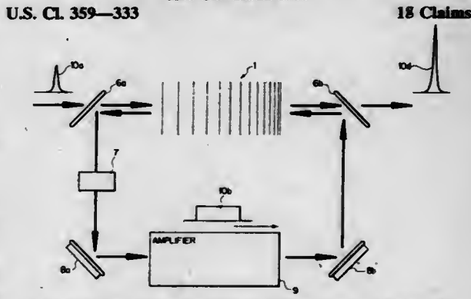
**OPTICAL PULSE AMPLIFICATION USING CHIRPED BRAGG GRATINGS**

**Almantas Galvanauskas, and Martin E. Fermann, both of Ann Arbor, Mich., assignors to Imra America, Ann Arbor, Mich.**

**Filed Aug. 24, 1994, Ser. No. 294,969**

**Int. Cl.[6] H01S *3/00***

**U.S. Cl. 359—333** **18 Claims**




1. An apparatus for amplifying an optical pulse, comprising:

generating means for generating an optical pulse;

spreading means, optically connected to said generating means, for reducing the peak amplitude of said optical pulse and increasing the duration of said optical pulse;

amplifying means, optically connected to said spreading means, for increasing the amplitude of said optical pulse after said optical pulse is output from said spreading means; and

recompressing means, optically connected to the output of said amplifying means, for decreasing the duration of said optical pulse after said optical pulse is output from said amplifying means;

wherein at least one of said spreading and recompressing means comprises a chirped Bragg grating.

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**5,499,135**

**OPTICAL AMPLIFIER**

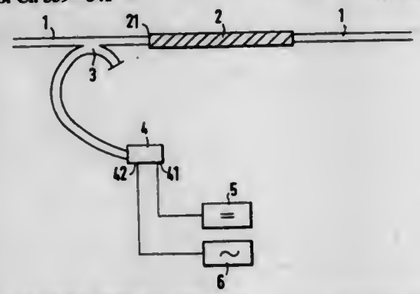
**Rolf Heidemann, Tamm; Thomas Pfeiffer, Stuttgart, and Manfred Kaiser, Hemmingen, all of, Germany, assignors to Alcatel N.V., Amsterdam, Netherlands**

**Continuation of Ser. No. 923,905, Aug. 24, 1992, abandoned. This application Oct. 14, 1994, Ser. No. 323,239**

**Claims priority, application Germany, Dec. 24, 1990, 40 41 760.3**

**Int. Cl.[6] H01S *3/30*; G02B *6/26***

**U.S. Cl. 359—341** **16 Claims**




1. An optical amplifier comprising:

a length of fiber (2) that contains a laser-active substance having an energy level with a lifetime for amplifying light signals when it decays;

at least one semiconductor laser (4, 8) being coupled to said length of fiber (2), for providing pump light, characterized in that

an operating current source (5, 6) provides a modulated operating current signal to said at least one semiconductor laser (4, 8), the modulated operating current signal having a substantially constant modulation frequency which represents absolutely no information and which is greater than a reciprocal of the lifetime of the energy level of the laser-active substance, so the light signals to be amplified are not modulated.

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**5,499,136**

**STEREOGRAPHIC BOOK**

**Charles W. Jones, 305 Belleview Ave. East, Apt. 206, Seattle, Wash. 98102**

**Continuation-in-part of Ser. No. 907,785, Jul. 1, 1992, Pat. No. 5,309,280. This application May 3, 1994, Ser. No. 237,275**

**Int. Cl.[6] G02B *27/22***

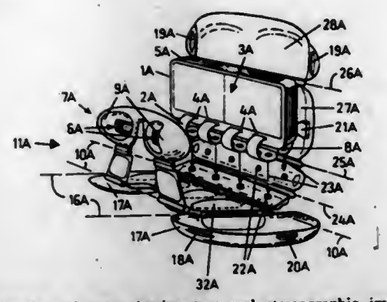
**U.S. Cl. 359—474** **19 Claims**

15. A stereographic book comprising:

a page mount portion;

said page mount portion configured to provide a cover plate including a page support surface when positioned in a viewing and reading configuration;

said page mount portion configured with fastening means to facilitate closure when co-operatively positioned in a storage configuration;




a plurality of pages having text and stereographic imagery thereon, the pages being pivotally coupled to the page mount portion about a page axis;

a stereographic viewer with a body including first and second eyepieces configured with first and second apertures provided with first and second lenses configured with means to enable interocular adjustment to facilitate viewing of the stereographic imagery thereon the pages positioned to be viewed;

a viewer pivotal array configured for pivotably coupling the stereographic viewer to the page mount portion, the viewer pivotal array including a plurality of pivotal axes interposed between and substantially parallel to the page pivotal axis and the stereographic viewer to facilitate alignment and focal adjustment of the stereographic viewer relative to the pages pivoted to be viewed;

said viewer pivotal array configured with fastening means to engage corresponding fastening means configured therewith said page mount portion to secure said viewer pivotal array, said stereographic viewer, said plurality of pages in a storage configuration.

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**5,499,137**

**EXPOSURE METHOD AND APPARATUS THEREFOR**

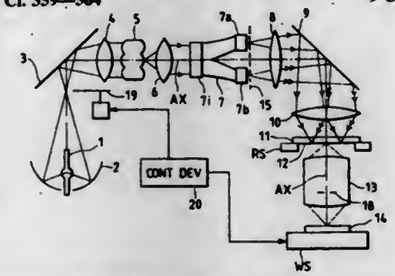
**Naomasa Shiraishi, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan**

**Continuation of Ser. No. 347,224, Nov. 23, 1994, abandoned, which is a continuation of Ser. No. 144,490, Nov. 1, 1993, abandoned, which is a continuation of Ser. No. 938,206, Sep. 1, 1992, abandoned. This application Apr. 24, 1995, Ser. No. 427,739**

**Claims priority, application Japan, Sep. 6, 1991, 3-227121**

**Int. Cl.[6] G02B *27/46*; G03B *27/42*;*27/72***

**U.S. Cl. 359—564** **9 Claims**




8. An exposure apparatus comprising:

an illumination optical system for illuminating a pattern formed on a mask with illumination light;

a projection optical system for projecting an image of said pattern on a photosensitive substrate;

a member for holding a mask having a phase shifter portion for shifting the phase of the illumination light by about $(2n+1)\pi$ (n is an integer), at an object plane side of said projection optical system; and



an optical member for making a light amount distribution of the illumination light around a local region centered on an optical axis of said illumination optical system within a predetermined plane substantially coincident with one of a Fourier transform plane of said mask in said illumination optical system or a plane conjugate thereto stronger than a light distribution within said local region, so as to illuminate said mask with a plurality of beams of the illumination light which are inclined with respect to said optical axis at substantially equal angles corresponding to a fineness of said pattern.

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**5,499,138**

**IMAGE DISPLAY APPARATUS**

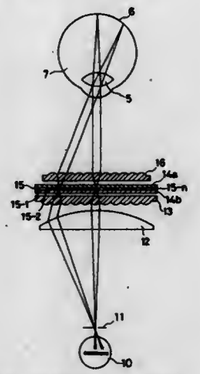
**Yoichi Iba, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan**

**Filed May 26, 1993, Ser. No. 67,144**

**Claims priority, application Japan, May 26, 1992, 4-133856; Jul. 27, 1992, 4-199486**

**Int. Cl.[6] G02B *5/18***

**U.S. Cl. 359—569** **11 Claims**




3. An image display apparatus comprising:

image display means having a plurality of pixels arranged in a two-dimensional array; and

optical means for converting beams of light emerging from said plurality of pixels into a plurality of approximately parallel beams of light, and for refracting said plurality of approximately parallel beams of light directly toward a retina of an observer's eye, each of said plurality of pixels having a conjugate relationship with said retina of said observer's eye;

said apparatus being a spectacle-type image display apparatus; and

said apparatus projecting an image directly on both of said observer's eyes.

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**5,499,139**

**ULTRA-WIDE FIELD OF VIEW, BROAD SPECTRAL BAND HELMET VISOR DISPLAY OPTICAL SYSTEM**

**Chungte W. Chen, Irvine, Calif., and Kris E. Bentley, Dallas, Tex., assignors to Hughes Aircraft Company, Los Angeles, Calif.**

**Filed Oct. 1, 1993, Ser. No. 130,471**

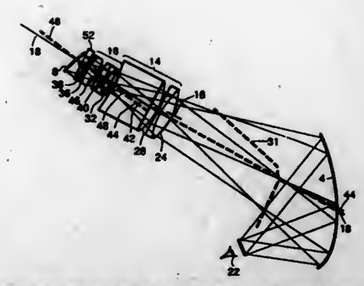
**Int. Cl.[6] G02B *3/00***

**U.S. Cl. 359—649** **33 Claims**

1. A wide field of view optical display system, comprising:

an image generator,

a reflector having a reflective surface positioned to receive and reflect an image from said image generator, and oriented at a substantial bending angle to said image generator so as to produce asymmetric aberrations in the reflected image,




a multi-lens rear optical lens relay group positioned in an optical path between said image generator and said reflector, and

a multi-lens front optical lens relay group positioned in said optical path between said rear relay group and said reflector,

said front relay group as a whole and said rear relay group as a whole being tilted and/or decentered relative to each other such that all of the lenses in said front relay group are misaligned with respect to all of the lenses in said rear relay group to compensate for said asymmetric aberrations.

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**5,499,140**

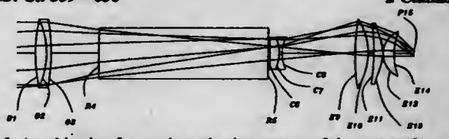
**WIDE ANGLE BINOCULAR SYSTEM WITH VARIABLE POWER CAPABILITY**

**Ellis I. Betensky, Redding, Conn., assignor to BenOpcon, Inc., Cincinnati, Ohio**

**Division of Ser. No. 28,413, Mar. 9, 1993, Pat. No. 5,371,626. This application Nov. 9, 1994, Ser. No. 336,413**

**Int. Cl.[6] G02B *21/02***

**U.S. Cl. 359—656** **2 Claims**




1. An objective for use in a viewing system of the monocular or binocular type which forms an image of an object, said objective forming an intermediate image of the object and comprising in order from the object end of the viewing system:

(a) a positive lens unit,

(b) reverting and inverting means for causing the intermediate image when formed to be reverted and inverted, and

(c) a fixed negative lens unit before the intermediate image.

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**5,499,141**

**ZOOM LENS**

**Motoyuki Ohtake, Ohmiya, Japan, assignor to Nikon Corporation, Tokyo, Japan**

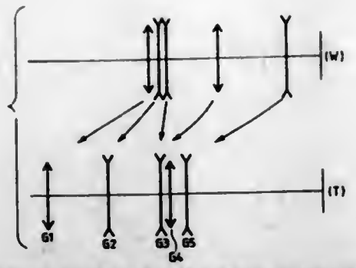
**Filed Sep. 12, 1994, Ser. No. 302,473**

**Claims priority, application Japan, Sep. 22, 1993, 5-259373; Sep. 22, 1993, 5-259374**

**Int. Cl.[6] G02B *15/14***

**U.S. Cl. 359—684** **15 Claims**

1. A zoom lens comprising, in the order from the object side, a first lens group having a positive refractive power, a second lens group having a negative refractive power, a third lens group having a negative refractive power, a fourth lens group having a positive refractive power and a fifth lens group having a negative refractive power, in which, at a refractive power varying operation from the wide angle end to the telescopic end, at least said first and fifth lens groups move to the object side, the air gaps between said first and second lens groups and between said second and third lens groups increase while the air gap between said fourth and fifth lens groups decreases, wherein:




a condition $0.4<\Delta Bf/(ft-fw)<0.8$ is satisfied, in which $\Delta Bf$ is the amount of movement along the optical axis of said fifth lens group at the refractive power varying operation from the wide angle end to the telescopic end, fw is the focal length of the entire lens system at the wide angle end, and ft is the focal length of the entire lens system at the telescopic end.

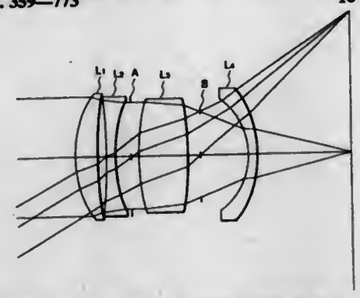
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**5,499,142**

**LARGE APERTURE WIDE ANGLE TYPE PHOTOGRAPHIC LENS SYSTEM**

**Koichi Ohshita, Tokyo, Japan, assignor to Nikon Corporation, Tokyo, Japan**

**Filed Apr. 5, 1994, Ser. No. 222,865**
**Claims priority, application Japan, Apr. 27, 1993, 5-101199**
**Int. Cl.[6] G02B *9/34;13/18***
**U.S. Cl. 359—773** **16 Claims**




1. A large aperture wide angle type photographic lens system comprising:
- a positive meniscus lens having an object side convex surface directed toward an object and provided coaxially with an optical axis;
- a bi-concave lens provided at an image side of said positive meniscus lens and coaxially with said optical axis and having an image side surface;
- a bi-convex lens provided at an image side of said bi-concave lens and coaxially with said optical axis; and
- a negative meniscus lens provided at an image side of said bi-convex lens and coaxially with said optical axis and having an image side convex surface directed toward an image; and

wherein the following conditions are satisfied:

$0.4<r1/f<0.45$

$-0.65<r8/f<-0.4$

$0.43<(d5+d6)/f<0.48$

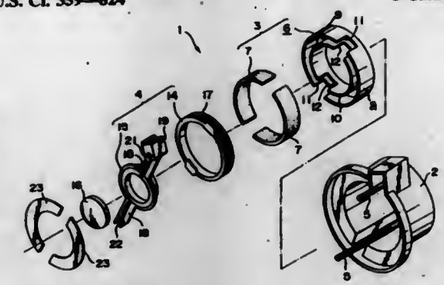
where:
- r1 is a radius of curvature of said object side convex surface of said positive meniscus lens;
- r8 is a radius of curvature of said image side convex surface of said negative meniscus lens;
- d5 is an axial thickness of said bi-convex lens;
- d6 is an axial distance between said bi-convex lens and said negative meniscus lens; and
- f is a compound focal length of the whole lens system.

**5,499,143**

**ELECTROMAGNETIC ACTUATOR AND LENS DRIVE MECHANISM USING THE SAME**

**Satoshi Sakamoto, Tokyo; Eiji Ohshima, Kanagawa; Hiroshi Kawamura, and Shinichi Orimo, both of Tokyo, all of, Japan, assignors to Sony Corporation, Tokyo, Japan**

**Filed Feb. 17, 1995, Ser. No. 389,937**
**Claims priority, application Japan, Feb. 25, 1994, 6-051121**
**Int. Cl.[6] G02B *7/02***
**U.S. Cl. 359—824** **8 Claims**



1. An electromagnetic actuator comprising:
- a cylindrical casing having a first supporting rail extending in parallel to the central axis of said casing;
- a yoke member which is disposed in said casing and made up of a cylindrical inner yoke having a first cut portion opening in the direction parallel to the central axis and a cylindrical outer yoke covering said inner yoke;
- a magnet fixed on said yoke member;
- a holding member which holds a driven body having a generally circular radial cross section;
- a cylindrical coil bobbin which is greater in diameter than said driven body holding member, with a coil being wound thereon coaxially;
- a first connecting arm which connects said coil bobbin to said driven body holding member in a generally concentric relation and is located in the first cut portion of said inner yoke; and
- a bearing device which is provided on said first connecting arm or said driven body holding member and supported slidably on said first supporting rail.

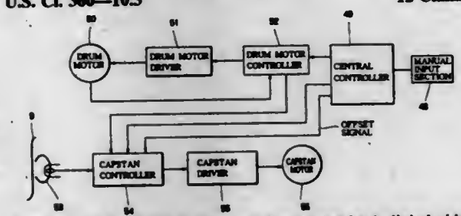
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**5,499,144**

**MAGNETIC RECORDING/PLAYBACK APPARATUS WHICH SHIFTS THE HEAD SCAN BY A ½ TRACK PITCH DURING HIGH SPEED PLAYBACK**

**Sadayuki Inoue; Junko Ishimoto; Haruhisa Inoue, and Ken Onishi, all of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Aug. 16, 1993, Ser. No. 106,722**
**Claims priority, application Japan, Aug. 24, 1992, 4-224084; Dec. 1, 1992, 4-321676; Jul. 15, 1993, 5-175363**
**Int. Cl.[6] G11B *5/584***
**U.S. Cl. 360—10.3** **12 Claims**




1. A magnetic playback apparatus for playing back digital video signals recorded on helical tracks on a magnetic tape using at least two rotary heads, comprising:



rotary speed control means for controlling a rotary speed of a rotary head;

tape travel and tracking control means for controlling the speed of magnetic tape travel and controlling a tracking phase at a beginning of tracking on the magnetic tape by the rotary heads; and

a control circuit for selectively causing one of normal playback and high-speed playback, and for providing a ½ track-pitch offset command to said tape travel and tracking control means at a time of selectively caused high speed playback;

said tape travel and tracking control means, in response to said ½ track-pitch offset command, offsetting the lateral position of the rotary head relative to the track by a ½ track-pitch from the lateral position of the rotary head relative to the track during normal playback, at a beginning of tracking on the magnetic tape,

the tape travel speed during the high speed playback being set substantially at (4n+2) times a normal playback speed, n being an integer not smaller than zero.

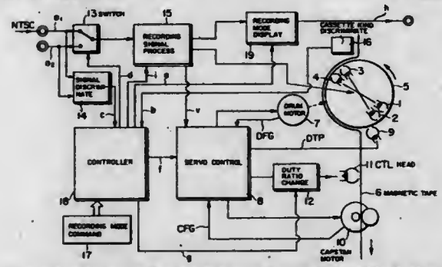
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**5,499,145**

**MAGNETIC RECORDING APPARATUS WITH CAPABILITY OF RECORDING SIGNALS OF A PLURALITY OF DIFFERENT TELEVISION SYSTEMS**

**Nobuo Azuma, Yokohama; Takashi Furuhata, Kamakura; Katsumi Takeda, and Hiroaki Takahashi, both of Yokohama, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Continuation of Ser. No. 799,953, Nov. 29, 1991, abandoned. This application Nov. 15, 1993, Ser. No. 151,790**
**Claims priority, application Japan, Nov. 30, 1990, 2-329103**
**Int. Cl.[6] H04N *5/78***
**U.S. Cl. 360—33.1** **19 Claims**




1. A magnetic recording apparatus of the rotary head helical scan type which can selectively record input information signals of a plurality of signal formats, comprising:
- input signal kind discriminating means having at least two kinds of input terminals for an HD signal and an NTSC signal;
- a recording signal processing circuit;
- a servo circuit;
- control means for generating control output signals to set at least the recording signal processing circuit and the servo circuit into a predetermined mode on the basis of the result of the discrimination of the input signal kind discriminating means and a recording mode command, and for controlling at least the recording signal processing circuit and the servo circuit; and
- means for displaying a present recording mode on the basis of a control output signal which is generated from the control means;

wherein the control means generates a control output signal so as to make only recording modes of a preset combination of at least a kind of input signal and a recording mode effective in correspondence to an output of the input signal kind discriminating means and the recording mode command; and

wherein when an initial setting state of the magnetic recording apparatus is selected, the control means generates a control output signal for setting a recording mode of the magnetic recording apparatus to a recording mode selected from a plurality of recording modes of preset available combinations of at least a kind of input signal and a recording mode ranked in an order of priority from a most optimum recording mode having a highest priority to a least optimum recording mode having a lowest priority, wherein a process of selecting a recording mode begins with the most optimum recording mode having the highest priority among the plurality of recording modes.

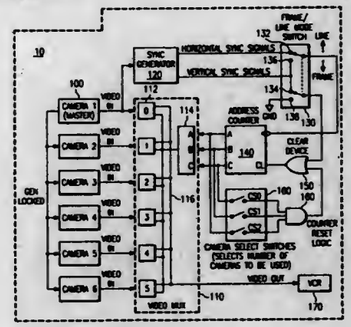
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**5,499,146**

**METHOD AND APPARATUS FOR RECORDING IMAGES FOR A VIRTUAL REALITY SYSTEM**

**Daniel M. Donahue, and Dale A. Cone, both of Garland, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed May 24, 1994, Ser. No. 248,297**
**Int. Cl.[6] H04N *5/78***
**U.S. Cl. 360—33.1** **6 Claims**




1. A system for sequentially recording a sequence of video images, comprising:
- circuitry for obtaining a plurality of different and complete video images, each of said different video images being of a different field of view to form a 360 degree scene;
- circuitry for controlling said circuitry for obtaining said plurality of different video images, to select a portion of said plurality of different video images corresponding to a selected number of said plurality of different video images;
- circuitry to control the selection of said portion of said plurality of different video images by selecting either lines or frames of said plurality of different video images;
- circuitry to output said portion of said plurality of different video images corresponding to said selected number of said plurality of said different video images;
- circuitry to sequentially record said portion of said plurality of different video images corresponding to said selected number of said plurality of different video images to form said sequence of video images.

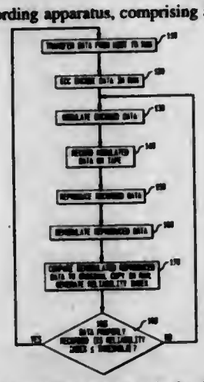
5,499,147

## ROTARY HEAD RECORDING AND REPRODUCTION APPARATUS WITH MEMORY AND METHOD OF OPERATION WHICH COMPARES A REPRODUCED SIGNAL WITH AN ORIGINAL SIGNAL

Jang-Zern Tsai, Ma Dow Town, and Chin-Chuan Liang, Taichung, both of, Taiwan, Prov. of China, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan, Prov. of China

Filed Dec. 2, 1993, Ser. No. 161,283
Int. Cl.[6] G11B *5/09;15/14;* G11C *29/00;* G06F *11/00*
U.S. Cl. 360—53 19 Claims

1. In a tape recording apparatus, comprising a memory and first



and second pairs of recording and reproducing heads positioned on a rotary drum so that each reproducing head scans a track recorded by the recording head of the respective pair after both the first and second recording heads record tracks, a method for recording a signal on a tape comprising the steps of:

(a) interleaving data to be recorded onto pairs of signals;

(b) sequentially recording each of first and second signals of a first pair of signals stored in said memory on respective consecutive adjacent tracks of said tape by scanning said first and second recording heads of said tape recording apparatus sequentially, over said consecutive adjacent tracks of said tape;

(c) after recording said first pair of signals in step (b), sequentially recording each of third and fourth signals of a second pair of signals stored in said memory on respective consecutive adjacent tracks of said tape adjacent to said track on which said second signal of said first pair of signals was recorded, said third and fourth signals succeeding said first pair of signals;

(d) while recording said second pair of signals in step (c), sequentially reproducing said first and second signals from said respective tracks of said tape by scanning said first and second reproducing heads of said recording apparatus sequentially over said consecutive adjacent tracks of said tape on which said first and second signals are recorded;

(e) comparing said reproduced first and second signals to corresponding first and second signals stored in said memory;

(f) in response to detecting errors in step (e) in either of said first and second reproduced signals, completing said recording of said second pair of signals and repeating steps (a)–(e) for said first and second pairs of signals, wherein said first and second pairs of signals are re-recorded on respective consecutive adjacent tracks of said tape adjacent to said track in which said fourth signal of said second pair of signals was most recently recorded; and

(g) if no error is detected in step (e), repeating steps (c)–(g) for subsequent consecutive pairs of signals,

wherein said re-recording of pairs of signals in step (f) re-records said pairs of signals on consecutive adjacent tracks beginning with the pair in which said errors were detected and continuing in sequence therefrom, regardless of in which signal, of said pair of signals containing said errors, said errors were detected, to preserve a sequence of said interleaving of data within each pair of signals of step (a).

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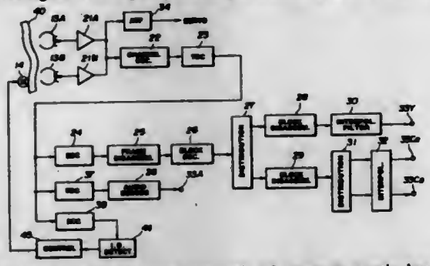
5,499,148

## DIGITAL VIDEO TAPE REPRODUCING APPARATUS COMPATIBLE WITH TAPES HAVING A TRACK WIDTH DIFFERENT FROM A ROTARY MAGNETIC HEAD WIDTH

Yukio Kubota, and Keiji Kanota, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 23, 1992, Ser. No. 966,540
Claims priority, application Japan, Jan. 30, 1991, 3-310156
Int. Cl.[6] G11B *15/46*
U.S. Cl. 360—73.06 8 Claims

1. A digital video tape reproducing or recording and reproducing



apparatus including at least one pair of rotary magnetic heads having a predetermined head width and gaps with mutually different azimuth angles and which helically scan a magnetic tape as said tape is advanced to reproduce digital video signals azimuth-recorded in oblique tracks on said tape, all of the rotary magnetic heads of said apparatus having the same predetermined width, said magnetic tape having an identification signal recorded in said oblique tracks thereon which is indicative of a track width of said oblique tracks, said apparatus comprising:

tape drive means for driving said tape at a tape transport speed selected from a standard speed and another speed that is faster than said standard speed; and

tape drive control means having means for detecting said identification signal recorded in said oblique tracks of said magnetic tape for controlling said tape drive means to drive said tape at said standard speed when said oblique tracks have a track width equal to said predetermined head width, and to drive said tape at said other speed when said oblique tracks have a track width wider than said predetermined width.

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5,499,149

## SLIDER WITH TRANSVERSE RIDGE SECTIONS SUPPORTING AIR-BEARING PADS AND DISK DRIVE INCORPORATING SLIDER

Moris M. Dovek, San Carlos, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 102,031, Aug. 3, 1993, Pat. No. 5,418,667. This application Apr. 13, 1995, Ser. No. 422,728
Int. Cl.[6] G11B *5/60*
U.S. Cl. 360—103 20 Claims

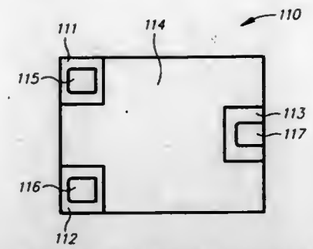
1. A magnetic recording disk drive comprising:

at least one magnetic recording disk having a lubricant film thereon;

a motor connected to the disk for rotating the disk;

a slider having a disk side, a side opposite the disk side, a front ridge section generally transverse to the slider longitudinal centerline and supporting two front air-bearing pads generally equally spaced about the slider longitudinal centerline, a rear ridge section generally parallel to the front ridge section and supporting generally rectangularly shaped a rear air-bearing






pad located on the slider longitudinal centerline, and a nonair-bearing surface recessed from and separating the front and rear ridge sections, the total surface area of the front air-bearing pads being greater than the surface area of the rear air-bearing pad, whereby the slider is pitched up during operation of the disk drive;

a magnetic head located on the slider near the rear air-bearing pad for reading data from or writing data to the disk;

an actuator for moving the slider generally radially across the disk so the head may access different regions of data on the disk;

a suspension attached to the side of the slider opposite the disk side and connecting the slider to the actuator for maintaining the air-bearing pads of the slider near the disk during operation of the disk drive; and

means for supporting the motor and actuator.

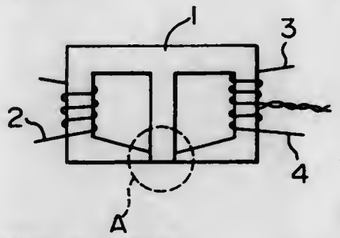
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5,499,150

## MAGNETIC HEAD

Jiro Kawana, and Katsuaki Kanaya, both of Hanamaki, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 55,304, May 3, 1993, abandoned. This application Oct. 24, 1994, Ser. No. 328,567
Claims priority, application Japan, May 11, 1992, 4-117190
Int. Cl.[6] G11B *5/17*
U.S. Cl. 360—123 6 Claims




1. A magnetic head, comprising:

a core having a read/write gap and an erase gap which are adjacent to each other;

a first coil having a first number of turns and wound around a first part of said core for generating, when a first recording current flows in said first coil, a first recording magnetic field in a first direction upon said read/write gap;

a second coil having a second number of turns and wound around a second part of said core adjacent to said first part of said core for generating, when a second recording current flows in said second coil, a second recording magnetic field in a second direction, which is opposite to said first direction, upon said read/write gap; and

a third coil wound around a third part of said core for generating, when a DC erasing current flows in said third coil, an erase magnetic field in said first direction upon said erase gap;

said second number of turns being less than said first number of turns by a predetermined number of turns so that said second coil has an inductance lower than an inductance of said first coil and a stray capacitance lower than a stray capacitance of said first coil, whereby a rise time of said second recording current is shorter than a rise time of said first recording current so as to correct an influence of a leaking bias magnetic field from said third coil which causes asymmetry of magnetization on a recording medium when each of said first and second recording currents flows simultaneously which said DC erasing current;

wherein:

said core comprises a read/write side portion, a center portion and an erase side portion;

said read/write gap is formed between said read/write side portion and said center portion;

said erase gap is formed between said erase side portion and said center portion;

said first part and said second part of said core are provided on said read/write side portion; and

said third part of said core is provided on said erase side portion.

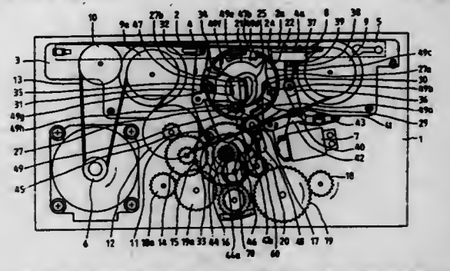
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5,499,151

## MODE CHANGING METHOD UTILIZING ONE CAM GEAR AND ONE SOLENOID FOR A CASSETTE TAPE RECORDER

Hae S. Lee, and Sang D. Yu, both of Seoul, Rep. of Korea, assignors to Goldstar Co., Ltd., Seoul, Rep. of Korea

Division of Ser. No. 982,541, Nov. 27, 1992, Pat. No. 5,392,182. This application Dec. 7, 1994, Ser. No. 350,846
Claims priority, application Rep. of Korea, Nov. 28, 1991, 21802/1991; Dec. 6, 1991, 22354/1991
Int. Cl.[6] G11B *5/02*
U.S. Cl. 360—137 3 Claims



1. A method for mode changing of a cassette tape recorder having a mode changing apparatus including mode changing means for changing a mode of the tape recorder into another mode in response to operating of a solenoid and a cam assembly for selectively rotating upon reception of driving power, the cam assembly having an outer cam which is provided with first to ninth inclination surfaces and first to third locking shoulders, the method comprising the steps of:

selectively controlling the mode changing means to move along the outer cam to engage selective ones of the inclination surfaces and be caught by selective ones of the locking shoulders, thereby achieving the mode changing for a stop mode, a play mode, a reverse play mode or a reverse record mode; the mode changing steps including:

a play mode changing step wherein the mode changing means is guided by the first inclination surface in order to be caught by the second locking shoulder, thereby causing the play mode to be achieved;

a record mode changing step wherein the mode changing means is sequentially guided by the first to third inclination surfaces in order to be caught by the second locking shoulder, thereby causing the record mode to be achieved;

a reverse play mode changing step wherein the mode changing means is sequentially guided by the fourth and fifth inclination surfaces in order to be caught by the third locking shoulder, thereby causing the reverse play mode to be achieved; and

a reverse record mode changing step wherein the mode changing means is sequentially guided by the fourth to seventh inclination surfaces in order to be caught by the third locking shoulder, thereby causing the reverse record mode to be achieved.

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**5,499,152**

**PROTECTION CIRCUIT**

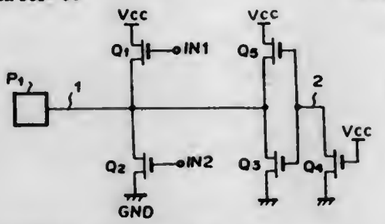
**Akira Tamakoshi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Continuation of Ser. No. 47,575, Apr. 13, 1993, abandoned. This application May 30, 1995, Ser. No. 453,810**

**Claims priority, application Japan, Apr. 15, 1992, 4-121356**

**Int. Cl.[6] H02H** *3/20*

**U.S. Cl. 361—56** **3 Claims**




1. A protection circuit, comprising:

an output line having an output pad at an output terminal thereof;

a first output transistor for setting said output line to a potential of a power supply Vcc according to a first signal supplied from an internal circuit, said first output transistor being connected to the power supply Vcc;

a second output transistor for setting said output line to ground level according to a second signal supplied from the internal circuit, said second output transistor being connected to ground level;

a first punch-through MOS transistor having a first punch through speed and a drain connected to said output line and a source connected to ground level;

a second punch-through MOS transistor having a second punch through speed and a drain connected to said output line and a source connected to the power supply Vcc; and

a grounding MOS transistor for setting both a gate of said first punch-through MOS transistor and a gate of said second punch-through MOS transistor to ground level, said grounding MOS transistor having a drain connected to both said gate of said first punch-through MOS transistor and said gate of said second punch-through MOS transistor, a source of said grounding MOS transistor being connected to ground level, and a gate of said grounding MOS transistor being connected to the power supply Vcc, said grounding MOS transistor having an operating speed slower than said first punch-through speed of said first punch-through MOS transistor and slower than said second punch-through speed of said second punch-through MOS transistor.

**5,499,153**

**FLOATING MAGNETIC HEAD DEVICE AND ITS SECURING METHOD**

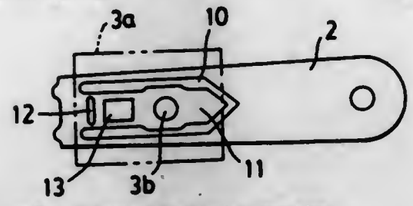
**Norio Uemura; Akira Taguchi, and Masayuki Hosoda, all of Mouka, Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan**

**Filed Jan. 9, 1994, Ser. No. 257,770**

**Claims priority, application Japan, Jun. 10, 1993, 5-165165; Jul. 5, 1993, 5-190951**

**Int. Cl.[6] G11B** *21/20*

**U.S. Cl. 360—103** **4 Claims**




1. A floating magnetic head device comprising:

a load arm;

a holding member attached to the tip of the load arm, the holding member having a recessed groove; and

a slider with an air bearing surface, having a leading and a trailing edge, the slider provided with a slit for holding a magnetic core on the trailing edge of the air bearing surface, the back of said slider being fixed with adhesive, to that part of the holding member closer to the leading edge of the air bearing surface than the recessed groove, whereby excess adhesive is trapped in said recessed groove.

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**5,499,154**

**PROTECTIVE SHUT-DOWN SYSTEM FOR SWITCH-MODE POWER SUPPLY**

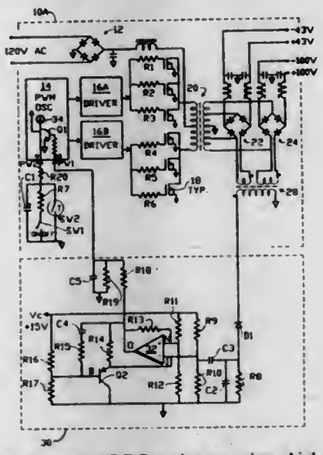
**Steven B. Cullison, Rancho Cordova, Calif., assignor to Stewart Electronics, Rancho Cordova, Calif.**

**Filed Dec. 20, 1994, Ser. No. 359,602**

**Int. Cl.[6] H02H** *7/125*

**U.S. Cl. 361—18** **10 Claims**

1. An overload protection circuit in a switch-mode power supply




having a low frequency AC-DC portion powering a high frequency ac-dc portion that generates ac under control of a PWM (pulse-width-modulated) oscillator and that provides a dc output voltage from a rectifier circuit having at least one rectifier diode, said overload protection circuit comprising:



a current-sensing transformer having a first primary winding connected in series with the rectifier diode of the high frequency ac-dc portion of the power supply, and having a secondary winding;

a detector circuit, connected across the secondary winding, providing a detected DC signal proportional to sense current flowing in the diode; and

a timing circuit, including an input comparator, receiving as input the detected DC signal, the comparator being made to have a threshold level corresponding to a predetermined current overload level of the detected DC signal and to actuate said timing circuit so as to generate as output a fast-rise shut-down signal of predetermined time duration in response to current overload as indicated by the DC detected signal exceeding the threshold level, the shut-down signal being applied to a control node of the PWM so as to control current overload shut-down and subsequent automatic start-up of the power supply.

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**5,499,155**

**CIRCUIT ANALYZING SYSTEM**

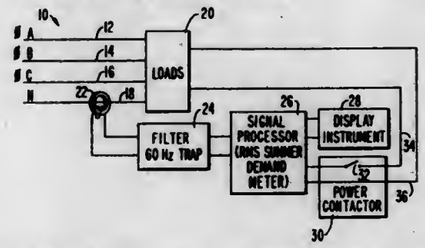
**Bernard Gershen, Centerport; Alfred J. Lombardi, LaGrangeville, both of N.Y.; James E. Meehan, Ste. Veronique, Canada, and Saul Rosenbaum, East Meadow, N.Y., assignors to Leviton Manufacturing Co., Inc., Little Neck, N.Y.**

**Continuation of Ser. No. 1,885, Jan. 8, 1993, Pat. No. 5,383,084. This application Jan. 17, 1995, Ser. No. 373,684**

**Int. Cl.[6] H02H** *3/26*

**U.S. Cl. 361—113** **7 Claims**

1. A circuit analyzing system comprising:




a) a first load to be supplied with current from an AC power supply;

b) a second load to be supplied with current from the same AC power supply;

c) three phase conductors and one neutral conductor connecting said AC power supply to said first and second loads;

d) means in said three phase conductors to open said three phase conductors to one of said first and second loads in response to an actuation signal;

e) means for extracting current from said neutral conductor;

f) filter means connected to said means for extracting current and functioning to substantially block the passage of fundamental frequency current, and to substantially pass harmonic frequency currents therethrough;

g) signal processing means connected to an output of said filter means and functioning to add said harmonic frequency currents together and to generate a signal representative of the total amount of harmonic frequency currents;

h) means for generating a variable voltage reference signal;

i) a comparator coupled to said signal processing means to receive said signal and to said means for generating to receive said variable voltage reference signal;

j) said comparator generating an actuation signal if said signal representative of the total amount of harmonic currents exceeds a predetermined value; and

k) coupling means connecting said comparator to said means to open to cause said means to open to open said three phase conductors in response to an actuating signal from said comparator.

**5,499,156**

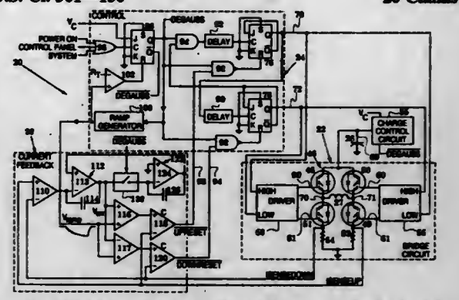
**FORCED, RESONANT DEGAUSSING SYSTEM AND METHOD**

**Robert M. Bentley, Hacienda Heights, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.**

**Filed Nov. 18, 1994, Ser. No. 341,727**

**Int. Cl.[6] H04N** *9/29*

**U.S. Cl. 361—150** **20 Claims**




1. A degaussing system for degaussing a color cathode-ray tube, comprising:

an energy source having an outlet port;

a coil having first and second ends and arranged to have a magnetic field coupling with said cathode-ray tube;

a control circuit configured to successively generate first and second coupling commands; and

a switching network arranged to couple said coil and said energy source in series with said first end adjacent said outlet port in response to said first coupling command and to couple said coil and said energy source in series with said second end adjacent said outlet port in response to said second coupling command;

the coupling between said energy source and said coil thereby producing successive, oppositely directed currents through said coil and successive, differently oriented magnetic fields.

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**5,499,157**

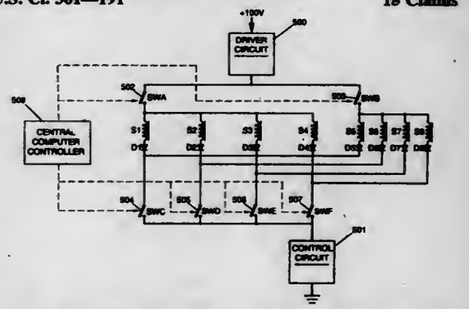
**MULTIPLEXED ELECTRONIC FUEL INJECTION CONTROL SYSTEM**

**Ramin Younessi, Ft. Collins, and Dale A. Beckman, Fort Collins, both of Colo., assignors to Woodward Governor Company, Loveland, Colo.**

**Filed Nov. 9, 1994, Ser. No. 336,501**

**Int. Cl.[6] H01H** *47/00*

**U.S. Cl. 361—191** **18 Claims**




1. An electronic fuel injection control system of the type having a plurality of fuel injection valves, each valve operated by an electromagnetic solenoid, the control system comprising:

at least one driver circuit for supplying power to a selected solenoid;

at least one control circuit for providing controlled operation of the selected solenoid;

a multiplexing means for selectively interconnecting the at least one driver circuit and the at least one control circuit to the terminals of the selected solenoid for selectively energizing the selected solenoid, the means including:

a first switch array having at least two switches selectively interconnecting at least one driver circuit to a first terminal of the solenoids; and

a second switch array having at least two switches selectively interconnecting at least one control circuit to a second terminal of the solenoids;

the multiplexing means being interconnected among the at least one driver circuit, the at least one control circuit, and the solenoids so that closure of any single switch from each switch array uniquely selects and energizes a single solenoid.

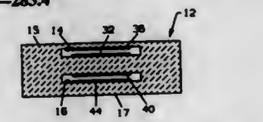
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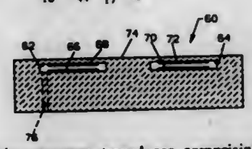
**5,499,158**

## PRESSURE TRANSDUCER APPARATUS WITH MONOLITHIC BODY OF CERAMIC MATERIAL

**Robert P. Bishop, Pembroke; Paul L. Hainey, Douglas; Stanley J. Lukasiewicz, North Attleboro, all of Mass.; Allan J. Sluzdak, Cumberland; Robert E. Luminello, Jr., Johnston, both of R.I., and Vishwa N. Shukla, North Attleboro, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Nov. 14, 1994, Ser. No. 339,038**
**Int. Cl.[6] H01G 7/00**
**U.S. Cl. 361—283.4** **12 Claims**





1. A capacitive pressure transducer comprising a monolithic body of ceramic material having an outer periphery and having a top and a bottom surface and having a first closed cavity in the body adjacent to and separated from the top surface by a flexible wall member, and a second closed cavity adjacent to and separated from the bottom surface by a rigid wall member, the cavities each having a bottom wall, a respective electrically conductive layer disposed on the flexible and the rigid wall members and the bottom walls, the conductive layers in each cavity separated from one another by a gap and electrically conductive via means extending from the conductive layers out to an external portion of the body for making electrical connection therewith.

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**5,499,159**

## MATING RING FOR A WATTHOUR METER COVER

**Christopher Gatz, West Lafayette, Ind., assignor to Landis & Gyr Energy Management, Inc., Lafayette, Ind.**

**Filed Aug. 23, 1994, Ser. No. 294,484**
**Int. Cl.[6] H02B 9/00**
**U.S. Cl. 361—667** **4 Claims**

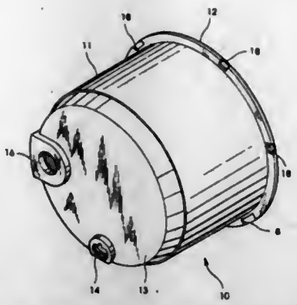
1. A mating ring mounting a meter cover onto a meter base in which the meter cover includes an annular flange at its open end, the mating ring comprising:

a cylindrical wall having an inner surface;

base attachment means defined on said inner surface removably attaching said wall to a meter base; and

cover attachment means integral with said wall attaching said wall to an annular flange of a meter cover, said cover attachment means including:

a plurality of ring flanges-projecting radially inward from said inner surface; and



a plurality of wedges opposing said plurality of ring flanges, each of said wedges defining a retaining surface directed toward said ring flanges and spaced apart therefrom to receive the annular flange of the meter cover between said ring flanges and said wedges, said wedges further defining an inclined surface opposite said retaining surface on which the annular flange of the meter cover slides before snapping between said wedges and said ring flanges.

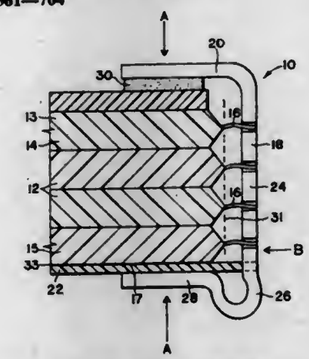
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**5,499,160**

## HIGH DENSITY INTEGRATED CIRCUIT MODULE WITH SNAP-ON RAIL ASSEMBLIES

**Carmen D. Burns, Austin, Tex., assignor to Staktek Corporation, Austin, Tex.**

**Continuation-in-part of Ser. No. 186,827, Jan. 24, 1994, abandoned, which is a continuation of Ser. No. 884,066, May 15, 1992, abandoned, which is a continuation-in-part of Ser. No. 561,417, Aug. 1, 1990, abandoned. This application Jan. 30, 1995, Ser. No. 380,543**
**Int. Cl.[6] H05H 7/20**
**U.S. Cl. 361—704** **17 Claims**



1. An integrated circuit module, comprising:

a plurality of stacked integrated circuit packages, wherein each said package includes a casing, an integrated circuit die disposed within said casing and a plurality of electrical interconnect leads; and

a plurality of electrically and thermally conductive rails, each said rail including:

(a) an upper portion which extends over the upper major surface of the uppermost of said integrated circuit packages in said module,

(b) a central portion connected to said upper portion, said central portion being electrically coupled to selected ones of said electrical interconnect leads,



(c) a lower portion connected to said central portion, said lower portion being in surface contact with the lower major surface of the lowermost of said integrated circuit packages in said module; and

(d) a spring-bias portion to provide a spring-bias force in said rails.

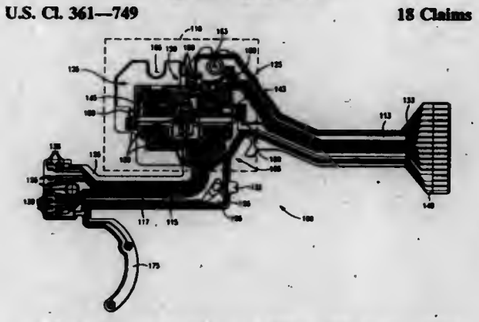
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**5,499,161**

## FLEXIBLE PREAMPLIFIER INTEGRATED CIRCUIT ASSEMBLIES AND METHOD

**Ali Hosseinzadeh, Fremont, and Maziar Amirkiai, Sunnyvale, both of Calif., assignors to Quantum Corporation, Milpitas, Calif.**

**Filed Feb. 18, 1994, Ser. No. 198,871**
**Int. Cl.[6] H05K 1/14**
**U.S. Cl. 361—749** **18 Claims**



1. A flexible circuit assembly for a mass storage device comprising:

a substrate having a component side and a non-component side comprising:

a mounting portion comprising a main body having a first integrated circuit for supporting basic functionality within the mass storage device by connection to a first group of electrical elements, the first integrated circuit being mounted on a first group of conductive mounting pads formed on said component side and a flap extending from the main body and foldable along a fold line and having a second group of conductive mounting pads formed on said component side for providing connections to an optional, second integrated circuit functionally duplicative of the first integrated circuit for supporting additional functionality within the mass storage device by connection to a second group of electrical elements of the same type connected to the first integrated circuit, said substrate configured such that after folding along the fold line said non-component side of said flap faces said non-component side of said main body:

a lead strip extending to a plurality of contacts and a connector strip, said lead strip comprising a plurality of conductive traces in electrical communication with selected pads of said first group of conductive mounting pads and said second group of conductive mounting pads; and

an access strip extending to a connector, said access strip comprising a plurality of circuit traces in electrical communication with selected pads of said first group of conductive mounting pads and said second group of conductive mounting pads.

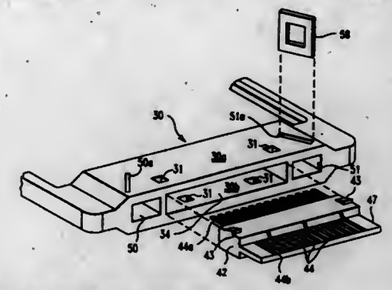
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**5,499,162**

## UNIVERSAL FRAME FOR DATA CARD

**Jaroslav B. Bartuska, E. York, Canada; Richard J. Grisam, Shelburne, Vt.; Albert J. Kerklaan, Milton; David J. Saunders, Brampton, both of, Canada, and Jerzy M. Zalesinski, Essex Junction, Vt., assignors to International Business Machines Corp., Armonk, N.Y.**

**Filed Nov. 8, 1994, Ser. No. 335,570**
**Int. Cl.[6] H05K 1/14**
**U.S. Cl. 361—737** **10 Claims**



1. A data card frame comprising:

a frame for mounting a printed circuit card therein;

said frame including a generally hollow receptacle port for the insertion of a removable interfacing connector header therein;

said header being provided with pass through terminal means having a first end connectable to said printed circuit board mounted in said frame and a second end adapted to mate with an external connector plug therein;

said header being further provided with locating means; and

said port being further provided with means for interfacing with said locating means on said header to selectively locate said header in said port.

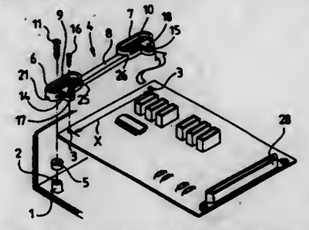
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**5,499,163**

## PRINTED CIRCUIT BOARD CLAMP FOR HOUSINGS OF ELECTRONIC, ELECTRIC AND APPARATUS INSTALLATIONS

**John-Erik Sonntag, Tammisaari, and Matti Ropponen, Espoo, both of, Finland, assignors to Fibox Oy AB, Tammisaari, Finland**

**Filed Sep. 19, 1994, Ser. No. 308,663**
**Claims priority, application Finland, Sep. 24, 1993, 934202**
**Int. Cl.[6] H05K 5/00**
**U.S. Cl. 361—759** **7 Claims**



1. A printed circuit board clamp for clamping a printed circuit board to a housing of electronic, electric and apparatus installations, which clamp is to be secured to at least one fixing stud disposed at a bottom of the housing and is provided with a bore, and the clamp comprising:

an elongated body having two ends and an interconnecting neck portion between the two ends;

fixing means for securing the printed circuit board to the clamp, each of the two ends of the clamp having a throughgoing

aperture to receive a fastener and at least one of said apertures being elongatedly shaped, and for securing the clamp to said fixing stud;

wherein the neck portion comprises a weakening point for manually separating at least one of the two ends of the clamp from the neck portion.

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**5,499,164**

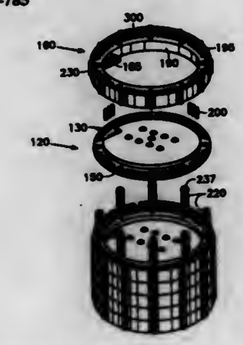
**HIGH IMPACT DIGITAL CRASH DATA RECORDER**

**Joseph W. Hill-Lindsay, Dana Point; John T. Yuen, Granada Hills, and Alfred R. Blanco, La Habra Heights, all of Calif., assignors to Northrop Grumman Corporation, Los Angeles, Calif.**

**Filed Jun. 22, 1994, Ser. No. 264,844**

**Int. Cl.[6] H01R *23/68***

**U.S. Cl. 361—785** **20 Claims**




1. A high impact high memory capacity crash data recorder, comprising:

(I.) a plurality of planar parallel circuit cards, each of said circuit cards comprising:

(A) a circuit board;

(B) plural integrated circuits mounted on said circuit board;

(C) plural connector pads on a periphery of said circuit board connected through said circuit board to output terminals of integrated circuit memories;

(D) a foam layer covering said plural integrated circuit memories and an adjacent portion of said circuit board, said periphery of said circuit board being uncovered by said foam layer;

(II.) a plurality of planar parallel spacers, said spacers and said circuit cards being stacked in alternating sequence to form a card stack, each of said spacers comprising:

(A.) a spacer body coextensive with said periphery of said circuit board and surrounding a void into which said foam layer nests;

(B.) a lip surrounding annulus and surrounding a void above said annulus, said annular periphery of said circuit board nesting in said void above said spacer body;

(C.) plural connector tunnels in registration with said plural connector pads and a button connector in each connector tunnel squeezed between connector pads of adjacent circuit boards; and

(III.) a rigid housing surrounding said plural circuit cards and plural spacers.

**5,499,165**

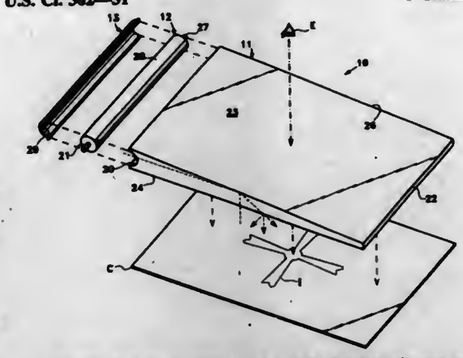
**TRANSPARENT EDGE-LIT LIGHTING PANE FOR DISPLAYS**

**Lawrence Holmes, Jr., P.O. Box 325, Midland Park, N.J. 07432-0325**

**Filed Oct. 8, 1992, Ser. No. 958,492**

**Int. Cl.[6] F21V *8/00***

**U.S. Cl. 362—31** **5 Claims**




1. An edge-lit window pane for illuminating maps, pictures and photographs placed in a display case thereunder in environments having a low ambient light level comprising:

a display case in which articles to be illuminated can be inserted;

a generally rectangular panel of transparent material having a top surface and bottom surface, said bottom surface tapering from one edge to its opposite edge to configure said panel in a wedge shape and mounted over said display case, said panel having an arcuate groove formed in one edge;

at least one linear light source means operable to provide illumination for said panel, said source imbedded in and sealed in said arcuate groove with a clear sealant having an index of refraction approximating that of said panel; and

etching on said bottom surface of said panel sufficient to enhance the refraction of light within said panel hitting said bottom surface, said etching operable to enhance illumination below said bottom surface of said panel by a factor of at least 5 from said light source means but not so rough as to obscure articles placed in said display case whereby the amount of light egressing from said panel toward said display case is increased by said etching.

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**5,499,166**

**LIGHTING DEVICE FOR VEHICLE**

**Hideyuki Kato, Nishio, and Yuji Chigusa, Kariya, both of, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan**

**Filed Jun. 18, 1993, Ser. No. 78,088**

**Claims priority, application Japan, Jun. 19, 1992, 4-159922; Dec. 24, 1992, 4-344404**

**Int. Cl.[6] F21V *8/00*; B60Q *1/04***

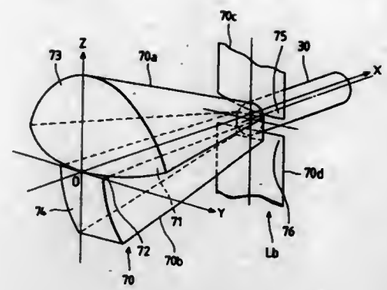
**U.S. Cl. 362—32** **13 Claims**

1. A lighting device for use in a vehicle, the lighting device having a lighting unit for receiving light from a light source and emitting the received light, the lighting unit comprising:

an optical fiber for receiving light from the light source and emitting the received light; and

an optical waveguide, directly connected to the optical fiber, for directly receiving the light emitted from the optical fiber and emitting light which has a desired luminous intensity distribution, said waveguide including a lens constructed and arranged to converge light and having a length extending from an end of the optical fiber to a light emitting surface of the waveguide.






**5,499,167**

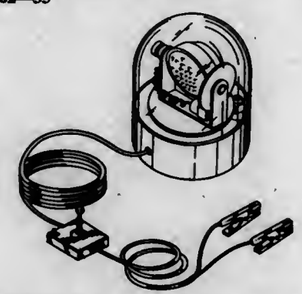
**SPOTLIGHT UNIT FOR USE ON A VEHICLE**

**Fred G. Brown, Box 1002, Pampa, Tex. 79066**

**Filed Jan. 11, 1995, Ser. No. 371,207**

**Int. Cl.[6] F21V *21/30***

**U.S. Cl. 362—35** **4 Claims**



1. A spotlight unit for use on a vehicle comprising:

A) a housing unit which includes

(1) a base housing having a bottom surface,

(2) means on said bottom surface for releasably mounting said base unit on an outer surface of a vehicle,

(3) a support wall located in said base housing, and

(4) a transparent cover mounted on said base housing;

B) a control unit which comprises

(1) a body,

(2) an on/off switch on said body,

(3) a control stick movably mounted on said body for movement in four directions,

(4) first lead means for connecting said control unit to a source of power, and

(5) second lead means for connecting said control unit to said housing unit;

C) a light mounting unit which includes

(1) a first motor mounted on said support wall inside said base housing and connected to said second lead means,

(2) a second motor mounted on said support wall in said cover and connected to said second lead means,

(3) a first base mounted on said support wall in said housing unit for rotation in 360° degrees in a first plane,

(4) a drive disc mounted on said support wall in said housing unit for rotation in 360° degrees in a second plane,

(5) first means for connecting said first motor to said first base to rotate said first base when said first motor is activated, and

(6) second means for connecting said second motor to said drive disc for rotating said drive disc in said second plane when said second motor is activated;

D) a pedestal unit in said cover which includes a yoke having a bight section mounted on said first base and two short legs on said bight section, said drive disc being mounted on one short leg;

E) a spotlight mounted on said pedestal unit; and

G) lead means for connecting said spotlight to said control unit.

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**5,499,168**

**DEVICE FOR REGULATING LIGHT WIDTH OF HEADLIGHTS OF MOTOR VEHICLES**

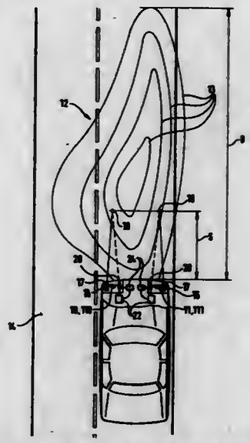
**Roland Cochard, Morges, and Frieder Heizmann, Denens, both of, Switzerland, assignors to Robert Bosch GmbH, Stuttgart, Germany**

**Filed Oct. 27, 1994, Ser. No. 331,343**

**Claims priority, application Germany, Dec. 4, 1993, 43 41 409.5**

**Int. Cl.[6] B60Q *1/10***

**U.S. Cl. 362—71** **19 Claims**



1. A device for regulating a light width of at least one headlight of a motor vehicle, comprising an adjusting device associated with said headlight; a transmitter which emits electromagnetic radiation to irradiate a region of a roadway located in front of the motor vehicle; an opto-electronic sensor which determines radiation emitted by said transmitter and reflected by the roadway and in dependence on the detected radiation produces signals; an evaluating device which processes the produced signals and controls said adjusting device for maintaining constant a light width of a light beam emitted by said headlight, said transmitter in addition to the light beam of the headlight emitting radiation and following an adjustment of the light width of the light beam emitted by said headlight which is provided by said adjusting device, so that the region irradiated by the radiation emitted by said transmitter on the roadway has a small extension and, with a correctly adjusted light width of the light beam emitted by said headlights is arranged at a predetermined distance from the motor vehicle, said evaluating device determining from the signals of said sensor a deviation of an actual distance of said irradiated region in front of the motor vehicle and, when a deviation is detected, controls said adjusting device for adjusting to said predetermined distance.

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**5,499,169**

**REARVIEW MIRROR LAMP CIRCUIT ASSEMBLY**

**Chun-Ming Chen, 1/F., No. 549, Min-Sheng Rd., Sheng-Ping Li, West Dist., Taichung City, Taiwan, Prov. of China**

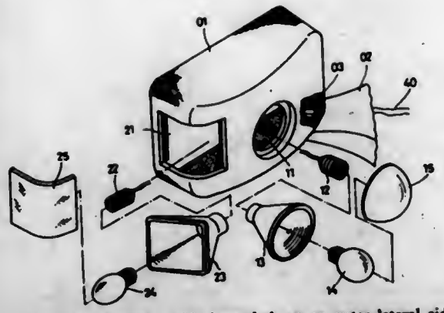
**Filed May 16, 1995, Ser. No. 442,342**

**Int. Cl.[6] B60Q *1/26***

**U.S. Cl. 362—83.1** **3 Claims**

1. A rearview mirror lamp circuit assembly comprising:

a motor vehicle rearview mirror case fastened to one side of the body of a motor vehicle by a mounting support, said motor vehicle rearview mirror case comprising a back lamp hole at a



back side thereof, a side lamp hole at an outer lateral side thereof, and a wire hole through said mounting support;

a front lamp mounted in said back lamp hole and electrically connected to the headlamps of the motor vehicle for a synchronizing operation;

a side lamp mounted in said side lamp hole and electrically connected to the front and rear directional signals of the motor vehicle of the same side; and

a control circuit connected to the electric circuit of the motor vehicle for controlling the operation of said front lamp and said side lamp, permitting said side lamp to be intermittently turned on and off with the corresponding directional signals of the motor vehicle, or permitting said side lamp to be constantly turned on without flashing.

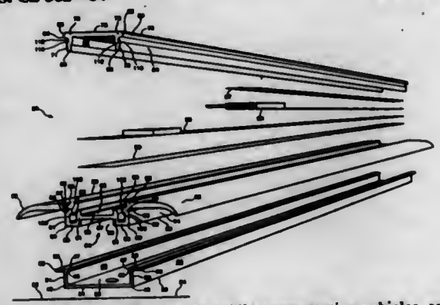
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**5,499,170**

**LIGHTING SYSTEM**

**Bertrand Gagne, 9560 Rue Ceres #301, Pierrefonds, Quebec, Canada**

**Filed Oct. 18, 1994, Ser. No. 325,117**
**Int. Cl.[6] F21V *9/16***
**U.S. Cl. 362—84** **20 Claims**



1. A lighting track for use in public transportation vehicles, said lighting track comprising:

an outer track having first and second upstanding walls connected together in spaced apart relation by a base portion spanning therebetween so as to together define a first retention channel, said upstanding walls each having top and bottom edges, inner and outer faces, and a downwardly facing first barrier portion;

a receptacle having first and second side walls connected together in spaced apart relation by a spanning portion spanning therebetween so as to together define a second retention channel, said side walls each having top and bottom edges, inner and outer faces, an upwardly facing second barrier portion, and a downwardly facing third barrier portion, and being shaped and dimensioned to fit closely between said first and second upstanding walls of said outer track;

a protective top cover having first and second side walls connected together in spaced apart relation by a lens spanning therebetween, said side walls each having top and bottom edges, inner and outer faces, and an upwardly facing fourth barrier portion, and being shaped and dimensioned to fit closely between said first and second side walls of said receptacle;

a lighting element shaped and dimensioned for placement between said receptacle and said top cover;

wherein, at least one of said first and second side walls of said receptacle and said first and second upstanding walls of said outer track is movable between a respective locking position where said second barrier portion is in intimate engagement with said first barrier portion and a respective unlocking position where said second barrier portion is removed from intimate engagement with said first barrier portion; and

wherein, when said lighting track is assembled, said protective top cover is in place in said second retention channel of said receptacle and said receptacle is in place in said first retention channel of said outer track, such that said first and second barrier portions intimately engage each other in interfering relation and said third and fourth barrier portions intimately engage each other in interfering relation, so as to thereby retain said receptacle in releasable locking engagement within said outer track and to thereby retain said protective top cover in releasable locking engagement within said receptacle.

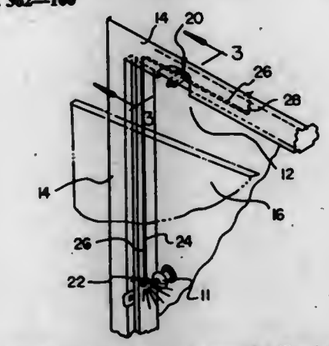
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**5,499,171**

**DOOR LOCK ILLUMINATION APPARATUS**

**Dixie L. Simpson, and Mike Simpson, both of 909 S. 29th, Muskogee, Okla. 74401**

**Filed Jul. 17, 1995, Ser. No. 502,937**
**Int. Cl.[6] E05B *17/10***
**U.S. Cl. 362—100** **2 Claims**



1. A door lock illumination apparatus for illuminating a door lock assembly carried by a dwelling door which is adjacent to a dwelling door frame and which is in close proximity to a storm door and to an AC power source, comprising:

a storm-door-responsive switch assembly mounted on a portion of the dwelling door frame,

an AC-powered illumination source mounted on a portion of the dwelling door frame in proximity to the door lock assembly,

a first conductor assembly connected between said AC-powered illumination source and said storm-door-responsive switch assembly,

a second conductor assembly connected between said storm-door-responsive switch assembly and the AC power source, and

a third conductor assembly connected between said AC-powered illumination source and the AC power source.

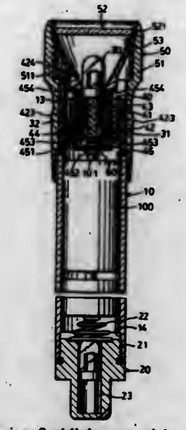


**5,499,172**

**VARIABLE FOCUSING FLASHLIGHT**

**Shoei-Shuh Shiau, No. 10, Alley 1, Lane 551, Sec. 1, Wan-Shou Rd., Gnei-Shan Hsiang, Tao-Yuan Hsien, Taiwan, Prov. of China**

**Filed May 23, 1995, Ser. No. 447,692**
**Int. Cl.[6] F21L *7/00***
**U.S. Cl. 362—187** **19 Claims**



1. A variable focusing flashlight comprising:

a barrel for housing a battery therein, said barrel being made of a conductive material and being coated with inner and outer anodized coatings;

a tail cap mounted on one end of said barrel and having a compression spring provided thereon for urging said battery towards the other end of said barrel;

a lamp having a pair of lamp terminals;

a lamp base for retaining said lamp adjacent to said other end of said barrel; and

a head assembly mounted rotatably and removably on said other end of said barrel and having a substantially planar lens and a substantially parabolic reflector with an open tail end to receive said lamp, said head assembly being controllably translatable along said barrel when rotated with respect to said barrel;

said lamp base including:

a stationary receptacle mounted to said barrel in said other end of said barrel and having a bottom side and an axially extending through bore formed therein;

a conductive connector having an annular plate adjacent said bottom side of said stationary receptacle, an upwardly extending plate projecting from said annular plate and sandwiched between said stationary receptacle and said barrel, and a pointed protrusion extending outwardly from said upwardly extending plate to pierce said inner anodized coating of said barrel so as to contact electrically said barrel;

a first conductor mounted in said stationary receptacle and connecting electrically with one of said lamp terminals, said first conductor having one end extending radially along said bottom side of said stationary receptacle within said barrel;

a second conductor mounted in said stationary receptacle and coupling electrically the other one of said lamp terminals and said conductive connector;

a movable receptacle having a plate portion disposed between said stationary receptacle and said battery, said plate portion being formed with an opening and an upward extension which extends slidably into said through bore of said stationary receptacle and which is longer than said through bore; and

a movable contact provided in said opening;

said open tail end of said reflector abutting against one end of said upward extension of said movable receptacle;

rotation of said head assembly in a direction toward said barrel causing said reflector to push said movable receptacle and said battery against the action of said spring, thereby moving said movable contact away from said first conductor to break electrical connection between said lamp and said battery;

rotation of said head assembly in a direction away from said barrel causing said spring to expand and push said movable receptacle and said movable contact toward said first conductor to make electrical connection between said lamp and said battery.

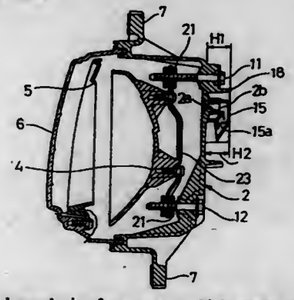
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**5,499,173**

**HEAD LAMP DEVICE FOR MOTOR VEHICLE**

**Takao Yamamoto, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Sep. 29, 1994, Ser. No. 313,588**
**Claims priority, application Japan, Sep. 30, 1993, 5-245729**
**Int. Cl.[6] F21V *29/00***
**U.S. Cl. 362—294** **21 Claims**



1. A head lamp device for a motor vehicle comprising:

a housing for accommodating a bulb and a reflector;

at least one vent hole defined in said housing venting vapors disposed within said housing;

at least one vent pipe operatively connected to said vent hole;

an aiming mechanism for adjusting an optical axis of said reflector being operatively mounted adjacent to said vent pipe; and

a guard rib projecting from the housing separating the aiming mechanism and the vent pipe from each other to prevent contact of said vent pipe during manual adjustment of said aiming mechanism.

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**5,499,174**

**DECORATIVE LAMP ASSEMBLY**

**Cheng-Yuan Lin, Hsin-Chu, Taiwan, Prov. of China, assignor to Yuan Mei Decorative Lamp & Painting Co., Ltd., Hsin-Chu, Taiwan, Prov. of China**

**Filed Sep. 21, 1994, Ser. No. 310,236**
**Int. Cl.[6] F21V *11/00***
**U.S. Cl. 362—353** **6 Claims**

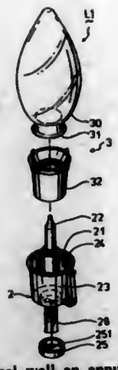
1. A decorative lamp assembly comprising:

a lamp holder including a substantially cylindrical seat having an upper end, a lower end and an elongated cylindrical wall extending from said upper end to said lower end;

a lamp connected securely to said upper end of said cylindrical seat and having two electrical wires extending outwardly through said cylindrical seat;

a lamp casing having a bottom access opening and an annular neck portion extending downwardly from said access opening; and

a lamp-casing holder having a one-piece hollow body which includes an inner cylindrical wall that is sleeved tightly around said cylindrical seat, and an outer cylindrical wall that is concentric with said inner cylindrical wall to confine with



said inner cylindrical wall an annular groove for receiving tightly said annular neck portion of said lamp casing when said lamp casing covers said lamp.

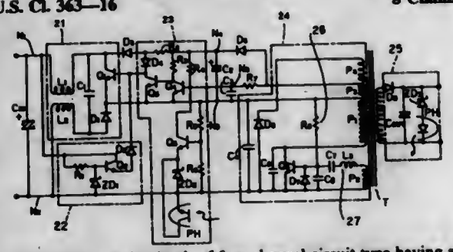
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**5,499,175**

**POWER SUPPLY CIRCUIT**

**Masao Noro, Hamamatsu, Japan, assignor to Yamaha Corporation, Japan**

**Filed Apr. 26, 1993, Ser. No. 53,103**
**Claims priority, application Japan, Apr. 27, 1992, 4-134311**
**Int. Cl.[6] H02M *3/325***
**U.S. Cl. 363—16** **8 Claims**



1. A power supply circuit of four-channel circuit type having an input terminal, an output terminal and a reference potential terminal comprising:

a first inductance, one end of which is connected to the input terminal;

a second inductance, one end of which is connected to the reference potential terminal;

a DC—DC converter circuit connected to the other end of the first inductance through an input side of the converter circuit and connected to the other end of the second inductance through a reference potential side thereof;

a switching inverter circuit connected to the output of said DC—DC converter circuit, said switching inverter circuit comprising:

switching means including switching elements capable of switching an input from the DC—DC converter to convert the input to ac and outputting ac from an output terminal thereof, the ac changing between two different potential;

series resonance means provided in series to current flowing from the output terminal of the switching means, the series resonance means being capable of generating resonance current;

parallel resonance means provided in parallel to voltage produced at the output terminal of the switching means, the parallel resonance means being capable of generating resonance voltage and potential at the output terminal of the switching means being converted from one of the two different potentials to the other by using the parallel resonance voltage of the parallel resonance means; and

switching control means for controlling the switching elements of the switching means so as to intermittently turn on the switching elements; and

dc output means for rectifying and smoothing an output of said switching inverter circuit, the dc output means being capable of taking out a dc output from the resonance current of the series resonance means, whereby all switching operations of the switching elements of the switching means are performed substantially at a voltage zero state or substantially at a current zero state and harmonic contents in operation voltage and operation current in the power supply circuit are reduced.

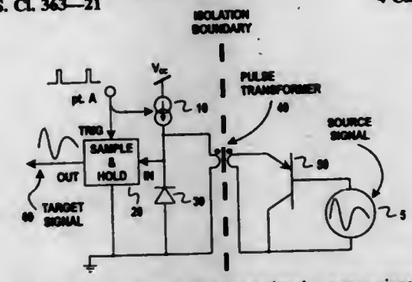
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**5,499,176**

**PULSE TRANSFORMER CIRCUIT FOR ISOLATING ELECTRICAL SIGNALS**

**Brian P. Erisman, Colorado Springs, Colo., assignor to Toko America, Inc., Mount Prospect, Ill.**

**Filed Aug. 12, 1993, Ser. No. 105,390**
**Int. Cl.[6] H02M *3/335***
**U.S. Cl. 363—21** **4 Claims**




1. A process for retrieving, as a target signal, a source signal that has been conveyed across an isolation boundary, the process comprising:

providing a puse transformer having a primary side to which the source signal is applied and having a secondary side from which the target signal is retrieved;

repetitively performing, in synchronization with a clocking signal, the following steps on the secondary side of the pulse transformer:

(1) driving a current pulse into the pulse transformer;

(2) sampling the voltage across the pulse transformer after it has stabilized but while the current pulse is still active; and

(3) storing the sampled voltage for a full clock cycle; and

performing the step on the primary side of the pulse transformer of clamping the voltage across the pulse transformer by the source signal during a portion of a clock cycle when the pulse transformer is being driven by the current pulse.

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**5,499,177**

**INVERTER DEVICE WITH A CIRCUIT FOR GENERATING PULSE WIDTH MODULATION SIGNALS**

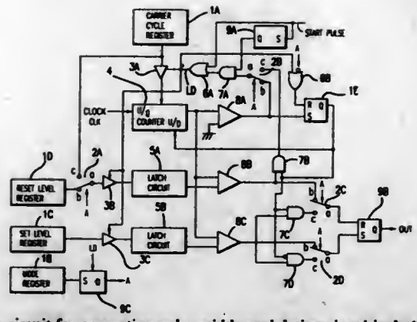
**Takao Ichihara, Kawasaki, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan**

**Continuation-in-part of Ser. No. 49,864, Apr. 20, 1993, Pat. No. 5,404,116. This application Oct. 26, 1994, Ser. No. 330,137**
**Claims priority, application Japan, Apr. 22, 1992, 4-103206**
**Int. Cl.[6] H05B *6/68***
**U.S. Cl. 363—37** **6 Claims**

1. An inverter device with a circuit for generating pulse width modulation signals, comprising,

an inverter section including a rectifier for changing an alternating current to a direct current, a smoothing capacitor connected to a direct current side of the rectifier, and an inverter for changing the direct current smoothed by the smoothing capacitor to an alternating current with variable voltage and frequency by a control of pulse width modulation, and






a circuit for generating pulse width modulation signal including;

a counter for counting a signal and regulating a control cycle of a waveform of pulse width modulation,

first register means for storing first information of the waveform of pulse width modulation,

second register means for storing second information of the waveform of pulse width modulation, and

a mode register for actuating one of first and second modes for automatically generating on-off timing of the waveform of pulse width modulation,

wherein when the first mode is selected in the mode register, the mode register actuates the counter, output of the signal counted by the counter being compared with the information of the first and second register means so that an on-timing signal is outputted when the output of the counter coincides with the first information of the first register means and an off-timing signal is outputted when the output of the counter coincides with the second information of the second register means, and

wherein when the second mode is selected in the mode register, the mode register actuates the counter within one cycle to automatically count down and count up again the signal after reaching a predetermined value so that an on-timing signal is outputted when the output of the counter at first coincides with the first information of the first register means and an off-timing signal is outputted when the output of the counter again coincides with the first information of the first register means after the signal reaches the predetermined value.

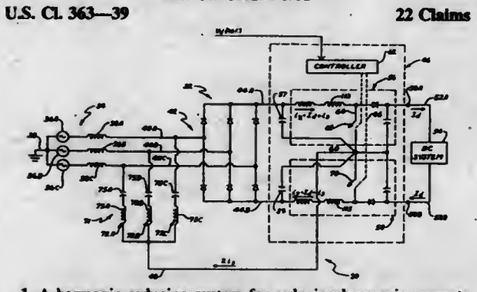
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**5,499,178**

**SYSTEM FOR REDUCING HARMONICS BY HARMONIC CURRENT INJECTION**

**Ned Mohan, St. Paul, Minn., assignor to Regents of The University of Minnesota, Minneapolis, Minn.**

**Continuation-in-part of Ser. No. 17,682, Feb. 12, 1993, abandoned, which is a continuation-in-part of Ser. No. 807,717, Dec. 16, 1991, Pat. No. 5,345,375. This application Feb. 10, 1994, Ser. No. 194,701**
**Int. Cl.[6] H02M *1/12***
**U.S. Cl. 363—39** **22 Claims**




1. A harmonic reducing system for reducing harmonic currents generated from power conversion means connected between a multiphase alternating current power system having a base fundamental frequency and a direct current power system having terminals carrying a direct current, said power conversion means operating at the base fundamental frequency, said harmonic reducing system comprising:

current modulating means connected between said direct current power system and said power conversion means, said current modulating means being connected to receive at least a portion of the direct current carried through the terminals and modulating said at least a portion of the direct current with first and second superimposed sinusoidal currents at a selected harmonic frequency of the fundamental frequency greater than the fundamental frequency, wherein the first and second superimposed sinusoidal currents have an amplitude proportional to the direct current to reduce the selected harmonic currents; and

means connected to the current modulating means for combining said first and second superimposed currents to form a sinusoidal injection current at the selected harmonic frequency, said injection current having an amplitude substantially equal to twice the amplitude of the first superimposed sinusoidal current; and

coupling means connected between said means for combining and said multiphase alternating current power system for injecting a portion of said injection current through said coupling means into each phase of the multiphase alternating current system, the coupling means including a set of windings connected in a zigzag arrangement having a neutral connected to the means for combining for receiving the injection current.

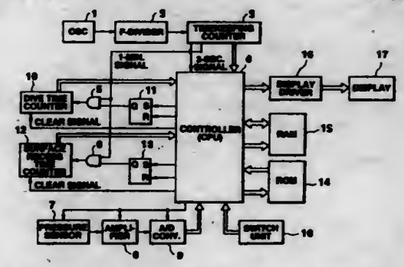
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**5,499,179**

**DECOMPRESSION DATA DISPLAY DEVICES**

**Hiroshi Sato, Hamura, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan**

**Filed Jun. 27, 1994, Ser. No. 266,424**
**Claims priority, application Japan, Jun. 30, 1993, 5-160718**
**Int. Cl.[6] G06F *15/42***
**U.S. Cl. 364—413.31** **30 Claims**




1. A decompression data display device, comprising:

pressure sensing means for sensing a pressure of an environment in which a diver is;

determining means for determining whether a plurality of respective tissues of the diver's body are absorbing or discharging an inert gas;

tissue inert gas level data calculating means for calculating from the pressure sensed by said pressure sensing means data on a level of the inert gas in each of the tissues in accordance with a first arithmetic expression when said determining means determines that the tissues are absorbing the inert gas, and for calculating from the pressure sensed by said pressure sensing means data on the level of the inert gas in each of the tissues in accordance with a second arithmetic expression different from the first arithmetic expression when said determining means determines that the tissues are discharging the inert gas;

decompression data calculating means for calculating decompression data from data on the levels of the inert gas in each

of the respective tissues calculated by said tissue inert gas level data calculating means; and

display means for displaying the decompression data calculated by said decompression data calculating means.

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**5,499,180**

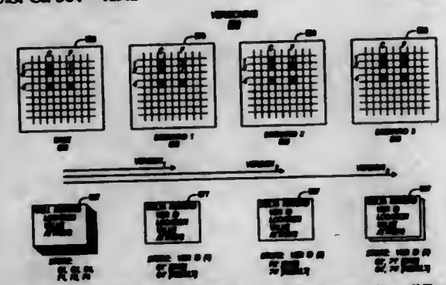
**SYSTEM AND METHODS FOR IMPROVED SCENARIO MANAGEMENT IN AN ELECTRONIC SPREADSHEET**

**Joseph M. Ammirato, San Jose, and Gavin Peacock, Capitola, both of Calif., assignors to Borland International, Inc., Scotts Valley, Calif.**

**Continuation of Ser. No. 31,379, Mar. 11, 1993, Pat. No. 5,303,146. This application Dec. 10, 1993, Ser. No. 165,237**

**Int. Cl.[6] G06F *15/00*; G09B *5/00*; G09C *1/00*; H01J *31/00***

**U.S. Cl. 364—419.1** **32 Claims**



1. An electronic spreadsheet system for processing different versions of a spreadsheet model comprising:

(a) a processor and a storage means;

(b) means for maintaining a base version of said spreadsheet model as ordered information on said storage means, said ordered information including a first type of information that includes data values and a second type of information that depends on other portions of said ordered information;

(c) means for creating a new version of said spreadsheet model in response to user input specifying modification of at least one portion of said ordered information;

(d) comparison means for determining portions of said new version which have changed when compared against said base version, said comparison means being responsive to said at least one portion of said ordered information that changed in direct response to said user input, and further responsive to information of said second type that changed as a result of changes to said at least one portion of said ordered information; and

(e) versioning means for maintaining said new version by storing additional information for only those portions determined to have changed.

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**5,499,181**

**METHODS AND APPARATUS FOR INPUTTING INFORMATION TO A VEHICLE**

**Harry F. Smith, Newtown, Conn., assignor to Intellectual Property Development Associates of Connecticut, Inc., Trumbull, Conn.**

**Continuation-in-part of Ser. No. 253,983, Jun. 3, 1994, which is a continuation of Ser. No. 66,967, May 25, 1993, Pat. No. 5,327,866. This application Oct. 4, 1994, Ser. No. 317,928**

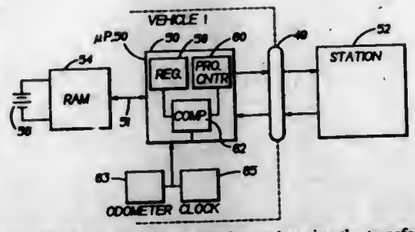
**Int. Cl.[6] G06F *15/00***

**U.S. Cl. 364—424.04** **26 Claims**

1. A method for communicating with an occupant of a vehicle, comprising the steps of:

coupling the vehicle to a station;

transferring information from the station into the vehicle, the transferred information including a date portion;




receiving the transferred information and storing the transferred information within the vehicle;

automatically comparing, in the vehicle, a current date to the stored date portion; and

when the current date is equal to the stored date portion, presenting a message within the vehicle in human perceptible form.

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**5,499,182**

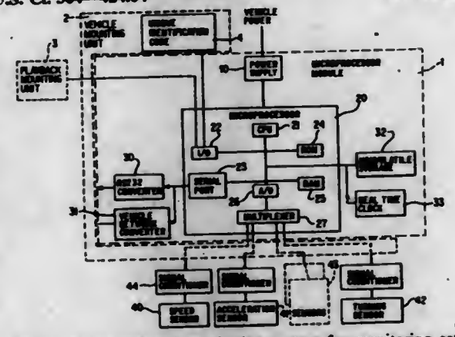
**VEHICLE DRIVER PERFORMANCE MONITORING SYSTEM**

**Jeffrey Ousborne, 5606 Foxview Ct., Clarksville, Md. 21029**

**Filed Dec. 7, 1994, Ser. No. 350,848**

**Int. Cl.[6] G06F *13/00***

**U.S. Cl. 364—424.04** **20 Claims**




19. A vehicle onboard monitoring system for monitoring safe handling of a vehicle by its driver, comprising:

(a) means for sensing vehicle operation to provide vehicle operation data, said vehicle operation sensing means including a plurality of vehicle sensors, each of said plurality of vehicle sensors transducing an operational parameter of a particular vehicle component to a signal representing a respective portion of said vehicle operation data;

(b) processor means having an input coupled to said plurality of vehicle sensors for controlling said vehicle onboard monitoring system and processing said vehicle operation data, said processor means including (1) a microprocessor having an input coupled to said plurality of vehicle sensors, (2) means for data storage coupled to said microprocessor, and (3) a scratch memory coupled to said microprocessor for temporary data storage, said microprocessor including means for sampling said vehicle operation data a plurality of times during a predetermined time interval for temporary storage in said scratch memory, said microprocessor including means for analyzing each sample of vehicle operation data to establish a driver performance characterization parameter for storage in said scratch memory with a respective sample of said vehicle operation data, said microprocessor including means to transfer one sample of said vehicle operation data and its associated driver performance characterization parameter to said means for data storage subsequent to said predetermined time interval responsive to said associated driver performance characterization parameter indicating poorer driver performance than other of said driver performance characterization parameters stored in said scratch memory, said microprocessor including means for detecting a memory full condition of said means for data storage and replacing a previously stored sample of vehicle operation data and its previously stored associated driver performance characterization parameter with a current sample of vehicle operation data and its associated driver performance characterization parameter responsive to said associated driver performance characterization parameter for said current sample of vehicle operation data indicating poorer driver performance than indicated by said previously stored driver performance characterization parameter;

(c) power conversion means coupled to said processor means for converting a vehicle electric power signal format to drive said processor means and said plurality of vehicle sensors;

(d) vehicle mounting means coupled to said processor means for simultaneously coupling said processor means with said vehicle electric power signal and with said plurality vehicle sensors, said vehicle mounting means including an electronically readable identification code unique to said vehicle; and,

(e) playback means adapted to be coupled to a remote computer and said processor means for digital communication between the remote computer and said processor means.



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**5,499,183**

**CONSTANT VOLTAGE GENERATING CIRCUIT HAVING STEP-UP CIRCUIT**

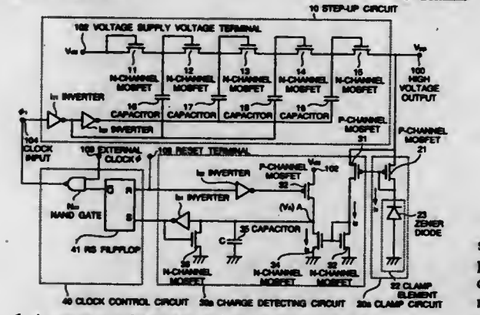
**Hiroyuki Kobatake, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Nov. 30, 1994, Ser. No. 352,675**

**Claims priority, application Japan, Nov. 30, 1993, 5-298800**

**Int. Cl.[6] H02M *3/18*; G05F *3/16***

**U.S. Cl. 363—59** **6 Claims**




1. A constant voltage generating circuit comprising:

a step-up circuit of a charge pump type for generating a predetermined high voltage by action of a charge pumping in response to a clock signal;

a high voltage output terminal connected to an output of said step-up circuit for outputting the generated high voltage;

a clamp circuit connected between said high voltage output terminal and a first voltage supply terminal, said clamp circuit including a clamp element and a first MOSFET of a first channel type having a drain and a gate interconnected to each other, said first MOSFET and said clamp element being connected in series between said high voltage output terminal and said first voltage supply terminal;

a charge detecting circuit reset by a reset signal and operating to generate a charge detection signal when a current having flowed through said clamp circuit reaches a predetermined value, said charge detecting circuit including a second MOSFET of said first channel type having a source connected to said high voltage output terminal and a gate connected to the gate and the drain of said first MOSFET, a third MOSFET of a second channel type opposite to said first channel type, having a gate and a drain connected in common to a drain of said second MOSFET, and a source connected to said first voltage supply terminal, a fourth MOSFET of said first channel type having a source connected to a second voltage supply terminal and a gate connected to receive an inverted signal of said reset signal, a fifth MOSFET of said second channel type having a drain connected to a drain of said fourth MOSFET, a gate connected to said gate of third MOSFET, and a source connected to said first voltage supply terminal, a capacitor connected between said drain of said fifth MOSFET and said first voltage supply terminal, an invertor having an input connected to said drain of said fifth MOSFET and an output for outputting said charge detection signal, and a sixth MOSFET of said second channel type having a drain connected to said drain of said fifth MOSFET, a gate connected to said output of said invertor, and a source connected to said first voltage supply terminal;

a clock control circuit responding to said charge detection signal so as to stop application of said clock signal to said step-up circuit.

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**5,499,184**

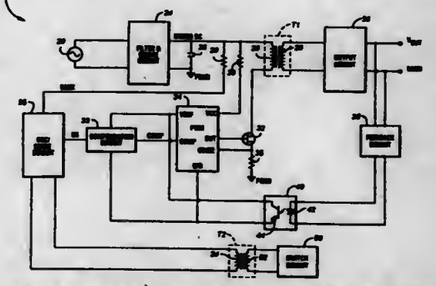
**POWER SWITCH CIRCUITRY FOR ELECTRICALLY ISOLATING THE POWER SWITCH FROM A POWER SUPPLY**

**George F. Squibb, Spring, Tex., assignor to Compaq Computer Corp., Houston, Tex.**

**Filed Jan. 28, 1994, Ser. No. 188,095**

**Int. Cl.[6] H02M *3/335***

**U.S. Cl. 363—100** **18 Claims**



1. A power switching circuit for turning on and off a power supply, the power supply including a power transformer having a primary and a secondary inductor, wherein the primary inductor is coupled to an unregulated DC input voltage and a pulse width modulation circuit for transferring power to an output circuit coupled to the secondary inductor of the power transformer, wherein the output circuit provides a feedback signal to a feedback compensation circuit, which develops a vital signal for controlling the pulse width modulation circuit, and wherein the power supply is turned off upon grounding the vital signal, but otherwise operates normally, said power switching circuit comprising:

a voltage regulator coupled to the unregulated DC input voltage for developing a low power DC signal;

an oscillator coupled to said voltage regulator for generating an oscillating signal;

means coupled to said oscillator for converting said oscillating signal to a DC voltage while said oscillator is providing said oscillating signal;

means coupled to said converting means for discharging said DC voltage while said oscillator is disabled;

a small signal transformer having a primary inductor and a secondary inductor, wherein said secondary inductor of said small signal transformer is coupled to the output of said oscillator;

a power switch coupled to said primary inductor of said small signal transformer, wherein when said power switch is off, said primary inductor of said small signal transformer is open circuited, enabling said oscillator to provide said oscillating

signal, and when said power switch is on, said power switch shorts said primary inductor of said small signal transformer, thereby disabling said oscillator; and

a switch coupled to said converting means and for coupling to the vital signal, wherein said switch is turned on grounding the vital signal when said converting means provides said DC voltage and wherein said switch is turned off, releasing the vital signal, when said converting means is discharged.

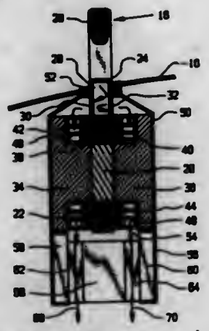
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**5,499,185**

## DUCTED AIR-COOLED SECONDARY OF AUTOMOBILE BATTERY CHARGING TRANSFORMER

**Herbert J. Tanzer, Topanga; William Quon, Alhambra, and John T. Hall, Woodland Hills, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.**

**Filed Nov. 2, 1993, Ser. No. 146,690**
**Int. Cl.[5] H02M 7/06; H01F 27/08;27/30**
**U.S. Cl. 363—126** **18 Claims**



1. A fluid-cooled transformer comprising:

a transformer primary comprising a primary winding and magnetic permeable material, said transformer primary being mounted on an inductive charge coupler, means to supply coolant fluid to said inductive charge coupler;

a transformer secondary having a secondary winding adjacent an inductive charger receptacle and an associated magnetic permeable material, first walls defining a coolant fluid passage adjacent said transformer secondary, second walls defining said inductive charge receptacle to removably receive said transformer primary inductive charge coupler and a duct for ducting coolant fluid from said primary winding through said coolant fluid passage adjacent said transformer secondary to said secondary winding.

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**5,499,186**

## THREE-PHASE POWER CONVERTER WITH FAIL SOFT CHARACTERISTICS

**Paul F. Caroso, Los Angeles, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.**

**Filed Jan. 7, 1994, Ser. No. 178,990**
**Int. Cl.[6] H02M 7/5387**
**U.S. Cl. 363—132** **14 Claims**

1. Apparatus comprising:

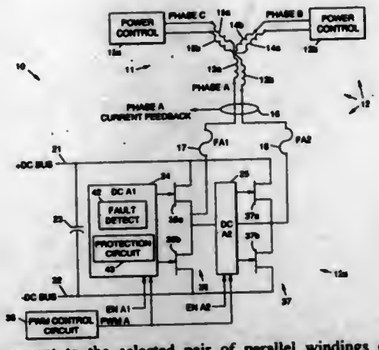
a three-phase motor having three pairs of parallel windings;

first and second DC power busses; and

three switching circuits that each comprise:

(a) first and second parallel coupled switching means coupled between the first and second DC power busses, and coupled to a selected pair of parallel windings of the motor for providing AC current to the motor; and

(b) first and second drive means respectively coupled to the first and second parallel coupled switching means for switching the respective switching means to apply AC current to the selected pair of parallel windings of the motor, and wherein the first and second drive means are responsive to first and second enable signals and a pulse width modulation control signal to control the switching frequency and duty cycle of the first and second switching means.



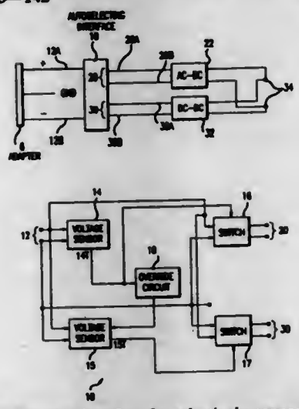
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**5,499,187**

## VOLTAGE SENSING, AUTOSELECTING AIRCRAFT POWER SUPPLY INTERFACE

**Gary B. Smith, Crownsville, Md., assignor to Arinc Research Corporation, Annapolis, Md.**

**Filed Apr. 3, 1995, Ser. No. 415,502**
**Int. Cl.[6] H02M 1/10; H01H 35/00**
**U.S. Cl. 363—142** **10 Claims**



1. An autoselecting interface for selectively connecting an input aircraft power source to one of two interface outputs according to a sensed voltage of the input aircraft power source, the interface comprising:

a pair of input terminals for connection to aircraft power sources;

first and second pairs of output terminals;

first and second voltage sensors connected to said input terminals, said first voltage sensor producing a first trigger output when an AC voltage is present at said input terminals and said second voltage sensor producing a second trigger output when a DC voltage is present at said input terminals;

a first switch responsive to said first trigger output for electrically connecting said pair of input terminals to said first pair of output terminals;

a second switch responsive to said second trigger output for electrically connecting said pair of input terminals to said second pair of output terminals; and

an override circuit for disabling said second voltage sensor from producing said second trigger output when an AC voltage is present at said input terminals.



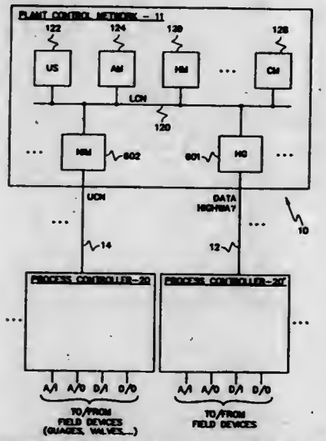
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**5,499,188**

## FLEXIBLE METHOD FOR BUILDING A RECIPE IN A PROCESS CONTROL SYSTEM

**Robert C. Kline, Jr.; Emory C. Clements, both of Glendale; Gretchen L. Krehbiel, Phoenix, all of Ariz.; Darrell R. Tanner, Cincinnati, Ohio; James A. Strilich, Phoenix, Ariz., and David A. Chappell, West Chester, Ohio, assignors to Honeywell Inc., Minneapolis, Minn.**

**Continuation of Ser. No. 989,853, Dec. 14, 1992, abandoned.**
**This application Aug. 22, 1994, Ser. No. 293,773**
**Int. Cl.[6] G06F 15/00;17/00**
**U.S. Cl. 364—468** **6 Claims**



1. In a process plant having a process control system and at least one production line, each production line having equipment with a predetermined equipment configuration, the process control system further including a controller for interfacing to each production line, the process control system having information pertaining to the equipment configuration of each production line stored in an equipment data base, the operations performed by each production line stored in an operations data base, and raw materials information of the process plant stored in a raw materials data base, a method for controlling the production of a product by a production line comprising the steps of:

a) based on the product to be produced, building a formula from formula data, the formula data providing information relating to relative quantities of raw materials included in the product, the order of combining the raw materials, and the process operations, the formula providing a sequence of operations for combining the raw materials compatible with production line operations and consistent with the formula data, the formula being independent of equipment;

b) based on the formula and a selected production line, building a recipe for the product in accordance with a predetermined set of rules to perform a merging of the formula and equipment of the selected production line, wherein the predetermined set of rules comprises the steps of:

i) fetching the formula information, equipment information, raw material information, and operations information from the respective data bases, to store the fetched information in a single data structure;

ii) identifying a material feed group to identify first predetermined steps of the recipe, said first predetermined steps including a START step, necessary to be inserted into the recipe being built;

iii) examining each START step within the recipe to determine if the START step should be made conditional;

iv) sorting each step of the recipe resulting from step (iii) above according to a vessel of the equipment configuration associated with the step;

v) inserting an initiate gauge fill step into the recipe prior to a gauge tank step; and

vi) calculating parameters associated with second predetermined steps of said recipe;

the recipe being a set of steps unique to the selected production line, and further wherein the set of steps is ordered to conform to the capabilities of the equipment configuration of the selected production line, necessary to produce the product; and

c) executing the recipe by the controller, the controller causing the equipment of the production line to perform the specified operations in the specified sequence as called for in each step of the recipe to geneate the product.

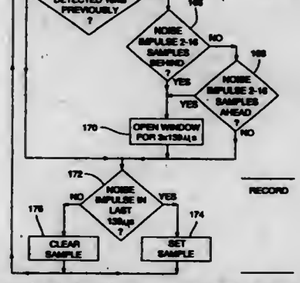
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**5,499,189**

## SIGNAL PROCESSING METHOD AND APPARATUS FOR DISCRIMINATING BETWEEN PERIODIC AND RANDOM NOISE PULSES

**Forrest S. Seitz, Beaverton, Oreg., assignor to Radar Engineers, Portland, Oreg.**

**Filed Sep. 21, 1992, Ser. No. 949,040**
**Int. Cl.[6] G01R 31/08**
**U.S. Cl. 364—480** **27 Claims**



1. A gating circuit for discriminating between first and second types of noise impulses, one of said types being periodic noise impulses, another of said types being random noise impulses, and for providing only pulses of a desired type to an output port, the apparatus comprising:

a circuit node having an input signal thereon, the input signal to be analyzed for the presence of noise;

an electronic switch having an input coupled to said circuit node and an output coupled to the output port;

a noise detector having an output for producing an output signal corresponding to the presence of a noise impulse at the circuit node;

an oscillator for providing a waveform having a reference periodicity;

a processor having a first input coupled to an output of the oscillator and a second input coupled to an output of the noise detector;

a memory associated with the processor;

the processor serving to store a datum in each of a plurality of memory locations in said memory, said datum indicating whether a noise impulse occurred in a time interval associated with said memory location;

the processor further providing an output signal that controls the instantaneous state of said electronic switch in accordance with data stored in said memory during a window of time a predetermined period earlier.

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**5,499,190**

## SYSTEM FOR MEASURING TIMING RELATIONSHIP BETWEEN TWO SIGNALS

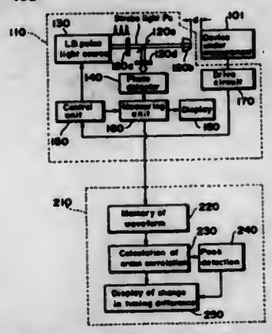
**Hironori Takahashi; Tsuneyuki Urakami; Shinichiro Aoshima, and Iwao Hirano, both of Hamamatsu, Japan, assignors to Hamamatsu Photonics K.K., Hamamatsu, Japan**

**Filed Jan. 15, 1993, Ser. No. 5,091**

**Claims priority, application Japan, Jan. 16, 1992, 4-005890; Dec. 25, 1992, 4-346819**

**Int. Cl.[6] G04F *13/02***

**U.S. Cl. 364—481** **26 Claims**



1. A system for measuring a timing relationship between at least two signals comprising:

first means for measuring waveforms of said at least two signals; and

second means for storing said signals and establishing a reference point for said signals and processing said stored signals to detect a time difference between said signals;

wherein said first means includes an optical system for converting an electrical field of each of said signals to a light signal by light modulation for detecting said signal, and a measuring system for measuring said waveform of each of said signals based upon said electrical field of the signal detected by said first means.

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**5,499,191**

## MULTI-LEVEL LOGIC OPTIMIZATION IN PROGRAMMABLE LOGIC DEVICES

**Stephen P. Young, Colorado Springs, Colo., assignor to Minc Incorporated, Colorado Springs, Colo.**

**Filed Jun. 15, 1992, Ser. No. 898,955**

**Int. Cl.[6] G06F *17/50***

**U.S. Cl. 364—489** **54 Claims**

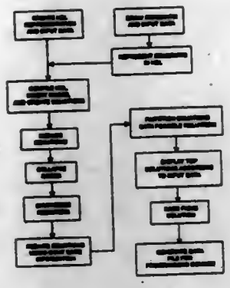
46. A method of designing a logic circuit to be implemented in a programmable logic device having a limited logic capability, said method comprising:

inputting data to be used in the design of said logic circuit into a data storage device;

generating one or more equations representative of said logic circuit, said equations including one or more nodal equations representative of nodes of said logic circuit;

minimizing the number of said nodal equations without exceeding the logic capabilities of said programmable logic device; and

translating said equations into one or more implementations of said logic circuit in said programmable logic device.



**5,499,192**

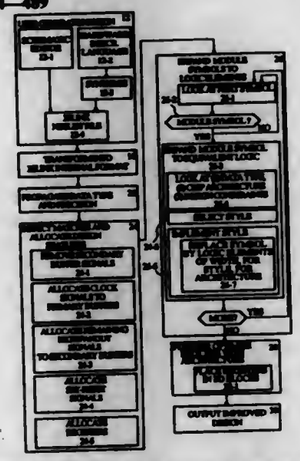
## METHOD FOR GENERATING LOGIC MODULES FROM A HIGH LEVEL BLOCK DIAGRAM

**Steven K. Knapp, Santa Clara; Jorge P. Seidel, San Jose, and Steven H. Kelem, Los Altos Hills, all of Calif., assignors to XILINX, Inc., San Jose, Calif.**

**Continuation of Ser. No. 785,659, Oct. 30, 1991, abandoned. This application Jun. 30, 1994, Ser. No. 268,884**

**Int. Cl.[6] G06F *15/60***

**U.S. Cl. 364—489** **16 Claims**



1. A method of designing a digital circuit comprising the steps of:

capturing a digital circuit design as a plurality of high level arithmetic and logical functions;

providing a library of arithmetic and logical components corresponding to the plurality of high level arithmetic and logical functions, wherein the arithmetic and logical components are adaptable to a plurality of data types and precisions, wherein said data types include encoding information;

assigning a component from the library to each function;

inputting a user-selected data type and precision in the digital circuit;

propagating the selected data type and precision through the digital circuit; and

adapting at least one component as a result of the step of propagating.



**5,499,193**

## AUTOMATED SYNTHESIS APPARATUS AND METHOD OF CONTROLLING THE APPARATUS

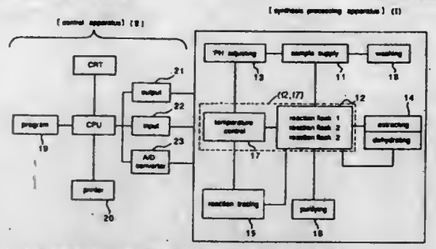
**Tohru Sugawara, Osaka, and Shinji Kato, Takatsuki, both of, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan**

**Continuation-in-part of Ser. No. 870,426, Apr. 17, 1992, abandoned. This application Jun. 21, 1993, Ser. No. 79,375**

**Claims priority, application Japan, Apr. 17, 1991, 3-085492; Jun. 23, 1992, 4-043600 U**

**Int. Cl.[6] G01N *33/50***

**U.S. Cl. 364—500** **37 Claims**



1. An automated synthesis apparatus comprising;

a synthesis processing apparatus including;

a means for shifting contents of at least one container selected from a plurality of storing containers including reaction vessels to another container;

a reaction means for reacting the contents of selected reaction vessels;

an analyzing means for analyzing with analyzers at least one portion of the contents taken out from the reaction vessels;

a purifier means for separating and purifying with purifiers at least one material from the contents of the reaction vessels; and

a restoring means for restoring each of said means of said synthesis processing apparatus to their initial conditions; and

a control apparatus including:

a storing means for storing in advance a plurality of unit operating procedures, each of said unit operating procedures operating one of said means of said synthesis processing apparatus;

a compiler means for compiling at least one unit operating procedure selected by said storing means for setting up an operating procedure for synthesizing a specific target compound;

an organizing means for selecting from and connecting together each means of said synthesis processing apparatus in accordance with the operating procedure of the compiler means to set up control procedures for operating all of the selected means of the synthesis processing apparatus in sequence; and

an operating means of a computer for actuating the control procedures to operate each means of said synthesis processing apparatus for synthesizing the specific target compound.

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**5,499,194**

## METHOD FOR SCANNING THE SURFACE OF AN OBJECT

**Tim Prestidge, and Alexander T. Sutherland, both of Edinburgh, Scotland, assignors to Renishaw plc, Gloucestershire, England**

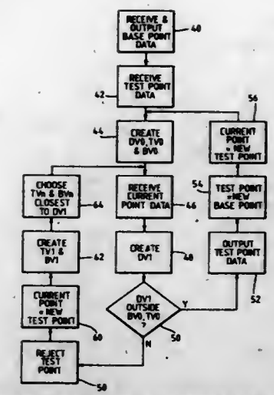
**Filed Mar. 31, 1994, Ser. No. 221,239**

**Claims priority, application United Kingdom, Apr. 14, 1993, 9307697**

**Int. Cl.[6] G01B *5/004***

**U.S. Cl. 364—506** **25 Claims**

18. A method for filtering a data signal generated by scanning the surface of a workpiece, comprising the steps of:



placing the workpiece within a measuring space of a machine having a probe and a plurality of axis measuring devices, each axis measuring device generating a coordinate signal indicating a distance of the surface from an origin position along an independent axis;

scanning the surface with the probe;

generating a data signal comprising a plurality of point position data signals, each point position data signal indicative of a position of a point of the surface relative to a predetermined coordinate system and comprising a plurality of the coordinate signals from the plurality of axis measuring devices;

filtering the data signal to remove redundant ones of the plurality of point position data signals to form a filtered data signal; and

storing the filtered data signal in a memory device;

wherein the filtering step comprises the steps of:

selecting a point corresponding to one of the plurality of point position data signals as a base point,

selecting another point corresponding to another of the plurality of point position data signals as a test point,

selecting another point corresponding to another of the plurality of point position data signals as a current point, the base, test and current points located in that order on the workpiece surface,

generating a test vector extending from the base point through the current point,

determining if the test vector lies within a selected tolerance distance extending from the test point, and

filtering the point position data signal corresponding to the test point from the data signal as one of the redundant ones of the plurality of point position data signals when the test vector lies within the tolerance distance.

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**5,499,195**

## FINE-GRAINED MULTI-PLANAR CLUTTER REJECTION PROCESSOR

**Patrick F. Castelaz, Yorba Linda, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.**

**Filed Apr. 19, 1994, Ser. No. 230,041**

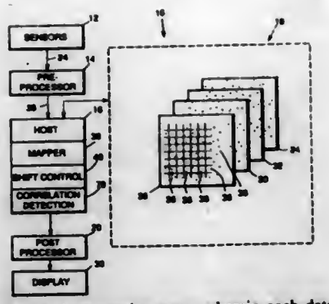
**Int. Cl.[6] G01S *13/52***

**U.S. Cl. 364—516** **13 Claims**

1. A system for correlating multiple sets of data, said system comprising:

a plurality of arrays, each including a mapping of one of said sets of data, the arrays each having coordinate locations, some of which contain data, including either target data which is correlated between sets, or clutter which is uncorrelated between sets;

means for shifting the positions of the second and subsequent arrays with respect to the first array such that the second and subsequent arrays move in a generally spiral pattern which is




larger for each successive array, wherein each data point in each shifted array is assigned a new reference coordinate location corresponding to its new location with respect to the first array; and

means for identifying, at each said shift, the coordinate locations in the first array which contain data points and which also contain data points in subsequent arrays in their reference coordinate locations, whereby the data points in the identified coordinate locations are correlated with each other.

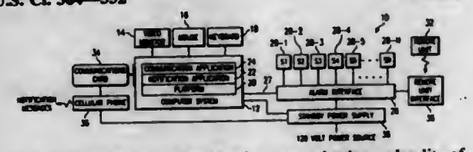
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**5,499,196**

## SENSOR INTERFACE FOR COMPUTER-BASED NOTIFICATION SYSTEM

**Steven M. Pacheco, Carrollton, Tex., assignor to P.C. Sentry, Inc., Richardson, and Harris Partners, Ltd., Allen, both of Tex.**

**Division of Ser. No. 108,884, Aug. 18, 1993. This application Oct. 19, 1993, Ser. No. 139,544**
**Int. Cl.[6] G08B *1/00***
**U.S. Cl. 364—552** **12 Claims**



1. For a computer-based notification system having a plurality of sensors installed at selected locations within defined area being monitored by said computer-based notification system and a computer system for determining whether an event requiring an issuance of a notification to a selected recipient has occurred, a sensor interface for interconnecting said plurality of sensors and said computer system, comprising:

a system bus;

a level register coupled to said system bus, said level register having a single bit block corresponding to each one of said plurality of sensors;

a status register coupled to said system bus, said status register having a flag bit corresponding to each one of said plurality of sensors;

a computer processor coupled to said system bus and to each of said plurality of sensors, said computer processor including:

means for repeatedly polling each of said plurality of sensors to determine its state;

means for storing, each time said plurality of sensors are polled, the state of each of said plurality of sensors in said corresponding bit block of said level register;

means for determining changes in the state of each of said plurality of sensors between successive pollings thereof;

means for setting said flag bits of said status register corresponding to each one of said plurality of sensors determined to have changed state between successive pollings thereof; said

means for peroidically transferred the contents of said level register and said status register to said computer system;

wherein said computer system determines whether an event requiring an issuance of a notification has occured based upon the contents of said level register and said status register transferred thereto.

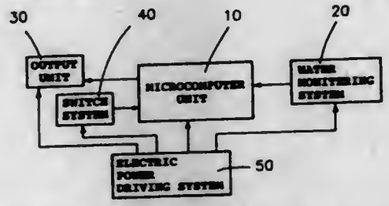
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**5,499,197**

## INTELLIGENT AND ALL-BEARING CONTROL CIRCUIT DEVICE OF REVERSE OSMOSIS DRINKING WATER MACHINE

**Hsu-Chao Fou, No. 109, Tunnel 316, Dah Shuenn 3 Road, Kaohsiung, Taiwan, Prov. of China**

**Filed Apr. 5, 1994, Ser. No. 222,996**
**Int. Cl.[6] G06F *19/00***
**U.S. Cl. 364—550** **10 Claims**




1. An intelligent and all-bearing control circuit device of a reverse osmosis drinking water machine which filters water by means of a plurality of filtration elements, comprising a microcomputer unit, a water monitoring system, an output unit, a switch system, and an electric power driving system, wherein:

said microcomputer unit having an output end and an input end for processing signals transmitted thereto;

said water monitoring system having an output end connected with said output end of said microcomputer unit and sending out signals to said microcomputer unit via said output end of said water monitoring system to said input end of said microcomputer unit, for measuring water quality signal; said water monitoring system comprising an analog-digital converter;

said switch system having an output end connected with said input end of said microcomputer unit for data searching and data setting up, said switch system comprising a SW1 starting key, a SW2 key for setting up the data at the time when the first filtration element replaced, a SW3 key for setting up the data at the time when the second filtration element replaced, a SW4 key for setting up data, a SW5 key for searching data, and a SW6 key for alternating a water-making switch;

said output unit, which comprises a driving circuit, an LCD displaying circuit and a speech circuit, having an input end connected with said output end of said microcomputer unit, for displaying instructions sent by said microcomputer unit in which the signals from said water monitoring system and said switch system are processed, whereto said speech circuit is used in receiving breakdown signals and providing warning signals of replacing the worn-out filtration element;

said electric power driving system, which is a source of operating power for driving said microcomputer unit, said water monitoring system, said output unit, and said switch system, having a direct current power supplying device for supplying the power that is required for the normal operation of said microcomputer unit, said water-monitoring system, said driving circuit of said output unit, and said switch system; said electric power driving system further comprising a standby power source IC which can be put into service on an emergency basis at such time when a power outage breaks out;

said microcomputer unit comprising a central processing unit, a time clock IC, a random access memory, an erasable programmable read only memory, a bolted lock decoder, a first interface circuit, a second interface circuit, a data bus, and an address bus; in which said data bus and address bus are conductors for common connection;



said central processing unit having data pins D0, D1, D2, D3, D4, D5, D6 and D7 connected with said data bus; address pins A0, A1, A2, A3, A4, A5, A6, A7, A8, A9, A10, A11, A12, A13, A14 and A15 connected with said address bus; data reading pins RD connected respectively with an OE pin of said random access memory, an OE pin of said erasable programmable read only memory, an I4 pin of said bolted lock decoder, a RD pin of said first interface circuit, a RD pin of said second interface circuit, and a RD pin of said analog-digital converter of said water monitoring system; data writing pins WR connected respectively with a WE pin of said random access memory, an I3 pin of said bolted lock decoder, a WR pin of said first interface circuit, a WR pin of said second interface circuit, a WR pin of said analog-digital converter, for controlling the access of data such as the PPM value and the current value of the volume of drinking water made and the service life of said filtration elements;

said time clock having address and data pins AD0, AD1, AD2, AD3, AD4, AD5, AD6 and AD7 connected with said data bus and an IRQ pin connected with an interruption pin INT of said central processing unit;

said random access memory having data pins D0, D1, D2, D3, D4, D5, D6 and D7 connected with said data bus and address pins A0, A1, A2, A3, A4, A5, A6, A7, A8, A9 and A10 connected with said address bus, for storing information of the time computed by said time clock IC, the parts per million (PPM) value of drinking water which is detected by said water monitoring system, and said current status of service life of each of said filtration elements;

said erasable programmable read only memory having data pins D0, D1, D2, D3, D4, D5, D6 and D7 connected with said data bus and address pins A0, A1, A2, A3, A4, A5, A6, A7, A8, A9, A10, A11, A12, A13 and A14 connected with said address bus, for storing therein a service life information of each of said filtration elements; said central processing unit being responsible for search instruction to make sure if said first and second interface circuits are grounded with the pins of said SW1, SW2, SW3, SW4, SW5, and SW6 keys of said switch system;

said bolted lock decoder having pins I0, I1, I2, I5, I6, I7, I8 and I9 connected respectively with control pins M1, MREQ, IORQ, A13, A14, A15 and RFSH of said central processing unit and a STBY pm and a RESET pin of said time clock IC; said bolted lock decoder further providing a plurality of output end pins F0, F1, F7, F2, F3, F4, F5, F6 and F8 connected respectively with a CD pin of said erasable programmable read only memory, a CEIN and a WATCH pins of said standby power source IC of said electric power driving system, an AS pin, a DC pin and a D/W pin of said time clock IC, a CS pin of said first interface circuit, and a CS pin of said second interface circuit;

said first interface circuit, which is an interface for transmitting data information among said driving circuit, said LCD displaying circuit, said speech circuit, and said switch system, having data pins D0, D1, D2, D3, D4, D5, D6 and D7 connected with said data bus, and data pins A0 and A1 connected respectively with an A0 pin and an A1 pin of said central processing unit and an A0 pin and an A1 pin of said second interface circuit; said first interface circuit further having pins PA0, PA1 and PA2 connected with an output end of said driving circuit; and

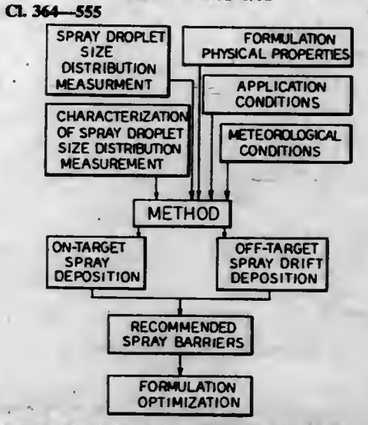
said second interface circuit, which is an interface for transmitting data information, having data pins D0, D1, D2, D3, D4, D5, D6 and D7 connected with said data bus.

**5,499,198**

## METHOD FOR PREDICTING SPRAY DRIFT

**Robert E. Gaidos, and Mukund R. Patel, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.**

**Filed Aug. 31, 1993, Ser. No. 114,524**
**Int. Cl.[6] B05D *1/02***
**U.S. Cl. 364—555** **7 Claims**




1. A method for delivering a maximum on-target and a minimum off-target spray deposition from aerial applications comprising the steps of:

a) providing an initial discrete spray droplet size distribution data for the applied spray formulation containing an active ingredient;

b) providing application condition data;

c) providing prevailing meteorological condition data;

d) providing volume fraction data of the non-volatile components of the formulation;

e) providing formulation carrier property data;

f) providing fluid property data of the fluid through which the formulation carrier traverses;

g) providing heights and widths of effective initial spray droplet volume sources which correspond to the discrete initial spray droplet sizes in the spray droplet distribution;

h) applying the data of steps (b)-(f)—to each of the volume sources defined in step (g) to determine spray deposition resulting from each volume source comprised of droplet size distribution of step (a);

i) combining the resulting deposition from each volume source to determine the total amount of active ingredient deposited on-target as well as off-target; and

k) delivering the aerial application, using the results of step (i), so as to provide a maximum on-target spray deposition and a minimum off-target spray deposition.

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**5,499,199**

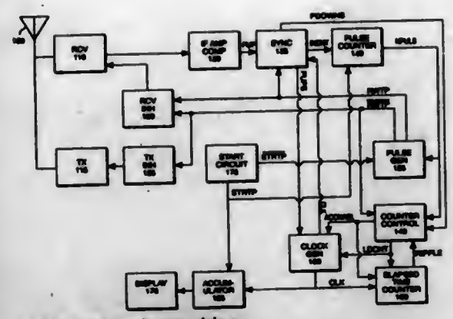
## DISTANCE MEASURING SYSTEM

**James G. Demas, 5037 ½ Rosewood Ave., Los Angeles, Calif. 90004; Nicholas G. Demas, 5249 Watson Rd., Cookeville, Tenn. 38501; John G. Demas, 4182 Seton Clr., Palm Harbor, Fla. 34683; Leonidas G. Demas, 9 Academy Ct., Bedminster, N.J. 07921, and Frank Cornett, Cookeville, Tenn., assignors to James G. Demas, Los Angeles, Calif.; Nicholas G. Demas, Cookeville, Tenn.; John G. Demas, Palm Harbor, Fla., and Leonidas G. Demas, Bedminster, N.J.**

**Filed Oct. 5, 1993, Ser. No. 131,755**
**Int. Cl.[6] G01B *7/14*; G01S *13/74***
**U.S. Cl. 364—561** **20 Claims**

1. A distance measuring system, comprising:

a first radio unit located at a first location and a second radio unit located at a second location,



said first radio unit comprising:
- a receiver for receiving an RF query signal from said second radio unit; and
- a transmitter responsive to said RF query signal for transmitting an RF answer signal to said second radio unit; and

said second radio unit comprising:
- a transmitter for transmitting said RF query signal to said first radio unit;
- a receiver for receiving said RF answer signal from said first radio unit;
- counting circuitry for counting during a time beginning when said RF query signal is transmitted and ending when said RF answer signal is received so as to generate a count which corresponds to the distance between said first radio unit and said second radio unit; and
- display means coupled to said counting circuitry for displaying said count, wherein said counting circuitry comprises:

a counter control circuit;

a counter circuit responsive to a first signal from said counter control circuit for counting in a first direction during the time beginning when said RF query signal is transmitted and ending when said RF answer signal is received and responsive to a second signal from said counter control circuit for counting in a second direction until said counter reaches a predetermined count, said counter circuit generating a ripple signal when said counter circuit reaches the predetermined count; and

an accumulator responsive to the second signal from said counter control circuit for counting in the first direction and responsive to said ripple signal for ending said counting in the first direction.

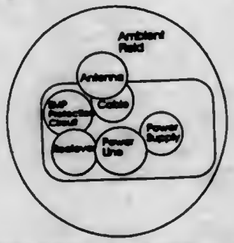
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**5,499,200**

**PROBABILISTIC MODELING OF ELECTROMAGNETIC INTERACTIONS**

**Andrew S. Podgorski, 332 Crestview Road, Ottawa, Ontario, Canada**

**Filed May 17, 1993, Ser. No. 62,804**
**Int. Cl.[6] G06F *17/00***
**U.S. Cl. 364—578** **6 Claims**




1. In an electrical system where components and environmental effects upon components within the system are modeled by a plurality of nodes which interact with each other, and where a field generated by a node and the susceptibility of that node dependent upon its shielding characteristics is determined, and where a most critical path between two of the nodes is determined based on the susceptibility, field generated, and shielding effectiveness, a method of determining the probability of failure of the system comprising the steps of:
- a) determining at least a value corresponding to the electromagnetic coupling between nodes in the critical path;
- b) determining at least an ambient field value for each nodes in the critical path;
- c) determining at least a susceptibility value for each node in the critical path;
- d) determining a probability function which approximates the values in step (a) wherein the probability function is integrated from minus infinity to plus infinity, a resulting integral of the probability function being a positive defined number;
- e) determining a probability function which approximates the values in step (b) wherein the probability function is integrable from minus infinity to plus infinity, a resulting integral of the probability function being a positive defined number;
- f) determining a probability function which approximates the values in step (c) wherein the probability function is integrable from minus infinity to plus infinity, a resulting integral of the probability function being a positive defined number;
- g) locating at least three points on a curve defined by each of the probability functions;
- h) determining a fuzzy value from the at least three points located in step (g) for each curve;
- i) performing fuzzy subtraction of the values in step (h) representing shielding effectiveness, ambient field and susceptibility;
- j) determining a probability function PF(x) of upset or damage of the whole system wherein the probability function is integrable from minus infinity to plus infinity, a resulting integral of the probability function being a positive defined number;
- k) adjusting the shielding or the system to reduce said positive defined number to an acceptable value.

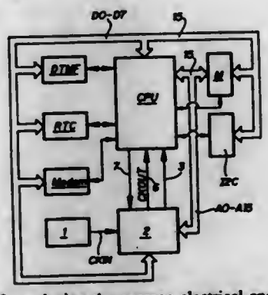
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**5,499,201**

**METHOD FOR REDUCING THE ELECTRICITY CONSUMPTION OF MICROPROCESSOR-BASED APPARATUSES, IN PARTICULAR THOSE FOR PUBLIC TELEPHONE STATIONS**

**Joel Wenger, Ch. de la Montagne 124, Chêne-Bougeries, Switzerland, and Philippe Broccard, Jules-Crosnier 16, Geneva, Switzerland**

**PCT No. PCT/CH93/00064, § 371 Date Nov. 12, 1993, § 102(e) Date Nov. 12, 1993, PCT Pub. No. WO93/18608, PCT Pub. Date Sep. 16, 1993**
**PCT Filed Mar. 10, 1993, Ser. No. 146,809**
**Claims priority, application Switzerland, Mar. 12, 1992, 805/92**
**Int. Cl.[6] H02J *3/16***
**U.S. Cl. 364—707** **12 Claims**




1. Process for reducing the average electrical energy consumption of a public telephone station subject to real-time constraints and equipped with a power reduction device comprising:



a microprocessor, which microprocessor passes temporarily into an energy-saving inactive state;

a system of oscillators providing clock pulses to the microprocessor,

means for varying the clock frequency arriving at the microprocessor between a high frequency and a lower frequency, these means including:

a fixed timebase providing the microprocessor with fixed timebase signals via a first line,

a second line for transmitting the clock pulses to the microprocessor,

means for interpreting a command from the microprocessor to a handler for making the system pass from the active state to the inactive state and vice versa,

comprising the steps of:

recognizing a need of the microprocessor to work at said high frequency;

commuting to the high frequency; and

applying the frequency to the microprocessor corresponding to the activity state.

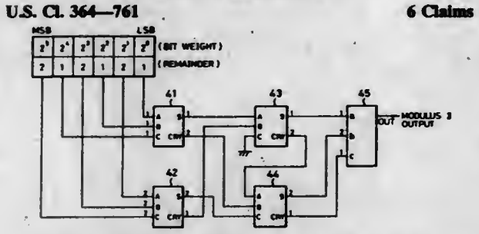
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**5,499,202**

**RESIDUE CIRCUIT**

**Tsugio Takahashi; Hitoshi Fujita, both of Tokyo, and Hiroshi Okamoto, Miyagi, all of, Japan, assignors to NEC Corporation, Tokyo, Japan**

**Filed Jun. 2, 1994, Ser. No. 253,057**
**Claims priority, application Japan, Jun. 2, 1993, 5-156294**
**Int. Cl.[6] G06F *7/52;7/50***
**U.S. Cl. 364—761** **6 Claims**




1. A residue circuit for calculating a remainder through division of a dividend of a binary number having six bits, comprising:
- first adding means for summing 3 bits in even number bits of even bits of said dividend to generate a summing output and a carry output;
- second adding means for summing 3 bits in odd number bits of even bits of said dividend to generate a summing output and a carry output;
- third adding means for summing said summing output of said first adding means and said carry output of said second adding means for generating a summing output and a carry output;
- fourth adding means for summing said summing output of said second adding means, said carry output of said first adding means and said carry output of said third adding means for generating a summing output and a carry output; and
- a remainder generation means for outputting a remainder with respect to divisor 3 according to a bit pattern of said summing output of said third adding means, said summing output and said carry output of said fourth adding means.

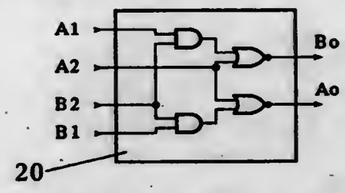
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**5,499,203**

**LOGIC ELEMENTS FOR INTERLACED CARRY/BORROW SYSTEMS HAVING A UNIFORM LAYOUT**

**Nathan Grundland, 6 Alkalai St., Rehovot, Israel**

**Filed Sep. 27, 1993, Ser. No. 126,650**
**Claims priority, application Italy, Sep. 27, 1992, 103299; Aug. 29, 1993, 106830**
**Int. Cl.[6] G06F *7/50***
**U.S. Cl. 364—786** **21 Claims**




1. An inverting-type logic element defined as a Binary Inverting Cell (BI-Cell) comprising:
- a pair of first and second output terminations Ao and Bo;
- at least first and second input termination pairs (Ai-Bi), each pair having first (Ai) and second (Bi) input terminations, and
- a first and second non-inverting type logic gate and a first and second inverting-type logic gate,
- said first non-inverting type logic gate providing its output to an input of said first inverting-type logic gate, said first non-inverting type logic gate and said first inverting-type logic gate defined as a first combined gate and having its output (Z1) being connected to said Bo output termination,
- said second non-inverting type logic gate providing its output to an input of said second inverting-type logic gate, said second non-inverting type logic gate and said second inverting-type logic gate defined as a second combined gate and having its output (Z2) being connected to said Ao output termination,
- each of said first and second combined gates having inputs U1, V1 and W,
- said first input termination (A1) of said first input termination pair being connected to said input (W) at said non-inverting type gate of said first combined gate, defined as W1,
- said second input termination (B1) of said first input termination pair being connected to said (W) at said non-inverting type gate of said second combined gate, defined as W2,
- said first input termination (A2) of said second input termination pair being connected in common to said inputs (U1) of said inverting-type logic gates of said first and second combined gates,
- said second input termination (B2) of said second input termination pair being connected in common to said inputs (V1) of said non-inverting type logic gates of said first and second combined gates,
- wherein said input termination pairs (Ai,Bi) are respectively provided with input signal pairs (Sai, Sbi), said input signal pairs having the IMPY relationship:

$$\overline{Sai}+Sbi=1$$

where Sbi⊃Sai;
- and wherein said first and second output terminations Ao and Bo provide, respectively, a binary output signal pair Sao and Sbo, and wherein said inverting-type logic element is characterized in that said first and second binary output signals Sao and Sbo are related by the logical IMPLY relation:

$$\overline{Sao}+Sbo=1,$$

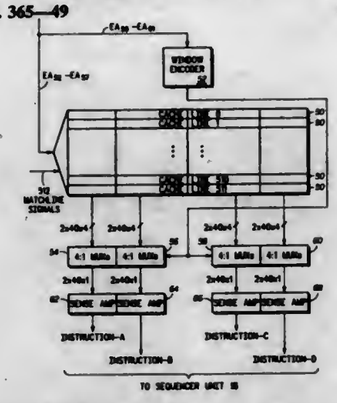
where Sbo⊃Sao.

**5,499,204**

## MEMORY CACHE WITH INTERLACED DATA AND METHOD OF OPERATION

David Barrera; Dave Levitan; Bahador Rastegar, and Paul C. Rossbach, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 5, 1994, Ser. No. 270,628
Int. Cl.[6] G11C *15/00*
U.S. Cl. 365—49 16 Claims




1. A memory cache outputting a subset of one of a plurality of contiguous memory elements responsive to an address, the memory cache comprising:

a plurality of cache lines, each one of the plurality of cache lines storing one of the plurality of contiguous memory elements, each one of the plurality of contiguous memory elements comprising a plurality of bits, each one of the plurality of contiguous memory elements interlaced at an element level and at a bit level in the each one of the plurality of cache lines, a "set of interlaced memory elements," the plurality of cache lines outputting the set of interlaced memory elements responsive to the address;

a first plurality of switching means coupled to the plurality of cache lines, a differing one of the first plurality of switching means receiving a differing subset of the set of interlaced memory elements and outputting one memory element of the subset of the one of the plurality of contiguous memory elements responsive to the address; and

a second plurality of switching means coupled to the first plurality of switching means, each one of the second plurality of switching means receiving the subset of the one of the plurality of contiguous memory elements, each one of the second plurality of switching means outputting a differing memory element of the subset of the one of the plurality of contiguous memory elements responsive to the address.

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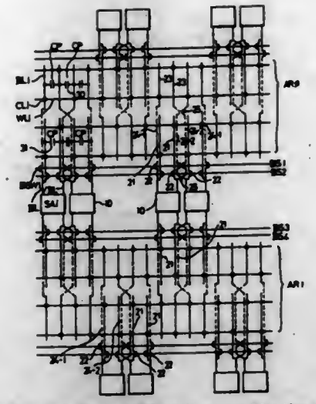
**5,499,205**

## BIT LINE STRUCTURE

Jin-Hong Ahn, and Tae-Hyoung Kim, both of Kyungki, Rep. of Korea, assignors to Goldstar Electron Co., Ltd., Chungcheongbuk, Rep. of Korea

Filed Jan. 31, 1995, Ser. No. 380,757
Int. Cl.[6] G11C *5/06*
U.S. Cl. 365—63 4 Claims

1. A bit line structure having sense amplifiers, each sense amplifier is connected to two pairs of bit lines BL and /BL through bit line selecting switches, to the bit line a plurality of cells being connected, comprising:




a first bit line pair BL and /BL and a second bit line pair BL and /BL formed by dividing a bit line disposed within a same column respectively in a cell array;

a first connecting bit line for connecting the bit line BL of said second bit line pair to said sense amplifier;

a second connecting bit line for connecting the bit line /BL of said second bit line pair to said sense amplifier;

said second connecting bit line having two crossing sections 25 in electrically disconnected state crossing with another second connecting bit line for connecting a bit line BL of a second bit line belonging to an adjacent sense amplifier; and

bit line selecting switches for connecting said first bit line pair and said second bit line pair respectively to said sense amplifier.

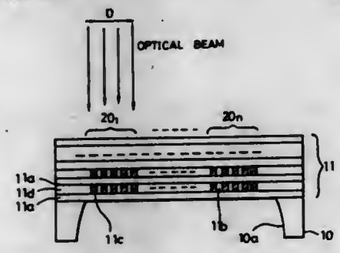
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**5,499,206**

## SEMICONDUCTOR OPTICAL MEMORY DEVICE FOR OPTICAL STORAGE OF INFORMATION WITH INCREASED RECORDING DENSITY

Shunichi Muto, Atsugi, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 635,434, Dec. 28, 1990, abandoned.
This application Nov. 24, 1993, Ser. No. 156,979
Claims priority, application Japan, Dec. 29, 1989, 1-340420
Int. Cl.[6] G11C *13/04*
U.S. Cl. 365—114 10 Claims




1. A semiconductor optical memory device for storing information in the form of a localized modulation of optical absorption, comprising:

a semiconductor layer having an upper major surface and a lower major surface, said semiconductor layer extending in first and second, mutually perpendicular directions; and



a plurality of quantized regions formed in said semiconductor layer, each of said quantized regions having first and second sizes in said first and second directions respectively, each said quantized region further having a third size in a third direction perpendicular to any of said first and second directions, at least two of said first through third sizes being set sufficiently small in each said quantized region such that a quantized energy level is formed in each of said quantized regions, each said quantized region thereby absorbing an optical radiation of which wavelength is pertinent to the quantized energy level of said quantized region by exciting first type carriers having a first polarity and second type carriers having a second, opposing polarity, each of said quantized regions comprising a first semiconductor material confined in at least two of said first through third directions to form said quantized energy level;

wherein each of the plurality of quantized regions has the optical absorption wavelength that is different from that of other quantized regions included in a common elemental recording area and

wherein each of said quantized regions is separated from the other quantized regions, with respect to the directions in which the size of the quantized region are limited, by a second semiconductor material that has a band gap larger than that of the first semiconductor material forming the quantized region.

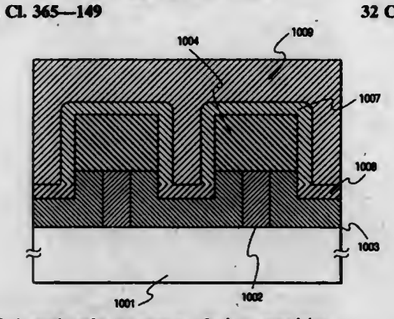
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**5,499,207**

## SEMICONDUCTOR MEMORY DEVICE HAVING IMPROVED ISOLATION BETWEEN ELECTRODES, AND PROCESS FOR FABRICATING THE SAME

Hiroshi Miki, Kokubunji; Yuzuru Ohji, Hinode, and Shinichi Tachi, Sayama, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 28, 1994, Ser. No. 281,568
Claims priority, application Japan, Aug. 6, 1993, 5-195829; Nov. 12, 1993, 5-283047
Int. Cl.[6] G11C *11/24*
U.S. Cl. 365—149 32 Claims




17. A semiconductor memory device comprising:

an insulator formed over a semiconductor active layer, which active layer includes a device for driving a capacitor;

a bottom electrode of the capacitor formed over a predetermined region of said insulator and having a predetermined shape;

a crystalline insulator formed continuously over an exposed surface of said insulator and said bottom electrode; and

an upper electrode of the capacitor formed over said crystalline insulator,

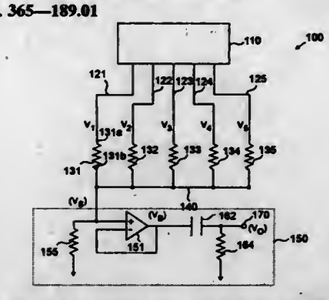
wherein the portion of said insulator, over which said bottom electrode is not formed, has a modified surface, and wherein the crystallinity and dielectric constant of said crystalline insulator formed over said modified surface are lower than the crystallinity and dielectric constant of said crystalline insulator formed over said bottom electrode.

**5,499,208**

## INTEGRATED CIRCUIT MEMORY DEVICE

Masakazu Shoji, Warren, N.J., assignor to AT&T Corp., Murray Hill, N.J.

Filed Sep. 12, 1994, Ser. No. 304,311
Int. Cl.[6] G11C *7/00*
U.S. Cl. 365—189.01 5 Claims




1. A method of obtaining data values stored within a memory circuit having a plurality of memory cells, each of the plurality of memory cells having a resistance value representative of the data stored therein, each of the memory cells connected to a source of ramp step signals and to a sum line, the method comprising:

a) generating a first ramp step signal and providing the first ramp step signal to a first memory cell to cause the voltage on the sum line to increase at a rate proportional to the resistance value of the first memory cell;

b) differentiating the sum line voltage to provide an output voltage proportional to the resistance value of the first memory cell;

c) generating a subsequent ramp step signal and providing the subsequent ramp step signal to a subsequent memory cell to cause the voltage on the sum line to ramp at a rate proportional to the resistance value of the subsequent memory cell;

d) differentiating the sum line voltage to provide an output voltage proportional to the resistance value of the subsequent memory cell; and

e) repeating steps c) and d) for each of the plurality of memory cells.

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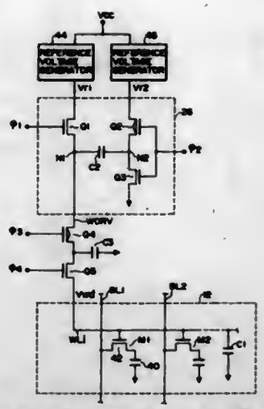
**5,499,209**

## INTEGRATED SEMICONDUCTOR MEMORY WITH INTERNAL VOLTAGE BOOSTER OF LESSER DEPENDENCY ON POWER SUPPLY VOLTAGE

Yukihito Oowaki, Yokohama; Daisaburo Takashima, Kawasaki, and Masako Ohta, Yokohama, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 182,397, Jan. 18, 1994, abandoned, which is a division of Ser. No. 708,362, May 31, 1991, Pat. No. 5,307,315. This application Jun. 1, 1995, Ser. No. 457,738
Claims priority, application Japan, Jun. 1, 1990, 2-141686
Int. Cl.[6] G11C *7/00;* H03K *17/687*
U.S. Cl. 365—189.11 9 Claims

1. A random-access memory comprising:



an array of rows and columns of memory cells, each of which has a data storage capacitor and a data transfer transistor;

bit lines associated with said memory cells at current carrying electrodes of said transistors;

word lines associated with said memory cells at control gates of said transistors; and

a driver circuit coupled with said word lines, for receiving a power supply voltage of said memory, for generating a specific potential-increased voltage of a preselected potential level that is essentially insensitive to variation in the power supply voltage during an operation of said memory, and for supplying a selected word line with the specific voltage as a drive voltage therefor, said driver circuit including at least one capacitor having a first insulated electrode and a second insulated electrode, and a circuit for supplying a regulated voltage, which is substantially independent of variation in the power supply voltage, to at least one of said first insulated electrode and second insulated electrode.

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**5,499,210**

**LOW POWER CONSUMPTION SEMICONDUCTOR MEMORY**

**Tadashi Usami, Hino, Japan, assignor to Motorola, Inc., Schaumburg, Ill.**

**Filed Mar. 10, 1995, Ser. No. 402,457**

**Claims priority, application Japan, Mar. 16, 1994, 6-045848**

**Int. Cl.[6] G11C *7/00***

**U.S. Cl. 365—190** **4 Claims**

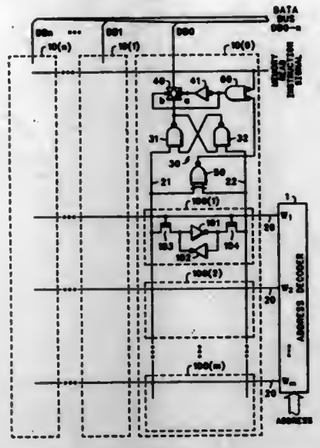
1. A low power consumption semiconductor memory device comprising:

a memory cell where an information signal is stored;

a pair of bit lines on which the information signal stored in said memory cell and an inverted version of said information signal are placed;

an information signal sense means for detecting when said information signal is placed onto said bit line in accordance with the exclusive-OR logic value of each of said bit lines and generating an information sense signal; and

an information signal reading means, responsive to said information sense signal, for reading said information signal on said bit line onto a data signal bus.



**5,499,211**

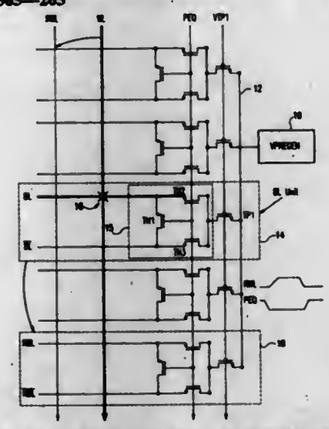
**BIT-LINE PRECHARGE CURRENT LIMITER FOR CMOS DYNAMIC MEMORIES**

**Toshiaki Kirihata, Wappingers Falls; Shuso Fujii, Hopewell Junction, and Yohji Watanabe, Fishkill, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y., and Kabushiki Kaisha Toshiba, Japan**

**Filed Mar. 13, 1995, Ser. No. 402,442**

**Int. Cl.[6] G11C *13/00***

**U.S. Cl. 365—203** **8 Claims**



1. A low power dynamic random access memory comprising:

a plurality of word-lines and a plurality of complementary bit-line pairs;

a source of precharge voltage for precharging said complementary bit-line pairs:

a plurality of precharge equalization circuits, each of which comprise first, second and third field effect transistors, said first field effect transistor being connected across a corresponding complementary pair of bit-lines and said second and third field effect transistors being connected in series with a respective one of said complementary pair of bit-lines, the gates of each of said first, second and third field effect transistors being connected to receive a precharge equalization control signal;

said plurality of precharge equalization circuits connected to said source of precharge voltage, one precharge equalization circuit for precharging each of said plurality of complementary bit-line pairs; and

current limiting means for limiting precharge current flowing into said complementary bit-line pairs to a precharge current limit value, whereby current flowing into a short between a bit-line and a word-line in a cross-fail is limited to a said precharge current value, wherein said current limiting means comprises a fourth field effect transistor connected between said source of precharge voltage and said second and third field effect transistors, said fourth field effect transistor being biased to limit current flow through said second and third field effect transistors to said precharge current limit value.



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**5,499,212**

**SEMICONDUCTOR MEMORY DEVICE HAVING A BIAS CONTROL CIRCUIT FOR ERASE VOLTAGE BLOCKING TRANSISTOR**

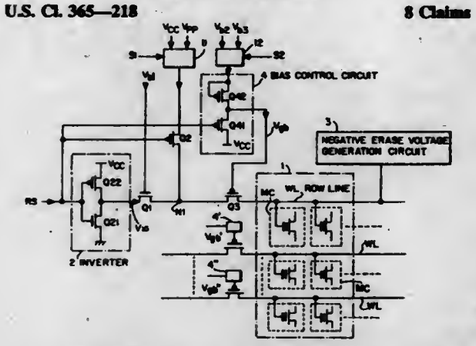
**Masakazu Amanai, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Dec. 21, 1994, Ser. No. 360,943**

**Claims priority, application Japan, Dec. 22, 1993, 5-324975**

**Int. Cl.[6] G11C *13/00***

**U.S. Cl. 365—218** **8 Claims**



1. A semiconductor memory device comprising, a word line which connected to a plurality of electrically writable and erasable memory cells, a first terminal which goes to an active level when said word line is selected, a second terminal which is applied with a read voltage during a read operation and with a write voltage which is higher than said read voltage during a write operation, a first transfer gate provided between said second terminal and a node, and having its control terminal coupled to said first terminal, an erasing voltage generation circuit which supplies an erasing control voltage to said word line during an erase operation, a transistor provided between said node and said word line, and a bias control circuit for supplying a gate of said transistor with a first bias voltage that renders said transistor non-conductive during said data erase operation, with a second bias voltage that renders said transistor conductive during said write operation and with a third bias voltage that renders said transistor conductive during said read operation, said second bias voltage being different from said third bias voltage.

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**5,499,213**

**SEMICONDUCTOR MEMORY DEVICE HAVING SELF-REFRESH FUNCTION**

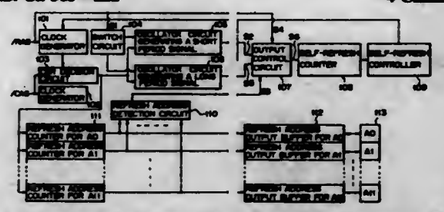
**Makoto Nimi; Shigemasa Ito, both of Kasugai; Toyonobu Yamada; Yoshihiro Takemae, both of Kawasaki, and Yoshiharu Kato, Kasugai, all of, Japan, assignors to Fujitsu Limited, Kawasaki, and Fujitsu VLSI Limited, Kasugai, both of, Japan**

**Filed Jun. 29, 1993, Ser. No. 83,443**

**Claims priority, application Japan, Jun. 29, 1992, 4-170682; Jul. 9, 1992, 4-182384; Aug. 7, 1992, 4-211820; Sep. 21, 1992, 4-251226; Jun. 18, 1993, 5-147673**

**Int. Cl.[6] G11C *7/00***

**U.S. Cl. 365—222** **4 Claims**



1. A semiconductor memory device having plural memory cells with corresponding memory cell addresses and operative in a self-refresh mode for automatically refreshing the plural memory cells, comprising:

oscillator means for generating pulse signals and providing the pulse signals as an output thereof;

refresh address detection means for detecting refreshed memory cells of the plurality of memory cells and the corresponding addresses thereof and outputting a completion signal upon the completion of the refreshing of the respective memory cells of all of the memory cell addresses; and

output control means responsive to a control signal for continuing the self-refresh mode thereby to refresh all memory cells of the respective memory cell addresses according to the completion signal from said refresh address detection means before releasing the self-refresh mode, the pulse signals output from said oscillator means being input to said output control means.

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**5,499,214**

**OSCILLATOR CIRCUIT GENERATING A CLOCK SIGNAL HAVING A TEMPERATURE DEPENDENT CYCLE AND A SEMICONDUCTOR MEMORY DEVICE INCLUDING THE SAME**

**Shigeru Mori; Takeshi Kajimoto, and Masanori Hayashikoshi, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

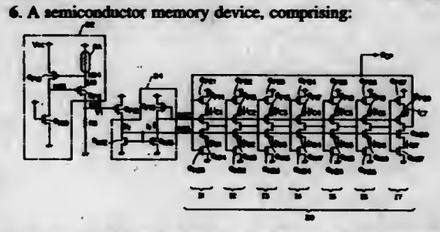
**Filed Jun. 10, 1994, Ser. No. 257,845**

**Claims priority, application Japan, Jun. 28, 1993, 5-157237; Feb. 16, 1994, 6-019210**

**Int. Cl.[6] G11C *7/00***

**U.S. Cl. 365—222** **13 Claims**

6. A semiconductor memory device, comprising:



a memory cell array including a plurality of memory cells requiring a refresh operation;

an oscillator circuit including

reference current generation means, wherein said reference current generation means includes a reference P channel transistor in which a reference current flows varying in response to an operating temperature, and a reference N channel transistor in which a reference current flows varying in response to an operating temperature, and

oscillator means including an odd number of a plurality of inverter means connected in a ring manner, each of said plurality of inverter means including an input node, an output node, a P channel transistor, connected between a first power supply potential node and said output node, and having a control electrode connected to said input node, and an N channel transistor, connected between said output node and a second power supply potential node, having a control electrode connected to said input node, wherein at least one of said plurality of inverter means further includes a control P channel transistor forming a current mirror circuit with said reference P channel transistor, connected between said first power supply potential node and said output node, in series with said P channel transistor, and a control N channel transistor forming a current mirror circuit with said reference N channel transistor, connected between said output node and said second power supply potential node, in series with said N channel transistor, said oscillator means providing a clock signal from an output node of the inverter means of the last stage, and

a refresh means responsive to said clock signal for carrying out a refresh operation for said plurality of memory cells;

wherein said reference current generation means comprises

potential generation means for generating an output potential varying in response to an operating temperature, and

voltage-current conversion means for generating a current varying in response to said output potential, and

wherein said reference current flows in said reference P and N channel transistors in response to said current generated by said voltage-current conversion means.

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**5,499,215**

**SEMICONDUCTOR MEMORY**

**Minoru Hatta, Osaka, Japan, assignor to Matsushita Electronics Corporation, Osaka, Japan**

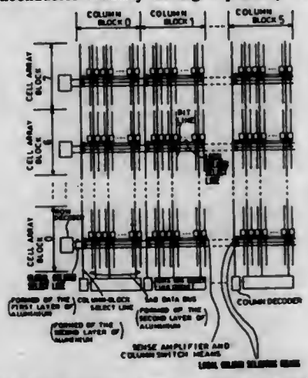
**Filed Oct. 11, 1994, Ser. No. 321,964**

**Claims priority, application Japan, Nov. 1, 1993, 5-273420**

**Int. Cl.[6] G11C *8/00***

**U.S. Cl. 365—230.03** **11 Claims**

1. A semiconductor memory having a plurality of cell array




blocks which have dynamic memory cells arranged in rows and columns and sense amplifiers for amplifying read signals from the dynamic memory cells,

said semiconductor memory comprising:

a plurality of column-block select lines each shared by said plurality of cell array blocks and extending substantially in parallel with bit lines, a selected column-block select line being adapted to select a predetermined column block out of a plurality of column blocks in said plurality of cell array blocks;

a plurality of global column select lines each disposed for a cell array block and extending in the direction which intersects said column-block select lines, a selected global column select line being adapted to simultaneously select a plurality of predetermined columns out of each of said plurality of column blocks;

a plurality of sub data buses each shared by said plurality of cell array blocks, said sub data buses being substantially in parallel with said column-block select lines, where the number of sub data buses disposed in each column block corresponds to the number of data bits carried by the columns, in each column block, simultaneously selected by a global column select line;

a plurality of local column selecting means respectively disposed corresponding to the positions where said plurality of column-block select lines cross said plurality of global column select lines, said plurality of local column selecting means being adapted such that the output of the local column selecting means corresponding to the position where an activated column-block select line crosses an activated global column select line, is made active; and

a plurality of local column select lines connected to the output terminals of said local column selecting means, each local column select line being connected to the input terminals of column switch transistors which connect sense amplifiers, of columns selected by an associated global column select line, in a cell array block comprising the associated global column select line, and in a column block selected by an associated column-block select line, to sub data buses in the selected column-block.

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**5,499,216**

**SEMICONDUCTOR MEMORY DEVICE SELECTIVELY OPERATING DIVIDED MEMORY BLOCKS**

**Kouji Yamamoto, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

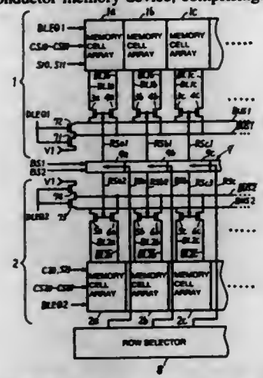
**Filed Mar. 24, 1995, Ser. No. 409,575**

**Claims priority, application Japan, Mar. 30, 1994, 6-061525**

**Int. Cl.[6] G11C *8/00***

**U.S. Cl. 365—230.03** **11 Claims**

6. A semiconductor memory device, comprising:




a plurality of memory blocks having a plurality of common row addresses and being operated selectively,

said plurality of memory blocks each including

a plurality of memory cell arrays,

a plurality of bit line pairs provided corresponding to said plurality of memory cell arrays and corresponding to said plurality of common row addresses,

a plurality of switching means provided corresponding to said plurality of bit line pairs, and



an input/output data line pair connected to said plurality of bit line pairs through said plurality of switching means;

first row selecting means for generating a row select signal for selection one of said common row addresses; and

a plurality of second row selecting means provided corresponding to said plurality of common row addresses and each receiving a memory block select signal indicating a selected memory block and corresponding said row select signal, for turning on said switching means corresponding to the selected common row address in the selected memory block in response to these signals.

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**5,499,217**

**BIAS CIRCUIT FOR A MEMORY LINE DECODER DRIVER OF NONVOLATILE MEMORIES**

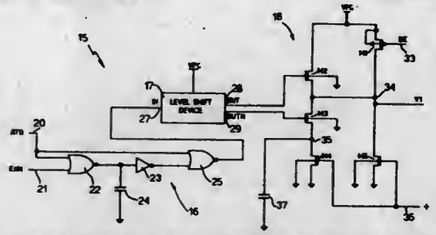
**Luigi Pascucci; Carla M. Golla, both of Sesto San Giovanni, and Marco Maccarrone, Palestro, all of, Italy, assignors to SGS-Thomson Microelectronics S.r.l., Milan, Italy**

**Filed Dec. 2, 1994, Ser. No. 348,461**

**Claims priority, application European Pat. Off., Dec. 2, 1993, 93830489**

**Int. Cl.[6] G11C *8/00***

**U.S. Cl. 365—230.06** **23 Claims**




14. A bias circuit for a memory line decoder driver of nonvolatile memories, wherein the decoder driver comprises a memory word line driver and a switch having a bias input for selectively coupling a supply electric potential to an input of the word line driver, and wherein the bias circuit comprises:

a control input coupled to an address phase signal;

a bias output coupled to the decoder driver switch bias input; and

a switch for alternately coupling a high bias electric potential and a threshold bias electric potential to the bias output in response to the address phase signal, wherein the high bias electric potential is sufficient to bias the decoder driver switch substantially beyond its threshold bias and the threshold bias electric potential is sufficient to bias the decoder driver switch substantially at its threshold bias.

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**5,499,218**

**METHOD FOR DRIVING BIT LINE SELECTING SIGNALS**

**Jin-Hong Ahn; Tae-Hyoung Kim, and Sung-Ho Wang, all of Kyungki-do, Rep. of Korea, assignors to Goldstar Electron Co., Ltd., Chungcheongbuk-do, Rep. of Korea**

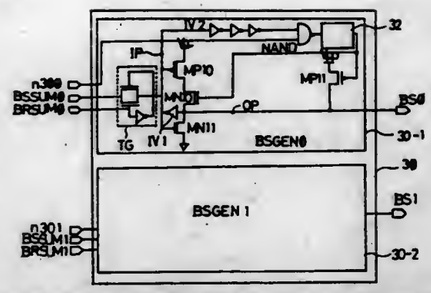
**Filed Jan. 31, 1995, Ser. No. 380,759**

**Int. Cl.[6] G11C *8/00***

**U.S. Cl. 365—230.06** **6 Claims**

4. A bit line selection signal generating circuit for connecting bit lines to a sense amplifier, comprising:

a serial circuit consisting of two NMOSFETs MN10 and MN11 and one PMOSFET MP10 connected between a Vcc terminal and a Vss terminal;




a PMOS transistor MP11 connected to a power source Vpp and connected to an output node OP which is the connection point between said NMOSFET MN10 and said NMOSFET MN11;

said output node OP being connected through an invertor IV1 to an input node IP;

said input node IP being connected through an invertor IV2 to an input terminal of a NAND gate;

the gates of said PMOSFET MP10 and said NMOSFET MN11 being connected to said input node IP;

said input node IP being connected through a transmission gate TG to a signal BSSUM0, another signal SRSUM0 being connected to a control input terminal of said transmission gate TG, and a signal n300 being connected to another input terminal said NAND gate; and

the output terminal of said NAND gate being connected to a level shifting circuit 32 for shifting a Vcc level to a Vpp level, and the output terminal of said level shifting circuit 32 being connected to the gates of said transistors MP11 and MN10.

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**5,499,219**

**ELECTRO-ACOUSTICAL TRANSDUCER ARRANGEMENT**

**Axel Brenner; Peter Mertens; Wilfried Meuser; Friedrich Meyer, all of Bremen; Horst Trense, Oyten; Friedrich Weber, Zeven-Badenstedt, and Wilfried Wilken, Bad Zwischenahn, all of, Germany, assignors to STN Atlas Elektronik GmbH, Bremen, Germany**

**Filed Nov. 15, 1994, Ser. No. 341,868**

**Claims priority, application Germany, Nov. 23, 1993, 43 39 798.0**

**Int. Cl.[6] H04R *17/00***

**U.S. Cl. 367—151** **20 Claims**

1. An electro-acoustical transducer arrangement for attachment to a support for an underwater antenna comprising:

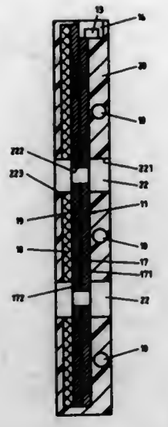
a plurality of hydrophones arranged at equal distances in a linear array and provided with respective connecting lines for their electrical connection;

a reflector disposed behind said linear array of hydrophones in the direction of incoming sound;

a sole, acoustically transparent rigid cast enclosure formed of an elastomer which can be worked in a casting process, with said hydrophones and said reflector being entirely embedded to completely enclose said hydrophones and said reflector in said rigid cast enclosure;

a common plug in which said connecting lines of said hydrophones of said transducer arrangement are combined, with said plug having a plug axis extending in a direction of the linear array, said plug being accessible at a frontal end of said rigid cast enclosure; and

means for fastening said rigid cast enclosure on the support, said means being provided in said rigid cast enclosure.



5,499,220

## ELECTRONIC TIMEPIECE

Kenji Ogasawara, Chiba, Japan, assignor to Seiko Instruments Inc., Japan

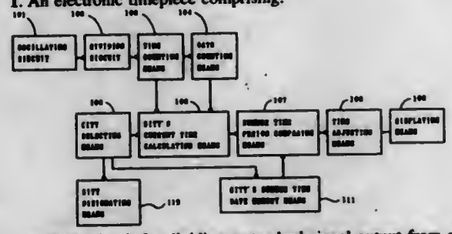
Filed Oct. 19, 1994, Ser. No. 325,810

Claims priority, application Japan, Nov. 5, 1993, 5-276705; Aug. 10, 1994, 6-188595

Int. Cl.[6] G04B *19/22*

U.S. Cl. 368—21 5 Claims

1. An electronic timepiece comprising:



a dividing circuit for dividing a standard signal output from an oscillating circuit, time counting means for counting time value, with the output signal from the oscillating circuit, date counting means for counting the date with the output signal from the time counting means, city selecting means for selecting a city, city designating means for displaying the selected city, city's current time calculating means for calculating the local time at the city selected by the city selecting means with the output signal from the time counting means and the output signal from the date counting means, city's summer time date memory means for memorizing such a value as the starting and the ending date of the summer time by city, summer time comparing means for judging if it is in the summer time period through comparing the time counted by the city's time calculating means with the summer time value memorized in the city's summer time date memory means, time adjusting means for adjusting the time in case it is judged by the summer time comparing means that it is in the summer time, and displaying means for displaying the adjusted time above.

5,499,221

## CD-ROM RETRIEVAL APPARATUS

Tamotsu Ito, Ayase; Toshiyuki Oda, Chigasaki; Takashi Takeuchi, Fujisawa, and Shiyouichirou Funato, Yokohama, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 621,041, Dec. 3, 1990, abandoned.

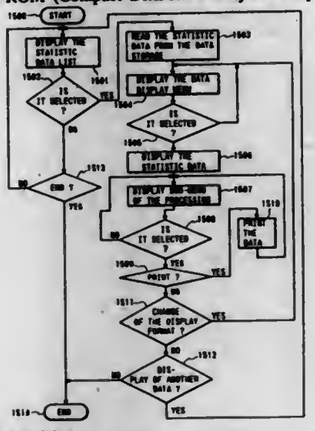
This application Dec. 16, 1993, Ser. No. 167,110

Claims priority, application Japan, Dec. 6, 1989, 1-315221; Jan. 26, 1990, 2-14940

Int. Cl.[6] G11B *7/00*

U.S. Cl. 369—32 2 Claims

1. A CD-ROM (Compact Disk-Read Only Memory) retrieval



apparatus comprising:

a CD-ROM drive for loading a CD medium;

a display for displaying characters and images;

input specifying means for specifying a desired input operation;

audio means for producing sounds;

means for retrieving information in said CD medium;

storage means for storing a sequence of data which indicates accessing information of each retrieving operation performed by said retrieving means, said accessing information including the time of day at which accessing occurs, the time of day at which the last accessing occurred and kind of information to be retrieved in each retrieving operation based upon said desired input operation performed by said input specifying means;

counting means for counting the number of the retrieving operations for each kind of information to be retrieved; and

means for providing the accessing information and the number of previous retrieving operations to provide history of previous retrieving operations for evaluating the retrieved information from said CD medium,

wherein the CD-ROM drive, the display, the input specifying means, the audio means, the retrieving means, the storage means and the providing means are connected to a control means for controlling the CD-ROM drive, the display, the input specifying means, the audio means, the retrieving means, the storage means and the providing means to perform their respective operations, and wherein at least the CD-ROM drive, the display, the audio means, the retrieving means, the storage means, the providing means and the control means are housed in a single cabinet.



5,499,222

## MEMORY DEVICE

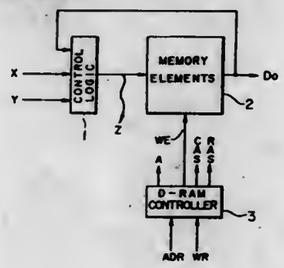
Koichi Kimura, Yokohama; Toshihiko Ogura, Ebina; Hiroaki Aotsu, Yokohama; Mitsuru Ikegami, Yamakitamachi; Tadashi Kuwahara, Yokohama; Hiromichi Enomoto, and Tadashi Kyoda, both of Hadano, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 294,403, Aug. 23, 1994, Pat. No. 5,424,981, which is a continuation of Ser. No. 855,843, Mar. 20, 1992, Pat. No. 5,450,342, which is a continuation-in-part of Ser. No. 349,403, May 8, 1989, Pat. No. 5,175,838, which is a continuation of Ser. No. 240,380, Aug. 29, 1988, now Re. 33,922, which is a continuation of Ser. No. 779,676, Sep. 24, 1985, abandoned, said Ser. No. 855,843is a continuation-in-part of Ser. No. 816,583, Jan. 3, 1992, which is a continuation of Ser. No. 314,238, Feb. 22, 1989, Pat. No. 5,113,487, which is a continuation of Ser. No. 864,502, May 19, 1986, abandoned, said Ser. No. 816,583is a continuation-in-part of Ser. No. 349,403, May 19, 0. This application May 5, 1995, Ser. No. 435,962

Claims priority, application Japan, Jan. 5, 1984, 59-208266; May 20, 1985, 60-105844; May 20, 1985, 60-105845; May 20, 1985, 60-105847; May 20, 1985, 60-105850

Int. Cl.[6] G11C *13/00*

U.S. Cl. 365—189.01 3 Claims



1. A system comprising:

a one-chip semiconductor integrated circuit device including:

a plurality of semiconductor memory elements,

terminals which are supplied with operation designation signals arbitrarily designating any one of a plurality of operations, and

a control unit which is coupled to said memory elements and said terminals and which sets a plurality of bits of said memory elements into a predetermined logic level according to a predetermined operation designated by said operation designation signals; and

an external device coupled to said one-chip semiconductor integrated circuit device for supplying said operation designation signals to said terminals of said one-chip semiconductor integrated circuit device,

wherein said predetermined logic level is data other than data provided by said external device, and

wherein said operation designation signals are control command data bits which are supplied from said terminals.

5,499,223

## BEAM POSITION CONTROL SYSTEM OF AN OPTICAL DISK UNIT

Shigenori Yanagi, Kawasaki; Makoto Takayanagi, Tokyo, and Kikuji Katoh, Tokorozawa, all of, Japan, assignors to Fujitsu Limited, Kawasaki, and Nippon Telegraph & Telephone Company, Tokyo, all of, Japan

Continuation of Ser. No. 859,469, Jun. 2, 1992, abandoned.

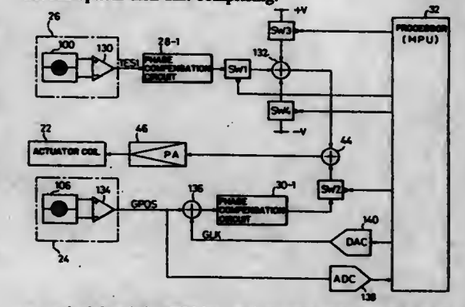
This application Jan. 1, 1995, Ser. No. 456,388

Claims priority, application Japan, Jan. 3, 1990, 2-265719; Jan. 3, 1990, 2-265722; Jan. 3, 1990, 2-265723; Jan. 3, 1990, 2-265724

Int. Cl.[6] G11B *7/00*

U.S. Cl. 369—44.28 16 Claims

16. An optical disk unit comprising:



an optical head for Writing and reading data to and from a medium with write and read beams, respectively;

lens drive means for driving an object lens to simultaneously move the write and read beams across tracks of the medium;

direction change means for changing direction of at least one of the write and read beams;

direction changer drive means for driving said direction change means to move one of the write and read beams across the tracks of the medium;

position detection means for detecting the position of said direction change means and providing a position signal;

tracking error detection means for detecting and providing a tracking error signal according to a return beam from the medium;

position servo means for driving said-direction change means according to the tracking error signal, to carry out tracking control of one of the write and read beams; and

position lock means for locking said direction change means at a predetermined position according to the positional signal;

a beam position control system, comprising:

a first servo switch for starting and stopping a position servo operation of said position servo means; and

a second servo switch for starting and stopping a position lock operation of said position lock means;

control means for turning ON and OFF said first and second servo switches according to a beam position control status, to enable one combination of one of the position servo operation and the position lock operation, both of the position servo operation and the position lock operation, and neither of the position servo operation and position lock operation;

first abnormality detection means for detecting an abnormality in the tracking error signal and notifying said control means of the abnormality; and

second abnormality detection means for detecting an abnormality in the position signal of said direction change means and notifying said control means of the abnormality,

when said beam position control system receives the abnormality notices from said first and second abnormality detection means, said control means turns OFF said first servo switch to disable the tracking control of one of the write and read

beams, and turns ON said second servo switch to carry out position lock control for returning said direction change means to a predetermined position.

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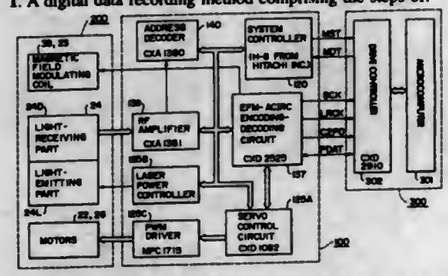
**5,499,224**

## DATA RECORDING AND REPRODUCING METHODS

**Shinji Sanada, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Filed Feb. 10, 1994, Ser. No. 195,858**
**Claims priority, application Japan, Feb. 24, 1993, 5-059600**
**Int. Cl.[6] G11B 7/00**
**U.S. Cl. 369—48** **10 Claims**

1. A digital data recording method comprising the steps of:




initially designating a recording unit size that is one of a plurality of possible recording unit sizes;

receiving the digital data to be recorded;

converting the digital data to a sector structure of a predetermined data quantity;

performing an error correction and encoding process, including interleaving, on the converted digital data; and

recording the processed data onto a disc-shaped storage medium rotated at a constant linear velocity, said disc-shaped storage medium having address information that includes repetitions of a plurality of sectors, the recording of said processed data to said disc-shaped storage medium being performed in accordance with said address information and in increments of substantially the designated recording unit size such that each recording unit includes a plurality of sectors, including linking and data recording sectors;

wherein the designated recording unit size is not greater than the number of repeated sectors of said address information.

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**5,499,225**

## OPTICAL RECORDING METHOD

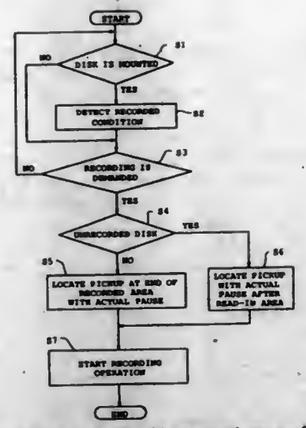
**Ryuichiro Yoshimura, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan**

**Continuation of Ser. No. 11,829, Feb. 1, 1993, abandoned, which is a continuation of Ser. No. 782,204, Oct. 24, 1991, abandoned. This application Jul. 28, 1994, Ser. No. 281,536**
**Claims priority, application Japan, Jan. 25, 1990, 2-287992**
**Int. Cl.[6] G11B 7/00**
**U.S. Cl. 369—58** **1 Claim**

1. A method for recording a first program and data on an optical disc at a first recording start position by means of an optical pickup so that said program can be properly reproduced by a compact disk (CD) player, the optical disk having a first area in which the program is recorded and a second area in which data are written, the disc being either one of an unrecorded and a recorded disk, said method comprising the steps of:

determining, by reading said second area of the disk to determine whether the first area has a program or no program recorded therein, and if it is determined that no program is recorded, providing an unrecorded disk signal;

detecting whether an unrecorded disk signal is produced, and upon detecting such signal, moving said optical pickup to a




first record start position with an actual pause after a beginning of a start position of the first area;

starting to record a program from said first record start position, without recording information at a position of the actual pause; and

recording blank data in the position of the actual pause after finishing of recording the program in the first area.

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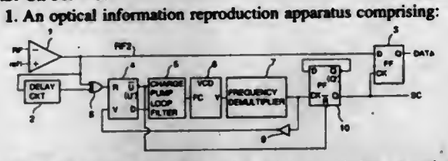
**5,499,226**

## OPTICAL INFORMATION REPRODUCTION APPARATUS AND OPTICAL INFORMATION REPRODUCTION METHOD

**Shinichi Ohta, and Hiroto Kitai, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Dec. 9, 1993, Ser. No. 163,689**
**Claims priority, application Japan, Dec. 11, 1992, 4-352460**
**Int. Cl.[6] G11B 5/00; H04N 5/76**
**U.S. Cl. 369—59** **18 Claims**

1. An optical information reproduction apparatus comprising:




means for reading out digital information recorded as an optical mark on an optical information recording medium as an information reproduction signal by scanning the recording medium with a light beam;

conversion means for converting the information reproduction signal into a binarized reproduction signal;

means for generating a first signal corresponding to leading and trailing edges of a change point of the binarized reproduction signal;

means for generating a sampling clock signal;

means for generating a second signal which oscillates at a frequency at least twice a frequency of the sampling clock signal;

phase comparison means for generating a phase advance signal and a phase delay signal, the phase advance signal being a signal which indicates a phase difference between the first signal and the second signal, the phase delay signal having a pulse width equal to the second signal; and

means for reproducing the digital information by sampling the binarized reproduction signal with the sampling clock signal on the basis of the phase advance signal and the phase delay signal.

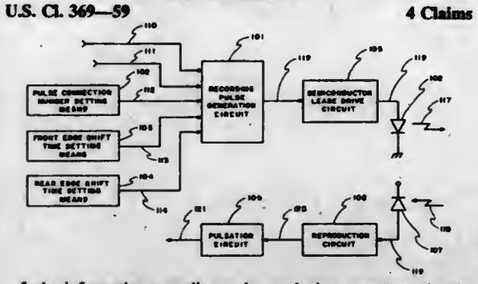


**5,499,227**

## INFORMATION RECORDING AND REPRODUCING APPARATUS

**Masashi Higasa, Tokyo, Japan, assignor to NEC Corporation, Japan**

**Filed Jul. 15, 1994, Ser. No. 275,791**
**Claims priority, application Japan, Jul. 23, 1993, 5-182970**
**Int. Cl.[6] G11B 7/00**
**U.S. Cl. 369—59** **4 Claims**




1. An information recording and reproducing apparatus wherein a recording pulse signal is modulated by intensity modulation and converted into an optical pulse signal and the optical pulse signal is optically recorded onto a rotating information recording medium in accordance with a mark length recording method to form a recorded mark train, and thereafter the recorded mark train is optically reproduced, comprising:

recording pulse generating means for dividing the recording pulse signal into multiple pulses with a clock pulse signal, which makes a reference for production of a recording signal, to form a short-pulse group, for connecting an arbitrary number of pulses of the short-pulse group beginning with a top pulse of the short-pulse group to produce a top long pulse, for shifting the positions of the front edge and the rear edge of the top long pulse, and for outputting the shifted top long pulse and the following pulses of the short-pulse group as recording pulses;

semiconductor laser drive means for inputting the recording pulses generated by said recording pulse generation means and converting the recording pulses into semiconductor laser drive current;

a semiconductor laser driven by the semiconductor laser drive current for irradiating intensity modulated laser emission light upon the surface of the information recording medium to form recorded marks and for irradiating laser emission light controlled for recorded data reproduction upon the surface of the information recording medium;

light reception means for receiving reflected light of the laser emission light controlled for recorded data reproduction from the surface of the information recording medium;

reproduction means for converting an output signal of said light reception means into a reproduced signal; and

pulsation means for pulsating the reproduced signal to generate reproduced pulses.

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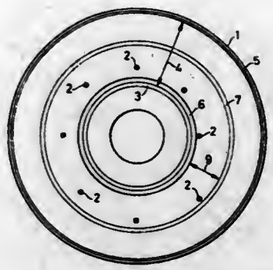
**5,499,228**

## LENS CLEANER FOR A DISK PLAYER

**Ken'ichi Takeda, 10-2, Kizugawadai 1-chome, Kizu-cho, Soraku-gun, Kyoto, Japan**

**Filed Oct. 4, 1993, Ser. No. 130,901**
**Claims priority, application Japan, Jan. 3, 1992, 4-289292**
**Int. Cl.[6] G11B 7/00**
**U.S. Cl. 369—71** **4 Claims**

1. A lens cleaner, comprising a cleaning device, and a disk having a lead-in area for recording TOC data including gap length data, a program area located radially outward of the lead-in area and including an introductory recording area, a gap area having a gap length of about 16 mm containing the cleaning device and a sound/program recording area provided radially outward of the gap area and continuously in the program area.



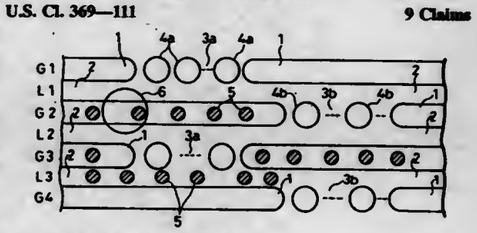
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**5,499,229**

## TRACK SCANNING FOR REPRODUCING ADDRESS INFORMATION BY CROSSTALK

**Yoshiteru Murakami, Nishinomiya; Akira Takahashi, Nara, and Kenji Ohta, Kitakatsuragi, all of, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Nov. 30, 1994, Ser. No. 346,759**
**Claims priority, application Japan, Dec. 1, 1993, 5-301500**
**Int. Cl.[6] G11B 7/00**
**U.S. Cl. 369—111** **9 Claims**




1. An optical disk comprising:

a substrate having thereon grooves and lands as guide tracks for guiding a light beam, and a series of address pits recorded as address information of said tracks,

wherein said grooves and said lands are arranged to have a substantially equal width so as to enable recording of information on both the tracks formed by said grooves and said lands,

the series of address pits is formed on the track of either one of said groove or said land,

the series of pits on one of said grooves or lands and the series of pits on the adjacent groove or land are located in different radial directions of said optical disk for preventing the light beam from being simultaneously projected onto a plurality of the series of address pits on different tracks, and

each of the series of pits in a radial direction of said disk has such a width that, when the light beam scans a track having no address pits thereon, address information of the track is reproducible by crosstalk of the series of address pits recorded on the adjacent track.

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**5,499,230**

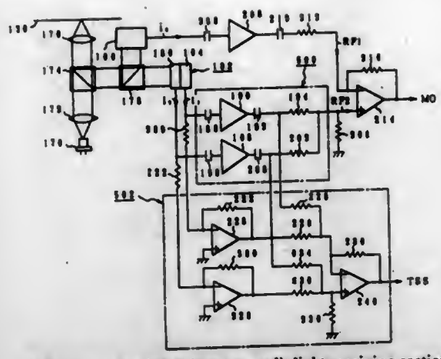
## OPTICAL DISK APPARATUS

**Shigenori Yanagi, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan**

**Filed Oct. 17, 1994, Ser. No. 324,626**
**Claims priority, application Japan, Jan. 10, 1994, 6-000723**
**Int. Cl.[6] G11B 7/00**
**U.S. Cl. 369—124** **22 Claims**

1. An optical disk apparatus comprising:

a reading optical unit for irradiating a reading beam onto an optical disk medium and for extracting a return light reflected and diffracted by a track portion of said medium;



a photodetector having at least two-split light receiving sections, each for converting the return light extracted by said reading optical unit into a detection signal;

a first circuit for AC coupling each of said detection signals from said two light receiving sections provided for said photodetector and separating a band on a high frequency side, for individually amplifying said detection signals in a frequency band in a range from a predetermined first cut-off frequency to a predetermined ultra high frequency, for adding the amplified signals after that, and for forming a high frequency signal that is used for demodulation of read data; and

a second circuit for DC coupling each of the detection signals from said two light receiving sections provided for said photodetector, for individually amplifying said detection signals in a frequency band in a range from DC to said first cut-off frequency, for adding the detection signals individually amplified by said first circuit after that, for producing two addition signals each having a frequency band in a range from a DC component to an ultra high cut-off frequency higher than said first cut-off frequency, for performing a subtraction between said two addition signals, and for forming a tracking error signal.

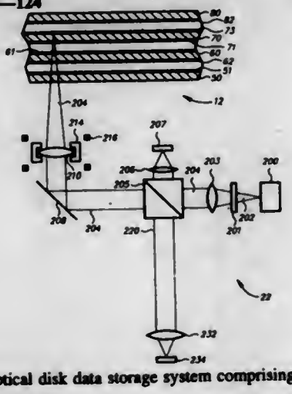
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**5,499,231**

**OPTICAL DISK DRIVE WITH MULTIPLE DATA LAYER DISK AND SYSTEM FOR FOCUSING THE OPTICAL BEAM**

**Alan A. Feeneman, Tucson, Ariz.; Wayne I. Imaino, San Jose, and Hal J. Rosen, Los Gatos, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Nov. 15, 1994, Ser. No. 339,626**
**Int. Cl.[6] G11B *7/00***
**U.S. Cl. 369—124** **23 Claims**



11. An optical disk data storage system comprising:

an optical disk having a central axis generally perpendicular to the disk, the disk comprising first and second axially spaced-apart data layers;

a disk motor for rotating the disk about the central axis;

a light source;

a lens for generating a focused light beam from the source;

a lens motor connected to the lens for moving the lens in an axial direction generally perpendicular to the data layers, whereby the light beam can be focused on the first data layer, moved to the second data layer and focused on the second data layer;

a radial actuator connected to the lens motor for moving the lens motor and connected lens generally radially relative to the disk so the focused light beam can be moved to different radial positions on the data layers;

a microprocessor coupled to the lens motor for generating signals to the lens motor representative of an acceleration profile for the lens to move the light beam from the first data layer to the second data layer, the microprocessor including means for computing values representative of axial velocities of the data layers at a plurality of radial and angular positions on the data layers; and

a memory storage coupled to the microprocessor for storing a map of the computed axial velocity values according to said radial and angular positions, whereby the microprocessor retrieves the stored axial velocity values and modifies the lens acceleration profile in response to the retrieved axial velocity values when the light beam is to be moved from the first data layer to the second data layer.

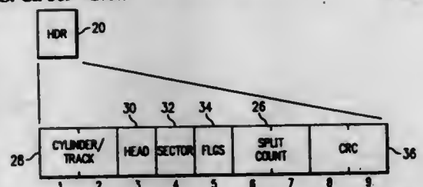
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**5,499,232**

**TRACK FORMAT AND RECORD CARRIER SYSTEM FOR SPLIT DATA FIELD SUPPORT**

**Andrew C. Hardwick, Boulder, Colo., assignor to Conner Peripherals, Inc., San Jose, Calif.**

**Continuation of Ser. No. 233,733, Apr. 26, 1994, abandoned, which is a continuation of Ser. No. 74,947, Jun. 10, 1993, abandoned, which is a continuation of Ser. No. 621,996, Dec. 4, 1990, abandoned. This application Dec. 27, 1994, Ser. No. 364,509**
**Int. Cl.[6] G11B *7/24***
**U.S. Cl. 369—275.3** **2 Claims**




1. A method for controlling the transfer of information on a disk relative to a data field on the disk that is split by a servo field, comprising:

a) providing a disk including a plurality of tracks having a first track and a second track, each of said first and second tracks having a plurality of first portions that each include a data field and a plurality of second portions that each include a servo field containing servo information for use in controlling the position of a transducer for reading and writing data in a data field, each of said first portions having a starting point and an ending point, said servo fields of said first and second tracks being located at predetermined positions on said disk, said servo fields of said first track occurring at a first frequency relative to said transducer used in reading said servo information contained in said servo fields of said first track, a predetermined one of said servo fields of said first track located intermediate of said starting point and said ending point of a predetermined one of said data fields of said first track, a predetermined one of said servo fields of said second track located intermediate of said starting point and said ending point of a predetermined one of said data fields of said second track,

i) a first count field residing on said disk for providing information relating the position of said predetermined one of said servo fields of said first track to the position of said predetermined one of said data fields of said first track

ii) a second count field residing on said disk for providing information relating the position of said predetermined one of said servo fields of said second track to the position of said predetermined one of said data fields of said second track, said servo fields of said second track occurring at a second frequency relative to said transducer for use in reading servo information contained in said servo field of said second track, said second frequency being substantially equal to said first frequency;

b) reading said servo information from said servo fields in said first track;

c) controlling said transducer to position said transducer relative to said second track using said servo information in said servo fields of said second track; and

d) transferring data relative to said data fields of said second track.



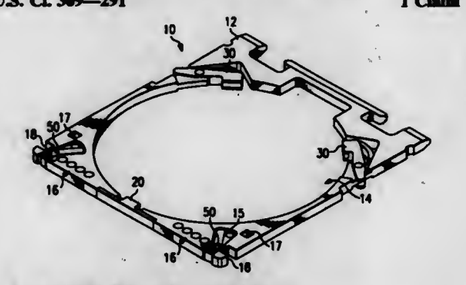
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**5,499,233**

**OPTICAL DISK CARRIER WITH WRITE-PROTECT MECHANISM**

**Edwin R. Childers, and Michael Henry, both of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jun. 20, 1994, Ser. No. 262,671**
**Int. Cl.[6] G11B *3/70;5/84;7/26***
**U.S. Cl. 369—291** **1 Claim**




1. An optical disk carrier, comprising:

a substantially rectangular frame having dimensions sized to be inserted into an optical disk drive and having a substantially circular opening with a diameter sized to receive an optical disk, said frame further having front and rear edges;

a write-protect mechanism in a first corner portion of said rear edge of said frame, said write-protect mechanism comprising:

an arm pivotable about an axis whereby, when said arm is in a first position, a write-protect hole through said frame is exposed and, when said arm is in a second position, said write-protect hole is concealed; and

an aperture extending vertically through said arm and an elongated member projecting from said aperture, such that, when two optical disk carriers are stacked, said elongated member of a lower carrier engages said aperture of an upper carrier and said write-protect mechanism of each carrier is movable simultaneously; and

a set of disk holders spaced around the circumference of the circular opening and secured to said frame for releasably retaining the optical disk within the circular opening whereby, when the carrier is mounted in an optical drive, said disk holders release the optical disk to be rotated on a spindle in the drive and, when the carrier is removed from the drive, said disk holders retain the disk within the circular opening preventing movement thereof, said set of disk holders comprising:

a leaf spring positioned substantially in the center of said rear edge of said frame, said leaf spring having a central portion with a grooved face for engaging a circumferential edge of the optical disk, said grooved face being biased towards the circular opening; and

first and second arms pivotably mounted in first and second corners portions, respectively, of said front edge of said frame, each of said arms having a first end portion with a grooved face for engaging the circumferential edge of the optical disk, said grooved face being biased towards the circular opening.

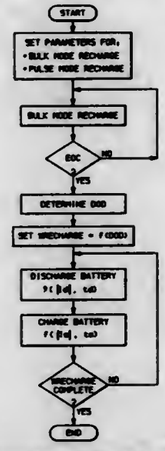
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**5,499,234**

**METHOD FOR RECHARGING FLOODED CELL BATTERIES**

**Robert A. Rider, Indianapolis, and Richard M. Bendert, Pendleton, both of Ind., assignors to General Motors Corporation, Detroit, Mich.**

**Filed Apr. 26, 1994, Ser. No. 233,795**
**Int. Cl.[6] H01M *10/44***
**U.S. Cl. 320—5** **5 Claims**




1. A method of improving cycle life of maintenance free flooded cell water-diluted electrolyte batteries comprising the steps of:

(a) during a bulk charge cycle,

charging the battery to substantially full capacity;

(b) during a charge restoral portion of a pulse charge/discharge cycle,

repetitively supplying a supply current to the battery for a supply duration at intervals interspersed with discharging a discharge current from the battery for a discharge duration, said supply current being apportioned between a gassing current effective to electrolyze water thereby evolving gas and a charge current effective to convert battery plate material thereby restoring charge, said supply duration apportioned between a charge duration wherein charge restoral dominates gas evolution and a gassing duration wherein gas evolution dominates charge restoral; and,

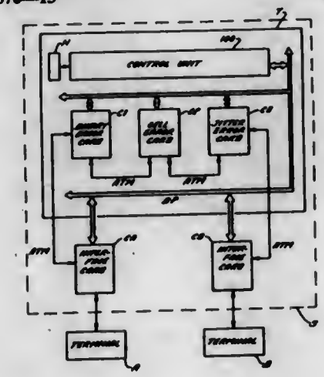
controlling a combination of said supply current and said supply duration to contemporaneously yield a high charge restoral rate and a destratifying gas evolution rate.

## 5,499,235

### METHOD FOR THE SIMULATION OF TRANSMISSION ON A TRANSMISSION NETWORK WORKING IN ASYNCHRONOUS TRANSFER MODE AND SIMULATOR OF TRANSMISSION ON SUCH A NETWORK

Thierry Houdoin, Pleumeur Bodou, and Jean-Yves Cochennec, Trebeurden, both of, France, assignors to France Telecom, Paris, France

Filed Dec. 15, 1993, Ser. No. 168,033
Claims priority, application France, Dec. 16, 1992, 92 15178
Int. Cl.[6] H04J 3/14; H04L 12/26;12/56
U.S. Cl. 370—13 51 Claims



35. A simulator of transmission on an asynchronous transfer mode transmission network, comprising:

connection means for connecting a reception terminal to the simulator, said reception terminal being capable of receiving signals constituted by cells according to the asynchronous transfer mode,

means for generating a digital signal with a format and bit rate corresponding to a format and a bit rate which are standard for transmissions on the network, the generated digital signal being constituted by cells identifiable by a header;

means for generating a signal representative of a simulated transmission error, the error generation means comprising cell error generation means for generating cell errors, the cell error generation means further comprising

a first storage device in which there is recorded at least one predetermined model of cell error generation,

a second read/write storage device in which the predetermined model is loaded at the required moment so as to obtain a digital error generation signal by reading the second storage device,

control means for controlling operations for the reading/writing of the second storage device; and

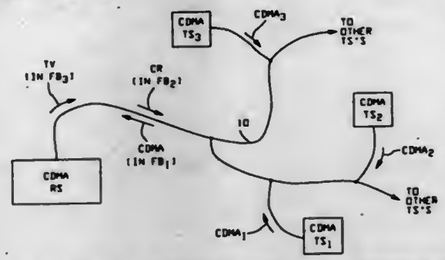
control and processing means for forming a processed signal by introducing the error signal into an incident signal, wherein said incident signal comprises one of (A) the generated digital signal and (B) a multiplexed signal formed by multiplexing the generated digital signal with a signal received from a transmission terminal, said control and processing means further comprising cell error generation means for receiving the error generation signal and for generating cell errors in the incident signal as a function of the received digital signal.

## 5,499,236

### SYNCHRONOUS MULTIPOINT-TO-POINT CDMA COMMUNICATION SYSTEM

Thomas R. Giallorenzi, Salt Lake City; Mark T. Rafter, Park City; Kenneth C. Greenwood; Harry B. Press, both of Sandy, and Samuel C. Kingston, Salt Lake City, all of Utah, assignors to Unisys Corporation, Blue Bell, Pa.

Filed Aug. 16, 1994, Ser. No. 291,648
Int. Cl.[6] H04J 13/02; H04L 7/00
U.S. Cl. 370—18 19 Claims




1. A synchronous multipoint-to-point CDMA communication system, comprising:

a plurality of CDMA transmitting stations and a single CDMA receiving station, all of which are intercoupled to each other over one CDMA channel and one feedback channel;

said CDMA transmitting stations each including a respective modulator which modulates data signals with a respective spreading code to generate CDMA signals that are added together on said CDMA channel and sent to said CDMA receiving station;

said CDMA receiving station including an error detection circuit which detects respective time differences between a reference clock signal and said spreading codes in said CDMA signals as received at said CDMA receiving station, and an error sending circuit which sends respective error signals that indicate said time differences over said feedback channel to each of said CDMA transmitting stations; and,

said CDMA transmitting stations each including a respective error receiver circuit which receives a respective error signal on said feedback channel, and a respective error correction circuit which responds to the received error signal by time shifting said CDMA signals to said CDMA channel such that said spreading code in said CDMA signals arrive at said receiving station in synchronization with said reference clock signal.

## 5,499,237

### WASTE CANCELING PACKET ROUTING SYSTEM AND METHOD

Peter J. Richetta, Tempe, and Victor H. Cutler, Jr., Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 23, 1995, Ser. No. 409,287
Int. Cl.[6] H04L 12/56
U.S. Cl. 370—54 21 Claims

1. In a communication system comprised of nodes that communicate with each other over links, a method of routing data packets among said nodes comprising the steps of:

simulating packet routing on a number of data packets between said nodes over said links using a set of initial routing instructions;

searching for forward and reverse link usage of data packets having a same destination node on at least one of said links;

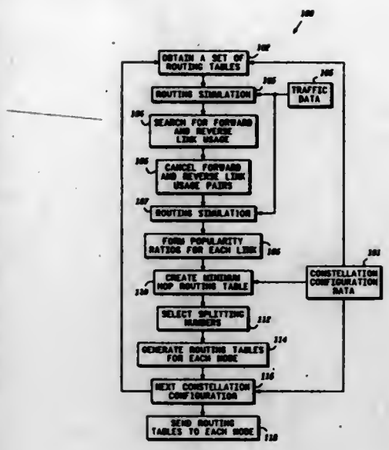
canceling pairs of said forward and reverse link usage;

forming new routes for each data packet of said pairs of said forward and reverse link usage;

generating a routing table for one of said nodes using said new paths; and

routing said data packets according to said routing table.



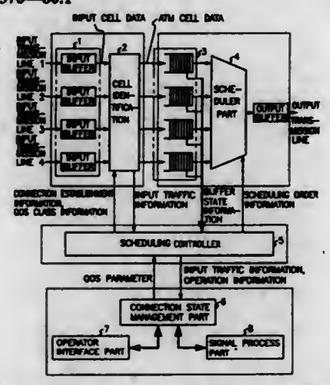



## 5,499,238

### ASYNCHRONOUS TRANSFER MODE (ATM) MULTIPLEXING PROCESS DEVICE AND METHOD OF THE BROADBAND INTEGRATED SERVICE DIGITAL NETWORK SUBSCRIBER ACCESS APPARATUS

Seung W. Shon, Daejeon, Rep. of Korea, assignor to Electronics and Telecommunications Research Institute, Daejeon, and Korea Telecommunication Authroity, Seoul, both of, Rep. of Korea

Filed Nov. 4, 1994, Ser. No. 336,650
Claims priority, application Rep. of Korea, Nov. 6, 1993, 1993-23534
Int. Cl.[6] H04Q 11/04
U.S. Cl. 370—60.1 3 Claims




1. An ATM multiplexing process device of a broadband integrated service digital network subscriber apparatus, comprising:

(a) input buffering means for storing cells inputting each input terminal through a plurality of input lines momentarily;

(b) cell identification means for classifying input cell data to a predetermined quality of service (QOS) class in accordance with connection establishment information, QOS class information and a header information of the input cell data after receiving the input cell data from said input buffering means, and outputting ATM cell data and input traffic information;

(c) QOS class buffering means for storing the ATM cell data input from said cell identification means, respectively, according to the class, and for outputting buffer stage information;

(d) scheduling control means for outputting the connection establishment information and QOS class information to said cell identification means, and for outputting all operation information of the ATM multiplexing process device and input traffic information, after receiving the input traffic information from said cell identification means, the buffer state information from said QOS class buffering means, and a QOS parameter;

(e) scheduling means for outputting the cells input from said QOS class buffering means to the outside in accordance with scheduling order information input from said scheduling control means; and

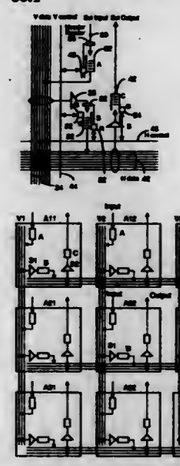
(f) connection state management means for outputting the QOS parameter to said scheduling control means in accordance with an added value of a network operator to provide network resources efficiently and equally to manage connection state information with the network, and for transferring all the operation information of the ATM multiplexing process device and the input traffic information to the network operator after receiving them from said scheduling control means.

## 5,499,239

### LARGE CAPACITY MODULAR ATM SWITCH

Ernst A. Munter, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Apr. 14, 1995, Ser. No. 422,240
Int. Cl.[6] H04L 12/56
U.S. Cl. 370—60.1 21 Claims



1. A large capacity modular ATM switch for exchanging data in ATM cells among I/O ports, comprising:

a plurality of switching modules arranged in a logical mxn matrix, m and n being positive integers, each switching module having an I/O port, a buffer, bus selector means and a control circuit;

H data buses separately connecting modules in each separate row of the matrix to send data to all the modules in each row;

V data buses separately connecting modules in each separate column of the matrix to send data to all the modules in each column;

H and V control buses connecting modules in rows and columns to exchange control signals among the module control circuits;

the bus selector means of each module connected to the H and V data buses for selectively receiving data therefrom in response to the control signals on the H and V control buses;

the buffer connected to both data buses for storing one or more ATM cells in transit between the I/O ports; and

the control circuits for generating the control signals in response to the state of the buffer.

5,499,240

## SWITCHED COMMUNICATION NETWORK WITH BANDWIDTH MANAGERS FOR ACHIEVING END-TO-END DATA COMPRESSION DURING TRANSPORT

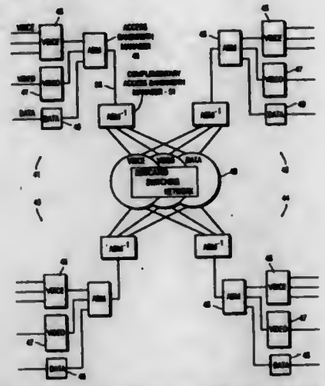
Christopher J. Gittins, Felixstowe, and Simon A. Cox, Woodbridge, both of, England, assignors to British Telecommunications public limited company, London, England

Filed Jun. 21, 1994, Ser. No. 263,346

Claims priority, application European Pat. Off., Mar. 9, 1994, 94301674

Int. Cl.[6] H04J 3/12; H04L 12/00; H04Q 11/04

U.S. Cl. 370—68.1 9 Claims



1. A switched telecommunications network comprising:

a plurality of interconnected switching devices and a plurality of bandwidth management devices arranged to provide access to the switching devices providing a plurality of switching networks, each switching network including means for switching a respective type of data,

the plurality of bandwidth management devices including a transmitting bandwidth management device arranged to compress data from a transmitting user for transmission over the network, and a receiving bandwidth management device arranged to de-compress received compressed data for transmission to a receiving user, wherein the transmitted data remains in compressed form while being switched and transmitted by the network,

means for compressing data prior to being multiplexed for transmission to a switching device constituting a local exchange, the multiplexed data being demultiplexed at the local exchange, and

means at the local exchange for de-multiplexing multiplexed data wherein each type of data obtained form the multiplex is supplied to respective networks in compressed form.

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5,499,241

## BROADBAND COMMUNICATIONS SYSTEM

Leo J. Thompson, Lilburn; Gregory T. Dubberly, Atlanta; John A. Ritchie, Jr., Duluth, all of Ga., and David M. Fellows, Beverly, Mass., assignors to Scientific-Atlanta, Inc., Norcross, Ga.

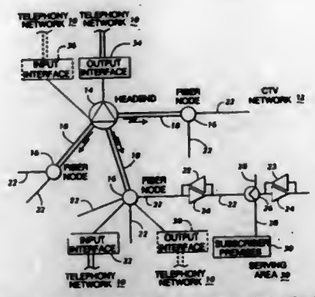
Filed Sep. 17, 1993, Ser. No. 123,363

Int. Cl.[6] H04H 1/08

U.S. Cl. 370—73 32 Claims

3. An apparatus for the communication of incoming telephony signals from a telephony network to a plurality of subscribers of a subscription system and for the communication of outgoing telephony signals from the plurality of subscribers to the telephony network, said subscription system including a subscription network having a forward band of frequencies and a reverse band of signaling frequencies, said apparatus comprising:

a first modulator for modulating the incoming telephony signals from the telephony network on a carrier in the forward band



of said subscription network, said incoming telephony signals from the telephony network comprising a digital multiplexed input signal including a plurality of input data channels, the position of a particular input data channel in the multiplexed input signal indicating the destination of the data in that channel to the particular one of the plurality of subscribers;

a subscriber terminal demodulater for demodulating the incoming telephony signals from the subscription network and coupling them to a particular one of the plurality of subscribers;

a second modulator, associated with said subscriber terminal demodulater, for modulating the outgoing telephony signals from the particular one of the plurality of subscribers on a carrier in the reverse band of the subscription network, said outgoing telephony signals to the telephony network comprising a digital multiplexed output signal including a plurality of output data channels, the position of a particular output data channel in the multiplexed output signal indicating the origin of the data in that channel from the particular one of the plurality of subscribers;

an outgoing telephony signal demodulator for demodulating the outgoing telephony signals from the reverse band of the subscription network;

a first coupler for coupling the incoming telephony signals from the telephony network to said first modulator, said first coupler coupling the particular input data channel to a predetermined carrier in the forward band of the subscription network; and

a second coupler for coupling the outgoing telephony signals from said outgoing telephony signal demodulator to the telephony network, said second coupler coupling the outgoing telephony signals from the particular one of the plurality of subscribers in the reverse band of the subscription network to the particular output data channel.

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5,499,242

## CIRCUIT FOR DISTRIBUTED COLLISION DETECTION

Wesley Lee, San Jose, Calif., and Jerry Grand, Atlanta, Ga., assignors to National Semiconductor Corporation, Del.

Filed Jan. 31, 1995, Ser. No. 381,183

Int. Cl.[6] H04L 12/413

U.S. Cl. 370—85.3 12 Claims

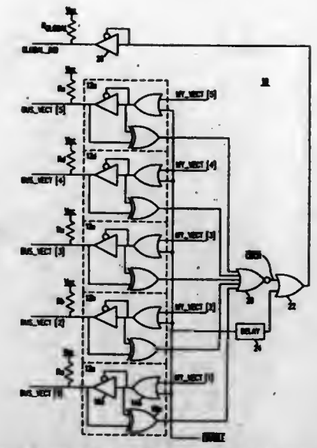
6. A collision detection circuit for use with each one of a plurality of stations' of a data processing network, plurality of stations' connected to an n-line common collision detection bus ($n \geq 2$), each station having a corresponding n-bit identifier, the collision detection circuit comprising:

a) n bit-collision circuits, each bit collision circuit including

i) a bit-collision circuit driver having an input coupled to receive an x-th bit of the n-bit identifier of the station with which the collision detection circuit is to be used, the bit-collision circuit driver having an output connected to drive an x-th line of said common collision detection bus when said x-th bit of said n-bit identifier is at a first level and to otherwise present a high impedance at the bit-collision circuit driver output; and

ii) comparing means for comparing said level of said x-th line of said common collision detection bus with said level of





said x-th bit of said n-bit identifier and providing a bit-collision result signal responsive thereto; and

b) combining means for receiving and combining the bit-collision result signals provided by the comparing means of said n bit-collision circuits and to generated a combined bit-collision result signal responsive thereto.

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5,499,243

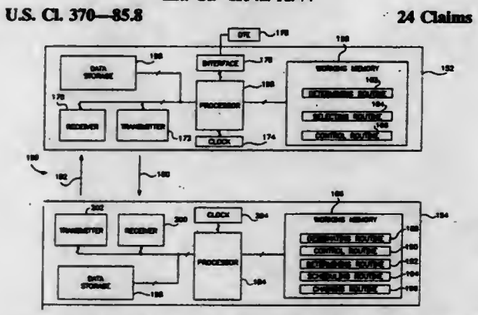
## METHOD AND APPARATUS FOR COORDINATING TRANSFER OF INFORMATION BETWEEN A BASE STATION AND A PLURALITY OF RADIOS

Dennis R. Hall, 750 Gonzales Dr., Apt. 3B, San Francisco, Calif. 94132

Filed Jan. 22, 1993, Ser. No. 7,586

Int. Cl.[6] H04L 12/44

U.S. Cl. 370—85.8 24 Claims



1. In a communications system comprising a base station which controls access to a communications channel and which divides time on said channel into periods, each said period comprising an assignment frame of plural request time slots and plural information time slots, a method for coordinating the transfer of information signals to said base station, comprising the steps of:

transmitting a request time slot assignment frame to a plurality of sending sources, each of the request time slots in the assignment frame designating a time during which corresponding ones of the sending sources may request to transfer information signals;

receiving a request signal from a sending source on said channel during a designated request time slot;

identifying a sending source which sent the received request signal;

ascertaining a priority associated with said sending source; and

determining, based on the priority of said sending source, whether to reserve one or more information time slots on said channel for said sending source to send information signals.

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5,499,244

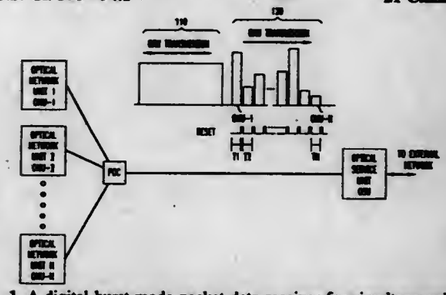
## PACKET DATA RECIEVER WITH SAMPLED DATA OUTPUT AND BACKGROUND LIGHT CANCELLATION

Theo W. M. Mooch, Wormerveer, Netherlands; Yusuke Ota, Mountain Lakes; Robert G. Swartz, Tinton Falls, both of N.J., and Richard A. van Wijk, Bunschoten, Netherlands, assignors to AT&T Corp., Murray Hill, N.J.

Filed May 2, 1994, Ser. No. 236,608

Int. Cl.[6] H04J 3/12; H04L 5/22

U.S. Cl. 370—94.1 21 Claims



1. A digital burst-mode packet data receiver for simultaneously receiving a high-speed burst-mode packet data signal and a lower frequency data signal, comprising.

first means for detecting the high-speed burst-mode packet data signal,

means for receiving a reset signal during a time period between consecutive packet data bursts of the high-speed packet data signal,

means, responsive to said reset signal, for resetting the first means for detecting to a reference level, and

second means, responsive to said reset signal, for detecting the lower frequency data signal during a predetermined portion of the time period between consecutive packet data bursts of the high-speed packet data without interference from said high-speed burst-mode packet data signal.

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5,499,245

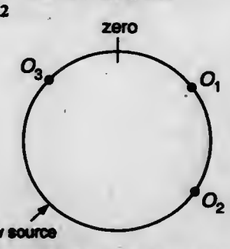
## TEMPORAL PLACEMENT CONTROL OF VIDEO FRAMES IN B-ISDN NETWORKS

Duan-Shin Lee, Princeton Junction, and Bhaskar Sengupta, Cranbury, both of N.J., assignors to NEC USA, Inc., Princeton, N.J.

Filed Nov. 1, 1994, Ser. No. 332,978

Int. Cl.[6] H04J 3/16

U.S. Cl. 370—94.2 4 Claims




1. A method of temporal placement control of video frames in B-ISDN networks comprising the steps of:

dividing the inter-frame interval (τ) into a quantity of intervals equal to the quantity of active calls, and

selecting the largest interval of said quantity of intervals and the midpoint of said selected largest interval is the offset for a newly arriving call.

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**5,499,246**

## DIGITAL RADIO RECEIVER WHICH DETECTS WHEN A PORTION OF A BURST IS STOLEN FOR A CONTROL MESSAGE

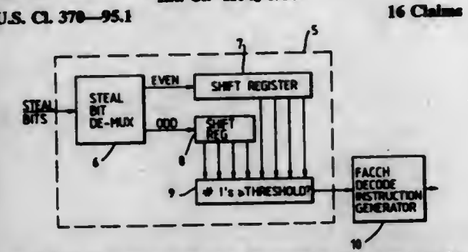
**Andrew Cooper, Wokingham, England, assignor to Nokia Mobile Phones (U.K.) Limited, United Kingdom**

**Filed Sep. 28, 1992, Ser. No. 952,559**

**Claims priority, application United Kingdom, Jan. 4, 1991, 9121145**

**Int. Cl.[6] H04J *3/16***

**U.S. Cl. 370—95.1** **16 Claims**




1. A receiver for receiving data transmitted in a burst-mode radio communications system, wherein first data elements relating to a first message are interleaved over a first plurality of bursts, and selected data elements relating to said first message are substituted by second data elements relating to a second message and interleaved over a second plurality of bursts, each burst including flag means which can be set to indicate if data elements relating to the first message have been substituted by data elements of the second message, the receiver comprising:

first means for extracting and re-ordering data elements of received data over said first plurality of bursts to reconstitute the first message,

second means for detecting the flag means over a predetermined number of said bursts, and

third means coupled to said second means for extracting substitute second data elements to reconstitute the second message conditional on a proportion of set flag means being detected by said second means.

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**5,499,247**

## MULTIPLEX TRANSMISSION SYSTEM HAVING PLURALITY OF NODES AND COMMON TRANSMISSION LINE AND USING DIVIDED DATA AREAS

**Yutaka Matsuda; Hiroo Meriue; Kyosuke Hashimoto, all of Hiratsuka; Mitsuru Akimoto, Yokohama; Seiji Hirano, Hiroshima; Osamu Michihira, Hiroshima; Koji Terayama, Hiroshima; Hiroaki Sakamoto, Fukuyama, and Koji Umegaki, Hiroshima, all of, Japan, assignors to The Furukawa Electric Corp., Tokyo, and Mazda Motor Corp., Hiroshima, both of, Japan**

**Continuation of Ser. No. 861,324, Mar. 31, 1992, abandoned. This application Jan. 18, 1994, Ser. No. 183,114**

**Claims priority, application Japan, Apr. 2, 1991, 3-070033; Jan. 25, 1991, 3-279596**

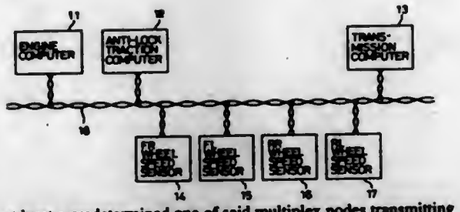
**Int. Cl.[6] H04L *12/40***

**U.S. Cl. 370—85.3** **18 Claims**

1. A multiplex transmission system comprising:

multiplex transmission lines; and

a plurality of multiplex nodes which are interconnected with said multiplex transmission lines, and which transmit a frame of data to each other;




at least a predetermined one of said multiplex nodes transmitting said frame of data which includes an identifier indicative of a send request of data and a data area following said identifier; and

said data area being divided into subdivided areas, each of said subdivided areas being assigned to a multiplex node specified by said identifier;

each of said plurality of multiplex nodes transmitting data of the respective multiplex nodes to the data area assigned to the respective multiplex nodes in said frame of data only when said frame of data includes an identifier indicative of a send request to the respective multiplex nodes.

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**5,499,248**

## TEST VECTOR GENERATOR COMPRISING A DECOMPRESSION CONTROL UNIT AND A CONDITIONAL VECTOR PROCESSING UNIT AND METHOD FOR GENERATING A TEST VECTOR

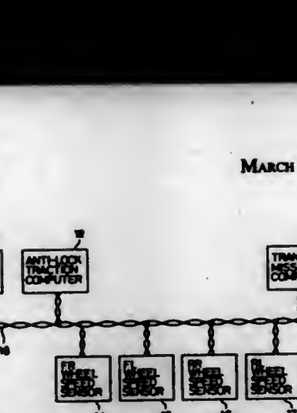
**Klaus-Peter Behrens, Geertringen; Martin Fischer, Heilbronn, and Thomas Henkel, Boeblingen, all of, Germany, assignors to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed Jan. 31, 1994, Ser. No. 189,200**

**Claims priority, application Germany, Feb. 23, 1993, 43 05 442.0**

**Int. Cl.[6] G01R *31/3183***

**U.S. Cl. 371—22.1** **33 Claims**



1. A test vector generator for generating a test vector used for testing an electronic device having a memory or a logic/memory combination and a plurality of terminals, said terminals including at least:

a first subset of said terminals, at least temporarily operative as address terminals,

a second subset of said terminals at least temporarily operative as data terminals,

wherein said test vector generator comprises:

at least one terminal channel assigned to said terminals or to a specific set of terminals, said terminal channel comprising:

a sequence controller for generating a first sequence of vectors,

at least one decompression control unit which is controlled by said first sequence of vectors generated by the sequence controller, generates plural subsequent decompression signals based on each vector of said first sequence of signals and feeds them to the sequence controller,

wherein said sequence controller further includes conditional vector processing means for generating a second sequence of vectors by logically combining said first sequence of said vectors with the decompressed signals received from the decompression control unit, and for applying the second sequence of vector to said terminal or to said specific set of terminals.



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**5,499,249**

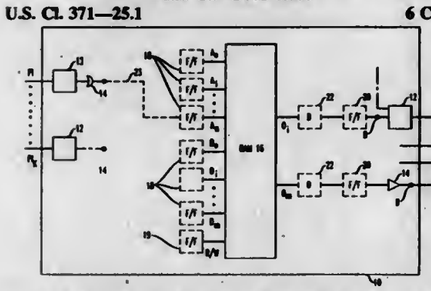
## METHOD AND APPARATUS FOR TEST GENERATION AND FAULT SIMULATION FOR SEQUENTIAL CIRCUITS WITH EMBEDDED RANDOM ACCESS MEMORIES (RAMS)

**Vishwani D. Agrawal, New Providence, and Tapan J. Chakraborty, Mercerville, both of N.J., assignors to AT&T Corp., Murray Hill, N.J.**

**Filed May 31, 1994, Ser. No. 251,550**

**Int. Cl.[6] G06F *11/00***

**U.S. Cl. 371—25.1** **6 Claims**



1. A method for testing a sequential circuit, including a least one sequential element and at least one embedded RAM linked to said one sequential element via a propagation path that includes at least one node and which extends from one of a set of primary circuit inputs through the RAM to one of a set of primary circuit outputs, comprising the steps of:

generating at least one sequence of test vectors for application to the primary inputs of the circuit to cause a fault at the node to be excited and to cause its effect to propagate through the RAM to said one of said primary circuit outputs when the node is upstream of the RAM and to cause the fault to be excited through the RAM when the node is downstream thereof, and to cause the fault's effect to be propagated to said one of said primary outputs;

applying the sequence of test vectors to the circuit at its primary inputs to cause the circuit to generate response signals at its primary outputs; and

comparing the responses at the circuit outputs to a set of reference values to determine if any differences exist therebetween.

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**5,499,250**

## SYSTEM HAVING MULTIPLE SUBSYSTEMS AND TEST SIGNAL SOURCE RESIDENT UPON COMMON SUBSTRATE

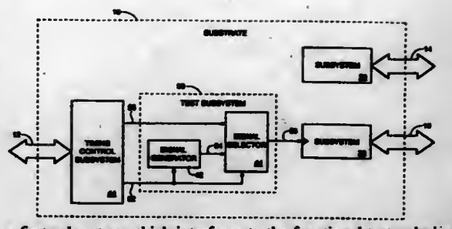
**Charles L. Ingalls, and Mark R. Thomann, both of Boise, Id., assignors to Micron Technology Inc., Boise, Id.**

**Continuation of Ser. No. 989,403, Dec. 11, 1992, Pat. No. 5,442,642. This application May 18, 1995, Ser. No. 443,818**

**Int. Cl.[6] H04B *1/16***

**U.S. Cl. 371—28** **26 Claims**

1. A system formed on a substrate, the system interfacing with an off-substrate functional tester during a first test, the system comprising:




a first subsystem which interfaces to the functional tester during the first test;

a second subsystem for performing, during the first test, an operation independent of operation and current state of the first subsystem;

a test signal source which generates a first signal during the first test, of the first and second subsystems only the second subsystem receiving the first signal during the first test; and

wherein the first subsystem, second subsystem and test signal source are resident to the substrate.

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**5,499,251**

## METHOD OF RECOVERING LOST BITS IN A DIGITAL TRANSMISSION

**Harald Brusewitz, Älvsjö , Sweden, assignor to Televerket, Farsta, Sweden**

**Continuation of Ser. No. 969,220, Feb. 12, 1993, abandoned. This application Oct. 17, 1994, Ser. No. 327,816**

**Claims priority, application Sweden, Aug. 15, 1990, 9002646**

**Int. Cl.[6] G06F *11/00***

**U.S. Cl. 371—37.1** **6 Claims**

1. A method of recovering at least one lost bit in a digital transmission, wherein a number of data bits (d1. . . dn) are transmitted together with at least one control bit (c1 . . . ck), comprising the steps of:

calculating at least one control bit in a transmitter using a number of parity constants (p11 . . . pkn) so that a corresponding number of parity relations are fulfilled according to ci=pi1·d1+pi2·d2+ . . . +pin·dn,

outputting from the transmitter plural data bits and the at least one control bit;

inputting into a receiver the plural data bits and the at least one control bit, the plural data bits and the at least one control bit having at least one lost bit;

detecting in the receiver, at least one position of the at least one lost bit,

calculating at least one syndrome bit (s1 . . . sk) from the transmitted data bits and the at least one control bit, the each of the at least one syndrome bit is calculated as si=ci'+pi1·d1'+pi2·d2'+ . . . +pin·dn', a prime symbol denoting that a lost bit is replaced by zero; and

recovering the at least one lost bit by mapping the at least one syndrome bit (s1 . . . sk) indicating the value of the at least one lost bit.

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**5,499,252**

## CD-ROM DECODER HAVING MEANS FOR READING SELECTED DATA FROM A CD INTO A MEMORY

**Tomofumi Watanabe, Gifu, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan**

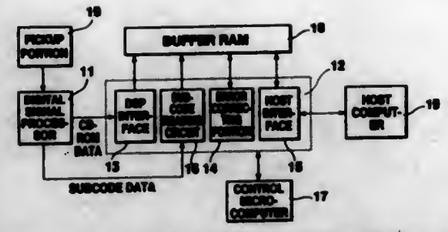
**Filed Nov. 10, 1993, Ser. No. 149,981**

**Claims priority, application Japan, Nov. 20, 1992, 4-312009; Nov. 26, 1992, 4-317537**

**Int. Cl.[6] G11B *20/18***

**U.S. Cl. 371—40.1** **4 Claims**

1. A CD-ROM decoder for receiving digital data which has been subjected to signal processing by a digital signal processor in




accordance with a predetermined format, correcting code errors of said digital data, and supplying the corrected data to a host computer, said CD-ROM decoder comprising:

an input interface means for receiving ROM data from said digital signal processor and writing said ROM data into a memory;

a subcode reading means for receiving subcode data from said digital signal processor and writing said subcode data to the memory;

an error correcting means for reading from the memory said ROM data which is written by said input interface means, detecting and correcting code errors of said ROM data, and writing said ROM data into the memory; and

an output interface means for reading from said memory said ROM data which is written by said error correcting means and said subcode data which is written by said subcode reading means, and supplying said ROM data and said subcode data to the host computer.

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**5,499,253**

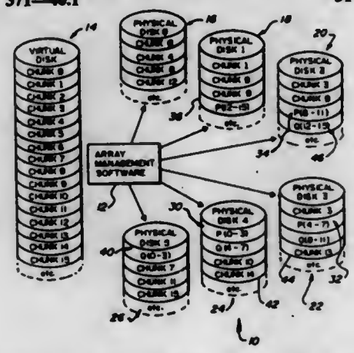
**SYSTEM AND METHOD FOR CALCULATING RAID 6 CHECK CODES**

**Richard F. Lary, Colorado Springs, Colo., assignor to Digital Equipment Corporation, Maynard, Mass.**

**Filed Jan. 5, 1994, Ser. No. 177,563**

**Int. Cl.[6] G06F *11/00***

**U.S. Cl. 371—40.1** **51 Claims**




1. A method for updating RAID 6 check codes by transforming a first check symbol difference to a second check symbol difference comprising the steps of:

establishing a generator polynomial of the form $G=X^N+X^D+1$;

selecting an index K;

renumbering said first check symbol difference by K bits to define a renumbered check symbol difference;

calculating a logical difference of each of said first K bits of said renumbered check symbol difference with each of another K bits of said renumbered check symbol difference thereof forming a resultant K bits of said renumbered check symbol difference starting at bit position D; and

defining said second check symbol difference by said renumbered check symbol difference inclusive of said resultant K bits.

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**5,499,254**

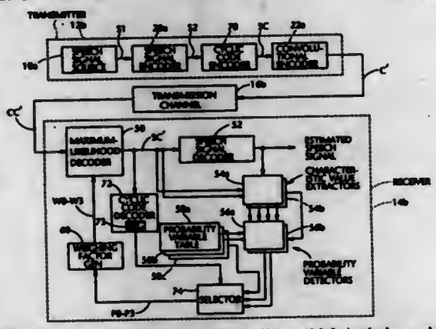
**APPARATUS FOR ERROR-CORRECT DECODING IN A DIGITAL DATA COMMUNICATIONS SYSTEM**

**Masao Ikekawa, and Toshiyuki Nomura, both of Tokyo, Japan, assignors to NEC Corporation, Japan**

**Filed Aug. 31, 1994, Ser. No. 299,237**

**Int. Cl.[6] G06F *11/10*; H03M *13/12***

**U.S. Cl. 371—43** **7 Claims**




1. An apparatus for error-control coding, which includes a data transmitter and a data receiver interconnected via a transmission channel, said data receiver including:

first means (**50**, **60**) for successively error-correct decoding a plurality of data frames which have been error-correct encoded at said transmitter, said first means changing decoding parameters in response to control data applied thereto, said control data being generated based on one or more than one data frames preceding a data frame currently decoded at said first means;

second means (**52**) coupled to said first means for decoding output of said first means;

third means (**54**, **54***a*–**54***b*), coupled to receive outputs of said first and second means, for extracting frame characteristic data therefrom; and

fourth means (**58**, **58***a*–**58***c*, **56**, **56***a*–**56***b*) coupled to said third means, said fourth means being responsive to said frame characteristic data and detecting one of a plurality of probability variable sets stored in said fourth means, said fourth means applying said one of a plurality of probability variable sets to said first means as said control data.

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**5,499,255**

**COAXIAL HYBRID WIGGLER**

**Robert H. Jackson, Springfield; Henry P. Freund, Vienna; Dean E. Pershing, Springfield, all of Va., and José M. Taccetti, Greenbelt, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Jul. 12, 1994, Ser. No. 274,183**

**Int. Cl.[6] H01S *3/00***

**U.S. Cl. 372—2** **6 Claims**

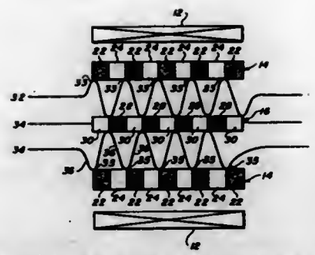
1. An electrogmagnetic wiggler, comprising:

an outer member disposed cylindrically about a central axis; and

an inner member disposed aloha said central axis and within said outer meter;

wherein said outer member comprises a plurality of sections along said axis alternatingly of ferromagnetic and non-ferromagnetic material, the total length along said axis of any one of said sections of said ferromagnetic material and any-





one of said sections of said non-ferromagnetic material is substantially the same, said total length being the period $\lambda_w$ of said wiggler;

wherein said inner member comprises a plurality of sections along said axis of ferromagnetic and non-ferromagnetic material, said sections of said inner member being disposed along said axis, the total length said axis of any one of said sections of said ferromagnetic material of said inner member, and anyone of said sections of said non-ferromagnetic material of said inner member, is substantially said $\lambda_w$;

wherein the sequence of said sections along said axis is shifted effective to cause said sections of ferromagnetic material of said outer member to be radially opposite said sections of non-ferromagnetic material of said inner member along said axis, and said sections of said ferromagnetic material of said inner member to be radially opposite said sections of non-ferromagnetic material of said outer member along said axis; and

wherein said inner member and said outer member are disposed right-circular cylindrically about said axis.

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**5,499,256**

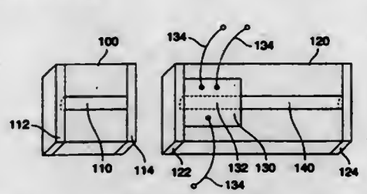
**POLARIZED FREQUENCY-SELECTIVE OPTICAL SOURCE**

**William K. Bischel, Menlo Park; Michael J. Brinkman, Redwood City, and David A. G. Deacon, Los Altos, all of Calif., assignors to Deacon Research, Palo Alto, Calif.**

**Filed Feb. 14, 1995, Ser. No. 388,318**

**Int. Cl.[6] H01S *3/10***

**U.S. Cl. 372—28** **22 Claims**




1. A polarized frequency-selective optical source comprising:

a first optical reflector;

at least a second optical reflector aligned with said first optical reflector to define a resonating structure;

a polarized solid state optical gain medium disposed in said resonating structure to generate first polarized optical energy;

a solid state integrated optical tuning structure in an optical path within said resonating structure optically coupled to said optical gain medium, the optical tuning structure comprising:

a frequency-selective polarization converter having a first port and a second port coupled by a first solid state waveguide, said first port coupled to receive said first polarized optical energy; and

a second solid state optical waveguide coupled to said second port of said polarization converter, said second waveguide supporting only second polarized optical energy, said second polarized optical energy being differently polarized than said first polarized optical energy; and

means for extracting frequency-selected optical energy from the optical path passing through said polarization converter, wherein at a selected optical frequency defined by said integrated optical tuning structure, said first polarized optical energy is substantially converted to said second polarized optical energy in order to produce a low-loss longitudinally-twisted polarization mode of said optical energy in said resonating structure.

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**5,499,257**

**OUTPUT CONTROL APPARATUS FOR LASER OSCILLATOR**

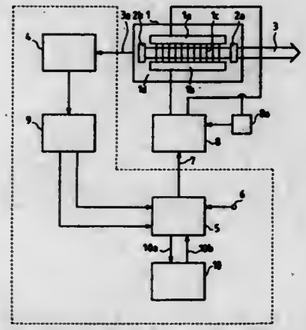
**Osamu Nagano, and Tsukasa Fukushima, both of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Jan. 6, 1994, Ser. No. 178,002**

**Claims priority, application Japan, Jan. 7, 1993, 5-001185**

**Int. Cl.[6] H01S *3/13***

**U.S. Cl. 372—31** **8 Claims**



1. An output control apparatus for a laser oscillator, comprising:

a laser oscillator;

a power supply device for supplying excitation power to said laser oscillator;

a detector for detecting the intensity of a laser beam output by said laser oscillator and outputting a signal indicative of said intensity;

a measuring means connected to said detector for measuring the output value of said detector and outputting a measurement signal; and

a control circuit for providing a power command to said power supply device based on said measurement signals and a desired laser output command indicative of a desired intensity of the laser beam output;

wherein said power command output by said control circuit indicates operation of the laser oscillator according to a constant power control mode when the measured output value of said detector exceeds a reference value, and otherwise indicates operation of the laser oscillator according to a constant laser output control mode; and

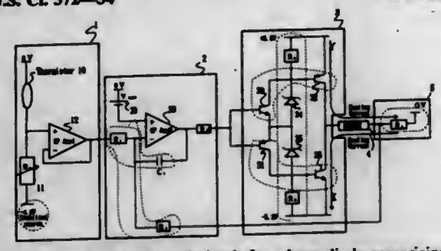
wherein said power supply device supplies excitation power to maintain the laser output to be equivalent to the desired laser output command when said power command indicates constant laser output control, and to provide the applied power based on a predetermined value when said power command indicates constant power control.

5,499,258

## AUTOMATIC TEMPERATURE CONTROL CIRCUIT OF LASER DIODE AND ELECTRIC/OPTICAL SIGNAL CONVERTING UNIT USING THE SAME

Michinao Kawano; Setsuo Misaizu; Tomoko Anzai, all of Yokohama, and Takashi Tsuda, Kawasaki, all of, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Dec. 9, 1994, Ser. No. 353,125
Claims priority, application Japan, May 19, 1994, 6-129807
Int. Cl.[6] H01S 3/04
U.S. Cl. 372—34 18 Claims



1. An temperature control circuit for a laser diode comprising:
a peltier element for changing a temperature of the laser diode by heating or cooling;
a temperature detecting section for detecting the temperature of the laser diode and outputting a corresponding detected voltage;
an error amplifying section for outputting an error voltage by comparing the detected voltage outputted from the temperature detecting section with a predetermined value;
a peltier current driving section for controlling a direction of a driving current flowing to the peltier element in correspondence with the error voltage outputted from the error amplifying section; and
a circuit for feeding back a voltage corresponding to the driving current flowing to the peltier element, to an input side of the error amplifying section, and adding it to the detected voltage outputted from the temperature detecting section.

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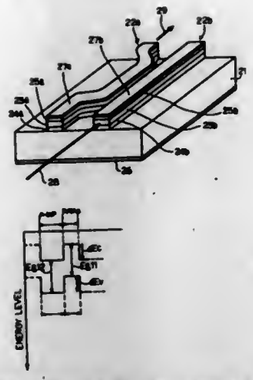
5,499,259

## SEMICONDUCTOR OPTICAL DEVICE WITH LIGHT CONTROLLING LAYER OF SUPER-LATTICE STRUCTURE

Kikuo Makita, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 27, 1994, Ser. No. 265,752
Claims priority, application Japan, Jun. 25, 1993, 5-154041
Int. Cl.[6] H01S 3/18
U.S. Cl. 372—45 7 Claims

1. A semiconductor light modulator of an electro-reflection type for controlling the intensity of an incident light, comprising:
a) a substrate;
b) a first wave guide having a first light transmitting layer implemented by a super-lattice structure formed by using a first compound semiconductor material and a second compound semiconductor material, said incident light being radiated into said first light transmitting layer for modulating the intensity thereof, said first compound semiconductor material having a first electron affinity and a first energy band gap, said second compound semiconductor material having a second electron affinity larger than said first electron affinity and a second energy band gap, the total of said second electron affinity and said second energy band gap being larger than the total of said first electron affinity and said first energy band gap;
c) a second wave guide having a second light transmitting layer implemented by the super-lattice structure formed by using said first compound semiconductor material and said second compound semiconductor material, and said incident light being transferred from said first light transmitting layer to said second light transmitting layer for emitting a modulated light to the outside thereof under a light coupling; and
d) a pair of electrodes operative to apply a variable voltage to said first and second light transmitting layers for controlling the light coupling between said first light transmitting layer and said second light transmitting layer.



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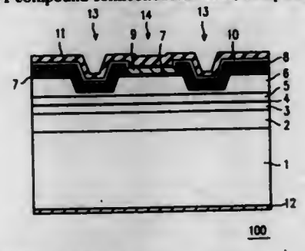
5,499,260

## SEMICONDUCTOR LASER AND A METHOD FOR FABRICATING THE SAME

Yasuhito Takahashi, Hirakata, and Ayumu Tsujimura, Takatsuki, both of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 29, 1994, Ser. No. 282,919
Claims priority, application Japan, Aug. 4, 1993, 5-193423
Int. Cl.[6] H01S 3/18
U.S. Cl. 372—46 29 Claims

1. A II-VI compound semiconductor laser, comprising:



a semiconductor substrate;
a semiconductor multilayer structure formed on the semiconductor substrate, the semiconductor multilayer structure including a lower cladding layer, an upper cladding layer and an active layer interposed between the lower and upper cladding layers;
an upper electrode formed on the semiconductor multilayer structure; and
a lower electrode formed on a bottom surface of the semiconductor substrate,
wherein the semiconductor multilayer structure comprises a striped ridge portion, side surfaces of the striped ridge portions being covered by a current blocking layer which confines current flowing between the upper and lower electrodes into the striped ridge portion, and
the current blocking layer includes a first insulating material and a second insulating material, the first insulating material having a smaller refractive index than that of the upper cladding layer, the second insulating material having a larger refractive index than that of the upper cladding layer.



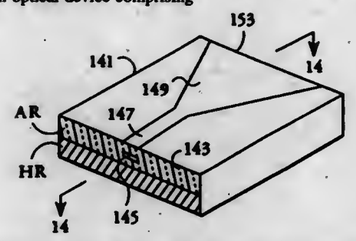
5,499,261

## LIGHT EMITTING OPTICAL DEVICE WITH ON-CHIP EXTERNAL CAVITY REFLECTOR

David F. Welch, Menlo Park; David G. Mehuys, Sunnyvale, and Donald R. Scifres, San Jose, all of Calif., assignors to SDL, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 1,735, Jan. 7, 1993, Pat. No. 5,392,308. This application Sep. 12, 1994, Ser. No. 304,530
Int. Cl.[6] H01S 3/19
U.S. Cl. 372—50 4 Claims

1. An optical device comprising



a multilayer semiconductor chip containing an active gain region and a light diverging region within said chip, said light diverging region allowing light propagation with a diverging phase front therein,
a resonant cavity associated with said chip containing at least a portion of said gain region and said light diverging region, said resonant cavity also including a single, spatial-mode filter therein, one optical feedback providing means of said resonant cavity positioned relative to said light diverging region such that light propagating within a diverging phase front is incident upon and partially reflected by said feedback providing means, said reflected light continuing to diverge as it propagates back towards said single-spatial-mode filter, a folded portion of said cavity lying outside of said chip, and
optical means outside of said chip for folding a light path and for coupling light into and out of said chip, said folded portion of said cavity lying outside of said chip including a reflecting surface on an outside surface of said chip providing at least partial optical feedback through said optical means back into said chip, wherein said reflecting surface is located on said outside surface of said chip away from a direct path of light exiting said chip into said outside portion of said cavity, said optical means including means for directing said light onto said reflecting surface.

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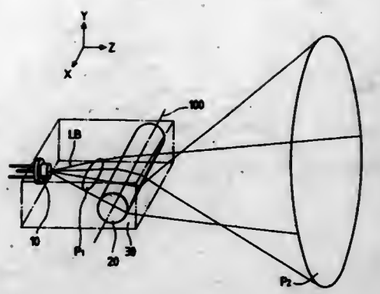
5,499,262

## SEMICONDUCTOR LASER LIGHT SOURCE UNIT

Naotaro Nakata, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Filed Feb. 25, 1993, Ser. No. 22,549
Claims priority, application Japan, Mar. 18, 1992, 4-062065; Mar. 18, 1992, 4-062066; Mar. 25, 1992, 4-066538
Int. Cl.[6] H01S 3/08
U.S. Cl. 372—108 19 Claims

1. A semiconductor laser light source unit comprising:
a semiconductor laser for emitting a laser beam having an elliptical sectional shape; and
optical means having orthogonal axes of different curvature with the axis of greater curvature being disposed parallel to the major axis of the elliptical sectional shape for increasing a divergence angle of the laser beam in a direction parallel with a minor-axis of the elliptical sectional shape so as to produce a substantially circular far field pattern of the laser beam.



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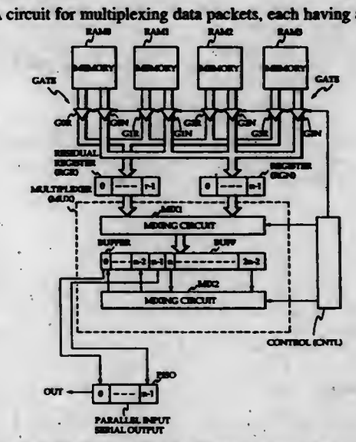
5,499,263

## MULTIPLEXING ARRANGEMENT

Jean-Jacques Schmit, Clos de la Rivière; Daniel F. J. Van De Pol, Acacialei, and Rudy Van Eeckhout, Beerzel, all of, Belgium, assignors to Alcatel N.V., Amsterdam, Netherlands

Filed Feb. 14, 1994, Ser. No. 195,259
Claims priority, application European Pat. Off., Feb. 22, 1993, 93200483
Int. Cl.[6] H04J 3/02
U.S. Cl. 370—112 10 Claims

1. A circuit for multiplexing data packets, each having a set of n



digital words and a residual set of r digital words, where n and r are integers and r is smaller than n, said multiplexing arrangement including an output terminal (OUT), a plurality of input memory units (RAM0–RAM3) each to receive and to store at least one of said data packets in a plurality of memory portions each to store n digital words, and a multiplexing means (MUX) coupled to said plurality of input memory units (RAM0–RAM3) and to transfer the data packets thereof to said output terminal (OUT), characterized in that

said circuit further includes register means (RGN) and residual register means (RGR), each connected in parallel to said plurality of input memory units (RAM0–RAM3), said register means (RGN) for reading and transferring said set of n digital words to said multiplexing means (MUX), said residual register means (RGR) for reading and transferring said residual set of r digital words to said multiplexing means (MUX), said multiplexing means (MUX) combining said set of n digital words and said residual set of r digital words, forming a combined set, and providing at least a portion of the combined set to said output terminal (OUT).

5,499,264

## PROCESS AND ARRANGEMENT FOR OPERATING A DOUBLE FURNACE INSTALLATION

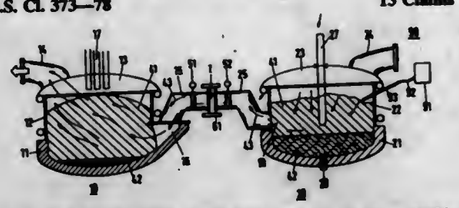
Hans-Ludwig Schaller, Meers; Horst Mellinghoff, Mülheim; Michael Schmengler, Duisburg, and Uwe Mager, Castrop-Rauxel, all of, Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Germany

Filed Jan. 24, 1994, Ser. No. 185,552

Claims priority, application Germany, Jan. 25, 1993, 43 02 285.5

Int. Cl.[6] F27D 23/00

U.S. Cl. 373—78 13 Claims



6. A steel making plant, comprising: a power supply; a double furnace arrangement including: two furnaces having furnace vessels with top vessel parts, covers for closing the furnaces, a gas purification installation, flue gas elbows connecting the covers to the gas purification installation, a connection line directly connecting together the two furnaces and opening into the top vessel parts, the connection line having a radial separation which separates the connection line into two parts and permits independent tilting of the connection line parts and independent radial movement of outlets of the connection line, a sliding sleeve arranged so as to enclose the radial separation, and means for closing the separation in a gas tight manner, the closing means including a shut-off device arranged in the connection line on each side of the separation; a power supply having a single main power feed, the power supply being connected to the two furnaces; and electric switching means for completely severing one furnace from the power supply so as to enable an unimpeded operation of the other furnace.

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5,499,265

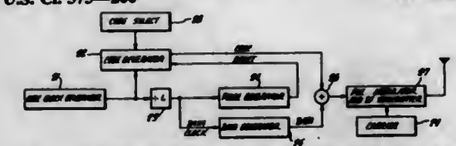
## SPREAD SPECTRUM CORRELATOR

Robert C. Dixon, Palmer Lake, and Jeffrey S. Vanderpool, Colorado Springs, both of Colo., assignors to Omnipoint Data Company, Incorporated, Boston, Mass.

Continuation of Ser. No. 949,331, Sep. 21, 1992, which is a continuation of Ser. No. 698,458, May 10, 1991, abandoned, which is a continuation of Ser. No. 390,315, Aug. 7, 1989, Pat. No. 5,022,047. This application Mar. 21, 1994, Ser. No. 216,884

Int. Cl.[6] H04K 1/00

U.S. Cl. 375—200 20 Claims



1. Apparatus for decoding a spread spectrum signal, said spread spectrum signal having a data signal modulated with the entirety of a pseudo-noise code, said apparatus comprising

a plurality of receiving registers capable of storing a received spread spectrum signal comprising a first plurality of chips,

a plurality of reference registers capable of storing an entire pseudo-noise code comprising a second plurality of chips,

a plurality of adders, each of said adders connected to one of said plurality of receiving registers and one of said plurality of reference registers, each of said adders having an output connected to a summer, said summer outputting a correlation signal, and

a data generator responsive to said correlation signal, generating, at selected clock times, a first data symbol in response to a comparison of said correlation signal and a first predetermined threshold level, and a second data symbol at said clock times in response to a comparison of said correlation signal and a second predetermined threshold level.

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5,499,266

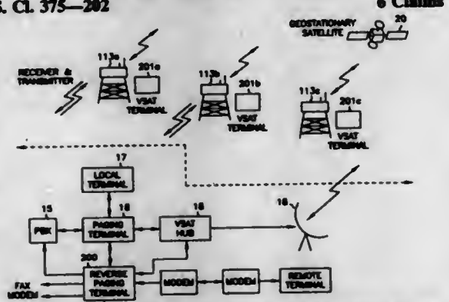
## LOW-POWER FREQUENCY-HOPPED SPREAD SPECTRUM ACKNOWLEDGEMENT PAGING SYSTEM

Hanoch Yokev, Ramat-Gan; Haim Harel, Herzelia, and Yehouda Meiman, Rishon Letzian, all of, Israel, assignors to Nexus 1994 Limited, London, England

Division of Ser. No. 158,441, Nov. 24, 1993, Pat. No. 5,430,759, which is a continuation-in-part of Ser. No. 961,776, Oct. 15, 1992, Pat. No. 5,335,246, which is a continuation-in-part of Ser. No. 932,610, Aug. 20, 1992, abandoned. This application Dec. 22, 1994, Ser. No. 362,794

Int. Cl.[6] H04B 1/713

U.S. Cl. 375—202 6 Claims



6. A base receiver for use with a reverse paging system having a base transmitter for transmitting messages each corresponding to unique addresses and a plurality of remote units for receiving the messages and transmitting information, the base receiver comprising:

radio frequency receiving means for receiving frequency-hoped spread-spectrum radio frequency signals from the plurality of remote units;

down converter means connected to the radio frequency receiving means for downconverting the frequency-hopped spread-spectrum radio frequency signals and for producing therefrom a plurality of frequency hops;

decoding means connected to the down converter means for decoding information contained in each of the frequency hops and for decoding modulation of the frequency hops to produce therefrom a plurality, of data bits from each of the frequency hops;

control means connected to the down converter means and the decoding means for selecting the local oscillator frequencies needed for downconverting the frequency-hopped spread-spectrum radio frequency signals;

wherein the decoding means is further operable for performing the steps of:

determining the signal to noise ratio of each of the frequency hops;

de-interleaving the plurality of data bits from each of the frequency hops;

locating individual bits of the plurality of data bits from each of the frequency hops to produce redundant groups of encoded bits of digital data;

tabulating the redundant groups of encoded bits of digital data to produce a table of a plurality of values representing the individual groups;

weighting each entry in the table of the plurality of values representing the individual groups by the signal to noise ratio of each of the hop frequencies to which each individual bit corresponds to produce weighted values for each of the individual bits; and

decoding the digital value of each of the weighted values for each of the individual bits.



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5,499,267

## SPREAD SPECTRUM COMMUNICATION SYSTEM

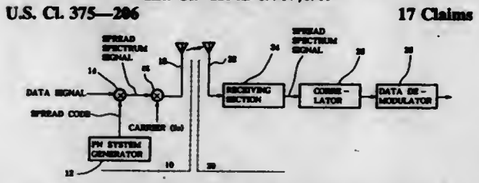
Ichirou Obe; Yutaka Nakamura, and Norihiro Suzuki, all of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Continuation of Ser. No. 686,493, Apr. 17, 1991, abandoned. This application Oct. 29, 1993, Ser. No. 145,031

Claims priority, application Japan, Apr. 19, 1990, 2-104183

Int. Cl.[6] H04B 1/707;1/69

U.S. Cl. 375—206 17 Claims



16. A spread spectrum communication receiving system for a modulated signal produced by modulating a carrier with a spread spectrum signal, the modulated signal having a frequency fo, the spread spectrum signal being modulated with a spread code, the spread code having a clock frequency fc, the spread spectrum communication receiving system comprising:

an antenna for receiving the modulated signal; and

a receiving section for the modulated signal connected to said antenna comprising:

local oscillation means for supplying a local oscillation signal, the local oscillation signal having a local oscillation frequency fL wherein the local oscillation frequency fL is substantially greater than or equal to approximately an absolute value of the frequency difference between the clock frequency fc and the frequency fo,

mixing means for mixing the modulated signal from said antenna with the local oscillation signal from said local oscillation means,

low-pass filter means for extracting a signal containing a component of the spread spectrum signal from an output of said mixing means,

a means for correlating coupled to an output of the filter, and

a means for demodulating an output of the correlator.

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5,499,268

## ADAPTIVE EQUALIZER CAPABLE OF COMPENSATING FOR CARRIER FREQUENCY OFFSET

Kyo Takahashi, Mitaka, Japan, assignor to Japan Radio Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 162,339, Dec. 3, 1993. This application Mar. 20, 1995, Ser. No. 404,842

Claims priority, application Japan, Dec. 9, 1992, 4-329245; Dec. 15, 1992, 4-334501; Dec. 17, 1992, 4-337587

Int. Cl.[6] H03H 7/30;7/40; H03K 5/159

U.S. Cl. 375—231 10 Claims

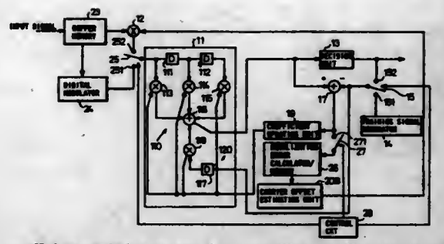
1. An adaptive equalizer comprising:

a filter for compensating for a transmission distortion to which an input signal is subjected, wherein the input signal comprises a training signal and data following the training signal;

decision means for estimating and outputting symbols of the input signal in response to an output signal from said filter;

training signal generating means for outputting a training signal;

a first selector for selecting one of an output signal from said decision means and the training signal outputted from said training signal generating means;



coefficient updating means for controlling coefficients of said filter based on an output signal which is produced by subtracting an output signal of said first selector from the output signal of said filter;

a memory for storing the input signal;

a modulator for successively modulating signals, as a carrier, having a plurality of frequencies within a predetermined frequency range containing an expected frequency offset with the training signal read from said memory;

a multiplier for multiplying the input signal read from said memory by a corrective signal;

a second selector for selectively supplying one of output signals from said multiplier and said modulator to said filter;

an adder for adding, while the input signal is the training signal, an output signal, per carrier frequency, which is produced by subtracting the output signal of said filter supplied with a modulated training signal outputted through said modulator and said second selector, from the training signal outputted through said first selector; and

correcting means for converting the carrier frequency corresponding to a minimum value of a sum output signal from said adder into said corrective signal based on said carrier frequency while the input signal is the training signal, and for supplying said corrective signal to said multiplier while the input signal is the data.

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5,499,269

## TRANSMISSION-RECEPTION CIRCUIT

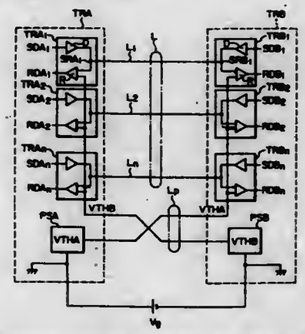
Ryozo Yoshino, Hadano, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 15, 1994, Ser. No. 275,393

Claims priority, application Japan, Jul. 20, 1993, 5-179127

Int. Cl.[6] H04B 1/00

U.S. Cl. 375—257 7 Claims



1. A transmission-reception apparatus, including a first

transmission-reception circuit connected to one end of a single transmission line, and a second transmission-reception circuit connected to the other end of the transmission line, for transmitting and receiving a signal over said transmission line between said first transmission-reception circuit and said second transmission-reception circuit, wherein

said first transmission-reception circuit includes a first transmitter circuit connected to said transmission line for transmitting a signal to, said second transmission-reception circuit, and a first receiver circuit connected to said transmission line for receiving a signal from said second transmission-reception circuit;

said second transmission-reception circuit includes a second transmitter circuit connected to said transmission line for transmitting the signal to said first transmission-reception circuit, and a second receiver circuit connected to said transmission line for receiving the signal from said first transmission-reception circuit;

a first power unit is disposed in the vicinity of said first transmission: reception circuit to supply electric power required for said first transmission-reception circuit;

a second power unit is disposed in the vicinity of said second transmission-reception circuit to supply electric power required for said second transmission-reception circuit;

a power supply line includes a first power supply wire connected between said first power unit and said second receiver circuit, and a second power supply wire connected between said second power unit and said first receiver circuit;

a threshold voltage for logical decision on a receiving signal of said first receiver circuit is supplied from said second power unit through said power supply line; and a threshold voltage for logical decision on a receiving signal of said second receiver circuit is supplied from said first power unit through said power supply line.

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**5,499,270**

## SPECTRAL ENCODING-DECODING SYSTEM AND METHOD THEREOF

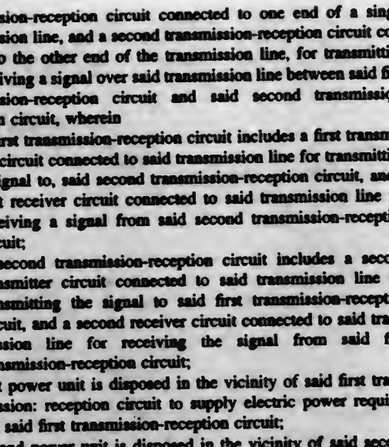
**Lascar B. Popovici, and Daniel Vliegen, both of Montréal, Canada, assignors to Pierre Charrier, St-Hubert, Canada**

**Filed Aug. 1, 1994, Ser. No. 283,903**

**Int. Cl.[6] H04L 27/10; H04B 1/38**

**U.S. Cl. 375—272** **15 Claims**

1. A spectral encoding-decoding system for encoding a sequence




of N data bits where N is a predetermined integer into an information signal to be transmitted on a communication medium, and for decoding said information signal transmitted on said communication medium into an estimated sequence of N data bits, said system comprising:

an encoder comprising:

a first receiver having an input for receiving the sequence of N data bits and an output for outputting the sequence received;

a sampler having an input connected to the output of said first receiver for assigning to each of the N data bits of the sequence received by said first receiver a successive position P where P is an integer greater than zero and smaller than (N+1), and having an output for outputting the position P;

a sinusoid generator having an input connected to the output of said sampler for generating a carrier signal having a predetermined frequency $f_1$ and for generating harmonic signals of frequencies equal to ($f_0$*P) for each data bit having a value 1 where $f_0$ is a predetermined frequency different than the frequency $f_1$, and having an output for outputting the carrier signal and the harmonic signals;

a combiner having an input connected to the output of said sinusoid generator for combining the harmonic signals and the carrier signal whereby forming the information signal, and having an output for outputting the information signal; and

a first emitter having an input connected to the output of said combiner for receiving the information signal from said combiner, and having an output connected to said communication medium for transmitting the information signal on said communication medium;

a decoder comprising:

a second receiver having an input connected to the communication medium for receiving the information signal transmitted, and an output for outputting the information signal received;

a sinusoid/cosinusoid generator for generating P pairs of sinusoid and cosinusoid of frequency ($f_0$*P), each pair corresponding to a different value of P, said sinusoid/cosinusoid generator having an output for outputting the P pairs of sinusoid and cosinusoid;

a multiplier having a first input coupled to the output of said second receiver and a second input connected to the output of said sinusoid/cosinusoid generator, for multiplying the information signal received by said second receiver to each of the sinusoid and cosinusoid of the P pairs generated by said sinusoid/cosinusoid generator to obtain P corresponding pairs of sinresult and cosresult, said multiplier having an output for outputting the P pairs of sinresult and cosresult;

calculating means having an input connected to the output of said multiplier for squaring and adding each sinresult and cosresult of each pair to obtain P frequency components, and having an output for outputting the P frequency components;

comparing means having an input connected to the output of said calculating means for comparing each of the P frequency components with a predetermined level, for generating estimated bits of value 1 for each frequency component greater than the predetermined level and for constructing the estimated sequence of N data bits, said comparing means having an output for outputting the estimated sequence of N data bits; and

a second emitter having an input connected to the output of said comparing means for receiving the estimated sequence of N data bits and having an output for transmitting the estimated sequence of N data bits.



**5,499,271**

## METHOD FOR BROADCASTING A DIGITALLY CODED STREAM OF DATA USING AN ALREADY OCCUPIED FREQUENCY SPECTRUM

**Georg Plenge, Thanning, and Günter Schneeberger, München, both of, Germany, assignors to Institut für Rundfunktechnik GmbH, München, Germany**

**PCT No. PCT/EP92/00795, § 371 Date Nov. 10, 1992, § 102(e) Date Nov. 10, 1992, PCT Pub. No. WO92/19053, PCT Pub. Date Oct. 29, 1992**

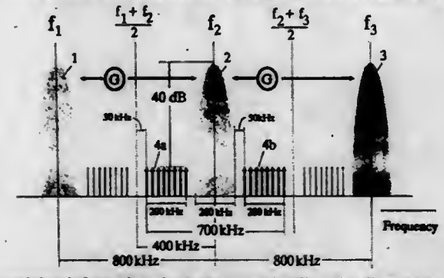
**PCT Filed Apr. 8, 1992, Ser. No. 946,475**

**Claims priority, application Germany, Apr. 11, 1991, 41 11 855.3**

**Int. Cl.[6] H04L 27/10**

**U.S. Cl. 375—295** **6 Claims**

1. A method for broadcasting a digitally coded stream of data




containing information about one or a plurality of radio programs or other data, wherein the stream of data is distributed to a plurality of RF carriers, comprising the steps of

(a) employing a frequency band already occupied by FM services to transmit the plurality of RF carriers, with each FM service maintaining a sufficient frequency spacing from the other FM services broadcast at the same location, and being sufficiently separated at a smaller frequency spacing from other local FM services transmitting at closely adjacent locations;

(b) transmitting the plurality of RF carriers modulated with the stream of data either in the frequency gap between two adjacent FM services at the same location, or in the unoccupied frequency ranges on both sides of an FM service, thereby leaving out the rated frequency occupation of said FM service; and

(c) selecting the overall amplitude level of the plurality of RF carriers, compared to the level of an RF carrier of an adjacent FM service or the FM service in the middle, to be sufficiently low relative to a signal to noise ratio sufficient for the FM reception of the FM service or services, and sufficiently high to provide noise immunity against the other local FM services that fall into the frequency range or frequency gap intended for the transmission of the plurality of RF carriers; and

(d) providing the stream of data modulating the RF carriers with a greater error protection to provide sufficient noise immunity against the adjacent FM service or services or the FM service in the middle.

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**5,499,272**

## DIVERSITY RECEIVER FOR SIGNALS WITH MULTIPATH TIME DISPERSION

**Gregory E. Bottomley, Cary, N.C., assignor to Ericsson GE Mobile Communications Inc., Research Triangle Park, N.C.**

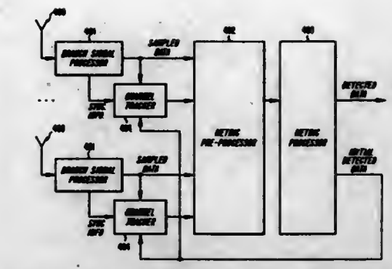
**Filed May 31, 1994, Ser. No. 251,202**

**Int. Cl.[6] H03H 7/30; H04B 7/10**

**U.S. Cl. 375—347** **14 Claims**

12. A method for joint equalization and diversity combining in a digital communications receiver, comprising the steps of:

signal processing a plurality of diversity branches to produce complex receive data samples and synchronization information from received signals;




forming time-varying channel tap estimates from said data samples, said synchronization information, and tentative data detections produced by a processor;

forming time-varying weighting factors using said data samples, said channel tap estimates, said synchronization information and said tentative data detections;

pre-processing said data samples, said channel tap estimates, and said weighting factors to produce metric multipliers; and

combining said metric multipliers with hypothesized data sequences to generate and accumulate metrics using a sequence estimation algorithm, producing a demodulated data stream.

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**5,499,273**

## METHOD AND APPARATUS FOR SYMBOL CLOCK RECOVERY FROM SIGNAL HAVING WIDE FREQUENCY POSSIBILITIES

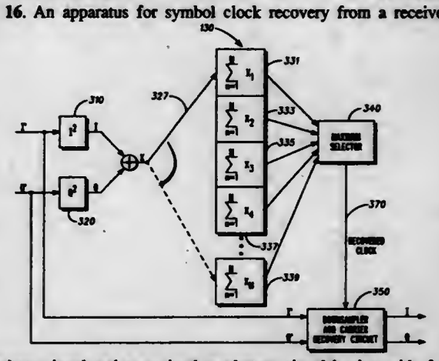
**A. Corbett S. Kull, Palatine; Bradley B. Bakke, Elgin, and John W. Arens, Grayslake, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed May 11, 1995, Ser. No. 438,721**

**Int. Cl.[6] H04L 7/00**

**U.S. Cl. 375—355** **16 Claims**

16. An apparatus for symbol clock recovery from a received




inphase signal and a received quadrature signal having wide frequency possibilities, said apparatus comprising:

a first sampler for sampling the received inphase signal at sampling times to provide a sampled inphase signal;

a second sampler for sampling the received quadrature signal at the sampling rate to provide a sampled quadrature signal;

a first magnitude determination circuit operatively coupled to said first sampler for receiving the sampled inphase signal to provide a first signal indicative of a square of the received inphase signal;

a second magnitude determination circuit operatively coupled to said second sampler for receiving the sampled quadrature signal to provide a second signal indicative of a square of the received quadrature signal;

an adder operatively coupled to said first magnitude determination circuit, said second magnitude determination circuit and

said distributor for adding the first and second signals to provide an added signal;

a distributor operatively coupled to said adder for distributing the added signal;

a plurality of accumulator registers operatively coupled to said distributor for accumulating sums of the first and second signals for each sample time and subtantially over a length of an expected burst, wherein said plurality of accumulator registers consists of a number of registers equal to the number of sample times per symbol of an expected burst;

a maximum-minimum determination circuit operatively coupled to said plurality of accumulator registers for determining the accumulator register having one of a largest sum and a smallest sum to provide a recovered clock signal; and

a downsampler operatively coupled to said maximum-minimum determination circuit, said first sampler and said second sampler for downsampling the sampled inphase signal and sampled quadrature signal based on the recovered clock signal, wherein said downsampler comprises a carrier recovery stage operatively coupled to said maximum-minimum determination circuit, said first sampler and said second sampler for recovering carrier based on the recovered clock signal, sampled inphase signal and sampled quadrature signal.

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**5,499,274**

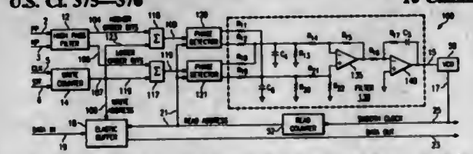
**FRACTIONAL BIT-LEAKING CLOCK SIGNAL RESYNCHRONIZER FOR A HIGH-SPEED DIGITAL COMMUNICATIONS SYSTEM**

**Carlton D. Brown, Dallas, Tex., assignor to Alcatel Network Systems, Inc., Richardson, Tex.**

**Filed Oct. 14, 1994, Ser. No. 323,831**

**Int. Cl.[6] H04L 7/00; H03D 3/24**

**U.S. Cl. 375—376** **10 Claims**



5. A clock signal resynchronizer for use in a high-speed digital communications system, comprising:

a digital filter circuit including at least a first input, a first output, and a second output complementary to said first output, said complementary first and second outputs indicative of said first input;

a first summation circuit and a second summation circuit, said first output coupled to an input of said first summation circuit, and said second output coupled to an input of said second summation circuit;

an elastic buffer circuit including a data input, a write address input, a read address input, and a data output, said elastic buffer operable to store data written in response to a write address provided, and transmit data read out responsive to a read address provided;

a write counter circuit including an input and output and operable to provide said write address, said output of said write counter circuit coupled to said write address input and a second input of each of said first and second summation circuits;

a first phase detector circuit and a second phase detector circuit, a first input of each said phase detector circuit coupled to a respective output of said first and second summation circuits, and an output of each said phase detector circuit coupled to a third summation circuit;

a smoothed clock generator circuit operable to generate a smoothed clock output signal responsive to combined signals received from said third summation circuit; and

a read counter circuit operable to provide said read address, connected between said smoothed clock output and said read address input, and a second input of each of said phase detector circuits.

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**5,499,275**

**CLOCK RECOVERY SYSTEM CAPABLE OF AUTOMATICALLY SWITCHING A DIRECTION OF A CLOCK PULSE SEQUENCE FROM ONE TO ANOTHER**

**Kaori Kishi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

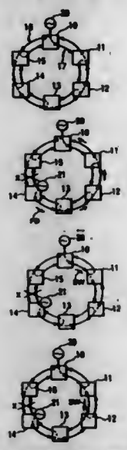
**Continuation of Ser. No. 903,345, Jun. 24, 1992, abandoned.**

**This application Sep. 15, 1994, Ser. No. 306,732**

**Claims priority, application Japan, Jun. 24, 1991, 3-151866**

**Int. Cl.[6] H04L 7/00**

**U.S. Cl. 375—357** **8 Claims**



1. A method of recovering a sequence of clock pulses in a ring-shaped synchronization network in which a master transmission device and a plurality of slave transmission devices are connected in a ring shape to one another and are communicable with one another in clockwise and counterclockwise directions through clockwise and counterclockwise transmission paths, respectively, a master clock pulse sequence being transmitted in a normal state from said master transmission device in a selected one of the clockwise and the counterclockwise directions, wherein each of said slave transmission devices operates in accordance with said master clock pulse sequence in said normal state, the method comprising the steps of:

detecting, in one of said slave transmission devices, interruption of said master clock pulse sequence sent from said master transmission device in said selected one of the clockwise and the counterclockwise directions through a selected one of the clockwise and counterclockwise transmission paths, to detect an extraordinary state different from said normal state;

switching operation of said one of said slave transmission devices from said master clock pulse sequence to an internal clock pulse sequence on detecting the interruption of said master clock pulse sequence;

informing, via interruption information supplied from said one of said slave transmission devices, and any intervening slave transmission devices, said master transmission device, of the interruption of the master clock pulse sequence, which is supplied to said master transmission device in accordance with said internal clock pulse sequence in the selected one of the clockwise and the counterclockwise directions;

transferring the master clock pulse sequence from said master transmission device to said slave transmission devices in a remaining one of the clockwise and the counterclockwise directions that is reverse to said selected one of the clockwise and the counterclockwise directions after said internal clock pulse sequence together with said interruption information is received by said master transmission device; and

delivering said master clock pulse sequence to said slave transmission devices through the remaining one of the clockwise and the counterclockwise transmission paths opposite to the selected one of the clockwise and the counterclockwise transmission paths by successively switching the selected one of the clockwise and the counterclockwise transmission paths to the remaining one of the clockwise and the counterclockwise transmission paths beginning with a nearest one of said slave transmission devices nearest to said master transmission device, to said one of said slave transmission devices.



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**5,499,276**

**METHOD FOR MINOR ACTINIDE NUCLIDES INCINERATION**

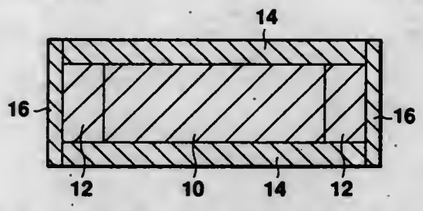
**Toshio Wakabayashi, Mito, Japan, assignor to Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo, Japan**

**Filed Sep. 28, 1994, Ser. No. 313,815**

**Claims priority, application Japan, Jan. 6, 1993, 5-275017**

**Int. Cl.[6] G21G 1/06**

**U.S. Cl. 376—170** **17 Claims**



1. A method of minor actinide nuclides incineration by adding neptunium of minor actinide nuclides separated from spent fuel to reactor core fuel of a fast reactor and adding americium of the separated minor actinide nuclides and rare earth elements to either or both of radial and axial blankets of the fast reactor for nuclear reaction.

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**5,499,277**

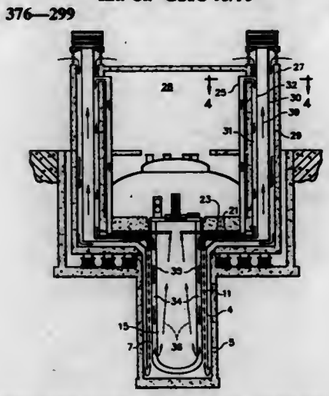
**METHOD AND APPARATUS FOR ENHANCING REACTOR AIR-COOLING SYSTEM PERFORMANCE**

**Anstein Hunsbedt, Los Gatos, Calif., assignor to General Electric Company, San Jose, Calif.**

**Filed Aug. 19, 1994, Ser. No. 293,868**

**Int. Cl.[6] G21C 15/18**

**U.S. Cl. 376—299** **19 Claims**



1. A liquid metal-cooled nuclear reactor comprising a containment vessel, a reactor vessel surrounded by said containment vessel with an inert gas-filled gap space therebetween, a nuclear fuel core arranged inside said reactor vessel, a heat collector cylinder surrounding said containment vessel with a space therebetween, a silo surrounding said heat collector cylinder, an air inlet duct and an air outlet duct in flow communication with atmospheric air external to said reactor, a cold air downcomer gap in flow communication with said air inlet duct and extending between said heat collector cylinder and said silo, a hot air riser gap in flow communication with said cold air downcomer gap and said air outlet duct and extending between said heat collector cylinder and said containment vessel, an inert gas inlet duct and an inert gas outlet duct in flow communication with said inert gas-filled gap space, an inert gas downcomer duct in flow communication with said inert gas inlet duct and an inert gas riser duct in flow communication with said inert gas outlet duct and with said inert gas downcomer duct, wherein said inert gas downcomer duct and said air outlet duct share a common wall made of heat conductive material for removing heat from said inert gas by heat exchange with atmospheric air, wherein said inert gas downcomer duct and said inert gas riser duct are not annular.

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**5,499,278**

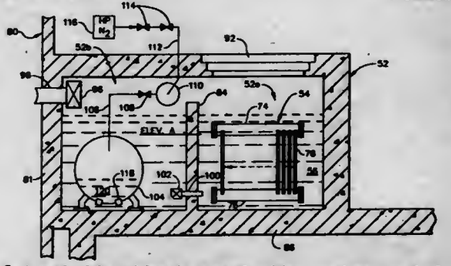
**WATER INVENTORY MANAGEMENT IN CONDENSER POOL OF BOILING WATER REACTOR**

**Douglas M. Gluntz, San Jose, Calif., assignor to General Electric Company, San Jose, Calif.**

**Filed Mar. 13, 1995, Ser. No. 402,589**

**Int. Cl.[6] G21C 15/18**

**U.S. Cl. 376—299** **4 Claims**



3. A method for raising the water level in a condenser pool of a boiling water reactor having a condenser at least partly submerged in water when the water level in the condenser pool is at a predetermined elevation, comprising the steps of:

injecting gas into a volume which is submerged in the water in the condenser pool; and

retaining the injected gas in said volume,

whereby an equal volume of water in said condenser pool is displaced from an elevation below said predetermined elevation to an elevation above said predetermined elevation without adding water into the condenser pool.

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**5,499,279**

**APPARATUS FOR REMOVING FREE HYDROGEN FROM A GAS MIXTURE CONTAINING HYDROGEN AND OXYGEN**

**Amiya K. Chakraborty, Erftstadt, Germany, assignor to Gesellschaft fur Anlagen- und Reaktorsicherheit, Cologne, Germany**

**Filed Dec. 5, 1994, Ser. No. 349,616**

**Claims priority, application European Pat. Off., Dec. 13, 1993, 93120086**

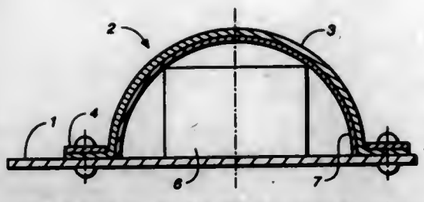
**Int. Cl.[6] G21C 9/00**

**U.S. Cl. 376—301** **16 Claims**

13. An apparatus for removing free hydrogen from a gas mixture containing essentially hydrogen, oxygen, and steam, said apparatus comprising:

a catalyst material in the form of granules, chips or powder for catalytically supporting oxidation of the hydrogen,

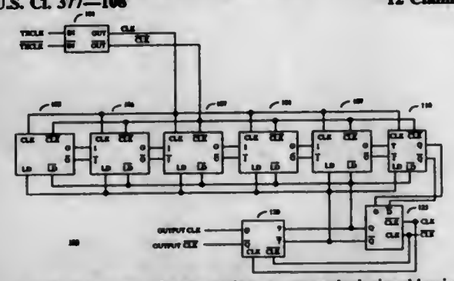
a hydrogen-storage material in the form of granules, chips or powder, which at temperatures below an effective reaction temperature of the catalyst material, binds hydrogen by hydride formation and generates heat, and



a container made of a net-like material containing a mixture of the catalyst material and the hydrogen-storage material.

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**5,499,280**
**CLOCK SIGNAL GENERATION**
**Nathaniel B. Wilson, San Diego, and Gene H. McAllister, La Mesa, both of Calif., assignors to QUALCOMM Incorporated, San Diego, Calif.**
**Filed Feb. 2, 1995, Ser. No. 382,770**
**Int. Cl.[6] H03K *23/48***
**U.S. Cl. 377—108** **12 Claims**

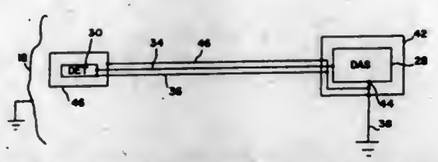


1. A clock generator for generating an output clock signal having a first frequency from an input clock signal having a second frequency, the first frequency being an uneven sub-multiple of the second frequency, the clock generator comprising:
- a counter having a clock input coupled to the input clock signal and a reset input coupled to a latched load signal, the counter generating a count overflow indication in response to a predetermined number of input clock signal pulses and resetting in response to the latched load signal;
- a data latch having an input coupled to the count overflow indication, the data latch generating the latched load signal in response to the input clock signal and the count overflow indication; and
- a toggle flip-flop having a first input coupled to the input clock signal and a second input coupled to the latched load signal, the toggle flip-flop generating the output clock signal in response to the latched load signal and the input clock signal.

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**5,499,281**
**APPARATUS FOR SHIELDING AND GROUNDING X-RAY DETECTORS OF A CT SCANNER**
**Hans Weedon, Salem, and John Dobbs, Hamilton, both of Mass., assignors to Analogic Corporation, Peabody, Mass.**
**Filed Oct. 3, 1994, Ser. No. 316,922**
**Int. Cl.[6] A61B *6/00***
**U.S. Cl. 378—19** **20 Claims**

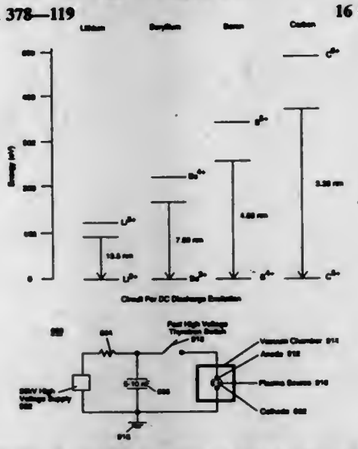
1. An apparatus for shielding and grounding an x-ray detector assembly, wherein the x-ray detector assembly is supported by a mounting structure, and the x-ray detector assembly is electrically connected to a data acquisition system (DAS) via at least a signal line and a return line, the DAS having a ground plane defining system ground, the apparatus comprising:
- an electrically conductive enclosure substantially enclosing the x-ray detector assembly; and



means for electrically connecting said electrically conductive enclosure to said ground plane independently of said signal line and said return line.

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**5,499,282**
**EFFICIENT NARROW SPECTRAL WIDTH SOFT-X-RAY DISCHARGE SOURCES**
**William T. Silfvast, Winter Springs, Fla., assignor to University of Central Florida, Orlando, Fla.**
**Filed May 2, 1994, Ser. No. 237,018**
**Int. Cl.[5] H05G *2/00***
**U.S. Cl. 378—119** **16 Claims**



1. A method of radiating a Lithium ion plasma source at approximately 13.5 nm comprising the steps of:

forming a plasma source substantially composed of $Li^{2+}$ ions; and radiating the plasma source at approximately 13.5 nm.

7. A method of radiating a carbon ion plasma source at approximately 3.38 to 3.6 nm, comprising the steps of:

a plasma source composed of predominantly $C^{5+}$ ions; and

radiating the plasma source at approximately 3.38 to 3.6 nm.

8. A method of radiating a beryllium ion plasma source at approximately 7.6 nm, comprising the steps of:

forming a plasma source composed of predominantly $Be^{3+}$ ions; and

radiating the plasma source at approximately 7.6 nm.

9. A method of radiating a boron ion plasma source at approximately 4.86 nm comprising the steps of:

forming a plasma source composed of predominantly $B^{4+}$ ions; and

radiating the plasma source at approximately 4.86 nm.

10. A pulsed discharge source comprising:

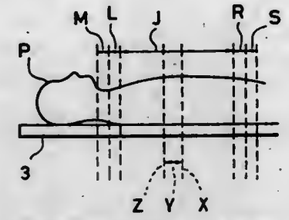
lithium;

an anode; and

an insulator for supporting the lithium, wherein a pulsed lithium plasma is generated between the anode and the insulator.



**5,499,283**
**METHOD AND APPARATUS FOR HELICAL SCAN IMAGING IN X-RAY COMPUTED TOMOGRAPHY**
**Yusuke Toki, Utsunomiya, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan**
**Continuation of Ser. No. 64,936, May 24, 1993, Pat. No. 5,386,452, which is a continuation of Ser. No. 784,223, Oct. 30, 1991, Pat. No. 5,224,135. This application Jan. 12, 1995, Ser. No. 371,789**
**Claims priority, application Japan, Nov. 1, 1990, 2-293595**
**Int. Cl.[6] G21K *1/04***
**U.S. Cl. 378—146** **16 Claims**

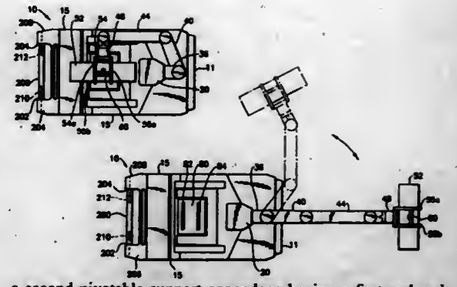


1. An X-ray computed tomography (CT) apparatus for carrying out a helical scan imaging, comprising:
- input means for selecting a desired imaging region;
- a bed plate for supporting a body to be examined along a direction of a body axis;
- an X-ray source for irradiating X-rays on the body, the X-ray source and the bed plate being rotatable relative to each other at a predetermined angular speed and linearly movable relative to each other along the direction of the body axis;
- a detector for detecting the X-rays passing through the body;
- data collection means for collecting data from the detected X-rays according to the desired imaging region selected by the input means;
- image reconstruction means for reconstructing tomographic images according to the collected data; and
- control means for controlling a relative linear motion of the X-ray source and the bed plate according to the desired imaging region selected by the input means, such that the X-ray source and the bed plate are relatively linearly moved through a distance covered by the desired imaging region in a plurality of scans, each scan by the X-ray source and the bed plate including a readjustment region which overlaps a region covered by a previous scan.

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**5,499,284**
**MOBILE X-RAY APPARATUS**
**Anthony J. Pellegrino, New Fairfield, Conn.; Kenneth F. Defreitas, Patterson, N.Y.; Daniel N. Lyke, New Milford, Conn., and Richard F. Schutz, Brewster, N.Y., assignors to ThermoTrex Corporation, San Diego, Calif.**
**Division of Ser. No. 158,625, Nov. 26, 1993, Pat. No. 5,425,069. This application Mar. 3, 1995, Ser. No. 400,288**
**Int. Cl.[6] H05G *1/02***
**U.S. Cl. 378—198** **10 Claims**

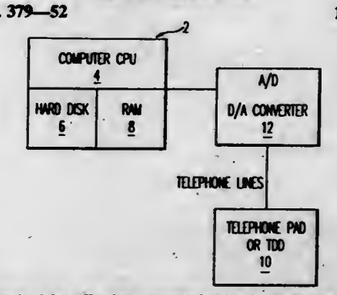
1. An improved mobile X-ray apparatus comprising:
- a carriage having a top;
- a mast having a front side, a first end, and a second end, wherein the first end is attached to the carriage;
- an articulating X-ray tube support arm, said articulating X-ray tube support arm further comprising:
- a first pivotable support appendage having a first end and a second end, wherein the first end is coupled to the front side of the mast so as to allow the first pivotable support appendage to slide along the front side of the mast substantially from the first end of the mast to the second end of the mast, and wherein the second end of the first pivotable support appendage includes a pivotal coupling means;



- a second pivotable support appendage having a first end and a second end, wherein the first and second ends include means for pivotal coupling, wherein pivotal coupling means at the first end of the second pivotable support appendage is pivotally coupled with the pivotal coupling means at the second end of the first pivotable support appendage so as to provide angular movement of the second pivotable support appendage in a horizontal plane;
- a third pivotable support appendage having a first end and a second end, wherein the first and second ends include means for pivotal coupling, wherein the pivotal coupling means at the first end of the third pivotable support appendage is pivotally coupled with the pivotal coupling means at the second end of the second pivotable support appendage so as to provide angular movement of the third pivotable support appendage in a horizontal plane; and
- a fourth pivotable support appendage having a first end and a second end, wherein the first end includes means for pivotal coupling, wherein the pivotal coupling means at the first end of the fourth pivotable support appendage is pivotally coupled to the pivotal coupling means at the second end of the third pivotable support appendage so as to provide angular movement of the forth pivotable support appendage in a horizontal plane, and wherein the second end has a means for supporting an X-ray tube;
- an X-ray tube supported in the means for supporting an X-ray tube; and
- means for locking the X-ray tube to the carriage when the X-ray tube is placed in a stowed position on the carriage so as to prevent movement of the X-ray tube and articulating X-ray tube support arm.

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**5,499,285**
**AUTOMATED TELEPHONE SYSTEM WITH TDD CAPABILITY**
**Georg E. Morduch, Alexandria, Va., assignor to Microlog Corporation, Germantown, Md.**
**Continuation of Ser. No. 798,257, Nov. 12, 1991. This application Sep. 19, 1994, Ser. No. 308,344**
**Int. Cl.[6] H04M *11/00***
**U.S. Cl. 379—52** **17 Claims**




1. A method for effecting communication between an automated telephone system and a telecommunications device for the deaf (TDD), comprising storing a plurality of messages in electronic

digital character format in a memory of said automated telephone system, recalling one of said messages from said memory, converting said message from electronic digital character format to TDD-compatible electronic analog format, and transmitting said message in TDD-compatible electronic analog format to said telecommunications device for the deaf.

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**5,499,286**

## DIGITAL RADIO TELEPHONE

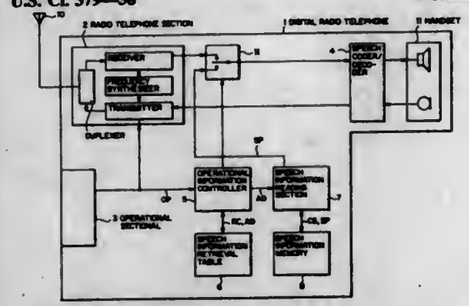
**Takeo Kobayashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Aug. 13, 1993, Ser. No. 105,952**

**Claims priority, application Japan, Aug. 13, 1992, 4-215873; Apr. 26, 1993, 5-099028**

**Int. Cl.[6] H04M *1/00***

**U.S. Cl. 379—58** **4 Claims**



1. A digital radio telephone comprising:

radio communication means for transmitting and receiving digital speech signals via an antenna;

a speech coder/decoder for generating analog speech signals to a user of the digital radio telephone and said digital speech signals to be transmitted by the radio communication means;

first memory means for storing items of digital speech Signals, each of the items having a predetermined speech pattern;

second memory means for storing first information for producing a voice message by using said items of digital speech signals stored in said first memory means;

read control means, responsive to an operation of said user, for controlling reading out of said times of digital speech signals according said first information stored in said second memory means, said speech coder/decoder producing said voice message accordingly; and

switching means for selecting one of said digital speech signals from said radio communication means and said items of the digital speech signals from said first memory means for output to said speech coder/decoder.

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**5,499,287**

## FAX-TELEPHONE INTERFACE CIRCUIT

**Bob Campbell, Cupertino; Curtis R. Gowan, San Jose; John D. Graf, Sunnyvale, and Nandini Nayak, San Jose, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.**

**Continuation of Ser. No. 975,416, Nov. 12, 1992, abandoned. This application Dec. 13, 1994, Ser. No. 357,049**

**Int. Cl.[6] H04M *1/64***

**U.S. Cl. 379—67** **3 Claims**

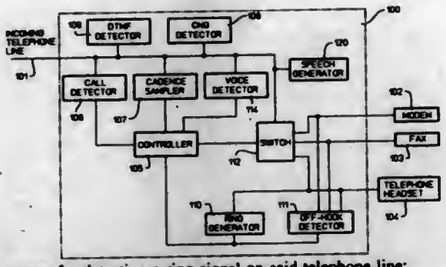
1. An apparatus for connecting a modem and a telephone handset to a telephone line, said apparatus comprising:

means for coupling said apparatus to said telephone line;

means for coupling said apparatus to said modem;

means for coupling said apparatus to said telephone handset;

switch means, responsive to a switch control signal, for connecting either said telephone handset or said modem to said telephone line;



means for detecting a ring signal on said telephone line;

off-hook detecting means for detecting if said telephone handset is off-hook, said off-hook condition being indicated by an off-hook signal generated by said off-hook detecting means; and

control means, responsive to said ring signal detecting means, for determining if a telephone call received on said telephone line is to be directed to said handset or said modem and for generating said switch control signal, wherein said control means further comprises means for detecting a sequence of off-hook signal pulses and wherein said control means terminates any connection between said telephone line and said modem and causes said switch means to couple said telephone handset to said telephone line when said sequence of off-hook signal pulses is detected thereby allowing said telephone handset to be used to initiate a telephone call on said telephone line.

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**5,499,288**

## SIMULTANEOUS VOICE RECOGNITION AND VERIFICATION TO ALLOW ACCESS TO TELEPHONE NETWORK SERVICES

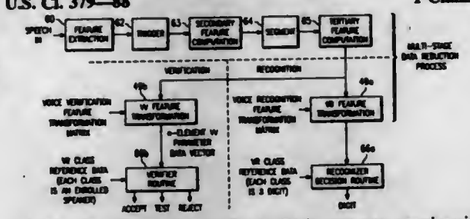
**Alan K. Hunt, Carrollton, and Thomas B. Schalk, Dallas, both of Tex., assignors to Voice Control Systems, Inc., Dallas, Tex.**

**Continuation of Ser. No. 901,742, Jun. 22, 1992, Pat. No. 5,297,194, which is a continuation of Ser. No. 523,486, May 15, 1990, Pat. No. 5,127,043. This application Mar. 22, 1994, Ser. No. 216,399**

**The portion of the term of this patent subsequent to Jun. 30, 2009, has been disclaimed.**

**Int. Cl.[6] G10L *9/08*; H04M *1/66***

**U.S. Cl. 379—88** **1 Claim**



1. A method for enabling a caller to obtain access to a service via a telephone network by speaking a password, comprising the steps of:

deriving first and second groups of speech feature data from the password:

recognizing the password and simultaneously attempting to verify that the caller who spoke the password is associated with the password using the first and second groups of speech feature data derived from the password;

if the caller's association with the password can be verified, accepting the caller's identity and providing access to the service;

if the caller's association with the password cannot be verified, prompting the caller to answer at least one personal question associated with the password;

determining whether the question is answered correctly;



if the question is answered correctly, accepting the caller's identity and providing access to the service; and

if the question is answered incorrectly, rejecting the caller's identity and prohibiting access to the service.

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**5,499,289**

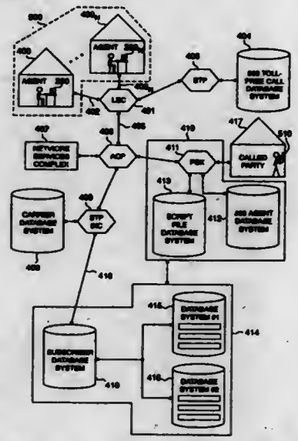
## SYSTEMS, METHODS AND ARTICLES OF MANUFACTURE FOR PERFORMING DISTRIBUTED TELECOMMUNICATIONS

**Richard F. Bruno, Morristown, and Robert E. Markowitz, Glen Rock, both of N.J., assignors to AT&T Corp., Murray Hill, N.J.**

**Filed Dec. 6, 1994, Ser. No. 350,290**

**Int. Cl.[6] H04M *7/00***

**U.S. Cl. 379—220** **28 Claims**



1. A distributed telecommunications system for facilitating telemarketing utilizing remotely located telemarketing agents while maintaining central control of a calling list comprising:

a network services complex for receiving a call originated by an agent operated processing system node and generating a query for routing instructions responsive to the call;

a subscriber database system connected in a network with the network services complex, the subscriber database system storing data sets which collectively comprise the calling list, and in response to said query for routing instructions producing an output of a particular data set identifying a next party to be called;

an outbound calling application system processing node connected in the network with the subscriber database system and the network services complex for receiving the particular data set from the subscriber database system, for calling the agent operated processing system node and transferring the data set, and for notifying the network services complex that the data set has been transferred to the agent operated processing node;

wherein the network services complex operates to initiate connection of the agent operated processing node with a communications node identified by the data set for the next party to be called.

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**5,499,290**

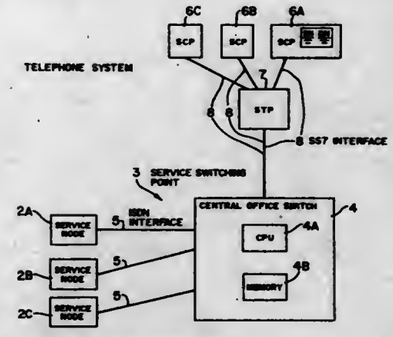
## AIN NON-CALL ASSOCIATED SIGNALLING FOR SERVICE NODES AND SERVICE CONTROL POINTS IN A TELEPHONE SYSTEM

**Karl Koster, Atlanta, Ga., assignor to BellSouth Corporation, Atlanta, Ga.**

**Filed Jan. 28, 1993, Ser. No. 10,287**

**Int. Cl.[6] H04M *3/00;7/00*; H04Q *11/04*; H04J *3/24***

**U.S. Cl. 379—242** **44 Claims**



1. A telephone system comprising:

one or more service nodes each including means for establishing one or more first channels carrying one or more of voice and data information and at least one second channel for carrying one or more of telephone network access control and signalling information;

a central office switch for providing for each service node call processing for calls over said one or more first channels of that service node in response to signalling on said at least one second channel of that service node;

one or more service control points each for communicating with said central office switch for providing information to and receiving information from said central office switch;

said central office switch being further adapted to have an advanced intelligence network ("AIN") non-call associated signalling service which permits a given service node to access a given service control point through said central office switch and utilizing the at least one second channel of that given service node.

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**5,499,291**

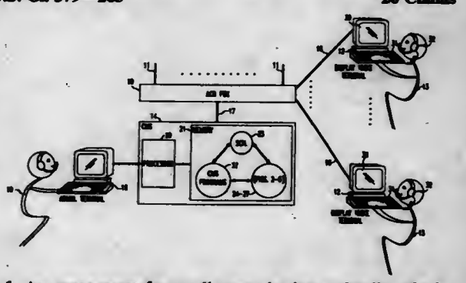
## ARRANGEMENT FOR AUTOMATING CALL-CENTER AGENT-SCHEDULE-NOTIFICATION AND SCHEDULE-ADHERENCE FUNCTIONS

**Garry D. Kepley, Boulder, Colo., assignor to AT&T Corp., Murray Hill, N.J.**

**Filed Jan. 14, 1993, Ser. No. 4,387**

**Int. Cl.[6] H04M *3/00;3/22*; H01J *31/00*; G06F *9/00***

**U.S. Cl. 379—265** **26 Claims**



1. An arrangement for a call center having a plurality of telecommunications terminals staffed by agents, comprising:

means responsive to an agent's schedule which includes predetermined events scheduled for predetermined times, for communicating each said event at its scheduled time to the agent via the agent's corresponding terminal; and

means cooperative with the communicating means, for monitoring the agent's performance of the communicated event at the scheduled time via the agent's input into the agent's corresponding terminal.

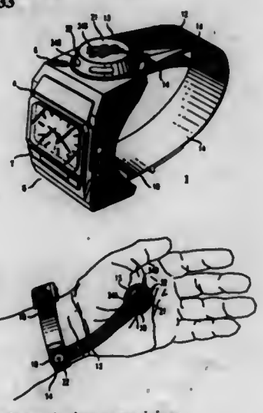
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**5,499,292**

## ON HOOK/OFF HOOK MECHANISM FOR WRIST TELEPHONE

**Greg E. Blonder, Summit; Bertrand H. Johnson, Murray Hill, and George Knoedl, Jr., Milford, all of N.J., assignors to AT&T Corp., Murray Hill, N.J.**

**Filed May 6, 1994, Ser. No. 240,061**
**Int. Cl.[6] H04M *1/00***
**U.S. Cl. 379—433** **13 Claims**



I. A radiotelephone device comprising:

a case having a transceiver;

a strap attached to the case for fastening the device to a user's wrist, said strap having a top layer and a bottom layer, said top layer being releasable from the bottom layer;

a microphone located on the strap and electrically connected to the transceiver;

a speaker located on the top layer of the strap and electrically connected to the transceiver, said speaker having magnetic qualities;

a cradle formed in the case for receiving the speaker; and

sensing means located proximate to the cradle for sensing the presence of magnetic fields created by leakage flux from the speaker.

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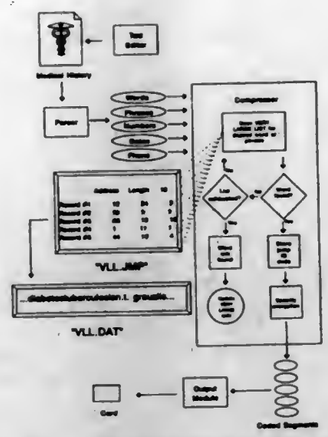
**5,499,293**

## PRIVACY PROTECTED INFORMATION MEDIUM USING A DATA COMPRESSION METHOD

**Sepehr Behram; Nancy T. Grauzlis, both of Hampton, Va., and Sammy W. Joseph, Derwood, Md., assignors to University of Maryland, College Park, Md.**

**Filed Jan. 24, 1995, Ser. No. 378,165**
**Int. Cl.[6] H04L *9/00***
**U.S. Cl. 380—4** **15 Claims**

1. A data compression/decompression method using very large lists which define a modifiable static dictionary means comprising a primary and secondary dictionary for data compression with a means for input of informational (INFO) data to a means for computing, the computing means transforms the INFO data into confidentially protected output encoded data, the output encoded




data is transmitted over a data transmission means for ultimate data storage by a data storage means, the method comprising the steps of:

assigning a sequential primary unique identification (ID) number to each word that is a part of the input INFO data that is within the very large list of data, the ID number is equal to a pointer position for each of these words in the secondary dictionary, the secondary dictionary has a structure for these words with the following features: i) each word can be a single phrase that is at least one word associated therewith, ii) the length of each word and iii) the primary unique ID number;

manipulating sequentially each of the primary unique ID numbers by a mathematical number base conversion technique that transforms the primary unique ID numbers into secondary numbers;

using at least a first designated key code by a user of the method for encryption of the secondary numbers;

transmitting each of the secondary encrypted numbers over the data transmission means sequentially for ultimate storage in the storage means;

whereby the secondary encrypted numbers can be retrieved at a later time even when the modifiable primary static dictionary changes.

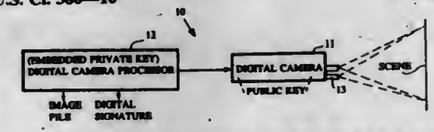
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**5,499,294**

## DIGITAL CAMERA WITH APPARATUS FOR AUTHENTICATION OF IMAGES PRODUCED FROM AN IMAGE FILE

**Gary L. Friedman, Encino, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.**

**Continuation-in-part of Ser. No. 159,980, Nov. 24, 1993, abandoned. This application May 24, 1995, Ser. No. 449,472**
**Int. Cl.[6] H04N *7/167*; H04K *1/00*; H04L *9/00***
**U.S. Cl. 380—10** **9 Claims**




1. A digital camera with apparatus for authentication of images produced from an image file taken by said digital camera of a scene, said digital camera having embedded therein a private key unique to said digital camera and a known public key so uniquely based upon said private key that digital data encrypted with said private key may be decrypted using said public key, said digital camera apparatus comprising

first means for calculating image hash of said image file using a predetermined algorithm,

second means for encrypting said image hash with said embedded private key, thereby producing a digital signature uniquely associated with said image file, and

third means for maintaining association of both said image file and said digital signature derived from said image file by said first and second means.

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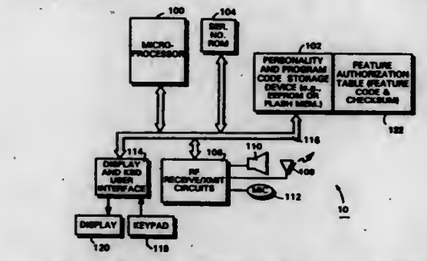


**5,499,295**

## METHOD AND APPARATUS FOR FEATURE AUTHORIZATION AND SOFTWARE COPY PROTECTION IN RF COMMUNICATIONS DEVICES

**Gerald M. Cooper, Gretna, Va., assignor to Ericsson Inc., Lynchburg, Va.**

**Filed Aug. 31, 1993, Ser. No. 113,643**
**Int. Cl.[6] H04L *9/00; 9/32***
**U.S. Cl. 380—23** **42 Claims**




14. In a digital radio communications device for transmitting and receiving radio frequency signals of the type including a microprocessor for performing a plurality of radio transceiving functions in response to program control information stored in a memory associated therewith, said program control information including function-enabling data for selectively permitting the operation of various predetermined combinations of transceiving functions, a method for providing function-enabling data that is specifically tailored for an individual communications device and for preventing unauthorized use of said program control information by alteration, duplication or downloading into other products, comprising the following steps of:

(a) providing said digital radio communications device with a serially assigned numerical value unique to said digital radio communications device, said assigned value stored within said digital communications device;

(b) performing a data transformation operation on selected function-enabling data using said assigned value, said transformation operation performed prior to storing said function-enabling data in said associated memory;

(c) storing the transformed function-enabling data in said associated memory along with program information for performing a reverse data transformation operation for reproducing said selected function-enabling data from transformed function-enabling data.

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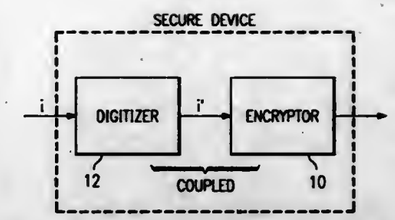
**5,499,296**

## NATURAL INPUT ENCRYPTION AND METHOD OF USE

**Silvio Micali, 459 Chestnut Hill Ave., Brookline, Mass. 02146**

**Filed Aug. 22, 1994, Ser. No. 294,178**
**Int. Cl.[6] H04K *1/00***
**U.S. Cl. 380—23** **19 Claims**

1. In a secure device having an encryptor and a digitizer, the digitizer for receiving an input i and generating an output supplied to the encryptor, the improvement comprising:




coupling the encryptor to the digitizer in such a manner as to guarantee that a given ciphertext is the encryption, generated by the encryptor, of an output i', generated by the digitizer.

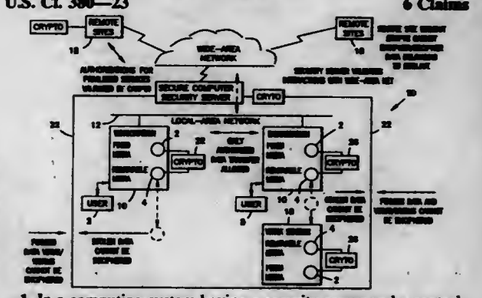
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**5,499,297**

## SYSTEM AND METHOD FOR TRUSTED PATH COMMUNICATIONS

**William E. Boebert, Minneapolis, Minn., assignor to Secure Computing Corporation, Roseville, Minn.**

**Continuation of Ser. No. 130,273, Oct. 1, 1993, abandoned, which is a continuation of Ser. No. 870,556, Apr. 17, 1992, Pat. No. 5,276,735. This application Dec. 20, 1994, Ser. No. 359,623**
**Int. Cl.[6] H04K *1/00***
**U.S. Cl. 380—23** **6 Claims**




1. In a computing system having a security server and a controller which can communicate with the security server, a method of identifying and authenticating a first user from a plurality of users seeking access to the security server, wherein the method comprises the steps of:

providing a cryptographic key;

assigning a user unique identifier to each user, wherein the step of assigning comprises assigning a first user unique identifier to the first user;

assigning a personal keying device to each user, wherein each personal keying device comprises input means for entering user input and storage means for storing an encrypted last countersign and an encrypted version of the user unique identifier of the user to whom the personal keying device is assigned;

storing, in the security server, and expected personal identification number associated with the first user unique identifier;

attaching the personal keying device assigned to the first user to the controller;

entering, at the input means of the personal keying device, a user-entered personal identification number;

combining the user-entered personal identification number, the first user unique identifier and the last countersign into a message;

encrypting the message with the cryptographic key and transmitting the encrypted message to the security server;

decrypting the message and comparing the user-entered personal identification number to the expected personal identification number;

if the user-entered personal identification number matches the expected personal identification number, comparing the

decrypted last countersign to a stored value to determine the first user's access rights.

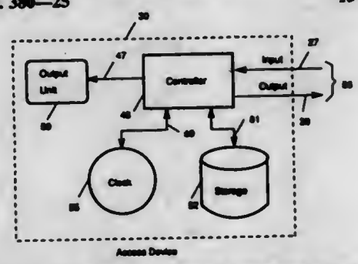
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5,499,298

## CONTROLLED DISSEMINATION OF DIGITAL INFORMATION

Arcot D. Narasimhalu; Weiguo Wang, and Mohan S. Kankanhalli, all of Singapore, Singapore, assignors to National University of Singapore, Singapore

Filed Mar. 17, 1994, Ser. No. 210,174
Int. Cl.[6] H04L 9/00
U.S. Cl. 380—25 13 Claims




8. In a system for controlling the dissemination of information by an information provider in an on-line manner over at least one transmission channel and at least one access device at an information consumer's disposal, said information including both controlled information COIN and uncontrolled information, a method for providing enhanced control over the usage of controlled information comprising the step of:

a. encrypting said COIN and a header to produce a Sealed-COIN before sending said Sealed-COIN to said information consumer, said header further comprising at least a total number of legal accesses, number of legal accesses left, a plurality of encryption/decryption keys for encrypting said information, said header being encrypted by an encryption/decryption key $K_H$ maintained for the life of a predetermined distribution contract;

b. encrypting a Seal Opener upon receiving access request from an information consumer and sending said Seal Opener to the information consumer, said Seal Opener comprising at least a plurality of access windows, and said key $K_H$;

c. decrypting said Seal Opener with a controller disposed in said access device, said controller checking the value in said Sealed Opener upon access by the information consumer, said controller disallowing access to said information if any of the checks in (a) and (b) fails;

d. decrypting said Sealed-COIN and presenting said information therein to an output unit disposed in said access device if all the checks in (a) and (b) with said controller succeeds, said header being modified to become modified header; and

e. re-encrypting said COIN and said modified header after each access request by said information consumer until there is no legal access left,

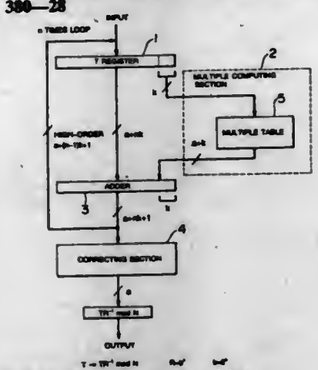
whereby said information provider exercises control of access by setting values for said header in accordance to the agreement between the information provider and the information consumer and the information consumer transparently accessing controlled and uncontrolled information.

5,499,299

## MODULAR ARITHMETIC OPERATION SYSTEM

Masahiko Takenaka; Naoya Torii; Takayuki Hasebe, and Ryota Akiyama, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 30, 1994, Ser. No. 268,435
Claims priority, application Japan, Jul. 2, 1993, 5-164870
Int. Cl.[6] H04L 9/30; G06F 7/38
U.S. Cl. 380—28 11 Claims




1. A modular arithmetic unit comprising:

an input register for holding an input number;

multiple computing means for obtaining a multiple of a modulus corresponding to a low-order predetermined bits of said input number in said input register by table lookup using a table in which arithmetic data have been stored in advance on the basis of said low-order predetermined bits of said input number;

adder means for performing addition of said multiple of said modulus obtained by said multiple computing means and the contents of said input register and updating the contents of said input register with high-order predetermined bits of the result of said addition for each addition until said addition is performed a predetermined number of times; and

correcting means for making a correction on the result of addition by said adder means.

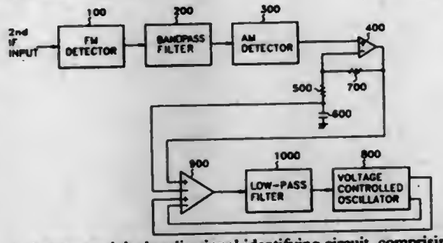
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5,499,300

## STEREO AND DUAL AUDIO SIGNAL IDENTIFYING CIRCUIT

Seung-yub Koo, Seoul, and Young-ho Shin, Kyungki, both of, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jan. 21, 1994, Ser. No. 184,181
Claims priority, application Rep. of Korea, Jan. 21, 1993, 93-726
Int. Cl.[6] H04H 5/00
U.S. Cl. 381—12 9 Claims




1. A stereo and dual audio signal identifying circuit, comprising:

an FM detector receiving an input signal, and detecting the presence of an FM waveform in the input signal;

a bandpass filter receiving an output from the FM detector;



an AM detector receiving a bandpass filtered output of the FM detector, and detecting the presence of an AM waveform in the bandpass-filtered output of the FM detector;

an amplifier having first and second inputs and an output, the first amplifier input receiving an output signal of the AM detector;

a resistor and a capacitor connected in series between the second amplifier input and ground;

a feedback resistor connected between the second amplifier input and the amplifier output; and,

a phase-locked loop having first and second positive inputs, first and second negative inputs, and first and second outputs, the first positive input being connected to the amplifier output, the first negative input being connected to a common node between the series connected resistor and capacitor, the second positive and second negative inputs being respectively connected to the first and second outputs.

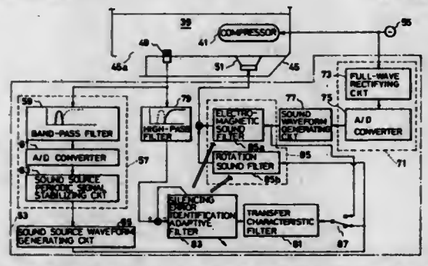
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5,499,301

## ACTIVE NOISE CANCELLING APPARATUS

Yuko Sudo, Kanagawa; Susumu Saruta, and Yasuyuki Sekiguchi, both of Osaka, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 947,170, Sep. 18, 1992, abandoned.
This application Oct. 20, 1994, Ser. No. 323,730
Claims priority, application Japan, Sep. 19, 1991, 3-239784; Mar. 23, 1992, 4-065259
Int. Cl.[6] G10K 11/16
U.S. Cl. 381—71 10 Claims




1. An active noise cancelling apparatus for actively controlling high frequency cyclic noise generated by a rotary machine, where noise is apt to externally leak from an opening portion of a machine chamber storing the rotary machine driven by an A.C. power supply, the apparatus comprising:

sound detecting means, provided in the vicinity of the opening portion, for detecting noise generated by the rotary machine;

fundamental wave component extracting means for extracting a fundamental wave component of rotation frequency of the rotary machine, from a sound signal of the noise detected by the sound detecting means;

periodic signal generating means for generating a periodic signal correlative to the fundamental wave component extracted by the fundamental wave component extracting means;

periodic signal outputting means for outputting a predetermined periodic signal by means of comparing a phase of the periodic signal generated by the periodic signal generating means with a phase of the fundamental wave component;

uncancelled sound extracting means for extracting noise having been not cancelled, after a control signal is outputted from control signal outputting means, excluding the fundamental wave component;

sound source waveform generating means for forming a harmonics component from the signal outputted by the periodic signal outputting means, the harmonics component being a sound source waveform which has a phase opposite to and a same amplitude with a sound source signal detected by the sound detecting means;

control signal generating means for correcting a control signal outputted from the sound source waveform generating means, based on a signal from the uncancelled sound extracting means and for generating the corrected signal in a feedback manner; and

output means for outputting the control generated from the control signal correcting means.

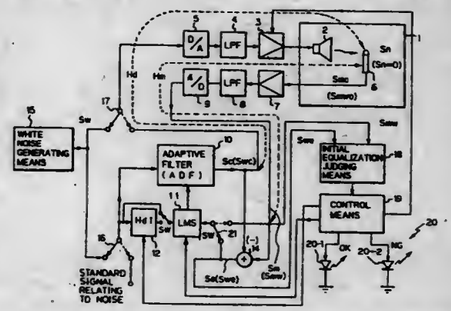
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5,499,302

## NOISE CONTROLLER

Masaaki Nagami, Akashi; Kazuya Seko, Kakogawa; Masahiro Babasaki, Takatsuki, and Kazuhiro Sakiyama, Akashi, all of, Japan, assignors to Fujitsu Ten Limited, Hyogo, Japan

Continuation of Ser. No. 66,428, May 25, 1993, abandoned.
This application May 31, 1995, Ser. No. 455,138
Claims priority, application Japan, May 26, 1992, 4-133686; May 26, 1992, 4-133737
Int. Cl.[6] G10K 11/16
U.S. Cl. 381—71 13 Claims




1. A noise controller which generates a cancelling sound having a phase opposite to and a sound pressure equal to those of a noise, comprising:

an adaptive filter which inputs a standard signal based on a type of said noise, varies a filter coefficient to cancel said noise, and outputs a cancelling signal for generating said cancelling sound;

coefficient updating means which updates the filter coefficient of the adaptive filter in order to minimize a level of an error sound remaining after the noise is cancelled by the cancelling sound;

simulated transfer characteristics compensation means which inputs the standard signal and outputs an initial equalization signal to the coefficient updating means for simulating transfer characteristics of a transmission path between an output of the adaptive filter and an input of the coefficient updating means, the transmission path including a space in which the noise is cancelled, and which provides initial equalization for the standard signal which is input to the adaptive filter;

white noise generating means for generating a white noise signal as a test signal for checking said initial equalization;

initial equalization judging means which evaluates and judges an accuracy of the initial equalization signal based on a ratio of an error signal, which corresponds to the error sound remaining in said space when said white noise signal is said cancelling signal, and a reproduced reference signal, which is obtained by synthesizing the cancelling signal output by said adaptive filter and said error signal when said white noise signal is said standard signal;

a first switch for switching an input of said adaptive filter between the standard signal and said white noise signal output by said white noise generating means;

a second switch for switching an input of a speaker outputting the cancelling sound between said cancelling signal output by said adaptive filter and said white noise signal output by said white noise generating means; and

a third switch for switching an input of said coefficient updating means between an output of a microphone detecting said error sound and generating said error signal and said reproduced reference signal.

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**5,499,303**

## CORRECTION OF THE GAZE DIRECTION FOR A VIDEOPHONE

**Eckart Hundt, Haar; Thomas Riegel, Munich; Heinz Schwärtzel, Munich, and Manfred Ziegler, Munich, all of, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany**

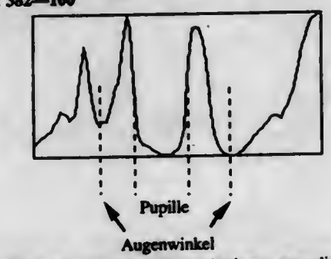
**PCT No. PCT/DE92/00007, § 371 Date Jul. 27, 1993, § 102(e) Date Jul. 27, 1993, PCT Pub. No. WO92/14340, PCT Pub. Date Aug. 20, 1992**

**PCT Filed Jan. 7, 1992, Ser. No. 94,171**

**Claims priority, application Germany, Jan. 31, 1991, 41 02 895.3**

**Int. Cl.[6] G06K *9/00***

**U.S. Cl. 382—100** **7 Claims**




1. A method for computer based altering a gaze direction of a face represented in a digital image, of a video image sequence describing persons communicating with each other via display while the persons are gazing at a monitor and the video image sequence is taken by a camera and thus an angular viewing error occurs between a person's gaze direction and a camera axis, the method comprising the steps of:

a) segmenting pupils and eyeballs of a depicted face by a computer;

b) displacing resulting segments corresponding to said pupils in an image plane and thereby computationally freeing areas previously occupied by the displaced segments;

c) filling in said areas which become free using color of said eyeballs to provide an image of a face having an altered gaze direction; and

d) displaying said image of a face having an altered gaze direction.

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**5,499,304**

## LIGHT MASK

**Simon P. Breen, Bucks; David Dickson, Liverpool, and Nigel I. Barrett, Merseyside, all of, United Kingdom, assignors to Delco Electronics Corration, Kokomo, Ind.**

**Filed Sep. 19, 1991, Ser. No. 762,313**

**Claims priority, application United Kingdom, Jan. 2, 1990, 9021444**

**Int. Cl.[6] G06L *9/74***

**U.S. Cl. 382—214** **25 Claims**

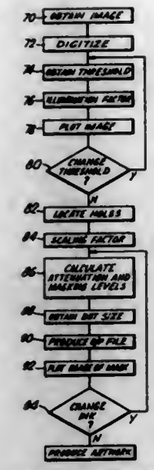
1. A method of producing a light mask for balancing light transmitted to a display area of an instrument comprising the steps of:

obtaining an image of at least part of the display area of the instrument;

defining an array of image areas, each of which image areas comprises part of the obtained image;

obtaining at least one illumination value representative of light intensity for each of the image areas;

selecting a reference illumination value;




determining an attenuation value for each of the image areas in dependence upon the obtained illumination values and the selected reference illumination value;

selecting a type of masking to be used for fabricating a light mask, the type of masking having defined light attenuating properties;

determining an amount of masking required for each of the image areas on the basis of the determined attenuation value and the light attenuating properties of the type of masking to be used;

generating masking data for the production of the light mask on the basis of the amount of masking required for each image area; and

fabricating the light mask for balancing light transmitted to the display area of the instrument based upon the masking data.

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**5,499,305**

## METHOD AND APPARATUS FOR COALESCING A GRAYSCALE IMAGE AND RENDERING THE COALESCED GRAYSCALE IMAGE AS A BINARY IMAGE

**Steven L. Lidke, Brooklyn Park, and Reed R. Esau, Burnsville, both of Minn., assignors to Lasermaster Corporation, Eden Prairie, Minn.**

**Filed Mar. 30, 1994, Ser. No. 220,280**

**Int. Cl.[6] G06K *9/36***

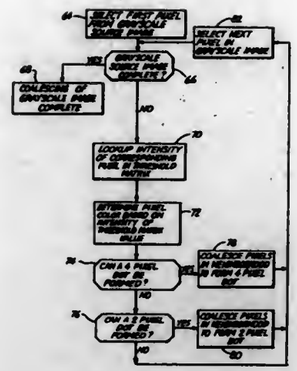
**U.S. Cl. 382—270** **14 Claims**

1. A method of forming a halftone image from a grayscale image, the method including:

identifying intensity threshold values from a lookup table for each of a plurality of selected pixel positions in the grayscale image; and

coalescing similar grayscale pixels in the grayscale image neighboring each selected pixel position based on the intensity threshold value associated with the selected pixel position and intensity information of neighboring pixels to form coalesced grayscale image information.






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**5,499,306**

## POSITION-AND-ATTITUDE RECOGNITION METHOD AND APPARATUS BY USE OF IMAGE PICKUP MEANS

**Mikio Suzuki; Yukihiro Kanayama; Hideki Saitou, all of Kariya, and Tetsuya Kouinami, Oobu, all of, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan**

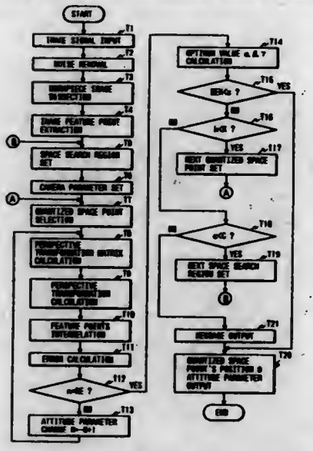
**Filed Mar. 7, 1994, Ser. No. 206,828**

**Claims priority, application Japan, Mar. 8, 1993, 5-046362; Mar. 10, 1993, 5-049240; Jan. 1, 1993, 5-247228; Jan. 1, 1993, 5-247229; Nov. 9, 1993, 5-279223**

**Int. Cl.[6] G06K *9/36***

**U.S. Cl. 382—291** **19 Claims**

1. A position and attitude recognition method for determining




the position and attitude of an image pickup means with respect to an object having three-dimensional shape, the method comprising:

an image pickup step using the image pickup means for taking two-dimensional image information of the object;

an image processing step for extracting actual image feature representing the shape of an object, on the basis of said two-dimensional image information of said object taken by said image pickup means;

a search region setting step for setting a search region with a plurality of discrete space points having a required accuracy in discrete value and allocated in the vicinity of said image pickup means whose position and attitude are estimated based on external information;

perspective transformation equation calculating step for obtaining a perspective transformation equation for calculating two-dimensional estimated image feature of said object to be obtained when a view of said object is taken by said image pickup means located at each of said discrete space points of said search region, derived from the three-dimensional shape of said object;

an error calculating step for calculating an error between said actual image feature extracted by said image processing step and said estimated image feature calculated by said perspective transformation calculating step for each of said discrete space points; and

a searching step for searching each of said discrete space points to find a space point which has a minimum error between said actual image feature and said estimated image feature, thereby determining the position and attitude of said image pickup means with respect to said object.

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**5,499,307**

## OPTICAL ISOLATOR AND POLARIZATION SPLITTER THEREFOR

**Shinji Iwatsuka, Ossishiranto, Japan, assignor to TDK Corporation, Tokyo, Japan**

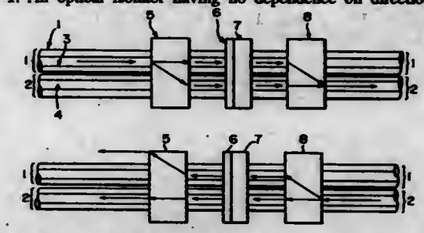
**Filed Oct. 11, 1994, Ser. No. 320,816**

**Claims priority, application Japan, Jan. 13, 1993, 5-278925; Jan. 13, 1993, 5-278926**

**Int. Cl.[6] G02B *6/27***

**U.S. Cl. 385—11** **12 Claims**

1. An optical isolator having no dependence on direction of




plane of polarization, which comprises:

a pair of parallel linear optical waveguides having first, second and third grooves formed in order along the waveguides;

a first birefringent crystal plate inserted in the first groove;

a half wave plate and a Faraday rotator inserted in the second groove;

a second birefringent crystal plate inserted in the third groove; and

said first and second birefringent crystal plates, said half wave plate and said Faraday rotator being arranged so that an incident light in a forward direction into one of the waveguides exits from the other of the optical waveguides, and an incident light in a reverse direction into the other optical waveguide does not return to said one of the waveguides.

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**5,499,308**

## GUIDED-WAVE OPTICAL MULTI/DEMULTIPLEXER

**Hideaki Arai, and Hisato Uetsuka, both of Hitachi, Japan, assignors to Hitachi Cable, Ltd., Tokyo, Japan**

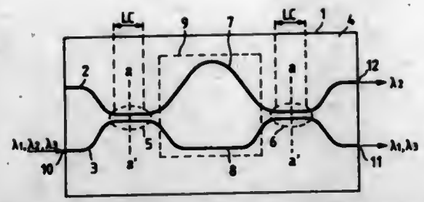
**Filed Mar. 13, 1995, Ser. No. 403,263**

**Claims priority, application Japan, Mar. 18, 1994, 6-048864; Jul. 27, 1994, 6-175418**

**Int. Cl.[6] G02B *6/26***

**U.S. Cl. 385—27** **10 Claims**

1. A guided-wave optical multi/demultiplexer having directional couplers in both sides of a phase shift region having a difference of optical path length which differs from an integral times a value multiplying an inverse number of an equivalent refractive index to a wavelength $\lambda_1$ by one-half times the value and agrees with an integral times a value multiplying an inverse number of an equiva-



lent refractive index to a wavelength $\lambda_2$, and is constructed so that the coupling ratio of light intensity at said wavelength $\lambda_2$ is at least 50%, the light in the wave band containing said wavelength $\lambda_1$ and the light in the wave band containing said wavelength $\lambda_2$ being multiplexed and demultiplexed, wherein:

each of said two directional couplers is constructed so that the coupling ratio of light intensity in said wavelength $\lambda_2$ is at least 50% and the coupling ratio of light intensity in said wavelength $\lambda_3$ having a wavelength band in close proximity to said wavelength $\lambda_1$ is 0% or 100%, the light in the wave band containing said wavelength $\lambda_1$ and said wavelength $\lambda_2$ and the light in the wave band containing said wavelength $\lambda_2$ being multiplexed and demultiplexed.

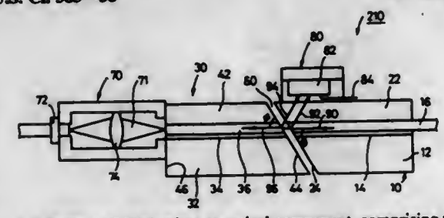
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**5,499,309**

**METHOD OF FABRICATING OPTICAL COMPONENT INCLUDING FIRST AND SECOND OPTICAL WAVEGUIDE CHIPS HAVING OPPOSED INCLINED SURFACES**

**Yoshinari Kozuka; Yukihisa Osugi, and Masashi Fukuyama, all of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan**

**Filed Sep. 30, 1994, Ser. No. 314,302**
**Claims priority, application Japan, Jan. 1, 1993, 5-247233**
**Int. Cl.[6] G02B *6/26***
**U.S. Cl. 385—38** **29 Claims**



1. A method of fabricating an optical component, comprising the steps of:

forming a first optical waveguide chip having a first optical waveguide;

forming a second optical waveguide chip having a second optical waveguide and different from said first optical waveguide chip;

processing said first optical waveguide chip to form a first end face thereof at which an end of said first optical waveguide is exposed;

polishing said first optical waveguide chip to an optical finish to incline a second end face thereof at which an opposite end of said first optical waveguide is exposed, to a direction in which light is propagated through said first optical waveguide;

processing said second optical waveguide chip to form a third end face thereof at which an end of said second optical waveguide is exposed;

polishing said second optical waveguide chip to an optical finish to incline a fourth end face thereof at which an opposite end of said second optical waveguide is exposed, to a direction in which light is propagated through said second optical waveguide; and

positioning said first optical waveguide chip and said second optical waveguide chip relative to each other such that said second and fourth end faces extend substantially parallel to each other with a layer interposed therebetween which has a refractive index that is different from the refractive index of at least one of said first and second optical waveguides, said first and second optical waveguides being optically coupled to each other such that a portion of light propagated from said first optical waveguide to said second optical waveguide is reflected out of at least one of the first and second optical waveguide chips by at least one of said second end face of said first optical waveguide chip and said fourth end face of said second optical waveguide chip, the reflected light propagating through a light transmissive portion of at least one of said optical waveguide chips.

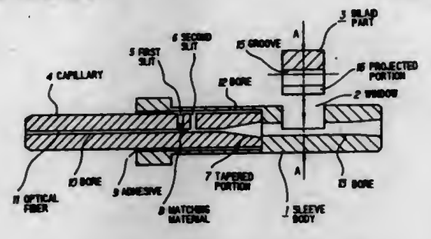
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**5,499,310**

**OPTICAL FIBER CONNECTOR WITH SLEEVE FOR RESILIENTLY FITTING AN OPTICAL FIBER THERETO**

**Tetsuji Ueda, Tokyo, Japan, assignor to NEC Corporation, Japan**

**Filed May 27, 1994, Ser. No. 250,556**
**Claims priority, application Japan, May 28, 1993, 5-126807**
**Int. Cl.[6] G02B *6/36***
**U.S. Cl. 385—84** **9 Claims**



1. A ferrule of an optical fiber connector comprising

a capillary having a leading end and a rear end, which has a first straight bore containing an optical fiber, said optical fiber extending from said leading end toward said rear end of said capillary to nearly a capillary halfway point, said optical fiber being supplied with optical matching material at a rear end thereof within said bore, and

a sleeve body, which is mechanically combined with said capillary, around a common central axis, and has a second bore for guiding an optical fiber with jacket to be spliced until its leading end butts against said rear end of said optical fiber,

said sleeve body having a third bore with an enlarged diameter near leading end thereof, which third bore encloses said rear end portion of said capillary, said sleeve body having a rectangular, window-like opening located at about a middle point between said rear end of said capillary and a rear end of said sleeve body, which window-like opening is cut in a radial direction from an outer surface of said sleeve body to a central axis, and

opposing side surfaces of remaining portions of said sleeve body which are dented at said window-like opening with respect to side surfaces of other portions of said sleeve body, said opposing side surfaces having at least one more deeply dented portion on each side surface, said at least one more deeply indented portion running in parallel with said central axis, and

an inlaid part which is made of resilient material and has n opened-rectangular inner surface with complementary unevenness corresponding to said at least one more deeply indented portion of said side surfaces of said sleeve body, said inlaid part having a groove along said central axis, a bottom surface of which has at least one vertical distance from said center axis being slightly smaller than a radius of said optical fiber with jacket.

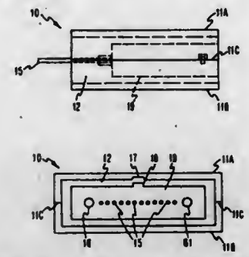


**5,499,311**

**RECEPTACLE FOR CONNECTING PARALLEL FIBER OPTIC CABLES TO A MULTICHIP MODULE**

**Casimer M. DeCusatis, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 16, 1994, Ser. No. 357,805**
**Int. Cl.[6] G02B *6/43***
**U.S. Cl. 385—89** **20 Claims**



1. A receptacle for a fiber optic cable connector having a plurality of optical fibers, said receptacle comprising:

a connector receiving body having a recess therein for receiving said fiber optic cable connector, said body also having at least one alignment means disposed within said recess;

a plurality of internal optical fibers disposed within said receiving body so as to extend from the bottom of said recess to provide external connectivity, said internal optical fibers being disposed so as to align with the optical fibers in said connector; and

a jacket disposed around at least a portion of said receiving body so as not to preclude access to said recess or to interfere with said plurality of internal optical fibers, said conductive jacket having a thermal expansion joint therein.

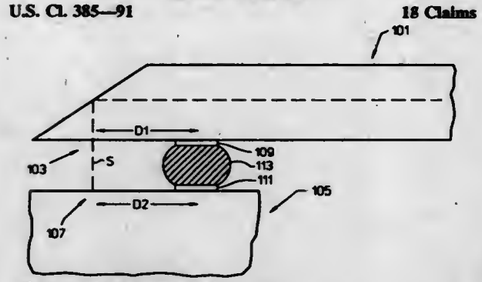
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**5,499,312**

**PASSIVE ALIGNMENT AND PACKAGING OF OPTOELECTRONIC COMPONENTS TO OPTICAL WAVEGUIDES USING FLIP-CHIP BONDING TECHNOLOGY**

**Kenneth H. Hahn, Cupertino, and Ronald T. Kaneshiro, Mountain View, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.**

**Continuation-in-part of Ser. No. 150,648, Nov. 9, 1993, abandoned. This application Aug. 31, 1994, Ser. No. 299,176**
**Int. Cl.[6] G02B *6/42***
**U.S. Cl. 385—91** **18 Claims**



1. An apparatus comprising:

an optical waveguide having an extremity for transmission of light there through, and further having at least one outer surface region that is substantially planar;

a photonic device having a central region on a surface of the photonic device;

a pair of wetable pads including:

a first wetable pad mechanically coupled with the substantially planar surface region of the waveguide and arranged at a selected lateral distance from the extremity of the waveguide; and

a second wetable pad mechanically coupled with the photonic device and arranged at a selected lateral distance from the central region of the photonic device;

and

a bond for holding the first pad in alignment with the second pad, so as to substantially provide a desired optical alignment of the extremity of the waveguide with the central region of the photonic device.

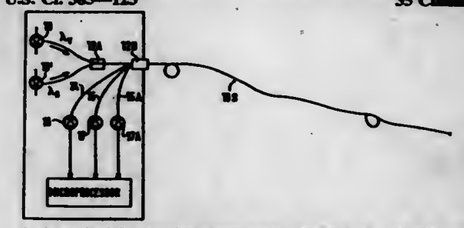
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**5,499,313**

**DISTRIBUTED AND SPATIALLY AVERAGED FIBER OPTIC TEMPERATURE SENSORS AND METHOD USING SAME**

**Marcos Y. Kleinerman, 24 Jerome St., Southbridge, Mass. 01550**

**Division of Ser. No. 815,741, Jan. 2, 1992, Pat. No. 5,363,463, which is a continuation-in-part of Ser. No. 491,942, Mar. 12, 1990, Pat. No. 5,096,277, which is a continuation-in-part of Ser. No. 293,119, Jan. 3, 1989, abandoned, which is a continuation-in-part of Ser. No. 102,835, Sep. 30, 1987, abandoned, which is a continuation-in-part of Ser. No. 711,062, Mar. 12, 1985, Pat. No. 5,004,913, which is a continuation-in-part of Ser. No. 608,932, May 14, 1984, Pat. No. 4,708,494, which is a continuation of Ser. No. 405,732, Aug. 6, 1982, abandoned. This application Sep. 13, 1994, Ser. No. 305,252**
**Int. Cl.[6] G02B *6/02; H04J 14/00; G01J 3/42; H01J 5/16***
**U.S. Cl. 385—123** **35 Claims**



1. A method for sensing temperature changes at a plurality of locations, comprising the steps of:

(a) providing a light-transmitting optical fiber system along a path including said locations, said optical fiber system having a first end and a second end and a sensing element at each of said locations, each sensing element being so characterized that, when exposed to the temperature changes to be sensed and transmitting interrogating light of suitable wavelength or wavelengths $\lambda_s$ and an intensity $P_o$, it converts a fraction $\alpha P_o$ of the intensity of said interrogating light into a light separable from the interrogating light, at least part of the intensity of which is emitted from the sensing element at wavelengths $\lambda_f$ different from $\lambda_s$, where $\alpha$ is a temperature-dependent fraction smaller than unity, the value of which increases with increasing temperature within a temperature range, the intensity of said light of wavelengths $\lambda_f$ being substantially proportional to the value of $\alpha$;

(b) injecting said interrogating light of intensity $P_o$ and wavelength or wavelengths $\lambda_s$ into the optical fiber system at said first end thereof, thereby converting at each sensing element a fraction $\alpha P_o$ of the intensity of said injected interrogating light into a light separable from the interrogating light, at least part of the intensity of which is emitted from each sensing element at wavelengths $\lambda_f$ different from $\lambda_s$, the value of $\alpha$ varying as a known function of temperature, said emitted light having an intensity varying with the value of $\alpha$;

(c) selectively directing a fraction of the intensity of said emitted light of wavelengths $\lambda_f$ received by said photodetector means;

(d) sensing the variations of the intensity of said emitted light of wavelengths $\lambda_f$ received by said photodetector means; and

(e) thereby sensing the temperature changes of the sensing elements from the variations of the intensity of said light of wavelengths $\lambda_y$ received by said photodetector means.

15. A device for sensing temperature changes at a plurality of locations, comprising

(a) a light-transmitting optical fiber system along a path including said locations, said optical fiber system having a first end and a second end and a sensing element at each of said locations, each sensing element being so characterized that, when exposed to the temperature changes to be sensed and transmitting interrogating light of suitable wavelength or wavelengths $\lambda_x$ and an intensity $P_o$, it converts a fraction $\alpha P_o$ of the intensity of said interrogating light into a light separable from the interrogating light, at least part of the intensity of which is emitted from at least one of said two ends of the probe at wavelengths $\lambda_y$ different from $\lambda_x$, where $\alpha$ is a temperature-dependent fraction smaller than unity, the value of which increases with increasing temperature within a temperature range, the intensity of said light of wavelengths $\lambda_y$ being substantially proportional to the value of $\alpha$;

(b) a source of said interrogating light of wavelength or wavelengths $\lambda_x$;

(c) optical means for selectively directing a fraction of the intensity of said emitted light of wavelengths $\lambda_y$ to photodetector means; and

(d) photodetector means for measuring the intensity of said pulses of optical radiation of wavelengths $\lambda_y$.

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**5,499,314**

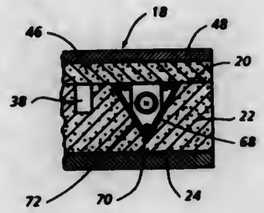
## SHOCK RESISTANT OPTIC FIBER ROTARY SPLICE HOLDING DEVICE

**Sara M. Leite, P.O. Box 160, Dahlgren, Va. 22448; Daniel D. Thomas, 6100 Igo Rd., King George, Va. 22485; Gair D. Brown, P.O. Box 56, Dahlgren, Va. 22448, and Alan Schwarting, Rt. 1, Box 315, Warsaw, Va. 22572**

**Filed Nov. 22, 1994, Ser. No. 345,716**

**Int. Cl.[6] G02B 6/38**

**U.S. Cl. 385—135** **8 Claims**




1. A protective holding device for a splice from which optical fibers extend, comprising: a tray and a retention lid, said tray having indentation means formed therein for cushioned confinement of the splice and guide means receiving the optical fibers extending from the splice while seated in the indentation means for resisting relative bending of the optical fibers.

**5,499,315**

## ADAPTIVE DIGITAL AUDIO INTERPOLATION SYSTEM

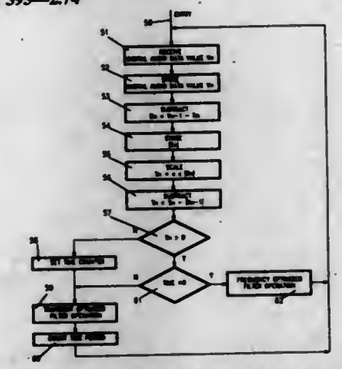
**Edmund Meitner, 4637 Mac Leod Tr. S.W., Calgary/Alberta, Canada, and Robert P. Gendron, 64 Millpond Rd., N. Andover, Mass. 01845**

**Continuation of Ser. No. 879,976, May 5, 1992, Pat. No. 5,388,221. This application Nov. 14, 1994, Ser. No. 338,678**

**The portion of the term of this patent subsequent to Feb. 7, 2012, has been disclaimed.**

**Int. Cl.[6] G10L 5/02;9/00**

**U.S. Cl. 395—2.74** **2 Claims**



1. Method for reducing signal distortion in the neighborhood of transitions in a digital audio system having a digital input signal including successive digital data values comprising the steps of

entering said digital data values;

storing said digital data values in a first storage for

providing said successive digital data values, and in a second storage for providing a delayed digital data value for each said digital data value;

subtracting each of said digital data values from the associated next one of said successive digital data values, thereby generating successive absolute difference values;

storing said absolute difference values in a third storage and providing a previous absolute difference value;

subtracting the stored previously generated one of said absolute difference values from the present one of said absolute difference values and generating a relative difference value;

determining the sign of said relative difference value as indicator for the occurrence of one of said transitions, setting a timing counter to a predetermined value, and starting said timing counter if said sign is positive;

processing said delayed digital input data values stored in said second storage in a frequency optimized filter for providing a first processed data value, and in a transient optimized filter for providing a second processed data value;

generating a digital audio output signal by selecting said first processed data value while said counter is not counting, and selecting said second processed data value while said counter is counting,

wherein said counter steps proportionally to the number of said so selected second processed data values

wherein said predetermined value corresponds to the number of said first processed data values distortable by the occurrence of one of said transitions

wherein said digital audio input is interpolated with a conventional frequency optimized filter until said transient information is detected, and wherein the digital input is interpolated with said transient optimized filter upon detection of said transient.



**5,499,316**

## RECORDING AND REPRODUCING SYSTEM FOR SELECTIVELY REPRODUCING PORTIONS OF RECORDED SOUND USING AN INDEX

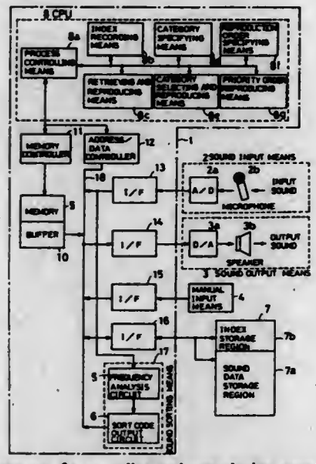
**Kengo Sudoh; Kousou Hayashi, both of Higashihiroshima, and Yuji Sumitomo, Yamatokoriyama, all of, Japan, assignors to Sharp Kabushiki Kaisha, Japan**

**Filed Jun. 24, 1992, Ser. No. 903,263**

**Claims priority, application Japan, Jul. 19, 1991, 3-179827**

**Int. Cl.[6] G10L 9/00**

**U.S. Cl. 395—2.79** **13 Claims**




1. An apparatus for recording and reproducing sound, comprising:

a random access semiconductor memory for storing recorded sounds;

means for recording sounds and storing the recorded sounds in random access fashion in the semiconductor memory;

means for storing index information in the semiconductor memory, each index including an address of a corresponding portion of recorded sound stored in the semiconductor memory and at least one of a plurality of index codes for marking selected portions of recorded sound;

means for retrieving a selected portion of stored sound from the semiconductor memory in random access fashion based on the index corresponding to the selected portion; and

means for reproducing the selected portion of sound retrieved by the means for retrieving.

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**5,499,317**

## AUDIO MESSAGE STORING CIRCUIT AND CONTROL METHOD THEREFOR

**Yong K. Oh, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea**

**Continuation-in-part of Ser. No. 800, Jan. 4, 1993, abandoned, which is a continuation of Ser. No. 752,995, Sep. 3, 1991, abandoned, which is a continuation of Ser. No. 400,879, Aug. 30, 1989, abandoned. This application May 5, 1994, Ser. No. 238,347**

**Claims priority, application Rep. of Korea, Aug. 30, 1988, 11041/1988**

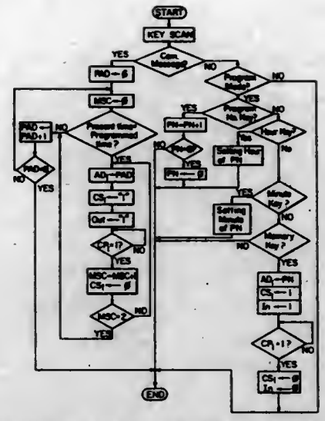
**Int. Cl.[6] G10L 9/00**

**U.S. Cl. 395—2.79** **1 Claim**

1. A method for storing and playing back a plurality of different audio messages for a plurality of time designations in a video cassette tape recorder, comprising the steps of

(a) inputting instructions through a key matrix;

(b) entering a message setting mode when a slide switch of the key matrix is located at a program position;




(c) increasing a program number by 1 in response to instructions received when step (b) has been executed;

(d) setting a program time for the program number by setting an hour key and a minute key;

(e) outputting an address signal in accordance with the program number by setting a memory key;

(f) entering a message transmission mode when a transmission message key is set and a present time is equal to a programmed time;

(g) outputting a program address;

(h) entering a recording mode and setting a predetermined time when instructions are received;

(i) designating a start address for a random access memory having a plurality of storage locations which are sequentially accessible;

(j) applying an audio message signal to an analog to digital converter and generating digital data from said message signal;

(k) applying said digital data to a signal processor in the form of three sequential data codes comprised of m-bits each, generating two difference data codes therefrom of n-bits and thereafter combining the two n-bit difference data codes into an m-bit bit output data code, where m and n are integers;

(l) applying the m-bit output data code and a record control signal to said random access memory;

(m) writing said m-bit output data code to a designated address;

(n) increasing an address of the random access memory by 1 until a predetermined time period has elapsed;

(o) generating a count completion signal when the predetermined time period has elapsed;

(p) executing program-recording by sequentially repeating said steps (i), (j), (k), (l), (m), (n), and (o) such that a plurality of audio messages are stored in sequential storage locations of said random access memory without regard to the amount of message information included in said code data for a plurality of specified time designations;

(q) thereafter entering a transmission mode and setting a predetermined time;

(r) designating a start address for the random access memory;

(s) applying the driving control signal to the random access memory;

(t) reading out the m-bit output data code stored at said designated address to said signal processor at said predetermined time designation, dividing the m-bit output data code into two n-bit data codes, and generating the original m-bit data code therefrom;

(u) applying the original m-bit data code to a digital to analog converter to generate an audio message signal;

(v) applying the audio message signal from said random access memory to an audio record circuit and then recording the audio message signal on an audio track of a video tape;

(w) increasing the address of the random access memory by 1 until the predetermined time has elapsed;
(x) generating a count completion signal; and
(y) repeating steps (r), (s), (t), (u), (v), (w) and (x), so that a predetermined audio message stored on said video tape is read out and played back with a video recording in conformity with the programmed recording time of the video cassette tape recorder.

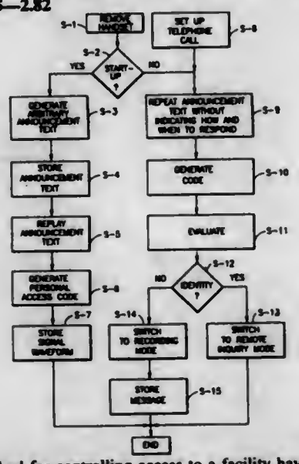
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5,499,318

## METHOD AND APPARATUS FOR ACCESS CONTROL BASED ON AN AUDIBLE UTTERING AND TIMING OF THE AUDIBLE UTTERING

Dieter Kopp, Hemmingen; Thomas Hörmann, Grossbottwar-Wzh.; Susanne Dvorak, Asperg, and Uwe Ackermann, Freiberg a.N., all of, Germany, assignors to Alcatel n.v., Amsterdam, Netherlands

Continuation of Ser. No. 29,474, Mar. 11, 1993, abandoned.
This application Feb. 13, 1995, Ser. No. 387,388
Claims priority, application Germany, Mar. 12, 1992, 42 07 837.7
Int. Cl.[6] G10L 9/00
U.S. Cl. 395—2.82 17 Claims



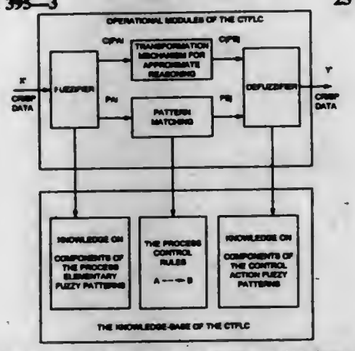

1. A method for controlling access to a facility having acoustic input and output means, comprising:
generating a first personal access code that is produced responsive to both a timing and a pattern of an audible uttering of one of a plurality of authorized users of at least one of freely selectable words and sounds during a playing of a pre-recorded text provided by the one authorized user;
storing the first personal access code in a memory for the plurality of authorized users;
subsequently playing back said pre-recorded text to a subsequent user trying to gain access to the facility, without indication how and when said subsequent user should repeat the audible uttering of said one of said plurality of authorized users of at least one of said freely selectable words and sounds during said subsequent playing back of said pre-recorded text;
generating a second personal access code, responsive to said subsequent user audibly uttering said at least one of said freely selectable words and sounds during said subsequent playing back of said pre-recorded text;
comparing said first and second personal access codes with each other; and
providing said subsequent user with access to the facility only if said first and second personal access codes correspond with each other in both the pattern thereof and the timing of the audible uttering of said freely selectable words and sounds during the playing back of the pre-recorded text.

5,499,319

## FUZZY LOGIC CONTROLLER

Talib H. Al Janabi, #19 - 3333 McCarthy Road, Ottawa, Ontario, Canada, and Labib Sultan, 135 Old Shepherd, Willowdale, Ontario, Canada

Continuation of Ser. No. 767,839, Sep. 30, 1991, abandoned.
This application Jan. 14, 1994, Ser. No. 181,373
Int. Cl.[6] G06F 9/44
U.S. Cl. 395—3 23 Claims




1. A fuzzy logic decision-maker for receiving input signals, utilizing data in a knowledge-base and, based on said input signals and said data, providing output signals in order to provide knowledge-based decision making, said knowledge-base of the type containing
fuzzy rules comprising representations of fuzzy patterns of consequents (THENs) and representations of fuzzy patterns of antecedents (IFs);
clearness distributions comprising collections of representations of clearness degrees, said clearness degrees defining cognitive measures which assess the fuzziness of fuzzy patterns, and
representations of thresholds of transitions, said thresholds of transitions being the intersection points of every two adjacent clearness distributions,
said fuzzy logic decision-maker comprising:
a fuzzifier comprising first means for mapping said input signals into representations of input fuzzy patterns and second means for mapping said input signals into representations of input clearness degrees of said input fuzzy patterns, said input clearness degrees being valued in the interval of zero to one, where zero represents "absolutely unclear" ("absolutely false") and one represents "absolutely clear" ("absolutely true");
pattern matching and rule selection means for receiving said representations of input fuzzy patterns from said first means of said fuzzifier and, responsive thereto, for selecting one rule from said knowledge-base, and for generating representations of output fuzzy patterns based on the consequent (THEN) portion of said rule;
approximate reasoning means for receiving said representations of input clearness degrees from said second means of said fuzzifier and for mapping said representations of input clearness degrees into a representation of an output clearness degree, said approximate reasoning means operating in parallel with said pattern matching and rule selection means; and
defuzzifier means for receiving said representations of output fuzzy patterns from said pattern matching and rule selection means and for receiving said representation of an output clearness degree from said approximate reasoning means and for mapping said representations of output fuzzy patterns and said representation of an output clearness degree into said output signals.

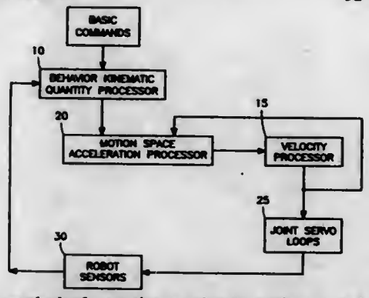


5,499,320

## EXTENDED TASK SPACE CONTROL FOR ROBOTIC MANIPULATORS

Paul G. Backes, La Crescenta, and Mark K. Long, Altadena, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 24, 1993, Ser. No. 34,607
Int. Cl.[6] G05B 19/00
U.S. Cl. 395—95 31 Claims




1. A method of operating a robot to perform a task in an environment of objects, said robot having joints and joint actuators, said method comprising the steps of:
decomposing said task into behavior kinematic quantities of plural behaviors to be exhibited simultaneously in respective behavior spaces by said robot, said plural behaviors including exerting force on at least one of said objects;
first transforming said behavior kinematic quantities from said respective behavior spaces to a common space;
computing, in said common space, from said behavior kinematic quantities command kinematic quantities including a force kinematic quantity corresponding to the force to be exerted on said one object and controlling said joint actuators in accordance with said command kinematic quantities;
wherein said computing comprises computing a first command kinematic quantity for a next sampling interval from;
(a) said behavior kinematic quantities, and
(b) other command kinematic quantities of a current sampling interval; and
computing said other command kinematic quantities for said next sampling interval from said first command kinematic quantity of said next sampling interval and from said other command kinematic quantities of said current sampling interval.

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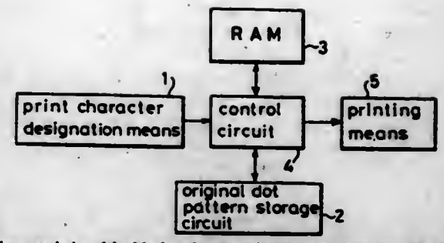
5,499,321

## PRINTING METHOD FOR USE WITH DOT PRINTER

Mikio Hayashi; Hiroshi Sato; Masahiro Nishida, and Kelichiro Takahashi, all of Tokyo, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

Division of Ser. No. 190,770, Feb. 2, 1994, which is a continuation of Ser. No. 985,519, Dec. 2, 1992, abandoned, which is a continuation of Ser. No. 697,125, May 8, 1991, abandoned, which is a division of Ser. No. 622,992, Dec. 6, 1990, abandoned. This application May 31, 1995, Ser. No. 455,773
Claims priority, application Japan, Dec. 6, 1989, 1-316964
Int. Cl.[6] G06K 15/00
U.S. Cl. 395—105 2 Claims

1. A method for printing wherein a printhead is successively scanned in a line direction to print a plurality of dots extending in said line direction and a recording medium is fed at right angles to said line direction in normal printing mode or high speed printing mode, selectively, scanning speed of the printhead in the normal printing mode is V1 and scanning speed of the printhead in the high speed printing mode is V2(V1<V2), and minimum driving cycle of the printing element in the normal printing mode is determined as t1, though the printing element having response




characteristics drivable by shorter driving cycle than the driving cycle t1 only while printing predetermined number of successive dots, wherein the steps in the high speed printing mode comprising of:
converting original dot pattern including fonts, graphics and the like, into secondary dot pattern having dot density lower than that of said original dot pattern;
scanning the printhead at the speed V2;
printing the secondary dot pattern by the printing element, the driving cycle of the printing element, in response to the predetermined number of successive dot data of the secondary dot pattern, being shorter than the minimum driving cycle t1, and the driving cycle of a printing element, in response to remaining dot data of the secondary dot pattern, being longer than or equal to the minimum driving cycle t1.

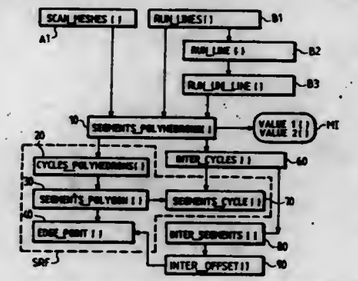
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5,499,322

## DEVICE FOR PROCESSING THREE-DIMENSIONAL IMAGE INFORMATION, WITH EXTRACTION OF SIGNIFICANT LINES

Jean-Philippe Thirion; Nicholas Ayache; Olivier Monga, and Alexis Gourdon, all of Paris, France, assignors to Iaria Institut National de Recherche en Informatique et en Automatique, Le Chesnay Cedex, France

Filed Mar. 30, 1993, Ser. No. 40,292
Claims priority, application France, Mar. 31, 1992, 92 03900
Int. Cl.[6] G06T 17/40
U.S. Cl. 395—118 24 Claims




1. An electronic device for processing image information comprising:
(a) image definition means for supplying, in correspondence with a polyhedral meshing of a portion of a space, a numerical value for each vertex of the polyhedral meshing,
(b) polygon processing means for receiving a representation of a polygon with p vertices in a plane p respective values for the p vertices, and a thresbold, and for supplying, in correspondence with the polygon a list of oriented segments linking points of edges of the polygon interpolated as equal to the threshold, in conformance with a predetermined direction convention,
(c) polyhedron processing means for receiving a representation of a polyhedron with values at vertices thereof and a threshold, and for calling the polygon processing means for each face of the polyhedron, the polygon processing means supplying a list of oriented segments, and associating with the

polyhedron a list of closed and oriented cycles formed by segments from the list of oriented segments, and

(d) main processing means for presenting sequentially a plurality of polyhedrons of the polyhedral meshing to the polyhedron processing means, with values associated with vertices thereof and a threshold, said polyhedron processing means thus producing cycles, the cycles belonging to an iso-surface of an image for the threshold value.

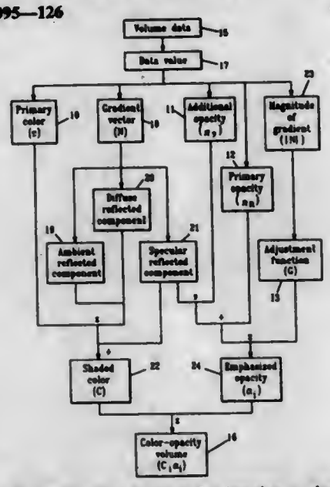
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5,499,323

## VOLUME RENDERING METHOD WHICH INCREASES APPARENT OPACITY OF SEMITRANSPARENT OBJECTS IN REGIONS HAVING HIGHER SPECULAR REFLECTIVITY

Akio Doi, Machida; Koji Koyamada, Hatano, and Tatsuo Miyazawa, Tokyo, all of, Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 16, 1994, Ser. No. 260,590
Claims priority, application Japan, Jun. 16, 1993, 5-144459
Int. Cl.[6] G06T 15/50
U.S. Cl. 395—126 4 Claims




1. A volume rendering method for imaging a shaded three-dimensional object from volume data comprising the steps of:

a. evaluating volume data representing a three-dimensional object at sampling points, including determining a value for the specular reflection component, if any, at the sampling points, the sampling points including a semi-transparent portion of the three-dimensional object;

b. deducing a color-opacity volume at each sampling point, the color-opacity volume being determined from a color at the sampling point and an emphasized opacity at the sampling point, the emphasized opacity at the sampling point being an opacity value between the actual opacity value at the sampling point and an opacity value of one and being increased above the actual opacity value at the sampling point in dependence upon the value of the specular reflection component at the sampling point;

c. determining a pixel color for each sampling point, the pixel color being determined from said color at the sampling point and a product of said emphasized opacities of said sampling points along a reference ray of light; and

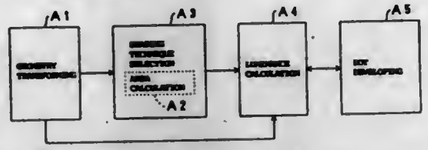
d. projecting the pixel colors onto a display screen to form an image of said three-dimensional object.

5,499,324

## GRAPHIC DISPLAY APPARATUS WITH IMPROVED SHADING CAPABILITIES

Noriko Nakayama, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 21, 1994, Ser. No. 184,102
Claims priority, application Japan, Mar. 18, 1993, 5-059130
Int. Cl.[6] G06T 15/50
U.S. Cl. 395—129 10 Claims




1. A graphic display apparatus comprising:

geometry transforming means for inputting graphic data of a target object and transforming the graphic data into coordinate values of a device coordinate system which is used by the graphic display apparatus;

area calculation means, coupled to said geometry transforming means, for calculating an area of a particular polygon that is formed by the transformed coordinate values of the device coordinate system;

shading technique selection means, coupled to said geometry transforming means, for selecting a shading technique corresponding to the area of the particular polygon calculated by said area calculation means from a plurality of shading techniques which are determined in advance depending upon the calculated area, said shading technique selection means selecting a shading technique which enables a first degree of realistic representation when the area of the polygon calculated by the area calculation means is larger than a threshold value, and selects a shading technique with a second degree of realistic representation, lower than said first degree of realistic representation, when the area of the polygon calculated by the area calculation means is not larger than the threshold value;

luminance calculation means, coupled to said shading technique selection means, for calculating a luminance of the graphic data of the target object according to the shading technique selected by said shading technique selection means for the particular polygon; and

dot developing means, coupled to said luminance calculation means, for developing the graphic data of the target object for which the luminance is calculated by said luminance calculation means into dots.

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5,499,325

## BRIGHTNESS CONTROLS FOR VISUAL SEPARATION OF VECTOR AND RASTER INFORMATION

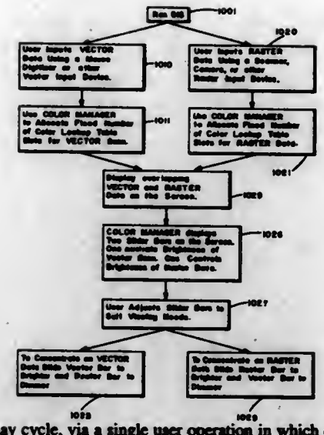
Robert F. Dugan, Jr., Kingston, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 932,865, Aug. 20, 1992, abandoned.
This application Jun. 7, 1995, Ser. No. 474,526
Int. Cl.[6] G06T 5/00; G09G 5/06; 5/10
U.S. Cl. 395—132 36 Claims

1. A method for enabling images on a display screen generated from raster data to be visually distinguished from images on the same screen generated from vector data, in a modeling system that includes a color table partitioned into a first set of color table entries each dedicated exclusively for specifying the color of raster data and a mutually exclusive second set of color table entries each dedicated exclusively for specifying the color of vector data, comprising the steps of:

(a) controlling the brightness of raster data images on said screen directly in response to a first control signal, generated in real time by a first control means, which causes all of the entries located in said first set of color table entries to be incrementally modified simultaneously to thereby adjust the brightness of all raster data images displayed during a given






display cycle, via a single user operation in which color table entry modification is transparent to the user; and

(b) controlling the brightness of vector data images on said screen directly in response to a second control signal, generated in real time by a second control means, which causes all of the entries located in said second set of color table entries to be incrementally modified simultaneously to thereby adjust the brightness of all vector data images displayed during a given display cycle via a single user operation in which color table entry modification is transparent to the user,

whereby the user is able to view an animated color differentiation between vector and raster data as the user adjusts vector and/or raster data image brightness.

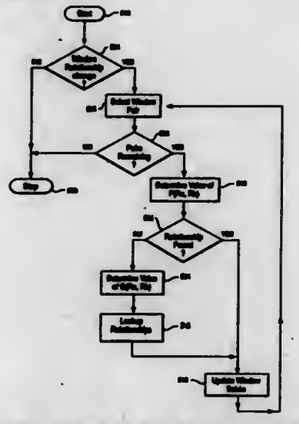
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5,499,326

## SYSTEM AND METHOD FOR RAPIDLY DETERMINING RELATIVE RECTANGLE POSITION

Chandrasekhar Narayanaswami, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 121,138, Sep. 14, 1993. This application Aug. 1, 1995, Ser. No. 509,882
Int. Cl.[6] G06T 11/00
U.S. Cl. 395—133 2 Claims




1. A computer program product having a computer readable medium having computer program logic recorded thereon for determining interactions between to isothetic rectangles each of said rectangles having four vertices including upper left, upper right, lower left and lower right, said computer program product comprising:

means for determining a first combined relative displacement based upon at most two vertices of said rectangles;

means for determining a relationship between the rectangles if said first combined relative displacement is determinitive;

means for determining a second combined relative relationship based upon at most two vertices of said rectangles, said at most two vertices being different than the previously tested two vertices; and

means for determining the relationship of the rectangles based on the first and second combined relative displacements.

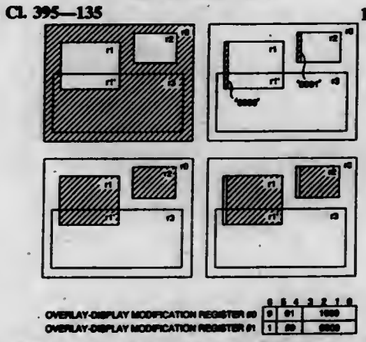
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5,499,327

## MULTI-WINDOW SYSTEM WHICH CAN OVERLAY-DISPLAY A DYNAMIC IMAGE IN A SPECIFIC WINDOW

Makoto Satoh, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 15, 1993, Ser. No. 5,158
Claims priority, application Japan, Jan. 20, 1992, 4-007440; Apr. 10, 1992, 4-091120
Int. Cl.[6] G06T 3/00
U.S. Cl. 395—135 18 Claims




4. An image processing system, which displays a plurality of portions of a plurality of images on a signal screen, comprising:

first storing means for storing overly-display data associated with allowance/disallowance of an overlay display of the images, with respect to display positions of the images of every display pixel;

second storing means for storing selection data for selecting at least one input image signal corresponding to the display positions of the images for every display pixel;

first selection means for selecting at least a first image from the plurality of portions of the plurality of images, based on the selection data corresponding to a display data being indicative of the allowance of the overlay display of the data;

second selection means for selecting at least a second image from the plurality of portions of the plurality of images, based on the selection data corresponding to a display data being indicative of the allowance of the overlay display of the data;

third selection means for selecting at least a third image from the plurality of portions of the plurality of images, based on the selection data corresponding to a display position in which the overlay-display data indicative of the disallowance of the overly display of the data;

means for generating a fourth image by overlapping the first image and the second image at a predetermined overlap ratio; and

display instruction means for instructing to overlay-display the fourth image on the third image on the screen in accordance with the overlay-display data and the selection data.

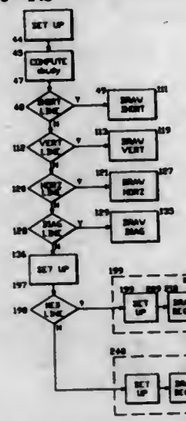
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5,499,328

## LINE DRAW METHOD FOR GENERATING, STORING AND DISPLAYING LINES IN A DISPLAY SYSTEM

Kevin B. Martin, San Jose, Calif., assignor to Network Computing Devices, Inc., Mountain View, Calif.

Filed Feb. 22, 1991, Ser. No. 660,285
Int. Cl.[6] G06T 11/00
U.S. Cl. 395—143 32 Claims



6. A line-draw method for drawing a line in a computer system relative to an axes system with a major axis and an orthogonal minor axis, where the line has a projection da onto the major axis and a projection db onto the minor axis, where for the line, the average segment length ASL is equal to da/db, and where the line includes a plurality of segments including a beginning segment, one or more middle segments and an end segment and for each middle segment, the computer system executes an outer loop having executable instructions to draw each middle segment with a segment length, SL, by performing the steps of,

determining the number A of pixels to be drawn with A less than or equal to a maximum number C by performing a maximum of A+1 tests, but not more than C tests, of a condition,

drawing A pixels,

executing an unconditional loop having executable instructions "n" times where "n"=ULS and where ULS is the unconditional loop size representing the number of pixels drawn for each of the "n" executions of the unconditional loop,

drawing U unconditional pixels, where,

$$U \leq SL \leq (U+C)$$

$$U \leq ASL \leq (U+C)$$

drawing R remainder pixels, where,

R=U ULS.

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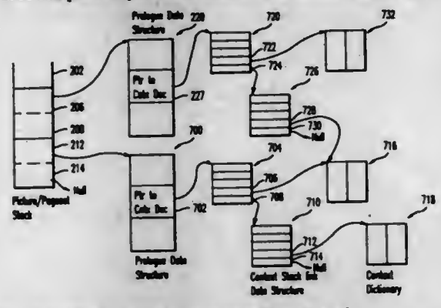
5,499,329

## METHOD AND SYSTEM TO HANDLE CONTEXT OF INTERPRETATION IN A DOCUMENT PROCESSING LANGUAGE

Tetsuro Motoyama, and Yueh-Lin Chang, both of San Jose, Calif., assignors to Ricoh Company, Ltd., Tokyo, Japan, and Ricoh Corporation, San Jose, Calif.

Continuation-in-part of Ser. No. 931,808, Aug. 11, 1992, Pat. No. 5,416,896, which is a continuation-in-part of Ser. No. 876,601, Apr. 30, 1992, Pat. No. 5,319,748, and Ser. No. 876,251, Apr. 30, 1992, Pat. No. 5,325,484. This application Jul. 2, 1993, Ser. No. 87,571
The portion of the term of this patent subsequent to Jun. 6, 2012, has been disclaimed.
Int. Cl.[6] G06F 9/45
U.S. Cl. 395—145 12 Claims

1. A computer implemented method for processing a hierarchically structured document, comprising the steps of:



creating a first data structure having a first set of information;

creating a first reference to the first data structure, said first reference to the first data structure being associated with a structure portion of a predetermined hierarchical level of the document;

creating, for said predetermined hierarchical level of the document when a content portion of said predetermined hierarchical level is processed, a second data structure which has a second reference thereto and copying the first set of information to a second set of information of the second data structure;

processing said content portion of said predetermined hierarchical level using the second reference to said second set of information;

determining if processing of content for said predetermined hierarchical level is finished;

processing a structure portion of a first subsequent hierarchical level, wherein said first subsequent hierarchical level is lower in the hierarchical structure of the document than the predetermined hierarchical level;

copying the first reference to a third reference associated with the structure portion of the first subsequent hierarchical level;

processing a structure portion of a second subsequent hierarchical level, wherein said second subsequent hierarchical level is lower in the hierarchical structure of the document than the first subsequent hierarchical level;

creating, for said second subsequent hierarchical level of the document when a content portion of said second subsequent hierarchical level is processed, a third data structure referenced by a fourth reference and copying the set of information referred to by the third reference to a third set of information of the third data structure;

processing said content portion of said second subsequent hierarchical level using said third set of information;

determining if processing of said content portion of said second subsequent hierarchical level is finished; and

copying the fourth reference to the third reference, when said processing of said content portion of said second subsequent hierarchical level is determined to be finished.



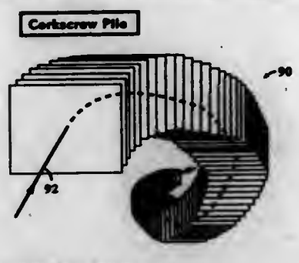
5,499,330

## DOCUMENT DISPLAY SYSTEM FOR ORGANIZING AND DISPLAYING DOCUMENTS AS SCREEN OBJECTS ORGANIZED ALONG STRAND PATHS

Peter Lucas, and Jeffrey A. Senn, both of Pittsburgh, Pa., assignors to Digital Equipment Corp., Maynard, Mass.

Filed Sep. 17, 1993, Ser. No. 123,403
Int. Cl.[6] G06F 15/00
U.S. Cl. 395—145 22 Claims

1. An apparatus for displaying documents, comprising:




a computer controlled display device;

means for displaying a strand of documents on said display device, said strand having a parent document and one or more child documents, said parent document represented on said display device by a screen object, each one of said child documents represented on said display device by a screen object displayed on a strand path, said strand path consisting of a two dimensional line through a three dimensional virtual display space in which said parent document and said child documents are arranged;

said parent document including a strand function, said strand function being an attribute having a value equal to a script representation of a mathematical equation which when interpreted and executed outputs the coordinates of said strand path; and

each one of said child documents identified by an entry in a child document list contained within said parent document, each entry in said child document list containing a unique identifier for one of said child documents.

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5,499,331

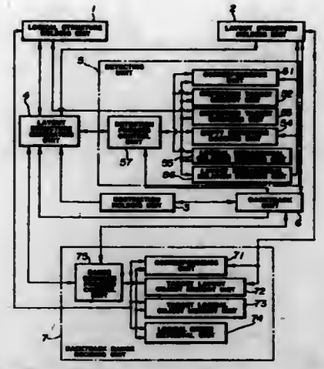
## METHOD OF DOCUMENT LAYOUT PROCESS AND SYSTEM

Naoki Hayashi, and Kazuo Saito, both of Tokyo, Japan, assignors to Fuji Xerox Co., Ltd., Japan

Continuation of Ser. No. 748,323, Aug. 21, 1991, abandoned.
This application Oct. 6, 1994, Ser. No. 319,254
Claims priority, application Japan, Aug. 24, 1990, 2-223502
Int. Cl.[6] G06F 17/21
U.S. Cl. 395—148 2 Claims

1. A method of document layout processing in which a structured document containing a tree logical structure describing logical divisions of contents in the structured document, and preset restriction conditions including a first restriction condition describing a layout of a predetermined logical object among a plurality of logical objects constituting a logical structure and a second restriction condition describing a generatable tree layout structure describing divisions of a layout of the structured document is stored and layout objects each corresponding to a plurality of nodes constituting said layout structure corresponding to the logical structure are generated from the preset restriction conditions, the method comprising:

a first step of making a correspondence among the predetermined logical object, a layout object and the first restriction condition when a layout object is generated to satisfy the first restriction condition corresponding to the predetermined logical object;



a second step of judging whether or not the layout object being made to correspond in the first step is conformable to the first restriction condition being made to correspond in the first step based on whether or not a subordinate structure of said layout object is conformable to the first restriction condition;

a third step of judging whether or not said layout object being generated in said first step satisfies the first restriction condition based on a result of the judgment in the second step;

a fourth step of recognizing based on the first restriction condition, when the third step judges that the layout structure being generated becomes unconformable to the preset restriction conditions, constituent elements of the logical structure necessary to be re-laid out when minimum required numbers of constituent elements are deleted from the layout structure so far generated, in order to generate based on the second restriction condition a layout structure different from the layout structure being generated, producing a recognition result based on said recognition, and determining, based on the recognition result, a particular logical object for which layout processing is to be restarted from among the plurality of logical objects constituting the logical structure,

said fourth step including;

a step (4A) of making a correspondence among the predetermined logical object, a layout object and the first restriction condition when a layout object is generated to satisfy the first restriction condition corresponding to a logical object,

a step (4B) of deleting at least one of the layout objects being unconformable to the first restriction condition when a layout object being generated becomes unconformable to the first restriction condition,

a step (4C) of retrieving at least one of the logical objects being made to correspond in said first step with at least one of the layout objects deleted in the 4B step, and

a step (4D) of determining, from among the logical objects retrieved in the 4C step, a first one of the logical objects in order of left-depth-first search for the logical structure, as a particular logical object for which layout is to be restarted; and

a fifth step of re-layouting a structure constituted by non-laid-out logical objects subordinate to said particular logical object determined in the fourth step.

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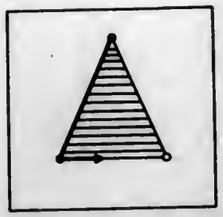
5,499,332

## CHARACTER PROCESSING METHOD AND APPARATUS

Masayuki Yoshida, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 679,893, Apr. 2, 1991, abandoned.
This application Sep. 30, 1994, Ser. No. 312,934
Claims priority, application Japan, Apr. 4, 1990, 2-89606
Int. Cl.[6] G09G 5/24
U.S. Cl. 395—150 24 Claims

1. A character processing apparatus comprising:



converting means for converting vector data into dot data, said converting means having a first painting process of painting an outline of a character based on the vector data and a second painting process of painting an area specified by the outline of the character based on the vector data;

recognizing means for recognizing a size of a character to be output; and

selection means for selecting a first mode in response to a recognition by said recognizing means that the recognized size is larger than a predetermined size and for selecting a second mode in response to a recognition by said recognizing means that the recognized size is smaller than the predetermined size,

wherein, in the first mode, the first painting process is omitted and the second painting process is executed, and, in the second mode, both the first and second painting processes are executed.

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**5,499,333**

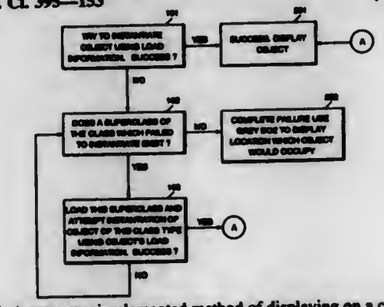
**METHOD AND APPARATUS FOR AT LEAST PARTIALLY INSTANTIATING AN OBJECT IN A COMPOUND DOCUMENT USING THE OBJECT'S PARENT CLASS CONFIGURATION DATA WHEN THE OBJECT'S CONFIGURATION DATA IS UNAVAILABLE**

**Gregory M. Doubikoff, Raleigh, and Richard J. Redpath, Cary, both of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Apr. 20, 1995, Ser. No. 425,838**

**Int. Cl.[6] G06F *17/30***

**U.S. Cl. 395—153** **4 Claims**




1. A computer implemented method of displaying on a computer system display, compound objects composed of plural object types wherein said computer system does not have a corresponding part handler for one or more said object types, comprising steps in said computer of:

attempting to display each said object and, for any said object which cannot be displayed due to the lack of a proper part handler corresponding to the type required for said object;

determining if the hierarchical class of said object type which could not be displayed has an existing superclass in said computer system, and if a superclass of said object's hierarchical class is found to exist, employing the part handler of said superclass to display said object; but if a superclass of said class of said object type which could not be displayed does not exist in said computer sysem, repeating said determining step to determine whether a superclass does exist for said superclass which was not found to exist and, if such a class does exist, repeating said employing step using the part handler of said superclass' superclass; and

repeating said steps until either a usable part handler is found for a superclass or said class structure is exhausted.

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**5,499,334**

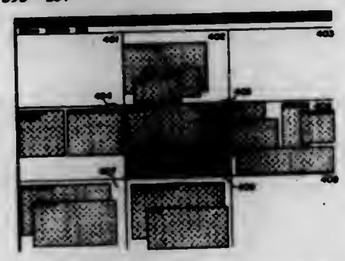
**METHOD AND SYSTEM FOR DISPLAYING WINDOW CONFIGURATION OF INACTIVE PROGRAMS**

**Sanford A. Staab, Woodinville, Wash., assignor to Microsoft Corporation, Redmond, Wash.**

**Filed Mar. 1, 1993, Ser. No. 24,732**

**Int. Cl.[6] G06F *3/03***

**U.S. Cl. 395—157** **17 Claims**



1. A method in a computer system for representing a window configuration of a window of a program when the program is inactive, the method comprising the steps of:

determining the window configuration of the window of the program when the program is active;

storing the determined window configuration;

setting the program to inactive; and

when the program is inactive, displaying a representation of the determined window configuration and an indication that the program is inactive.

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**5,499,335**

**METHOD AND SYSTEM FOR PROVIDING STANDARD RESOURCES IN DIFFERENT NATURAL LANGUAGES**

**David M. Silver, Bellevue, and John R. Windsor, Redmond, both of Wash., assignors to Microsoft Corporation, Redmond, Wash.**

**Continuation of Ser. No. 110,862, Aug. 24, 1993, abandoned.**

**This application Apr. 21, 1995, Ser. No. 426,645**

**Int. Cl.[6] G06F *3/14***

**U.S. Cl. 395—161** **27 Claims**

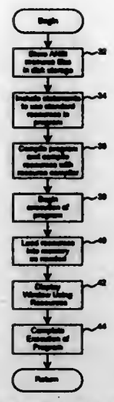
1. In a data processing system having processing means running an operating system, memory means and a video display, a method, comprising the steps of:

storing a first standard resource in the memory means, said first standard resource being provided by the operating system and specifying appearance of a non-textual component of a window element of a window and specifying that text in the window element is in a first natural language;

storing a second standard resource in the memory means, said second standard resource being provided by the operating system and specifying the same appearance of the non-textual component of the window element as specified by the first standard resource but specifying that text in the window element is in a second natural language; and

running a program on the processing means that uses one of the first standard resource or second standard resource to display the window element in a window on the video display, said non-textual component of the window element having the appearance specified by the standard resource used by the program and including text in the natural language specified by the standard resource used by the program.





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**5,499,336**

**MONITORING A COMPUTER NETWORK**

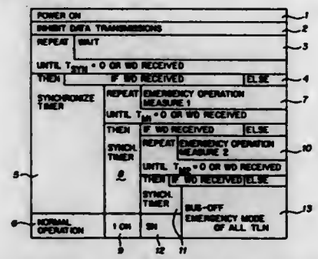
**Karl-Heinrich Preis, Bühlertal; Harald Bührea, Bühl, and Bernd Klumpp, Lauf, all of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany**

**Continuation of Ser. No. 743,368, Aug. 16, 1991, abandoned.**

**This application May 25, 1994, Ser. No. 249,075**

**Int. Cl.[6] G06F *11/34***

**U.S. Cl. 395—182.02** **25 Claims**




1. In a computer network having a plurality of subscribers, each having a transmitting/receiving component and an error detection device, and

a single databus, comprising at least two lines (U+, U–), interconnecting said subscribers,

a method of monitoring the functioning of the databus and of the subscribers,

comprising the steps of:

periodically transmitting, from any arbitrary one (M) of said subscribers to the other ones (A,B) of said subscribers, an external error recognition signal ($S_{we}$),

independently monitoring, in the error detection device in each of said other subscribers (A,B), the databus for any dropout of said external error recognition signal, and,

upon detection within said other subscriber (A,B) of such dropout, generating, within said other subscriber, an internal error recognition signal (CEI), thereby triggering emergency operation measures in the subscriber and actuating defined emergency modes of operation.

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**5,499,337**

**STORAGE DEVICE ARRAY ARCHITECTURE WITH SOLID-STATE REDUNDANCY UNIT**

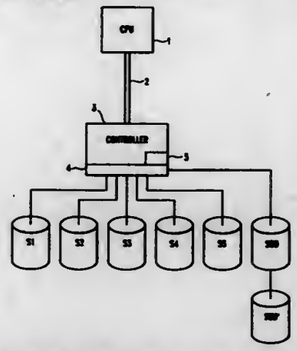
**David W. Gordon, Boulder, Colo., assignor to EMC Corporation, Hopkinton, Mass.**

**Continuation of Ser. No. 767,066, Sep. 27, 1991, abandoned.**

**This application Oct. 14, 1994, Ser. No. 324,155**

**Int. Cl.[6] G06F *11/00***

**U.S. Cl. 395—182.04** **18 Claims**




1. A fault-tolerant storage device array including:

a. a plurality of failure independent data storage units for storing data as blocks;

b. at least one solid state device storage unit for storing a plurality of redundancy blocks, each redundancy block corresponding to a plurality of data blocks stored in the plurality of failure independent data storage units, and wherein the solid state device storage unit has Read and Write cycle times substantially less than the Read and Write cycle times of the plurality of failure independent data storage units; and

c. a storage unit controller, coupled to the plurality of failure independent data storage units and to the at least one solid state device storage unit, comprising control means for modifying a data block including means for:

(1) reading a data block to be modified from one of the failure independent data storage units;

(2) reading a redundancy block, corresponding to the read data block, from at least one solid state device storage unit;

(3) generating a new redundancy block from the read data block, the read redundancy block, and a new data block; and

(4) writing the new redundancy block to the at least one solid state device storage unit.

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**5,499,338**

**BUS SYSTEM HAVING A SYSTEM BUS, AN INTERNAL BUS WITH FUNCTIONAL UNITS COUPLED THEREBETWEEN AND A LOGIC UNIT FOR USE IN SUCH SYSTEM**

**Anil Gercekci, and Roland H. Schwarz, both of Geneva, Switzerland, assignors to Motorola, Inc., Schaumburg, Ill.**

**Continuation of Ser. No. 803,819, Dec. 9, 1991, abandoned.**

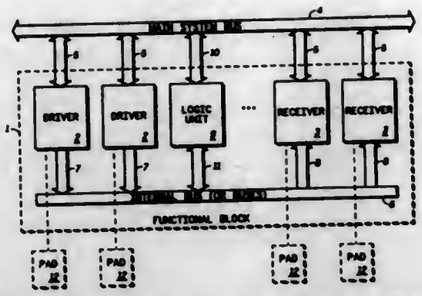
**This application Oct. 11, 1994, Ser. No. 320,590**

**Claims priority, application United Kingdom, Dec. 19, 1990, 9027458**

**Int. Cl.[6] G06F *11/26;11/277;* H04B *3/46;17/00***

**U.S. Cl. 395—183.01** **8 Claims**

1. A bus system comprising a main data bus, a functional block having one or more unidirectional driver units and one or more unidirectional receiver units, and an internal data bus, the one or more unidirectional driver units and one or more unidirectional receiver units being coupled between the main bus and the internal bus wherein data on the internal bus is not accessible during testing of the one or more unidirectional driver and receiver units, and logic means provides two way test access between the main and




internal buses for individual testing of the one or more unidirectional driver and receiver units, wherein the logic means provides driver test data placed on the internal data bus by a driver unit under test to the main data bus for verification of the driver unit functionality, and wherein the logic means provides receiver test data to the internal data bus such that a receiver unit under test receives the receiver test data from the internal bus and transfers the receiver test data to the main data bus for verification of the receiver unit functionality.

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**5,499,339**

**PROCESS FOR DETERMINING THE ORIGIN OF BIT ERRORS IN A DATA STREAM TRANSMITTED FROM A DATA SOURCE TO A DATA RECEIVER**

**Hans-Werner Arweiler, and Andreas Wolf, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany**

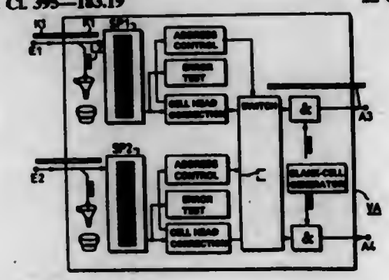
**PCT No. PCT/DE92/00395, § 371 Date May 16, 1994, § 102(e) Date May 16, 1994, PCT Pub. No. WO93/00760, PCT Pub. Date Jan. 7, 1993**

**PCT Filed May 12, 1992, Ser. No. 167,900**

**Claims priority, application Germany, Jun. 26, 1991, 41 21 478.1**

**Int. Cl.[6] H04L *12/26;25/00***

**U.S. Cl. 395—183.19** **22 Claims**




1. In a system having

a data source, providing a data stream,

at least one intermediate transmission path, providing a transmission path for the data stream,

a scrambler, scrambling the data stream in accordance with a specified instruction of a predetermined period length,

at least one transmission path, providing a transmission path for the scrambled data stream, and

a descrambler, descrambling the scrambled data stream in accordance with an instruction corresponding to the specified instruction of a predetermined period length,

a method for determining the origin of bit errors in the descrambled data stream comprising steps of:

a) injecting test data into the data stream;

b) evaluating bit errors contained in the descrambled data stream;

c) deriving a bit error function from received test data based on the evaluation of bit errors of step (b);

d) evaluating the bit error function section by section, based on the predetermined period length;

e) determining a period length of the bit error function based on the section by section evaluation of the bit error function of step (d);

f) comparing the period length of the bit error function determined in step (e) with the predetermined period length;

g) determining the origin of the error to He in the transmission path if the period length of the bit error function determined is equal to the predetermined period length and determining the origin of the error to lie in the intermediate transmission path if the period length of the bit error function determined is not equal to the predetermined period length.

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**5,499,340**

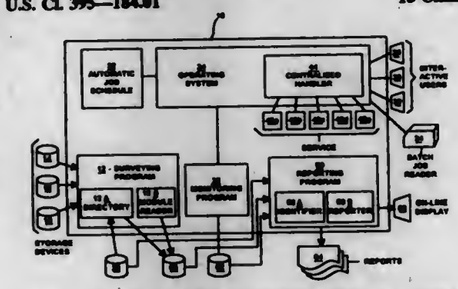
**METHOD AND APPARATUS FOR COMPUTER PROGRAM USAGE MONITORING**

**Robert Barritz, New York, N.Y., assignor to Isogon Corporation, New York, N.Y.**

**Filed Jan. 12, 1994, Ser. No. 180,218**

**Int. Cl.[6] G06F *11/34***

**U.S. Cl. 395—184.01** **18 Claims**




1. Apparatus for determining program usage on a computer having a plurality of storage devices, said apparatus comprising:

first, second and third memory means;

said first memory means storing a list of program module names of program modules and for each of said program module names storing a product name associated therewith;

surveying means that surveys the storage devices and stores in said second memory means module names of modules stored on said storage devices;

associating means that stores in said second memory means an association between the product names stored in said first memory means and each of said module names stored in said second memory means;

monitoring means that monitors invocations of said modules on said computer system and stores in said third memory means invocation data relating to said invocations of said modules;

correlating means that correlates said invocation data stored in said third memory means and said association between the product names and each of said module names stored in said second memory means; and



reporting means that outputs the data correlated by said correlating means.

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**5,499,341**

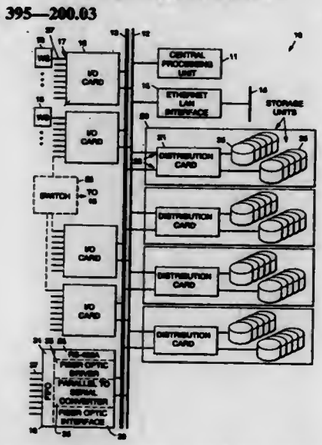
**HIGH PERFORMANCE IMAGE STORAGE AND DISTRIBUTION APPARATUS HAVING COMPUTER BUS, HIGH SPEED BUS, ETHERNET INTERFACE, FDDI INTERFACE, I/O CARD, DISTRIBUTION CARD, AND STORAGE UNITS**

**Dennis L. Wilson, Palo Alto, and Patrick W. O'Connor, Sunnyvale, both of Calif., assignors to Loral Aerospace Corp., New York, N.Y.**

**Filed Jul. 25, 1994, Ser. No. 279,995**

**Int. Cl.[6] G06F *13/12;13/14***

**U.S. Cl. 395—200.03** **10 Claims**




1. Image storage and distribution apparatus comprising:

a computer bus;

a high speed backplane bus;

a local area network;

a central processing unit coupled to the computer bus;

an Ethernet local area network interface coupled between the computer bus and the local area network;

a plurality of bidirectional input/output interface cards coupled to the computer bus and the high speed backplane bus that each comprise a plurality of bidirectional input/output ports that are respectively coupled to a plurality of user workstations, a fiber optic interface, and a FIFO buffer; and

a plurality of disk modules coupled to the computer bus and the high speed backplane bus, that each comprise:

a plurality of storage units, one of which provides for movement of parity bits and the remainder of which provides for movement of data; and

a distribution card coupled to the plurality of storage units that comprises a plurality of input/output ports, a controller coupled to the computer bus through a first input/output port, a double buffer coupled to the high speed backplane bus through a second input/output port, and an error correction circuit coupled between the double buffer and the plurality of storage units.

**5,499,342**

**SYSTEM FOR DYNAMICALLY SWITCHING LOGICAL SESSIONS BETWEEN TERMINAL DEVICE AND A PROCESSOR WHICH STOPS ITS OPERATION TO ANOTHER WORKING PROCESSOR UNDER CONTROL OF COMMUNICATION CONTROL PROCESSOR**

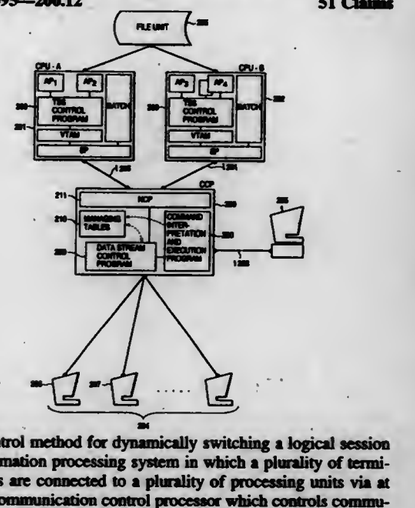
**Jun'ichi Kurihara, Mitaka; Toshio Hirosawa, Machida, and Minoru Shibamiya, Yokohama, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Continuation of Ser. No. 272,936, Nov. 18, 1988, Pat. No. 5,121,486. This application May 1, 1992, Ser. No. 867,988**

**Claims priority, application Japan, Nov. 20, 1987, 62-292024; Feb. 3, 1988, 63-21959**

**Int. Cl.[6] G06F *15/16;11/20;11/34***

**U.S. Cl. 395—200.12** **51 Claims**




1. A control method for dynamically switching a logical session in an information processing system in which a plurality of terminal devices are connected to a plurality of processing units via at least one communication control processor which controls communication between the processing units and the terminal devices, each of the processing units executes one or a plurality of programs, each of said one or plurality of programs being used by one of the terminal devices, comprising the steps of:

identifying, by said communication control processor, a terminal device which has used at least one of said one or said plurality of programs having been executed by a first one of said plurality of processing units when operation of said first processing unit is stopped; and

establishing, by said communication control processor, a logical connection between said identified terminal device and a second one of said plurality of processing units which replaces said first processing unit.

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**5,499,343**

**OBJECT-ORIENTED NETWORKING SYSTEM WITH DYNAMICALLY CONFIGURABLE COMMUNICATION LINKS**

**Christopher E. Pettus, San Francisco, Calif., assignor to Taligent, Inc., Cupertino, Calif.**

**Filed Dec. 17, 1993, Ser. No. 169,869**

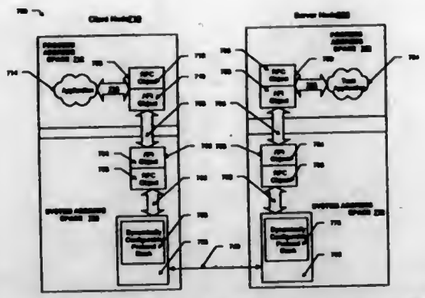
**Int. Cl.[6] G06F *15/16***

**U.S. Cl. 395—200.2** **11 Claims**

1. A multi-node computer network system for connecting a client node to a sewer node over a plurality of alternate communication links, the computer network system comprising:

(a) a network having a plurality of alternate communication links, each of the alternate communication links using a different network protocol;

(b) a server node attached to the network by a first reconfigurable protocol;



(c) a client node attached to the network by a second reconfigurable protocol stack and having an application program running therein for generating a service request;

(d) a service program located in the server node for providing a service to the application program, the service program being accessible by the plurality of alternate communication links and having means for reconfiguring the first reconfigurable protocol stack to connect the service program to the plurality of alternate communication links using a network protocol appropriate for each of the alternate communication links;

(e) directory server located in the client node for receiving a service object from the service program, the service object including reconfiguration data for each of the alternate communication links; and

(f) networking means responsive to the service request or retrieving the service object from the directory server and using the data therein to reconfigure the second reconfigurable protocol stack to connect the application program to the plurality of alternate communication links using a network protocol appropriate for each of the alternate communication links.

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**5,499,344**

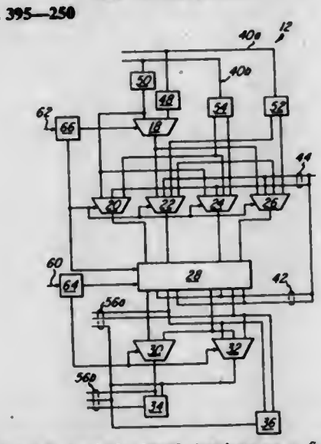
**PROGRAMMABLE DUAL PORT DATA UNIT FOR INTERFACING BETWEEN MULTIPLE BUSES**

**Khodor S. Elnashar, Richardson; Jay T. Cantrell, Dallas, both of Tex., and William Saperstein, San Carlos, Calif., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Oct. 7, 1992, Ser. No. 957,936**

**Int. Cl.[6] G06F *13/14***

**U.S. Cl. 395—250** **14 Claims**



1. A digital circuit for interfacing between a first bus and a second bus, said digital circuit comprising:

circuitry for receiving data and decoding data from a packet mode format or a compelled mode format, said circuitry for receiving data and decoding data provides decoded data;

a digital storage device connected to said circuitry for receiving and decoding data, said digital storage device for storing said decoded data;

circuitry for providing a timing signal to said digital storage device to enable said storage device to accept said decoded data multiple times in a clock cycle said circuitry for providing a timing signal to said digital storage device is connected to said digital storage device; and

circuitry for encoding data into packet mode format or compelled format, said circuitry for encoding data is connected to said digital storage device.

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**5,499,345**

**BUS ARBITRATION SYSTEM**

**Yoshikazu Watanabe, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

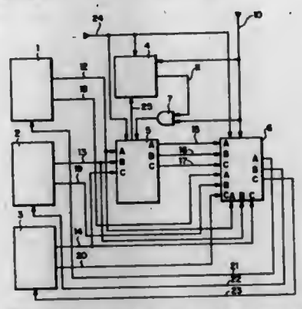
**Continuation of Ser. No. 955,975, Oct. 2, 1992, abandoned.**

**This application Mar. 15, 1995, Ser. No. 405,406**

**Claims priority, application Japan, Jan. 2, 1991, 3-282110**

**Int. Cl.[6] G06F *13/36***

**U.S. Cl. 395—297** **9 Claims**



1. A bus arbitration system for assigning priority of bus occupation among a plurality of bus masters so as to even the occupancy periods of the bus by the plurality of bus masters, said system comprising:

counting means connected to said plurality of bus masters for individually counting durations of real bus occupation by respective ones of said plurality of bus masters; and

bus arbitrating means connected to said counting means and said plurality of bus masters for giving, when at least two of said plurality of bus masters concurrently send valid bus request signals, priority to one of said plurality of bus masters having the shorter previous duration of bus occupation, as last counted by said counting means, and for giving priority in a predetermined order when immediately preceding durations of bus occupation by said at least two of said plurality of bus masters are equal.

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**5,499,346**

**BUS-TO-BUS BRIDGE FOR A MULTIPLE BUS INFORMATION HANDLING SYSTEM THAT OPTIMIZES DATA TRANSFERS BETWEEN A SYSTEM BUS AND A PERIPHERAL BUS**

**Nader Amini, Boca Raton; Patrick M. Bland, Delray Beach; Bechara F. Boury, Boca Raton, and Robert T. Jackson, Boynton Beach, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.**

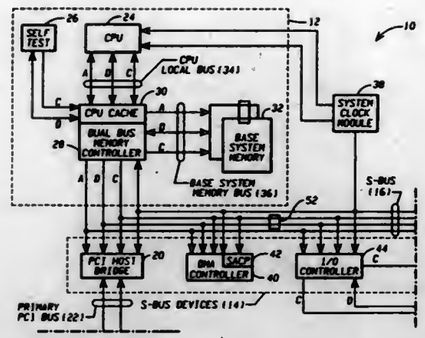
**Filed May 28, 1993, Ser. No. 69,230**

**Int. Cl.[6] G06F *11/00***

**U.S. Cl. 395—308** **15 Claims**

1. An information processing system, comprising:





a system bus having connected thereto a central processing unit (CPU);

a peripheral bus having connected thereto a master peripheral device which initiates transactions over said peripheral bus in which data is transferred between said master peripheral device and a slave peripheral device connected to said peripheral bus, said master peripheral device able to detect parity errors occurring during said transactions, set a status register and re-initiate transactions if a parity error is detected, and reset said status register if a re-initiated transaction is successfully transacted without an occurrence of a parity error;

a host bridge connecting said system bus to said peripheral bus for simultaneously monitoring said transactions as they occur over said peripheral bus, said host bridge including register space for temporarily storing the identification of a master peripheral device initiating a transaction and said data being transmitted over said peripheral bus between said master peripheral device and said slave peripheral device during the transaction; and

logic for saving said data and identification information in said host bridge register space and generating an interrupt routine over said system bus to said CPU, in response to detection of a parity error over said peripheral bus, wherein said CPU gains access to said peripheral bus in response to said interrupt routine and alternatively (a) reads said register space in said host bridge and attempts recovery operations over said peripheral bus if said status bit is set or (b) relinquishes control of said peripheral bus if said status bit is not set, indicating that a re-initiated transaction has been successfully transacted by said master peripheral device without an occurrence of a parity error.

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**5,499,347**

**SYSTEM HAVING MULTIPLE DATA FLOW PROCESSORS AND SWITCHING UNIT FOR SELECTIVELY SUPPLYING PACKETS CONTAINING DATA FROM PACKET TRANSMITTER TO ANY SELECTED DATA FLOW PROCESSOR**

**Tatsuyuki Kuwabara; Masaharu Tomita; Kiyotaka Nagamura; Takao Nakamura, all of Mitaka; Shin'ichi Yoshida, Osaka; Souichi Miyata, Osaka, and Tsuyoshi Muramatsu, Osaka, all of, Japan, assignors to Japan Radio Co., Ltd., Tokyo, and Sharp Corporation, Osaka, both of, Japan**

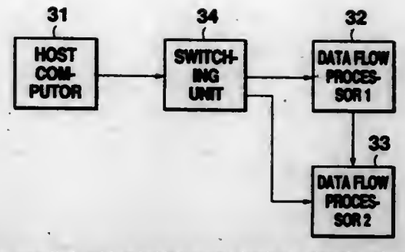
**Filed Oct. 14, 1993, Ser. No. 136,972**

**Claims priority, application Japan, Jan. 16, 1992, 4-278275**

**Int. Cl.[6] G06F *3/00***

**U.S. Cl. 395—311** **4 Claims**

1. A system having multiple data flow processors comprising a plurality of data flow processors connected in series with one another, packet transmitting means for transmitting packets required to execute a desired data flow processing and switching means for receiving said packets and for selecting one of said plurality of data flow processors to which said received packets are



to be supplied, said switching means having a plurality of outputs each connected to a respective one of said data flow processors for supplying packets received by said switching means to the respective one of said data flow processors, said switching means being operable for selectively supplying packets from said packet transmitting means to only one of said outputs.

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**5,499,348**

**DIGITAL PROCESSOR CAPABLE OF CONCURRENTLY EXECUTING EXTERNAL MEMORY ACCESS AND INTERNAL INSTRUCTIONS**

**Toshiyuki Araki, Yawata; Kunitoshi Aono, Hirakata, and Masaki Toyokura, Katano, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Continuation of Ser. No. 659,571, Feb. 22, 1991, abandoned.**

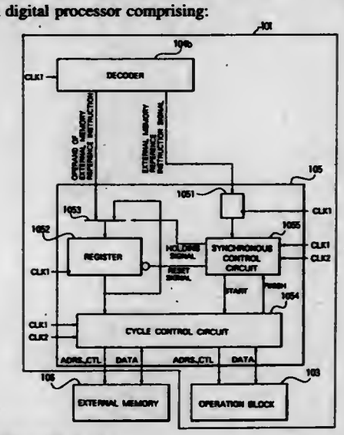
**This application Jun. 27, 1994, Ser. No. 266,104**

**Claims priority, application Japan, Feb. 27, 1990, 2-048619**

**Int. Cl.[6] G06F *9/38***

**U.S. Cl. 395—375** **10 Claims**

1. A digital processor comprising:



an instruction memory;

a sequencer for reading instructions from said instruction memory;

a decoder for analyzing said instructions, incorporated on a semiconductor chip; and

an external memory reference control circuit comprising:

a first storage means for fetching an external memory reference instruction signal being output from said decoder

a second storage means for fetching an operand of said external memory reference instruction;

a selection means for holding said operand in said second storage means;

a cycle control circuit for controlling an external memory associated with said digital processor and internal resources of said digital processor; and

a synchronous control circuit for providing a start signal to said cycle control circuit and for providing a holding signal

for controlling said selection means and a reset signal for resetting said second storage means when said synchronous control circuit senses termination of said external memory reference instruction by receiving a termination signal;

said sequencer serving to keep later instructions being read while said external memory reference instruction is being executed and to execute the later instructions concurrently with said external memory reference instruction if said later instructions are an instruction group for referring to resources unoccupied by said external memory reference instruction.

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**5,499,349**

**PIPELINED PROCESSOR WITH FORK, JOIN, AND START INSTRUCTIONS USING TOKENS TO INDICATE THE NEXT INSTRUCTION FOR EACH OF MULTIPLE THREADS OF EXECUTION**

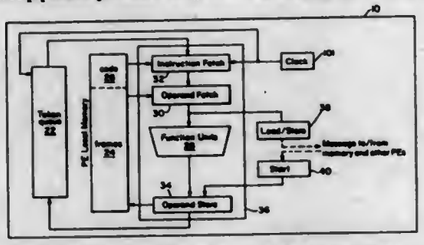
**Rishiyur S. Nikhil, and Arvind, both of Arlington, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.**

**Division of Ser. No. 527,122, May 21, 1990, Pat. No. 5,353,418, which is a continuation-in-part of Ser. No. 358,937, May 26, 1989, abandoned. This application Oct. 3, 1994, Ser. No. 317,708**

**Int. Cl.[6] G06F** *9/30;9/38*

**U.S. Cl. 395—375** **8 Claims**

1. A pipelined processor for performing imperative control flow




instructions of multiple threads of computation comprising:

token storage wherein tokens are stored, each token identifying a next instruction to be processed in a thread of computation; and

at least one processing pipeline which successively receives tokens from token storage for processing of the next instruction identified therein, the processing pipeline processing a forking instruction identified by a token to generate two tokens, the tokens identifying respective instructions of different threads that are subsequently applied to the at least one processor pipeline and processed independently.

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**5,499,350**

**VECTOR DATA PROCESSING SYSTEM WITH INSTRUCTION SYNCHRONIZATION**

**Keiichiro Uchida, Kawasaki, and Tetsuro Okamoto, Machida, both of, Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Continuation of Ser. No. 599,602, Apr. 16, 1984, abandoned, which is a continuation of Ser. No. 296,264, Aug. 21, 1981, abandoned. This application Jun. 6, 1995, Ser. No. 469,769**

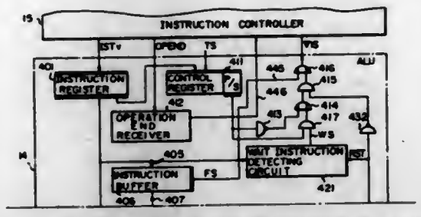
**Int. Cl.[6] G06F** *9/30*

**U.S. Cl. 395—375** **9 Claims**

1. An information processing system, comprising:

main storage; and

a data processor, connected to said main storage, receiving sequential application program instructions from the main storage and returning, to the main storage, resultant data after being processed according to a predetermined data process, the sequential application program instructions including preceding instructions a synchronization instruction and following instructions, and said data processor comprising:




an instruction controller connected to the main storage; and

arithmetic units, connected to the instruction controller, the instruction controller functioning to receive the instructions from the main storage and distribute the instructions, the arithmetic units receiving respective instructions distributed by the instruction controller;

the synchronization instruction being inserted, in advance into the sequential application program instructions supplied sequentially from the main storage, the following-instructions, which are provided sequentially after the occurrence of said synchronization instruction, are reserved or inhibited by said instruction controller from being executed until execution of the preceding-instructions, which are provided sequentially before occurrence of said synchronization instruction, said following-instructions are executed after said preceding-instructions have been completely executed.

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**5,499,351**

**ARRANGEMENT OF DETECTING BRANCH ERROR IN A DIGITAL DATA PROCESSING SYSTEM**

**Toshio Misaka, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

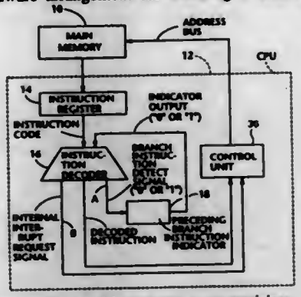
**Continuation of Ser. No. 15,000, Feb. 8, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 483,882**

**Claims priority, application Japan, Feb. 6, 1992, 4-056241**

**Int. Cl.[6] G06F** *9/32*

**U.S. Cl. 395—375** **5 Claims**

1. A hardware arrangement for detecting a branch error in a




program previously stored in a memory, comprising:

first means for receiving said program from said memory and further receiving a first signal, said program including an entry point instruction embedded therein at an entry point where control is transferred to new program flow, said first means successively decoding a plurality of program instructions of said program and generating decoded program instructions therefrom, said first means further generating a second signal, said second signal indicating whether or not a program instruction just decoded is a branch instruction; and

second means, coupled to receive said second signal, for storing said second signal, said second means applying said second signal to said first means as said first signal at a next cycle,

wherein said first means generates a third signal indicating a branch error when said first means decodes an entry point instruction indicating that control has been transferred to new program flow and said first signal indicates that a program instruction previously decoded is not a branch instruction.



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**5,499,352**

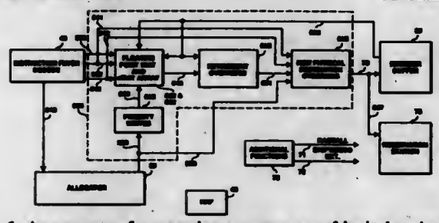
**FLOATING POINT REGISTER ALIAS TABLE FXCH AND RETIREMENT FLOATING POINT REGISTER ARRAY**

**David W. Cliff, Hillsboro; James M. Arnold, Aloha; Robert P. Colwell, Portland, and Andrew F. Glew, Hillsboro, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.**

**Filed Sep. 30, 1993, Ser. No. 129,687**

**Int. Cl.[6] G06F** *12/02;9/30;15/31*

**U.S. Cl. 395—412** **51 Claims**



1. An apparatus for renaming a current set of logical registers associated with a current set of operations, said apparatus comprising:

a retirement register file means for maintaining register values associated with non-speculative operations;

array means for renaming said logical registers of said current set of logical registers to physical registers, said physical registers residing within a separate array means, said array means comprising a plurality of addressable entries corresponding to individual logical registers, said plurality of addressable entries for storing pointers to individual physical registers; and

retirement array means for maintaining a retirement register ordering of registers within said retirement register file means, said retirement array means comprising a plurality of addressable entries for storing pointers to individual registers of said retirement register file means;

means for updating said array means based on issuing operations of said current set of operations which are speculative; and

means for updating said retirement array means based on retiring operations which are non-speculative.

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**5,499,353**

**CACHE ADDRESS STROBE CONTROL LOGIC FOR STIMULATED BUS CYCLE INITIATION**

**Ken A. Kadlec, and Wendy P. Kadlec, both of Irvine, Calif., assignors to AST Research, Inc., Irvine, Calif.**

**Continuation of Ser. No. 39,891, Mar. 30, 1993, abandoned. This application Jun. 20, 1995, Ser. No. 492,870**

**Int. Cl.[6] G06F** *12/02*

**U.S. Cl. 395—445** **7 Claims**

1. An improved cache control logic system for a computer system, said computer system including a central processor which generates a plurality of address signals and activates an address valid signal when it begins a memory access cycle, said computer system further including a cache storage area and a system bus, said system bus interconnecting the central processor and the cache storage area, said cache storage area receiving said address signals and latching said address signals to begin an access cycle when said address valid signal is active, said cache control logic system comprising:

cache control signal generation logic which generates an alternate cache control signal which is provided as a control input to said cache storage area instead of said address valid signal, said alternate cache control logic signal being set at an active level before the central processor activates the address valid signal to enable the cache storage area to receive said plurality of address signals from said system bus, and said alternate cache control signal being set at an inactive level to latch said address signals in said cache storage area to cause said cache storage area to hold said latched address signals present when said alternate cache control signal changes from said active level to said inactive level so that said latched address signals remain unchanged within said cache storage area while said alternate cache control signal is at said inactive level, said cache control signal generation logic receiving said address valid signal from said central processor when said central processor is ready to begin a memory access cycle on said bus and setting said alternate cache control signal at said inactive level after the beginning of said memory access cycle, said cache control signal generation logic determining when said memory access cycle has ended and setting said alternate cache control signal at said active level to enable said cache storage area to receive address signals on said system bus.

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**5,499,354**

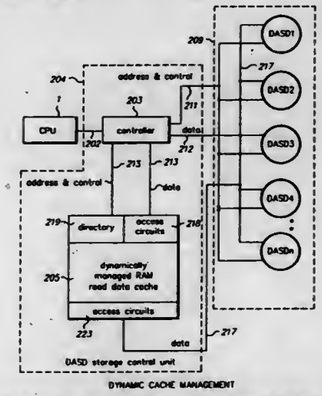
**METHOD AND MEANS FOR DYNAMIC CACHE MANAGEMENT BY VARIABLE SPACE AND TIME BINDING AND REBINDING OF CACHE EXTENTS TO DASD CYLINDERS**

**John G. Aschoff, Watsonville, Calif.; Jeffrey A. Berger, San Jose, Calif.; David A. Burton, Tucson, Ariz.; Bruce McNutt, Gilroy, and Stanley C. Kurtz, Watsonville, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed May 19, 1993, Ser. No. 64,295**

**Int. Cl.[6] G06F** *12/02*

**U.S. Cl. 395—456** **6 Claims**




1. In a system comprising a partitionable read data cache interposed in a data path between a processor and at least one direct access storage device (DASD), and means for storing records at

cylindrically addressable DASD locations, a logic means responsive to a chain of commands from said processor for staging records either from the DASD or from the cache to the processor, said system further comprising:

(a) means for allocating read data cache partitions to counterpart space among bands of DASD cylinders;

(b) means for measuring a running average hit ratio for each cache partition and means for measuring intervals defined by a number of cache accesses; and

(c) means responsive to the running average hit ratio for any partition falling below a predetermined threshold for disabling the caching of the counterpart band for a defined interval as measured by a number of cache accesses and for then rebinding the disabled band to another cache partition after a predetermined number of I/Os have occurred.

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5,499,355

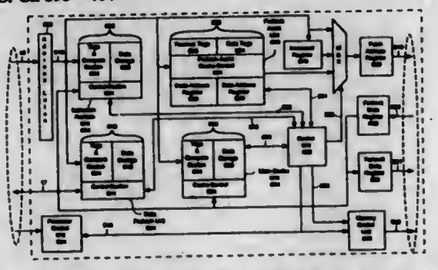
**PREFETCHING INTO A CACHE TO MINIMIZE MAIN MEMORY ACCESS TIME AND CACHE SIZE IN A COMPUTER SYSTEM**

Karunasadakala Krishnamohan, San Jose; Paul M. Farnwald, Portola Valley, and Frederick A. Ware, Los Altos, all of Calif., assignors to Rambus, Inc., Mountain View, Calif.

Continuation of Ser. No. 847,308, Mar. 6, 1992, abandoned. This application Nov. 15, 1994, Ser. No. 339,920

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—464 21 Claims



18. A memory access method in a cache subsystem coupled to a process and a main memory in a computer system, comprising the steps of:

(A) receiving an address for a memory fetch from the processor;

(B) determining if the address is an unpredictable address by determining if the address is contained in the cache subsystem, wherein the address is an unpredictable address if the cache subsystem does not contain the address;

(C) if the address is an unpredictable address, then fetching a first data from the main memory into a main cache of the cache subsystem in accordance with the unpredictable address, wherein the main cache only stores data fetched by unpredictable addresses;

(D) generating a predicted address for a next memory fetch by the processor based upon the unpredictable address and prefetching a second data from the main memory from the predicted address and then storing the second data in a prefetch buffer, wherein the main cache is not coupled to the prefetch buffer and does not receive data from the prefetch buffer.

5,499,356

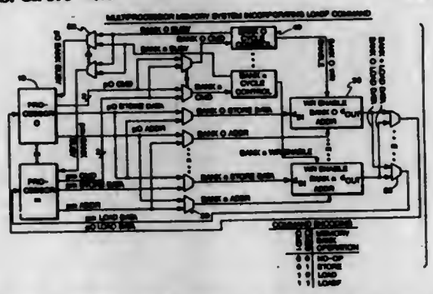
**METHOD AND APPARATUS FOR A MULTIPROCESSOR RESOURCE LOCKOUT INSTRUCTION**

Roger E. Eckert, Eau Claire; Richard E. Hessel, Altoona; Andrew E. Phelps, Eau Claire; George A. Spix, Eau Claire, and Jimmie R. Wilson, Eau Claire, all of Wis., assignors to Cray Research, Inc., Chippewa Falls, Wis.

Continuation of Ser. No. 920,155, Jul. 23, 1992, abandoned, which is a continuation of Ser. No. 536,217, Jun. 11, 1990, abandoned, which is a continuation-in-part of Ser. No. 459,083, Dec. 29, 1989, Pat. No. 5,197,130. This application Dec. 28, 1993, Ser. No. 173,923

Int. Cl.[6] G06F *12/14*

U.S. Cl. 395—479 7 Claims



1. In a computer system a method of protecting data accessed by more than one requestor the method comprising the steps of:

(a) defining a set of data values and a set of lock values, wherein the sets of data values and lock values are mutually exclusive;

(b) reading a protected memory location, wherein the step of reading the protected memory location comprises atomically swapping a lock value selected from the set of lock values with information at the protected memory location;

(c) determining whether the information read from the protected memory location is within the set of data values; and

(d) if the information read from the protected memory location is within the set of data values, then operating on the information to form a result, else repeating steps (b)–(d).

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5,499,357

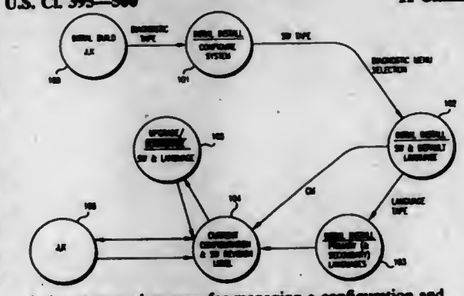
**PROCESS FOR CONFIGURATION MANAGEMENT**

Atashi C. Sonty, Pittsford; Jose A. Faria; Alan W. Willett, both of Rochester; Kim P. Ciulla, Honeoye Falls; Christopher Comparetta, Pittsford, and Jack T. Latone, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 68,336, May 28, 1993, abandoned. This application Aug. 19, 1994, Ser. No. 293,258

Int. Cl.[6] G06F *7/20*

U.S. Cl. 395—500 11 Claims



1. An automated process for managing a configuration and



ensuring compatibility of components in a computing system, comprising the steps of:

identifying components of the system;

identifying an initial configuration of the components, comprising the steps of:

identifying at least two compatibility relationships, each compatibility relationship identified between at least two components and indicating at least one of an interfacing capability and a functional operability between the at least two components in the computing system, and

identifying at least one compatibility inter-relationship, each compatibility inter-relationship identified between at least two of said compatibility relationships, or between one of said compatibility relationships and at least one of said components, the compatibility inter-relationships defining at least one of an interfacing capability and a functional operability between at least three components in the computing system;

sampling a current configuration of said components after at least one of the components is changed, the current configuration sampled in a manner similar to that of identifying an initial configuration;

comparing said current configuration to said initial configuration to obtain a validity result;

indicating one of a compatibility state and an incompatibility state based on said validity result; and

taking corrective action when said indicating step indicates said incompatibility state and recording as said initial configuration said current configuration when said indicating step indicates said compatibility state.

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5,499,358

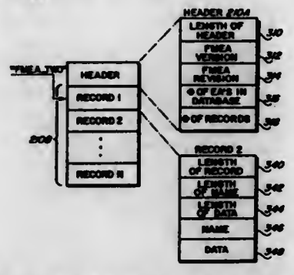
**METHOD FOR STORING A DATABASE IN EXTENDED ATTRIBUTES OF A FILE SYSTEM**

Carlos A. Nevarez, Orem, Utah 84057, assignor to Novell, Inc., Orem, Utah

Filed Dec. 10, 1993, Ser. No. 165,971

Int. Cl.[6] G06F *17/30*

U.S. Cl. 395—600 14 Claims



1. A method for storing a database in extended attributes of a directory entry within a file system comprising the steps of:

associating a plurality of extended attributes with a directory entry of a file system, each of said plurality of extended attributes comprising a first field indicating the number of said plurality of extended attributes associated with said directory entry; and

storing an arbitrary number of records of arbitrary content in each of said plurality of extended attributes associated with said directory entry.

5,499,359

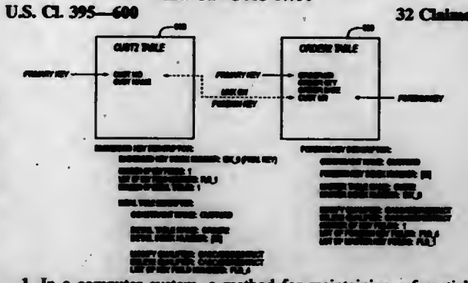
**METHODS FOR IMPROVED REFERENTIAL INTEGRITY IN A RELATIONAL DATABASE MANAGEMENT SYSTEM**

Narayanan Vijaykumar, Santa Cruz, Calif., assignor to Borland International, Inc., Scotts Valley, Calif.

Filed Jan. 18, 1994, Ser. No. 183,619

Int. Cl.[6] G06F *17/30*

U.S. Cl. 395—600 32 Claims



1. In a computer system, a method for maintaining referential integrity among a plurality of data tables stored in a relational database system, the method comprising:

(a) receiving from a user a request specifying a desired referential integrity link between two data tables, said request designating a master table having at least one field whose values are to serve as a reference, said at least one field serving as a primary key for said master table, and said request designating a detail table having at least one field whose values are required to match reference values in the master table, said at least one field of the detail table serving as a foreign key linking said detail table to the primary key of said master table;

(b) associating with said detail table a foreign key descriptor, said foreign key descriptor storing information specifying which index of the detail table supports said foreign key, which table is said master table for the referential integrity link, and which fields of the detail table contribute to said foreign key, said foreign key descriptor being stored together with said detail table so that a transfer of said detail table to a remote location includes transfer of said foreign key descriptor;

(c) associating with said master table an embedded key descriptor, said embedded key descriptor storing information specifying which fields of said master table contribute to said primary key and further specifying said detail table for the referential integrity link, said embedded key descriptor being stored together with said master table so that a transfer of said master table to a remote location includes transfer of said embedded key descriptor; and

(d) storing with said embedded key descriptor a detail table descriptor, said detail table descriptor storing information specifying said detail table, which index supports said foreign key, and which at least one field of said detail table contributes to said foreign key.

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5,499,360

**METHOD FOR PROXIMITY SEARCHING WITH RANGE TESTING AND RANGE ADJUSTMENT**

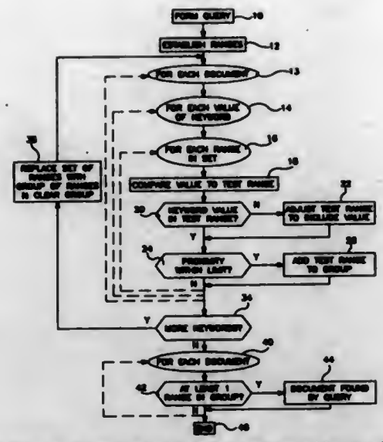
Daniel Barbara, Princeton, N.J.; Stephen Johnson, Erdenheim, Pa.; Sharad Mehrotra, Plainsboro, and Walid Aref, Monmouth Junction, both of N.J., assignors to Panasonic Technolgies, Inc., Princeton, N.J.

Filed Feb. 28, 1994, Ser. No. 203,329

Int. Cl.[6] G06F *17/30*

U.S. Cl. 395—600 16 Claims

1. A method of searching for keywords in a database having a plurality of documents, each including a subset of a plurality of keywords and, for each keyword in the subset, a number of values stored in a storage medium, each value indicating a location of the keyword within the document, the method comprising the steps of:



(a) forming a query specifying first and second keywords and a maximum distance defining a relative range of keyword locations that satisfy the query;

(b) establishing a plurality of ranges, comprising a set of ranges and a group of ranges for each respective document in which the first keyword appears at least once, each set of ranges including a range for each respective location of the first keyword, each range being defined by respective minimum and maximum location values;

(c) repeating, for each respective value of the second keyword in each respective document for which a set of ranges is established, the step of:

(1) repeating, for each one of the set of ranges corresponding to the respective document, the steps of:

(i) establishing a test range having minimum and maximum test values equal to the respective minimum and maximum values of the one range,

(ii) adjusting the test range, so that the respective value is included in the test range, if the respective value is not between the minimum and maximum test values, and

(iii) adding the test range to the group of ranges corresponding to the respective document if the minimum and maximum test values do not differ from one another by more than the maximum distance after step (ii); and

(d) identifying each document for which the respective group of ranges includes at least one range as being found by the searching.

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**5,499,361**

**DENSITY PROCESSING METHOD**

**Masaya Fujimoto; Haruo Yamamoto; Shuji Hayashi, and Tetsuya Kagawa, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Japan**

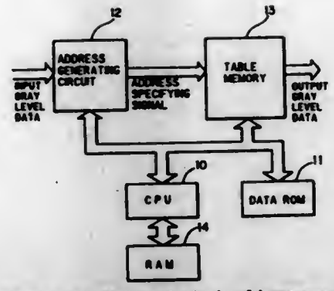
**Filed Mar. 9, 1993, Ser. No. 28,172**

**Claims priority, application Japan, Mar. 12, 1992, 4-089854; Mar. 12, 1992, 4-089855; Mar. 12, 1992, 4-089856**

**Int. Cl.[6] G06K *15/00***

**U.S. Cl. 395—109** **18 Claims**

1. In a density processing method in which input gray level-output gray level data representing an output gray level relative to an input gray level are previously generated and stored in a first storing means, the input gray level-output gray level data are transferred to a second storing means, and an address in the second storing means is specified on the basis of input gray level data inputted so that output gray level data stored in the specified address in the second storing means is outputted, wherein access addresses to the second storing means are converted by adding or subtracting a value corresponding to a designated copy density, thereby to convert input gray level-output gray level characteristics into characteristics corresponding to the designated copy density.



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**5,499,362**

**IMAGE PROCESSING APPARATUS**

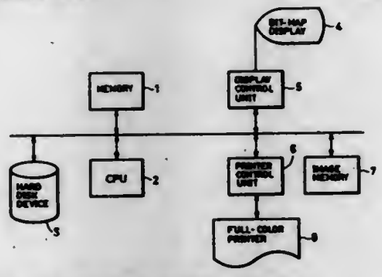
**Tomoaki Kawai; Hiroyuki Yamamoto, and Hiroshi Okazaki, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 826,866, Jan. 28, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 473,971**

**Claims priority, application Japan, Feb. 1, 1991, 3-011968; Jan. 10, 1992, 4-003003**

**Int. Cl.[6] G06K *15/00***

**U.S. Cl. 395—109** **6 Claims**



1. An image processing apparatus, comprising:

storage means for storing image data;

display means for displaying the image data;

judging means for judging whether the image data stored in said storage means is first image data having a first gradation higher than a gradation with which said display means is capable of displaying or second image data having a second gradation lower than the gradation with which said display means is capable of displaying; and

display control means for compressing the gradation of the image data and displaying the compressed image data when the image data are judged to be the first image data by said judgement means, and displaying the image data when said image data are judged to be the second image data by said judgment means.



**5,499,363**

**MICROPROCESSOR COUPLED TO COPROCESSOR BY COPROCESSOR BUS SEPARATE FROM SYSTEM BUS TO EXTERNAL MEMORY FOR INCREASED EFFICIENCY**

**Hiroaki Kaneko, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

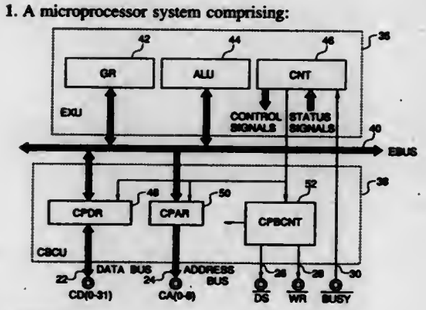
**Continuation of Ser. No. 215,663, Mar. 22, 1994, abandoned, which is a continuation of Ser. No. 83,870, Jun. 30, 1993, abandoned, which is a continuation of Ser. No. 474,262, Feb. 5, 1990, abandoned. This application Mar. 3, 1995, Ser. No. 400,390**

**Claims priority, application Japan, Feb. 3, 1989, 1-24858**

**Int. Cl.[6] G06F *13/00***

**U.S. Cl. 395—280** **2 Claims**

1. A microprocessor system comprising:



a memory;

a coprocessor;

a system bus;

a coprocessor bus independent of said system bus; and

a microprocessor including

a first set of terminals Coupled to said system bus, for transferring at least address information and data for said memory:

a second set of terminals independent of said first set of terminals coupled to said coprocessor bus, said coprocessor bus transferring at least address information and data between said coprocessor and said second set of terminals;

a first bus cycle control unit, coupled via said first set of terminals to said memory through said system bus, for data transfer between said microprocessor and said memory; and

a second bus cycle control unit, independent of said first bus cycle control unit and coupled via said second set of terminals to said coprocessor through said coprocessor bus, for data transfer between said microprocessor and said coprocessor,

wherein, when an operation is to be executed by said coprocessor,

said first bus cycle control unit fetches, from said memory through said system bus, data required for said operation to be executed by said coprocessor,

fetched data is transferred through said second bus cycle control unit to said coprocessor under control of said second bus cycle control unit, and

after said operation has been executed by said coprocessor, a result of said operation is transferred from said coprocessor to said second bus cycle control unit and then returned through said first bus cycle control unit to said memory.

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**5,499,364**

**SYSTEM AND METHOD FOR OPTIMIZING MESSAGE FLOWS BETWEEN AGENTS IN DISTRIBUTED COMPUTATIONS**

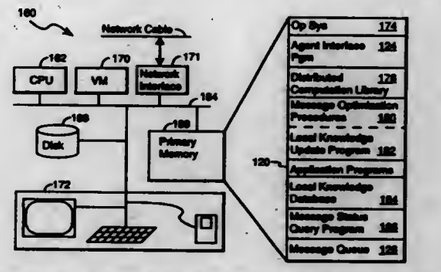
**Johannes Klein, San Francisco, and Francis R. Upton, IV, Saratoga, both of Calif., assignors to Digital Equipment Corporation, Maynard, Mass.**

**Filed Oct. 14, 1993, Ser. No. 138,451**

**Int. Cl.[6] G06F *15/163;17/10***

**U.S. Cl. 395—200.03** **16 Claims**

1. In a computer system, a method of performing distributed



computations, the steps of the method performed by said computer system comprising:

providing cooperating agents to perform each distributed computation, each agent having an associated set of events representing state transitions among a predefined set of states, each said event having a truth value that said agent changes while performing said distributed computation, each agent further having means for sending event value notifications to other ones of said agents when said agent changes said truth value of any said event;

storing in a computer memory associated with each agent a local knowledge database, said local knowledge database including data representing conditions for changing the truth value of local events, comprising events in said each agent and data representing conditions for changing the truth value of external events, comprising events in other ones of said agents, each of said conditions being represented in said local knowledge database as a boolean expression of the truth values of specified ones of said events in specified ones of said agents; said local knowledge database further storing data representing truth values for said local and external events known to said each agent; wherein said data representing said known truth values for at least a plurality of said local and external events is initialized to represent that said truth values are Undefined;

performing each distributed computation with said agents provided for that distributed computation, including:

whenever any one of said agents changes the truth value of any one of said local events, said one agent identifying from said conditions represented in said one agent's associated local knowledge database (A) those of said external events whose condition depends on said one local event, (B) for each identified external event, other ones of said local events, if any, upon which said external events' conditions depend, and (C) the truth values of said other local events;

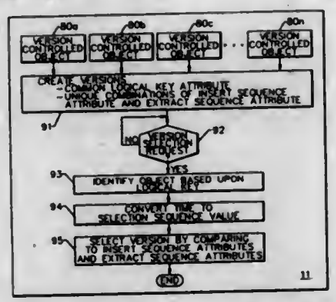
evaluating said condition for each said identified external event to generate a truth value for said evaluated condition; and

sending notifications of said one local event and said other local events from said one agent to said agent associated with each said identified external event only when the evaluated condition associated with each said identified external event has a truth value other than an Undefined truth value.

## 5,499,365
## SYSTEM AND METHOD FOR CONTROLLING VERSIONS OF OBJECTS IN AN OBJECT ORIENTED COMPUTING ENVIRONMENT

James B. Anderson; Francis L. Fitzpatrick, both of Austin, Tex.; William M. Haas, New City, N.Y.; Charles B. Harvey, Jr., Golden, Colo.; Herman Mitchell, Lithonia, Ga., and James R. Wason, Tuxedo, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 4, 1993, Ser. No. 101,618
Int. Cl.[6] G06F 17/30;17/50
U.S. Cl. 395—600 28 Claims




1. A system for controlling versions of selected objects in an object oriented computing system on a computing platform, each object including an object frame containing data attributes and at least one object method for performing actions on the associated object, said version controlling system comprising:

means for creating a plurality of versions of a selected object, the data frame of each of said plurality of versions including a common logical key attribute, the data frame of each of said plurality of versions including a unique combination of an insert sequence attribute and an extract sequence attribute;

means, responsive to a selection request, for identifying said plurality of versions of said selected object based upon the common logical key attribute associated therewith;

means, responsive to said selection request and to a version identifier, for converting said version identifier into a selection sequence value; and

means, responsive to said selection sequence value, for selecting at least one of said plurality of versions of said selected object by comparing said selection sequence value to at least one of said insert sequence attributes and said extract sequence attributes.

## 5,499,366
## SYSTEM AND METHODS FOR GENERATION OF DESIGN IMAGES BASED ON USER DESIGN INPUTS

Daniel Rosenberg, San Jose, and Anne Way, Livermore, both of Calif., assignors to Borland International, Inc., Scotts Valley, Calif.

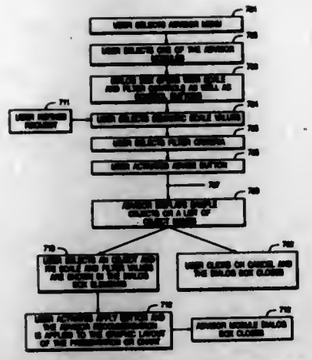
Continuation of Ser. No. 746,733, Aug. 15, 1991. This application Aug. 15, 1994, Ser. No. 290,403
Int. Cl.[6] G06F 17/30
U.S. Cl. 395—600 24 Claims

1. A method of identifying a solution based on user selected parameters comprising the steps of:

generating a solution database, said solution database comprising a plurality of solutions, each of said solutions having associated scale values and rejection constraint filter criteria; said solution database stored in a memory;

receiving input specifying user rejection constraints, said user rejection constraints specifying user preference for parameters which are expressed to the user quantitatively;

receiving input specifying user scale values, said user scale values specifying user preference for parameters which are expressed to the user qualitatively;



comparing, in a processing means, said user rejection constraints to said rejection constraints;

generating a first reduced solution database by eliminating those solutions having rejection constraints that do not match said user rejection constraints;

comparing, in said processing means, said user scale values with said solution database scale values in said first reduced solution database;

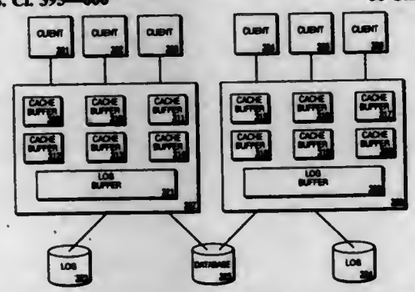
generating a second reduced solution database by eliminating those solutions having scale values outside of a predetermined range of said user selected scale values; and

determining a closeness of fit of each of said solutions of said second reduced database by comparing a matrix comprised of said scale values of said solutions to a vector comprised of said user scale values.

## 5,499,367
## SYSTEM FOR DATABASE INTEGRITY WITH MULTIPLE LOGS ASSIGNED TO CLIENT SUBSETS

Roger J. Bamford, Woodside; Forrest W. Howard, Berkeley; Dirk A. Kabcenell, Portola Valley, and Robert N. Miner, San Francisco, all of Calif., assignors to Oracle Corporation, Redwood Shores, Calif.

Continuation of Ser. No. 792,787, Nov. 15, 1991, abandoned. This application Oct. 27, 1994, Ser. No. 330,100
Int. Cl.[6] G06F 17/30
U.S. Cl. 395—600 66 Claims




1. A method of distributing log entries of transactions initiated by a plurality of clients commonly accessing at least one database, said method comprising the steps of:

dividing said plurality of clients into a plurality of subsets of clients, each of said plurality of clients commonly accessing said at least one database, each of said plurality of clients initiating transactions with said at least one database, each of said subsets including at least one of said plurality of clients;

providing in a first memory means a different transaction log buffer associated with each one of said plurality of subsets of clients; and

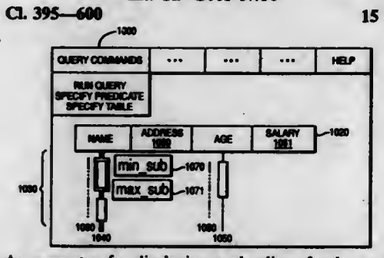


for each transaction of one of said plurality of clients, storing a transaction log entry in said different transaction log buffer associated with the subset of clients that includes the client that initiated said transaction.

## 5,499,368
## SCALED DEPICTION OF INFORMATION FROM A DATABASE

Bruce A. Tate, and Shih-Gong Li, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 837,121, Feb. 19, 1992, abandoned. This application Dec. 1, 1994, Ser. No. 348,003
Int. Cl.[6] G06F 17/30
U.S. Cl. 395—600 15 Claims




1. An apparatus for displaying a plurality of columns from a database as a plurality of numberlines, said numberlines used to generate a database query, comprising:

a processor;

use controls;

in response to said user controls, means for controlling said processor to retrieve a plurality of columns from said database;

a display for displaying a range of values of each of said retrieved columns, each of said ranges being displayed as one of said numberlines;

in response to said user controls, means for controlling said processor to create at least one subrange of values on each of said numberlines; and

means for controlling said processor to build a database query from said subranges.

## 5,499,369
## METHOD AND SYSTEM FOR CONNECTING OBJECTS USING ALERT AND RUNNING STATES

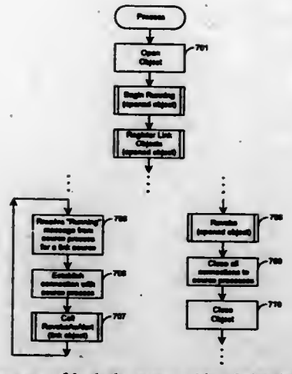
Robert G. Atkinson, Woodinville, Wash., assignor to Microsoft Corporation, Redmond, Wash.

Continuation of Ser. No. 974,959, Nov. 9, 1992, abandoned. This application Sep. 30, 1994, Ser. No. 316,058
Int. Cl.[6] G06F 9/06
U.S. Cl. 395—650 14 Claims

1. A method executed in a computer system for establishing a connection between a source object and a link object, the link object having a reference to the source object, the link object being contained within a consumer object, the source object having a source process for managing the source object, the consumer object having a consumer process for managing the consumer object, the method comprising the steps of:

executing the source process and putting the source object in a running state, the running state indicating that the source object can be connected to the link object when the link object is in an alert state;

executing the consumer process, putting the consumer object in the running state, and putting the link object in the aim state, the alert state indicating that the link object is to be connected to the source object when the source object is in the running state; and

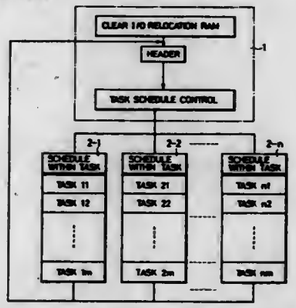



upon occurrence of both the source object being in the running state and the link object being in the alert state, automatically connecting the link object to the source object by sending to the source process a reference to the link object that is in the alert state, wherein the source process notifies the link object of changes to the source object the reference to the link object.

## 5,499,370
## IMAGE FORMING SYSTEM WITH TASK SCHEDULING AND EXECUTING BACK ON PROGRAM AND CONTROL PORIORITY STATUS OF MALFUNCTION PERFORMANCE AND EXECUTION

Masao Hosaka, Sagamihara; Yoshimasa Kimura, Kawasaki, and Hisashi Sakamaki, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 29,297, Mar. 8, 1993, abandoned, which is a continuation of Ser. No. 391,719, Aug. 7, 1989, abandoned, which is a continuation of Ser. No. 615,106, May 29, 1984, abandoned. This application Apr. 28, 1995, Ser. No. 430,603
Claims priority, application Japan, May 31, 1983, 58-97273; May 31, 1983, 58-97274
Int. Cl.[6] G06F 9/46
U.S. Cl. 395—650 4 Claims




1. A data processing system which performs a plurality of processes sequentially, said data processing system comprising:

program memory means for storing therein a plurality of task programs which correspond to respective tasks;

execution means for executing one of the tasks based on a corresponding one of the plurality of task programs stored in said program memory means, wherein each of the plurality of processes is performed by executing several of the tasks and some of the tasks are executed commonly in different processes;

flag storage means for storing first flags each corresponding to respective malfunctions of said data processing system and respective user's operations, second flags each corresponding to respective statuses of performance of the plurality of processes and groups of third flags each of the groups corresponding to respective processes and each of a third flag corresponding to respective statuses of execution of tasks in the plurality of processes;

flag management means for setting flags in response to an occurrence of respective malfunctions and respective user's operations and at a start of respective tasks, and resetting each of the flags in response to an end of execution of respective tasks;

first check means for checking the first flags and the second flags in a predetermined order until a set flag is located in response to an end of execution of each task;

first scheduling means for selecting one of the plurality of processes to be performed next in accordance with a set first flag if one of the first flags is found to be set by said first check means or in accordance with a set second flag if one of the second flags is found to be set by said first check means;

second check means for checking the third flags of a group corresponding to a process selected by said first scheduling means in a predetermined order until a set flag is located in response to the end of the execution of each task;

second scheduling means for selecting a task to be executed next among tasks corresponding to the process selected by said first scheduling means in accordance with a third flag found to be set by said second check means; and

control means for controlling said execution means to execute a task selected by said second scheduling means.

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**5,499,371**

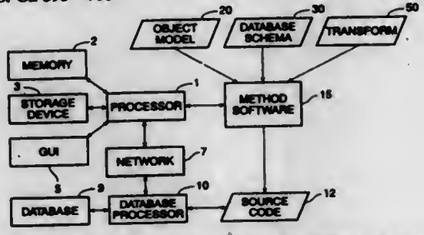
## METHOD AND APPARATUS FOR AUTOMATIC GENERATION OF OBJECT ORIENTED CODE FOR MAPPING RELATIONAL DATA TO OBJECTS

**Derek P. Henninger, Cupertino; Richard H. Jensen, Redwood City, and Christopher T. Keene, San Francisco, all of Calif., assignors to Persistence Software, Inc., San Mateo, Calif.**

**Continuation of Ser. No. 95,322, Jul. 21, 1993, abandoned. This application Mar. 22, 1995, Ser. No. 409,476**

**Int. Cl.[6] G06F 9/44;15/40**

**U.S. Cl. 395—700** **30 Claims**




1. A method for automatically mapping information of an object said information comprising the object attributes, relationships, and inheritances between an object-oriented application and a structured database, said method being carried out using a digital computing system comprising a processor, said method comprising the steps of:

executing instructions on said processor to load into temporary storage an object model, said object model comprising a plurality of semantic elements, said semantic elements being less complex than object class source code definitions, representing a plurality of object classes and a plurality of relationships between said plurality of object classes within said object-oriented application, each of said plurality of semantic elements comprising relationships between object classes, inheritances between object classes, and attributes of an object class comprising at least one object ID attribute;

executing instructions on said processor to automatically generate code by parsing said object model to identify the object classes and their relationships for which said code is generated and automatically generating class definitions and methods, said code being suitable for conversion to an executable form that when executed automatically maps said information between said object-oriented application and said structured database; and

executing instructions on said processor to output to persistent storage said code.

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**5,499,372**

## METHOD OF CONTROLLING ACCESS TO RESTRICTED ACCESS DATA AND COMMUNICATION SYSTEM THEREFOR

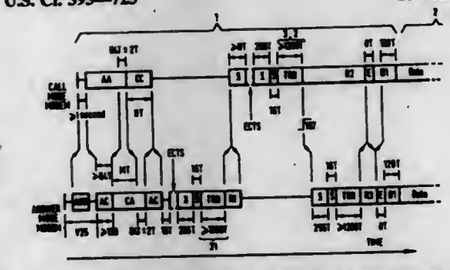
**John R. S. MacKenzie, and Bernard P. Collins, both of Surrey, Great Britain, assignors to Avant Guardian Limited, Surrey, United Kingdom**

**Continuation of Ser. No. 842,167, Jun. 3, 1992, abandoned. This application Feb. 28, 1994, Ser. No. 202,908**

**Claims priority, application United Kingdom, Jan. 5, 1989, 8922473**

**Int. Cl.[6] G06F 15/00; H04L 9/00**

**U.S. Cl. 395—725** **16 Claims**



1. A method of enabling a first apparatus to determine whether or not a second apparatus should be permitted access to restricted access data, said method comprising the steps of:

the first and second apparatuses performing joint negotiations to ensure technical compatibility for subsequent data transmission between themselves, the negotiations being in accordance with an industry, standard protocol;

the first apparatus monitoring the negotiations to detect whether, within the negotiations, there is a first indication which originates from the second apparatus and is not specified by the protocol, and which the first apparatus recognizes as indicating that the second apparatus is entitled to access to the restricted access data; and

the first apparatus responding if it detects the first indication, whereby the response of the first apparatus may be used to permit the second apparatus to gain access to the restricted access data when data transmission starts after the negotiations have been completed.



**5,499,373**

## APPARATUS AND METHODS FOR DESIGNING, ANALYZING OR SIMULATING SIGNAL PROCESSING FUNCTIONS

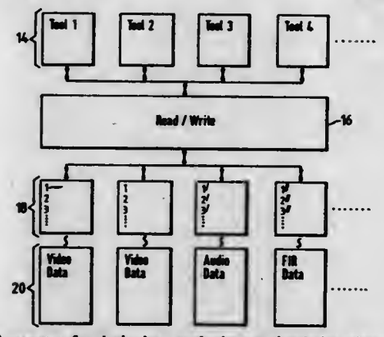
**John W. Richards, Stockbridge; Jonathan J. Stone, Reading; Alan Turner, Basingstoke; Carl W. Walters, Reading; Mukesh Chouhan, Basingstoke, and Peter Kavanagh, Guildford, all of, United Kingdom, assignors to Sony Corporation, Tokyo, Japan, and Sony United Kingdom Limited, Middlesex, England**

**Continuation of Ser. No. 984,522, Dec. 2, 1992, abandoned. This application Nov. 9, 1994, Ser. No. 337,150**

**Claims priority, application United Kingdom, Dec. 10, 1991, 9126208**

**Int. Cl.[6] G06F 15/00**

**U.S. Cl. 395—154** **19 Claims**




1. Apparatus for designing, analyzing or simulating signal processing operations, said apparatus comprising:

application data file storage means for storing at least one application data file containing application data available to be processed;

header file storage means for storing at least one header file, each corresponding to a respective one of said application data files and each containing a plurality of attributes associated with said application data of said corresponding application data file;

application data file selection means for selecting at least one of said application data files to be read in its entirety for a signal processing operation;

signal processing operation selection means for selecting one of a plurality of different signal processing operations to be performed using the application data read in its entirety from said selected application data file; and

signal processing means for performing said selected signal processing operation using the application data read in its entirety from said selected application data file and for selecting a set of attributes from the plurality of attributes read in its entirety from the header file corresponding to said selected application data file, said selected set of attributes being only those necessary to perform said selected signal processing operation, said selected set of attributes being smaller than said plurality of attributes.

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**5,499,374**

## EVENT DRIVEN COMMUNICATION NETWORK

**Peter C. Di Giulio, Fairfield; David K. Lee, Monroe; David W. Riley, Easton, and Frederick W. Ryan, Jr., New Haven, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.**

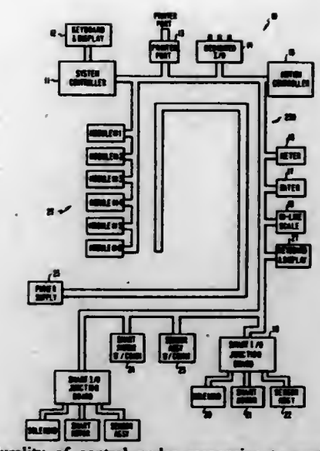
**Continuation of Ser. No. 847,505, Mar. 6, 1992, abandoned. This application Nov. 22, 1993, Ser. No. 155,496**

**Int. Cl.[6] G06F 13/36**

**U.S. Cl. 395—728** **20 Claims**

1. A communication network comprising:

a) a bus



b) a plurality of control nodes responsive to predetermined events to transmit messages on said bus, wherein a possibility of contention among said nodes exists;

c) a central node for transmitting an access control signal on said bus, said access control signal being followed by a contention avoiding time period, said time period being shorter than the duration of at least some of said messages and said time period comprising a plurality of successive time slots; wherein,

d) at least one of said control nodes is responsive to said access control signal to select a predetermined one of said time slots to begin transmitting one of said messages on said bus if and only if a one of said events to which said control node is responsive has occurred and no other of said nodes has begun transmitting in an earlier said time slots.

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**5,499,375**

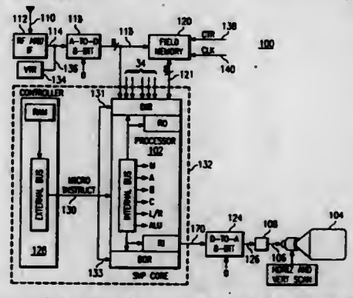
## FEEDBACK REGISTER CONFIGURATION FOR A SYNCHRONOUS VECTOR PROCESSOR EMPLOYING DELAYED AND NON-DELAYED ALGORITHMS

**Hiroshi Miyaguchi, Tokyo, Japan, assignor to Texas Instruments Incorporated, Dallas, Tex.**

**Continuation-in-part of Ser. No. 72,605, Jun. 3, 1993, abandoned. This application Aug. 9, 1993, Ser. No. 105,198**

**Int. Cl.[6] G06F 15/00;15/64;15/76**

**U.S. Cl. 395—800** **7 Claims**




1. A processing system for receiving input data as parallel data words which are received at periodic time intervals, processing the received input data at said periodic time intervals in processing cycles and outputting processed data for each processing cycle, comprising:

a data input register for receiving and storing the input parallel data words in a serial manner;

a plurality of processor elements for receiving stored data from said data input register, each for processing one of said parallel data words and outputting said processed data during a given processing cycle in accordance with at least two predetermined processing algorithms, which predetermined processing algorithms have associated therewith variables that are utilized by each of said processor elements during processing, said predetermined algorithms comprising a delayed algorithm and a non-delayed algorithm;

a data output register for receiving said processed data from said plurality of processor elements and storing said processed data, and subsequently outputting said processed data therefrom;

an auxiliary register for storing select portions of said processed data received by said data output register;

a feedback circuit for selectively inputting the contents of said auxiliary register to said plurality of processing elements as one of said variables; and

a controller for controlling the operation of said processing elements to process said received data to calculate a predetermined variable in one of said processing cycles utilizing data received from said data input register and transferring said calculated predetermined variable to said data output register and to said auxiliary register, and, during a processing cycle subsequent to a current processing cycle, utilizing said calculated predetermined variables stored in said auxiliary register for processing of data by said processing elements, said delayed algorithm utilizing said calculated predetermined variable stored in said auxiliary register, said controller comprising:

a current controller for processing data received in said one processing cycle by said non-delayed algorithm to calculate said variable for storage in said auxiliary register;

a delay device for storing data received in said one processing cycle for use in a cycle subsequent to said one processing cycle that occurs n processing cycles later;

a delay controller for processing said delayed data delayed by said delay device in said one processing cycle by said delayed algorithm and utilizing said calculated predetermined variable calculated during a processing cycle that occurred by n previous processing cycles; and

said variable calculated in said one processing cycle utilized in said processing cycle subsequent to said one processing cycle by said delay controller.

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**5,499,376**

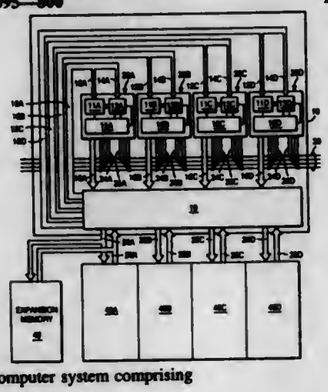
**HIGH SPEED MASK AND LOGICAL COMBINATION OPERATIONS FOR PARALLEL PROCESSOR UNITS**

**Edward C. King, Pleasanton, and Alan G. Smith, Dublin, both of Calif., assignors to CPU Technology, Inc., Fremont, Calif.**

**Filed Dec. 6, 1993, Ser. No. 163,460**

**Int. Cl.[6] G06F *13/00;15/16***

**U.S. Cl. 395—800** **10 Claims**



1. A computer system comprising

a plurality of processor units, said processor units connected in parallel to a memory for parallel processing, each processor unit having:

an instruction unit;

a plurality of registers, each register holding a plurality of N bits, i=0 to N−1; and

an execution unit connected to each of said plurality of registers, said execution unit, in a selected processor unit masking a plurality of bits in a selected register responsive to control signals from an instruction unit in said selected processor unit by logically ANDing an ith bit of said selected register with an ith bit of a second selected register in each selected processor unit for a resulting ith masked bit;

and said computer system further comprising

combining means, connected to said execution unit to said plurality of registers in each of said processor units, for logically combining a plurality of masked bits of said selected register in each said selected processor unit into a plurality of output bits by logically ORing said ith masked bit from each said selected processor unit for an ith parallel output bit and transmitting said plurality of output bits to each said selected register in each said selected processor unit in a single computer operation.

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**5,499,377**

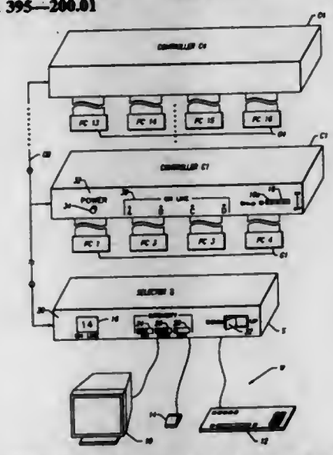
**MULTI-COMPUTER ACCESS SWITCHING SYSTEM**

**Won S. Lee, Laguna Hills, Calif., assignor to Designed Enclosures, Inc., Escondido, Calif.**

**Filed May 3, 1993, Ser. No. 57,007**

**Int. Cl.[6] G06F *13/00***

**U.S. Cl. 395—200.01** **7 Claims**



1. A multi-computer access switching system for accessing a plurality of computers from a single work center, said work center including input/out devices, said plurality of computers located at distinct physical locations substantially remote from said work center, said system comprising:

a selector unit, including a designator to provide computer identification signals for selective communication between said work center and a selected one of said plurality of computers, said selector unit located at or near said work center and connected to said input/out devices of said work center;

at least one controller unit, including switch elements for selectively connecting said selected one of said computers to said work center as indicated by said computer identification signals and located proximate said plurality of computers and connected to said computers; and



a cable bus coupling said selector unit to said at least one controller unit to enable said work center to be selectively connected to one of said plurality of computers through said switch elements in accordance with said computer identification signals and to enable said selective communication between said work center and said selected computer through said same cable bus; wherein said designator in said selector unit includes a counter and a counter switch for actuating said counter to selectively identify said computers and provide said computer identification signals representative thereof and wherein said cable bus includes a plurality of signal paths to carry said computer identification signals.

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**5,499,378**

**SMALL COMPUTER SYSTEM EMULATOR FOR NON-LOCAL SCSI DEVICES**

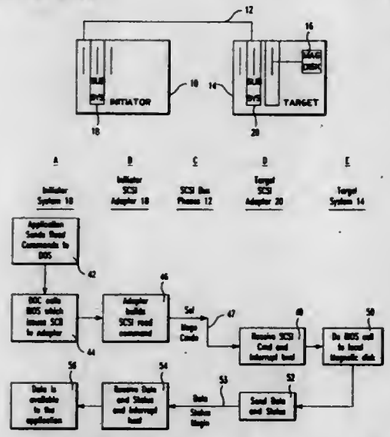
**Andrew B. McNeill, Jr., Deerfield Beach, and Edward I. Wachtel, Boca Raton, both of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Continuation of Ser. No. 812,197, Dec. 20, 1991, abandoned.**

**This application Jun. 21, 1994, Ser. No. 263,168**

**Int. Cl.[6] G06F *15/16***

**U.S. Cl. 395—500** **1 Claim**



1. A computer network system of two computers having BIOS software dependency wherein the first computer accesses a remote peripheral device of the second computer, comprising:

a first computer including a first Small Computer System Interface (SCSI) adapter;

a second computer including a second SCSI adapter with at least one remote peripheral device;

a SCSI bus communications link between the first and second SCSI adapters; and

memory resident emulation means in the second computer emulating a SCSI remote peripheral device for direct access of the SCSI remote peripheral device by the first computer and emulating a non-SCSI remote peripheral device for direct access of the non-SCSI remote peripheral device by the first computer upon command by the first computer and providing for proper sharing of any BIOS software interrupt which supports remote peripheral device access by both the first and second computers upon command by the first computer such that proper hardware and software priority operation is maintained and providing synchronization procedures to preclude BIOS software interrupt recursion.

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**5,499,379**

**INPUT/OUTPUT EXECUTION APPARATUS FOR A PLURAL-OS RUN SYSTEM**

**Shunji Tanaka, Machida; Toru Ohtsuki, Hadano; Hiroaki Sato, Hadano; Hideo Sawamoto, Hadano; Ryo Yamagata, Hadano; Masaya Watanabe, Hadano; Hidenori Umeno, Kanagawa, and Masatoshi Haraguchi, Fujisawa, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

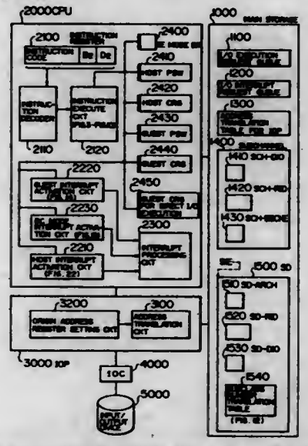
**Continuation of Ser. No. 373,216, Jun. 28, 1989, abandoned.**

**This application Jan. 25, 1993, Ser. No. 8,842**

**Claims priority, application Japan, Jun. 30, 1988, 63-164758**

**Int. Cl.[6] G06F *9/00***

**U.S. Cl. 395—700** **3 Claims**



1. A computer system for running plural operating systems under control of a control program, said computer system comprising:

(a) a plurality of I/O devices;

(b) a main storage partitioned to said operating systems;

(c) an I/O processor, responsive to an I/O operation request by one of said operating systems which designates a subchannel number assigned to one of the I/O devices and a control signal required for execution of an I/O operation, for executing the I/O operation between said one I/O device and said main storage assigned to said one operating system;

(d) an instruction processor, responsive to an I/O instruction of a first kind issued from a first one of the operating systems which designates a subchannel number and an operand of a first kind which designates an I/O operation to be executed, for providing, without interrupting the control program, said I/O processor with the subchannel number and a control signal designated by the operand of the first kind, said instruction processor comprising:

(e) judging means, responsive to an I/O instruction of a second kind which includes a device address assigned to a second one of the I/O devices and an operand of a second kind which designates an I/O operation to be executed, for judging whether said I/O instruction is issued by a second one of the operating systems, and

(f) I/O instruction execution means, responsive to an affirmative judging by said judging means, for providing said I/O processor with (i) a subchannel number assigned to said second one of the I/O devices and (ii) a control signal corresponding to the operand of the second kind;

interruption subclass indicating means for indicating one or more interruption subclasses for direct input/output execution at the time when an operating system starts to run on an instruction processor; and

TPI (test pending interruption) instruction executing means, wherein:

when the operating system running on said instruction processor issues a TPI (test pending interruption) instruction for releasing an interrupt assigned with a highest priority from interrupts for said one of the input/output devices, when

allowability of the interrupt for said input/output device is indicated by an interruption subclass mask, and storing identification information of the input/output device having the interrupt released from suspension in a main storage at a region designated by the TPI instruction,

said TPI instruction execution means responds to the issuance of said TPI instruction to thereby release a pending interrupt having the highest priority assigned thereto from the interrupts for the input/output device of said input/output devices, the interrupt allowability of said input/output device being indicated by said operating system, and store the identification information of the input/output device having the interrupt released in the main storage of said operating system at a region designated by said TPI instruction.

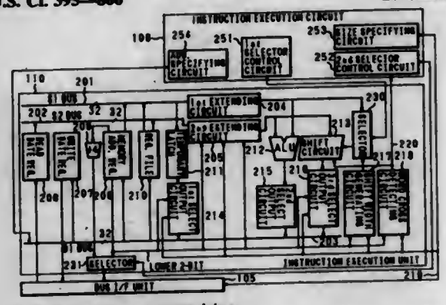
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**5,499,380**

## DATA PROCESSOR AND READ CONTROL CIRCUIT, WRITE CONTROL CIRCUIT THEREFOR

**Shunichi Iwata, and Toru Shimizu, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed May 18, 1994, Ser. No. 245,263**
**Claims priority, application Japan, May 21, 1993, 5-119778**
**Int. Cl.[6] G06F *12/08***
**U.S. Cl. 395—800** **20 Claims**




1. A data processor, comprising:

accessing means for read-accessing to a memory to which memory addresses are allocated by a predetermined number of bits as a unit data, and from which a predetermined number of continuous unit data are read out as one word in one access;

size specifying means for generating a size information which specifies a number of unit data to be accessed at read-accessing to said memory by said accessing means;

address specifying means for generating address information which specifies a start address to be accessed by said accessing means;

a read data register for storing the word data, which includes the unit data to be read and is specified by said address information and said size information, read from said memory by said accessing means;

a working register for storing a word data; and

a shift circuit for shifting a word data stored in said working register;

further comprising:

shift controlling means,

when one or all of a plurality of unit data to be read are located in one word, for controlling said shift circuit to shift said unit data to be read included in one word data stored in said read data register in order to be located at the position determined by said address information and said size information in a new word data, or

when a plurality of unit data to be read are located extending over two words, for controlling said shift circuit to shift a part of said unit data to be read included in one word data stored in said read data register in order to be located at the position determined by said address information and said size information in the new word data and for storing temporarily in said working register, then for controlling said shift circuit to shift the remainder of said unit data to be read included in one word data, which has been read consecutively from said memory by said accessing means and stored in said read data register, in order to be located at the position determined by said address information and said size information in the new word data;

data generating means for generating new word data from the word data which has been shifted by said shift circuit when one or all of a plurality of unit data to be read are located in one word, or from the word data stored in said working register and the word data which has been shifted by said shift circuit when a plurality of unit data to be read extend over two words; and

data generating controlling means for controlling selection of unit data by said data generating means so that said unit data to be read in said new word data generated by said data generating means is located at the position determined by said address information and said size information in said new word data.

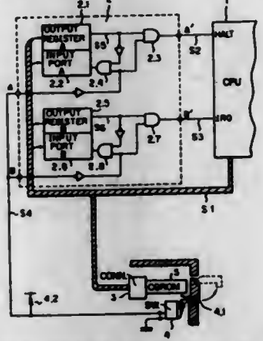
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**5,499,381**

## ELECTRONIC APPARATUS WITH INTERCHANGEABLE PERIPHERAL DEVICE AND A PROCESSOR INTERRUPT FEATURE

**Yoshikazu Shibamiya, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 62,153, May 17, 1993, abandoned, which is a continuation of Ser. No. 383,275, Jul. 19, 1989, abandoned, which is a continuation of Ser. No. 99,615, Sep. 22, 1987, abandoned. This application Nov. 17, 1994, Ser. No. 344,622**
**Claims priority, application Japan, Sep. 25, 1986, 61-227805**
**Int. Cl.[6] G06F *13/00***
**U.S. Cl. 395—800** **4 Claims**




1. An electronic apparatus provided with an interchangeable peripheral device detachably connected to a CPU, comprising:

a bus line connected to said CPU, said peripheral device being detachably connected to said bus line;

means for detecting a connection of said peripheral device to said bus line before said peripheral device comes into contact with a connector of said CPU;

means for generating a detection signal of said detecting means;

means coupled to said CPU for outputting a halt control signal;

means coupled to said CPU for outputting an interruption control signal;

means for controlling said means for outputting a halt control signal in such a manner that when said CPU is in normal operation, said control means inhibits said output means from outputting the halt control signal, when a halt preprocess is completed and the generation of said detection signal is confirmed, said control means enables said output means to output the halt control signal, and after completion of the halt preprocess, said control means inhibits said output means from outputting the halt control signal; and

means for controlling said means for outputting the interruption control signal in such a manner that when said CPU is in normal operation, said control means enables said output means to output the interruption control signal, when said detection signal is generated and the halt preprocess is executed, said control means inhibits said output means from outputting the interruption control signal, and further after it is confirmed that the detection signal is not generated, said control means enables said output means to output the interruption control signal.



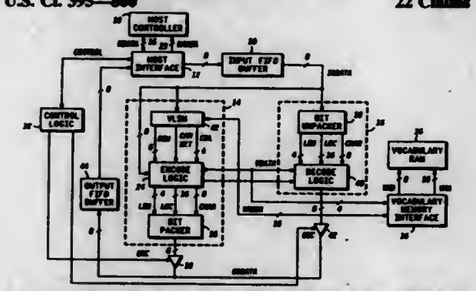
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**5,499,382**

## CIRCUIT AND METHOD OF BIT-PACKING AND BIT-UNPACKING USING A BARREL SHIFTER

**Eugene B. Nusinov, 50 Bradford Ave., Sharon, Mass. 02067, and James A. Pasco-Anderson, 1061 Highland Ave., Needham, Mass. 02194**

**Continuation of Ser. No. 123,550, Sep. 20, 1993, abandoned. This application Jan. 23, 1995, Ser. No. 376,635**
**Int. Cl.[6] G06F *5/00***
**U.S. Cl. 395—800** **22 Claims**




22. A method of packing variable length input data into fixed length output data, comprising the steps of:

accumulating a width signal indicating a number of bits in the variable length input data for providing a select signal;

decoding said select signal for selecting one of a plurality of control signals and deselecting other ones of said plurality of control signals;

translating the variable length input data into the fixed length output data in response to said one of a plurality of control signals; and

storing the fixed length output data when said other ones of plurality of control signals are deselected.

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**5,499,383**

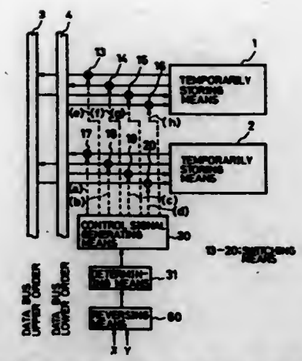
## DMA CONTROL DEVICE CONTROLLING SEQUENTIAL STORAGE OF DATA

**Takashi Yamazaki, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan**

**Continuation of Ser. No. 716,499, Jun. 17, 1991, abandoned. This application Sep. 6, 1994, Ser. No. 301,222**
**Claims priority, application Japan, Jul. 20, 1990, 2-192664**
**Int. Cl.[6] G06F *13/20;13/28***
**U.S. Cl. 395—842** **14 Claims**

1. A DMA control device provided with a plurality of temporary storing means for data to be transferred from a transfer source beginning at a first address to a transfer destination through data buses, switching means for shifting input and output between said temporary storing means and the data buses, control signal generating means for generating control signals for controlling the switching means, and determining means outputting a determined result indicating whether said first address is even or odd, said determining means formed from a flip-flop; in which the control signal generating means produces said control signals in accordance with said determined result, so that data stored in the temporary storing means are handled in the proper order regardless of whether the first address to be transferred is even or odd and whether the proceeding direction of the address is in a forward direction or a reverse direction, the control device comprising:

reversing means, coupled to an input of said determining means, for causing said determined result output from said determining means to reverse when a first signal indicates a multiple byte configuration of transfer data and when a second signal indicates data storage in a reverse direction, the first signal indicating whether the bit configuration of the transfer data is of one byte or more than one byte, and the second signal indicating whether data are stored in storage areas arranged in an increasing address sequence or a decreasing address sequence at a transfer source, or whether data are stored in storage areas arranged in an increasing address sequence or in a decreasing address sequence at a transfer destination.



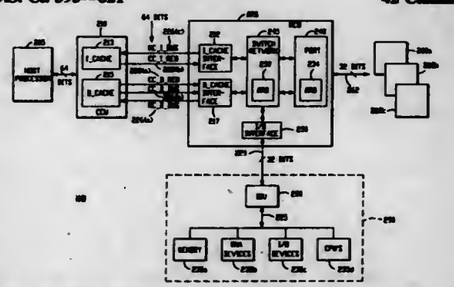

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**5,499,384**

## INPUT OUTPUT CONTROL UNIT HAVING DEDICATED PATHS FOR CONTROLLING THE INPUT AND OUTPUT OF DATA BETWEEN HOST PROCESSOR AND EXTERNAL DEVICE

**Derek J. Lentz, Los Gatos, and Kian-Chin Yap, San Jose, both of Calif., assignors to Seiko Epson Corporation, Tokyo, Japan**

**Filed Dec. 31, 1992, Ser. No. 997,943**
**Int. Cl.[6] G06F *15/02***
**U.S. Cl. 395—821** **42 Claims**




20. An input output control unit that connects a host processor to an external input/output bus that is connected to at least one external master device, the input output control unit and the host processor are also connected to a memory device via a memory control unit, the input output control unit comprising:

a first dedicated path for the transfer of data read from the at least one external master device or data written from the at least one external master device to the memory control unit, or for the transfer of data returned from a read of the memory device from the memory control unit to the at least one external master device;

a second dedicated path for transfer of data written by the host processor from the memory unit to the at least one external master device;

a third dedicated path, connected between the memory control unit and the at least one external master device for transfer of memory addresses for identification of addressed memory segments; and

interface logic, to permit data of differing widths to be transferred between the memory control unit and the at least one external master device;

wherein the input output control unit is configured to provide status information to the host processor, and the input output control unit and the host processor are located on a single chip.

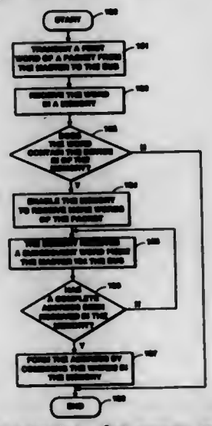
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**5,499,385**

## METHOD FOR ACCESSING AND TRANSMITTING DATA TO/FROM A MEMORY IN PACKETS

**Michael Farmwald, Berkeley, and Mark Horowitz, Palo Alto, both of Calif., assignors to Rambus, Inc., Mountain View, Calif.**

**Division of Ser. No. 510,898, Apr. 18, 1990. This application Mar. 5, 1992, Ser. No. 849,212**
**Int. Cl.[6] G06F 13/00**
**U.S. Cl. 395—823** **6 Claims**



1. A method of addressing a first memory among a plurality of memories coupled to a bi-directional multiline bus for a memory operation from a master also coupled to the bus, comprising the steps of:

(A) transmitting from the master a first word of a packet to the bus, wherein the bus (1) does not include separate device selection lines for the memories and (2) has a total number of lines less than a total number of bits in any single address, wherein the first word includes (1) a device ID of the first memory and (2) a first portion of an address that alone cannot address any memory location within each of the memories;

(B) receiving the first word in the first memory from the bus, wherein the first memory is enabled to receive subsequent words of the packet after receiving the device ID in the first word from the bus;

(C) transmitting from the master a second word of the packet to the first memory via the bus, wherein the second word includes a second portion of the address such that the first memory is selected and addressed for the memory operation without a separate device selection line:

(D) combining the first and second portions of the address together in the first memory to form the address for addressing a location within the first memory;

(E) Reading/Writing the location within the first memory using the combined address.

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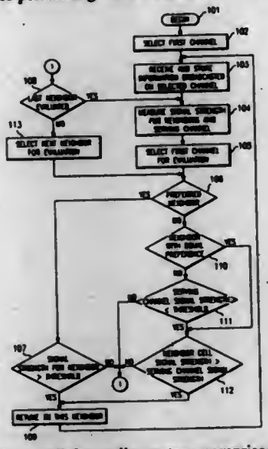
**5,499,386**

## BEST SERVER SELECTION IN LAYERED CELLULAR RADIO SYSTEM

**Bror Å. Karlsson, Montreal, Canada, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden**

**Filed Jul. 9, 1993, Ser. No. 90,734**
**Int. Cl.[6] H04B 7/26; H04Q 7/22;7/36**
**U.S. Cl. 455—33.2** **30 Claims**

1. A method of performing server selection for a mobile station



operating within a cellular radio system comprised of multiple levels of cells having different service areas, said method comprising the steps of:

assigning to each cell according to cell level a category of preference for selection with respect to each other associated cell within the system having either a coextensive, adjacent, contiguous, or overlapping service area;

assigning to each associated cell a preselected signal strength threshold;

measuring the signal strength of communications between the mobile station and each base station serving the associated cells;

comparing the measured signal strengths to the preselected thresholds for each of the associated cells; and

selecting for the mobile station as server a base station serving a candidate one of the associated cells based upon whether the measured signal strength to the candidate associated cell is greater than the preselected signal strength threshold assigned to said cell and whether the candidate associated cell has a higher category of preference than a currently serving cell.



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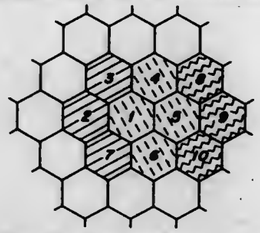
**5,499,387**

## HANDOFF METHOD WHEREIN STORED MEASURED INFORMATION IS TRANSFERRED BETWEEN BASE STATIONS

**William R. G. Chambert, Uppsala, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden**

**Continuation of Ser. No. 711,892, Jun. 7, 1991, abandoned. This application May 23, 1994, Ser. No. 247,457**
**Claims priority, application Japan, Jul. 6, 1990, 1-2377**
**Int. Cl.[6] H04Q 7/30**
**U.S. Cl. 455—33.2** **8 Claims**

1. A handoff method in a mobile radio communication system



comprising at least one mobile station and a set of base stations surrounding said mobile station, each of said base stations comprising at least one traffic channel, said method comprising the steps of:

repeatedly measuring at least one channel quality parameter of a first traffic channel associated with one of said base stations;

storing a plurality of recently measured values of said at least one channel quality parameter;

determining whether a handoff is necessary using said associated plurality of recently measured values;

ordering handoff from said first traffic channel to a second traffic channel;

assigning said stored plurality of recently measured values to said second traffic channel for use in determining future handoffs; and

gradually replacing values in said plurality by values of said at least one channel quality parameter measured after handoff to said second traffic channel.

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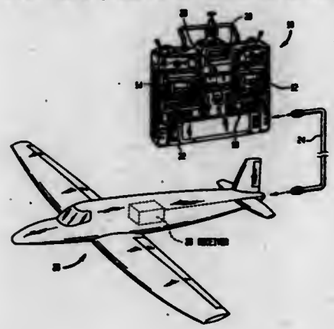
**5,499,388**

## RADIO WITH FREQUENCY SCANNING AND INTERFERENCE DETECTION CAPABILITY FOR REMOTE CONTROLLED MODEL AIRCRAFT

**Byung M. Song, Gillette, N.J., assignor to Polk's Model Craft Hobbies, Inc., Jersey City, N.J.**

**Filed Oct. 20, 1993, Ser. No. 139,943**
**Int. Cl.[6] H04B 15/00**
**U.S. Cl. 455—62** **33 Claims**

1. A remote control system for use with model aircraft, comprising:



receiver means mounted in correspondence with said model aircraft for receiving rf signals within a selected channel;

transmitter means remote from said receiver means for transmitting rf signals to be picked up by said receiver means within said selected channel;

frequency interference detection means for detecting interference within the selected channel picked up by said receiver means;

warning means arranged to communicate with said frequency interference detection means for providing a warning signal to a user that interference has been detected within the selected channel;

scanning means for selectively scanning said receiver means through a plurality of channels having a predetermined frequency bandwidth so that said frequency interference detection means determines whether interference exists on the channels;

means for permitting the user to selectively place said remote control system into a scanning mode wherein said scanning means and said receiver means are operational and wherein no rf energy is emitted from said transmitter means, said means for selectively placing said remote control system into said scanning mode comprises a jumper cable for electrically connecting said receiver means to said scanning means to permit communication therebetween; and

tuning means for locking said receiver means and said transmitter means on a selected one of the plurality of channels which is free of interference so that said user can control the flight of said model aircraft by sending the rf signals from said transmitter means to said receiver means.

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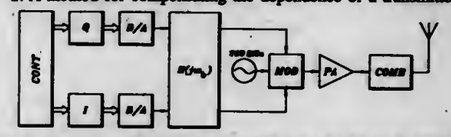
**5,499,389**

## METHOD OF COMPENSATING THE DEPENDENCE OF THE USEFUL TRANSMITTER SIGNAL ON THE TRANSFER FUNCTION OF A COMBINER FILTER

**John A. Victorin, Stockholm, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden**

**Continuation of Ser. No. 897,289, Jun. 11, 1992, abandoned. This application Aug. 22, 1994, Ser. No. 293,939**
**Claims priority, application Sweden, Jun. 12, 1991, 9101805**
**Int. Cl.[6] H04B 1/04**
**U.S. Cl. 455—119** **6 Claims**

1. A method for compensating the dependence of a transmitter



output signal on a distorting transfer function, having both amplitude and phase, of a combiner filter in a mobile radio communication system, comprising the steps of:

converting digital signals into analog baseband signals;

compensating said analog baseband signals in a compensating filter having a transfer function, having both amplitude and phase, that approximates the reciprocal of said combiner transfer function after frequency transformation to a baseband;

modulating a carrier signal with said compensated analog baseband signals;

amplifying said modulated carrier signal; and

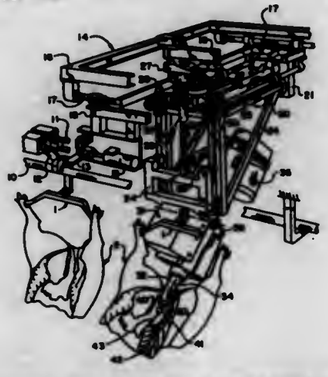
filtering said amplified modulated carrier signal in said combiner filter to produce said transmitter output signal.

5,499,390

## CONTROLLED DEVICE FOR REMOVING THE ANUS OF SLAUGHTERED ANIMALS

Sander A. Van Ochten, Lichtenvoorde, and Leonardus J. A. Tiggeloven, Groenlo, both of, Netherlands, assignors to Stork R.M.S. B.V., Netherlands

Filed Apr. 21, 1994, Ser. No. 231,192
Claims priority, application Netherlands, Apr. 22, 1993, 9300686
Int. Cl.[6] A22B 5/00
U.S. Cl. 452—122 20 Claims



1. A device for removing the anus of a slaughtered animal, said device comprising:
- a cutting device for cutting out the anus of the slaughtered animal, said cutting device including a substantially cylindrical blade drivable for rotation and translation and having a leading cutting edge, wherein the blade is carried on a pivotable fame;
- positioning means for initially positioning the blade such that the center line thereof extends substantially through the anus of the slaughtered animal; and
- following means for causing the blade on the pivotable frame to follow a curved path as the blade advances through the rectum such that the cutting edge follows substantially the lengthwise form of the rectum of the slaughtered animal while avoiding contact with bone.

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5,499,391

## DIGITAL CHANNELIZED IFM RECEIVER

James B. Y. Tsui, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 30, 1994, Ser. No. 269,317
Int. Cl.[6] H04B 17/00; G01R 23/16; G01S 7/36
U.S. Cl. 455—226.2 2 Claims




1. A digital channelized IFM (Instantaneous Frequency Measurement) receiver comprising first means for receiving RF input signals from antenna means and for converting the RF input signals to IF signals, analog-to-digital conversion means coupled to the first means for converting the IF signals to digital signals at D data points, the analog-to-digital conversion means being coupled to digital filter bank means for providing channelized digital signals using a P point short FFT (Fast Fourier Transform) to perform the channelization to provide i=1 to P/2 channels, digital IFM receiver means for processing the channelized digital signals to effectively provide digital IFM receiver means for the output of each channel;

wherein the short FFT is overlapped P−1 points, and the output of each channel is written as $I_i(t_j)$ and $Q_i(t_j)$ where I and Q are inphase and quadrature components of a complex form, i represents output channel number, and j=1 to (D−P+1) represents the output time, and the means for finding a phase $\Theta_i$ of each output signal as

$$\Theta_i(t_j) = \tan^{-1}\left[\frac{I_i(t_j)}{Q_i(t_j)}\right]$$

means for finding the phase difference of each channel as

$$\delta\Theta_i(t_j) = \Theta_i(t_{j+1}) - \Theta_i(t_j)$$

and means for finding the frequency of the output signal from

$$f_i = \frac{\delta\Theta_i(t_j)}{t_{j+1} - t_j}\ ;$$

wherein the frequencies of all channels are measured, if the frequency measured by an IFM receiver matches the center of a channel, that channel contains a signal, and if the frequency measured by the IFM receiver does not match the center of the channel, that channel does not contain a signal, so that using this measurement, the channels containing signals can be identified.

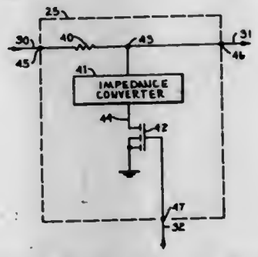
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5,499,392

## FILTER HAVING A VARIABLE RESPONSE TIME FOR FILTERING AN INPUT SIGNAL

Randall L. Grunwell, Suwanee, Ga., assignor to Matsushita Communication Industrial Corporation of America, Peachtree City, Ga.

Filed Jul. 19, 1994, Ser. No. 277,226
Int. Cl.[6] H03L 7/099; H03H 11/00; H04B 1/16
U.S. Cl. 455—260 14 Claims




1. A filter apparatus having a variable response time for filtering an input signal to provide a filtered output signal, comprising:
- a resistor having a first terminal connected to said input signal and a second terminal for providing said filtered output signal;
- a series circuit connected between said second terminal and a signal return point, said series circuit comprising a variable resistor connected in series with an impedance converter, said variable resistor having a control terminal and having a resistance responsive to a response control signal; and

means for providing said response control signal to said control terminal of said variable resistor.

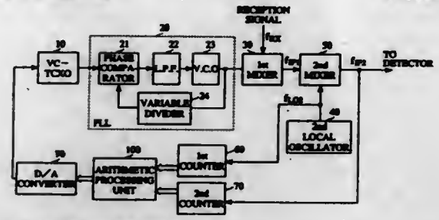


5,499,393

## RECEIVER WITH FUNCTION TO ADJUST LOCAL FREQUENCY FOLLOWING RECEPTION FREQUENCY

Sinichi Fukui, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 20, 1994, Ser. No. 246,632
Claims priority, application Japan, Jun. 10, 1993, 5-163883
Int. Cl.[6] H04B 7/00
U.S. Cl. 455—264 8 Claims




1. A receiver, comprising:
- a voltage controlled reference oscillator which produces a reference frequency signal;
- a phase locked loop circuit for functioning as a first local oscillator including a voltage controlled oscillator which produces a first local signal based on the reference frequency signal;
- a first mixer which mixes a reception signal with the first local signal and produces a first intermediate frequency signal;
- a second local oscillator which produces a second local signal;
- a second mixer which mixes the first intermediate frequency signal with the second local signal and produces a second intermediate frequency signal;
- a first counter which counts a frequency of the second local signal;
- a second counter which counts a frequency of the second intermediate frequency signal;
- a first digital-to-analog converter for supplying a control voltage to the voltage controlled reference oscillator;
- means for storing information representing a relationship between frequency deviations of the voltage controlled reference oscillator and corresponding voltage changes to said control voltage for compensating the frequency deviations, the relationship being represented as a first linear expression;
- means for calculating a frequency deviation of the voltage controlled reference oscillator based on count values of the first and the second counters; and
- means for supplying control data to the first digital to analog converter and for changing the control data based on the information so as to compensate the frequency deviation when the frequency deviation of the voltage controlled reference oscillator is not within a permissible range, the control data corresponding to the control voltage to be supplied to the voltage controlled reference oscillator.

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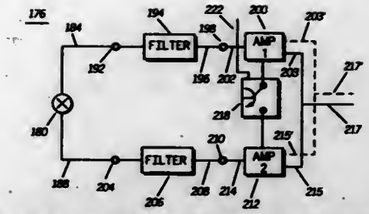
5,499,394

## FILTER SWITCHING CIRCUIT

Gary F. Kaatz, Barrington, and John E. Becker, Prospect Heights, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 143,548, Oct. 27, 1993, abandoned, which is a continuation of Ser. No. 591,303, Oct. 1, 1990, abandoned. This application May 25, 1994, Ser. No. 249,642
Int. Cl.[6] H04B 1/16
U.S. Cl. 455—266 5 Claims

1. A transceiver operative to receive wideband signals within a first bandwidth and narrowband signals of a second bandwidth, the transceiver comprising:
- an antenna;
- transmit circuitry coupled to the antenna for transmitting a transmit signal; and




- an integrated circuit upon which a drive circuit is disposed, the integrated circuit having a first input coupled to the antenna to receive the narrowband signals and the wideband signals, and the drive circuit coupled to the first input to receive the narrowband signals and wideband signals and operative to simultaneously generate a first isolated drive signal at a first output of the integrated circuit and a second isolated drive signal at a second output of the integrated circuit, wherein the first isolated drive signal and the second isolated drive signal generated at the first and second outputs of the integrated circuit, respectively, are isolated from one another;
- a wideband bandpass filter of the wideband bandwidth coupled to the first output of the integrated circuit and to a second input of the integrated circuit, the wideband bandpass filter operative to receive the first isolated drive signal generated by the drive circuit at the first output of the integrated circuit, to pass signal portions of the first isolated drive signal of frequencies within the wideband bandwidth, the signal portions of the first signal comprising the signal of the wideband bandwidth, and to apply the signal portions of the first isolated drive signal within the wideband bandwidth to the second input of the integrated circuit;
- a narrowband bandpass filter of the narrowband bandwidth coupled to the second output of the integrated circuit and to a third input of the integrated circuit, the narrowband bandpass filter operative to pass signal portions of the second isolated drive signal of frequencies within the narrowband bandwidth, the signal portions of the second signal comprising the signal of the narrowband bandwidth, and to apply the signal portions of the second isolated drive signal within the narrowband bandwidth to the third input of the integrated circuit;
- a first amplification circuit disposed upon the integrated circuit upon which the drive circuit is disposed and coupled to receive the signal portions of the first isolated drive signal passed by the wideband bandpass filter;
- a second amplification circuit disposed upon the integrated circuit upon which the drive circuit and the first amplification circuit are disposed and coupled to receive the signal portions of the second isolated drive signal passed by the narrowband bandpass filter; and
- a switching circuit coupled to the first amplification circuit and to the second amplification circuit for alternately permitting powering of the first amplification circuit or of the second amplification circuit, thereby for permitting, alternately, passage of the signal of the wideband bandwidth or the signal of the narrowband bandwidth.

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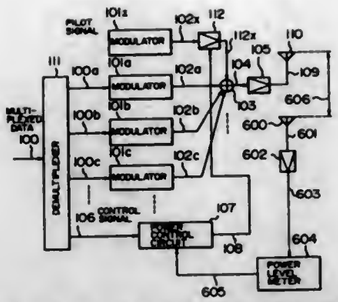
5,499,395

## CELLULAR MOBILE COMMUNICATION SYSTEM HAVING APPARATUS FOR CHANGING BOUNDARIES OF CELLS ACCORDING TO TRAFFIC CONDITION

Nobukazu Doi, Hachioji, and Takashi Yano, Tokorozawa, both of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 9, 1994, Ser. No. 207,688
Claims priority, application Japan, Mar. 11, 1993, 5-050393
Int. Cl.[6] H04Q 7/30
U.S. Cl. 455—33.1 15 Claims

1. A cellular mobile communication system, comprising:
- a relay station connected to a network;




a plurality of base stations connected to said relay station via communication channels and defining cells, respectively;

first means for monitoring volume of traffic between mobile terminals resident within each of said cells and the base station located within each of said cells; and

second means for controlling a boundary between a given one of said cells and a plurality of the cells adjacent to said given one in accordance with the traffic volume;

wherein said second means comprises means for changing the sending power of a pilot signal emitted from a given base station located within a given one of said cells and the sending power of a pilot signal emitted from a neighboring base station located within the cell adjacent to said given cell relative to each other in accordance with an output signal of said first means, the sending power of pilot signals emitted from the base stations being controlled independent of the sending power of transmission data from the base stations to the mobile terminals, said second means controlling the boundary between mutually adjacent cells based on the power level of a pilot signal received from each of said base stations.

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**5,499,396**

**TRANSMISSION DEVICE FOR TRANSMITTING A WANTED SIGNAL MODULATED ON A CARRIER**

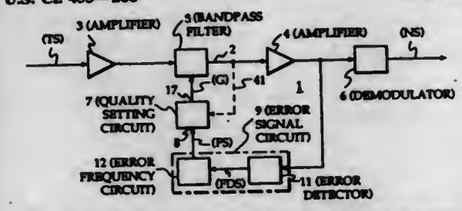
**Gerd Reime, Schomberg, Germany, assignor to Nokia Technology GmbH, Pforzheim, Germany**

**PCT No. PCT/EP92/01041, § 371 Date Jul. 12, 1994, § 102(e) Date Jul. 12, 1994, PCT Pub. No. WO93/23951, PCT Pub. Date Nov. 25, 1993**

**PCT Filed Dec. 5, 1992, Ser. No. 256,427**

**Int. Cl.[6] H04B 1/10**

**U.S. Cl. 455—266** **6 Claims**




1. A circuit arrangement to eliminate distortion from information in a useful signal (NS), which is modulated to a carrier oscillation (TS) with double sideband modulation, and which is received distorted because of transmission by a receiver, having a bandpass filter (5) that is tuned to a frequency (f(T)) of the carrier oscillation (TS), which precedes a demodulator (6) of the receiver, and having an error signal circuit (9) for controlling a transfer factor of the bandpass filter (5), which recognizes oscillations in the bandpass filter (5), whose amplitude remains below a threshold value (SW) adjusted by the error signal circuit (9), and that produces an error rate signal (FS) corresponding to a frequency of recognized error oscillations, characterized in that

a quality setting circuit (7) is connected to the bandpass filter (5) and has a quality transducer curve (10) set in the quality setting circuit (7), having a control input that receives the error rate signal (FS), resulting in an adjusting of a filter quality (G) from the bandpass filter (5) so that when the error rate signal is missing, where a filter bandwidth (Bf18) of the bandpass filter (5) is at least equal to a transmission bandwidth of the useful signal (NS), and the error signal circuit (9) produces the error rate signal (FS) at a maximum value ($FS_m$), the filter quality (G) reaches substantially a maximum quality value (Gm) before an onset of oscillation of the bandpass filter (5) and the carrier oscillation (TS) exhibits an overvoltage in an output of the bandpass filter (5).

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**5,499,397**

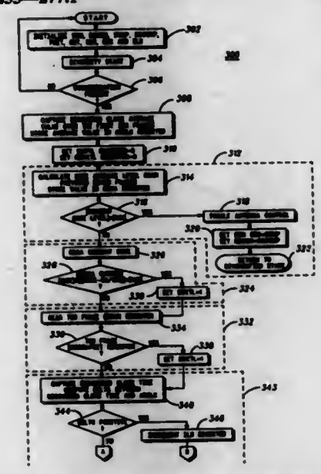
**SWITCHED ANTENNA DIVERSITY ALGORITHM EMPLOYING RECEIVED SIGNAL STRENGTH, PHASE ERRORS AND RECOVERED CLOCK**

**Craig P. Wadin, Sunrise, and Paul D. Marko, Ft. Lauderdale, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed May 2, 1994, Ser. No. 236,826**

**Int. Cl.[6] H04B 1/16**

**U.S. Cl. 455—277.1** **18 Claims**




1. A method for selecting between first and second antennas in a communication device, the communication device currently receiving a signal at the first antenna, the method comprising the steps of:

receiving a signal at the communication device;

measuring characteristics of the received signal including: received signal strength, phase error, and recovered clock of the received signal;

determining signal quality of the received signal based on the measurements;

switching from the first antenna to the second antenna when the received signal strength exceeds a received signal strength threshold and the phase error exceeds a phase error threshold and the recovered clock exceeds a recovered clock threshold.



**5,499,398**

**WRISTWATCH-TYPE SELECTIVE CALLING RECEIVER**

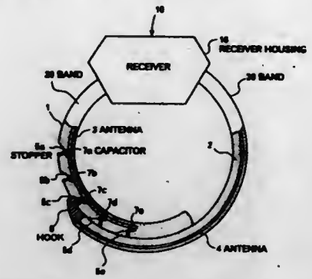
**Kazuhiro Kudoh, Tokyo, and Hisami Nagai, Kakegawa, both of, Japan, assignors to NEC Corporation, Tokyo, Japan**

**Filed Jul. 18, 1994, Ser. No. 276,394**

**Claims priority, application Japan, Jul. 16, 1993, 5-175812**

**Int. Cl.[6] H01Q 7/00**

**U.S. Cl. 455—290** **10 Claims**




1. A selective calling receiver comprising a receiver, a first band, and a second band, the first and the second bands being connected to the receiver at both sides,

the first band comprising:

a first antenna extending longitudinally and being electrically connected to the receiver, the first antenna comprising a plurality of points providing different effective antenna lengths, respectively;

first connection means for connecting the first band and the second band in a ring form, the first connection means comprising a plurality of electrodes arrayed longitudinally in a line on the outer surface of the first band; and

a plurality of tuning elements elements electrically connected between the electrodes and the points of the first antenna, respectively, for cancelling out the differences in effective antenna length of the first antenna, and

the second band comprising:

a second antenna electrically connected to the receiver; and

second connection means capable of being engaged with the first connection means to connect the first band and the second band in a ring form, the second connection means comprising a conductor provided at a predetermined location of the second band and electrically connected to the second antenna, and the conductor being in electrical contact with a selected one of the electrodes with the second connection means being engaged with the first connection means, wherein

the first connection means comprises a plurality of stoppers, said stoppers comprising recesses arrayed longitudinally in a line on the outer surface of the first band so as not to penetrate through the first band, the electrodes being provided, respectively, within each of the recesses; and

the conductor of said second connection means comprises a hook which is engaged within a selected one of the recesses of the first connection means so that the first and second connection means are secured together, the hook being in electrical contact with the electrode provided in the recess.

**5,499,399**

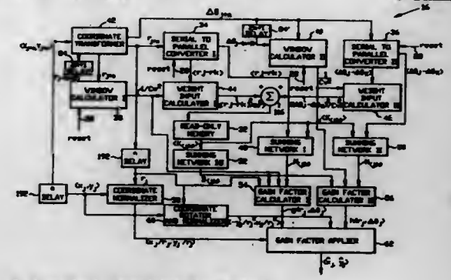
**TWO-DIMENSIONAL KERNEL ADAPTIVE INTERFERENCE SUPPRESSION SYSTEM**

**James W. Bond; David J. Marchette, both of San Diego, Calif.; Carey E. Priebe, King George, Va., and Thomas W. Schlosser, San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed May 29, 1991, Ser. No. 707,354**

**Int. Cl.[6] H04B 15/00**

**U.S. Cl. 455—296** **8 Claims**




1. A method comprising the steps of:

receiving signals;

taking samples of said signals;

finding an amplitude value corresponding to each signal sample;

finding a phase-difference value corresponding to each signal sample, said phase-difference value being the difference between the phase of each signal sample and the phase of a previous signal sample;

storing said amplitude values and said phase-difference values;

calculating the variance of said stored amplitude values;

calculating the variance of said stored phase-difference values;

obtaining an approximation of a probability density function corresponding to each signal sample using said variance of said stored amplitude values and said variance of said stored phase-difference values;

averaging the probability density functions calculated;

finding the derivative of the average of the probability density functions with respect to amplitude value;

finding the derivative of the average of the probability density functions with respect to phase-difference;

forming an amplitude gain factor from said derivative of the average of the probability density functions with respect to amplitude value, said average of the probability density functions and one of said amplitude values;

forming a phase-difference gain factor from said derivative of the average of the probability density functions with respect to phase-difference, said average of the probability density functions and one of said phase-difference values;

normalizing each radio frequency signal sample taken;

rotating and normalizing each radio frequency signal sample taken;

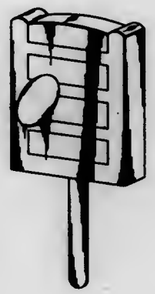
multiplying said amplitude gain factor times each normalized signal sample to obtain amplitude gain factor adjusted signal samples;

multiplying said phase-difference gain factor times each rotated and normalized signal sample to obtain phase-difference gain factor adjusted signal samples;

adding each amplitude gain factor adjusted signal sample to its corresponding gain factor adjusted signal sample to obtain summed gain factor adjusted signal samples; and

inserting said summed gain factor adjusted signal samples into a demodulator.

367,751
FROZEN CONFECTION
Connie A. Kellogg, and Daryl D. Spors, both of Green Bay, Wis., assignors to Good Humor Corporation, Green Bay, Wis.
Filed Feb. 10, 1995, Ser. No. 34,690
Term of patent 14 years
U.S. Cl. D1—102



367,752
SHAFT GLOVE
Richard C. Bruckert, E10198A Kings Corner Rd., North Freedom, Wis. 53951-9730
Filed May 2, 1994, Ser. No. 22,133
Term of patent 14 years
U.S. Cl. D2—616



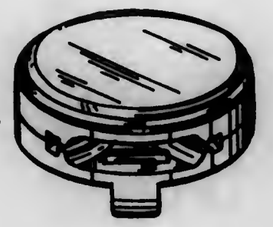
367,753
SUN VISOR
Jennifer Burge, P.O. Box 36425, Louisville, Ky. 40233
Filed Sep. 30, 1992, Ser. No. 948,744
Term of patent 14 years
U.S. Cl. D2—876



367,754
SHOE
Brent James, Manhattan Beach, Calif., assignor to Otomix, Inc., Santa Monica, Calif.
Filed Jun. 13, 1994, Ser. No. 24,307
Term of patent 14 years
U.S. Cl. D2—912



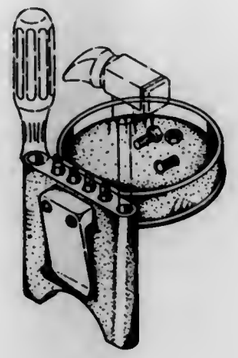
367,755
LOCKING DEVICE FOR SHOELACES
David Jones, 6064 Vista Linda La., Boca Raton, Fla. 33433
Filed Oct. 28, 1994, Ser. No. 30,416
Term of patent 14 years
U.S. Cl. D2—978



367,756
PORTABLE CARRYING GRIP WITH BELT
Haruo Ohba, and Tomoyuki Shado, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Jun. 20, 1994, Ser. No. 24,673
Term of patent 14 years
U.S. Cl. D3—218



367,757
MAGNETIC DISH
Chien-Tu Liu, 4F., No. 9, Lane 477, Peng-Yi Rd., Tai-Ping Hsiang, Taichung Hsien, Taiwan, Prov. of China
Filed Aug. 30, 1994, Ser. No. 27,840
Term of patent 14 years
U.S. Cl. D3—228

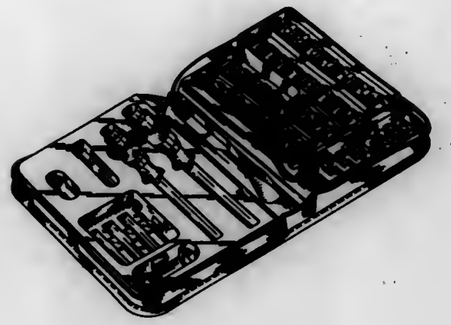


367,758
CAMCORDER CARRYING STRAP
Ryan Pernela, 23307 Peterson Dr., Mountlake Terrace, Wash. 98043
Filed Oct. 21, 1994, Ser. No. 30,070
Term of patent 14 years
U.S. Cl. D3—267

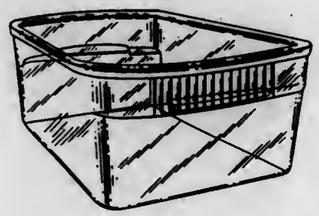




367,759
TOOL CASE
Arthur F. Jacobson, 1414 Jacobson Dr., Waukegan, Ill. 60085-7408
Filed Oct. 19, 1994, Ser. No. 29,933
Term of patent 14 years
U.S. Cl. D3—301



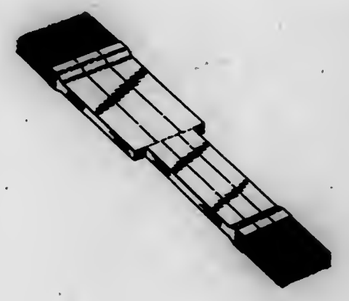
367,760
CONTAINER
Larry G. Zimmerman, Hollis, N.H., assignor to Sterilite Corporation, Townsend, Mass.
Filed Jul. 15, 1993, Ser. No. 10,703
Term of patent 14 years
U.S. Cl. D3—314



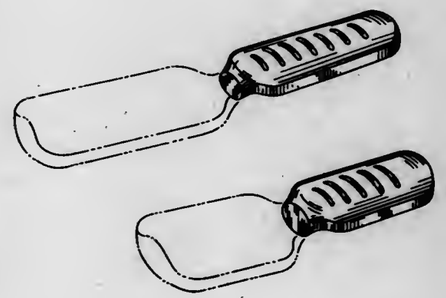
367,761
CARRYING STRAP
Lynn D. Knutson, 111 Joyner Dr. Apt. D-2, Smyrna, Tenn. 37167
Filed Jul. 25, 1994, Ser. No. 26,346
Term of patent 14 years
U.S. Cl. D3—327



367,762
PACKAGED UNIT FOR BRUSHES
Barbara K. Schmotter, Stillwater, and Mark D. Serlien, White Bear Lake, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Nov. 30, 1992, Ser. No. 2,839
The portion of the term of this patent subsequent to Apr. 18, 2009, has been disclaimed.
Term of patent 14 years
U.S. Cl. D4—120



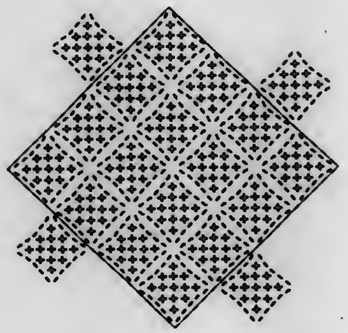
367,763
BRUSH HANDLE
Eric Chan, New York, N.Y., assignor to Goody Products, Inc., Peach Tree City, Ga.
Continuation-in-part of Ser. No. 7,129, Apr. 15, 1993. This application May 25, 1995, Ser. No. 39,497
Term of patent 14 years
U.S. Cl. D4—138



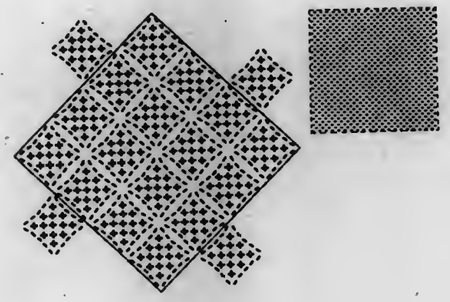
367,764
EMBOSSED PAPER PRODUCT
Kambiz B. Makoui, Menasha; Roger A. Schroeder, Neenah; Joseph H. Miller, Menasha, and Cheryl L. Ferraro, Green Bay, all of Wis., assignors to James River Corporation of Virginia, Richmond, Va.
Filed Apr. 26, 1994, Ser. No. 21,926
Term of patent 14 years
U.S. Cl. D5—57



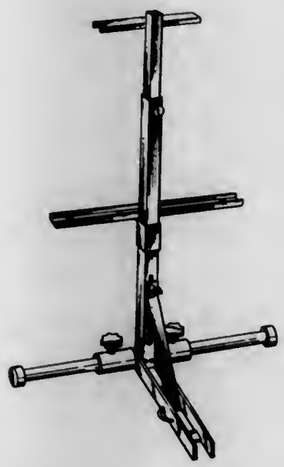
367,765
EMBOSSED PAPER PRODUCT
Kambiz B. Makoui, Menasha; Roger A. Schroeder, Neenah; Joseph H. Miller, Menasha, and Cheryl L. Ferraro, Green Bay, all of Wis., assignors to James River Corporation of Virginia, Richmond, Va.
Filed Apr. 26, 1994, Ser. No. 21,927
Term of patent 14 years
U.S. Cl. D5—57



367,766
EMBOSSED PAPER PRODUCT
Kambiz B. Makoui, Menasha; Roger A. Schroeder, Neenah; Joseph H. Miller, Menasha, and Cheryl L. Ferraro, Green Bay, all of Wis., assignors to James River Corporation of Virginia, Richmond, Va.
Filed Apr. 26, 1994, Ser. No. 21,943
Term of patent 14 years
U.S. Cl. D5—57

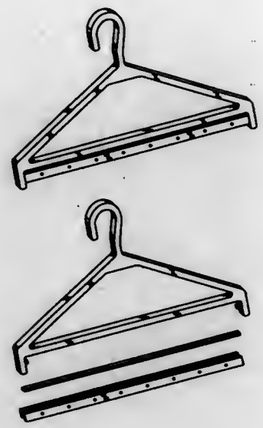


367,767
COMMERCIAL ART EASEL
Andrew Rhodes, 51 Watson Ave., Ossining, West Chester, N.Y. 10562
Filed Nov. 7, 1994, Ser. No. 30,760
Term of patent 14 years
U.S. Cl. D6—312

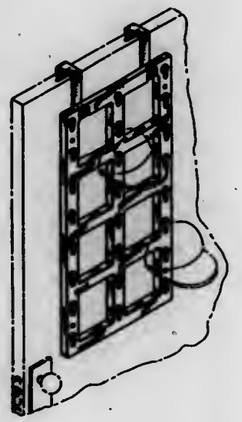




367,768
HANGER WITH SCENT BAR
William F. Wagner, 10385 Pritchard Rd., Hinckley, Ill. 60520
Filed Aug. 12, 1994, Ser. No. 26,935
Term of patent 14 years
U.S. Cl. D6—319



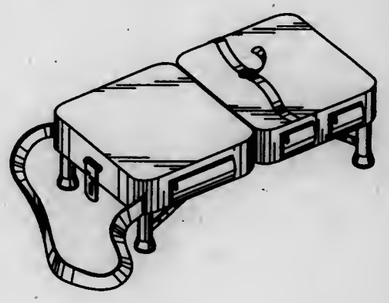
367,769
OVER THE DOOR CAP RACK
Marvin Dorfman, Bronx, N.Y., assignor to Etna Products Company, Inc., New York, N.Y.
Filed Jun. 17, 1994, Ser. No. 24,639
Term of patent 14 years
U.S. Cl. D6—320



367,770
GARMENT HANGER BODY
Nicoleon Petrou, 1531 W. Tadmar Ave., Anaheim, Calif. 92802, and David Petrou, 2728 Benvenue Ave., Apt. 3, Berkeley, Calif. 94705
Filed Nov. 29, 1994, Ser. No. 31,596
Term of patent 14 years
U.S. Cl. D6—328



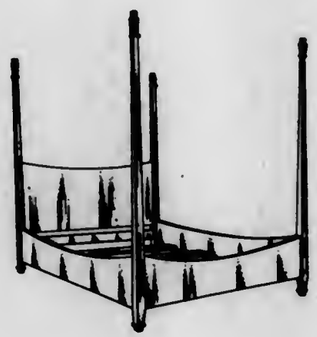
367,771
PORTABLE DIAPER CHANGING TABLE
John N. Julian, 8806 N. Portsmouth Ave., Apt. LWR, Portland, Oreg. 97203
Filed Jun. 1, 1995, Ser. No. 39,660
Term of patent 14 years
U.S. Cl. D6—333



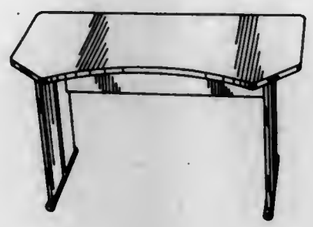
367,772
**COMBINED TABLE AND SEATING UNIT**
Michael F. Stirling, and Michael J. Katje, both of Spring Lake, Mich., assignors to Brunswick Bowling & Billiards Corporation, Muskegon, Mich.
Filed Jan. 5, 1995, Ser. No. 33,142
Term of patent 14 years
U.S. Cl. D6—337



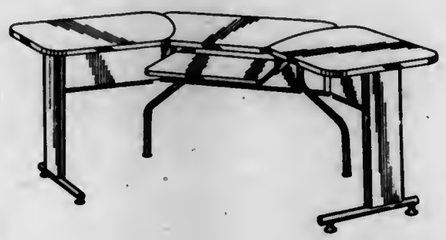
367,773
**BED**
Sally S. Lewis, 715 N. Canon Dr., Beverly Hills, Calif. 90210
Filed Oct. 25, 1994, Ser. No. 30,261
Term of patent 14 years
U.S. Cl. D6—393



367,774
**WORKSTATION MODULE**
Ronald L. Wood, Jr., 4962 Essington Ct., Barrington, Ill. 60010
Filed Apr. 28, 1994, Ser. No. 22,849
Term of patent 14 years
U.S. Cl. D6—422

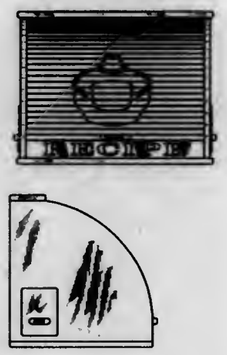


367,775
**COMPUTER WORK CENTER**
Ronald L. Wood, Jr., 4962 Essington Ct., Barrington, Ill. 60010
Filed Apr. 28, 1994, Ser. No. 22,897
Term of patent 14 years
U.S. Cl. D6—423

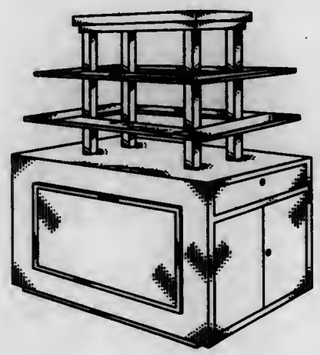




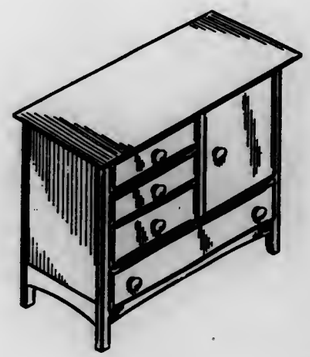
367,776
**ROLL-TOP RECIPE BOX**
Victor A. Lohroff, 1478 135th Ave., Wayland, Mich. 49348
Filed Oct. 4, 1993, Ser. No. 13,815
Term of patent 14 years
U.S. Cl. D6—433



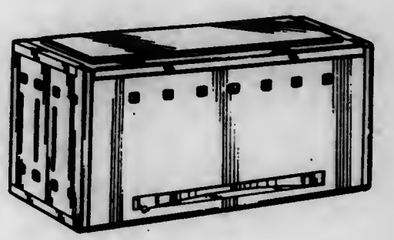
367,777
**STORAGE AND DISPLAY CART**
Louis F. Arnone, 9 Pleasantview Dr., Novato, Calif. 94947
Filed Oct. 27, 1993, Ser. No. 14,673
Term of patent 14 years
U.S. Cl. D6—436



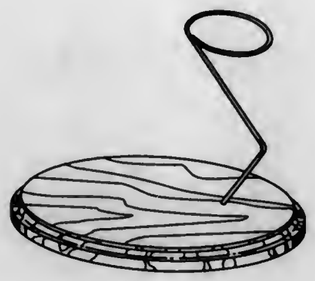
367,778
**DRESSER**
Merlin A. Brunner, Appleton, and Harvey J. Drabelm, Weyauwega, both of Wis., assignors to Shamrock Juvenile Products Company, Inc., New London, Wis.
Filed May 25, 1994, Ser. No. 23,449
Term of patent 14 years
U.S. Cl. D6—445



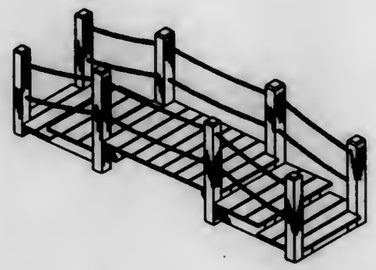
367,779
**FILE DRAWER**
Maria J. Koso, Maryville, Tenn., assignor to Rubbermaid Office Products Inc., Maryville, Tenn.
Filed Jul. 11, 1994, Ser. No. 25,743
Term of patent 14 years
U.S. Cl. D6—448



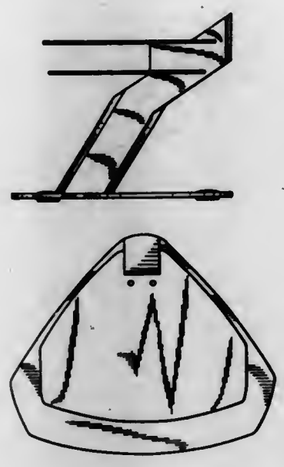
367,780
WESTERN HAT RACK
Joseph M. Torres, P.O. Box 563, Taos, N.M. 87571
Filed Mar. 20, 1995, Ser. No. 36,434
Term of patent 14 years
U.S. Cl. D6—462



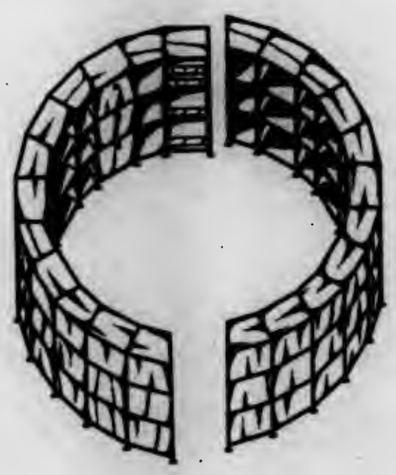
367,781
MODEL BRIDGE TO DISPLAY COLLECTIBLE ITEMS
Paul Motta, and Linda Motta, both of P.O. Box 755, Westport, Mass. 02790
Filed Nov. 4, 1993, Ser. No. 14,906
Term of patent 14 years
U.S. Cl. D6—474



367,782
STAND FOR TELEVISION RECEIVER
Shigeyuki Kunimaa, Ramsey, N.J., assignor to Sony Corporation of America, Park Ridge, N.J.
Filed Mar. 16, 1995, Ser. No. 36,240
Term of patent 14 years
U.S. Cl. D6—474

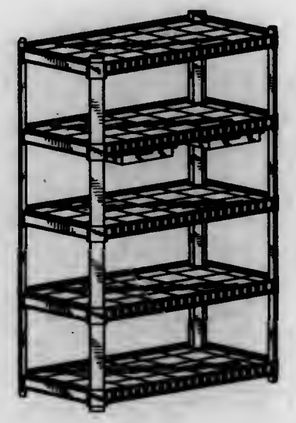


367,783
CIRCULAR SHELF AND STORAGE UNIT
André Gerber, Spiez, Switzerland, assignor to USM U. Schärer Söhne AG., Münsingen, Switzerland
Filed Oct. 27, 1994, Ser. No. 30,347
Claims priority, application Switzerland, Apr. 27, 1994, 12128/6
Term of patent 14 years
U.S. Cl. D6—477

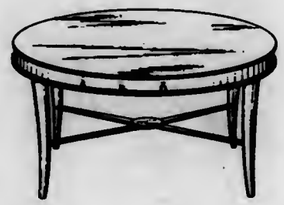




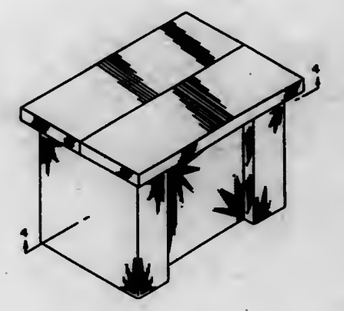
367,784
HEAVY-DUTY DECORATIVE SHELVING
Charles R. Goetz, Carnegie, Pa., assignor to Alco Industries, Inc., Valley Forge, Pa.
Filed Jul. 26, 1994, Ser. No. 26,352
Term of patent 14 years
U.S. Cl. D6—479



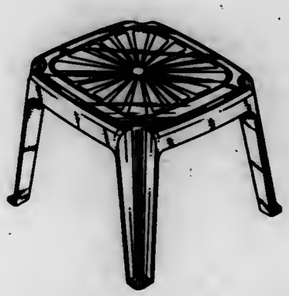
367,785
COFFEE TABLE
Sally S. Lewis, 715 N. Canon Dr., Beverly Hills, Calif. 90210
Filed Dec. 7, 1994, Ser. No. 31,832
Term of patent 14 years
U.S. Cl. D6—480



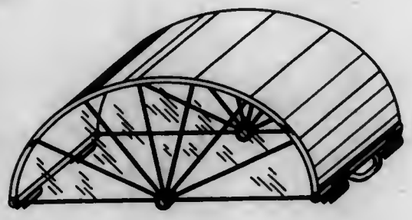
367,786
COUNTER
Arthur G. Carr, Washington, D.C., and Christopher A. Durgin, Springfield, Va., assignors to Nomadic Structures, Inc., Springfield, Va.
Filed Feb. 18, 1994, Ser. No. 18,983
Term of patent 14 years
U.S. Cl. D6—481



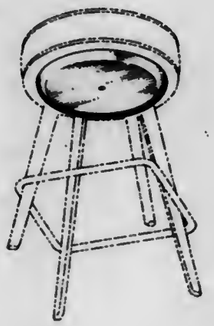
367,787
TABLE
Ralph VanSkiver, and Shannon R. Bynum, both of Arlington, Tex., assignors to Dunkocil Mfg. Co., Inc., Arlington, Tex.
Filed Aug. 11, 1994, Ser. No. 27,014
Term of patent 14 years
U.S. Cl. D6—484



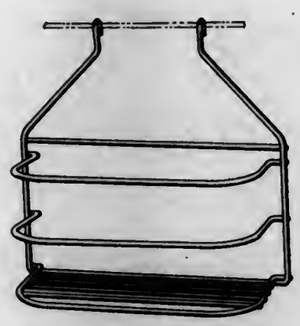
367,788
PLAYPEN COVER
Anthony Lawhorn, 415 N. 17th, Richmond, Ind. 47374
Filed May 19, 1995, Ser. No. 39,828
Term of patent 14 years
U.S. Cl. D6—491



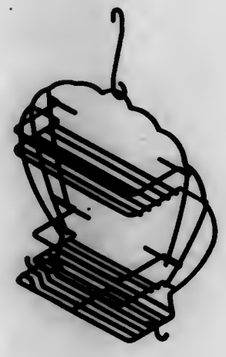
367,789
SWIVEL MECHANISM FOR ROTATING CHAIR OR STOOL SEAT
Peter Barile, Morristown, Tenn., assignor to Shelby Williams Industries, Inc., Morristown, Tenn.
Filed Apr. 13, 1994, Ser. No. 21,279
Term of patent 14 years
U.S. Cl. D6—500



367,790
SHOWER CADDY EXTENDER
Raul Munoz, Chicago, and Charmaine A. Alsager, Park Forest, both of Ill., assignors to Selfix, Inc., Chicago, Ill.
Filed Mar. 31, 1995, Ser. No. 36,989
Term of patent 14 years
U.S. Cl. D6—525

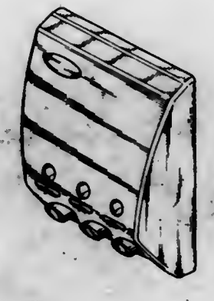


367,791
SHOWER CADDY
William W. Emery, Berkeley Heights, and Russell A. Fritts, Warren, both of N.J., assignors to Better Sleep Mfg. Co., Berkeley Heights, N.J.
Filed May 25, 1995, Ser. No. 39,249
Term of patent 14 years
U.S. Cl. D6—525

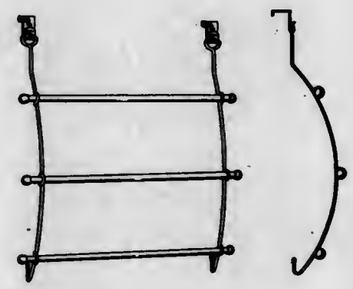




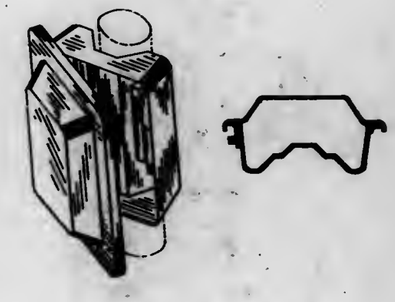
367,792
LIQUID SOAP DISPENSER
Chen-yueh Fan, 3rd Fl., No. 2, Alley 2, Lane 88, Sec. 2, Shui Yuan Rd., Hsin Chih Chen, Taipei Hsien, Taiwan, Prov. of China
Filed Jun. 2, 1995, Ser. No. 39,687
Term of patent 14 years
U.S. Cl. D6—545



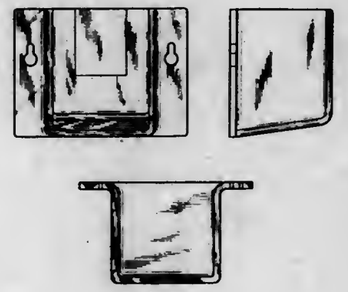
367,793
OVER DOOR TOWEL RACK
Thomas J. Macek, Chicago, Ill., assignor to Selfix, Inc., Chicago, Ill.
Filed Mar. 31, 1995, Ser. No. 36,975
Term of patent 14 years
U.S. Cl. D6—548



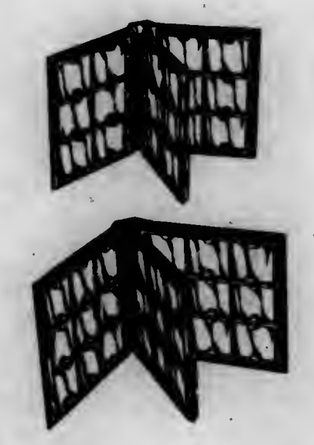
367,794
DOCK PILING LOCKER
Jeffrey D. Brawner, 29701 Elmgrove, St. Clair Shores, Mich. 48082, assignor to Jeffrey D. Brawner, St. Clair Shores, Mich.
Filed Jan. 9, 1995, Ser. No. 33,246
Term of patent 14 years
U.S. Cl. D6—559



367,795
SANITIZING TEST KIT HOLDER
Kevin C. Buckley, and Kathy R. Buckley, both of 721 Fairway Ln., Columbia, S.C. 29210-5733
Filed Jan. 21, 1994, Ser. No. 17,690
Term of patent 14 years
U.S. Cl. D6—567



367,796
RECORDING MEDIUM STORING CASE
Jiro Ozeki, Tokyo, Japan, assignor to Slidex Corporation, Tokyo, Japan
Filed May 12, 1994, Ser. No. 22,834
Claims priority, application Japan, Dec. 2, 1993, 5-36771; Dec. 2, 1993, 5-36772
Term of patent 14 years
U.S. Cl. D6—629



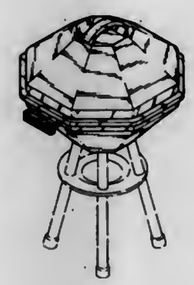
367,797
LIQUID DISPENSING CABINET
Jon W. Hauser, II, Geneva, and Ronald C. Katz, Hinsdale, both of Ill., assignors to Elkay Manufacturing Company, Oak Brook, Ill.
Filed Oct. 20, 1993, Ser. No. 14,390
The portion of the term of this patent subsequent to Feb. 6, 2010, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—307



367,798
ELECTRIC COFFEEMAKER HAVING ONE GLASS SERVER AND ONE INSULATED SERVER
Gunter Sternberg, Solingen, Germany, assignor to Robert Krups GmbH & Co. KG, Solingen, Germany
Filed May 23, 1994, Ser. No. 23,462
Claims priority, application France, Nov. 22, 1993, 936,051
The portion of the term of this patent subsequent to Jun. 28, 2008, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—309

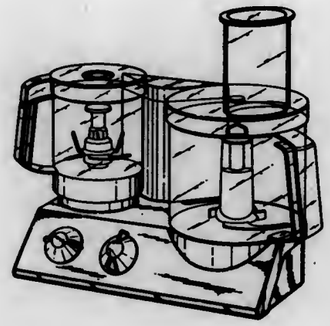


367,799
BARBEQUE GRILL KETTLE
Tse-fa Pai, No. 616, Yungfang Rd., Tungfang Li, Changhua, Taiwan, Prov. of China
Filed Mar. 3, 1995, Ser. No. 35,645
Term of patent 14 years
U.S. Cl. D7—332

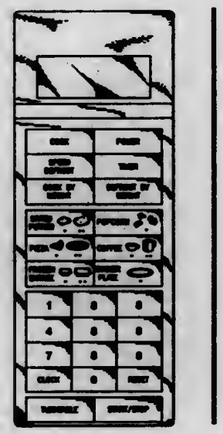




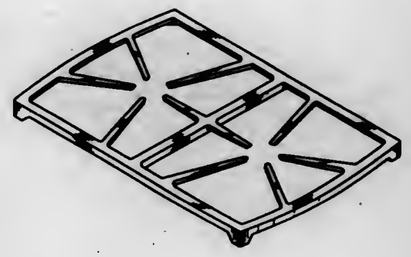
367,800
FOOD PROCESSOR
Ludwig Littmann, Kronberg, Germany, assignor to Braun Aktiengesellschaft, Kronbert/Ts., Germany
Filed Apr. 24, 1995, Ser. No. 37,934
Claims priority, application Germany, Jan. 24, 1994, 94 08 318.5
Term of patent 14 years
U.S. Cl. D7—384



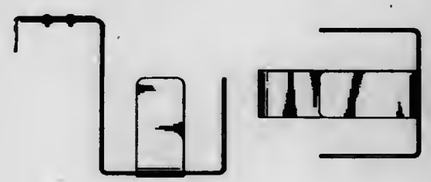
367,801
MICROWAVE OVEN CONTROL PANEL
J. Michael McDavitt, Anniston, Ala., assignor to MCD, Inc., Anniston, Ala.
Filed Jul. 14, 1994, Ser. No. 25,852
Term of patent 14 years
U.S. Cl. D7—406



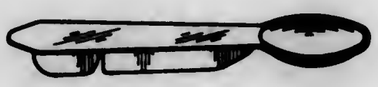
367,802
COOKTOP BURNER GRATE
Robert A. Lewis, Alta Loma; Harold Cole, Monterey Park; Alan Leukhardt, La Verne, and Ray G. Smith, Los Angeles, all of Calif., assignors to Dacor, Pasadena, Calif.
Filed May 13, 1994, Ser. No. 22,882
Term of patent 14 years
U.S. Cl. D7—408



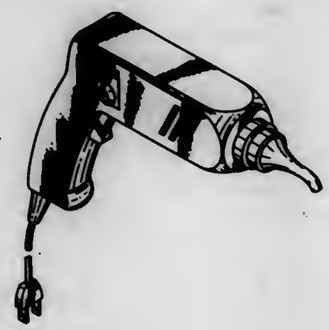
367,803
CUP HOLDER
Wayne Hardway, 6370 Simms St., Hollywood, Fla. 33024
Filed Jun. 1, 1994, Ser. No. 23,883
Term of patent 14 years
U.S. Cl. D7—620



367,804
SPOON
Johan M. A. Pierret, and Karel L. W. Pierret, both of Breughelstraat 48, 2018 Antwerpen, Belgium
Filed Mar. 14, 1995, Ser. No. 36,163
Claims priority, application Benelux TM/Dec. Off., Nov. 8, 1994, 70247
Term of patent 14 years
U.S. Cl. D7—643



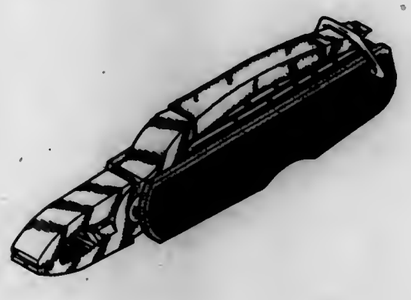
367,805
VARIABLE HEAT GLUE APPLICATION GUN
Kenneth Pringle, R.R. 5 Box 5561 Aberdeen Rd., Moscow, Pa. 18444
Filed Jul. 27, 1994, Ser. No. 26,763
Term of patent 14 years
U.S. Cl. D8—29.1



367,806
COMBINATION LINESMAN'S PLIERS
Timothy L. Neal, HC 71 Box 74, Graysville, Tenn. 37338
Filed Dec. 27, 1994, Ser. No. 32,712
Term of patent 14 years
U.S. Cl. D8—52

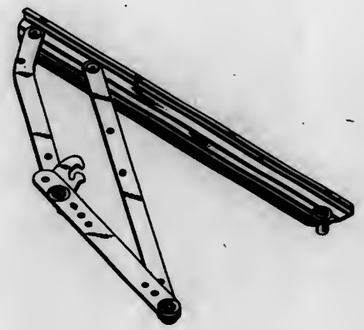


367,807
MULTI PURPOSE HAND TOOL
Cheng-sung Hung, No. 28, Alley 11, Chungnan 50th Lane, Kuanghsin Rd., Taiping Hsiang, Taichung Hsien, Taiwan, Prov. of China
Filed Feb. 1, 1995, Ser. No. 34,316
Term of patent 14 years
U.S. Cl. D8—105

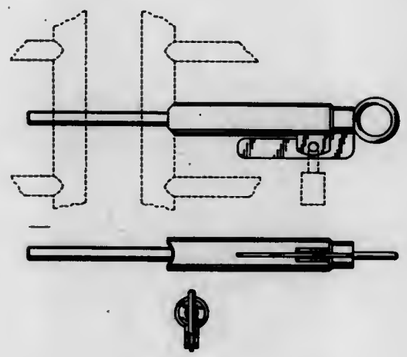




367,808
HINGE
Berthold Blomqvist, Lammhult, Sweden, assignor to Teknoskand Invest AB, Lammhult, Sweden
Filed Feb. 4, 1993, Ser. No. 4,406
Claims priority, application Denmark, Aug. 6, 1992, MA 0768 1992
Term of patent 14 years
U.S. Cl. D8—323



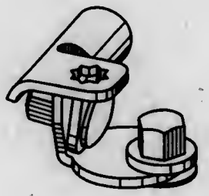
367,809
GATE LATCH
Michael F. Groves, 63291 Nels Anderson Rd., Bend, Oreg. 97708
Filed Jan. 3, 1995, Ser. No. 33,802
Term of patent 14 years
U.S. Cl. D8—339



367,810
RESILIENT LATCH FOR A RETRACTABLE HANDLE
King-Sheng Wang, No. 17, Lane 116, Ta An Gau Rd., Tachia Chen, Taichung Hsien, Taiwan, Prov. of China
Filed Oct. 13, 1994, Ser. No. 29,705
Term of patent 14 years
U.S. Cl. D8—342



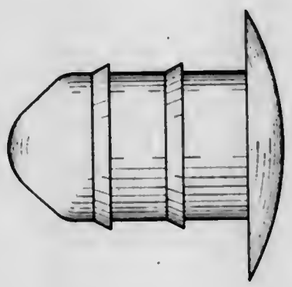
367,811
MOUNTING SUPPORT
Johann Leblhuber, Birkenweg 18, A-4501 Neuhofen/Krems, Austria
Filed Feb. 10, 1995, Ser. No. 34,730
Claims priority, application Austria, Aug. 12, 1994, MU3179/94
Term of patent 14 years
U.S. Cl. D8—354



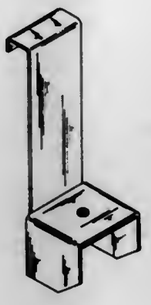
367,812
FLANGE ANCHOR
Allen A. Spielberger, San Jose, and Douglas E. Weiland, Milpitas, both of Calif., assignors to Lord and Sons, Inc., San Jose, Calif.
Filed Jan. 23, 1994, Ser. No. 24,957
Term of patent 14 years
U.S. Cl. D8—385



367,813
RIVET
Robert N. Halstrom, 1515 N. Milpitas, Milpitas, Calif. 95035
Filed Sep. 20, 1994, Ser. No. 28,689
Term of patent 14 years
U.S. Cl. D8—386



367,814
ROOF MOUNTED SNOW GUARD
Joseph D. Zaleski, 510 Burritt St., New Britain, Conn. 06053
Filed May 9, 1991, Ser. No. 697,956
Term of patent 14 years
U.S. Cl. D8—499



367,815
DISPENSING BOTTLE WITH EXTERNAL CARTRIDGE
Stanley I. Mason, Jr., Weston, and Gregory M. Clark, Westport, both of Conn., assignors to Scott Paper Company, Delaware County, Pa.
Filed Aug. 29, 1994, Ser. No. 27,800
Term of patent 14 years
U.S. Cl. D9—347

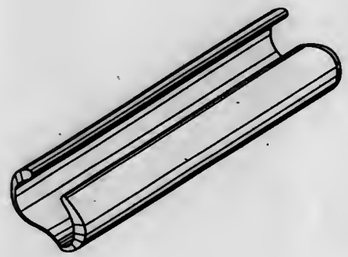




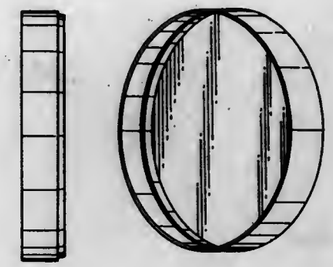
367,816
CLOSABLE CUP
Liming Cai, West Chester, Pa., assignor to Dopaco, Inc., Downingtown, Pa.
Filed Feb. 15, 1995, Ser. No. 34,909
Term of patent 14 years
U.S. Cl. D9—431



367,817
PLASTIC BAG HANDLE
Neil Halpin, and Iris Okouchi-Halpin, both of 124 Hoopika Pl., Wahiawa, Hi. 96786
Filed Oct. 3, 1994, Ser. No. 29,312
Term of patent 14 years
U.S. Cl. D9—434



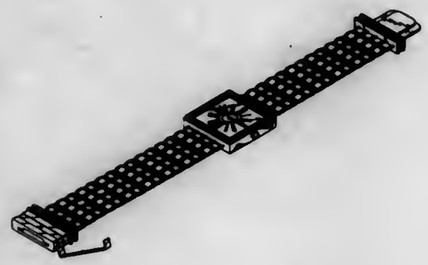
367,818
PLASTIC LID WITH AN EXTENDED SKIRT FOR PAPER CONTAINERS
Ramon Zana, Kent, Ohio, assignor to Cardinal Packaging, Inc., Streetsboro, Ohio
Filed Jan. 13, 1994, Ser. No. 17,430
Term of patent 14 years
U.S. Cl. D9—454



367,819
RECLOSABLE KIDDIE WATCH
Leslie E. Wagenheim, 22 Hunting Hollow Dr., Pepper Pike, Ohio 44124-5247
Filed Nov. 25, 1994, Ser. No. 31,384
Term of patent 14 years
U.S. Cl. D10—32



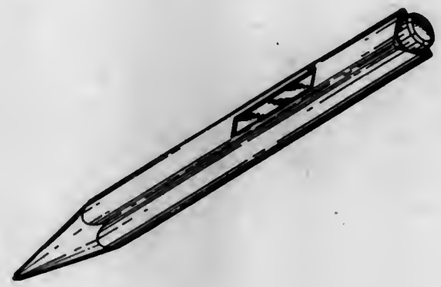
367,820
WATCH
Jacques C. Helleu, Garches, France, assignor to Chanel, Inc., New York, N.Y.
Division of Ser. No. 14,431, Oct. 5, 1993, Pat. No. Des. 358,554, which is a division of Ser. No. 583,783, Sep. 14, 1990, Pat. No. Des. 342,985. This application Apr. 11, 1995, Ser. No. 37,396
Term of patent 14 years
U.S. Cl. D10—32



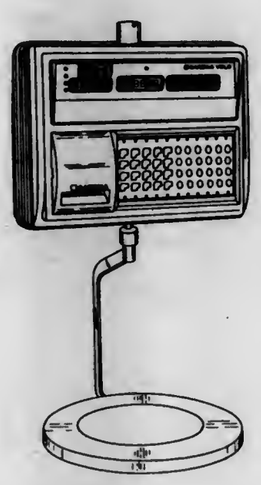
367,821
COATING THICKNESS GAUGE
Helmut Fischer, Industriestrasse, 71069 Sindelfingen, Germany
Filed May 5, 1994, Ser. No. 22,534
Claims priority, application Germany, Nov. 6, 1993, 93 08 822.1
Term of patent 14 years
U.S. Cl. D10—65



367,822
CALIBRATION TOOL
Roger Grabczynski, 11268 Centennial, Whitmore Lake, Mich. 48189
Filed Nov. 29, 1994, Ser. No. 31,595
Term of patent 14 years
U.S. Cl. D10—70

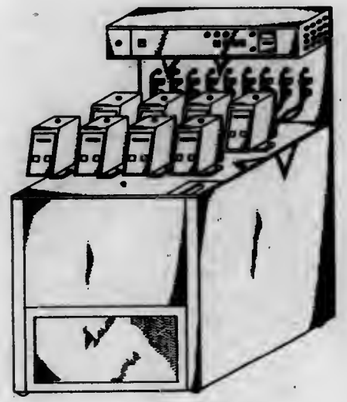


367,823
ELECTRONIC SUSPENDED BALANCE
Riccardo Sassoli, Bologna, Italy, assignor to S.A.R.E.M.A. S.r.l., Bologna, Italy
Filed Oct. 1, 1993, Ser. No. 13,776
Claims priority, application WIPO, Apr. 13, 1993, DM/025810
Term of patent 14 years
U.S. Cl. D10—90

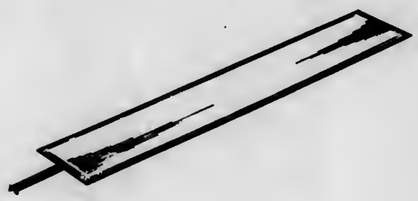




367,824
SENSITIVE ROTATING VISCOMETER INSTRUMENT WITH A STAGGERED MULTIPLE HEAD ARRAY
Theodore W. Selby; Gregory C. Miller, both of Midland, and Michael A. Tubbs, Zeeland, all of Mich., assignors to Tannas Co., Midland, Mich.
Filed Nov. 8, 1994, Ser. No. 30,789
Term of patent 14 years
U.S. Cl. D10—96



367,825
SIGNAL FOR INDICATING THE PROXIMITY OF VEHICLES
Merle Webb, 6291 Melrose Dr., Douglasville, Ga. 30134, and Dale Cook, 5939 Farmbrook La., Rex, Ga. 30273
Filed Jul. 20, 1992, Ser. No. 915,556
Term of patent 14 years
U.S. Cl. D10—104



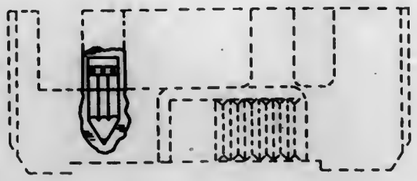
367,826
INFLATABLE DISTRESS SIGNAL KIT
William A. Ball, and Rita D. Ball, both of 2312 Wadding Crescent, Mississauga, Ontario, Canada
Filed Feb. 13, 1995, Ser. No. 34,755
Term of patent 14 years
U.S. Cl. D10—109



367,827
BELL
Chung-Shyan Huang, No. 1-1, Chang Mar Street, Hsiu Shui Hsiang, Chang Hua Hsien, Taiwan, Prov. of China
Filed Jun. 12, 1995, Ser. No. 40,187
Term of patent 14 years
U.S. Cl. D10—116



367,828
INDICATOR PORTION OF A WRITE PROTECT BLOCK
David T. Hoge, Westminster; John C. Owens, Arvada, and William C. Dodt, Broomfield, all of Colo., assignors to Storage Technology Corporation, Louisville, Colo.
Filed Apr. 28, 1993, Ser. No. 7,635
Term of patent 14 years
U.S. Cl. D10—122



367,829
DOMED WATCH GLASS
Hayashi Takigawa, 7-13-2 Nilan Minoo-shi, Osaka, Japan
Filed Jul. 22, 1994, Ser. No. 26,255
Term of patent 14 years
U.S. Cl. D10—132



367,830
AIR CHUTE FOR A TEMPERATURE CONTROLLED CONTAINER
Lyle W. Brys, 1174 Weld Co. Rd. 45, Hudson, Colo. 80642
Filed May 3, 1994, Ser. No. 22,266
Term of patent 14 years
U.S. Cl. D12—97



367,831
MOTORHOME FRONT PANEL UNIT EXTERIOR SURFACE
James F. Shea, Sr., South Bend, Ind., assignor to Gulf Stream Coach, Inc., Nappanee, Ind.
Filed May 6, 1994, Ser. No. 22,524
Term of patent 14 years
U.S. Cl. D12—100



367,832
CHIROPRACTIC BICYCLE TRAINER
Michael Melita, 36 Valley Stream St., Islip Terrace, N.Y. 11752
Filed Jun. 13, 1994, Ser. No. 24,459
Term of patent 14 years
U.S. Cl. D12—114

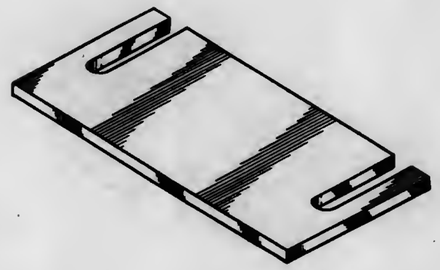




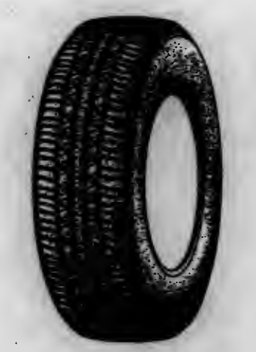
367,833
ROLLING WALKER
Anders Ahlbertz, Almedahlsvägen, Sweden, assignor to Dolomite Svenska AB, Anderstorp, Sweden
Filed Apr. 25, 1995, Ser. No. 37,942
Claims priority, application Sweden, Jan. 26, 1994, 942144
Term of patent 14 years
U.S. Cl. D12—130



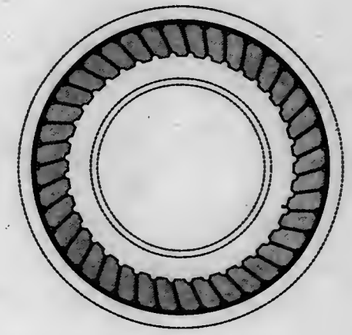
367,834
SEAT FOR A WALKER
James Beavers, 1456 E. 116th St., Cleveland, Ohio 44106, and Cecil R. Embry, 3396 E. 110th St., Cleveland, Ohio 44104
Filed Apr. 3, 1995, Ser. No. 37,084
Term of patent 14 years
U.S. Cl. D12—133



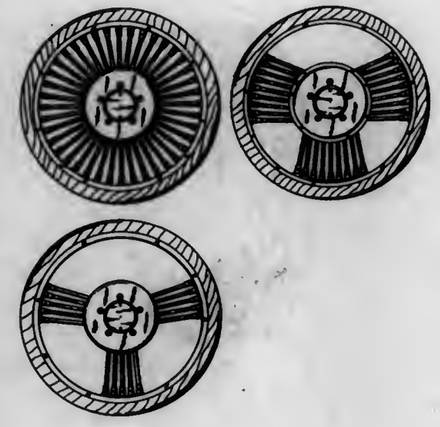
367,835
TIRE
Laurie W. Killian, Louisville, Ky., assignor to Michelin Recherche et Technique S.A., Granges-Paccot, Switzerland
Filed Sep. 20, 1994, Ser. No. 28,692
Term of patent 14 years
U.S. Cl. D12—147



367,836
TIRE SIDEWALL SEGMENT
Keith C. Trares, and Stephanie C. Brown, both of Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Dec. 5, 1994, Ser. No. 31,720
Term of patent 14 years
U.S. Cl. D12—152



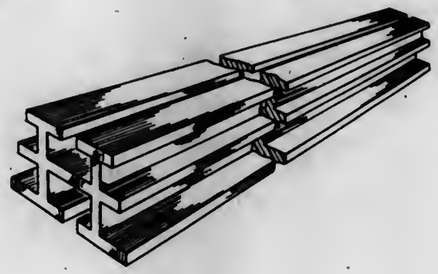
367,837
STEERING WHEEL
Stephen A. Harding, Chandler, Ariz., assignor to Cragar Industries, Inc., Phoenix, Ariz.
Filed Oct. 28, 1994, Ser. No. 30,388
Term of patent 14 years
U.S. Cl. D12—176



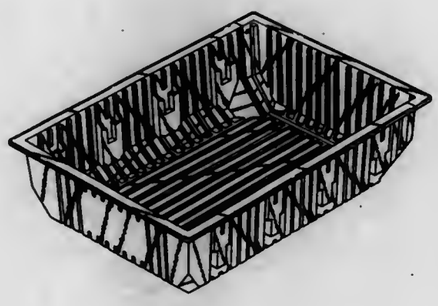
367,838
WHEEL HUB
Steven J. Snook, 3752 Helena Cir., La Verne, Calif. 91750-3238
Filed Oct. 21, 1993, Ser. No. 14,399
Term of patent 14 years
U.S. Cl. D12—207



367,839
EXTRUDED WIPER BACKING STRIP
Barry J. Abbott; Valerie M. Abbott, both of Belgrave; Stephen J. Clarke, and Dino Donchi, both of Ringwood, all of, Australia, assignors to Clean Screen Wipers Pty Ltd, Boronia, Australia
Filed Feb. 4, 1994, Ser. No. 18,378
Claims priority, application Australia, Sep. 24, 1993, 3028/93; Dec. 2, 1993, 3001/93
Term of patent 14 years
U.S. Cl. D12—220



367,840
VEHICLE CARGO AREA PROTECTIVE DEVICE
Jeffery J. VanHoose, Edmond, and James M. Clanton, Ardmore, both of Okla., assignors to Vehicle Protection, Inc., Edmond, Okla.
Filed Sep. 26, 1994, Ser. No. 28,924
Term of patent 14 years
U.S. Cl. D12—221

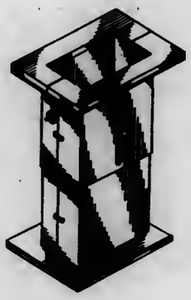




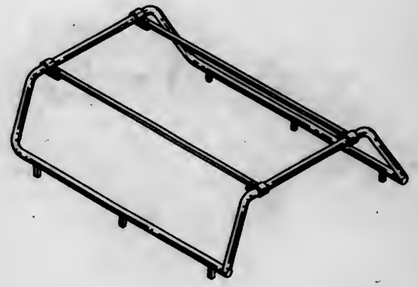
367,841
TUBULAR SUPPORT PILLAR FOR BOAT SEAT OR TABLE
Richard J. Garelick, Minneapolis, Minn., assignor to Garelick Mfg. Co., St. Paul, Minn.
Continuation of Ser. No. 136,018, Oct. 14, 1993, Pat. No. 5,385,323. This application Oct. 3, 1994, Ser. No. 29,811
Term of patent 14 years
U.S. Cl. D12—317



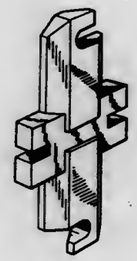
367,842
ANTI-VERMIN SHIELD FOR AN AIRPLANE WHEEL
Jack Madden, 617A Lilikoi Rd., Haiku, Hi. 96708
Filed Oct. 3, 1994, Ser. No. 29,813
Term of patent 14 years
U.S. Cl. D12—345



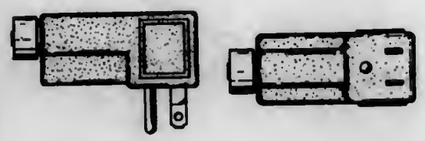
367,843
LOADING RACK FOR PICKUP TRUCKS
Eli Tayar, c/o Magerist Tal., Tel-Josef 019132, Israel
Filed Nov. 30, 1994, Ser. No. 31,985
Claims priority, application Israel, Jun. 1, 1994, 22686; Jun. 1, 1994, 22687
Term of patent 14 years
U.S. Cl. D12—412



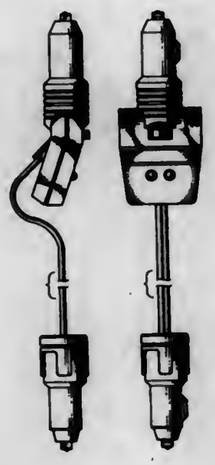
367,844
HEATER INSULATOR
Roger P. Engelke, Huntsville, Ala., assignor to Hart & Cooley, Inc., Holland, Mich.
Filed May 4, 1995, Ser. No. 38,360
Term of patent 14 years
U.S. Cl. D13—131



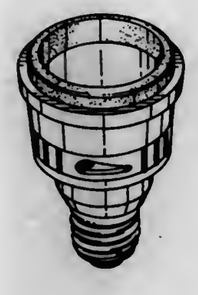
367,845
ELECTRICAL PLUG WITH INTEGRAL OVERLOAD PROTECTION
David Jacobs, El Dorado Hills, Calif., assignor to JDS Products Inc., El Dorado Hills, Calif.
Filed Jun. 26, 1995, Ser. No. 40,723
Term of patent 14 years
U.S. Cl. D13—141



367,846
VEHICLE STARTER CABLE
Eitan B. Moshe, Canoga Park, Calif., assignor to Sun-Mate Corporation, Canoga Park, Calif.
Filed Apr. 24, 1995, Ser. No. 37,888
Term of patent 14 years
U.S. Cl. D13—144



367,847
LAMP SOCKET ADAPTER SWITCH
Joseph A. Tarulli, South Euclid; Paul R. Metcalfe, Bentleyville Village, and Dennis P. Reviock, Sr., Eastlake, all of Ohio, assignors to Lamson & Sessions Co., Cleveland, Ohio
Filed Dec. 28, 1994, Ser. No. 32,487
Term of patent 14 years
U.S. Cl. D13—158



367,848
MODULE FOR RECEIVING INFRA-RED SIGNAL OF REMOTE CONTROLLER
Yoshio Harada; Hiroyuki Takamatsu; Toshiyasu Shimada, and Takanori Yamashita, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Dec. 29, 1994, Ser. No. 34,927
Claims priority, application Japan, Jun. 30, 1994, 6-19420; Jun. 30, 1994, 6-19421
Term of patent 14 years
U.S. Cl. D13—165

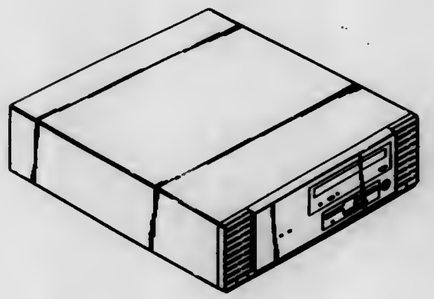




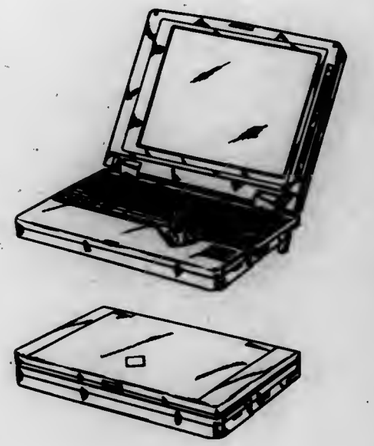
367,849
RACK FOR COMPUTER EQUIPMENT
Gilbert Podinielli, Nice, and Daniel Richelet, St. Barnabe, both of, France, assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 16, 1992, Ser. No. 2,697
Claims priority, application France, Jun. 16, 1992, 92 3733
Term of patent 14 years
U.S. Cl. D13—184



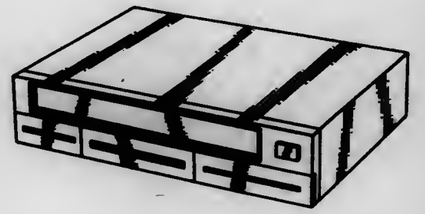
367,850
DESKTOP COMPUTER
Hartmut H. Esslinger, Los Gatos, Calif., assignor to Packard Bell Electronics, Inc., Westlake Village, Calif.
Division of Ser. No. 23,815, Jun. 1, 1994. This application Jun. 6, 1995, Ser. No. 39,842
Claims priority, application Germany, Jan. 5, 1994, M 9400004.2
Term of patent 14 years
U.S. Cl. D14—100



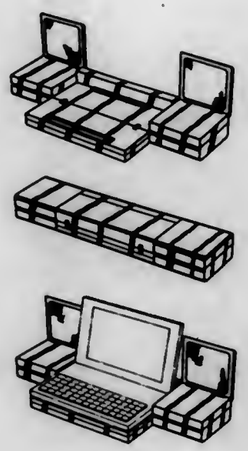
367,851
COMPUTER
Hajime Sekine, Tottori, Japan, assignor to Tottori Sanyo Electric Co., Ltd., Tottori, Japan
Filed Jun. 30, 1995, Ser. No. 36,608
Claims priority, application Japan, Aug. 25, 1994, 6-25796
Term of patent 14 years
U.S. Cl. D14—106



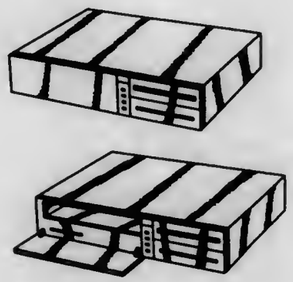
367,852
UNIT FOR EXTENDING THE FUNCTIONS OF ELECTRONIC COMPUTERS
Masaaki Hao, Yokohama, and Toeru Okuyama, Kanagawa, both of, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan
Filed Jan. 10, 1995, Ser. No. 33,335
Claims priority, application Japan, Jul. 22, 1994, 6-21801
Term of patent 14 years
U.S. Cl. D14—107



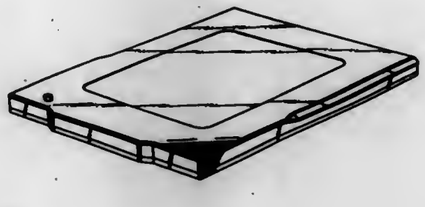
367,853
UNIT FOR EXTENDING THE FUNCTION OF ELECTRONIC COMPUTERS
Masaaki Ilno, Yokohama, and Toeru Okuyama, Kanagawa, both of, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan
Filed Jan. 10, 1996, Ser. No. 33,336
Claims priority, application Japan, Jul. 22, 1994, 6-21798
Term of patent 14 years
U.S. Cl. D14—107



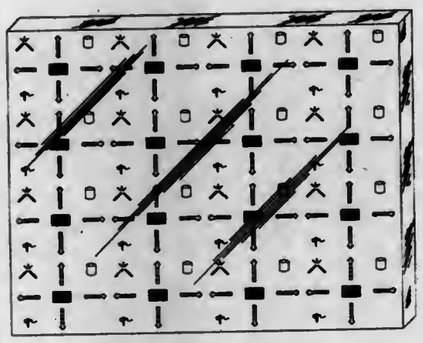
367,854
UNIT FOR EXTENDING THE FUNCTIONS OF ELECTRONIC COMPUTERS
Masaaki Ilno, Yokohama, and Toeru Okuyama, Kanagawa, both of, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan
Filed Jan. 10, 1995, Ser. No. 33,338
Claims priority, application Japan, Jul. 22, 1994, 6-21800
Term of patent 14 years
U.S. Cl. D14—107



367,855
DISK DRIVE
Takao Tanishima, Musashino, Japan, assignor to TEAC Corporation, Tokyo, Japan
Filed Feb. 8, 1995, Ser. No. 34,584
Term of patent 14 years
U.S. Cl. D14—109

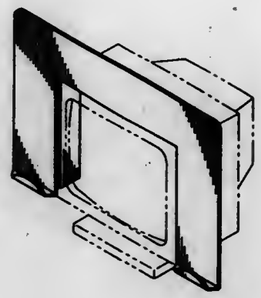


367,856
PARALLEL PROCESSOR DISPLAY PANEL
Daniel A. Neuss, Park City, Utah, assignor to Unisys Corporation, Blue Bell, Pa.
Filed May 3, 1994, Ser. No. 22,412
Term of patent 14 years
U.S. Cl. D14—114

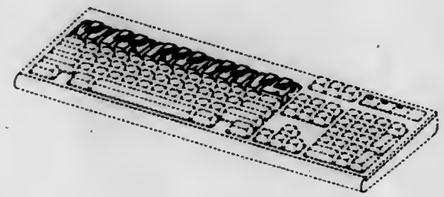




367,857
COMPUTER MONITOR MEMORANDUM BOARD
Frits H. Emmerik, De Brink 1042, 2553 HX The Hague, Netherlands
Filed Oct. 21, 1994, Ser. No. 30,850
Term of patent 14 years
U.S. Cl. D14—114



367,858
PIANO-LIKE COMPUTER KEYS
Randal L. Bertram, Raleigh, and John D. Swansey, Durham, both of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 5, 1994, Ser. No. 31,761
Term of patent 14 years
U.S. Cl. D14—115



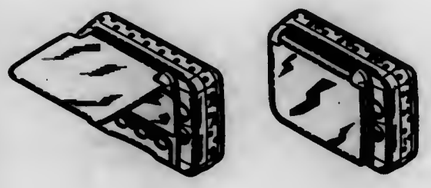
367,859
HOUSING FOR A CELLULAR BASE UNIT
Thomas G. Beaumont, Bedford, Tex., and Neill Butcher, Basingstoke, United Kingdom, assignors to Motorola, Inc., Schaumburg, Ill.
Filed Feb. 28, 1995, Ser. No. 35,464
Term of patent 14 years
U.S. Cl. D14—142



367,860
COMBINED TAPE RECORDER AND RADIO RECEIVER
Kazuo Ichikawa, Kanagawa; Hitoshi Takahashi, Chiba, and Katsumi Kashimura, Tokyo, all of, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed May 18, 1994, Ser. No. 23,124
Term of patent 14 years
U.S. Cl. D14—163



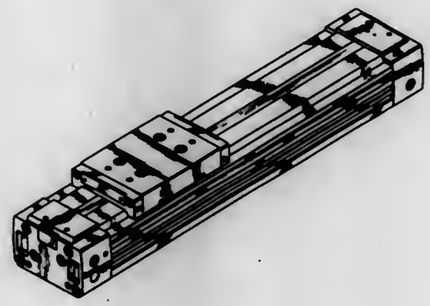
367,861
SELECTIVE CALL RECEIVER
William J. Scheid, Coral Springs; Suthirug Pinsthe-Arnond, Boynton Beach, and Michael J. Hartigan, Boca Raton, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Jun. 9, 1994, Ser. No. 24,153
Term of patent 14 years
U.S. Cl. D14—191



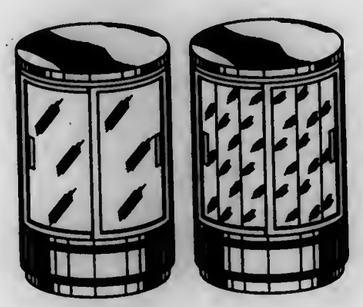
367,862
LOUDSPEAKER SYSTEM
Barry S. Goldfarb, Deland, Fla., assignor to BSG Laboratories, Inc., Deland, Fla.
Filed Jan. 31, 1994, Ser. No. 18,141
Term of patent 14 years
U.S. Cl. D14—213



367,863
RODLESS CYLINDER WITH A MOVABLE TABLE
Masatoshi Shiino, Kakamihara; Terumasa Takeuchi, Aichi, and Osamu Fushihara, Nagoya, all of, Japan, assignors to CKD Corporation, Aichi, Japan
Filed Jan. 27, 1995, Ser. No. 34,164
Claims priority, application Japan, Jul. 29, 1994, 6-23011; Jul. 29, 1994, 6-23012
Term of patent 14 years
U.S. Cl. D15—5

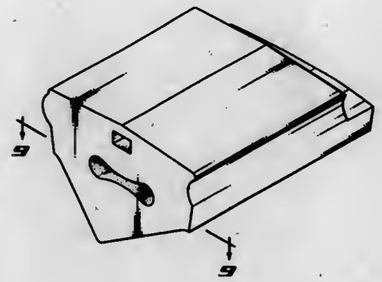


367,864
REFRIGERATED DISPLAY CASE
Edward L. Lacewell, Pontotoc, Miss., assignor to Master-Bilt Products, New Albany, Miss.
Filed Sep. 6, 1994, Ser. No. 28,071
Term of patent 14 years
U.S. Cl. D15—85

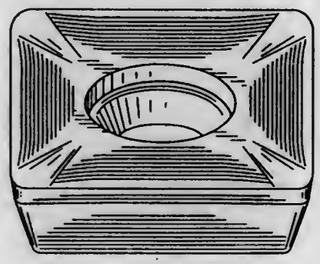




367,865
SINGLE BREAKER ROCK CRUSHER ANVIL
William J. Bajadali, Veradale, Wash., assignor to Spokane Industries, Inc., Spokane, Wash.
Filed Oct. 28, 1994, Ser. No. 30,404
Term of patent 14 years
U.S. Cl. D15—123



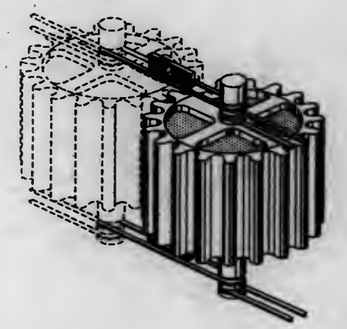
367,866
CUTTING INSERT FOR MILLING CUTTERS
Göran Pantzar, Årsunda, and Lars-Gunnar Wallström, Sandviken, both of, Sweden, assignors to Sandvik AB, Sandviken, Sweden
Filed Mar. 16, 1995, Ser. No. 36,277
Term of patent 14 years
U.S. Cl. D15—139



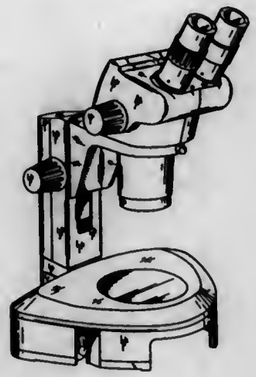
367,867
SMALL-SIZED CENTRIFUGE
Junichi Suzuki, Mito, and Yoshitaka Niinai, Hitachinaka, both of, Japan, assignors to Hitachi Koki Company Limited, Tokyo, Japan
Filed May 3, 1995, Ser. No. 38,301
Claims priority, application Japan, Nov. 4, 1994, 6-33821
Term of patent 14 years
U.S. Cl. D15—147



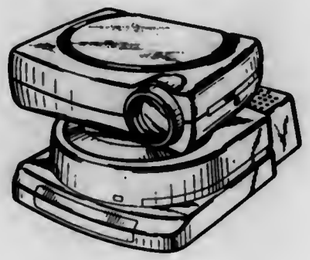
367,868
OIL SLICK RETAINING BARRIER
Robert W. Estes, 5304 U.S. Hwy. 50, Las Animas, Colo. 81054
Filed Apr. 17, 1995, Ser. No. 37,576
Term of patent 14 years
U.S. Cl. D15—150



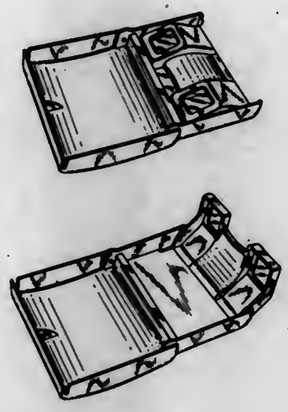
367,869
STEREOMICROSCOPE
Ernest Hofmann-Igl, Davos-Platz, Switzerland, and Werner Hübl, Vienna, Austria, assignors to Leica Inc., Depew, N.Y.
Filed Mar. 15, 1994, Ser. No. 19,931
Term of patent 14 years
U.S. Cl. D16—131



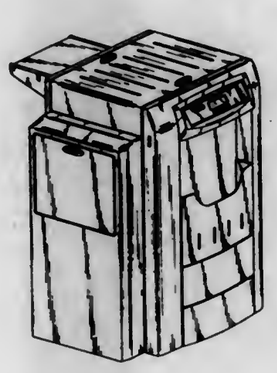
367,870
STILL VIDEO CAMERA FOR A PERSONAL COMPUTER
Toru Shinano, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 17, 1994, Ser. No. 24,615
Claims priority, application Japan, Dec. 21, 1993, 5-38730
The portion of the term of this patent subsequent to Feb. 28, 2009, has been disclaimed.
Term of patent 14 years
U.S. Cl. D16—202



367,871
MINI VIEWER FOR PHOTOGRAPHIC PRINTS
Anthony Lo, 12A Olympian Mansion, 9 Conduit Road, Hong Kong, Hong Kong
Filed Aug. 4, 1993, Ser. No. 11,411
Term of patent 14 years
U.S. Cl. D16—222

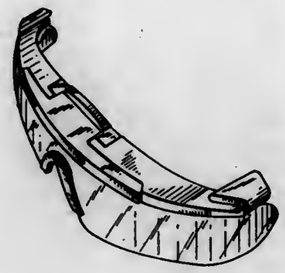


367,872
X-RAY FILM PROCESSOR
Laura R. Whitby, Rochester, and Richard K. Neace, Hilton, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Mar. 3, 1995, Ser. No. 35,662
Term of patent 14 years
U.S. Cl. D16—247





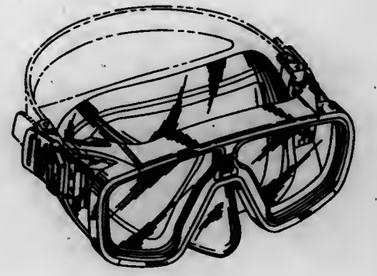
367,873
BILL CLIP-ON, TILT-UP SUNGLASSES
Peter F. Connolly, 57 Farrand Dr., Parsippany, N.J. 07054, and Jack Provost, 17F Canterbury Rd., Chatham, N.J. 07928
Filed Jul. 22, 1994, Ser. No. 26,249
Term of patent 14 years
U.S. Cl. D16—304



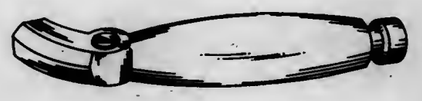
367,874
COMBINED SUNGLASSES AND VISOR
Wen-Te Wang, No. 246-1, Kang-Kou, Kang-Kou Trun, An-Ting Hsiang, Tainan Hsien, Taiwan, Prov. of China
Filed Feb. 16, 1995, Ser. No. 34,961
Term of patent 14 years
U.S. Cl. D16—310



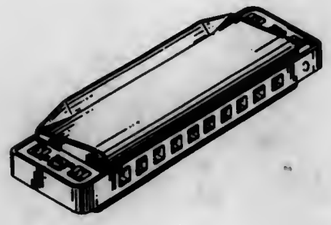
367,875
DIVING MASK WITH FOUR WINDOWS
James R. Lutz, Round Lake; Russell Robertson, Chicago, and Craig Scherer, Wilmette, all of Ill., assignors to Decor Corporation, Northfield, Ill.
Filed Sep. 23, 1994, Ser. No. 28,892
Term of patent 14 years
U.S. Cl. D16—311



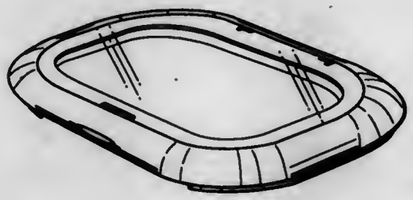
367,876
HINGE FOR SPECTACLES
Claude Rabut, Longchaumois, France, assignor to SIPAL S.A., Morez, France
Filed Mar. 18, 1994, Ser. No. 20,047
Term of patent 14 years
U.S. Cl. D16—334



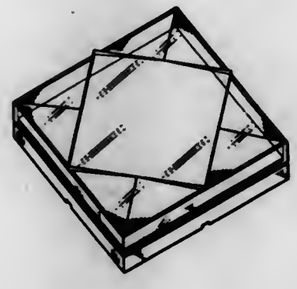
367,877
HARMONICA
Yasuyuki Hayashi, Noda, Japan, assignor to Tombo Musical Instruments Co., Ltd., Tokyo, Japan
Filed Aug. 20, 1993, Ser. No. 12,034
Term of patent 14 years
U.S. Cl. D17—12



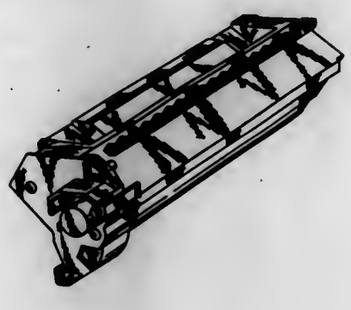
367,878
RUBBER STAMP PAD
June Lee, San Francisco; Jeffrey Smith, San Mateo, and Gray Holland, San Francisco, all of Calif., assignors to Rubber-Stampede Partnership, Oakland, Calif.
Filed Sep. 12, 1994, Ser. No. 28,307
Term of patent 14 years
U.S. Cl. D18—17



367,879
STAMP PAD CONTAINER
Jeffrey Smith, San Mateo; Jeffrey A. Hoefer, Sunnyvale, and Gerard A. Fabershaw, Menlo Park, all of Calif., assignors to Rubber Stampede, Oakland, Calif.
Filed May 30, 1995, Ser. No. 39,523
Term of patent 14 years
U.S. Cl. D18—18

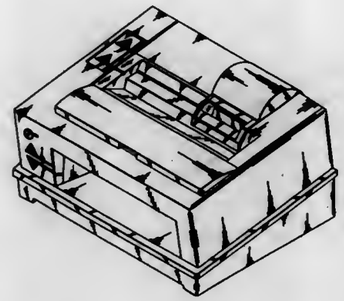


367,880
IMAGE FORMING APPARATUS
Noriaki Miyamoto, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 15, 1994, Ser. No. 31,235
Claims priority, application Japan, May 18, 1994, 6-14175
Term of patent 14 years
U.S. Cl. D18—43

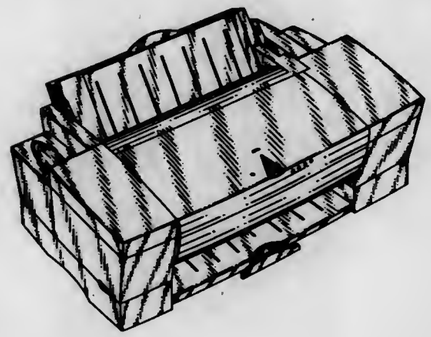




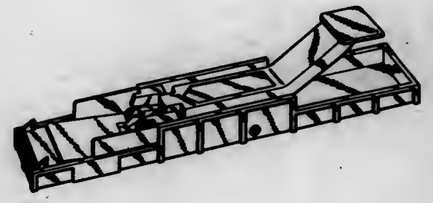
367,881
PRINTER FOR COMPUTERS
Ronald A. Smith, Apex, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed May 18, 1993, Ser. No. 8,553
Term of patent 14 years
U.S. Cl. D18—55



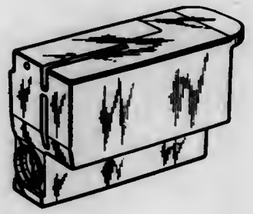
367,882
COMPUTER PRINTER
Timothy J. L. Parsey, Palo Alto, and Christopher Loew, San Francisco, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.
Filed Feb. 16, 1994, Ser. No. 18,860
Term of patent 14 years
U.S. Cl. D18—55



367,883
TOOL FOR INSERTING AND REMOVING A LOGO DIE FOR A DEBOSSMENT STAMPER
William A. Banks, Carrollton; Raymond D. Halstead, II, Flower Mound; Barry C. Kockler, Lewisville, and William J. Ualtale, Farmers Branch, all of Tex., assignors to Taurus Impressions, Inc., Mountain View, Calif.
Filed Jun. 17, 1993, Ser. No. 9,667
Term of patent 14 years
U.S. Cl. D18—56



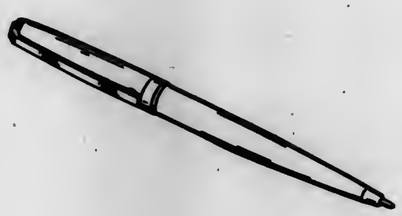
367,884
INK TANK FOR PRINTER
Yoichi Tamcya, Yokohama; Hiroyuki Ishinaga, Tokyo; Hiroyuki Tokuda, Yokohama, and Tetsuya Sekine, Kawasaki, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 29, 1994, Ser. No. 32,823
Claims priority, application Japan, Jul. 5, 1994, 6-19891
Term of patent 14 years
U.S. Cl. D18—56



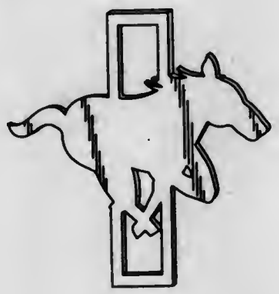
367,885
RIBBON CARTRIDGE FOR PRINTER
Takashi Ikenaga, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Jan. 17, 1995, Ser. No. 33,534
Claims priority, application Japan, Jul. 15, 1994, 6-21269
Term of patent 14 years
U.S. Cl. D18—56



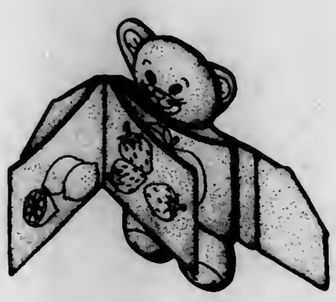
367,887
BALL-POINT PEN
Philippe Compte, Paris, France, assignor to S. T. Dupont S.A., Paris, France
Filed Sep. 14, 1994, Ser. No. 28,126
Claims priority, application France, Mar. 17, 1994, 941562
The portion of the term of this patent subsequent to Mar. 5, 2010, has been disclaimed.
Term of patent 14 years
U.S. Cl. D19—51



367,886
DECORATIVE WINDOW STENCIL
Harold H. Dutton, Jr., 3924 Main St., Slatedale, Pa. 18079-999
Filed Oct. 3, 1994, Ser. No. 29,318
Term of patent 14 years
U.S. Cl. D19—40



367,888
TEACHING AID PUPPET
Yen-ping Lai, No. 8, Lane 211, Linsen E. Rd., 3rd Lin, Taiping Li, East Dist., Chiayi, Taiwan, Prov. of China
Filed Apr. 11, 1995, Ser. No. 37,354
Term of patent 14 years
U.S. Cl. D19—59

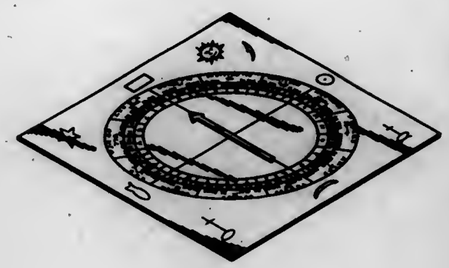




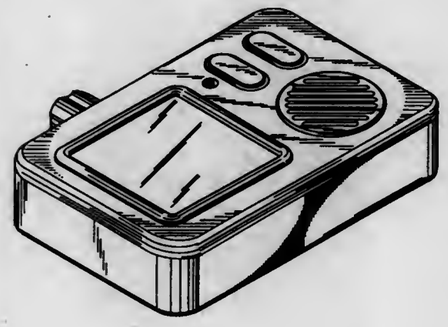
367,889
STATIONERY HOLDER
Tien-Tzu Chiu, P. O. Box 82-144, Taipei, Taiwan, Prov. of China
Filed May 23, 1995, Ser. No. 39,314
Term of patent 14 years
U.S. Cl. D19—77



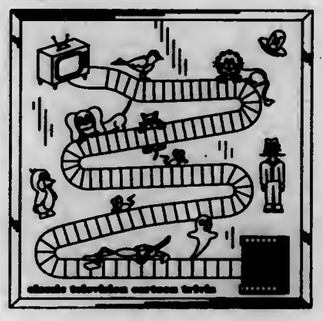
367,891
BOARD GAME
Michael Minutillo, 208 Elaine St., Lakewood, N.J. 08701-5011
Filed Nov. 21, 1994, Ser. No. 31,550
Term of patent 14 years
U.S. Cl. D21—22



367,890
HAND-HELD ELECTRONIC GAME HOUSING
Ralph F. Osterhout, San Francisco, Calif., assignor to Tiger Electronics, Inc., Vernon Hills, Ill.
Filed Jan. 17, 1995, Ser. No. 33,638
Term of patent 14 years
U.S. Cl. D21—13



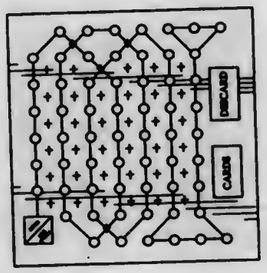
367,892
GAME BOARD
Janet E. Baier, and Denise A. Diggan, both of 707 Hepburn St., Williamsport, Pa. 17701
Filed Dec. 12, 1994, Ser. No. 31,988
Term of patent 14 years
U.S. Cl. D21—25



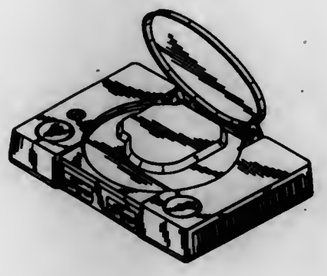
367,893
**BARNYARD GAME BOARD**
Julie A. Parker, 383 S. 15th St., Chariton, Iowa 50049
Filed Oct. 17, 1994, Ser. No. 29,839
Term of patent 14 years
U.S. Cl. D21—31



367,894
**GAME BOARD**
Nathan Monger, P.O. Box 423, Roseburg, Oreg. 97470
Filed Jan. 23, 1995, Ser. No. 33,849
Term of patent 14 years
U.S. Cl. D21—35




367,895
**GAME MACHINE**
Teiyu Goto, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Oct. 7, 1994, Ser. No. 30,012
Claims priority, application Japan, Apr. 11, 1994, 6-9791
Term of patent 14 years
U.S. Cl. D21—48

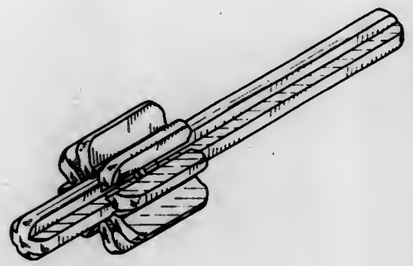


367,896
**TOY BUILDING ELEMENT**
Jens N. Knudsen, Billund, Denmark, assignor to INTERLEGO AG, Baar, Switzerland
Filed Sep. 29, 1994, Ser. No. 29,115
Term of patent 14 years
U.S. Cl. D21—108

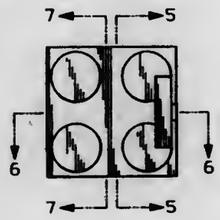




367,897
**TOY BUILDING ELEMENT**
Sten Schmidt, Grindsted, and Kurt Jensen, Vejle, both of, Denmark, assignors to INTERLEGO AG*, Baar, Switzerland
Filed Sep. 29, 1994, Ser. No. 29,152
Term of patent 14 years
U.S. Cl. D21—108



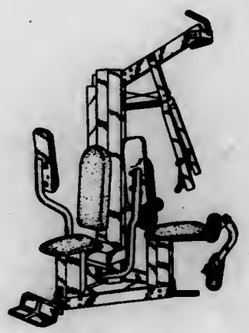
367,898
**TOY CONSTRUCTION BLOCK WITH T-SLOT**
Kenneth P. Glynn, Raritan Township, Hunterdon County, N.J., assignor to Ideal Ideas, Inc., Flemington, N.J.
Filed Dec. 20, 1994, Ser. No. 32,503
Term of patent 14 years
U.S. Cl. D21—108



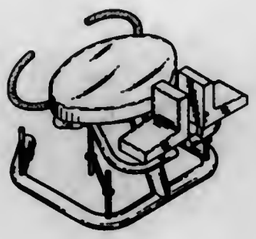

367,899
**DOLL**
Stella McDonnell, 10301 Highway #2, R.R. #2, Port Perry, Ontario, Canada
Filed Apr. 26, 1995, Ser. No. 38,015
Claims priority, application Canada, Mar. 3, 1995, 1995-0508
Term of patent 14 years
U.S. Cl. D21—166



367,900
**PHYSICAL EXERCISER**
Chang-Sung Hu, Room 26, 3Fl., No. 5, Sec. 5, Sinyi Rd., Taipei, Taiwan, Prov. of China
Filed Aug. 16, 1994, Ser. No. 27,196
Term of patent 14 years
U.S. Cl. D21—195



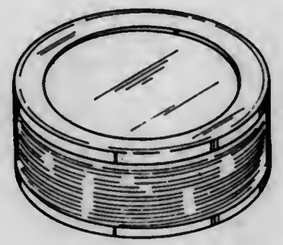
367,901
COMBINED HIP AND THIGH EXERCISE MACHINE
Ken G. Real, Redmond, Wash., assignor to Tunturi, Inc., Redmond, Wash.
Filed Feb. 3, 1995, Ser. No. 34,378
Term of patent 14 years
U.S. Cl. D21—195



367,903
HANDLE FOR HOOP-AND-STICK GAME APPARATUS
Tripp D. Hurlbert, 71760 San Jacinto Rd., #112, Rancho Mirage, Calif. 92270
Filed Jan. 17, 1995, Ser. No. 33,555
Term of patent 14 years
U.S. Cl. D21—210



367,902
HOCKEY PUCK
Kevin Silk, 744 Arbol Verde, Carpinteria, Calif. 93013
Filed Oct. 3, 1994, Ser. No. 29,289
Term of patent 14 years
U.S. Cl. D21—203



367,904
TENNIS RACKET
Joseph J. Hodges, 2 Hull St., Oceanside, N.Y. 11572
Filed Sep. 6, 1994, Ser. No. 30,042
Term of patent 14 years
U.S. Cl. D21—212





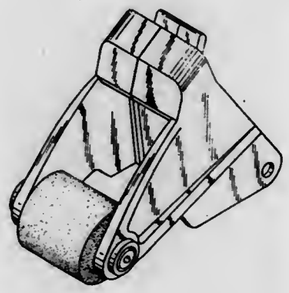
367,905
GOLF CLUB HEAD
Toshihiko Kanazawa, Higashikurume, Japan, assignor to Daiwa Golf Co., Ltd., Higashikurume, Japan
Filed Dec. 29, 1994, Ser. No. 32,911
Claims priority, application Japan, Jun. 29, 1994, 6-19285; Jul. 20, 1994, 6-21762
Term of patent 14 years
U.S. Cl. D21—217



367,907
TEE MARKER
Lloyd I. Sandstrom, 1692 W. Paiute Rd., Bloomington, Utah 84770; Todd L. Sandstrom, 80 N. Main, North Salt Lake, Utah 84054, and Robert I. Sandberg, 628 Sir Michael Dr., Salt Lake City, Utah 84116
Filed Oct. 11, 1994, Ser. No. 29,600
Term of patent 14 years
U.S. Cl. D21—234



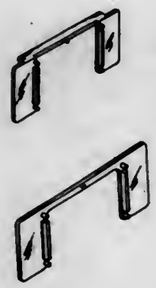
367,906
ROLLERSKATE BRAKE
Robert A. Iverson, Eden Prairie, Minn., assignor to First Team Sports, Inc., Mounds View, Minn.
Filed Apr. 27, 1995, Ser. No. 38,072
Term of patent 14 years
U.S. Cl. D21—226



367,908
BALL CADDY FOR BALL WASHING
David D. Byers, 3902 Rolling Pines Dr., Enterprise, Ala. 36330
Filed Nov. 10, 1994, Ser. No. 30,860
Term of patent 14 years
U.S. Cl. D21—234



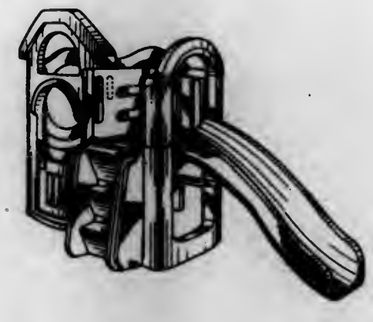
367,909
GOLF PUTTING PRACTICE AID FOR USE ON A GOLF PUTTER
Do W. Lee, 1808 Daeyeon-Dong, Daeyeonsamikbeach Apt. 105-1103, Nam-ku, Pusan, Rep. of Korea
Continuation of Ser. No. 354,851, Dec. 9, 1994. This application Dec. 9, 1994, Ser. No. 32,277
Term of patent 14 years
U.S. Cl. D21—234



367,910
FLOTATION DEVICE FOR HANDICAPPED PERSONS
Kathleen T. Roberts, 2166 Glenn St. Ext., Newberry, S.C. 29108
Filed Feb. 24, 1995, Ser. No. 35,333
Term of patent 14 years
U.S. Cl. D21—237



367,911
ACTIVITY PLAY GYM
Maarten van Huystee, East Aurora, N.Y., assignor to Fisher-Price, Inc., East Aurora, N.Y.
Filed Aug. 19, 1994, Ser. No. 27,331
Term of patent 14 years
U.S. Cl. D21—244



367,912
DOUBLE EDGE KNIFE
Lynn C. Thompson, 2747 Seahorse, Ventura, Calif. 93001
Filed Feb. 7, 1995, Ser. No. 34,530
Term of patent 14 years
U.S. Cl. D22—118

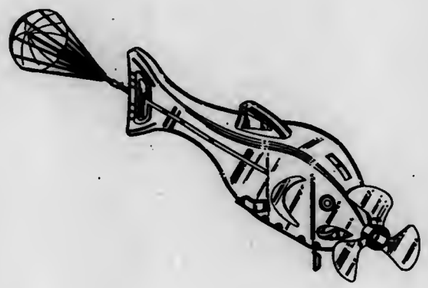




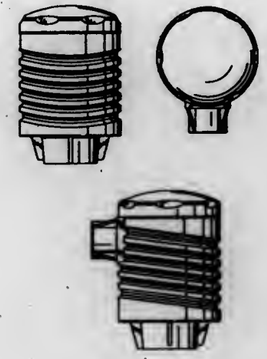
367,913
ELECTRONIC INSECT KILLER
Russell J. Hafford, and Wilmer C. Hafford, both of Rte. #1, Box 149, Allagash, Me. 04774
Filed Nov. 10, 1994, Ser. No. 30,889
Term of patent 14 years
U.S. Cl. D22—123



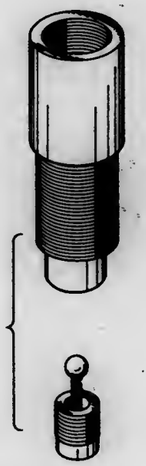
367,914
WATER POWERED JIGGER AND FISH DECOY
Paul C. Dubrinke, Keene, N.H., assignor to Strike Line, Inc., Keene, N.H.
Continuation-in-part of Ser. No. 123,753, Sep. 17, 1993, Pat. No. 5,428,916. This application Sep. 16, 1994, Ser. No. 28,523
Term of patent 14 years
U.S. Cl. D22—134



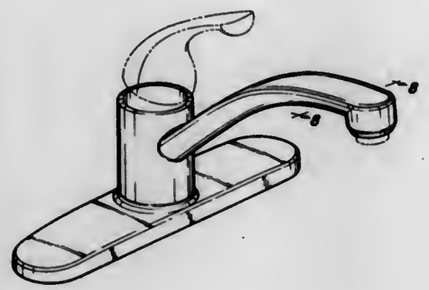
367,915
CONTROLLER ELECTRONICS ENCLOSURE FOR LIQUID HANDLING EQUIPMENT
Stephen T. Daugherty, Colombier, Switzerland, assignor to Flowline Inc., Seal Beach, Calif.
Filed Oct. 2, 1992, Ser. No. 152
Term of patent 14 years
U.S. Cl. D23—200



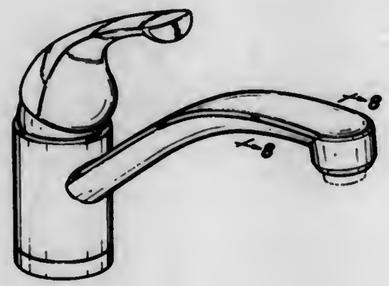
367,916
SAFETY SHUT-OFF VALVE FOR HIGH PRESSURE BOTTLES
Clinton L. Thomas, 1201 N. Custer, Miles City, Mont. 59301, and Jason R. Coldwell, HC46, Kinsey, Mont. 59338
Filed Apr. 5, 1995, Ser. No. 37,147
Term of patent 14 years
U.S. Cl. D23—233



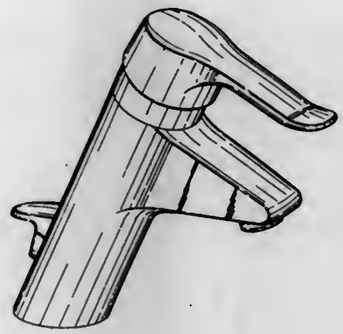
367,917
COMBINED FAUCET BODY, SPOUT AND BASE
Andreas Haug, Stuttgart, Germany; Loran R. Hill, Indianapolis, Ind.; Thomas W. Schonherr, Stuttgart, Germany, and Anthony G. Spangler, Sheridan, Ind., assignors to Masco Corporation of Indiana, Taylor, Mich.
Continuation of Ser. No. 15,040, Nov. 2, 1993, abandoned.
This application Nov. 21, 1994, Ser. No. 31,160
Term of patent 14 years
U.S. Cl. D23—238



367,918
FAUCET
Andreas Haug, Stuttgart, Germany; Loran R. Hill, Indianapolis, Ind.; Thomas W. Schonherr, Stuttgart, Germany, and Anthony G. Spangler, Sheridan, Ind., assignors to Masco Corporation of Indiana, Taylor, Mich.
Continuation of Ser. No. 15,038, Nov. 2, 1993, abandoned.
This application Nov. 21, 1994, Ser. No. 31,163
Term of patent 14 years
U.S. Cl. D23—238



367,919
FAUCET
Hans Lobermeier, Menden, Germany, assignor to Friedrich Grohe Aktiengesellschaft, Hemer, Germany
Filed Apr. 5, 1995, Ser. No. 37,165
Claims priority, application Germany, Jan. 31, 1994, 94 08 477.7
Term of patent 14 years
U.S. Cl. D23—238



367,920
FAUCET SPOUT
Loran R. Hill, Indianapolis, and Anthony G. Spangler, Sheridan, both of Ind., assignors to Masco Corporation of Indiana, Taylor, Mich.
Continuation of Ser. No. 15,162, Nov. 9, 1993, abandoned.
This application Jan. 18, 1995, Ser. No. 33,663
Term of patent 14 years
U.S. Cl. D23—255

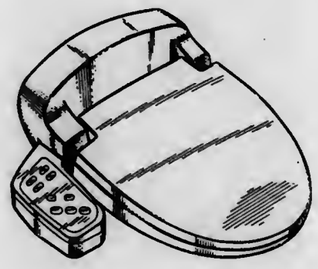




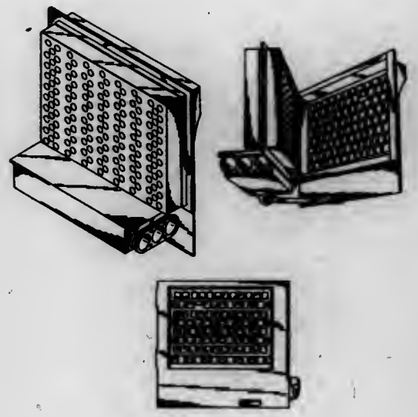
367,921
COVER FOR A REGULATOR AND FILL VALVE
Richard Lewellen, Wooster, Ohio, assignor to The Scott Fetzer Company, Westlake, Ohio
Filed Dec. 2, 1994, Ser. No. 31,702
Term of patent 14 years
U.S. Cl. D23—260



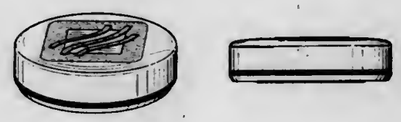
367,922
COMBINED TOILET SEAT, LID, AND BIDET
Jiro Kobayashi, and Toshiaki Nakajo, both of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan
Filed Mar. 10, 1995, Ser. No. 35,987
Claims priority, application Japan, Jan. 7, 1994, 6-30568
Term of patent 14 years
U.S. Cl. D23—311



367,923
FILTER HOUSING
Lindsay D. Rose, 24 Waterloo Street, Heathmont, Victoria, Australia
Filed May 20, 1991, Ser. No. 702,673
Claims priority, application Australia, Mar. 22, 1991, 854/91
Term of patent 14 years
U.S. Cl. D23—365



367,924
SMALL SPACE ODOR NEUTRALIZER
Manhar K. Patel, Saddle Brook, and Matthew S. Okin, Creskill, both of N.J., assignors to Reckitt & Colman Inc., Wayne, N.J.
Filed Mar. 21, 1995, Ser. No. 36,469
Term of patent 14 years
U.S. Cl. D23—369



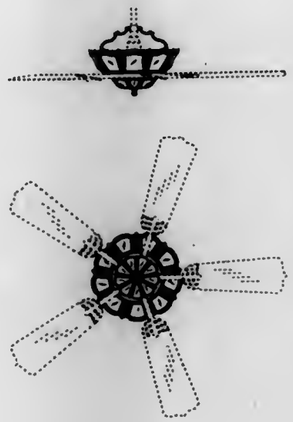
367,925
AIR CURTAIN
Martin Smilo, Los Angeles, Calif., assignor to Mars Sales Company, Inc., Gardena, Calif.
Filed Nov. 2, 1994, Ser. No. 30,586
Term of patent 14 years
U.S. Cl. D23—370



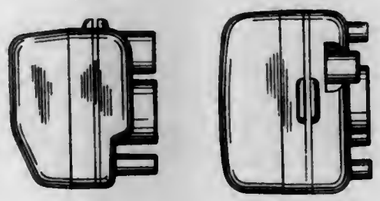
367,926
FIREPLACE SCREEN
Patrick Lin, 14th Fl., No. 128, Sec. 3, Min Sheng E. Rd., Taipei, Taiwan, Prov. of China
Filed Mar. 3, 1995, Ser. No. 35,644
Term of patent 14 years
U.S. Cl. D23—406



367,927
COMBINED CEILING FAN MOTOR HOUSING AND SUPPORT ARMS UNIT
Patrick Dolan, 1020 SW. Westwood Ct., Portland, Oreg. 97201
Filed Nov. 29, 1994, Ser. No. 31,593
Term of patent 14 years
U.S. Cl. D23—411



367,928
DIAPHRAGM PULSATOR
James F. Pharaoh, Hamilton, New Zealand, assignor to Carter Holt Harvey Plastic Products Group Limited, Hamilton, New Zealand
Filed Feb. 17, 1994, Ser. No. 18,879
Claims priority, application New Zealand, Aug. 19, 1993, 25388
Term of patent 14 years
U.S. Cl. D24—109





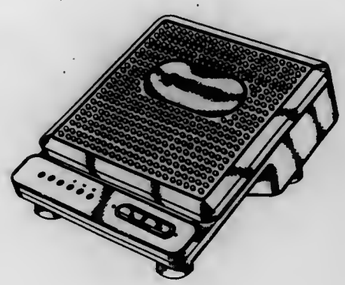
367,929
PACIFIER COVER
Queen E. English, 16140 Cherrylawn, Detroit, Mich. 48221
Filed Oct. 28, 1991, Ser. No. 784,050
Term of patent 14 years
U.S. Cl. D24—193



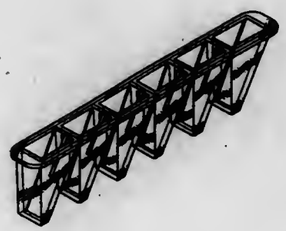
367,930
PORTABLE HYDROMASSAGE UNIT
Miguel Labadia Del Fresno, San Sebastian, Spain, assignor to Electrodomesticos Solac, S.A., Victoria, Spain
Filed Oct. 14, 1993, Ser. No. 14,166
Claims priority, application Spain, Apr. 14, 1993, 129921
Term of patent 14 years
U.S. Cl. D24—201



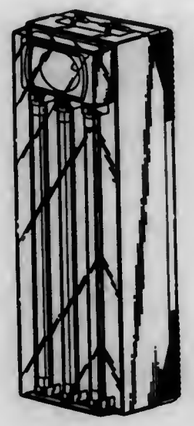
367,931
FOOT MASSAGER
Shinichi Shimizu, Osaka, Japan, assignor to HWE, Inc., North Hollywood, Calif.
Filed Oct. 11, 1994, Ser. No. 29,582
Term of patent 14 years
U.S. Cl. D24—212



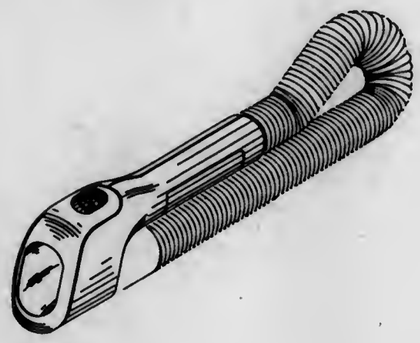
367,932
COMPARTMENTED CONTAINER FOR MICROBIOLOGICAL SAMPLES
Pak L. Lim, Clinical Immunology Unit, Department of Medicine, Prince of Wales Hospital, Shatin, New Territories, Hong Kong
Filed Sep. 2, 1994, Ser. No. 27,943
Claims priority, application United Kingdom, Mar. 3, 1994, 2037508
Term of patent 14 years
U.S. Cl. D24—226



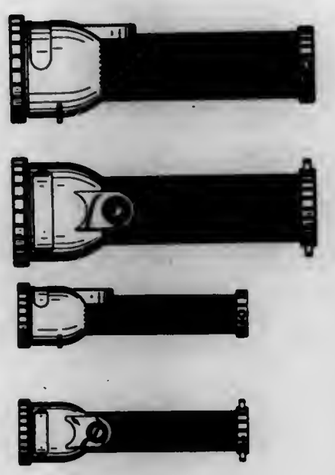
367,933
LANTERN
Leung C. Sum, Hong Kong, Hong Kong, assignor to Create Limited, Tsuen Wan, Hong Kong
Filed Jun. 23, 1994, Ser. No. 24,954
Claims priority, application United Kingdom, Dec. 29, 1993, 2036099
Term of patent 14 years
U.S. Cl. D26—42



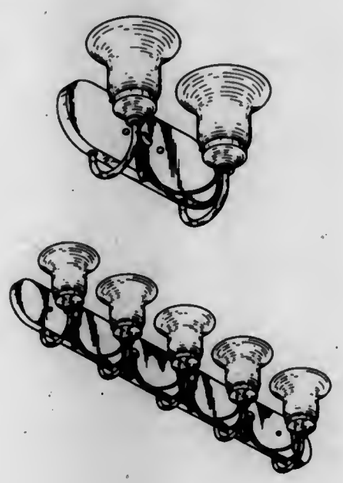
367,934
HEAD FOR A FLASHLIGHT
Richard J. Carbone, Southbury, Conn., assignor to Black & Decker Inc., Newark, Del.
Filed Feb. 6, 1995, Ser. No. 34,504
Term of patent 14 years
U.S. Cl. D26—43



367,935
FLASHLIGHT
Bruce Burns, Portland, Oreg., assignor to Burns Bros., Inc., Portland, Oreg.
Filed Dec. 19, 1994, Ser. No. 32,455
Term of patent 14 years
U.S. Cl. D26—49

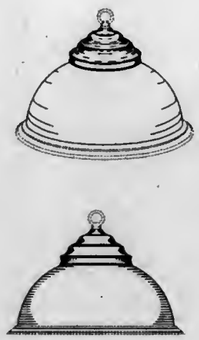


367,936
WALL LAMP
Melissa S. Kay, South Euclid, Ohio, assignor to The L.D. Kichler Co., Cleveland, Ohio
Filed Jan. 5, 1995, Ser. No. 33,095
Term of patent 14 years
U.S. Cl. D26—87

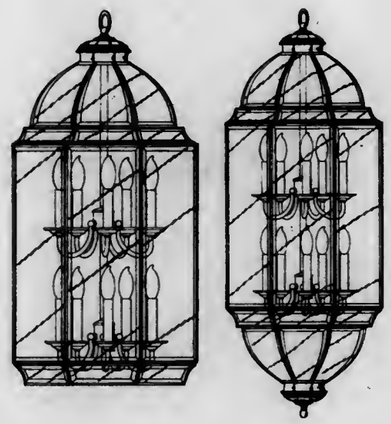




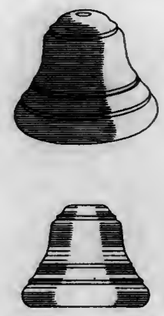
367,937
PENDANT LIGHTING FIXTURE
Patrick S. Dolan, 1901 NW. Upshur St., Portland, Oreg. 97209
Filed Dec. 19, 1994, Ser. No. 32,497
Term of patent 14 years
U.S. Cl. D26—88



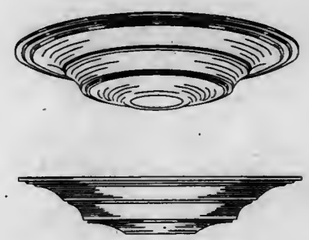
367,938
SUSPENDED LIGHTING FIXTURE
Mark A. Pickett, Louisville, Ky., assignor to Thomas Industries, Inc., Louisville, Ky.
Filed Dec. 14, 1994, Ser. No. 32,226
Term of patent 14 years
U.S. Cl. D26—91



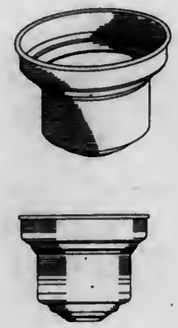
367,939
GLASS HOLDER FOR LIGHTING FIXTURE
Patrick S. Dolan, 1901 NW. Upshur St., Portland, Oreg. 97209
Filed Dec. 19, 1994, Ser. No. 32,492
Term of patent 14 years
U.S. Cl. D26—149



367,940
CANOPY FOR LIGHTING FIXTURE
Patrick S. Dolan, 1901 NW. Upshur St., Portland, Oreg. 97209
Filed Dec. 19, 1994, Ser. No. 32,494
Term of patent 14 years
U.S. Cl. D26—149



367,941
GLASS HOLDER FOR LIGHTING FIXTURE
Patrick S. Dolan, 1901 NW. Upshur St., Portland, Oreg. 97209
Filed Dec. 21, 1994, Ser. No. 32,556
Term of patent 14 years
U.S. Cl. D26—149



367,942
CENTER COLUMN FOR CHANDELIER
Patrick S. Dolan, 1901 NW. Upshur St., Portland, Oreg. 97209
Filed Jan. 4, 1995, Ser. No. 33,854
Term of patent 14 years
U.S. Cl. D26—153



367,943
LIGHTER HOLDER
Gerald Tien, Oakville, Canada, assignor to Bingo Press Specialty Ltd., St. Catharines, Canada
Filed Apr. 1, 1994, Ser. No. 20,886
Claims priority, application Canada, Jan. 8, 1993, 08-10-93-2
Term of patent 14 years
U.S. Cl. D27—144



367,944
ELECTRIC SHAVER
Shunji Izumi, Matsumoto, Japan, assignor to Kabushiki Kaisha Izumi Seiki Seisakusho, Nagano, Japan
Filed Nov. 8, 1994, Ser. No. 31,194
Claims priority, application Japan, Jun. 3, 1994, 6-16388
Term of patent 14 years
U.S. Cl. D28—50

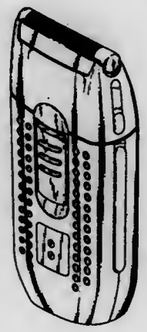




367,945
ELECTRIC DRY SHAVER
Roland Ullmann, Offenbach, Germany, assignor to Braun Aktiengesellschaft, Kronberg, Germany
Filed Sep. 29, 1993, Ser. No. 13,675
Claims priority, application Hague Agreement, Apr. 8, 1993, DMA/002109
The portion of the term of this patent subsequent to Jun. 20, 2009, has been disclaimed.
Term of patent 14 years
U.S. Cl. D28—51



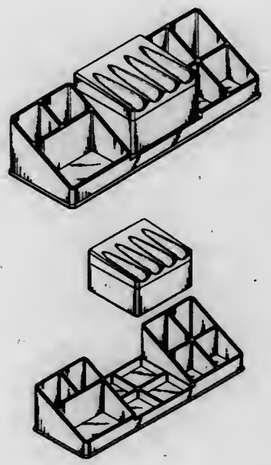
367,946
ELECTRIC SHAVER
Hisanori Akashi; Gen Nagai, and Akira Kojima, all of Kokubunji, Japan, assignors to Kyushu Hitachi Maxell, Ltd., Fuknoka, Japan
Filed May 19, 1994; Ser. No. 23,213
Term of patent 14 years
U.S. Cl. D28—51



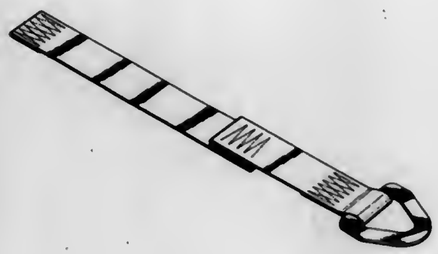
367,947
DRY SHAVER
Albart J. Kip, and Marten F. Elkerbout, both of Groningen, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Dec. 14, 1994, Ser. No. 32,199
Claims priority, application Hague Agreement, Jun. 27, 1994, DMA/002554
Term of patent 14 years
U.S. Cl. D28—51



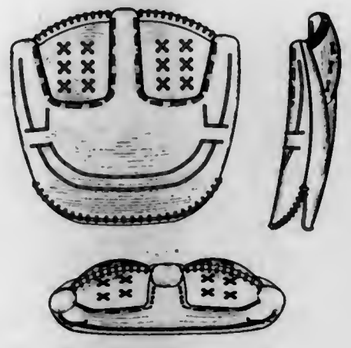
367,948
MAKE-UP ORGANIZER
Junior J. Hsu, 3633 Palm Canyon, Northbrook, Ill. 60062
Filed Oct. 12, 1994, Ser. No. 29,649
Term of patent 14 years
U.S. Cl. D28—73



367,949
FALL-ARREST STRAP
Richard Vallance, 160 Applewood Crescent, Unit 31, Concord, Ontario, Canada
Filed Feb. 7, 1994, Ser. No. 18,550
Term of patent 14 years
U.S. Cl. D24—100



367,950
DOUBLE POCKET GLOVE
Robert W. Sewell, 22 Thompson Rd., Grand Bay, New Brunswick, Canada
Filed Oct. 24, 1994, Ser. No. 30,197
Term of patent 14 years
U.S. Cl. D29—115



# LIST OF PATENTEES

TO WHOM

## PATENTS WERE ISSUED ON THE 12th DAY OF MARCH, 1996

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Sugiyama, Norihide; Watakabe, Atsushi; Yokotsuka, Shunsuke; Hiroi, Atsuo; Naritomi, Masaki; Shirota, Naoko; Aosaki, Ko; and Nakamura, Masaru, 5,498,657, Cl. 524-463.000.

Aoshima, Shinichiro: *See—*
Takahashi, Hironori; Urakami, Tsuneyuki; Aoshima, Shinichiro; and Hirano, Isuke, 5,499,190, Cl. 364-481.000.

Aotsu, Hiroaki: *See—*
Kimura, Koichi; Ogura, Toshihiko; Aotsu, Hiroaki; Ikegami, Mitsuru; Kuwabara, Tadashi; Enomoto, Hiromichi; and Kyoda, Tadashi, 5,499,222, Cl. 365-189.010

Aoyama, Takahiro; Nakazaki, Mitsuo; Banba, Akikazu; Yoshida, Masatoshi; Matsunaga, Toshiaki; and Tsubakimoto, Tsuneo, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Coating compositions containing crosslinked spherical fine particles. 5,498,670, Cl. 525-217.000.

Aoyama, Toshimi: *See—*
Uchikawa, Kiyoshi; Komano, Hiroshi; Aoyama, Toshimi; and Ohta, Katsuyuki, 5,498,498, Cl. 430-7.000.

Appel, James J.; and Paoli, Thomas L., to Xerox Corporation. Apparatus for wobble correction using an agile beam polygon ROS and all-spherical optics. 5,498,869, Cl. 250-236.000.

Appleford, David E.; and Engerran, David, to Alpha Thames Engineering Limited. Valve actuator. 5,497,672, Cl. 74-424.8VA.

Apprille, Domenic V., Jr., to Gillette Company, The. Razor handle assembly. 5,497,551, Cl. 30-85.000.

APV Gaulin GmbH: *See—*
Jarchau, Michael; and Jahnke, Steffen, 5,498,075, Cl. 366-176.200.

APV Rosista A/S: *See—*
Agger, Frode, 5,498,141, Cl. 417-231.000.

Arabeyre, Françoise; and Arabeyre, René, to Cognon-Morin. Remedial support appliance for medical use on a leg or an arm. 5,497,513, Cl. 2-240.000.

Arabeyre, René: *See—*
Arabeyre, Françoise; and Arabeyre, René, 5,497,513, Cl. 2-240.000.

Aradigm Corporation: *See—*
Lloyd, Lester J.; Lloyd, Peter M.; and Rubsamen, Reid M., 5,497,763, Cl. 128-200.140.
Ritson, Carl; and Rubsamen, Reid M., 5,497,764, Cl. 128-200.140.

Arai, Hideaki; and Uetsuka, Hisato, to Hitachi Cable, Ltd. Guided-wave optical multi/demultiplexer. 5,499,308, Cl. 385-27.000.

Arakatsu, Hiroshi: *See—*
Tsukahara, Jiro; and Arakatsu, Hiroshi, 5,498,505, Cl. 430-213.000.

Arakawa, Masahiro: *See—*
Sasaki, Masaaki; Horii, Tohru; Arakawa, Masahiro; and Murata, Kazuo, 5,498,496, Cl. 429-233.000.

Araki, Kyousuke: *See—*
Todo, Yoshinori; Sakamoto, Masami; Ushijima, Noriaki; Sonoda, Akira; Miura, Yukio; and Araki, Kyousuke, 5,498,121, Cl. 414-719.000.

Araki, Toshiyuki; Aono, Kunitoshi; and Toyokura, Masaki, to Matsushita Electric Industrial Co., Ltd. Digital processor capable of concurrently executing external memory access and internal instructions. 5,499,348, Cl. 395-375.000.

Arano, Yukari; and Onishi, Ken, to Mitsubishi Denki Kabushiki Kaisha. Digital signal recording method and digital video tape recorder. 5,499,106, Cl. 358-343.000.

Araya, Junji: *See—*
Furuya, Tadashi; Araya, Junji; Yano, Hideyuki; and Kugoh, Harumi, 5,499,080, Cl. 355-208.000.

ARCO Chemical Technology, Inc.: *See—*
Le-Khac, Bi, 5,498,583, Cl. 502-154.000.

Aref, Walid: *See—*
Barbara, Daniel; Johnson, Stephen; Mehrotra, Sharad; and Aref, Walid, 5,499,360, Cl. 395-600.000.

Arens, John W.: *See—*
Kull, A. Corbett S.; Bakke, Bradley B.; and Arens, John W., 5,499,273, Cl. 375-355.000.

Arinc Research Corporation: *See—*
Smith, Gary B., 5,499,187, Cl. 363-142.000.

Aritech B.V.: *See—*
Pantus, Mathias M. J., 5,499,016, Cl. 340-555.000.

Armco Inc.: *See—*
van Ooij, Wim J., 5,498,481, Cl. 428-413.000.

Armstrong, Walter N.: *See—*
Warren, Oscar E.; Armstrong, Walter N.; and Beard, Bob J., 5,497,857, Cl. 188-4.00R.

Armstrong, William D. Self-powered fastener system. 5,497,929, Cl. 227-9.000.

Arnhem, Inc.: *See—*
Bonner, Michael J., 5,498,439, Cl. 426-650.000.

Arnold, Fred E.; and Chen, Jom P., to United States of America, Air Force. Phosphonic acid-pendent benzoxazole copolymers. 5,498,784, Cl. 528-337.000.

Arnold, James M.: *See—*
Clift, David W.; Arnold, James M.; Colwell, Robert P.; and Glew, Andrew F., 5,499,352, Cl. 395-412.000.

Arnold, Manfred; Blang, Guido; Gegenwart, Rainer; Ritter, Jochen; and Stoll, Helmut, to Leybold Aktiengesellschaft. Arrangement for coating or etching substrates. 5,498,291, Cl. 118-723.00E.

Arnold, Mark L.; Brannan, James R.; Kus, Richard A.; and Romine, Richard L., to Oxytech Systems, Inc. Electrolysis cell diaphragm reclamation. 5,498,321, Cl. 205-525.000.

Arnold, Sidney A., to Baldwin, Gordon George. Saddle cloth. 5,497,602, Cl. 54-44.700.

Arnone, Joseph: *See—*
Ortyn, William E.; and Arnone, Joseph, 5,499,097, Cl. 356-372.000.

Arnst, Theodore C., to Nalco Chemical Company. In situ formation of corrosion inhibitors. 5,498,813, Cl. 585-466.000.

Aronson, Michael P.: *See—*
Tsaur, Liang S.; Slayton, Michael; and Aronson, Michael P., 5,498,378, Cl. 264-4.400.

Arrington, Noel D.: *See—*
McLean, Michael E.; Pinkston, Melvin D.; Arrington, Noel D.; Wolters, Dennis R.; Shannon, Allen T.; Ferguson, Thomas G.; Macfarlane, Graham; Baldermann, Chris; and Dolan, John, 5,498,470, Cl. 428-246.000.

ARS Corporation: *See—*
Koch, Richard L.; and Gray, Alan C., 5,497,643, Cl. 72-217.000.

Arutunian, Tom. Auto-adjusting finger inserts for a bowling ball. 5,498,209, Cl. 473-128.000.

Arvedi, Giovanni; and Gosio, Giovanni, to Arvedi, Giovanni. Manufacture of billets and blooms from a continuously cast steel. 5,497,821, Cl. 164-476.000.

Arvind: *See—*
Nikhil, Rishiyur S.; and Arvind, 5,499,349, Cl. 395-375.000.

Arweiler, Hans-Werner; and Wolf, Andreas, to Siemens Aktiengesellschaft. Process for determining the origin of bit errors in a data stream transmitted from a data source to a data receiver. 5,499,339, Cl. 395-183.190.

Asahi Denka Kogyo K.K.: *See—*
Kamakura, Tamiji; Tanaka, Noriyoshi; Namiwa, Kimiyoshi; Tatsumi, Yukio; Namiki, Masato; and Yokobori, Hideo, 5,498,356, Cl. 252-50.000.

Asahi Glass Company: *See—*
Matsumoto, Itsuo; Furui, Yuji; and Tsuchimoto, Yoshihiro, 5,498,274, Cl. 65-80.000.

Asahi Glass Company Ltd.: *See—*
Sugiyama, Norihide; Watakabe, Atsushi; Yokotsuka, Shunsuke; Hiroi, Atsuo; Naritomi, Masaki; Shirota, Naoko; Aosaki, Ko; and Nakamura, Masaru, 5,498,657, Cl. 524-463.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Nakata, Masahiro, 5,498,944, Cl. 318-640.000.
Wakui, Yoshio, 5,499,105, Cl. 358-342.000.

Aschoff, John G.; Berger, Jeffrey A.; Burton, David A.; McNutt, Bruce; and Kurtz, Stanley C., to International Business Machines Corporation. Method and means for dynamic cache management by variable space and time binding and rebinding of cache extents to DASD cylinders. 5,499,354, Cl. 395-456.000.

Ashjian, Henry; Peel, Larry C.; Sheerin, Thomas J.; and Williamson, Robert S., to Mobil Oil Corporation. Non toxic, biodegradable well fluids. 5,498,596, Cl. 507-103.000.

Askari, Syed H.; Neidlinger, Hermann H.; and Gandhi, Khushroo, to Pilkington Barnes Hind, Inc. Maserial for use in the manufacture of polymeric articles. 5,498,681, Cl. 526-246.000.

Asnis, Stanley E.; and Crombie, John S., to Howmedica Inc. Screw and driver. 5,498,265, Cl. 606-73.000.

Aso, Yutaka: *See—*
Inoue, Masahide; Kato, Mamoru; Tsuyama, Koichi; Murata, Koji; and Aso, Yutaka, 5,499,083, Cl. 355-251.000.

AST Research, Inc.: *See—*
Kadlec, Ken A.; and Kadlec, Wendy P., 5,499,353, Cl. 395-445.000.

Aswad, Andrew D.; Severs, Dale; Silvestri, Joyce; Forman, Hugh M.; Woo, Lecon; Hiller, Thomas D.; Walsh, Lisa S.; Wade, Sandra; Chan, Eddie; Balteau, Patrick; Peluso, Franco; and Henaut, Eric, to Baxter International Inc. Port adaptor and protector and container having same. 5,498,253, Cl. 604-403.000.

AT&T Corp.: *See—*
Agrawal, Vishwani D.; and Chakraborty, Tapan J., 5,499,249, Cl. 371-25.100.
Bell, Randall F.; Kochanski, Gregory P.; and Thomson, John, Jr., 5,498,925, Cl. 313-497.000.
Blonder, Greg E.; Johnson, Bertrand H.; and Knoedl, George, Jr., 5,499,292, Cl. 379-433.000.
Bruno, Richard F.; and Markowitz, Robert E., 5,499,289, Cl. 379-220.000.
Kepley, Garry D., 5,499,291, Cl. 379-265.000.
La Fontaine, Bruno M.; White, Donald L.; and Wood, Obert R., II, 5,498,923, Cl. 313-467.000.
Miller, David A. B., 5,498,863, Cl. 250-214.100.
Mosch, Theo W. M.; Ota, Yusuke; Swartz, Robert G.; and van Wijk, Richard A., 5,499,244, Cl. 370-94.100.
Shoji, Masakazu, 5,499,208, Cl. 365-189.010.

Atassi, G.: *See—*
Bisagni, E.; Jaszold-Howorko, R.; Atassi, G.; and Pierre, A., 5,498,611, Cl. 514-232.800.

Atkinson, Robert G., to Microsoft Corporation. Method and system for connecting objects using alert and running states. 5,499,369, Cl. 395-650.000.

Atlantic Richfield Company: *See—*
Fletcher, Paul A.; Montgomery, Carl T.; and Ramos, Gangerico G., 5,497,658, Cl. 73-151.000.
Hainey, Bryant W.; and Weng, Xiaowei, 5,497,831, Cl. 166-308.000.

Atlas, Sheldon M. Poly(2-hydroxyethyl methacrylate) and all copolymers of poly-HEMA fibers and cosmetic compositions containing same. 5,498,407, Cl. 424-70.700.

Atoma International, Inc.: *See—*
Severini, Joseph A.; Yee, Daniel C. L.; Tame, Omar D.; Plaza, Shelly M.; Gravenstruter, Noel P.; Jovan, Dragi; Susko, Thomas J.; and Schulte, Steven A., 5,498,052, Cl. 296-65.100.

Atsumi, Akira: *See—*
Kyushima, Hiroyuki; Nagura, Koji; Hasegawa, Yutaka; Kawano, Eiichiro; Kuroyanagi, Tomihiko; Atsumi, Akira; and Mizuide, Masuya, 5,498,926, Cl. 313-533.000.

Augerscope, Inc.: *See—*
Irwin, Lawrence F., 5,497,516, Cl. 4-694.000.

Ausimont S.p.A.: *See—*
Abusleme, Julio A.; and Maccone, Patrizia, 5,498,680, Cl. 526-209.000.
Navarrini, Walter; Tortelli, Vito; Colaianna, Pasqua; and Abusleme, Julio A., 5,498,682, Cl. 526-247.000.

Ausmelt Limited: *See—*
Floyd, John M.; Chard, Ian L.; and Baldock, Brian R., 5,498,277, Cl. 75-385.000.

Autoline, Inc.: *See—*
Hiebert, Jacob F., 5,497,887, Cl. 209-538.000.

Avant Guardian Limited: *See—*
MacKenzie, John R. S.; and Collins, Bernard P., 5,499,372, Cl. 395-725.000.

Averbukh, Moshe. Electromagnetic percussion device. 5,497,555, Cl. 30-362.000.

Avid: *See—*
Beigel, Michael L., 5,499,017, Cl. 340-572.000.

Axelbaum, Richard L.; and DuFaux, Douglas P., to Washington University. Method and apparatus for producing high purity and unagglomerated submicron particles. 5,498,446, Cl. 427-212.000.

Aya, Yoichiro: *See—*
Harata, Yasuki; Kameda, Masaaki; Sano, Keiichi; and Aya, Yoichiro, 5,498,904, Cl. 257-62.300.

Ayache, Nicholas: *See—*
Thirion, Jean-Philippe; Ayache, Nicholas; Monga, Olivier; and Gourdon, Alexis, 5,499,322, Cl. 395-118.000.

Aydin, Oral; Portugall, Michael; Neutzner, Josef; and Maechtle, Walter, to BASF Aktiengesellschaft. Aqueous polymer dispersion. 5,498,655, Cl. 524-458.000.

Ayorinde, Folahan O.; and Nwaonicha, Chukwuma P., to Howard University. Synthesis of nylon-11 monomer. 5,498,733, Cl. 554-132.000.

Azevedo, Aaron: *See—*
Allen, Bernie; Rusnak, Joel; Azevedo, Aaron; and Kimball, Neal, 5,497,564, Cl. 36-50.100.

Azuma, Nobuo; Furuhata, Takashi; Takeda, Katsumi; and Takahashi, Hiroaki, to Hitachi, Ltd. Magnetic recording apparatus with capability of recording signals of a plurality of different television systems. 5,499,145, Cl. 360-33.100.

B. F. Goodrich Company, The: *See—*
Pourahmady, Naser; Anderle, Gary A.; and Williamson, Alex S., 5,498,658, Cl. 524-502.000.

B.I.G. Batteries Limited: *See—*
Gatehouse, Peter P., 5,498,486, Cl. 429-7.000.

Babasaki, Masahiro: *See—*
Nagami, Masaaki; Sako, Kazuya; Babasaki, Masahiro; and Sakiyama, Kazuhiro, 5,499,302, Cl. 381-71.000.

Bachtel, Robert W.: *See—*
Stangeland, Bruce E.; Krasner, David C.; Smith, David S.; McCall, James T.; Scheuerman, Georgieanne L.; Bachtel, Robert W.; and Johnson, David R., 5,498,327, Cl. 208-148.000.

Backes, Paul G.; and Long, Mark K., to United States of America, National Aeronautics and Space Administration. Extended task space control for robotic manipulators. 5,499,320, Cl. 395-95.000.

Bae, Sang M., to Hyundai Electronics Industries Co., Ltd. Photoresist film coating method. 5,498,449, Cl. 427-240.000.

Bae, Sang M., to Hyundai Electronics Industries Co., Ltd. Overlay measurement mark and method of measuring an overlay error between multi patterns in a semiconductor device using the measurement mark. 5,498,500, Cl. 430-22.000.

Baets, Jozef; and Zehnder, Marcel, to ABB Management AG. Radial-flow exhaust gas turbocharger turbine with adjustable guide vanes. 5,498,128, Cl. 415-164.000.

Bagaoisan, Celso S. J.; Shanahan, John P.; Muni, Ketan P.; Hammack, Elizabeth N.; Abrams, Robert M.; Peacock, James C., III; and Tremulis, William S., to Advanced Cardiovascular Systems, Inc. Intravascular catheter with a replaceable shaft section. 5,498,240, Cl. 604-96.000.

Bagley, Rodney D.; Brown, Jacqueline L.; and Wedding, Brent M., to Corning Incorporated. Gas-enriched light-off. 5,497,617, Cl. 60-274.000.

Bagli, Jehan: *See—*
Ellingboe, John W.; Nikaido, Madelene; and Bagli, Jehan, 5,498,776, Cl. 514-183.000.

Bahn, Itsuki, to Secoh Giken Inc. Flat core-less direct-current motor. 5,498,919, Cl. 310-268.000.

Bailey, Michael E.; Dang, Dinh; Michael, James G.; Neary, Timothy E.; Pastel, Paul W.; Tousley, Sylvia R. R.; and Winslow, Arthur C., to International Business Machines Corp. Symmetrical etching ring with gas control. 5,498,313, Cl. 156-643.100.

Baker, Denny D., to Baker, Denny D.; Mrocek, Richard; and Mrocek, Sharon. Mixing bag arrangement and method. 5,497,913, Cl. 222-102.000.

Baker Hughes Incorporated: *See—*
Pastusek, Paul E.; and Thayn, Corey S., 5,497,842, Cl. 175-334.000.

Bakke, Bradley B.: *See—*
Kull, A. Corbett S.; Bakke, Bradley B.; and Arens, John W., 5,499,273, Cl. 375-355.000.

Baldermann, Chris: *See—*
McLean, Michael E.; Pinkston, Melvin D.; Arrington, Noel D.; Wolters, Dennis R.; Shannon, Allen T.; Ferguson, Thomas G.; Macfarlane, Graham; Baldermann, Chris; and Dolan, John, 5,498,470, Cl. 428-246.000.

Baldes, Gary C.; Echols, Ben; and Kasai, Arlene, to Intel Corporation. Method and apparatus for monitoring video compression processing. 5,499,050, Cl. 348-180.000.

Baldock, Brian R.: *See—*
Floyd, John M.; Chard, Ian L.; and Baldock, Brian R., 5,498,277, Cl. 75-385.000.

Baldwin, Gordon George: *See—*
Arnold, Sidney A., 5,497,602, Cl. 54-44.700.

Baldygo, William J., Jr.: *See—*



Wicks, Michael C.; Baldygo, William J., Jr.; and Brown, Russell D., 5,499,030, Cl. 342-93.000.

Balgin, Lionel G. Spike assembly for footwear. 5,497,565, Cl. 36-61.000.

Ballard, Arthur D.: *See—*
Modliszewski, James J.; and Ballard, Arthur D., 5,498,436, Cl. 426-573.000.

Ballard Power Systems Inc.: *See—*
Wei, Jinzhu; Stone, Charles; and Steck, Alfred E., 5,498,639, Cl. 521-27.000.

Balteau, Patrick: *See—*
Aswad, Andrew D.; Severs, Dale; Silvestri, Joyce; Forman, Hugh M.; Woo, Lecon; Hiller, Thomas D.; Walsh, Lisa S.; Wade, Sandra; Chan, Eddie; Balteau, Patrick; Peluso, Franco; and Henaut, Eric, 5,498,253, Cl. 604-403.000.

Balzen, Robert H.: *See—*
Balzen, William H.; and Balzen, Robert H., 5,497,973, Cl. 248-551.000.

Balzen, William H.; and Balzen, Robert H. Theft resistant sign clamp. 5,497,973, Cl. 248-551.000.

Bamford, Roger J.; Howard, Forrest W.; Kabcenell, Dirk A.; and Miner, Robert N., to Oracle Corporation. System for database integrity with multiple logs assigned to client subsets. 5,499,367, Cl. 395-600.000.

Banba, Akikazu: *See—*
Aoyama, Takahiro; Nakazaki, Mitsuo; Banba, Akikazu; Yoshida, Masatoshi; Matsunaga, Toshiaki; and Tsubakimoto, Tsuneo, 5,498,670, Cl. 525-217.000.

Banyu Pharmaceutical Co., Ltd.: *See—*
Ishikawa, Kiyofumi; and Hayama, Takashi, 5,498,717, Cl. 546-139.000.

Barbara, Daniel; Johnson, Stephen; Mehrotra, Sharad; and Aref, Walid, to Panasonic Technolgies, Inc. Method for proximity searching with range testing and range adjustment. 5,499,360, Cl. 395-600.000.

Barber, Rennie: *See—*
Mayeda, Mark; and Barber, Rennie, 5,497,727, Cl. 118-733.000.

Barbieri, Beniamino: *See—*
Gratton, Enrico; Fantini, Sergio; Franceschini, Maria A.; Mantulin, William; and Barbieri, Beniamino, 5,497,769, Cl. 128-633.000.

Barnard, Michael A., to Wescon Products Company. Actuator control assembly for motion furniture. 5,497,676, Cl. 74-501.50R.

Barnfield, Ronald. Apparatus for supporting a fluid and tape to be dispensed for sealing seams of wallboard panels. 5,498,287, Cl. 118-43.000.

Baron, Sam S.: *See—*
Unterlander, Richard M.; Ingram, Ronald W.; Fior, Lou L.; Kamka, Peter; Jaspar, Marc J.; Baron, Sam S.; and Yang, Kevin T., 5,498,152, Cl. 425-534.000.

Baron, Sophie: *See—*
Praud, Jean-Paul; Baron, Sophie; Geoffroy, Mario; and Rouleau, Rachel, 5,497,765, Cl. 128-200.230.

Barquet, Henri F.: *See—*
Dequin, Andre-Michel L.; Daldoss, Louis J.; and Barquet, Henri F., 5,498,129, Cl. 415-209.300.

Barrera, David; Levitan, Dave; Rastegar, Bahador; and Rossbach, Paul C., to Motorola, Inc. Memory cache with interlaced data and method of operation. 5,499,204, Cl. 365-49.000.

Barrett, Nigel I.: *See—*
Breen, Simon P.; Dickson, David; and Barrett, Nigel I., 5,499,304, Cl. 382-214.000.

Barritz, Robert, to Isogon Corporation. Method and apparatus for computer program usage monitoring. 5,499,340, Cl. 395-184.010.

Barry, Gerard F.; Kishore, Ganesh M.; and Stark, David M., to Monsanto Company. Decreased oil content in plant seeds. 5,498,830, Cl. 800-205.000.

Barsky, Barry E.; and Lessard, Joseph J., to Air-Shields, Inc. Infant radiant warmer. 5,498,229, Cl. 600-22.000.

Bartels, Karin; Deller, Klaus; Despeyroux, Bertrand; and Simon, Jochen, to Degussa Aktiengesellschaft. Sulphidized catalyst which contains platinum on activated carbon. 5,498,585, Cl. 502-185.000.

Bartling, Ralf: *See—*
Bendicks, Norbert; and Bartling, Ralf, 5,498,866, Cl. 250-227.250.

Bartuska, Jaroslav B.; Grimm, Richard J.; Kerklaan, Albert J.; Saunders, David J.; and Zalesinski, Jerzy M., to International Business Machines Corp. Universal frame for data card. 5,499,162, Cl. 361-737.000.

Basel, Richard A.: *See—*
Ruka, Roswell J.; and Basel, Richard A., 5,498,487, Cl. 429-20.000.

BASF Aktiengesellschaft: *See—*
Aydin, Oral; Portugall, Michael; Neutzner, Josef; and Maechtle, Walter, 5,498,655, Cl. 524-458.000.
Kim, Son N.; Sanner, Axel; and Sperling-Vietmeier, Karin, 5,498,690, Cl. 528-296.000.
Pohl, Siegmund; Lehrich, Friedhelm; Genz, Manfred; Bruchmann, Bernd; Tesch, Helmut; Minges, Roland; and Streu, Joachim, 5,498,747, Cl. 560-25.000.
Sterzel, Hans-Josef, 5,498,390, Cl. 264-532.000.
Witt, Michael; and Henn, Rolf, 5,498,640, Cl. 521-59.000.
Wolf, Gerhard; Oftring, Alfred; Oetter, Guenter; Schmidt, Richard R.; and Klotz, Wolfgang, 5,498,704, Cl. 536-18.600.
de Clercq, Arnold; Ettl, Roland; Goncalves, Carlos A.; Hoehr, Lothar; Hohmann, Andreas; and Riebeling, Ulrich, 5,498,648, Cl. 524-47.000.

BASF Corporation: *See—*
Foukes, Richard J.; and Stants, Cynthia A., 5,498,783, Cl. 525-165.000.
Hall, Jon R.; Carpenter, Clint W.; and Scott, Stuart K., 5,498,781, Cl. 523-213.000.

Bashforth, Michael B.; Gardner, Duane; Patrick, Douglas; Lewallen, Tricia A.; Nammath, Sharyn R.; Painter, Kelly D.; and Vadnais, Kenneth G., to EG&G Energy Measurements, Inc. Wide band stepped frequency ground penetrating radar. 5,499,029, Cl. 342-22.000.

Bass, Craig D.; Valenti, Richard D., Jr.; and Flounders, Emer C., Jr., to Henkels & McCoy, Inc. System and methods of use for conducting a neutral corrosion survey. 5,498,967, Cl. 324-543.000.

Bassett, David L.; and Weatherly, Dan E., to Pennsylvania Power & Light Company. Control system and method for the parallel operation of voltage regulators. 5,498,954, Cl. 323-340.000.

Basu, Arunabha: *See—*
Bhattacharyya, Alakananda; and Basu, Arunabha, 5,498,370, Cl. 252-373.000.

Bateson, George F.: *See—*
Heuer, Glenn C.; and Bateson, George F., 5,498,646, Cl. 523-344.000.

Bauer, Andrew J., III. Applicator apparatus for dispensing a sealant. 5,498,103, Cl. 404-107.000.

Bauer, Franz: *See—*
Linde, Hansjürgen; Wolf, Peter; Seeser, Günter; Wimmer, Manfred; Weishaupt, Walter; Wegge, Martin; Schüch, Siegmund; Schackmann, Horst; Bauer, Franz; and Eckrich, Michael, 5,497,641, Cl. 70-257.000.

Baumann, Hans U.; and Mertens, Carsten-Joerg, to Dr. Ing. h.c.F. Porsche AG. Accelerator pedal device for a motor vehicle. 5,497,677, Cl. 74-513.000.

Bausch & Lomb Incorporated: *See—*
Chan, Eric, 5,498,508, Cl. 430-321.000.

Baxter International Inc.: *See—*
Aswad, Andrew D.; Severs, Dale; Silvestri, Joyce; Forman, Hugh M.; Woo, Lecon; Hiller, Thomas D.; Walsh, Lisa S.; Wade, Sandra; Chan, Eddie; Balteau, Patrick; Peluso, Franco; and Henaut, Eric, 5,498,253, Cl. 604-403.000.
Chapman, John R., 5,498,520, Cl. 435-5.000.

Baxter, Robert H. Mower with forward mounted edger. 5,497,606, Cl. 56-16.900.

Bayer Aktiengesellschaft: *See—*
Böhm, Stefan; and Marbold, Albrecht, 5,498,750, Cl. 560-124.000.
Buysch, Hans-Josef; Hesse, Carsten; Rechner, Johann; Schomäcker, Reinhard; Wagner, Paul; and Kaufmann, Dieter, 5,498,742, Cl. 558-274.000.
Henk, Hermann; and Hansmann, Wilfried, 5,498,700, Cl. 534-638.000.
Jentsch, Joerg-Dietrich; Klausener, Alexander; Landscheidt, Heinz; Lenders, Bernd; Pennemann, Bernd; Wolters, Erich; and Zirngbiebl, Eberhard, 5,498,744, Cl. 558-277.000.

Bayer Corporation: *See—*
Corey, Paul F.; and Musho, Matthew K., 5,498,542, Cl. 435-283.100.

Bayerische Motoren Werke AG: *See—*
Linde, Hansjürgen; Wolf, Peter; Seeser, Günter; Wimmer, Manfred; Weishaupt, Walter; Wegge, Martin; Schüch, Siegmund; Schackmann, Horst; Bauer, Franz; and Eckrich, Michael, 5,497,641, Cl. 70-257.000.

Beacon Light Products, Inc.: *See—*
Nelson, Richard E., 5,498,987, Cl. 327-143.000.

Beard, Bob J.: *See—*
Warren, Oscar E.; Armstrong, Walter N.; and Beard, Bob J., 5,497,857, Cl. 188-4.00R.

Becker, David S., to Micron Technology Inc. Method of reducing overetch during the formation of a semiconductor device. 5,498,570, Cl. 437-187.000.

Becker, John E.: *See—*
Kaatz, Gary F.; and Becker, John E., 5,499,394, Cl. 455-266.000.

Becker, Willi, to Heidelberger Druckmaschinen AG. Device for adjusting the oblique register in a clamping device for locking printing plates in an offset printing machine. 5,497,703, Cl. 101-415.100.

Beckman, Dale A.: *See—*
Youness, Ramin; and Beckman, Dale A., 5,499,157, Cl. 361-191.000.

Beckman Instruments, Inc.: *See—*
Obremski, Robert J.; and Silzel, John W., 5,498,875, Cl. 250-458.100.

Becton Dickinson and Company: *See—*
Berndt, Klaus W., 5,498,543, Cl. 435-286.100.
Brimhall, Greg L., 5,498,247, Cl. 604-244.000.
Flower, Ronald J., 5,498,235, Cl. 604-20.000.

Bedocs, Lou, to TLG plc. Method for automatic switching and control of lighting. 5,498,931, Cl. 315-158.000.

Behram, Sepehr; Grauzlis, Nancy T.; and Joseph, Sammy W., to University of Maryland. Privacy protected information medium using a data compression method. 5,499,293, Cl. 380-4.000.

Behrendt, Martin; Franz, Adolf; Hunke, Roland; and Roether, Roland, to RXS Schrumpftechnik-Garnituren GmbH. Cable sleeve composed of a pipe section and seal members at the face end. 5,498,839, Cl. 174-92.000.

Behrens, Klaus-Peter; Fischer, Martin; and Henkel, Thomas, to Hewlett-Packard Company. Test vector generator comprising a decompression control unit and a conditional vector processing unit and method for generating a test vector. 5,499,248, Cl. 371-22.100.

Beigel, Michael L., to Avid. Multi-memory electronic identification tag. 5,499,017, Cl. 340-572.000.

Beiles, Edward W.: *See—*
Speer, Richard W.; and Beiles, Edward W., 5,498,174, Cl. 439-567.000.

Belaney, Steven D.: *See—*
Kilada, Ashraf N.; Burlingame, Michael J.; and Belaney, Steven D., 5,498,011, Cl. 280-47.340.

Bell, Randall F.; Kochanski, Gregory P.; and Thomson, John, Jr., to AT&T Corp. Flat panel display apparatus, and method of making same. 5,498,925, Cl. 313-497.000.

BellSouth Corporation: *See*—
Koster, Karl, 5,499,290, Cl. 379-242.000.

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Edlund, David J., 5,498,278, Cl. 96-11.000.

Bender, Albert, to Hoechst Aktiengesellschaft. Self-gelling binder resins for offset-printing inks having improved storage stability. 5,498,684, Cl. 528-40.000.

Bendert, Richard M.: *See*—
Rider, Robert A.; and Bendert, Richard M., 5,499,234, Cl. 320-5.000.

Bendicks, Norbert; and Bartling, Ralf, to Leopold Kostal GmbH & Co. KG. Optoelectronic sensor for detecting moisture on a windshield with means to compensate for a metallic layer in the windshield. 5,498,866, Cl. 250-227.250.

Beagtsson, Jörgen, to Tetra Laval Holdings & Finance S.A. Device for thermoforming a pouring spout. 5,498,149, Cl. 425-387.100.

Bennett, Dale W.; Fixemer, James V.; Hood, Teresa I.; Siebels, Randall L.; and Van Waart, Douglas, to Square D Company. Arc stack for a circuit breaker. 5,498,847, Cl. 218-81.000.

Bennett, Patricia A.: *See*—
Antonucci, Joseph M.; and Bennett, Patricia A., 5,498,643, Cl. 523-118.000.

BenOpcon, Inc.: *See*—
Betensky, Ellis I., 5,499,140, Cl. 359-656.000.

Bentley, Kris E.: *See*—
Chen, Chungte W.; and Bentley, Kris E., 5,499,139, Cl. 359-649.000.

Bentley, Robert M., to Hughes Aircraft Company. Forced, resonant degaussing system and method. 5,499,156, Cl. 361-150.000.

Bentsen, James G.: *See*—
Nagel, Colleen C.; Bentsen, James G.; Yafuso, Masao; Katritzky, Alan R.; Dektar, John L.; and Kipke, Cary A., 5,498,549, Cl. 436-172.000.

Benz, Mark G.; Jackson, Melvin R.; Zabala, Robert J.; Jones, Marshall G.; Nied, Herman A.; and Eggleston, Michael R., to General Electric Company. Method of making an improved target/stem connection for x-ray tube anode assemblies. 5,498,186, Cl. 445-28.000.

Benz, Mark G.: *See*—
Eggleston, Michael R.; Benz, Mark G.; Jackson, Melvin R.; and Zabala, Robert J., 5,498,187, Cl. 445-28.000.

Benz, Urs; Walhood, David; and Schulte-Werning, Burkhard, to ABB Management AB. Process for the cooling of an auto-ignition combustion chamber. 5,497,611, Cl. 60-39.060.

Berg, John: *See*—
Gyure, Alex; Berg, John; Carver, Damian; and Manos, Pete, 5,498,896, Cl. 257-402.000.

Berger, Jeffrey A.: *See*—
Aschoff, John G.; Berger, Jeffrey A.; Burton, David A.; McNutt, Bruce; and Kurtz, Stanley C., 5,499,354, Cl. 395-456.000.

Berger, Jeffrey M.; and Foster, Randy C., to Dayco Products, Inc. Hose assembly and method of making the same. 5,497,810, Cl. 138-113.000.

Bergeron, Raymond J., to University of Florida Research Foundation, Inc. Anti-neoplastic, anti-viral and ribonucleotide reductase activity affecting pharmaceutical compositions and methods of treatment. 5,498,622, Cl. 514-374.000.

Bergmann, Konrad, to Ideal-Standard GmbH. Plaster protective cover for flush mounted bathroom fittings. 5,497,584, Cl. 52-34.000.

Bergwerksverband GmbH: *See*—
Schröter, Hans-Jürgen; Heimbach, Heinrich; Henning, Klaus-Dirk; Knoblauch, Karl; Berndt, Alfons S.-S.; and Tarnow, Ferdinand, 5,498,589, Cl. 502-416.000.

Berka, Thomas R.; Forawald, James A.; Goraiak, Joselina G.; Rosenberg, Martin; Strickler, James E.; and Taylor, Dean P., to SmithKline Beckman Corporation. Protein protease inhibitors from streptomyces. 5,498,529, Cl. 435-69.100.

Berkcan, Ertugrul; and Welles, Kenneth B., II, to General Electric Company. System based on inductive coupling for sensing loads in a washing machine. 5,497,638, Cl. 68-12.040.

Berman, Ronald M.: *See*—
Brown, Charles N.; and Berman, Ronald M., 5,497,724, Cl. 114-343.000.

Berndt, Alfons S.-S.: *See*—
Schröter, Hans-Jürgen; Heimbach, Heinrich; Henning, Klaus-Dirk; Knoblauch, Karl; Berndt, Alfons S.-S.; and Tarnow, Ferdinand, 5,498,589, Cl. 502-416.000.

Berndt, Klaus W., to Becton Dickinson and Company. Sub-compact blood culture apparatus. 5,498,543, Cl. 435-286.100.

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Carr, Albert A.; Thomas, Craig E.; Bernotas, Ronald C.; and Ku, George, 5,498,778, Cl. 514-309.000.

Berson, Eliot L.: *See*—
Dryja, Thaddeus P.; and Berson, Eliot L., 5,498,521, Cl. 435-6.000.

Berta, Norbert I., to McNeil-PPC. Method and apparatus for creating a gelatin coating on a tablet. 5,498,441, Cl. 427-2.140.

Bertilsson, Lars Y.: *See*—
Wedin, Ananette G.; Hallenfur, Lars-Erik; Bertilsson, Lars Y.; and Karlsson, Jan-Erik, 5,498,168, Cl. 439-95.000.

Bess, David O.: *See*—
Carter, Daniel S.; Rupp, Dennis M.; and Bess, David O., 5,498,387, Cl. 264-219.000.

Best, Bernd: *See*—
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Bestline Liner Systems: *See*—
Hudson, Leo D., 5,497,840, Cl. 175-72.000.

Betensky, Ellis I., to BenOpcon, Inc. Wide angle binocular system with variable power capability. 5,499,140, Cl. 359-656.000.

Betto, Massimo; Betto, Stefano; and Betto, Pietro. Deep-sea fishing reel with friction unwinding device. 5,497,953, Cl. 242-270.000.

Betto, Pietro: *See*—
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Beulin, Benoit: *See*—
Krzywdzjak, Alain; and Beulin, Benoit, 5,498,077, Cl. 366-247.000.

Beutner, Dieter; von Knobelsdorff, Henning; Wolff, Hans-Michael; Hoffmann, Rainer; Meconi, Reinhold; and Klein, Robert P., to Schwarz Pharma AG; and LTS Lohmann Therapie-Systemme GmbH & Co. KG. Nitroglycerine plaster and process for its production. 5,498,418, Cl. 424-448.000.

Beynon, Lamar C.: *See*—
Kunz, Richard D.; Kelsch, Dale O.; and Beynon, Lamar C., 5,497,520, Cl. 5-648.000.

Bezzerides, James; and Lux, Oscar W., III, to Bezzerides, James; Lux, III, Oscar W.; and Wiggins, Clyde. Gate latch assembly. 5,498,041, Cl. 292-225.000.

Bhanage, Bhalchandra M.: *See*—
Chaudhari, Raghunath V.; Bhanage, Bhalchandra M.; Divekar, Sunil S.; and Deshpande, Raj M., 5,498,801, Cl. 568-454.000.

Bhattacharyya, Alakananda; and Basu, Arunabha, to Amoco Corporation. Process for hydroshifting dimethyl ether. 5,498,370, Cl. 252-373.000.

Bien, Paul R.; and Hagle, Michael P., to General Electric Company. Stator frame fabrication. 5,497,544, Cl. 29-596.000.

Bierer, Barbara E.: *See*—
Burakoff, Steven J.; Schreiber, Stuart L.; and Bierer, Barbara E., 5,498,597, Cl. 514-2.000.

Bigio, Irving J.: *See*—
Mourant, Judith R.; Anderson, Gerhard D.; Bigio, Irving J.; and Johnson, Tamara M., 5,498,259, Cl. 606-8.000.

Bihovsky, Ron: *See*—
Mallamo, John P.; Bihovsky, Ron; Chatterjee, Sankar; and Tripathy, Rabindranath, 5,498,616, Cl. 514-300.000.

Bilka, Kenneth P.: *See*—
Orlandi, Daniel A.; Wong, Lucy L.; Olaya, Hector; and Bilka, Kenneth P., 5,498,429, Cl. 426-5.000.

Binair Groep b.v.: *See*—
Bolkestein, Cornelis, 5,497,698, Cl. 99-476.000.

Bindloss, William: *See*—
Lee, Denny L. Y.; Jeromin, Lothar S.; and Bindloss, William, 5,498,880, Cl. 250-580.000.

Binney & Smith Inc.: *See*—
Fistner, David C.; and Snedeker, Colin M., 5,498,280, Cl. 106-19.00B.
Mariano, Karen M.; Kauffman, Thomas; and Gregor, Stacey A., 5,498,645, Cl. 523-218.000.
Miller, Richard E.; and Dereamus, Robert C., 5,498,282, Cl. 106-22.00B.

Bio-Lab, Inc.: *See*—
Jones, Ronald L., 5,498,415, Cl. 424-409.000.

Biomagnetic Technologies, Inc.: *See*—
Esser, Keith A.; Riley, Scott W.; and Warden, Laurence, 5,497,828, Cl. 165-185.000.

Bisagni, E.; Jazzitold-Howorko, R.; Atassi, G.; and Pierre, A., to Adir et Compagnie. Ellipticine compounds: 5,498,611, Cl. 514-232.800.

Bischel, William K.; Brinkman, Michael J.; and Deacon, David A. G., to Deacon Research. Polarized frequency-selective optical source. 5,499,256, Cl. 372-28.000.

Bishop, Gary: *See*—
Stedman, Donald H.; Bishop, Gary; and McLaren, Scott, 5,498,872, Cl. 250-338.500.

Bishop, Robert P.; Hainey, Paul L.; Lukasiewicz, Stanley J.; Siuzdak, Allan J.; Luminello, Robert E., Jr.; and Shukla, Vishwa N., to Texas Instruments Incorporated. Pressure transducer apparatus with monolithic body of ceramic material. 5,499,158, Cl. 361-283.400.

Bisse-Werke Baehre & Greten GmbH & Co. KG: *See*—
Greten, Bernd; Seeger, Günter; and Poppelreuter, Klaus, 5,498,309, Cl. 156-347.000.

Bissell, Sheldon. Electromechanical tire deflating spike strip. 5,498,102, Cl. 404-6.000.

Bitsche, Otmar; and Schneeberfer, Erwin, to Steyr-Daimler-Puch AG. Drive arrangement for an electric motor vehicle and process for shifting gears. 5,498,216, Cl. 477-20.000.

Bivens, Steven L., to Illinois Tool Works Inc. Spring loaded latch assembly. 5,498,039, Cl. 292-145.000.

BJ Services Company: *See*—
Boles, Joel L.; Metcalf, Arthur S.; and Dawson, Jeffrey C., 5,497,830, Cl. 166-300.000.

Black, Gerald: *See*—
Hoshizaki, T. Blaine; Acheson, Jeffrey J.; and Black, Gerald, 5,498,033, Cl. 280-841.000.





Blair, Clifford, Jr. Hip-turning exercise machine. 5,498,221, Cl. 482-99.000.

Blake, Kenneth A.; Rupe, Chauncey O.; and Terry, Carol A., to Environmental Test Systems, Inc. Method and device for the determination of polymeric biguanides in aqueous fluids. 5,498,547, Cl. 436-111.000.

Blanchard, Clarence E.: *See*—
Anselm, Michael C.; Blanchard, Clarence E.; and Nerstrom, James S., 5,498,182, Cl. 440-76.000.

Blanco, Alfred R.: *See*—
Hill-Lindsay, Joseph W.; Yuen, John T.; and Blanco, Alfred R., 5,499,164, Cl. 361-785.000.

Bland, Patrick M.: *See*—
Amini, Nader; Bland, Patrick M.; Boury, Bechara F.; and Jackson, Robert T., 5,499,346, Cl. 395-308.000.

Blaney, Carol A., to Kimberly-Clark Corporation. Fabrics composed of ribbon-like fibrous material and method to make the same. 5,498,468, Cl. 428-198.000.

Blang, Guido: *See*—
Arnold, Manfred; Blang, Guido; Gegenwart, Rainer; Ritter, Jochen; and Stoll, Helmut, 5,498,291, Cl. 118-723.00E.

Blezard, Michael; Jones, Glyn R.; and Ghadimi, Moharam, to Albright & Wilson, Limited. Nitrosamine and nitrite inhibition. 5,498,791, Cl. 564-2.000.

Block Drug Company, Inc.: *See*—
Wood, Thomas G.; Curro, Frederick A.; and Parashos, Demetra E., 5,498,425, Cl. 424-464.000.

Block, Vurl D.; and Hamilton, Robert K., to Colson Caster Corporation. Locking caster brake assembly. 5,497,856, Cl. 188-1.120.

Blodgett, Fred B.; Brand, Jerry D.; Koch, Steven J.; and Smith, Ronald L., to Blount, Inc. Case trimmer. 5,497,539, Cl. 29-1.320.

Bloeder, Greg E.; Johnson, Bertrand H.; and Knoedl, George, Jr., to AT&T Corp. On hook/off hook mechanism for wrist telephone. 5,499,292, Cl. 379-433.000.

Bloom, Devin A.: *See*—
Angellotti, Thomas J.; Jackson, Steve C.; and Bloom, Devin A., 5,497,955, Cl. 242-338.400.

Blose, Thomas L.; and Britten, David L. Pipe coupling. 5,498,035, Cl. 285-94.000.

Blount, Inc.: *See*—
Blodgett, Fred B.; Brand, Jerry D.; Koch, Steven J.; and Smith, Ronald L., 5,497,539, Cl. 29-1.320.

Blume, Joseph A.: *See*—
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Board of Regents, The University of Texas System: *See*—
Briggs, Michael R.; Brown, Michael S.; Goldstein, Joseph L.; and Wang, Xiaodong, 5,498,696, Cl. 530-350.000.

Bobbitt, Billy T., to Southern Alloy Corporation. Grate plate. 5,497,711, Cl. 110-278.000.

Bochinski, Jason R.: *See*—
Lapatovich, Walter P.; Butler, Scott J.; and Bochinski, Jason R., 5,498,928, Cl. 315-39.000.

Boczar, Lawrence C.: *See*—
Kizer, Thomas L.; and Boczar, Lawrence C., 5,498,085, Cl. 384-484.000.

Bodonyi, Janos, to Marconi Company Limited, The. Distributed receiver system for antenna array. 5,499,031, Cl. 342-174.000.

Boebert, William E., to Secure Computing Corporation. System and method for trusted path communications. 5,499,297, Cl. 380-23.000.

Boeshart, Patrick E. Quick release tie. 5,497,592, Cl. 52-699.000.

Boesi, Anna M. Electrical apparatus for cleaning surfaces by suction in dwelling premises. 5,497,529, Cl. 15-319.000.

Bogdan, Paula L.; Lawson, R. Joe; Sachtler, J. W. Adriaan; and Schmidt, Robert J., to UOP. Selective isoparaffin synthesis from naphtha. 5,498,810, Cl. 585-310.000.

Bogdanovic, Borislav; and Wilczok, Ursula, to Studiengesellschaft Kohle mbH. Metal-magnesium compounds. 5,498,402, Cl. 423-463.000.

Böhm, Stefan; and Marhold, Albrecht, to Bayer Aktiengesellschaft. Process for the preparation of 1-fluoro-cyclopropane-1-carboxylic acid. 5,498,750, Cl. 560-124.000.

Boit Inc.: *See*—
Brewer, Donald R., 5,499,121, Cl. 359-51.000.

Boldrini, Fulvio, to G. D S.p.A. Equipment for the application of seal labels to containers. 5,497,598, Cl. 53-136.100.

Boles, Joel L.; Metcalf, Arthur S.; and Dawson, Jeffrey C., to BJ Services Company. Coated breaker for crosslinked acid. 5,497,830, Cl. 166-300.000.

Bolkestein, Cornelis, to Binair Groep b.v. Device for storing fruit, kept in containers placed on a pallet, under controlled conditions. 5,497,698, Cl. 99-476.000.

Bond, Cecil F.: *See*—
McCannon, W. Allen, Jr.; Dye, Dan W.; and Bond, Cecil F., 5,497,838, Cl. 175-27.000.

Bond, James W.; Marchette, David J.; Priebe, Carey E.; and Schlosser, Thomas W., to United States of America, Navy. Two-dimensional kernel adaptive interference suppression system. 5,499,399, Cl. 455-296.000.

Bonifay, Régis: *See*—
Galtier, Pierre; Bonifay, Régis; Franckowiak, Sigismond; Gauthier, Thierry; and Pontier, Renaud, 5,498,326, Cl. 208-74.000.

Bonner, Michael J., to Arnhem, Inc. Process for encapsulating the flavor with colloid gel matrix. 5,498,439, Cl. 426-650.000.

Borden, Inc.: *See*—
Shinn, David W.; Detlefsen, William D.; and Phillips, Earl K., 5,498,647, Cl. 524-14.000.

Borek, Donna M.: *See*—
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Borg-Warner Automotive, Inc.: *See*—
Siemon, Edward C.; and Quinn, Stanley B., Jr., 5,497,738, Cl. 123-90.170.

Borland International, Inc.: *See*—
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Rosenberg, Daniel; and Way, Anne, 5,499,366, Cl. 395-600.000.
Vijaykumar, Narayanan, 5,499,359, Cl. 395-600.000.

Borodovsky, Yan A.; and Sarangi, Ananda G., to Intel Corporation. Method of producing semiconductor device layer layout. 5,498,579, Cl. 437-250.000.

Borthwick, Paul G.: *See*—
Trost, Jerry J.; and Borthwick, Paul G., 5,498,015, Cl. 280-293.000.

Boschini, Alain, to Valeo Electronique. Remote control system for locking and unlocking doors and other openings in a passenger space, in particular in a motor vehicle. 5,499,022, Cl. 340-825.690.

Bossan, Edmond: *See*—
Charbonneau, Michel; Bossan, Edmond; Laboch, Kazimir; and Pia, Jean-Pierre, 5,498,073, Cl. 312-257.100.

Bossler, Hans J.; and Kreuzer, Martin, to Kolbenschmidt Aktiengesellschaft. Apparatus for transmitting electric power and data in motor vehicles. 5,498,911, Cl. 307-10.100.

Botros, Raouf; and Chavan, Sunita, to Sciex Digital Printing, Inc. Waterfast security inks. 5,498,283, Cl. 106-22.00H.

Bottomley, Gregory E., to Ericsson GE Mobile Communications Inc. Diversity receiver for signals with multipath time dispersion. 5,499,272, Cl. 375-347.000.

Boulanger, Jean: *See*—
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Boury, Bechara F.: *See*—
Amini, Nader; Bland, Patrick M.; Boury, Bechara F.; and Jackson, Robert T., 5,499,346, Cl. 395-308.000.

Bovellan, Kent; and Braun, Pär, to Saab Automobile Aktiebolag. Energy absorbent bumper for motor vehicles. 5,498,044, Cl. 293-120.000.

Bowen, Larry; and Sasidr, Stanislav M., to 114935 Ontario Inc. Smoker's accessory. 5,497,791, Cl. 131-175.000.

Bowles, Gary-Alexander, to Siemens Aktiengesellschaft. Ternary/binary converter circuit. 5,498,980, Cl. 326-60.000.

Bowlin, Kevin R.: *See*—
Stuebinger, Lon A.; Bowlin, Kevin R.; and Pardo, Carlos W., 5,497,832, Cl. 166-369.000.

Bowling, John M. Cutting tooth. 5,497,815, Cl. 144-241.000.

Box, W. Donald, to Martin Marietta Energy Systems, Inc. Robotic vehicle. 5,497,707, Cl. 104-138.200.

Boyd Coffee Company: *See*—
Johnson, Michael W.; and Engler, Christopher J., 5,498,757, Cl. 426-520.000.

Boyd, Richard M., to Quadion Corporation. Automatic transmission front-bearing oil-flow control and method of controlling same. 5,498,084, Cl. 384-130.000.

Boyt Limited Partnership: *See*—
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Braccolino, Diane S.: *See*—
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Bradway, Robert A.; Green, Larry A.; and Rollmann, L. Deane, to Mobil Oil Corporation. Two-stage process for producing diamondoid hydrocarbons. 5,498,812, Cl. 585-352.000.

Brady, Robert H.; Calabrese, Philip D.; and Van Leeuwen, Timothy O., to United States Surgical Corporation. Surgical apparatus with indicator. 5,497,934, Cl. 227-176.100.

Brailsford, Alan D.; Hamburg, Douglas R.; Logothetis, Eleftherios M.; and Yussouff, Mohammed, to Ford Motor Company. Air/fuel control system with catalytic converter monitoring. 5,497,618, Cl. 60-274.000.

Brand, Jerry D.: *See*—
Blodgett, Fred B.; Brand, Jerry D.; Koch, Steven J.; and Smith, Ronald L., 5,497,539, Cl. 29-1.320.

Brandenburg, Eric L.; Franz, Patrick J.; and Straayer, David H., to InControl Solutions, Inc. Keyboard integrated pointing device. 5,499,041, Cl. 345-174.000.

Branham, Larry E.: *See*—
Meadows, David L.; Kurjan, Katherine C.; and Branham, Larry E., 5,497,910, Cl. 222-95.000.

Brannan, James R.: *See*—
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Branson, Thomas, to Palitex Project-Company GmbH. Two-for-one twisting spindle with bristle ring for smoothing and tensioning threads. 5,497,607, Cl. 57-58.520.

Brasset, Jean-François: *See*—
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Braun, Eric E., to Oshkosh Truck Corporation. Speed reducing universal joint using planetary gears. 5,498,208, Cl. 464-109.000.

Braun, Pär: *See*—
Bovellan, Kent; and Braun, Pär, 5,498,044, Cl. 293-120.000.

Braun, Reinhold: *See*—
Dermeik, Salman; Wanner, Martina; Lemmer, Karl-Heinz; and Braun, Reinhold, 5,498,740, Cl. 558-89.000.
Braverman, Josef J. Road barrier. 5,498,101, Cl. 404-6.000.
Bray, Daniel M.: *See*—
Folkins, Jeffrey J.; Bray, Daniel M.; and Fioravanti, Alexander J., 5,499,084, Cl. 355-259.000.
Brazdil, James F.; and Cavalcanti, Fernando A. P., to Standard Oil Company, The. Surface modification and promotion of vanadium antimony oxide catalysts. 5,498,588, Cl. 502-353.000.
Bredol, Michael; Merikhi, Jacqueline; and Ronda, Cornelis, to U.S. Philips Corporation. Method of manufacturing ZnS particles. 5,498,369, Cl. 252-301.650.
Bredy, Thierry; Rodriguez, Hervè; and Marchand, Emmanuel, to Giat Industries. Zone-defense weapon system and method for controlling same. 5,497,705, Cl. 102-427.000.
Breen, Simon P.; Dickson, David; and Barrett, Nigel L, to Delco Electronics Corporation. Light mask. 5,499,304, Cl. 382-214.000.
Brekner, Michael-Joachim: *See*—
Weller, Thomas; Brekner, Michael-Joachim; and Osan, Frank, 5,498,677, Cl. 526-133.000.
Breneecke, Detlef, to Agfa-Gevaert, N.V. Chloride rich tabular grain emulsion with (100) major faces. 5,498,518, Cl. 430-569.000.
Brenner, Axel; Mertens, Peter; Meuser, Wilfried; Meyer, Friedrich; Trense, Horst; Weber, Friedrich; and Wilken, Wilfried, to STN Atlas Elektronik GmbH. Electro-acoustical transducer arrangement. 5,499,219, Cl. 367-151.000.
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Brewer, Donald R., to Boit Inc. Color variance polymer matrix display having two scattering states or $N_p$ <or> both $N_E$ and $N_O$. 5,499,121, Cl. 359-51.000.
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Rogers, Alan F., 5,497,807, Cl. 138-98.000.
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Amir, Nadav; and Bronicki, Lucien F., 5,497,624, Cl. 60-641.500.
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Brotz, Gregory R. Variable motion dampener. 5,497,861, Cl. 188-267.000.
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Brown, Fred G. Spotlight unit for use on a vehicle. 5,499,167, Cl. 362-35.000.
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Leite, Sara M.; Thomas, Daniel D.; Brown, Gair D.; and Schwarting, Alan, 5,499,314, Cl. 385-135.000.
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Browning, William E. Light switch extension. 5,498,845, Cl. 200-331.000.
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Ouellette, Edward L.; Broyles, Carolyn E.; and Wilson, Barry F., 5,498,148, Cl. 425-294.000.
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Brunelle, Daniel J., to General Electric Company. Method for polymerizing macrocyclic polyester oligomers. 5,498,651, Cl. 524-176.000.
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Bryan, Donald W. Spinal fixation apparatus and method. 5,498,262, Cl. 606-61.000.
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Büchner, Klaus, to Alusuisse-Lonza Services Ltd. Polymer-containing mixture. 5,498,482, Cl. 428-461.000.
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Anderson, Charles R.; and Kenrick, Charles B., 5,498,204, Cl. 454-359.000.
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Burke, Phillip C.: *See*—
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Kilada, Ashraf N.; Burlingame, Michael J.; and Belaney, Steven D., 5,498,011, Cl. 280-47.340.



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Burns, Carmen D., to Staktek Corporation. High density integrated circuit module with snap-on rail assemblies. 5,499,160, Cl. 361-704.000.
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Burns, Irvin; and Robbins, Patrick, to Rockford Manufacturing Group, Inc. Apparatus for feeding wire having a linearly movable roller pinch pair with guide rod. 5,497,928, Cl. 226-108.000.
Burns, Raymond W.; and Oberlander, Kyle, to Central Mine Equipment. Hollow auger head assembly. 5,497,843, Cl. 175-403.000.
Burshaw, Ron; Thompson, Hugh; and Brownrigg, Geoff, to Cambridge Towel Corporation, The. Fitted ironing board covers with pleats. 5,497,570, Cl. 38-140.000.
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Butler, E. Dean; and Risk, Craig H., to Vision Express Group Limited. Multifocal trial frame system. 5,499,063, Cl. 351-54.000.
Butler, Scott J.: *See*—
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Byczek, Roger W., to Woodhead Industries, Inc. Electrical connector. 5,498,179, Cl. 439-843.000.
Byman, Lorne. Groomer attachment for forklifts. 5,497,569, Cl. 37-410.000.
Byrne, Stephen C., to Aluminum Company of America. Aluminum alloy cathode plate for electrowinning of zinc. 5,498,322, Cl. 205-603.000.
Bytebier, Gaspar A. H.; and Lefebvre, Hendrik, to Bytebier, Gaspar A. H. Method and apparatus for temporarily storing and transporting successive textile sheets. 5,497,985, Cl. 271-7.000.
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Tracy, Lawrence; Dorando, Dale; and Eggers, Frederick, 5,499,012, Cl. 340-514.000.
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Manneschi, Alessandro, 5,498,959, Cl. 324-243.000.
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Schiller, Jay B.; and Schmelzer, Richard A., 5,499,046, Cl. 348-6.000.
Caccavale, Charles F.: *See*—
Carozza, Eugene J.; Frank, Gregory R.; Caccavale, Charles F.; and Robb, Ronald R., 5,498,132, Cl. 416-97.00R.
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Cage, Donald R.; and Schott, Michael N., to Direct Measurement Corporation. Coriolis mass flow rate meter having adjustable pressure and density sensitivity. 5,497,665, Cl. 73-861.380.
Cairns, James W., to Nola Plastics, Inc. Two-piece clamping assembly. 5,498,098, Cl. 403-400.000.
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Keayon, Robin G. B., 5,497,882, Cl. 206-485.000.
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Mitchell, Cheryl R.; and Mitchell, Pat R., 5,498,702, Cl. 536-2.000.
Cama, Lovji D.; Sasor, Mary F.; and Hammond, Milton L., to Merck & Co., Inc. 3-thioheteroaryl cephalosporin compounds, compositions and methods of use. 5,498,777, Cl. 514-206.000.
Camacho, Salvador L., to Plasma Technology Corporation. Apparatus for vitrification of fine particulate matter. 5,497,710, Cl. 110-250.000.
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Burshaw, Ron; Thompson, Hugh; and Brownrigg, Geoff, 5,497,570, Cl. 38-140.000.
Campbell, Andrew B.: *See*—
Simon, Ira J.; Curtis, George W.; and Campbell, Andrew B., 5,498,038, Cl. 292-36.000.
Campbell, Bob; Gowan, Curtis R.; Graf, John D.; and Nayak, Nandini, to Hewlett-Packard Company. FAX-telephone interface circuit. 5,499,287, Cl. 379-67.000.
Canela, Heriberto. Food steamer with automatic timed stirring paddle. 5,497,695, Cl. 99-335.000.
Cannon, John. Invertible no waste funnel. 5,497,814, Cl. 141-331.000.
Cannon Kabushiki Kaisha: *See*—
Kawai, Tatsundo; Hamamoto, Osamu; Takeda, Shinichi; Itabashi, Satoshi; and Iso, Toshimitsu, 5,499,112, Cl. 358-475.000.
Canon Kabushiki Kaisha: *See*—
Eguchi, Ken, 5,498,762, Cl. 428-1.000.
Furuya, Tadashi; Araya, Junji; Yano, Hideyuki; and Kugoh, Harumi, 5,499,080, Cl. 355-208.000.
Hasegawa, Noriyasu; and Mori, Tetsuzo, 5,498,878, Cl. 250-548.000.
Hosaka, Masao; Kimura, Yoshimasa; and Sakamaki, Hisashi, 5,499,370, Cl. 395-650.000.
Hoshi, Hidenori; and Tanaka, Yasuyuki, 5,499,104, Cl. 358-341.000.
Ishizuka, Koh, 5,498,870, Cl. 250-237.00G.
Kasiwabara, Akihiro; and Mukasa, Mitsuhiro, 5,499,091, Cl. 355-319.000.
Kawai, Tomoaki; Yamamoto, Hiroyuki; and Okazaki, Hiroshi, 5,499,362, Cl. 395-109.000.
Menjo, Takeshi, 5,499,088, Cl. 355-285.000.
Miura, Toshihiko; and Inaba, Ryohei, 5,498,122, Cl. 414-786.000.
Muraki, Masato, 5,499,076, Cl. 355-53.000.
Ohta, Shinichi; and Kitai, Hiroto, 5,499,226, Cl. 369-59.000.
Okada, Shinjiro, 5,499,130, Cl. 359-87.000.
Osaka, Tsutomu, 5,499,043, Cl. 347-108.000.
Sato, Makoto; and Uzawa, Shigeyuki, 5,499,099, Cl. 356-400.000.
Satoh, Makoto, 5,499,327, Cl. 395-135.000.
Shibamiya, Yoshikazu, 5,499,381, Cl. 395-800.000.
Shibata, Makoto; and Itoh, Hitoshi, 5,498,306, Cl. 156-275.300.
Shimoda, Isamu; Kariya, Takao; Mizusawa, Nobunoshi; Ozawa, Kunitaka; and Uzawa, Shunichi, 5,498,501, Cl. 430-22.000.
Suda, Shigeyuki; Niwa, Yukichi; and Katayama, Tatsushi, 5,499,051, Cl. 348-218.000.
Yoshida, Masayuki, 5,499,332, Cl. 395-150.000.
Canstar Sports Group Inc.: *See*—
Hoshizaki, T. Blaine; Acheson, Jeffrey J.; and Black, Gerald, 5,498,033, Cl. 280-841.000.
Canther, David M. Cover and lid with sealably enclosed gasket for swimming pool. 5,498,333, Cl. 210-198.100.
Cantrell, Jay T.: *See*—
Elanshar, Khodor S.; Cantrell, Jay T.; and Saperstein, William, 5,499,344, Cl. 395-250.000.
CAPCOM Coin-Op, Inc.: *See*—
Hansen, Bryan P.; and Morgan, Rick, 5,497,994, Cl. 273-121.00A.
Ritchie, Mark D.; Zhang, Ming D.; and Morrison, Robert S., 5,497,989, Cl. 273-118.00R.
Cappon, Wilfried J. M.; Teetaert, Pierre E.; Naaktgeboren, Adrianus; and Muijs, Cornelis G. M., to New Holland North America, Inc. Front unit for a forage harvester. 5,498,207, Cl. 460-119.000.
Caputo, Ross A.; and Martens, Phillip A., to Abtox, Inc. *Bacillus circulans* based biological indicator for gaseous sterilants. 5,498,526, Cl. 435-31.000.
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Ross, Barry C.; Middlemiss, David; Scopes, David I. C.; Jack, Torquil I. M.; Cardwell, Kevin S.; Dowle, Michael D.; Judd, Duncan B.; and Watson, Stephen P., 5,498,722, Cl. 548-315.400.
Cargill, Incorporated: *See*—
Goertzen, Kenneth; and Goertzen, Betty, 5,498,829, Cl. 800-200.000.
Carl, Richard A. Liquid dispensing apparatus including means for loading pipette tips onto liquid dispensing cylinders and maintaining the loading force during the apparatus operation cycle. 5,497,670, Cl. 73-863.320.
Carlin, Mark; McCaskey, James G.; and Sugiyama, Koichi, to TRW Inc.; and Toyota Jidosha Kabushiki Kaisha. Method and apparatus for controlling an actuatable restraining device. 5,498,028, Cl. 280-735.000.
Carlson, James G.; Truong, Jack G.; Anderson, Jeffrey T.; and Rotto, Nelson T., to Minnesota Mining and Manufacturing Company. Carboxylic-acid functional polyurethane polymers and their use in magnetic recording media. 5,498,685, Cl. 528-71.000.
Carlsson, Hakan, to Whirlpool Europe B.V. Microwave oven for heating of beverages. 5,498,856, Cl. 219-689.000.
Carosa, Paul F., to Hughes Aircraft Company. Three-phase power converter with fail soft characteristics. 5,499,186, Cl. 363-132.000.
Carozza, Eugene J.; Frank, Gregory R.; Caccavale, Charles F.; and Robb, Ronald R., to Howmet Corporation. Improved hollow cast products such as gas-cooled gas turbine engine blades. 5,498,132, Cl. 416-97.00R.
Carpenter, Burton J., Jr.; McMaster, Michael G.; LaTorre, Joseph; and Simpson, Logan L., to International Business Machines Corporation. Positive photoresist composition containing photoacid generator and use thereof. 5,498,765, Cl. 430-323.000.
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Hall, Jon R.; Carpenter, Clint W.; and Scott, Stuart K., 5,498,781, Cl. 523-213.000.
Carpenter, Michael K. Artificial stem, support, and floral pick device. 5,497,577, Cl. 47-41.120.
Carr, Albert A.; Thomas, Craig E.; Bernotas, Ronald C.; and Ku, George, to Merrell Dow Pharmaceuticals Inc. Cyclic nitrone compounds useful in treating stroke. 5,498,778, Cl. 514-309.000.
Carrier Corporation: *See*—
Shapess, Robert P., 5,498,097, Cl. 403-322.000.
Carsenti-Etesse, Helene J.; and Dellamonica, Pierre L. Process for the protection of prostheses and of temporarily or permanently implantable material against bacterial colonization and infection. 5,498,416, Cl. 424-422.000.
Carter, Daniel S.; Rupp, Dennis M.; and Betz, David O., to Vendo Company, The; and Wrex Products, Inc., a part interest. Method of manufacturing a helical structure. 5,498,387, Cl. 264-219.000.
Caruso, Charles P., Jr.; and Ward, Michael J., to Morton International, Inc. Inflatable restraint assembly. 5,498,024, Cl. 280-728.200.
Caruso, Jerome, to Sub-Zero Freezer Company, Inc. Double arm hinge for a refrigerator door. 5,497,534, Cl. 16-288.000.
Carver, Damian: *See*—

Gyure, Alex; Berg, John; Carver, Damian; and Manos, Pete, 5,498,896, Cl. 257-402.000.
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Case, Milford D. Miter clamp. 5,497,981, Cl. 269-37.000.
Cash, David R., to James Cash Machine Co., Inc. Air operated system for tape edge machine in mattress manufacturing. 5,497,718, Cl. 112-2.100.
Casio Computer Co., Ltd.: *See—*
Sato, Hiroshi, 5,499,179, Cl. 364-413.310.
Castelaz, Patrick F., to Hughes Aircraft Company. Fine-grained multi-planar clutter rejection processor. 5,499,195, Cl. 364-516.000.
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Gerwick, William H.; Jacobs, Robert S.; Castenholz, Richard; Garcia-Pichel, Ferran; Grace, Krista J. S.; Proteau, Philip J.; and Rossi, James, 5,498,405, Cl. 424-59.000.
Casto, James J.: *See—*
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Caterpillar Inc.: *See—*
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Codina, George; Oestmann, Eldon D.; and Shane, Gary J., 5,497,804, Cl. 137-554.000.
Cuthbertson, Robert A.; James, Barry E.; Magalhaes, Carlos E.; and Smith, Jerry P., 5,498,066, Cl. 298-23.00C.
Maloney, Ronald P., 5,497,755, Cl. 123-572.000.
Marcott, Tony L., 5,497,692, Cl. 91-523.000.
Causton, Barry J.: *See—*
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Cavalcanti, Fernando A. P.: *See—*
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Cavaliere, William A.; Ferrario, John S.; Ferris, Howard E.; Schuler, Raymond C.; and Srijek, Ronald L., to International Business Machines Corporation. Apparatus for testing semiconductor laser devices. 5,498,973, Cl. 324-765.000.
Cavanagh, Mark S.: *See—*
Swank, Bryan W.; Pataki, Arpad M.; Doszpoly, Bela; Cavanagh, Mark S.; Lane, John D.; Shields, Kent V.; and Dingle, Philip J. G., 5,497,806, Cl. 137-625.650.
Cavender, D. Lea; and Slater, Tina L. B. Doll making method. 5,497,543, Cl. 29-469.000.
Cellco, Inc.: *See—*
Bresler, Herbert S.; and Knazek, Richard A., 5,498,537, Cl. 435-235.100.
Central Glass Company, Limited: *See—*
Fujii, Hiroyuki; and Ieiri, Junichiro, 5,499,034, Cl. 343-713.000.
Nakamura, Tamio; Yokoyama, Takashi; and Kobayashi, Yoshiyuki, 5,498,754, Cl. 562-113.000.
Central Mine Equipment: *See—*
Burns, Raymond W.; and Oberlander, Kyle, 5,497,843, Cl. 175-403.000.
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Mallamo, John P.; Bihovsky, Ron; Chatterjee, Sankar; and Tripathy, Rabindranath, 5,498,616, Cl. 514-300.000.
Ceramaspeed Limited: *See—*
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Cewers, Goeran: *See—*
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Chakraborty, Amiya K., to Gesellschaft fur Anlagen- und Reaktorsicherheit. Apparatus for removing free hydrogen from a gas mixture containing hydrogen and oxygen. 5,499,279, Cl. 376-301.000.
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Agrawal, Vishwani D.; and Chakraborty, Tapan J., 5,499,249, Cl. 371-25.100.
Chambert, William R. G., to Telefonaktiebolaget LM Ericsson. Handoff method wherein stored measured information is transferred between base stations. 5,499,387, Cl. 455-33.200.
Chan, Eddie: *See—*
Aswad, Andrew D.; Severs, Dale; Silvestri, Joyce; Forman, Hugh M.; Woo, Lecon; Hiller, Thomas D.; Walsh, Lisa S.; Wade, Sandra; Chan, Eddie; Balteau, Patrick; Peluso, Franco; and Henaut, Eric, 5,498,253, Cl. 604-403.000.
Chan, Eric, to Bausch & Lomb Incorporated. Symmetric scanning technique for laser ablation. 5,498,508, Cl. 430-321.000.
Chan, Joning C. Steering wheel with horn button overlay. 5,498,844, Cl. 200-331.000.
Chan, Kam-Hoi, to Go-Gro Industries Ltd. Connecting assembly for fixing the tubular stem/stud of a portable lamp to the base of the same. 5,498,091, Cl. 403-3.000.
Chan, Michael Y. S.: *See—*
Liao, York; and Chan, Michael Y. S., 5,499,026, Cl. 341-33.000.
Chandraratna, Roshantha A.; and Teng, Min. Disubstituted aryl and heteroaryl imines having retinoid-like biological activity. 5,498,755, Cl. 564-272.000.
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Chou, Wayne W. Adjustable adaptor attachment for the accelerator pedal of a manual transmission vehicle used in competitive driving. 5,497,678, Cl. 74-562.500.
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Oien, Gene, 5,497,864, Cl. 188-352.000.
Severini, Joseph A.; Yee, Daniel C. L.; Tame, Omar D.; Plaza, Shelly M.; Gravenstruter, Noel P.; Jovan, Dragi; Susko, Thomas J.; and Schulte, Steven A., 5,498,052, Cl. 296-65.100.
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Jöllenbeck, Martin; and Neukom, Alfred J., 5,498,345, Cl. 252-589.000.
Ciolkevich, John T. Tire singulation system. 5,497,871, Cl. 198-443.000.
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Cohn, Theodore E., to University of California, The Regents of the. Braking light system for a vehicle. 5,499,010, Cl. 340-479.000.
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Collins, Donald A., Jr.; and Nye, Andrew B., III, to NCR Corporation. Labor-saving consolidated checkout system. 5,497,853, Cl. 186-61.000.
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Compton, John T., to Eastman Kodak Company. Digital image scanning apparatus with pixel data compensation for bad photosites. 5,499,114, Cl. 358-483.000.

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Counihan, James. Resilient flooring. 5,497,590, Cl. 52-385.000.

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Crist, Scott D.: *See—*
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Cross, Robert P.: *See—*
Chu, Hsien-Kun; and Cross, Robert P., 5,498,642, Cl. 522-99.000.

Crossman, Roy D. Dolly block for use in straightening, smoothing and cold shrinking of sheet metal panels. 5,497,648, Cl. 72-465.000.

Crowell, Bryan P.: *See—*
Mossi, G. Dean; and Crowell, Bryan P., 5,498,029, Cl. 280-741.000.

Crum, Robert S.: *See—*
Wey, Geoffrey A.; McCrimmon, Kenneth A.; and Crum, Robert S., 5,498,087, Cl. 400-68.000.

Cruz, William A.: *See—*
Wilson, Robert L.; Ubelhor, Sara A.; and Cruz, William A., 5,498,426, Cl. 424-602.000.

Cull, Millard G.: *See—*
Schatz, Peter J.; Cull, Millard G.; Miller, Jeff F.; and Stemmer, Willem P. C., 5,498,530, Cl. 435-69.100.

Cullen, Michael J.; and Dona, Alan R., to Ford Motor Company. Engine control for enhanced catalyst warm up while maintaining manifold vacuum. 5,497,745, Cl. 123-339.110.

Cullen, Michael J.: *See—*
Gee, Thomas S.; Smith, Paul F.; and Cullen, Michael J., 5,497,655, Cl. 73-118.200.

Cullison, Steven B., to Stewart Electronics. Protective shut-down system for switch-mode power supply. 5,499,154, Cl. 361-18.000.

Cully, Jan: *See—*
Kohlrausch, Utz; Cully, Jan; and Schmid, Bruno, 5,498,437, Cl. 426-614.000.

Cummins Electronics Company, Inc.: *See—*
White, Gregory R.; Gatewood, Bryan S.; Wilson, Mark L.; Griffen, Peter J.; Steeby, Jon A.; Anderson, Dean S.; and Webber, Larry R., 5,498,195, Cl. 477-110.000.

Cummins Engine Company, Inc.: *See—*
Swank, Bryan W.; Pataki, Arpad M.; Doszpoly, Bela; Cavanagh, Mark S.; Lane, John D.; Shields, Kent V.; and Dingle, Philip J. G., 5,497,806, Cl. 137-625.650.



Cuneo, Gregory. Goaltender simulator system. 5,498,000, Cl. 273-354.000.

Curro, Frederick A.: *See—*
Wood, Thomas G.; Curro, Frederick A.; and Parashos, Demetra E., 5,498,425, Cl. 424-464.000.

Curtis, George W.: *See—*
Simon, Ira J.; Curtis, George W.; and Campbell, Andrew B., 5,498,038, Cl. 292-36.000.

Cuthbertson, Robert A.; James, Barry E.; Magalhaes, Carlos E.; and Smith, Jerry F., to Caterpillar Inc. Articulated cover for a top loading hauling body. 5,498,066, Cl. 298-23.00C.

Cutler, Victor H., Jr.: *See—*
Richetta, Peter J.; and Cutler, Victor H., Jr., 5,499,237, Cl. 370-54.000.

Cymbaluk, Ted H.: *See—*
Johnson, Marvin M.; Nowack, Gerhard P.; and Cymbaluk, Ted H., 5,498,824, Cl. 985-848.000.

D & S Plastic International: *See—*
Srinivasan, Satchit, 5,498,671, Cl. 525-240.000.

Dadgar, Ali M.: *See—*
Schaerfl, Robert A., Jr.; Dadgar, Ali M.; and Lanier, Carroll W., 5,498,815, Cl. 585-512.000.

Daems, Eddie: *See—*
Leenders, Luc; and Daems, Eddie, 5,498,504, Cl. 430-199.000.

Daewoo Electronics Co., Ltd.: *See—*
Lim, Han-Sub, 5,499,054, Cl. 348-563.000.

Dahn, Jeffrey R.; and Way, Brian M., to Moli Energy (1990) Limited. Electron acceptor substituted carbons for use as anodes in rechargeable lithium batteries. 5,498,493, Cl. 429-218.000.

Dai-Ichi Kogyo Seiyaku Co., Ltd.: *See—*
Nishibori, Setsuo; and Kondo, Hideto, 5,498,714, Cl. 544-219.000.

Dai, Pei-Shing E.; and Sherwood, David E., Jr., to Texaco Inc. Catalyst with specified pore size distribution. 5,498,586, Cl. 502-313.000.

Daicel Chemical Industries, Ltd.: *See—*
Negawa, Masakazu; and Shoji, Fumihiko, 5,498,752, Cl. 560-249.000.
Oshino, Yasuhiro; and Kanno, Tatsuya, 5,498,688, Cl. 528-198.000.

Daig Corporation: *See—*
Swartz, John F.; Ockuly, John D.; Fleischhacker, John J.; and Hassett, James A., 5,497,774, Cl. 128-658.000.

Daiichi Pharmaceutical Co., Ltd.: *See—*
Harrison, David G.; Alexander, R. Wayne; Murphy T. J.; and Nishida, Ken'ichi, 5,498,539, Cl. 435-240.200.

Daikin Industries Ltd.: *See—*
Ichikawa, Masaru; Ohnishi, Ryuichiro; and Suzuki, Hisao, 5,498,806, Cl. 570-156.000.

Dainippon Ink and Chemicals, Inc.: *See—*
Shoji, Tadao; Takahashi, Nahoko; Ikushima, Naoya; Uryu, Toshiyuki; Yoshida, Takashi; Yamamoto, Naoki; Nakashima, Hideki; Katsuraya, Kaname; Adachi, Koichiro; and Kataoka, Fusayo, 5,498,602, Cl. 514-25.000.

Daldoss, Louis J.: *See—*
Dequin, Andre-Michel L.; Daldoss, Louis J.; and Barquet, Henri F., 5,498,129, Cl. 415-209.300.

Dalea, Lisa M.; Esse, Robert L.; and Shee, Francis M., to General Mills, Inc. Easily expandable, flexible paper popcorn package. 5,498,080, Cl. 383-120.000.

Dalsgaard, Kristian: *See—*
Casal Alvarez, Jose I.; Cortes Valdes, Elena; Ranz Casares, Ana I.; Vela Olmo, Carmen; and Dalsgaard, Kristian, 5,498,413, Cl. 424-233.100.

Dalton, Michael J. Tissue perfusion catheter. 5,498,251, Cl. 604-282.000.

Dana-Farber Cancer Institute, Inc.: *See—*
Burakoff, Steven J.; Schreiber, Stuart L.; and Bierer, Barbara E., 5,498,597, Cl. 514-2.000.

Dancyger, Michael; and Litwin, Larry. Paint can holder. 5,497,921, Cl. 224-148.000.

Danfoss A/S: *See—*
Weihrauch, Niels C., 5,498,918, Cl. 310-261.000.

Dang, Dinh: *See—*
Bailey, Michael E.; Dang, Dinh; Michael, James G.; Neary, Timothy E.; Pastel, Paul W.; Tousley, Sylvia R. R.; and Winslow, Arthur C., 5,498,313, Cl. 156-643.100.

Danieli & C. Officine Meccaniche SpA: *See—*
Poloni, Alfredo; and Drigani, Fausto, 5,497,644, Cl. 72-239.000.

Dannheim, Jörg; Russ, Werner H.; Springer, Hartmut, deceased (by Sebastian Springer, Johannes Springer, heirs), to Hoechst Aktiengesellschaft. Water-soluble anthraquinone compounds. 5,498,713, Cl. 544-189.000.

Darfler, Stephen C., to Hexcel Corporation. High thermal conductivity non-metallic honeycomb. 5,498,462, Cl. 428-116.000.

Darland, Richard E. Power miter table saw. 5,497,816, Cl. 144-287.000.

Das, Amitabh, to Philip Morris Incorporated. Semiconductor electrical heater and method for making same. 5,498,850, Cl. 219-121.660.

Dasgupta, Sankar; and Jacobs, James K. Rechargeable non-aqueous lithium battery having stacked electrochemical cells. 5,498,489, Cl. 424-152.000.

Dashevsky, Sophia: *See—*
Kim, Ki-Soo; Dashevsky, Sophia; and Burk, Johst H., 5,498,358, Cl. 252-51.005.00A.

DataSouth Computer Corporation: *See—*
Uland, David M., 5,497,701, Cl. 101-288.000.

Date, Toshinori; and Takasu, Yasuo, to Sega Enterprises, Ltd. Control key multiple electrical contact switching device. 5,498,843, Cl. 200-6.00A.

Daumy, Gaston O.; and Reiter, Lawrence A., to Pfizer Inc. Paranitroaniline peptides. 5,498,695, Cl. 530-331.000.

Davenport, Edward F.: *See—*
Bruni, Michael F.; and Davenport, Edward F., 5,498,948, Cl. 320-2.000.

Davenport, Roger A., to Motorola, Inc. Differential saw filter including series coupled resonant/antiresonant tracks. 5,499,003, Cl. 333-195.000.

David, Donald J.; Dickerson, Jerauld L.; Sincock, Thomas F.; and Williams, Susan R., to Monsanto Company. Thermoplastic composition and method for producing thermoplastic composition by melt blending carpet. 5,498,667, Cl. 525-166.000.

David-Comte, Marie-Thérèse; and Roussel, Gérard, to Rhone-Poulenc Rorer S.A. 2-amino naphthyridine derivative, its preparation and its use. 5,498,716, Cl. 546-122.000.

Davidson, James A., to Smith & Nephew Richards, Inc. Surface hardened biocompatible metallic medical implants. 5,498,302, Cl. 148-317.000.

Davis, George B., to Honeywell Inc. Energy recovery ventilator: means for defrosting heat exchanger medium and damper motor actuation means. 5,497,823, Cl. 165-1.000.

Davis, Kevin A., to Microflash, Inc. Light flashing system. 5,499,009, Cl. 340-468.000.

Dawn Equipment Company: *See—*
Kehrney, Barry R., 5,497,837, Cl. 172-619.000.

Dawson, Jeffrey C.: *See—*
Boles, Joel L.; Metcalf, Arthur S.; and Dawson, Jeffrey C., 5,497,830, Cl. 166-300.000.

Day International, Inc.: *See—*
McLean, Michael E.; Pinkston, Melvin D.; Arrington, Noel D.; Wolters, Dennis R.; Shannon, Allen T.; Ferguson, Thomas G.; Macfarlane, Graham; Baldermann, Chris; and Dolan, John, 5,498,470, Cl. 428-246.000.

Day, Sally E.: *See—*
McDonnell, Damien G.; Day, Sally E.; Coates, David; Jenner, John A.; Hird, Michael; and Toyne, Kenneth J., 5,498,366, Cl. 252-299.600.

Dayco Products, Inc.: *See—*
Berger, Jeffrey M.; and Foster, Randy C., 5,497,810, Cl. 138-113.000.

Deacon, David A. G.: *See—*
Bischel, William K.; Brinkman, Michael J.; and Deacon, David A. G., 5,499,256, Cl. 372-28.000.

Deacon Research: *See—*
Bischel, William K.; Brinkman, Michael J.; and Deacon, David A. G., 5,499,256, Cl. 372-28.000.

Deahr, Christine M. Child-constructable toys that are assembled using a system of color-coordinated components and tools. 5,498,188, Cl. 446-75.000.

Deal, Judy G.: *See—*
Varney, Michael D.; Palmer, Cindy L.; and Deal, Judy G., 5,498,727, Cl. 548-436.000.

Deaner, Michael J.: *See—*
Giuseppe, Puppin; Deaner, Michael J.; and Heikkila, Kurt E., 5,497,594, Cl. 52-730.400.

Debelius, Stephen A.: *See—*
Brewer, Kevin D.; and Debelius, Stephen A., 5,497,932, Cl. 227-132.000.

De Boer, Jan R., to U.S. Philips Corporation. Capacitive sensor circuit. 5,498,914, Cl. 307-116.000.

DeCanio, Stephen J.: *See—*
Khan, Motasimur R.; Albert, Christine C.; and DeCanio, Stephen J., 5,498,827, Cl. 588-213.000.

Deckers, Gregor; Diekhaus, Gerhard; Dorsch, Bernd; Frohning, Carl D.; Horn, Gerhardt; and Horrig, Horst B., to Hoechst Aktiengesellschaft. Hydrogenation catalyst, a process for its preparation, and use thereof. 5,498,587, Cl. 502-328.000.

Deckers, Gregor; and Frohning, Dieter, to Hoechst Aktiengesellschaft. Process for the preparation of amines by catalytic hydrogenation of nitriles. 5,498,796, Cl. 564-493.000.

de Clercq, Arnold; Ettl, Roland; Goncalves, Carlos A.; Hoehr, Lothar; Hohmann, Andreas; and Riebeling, Ulrich, to BASF Aktiengesellschaft. Paper size mixtures. 5,498,648, Cl. 524-47.000.

De Cock, Etienne M.: *See—*
Aerens, Ronny J. V.; De Cock, Etienne M.; De Schamphelaere, Lucien A.; Steylaerts, Peter A. R.; and Van Weverberg, Erik G. G., 5,499,093, Cl. 355-326.00R.

DeCusatis, Casimer M., to International Business Machines Corporation. Receptacle for connecting parallel fiber optic cables to a multichip module. 5,499,311, Cl. 385-89.000.

Deen, M. Jamal; Malhi, Duljit S.; Yan, Zhixin; and Hadaway, Robert A., to Northern Telecom Limited. Modulation circuit. 5,498,885, Cl. 257-139.000.

Deere & Company: *See—*
Formwalt, Charles W., Jr., 5,498,929, Cl. 315-77.000.
Underwood, Mark R.; and Dwyer, Sushil V., 5,497,605, Cl. 56-14.600.
Underwood, Mark R.; and Dwyer, Sushil V., 5,498,206, Cl. 460-14.000.

Deevi, Seetharama C.; and Lilly, A. Clifton, Jr., to Philip Morris Incorporated. Electrically powered ceramic composite heater. 5,498,855, Cl. 219-553.000.

DeFeo, Brent S.: *See—*
Johnson, Russell W.; DeFeo, Brent S.; Lupton, Francis S.; and Koch, Mark B., 5,498,401, Cl. 423-352.000.

De Filippo, Antonio: *See—*
Kamm, Roland; Veit, Eberbard; Schneider, Josef; De Filippo, Antonio; Murray, Donald W.; Story, Michael C.; and Lammons, Carl S., 5,497,530, Cl. 15-321.000.

DeFonzo, Stephan A.; Young, Wayne P.; Pennatto, Samson L.; and Komlosi, Andrew, to United States Surgical Corporation. Apparatus and method for applying surgical staples to attach an object to body tissue. 5,497,933, Cl. 227-175.100.
Defreitas, Kenneth F.: *See—*
Pellegrino, Anthony J.; Defreitas, Kenneth F.; Lyke, Daniel N.; and Schutz, Richard F., 5,499,284, Cl. 378-198.000.
de Frésart, Edouard: *See—*
Steele, John W.; de Frésart, Edouard; and Theodore, N. David, 5,498,578, Cl. 437-235.000.
Degremont: *See—*
Richard, Yves R., 5,498,347, Cl. 210-739.000.
Degun, Joginder S.; and Abulii, Robert. Cavity matched hybrid coupler. 5,499,001, Cl. 333-115.000.
Degussa Aktiengesellschaft: *See—*
Bartels, Karin; Deller, Klaus; Despeyroux, Bertrand; and Simon, Jochen, 5,498,585, Cl. 502-185.000.
Burmeister, Roland; Deller, Klaus; and Despeyroux, Bertrand, 5,498,590, Cl. 502-439.000.
de Jaeger, Nikolaas C. J.; Monbaliu, Marcel J.; Noppe, Marcus J. M.; and Konings, Frank J., to Janssen Pharmaceutica N.V. Method for the detection of specific binding agents and their corresponding bindable substances. 5,498,551, Cl. 436-533.000.
Dektar, John L.: *See—*
Nagel, Colleen C.; Bentsen, James G.; Yafuso, Masao; Katritzky, Alan R.; Dektar, John L.; and Kipke, Cary A., 5,498,549, Cl. 436-172.000.
Delco Electronics: *See—*
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Delco Electronics Corporation: *See—*
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Manlove, Gregory J., 5,498,986, Cl. 327-77.000.
Ouwerkerk, David B., 5,498,950, Cl. 320-18.000.
Del Fabro, Giorgio; and Del Fabro, Marcello, to M.E.P. Macchine Elettroniche Piegatrici SpA. Method to butt bars, and bar butting assembly that employs such method. 5,498,113, Cl. 414-14.000.
Del Fabro, Marcello: *See—*
Del Fabro, Giorgio; and Del Fabro, Marcello, 5,498,113, Cl. 414-14.000.
DeLisle, David J.: *See—*
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Dellamonica, Pierre L.: *See—*
Carsenti-Etesse, Helene J.; and Dellamonica, Pierre L., 5,498,416, Cl. 424-422.000.
Delle Cave, Steven F. Gray water reclamation system including plural filtration steps. 5,498,330, Cl. 210-103.000.
Deller, Klaus: *See—*
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Burmeister, Roland; Deller, Klaus; and Despeyroux, Bertrand, 5,498,590, Cl. 502-439.000.
Deluxe Craft Manufacturing Co.: *See—*
Motyka, Kenneth J., 5,498,089, Cl. 402-4.000.
De Man, Ivo, to Mars Incorporated. Apparatus for the optical recognition of documents by photoelectric elements having vision angles with different length and width. 5,498,879, Cl. 250-556.000.
DeMars, Robert A. Bubble producing toy. 5,498,191, Cl. 446-015.000.
Demas, James G.; Demas, Nicholas G.; Demas, John G.; Demas, Leonidas G.; and Cornett, Frank, to Demas, James G.; Demas, Nicholas G.; Demas, John G.; and Demas, Leonidas G. Distance measuring system. 5,499,199, Cl. 364-561.000.
Demas, John G.: *See—*
Demas, James G.; Demas, Nicholas G.; Demas, John G.; Demas, Leonidas G.; and Cornett, Frank, 5,499,199, Cl. 364-561.000.
Demas, Leonidas G.: *See—*
Demas, James G.; Demas, Nicholas G.; Demas, John G.; Demas, Leonidas G.; and Cornett, Frank, 5,499,199, Cl. 364-561.000.
Demas, Nicholas G.: *See—*
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DeMatteis, Robert B.; and Schleader, Ralph E., to Polytec Packaging. Self opening dual tab merchandising bag. 5,497,884, Cl. 206-554.000.
Densing, David M.: *See—*
Theisen, Terry J.; Dumoit, Joe D.; and Densing, David M., 5,497,725, Cl. 116-277.000.
Dennis, Mahlon; and Dennis, Thomas M., to Dennis Tool Company. Bearing assembly incorporating shield ring precluding erosion. 5,498,081, Cl. 384-95.000.
Dennis, Thomas M.: *See—*
Dennis, Mahlon; and Dennis, Thomas M., 5,498,081, Cl. 384-95.000.
Dennis Tool Company: *See—*
Dennis, Mahlon; and Dennis, Thomas M., 5,498,081, Cl. 384-95.000.
Dennison, Charles H.; and Walker, Michael A., to Micron Technology, Inc. Semiconductor processing methods of forming stacked capacitors. 5,498,562, Cl. 437-52.000.
Denyer, Stephen P.: *See—*
Rees, Catherine E. D.; Rostas-Mulligan, Katalin; Park, Simon F.; Denyer, Stephen P.; Stewart, Gordon S. A. B.; and Jassim, Sabah A. A., 5,498,525, Cl. 435-29.000.
Dequin, Andre-Michel L.; Daldoss, Louis J.; and Barquet, Henri F., to Eurocopter France. Counter-torque device with ducted tail rotor and ducted flow-straightening stator, for helicopters. 5,498,129, Cl. 415-209.300.
Dereamus, Robert C.: *See—*
Miller, Richard E.; and Dereamus, Robert C., 5,498,282, Cl. 106-22.00B.
Dernelk, Salman; Wanner, Martina; Lemmer, Karl-Heinz; and Braun, Reinhold, to Ciba-Geigy Corporation. Compositions comprising reaction products of phosphites, quinones and isocyanates. 5,498,740, Cl. 558-89.000.
Desai, Manoj C., to Pfizer Inc. Bridged aza-bicyclic derivatives as substance P antagonist. 5,498,614, Cl. 514-299.000.
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De Schamphelaere, Lucien A.: *See—*
Aerens, Ronny J. V.; De Cock, Etienne M.; De Schamphelaere, Lucien A.; Steylaerts, Peter A. R.; and Van Weverberg, Erik G. G., 5,499,093, Cl. 355-326.00R.
Deshpande, Raj M.: *See—*
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Designed Enclosures, Inc.: *See—*
Lee, Won S., 5,499,377, Cl. 395-200.010.
Despeyroux, Bertrand: *See—*
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Burmeister, Roland; Deller, Klaus; and Despeyroux, Bertrand, 5,498,590, Cl. 502-439.000.
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Detra SA: *See—*
Tu, Mai X.; and Schwab, Michel, 5,498,958, Cl. 324-207.160.
Deutchman, Arnold H.: *See—*
Deutchman, Mark E.; and Deutchman, Arnold H., 5,498,246, Cl. 604-227.000.
Deutchman, Mark E.; and Deutchman, Arnold H. Aspirator/injector device with palm engaging handle. 5,498,246, Cl. 604-227.000.
Deutsche Forschungsanstalt für Luft- und Raumfahrt e.V.: *See—*
Schlenger, Manfred; and Hald, Hermann, 5,497,548, Cl. 29-893.000.
Devonshire, William J.: *See—*
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deZordo, Stephen: *See—*
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Diba, Sholeh, to Xilinx, Inc. Integrated circuit one shot with extended length output pulse. 5,498,989, Cl. 327-230.000.
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Dickerson, Jerauld L.: *See—*
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Dickson, David: *See—*
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Dieffenbach, Erich A. Cable transport container. 5,497,880, Cl. 206-395.000.
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Deckers, Gregor; Diekhaus, Gerhard; Dorsch, Bernd; Frohning, Carl D.; Horn, Gerhardt; and Horrig, Horst B., 5,498,587, Cl. 502-328.000.
Dierks & Soehne GmbH & Co. KG: *See—*
Möller, Dieter; Thies, Konrad; Schmidt, Willi; Gerbel, Daniel; and Etzenbach, Joachim, 5,498,074, Cl. 366-94.000.
Dietz, Matthias: *See—*
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Digital Equipment Corporation: *See—*
Klein, Johannes; and Upton, Francis R., IV, 5,499,364, Cl. 395-200.030.
Lary, Richard F., 5,499,253, Cl. 371-40.100.
Lucas, Peter; and Sena, Jeffrey A., 5,499,330, Cl. 395-145.000.
Mellitz, Richard I., 5,498,965, Cl. 324-532.000.
Di Giulio, Peter C.; Lee, David K.; Riley, David W.; and Ryan, Frederick W., Jr., to Pitney Bowes Inc. Event driven communication network. 5,499,374, Cl. 395-728.000.
Dila, Deborah K.: *See—*
Fomenkov, Aleksei; Dila, Deborah K.; Raleigh, Elisabeth A.; and Xu, Shuang-Yong, 5,498,535, Cl. 435-172.300.
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DiNello, Alexandre M.; Hildebrand, Bryan D.; and White, Hoyt D., to AcroMed Corporation. Transverse connector for spinal column corrective devices. 5,498,263, Cl. 606-61.000.
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Dingle, Jason E.: *See—*
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Dingle, Philip J. G.: *See—*
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Dingman, Randy R.: *See—*
Kulkarni, Sunil B.; and Dingman, Randy R., 5,498,007, Cl. 277-96.100.
Dinnis, Reinfrid C.; and Dinnis, Samuel T. A. Apparatus for opening sealed containers. 5,497,813, Cl. 141-329.000.
Dinnis, Samuel T. A.: *See—*
Dinnis, Reinfrid C.; and Dinnis, Samuel T. A., 5,497,813, Cl. 141-329.000.
Direct Measurement Corporation: *See—*
Cage, Donald R.; and Schott, Michael N., 5,497,665, Cl. 73-861.380.
Director-General of Agency of Industrial Science and Technology: *See—*
Todo, Yoshinori; Sakamoto, Masami; Ushijima, Noriaki; Sonoda, Akira; Miura, Yukio; and Araki, Kyousuke, 5,498,121, Cl. 414-719.000.
DiSanto, Frank J.; and Krusos, Denis A., to Copytele, Inc. Method of operation for reducing power, increasing life and improving performance of EPIDs. 5,499,038, Cl. 345-107.000.
Divekar, Sunil S.: *See—*
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Dixon, Robert C.; and Vanderpool, Jeffrey S., to Omnipoint Data Company, Incorporated. Spread spectrum correlator. 5,499,265, Cl. 375-200.000.
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Rodgers, Kathleen E.; and Dizerega, Gere S., 5,498,613, Cl. 514-258.000.
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Weston, Terence E.; and Dunne, Stephen T., 5,497,944, Cl. 239-321.000.
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Mansour, Raafat R.; and Dokas, Van, 5,498,771, Cl. 505-210.000.
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McLean, Michael E.; Pinkston, Melvin D.; Arrington, Noel D.; Wolters, Dennis R.; Shannon, Allen T.; Ferguson, Thomas G.; Macfarlane, Graham; Baldermann, Chris; and Dolan, John, 5,498,470, Cl. 428-246.000.
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Easter, Kenneth M.; Lotspih, John A.; and Donegan, Michael W., 5,498,025, Cl. 280-728.200.
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Wakabayashi, Toshio, 5,499,276, Cl. 376-170.000.
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Pandey, Ravindra K.; Dougherty, Thomas J.; Smith, Kevin M.; and Meunier, Isabelle, 5,498,710, Cl. 540-145.000.
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Holdampf, Carl J., 5,498,062, Cl. 297-238.000.
Dovek, Moris M., to International Business Machines Corporation. Slider with transverse ridge sections supporting air-bearing pads and disk drive incorporating slider. 5,499,149, Cl. 360-103.000.
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Gaidos, Robert E.; and Patel, Mukund R., 5,499,198, Cl. 364-555.000.
Dow Corning Limited: *See—*
Coles, Harry J., 5,498,368, Cl. 252-294.670.
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Ross, Barry C.; Middlemiss, David; Scopes, David I. C.; Jack, Torquil I. M.; Cardwell, Kevin S.; Dowle, Michael D.; Judd, Duncan B.; and Watson, Stephen P., 5,498,722, Cl. 548-315.400.
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Drewanz, Andreas; Holmes, Robert L.; Key, Edward; and Reinken, Allan J., to North American Philips Corporation. Electrical connecting device. 5,498,173, Cl. 439-404.000.
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Creusen, Raimond J. M.; Hendriks, Everardus C. A.; and Hanemaaijer, Jan H., 5,498,339, Cl. 210-644.000.
Schellekens, Ronald M. A. M.; and Van Dijk, Hans K., 5,498,371, Cl. 252-500.000.
Du Pont Canada Inc.: *See—*
Wirsig, Ralph C.; and Thompson, John R., 5,497,909, Cl. 222-82.000.
Du Pont de Nemours, E. I., and Company: *See—*
Lee, Denny L. Y.; Jeromin, Lothar S.; and Bindloss, William, 5,498,880, Cl. 250-580.000.
Lin, Perry H.; and Sun, Yanhui, 5,498,386, Cl. 264-211.000.
Mokhtar, Ahmed M.; Popper, Peter; Walker, William C.; and Yagve, Paul W., 5,498,459, Cl. 428-85.000.
Williams, Clive I., 5,498,669, Cl. 525-195.000.
Zatkulak, Tony D., 5,497,596, Cl. 52-746.100.
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Thompson, Leo J.; Dubberly, Gregory T.; Ritchie, John A., Jr.; and Fellows, David M., 5,499,241, Cl. 370-73.000.
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Duffy, John C. Luff groove bracket and method. 5,497,849, Cl. 182-136.000.
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Dummersdorf, Hans-Ulrich; Hebecker, Dietrich; von Lengerken, Dirk; Winter, Carsten, deceased; Winter, Walter, heir; and Winter, Renate, heir, to Maschinen- und Anlagenbau Grimma GmbH (MAG). Plasmatron with steam as the plasma gas and process for stable operation of the plasmatron. 5,498,826, Cl. 588-210.000.
Dumoit, Joe D.: *See—*
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Dunham, Jason W.: *See—*
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Dunlop Slazenger Corporation: *See—*
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Dunne, Stephen T.: *See—*
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Dupree, Paul L.: *See—*
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Durametallic Corporation: *See—*
Kulkarni, Sunil B.; and Dingman, Randy R., 5,498,007, Cl. 277-96.100.
Durgin, David L.; Malins, Robert J.; and Hoke, Richard T., to Quatro Corporation. Process for manufacture of printed circuit boards. 5,498,311, Cl. 216-20.000.
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Miller, Larry E.; Hawkins, Gene P.; and Durham, Bernard G., 5,498,373, Cl. 252-546.000.
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Northrop, Donald P., 5,498,924, Cl. 313-486.000.
Duva, Anthony W., to United States of America, Navy. External combustion engine having an asymmetrical cam and method of operation. 5,497,614, Cl. 60-39.630.
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Underwood, Mark R.; and Dwyer, Sushil V., 5,498,206, Cl. 460-14.000.
Dye, Dan W.: *See—*
McCannon, W. Allen, Jr.; Dye, Dan W.; and Bond, Cecil F., 5,497,838, Cl. 175-27.000.
Dykes, Edward R., to General Electric Company. Method and apparatus for measuring and controlling refracted angle of ultrasonic waves. 5,497,662, Cl. 73-634.000.
D2B Systems Company: *See—*
Welmer, Harm J., 5,499,018, Cl. 340-825.070.
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Gross, Martin; and Renz, Werner, 5,498,853, Cl. 219-463.000.
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Mankovitz, Roy J., 5,499,103, Cl. 358-335.000.
Eastep, Brian, to Ramtron International Corporation. Layered local interconnect compatible with integrated circuit ferroelectric capacitors. 5,498,569, Cl. 437-187.000.
Easter, Kenneth M.; Lotspih, John A.; and Donegan, Michael W., to General Motors Corporation. Air bag module. 5,498,025, Cl. 280-728.200.
Eastland Technology Australia PTY LTD: *See—*
Whisson, Maxwell E., 5,498,245, Cl. 604-198.000.
Eastman Chemical Company: *See—*
Heise, William H.; Folk, Daniel P.; Yau, Cheuk C.; and Sink, Chester W., 5,498,749, Cl. 560-78.000.
Puckette, Thomas A., 5,498,584, Cl. 502-162.000.
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Compton, John T., 5,499,114, Cl. 358-483.000.
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Gaboury, Michael J.; and Jackson, Todd A., 5,498,865, Cl. 250-214.00A.
Griffith, John D., 5,499,069, Cl. 354-152.000.
James, Robert O.; Rowley, Lawrence A.; and Oltean, George L., 5,498,512, Cl. 430-496.000.
Merkel, Paul B.; Poslusny, Jerrold N.; Williamson, Hugh M.; Clark, Bernard A.; and Stanley, Paul L. R., 5,498,515, Cl. 430-556.000.
Pummell, Leslie J. H., 5,499,073, Cl. 354-320.000.
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Easy Up Sash Lift, Inc.: *See—*
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Eaton Corporation: *See—*
Hirsch, Mark A.; Stout, Donald M.; Corns, Derek P. J.; Randrianarison, Patrick; and Skotnicki, George, 5,497,867, Cl. 192-48.910.
ECC International Corp.: *See—*
Vogelpohl, Gregory J.; and South, Phillip C., 5,497,905, Cl. 221-226.000.
Eccleston, William, to British Technology Group Limited. Method of activation of superconductors and devices produced thereby. 5,498,595, Cl. 505-235.000.
Eccli, William D.; and Premuth, Alexander D. S., to Mobil Oil Corporation. Single temperature stage crystallization of paraxylene. 5,498,822, Cl. 585-816.000.
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Maggio, Mark S.; Allsup, David S.; Cox, Alvin E.; Metzner, Tom; Eckerd, Steven; and Skarky, Loren, 5,498,840, Cl. 174-260.000.
Eckert, Roger E.; Hessel, Richard E.; Phelps, Andrew E.; Spix, George A.; and Wilson, Jimmie R., to Cray Research, Inc. Method and apparatus for a multiprocessor resource lockout instruction. 5,499,356, Cl. 395-479.000.
Eckhout, Thomas L., to Winget, Larry J. Air bag cover having a hidden break seam. 5,498,026, Cl. 280-728.300.
Eckrich, Michael: *See—*
Linde, Hansjürgen; Wolf, Peter; Seeser, Günter; Wimmer, Manfred; Weishaupt, Walter; Wegge, Martin; Schüch, Siegmund; Schackmann, Horst; Bauer, Franz; and Eckrich, Michael, 5,497,641, Cl. 70-257.000.
Ecological Chemical Products: *See—*
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Edler, Peter A., to International Computers Limited. Side scanning bar code reader with vertical and horizontal scan patterns. 5,498,862, Cl. 235-457.000.
Edlund, David J., to Bend Research, Inc. Composite hydrogen separation element and module. 5,498,278, Cl. 96-11.000.
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EG&G Energy Measurements, Inc.: *See—*
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Egli, Margaret A.: *See—*
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Eguchi, Ken, to Canon Kabushiki Kaisha. Ferroelectric liquid crystal device. 5,498,762, Cl. 428-1.000.
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Shon, Seung W., 5,499,238, Cl. 370-60.100.
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Elliot, M. Edmund; and Pfautz, James C. Hand-held universal dispensing container which operates regardless of its orientation. 5,497,911, Cl. 222-95.000.
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Emert, Jacob; Rossi, Albert; Rea, Salvatore; Frederick, Jeffrey W.; and Kim, Mahn W., to Exxon Chemical Patents Inc. Polymers derived from ethylene and 1-butene for use in the preparation of lubricant dispersant additives. 5,498,809, Cl. 585-13.000.
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Emmons, William D.; and Gross, Andrew W., to Rohm and Haas Company. Block copolymers containing latent thiol mercaptan chain transfer agents and the method of making these block copolymers. 5,498,675, Cl. 525-537.000.
EMS Inventa AG: *See—*
Prische, Rainer; Gross-Lannert, Renate; Wollmann, Klaus; Best, Bernd; Schmid, Eduard; and Buehler, Fritz, 5,498,706, Cl. 536-45.000.
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Engler, Carl W. Bird anti-perching device. 5,497,585, Cl. 52-101.000.
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English, Charles, Sr. Keelless concave hull. 5,497,722, Cl. 114-62.000.
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Enichem S.p.A.: *See—*
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Ensmenger, Gary. Toe-articulated stilt. 5,498,220, Cl. 482-76.000.
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Envirovac, Inc.: *See—*
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Hamlin, Michael R., 5,497,554, Cl. 30-330.000.
Flexman, Edmund A.; and Kelly, William E., Jr., to Ecological Chemical Products. Poly(lactic acid) composition having improved physical properties. 5,498,650, Cl. 524-114.000.
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Frankland, Scott G., to Wavestream Kinetics. High-power, high-fidelity tube amplifier. 5,498,996, Cl. 330-118.000.
Franks, Johnny D.; and Kinas, Richard. Archery target. 5,498,001, Cl. 273-403.000.
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Fried, Joseph, to Yamit Sachar Ltd. Rifle support apparatus. 5,497,575, Cl. 42-94.000.
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Sasaki, Beji, 5,498,380, Cl. 264-39.000.
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Fugoso, Mauricio L., to Medtronic, Inc. Lockable guidewire. 5,497,782, Cl. 128-772.000.
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Kikuchi, Makoto; and Okamura, Hisashi, 5,498,516, Cl. 430-567.000.
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Okumura, Kenichi; Fujioka, Hakaru; and Oshima, Kazuhiro, 5,497,559, Cl. 33-517.000.
Fujioka, Kazuyohsi: *See*—
Tsubota, Koujiro; Fujioka, Kazuyohsi; Yoshimura, Yohji; Obgami, Hiroyuki; Takafuji, Yutaka; Nomura, Katsumi; Kubo, Masumi; and Kamei, Hirokazu, 5,499,127, Cl. 359-80.000.
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Sohda, Takashi; Fujisawa, Yukio; Yasuma, Tsuneo; Mizoguchi, Junji; Kori, Masakuni; and Takizawa, Masayuki, 5,498,728, Cl. 548-493.000.
Fujishige, Masaru, to Japan Tobacco Inc. Cut tobacco layer trimming apparatus for a cigarette manufacturing machine. 5,497,790, Cl. 131-84.400.
Fujita, Hitoshi: *See*—
Takahashi, Tsugio; Fujita, Hitoshi; and Okamoto, Hiroshi, 5,499,202, Cl. 364-761.000.
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Matsumoto, Misuhiro; and Fujita, Kunihiko, 5,498,725, Cl. 548-408.000.
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Watanabe, Mamoru; Fujii, Michihiro; and Fujita, Nobuo, 5,499,082, Cl. 355-245.000.
Fujitsu Limited: *See*—
Kawano, Michinao; Misaizu, Setsuo; Anzai, Tomoko; and Tsuda, Takashi, 5,499,258, Cl. 372-34.000.
Kimoto, Takashi; Masumoto, Daiki; Yamakawa, Hiroshi; and Nagata, Shigemi, 5,498,943, Cl. 318-601.000.
Muto, Shunichi, 5,499,206, Cl. 365-114.000.
Nakayama, Noriko, 5,499,324, Cl. 395-129.000.
Niimi, Makoto; Ito, Shigemasa; Yamada, Toyonobu; Takemae, Yoshihiro; and Kato, Yoshiharu, 5,499,213, Cl. 365-222.000.
Sato, Noriaki, 5,498,891, Cl. 257-316.000.
Takenaka, Masahiko; Torii, Naoya; Hasebe, Takayuki; and Akiyama, Ryota, 5,499,299, Cl. 380-28.000.
Tanaka, Hiroyuki, 5,499,100, Cl. 356-401.000.
Uchida, Keiichiro; and Okamoto, Tetsuro, 5,499,350, Cl. 395-375.000.
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Yanagi, Shigenori; Takayanagi, Makoto; and Katoh, Kikuji, 5,499,223, Cl. 369-44.280.
Yanagi, Shigenori, 5,499,230, Cl. 369-124.000.
Fujitsu Ten Limited: *See*—
Nagami, Masaaki; Sako, Kazuya; Babasaki, Masahiro; and Sakiyama, Kazuhiro, 5,499,302, Cl. 381-71.000.
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Niimi, Makoto; Ito, Shigemasa; Yamada, Toyonobu; Takemae, Yoshihiro; and Kato, Yoshiharu, 5,499,213, Cl. 365-222.000.
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Yamashiro, Akiyoshi; Fujiwara, Kiyoshi; and Oguma, Nobuhiro, 5,497,978, Cl. 266-176.000.
Fujiwara, Koichi; Mizutani, Hiromichi, deceased (by Hiroko Mizutani, legal representative), to Nippon Telegraph & Telephone Corporation. Device for collecting or preparing specimens using magnetic micro-particles. 5,498,550, Cl. 436-526.000.
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Isshiki, Osamu; Murashita, Masaki; Matsushima, Osamu; Nakagawa, Seizo; Goto, Koji; Hashiura, Masayoshi; Kobayashi, Sadao; Nakano, Seizo; Goto, Koji; Hashiura, Masayoshi; Kobayashi, Yutaka; Satoh, Takashi; Ota, Katsuro; Kikuchi, Hideaki; Sato, Takashi; and Fukuda, Shinji, 5,498,849, Cl. 219-121.640.
Fukui, Hiroshi: *See*—
Nakamichi, Kouichi; Izumi, Shogo; and Fukui, Hiroshi, 5,498,422, Cl. 424-451.000.
Fukui, Sinichi, to Mitsubishi Denki Kabushiki Kaisha. Receiver with function to adjust local frequency following reception frequency. 5,499,393, Cl. 455-264.000.
Fukuma, Kooji; Sakurai, Soichi; Okuyama, Nobutaka; Satoh, Yoshio; and Obara, Yoshihiro, to Hitachi, Ltd.; and Hitachi Mizusawa Electronics Co., Ltd. Deflection yoke and cathode ray tube having the same. 5,498,939, Cl. 315-370.000.
Fukuoka Kagaku Ltd.: *See*—
Fukuoka, Masahiro, 5,498,061, Cl. 297-217.700.
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Fukushige, Minoru, to NEC Corporation. Ready signal control apparatus capable of automatically deactivating ready signal. 5,498,981, Cl. 326-93.000.
Fukushima, Masami: *See*—
Morita, Yusuke; Fukushima, Masami; Gotou, Fumio; and Aoki, Shigeo, 5,498,656, Cl. 524-140.000.
Fukushima, Tsukasa: *See*—
Nagano, Osamu; and Fukushima, Tsukasa, 5,499,257, Cl. 372-31.000.
Fukuyama, Masashi: *See*—
Kozuka, Yoshinari; Osugi, Yukihisa; and Fukuyama, Masashi, 5,499,309, Cl. 385-38.000.
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Fuller, B. Franklin; and Fuller, Franklin G., 5,497,637, Cl. 68-4.000.
Fulford, H. Jim, Jr.; and Gardner, Mark I., to Advanced Micro Devices, Inc. Method for fabricating thin oxides for a semiconductor technology. 5,498,577, Cl. 437-228.000.
Fuller, B. Franklin; and Fuller, Franklin G., to Ful-Dye, Inc. Dye bath structure and apparatus for applying dye to textiles. 5,497,637, Cl. 68-4.000.
Fuller, Franklin G.: *See*—
Fuller, B. Franklin; and Fuller, Franklin G., 5,497,637, Cl. 68-4.000.
Fuller, Robert: *See*—
Proctor, Richard I.; and Fuller, Robert, 5,498,218, Cl. 482-10.000.
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Nishida, Kiyoshi; Sugiyama, Tsutomu; Funato, Katsuro; and Hattori, Kenzi, 5,498,479, Cl. 428-403.000.
Funato, Shiyouichirou: *See*—
Ito, Tamotsu; Oda, Toshiyuki; Takeuchi, Takashi; and Funato, Shiyouichirou, 5,499,221, Cl. 369-32.000.
Fung, Min-Su: *See*—
Verkuil, Roger L.; and Fung, Min-Su, 5,498,974, Cl. 324-767.000.
Furman, Lev B., to Whitaker Corporation, The. Modular electrical contact assemblies. 5,498,838, Cl. 174-74.00R.
Furnish, Greg, to Snowden-Pencer, Inc. Surgical instrument handle. 5,498,256, Cl. 606-1.000.
Furon Company: *See*—
Kingsford, Kenji A., 5,498,036, Cl. 285-138.000.
Furuhata, Takashi: *See*—
Azuma, Nobuo; Furuhata, Takashi; Takeda, Katsumi; and Takahashi, Hiroaki, 5,499,145, Cl. 360-33.100.
Furui, Yuji: *See*—
Matsumoto, Itsuo; Furui, Yuji; and Tsuchimoto, Yoshihiro, 5,498,274, Cl. 65-80.000.
Furukawa Electric Corp., The: *See*—
Matsuda, Yutaka; Morise, Hiroo; Hashimoto, Kyosuke; Akimoto, Mitsuru; Hirano, Seiji; Michihira, Osamu; Terayama, Koji; Sakamoto, Hiroaki; and Umegaki, Koji, 5,499,247, Cl. 370-85.300.
Furukawa, Hisao: *See*—
Nambu, Toshiro; Inoue, Masaharu; Nakamura, Seigo; and Furukawa, Hisao, 5,498,666, Cl. 525-100.000.
Furuta, Michihiro, to Mitsubishi Denki Kabushiki Kaisha. Active filter device. 5,498,994, Cl. 327-532.000.
Furuta, Motonobu; Yamaguchi, Takanari; and Ohashi, Kazutoshi, to Sumitomo Chemical Company, Limited. Modified polyphenylene ether, process for preparing the same and thermoplastic resin composition comprising the same. 5,498,689, Cl. 528-214.000.
Furuya, Tadashi; Araya, Junji; Yano, Hideyuki; and Kugoh, Harumi, to Canon Kabushiki Kaisha. Image forming apparatus having a voltage controlled contact charger. 5,499,080, Cl. 355-208.000.
Fusion Systems Corp.: *See*—
Kamarchi, Mohammad; and Simpson, James E., 5,498,308, Cl. 156-345.000.
G. D S.p.A.: *See*—
Boldrini, Pulvio, 5,497,598, Cl. 53-136.100.
G. S. Blodgett Corporation: *See*—
Alden, Lorne B.; Cole, J. Timothy; Kleva, James A.; and Lonergan, Erin D., 5,497,760, Cl. 126-21.00A.
Gaboury, Michael J.; and Jackson, Todd A., to Eastman Kodak Company. Photodiode amplifier circuit with improved sensitivity to high efficiency illumination. 5,498,865, Cl. 250-214.00A.
Gagliardi, John J.; and Chesley, Jason A., to Minnesota Mining and Manufacturing Company. Abrasive articles and method of making abrasive articles. 5,498,268, Cl. 51-294.000.
Gagne, Bertrand. Lighting system. 5,499,170, Cl. 362-84.000.
Gaidos, Robert E.; and Patel, Mukund R., to Dow Chemical Company, The. Method for predicting spray drift. 5,499,198, Cl. 364-555.000.
Galel, Zev; and Yang, Yi, to Guided Medical Systems, Inc. Catheter placement by pressurizable tubular guiding core. 5,498,239, Cl. 604-95.000.
Gallo, Kevin T.: *See*—
Mathur, Sharad; Menezes, Arul; VanBuskirk, Michael R.; and Gallo, Kevin T., 5,499,109, Cl. 358-400.000.
Galtier, Pierre; Bonifay, Régis; Franckowiak, Sigismond; Gauthier, Thierry; and Pontier, Renaud, to Institut Francais du Petrole. Process for and apparatus for catalytic cracking in two successive reaction zones. 5,498,326, Cl. 208-74.000.
Galvanauskas, Almantas; and Fermann, Martin E., to Imra America. Optical pulse amplification using chirped Bragg gratings. 5,499,134, Cl. 359-333.000.
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Askari, Syed H.; Neidlinger, Hermann H.; and Gandhi, Khushroo, 5,498,681, Cl. 526-246.000.
Ganslaw, Stuart: *See*—
Lhila, Ramesh; Ganslaw, Stuart; and Serra, Eleanor, 5,498,417, Cl. 424-448.000.
Ganson, Arthur M., to HandsOnToys, Inc. Flexible foam construction toy and method of manufacturing same. 5,498,190, Cl. 446-107.000.
Gantois, Johan. Bicycle repair stand. 5,497,967, Cl. 248-166.000.
Ganzhorn, Axel: *See*—
Neises, Bernhard; Ganzhorn, Axel; Tarnus, Céline; and Broersma, Robert J., Jr., 5,498,779, Cl. 514-428.000.
Garcia-Pichel, Ferran: *See*—
Gerwick, William H.; Jacobs, Robert S.; Castenholz, Richard; Garcia-Pichel, Ferran; Grace, Krista J. S.; Proteau, Philip J.; and Rossi, James, 5,498,405, Cl. 424-59.000.
Gardner, Duane: *See*—
Bashforth, Michael B.; Gardner, Duane; Patrick, Douglas; Lewallen, Tricia A.; Nammath, Sharyn R.; Painter, Kelly D.; and Vadnais, Kenneth G., 5,499,029, Cl. 342-22.000.
Gardner, Mark I.: *See*—
Fulford, H. Jim, Jr.; and Gardner, Mark I., 5,498,577, Cl. 437-228.000.
Gardner, Robert M.: *See*—
White, Alan W.; Pearcy, Barry G.; Jones, Allan S.; Buchanan, Charles M.; and Gardner, Robert M., 5,498,453, Cl. 428-35.700.
Garlicha, Siemen: *See*—
Schwettmann, Dietmar; and Garlichs, Siemen, 5,498,112, Cl. 412-1.000.
Garrido, Fabrice: *See*—
Rognan, Didier; Mann, Andre; Wermuth, Camille-Georges; Martres, Marie-Pascale; Giros, Bruno; Sokoloff, Pierre; Schwartz, Jean-Charles; LeComte, Jeanne-Marie; and Garrido, Fabrice, 5,498,628, Cl. 514-428.000.
Gast, Jürgen; and Simon, Arno, to Bruker Analytische MeBtechnik GmbH. Fourier spectrometer with exchangeable entrance and exit ports allowing for both internal and external radiation sources. 5,499,095, Cl. 356-346.000.



Gate Mold, Inc.: *See*—
Woodgate, Daniel E., 5,497,525, Cl. 15-104.800.
Gatehouse, Peter P., to B.I.G. Batteries Limited. Security batteries for automotive vehicles. 5,498,486, Cl. 429-7.000.
Gatewood, Bryan S.: *See*—
White, Gregory R.; Gatewood, Bryan S.; Wilson, Mark L.; Griffen, Peter J.; Steeby, Jon A.; Anderson, Dean S.; and Webber, Larry R., 5,498,195, Cl. 477-110.000.
Gatlin, Larry W. Hydrogen sulfide converter. 5,498,707, Cl. 536-55.200.
Gatz, Christopher, to Landis & Gyr Energy Management, Inc. Mating ring for a watthour meter cover. 5,499,159, Cl. 361-667.000.
Gausing, Kirsten; and Kreiberg, Jette D., to A/S De Danske Spritfabrikker. Potato α-amylase genes. 5,498,832, Cl. 800-205.000.
Gauthier, Thierry: *See*—
Galtier, Pierre; Bonifay, Régis; Franckowiak, Sigismond; Gauthier, Thierry; and Pontier, Renaud, 5,498,326, Cl. 208-74.000.
Gebauer, Paul; and White, Jay R., to Jay Roberts Company. Reciprocating plate mechanism. 5,498,053, Cl. 296-97.500.
Gebr. Happich GmbH: *See*—
Viertel, Lothar; and Welter, Patrick, 5,498,056, Cl. 296-97.500.
Gechter, Jerry. Interactive electronic games and screen savers with multiple characters. 5,498,002, Cl. 273-434.000.
Gechter, Jerry. Interactive electronic games and screen savers with multiple characters. 5,498,003, Cl. 273-434.000.
Gee, Calvin L.: *See*—
Smith, Richard G., Jr.; and Gee, Calvin L., 5,499,035, Cl. 343-789.000.
Gee, Thomas S.; Smith, Paul F.; and Cullen, Michael J., to Ford Motor Company. Controlling resistance heaters on exhaust gas oxygen sensors. 5,497,655, Cl. 73-118.200.
Gegenwart, Rainer: *See*—
Arnold, Manfred; Blang, Guido; Gegenwart, Rainer; Ritter, Jochen; and Stoll, Helmut, 5,498,291, Cl. 118-723.00E.
Gehlbach, Peter: *See*—
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Gehrke, James K.; and Sarocka, Robert J. Method for adjusting the output frequency of a frequency synthesizer. 5,498,998, Cl. 331-17.000.
Geissler, Stephen F.; Lloyd, David K.; and Paggi, Matthew, to International Business Machines Corporation. Structure and method for reducing parasitic leakage in a memory array with merged isolation and node trench construction. 5,498,564, Cl. 437-52.000.
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McGarry, Frederick J.; and McBain, Douglas S., 5,498,763, Cl. 428-229.000.
Gendron, Robert P.: *See*—
Meitner, Edmund; and Gendron, Robert P., 5,499,315, Cl. 395-2.740.
Generac Corporation: *See*—
Kern, Robert; Ruehlow, Gerald; Hoenisch, Herb; and Sarder, Mark, 5,497,735, Cl. 123-90.600.
General Electric Company: *See*—
Abdel-Malek, Aiman A.; and Costa, Max H. M., 5,497,777, Cl. 128-660.070.
Benz, Mark G.; Jackson, Melvin R.; Zabala, Robert J.; Jones, Marshall G.; Nied, Herman A.; and Eggleston, Michael R., 5,498,186, Cl. 445-28.000.
Berkcan, Ertugrul; and Welles, Kenneth B., II, 5,497,638, Cl. 68-12.040.
Bien, Paul R.; and Hagle, Michael P., 5,497,544, Cl. 29-596.000.
Brunelle, Daniel J., 5,498,651, Cl. 524-176.000.
Chao, Herbert S., 5,498,440, Cl. 427-304.000.
Duderstadt, Edward C., 5,498,484, Cl. 428-633.000.
Dykes, Edward R., 5,497,662, Cl. 73-634.000.
Eggleston, Michael R.; Benz, Mark G.; Jackson, Melvin R.; and Zabala, Robert J., 5,498,187, Cl. 445-28.000.
Ehlinger, Robert B., 5,498,319, Cl. 203-39.000.
Gluntz, Douglas M., 5,499,278, Cl. 376-299.000.
Hunsbedt, Anstein, 5,499,277, Cl. 376-299.000.
Knudsen, Bruce A.; and Briant, Clyde L., 5,498,185, Cl. 445-28.000.
Kraft, Robert E.; and Kontos, Karen B., 5,498,127, Cl. 415-119.000.
Lee, Ching-Pang, 5,498,133, Cl. 416-97.00R.
Minto, Karl D., 5,498,131, Cl. 415-216.100.
Ritter, Ann M.; Dupree, Paul L.; and Wemple, Donald N., Jr., 5,498,146, Cl. 425-78.000.
Schneider, Erika; Zang, Xiguang; and Hartley, Michael R., 5,498,963, Cl. 324-309.000.
Snow, Barton H., 5,497,653, Cl. 73-40.50R.
Venkataramani, Subramaniam; Kwasnick, Robert F.; and Lorraine, Peter W., 5,497,540, Cl. 29-25.350.
Whetten, Nathan R., 5,498,573, Cl. 437-192.000.
White, Dwain M.; and Gordon, Janet L., 5,498,672, Cl. 525-314.000.
General Mills, Inc.: *See*—
Dalea, Lisa M.; Esse, Robert L.; and Shee, Francis M., 5,498,080, Cl. 383-120.000.
General Motors Corporation: *See*—
Easter, Kenneth M.; Lotspih, John A.; and Donegan, Michael W., 5,498,025, Cl. 280-728.200.
Hill, Timothy W.; Oleszko, Mark A.; Spencer, Graham T.; and Sparkman, John P., 5,498,030, Cl. 280-743.100.
Morgan, Terry B.; and Sedlock, Joseph J., 5,498,045, Cl. 293-122.000.
Muirhead, Hugh J.; and Marker, Richard L., 5,497,869, Cl. 192-84.00B.
Rider, Robert A.; and Bendert, Richard M., 5,499,234, Cl. 320-5.000.
Gengenbach, Burle G.; Somers, David A.; Wyse, Donald L.; Gronwald, John W.; Egli, Margaret A.; and Lutz, Sheila M., to University of Minnesota, Regents of the. Method and an acetyl CoA carboxylase gene for conferring herbicide tolerance. 5,498,544, Cl. 435-320.100.
Geneovesi, Arnold J. Compact disc storage case display rack. 5,497,889, Cl. 211-40.000.
Genz, Manfred: *See*—
Pohl, Siegmund; Lehrich, Friedhelm; Genz, Manfred; Bruchmann, Bernd; Teach, Helmut; Minges, Roland; and Streu, Joachim, 5,498,747, Cl. 560-25.000.
Geo. Pfau's Sons Company, Inc.: *See*—
Johnston, John D., 5,498,434, Cl. 426-541.000.
Geoffroy, Mario: *See*—
Praud, Jean-Paul; Baron, Sophie; Geoffroy, Mario; and Rouleau, Rachel, 5,497,765, Cl. 128-200.230.
Georges, Michael K.: *See*—
Moffat, Karen A.; Kazmaier, Peter M.; Hamer, Gordon K.; and Georges, Michael K., 5,498,679, Cl. 526-204.000.
Georgetown University: *See*—
Moscovitch, Marko, 5,498,876, Cl. 250-474.100.
Gerbel, Daniel: *See*—
Möller, Dieter; Thies, Konrad; Schmidt, Willi; Gerbel, Daniel; and Etzenbach, Joachim, 5,498,074, Cl. 366-94.000.
Gercekci, Anil; and Schwarz, Roland H., to Motorola, Inc. Bus system having a system bus, an internal bus with functional units coupled therebetween and a logic unit for use in such system. 5,499,338, Cl. 395-183.010.
Gerer, Roman: *See*—
Siebenhofer, Gottfried; Zitz, Alfred; and Gerer, Roman, 5,498,069, Cl. 299-81.300.
Germanton, Damon; and Petrucelli, Steven P., to Measurement Specialties, Inc. Infrared indoor/outdoor thermometer system. 5,499,024, Cl. 340-870.170.
Gershen, Bernard; Lombardi, Alfred J.; Meehan, James E.; and Rosenbaum, Saul, to Leviton Manufacturing Co., Inc. Circuit analyzing system. 5,499,155, Cl. 361-113.000.
Gerwick, William H.; Jacobs, Robert S.; Castenholz, Richard; Garcia-Pichel, Ferran; Grace, Krista J. S.; Proteau, Philip J.; and Rossi, James, to University of California, The Regents of the. Indole alkaloids useful as UV protective and anti-inflammatory agents. 5,498,405, Cl. 424-59.000.
Gesellschaft fur Anlagen- und Reaktorsicherheit: *See*—
Chakraborty, Amiya K., 5,499,279, Cl. 376-301.000.
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Blezard, Michael; Jones, Glyn R.; and Ghadimi, Moharam, 5,498,791, Cl. 564-2.000.
Giallorenzi, Thomas R.; Rafter, Mark T.; Greenwood, Kenneth C.; Press, Harry B.; and Kingston, Samuel C., to Unisys Corporation. Synchronous multipoint-to-point CDMA communication system. 5,499,236, Cl. 370-18.000.
Giat Industries: *See*—
Bredy, Thierry; Rodriguez, Hervé; and Marchand, Emmanuel, 5,497,705, Cl. 102-427.000.
Gilbert, Jerry F. Wide trencher with plurality of chain type diggers. 5,497,567, Cl. 37-352.000.
Gillette Company, The: *See*—
Apprille, Domenic V., Jr., 5,497,551, Cl. 30-85.000.
Trotta, Robert A.; Hahn, Steve S.; Madeira, John; Chou, Chong-ping P.; and Brooks, Lamar E., 5,497,550, Cl. 30-50.000.
Gin, Malcolm: *See*—
Farmer, John W.; Smith, George; Gin, Malcolm; Brook, John F. H.; White, Daryl R.; See, Brian A.; and Powell, Ian, 5,499,066, Cl. 351-221.000.
Ginsberg, Mark H.: *See*—
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Gioia, Samuel C.: *See*—
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Giros, Bruno: *See*—
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Gittins, Christopher J.; and Cox, Simon A., to British Telecommunications public limited company. Switched communication network with bandwidth managers for achieving end-to-end data compression during transport. 5,499,240, Cl. 370-68.100.
Giuseppe, Puppin; Deaner, Michael J.; and Heikkila, Kurt E., to Andersen Corporation. Advanced polymer and wood fiber composite structural component. 5,497,594, Cl. 52-730.400.
GKN Walterscheid GmbH: *See*—
Laubner, Joachim; Vollmer, Jürgen; and Coenen, Klaus-Herbert, 5,497,835, Cl. 172-272.000.
Glass, Gary L.: *See*—
Welch, M. Bruce; Alt, Helmut G.; Peifer, Bernd; Palackal, Syriac J.; Glass, Gary L.; Pettijohn, Ted M.; Hawley, Gil R.; and Fahey, Darryl R., 5,498,581, Cl. 502-102.000.
Glasstech, Inc.: *See*—
Reunamaki, Pauli T., 5,498,275, Cl. 65-268.000.
Glatz, Dietmar, to Wessel-Werk GmbH & Co. KG. Vacuum cleaner nozzle. 5,497,532, Cl. 15-401.000.
Glaxo Group: *See*—

Ross, Barry C.; Middlemiss, David; Scopes, David I. C.; Jack, Torquil I. M.; Cardwell, Kevin S.; Dowle, Michael D.; Judd, Duncan B.; and Watson, Stephen P., 5,498,722, Cl. 548-315.400.

Gleich, Gerald J. Method for the treatment of eosinophil-associated conditions with anionic polymers. 5,498,410, Cl. 424-78.360.

Glew, Andrew F.: *See*—
Clift, David W.; Arnold, James M.; Colwell, Robert P.; and Glew, Andrew F., 5,499,352, Cl. 395-412.000.

Glantz, Douglas M., to General Electric Company. Water inventory management in condenser pool of boiling water reactor. 5,499,278, Cl. 376-299.000.

Gnuser, Bruno; and Naef, Peter, to Buehler AG. Micro-metering device. 5,497,907, Cl. 222-58.000.

Gneuss, Detlef, to Gneuss Kunststoffechnik GmbH. Filter for a plastic (synthetic resin) melt. 5,498,334, Cl. 210-236.000.

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Gneuss, Detlef, 5,498,334, Cl. 210-236.000.

Go-Gro Industries Ltd.: *See*—
Chan, Kam-Hoi, 5,498,091, Cl. 403-3.000.

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Francis, Kurt M.; and Hubbard, Leroy, 5,498,144, Cl. 425-9.000.

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Jeong, Suk D., 5,498,858, Cl. 219-757.000.
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Oh, Yong K., 5,499,317, Cl. 395-2.790.
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Ahn, Jin-Hong; and Kim, Tae-Hyoung, 5,499,205, Cl. 365-63.000.
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Marshall, Richard A.; Parker, Dane K.; and Hershberger, James W., 5,498,693, Cl. 528-483.000.

Gopinathan, Venugopal; and Izzard, Martin J., to Texas Instruments Incorporated. High speed comparator with a precise sampling instant. 5,498,982, Cl. 326-126.000.

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McMahan, William H.; and Gordon, Kevin W., 5,498,935, Cl. 315-241.00P.

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Berka, Thomas R.; Forawald, James A.; Gorniak, Joselina G.; Rosenberg, Martin; Strickler, James E.; and Taylor, Dean P., 5,498,529, Cl. 435-69.100.

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Arvedi, Giovanni; and Gosio, Giovanni, 5,497,821, Cl. 164-476.000.

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Goto, Kenji: *See*—
Hosaka, Motoki; Goto, Kenji; and Matsuo, Masahiko, 5,498,770, Cl. 502-116.000.

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Naka, Michiharu; Koizumi, Hideki; Takahashi, Yuzo; Goto, Koici; Endo, Toshiaki; and Suzuki, Yoichi, 5,498,357, Cl. 252-51.50R.

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Thirion, Jean-Philippe; Ayache, Nicholas; Monga, Olivier; and Gourdon, Alexis, 5,499,322, Cl. 395-118.000.

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Campbell, Bob; Gowan, Curtis R.; Graf, John D.; and Nayak, Nandini, 5,499,287, Cl. 379-67.000.

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Jeffries, Thomas W.; Grabski, Anthony C.; Patel, Rajesh N.; Elegir, Graziano; and Szakacs, George, 5,498,534, Cl. 435-278.000.

Grace, Krista J. S.: *See*—
Gerwick, William H.; Jacobs, Robert S.; Castenholz, Richard; Garcia-Pichel, Ferran; Grace, Krista J. S.; Proteau, Philip J.; and Rossi, James, 5,498,405, Cl. 424-59.000.

Graf, Felix; Maier, Jorg; Wagner, Rudi; and Wirz, Armin, to Maschinenfabrik Rieter AG. Device for texturizing continuous filament threads. 5,497,538, Cl. 28-255.000.

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Phillion, Dennis P.; Braccolino, Diane S.; Graneto, Matthew J.; Phillips, Wendell G.; Van Sant, Karey A.; Walker, Daniel M.; and Wong, Sai C., 5,498,630, Cl. 514-443.000.

Granger, Carol A.; Smith, Gary B.; and Taylor, Bruce L., to Pall Corporation. Processing of protein-containing body fluids. 5,498,340, Cl. 210-645.000.

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Behram, Sepehr; Grauzlis, Nancy T.; and Joseph, Sammy W., 5,499,293, Cl. 380-4.000.

Gravenstruter, Noel P.: *See*—
Severini, Joseph A.; Yee, Daniel C. L.; Tame, Omar D.; Plaza, Shelly M.; Gravenstruter, Noel P.; Jovan, Dragi; Susko, Thomas J.; and Schulte, Steven A., 5,498,052, Cl. 296-65.100.

Gravier, Michel, to Jammes Industrie S.A. Automated production lines for rolled and welded ferrules. 5,497,935, Cl. 228-17.500.

Gray, Alan C.: *See*—
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Grey, Terrance H. Leaching chamber. 5,498,104, Cl. 405-43.000.

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Hill, John E., 5,498,400, Cl. 423-300.000.





Great Plains Manufacturing Incorporated: *See*—
Meek, Roger L.; and McClure, J. Michael, 5,497,715, Cl. 111-137.000.

Green, Larry A.: *See*—
Bradway, Robert A.; Green, Larry A.; and Rollmann, L. Deane, 5,498,812, Cl. 585-352.000.

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Mariano, Karen M.; Kauffman, Thomas; and Gregor, Stacey A., 5,498,645, Cl. 523-218.000.

Greicar, Richard K.: *See*—
McLaughlin, Michael D.; Signa, John C.; Greicar, Richard K.; and Taylor, John M., 5,499,040, Cl. 345-146.000.

Greis, Howard A., to Kinefac Corporation. Apparatus and method for forming precision surfaces on shaft-like components. 5,497,642, Cl. 72-19.800.

Grendel, Robert W.; Klopfenstein, Jeffrey B.; Prokop, Robin K.; Reid, Stanley L.; and Willock, J. Michael, to Novus International, Inc. Regeneration of sulfuric acid from sulfate by-products of 2-hydroxy-4-(methylthio)butyric acid manufacture. 5,498,790, Cl. 562-581.000.

Greten, Berndt; Seeger, Günter; and Poppelreuter, Klaus, to Bison-Werke Bachre & Greten GmbH & Co. KG. Apparatus for continuously producing plates having a structured surface. 5,498,309, Cl. 156-347.000.

Griffen, Peter J.: *See*—
White, Gregory R.; Gatewood, Bryan S.; Wilson, Mark L.; Griffen, Peter J.; Steeby, Jon A.; Anderson, Dean S.; and Webber, Larry R., 5,498,195, Cl. 477-110.000.

Griffith, John D., to Eastman Kodak Company. Camera system and an optical adapter to reduce image format size. 5,499,069, Cl. 354-152.000.

Grimm, Richard J.: *See*—
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Grinstaff, Mark W.; Soon-Shiong, Patrick; Wong, Michael; Sandford, Paul A.; Suslick, Kenneth S.; and Desai, Neil P., to Vivorx Pharmaceuticals, Inc. Composition useful for in vivo delivery of biologics and methods employing same. 5,498,421, Cl. 424-450.000.

Groff, Jerry L. Row cleaner. 5,497,836, Cl. 172-555.000.

Gronwald, John W.: *See*—
Gengenbach, Burle G.; Somers, David A.; Wyse, Donald L.; Gronwald, John W.; Egli, Margaret A.; and Lutz, Sheila M., 5,498,544, Cl. 435-320.100.

Gross, Andrew W.: *See*—
Emmons, William D.; and Gross, Andrew W., 5,498,675, Cl. 525-537.000.

Gross, Martin; and Renz, Werner, to E.G.O. Elektro-Gerate Blanc u. Fischer. Heater, particularly for kitchen appliances. 5,498,853, Cl. 219-463.000.

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Grove, James B.: *See*—
Little, John; Kotyk, Jeffrey; and Grove, James B., 5,497,852, Cl. 184-7.400.

Grubbs, Harvey J.: *See*—
Prasad, Ravi; and Grubbs, Harvey J., 5,497,792, Cl. 131-297.000.

Grundland, Nathan. Logic elements for interlaced carry/borrow systems having a uniform layout. 5,499,203, Cl. 364-786.000.

Grunwell, Randall L., to Matsushita Communication Industrial Corporation of America. Filter having a variable response time for filtering an input signal. 5,499,392, Cl. 455-260.000.

Grupo Internacional Marc S.A. de C.V.: *See*—
León-Betanzos, Apolinar; and Cortina, Jose L. M., 5,498,337, Cl. 210-610.000.

GTE Products Corporation: *See*—
Loy, Helmut M.; Kohler, Sigurd; and Eich, Armin, 5,498,930, Cl. 315-97.000.

Gu, Wang-Chang A.; Kommrusch, Richard S.; and Huang, Rong-Fong. Transmission line device using stacked conductive layers. 5,499,005, Cl. 333-246.000.

Guenin, Maurice, to Voumard Machines Co. S.A. Driving apparatus for a diamond toolholder. 5,497,759, Cl. 125-11.010.

Guernsey, Robert M. Retractable delineator system for suspension span & truss bridges. 5,498,100, Cl. 404-6.000.

Guided Medical Systems, Inc.: *See*—
Galel, Zev; and Yang, Yi, 5,498,239, Cl. 604-95.000.

Guillot, David G., to Thiokol Corporation. Low density thermoplastic elastomeric insulation for rocket motors. 5,498,649, Cl. 524-100.000.

Gunther, John E.: *See*—
Wreede, John E.; Gunther, John E.; Virgadamo, Michael J.; Yu, Kevin; Yin, Lillian; Mulder, Jerry L.; Upper, Richard B.; and Scott, James E., 5,499,116, Cl. 359-2.000.

Gustin, Joseph A.: *See*—
Rafalovich, Alexander P.; Gustin, Joseph A.; Longardner, William J.; Keller, Gilbert P.; and Schmidter, Thomas C., 5,497,629, Cl. 62-98.000.

Güther, Hans-Michael: *See*—
Seitz, Katherina; Güther, Hans-Michael; Hessel, Friedrich; Schröder, Frank; Köstler, Christine; Roosen, Andreas; and May, Christian, 5,498,382, Cl. 264-56.000.

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Sikora, Harald; and Gwinner, Ulrich, 5,498,145, Cl. 425-71.000.

Gyure, Alex; Berg, John; Carver, Damian; and Manos, Pete, to Zilog, Inc. High threshold metal oxide silicon read-only-memory transistors. 5,498,896, Cl. 257-402.000.

H. B. Fuller Licensing & Financing, Inc.: *See*—
Heuer, Glenn C.; and Bateson, George F., 5,498,646, Cl. 523-344.000.

Haapalinna, Antti S.: *See*—
Karjalainen, Arto J.; Virtanen, Raimo E.; Karjalainen, Arja L.; Eloranta, Maire M.; Salonen, Jarmo S.; Sipila, Hannu T.; and Haapalinna, Antti S., 5,498,623, Cl. 514-396.000.

Hablanian, Marshed. High performance turbomolecular vacuum pumps. 5,498,125, Cl. 415-90.000.

Hachigo, Akihiro: *See*—
Shikata, Shinichi; Hachigo, Akihiro; Nakahata, Hideaki; and Higaki, Kenjiro, 5,497,726, Cl. 117-89.000.

Hadaway, Robert A.: *See*—
Deen, M. Jamal; Malhi, Duljit S.; Yan, Zhixin; and Hadaway, Robert A., 5,498,885, Cl. 257-139.000.

Hadfield, David A.; and Schubert, Mark F., to Conoco Specialty Products, Inc. Hydrocyclones for oil spill cleanup having a controlled split ratio. 5,498,346, Cl. 210-739.000.

Häfner, Hans W., to Pfister Messtechnik GmbH. Force measuring device. 5,497,669, Cl. 73-862.636.

Hagiwara, Haruo: *See*—
Takagawa, Hiroyuki; Tsubaki, Yasuhiro; Miyairi, Yoshio; Hattori, Toshio; and Hagiwara, Haruo, 5,498,266, Cl. 8-142.000.

Hagiwara, Sanjiro, to Velbon International Corporation. Stand for golf bag. 5,497,964, Cl. 248-96.000.

Hagiwara, Syuya: *See*—
Kobayashi, Kenji; Takano, Yasushi; Iida, Akiyoshi; Ikegawa, Masahiro; Hagiwara, Syuya; and Hattori, Morishige, 5,497,866, Cl. 191-55.000.

Hagle, Michael P.: *See*—
Bien, Paul R.; and Hagle, Michael P., 5,497,544, Cl. 29-596.000.

Hahn, Kenneth H.; and Kaneshiro, Ronald T., to Hewlett-Packard Company. Passive alignment and packaging of optoelectronic components to optical waveguides using flip-chip bonding technology. 5,499,312, Cl. 385-91.000.

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Trotta, Robert A.; Hahn, Steve S.; Madeira, John; Chou, Chong-ping P.; and Brooks, Lamar E., 5,497,550, Cl. 30-50.000.

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Hainey, Paul L.: *See*—
Bishop, Robert P.; Hainey, Paul L.; Lukasiewicz, Stanley J.; Siuzdak, Allan J.; Luminello, Robert E., Jr.; and Shukla, Vishwa N., 5,499,158, Cl. 361-283.400.

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Hansen, Jens-Henrik B.; Storgaard, Leif; and Jensen, Poul E., 5,498,404, Cl. 423-654.000.
Hommeltoft, Sven I., 5,498,820, Cl. 585-730.000.
Nielsen, Poul E. H.; and Lehrmann, Peter, 5,498,816, Cl. 585-658.000.

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Hall, Dennis R. Method and apparatus for coordinating transfer of information between a base station and a plurality of radios. 5,499,243, Cl. 370-85.800.

Hall, John T.: *See*—
Tanzer, Herbert J.; Quon, William; and Hall, John T., 5,499,185, Cl. 363-126.000.

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Wedin, Annette G.; Hallenfur, Lars-Erik; Bertilsson, Lars Y.; and Karlsson, Jan-Erik, 5,498,168, Cl. 439-95.000.

Ham, Young M.: *See*—
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Hamada, Emiko: *See*—
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Takahashi, Hironori; Urakami, Tsuneyuki; Aoshima, Shinichiro; and Hirano, Isuke, 5,499,190, Cl. 364-481.000.

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Hamamoto, Takashi: *See—*
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Hamburg, Douglas R.: *See—*
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Hamel, Roger G.: *See—*
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Hamer, Gordon K.: *See—*
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Hamilton, Robert K.: *See—*
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Hamlin, Michael R., to Flexible Technologies, Inc. Plier-type hand tool. 5,497,554, Cl. 30-330.000.

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Bagaoisan, Celso S. J.; Shanahan, John P.; Muni, Ketan P.; Hammack, Elizabeth N.; Abrams, Robert M.; Peacock, James C., III; and Tremulis, William S., 5,498,240, Cl. 604-96.000.

Hammond, Milton L.: *See—*
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Poovaiah, Bachettira W.; Takezawa, Daisuke; Han, Tae-Jin; and An, Gynheung H., 5,498,533, Cl. 435-172.300.

Hanasaki, Yasuaki; Tsukuda, Kazuaki; Watanabe, Hiroyuki; Tsuzuki, Kenji; Murakami, Mitsuyuki; and Niimi, Noritoshi, to TOSOH Corporation. Thiadiazole derivatives and herbicide compositions containing the same. 5,498,593, Cl. 504-264.000.

Handa, Tokuhiko; Inaba, Ryo; Haratani, Susumu; and Tominaga, Junji, to TDK Corporation. Optical recording media. 5,498,507, Cl. 430-273.100.

HandsOnToys, Inc.: *See—*
Ganson, Arthur M., 5,498,190, Cl. 446-107.000.

Handtmann, Thomas. Precoating head. 5,498,332, Cl. 210-193.000.

Hanemaaijer, Jan H.: *See—*
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Haney, Donald C.: *See—*
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Hannan, Susan: *See—*
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Hannon, J. R. Support for golf bag. 5,497,891, Cl. 211-71.000.

Hans, William M.: *See—*
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Hansen, Jens-Henrik B.; Storgaard, Leif; and Jensen, Poul E., to Haldor Topsøe A/S. Process for the steam reforming of hydrocarbons. 5,498,404, Cl. 423-654.000.

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Hansmann, Wilfried: *See—*
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Fisch, Fritz; and Rehm, Ulrith, 5,497,924, Cl. 224-326.000.
Lumpe, Karl-Heinz; and Kolodziej, Klaus, 5,497,925, Cl. 224-326.000.

Hara, Akitoshi, to Seiko Epson Corporation. Semiconductor device and its manufacturing method. 5,498,902, Cl. 257-686.000.

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Tanaka, Shunji; Ohtsuki, Toru; Sato, Hiroaki; Sawamoto, Hideo; Yamagata, Ryo; Watanabe, Masaya; Umeno, Hidenori; and Haraguchi, Masatoshi, 5,499,379, Cl. 395-700.000.

Haraguchi, Yuuji: *See—*
Nishimura, Takashi; Seino, Kazuyuki; Haraguchi, Yuuji; and Kamohara, Eiji, 5,498,921, Cl. 313-2.100.

Harata, Yasuki; Kameda, Masaaki; Sano, Keiichi; and Aya, Yoichiro, to Sanyo Electric Co., Ltd. Polycrystalline semiconductive film, semiconductor device using the same and method of manufacturing the same. 5,498,904, Cl. 257-62.300.

Haratani, Susumu: *See—*
Handa, Tokuhiko; Inaba, Ryo; Haratani, Susumu; and Tominaga, Junji, 5,498,507, Cl. 430-273.100.

Hardwick, Andrew C., to Conner Peripherals, Inc. Track format and record carrier system for split data field support. 5,499,232, Cl. 369-275.300.

Harel, Haim: *See—*
Yokev, Hanoch; Harel, Haim; and Meiman, Yehouda, 5,499,266, Cl. 375-202.000.

Hargreaves, David: *See—*
Christy, Orrin D.; Hook, Kevin J.; Hargreaves, David; Ruchalski, Mark E.; and Akins, Michael D., 5,499,085, Cl. 355-273.000.

Harris, Alan, to Ferring AB. Composition for nasal administration of desmopressin. 5,498,598, Cl. 514-11.000.

Harris Partners, Ltd.: *See—*
Pacheco, Steven M., 5,499,196, Cl. 364-552.000.

Harrison, David G.; Alexander, R. Wayne; Murphy T. J.; and Nishida, Ken'ichi, to Daiichi Pharmaceutical Co., Ltd. Bovine endothelial nitric oxide synthase nucleic acids. 5,498,539, Cl. 435-240.200.

Harrison, Sol E.: *See—*
Soll, David B.; and Harrison, Sol E., 5,498,606, Cl. 514-54.000.

Hart, Anthony J., to Mansign Engineering Limited. Cable hose handling chain. 5,497,536, Cl. 24-459.000.

Hartley, Michael R.: *See—*
Schneider, Erika; Zang, Xiguang; and Hartley, Michael R., 5,498,963, Cl. 324-309.000.

Harvey, Charles B., Jr.: *See—*
Anderson, James B.; Fitzpatrick, Francis L.; Hans, William M.; Harvey, Charles B., Jr.; Mitchell, Herman; and Wason, James R., 5,499,365, Cl. 395-600.000.

Hasebe, Takayuki: *See—*
Takenaka, Masahiko; Torii, Naoya; Hasebe, Takayuki; and Akiyama, Ryota, 5,499,299, Cl. 380-28.000.

Hasegawa, Akihiko: *See—*
Maruyama, Shinichi; and Hasegawa, Akihiko, 5,498,050, Cl. 296-39.300.

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Hasegawa, Noriyasu; and Mori, Tetsuzo, to Canon Kabushiki Kaisha. Method and apparatus for detecting positional deviation by using diffraction gratings with a compensation delay determining unit. 5,498,878, Cl. 250-548.000.

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Kabasawa, Yasuhiro; Ozaki, Fumihiro; Ishibashi, Keiji; Hasegawa, Takashi; Oinuma, Hitoshi; Ogawa, Toshiaki; Adachi, Hideyuki; Katoh, Hiroshi; Kodama, Kohtarou; Ohara, Hideto; Mori, Nobuyuki; and Minami, Norio, 5,498,634, Cl. 514-459.000.

Hasegawa, Tomohisa: *See—*
Tanaka, Hideaki; Oba, Hiroyuki; Sato, Tomoaki; and Hasegawa, Tomohisa, 5,498,662, Cl. 525-54.200.

Hasegawa, Yutaka: *See—*
Kyushima, Hiroyuki; Nagura, Koji; Hasegawa, Yutaka; Kawano, Eiichiro; Kuroyanagi, Tomihiko; Atsumi, Akira; and Mizuide, Masuya, 5,498,926, Cl. 313-533.000.

Hashimoto Corporation: *See—*
Hashimoto, Kazuo, 5,499,102, Cl. 358-335.000.

Hashimoto, Kazuo, to Hashimoto Corporation. Display device for videocassette recorder recording reservations. 5,499,102, Cl. 358-335.000.

Hashimoto, Kyosuke: *See—*
Matsuda, Yutaka; Moriue, Hiroo; Hashimoto, Kyosuke; Akimoto, Mitsuru; Hirano, Seiji; Michihira, Osamu; Terayama, Koji; Sakamoto, Hiroaki; and Umegaki, Koji, 5,499,247, Cl. 370-85.300.

Hashimoto, Yotaro, to Eiwa Co., Ltd. Method for processing wood with vapor. 5,498,448, Cl. 427-255.600.

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Hashiura, Masayoshi: *See—*
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Hashizawa, Shigemi; and Inaba, Shigemitsu, to Yazaki Corporation. System for connecting shielding wire and terminal. 5,498,176, Cl. 439-585.000.

Hassett, James A.: *See—*
Swartz, John F.; Ockuly, John D.; Fleischhacker, John J.; and Hassett, James A., 5,497,774, Cl. 128-658.000.

Hasunuma, Masahiko; Kaneko, Hisashi; Sawabe, Atsuhito; Kawanoue, Takashi; Kohanawa, Yoshiko; and Komatsu, Shuichi, to Kabushiki Kaisha Toshiba. Semiconductor device and method of manufacturing such semiconductor device. 5,498,909, Cl. 257-754.000.

Hatfield, Stephen F.: *See—*
Kauffman, Thomas F.; Wieczorek, Joseph, Jr.; and Hatfield, Stephen F., 5,498,224, Cl. 493-39.000.

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Takahashi, Makoto; Hatori, Fumitoshi; Nogami, Kazutaka; and Uchida, Masanori, 5,498,978, Cl. 326-38.000.





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Hattori, Kunihiro: *See—*
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Hattori, Morishige: *See—*
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Shiga, Toshihiko; Hattori, Ryo; and Oku, Tomoki, 5,498,572, Cl. 437-190.000.

Hattori, Toshio: *See—*
Takagawa, Hiroyuki; Tsubaki, Yasuhiro; Miyairi, Yoshio; Hattori, Toshio; and Hagiwara, Haruo, 5,498,266, Cl. 8-142.000.

Hauck, Lane T., to Proxima Corporation. Display control apparatus and method of using same. 5,499,036, Cl. 345-3.000.

Haulin, Tord, to Telefonaktiebolaget LM Ericsson. Device for monitoring the supply voltage on integrated circuits. 5,498,972, Cl. 324-765.000.

Hausdorf, Jorg; Kuhlmann, Thomas; Schneider, Rolf; Kosack, Steffen; Schafer, Werner; and Kuhlmann, Volker, to Firma Carl Freudenberg. Flame-resistant substrate for flexible circuit boards. 5,498,471, Cl. 428-283.000.

Hauser, Ray M.; and Johnson, Alan W., to Hydro-Gear Limited Partnership. Hydrostatic pump and motor unit. 5,497,623, Cl. 60-487.000.

Hautmann, Nikolaus: *See—*
Matthiesen, Klaus; and Hautmann, Nikolaus, 5,497,756, Cl. 123-634.000.

Hawkins, Gene P.: *See—*
Miller, Larry E.; Hawkins, Gene P.; and Durham, Bernard G., 5,498,373, Cl. 252-546.000.

Hawley, Gil R.: *See—*
Welch, M. Bruce; Alt, Helmut G.; Peifer, Bernd; Palackal, Syriac J.; Glass, Gary L.; Pettijohn, Ted M.; Hawley, Gil R.; and Fahey, Darryl R., 5,498,581, Cl. 502-102.000.

Hay, Andrew G., to Stamet, Inc. Apparatus and method employing an inlet extension for transporting and metering fine particulate and powdery material. 5,497,873, Cl. 198-642.000.

Hayakawa, Hideaki: *See—*
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Hayakawa, Hiroaki: *See—*
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Hayama, Takashi: *See—*
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Hayashi, Eikichi; and Fujimoto, Ryuichi, to Mitsubishi Denki Kabushiki Kaisha. Laser machining apparatus and method. 5,498,851, Cl. 219-121.700.

Hayashi, Kousou: *See—*
Sudoh, Kengo; Hayashi, Kousou; and Sumitomo, Yuji, 5,499,316, Cl. 395-2.790.

Hayashi, Mikio; Sato, Hiroshi; Nishida, Masahiro; and Takahashi, Keiichiro, to Seikosha Co., Ltd. Printing method for use with dot printer. 5,499,321, Cl. 395-105.000.

Hayashi, Naoki; and Saito, Kazuo, to Fuji Xerox Co., Ltd. Method of document layout process and system. 5,499,331, Cl. 395-148.000.

Hayashi, Satoru, to Mitsubishi Denki Kabushiki Kaisha. Metal base board and electronic equipment using the same. 5,498,465, Cl. 428-209.000.

Hayashi, Shuji: *See—*
Fujimoto, Masaya; Yamamoto, Haruo; Hayashi, Shuji; and Kagawa, Tetsuya, 5,499,361, Cl. 395-109.000.

Hayashi, Yoshio: *See—*
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Hayashikoshi, Masanori: *See—*
Mori, Shigeru; Kajimoto, Takeshi; and Hayashikoshi, Masanori, 5,499,214, Cl. 365-222.000.

Hayden, James D., to Motorola, Inc. Semiconductor device having increased capacitance and method for making the same. 5,498,889, Cl. 257-301.000.

Hayes, Donald J., to Microfab Technologies, Inc. Method for producing micro-optical components. 5,498,444, Cl. 427-162.000.

He, Jin L.: *See—*
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Health Research, Inc.: *See—*
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Porter, Carl W., 5,498,522, Cl. 435-6.000.

Hebecker, Dietrich: *See—*
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Hedges, Winston L., to Hexcel Corporation. Electrically conductive polymeric compositions. 5,498,372, Cl. 252-511.000.

Hefling, Jerry P., to Loctite Corporation. Anti-seizing lubricant composition, and method of making the same. 5,498,351, Cl. 252-26.000.

Heidelberger Druckmaschinen AG: *See—*
Becker, Willi, 5,497,703, Cl. 101-415.100.
Henn, Manfred; and Wehle, Josef, 5,497,987, Cl. 271-204.000.

Heidemann, Rolf; Pfeiffer, Thomas; and Kaiser, Manfred, to Alcatel N.V. Optical amplifier. 5,499,135, Cl. 359-341.000.

Heikkila, Kurt E.: *See—*
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Heimbach, Heinrich: *See—*
Schröter, Hans-Jürgen; Heimbach, Heinrich; Henning, Klaus-Dirk; Knoblauch, Karl; Berndt, Alfons S.-S.; and Tarnow, Ferdinand, 5,498,589, Cl. 502-416.000.

Heinrich Kopp AG: *See—*
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Heise, William H.; Folk, Daniel P.; Yau, Cheuk C.; and Sink, Chester W., to Eastman Chemical Company. Process for separating cyclohexane dimethanol from dimethyl terephthalate. 5,498,749, Cl. 560-78.000.

Heiskell, Ronald E.; and Theys, Ezra E., to Advanced Container Corporation. Container with panel lock. 5,497,939, Cl. 229-23.00R.

Heizmann, Frieder: *See—*
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Helgren, R. Hayes: *See—*
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Aswad, Andrew D.; Severs, Dale; Silvestri, Joyce; Forman, Hugh M.; Woo, Lecon; Hiller, Thomas D.; Walsh, Lisa S.; Wade, Sandra; Chan, Eddie; Balteau, Patrick; Peluso, Franco; and Henaut, Eric, 5,498,253, Cl. 604-403.000.

Hendel, Horst: *See—*
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Hendricks, Wayne D., to Venturedyne Limited. Electromagnetic brake with improved magaet structure. 5,497,860, Cl. 188-162.000.

Hendriks, Everardus C. A.: *See—*
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Heng-An Co., Ltd.: *See—*
Chien, Kun-Lin, 5,497,650, Cl. 73-12.070.

Henk, Hermann; and Hansmann, Wilfried, to Bayer Aktiengesellschaft. Naphthylazonaphthol dyes which contain a 5-chloro-6-fluoropyrimidin-4-yl reactive group. 5,498,700, Cl. 534-638.000.

Henkel Corporation: *See—*
Aoki, Tomoyuki; and Yoshida, Masayuki, 5,498,300, Cl. 148-261.000.
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Henkel Kommanditgesellschaft auf Aktien: *See—*
Kuhlmann, Werner; and Kling, Hans-Willi, 5,498,546, Cl. 436-55.000.

Henkel, Thomas: *See—*
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Henkels & McCoy, Inc.: *See—*
Bass, Craig D.; Valenti, Richard D., Jr.; and Flounders, Emer C., Jr., 5,498,967, Cl. 324-543.000.

Henn, Manfred; and Wehle, Josef, to Heidelberger Druckmaschinen AG. Sheet-guiding device. 5,497,987, Cl. 271-204.000.

Henn, Rolf: *See—*
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Hennessee, Walter C.: *See—*
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Henning, Klaus-Dirk: *See—*
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Henninger, Derek P.; Jensen, Richard H.; and Keene, Christopher T., to Persistence Software, Inc. Method and apparatus for automatic generation of object oriented code for mapping relational data to objects. 5,499,371, Cl. 395-700.000.

Henry, Michael: *See—*
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Hensley, Mark: *See—*
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Henz, Jürg; Abegglen, Hans; and Yu, Yueliang, to Saurer Sticksysteme AG. Stand for an embroidering machine. 5,497,719, Cl. 112-83.000.

Herb, Rudolf, to Albert-Frankenthal Aktiengesellschaft. Rotogravure inking system. 5,497,700, Cl. 101-153.000.

Herbst, Gilles: *See—*
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Hergenrother, Paul M.; and Jensen, Brian J., to United States of America, National Aeronautics and Space Administration. Poly(arylene ether)s containing pendent ethynyl groups. 5,498,803, Cl. 568-646.000.

Herm, Hartmut: *See—*
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Hermann, Bruce W.: *See—*
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Herner, Arthur C.: *See—*
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Hershberger, James W.: *See—*
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Hershler, Cecil: *See—*

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Hess, Martin: *See—*
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Hesse, Carsten: *See—*
Buysch, Hans-Josef; Hesse, Carsten; Rechner, Johann; Schomäcker, Reinhard; Wagner, Paul; and Kaufmann, Dieter, 5,498,742, Cl. 558-274.000.

Hessel, Friedrich: *See—*
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Eckert, Roger E.; Hessel, Richard E.; Phelps, Andrew E.; Spix, George A.; and Wilson, Jimmie R., 5,499,356, Cl. 395-479.000.

Hester, Kenneth D. Liquid dispenser featuring automatic pouring of measured doses. 5,497,916, Cl. 222-456.000.

Heuer, Glenn C.; and Bateson, George F., to H. B. Fuller Licensing & Financing, Inc. Production of block polymer adhesives. 5,498,646, Cl. 523-344.000.

Hewko, Barry J., to Vancouver Island Helicopters Ltd. Emergency response equipment securing system and accessories. 5,497,968, Cl. 248-214.000.

Hewlett-Packard Company: *See—*
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Behrens, Klaus-Peter; Fischer, Martin; and Henkel, Thomas, 5,499,248, Cl. 371-22.100.
Campbell, Bob; Gowan, Curtis R.; Graf, John D.; and Nayak, Nandini, 5,499,287, Cl. 379-67.000.
Hahn, Kenneth H.; and Kaneshiro, Ronald T., 5,499,312, Cl. 385-91.000.
Kerschner, Ronald K.; Crook, David T.; and Kent, Lisa M., 5,498,964, Cl. 324-530.000.
Lai, Benny W. H.; and Walker, Richard C., 5,498,992, Cl. 327-345.000.
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Heyduk, Alan F.; Mouk, Robert W.; and Abel, Albert E., to Commodore Laboratories, Inc. Methods for purifying refrigerant compositions. 5,497,627, Cl. 62-85.000.

Hibbard, Lynda D. Method and apparatus of braiding hair. 5,497,795, Cl. 132-200.000.

Hida, Tsuneaki: *See—*
Ishii, Takafumi; Hida, Tsuneaki; Nozaki, Yukimasa; and Ootsu, Koichiro, 5,498,627, Cl. 514-423.000.

Hiebert, Jacob P., to Autoline, Inc. Method and apparatus for handling objects. 5,497,887, Cl. 209-538.000.

Higaki, Kenjiro: *See—*
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Higasa, Masashi, to NEC Corporation. Information recording and reproducing apparatus. 5,499,227, Cl. 369-59.000.

Highland Supply Corporation: *See—*
Weder, Donald E., 5,497,881, Cl. 206-423.000.

Highsmith, Thomas K.; Edwards, W. Wayne; and Wardle, Robert B., to Thiokol Corporation. Synthesis of 4,10-dinitro-2,6,8,12-tetraoxa-4,10-diazatetracyclo[5.5.0.05,903,11]dodecane. 5,498,711, Cl. 540-546.000.

Highsmith, Tom K.: *See—*
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Hildebrand, Bryan D.: *See—*
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Hill, John E., to Great Lakes Chemical Corporation. Preparation of thionyl chloride and phosphorus oxyhloride from sulfur dioxide. 5,498,400, Cl. 423-300.000.

Hill-Rom Company, Inc.: *See—*
Foster, L. Dale; and Reeder, Ryan A., 5,497,766, Cl. 128-200.240.

Hill, Timothy W.; Oleszko, Mark A.; Spencer, Graham T.; and Spartzman, John F., to General Motors Corporation. Air bag module. 5,498,030, Cl. 280-743.100.

Hiller, Thomas D.: *See—*
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Hill-Lindsay, Joseph W.; Yuen, John T.; and Blanco, Alfred R., to Northrop Grumman Corporation. High impact digital crash data recorder. 5,499,164, Cl. 361-785.000.

Hills Mfg., Inc., Pride of the: *See—*
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Hilton, Charles B.: *See—*
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Hinshaw, Carol J.; Wardle, Robert B.; and Highsmith, Tom K., to Thiokol Corporation. Propellant formulations based on dinitramide salts and energetic binders. 5,498,303, Cl. 149-19.600.

Hirai Engineering Corporation: *See—*
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Hirai, Keisuke: *See—*
Hirai, Takashi; and Hirai, Keisuke, 5,497,587, Cl. 52-173.300.

Hirai, Takashi; and Hirai, Keisuke, to Hirai Engineering Corporation. Roof system utilizing a solar cell. 5,497,587, Cl. 52-173.300.

Hirano, Isuke: *See—*
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Hirano, Seiji: *See—*
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Hirano, Yasuhiro; Endo, Yasuhiro; Takebe, Kazuo; Shibata, Mitsuhiro; Kanagawa, Shuichi; Shiomi, Yutaka; Akiba, Masatsugu; and Kitayama, Shinichiro, to Sumitomo Chemical Company, Limited. Unsaturated imide compounds containing alicyclic structure, process for producing the same and intermediate therefor. 5,498,687, Cl. 528-96.000.

Hirao, Hirohiko; Kikukawa, Yoshimasa; Okamoto, Toshihiro; Murai, Takayuki; Sogabe, Seiji; Tsuioka, Miya; Nakayama, Rie; and Yoshioka, Takashi, to Shikoku Chemicals Corporation. Agent for treating surfaces of copper and copper alloys. 5,498,301, Cl. 148-269.000.

Hiraoka, Chikara; Matsuno, Junichi; Mitani, Masao; Oda, Hiroshi; and Tsumura, Toshikazu, to Hitachi, Ltd.; Ube Industries, Ltd.; and Hitachi Koki Co., Ltd. Heat fixing device and electrophotographic apparatus incorporating the same having a PTC heating element received in a recess of a holder. 5,499,087, Cl. 355-285.000.

Hiraoka, Keijun: *See—*
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Hirata, Norihiko: *See—*
Mizuno, Masahiko; Kurimoto, Isao; Hirata, Norihiko; Takahashi, Toshiya; Minai, Masayoshi; Yamamoto, Takahiro; Mizuno, Tadashi; and Miyamoto, Yasunobu, 5,498,721, Cl. 548-303.700.

Hirata, Toichi: *See—*
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Hirayama, Hiroshi: *See—*
Yamada, Jun; Kanehara, Kenji; Igashira, Toshihiko, Morishima, Shingo; Takada, Toshihiro; and Hirayama, Hiroshi, 5,497,619, Cl. 60-279.000.

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Hirokane, Junji: *See—*
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Hirosawa, Toshio: *See—*
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Hirsch, Mark A.; Stout, Donald M.; Corna, Derek P. J.; Randrianarison, Patrick; and Skotnicki, George, to Eaton Corporation. Synchronizer with cone cup locater pins. 5,497,867, Cl. 192-48.910.

Hiruta, Tomoko: *See—*
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Hitachi Koki Co., Ltd.: *See—*
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Kimura, Koichi; Ogura, Toshihiko; Aotsu, Hiroaki; Ikegami, Mitsuru; Kawabara, Tadashi; Enomoto, Hiromichi; and Kyoda, Tadashi, 5,499,222, Cl. 365-189.010.
Kobayashi, Kenji; Takano, Yasushi; Iida, Akiyoshi; Ikegawa, Masahiro; Hagiwara, Syuya; and Hattori, Morishige, 5,497,866, Cl. 191-55.000.
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Hitachi Metals, Ltd.: *See—*
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Hizatate, Shoji: *See—*
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Hoback, Michael W.; and Hennessee, Walter C. Disposable self-dispensing pressurized package for delivery of sterile fluids. 5,497,912, Cl. 222-95.000.

Hockmeyer Equipment Corp.: *See—*
Hockmeyer, Herman H., 5,497,948, Cl. 241-46.170.

Hockmeyer, Herman H., to Hockmeyer Equipment Corp. Basket media mill with extended impeller. 5,497,948, Cl. 241-46.170.

Hodder, Roger A.: *See—*
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Russ, Werner H.; Schrell, Andreas; and von der Eltz, Andreas, 5,498,267, Cl. 8-532.000.

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Naumann, Christoph; Lang, Hans-Jochen; Sandow, Jürgen; and Moura, Anne-Marie, 5,498,617, Cl. 514-315.000.
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Seitz, Katherina; Günther, Hans-Michael; Hessel, Friedrich; Schröder, Frank; Köstler, Christine; Roosen, Andreas; and May, Christian, 5,498,382, Cl. 264-56.000.
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Hoffman, Peter. Illuminated sign and method of assembly. 5,497,572, Cl. 40-544.000.

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Hoffmann, Rainer: *See—*
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Hohmann, Andreas: *See—*
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Holdampf, Carl J., to Douglas & Lomason Company. Child restraint seat. 5,498,062, Cl. 297-238.000.

Holiday, Allan D., to Farmland Industries, Inc. Apparatus for treating chemical production plant process condensate. 5,498,317, Cl. 202-154.000.

Holmes, Lawrence, Jr. Transparent edge-lit lighting pane for displays. 5,499,165, Cl. 362-31.000.

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Kline, Robert C., Jr.; Clements, Emory C.; Krehbiel, Gretchen L.; Tanner, Darrell R.; Strilich, James A.; and Chappell, David A., 5,499,188, Cl. 364-468.000.

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Hooker, John A., deceased; and Hooker, by Christopher J., legal representative. Seat unit. 5,498,064, Cl. 297-339.000.
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Hooykaas, Carel W. J., to Pek & Hooykaas B.V. Process for the synthesis of a layered, clay-like material as well as its use. 5,498,285, Cl. 106-486.000.
Hopkins, Evan L.; and Yotz, Gregory A., to Hopkins Manufacturing Corporation. Brake turn signal adaptor for trailers. 5,498,910, Cl. 307-10.100.
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Horimura, Hiroyuki; Okamoto, Kenji; Minemi, Masahiko; Kaji, Toshihiko; Takano, Yoshiharu; and Takeda, Yoshinobu, to Honda Giken Kogyo Kabushiki Kaisha; and Sumitomo Electric Industries, Ltd. Powder forging method of aluminum alloy powder having high proof stress and toughness. 5,498,393, Cl. 419-28.000.
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Horng, Chin-Fu. Air freshener. 5,498,397, Cl. 422-124.000.
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Hosaka, Motoki; Goto, Kenji; and Matsuo, Masahiko, to Toho Titanium Co., Ltd. Catalyst for the polymerization of olefins and process for the polymerization of olefins. 5,498,770, Cl. 502-116.000.
Hoshi, Hidenori; and Tanaka, Yasuyuki, to Canon Kabushiki Kaisha. Apparatus for recording a video signal and stereophonic audio signals. 5,499,104, Cl. 358-341.000.
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Hoshizaki, T. Blaine; Acheson, Jeffrey J.; and Black, Gerald, to Canstar Sports Group Inc. Skate boot with molded plastic overlay. 5,498,033, Cl. 280-841.000.
Hosoba, Hiroyuki; Nakamura, Junichi; and Watanabe, Masanori, to Sharp Kabushiki Kaisha. Method of producing a compound semiconductor crystal layer with a steep heterointerface. 5,498,568, Cl. 437-129.000.
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Hosogai, Takashi, to Ricoh Company, Ltd. Image processing apparatus for synthesizing different input data without using hard copy. 5,499,110, Cl. 358-450.000.
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Hosokawa, Toshihiro; Ohara, Hitoshi; Nishikawa, Takahiro; and Ishimoto, Eiji. Reduction gear assembly. 5,498,215, Cl. 475-162.000.
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Hou, Wei-Hsin; Lloyd, Thomas B.; and Schubert, Frederic E., to Copytele, Inc. Colored polymeric dielectric particles and method of manufacture. 5,498,674, Cl. 525-369.000.
Houdoin, Thierry; and Cochennec, Jean-Yves, to France Telecom. Method for the simulation of transmission on a transmission network working in asynchronous transfer mode and simulator of transmission on such a network. 5,499,235, Cl. 370-13.000.
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Howard, Forrest W.: *See*—
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Howard, Lee J.; and Rowles, Howard C., to Air Products and Chemicals, Inc. Open loop mixed refrigerant cycle for ethylene recovery. 5,497,626, Cl. 62-23.000.
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Hsia, Sung L.; and He, Jin L., to University of Miami. Treatment for hypercholesterolemia. 5,498,607, Cl. 514-77.000.
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Hsu, Frank. Torsion wrench. 5,497,682, Cl. 81-483.000.
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Huang, Hai-su. Table-top cutting machine. 5,497,687, Cl. 83-790.000.
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Huang, Tracy J.; and Kresge, Charles T., to Mobil Oil Corporation. Isoparaffin/olefin alkylation over vacancy-containing titanometallate molecular sieves. 5,498,817, Cl. 585-709.000.
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Wreede, John E.; Gunther, John E.; Virgadamo, Michael J.; Yu, Kevin; Yin, Lillian; Mulder, Jerry L.; Upper, Richard B.; and Scott, James E., 5,499,116, Cl. 359-2.000.
Wreede, John E.; Scott, James E.; and Tanaka, David D., 5,499,118, Cl. 359-12.000.
Yin, Khin S.; and Yu, Kevin H., 5,499,117, Cl. 359-3.000.
Young, Brian D., 5,498,905, Cl. 257-700.000.
Hughes, Sharon D.: *See*—
Michaels, Dean; Sheiler, Steven T.; Fioritto, Michelle L.; Hughes, Sharon D.; and Cole, Stephan W., 5,497,888, Cl. 211-10.000.
Huh, Ik B.: *See*—
Kim, Young S.; Ham, Young M.; Huh, Ik B.; and Kim, Hung E., 5,498,497, Cl. 430-5.000.
Hulin, Bernard: *See*—
Dow, Robert L.; Hulin, Bernard; and Clark, David A., 5,498,621, Cl. 514-369.000.
Hull, Harold L.; and Torvick, Curt D. Animal control, training apparatus and method of use. 5,497,733, Cl. 119-793.000.
Hundt, Eckart; Riegel, Thomas; Schwärtzel, Heinz; and Ziegler, Manfred, to Siemens Aktiengesellschaft. Correction of the gaze direction for a videophone. 5,499,303, Cl. 382-100.000.
Hundt, Michael J.: *See*—





Dixon, D. Craig; and Hundt, Michael J., 5,498,903, Cl. 257-690.000.
Hung, Paul L. K.: *See*—
Trapasso, Louis E.; Padegimas, Stanley J.; Epstein, Peter F.; Hung, Paul L. K.; Mukhopadhyay, Purnendu; and Meisel, Philip L., 5,498,751, Cl. 560-217.000.
Hunke, Roland: *See*—
Behrendt, Martin; Franz, Adolf; Hunke, Roland; and Roether, Roland, 5,498,839, Cl. 174-92.000.
Hunsbedt, Anstein, to General Electric Company. Method and apparatus for enhancing reactor air-cooling system performance. 5,499,277, Cl. 376-299.000.
Hunt, Alan K.; and Schalk, Thomas B., to Voice Control Systems, Inc. Simultaneous voice recognition and verification to allow access to telephone network services. 5,499,288, Cl. 379-88.000.
Hunt, Pamela: *See*—
Choi, Esther S.; Hokom, Martha M.; Hunt, Pamela; and Nichol, Janet L., 5,498,599, Cl. 514-12.000.
Hur, Young B. Exercise device. 5,498,222, Cl. 482-112.000.
Husky Injection Molding Systems Ltd.: *See*—
Unterlander, Richard M.; Ingram, Ronald W.; Fior, Lou L.; Kamka, Peter; Jaspar, Marc J.; Baron, Sam S.; and Yang, Kevin T., 5,498,152, Cl. 425-534.000.
Hutter, G. Frederick, to Westvaco Corporation. Rosin carboxypyrrolidinone adducts. 5,498,653, Cl. 524-272.000.
Hutter, G. Frederick, to Westvaco Corporation. Binder for chemical-resistant inks. 5,498,661, Cl. 524-753.000.
Huyart, Bernard; and Wiedmann, Frank, to France Telecom Etablissement Autonome de Droit Public. Device for the vector measurement of ultra-high frequency signals of the same angular frequency of the six port junction type. 5,498,969, Cl. 324-638.000.
Hwang, Ching-Tung, to Acer Incorporated. Parallel buffer/driver configuration between data sending terminal and data receiving terminal. 5,498,976, Cl. 326-30.000.
Hwang, Chiuon T. Bicycle frame having shock absorbing device. 5,498,013, Cl. 280-283.000.
Hydro-Gear Limited Partnership: *See*—
Hauser, Ray M.; and Johnson, Alan W., 5,497,623, Cl. 60-487.000.
Hyundai Electronics Industries Co., Ltd.: *See*—
Bae, Sang M., 5,498,449, Cl. 427-240.000.
Bae, Sang M., 5,498,500, Cl. 430-22.000.
Kim, Young S.; Ham, Young M.; Huh, Ik B.; and Kim, Hung E., 5,498,497, Cl. 430-5.000.
Koo, Jeong H.; Kim, Chung T.; and Ju, Song K., 5,498,871, Cl. 250-307.000.
Seo, Ho I., 5,499,048, Cl. 348-10.000.
Hyundai Motor Co.: *See*—
Kim, Chang-Rae, 5,497,749, Cl. 123-416.000.
Lee, Unkoo, 5,498,020, Cl. 280-675.000.
Shin, Dong-Yup, 5,498,403, Cl. 423-592.000.
I.S.S. (USA) Inc.: *See*—
Gratton, Enrico; Fantini, Sergio; Franceschini, Maria A.; Mantulin, William; and Barbieri, Beniamino, 5,497,769, Cl. 128-633.000.
Iams, John F.; and Splane, Robson L., Jr., to Superspine, Inc. Shoulder exerciser. 5,498,223, Cl. 482-129.000.
Iba, Yoichi, to Olympus Optical Co., Ltd. Image display apparatus. 5,499,138, Cl. 359-569.000.
Ibekwe, Sam. Hand-held electric fan. 5,498,134, Cl. 416-142.000.
Ichihara, Takao, to Fuji Electric Co., Ltd. Inverter device with a circuit for generating pulse width modulation signals. 5,499,177, Cl. 363-37.000.
Ichijo, Hisao: *See*—
Kishi, Ryoichi; Ichijo, Hisao; Kitano, Takeshi; and Iguchi, Masatoshi, 5,498,363, Cl. 252-79.000.
Ichikawa, Masaru; Ohnishi, Ryuichiro; and Suzuki, Hisao, to Daikin Industries Ltd. Process for preparing 1-chloro-1,2,2-trifluoroethylene or 1,2,2-trifluoroethylene. 5,498,806, Cl. 570-156.000.
Ichiki, Tetsuji, to Yamaha Corporation. Digital signal processing apparatus for applying effects to a musical tone signal. 5,498,835, Cl. 84-630.000.
Ide, Hiroshi: *See*—
Urano, Toshiyuki; Nagasaka, Hideki; Tsuchiyama, Masaaki; and Ide, Hiroshi, 5,498,641, Cl. 522-26.000.
Ideal-Standard GmbH: *See*—
Bergmann, Konrad, 5,497,584, Cl. 52-34.000.
Idemitsu Petrochemical Co., Ltd.: *See*—
Takeuchi, Kunio; Tamura, Takao; and Tashiro, Hironori, 5,498,735, Cl. 556-187.000.
Iding, Michael, to W. Schlafhorst AG & Co. Automatic bobbin winder having processors for yarn end preparation information. 5,497,952, Cl. 242-18.00R.
Idogawa, Hiroyuki; Wakata, Atsushi; Watanabe, Nobuatsu; and Chong, Yong-Bo, to Mitsubishi Pencil Kabushiki Kaisha. Recording material containing carbonaceous powder whose surface is modified with fluorine gas. 5,498,281, Cl. 106-20.00R.
Ieiri, Junichiro: *See*—
Fujii, Hiroyuki; and Ieiri, Junichiro, 5,499,034, Cl. 343-713.000.
Igashira, Toshihiko: *See*—
Yamada, Jun; Kanehara, Kenji; Igashira, Toshihiko; Morishima, Shingo; Takada, Toshihiro; and Hirayama, Hiroshi, 5,497,619, Cl. 60-279.000.
Iguchi, Masatoshi: *See*—
Kishi, Ryoichi; Ichijo, Hisao; Kitano, Takeshi; and Iguchi, Masatoshi, 5,498,363, Cl. 252-79.000.
Iida, Akiyoshi: *See*—
Kobayashi, Kenji; Takano, Yasushi; Iida, Akiyoshi; Ikegawa, Masahiro; Hagiwara, Syuya; and Hattori, Morishige, 5,497,866, Cl. 191-55.000.
Iida, Kazuhiro: *See*—
Morikawa, Takehiko; and Iida, Kazuhiro, 5,499,000, Cl. 333-104.000.
Iida, Kazuyuki: *See*—
Maruyama, Jun; Iida, Kazuyuki; Torizuka, Koichi; Hizatate, Shoji; Sano, Hidekazu; and Ikeda, Mitsuhiro, 5,498,772, Cl. 503-216.000.
Iida, Kiyonobu: *See*—
Nakano, Keiichi; Doi, Kiyoshi; Iida, Kiyonobu; and Inoue, Naoki, 5,497,747, Cl. 123-363.000.
Iijima, Yasuteru: *See*—
Kaneko, Masakatsu; Murofushi, Yoshinobu; Kimura, Misako; Yamazaki, Mitsuo; and Iijima, Yasuteru, 5,498,819, Cl. 514-261.000.
Ijuin, Kenichi, to Sony Corporation. Electronic packaging apparatus. 5,498,942, Cl. 318-567.000.
Ikebe, Masaru; Shiba, Haruo; Miyazaki, Yukio; Sasaki, Morimasa; and Katoh, Hisao, to TDK Corporation. Disc cartridge. 5,498,456, Cl. 428-66.600.
Ikeda, Mitsuhiro: *See*—
Maruyama, Jun; Iida, Kazuyuki; Torizuka, Koichi; Hizatate, Shoji; Sano, Hidekazu; and Ikeda, Mitsuhiro, 5,498,772, Cl. 503-216.000.
Ikegami, Hiroshi, to Nippon Steel Corporation. Method for continuously annealing steel strip. 5,497,817, Cl. 148-500.000.
Ikegami, Mitsuru: *See*—
Kimura, Koichi; Ogura, Toshihiko; Aotsu, Hiroaki; Ikegami, Mitsuru; Kuwabara, Tadashi; Enomoto, Hiromichi; and Kyoda, Tadashi, 5,499,222, Cl. 365-189.010.
Ikegami, Yasuyuki: *See*—
Kataumi, Yoshimasa; and Ikegami, Yasuyuki, 5,497,673, Cl. 74-473.00R.
Ikegawa, Masahiro: *See*—
Kobayashi, Kenji; Takano, Yasushi; Iida, Akiyoshi; Ikegawa, Masahiro; Hagiwara, Syuya; and Hattori, Morishige, 5,497,866, Cl. 191-55.000.
Ikejima, Shoichi; Yamanaka, Tetsu; Koishihara, Takeshi; Shibuya, Kenichi; and Chonan, Satoshi, to Riso Kagaku Corporation. Heat-sensitive stencil sheets and process. 5,498,464, Cl. 428-195.000.
Ikekawa, Masao; and Nomura, Toshiyuki, to NEC Corporation. Apparatus for error-correct decoding in a digital data communications system. 5,499,254, Cl. 371-43.000.
Ikemoto, Shinichi, to Kel Corporation. Flexible cable connector. 5,498,169, Cl. 439-260.000.
Ikeuchi, Kazuo: *See*—
Namura, Kiyoshi; Saito, Eiji; Takasumi, Masakazu; and Ikeuchi, Kazuo, 5,498,136, Cl. 416-190.000.
Ikeuchi, Takenobu: *See*—
Sato, Shinichi; Kobayashi, Kazuto; and Ikeuchi, Takenobu, 5,499,111, Cl. 358-455.000.
Ikushima, Naoya: *See*—
Shoji, Tadao; Takahashi, Nahoko; Ikushima, Naoya; Uryu, Toshiyuki; Yoshida, Takashi; Yamamoto, Naoki; Nakashima, Hideki; Katsuraya, Kaname; Adachi, Koichiro; and Kataoka, Pusayo, 5,498,602, Cl. 514-25.000.
Ilardi, Joseph M.; and Schwartzkopf, George, to Mallinckrodt Baker, Inc. Cleaning wafer substrates of metal contamination while maintaining wafer smoothness. 5,498,293, Cl. 134-3.000.
Illinois Tool Works Inc.: *See*—
Bivens, Steven L., 5,498,039, Cl. 292-145.000.
Imai, Katsuhiko, to Kawatetsu Kenzai Kogyo Kabushiki Kaisha. Joint device for a structural member of a truss. 5,498,093, Cl. 403-171.000.
Imai, Katsuhiko, to Kawatetsu Kenzai Kogyo Kabushiki Kaisha. Double steel pipe structural member. 5,498,094, Cl. 403-171.000.
Imaino, Wayne I.: *See*—
Fennema, Alan A.; Imaino, Wayne I.; and Rosen, Hal J., 5,499,231, Cl. 369-124.000.
Imaoka, Kazunori: *See*—
Usui, Shouji; Inagaki, Taketoshi; Kamei, Kiyomasa; Matsutani, Takeshi; and Imaoka, Kazunori, 5,498,893, Cl. 257-347.000.
i Molas, Montserrat B.: *See*—
Oltra, Maria T. B.; Ernstberger, Wolfgang; and i Molas, Montserrat B., 5,498,408, Cl. 424-78.010.
Implemed, Inc.: *See*—
Milder, Fredric L., 5,498,248, Cl. 604-265.000.
Imra America: *See*—
Galvanauskas, Almantas; and Fermann, Martin E., 5,499,134, Cl. 359-333.000.
Imran, Mir, to Intelliwire, Inc. Flexible elongate device having steerable distal extremity. 5,497,784, Cl. 128-772.000.
Ina, Shinichiro: *See*—
Senuma, Takeo; Ina, Shinichiro; Nakazawa, Hiroshi; Tamura, Yasuaki; Mano, Kunihiko; Nakamura, Fumio; Ishikawa, Munenori; and Kubo, Yoshiharu, 5,498,867, Cl. 250-231.180.
Inaba, Ryo: *See*—
Handa, Tokuhiko; Inaba, Ryo; Haratani, Susumu; and Tominaga, Junji, 5,498,507, Cl. 430-273.100.
Inaba, Ryohei: *See*—
Miura, Toshihiko; and Inaba, Ryohei, 5,498,122, Cl. 414-786.000.
Inaba, Shigemitsu; and Yamamoto, Masayuki, to Yazaki Corporation. Screw connector. 5,498,111, Cl. 411-432.000.
Inaba, Shigemitsu: *See*—
Hashizawa, Shigemi; and Inaba, Shigemitsu, 5,498,176, Cl. 439-585.000.
Inada, Koichi: *See*—

Hattori, Kenshiro; and Inada, Koichi, 5,497,683, Cl. 82-18.000.
Inada, Takahiro, to Kawasaki Jukogyo Kabushiki Kaisha. Industrial robot. 5,497,674, Cl. 74-490.030.
Inagaki, Taketoshi: *See—*
Usui, Shouji; Inagaki, Taketoshi; Kamei, Kiyomasa; Matsutani, Takeshi; and Imaoka, Kazunori, 5,498,893, Cl. 257-347.000.
Inagaki, Yoshihiro; and Masaki, Kazuo, to Yamaha Corporation. Electronic musical instrument capable of generating a resonance tone together with a musical tone. 5,498,834, Cl. 84-622.000.
Inagawa, Shinichi; and Matsuda, Shohei, to Honda Giken Kogyo Kabushiki Kaisha. Fluid pressure boosting type brake system. 5,498,070, Cl. 303-3.000.
Inazawa, Shinji: *See—*
Sawada, Kazuo; Inazawa, Shinji; and Yamada, Kouichi, 5,498,296, Cl. 136-236.100.
InControl Solutions, Inc.: *See—*
Brandenburg, Eric L.; Franz, Patrick J.; and Straayer, David H., 5,499,041, Cl. 345-174.000.
Incro Limited: *See—*
Laidler, Kevin O., 5,497,946, Cl. 239-452.000.
Indiana Mills & Manufacturing, Inc.: *See—*
Crook, James E., 5,497,956, Cl. 242-382.100.
Industrial Technology Research Institute: *See—*
Horng, Chun-Hsien; and Tzeng, Guang-Nan, 5,499,058, Cl. 348-642.000.
Tsai, Jang-Zern; and Liang, Chin-Chuan, 5,499,147, Cl. 360-53.000.
Ingalls, Charles L.; and Thomann, Mark R., to Micron Technology Inc. System having multiple subsystems and test signal source resident upon common substrate. 5,499,250, Cl. 371-28.000.
Ingersoll-Rand Company: *See—*
Putzer, Rüdiger; and Narcy, Jean L., 5,498,068, Cl. 299-17.000.
Young, Douglas L. G.; and Abdulmassih, Antoine G., 5,497,886, Cl. 209-270.000.
Ingram, Rex A. Heating/cooling systems. 5,497,826, Cl. 165-56.000.
Ingram, Ronald W.: *See—*
Unterlander, Richard M.; Ingram, Ronald W.; Fior, Lou L.; Kamka, Peter; Jaspar, Marc J.; Baron, Sam S.; and Yang, Kevin T., 5,498,152, Cl. 425-534.000.
Inman, J. D.; and Ward, C. E., Jr., to Tecnol Medical Products, Inc. Wound closure device for viewing a wound and method. 5,497,788, Cl. 128-888.000.
Inmunologia Y Genetica, S.A.: *See—*
Casal Alvarez, Jose I.; Cortes Valdes, Elena; Ranz Casares, Ana I.; Vela Olmo, Carmen; and Dalsgaard, Kristian, 5,498,413, Cl. 424-233.100.
Inokoshi, Junichi: *See—*
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Inoue, Haruhisa: *See—*
Inoue, Sadayuki; Ishimoto, Junko; Inoue, Haruhisa; and Onishi, Ken, 5,499,144, Cl. 360-10.300.
Inoue, Kouichi: *See—*
Seto, Masashi; Aihara, Shinichi; and Inoue, Kouichi, 5,498,167, Cl. 439-74.000.
Inoue, Masaharu: *See—*
Nambu, Toshiro; Inoue, Masaharu; Nakamura, Seigo; and Purukawa, Hisao, 5,498,666, Cl. 525-100.000.
Inoue, Masahide; Kato, Mamoru; Tsuyama, Koichi; Murata, Koji; and Aso, Yutaka, to Mita Industrial Co., Ltd. Developing method using a developing agent conveying sleeve of a small diameter and toner for the developing agent used therefor. 5,499,083, Cl. 355-251.000.
Inoue, Naoki: *See—*
Nakano, Keiichi; Doi, Kiyoshi; Iida, Kiyonobu; and Inoue, Naoki, 5,497,747, Cl. 123-363.000.
Inoue, Sadayuki; Ishimoto, Junko; Inoue, Haruhisa; and Onishi, Ken, to Mitsubishi Denki Kabushiki Kaisha. Magnetic recording/playback apparatus which shifts the head scan by a ½ track pitch during high speed playback. 5,499,144, Cl. 360-10.300.
Inoue, Shoji: *See—*
Matsukawa, Atsuhito; and Inoue, Shoji, 5,498,361, Cl. 252-62.620.
Inoue, Yoshiaki: *See—*
Yoshikawa, Yoshio; Inoue, Yoshiaki; Yoshino, Isamu; and Takeuchi, Teruo, 5,497,937, Cl. 228-205.000.
Inoue, Yuuichi: *See—*
Taguchi, Takeyasu; Naito, Toshiharu; Tokuda, Hiromi; Inoue, Yuuichi; Fujimoto, Shusaku; and Fujiwara, Kenji, 5,497,657, Cl. 73-146.200.
Inpro Companies, Inc.: *See—*
Orlowski, David C., 5,498,006, Cl. 277-53.000.
Inria Institut National de Recherche en Informatique et en Automatique: *See—*
Thirion, Jean-Philippe; Ayache, Nicholas; Monga, Olivier; and Gourdon, Alexis, 5,499,322, Cl. 395-118.000.
Insinger Machine Company: *See—*
Fritz, Herbert D.; and Rosenblum, Austin H., 5,497,798, Cl. 134-151.000.
Institut Francais du Petrole: *See—*
Alagy, Jacques; Forestiere, Alain; Le Page, Jean-Francois; Marion, Marie-Claire; and Viltard, Jean-Charles, 5,498,318, Cl. 203-29.000.
Institut Francais du Petrole: *See—*
Galtier, Pierre; Bonifay, Régis; Franckowiak, Sigismond; Gauthier, Thierry; and Pontier, Renaud, 5,498,326, Cl. 208-74.000.
Institut fuer Getreideverarbeitung GmbH: *See—*
Volk, Juergen; and Kropp, Detlef, 5,498,384, Cl. 264-122.000.
Institut für Rundfunktechnik GmbH: *See—*
Plenge, Georg; and Schneeberger, Günter, 5,499,271, Cl. 375-295.000.
Institut National de la Sante et de la Recherche Medicale: *See—*
Rognan, Didier; Mann, Andre; Wermuth, Camille-Georges; Martres, Marie-Pascale; Giros, Bruno; Sokoloff, Pierre; Schwartz, Jean-Charles; LeComte, Jeanne-Marie; and Garrido, Fabrice, 5,498,628, Cl. 514-428.000.
Integrated Packaging Assembly Corporation: *See—*
Ong, EE-Chang, 5,497,681, Cl. 76-101.100.
Intel Corporation: *See—*
Baldes, Gary C.; Echols, Ben; and Kasai, Arlene, 5,499,050, Cl. 348-180.000.
Borodovsky, Yan A.; and Sarangi, Ananda G., 5,498,579, Cl. 437-250.000.
Clift, David W.; Arnold, James M.; Colwell, Robert P.; and Glew, Andrew F., 5,499,352, Cl. 395-412.000.
McMahon, John F.; and Chiu, George, 5,497,938, Cl. 228-253.000.
Intellectual Property Development Associates of Connecticut, Inc.: *See—*
Smith, Harry F., 5,499,181, Cl. 364-424.040.
Intelliwire, Inc.: *See—*
Imran, Mir, 5,497,784, Cl. 128-772.000.
Interclean Equipment, Inc.: *See—*
Lamminen, Olli; and Kaipainen, P. Mikael, 5,498,329, Cl. 210-86.000.
International Business Machines Corporation: *See—*
Amini, Nader; Bland, Patrick M.; Boury, Bechara F.; and Jackson, Robert T., 5,499,346, Cl. 395-308.000.
Anderson, James B.; Fitzpatrick, Francis L.; Hans, William M.; Harvey, Charles B., Jr.; Mitchell, Herman; and Wason, James R., 5,499,365, Cl. 395-600.000.
Aschoff, John G.; Berger, Jeffrey A.; Burton, David A.; McNutt, Bruce; and Kurtz, Stanley C., 5,499,354, Cl. 395-456.000.
Bailey, Michael E.; Dang, Dinh; Michael, James G.; Neary, Timothy E.; Pastel, Paul W.; Tousley, Sylvia R. R.; and Winslow, Arthur C., 5,498,313, Cl. 156-643.100.
Bartuska, Jaroslav B.; Grimm, Richard J.; Kerklaan, Albert J.; Saunders, David J.; and Zalesinski, Jerzy M., 5,499,162, Cl. 361-737.000.
Carpenter, Burton J., Jr.; McMaster, Michael G.; LaTorre, Joseph; and Simpson, Logan L., 5,498,765, Cl. 430-323.000.
Cavaliere, William A.; Ferrario, John S.; Ferris, Howard E.; Schuler, Raymond C.; and Strijek, Ronald L., 5,498,973, Cl. 324-765.000.
Childers, Edwin R.; and Henry, Michael, 5,499,233, Cl. 369-291.000.
DeCusatis, Casimer M., 5,499,311, Cl. 385-89.000.
Doi, Akio; Koyamada, Koji; and Miyazawa, Tatsuo, 5,499,323, Cl. 395-126.000.
Doudnikoff, Gregory M.; and Redpath, Richard J., 5,499,333, Cl. 395-153.000.
Dovek, Moris M., 5,499,149, Cl. 360-103.000.
Dugan, Robert F., Jr., 5,499,325, Cl. 395-132.000.
Fennema, Alan A.; Imaino, Wayne I.; and Rosen, Hal J., 5,499,231, Cl. 369-124.000.
Geissler, Stephen F.; Lloyd, David K.; and Paggi, Matthew, 5,498,564, Cl. 437-52.000.
Kirihata, Toshiaki; Fujii, Shuso; and Watanabe, Yohji, 5,499,211, Cl. 365-203.000.
McNeill, Andrew B., Jr.; and Wachtel, Edward I., 5,499,378, Cl. 395-500.000.
Narayanaswami, Chandrasekhar, 5,499,326, Cl. 395-133.000.
Tate, Bruce A.; and Li, Shih-Gong, 5,499,368, Cl. 395-600.000.
Verkuil, Roger L.; and Fung, Min-Su, 5,498,974, Cl. 324-767.000.
International Business Machines Inc.: *See—*
Steiner, Werner; and Trippel, Gerhard, 5,498,445, Cl. 427-162.000.
International Computers Limited: *See—*
Edler, Peter A., 5,498,862, Cl. 235-457.000.
International Protective Coatings Corp.: *See—*
Navarro, Mario; and DiMarino, Gabe, 5,498,466, Cl. 428-408.000.
International Rectifier Corporation: *See—*
Ajit, Janardhanan S., 5,498,884, Cl. 257-137.000.
International Superconductivity Technology Ctr.: *See—*
Fujimoto, Manabu; Yamaguchi, Keiichi; Enomoto, Youichi; Mitsuzuka, Tsutomu; and Suzuki, Katsumi, 5,498,881, Cl. 257-35.000.
Iohara, Koh-ichi: *See—*
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Iowa State University Research Foundation, Inc.: *See—*
Yeung, Edward S.; and Taylor, John A., 5,498,324, Cl. 204-452.000.
Ipsco Enterprises Inc.: *See—*
Smith, Glan R., 5,498,156, Cl. 432-75.000.
Irwin, Lawrence F., to Augerscope, Inc. Drain sealing apparatus. 5,497,516, Cl. 4-694.000.
Isaka, Kumiko: *See—*
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Isaka, Tsutomu: *See—*
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Ishibashi, Keiji: *See—*
Kabasawa, Yasuhiro; Ozaki, Fumihiro; Ishibashi, Keiji; Hasegawa, Takashi; Oinuma, Hitoshi; Ogawa, Toshiaki; Adachi, Hideyuki; Katoh, Hiroshi; Kodama, Kohtarou; Ohara, Hideto; Mori, Nobuyuki; and Minami, Norio, 5,498,634, Cl. 514-459.000.





Ishida Co., Ltd.: *See—*
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Ishida, Hideki: *See—*
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Ishida, Kazuhito: *See—*
Endo, Yoshinori; and Ishida, Kazuhito, 5,499,077, Cl. 355-203.000.
Ishida, Yasuo: *See—*
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Ishiguro, Takashi: *See—*
Shin, Yuaki; Ishiguro, Takashi; Hamada, Emiko; and Kagawa, Keiichi, 5,498,509, Cl. 430-321.000.
Ishihara, Heigo; and Kudo, Takanori, to Hitachi, Ltd. Magnetic recording medium having a lubricant layer comprising ionically interbonded fluoropolyethers with acidic and basic terminal groups. 5,498,457, Cl. 428-65.400.
Ishii, Kazuo: *See—*
Kato, Eiichi; and Ishii, Kazuo, 5,498,503, Cl. 430-96.000.
Ishii, Takafumi; Hida, Tsuneaki; Nozaki, Yukimasa; and Ootsu, Koichiro, to Takeda Chemical Industries, Ltd. Octahydro-2-naphthalenecarboxylic acid derivative, its production and use. 5,498,627, Cl. 514-423.000.
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Yamashita, Seiji; Saitou, Mitsuo; Ozeki, Tomoyuki; and Ishizaka, Tatsuya, 5,498,511, Cl. 430-496.000.
Ishizuka, Koh, to Canon Kabushiki Kaisha. Rotation information detection apparatus. 5,498,870, Cl. 250-237.00G.
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Kawai, Tatsundo; Hamamoto, Osamu; Takeda, Shinichi; Itabashi, Satoshi; and Iso, Toshimitsu, 5,499,112, Cl. 358-475.000.
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Shinomoto, Sayaka; Kohno, Kenji; Uetani, Yuko; Isoe, Noboru; and Miyata, Kazushi, 5,498,359, Cl. 252-54.000.
Isogon Corporation: *See—*
Barritz, Robert, 5,499,340, Cl. 395-184.010.
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Ito, Kozo; and Takano, Yoshishige, to Sumitomo Electric Industries, Ltd. Wear-resistant sintered ferrous alloy for valve seat. 5,498,483, Cl. 428-552.000.
Ito, Masumi: *See—*
Tsurita, Yasushi; Ito, Masumi; and Shiraga, Ken, 5,498,731, Cl. 549-259.000.
Ito, Motoya; Yasuda, Minoru; and Kobayashi, Atsushige, to Nippondenso Co., Ltd. Regenerative pump and casing thereof. 5,498,124, Cl. 415-55.100.
Ito, Noboru; Murasaki, Hiroshi; Yoshida, Hirokazu; and Masuda, Fumio, to Minolta Camera Kabushiki Kaisha. Image forming apparatus having a toner recycling mechanism. 5,499,090, Cl. 355-298.000.
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Niimi, Makoto; Ito, Shigemasa; Yamada, Toyonobu; Takemae, Yoshihiro; and Kato, Yoshiharu, 5,499,213, Cl. 365-222.000.
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ITW-ATECO GmbH: *See—*
Schmidt, Klaus; and Klein, Roland, 5,497,863, Cl. 188-306.000.
Iura, Tadashi. Rotary bed. 5,497,518, Cl. 5-618.000.
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Iwaki Glass Company Ltd.: *See—*
Sugiyama, Norihide; Watakabe, Atsushi; Yokotsuka, Shunsuke; Hiroi, Atsuo; Naritomi, Masaki; Shirota, Naoko; Aosaki, Ko; and Nakamura, Masaru, 5,498,657, Cl. 524-463.000.
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Iwata, Shunichi; and Shimizu, Toru, to Mitsubishi Denki Kabushiki Kaisha. Data processor and read control circuit, write control circuit therefor. 5,499,380, Cl. 395-800.000.
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Papandreou, John; and Numata, Shigeo, 5,498,022, Cl. 280-728.100.
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Kraft, Wilfried, 5,498,316, Cl. 162-301.000.
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Benz, Mark G.; Jackson, Melvin R.; Zabala, Robert J.; Jones, Marshall G.; Nied, Herman A.; and Eggleston, Michael R., 5,498,186, Cl. 445-28.000.
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Amini, Nader; Bland, Patrick M.; Boury, Bechara F.; and Jackson, Robert T., 5,499,346, Cl. 395-308.000.
Jackson, Steve C.: *See—*
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Jackson, Todd A.: *See—*
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Jacob, Michel: *See—*
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Jacobs, James K.: *See—*
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Jacobs, Robert S.: *See—*
Gerwick, William H.; Jacobs, Robert S.; Castenholz, Richard; Garcia-Pichel, Ferran; Grace, Krista J. S.; Proteau, Philip J.; and Rossi, James, 5,498,405, Cl. 424-59.000.
Jacobson, Kenneth A.; and Maillard, Michel G., to United States of America, Health and Human Services. Sulfo-derivatives of adenosine. 5,498,605, Cl. 514-46.000.
Jacquault, Patrick, to Societe Prolabo. Microwave heating device with deflectors for simultaneously treating plural samples. 5,498,857, Cl. 219-745.000.
Jacques, Alexander A. Circular pegboard strategy game. 5,498,005, Cl. 273-248.000.
Jacques, Cotteret: *See—*
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James, Barry E.: *See—*

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James Cash Machine Co., Inc.: *See*—
Cash, David R., 5,497,718, Cl. 112-2.100.
James, Robert O.; Rowley, Lawrence A.; and Oltean, George L., to Eastman Kodak Company. Photographic element having a transparent magnetic recording layer. 5,498,512, Cl. 430-496.000.
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Gravier, Michel, 5,497,935, Cl. 228-17.500.
Jang, Bor-Zeng B.; and Parker, Don W. Paint roller handle. 5,497,527, Cl. 15-230.110.
Janssen Pharmaceutica N.V.: *See*—
Leysen, Josepha E. M. F.; and Van Daele, Georges H. P., 5,498,618, Cl. 514-329.000.
de Jaeger, Nikolaas C. J.; Monbaliu, Marcel J.; Noppe, Marcus J. M.; and Konings, Frank J., 5,498,551, Cl. 436-533.000.
Japan Radio Co., Ltd.: *See*—
Kuwabara, Tatsuyuki; Tomita, Masaharu; Nagamura, Kiyotaka; Nakamura, Takao; Yoshida, Shin'ichi; Miyata, Souichi; and Muramatsu, Tsuyoshi, 5,499,347, Cl. 395-311.000.
Takahashi, Kyo, 5,499,268, Cl. 375-231.000.
Japan Tobacco Inc.: *See*—
Fujishige, Masaru, 5,497,790, Cl. 131-84.400.
Oka, Ichiro; and Sluis, Carolyn, 5,498,541, Cl. 435-240.450.
Okumoto, Yutaka, 5,497,794, Cl. 131-364.000.
Jarchau, Michael; and Jahnke, Steffen, to APV Gaulin GmbH. Premix homogenizing system. 5,498,075, Cl. 366-176.200.
Jarrell, Kevin A., to President and Fellows of Harvard College. Intron-mediated recombinant techniques and reagents. 5,498,531, Cl. 435-91.310.
Jaspar, Marc J.: *See*—
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Jassim, Sabah A. A.: *See*—
Rees, Catherine E. D.; Rostas-Mulligan, Katalin; Park, Simon F.; Denyer, Stephen P.; Stewart, Gordon S. A. B.; and Jassim, Sabah A. A., 5,498,525, Cl. 435-29.000.
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Jay Roberts Company: *See*—
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Jednacz, Scott T.: *See*—
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Jeffries, Thomas W.; Grabski, Anthony C.; Patel, Rajesh N.; Elegir, Graziano; and Szakacs, George, to United States of America, Agriculture. Method of removing color from wood pulp using xylanase from *streptomyces roseiscleroticus* NRRL B-11019. 5,498,534, Cl. 435-278.000.
Jenner, John A.: *See*—
McDonnell, Damien G.; Day, Sally E.; Coates, David; Jenner, John A.; Hird, Michael; and Toyne, Kenneth J., 5,498,366, Cl. 252-299.600.
Jensen, Brian J.: *See*—
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Jensen, Poul E.: *See*—
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Jentsch, Joerg-Dietrich; Klausener, Alexander; Landscheidt, Heinz; Lenders, Bernd; Pennemann, Bernd; Wolters, Erich; and Zirngbiebl, Eberhard, to Bayer Aktiengesellschaft. Process for the preparation of dimethyl carbonate. 5,498,744, Cl. 558-277.000.
JEOL Ltd.: *See*—
Okamura, Michio; Morimoto, Takeshi; and Hiratsuka, Kazuya, 5,498,951, Cl. 322-2.00R.
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Cho, Kwang-Yun; Kim, Bum-Tae; Kim, Young-Sup; Min, Yong-Ki; Park, No-Kyun; and Jeong, In-Howa, 5,498,730, Cl. 549-78.000.
Jeong, Suk D., to Goldstar Co., Ltd. Method for controlling a ventilation motor of a microwave oven. 5,498,858, Cl. 219-757.000.
Jeromin, Lothar S.: *See*—
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Jeruzal, Thomas M., to Chrysler Corporation. Pallet with adjustable article mounting hardware and article attachment method. 5,497,708, Cl. 108-54.100.
Jiang, Rong K.: *See*—
Lawrence, Carl A.; and Jiang, Rong K., 5,497,609, Cl. 57-400.000.
Jodelet, François, to Skis Rossignol S.A. Process for manufacturing a ski incorporating an injected core and a perforated internal reinforcement, and ski obtained by this process. 5,498,016, Cl. 280-602.000.
Johansson, Arne, to Abu AB. Line spool for a fishing reel. 5,497,954, Cl. 242-322.000.
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Johnson, Alton P.: *See*—
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Johnson & Johnson Vision Products, Inc.: *See*—
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Johnson, Bertrand H.: *See*—
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Johnson, Gary E.; Blume, Joseph A.; and Zahn, Harlie C., to Paper Converting Machine Company. Coreless winding method and apparatus. 5,497,959, Cl. 242-542.200.
Johnson, James A., to Hoover Universal, Inc. Tube joint formed with adhesive and metal forming process. 5,498,096, Cl. 403-267.000.
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Johnson, Marvin M.; Nowack, Gerhard P.; and Cymbaluk, Ted H., to Phillips Petroleum Company. Methods of preparing cuprous and cupric carboxylates. 5,498,824, Cl. 985-848.000.
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Johnson, Russell W.; DeFeo, Brent S.; Lupton, Francis S.; and Koch, Mark B., to AlliedSignal Inc. Disposal of hydrazine propellants. 5,498,401, Cl. 423-352.000.
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Jones, Charles W. Stereographic book. 5,499,136, Cl. 359-474.000.
Jones, Gerald T. Gum label dispenser. 5,497,904, Cl. 221-185.000.
Jones, Glyn R.: *See*—
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Jones, Kyle D.: *See*—
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Jones, Ronald L., to Bio-Lab, Inc. Disinfectant for the treatment of water systems. 5,498,415, Cl. 424-409.000.
Jones, Wendyle. Gas flare. 5,498,153, Cl. 431-202.000.
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Jorritsma, Johannes N. Method and apparatus for calculating flow rates through a pumping station. 5,497,664, Cl. 73-861.000.
Joseph, Sammy W.: *See*—
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Junino, Alex; Vandenbossche, Jean J.; and Lang, Gerard, to L'Oreal. Process for the preparation of 5,6-dihydroxyindole and intermediate compounds. 5,498,746, Cl. 558-408.000.
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Kastz, Gary F.; and Becker, John E., to Motorola, Inc. Filter switching circuit. 5,499,394, Cl. 455-266.000.
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Kagawa, Takashi: *See*—
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Kaipainen, P. Mikael: *See*—
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Kamm, Roland; Veit, Eberbard; Schneider, Josef; De Filippo, Antonio; Murray, Donald W.; Story, Michael C.; and Lasmasos, Carl S., to Alfred Karcher GmbH & Co. Wiper device for hard surfaces, in particular a window wiper. 5,497,530, Cl. 15-321.000.
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Kao, Richard C. Film status cap. 5,497,879, Cl. 206-389.000.
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Karanicolas, Andrew N.; and Lee, Hae-Seung, to Massachusetts Institute of Technology. Digitally self-calibrating pipeline analog-to-digital converter. 5,499,027, Cl. 341-120.000.
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Karlsson, Tord E. R., to Aktiebolaget Electrolux. Muffler for an internal combustion engine. 5,498,842, Cl. 181-230.000.
Karvinen, Esko; and Koskinen, Ari. Method for the preparation of a novel a-ring precursor for taxoids and novel intermediates. 5,498,738, Cl. 556-441.000.
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Kaser, Karl E.: *See—*
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Kasiwabara, Akihiro; and Mukasa, Mitsuhiro, to Canon Kabushiki Kaisha. Image forming apparatus having a counting device to facilitate two-sided copying. 5,499,091, Cl. 355-319.000.
Kasugai, Joji: *See—*
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Katagiri, Takeshi; Yamamoto, Masao; Tajima, Tukasa; and Shirasaki, Siro, to Yoshizuka Seiki Co., Ltd. Powder molding press. 5,498,147, Cl. 425-78.000.
Katamoto, Koji: *See—*
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Kato, Eiichi; and Ishii, Kazuo, to Fuji Photo Film Co., Ltd. Electrophotographic light-sensitive material. 5,498,503, Cl. 430-96.000.
Kato, Eishin: *See—*
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Kato, Hideyuki; and Chigusa, Yuji, to Nippondenso Co., Ltd. Lighting device for vehicle. 5,499,166, Cl. 362-32.000.
Kato, Hisahiro: *See—*
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Kato, Koichi: *See—*
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Kato, Yoshiharu: *See—*
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Kauffman, Thomas F.; Wieczorek, Joseph, Jr.; and Hatfield, Stephen F., to National Starch and Chemical Investment Holding Corporation. Starch based hot melt adhesives for cigarettes. 5,498,224, Cl. 493-39.000.
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Kawai, Tatsundo; Hamamoto, Osamu; Takeda, Shinichi; Itabashi, Satoshi; and Iso, Toshimitsu, to Cannon Kabushiki Kaisha. Light guide, illuminating device having the light guide, and image reading device and information processing apparatus having the illuminating device. 5,499,112, Cl. 358-475.000.
Kawai, Tomoaki; Yamamoto, Hiroyuki; and Okazaki, Hiroshi, to Canon Kabushiki Kaisha. Image processing apparatus. 5,499,362, Cl. 395-109.000.
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Kawamura, Hiroshi: *See—*
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Kawamura, Koichiro, to Nippon Steel Corporation. Semiconductor device using element isolation by field shield. 5,498,898, Cl. 257-503.000.
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Kawano, Michinao; Misaizu, Setsuo; Anzai, Tomoko; and Tsuda, Takashi, to Fujitsu Limited. Automatic temperature control circuit of laser diode and electric/optical signal converting unit using the same. 5,499,258, Cl. 372-34.000.
Kawanoue, Takashi: *See—*
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Senuma, Takeo; Ina, Shinichiro; Nakazawa, Hiroshi; Tamura, Yasuaki; Mano, Kunihiko; Nakamura, Fumio; Ishikawa, Munenori; and Kubo, Yoshiharu, 5,498,867, Cl. 250-231.180.
Kawasaki, Kiyoshi, to Tachi-S Co., Ltd. Device for guiding a cover member to a sewing machine. 5,497,720, Cl. 112-153.000.
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Imai, Katsuhiko, 5,498,094, Cl. 403-171.000.
Kay, Brian K.; and Fowlkes, Dana M., to University of North Carolina at Chapel Hill, The. Totally synthetic affinity reagents. 5,498,538, Cl. 435-69.100.
Kay, William W.: *See—*
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Kaye Instruments, Inc.: *See—*
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Kaylor, Joseph B., to Valkyrie Scientific Proprietary, L.C. Gas boosted nozzles and methods for use. 5,497,833, Cl. 169-15.000.
Kazmaier, Peter M.: *See—*
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Kehrney, Barry R., to Dawn Equipment Company. Apparatus for controlling down pressure on agricultural implements. 5,497,837, Cl. 172-619.000.
Kel Corporation: *See—*
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Keller, Richard D. Squeeze-actuated medicinal fluid applicator. 5,498,237, Cl. 604-438.000.
Keller, Wilhelm A. Mixer for double dispensing cartridges or dispensing appliances. 5,498,078, Cl. 366-339.000.
Kelley, David C.; Cisneros, Joseph; and Greenbaum, Louis A., to Terrapin Corporation. Navigation and positioning system and method using uncoordinated beacon signals. 5,499,032, Cl. 342-357.000.
Kelley, Scott A.; and Smydra, Andrew J., to TRW Vehicle Safety Systems Inc. Seamless door for air bag module. 5,498,027, Cl. 280-728.300.
Kelly, James D.: *See—*
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Kelly, Sarah E.; and Chang, George, to Pfizer Inc. Synthesis of intermediates in the preparation of ACAT inhibitors. 5,498,786, Cl. 554-67.000.
Kelly, William E., Jr.: *See—*
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Kenyon, Robin G. B., to Calidad Holdings Pty. Ltd. Multiple package holder. 5,497,882, Cl. 206-485.000.
Kepley, Garry D., to AT&T Corp. Arrangement for automating call-center agent-schedule-notification and schedule-adherence functions. 5,499,291, Cl. 379-265.000.
Kerklaan, Albert J.: *See—*
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Kern, Robert; Ruehlow, Gerald; Hoenisch, Herb; and Sarder, Mark, to Generac Corporation. Internal combustion engine for portable power generating equipment. 5,497,735, Cl. 123-90.600.
Kernforschungszentrum Karlsruhe GmbH: *See—*
Stripf, Helmut; Kilhaer, Thomas; and Herth, Armin, 5,497,661, Cl. 73-611.000.
Kerschner, Ronald K.; Crook, David T.; and Kent, Lisa M., to Hewlett-Packard Company. Capacitive electrode system for detecting open solder joints in printed circuit assemblies. 5,498,964, Cl. 324-530.000.
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Kraft, Robert E.; and Kontos, Karen B., to General Electric Company. Active acoustic liner. 5,498,127, Cl. 415-119.000.
Kraft, Wilfried, to J. M. Voith GmbH. Twin wire former for a paper making machine. 5,498,316, Cl. 162-301.000.
Kramer, David C.: *See*—
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Krause, Michael J.; Lo, Frederick Y.; and Chranowski, Steven M., to Mobil Oil Corporation. Supported metallocene catalysts for the production of polyolefins. 5,498,582, Cl. 502-103.000.
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Krawiec, Paul P.: *See*—
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Krehbiel, Gretchen L.: *See*—
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Kreuzer, Martin: *See*—
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Kricka, Larry J.: *See*—
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Krimmel, Gary W.; Miller, James L.; and McNamara, George E., to Service Ideas, Inc. Cap for a beverage server. 5,497,917, Cl. 222-475.100.
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Krivec, Bert, to Snap-on Incorporated. Press fitted flexural pivot joint. 5,498,095, Cl. 403-291.000.
Krnjevic, Hrvoje: *See*—
Djokic, Slobodan; Vajtner, Zlatko; Krnjevic, Hrvoje; Lopotar, Nevenka; and Kolacny-Babic, Lidija, 5,498,699, Cl. 534-15.000.
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Kruger, Robert J.; Frederick, Warren P.; Helgren, R. Hayes; Larkin, Mark E.; Mayoral, Joaquin; Schmolesky, Brad A.; Siczek, Roman W.; and Timmons, Kenneth J., to Abbott Laboratories. Peritoneal dialysis system using reverse osmosis purification device. 5,498,338, Cl. 210-641.000.
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Ku, George: *See*—
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Kubiak, John A.: *See*—
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Kubica, Stephen A. Cigarette and soluble cigarette filter therefor. 5,497,793, Cl. 131-331.000.
Kubo, Masao; Kamada, Kazuo; Ogasawara, Masanobu; and Nakamura, Yoshimitsu, to Matsushita Electric Works, Ltd. Method for mounting lead terminals to circuit board. 5,497,546, Cl. 29-843.000.
Kubo, Masumi: *See*—
Tsubota, Koujiro; Fujioka, Kazuyohsi; Yoshimura, Yohji; Ohgami, Hiroyuki; Takafuji, Yutaka; Nomura, Katsumi; Kubo, Masumi; and Kamei, Hirokazu, 5,499,127, Cl. 359-80.000.
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Kubota Corporation: *See*—
Nakano, Keiichi; Doi, Kiyoshi; Iida, Kiyonobu; and Inoue, Naoki, 5,497,747, Cl. 123-363.000.
Kubota, Mikio, to Toska Co., Ltd. Tag attacher. 5,497,930, Cl. 227-67.000.
Kubota, Yukio; and Kanota, Keiji, to Sony Corporation. Digital video tape reproducing apparatus compatible with tapes having a track width different from a rotary magnetic head width. 5,499,148, Cl. 360-73.060.
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Kudo, Taku, to Ricoh Company, Ltd. Automatic document feeder. 5,497,986, Cl. 271-122.000.
Kudoh, Kazuhiro; and Nagai, Hisami, to NEC Corporation. Wristwatch-type selective calling receiver. 5,499,398, Cl. 455-290.000.
Kudu Industries, Inc.: *See*—
Mills, Robert A. R., 5,498,142, Cl. 418-48.000.
Kugoh, Harumi: *See*—
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Kuhara, Shigehide; Sato, Kozo; and Kanayama, Shoichi, to Kabushiki Kaisha Toshiba. Nuclear magnetic resonance imaging with patient protection against nerve stimulation and image quality protection against artifacts. 5,497,773, Cl. 128-653.500.
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Kuhn, Thomas J. Crabbing bait holder. 5,497,582, Cl. 43-44.990.
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Stripf, Helmut; Kühner, Thomas; and Herth, Armin, 5,497,661, Cl. 73-611.000.
Kuhrau, Michael K.; and Knight, John C., Sr, to Mayer Industries, Inc. Manifold for use with a circular sliver knitting machine. 5,497,531, Cl. 15-345.000.
Kulhawik, Joseph E.; and Lee, Thomas E. Bicycle incorporating bifurcated frame. 5,498,014, Cl. 280-284.000.
Kulite Tungsten Corporation: *See*—
Mariella, Gaetano; Kurtz, Ronald; and Utzinger, Heary, 5,498,004, Cl. 273-416.000.
Kulkarni, Sunil B.; and Dingman, Randy R., to Durametallic Corporation. Double gas barrier seal. 5,498,007, Cl. 277-96.100.
Kull, A. Corbett S.; Bakke, Bradley B.; and Arens, John W., to Motorola, Inc. Method and apparatus for symbol clock recovery from signal having wide frequency possibilities. 5,499,273, Cl. 375-355.000.
Kumazaki, Toshimi, to Mitsuboshi Belting Ltd. Power transmission belt with reinforcing fibers. 5,498,212, Cl. 474-263.000.
Kunert, Reinhard: *See*—
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Kunz, Richard D.; Kelsch, Dale O.; and Beynon, Lamar C. Inflatable leg and foot support. 5,497,520, Cl. 5-648.000.
Kuo, Chen-Hsiung. Air current guiding device a pickup. 5,498,058, Cl. 296-180.100.
Kuo, David L.; Eyer, Martin; Roduit, Jean-Paul; and Wellig, Alain, to Lonza Ltd. Process for preparing imidazopyridine derivatives. 5,498,715, Cl. 546-118.000.
Kuo, Jack C. Boxed traveling item. 5,497,875, Cl. 206-45.130.
Kurahashi, Yoichi; Usui, Yoshifumi; Yagishita, Kazuhiko; and Yagishita, Aisaburo, to Kabushiki Kaisha Sanshin Seisakusho. Filtration concentration apparatus and method. 5,498,349, Cl. 210-798.000.
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Kuraray Co., Ltd.: *See*—
Torihara, Masahiro; and Tamai, Yoshin, 5,498,799, Cl. 568-354.000.
Kurata, Noboru: *See*—
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Tanaka, Hideaki; Oba, Hiroyuki; Sato, Tomoaki; and Hasegawa, Tomohisa, 5,498,662, Cl. 525-54.200.
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Ogihara, Tsutomu; Shimizu, Takaaki; Kinsho, Takeshi; Kaneko, Tatsushi; Saito, Ryuichi; and Kurihara, Hideshi, 5,498,737, Cl. 556-406.000.
Kurihara, Jun'ichi; Hirosawa, Toshio; and Shibamiya, Minoru, to Hitachi, Ltd. System for dynamically switching logical sessions between terminal device and a processor which stops its operation to another working processor under control of communication control processor. 5,499,342, Cl. 395-200.120.
Kurimoto, Isao: *See*—
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Kurjan, Katherine C.: *See*—
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Kuroda, Muneo, to Minolta Co., Ltd. Laser beam optical scanning system. 5,499,107, Cl. 358-347.000.
Kuroda Precision Industries, Ltd.: *See*—
Takamura, Zenichi; Yano, Yuji; and Sato, Yasuo, 5,498,163, Cl. 439-13.000.
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Kurokawa, Junji; Nojima, Kazuo; and Sohmiya, Norimasa, to Ricoh Company, Ltd. Charge roller and image forming apparatus using the same. 5,499,078, Cl. 355-206.000.
Kuroyanagi, Tomihiko: *See*—
Kyushima, Hiroyuki; Nagura, Koji; Hasegawa, Yutaka; Kawano, Eiichiro; Kuroyanagi, Tomihiko; Atsumi, Akira; and Mizuide, Masuya, 5,498,926, Cl. 313-533.000.
Kurschner, Dennis L.; Erdmann, David P.; and Crist, Scott D., to Alliant Techsystems Inc. Multifunctional magnetic fuze. 5,497,704, Cl. 102-264.000.
Kurtz, Ronald: *See*—
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Kurtz, Stanley C.: *See*—
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Kus, Richard A.: *See*—
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Kushibe, Takahiro: *See*—
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Kusunose, Masashi; Mitsui, Shoji; Yanagiso, Hiroei; and Sawashima, Chiyuki, to Mitsubishi Jukogyo Kabushiki Kaisha. Flow control valve. 5,497,801, Cl. 137-117.000.
Kuwabara, Tadashi: *See*—
Kimura, Koichi; Ogura, Toshihiko; Aotsu, Hiroaki; Ikegami, Mitsuru; Kuwabara, Tadashi; Enomoto, Hiromichi; and Kyoda, Tadashi, 5,499,222, Cl. 365-189.010.
Kuwabara, Tatsuyuki; Tomita, Masaharu; Nagamura, Kiyotaka; Nakamura, Takao; Yoshida, Shin'ichi; Miyata, Souichi; and Muramatsu, Tsuyoshi, to Japan Radio Co., Ltd.; and Sharp Corporation. System having multiple data flow processors and switching unit for selectively supplying packets containing data from packet transmitter to any selected data flow processor. 5,499,347, Cl. 395-311.000.
Kuwano, Hiromichi; and Tahara, Hisashi, to Texas Instruments Incorporated. Analog/digital converter. 5,499,028, Cl. 341-159.000.
Kuze, Katsuaki; Nagano, Hiroshi; Ohta, Saburoh; Mori, Kuniharu; and Isaka, Tsutomu, to Toyo Boseki Kabushiki Kaisha. Polyester film, laminated metal sheet and metal container. 5,498,454, Cl. 428-35.900.
Kwasnick, Robert F.: *See*—
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Kwiatkowska, Regina: *See*—
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Kwon, Young I., to VLSI Technology, Inc. Method and apparatus for cooling a molded-plastic integrated-circuit package. 5,497,547, Cl. 29-890.030.
Kyoda, Tadashi: *See*—
Kimura, Koichi; Ogura, Toshihiko; Aotsu, Hiroaki; Ikegami, Mitsuru; Kuwabara, Tadashi; Enomoto, Hiromichi; and Kyoda, Tadashi, 5,499,222, Cl. 365-189.010.
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Naka, Michiharu; Koizumi, Hideki; Takahashi, Yuzo; Goto, Koici; Endo, Toshiaki; and Suzuki, Yoichi, 5,498,357, Cl. 252-51.50R.
Kyooh Precision Industry Co., Ltd.: *See*—
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La Jolla Cancer Research Foundation: *See*—
Ruoslahti, Erkki I., 5,498,694, Cl. 530-324.000.
Laboch, Kazimir: *See*—
Charbonneau, Michel; Bossan, Edmond; Laboch, Kazimir; and Pin, Jean-Pierre, 5,498,073, Cl. 312-257.100.
Laboratoires Pharmascience: *See*—
Rancurel, Alain, 5,498,411, Cl. 424-195.100.
Lachman, Leonard: *See*—
Goldberg, Arthur H.; and Lachman, Leonard, 5,498,636, Cl. 514-652.000.
Laermer, Franz; and Schilp, Andrea, to Robert Bosch GmbH. Method for anisotropic plasma etching of substrates. 5,498,312, Cl. 156-643.100.
Lafond, Luc. Metal spacer for insulated glass assemblies. 5,498,451, Cl. 428-34.000.
La Fontaine, Bruno M.; White, Donald L.; and Wood, Obert R., II, to AT&T Corp. Fluoresence imaging. 5,498,923, Cl. 313-467.000.
Lai, Benny W. H.; and Walker, Richard C., to Hewlett-Packard Company. Unity gain positive feedback integrator with programmable charging currents and polarities. 5,498,992, Cl. 327-345.000.
Laidler, Kevin O., to Incro Limited. Self-cleaning/unblocking spray nozzle. 5,497,946, Cl. 239-452.000.
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Charbonnel, Jean-Christophe; Soula, Richard; and Suzon, Serge, 5,497,943, Cl. 239-132.000.
Lalezari, Iraj, to Montefiore Medical Center. Method of synthesizing polyesters. 5,498,708, Cl. 536-115.000.
Lamirand, Joseph: *See*—
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Lamminen, Olli; and Kaipainen, P. Mikael, to Interclean Equipment, Inc. Vehicle wash apparatus using reclaimed water. 5,498,329, Cl. 210-86.000.
Lammons, Carl S.: *See*—
Kamm, Roland; Veit, Eberbard; Schneider, Josef; De Filippo, Antonio; Murray, Donald W.; Story, Michael C.; and Lammons, Carl S., 5,497,530, Cl. 15-321.000.
Landis & Gyr Energy Management, Inc.: *See*—
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Jentsch, Joerg-Dietrich; Klausener, Alexander; Landscheidt, Heinz; Lenders, Bernd; Pennemann, Bernd; Wolters, Erich; and Zirngbiebl, Eberhard, 5,498,744, Cl. 558-277.000.
Lane, John D.: *See*—
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Lang, Hans-Jochen: *See*—
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Lang, Ko C.: *See*—
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Lapatovich, Walter P.; Butler, Scott J.; and Bochinski, Jason R., to Osram Sylvania Inc. Electrodeless high intensity discharge lamp energized by a rotating electric field. 5,498,928, Cl. 315-39.000.
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Cuthbertson, Robert A.; James, Barry E.; Magalhaes, Carlos E.; and Smith, Jerry F., 5,498,066, Cl. 298-23.00C.
Mager, Uwe: *See—*
Schaller, Hans-Ludwig; Mellinghoff, Horst; Schmengler, Michael; and Mager, Uwe, 5,499,264, Cl. 373-78.000.
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Semence, Pierre; and Joigneau, Jean-Pierre, 5,497,746, Cl. 123-339.270.
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Jacobson, Kenneth A.; and Maillard, Michel G., 5,498,605, Cl. 514-46.000.
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Mallamo, John P.; Bibovsky, Ron; Chatterjee, Sankar; and Tripathy, Rabindranath, to Cephalon, Inc. Cysteine protease and serine protease inhibitors. 5,498,616, Cl. 514-300.000.
Mallett, Dudley C., to Fenner Fluid Power, a Division of Fenner, Inc. Plastic reservoir. 5,497,621, Cl. 60-325.000.
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Ilardi, Joseph M.; and Schwartzkopf, George, 5,498,293, Cl. 134-3.000.
Maloney, Ronald P., to Caterpillar Inc. Engine crankcase ventilation. 5,497,755, Cl. 123-572.000.
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Moore, Glenn A., Jr.; and Mannari, Christopher J., 5,498,395, Cl. 422-100.000.
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Gyure, Alex; Berg, John; Carver, Damian; and Manos, Pete, 5,498,896, Cl. 257-402.000.
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Hart, Anthony J., 5,497,536, Cl. 24-459.000.
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Gratton, Enrico; Fantini, Sergio; Franceschini, Maria A.; Mantulin, William; and Barbieri, Beniamino, 5,497,769, Cl. 128-633.000.
Manz, Kenneth W.; and Reyzin, Ilya, to SPX Corporation. Thermoelectric refrigerant handling system. 5,497,625, Cl. 62-3.300.
Marcarelli, Hawk R. G. Wallet tether and wallet. 5,497,818, Cl. 150-134.000.
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Bredy, Thierry; Rodriguez, Hervè; and Marchand, Emmanuel, 5,497,705, Cl. 102-427.000.
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Marck, Guy: *See—*
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Marconi Company Limited, The: *See—*
Bodonyi, Janos, 5,499,031, Cl. 342-174.000.
Marcott, Tony L., to Caterpillar Inc. Electrohydraulic steering system. 5,497,692, Cl. 91-523.000.
Marhold, Albrecht: *See—*
Böhm, Stefan; and Marhold, Albrecht, 5,498,750, Cl. 560-124.000.
Mariano, Karen M.; Kauffman, Thomas; and Gregor, Stacey A., to Binney & Smith Inc. Modeling dough. 5,498,645, Cl. 523-218.000.
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Marinoni, Mario: *See—*
Dodd, Graham S.; and Marinoni, Mario, 5,497,586, Cl. 52-172.000.
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Marker, Richard L.: *See—*
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Marko, Paul D.: *See—*
Wadin, Craig P.; and Marko, Paul D., 5,499,397, Cl. 455-277.100.
Markowitz, Robert E.: *See—*
Bruno, Richard F.; and Markowitz, Robert E., 5,499,289, Cl. 379-220.000.
Marple, Basil; and Boulanger, Jean, to National Research Council of Canada. Slip casting process and apparatus for producing graded materials. 5,498,383, Cl. 264-87.000.
Marple, Virgil A.; Olson, Bernard A.; and Rubow, Kenneth L., to MSP Corporation. Diesel particle virtual impactor sampler. 5,498,271, Cl. 55-321.000.
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Marshall, Richard A.; Parker, Dane K.; and Hershberger, James W., to Goodyear Tire & Rubber Company, The. Method of reducing the residual unsaturated monomer content of an aqueous dispersion of a saturated polymer. 5,498,693, Cl. 528-483.000.
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Martell, Trevor J.: *See—*
Tank, Klaus; Tomlinson, Peter N.; Martell, Trevor J.; Lloyd, Andrew I.; and Olmstead, Bruce R., 5,498,480, Cl. 428-408.000.
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Martin, David O.; and Scott, Robert S., to Martin Door Manufacturing, Inc. Window apparatus and method for a garage door. 5,497,588, Cl. 52-208.000.
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Martin, Howard. Furrow closing device. 5,497,717, Cl. 111-191.000.
Martin, Kevin B., to Network Computing Devices, Inc. Line draw method for generating, storing and displaying lines in a display system. 5,499,328, Cl. 395-143.000.
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Box, W. Donald, 5,497,707, Cl. 104-138.200.
Martin, Richard R. Method for reducing the kerf width made by a circular saw blade. 5,497,684, Cl. 83-13.000.
Martinez, Jean: *See—*
Loffet, Albert; Fehrentz, Jean-Alain; Martinez, Jean; and Winternitz, Philippe-François, 5,498,732, Cl. 549-274.000.
Martinsson, Pär B. G., to Aktiebolaget Electrolux. Chain stretching device for a chain saw. 5,497,557, Cl. 30-386.000.
Martinuzzi, Guiseppe: *See—*
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Martres, Marie-Pascale: *See—*
Rognan, Didier; Mann, Andre; Wermuth, Camille-Georges; Martres, Marie-Pascale; Giros, Bruno; Sokoloff, Pierre; Schwartz, Jean-Charles; LeComte, Jeanne-Marie; and Garrido, Fabrice, 5,498,628, Cl. 514-428.000.
Marumoto, Mitsuhiro: *See—*
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Marusawa, Hiroshi; Kawanami, Takashi; Konoike, Takehiro; and Tomono, Kunisaburo, to Murata Manufacturing Co., Ltd. High-frequency use non-reciprocal circuit element. 5,498,999, Cl. 333-1.100.
Maruyama, Ikuo; Nagayoshi, Yoshimasa; Nakamura, Hisaji; Takada, Akio; Kato, Koichi; Oyaide, Sadamu; Shimazaki, Tatsuya; and Konno, Yoshihiro, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Control method of vehicle engine arranged in association with fluid coupling having clutch. 5,498,217, Cl. 477-169.000.
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Maruyama, Shinichi; and Hasegawa, Akihiko, to Nissan Motor Co., Ltd. Structure of rear window shelf portion to partition vehicular passenger compartment and rear trunk. 5,498,050, Cl. 296-39.300.
Maruyama, Tatsuya: *See—*
Hara, Hiromu; Maruyama, Tatsuya; Saito, Munetoshi; and Mase, Toshiyasu, 5,498,635, Cl. 514-620.000.
Maruzen Kabushiki Kaisha: *See—*
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Marvin Lumber and Cedar Co.: *See—*
Simon, Ira J.; Curtis, George W.; and Campbell, Andrew B., 5,498,038, Cl. 292-36.000.
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Masaki, Kazuo: *See—*
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Maschinen- und Anlagenbau Grimma GmbH (MAG): *See—*
Dummersdorf, Hans-Ulrich; Hebecker, Dietrich; von Lengerken, Dirk; Winter, Carsten, deceased; Winter, Walter, heir; and Winter, Renate, heir, 5,498,826, Cl. 588-210.000.
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Graf, Felix; Maier, Jorg; Wagner, Rudi; and Wirz, Armin, 5,497,538, Cl. 28-255.000.
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Hara, Hiromu; Maruyama, Tatsuya; Saito, Munetoshi; and Mase, Toshiyasu, 5,498,635, Cl. 514-620.000.
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Nikhil, Rishiyur S.; and Arvind, 5,499,349, Cl. 395-375.000.
Massaro, Michael: *See—*
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Masuda, Fumio: *See—*
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Masuda, Yoshihumi: *See—*
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Masumoto, Kazuhisa; Nakamura, Akihiko; Kiyoshima, Yujiro; Sasaki, Mikio; and Tanahashi, Asako, to Shionogi & Co., Ltd.; and Sumitomo Chemical Co., Ltd. Process of producing N-alkylacetamides. 5,498,792, Cl. 564-164.000.
Mather, Clifford L. Method of silk screen printing on a rough surface such as a football. 5,497,699, Cl. 101-129.000.
Mathews, Alexander P., to Kansas State University Research Foundation. Process for the production of road deicers from water plant residuals. 5,498,362, Cl. 252-70.000.
Mathieu, Edward F., Jr. Releasable microphone stand apparatus. 5,497,965, Cl. 248-159.000.

Mathur, Sharad; Menezes, Arul; VanBuskirk, Michael R.; and Gallo, Kevin T., to Microsoft Corporation. System for transferring messages between input and output devices in a communication device. 5,499,109, Cl. 358-400.000.

Matossian, Jesse N.; and Williams, John D., to Hughes Aircraft Company. Confinement of secondary electrons in plasma ion processing. 5,498,290, Cl. 118-723.00E.

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Tanada, Hideki; Sakai, Kazuya; Kajiya, Seitaro; Ohto, Norio; Horikomi, Kazutoshi; Matsubara, Akira; Shimizu, Hideshi; and Mizuchi, Akira, 5,498,619, Cl. 514-338.000.

Matsuda, Hiroshi: *See*—
Urano, Fumiyoshi; Oono, Keiji; and Matsuda, Hiroshi, 5,498,748, Cl. 560-67.000.

Matsuda, Kazuhiro: *See*—
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Matsuda, Masami; Nishi, Takashi; Kikuchi, Makoto; Izumida, Tatsuo; Tamata, Shin; and Kiuchi, Yoshimasa, to Hitachi, Ltd.; and Hitachi Engineering & Services Co., Ltd. Solidification agents for radioactive waste and a method for processing radioactive waste. 5,498,828, Cl. 588-252.000.

Matsuda, Shohei: *See*—
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Matsumoto, Itsuo; Furui, Yuji; and Tsuchimoto, Yoshihiro, to Asahi Glass Company. Method and device for forming a glass product. 5,498,274, Cl. 65-80.000.

Matsumoto, Misuhiro; and Fujita, Kunihiko, to Sumitomo Chemical Company, Limited. Process for preparing 5-aminodihydropyrrole intermediate thereof and process for preparing said intermediate. 5,498,725, Cl. 548-408.000.

Matsumoto, Mitsuo; Takahashi, Nobuo; Ohwaki, Shinji; Fujimoto, Kazushi; and Iohara, Koh-ichi, to Teijin Limited. Short fiber and continuous filament containing spun yarn-like composite yarn. 5,497,608, Cl. 57-207.000.

Matsunaga, Toshiaki: *See*—
Aoyama, Takahiro; Nakazaki, Mitsuo; Banba, Akikazu; Yoshida, Masatoshi; Matsunaga, Toshiaki; and Tsubakimoto, Tsuneo, 5,498,670, Cl. 525-217.000.

Matsuno, Junichi; Obata, Shigeru; Takuma, Yasuo; Miwa, Masato; and Uno, Kazuo, to Hitachi, Ltd.; and Hitachi Koki Co., Ltd. Belt type transfer device for electrophotographic apparatus. 5,499,086, Cl. 355-274.000.

Matsuno, Junichi: *See*—
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Matsuo, Masahiko: *See*—
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Matsuoka, Yuichi: *See*—
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Matsushita Communication Industrial Corporation of America: *See*—
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Matsushita Electric Industrial Co., Ltd.: *See*—
Araki, Toshiyuki; Aono, Kunitoshi; and Toyokura, Masaki, 5,499,348, Cl. 395-375.000.
Kado, Hiroyuki; and Tohda, Takao, 5,497,656, Cl. 73-105.000.
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Kojima, Kazunobu; Kagawa, Takashi; and Matsuoka, Yuichi, 5,499,115, Cl. 348-836.000.
Nakabayashi, Takashi; Uehara, Takashi; and Shinohara, Akihira, 5,498,908, Cl. 257-751.000.
Noguchi, Toshiharu; Eguchi, Kazuhiro; and Ohno, Hiroshi, 5,499,004, Cl. 333-202.000.
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Tojo, Masaaki; Kurata, Noboru; and Souda, Hironori, 5,499,132, Cl. 359-281.000.

Matsushita Electric Works, Ltd.: *See*—
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Matsushita Electronics Corporation: *See*—
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Matsushita Graphic Communication Systems, Inc.: *See*—
Sato, Shinichi; Kobayashi, Kazuto; and Ikeuchi, Takenobu, 5,499,111, Cl. 358-455.000.

Matsushita, Michiaki; and Yamahira, Yutaka, to Tokyo Electron Limited; and Tokyo Electron Kyushu Limited. Apparatus and method for washing substrates. 5,498,294, Cl. 134-6.000.

Matsutani, Takeshi: *See*—
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Matsuura, Kazuho: *See*—
Mitsudera, Hiroyuki; Konobe, Masato; Ishida, Yasuo; and Matsuura, Kazuho, 5,498,774, Cl. 504-246.000.

Mattel, Inc.: *See*—
Fritzinger, Daniel D., 5,497,844, Cl. 180-65.600.

Matter, Ulrich; Nunlist, Rene; Burtscher, Heinz; and Mukrowsky, Michael, to Lehmann, Martin. Method and apparatus for automatic selection of containers. 5,497,651, Cl. 73-23.200.

Matthiesen, Klaus; and Hautmann, Nikolaus, to Robert Bosch GmbH. Ignition coil for an internal combustion engine. 5,497,756, Cl. 123-634.000.

Mattke, Reinhard: *See*—
May, Karl; Herm, Hartmut; and Mattke, Reinhard, 5,497,712, Cl. 110-342.000.

Matuszewski, Wojciech: *See*—
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Mawad, Michel E. Retrievable, shielded radiotherapy implant. 5,498,227, Cl. 600-3.000.

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Schaffer, Gregory L., 5,498,984, Cl. 327-51.000.

May, Christian: *See*—
Seitz, Katherina; Güther, Hans-Michael; Hessel, Friedrich; Schröder, Frank; Köstler, Christine; Roosen, Andreas; and May, Christian, 5,498,382, Cl. 264-56.000.

May, Karl; Herm, Hartmut; and Mattke, Reinhard, to Siemens Aktiengesellschaft. Low-temperature carbonization/combustion process and low-temperature carbonization/combustion plant with pressure control. 5,497,712, Cl. 110-342.000.

Mayeda, Mark; and Barber, Rennie, to LSI Logic Corporation. Cooling element for a semiconductor fabrication chamber. 5,497,727, Cl. 118-733.000.

Mayer Industries, Inc.: *See*—
Kuhrau, Michael K.; and Knight, John C., Sr, 5,497,531, Cl. 15-345.000.

Mayfield, Alfred B., to Johnson, Charles D. Dryer apparatus. 5,497,563, Cl. 34-572.000.

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Kruger, Robert J.; Frederick, Warren P.; Helgren, R. Hayes; Larkin, Mark E.; Mayoral, Joaquin; Schmolesky, Brad A.; Siczek, Roman W.; and Timmons, Kenneth J., 5,498,338, Cl. 210-641.000.

Mayr, Konrad. Heating device for solid fuels. 5,497,761, Cl. 126-523.000.

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Matsuda, Yutaka; Moriue, Hiroo; Hashimoto, Kyosuke; Akimoto, Mitsuru; Hirano, Seiji; Michihira, Osamu; Terayama, Koji; Sakamoto, Hiroaki; and Umegaki, Koji, 5,499,247, Cl. 370-85.300.

McAllister, Gene H.: *See*—
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McBain, Douglas S.: *See*—
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McCall, James T.: *See*—
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McCannon, W. Allen, Jr.; Dye, Dan W.; and Bond, Cecil P. Automated rock burner. 5,497,838, Cl. 175-27.000.

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Meek, Roger L.; and McClure, J. Michael, 5,497,715, Cl. 111-137.000.

McClurg, George W.: *See*—
Burgan, John M.; McClurg, George W.; and Lerner, Kenneth S., 5,499,019, Cl. 340-825.220.

McComsey, David F: *See*—
Costenzo, Michael J.; Maryanoff, Bruce E.; McComsey, David F.; and Nortey, Samuel O., 5,498,629, Cl. 514-439.000.

McCormick, Ronald W.: *See*—
Noveroske, Robert L.; and McCormick, Ronald W., 5,498,773, Cl. 504-103.000.

McCrimmon, Kenneth A.: *See*—
Wey, Geoffrey A.; McCrimmon, Kenneth A.; and Crum, Robert S., 5,498,087, Cl. 400-68.000.

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Carlin, Mark; McCuskey, James G.; and Sugiyama, Koichi, 5,498,028, Cl. 280-735.000.

McDanal, Almus J.: *See*—
O'Neill, Mark J.; and McDanal, Almus J., 5,498,297, Cl. 136-246.000.

McDaniel, Gale E.: *See*—
McDaniel, Patrick K.; and McDaniel, Gale E., 5,498,012, Cl. 280-166.000.

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McGarry, Frederick J.; and McBain, Douglas S., to GenCorp Inc. Polyester-flexible polymer block copolymer coated fiber structures. 5,498,763, Cl. 428-229.000.

McGuigan, Arthur W.; and Wiant, Benjamin C., to Westinghouse Electric Corporation. Hot gas manifold system for a dual topping combustor gas turbine system. 5,497,613, Cl. 60-39.370.

McKay, Christopher B.; and deZordo, Stephen, to DoodleTop. Top with precession tracing point for tracing unique spirals. 5,498,192, Cl. 446-264.000.

McKeirnan, Robert D., Jr.: *See*—
Noe, James C.; and McKeirnan, Robert D., Jr., 5,497,615, Cl. 60-39.511.

McLaren, Scott: *See*—
Stedman, Donald H.; Bishop, Gary; and McLaren, Scott, 5,498,872, Cl. 250-338.500.

McLaughlin, Michael D.; Signa, John C.; Greicar, Richard K.; and Taylor, John M., to Radius Inc. Method and apparatus for display calibration and control. 5,499,040, Cl. 345-146.000.

McLean, Michael E.; Pinkston, Melvin D.; Arrington, Noel D.; Wolters, Dennis R.; Shannon, Allen T.; Ferguson, Thomas G.; Macfarlane, Graham; Baldermann, Chris; and Dolan, John, to Day International, Inc. Printing blanket having improved dynamic thickness stability and method of making. 5,498,470, Cl. 428-246.000.

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McMahon, John F.; and Chiu, George, to Intel Corporation. Tape with solder forms and methods for transferring solder to chip assemblies. 5,497,938, Cl. 228-253.000.

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Carpenter, Burton J., Jr.; McMaster, Michael G.; LaTorre, Joseph; and Simpson, Logan L., 5,498,765, Cl. 430-323.000.

McNamara, George E.: *See*—
Krimmel, Gary W.; Miller, James L.; and McNamara, George E., 5,497,917, Cl. 222-475.100.

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Little, John; Kotyk, Jeffrey; and Grove, James B., 5,497,852, Cl. 184-7.400.

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Berta, Norbert I., 5,498,441, Cl. 427-2.140.

McNeil-PPC, Inc.: *See*—
Navia, Juan L.; Walkup, Robert E.; Vernon, Nicholas M.; and Neiditch, David S., 5,498,709, Cl. 536-124.000.

McNeill, Andrew B., Jr.; and Wachtel, Edward I., to International Business Machines Corporation. Small computer system emulator for non-local SCSI devices. 5,499,378, Cl. 395-500.000.

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Christenson, Ronald E., 5,498,021, Cl. 280-704.000.

McNeilus Truck and Manufacturing, Inc.: *See*—
Christenson, Ronald E., 5,498,067, Cl. 298-23.0MD.

McNutt, Bruce: *See*—
Aschoff, John G.; Berger, Jeffrey A.; Burton, David A.; McNutt, Bruce; and Kurtz, Stanley C., 5,499,354, Cl. 395-456.000.

McWilliams, Kevin R., to Ceramaspeed Limited. Radiant electric heater. 5,498,854, Cl. 219-464.000.

Mead, William L.: *See*—
Zingle, Ralph D.; Tilley, Mary W.; and Mead, William L., 5,497,942, Cl. 239-6.000.

Meadows, David L.; Kurjan, Katherine C.; and Branham, Larry E., to Allergan, Inc. Dropwise liquid dispensing system particularly suitable for liquids having low surface tension. 5,497,910, Cl. 222-95.000.

Meason, John: *See*—
Sheng, Zhengzhi; Meason, John; and Xin, Ying, 5,498,594, Cl. 505-120.000.

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Germanton, Damon; and Petrucelli, Steven P., 5,499,024, Cl. 340-870.170.

Meconi, Reinhold: *See*—
Beutner, Dieter; von Knobelsdorff, Henning; Wolff, Hans-Michael; Hoffmann, Rainer; Meconi, Reinhold; and Klein, Robert P., 5,498,418, Cl. 424-448.000.

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Hall, Christian, 5,498,524, Cl. 435-7.100.

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Fugoso, Mauricio L., 5,497,782, Cl. 128-772.000.

Meece, Carl E.: *See*—
El-Aini, Yehia M.; Burge, Joseph C.; and Meece, Carl E., 5,498,137, Cl. 416-229.00A.

Meehan, James E.: *See*—
Gershen, Bernard; Lombardi, Alfred J.; Meehan, James E.; and Rosenbaum, Saul, 5,499,155, Cl. 361-113.000.

Meek, Roger L.; and McClure, J. Michael, to Great Plains Manufacturing Incorporated. Seed metering drive mechanism for seed planters and the like. 5,497,715, Cl. 111-137.000.

Mehrotra, Sharad: *See*—
Barbara, Daniel; Johnson, Stephen; Mehrotra, Sharad; and Aref, Walid, 5,499,360, Cl. 395-600.000.

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Welch, David P.; Mehuys, David G.; and Scifres, Donald R., 5,499,261, Cl. 372-50.000.

Mei, Chia-Cu P., to Texas Instruments Incorporated. Method of making extended drain resurf lateral DMOS devices. 5,498,554, Cl. 437-34.000.

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Yokev, Hanoch; Harel, Haim; and Meiman, Yehouda, 5,499,266, Cl. 375-202.000.

Meisel, Philip L.: *See*—
Trapasso, Louis E.; Padegimas, Stanley J.; Epstein, Peter F.; Hung, Paul L. K.; Mukhopadhyay, Purnendu; and Meisel, Philip L., 5,498,751, Cl. 560-217.000.

Meister, Thomas: *See*—
Klose, Helmut; Meister, Thomas; Meul, Hans-Willi; and Stengl, Reinhard, 5,498,567, Cl. 437-89.000.

Meitner, Edmund; and Gendron, Robert P. Adaptive digital audio interpolation system. 5,499,315, Cl. 395-2.740.

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Schaller, Hans-Ludwig; Mellinghoff, Horst; Schmengler, Michael; and Mager, Uwe, 5,499,264, Cl. 373-78.000.

Mellitz, Richard I., to Digital Equipment Corporation. Driving point reference plane time domain reflectometry method for measuring characteristic impedance. 5,498,965, Cl. 324-532.000.

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Effer, Erhard; Melzig, Manfred; Schuster, Herbert; and Martinuzzi, Guiseppe, 5,498,686, Cl. 528-76.000.

Menasche, Philippe, to Pasteur Merieux Serums et Vaccines. Solutions for the perfusion, preservation and reperfusion of organs. 5,498,427, Cl. 424-678.000.

Menezes, Arul: *See*—
Mathur, Sharad; Menezes, Arul; VanBuskirk, Michael R.; and Gallo, Kevin T., 5,499,109, Cl. 358-400.000.

Menicon Co., Ltd.: *See*—
Hattori, Kenshiro; and Inada, Koichi, 5,497,683, Cl. 82-18.000.

Menjo, Takeshi, to Canon Kabushiki Kaisha. Color toner image fixing apparatus having a back-up member, heater and film with a deformable surface layer. 5,499,088, Cl. 355-285.000.

Mentrup Edgar; Michel, Christoph; and Purmann, Thomas, to Merz & Co. GmbH & Co. Stable small particle liposome preparations, their production and use in topical cosmetic, and pharmaceutical compositions. 5,498,420, Cl. 424-450.000.

Meola, Carmine G., to W. L. Gore & Associates, Inc. Process for preparing selectively conductive materials by electroless metal deposition and product made therefrom. 5,498,467, Cl. 428-198.000.

Merck & Co., Inc.: *See*—
Cama, Lovji D.; Sasor, Mary F.; and Hammond, Milton L., 5,498,777, Cl. 514-206.000.

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Nolan, Patrick; and Coates, David, 5,498,365, Cl. 252-299.010.

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Bredol, Michael; Merikhi, Jacqueline; and Ronda, Cornelis, 5,498,369, Cl. 252-301.650.

Merkel, Paul B.; Poslusny, Jerrold N.; Williamson, Hugh M.; Clark, Bernard A.; and Stanley, Paul L. R., to Eastman Kodak Company. Photographic element containing a certain sulfonated acylacetanilide coupler in combination with low- or non-chloride emulsions. 5,498,515, Cl. 430-556.000.

Merkle, Holger: *See*—
Wessling, Bernhard; and Merkle, Holger, 5,498,761, Cl. 427-542.000.

Merrell Dow Pharmaceuticals Inc.: *See*—
Carr, Albert A.; Thomas, Craig E.; Bernotas, Ronald C.; and Ku, George, 5,498,778, Cl. 514-309.000.

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Neises, Bernhard; Ganzhorn, Axel; Tarnus, Céline; and Broersma, Robert J., Jr., 5,498,779, Cl. 514-428.000.

Mertens, Carsten-Joerg: *See*—
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Mertens, Peter: *See*—
Brenner, Axel; Mertens, Peter; Meuser, Wilfried; Meyer, Friedrich; Trense, Horst; Weber, Friedrich; and Wilken, Wilfried, 5,499,219, Cl. 367-151.000.

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Mentrup Edgar; Michel, Christoph; and Purmann, Thomas, 5,498,420, Cl. 424-450.000.

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Metcalf, Arthur S.: *See*—
Boles, Joel L.; Metcalf, Arthur S.; and Dawson, Jeffrey C., 5,497,830, Cl. 166-300.000.

Metz, Suzanne: *See*—
McLoughlin, Jim I.; Mischke, Deborah A.; Williams, Marla J.; and Metz, Suzanne, 5,498,624, Cl. 514-406.000.

Metzner, Tom: *See*—
Maggio, Mark S.; Allsup, David S.; Cox, Alvin E.; Metzner, Tom; Eckerd, Steven; and Skarky, Loren, 5,498,840, Cl. 174-260.000.

Meul, Hans-Willi: *See*—
Klose, Helmut; Meister, Thomas; Meul, Hans-Willi; and Stengl, Reinhard, 5,498,567, Cl. 437-89.000.

Meunier, Isabelle: *See*—
Pandey, Ravindra K.; Dougherty, Thomas J.; Smith, Kevin M.; and Meunier, Isabelle, 5,498,710, Cl. 540-145.000.

Meuser, Wilfried: *See*—
Brenner, Axel; Mertens, Peter; Meuser, Wilfried; Meyer, Friedrich; Trense, Horst; Weber, Friedrich; and Wilken, Wilfried, 5,499,219, Cl. 367-151.000.

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Meyer, Friedrich: *See*—
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Meyer, Richard C.: *See*—
Gove, Robert J.; Meyer, Richard C.; and Markandey, Vishal, 5,499,060, Cl. 348-651.000.

Micali, Silvio. Natural input encryption and method of use. 5,499,296, Cl. 380-23.000.

Michael, James G.: *See*—
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Michaels, Dean; Sheiler, Steven T.; Fioritto, Michelle L.; Hughes, Sharon D.; and Cole, Stephan W., to American Consumer Products, Inc. Modular display system. 5,497,888, Cl. 211-10.000.

Michel, Christoph: *See*—
Mentrup Edgar; Michel, Christoph; and Purmann, Thomas, 5,498,420, Cl. 424-450.000.

Michel, Hartmut, to Hoechst Aktiengesellschaft. Process and device for homogenizing the winding hardness of a roll profile of a film reel. 5,497,957, Cl. 242-534.000.

Michihira, Osamu: *See*—
Matsuda, Yutaka; Moriue, Hiroo; Hashimoto, Kyosuke; Akimoto, Mitsuru; Hirano, Seiji; Michihira, Osamu; Terayama, Koji; Sakamoto, Hiroaki; and Umegaki, Koji, 5,499,247, Cl. 370-85.300.

Micklich, Frank T.; and Sechrist, Paul A., to UOP. Moving bed regeneration process with internally mixed chloride gas. 5,498,756, Cl. 422-223.000.

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Patten, Andrew T.; Stack, Charles P.; and Levien, Andrew K., 5,497,666, Cl. 73-861.380.

Micro Motors, Inc.: *See*—
Coss, Ronald G., 5,498,159, Cl. 433-126.000.

Microfab Technologies, Inc.: *See*—
Hayes, Donald J., 5,498,444, Cl. 427-162.000.

Microflash, Inc.: *See*—
Davis, Kevin A., 5,499,009, Cl. 340-468.000.

Microlog Corporation: *See*—
Morduch, Georg E., 5,499,285, Cl. 379-52.000.

Micron Technology Inc.: *See*—
Becker, David S., 5,498,570, Cl. 437-187.000.
Dennison, Charles H.; and Walker, Michael A., 5,498,562, Cl. 437-52.000.
Ingalls, Charles L.; and Thomann, Mark R., 5,499,250, Cl. 371-28.000.

Microsoft Corporation: *See*—
Atkinson, Robert G., 5,499,369, Cl. 395-650.000.
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Silver, David M.; and Windsor, John R., 5,499,335, Cl. 395-161.000.
Staab, Sanford A., 5,499,334, Cl. 395-157.000.

Middlemiss, David: *See*—
Ross, Barry C.; Middlemiss, David; Scopes, David I. C.; Jack, Torquil I. M.; Cardwell, Kevin S.; Dowle, Michael D.; Judd, Duncan B.; and Watson, Stephen P., 5,498,722, Cl. 548-315.400.

Middleton, David B.; Srivatsan, Raghavachari; and Person, Lee H., Jr., to United States of America, National Aeronautics and Space Administration. Airplane takeoff and landing performance monitoring system. 5,499,025, Cl. 340-959.000.

Midland Brake, Inc.: *See*—
Plantan, Ronald S., 5,497,742, Cl. 123-197.500.

Mieda, Michinobu: *See*—
Nakayama, Junichiro; Katayama, Hiroyuki; Hirokane, Junji; and Mieda, Michinobu, 5,498,485, Cl. 428-694.0ML.

Mihayashi, Keiji; and Ohkawa, Atsuhiro, to Fuji Photo Film Co., Ltd. Silver halide color photographic photosensitive materials. 5,498,513, Cl. 430-505.000.

Miki, Hiroshi; Ohji, Yuzuru; and Tachi, Shinichi, to Hitachi, Ltd. Semiconductor memory device having improved isolation between electrodes, and process for fabricating the same. 5,499,207, Cl. 365-149.000.

Mikita, Toshiya: *See*—
Murakami, Susumu; Okamura, Naoya; Ohata, Tomonori; Hamaguchi, Kazuya; Katamoto, Koji; and Mikita, Toshiya, 5,497,984, Cl. 270-53.000.

Mikoshiba, Hiroaki, to NEC Corporation. Active matrix liquid crystal display cell with light blocking capacitor electrode above insulating layer. 5,499,123, Cl. 359-59.000.

Milder, Fredric L., to Implemed, Inc. Iontophoretic structure for medical devices. 5,498,248, Cl. 604-265.000.

Miller, David A. B., to AT&T Corp. Wavelength-sensitive detectors based on absorbers in standing waves. 5,498,863, Cl. 250-214.100.

Miller, Floyd. Drain cleaning device. 5,497,514, Cl. 4-255.040.

Miller, James L.: *See*—
Krimmel, Gary W.; Miller, James L.; and McNamara, George E., 5,497,917, Cl. 222-475.100.

Miller, Jeff F.: *See*—
Schatz, Peter J.; Cull, Millard G.; Miller, Jeff F.; and Stemmer, Willem P. C., 5,498,530, Cl. 435-69.100.

Miller, John M.; and Stuntz, Ross M., to Ford Motor Company. Electric actuator for rotary valve control of electrohydraulic valvetrain. 5,497,736, Cl. 123-90.130.

Miller, Larry E.; Hawkins, Gene P.; and Durham, Bernard O., to Procter & Gamble Company, The. Process for reducing the levels of nitrite contaminants in amine oxide surfactants. 5,498,373, Cl. 252-546.000.

Miller, Leonard G.: *See*—
Mitchell, Robert K.; and Miller, Leonard G., 5,497,679, Cl. 74-567.000.

Miller, Richard E.; and Dereamus, Robert C., to Binney & Smith Inc. Color changing pan paint compositions. 5,498,282, Cl. 106-22.00B.

Millipore Corporation: *See*—
Moya, Wilson, 5,498,335, Cl. 210-490.000.

Millman, Steven D.: *See*—
Reyes, Alberto J.; Millman, Steven D.; and Tyler, Sean C., 5,498,988, Cl. 327-199.000.

Mills, Robert A. R., to Kudu Industries, Inc. Hardfacing for progressing cavity pump rotors. 5,498,142, Cl. 418-48.000.

Milohanic, Slobodan, to Nestec S.A. Apparatus for dosing a pumpable fluid. 5,498,286, Cl. 118-13.000.

Milsco Manufacturing Company: *See*—
Lorbiecki, James R.; and Lutz, Susan J., 5,498,381, Cl. 264-46.400.

Min, Yong-Ki: *See*—
Cho, Kwang-Yun; Kim, Bum-Tae; Kim, Young-Sup; Min, Yong-Ki; Park, No-Kyun; and Jeong, In-Howa, 5,498,730, Cl. 549-78.000.

Minai, Masayoshi: *See*—
Mizuno, Masahiko; Kurimoto, Isao; Hirata, Norihiko; Takahashi, Toshiya; Minai, Masayoshi; Yamamoto, Takahiro; Mizuno, Tadashi; and Miyamoto, Yasunobu, 5,498,721, Cl. 548-303.700.

Minami, Norio: *See*—
Kabasawa, Yasuhiro; Ozaki, Fumihiro; Ishibashi, Keiji; Hasegawa, Takashi; Oinuma, Hitoshi; Ogawa, Toshiaki; Adachi, Hideyuki; Katoh, Hiroshi; Kodama, Kohtarou; Ohara, Hideto; Mori, Nobuyuki; and Minami, Norio, 5,498,634, Cl. 514-459.000.

Minc Incorporated: *See*—
Young, Stephen P., 5,499,191, Cl. 364-489.000.

Mine, Toshihiro; Kazui, Shinichi; Morita, Kenji; Ogino, Hiroyuki; Shiokawa, Takeji; and Sasaki, Hideaki, to Hitachi, Ltd. Drilling apparatus of hard brittle material and method thereof. 5,498,109, Cl. 408-1.00R.

Minemi, Masahiko: *See*—
Horimura, Hiroyuki; Okamoto, Kenji; Minemi, Masahiko; Kaji, Toshihiko; Takano, Yoshishige; and Takeda, Yoshinobu, 5,498,393, Cl. 419-28.000.

Miner, Robert N.: *See*—
Bamford, Roger J.; Howard, Forrest W.; Kabcenell, Dirk A.; and Miner, Robert N., 5,499,367, Cl. 395-600.000.

Minges, Roland: *See*—
Pohl, Siegmund; Lehrich, Friedhelm; Genz, Manfred; Bruchmann, Bernd; Tesch, Helmut; Minges, Roland; and Streu, Joachim, 5,498,747, Cl. 560-25.000.

Minh Food Corporation: *See*—
Leu, Romeo J., 5,498,432, Cl. 426-293.000.

Minnesota Mining and Manufacturing: *See*—
Petersen, Kurt H., 5,498,970, Cl. 324-755.000.

Minnesota Mining and Manufacturing Company: *See*—
Carlson, James G.; Truong, Jack G.; Anderson, Jeffrey T.; and Rotto, Nelson T., 5,498,685, Cl. 528-71.000.
Gagliardi, John J.; and Chesley, Jason A., 5,498,268, Cl. 51-294.000.
Larmie, Henry A., 5,498,269, Cl. 51-295.000.
Nagel, Colleen C.; Bentsen, James G.; Yafuso, Masao; Katritzky, Alan R.; Dektar, John L.; and Kipke, Cary A., 5,498,549, Cl. 436-172.000.
Scholz, Matthew T., 5,498,232, Cl. 602-8.000.
Tucker, Pamela S.; and Pyun, Eumi, 5,498,476, Cl. 428-343.000.

Minolta Camera Kabushiki Kaisha: *See*—
Ito, Noboru; Murasaki, Hiroshi; Yoshida, Hirokazu; and Masuda, Fumio, 5,499,090, Cl. 355-298.000.
Kinoshita, Takeru; and Yamada, Takanobu, 5,499,079, Cl. 355-208.000.
Tsuboi, Toshio; Nakatani, Munehiro; Yamada, Hirokazu; and Omura, Kunihiko, 5,499,113, Cl. 358-479.000.

Minolta Co., Ltd.: *See*—
Kuroda, Muneo, 5,499,107, Cl. 358-347.000.
Takeshita, Kenji; Kanai, Nobuo; and Kageyama, Hitoshi, 5,499,045, Cl. 347-257.000.

Minto, Karl D., to General Electric Company. Steam turbine with thermal stress reduction system. 5,498,131, Cl. 415-216.100.

Mintz, Alan I. Orthopedic body pillow. 5,497,519, Cl. 5-648.000.

MIPM Mammendorfer Institut fuer Physik und Medizin GmbH: *See*—
Rosenheimer, Michael N., 5,497,771, Cl. 128-633.000.

Misaizu, Setsuo: *See*—
Kawano, Michinao; Misaizu, Setsuo; Anzai, Tomoko; and Tsuda, Takashi, 5,499,258, Cl. 372-34.000.

Misaka, Toshio, to NEC Corporation. Arrangement of detecting branch error in a digital data processing system. 5,499,351, Cl. 395-375.000.





Mischke, Deborah A.: *See*—
McLoughlin, Jim I.; Mischke, Deborah A.; Williams, Marla J.; and Metz, Suzanne, 5,498,624, Cl. 514-406.000.

Mishima, Kyoichi, to Mitsuboshi Belting Ltd. Power transmission belt. 5,498,213, Cl. 474-263.000.

Misiti, Domenico: *See*—
Santaniello, Moæ; Tinti, Marie O.; Misiti, Domenico; and Foresta, Piero, 5,498,632, Cl. 514-547.000.
Santaniello, Moæ; Tinti, Maria O.; Misiti, Domenico; and Foresta, Piero, 5,498,633, Cl. 514-547.000.

Mistrot, Henry B. Microkeyer: a microcomputer broadcast video overlay device and method. 5,499,039, Cl. 345-115.000.

Mita Industrial Co., Ltd.: *See*—
Fujimoto, Masaya; Yamamoto, Haruo; Hayashi, Shuji; and Kagawa, Tetsuya, 5,499,361, Cl. 395-109.000.
Inoue, Masahide; Kato, Mamoru; Tsuyama, Koichi; Murata, Koji; and Aso, Yutaka, 5,499,083, Cl. 355-251.000.
Mizude, Kazuhiro; Ishida, Hideki; Kato, Hisahiro; and Tsutano, Tomohiro, 5,499,081, Cl. 355-208.000.

Mitani, Masao: *See*—
Hiraoka, Chikara; Matsuno, Junichi; Mitani, Masao; Oda, Hiroshi; and Tsumura, Toshikazu, 5,499,087, Cl. 355-285.000.

Mitchell, Cheryl R.; and Mitchell, Pat R., to California Natural Products. Treated pectinic acid process and product. 5,498,702, Cl. 536-2.000.

Mitchell, Herman: *See*—
Anderson, James B.; Fitzpatrick, Francis L.; Hans, William M.; Harvey, Charles B., Jr.; Mitchell, Herman; and Wason, James R., 5,499,365, Cl. 395-600.000.

Mitchell, Pat R.: *See*—
Mitchell, Cheryl R.; and Mitchell, Pat R., 5,498,702, Cl. 536-2.000.

Mitchell, Robert K.; and Miller, Leonard G., to Briggs & Stratton Corporation. Molded camshaft assembly. 5,497,679, Cl. 74-567.000.

MiTek Holdings, Inc.: *See*—
Nelson, Thomas E., 5,497,591, Cl. 52-481.100.

Mitsubishi Cable Industries, Ltd.: *See*—
Ozaki, Hidenori; Fuchimoto, Minoru; and Kaide, Tamotsu, 5,498,377, Cl. 264-40.100.
Takada, Yoshinori; Marumoto, Mitsuhiro; and Sasaki, Kouzou, 5,498,495, Cl. 429-219.000.

Mitsubishi Chemical Corporation: *See*—
Takagi, Masatoshi; Miyagi, Hidekazu; Ohgomori, Yuji; and Iwane, Hiroshi, 5,498,789, Cl. 558-270.000.
Tsurita, Yasushi; Ito, Masumi; and Shiraga, Ken, 5,498,731, Cl. 549-259.000.
Urano, Toshiyuki; Nagasaka, Hideki; Tsuchiyama, Masaaki; and Ide, Hiroshi, 5,498,641, Cl. 522-26.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Arano, Yukari; and Onishi, Ken, 5,499,106, Cl. 358-343.000.
Fujii, Toshiyuki; Tamai, Shinzo; Naitoh, Hatsuhiko; and Toki, Naohiro, 5,498,955, Cl. 324-76.770.
Fukui, Sinichi, 5,499,393, Cl. 455-264.000.
Furuta, Michihiro, 5,498,994, Cl. 327-532.000.
Hayashi, Eiichi; and Fujimoto, Ryuichi, 5,498,851, Cl. 219-121.700.
Hayashi, Satoru, 5,498,465, Cl. 428-209.000.
Inoue, Sadayuki; Ishimoto, Junko; Inoue, Haruhisa; and Onishi, Ken, 5,499,144, Cl. 360-10.300.
Itagaki, Takushi, 5,498,289, Cl. 118-401.000.
Iwata, Shunichi; and Shimizu, Toru, 5,499,380, Cl. 395-800.000.
Kodai, Syojiro; Ochi, Katsunori; and Murakami, Osamu, 5,498,388, Cl. 264-263.000.
Mori, Shigeru; Kajimoto, Takeshi; and Hayashikoshi, Masanori, 5,499,214, Cl. 365-222.000.
Nagano, Osamu; and Fukushima, Tsukasa, 5,499,257, Cl. 372-31.000.
Nakamura, Kenji, 5,498,933, Cl. 315-205.000.
Shiga, Toshihiko; Hattori, Ryo; and Oku, Tomoki, 5,498,572, Cl. 437-190.000.
Yamamoto, Kouji, 5,499,216, Cl. 365-230.030.
Yamasaki, Takashi, 5,499,383, Cl. 395-842.000.

Mitsubishi Gas Chemical Company, Inc.: *See*—
Yoshikawa, Yoshio; Inoue, Yoshiaki; Yoshino, Isamu; and Takeuchi, Teruo, 5,497,937, Cl. 228-205.000.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Maruyama, Ikuo; Nagayoshi, Yoshimasa; Nakamura, Hisaji; Takada, Akio; Kato, Koichi; Oyaide, Sadamu; Shimazaki, Tatsuya; and Konno, Yoshihiro, 5,498,217, Cl. 477-169.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Kusunose, Masashi; Mitsui, Shoji; Yanagino, Hiroei; and Sawashima, Chiyuki, 5,497,801, Cl. 137-117.000.
Takagawa, Hiroyuki; Tsubaki, Yasuhiro; Miyairi, Yoshio; Hattori, Toshio; and Hagiwara, Haruo, 5,498,266, Cl. 8-142.000.

Mitsubishi Materials Corporation: *See*—
Yamashiro, Akiyoshi; Fujiwara, Kiyoshi; and Oguma, Nobuhiro, 5,497,978, Cl. 266-176.000.

Mitsubishi Paper Mills Limited: *See*—
Maruyama, Jun; Iida, Kazuyuki; Torizuka, Koichi; Hizatate, Shoji; Sano, Hidekazu; and Ikeda, Mitsuhiro, 5,498,772, Cl. 503-216.000.

Mitsubishi Pencil Kabushiki Kaisha: *See*—
Idogawa, Hiroyuki; Wakata, Atsushi; Watanabe, Nobuatsu; and Chong, Yong-Bo, 5,498,281, Cl. 106-20.00R.

Mitsuboshi Belting Ltd.: *See*—
Kumazaki, Toshimi, 5,498,212, Cl. 474-263.000.
Mishima, Kyoichi, 5,498,213, Cl. 474-263.000.

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Mitsui Toatsu Chemicals, Incorporated: *See*—
Gohbara, Masatoshi; Yamaguchi, Kenichi; Shinmi, Tatsuo; Shinmi, Emi; Takanaka, Kazunori; and Hiruta, Tomoko, 5,498,591, Cl. 504-117.000.
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Tanada, Hideki; Sakai, Kazuya; Kajiya, Seitaro; Ohto, Norio; Horikomi, Kazutoshi; Matsubara, Akira; Shimizu, Hideshi; and Mizuchi, Akira, 5,498,619, Cl. 514-338.000.

Mitsuzuka, Tsutomu: *See*—
Fujimoto, Manabu; Yamaguchi, Keiichi; Enomoto, Youichi; Mitsuzuka, Tsutomu; and Suzuki, Katsumi, 5,498,881, Cl. 257-35.000.

Miura, Kosho, to Nikon Corporation. Shutter control device. 5,499,070, Cl. 354-152.000.

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Watanabe, Ryuji; Miura, Osamu; Miyazaki, Kunio; Ookoshi, Yukio; and Takahashi, Akio, 5,497,545, Cl. 29-830.000.

Miura, Toshihiko; and Inaba, Ryohei, to Canon Kabushiki Kaisha. Work supply method and apparatus therefor. 5,498,122, Cl. 414-786.000.

Miura, Yukio: *See*—
Todo, Yoshinori; Sakamoto, Masami; Ushijima, Noriaki; Sonoda, Akira; Miura, Yukio; and Araki, Kyousuke, 5,498,121, Cl. 414-719.000.

Miwa, Masato: *See*—
Matsuno, Junichi; Obata, Shigeru; Takuma, Yasuo; Miwa, Masato; and Uno, Kazuo, 5,499,086, Cl. 355-274.000.

Miyagi, Hidekazu: *See*—
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Miyamoto, Hidenori: *See*—
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Miyamoto, Yasunobu: *See*—
Mizuno, Masahiko; Kurimoto, Isao; Hirata, Norihiko; Takahashi, Toshiya; Minai, Masayoshi; Yamamoto, Takahiro; Mizuno, Tadashi; and Miyamoto, Yasunobu, 5,498,721, Cl. 548-303.700.

Miyasaka, Yoichi: *See*—
Sakuma, Toshiyuki; and Miyasaka, Yoichi, 5,498,561, Cl. 437-52.000.

Miyata, Kazushi: *See*—
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Miyata, Souichi: *See*—
Kuwabara, Tatsuyuki; Tomita, Masaharu; Nagamura, Kiyotaka; Nakamura, Takao; Yoshida, Shin'ichi; Miyata, Souichi; and Muramatsu, Tsuyoshi, 5,499,347, Cl. 395-311.000.

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Miyazaki, Yukio: *See*—
Ikebe, Masaru; Shiba, Haruo; Miyazaki, Yukio; Sasaki, Morimasa; and Katoh, Hisao, 5,498,456, Cl. 428-66.600.

Miyazawa, Tatsuo: *See*—
Doi, Akio; Koyamada, Koji; and Miyazawa, Tatsuo, 5,499,323, Cl. 395-126.000.

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Mizoguchi, Junji: *See*—
Sohda, Takashi; Fujisawa, Yukio; Yasuma, Tsuneo; Mizoguchi, Junji; Kori, Masakuni; and Takizawa, Masayuki, 5,498,728, Cl. 548-493.000.

Mizuchi, Akira: *See*—
Tanada, Hideki; Sakai, Kazuya; Kajiya, Seitaro; Ohto, Norio; Horikomi, Kazutoshi; Matsubara, Akira; Shimizu, Hideshi; and Mizuchi, Akira, 5,498,619, Cl. 514-338.000.

Mizude, Kazuhiro; Ishida, Hideki; Kato, Hisahiro; and Tsutano, Tomohiro, to Mita Industrial Co., Ltd. High speed image forming apparatus. 5,499,081, Cl. 355-208.000.

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Kyushima, Hiroyuki; Nagura, Koji; Hasegawa, Yutaka; Kawano, Eiichiro; Kuroyanagi, Tomihiko; Atsumi, Akira; and Mizuide, Masuya, 5,498,926, Cl. 313-533.000.

Mizuno, Hiroyuki: *See*—
Yokoi, Koichi; Mogi, Kinichi; Kohya, Hidehiko; Obtsuka, Mari; Mizuno, Hiroyuki; Sato, Susumu; and Kuraishi, Tadayuki, 5,498,780, Cl. 514-492.000.

Mizuno, Masahiko; Kurimoto, Isao; Hirata, Norihiko; Takahashi, Toshiya; Minai, Masayoshi; Yamamoto, Takahiro; Mizuno, Tadashi; and Miyamoto, Yasunobu, to Sumitomo Chemical Company, Limited. Process for producing thiophese derivatives. 5,498,721, Cl. 548-303.700.
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Mizusawa, Nobutoshi: *See*—
Shimoda, Isamu; Kariya, Takao; Mizusawa, Nobutoshi; Ozawa, Kunitaka; and Uzawa, Shunichi, 5,498,501, Cl. 430-22.000.
Mizutani, Hiroko, legal representative: *See*—
Fujiwara, Koichi; Mizutani, Hiromichi, deceased, 5,498,550, Cl. 436-526.000.
Mizutani, Hiromichi, deceased (by Hiroko Mizutani, legal representative): *See*—
Fujiwara, Koichi; Mizutani, Hiromichi, deceased, 5,498,550, Cl. 436-526.000.
Mobil Oil Corporation: *See*—
Ashjian, Henry; Peel, Larry C.; Sheerin, Thomas J.; and Williamson, Robert S., 5,498,596, Cl. 507-103.000.
Bradway, Robert A.; Green, Larry A.; and Rollmann, L. Deane, 5,498,812, Cl. 585-352.000.
Chang, Clarence D.; and Rodewald, Paul G., 5,498,814, Cl. 585-475.000.
Eccli, William D.; and Fremuth, Alexander D. S., 5,498,822, Cl. 585-816.000.
Huang, Tracy J.; and Kresge, Charles T., 5,498,817, Cl. 585-709.000.
Krause, Michael J.; Lo, Frederick Y.; and Chranowski, Steven M., 5,498,582, Cl. 502-103.000.
Shih, Stuart S.; Wu, Margaret M.; and Yan, Tsoung Y., 5,498,743, Cl. 558-277.000.
Mochizuki, Kousuke; and Teratoko, Ryuji, to Aderans Co., Ltd. Method for hair joining, hair used for the method, and joining hair retainer. 5,497,796, Cl. 132-201.000.
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Moeller, Michael D.; and Burke, Phillip C., to Moeller, Michael D. Quickly refillable splash resistant sports bottle. 5,497,920, Cl. 224-36.000.
Moffat, Karen A.; Kazmaier, Peter M.; Hamer, Gordon K.; and Georges, Michael K., to Xerox Corporation. Process for producing telechelic, branched and star thermoplastic resin polymers. 5,498,679, Cl. 526-204.000.
Moffre, Patrick; and Schreiber, Douglas. Portable dog run. 5,497,732, Cl. 119-784.000.
Mogi, Kazuhisa: *See*—
Nagaosa, Hideo; Mogi, Kazuhisa; Kushibe, Takahiro; Nakamura, Norihiko; and Nomura, Kenichi, 5,497,744, Cl. 123-297.000.
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Mohamed, Belkacem: *See*—
Yves, Aurelle; Mohamed, Belkacem; Dimitri, Hadjiev; Jullen, Edmond; and Jacques, Cotteret, 5,498,341, Cl. 210-651.000.
Mohan, Ned, to Regents of The University of Minnesota. System for reducing harmonics by harmonic current injection. 5,499,178, Cl. 363-39.000.
Mohlenhoff, William: *See*—
Cox, Robert D.; and Mohleahoff, William, 5,497,841, Cl. 175-11.000.
Mohr, Wolfgang. Apparatus for optimizing cutting of stacked sheets of material in a cutting machine. 5,497,685, Cl. 83-282.000.
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Mohrman, John H. Toilet bowl water flush system. 5,497,515, Cl. 4-420.000.
Moir, Fredrich G., to SDS Pty Ltd. Liquid-driven downhole hammer drill. 5,497,839, Cl. 175-65.000.
Mokhtar, Ahmed M.; Popper, Peter; Walker, William C.; and Yngve, Paul W., to Du Pont de Nemours, E. I., and Company. Method and apparatus for making a pile article and the products thereof. 5,498,459, Cl. 428-85.000.
Molecucare, Inc.: *See*—
Matschke, Arthur L., 5,498,394, Cl. 422-24.000.
Molex Incorporated: *See*—
Crane, Burke J., 5,498,915, Cl. 307-139.000.
Seto, Masashi; Aihara, Shinichi; and Inoue, Kouichi, 5,498,167, Cl. 439-74.000.
Moli Energy (1990) Limited: *See*—
Dahn, Jeffrey R.; and Way, Brian M., 5,498,493, Cl. 429-218.000.
Möller, Dieter; Thies, Konrad; Schmidt, Willi; Gerbel, Daniel; and Etzenbach, Joachim, to Dierks & Soehne GmbH & Co. KG. Machine for kneading dough including a rotatable container and kneading tools rotatable in the container. 5,498,074, Cl. 366-94.000.
Mölnlycke AB: *See*—
Perneborn, Robert, 5,498,115, Cl. 414-326.000.
Molock, Frank F.: *See*—
Nunez, Ivan M.; Molock, Frank F.; Elliott, Laura D.; and Ford, James D., 5,498,379, Cl. 264-2.600.
Monbaliu, Marcel J.: *See*—
de Jaeger, Nikolaas C. J.; Monbaliu, Marcel J.; Noppe, Marcus J. M.; and Konings, Frank J., 5,498,551, Cl. 436-533.000.
Monetti, Giovanni, to Monetti S.p.A. Warm food isothermal container, particularly for collective catering. 5,497,883, Cl. 206-545.000.
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Thirion, Jean-Philippe; Ayache, Nicholas; Monga, Olivier; and Gourdon, Alexis, 5,499,322, Cl. 395-118.000.
Monogram Aerospace Fasteners: *See*—
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Monolithic System Technology, Inc.: *See*—
Hsu, Fu-Chieh; and Leung, Wingyu, 5,498,886, Cl. 257-213.000.
Leung, Wingyu; Lee, Winston; and Hsu, Fu-Chieh, 5,498,990, Cl. 327-323.000.
Monsanto Company: *See*—
Barry, Gerard F.; Kishore, Ganesh M.; and Stark, David M., 5,498,830, Cl. 800-205.000.
David, Donald J.; Dickerson, Jerauld L.; Sincock, Thomas F.; and Williams, Susan R., 5,498,667, Cl. 525-166.000.
McLoughlin, Jim I.; Mischke, Deborah A.; Williams, Marla J.; and Metz, Suzanne, 5,498,624, Cl. 514-406.000.
Phillion, Dennis P.; Braccolino, Diane S.; Graneto, Matthew J.; Phillips, Wendell G.; Van Sant, Karey A.; Walker, Daniel M.; and Wong, Sai C., 5,498,630, Cl. 514-443.000.
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Lalezari, Iraj, 5,498,708, Cl. 536-115.000.
Monteith, Joseph G., to 1137361 Ontario Limited. Tank interceptor. 5,498,331, Cl. 210-170.000.
Montgomery, Carl T.: *See*—
Fletcher, Paul A.; Montgomery, Carl T.; and Ramos, Gangerico G., 5,497,658, Cl. 73-151.000.
Moore Business Forms, Inc.: *See*—
Christy, Orrin D.; Hook, Kevin J.; Hargreaves, David; Ruchalski, Mark E.; and Akins, Michael D., 5,499,085, Cl. 355-273.000.
Moore, Chester G. Exterior fire fighting and evacuation system for high rise buildings. 5,497,855, Cl. 187-239.000.
Moore, Glenn A., Jr.; and Mannari, Christopher J. Liquid collection and seperation apparatus. 5,498,395, Cl. 422-100.000.
Morales, Wilfredo: *See*—
Graham, Edgar E.; and Morales, Wilfredo, 5,498,354, Cl. 252-48.200.
Morcos, N. Charle; and Nahas, Roger A., to University of California, The Regents of the. Tissue viability monitor. 5,497,770, Cl. 128-633.000.
Morduch, Georg E., to Microlog Corporation. Automated telephone system with TDD capability. 5,499,285, Cl. 379-52.000.
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Morgan, Rick: *See*—
Hansen, Bryan P.; and Morgan, Rick, 5,497,994, Cl. 273-121.00A.
Morgan, Terry B.; and Sedlock, Joseph J., to General Motors Corporation. Blow molded bumper beam and U-bolt attachment. 5,498,045, Cl. 293-122.000.
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Mori, Kazuya; and Otsuka, Kenichi, to Kabushiki Kaisha Toshiba. Method of manufacturing a semiconductor device having reliable multi-layered wiring. 5,498,571, Cl. 437-189.000.
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Mori, Miki: *See*—
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Hirayama, Chuichi; Hiraoka, Keijun; and Morimoto, Sunao, 5,498,409, Cl. 424-78.360.
Morimoto, Takeshi: *See*—
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Morita, Yusuke; Fukushima, Masami; Gotou, Fumio; and Aoki, Shigeo, to Shin-Etsu Polymer Co., Ltd.; and Akishima Chemical Industries Co., Ltd. Polyvinyl alcohol molding resin composition. 5,498,656, Cl. 524-140.000.
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Morrison, Robert S.: *See*—
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Morton International, Inc.: *See*—
Adams, Stephen L.; and Vine, Daniel C., 5,498,023, Cl. 280-728.200.
Caruso, Charles P., Jr.; and Ward, Michael J., 5,498,024, Cl. 280-728.200.
Mossi, G. Dean; and Crowell, Bryan P., 5,498,029, Cl. 280-741.000.
Rei, Nuno M.; and Hamel, Roger G., 5,498,344, Cl. 252-404.000.
Mosch, Theo W. M.; Ota, Yusuke; Swartz, Robert G.; and van Wijk, Richard A., to AT&T Corp. Packet data reciever with sampled data output and background light cancellation. 5,499,244, Cl. 370-94.100.
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Burgan, John M.; McClurg, George W.; and Lerner, Kenneth S., 5,499,019, Cl. 340-825.220.
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Davenport, Roger A., 5,499,003, Cl. 333-195.000.
Gercekci, Anil; and Schwarz, Roland H., 5,499,338, Cl. 395-183.010.
Hansen, Ingolf G., 5,499,120, Cl. 359-48.000.
Hayden, James D., 5,498,889, Cl. 257-301.000.
Huddleston, Wyatt A.; and Casto, James J., 5,498,767, Cl. 437-8.000.
Kaatz, Gary F.; and Becker, John E., 5,499,394, Cl. 455-266.000.
Kull, A. Corbett S.; Bakke, Bradley B.; and Arens, John W., 5,499,273, Cl. 375-355.000.
Lebby, Michael S.; and Ackley, Donald E., 5,498,883, Cl. 257-95.000.
Reyes, Alberto J.; Millman, Steven D.; and Tyler, Sean C., 5,498,988, Cl. 327-199.000.
Richetta, Peter J.; and Cutler, Victor H., Jr., 5,499,237, Cl. 370-54.000.
Sharma, Umesh; and Woo, Michael P., 5,498,560, Cl. 437-43.000.
Steele, John W.; de Frésart, Edouard; and Theodore, N. David, 5,498,578, Cl. 437-235.000.
Usami, Tadashi, 5,499,210, Cl. 365-190.000.
Wadin, Craig P.; and Marko, Paul D., 5,499,397, Cl. 455-277.100.
Motoyama, Tetsuro; and Chang, Yueh-Lin, to Ricoh Company, Ltd.; and Ricoh Corporation. Method and system to handle context of interpretation in a document processing language. 5,499,329, Cl. 395-145.000.
Mott, Graham N.: *See*—
Sounik, James R.; Mott, Graham N.; and Hilton, Charles B., 5,498,804, Cl. 568-764.000.
Motyka, Kenneth J., to Deluxe Craft Manufacturing Co. Holder for pen-like articles. 5,498,089, Cl. 402-4.000.
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Heyduk, Alan F.; Mouk, Robert W.; and Abel, Albert E., 5,497,627, Cl. 62-85.000.
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Naumann, Christoph; Lang, Hans-Jochen; Sandow, Jürgen; and Moura, Anne-Marie, 5,498,617, Cl. 514-315.000.
Mourant, Judith R.; Anderson, Gerhard D.; Bigio, Irving J.; and Johnson, Tamara M., to University of California, The Regents of the. Method for fusing bone. 5,498,259, Cl. 606-8.000.
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Baker, Denny D., 5,497,913, Cl. 222-102.000.
Mrocek, Sharon: *See*—
Baker, Denny D., 5,497,913, Cl. 222-102.000.
MSP Corporation: *See*—
Marple, Virgil A.; Olson, Bernard A.; and Rubow, Kenneth L., 5,498,271, Cl. 55-321.000.
Mueller, Peter; and Hlousek, Jaroslaw, to Robert Bosch GmbH. Fuel injection device for internal combustion engines. 5,497,750, Cl. 123-446.000.
Muijs, Cornelis G. M.: *See*—
Cappon, Wilfried J. M.; Teetaert, Pierre E.; Naaktgeboren, Adrianus; and Muija, Cornelis G. M., 5,498,207, Cl. 460-119.000.
Muirhead, Hugh J.; and Marker, Richard L., to General Motors Corporation. Electromagnetic clutch with improved engagement. 5,497,869, Cl. 192-84.00B.
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Mukhopadhyay, Purnendu: *See*—
Trapasso, Louis E.; Padegimas, Stanley J.; Epstein, Peter F.; Hung, Paul L. K.; Mukhopadhyay, Purnendu; and Meisel, Philip L., 5,498,751, Cl. 560-217.000.
Mukrowsky, Michael: *See*—
Matter, Ulrich; Nunlist, Rene; Burtscher, Heinz; and Mukrowsky, Michael, 5,497,651, Cl. 73-23.200.
Mulder, Jerry L.: *See*—
Wreede, John E.; Gunther, John E.; Virgadamo, Michael J.; Yu, Kevin; Yin, Lillian; Mulder, Jerry L.; Upper, Richard B.; and Scott, James E., 5,499,116, Cl. 359-2.000.
Müller, Werner. Kick starting means. 5,497,739, Cl. 123-185.600.
Muni, Ketan P.: *See*—
Bagaoisan, Celso S. J.; Shanahan, John P.; Muni, Ketan P.; Hammack, Elizabeth N.; Abrams, Robert M.; Peacock, James C., III; and Tremeliz, William S., 5,498,240, Cl. 604-96.000.
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Kodai, Syojiro; Ochi, Katsunori; and Murakami, Osamu, 5,498,388, Cl. 264-263.000.
Murakami, Susumu; Okamura, Naoya; Ohata, Tomonori; Hamaguchi, Kazuya; Katamoto, Koji; and Mikita, Toshiya, to Sharp Kabushiki Kaisha. Sheet post-processing apparatus. 5,497,984, Cl. 270-53.000.
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Tashiro, Hiroshi; Murakawa, Takaji; and Yagi, Toyoji, 5,497,741, Cl. 123-192.100.
Muraki, Masato, to Canon Kabushiki Kaisha. Exposure method and apparatus. 5,499,076, Cl. 355-53.000.
Muramatsu, Tsuyoshi: *See*—
Kuwabara, Tatsuyuki; Tomita, Masaharu; Nagamura, Kiyotaka; Nakamura, Takao; Yoshida, Shin'ichi; Miyata, Souichi; and Muramatsu, Tsuyoshi, 5,499,347, Cl. 395-311.000.
Muramoto, Hisaichi; Kanda, Kazunori; and Kanoi, Yutaka, to Nippon Paint Co., Ltd. Negative charging type printing photosensitive resin composition. 5,498,502, Cl. 430-49.000.
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Ito, Noboru; Murasaki, Hiroshi; Yoshida, Hirokazu; and Masuda, Fumio, 5,499,090, Cl. 355-298.000.
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Isshiki, Osamu; Murashita, Masaki; Matsushima, Osamu; Nakagawa, Sadao; Nakano, Seizo; Goto, Koji; Hashiura, Masayoshi; Kobayashi, Yutaka; Satoh, Takashi; Ota, Katsuro; Kikuchi, Hideaki; Sato, Takashi; and Fukuda, Shinji, 5,498,849, Cl. 219-121.640.
Murata, Kazuo: *See*—
Sasaki, Masaaki; Horii, Tohru; Arakawa, Masahiro; and Murata, Kazuo, 5,498,496, Cl. 429-233.000.
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Inoue, Masahide; Kato, Mamoru; Tsuyama, Koichi; Murata, Koji; and Aso, Yutaka, 5,499,083, Cl. 355-251.000.
Murata Manufacturing Co., Ltd.: *See*—
Marusawa, Hiroshi; Kawanami, Takashi; Konoike, Takehiro; and Tomono, Kunisaburo, 5,498,999, Cl. 333-1.100.
Morikawa, Takehiko; and Iida, Kazuhiro, 5,499,000, Cl. 333-104.000.
Murch, Bruce P.; Roselle, Brian J.; and Jones, Kyle D., to Procter & Gamble Company, The. Cleaning methods and compositions for produce. 5,498,295, Cl. 134-16.000.
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Kaneko, Masakatsu; Murofushi, Yoshinobu; Kimura, Misako; Yamazaki, Mitsuo; and Iijima, Yasuteru, 5,498,819, Cl. 514-261.000.
Murphy T. J.: *See*—
Harrison, David G.; Alexander, R. Wayne; Murphy T. J.; and Nishida, Ken'ichi, 5,498,539, Cl. 435-240.200.
Murray, Curtis W., Jr.: *See*—
Murray, Curtis W., Sr.; and Murray, Curtis W., Jr., 5,497,561, Cl. 34-80.000.
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Kamm, Roland; Veit, Eberbard; Schneider, Josef; De Filippo, Antonio; Murray, Donald W.; Story, Michael C.; and Lammons, Carl S., 5,497,530, Cl. 15-321.000.

Murray, Mark J.; and Kelly, James D., to ZymoGenetics, Inc. Biologically active mosaic proteins. 5,498,600, Cl. 514-12.000.

Musho, Matthew K.: *See*—
Corey, Paul F.; and Musho, Matthew K., 5,498,542, Cl. 435-283.100.

Mutimer, Frederick J.: *See*—
Shaw, Neil W.; Padanyi, Zsolt V.; and Mutimer, Frederick J., 5,498,304, Cl. 156-210.000.

Muto, Shusichi, to Fujitsu Limited. Semiconductor optical memory device for optical storage of information with increased recording density. 5,499,206, Cl. 365-114.000.

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Cappon, Wilfried J. M.; Teetaert, Pierre E.; Naaktgeboren, Adrianus; and Muijs, Cornelis G. M., 5,498,207, Cl. 460-119.000.

Nabisco, Inc.: *See*—
Strong, David R.; and Kristbergsson, Kristberg, 5,498,438, Cl. 426-632.000.

Nadjafi, Robert H., to AlliedSignal Inc. Bi-directional foil thrust bearing. 5,498,082, Cl. 384-105.000.

Naef, Peter: *See*—
Gmuer, Bruno; and Naef, Peter, 5,497,907, Cl. 222-58.000.

Nagahashi, Isao: *See*—
Karlsrud, Chris E.; Van Woerkom, Anthony G.; Odagiri, Shigeru; and Nagahashi, Isao, 5,498,196, Cl. 451-11.000.
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Nagai, Hisami: *See*—
Kudoh, Kazuhiro; and Nagai, Hisami, 5,499,398, Cl. 455-290.000.

Nagakura, Seiju, to Toyokoki Co., Ltd. Method and an apparatus for bending. 5,497,647, Cl. 72-389.300.

Nagami, Masaaki; Sako, Kazuya; Babesaki, Masahiro; and Sakiyama, Kazuhiro, to Fujitsu Ten Limited. Noise controller. 5,499,302, Cl. 381-71.000.

Nagamura, Kiyotaka: *See*—
Kuwabara, Tatsuyuki; Tomita, Masaharu; Nagamura, Kiyotaka; Nakamura, Takao; Yoshida, Shin'ichi; Miyata, Souichi; and Muramatsu, Tsuyoshi, 5,499,347, Cl. 395-311.000.

Nagano, Hiroshi: *See*—
Kuze, Katsuaki; Nagano, Hiroshi; Ohta, Saburoh; Mori, Kuniharu; and Isaka, Tsutomu, 5,498,454, Cl. 428-35.900.

Nagano, Masashi, to Shimano Inc. Apparatus for securing a shoe to a bicycle pedal. 5,497,680, Cl. 74-594.600.

Nagano, Osamu; and Fukushima, Tsukasa, to Mitsubishi Denki Kabushiki Kaisha. Output control apparatus for laser oscillator. 5,499,257, Cl. 372-31.000.

Nagao, Masaki: *See*—
Satoh, Tatsuya; and Nagao, Masaki, 5,499,068, Cl. 354-106.000.

Nagaosa, Hideo; Mogi, Kazuhisa; Kushibe, Takahiro; Nakamura, Norihiko; and Nomura, Kenichi, to Toyota Jidosha Kabushiki Kaisha. Fuel injector with an integrated spark plug for a direct injection type engine. 5,497,744, Cl. 123-297.000.

Nagasaka, Hideki: *See*—
Urano, Toshiyuki; Nagasaka, Hideki; Tsuchiyama, Masaaki; and Ide, Hiroshi, 5,498,641, Cl. 522-26.000.

Nagata, Shigemi: *See*—
Kimoto, Takashi; Masumoto, Daiki; Yamakawa, Hiroshi; and Nagata, Shigemi, 5,498,943, Cl. 318-601.000.

Nagayoshi, Yoshimasa: *See*—
Maruyama, Ikuo; Nagayoshi, Yoshimasa; Nakamura, Hisaji; Takada, Akio; Kato, Koichi; Oyaide, Sadamu; Shimazaki, Tatsuya; and Konno, Yoshihiro, 5,498,217, Cl. 477-169.000.

Nagel, Colleen C.; Bentsen, James G.; Yafuso, Masao; Katritzky, Alan R.; Dektar, John L.; and Kipke, Cary A., to Minnesota Mining and Manufacturing Company. Sensors and methods for sensing. 5,498,549, Cl. 436-172.000.

Naggert, Dietrich K.: *See*—
Caleffi, Antonio; Ames, T. William; Traczyk, Edward S.; and Naggert, Dietrich K., 5,497,900, Cl. 220-656.000.

Nagino, Yoshihiro: *See*—
Ohashi, Tamiyoshi; Kasugai, Joji; and Nagino, Yoshihiro, 5,497,800, Cl. 137-110.000.

Nagura, Koji: *See*—
Kyushima, Hiroyuki; Nagura, Koji; Hasegawa, Yutaka; Kawano, Eiichiro; Kuroyanagi, Tomihiko; Atsumi, Akira; and Mizuide, Masuya, 5,498,926, Cl. 313-533.000.

Nahas, Roger A.: *See*—
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Naiki, Ihachi: *See*—
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Naito, Toshiharu: *See*—
Taguchi, Takeyasu; Naito, Toshiharu; Tokuda, Hiromi; Inoue, Yuuichi; Fujimoto, Shusaku; and Fujiwara, Kenji, 5,497,657, Cl. 73-146.200.

Naitoh, Hatsuhiko: *See*—
Fujii, Toshiyuki; Tamai, Shinzo; Naitoh, Hatsuhiko; and Toki, Naohiro, 5,498,955, Cl. 324-76.770.

Naka, Michiharu; Koizumi, Hideki; Takahashi, Yuzo; Goto, Koici; Endo, Toshiaki; and Suzuki, Yoichi, to NSK Ltd.; and Kyodo Yushi Co., Ltd. Grease composition for high-temperature, high-speed and high-load bearings. 5,498,357, Cl. 252-51.50R.

Nakabayashi, Takashi; Uehara, Takashi; and Shinohara, Akihira, to Matsushita Electric Industrial Co., Ltd. Semiconductor apparatus having an n-channel MOS transistor and a p-channel MOS transistor and method for manufacturing the semiconductor apparatus. 5,498,908, Cl. 257-751.000.

Nakada, Kazuya; and Yoshida, Masayuki, to Henkel Corporation. Surface treatment method for aluminum. 5,498,759, Cl. 427-353.000.

Nakagami, Hiroshi: *See*—
Ota, Singo; and Nakagami, Hiroshi, 5,497,847, Cl. 180-333.000.

Nakagawa, Kenichi; and Numao, Takaji, to Sharp Kabushiki Kaisha. Liquid crystal display device for display with gray levels. 5,499,037, Cl. 345-89.000.

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Isshiki, Osamu; Murashita, Masaki; Matsushima, Osamu; Nakagawa, Sadao; Nakano, Seizo; Goto, Koji; Hashiura, Masayoshi; Kobayashi, Yutaka; Satoh, Takashi; Ota, Katsuro; Kikuchi, Hideaki; Sato, Takashi; and Fukuda, Shinji, 5,498,849, Cl. 219-121.640.

Nakahara, Kanefumi, to Nikon Corporation. Apparatus for and method of carrying a substrate. 5,498,118, Cl. 414-416.000.

Nakahata, Hideaki: *See*—
Shikata, Shinichi; Hachigo, Akihiro; Nakahata, Hideaki; and Higaki, Kenjiro, 5,497,726, Cl. 117-89.000.

Nakamichi, Kouichi; Izumi, Shogo; and Fukui, Hiroshi, to Nippon Shinyaku Company Limited. Sustained release capsule. 5,498,422, Cl. 424-451.000.

Nakamura, Akihiko: *See*—
Masumoto, Katuhisa; Nakamura, Akihiko; Kiyoshima, Yujiro; Sasaki, Mikio; and Tanahashi, Asako, 5,498,792, Cl. 564-164.000.

Nakamura, Fumio: *See*—
Senuma, Takeo; Ina, Shinichiro; Nakazawa, Hiroshi; Tamura, Yasuaki; Mano, Kunihiko; Nakamura, Fumio; Ishikawa, Munenori; and Kubo, Yoshiharu, 5,498,867, Cl. 250-231.180.

Nakamura, Hisaji: *See*—
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Nakamura, Junichi: *See*—
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Nakamura, Kenji, to Mitsubishi Denki Kabushiki Kaisha. Lighting device and method applying a relatively higher potential to light source surroundings. 5,498,933, Cl. 315-205.000.

Nakamura, Makoto, to Nissan Motor Co., Ltd. Intake and exhaust valves control of internal combustion engine. 5,497,737, Cl. 123-90.150.

Nakamura, Masaru: *See*—
Sugiyama, Norihide; Watakabe, Atsushi; Yokotsuka, Shunsuke; Hiroi, Atsuo; Naritomi, Masaki; Shirota, Naoko; Aosaki, Ko; and Nakamura, Masaru, 5,498,657, Cl. 524-463.000.

Nakamura, Norihiko: *See*—
Nagaosa, Hideo; Mogi, Kazuhisa; Kushibe, Takahiro; Nakamura, Norihiko; and Nomura, Kenichi, 5,497,744, Cl. 123-297.000.

Nakamura, Seigo: *See*—
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Nakamura, Takao: *See*—
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Nakamura, Tamio; Yokoyama, Takashi; and Kobayashi, Yoshiyuki, to Central Glass Co., Ltd. Process for refining crude fluoroalkylsulfonic acid with the use of water. 5,498,754, Cl. 562-113.000.

Nakamura, Yasuhiko, to Maruzen Kabushiki Kaisha. Stapler for dispensing staples of different sizes. 5,497,931, Cl. 227-109.000.

Nakamura, Yoshimitsu: *See*—
Kubo, Masao; Kamada, Kazuo; Ogasawara, Masanobu; and Nakamura, Yoshimitsu, 5,497,546, Cl. 29-843.000.

Nakamura, Yutaka: *See*—
Ohe, Ichirou; Nakamura, Yutaka; and Suzuki, Norihiro, 5,499,267, Cl. 375-206.000.

Nakanishi, Atsushi; and Kato, Yukihiro, to Sony Corporation. Single-unit video camera-recorder with selectively illuminated function keys. 5,499,052, Cl. 348-220.000.

Nakanishi, Keiko: *See*—
Katsumata, Ryoichi; Kikuchi, Yasuhiro; and Nakanishi, Keiko, 5,498,532, Cl. 435-106.000.

Nakano, Keiichi; Doi, Kiyoshi; Iida, Kiyonobu; and Inoue, Naoki, to Kubota Corporation. Engine with mechanical governor. 5,497,747, Cl. 123-363.000.

Nakano, Seizo: *See*—
Isshiki, Osamu; Murashita, Masaki; Matsushima, Osamu; Nakagawa, Sadao; Nakano, Seizo; Goto, Koji; Hashiura, Masayoshi; Kobayashi, Yutaka; Satoh, Takashi; Ota, Katsuro; Kikuchi, Hideaki; Sato, Takashi; and Fukuda, Shinji, 5,498,849, Cl. 219-121.640.

Nakano, Yoshiyuki: *See*—
Ohsawa, Keiji; Matsukawa, Nobuo; Nishioka, Sunao; Mori, Ryuichi; and Nakano, Yoshiyuki, 5,499,074, Cl. 354-402.000.

Nakao, Taku; Yamazaki, Hiroyuki; Tokutake, Nobuo; Saito, Masato; Kohara, Hidekatsu; and Nakayama, Toshimasa, to Tokyo Ohka Kogyo Co., Ltd. Lithographic double-coated patterning plate with undercoat levelling layer. 5,498,514, Cl. 430-512.000.

Nakashima, Hideki: *See*—





Shoji, Tadao; Takahashi, Nahoko; Ikushima, Naoya; Uryu, Toshiyuki; Yoshida, Takashi; Yamamoto, Naoki; Nakashima, Hideki; Katsuraya, Kaname; Adachi, Koichiro; and Kataoka, Pusayo, 5,498,602, Cl. 514-25.000.

Nakata, Masahiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Automatic focusing apparatus. 5,498,944, Cl. 318-640.000.

Nakata, Naotaro, to Rohm Co., Ltd. Semiconductor laser light source unit. 5,499,262, Cl. 372-108.000.

Nakatani, Munehiro: *See*—
Tsuboi, Toshio; Nakatani, Munehiro; Yamada, Hirokazu; and Omura, Kunihiko, 5,499,113, Cl. 358-479.000.

Nakaura, Shunsuke, to Koyo Seiko Co., Ltd. Torque detecting apparatus. 5,497,667, Cl. 73-862.328.

Nakayama Iron Works, Ltd.: *See*—
Watajima, Teruji, 5,497,951, Cl. 241-300.000.

Nakayama, Junichiro; Katayama, Hiroyuki; Hirokane, Junji; and Mieda, Michinobu, to Sharp Kabushiki Kaisha. Magneto-optical recording medium and manufacturing method thereof. 5,498,485, Cl. 428-694.0ML.

Nakayama, Noriko, to Fujitsu Limited. Graphic display apparatus with improved shading capabilities. 5,499,324, Cl. 395-129.000.

Nakayama, Rie: *See*—
Hirao, Hirohiko; Kikukawa, Yoshimasa; Okamoto, Toshihiro; Murai, Takayuki; Sogabe, Seiji; Tanioka, Miya; Nakayama, Rie; and Yoshioka, Takashi, 5,498,301, Cl. 148-269.000.

Nakayama, Toshimasa: *See*—
Nakao, Taku; Yamazaki, Hiroyuki; Tokutake, Nobuo; Saito, Masato; Kohara, Hidekatsu; and Nakayama, Toshimasa, 5,498,514, Cl. 430-512.000.

Nakazaki, Mitsuo: *See*—
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Nakazawa, Hiroshi: *See*—
Senuma, Takeo; Ina, Shinichiro; Nakazawa, Hiroshi; Tamura, Yasuaki; Mano, Kunihiko; Nakamura, Fumio; Ishikawa, Munenori; and Kubo, Yoshiharu, 5,498,867, Cl. 250-231.180.

Nalco Chemical Company: *See*—
Arnst, Theodore C., 5,498,813, Cl. 585-466.000.

Nam, Jung-Jin, to Samsung Heavy Industry Co., Ltd. Time delay valve of a hydraulic motor. 5,497,622, Cl. 60-435.000.

Nam, Keun S.: *See*—
Kim, Wan J.; Park, Tae H.; Kim, Moon H,; Lee, Tae S.; and Nam, Keun S., 5,498,615, Cl. 514-300.000.

Nambu, Toshiro: Inoue, Masaharu; Nakamura, Seigo; and Furukawa, Hisao, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Curable composition suitable as top coat. 5,498,666, Cl. 525-100.000.

Namic B.V.: *See*—
Gorter, Cornelis, 5,497,702, Cl. 101-366.000.

Namiki, Masato: *See*—
Kamakura, Tamiji; Tanaka, Noriyoshi; Namiwa, Kimiyoshi; Tatsumi, Yukio; Namiki, Masato; and Yokobori, Hideo, 5,498,356, Cl. 252-50.000.

Namiwa, Kimiyoshi: *See*—
Kamakura, Tamiji; Tanaka, Noriyoshi; Namiwa, Kimiyoshi; Tatsumi, Yukio; Namiki, Masato; and Yokobori, Hideo, 5,498,356, Cl. 252-50.000.

Nammath, Sharyn R.: *See*—
Bashforth, Michael B.; Gardner, Duane; Patrick, Douglas; Lewallen, Tricia A.; Nammath, Sharyn R.; Painter, Kelly D.; and Vadnais, Kenneth G., 5,499,029, Cl. 342-22.000.

Namura, Kiyoshi; Saito, Eiji; Takasumi, Masakazu; and Ikeuchi, Kazuo, to Hitachi, Ltd. Fluid machinery having blade apparatus and blade apparatus for fluid machinery. 5,498,136, Cl. 416-190.000.

Nanjo, Yusuke, to Sony Corporation. Variable magnification finder. 5,499,072, Cl. 354-222.000.

Nanni, Liborio F. Method for playing a lottery game using currency bills. 5,497,990, Cl. 273-138.00A.

Narasimhalu, Arcot D.; Wang, Weiguo; and Kankanhalli, Mohan S., to National University of Singapore. Controlled dissemination of digital information. 5,499,298, Cl. 380-25.000.

Narayanaswami, Chandrasekhar, to International Business Machines Corporation. System and method for rapidly determining relative rectangle position. 5,499,326, Cl. 395-133.000.

Narcy, Jean L.: *See*—
Putzer, Rüdiger; and Narcy, Jean L., 5,498,068, Cl. 299-17.000.

Naritomi, Masaki: *See*—
Sugiyama, Norihide; Watakabe, Atsushi; Yokotsuka, Shunsuke; Hiroi, Atsuo; Naritomi, Masaki; Shirota, Naoko; Aosaki, Ko; and Nakamura, Masaru, 5,498,657, Cl. 524-463.000.

Narumi, Manabu: *See*—
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National Research Council of Canada: *See*—
Marple, Basil; and Boulanger, Jean, 5,498,383, Cl. 264-87.000.

National Semiconductor Corporation: *See*—
Chillara, Satya; and Mostafazadeh, Shahram, 5,498,901, Cl. 257-666.000.
Lee, Wesley; and Grand, Jerry, 5,499,242, Cl. 370-85.300.
Szepesi, Thomas; and Santo, Hendrik, 5,498,995, Cl. 327-538.000.

National Starch and Chemical Investment Holding Corporation: *See*—
Kauffman, Thomas F.; Wieczorek, Joseph, Jr.; and Hatfield, Stephen F., 5,498,224, Cl. 493-39.000.

National University of Singapore: *See*—
Narasimhalu, Arcot D.; Wang, Weiguo; and Kankanhalli, Mohan S., 5,499,298, Cl. 380-25.000.

Natural Balance Design Co., The: *See*—
Tate, Aarn, 5,497,922, Cl. 224-209.000.

Naumann, Christoph; Lang, Hans-Jochen; Sandow, Jürgen; and Moura, Anne-Marie, to Hoechst Aktiengesellschaft. Guanidinealkyl-1,1-bisphosphonic acid derivatives process for their preparation and their use. 5,498,617, Cl. 514-315.000.

Navarrini, Walter; Tortelli, Vito; Colaianna, Pasqua; and Abusleme, Julio A., to Ausimont, S.p.A. Perfluorodioxoles, the preparation process thereof, and homopolymers and copolymers obtained therefrom. 5,498,682, Cl. 526-247.000.

Navarro, Mario; and DiMarino, Gabe, to International Protective Coatings Corp.; and Pyro-Tech Industries, Inc. Intumescent composite. 5,498,466, Cl. 428-408.000.

Navia, Juan L.; Walkup, Robert E.; Vernon, Nicholas M.; and Neiditch, David S., to McNeil-PPC, Inc. Production of sucralose without intermediate isolation of crystalline sucralose-6-ester. 5,498,709, Cl. 536-124.000.

Navon, Gil: *See*—
Rubin, Yoram; and Navon, Gil, 5,498,519, Cl. 435-1.200.

Nayak, Nandini: *See*—
Campbell, Bob; Gowan, Curtis R.; Graf, John D.; and Nayak, Nandini, 5,499,287, Cl. 379-67.000.

NCR Corporation: *See*—
Collins, Donald A., Jr.; and Nye, Andrew B., III, 5,497,853, Cl. 186-61.000.
Walker, John D.; and Gioia, Samuel C., 5,498,892, Cl. 257-336.000.

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Kaneko, Hiroaki, 5,499,363, Cl. 395-280.000.
Kishi, Kaori, 5,499,275, Cl. 375-357.000.
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Kobayashi, Takeo, 5,499,286, Cl. 379-58.000.
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Mikoshiba, Hiroaki, 5,499,123, Cl. 359-59.000.
Misaka, Toshio, 5,499,351, Cl. 395-375.000.
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Sakuma, Toshiyuki; and Miyasaka, Yoichi, 5,498,561, Cl. 437-52.000.
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Neises, Bernhard; Ganzhorn, Axel; Tarnus, Céline; and Broersma, Robert J., Jr., to Merrell Pharmaceuticals Inc. Thrombin inhibitors. 5,498,779, Cl. 514-428.000.
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Nelson, Thomas E., to MiTek Holdings, Inc. Metal wall framing. 5,497,591, Cl. 52-481.100.
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Nennecker, Gunter H. Mixing head for molding machine. 5,498,151, Cl. 425-4.00R.
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Ortyn, William E.; and Arnone, Joseph, 5,499,097, Cl. 356-372.000.
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Anselm, Michael C.; and Nerstrom, James S., 5,498,181, Cl. 440-53.000.
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Klavetter, Floyd, 5,498,477, Cl. 428-364.000.
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Milohanic, Slobodan, 5,498,286, Cl. 118-13.000.
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Martin, Kevin B., 5,499,328, Cl. 395-143.000.
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Zisapel, Nava, 5,498,423, Cl. 424-464.000.
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Strong, Russell W., 5,497,846, Cl. 180-315.000.
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Stallard, Clinton W., III, 5,498,135, Cl. 416-155.000.
Newton, Arnold C., to Rolls-Royce plc. Gas turbine engine nacelle assembly. 5,497,961, Cl. 244-54.000.
Nexus 1994 Limited: *See—*
Yokev, Hanoch; Harel, Haim; and Meiman, Yehouda, 5,499,266, Cl. 375-202.000.
Nezu, Hiroki: *See—*
Nishitani, Eisuke; Tsuzuku, Susumu; Kobayashi, Shigeru; Kasahara, Osamu; Nezu, Hiroki; Ishino, Masakazu; and Tamaru, Tsuyoshi, 5,498,768, Cl. 437-192.000.
Nezu, Takashi, to Tachi-S Co., Ltd. Device for sidetracking a truck. 5,498,117, Cl. 414-355.000.
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Kozuka, Yoshinari; Osugi, Yukihisa; and Fukuyama, Masashi, 5,499,309, Cl. 385-38.000.
Nguyen, Thomas T.: *See—*
Novak, Sarah T. A.; Soll, Richard M.; Ellingboe, John W.; and Nguyen, Thomas T., 5,498,775, Cl. 514-25.000.
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Niedecker, Herbert. U-shaped closing staple for bags and flexible tubes and apparatus for closing them. 5,497,645, Cl. 72-330.000.
Nielsen, Poul E. H.; and Lehrmann, Peter, to Haldor Topsøe A/S. Process for the dehydrogenation of hydrocarbons. 5,498,816, Cl. 585-658.000.
Niimi, Makoto; Ito, Shigemasa; Yamada, Toyonobu; Takemae, Yoshihiro; and Kato, Yoshiharu, to Fujitsu Limited; and Fujitsu VLSI Limited. Semiconductor memory device having self-refresh function. 5,499,213, Cl. 365-222.000.
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Hanasaki, Yasuaki; Tsukuda, Kazuaki; Watanabe, Hiroyuki; Tsuzuki, Kenji; Murakami, Mitsuyuki; and Niimi, Noritoshi, 5,498,593, Cl. 504-264.000.
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Nikas, Dimitrios; and Jakoncic, Harry. Captive-track game apparatus. 5,497,997, Cl. 273-264.000.
Nikhil, Rishiyur S.; and Arvind, to Massachusetts Institute of Technology. Pipelined processor with fork, join, and start instructions using tokens to indicate the next instruction for each of multiple threads of execution. 5,499,349, Cl. 395-375.000.
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Miura, Kosho, 5,499,070, Cl. 354-152.000.
Nakahara, Kanefumi, 5,498,118, Cl. 414-416.000.
Ohsawa, Keiji; Matsukawa, Nobuo; Nishioka, Sunao; Mori, Ryuichi; and Nakano, Yoshiyuki, 5,499,074, Cl. 354-402.000.
Ohshita, Koichi, 5,499,142, Cl. 359-773.000.
Obtake, Motoyuki, 5,499,141, Cl. 359-684.000.
Osawa, Keiji, 5,498,864, Cl. 250-201.800.
Sato, Toshihiro; Takagi, Tadao; and Yasukawa, Seiichi, 5,499,075, Cl. 354-415.000.
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Wakabayashi, Hiroshi; Miyamoto, Hidenori; and Soshi, Isao, 5,499,071, Cl. 354-173.100.
Nilssen, Ole K. Electronic flashlight. 5,498,934, Cl. 315-224.000.
Nilssen, Ole K. High-efficacy incandescent lighting system. 5,498,938, Cl. 315-312.000.
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Nippon Oil and Fats Co., Ltd.: *See—*
Shimada, Eiji; Maeda, Kenzo; and Okamoto, Shingo, 5,498,663, Cl. 525-54.300.
Nippon Paint Co., Ltd.: *See—*
Muramoto, Hisaichi; Kanda, Kazunori; and Kanoi, Yutaka, 5,498,502, Cl. 430-49.000.
Nippon Sheet Glass Co., Ltd.: *See—*
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Nippon Shinyaku Company, Limited: *See—*
Hasegawa, Akira; Kiso, Makoto; and Yoshikuni, Yoshiaki, 5,498,604, Cl. 514-27.000.
Nakamichi, Kouichi; Izumi, Shogo; and Fukui, Hiroshi, 5,498,422, Cl. 424-451.000.
Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See—*
Aoyama, Takahiro; Nakazaki, Mitsuo; Banba, Akikazu; Yoshida, Masatoshi; Matsunaga, Toshiaki; and Tsubakimoto, Tsuneo, 5,498,670, Cl. 525-217.000.
Nippon Soken, Inc.: *See—*
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Nippon Steel Corporation: *See—*
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Kawamura, Koichiro, 5,498,898, Cl. 257-503.000.
Sato, Yoshimi; Hayashi, Yoshio; and Katada, Jun, 5,498,601, Cl. 514-17.000.
Nippon Telegraph & Telephone Company: *See—*
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Nippon Telegraph & Telephone Corporation: *See—*
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Ito, Motoya; Yasuda, Minoru; and Kobayashi, Atsushige, 5,498,124, Cl. 415-55.100.
Kato, Hideyuki; and Chigusa, Yuji, 5,499,166, Cl. 362-32.000.
Nishikawa, Hideaki; Koumura, Tukasa; and Hisanaga, Michio, 5,498,868, Cl. 250-234.000.
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Sasaki, Mikio; Kanayama, Yukihiro; Saitou, Hideki; and Kominami, Tetsuya, 5,499,306, Cl. 382-291.000.
Taguchi, Takeyasu; Naito, Toshiharu; Tokuda, Hiromi; Inoue, Yuuichi; Fujimoto, Shusaku; and Fujiwara, Kenji, 5,497,657, Cl. 73-146.200.
Tashiro, Hiroshi; Murakawa, Takaji; and Yagi, Toyoji, 5,497,741, Cl. 123-192.100.
Nishi, Takashi: *See—*
Matsuda, Masami; Nishi, Takashi; Kikuchi, Makoto; Izumida, Tatsuo; Tamata, Shin; and Kiuchi, Yoshimasa, 5,498,828, Cl. 588-252.000.
Nishibayashi, Hideo: *See—*
Takaya, Masami; and Nishibayashi, Hideo, 5,497,779, Cl. 128-672.000.
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Nishida, Ken'ichi: *See—*



Harrison, David G.; Alexander, R. Wayne; Murphy T. J.; and Nishida, Ken'ichi, 5,498,539, Cl. 435-240.200.
Nishida, Kiyoshi; Sugiyama, Tsutomu; Funato, Katsuro; and Hattori, Kenzi, to Tomoegawa Paper Co., Ltd. Powder coating. 5,498,479, Cl. 428-403.000.
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Nishii, Hiroyuki; Kobayashi, Masaru; Toya, Kazutoshi; and Uchiyama, Nobuo, to Sumitomo Pharmaceuticals Company, Limited. Coating method. 5,498,447, Cl. 437-213.000.
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Kondo, Tetsujiro; Horishi, Takashi; Fujimori, Yasuhiro; and Nishikata, Takeharu, 5,499,057, Cl. 348-607.000.
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Nishima, Osamu: *See—*
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Nishimura, Seiya; Maejima, Yoshihisa; and Ohta, Tokuyoshi, to Yamaha Corporation. Method of electroplating. 5,498,325, Cl. 205-96.000.
Nishimura, Takashi; Seino, Kazuyuki; Haraguchi, Yuuji; and Kamohara, Eiji, to Kabushiki Kaisha Toshiba. Cathode ray tube apparatus and method of manufacturing the same. 5,498,921, Cl. 313-2.100.
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Ohsawa, Keiji; Matsukawa, Nobuo; Nishioka, Sunao; Mori, Ryuichi; and Nakano, Yoshiyuki, 5,499,074, Cl. 354-402.000.
Nishitani, Eisuke; Tsuzuku, Susumu; Kobayashi, Shigeru; Kasahara, Osamu; Nezu, Hiroki; Ishino, Masakazu; and Tamaru, Tsuyoshi, to Hitachi, Ltd. Process for forming multilayer wiring. 5,498,768, Cl. 437-192.000.
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Kokuryo, Yoshiki, 5,497,640, Cl. 70-237.000.
Maruyama, Shinichi; and Hasegawa, Akihiko, 5,498,050, Cl. 296-39.300.
Nakamura, Makoto, 5,497,737, Cl. 123-90.150.
Okada, Hiroshi, 5,497,734, Cl. 123-41.100.
Shimizu, Kouichi, 5,498,072, Cl. 303-191.000.
Niwa, Yukichi: *See—*
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Noble, Richard D.; Thoen, Paul M.; and Koval, Carl A., to University of Colorado, Regents of the. Ion-exchange supports for facilitated transport membranes with enhanced selectivity. 5,498,823, Cl. 585-818.000.
Noble, Walter E., Jr., to Northrop Grumman Corporation. Anti-G suit simulator. 5,498,161, Cl. 434-59.000.
Noda, Isao, to Procter & Gamble Company, The. Biodegradable copolymers and plastic articles comprising biodegradable copolymers. 5,498,692, Cl. 528-361.000.
Noda, Sadao, to Sunx Kabushiki Kaisha. Electrical connector for interconnecting parallel multiconductor cables. 5,498,172, Cl. 439-404.000.
Noe, James C.; and McKeirnan, Robert D., Jr. Gas turbiue generator set. 5,497,615, Cl. 60-39.511.
Nogami, Kazutaka: *See—*
Takahashi, Makoto; Hatori, Fumitoshi; Nogami, Kazutaka; and Uchida, Masanori, 5,498,978, Cl. 326-38.000.
Noguchi, Toshiharu; Eguchi, Kazuhiro; and Ohno, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Dielectric filter having interstage coupling using adjacent electrodes. 5,499,004, Cl. 333-202.000.
Nogueira, Jose L. A., to Fabricas Lucia Antonio Betere, S.A. (Flabesa). Stapling machine for spring carcass frames. 5,497,541, Cl. 29-33.00K.
Nojima, Kazuo: *See—*
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Nokia Mobile Phones (U.K.) Limited: *See—*
Cooper, Andrew, 5,499,246, Cl. 370-95.100.
Nokia Technology GmbH: *See—*
Reime, Gerd, 5,499,396, Cl. 455-266.000.
Noky, Werner, to Schott Glaswerke. Apparatus for producing a filter in the form of a monolithic honeycomb body. 5,498,288, Cl. 118-305.000.
Nolan, Patrick; and Coates, David, to Merck Patent Gesellschaft mit beschrankter Haftung. Electrooptical liquid crystal system. 5,498,365, Cl. 252-299.010.
Nohu Plastics, Inc.: *See—*
Cairns, James W., 5,498,098, Cl. 403-400.000.
Nomura, Katsumi: *See—*
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Nomura Kohsan Co., Ltd.: *See—*
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Noppe, Marcus J. M.: *See—*
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Noro, Masao, to Yamaha Corporation. Power supply circuit. 5,499,175, Cl. 363-16.000.
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North American Philips Corporation: *See—*
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Northern Telecom Limited: *See—*
Deen, M. Jamal; Malhi, Duljit S.; Yan, Zhixin; and Hadaway, Robert A., 5,498,885, Cl. 257-139.000.
Munter, Ernst A., 5,499,239, Cl. 370-60.100.
Smith, Martin S., 5,499,033, Cl. 343-700.0MS.
Terry, John B.; Warwick, Alastair A.; and Anderson, Carl W. C., 5,499,047, Cl. 348-6.000.
Northrop, Donald P., to Duro-Test Corp. Fluorescent lamp capable of operating on multiple ballast system. 5,498,924, Cl. 313-486.000.
Northrop Grumman Corporation: *See—*
Hill-Lindsay, Joseph W.; Yuen, John T.; and Blanco, Alfred R., 5,499,164, Cl. 361-785.000.
Noble, Walter E., Jr., 5,498,161, Cl. 434-59.000.
Novak, Sarah T. A.; Soll, Richard M.; Ellingboe, John W.; and Nguyen, Thomas T., to American Home Products Corporation. Polyanionic benzylglycosides as inhibitors of smooth muscle cell proliferation. 5,498,775, Cl. 514-25.000.
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Nevarez, Carlos A., 5,499,358, Cl. 395-600.000.
Noveroske, Robert L.; and McCormick, Ronald W., to DowElanco. Herbicidal compositions with increased crop safety. 5,498,773, Cl. 504-103.000.
Novus International, Inc.: *See—*
Grendel, Robert W.; Klopfenstein, Jeffrey B.; Prokop, Robin K.; Reid, Stanley L.; and Willock, J. Michael, 5,498,790, Cl. 562-581.000.
Nowack, Gerhard P.: *See—*
Johnson, Marvin M.; Nowack, Gerhard P.; and Cymbaluk, Ted H., 5,498,824, Cl. 985-848.000.
Nowak, Martin. Snake trap. 5,497,576, Cl. 43-58.000.
Nowosielski, Johann A. Hydraulic slack adjuster. 5,497,859, Cl. 188-79.620.
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NSK Ltd.: *See—*
Naka, Michiharu; Koizumi, Hideki; Takahashi, Yuzo; Goto, Koici; Endo, Toshiaki; and Suzuki, Yoichi, 5,498,357, Cl. 252-51.50R.
Okumura, Kenichi; Fujioka, Hakaru; and Oshima, Kazuhiro, 5,497,559, Cl. 33-517.000.
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Numata, Shigeo: *See—*
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Numazawa, Shigeo; and Suzuki, Takahisa, to Nippondenso Co., Ltd. System for controlling the temperature of the air in a cabin for an engine-electric motor hybrid car. 5,497,941, Cl. 237-2.00A.
Nunez, Ivan M.; Molock, Frank F.; Elliott, Laura D.; and Ford, James D., to Johnson & Johnson Vision Products, Inc. Method of forming shaped hydrogel articles including contact lenses using inert, displaceable diluents. 5,498,379, Cl. 264-2.600.
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Nwaonicha, Chukwuma P.: *See—*
Ayorinde, Folahan O.; and Nwaonicha, Chukwuma P., 5,498,733, Cl. 554-132.000.
Nye, Andrew B., III: *See—*
Collins, Donald A., Jr.; and Nye, Andrew B., III, 5,497,853, Cl. 186-61.000.
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Obara, Yoshihiro: *See—*
Fukuma, Kooji; Sakurai, Soichi; Okuyama, Nobutaka; Satoh, Yoshio; and Obara, Yoshihiro, 5,498,939, Cl. 315-370.000.
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Matsuno, Junichi; Obata, Shigeru; Takuma, Yasuo; Miwa, Masato; and Uno, Kazuo, 5,499,086, Cl. 355-274.000.

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Oberlander, Kyle: *See*—
Burns, Raymond W.; and Oberlander, Kyle, 5,497,843, Cl. 175-403.000.
Obremski, Robert J.; and Silzel, John W., to Beckman Instruments, Inc. Signal processing for chemical analysis of samples. 5,498,875, Cl. 250-458.100.
O'Brien, Frank L.: *See*—
Roberts, Stephen C.; and O'Brien, Frank L., 5,497,646, Cl. 72-345.000.
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Stults, Jeffrey S.; Lin, Henry C.; Buchanan, Robert A.; and Ostrozynski, Robert L., 5,498,691, Cl. 528-353.000.
Ochi, Katsunori: *See*—
Kodai, Syojiro; Ochi, Katsunori; and Murakami, Osamu, 5,498,388, Cl. 264-263.000.
Ockuly, John D.: *See*—
Swartz, John F.; Ockuly, John D.; Fleischhacker, John J.; and Hassett, James A., 5,497,774, Cl. 128-658.000.
O'Connor, Patrick W.: *See*—
Wilson, Dennis L.; and O'Connor, Patrick W., 5,499,341, Cl. 395-200.030.
Oda, Hiroshi: *See*—
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Ito, Tamotsu; Oda, Toshiyuki; Takeuchi, Takashi; and Funato, Shiyouichirou, 5,499,221, Cl. 369-32.000.
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Karlsrud, Chris E.; Van Woerkom, Anthony G.; Odagiri, Shigeru; and Nagahashi, Isao, 5,498,196, Cl. 451-11.000.
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Oestmann, Eldon D.: *See*—
Codina, George; Oestmann, Eldon D.; and Shane, Gary J., 5,497,804, Cl. 137-554.000.
Oetter, Guenter: *See*—
Wolf, Gerhard; Oftring, Alfred; Oetter, Guenter; Schmidt, Richard R.; and Klotz, Wolfgang, 5,498,704, Cl. 536-18.600.
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Kubo, Masao; Kamada, Kazuo; Ogasawara, Masanobu; and Nakamura, Yoshimitsu, 5,497,546, Cl. 29-843.000.
Ogawa, Hidenori; Kondo, Kazumi; Yamashita, Hiroshi; Kan, Keizo; Tominaga, Michiaki; and Yabuuchi, Yoichi, to Otsuka Pharmaceutical Company, Limited. Benzoazepinyl compounds as oxytocin and vasopressin antagonists. 5,498,609, Cl. 514-213.000.
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Kabasawa, Yasuhiro; Ozaki, Fumihiro; Ishibashi, Keiji; Hasegawa, Takashi; Oinuma, Hitoshi; Ogawa, Toshiaki; Adachi, Hideyuki; Katoh, Hiroshi; Kodama, Kohtarou; Ohara, Hideto; Mori, Nobuyuki; and Minami, Norio, 5,498,634, Cl. 514-459.000.
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Ogihara, Tsutomu; Shimizu, Takaaki; Kinsho, Takeshi; Kaneko, Tatsushi; Saito, Ryuichi; and Kurihara, Hideshi, to Shin-Etsu Chemical Co., Ltd. Silacyclohexane compound, a method of preparing it and a liquid crystal composition containing it. 5,498,737, Cl. 556-406.000.
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Mine, Toshihiro; Kazui, Shinichi; Morita, Kenji; Ogino, Hiroyuki; Shiokawa, Takeji; and Sasaki, Hideaki, 5,498,109, Cl. 408-1.00R.
Oguma, Nobuhiro: *See*—
Yamashiro, Akiyoshi; Fujiwara, Kiyoshi; and Oguma, Nobuhiro, 5,497,978, Cl. 266-176.000.
Ogura Clutch Co., Ltd.: *See*—
Takashi, Ishimaru, 5,497,870, Cl. 192-84.00C.
Ogura, Toshihiko: *See*—
Kimura, Koichi; Ogura, Toshihiko; Aotsu, Hiroaki; Ikegami, Mitsuru; Kuwabara, Tadashi; Enomoto, Hiromichi; and Kyoda, Tadashi, 5,499,222, Cl. 365-189.010.
Oh, Yong K., to Goldstar Co., Ltd. Audio message storing circuit and control method therefor. 5,499,317, Cl. 395-2.790.
Ohara, Hideto: *See*—
Kabasawa, Yasuhiro; Ozaki, Fumihiro; Ishibashi, Keiji; Hasegawa, Takashi; Oinuma, Hitoshi; Ogawa, Toshiaki; Adachi, Hideyuki; Katoh, Hiroshi; Kodama, Kohtarou; Ohara, Hideto; Mori, Nobuyuki; and Minami, Norio, 5,498,634, Cl. 514-459.000.
Ohara, Hitoshi: *See*—
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Ohashi, Kazutoshi: *See*—
Furuta, Motonobu; Yamaguchi, Takanari; and Ohashi, Kazutoshi, 5,498,689, Cl. 528-214.000.
Ohashi, Tamiyoshi; Kasugai, Joji; and Nagino, Yoshihiro, to Toyoda Gosei Co., Ltd. Fuel vapor processing device. 5,497,800, Cl. 137-110.000.
Ohata, Tomonori: *See*—
Murakami, Susumu; Okamura, Naoya; Ohata, Tomonori; Hamaguchi, Kazuya; Katamoto, Koji; and Mikita, Toshiya, 5,497,984, Cl. 270-53.000.
Ohe, Ichirou; Nakamura, Yutaka; and Suzuki, Norihiro, to Yamaha Corporation. Spread spectrum communication system. 5,499,267, Cl. 375-206.000.
Oh-Eda, Masayoshi: *See*—
Yamaguchi, Nozomi; Oh-Eda, Masayoshi; and Hattori, Kunihiro, 5,498,698, Cl. 530-399.000.
Ohgami, Hiroyuki: *See*—
Tsubota, Koujiro; Fujioka, Kazuyohsi; Yoshimura, Yohji; Ohgami, Hiroyuki; Takafuji, Yutaka; Nomura, Katsumi; Kubo, Masumi; and Kamei, Hirokazu, 5,499,127, Cl. 359-80.000.
Ohgomori, Yuji: *See*—
Takagi, Masatoshi; Miyagi, Hidekazu; Ohgomori, Yuji; and Iwane, Hiroshi, 5,498,789, Cl. 558-270.000.
Ohhara, Kenji, to Unisia jecs Corporation. Viscous fluid clutch. 5,497,868, Cl. 192-58.400.
Ohji, Yuzuru: *See*—
Miki, Hiroshi; Ohji, Yuzuru; and Tschi, Shinichi, 5,499,207, Cl. 365-149.000.
Ohkawa, Atsuhiro: *See*—
Mihayashi, Keiji; and Ohkawa, Atsuhiro, 5,498,513, Cl. 430-505.000.
Ohki, Hiroaki; Nishima, Osamu; Mori, Hiroyuki; and Suzuki, Junya, to Sony Corporation. Output circuit device for a charge transfer element having tripartite diffusion layer. 5,498,887, Cl. 257-239.000.
Ohmi, Tadahiro. Method and apparatus for evaluating quantities of absorbed impurities. 5,497,652, Cl. 73-31.030.
Ohnishi, Ryuichiro: *See*—
Ichikawa, Masaru; Ohnishi, Ryuichiro; and Suzuki, Hisao, 5,498,806, Cl. 570-156.000.
Ohno, Hiroshi: *See*—
Noguchi, Toshiharu; Eguchi, Kazuhiro; and Ohno, Hiroshi, 5,499,004, Cl. 333-202.000.
Ohno, Tadayoshi; Yamaguchi, Takashi; Itoh, Shinichi; and Tanaka, Hisatoshi, to Kabushiki Kaisha Toshiba. Portable storage medium and processing apparatus therefor. 5,498,860, Cl. 235-384.000.
Ohsaki, Takahisa: *See*—
Hara, Michikazu; Satoh, Asako; Takami, Norio; and Ohsaki, Takahisa, 5,498,492, Cl. 429-212.000.
Ohsawa, Keiji; Matsukawa, Nobuo; Nishioka, Sunao; Mori, Ryuichi; and Nakano, Yoshiyuki, to Nikon Corporation. Autofocus camera. 5,499,074, Cl. 354-402.000.
Ohshima, Eiji: *See*—
Sakamoto, Satoshi; Ohshima, Eiji; Kawamura, Hiroshi; and Orimo, Shinichi, 5,499,143, Cl. 359-824.000.
Ohshita, Koichi, to Nikon Corporation. Large aperture wide angle type photographic lens system. 5,499,142, Cl. 359-773.000.
Ohta, Katsuyuki: *See*—
Uchikawa, Kiyoshi; Komano, Hiroshi; Aoyama, Toshimi; and Ohta, Katsuyuki, 5,498,498, Cl. 430-7.000.
Ohta, Kenji: *See*—
Murakami, Yoshiteru; Takahashi, Akira; and Ohta, Kenji, 5,499,229, Cl. 369-111.000.
Ohta, Masako: *See*—
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Ohta, Saburoh: *See*—
Kuze, Katsuaki; Nagano, Hiroshi; Ohta, Saburoh; Mori, Kuniharu; and Isaka, Tsutomu, 5,498,454, Cl. 428-35.900.
Ohta, Shinichi; and Kitai, Hiroto, to Canon Kabushiki Kaisha. Optical information reproduction apparatus and optical information reproduction method. 5,499,226, Cl. 369-59.000.
Ohta, Tokuyoshi: *See*—
Nishimura, Seiya; Maejima, Yoshihisa; and Ohta, Tokuyoshi, 5,498,325, Cl. 205-96.000.
Ohta, Tsunetaka: *See*—
Iwaki, Kanso; Ohta, Tsunetaka; and Kurimoto, Masashi, 5,498,697, Cl. 530-350.000.
Ohtake, Motoyuki, to Nikon Corporation. Zoom lens. 5,499,141, Cl. 359-684.000.
Ohtake, Yukio, to Toyota Jidosha Kabushiki Kaisha. Safety control apparatus for reciprocating engine. 5,497,751, Cl. 123-479.000.
Ohto, Norio: *See*—
Tanada, Hideki; Sakai, Kazuya; Kajiya, Seitaro; Ohto, Norio; Horikomi, Kazutoshi; Matsubara, Akira; Shimizu, Hideshi; and Mizuchi, Akira, 5,498,619, Cl. 514-338.000.
Ohtsuka, Mari: *See*—
Yokoi, Koichi; Mogi, Kinichi; Kohya, Hidehiko; Ohtsuka, Mari; Mizuno, Hiroyuki; Sato, Susumu; and Kuraishi, Tadayuki, 5,498,780, Cl. 514-492.000.
Ohtsuka, Yoshihiro; and Masuda, Yoshifumi, to Sharp Kabushiki Kaisha. Pulse light-receiving circuit with means to minimize power source noise. 5,498,993, Cl. 327-514.000.
Ohtsuki, Toru: *See*—
Tanaka, Shunji; Ohtsuki, Toru; Sato, Hiroaki; Sawamoto, Hideo; Yamagata, Ryo; Watanabe, Masaya; Umeno, Hidenori; and Haraguchi, Masatoshi, 5,499,379, Cl. 395-700.000.



Ohwaki, Shinji: *See*—
Matsumoto, Mitsuo; Takahashi, Nobuo; Ohwaki, Shinji; Fujimoto, Kazushi; and Iohara, Koh-ichi, 5,497,608, Cl. 57-207.000.
Oien, Gene, to Chrysler Corporation. Hydraulic brake bleeder apparatus. 5,497,864, Cl. 188-352.000.
Oikawa, Hirotaka; and Takayama, Toshio, to Tokico, Ltd. Split anti-skid control apparatus. 5,498,071, Cl. 303-149.000.
Oin, Jian, to Kimberly-Clark Corporation. Modified polysaccharides having improved absorbent properties and process for the preparation thereof. 5,498,705, Cl. 536-20.000.
Oinuma, Hitoshi: *See*—
Kabasawa, Yasuhiro; Ozaki, Fumihiro; Ishibashi, Keiji; Hasegawa, Takashi; Oinuma, Hitoshi; Ogawa, Toshiaki; Adachi, Hideyuki; Katoh, Hiroshi; Kodama, Kohtarou; Ohara, Hideto; Mori, Nobuyuki; and Minami, Norio, 5,498,634, Cl. 514-459.000.
OIS Optical Imaging Systems, Inc.: *See*—
Abileah, Adiel; Xu, Gang; and Brinkley, Patrick F., 5,499,126, Cl. 359-68.000.
Oka, Ichiro; and Sluis, Carolyn, to Japan Tobacco Inc. Method for producing potato microtubers. 5,498,541, Cl. 435-240.450.
Okada, Hiroshi, to Nissan Motor Co., Ltd. Cooling system for liquid-cooled engine. 5,497,734, Cl. 123-41.100.
Okada, Kazuhiro. Method of testing the operation of an apparatus for detecting acceleration. 5,497,668, Cl. 73-862.626.
Okada, Shinjiro, to Canon Kabushiki Kaisha. Method of making liquid crystal device having plural stripe-shaped ribs on one substrate. 5,499,130, Cl. 359-87.000.
Okamoto, Hiroshi: *See*—
Takahashi, Tsugio; Fujita, Hitoshi; and Okamoto, Hiroshi, 5,499,202, Cl. 364-761.000.
Okamoto, Kenji: *See*—
Horimura, Hiroyuki; Okamoto, Kenji; Minemi, Masahiko; Kaji, Toshihiko; Takano, Yoshishige; and Takeda, Yoshinobu, 5,498,393, Cl. 419-28.000.
Okamoto, Shingo: *See*—
Shimada, Eiji; Maeda, Kenzo; and Okamoto, Shingo, 5,498,663, Cl. 525-54.300.
Okamoto, Tetsuo; and Usa, Satoshi, to Yamaha Corporation. Controller for tone signal synthesizer of electronic musical instrument. 5,498,836, Cl. 84-658.000.
Okamoto, Tetsuro: *See*—
Uchida, Keiichiro; and Okamoto, Tetsuro, 5,499,350, Cl. 395-375.000.
Okamoto, Toshihiro: *See*—
Hirao, Hirohiko; Kikukawa, Yoshimasa; Okamoto, Toshihiro; Murai, Takayuki; Sogabe, Seiji; Tanioka, Miya; Nakayama, Rie; and Yoshioka, Takashi, 5,498,301, Cl. 148-269.000.
Okamoto, Yutaka, to Sony Corporation. Method of manufacturing a static random access memory device including a coupling capacitor between a pair of storage nodes. 5,498,563, Cl. 437-52.000.
Okamura, Hisashi: *See*—
Kikuchi, Makoto; and Okamura, Hisashi, 5,498,516, Cl. 430-567.000.
Okamura, Michio; Morimoto, Takeshi; and Hiratsuka, Kazuya, to JEOL Ltd. Method and apparatus for charging electric double layer capacitor. 5,498,951, Cl. 322-2.00R.
Okamura, Naoya: *See*—
Murakami, Susumu; Okamura, Naoya; Ohata, Tomonori; Hamaguchi, Kazuya; Katamoto, Koji; and Mikita, Toshiya, 5,497,984, Cl. 270-53.000.
Okano, Hiroshi; Tanaka, Naoki; Shibata, Kenichi; and Takahashi, Yusuke, to Sanyo Electric Co., Ltd. Acoustic wave device and process for producing same. 5,498,920, Cl. 310-313.00A.
Okazaki, Hiroshi: *See*—
Kawai, Tomoaki; Yamamoto, Hiroyuki; and Okazaki, Hiroshi, 5,499,362, Cl. 395-109.000.
Oki Electric Industry Co., Ltd.: *See*—
Senuma, Takeo; Ina, Shinichiro; Nakazawa, Hiroshi; Tamura, Yasuaki; Mano, Kunihiko; Nakamura, Fumio; Ishikawa, Munenori; and Kubo, Yoshiharu, 5,498,867, Cl. 250-231.180.
Shin, Yasuhiro; and Hamamoto, Takashi, 5,498,932, Cl. 315-169.300.
Tanoi, Satoru, 5,498,991, Cl. 327-333.000.
Oku, Kentaro, to Hitachi, Ltd. Projection system and display apparatus for compressing and expanding aspect ratio of a picture. 5,499,061, Cl. 348-746.000.
Oku, Tomoki: *See*—
Shiga, Toshihiko; Hattori, Ryo; and Oku, Tomoki, 5,498,572, Cl. 437-190.000.
Okumoto, Yutaka, to Japan Tobacco Inc. Cigarette. 5,497,794, Cl. 131-364.000.
Okumura, Katsuya: *See*—
Miyoshi, Motosuke; and Okumura, Katsuya, 5,498,874, Cl. 250-397.000.
Okumura, Kenichi; Fujioka, Hakaru; and Oshima, Kazuhiro, to NSK Ltd. Method of measuring preload clearance in double row rolling bearing and apparatus therefore. 5,497,559, Cl. 33-517.000.
Okuyama, Nobutaka: *See*—
Fukuma, Kooji; Sakurai, Soichi; Okuyama, Nobutaka; Satoh, Yoshio; and Obara, Yoshihiro, 5,498,939, Cl. 315-370.000.
Olaya, Hector: *See*—
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O'Lenick, Anthony J., Jr., to Siltech Inc. Silanol based glycosides. 5,498,703, Cl. 536-4.100.
Oleszko, Mark A.: *See*—
Hill, Timothy W.; Oleszko, Mark A.; Spencer, Graham T.; and Sparkman, John P., 5,498,030, Cl. 280-743.100.
Olmstead, Bruce R.: *See*—
Tank, Klaus; Tomlinson, Peter N.; Martell, Trevor J.; Lloyd, Andrew I.; and Olmstead, Bruce R., 5,498,480, Cl. 428-408.000.
Olson, Bernard A.: *See*—
Marple, Virgil A.; Olson, Bernard A.; and Rubow, Kenneth L., 5,498,271, Cl. 55-321.000.
Olsson, Sven-Gunnar; Cewers, Goeran; and Rydgren, Goeran, to Siemens Elema AB. Method and apparatus for supplying fresh gas to a patient during manual ventilation. 5,497,767, Cl. 128-205.130.
Oltean, George L.: *See*—
James, Robert O.; Rowley, Lawreace A.; and Oltean, George L., 5,498,512, Cl. 430-496.000.
Oltra, Maria T. B.; Ernstberger, Wolfgang; and i Molas, Montserrat B., to Sandoz Nutrition Ltd. Oral rehydration composition. 5,498,408, Cl. 424-78.010.
Olympus Optical Co., Ltd.: *See*—
Iba, Yoichi, 5,499,138, Cl. 359-569.000.
Itoh, Kazumi, 5,499,053, Cl. 348-333.000.
Satoh, Tatsuya; and Nagao, Masaki, 5,499,068, Cl. 354-106.000.
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Omnipoint Data Company, Incorporated: *See*—
Dixon, Robert C.; and Vanderpool, Jeffrey S., 5,499,265, Cl. 375-200.000.
Omura, Kunihiko: *See*—
Tsuboi, Toshio; Nakatani, Munehiro; Yamada, Hirokazu; and Omura, Kunihiko, 5,499,113, Cl. 358-479.000.
Omura, Yoshitaka: *See*—
Katsurada, Naoki; Wakabayashi, Sobei; Hashimukai, Tomoko; and Omura, Yoshitaka, 5,498,336, Cl. 210-496.000.
O'Neill, Mark J.; and McDanal, Almus J., to Entech, Inc. Photovoltaic receiver. 5,498,297, Cl. 136-246.000.
Ong, EE-Chang, to Integrated Packaging Assembly Corporation. Method for making an IC lead-frame punch. 5,497,681, Cl. 76-101.100.
Onishi, Hiroaki; and Suetsugu, Kenichiro, to Matsushita Electric Industrial Co., Ltd. Bonding film member and mounting method of electronic component. 5,498,575, Cl. 437-209.000.
Onishi, Ken: *See*—
Arano, Yukari; and Onishi, Ken, 5,499,106, Cl. 358-343.000.
Inoue, Sadayuki; Ishimoto, Junko; Inoue, Haruhisa; and Onishi, Ken, 5,499,144, Cl. 360-10.300.
Onuki, Hiroshi, to Senju Sprinkler Company Limited. Sprinkler head with plate for absorbing and indicating shocks thereto. 5,497,834, Cl. 169-37.000.
Ooka, Akira: *See*—
Obata, Tokio; Fujii, Katsutoshi; Ooka, Akira; and Yamanaka, Yoshinori, 5,498,612, Cl. 514-256.000.
Ookoshi, Yukio: *See*—
Watanabe, Ryuji; Miura, Osamu; Miyazaki, Kunio; Ookoshi, Yukio; and Takahashi, Akio, 5,497,545, Cl. 29-830.000.
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Ootsu, Koichiro: *See*—
Ishii, Takafumi; Hida, Tsuneaki; Nozaki, Yukimasa; and Ootsu, Koichiro, 5,498,627, Cl. 514-423.000.
Oowaki, Yukihito; Takashima, Daisaburo; and Ohta, Masako, to Kabushiki Kaisha Toshiba. Integrated semiconductor memory with internal voltage booster of lesser dependency on power supply voltage. 5,499,209, Cl. 365-189.110.
Optische Werke G. Rodenstock: *See*—
Effer, Erhard; Melzig, Manfred; Schuster, Herbert; and Martinuzzi, Guiseppe, 5,498,686, Cl. 528-76.000.
Oracle Corporation: *See*—
Bamford, Roger J.; Howard, Forrest W.; Kabcenell, Dirk A.; and Miner, Robert N., 5,499,367, Cl. 395-600.000.
Oral Logic Inc.: *See*—
Klinkhammer, Ronald W., 5,497,526, Cl. 15-167.200.
Orf, Ronald F.; and Orf, Sandra L. Fencing material dispenser. 5,497,958, Cl. 242-597.700.
Orf, Sandra L.: *See*—
Orf, Ronald F.; and Orf, Sandra L., 5,497,958, Cl. 242-597.700.
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Orion-yhtyma Oy: *See*—
Karjalainen, Arto J.; Virtanen, Raimo E.; Karjalainen, Arja L.; Eloranta, Maire M.; Salonen, Jarmo S.; Sipila, Hannu T.; and Haapalinna, Antti S., 5,498,623, Cl. 514-396.000.
Orlandi, Daniel A.; Wong, Lucy L.; Olaya, Hector; and Bilka, Kenneth P., to Warner-Lambert Company. Fruit juice center-filled chewing gum. 5,498,429, Cl. 426-5.000.
Orlowski, David C., to Inpro Companies, Inc. Pinned unitary bearing seal. 5,498,006, Cl. 277-53.000.
Ormat, Inc.: *See*—
Amir, Nadav; and Bronicki, Lucien F., 5,497,624, Cl. 60-641.500.

Orosco, Anthony R.; and Johnson, Alton P. Apparatus for rapidly filling a dry wall cement dispensing tool. 5,497,812, Cl. 141-21.000.

Ortho Pharmaceutical Corporation: *See—*
Costenzo, Michael J.; Maryanoff, Bruce E.; McComsey, David F.; and Nortey, Samuel O., 5,498,629, Cl. 514-439.000.

Ortyn, William E.; and Arnone, Joseph, to NeoPath, Inc. Method and apparatus for checking automated optical system performance repeatability. 5,499,097, Cl. 356-372.000.

Osaka, Tsutomu, to Canon Kabushiki Kaisha. Portable recording apparatus with included recording unit. 5,499,043, Cl. 347-108.000.

Osan, Frank: *See—*
Weller, Thomas; Brekner, Michael-Joachim; and Osan, Frank, 5,498,677, Cl. 526-133.000.

Osanai, Akinori, to Toyota Jidosha Kabushiki Kaisha. Apparatus for correcting amount of fuel injection of internal combustion engine in accordance with amount of fuel-vapor purged from canister and fuel tank. 5,497,757, Cl. 123-674.000.

Osawa, Keiji, to Nikon Corporation. Camera focus detection apparatus detecting focus conditions among multiple areas within a photographic scene. 5,498,864, Cl. 250-201.800.

Oshima, Kazuhiro: *See—*
Okumura, Kenichi; Fujioka, Hakaru; and Oshima, Kazuhiro, 5,497,559, Cl. 33-517.000.

Oshino, Yasuhiro; and Kanno, Tatsuya, to Daicel Chemical Industries, Ltd. Two-step process for the preparation of a (co)polycarbonate by transesterification. 5,498,688, Cl. 528-198.000.

Oshkosh Truck Corporation: *See—*
Braun, Eric E., 5,498,208, Cl. 464-109.000.

Osram Sylvania Inc.: *See—*
Lapatovich, Walter P.; Butler, Scott J.; and Bochinski, Jason R., 5,498,928, Cl. 315-39.000.

Ostrozynski, Robert L.: *See—*
Stults, Jeffrey S.; Lin, Henry C.; Buchanan, Robert A.; and Ostrozynski, Robert L., 5,498,691, Cl. 528-353.000.

Osugi, Yukihisa: *See—*
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Kim, Wan J.; Park, Tae H.; Kim, Moon H.; Lee, Tae S.; and Nam, Keun S., 5,498,615, Cl. 514-300.000.

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Prakash, Rajiva, to Ford Motor Company. Peak-torque-per-ampere (PTPA) control method for an induction motor. 5,498,945, Cl. 318-807.000.
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Prestidge, Tim; and Sutherland, Alexander T., to Renishaw plc. Method for scanning the surface of an object. 5,499,194, Cl. 364-506.000.
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Karlsrud, Chris E.; Van Woerkom, Anthony G.; Odagiri, Shigeru; Nagahashi, Isao; and Preston, Spencer, 5,498,199, Cl. 451-289.000.
Previnaire, Emmanuel E. Device for aircraft and aircraft provided with such a device. 5,497,960, Cl. 244-17.110.
Price, Timothy D., to Rosemount Inc. Temperature transmitter. 5,498,079, Cl. 374-208.000.
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Wilson, Robert L.; Ubelhor, Sara A.; and Cruz, William A., 5,498,426, Cl. 424-602.000.
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Promny, Lech. Tumbler basket. 5,497,697, Cl. 99-427.000.
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Loffet, Albert; Fehrentz, Jean-Alain; Martinez, Jean; and Winternitz, Philippe-François, 5,498,732, Cl. 549-274.000.
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Proxima Corporation: *See—*
Hauck, Lane T., 5,499,036, Cl. 345-3.000.
Puckette, Thomas A., to Eastman Chemical Company. Process for the selective hydrogenation of epoxyalkenes to epoxyalkanes. 5,498,584, Cl. 502-162.000.
Pugel, Michael A., to Thomson Consumer Electronics, Inc. Bandswitchable double tuned RF circuit with balanced secondary. 5,499,056, Cl. 348-73.000.
Pummell, Leslie J. H., to Eastman Kodak Company. Processing apparatus. 5,499,073, Cl. 354-320.000.
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Pyro-Tech Industries, Inc.: *See—*
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Quadion Corporation: *See—*
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Quinn, Stanley B., Jr.: *See—*
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Quon, William: *See—*
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McLaughlin, Michael D.; Signa, John C.; Greicar, Richard K.; and Taylor, John M., 5,499,040, Cl. 345-146.000.
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Rafalovich, Alexander P.; Gustin, Joseph A.; Longardner, William J.; Keller, Gilbert P.; and Schmidter, Thomas C., to Store Heat and Produce Energy, Inc. Heating and cooling systems incorporating thermal storage. 5,497,629, Cl. 62-98.000.
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Reay, William G.; and Walthall, Harry G., to United States of America, National Aeronautics and Space Administration. Flow rate logging seepage meter. 5,497,663, Cl. 73-861.000.
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Rees, Catherine E. D.; Rostas-Mulligan, Katalin; Park, Simon F.; Denyer, Stephen P.; Stewart, Gordon S. A. B.; and Jassim, Sabah A. A., to Amersham International plc. Methods for rapid microbial detection. 5,498,525, Cl. 435-29.000.
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Regnat, Dieter; and Kleiner, Hans-Jerg, to Hoechst Aktiengesellschaft. Bis-(phosphinozlkoxy)biaryl compounds and a process for their preparation. 5,498,797, Cl. 568-8.000.
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Reichert, Gottfried. Manually adjustable forced air-flow deflector. 5,498,203, Cl. 454-289.000.
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Reina, Arthur; and Dozier, Pete. Automatic vehicle load cover. 5,498,057, Cl. 296-100.000.
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Rendall, John S., to Solv-Ex Corporation. Method and apparatus for electrolytic reduction of fine-particle alumina with porous-cathode cells. 5,498,320, Cl. 205-385.000.
Renfro, Cecil S.: *See*—
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Rennamaki, Pauli T., to Glasstech, Inc. Glass sheet bending apparatus. 5,498,275, Cl. 65-268.000.
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Reynolds, James F.: *See*—
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Rhoads, Rodney E. Cylindrical rain gutter. 5,497,583, Cl. 52-12.000.
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Riesberg, James J. System for interlocking perpendicular members. 5,497,593, Cl. 52-702.000.
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Risk, Craig H.: *See*—
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Ritke, Harold A. Golf club and set having shaft axis extending through impact point. 5,497,992, Cl. 273-167.00G.
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Rittenhouse, Donald K. Wheelchair-accessory support-frame. 5,497,926, Cl. 224-407.000.
Ritter, Ann M.; Dupree, Paul L.; and Wemple, Donald N., Jr., to General Electric Company. Apparatus for making metal alloy foils. 5,498,146, Cl. 425-78.000.
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Mueller, Peter; and Hlousek, Jaroslaw, 5,497,750, Cl. 123-446.000.
Ott, Karl; Schmuck, Erwin; Krauter, Immanuel; and Fuchs, Joerg, 5,497,748, Cl. 123-414.000.
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Templeman, Douglas D.; and Weiss, Melvyn, 5,498,912, Cl. 307-115.000.
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Nakata, Naotaro, 5,499,262, Cl. 372-108.000.
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Seitz, Katherina; Güther, Hans-Michael; Hessel, Friedrich; Schröder, Frank; Köstler, Christine; Roosen, Andreas; and May, Christian, 5,498,382, Cl. 264-56.000.
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Sonntag, John-Erik; and Ropponen, Matti, 5,499,163, Cl. 361-759.000.
Roselle, Brian J.: *See*—
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Barrera, David; Levitan, Dave; Rastegar, Bahador; and Rossbach, Paul C., 5,499,204, Cl. 365-49.000.
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Gerwick, William H.; Jacobs, Robert S.; Castenholz, Richard; Garcia-Pichel, Ferran; Grace, Krista J. S.; Proteau, Philip J.; and Rossi, James, 5,498,405, Cl. 424-59.000.
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Carlson, James G.; Truong, Jack G.; Anderson, Jeffrey T.; and Rotto, Nelson T., 5,498,685, Cl. 528-71.000.
Rouf, Mohammad A. Method of improved heat transfer. 5,497,824, Cl. 165-1.000.
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Praud, Jean-Paul; Baron, Sophie; Geoffroy, Mario; and Rouleau, Rachel, 5,497,765, Cl. 128-200.230.
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Piketty-Leydier, Laurence; Dorvaux, Jean-Marc; and Rousseau, Gérard, 5,498,760, Cl. 427-452.000.
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Howard, Lee J.; and Rowles, Howard C., 5,497,626, Cl. 62-23.000.
Rowley, Lawrence A.: *See*—
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Roxell, N.V.: *See*—
van Daele, Antoine A.; and Martens, Jean-Paul A. P., 5,497,730, Cl. 119-53.000.
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Lloyd, Lester J.; Lloyd, Peter M.; and Rubsamen, Reid M., 5,497,763, Cl. 128-200.140.
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Kern, Robert; Ruehlow, Gerald; Hoenisch, Herb; and Sarder, Mark, 5,497,735, Cl. 123-90.600.

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Allen, Bernie; Rusnak, Joel; Azevedo, Aaron; and Kimball, Neal, 5,497,564, Cl. 36-50.100.

Russ, Werner H.; Schrell, Andreas; and von der Eltz, Andreas, to Hoechst AG. Process and use of reactive disperse dyes for dyeing and printing aminated, textile cotton and cotton-polyester blend fabrics. 5,498,267, Cl. 8-532.000.

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Rutt, Michael E.: *See*—
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RXS Schrumpftechnik-Garnituren GmbH: *See*—
Behrendt, Martin; Franz, Adolf; Hunke, Roland; and Roether, Roland, 5,498,839, Cl. 174-92.000.

Ryan, Daniel F.; and Wittenbrink, Robert J., to Exxon Research and Engineering Company. Carbon dioxide addition in hydrocracking/hydroisomerization processes to control methane production. 5,498,821, Cl. 585-750.000.

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Bogdan, Paula L.; Lawson, R. Joe; Sachtler, J. W. Adriaan; and Schmidt, Robert J., 5,498,810, Cl. 585-310.000.

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Safety Equipment Inc.: *See*—
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Saito, Kazuo: *See*—
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Saito, Toshio: *See*—
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Saitou, Hideki: *See*—
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Saitou, Mitsuo: *See*—
Yamashita, Seiji; Saitou, Mitsuo; Ozeki, Tomoyuki; and Ishizaka, Tatsuya, 5,498,511, Cl. 430-496.000.

Sakai, Kazuya: *See*—
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Sakamaki, Hisashi: *See*—
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Sakamoto, Masami: *See*—
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Sakiyama, Kazuhiro: *See*—
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Salonen, Jarmo S.: *See*—
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Scholes, Addison B.; Lamirand, Joseph; and Saltsgaver, Duane, 5,498,758, Cl. 427-255.000.

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Samoto, Norihiko, to NEC Corporation. Method for thermally treating resist film and forming undercut pattern. 5,498,769, Cl. 430-327.000.

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Kim, Hyeon-tae; and Kang, Jin-kyu, 5,499,125, Cl. 359-67.000.
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Samsung Electronics Co., Ltd.: *See*—
Kim, Ji-Hyun; Han, Suk-Jin; and Lee, Jae-Bong, 5,498,940, Cl. 318-6.000.
Kim, Sungtae; and Choi, Soohaa, 5,498,890, Cl. 257-310.000.
Koo, Seung-yub; and Shin, Young-ho, 5,499,300, Cl. 381-12.000.

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Kim, Chang-Soo, 5,498,941, Cl. 318-371.000.
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Sandonato, Henry L. Work surface extensions for tool storage units. 5,497,878, Cl. 206-372.000.

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Sankyo Company, Limited: *See*—
Kaneko, Masakatsu; Murofushi, Yoshinobu; Kimura, Misako; Yamazaki, Mitsuo; and Iijima, Yasuteru, 5,498,819, Cl. 514-261.000.

Sanner, Axel: *See*—
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Sano, Hidekazu: *See*—
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Sano, Keiichi: *See*—





Harata, Yasuki; Kameda, Masaaki; Sano, Keiichi; and Aya, Yoichiro, 5,498,904, Cl. 257-62.300.

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Harata, Yasuki; Kameda, Masaaki; Sano, Keiichi; and Aya, Yoichiro, 5,498,904, Cl. 257-62.300.
Okano, Hiroshi; Tanaka, Naoki; Shibata, Kenichi; and Takahashi, Yusuke, 5,498,920, Cl. 310-313.00A.
Watanabe, Tomofumi, 5,499,252, Cl. 371-40.100.

Saperstein, William: *See*—
Elnashar, Khodor S.; Cantrell, Jay T.; and Saperstein, William, 5,499,344, Cl. 395-250.000.

Sarangi, Ananda G.: *See*—
Borodovsky, Yan A.; and Sarangi, Ananda G., 5,498,579, Cl. 437-250.000.

Sarder, Mark: *See*—
Kern, Robert; Ruehlow, Gerald; Hoenisch, Herb; and Sarder, Mark, 5,497,735, Cl. 123-90.600.

Sarocka, Robert J.: *See*—
Gehrke, James K.; and Sarocka, Robert J., 5,498,998, Cl. 331-17.000.

Saruta, Susumu: *See*—
Sudo, Yuko; Saruta, Susumu; and Sekiguchi, Yasuyuki, 5,499,301, Cl. 381-71.000.

Sasaki, Beji, to Friends of Freesia Co., Ltd. Plastic resin kneading/extruding method and apparatus by alternate extrusions of cylinders. 5,498,380, Cl. 264-39.000.

Sasaki, Eiichi, to Ricoh Company, Ltd. Method and a color image forming apparatus forming a positioning mark. 5,499,092, Cl. 355-326.00R.

Sasaki, Hideaki: *See*—
Mine, Toshihiro; Kazui, Shinichi; Morita, Kenji; Ogino, Hiroyuki; Shiokawa, Takeji; and Sasaki, Hideaki, 5,498,109, Cl. 408-1.00R.

Sasaki, Katumaru: *See*—
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Sasaki, Kouzou: *See*—
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Sasaki, Masaaki; Horii, Tohru; Arakawa, Masahiro; and Murata, Kazuo, to Yuasa Corporation. Lead acid battery. 5,498,496, Cl. 429-233.000.

Sasaki, Masayoshi: *See*—
Negishi, Michio; Naiki, Ihachi; Sasaki, Masayoshi; and Kimura, Tadayuki, 5,498,557, Cl. 437-40.000.

Sasaki, Mikio; Kanayama, Yukihiro; Saitou, Hideki; and Kominami, Tetsuya, to Nippondenso Co., Ltd. Position-and-attitude recognition method and apparatus by use of image pickup means. 5,499,306, Cl. 382-291.000.

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Masumoto, Katuhisa; Nakamura, Akihiko; Kiyoshima, Yujiro; Sasaki, Mikio; and Tanahashi, Asako, 5,498,792, Cl. 564-164.000.

Sasaki, Morimasa: *See*—
Ikebe, Masaru; Shiba, Haruo; Miyazaki, Yukio; Sasaki, Morimasa; and Katoh, Hisao, 5,498,456, Cl. 428-66.600.

Sasaki, Shuuzou, to NEC Corporation. Process of fabricating semiconductor device having flattening stage for inter-level insulating layer without deterioration of device characteristics. 5,498,574, Cl. 437-195.000.

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Cama, Lovji D.; Sasor, Mary F.; and Hammond, Milton L., 5,498,777, Cl. 514-206.000.

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Tanaka, Shunji; Ohtsuki, Toru; Sato, Hiroaki; Sawamoto, Hideo; Yamagata, Ryo; Watanabe, Masaya; Umeno, Hidenori; and Haraguchi, Masatoshi, 5,499,379, Cl. 395-700.000.

Sato, Hiroshi, to Casio Computer Co., Ltd. Decompression data display devices. 5,499,179, Cl. 364-413.310.

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Sato, Kozo: *See*—
Kuhara, Shigehide; Sato, Kozo; and Kanayama, Shoichi, 5,497,773, Cl. 128-653.500.

Sato, Makoto; and Uzawa, Shigeyuki, to Canon Kabushiki Kaisha. Alignment method and alignment system. 5,499,099, Cl. 356-400.000.

Sato, Noriaki, to Fujitsu Limited. EPROM with trench in thick field oxide. 5,498,891, Cl. 257-316.000.

Sato, Shinichi; Kobayashi, Kazuto; and Ikeuchi, Takenobu, to Matsushita Graphic Communication Systems, Inc. Image signal processing apparatus. 5,499,111, Cl. 358-455.000.

Sato, Susumu: *See*—
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Sato, Takashi: *See*—
Isshiki, Osamu; Murashita, Masaki; Matsushima, Osamu; Nakagawa, Sadao; Nakano, Seizo; Goto, Koji; Hashiura, Masayoshi; Kobayashi, Yutaka; Satoh, Takashi; Ota, Katsuro; Kikuchi, Hideaki; Sato, Takashi; and Fukuda, Shinji, 5,498,849, Cl. 219-121.640.

Sato, Tomoaki: *See*—
Tanaka, Hideaki; Oba, Hiroyuki; Sato, Tomoaki; and Hasegawa, Tomohisa, 5,498,662, Cl. 525-54.200.

Sato, Toshifumi, to NEC Corporation. Paging receiver with a display function that inhibits display of a received command signal. 5,499,021, Cl. 340-825.440.

Sato, Toshihiro; Takagi, Tadao; and Yasukawa, Seiichi, to Nikon Corporation. Photometric apparatus for a camera. 5,499,075, Cl. 354-415.000.

Sato, Yasuo: *See*—
Takamura, Zenichi; Yano, Yuji; and Sato, Yasuo, 5,498,163, Cl. 439-13.000.

Sato, Yoshimi; Hayashi, Yoshio; and Katada, Jun, to Nippon Steel Corporation. Platelet aggregation-inhibiting peptides. 5,498,601, Cl. 514-17.000.

Satoh, Asako: *See*—
Hara, Michikazu; Satoh, Asako; Takami, Norio; and Ohsaki, Takahisa, 5,498,492, Cl. 429-212.000.

Satoh, Makoto, to Canon Kabushiki Kaisha. Multi-window system which can overlay-display a dynamic image in a specific window. 5,499,327, Cl. 395-135.000.

Satoh, Takashi: *See*—
Isshiki, Osamu; Murashita, Masaki; Matsushima, Osamu; Nakagawa, Sadao; Nakano, Seizo; Goto, Koji; Hashiura, Masayoshi; Kobayashi, Yutaka; Satoh, Takashi; Ota, Katsuro; Kikuchi, Hideaki; Sato, Takashi; and Fukuda, Shinji, 5,498,849, Cl. 219-121.640.

Satoh, Tatsuya; and Nagao, Masaki, to Olympus Optical Co., Ltd. Camera having hand shake detecting function and trimming mode selecting function. 5,499,068, Cl. 354-106.000.

Satoh, Yoshio: *See*—
Fukuma, Kooji; Sakurai, Soichi; Okuyama, Nobutaka; Satoh, Yoshio; and Obara, Yoshihiro, 5,498,939, Cl. 315-370.000.

Satomi, Takeshi, to Kabushiki Kaisha Komatsu Seisakusho. Floor frame supporting structure for construction machines. 5,498,060, Cl. 296-190.000.

Satou, Youji; and Sasaki, Katumaru, to Kabushiki Kaisha Toshiba. Electronic apparatus having a rib integral with the display housing for protecting the fluorescent lamp. 5,499,129, Cl. 359-83.000.

Saunders, David J.: *See*—
Bartuska, Jaroslav B.; Grimm, Richard J.; Kerklaan, Albert J.; Saunders, David J.; and Zalesinski, Jerzy M., 5,499,162, Cl. 361-737.000.

Saurer Stickysteme AG: *See*—
Henz, Jürg; Abegglen, Hans; and Yu, Yueliang, 5,497,719, Cl. 112-83.000.

Sawabe, Atsuhito: *See*—
Hasunuma, Masahiko; Kaneko, Hisashi; Sawabe, Atsuhito; Kawanoue, Takashi; Kohanawa, Yoshiko; and Komatsu, Shuichi, 5,498,909, Cl. 257-754.000.

Sawada, Kazuo; Inazawa, Shinji; and Yamada, Kouichi, to Sumitomo Electric Industries, Ltd. Thermocouple. 5,498,296, Cl. 136-236.100.

Sawamoto, Hideo: *See*—
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Sawashima, Chiyuki: *See*—
Kusunose, Masashi; Mitsui, Shoji; Yanagino, Hiroei; and Sawashima, Chiyuki, 5,497,801, Cl. 137-117.000.

Sawyer, Evelyn S.; and Sawyer, Philip J., to Sea Run Holdings, Inc. Method for culturing insect cells in a medium containing fish serum. 5,498,540, Cl. 435-240.200.

Sawyer, Lawrence H.: *See*—
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Sawyer, Philip J.: *See*—
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Schach, Thomas; and Papenfuhs, Theodor, to Hoechst Aktiengesellschaft. Process for preparing fluoroanilines. 5,498,794, Cl. 564-417.000.

Schach, Thomas; and Papenfuhs, Theodor, to Hoechst Aktiengesellschaft. Process for the preparation of aromatic fluoro compounds. 5,498,807, Cl. 570-127.000.

Schackmann, Horst: *See*—
Linde, Hansjürgen; Wolf, Peter; Seeser, Günter; Wimmer, Manfred; Weishaupt, Walter; Wegge, Martin; Schüch, Siegmund; Schackmann, Horst; Bauer, Franz; and Eckrich, Michael, 5,497,641, Cl. 70-257.000.

Schadt, Martin: *See*—
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Schaefer, Michael J., to Risk Management, Consultant, Inc. Method for demonstrating a lifting technique. 5,498,162, Cl. 434-258.000.

Schaerfl, Robert A., Jr.; Dadgar, Ali M.; and Lanier, Carroll W., to Albemarle Corporation. Preparation of synthetic oils from vinylidene olefins and alpha-olefins. 5,498,815, Cl. 585-512.000.

Schafer, Werner: *See*—
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Schaffer, Gregory L., to Maxim Integrated Products. High side, current sense amplifier using a symmetric amplifier. 5,498,984, Cl. 327-51.000.

Schalk, Thomas B.: *See*—

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Schaller, Hans-Ludwig; Mellinghoff, Horst; Schmengler, Michael; and Mager, Uwe, to Mannesmann Aktiengesellschaft. Process and arrangement for operating a double furnace installation. 5,499,264, Cl. 373-78.000.
Schatz, Peter J.; Cull, Millard G.; Miller, Jeff F.; and Stemmer, Willem P. C., to Affymax Technologies, N.V. Peptide library and screening method. 5,498,530, Cl. 435-69.100.
Schatzle, Conrad J., Jr. Apparatus and method for installing cabled guyed caissons. 5,498,107, Cl. 405-224.000.
Scheidecker, Dieter: *See*—
Schuhmann, Detlef E.; Dries, Thomas; Wilhelm, Adolf; Scheidecker, Dieter; and Lohmann, Harald, 5,498,474, Cl. 428-323.000.
Schellekens, Ronald M. A. M.; and Van Dijk, Hans K., to DSM N.V. Process for the production of an assembly conducting article. 5,498,371, Cl. 252-500.000.
Schenk, Raymond L. Shoe for use on continuous casting machines and method of use. 5,497,822, Cl. 114-479.000.
Scherrer, Robert A., to Riker Laboratories, Inc. Substituted di-t-butylphenols. 5,498,745, Cl. 558-408.000.
Scheu, Leland C.: *See*—
Velie, Wallace W.; and Haney, Donald C., 5,498,154, Cl. 431-264.000.
Scheuer, Helmuth, to Schüco International KG. Butt joint. 5,498,099, Cl. 403-403.000.
Scheuerman, Georgieanne L.: *See*—
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Schiebold, Cristopher F. Transformerless audio amplifier. 5,498,997, Cl. 330-277.000.
Schiller, Jay B.; and Schmelzer, Richard A., to Cable Services Technologies, Inc. CATV distribution system with each channel having its own remote scheduler. 5,499,046, Cl. 348-6.000.
Schilp, Andrea: *See*—
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Schlachter, Bradley S. Hinged security trunk for vehicle tailgate. 5,498,049, Cl. 296-37.600.
Schlapfer, Johannes P.; Hess, Martin; Woreth, Roland; Tanner, Peter; and Weigum, Hans, to Synthes (U.S.A.). Clamp connection for connecting two construction components for a setting device, particularly an osteosynthetic setting device. 5,498,264, Cl. 606-72.000.
Schlender, Ralph E.: *See*—
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Schlenger, Manfred; and Hald, Hermann, to Deutsche Forschungsanstalt für Luft- und Raumfahrt e.V. Method of making rings for gears having internal or external toothing. 5,497,548, Cl. 29-893.000.
Schlosser, Thomas W.: *See*—
Bond, James W.; Marchette, David J.; Priebe, Carey E.; and Schlosser, Thomas W., 5,499,399, Cl. 455-296.000.
Schlotthauer, James J. Planting hole digger. 5,497,714, Cl. 111-106.000.
Schlund, Jim D.; and Reichel, Robert T. Fluid pressure line patch. 5,497,808, Cl. 138-99.000.
Schmelzer, Richard A.: *See*—
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Schmengler, Michael: *See*—
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Schmid, Eduard: *See*—
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Schmidt, Klaus; and Klein, Roland, to ITW-ATECO GmbH. Rotary damper. 5,497,863, Cl. 188-306.000.
Schmidt, Richard R.: *See*—
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Schmidt, Willi: *See*—
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Schmidter, Thomas C.: *See*—
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Schmolesky, Brad A.: *See*—
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Schmuck, Erwin: *See*—
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Schneider Electric SA: *See*—
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Schneider, Erika; Zang, Xiguang; and Hartley, Michael R., to General Electric Company. Correction of geometric distortion in MRI phase and phase difference images. 5,498,963, Cl. 324-309.000.
Schneider, Josef: *See*—
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Schneider, Ralf, to Mannesmann Aktiengesellschaft. Process and apparatus for preheating and inserting scrap into a smelting furnace. 5,497,977, Cl. 266-156.000.
Schneider, Rolf: *See*—
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Schoellkopf, Jean-Pierre, to SGS-Thomson Microelectronics S.A. Device for checking the skew between two clock signals. 5,498,983, Cl. 327-3.000.
Scholes, Addison B.; Lamirand, Joseph; and Saltsgaver, Duane, to Allurista Corporation. Method for the cold end coating of glassware using a vaporizer having an internal flow path from a reservoir of liquid coating material to a vapor deposition chamber. 5,498,758, Cl. 427-255.000.
Scholz, Matthew T., to Minnesota Mining and Manufacturing Company. Microcreping of fabrics for orthopedic casting tapes. 5,498,232, Cl. 602-8.000.
Schomäcker, Reinhard: *See*—
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Schrödl, Hermann. Rotor for a disintegrating machine. 5,497,950, Cl. 241-191.000.
Schröter, Hans-Jürgen; Heimbach, Heinrich; Henning, Klaus-Dirk; Knoblauch, Karl; Berndt, Alfons S.-S.; and Tarnow, Ferdinand, to Bergwerksverband GmbH. Process for the production of carbon molecular sieves. 5,498,589, Cl. 502-416.000.
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Schulman, Joseph H.; Rule, Orville R., III; Whitmoyer, David I.; Lebel, Ronald J.; Lucisano, Joseph Y.; and Mann, Alfred E., to Alfred E. Mann Foundation For Scientific Research. Glucose monitoring system. 5,497,772, Cl. 128-635.000.
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Schulz, Martin, Jr.; Pieper, Billie; and Warner, David, to Steadley Company. Foundation unit, wire element for the foundation unit, and method of forming the foundation unit. 5,497,979, Cl. 267-103.000.



Schulze, Joachim; and Figge, Rainer, to Wacker-Chemie GmbH. Use of polypropylene glycol as a shrinkage-reducing additive in dispersion powder compositions for construction materials. 5,498,665, Cl. 525-57.000.
Schumacher, Egon, to Lubing Maschinenfabrik Ludwig Bening GmbH & Co. KG. Water storage tank for an animal watering trough. 5,497,731, Cl. 119-78.000.
Schuster, Herbert: *See*—
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Schwinn Cycling & Fitness Inc.: *See*—
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Onuki, Hiroshi, 5,497,834, Cl. 169-37.000.
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Lhila, Ramesh; Ganslaw, Stuart; and Serra, Eleanor, 5,498,417, Cl. 424-448.000.
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Severini, Joseph A.; Yee, Daniel C. L.; Tame, Omar D.; Plaza, Shelly M.; Gravenstruter, Noel P.; Jovan, Dragi; Susko, Thomas J.; and Schulte, Steven A., to Atoma International, Inc.; Chrysler Corporation; and Lear Seating Corporation. Seat hinge and latch assembly with bi-directional release. 5,498,052, Cl. 296-65.100.
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Dixon, D. Craig; and Hundt, Michael J., 5,498,903, Cl. 257-690.000.
Ryat, Marc H., 5,498,953, Cl. 323-315.000.
SGS-Thomson Microelectronics, S.A.: *See*—
Ryat, Marc, 5,498,952, Cl. 323-312.000.
Schoeilkopf, Jean-Pierre, 5,498,983, Cl. 327-3.000.
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Ashjian, Henry; Peel, Larry C.; Sheerin, Thomas J.; and Williamson, Robert S., 5,498,596, Cl. 507-103.000.
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Tryon, John F.; Reynolds, James F.; and Buoniconti, Ralph R., Jr., 5,497,571, Cl. 40-544.000.
Vinegar, Harold J.; Akkurt, Ridvan; and Tutunjian, Pierre N., 5,498,960, Cl. 324-303.000.
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Shiraki, Seiichi, to NEC Corporation. Method of manufacturing semiconductor device using measurement mark pattern. 5,498,877, Cl. 250-491.100.
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Katagiri, Takeshi; Yamamoto, Masao; Tajima, Tukasa; and Shirasaki, Siro, 5,498,147, Cl. 425-78.000.
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Bowles, Gary-Alexander, 5,498,980, Cl. 326-60.000.
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Klose, Helmut; Meister, Thomas; Meul, Hans-Willi; and Stengl, Reinhard, 5,498,567, Cl. 437-89.000.
May, Karl; Herm, Hartmut; and Mattke, Reinhard, 5,497,712, Cl. 110-342.000.
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Kinney, Michael A.; Cronvich, James T.; and Zavis, Wayne M., 5,498,956, Cl. 324-142.000.
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Silber, Arthur L. Toxicity resistant, self-fitting and adjustable, self-closing tampon structure. 5,498,252, Cl. 604-330.000.
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O'Lenick, Anthony J., Jr., 5,498,703, Cl. 536-4.100.
Silver, David M.; and Windsor, John R., to Microsoft Corporation. Method and system for providing standard resources in different natural languages. 5,499,335, Cl. 395-161.000.
Silvestri, Joyce: *See*—
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Silvestro, Gayton L.: *See*—
Tumpey, John J.; Shekhawat, Sampat; Silvestro, Gayton L.; and Brogle, John J., 5,498,907, Cl. 257-724.000.
Silye, Ronald P., to Kelsey-Hayes Company. Deck lid latch and actuator. 5,498,040, Cl. 292-201.000.
Silzel, John W.: *See*—
Obremski, Robert J.; and Silzel, John W., 5,498,875, Cl. 250-458.100.
Simon, Arno: *See*—

Gast, Jürgen; and Simon, Arno, 5,499,095, Cl. 356-346.000.
Simon, Ira J.; Curtis, George W.; and Campbell, Andrew B., to Marvin Lumber and Cedar Co. Multi-point door lock system. 5,498,038, Cl. 292-36.000.
Simon, Jochen: *See*—
Bartels, Karin; Deller, Klaus; Despeyroux, Bertrand; and Simon, Jochen, 5,498,585, Cl. 502-185.000.
Simpson, Dixie L.; and Simpson, Mike. Door lock illumination apparatus. 5,499,171, Cl. 362-100.000.
Simpson, James E.: *See*—
Kanarehi, Mohammad; and Simpson, James E., 5,498,308, Cl. 156-345.000.
Simpson, Logan L.: *See*—
Carpenter, Burton J., Jr.; McMaster, Michael G.; LaTorre, Joseph; and Simpson, Logan L., 5,498,765, Cl. 430-323.000.
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Simpson, Dixie L.; and Simpson, Mike, 5,499,171, Cl. 362-100.000.
Sincock, Thomas F.: *See*—
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Sink, Chester W.: *See*—
Heise, William H.; Folk, Daniel P.; Yau, Cheuk C.; and Sink, Chester W., 5,498,749, Cl. 560-78.000.
Sinvent A/S: *See*—
Lorentzen, Gustav; and Pettersen, Jostein, 5,497,631, Cl. 62-115.000.
Sipila, Hannu T.: *See*—
Karjalainen, Arto J.; Virtanen, Raimo E.; Karjalainen, Arja L.; Eloranta, Maire M.; Salonen, Jarmo S.; Sipila, Hannu T.; and Haapalinna, Antti S., 5,498,623, Cl. 514-396.000.
Siuzdak, Allan J.: *See*—
Bishop, Robert P.; Hainey, Paul L.; Lukasiewicz, Stanley J.; Siuzdak, Allan J.; Luminello, Robert E., Jr.; and Shukla, Vishwa N., 5,499,158, Cl. 361-283.400.
Sjöbom, Hans F.: *See*—
Nyström, Jan-Erik; and Sjöbom, Hans F., 5,498,724, Cl. 548-375.100.
Skarky, Loren: *See*—
Maggio, Mark S.; Allsup, David S.; Cox, Alvin E.; Metzner, Tom; Eckerd, Steven; and Skarky, Loren, 5,498,840, Cl. 174-260.000.
Skele, Martins: *See*—
Parle, Jonathan J.; and Skele, Martins, 5,498,985, Cl. 327-74.000.
Skinner, Kenneth R., to Philips Electronics North America Corporation. Method and apparatus for effecting dynamic color shift in a television receiver. 5,499,059, Cl. 348-645.000.
Skis Rossignol S.A.: *See*—
Jodelet, François, 5,498,016, Cl. 280-602.000.
Skotnicki, George: *See*—
Hirsch, Mark A.; Stout, Donald M.; Corns, Derek P. J.; Randrianarison, Patrick; and Skotnicki, George, 5,497,867, Cl. 192-48.910.
SKW Trostberg: *See*—
Kohlrausch, Utz; Cully, Jan; and Schmid, Bruno, 5,498,437, Cl. 426-614.000.
Slater, Tina L. B.: *See*—
Cavender, D. Lea; and Slater, Tina L. B., 5,497,543, Cl. 29-469.000.
Slayton, Michael: *See*—
Tsaur, Liang S.; Slayton, Michael; and Aronson, Michael P., 5,498,378, Cl. 264-4.400.
Sleisenger, Marvin H.: *See*—
Johnson, Lorin K.; and Sleisenger, Marvin H., 5,498,608, Cl. 514-150.000.
Sloan Valve Company: *See*—
Whiteside, John F., 5,497,802, Cl. 137-377.000.
Sluis, Carolyn: *See*—
Oka, Ichiro; and Sluis, Carolyn, 5,498,541, Cl. 435-240.450.
Slumberland PLC: *See*—
Rodgers, Paul, 5,497,600, Cl. 53-418.000.
Smith, Alan G.: *See*—
King, Edward C.; and Smith, Alan G., 5,499,376, Cl. 395-800.000.
Smith & Nephew Richards, Inc.: *See*—
Davidson, James A., 5,498,302, Cl. 148-317.000.
Smith, David S.: *See*—
Stangeland, Bruce E.; Kramer, David C.; Smith, David S.; McCall, James T.; Scheuerman, Georgieanne L.; Bachtel, Robert W.; and Johnson, David R., 5,498,327, Cl. 208-148.000.
Smith, Gary B., to Arinc Research Corporation. Voltage sensing, autoselecting aircraft power supply interface. 5,499,187, Cl. 363-142.000.
Smith, Gary B.: *See*—
Granger, Carol A.; Smith, Gary B.; and Taylor, Bruce L., 5,498,340, Cl. 210-645.000.
Smith, George: *See*—
Farmer, John W.; Smith, George; Gin, Malcolm; Brook, John F. H.; White, Daryl R.; See, Brian A.; and Powell, Ian, 5,499,066, Cl. 351-221.000.
Smith, Harry F., to Intellectual Property Development Associates of Connecticut, Inc. Methods and apparatus for inputting information to a vehicle. 5,499,181, Cl. 364-424.040.
Smith, Jerry F.: *See*—
Cuthbertson, Robert A.; James, Barry E.; Magalhaes, Carlos E.; and Smith, Jerry F., 5,498,066, Cl. 298-23.00C.
Smith, Jerry J. Power system with simplified, low cost self-starting self oscillator, power factor correction, power regulation and output open circuit voltage regulation, overload and short circuit protection. 5,498,936, Cl. 315-247.000.
Smith, Kevin M.: *See*—
Pandey, Ravindra K.; Dougherty, Thomas J.; Smith, Kevin M.; and Meunier, Isabelle, 5,498,710, Cl. 540-145.000.
Smith, Martin S., to Northern Telecom Limited. Polarization diversity antenna. 5,499,033, Cl. 343-700.0MS.
Smith, Michael J., to United Color Manufacturing, Inc. Fluorescent petroleum markers. 5,498,808, Cl. 585-3.000.
Smith, Olan R., to Ipsco Enterprises Inc. Dual-purpose guide and drum cleaner for Steckel mill coiler furnace. 5,498,156, Cl. 432-75.000.
Smith, Paul F.: *See*—
Gee, Thomas S.; Smith, Paul F.; and Cullen, Michael J., 5,497,655, Cl. 73-118.200.
Smith, Raymond C.: *See*—
Showalter, Michael S.; Pierce, David L.; Engel, Stephen A.; and Smith, Raymond C., 5,497,976, Cl. 266-51.000.
Smith, Richard G., Jr.; and Gee, Calvin L., to Texas Instruments Incorporated. Phased array antenna aperture and method. 5,499,035, Cl. 343-789.000.
Smith, Ronald L.: *See*—
Blodgett, Fred B.; Brand, Jerry D.; Koch, Steven J.; and Smith, Ronald L., 5,497,539, Cl. 29-1.320.
Smith, Strom W. Sulfur trap. 5,498,270, Cl. 55-216.000.
Smith-Haddon, William F., to Cross Manufacturing Company (1938) Limited. Apparatus for selectively sampling filter backwash fluid. 5,498,328, Cl. 210-85.000.
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Berka, Thomas R.; Fornwald, James A.; Gorniak, Joselina G.; Rosenberg, Martin; Strickler, James E.; and Taylor, Dean P., 5,498,529, Cl. 435-69.100.
Smydra, Andrew J.: *See*—
Kelley, Scott A.; and Smydra, Andrew J., 5,498,027, Cl. 280-728.300.
Snaidr, Stanislav M.: *See*—
Bowen, Larry; and Snaidr, Stanislav M., 5,497,791, Cl. 131-175.000.
Snap-on Incorporated: *See*—
Krivec, Bert, 5,498,095, Cl. 403-291.000.
Snedeker, Colin M.: *See*—
Fistner, David C.; and Snedeker, Colin M., 5,498,280, Cl. 106-19.00B.
Snetting, Mark E.: *See*—
Steinberg, Timothy D.; Snetting, Mark E.; and Svendsen, John M., 5,497,945, Cl. 239-329.000.
Snow, Barton H., to General Electric Company. Method and system for detecting significant hydraulic leaks. 5,497,653, Cl. 73-40.50R.
Snowden-Pencer, Inc.: *See*—
Furnish, Greg, 5,498,256, Cl. 606-1.000.
Snyder, Steven P.: *See*—
Brown, Kiel L.; Jordan-Brunson, E. Judy; Potok, Timothy A.; and Snyder, Steven P., 5,497,675, Cl. 74-492.000.
Sobol, Thomas J. Particle loading of flexible three-dimensional non-woven fabrics. 5,498,443, Cl. 427-122.000.
Societa Italiana Progetti S.r.l.: *See*—
Dodd, Graham S.; and Marinoni, Mario, 5,497,586, Cl. 52-172.000.
Societe Prolabo: *See*—
Jacquault, Patrick, 5,498,857, Cl. 219-745.000.
Sodoma, Joe S.: *See*—
Anderson, Jesse L.; and Sodoma, Joe S., 5,497,713, Cl. 111-92.000.
Sofy, Hugh M., to HMS Mfg. Co. Stand for artificial Christmas tree or the like. 5,497,972, Cl. 248-523.000.
Sogabe, Seiji: *See*—
Hirao, Hirohiko; Kikukawa, Yoshimasa; Okamoto, Toshihiro; Murai, Takayuki; Sogabe, Seiji; Tanioka, Miya; Nakayama, Rie; and Yoshioka, Takashi, 5,498,301, Cl. 148-269.000.
Sohda, Takashi; Pujisawa, Yukio; Yasuma, Tsuneo; Mizoguchi, Junji; Kori, Masakuni; and Takizawa, Masayuki, to Takeda Chemical Industries, Ltd. Derivatives of L-tryptophanal and their use as medicinals. 5,498,728, Cl. 548-493.000.
Sohmiya, Norimasa: *See*—
Kurokawa, Junji; Nojima, Kazuo; and Sohmiya, Norimasa, 5,499,078, Cl. 355-206.000.
Sokoloff, Pierre: *See*—
Rognan, Didier; Mann, Andre; Wermuth, Camille-Georges; Martres, Marie-Pascale; Giros, Bruno; Sokoloff, Pierre; Schwartz, Jean-Charles; LeComte, Jeanne-Marie; and Garrido, Fabrice, 5,498,628, Cl. 514-428.000.
Soll, David B.; and Harrison, Sol E. Protection of human and animal cells. 5,498,606, Cl. 514-54.000.
Soll, Richard M.: *See*—
Novak, Sarah T. A.; Soll, Richard M.; Ellingboe, John W.; and Nguyen, Thomas T., 5,498,775, Cl. 514-25.000.
Solv-Ex Corporation: *See*—
Rendall, John S., 5,498,320, Cl. 205-385.000.
Somers, David A.: *See*—
Gengenbach, Burle G.; Somers, David A.; Wyse, Donald L.; Gronwald, John W.; Egli, Margaret A.; and Lutz, Sheila M., 5,498,544, Cl. 435-320.100.
Sommerer, Karl: *See*—
Wahl, George; Dietz, Matthias; Schote, Norbert; Klosterhuber, Robert; Sommerer, Karl; and Kunert, Reinhard, 5,498,018, Cl. 280-673.000.



Song, Byung M., to Polk's Model Craft Hobbies, Inc. Radio with frequency scanning and interference detection capability for remote controlled model aircraft. 5,499,388, Cl. 455-62.000.
Song, Tae K.; and Chandraratna, Roshantha A., to Allergan, Inc. Acetylenes disubstituted with hydroxyaryl and aryl or heteroaryl groups having retinoid-like biological activity. 5,498,795, Cl. 562-474.000.
Sonntag, John-Erik; and Ropponen, Matti, to Fibox Oy AB. Printed circuit board clamp for housings of electronic, electric and apparatus installations. 5,499,163, Cl. 361-759.000.
Sonobe, Masanori: *See*—
Kawaguchi, Masahiro; Sonobe, Masanori; Kanzaki, Shigeki; and Yokono, Tomohiko, 5,498,140, Cl. 417-199.100.
Sonoda, Akira: *See*—
Todo, Yoshinori; Sakamoto, Masami; Ushijima, Noriaki; Sonoda, Akira; Miura, Yukio; and Araki, Kyousuke, 5,498,121, Cl. 414-719.000.
Sonty, Atashi C.; Faria, Jose A.; Willett, Alan W.; Ciulla, Kim P.; Comparetta, Christopher; and Latone, Jack T., to Xerox Corporation. Process for configuration management. 5,499,357, Cl. 395-500.000.
Sony Corporation: *See*—
Gocho, Tetsuo; and Hayakawa, Hideaki, 5,498,565, Cl. 437-67.000.
Ijuin, Kenichi, 5,498,942, Cl. 318-567.000.
Kondo, Tetsujiro; Horishi, Takashi; Fujimori, Yasuhiro; and Nishikata, Takeharu, 5,499,057, Cl. 348-607.000.
Kubota, Yukio; and Kanota, Keiji, 5,499,148, Cl. 360-73.060.
Nakanishi, Atsushi; and Kato, Yukihiro, 5,499,052, Cl. 348-220.000.
Nanjo, Yusuke, 5,499,072, Cl. 354-222.000.
Negishi, Michio; Naiki, Ihachi; Sasaki, Masayoshi; and Kimura, Tadayuki, 5,498,557, Cl. 437-40.000.
Ohki, Hiroaki; Nishima, Osamu; Mori, Hiroyuki; and Suzuki, Junya, 5,498,887, Cl. 257-239.000.
Okamoto, Yutaka, 5,498,563, Cl. 437-52.000.
Richards, John W.; Stone, Jonathan J.; Turner, Alan; Walters, Carl W.; Chouhan, Mukesh; and Kavanagh, Peter, 5,499,373, Cl. 395-154.000.
Sakamoto, Satoshi; Ohshima, Eiji; Kawamura, Hiroshi; and Orimo, Shinichi, 5,499,143, Cl. 359-824.000.
Sanada, Shinji, 5,499,224, Cl. 369-48.000.
Yano, Tomoya, 5,499,122, Cl. 359-54.000.
Sony Magnescale Inc.: *See*—
Tamiya, Hideaki, 5,499,096, Cl. 356-356.000.
Sony United Kingdom Limited: *See*—
Richards, John W.; Stone, Jonathan J.; Turner, Alan; Walters, Carl W.; Chouhan, Mukesh; and Kavanagh, Peter, 5,499,373, Cl. 395-154.000.
Soon-Shiong, Patrick: *See*—
Grinstaff, Mark W.; Soon-Shiong, Patrick; Wong, Michael; Sandford, Paul A.; Suslick, Kenneth S.; and Desai, Neil P., 5,498,421, Cl. 424-450.000.
Soshi, Isao: *See*—
Wakabayashi, Hiroshi; Miyamoto, Hidenori; and Soshi, Isao, 5,499,071, Cl. 354-173.100.
Souda, Hironori: *See*—
Tojo, Masaaki; Kurata, Noboru; and Souda, Hironori, 5,499,132, Cl. 359-281.000.
Soufi, Abdoull K. Infant walking trainer. 5,498,219, Cl. 482-69.000.
Soula, Richard: *See*—
Charbonnel, Jean-Christophe; Soula, Richard; and Suzon, Serge, 5,497,943, Cl. 239-132.000.
Sounik, James R.; Mott, Graham N.; and Hilton, Charles B., to Hoechst Celanese Corporation. Process for preparing 4-hydroxyphenylmethylcarbinol. 5,498,804, Cl. 568-764.000.
Soupios, Charles C. String vibration enhancer for guitar-type musical instruments. 5,497,690, Cl. 84-453.000.
South, Phillip C.: *See*—
Vogelpohl, Gregory J.; and South, Phillip C., 5,497,905, Cl. 221-226.000.
Southern Alloy Corporation: *See*—
Bobbitt, Billy T., 5,497,711, Cl. 110-278.000.
Span Tech Corporation: *See*—
Layne, James L., 5,497,874, Cl. 198-698.000.
Spanset Inter AG: *See*—
Treuling, Walter, 5,498,047, Cl. 294-74.000.
Sparkman, John P.: *See*—
Hill, Timothy W.; Oleszko, Mark A.; Spencer, Graham T.; and Sparkman, John P., 5,498,030, Cl. 280-743.100.
Specialty Silicone Products, Inc.: *See*—
Reo, Ned J., 5,498,644, Cl. 523-218.000.
Spector, George: *See*—
Rodriguez, Edwin; and Spector, George, 5,497,552, Cl. 30-123.500.
Speedfam Corporation: *See*—
Karlsrud, Chris E.; Van Woerkom, Anthony G.; Odagiri, Shigeru; and Nagahashi, Isao, 5,498,196, Cl. 451-11.000.
Karlsrud, Chris E.; Van Woerkom, Anthony G.; Odagiri, Shigeru; Nagahashi, Isao; and Preston, Spencer, 5,498,199, Cl. 451-289.000.
Speer, Drew V.; Roberts, William P.; and Morgan, Charles R., to W.R. Grace & Co.-Conn. Methods and compositions for oxygen scavenging by a rigid semi-rigid article. 5,498,364, Cl. 252-188.280.
Speer, Richard W.; and Beiles, Edward W., to Whitaker Corporation, The. Electrical connector with spring leg retention feature. 5,498,174, Cl. 439-567.000.
Spencer, Graham T.: *See*—
Hill, Timothy W.; Oleszko, Mark A.; Spencer, Graham T.; and Sparkman, John P., 5,498,030, Cl. 280-743.100.
Sperling-Vietmeier, Karin: *See*—
Kim, Son N.; Sanner, Axel; and Sperling-Vietmeier, Karin, 5,498,690, Cl. 528-296.000.
Spielberger, Richard K.: *See*—
Dunaway, Thomas J.; and Spielberger, Richard K., 5,498,900, Cl. 257-659.000.
Spiess, Walter: *See*—
Wengenroth, Horst; Roeschert, Horst; Spiess, Walter; Buhr, Gerhard; and Pawlowski, Georg, 5,498,506, Cl. 430-270.140.
Spiro, Alexander C. Trigonal pyramidal bookstand. 5,497,971, Cl. 248-455.000.
Spix, George A.: *See*—
Eckert, Roger E.; Hessel, Richard E.; Phelps, Andrew E.; Spix, George A.; and Wilson, Jimmie R., 5,499,356, Cl. 395-479.000.
Splane, Robson L., Jr.: *See*—
Iams, John F.; and Splane, Robson L., Jr., 5,498,223, Cl. 482-129.000.
Sponsler, Karl G.; Seibold, Kurt A.; and Pattok, Mark A., to Hoover Universal, Inc. Tumble forward seat. 5,498,051, Cl. 296-65.100.
Springer, Hartmut, deceased (by Sebastian Springer, Johannes Springer, heirs): *See*—
Dannheim, Jörg; Russ, Werner H.; Springer, Hartmut, deceased, 5,498,713, Cl. 544-189.000.
Springer, Sebastian, Johannes Springer, heirs: *See*—
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Springs Window Fashions Division, Inc.: *See*—
Drake, Frank J., III, 5,497,820, Cl. 160-107.000.
SPX Corporation: *See*—
Manz, Kenneth W.; and Reyzin, Ilya, 5,497,625, Cl. 62-3.300.
Square D Company: *See*—
Bennett, Dale W.; Fixemer, James V.; Hood, Teresa L.; Siebels, Randall L.; and Van Waart, Douglas, 5,498,847, Cl. 218-81.000.
Collins, Paul D., 5,498,861, Cl. 235-440.000.
Squibb, George F., to Compaq Computer Corp. Power switch circuitry for electrically isolating the power switch from a power supply. 5,499,184, Cl. 363-100.000.
Srinivasan, Satchit, to D & S Plastic International. Polyolefin compositions containing high and low molecular weight EPDM rubbers. 5,498,671, Cl. 525-240.000.
Srivatsan, Raghavachari: *See*—
Middleton, David B.; Srivatsan, Raghavachari; and Person, Lee H., Jr., 5,499,025, Cl. 340-959.000.
SS Pharmaceutical Co., Ltd.: *See*—
Yokoi, Koichi; Mogi, Kinichi; Kohya, Hidehiko; Ohtsuka, Mari; Mizuno, Hiroyuki; Sato, Susumu; and Kuraishi, Tadayuki, 5,498,780, Cl. 514-492.000.
Staab, Sanford A., to Microsoft Corporation. Method and system for displaying window configuration of inactive programs. 5,499,334, Cl. 395-157.000.
Stabilus GmbH: *See*—
Fuhrmann, Castor, 5,497,966, Cl. 248-161.000.
Stack, Charles P.: *See*—
Patten, Andrew T.; Stack, Charles P.; and Levien, Andrew K., 5,497,666, Cl. 73-861.380.
Stadjuhar, Robert C.; and Renfro, Cecil S. Thermally-protected display with a ventilation system. 5,497,573, Cl. 40-564.000.
Stahl, Joel S. Plutonium and nuclear toxic waste storage depot and method. 5,498,825, Cl. 588-16.000.
Staktek Corporation: *See*—
Burns, Carmen D., 5,499,160, Cl. 361-704.000.
Roane, Jerry M.; and Burns, Carmen D., 5,498,906, Cl. 257-724.000.
Stallard, Clinton W., III, to Newport News Shipbuilding and Dry Dock Company. Actuator for a variable pitch propeller. 5,498,135, Cl. 416-155.000.
Stamet, Inc.: *See*—
Hay, Andrew G., 5,497,873, Cl. 198-642.000.
Standard Chemical & Pharmaceutical Co., Ltd.: *See*—
Wang, Hui-Po; and Lee, Jia-Shuai, 5,498,787, Cl. 540-222.000.
Standard Oil Company, The: *See*—
Brazdil, James F.; and Cavalcanti, Fernando A. P., 5,498,588, Cl. 502-353.000.
Stangeland, Bruce E.; Kramer, David C.; Smith, David S.; McCall, James T.; Scheuerman, Georgieanne L.; Bachtel, Robert W.; and Johnson, David R. Catalyst, method and apparatus for an on-stream particle replacement system for countercurrent contact of a gas and liquid feed stream with a packed bed. 5,498,327, Cl. 208-148.000.
Stanley, Paul L. R.: *See*—
Merkel, Paul B.; Poslusny, Jerrold N.; Williamson, Hugh M.; Clark, Bernard A.; and Stanley, Paul L. R., 5,498,515, Cl. 430-556.000.
Stants, Cynthia A.: *See*—
Foukes, Richard J.; and Stants, Cynthia A., 5,498,783, Cl. 525-165.000.
Stark, David M.: *See*—
Barry, Gerard F.; Kishore, Ganesh M.; and Stark, David M., 5,498,830, Cl. 800-205.000.
Steadley Company: *See*—
Schutz, Martin, Jr.; Pieper, Billie; and Warner, David, 5,497,979, Cl. 267-103.000.
Steck, Alfred E.: *See*—
Wei, Jinzhu; Stone, Charles; and Steck, Alfred E., 5,498,639, Cl. 521-27.000.

Stedman, Donald H.; Bishop, Gary; and McLaren, Scott, to Colorado Seminary. Apparatus for remote analysis of vehicle emissions. 5,498,872, Cl. 250-338.500.
Steeby, Jon A.: *See*—
White, Gregory R.; Gatewood, Bryan S.; Wilson, Mark L.; Griffen, Peter J.; Steeby, Jon A.; Anderson, Dean S.; and Webber, Larry R., 5,498,195, Cl. 477-110.000.
Steele, John W.; de Frésart, Edouard; and Theodore, N. David, to Motorola, Inc. Method for selectively forming semiconductor regions. 5,498,578, Cl. 437-235.000.
Steffier, Larry W., to Rohm and Haas Company. Suspension polymerization process for water-soluble monomers. 5,498,678, Cl. 526-200.000.
Stein, Charles; and Redding, Edward M., to Thermal Electric Devices, Inc. Method and apparatus for hydride heat pumps. 5,497,630, Cl. 62-112.000.
Steinberg, Timothy D.; Snetting, Mark E.; and Svendsen, John M., to Wagner Spray Tech Corporation. Paint gun inlet suction seal. 5,497,945, Cl. 239-329.000.
Steiner, Werner; and Trippel, Gerhard, to International Business Machines Inc. Manufacturing process for grooved substrates and multilayer structure. 5,498,445, Cl. 427-162.000.
Stemmer, Willem P. C.: *See*—
Schatz, Peter J.; Cull, Millard G.; Miller, Jeff F.; and Stemmer, Willem P. C., 5,498,530, Cl. 435-69.100.
Stencel, Edgar L.; and Krawiec, Paul P., to Monogram Aerospace Fasteners. Blind fastener with deformable sleeve. 5,498,110, Cl. 411-43.000.
Stengl, Reinhard: *See*—
Klose, Helmut; Meister, Thomas; Meul, Hans-Willi; and Stengl, Reinhard, 5,498,567, Cl. 437-89.000.
Sterzel, Hans-Josef, to BASF Aktiengesellschaft. Production of hollow articles from thermoplastics. 5,498,390, Cl. 264-532.000.
Steveason, John D. In-mold labeling using an adhesive. 5,498,307, Cl. 156-277.000.
Stewart, Charles P.; and Stewart, Constance M. Method of playing a card game teaching golf rules. 5,497,999, Cl. 273-298.000.
Stewart, Constance M.: *See*—
Stewart, Charles P.; and Stewart, Constance M., 5,497,999, Cl. 273-298.000.
Stewart Electronics: *See*—
Cullison, Steven B., 5,499,154, Cl. 361-18.000.
Stewart, Gordon S. A. B.: *See*—
Rees, Catherine E. D.; Rostas-Mulligan, Katalin; Park, Simon F.; Denyer, Stephen P.; Stewart, Gordon S. A. B.; and Jassim, Sabah A. A., 5,498,525, Cl. 435-29.000.
Steylaerts, Peter A. R.: *See*—
Aerens, Ronny J. V.; De Cock, Etienne M.; De Schamphelaere, Lucien A.; Steylaerts, Peter A. R.; and Van Weverberg, Erik G. G., 5,499,093, Cl. 355-326.00R.
Steyr-Daimler-Puch AG: *See*—
Bitsche, Otmar; and Schneeberfer, Erwin, 5,498,216, Cl. 477-20.000.
St. Louis, Daniel M.; and Lang, Ko C., to Lantec Products, Inc. Packing. 5,498,376, Cl. 261-113.000.
STN Atlas Elektronik GmbH: *See*—
Brenner, Axel; Mertens, Peter; Meuser, Wilfried; Meyer, Friedrich; Trense, Horst; Weber, Friedrich; and Wilken, Wilfried, 5,499,219, Cl. 367-151.000.
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Stojanović, Branislav. Device for therapeutic treatment of spine system. 5,498,233, Cl. 602-19.000.
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Stoltz, James V.; and Zeeb, Tony J. Universal ski holding device. 5,497,982, Cl. 269-71.000.
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Stone, Jonathan J.: *See*—
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Store Heat and Produce Energy, Inc.: *See*—
Rafalovich, Alexander P.; Gustin, Joseph A.; Longardner, William J.; Keller, Gilbert P.; and Schmidter, Thomas C., 5,497,629, Cl. 62-98.000.
Storgaard, Leif: *See*—
Hansen, Jens-Henrik B.; Storgaard, Leif; and Jensen, Poul E., 5,498,404, Cl. 423-654.000.
Stork R.M.S. B.V.: *See*—
Van Ochten, Sander A.; and Tiggeloven, Leonardus J. A., 5,499,390, Cl. 452-122.000.
Story, Michael C.: *See*—
Kamm, Roland; Veit, Eberbard; Schneider, Josef; De Filippo, Antonio; Murray, Donald W.; Story, Michael C.; and Lammons, Carl S., 5,497,530, Cl. 15-321.000.
Stout, Donald M.: *See*—
Hirsch, Mark A.; Stout, Donald M.; Corns, Derek P. J.; Randrianarison, Patrick; and Skotnicki, George, 5,497,867, Cl. 192-48.910.
Straayer, David H.: *See*—
Brandenburg, Eric L.; Franz, Patrick J.; and Straayer, David H., 5,499,041, Cl. 345-174.000.
Strack, David C.: *See*—
McDowall, Debra J.; Sawyer, Lawrence H.; Strack, David C.; and Timmons, Terry K., 5,498,463, Cl. 428-198.000.
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Pohl, Siegmund; Lehrich, Friedhelm; Genz, Manfred; Bruchmann, Bernd; Tesch, Helmut; Minges, Roland; and Streu, Joachim, 5,498,747, Cl. 560-25.000.
Strickland, William A. Integrated group of excavator control assemblies. 5,497,568, Cl. 37-348.000.
Strickler, James E.: *See*—
Berka, Thomas R.; Fornwald, James A.; Gorniak, Joselina G.; Rosenberg, Martin; Strickler, James E.; and Taylor, Dean P., 5,498,529, Cl. 435-69.100.
Strijek, Ronald L.: *See*—
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Strilich, James A.: *See*—
Kline, Robert C., Jr.; Clements, Emory C.; Krehbiel, Gretchen L.; Tanner, Darrell R.; Strilich, James A.; and Chappell, David A., 5,499,188, Cl. 364-468.000.
Stripf, Helmut; Kühner, Thomas; and Herth, Armin, to Kernforschungszentrum Karlsruhe GmbH; and Pipetronix GmbH. Method of measuring the delay of ultrasound in the pulse reflection method. 5,497,661, Cl. 73-611.000.
Strong, David R.; and Kristbergsson, Kristberg, to Nabisco, Inc. Nut based snack products and process of making. 5,498,438, Cl. 426-632.000.
Strong, Russell W., to New Holland North America, Inc. Hand support for tractor controls. 5,497,846, Cl. 180-315.000.
Strul, Bruno, to Advanced Cardiovascular Systems, Inc. Thermal angioplasty system. 5,498,261, Cl. 606-29.000.
Stuart, Earnest D.; and Latimer, Vivian M., to Colorado State University Research Foundation. Treatment method for fibrous lignocellulosic biomass using fixed stator device having nozzle tool with opposing coaxial toothed rings to make the biomass more susceptible to hydrolysis. 5,498,766, Cl. 435-99.000.
Stube, Thomas L., to Boyt Limited Partnership. Edge bumper guard and roller wheel assembly for rollable suitcase. 5,498,010, Cl. 280-37.000.
Studebaker, Thomas J.: *See*—
Woodruff, Daniel J.; Hoekstra, Daniel W.; Scott, Christopher L.; Volckhausen, Thomas W.; Studebaker, Thomas J.; and Younglove, Bruce L., 5,498,116, Cl. 414-331.000.
Studiengesellschaft Kohle mbH: *See*—
Bogdanovic, Borislav; and Wilczok, Ursula, 5,498,402, Cl. 423-463.000.
Stuebinger, Lon A.; Bowlin, Kevin R.; and Pardo, Carlos W., to Texaco Inc. Dual action pumping system. 5,497,832, Cl. 166-369.000.
Stueble, Helmut, to LTG Lufttechnische GmbH. Air conditioning process and device. 5,497,628, Cl. 62-91.000.
Stults, Jeffrey S.; Lin, Henry C.; Buchanan, Robert A.; and Ostrozynski, Robert L., to Occidental Chemical Corporation. Bis-m-benzotrifluoride compounds. 5,498,691, Cl. 528-353.000.
Stuntz, Ross M.: *See*—
Miller, John M.; and Stuntz, Ross M., 5,497,736, Cl. 123-90.130.
Sub-Zero Freezer Company, Inc.: *See*—
Caruso, Jerome, 5,497,534, Cl. 16-288.000.
Suda, Shigeaki: *See*—
Kanemaru, Takashi; Iwasaki, Takaaki; Saito, Toshio; Suda, Shigeaki; and Kitagawa, Takeo, 5,498,360, Cl. 252-62.560.
Suda, Shigeyuki; Niwa, Yukichi; and Katayama, Tatsushi, to Canon Kabushiki Kaisha. Multi-lens image pickup apparatus having unsharpness correcting mechanism. 5,499,051, Cl. 348-218.000.
Sudo, Yuko; Saruta, Susumu; and Sekiguchi, Yasuyuki, to Kabushiki Kaisha Toshiba. Active noise cancelling apparatus. 5,499,301, Cl. 381-71.000.
Sudoh, Kengo; Hayashi, Kousou; and Sumitomo, Yuji, to Sharp Kabushiki Kaisha. Recording and reproducing system for selectively reproducing portions of recorded sound using an index. 5,499,316, Cl. 395-2.790.
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Sugawara, Tohru; and Kato, Shinji, to Takeda Chemical Industries, Ltd. Automated synthesis apparatus and method of controlling the apparatus. 5,499,193, Cl. 364-500.000.
Sugiyama, Koichi: *See*—
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Sugiyama, Norihide; Watakabe, Atsushi; Yokotsuka, Sbunsuke; Hiroi, Atsuo; Naritomi, Masaki; Shirota, Naoko; Aosaki, Ko; and Nakamura, Masaru, to Asahi Glass Company Ltd.; and Iwaki Glass Company Ltd. Fluorine-containing polymer composition. 5,498,657, Cl. 524-463.000.
Sugiyama, Takeshi: *See*—
Shirouchi, Shoji; Sugiyama, Takeshi; and Morioka, Kouichi, 5,498,399, Cl. 423-239.100.
Sugiyama, Tsutomu: *See*—
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Hosoda, Shinya; Hosoda, Yukie; and Kato, Eishin, 5,498,435, Cl. 426-573.000.
Suita, Yoshihiro: *See*—
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Sulser, René; and Rapold, Franz, to Fritz Gegauf Aktiengesellschaft. Sewing machine for guiding fabric to be sewn at a pre-determined distance relative to a stitch-forming needle. 5,497,721, Cl. 112-153.000.
Sultan, Labib: *See*—
Al Janabi, Talib H.; and Sultan, Labib, 5,499,319, Cl. 395-3.000.
Sumitomo Chemical Company, Limited: *See*—
Furuta, Motonobu; Yamaguchi, Takanari; and Ohashi, Kazutoshi, 5,498,689, Cl. 528-214.000.
Hirano, Yasuhiro; Endo, Yasuhiro; Takebe, Kazuo; Shibata, Mitsuhiro; Kanagawa, Shuichi; Shiomi, Yutaka; Akiba, Masatsugu; and Kitayama, Shinichiro, 5,498,687, Cl. 528-96.000.
Kotani, Kozo; Kawakita, Toshio; Sakaya, Taiichi; and Kuroda, Ryuma, 5,498,664, Cl. 525-56.000.
Masumoto, Katuhisa; Nakamura, Akihiko; Kiyoshima, Yujiro; Sasaki, Mikio; and Tanahashi, Asako, 5,498,792, Cl. 564-164.000.
Matsumoto, Misuhiro; and Fujita, Kunihiko, 5,498,725, Cl. 548-406.000.
Mizuno, Masahiko; Kurimoto, Isao; Hirata, Norihiko; Takahashi, Toshiya; Minai, Masayoshi; Yamamoto, Takahiro; Mizuno, Tadashi; and Miyamoto, Yasunobu, 5,498,721, Cl. 548-303.700.
Sumitomo Electric Industries, Ltd.: *See*—
Horimura, Hiroyuki; Okamoto, Kenji; Minemi, Masahiko; Kaji, Toshihiko; Takano, Yoshishige; and Takeda, Yoshinobu, 5,498,393, Cl. 419-28.000.
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Sawada, Kazuo; Inazawa, Shinji; and Yamada, Kouichi, 5,498,296, Cl. 136-236.100.
Shikata, Shinichi; Hachigo, Akihiro; Nakahata, Hideaki; and Higaki, Kenjiro, 5,497,726, Cl. 117-89.000.
Sumitomo Metal Industries Ltd.: *See*—
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Sumitomo Pharmaceuticals Company, Limited: *See*—
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Sunamura, Kazuhiro; Takegahara, Hidefumi; and Hirata, Toichi, to Hitachi Construction Machinery Co., Ltd. Drive control system for hydraulic machine. 5,497,805, Cl. 137-596.160.
Sunx Kabushiki Kaisha: *See*—
Noda, Sadao, 5,498,172, Cl. 439-404.000.
Superspine, Inc.: *See*—
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Susko, Thomas J.: *See*—
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Suslick, Kenneth S.: *See*—
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Sussman, Sy. Lap tray for carrying food. 5,497,885, Cl. 206-563.000.
Sutherland, Alexander T.: *See*—
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Suzuki, Hisao: *See*—
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Suzuki, Junya: *See*—
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Suzuki, Katsuhiko: *See*—
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Swank, Bryan W.; Pataki, Arpad M.; Doszpoly, Bela; Cavanagh, Mark S.; Lane, John D.; Shields, Kent V.; and Dingle, Philip J. G., to Cummins Engine Company, Inc.; and Lucas Industries PLC. Compact pin-within-a-sleeve three-way valve. 5,497,806, Cl. 137-625.650.
Swartz, John F.; Ockuly, John D.; Fleischhacker, John J.; and Hassett, James A., to Daig Corporation. Guiding introducer for left atrium. 5,497,774, Cl. 128-658.000.
Swartz, Robert G.: *See*—
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Swierczek, Stephen A., to Eastman Kodak Company. Apparatus and method for measuring the length and width of a spot of light utilizing two different masks. 5,499,094, Cl. 356-121.000.
Swisshelm, Charles T. Metalwood with raised sole. 5,497,995, Cl. 273-172.000.
Switlik, Stanley. Apparatus for reducing drag. 5,498,059, Cl. 296-180.100.
Symphony Group International Co., Ltd.: *See*—
Yu, Chien-Chun, 5,497,825, Cl. 165-11.100.
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Schlapfer, Johannes F.; Hess, Martin; Woreth, Roland; Tanner, Peter; and Weigum, Hans, 5,498,264, Cl. 606-72.000.
Szakacs, George: *See*—
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Szepesi, Thomas; and Santo, Hendrik, to National Semiconductor Corporation. Short circuit frequency shift circuit for switching regulators. 5,498,995, Cl. 327-538.000.
Tabata, Masaaki, to Sumitomo Wiring Systems, Ltd. Electrical wire connecting fixture. 5,498,178, Cl. 439-762.000.
Tabor, Stanley; and Richardson, Charles C., to President and Fellows of Harvard College. DNA sequencing with pyrophosphatase. 5,498,523, Cl. 435-6.000.
Taccetti, José M.: *See*—
Jackson, Robert H.; Freund, Henry P.; Pershing, Dean E.; and Taccetti, José M., 5,499,255, Cl. 372-2.000.
Tachi-S Co., Ltd.: *See*—
Kawasaki, Kiyoshi, 5,497,720, Cl. 112-153.000.
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Tachi, Shinichi: *See*—
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Taguchi, Takeyasu; Naito, Toshiharu; Tokuda, Hiromi; Inoue, Yuuichi; Fujimoto, Shusaku; and Fujiwara, Kenji, to Nippondenso Co., Ltd. Tire air pressure detecting device. 5,497,657, Cl. 73-146.200.
Tahara, Hisashi: *See*—
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Taiho Kogyo Co., Ltd.: *See*—
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Tajima, Tukasa: *See*—
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Takada, Akio: *See*—
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Takada, Kunio; Otani, Kenji; and Tanaka, Sadashi, to Hitachi, Ltd. Drainage water pumping station and method for operating the same. 5,498,105, Cl. 405-52.000.
Takada, Toshihiro: *See*—
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Takada, Yoshinori; Marumoto, Mitsuhiro; and Sasaki, Kouzou, to Mitsubishi Cable Industries, Ltd. Alloy for negative electrode of lithium secondary battery and lithium secondary battery. 5,498,495, Cl. 429-219.000.
Takafuji, Yutaka: *See*—
Tsubota, Koujiro; Fujioka, Kazuyohsi; Yoshimura, Yohji; Ohgami, Hiroyuki; Takafuji, Yutaka; Nomura, Katsumi; Kubo, Masumi; and Kamei, Hirokazu, 5,499,127, Cl. 359-80.000.
Takagawa, Hiroyuki; Tsubaki, Yasuhiro; Miyairi, Yoshio; Hattori, Toshio; and Hagiwara, Haruo, to Mitsubishi Jukogyo Kabushiki Kaisha. Method of washing and drying clothes. 5,498,266, Cl. 8-142.000.
Takagi, Masatoshi; Miyagi, Hidekazu; Ohgomori, Yuji; and Iwane, Hiroshi, to Mitsubishi Chemical Corporation. Method of producing aromatic carbonate. 5,498,789, Cl. 558-270.000.
Takagi, Tadao: *See*—
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Takahashi, Akio: *See*—
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Takahashi, Akira: *See*—

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Takahashi, Hiroaki: *See—*
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Takahashi, Hironori; Urakami, Tsuneyuki; Aoshima, Shinichiro; and Hirano, Isuke, to Hamamatsu Photonics K.K. System for measuring timing relationship between two signals. 5,499,190, Cl. 364-481.000.
Takahashi, Keiichiro: *See—*
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Takahashi, Kyo, to Japan Radio Co., Ltd. Adaptive equalizer capable of compensating for carrier frequency offset. 5,499,268, Cl. 375-231.000.
Takahashi, Makoto; Hatori, Fumitoshi; Nogami, Kazutaka; and Uchida, Masanori, to Kabushiki Kaisha Toshiba. Field programmable gate array. 5,498,978, Cl. 326-38.000.
Takahashi, Masaharu; and Narumi, Manabu, to Shin-Etsu Chemical Co., Ltd. Silicone rubber compositions and method for making. 5,498,660, Cl. 524-730.000.
Takahashi, Nahoko: *See—*
Shoji, Tadao; Takahashi, Nahoko; Ikushima, Naoya; Uryu, Toshiyuki; Yoshida, Takashi; Yamamoto, Naoki; Nakashima, Hideki; Katsuraya, Kaname; Adachi, Koichiro; and Kataoka, Fusayo, 5,498,602, Cl. 514-25.000.
Takahashi, Nobuo: *See—*
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Takahashi, Tsugio; Fujita, Hitoshi; and Okamoto, Hiroshi, to NEC Corporation. Residue circuit. 5,499,202, Cl. 364-761.000.
Takahashi, Yasuhito; and Tsujimura, Ayumu, to Matsushita Electric Industrial Co., Ltd. Semiconductor laser and a method for fabricating the same. 5,499,260, Cl. 372-46.000.
Takahashi, Yusuke: *See—*
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Takahashi, Yuzo: *See—*
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Takamura, Zenichi; Yano, Yuji; and Sato, Yasuo, to Kuroda Precision Industries, Ltd. Fluid/electrical rotary joint. 5,498,163, Cl. 439-13.000.
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Takano, Yoshishige: *See—*
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Ito, Kozo; and Takano, Yoshishige, 5,498,483, Cl. 428-552.000.
Takashi, Ishimaru, to Ogura Clutch Co., Ltd. Electromagnetic clutch slip protection system. 5,497,870, Cl. 192-84.00C.
Takashima, Daisaburo: *See—*
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Takata Corporation: *See—*
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Takatsuki, Toyohiko; and Kiriu, Nobutaka, to Zojirushi Corporation. Filler caps for insulated urns and thermal containers. 5,497,892, Cl. 215-309.000.
Takaya, Masami; and Nishibayashi, Hideo, to Colin Corporation. Pulse wave detecting apparatus. 5,497,779, Cl. 128-672.000.
Takayama, Toshio: *See—*
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Takayanagi, Makoto: *See—*
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Mitsudera, Hiroyuki; Konobe, Masato; Ishida, Yasuo; and Matsuura, Kazuho, 5,498,774, Cl. 504-246.000.
Sohda, Takashi; Fujisawa, Yukio; Yasuma, Tsuneo; Mizoguchi, Junji; Kori, Masakuni; and Takizawa, Masayuki, 5,498,728, Cl. 548-493.000.
Sugawara, Tohru; and Kato, Shinji, 5,499,193, Cl. 364-500.000.
Takeda, Katsumi: *See—*
Azuma, Nobuo; Furuhata, Takashi; Takeda, Katsumi; and Takahashi, Hiroaki, 5,499,145, Cl. 360-33.100.
Takeda, Ken'ichi. Lens cleaner for a disk player. 5,499,228, Cl. 369-71.000.
Takeda, Shinichi: *See—*
Kawai, Tatsundo; Hamamoto, Osamu; Takeda, Shinichi; Itabashi, Satoshi; and Iso, Toshimitsu, 5,499,112, Cl. 358-475.000.
Takeda, Yoshinobu: *See—*
Horimura, Hiroyuki; Okamoto, Kenji; Minemi, Masahiko; Kaji, Toshihiko; Takano, Yoshishige; and Takeda, Yoshinobu, 5,498,393, Cl. 419-28.000.
Takegahara, Hidefumi: *See—*
Sunamura, Kazuhiro; Takegahara, Hidefumi; and Hirata, Toichi, 5,497,805, Cl. 137-596.160.
Takemae, Yoshihiro: *See—*
Niimi, Makoto; Ito, Shigemasa; Yamada, Toyonobu; Takemae, Yoshihiro; and Kato, Yoshiharu, 5,499,213, Cl. 365-222.000.
Takenaka, Masahiko; Torii, Naoya; Hasebe, Takayuki; and Akiyama, Ryota, to Fujitsu Limited. Modular arithmetic operation system. 5,499,299, Cl. 380-28.000.
Takeshita, Kenji; Kanai, Nobuo; and Kageyama, Hitoshi, to Minolta Co., Ltd. Image forming apparatus with optical element support structure. 5,499,045, Cl. 347-257.000.
Takeuchi, Esther S.; and Thiebolt, William C., III, to Wilson Greatbatch Ltd. Preparation of silver vanadium oxide cathodes using AG20 and V205 as starting materials. 5,498,494, Cl. 429-219.000.
Takeuchi, Kunio; Tamura, Takao; and Tashiro, Hironori, to Idemitsu Petrochemical Co., Ltd. Process of producing α-olefin. 5,498,735, Cl. 556-187.000.
Takeuchi, Masaki; Yamamoto, Akira; and Endo, Mikio, to Shin-Etsu Chemical Co., Ltd. Method for introducing hydrocarbons into chlorosilanes. 5,498,739, Cl. 556-478.000.
Takeuchi, Takashi: *See—*
Ito, Tamotsu; Oda, Toshiyuki; Takeuchi, Takashi; and Funato, Shiyouichirou, 5,499,221, Cl. 369-32.000.
Takeuchi, Teruo: *See—*
Yoshikawa, Yoshio; Inoue, Yoshiaki; Yoshino, Isamu; and Takeuchi, Teruo, 5,497,937, Cl. 228-205.000.
Takezawa, Daisuke: *See—*
Poovaiah, Bachettira W.; Takezawa, Daisuke; Han, Tae-Jin; and An, Gynheung H., 5,498,533, Cl. 435-172.300.
Takigawa, Akio; Hirayama, Naoto; and Kitaoka, Masaki, to Nippon Sheet Glass Co., Ltd. Coated plastic molded articles. 5,498,475, Cl. 428-334.000.
Takizawa, Masayuki: *See—*
Sohda, Takashi; Fujisawa, Yukio; Yasuma, Tsuneo; Mizoguchi, Junji; Kori, Masakuni; and Takizawa, Masayuki, 5,498,728, Cl. 548-493.000.
Takuma, Yasuo: *See—*
Matsuno, Junichi; Obata, Shigeru; Takuma, Yasuo; Miwa, Masato; and Uno, Kazuo, 5,499,086, Cl. 355-274.000.
Taligent, Inc.: *See—*
Pettus, Christopher E., 5,499,343, Cl. 395-200.200.
Tamai, Shinzo: *See—*
Fujii, Toshiyuki; Tamai, Shinzo; Naitoh, Hatsuhiko; and Toki, Naohiro, 5,498,955, Cl. 324-76.770.
Tamai, Yoshin: *See—*
Torihara, Masahiro; and Tamai, Yoshin, 5,498,799, Cl. 568-354.000.
Tamakoshi, Akira, to NEC Corporation. Protection circuit. 5,499,152, Cl. 361-56.000.
Tamao, Kohei; and Yamaguchi, Shigehiro, to Shin-Etsu Chemical Co., Ltd. 2,5-reactive substituent group-containing siloles, silole polycondensates and preparation thereof. 5,498,736, Cl. 556-406.000.
Tamaru, Tsuyoshi: *See—*
Nishitani, Eisuke; Tsuzuku, Susumu; Kobayashi, Shigeru; Kasahara, Osamu; Nezu, Hiroki; Ishino, Masakazu; and Tamaru, Tsuyoshi, 5,498,768, Cl. 437-192.000.
Tamata, Shin: *See—*
Matsuda, Masami; Nishi, Takashi; Kikuchi, Makoto; Izumida, Tatsuo; Tamata, Shin; and Kiuchi, Yoshimasa, 5,498,828, Cl. 588-252.000.
Tame, Omar D.: *See—*
Severini, Joseph A.; Yee, Daniel C. L.; Tame, Omar D.; Plaza, Shelly M.; Gravenstruter, Noel P.; Jovan, Dragi; Susko, Thomas J.; and Schulte, Steven A., 5,498,052, Cl. 296-65.100.
Tamiya, Hideaki, to Sony Magnescale Inc. Optical instrument and measurement for measuring displacement of scale using different order diffraction of a diffraction grating. 5,499,096, Cl. 356-356.000.
Tamura, Takao: *See—*
Takeuchi, Kunio; Tamura, Takao; and Tashiro, Hironori, 5,498,735, Cl. 556-187.000.
Tamura, Yasuaki: *See—*
Senuma, Takeo; Ina, Shinichiro; Nakazawa, Hiroshi; Tamura, Yasuaki; Mano, Kunihiko; Nakamura, Fumio; Ishikawa, Munenori; and Kubo, Yoshiharu, 5,498,867, Cl. 250-231.180.
Tamura, Yumiko: *See—*



Sakata, Yushi; Tamura, Yumiko; and Inokoshi, Junichi, 5,498,350, Cl. 252-8.600.
Tanada, Hideki; Sakai, Kazuya; Kajiya, Seitaro; Ohto, Norio; Horikomi, Kazutoshi; Matsubara, Akira; Shimizu, Hideshi; and Mizuchi, Akira, to Mitsui Toatsu Chemicals, Incorporated. Aminoketone derivative and use thereof. 5,498,619, Cl. 514-338.000.
Tanahashi, Asako: *See—*
Masumoto, Katuhisa; Nakamura, Akihiko; Kiyoshima, Yujiro; Sasaki, Mikio; and Tanahashi, Asako, 5,498,792, Cl. 564-164.000.
Tanaka, David D.: *See—*
Wreede, John E.; Scott, James E.; and Tanaka, David D., 5,499,118, Cl. 359-12.000.
Tanaka, Hideaki; Oba, Hiroyuki; Sato, Tomoaki; and Hasegawa, Tomohisa, to Kureha Kagaku Kogyo K.K. Gas barrier film and production process thereof. 5,498,662, Cl. 525-54.200.
Tanaka, Hiroyuki, to Fujitsu Limited. Photo-lithography apparatus and method of correcting off-telecentricity of the apparatus caused by shift of effective illumination source. 5,499,100, Cl. 356-401.000.
Tanaka, Hisatoshi: *See—*
Ohno, Tadayoshi; Yamaguchi, Takashi; Itoh, Shinichi; and Tanaka, Hisatoshi, 5,498,860, Cl. 235-384.000.
Tanaka, Naoki: *See—*
Okano, Hiroshi; Tanaka, Naoki; Shibata, Kenichi; and Takahashi, Yusuke, 5,498,920, Cl. 310-313.00A.
Tanaka, Noriyoshi: *See—*
Kamakura, Tamiji; Tanaka, Noriyoshi; Namiwa, Kimiyoshi; Tatsumi, Yukio; Namiki, Masato; and Yokobori, Hideo, 5,498,356, Cl. 252-50.000.
Tanaka, Sadashi: *See—*
Takada, Kunio; Otani, Kenji; and Tanaka, Sadashi, 5,498,105, Cl. 405-52.000.
Tanaka, Shunji; Ohtsuki, Toru; Sato, Hiroaki; Sawamoto, Hideo; Yamagata, Ryo; Watanabe, Masaya; Umeno, Hidenori; and Haraguchi, Masatoshi, to Hitachi, Ltd. Input/output execution apparatus for a plural-OS run system. 5,499,379, Cl. 395-700.000.
Tanaka, Tsutomu, to Sumitomo Wiring Systems, Ltd. Waterproof electrical connector. 5,498,170, Cl. 439-271.000.
Tanaka, Yasuyuki: *See—*
Hoshi, Hidenori; and Tanaka, Yasuyuki, 5,499,104, Cl. 358-341.000.
Taniguchi, Masayuki: *See—*
Yabusa, Kazuya; Kato, Takeo; Aizawa, Tetsuo; and Taniguchi, Masayuki, 5,498,385, Cl. 264-171.230.
Tanioka, Miya: *See—*
Hirao, Hirohiko; Kikukawa, Yoshimasa; Okamoto, Toshihiro; Murai, Takayuki; Sogabe, Seiji; Tanioka, Miya; Nakayama, Rie; and Yoshioka, Takashi, 5,498,301, Cl. 148-269.000.
Tank, Klaus; Tomlinson, Peter N.; Martell, Trevor J.; Lloyd, Andrew I.; and Olmstead, Bruce R. Composite diamond abrasive compact. 5,498,480, Cl. 428-408.000.
Tanner, Conrad W.: *See—*
Pearson, David P.; and Tanner, Conrad W., 5,497,923, Cl. 224-253.000.
Tanner, Darrell R.: *See—*
Kline, Robert C., Jr.; Clements, Emory C.; Krehbiel, Gretchen L.; Tanner, Darrell R.; Strilich, James A.; and Chappell, David A., 5,499,188, Cl. 364-468.000.
Tanner, Peter: *See—*
Schlapfer, Johannes F.; Hess, Martin; Woreth, Roland; Tanner, Peter; and Weigum, Hans, 5,498,264, Cl. 606-72.000.
Tanoi, Satoru, to Oki Electric Industry Co., Ltd. Level shifter circuit. 5,498,991, Cl. 327-333.000.
Tanzer, Herbert J.; Quon, William; and Hall, John T., to Hughes Aircraft Company. Ducted air-cooled secondary of automobile battery charging transformer. 5,499,185, Cl. 363-126.000.
Tapang, Carlos C. Geodesic igloo constructor. 5,497,974, Cl. 249-74.000.
Tarnoff, David, to Golf Zone, Inc., The. Automatic golf spike replacer. 5,497,523, Cl. 7-138.000.
Tarnow, Ferdinand: *See—*
Schröter, Hans-Jürgen; Heimbach, Heinrich; Henning, Klaus-Dirk; Knoblauch, Karl; Berndt, Alfons S.-S.; and Tarnow, Ferdinand, 5,498,589, Cl. 502-416.000.
Tarnus, Céline: *See—*
Neises, Bernhard; Ganzhorn, Axel; Tarnus, Céline; and Broersma, Robert J., Jr., 5,498,779, Cl. 514-428.000.
Tashiro, Hironori: *See—*
Takeuchi, Kunio; Tamura, Takao; and Tashiro, Hironori, 5,498,735, Cl. 556-187.000.
Tashiro, Hiroshi; Murakawa, Takaji; and Yagi, Toyoji, to Nippondenso Co., Ltd. Torque control system for internal combustion engines. 5,497,741, Cl. 123-192.100.
Tate, Aarn, to Natural Balance Design Co., The. Counter balance pockets with frame for backpacks. 5,497,922, Cl. 224-209.000.
Tate, Bruce A.; and Li, Shih-Gong, to International Business Machines Corporation. Scaled depiction of information from a database. 5,499,368, Cl. 395-600.000.
Tatsumi, Yukio: *See—*
Kamakura, Tamiji; Tanaka, Noriyoshi; Namiwa, Kimiyoshi; Tatsumi, Yukio; Namiki, Masato; and Yokobori, Hideo, 5,498,356, Cl. 252-50.000.
Taylor, Bruce L.: *See—*
Granger, Carol A.; Smith, Gary B.; and Taylor, Bruce L., 5,498,340, Cl. 210-645.000.
Taylor, Dean P.: *See—*
Berka, Thomas R.; Fornwald, James A.; Gorniak, Joselina G.; Rosenberg, Martin; Strickler, James E.; and Taylor, Dean P., 5,498,529, Cl. 435-69.100.
Taylor, John A.: *See—*
Yeung, Edward S.; and Taylor, John A., 5,498,324, Cl. 204-452.000.
Taylor, John M.: *See—*
McLaughlin, Michael D.; Signa, John C.; Greicar, Richard K.; and Taylor, John M., 5,499,040, Cl. 345-146.000.
TDK Corporation: *See—*
Handa, Tokuhiko; Inaba, Ryo; Haratani, Susumu; and Tominaga, Junji, 5,498,507, Cl. 430-273.100.
Ikebe, Masaru; Shiba, Haruo; Miyazaki, Yukio; Sasaki, Morimasa; and Katoh, Hisao, 5,498,456, Cl. 428-66.600.
Iwatsuka, Shinji, 5,499,307, Cl. 385-11.000.
Kanemaru, Takashi; Iwasaki, Takaaki; Saito, Toshio; Suda, Shigeaki; and Kitagawa, Takeo, 5,498,360, Cl. 252-62.560.
Matsukawa, Atsuhito; and Inoue, Shoji, 5,498,361, Cl. 252-62.620.
Tebbetts, John B. Cartilage and graft palette. 5,498,257, Cl. 606-1.000.
Tecnol Medical Products, Inc.: *See—*
Inman, J. D.; and Ward, C. E., Jr., 5,497,788, Cl. 128-888.000.
Tecumseh Products Company: *See—*
Dreiman, Nelik I.; and Richardson, Hubert, Jr., 5,498,143, Cl. 418-55.100.
Teetaert, Pierre E.: *See—*
Cappon, Wilfried J. M.; Teetaert, Pierre E.; Naaktgeboren, Adrianus; and Muijs, Cornelis G. M., 5,498,207, Cl. 460-119.000.
Teijin Limited: *See—*
Matsumoto, Mitsuo; Takahashi, Nobuo; Ohwaki, Shinji; Fujimoto, Kazushi; and Iohara, Koh-ichi, 5,497,608, Cl. 57-207.000.
Telefonaktiebolaget L M Ericsson: *See—*
Karlsson, Bror Å., 5,499,386, Cl. 455-33.200.
Telefonaktiebolaget LM Ericsson: *See—*
Chambert, William R. G., 5,499,387, Cl. 455-33.200.
Haulin, Tord, 5,498,972, Cl. 324-765.000.
Kjebon, Fredrik E., 5,498,968, Cl. 324-627.000.
Victorin, John A., 5,499,389, Cl. 455-119.000.
Wedin, Annette G.; Hallenfur, Lars-Erik; Bertilsson, Lars Y.; and Karlsson, Jan-Erik, 5,498,168, Cl. 439-95.000.
Televerket: *See—*
Brusewitz, Harald, 5,499,251, Cl. 371-37.100.
Temmyo, Minoru: *See—*
Kojima, Takao; Temmyo, Minoru; and Kishimoto, Takuya, 5,497,634, Cl. 62-441.000.
Templeman, Douglas D.; and Weiss, Melvyn, to Rockwell International Corporation. Majority voted two fault tolerant power switch. 5,498,912, Cl. 307-115.000.
Teng, Min: *See—*
Chandraratna, Roshantha A.; and Teng, Min, 5,498,755, Cl. 564-272.000.
Tenryu Technics Co., Ltd.: *See—*
Fujioka, Teruhiko, 5,497,983, Cl. 269-155.000.
Teratoko, Ryuji: *See—*
Mochizuki, Kousuke; and Teratoko, Ryuji, 5,497,796, Cl. 132-201.000.
Terayama, Koji: *See—*
Matsuda, Yutaka; Moriue, Hiroo; Hashimoto, Kyosuke; Akimoto, Mitsuru; Hirano, Seiji; Michihira, Osamu; Terayama, Koji; Sakamoto, Hiroaki; and Umegaki, Koji, 5,499,247, Cl. 370-85.300.
Terrapin Corporation: *See—*
Kelley, David C.; Cisneros, Joseph; and Greenbaum, Louis A., 5,499,032, Cl. 342-357.000.
Terry, Carol A.: *See—*
Blake, Kenneth A.; Rupe, Chauncey O.; and Terry, Carol A., 5,498,547, Cl. 436-111.000.
Terry, John B.; Warwick, Alastair A.; and Anderson, Carl W. C., to Northern Telecom Limited. Distribution network comprising coax and optical fiber paths for transmission of television and additional signals. 5,499,047, Cl. 348-6.000.
Terumo Kabushiki Kaisha: *See—*
Katsurada, Naoki; Wakabayashi, Sobei; Hashimukai, Tomoko; and Omura, Yoshitaka, 5,498,336, Cl. 210-496.000.
Tesch, Helmut: *See—*
Pohl, Siegmund; Lehrich, Friedhelm; Genz, Manfred; Bruchmann, Bernd; Tesch, Helmut; Minges, Roland; and Streu, Joachim, 5,498,747, Cl. 560-25.000.
Tetra Laval Holdings & Finance S.A.: *See—*
Bengtsson, Jörgen, 5,498,149, Cl. 425-387.100.
Nedstedt, Ulf, 5,498,225, Cl. 493-87.000.
Texaco Inc.: *See—*
Dai, Pei-Shing E.; and Sherwood, David E., Jr., 5,498,586, Cl. 502-313.000.
Khan, Motasimur R.; Albert, Christine C.; and DeCanio, Stephen J., 5,498,827, Cl. 588-213.000.
Stuebinger, Lon A.; Bowlin, Kevin R.; and Pardo, Carlos W., 5,497,832, Cl. 166-369.000.
Texas Instruments Incorporated: *See—*
Bishop, Robert P.; Hainey, Paul L.; Lukasiewicz, Stanley J.; Siuzdak, Allan J.; Luminello, Robert E., Jr.; and Shukla, Vishwa N., 5,499,158, Cl. 361-283.400.
Donahue, Daniel M.; and Cone, Dale A., 5,499,146, Cl. 360-33.100.

Elnashar, Khodor S.; Cantrell, Jay T.; and Saperstein, William, 5,499,344, Cl. 395-250.000.
Gopinathan, Venugopal; and Izzard, Martin J., 5,498,982, Cl. 326-126.000.
Gove, Robert J.; Meyer, Richard C.; and Markandey, Vishal, 5,499,060, Cl. 348-651.000.
Hotchkiss, Gregory; Levine, Jules D.; and Sharrock, Paul R., 5,498,576, Cl. 437-209.000.
Houston, Theodore W., 5,498,882, Cl. 257-57.000.
Komatsuzaki, Katsuo; Kawamura, Masayasu; and Iwai, Hidetoshi, 5,498,897, Cl. 257-413.000.
Kuwano, Hiromichi; and Tahara, Hisashi, 5,499,028, Cl. 341-159.000.
Mei, Chia-Cu P., 5,498,554, Cl. 437-34.000.
Miyaguchi, Hiroshi, 5,499,375, Cl. 395-800.000.
Smith, Richard G., Jr.; and Gee, Calvin L., 5,499,035, Cl. 343-789.000.
Urbanus, Paul M., 5,499,062, Cl. 348-771.000.

Thayn, Corey S.: *See*—
Pastusek, Paul E.; and Thayn, Corey S., 5,497,842, Cl. 175-334.000.

Theard, Leslie P.: *See*—
Wang, James H.; Kurkov, Victor P.; Theard, Leslie P.; and Rosendale, David, 5,498,785, Cl. 525-371.000.

Theisen, Terry J.; Dumoit, Joe D.; and Denning, David M. Sight indicator. 5,497,725, Cl. 116-277.000.

Theodore, N. David: *See*—
Steele, John W.; de Frésart, Edouard; and Theodore, N. David, 5,498,578, Cl. 437-235.000.

Thermal Electric Devices, Inc.: *See*—
Stein, Charles; and Redding, Edward M., 5,497,630, Cl. 62-112.000.

ThermoTrex Corporation: *See*—
Pellegrino, Anthony J.; Defreitas, Kenneth F.; Lyke, Daniel N.; and Schutz, Richard P., 5,499,284, Cl. 378-198.000.

Theys, Ezra E.: *See*—
Heiskell, Ronald E.; and Theys, Ezra E., 5,497,939, Cl. 229-23.00R.

Thiebolt, William C., III: *See*—
Takeuchi, Esther S.; and Thiebolt, William C., III, 5,498,494, Cl. 429-219.000.

Thiemeier, Thomas, to Hoechst Aktiengesellschaft. Ceramic valve for internal combustion engines having a reduced tendency to stress fracture. 5,497,740, Cl. 123-188.130.

Thies, Konrad: *See*—
Möller, Dieter; Thies, Konrad; Schmidt, Willi; Gerbel, Daniel; and Etzenbach, Joachim, 5,498,074, Cl. 366-94.000.

Thiokol Corporation: *See*—
Guillot, David G., 5,498,649, Cl. 524-100.000.
Highsmith, Thomas K.; Edwards, W. Wayne; and Wardle, Robert B., 5,498,711, Cl. 540-546.000.
Hinshaw, Carol J.; Wardle, Robert B.; and Highsmith, Tom K., 5,498,303, Cl. 149-19.600.

Thirion, Jean-Philippe; Ayache, Nicholas; Monga, Olivier; and Gourdon, Alexis, to Inria Institut National de Recherche en Informatique et en Automatique. Device for processing three-dimensional image information, with extraction of significant lines. 5,499,322, Cl. 395-118.000.

Thoen, Paul M.: *See*—
Noble, Richard D.; Thoen, Paul M.; and Koval, Carl A., 5,498,823, Cl. 585-818.000.

Thomann, Mark R.: *See*—
Ingalls, Charles L.; and Thomann, Mark R., 5,499,250, Cl. 371-28.000.

Thomas, Craig E.: *See*—
Carr, Albert A.; Thomas, Craig E.; Bernotas, Ronald C.; and Ku, George, 5,498,778, Cl. 514-309.000.

Thomas, Daniel D.: *See*—
Leite, Sara M.; Thomas, Daniel D.; Brown, Gair D.; and Schwarting, Alan, 5,499,314, Cl. 385-135.000.

Thomas, Robert M., to Chrysler Corporation. Steering column assembly. 5,498,032, Cl. 280-777.000.

Thompson, Hugh: *See*—
Burshaw, Ron; Thompson, Hugh; and Brownrigg, Geoff, 5,497,570, Cl. 38-140.000.

Thompson, John R.: *See*—
Wirsig, Ralph C.; and Thompson, John R., 5,497,909, Cl. 222-82.000.

Thompson, Leo J.; Dubberly, Gregory T.; Ritchie, John A., Jr.; and Fellows, David M., to Scientific-Atlanta, Inc. Broadband communications system. 5,499,241, Cl. 370-73.000.

Thomson Consumer Electronics, Inc.: *See*—
Pugel, Michael A., 5,499,056, Cl. 348-73.000.

Thomson, Gordon A., to Zeneca Limited. Triphenodioxazine dyes. 5,498,712, Cl. 544-76.000.

Thomson, John, Jr.: *See*—
Bell, Randall F.; Kochanski, Gregory P.; and Thomson, John, Jr., 5,498,925, Cl. 313-497.000.

Thornton, Julian C.; and Kay, William W., to University of Victoria. Attenuated strains of *Aeromonas salmonicida* useful as fish vaccines. 5,498,414, Cl. 424-234.100.

TIF Instruments, Inc.: *See*—
Liebermann, Leonard; and Salzmann, Philip, 5,498,873, Cl. 250-343.000.

Tiggeloven, Leonardus J. A.: *See*—
Van Ochten, Sander A.; and Tiggeloven, Leonardus J. A., 5,499,390, Cl. 452-122.000.

Tilley, Mary W.: *See*—
Zingle, Ralph D.; Tilley, Mary W.; and Mead, William L., 5,497,942, Cl. 239-6.000.

Timmermeyer, Ronald E., Sr.; and Zarp, Susan K. Sun rise lotion. 5,498,637, Cl. 424-195.100.

Timmons, Kenneth J.: *See*—
Kruger, Robert J.; Frederick, Warren P.; Helgren, R. Hayes; Larkin, Mark E.; Mayoral, Joaquin; Schmolesky, Brad A.; Siczek, Roman W.; and Timmons, Kenneth J., 5,498,338, Cl. 210-641.000.

Timmons, Terry K.: *See*—
McDowall, Debra J.; Sawyer, Lawrence H.; Strack, David C.; and Timmons, Terry K., 5,498,463, Cl. 428-198.000.

Tingley, Daniel A. Surface treated synthetic reinforcement for structural wood members. 5,498,460, Cl. 428-96.000.

Tinti, Maria O.: *See*—
Santaniello, Mosè; Tinti, Maria O.; Misiti, Domenico; and Foresta, Piero, 5,498,633, Cl. 514-547.000.

Tinti, Marie O.: *See*—
Santaniello, Mosè; Tinti, Marie O.; Misiti, Domenico; and Foresta, Piero, 5,498,632, Cl. 514-547.000.

TLG plc: *See*—
Bedocs, Lou, 5,498,931, Cl. 315-158.000.

Todo, Yoshinori; Sakamoto, Masami; Ushijima, Noriaki; Sonoda, Akira; Miura, Yukio; and Araki, Kyousuke, to Director-General of Agency of Industrial Science and Technology. Robot which is capable of receiving impact load. 5,498,121, Cl. 414-719.000.

Tohda, Takao: *See*—
Kado, Hiroyuki; and Tohda, Takao, 5,497,656, Cl. 73-105.000.

Toho Titanium Co., Ltd.: *See*—
Hosaka, Motoki; Goto, Kenji; and Matsuo, Masahiko, 5,498,770, Cl. 502-116.000.

Tojo, Masaaki; Kurata, Noboru; and Souda, Hironori, to Matsushita Electric Industrial Co., Ltd. Optical passive components. 5,499,132, Cl. 359-281.000.

Tokai Kogyo KK: *See*—
Ito, Toshikazu; and Suita, Yoshihiro, 5,498,391, Cl. 264-252.000.

Toki, Naohiro: *See*—
Fujii, Toshiyuki; Tamai, Shinzo; Naitoh, Hatsuhiko; and Toki, Naohiro, 5,498,955, Cl. 324-76.770.

Toki, Yusuke, to Kabushiki Kaisha Toshiba. Method and apparatus for helical scan imaging in X-ray computed tomography. 5,499,283, Cl. 378-146.000.

Tokico, Ltd.: *See*—
Oikawa, Hirotaka; and Takayama, Toshio, 5,498,071, Cl. 303-149.000.

Toko America, Inc.: *See*—
Erisman, Brian P., 5,499,176, Cl. 363-21.000.

Tokuda, Hiromi: *See*—
Taguchi, Takeyasu; Naito, Toshiharu; Tokuda, Hiromi; Inoue, Yuuichi; Fujimoto, Shusaku; and Fujiwara, Kenji, 5,497,657, Cl. 73-146.200.

Tokutake, Nobuo: *See*—
Nakao, Taku; Yamazaki, Hiroyuki; Tokutake, Nobuo; Saito, Masato; Kohara, Hidekatsu; and Nakayama, Toshimasa, 5,498,514, Cl. 430-512.000.

Tokyo Electron Kyushu Limited: *See*—
Matsushita, Michiaki; and Yamahira, Yutaka, 5,498,294, Cl. 134-6.000.

Tokyo Electron Limited: *See*—
Matsushita, Michiaki; and Yamahira, Yutaka, 5,498,294, Cl. 134-6.000.

Tokyo Ohka Kogyo Co., Ltd.: *See*—
Nakao, Taku; Yamazaki, Hiroyuki; Tokutake, Nobuo; Saito, Masato; Kohara, Hidekatsu; and Nakayama, Toshimasa, 5,498,514, Cl. 430-512.000.
Uchikawa, Kiyoshi; Komano, Hiroshi; Aoyama, Toshimi; and Ohta, Katsuyuki, 5,498,498, Cl. 430-7.000.

Tokyo Pet Kabushiki Kaisha: *See*—
Watanabe, Kenichi, 5,497,728, Cl. 119-17.000.

Tolley, Philip A.; and Walker, Kraig A. Golf distance marker. 5,497,988, Cl. 273-32.00H.

Tominaga, Junji: *See*—
Handa, Tokuhiko; Inaba, Ryo; Haratani, Susumu; and Tominaga, Junji, 5,498,507, Cl. 430-273.100.

Tominaga, Michiaki: *See*—
Ogawa, Hidenori; Kondo, Kazumi; Yamashita, Hiroshi; Kan, Keizo; Tominaga, Michiaki; and Yabuuchi, Yoichi, 5,498,609, Cl. 514-213.000.

Tomita, Masaharu: *See*—
Kuwabara, Tatsuyuki; Tomita, Masaharu; Nagamura, Kiyotaka; Nakamura, Takao; Yoshida, Shin'ichi; Miyata, Souichi; and Muramatsu, Tsuyoshi, 5,499,347, Cl. 395-311.000.

Tomlinson, Peter N.: *See*—
Tank, Klaus; Tomlinson, Peter N.; Martell, Trevor J.; Lloyd, Andrew I.; and Olmstead, Bruce R., 5,498,480, Cl. 428-408.000.

Tomlinson, Richard S. Adjustable knock down chair. 5,498,054, Cl. 297-16.200.

Tomoegawa Paper Co., Ltd.: *See*—
Nishida, Kiyoshi; Sugiyama, Tsutomu; Funato, Katsuro; and Hattori, Kenzi, 5,498,479, Cl. 428-403.000.

Tomono, Kunisaburo: *See*—
Marusawa, Hiroshi; Kawanami, Takashi; Konoike, Takehiro; and Tomono, Kunisaburo, 5,498,999, Cl. 333-1.100.

Toppan Printing Co., Ltd.: *See*—
Yabusa, Kazuya; Kato, Takeo; Aizawa, Tetsuo; and Taniguchi, Masayuki, 5,498,385, Cl. 264-171.230.



Torihara, Masahiro; and Tamai, Yoshin, to Kuraray Co., Ltd. Process for producing optically active 2-norbornanone. 5,498,799, Cl. 568-354.000.

Torii, Naoya: *See*—
Takenaka, Masahiko; Torii, Naoya; Hasebe, Takayuki; and Akiyama, Ryota, 5,499,299, Cl. 380-28.000.

Torizuka, Koichi: *See*—
Maruyama, Jun; Iida, Kazuyuki; Torizuka, Koichi; Hizatate, Shoji; Sano, Hidekazu; and Ikeda, Mitsuhiro, 5,498,772, Cl. 503-216.000.

Toro Company, The: *See*—
Lonn, Dana R., 5,497,604, Cl. 56-10.20H.

Tortelli, Vito: *See*—
Navarrini, Walter; Tortelli, Vito; Colaianna, Pasqua; and Abusleme, Julio A., 5,498,682, Cl. 526-247.000.

Torvick, Curt D.: *See*—
Hull, Harold L.; and Torvick, Curt D., 5,497,733, Cl. 119-793.000.

Toska Co., Ltd.: *See*—
Kubota, Mikio, 5,497,930, Cl. 227-67.000.

TOSOH Corporation: *See*—
Hanasaki, Yasuaki; Tsukuda, Kazuaki; Watanabe, Hiroyuki; Tsuzuki, Kenji; Murakami, Mitsuyuki; and Niimi, Noritoshi, 5,498,593, Cl. 504-264.000.

Tosoni, Isidoro, to Effezeta S.r.l. Office armchair body which can be dismantled. 5,498,065, Cl. 297-440.210.

Tousley, Sylvia R. R.: *See*—
Bailey, Michael E.; Dang, Dinh; Michael, James G.; Neary, Timothy E.; Pastel, Paul W.; Tousley, Sylvia R. R.; and Winslow, Arthur C., 5,498,313, Cl. 156-643.100.

Townsend, Charles P., to Townsend Croquet Limited. Animated finger puppet. 5,498,189, Cl. 446-100.000.

Townsend Croquet Limited: *See*—
Townsend, Charles P., 5,498,189, Cl. 446-100.000.

Toya, Kazutoshi: *See*—
Nishii, Hiroyuki; Kobayashi, Masaru; Toya, Kazutoshi; and Uchiyama, Nobuo, 5,498,447, Cl. 437-213.000.

Toyne, Kenneth J.: *See*—
McDonnell, Damien G.; Day, Sally E.; Coates, David; Jenner, John A.; Hird, Michael; and Toyne, Kenneth J., 5,498,366, Cl. 252-299.600.

Toyo Boseki Kabushiki Kaisha: *See*—
Kuze, Katsuaki; Nagano, Hiroshi; Ohta, Saburoh; Mori, Kuniharu; and Isaka, Tsutomu, 5,498,454, Cl. 428-35.900.

Toyoda Gosei Co., Ltd.: *See*—
Ohashi, Tamiyoshi; Kasugai, Joji; and Nagino, Yoshihiro, 5,497,800, Cl. 137-110.000.

Toyokoki Co., Ltd.: *See*—
Nagakura, Seiju, 5,497,647, Cl. 72-389.300.

Toyokura, Masaki: *See*—
Araki, Toshiyuki; Aono, Kunitoshi; and Toyokura, Masaki, 5,499,348, Cl. 395-375.000.

Toyota Jidosha Kabushiki Kaisha: *See*—
Carlin, Mark; McCuskey, James G.; and Sugiyama, Koichi, 5,498,028, Cl. 280-735.000.
Nagaosa, Hideo; Mogi, Kazuhisa; Kushibe, Takahiro; Nakamura, Norihiko; and Nomura, Kenichi, 5,497,744, Cl. 123-297.000.
Ohtake, Yukio, 5,497,751, Cl. 123-479.000.
Osanai, Akinori, 5,497,757, Cl. 123-674.000.
Yamada, Jun; Kanehara, Kenji; Igashira, Toshihiko; Morishima, Shingo; Takada, Toshihiro; and Hirayama, Hiroshi, 5,497,619, Cl. 60-279.000.

Tracy, Lawrence; Dorando, Dale; and Eggers, Frederick, to C & K Systems, Inc. Intrusion detector test circuit which automatically disables a detected-event indicator. 5,499,012, Cl. 340-514.000.

Traczyk, Edward S.: *See*—
Caleffi, Antonio; Ames, T. William; Traczyk, Edward S.; and Naggert, Dietrich K., 5,497,900, Cl. 220-656.000.

TransTech Resources, Inc.: *See*—
Warren, Oscar E.; Armstrong, Walter N.; and Beard, Bob J., 5,497,857, Cl. 188-4.00R.

Trapasso, Louis E.; Padegimas, Stanley J.; Epstein, Peter F.; Hung, Paul L. K.; Mukhopadhyay, Purnendu; and Meisel, Philip L., to CPS Chemical Company, Inc. Organotin catalyzed transesterification. 5,498,751, Cl. 560-217.000.

Travis, Walton L. Ladder mounted gutter protectors. 5,497,848, Cl. 182-107.000.

Tremulis, William S.: *See*—
Bagaoisan, Celso S. J.; Shanahan, John P.; Muni, Ketan P.; Hammack, Elizabeth N.; Abrams, Robert M.; Peacock, James C., III; and Tremulis, William S., 5,498,240, Cl. 604-96.000.

Trense, Horst: *See*—
Brenner, Axel; Mertens, Peter; Meuser, Wilfried; Meyer, Friedrich; Trense, Horst; Weber, Friedrich; and Wilken, Wilfried, 5,499,219, Cl. 367-151.000.

Treuling, Walter, to Spanset Inter AG. Textile lifting sling with reinforcement. 5,498,047, Cl. 294-74.000.

Trimberger, Stephen M.: *See*—
Parlour, David B.; Goetting, F. Erich; Trimberger, Stephen M.; and Young, Edel M., 5,498,979, Cl. 326-38.000.

Tripathy, Rabindranath: *See*—
Mallamo, John P.; Bihovsky, Ron; Chatterjee, Sankar; and Tripathy, Rabindranath, 5,498,616, Cl. 514-300.000.

Trippel, Gerhard: *See*—
Steiner, Werner; and Trippel, Gerhard, 5,498,445, Cl. 427-162.000.

Trojanowicz, Marek: *See*—
Lewenstam, Andrzej; Matuszewski, Wojciech; and Trojanowicz, Marek, 5,498,323, Cl. 205-780.500.

Trotta, Robert A.; Hahn, Steve S.; Madeira, John; Chou, Chong-ping P.; and Brooks, Lamar E., to Gillette Company, The. Shaving system. 5,497,550, Cl. 30-50.000.

Trout, Jerry J.; and Borthwick, Paul G. Bicycle stand. 5,498,015, Cl. 280-293.000.

Truong, Jack G.: *See*—
Carlson, James G.; Truong, Jack G.; Anderson, Jeffrey T.; and Rotto, Nelson T., 5,498,685, Cl. 528-71.000.

TRW Inc.: *See*—
Carlin, Mark; McCuskey, James G.; and Sugiyama, Koichi, 5,498,028, Cl. 280-735.000.
Fellows, Russell T., 5,498,092, Cl. 403-12.000.

TRW Vehicle Safety Systems Inc.: *See*—
Kelley, Scott A.; and Smydra, Andrew J., 5,498,027, Cl. 280-728.300.

Tryon, John F.; Reynolds, James F.; and Buoniconti, Ralph R., Jr., to Shell Oil Company. Illuminated dispenser. 5,497,571, Cl. 40-544.000.

Tsai, Jang-Zern; and Liang, Chin-Chuan, to Industrial Technology Research Institute. Rotary head recording and reproduction apparatus with memory and method of operation which compares a reproduced signal with an original signal. 5,499,147, Cl. 360-53.000.

Tsaur, Liang S.; Slayton, Michael; and Arneson, Michael P., to Lever Brothers Company, Division of Conopco, Inc. Process for preparing capsules with structuring agents. 5,498,378, Cl. 264-4.400.

Tseng, Lyre, to Chiahuan Spring Co., Ltd. Combined hinge and electrical connector for portable computer. 5,498,165, Cl. 439-31.000.

Tsubaki, Yasuhiro: *See*—
Takagawa, Hiroyuki; Tsubaki, Yasuhiro; Miyairi, Yoshio; Hattori, Toshio; and Hagiwara, Haruo, 5,498,266, Cl. 8-142.000.

Tsubakimoto, Tsuneo: *See*—
Aoyama, Takahiro; Nakazaki, Mitsuo; Banba, Akikazu; Yoshida, Masatoshi; Matsunaga, Toshiaki; and Tsubakimoto, Tsuneo, 5,498,670, Cl. 525-217.000.

Tsuboi, Toshio; Nakatani, Munehiro; Yamada, Hirokazu; and Omura, Kunihiko, to Minolta Camera Kabushiki Kaisha. Image data processing system with still video camera and digital image forming apparatus. 5,499,113, Cl. 358-479.000.

Tsubota, Koujiro; Fujioka, Kazuyohsi; Yoshimura, Yohji; Ohgami, Hiroyuki; Takafuji, Yutaka; Nomura, Katsumi; Kubo, Masumi; and Kamei, Hirokazu, to Sharp Kabushiki Kaisha. Liquid crystal display device having a larger gap between the substrates in the display area than in the sealant area. 5,499,127, Cl. 359-80.000.

Tsuchimoto, Yoshihiro: *See*—
Matsumoto, Itsuo; Furui, Yuji; and Tsuchimoto, Yoshihiro, 5,498,274, Cl. 65-80.000.

Tsuchiyama, Masaaki: *See*—
Urano, Toshiyuki; Nagasaka, Hideki; Tsuchiyama, Masaaki; and Ide, Hiroshi, 5,498,641, Cl. 522-26.000.

Tsuda, Takashi: *See*—
Kawano, Michinao; Misaizu, Setsuo; Anzai, Tomoko; and Tsuda, Takashi, 5,499,258, Cl. 372-34.000.

Tsui, James B. Y., to United States of America, Air Force. Digital channelized IFM receiver. 5,499,391, Cl. 455-226.200.

Tsuji, Masanori, to Yazaki Corporation. Structure for thin-walled hinge. 5,498,177, Cl. 439-596.000.

Tsuji, Masaru: *See*—
Tsukamoto, Kimihide; and Tsuji, Masaru, 5,499,089, Cl. 355-290.000.

Tsujimura, Ayumu: *See*—
Takahashi, Yasuhito; and Tsujimura, Ayumu, 5,499,260, Cl. 372-46.000.

Tsukahara, Jiro; and Arakatsu, Hiroshi, to Fuji Photo Film Co., Ltd. Dye fixing element. 5,498,505, Cl. 430-213.000.

Tsukamoto, Kimihide; and Tsuji, Masaru, to Sharp Kabushiki Kaisha. Toner image fixing device with deformable cylinder. 5,499,089, Cl. 355-290.000.

Tsukuda, Kazuaki: *See*—
Hanasaki, Yasuaki; Tsukuda, Kazuaki; Watanabe, Hiroyuki; Tsuzuki, Kenji; Murakami, Mitsuyuki; and Niimi, Noritoshi, 5,498,593, Cl. 504-264.000.

Tsumura, Toshikazu: *See*—
Hiraoka, Chikara; Matsuno, Junichi; Mitani, Masao; Oda, Hiroshi; and Tsumura, Toshikazu, 5,499,087, Cl. 355-285.000.

Tsurita, Yasushi; Ito, Masumi; and Shiraga, Ken, to Mitsubishi Chemical Corporation. Oxide catalyst and process for producing maleic anhydride by using oxide catalyst. 5,498,731, Cl. 549-259.000.

Tsutano, Tomohiro: *See*—
Mizude, Kazuhiro; Ishida, Hideki; Kato, Hisahiro; and Tsutano, Tomohiro, 5,499,081, Cl. 355-208.000.

Tsuyama, Koichi: *See*—
Inoue, Masahide; Kato, Mamoru; Tsuyama, Koichi; Murata, Koji; and Aso, Yutaka, 5,499,083, Cl. 355-251.000.

Tsuzuki, Kenji: *See*—
Hanasaki, Yasuaki; Tsukuda, Kazuaki; Watanabe, Hiroyuki; Tsuzuki, Kenji; Murakami, Mitsuyuki; and Niimi, Noritoshi, 5,498,593, Cl. 504-264.000.

Tsuzuku, Susumu: *See*—
Nishitani, Eisuke; Tsuzuku, Susumu; Kobayashi, Shigeru; Kasahara, Osamu; Nezu, Hiroki; Ishino, Masakazu; and Tamaru, Tsuyoshi, 5,498,768, Cl. 437-192.000.

Tu, Mai X.; and Schwab, Michel, to Detra SA. Inductive proximity sensor with periodic switching for sensing the presence of objects. 5,498,958, Cl. 324-207.160.

Tucker, Pamela S.; and Pyun, Eumi, to Minnesota Mining and Manufacturing Company. Electrically insulating film backing. 5,498,476, Cl. 428-343.000.
Tufts University School of Medicine: *See*—
Gorbach, Sherwood L.; Goldin, Barry R.; and Aldercreutz, Herman, 5,498,631, Cl. 514-456.000.
Tumpey, John J.; Shekhawat, Sampat; Silvestro, Gayton L.; and Brogle, John J., to Allied Signal Inc. Interconnection arrangement for power semiconductor switching devices. 5,498,907, Cl. 257-724.000.
Turnbull, Robert R.; DeLisle, David J.; and Kohtz, Robert A., to Zenith Data Systems Corporation. Method and control circuit for measuring the temperature of an integrated circuit. 5,498,971, Cl. 324-760.000.
Turner, Alan: *See*—
Richards, John W.; Stone, Jonathan J.; Turner, Alan; Walters, Carl W.; Chouhan, Mukesh; and Kavanagh, Peter, 5,499,373, Cl. 395-154.000.
Tutunjian, Pierre N.: *See*—
Vinegar, Harold J.; Akkurt, Ridvan; and Tutunjian, Pierre N., 5,498,960, Cl. 324-303.000.
Twin Base Limited: *See*—
Chong, Sing-Yuen, 5,497,553, Cl. 30-162.000.
Tyler, Sean C.: *See*—
Reyes, Alberto J.; Millman, Steven D.; and Tyler, Sean C., 5,498,988, Cl. 327-199.000.
Tzeng, Guang-Nan: *See*—
Horng, Chun-Hsien; and Tzeng, Guang-Nan, 5,499,058, Cl. 348-642.000.
Ube Industries, Ltd.: *See*—
Hiraoka, Chikara; Matsuno, Junichi; Mitani, Masao; Oda, Hiroshi; and Tsumura, Toshikazu, 5,499,087, Cl. 355-285.000.
Obata, Tokio; Fujii, Katsutoshi; Ooka, Akira; and Yamanaka, Yoshinori, 5,498,612, Cl. 514-256.000.
Yamamoto, Naoki; and Matsuda, Kazuhiro, 5,498,527, Cl. 435-34.000.
Ubelhor, Sara A.: *See*—
Wilson, Robert L.; Ubelhor, Sara A.; and Cruz, William A., 5,498,426, Cl. 424-602.000.
Uchida, Keiichiro; and Okamoto, Tetsuro, to Fujitsu Limited. Vector data processing system with instruction synchronization. 5,499,350, Cl. 395-375.000.
Uchida, Masanori: *See*—
Takahashi, Makoto; Hasori, Fumitoshi; Nogami, Kazutaka; and Uchida, Masanori, 5,498,978, Cl. 326-38.000.
Uchikawa, Kiyoshi; Komano, Hiroshi; Aoyama, Toshimi; and Ohta, Katsuyuki, to Tokyo Ohka Kogyo Co., Ltd. Photosensitive resin composition used in a method for forming a light-shielding film. 5,498,498, Cl. 430-7.000.
Uchiyama, Nobuo: *See*—
Nishii, Hiroyuki; Kobayashi, Masaru; Toya, Kazutoshi; and Uchiyama, Nobuo, 5,498,447, Cl. 437-213.000.
Ueda, Tetsuji, to NEC Corporation. Optical fiber connector with sleeve for resiliently fitting an optical fiber thereto. 5,499,310, Cl. 385-84.000.
Uehara, Sachio: *See*—
Senuma, Takeo; Iaa, Shinichiro; Nakazawa, Hiroshi; Tamura, Yasuaki; Mano, Kunihiko; Nakamura, Fumio; Ishikawa, Munenori; and Kubo, Yoshiharu, 5,498,867, Cl. 250-231.180.
Uehara, Takashi: *See*—
Nakabayashi, Takashi; Uehara, Takashi; and Shinohara, Akihira, 5,498,908, Cl. 257-751.000.
Uemura, Norio; Taguchi, Akira; and Hosoda, Masayuki, to Hitachi Metals, Ltd. Floating magnetic head device and its securing method. 5,499,153, Cl. 360-103.000.
Uetani, Yuko: *See*—
Shinomoto, Sayaka; Kohno, Kenji; Uetani, Yuko; Isoe, Noboru; and Miyata, Kazushi, 5,498,359, Cl. 252-54.000.
Uetsuka, Hisato: *See*—
Arai, Hideaki; and Uetsuka, Hisato, 5,499,308, Cl. 385-27.000.
Ueyama, Kenji: *See*—
Ninomiya, Yuji; and Ueyama, Kenji, 5,498,917, Cl. 310-216.000.
Uland, David M., to DataSouth Computer Corporation. Method and apparatus for printing linerless media having an adhesive backing. 5,497,701, Cl. 101-288.000.
Umegaki, Koji: *See*—
Matsuda, Yutaka; Moriue, Hiroo; Hashimoto, Kyosuke; Akimoto, Mitsuru; Hirano, Seiji; Michihira, Osamu; Terayama, Koji; Sakamoto, Hiroaki; and Umegaki, Koji, 5,499,247, Cl. 370-85.300.
Umeno, Hidenori: *See*—
Tanaka, Shunji; Ohtsuki, Toru; Sato, Hiroaki; Sawamoto, Hideo; Yamagata, Ryo; Watanabe, Masaya; Umeno, Hidenori; and Haraguchi, Masatoshi, 5,499,379, Cl. 395-700.000.
Underwood, Mark R.; and Dwyer, Sushil V., to Deere & Company. Header and feeder for a grain combine. 5,497,605, Cl. 56-14.600.
Underwood, Mark R.; and Dwyer, Sushil V., to Deere & Company. Rethreshing rotor for grain combine. 5,498,206, Cl. 460-14.000.
Union Carbide Chemicals & Plastics Technology Corporation: *See*—
Rex, Gary C., 5,498,782, Cl. 525-126.000.
Unique Management Enterprises, Inc.: *See*—
Vallelunga, Anthony J.; and Crawford, Brian, 5,498,243, Cl. 604-197.000.
Unisia Jecs Corporation: *See*—
Hoya, Hiroshi, 5,497,862, Cl. 188-282.000.
Ohhara, Kenji, 5,497,868, Cl. 192-58.400.
Unisys Corporation: *See*—
Giallorenzi, Thomas R.; Rafter, Mark T.; Greenwood, Kenneth C.; Press, Harry B.; and Kingston, Samuel C., 5,499,236, Cl. 370-18.000.
United Color Manufacturing, Inc.: *See*—
Smith, Michael J., 5,498,808, Cl. 585-3.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in her Britannic Majesty's Government of the: *See*—
McDonnell, Damien O.; Day, Sally E.; Coates, David; Jenner, John A.; Hird, Michael; and Toyne, Kenneth J., 5,498,366, Cl. 252-299.600.
United Microelectronics Corp.: *See*—
Hong, Gary; and Hsu, Chen-Chung, 5,498,556, Cl. 437-35.000.
Lin, Jenping, 5,498,555, Cl. 437-35.000.
Yang, Sheng-Hsing, 5,498,553, Cl. 437-34.000.
United States of America
Agriculture: *See*—
Jeffries, Thomas W.; Grabski, Anthony C.; Patel, Rajesh N.; Elegir, Graziano; and Szakacs, George, 5,498,534, Cl. 435-278.000.
Air Force: *See*—
Arnold, Fred E.; and Chen, Jom P., 5,498,784, Cl. 528-337.000.
Sabroske, Kelly R.; Hoying, Donald A.; and Rabe, Douglas C., 5,498,374, Cl. 261-77.000.
Tsui, James B. Y., 5,499,391, Cl. 455-226.200.
Wicks, Michael C.; Baldygo, William J., Jr.; and Brown, Russell D., 5,499,030, Cl. 342-93.000.
Army: *See*—
Farina, Anthony; and Young, Mark, 5,498,160, Cl. 434-12.000.
Commerce: *See*—
Antonucci, Joseph M.; and Bennett, Patricia A., 5,498,643, Cl. 523-118.000.
Energy: *See*—
Lindner, Melvin; and Cottingham, James G., 5,498,916, Cl. 310-214.000.
Health and Human Services: *See*—
Jacobson, Kenneth A.; and Maillard, Michel G., 5,498,605, Cl. 514-46.000.
Kohn, Elise C.; Liotta, Lance A.; and Felder, Christian C., 5,498,620, Cl. 514-359.000.
Marquez, Victor E.; Driscoll, John S.; and Siddiqui, Magbool A., 5,498,719, Cl. 548-230.000.
National Aeronautics and Space Administration: *See*—
Ambur, Damodar R.; Prasad, Chunchu B.; Waters, William A., Jr.; Stockum, Robert W.; and Walter, Manfred A., 5,497,649, Cl. 73-12.060.
Backes, Paul G.; and Long, Mark K., 5,499,320, Cl. 395-95.000.
Friedman, Gary L., 5,499,294, Cl. 380-10.000.
Hergenrother, Paul M.; and Jensen, Brian J., 5,498,803, Cl. 568-646.000.
Middleton, David B.; Srivatsan, Raghavachari; and Person, Lee H., Jr., 5,499,025, Cl. 340-959.000.
Reay, William G.; and Walthall, Harry G., 5,497,663, Cl. 73-861.000.
Navy: *See*—
Bond, James W.; Marchette, David J.; Priebe, Carey E.; and Schlosser, Thomas W., 5,499,399, Cl. 455-296.000.
Duva, Anthony W., 5,497,614, Cl. 60-39.630.
Jackson, Robert H.; Freund, Henry P.; Pershing, Dean E.; and Taccetti, José M., 5,499,255, Cl. 372-2.000.
U.S. Philips Corporation: *See*—
Bredol, Michael; Merikhi, Jacqueline; and Ronda, Cornelis, 5,498,369, Cl. 252-301.650.
De Boer, Jan R., 5,498,914, Cl. 307-116.000.
Körber, Achim; and Van Vliet, Johannes A. J. M., 5,498,937, Cl. 315-248.000.
Kuhn, Michael H.; Rasche, Volker; and Proksa, Roland, 5,498,961, Cl. 324-309.000.
Vervecken, Karel R.; and Van Gennip, Petrus M. G., 5,498,927, Cl. 313-623.000.
United States Surgical Corporation: *See*—
Brady, Robert H.; Calabrese, Philip D.; and Van Leeuwen, Timothy O., 5,497,934, Cl. 227-176.100.
DeFonzo, Stephan A.; Young, Wayne P.; Pennatto, Samson L.; and Komlosi, Andrew, 5,497,933, Cl. 227-175.100.
United Technologies Corporation: *See*—
El-Aini, Yehia M.; Burge, Joseph C.; and Meece, Carl E., 5,498,137, Cl. 416-229.00A.
Pighetti, Annette M.; and Seidel, Lawrence A., 5,498,126, Cl. 415-115.000.
Williams, Christopher C., 5,498,139, Cl. 415-173.700.
University of Arkansas: *See*—
Sheng, Zhengzhi; Meason, John; and Xin, Ying, 5,498,594, Cl. 505-120.000.
University of California, The Regents of the: *See*—
Cohn, Theodore E., 5,499,010, Cl. 340-479.000.
Gerwick, William H.; Jacobs, Robert S.; Castenholz, Richard; Garcia-Pichel, Ferran; Grace, Krista J. S.; Proteau, Philip J.; and Rossi, James, 5,498,405, Cl. 424-59.000.
Morcos, N. Charle; and Nahas, Roger A., 5,497,770, Cl. 128-633.000.
Morris, R. Curtis, Jr.; and Sebastian, Anthony, 5,498,428, Cl. 424-717.000.
Mourant, Judith R.; Anderson, Gerhard D.; Bigio, Irving J.; and Johnson, Tamara M., 5,498,259, Cl. 606-8.000.
Pandey, Ravindra K.; Dougherty, Thomas J.; Smith, Kevin M.; and Meunier, Isabelle, 5,498,710, Cl. 540-145.000.



University of Central Florida: *See*—
Silfvast, William T., 5,499,282, Cl. 378-119.000.
University of Colorado, Regents of the: *See*—
Noble, Richard D.; Thoen, Paul M.; and Koval, Carl A., 5,498,823, Cl. 585-818.000.
University of Florida Research Foundation, Inc.: *See*—
Bergeron, Raymond J., 5,498,622, Cl. 514-374.000.
University of Illinois, The Board of Trustees of the: *See*—
Gratton, Enrico; Fantini, Sergio; Franceschini, Maria A.; Mantulin, William; and Barbieri, Beniamino, 5,497,769, Cl. 128-633.000.
University of Maryland: *See*—
Behram, Sepehr; Grauzlis, Nancy T.; and Joseph, Sammy W., 5,499,293, Cl. 380-4.000.
University of Miami: *See*—
Hsia, Sung L.; and He, Jin L., 5,498,607, Cl. 514-77.000.
University of Minnesota, Regents of the: *See*—
Gengenbach, Burle G.; Somers, David A.; Wyse, Donald L.; Gronwald, John W.; Egli, Margaret A.; and Lutz, Sheila M., 5,498,544, Cl. 435-320.100.
Hoey, Michael; and Gehlbach, Peter, 5,498,254, Cl. 604-891.100.
University of Nebraska: *See*—
Rieke, Reuben D., 5,498,734, Cl. 556-87.000.
University of North Carolina at Chapel Hill, The: *See*—
Kay, Brian K.; and Fowlkes, Dana M., 5,498,538, Cl. 435-69.100.
University of Pennsylvania, Trustees of the: *See*—
Wilding, Peter; and Kricka, Larry J., 5,498,392, Cl. 422-68.100.
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Schlapfer, Johannes F.; Hess, Martin; Woreth, Roland; Tanner, Peter; and Weigum, Hans, 5,498,264, Cl. 606-72.000.

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Aerens, Ronny J. V.; De Cock, Etienne M.; De Schamphelaere, Lucien A.; Steylaerts, Peter A. R.; and Van Weverberg, Erik G. G., 5,499,093, Cl. 355-326.00R.

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Folkins, Jeffrey J.; Bray, Daniel M.; and Fioravanti, Alexander J., 5,499,084, Cl. 355-259.000.
Moffat, Karen A.; Kazmaier, Peter M.; Hamer, Gordon K.; and Georges, Michael K., 5,498,679, Cl. 526-204.000.
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Diba, Sholeh, 5,498,989, Cl. 327-230.000.
Knapp, Steven K.; Seidel, Jorge P.; and Kelem, Steven H., 5,499,192, Cl. 364-489.000.
Parlour, David B.; Goetting, F. Erich; Trimberger, Stephen M.; and Young, Edel M., 5,498,979, Cl. 326-38.000.

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Rink, John L.; and Chou, Marilyn M., 5,498,260, Cl. 606-16.000.

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Nagel, Colleen C.; Bentsen, James G.; Yafuso, Masao; Katritzky, Alan R.; Dektar, John L.; and Kipke, Cary A., 5,498,549, Cl. 436-172.000.

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Tashiro, Hiroshi; Murakawa, Takaji; and Yagi, Toyoji, 5,497,741, Cl. 123-192.100.

Yagishita, Aisaburo: *See*—
Kurahashi, Yoichi; Usui, Yoshifumi; Yagishita, Kazuhiko; and Yagishita, Aisaburo, 5,498,349, Cl. 210-798.000.

Yagishita, Kazuhiko: *See*—
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Tsuboi, Toshio; Nakatani, Munehiro; Yamada, Hirokazu; and Omura, Kunihiko, 5,499,113, Cl. 358-479.000.

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Sawada, Kazuo; Inazawa, Shinji; and Yamada, Kouichi, 5,498,296, Cl. 136-236.100.

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Sagisaka, Yasuo; Yamada, Masakazu; Ninomiya, Masakazu; and Sekiguchi, Kiyonori, 5,497,752, Cl. 123-491.000.

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Kinoshita, Takeru; and Yamada, Takanobu, 5,499,079, Cl. 355-208.000.

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Niimi, Makoto; Ito, Shigemasa; Yamada, Toyonobu; Takemae, Yoshihiro; and Kato, Yoshiharu, 5,499,213, Cl. 365-222.000.

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Yamaguchi, Keiichi: *See*—
Fujimoto, Manabu; Yamaguchi, Keiichi; Enomoto, Youichi; Mitsuzuka, Tsutomu; and Suzuki, Katsumi, 5,498,881, Cl. 257-35.000.

Yamaguchi, Kenichi: *See*—
Gohbara, Masatoshi; Yamaguchi, Kenichi; Shinmi, Tatsuo; Shinmi, Emi; Takanaka, Kazunori; and Hiruta, Tomoko, 5,498,591, Cl. 504-117.000.
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Furuta, Motonobu; Yamaguchi, Takanari; and Ohashi, Kazutoshi, 5,498,689, Cl. 528-214.000.

Yamaguchi, Takashi: *See*—
Ohno, Tadayoshi; Yamaguchi, Takashi; Itoh, Shinichi; and Tanaka, Hisatoshi, 5,498,860, Cl. 235-384.000.

Yamaguchi, Yasushi: *See*—
Shimasaki, Keiichi; Ito, Hiroshi; Yamaguchi, Yasushi; and Hayakawa, Hiroaki, 5,498,654, Cl. 524-432.000.

Yamaha Corporation: *See*—
Ichiki, Tetsuji, 5,498,835, Cl. 84-630.000.
Inagaki, Yoshihiro; and Masaki, Kazuo, 5,498,834, Cl. 84-622.000.
Nishimura, Seiya; Maejima, Yoshihisa; and Ohta, Tokuyoshi, 5,498,325, Cl. 205-96.000.
Noro, Masao, 5,499,175, Cl. 363-16.000.
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Fujimoto, Masaya; Yamamoto, Haruo; Hayashi, Shuji; and Kagawa, Tetsuya, 5,499,361, Cl. 395-109.000.

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Kawai, Tomoaki; Yamamoto, Hiroyuki; and Okazaki, Hiroshi, 5,499,362, Cl. 395-109.000.

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Katagiri, Takeshi; Yamamoto, Masao; Tajima, Tukasa; and Shirasaki, Siro, 5,498,147, Cl. 425-78.000.

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Yamamoto, Takahiro: *See*—
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Yamamoto, Takao, to Honda Giken Kogyo Kabushiki Kaisha. Head lamp device for motor vehicle. 5,499,173, Cl. 362-294.000.

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Yamanaka, Yoshinori: *See*—
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Hara, Hironu; Maruyama, Tatsuya; Saito, Munetoshi; and Mase, Toshiyasu, 5,498,635, Cl. 514-620.000.

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Yamashiro, Akiyoshi; Fujiwara, Kiyoshi; and Oguma, Nobuhiro, to Mitsubishi Materials Corporation. Apparatus for charging scrap into a converting furnace. 5,497,978, Cl. 266-176.000.

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Yamashita, Keitaro, to Hitachi Metals, Ltd. Sleeve for developing roll member. 5,498,837, Cl. 118-658,000.

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Yamazaki, Hiroyuki: *See*—
Nakao, Taku; Yamazaki, Hiroyuki; Tokutake, Nobuo; Saito, Masato; Kohara, Hidekatsu; and Nakayama, Toshimasa, 5,498,514, Cl. 430-512.000.

Yamazaki, Mitsuo: *See*—
Kaneko, Masakatsu; Murofushi, Yoshinobu; Kimura, Misako; Yamazaki, Mitsuo; and Iijima, Yasuteru, 5,498,819, Cl. 514-261.000.

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Yan, Tsoung Y.: *See*—
Shih, Stuart S.; Wu, Margaret M.; and Yan, Tsoung Y., 5,498,743, Cl. 558-277.000.

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Yanagino, Hiroei: *See*—
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Unterlander, Richard M.; Ingram, Ronald W.; Fior, Lou L.; Kamka, Peter; Jaspar, Marc J.; Baron, Sam S.; and Yang, Kevin T., 5,498,152, Cl. 425-534.000.

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Yano, Takashi: *See*—
Doi, Nobukazu; and Yano, Takashi, 5,499,395, Cl. 455-33.100.

Yano, Tomoya, to Sony Corporation. Plasma-addressed liquid crystal display device having a transparent dielectric sheet with a porous layer containing an impregnated liquid crystal. 5,499,122, Cl. 359-54.000.

Yano, Yuji: *See*—
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Yasukawa, Seiichi: *See*—
Sato, Toshihiro; Takagi, Tadao; and Yasukawa, Seiichi, 5,499,075, Cl. 354-415.000.

Yasuma, Tsuneo: *See*—
Sobda, Takashi; Fujisawa, Yukio; Yasuma, Tsuneo; Mizoguchi, Junji; Kori, Masakuni; and Takizawa, Masayuki, 5,498,728, Cl. 548-493.000.

Yau, Cheuk C.: *See*—
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Yazaki Corporation: *See*—
Hashizawa, Shigemi; and Inaba, Shigemitsu, 5,498,176, Cl. 439-585.000.
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Yee, Daniel C. L.: *See*—
Severini, Joseph A.; Yee, Daniel C. L.; Tame, Omar D.; Plaza, Shelly M.; Gravenstreter, Noel P.; Jovan, Dragi; Susko, Thomas J.; and Schulte, Steven A., 5,498,052, Cl. 296-65.100.

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Wreede, John E.; Gunther, John E.; Virgadamo, Michael J.; Yu, Kevin; Yin, Lillian; Mulder, Jerry L.; Upper, Richard B.; and Scott, James E., 5,499,116, Cl. 359-2.000.

Yngve, Paul W.: *See*—
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Yokev, Hanoch; Harel, Haim; and Meiman, Yehouda, to Nexus 1994 Limited. Low-power frequency-hopped spread spectrum acknowledgement paging system. 5,499,266, Cl. 375-202.000.

Yokobori, Hideo: *See*—
Kamakura, Tamiji; Tanaka, Noriyoshi; Namiwa, Kimiyoshi; Tatsumi, Yukio; Namiki, Masato; and Yokobori, Hideo, 5,498,356, Cl. 252-50.000.

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Yokono, Tomohiko: *See*—
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Yokoshima, Yasuhiro: *See*—
Kamiyama, Takao; Yokoshima, Yasuhiro; and Endoh, Shigeru, 5,498,389, Cl. 264-516.000.

Yokotsuka, Shunsuke: *See*—
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Yokoyama, Takashi: *See*—
Nakamura, Tamio; Yokoyama, Takashi; and Kobayashi, Yoshiyuki, 5,498,754, Cl. 562-113.000.

Yonezama, Katsu. Multiple folded paper for continuous disposal. 5,497,903, Cl. 221-48.000.

Yong, Cheong Ah. Portable table apparatus. 5,497,706, Cl. 108-23.000.

Yoshida, Hirokazu: *See*—
Ito, Noboru; Murasaki, Hiroshi; Yoshida, Hirokazu; and Masuda, Fumio, 5,499,090, Cl. 355-298.000.

Yoshida, Masatoshi: *See*—
Aoyama, Takahiro; Nakazaki, Mitsuo; Banba, Akikazu; Yoshida, Masatoshi; Matsunaga, Toshiaki; and Tsubakimoto, Tsuneo, 5,498,670, Cl. 525-217.000.

Yoshida, Masayuki, to Canon Kabushiki Kaisha. Character processing method and apparatus. 5,499,332, Cl. 395-150.000.

Yoshida, Masayuki: *See*—
Aoki, Tomoyuki; and Yoshida, Masayuki, 5,498,300, Cl. 148-261.000.
Nakada, Kazuya; and Yoshida, Masayuki, 5,498,759, Cl. 427-353.000.

Yoshida, Shin'ichi: *See*—
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Shoji, Tadao; Takahashi, Nahoko; Ikushima, Naoya; Uryu, Toshiyuki; Yoshida, Takashi; Yamamoto, Naoki; Nakashima, Hideki; Katsuraya, Kaname; Adachi, Koichiro; and Kataoka, Fusayo, 5,498,602, Cl. 514-25.000.

Yoshikawa, Yoshio; Inoue, Yoshiaki; Yoshino, Isamu; and Takeuchi, Teruo, to Mitsubishi Gas Chemical Company, Inc. Method for bonding a member having metal. 5,497,937, Cl. 228-205.000.

Yoshikuni, Yoshiaki: *See*—
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Yoshimura, Ryuichiro, to Pioneer Electronic Corporation. Optical recording method. 5,499,225, Cl. 369-58.000.

Yoshimura, Yohji: *See—*
Tsubota, Koujiro; Fujioka, Kazuyohsi; Yoshimura, Yohji; Ohgami, Hiroyuki; Takafuji, Yutaka; Nomura, Katsumi; Kubo, Masumi; and Kamei, Hirokazu, 5,499,127, Cl. 359-80.000.

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Yoshikawa, Yoshio; Inoue, Yoshiaki; Yoshino, Isamu; and Takeuchi, Teruo, 5,497,937, Cl. 228-205.000.

Yoshino, Ryozo, to Hitachi, Ltd. Transmission-reception circuit. 5,499,269, Cl. 375-257.000.

Yoshioka, Takashi: *See—*
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Yoshizuka Seiki Co., Ltd.: *See—*
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Yotz, Gregory A.: *See—*
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Younessi, Ramin; and Beckman, Dale A., to Woodward Governor Company. Multiplexed electronic fuel injection control system. 5,499,157, Cl. 361-191.000.

Young, Brian D., to Hughes Aircraft Company. Layered features for co-fired module integration. 5,498,905, Cl. 257-700.000.

Young, Douglas L. G.; and Abdulmassih, Antoine G., to Ingersoll-Rand Company. Screening apparatus for papermaking pulp. 5,497,886, Cl. 209-270.000.

Young, Edel M.: *See—*
Parlour, David B.; Goetting, F. Erich; Trimberger, Stephen M.; and Young, Edel M., 5,498,979, Cl. 326-38.000.

Young, Gang. Ice skate with an extendible sole plate. 5,498,009, Cl. 280-11.120.

Young, Hsien-Fong. Brake proportioning display third brakelight. 5,499,011, Cl. 340-479.000.

Young, Mark: *See—*
Farina, Anthony; and Young, Mark, 5,498,160, Cl. 434-12.000.

Young, Stephen P., to Minc Incorporated. Multi-level logic optimization in programmable logic devices. 5,499,191, Cl. 364-489.000.

Young, Wayne P.: *See—*
DeFonzo, Stephan A.; Young, Wayne P.; Pennatto, Samson L.; and Komlosi, Andrew, 5,497,933, Cl. 227-175.100.

Younglove, Bruce L.: *See—*
Woodruff, Daniel J.; Hoekstra, Daniel W.; Scott, Christopher L.; Volckhausen, Thomas W.; Studebaker, Thomas J.; and Younglove, Bruce L., 5,498,116, Cl. 414-331.000.

Yu, Chien-Chun, to Symphony Group International Co., Ltd. Heat-radiator for CPU of a computer. 5,497,825, Cl. 165-11.100.

Yu, Kevin: *See—*
Wreede, John E.; Gunther, John E.; Virgadamo, Michael J.; Yu, Kevin; Yin, Lillian; Mulder, Jerry L.; Upper, Richard B.; and Scott, James E., 5,499,116, Cl. 359-2.000.

Yu, Kevin H.: *See—*
Yin, Khin S.; and Yu, Kevin H., 5,499,117, Cl. 359-3.000.

Yu, Sang D.: *See—*
Lee, Hae S.; and Yu, Sang D., 5,499,151, Cl. 360-137.000.

Yu, Yueliang: *See—*
Henz, Jürg; Abegglen, Hans; and Yu, Yueliang, 5,497,719, Cl. 112-83.000.

Yuan Mei Decorative Lamp & Painting Co., Ltd.: *See—*
Lin, Cheng-Yuan, 5,499,174, Cl. 362-353.000.

Yuasa Corporation: *See—*
Sasaki, Masaaki; Horii, Tohru; Arakawa, Masahiro; and Murata, Kazuo, 5,498,496, Cl. 429-233.000.

Yuen, John T.: *See—*
Hill-Lindsay, Joseph W.; Yuen, John T.; and Blanco, Alfred R., 5,499,164, Cl. 361-785.000.

Yun-Pi, Wu. Retractable travel bag handle assembly. 5,497,865, Cl. 190-115.000.

Yussouff, Mohammed: *See—*
Brailsford, Alan D.; Hamburg, Douglas R.; Logothetis, Eleftherios M.; and Yussouff, Mohammed, 5,497,618, Cl. 60-274.000.

Yves, Aurelie; Mohamed, Belkacem; Dimitri, Hadjiev; Julien, Edmond; and Jacques, Cotteret, to Elf Antar France. Process for ultrafiltration of stabilized emulsions. 5,498,341, Cl. 210-651.000.

Zabala, Robert J.: *See—*
Benz, Mark G.; Jackson, Melvin R.; Zabala, Robert J.; Jones, Marshall G.; Nied, Herman A.; and Eggleston, Michael R., 5,498,186, Cl. 445-28.000.

Eggleston, Michael R.; Benz, Mark G.; Jackson, Melvin R.; and Zabala, Robert J., 5,498,187, Cl. 445-28.000.

Zade, Isimail Y. Protective paints for the hip. 5,497,511, Cl. 2-22.000.

Zahn, Harlie C.: *See—*
Johnson, Gary E.; Blume, Joseph A.; and Zahn, Harlie C., 5,497,959, Cl. 242-542.200.

Zalesinski, Jerzy M.: *See—*
Bartuska, Jaroslav B.; Grimm, Richard J.; Kerklaan, Albert J.; Saunders, David J.; and Zalesinski, Jerzy M., 5,499,162, Cl. 361-737.000.

Zang, Xiguang: *See—*
Schneider, Erika; Zang, Xiguang; and Hartley, Michael R., 5,498,963, Cl. 324-309.000.

Zarp, Susan K.: *See—*
Timmermeyer, Ronald E., Sr.; and Zarp, Susan K., 5,498,637, Cl. 424-195.100.

Zarrinaghalam, Mohamadreza: *See—*
Esfandiari, Sohrab; and Zarrinaghalam, Mohamadreza, 5,499,049, Cl. 348-143.000.

Zatkulak, Tony D., to Du Pont de Nemours, E. I., and Company. Method for reducing penetration of liquid through nonwoven film-fibril sheets pierced by fastening elements. 5,497,596, Cl. 52-746.100.

Zavis, Wayne M.: *See—*
Kinney, Michael A.; Cronvich, James T.; and Zavis, Wayne M., 5,498,956, Cl. 324-142.000.

Zeeb, Tony J.: *See—*
Stoltz, James V.; and Zeeb, Tony J., 5,497,982, Cl. 269-71.000.

Zehender, Manfred. Apparatus for signal analysis of the electrical potential curve of heart excitation. 5,497,780, Cl. 128-696.000.

Zehnder, Marcel: *See—*
Baets, Jozef; and Zehnder, Marcel, 5,498,128, Cl. 415-164.000.

Zeneca Limited: *See—*
Thomson, Gordon A., 5,498,712, Cl. 544-76.000.

Zenith Data Systems Corporation: *See—*
Turnbull, Robert R.; DeLisle, David J.; and Kohtz, Robert A., 5,498,971, Cl. 324-760.000.

Zhang, Ming D.: *See—*
Ritchie, Mark D.; Zhang, Ming D.; and Morrison, Robert S., 5,497,989, Cl. 273-118.00R.

Ziegler, Manfred: *See—*
Hundt, Eckart; Riegel, Thomas; Schwärtzel, Heinz; and Ziegler, Manfred, 5,499,303, Cl. 382-100.000.

Zilog, Inc.: *See—*
Gyure, Alex; Berg, John; Carver, Damian; and Manos, Pete, 5,498,896, Cl. 257-402.000.

Zimmerman, Thom J. Device for preventing eye drops from entering the nasolacrimal duct system. 5,499,065, Cl. 351-200.000.

Zingle, Ralph D.; Tilley, Mary W.; and Mead, William L., to W. L. Gore & Associates, Inc. Dispersant delivery system and method for producing and using same. 5,497,942, Cl. 239-6.000.

Zirngbiebl, Eberhard: *See—*
Jentsch, Joerg-Dietrich; Klausener, Alexander; Landscheidt, Heinz; Leaders, Bernd; Pennemann, Bernd; Wolters, Erich; and Zirngbiebl, Eberhard, 5,498,744, Cl. 558-277.000.

Zisapel, Nava, to Neurim Pharmaceuticals (1991) Ltd. Method for correcting plasma melatonin levels and pharmaceutical formulation comprising melatonin. 5,498,423, Cl. 424-464.000.

Zitz, Alfred: *See—*
Siebenhofer, Gottfried; Zitz, Alfred; and Gerer, Roman, 5,498,069, Cl. 299-81.300.

Zmitek, Janko; Fercej-Temeljotov, Darja; Verhnjak, Katarina; Kotnik, Sonja; and Kovacic, Mateja, to LEK, tovarna farmacevtskih. Inclusion complexes of clavulanic acid and of potassium salts thereof with hydrophobic β-cyclodextrin derivatives a process for the preparation thereof. 5,498,788, Cl. 540-349.000.

Zojirushi Corporation: *See—*
Takatsuki, Toyohiko; and Kiriu, Nobutaka, 5,497,892, Cl. 215-309.000.

Zook, Gerald P. Foot protector incorporating a viscoelastic gel. 5,497,789, Cl. 128-893.000.

ZymoGenetics, Inc.: *See—*
Murray, Mark J.; and Kelly, James D., 5,498,600, Cl. 514-12.000.

1137361 Ontario Limited: *See—*
Monteith, Joseph G., 5,498,331, Cl. 210-170.000.

114935 Ontario Inc.: *See—*
Bowen, Larry; and Snaidr, Stanislav M., 5,497,791, Cl. 131-175.000.

# LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 12th DAY OF MARCH, 1996

NOTE— Arranged in accordance with the first significant character or word if the name (in accordance with city and telephone directory practice).

Advanced Cardiovascular Systems, Inc.: *See—*
Powell, Philip E., Re. 35,176, Cl. 604-96.000.

Brother Kogyo Kabushiki Kaisha: *See—*
Yamaguchi, Koshiro, Re. 35,175, Cl. 400-621.000.

Chichibu Onoda Cement Corporation: *See—*
Umemoto, Teruo; Tomita, Kyoichi; Kawada, Kosuke; and Tomizawa, Ginjiro, Re. 35,177, Cl. 546-9.000.

Clark, Barre A. M. Pulsed piston-compressor jet engine. Re. 35,172, Cl. 60-247.000.

Delzio, Robert J. Cat scratching post feeder. Re. 35,173, Cl. 119-51.010.

General Electric Company: *See—*
Stein, Judith, Re. 35,178, Cl. 556-408.000.

Kawada, Kosuke: *See—*
Umemoto, Teruo; Tomita, Kyoichi; Kawada, Kosuke; and Tomizawa, Ginjiro, Re. 35,177, Cl. 546-9.000.

Powell, Philip E., to Advanced Cardiovascular Systems, Inc. Self-venting balloon dilatation catheter and method. Re. 35,176, Cl. 604-96.000.

Robert Bosch GmbH: *See—*
Wanner, Karl, Re. 35,174, Cl. 279-19.300.

Sagami Chemical Research Center: *See—*
Umemoto, Teruo; Tomita, Kyoichi; Kawada, Kosuke; and Tomizawa, Ginjiro, Re. 35,177, Cl. 546-9.000.

Stein, Judith, to General Electric Company. Cyclic aminoalkylsilanes and their use as adhesion promoters in room temperature vulcanizable polydiorganosiloxane compositions. Re. 35,178, Cl. 556-408.000.

Tomita, Kyoichi: *See—*
Umemoto, Teruo; Tomita, Kyoichi; Kawada, Kosuke; and Tomizawa, Ginjiro, Re. 35,177, Cl. 546-9.000.

Tomizawa, Ginjiro: *See—*
Umemoto, Teruo; Tomita, Kyoichi; Kawada, Kosuke; and Tomizawa, Ginjiro, Re. 35,177, Cl. 546-9.000.

Umemoto, Teruo; Tomita, Kyoichi; Kawada, Kosuke; and Tomizawa, Ginjiro, to Sagami Chemical Research Center; and Chichibu Onoda Cement Corporation. N-fluoropyridinium salt and process for preparing same. Re. 35,177, Cl. 546-9.000.

Wanner, Karl, to Robert Bosch GmbH. Tool shaft for a tool of the percussive and rotative type. Re. 35,174, Cl. 279-19.300.

Yamaguchi, Koshiro, to Brother Kogyo Kabushiki Kaisha. Tape printing device having tape cut position regulator. Re. 35,175, Cl. 400-621.000.

# LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Al-Baker, Salaam: *See—*
Khokhar, Abdul R.; Siddik, Zahid H.; and Al-Baker, Salaam, B1 5,288,887, Cl. 556-137.000.

Asahi Medical Co., Ltd.: *See—*
Watanabe, Hiroyuki; and Rikumaru, Hiroshi, B1 4,701,267, Cl. 604-5.000.

Board of Reagents, The University of Texas System: *See—*
Khokhar, Abdul R.; Siddik, Zahid H.; and Al-Baker, Salaam, B1 5,288,887, Cl. 556-137.000.

Bubik, Leslie, to Vulcan International, Inc. Towing apparatus. B1 4,637,623, Cl. 280-402.000.

Citizen Watch Co., Ltd.: *See—*
Moriya, Mikio; and Furukawa, Junichi, B1 5,158,379, Cl. 400-279.000.

Clark, Brian E.; Lawlor, Francis D.; Schmidt-Stumpf, Werner E.; Stewart, Terrence J.; and Timms, George D., Jr., to International Business Machines Corp. Parity spreading to enhance storage access. B1 4,761,785, Cl. 371-51.100.

Furukawa, Junichi: *See—*
Moriya, Mikio; and Furukawa, Junichi, B1 5,158,379, Cl. 400-279.000.

International Business Machines Corp.: *See—*
Clark, Brian E.; Lawlor, Francis D.; Schmidt-Stumpf, Werner E.; Stewart, Terrence J.; and Timms, George D., Jr., B1 4,761,785, Cl. 371-51.100.

Khokhar, Abdul R.; Siddik, Zahid H.; and Al-Baker, Salaam, to Board of Reagents, The University of Texas System. Diamine platinum(IV) complexes having mixed carboxylate ligands as antitumor agents. B1 5,288,887, Cl. 556-137.000.

Lawlor, Francis D.: *See—*
Clark, Brian E.; Lawlor, Francis D.; Schmidt-Stumpf, Werner E.; Stewart, Terrence J.; and Timms, George D., Jr., B1 4,761,785, Cl. 371-51.100.

Leen & Associates, Inc.: *See—*
Leen, Monte A.; and Wen-Chung, Frank T., B1 8,348,743, Cl. D26-60.000.

Leen, Monte A.; and Wen-Chung, Frank T., to Leen & Associates, Inc. Halogen clamp lamp. B1 8,348,743, Cl. D26-60.000.

Moriya, Mikio; and Furukawa, Junichi, to Citizen Watch Co., Ltd. Printing starting position controller for serial printer. B1 5,158,379, Cl. 400-279.000.

Rikumaru, Hiroshi: *See—*
Watanabe, Hiroyuki; and Rikumaru, Hiroshi, B1 4,701,267, Cl. 604-5.000.

Schmidt-Stumpf, Werner E.: *See—*
Clark, Brian E.; Lawlor, Francis D.; Schmidt-Stumpf, Werner E.; Stewart, Terrence J.; and Timms, George D., Jr., B1 4,761,785, Cl. 371-51.100.

Siddik, Zahid H.: *See—*
Khokhar, Abdul R.; Siddik, Zahid H.; and Al-Baker, Salaam, B1 5,288,887, Cl. 556-137.000.

Stewart, Terrence J.: *See—*
Clark, Brian E.; Lawlor, Francis D.; Schmidt-Stumpf, Werner E.; Stewart, Terrence J.; and Timms, George D., Jr., B1 4,761,785, Cl. 371-51.100.

Timms, George D., Jr.: *See—*
Clark, Brian E.; Lawlor, Francis D.; Schmidt-Stumpf, Werner E.; Stewart, Terrence J.; and Timms, George D., Jr., B1 4,761,785, Cl. 371-51.100.

Tselesin, Naum N., to Ultimate Abrasive Systems, Inc. Abrasive tool with contoured surface. B1 5,190,568, Cl. 51-293.000.

Ultimate Abrasive Systems, Inc.: *See—*
Tselesin, Naum N., B1 5,190,568, Cl. 51-293.000.

Vulcan International, Inc.: *See—*
Bubik, Leslie, B1 4,637,623, Cl. 280-402.000.

Watanabe, Hiroyuki; and Rikumaru, Hiroshi, to Asahi Medical Co., Ltd. Method for removing leukocytes. B1 4,701,267, Cl. 604-5.000.

Wen-Chung, Frank T.: *See—*
Leen, Monte A.; and Wen-Chung, Frank T., B1 8,348,743, Cl. D26-60.000.

# LIST OF DESIGN PATENTEES

Abbott, Barry J.; Abbott, Valerie M.; Clarke, Stephen J.; and Donchi, Dino, to Clean Screen Wipers Pty Ltd. Extruded wiper backing strip. 367,839, Cl. D12-220.000.

Abbott, Valerie M.: *See—*
Abbott, Barry J.; Abbott, Valerie M.; Clarke, Stephen J.; and Donchi, Dino, 367,839, Cl. D12-220.000.

Ahlbertz, Anders, to Dolomite Svenska AB. Rolling walker. 367,833, Cl. D12-130.000.

Akashi, Hisanori; Nagai, Gen; and Kojima, Akira, to Kyushu Hitachi Maxell, Ltd. Electric shaver. 367,946, Cl. D28-51.000.

Alco Industries, Inc.: *See—*
Goetz, Charles R., 367,784, Cl. D6-479.000.

Alsager, Charmaine A.: *See—*

Munoz, Raul; and Alsager, Charmaine A., 367,790, Cl. D6-525.000.
Apple Computer, Inc.: *See—*
Parsey, Timothy J. L.; and Loew, Christopher, 367,882, Cl. D18-55.000.
Arnone, Louis F. Storage and display cart. 367,777, Cl. D6-436.000.
Baier, Janet E.; and Diggan, Denise A. Game board. 367,892, Cl. D21-25.000.
Bajadali, William J., to Spokane Industries, Inc. Single breaker rock crusher anvil. 367,865, Cl. D15-123.000.
Ball, Rita D.: *See—*
Ball, William A.; and Ball, Rita D., 367,826, Cl. D10-109.000.
Ball, William A.; and Ball, Rita D. Inflatable distress signal kit. 367,826, Cl. D10-109.000.
Banks, William A.; Heistand, Raymond D., II; Kockler, Barry C.; and Usitalo, William J., to Taurus Impressions, Inc. Tool for inserting and removing a logo die for a debossment stamper. 367,883, Cl. D18-56.000.
Barile, Peter, to Shelby Williams Industries, Inc. Swivel mechanism for rotating chair or stool seat. 367,789, Cl. D6-500.000.
Beaumont, Thomas G.; and Butcher, Neill, to Motorola, Inc. Housing for a cellular base unit. 367,859, Cl. D14-142.000.
Beavers, James; and Embry, Cecil R. Seat for a walker. 367,834, Cl. D12-133.000.
Bertram, Randal L.; and Swansey, John D., to International Business Machines Corporation. Piano-like computer keys. 367,858, Cl. D14-115.000.
Better Sleep Mfg. Co.: *See—*
Emery, William W.; and Fritts, Russell A., 367,791, Cl. D6-525.000.
Bingo Press Specialty Ltd.: *See—*
Tien, Gerald, 367,943, Cl. D27-144.000.
Black & Decker Inc.: *See—*
Carbone, Richard J., 367,934, Cl. D26-43.000.
Blomqvist, Berthold, to Teknoskand Invent AB. Hinge. 367,808, Cl. D8-323.000.
Braun Aktiengesellschaft: *See—*
Littmann, Ludwig, 367,800, Cl. D7-384.000.
Ullmann, Roland, 367,945, Cl. D28-51.000.
Brawner, Jeffrey D., to Brawner, Jeffrey D. Dock piling locker. 367,794, Cl. D6-559.000.
Brown, Stephanie C.: *See—*
Trares, Keith C.; and Brown, Stephanie C., 367,836, Cl. D12-152.000.
Bruckert, Richard C. Shaft glove. 367,752, Cl. D2-616.000.
Brunner, Merlin A.; and Draheim, Harvey J., to Simmons Juvenile Products Company, Inc. Dresser. 367,778, Cl. D6-445.000.
Brunswick Bowling & Billiards Corporation: *See—*
Stirling, Michael F.; and Katje, Michael J., 367,772, Cl. D6-337.000.
Brys, Lyle W. Air chute for a temperature controlled container. 367,830, Cl. D12-97.000.
BSG Laboratories, Inc.: *See—*
Goldfarb, Barry S., 367,862, Cl. D14-213.000.
Buckley, Kathy R.: *See—*
Buckley, Kevin C.; and Buckley, Kathy R., 367,795, Cl. D6-567.000.
Buckley, Kevin C.; and Buckley, Kathy R. Sanitizing test kit holder. 367,795, Cl. D6-567.000.
Burge, Jennifer. Sun visor. 367,753, Cl. D2-876.000.
Burns Bros., Inc.: *See—*
Burns, Bruce, 367,935, Cl. D26-49.000.
Burns, Bruce, to Burns Bros., Inc. Flashlight. 367,935, Cl. D26-49.000.
Butcher, Neill: *See—*
Beaumont, Thomas G.; and Butcher, Neill, 367,859, Cl. D14-142.000.
Byers, David D. Ball caddy for ball washing. 367,908, Cl. D21-234.000.
Bynum, Shannon R.: *See—*
VanSkiver, Ralph; and Bynum, Shannon R., 367,787, Cl. D6-484.000.
Cai, Liming, to Dopaco, Inc. Closable cup. 367,816, Cl. D9-431.000.
Canon Kabushiki Kaisha: *See—*
Miyamoto, Noriaki, 367,880, Cl. D18-43.000.
Shinano, Toru, 367,870, Cl. D16-202.000.
Taneya, Yoichi; Ishinaga, Hiroyuki; Tokuda, Hiroyuki; and Sekine, Tetsuya, 367,884, Cl. D18-56.000.
Carbone, Richard J., to Black & Decker Inc. Head for a flashlight. 367,934, Cl. D26-43.000.
Cardinal Packaging, Inc.: *See—*
Zana, Ramon, 367,818, Cl. D9-434.000.
Carr, Arthur G.; and Durgin, Christopher A., to Nomadic Structures, Inc. Counter. 367,786, Cl. D6-481.000.
Carter Holt Harvey Plastic Products Group Limited: *See—*
Pharaoh, James F., 367,928, Cl. D24-109.000.
Chas, Eric, to Goody Products, Inc. Brush handle. 367,763, Cl. D4-138.000.
Chanel, Inc.: *See—*
Helleu, Jacques C., 367,820, Cl. D10-32.000.
Chiu, Tien-Tzu. Stationery holder. 367,889, Cl. D19-77.000.
CKD Corporation: *See—*
Shiino, Masatoshi; Takeuchi, Terumasa; and Fushihara, Osamu, 367,863, Cl. D15-5.000.
Clanton, James M.: *See—*
VanHoose, Jeffery J.; and Clanton, James M., 367,840, Cl. D12-221.000.
Clark, Gregory M.: *See—*
Mason, Stanley L., Jr.; and Clark, Gregory M., 367,815, Cl. D9-347.000.
Clarke, Stephen J.: *See—*
Abbott, Barry J.; Abbott, Valerie M.; Clarke, Stephen J.; and Donchi, Dino, 367,839, Cl. D12-220.000.
Clean Screen Wipers Pty Ltd: *See—*
Abbott, Barry J.; Abbott, Valerie M.; Clarke, Stephen J.; and Donchi, Dino, 367,839, Cl. D12-220.000.
Coldwell, Jason R.: *See—*
Thomas, Clinton L.; and Coldwell, Jason R., 367,916, Cl. D23-233.000.
Cole, Harold: *See—*
Lewis, Robert A.; Cole, Harold; Leukhardt, Alan; and Smith, Ray G., 367,802, Cl. D7-408.000.
Compte, Philippe, to S. T. Dupont S.A. Ball-point pen. 367,887, Cl. D19-51.000.
Connolly, Peter F.; and Provost, Jack. Bill clip-on, tilt-up sunglasses. 367,873, Cl. D16-304.000.
Cook, Dale: *See—*
Webb, Merle; and Cook, Dale, 367,825, Cl. D10-104.000.
Cragar Industries, Inc.: *See—*
Harding, Stephen A., 367,837, Cl. D12-176.000.
Create Limited: *See—*
Sum, Leung C., 367,933, Cl. D26-42.000.
Dacor: *See—*
Lewis, Robert A.; Cole, Harold; Leukhardt, Alan; and Smith, Ray G., 367,802, Cl. D7-408.000.
Dacor Corporation: *See—*
Lutz, James R.; Robertson, Russell; and Scherer, Craig, 367,875, Cl. D16-311.000.
Daiwa Golf Co., Ltd.: *See—*
Kanazawa, Toshihiko, 367,905, Cl. D21-217.000.
Daugherty, Stephen T., to Flowline Inc. Controller electronics enclosure for liquid handling equipment. 367,915, Cl. D23-200.000.
Diggan, Denise A.: *See—*
Baier, Janet E.; and Diggan, Denise A., 367,892, Cl. D21-25.000.
Dodt, William C.: *See—*
Hoge, David T.; Owens, John C.; and Dodt, William C., 367,828, Cl. D10-122.000.
Dolan, Patrick. Combined ceiling fan motor housing and support arms unit. 367,927, Cl. D23-411.000.
Dolan, Patrick S. Pendant lighting fixture. 367,937, Cl. D26-88.000.
Dolan, Patrick S. Glass holder for lighting fixture. 367,939, Cl. D26-149.000.
Dolan, Patrick S. Canopy for lighting fixture. 367,940, Cl. D26-149.000.
Dolan, Patrick S. Glass holder for lighting fixture. 367,941, Cl. D26-149.000.
Dolan, Patrick S. Center column for chandelier. 367,942, Cl. D26-153.000.
Dolomite Svenska AB: *See—*
Ahlbertz, Anders, 367,833, Cl. D12-130.000.
Donchi, Dino: *See—*
Abbott, Barry J.; Abbott, Valerie M.; Clarke, Stephen J.; and Donchi, Dino, 367,839, Cl. D12-220.000.
Dopaco, Inc.: *See—*
Cai, Liming, 367,816, Cl. D9-431.000.
Dorfman, Marvin, to Etna Products Company, Inc. Over the door cap rack. 367,769, Cl. D6-320.000.
Doskocil Mfg. Co., Inc.: *See—*
VanSkiver, Ralph; and Bynum, Shannon R., 367,787, Cl. D6-484.000.
Draheim, Harvey J.: *See—*
Brunner, Merlin A.; and Draheim, Harvey J., 367,778, Cl. D6-445.000.
Dubriske, Paul C., to Strike Line, Inc. Water powered jigger and fish decoy. 367,914, Cl. D22-134.000.
Durgin, Christopher A.: *See—*
Carr, Arthur G.; and Durgin, Christopher A., 367,786, Cl. D6-481.000.
Dutton, Harold H., Jr. Decorative window stencil. 367,886, Cl. D19-40.000.
Eastman Kodak Company: *See—*
Whitby, Laura R.; and Neace, Richard K., 367,872, Cl. D16-247.000.
Electrodomesticos Solac, S.A.: *See—*
Labadia Del Fresno, Miguel, 367,930, Cl. D24-201.000.
Elkay Manufacturing Company: *See—*
Hauser, Jon W., II; and Katz, Ronald C., 367,797, Cl. D7-307.000.
Elkerbout, Marten F.: *See—*
Kip, Albart J.; and Elkerbout, Marten F., 367,947, Cl. D28-51.000.
Embry, Cecil R.: *See—*
Beavers, James; and Embry, Cecil R., 367,834, Cl. D12-133.000.
Emery, William W.; and Fritts, Russell A., to Better Sleep Mfg. Co. Shower caddy. 367,791, Cl. D6-525.000.
Emmerik, Frits H. Computer monitor memorandum board. 367,857, Cl. D14-114.000.
Engelke, Roger P., to Hart & Cooley, Inc. Heater insulator. 367,844, Cl. D13-131.000.
English, Queen E. Pacifier cover. 367,929, Cl. D24-193.000.
Esslinger, Hartmut H., to Packard Bell Electronics, Inc. Desktop computer. 367,850, Cl. D14-100.000.
Estes, Robert W. Oil slick retaining barrier. 367,868, Cl. D15-150.000.
Etna Products Company, Inc.: *See—*
Dorfman, Marvin, 367,769, Cl. D6-320.000.
Fan, Chen-yueh. Liquid soap dispenser. 367,792, Cl. D6-545.000.
Ferraro, Cheryl L.: *See—*
Makoui, Kambiz B.; Schroeder, Roger A.; Miller, Joseph H.; and Ferraro, Cheryl L., 367,764, Cl. D5-57.000.
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# CLASSIFICATION OF PATENTS

ISSUED MARCH 12, 1996

NOTE—First number, class; second number, subclass; third number, patent number

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317 5,498,302
500 5,497,817

**CLASS 149**

5,498,303

**CLASS 150**

134 5,497,818
166 5,497,819

**CLASS 156**

5,498,306
5,498,312
5,498,313
210 5,498,304
249 5,498,305
277 5,498,307
345 5,498,308
347 5,498,309
513 5,498,310

**CLASS 160**

107 5,497,820

**CLASS 162**

5,498,315
158 5,498,314
301 5,498,316

**CLASS 164**

476 5,497,821

**CLASS 165**

5,497,825
1 5,497,823
5,497,824
56 5,497,826
162 5,497,827
185 5,497,828

**CLASS 166**

285 5,497,829
300 5,497,830
308 5,497,831
369 5,497,832

**CLASS 169**

15 5,497,833
37 5,497,834

**CLASS 172**

272 5,497,835

355 5,497,836
619 5,497,837

**CLASS 174**

74 R 5,498,838
92 5,498,839
260 5,498,840

**CLASS 175**

11 5,497,841
27 5,497,838
65 5,497,839
72 5,497,840
334 5,497,842
403 5,497,843

**CLASS 180**

5,497,844
76 5,497,845
315 5,497,846
333 5,497,847

**CLASS 181**

137 5,498,841
230 5,498,842

**CLASS 182**

107 5,497,848
136 5,497,849
204 5,497,850
223 5,497,851

**CLASS 184**

5,497,852

**CLASS 186**

61 5,497,853

**CLASS 187**

213 5,497,854
239 5,497,855

**CLASS 188**

5,497,856
5,497,859
4 R 5,497,857
67 5,497,858
162 5,497,860
267 5,497,861
282 5,497,862
306 5,497,863
352 5,497,864

**CLASS 190**

115 5,497,865

**CLASS 191**

55 5,497,866

**CLASS 192**

5,497,867
5,497,868
84 B 5,497,869
84 C 5,497,870

**CLASS 198**

443 5,497,871
498 5,497,872
642 5,497,873
698 5,497,874

**CLASS 200**

6 A 5,498,843
331 5,498,844
5,498,845
557 5,498,846

**CLASS 202**

154 5,498,317

**CLASS 203**

29 5,498,318
39 5,498,319

**CLASS 204**

452 5,498,324

**CLASS 205**

5,498,323
96 5,498,325
385 5,498,320
525 5,498,321
603 5,498,322

**CLASS 206**

5,497,875
232 5,497,876
362 5,497,877
372 5,497,878
389 5,497,879
395 5,497,880
423 5,497,881
485 5,497,882
545 5,497,883
554 5,497,884
563 5,497,885

**CLASS 208**

74 5,498,326
148 5,498,327

**CLASS 209**

270 5,497,886
538 5,497,887

**CLASS 210**

5,498,333
85 5,498,328
86 5,498,329
103 5,498,330
170 5,498,331
193 5,498,332
236 5,498,334
490 5,498,335
496 5,498,336
610 5,498,337
641 5,498,338
644 5,498,339
645 5,498,340
651 5,498,341
739 5,498,346
5,498,347
776 5,498,348
798 5,498,349

**CLASS 211**

10 5,497,888
40 5,497,889
41 5,497,890
71 5,497,891

**CLASS 215**

309 5,497,892

**CLASS 216**

20 5,498,311

**CLASS 218**

81 5,498,847

**CLASS 219**

5,498,848
5,498,849
5,498,850
5,498,851
390 5,498,852
463 5,498,853
464 5,498,854
553 5,498,855
689 5,498,856
745 5,498,857
757 5,498,858

**CLASS 220**

5,497,893
269 5,497,894
5,497,895
5,497,896
320 5,497,897
358 5,497,898
465 5,497,899
656 5,497,900
708 5,497,901
737 5,497,902

**CLASS 221**

48 5,497,903
185 5,497,904
226 5,497,905

**CLASS 222**

5,497,915
5,497,917
23 5,497,906
38 5,497,907
82 5,497,909
95 5,497,910
5,497,911
5,497,912
102 5,497,913
135 5,497,914
456 5,497,916
626 5,497,918

**CLASS 223**

74 5,497,908

**CLASS 224**

32 R 5,497,919
36 5,497,920
148 5,497,921
209 5,497,922
253 5,497,923
326 5,497,924
5,497,925
407 5,497,926
519 5,497,927

**CLASS 226**

108 5,497,928

**CLASS 227**

5,497,933
5,497,934
9 5,497,929
67 5,497,930
109 5,497,931
132 5,497,932

**CLASS 228**

5,497,935
5,497,936
205 5,497,937
253 5,497,938

**CLASS 229**

23 R 5,497,939

**CLASS 232**

35 5,497,940

**CLASS 235**

384 5,498,859
5,498,860
440 5,498,861
457 5,498,862

**CLASS 237**

2 A 5,497,941

**CLASS 239**

5,497,947
6 5,497,942
132 5,497,943
321 5,497,944
329 5,497,945
452 5,497,946

**CLASS 241**

5,497,948
76 5,497,949
191 5,497,950
300 5,497,951

**CLASS 242**

5,497,955
5,497,956
5,497,958
5,497,959
18 R 5,497,952
270 5,497,953
322 5,497,954
534 5,497,957

**CLASS 244**

5,497,960
54 5,497,961
116 5,497,962

**CLASS 248**

5,497,970
52 5,497,963
96 5,497,964
139 5,497,965
161 5,497,966
166 5,497,967
214 5,497,968
352 5,497,969
455 5,497,971
523 5,497,972
551 5,497,973

**CLASS 249**

74 5,497,974

**CLASS 250**

5,498,863
5,498,864
5,498,866
5,498,867
5,498,872
5,498,875
5,498,876
5,498,877
214 A 5,498,865
234 5,498,868
236 5,498,869
237 G 5,498,870
307 5,498,871
343 5,498,873
397 5,498,874
548 5,498,878
556 5,498,879
580 5,498,880

**CLASS 251**

5,497,975

**CLASS 252**

5,498,350
5,498,352
5,498,353
5,498,354
5,498,355
5,498,357
5,498,358
5,498,360
5,498,361
5,498,364
5,498,365
5,498,366
5,498,367
5,498,368
5,498,369
26 5,498,351
50 5,498,356
54 5,498,359
70 5,498,362
79 5,498,363
95 5,498,342
108 5,498,343
373 5,498,370
404 5,498,344
500 5,498,371
511 5,498,372
546 5,498,373
589 5,498,345

**CLASS 253**

67 5,498,034

**CLASS 257**

35 5,498,881
57 5,498,882
95 5,498,883
137 5,498,884
139 5,498,885
213 5,498,886
239 5,498,887
295 5,498,888
301 5,498,889
310 5,498,890
316 5,498,891
336 5,498,892
347 5,498,893
349 5,498,894
355 5,498,895
402 5,498,896
413 5,498,897
503 5,498,898
536 5,498,899
659 5,498,900
666 5,498,901
686 5,498,902
690 5,498,903
700 5,498,905
724 5,498,906
5,498,907
751 5,498,908
754 5,498,909

**CLASS 261**

77 5,498,374
113 5,498,376

**CLASS 264**

5,498,377
5,498,378
5,498,379
5,498,381
5,498,385
39 5,498,380
56 5,498,382
87 5,498,383
122 5,498,384
211 5,498,386
219 5,498,387
252 5,498,391
263 5,498,388
516 5,498,389
532 5,498,390

**CLASS 266**

51 5,497,976
156 5,497,977
176 5,497,978

**CLASS 267**

103 5,497,979

**CLASS 269**

37 5,497,981
43 5,497,980
71 5,497,982
155 5,497,983

**CLASS 270**

53 5,497,984

**CLASS 271**

7 5,497,985
122 5,497,986
204 5,497,987

**CLASS 273**

32 H 5,497,988
118 R 5,497,989
121 A 5,497,994
138 A 5,497,990
157 R 5,497,991
167 G 5,497,992
167 H 5,497,993
172 5,497,995
226 5,497,996
248 5,498,005
264 5,497,997
285 5,497,998
298 5,497,999
354 5,498,000
403 5,498,001
416 5,498,004
434 5,498,002
5,498,003

**CLASS 277**

5,498,007
53 5,498,006

**CLASS 279**

Re.35,174
153 5,498,008

**CLASS 280**

5,498,009
5,498,011
5,498,022
5,498,023
5,498,024
5,498,025
5,498,026
5,498,027
5,498,030
5,498,031
37 5,498,010
166 5,498,012
283 5,498,013
284 5,498,014
293 5,498,015
402 B1 4,637,623
602 5,498,016
633 5,498,017
673 5,498,018
675 5,498,019
5,498,020
704 5,498,021
735 5,498,028
741 5,498,029
777 5,498,032
841 5,498,033

**CLASS 285**

94 5,498,035
138 5,498,036
177 5,498,042
242 5,498,043

**CLASS 292**

5,498,037
36 5,498,038
145 5,498,039
201 5,498,040
225 5,498,041

**CLASS 293**

120 5,498,044
122 5,498,045

**CLASS 294**

5,498,046
74 5,498,047

**CLASS 296**

5,498,048
5,498,049
5,498,050
5,498,051
5,498,052
5,498,053
5,498,056
5,498,058
5,498,059
100 5,498,057
190 5,498,060

**CLASS 297**

5,498,054
5,498,061
5,498,063
5,498,065
5,498,055
68 5,498,062
238 5,498,064
339 5,498,064

**CLASS 298**

23 C 5,498,066
23 MD 5,498,067

**CLASS 299**

5,498,069
17 5,498,068

**CLASS 303**

3 5,498,070
149 5,498,071
191 5,498,072

**CLASS 307**

5,498,910
5,498,911
64 5,498,913
115 5,498,912
116 5,498,914
139 5,498,915

**CLASS 310**

214 5,498,916
216 5,498,917
261 5,498,918
268 5,498,919
313 A 5,498,920

**CLASS 312**

5,498,073

**CLASS 313**

5,498,921
5,498,922
467 5,498,923
486 5,498,924
497 5,498,925
533 5,498,926
623 5,498,927

**CLASS 315**

5,498,932
39 5,498,928
77 5,498,929
97 5,498,930
158 5,498,931
205 5,498,933
224 5,458,934
241 P 5,498,935
247 5,498,936
248 5,498,937
312 5,498,938
370 5,498,939

**CLASS 318**

6 5,498,940
371 5,498,941
567 5,498,942
601 5,498,943
640 5,498,944
807 5,498,945
809 5,498,946
811 5,498,947

**CLASS 320**

2 5,498,948
5 5,498,949
5,499,234
18 5,498,950

**CLASS 322**

2 R 5,498,951

**CLASS 323**

312 5,498,952
315 5,498,953
340 5,498,954

**CLASS 324**

5,498,955
5,498,957
5,498,958
142 5,498,956
243 5,498,959
303 5,498,960
309 5,498,961
5,498,962
5,498,963
530 5,498,964
532 5,498,965
538 5,498,966
543 5,498,967
627 5,498,968
638 5,498,969
755 5,498,970
760 5,498,971
765 5,498,972
5,498,973
767 5,498,974

**CLASS 326**

10 5,498,975
30 5,498,976



31 5,498,977
38 5,498,978
5,498,979
60 5,498,980
93 5,498,981
126 5,498,982

**CLASS 327**

3 5,498,983
51 5,498,984
74 5,498,985
77 5,498,986
143 5,498,987
199 5,498,988
230 5,498,989
323 5,498,990
333 5,498,991
345 5,498,992
514 5,498,993
532 5,498,994
538 5,498,995

**CLASS 330**

118 5,498,996
277 5,498,997

**CLASS 331**

17 5,498,998

**CLASS 333**

5,498,999
104 5,499,000
115 5,499,001
187 5,499,002
195 5,499,003
202 5,499,004
246 5,499,005

**CLASS 335**

4 5,499,006
201 5,499,007

**CLASS 340**

5,499,008
5,499,018
5,499,019
5,499,020
5,499,021
5,499,022
5,499,023
5,499,024
468 5,499,009
479 5,499,010
5,499,011
514 5,499,012
539 5,499,013
5,499,014
551 5,499,015
555 5,499,016
572 5,499,017
959 5,499,025

**CLASS 341**

33 5,499,026
120 5,499,027
159 5,499,028

**CLASS 342**

22 5,499,029
93 5,499,030
174 5,499,031
357 5,499,032

**CLASS 343**

700 MS 5,499,033
713 5,499,034
789 5,499,035

**CLASS 345**

3 5,499,036
89 5,499,037
107 5,499,038
115 5,499,039
146 5,499,040
174 5,499,041

**CLASS 347**

69 5,499,042
108 5,499,043
232 5,499,044
257 5,499,045

**CLASS 348**

6 5,499,046
5,499,047
10 5,499,048
73 5,499,056
92 5,499,055
143 5,499,049
180 5,499,050
218 5,499,051
220 5,499,052
333 5,499,053
563 5,499,054
607 5,499,057
642 5,499,058
645 5,499,059
651 5,499,060
746 5,499,061
771 5,499,062
836 5,499,115

**CLASS 351**

54 5,499,063
158 5,499,064
200 5,499,065
221 5,499,066

**CLASS 353**

99 5,499,067

**CLASS 354**

5,499,071
106 5,499,068
152 5,499,069
5,499,070
222 5,499,072
320 5,499,073
402 5,499,074
415 5,499,075

**CLASS 355**

53 5,499,076
203 5,499,077
206 5,499,078
208 5,499,079
5,499,080
5,499,081
245 5,499,082
251 5,499,083
259 5,499,084
273 5,499,085
274 5,499,086
285 5,499,087
5,499,088
290 5,499,089
298 5,499,090
319 5,499,091
326 R 5,499,092
5,499,093

**CLASS 356**

121 5,499,094
346 5,499,095
356 5,499,096
372 5,499,097
375 5,499,098
400 5,499,099
401 5,499,100

**CLASS 358**

296 5,499,101
335 5,499,102
5,499,103
341 5,499,104
342 5,499,105
343 5,499,106
347 5,499,107
400 5,499,108
5,499,109
450 5,499,110
455 5,499,111
475 5,499,112
479 5,499,113
483 5,499,114

**CLASS 359**

2 5,499,116
3 5,499,117
12 5,499,118
48 5,499,120
51 5,499,121
54 5,499,122
59 5,499,123
5,499,124
67 5,499,125
68 5,499,126
80 5,499,127
81 5,499,128
83 5,499,129
87 5,499,130
88 5,499,131
281 5,499,132
333 5,499,134
341 5,499,135
474 5,499,136
564 5,499,137
569 5,499,138
649 5,499,139
656 5,499,140
684 5,499,141
773 5,499,142
824 5,499,143

**CLASS 360**

5,499,144
5,499,145
5,499,146
5,499,148
53 5,499,147
103 5,499,149
5,499,153
123 5,499,150
137 5,499,151

**CLASS 361**

5,499,158
18 5,499,154
56 5,499,152
113 5,499,155
150 5,499,156
191 5,499,157
667 5,499,159
704 5,499,160
737 5,499,162
749 5,499,161
759 5,499,163
785 5,499,164

**CLASS 362**

5,499,169
31 5,499,165
32 5,499,166
35 5,499,167
71 5,499,168
84 5,499,170
100 5,499,171
187 5,499,172
294 5,499,173
353 5,499,174

**CLASS 363**

16 5,499,175
21 5,499,176
37 5,499,177
39 5,499,178
59 5,499,183
100 5,499,184
126 5,499,185
132 5,499,186
142 5,499,187

**CLASS 364**

5,499,179
5,499,180
5,499,181
5,499,182
468 5,499,188
480 5,499,189
481 5,499,190
489 5,499,191
5,499,192
500 5,499,193
506 5,499,194
516 5,499,195
550 5,499,197
552 5,499,196
555 5,499,198
561 5,499,199
578 5,499,200
707 5,499,201
761 5,499,202
786 5,499,203

**CLASS 365**

5,499,208
5,499,209
5,499,215
5,499,216
5,499,217
5,499,218
5,499,222
49 5,499,204
63 5,499,205
114 5,499,206
149 5,499,207
190 5,499,210
203 5,499,211
218 5,499,212
222 5,499,213
5,499,214

**CLASS 366**

5,498,075
94 5,498,074
245 5,498,076
247 5,498,077
339 5,498,078

**CLASS 367**

151 5,499,219

**CLASS 368**

21 5,499,220

**CLASS 369**

5,499,223
5,499,232
32 5,499,221
48 5,499,224
58 5,499,225
59 5,499,226
5,499,227
71 5,499,228
111 5,499,229
124 5,499,230
5,499,231
291 5,499,233

**CLASS 370**

5,499,238
5,499,239
5,499,240
5,499,242
5,499,243
5,499,244
5,499,245
5,499,246
5,499,247
13 5,499,235
18 5,499,236
54 5,499,237
73 5,499,241
112 5,499,263

**CLASS 371**

5,499,248
5,499,249
5,499,251
5,499,252
5,499,253
B1 4,761,785
28 5,499,250
43 5,499,254

**CLASS 372**

2 5,499,255
28 5,499,256
31 5,499,257
34 5,499,258
45 5,499,259
46 5,499,260
50 5,499,261
108 5,499,262

**CLASS 373**

78 5,499,264

**CLASS 374**

208 5,498,079

**CLASS 375**

200 5,499,265
202 5,499,266
206 5,499,267
231 5,499,268
257 5,499,269
272 5,499,270
295 5,499,271
347 5,499,272
355 5,499,273
357 5,499,275
376 5,499,274

**CLASS 376**

170 5,499,276
299 5,499,277
5,499,278
301 5,499,279

**CLASS 377**

108 5,499,280

**CLASS 378**

19 5,499,281
119 5,499,282
146 5,499,283
198 5,499,284

**CLASS 379**

52 5,499,285
58 5,499,286
67 5,499,287
88 5,499,288
220 5,499,289
242 5,499,290
265 5,499,291
433 5,499,292

**CLASS 380**

4 5,499,293
10 5,499,294
23 5,499,295
5,499,296
5,499,297
25 5,499,298
28 5,499,299

**CLASS 381**

12 5,499,300
71 5,499,301
5,499,302

**CLASS 382**

100 5,499,303
214 5,499,304
270 5,499,305
291 5,499,306

**CLASS 383**

120 5,498,080

**CLASS 384**

95 5,498,081
105 5,498,082
106 5,498,083
130 5,498,084
484 5,498,085
491 5,498,086

**CLASS 385**

11 5,499,307
27 5,499,308
38 5,499,309
84 5,499,310
89 5,499,311
91 5,499,312
123 5,499,313
135 5,499,314

**CLASS 395**

5,499,315
5,499,316
5,499,317
5,499,318
5,499,336
5,499,337
5,499,338
5,499,339
5,499,340
5,499,341
5,499,342
5,499,343
5,499,364
5,499,377
3 5,499,319
95 5,499,320
105 5,499,321
109 5,499,361
5,499,362
118 5,499,322
126 5,499,323
129 5,499,324
132 5,499,325
133 5,499,326
135 5,499,327
143 5,499,328
145 5,499,329
5,499,330
148 5,499,331
150 5,499,332
153 5,499,333
154 5,499,373
157 5,499,334
161 5,499,335
250 5,499,344
280 5,499,363
297 5,499,345
308 5,499,346
311 5,499,347
375 5,499,348
5,499,349
5,499,350
5,499,351
412 5,499,352
445 5,499,353
456 5,499,354
464 5,499,355
479 5,499,356
500 5,499,357
5,499,378
600 5,499,358
5,499,359
5,499,360
5,499,365
5,499,366
5,499,367
5,499,368
650 5,499,369
5,499,370
700 5,499,371
5,499,379
725 5,499,372
728 5,499,374
800 5,499,375
5,499,376
5,499,380
5,499,381
5,499,382
821 5,499,384
823 5,499,385
842 5,499,383

**CLASS 400**

68 5,498,087
279 B1 5,158,379
486 5,498,088
621 Re.35,175

**CLASS 402**

4 5,498,089
57 5,498,090

**CLASS 403**

3 5,498,091
12 5,498,092
171 5,498,093
5,498,094
267 5,498,096
291 5,498,095
322 5,498,097
400 5,498,098
403 5,498,099

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107 5,498,103

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43 5,498,104
52 5,498,105
184 5,498,106
224 5,498,107

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432 5,498,111

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223 5,498,756

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422 5,498,416
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451 5,498,422
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602 5,498,426
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353 5,498,759
452 5,498,760
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100 5,498,461
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209 5,498,465
218 5,498,469
229 5,498,763
246 5,498,470
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505 5,498,513
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569 5,498,517
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264 5,498,154
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126 5,498,159

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5 5,498,520
6 5,498,521
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29 5,498,525
31 5,498,526
34 5,498,527
5,498,528
99 5,498,766
106 5,498,532
200 5,498,536
278 5,498,534

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192 5,498,573
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250 5,498,579

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363 5,498,205

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268 5,498,214

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110 5,498,195
169 5,498,217

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76 5,498,220
99 5,498,221
112 5,498,222
129 5,498,223

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87 5,498,225

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103 5,498,582
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154 5,498,583
162 5,498,584
185 5,498,585
313 5,498,586
328 5,498,587
353 5,498,588
416 5,498,589
439 5,498,590

**CLASS 503**

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**CLASS 504**

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117 5,498,591
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246 5,498,774
264 5,498,593

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235 5,498,595

**CLASS 507**

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11 5,498,598
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25 5,498,602
5,498,603
5,498,775
27 5,498,604
46 5,498,605
54 5,498,606
77 5,498,607
150 5,498,608
183 5,498,776
206 5,498,777
213 5,498,609
256 5,498,612
258 5,498,613
261 5,498,819
299 5,498,614
300 5,498,615
5,498,616
309 5,498,778
315 5,498,617
329 5,498,618
338 5,498,619
359 5,498,620
369 5,498,621
374 5,498,622
396 5,498,623
406 5,498,624
412 5,498,625
414 5,498,626
423 5,498,627
428 5,498,628
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439 5,498,629
443 5,498,630
456 5,498,631
459 5,498,634
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547 5,498,632
5,498,633
620 5,498,635
652 5,498,636

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706 5,498,638

**CLASS 521**

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59 5,498,640

**CLASS 522**

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99 5,498,642

**CLASS 523**

118 5,498,643
213 5,498,781
218 5,498,644
5,498,645
344 5,498,646

**CLASS 524**

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47 5,498,648
100 5,498,649
114 5,498,650
140 5,498,656
176 5,498,651
219 5,498,652
272 5,498,653
432 5,498,654
458 5,498,655
463 5,498,657
502 5,498,658
549 5,498,659
730 5,498,660
753 5,498,661

**CLASS 525**

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5,498,663
5,498,673
5,498,664
56 5,498,665
57 5,498,666
100 5,498,782
126 5,498,783
165 5,498,667
166 5,498,668
173 5,498,669
195 5,498,670
217 5,498,671
240 5,498,672
314 5,498,674
369 5,498,785
371 5,498,675

**CLASS 526**

122 5,498,676
133 5,498,677
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204 5,498,679
209 5,498,680
246 5,498,681
247 5,498,682
320 5,498,683

**CLASS 528**

40 5,498,684
71 5,498,685
76 5,498,686
96 5,498,687
198 5,498,688
214 5,498,689
296 5,498,690
337 5,498,784
353 5,498,691
361 5,498,692
483 5,498,693

**CLASS 530**

324 5,498,694
331 5,498,695
350 5,498,696
5,498,697
399 5,498,698

**CLASS 534**

15 5,498,699
638 5,498,700
797 5,498,701

**CLASS 536**

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5,498,707
2 5,498,702
20 5,498,705
45 5,498,706
115 5,498,708
124 5,498,709

**CLASS 540**

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222 5,498,787
349 5,498,788
546 5,498,711

**CLASS 544**

76 5,498,712
189 5,498,713
219 5,498,714

**CLASS 546**

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122 5,498,716
139 5,498,717
276 5,498,720
348 5,498,718

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5,498,722
5,498,723
5,498,724
230 5,498,719
408 5,498,725
429 5,498,726
436 5,498,727
493 5,498,728
500 5,498,729

**CLASS 549**

78 5,498,730
259 5,498,731
274 5,498,732

**CLASS 554**

67 5,498,786
132 5,498,733

**CLASS 556**

87 5,498,734
137 B1 5,288,887
187 5,498,735
406 5,498,736
5,498,737
408 Re.35,178
441 5,498,738
478 5,498,739

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118 5,498,741
270 5,498,789
274 5,498,742
277 5,498,743
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408 5,498,745
5,498,746

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67 5,498,748
78 5,498,749
124 5,498,750
217 5,498,751
249 5,498,752

**CLASS 562**

110 5,498,753
113 5,498,754
474 5,498,795
581 5,498,790

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164 5,498,792
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272 5,498,755
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493 5,498,796

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28 5,498,798
354 5,498,799
437 5,498,800
454 5,498,801
495 5,498,802
646 5,498,803
764 5,498,804



827 5,498,805

**CLASS 570**

127 5,498,807
156 5,498,806

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13 5,498,809
310 5,498,810
324 5,498,811
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466 5,498,813
475 5,498,814
512 5,498,815
658 5,498,816
709 5,498,817
723 5,498,818
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750 5,498,821
816 5,498,822
818 5,498,823

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16 5,498,825
210 5,498,826
213 5,498,827
252 5,498,828

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15 5,498,258
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484 367,787
491 367,788
500 367,789
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| | | 5,498,594 | 5,498,038 | 5,498,795 | 5,499,186 | | | 5,499,157 | | | 5,498,054 |
| 06 | : | Re.35,172 | 5,498,041 | 5,498,831 | 5,499,192 | | | 5,499,176 | | | 5,498,137 |
| | | Re.35,173 | 5,498,057 | 5,498,838 | 5,499,195 | | | 5,499,191 | | | 5,498,139 |
| | | Re.35,176 | 5,498,082 | 5,498,841 | 5,499,199 | | | 5,499,232 | | | 5,498,181 |
| | | 5,497,516 | 5,498,087 | 5,498,862 | 5,499,242 | | | 5,499,253 | | | 5,498,182 |
| | | 5,497,539 | 5,498,100 | 5,498,873 | 5,499,243 | | | 5,499,265 | | | 5,498,220 |
| | | 5,497,547 | 5,498,102 | 5,498,875 | 5,499,256 | | | 5,499,291 | | | 5,498,228 |
| | | 5,497,585 | 5,498,110 | 5,498,884 | 5,499,261 | | | 5,499,337 | | | 5,498,231 |
| | | 5,497,615 | 5,498,154 | 5,498,886 | 5,499,277 | 09 | : | 5,497,678 | | | 5,498,258 |
| | | 5,497,633 | 5,498,159 | 5,498,895 | 5,499,278 | | | 5,497,908 | | | 5,498,330 |
| | | 5,497,660 | 5,498,191 | 5,498,896 | 5,499,280 | | | 5,497,933 | | | 5,498,333 |
| | | 5,497,662 | 5,498,192 | 5,498,901 | 5,499,287 | | | 5,497,934 | | | 5,498,379 |
| | | 5,497,670 | 5,498,209 | 5,498,912 | 5,499,294 | | | 5,498,019 | | | 5,498,395 |
| | | 5,497,671 | 5,498,218 | 5,498,947 | 5,499,312 | | | 5,498,126 | | | 5,498,607 |
| | | 5,497,681 | 5,498,223 | 5,498,948 | 5,499,320 | | | 5,498,132 | | | 5,498,622 |
| | | 5,497,727 | 5,498,236 | 5,498,950 | 5,499,328 | | | 5,498,387 | | | 5,498,825 |
| | | 5,497,763 | 5,498,239 | 5,498,953 | 5,499,329 | | | 5,498,394 | | | 5,499,003 |
| | | 5,497,764 | 5,498,240 | 5,498,975 | 5,499,341 | | | 5,498,417 | | | 5,499,015 |
| | | 5,497,770 | 5,498,252 | 5,498,984 | 5,499,343 | | | 5,498,610 | | | 5,499,019 |
| | | 5,497,772 | 5,498,255 | 5,498,989 | 5,499,353 | | | 5,498,621 | | | 5,499,282 |
| | | 5,497,778 | 5,498,260 | 5,498,990 | 5,499,354 | | | 5,498,626 | | | 5,499,346 |
| | | 5,497,782 | 5,498,261 | 5,498,992 | 5,499,355 | | | 5,498,642 | | | 5,499,378 |
| | | 5,497,784 | 5,498,290 | 5,498,995 | 5,499,359 | | | 5,498,695 | | | 5,499,397 |
| | | 5,497,788 | 5,498,327 | 5,498,996 | 5,499,364 | | | 5,498,786 | 13 | : | 5,497,521 |
| | | 5,497,804 | 5,498,371 | 5,498,997 | 5,499,366 | | | 5,498,936 | | | 5,497,616 |
| | | 5,497,812 | 5,498,372 | 5,499,001 | 5,499,367 | | | 5,499,140 | | | 5,497,838 |
| | | 5,497,818 | 5,498,421 | 5,499,008 | 5,499,371 | | | 5,499,181 | | | 5,497,853 |
| | | 5,497,828 | 5,498,428 | 5,499,010 | 5,499,376 | | | 5,499,284 | | | 5,497,859 |
| | | 5,497,840 | 5,498,443 | 5,499,012 | 5,499,377 | | | 5,499,374 | | | 5,498,201 |
| | | 5,497,841 | 5,498,462 | 5,499,013 | 5,499,384 | 10 | : | 5,498,386 | | | 5,498,256 |
| | | 5,497,858 | 5,498,477 | 5,499,017 | 5,499,385 | | | 5,498,650 | | | 5,498,415 |
| | | 5,497,873 | 5,498,490 | 5,499,029 | 5,499,399 | 11 | : | 5,497,971 | | | 5,498,463 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 5,498,468 | | 5,497,874 | | 5,498,164 | | 5,498,817 | | 5,497,742 | | 5,498,543 |
| | 5,498,539 | | 5,498,103 | | 5,498,171 | | 5,498,822 | | 5,497,855 | | 5,498,548 |
| | 5,498,703 | | 5,499,065 | | 5,498,183 | | 5,498,863 | | 5,497,890 | | 5,498,583 |
| | 5,498,709 | 22 : | 5,498,048 | | 5,498,193 | | 5,498,907 | | 5,498,174 | | 5,498,606 |
| | 5,499,035 | | 5,498,107 | | 5,498,279 | | 5,498,924 | | 5,498,205 | | 5,498,616 |
| | 5,499,241 | | 5,498,134 | | 5,498,329 | | 5,498,925 | | 5,498,470 | | 5,498,629 |
| | 5,499,290 | | 5,498,452 | | 5,498,376 | | 5,499,024 | | 5,498,538 | | 5,498,645 |
| | 5,499,392 | | 5,498,800 | | 5,498,781 | | 5,499,113 | | 5,498,775 | | 5,498,674 |
| | 5,190,568 | | 5,498,815 | | 5,498,783 | | 5,499,165 | | 5,498,861 | | 5,498,675 |
| 16 : | 5,497,758 | | 5,498,821 | | 5,498,945 | | 5,499,208 | | 5,498,956 | | 5,498,808 |
| | 5,497,808 | 23 : | 5,498,104 | | 5,498,971 | | 5,499,244 | | 5,499,272 | | 5,498,880 |
| | 5,498,562 | | 5,498,540 | | 5,499,009 | | 5,499,245 | | 5,499,333 | | 5,498,954 |
| | 5,498,570 | 24 : | 5,497,579 | | 5,499,126 | | 5,499,249 | 39 : | 5,497,561 | | 5,498,979 |
| | 5,498,987 | | 5,497,581 | | 5,499,134 | | 5,499,289 | | 5,497,625 | | 5,499,330 |
| | 5,499,250 | | 5,497,823 | | 5,499,198 | | 5,499,292 | | 5,497,627 | 43 : | 5,497,688 |
| 17 : | 5,497,534 | | 5,497,942 | 27 : | 5,497,562 | | 5,499,360 | | 5,497,653 | 44 : | 5,497,614 |
| | 5,497,558 | | 5,498,184 | | 5,497,594 | | 5,499,388 | | 5,497,815 | 45 : | 5,497,531 |
| | 5,497,623 | | 5,498,237 | | 5,497,604 | 35 : | 5,497,630 | | 5,497,851 | | 5,497,590 |
| | 5,497,692 | | 5,498,308 | | 5,497,704 | | 5,498,259 | | 5,497,871 | | 5,497,628 |
| | 5,497,716 | | 5,498,364 | | 5,497,783 | | 5,498,311 | | 5,497,877 | | 5,497,891 |
| | 5,497,743 | | 5,498,467 | | 5,497,786 | | 5,498,320 | | 5,497,888 | | 5,497,949 |
| | 5,497,755 | | 5,498,537 | | 5,497,829 | | 5,499,005 | | 5,497,896 | | 5,497,976 |
| | 5,497,769 | | 5,498,605 | | 5,497,879 | 36 : | Re.35,178 | | 5,498,025 | | 5,497,996 |
| | 5,497,799 | | 5,498,620 | | 5,497,894 | | 5,497,511 | | 5,498,127 | | 5,498,315 |
| | 5,497,802 | | 5,498,643 | | 5,497,913 | | 5,497,519 | | 5,498,130 | | 5,498,653 |
| | 5,497,824 | | 5,498,719 | | 5,497,917 | | 5,497,533 | | 5,498,133 | | 5,498,661 |
| | 5,497,843 | | 5,498,733 | | 5,497,945 | | 5,497,540 | | 5,498,144 | 47 : | 5,497,543 |
| | 5,497,864 | | 5,498,876 | | 5,498,067 | | 5,497,552 | | 5,498,151 | | 5,497,612 |
| | 5,497,881 | | 5,499,182 | | 5,498,080 | | 5,497,560 | | 5,498,226 | | 5,497,637 |
| | 5,497,900 | | 5,499,187 | | 5,498,084 | | 5,497,565 | | 5,498,263 | | 5,497,707 |
| | 5,497,965 | 25 : | 5,497,590 | | 5,498,162 | | 5,497,617 | | 5,498,275 | | 5,497,722 |
| | 5,497,989 | | 5,497,551 | | 5,498,232 | | 5,497,636 | | 5,498,283 | | 5,497,899 |
| | 5,497,992 | | 5,497,564 | | 5,498,238 | | 5,497,638 | | 5,498,295 | | 5,497,904 |
| | 5,497,994 | | 5,497,642 | | 5,498,250 | | 5,497,690 | | 5,498,321 | | 5,497,912 |
| | 5,498,006 | | 5,497,880 | | 5,498,254 | | 5,497,732 | | 5,498,352 | | 5,497,958 |
| | 5,498,039 | | 5,498,000 | | 5,498,269 | | 5,497,738 | | 5,498,354 | | 5,498,021 |
| | 5,498,066 | | 5,498,002 | | 5,498,271 | | 5,497,777 | | 5,498,373 | | 5,498,246 |
| | 5,498,089 | | 5,498,003 | | 5,498,410 | | 5,497,787 | | 5,498,374 | | 5,498,302 |
| | 5,498,173 | | 5,498,046 | | 5,498,544 | | 5,497,869 | | 5,498,426 | | 5,498,433 |
| | 5,498,179 | | 5,498,055 | | 5,498,549 | | 5,497,872 | | 5,498,442 | | 5,498,652 |
| | 5,498,194 | | 5,498,125 | | 5,498,646 | | 5,497,878 | | 5,498,458 | | 5,498,749 |
| | 5,498,249 | | 5,498,190 | | 5,498,685 | | 5,497,889 | | 5,498,481 | 48 : | 5,497,525 |
| | 5,498,251 | | 5,498,221 | | 5,498,745 | | 5,497,898 | | 5,498,484 | | 5,497,530 |
| | 5,498,253 | | 5,498,248 | | 5,498,865 | | 5,498,011 | | 5,498,588 | | 5,497,567 |
| | 5,498,338 | | 5,498,305 | | 5,498,900 | | 5,498,022 | | 5,498,658 | | 5,497,571 |
| | 5,498,370 | | 5,498,344 | | 5,499,014 | | 5,498,097 | | 5,498,692 | | 5,497,635 |
| | 5,498,396 | | 5,498,419 | | 5,499,178 | | 5,498,123 | | 5,498,693 | | 5,497,658 |
| | 5,498,401 | | 5,498,521 | | 5,499,297 | | 5,498,131 | | 5,498,778 | | 5,497,725 |
| | 5,498,461 | | 5,498,523 | | 5,499,305 | | 5,498,146 | | 5,498,784 | | 5,497,830 |
| | 5,498,520 | | 5,498,531 | | 4,761,785 | | 5,498,161 | | 5,499,063 | | 5,497,831 |
| | 5,498,526 | | 5,498,535 | 28 : | 5,497,510 | | 5,498,180 | | 5,499,391 | | 5,497,857 |
| | 5,498,756 | | 5,498,597 | | 5,497,713 | | 5,498,185 | 40 : | 5,497,774 | | 5,497,929 |
| | 5,498,810 | | 5,498,631 | 29 : | 5,497,591 | | 5,498,186 | | 5,498,034 | | 5,497,973 |
| | 5,498,915 | | 5,498,667 | | 5,497,693 | | 5,498,187 | | 5,498,088 | | 5,497,979 |
| | 5,498,934 | | 5,498,668 | | 5,497,810 | | 5,498,219 | | 5,498,197 | | 5,497,988 |
| | 5,498,938 | | 5,498,763 | | 5,497,852 | | 5,498,234 | | 5,498,581 | | 5,498,001 |
| | 5,498,998 | | 5,498,844 | | 5,497,897 | | 5,498,243 | | 5,498,818 | | 5,498,008 |
| | 5,499,002 | | 5,498,928 | | 5,498,446 | | 5,498,265 | | 5,498,824 | | 5,498,035 |
| | 5,499,273 | | 5,498,963 | | 5,498,459 | | 5,498,319 | | 5,498,840 | | 5,498,049 |
| | 5,499,394 | | 5,499,023 | | 5,498,624 | | 5,498,358 | | 5,499,171 | | 5,498,081 |
| 18 : | 5,497,514 | | 5,499,027 | | 5,498,630 | | 5,498,407 | 41 : | 5,497,648 | | 5,498,138 |
| | 5,497,603 | | 5,499,124 | | 5,498,790 | | 5,498,440 | | 5,497,714 | | 5,498,148 |
| | 5,497,629 | | 5,499,158 | | 5,498,830 | | 5,498,494 | | 5,497,789 | | 5,498,158 |
| | 5,497,766 | | 5,499,281 | | 5,498,967 | | 5,498,512 | | 5,497,940 | | 5,498,204 |
| | 5,497,806 | | 5,499,296 | 31 : | 5,497,643 | | 5,498,515 | | 5,497,974 | | 5,498,227 |
| | 5,497,816 | | 5,499,313 | | 5,497,836 | | 5,498,522 | | 5,497,981 | | 5,498,257 |
| | 5,497,844 | | 5,499,315 | | 5,498,734 | | 5,498,536 | | 5,498,278 | | 5,498,270 |
| | 5,497,956 | | 5,499,349 | 32 : | 5,497,733 | | 5,498,573 | | 5,498,405 | | 5,498,297 |
| | 5,498,195 | | 5,499,382 | | 5,498,852 | | 5,498,644 | | 5,498,460 | | 5,498,307 |
| | 5,498,400 | 26 : | 5,497,578 | 33 : | 5,497,886 | | 5,498,651 | | 5,498,469 | | 5,498,346 |
| | 5,498,434 | | 5,497,589 | | 5,498,287 | | 5,498,672 | | 5,498,579 | | 5,498,424 |
| | 5,498,542 | | 5,497,593 | | 5,498,335 | | 5,498,691 | | 5,498,647 | | 5,498,432 |
| | 5,498,547 | | 5,497,618 | 34 : | 5,497,582 | | 5,498,708 | | 5,498,757 | | 5,498,433 |
| | 5,498,718 | | 5,497,655 | | 5,497,729 | | 5,498,710 | | 5,499,041 | | 5,498,444 |
| | 5,498,758 | | 5,497,675 | | 5,497,948 | | 5,498,805 | | 5,499,050 | | 5,498,476 |
| | 5,498,773 | | 5,497,708 | | 5,497,999 | | 5,498,809 | | 5,499,189 | | 5,498,508 |
| | 5,498,779 | | 5,497,709 | | 5,498,004 | | 5,498,827 | | 5,499,352 | | 5,498,545 |
| | 5,498,986 | | 5,497,723 | | 5,498,042 | | 5,498,845 | 42 : | 5,497,515 | | 5,498,554 |
| | 5,499,056 | | 5,497,736 | | 5,498,043 | | 5,498,869 | | 5,497,544 | | 5,498,559 |
| | 5,499,121 | | 5,497,745 | | 5,498,059 | | 5,498,874 | | 5,497,577 | | 5,498,560 |
| | 5,499,159 | | 5,497,753 | | 5,498,160 | | 5,498,916 | | 5,497,583 | | 5,498,576 |
| | 5,499,234 | | 5,497,793 | | 5,498,235 | | 5,498,923 | | 5,497,626 | | 5,498,577 |
| 19 : | 5,497,592 | | 5,497,822 | | 5,498,293 | | 5,498,949 | | 5,497,761 | | 5,498,584 |
| | 5,497,922 | | 5,497,867 | | 5,498,343 | | 5,498,973 | | 5,497,798 | | 5,498,586 |
| | 5,498,010 | | 5,497,928 | | 5,498,378 | | 5,498,974 | | 5,497,819 | | 5,498,671 |
| | 5,498,015 | | 5,497,972 | | 5,498,425 | | 5,499,030 | | 5,497,932 | | 5,498,676 |
| | 5,498,202 | | 5,498,007 | | 5,498,429 | | 5,499,038 | | 5,497,980 | | 5,498,696 |
| | 5,498,324 | | 5,498,026 | | 5,498,436 | | 5,499,044 | | 5,498,083 | | 5,498,707 |
| | 5,498,847 | | 5,498,027 | | 5,498,438 | | 5,499,059 | | 5,498,098 | | 5,498,753 |
| | 5,498,929 | | 5,498,030 | | 5,498,439 | | 5,499,069 | | 5,498,166 | | 5,498,765 |
| 20 : | 5,497,563 | | 5,498,032 | | 5,498,582 | | 5,499,084 | | 5,498,224 | | 5,498,766 |
| | 5,497,605 | | 5,498,040 | | 5,498,596 | | 5,499,085 | | 5,498,229 | | 5,498,767 |
| | 5,497,676 | | 5,498,045 | | 5,498,636 | | 5,499,094 | | 5,498,244 | | 5,498,802 |
| | 5,497,715 | | 5,498,051 | | 5,498,638 | | 5,499,114 | | 5,498,276 | | 5,498,804 |
| | 5,497,916 | | 5,498,052 | | 5,498,673 | | 5,499,155 | | 5,498,280 | | 5,498,813 |
| | 5,498,206 | | 5,498,053 | | 5,498,678 | | 5,499,211 | | 5,498,282 | | 5,498,882 |
| | 5,498,317 | | 5,498,062 | | 5,498,726 | | 5,499,311 | | 5,498,284 | | 5,498,889 |
| | 5,498,351 | | 5,498,085 | | 5,498,743 | | 5,499,325 | | 5,498,322 | | 5,498,903 |
| | 5,498,362 | | 5,498,092 | | 5,498,751 | | 5,499,340 | | 5,498,392 | | 5,498,905 |
| | 5,498,829 | | 5,498,096 | | 5,498,776 | | 5,499,357 | | 5,498,441 | | 5,498,906 |
| | 5,498,910 | | 5,498,120 | | 5,498,777 | 37 : | 5,497,607 | | 5,498,466 | | 5,498,960 |
| 21 : | 5,497,717 | | 5,498,143 | | 5,498,812 | | 5,497,701 | | 5,498,487 | | 5,498,970 |
| | 5,497,718 | | 5,498,150 | | 5,498,814 | | 5,497,710 | | 5,498,529 | | 5,498,982 |



| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 5,499,039 | | 5,288,887 | | 5,499,358 | | 5,498,803 | | 5,498,600 | | 5,497,860 |
| | 5,499,060 | 49 : | 5,497,520 | 50 : | 5,497,760 | | 5,498,850 | | 5,498,977 | | 5,497,861 |
| | 5,499,062 | | 5,497,588 | | 5,497,846 | | 5,498,855 | | 5,498,985 | | 5,497,926 |
| | 5,499,064 | | 5,497,842 | | 5,498,313 | | 5,499,025 | | 5,499,097 | | 5,497,959 |
| | 5,499,146 | | 5,497,977 | | 5,498,564 | | 5,499,255 | | 5,499,109 | | 5,498,095 |
| | 5,499,160 | | 5,497,998 | | 5,499,162 | | 5,499,285 | | 5,499,136 | | 5,498,188 |
| | 5,499,167 | | 5,498,023 | 51 : | 5,497,596 | | 5,499,293 | | 5,499,334 | | 5,498,208 |
| | 5,499,184 | | 5,498,024 | | 5,497,649 | | 5,499,295 | | 5,499,335 | | 5,498,268 |
| | 5,499,196 | | 5,498,029 | | 5,497,663 | | 5,499,314 | | 5,499,369 | | 5,498,381 |
| | 5,499,204 | | 5,498,247 | | 5,497,792 | 53 : | 5,497,523 | | 348,743 | | 5,498,534 |
| | 5,499,274 | | 5,498,262 | | 5,497,833 | | 5,497,526 | 54 : | 5,497,850 | | 5,498,705 |
| | 5,499,288 | | 5,498,303 | | 5,497,848 | | 5,497,554 | | 5,498,782 | | 5,498,785 |
| | 5,499,326 | | 5,498,532 | | 5,497,970 | | 5,498,012 | 55 : | 5,497,542 | | 5,498,963 |
| | 5,499,344 | | 5,498,649 | | 5,498,135 | | 5,498,242 | | 5,497,679 | | 5,499,356 |
| | 5,499,365 | | 5,498,711 | | 5,498,314 | | 5,498,478 | | 5,497,735 | 56 : | 5,498,935 |
| | 5,499,368 | | 5,499,236 | | 5,498,355 | | 5,498,533 | | 5,497,820 | | |

## DESIGN PATENTS

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 : | 367,801 | | 367,912 | | 367,797 | | 367,906 | | 367,819 | 45 : | 367,795 |
| | 367,844 | | 367,925 | | 367,875 | 28 : | 367,864 | | 367,834 | | 367,910 |
| | 367,908 | 08 : | 367,828 | | 367,948 | 30 : | 367,916 | | 367,836 | 47 : | 367,761 |
| 04 : | 367,837 | | 367,830 | 18 : | 367,788 | 33 : | 367,760 | | 367,847 | | 367,779 |
| 06 : | 367,754 | | 367,868 | | 367,831 | | 367,914 | | 367,921 | | 367,789 |
| | 367,770 | 09 : | 367,814 | | 367,917 | 34 : | 367,782 | | 367,936 | | 367,806 |
| | 367,773 | | 367,815 | | 367,918 | | 367,791 | 40 : | 367,840 | 48 : | 367,787 |
| | 367,777 | | 367,934 | | 367,920 | | 367,873 | 41 : | 367,771 | | 367,859 |
| | 367,785 | 11 : | 367,786 | 19 : | 367,893 | | 367,891 | | 367,809 | | 367,883 |
| | 367,802 | 12 : | 367,755 | 21 : | 367,753 | | 367,898 | | 367,894 | 49 : | 367,856 |
| | 367,812 | | 367,803 | | 367,835 | | 367,924 | | 367,927 | | 367,907 |
| | 367,813 | | 367,861 | | 367,938 | 35 : | 367,780 | | 367,935 | 53 : | 367,758 |
| | 367,838 | | 367,862 | 23 : | 367,913 | 36 : | 367,763 | | 367,937 | | 367,865 |
| | 367,845 | 13 : | 367,825 | 25 : | 367,781 | | 367,767 | | 367,939 | | 367,901 |
| | 367,846 | 15 : | 367,817 | 26 : | 367,772 | | 367,769 | | 367,940 | 55 : | 367,751 |
| | 367,850 | | 367,842 | | 367,776 | | 367,832 | | 367,941 | | 367,752 |
| | 367,878 | 17 : | 367,759 | | 367,794 | | 367,872 | | 367,942 | | 367,764 |
| | 367,879 | | 367,768 | | 367,822 | | 367,904 | 42 : | 367,784 | | 367,765 |
| | 367,882 | | 367,774 | | 367,824 | | 367,911 | | 367,805 | | 367,766 |
| | 367,890 | | 367,775 | | 367,929 | 37 : | 367,858 | | 367,816 | | 367,778 |
| | 367,902 | | 367,790 | 27 : | 367,762 | | 367,881 | | 367,886 | | |
| | 367,903 | | 367,793 | | 367,841 | 39 : | 367,818 | | 367,892 | | |

## PLANT PATENTS

| | | | | | |
|---|---|---|---|---|---|
| 06 : | 9,470 | 9,471 | 9,472 | 9,473 | 9,475 | 9,476 |

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March 19, 1996



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# PATENT AND TRADEMARK OFFICE NOTICES

## Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1181 O.G. 50, on December 19, 1995.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on September 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987, and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed, effective June 20, 1995, due to a change in the exchange rate of the U.S. dollar with regard to the German mark, and was announced in the *Official Gazette* at 1181 O.G. 49, on December 19, 1995.

International fees were changed, effective on January 1, 1996, due to a change in the exchange rate of the U.S. dollar with regard to the Swiss franc, and were announced in the *Official Gazette* at 1181 O.G. 49, on December 19, 1995.

Certain domestic PCT fees and charges for International Search and Preliminary Examination were changed, effective October 1, 1995, and were announced in the *Official Gazette* at 1177 O.G. 171, on August 29, 1995.

The schedule of PCT fees (in U.S. dollars), effective January 1, 1996, is as follows:

| International Application (PCT Chapter I) fees: | |
|---|---|
| Transmittal fee | 220.00 |
| Search Fee | |
| U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA) | |
| —No corresponding prior U.S. national application filed | 660.00 |
| —Corresponding prior U.S. national application filed | 430.00 |
| —Supplemental search fee, per additional invention (payable only upon invitation) | 190.00 |
| European Patent Office as ISA | 1700.00 |
| **International fees** | |
| Basic fee | 677.00 |
| Basic Supplemental fee (for each page over 30) | 13.00 |
| Designation fee per country or region | |
| —For the first 11 national or regional offices designated | 164.00 |
| —For each designation in excess of 11 offices | No Charge |
| Precautionary designation fee and confirmation fee for each precautionary designation confirmed (PCT Rule 15.5) | |
| —Designation fee | 164.00 |
| —Confirmation fee | 82.00 |
| International Application (PCT Chapter II) fees associated with filing a Demand for Preliminary Examination: | |
| Handling fee | 207.00 |
| Preliminary examination fee | |
| USPTO as International Preliminary Examining Authority (IPEA) | |
| —USPTO was ISA in PCT Chapter I | 470.00 |
| —Additional examination fee, per additional invention (payable only upon invitation) | 140.00 |
| —USPTO was not ISA in PCT Chapter I | 710.00 |
| —Additional examination fee, per additional invention (payable only upon invitation) | 250.00 |

| U.S. National Stage Fees | Small Entity | Regular |
|---|---|---|
| Basic National fee | | |
| USPTO was IPEA | | |
| —All claims presented satisfied provisions of PCT Article 33(2) to (4) | 47.00 | 94.00 |
| —All claims presented did not satisfy provisions of PCT Article 33(2) to (4) | 340.00 | 680.00 |
| USPTO was ISA but not IPEA | 375.00 | 750.00 |
| USPTO was neither ISA nor IPEA | | |
| —Search report has not been prepared by the European Patent Office or the Japanese Patent Office | 505.00 | 1010.00 |
| —Search report has been prepared by the European Patent Office or the Japanese Patent Office | 440.00 | 880.00 |
| Other National fees | | |
| —For each independent claim in excess of 3 | 39.00 | 78.00 |
| —For each claim in excess of 20 | 11.00 | 22.00 |
| —For each application containing a multiple dependent claim | 125.00 | 250.00 |
| —Surcharge for filing oath or declaration after the time limit applicable under PCT Article 22 or 39(l) | 65.00 | 130.00 |
| —Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(l) | 130.00 | 130.00 |

Nov. 27, 1995

BRUCE A. LEHMAN
*Assistant Secretary of Commerce and Commissioner of Patents and Trademarks*

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## Notice of Maintenance Fees Payable

Title 37 Code of Federal Regulations (CFR), Section 1.362(d) provides that maintenance fees may be paid without surcharge for the six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in the patent requiring such payment the patent will expire on the 4th, 8th, or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on March 16, 1993 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,193,225 through 5,195,186
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on March 14, 1989 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,811,427 through 4,813,078
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on March 12, 1985 for which maintenance fees due at 11 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,503,565 through 4,504,976
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after Dec. 12, 1980, but before Aug. 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months, 7 years and six months, and 11 years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1994, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9(f)) ..... $495.00
By other than a small entity ..... $990.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9(f)) ..... $995.00
By other than a small entity ..... $1,990.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§ 1.9(f)) ..... $1,495.00
By other than a small entity ..... $2,990.00

The amount of the surcharge for paying the maintenance fee during the grace period or after expiration of the patent are set forth in 37 CFR 1.20(h), and (i) which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980:

By a small entity (§ 1.9(f)) ..... $65.00
By other than a small entity ..... $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been:

(1) unavoidable ..... $660.00
(2) unintentional ..... $1,550.00

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## Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

*PATENTS WHICH EXPIRED January 17, 1996*
*DUE TO FAILURE TO PAY MAINTENANCE FEES*

| Patent Number | Serial Number | Issue Date |
|---|---|---|
| Re. 32,768 | 06/793,059 | 10/18/88 |
| (4,426,631) | (06/349,347) | (01/17/84) |
| Re. 33,319 | 07/309,298 | 09/04/90 |
| (4,718,570) | (07/027,601) | (01/12/88) |
| Re. 33,381 | 06/819,162 | 10/09/90 |
| (4,426,728) | (06/298,230) | (01/17/84) |
| Re. 33,530 | 06/819,544 | 02/05/91 |
| (4,426,267) | (06/351,730) | (01/17/84) |
| 4,425,672 | 06/256,907 | 01/17/84 |
| 4,425,675 | 06/279,172 | 01/17/84 |
| 4,425,692 | 06/350,211 | 01/17/84 |
| 4,425,695 | 06/252,607 | 01/17/84 |
| 4,425,696 | 06/280,025 | 01/17/84 |
| 4,425,699 | 06/225,839 | 01/17/84 |
| 4,425,701 | 06/310,114 | 01/17/84 |
| 4,425,705 | 06/275,475 | 01/17/84 |
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| 4,425,715 | 06/243,867 | 01/17/84 |
| 4,425,721 | 06/304,922 | 01/17/84 |
| 4,425,727 | 06/336,049 | 01/17/84 |
| 4,425,732 | 06/274,489 | 01/17/84 |
| 4,425,736 | 06/359,867 | 01/17/84 |
| 4,425,737 | 06/311,405 | 01/17/84 |
| 4,425,756 | 06/347,332 | 01/17/84 |
| 4,425,758 | 06/361,306 | 01/17/84 |
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| 4,425,765 | 06/320,535 | 01/17/84 |
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| 4,425,788 | 06/344,407 | 01/17/84 |
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| 4,425,800 | 06/272,007 | 01/17/84 |
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| Patent Number | Serial Number | Issue Date |
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| 5,080,996 | 07/646,567 | 01/14/92 |
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| 5,081,015 | 07/401,132 | 01/14/92 |
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| 5,081,022 | 07/360,305 | 01/14/92 |
| 5,081,044 | 07/590,226 | 01/14/92 |
| 5,081,045 | 07/541,042 | 01/14/92 |
| 5,081,047 | 07/544,768 | 01/14/92 |
| 5,081,058 | 07/642,027 | 01/14/92 |
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| 5,081,093 | 07/608,853 | 01/14/92 |
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| 5,081,116 | 07/504,926 | 01/14/92 |
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| 5,081,465 | 07/621,880 | 01/14/92 |
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| 5,081,603 | 07/502,707 | 01/14/92 |
| 5,081,608 | 07/339,769 | 01/14/92 |
| 5,081,636 | 07/367,286 | 01/14/92 |
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## Reissue Applications Filed

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.12(b)).

**5,160,767**, Re. S.N. 08/552,132, Nov. 2, 1995, Cl. 310/114, COMPACT MOTOR MOUNT FOR INFORMATION STORAGE DEVICES, Heinrich Cap, et. al., Owner of Record: *Elf Atochem SA*, Attorney or Agent: Jerold B. Schnayer, Ex. Gp.: 2102

## Requests for Reexaminations Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

**4,473,826**, Reexam. No. 90/004,127, Jan. 31, 1996, Cl. 114/255, FISHING BOAT, Robert T. Bass, Owner of Record: *Inventor*, Attorney or Agent: Michael Ebert, Hopgood Calimafde Kalil & Judlowe, New York, N.Y., Ex. Gp.: 3102, Requester: John R. Hlavka, Watts, Hoffmann Fisher & Heinke, Cleveland, Ohio

**4,583,835**, Reexam. No. 90/004,131, Feb. 7, 1996, Cl. 424/85.5, PROTEIN PURIFICATION PROCESS & PRODUCT, Sidney Pestka, et. al., Owner of Record: *Hoffmann-LaRoche, Inc., Nutley, N.J.*, Attorney or Agent: Jennifer Gordon, Pennie & Edmonds, New York, N.Y., Ex. Gp.: 1806, Requester: Martin P. Hoffman, Hofman, Wasson & Gitler, Arlington, Va.

**4,585,138**, Reexam. No. 90/004,126, Jan. 30, 1996, Cl. 220/615, CONTAINER WITH LOCKING COVER, Godefridus H. J. Jonkers, Owner of Record: *WIVA Verpakkingen, RH Oosterho, Netherlands*, Attorney or Agent: Diller Ramik & Wight, Annandale, Va., Ex. Gp.: 3207, Requester: Philip K. Fitzsimmons, Shlesinger Fitzsimmons & Shlesinger, Rochester, N.Y.

**4,601,710**, Reexam. No. 90/004,129, Feb. 1, 1996, Cl. 604/165, TROCAR ASSEMBLY, Frederic H. Moll, Owner of Record: *Endo Therapeutics Corp., Norwalk, Conn.*, Attorney or Agent: Neil Y. Gilbert, Endo Therapeutics Corp., Norwalk, Conn., Ex. Gp.: 3301, Requester: Owner

**4,856,787**, Reexam. No. 90/004,128, Feb. 5, 1996, Cl. 273/237, CONCURRENT GAME NETWORK, Boris Itkis, Owner of Record: *Fortunet Inc., Las Vegas, Nev.*, Attorney or Agent: Robert H. Berdo, Roylance, Abrams, Berdo & Goodman, Washington, D.C., Ex. Gp.: 3304, Requester: D.C. Toedt III, Arnold White & Durkee, Houston, Tex.

**5,391,298**, Reexam. No. 90/004,130, Feb. 5, 1996, Cl. 210/638, METHOD FOR PERFORMING A SOLID-PHASE EXTRACTION UNDER PRESSURIZED CONDITIONS, Richard M. Pieper, et. al., Owner of Record: *Minnesota Mining and Manufacturing Co., St. Paul, Minn.*, Attorney or Agent: Gary L. Griswold, 3-M, Office of Intellectual Property, St. Paul, Minn., Ex. Gp.: 1306, Requester: Walter A. Hackler, Newport Beach, Calif.

## Notice of Expiration of Trademark Registrations Due To Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

TRADEMARK REGISTRATIONS WHICH EXPIRED DECEMBER 11, 1995 DUE TO FAILURE TO RENEW

| Reg. Number | Serial Number | Reg. Date |
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| 1,006,096 | 72/459,025 | 03/04/1975 |
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| 1,006,100 | 72/467,171 | 03/04/1975 |
| 1,006,102 | 72/458,335 | 03/04/1975 |
| 1,006,103 | 72/460,136 | 03/04/1975 |
| 1,006,104 | 72/441,214 | 03/04/1975 |
| 1,006,108 | 72/444,470 | 03/04/1975 |
| 1,006,109 | 72/444,876 | 03/04/1975 |
| 1,006,111 | 72/454,178 | 03/04/1975 |
| 1,006,116 | 72/424,594 | 03/04/1975 |
| 1,006,124 | 72/453,150 | 03/04/1975 |
| 1,006,125 | 72/461,874 | 03/04/1975 |
| 1,006,126 | 72/463,723 | 03/04/1975 |
| 1,006,127 | 72/464,034 | 03/04/1975 |
| 1,006,132 | 72/451,910 | 03/04/1975 |
| 1,006,139 | 72/463,131 | 03/04/1975 |
| 1,006,141 | 72/463,475 | 03/04/1975 |
| 1,006,142 | 72/444,293 | 03/04/1975 |
| 1,006,147 | 72/463,496 | 03/04/1975 |
| 1,006,149 | 72/350,501 | 03/04/1975 |
| 1,006,153 | 72/459,473 | 03/04/1975 |
| 1,006,154 | 73/007,674 | 03/04/1975 |
| 1,006,155 | 73/008,405 | 03/04/1975 |
| 1,006,162 | 73/001,809 | 03/04/1975 |
| 1,006,167 | 72/298,457 | 03/04/1975 |

### 37 CFR 1.47 Notice by Publication

Notice is hereby given of the filing of an national stage application with a petition under 37 CFR 1.47 requesting acceptance of the application without the signature of all inventors. The petition has been granted. A notice has been sent to the last known address of the nonsigning inventor. The inventor whose signature is missing (Jon Brunetti) may join in the application by promptly filing an appropriate oath or Declaration complying with 37 CFR 1.63. The international application number is PCT/US95/00933 and was filed on 24 January 1995, in the names of Charles F. Neugebauer, Jon Brunetti, and Günenter Steinbach for the invention entitled HIGH VOLTAGE ELECTRONIC AMPLIFIERS. The national stage application number is 08/448,554 and has a 35 U.S.C. 371 date of 23 October 1995.

### 37 CFR 1.47 Notice by Publication

Notice is hereby given of the filing of an application with a petition under 37 CFR 1.47 requesting acceptance of the application without the signature of all inventors. The petition has been granted. A notice has been sent to the last known address of the non-signing inventor. The inventor whose signature is missing (Lawrence B. Edwards) may join in the application by promptly filing an appropriate oath or Declaration complying with 37 CFR 1.63. The international application number is PCT/US93/11166 and was filed on 17 November 1993 in the name of Lawrence B. Edwards for the invention entitled Method and Apparatus for Compacting Integrated Circuits with Wire Length Minimization. The national stage application number is 08/433,438 and has a 35 U.S.C. 371 date of 28 November 1995.

### Certificate of Corrections For Week of March 19, 1996

| | | | | |
|---|---|---|---|---|
| B1 4,782,202 | 5,326,974 | 5,411,513 | 5,436,665 |
| Re. 34,069 | 5,334,322 | 5,413,242 | 5,437,718 |
| D. 328,304 | 5,334,618 | 5,413,816 | 5,438,032 |
| D. 342,433 | 5,340,436 | 5,414,048 | 5,438,565 |
| D. 359,841 | 5,353,386 | 5,414,341 | 5,439,068 |
| D. 363,469 | 5,353,996 | 5,415,941 | 5,439,425 |
| D. 365,625 | 5,354,345 | 5,421,153 | 5,440,315 |
| D. 365,636 | 5,357,027 | 5,423,826 | 5,442,431 |
| D. 365,641 | 5,364,856 | 5,425,053 | 5,443,190 |
| 4,989,652 | 5,371,653 | 5,426,143 | 5,443,747 |
| 5,064,036 | 5,373,082 | 5,427,121 | 5,444,699 |
| 5,065,596 | 5,375,067 | 5,428,714 | 5,444,877 |
| 5,130,136 | 5,379,368 | 5,428,935 | 5,445,109 |
| 5,179,982 | 5,382,909 | 5,429,987 | 5,445,608 |
| 5,222,478 | 5,384,094 | 5,430,194 | 5,445,924 |
| 5,242,921 | 5,384,313 | 5,430,334 | 5,446,070 |
| 5,254,150 | 5,386,827 | 5,430,507 | 5,446,111 |
| 5,264,184 | 5,387,430 | 5,430,551 | 5,446,207 |
| 5,267,909 | 5,387,692 | 5,430,652 | 5,446,251 |
| 5,272,144 | 5,390,572 | 5,430,884 | 5,446,715 |
| 5,275,337 | 5,392,074 | 5,431,535 | 5,446,849 |
| 5,282,077 | 5,392,749 | 5,432,442 | 5,447,195 |
| 5,284,176 | 5,393,787 | 5,432,817 | 5,447,214 |
| 5,291,895 | 5,395,832 | 5,432,971 | 5,447,529 |
| 5,293,706 | 5,399,423 | 5,433,545 | 5,448,345 |
| 5,313,596 | 5,403,685 | 5,434,797 | 5,449,452 |
| 5,317,937 | 5,410,128 | 5,436,024 | 5,449,970 |
| 5,319,653 | 5,411,440 | 5,436,608 | 5,450,102 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 5,450,123 | 5,453,257 | 5,456,901 | 5,460,409 | 5,463,612 | 5,468,552 | 5,471,730 | 5,477,918 |
| 5,450,161 | 5,453,857 | 5,456,972 | 5,460,439 | 5,463,805 | 5,468,688 | 5,472,258 | 5,477,994 |
| 5,450,192 | 5,454,052 | 5,457,369 | 5,460,619 | 5,464,291 | 5,468,867 | 5,472,268 | 5,478,056 |
| 5,450,503 | 5,454,501 | 5,457,621 | 5,461,015 | 5,464,685 | 5,469,228 | 5,472,592 | 5,478,118 |
| 5,450,709 | 5,454,680 | 5,458,221 | 5,461,080 | 5,464,945 | 5,469,285 | 5,474,041 | 5,478,295 |
| 5,451,186 | 5,454,872 | 5,458,404 | 5,461,317 | 5,464,963 | 5,469,415 | 5,474,308 | 5,478,828 |
| 5,451,231 | 5,455,067 | 5,458,567 | 5,461,321 | 5,465,749 | 5,469,533 | 5,474,832 | 5,478,950 |
| 5,451,292 | 5,455,262 | 5,458,647 | 5,461,711 | 5,466,220 | 5,469,668 | 5,475,130 | 5,479,057 |
| 5,451,369 | 5,455,420 | 5,458,670 | 5,461,730 | 5,466,304 | 5,469,672 | 5,475,323 | 5,479,255 |
| 5,451,602 | 5,455,517 | 5,458,868 | 5,461,913 | 5,466,431 | 5,469,847 | 5,476,072 | 5,479,526 |
| 5,451,775 | 5,455,654 | 5,459,101 | 5,462,234 | 5,466,607 | 5,469,925 | 5,476,073 | 5,480,518 |
| 5,451,825 | 5,455,666 | 5,459,128 | 5,462,584 | 5,466,689 | 5,469,974 | 5,476,292 | 5,480,634 |
| 5,452,319 | 5,455,740 | 5,459,245 | 5,462,866 | 5,467,189 | 5,470,390 | 5,476,369 | 5,480,864 |
| 5,452,636 | 5,455,941 | 5,459,310 | 5,462,900 | 5,467,264 | 5,470,861 | 5,476,377 | 5,480,969 |
| 5,452,745 | 5,456,126 | 5,459,369 | 5,463,087 | 5,467,574 | 5,470,941 | 5,476,522 | 5,481,474 |
| 5,453,196 | 5,456,500 | 5,459,479 | 5,463,325 | 5,468,037 | 5,471,187 | 5,476,768 | 5,483,002 |
| 5,453,224 | 5,456,718 | 5,459,661 | 5,463,329 | 5,468,076 | 5,471,477 | 5,476,773 | |

## Notice of Meeting to Provide Information to the Public about the Sequence Search Systems Utilized by the Patent and Trademark Office

The Commissioner of Patents and Trademarks is authorized under 35 U.S.C. 131 to cause an examination to be made of patent applications. The PTO has received a small number of patent applications each of which claim thousands of nucleic acid sequences. The search and examination of these applications will require the dedication of human and computer resources far in excess of normal workloads. These relatively few applications alone will require a large share of resources from both the sequence searching staff of the PTO Scientific and Technical Information Center (STIC) and the biotechnology examining staff for over a year. In an effort to get public suggestions on how the PTO can best meet this challenge, the PTO is establishing a dialog with its customers. On April 3, 1996, from 9:00 a.m. to 1:00 p.m., the PTO will host an open house meeting to provide information about our current sequence search systems, including the hardware and software utilized, types of claims found in typical biotechnology applications, and the search times and costs associated with the volume of sequences which have been filed. The meeting will take place in the PTO Patent Academy, Crystal Square 4, Suite 700, 1745 Jefferson Davis Highway, Arlington, Virginia, 22202. PTO would welcome recommendations from the public on available search systems, strategies, automated solutions or suggestions for efficiencies to address these search and examination challenges.

Space is limited and reservations will be allotted on a first come, first served basis. Individuals interested in participating should contact John Doll, Director, Patent Examining Group 1800, by telephone at (703) 308-1123, by fax at (703) 308-4930, by mail marked to his attention addressed to the Assistant Commissioner for Patents, Box Comments-Patents, Washington, D.C. 20231 or over the Internet to seqmeet@uspto.gov. A request for participation should include the names and addresses of attendees, the number of spaces requested, affiliation, the area of expertise for each attendee and telephone number. PTO will confirm your participation by telephone.

March 1, 1996

LAWRENCE J. GOFFNEY
*Acting Assistant Secretary of Commerce and*
*Commissioner of Patents and Trademarks*



**Summary of Final Decisions**
**Issued by the**
**Trademark Trial and Appeal Board**
**December 11-15, 1995**

| Date Issued | Type of Case[1] | Proceeding or App'n No. | Party/Parties | Issue | TTAB Decision | Mark and Goods Cited by Examining Attorney | Recommended for Publication | Opposer's/ Petitioner's Mark and Goods/Services | Applicant's/ Respondent's Mark and Goods/Services |
|---|---|---|---|---|---|---|---|---|---|
| 12-11 | EX | 74/258,075 | Cycle Fit Publishing, Inc. | 2(d) | Refusal Affirmed | "SUNCOOLERS" [sunglasses] | No | | "SUN COOLERS" (and design) [sun visors made of plastic foam] |
| 12-11 | EX | 74/390,049 | Mead Corp. | 2(d) | Refusal Affirmed | "ACADEMY" [paper drawing pads and tablets sold through mass discount merchandisers] | No | | "ACADEMITE" [paper drawing pads and tablets sold through mass discount merchandisers] |
| 12-11 | EX | 74/265,970 | Twelve Stone Flagons, Ltd. | genericness | Refusal Reversed | | No | | "USQUAEBACH" [whiskey] |
| 12-11 | EX | 74/425,698 | IWC Int'l. Watch Co. AG | 2(d) | Refusal Affirmed | "MARK VII" [expansible watch bracelets with gold-filled tops] | No | | "MARX XI" [watches, clocks, and chronometers] |
| 12-11 | EX | 74/378,178 | Micro 2000, Inc. | 2(e)(1) | Refusal Affirmed | | No | | "POST-PROBE" [computer diagnostic hardware utilized to locate, analyze, and solve computer hardware defects] |
| 12-13 | OPP | 92,237 | A & M Cleaning Products, Inc. v. Ramco-USA, Inc. | 2(d) | Opposition Dismissed | "GREASED LIGHTNING GL3000" [lubricating oils for automotive use] | No | "GREASED LIGHTNING" [multipurpose cleaner] | |
| 12-13 | EX | 74/178,145 | Express America Freight Systems, Inc. | 2(d) | Refusal Reversed | "AMERICAN FREIGHT SYSTEM" (transportation of freight by truck and storage of freight) | No | | "EXPRESS AMERICA FREIGHT SYSTEMS, INC." (and design) [domestic and international air and surface freight transportation services] |

(1)EX = EX PARTE APPEAL; OPP = OPPOSITION; CANC = CANCELLATION; CU = CONCURRENT USE; (R) = REQ. FOR RECONSIDERATION

| Date Issued | Type of Case[1] | Proceeding or App'n No. | Party/Parties | Issue | TTAB Decision | Opposer's/ Petitioner's Mark and Goods/Services | Applicant's/ Respondent's Mark and Goods/Services | Mark and Goods Cited by Examining Attorney | Recommended for Publication |
|---|---|---|---|---|---|---|---|---|---|
| 12-13 | EX | 74/288,443 | Hacot-Colombier | whether the drawing filed with appl.'s Sec. 44(e) application is a substantially exact representation of the mark shown in the foreign reg'n; whether the mark in applicant's proposed amended drawing is a material alteration of the mark shown in the original drawing | Refusal Affirmed | | "LA MAISON NATURE" (and design) [natural dyes for textile fibers] | | No |
| 12-13 | OPP | 81,828 | Ringling Bros.-Barnum & Bailey Combined Shows, Inc. v. Utah Division of Travel Development | 2(d) | Opposition Dismissed | "THE GREATEST SHOW ON EARTH" [circus entertainment services (and collateral products)] | "THE GREATEST SHOW ON EARTH" [promoting business and tourism in the area of Utah] | | No |

(1)EX = EX PARTE APPEAL; OPP = OPPOSITION; CANC = CANCELLATION; CU = CONCURRENT USE; (R) = REQ. FOR RECONSIDERATION



| Date Issued | Type of Case[1] | Proceeding or App'n No. | Party/Parties | Issue | TTAB Decision | Opposer's/ Petitioner's Mark and Goods/Services | Applicant's/ Respondent's Mark and Goods/Services | Mark and Goods Cited by Examining Attorney | Recommended for Publication |
|---|---|---|---|---|---|---|---|---|---|
| 12-13 | EX | 74/326,954 | Granum Communications, Inc. | 2(d) | Refusal Affirmed | | "OASIS" [radio broadcasting services] | "OASIS" [entertainment services in the nature of radio music programs] | No |
| 12-15 (R) | EX | 74/358,223 | M. Lynn Fischer | Section 6 disclaimer requirement (of the words "HOSPITALITY TELEVISION") | Request for Reconsideration Denied (Refusal Affirmed) | | HTV HOSPITALITY TELEVISION" [satellite and telephone line television transmission service to personal service institutions, restaurants, hotels, clubs, resorts and transportation facilities in the field of personal care, education, training and news] | | No |
| 12-15 | EX | 74/375,634 | U.S. Risk Insurance Group, Inc. | 2(e)(2) | Refusal Reversed | | "U.S. RISK" [commercial and environmental property and casualty insurance underwriting, insurance brokerage, insurance administration and insurance claims management services] | | No |

(1)EX = EX PARTE APPEAL; OPP = OPPOSITION; CANC = CANCELLATION; CU = CONCURRENT USE; (R) = REQ. FOR RECONSIDERATION

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Special box designations should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these special boxes. If any documents other than the specified type identified for each special box are addressed to that box, they will be significantly delayed in reaching the appropriate area for which they are intended.

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| Box AF | Expedited procedure for processing amendments and other responses after final rejection. |
| Box Comments Patents | Public comments regarding patent related regulations and procedures. |
| Box DAC | Petitions decided by the Office of Petitions including petitions to revive and petitions to accept late payment of issue fees or maintenance fees. |
| Box DD | Disclosure Documents or materials related to the Disclosure Document Program. |
| Box FWC | Requests for File Wrapper Continuation Applications (under 37 CFR 1.62). |
| Box Interference | Communications relating to interferences and applications and patents involved in interference. |
| Box Issue Fee | All communications following the receipt of a PTOL-85, "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments are the exception. Assignments should be submitted in a separate envelope and not be sent to Box Issue Fee. |
| Box M Fee | Correspondence related to a patent that is subject to the payment of a maintenance fee. |
| Box MPEP | Submissions concerning the Manual of Patent Examining Procedures. |
| Box Non-Fee-Amendment | Non-fee amendments to patent applications. (Use Box AF for responses after final rejection). |
| Box PATENT APPLICATION | New patent applications and associated papers and fees. |
| Box Patent Ext. | Applications for patent term extension. |
| Box PCT | Mail related to applications filed under the Patent Cooperation Treaty. |
| Box Provisional Patent Application | The filing of all provisional patent applications and any communications relating thereto. |
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| Box 9 | Coupon orders for U.S. patent and trademark copies. |
| Box 10 | Orders for certified copies of PTO documents. |
| Box 11 | Electronic Ordering Service (EOS). |
| Box 13 | Mail for the Employee and Labor Relations Division. |
| Box 14 | Mail directed to the APS Contracts Office. |
| Box 16 | Deposit Account Replenishment Checks. |
| Box 17 | Invoices directed to the Office of Finance. |
| Box 171 | Vacancy Announcement Applications. |
| Box Assignment | All assignment documents except those filed with new applications. |
| Box EEO | Mail for the Office of Civil Rights. |
| Box OED | Mail for the Office of Enrollment and Discipline. |

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The following libraries, designated as Patent and Trademark Depository Libraries (PTDLs), receive patent and trademark information in various formats from the U.S. Patent and Trademark Office. Many PTDLs have on file all full-text patents issued since 1790, trademarks published since 1872, and select collections of foreign patents. All PTDLs have both the patent and trademark sections of the *Official Gazette of the U.S. Patent and Trademark Office*. The full-text utility and design patents are distributed numerically on 16 mm microfilm, and plant patents on color microfiche. Patent and trademark search systems on CD-ROM (Compact Disc-Read Only) format are available at all PTDLs to increase utilization of and enhance access to the information found in patents and trademarks. It is through the CD-ROM systems that preliminary patent and trademark searches can be conducted through the numerically arranged collections.

All information is available for use by the public free of charge.

In addition, each PTDL offers reference publications which outline and provide access to the patent and trademark classification systems, as well as other documents and publications which supplement the basic search tools. PTDLs provide technical staff assistance in using all materials. Facilities for making paper copies of patent and trademark information are generally provided for a fee.

Since there are variations in the scope of patent and trademark collections among the PTDLs, and their hours of service to the public vary, anyone contemplating use of these collections at a particular library is urged to contact that library in advance about its collections, services, and hours in order to avert possible inconvenience.

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| Washington | Seattle: Engineering Library, University of Washington | (206) 543-0740 |
| West Virginia | Morgantown: Evansdale Library, West Virginia University | (304) 293-2510 |
| Wisconsin | Madison: Kurt F. Wendt Library, University of Wisconsin Madison | (608) 262-6845 |
| | Milwaukee Public Library | (414) 286-3051 |
| Wyoming | Casper: Natrona County Public Library | (307) 237-4935 |

## PATENT EXAMINING CORPS

BRUCE A. LEHMAN, Commissioner
LAWRENCE J. GOFFNEY Jr., Assistant Commissioner for Patents
EDWARD R. KAZENSKE, Deputy Assistant Commissioner for Patents
STEPHEN G. KUNIN, Deputy Assistant Commissioner for Patent Policy
J.O. THOMAS, JR., Deputy Assistant Commissioner for Patent Process Services

| PATENT EXAMINING GROUPS | Phone number Area Code 703 | New Case Date* |
|---|---|---|
| **CHEMICAL EXAMINING GROUPS** | | |
| GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, ENGINEERING AND DESIGNS, GROUP 1100—JOHN E. KITTLE, Director | 308-0661 | 07/28/94 |
| ORGANIC CHEMISTRY, DRUG, BIO-AFFECTING AND BODY TREATING COMPOSITION, GROUP 1200—RICHARD V. FISHER, Director | 308-1235 | 07/03/94 |
| SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300—BARRY S. RICHMAN, Director | 308-0651 | 08/31/94 |
| HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY STOCK MATERIALS AND COMPOSITIONS, GROUP 1500—THEODORE MORRIS, Director | 308-2351 | 10/20/94 |
| BIOTECHNOLOGY, GROUP 1800—JOHN J. DOLL, Director | 308-0196 | 05/06/94 |
| **ELECTRICAL EXAMINING GROUPS** | | |
| INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100—STEWART LEVY, Director | 308-1782 | 03/28/94 |
| SPECIAL LAWS AND ADMINISTRATION, GROUP 2200—ROBERT E. GARRETT, Director | 308-0511 | 08/09/94 |
| COMPUTER SYSTEMS AND COMPUTER APPLICATION, GROUP 2300—BOBBY R. GRAY, Director | 305-9600 | 07/29/93 |
| SPECIAL COMPUTER APPLICATIONS: COMPUTER GRAPHICS, BUSINESS PRACTICES, & DIAGNOSTIC TESTING, GROUP 2400—GERALD GOLDBERG, Director | 305-3800 | 04/06/94 |
| ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500—JANICE A. HOWELL, Director | 308-0956 | 08/02/94 |
| TELECOMMUNICATIONS, GROUP 2600—NICHOLAS P. GODICI, Director | 305-4700 | 06/28/94 |
| DESIGN, GROUP 2900—JOHN E. KITTLE, Director | 308-0661 | 08/08/94 |
| **MECHANICAL EXAMINING GROUPS** | | |
| HANDLING AND TRANSPORTATION MEDIA, GROUP 3100—F.R. SCHMIDT, Director | 308-1113 | 05/18/94 |
| MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200—CARLTON R. CROYLE, Director | 308-1148 | 09/21/94 |
| MEDICAL INSTRUMENTS, DIAGNOSTIC EQUIPMENT AND TREATMENT DEVICES; SURGERY AND SURGICAL SUPPLIES; AMUSEMENT AND EXERCISING DEVICES; ANIMAL HUSBANDRY; SPORTING GOODS; TOBACCO PRODUCTS AND MANUFACTURING EQUIPMENT; AND PRINTING, GROUP 3300—J.J. LOVE, Director | 308-0858 | 12/05/94 |
| SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400—DONALD G. KELLY, Director | 308-0861 | 11/03/94 |
| GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500—A.L. SMITH, Director | 308-1021 | 07/26/94 |

*A communication from the examiner should have been received in most applications filed prior to this date.

Patents will Expire as Follows:
(1) The term of any utility or plant patent that is in force on or results from an application filed before June 8, 1995 is the greater of the 20 year term provided in 35 U.S.C. 154(a)(2) or 17 years from grant subject to any terminal disclaimers. 35 U.S.C. 154(c)(1).
(2) All utility and plant patents granted on applications having an actual United States filing date on or after June 8, 1995 are granted for a term which begins on the date on which the patent is granted and ends 20 years from the date on which the application was filed in the United States. If the application contains a specific reference to an earlier application under 35 U.S.C. 120, 121 or 365(c), the patent term ends twenty years from that date on which the earliest application was filed. 35 U.S.C. 154(a)(2).
(3) All design patents are granted for a term of 14 years from the date of the grant.
However, the term of any patent may have been curtailed by disclaimer under the provisions of 35 U.S.C. 153, have lapsed due to failure to pay maintenance fees, or have been extended under the provisions of 35 U.S.C. 154, 155, or 156. Thus, if more reliable information is needed with respect to a particular patent, then the specific patent file should be reviewed to determine the actual date of patent expiration.





## TRADEMARK OPERATION

Bruce A. Lehman, Commissioner
Philip G. Hampton, II, Assistant Commissioner
Robert M. Anderson, Deputy Assistant Commissioner
David E. Bucher, Director, Trademark Examining Office
Condition of Trademark Applications as of February 1, 1996

| Law Office | Oldest Date New* | Oldest Date Amendment Filed |
|---|---|---|
| Law Office 101—Ron Sussman, Acting Managing Attorney, (703) 308-9101—4th Floor Foods, Beverages, Wines & Spirits—Int. Classes 29, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 06/28/95 | 11/03/95 |
| Law Office 102—Myra Kurzbard, Managing Attorney, (703) 308-9102—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 08/11/95 | 10/03/95 |
| Law Office 103—Kathryn Erskine, Managing Attorney, (703) 308-9103—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 07/25/95 | 01/04/96 |
| Law Office 104—Sidney Moskowitz, Managing Attorney, (703) 308-9104—6th Floor Unwrought metals, Industrial Equipment, Tools, Installation, Vehicles, Firearms, Musical Instruments, Building Materials & Floor Coverings—Int. Classes 6, 7, 8, 11, 12, 13, 15, 19, 27 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 07/10/95 | 11/20/95 |
| Law Office 105—Thomas Howell, Managing Attorney, (703) 308-9105—6th Floor Chemicals, Paints, Lubricants, Pharmaceuticals, Medical Apparatus & Tobacco—Int. Classes 1, 2, 4, 5, 10, 34 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 08/17/95 | 08/31/95 |
| Law Office 106—Mary Sparrow, Managing Attorney, (703) 308-9106—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 08/11/95 | 07/25/95 |
| Law Office 107—Thomas Lamone, Managing Attorney, (703) 308-9107—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 08/11/95 | 10/18/95 |
| Law Office 108—David Shallant, Managing Attorney, (703) 308-9108—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 08/18/95 | 10/25/95 |
| Law Office 109—Deborah Cohn, Managing Attorney, (703) 308-9109—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 09/18/95 | 11/15/95 |
| **Collective Marks—Class 200 | | |
| **Certification Marks—Classes A & B | | |
| Office of Trademark Services—John Walker, Director, (703) 308-9100 Trademark Assistance Center—(703) 308-9000 Pre-Examination—Alan Lambert, Supervisor, (703) 308-9401 ext. 188 Intent-To-Use—(ITU)—(703) 308-9500 Post Registration Section—Mary Bowman, Supervisor, (703) 308-9500 ext. 126 | | |
| Affidavits Under Sections 8 & 15 (All Classes) | 06/05/95 | —0— |
| Renewals (All Classes) | 10/20/95 | —0— |
| Section 12(c) Publications (All Classes) | 08/14/95 | —0— |

1. ** Assigned to all Law Office

2. Applicants with inquiries concerning the status of their applications and a touch telephone should call (703) 305-8747 through (703) 305-9752 from 6:30 a.m. to Midnight EST, Monday through Friday. This automated voice system will provide the current status of your application. Applicants are urged not to file unnecessary inquiries concerning the status of their applications. See SECTION 411 of the TRADEMARK MANUAL OF EXAMINING PROCEDURE.

3. * These dates identify the oldest unassigned new case in each Law Office. All cases with earlier dates have either been examined and made the subject of an action or are currently being worked on by the assigned examining attorney.

VOL 184 ISS 3 MR 19 1996 UMI

# REEXAMINATIONS

## MARCH 19, 1996

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

**B1 4,503,035 (2816th)**

**PROTEIN PURIFICATION PROCESS AND PRODUCT**

**Sidney Pestka, North Caldwell, N.J., and Menachem Rubinstein, Rimon, Israel, assignors to Hoffmann-La Roche, Inc., Nutley, N.J.**

**Reexamination Request No. 90/002,881, Nov. 20, 1992.**

**Reexamination Certificate for Patent 4,503,035, issued Mar. 5, 1985, Ser. No. 465,979, Feb. 14, 1983.**

**Continuation of Ser. No. 247,442, Mar. 25, 1981, abandoned, which is a division of Ser. No. 167,165, Jul. 9, 1980, Pat. No. 4,289,690, which is a continuation-in-part of Ser. No. 106,644, Dec. 26, 1979, abandoned, which is a continuation-in-part of Ser. No. 77,710, Sep. 21, 1979, abandoned, which is a continuation-in-part of Ser. No. 62,374, Jul. 31, 1979, abandoned, which is a continuation-in-part of Ser. No. 963,257, Nov. 24, 1978, abandoned.**

**Int. Cl.**[6] **A61K** *38/21*; **C12P** *21/02*; **C07K** *1/00;1/16;14/56*

**U.S. Cl. 424—85.7**

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–14 is confirmed.

New claims 15–22 are added and determined to be patentable.

1. Human leukocyte interferon as a homogeneous protein species having a specific activity of from $0.9\times10^8$–$4\times10^8$ Units/mg. of protein when assayed on the MDBK bovine cell line and from $2\times10^6$–$7.6\times10^8$ Units/mg. of protein when assayed on the AG 1732 human cell line.

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**B1 4,748,962 (2817th)**

**COMPOUND ARCHERY BOWS**

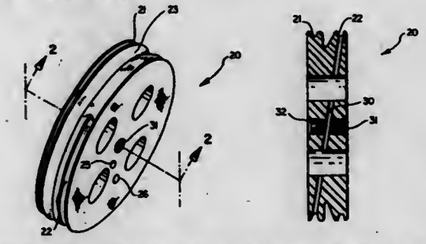
**Marlow W. Larson, Ogden, Utah, assignor to Browning Arms Company, Morgan, Utah**

**Reexamination Request No. 90/002,480, Oct. 17, 1991.**

**Reexamination Certificate for Patent 4,748,962, issued Jun. 7, 1988, Ser. No. 236,781, Feb. 23, 1981.**

**Int. Cl.**[6] **F41B** *5/10*

**U.S. Cl. 124—25.6**




AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–16 and 25–26 is confirmed.

Claims 20–24 are cancelled.

Claim 17 is determined to be patentable as amended.

Claims 18 –19 dependent on an amended claim, are determined to be patentable.

New claims 27–40 are added and determined to be patentable.

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1. In a compound bow including a handle, a pair of limbs extending from opposite ends of the handle, a pair of eccentrics carried by the respective distal ends of said limbs and a pair of cables, each anchored at one end to a respective limb and wrapped around the eccentric carried by the opposite limb to provide a wound end and strung end connected to a bow string, an improved eccentric, comprising:

a member adapted for mounting by an axle through an axle journal in said member to a said limb;

a first groove near a first edge of said member to receive said strung end of said cable;

a second groove near the opposite edge of said member to receive said wound end of the same said cable;

a valley of smaller diameter than said second groove disposed between said first and second grooves; and

a ramped surface extending from said valley and merging with said second groove so that as said member pivots on said axle to wind said wound end, the cable following said wound end is cammed down and laterally towards said first groove into said valley.

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**B1 4,926,570 (2818th)**

**SHOE INNER SOLE, PARTICULARLY INSOLE OR WELT**

**Manfred Fohst, Dierdorf, Germany, assignor to Lohmann GmbH & Co. KG, Neuwied, Germany**

**Reexamination Request No. 90/003,457, Jun. 6, 1994.**

**Reexamination Certificate for Patent 4,926,570, issued May 22, 1990, Ser. No. 222,098, Jul. 20, 1988.**

**Claims priority, application Germany, Jul. 22, 1987, 3724327**

**Int. Cl.**[6] **A43B** *13/38*

**U.S. Cl. 36—43**




AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–10 are cancelled.

[1. Shoe inner sole, particularly insole or welt for working or safety shoes, with a binder and a non-woven fabric as well as antistatic additives, wherein the non-woven fabric comprises a mixture of fibers with between approximately 1 to 10% by weight of electrically conductive staple fibers.]

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**B1 5,193,936 (2819th)**

**FIXATION AND STABILIZATION OF LEAD IN CONTAMINATED SOIL AND SOLID WASTE**

**Dhiraj Pal, Chicago Heights, and Karl Yost, Crete, both of Ill., assignors to MAECORP Incorporated, Chicago, Ill.**

**Reexamination Request No. 90/003,305, Jan. 13, 1994.**

**Reexamination Certificate for Patent 5,193,936, issued Mar. 16, 1993, Ser. No. 721,935, Jul. 23, 1991.**

**Continuation-in-part of Ser. No. 494,774, Mar. 16, 1990, abandoned.**

**Int. Cl.**[6] **B09B** *3/00*; **E02D** *3/00*

**U.S. Cl. 405—128**

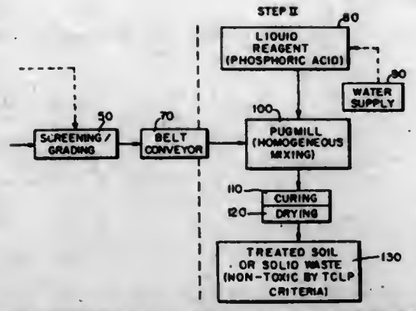
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 5, 6 is confirmed.

Claims 1–4, 7–20 are cancelled.

1. A treatment process for treating lead-toxic solid wastes to stabilize leachable lead contained therein, said process comprising the steps of:

mixing a solid waste containing leachable lead with a sulfate compound having at least one sulfate ion for reacting with said leachable lead to produce a first mixture, said first mixture containing a substantially insoluble lead compound or mineral species; and




mixing said first mixture with a phosphate reagent having at least one phosphate ion for reacting with leachable lead remaining said first mixture to produce a second mixture, said second mixture containing a substantially insoluble lead compound or mineral species;

curing said second mixture for a period

such that the material so treated is substantially solid in form at the end of curing, the material passes the paint filter test, TCLP lead levels are decreased below 5.0 mg/l, the volume of said solid waste is reduced as a result of treatment and curing, and no secondary waste streams are generated.

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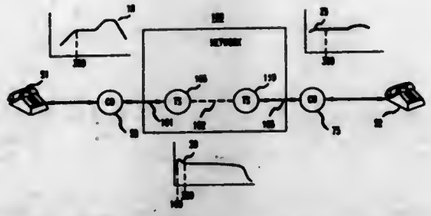
**B1 5,195,132 (2820th)**

**TELEPHONE NETWORK SPEECH SIGNAL ENHANCEMENT**

**Duane O. Bowker, Neptune City; John T. Ganley, Milford, and J. H. James, Farmingdale, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.**

**Reexamination Request No. 90/003,674, Dec. 29, 1994.**
**Reexamination Certificate for Patent 5,195,132, issued Mar. 16, 1993, Ser. No. 620,997, Dec. 3, 1990.**
**Int. Cl.[6] H04M *1/76***
**U.S. Cl. 379—410**

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:



Claims 2 and 17 are cancelled.

Claims 1, 3, 8, 12, 14, 18, 19, 22 and 24 are determined to be patentable as amended.

Claims 4–7, 9–11, 13, 15, 16, 20, 21 and 23, dependent on an amended claim, are determined to be patentable.

New claims 25–32 are added and determined to be patentable.

1. A method of enhancing the quality of speech signals exchanged between first and second telephone station sets, said method comprising the steps of

responding to receipt of a request originated by either one of said first or second telephone station sets by establishing a communication path between said first and second telephone station sets wherein at least one of said first and second telephone station sets is arranged to attenuate by a predetermined attenuation rate those of said speech signals having frequencies below a predetermined frequency and to transmit said speech signals over said [communications] *communication* path, and

responding to receipt of said speech signals transmitted by said one of said first and second telephone station sets by selectively increasing the amplitude level of said attenuated speech signals and then supplying to the other one of said first and second telephone sets via said communication path the resulting speech signals, *said step of increasing being carried out in said communication path between telephone switch circuitry at which said speech signals are received from said one of said first and second telephone station sets and telephone switch circuitry from which said resulting speech signals are supplied to said other of said first and second telephone station sets.*



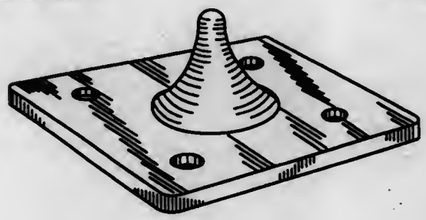
Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

**Re. 35,179**

**ENGINE AIR INTAKE VORTEX PLATE**

**Kenneth F. Klus, 34191 Camino Capistrano, Capistrano Beach, Calif. 92624**

**Original No. D. 332,612, dated Jan. 19, 1993, Ser. No. 836,608, Feb. 18, 1992. Continuation of Ser. No. 637,763, Jan. 4, 1991, abandoned, which is a continuation of Ser. No. 240,568, Sep. 6, 1988, abandoned. Application for reissue Dec. 5, 1994, Ser. No. 31,750**
**U.S. Cl. D15—5** **1 Claim**



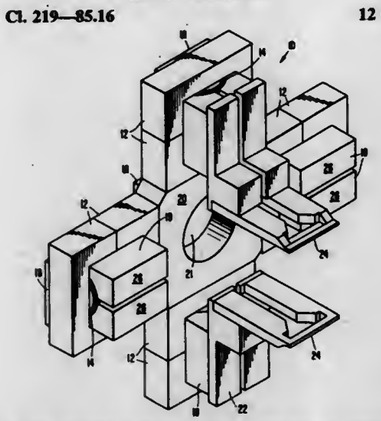
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**Re. 35,180**

**HIGH FREQUENCY THERMODE DRIVEN DEVICE EMPLOYING ONE-TURN-SECONDARY TRANSFORMERS**

**Eldred H. Paufve, Windsor, and Richard Porterfield, Binghamton, both of N.Y., assignors to Delaware Capital Formation, Inc., Wilmington, Del.**

**Original No. 5,068,509, dated Nov. 26, 1991, Ser. No. 463,456, Jan. 11, 1990. Application for reissue Oct. 20, 1992, Ser. No. 963,664**
**Int. Cl.[6] B23K *3/00***
**U.S. Cl. 219—85.16** **12 Claims**



1. A high-frequency device having a plurality of transformers, each transformer having a primary winding driven by a high-voltage source, said device comprising:

a support member, said support member having a plurality of projections extending radially outwardly from a central portion, each of said projections having at least one pair of ears extending therefrom;

a plurality of transformer cores corresponding in number to the number of said projections, each of said ears protruding through an aperture of said corresponding transformer core outside of the primary winding; and

a plurality of thermodes corresponding in number to the number of said projections, each of said thermodes being electrically coupled to said corresponding projection;

wherein each of said projections acts as a one-turn-secondary winding for a corresponding primary winding.

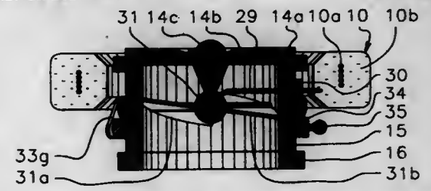
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**Re. 35,181**

**THERMO-MAGNETIC VAPORIZER CARBURETOR**

**Paul H. Hudz, 3400 Inverness St., Redding, Calif. 96002**

**Original No. 5,171,487, dated Dec. 15, 1992, Ser. No. 847,588, Mar. 5, 1992. Application for reissue Dec. 15, 1994, Ser. No. 356,154**
**Int. Cl.[6] F02M *15/04***
**U.S. Cl. 261—142** **11 Claims**




1. A carburetor comprising dual means for heating/vaporization and magnetic dispersion of the liquid fuel for [all types of] internal combustion engines[;] *comprising:*

a thermo-magnetic vaporizer chamber [in a circular ring form] with [multiple turns of] tubing *means* through which the fuel passes;

[a] fuel supply means [of a fuel pump, pressure regulator and fuel mixture intensity metering valve along with an electric fuel shut-off solenoid suitably connected] to provide a high pressure fuel source;

a carburetor body casting which provides vaporized and dispersed fuel entrance into the engine intake manifold;

[said carburetor body casting supports] a vortex forming carburetor top plate and said thermo-magnetic vaporizer chamber [by means of multiple shaped metal supports] *supported by said carburetor body casting*;

[said carburetor top plate to which] a central vane gimbal [is] affixed [at the center line of the carburetor body casting] *to said carburetor top plate*;

said central vane gimbal [which supports] *supporting at least* three [or more identical] throttle control vane shafts within said body casting;

said throttle control vane shafts supporting *at least* three [or more identical shaped] throttle vanes;

a throttle control means for positioning said [three or more identical shaped] throttle vanes, one of which is also connected to a mixture intensity metering valve;

[a multi-turn-coil tubing which serves as an electrical resistance] *a fuel* heater, [a coil of] *and* an electromagnet [and a conduit for the fuel] *mounted on said casting*;
a electrical source and control means for energizing and controlling said [multi-turn-coil tubing within said thermo-magnet vaporizer chamber] *heater*;
a vapor injection tube secured [within the side of] *in* said carburetor casting with connection to the exit end of said [multi-turn-coil] tubing *means*;
said vapor injection tube *having* the exit end [is affixed and] connected [into] *to* the central vane gimbal; *and*
a central vane gimbal exit port [at the bottom center line of central vane gimbal].

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**Re. 35,182**

## GAMING AND AMUSEMENT MACHINES AND REELS FOR THEM

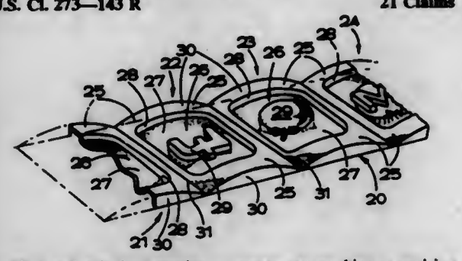
**Terence Howard, Nottingham, England, assignor to Bell-Fruit Manufacturing Company Limited, Nottingham, England**

**Original No. 5,211,399, dated May 18, 1993, Ser. No. 833,860, Feb. 11, 1992. Application for reissue Oct. 25, 1994, Ser. No. 328,488**

**Claims priority, application United Kingdom, Aug. 12, 1989, 8918448**

**Int. Cl.[6] G09F 11/12**

**U.S. Cl. 273—143 R** **21 Claims**



**19.** A reel strip for a gaming or amusement machine comprising a raised region and a plurality of lower, sunken regions, each of said plurality of sunken regions being provided with a symbol or fruit and being surrounded and framed by respective portions of said raised region.

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**Re. 35,183**

## DEFLECTION YOKE FOR USE IN COLOR CATHODE RAY TUBES

**Toshio Ose; Toshifumi Yoshida, both of Osaka, and Katsuyo Iwasaki, Hyogo, all of, Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan**

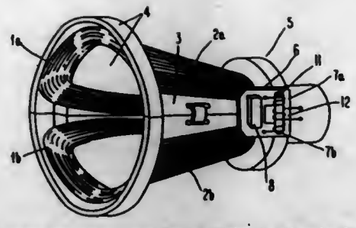
**Original No. 5,115,170, dated May 19, 1992, Ser. No. 558,740, Jul. 27, 1990. Application for reissue May 19, 1994, Ser. No. 246,016**

**Claims priority, application Japan, Jul. 31, 1989, 1-199005**

**Int. Cl.[6] H01J 29/56**

**U.S. Cl. 315—370** **9 Claims**

1. A deflection yoke for use in color cathode ray tubes, the deflection yoke comprising a larger rim portion and a smaller rim portion, a vertical deflection coil for generating a vertical deflecting magnetic field having a barrel-shaped distortion, and a horizontal deflection coil for generating a horizontal deflection magnetic field having a pin-cushion shaped distortion, a differential coil connected to the horizontal deflection coil, a pair of cores located in opposite positions in relation to the smaller rim portion, the cores being provided with coils for generating a quadripolar magnetic field, a pickup coil magnetically coupled to one of the differential coil and the horizontal deflection coil, and a current waveform shaping circuit for supplying a current to the quadripolar magnetic field generating coils.



3. A deflection yoke according to claim 1, wherein the [differential] *pick-up* coil is located near [windows] *a window* of the horizontal deflection coil.

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**Re. 35,184**

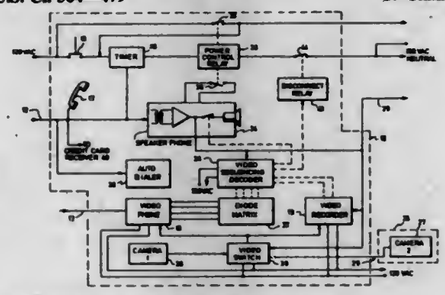
## REMOTE TRANSACTION SYSTEM

**Mark E. Walker, 1207 White Pine, San Antonio, Tex. 78232**

**Original No. 4,845,636, dated Jul. 4, 1989, Ser. No. 920,280, Oct. 17, 1986. Application for reissue Jul. 3, 1991, Ser. No. 725,360**

**Int. Cl.[6] G06F 19/00**

**U.S. Cl. 364—479** **17 Claims**



*9. A business transaction system, comprising:*
*an operations center;*
*a transaction station located remote from said operations center;*
*said transaction station including:*
*an audio device to transmit and receive audio signals between said transaction station and said operations center;*
*a first image device to transmit and receive images between said transaction station and said operations center;*
*a second image device to transmit images from said transaction station to said operations center for purposes of verification of identification documents;*
*a decoder connected to receive signals from said operations center and responsive to said signals to control said first and said second image devices; and*
*a dispenser coupled to said decoder for dispensing items to a user in response to control by said decoder; and*
*a communication path extending between said operations center and said transaction station for conveying signals between said operations center and said transaction station;*
said transaction station further including a switching device for selectively coupling said first and second image devices to said communication path.



**Re. 35,185**

## SEPARATION MEDIA CONTAINING ACYL DIAZEPINES

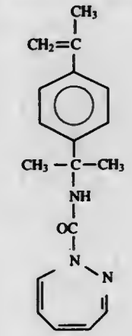
**Henry S. Kolesinski, Beverly, Mass., assignor to Cohesive Technologies, Inc., Acton, Mass.**

**Original No. 5,159,039, dated Oct. 27, 1992, Ser. No. 497,787, Mar. 21, 1990. Division of Ser. No. 337,342, Apr. 13, 1989, abandoned. Application for reissue Sep. 17, 1993, Ser. No. 122,698**

**Int. Cl.[6] C08F 26/06;126/06;226/06**

**U.S. Cl. 526—263** **9 Claims**

4. A chromatographic separation medium comprising a chromatographic inert substrate having a coating comprising a polymeric N-acyl diazepine moiety of the general formula:



**Re. 35,186**

## SEPARATION MEDIA CONTAINING ACYL DIAZEPINES

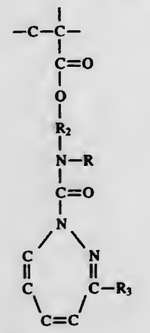
**Henry S. Kolesinski, Atkinson, N.H., assignor to Cohesive Technologies, Inc., Acton, Mass.**

**Original No. 5,159,039, dated Oct. 27, 1992, Ser. No. 497,787, Mar. 21, 1990. Division of Ser. No. 337,342, Apr. 13, 1989, abandoned. Application for reissue Aug. 31, 1994, Ser. No. 298,759**

**Int. Cl.[6] C08F 26/06;126/06;226/06**

**U.S. Cl. 526—263** **1 Claim**

[1. A chromatographic separation medium comprising a chromatographic inert substrate having a coating comprising a polymeric N-acyl diazepine moiety of the general formula:



where R is a hydrogen, alkyl, aryl, alkaryl or aralkyl, $R_2$ is a divalent alkylene radical, and $R_3$ is an alkyl, aryl, alkaryl or aralkyl group.]

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# PLANT PATENTS

## GRANTED MARCH 19, 1996

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

9,477

### RED RASPBERRY PLANT NAMED 'DINKUM'

Graeme McGregor, Warrandyte, Australia, assignor to Daratech Pty., Melbourne, Australia

Filed Apr. 20, 1994, Ser. No. 230,113
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—46.2 1 Claim

1. The new and distinct variety of raspberry plant described and illustrated herein and identified by the characteristics enumerated above.

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9,478

### CHRYSANTHEMUM PLANT NAMED 'CHARIBO'

Jean-Pierre Challet, Lafayette, Calif., assignor to Selection New Plant Sarl, Le Cannet des Maures, France

Filed Jul. 12, 1994, Ser. No. 273,995
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—77 1 Claim

1. A new and distinct cultivar of Chrysanthemum plant named 'Charibo', substantially as herein shown and described, which
(a) exhibits attractive double incurved white pompon blossoms generally in the shape of a round ball,
(b) exhibits a flower response period of approximately nine weeks,
(c) forms attractive dark green foliage,
(d) achieves a short to medium plant height, and
(e) is particularly suited for pot mum production on a recurrent basis throughout the year.

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9,479

### CHRYSANTHEMUM PLANT NAMED 'CHAKUSE'

Jean-Pierre Challet, Lafayette, Calif., assignor to Selection New Plant Sarl, Le Cannet des Maures, France

Filed Jul. 12, 1994, Ser. No. 273,993
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—78 1 Claim

1. A new and distinct cultivar of Chrysanthemum plant named 'Chakuse', substantially as herein shown and described, which
(a) exhibits in profusion attractive double bright yellow spider blossoms with upright petals,
(b) exhibits a flower response period of approximately eight and one-half weeks,
(c) is highly amenable to branching by pinching,
(d) achieves a short plant height, and
(e) is particularly suited for pot mum production on a recurrent basis throughtout the year.

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9,480

### CHRYSANTHEMUM PLANT NAMED 'CHATUPA'

Jean-Pierre Challet, Lafayette, Calif., assignor to Selection New Plant Sarl, Le Cannet Des Maures, France

Filed Jul. 12, 1994, Ser. No. 273,997
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—79 1 Claim

1. A new and distinct cultivar of Chrysanthemum plant named 'Chatupa', substantially as herein shown and described, which
(a) exhibits attractive extremely large double incurved pompon blossoms that are honey gold in coloration,
(b) exhibits a flower response period of approximately nine weeks,
(c) forms attractive dark green glossy foliage,
(d) achieves a short to medium plant height, and
(e) is particularly suited for pot mum production on a recurrent basis throughout the year.

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9,481

### CHRYSANTHEMUM PLANT NAMED 'CHAREMI'

Jean-Pierre Challet, Lafayette, Calif., assignor to Selection New Plant Sarl, Le Cannet des Maures, France

Filed Jul. 12, 1994, Ser. No. 274,002
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—80 1 Claim

1. A new and distinct cultivar of Chrysanthemum plant named 'Charemi', substantially as herein shown and described, which
(a) exhibits attractive double incurved light pink pompon blossoms generally in the form of a large ball,
(b) exhibits a flower response period of approximately eight weeks,
(c) forms attractive dark green foliage,
(d) achieves a short plant height, and
(e) is particularly suited for pot mum production on a recurrent basis throughout the year.

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# PATENTS

## GRANTED MAR. 19, 1996

### ERRATA

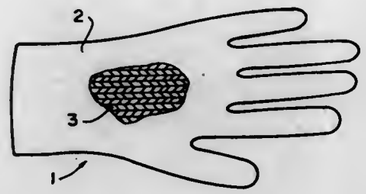
| For CLASS | See PATENT NO. |
|---|---|
| 008–055 | 5,499,554 |
| 101–375 | 5,499,580 |
| 119–061 | 5,499,609 |
| 119–166 | 5,499,610 |
| 119–166 | 5,499,611 |
| 134–001 | 5,499,668 |
| 222–386 | 5,499,758 |
| 223–046 | 5,499,759 |
| 224–155 | 5,499,760 |
| 224–202 | 5,499,761 |
| 224–321 | 5,499,762 |
| 604–252 | 5,500,003 |
| 427–247 | 5,500,053 |
| 264–401 | 5,500,069 |
| 204–192 | 5,500,102 |
| 204–192 | 5,500,103 |
| 204–253 | 5,500,104 |
| 252–001 | 5,500,157 |
| 424–078 | 5,500,190 |
| 427–358 | 5,500,191 |
| 429–206 | 5,500,291 |
| 429–209 | 5,500,292 |
| 524–571 | 5,500,447 |
| 524–437 | 5,500,480 |
| 562–018 | 5,500,485 |
| 342–182 | 5,500,833 |
| 395–700 | 5,500,881 |

# PATENTS

GRANTED MARCH 19, 1996

## GENERAL AND MECHANICAL

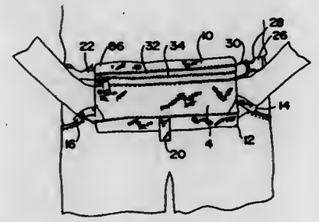
**5,499,400**
**WORK GLOVES AND MANUFACTURE THEREOF**
**Haruyuki Masuda, and Yasuo Takata, both of Naruto, Japan, assignors to Nankai Technart Corporation, Naruto, Japan**
**Filed Dec. 10, 1993, Ser. No. 165,368**
**Int. Cl.[6] A41D** *13/10;19/00;19/04*
**U.S. Cl. 2—161.6** **22 Claims**




1. Work gloves comprising:
knitted gloves having an inner surface and an outer surface, the gloves are knitted using a combination of untreated yarn and yarn treated with a first agent selected from the group consisting of an antimicrobial agent and a deodorizing agent and a repellent agent selected from the group consisting of a water repellent agent and an oil repellent agent, said treated yarn appearing on the inner surface side of said knitted gloves; and
a flexible coating formed on the outer surface of said knitted gloves.

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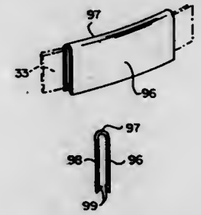
**5,499,401**
**INSULATED HAND WARMER WITH A COLLAPSIBLE WALL AND RETAINING MEANS**
**Helen Heinmiller, 43503 Plantation Ter., Ashburn, Va. 22011**
**Filed Mar. 23, 1995, Ser. No. 409,163**
**Int. Cl.[6] A41D** *13/08*
**U.S. Cl. 2—208** **22 Claims**




1. A hand warmer comprising:
a front wall, said front wall having an outer face and an inner face and a first edge and a second edge and a first end and a second end;
a collapsible wall, said collapsible wall having an outer face and an inner face and a first edge and a second edge and a first end and a second end, wherein said second edge of said front wall is connected to said first edge of said collapsible wall;
a bottom wall, said bottom wall having an outer face and an inner face and a first edge and a second edge and a first end and a second end, wherein said second edge of said collapsible wall is connected to said first edge of said bottom wall;
a back wall, said back wall having an outer face and an inner face and a first edge and a second edge and a first end and a second end, wherein said second edge of said bottom wall is connected to said first edge of said back wall;
a top wall, said top wall having an outer face and an inner face and a first edge and a second edge and a first end and a second end, wherein said second edge of said back wall is connected to said first edge of said top wall and wherein said second edge of said top wall is connected to said first edge of said front wall; and,
at least one closing means connected to said front wall for maintaining said collapsible wall in a collapsed condition.

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**5,499,402**
**ATTACHMENT TO ADJUSTABLE STRAP ON BASEBALL CAPS**
**Michael J. Rose, 3247 Morino Ave., San Jose, Calif. 95127**
**Filed Oct. 4, 1993, Ser. No. 131,765**
**Int. Cl.[6] A42B** *1/24*
**U.S. Cl. 2—209.13** **2 Claims**

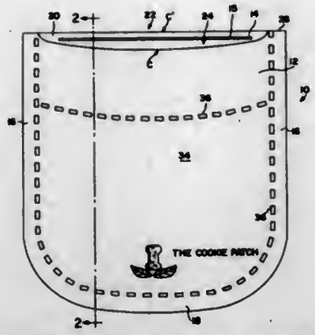



1. In combination, a logo display and a cap to fit a human head, said cap having an opening at the rear and a pair of headband adjustment straps extending across said opening,
said logo display comprising a generally tubular flexible member shaped and dimensioned to fit around said adjustment straps to at least partially enclose said adjustment straps and a front member having a logo thereon comprising a part of said flexible member wherein the logo faces rearwardly of said cap, said flexible member also having a fold along one edge thereof, said flexible member also comprising a rear member integral with said fold and spaced behind said front member, said front member being flat and rectangular and depending from said fold, said rear member being flat and rectangular depending from said fold and parallel to said front member, said flexible member further comprising first and second tangs on facing edges of said front member and rear member remote from said fold, said first and second tangs being generally triangular in cross section and having upper sides projecting inwardly horizontally perpendicular to said front member and said rear member, respectively, and having inward facing sides slanting downwardly-outwardly from said upper sides whereby said straps fit between said front member and said rear member and between said fold and said tangs.

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**5,499,403**
**DISPOSABLE POCKET FOR ANIMAL TREATS**
**Lora Harrigan, 14 Peck St., Stratford, Conn. 06497**
**Filed May 27, 1994, Ser. No. 250,022**
**Int. Cl.[6] A41D** *27/20*
**U.S. Cl. 2—247** **7 Claims**

1. A disposable pocket for temporary attachment to a person's outer garment and for receiving and holding an animal treat comprising front and back panels joined to each other along side and bottom edges in a leakproof seam to form a pocket, the joined front and back panels having upper margins defining a top end of the pocket, a top panel having a slot therein, the top panel having front




and back edges secured respectively to the upper margins of the front and back panels to enclose the pocket and provide access to the pocket through the slot, the front, back, and top panels being formed of greaseproof material, the back panel having an outer face and the front panel having a front face, the outer face of the back panel having a pressure sensitive adhesive thereon and a peel-off backing attached to the adhesive for protecting the adhesive prior to use, and the front face of the front panel being textured to have the appearance of a fabric.

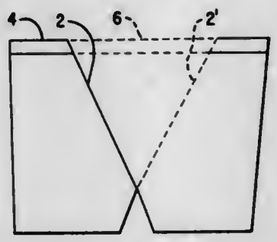
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**5,499,404**

## ARTICLE OF MEN'S UNDERWEAR HAVING SHIRRED FRONTAL FLY OPENING

**Piero Marchiorello, Via Matteotti, 1, 36027 Rosa', Italy**

**Filed Nov. 18, 1994, Ser. No. 344,717**
**Claims priority, application Italy, Nov. 19, 1993, VE93U0025**
**Int. Cl.[6] A41B *9/02***
**U.S. Cl. 2—403** **4 Claims**




1. An article of underwear having a front aperture bounded by two edges comprising:

a front portion of a waistband having two strips for independently supporting said edges, at least one of said two edges being slidable along its respective strip between a position in which said two edges are at least partly superposed and a position in which said two edges are spaced apart.

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**5,499,405**

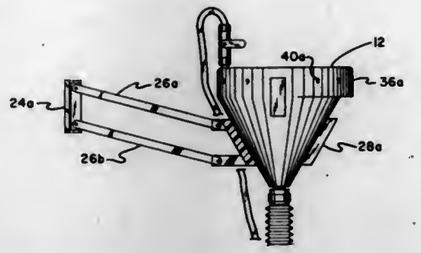
## URINAL

**William T. Collins, 27216 112th St. E., Buckley, Wash. 98321**

**Filed Nov. 16, 1994, Ser. No. 340,604**
**Int. Cl.[6] E03D *13/00***
**U.S. Cl. 4—306** **5 Claims**

1. A urinal comprising:

a urinal bowl, the urinal bowl including spaced side walls which are connected together by a front end of the urinal bowl, the urinal bowl further including a depending lip which extends from an upper perimeter of the side walls and the front end




and into an interior of the urinal bowl, the depending lip being spaced from an interior surface of the urinal bowl, with the urinal bowl including a plurality of vent holes extending therethrough and into a space between the depending lip and the interior surface of said urinal bowl, the vent holes being operable to draw ambient air into the urinal bowl by a venturi vacuum created as flush water flows from the depending lip to the interior surface of the urinal bowl.

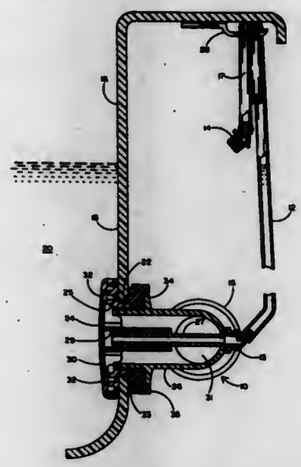
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**5,499,406**

## SAFETY SUCTION ASSEMBLY FOR USE IN WHIRLPOOL BATHS AND THE LIKE

**Philip E. Chalberg, and Paul N. Kenchel, both of Costa Mesa, Calif., assignors to Hydrabaths, Inc., Santa Ana, Calif.**

**Filed Dec. 12, 1994, Ser. No. 353,664**
**Int. Cl.[6] A47K *3/00*; E04H *4/12***
**U.S. Cl. 4—541.2** **10 Claims**



1. A spa or whirlpool bath suction assembly comprising:

a body having a main chamber and an induction chamber, an integral pump inlet pipe connected to said main chamber and an induction tube connected to said induction chamber;

a face connected to said body, said face having a plurality of suction apertures providing passages for water flow into said body and into said pump inlet pipe, said face having an integral face tube extending into said body in overlapping coaxial relation to said induction chamber and forming a bleed path therebetween.

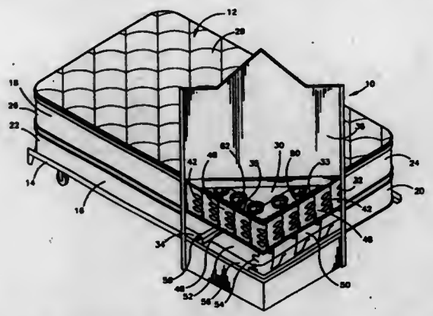


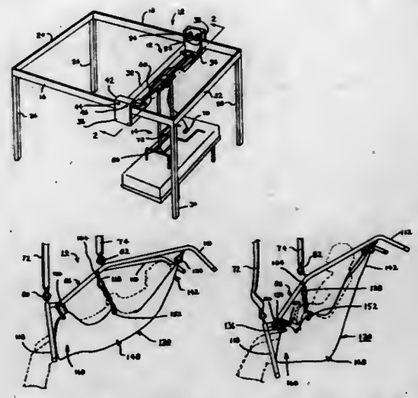
**5,499,407**

## SPACE-SAVING BEDDING SYSTEM DISPLAY DEVICE

**Michael J. Atwell, Medina, and Thomas J. O'Donnell, Westlake, both of Ohio, assignors to Ohio Mattress Company Licensing and Components Group, Cleveland, Ohio**

**Filed Apr. 13, 1994, Ser. No. 227,066**
**Int. Cl.[6] C09F *19/00***
**U.S. Cl. 5—1** **16 Claims**





1. A display device for displaying the internal construction of a bedding system, said bedding system being arranged in a generally-horizontal, in-use configuration,

said bedding system comprising a foundation and an innerspring mattress arranged on top of said foundation, said foundation comprising an interior assembly and an opaque covering thereon, said innerspring mattress comprising an innerspring assembly defining a body-receiving surface and at least one side surface, said innerspring mattress having an opaque covering on said body-receiving surface and said side surface,

said display device comprising a first generally-planar member corresponding to the body-receiving surface of said mattress and a second generally-planar member corresponding to a side surface of said mattress,

said first generally-planar member bearing a first picture of the innerspring assembly of said innerspring mattress such that the likenesses of the individual components of the innerspring assembly in said first picture are so portrayed that they simulate in two dimensions the structure and arrangement of the corresponding components of the innerspring assembly of said mattress when viewed from above said mattress innerspring assembly,

said second generally-planar member bearing a second picture of the innerspring assembly of said innerspring mattress such that the likenesses of the individual components of said innerspring assembly in said second picture are so portrayed that they simulate in two dimensions the structure and arrangement of the corresponding components in the innerspring assembly of said mattress when viewed from the side of said mattress innerspring assembly.

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**5,499,408**

## APPARATUS FOR LIFTING INVALIDS

**John W. Nix, 2360 Freshwater Rd., Haw River, N.C. 27258**

**Filed Sep. 9, 1994, Ser. No. 303,484**
**Int. Cl.[6] A61G *7/10***
**U.S. Cl. 5—85.1** **21 Claims**

1. An apparatus for moving an invalid between first horizontal and second sitting positions, said apparatus comprising:

(a) an overhead frame extending over said first and second positions;

(b) a hoist assembly supported by said frame, said assembly including independently operable first and second retractable sling frame supports; and

(c) a sling frame having a two point connection to the hoist assembly, comprised of longitudinally spaced, upper and lower frame attachments to connect said sling frame to said frame supports and sling attachments to connect a sling beneath said frame.



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**5,499,409**

## EPOXIDIZED POLYDIENE BLOCK POLYMER WITH EPOXY RESINS

**David J. St. Clair, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.**

**Filed Jul. 18, 1994, Ser. No. 277,379**
**Int. Cl.[6] C08L *53/00*; *53/02***
**U.S. Cl. 525—92 H** **11 Claims**

1. A toughened cycloaliphatic epoxy resin composition comprising:

(a) 30 to 90 percent by weight of a curable cycloaliphatic epoxy resin,

(b) 5 to 40 percent by weight of an epoxidized low viscosity polydiene polymer which contains less than 5% by weight of a vinyl aromatic hydrocarbon wherein the polymer contains from 3.0 to 6.0 milliequivalents of epoxy per gram of polymer, said polymer having the structural formula

$$(A—B—A_p)_n—Y,—(A_q—B)_m$$

wherein Y is a coupling agent or coupling monomer or initiator, A and B are homopolymer blocks of conjugated diolefin monomers or copolymer blocks of conjugated diolefin monomer, the A blocks having a molecular weight of from 100 to 6,000 and the B blocks having a molecular weight of from 1000 to 15,000, n is greater than 0, r is 0 or 1, m is greater than or equal to ), n+ m ranges from 1 to 100, and p and q is 0 or 1

(c) a curing agent,

(d) 3 to 30 percent by weight of an aromatic epoxy resin, and

(e) 1 to 30% by weight of a hydroxy functional material which has a number average molecular weight of 75 to 300, at least 6 carbon atoms, and is soluble in a blend of (a) and (b).

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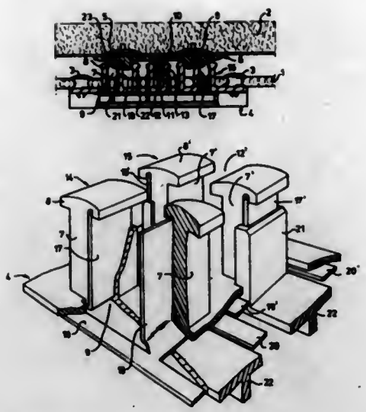
**5,499,410**

## COUPLING DEVICE FOR A MATTRESS

**Bernardus A. T. F. Assink, Schalkhaar, Netherlands, assignor to Koninklijke Auping B.V., Deventer, Netherlands**

**Filed Jul. 5, 1994, Ser. No. 270,673**
**Claims priority, application Netherlands, Jul. 5, 1993, 9301174**
**Int. Cl.[6] A47C *21/00***
**U.S. Cl. 5—411** **14 Claims**

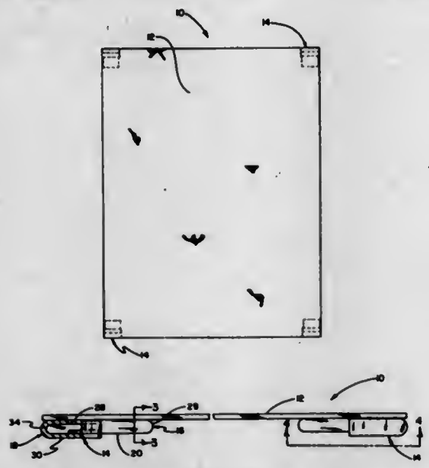
1. Coupling device for coupling a mattress to a mattress base in a variety of positions in the same plane, comprising a lower



coupling element attached to the mattress base and an upper coupling element attached to the mattress, each of the lower and upper coupling elements including protrusions, at least some of the protrusions on one of the coupling elements being arranged in spaced relationship to one another to define a plurality of cavities engageable with the protrusions on the other coupling element.

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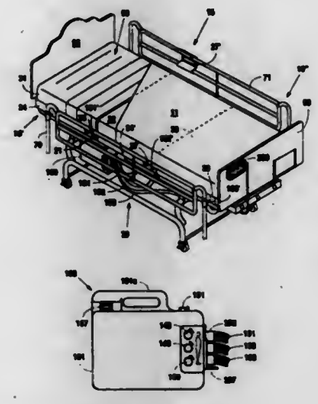
**5,499,411**
**SAND POCKET BEACH BLANKET**
**King Wong, 38 Richard Rd., Edison, N.J. 08820**
**Filed Mar. 22, 1995, Ser. No. 408,500**
**Int. Cl.[6] A47G 9/06**
**U.S. Cl. 5—417** **2 Claims**



1. A sand pocket beach blanket comprising:
a blanket web formed of a substantially flexible material and positionable upon a support surface;
a plurality of anchor means secured to the bottom surface of said blanket web for receiving granular material therein to anchor said blanket web to the support surface, each of said anchor means comprising;
an interior pocket secured to the bottom surface of said blanket web, said pocket having an opening only at one end extending across said pocket;
an exterior pocket secured to the bottom surface of said blanket web and partially overlying said interior pocket, said exterior pocket having an opening only at one end extending across said exterior pocket, the openings of said interior pocket and of said exterior pocket facing one another and in communication with one another;
the interior pocket comprising a main web having lateral webs extending therefrom and secured to the bottom surface of said blanket web, said main web extending between the lateral webs and being secured to the bottom surface of said blanket web; and
the exterior pocket comprising a main web having lateral webs extending therefrom and being secured to the bottom surface of said blanket web, said main web extending between said lateral webs and being secured to the bottom surface of said blanket web, said main web overlapping the main web of said interior pocket to form a closure therebetween.

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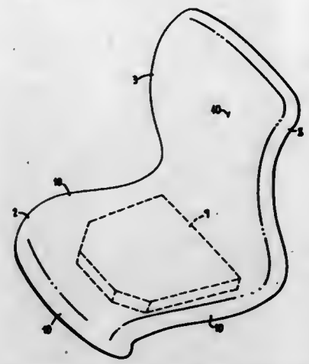
**5,499,412**
**PRESSURE RELIEF AIR MATTRESS AND RELATED SYSTEM**
**Steven A. Berkowitz, San Antonio, Tex., assignor to Kinetic Concepts, Inc.**
**Continuation of Ser. No. 932,873, Aug. 20, 1992, abandoned.**
**This application Sep. 20, 1994, Ser. No. 309,557**
**Int. Cl.[6] A61G 7/04**
**U.S. Cl. 5—453** **5 Claims**



1. An inflatable mattress system comprising:
a first inflatable air cushion positioned to support the seat portion of a patient;
a second inflatable air cushion positioned to support another portion of the patient; and
a source of pressurized gas in fluid communication with an inlet opening in the first air cushion and an inlet opening in the second air cushion for inflating the same;
said source being in unrestricted fluid communication with the inlet opening in the first air cushion;
said source comprising at least a first and a second control for controlling the flow of air to the first and second air cushions;
said first control being operable to adjust the output of a blower integral with said source, the outlet of which is in fluid communication with each of the said first and second cushions for inflating the same; and
said second control being an adjustable flow restricting device for controlling the flow from the blower unit to the second inflatable air cushion.



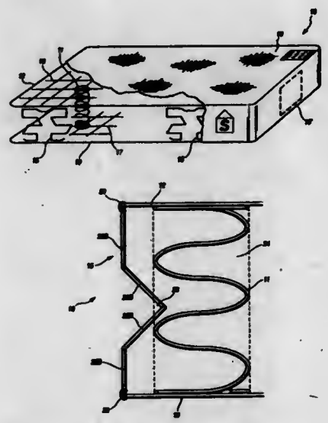
**5,499,413**
**COMPOSITE FOAM CHAIR CUSHION AND METHOD**
**Hendrik R. Van Hekken, Allentown, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.**
**Filed Apr. 29, 1994, Ser. No. 235,850**
**Int. Cl.[6] A47C 27/00;7/02**
**U.S. Cl. 5—464** **13 Claims**



1. A composite foam chair cushion comprising an insert of a foamed material of a predetermined density and compressibility, the insert having a top surface a bottom surface and side surfaces, the side surfaces of the insert being bonded to and completely surrounded by a foamed border material of less density and greater compressibility than that of the insert.

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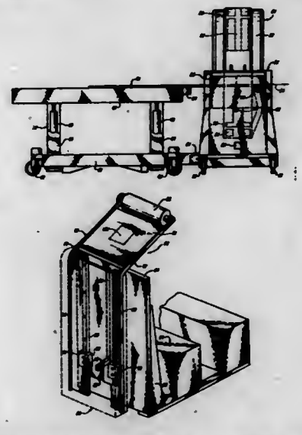
**5,499,414**
**INNERSPRING CONSTRUCTION INCLUDING IMPROVED EDGE CHARACTERISTICS**
**Paul J. Dillon, Roswell, Ga., assignor to Simmons Company, Atlanta, Ga.**
**Filed May 5, 1994, Ser. No. 238,835**
**Int. Cl.[6] A47C 25/02**
**U.S. Cl. 5—474** **15 Claims**



1. An innerspring mattress construction comprising:
a) an upper peripheral border wire having an elongate portion lying along a first axis;
b) a lower peripheral border wire having an elongate portion lying along a second axis, said first and second axes lying within an innerspring construction side wall plane;
c) at least one coil spring providing spring resistance to a force placed atop said mattress innerspring construction;
d) a torsion edge support unit having an upper horizontal portion attached to said elongate portion of said upper peripheral border wire and having a lower horizontal portion attached to said elongate portion of said lower peripheral border wire, and having a first torsion bar positioned within the spacial volume of said interior coil spring and a second torsion bar lying approximately in the same plane as said innerspring construction side wall plane, said torsion edge support providing resistance to a force tending to urge said respective elongate portions of said upper and lower border wires closer together.

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**5,499,415**
**STABILIZED, CANTILEVERED, PATIENT TRAUMA TABLE SYSTEM**
**Gilbert W. McKenna, Revere, Mass., assignor to Analogic Corporation, Peabody, Mass.**
**Filed Feb. 8, 1994, Ser. No. 193,782**
**Int. Cl.[6] A61B 6/04**
**U.S. Cl. 5—601** **20 Claims**

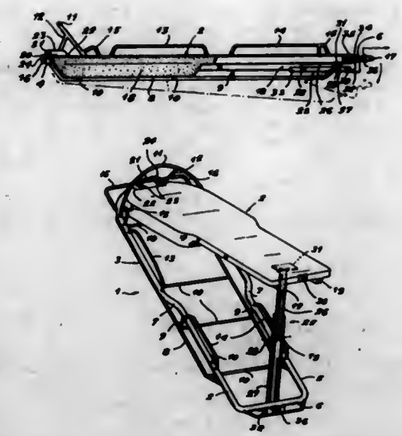


1. A table for supporting a patient in a reposed position, said table comprising:
a base supported on wheels;
a planar top for supporting the patient in a reposed position and supported by and capable of being moved relative to said base so that a portion of patient can be cantilevered relative to the base;
support means for supporting the cantilevered portion of said planar top when said patient is cantilevered relative to said base; and
means for controllably moving said support means into and out of supporting contact with the cantilevered portion of said planar top.

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**5,499,416**
**FLOATING STRETCHER DESIGNED, IN PARTICULAR, FOR THE RECOVERY OF INJURED PERSONS AT SEA**
**Antar Daouk, 27, avenue du Maréchal Lyautey, 75016 Paris, France**
**Filed Sep. 8, 1994, Ser. No. 303,206**
**Claims priority, application France, Sep. 9, 1993, 93 10704**
**Int. Cl.[6] A61G 1/00;1/013**
**U.S. Cl. 5—625** **8 Claims**

1. Floating stretcher, designed, in particular, for recovering injured persons at sea, of the type including a metallic framework



(1) capable of being winched by helicopter and supporting a panel of composite material (2) ensuring the buoyancy of the whole, characterized in that the panel of composite material (2) is pivotably fixed to the front of the metallic framework (1) and in that means (25, 34) are provided for maintaining the said panel (2) either in a position inclined at a given angle in relation to the plane of the framework (1) and above the latter, or in the plane of the framework.

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**5,499,417**

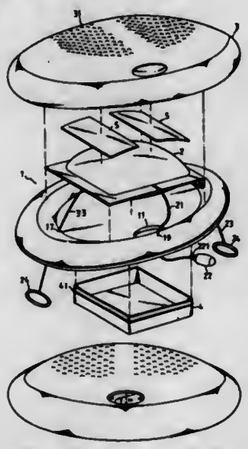
**MULTIPURPOSE INFLATABLE FLOATING PILLOW**

**Chih C. Wang, 2F., No. 3, Lane 280, Chung-Chan Rd., Hsin Tien City, Taipei Hsien, Taiwan**

**Filed Dec. 13, 1994, Ser. No. 357,612**

**Int. Cl.[6] A47G *9/00***

**U.S. Cl. 5—652** **2 Claims**



1. A multipurpose floating pillow comprising a lower member being provided on a top surface thereof with a central spherical recess for receiving an inflatable sac therein, a molded and resilient upper member being disposed above and engaged with said lower member, a container being disposed below said lower member in a recess provided at a bottom side of said lower member, and pads made of slightly rigid material being disposed between said inflatable sac and said upper member; said inflatable sac being controllably inflated by means of an inflating ball which is connected to said inflatable sac at a front portion thereof by means of an inflating hose; two gripping rings being symmetrically connected to two lateral sides of said lower member by means of two pulling strings; both of said inflating hose and said two pulling strings extending to said bottom side of said lower member via through holes formed on said lower member at predetermined positions while said two pulling strings being separately threaded through two substantially diametrically opposite round recesses symmetrically formed at said bottom side of said lower member via a central projection provided at each of said round recesses; said floating pillow being characterized in an adjustable resiliency which can be controlled through the internal pressure of said inflatable sac by means of said inflating ball and said inflating hose connected to said inflatable sac and thereby, permits said floating pillow to be used in different occasions.

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**5,499,418**

**BODY SUPPORT FOR A BABY**

**Sze W. Tan, and Valerie A. Capper, both of 18-B Iverson Road, London NW6 2HE, Great Britain**

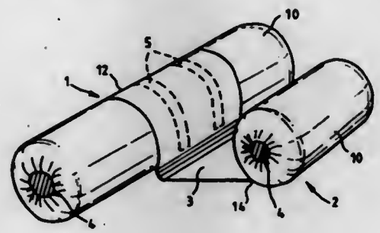
**PCT No. PCT/GB92/02173, § 371 Date Jun. 22, 1994, § 102(e) Date Jun. 22, 1994, PCT Pub. No. WO93/10695, PCT Pub. Date Jun. 10, 1993**

**PCT Filed Nov. 25, 1992, Ser. No. 240,779**

**Claims priority, application United Kingdom, Nov. 25, 1991, 9125013; Feb. 12, 1992, 9202952; Jun. 25, 1992, 9213489**

**Int. Cl.[6] A47C *20/02***

**U.S. Cl. 5—655** **4 Claims**



1. A body support for a young child or baby comprising:

a first bolster case and a second bolster case;

a flexible sheet having two ends and a center portion, each end being permanently connected to one of said first and second bolster cases;

a bolster in said first bolster case and a bolster in said second bolster case, said bolsters being substantially cylindrical in shape;

a first strip of releasable fastening material mounted on said sheet and a second strip of releasable fastening material mounted on said first bolster case, said first strip of releasable fastening material being the fastening mate of said second strip of releasable fastening material, said strips of releasable fastening material being positioned for adjustably connecting said center portion of said sheet to said first bolster case when said first bolster case is rolled under said sheet such that the distance between said first and second bolster cases is infinitely adjustable.



**5,499,419**

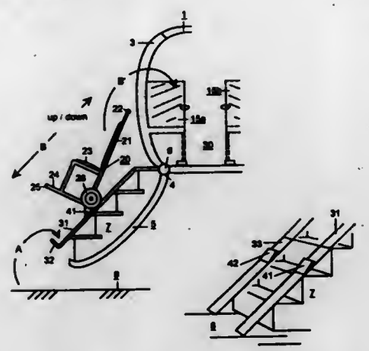
**FACILITATOR FOR ASSISTING WHEELCHAIR CHALLENGED PERSONS UP AND/OR DOWN INCLINES TRAVERSED BY A PATHWAY ACCESS SYSTEM**

**Edwin M. Baranowski, 75 Marrus Dr., Gahanna, Ohio 43230**

**Continuation-in-part of Ser. No. 86,252, Jul. 1, 1993, Pat. No. 5,402,546, which is a continuation-in-part of Ser. No. 826,838, Jan. 27, 1992, Pat. No. 5,319,818. This application Jan. 27, 1995, Ser. No. 379,183**

**Int. Cl.[6] E01D *15/00***

**U.S. Cl. 14—69.5** **21 Claims**



1. Apparatus for assisting transit of a person seated in a chair transport device in either direction between a lower level and an upper level including:

a pair of separate spaced-apart longitudinally extended pathways having upper and lower ends disposed between the lower level and the upper level, each pathway having a width sufficient to accommodate a support on one side of a chair, in which the separation of the pathways is sufficient to provide an access path for at least one assistant who guides the chair with respect to the pathways, and in which each pathway includes at least one stop for maintaining the location of the chair at a predetermined location along the length of the pathways, the stop being at a location along the length of the pathways intermediate and spaced from the upper and lower ends thereof.

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**5,499,420**

**BRUSH HOLDER FOR A TOOTHBRUSH**

**Bernhard Boland, Frankfurt, Germany, assignor to Braun Aktiengesellschaft, Kronberg, Germany**

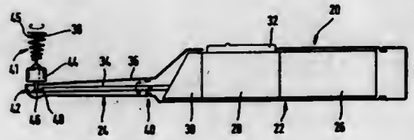
**PCT No. PCT/EP93/01685, § 371 Date Jan. 4, 1995, § 102(e) Date Jan. 4, 1995, PCT Pub. No. WO94/02047, PCT Pub. Date Feb. 3, 1994**

**PCT Filed Jun. 30, 1993, Ser. No. 362,542**

**Claims priority, application Germany, Jul. 15, 1992, 42 23 196.5**

**Int. Cl.[6] A61C *17/26*; A46B *13/02***

**U.S. Cl. 15—22.1** **13 Claims**



1. A brush holder for a toothbrush for cleaning the interproximal spaces, said brush holder for releasably locating a brush including a stem-shaped bristle supporting structure having bristles secured thereto, the bristle supporting structure including a bare portion carrying no bristles, said brush holder comprising an approximately disk-shaped body having a receiving means adapted to receive the bare portion of the stem-shaped structure, said body also having a recess proximate to said receiving means, and said brush holder also comprising a clamping means that the recess carries pivotally therein, said clamping means for clampingly, yet releasably, positioning the brush in its proper location relative to the brush holder.

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**5,499,421**

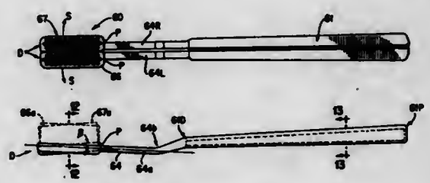
**TWIN-HEADED TOOTHBRUSH**

**Michael F. Brice, 2 Ava Dr., Syosset, N.Y. 11791**

**Filed Jun. 15, 1993, Ser. No. 76,667**

**Int. Cl.[6] A46B *9/04***

**U.S. Cl. 15—167.1** **27 Claims**



1. A twin-headed toothbrush comprising:

a substantially elongated handle defining a first longitudinal axis extending along a length of said handle, said longitudinal axis defining a longitudinal direction;

first and second of side-by-side elongated bristle heads, said first head having a first plurality of bristles extending therefrom and said second head having a second plurality of bristles extending therefrom; and

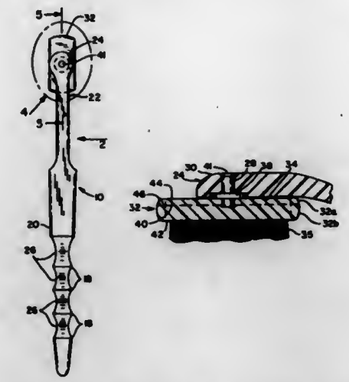
an elongated neck connected to said first and second heads, said neck defining a second longitudinal axis, said neck being positioned between one end of said handle to said heads and coupled thereto,

wherein said first elongated head has a first distal end and a first proximal end, said first plurality of bristles extending from said first head between said first distal end to said first proximal end, ends of said first plurality of bristles forming a first brushing plane surface, said first distal end being situated further away from said handle along said first longitudinal axis than said first proximal end;

wherein said second elongated head has a second distal end and a second proximal end, said second plurality of bristles extending from said second head between said second distal end to said second proximal end, ends of said second plurality of bristles forming a second brushing plane surface, said second distal end being situated further away from said handle along said first longitudinal axis than said second proximal end,

wherein when no pressure is applied to said heads, said first brushing plane surface and second brushing plane surface are angled relative to each other along the longitudinal direction with ends of a predetermined number of said first plurality of bristles nearest said first distal end of said first head being spaced perpendicularly further away from said second axis than ends of a predetermined number of said second plurality of bristles nearest said second distal end of said second head, and ends of a predetermined number of said second plurality of bristles nearest said second proximal end of said second head being spaced perpendicularly further away from said second axis than ends of a predetermined number of said first bristles nearest said first proximal end of said first head.

5,499,422
## ROTATING HEAD TOOTH BRUSH
Rudi Lavazoli, 10 Beech Ct., College Point, N.Y. 11356
Filed Jan. 5, 1995, Ser. No. 368,854
Int. Cl.[6] A46B 9/04
U.S. Cl. 15—167.1 2 Claims

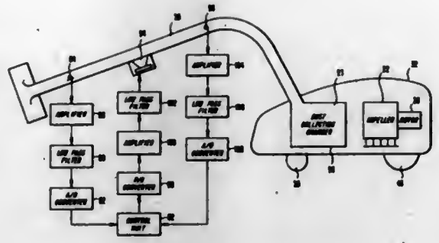




1. A tooth brush comprising a brush head, a rivet, a friction disk, and an elongated handle having a first end comprising a terminal with an upper surface and a lower surface, and a second end, wherein:
a) the terminal has a hole in its upper surface for receiving the rivet and a widened recess in its lower surface for receiving the friction disk, the center of the upper hole registering with the center of the widened recess in the lower surface of the terminal;
b) the terminal is made of a compressible material without cold flow;
c) the friction disk is partially recessed in the widened recess in the lower surface of the terminal;
d) the brush head has a hole registering with the hole in the upper surface of the terminal and the widened recess in the lower surface of the terminal; and
e) the rivet extends through the hole in the upper surface of the terminal, the friction disk, and into the hole in the brush head, said rivet having been hammered so as to compress the terminal and hold the terminal, the friction disk, and the brush head in close proximity, whereby the terminal being in a compressed state exerts pressure on the friction disk thus causing it to frictionally engage both the terminal and the brush head, whereby the brush head is rotatable with respect to the handle and is maintained in a desired orientation with respect to the brush handle by the frictional resistance supplied by the friction disk.

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5,499,423
## NOISE CONTROL APPARATUS FOR VACUUM CLEANER
Jae-Man Joo, Seoul, and Yong-Woo Kim, Suwon, both of, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea
Filed May 19, 1994, Ser. No. 246,143
Claims priority, application Rep. of Korea, May 19, 1993, 93-8571; Jul. 26, 1993, 93-14203
Int. Cl.[6] A47L 9/28; G01H 3/00; G10K 11/16
U.S. Cl. 15—319 20 Claims



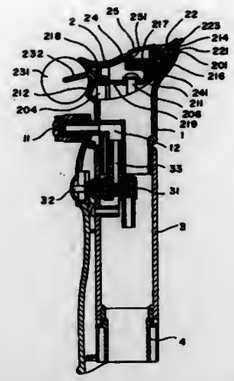
1. A noise control apparatus for a vacuum cleaner, said noise control apparatus comprising:
control means for controlling operation of the noise control apparatus;
noise detecting means for detecting at least one characteristic of a noise generated from a noise source, generating a noise level signal on the basis of the noise detection, and sending the noise level signal to the control means;
control sound generating means for generating a control sound to attenuate the noise from the noise source based on a control sound signal output from the control means; and
error sound detecting means for detecting an error sound resulting from the noise attenuation by the control sound from the control sound generating means, generating an error sound signal on the basis of the error sound detection, and sending the error sound signal to the control means
wherein the control means comprises a control sound signal outputting circuit for receiving the noise level signal from the noise detecting means, generating a control sound signal having the same amplitude and intensity as the noise level signal and a phase opposite to that of the noise level signal, and sending the control sound signal to the control sound generating means;
a second compensation circuit for generating a compensation signal to minimize an intensity of an error sound, based on the error sound signal from the error sound detecting means and the noise level signal from the noise detecting means, and for sending the compensation signal to the control sound signal outputting circuit;
a delay circuit for delaying the noise level signal output from the noise detecting means such that the noise generated from the noise source is synchronized with the control sound generated from the control sound generating means at the site of the error sound detecting means, and sending the delayed noise level signal to the second compensation circuit;
a control sound signal intensity adjusting circuit for receiving the control sound signal from the control sound signal outputting circuit and for adjusting an intensity of the received control sound signal; and
a first compensation circuit for subtracting the control sound signal generated from the control sound signal outputting circuit as adjusted in intensity by the intensity adjusting circuit from the noise level signal generated from the noise detecting means and for sending the noise level signal compensated on the basis of the subtraction to both the control sound signal outputting circuit and the delay circuit, whereby only the noise generated from the noise source is transmitted to the control sound signal outputting circuit and the delay circuit.

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5,499,424
## CLEANING DEVICE FOR HARD AND FLAT SURFACES
Alfred T. Lau, Hong Kong, Hong Kong, assignor to Senson Investments Limited, Hong Kong, Hong Kong
Filed Oct. 7, 1994, Ser. No. 319,784
Int. Cl.[6] A47L 1/095
U.S. Cl. 15—322 15 Claims

1. A cleaning device for use with a suction means comprising a head portion and a neck portion, wherein:
a) said neck portion is in abutment with said head portion and connectible with a suction means; and
b) said head portion comprises a base housing and a closure means for closing an inlet to the head portion,

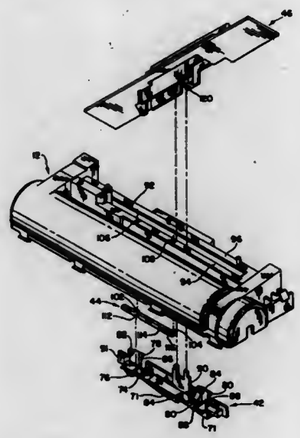




i) said base housing having an inlet edge defining said inlet, said inlet edge being normally in contiguous contact with said closure means, and
ii) said closure means comprising a rigid, non-absorbent closure plate pivotally attached to said base housing along one edge so that another edge is movable relative to said housing at said inlet edge, and a wiper blade, said wiper blade being flexible, non-absorbent and releasably attachable to said closure plate, said closure means being normally urged against said inlet edge of said base housing, and being movable away from said inlet edge when pressed against surfaces to be cleaned.

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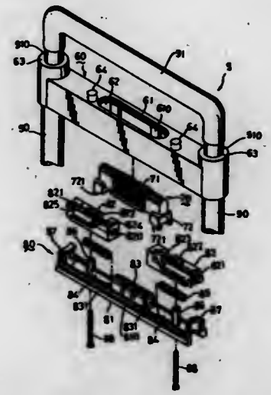
5,499,425
## HEIGHT ADJUSTMENT MECHANISM FOR AN UPRIGHT VACUUM CLEANER
William K. Glenn, III, Anderson, S.C., assignor to Ryobi Motor Products, Easley, S.C.
Filed Dec. 20, 1994, Ser. No. 360,252
Int. Cl.[6] A47L 5/34
U.S. Cl. 15—354 6 Claims



1. A vacuum cleaner comprising:
a chassis supporting a motor and a fan;
an interchangeable detent bar attached to the chassis having a plurality of detents;
a wheel retainer pivotally attached to the chassis to pivot about a laterally extending pivot axis, the wheel retainer supporting a pair of laterally spaced apart wheels and having at least one upwardly extending strut with a cam follower surface thereon;
a cam member movably mounted to the chassis and having a variable height cam surface thereon for engaging the cam follower surface of the wheel retainer, the cam member having a positioning finger thereon for selectively engaging the plurality of detents to selectively laterally position the cam surface relative to the cam follower surface thereby adjusting the distance between the wheels and the chassis; and
a handle attached to the cam member for moving the cam member relative to the chassis thereby raising and lowering the wheels relative to the chassis;
wherein the interchangeable detent bar may be replaced with another detent bar having a different number of detents thereon so that the number of height adjustment settings may be altered.

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5,499,426
## RETRACTABLE HANDLE DEVICE FOR A WHEELED SUITCASE
Dick M. Hsieh, No.18, Lane 777, Chung-Shan Rd., Kuei-Jen Hsiang, Tainan Hsien, Taiwan
Filed Apr. 29, 1994, Ser. No. 235,667
Int. Cl.[6] B25G 1/04
U.S. Cl. 16—115 4 Claims



1. A retractable handle device for a wheeled suitcase, comprising:
a pair of parallel storage tubes adapted to be mounted on said wheeled suitcase, wherein each of said storage tubes has a top open end and a bottom open end, and a first engaging hole formed adjacent said top open end and facing radially toward the other remaining tube;
a hollow seat frame extending between said storage tubes adjacent to said open ends and having two opposite end portions fastened respectively to said storage tubes, said hollow seat frame confining a receiving space therein which communicates with said first engaging holes, said hollow seat frame having a substantially flat top wall;
a handle member with two parallel arm portions inserted slidingly and axially into said storage tubes via said top open ends, each of said arm portions being provided with at least one second engaging hole to be aligned and communicated with a respective one of said first engaging holes;
a locking mechanism provided in said receiving space of said hollow seat frame and having two projecting members with a biasing means therebetween for biasing said projecting members to extend into said first engaging holes and said second engaging holes when said second engaging holes are in align-

ment with said first engaging holes so as to lock said handle member relative to said storage tubes, said locking mechanism including a holding frame fastened to said hollow seat frame and extending between said storage tubes, said holding frame having a mounting face which faces said flat top wall and which is provided with two spaced and aligned guiding rails that extend along a length thereof, said projecting members being guided respectively by said guiding rails; and

means for operably retracting said projecting members against action of said biasing means to release said handle member relative to said storage tubes.

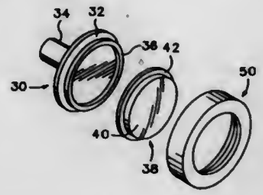
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**5,499,427**

## DRAWER KNOB ASSEMBLY

**Myrlen L. Bowman, Gresham, Oreg., assignor to Blaser Die Casting Co., Seattle, Wash.**

**Filed Sep. 2, 1994, Ser. No. 300,040**
**Int. Cl.[6] F16K *31/60***
**U.S. Cl. 16—121** **2 Claims**




1. A knob assembly for drawers and the like comprising:

(a) an integral knob having a flat base member, a longitudinally-extending stem connected at a first stem end to said base member and a threaded bore opening in a second stem end for receiving a screw fastener therein;

(b) an insert piece having a top portion and a recessed shoulder portion extending around the perimeter of said top portion; and

(c) a collar having a central opening sized to receive therethrough said top portion of said insert but blocking the passage of said shoulder portion of said insert, said collar being adapted to be crimped so as to securely engage said base member by its periphery.

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**5,499,428**

## FLUSH HINGE FOR ATHLETIC COURT DOORS

**Paul M. Okada, 12670 E. 132nd Ave., Brighton, Colo. 80601**

**Filed Jan. 31, 1994, Ser. No. 188,938**
**Int. Cl.[6] E05D *11/06***
**U.S. Cl. 16—387** **22 Claims**

1. In a hinged door and wall assembly the combination comprising:

a wall support having an inner face with a notch,

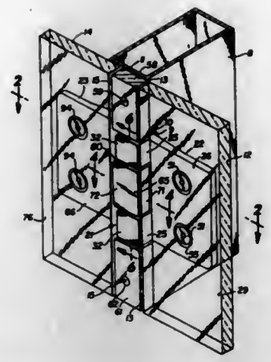
a door having an inner face and a vertical side edge,

a wall having an inner face and a vertical side edge spaced from said vertical side edge of said door to form a gap between said vertical side edges,

a hinge including a first hinge member attached to the door, a second hinge member attached to the wall and a pintle connecting said first and second hinge members defining a pivot axis for pivotally connecting said door to said wall for the movement of said first hinge member and door between an open position and a closed position,

said first hinge member including a first knuckle portion and a first leaf portion connected to said first knuckle portion,

said first hinge member having a first end face and a first notch defined by a first recessed inner face and a first inset face perpendicular to said first recessed inner face,



said second hinge member having a second knuckle portion and a second leaf portion connected to said second knuckle portion,

said second hinge member having a second end face and a second notch defined by a second recessed inner face and a second inset face perpendicular to said second recessed inner face,

said second hinge member having a base portion attached to said wall support, said base portion extending away from said knuckle portion and at right angles to said second leaf portion,

said first and second hinge members being recessed in said notch of said wall support, said door being recessed in said first notch and said wall being recessed in said second notch whereby said inner faces of said first and second hinge members, said door and said wall are in substantially the same plane when said door is in the closed position,

said first hinge member having a first stop face for the closed position,

said second hinge member having second stop face for the closed position that abuts against said first stop face to inhibit the movement of the door past an end to end disposition of said door with said wall in said closed position,

said first hinge member having a third stop face provided by said first stop face for the open position,

said second hinge member having a fourth stop face that abuts against said third stop face to inhibit the movement of the door past 90 degrees from the closed position in said open position,

the distance from the pivot axis to said first end face and the distance from the pivot axis to said first inset face being substantially the same and the distance from the pivot axis to said second end face and the distance from the pivot axis to said second inset face being substantially the same to minimize the gap between said door and wall,

said first recessed inner face of said first hinge member moving toward said second recessed inner face of said second hinge member in moving to said open position, and

mounting base means extending transverse to said second hinge member for mounting said second hinge member to a support adjacent an outer face of said second hinge member.

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**5,499,429**

## PAGER CLIP HAVING APERTURE FOR FASTENING TO AN EXTERNAL ARTICLE

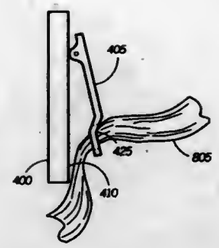
**Sandra Higginbotham, Sunrise, Fla., assignor to Motorola, Inc., Schaumburg, Ill.**

**Filed Jun. 20, 1994, Ser. No. 262,286**
**Int. Cl.[6] A44B *21/00*; A45F *5/00***
**U.S. Cl. 24—3.11** **13 Claims**

1. A clip for attaching a portable electronic device to an external article, the clip comprising:

a first end for coupling the clip to the portable electronic device;






a second end having an aperture formed therein and fully surrounded in a single plane thereby, wherein the external article can be positioned through the aperture to secure the portable electronic device to the external article;

mounting means coupled to the first end for pivotally attaching the first end of the clip to the portable electronic device such that the clip can be rotated between open and closed positions; and

an elongated arm connecting the first and second ends;

wherein the second end includes a contact surface for contacting the portable electronic device when the clip is in the closed position and a transition portion which slopes toward the portable electronic device to connect the elongated arm and the contact surface.

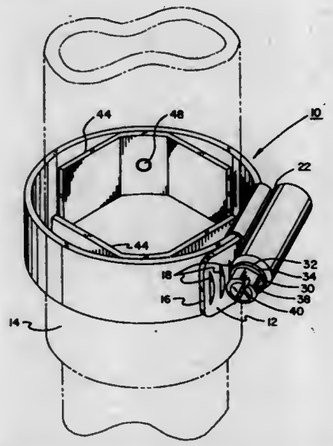
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**5,499,430**

## HOSE CLAMP WITH SUPPLEMENTAL HOLDING FINGERS

**Andrew A. Strazar, R.R. 1 Box 9B, Nokomis, Ill. 62075**

**Filed Aug. 10, 1994, Ser. No. 288,016**
**Int. Cl.[6] F16L *33/04***
**U.S. Cl. 24—279** **3 Claims**




1. A new and improved hose clamp with supplemental holding fingers comprising, in combination:

a worm drive clamp of a resilient material positionable in a loop about the free end of a hose to be clamped to an interior cylindrical member, the clamp having one free end with recesses for use with a worm in tightening the clamp;

a tightening member having a radially interior end secured to the interior face of the clamp adjacent to the recesses with a hollow tubular member radially outward thereof, the tubular member having internal threads with a threaded rotatable member interior thereof, the rotatable member having a hex head and screwdriver slot at one end for rotation thereof whereby the threads of the rotatable member function to cooperate with the recesses of the clamp for movement thereof to tighten or loosen the clamp;

a pair of generally V-shaped fingers each with a flat central section having a rivet to form a pair of spring clips interior the clamp, the rivet securing each V-shaped finger to the interior surface of the clamp at diametrically opposed points, the height of the fingers being essentially the same as the height of the clamp, each of the fingers extending at obtuse angles at about 135 degrees, plus or minus ten percent, from the central section in opposite directions for applying an initial holding force between the clamp and the tube to be clamped while the rotatable member is rotated in one direction or another to tighten or loosen the clamp; and

the spring clips, each of which have teeth thereon for greater grasping of the tube to be clamped, the spring clips hold the tube within the clamp while the rotatable member is turned with one hand, the hand turning the rotatable member securing the worm clamp around the free end of the hose with the one free end of the hose being held in position by the spring clips.

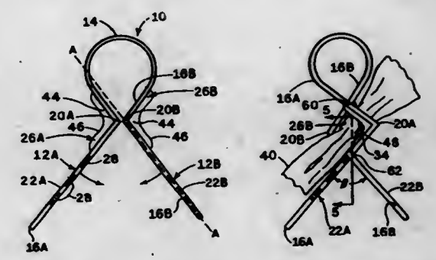
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**5,499,431**

## SPRING CLIP FOR HOLDING GARMENTS

**Erik D. Mortensen, 20 Maple St., 329 Ramsey Hall, London, England, and Donald W. Mortensen, 1215 Doctor's Dr., Neenah, Wis. 54956**

**Filed Dec. 9, 1994, Ser. No. 352,511**
**Int. Cl.[6] B65D *77/00*; A44B *21/00***
**U.S. Cl. 24—543** **36 Claims**




1. A spring clip for holding one or more garments while the garments are being processed, said spring clip comprising a length of elongated material having resilient spring-like restorative properties such that the elongated material tolerates significant bending deformation without exceeding the corresponding elastic limit of the material, said length of elongated material comprising, when said spring clip is in a fully relaxed configuration, a bight, first and second legs extending from the bight, said first leg having a first upper section, said second leg having a second upper section, said first and second upper sections extending toward each other and terminating in corresponding first and second elbows, said first leg having a first lower section extending from said first elbow, said second leg having a second lower section extending from said second elbow, said first and second lower sections extending away from each other and terminating at first and second leg ends,

said first and second legs being configured such that said first and second leg ends can be brought together whereby said first and second lower sections can be crossed, thereby creating an opening between said first and second elbows, an upper crossing locus wherein said first leg is in front of said second leg and a lower crossing locus wherein said second leg is in front of said first leg, edges of said opening being effective for gripping the garments substantially within said opening,

said spring clip including a bias on said first and second legs when said legs are so crossed, urging facing surfaces of said first and second legs into engagement with each other,

said first lower section of said first leg comprising a lock, said lock comprising a step irregularity in the cross-section of said second lower section, the bias in combination with the irregularity being effective to engage said second lower section of said leg and to lock said second lower section to said first lower section.

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5,499,432

## FASTENING DEVICE

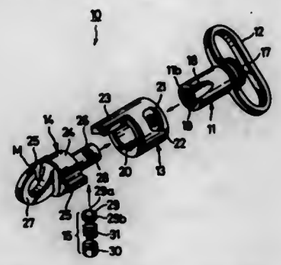
Yasuharu Terada, Uozu; Tsuneo Suzuki, Kurobe; Hideyuki Matsushima, and Yoshiyuki Horita, both of Toyama, all of, Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Filed May 9, 1994, Ser. No. 239,562

Claims priority, application Japan, May 10, 1993, 5-029691 U

Int. Cl.[6] F16B *45/02*

U.S. Cl. 24—599.2 10 Claims



1. A fastening device for fastening a web-like material to a garment article which comprises a connecting member having an opening and a hole diametrically opposed thereto; a link rotatably connected to said connecting member; a retaining member having a cylindrical bore dimentioned to fit over and rotatable relative to said connecting member and a hole communicating with said bore, and a retaining bar extending axially from said retaining member; a hook member having an axially extending connecting pin having a through-hole and a J-shaped hook disposed remote from said connecting pin in normally confronting relation to said retaining bar; and a retaining pin member including a cap portion, a base portion and a spring portion interposed therebetween; said holes including said through hole being registered with one another to receive said retaining pin member with said cap portion exposed to view in said hole of said retaining member.

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5,499,433

## APPARATUS FOR SURFACE TREATMENT OF PILE AND PLUSH FABRICS

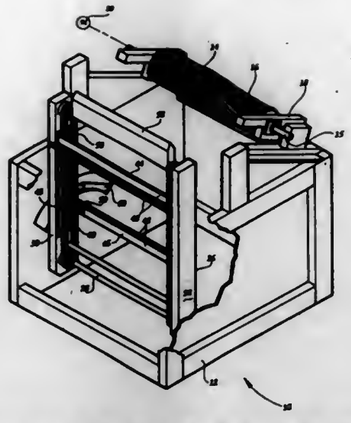
Majid Moghaddassi, Greensboro, and Arne Nielsen, Oak Ridge, both of N.C., assignors to Guilford Mills, Inc., Greensboro, N.C.

Filed Dec. 17, 1993, Ser. No. 170,001

Int. Cl.[6] D06C *11/00;13/00*

U.S. Cl. 26—2 R 13 Claims

1. Apparatus for surface treatment of a finite length of pile and plush fabrics, comprising a rotatably driven treating roller having means at a pile-engaging periphery thereof for physical manipulation of a surface of the length of fabric, means for supporting the length of fabric for presentation to the roller for surface treatment, the fabric supporting means being movable between a fabric-loading position spaced from the roller and a treatment position in close adjacency to the roller, the fabric supporting means comprising a pair of fabric clamps, means for moving the clamps selectively toward one another for attachment of opposite ends of the length of fabric respectively to the clamps and away from one another for tensioning the length of fabric, and means for moving the clamps in synchronism with one another to cause the length of fabric to travel in tensioned condition for presentation to the roller for surface treatment.



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5,499,434

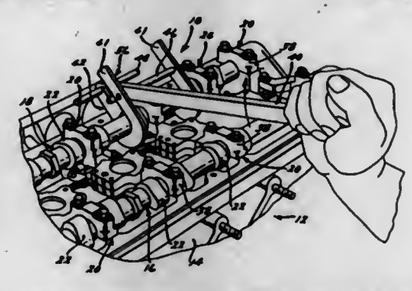
## VALVE SPRING COMPRESSOR TOOL

Julian Zdral, Goodells, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Nov. 3, 1994, Ser. No. 333,920

Int. Cl.[6] B23P *19/04*

U.S. Cl. 29—220 10 Claims



1. A tool for compressing valve springs for removal of a rocker arm contacting an overhead camshaft and at least partially located in underlying relationship to the camshaft in the engine cylinder head of an internal combustion engine, said valve springs each having an end cap operatively connected thereto, said tool comprising a lever member having a handle end and a work end, a support rod mounted in said lever member along an axis which extends transversely to the longitudinal axis of said lever member, said support rod being positioned at said work end of said lever member, hook member means pivotally connected to said support rod, said hook member means including a curved foot portion and a leg portion having an extension part, said curved foot portion located below said lever member and said extension part of said leg portion located above said lever member during a spring compression operation, a depressor member having one end thereof formed with a first surface for maintaining contact with the work end of said lever member, the other end of said depressor member being formed with a second surface for contact with said end cap, the arrangement being such that said hook member means is adapted to have the curved foot portion thereof placed in engagement with the underside of said overhead camshaft whereby said curved foot portion engages a substantial portion of the camshaft's undersurface which serves as a fulcrum for said lever member while said second surface of said other end of said depressor is engaging the end cap of one of said valve springs so that said handle end of said lever member can be pivoted about the support rod to compress the valve spring contacted by said end cap of one of said valve springs so as to remove the rocker arm associated with said one of said valve springs.



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5,499,435

## TOOL FOR PLACING SEALING STRIP

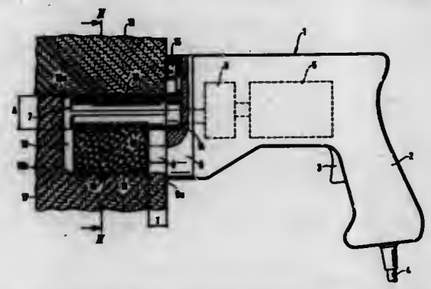
Jürgen Kortenkamp, Dornbirn; Gebhard Gantner, Nenzing, both of, Austria, and Walter Winkler, Game, Switzerland, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Jun. 8, 1994, Ser. No. 255,691

Claims priority, application Germany, Jun. 8, 1993, 43 18 964.4

Int. Cl.[6] B23P *19/02*

U.S. Cl. 29—235 5 Claims



1. A tool for placing and securing sealing strip (11, 39) in a joint gap (19,41) extending inwardly, from an outside surface of structural parts (17,18,27,28) with the joint gap having a pair of spaced apart sidewalls (19*a*,19*b*,41*a*, 41*b*), comprises a lead-in device (10) for guiding the sealing strip (11,39) into the joint gap (19,41), an insertion device (8,31) for pressing the sealing strip (11,39) for a predetermined depth into the joint gap (19,41), a stop (9,26) with a stop face (9*a*,26*a*) arranged for abutting the tool against the outside surface of the structural part, and a contact pressure device (7,29) arranged to project at least partially into the joint gap (19,41) for securing the sealing strip (11,39) in the gap (19,41), wherein the improvement comprises that said contact device (7,29) has at least two elongated coextensive contact pressure faces (12,13,37,38) arranged to extend into the joint gap, means connected to said contact pressure device for alternately moving said contact pressure faces (12,13,37,38) uniformly away from and towards one another for pressing the sealing strip against one of the said sidewalls of the joint gap and then releasing the sealing strip, and said contact pressure faces (12,13,37,38) having a variable spacing therebetween with a least spacing sufficient for inserting the contact pressure faces into the joint gap out of contact with the sealing strip.

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5,499,436

## TOOL FOR FILMSTRIP ATTACHMENT OR DETACHMENT

Thomas C. Merle; Dale W. Ryan, and David L. Rowden, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 22, 1993, Ser. No. 172,006

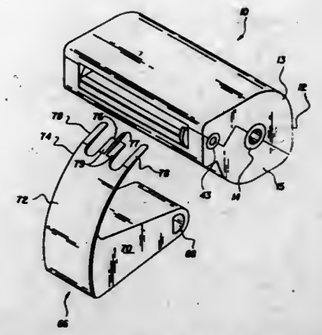
Int. Cl.[6] G03B *17/26;* B25B *27/00*

U.S. Cl. 29—270 8 Claims

1. An integrally formed tool for attaching and/or detaching a filmstrip to a cartridge, said cartridge having a spool rotatably mounted therein about an axis of rotation and an opening through which said filmstrip may be inserted or removed from said cartridge, said opening having a top edge and a bottom edge, a rotatable light valve is provided adjacent said opening for moving between an opened position and closed position, comprising:

an arcuate metal blade having a terminal end;

a base section made of a plastic material, said base section having an upper end and a lower end, said blade being integrally secured by placing said blade in a mold and providing plastic resin from mold so as to integrally form the base section directly to the upper end of the blade, said lower end being designed to be rotatably mounted so as to move said blade in and out of engagement with the spool of the cartridge.



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5,499,437

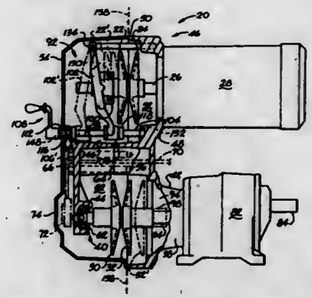
## METHOD OF ASSEMBLING A MAINTENANCE FRIENDLY VARIABLE SPEED BELT DRIVE

Todd C. Lucich, Simpsonville, S.C.; Edward F. Krome, Jr., Columbus, Ind.; Michael G. Howe, Columbus, Ind.; Larry D. Fields, Columbus, Ind., and Joseph R. Mihelick, Simpsonville, S.C., assignors to Reliance Electric Industrial Company, Greenville, S.C.

Division of Ser. No. 798,912, Nov. 27, 1991, Pat. No. 5,236,395. This application Apr. 12, 1993, Ser. No. 45,896

Int. Cl.[6] B23P *19/04*

U.S. Cl. 29—402.03 7 Claims



1. A method of assembling a maintenance friendly belt drive, said assembly method comprising;

providing a drive housing with a relatively large interior access opening thereto, said drive housing having a support backbone at a generally central location in said interior access opening, a first shaft supported on its proximal end by said housing on one side of said backbone and adapted for receiving a constant speed drive input, and a second shaft supported on its proximal end by said housing on the other side of said

backbone and adapted for providing a variable speed drive output, said second shaft having a pair of variable speed discs mounted thereon;

securing a support bracket to said support backbone, so that such bracket engages and rotatably supports a distal end of said second shaft;

providing a pair of constant speed discs, and mounting a first one of said discs on said first shaft;

installing a drive belt about said second shaft entrained in between said variable speed discs and with the loop of said drive belt placed about said first shaft;

mounting a second one of said constant speed discs onto said first shaft;

installing speed change means for adjusting the drive ratio between the respective pairs of discs so as to vary the drive power transmitted between the shafts via said drive belt, including mounting a thrust bearing over the distal end of said first shaft, with such thrust bearing supported for axial movement thereof along said first shaft by operation of an actuation mechanism associated therewith; and

securing a housing cover to said drive housing opening; wherein said assembly steps may be selectively reversed for maintenance and/or adjustment to said drive belt and other components within said drive housing;

wherein said mounting of said first one of said constant speed discs includes aligning such disc on said first shaft with an alignment edge defined by said drive housing opening.

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**5,499,438**

## PROCESS FOR THE PRODUCTION OF A PALLET CONTAINER

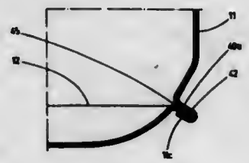
**Udo Schutz, Ruckersteg 4, D-56242 Selters, Germany**

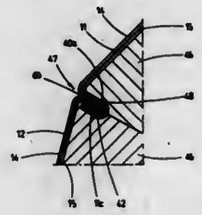
**Filed Jul. 6, 1994, Ser. No. 272,387**

**Claims priority, application Germany, Jul. 6, 1993, 43 22 375.3**

**Int. Cl.[6] B23Q *17/00***

**U.S. Cl. 29—407.01** **1 Claim**





1. A process for the production of an inner container made of sheet metal for a pallet container, comprising the following steps:

a) bending a rectangular sheet metal blank to form a pipe element;

b) welding mating edges of said pipe element lengthwise;

c) stretching said pipe element to form a jacket of rectangular cross-section having jacket edges;

d) forming a peripheral bead with a v-shaped cross section in each of two end areas of said jacket at a distance from said jacket edges;

e) cutting to size two outer edge strips of said jacket which adjoin said beads;

f) superposing a bottom part with a rounded edge on an outer side of a bead of said jacket and attaching said bottom part to said jacket;

g) superposing a cover with a rounded edge on an outer side of the other said bead of said jacket and attaching said cover to said jacket;

h) fluidtightly welding said bottom part and said cover to said jacket to form said inner container;

i) laying flat said edge strips of said jacket over corresponding rounded edges of said bottom part and of said cover;

j) flaring inner transition areas between said jacket and said bottom part and between said jacket and said cover of said inner container in a supporting mold to eliminate annular gaps that form between said jacket and bottom part, as well as between said jacket and cover, by pressurization of said inner container; and

k) checking said inner container for leaks under internal pressure.

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**5,499,439**

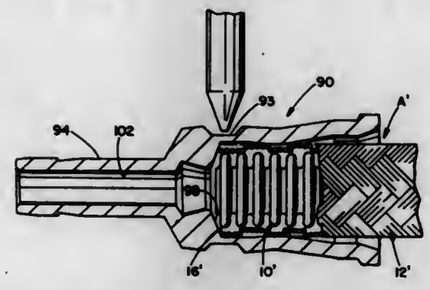
## METHOD OF FORMING A FLEXIBLE METAL HOSE CONNECTOR

**Stephen J. Zaborszki, Bedford, and Gregory Kreczko, Hudson, both of Ohio, assignors to Swagelok Quick-Connect Co., Hudson, Ohio**

**Continuation-in-part of Ser. No. 897,441, Jun. 2, 1992, Pat. No. 5,404,632. This application Dec. 1, 1994, Ser. No. 348,722**

**Int. Cl.[6] B23P *11/00***

**U.S. Cl. 29—508** **5 Claims**




1. A method of securing a fitting to a flexible cylindrical metal hose end wherein the flexible metal hose includes a corrugated metal tube with a metal braid received over the tube, the method comprising the steps of:

a) providing a metal fitting including a generally cylindrical first body section having a first end and a second end with a cylindrical bore sized to closely receive the end of the flexible metal hose extending axially inwardly from the first end toward the second end to define a continuous cylindrical side wall terminating in a radially inwardly extending shoulder, the side wall being of a relatively uniform first thickness from the first end to a first point spaced a short distance from the shoulder and a substantially thinner second thickness between the first point and the shoulder;

b) cutting the end of the hose to terminate the corrugated tube and the braid in substantially the same plane perpendicular to the axis of the hose;

c) inserting the cut end of the hose into the cylindrical bore of the fitting to bring the cut end into engagement with the shoulder;

d) deforming the first body section radially inward to mechanically interlock the braid, tube, and fitting together; and,

e) welding the metal fitting to the metal braid and the metal tube in the area of the thinner second thickness of the first body section between the first point and the shoulder.



**5,499,440**

## STAKING METHOD

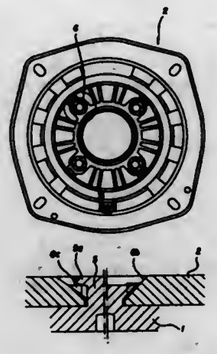
**Masatoshi Satoh, and Tetsuya Ohsuma, both of Yamagata, Japan, assignors to Pioneer Electric Corporation, Tokyo, Japan**

**Continuation of Ser. No. 88,536, Jul. 9, 1993, abandoned. This application Jul. 5, 1994, Ser. No. 276,482**

**Claims priority, application Japan, Aug. 21, 1992, 4-245540**

**Int. Cl.[6] B21D *31/06***

**U.S. Cl. 29—512** **3 Claims**



1. A method of staking two members comprising the steps of:

providing two members, one of said members having first and second surfaces defining a predetermined thickness therebetween;

forming a perforated hole through the thickness of said one member, said perforated hole comprising a cylindrical portion extending from said first surface to a junction point located within said predetermined thickness and a tapered wall above said cylindrical portion extending from said junction point to said second surface;

forming a plurality of upwardly projecting radial ribs on the tapered wall, each of said radial ribs having an edge projecting in an upwardly slant direction with respect to said first surface into said perforated hole;

forming a projection on the other member;

engaging the projection through the perforated hole;

peening a top of the projection as to plastically deform the projection wherein a peripheral portion of the projection encroaches indentations between the radial ribs.

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**5,499,441**

## CONTINUOUS EXTRUSION IMPREGNATION MOLDED ARTICLE PROCESS

**Thomas P. Dunton, Lebanon Springs, N.Y.; Walter L. Hall, Mt. Vernon, Ind., and Erich O. Teutsch, Richmond, Mass., assignors to General Electric Company, Pittsfield, Mass.**

**Filed Aug. 11, 1993, Ser. No. 106,092**

**Int. Cl.[6] B21B *1/46***

**U.S. Cl. 29—527.2** **12 Claims**

1. A continuous process for producing a molded thermoplastic resin fiber reinforced article comprising a fiber mat core, a thermoplastic resin and a metal surface on at least one side thereof, which comprises continuously applying a thermoplastic resin, said thermoplastic resin being in molten form, in film form or in powder form, onto at least one surface of the fiber mat core, applying a metal film onto at least one surface of the fiber mat core, provided that, if the thermoplastic resin is applied in film or powder form, the fiber mat core and thermoplastic resin are heated to a temperature effective to melt the thermoplastic resin prior to applying the metal film, passing the combination of fiber mat core, thermoplastic resin and metal film to a molding zone and then molding the combination thereof under pressure and heat into a molded thermoplastic resin fiber reinforced article having a metal surface on at least one side thereof.

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**5,499,442**

## DELAY LINE DEVICE AND METHOD OF MANUFACTURING THE SAME

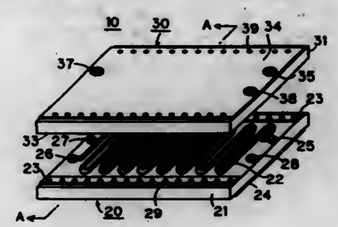
**Nakaba Nakamura, and Makoto Kaneki, both of Kyoto, Japan, assignors to Susumu Co., Ltd., Kyoto, Japan**

**Division of Ser. No. 140,539, Oct. 25, 1993, Pat. No. 5,365,203. This application Jul. 7, 1994, Ser. No. 271,732**

**Claims priority, application Japan, Nov. 6, 1992, 4-322383**

**Int. Cl.[6] H01P *11/00***

**U.S. Cl. 29—600** **2 Claims**




1. A method of manufacturing delay line devices, comprising the following steps:

a step of preparing a first mother substrate having a plurality of signal lines formed on a first main surface of a first ceramic substrate, bonding electrodes respectively formed adjacent to peripheral portions of said signal lines, a ground electrode formed over substantially the entire region of a second main surface of said first ceramic substrate, and through holes providing electrical connections between said ground electrode and said respective bonding electrodes, said bonding electrodes and said ground electrode comprising gold thin films formed on conductors provided on said first and second main surfaces, respectively, of said first ceramic substrate;

a step of preparing a second mother substrate having bonding electrodes respectively formed on a first main surface of a second ceramic substrate identical in thickness and material to the first ceramic substrate of said first mother substrate and at positions corresponding to the respective bonding electrodes of said first mother substrate, a ground electrode formed over substantially the entire region of a second main surface of said second ceramic substrate, and through holes providing electrical connections between said ground electrode and said bonding electrodes, said bonding electrodes and ground electrodes of said second mother substrate comprising tin thin films formed on conductors provided on said first and second main surfaces, respectively, of said second ceramic substrate;

a step of preparing two mother dummy substrates each having a ground electrode formed over substantially the entire region of respective first main surfaces of third and fourth ceramic substrates, each of said third and fourth substrate greater in thickness than the first and second ceramic substrates, respectively, of said first and second mother substrates, one of said two mother dummy substrates having tin thin films formed on its respective ground electrode and the other mother dummy substrate having gold thin films formed on its respective grounding electrode;

a first step of superposing said first and second mother substrates on one another in such a manner that the respective bonding electrodes of said first and second mother substrates are disposed in facing relationship to one another, a second step of superposing said two mother dummy substrates on both outer sides of said superposed first and second mother substrates with the ground electrodes thereof oriented inwardly, applying pressure to the product obtained by said second superposition and heating the same in a non-oxidizing atmo-

sphere to form gold-tin alloys from the opposing gold and tin thin films and to produce a layered board;

a step of charging a resin having a dielectric constant lower than that of each of the first and second ceramic substrates of said first and second mother substrates into spacings existing in said layered board; and

a step of cutting said layered board to produce a plurality of delay line devices including said signal lines.

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5,499,443

## CONNECTOR PRESS-FITTING APPARATUS

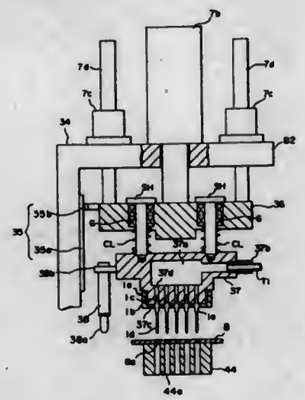
Yasunori Ota, and Nobuhide Fujita, both of Tokyo, Japan, assignors to Ando Electric Co., Ltd., Tokyo, Japan

Filed Oct. 24, 1994, Ser. No. 327,853

Claims priority, application Japan, Jan. 25, 1993, 5-288675; Jan. 29, 1993, 5-294089; Jan. 31, 1994, 6-827278; Mar. 31, 1994, 6-085627

Int. Cl.[6] H05K 3/30;13/04; B23P 19/04

U.S. Cl. 29—741 15 Claims



1. A connector press-fitting apparatus for mounting a connector on a printed board, the apparatus comprising:

(a) control means for generating a first directive to specify a type of connector to be press-fitted, a second directive for specifying a mounting position on said printed board at which said type of connector is to be press-fitted; and a third directive for specifying a storage position of said type of connector;

(b) positioning means for maintaining said printed board, and for moving said printed board in accordance with said second directive and said third directive;

(c) storing means for storing a plurality of connector types for movement by said positioning means along with said printed board;

(d) a plurality of types of press-fitting heads, each having a surface with a channel opening opposing one face of a printed board maintained by the positioning means, each said press-fitting head being mounted to be accessible to and separable from said one face of the maintained printed board in opposite directions relative to said one face of said printed board;

(e) press-fitting head switching means for selecting and positioning one of said plurality of types of press fitting heads corresponding to said type of connector selected by said first directive at a predetermined press-fitting position;

(f) head moving means for moving said selected and positioned press-fitting head in said opposite directions with respect to said one face of said printed board;

(g) first pressure-reducing means for reducing the pressure of said channel to affix a connector type to said press-fitting head at said press-fitting position;

(h) transporting means for transporting said connector type specified by said first directive from said storing means to said selected press-fitting head;

(i) a plurality of pressure receiving heads, each having a surface with pin insertion apertures corresponding to each type of connector and with a channel opening opposing a face of the printed board opposite said one face of the maintained printed board, each said pressure-receiving head being mounted to be accessible to and separable from said opposite face of the maintained printed board in opposite directions toward and away from said one face of said maintained printed board;

(j) pressure-receiving head switching means for selecting and positioning one of said plurality of types of press fitting heads corresponding to said type of connector selected by said first directive at a predetermined press-fitting position; and

(k) pressure-receiving head moving means for moving said pressure-receiving head in opposite directions toward and away from said opposite face of the printed board at said press-fitting position.

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5,499,444

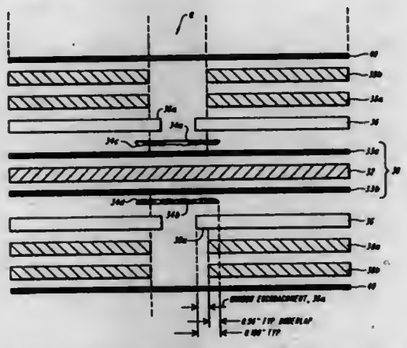
## METHOD OF MANUFACTURING A RIGID FLEX PRINTED CIRCUIT BOARD

Howard Doane, Jr., Amesbury, Mass.; Alfred F. Covino, Hudson, and John M. Waite, Derry, both of N.H., assignors to Coesen, Inc., Hudson, N.H.

Filed Aug. 2, 1994, Ser. No. 285,126

Int. Cl.[6] H05K 3/36;3/46

U.S. Cl. 29—830 7 Claims



1. A method of forming a rigid flex printed circuit board, such method comprising the steps of

providing a first flexible circuit layer including a flexible substrate and a flexible metal film patterned into conductive leads

providing a plurality of rigid circuit layers, each rigid circuit layer including an aperture the apertures together forming a window region about said flexible circuit layer

each of said flexible and said plurality of rigid circuit layers having slots therein along two orthogonal radii, wherein conductive lines on said layers are formed in registry with the slots, and

subsequently, in a single lamination step assembling all of the foregoing layers together in a stack with an insulating layer adjacent the first flexible circuit layer extending only slightly beyond said window region to insulate and support the first flexible circuit layer, and with a first stiffening layer above said insulating layer and extending only slightly into said window region to provide a reinforcing lip about edges of said flexible layer, the step of assembling including stacking the layers on a plate with alignment pegs extending only slightly through said slots whereby circuit conductors of each layer are positioned in registration with each other, and

curing the stack to form a unitary circuit board which is rigid outside said window region.



5,499,445

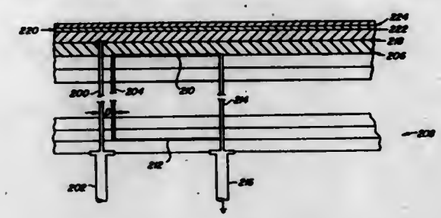
## METHOD OF MAKING A MULTI-LAYER TO PACKAGE

Steven R. Boyle, Santa Clara; Robert J. Proebsting, Los Altos Hills, and William H. Herndon, Sunnyvale, all of Calif., assignors to Intergraph Corporation, Huntsville, Ala.

Division of Ser. No. 36,564, Mar. 24, 1993. This application Apr. 13, 1994, Ser. No. 226,920

Int. Cl.[6] H05K 3/36

U.S. Cl. 29—830 6 Claims



1. In a multi-layer package having a plurality of interleaved layers of conductive material and dielectric material surrounding a die-attach area of predetermined size, and a plurality of via columns electrically connecting selected paths from any one of said plurality of layers of conductive materials to any other, an improved packaging method comprising the steps of:

(a) providing vertical shielding by assigning said plurality of layers of conductive materials to signal layers and shield layers in an alternating fashion, with every signal layer disposed half way between two shield layers; and

(b) providing horizontal shielding of a signal path on a signal layer from other signal paths on said layer by placing a first shield path on a first side and a second shield path on a second side of said signal path.

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5,499,446

## METHOD FOR MANUFACTURING PRINTED CIRCUIT BOARD WITH THROUGH-HOLE

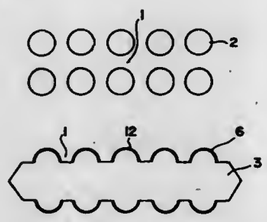
Tomoo Murakami, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 29, 1994, Ser. No. 349,991

Claims priority, application Japan, Dec. 1, 1993, 5-301394

Int. Cl.[6] H01K 3/10

U.S. Cl. 29—852 6 Claims



1. A method for manufacturing a printed circuit board, said method comprising the steps of:

forming a plurality of penetrating holes at predetermined locations along a straight line on a laminate board whose two surfaces are copper plated;

forming a plurality of semi-circular grooves by cutting said penetrating holes into halves by a slit forming process; and

forming a plurality of semi-circular through-holes by using a jig member inserted into said slit and forming a copper plated layer on a surface of each of said semi-circular grooves.

5,499,447

## METHOD FOR MANUFACTURING A PRINTED CIRCUIT BOARD HAVING ELECTRODES ON END SURFACE OF SUBSTRATE

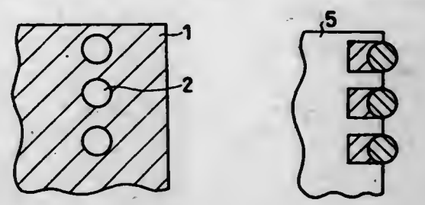
Tomoo Murakami, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 19, 1994, Ser. No. 358,370

Claims priority, application Japan, Dec. 17, 1993, 5-344372

Int. Cl.[6] H01K 3/10

U.S. Cl. 29—852 8 Claims



1. A method for manufacturing a printed circuit board having an electrode on an end surface of a substrate, said method comprising the steps of:

forming a hole at a predetermined position of a laminate board whose two surfaces are copper plated;

filling in said hole with copper paste;

forming a circuit pattern such that a copper foil portion remains only in one half of said hole; and

etching away an exposed region of said substrate.

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5,499,448

## PROCESS FOR CONNECTING AN ELECTRIC CABLE TO AN END MEMBER

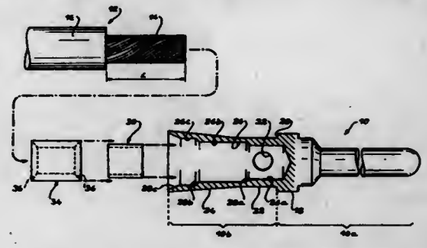
Gilles Tournier, Lequevin; Serge Roques, Blagnac, and Jean-Luc Balleaghien, Blagnac, all of, France, assignors to Aerospace Societe Nationale Industrielle, Paris, France

Filed Jul. 15, 1994, Ser. No. 275,953

Claims priority, application France, Jul. 19, 1993, 93 08818

Int. Cl.[6] H01B 43/00

U.S. Cl. 29—863 5 Claims



1. Process for the connection of an electric cable having a core covered with an insulating sheath to an end member, whose rear connection portion has a blind hole and an outer surface having at least one truncated cone-shaped portion, whose diameter increases towards an open end of the hole along an axial direction, comprising the steps of:

baring the cable over a length smaller than that of the blind hole,

introducing the cable into a stepped blind hole formed from at least two cylindrical sections of said rear connection portion of said end member, each of the sections having a chamfered entrance end, so that an unbared portion of the cable is received in an entrance section of the hole, the truncated cone-shaped portion of the outer surface being located around the entrance section and at least one other section of the hole and

wiredrawing said end member in said axial direction to cause radial compaction of the rear connection portion of the end member whilst exerting a tension on said member, so as to pass the rear connection portion into a calibrated die to deform the rear portion radially inward for making the connection of the cable to said end member.

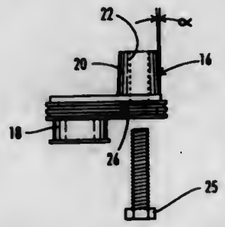
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5,499,449

## METHOD OF MANUFACTURING BATTERY TERMINALS

Warren Carter, Murfreesboro, and Brad Carter, Rockvale, both of Tenn., assignors to Molded Metal Services, Inc., Murfreesboro, Tenn.

Filed Mar. 1, 1994, Ser. No. 203,561
Int. Cl.[6] H01R 43/04
U.S. Cl. 29—882 20 Claims




1. A method of forming a battery terminal having an electrically conductive post component and a metallic casting component surrounding at least a portion of the post, comprising the steps of:
providing a die means for forming a battery terminal;
providing a battery terminal casting with a bore extending from a top of the casting to a bottom of the casting;
providing and aligning a conductive post component with the bore in the battery terminal casting;
aligning the casting and the conductive post with the die means; and
inserting the conductive post component into the bore from the bottom of the battery terminal casting while forging the battery terminal casting component about the conductive post component with the die means.

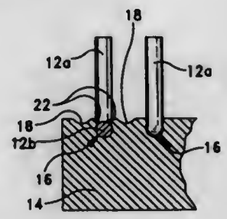
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5,499,450

## METHOD OF MANUFACTURING A MULTIPLE PIN HEATSINK DEVICE

John Jacoby, Jackson Pond Rd., New Hampton, N.H. 03256

Filed Dec. 19, 1994, Ser. No. 358,956
Int. Cl.[6] B23P 15/00
U.S. Cl. 29—890.03 8 Claims




1. A method of manufacturing a multiple pin heatsink, comprising the steps of:
providing a die member with a plurality of pairs of pin receiving holes in its upper surface;
providing a base element with a plurality of channels in its upper surface which align and correspond with said pin receiving holes;
providing a plurality of U-shaped wire elements each with two substantially parallel pins and a central portion;
introducing said two pins of each U-shaped wire element into respective pairs of pin receiving holes with said central portion remaining above the upper surface of the die member;
placing said base element over said die member with U-shaped wire elements therein;
applying sufficient downward pressure to said base element to swage and expand the central portions of said wire elements into the matching channel in said base member for permanent attachment of said wire elements to said base element; and
removing said base element and said attached wire elements from said die member.

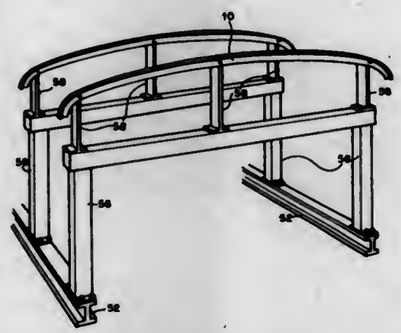
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5,499,451

## METHOD FOR MANUFACTURE OF RAILWAY OR TRANSIT CAR SHELL SUBASSEMBLIES

John Krivda, Chicago, Ill., and Raymond L. Phebus, Jr., Highland, Ind., assignors to Morrison-Knudsen Corporation, Boise, Id.

Filed Aug. 17, 1994, Ser. No. 292,070
Int. Cl.[6] B23Q 17/00
U.S. Cl. 29—897.2 3 Claims




1. A method of manufacturing a railway or transit car body panel subassembly, said panel subassembly for assembly together with other panel subassemblies into a rail or transit car body, said panel subassembly formed of structural frame members and sheeting material, using a car body panel subassembly jig having a plurality of tooling pin sets held at preselected and fixed locations for holding a plurality of structural frame members in preselected spaced relationship, which comprises:
forming a plurality of structural frame members, each having a set of reference holes formed therethrough for interfitting engagement with a corresponding tooling pin set of said subassembly jig;
positioning and holding said plurality of structural frame members in preselected spaced relationship by interfitting each tooling pin set within the set of reference holes of each of a corresponding structural frame member;
positioning the sheeting material against said plurality of positioned and held structural frame members; and
attaching the sheeting material to said plurality of positioned and held structural frame members.

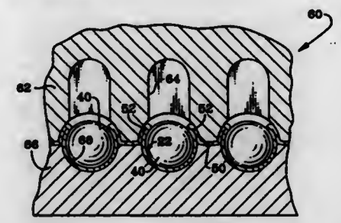


5,499,452

## METHOD OF MAKING RETAINERS FOR BALL BEARINGS

Maksimilijan Godec, Torrington, Conn., and James L. Lawson, Spartanburg, S.C., assignors to The Torrington Company, Torrington, Conn.

Continuation of Ser. No. 963,146, Oct. 12, 1992, abandoned, which is a continuation-in-part of Ser. No. 717,474, Jun. 19, 1991, abandoned. This application Nov. 30, 1994, Ser. No. 346,984
Int. Cl.[6] F16C 33/00;33/42
U.S. Cl. 29—898.067 21 Claims




1. A method of producing a one-piece ball bearing retainer or bearing cage comprising the steps of:
forming material into a flat ring;
pressing the flat ring, thereby forming ball receiving pockets and bridge material between adjacent ball receiving pockets;
inserting a bearing ball into each ball receiving pocket, each of the bearing balls having a spherical surface equi-distant from a center point; and
reshaping the bridge material between adjacent ball receiving pockets such that the bridge material wraps partially around the bearing balls, thereby retaining the bearing balls, and forms a rigid bridge between adjacent ball pockets, the rigid bridge coinciding with a plane intersecting the center point of each of the bearing balls.

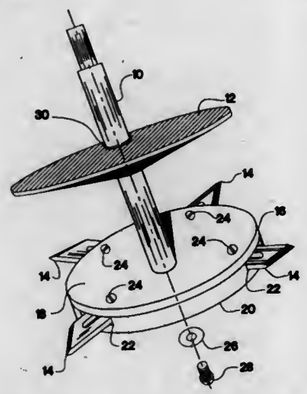
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5,499,453

## SYNTHETIC RESIN TOILET FLANGE CUTTING TOOL

Nelson F. Brauchitsch, A-24 Campo Rey, Albonito, Puerto Rico

Filed Feb. 10, 1994, Ser. No. 194,697
Int. Cl.[6] B23D 21/10
U.S. Cl. 30—105 3 Claims




1. An electric hand drill attachment tool for removing toilet flanges from sanitary installations comprising a cylindrical shank serving as arbor of convenient length and having a threaded bore at bottom and whereby cutting circular body members are centrally secured by means of a threaded screw and washer, a reference disk of greater diameter than the circular body, centrally bored, affixed to the cylindrical shank by upper and lower clip washers and distal to the circular body along the central vertical axis, said reference means is generally shaped like a saucer to cup-snugly-into the generally bowl shaped inner geometry of most toilet flanges and for ease of rotational movement when pressured against the pipe or flange to be cut, said circular body members forming a lower circular body member of smaller diameter than the pipe to be cut, being centrally bored and having a plurality of independent equi-distant guide channels all extending from a convenient inner radius to the edge of the circular body member and therethrough along a horizontal plane, said guide channels each additionally comprising a threaded smaller diameter bore central to the shorter distance of said guide channels and distal to the central bore of the circular body lengthwise extending through the plate at the guide channels, an upper circular body member of equal diameter than the lower body member, centrally bored additionally having a plurality of threaded bores corresponding in relation to those claimed extending through the plate at the guide channels, a plurality of independent cutting means, corresponding in number to said guide channels, the independent cutting means each having a prolate cutout lengthwise and central to said means, furthermore said cutting means are generally flat made of metal and rectangularly shaped having one oblique shorter distance which can be machined to be filed sharp, all similarly on the same face, or all similarly saw toothed, a plurality of tightening screws corresponding in number and location to the threaded smaller diameter bores in the upper and lower members serving to assemble the circular body and as snub pins extending transversely through the prolate cutout of the cutting means assembled intermediate to both body members, all assembled on the same plane serving to effect a singular cutting action by combining the independent cutting force of each said means, and maintaining a constant pressure along the cutting circle.

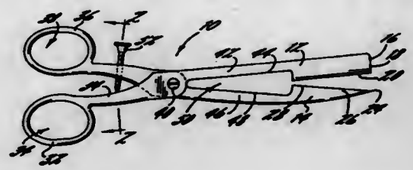
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5,499,454

## BUTTONHOLE SCISSORS

Dorothy G. Compton, P.O. Box 4570, Suite 102, Columbia, S.C. 29204

Filed Oct. 3, 1994, Ser. No. 317,207
Int. Cl.[6] A41H 25/00; B26B 13/06
U.S. Cl. 30—120 9 Claims



1. A buttonhole scissors comprising:
a first blade having a blunt distal end and an inner flat surface between a tapered cutting edge and an outer edge,
a second blade having a pointed distal end and an inner flat surface between a tapered cutting edge and an outer edge,
said first blade and said second blade slidable over each other with each of said inner flat surfaces in close cutting engagement,
a first handle of said first blade,
a second handle of said second blade pivotally connected to said first handle,
an intermediate portion of said first blade, provided with a first notch, said first notch being smooth and having a relatively constant depth, arranged between said cutting edge and its pivot,
an intermediate portion of said second blade, provided with a second notch, said second notch being smooth and having a relatively constant depth, arranged between said cutting edge and its pivot,

said first and second notches cooperate to form a noncutting area which receives cloth not to be cut, and

an adjustable setting means mounted through said second handle and contacting said first handle, said setting means capable of adjustment to limit the movement of said first and said second blades.

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**5,499,455**

## PORTABLE RETICLE ALIGNMENT DEVICE FOR FIREARMS

**Michael R. Palmer, Nine Somerset Dr., Suffern, N.Y. 10901**

**Continuation-in-part of Ser. No. 92,395, Jul. 15, 1993. This application May 2, 1995, Ser. No. 433,239**

**Int. Cl.[6] G01B *11/26***

**U.S. Cl. 33—233** **1 Claim**



1. A device for aiding in the cross-hair alignment of the reticle of a gun having a gun barrel including a longitudinal barrel axis and a telescopic sight attached to said gun on at least one scope base, said telescopic sight having a viewing end and a reticle with at least one sighting hairline, said device comprising:

a source of light for producing a beam of projected light;

means for modifying said beam of projected light to form a projected reference line; and

said source of light including means thereon for securing said source of light directly to said at least one scope base of said gun so that said projected reference line is automatically aligned with the axis of the barrel of said gun, said source of light being offset from the optical axis of said telescopic sight such that said projected reference line may be viewed through said telescopic sight so that the orientation of said at least one sighting hairline of said reticle may be compared with said projected reference line and adjusted to align the telescopic sight with the barrel axis of the gun.

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**5,499,456**

## SIGHT SCOPE

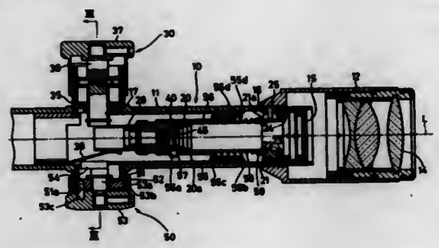
**Saburo Tomita, Fujimi, Japan, assignor to Asia Optical Co., Ltd., Tokyo, Japan**

**Filed Mar. 3, 1995, Ser. No. 398,074**

**Claims priority, application Japan, Mar. 3, 1994, 6-058122**

**Int. Cl.[6] F41G *1/38***

**U.S. Cl. 33—245** **7 Claims**



1. A sight scope comprising:

(a) a sleeve-like scope body having an objective lens system on a front end portion thereof and an eyepiece lens system on a rear end portion thereof;

(b) an erect sleeve received in said scope body;

(c) an inclination adjusting mechanism for inclining said erect sleeve with respect to an axis of said scope body;

(d) a movable sleeve axially movably disposed within said erect sleeve and adapted to support an erect lens system; and

(e) a position adjusting mechanism for moving said movable sleeve axially of said scope body, said position adjusting mechanism including:

(i) a rotary member pierced into and supported by said scope body, said rotary member being capable of turning about an axis extending radially of said scope body;

(ii) a control handle mounted on an external end of said rotary member;

(iii) a cam member disposed at an internal end of said rotary member;

(iv) a follower received in said scope body, said follower being in association with said cam member and moved axially of said scope body in accordance with rotation of said cam member; and

(v) association means for associating said follower with said movable sleeve, so that said movable sleeve moves after said follower.

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**5,499,457**

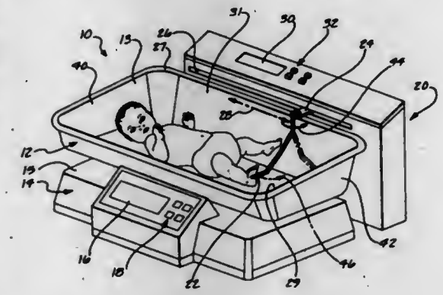
## INFANT LENGTH AND WEIGHT MEASURING APPARATUS

**Edward B. Weller, Seattle; Jay A. Jones, Mercer Island; Joseph P. Stefanile, Issaquah, and Steven G. Miles, Tacoma, all of Wash., assignors to Olympic Medical Group, Seattle, Wash.**

**Continuation of Ser. No. 138,365, Oct. 15, 1993, abandoned. This application Apr. 28, 1995, Ser. No. 431,018**

**Int. Cl.[6] G01B *7/02*; G01G *19/50***

**U.S. Cl. 33—512** **9 Claims**



1. An apparatus for measuring the length of an infant, the apparatus comprising:

a housing;

a platform on which the infant is placed lengthwise removably coupled to the housing, the platform including a wall at one end, the wall locating the infant lengthwise on the platform when one end of the infant is placed adjacent the wall;

an actuated wand that extends at least partially across the width of the platform and that moves toward the infant when the infant is placed on the platform and that stops when the wand contacts the infant;

a drive mechanism that actuates the wand, the wand being rotatably coupled to the drive mechanism about an axis approximately normal to the platform, the drive mechanism stopping the movement of the wand toward the infant when the wand rotates about the axis of rotation;

means for detecting a position of the actuated wand when the wand contacts the infant; and

means for determining the length of the infant as a function of the position of the actuated wand when the wand contacts the infant.



**5,499,458**

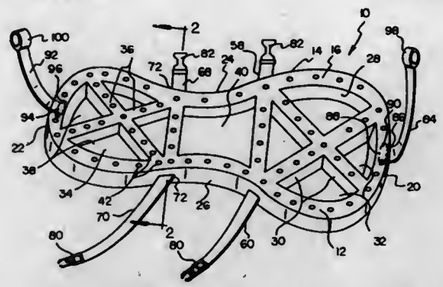
## ATTACHMENTS FOR SHOES FOR WALKING ON ICY SURFACES

**Michael K. Krunic, 201 Miracle Mile Dr., Apt. 1-H, Anderson, S.C. 29621**

**Filed Sep. 16, 1994, Ser. No. 307,020**

**Int. Cl.[6] A43C *15/06***

**U.S. Cl. 36—7.6** **1 Claim**



1. A new and improved ice cleat for securing to existing footwear to aid in walking on icy surfaces comprising, in combination:

a base piece having a foot-like shape periphery, the base piece having an upper surface, a lower surface, a toe portion, a heel portion, a right side portion, and a left side portion, the base piece having a front open section with cross braces to form four generally triangular openings, a back open section with cross braces to form four generally triangular openings and a center generally rectangular opening;

a plurality of holes extending through the base piece from the upper surface to the lower surface around the entire peripheral shape as well as through the front cross brace, rear cross brace and around the center open section;

a plurality of nails having a lower end with a point and an upper end with a head, the head being positioned upon the upper surface with the point end extending beyond the lower surface for a distance of between about 0.25 and 0.50 inch, its nails having a common diameter such as to be fictionally supported within its associated hole;

a forward strap pair having interior ends with a loop and rod therethrough secured to the side portion at the periphery of the base piece and a rearward strap pair having interior ends with a loop and rod therethrough secured to the side portion at the periphery of the base piece, each strap pair having an external end with a male buckle member and a female buckle member to allow for the removable coupling therebetween;

a front attachment strap having an interior end with a loop and rod therethrough secured to the toe portion of the periphery of the base piece and a rear attachment strap having an internal end with a loop and rod therethrough secured to the periphery of the base piece, the front strap piece having a loop at an outboard end thereof for receiving the front strap pair and the rear strap piece having a loop at its outboard end for receiving a portion of the rear strap pair; and

openings in the base piece extending from the interior of the base piece to the periphery of the base piece and molded into the base piece for receiving the interior end of the strap pairs and straps for added securement between the base piece, the straps and strap pairs.

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**5,499,459**

## FOOTWEAR WITH REPLACEABLE, WATERTIGHT BOOTIE

**Rita Tomaro, Nashua, N.H., assignor to H. H. Brown Shoe Company, Inc., Greenwich, Conn.**

**Filed Oct. 6, 1994, Ser. No. 319,120**

**Int. Cl.[6] A43B *23/07***

**U.S. Cl. 36—10** **6 Claims**

1. An interchangeable footwear system comprising:



a shoe comprising a sole and an upper, said sole and upper together defining a volume for receiving and protecting a wearer's foot against external elements, and

a first replaceable bootie and a second replaceable bootie, each said replaceable bootie sized and shaped to fit snugly within said volume and each comprising a bootie sole, a bootie upper, and releasable attachment elements for releasable securement of each said replaceable bootie in turn within said volume,

said first replaceable bootie comprising a waterproofing layer of material impervious to penetration by water, thereby to provide protection to the wearer's foot in wet conditions, and

said second replaceable bootie comprising an inner layer fabricated of a moisture absorbing and breathable material, thereby to provide comfort to the wearer's foot in warm weather conditions,

wherein said first replaceable bootie and said second replaceable bootie are interchangeably received within said shoe.

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**5,499,460**

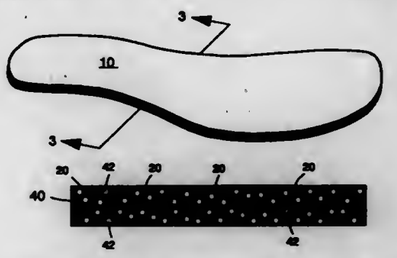
## MOLDABLE FOAM INSOLE WITH REVERSIBLE ENHANCED THERMAL STORAGE PROPERTIES

**Yvonne G. Bryant, 316 Lord Berkley Rd., Raleigh, N.C. 27610, and David P. Colvin, Rte. 5, Box 67, Apex, N.C. 27502**

**Continuation-in-part of Ser. No. 129,490, Sep. 30, 1993, abandoned, which is a continuation of Ser. No. 837,762, Feb. 18, 1992, abandoned. This application Jul. 13, 1994, Ser. No. 275,226**

**Int. Cl.[6] A43B *13/38*; *7/02*; B32B *5/16*/3/26**

**U.S. Cl. 36—43** **14 Claims**



1. An insole having thermal energy storage and insulative properties adapted to be positioned within an article of footwear to protect the foot and comprising:

a flexible resilient base material forming an insulative pad,

a plurality of microcapsules integral with and dispersed throughout at least a longitudinal section of said pad, and wherein

said microcapsules are individually surroundingly encapsulated and embedded within said base material, and further wherein substantially all of said microcapsules are spaced apart from each other, the space between neighboring adjacent microcapsules comprising base material, said microcapsules containing a temperature stabilizing means;

whereby the insole exhibits enhanced thermal stability and thermal insulation properties.

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**5,499,461**

**BOOT FOR GUIDING SPORTS**

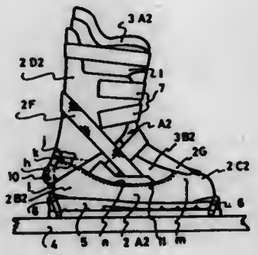
**Bruno Danezin, Chilly; Joël Bourdeau, Saint-Jorioz, France, and Olivier Senee, Pringy, all of, France, assignors to Salomon S.A., Metz-Tessy, France**

**Filed Feb. 7, 1994, Ser. No. 193,418**

**Claims priority, application France, Mar. 24, 1993, 93 03550**

**Int. Cl.[6] A43B *5/04***

**U.S. Cl. 36—117** **22 Claims**




1. A boot for a gliding sport, said boot comprising:

a support/control circuit and a comfort/sensing circuit, each of said circuits including separate structural components and independent functions;

said support/control circuit comprising relatively rigid structural components of the boot for consolidating forces transmitted between the gliding device and a foot and lower leg within the boot, said forces transmitted including rear support forces and front support forces for the foot and lower leg, said relatively rigid structural components of the boot comprising:

a relatively rigid sole;

a shell in the form of a shoe affixed to said sole, said shoe comprising a front abutment for the front of the foot and a rear stiffener for enveloping the heel of the foot, said rear stiffener having a rearward-facing upper surface;

a collar for receiving the lower leg, said collar extending above and overlapping said rear stiffener, said collar having a forward-facing lower surface;

a rear axle affixed to a rearward portion of said collar and a rearward portion of said rear stiffener for enabling a journalled movement of said collar in forward and rearward directions about an axis rearward of a wearer's heel;

said forward-facing lower surface of said collar engagable with said rearward-facing upper surface of said rear stiffener at a forward position of said collar to thereby comprise a front support for the lower leg;

means for providing a rear support for the lower leg;

means for tightening said collar against the lower leg; and

said comfort/sensing circuit comprising relatively flexible structural components of the boot, said relatively flexible structural components of the boot comprising means for providing comfort of the foot and lower leg within the boot and transmission of information in a direction from the gliding member to sensitive zones of the foot and lower leg;

both said support/control circuit and said comfort/sensing circuit being affixed to a common reference component of the boot, said common reference component comprising said sole.

**5,499,462**

**METHOD AND DEVICE TO SCATTER A PREHEATED MATERIAL ON A SURFACE**

**Sixten Forsdahl, Strandvägen 23, Skoghall, Sweden, and Håkan Törner, Botkyrkovägen 3, Stockholm Wårby, Sweden**

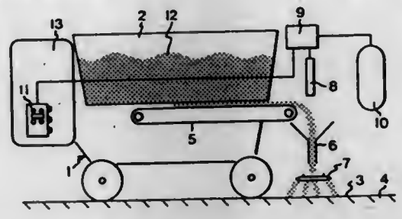
**PCT No. PCT/SE93/00017, § 371 Date Jul. 11, 1994, § 102(e) Date Jul. 11, 1994, PCT Pub. No. WO93/14270, PCT Pub. Date Jul. 22, 1993**

**PCT Filed Jan. 15, 1993, Ser. No. 256,472**

**Claims priority, application Sweden, Jan. 15, 1992, 9200108**

**Int. Cl.[6] E01C *19/20***

**U.S. Cl. 37—227** **13 Claims**




1. A process for scattering granular material at a raised temperature from a vehicle over a roadway, comprising the steps of:

feeding granular material from a supply container in a vehicle by a feed means to an upper, upstream portion of a substantially vertically disposed shaft;

conveying the granular material downwardly through the shaft to a scattering means at a lower, downstream portion of the shaft; and

heating the granular material during passage thereof downwardly through the shaft by combustion gases flowing under pressure through the shaft from the upstream portion of the shaft to separate and uniformly heat individual particles of the granular material;

whereby, the combustion gases assist gravity in transporting the particles through the shaft.

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**5,499,463**

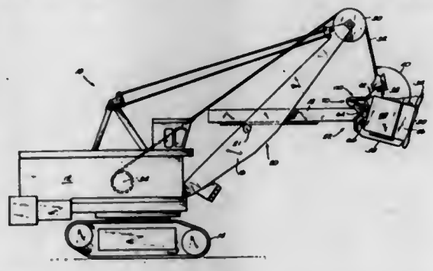
**POWER SHOVEL WITH VARIABLE PITCH BRACES**

**Richard L. Profio, Wauwatosa, and Frederick W. Loeber, Delafield, both of Wis., assignors to Harnischfeger Corporation, Brookfield, Wis.**

**Filed Oct. 17, 1994, Ser. No. 323,637**

**Int. Cl.[6] E02F *3/81***

**U.S. Cl. 37—398** **28 Claims**



1. A power shovel comprising

a frame,

a dipper handle mounted on said frame for pivotal movement relative thereto about a generally horizontal dipper handle axis,

a dipper connected to said handle for pivotal movement relative thereto about a generally horizontal dipper axis, and



a collapsible shock attenuator means connected between said handle and said dipper at a point spaced from said dipper axis, said shock attenuator allowing limited pivotal movement of said dipper relative to said handle and about said dipper axis.

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**5,499,464**

**COMPENSATION FOR FRICTION FORCE IN A LAUNDRY MANGLE**

**Friedrich Geiger, Todtenweis, Germany, assignor to Bowe-Passat Reinigungs Und, Augsburg, Germany**

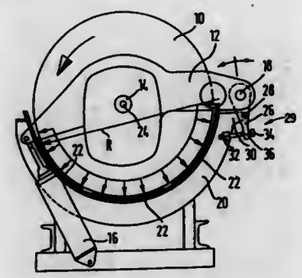
**PCT No. PCT/EP92/01937, § 371 Date Jul. 25, 1994, § 102(e) Date Jul. 25, 1994, PCT Pub. No. WO93/06292, PCT Pub. Date Apr. 1, 1993**

**PCT Filed Aug. 24, 1992, Ser. No. 211,853**

**Claims priority, application Germany, Sep. 27, 1991, 41 32 213.4**

**Int. Cl.[6] D06F *63/00***

**U.S. Cl. 38—46** **8 Claims**




1. Laundry mangle for counteracting a frictional force generated during service of the laundry mangle, said mangle comprising at least one mangle roller, at least one arm for supporting said mangle roller in a heatable trough in a service position, said mangle roller and said trough being movably positioned relative to each other, inlet and outlet passages for laundry articles provided between said mangle roller and heatable trough: a force generating mechanism which counteracts the frictional force generated during service of the laundry mangle comprising an adjusting device acting on a component selected from the group of components consisting of said mangle roller and said trough, wherein said adjusting device engages said supporting arm, and said supporting arm is swivelable about a point and movable with a movement selected from the group of movements consisting of translation and rotational movement in the service position: and wherein said trough is longitudinally movable and wherein said adjusting device acts directly on said trough.

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**5,499,465**

**PRESSURE-SENSITIVE SWITCH FOR TALKING PICTURE FRAME**

**Joseph A. Manico, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

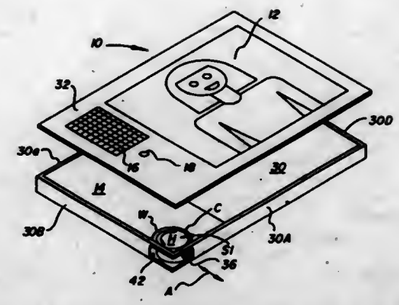
**Filed Mar. 13, 1995, Ser. No. 402,743**

**Int. Cl.[6] A47G *7/00***

**U.S. Cl. 40—152** **8 Claims**

1. Apparatus for displaying pictorial in formation while selectively providing audio information adapted, to enhance the content of the pictorial information, said apparatus comprising:

(a) a frame for accommodating a picture provided by a user, said frame having a first side adapted to rest upon a frame-supporting surface to support the frame in a first orientation, and a second side adapted to rest upon such frame-supporting surface to support the frame in a second orientation different from said first orientation;




(b) an audio system operatively coupled to said frame for selectively playing prerecorded audio information in response to receiving an electric control signal; and

(c) an electric switch for selectively producing said electric control signal, said switch comprising (i) a switch actuator slidably mounted for movement between extended and retracted positions, said switch actuator being adapted to produce said control signal during movement between said extended and retracted positions; (ii) biasing means for normally biasing said switch actuator towards its extended position; and (iii) mounting means for movably mounting said switch actuator on said frame for movement between a first position in which said switch actuator, when located in its extended position, extends outwardly from said first side of the frame, and a second position in which said switch actuator, when located in its extended position, extends outwardly from said second side of the frame.

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**5,499,466**

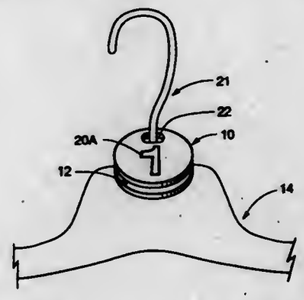
**METHOD AND APPARATUS FOR MONITORING GARMENT USAGE**

**Thomas A. House, 1032 Irving St., San Francisco, Calif. 94122**

**Continuation-in-part of Ser. No. 60,015, May 10, 1993, abandoned. This application Jul. 11, 1994, Ser. No. 272,838**

**Int. Cl.[6] G09F *3/00***

**U.S. Cl. 40—322** **18 Claims**




7. An apparatus for monitoring the usage of a garment, the apparatus comprising:

a garment hanger, wherein the garment hanger includes a garment hanger hook;

a plurality of garment monitoring tags, each of the tags including a first major surface and a second major surface, wherein the first major surface bears a first numerical indicator and the second major surface bears a second numerical indicator, wherein the first major surface and the second major surface form a circular shape; wherein the numerical indicators of all of the tags are sequential; wherein the tags have a thickness which does not exceed 0.25 inches; and wherein each of the

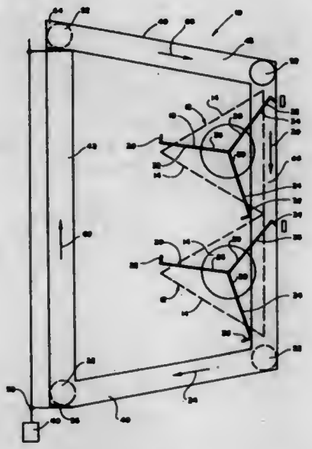
tags defines an opening which receives the hanger hook so that the tags are disposed on the hanger in a stacked arrangement.

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**5,499,467**
**INFORMATION DISPLAY STAND**

**Edward S. Kuznetsov, and Maxim E. Kuznetsov, both of 27 Revolution Hwy., Apt. 41, St. Petersburg 195176, Russian Federation**

**Filed Mar. 24, 1995, Ser. No. 409,415**
**Int. Cl.[6] G09F *11/02***
**U.S. Cl. 40—504** **10 Claims**



1. An information stand, comprising:
a rigid hollow frame having a first vertical side, a second vertical side oriented in a substantially parallel relationship to the first side, an upper part and a lower part connecting said first and said second vertical sides, said upper part and said lower part being mounted at an obtuse angle to said second side;
at least one multi-face information carrier means positioned adjacent said second side, said information carrier means being fixedly attached to a rotational shaft;
a means for intermittently rotating said shaft, said rotating means comprising at least one lever arm extending outwardly from said shaft so that a free end of the lever arm extends into said second side;
a means slidably mounted within said frame for imparting rotational force on said free end of the lever arm, thereby causing rotation of said shaft and said at least one information carrier means so that a different face of said at least one information carrier means is intermittently exposed to a viewer.

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**5,499,468**
**IDENTIFICATION BRACELET**

**Jesse E. Henry, P.O. Box 671821, Houston, Tex. 77267-1821**

**Filed Aug. 26, 1994, Ser. No. 296,458**
**Int. Cl.[6] A44C *5/00***
**U.S. Cl. 40—633** **8 Claims**

1. An identification bracelet comprising:
a bracelet body having a pocket slidably received between an inner wall and outer wall of said body, said pocket having one end opening at one end of said bracelet body, said pocket terminating between an opposite end and said one end of said body;



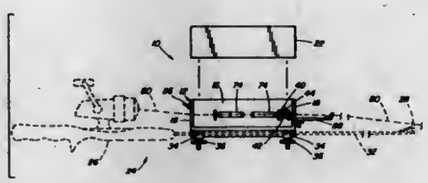
a closure seal means removably affixed in said opening at said one end of said bracelet body, said closure seal means for sealing an interior of said pocket in a water-tight condition; and
buckle means affixed to one of said ends of said bracelet body, said buckle means for detachably connecting the ends of said bracelet body together.

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**5,499,469**
**FISH HOOK SETTING DEVICE**

**Jean-Guy Guillemette, 613 Maloney Est, Gatineau, Quebec, Canada**

**Filed Jan. 18, 1995, Ser. No. 375,153**
**Claims priority, application Canada, Jan. 18, 1994, 2113704**
**Int. Cl.[6] A01K *97/12***
**U.S. Cl. 43—16** **5 Claims**



1. A fish hook setting device comprising
a housing having side walls, end walls and a bottom wall; said housing being adapted to be secured to a fishing rod at a point intermediate a handle portion and tip portion of said rod;
a solenoid secured within said housing;
said solenoid being operatively associated with a power source;
a solenoid actuator operatively associated with a fishing line so that the solenoid actuator is activated by the tension on said line;
a bearing secured to one of the side walls of the housing,
a first shaft extending in a direction generally perpendicular to the side walls, a first end portion of said first shaft being secured to said bearing;
a second shaft being spaced from said first shaft and extending parallel thereto, a first end portion of said second shaft being secured to said side wall of said housing spaced from said bearing;



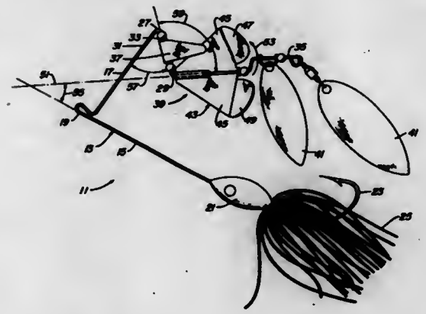
linkage means transferring rotary movement of first shaft to said second shaft, said linkage means being secured to said first and second shafts adjacent the second end portions of said shafts;
line support means for supporting the fishing line on the outside of the side wall of the housing, said line support means being secured to second end portions of said first and second shafts;
the actuation of said solenoid causing the rotation of the bearing, which in turn causes the rotation of the first shaft and of the second shaft, so that the line support means rotate causing the fishing line to be pulled up a predetermined distance to set the hook in a fish's mouth; means for deactivating the solenoid operatively associated with said second shaft;
spring return means causing the bearing, the first and second shafts, the linkage means and the line support means upon deactivation of the solenoid to return to their starting position.

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**5,499,470**
**FISHING LURE**

**Andrew J. Reed, Rte. 4, Box 380, Atlanta, Tex. 75551**

**Filed Jun. 3, 1994, Ser. No. 253,407**
**Int. Cl.[6] A01K *85/00***
**U.S. Cl. 43—42.13** **8 Claims**



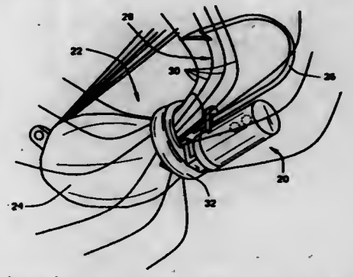
1. In a fishing lure of the type having a wire formed into first and second legs which both extend in rearward directions from an intermediate section which is included within the wire between the first and second legs for securing a fishing line thereto, a head and hook included as part of the first leg, the second leg including forward and rearward portions in which the forward portion outwardly extends away from the intermediate section and the rearward portion rearwardly extends in a direction which is not substantially toward the first leg, and a spinner rotatably secured to the rearward portion for spinning about the second leg as the fishing lure is pulled through water, the improvement comprising:
a clicker secured to the second leg for repeatedly knocking against the spinner, as the spinner rotates about the second leg, to produce a clicking noise for attracting fish;
wherein the spinner is secured about the second leg for rotating about an axis of rotation which is coaxial with the rearward portion of the second leg, and rearwardly inclines away from the first leg for urging the fishing lure to submerge as the fishing lure is pulled through the water;
an inward bend included within the second leg, intermediate of the forward and rearward portions, for directing a central portion of the second leg to extend toward the first leg;
an outward bend included within the second leg between the inward bend and the rearward portion, wherein the outward bend, in combination with the inward bend, disposes the spinner rearward of the forward portion of the second leg so that most of the spinner trails the forward portion of the second leg through the water; and
wherein the clicker is rotatably secured to the central portion of the second leg for swivelling about the central portion to trail the central portion and knock against the spinner as the fishing lure is pulled through the water.

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**5,499,471**
**RATTLE FOR FISHING LURE**

**Michael J. Foutch, R.R. 5, Southern MHP #72, Carbondale, Ill. 62901, and John J. Foutch, 1507 Winter Dr., Freeport, Ill. 61072**

**Filed Jan. 3, 1995, Ser. No. 368,304**
**Int. Cl.[6] A01K *85/01***
**U.S. Cl. 43—42.31** **20 Claims**



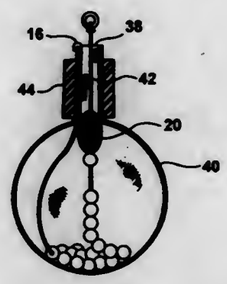
17. A fishing lure rattle adapted to be mounted on a fishing lure having a body with a fish hook depending therefrom, and a resilient band on the body, the rattle comprising:
a generally cylindrical rattle chamber having a rattle member therein;
a first arm extending generally axially from the chamber and having a hook adjacent its free end for engaging the resilient band; and
a second arm extending generally radially from the chamber and having an opening adjacent its free end for receiving a portion of the fish hook to secure the rattle thereto.

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**5,499,472**
**RECOVERABLE FISHING SINKER**

**Henry J. Krenn, 2545 Solano Rd., Shell Beach, Calif. 93449**

**Filed Apr. 21, 1995, Ser. No. 426,578**
**Int. Cl.[6] A01K *95/00***
**U.S. Cl. 43—44.97** **10 Claims**



1. A snag-resistant wholly recoverable sinker for a distal end of a line used for fishing, comprising:
a bag having a mouth;
a plurality of beads strung onto a portion of the line adjacent the distal end of the line, the first bead strung having a larger diameter than the succeeding beads, the first bead strung being crimped to the line and the last bead strung being crimped to the line;

said bag enclosing said plurality of beads; and,

a resilient collar affixed to said bag, encircling and elastically constricting the mouth of said bag and preventing said first bead from being withdrawn from said bag until a predetermined tension in the line is exceeded, said predetermined tension being less than the tension required to break the line; the distal end of the line affixed to said bag.

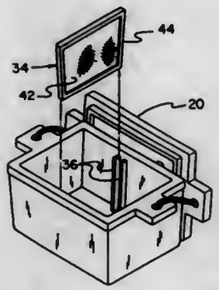
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**5,499,473**

**DIVIDED BAIT CONTAINER**

**Clifford F. Ramberg, 6825 Sunrise Rd., P.O. Box 145, Harris, Minn. 55032**

**Filed Nov. 16, 1994, Ser. No. 340,596**
**Int. Cl.[6] A01K** *97/04*
**U.S. Cl. 43—55** **7 Claims**




7. A divided bait container comprising:

a container means for receiving objects, said container means comprising a substantially rectangular container including a front wall spaced from a rear wall with a pair of side walls extending between said front and rear walls; and a bottom wall extending between said front and rear walls and between said side walls to close a bottom end of said rectangular container, said rectangular container including an open upper end, said rectangular container being comprised of a foam core encapsulated by an interior skin and an exterior skin;

a dividing means for separating an interior of said container means into a plurality of compartments, said dividing means comprising a plurality of spaced vertical flanges extending in pairs along opposed interior surfaces of said rectangular container, said pairs of vertical flanges cooperating to define unlabeled channels extending vertically within said container; and a screen plate having a perimeter frame extending thereabout, said screen plate perimeter frame being received within said channels so as to extend across said interior of said container;

a cover removably placed across said upper end of said rectangular container, said cover being substantially planar in configuration and including an interiorly positioned depending circumferential flange which extends along and engages a portion of interior surfaces of said rectangular container to orient said cover relative to said container and to sealingly engage said interior surfaces to preclude a transfer of fluid through a juncture of said cover and said upper end of said rectangular container, said cover being comprised of a foam core encapsulated by an interior skin and an exterior skin;

wherein said rectangular container cooperates with said cover to define a pair of side handles projecting from laterally opposed sides of said container, wherein container lateral flanges project from said side walls of said rectangular container, and cover lateral flanges project from opposed sides of said cover and are positioned to abuttingly engage said container lateral flanges to define said side handles;

a rope handle extending through apertures in said lateral flanges of both said rectangular container and said cover and secured from removal therethrough; and,

a drain means extending through an aperture in said cover for permitting drainage of fluid from said rectangular container when said container is in an inverted position, said drain means comprising a cylindrical fitting secured within said aperture extending through said cover, said cylindrical fitting being shaped so as to define a cylindrical cavity; a rotatable valve member positioned within said cylindrical cavity, said cylindrical fitting including a through-extending eccentric aperture, and said rotatable valve member including a through-extending eccentric aperture which is positionable into contiguous communication with said eccentric aperture of said cylindrical fitting through a manual rotation of said rotatable valve member, whereby an inversion of said rectangular container will permit drainage of fluids contained therewithin through said cover.

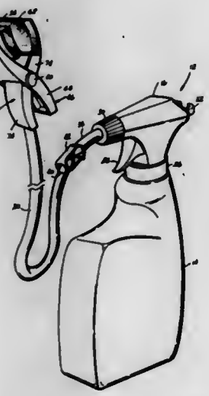
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**5,499,474**

**METHOD AND APPARATUS FOR LIQUID APPLICATION**

**Louis D. Knoolhuizen, 3530 Navaho Dr., Grandville, Mich. 49418**

**Filed Nov. 28, 1994, Ser. No. 345,927**
**Int. Cl.[6] A01G** *13/00*
**U.S. Cl. 47—1.5** **19 Claims**



1. An applicator assembly for the controlled application of fluid to a surface, the assembly comprising:

a fluid reservoir;

a pump mechanism having an inlet and an outlet, the inlet of the pump mechanism being in fluid communication with the fluid reservoir;

a fluid conduit having a proximal end and a distal end, the proximal end being mounted to the outlet of the pump mechanism and;

an applicator mounted to the distal end of the fluid conduit, the applicator comprising:

a pair of opposed support members movable with respect to one another between a first position wherein a portion of one support member is disposed away from a portion of the other support member and a second position wherein the portion of each support member is disposed nearer to each other;

at least one applicator pad mounted to the portion of one of the support members, the at least one applicator pad being in fluid communication with the fluid conduit;

a spring to bias the opposed support members toward the second position; and

a clamping projection positioned to compress the fluid conduit intermediate the pump mechanism and the at least one applicator pad when the opposed support members are in one of the first and second positions;



whereby fluid is selectively supplied to the at least one applicator pad from the fluid reservoir by pumping the pump mechanism to supply fluid to the fluid conduit and biasing the opposed support members to the other of the first and second positions so that the fluid in the fluid conduit flows to the at least one applicator pad.

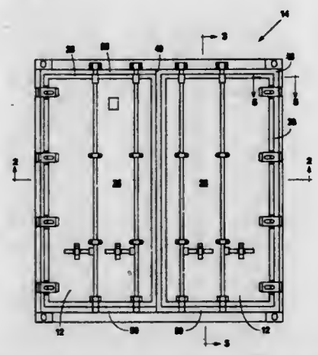
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**5,499,475**

**DOOR SEAL**

**Melvin T. Court, and Alec V. Monte, both of Texarkana, Tex., assignors to Newcourt, Inc., Texarkana, Tex.**

**Filed May 11, 1995, Ser. No. 439,181**
**Int. Cl.[6] E06B** *7/16*
**U.S. Cl. 49—495.1** **7 Claims**



1. A seal for sealing the perimeter of a door having an inside surface facing an enclosed chamber and an outside surface facing away from said enclosed chamber when the door is at a closed position, and at least four edge surfaces all having a predetermined length, and a seal retainer extending along each of said edge surfaces of the door, said seal comprising:

a base portion comprising at least four straight sections each having a predetermined width and a length substantially equal to the length of a respective one of said door edge surfaces, each of said straight sections being joined at each end of the length with another one of said straight sections and forming a corner joint at each of the joined ends, and a pair of opposed notches extending along the length of each section and adapted to receive a portion of said seal retainer therein;

at least four first seal sections, one of each being disposed at a respective one of the corner joints of the base portion in spaced relationship with each other and comprising a first lip seal extending outwardly from said base portion and adapted to overlay a surface adjacent to and substantially aligned in a plane with the outer surface of said door when said door is in the closed position, and a second lip seal extending outwardly from said base portion and spaced from said first lip seal and adapted to abut an opposed surface spaced from and in substantial parallel relationship with a respective edge surface of said door when the door is in the closed position; and,

a plurality of second seal sections each having a length that extends between a spaced pair of the first seal sections, one of said second seal sections being disposed along each of at least three of the straight sections of the base portion, each of said second seal sections comprising a lip seal extending outwardly from said base portion and adapted to overlay a surface adjacent to and substantially aligned in a plane with the outer surface of said door when the door is in the closed position, and a compression seal spaced from said lip seal and having a deformable wall defining, in cooperation with said base portion, a hollow chamber extending the length of each of said second seal sections.

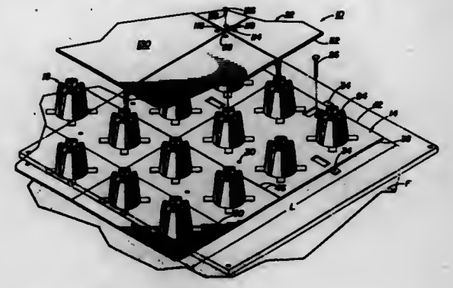
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**5,499,476**

**LOW PROFILE RAISED PANEL FLOORING WITH METAL SUPPORT STRUCTURE**

**Harold F. Adams, LaGrange; Roderick A. Suarez, Forest Park, and Lewis H. Engle, Peachtree City, all of Ga., assignors to Interface, Inc., La Grange, Ga.**

**Filed Aug. 31, 1993, Ser. No. 114,447**
**Int. Cl.[6] E04B** *5/43*
**U.S. Cl. 52—220.1** **14 Claims**



2. A flooring system comprising:

a. a base defining four openings;

b. a stand-off comprising:

i. a central section defining a groove; and

ii. four arms integrally formed with and depending from the central section, each arm defining means for insertion into a corresponding one of the four openings; and

c. a panel comprising means for engaging the groove when the flooring system is in use.

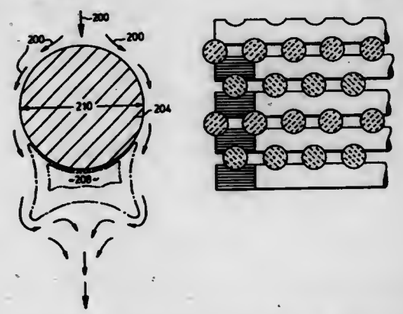
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**5,499,477**

**CARBON BLACK REFRACTORY SYSTEM**

**Donald Hurkot, Medicine Hat, Canada, assignor to Cancarb Limited, Alberta, Canada**

**Filed Dec. 30, 1993, Ser. No. 175,579**
**Int. Cl.[6] F28D** *17/04;17/02*
**U.S. Cl. 52—604** **19 Claims**




1. A refractory system for a reactor for producing carbon black, comprising:

a plurality of refractory bricks each having an elongate axis, the plurality of bricks being arranged to provide at least one path through which a gas can flow, said at least one path extending substantially perpendicular to the elongate axes, and each of said plurality of refractory bricks having a cross-section for reducing the formation of dead regions in said gas flow adjacent said bricks, each brick cross-section having a width which decreases in a downstream direction with respect to the gas flow to reduce the dead regions, said plurality of refractory bricks being disposed in at least three courses such that

bricks of a first course are staggered with respect to bricks of the third course, bricks of the second course being disposed at an angle with respect to bricks of the first course, the three courses presenting an aspect to said gas flow which is substantially free of flue openings.

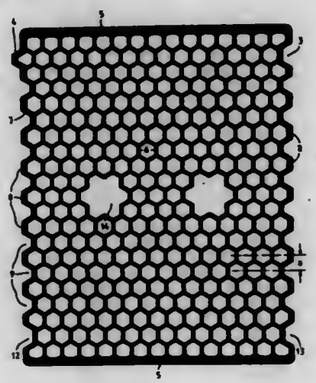
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5,499,478

**LIGHTWEIGHT VERTICALLY PERFORATED BRICK**

Raimund Rimmele, Altsteusslinger Strasse 24, D-89583 Ehingen, Germany

Filed Nov. 24, 1993, Ser. No. 156,778
Claims priority, application Germany, Nov. 25, 1992, 42 39 616.6; Feb. 25, 1993, 43 05 747.0
Int. Cl.[6] E04C *1/00*; E04B *1/74;1/14*
U.S. Cl. 52—606 12 Claims



1. A light weight, vertically perforated brick having a pattern of perforations that exhibits a plurality of perforation rows, extending in a longitudinal direction of the brick, and webs separating the perforations from one another, wherein:

a) the webs have a thickness from 1.5 mm to not more than 4 mm;

b) each perforation has a cross section exhibiting a ratio of largest to smallest inside width that lies in a range of 1:1 to 1:1.25;

c) the perforation rows have a spacing of not more than 22 mm;

d) the perforations comprise a 50% proportion of the brick; and

e) the brick is made of material having a density of less than or equal to 1.7 kg/dm$^3$.

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5,499,479

**Patent Not Issued For This Number**

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5,499,480

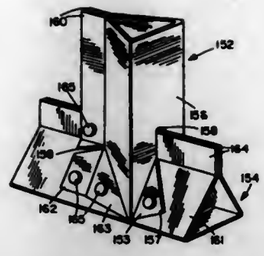
**LIGHTWEIGHT METAL TRUSS AND FRAME SYSTEM**

Kenneth R. Bass, 1728 Eldon Ct., El Cajon, Calif. 92021

Continuation-in-part of Ser. No. 82,989, Jun. 25, 1993, which is a continuation-in-part of Ser. No. 40,494, Mar. 31, 1993, abandoned. This application Feb. 2, 1994, Ser. No. 190,643
Int. Cl.[6] E04H *12/10*
U.S. Cl. 52—653.1 15 Claims

1. A lightweight metal frame and truss system comprising:

a plurality of beams, each beam comprising a single piece of sheet metal bent lengthwise along four parallel lines to form a triangular cross-section having a base and two sides and two



wings, one wing corresponding to each side, extending from an apex of said triangular cross-section and having a wing height less than a side length of said each side, said beam having a beam length, an inner beam surface and an outer beam surface and being openable between said two wings, each of said inner beam surface and said outer beam surface having five planar segments defined by said base, said two sides and said two wings;

a plurality of end joints, each end joint comprising a single piece of sheet metal formed at an end of a first beam of said plurality of beams with at least one lengthwise cut therein to create a joint opening conforming to at least two planar segments of an outer surface of a first construction material so that said at least two planar segments of said outer surface of said construction material are contained within said joint opening to create a first connection point having a width much less than a length of said construction material;

a plurality of brackets for connecting at least one of said beams to a second construction material, each bracket comprising a strip of sheet metal having at least one lateral bend therein to conform said strip to at least two planar segments of said outer beam surface and at least one extension for abutting said at least two planar segments of said outer surface of said construction material to create a second connection point having a second length much less than said beam length;

a plurality of gussets, each gusset comprising a flat piece of sheet metal having a plurality of edges and a third length much less than said beam length, at least one lengthwise edge being inserted between said two wings of said beam to create a third connection point with at least two planar segments of said inner beam surface and having said third length; and

a plurality of fastening means for fastening said end joints, said brackets and said gussets to said construction material and to said beams;

wherein said beam and said construction material are attached together at said first, second and third connection points so that a space exists between said beam and said construction material except at one of said first, second and third connection points.

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5,499,481

**SECTIONAL NETWORK STRUCTURE FOR LIGHTING**

Giampalo Targetti, Via Barbacane No. 29, 50133 Firenze, Italy

Filed Mar. 1, 1994, Ser. No. 203,388
Claims priority, application Italy, Mar. 5, 1993, FI93A0037
Int. Cl.[6] E04H *12/10*
U.S. Cl. 52—654.1 8 Claims

1. A sectional network structure comprising in combination the following: a plurality of lattice elements (1) extending in substantially parallel relation such that adjacent lattice elements converge and diverge to define said sectional network structure longitudinal connecting means (1B) together with partial longitudinal connecting means (1C) for joining successive lattice elements (1) in alignment with each other; links (3) for providing connection between said longitudinal connecting means (1B and 1C) for successive lattice elements (1); said links (3) being electrically insulated; means (5 and 7) for providing a mechanical connection





between successive lattice elements (1); means (24 and 26) for providing mechanical and electrical connection between successive lattice elements such that a line of successive lattice elements (1) provides a low-voltage current conductor capable of being combined with another conductor formed by a contiguous line of successively abutted lattice elements (1), and said sectional network structure including adapters (61 and 71) adapted to be fitted to said longitudinal connecting means (1B and 1C) for providing lighting and adapted to be combined with said sectional network structure, said adapters (61 and 71) having take-off contacts (67A and 79A) for supplying lighting.

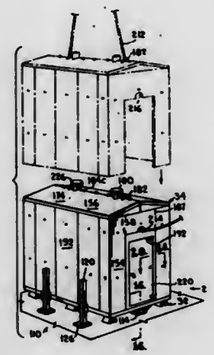
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5,499,482

**STRUCTURE AND METHOD FOR ENCAPSULATING AN EXISTING BUILDING**

Todd A. Goff, Topeka, Kans., assignor to PTMW, Incorporated, Topeka, Kans.

Filed Aug. 6, 1993, Ser. No. 102,847
Int. Cl.[6] E04G *23/00*; E02D *27/48*
U.S. Cl. 52—742.13 25 Claims



1. A method of encapsulating an existing building, which comprises the steps of:

(a) providing an underpinning system;

(b) fastening the underpinning system to the existing building;

(c) providing a shell system with opposite side walls, opposite end walls, a roof and an open bottom;

(d) placing said shell system in covering relation over and in spaced relation from said existing building to form an interstitial space between said shell system and said building; and

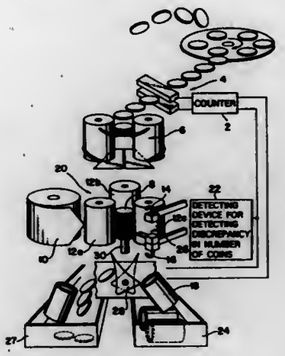
(e) attaching said shell system to said underpinning system.

5,499,483

**COIN WRAPPING APPARATUS**

Yoshio Oikawa, Okegawa, Japan, assignor to Laurel Bank Machines Co., Ltd., Tokyo, Japan

Filed Dec. 9, 1994, Ser. No. 355,234
Claims priority, application Japan, Dec. 17, 1993, 5-317194
Int. Cl.[6] B65B *11/04;57/10;57/20*
U.S. Cl. 53—53 22 Claims




1. A coin wrapping apparatus, comprising:

a coin discriminating and counting means for discriminating deposited coins as to whether or not they are genuine and their denomination agrees with a predetermined one while counting the number of coins;

a coin stacking means for stacking a predetermined number of coins of predetermined denomination to be wrapped;

wrapping roller means for winding a wrapping film whose width is wider than a height of coins stacked in the coin stacking section around the stacked coins so that there remain crimp regions above and below the stacked coins;

upper crimp claw means and lower crimp claw means, movable in the vertical direction toward each other so that the stacked coins are beld therebetween, for crimping the crimp regions to generate rolls of wrapped coins;

discrepancy detecting means for detecting as to whether or not the predetermined number of stacked coins are wrapped after the wrapping film is wrapped around the stacked coins by the wrapping roller means;

rolls of wrapped coins collecting means for collecting the rolls of wrapped coins;

cutting means for cutting the wrapping film when it is detected that the number of stacked coins wrapped with the wrapping film is less than or more than the predetermined number of coins;

coin collecting means for collecting the coins whose wrapping film is cut by the cutting means; and

gate means for selectively delivering the coins to the wrapped rolls of coins collecting means or the coin collecting means in accordance with the detected result by the discrepancy detecting means.

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5,499,484

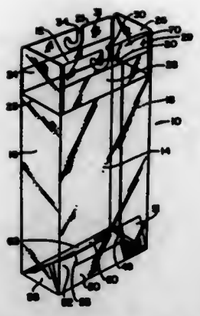
**DISPLAY CONTAINER**

Melvin B. Herrin, Rydal, Pa., assignor to Klearfold, Inc., Warrington, Pa.

Continuation-in-part of Ser. No. 195,751, Feb. 10, 1994, Pat. No. 5,458,233. This application Mar. 1, 1994, Ser. No. 204,767
Int. Cl.[6] B65B *43/26;3/02*
U.S. Cl. 53—458 25 Claims

1. A method of packaging comprising the steps of:

(a) providing a display container comprising permanent side walls, a first end comprising at least two side wall flanges depending from said side walls, and a second end sealable to



form a closed bottom wall and wherein said second end is attached along at least a portion thereof and is so constructed such that when said display container is moved to its set-up position, said second end forms said closed bottom wall;

(b) setting up said display container to its set up position to form a walled enclosure;

(c) filling said display container with a desired product;

(d) sealing said second end to form said closed bottom wall;

(e) permanently bonding at least a portion of one of said side wall flanges to at least another of said side wall flanges to form a closed, bonded top wall to maintain said display container in a permanently sealed condition so that said product inside said display container is inaccessible from either said top or bottom wall.

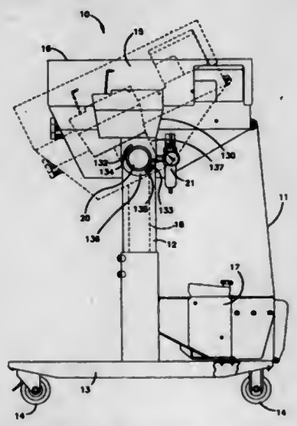
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**5,499,485**

**PACKAGING MACHINE AND METHOD**

**Bernard Lerner, Aurora; Richard W. Hess, Hudson; William M. Crossner, Tallmadge; Rick S. Wehrmann, Hudson, and James D. Kramer, Medina, all of Ohio, assignors to Automated Packaging Systems, Inc., Streetsboro, Ohio**

**Division of Ser. No. 954,378, Sep. 30, 1992, Pat. No. 5,394,676.**
**This application Aug. 31, 1994, Ser. No. 298,786**
**Int. Cl.[6] B65B** *43/12*
**U.S. Cl. 53—459** **17 Claims**



1. A packaging machine comprising:

a) a base section;

b) an upstanding support section mounted on the base at a location offset to one side of the base;

c) a web supply positioner connected to the base and in cantilever relationship with the support section and projecting laterally above the one side of the base section toward the other side of the base section cantilever fashion;

d) a web dispensing section mounted on the support section above the positioner and projecting laterally from the support section toward the other side of the base section cantilever fashion; and

e) web path delineating elements carried by at least one of the sections to delineate a path of web travel from the supply positioner to the dispensing section.

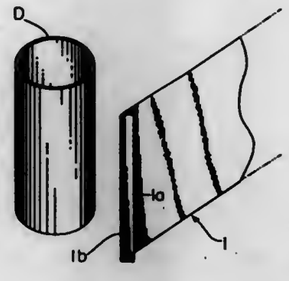
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**5,499,486**

**PROCESS FOR PACKING ELECTROPHOTOGRAPHIC PHOTORECEPTOR**

**Keizo Kimoto; Yasuyuki Hanatani; Hiroaki Sakai; Tsuneo Oki, and Mamoru Uemura, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan**

**Filed Nov. 18, 1994, Ser. No. 345,384**
**Claims priority, application Japan, Nov. 29, 1993, 5-298674**
**Int. Cl.[6] B65B** *11/48;19/34;25/00*
**U.S. Cl. 53—465** **5 Claims**



1. A process for packing a drum-shaped electrophotographic photoreceptor, comprising the steps of:

folding a wrapping-start edge portion of a light-shielding packing sheet outwardly in a diametrical direction of the electrophotographic photoreceptor across a width of the packing sheet to prevent physical damage to said photoreceptor by said wrapping-start edge portion of said packing sheet; and

wrapping the packing sheet on a circumferential surface of the electrophotographic photoreceptor.

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**5,499,487**

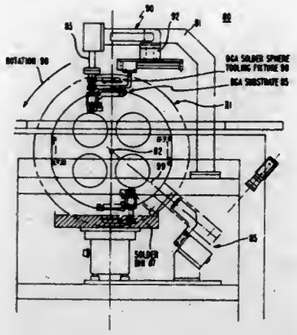
**METHOD AND APPARATUS FOR FILLING A BALL GRID ARRAY**

**Scott D. McGill, Tucson, Ariz., assignor to Vanguard Automation, Inc., Tucson, Ariz.**

**Filed Sep. 14, 1994, Ser. No. 306,144**
**Int. Cl.[6] B65B** *5/10*
**U.S. Cl. 53—473** **10 Claims**

10. A method for filling the recesses in a ball grid array with solder balls located in an array of recesses in a tooling fixture, said method comprising the steps of placing said ball grid array and said fixture in closely spaced apart positions, recesses facing, moving said array and said fixture about a circular path through first and second positions at which said fixture is beneath said array and at which said array is beneath said fixture, respectively, moving said array and said fixture into said first position such that only said fixture enters a reservoir of said solder balls, moving said array and said fixture to said second position at which gravity acts to transfer solder balls in recesses in said fixture into recesses in said array, and moving said array and said fixture into juxtaposition before said second position is reached.





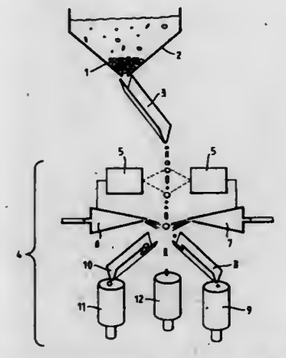
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**5,499,488**

**MATERIAL SUPPLY**

**Andrew Green, Middlesex, and Paul C. Ward, Herts, both of, England, assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Jul. 14, 1994, Ser. No. 275,220**
**Claims priority, application United Kingdom, Jul. 14, 1993, 9314621**
**Int. Cl.[6] B65B** *5/10;* **G03C** *5/26*
**U.S. Cl. 53—474** **13 Claims**



1. A method of supplying a plurality of different materials required for use in a process where the different materials are to be kept separate up to a predetermined stage in the process, the method comprising the steps of encapsulating each different material within a plurality of discrete shells which serve to keep the different materials separate from each other, the shells for each different material being distinguishable from each other, and sorting the different encapsulated materials using an optical sorting apparatus.

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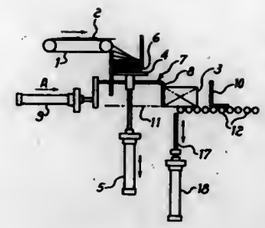
**5,499,489**

**MACHINE FOR MAKING BUNDLES OF WRAPPED SHEETS**

**Aldo Perobelli, and Giorgia Pessina, both of Cusano Milanino, Italy, assignors to O.M.G. di Giorgio Pessina e Aldo Perobelli S.n.c., Milan, Italy**

**Filed Mar. 30, 1995, Ser. No. 413,883**
**Claims priority, application Italy, Jun. 2, 1994, MI94A1154**
**Int. Cl.[6] B65B** *11/00*
**U.S. Cl. 53—540** **13 Claims**

1. A machine for making bundles of sheets to be wrapped by a wrapping machine comprising: means for transporting said sheets; means for bundling said transported sheets to make bundles of said sheets; a horizontal plane on which said bundles of sheets arrive; a first pusher which moves said bundles in a first direction to against a stop, and means for positioning said bundles, at the wrapping machine, comprising a second pusher for moving each bundle in a second direction perpendicular to the first direction and to a wrapper of the wrapping machine until the bundle is positioned at the wrapping machine arranged side by side with the machine for making bundles in such a way as to wrap the bundle with the wrapper transversely with respect to the second direction of motion of said second pusher, means for keeping the bundle pushed against said stop even when the first pusher moves away from the bundle to return to the first position along a third direction and to move subsequently a new bundle, wherein the first pusher is made up of spaced vertical bars and the means for keeping said bundle pushed against said stop comprise a series of rounded pegs vertically passing through said bars so as to fill spaces therebetween and thus achieve the free sliding of the bundle, pushed by the second pusher, along said pegs towards the wrapping machine and keeping the bundle pushed against the stop.



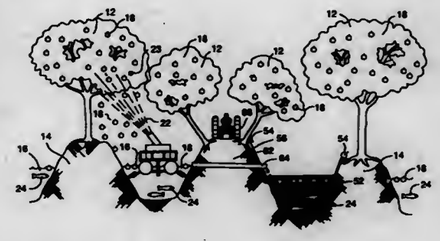
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**5,499,490**

**AQUA FARMING**

**Walter W. Minnich, 119 Broadmeadows Blvd., Columbus, Ohio 43214**

**Filed Apr. 7, 1994, Ser. No. 224,286**
**Int. Cl.[6] A01D** *46/00*
**U.S. Cl. 56—9** **51 Claims**



28. A aqua-farming manufacture comprising:

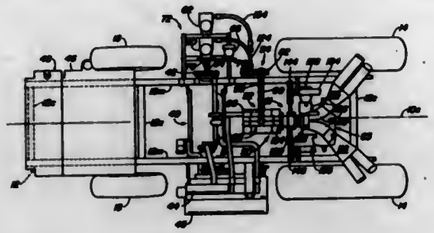
a) a plurality of elongated land masses;

b) a plurality of elongated bodies of water juxtaposed between said elongated land masses;

c) plants planted and grown on said land masses;

d) said elongated land masses sized and shaped to allow detached plant parts from said plants to enter into said bodies of water as a result of gravitational force.

5,499,491
**COTTON HARVESTER**
Timothy A. Deutsch, Newton, and Gary L. Warnsholz, Des Moines, both of Iowa, assignors to Deere & Company, Moline, Ill.
Division of Ser. No. 101,206, Aug. 3, 1993, Pat. No. 5,406,779.
This application Dec. 27, 1994, Ser. No. 364,350
Int. Cl.[6] A01D *46/08*
U.S. Cl. 56—10.2 H 15 Claims

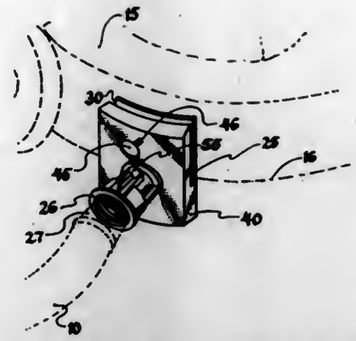


1. In a cotton harvester having a fore-and-aft extending main frame supported for forward movement in a range of speeds over the ground by forward drive wheels and rear steerable wheels, a hydraulic transmission connected to the drive wheels, at least one row unit connected to the forward end of the frame and having variable speed harvesting structure including a spindle drum rotatable about an upright axis for removing cotton from rows of cotton plants, an engine supported by the frame and having a crankshaft rotatable about an axis, controllable drive structure comprising:
a first hydraulic motor drivingly connected to the transmission;
a second hydraulic motor drivingly connected to the row unit harvesting structure;
first and second variable output pumps connected to the first hydraulic motor and second hydraulic motor, respectively, the pumps connected in tandem at one end of the engine and drivingly connected to the engine;
means for selectively varying the output of the first and second pumps relative to each other for varying the ratio of the harvesting structure to the forward ground speeds, the means for selectively varying including an adjustable linkage extending between the pumps; and
wherein the engine is supported on the frame transverse to the forward direction and the pumps extend axially outwardly from the engine.

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5,499,492
**LAWN MOWER CLEANING METHOD AND ATTACHMENT**
Eddie A. Jameson, 501 Ledge Rd., Yarmouth, Me. 04096
Continuation-in-part of Ser. No. 845,437, Mar. 5, 1992, Pat. No. Des. 350,357. This application Jun. 16, 1994, Ser. No. 260,755
Int. Cl.[6] A01D *75/10*
U.S. Cl. 56—12.1 15 Claims

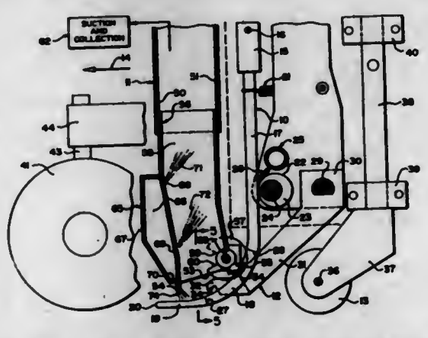
9. A method of cleaning a rotary lawn mower having a rotating blade carried by a carriage, which carriage has a vertically depending skirt generally surrounding the blade, said cleaning method comprising:
connecting to said vertical skirt, without requiring any modification to said carriage and/or said skirt, a cleaning attachment having a body portion with a water passageway therein;
positioning said attachment so that the water passageway therein is below the lowest edge of said skirt and runs from the outside surface of said body portion to the inner surface thereof;
feeding water from a hose into said water passageway of said cleaning attachment;
directing water fed from said hose into said water passageway and through said body portion of said attachment essentially



in a horizontal manner from the outside of said attachment into the body portion and under the lowest edge of the carriage skirt;
angling the water upwardly through a nozzle in said body portion, which nozzle is positioned at an angle, Å, of about 25 to 45 degrees to the horizontal and has an exit opening on the inner surface of said body member located on the inside of said skirt;
reducing the size of said water passageway in said cleaning attachment from about hose size at the outer water entrance of the body portion to a considerably smaller exit size on the inside of said body portion;
forming an upwardly-directed jet stream of water by said reduction in size and selected angle for said water passageway in said body portion;
facing the inside exit opening from beneath and upward toward the rotating blade tips of said mower;
directing said formed jet stream from beneath and against the tip portions of the mower blade such that said jet stream strikes the rotating mower blade at or near the blade tips; and
forming a pulsating cleaning action for the underside of said carriage, blade and skirt by cutting said jet stream with said rotating blade tips.

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5,499,493
**FRUIT HARVESTER**
René R. Rosset, 28 Braewood Place, Winnipeg, Manitoba, Canada
Filed Sep. 8, 1994, Ser. No. 303,011
Int. Cl.[6] A01D *46/00*
U.S. Cl. 56—13.3 19 Claims

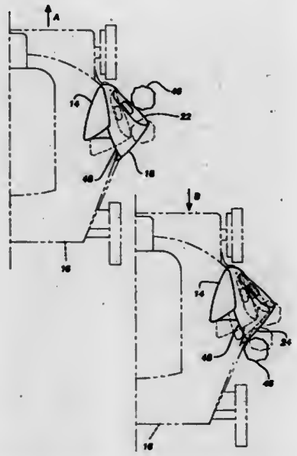



1. A harvester for small fruit berries of a type such as cranberries which grow on vines across the ground, the harvester comprising a plurality of tines, means mounting the tines arranged side by side in a row transversely of a direction of working movement of the harvester for engaging the vines as the tines are moved forwardly along the direction of working movement, each tine including a generally horizontal forwardly extending end portion and an upwardly curved rear portion rearwardly of the forward portion, a ground roller, means mounting the ground roller rearwardly of the tines for rolling on the vines behind the tines, said means mounting the tines being arranged to allow reciprocating movement of each tine in a vertical plane longitudinally of the direction of movement, cam means for actuating reciprocating movement of the tines such that alternate tines are arranged to move out of phase to lift the berries from the vines, suction duct means arranged above the tine to lift the berries from the tines for transportation to collection means, each tine including a substantially vertical portion extending upwardly from said rearward portion and substantially at right angles to said generally horizontal forward portion.



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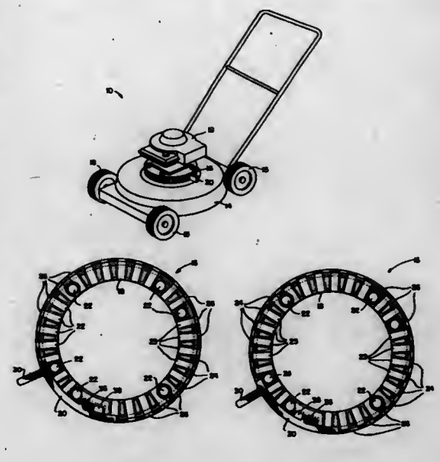
5,499,494
**LAWN MOWER DISCHARGE CHUTE**
Gregory A. Boshell, Orangeburg, and Charles R. Sagraves, Columbia, both of S.C., assignors to White Consolidated Industries, Inc., Cleveland, Ohio
Filed Jul. 23, 1993, Ser. No. 97,079
Int. Cl.[6] A01D *34/70*
U.S. Cl. 56—320.1 18 Claims



1. A discharge door for a mower having an aerodynamically contoured interior and a side discharge port from said interior, said port having a leading portion and a trailing portion, said door comprising:
an attaching structure for pivotably attaching said door to said mower near said port leading portion, said structure including a pivot;
a leading camming surface for pivoting said door from an open position to an obstacle-clearing position in response to said leading camming surface contacting an obstacle to forward movement of said mower; and
a trailing camming surface for pivoting said door from said open position to said obstacle-clearing position in response to said trailing camming surface contacting an obstacle to rearward movement of said mower, said trailing camming surface being at a decreasing distance from the pivot in a direction away from said mower.

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5,499,495
**LAWN MOWER HAVING ADJUSTABLE AIR VENTS**
Richard A. Heisman, Jackson; Keith Mosley, Alamo, and Stephen J. Vos, Jackson, all of Tenn., assignors to Murray, Inc., Brentwood, Tenn.
Continuation of Ser. No. 190,548, Feb. 1, 1994, abandoned.
This application Dec. 28, 1994, Ser. No. 365,305
Int. Cl.[6] A01D *34/64;34/66;34/68*
U.S. Cl. 56—320.1 19 Claims

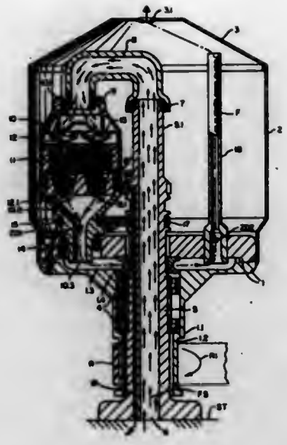


1. Adjustable ventilation apparatus for a lawn mower having a cutting deck supported by a plurality of wheels at a cutting height, said apparatus providing variable airflow into the interior of said cutting deck, said apparatus comprising:
a stationary member mounted to said cutting deck, said stationary member having a plurality of first openings formed therethrough, said first openings defining airflow passageways into the interior of said cutting deck; and
a cover member slidably disposed adjacent said stationary member and having a plurality of second openings formed therethrough, said cover member being selectively moveable so that said second openings therein are moveable into and out of alignment with said first openings in said cover member, thereby defining fully open and closed positions, respectively, for said apparatus, wherein
said open position allows maximum airflow through said apparatus into the interior of said cutting deck, and said closed position allows minimum airflow through said apparatus, said airflow being operative to affect the cutting performance of said lawn mower, and
said cutting height is unaffected by said airflow.

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5,499,496
**METHOD AND DEVICE FOR MANUFACTURING A TWISTED YARN**
Heinz Stenmans, Grefrath, Germany, assignor to Palitex Project-Company GmbH, Krefeld, Germany
Filed Oct. 21, 1994, Ser. No. 330,061
Claims priority, application Germany, Jan. 22, 1993, 43 36 109.9
Int. Cl.[6] D01H *4/08;4/38;4/40*
U.S. Cl. 57—406 11 Claims

1. A method of manufacturing a twisted yarn, said method comprising the steps of:
rotatably supporting a rotor on a machine frame;



providing a yarn guide channel within the rotor so as to extend radially relative to an axis of rotation of the rotor over at least a portion of a diameter of the rotor;

positioning a means for centering the twisted yarn on an extension of the axis of rotation of the rotor;

arranging a yarn guide tube so as to guide a yarn exiting from the yarn guide channel to the means for centering;

rotatably supporting a spinning device on the rotor so as to be positioned eccentrically relative to the axis of rotation of the rotor;

dissolving a fiber strand into dissolved fiber material;

feeding the dissolved fiber material in the axial direction through the rotor into a space above the rotor and upwardly toward the spinning device;

producing at least two spun fibers from the dissolved fiber material within the spinning device;

guiding the spun fibers downwardly toward the yarn guide channel so as to form a plied yarn;

simultaneously to guiding the spun fibers, subjecting the spun fibers to a first twist to form a once twisted yarn by the rotation of the spinning device relative to the rotor;

guiding the once twisted yarn into the yarn guide channel and from the yarn guide channel upwardly into the yarn guide tube and toward the means for centering; and

simultaneously to guiding the once twisted yarn, subjecting the once twisted yarn to a second twist to form a twice twisted yarn by the rotation of the rotor counter to the direction of rotation of the spinning device.

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**5,499,497**

**TEMPERATURE DETECTOR AND CONTROL FOR AN IGNITER**

**Dennis M. DeFreitas, Oxford, N.Y., assignor to Simmonds Precision Engine Systems, Akron, Ohio**

**Filed Aug. 6, 1993, Ser. No. 103,021**

**Int. Cl.[6] F02C *7/266***

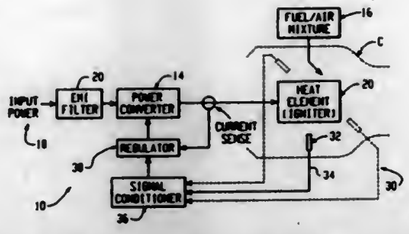
**U.S. Cl. 60—39.06** **17 Claims**

14. A method for controlling temperature of an igniter of the type having a heating element used for combustion, comprising the steps of:

a. disposing the igniter in the path of an air/fuel mixture to a compressed high volume air flow through combustor;

b. supplying electrical energy to the igniter to heat the igniter in the presence of the high volume air flow to ignite the air/fuel mixture;

c. detecting optically at least a portion of electromagnetic energy emitted by the heated igniter;




d. converting the detected electromagnetic energy to a signal that represents temperature of the igniter; and

e. regulating electrical energy to the igniter in response to said signal to maintain the igniter substantially at a predetermined temperature through ignition of the air/fuel mixture.

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**5,499,498**

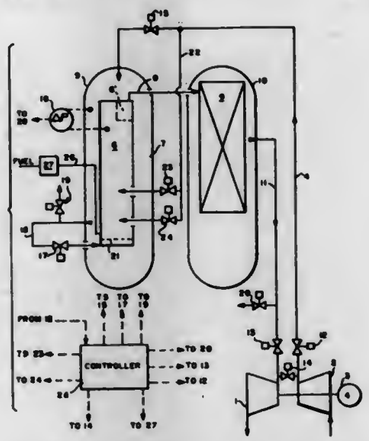
**PRESSURIZED FLUIDIZED BED REACTOR**

**Juhani Isakseon, Karhula, Finland, assignor to Foster Wheeler Energia Oy, Karhula, Finland**

**Division of Ser. No. 200,327, Feb. 23, 1994. This application Apr. 13, 1995, Ser. No. 421,312**

**Int. Cl.[6] F02C *3/28***

**U.S. Cl. 60—39.12** **10 Claims**




1. A pressurized fluidized bed power plant, comprising:

a pressure vessel;

a fluidized bed reactor contained within said pressure vessel with a pressurized gas volume defined between said reactor and said pressure vessel;

a first conduit for supplying primary gas from the gas volume to said reactor;

a second conduit;

a compressor for supplying gas at a pressure above atmospheric pressure to the gas volume through said second conduit;

a hot gas discharge from said reactor, including a portion which passes through said pressure vessel;

means for separating particles from said hot gas discharge;

a turbine operatively connected to said hot gas discharge;

a first automatically controlled valve disposed in said first conduit for allowing or preventing the supply of primary gas from the gas volume to said reactor; and

a second automatically controlled valve disposed in said second conduit for allowing or preventing the passage of gas at superatmospheric pressure from said compressor to the gas volume.



**5,499,499**

**CLADDED COMBUSTION CHAMBER CONSTRUCTION**

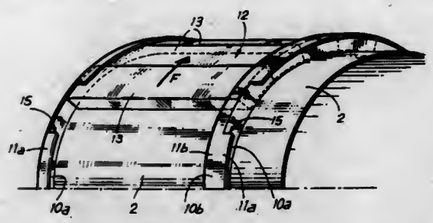
**Christine J. M. Ambrogi, Courcouronnes; Denis R. H. Ansart, Bois Le Roi; Eric J. S. Lancelot, Melun, and Serge M. Meunier, Le Chatelet En Brie, all of, France, assignors to Societe Nationale D'Etude et de Construction de Moteurs D'Aviation, Paris, France**

**Filed Sep. 30, 1994, Ser. No. 316,338**

**Claims priority, application France, Jan. 6, 1993, 93 11897**

**Int. Cl.[6] F23R *3/60***

**U.S. Cl. 60—39.32** **11 Claims**



1. A cladded combustion chamber for a turbojet engine, the chamber having a longitudinal axis with a generally cylindrical wall extending about the longitudinal axis, with an external surface and an internal surface bounding the combustion chamber, comprising:

a) a plurality of cladding tiles each having a length extending in the direction of the longitudinal axis; a width extending transversely thereto and a thickness extending in a radical direction, the tiles being located on one of the external and internal surfaces of the wall; and

b) attachment means to attacb the plurality of cladding tiles to the wall, the attachment means comprising:

i) a plurality of first members axially spaced apart long the longitudinal axis attached to and extending from the wall in a generally radial direction with respect to the longitudinal axis;

ii) a second member in the configuration of an annular strip extending generally transversely from each of the first members in a direction generally parallel to the surfaces of the wall and spaced from the adjacent wall a distance greater than the thickness of the tiles; and

iii) a circumferentially extending cut out defined by one of the second members, the cut out having a dimension in the circumferential direction greater than widths of the cladding tiles, such that a portion of the cladding tiles can be passed through the cut out and the cladding tiles retained against the wall by the second member after being moved in a circumferential direction out of alignment with the cut out.

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**5,499,500**

**ENGINE AIR/FUEL CONTROL SYSTEM WITH CATALYTIC CONVERTER AND EXHAUST GAS OXYGEN SENSOR MONITORING**

**Douglas R. Hamburg, Bloomfield, and Eleftherios M. Logothetis, Birmingham, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.**

**Filed Dec. 19, 1994, Ser. No. 358,509**

**Int. Cl.[6] F01N *3/20***

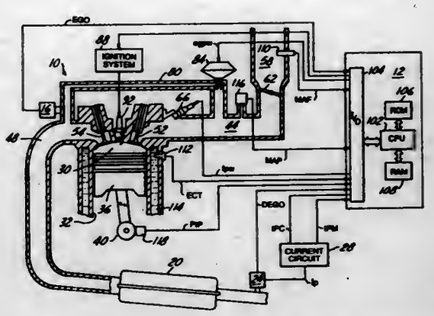
**U.S. Cl. 60—274** **15 Claims**

1. A method for controlling engine air/fuel ratio and concurrently monitoring efficiency of a catalytic converter coupled to the engine exhaust, comprising the steps of:

adjusting fuel delivered to the engine to maintain engine/air fuel ratio at a desired air/fuel ratio;

pumping current at a gradually increasing amplitude into an electrode of an exhaust gas oxygen sensor having a non-catalytic electrode positioned in the engine exhaust downstream of the converter until an output of said exhaust gas oxygen sensor changes output states; and

providing an indication of converter efficiency in relation to said pumping current amplitude occurring at said change in exhaust gas oxygen sensor output states.




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**5,499,501**

**ENGINE EXHAUST EMISSION CONTROL SYSTEM**

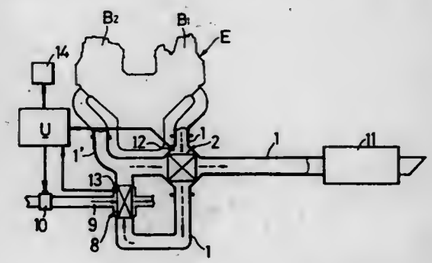
**Hiroaki Kato; Yuichi Shimasaki; Akihisa Saito; Takashi Komatsuda; Toshikazu Oketani; Seiji Haccho; Seiji Matsumoto; Takuya Aoki, and Yukio Miyashita, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Nov. 18, 1994, Ser. No. 341,175**

**Claims priority, application Japan, Nov. 19, 1993, 5-290534**

**Int. Cl.[6] F01N *3/28***

**U.S. Cl. 60—286** **5 Claims**




1. An engine exhaust emission control system comprising:

(a) a ternary catalyst means having first and second passages, said first and second passages being laminated with respect to one another thereby enabling heat exchange between the exhaust gas flowing in said first and second passages, wherein the first and second passages are separate from each other such that there is no intermixing of the flow through said first and second passages;

(b) a hydrocarbon adsorber coupled to said first and second passages, wherein exhaust gas flows from said first passages into said adsorber and exhaust gas flows from said adsorber into said second passages;

(c) cooling means for cooling said hydrocarbon adsorber; and

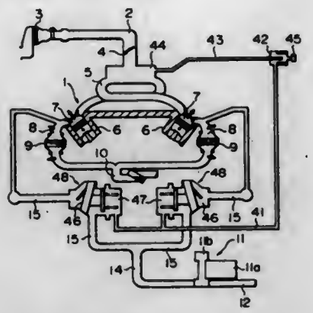
(d) exhaust passageway means for coupling said first passages to said adsorber and for coupling said adsorber to said second passages.

5,499,502

## SECONDARY AIR SUPPLYING SYSTEM HAVING A MOTOR-DRIVEN AIR PUMP

Yukio Haniu, Chita; Shinji Ishida, Chiryu, and Michio Koshimizu, Toyohashi, all of, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 22, 1995, Ser. No. 408,708
Claims priority, application Japan, Nov. 2, 1994, 6-269598
Int. Cl.[6] F01N 3/22
U.S. Cl. 60—290 19 Claims



1. A secondary air supplying system comprising:
an engine exhaust gas passage having a catalyst therein for purifying exhaust gas from an engine;
a secondary air passage connected to a portion of said exhaust gas passage upstream of said catalyst;
circulating means, including a motor-driven air pump, for forcibly supplying secondary air through said secondary air passage to said exhaust gas passage when the engine is starting to expedite warming-up of said catalyst, and for passively allowing the secondary air to pass therethrough after being warmed up when the engine runs and said motor-driven air pump is not energized; and
a check valve, disposed at a position downstream from said air pump and having a reed member responsive to a pulsating change in exhaust gas pressure, for passing therethrough the secondary air.

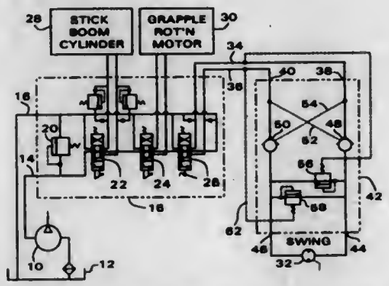
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5,499,503

## HYDRAULIC SWING CIRCUIT

Terry A. Stoychoff, Garner, Iowa, assignor to Iowa Mold Tooling Company, Inc., Garner, Iowa

Filed Sep. 22, 1994, Ser. No. 310,568
Int. Cl.[6] F16D 31/02; F15B 11/08
U.S. Cl. 60—469 5 Claims




1. In a hydraulic system including a swing circuit having a hydraulic motor which, when under an aiding load, may function as a pump; a source of hydraulic fluid under pressure; a control valve interconnected between said source and said hydraulic motor; the combination of:
a pair of hydraulic conduits extending from the control valve to said hydraulic motor;
a pair of pilot operated relief valves connected oppositely across said conduits; and
a pair of pilot operated check valves, one in each of said conduits at a location between said control valve and said relief valves, each said check valve being oriented in the associated conduit to allow flow from said control valve for said swing circuit toward said hydraulic motor, but not the reverse, except when receiving a pilot signal;
the pilots of said relief valves being connected to the conduit whose pressure is relieved by the associated relief valve at a location between said relief valves and said control valve; and
the pilot of each said check valve being connected to the conduit in which the other check valve is located at a location between said check valves and said control valve.

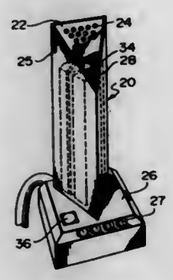
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5,499,504

## DESK MOUNTED PERSONAL ENVIRONMENT SYSTEM

Peter D. Mill, Ottawa, and Richard Tice, Halifax, both of, Canada, assignors to Scots Pine Enterprises Ltd., c/o Perly-Robertson Panet, Hill & McDougall, Ottawa, Canada

PCT No. PCT/CA92/00121, § 371 Date Sep. 20, 1993, § 102(e) Date Sep. 20, 1993, PCT Pub. No. WO92/16799, PCT Pub. Date Oct. 1, 1992
PCT Filed Mar. 19, 1992, Ser. No. 119,123
Claims priority, application Canada, Mar. 19, 1991, 2038563; Nov. 8, 1991, 2055162
Int. Cl.[6] F25B 21/02
U.S. Cl. 62—3.3 11 Claims



1. A personal environment system for creating a user-definable local environment within a localized zone in an ambient space, comprising:
a modular housing comprising an upright desk mountable, triangular prismatic body with an inclined truncated top, said housing being mountable in said localized zone and having an air inlet, an air outlet incorporating a diffuser for distributing conditioned air into said localized zone, said air outlet being defined by said truncated top, an air flow channel between said air inlet and said air outlet, and a channel for a thermal fluid for supplying heat from or carrying away heat to a common space outside said localized zone;
blower means for causing air to flow through said air channel;
a heat exchanger between said air flow channel and said thermal fluid channel and including a thermoelectric heat pump to effect transfer of heat between air flowing through said air flow channel and said thermal fluid channel;
and user-controlled means for setting the amount of heating or cooling applied by said heat pump to air flowing through said air channel to permit the user to control the air temperature within the localized zone according to personal comfort requirements independently of the general air temp mature of the ambient space.

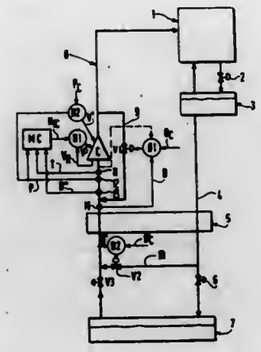


5,499,505

## HELIUM REFRIGERATOR WITH COMPRESSOR DRIVE CONTROL

Guy Gistau-Baguer, Biviers, France, assignor to L'Air Liquide Societe Anoneyme Pour L'Etude et L'Exploitation des Procedes Georges Claude, Paris, France

Filed Jul. 7, 1994, Ser. No. 271,178
Claims priority, application France, Jul. 23, 1993, 93 09092
Int. Cl.[6] F25J 1/00
U.S. Cl. 62—9 8 Claims



1. In a refrigeration apparatus comprising a container for containing a biphasic fluid at low pressure and low temperature and in fluid communication with a feeding line and with a return line including at least one rotating compressor for compressing gas extracted from the container, the improvement comprising a first fluid flow sensing means for sensing the flow rate of the gas into the return line upstream of the compressor and for generating a first flow signal, and at least a first speed control means responsive to the first flow signal for controlling the rotational speed of the compressor dependent upon the flow rate of gas in the return line.

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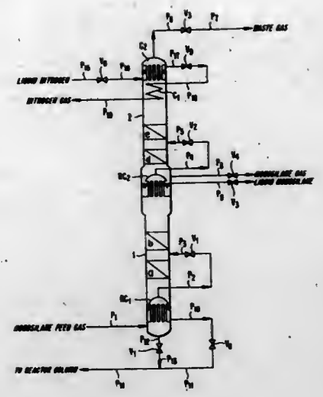
5,499,506

## ULTRA-HIGH PURITY MONOSILANE PRODUCING PROCESS AND UNIT

Takashi Nagamura, and Shinji Tomita, both of Hyogo, Japan, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Expolitation des Procedes Georges Claude, France

Filed Nov. 16, 1994, Ser. No. 256,970
Claims priority, application Japan, Dec. 1, 1992, 4-343536
Int. Cl.[6] F25J 3/00
U.S. Cl. 62—11 7 Claims

1. A process for producing ultra-high purity monosilane which comprises
introducing a monosilane feed gas containing a mixture of gaseous components into a lower portion of a rectification column having a lower portion and an upper portion;
indirectly cooling and liquefying monosilane contained in the feed gas by condensing the monosilane in the upper portion of the rectification column to thereby provide a monosilane reflux liquid;
rectifying the reflux liquid by contact with the feed gas so that the components other than the monosilane are separated from the feed gas and removed from the column; and
recovering ultra-high purity monosilane gas or liquid monosilane from the column.

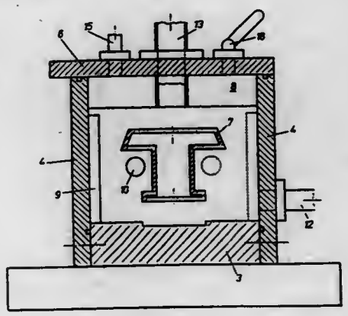


5,499,507

## APPARATUS FOR COOLING PLASTIC PROFILES

Frank P. Dorninger, Micheldorf, Austria, assignor to Technoplast Kunststofftechnik Gesellschaft m.b.H., Micheldorf, Austria

Filed Dec. 22, 1994, Ser. No. 362,764
Claims priority, application Austria, Dec. 23, 1993, 2616/93
Int. Cl.[6] F25D 13/06
U.S. Cl. 62—63 12 Claims



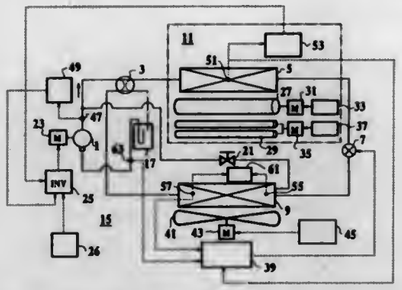
1. An apparatus for cooling plastic profiles, comprising:
a trough for receiving a cooling medium through which the profile can be guided;
at least one inflow opening for delivering said cooling medium into said trough;
at least one outflow opening for moving said cooling medium out of said trough;
several guiding means arranged in said trough as separating walls which subdivide the trough into several sections in the longitudinal direction of the profile with first openings for calibrating the profile, and with further openings for producing a turbulent flow of the cooling medium circulating between said inflow opening and said outflow opening.

**5,499,508**

## AIR CONDITIONER

**Yasuhiro Arai, Kanagawa; Tetsuo Sano, Shizuoka; Tetsuji Yamashita, Kanagawa; Takaki Iwanaga, Tokyo, and Koichi Goto, Kanagawa, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan**

**Filed Mar. 30, 1994, Ser. No. 220,092**
**Claims priority, application Japan, Mar. 30, 1993, 5-072193**
**Int. Cl.[6] F25B *1/00***
**U.S. Cl. 62—114** **15 Claims**



1. An air conditioner, comprising:
(a) a refrigerating cycle including a compressor, an outdoor heat exchanger, an indoor heat exchanger, a throttle mechanism, and coolant piping connecting these components to one another;
(b) a non-azeotropic mixture of high and low boiling coolants sealed in said refrigerating cycle; and
(c) a control means for changing basic operation parameters on operation conditions that cause a change in a ratio between the high and low boiling coolants of the coolant mixture according to a change in an opening of said throttle mechanism.

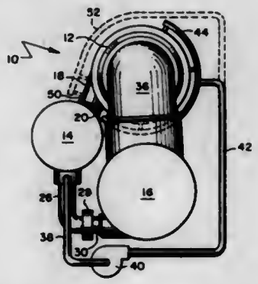
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**5,499,509**

## NOISE CONTROL IN A CENTRIFUGAL CHILLER

**Robert G. Harold, West Salem, and John W. Leary, Onalaska, both of Wis., assignors to American Standard Inc., Piscataway, N.J.**

**Filed Aug. 16, 1994, Ser. No. 291,264**
**Int. Cl.[6] F25B *5/00;31/00***
**U.S. Cl. 62—117** **10 Claims**



1. A centrifugal chiller comprising:
a centrifugal refrigerant gas compressor, said compressor including a volute portion, said volute portion defining a passage downstream of the occurrence of the compression process in said compressor through which gas is discharged therefrom;
a condenser in flow communication with said volute portion of said compressor;
an evaporator in flow communication with said condenser and said compressor;
a device for metering refrigerant from said condenser to said evaporator; and
a pump, said pump pumping liquid refrigerant from said condenser to a location in or downstream of said passage defined by said volute portion but upstream of the location in said condenser where refrigerant received from said compressor condenses so as to bring said liquid refrigerant into contact with gas compressed in said compressor.

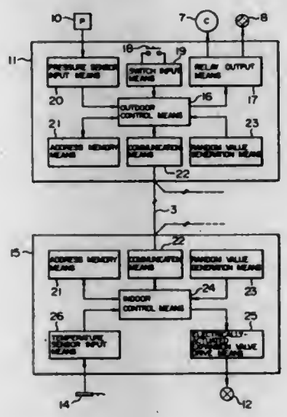
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**5,499,510**

## MULTIPLE TYPE AIR CONDITIONER SYSTEM AND ADDRESS SETTING METHOD THEREOF

**Satoru Yoshida, Shimizu; Keiji Sato, Shizuoka; Masamichi Mochizuki, Fujinomiya; Masashi Watanabe, Shimizu, and Takashi Kato, Fujieda, all of, Japan, assignors to Hitachi, Ltd., and Hitachi Shimizu, Japan**

**Filed Sep. 16, 1994, Ser. No. 308,106**
**Claims priority, application Japan, Sep. 20, 1993, 5-232795**
**Int. Cl.[6] F25B *49/02***
**U.S. Cl. 62—175** **9 Claims**



1. An air conditioner system comprising a plurality of outdoor units each having a compressor, an outdoor heat exchanger and a 4-way valve and a plurality of indoor units having an expansion means and an indoor heat exchanger, said plurality of outdoor units are serially connected to said plurality of indoor units through a communication line, each of said outdoor units has an outdoor controller, each of said indoor units has an indoor controller, said outdoor controller includes communication means, outdoor control means for performing transmission and reception of a message to and from the other outdoor and indoor units through said communication means, random value generation means for generating a random address under a command of said outdoor control means, and address control means for storing therein said random address, said outdoor controller includes second communication means, indoor control means for performing transmission and reception of a second message to and from the other outdoor units through said communication means, second random value generation means for generating second random address under a command of said indoor control means, and second address control means for storing therein said second random address.



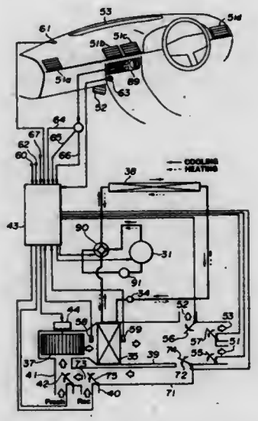
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**5,499,511**

## HEAT PUMP TYPE AIR CONDITIONER FOR VEHICLE

**Junichiro Hara, Yokohama, and Takayoshi Matsuoka, Tokyo, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan**

**Filed Apr. 18, 1995, Ser. No. 423,847**
**Claims priority, application Japan, Apr. 19, 1994, 6-080626**
**Int. Cl.[6] F25D *17/00***
**U.S. Cl. 62—180** **22 Claims**



1. A heat pump type air conditioner for a vehicle, comprising:
refrigerant;
a compressor applying a workload to said refrigerant;
a compressor commanding means for commanding said compressor to set a correlation amount of a refrigerant discharge amount according to a vehicle passenger's operation;
an air-flow making means for making a flow of conditioned air to be supplied to a passenger compartment;
a flow-rate commanding means for commanding said air-flow making means to set a flow rate of the flow of the conditioned air according to the vehicle passenger's operation;
a thermal control means for thermally controlling the conditioned-air, said thermal controlling means including a refrigeration cycle where said refrigerant is circulated by the operation of said compressor;
a thermal-control commanding means for commanding said thermal control means to be set at a thermal operating condition according to the vehicle passenger's operation;
a changing-speed setting means for setting a changing-speed of a correlation amount of a refrigerant discharge amount from said compressor according to a presence of a command from at least one of said compressor commanding means, said flow-rate commanding means and said thermal-control commanding means; and
a control means for controlling said compressor, said air-flow making means and said thermal control means according to the command from said compressor commanding means, said flow rate commanding means and said thermal-control means, said control means controlling said compressor so that the correlation amount of the refrigerant discharge amount is changed at the changing-speed set by said changing-speed setting means.

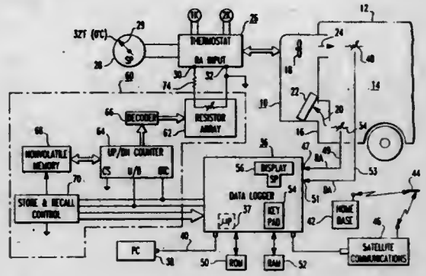
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**5,499,512**

## METHODS AND APPARATUS FOR CONVERTING A MANUALLY OPERABLE REFRIGERATION UNIT TO REMOTE OPERATION

**Romuald M. Jurewicz, St. Louis Park; Albert C. K. Wong, Golden Valley, and Verlon J. Wirth, Apple Valley, all of Minn., assignors to Thermo King Corporation, Minneapolis, Minn.**

**Continuation of Ser. No. 239,492, May 9, 1994, abandoned.**
**This application Apr. 14, 1995, Ser. No. 422,690**
**Int. Cl.[6] G05D *23/00***
**U.S. Cl. 62—229** **7 Claims**



1. A method of converting a refrigeration unit to remote control using a data logger which is remotely operable, with the refrigeration unit having a thermostat having a temperature input connected to a temperature sensor responsive to the temperature of a space conditioned by the refrigeration unit, and set point selector means for selecting a set point temperature for the conditioned space, comprising the steps of:
fixing the set point selector means at a predetermined temperature,
disconnecting the temperature sensor from the temperature input of the thermostat,
connecting a temperature sensor responsive to the temperature of the conditioned space to a temperature input of the data logger,
selecting a set point temperature for the conditioned space via the data logger,
determining an operating mode required to hold the selected set point temperature,
and providing a signal for the temperature input of the thermostat which forces the thermostat to implement the required operating mode.

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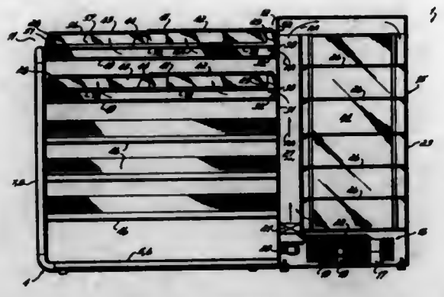
**5,499,513**

## REFRIGERATED SHELF MERCHANDISER

**Rafael T. Bustos, Alpharetta, Ga., assignor to L&P Property Management Company, Chicago, Ill.**

**Division of Ser. No. 184,968, Jan. 19, 1994, abandoned, which is a division of Ser. No. 93,309, Jul. 16, 1993, Pat. No. 5,301,517, which is a continuation of Ser. No. 891,653, May 29, 1992, abandoned. This application Mar. 3, 1995, Ser. No. 398,453**
**Int. Cl.[6] A47F *3/04***
**U.S. Cl. 62—252** **4 Claims**

1. A food merchandiser for merchandising refrigerated food products comprising:
a floor-supported support structure having two ends;
a plurality of openable and closable refrigerated merchandising shelves for supporting product and permitting access thereto when opened and for containing refrigerated air and preventing escape thereof when closed spanning between said ends of said support structure;
means for refrigerating product located on said at least one refrigerated merchandising shelf;



said all of refrigerated merchandising shelves each being individually supplied with refrigerated air from said refrigerating means;

said refrigerating means being a component of a separate floor-supported beverage merchandiser placed adjacent said food merchandiser in an end-to-end relationship.

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**5,499,514**

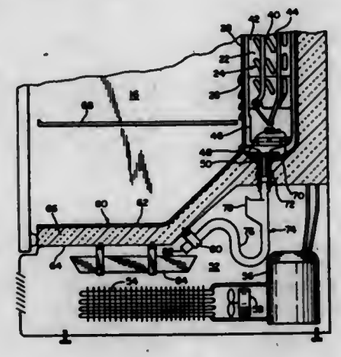
**DEFROST WATER DRAIN SYSTEM FOR A REFRIGERATOR**

**Robert K. Ho, Evansville, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.**

**Filed Sep. 15, 1994, Ser. No. 306,298**

**Int. Cl.[6] F25D *21/14***

**U.S. Cl. 62—291** **9 Claims**



7. A refrigerator having a defrostable evaporator within a food storage compartment, a drain system for disposing of the defrost water dripping from the evaporator, said drain system comprising:

a drain tube positioned below said evaporator for receiving said defrost water, said drain tube including:

a drain trap portion for collecting said defrost water thereby blocking air flow through said drain tube, and

a vent disposed on said drain tube upstream of said drain trap portion, said vent having a valve for allowing air flow into said drain tube for equalizing the air pressure in said food storage compartment with the ambient air pressure but preventing air flow out of said drain tube; and

an evaporator pan mounted below said food storage compartment for receiving said defrost water from said drain tube.

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**5,499,515**

**ROTARY VANE-TYPE COMPRESSOR**

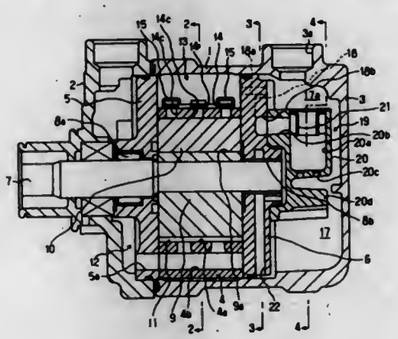
**Chuichi Kawamura; Ichiro Kasugai; Mitsuru Hashimoto, and Masahiro Ida, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan**

**Filed Jun. 21, 1994, Ser. No. 263,032**

**Claims priority, application Japan, Jun. 23, 1993, 5-152487**

**Int. Cl.[6] F04C *18/344;29/02***

**U.S. Cl. 62—470** **15 Claims**



1. A rotary compressor of the vane-type adapted for use in an air conditioning system comprising:

housing means;

a cylinder block accommodated in said housing means;

a drive shaft rotatably supported in said housing means and extending through said cylinder block;

a rotor fixed on said drive shaft for rotation therewith and disposed in said cylinder block, said rotor having formed therein a plurality of substantially radially extending slots;

a pair of front and rear side plates disposed in said housing means so as to close the axial ends of said cylinder block;

a plurality of vanes slidably received in said slots and cooperating with said cylinder block, said rotor and said front and rear side plate to form a plurality of compression chambers;

a discharge chamber formed between said housing means and said cylinder block for receiving refrigerant gas compressed in said compression chambers and discharged therefrom;

an oil separator compartment formed by said housing means and said rear side plate, having therein an oil separator fixed to said rear side plate in contact therewith for separating from said refrigerant at least part of an lubricating oil contained in the refrigerant, and providing at the bottom thereof an oil reservoir;

discharge passage means providing communication between said discharge chamber and said oil separator compartment;

a delivery port formed through said housing means for allowing the refrigerant to flow out therethrough to be discharged from the compressor;

said discharge passage means including a restricted passage portion whose transverse cross sectional area is smaller than that of said delivery port, and part of said discharge passage means being disposed in the area of said contact between said rear side plate and said oil separator.



**5,499,516**

**ABSORBER FOR AN ABSORPTION REFRIGERATING APPARATUS**

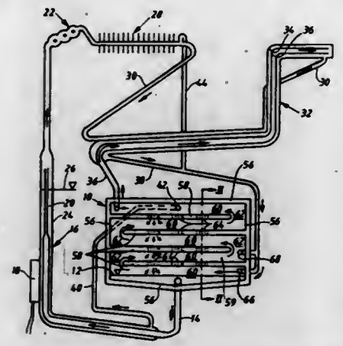
**Sven-Erik Andersson, Trosa, and Johnny S. Kornelind, Tyresö, both of, Sweden, assignors to Aktiebolaget Electrolux, Stockholm, Sweden**

**Filed Apr. 28, 1994, Ser. No. 234,286**

**Claims priority, application Sweden, May 14, 1993, 9301671-5**

**Int. Cl.[6] F25B *37/00;* F28D *7/02***

**U.S. Cl. 62—494** **5 Claims**



1. Absorber for an absorption refrigerating apparatus, said absorber (**10**) comprising an inlet (**42**) for a liquid, the liquid flowing downwards through the absorber and absorbing a refrigerant which in gaseous form flows through the absorber, and two joined plates (**52** and **54**, respectively) which between themselves form a plurality of substantially horizontal ducts (**60**), arranged above each other, for the refrigerant, wherein the plates on the inside of the absorber are treated in a way which promotes that the inside is wetted by the liquid and the bottom of the ducts have small openings (**64**, **72**, **74**), through which the liquid leaks down into the roof of a duct located below and moves downwards along its roof and walls, and said openings are sized such that the liquid substantially blocks passage of the refrigerant through said openings.

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**5,499,517**

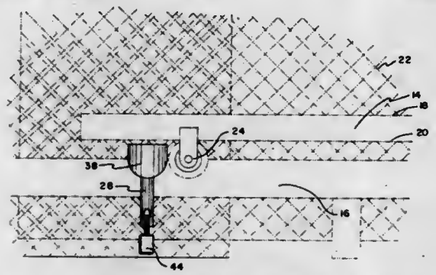
**ROLLING GATE STOPPING AND LOCKING SYSTEM**

**Scottland D. McCraw, 1580 Southgate Ave. #215, Daly City, Calif. 94015-2232**

**Filed Nov. 15, 1994, Ser. No. 339,793**

**Int. Cl.[6] E05B *65/08***

**U.S. Cl. 70—95** **4 Claims**



2. A new and improved rolling gate stopping and locking system for locking a rolling gate in place without being able to be cut by bolt cutters comprising, in combination:

a rolling gate;

a steel pole having a first end, a second end, and an intermediate extent therebetween, the steel pole having an aperture drilled therethrough upwardly of the first end, the steel pole positionable within an aperture drilled through a stationary portion of a rolling gate;

a rubber head having a flat upper surface and a contoured lower surface, the rubber head secured to the second end of the steel pole, the second end of the steel pole extending upwardly through the contoured lower surface, the contoured lower surface corresponding with the stationary portion of the rolling gate to prevent the rolling gate from advancing thereby opening the rolling gate;

a padlock securable to the aperture drilled through the steel pole, the padlock serving to lock the steel pole to the rolling gate.

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**5,499,518**

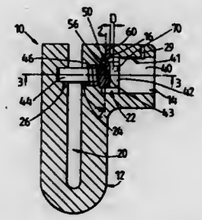
**MULTISTEPPED DISK BRAKE LOCK FOR MOTORCYCLE**

**Jin-Ren Shieh, No. 178, Shih Chia Rd., Taichung, Taiwan**

**Filed Jul. 12, 1995, Ser. No. 501,663**

**Int. Cl.[6] E05B *67/36***

**U.S. Cl. 70—233** **8 Claims**



1. A motorcycle disk brake lock comprising:

a main body provided with a slot, a receiving space, and a through hole located between said slot and said receiving space;

a locking member disposed in said receiving space and provided with a press portion movable back and forth in said through hole, said locking member further provided with a locating rod movable along with said press portion;

a first stopping portion located on said locking member such that said first stopping portion can be driven by said locking member to move back and forth along a predetermined direction; and

a second stopping portion located on an inner edge of said receiving space such that said second stopping portion can be caused to make contact with said first stopping portion so as to prevent said locking member from being driven forcibly to move toward the outside of said receiving space;

wherein said receiving space is provided on said inner edge thereof with a third stopping portion which is separated from said second stopping portion by a predetermined distance parallel to a direction in which said first stopping portion is caused to move back and forth, said third stopping portion capable of cooperating with said first stopping portion to prevent said locking member from being driven forcibly to move toward the outside of said receiving space.

**5,499,519**

## DEVICE FOR SHOT-BLASTING SURFACES INACCESSIBLE BY A STRAIGHT PIPE

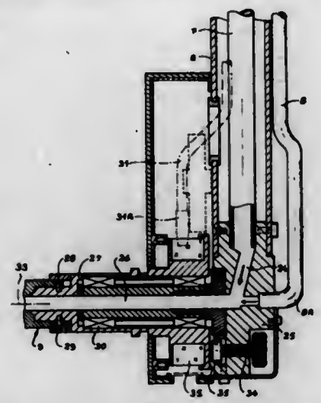
**Régis G. Brunier, Ceray; Dominique J. Cotte, Vlry Chatillon; Richard G. A. Joly, Ris Orangis; Stéphane M. Kernels, Velizy, and Michel F. F. Silvestrelli, Bondoufle, all of, France, assignors to Societe Nationale d'Etude et de Construction de Moteures d'Aviation "SNECMA", Paris, France**

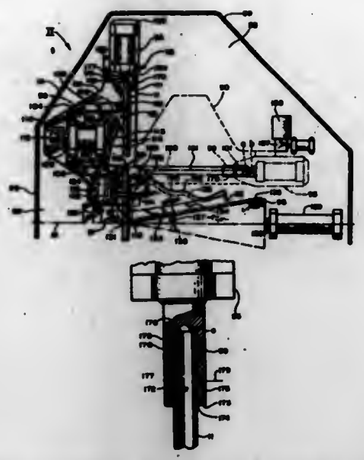
**Filed Dec. 21, 1994, Ser. No. 360,290**

**Claims priority, application France, Dec. 22, 1993, 93 15390**

**Int. Cl.[6] B24C *1/00***

**U.S. Cl. 72—53** **9 Claims**





1. A shot projection apparatus using shot for shot-blasting under pressure surfaces inaccessible by a straight pipe and requiring the shot to change direction to shot-blast the surfaces, comprising:

a shot feed pipe;

propulsion means fixed to an outlet of the shot feed pipe for providing high pressure compressed air;

a shot-blasting pipe to direct the shot under pressure of said propulsion means to surfaces to be shot-blasted, said shot-blasting pipe being rectilinear and fixed to the propulsion means;

a projection nozzle placed at an end of the shot-blasting pipe where the shot projects from the shot-blasting pipe;

said propulsion means including first and second high pressure compressed air pipes entering into an elbow at a first end and receiving the shot feed pipe at a second end, a sudden change of direction for the shot flow taking place in the elbow so that propulsion energy from the high pressure compressed air is transferred only to the shot at the projection nozzle; and

a sleeve and bayonet fixing device for lockably attaching the shot-blasting pipe to an outlet of the propulsion means such that the shot-blasting pipe can be disengaged from the propulsion means.

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**5,499,520**

## APPARATUS FOR FORMING A TUBULAR FRAME MEMBER

**Ralph E. Roper, Indianapolis, Ind., assignor to Aquaform Inc.**

**Division of Ser. No. 77,616, Aug. 23, 1993, Pat. No. 5,353,618, which is a continuation-in-part of Ser. No. 398,272, Aug. 24, 1989, abandoned. This application Jun. 21, 1994, Ser. No. 263,325**

**Int. Cl.[6] B21D *9/15;26/02;15/03***

**U.S. Cl. 72—58** **7 Claims**

1. In an apparatus for forming a complex-shaped frame member from a cylindrical tube blank having first and second opposite ends, a device for pressurizing the interior of the blank, comprising:

a base;

a first tool mounted to said base, said tool defining an axial bore having an open end and an o-ring mounted inwardly from the open end, said tool further defining a port inwardly from the o-ring;

end sealing means for sealing off one end of a tube blank;

supporting means mounted to said base for supporting a blank;

tool moving means for moving said tool between a retracted position away from a blank supported by said supporting means and an extended, engaging position whereby a first end of a blank supported by said supporting means is telescopically received within the bore of said tool, whereby the o-ring forms a circumferential seal between the tool and the first end and wherein, with the second end of the blank sealed by said sealing means, movement of said tool from said retracted position to said extended position, pressurizes the interior of the blank; and,

pressure relief means connected to said port for relieving pressure within the blank above a predetermined value.

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**5,499,521**

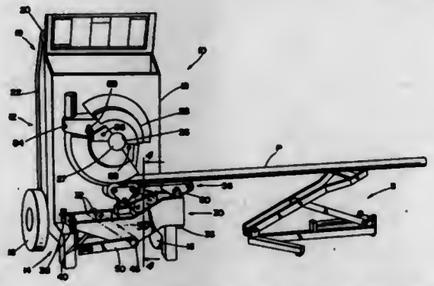
## TUBE BENDER APPARATUS

**Myron E. Luikart, Chagrin Falls; Edward A. Pezak, Solon; Howard C. B. Kuhns, Aurora, and Steven J. Volcansek, Garfield Heights, all of Ohio, assignors to Crawford Fitting Company, Solon, Ohio**

**Filed Mar. 8, 1994, Ser. No. 207,913**

**Int. Cl.[6] B21D *7/04;7/02***

**U.S. Cl. 72—157** **8 Claims**



1. Apparatus for bending tube, pipe, and conduit comprising:

a generally circular bending shoe mounted for rotation about a first axis and having a plurality of semi-circular concave grooves in the outer surface thereof, the grooves being of differing sizes and located in side-by-side axial spaced planes perpendicular to the first axis;

a separate pair of rollers for cooperation with each separate concave groove, each pair of rollers including a first roller and a second roller having concave exterior grooves and mounted on a bracket for independent rotary movement about separate second and third axes;

a support arm joined to said bracket for permitting tilting movement of the bracket relative to the support arm about a fourth axis parallel to the second and third axes; and,

a frame assembly for carrying the support arms to position the cooperating roller pairs adjacent the associated groove of the bending shoe, the frame assembly including means for permitting rapid telescopic insertion and removal of the support arms from the frame assembly for selective use of separate ones of the plurality of grooves in the outer surface of the bending shoe.



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**5,499,522**

## DOUBLE-HEAD PIPE BENDING MACHINE

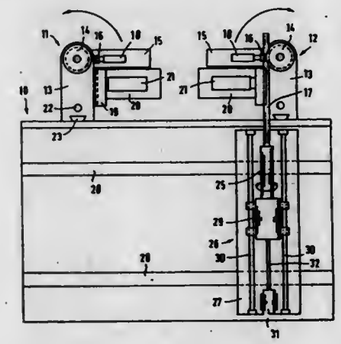
**Rigobert Schwarze, Olpener Str. 462, 51109 Koeln, Germany**

**Filed Aug. 19, 1994, Ser. No. 292,194**

**Claims priority, application Germany, Jan. 21, 1993, 43 35 901**

**Int. Cl.[6] B21D *7/024***

**U.S. Cl. 72—157** **7 Claims**



1. A double-head pipe bending machine comprising a machine frame (**10**) supporting two cantilever-like bending heads (**11, 12**) each of which comprises a supporting member (**13**) carrying a rotatable bending template (**14**) and a pivot arm (**15**) with a clamping jaw (**16**) cooperating with each bending template (**14**), a single pipe holding device (**25**) on the machine frame (**10**), a longitudinal axis of said single pipe holding device (**25**) transversely passes a plane in which axes of the bending templates (**14**) are located, the pipe holding device (**25**) is supported on a transverse slide (**27**) transversely displaceable relative to said longitudinal axis for cooperating with either one of the bending heads (**11, 12**), and means (**23**) for effecting controlled vertical displacement of each supporting member (**13**) between an operative pipe bending position and at least one other position at which at least one of said bending heads (**11, 12**) is below its operative pipe bending position so that the pipe holding device (**25**) can slide transversely along said transverse slide (**27**) absent interference from said at least one bending head.

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**5,499,523**

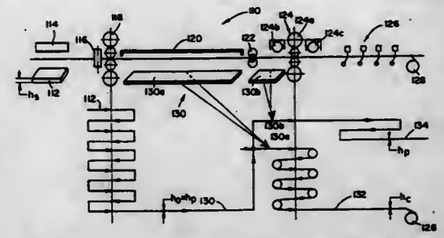
## METHOD FOR PRODUCING METAL STRIPS HAVING DIFFERENT THICKNESSES FROM A SINGLE SLAB

**Vladimir B. Ginzburg, Pittsburgh, Pa., assignor to Danieli United, Inc., and International Rolling Mill Consultants, Inc., both of Pittsburgh, Pa.**

**Continuation-in-part of Ser. No. 139,389, Oct. 19, 1993. This application Jan. 14, 1994, Ser. No. 183,085**

**Int. Cl.[6] B21B *1/32***

**U.S. Cl. 72—203** **10 Claims**



1. A method for producing metal strips having different thicknesses from a single slab of metal having a thickness greater than that of the strips comprising the steps of

(a) rolling the slab in a first rolling stand to reduce the slab thickness to produce a transfer bar having a first thickness;

(b) shearing the transfer bar into first and second transfer bar portions;

(c) rolling the first transfer bar portion in a second rolling stand to reduce the first transfer bar portion to a first strip having a second thickness different from the first thickness; and

(d) passing the second transfer bar portion through the second rolling stand without reducing the thickness of the second transfer bar portion.

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**5,499,524**

## WHEEL REPAIR STAND

**Aaron Len, 25A Viljoen Street, Rouxville, Johannesburg, South Africa**

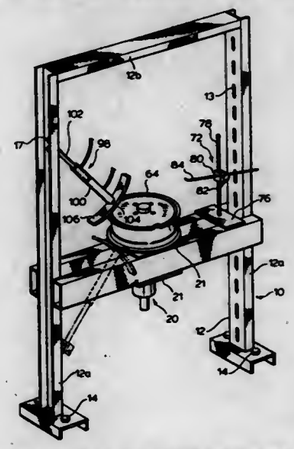
**Filed Jun. 16, 1994, Ser. No. 261,345**

**Claims priority, application United Kingdom, Dec. 21, 1993, 9326068**

**Int. Cl.[6] B21D *3/14;* B21J *13/04***

**U.S. Cl. 72—420** **9 Claims**

1. A wheel repair stand comprising a pair of vertical frame members spaced apart from one another and each having a plural-



ity of discrete attachment points spaced from one another along said frame members, a support extending between said frame members and having a pair of beams laterally spaced from one another to provide an elongate slot extending between said frame members, a turntable mounted on said support between said frame members and including a shaft rotatable relative to said support about a vertical axis and a platform secured to said shaft to receive a wheel rim, said platform having a boss to engage said wheel rim and inhibit relative radial movement between said rim and said platform, said stand further including at least one attachment bracket selectively positionable at one of said attachment points and operable to support an extensible tool in applying a force between a selected position of said rim and said frame.

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**5,499,525**

## HYDRAULIC DRIVE FOR A SHEET METAL FORMING PRESS

**Rolf Kordak; Michael Reinert, both of Lohr, and Thassilo Maxeiner, Gemünden/Main, all of, Germany, assignors to Mannesmann Rexroth GmbH, Germany**

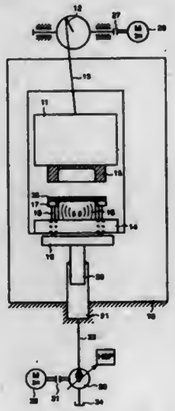
**PCT No. PCT/DE93/00275, § 371 Date May 20, 1994, § 102(e) Date May 20, 1994, PCT Pub. No. WO93/19866, PCT Pub. Date Oct. 14, 1993**

**PCT Filed Mar. 25, 1993, Ser. No. 142,490**

**Claims priority, application Germany, Mar. 27, 1992, 42 10 053.4; Jun. 10, 1992, 42 18 954.3**

**Int. Cl.[6] B21J *9/18***

**U.S. Cl. 72—453.03** **15 Claims**



1. A hydraulic drive for a press, said press comprising a press ram (11) which can be moved mechanically up and down, and a hydraulically movable counter support (17), said counter support being movable in a forward stroke in a direction towards the press ram (11) via at least one hydraulic cylinder (21, 101) by means of a first hydrostatic machine (30), and in a return stroke by said press ram (11), wherein said first hydrostatic machine (30) is designed as a pressure controlled axial piston machine of variable over center displacement and that the press ram (11) is mechanically coupled to a second hydrostatic machine (41, 51) which is speed controlled, said second hydrostatic machine being driven at least during a part of the return stroke of the counter support (17) as a hydraulic motor, indirectly by means of pressure medium displaced from said hydraulic cylinder (21).

**5,499,526**

## SEMICONDUCTOR SENSOR SELF-CHECKING CIRCUIT

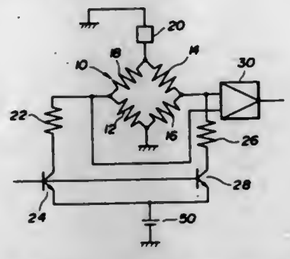
**Hideo Muro, Kanagawa, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan**

**Continuation of Ser. No. 959,622, Oct. 13, 1992, abandoned. This application Jan. 6, 1995, Ser. No. 369,284**

**Claims priority, application Japan, Jan. 14, 1991, 3-293685**

**Int. Cl.[6] G01L *1/20***

**U.S. Cl. 73—1 D** **4 Claims**




1. A self-checking circuit for use with a semiconductor sensor including a semiconductor substrate having a cantilever, and piezo resistors formed in said cantilever and connected in a bridge circuit having first and second output terminals, a first voltage source for supplying a predetermined driving voltage to drive said bridge circuit, and a differential amplifier connected to said first and second output terminals for producing an output signal corresponding to a stress produced in said cantilever, the self-checking circuit comprising:

a second voltage source;

a first resistor having a first resistance;

a second resistor having a second resistance to provide a difference between the first and second resistances;

first switching means responsive to a checking signal for connecting said first output terminal to said second voltage source through said first resistor;

second switching means responsive to said checking signal for connecting said second output terminal to said second voltage source through said second resistor, said second voltage source being connected to said first and second switching means for providing a predetermined control voltage to said first and second resistors via said first and second switching means, respectively; and

means for producing said checking signal to said first switching means and at the same time to said second switching means.

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**5,499,527**

## METHOD AND APPARATUS FOR TESTING A SPRING-LOADED SAFETY VALVE

**Edmund Kuehn, Erlangen; Tilo Sieber, Bannewitz, and Werner Butkereit, Weisendorf, all of, Germany, assignors to Siemens Aktiengesellschaft, Germany**

**Filed May 9, 1994, Ser. No. 239,725**

**Claims priority, application Germany, May 7, 1993, 43 15 281.3**

**Int. Cl.[6] G01L *27/00*; G01M *19/00*; F16K *37/00***

**U.S. Cl. 73—4 R** **2 Claims**

1. A method for testing a spring-loaded safety valve, which comprises:

ascertaining a closing pressure of a spring-loaded safety valve by selecting a pressure of a medium acting on a closing device of the safety valve to be less than an expected closing pressure;

lifting the closing device with a force originating at an auxiliary lifting device by acting upon a chamber below a lifting bell in the auxiliary lifting device with an auxiliary medium;

then closing the safety valve by diverting the auxiliary medium out of the chamber of the auxiliary lifting device being acted upon by the auxiliary medium and simultaneously passing a supply of auxiliary medium through the chamber and diverting the simultaneously passing supply of auxiliary medium;

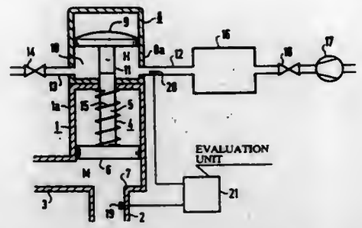
measuring pressures of the medium and of the auxiliary medium, before diversion from the chamber, as the safety valve is closing; and

determining the closing pressure from the measured pressures, from an effective area ratio of the lifting bell and a valve plate of the closing device, and from a constant, in accordance with the equation:

$$P_S = P_P + \frac{P_H \cdot V_A}{m+1}$$

wherein $P_S$ is the closing pressure of the safety valve, $P_P$ is the measured pressure of the medium acting upon the closing device in the closing process, $P_H$ is the measured pressure of the auxiliary medium acting upon the lifting bell in the closing process, $V_A$ is the ratio of the effective area of the lifting bell and the closing device, and m is a constant.






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**5,499,528**

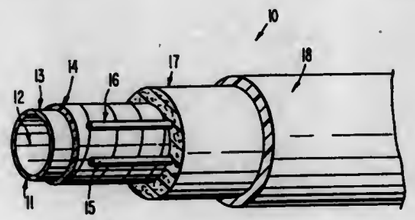
## APPARATUS FOR MEASURING HOT GAS CONTENT

**Bamdad Bahar, Baltimore, Md., assignor to W. L. Gore & Associates, Inc., Newark, Del.**

**Filed Sep. 26, 1994, Ser. No. 312,259**

**Int. Cl.[6] F16L *53/00*; H05B *3/06:3/58***

**U.S. Cl. 73—23.2** **4 Claims**




1. An apparatus for measuring content of stack gases comprising:

(a) a gas measuring device;

(b) a hose connected to said measuring device at one end and having an opposite end adapted to connect to a conduit for passing stack gases;

said hose comprising;

(I) a central polymer tube comprising polyether ether ketone;

(ii) a layer of polymer tape wrapped upon the outside surface of said central polymer tube;

(iii) means for heating said central polymer tube and a means for monitoring and controlling the means for heating the central polymer tube such that the means for heating, along with said means for monitoring and controlling is arranged on the layer of polymer tape and extends along the length of said central polymer tube;

(iv) a layer of thermal insulation surrounding the means for heating, along with said means for monitoring and controlling said heating means, applied onto said polymer tape; and

(v) a protective jacket surrounding said thermal insulation layer.

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**5,499,529**

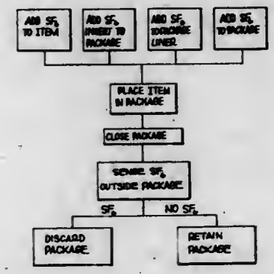
## DETECTING SMALL HOLES IN PACKAGES

**James W. Kronberg, and James R. Cadieux, both of Aiken, S.C., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Jun. 2, 1993, Ser. No. 70,196**

**Int. Cl.[6] G01M *3/20***

**U.S. Cl. 73—40.7** **21 Claims**




1. A method for detecting a hole in a material forming a package, said package containing an item, said method comprising the steps of:

adding a quantity of gas to said item, said gas selected to pass through said hole, but not said material from inside said package to outside said package;

placing said item into said package;

closing said package; and

sensing outside said package to detect said gas, whereupon, if said gas is detected outside said package, the existence of said hole in said package is confirmed.

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**5,499,530**

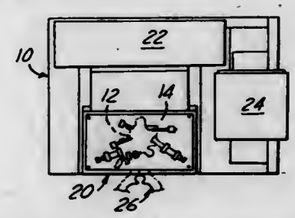
## PNEUMATIC TESTER FOR ENGINE OIL PUMPS

**Edward P. Vondell, Birmingham; Juliana Mobley, Waterford; Jospeh M. Nunez, Warren; Charles A. Maas, Troy; Donald Stuch, Canton, and Jinquan Yu, Warren, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.**

**Filed Oct. 3, 1994, Ser. No. 316,766**

**Int. Cl.[6] G01M *3/26;19/00*; F04B *51/00***

**U.S. Cl. 73—49.7** **5 Claims**




1. Apparatus for testing an engine oil pump having a generally planar surface, an inlet, and an outlet, comprising: table means defining a substantially horizontal surface for supporting the planar surface of the pump; means to selectively engage the pump and

exert a clamping force thereon for securing the pump upon the support table; a fitting for selectively mating with the pump inlet; source means for pressurized air connected to said pump to selectively induce an air flow in the pump; means for measuring air flows to and from the pump whereby characteristics of the flow are indicative of pump conditions.

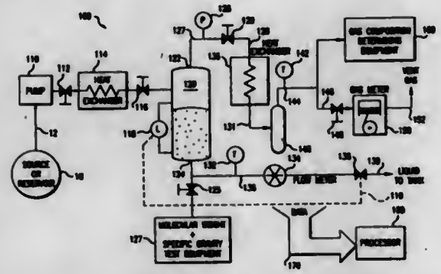
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5,499,531

## SYSTEM AND METHOD FOR DETERMINING VOLATILE CONSTITUENTS, VAPOR PRESSURE AND VAPOR EMISSIONS OF LIQUIDS

James K. Henderson, New Orleans, La., assignor to The Mitre Corporation, Bedford, Mass.

Filed Mar. 17, 1995, Ser. No. 404,482
Int. Cl.[6] G01N 7/00
U.S. Cl. 73—64.45 30 Claims



1. A system for determining volatile constituents of an unknown liquid from which vapor pressure and vapor emissions can be determined therefrom, comprising:

a. means for displacing a liquid to be tested at a predetermined flow rate, said liquid displacement means having an outlet ports;

b. a gas/liquid separator having an inlet coupled in fluid communication with said outlet port of said liquid displacement means, said gas/liquid separator having a gas outlet port and a liquid outlet port, said gas/liquid separator having a liquid exiting from said liquid outlet port and a gas exiting from said gas outlet port;

c. means for measuring selected physical parameters of the liquid exiting from said gas/liquid separator being coupled in fluid communication to said liquid outlet port of said gas/liquid separator;

d. means for measuring selected physical parameters of the gas exiting from said gas outlet port of said gas/liquid separator being coupled in fluid communication to said gas outlet port of said gas/liquid separator, said means for measuring selected physical parameters of the gas including gas sampling means having a gas inlet coupled in fluid communication with said gas outlet port of said gas/liquid separator for establishing gas composition data for gas exiting said gas/liquid separator; and,

e. processing means for establishing a composition of the liquid being tested from at least the measured selected liquid physical parameters and the measured selected gas physical parameters, said processing means including:

I. means for establishing an estimated initial liquid component molecular flow rate entering said gas/liquid separator;

II. means for determining equilibrium constants for said estimated initial liquid molecular flow rate components;

III. means for calculating selected physical parameters of gas exiting said gas/liquid separator and selected physical parameters of liquid exiting said gas/liquid separator using at least said estimated initial liquid component molecular flow rate and said equilibrium constants; and

IV means for converging data representing said measured selected physical parameters of liquid exiting said gas/liquid separator, said measured selected physical parameters of gas exiting said gas/liquid separator, and said estimated initial liquid molecular flow rate, with said calculated selected physical parameters of gas exiting said gas/liquid separator and said calculated selected physical parameters of liquid exiting said gas/liquid separator to ascertain an inlet liquid molecular flow rate.

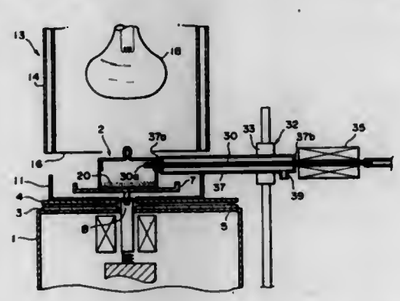
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5,499,532

## AQUAMETER

Mamoru Kaiho, Toride, and Hajime Yasuda, Tsukuba, both of, Japan, assignors to Director-General Of Agency Of Industrial Science And Technology, Japan

Filed Mar. 18, 1994, Ser. No. 214,565
Claims priority, application Japan, May 18, 1993, 5-139613
Int. Cl.[6] G01N 5/04;25/56
U.S. Cl. 73—76 4 Claims



1. A device for measuring the moisture content of a moisture-containing substance, comprising:

an electronic balance for measuring and indicating the weight of a sample placed on a sample receiver thereof;

a sample holder for containing said moisture-containing substance, said sample holder defining an airtight chamber therewithin and having a bottom wall for receiving said moisture-containing substance thereon and a side wall upwardly extending from the periphery of said bottom wall, said sample holder being provided with a gas discharge pipe extending outwardly from said side wall so that said airtight chamber is in fluid communication with the outside of said sample holder only through said gas discharge pipe, and said sample holder being so shaped as to be held on said sample receiver of said electronic balance;

a gas feed tube having a first end for connection to a source of an inert gas and an open second end, said gas feed tube having a front portion adjacent to said second end which has an outside diameter smaller than the inside diameter of said gas discharge pipe, so that said front portion is adapted to be positioned in such a fixed position where said front portion is inserted into said gas discharge pipe to define an annular space between said gas discharge pipe and said front portion with said second end being located in said airtight chamber;

means for holding said front portion of said gas feed tube in said fixed position;

gas heating means for heating a flow of the inert gas in said gas feed tube; and

sample heating means for heating said sample placed on said sample receiver, whereby when said sample holder containing said moisture-containing substance is placed as said sample on said sample receiver and when said first end of said gas feed tube is connected to said inert gas source with said front portion thereof being positioned in said fixed position, said moisture-containing substance is heated with said sample heating means in the atmosphere of said inert gas, so that the moisture of said moisture-containing substance is vaporized and liberated therefrom and is discharged together with said inert gas through said annular space from said airtight cheer and so that the change in weight of said moisture-containing substance caused by the loss of the moisture is detected by said electronic balance.



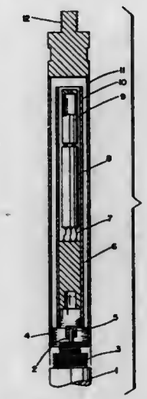
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5,499,533

## DOWNHOLE PRESSURE GAUGE CONVERTER

Mark Miller, 13360 Wheelock Rd., and Thomas W. Miller, 7 Airport Rd., both of Corry, Pa. 16407

Filed Aug. 26, 1992, Ser. No. 935,860
Int. Cl.[6] E21B 21/08
U.S. Cl. 73—152 11 Claims



9. In a downhole pressure gauge for wells including a housing containing a mechanical pressure sensitive device with connecting pin linked to a stylus and a mechanical recording unit and clock, wherein the improvement comprises the replacement of the stylus, mechanical recording unit and clock with a potentiometer fitted to receive the connecting pin, said potentiometer being connected to an electronic memory board and a electric power source, all to be contained in the housing.

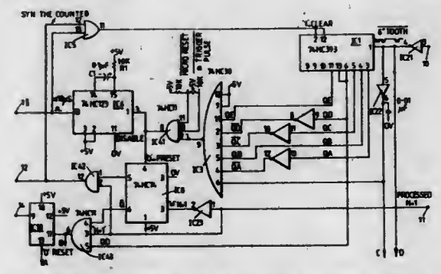
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5,499,534

## SIGNAL PROCESSING CIRCUIT FOR ENGINE CONTROL SYSTEM

Anthony S. B. Chan, Hertfordshire, England, assignor to Lucas Industries Public Limited Company, England

Filed Apr. 28, 1994, Ser. No. 234,826
Claims priority, application United Kingdom, Aug. 5, 1993, 3909527
Int. Cl.[6] G01M 15/00
U.S. Cl. 73—116 3 Claims



1. A signal processing circuit for use with a control system of an internal combustion engine, the processing circuit in use receiving a first series of signals from a first transducer, the signals of the first series occurring at relatively small intervals of engine crankshaft rotation, and a second series of signals from a second transducer, the signals of the second series occurring at relatively large intervals of engine crankshaft rotation and serving as engine cylinder identification signals, the signals of the second series including a further signal which occurs a predetermined interval before one of the cylinder identification signals and which acts as an engine position signal, the processing circuit acting to provide at first and second output terminals, the engine cylinder identification signals and the engine position signal respectively, and at third and fourth output terminals artificial engine cylinder identification signals and an artificial engine position signal respectively, the artificial signals being generated from said first series of signals to enable the engine to run in the event of failure of said second transducer and in the absence of said second series of signals.

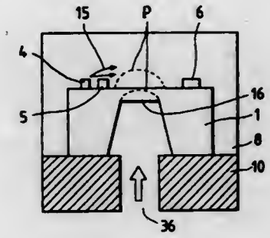
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5,499,535

## PRESSURE SENSOR AND TEMPERATURE SENSOR

Akira Amano; Kazuo Matsuzaki, and Toshiaki Sakai, all of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Division of Ser. No. 154,025, Nov. 18, 1993. This application May 11, 1995, Ser. No. 438,967
Claims priority, application Japan, Nov. 19, 1992, 4-309921; Feb. 8, 1993, 5-19965; Jul. 5, 1993, 5-165269
Int. Cl.[6] G01L 7/00
U.S. Cl. 73—717 6 Claims



1. A pressure sensor comprising:

a substrate having a movable unit which is displaceable in response to an applied force;

an electron emission unit having a cathode for emitting electrons in accordance with an applied potential;

an electron absorption unit having an anode for capturing electrons emitted from said cathode, said electron emission unit and said electron absorption unit being formed on a surface of said substrate;

said movable unit comprising a diaphragm formed by thinning said substrate at a location between said electron emission unit and said electron absorption unit, the diaphragm being deformable by pressure in an introduction port opening to the diaphragm;

said diaphragm functioning as a control means for controlling the electron capturing efficiency of said anode with respect to electrons emitted from said cathode, and being displacable to block an electron path from said cathode to said anode, thereby controlling said electron capturing efficiency.

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**5,499,536**

## METHOD FOR DETECTING COMBUSTION MISFIRES IN A PLURALITY OF CYLINDERS

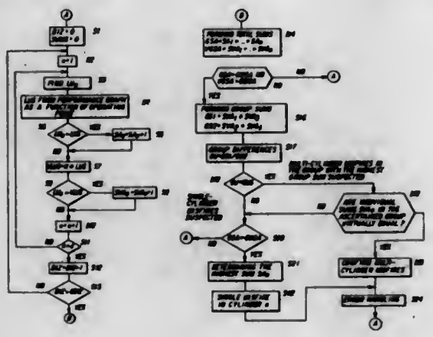
**Manfred Wier, Wenzenbach; Stefan Krebs; Wolfgang Reupke, both of Regensburg, and Anton Angermaier, Landshut, all of, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany**

**Filed Jun. 28, 1994, Ser. No. 267,806**

**Claims priority, application European Pat. Off., Jun. 28, 1993, 93110262**

**Int. Cl.[6] G01M** *15/00*

**U.S. Cl. 73—117.3** **10 Claims**



1. In a method for detecting combustion misfires, which includes calculating engine roughness values from fluctuations in crankshaft rpm, comparing the values with threshold values, and forming cylinder groups having an increased likelihood of misfiring, the improvement which comprises:

during a period of observation:

separately comparing each engine roughness value calculated for each cylinder with a first threshold value and with a second threshold value being reduced in comparison with the first threshold value,

forming a first counting sum associated with the cylinder if the first threshold value is exceeded, and forming a second counting sum associated with the cylinder if the second threshold value is exceeded; and

after the period of observation has elapsed, if total sums of all of the first or second counting sums exceed a predeterminable total sum limit value:

forming group sums for each cylinder group from the second counting sums, and

drawing a conclusion as to the occurrence of a multicylinder misfire in the group having a higher group sum if the second counting sums of the individual cylinders in a group are approximately of equal magnitude,

and conversely, if the second counting sums of the various cylinders are different, drawing a conclusion as to a single-cylinder combustion misfire for the cylinder having the highest first counting sum, if the total sum of the first counting sums exceeds a predeterminable total sum limit value.

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**5,499,537**

## APPARATUS FOR DETECTING MISFIRE IN INTERNAL COMBUSTION ENGINE

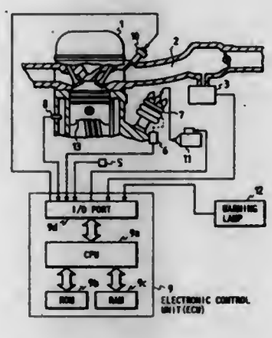
**Masaaki Nakayama, Toyoake; Yasutoshi Baba, Chiryu; Takehiko Terada, Kariya; Shuji Sakakibara, Okazaki, and Kenji Yamamoto, Anjo, all of, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan**

**Filed Dec. 23, 1994, Ser. No. 363,211**

**Claims priority, application Japan, Dec. 24, 1993, 5-328643; Mar. 24, 1994, 6-053681; Aug. 5, 1994, 6-184848; Nov. 18, 1994, 6-285343**

**Int. Cl.[6] G01M** *15/00*

**U.S. Cl. 73—117.3** **24 Claims**




1. A misfire detecting apparatus for an internal combustion engine, comprising:

rotation signal outputting means for outputting a rotation signal at every predetermined rotational angle in accordance with rotation of an output shaft of an internal combustion engine;

actual measurement value calculating means for measuring an interval of time spent in rotation between predetermined rotational angles in an expansion stroke of every cylinder of the engine in response to rotation signals outputted by the rotation signal outputting means, and for calculating an actual measurement value in response to the measured time interval;

first variation amount calculating means for calculating a first difference between actual measurement values, calculated by the actual measurement value calculating means, in two cylinders of the engine which successively fall into expansion strokes, and for calculating a first variation amount in response to the calculated first difference;

second variation amount calculating means for calculating a second difference between a current first variation amount calculated by the first variation amount calculating means and a previous first variation amount calculated by the first variation amount calculating means during a time which precedes a time of calculation of the current first variation amount by a period equal to an integer times a crank angle of 360 degrees in the engine, and for calculating a second variation amount in response to the calculated second difference;

smoothing means for smoothing the second variation amount calculated by the second variation amount calculating means into a third variation amount; and

consecutive misfire detecting means for detecting misfire in response to the third variation amount.



**5,499,538**

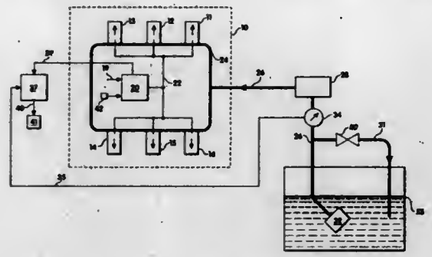
## ON-BOARD DETECTION OF FUEL PUMP MALFUNCTION

**John M. Glidewell, Dearborn; Granger K. Chui, Dearborn Heights, and Woong-Chul Yang, Ann Arbor, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.**

**Filed Mar. 3, 1994, Ser. No. 206,681**

**Int. Cl.[6] F02M** *39/00*

**U.S. Cl. 73—119 A** **2 Claims**



1. An internal combustion engine having an on-board diagnostic system for detecting a malfunctioning fuel pump during engine operation, comprising:

fuel supply means for supplying liquid fuel under pressure to combustion cylinders of the engine, comprising the fuel pump operatively connected to a fuel line;

pressure sensor means for generating pressure signals corresponding to transient fuel pressure waves in the fuel rail;

signal processing means comprising a waveform analyzer for Fast Fourier Transform analysis of the pressure signals, operatively connected to the pressure sensor means for receiving and processing the pressure signals from the pressure sensor means and for generating an output signal in response to selected pressure signals corresponding to transient fuel pressure waves indicative of malfunction of the fuel pump; and

utilization means operatively connected to the signal processing means for receiving the output signal and manifesting its presence.

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**5,499,539**

## METALLIC CONNECTING FLANGE FOR CERAMIC PRESSURE SENSING ELEMENTS

**Horst Glienke, Lörrach, and Winfried Maier, Maulburg, both of, Germany, assignors to Endress + Hauser GmbH + Co., Germany**

**PCT No. PCT/DE93/00870, § 371 Date Jun. 2, 1994, § 102(e) Date Jun. 2, 1994, PCT Pub. No. WO94/07120, PCT Pub. Date Mar. 31, 1994**

**PCT Filed Sep. 15, 1993, Ser. No. 244,176**

**Claims priority, application Germany, Sep. 23, 1992, 42 31 823.8; Sep. 23, 1992, 9212768 U**

**Int. Cl.[5] G01L** *7/00*

**U.S. Cl. 73—756** **7 Claims**

1. A connecting flange assemblage for connecting a ceramic enclosed pressure sensor to a source of pressure medium to be sensed comprising:

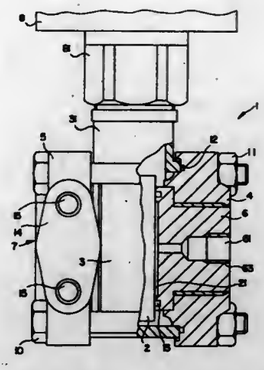
A metallic connecting flange;

An intermediate piece for connecting an electronic housing to the ceramic enclosed pressure sensor;

A plastic connecting pin for connecting and conducting the source of pressure medium to the ceramic enclosed pressure sensor which plastic pin is resistant to the chemical properties of the pressure medium;

wherein the metallic connecting flange provides a support for the plastic pin and engages the intermediate piece;

wherein the plastic pin is sealing held against the ceramic enclosed pressure sensor by the metallic connecting flange; and



wherein the metallic connecting flange does not directly contact the ceramic enclosed pressure sensor but rather applies a force to the plastic pin to provide the sealing so that the different relative expansions of the metallic connecting flange and ceramic enclosed sensor are accommodated.

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**5,499,540**

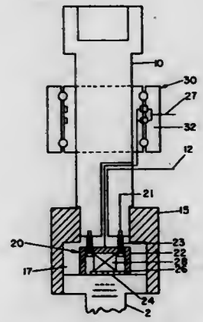
## ELECTROMAGNETIC ACOUSTIC TRANSDUCER FOR BOLT TENSION AND LOAD MEASUREMENT

**Hubert L. Whaley; Thomas Powers, and Daniel T. MacLauchlan, all of Lynchburg, Va., assignors to The Babcock & Wilcox Company, New Orleans, La.**

**Filed Feb. 15, 1994, Ser. No. 196,917**

**Int. Cl.[6] F16B** *31/02*

**U.S. Cl. 73—761** **12 Claims**



1. A device for measuring a load on a part, the device comprising:

means for engaging the part, said engaging means having an interior space, the interior space of the engaging means being located between the engaging means and the part;

drive means for transmitting a load to the part through said engaging means, said drive means being detachably engagable with said engaging means;

a coil located in the interior space near the part for introducing an eddy current in the part;

means for providing current to said coin;

a magnet engaging the coil in the interior space and being attached to said drive means for providing a magnetic field, the magnet and the coil generating a noncontact ultrasonic signal in the part; and

detection means for detecting a change in the ultrasonic signal provided to the part.

5,499,541

## PIEZOELECTRIC FORCE SENSOR

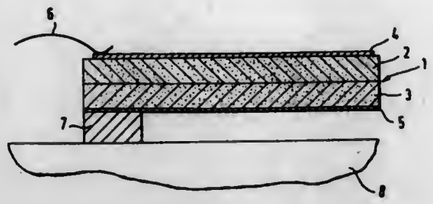
Gerald Hopf; Botho Ziegenbein, and Bernd Malhoefer, all of Reutlingen, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Jul. 21, 1994, Ser. No. 278,667

Claims priority, application Germany, Jul. 23, 1993, 43 24 692.3

Int. Cl.[6] G01L *1/18;25/00*

U.S. Cl. 73—763 9 Claims




1. A piezoelectric force sensor comprising:

at least one piezoelectric plate that is susceptible to bending, having top and bottom sides;

at least one electrode arranged on each of the top and bottom sides of the piezoelectric plate;

at least one conductor arranged on the piezoelectric plate, with which at least one of the at least one electrode is in electrical contact, the conductor being arranged so as to break in the case that the piezoelectric plate experiences breakage; and

means for determining whether damage has occurred by measuring a capacitance at the at least one conductor.

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5,499,542

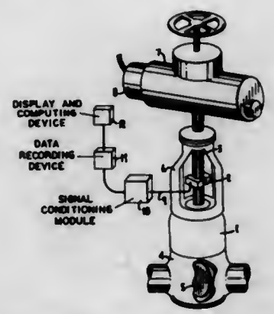
## DIAMETRAL FORCE SENSOR

David E. Morlan, Marietta, Ga., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 22, 1994, Ser. No. 231,087

Int. Cl.[6] G01L *1/26*

U.S. Cl. 73—818 13 Claims




1. A device for determining the diametral changes in a substantially cylindrical member produced by axial loads imposed on the cylindrical member, comprising a clamp assembly having a first jaw member and a second jaw member rigidly connected to each other on opposite sides of the cylindrical member, the first jaw member having a substantially V-shaped recess adapted to engage two peripheral portions of the cylindrical member, the second jaw member having a flexure with a contact surface contacting a peripheral portion of the cylindrical member and a projection extending away from the contact surface to provide the transmittal of compressive forces representative of diametral changes in the cylindrical member against a compression load cell contained within the second jaw member.

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5,499,543

## DEVICE FOR MEASURING THE FLOW OF FLUID THROUGH A MEASURING PIPE

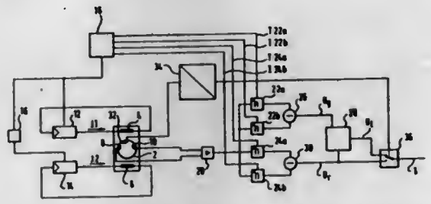
Peter Nissen, Rosdorf, and Klaus Schäfer, Hann Münden, both of, Germany, assignors to Fischer & Porter GmbH, Goettingen, Germany

Filed Aug. 29, 1994, Ser. No. 297,043

Claims priority, application Germany, Sep. 7, 1993, 42 30 290.4

Int. Cl.[6] G01F *1/58*

U.S. Cl. 73—861.16 4 Claims



1. A device for measuring the flow of a fluid through a measuring pipe, comprising

a first coil arranged above said measuring pipe,

a second coil arranged below said measuring pipe,

first and second electrodes facing one another, on the sides of said measuring pipe, wherein the first and second coils are excitable and produce both aiding and opposing magnetic fields,

a correction circuit for correcting the voltage ($U_r$) between said first and second electrodes which is approximately proportional to the fluid flow in the presence of aiding magnetic fields when said measuring pipe is partially filled, said correction circuit providing correction to an output signal corresponding to the flow of the fluid when the measuring pipe is partly filled by means of a correction function to a corrected voltage ($U_r$) depending on the voltages between the first and second electrodes in the presence of aiding and opposing magnetic fields,

a third electrode arranged at the top of said measuring pipe for detecting complete filling of said measuring pipe, and

circuit means responsive to the potential of said third electrode such that when the measuring pipe is completely filled, said circuit means generates a voltage ($U_r$) corresponding to the aiding magnetic fields as an output signal, and when the measuring pipe is partly filled, said circuit means generates the corrected voltage ($U_r$) as an output signal.

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5,499,544

## CAPACITIVELY COUPLED OHMIC RESISTANCE POSITION SENSOR

Hyok S. Lew, and Yon S. Lew, both of 7890 Oak St., Arvada, Colo. 80005

Continuation-in-part of Ser. No. 36,953, Mar. 25, 1993, Pat. No. 5,347,875. This application Oct. 8, 1993, Ser. No. 133,349

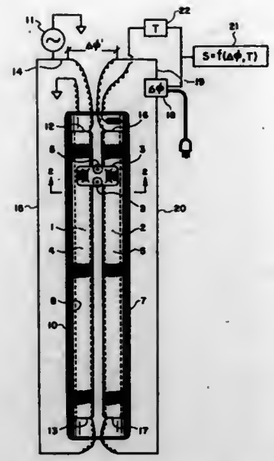
Int. Cl.[6] G01F *1/22;23/68*

U.S. Cl. 73—861.56 21 Claims

1. An apparatus for measuring position of a target member comprising in combination:

a) an electrically conducting elongated member having a finite value of ohmic resistance per unit length thereof and a sizable surface area disposed in a direction defined by displacement of the target member;






b) a capacitively coupling member having a sizable surface area disposed adjacent to the electrically conducting elongated member and kinematically coupled to the displacement of the target member in a relationship wherein displacement of the target member creates displacement of the capacitively coupling member in said direction, wherein said sizable surface area of the capacitively coupling member maintains a close surface-to-surface proximity relationship with a portion of said sizable surface area of the electrically conducting elongated member in an electrically nonconducting relationship at all instants during displacement of the capacitively coupling member in said direction;

c) means for transmitting an alternating electrical signal to one of the following three elements; the capacitively coupling member, a first extremity of the electrically conducting elongated member and a second extremity of the electrically conducting elongated member opposite to said first extremity; wherein the alternating electrical signal is transmitted between the capacitively coupling member and the electrically conducting elongated member by a capacitive electrical interaction between said sizable surface area of the capacitively coupling member and said a portion of the sizable surface area of the electrically conducting elongated member;

d) means for taking off two alternating electrical signals respectively from two of the following three elements; the capacitively coupling member, the first extremity of the electrically conducting elongated member and the second extremity of the electrically conducting elongated member; and

e) means for obtaining an electrical variable related to a phase angle difference between said two alternating electrical signals respectively taken off from said two of the three elements, wherein the electrical variable provides a measure of position of the target member.

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5,499,545

## PIPETTING DEVICE AND METHOD THEREFORE

Akira Kimura, Tokyo; Tadashi Watanabe; Tsuyoshi Inoue, both of Kanagawa, and Keiichi Nakamachi, Saitama, all of, Japan, assignors to Sony Corporation, Tokyo, Japan

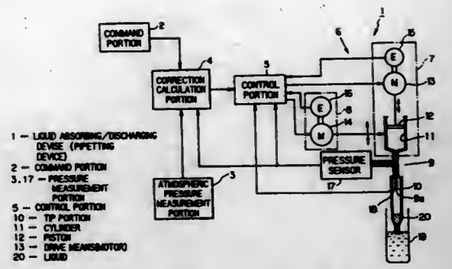
Filed Jun. 14, 1994, Ser. No. 261,117

Claims priority, application Japan, Jun. 18, 1993, 5-170925

Int. Cl.[6] G01F *11/06;* B01L *3/02*

U.S. Cl. 73—864.18 9 Claims

1. A pipetting device for inducting or discharging a specified quantity of liquid by controlling the pressure in a cylinder-like portion, said cylinder-like portion including a cylinder and a piston slidably disposed in the cylinder, comprising:




a command portion for specifying a control target value for a quantity of liquid to be inducted or discharged, a pressure measurement portion for measuring atmospheric pressure and an internal pressure of the cylinder;

a correction calculation portion for calculating a distance to be traveled by the piston by making a calculation to correct the control target value specified by the command portion based on measured data from the pressure measurement portion and data indicative of a shape of a portion of the cylinder-like portion into which liquid is inducted; and

a control portion for controlling a piston driving means according to the distance to be traveled by the piston calculated by the correction calculation portion.

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5,499,546

## METHOD OF MEASURING THE MASS OF FIBER SLIVERS

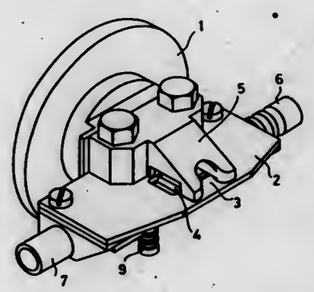
François Baechler, Wermatswil; Klaus Strehler, Zärich; Isidor Harzenmoser, Wallisellen, and Jürg Zehr, Uster, all of, Switzerland, assignors to Zellweger Luwa AG, Switzerland

Division of Ser. No. 264,334, Jun. 23, 1994. This application Jun. 2, 1995, Ser. No. 458,749

Claims priority, application Switzerland, Jun. 23, 1993, 1886/93

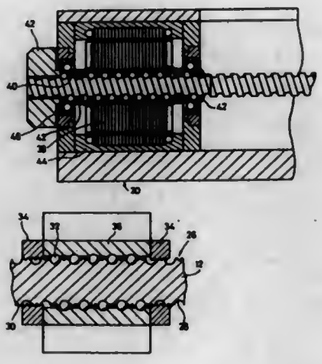
Int. Cl.[6] G01N *33/36;* G01B *21/12*

U.S. Cl. 73—865 6 Claims

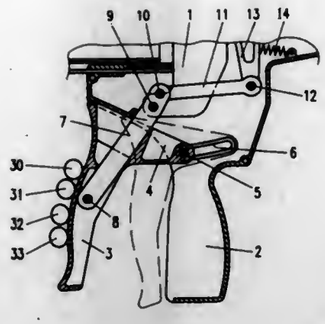



1. Method for measuring the mass of a fiber sliver, comprising advancing a fiber sliver along a measuring device that includes first and second measuring members which work on different measurement principles and which each generate signals that are a function of at least the fiber sliver mass, examining the signals generated by the two measuring members; identifying deviations in the signals generated by each measuring member to determine fluctuations in at least the fiber-silver mass.

**5,499,547**
**ACTUATOR**
**Shigekazu Nagai; Akio Saitoh, and Toru Sugiyama, all of Ibaraki, Japan, assignors to SMC Kabushiki Kaisha, Tokyo, Japan**
**Filed Mar. 4, 1994, Ser. No. 193,053**
**Claims priority, application Japan, Sep. 4, 1991, 3-224403; Jul. 23, 1992, 4-197178**
**Int. Cl.[6] F16H** *25/22*
**U.S. Cl. 74—89.15** **7 Claims**



1. An actuator comprising:
a feed screw shaft operatively connected at one end thereof to a rotor of a motor for converting a rotational motion of said motor into a linear motion to displace a slider and wherein said feed screw shaft is connected at an opposite end thereof to a bearing permitting rotational motion of said feed screw shaft, said feed screw shaft having ball-screw splines formed over a length thereof, wherein said feed screw shaft is connected with said rotor and said bearing such that a center of rotation of said feed screw shaft is aligned with a center of rotation of said rotor and a center of rotation of said bearing by a plurality of balls disposed in said ball-screw splines between said feed screw shaft and said rotor, and between said feed screw shaft and said bearing, respectively.



a lever system connected to said actuating lever comprising two swivelling levers which hinge and guide said actuating lever;
wherein one of said two swivelling levers is a transmission lever for connecting said actuating lever to said movable part;
wherein a second swivelling lever is a guiding lever connected between the actuating lever and a housing of said apparatus;
wherein at least one of said transmission lever and guiding lever is connected to the actuation lever at a position located within an upper half of said actuation lever facing said apparatus; and
wherein said movable part is a thrust member for the delivery of a flowable medium.

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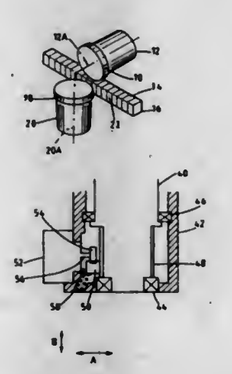
**5,499,548**
**MANUALLY OPERATED ACTUATING DEVICE**
**Wilhelm A. Keller, Obstgartenweg 9, CH-6402 Merlischachen, Switzerland**
**Filed Mar. 24, 1994, Ser. No. 216,977**
**Claims priority, application Switzerland, Apr. 20, 1993, 01195/93**
**Int. Cl.[6] B67D** *5/42;* **G01F** *11/18*
**U.S. Cl. 74—96** **10 Claims**

1. An actuating device on an apparatus for manually operating at least one movable part of said apparatus comprising:
an actuating lever with four gripping points corresponding to four fingers of a hand that actuates the device;
a lever system connecting said actuating lever and said movable part; and
a guideway for guiding a motion path of said actuating lever;
wherein said lever system comprises a transmission lever pivotally connected to said actuating lever at a swiveling axis; and
wherein said movable part is a thrust member for the delivery of a flowable medium.

7. An actuating device on an apparatus for manually operating at least one movable part of said apparatus comprising:
an actuating lever with four gripping points corresponding to four fingers of a hand that actuates the device;

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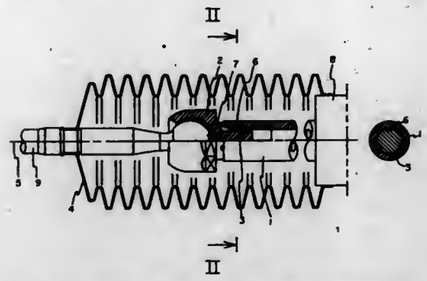
**5,499,549**
**GEAR ARRANGEMENT**
**Stephen J. Willacy, West Yorkshire, England, assignor to Lucas Industries Public Limited Company, England**
**Filed Sep. 7, 1994, Ser. No. 302,614**
**Claims priority, application United Kingdom, Sep. 18, 1993, 9319359**
**Int. Cl.[6] F16H** *1/20*
**U.S. Cl. 74—422** **5 Claims**



1. A gear arrangement comprising a first gear mounted on a first shaft having a first axis of rotation, a second gear mounted on a second shaft having a second axis of rotation, and a linear rack having first and second rows of teeth which are resiliently biased into engagement with the first and second gears respectively, said first and second axes intersecting each other.



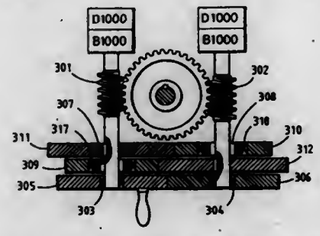
**5,499,550**
**RACK-AND-PINION STEERING FOR MOTOR VEHICLES**
**Paul Westphal, Stenwede, and Reinhard Buhl, Bohmte, both of, Germany, assignors to Lemförder Metallwaren AG, Lemförde, Germany**
**Filed Sep. 15, 1994, Ser. No. 306,624**
**Int. Cl.[6] B62D** *5/22*
**U.S. Cl. 74—422** **11 Claims**



1. Rack-and-pinion steering for motor vehicles, comprising:
a ball pin, which forms an end piece of a steering tie rod and a ball joint housing having a bearing shell for receiving said ball pin to define a ball joint;
a rack guide housing;
a rack formed of at least partially as a hollow cylinder, said rack being guided within said rack guide housing;
a bellows in sealing contact on one side with said rack guide housing and in sealing contact on another side with said ball pin; and
a connection pin connecting said hollow cylindrical rack to said ball joint housing, said connection pin and said hollow cylindrical rack defining air passage means for equalizing differences in pressure developing within said bellows due to movement of said rack.

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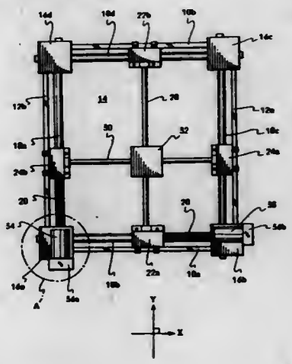
**5,499,551**
**DOUBLE-ACTING TYPE DYNAMIC BACK CLEARANCE RELIEF DRIVING SYSTEM**
**Tai-Her Yang, No. 32 Lane 29, Taipin St., Si-Hu Town, Dzan-Hwa, Taiwan**
**Filed Feb. 7, 1994, Ser. No. 192,617**
**Int. Cl.[6] F16H** *55/24;57/12*
**U.S. Cl. 74—427** **8 Claims**




1. A double-acting type dynamic back clearance relief driving system comprising:
a) first and second worms, each worm having a worm shaft;
b) a toothed element engaging both of the worms such that rotation of the worms causes movement of the toothed element;
c) drive means to rotate the first and second worms in opposite directions at different speeds, the drive means comprising:
i) a first input gear attached to the first worm shaft by a first one way driving device;
ii) a second gear engaged with the first input gear and attached to the second worm shaft by a second one way driving device;
iii) a third gear attached to the first worm shaft by a third one way driving device;
iv) a fourth gear fixedly attached to the second worm shaft so as to rotate therewith and engaged with the third gear;
v) a fifth gear fixedly attached to the first worm shaft so as to rotate therewith; and
vi) a sixth gear attached to the second worm shaft by a fourth one way driving device and engaged with the fifth gear;
whereby rotation of the first input gear in the first direction causes rotation of the first worm in the first direction and rotation of the second worm in a second, opposite direction at a slower speed than the first worm, and rotation of the first input gear in the second, opposite direction causes rotation of the first worm in the second direction and rotation of the second worm in the first direction at a speed higher than that of the first worm.

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**5,499,552**
**TWO DIMENSIONAL DRIVE SYSTEM**
**Ken Yanagisawa, c/o Kabushiki Kaisha Mechanic Sekkei Jimusho, 5175-1, Ooaza Toyoshina, Toyoshina-machi, Minamiazumi-gun, Nagano-ken, Japan**
**Filed May 11, 1993, Ser. No. 59,363**
**Claims priority, application Japan, May 15, 1992, 4-148565**
**Int. Cl.[6] B23Q** *1/18;* **G05G** *11/00;* **F16H** *19/06*
**U.S. Cl. 74—471 XY** **12 Claims**



1. A two dimensional drive system,
comprising:
a pair of first looped members being arranged in a first direction, said first looped members being capable of running in the first direction;
a pair of second looped members being arranged in a second direction perpendicular to the first direction, said second looped members being capable of running in the second direction;
two first turning means for turning said first looped members being respectively engaged with each turning section of said first looped members;
two second turning means for turning said second looped members being respectively engaged with each turning section of said second looped members;
four corner blocks being respectively provided at each corner of a rectangular plane, which is enclosed by said first looped members and said second looped members, each said corner block accommodating said first turning means and said second turning means;
four guide pipes being spanned between two adjacent said corner blocks, both ends of each said guide pipe being opened;

four connecting shafts being respectively pierced through said guide pipes, each said connecting shaft connects a couple of said first turning means or said second turning means;

a couple of first moving blocks being respectively attached to said first looped members, each said first moving block being capable of moving in the first direction on each said guide pipe;

a couple of second moving blocks being respectively attached to said second looped members, each said second moving block being capable of moving in the second direction on each said guide pipe;

a first shaft being arranged in the second direction, each end of said first shaft being connected to each said first moving block;

a second shaft being arranged in the first direction, each end of said first shaft being connected to each said second moving block;

a moving body being capable of moving on said first shaft and said second shaft;

first driving means for running said first looped members in the same direction at the same speed; and

second driving means for running said second looped members in the same direction at the same speed.

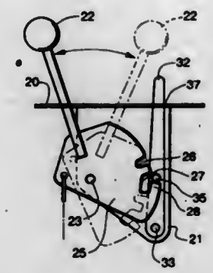
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**5,499,553**

## CONTROL LEVER LOCKOUT MECHANISM

**Allan N. Schott, Warren, and Mario P. Girard, Winnipeg, both of, Canada, assignors to New Holland North America, Inc., New Holland, Pa.**

**Filed Nov. 18, 1993, Ser. No. 154,058**
**Int. Cl.[6] G05G *5/06***
**U.S. Cl. 74—526** **13 Claims**




8. A position control mechanism for a pivotally movable control lever comprising:

a pivoted actuating lever having a lockout pin projecting outwardly therefrom, said actuating lever being movable between three respective pivoted positions; and

a gated plate pivotally movable with said control lever, said gated plate including:

a first gate engageable with said lockout pin when said actuating lever is in a first position to fix said control lever in a neutral mode;

a second elongated gate alternatively engageable with said lockout pin when said actuating lever is in said first position to fix said control lever in a hydraulic motor mode; and

a stop engageable with said lockout pin when said actuating lever is in a second position to restrain the pivotal movement of said control lever from being positioned in a float mode; and

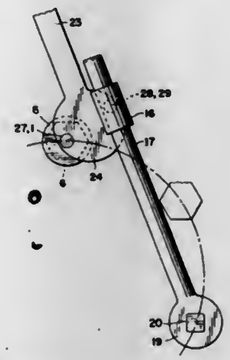
said lockout pin being positionable out of engagement with said gated plate when said actuating lever is in a third position to allow said control lever an unrestricted freedom of movement.

**5,499,554**

## NUT WRENCH DEVICE, ESPECIALLY FOR LOOSENING OR TIGHTENING WHEEL NUTS OR SIMILAR

**Ivan Ilyes, Sportvägen 32, S-246 52 Löddeköpinge, Sweden**

**PCT No. PCT/SE94/00129, § 371 Date Dec. 21, 1994, § 102(e) Date Dec. 21, 1994, PCT Pub. No. WO94/22642, PCT Pub. Date Oct. 13, 1994**
**PCT Filed Feb. 16, 1994, Ser. No. 347,485**
**Claims priority, application Sweden, Apr. 7, 1993, 9301170**
**Int. Cl.[6] B25B *33/00***
**U.S. Cl. 81—55** **1 Claim**




1. A nut wrench device, especially for loosening or tightening wheel nuts or similar, comprising an input axle having operating means, an output axle having actuating means disposed at one of its ends, which actuating means has a non-round peg on which a nut socket or the like is non-rotatably secured for wrenching said nut, a force transmission mechanism which links the input axle with the output axle, and anchoring means to anchor the nut wrench device on a second wheel nut spaced from said nut, whereby a force applied to the operating means is transmitted as a torque to the nut which is to be wrenched, the anchoring means is disposed at one end of the input axle and the operating means is disposed at its second end, wherein the force transmitting mechanism comprises a head integrated with one end of said force transmission mechanism, the second end of said input axle disposed substantially at the periphery of the head, a second bore disposed substantially at the periphery of the head opposite said input axle, a socket member enclosingly and slidably arranged on said output axle, and a peg which is projecting from the socket member at an angle to an axle of said socket member and which is receivable in said bore of said head.

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**5,499,555**

## SKI SHARPENING GUIDE WITH FILE-SUPPORT PLATFORMS

**James H. Vermillion, 14220 Orchard Ave., Caldwell, Id. 83605**

**Continuation-in-part of Ser. No. 322,435, Oct. 13, 1994. This application Feb. 6, 1995, Ser. No. 384,038**
**Int. Cl.[6] B23D *69/02*; B24B *9/04***
**U.S. Cl. 76—83** **11 Claims**

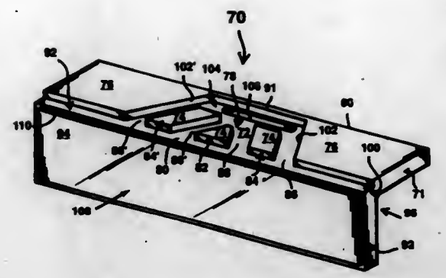
1. A ski sharpening guide for use with a file for sharpening edges of skis, the guide comprising an angular member comprising:

a generally horizontal outer top surface having a front edge and an opposing rear edge and a generally vertical outer side surface having an upper edge, the front edge of the top surface being connected to the upper edge of the side surface at a junction,

a channel cut into the top surface and the side surface at the said junction and extending horizontally along the said junction,

a recess cut into the top surface extending from the channel to near the rear edge, the recess being defined by a bottom surface and first and second side walls, the recess having an inlet at the channel and an outlet near the rear edge, and






a platform upending from the recess bottom surface and having a platform top surface co-planar with the said angular member top surface,

wherein the angular member top surface and the platform top surface are for supporting the file, the side surface is for placement against and moving against the ski, and the channel and recess are for collecting filings that drop from the file and ski edge.

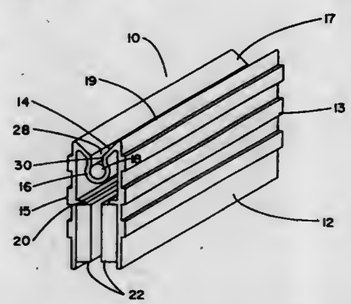
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**5,499,556**

## PORTABLE ICE SKATE BLADE SHARPENER

**Walter R. Exner, R.R. #1, Tappen, British Columbia, Canada; Vincent A. Exner, 8273 Copper Place, Mission, British Columbia, Canada, and Urbin L. Foucher, 23177 - 129th Avenue, Maple Ridge, British Columbia, Canada, assignors to Walter R. Exner; Vincent A. Exner, and Urbin L. Foucher, all of British Columbia, Canada**

**Filed Apr. 7, 1995, Ser. No. 418,675**
**Int. Cl.[6] B21K *17/00***
**U.S. Cl. 76—83** **12 Claims**



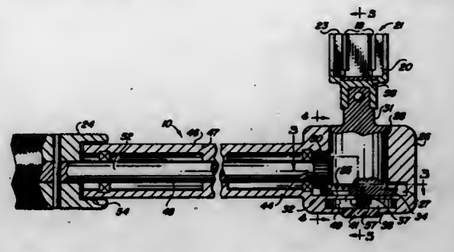

1. An ice skate blade sharpener, comprising an elongate body having a first elongated slot along one side edge with a honing stone affixed to a bottom thereof, presenting a convex, elongated, outwardly facing surface and side walls extending from said one side edge to another side edge of said body opposite said one side edge, said another side edge having a pair of elongated honing stones affixed to respective flexible side walls with planar parallel surfaces spaced apart and defining a second elongated slot slightly wider than the thickness of a skate blade, such that upon squeezing said side walls together said second elongated slot is narrowed so as to cause deburring of a sharpened skate blade inserted into said second slot and moved along the length thereof.

**5,499,557**

## DRAIN PLUG REMOVING DEVICE

**James K. Fry, 1661 NW. 107 Ave., Plantation, Fla. 33322**

**Filed Jan. 21, 1994, Ser. No. 183,837**
**Int. Cl.[6] B25B *17/00; 13/52***
**U.S. Cl. 81—57.29** **6 Claims**



1. A drain plug removing device comprising:

(a) a housing having a first end and a second end, said housing having a chamber extending from said first end to said second end;

(b) a head connected to said first end of said housing, said head having a cavity in communication with said chamber;

(c) a socket holder having a lower section disposed within said head cavity and a member projecting externally from said head;

(d) a socket adapted to fixedly engage said external member of said socket holder, said socket being formed to engage a drain plug head;

(e) a crown gear disposed within said head cavity, said crown gear being fixedly coupled to said lower section of said socket holder, said crown gear being adapted for rotation within said head cavity;

(f) means disposed within said device head for securely yet rotatably fixing said crown gear within said device head, with respect to which said crown gear rotates coaxially;

(g) a pinion gear disposed within said head cavity, said pinion gear being movably coupled to said crown gear;

(h) a drive shaft disposed within and extending throughout the length of said housing chamber, said drive shaft having a first end and a second end, said first end of said drive shaft being fixedly coupled to said pinion gear; a

(i) a rotatable handle positioned adjacent said second end of said housing, said handle being fixedly connected to said second end of said drive shaft,

whereby rotation of said handle applies rotational force to said drive shaft, causing said drive shaft and said pinion gear to rotate together and in turn to apply rotational force to said crown gear, whereby the resulting rotation of said crown gear produces a simultaneous rotation of said socket holder, said socket and a drain plug securedly engaged with said socket; and

(j) said device head including at least one aperture for allowing oil to drain therefrom.

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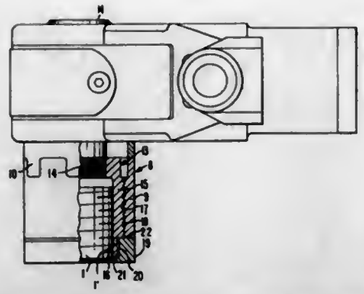
**5,499,558**

## FLUID OPERATED TOOL FOR ELONGATING AND RELAXING A THREADED CONNECTOR

**John K. Junkers, 7 Arrowhead La., Saddle River, N.J. 07540**

**Continuation-in-part of Ser. No. 153,217, Nov. 16, 1993, abandoned, which is a continuation of Ser. No. 879,342, May 7, 1992, Pat. No. 5,318,397. This application May 27, 1994, Ser. No. 250,035**
**Int. Cl.[6] B25B *13/46***
**U.S. Cl. 81—57.39** **8 Claims**

1. A fluid operated tool for elongating and relaxing a threaded connector, comprising a hydraulic drive; a driving part driven by said hydraulic drive; a non-rotatable reaction part, said reaction part including a non-rotatable tool element provided with first



engaging means for non-rotatably engaging a threaded connector, said driving part including a rotatable tool element rotatable about an axis of the threaded connector and having second engaging means for engaging said rotatable tool element with said non-rotatable tool element; and an intermediate element arranged between said non-rotatable tool element and said rotatable tool element and formed so that it engages with said non-rotatable tool element so as to be non-rotatable as well while said rotatable tool element freely turns relative to said intermediate element, whereby when said rotatable tool element is turned around said axis said non-rotatable tool element only moves in an axial direction but does not rotate and therefore displaces a threaded connector in the axial direction.

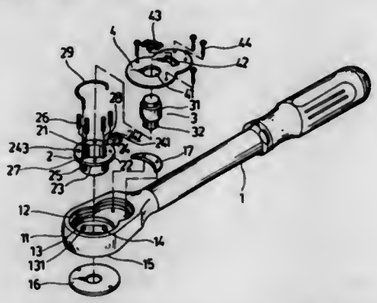
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**5,499,559**

**STRUCTURE OF REVERSIBLE SOCKET WRENCH**

**Ching-Chou Lin, No. 150, Sec. 3, Chung Shan Road, Wu Jih Hsiang, Taichung Hsien, Taiwan**

**Filed Feb. 22, 1995, Ser. No. 392,325**
**Int. Cl.[6] B25B *13/46***
**U.S. Cl. 81—59.1** **1 Claim**



1. A reversible socket wrench comprising a handle having a box end, an adapter for mounting a socket for turning a workpiece, an adapter holder mounted within said box end and covered with a top cover plate to hold said adapter, a crescent plate mounted within said box end to guide rotary motion of said adapter holder in said box end, a locating spring wire fastened to said adapter holder to hold it in position, and a slide coupled to said adapter holder for moving said adapter holder between a forward operating position and a backward operating position, wherein said box end comprises a substantially 8-shaped top recess, a mounting groove around the peripheral wall of said 8-shaped top recess at the top, a circular recess on a front half of said 8-shaped top recess below the elevation of said mounting groove, a projecting portion raised from the peripheral wall of said 8-shaped top recess and projecting into said circular recess, a square through hole through said circular recess, a circular bottom recess, and an annular bottom cover plate securely fixed to said circular bottom recess; said adapter holder is inserted into said square through hole, comprising a center through hole, an outward top flange disposed in said 8-shaped top recess, a half-round block raised from a bottom side of said outward top flange and fitted into said circular recess, a lever horizontally extended from the border of said outward top flange and terminating in a coupling end with a mounting hole, a plurality of raised portions raised from said outward top flange and equiangularly spaced from one another, a plurality of roller bearing holes spaced around the periphery in communication with said center through hole, a plurality of roller bearings respectively mounted within said roller bearing holes, a top through hole and a hook hole made through said outward top flange at two opposite locations; said adapter comprises a stepped circular top section retained in the center through hole on said adapter holder by said roller bearings, and a square bottom section for mounting a socket for turning a workpiece; said crescent plate is mounted within a rear half of said 8-shaped top recess and abutted against the periphery of said coupling end of said lever; said locating spring wire is bridged over the raised portions on said adapter holder, having one end inserted through said top through hole into said circular recess and stopped at said projecting portion and an opposite end into said hook hole; said top cover plate is securely fixed to said mounting groove on said box end, having a circular hole, which receives said stepped circular top section, and an arched slot, which receives said coupling end of said lever; said slide is fastened to the mounting hole on said coupling end of said lever and moved within said arched slot between said forward operating position for allowing said adapter holder to be turned by said handle clockwise, and said backward operating position for allowing said adapter holder to be turned by said handle counter-clockwise.

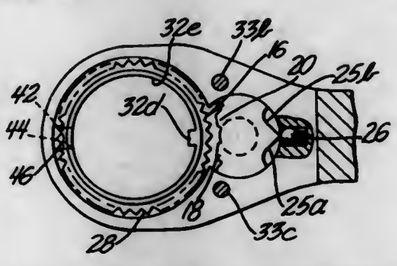
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**5,499,560**

**UNIVERSAL OPEN ENDED SOCKET WRENCH**

**William M. Aeschliman, 604 Parkway Dr., Gladwin, Mich. 48624**

**Filed May 20, 1994, Ser. No. 246,757**
**Int. Cl.[6] B25B *13/46***
**U.S. Cl. 81—63.2** **1 Claim**



1. A tool kit including different sized open ended drive sockets, an extension adapter and an open ended socket wrench with a handle and a head with a bore therethrough:

said head having a stepped bushing with end portions fit in and extending through said bore and including a center head opening with a head drive tooth connected to said stepped bushing and extending radially into said center head opening;

each of said different sized open ended drive sockets being selectively connectable to said head by each of different sized open ended drive sockets having a driven connector end including a slot that receives said head drive tooth for interlocking said driven connector end to said head drive tooth; said different sized open ended drive sockets each having an opening for passage of a threaded member therethrough;

said extension adapter having an adapter connector end with a slot having the same configuration as said slot on each of said different sized open ended drive sockets and said slot on said adapter connector end engageable by said head drive tooth for interlocking said extension adapter to said head drive tooth; said adapter connector end slot selectively engageable with said head drive tooth when said different sized open ended drive sockets are disconnected therefrom; said extension adapter having an opening for passage of a threaded member through said extension adapter and said head;

said extension adapter having an adapter drive end; said adapter drive end having an adapter drive opening therein and an adapter drive tooth; said adapter drive opening and said adapter drive tooth having the same configuration as said head opening and said head drive tooth;

said adapter connector end on said extension adapter and said driven connector ends on said different sized open ended drive sockets having the same configuration for being universally selectively engageable by said head drive tooth and said driven connector ends on said different sized open ended drive sockets further being selectively engageable to said adapter drive end of said extension adapter when said adapter connector end of said extension adapter is engaged with said head drive tooth.



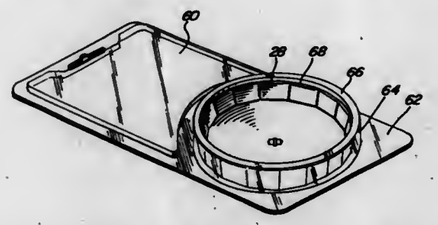
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**5,499,561**

**OIL FILTER WRENCH AND PACKAGING THEREFOR**

**Gregory F. Quinn, Fullerton, Calif., assignor to FloTool International, Inc., Tustin, Calif.**

**Filed Mar. 6, 1995, Ser. No. 398,983**
**Int. Cl.[6] B25B *13/00*; B65D *75/02***
**U.S. Cl. 81—124.6** **18 Claims**



1. In combination, an oil filter wrench for an oil filter and packaging for said filter wrench, said combination comprising:

a dome-shaped top portion having a longitudinal axis and terminating into an axially extending annular side wall with a peripheral edge, said side wall having an inner surface comprising an upper wall portion and a lower wall portion, the lower wall portion having segmented facets thereon for receiving the top portion of the oil filter, the upper wall portion of the inner surface defining an annular step which extends from the peripheral edge to the lower wall portion; and

packaging comprising a back member and a front sheet with the oil filter wrench being disposed therebetween; said front sheet extending over the peripheral edge of the side wall of the wrench, whereby the wrench is securely held to the back member by the front sheet while providing unobstructed access to the segmented facets on the lower wall portion of the inner surface of the wrench by the filter for size comparison.

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**5,499,562**

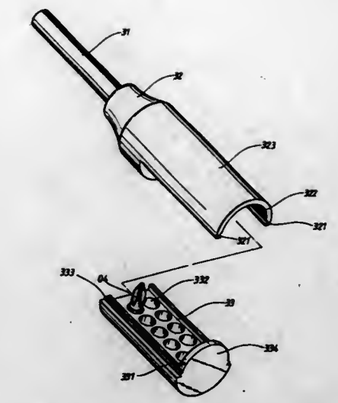
**EXCHANGEABLE TYPE SCREWDRIVER WITH WORK-HEAD STORAGE MODULE(S)**

**Yee-Chang Feng, 2F.,No. 166-5,Sec.3,Hsi-Tun Rd., Taichung, Taiwan**

**Filed Jun. 15, 1994, Ser. No. 260,329**
**Int. Cl.[6] B25G *1/08***
**U.S. Cl. 81—177.4** **1 Claim**

1. A screwdriver comprising:

a) a shank having a front end for detachably securing a selected work head thereon;



b) a support connected to the shank, the support including a longitudinal axis, a canopy having a substantially semi-circular cross section, a pair of dovetail-groove longitudinal edges, and a pair of pits formed adjacent a rear inner periphery of the canopy; and

c) a module having a substantially-circular cross section defining a pair of longitudinal sides, the module including a pair of axially extending flange ribs formed at the longitudinal sides for detachable engagement with the dovetail-groove longitudinal edges of the canopy in a direction which is substantially parallel with the longitudinal axis of the support, a plurality of holes for storing spare work heads, and a pair of bosses provided on a rear portion of the module for detachable engagement with the pits of the canopy.

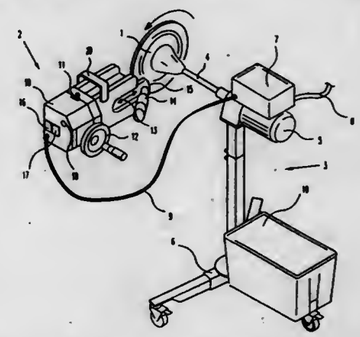
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**5,499,563**

**ON-CAR DISC BRAKE LATHE**

**Kim Hansen, Aarslev, Denmark, assignor to Canvik A/S, Vissenglerg, Denmark**

**Filed Sep. 12, 1994, Ser. No. 304,442**
**Int. Cl.[6] B23B *5/04***
**U.S. Cl. 82—112** **4 Claims**



1. An on-car disc brake lathe for simultaneous resurfacing of opposite sides of a brake disc for a wheel without removing the disc but only the wheel and other parts of the brake mechanism, comprising:

means for rotating a brake disc on a vehicle, and

a disc brake lathe unit adapted to be mounted on a wheel suspension of the vehicle for resurfacing the brake disc on the vehicle that is rotated by said means for rotating, said disc brake lathe unit including:

a) a housing with two synchronous sliding holders, each with a tool for resurfacing a disc brake surface,
b) means for driving the sliding holders in both an infeed direction and an outfeed direction with respect to the brake disc to be resurfaced, said means for driving comprising an electric motor and a gear between the electric motor and the sliding holders,
c) means for controlling the current to the electric motor in relation to the position of the resurfacing tools during infeeding to stop infeeding at a predetermined position when said tools approach the central area of the brake disc, which is not to be resurfaced,
d) a microswitch for controlling the current to said electric motor in relation to the position at the resurfacing tools during outfeeding when the tools are moved in the direction away from the central area toward the edge of the disc, and
e) positioning means permitting an operator to adjust the location of said predetermined position of which infeeding is stopped by said means for controlling while said disc brake lathe unit is mounted on said wheel suspension of the vehicle for resurfacing the brake disc on the vehicle.

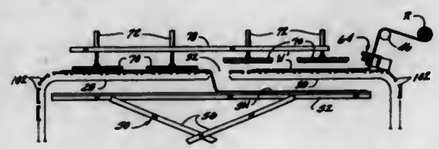
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**5,499,564**

## METHOD AND APPARATUS FOR FORMING A SPREAD

**Charles H. Sanborn, III, and Joel D. Clanton, both of Shelbyville, Tenn., assignors to Ark, Inc., Shelbyville, Tenn.**

**Filed Apr. 15, 1994, Ser. No. 228,447**
**Int. Cl.[6] B65H *28/18;29/34***
**U.S. Cl. 83—23** **24 Claims**



1. A method for forming a spread of generally thin, pliable material from a roll thereof onto a table, the spread comprising a stack of sheets of material cut from said roll of material, the method comprising the steps of:
(a) moving an endless conveyor having an upper reach disposed generally over the table so that the upper reach travels in a forward direction, the conveyor including a series of flights spaced at intervals therealong with openings between the flights;
(b) rotating the roll of material to feed a web of the material from the roll in generally the forward direction to the upper reach;
(c) carrying the web fed from the roll forwardly on a flight in the upper reach of the endless conveyor;
(d) stopping rotation of the roll of material and forward travel of the upper reach of the endless conveyor when a predetermined length of the web of material has been fed onto the flight;
(e) cutting the web of material to separate it from the roll of material, thereby forming a first sheet of material supported on the flight in the upper reach of the endless conveyor;
(f) restarting rotation of the roll of material to feed another web of material from the roll generally in the forward direction to the upper reach;
(g) restarting movement of the upper reach of the endless conveyor in the forward direction;
(h) holding the first sheet of material on the flight in the upper reach of the endless conveyor from moving forwardly with the flight whereby the flight slides from underneath the first sheet and the first sheet falls through an opening trailing the flight and onto the table at the same time said other web of material is fed onto a trailing flight in the upper reach of the endless conveyor and is carried in the forward direction by the trailing flight; and
(i) repeating steps (d)–(h) for said other web of material and subsequent webs of material fed from the roll thereby to successively cut sheets of material from said roll of material and stack them one on top of another on the table to a predetermined height to form the spread.

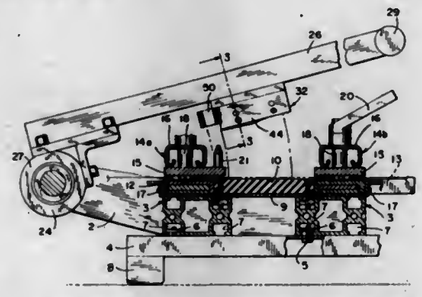
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**5,499,565**

## BELT CUTTING APPARATUS

**Kenneth N. Hansen, Waukesha, and Daniel E. Ertel, Oconomowoc, both of Wis., assignors to Dorner Mfg. Corp., Hartland, Wis.**

**Filed Aug. 31, 1994, Ser. No. 298,576**
**Int. Cl.[6] B26D *7/02***
**U.S. Cl. 83—452** **20 Claims**



1. A belt cutting apparatus, comprising a base having a belt supporting surface, clamping means mounted on the base for clamping the belt against said surface, a pivot shaft mounted on said base, a lever arm journaled for pivotal movement on said shaft and mounted to slide axially on said shaft, a cutter head mounted on the lever arm and having a plurality of blades disposed to cut a plurality of slits in the belt as the lever arm is pivoted downwardly in a cutting stroke, and locating means mounted on the cutter head for positioning the cutter head along the width of the belt to correlate the cut slits and provide a series of V-shaped cut fingers in the belt.

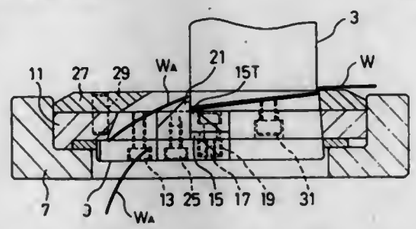
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**5,499,566**

## FOLLOW-UP SLOTTING TOOL

**Shigeru Endo, and Fumitaka Sugizaki, both of Isehara, Japan, assignors to Amada Metrecs Company, Limited, Isehara, Japan**

**Filed Aug. 17, 1994, Ser. No. 292,008**
**Claims priority, application Japan, Aug. 17, 1993, 5-203251**
**Int. Cl.[6] B26D *5/08***
**U.S. Cl. 83—636** **6 Claims**



2. A follow-up slotting tool for continuously punching a workpiece fed at a predetermined pitch, which comprises:
a punch having a front end and a rear end and formed with a shear angle at an end surface thereof in such a way that the front end of the punch cuts the workpiece but the rear end thereof does not reach the workpiece when lowered at a first predetermined downward stroke; and
a die unit having:
a lower die plate formed with a die opening;
an upper die plate arranged on said lower die plate and formed with a rectangular opening corresponding to the die opening and with first and second openings both extending perpendicular to the rectangular opening;
a counter member received in the first opening of said upper die plate, for raising a residue partially cut away from the workpiece, after said punch has been lowered at said first predetermined downward stroke; and
a cutting edge received in the second opening of said upper die plate, for cutting off the partially cut away residue raised by said counter member in cooperation with said punch, when said punch is lowered at the succeeding predetermined downward stroke after said workpiece is fed at said predetermined pitch.



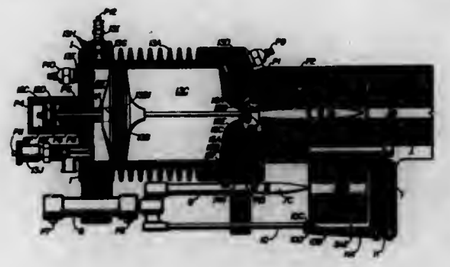
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**5,499,567**

## DISTILLATE FUEL OIL/AIR-FIRED, RAPID-FIRE CANNON

**Jordan L. Gay, Sarasota, Fla.**

**Division of Ser. No. 210,263, Mar. 18, 1994, Pat. No. 5,398,591, which is a continuation of Ser. No. 6,924, Jan. 22, 1993, abandoned. This application Feb. 23, 1995, Ser. No. 393,559**
**Int. Cl.[6] F41A *1/04***
**U.S. Cl. 89—7** **1 Claim**



1. A distillate fuel oil/air-fired cannon, comprising:
a housing forming a cylinder, a propulsor chamber forward of said cylinder and a barrel forward of said propulsor chamber;
a piston within said cylinder forming a combustion chamber aft of said piston and a charge chamber forward of said piston;
a control valve located between said charge chamber and said propulsor chamber, for sealing a passage between said charge chamber and said propulsor chamber when in the aftmost position.
piston control means attached to said control valve for applying a desired pressure to said control valve either in the forward direction or the aft direction;
means for introducing pressurized, air different pressures to said charge chamber and said combustion chamber;
means for supplying high pressure fuel for combustion in said combustion chamber to cause said piston to move forward in said cylinder and to further compress high pressure air in said charge cylinder;
means for introducing high pressure fuel into said propulsor chamber for combusting with pressurized air introduced into said propulsor chamber from said charge chamber when said control valve is open.

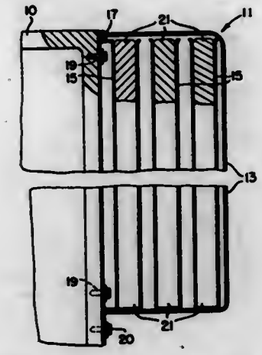
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**5,499,568**

## MODULAR PROTECTION SYSTEM

**James R. Turner, Campbell, Calif., assignor to FMC Corporation, Chicago, Ill.**

**Division of Ser. No. 245,715, May 18, 1994, Pat. No. 5,398,592. This application Dec. 12, 1994, Ser. No. 354,396**
**Int. Cl.[6] F41H *5/04;5/18***
**U.S. Cl. 89—36.08** **1 Claim**



1. An apparatus for protecting a vehicle, comprising:
an outer cover;
a plurality of removable armor panels, within the outer cover;
a movable joint for joining the outer cover to the vehicle, wherein at least part of the outer cover may be moved with respect to the vehicle; and
a plurality of mounting means, within the outer cover, wherein the plurality of mounting means comprises:
a plurality of spacers between the armor panels and the outer cover; and
a plurality of clamps mechanically connected to the armor panels and the spacers to hold the armor panels and spacers in place.

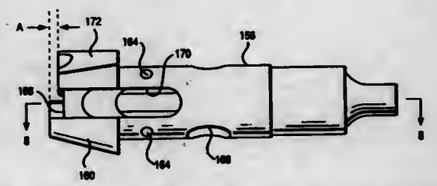
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**5,499,569**

## GAS-OPERATED RIFLE SYSTEM

**Brian D. Schuetz, Olympia, Wash., assignor to Olympic Arms, Inc., Olympia, Wash.**

**Continuation of Ser. No. 887,300, May 22, 1992. This application Apr. 12, 1995, Ser. No. 420,754**
**Int. Cl.[6] F41A *3/54***
**U.S. Cl. 89—197** **3 Claims**



1. A handheld rifle capable of firing short wide pistol cartridges, said rifle comprising:
a lower receiver having a magazine housing, a trigger and hammer assembly, a handgrip, a buffer assembly, and a buttstock assembly;
an upper receiver pivotally connected to said lower receiver;
a barrel attached to said upper receiver, said barrel having a rifled bore, a cartridge chamber adapted to receive a short wide pistol cartridge to be fired therein, said chamber communicating with said bore, and a breech chamber having a forcing cone formed therein;

a non-rotating bolt assembly slidably located in said upper receiver in a forwardly biased relationship by said buffer assembly and axially aligned with said barrel, and having a conical end adapted for close-fitting, non-locking sealing engagement in said forcing cone;

an extractor located resiliently in said bolt assembly and arranged to grip the rim of a cartridge in said cartridge chamber;

a firing pin slidably located in said bolt assembly and arranged to be activated by said trigger and hammer assembly to fire a cartridge located in said chamber; and

an ejector assembly located in said upper receiver and arranged to eject cartridges from said bolt assembly upon rearwardly movement of said bolt assembly;

wherein said bolt assembly conical end has a recessed bolt face adapted to receive a short wide pistol cartridge therein, an ejector groove extending at least partially therethrough, and a cartridge feed shoulder extending. downwardly therefrom.

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**5,499,570**

## PISTON WITH PISTON ROD BEING LATCHABLE THROUGH A RETAINING MEMBER

**Klaus Bergelin, Niederrahausen; Willi Hartmann, Riedstadt; Kurt Saalbach, Morfelden-Walldorf, and Peter Low, Gravenwiesbach, all of, Germany, assignors to ITT Automotive Europe GmbH, Germany**

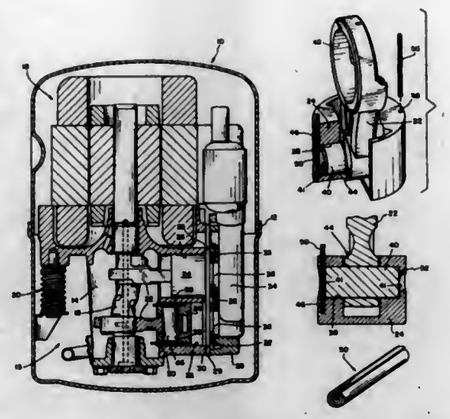
**PCT No. PCT/EP93/00306, § 371 Date Nov. 17, 1994, § 102(e) Date Nov. 17, 1994, PCT Pub. No. WO93/15942, PCT Pub. Date Aug. 19, 1993**

**PCT Filed Feb. 9, 1993, Ser. No. 284,633**

**Claims priority, application Germany, Feb. 14, 1992, 42 04 418.9; Sep. 30, 1992, 42 32 807.1**

**Int. Cl.[6] F16J *1/10*; F01B *29/00*; F16C *11/00***

**U.S. Cl. 92—84** **14 Claims**



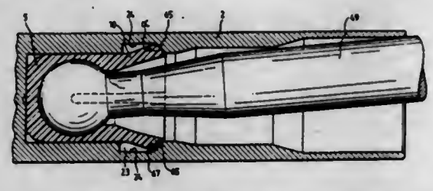
a crankcase disposed within said housing, said crankcase having a cylinder bore;

a piston reciprocably disposed within said cylinder bore, said piston having a wrist pin bore extending transversely therethrough, said piston having pin members disposed transversely through said wrist pin bore;

a connecting rod;

a wrist pin connecting said piston to said connecting rod, said wrist pin floatingly disposed within said wrist pin bore between said pin members, whereby said wrist pin is permitted to slide axially with respect to said wrist pin bore but is prevented from sliding against said cylinder bore during piston reciprocation.

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1. A piston assembly for hydraulic cylinders of automotive vehicles, in which a pistoo rod is swivellingly fixed to said piston assembly, comprising:

a piston having a recess, and undercuts in said recess,

an elastic retaining member which is fixed to said piston rod wherein said retaining member is formed by a hollow body which is formed with projections which grip behind an attachment at the end of the piston rod, and wherein said retaining member further includes resilient latching noses which reside within said under-cuts in the piston, wherein a plurality of circumferential bevels are provided along an outside surface of said cylindrical section, wherein said bevels have a different inclination which increases toward a bottom portion of said cylindrical section.

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**5,499,571**

## WRIST PIN - PISTON ASSEMBLY

**Neilk I. Dreiman, Tipton, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.**

**Filed Aug. 29, 1994, Ser. No. 297,586**

**Int. Cl.[6] F16J *1/14***

**U.S. Cl. 92—187** **13 Claims**

1. A compressor comprising:

a housing;

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**5,499,572**

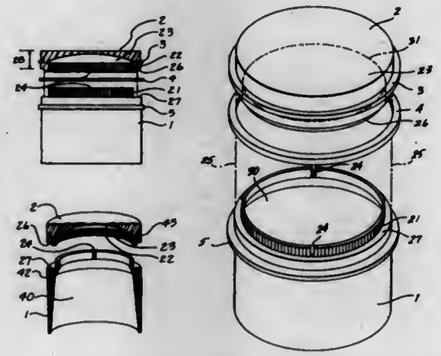
## BI-TECH PISTON

**Daniel L. Cobble, P.O. Box 2281, Oak Harbor, Wash. 98277**

**Continuation of Ser. No. 91,246, Aug. 26, 1993, abandoned. This application Apr. 14, 1995, Ser. No. 422,638**

**Int. Cl.[6] F16J *1/04*; F02F *3/00***

**U.S. Cl. 92—212** **19 Claims**



1. A modular piston, for use in a combustion-type engine for developing compression, in which said piston is manufactured as having a distinctive removable crown and skirt portions to form a composite assembly as said piston; said composite assembly having a crown of the piston, for direct contact with compression or combustion gases in a cylinder, in which the material or materials that compose said crown are of different material from said skirt, said skirt adapted to sustain, support, and bolster said crown during



movement through said cylinder, said crown and skirt being fastened together and keyed to prevent separation and relative rotation thereof during use, said crown being composed of metal and said skirt being composed of at least one of plastic composite, plastic based material, materials including plastics, resin-based epoxies, and silicon, said piston including further: a fastening means for securely binding said crown and said skirt as a composite assembly in a rotation resistant inter-engagement, in which said crown and said skirt are press-fitted together, at the underside of said crown and at the top of said skirt by mutually mated rims, as one of said mutually mated rims align the perimeter of the cross-surface clearance of said underside, and the other rim aligns said top perimeter of said skirt.

8. A modular piston for attachment to a force-transmitting rod and for use within a cylinder that is subject to substantial compressive forces of gases, the piston comprising:

(a) a skirt having a top and a bottom, said skirt being made of a lightweight strong material and being generally cylindrical in shape with a through opening extending from the bottom to the top, said skirt including an attachment means for securing the force-transmitting rod; and

(b) a crown removably attached to the top of said skirt, said crown being constructed of a different, higher density material than said skirt said crown material being strong enough to resist the compression forces within a cylinder, the through opening in the top of said skirt exposing at least a portion of the underside of the crown, wherein said skirt and said crown are attached with means for allowing significantly different rates of thermal expansion of said skirt and said crown, wherein said skirt includes a skirt rim projecting upwardly from the top thereof, and wherein said crown includes a crown rim projecting downwardly and being press fit over said skirt rim, said skirt rim including slots extending vertically therein for allowing adequate convergence of said skirt rim to accommodate the thermal expansion of said crown rim.

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**5,499,573**

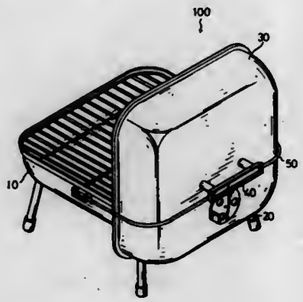
## BARBECUE GRILL

**Patrick Lin, 14th Fl., No. 128, Sec. 3, Min Sheng E. Rd., Taipei, Taiwan**

**Filed Aug. 4, 1995, Ser. No. 511,539**

**Int. Cl.[6] A47J *37/00***

**U.S. Cl. 99—337** **1 Claim**



1. A barbecue grill comprising:

a fire bowl for supporting a plurality of grids;

a plurality of legs extending from the fire bowl for supporting the fire bowl;

a lid with a grip in a center, top portion thereof;

a resilient handle secured on the opposite sides of the fire bowl via two fixation blocks secured on the fire bowl each defining an L-shaped channel for receiving the handle and an aperture in a corner of the L-shaped channel for the handle to extend therethrough and couple with the fire bowl so that a user may expand the resilient handle and pivotally adjust a position of the handle and the lid may be retained vertically among the fire bowl, one pair of the legs, and the handle when the handle is in a horizontal position.

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**5,499,574**

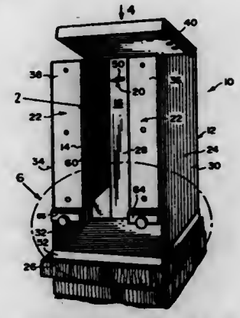
## VERTICALLY ORIENTED DUEL GRILL

**Michael Esposito, 10 Viking Ct., Nesconset, N.Y. 11767**

**Filed Jan. 17, 1995, Ser. No. 373,757**

**Int. Cl.[6] A47J *37/08***

**U.S. Cl. 99—339** **3 Claims**



1. A vertically oriented duel grill comprising:

a) a generally upstanding box-shaped housing having a latitudinal front opening with a cooking chamber therein, said housing being fabricated out of a heat resistant material, said housing including a bottom wall, a rear wall extending upwardly from said bottom wall, a right side wall extending upwardly from said bottom wall, a left side wall extending upwardly from said bottom wall, and a front wall divided into two latitudinal segments thereby having said front opening and suspended upwardly above said bottom wall, so as to form said cooking chamber therein, said housing further including a perforated removable top cover to fit over said cooking chamber in said housing, said housing further including a pullout drip pan located over said bottom wall, so as to catch the fats and liquids that drip down from the food in said cooking rack in said cooking chamber;

b) means for holding food to be cooked, said food holding means being a cooking rack, said cooking rack including a pair of folding skeletal leaves, a pair of handles, each extending from one said skeletal leaf, and a clamp over said handles for holding said skeletal leaves together;

c) means for vertically suspending said holding means within said cooking chamber in said housing through said front opening, said vertical suspending means being a bracket hook affixed to said back wall at an upper center interior surface in said cooking chamber behind said front opening in said front wall; and

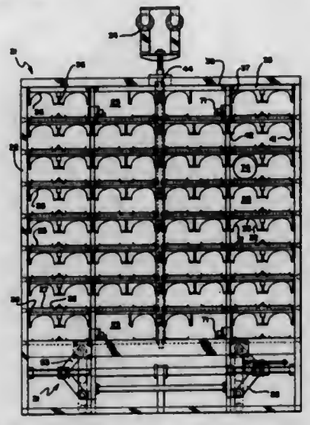
d) means within said cooking chamber for supplying heat to opposite sides of said food holding means, so that the food can be cooked on both sides simultaneously, while any fats and liquids from the food can drip down away from the food and the heat supply means, thereby preventing the build up of carcinogens on the food being cooked, said heat supplying means including a right inner side perforated partition wall spaced parallel away from said right side wall between said first segment of said front wall and said rear wall, to form a first heating compartment for charcoal to be deposited and heated therein, and a left inner side perforated partition wall spaced parallel away from said left side wall between said second segment of said front wall and said rear wall, to form a second heating compartment for charcoal to be deposited and heated therein, said heat supplying means further including a first pullout ashtray under said first heating compartment, and a second pullout ashtray under said second heating compartment.

5,499,575

## FOOD LOAF SHAPING AND TEXTURIZING RACK

Gary A. Handel, Austin, Minn.; John A. Jonovic, Fitchburg, and Otto L. Krueger, Madison, both of Wis., assignors to Oscar Mayer Foods Corporation, Madison, Wis.

Filed May 26, 1994, Ser. No. 249,563
Int. Cl.[6] A22C 7/00; A23P 1/00
U.S. Cl. 99—349 19 Claims



1. A rack apparatus for forming food cylinders into food loaves having a shape which, when sliced, emulates food product slices from naturally occurring food sources such as whole muscle meat sources, the rack apparatus comprising:

a frame assembly generally defining at least one elongated compartment;

an elongated bottom plate within said compartment;

an elongated top plate within said compartment and generally oppositely disposed with respect to said elongated bottom plate;

at least one of said elongated plates has a plurality of indents defining a latticed inside surface;

said elongated bottom plate and elongated top plate combine to define a loaf-forming cavity which receives a food cylinder at a time when said cavity has a selected initial height of separation between said elongated bottom plate and said elongated top plate; and

a moving assembly for controllably moving one or more of said elongated plates with respect to each other while the food cylinder is within said loaf-forming cavity until said selected initial height is reduced to a chosen compression height of said cavity.

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5,499,576

## TABLETOP DEVICE FOR THE PREPARATION OF MEALS

Roger Grunder, Bleiki, CH-8143 Stallikon, Switzerland

Filed Mar. 24, 1994, Ser. No. 216,937
Claims priority, application Switzerland, Mar. 29, 1993, 952/93
Int. Cl.[6] A47J 37/04; F24C 1/16
U.S. Cl. 99—421 H 5 Claims

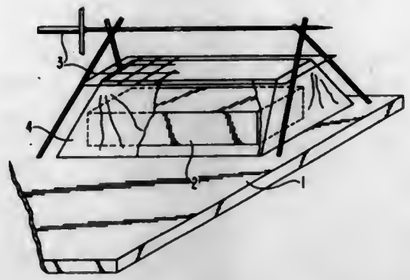
1. A tabletop device for the preparation of meals, comprising:

a plate;

a burner having side walls and being positioned on the plate, the burner receiving fuel to be burned;

a removable grilling carrier supported above the burner, and comprising one of a grilling grid and a revolving spit; and

a chimney hood having side walls surrounding the burner, the chimney hood side walls being laterally separated from the burner side walls by a distance so as to define an air flow



channel; at least a portion of the chimney hood side walls extending towards the plate and being separated from the plate by a distance to form an opening so that ambient air can communicate with the air flow channel; said one of a grilling grid and a revolving spit being supported over said chimney hood.

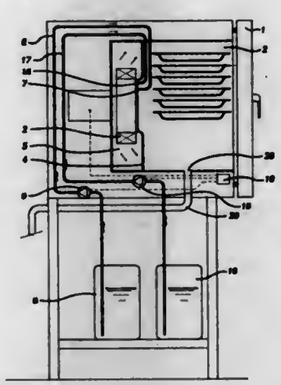
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5,499,577

## AUTOMATIC SELF-CLEANING ARRANGEMENT OF A COOKING OVEN

Stelvio Tommasini, Pordenone, Italy, assignor to Zanussi Grandi Impianti S.p.A., Pordenone, Italy

Filed Oct. 31, 1994, Ser. No. 331,720
Claims priority, application Italy, Nov. 4, 1993, PN93A0069
Int. Cl.[6] A47J 27/10
U.S. Cl. 99—476 12 Claims



1. A food cooking oven comprising a cooking cavity, an access door closing said cavity, a motor-driven fan situated on a back side of said cooking cavity, a partition wall provided to diffuse air flow generated by said fan, a chamber accommodating said fan and defined in part by said partition wall, wherein the oven is provided with a conduit, a first end portion of said conduit having a nozzle disposed adjacent the fan and a second end portion of said conduit being divided into first and second distinct branches, said first branch being connected to a reservoir containing a detergent substance and said second branch being connected to a reservoir containing a rinsing liquid wherein said nozzle is adapted for spraying at least one of said detergent and said rinsing liquid onto said fan so as to be diffused into said cooking cavity.

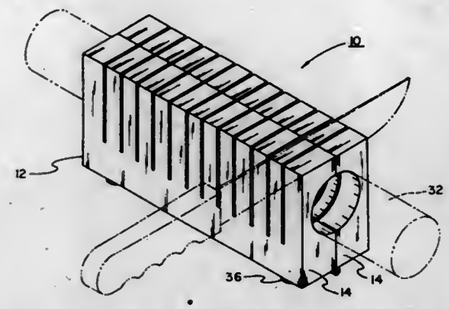


5,499,578

## SAUSAGE CUTTER

Patricia K. Payne, 702 Stony Creek, Sutton, W. Va. 26601

Filed Feb. 23, 1995, Ser. No. 393,199
Int. Cl.[6] A22C 9/00; A47J 43/00
U.S. Cl. 99—537 2 Claims



1. A sausage cutter for enabling the user to cut frozen sausage without the need to place fingers in the proximity of a cutting blade comprising, in combination:

a cutting block comprising two portions, each of the two portions having an upper surface, a lower surface, an inner surface, and an outer surface, the two portions hingedly secured together at the lower surface thereof, each inner surface having a longitudinally oriented concave recess formed therein, when the two portions are closed together each concave recess forms a containment chamber, each lower surface having a recess formed therein at opposing ends thereof, each of the two portions having a plurality of transversely oriented slots extending downwardly through the upper surface thereof to a position below the longitudinally oriented concave recess, the two portions serving to contain a sausage within the containment chamber formed by the longitudinally oriented concave recesses as the two portions are closed together;

four small legs, each of the small legs having a first end and a second end, each first end dimensioned to be received within the recesses formed in the lower surface of the two portions of the cutting block, each second end having a non-skid rubber surface thereon.

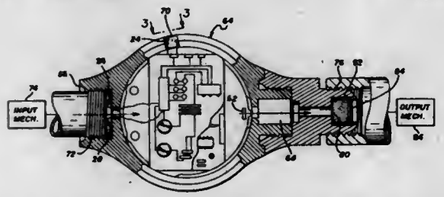
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5,499,579

## DELAY ORDNANCE SYSTEM

Donald J. Lewis, Scottsdale, Ariz., assignor to Universal Propulsion Company, Inc., Phoenix, Ariz.

Filed Oct. 22, 1993, Ser. No. 141,260
Int. Cl.[6] F42B 3/00; F42C 15/40
U.S. Cl. 102—331 24 Claims




1. In combination for receiving an input from an input mechanism and for providing a housing for an output mechanism,

a first switch having first and second operative relationships,

a second switch having first and second operative relationships,

a pyrotechnic device,

an energy source,

energy storage means,

means for short circuiting the pyrotechnic device in the first operative relationship of the first switch,

means for disconnecting the energy source in the first operative relationship of the second switch,

means for connecting the energy source and the energy storage means to obtain the storage of energy in the energy storage means in the second operative relationship of the second switch,

a third switch having conductive and non-conductive states and normally operative in the non-conductive state,

means for preventing a timing period from being initiated in the first operative relationship of the second switch,

means for initiating the start of the timing period in the second operative relationship of the second switch and for producing the conductivity of the third switch at the end of the timing period,

means for connecting the energy storage means, the first switch, the pyrotechnic device and the third switch in a circuit in the second operative relationship of the second switch and the conductive state in the third switch to obtain a discharge of the energy in the energy storage means through the pyrotechnic device for a firing of the pyrotechnic device, and

a housing for holding the first, second and third switches, the energy source, the energy storage means and the pyrotechnic device.

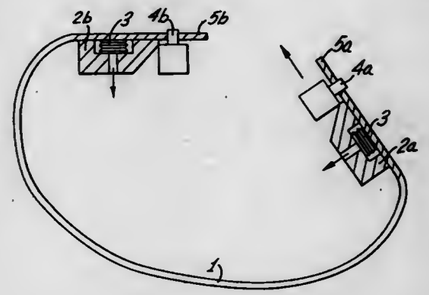
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5,499,580

## PROCESS FOR FABRICATING A SLEEVE SHAPED PRINTING FORM

Eduard Hoffmann, Bobingen; Johann Winterholler, Friedberg, and Wolfgang Prem, Kutzenhausen, all of, Germany, assignors to MAN Roland Druckmaschinen AG, Offenbach am Main, Germany

Filed Nov. 2, 1994, Ser. No. 333,216
Claims priority, application Germany, Nov. 11, 1993, 43 38 467.6
Int. Cl.[6] B41N 1/16; B21C 37/08
U.S. Cl. 101—375 5 Claims



1. A process for the manufacture of a sleeve-shaped printing form dimensioned for placement over a form cylinder of a printing machine, comprising the steps of:

providing a plate shaped, metallic print form base having a length greater than a circumference of an intended printing form and a width corresponding to a width of the form cylinder;

bending the print form base to align opposite edges thereof in a bending device;

cutting the print form base to produce at least one waste piece and a final blank having a length corresponding to the circumference of the intended printing form and having first and second aligned opposite edges;

providing the print form base with edge aligning indicia in a region of the base defining the at least one waste piece, prior to said bending step;

positioning, after said cutting step, the first and second aligned opposite edges in contiguous, facing relation without overlap; and

welding the first and second aligned opposite edges together to form the printing form.

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**5,499,581**

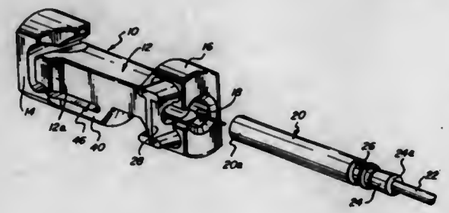
## MOLDED ARTICLE HAVING INTEGRAL DISPLACEABLE MEMBER OR MEMBERS AND METHOD OF USE

**Daniel P. Sutula, Jr., Bristol, Conn., assignor to The Ensign-Bickford Company, Simsbury, Conn.**

**Filed May 26, 1994, Ser. No. 249,522**

**Int. Cl.[6] C06C 5/06**

**U.S. Cl. 102—275.12** **27 Claims**



1. A molded plastic article comprising a body member having receiving means comprising a bore formed within the body member, the bore having a longitudinal axis and being dimensioned and configured to receive and retain therein a mountable member having at least a part thereof dimensioned and configured to be received within the bore, the mountable member having first engagement means formed thereon, the first engagement means being dimensioned and configured to be engaged by second engagement means whereby the mountable member is retained on the body member;

at least one displaceable member having the second engagement means formed thereon, the displaceable member being integrally molded with the body member and connected thereto by frangible web means which retain the displaceable member in a first position in which the displaceable member is aligned with but displaced from a locking position in which the second engagement means of the displaceable member engages the first engagement means of such mountable member, the displaceable member being displaceable in a direction transverse to the longitudinal axis of the bore from its first position to its locking position by application of force to the displaceable member to rupture the frangible web means and move the displaceable member in said direction to force the first and second engagement means into locking engagement with each other.

**5,499,582**

## PROJECTILE

**Alois Schiessl; Wolfgang Steinicke, both of Marzoll; Wolfgang Trede, Weil am Rhein, and Hartmut Krone, Auggen, all of, Germany, assignors to Buck Chemische-Technische Werke GmbH & Co., Bad Reichenhall, Germany**

**Filed Mar. 8, 1979, Ser. No. 23,526**

**Claims priority, application Germany, Mar. 14, 1978, 28 11 016.9**

**The portion of the term of this patent subsequent to Aug. 29, 2006, has been disclaimed.**

**Int. Cl.[6] F42B 12/48**

**U.S. Cl. 102—334** **23 Claims**



1. A projectile consisting of a contact head having a box-shaped centrally disposed interior charge chamber containing a propellant charge, ports for firing leads and an outer casing therearound, said contact head having connected thereto a screen material canister (3) consisting of a drawn aluminum container having a base (29), a plate (71) located in the bottom of the canister for fastening the canister to the contact head, and aluminum container (3) being composed of wall (41) being closed at its top (43) by flanging with an aluminum cover (5), said canister containing a screen material, the outer casing of the contact head having contact rings arranged thereon which are connected via firing leads to a primer capsule, said charge chamber being gas-tight by virtue of a screw cover at its base and at the firing lead ports by virtue of a sealing agent, the screw cover having rupture discs thereon for the escape of the propellant gas upon ignition, the canister having therein a centrally disposed tube-like igniter-destructor unit with an igniter-destructor charge for igniting the screen material contained in the canister and fragmenting the canister wall, the contact head and canister being securely connected to one another by bolts and having disposed between the two, a delayed action fuse assembly which communicates with the igniter-destructor unit and the interior charge chamber.

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**5,499,583**

## RAILWAY SWITCH

**Gottfried Blümel, Odelzhausen, Germany, assignor to Magnetbahn GmbH, Starnberg, Germany**

**Filed Dec. 16, 1994, Ser. No. 358,164**

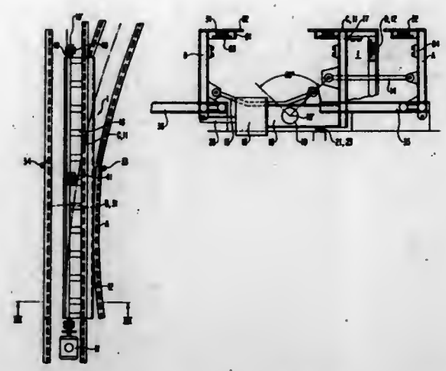
**Claims priority, application Germany, Dec. 18, 1993, 43 43 395.5**

**Int. Cl.[6] E01B 26/00;25/12**

**U.S. Cl. 104—130.03** **9 Claims**

1. In a railway switch for a railway track guiding and supporting vehicles propelled by a linear motor; the switch having a rightward switch position for coupling a track with a right track and a leftward switch position for coupling the track with a left track;





each track having a right rail and a left rail; and said switch having a first or right rail of the rightward switch position, a second or left rail of the rightward switch position, a third or right rail of the leftward switch position and a fourth or left rail of the leftward switch position; the improvement comprising

(a) a turning segment including

(1) a movable carrier member;

(2) said second rail carried by the carrier member for moving therewith as a unit;

(3) said third rail carried by the carrier member for moving therewith as a unit; and

(4) bearing means for rotatably supporting said carrier member;

(b) a first switch tongue for shiftably supporting said first rail;

(c) a second switch tongue for shiftably supporting said fourth rail; and

(d) means for rotating said turning segment through substantially 90° into first and second positions and means for shifting said first and second switch tongues into first and second positions; in said first position of said turning segment and said first and second switch tongues, said switch assuming said rightward switch position in which said first and second rails are in an operative state and said third and fourth rails are in a withdrawn, inoperative state; and in said second position of said turning segment and said first and second switch tongues, said switch assuming said leftward switch position in which said third and fourth rails are in an operative state and said first and second rails are in a withdrawn, inoperative state.

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**5,499,584**

## RETRACTABLE ADJUSTABLE SHELF APPARATUS

**Michael J. Taylor, 6 B Durban Ct., Baltimore, Md. 21236-5133**

**Filed Dec. 7, 1994, Ser. No. 350,458**

**Int. Cl.[6] A47B 57/00**

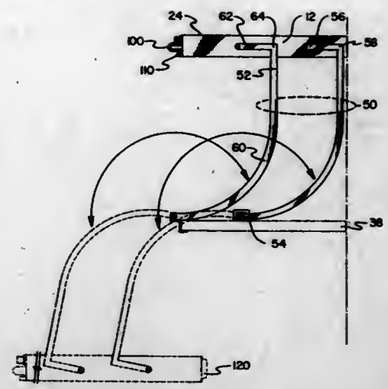
**U.S. Cl. 108—96** **7 Claims**

2. A retractable adjustable shelf apparatus for holding items thereupon comprising:

a hollow first shelf formed of a top wall, a bottom wall, and a periphery interconnecting the top wall and bottom wall with the periphery further formed of a front wall, a rear wall, and opposed side walls;

a pair of brace mechanisms with each brace mechanism including a strut having a first end and a second end with the first end pivotally couplable to a separate external second shelf; and

a pair of level adjustment mechanisms with each level adjustment mechanism disposed within the first shelf at location near a separate side wall thereof, each level adjustment mechanism further comprising an elongated longitudinally slidable geared upper track slidably coupled to the top wall, an elongated geared lower track coupled to the bottom wall, a gear disposed between and in mesh with the tracks and with the gear coupled to the second end of the strut, and a spring-loaded bolt extended from one end of the upper track and through the front wall to terminate at a knob, and with the knob being turnable for allowing the first track to be slid to a desired position for permitting the levelness of the first shelf to be adjusted when coupled to and pivoted with respect to a separate external second shelf.



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**5,499,585**

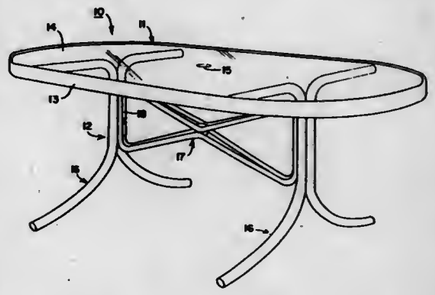
## TRESTLE TABLE

**Robert D. Vanderminden, Sr., Granville, N.Y., assignor to Telescope Casual Furniture Co., Granville, N.Y.**

**Filed May 27, 1994, Ser. No. 266,012**

**Int. Cl.[6] A47B 3/06**

**U.S. Cl. 108—153** **25 Claims**



1. A leg assembly for supporting a table top thereon, said leg assembly comprising

a pair of spaced apart leg units, each leg unit having a vertically disposed mounting plate located centrally thereof, said mounting plate having a pair of vertically spaced slots therein with each slot having an entrance portion and a depending portion extending from said entrance portion; and

a cross-piece unit disposed transversely between and removably connected to said leg units, said cross-piece unit having a pair of parallel vertical portions at each end and a pair of spacers spacing said vertical portions apart at each said end, each pair of vertical portions receiving said mounting plate of a respective leg unit therebetween with said spacers disposed in said slots of a respective mounting plate.

**5,499,586**

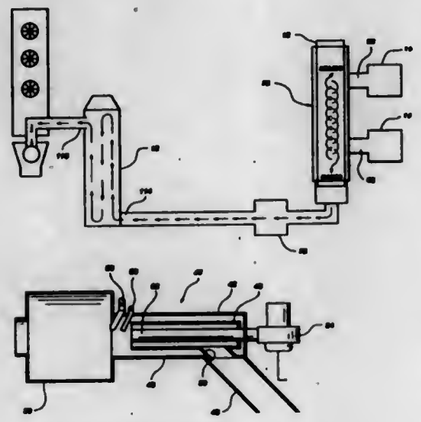
## SOIL DECONTAMINATION AND REMEDIATION SYSTEM

**Kenneth W. Davis, Mountain View, Wyo., assignor to Material Processing, Inc., Salt Lake City, Utah**

**Continuation-in-part of Ser. No. 201,313, Feb. 24, 1994, abandoned. This application Nov. 30, 1994, Ser. No. 346,783**

**Int. Cl.[6] A47J** *36/00*

**U.S. Cl. 110—246** **10 Claims**



1. A soil remediation apparatus, comprising:

(a) a heat energy generator comprising

(1) a vaporization chamber for receiving and holding waste materials to be vaporized;

(2) air supply means for supplying air under slight pressure into the vaporization chamber;

(3) fuel supply means for supplying fuel into the vaporization chamber;

(4) a volatile gas withdrawal manifold communicating with the vaporization chamber for withdrawing volatile gases from the vaporization chamber;

(5) a mixing chamber having a volatile gas inlet communicating with the volatile gas withdrawal manifold, air pressure means for introducing pressurized air thereinto, a fuel injector, and ignition means for igniting a gas\fuel\air mixture, and an outlet; and

(6) a combustion chamber that communicates with the mixing chamber outlet, the combustion chamber having an outlet;

(b) a soil remediator, comprising:

(1) a housing communicating with the combustion chamber outlet, whereby ignited gas/fuel/air mixture acts directly into the interior of the housing;

(2) a rotary drum mounted for rotation about its longitudinal axis within the housing, the drum having an inlet and an outlet adjacent opposite ends thereof;

(3) vane means within the rotary drum for migrating the soil within the drum as the drum rotates;

(4) a discharge outlet formed in the housing adjacent the drum outlet for discharging the soil from the housing; and

(5) a vapor discharge outlet for withdrawing volatile vapors from the contaminated soil; and

(c) a hydrocarbon recovery system comprising:

(1) a housing having a hydrocarbon vapor inlet communicating with the soil remediation vapor discharge outlet, and an exhaust gas outlet;

(2) condensing means for condensing the hydrocarbon vapor from exhaust gases.

**5,499,587**

## SULFUR-SORBENT PROMOTER FOR USE IN A PROCESS FOR THE IN-SITU PRODUCTION OF A SORBENT-OXIDE AEROSOL USED FOR REMOVING EFFLUENTS FROM A GASEOUS COMBUSTION STREAM

**Domingo Rodriquez, Edo Miranda, Venezuela; Roy Payne, Mission Viejo, Calif.; Cebers Gomez; Jose Carrazza, both of Miranda, Venezuela, and John Kramlich, Irvine, Calif., assignors to Intevep, S.A., Caracas, Venezuela**

**Continuation-in-part of Ser. No. 498,952, Mar. 26, 1990, which is a continuation-in-part of Ser. No. 263,896, Oct. 28, 1988, Pat. No. 4,923,483, which is a division of Ser. No. 96,643, Sep. 11, 1987, Pat. No. 4,795,478, which is a continuation-in-part of Ser. No. 14,871, Feb. 17, 1987, Pat. No. 4,834,775, which is a continuation-in-part of Ser. No. 875,450, Jun. 17, 1986, Pat. No. 4,891,304, which is a continuation-in-part of Ser. No. 342,148, Apr. 24, 1989, Pat. No. 4,976,745, which is a continuation-in-part of Ser. No. 133,323, Dec. 16, 1987, Pat. No. 4,824,439, which is a continuation-in-part of Ser. No. 14,871, Feb. 17, 1987, Pat. No. 4,834,775. This application Feb. 19, 1991, Ser. No. 657,103**

**Int. Cl.[6] F23B** *7/00*; **F23J** *7/00*

**U.S. Cl. 110—342** **26 Claims**

1. A process for the in-situ production of an effluent sorbent-oxide aerosol during the combustion of a hydrocarbon containing fuel whereby effluents are removed from the resultant gaseous hydrocarbon combustion stream comprising: (1) forming an aqueous solution comprising an effluent sorbent compound selected from the group consisting of $CaCl_2$, $Ca(NO_3)_2$, $Ca(CH_3COO)_2$, $Ca(C_2H_5COOH)_2$, $Ca(CHOO)_2$, $Ca(OH)_2$, $CaO$ and mixtures thereof and a promoter selected from the group consisting of salts of Fe, Cu, Mn, B, Al, Na, K, P, V, Zn, Ni and mixtures thereof dissolved in water; (2) admixing the aqueous solution of the effluent sorbent compound and promoter with a hydrocarbon containing fuel so as to form a combustible fuel mixture; (3) atomizing said combustible fuel mixture and feeding said atomized fuel to a combustion zone; (4) combusting said atomized fuel mixture in said combustion zone under controlled temperature conditions $T_1$ wherein $T_1$ is between about 1525° K to about 2450° K in the presence of an oxygen containing oxidant so as to obtain a sorbent-oxide aerosol with promoter comprising ultra-fine calcium sorbent-oxide particles having a mean diameter of less than 1.5 um in said gaseous combustion stream; and (5) cooling said gaseous combustion stream to a temperature $T_2$ wherein $T_2$ is between about 700° K to about 1500° K so that said calcium sorbent-oxide particles absorb said effluents from said gaseous combustion stream.

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**5,499,588**

## METHOD AND APPARATUS FOR PRODUCING TUFTS IN LONGITUDINAL LINES

**Roy T. Card, Chattanooga, Tenn., and Wilton Hall, Fort Oglethorpe, Ga., assignors to Card-Monroe Corp., Chattanooga, Tenn.**

**Continuation of Ser. No. 66,780, May 24, 1993, abandoned, which is a continuation of Ser. No. 934,292, Aug. 24, 1992, Pat. No. 5,224,434, which is a continuation of Ser. No. 653,766, Feb. 11, 1991, abandoned. This application Jul. 14, 1994, Ser. No. 275,077**

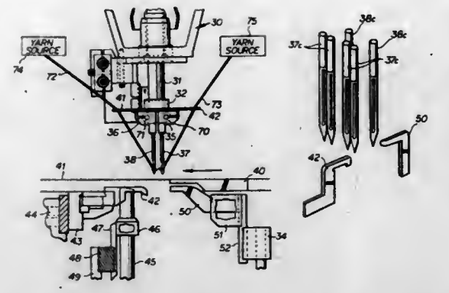
**The portion of the term of this patent subsequent to Jul. 6, 2010, has been disclaimed.**

**Int. Cl.[6] D05C** *15/30*

**U.S. Cl. 112—80.41** **6 Claims**

1. A tufting machine having a frame through which a backing





material is fed along a longitudinal path, a reciprocatable front needle bar disposed on one side of said backing material, transversely spaced front needles carried by said front needle bar for inserting first yarns carried by said front needles through said backing material for producing successive first tufts of first yarns in said backing material upon reciprocation of said front needle bar, a reciprocatable rear needle bar disposed on said one side of said backing material, transversely spaced rear needles carried by said rear needle bar for inserting second yarns carried by said rear needles through said backing material for producing successive second tufts of second yarns in said backing material upon reciprocation of said rear needle bar, means for reciprocating said front needle bar and said rear needle bar, a plurality of loopers cooperating with said front needles and said rear needles, said loopers having first bill portions and second bill portions for catching and holding the yarns carried by said front needles and the yarns carried by said rear needles when the needles are inserted through the backing material, said first bill portions cooperating with said front needles and said second bill portions cooperating with said rear needles, said first bill portions being respectively aligned longitudinally along the path of travel of said backing material with said second bill portions so that tufts of yarns sewn by said front needles and by said rear needles are sewn in individual longitudinal rows along said backing material, the front needles being arranged in front groups of needles which have a prescribed gauge spacing between needles in each front group, the spacing between adjacent needles in adjacent of said front groups of said front needles being greater than said prescribed spacing, such that when said front needle bar is reciprocated, to form first groups of first tufts and is shifted and reciprocated again according to a prescribed pattern to form second groups of first tufts, the first groups are transversely spaced from each other and the first groups are longitudinally spaced from the second groups; said rear needles also being arranged in groups of needles so that when said rear needle bar is reciprocated and shifted according to said prescribed pattern, said rear needles will supply second tufts substantially only in longitudinal spaces between adjacent of said groups of first tufts in the respective longitudinal rows of first tufts, thereby producing parallel longitudinal rows of tufts in which each row has first tufts and second tufts interspersed and in aligned succession with respect to each other;

means for shifting of said front needle bar and said rear needle bar transversely with respect to each other and with respect to said backing material in timed relationship to the travel of said backing material and to each other so that the front needles are at times selectively aligned with different of said first bill portions and the rear needles are at times selectively aligned with different of said second bill portions in producing the interspersed tufts of the longitudinal rows of tufts in said backing material.

**5,499,589**

## METHOD AND APPARATUS FOR PRODUCING IMAGE DATA TO BE USED BY EMBROIDERY DATA PROCESSING APPARATUS

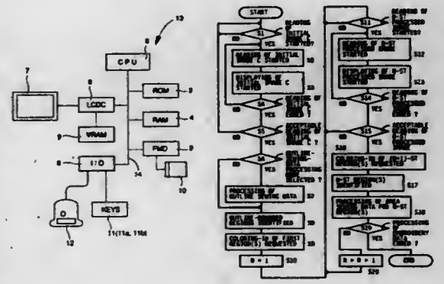
**Mitsuyasu Kyuno, Aichi; Masahiro Mizuno, Nagoya; Masao Futamura, Nagoya, and Yukiyoshi Muto, Nagoya, all of, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan**

**Filed Feb. 21, 1995, Ser. No. 391,170**

**Claims priority, application Japan, Feb. 25, 1994, 6-027734**

**Int. Cl.[6] D05B** *21/00*; **D05C** *5/06*

**U.S. Cl. 112—102.5** **25 Claims**



13. An apparatus for producing image data defining an original image comprising at least one outline-bounded region having at least one outline and an inside area bounded by the outline, the apparatus comprising:

an image detector which detects, from an original having an initial original image comprising said outline of said at least one outline-bounded region, said initial original image so as to produce initial image data defining at least one of said outline of said region and said inside area of the region,

a first memory which stores said initial image data;

said image,detector detecting an initially processed original image obtained by processing said initial original image of said original by forming, with a material detectable by said image detector, at least one detectable image in the inside area of at least one current region out of said at least one outline-bounded region thereby forming at least one initially processed region, so as to produce initially processed image data defining said initially processed original image;

a second memory which stores said initially processed image data; and

identifying means for identifying the at least one initially processed region based on a difference of said initial image data stored in said first memory and said initially processed image data stored in said second memory.

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**5,499,590**

## THREAD GUIDE HOLDER DEVICE FOR SEWING MACHINE

**Makoto Kamewada, and Shinji Kojima, both of Utsunomiya, Japan, assignors to The Singer Company N.V., Curaco, Netherlands Antilles**

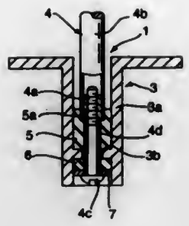
**Filed Nov. 9, 1994, Ser. No. 336,585**

**Claims priority, application Japan, Nov. 17, 1993, 5-065868**

**Int. Cl.[6] D05B** *53/00*

**U.S. Cl. 112—302** **1 Claim**

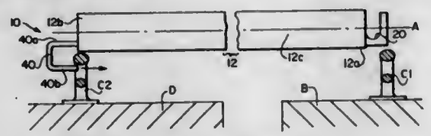
1. A thread guide holder device comprising a thread guide holder mounted on a spool stand base and having thread guides for guiding threads therethrough, said thread guide holder including a thread guide holder body received within said spool stand base, wherein said thread guide holding device further comprises damping material disposed between said spool stand base and said thread guide holder body.



a forward member comprising a first longitudinally extending shaft and forward fins which extend from said first shaft;
an aft member comprising a second longitudinally extending shaft and aft fins which extend from said second shaft, wherein said first shaft and said second shaft are rotatably connected in axial alignment;
means for grasping said aft member, said means for grasping comprising at least one handle being directly connected between adjacent fins; and
said forward fins each defining a cut-out to permit a full range of rotational movement of said forward fins relative to said aft fins when said means for grasping are grasped by the rider.

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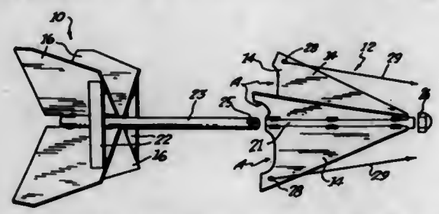
**5,499,591**
**MOORING DEVICE FOR BOATS**
**Laura L. Chippas, 1450 SW. 10th St., Bay #2, Delray Beach, Fla. 33444**
**Filed Feb. 16, 1995, Ser. No. 389,411**
**Int. Cl.[6] B63H** *21/00*
**U.S. Cl. 114—230** **13 Claims**



1. A mooring device for boats comprising:
an elongate arm having a first end, a second end, and a longitudinal axis, said arm having a slot therein adjacent said first end, said slot extending transversely in a plane perpendicular to said longitudinal axis, and said slot being dimensioned to received a cleat therein;
means for locking a cleat in said slot; and
a hook having a free leg and an attached leg, said hook being mounted by said attached leg to said second end of said arm for rotation about an axis parallel to said longitudinal axis of said arm, said hook being rotatable between a closed position in which said free leg opposes said second end and an open position in which said free leg is spaced from said second end, said hook in said closed position lying in a plane perpendicular to said plane of said slot, and said hook being dimensioned to engage a cleat.

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**5,499,592**
**AQUATIC AMUSEMENT DEVICE**
**Robert W. Monfort, 1515 Harding St., Hollywood, Fla. 33020**
**Continuation of Ser. No. 105,303, Aug. 11, 1993, abandoned, which is a continuation of Ser. No. 833,629, Feb. 7, 1992, Pat. No. 5,263,430, which is a continuation of Ser. No. 499,019, Mar. 26, 1990, abandoned. This application Aug. 17, 1994, Ser. No. 292,064**
**Int. Cl.[6] B63B** *21/56*
**U.S. Cl. 114—244** **4 Claims**



1. A device by which a rider may be towed below or on the surface of a body of water behind the device, said device comprising:

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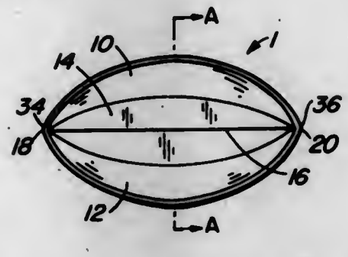
**5,499,593**
**BOAT HULL**
**Manfred Raab, 39, Syngrou Avenue, Athens, Greece**
**PCT No. PCT/EP90/02028, § 371 Date May 22, 1992, § 102(e) Date May 22, 1992, PCT Pub. No. WO91/08137, PCT Pub. Date Jun. 13, 1991**
**PCT Filed Nov. 27, 1990, Ser. No. 859,354**
**Claims priority, application Austria, Nov. 27, 1989, 2713/89**
**Int. Cl.[6] B63B** *1/04*
**U.S. Cl. 114—271** **16 Claims**



1. A high speed planing craft having a hull comprising:
an underside forming a curved profile extending continuously from a bow end to a stern end;
a chord line extending linearly from the bow end to the stern end, the chord line defining a positive angle with the horizontal plane, the angle being less than 4 degrees and greater than 1.3 degrees when the boat hull is loaded and trimmed and when the boat is unloaded and trimmed; and
a vertex point along the profile defined by the greatest vertical distance from the profile to the chord line, the vertex point being closer to the bow end than the stern end.

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**5,499,594**
**COLLAPSIBLE TENSION-COMPRESSION VARIABLE HULL STRUCTURE**
**Donald C. Bullock, 31 Logging Hill Rd., Bow, N.H. 03304**
**Filed Sep. 29, 1994, Ser. No. 315,255**
**Int. Cl.[6] B63B** *7/00*
**U.S. Cl. 114—354** **3 Claims**



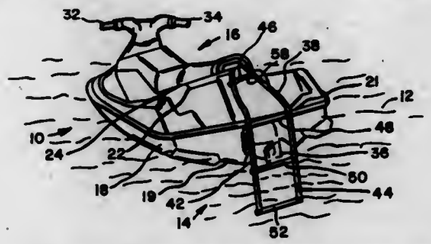
1. A collapsible hull having an adjustable hull shape comprising
(a) two hull sidewalls constructed of bendable sheets of material connected and sealed at the bow and stern end portions of the hull,
(b) said sidewalls being connected and sealed to a bottom constructed of a flexible and waterproof material,



(c) at least one elongate and adjustable tension member attached to and extending between the bow and stern end portions of the hull,
(d) means for increasing or decreasing the tension of said at least one tension member,
whereby the hull width is increased by increasing the tension in said at least one tension member, the hull width and tension being adjustable over a wide range.

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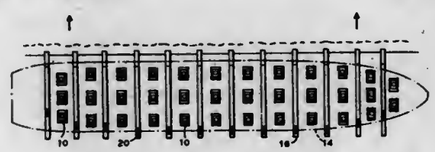
**5,499,595**
**PERSONAL WATER CRAFT WITH REAR MOUNTING MEANS**
**Randall P. Pollen, 1237 E. 900 N., Milford, Ind. 46542**
**Continuation-in-part of Ser. No. 376,845, Jan. 23, 1995, abandoned. This application Jun. 5, 1995, Ser. No. 463,017**
**Int. Cl.[6] B63B** *17/00*
**U.S. Cl. 114—362** **12 Claims**



1. In a personal water craft having a unitary housing with a compartment therein for retaining a source of power, said compartment having an opening therein, a seat member having a first edge hinged to said housing and a second edge with a movable projection thereon, a clasp fixed to said housing, said movable projection engaging said clasp to join said seat member to said housing and close said opening, said source of power being adapted to propel said personal water craft through an aquatic environment in response to an in input from an operator positioned on said seat member, the improvement comprising:
mounting means secured to said clasp and selectably extendible from said housing into said aquatic environment in response to an operator located in said aquatic environment, said mounting means providing structure for an operator to move from said aquatic environment onto said seat member.

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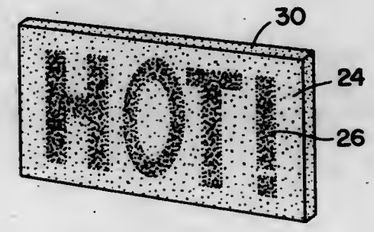
**5,499,596**
**MARINE VESSEL LAUNCH APPARATUS UTILIZING EXPLOSIVE TRIGGERS**
**Gayle C. Brown, Gretna; Juan J. Campo, Metairie; Philip F. Heiser, Schriever, and Steven M. McKnight, Slidell, all of La., assignors to McDermott International, Inc., New Orleans, La.**
**Filed Mar. 23, 1995, Ser. No. 409,290**
**Int. Cl.[6] B63B** *23/00*
**U.S. Cl. 114—375** **3 Claims**



1. In a marine vessel launch facility having skidways for supporting and launching a vessel into a body of water, a vessel tieback/support and release apparatus, comprising:
a. a support bracket rigidly attached to the skidway, said bracket having a bore therethrough;
b. a cradle wedge having a bore therethrough coaxial with the bore in said support bracket, said cradle wedge being slidably received on the skidway;
c. a bolt received through the bores in said support bracket and cradle wedge;
d. a frangible nut threadably received on said bolt for temporarily holding said cradle wedge adjacent said support bracket;
e. means for causing shearing of said frangible nut to detach said cradle wedge from said support bracket; and
f. a jack mounted on the skidway for imparting positive pressure on said cradle wedge.

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**5,499,597**
**OPTICAL TEMPERATURE INDICATOR USING THERMOCHROMIC SEMICONDUCTORS**
**James W. Kronberg, 108 Independent Blvd., Aiken, S.C. 29801**
**Continuation-in-part of Ser. No. 332,068, Nov. 1, 1994. This application Jan. 3, 1995, Ser. No. 367,605**
**Int. Cl.[6] G01K** *1/02;11/12*
**U.S. Cl. 116—216** **18 Claims**

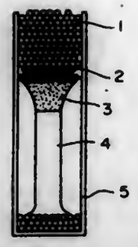


1. An optical temperature indicator comprising:
a thermochromic semiconductor material;
said thermochromic semiconductor material being contained within a first vitreous enamel and coated as indicia on a sign so that increased temperature causes the thermochromic semiconductor material to reversibly change color in response to variations in temperature to provide a warning;
a second vitreous enamel;
said second vitreous enamel surrounding said indicia and covering the other surfaces of the sign;
said second vitreous enamel having a color which does not change significantly in response to temperature.

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**5,499,598**
**METHOD FOR PRODUCING A SILICON ROD**
**Hiroyuki Oda, Hikari, Japan, assignor to Tokuyama Corporation, Yamaguchi, Japan**
**Filed Mar. 11, 1994, Ser. No. 208,864**
**Claims priority, application Japan, Mar. 17, 1993, 5-056890**
**Int. Cl.[6] C30B** *13/06*
**U.S. Cl. 117—49** **10 Claims**

1. A method for producing a silicon rod, consisting essentially of the steps of:
filling silicon granules inside a nonconductive cylinder arranged so that its longitudinal axis is substantially vertical;
heating the silicon granules at a local heating region inside the cylinder using a local heating means disposed outside of the cylinder to form, in a section inside the cylinder which is close to the local heating means, a silicon granule sintering portion and a molten silicon portion which does not contact the inner wall surface of the cylinder; and




gradually moving the local heating region in the direction of the longitudinal axis of the cylinder to progressively cause solidification of the molten portion, melting of the sintering portion, and formation of a new sintering portion;

wherein there is formed inside the cylinder a silicon rod from the molten granules which is solidified without contacting the inner wall surface of the cylinder.

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**5,499,599**

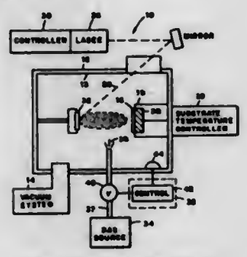
**METHOD FOR CONTINUOUS CONTROL OF COMPOSITION AND DOPING OF PULSED LASER DEPOSITED FILMS BY PRESSURE CONTROL**

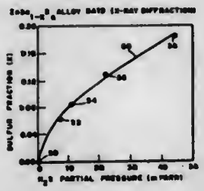
**Douglas H. Lowndes, and James W. McCamy, both of Knoxville, Tenn., assignors to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.**

**Continuation of Ser. No. 132,528, Oct. 6, 1983, Pat. No. 5,386,798. This application Aug. 11, 1994, Ser. No. 289,100**

**Int. Cl.[6] H01L *21/20***

**U.S. Cl. 117—50** **8 Claims**




1. A method for growing a thin-film compound semiconductor deposit upon a substrate including the steps of:

positioning a target and a substrate in a low-pressure gas atmosphere;

heating the substrate to an elevated temperature so that a film can be grown and the gas of the atmosphere may dissociate to an atomic or smaller molecular level;

irradiating the target with a laser so that the near-surface of the target is ablated from the remainder of the target and deposited upon the heated substrate, together with the atoms of the gas, in a thin-film deposit; and

continuously controlling the accumulation of atoms of the gas upon the substrate during the laser irradiating step to thereby control the concentration of gas atoms within the thin-film deposit being built upon the substrate by controlling the pressure of the gas of the atmosphere throughout the laser irradiating step so that an adjustment in the pressure of the gas of the atmosphere effects a corresponding adjustment in the accumulation of the atoms of the gas upon the substrate.

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**5,499,600**

**METHODS FOR COMPOUND SEMICONDUCTOR CRYSTAL GROWTH FROM SOLUTION**

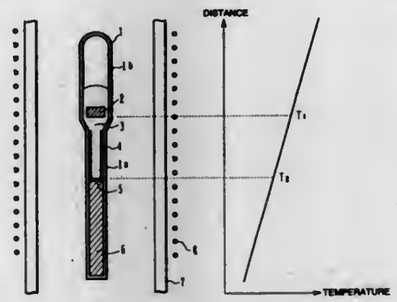
**Yasuo Okuno; Shotaro Tomita, and Hiroyuki Kato, all of Yokohama, Japan, assignors to Stanley Electric Co., Ltd., Tokyo, and Kanagawa Academy of Science and Technology, Kawasaki, both of, Japan**

**Filed Dec. 19, 1994, Ser. No. 358,864**

**Claims priority, application Japan, Dec. 24, 1993, 5-327010; Dec. 24, 1993, 5-327011**

**Int. Cl.[6] C30B *28/04***

**U.S. Cl. 117—68** **15 Claims**




1. A crystal solution growth method for growing a crystal comprising:

(a) placing a seed crystal on a recess disposed on a top surface of a heat sink, said heat sink being disposed under a solvent, said solvent having a higher region and a lower region;

(b) fixing the seed crystal to said heat sink by placing a seed stopper on the seed crystal, said seed stopper having (i) a tubular part with an inner diameter the same as a diameter of the seed crystal and (ii) a seed crystal fixing part for fixing the seed crystal, said seed crystal fixing part being disposed at one end of the tubular part facing the seed crystal;

(c) disposing a source crystal in the higher region of said solvent,

(d) causing a temperature difference between the higher region of the solvent, corresponding to a high temperature region and a lower region of the solvent corresponding to a low temperature region, said seed crystal being disposed in the low temperature region of said solvent and said source crystal being disposed in the high temperature region of said solvent and

(e) growing a crystal on the surface of the seed crystal.



**5,499,601**

**METHOD FOR VAPOR PHASE SYNTHESIS OF DIAMOND**

**Takahiro Imai; Takashi Tsuno; Yoshiyuki Yamamoto, and Naoji Fujimori, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan**

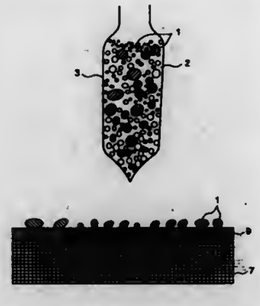
**PCT No. PCT/JP94/00035, § 371 Date Sep. 14, 1994, § 102(e) Date Sep. 14, 1994, PCT Pub. No. WO94/16125, PCT Pub. Date Jul. 21, 1994**

**PCT Filed Jan. 13, 1994, Ser. No. 302,879**

**Claims priority, application Japan, Jan. 14, 1993, 5-4704**

**Int. Cl.[6] C30B *25/02***

**U.S. Cl. 117—84** **7 Claims**



1. A method for producing diamond by a vapor phase synthesis which comprises dispersing diamond particles in a matrix solid material having a melting point of at most 1,400° C., melting and recrystallizing the matrix solid material, removing a part of the matrix solid material to expose the diamond particles and then growing diamond through the vapor phase synthesis using the exposed diamond particles as the seed crystals.

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**5,499,602**

**APPARATUS FOR MANFUACTURING A SEMICONDUCTOR LAYER USING RAPID THERMAL PROCESSING**

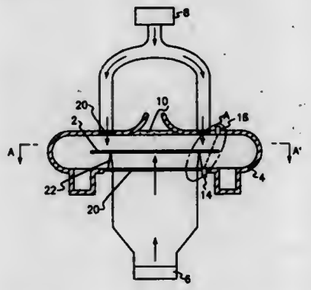
**Byung J. Cho, Bubaleub, Rep. of Korea, assignor to Hyundai Electroulcs Industries Co., Ltd., Kyoungkido, Rep. of Korea**

**Filed May 23, 1995, Ser. No. 447,916**

**Claims priority, application Rep. of Korea, May 25, 1994, 1994-11439**

**Int. Cl.[6] B05C *11/00***

**U.S. Cl. 118—712** **6 Claims**




1. An apparatus for manufacturing a semiconductor layer using rapid thermal processing, the apparatus comprising:

a chamber for processing a wafer;

a first means for appling microwave to a center portion of said wafer, being formed on one side of said chamber; and

a second means for appling microwave to the edge portion of said wafer, being formed on the other side of said processing chamber;

means for injecting a processing gas into said processing chamber, being formed in top of said processing chamber;

means for exhausting said processing gas in said processing chamber.

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**5,499,603**

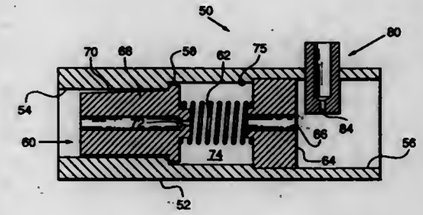
**LIQUID INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINE**

**Michael Vinokur, 5 Fisherville Road, Unit #509, North York, Ontario, Canada**

**Filed Oct. 27, 1993, Ser. No. 144,083**

**Int. Cl.[6] F02B *47/00*; B01F *5/04***

**U.S. Cl. 123—25 E** **13 Claims**




1. A liquid injection control system for injecting a non-combustible liquid into the induction manifold of an internal combustion engine, said system having a spray nozzle means located externally of said engine for the passage of said injection liquid therethrough, said spray nozzle means having a liquid inlet, an orifice for passage of injection liquid therethrough;

an outlet for said liquid downstream of said orifice connecting with said manifold, an expansion chamber intermediate said orifice and said outlet, and an air nozzle having an inlet and an outlet, with said inlet located outside said spray nozzle means and with said outlet located within said expansion chamber, to admit atmospheric air to the chamber;

the main axis of said air nozzle being inclined from the main axis of said expansion chamber, whereby, in use, air leaving said air nozzle impinges laterally upon liquid leaving said orifice, in atomizing droplet forming relation therewith, to substantially atomize said injection liquid before passage thereof into said manifold.

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**5,499,604**

**POSITIVE CRANK VENTILATION APPARATUS FOR AN ENGINE SYSTEM**

**Eiji Ito, Nagoya; Tetsushi Suzuki, Aichi; Kaoru Ito, Okazaki, and Hiroyuki Kawakubo, Toyota, all of, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan**

**Filed Dec. 16, 1994, Ser. No. 357,681**

**Claims priority, application Japan, Dec. 17, 1993, 5-318608**

**Int. Cl.[6] F01M *13/00*; F02M *25/00***

**U.S. Cl. 123—41.86** **24 Claims**

1. A positive crank ventilation apparatus for an engine system, the system including:

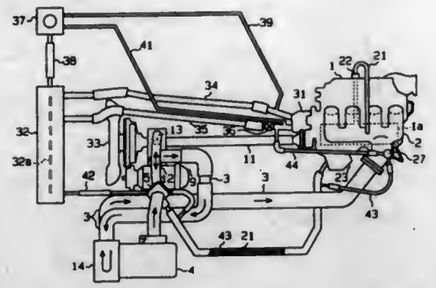
an engine having a block, and a crankcase wherein

said crankcase contains blow-by gas;

an engine cooling structure including:

a radiator spaced apart from said engine;

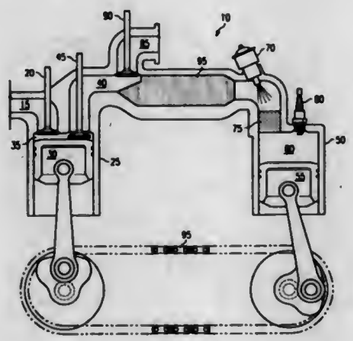
an outflow coolant passage connecting said engine to said radiator and a coolant return passage connecting said radiator to said engine, said outflow coolant passage and said radiator forming a hot coolant path;



a pump for forcing coolant through said outflow coolant passage towards said radiator;
an air intake passage having a throttle valve disposed therein, said throttle valve being spaced apart from said engine block and located closer to said radiator than to said engine block; said apparatus comprising:
a gas passage for directing the blow-by gas to the air intake passage;
a valve for controlling the flow of blow-by gas in the gas passage;
a heating passage for heating said gas passage and connecting said hot coolant path to said engine, said heating passage including a first portion extending from said hot coolant path to said gas passage and a second portion extending along a substantial portion of said gas passage, said first portion being shorter in length than the distance between said throttle valve and said engine.

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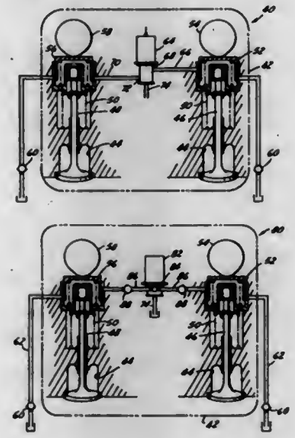
**5,499,605**
**REGENERATIVE INTERNAL COMBUSTION ENGINE**
**Robert H. Thring, Devine, Tex., assignor to Southwest Research Institute, San Antonio, Tex.**
**Filed Mar. 13, 1995, Ser. No. 403,204**
**Int. Cl.[6] F02B *43/08***
**U.S. Cl. 123—70 R** **28 Claims**



1. An open cycle regenerative internal combustion engine, comprising:
a compression cylinder with a compression piston reciprocating therein;
a combustion cylinder with a combustion piston reciprocating therein;
an intake manifold connected in fluid communication with the compression cylinder and an exhaust manifold connected in fluid communication with the combustion cylinder;
the compression cylinder and the compression piston are operable to compress a charge of air admitted into the engine by the intake manifold;
a transfer manifold connected in fluid communication between the compression cylinder and the combustion cylinder;
a regenerator disposed in the transfer manifold;
a catalyst disposed in the transfer manifold adjacent the combustion cylinder;
a fuel injector operable to dispense fuel into the transfer manifold between the regenerator and the catalyst;
a linkage connecting the compression piston to the combustion piston;
an ignition means for igniting fuel within the combustion cylinder; and
a plurality of valves operable to control the flow of a charge of air throughout the engine.

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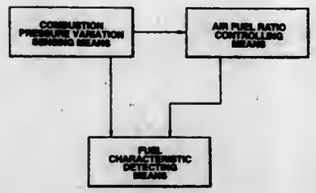
**5,499,606**
**VARIABLE TIMING OF MULTIPLE ENGINE CYLINDER VALVES**
**James T. Robnett, Royal Oak, and Mark R. Molitor, Muskegon, both of Mich., assignors to Siemens Automotive Corporation, Auburn Hills, Mich.**
**Filed Jan. 11, 1995, Ser. No. 371,185**
**Int. Cl.[6] F01L *9/02;13/00***
**U.S. Cl. 123—90.12** **9 Claims**



1. An engine including at least one cylinder with multiple valves controlling access to one of said at least one cylinder and cams having at least similar timing, one of the cams respectively associated with each of said valves for actuating the valves open during common periods; and
a variable valve timing system for controlling the actuation of said valves, said system characterized by:
a lost motion hydraulic actuator operatively disposed between each of the valves and its associated cam for causing and maintaining opening of its respective valve in response to cam actuation through a body of trapped fluid while maintained therein, each actuator being connected with fluid inlet and outlet means that are connected in turn with a source of fluid;
one way valve means in the inlet means of each actuator and preventing outlet flow therethrough;
a single hydraulic outlet control valve connected with the outlet means of all of said actuators; and
prevention means associated with at least one of said control valve and said outlet means for preventing the transfer of pressure pulses from the outlet means of one actuator to another actuator through its outlet means.



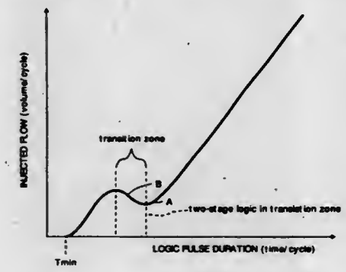
**5,499,607**
**FUEL CHARACTERISTIC DETECTING SYSTEM FOR INTERNAL COMBUSTION ENGINE**
**Naoki Tomisawa, Atsugi, Japan, assignor to Unisia Jecs Corporation, Atsugi, Japan**
**Filed Mar. 22, 1995, Ser. No. 408,087**
**Claims priority, application Japan, Mar. 23, 1994, 6-052180**
**Int. Cl.[6] F02D *41/00***
**U.S. Cl. 123—435** **11 Claims**




1. A fuel characteristic detecting system for an internal combustion engine, comprising:
a combustion pressure variation sensing means for sensing a variation of a combustion pressure in a specified cylinder of the engine;
an air/fuel ratio controlling means for forcibly varying an air/fuel ratio for the specified cylinder until the variation of the combustion pressure sensed by said combustion pressure variation sensing means becomes equal to or greater than a predetermined level; and
a fuel characteristic detecting means for determining a fuel characteristic in accordance with an air/fuel ratio in said specified cylinder obtained when the variation of the combustion a pressure is made equal to or greater than the predetermined level by the forcible variation of the air/fuel ratio by the air fuel ratio controlling means.

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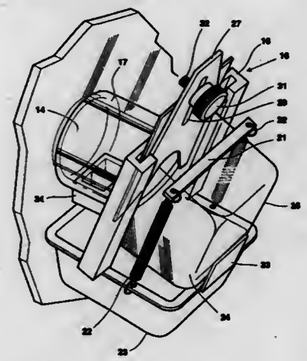
**5,499,608**
**METHOD OF STAGED ACTIVATION FOR ELECTRONICALLY ACTUATED FUEL INJECTORS**
**Steven F. Meister, Chillicothe, and Charles R. Miller, Metamora, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.**
**Filed Jun. 19, 1995, Ser. No. 492,353**
**Int. Cl.[6] F02M *41/00***
**U.S. Cl. 123—467** **9 Claims**




1. A method of fuel injection, comprising the steps of:
providing a fuel injector having an electronically actuated valve that opens to permit flow of high pressure fluid into the injector to initiate injection when activated but is biased to close when deactivated to end injection;
determining a desired amount of fuel to be injected;
calculating an activation duration;
determining whether the activation duration corresponds to a transition zone of operation for the electronically actuated valve;
if within the transition zone then:
calculating a revised activation duration;
activating the electronically actuated valve;
deactivating the electronically actuated valve;
reactivating the electronically actuated valve for said revised activation duration; and
deactivating the electronically actuated valve at the end of said revised activation duration;
if outside the transition zone then:
activating the electronically actuated valve for said activation duration; and
deactivating the electronically actuated valve at the end of said activation duration.

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**5,499,609**
**LOW SPILLAGE METABOLIC FEEDER**
**JuliAnn Evans; Daniel P. Gundo, both of San Jose; Jennifer S. Harper, Sunnyvale; Gerald M. Mulenburg, Mountain View, and Thomas L. Skundberg, San Jose, all of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.**
**Filed Mar. 25, 1994, Ser. No. 217,909**
**Int. Cl.[6] A01K *5/01***
**U.S. Cl. 119—61** **8 Claims**

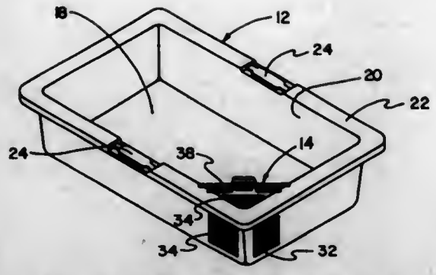


1. A metabolic animal feeder comprising:
a food cup,
means for varying the entry area to said foot cup, said means for varying the entry area including a gate and a guide, said gate and said food cup being supported by said guide, and
a passageway abutting said means for varying the entry area, said passageway having a perforated floor whereby the floor perforations enable the passage of any food spilled from said food cup.

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**5,499,610**
**PLURAL RECEPTACLE FILTERING LITTER BOX SYSTEM**
**Dennis R. Bruner, and Donna L. Batagianis, both of 122 W. 10th St., Michigan City, Ind. 46360**
**Filed Dec. 16, 1994, Ser. No. 357,852**
**Int. Cl.[6] A01K *1/035***
**U.S. Cl. 119—166** **11 Claims**

11. A litter box comprising:
a receptacle, the receptacle including a substantially rectangular bottom wall circumscribed by an upwardly projecting side




wall, the side wall being shaped so as to define corners, with an aperture directed through the side wall proximal to a first corner thereof; and,

filter means coupled to the receptacle for dispensing and filtering animal litter from the receptacle, the filter means comprising a screen panel positioned over the aperture in the side wall to permit a passage of litter material therethrough while simultaneously filtering the litter material to retain solid waste products within the receptacle.

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**5,499,611**

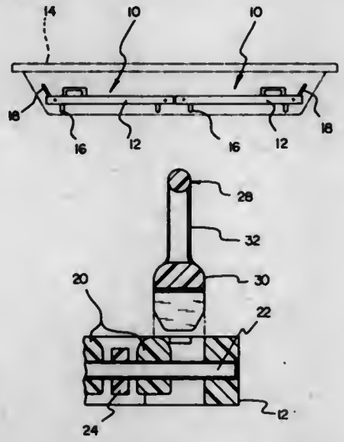
**LITTER BOX SLATTED SPACING SHELF**

**Stephen P. Thomas, P.O. Box 1726, Vashon, Isl., Wash. 98070**

**Filed Jan. 25, 1995, Ser. No. 377,970**

**Int. Cl.[6] A01K *1/01***

**U.S. Cl. 119—166** **4 Claims**




1. A litter box slatted spacing shelf comprising:

a perimeter frame positionable within a litter box;

a plurality of slats extending in substantially spaced and parallel orientation across the perimeter frame;

a pair of slat support rods extending across the perimeter frame and projecting through apertures in each of the slats located proximal to respectively opposed ends of the slats to support the slats in the substantially spaced and parallel orientation across the perimeter frame;

a plurality of spacers interposed between adjacent slats so as to support the slats in a substantially spaced and parallel orientation relative to one another;

and,

a locking means for selectively permitting and precluding movement of the slats relative to the perimeter frame over the support rods, the locking means comprising a locking wedge positioned between one of the slats and a portion of the perimeter frame; and a locking wedge handle coupled to the locking wedge to permit manual insertion and removal of the locking wedge relative to the perimeter frame, wherein the locking wedge can be selectively disengaged from the perimeter frame to permit movement of the slats and the spacers along the slat support rods, whereby debris captured between adjacent slats is free to fall therefrom.

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**5,499,612**

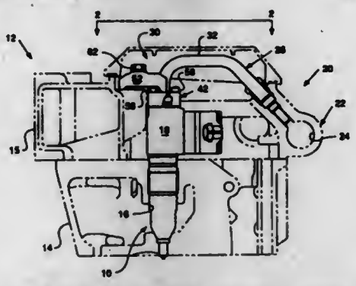
**DUAL-FUNCTION CLAMPING ASSEMBLY ADAPTED FOR A HYDRAULICALLY-ACTUATED FUEL INJECTOR**

**Michael A. Haughney, Peoria; Mehrdad Mojarrad, Chillicothe; Devin C. Tornow, Peoria, and Norval J. Wiemken, Dwight, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.**

**Filed Oct. 3, 1994, Ser. No. 316,758**

**Int. Cl.[6] F02M *37/04***

**U.S. Cl. 123—470** **5 Claims**




1. A dual-function clamping assembly adapted for a hydraulically-actuated fuel injector positioned in an engine member, said injector having an actuating fluid inlet port located at one end portion of the injector, said clamping assembly comprising:

an external actuating fluid line having a centerline axis and a flared end portion defining an annular internal sealing surface and an annular external sealing surface;

a flange defining a main bore through which said fluid line loosely extends and a counterbore facing said flared end portion;

a sleeve positioned in the counterbore of the flange and having an annular internal surface adapted to sealedly contact said annular external surface of the fluid line; and

a seat defining a bore therethrough, said seat having a relatively flat first end portion and an annular second end portion, said first end portion of the seat adapted to sealedly seat around the actuating fluid inlet port of the injector, said second end portion of the seat adapted to sealedly seat against the annular internal sealing surface of the fluid line;

first connecting means for connecting the flange to the injector and

second connecting means for connecting the flange to the engine member.

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**5,499,613**

**METHOD FOR MONITORING A TANK VENTING SYSTEM THAT TRAPS FUEL VAPORS AND FEEDS THEM TO AN INTERNAL COMBUSTION ENGINE**

**Klaus Bayerle, and Hartmut Pfleger, both of Regensburg, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany**

**Filed Jul. 21, 1994, Ser. No. 278,272**

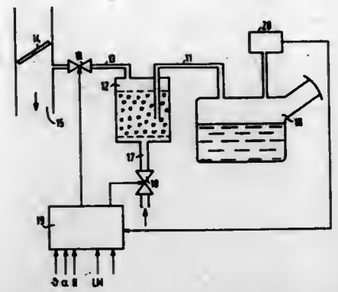
**Claims priority, application European Pat. Off., Jul. 21, 1993, 93111691**

**Int. Cl.[6] F02M *33/02***

**U.S. Cl. 123—520** **2 Claims**

1. In a method for monitoring a tank venting system for trapping fuel vapors and feeding the fuel vapors to an internal combustion






engine having a fuel tank and an intake tube, wherein the tank venting system includes:

a container adsorbing fuel vapors, a venting line connected between the fuel tank and the container, a regeneration line connected between the container and the intake tube of the internal combustion engine, a ventilation line communicating with the atmosphere and the container, a ventilation valve for closing the ventilation line, a tank venting valve being disposed in the regeneration line and being triggered in an opening direction for feeding fuel vapors stored in the container, and a pressure sensor detecting a system pressure of the tank venting system,

the improvement which comprises:

monitoring the system pressure with the pressure sensor during the feeding of the fuel vapors;

categorizing the ventilation valve as functioning improperly if the system pressure determined in the monitoring step exceeds a predetermined pressure threshold value; and

closing the tank venting valve.

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**5,499,614**

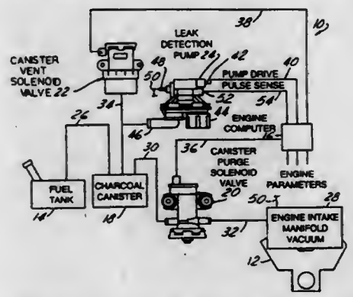
**MEANS AND METHOD FOR OPERATING EVAPORATIVE EMISSION SYSTEM LEAK DETECTION PUMP**

**Murray F. Busato; Paul D. Perry, and John E. Cook, all of Chatham, Canada, assignors to Siemens Electric Limited, Chatham, Canada**

**Filed Nov. 3, 1994, Ser. No. 333,824**

**Int. Cl.[6] F02M *33/02***

**U.S. Cl. 123—520** **20 Claims**




1. An automotive vehicle comprising an internal combustion engine and a fuel system for said engine which comprises a fuel tank for storing volatile liquid fuel for the engine and an evaporative emission control system which comprises a collection canister that in cooperative combination with headspace of said tank cooperatively defines an evaporative emission space wherein fuel vapors generated from the volatilization of fuel in said tank are temporarily confined and collected until periodically purged by means of a canister purge valve to an intake manifold of the engine for entrainment with induction flow of combustible mixture into combustion chamber space of the engine and ensuing combustion in said combustion chamber space, valve means via which said evaporative emission space is selectively communicated to atmosphere, said vehicle further comprising means, including pump means, for distinguishing between integrity and non-integrity of said evaporative emission control system, under conditions conducive to obtaining a reliable distinction between such integrity and non-integrity, against leakage of volatile fuel vapor from that portion thereof which includes said tank, said canister, said valve means, and said canister purge valve, said pump means comprising a positive displacement reciprocating pump having a mechanism that, while said valve means is closed to prevent communication of said evaporative emission space to atmosphere and while said canister purge valve is closed to prevent communication of said evaporative emission space to said intake manifold, executes reciprocating motion comprising an intake stroke and a compression stroke and that comprises means to intake air during each occurrence of an intake stroke for creating a measured charge volume of air at given pressure and means to compress a measured charge volume of air to pressure greater than such given pressure and force a portion thereof into said evaporative emission space during each occurrence of a compression stroke, said means to compress a measured charge volume of air to pressure greater than such given pressure and force a portion thereof into said evaporative emission space during each occurrence of a compression stroke comprises mechanical spring means to which energy in imparted during an intake stroke and which releases energy during a compression stroke, characterized in that;

operation of the pump is under control of a computer a) that causes the pump to operate initially in a first mode that accelerates initial pressurizing of said space by causing said movable wall to repeatedly execute less than a full compression stroke beginning at an initial position wherein maximum energy is stored in said spring means and ending before completing a full compression stroke, and b) that at the conclusion of said first mode causes the pump to operate in a second mode wherein said movable wall is caused to repeatedly execute full compression strokes.

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**5,499,615**

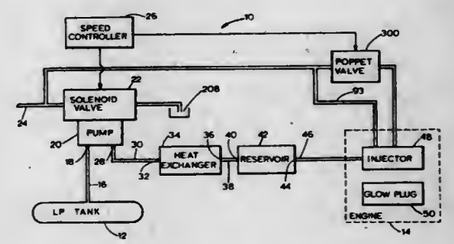
**DIRECT INJECTION PROPANE FUEL SYSTEM FOR DIESEL ENGINE APPLICATIONS**

**Keith E. Lawrence, Peoria; Kenneth J. Suda, Edelstein, and William J. Hays, Peoria, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.**

**Filed Oct. 28, 1994, Ser. No. 331,001**

**Int. Cl.[6] F02M *21/02***

**U.S. Cl. 123—526** **20 Claims**




1. A propane injection system for a diesel engine comprising:

a source of liquid propane;

a pump having an inlet and an outlet, wherein the inlet of the pump is connected to the source of liquid propane, wherein the pump is arranged to pump liquid propane from the source of liquid propane through the inlet of the pump to the outlet of the pump, and wherein the pump is arranged to increase the pressure of the liquid propane to the level at which fuel is injected into a combustion chamber of the diesel engine;

a heat exchanger having an inlet and an outlet, wherein the inlet of the heat exchanger is connected to the outlet of the pump so that the heat exchanger receives liquid propane from the pump, and wherein the heat exchanger is arranged to vaporize the liquid propane received from the pump in order to provide propane gas at its outlet;

a reservoir having an inlet and an outlet, wherein the inlet of the reservoir is connected to the outlet of the heat exchanger so that the reservoir receives propane gas from the heat exchanger, and wherein the reservoir stores propane gas received from the heat exchanger; and,

an injector having an inlet and an outlet, wherein the inlet of the injector is connected to the outlet of the reservoir so that the injector receives propane gas from the reservoir, and wherein the injector is arranged to supply propane gas through its outlet to a combustion chamber of the diesel engine.

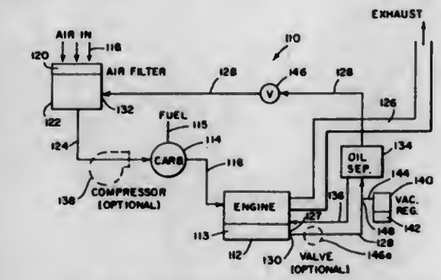
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**5,499,616**

**CRANKCASE PRESSURE REGULATION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE**

**Bernard F. Enright, Wauwatosa, Wis., assignor to Dresser Industries, Inc., Dallas, Tex.**

**Filed May 22, 1995, Ser. No. 447,199**
**Int. Cl.[6] F01M** *13/04*
**U.S. Cl. 123—572** **16 Claims**




1. In an internal combustion engine having a crankcase, an improved crankcase pressure regulation system comprising:

an engine air intake;

an air filter that filters ambient air to provide filtered intake air to the engine air intake;

a crankcase having a breather port through which crankcase blowby gases exit;

a breather tube having an inlet that receives the crankcase blowby gases exiting the breather port and having an outlet that feeds blowby gases into the filtered intake air flow;

an oil separator located along the breather tube; and

a vacuum pressure regulator that adds a regulated amount of ambient air to crankcase blowby gases flowing through the breather tube at a location between the crankcase breather port and the oil separator.

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**5,499,617**

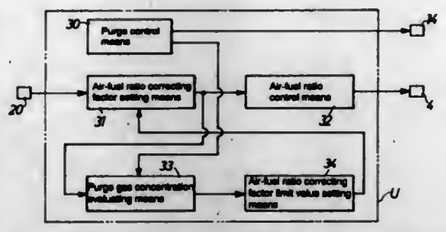
**EVAPORATIVE FUEL CONTROL SYSTEM IN INTERNAL COMBUSTION ENGINE**

**Shinichi Kitajima; Hiroaki Muramatsu, both of Wako, and Yoshihiko Kobayashi, Haga, all of, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Mar. 17, 1995, Ser. No. 405,249**
**Claims priority, application Japan, Mar. 18, 1994, 6-049194**
**Int. Cl.[6] F02D** *41/14;* **F02M** *25/08*
**U.S. Cl. 123—698** **7 Claims**

1. An evaporative fuel control system in an internal combustion engine, comprising:

a canister for adsorbing an evaporative fuel from a fuel tank;




a purge control valve provided between an intake system of the engine and said canister;

a purge control means for controlling operation of said purge control valve to control a flow rate of a purge gas from said canister to said intake system;

an exhaust gas concentration sensor provided in an exhaust system of the engine;

an air-fuel ratio correcting factor setting means for determining an air-fuel ratio correcting factor in accordance with a detection value detected by said exhaust gas concentration sensor;

an air-fuel ratio control means for controlling an air-fuel ratio of an air-fuel mixture supplied to the engine by use of the determined air-fuel ratio correcting factor;

a purge gas concentration estimating means for estimating a purge gas concentration based on said air-fuel ratio correcting factor provided when said purge control valve is opened and said air-fuel ratio correcting factor provided when said purge control valve is closed; and

an air-fuel ratio correcting factor limit value setting means for determining a lower limit value of the air-fuel ratio correcting factor set by said air-fuel ratio correcting factor setting means in accordance with the purge gas concentration estimated by said purge gas concentration estimating means.

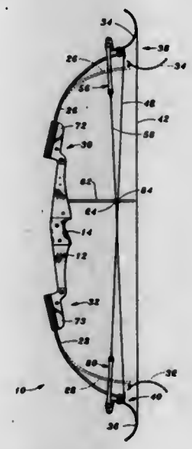
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**5,499,618**

**LEVER ACTION ARCHERY BOW**

**George E. Thompson, 19088 Hess Ave., Sonora, Calif. 95370**

**Filed Sep. 20, 1994, Ser. No. 309,071**
**Int. Cl.[6] F41B** *5/10*
**U.S. Cl. 124—25.6** **9 Claims**



1. An archery bow, comprising:

an elongated body;

first and second inner limbs extending outwardly from the opposite ends of said body;



first and second pivot means mounted on the portions of said inner limbs remote from said body;

first and second outer limbs mounted on said first and second pivot means, each of said pivot means being located between an inner portion and an outer portion of its associated outer limb;

first and second coupling cable assemblies each of which extends directly from the said inner portion of one of said outer limbs to the outer portion of the opposite one of said inner limbs; and

a bowstring extending between said outer portions of said outer limbs.

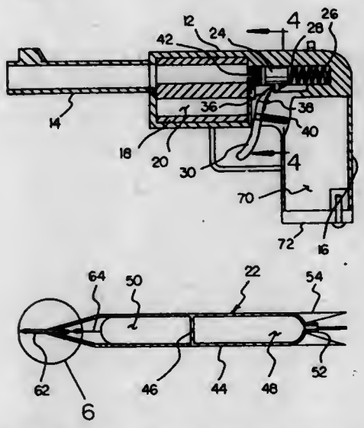
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**5,499,619**

**UNDERWATER DART GUN**

**Joseph A. Tarta, 991 E. Saddle River Rd., Hohokus, N.J. 07423**

**Filed Dec. 12, 1994, Ser. No. 354,485**
**Int. Cl.[6] F41B** *11/08*
**U.S. Cl. 124—57** **17 Claims**



7. An underwater dart gun for initiating propulsion of a dart having a pressurized gas contained by a frangible seal, said gun comprising:

a gun body for receiving said dart, said gun body being shaped so as to define a cylindrical bore;

a hammer slidably mounted within said cylindrical bore of said gun body, said hammer including a depending projection extending therefrom;

a hammer spring interposed between said hammer and a closed end of said cylindrical bore;

a trigger slidably mounted within said gun body, said trigger being mounted relative to said gun body so as to move in a non-parallel orientation relative to a longitudinal axis of said cylindrical bore, said trigger including a catch engagable to said depending projection to effect compression of said spring to a point where said catch disengages from said depending projection;

and,

a firing pin mounted within said cylindrical bore and positioned for engagement with said frangible seal of said dart.

15. A dart comprising:

a substantially cylindrical body with a rear end of said cylindrical body being shaped so as to define a nozzle having a frangible seal extending thereacross; and a pressurized gas contained within said cylindrical body, whereby said frangible seal can be punctured to permit expulsion of said pressurized from said cylindrical body through said nozzle to accelerate said dart from said gun body, said dart including a plurality of guide fins projecting from said rear end of said cylindrical body which cooperate to stabilize said dart during motion of said dart through a fluid medium by imparting a rotational spin to said dart, said dart including a dividing wall extending across an interior of said cylindrical body to separate said interior of said cylindrical body into a propellant chamber and an injection chamber; a frangible wall extending across the injection chamber; and a further pressurized gas contained within said injection chamber, and further wherein a front end of said cylindrical body of said dart is shaped so as to define a conical nose having a plurality of dispensing apertures directed through said conical nose to permit egress of said further pressurized gas contained within said injection chamber upon a puncturing of said frangible wall extending thereacross; and means for puncturing said frangible wall.

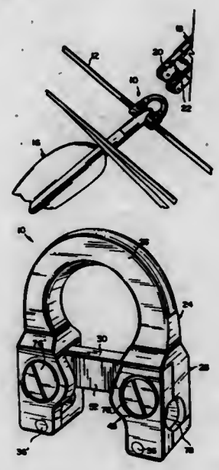
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**5,499,620**

**CENTER NOCK FOR ARCHERY BOW STRING**

**Gregory E. Summers, 105 Overlink Ct., Lynchburg, Va.**

**Filed Feb. 3, 1995, Ser. No. 383,496**
**Int. Cl.[6] F41B** *5/18*
**U.S. Cl. 124—91** **17 Claims**



1. A center nock for a bow string of an archery bow; the center nock comprising:

a substantially C-shaped body portion having spaced ends extending substantially linearly therefrom, said ends formed with first respectively axially aligned half groove portions adapted for engagement with the bow string; and

a cross support bar secured to said spaced ends, said support bar including second respectively aligned half groove portions which cooperate with said first respectively aligned groove portions to form a pair of closed apertures fully encircling the bow string.

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**5,499,621**

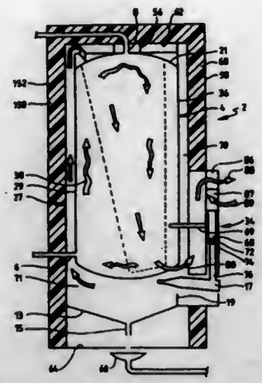
**HOT WATER HEATERS**

**John M. Trihey, Victoria, Australia, assignor to Aqua Max Pty Ltd., Moorabbin, Australia**

**Division of Ser. No. 775,977, Oct. 29, 1991, Pat. No. 5,361,729.**
**This application Aug. 15, 1994, Ser. No. 291,511**
**Claims priority, application Australia, Apr. 19, 1989, PJ3790; Dec. 18, 1989, PJ7895**
**Int. Cl.[6] F24H** *1/00*
**U.S. Cl. 126—361** **3 Claims**

1. A hot water heater comprising in combination;

a gas burner,



a vessel having a bottom and holding water heated by the combustion products of the burner,

the burner having a body with a rear part and a front part,

a gas fuel inlet extending from the body at the rear part thereof,

a row of outlet orifices at the front part of the body,

the body tapering from the rear part where the inlet supplies gas to the burner body and towards the front part where the row of outlet orifices is located,

the row of outlet orifices extending along a line of greater width than the rear part of the body so that gas from the inlet in the rear part of the body flows outwardly in a widening flow path through the body to emerge from the row of outlet orifices while at the same time flowing through the body which tapers towards the outlet orifices,

the burner body being located so that at least the front part of the body is located beneath the bottom of the vessel,

the body being arranged so that a plane which extends through the body and through the rear part of the body and through the row of outlet orifices is upwardly inclined towards the bottom of the vessel,

the outlet orifices being arranged across the bottom of the vessel for directing flames across the bottom of the vessel,

the inlet comprising an inlet pipe having an upper end,

the inlet pipe having a substantially vertical axis and extending downwardly alongside the vessel to open into the rear part of the body of the burner so that the axis of the inlet pipe defines an acute angle to said plane extending through the row of outlet orifices and through the burner body to the rear part of the body,

the hot water heater including means to inject fuel gas into the upper end of the inlet pipe so as to draw primary combustion air into the upper end of the inlet pipe to mix with the fuel gas whereby the fuel gas and primary combustion air flow down the inlet pipe around a curved path into the rear part of the body and upwardly through the tapering and widening path through the body to emerge through the row of outlet orifices and be ignited so that the flames are directed upwardly towards the bottom of the vessel and in a line across the bottom of the vessel.

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**5,499,622**

**AFTERBURNER SYSTEM AND PROCESS**

**Maurice G. Woods, 1533 Glenbrook, Oklahoma City, Okla. 73118**

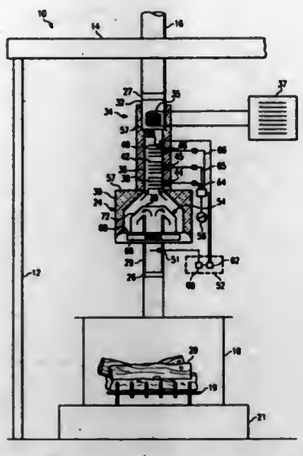
**Filed Jan. 20, 1995, Ser. No. 375,952**

**Int. Cl.[6] F24B *1/18***

**U.S. Cl. 126—500** **26 Claims**

1. In a heating system for use in providing heat within the interior of a structure, the combination comprising:

(a) a primary combustion chamber within said structure and adapted to receive solid combustible fuels such as logs and the like;



(b) a chimney structure extending vertically from said primary combustion chamber and having a flue passageway therein extending from said primary combustion chamber to provide for the flow of gaseous combustion products from said primary combustion chamber to the exterior of said structure;

(c) a heating bank disposed in said flue passage above said primary combustion chamber comprising a plurality of heating elements at longitudinally spaced positions within said flue passage;

(d) a first temperature sensor located below said heating element bank and a second temperature sensor located above said heating element bank;

(e) a baffle system in said flue passage interposed between said heating bank and said primary combustion chamber to deflect the flow of combustion products passing upwardly through said flue passage from said primary combustion chamber from a vertical flow path in a manner to extract particulate materials from said gaseous combustion products; and

(f) a control system for said heating elements responsive to signals from said first and second temperature sensors to control the operation of said heating elements.

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**5,499,623**

**GAS MASK AND BREATHING EQUIPMENT WITH LIQUEFIED RESPIRATION GAS**

**Adalbert Pasternack, Bad Schwartau, Germany, assignor to Dragerwerk AG, Lubeck, Germany**

**Filed Jan. 7, 1993, Ser. No. 1,264**

**Claims priority, application Germany, Feb. 22, 1992, 42 05 412.5**

**Int. Cl.[6] A62B *7/06;9/00*; F17C *7/04;9/02***

**U.S. Cl. 128—201.21** **5 Claims**

1. A gas mask and breathing equipment arrangement, comprising:

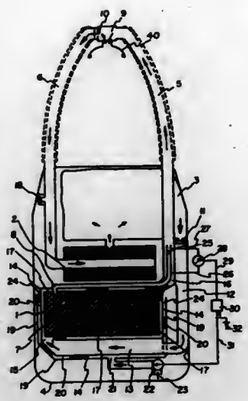
a breathing loop having an exhalation tube, a carbon dioxide scrubber, a breathing bag, a storage tank for storing liquified respiration fluid, and an inhalation tube, wherein exhaled gas enters said exhalation tube, passes through said carbon dioxide scrubber and then passes to said breathing bag;

air circulation duct means including an air circulation duct having an intake for ambient air and a discharge, said circulation duct maintaining ambient air separate from said storage tank, said circulation duct being disposed adjacent to said storage tank for transferring heat of evaporation from ambient air in said circulation duct to said liquified respiration fluid;

a fan delivering ambient air through said air circulation duct;

a control unit means connected to said fan for controlling the air delivery capacity of said fan and the amount of heat supplied





to said storage tank, and thereby controlling the amount of respiration fluid evaporated; and

a sensor means positioned adjacent to an output of said storage tank for sensing an amount of respiration fluid evaporated per unit time, said sensor means being connected to said control unit and supplying a control signal based on said amount of sensed evaporated fluid, said control signal adjusting the air delivery capacity of said fan and thereby controlling the amount of respiration gas evaporated per unit time to a predeterminable value.

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**5,499,624**

**BREATHING MASK WITH FACE-CONTACT ACTUATED OVERPRESSURE GENERATING SWITCH**

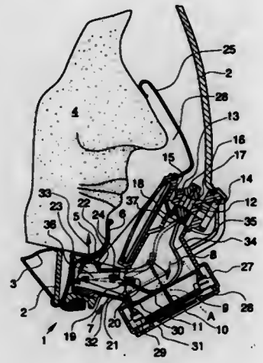
**Edmund Krüger, and Thomas Neuber, both of Lübeck, Germany, assignors to Drägerwerk AG, Lübeck, Germany**

**Filed Oct. 21, 1993, Ser. No. 140,764**

**Claims priority, application Germany, Nov. 5, 1992, 42 37 294.1**

**Int. Cl.[6] A62B *7/04;18/02;18/10*; F16K *31/26***

**U.S. Cl. 128—204.26** **6 Claims**



1. A breathing mask, comprising:

a mask body;

a connection piece including a demand gas system for providing gas to an interior space of the breathing mask on demand said connection piece being inserted into said mask body;

overpressure switching means connected to said demand gas system for switching said demand gas system from a stable switched off position into a switched on position for generating an overpressure in said mask interior space;

actuating element means acting on said switching means at said connection piece for switching to overpressure generation in said switched-on position, said actuating element means including an actuating element extending out or said connection piece to a boundary area between said breathing mask body and a face of a mask user, said actuating element means for moving said switching means to said switched-on position when the breathing mask is donned by the wearer upon interaction between a portion of the surface of the face of the mask user and said boundary area, said actuating element being designed as a sensor mounted via a sensor hinge for movement of said sensor in a rocker-like manner, said switching member being designed as a rocker arm mounted via a switching member hinge, each of said sensor and rocker arm being tensioned in relation to one another by means of a tension spring acting on said sensor and a coil spring acting on said rocker arm.

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**5,499,625**

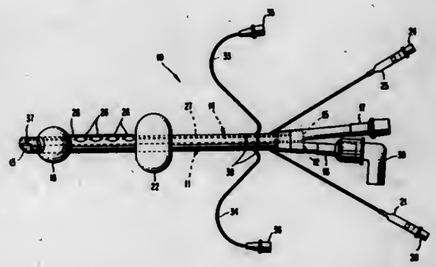
**ESOPHAGEAL-TRACHEAL DOUBLE LUMEN AIRWAY**

**Michael Frass; Reinhard Frenzer, both of Moedling, Austria; Gregor Long, Lake George; John S. Kline, Queensbury; David S. Sheridan, Argyle; E. David Fink, Rexford, and Anthony N. Toppses, Ganesvoort, all of N.Y., assignors to The Kendall Company, Mansfield, Mass.**

**Filed Jan. 27, 1994, Ser. No. 186,915**

**Int. Cl.[6] A61M *16/04***

**U.S. Cl. 128—207.15** **23 Claims**



1. An airway for both sole esophageal obturator ventilation and for combined endotracheal and esophageal obturator ventilation of a patient, selectively, comprising:

a tube having an exterior surface, a proximal end and a distal end, said distal end being insertable into an esophagus or into a trachea randomly, said tube comprising two lumens extending axially and each having a proximal end and a distal end, both of said lumens being open at the proximal end, the distal end of one of said lumens being open and the distal end of the other of said lumens being closed, said tube further comprising at least one air outlet communicating with said lumen having said closed distal end wherein said at least one air outlet is locatable in a patient's pharyngeal area;

an inflatable distal cuff on said tube located adjacent the distal end of said tube;

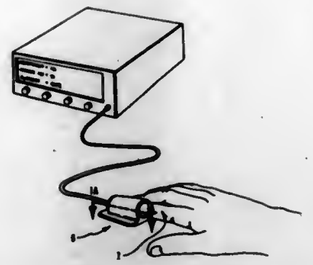
an inflation conduit connected to said inflatable distal cuff for allowing selective inflation of said inflatable distal cuff;

an inflatable pharyngeal cuff on said tube located between said at least one air outlet and said proximal end of said tube, said pharyngeal cuff being sized and located with respect to said tube such that when inflated, said pharyngeal cuff is situated within the boundaries of the oropharynx of a patient;

an inflation conduit connected to said inflatable pharyngeal cuff for allowing selective inflation of said pharyngeal cuff;

an X-ray opaque stripe extending along the tube, said stripe being present at least between the inflatable pharyngeal cuff and the inflatable distal cuff and being interrupted by at least one air outlet; and

an X-ray opaque shaft separate from the X-ray opaque stripe, said X-ray opaque shaft being attached to the exterior surface of the tube between the inflatable pharyngeal cuff and the inflatable distal cuff and being constructed to maintain said at least one air outlet interrupting said X-ray opaque stripe free from blockage when the airway is positioned in the patient.



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**5,499,626**

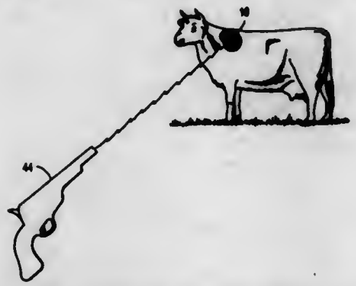
**INDIVIDUAL DESCRIPTIVE RECORD SYSTEM**

**Richard L. William, 316 E. 20th, Ames, Iowa 50010; Robert J. Weber, 1160 115th Rd., Boone, Iowa 50036, and Marwan M. Hassoun, 310 Westwood, Ames, Iowa 50014**

**Continuation-in-part of Ser. No. 877,461, May 1, 1992, Pat. No. 5,322,034. This application Jun. 20, 1994, Ser. No. 263,651**

**Int. Cl.[6] G06F *159/00*; A01K *11/00***

**U.S. Cl. 128—630** **31 Claims**



22. A method of maintaining individual descriptive records for identifying and monitoring individuals comprising:

implanting identification and descriptive data in an individual so that the individual's identification and descriptive data and the individual itself are one, wherein said data is stored in a programmable electronic identification and data storage module;

accessing the individual by retrieving the identification data implanted in the individual;

retrieving the descriptive data implanted in the individual;

transmitting updated descriptive data to the individual so that the individual's descriptive data is continuously maintained and accumulated in the individual; and

substantially removing power from said module when it is not being accessed.

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**5,499,627**

**SYSTEM FOR NONINVASIVE HEMATOCRIT MONITORING**

**Robert R. Steuer, Pleasant View, and David H. Harris, Ogden, both of Utah, assignors to In-Line Diagnostics Corporation, Riverdale, Utah**

**Division of Ser. No. 11,882, Feb. 1, 1993, Pat. No. 5,372,136, which is a continuation of Ser. No. 598,189, Oct. 16, 1990, abandoned. This application Oct. 4, 1994, Ser. No. 317,726**

**Int. Cl.[6] A61B *5/00***

**U.S. Cl. 128—633** **53 Claims**

30. A system for determining the desired biologic constituent concentration of the blood of a patient, the blood flowing in a pulsatile fashion in a body part of the patient or in an extracorporeal passageway in communication with the circulatory system of the patient so as to be subjectable to transcutaneous examination in the body part or to noninvasive examination in the extracorporeal passageway, the body part and the extracorporeal passageway defining a blood conduit, the system comprising:

(a) a blood conduit receiving means for receiving a blood conduit containing the flowing blood of the patient;

(b) emission means for directing radiation into the flowing blood within the blood conduit, said emission means being situated within said blood conduit receiving means, said radiation defining a directed radiation comprising:

(i) a first quantity of a radiation at a first radiation wavelength which, when directed into the flowing blood within the blood conduit,

(A) has a first extinguishment value which varies with the desired biologic constituent concentration in the flowing blood and

(B) has a second extinguishment value which varies with the concentration of components other than the desired biologic constituent in the flowing blood, which second extinguishment value is at least ten times smaller than said first extinguishment value; and

(ii) a first quantity of a radiation at a second radiation wavelength, distinct from said first wavelength, which, when directed into the flowing blood within the blood conduit,

(A) has a third extinguishment value which for varying concentrations in the flowing blood of the desired blood constituent is a non-fixed multiple of said first extinguishment value and

(B) has a fourth extinguishment value which varies with the concentration of components other than the desired biologic constituent in the flowing blood, which fourth extinguishment value is at least ten times greater than said second extinguishment value;

(c) detection means for detecting the portion of said directed radiation which passes through both the blood conduit and the flowing blood therein, said detection means being situated within said blood conduit receiving means, said detected portion of said directed radiation comprising:

(i) a second quantity of a radiation at the first radiation wavelength, and

(ii) a second quantity of a radiation at the second radiation wavelength; and

(d) calculation means for determining the desired biologic constituent concentration by operating exclusively on the second quantities of the first and second radiation wavelengths.

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**5,499,628**

**MEDICAL ELECTRODE**

**Richard A. Wright, Westminster, Mass., assignor to Micron Medical Products, Inc., Fitchburg, Mass.**

**Filed Aug. 27, 1993, Ser. No. 113,420**

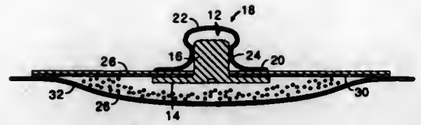
**Int. Cl.[6] A61B *5/0416***

**U.S. Cl. 128—641** **62 Claims**

1. An electrode, mountable on skin, comprising:

a first solid conductor for being mounted proximate to the skin, said first solid conductor having a conductive metallic surface;





a second solid conductor, in electrical communication with said first solid conductor, and permanently mounted thereto, for providing a terminal, said second solid conductor being made of a conductive resilient composition; and

means for adhering said first solid conductor proximate to the skin.

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**5,499,629**

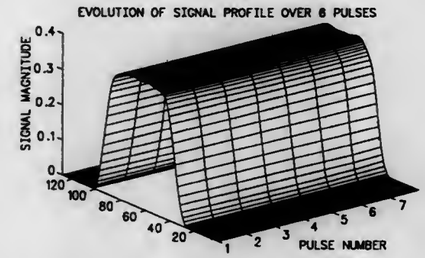
**SLICE PROFILE STABILIZATION FOR SEGMENTED K-SPACE MAGNETIC RESONANCE IMAGING**

**Adam B. Kerr, Stanford, and John M. Pauly, San Francisco, both of Calif., assignors to Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.**

**Filed Feb. 1, 1994, Ser. No. 191,342**

**Int. Cl.[6] A61B *5/055***

**U.S. Cl. 128—653.2** **10 Claims**




1. A method of obtaining magnetic resonance imaging signals comprising the steps of

a) placing an object to be imaged in a magnetic field ($B_0$),

b) applying a plurality of RF excitation pulses to said object to selectively excite nuclei in a slice through said object, one pulse of said plurality of RF excitation pulses serving as a template for other RF excitation pulses with said plurality of RF excitation pulses having varying tip-angle profiles for said nuclei whereby a stabilized signal profile is realized and wherein a tip-angle profile for the last pulse in the plurality of RF pulses is given, the required sequence of tip-angles to achieve a given signal level for all possible signal levels is known, and the tip-angle profiles $\theta_{i-1}$ (x) for pulse i−1 are recursively determined from a known tip-angle profile $\theta_i$ (x) for pulse i, beginning with the last tip-angle profile, and

c) detecting said signals from said nuclei.

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**5,499,630**

**CATHETER TYPE ULTRASOUND PROBE**

**Susumu Hiki, Otawara; Mituo Kondo, and Kenji Abe, both of Omiya, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, and Fuji Photo Optical Co. Ltd., Omiya, both of, Japan**

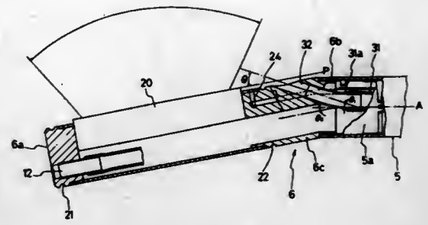
**Filed Nov. 22, 1994, Ser. No. 346,172**

**Claims priority, application Japan, Nov. 22, 1993, 5-313962**

**Int. Cl.[6] A61B *8/12***

**U.S. Cl. 128—662.05** **3 Claims**

1. An ultrasound probe with a needle guide passage for a puncture needle, said ultrasound probe comprising:



an ultrasound transducer mounted on a girder portion of a rigid fore end section at the distal end of a flexible insert section of a catheter member of said ultrasound probe; and

a needle passage provided axially within said catheter member of said ultrasound probe for launching a puncture needle therethrough, said needle passage being turned toward an exit opened on a lateral side portion of said rigid fore end section at a position on the near side of said ultrasound transducer; and

said rigid fore end section of said catheter member being provided with a bent portion which bent portion being turned off the axis of said catheter member through a predetermined angle in a direction away from a needle launching direction of said needle passage at a position on the near side of said exit opening of said needle passage.

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**5,499,631**

**METHOD OF MEASURING THE ELECTRIC CONDUCTIVITY OF BODY FLUIDS, AND TEST PROBE FOR CARRYING OUT THE METHOD**

**Werner Weiland, Bendorf-Sayn, Germany, assignor to Rheintechnik Weiland & Kaspar KG Maschinenfabrik, Benford, Germany**

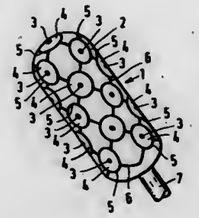
**PCT No. PCT/EP92/02573, § 371 Date May 12, 1994, § 102(e) Date May 12, 1994, PCT Pub. No. WO93/09716, PCT Pub. Date May 27, 1993**

**PCT Filed Nov. 10, 1992, Ser. No. 244,035**

**Claims priority, application Germany, Nov. 13, 1991, 41 37 303.0**

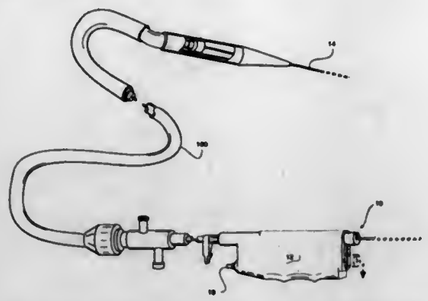
**Int. Cl.[6] A61B *10/00***

**U.S. Cl. 128—734** **19 Claims**



1. A method for measuring electrical conductivity of body fluids comprising the steps of: positioning a plurality of test electrodes at various sites on one area of a body to determine electrical resistance; taking measurements with said test electrodes; detecting resistances by said test electrodes; evaluating said resistances detected by said test electrodes and obtaining a minimal resistance; designating the minimal resistance as a reference for determining electrical conductivity; and providing a common ground for said test electrodes, whereby the electrical conductivity of body fluids is measured through said test electrodes.

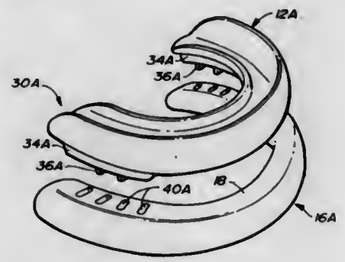
**5,499,632**
**GUIDE WIRE MIGRATION CONTROLLER**
**E. Richard Hill, III, Berkely; Glenn Davis, Sunnyvale, and Brian Farley, Los Altos, all of Calif., assignors to Devices for Vascular Intervention, Redwood City, Calif.**
**Filed May 4, 1994, Ser. No. 237,690**
**Int. Cl.[6] A61M** *37/00*
**U.S. Cl. 128—772** **17 Claims**



1. A guide wire migration controller for use with a motor driven unit and a guide wire, the guide wire having a longitudinal axis and the guide wire migration controller controlling migration of the guide wire along the longitudinal axis, the guide wire migration controller comprising:
a motor drive unit;
a housing connectable to the motor drive unit;
a guide wire gripper for gripping the guide wire along its longitudinal axis and being insertable within the housing; and
a locking member for locking the guide wire gripper within the housing, whereby, the gripper is locked within the housing controlling guide wire migration along the longitudinal axis.

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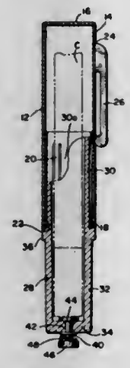
**5,499,633**
**ANTI-SNORING DEVICE WITH ADJUSTABLE UPPER AND LOWER RELATIONAL MEMBERS**
**Douglas F. Fenton, 2559 Union St., San Francisco, Calif. 94123**
**Continuation-in-part of Ser. No. 168,844, Dec. 17, 1993, abandoned. This application Mar. 28, 1994, Ser. No. 218,714**
**Int. Cl.[6] A61F** *5/56;* **A61C** *5/14*
**U.S. Cl. 128—848** **16 Claims**



1. An anti-snore dental device comprising:
an upper member having a substantially curved shape and defining an upwardly oriented channel for receiving at least a portion of at least some of the upper teeth of a user, the upper member further defining opposed sides thereof;
a lower member having a substantially curved shaped and defining a downwardly oriented channel for receiving at least a portion of at least some of the lower teeth of a user, the lower member further defining opposed sides thereof;
adjustable connectors for adjustably joining the upper and lower members together wherein the adjustable connectors comprise a pair of upper stanchions each coupled to one of the opposed sides of the upper member, the upper stanchions each having at least two projections extending downwardly therefrom, and a plurality of apertures formed in the lower member wherein said apertures are operable and can receive and frictionally engage at least one of the projections extending downwardly from the upper stanchions.

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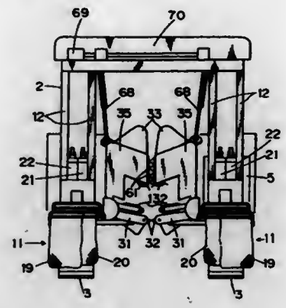
**5,499,634**
**CIGARETTE SNUFFER**
**Dale Herrmann, N84 W16033 Menomonee Ave. #210, Menomonee Falls, Wis. 53051**
**Filed Mar. 20, 1995, Ser. No. 407,573**
**Int. Cl.[6] A24F** *13/18*
**U.S. Cl. 131—256** **7 Claims**



1. A device for extinguishing lighted tobacco products, said device comprising:
an elongated, tubular cap having a closed, upper end terminating in a cap end wall and an open, lower end;
an elongated, tubular holder constructed and arranged to be telescoped within said cap and having an open, upper end and a closed, lower end terminating in a holder end wall opposite said closed, upper end of said cap, said holder having a radially outwardly projecting collar between said open, upper end and said closed, lower end;
said cap having a series of longitudinally extending biasing strips located about the inner periphery of said cap, said biasing strips being normally biased outwardly towards the longitudinal center line of said cap;
said holder being tapered outwardly in the direction of said closed, lower end thereof, the taper terminating in said collar;
said tapered holder being engageable with said biasing strips on said cap as said holder is telescoped within said cap until said open, lower end of said cap abuts said collar and said holder to thereby form a frictional closure between said cap and said holder,
whereby a lighted tobacco product placed in said holder is extinguished by frictional closure between said cap and said holder.



**5,499,635**
**TOBACCO HARVESTER**
**Teruo Haruzono, Kagoshima, Japan, assignor to Japan Tobacco Inc., Tokyo, Japan**
**Continuation of Ser. No. 953,914, Sep. 30, 1992, Pat. No. 5,402,804. This application Oct. 28, 1994, Ser. No. 330,544**
**Claims priority, application Japan, Feb. 6, 1992, 4-21113**
**Int. Cl.[6] A01D** *45/16*
**U.S. Cl. 131—290** **10 Claims**

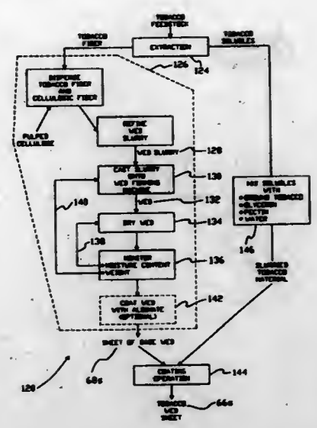


1. A tobacco harvester comprising:
a movable main body;
a harvesting mechanism mounted on said main body for harvesting tobacco leaves while said main body travels in a traveling direction, said harvesting mechanism comprising,
a pair of leaf transporting mechanisms which oppose each other with a clearance through which a stem of a tobacco plant passes, said leaf transporting mechanisms being arranged on right and left sides of said main body, and
leaf stripping chains disposed above and opposing said pair of leaf transporting mechanisms with an end of said leaf stripping chains on a front portion side of said main body being higher than the end of the leaf stripping chains on a rear portion side of said main body, said leaf stripping chains having leaf stripping claws which project from said leaf stripping chains and travel in a reverse direction to that of said main body at portions opposing said leaf transporting mechanisms, each of said leaf stripping claws comprising a bracket attached to said leaf stripping chain, a base member pivotally attached to said bracket, and a tip member pivotally attached to said base member; and
a storage section mounted on said main body for storing said tobacco leaves harvested by said harvesting mechanism;
wherein each of said leaf stripping claws extend in a direction substantially perpendicular to the leaf stripping chain, and wherein each of said leaf stripping claws on one leaf stripping chain are out of contact with each leaf stripping claw on the opposing leaf stripping chain when each of said leaf stripping claws are extended in a direction substantially perpendicular to the leaf stripping chain.

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**5,499,636**
**CIGARETTE FOR ELECTRICAL SMOKING SYSTEM**
**James D. Baggett, Jr.; David A. Clark; Patrick C. Cowling, all of Richmond; Richard G. Uhl, Midlothian, and Susan E. Wrenn, Chesterfield, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.**
**Continuation-in-part of Ser. No. 380,718, Jan. 30, 1995, which is a continuation of Ser. No. 118,665, Sep. 10, 1993, Pat. No. 5,388,594, which is a continuation-in-part of Ser. No. 943,504, Sep. 11, 1992. This application Apr. 20, 1995, Ser. No. 425,837**
**Int. Cl.[6] A24B** *15/12;15/18*
**U.S. Cl. 131—374** **8 Claims**

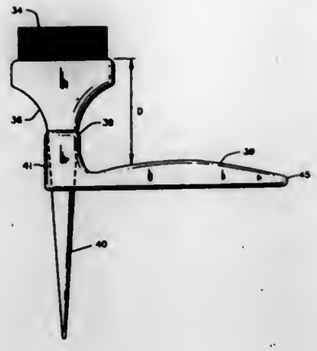
1. A method of manufacturing a tobacco web comprising a base web and a layer of tobacco material, said tobacco web being foldable into a tubular form as part of a cigarette operative with an electrical cigarette lighter, said method comprising the steps of:
separating solubles from fibers of a tobacco feedstock, said solubles being in solution comprising 5 to 10% by weight dissolved tobacco constituents;
producing said base web by forming a slurry of said separated tobacco fiber, mixing said slurried tobacco-fiber with a slurried strengthening agent to form a slurried mixture and casting said slurried mixture onto a web forming apparatus;
producing said tobacco material by mixing said 5 to 10% solution of tobacco constituents with additional tobacco particles, glycerin and pectin so as to form a dispersion of tobacco material and adjusting water content so as to achieve in said dispersion a solids content in the range of approximately 20 to 30%;
applying said dispersion of tobacco material along said base web to form a sheet of said tobacco web;
drying said sheet of said tobacco web to moisture content in the range of approximately 8.5 to 12%;
cooling said sheet of said tobacco web to a temperature in the range of approximately 70° to 80° F.;
decurling said sheet of said tobacco web;
winding said sheet of said tobacco web so as to form a roll of tobacco web; and
slitting said roll of tobacco web so as to produce a bobbin of tobacco web.



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**5,499,637**
**APPLICATOR FOR HAIR COLORING AND THE LIKE**
**Anthony Foti, 4 Sailer Ct., Elizabeth, N.J. 07201**
**Filed Dec. 13, 1994, Ser. No. 354,667**
**Int. Cl.[6] A45D** *24/00;* **A46B** *5/02*
**U.S. Cl. 132—200** **6 Claims**

1. An improved applicator brush apparatus for applying hair color and the like comprising:
a first handle for gripping by a user said first handle being tapered;
an applicator brush mounted to said first handle and substantially perpendicular thereto, said applicator brush including bristles for the application of hair color and the like, and a second handle, said second handle and said bristles extending in the same direction longitudinally, said first handle being substantially perpendicular to said second handle and to said bristles, said second handle being tapered, said first handle and said second handle slidably engaging one another to form a frictional connection.

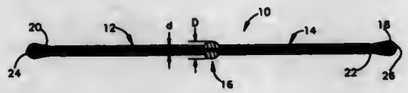


**5,499,638**

## HAIR HOLDING DEVICE

**Jamie R. Ripley, 19645 Detroit Rd., Apartment 281, Rocky River, Ohio 44116**

**Filed Oct. 17, 1994, Ser. No. 324,768**
**Int. Cl.[6] A45D** *8/14;2/18*
**U.S. Cl. 132—273** **25 Claims**



1. A hair accessory, comprising:
a first compressible flexible holder arm,
a second compressible flexible holder arm,
a joint member in the form of a bead disposed between and interconnecting an inner end of the first holder arm and an inner end of the second holder arm, said first and second holder arms extending outwardly away from diametrically opposite sides of said joint member,
a first end member disposed at an outer end of the first holder arm, and a second end member disposed at an outer end of the second holder arm, wherein said holder arms are separately movable and bendable into selected configurations from a position where the entire length of the first and second holder arms are substantially co-linear with one another, to a position where the entire length of the first and second holder arms are substantially parallel with one another.

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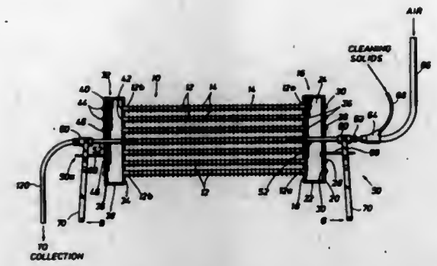
**5,499,639**

## APPARATUS AND METHOD FOR CLEANING EXCHANGER TUBES

**Robert V. Williams, Jr., 16 Bay Harbor, La Porte, Tex. 77571**

**Filed May 1, 1995, Ser. No. 431,557**
**Int. Cl.[6] F28G** *9/00;* **B08B** *3/02*
**U.S. Cl. 134—7** **17 Claims**

1. An apparatus for use in cleaning the tubes of a heat exchanger of a type having at least one header, said header having spaced, first and second walls defining a manifold chamber therebetween, a plurality of tubes extending from said first wall and having ends cooperating with said first wall to define tube openings providing open communication between said tubes and said manifold chamber, each of said tube openings defining a peripheral seating surface, said second wall being provided with a plurality of bores, respective ones of said bores in said second wall being in register with respective ones of said tube openings in said first wall, said apparatus comprising:



a tubular member having a first end and a second end, said tubular member being dimensioned such that said first end of said tubular member can be received through at least one of said bores;
force transmitting means connected to said tubular member and operatively connectable to said second wall, said force transmitting means including a pivot point whereby a force exerted on said force transmitting means and acting around said pivot point urges said tubular member toward the seating surface of a tube opening in register with said bore through which said tubular member is received; and
means to effect a substantial seal between said tubular member and said seating surface.

14. A method for cleaning the tubes of a heat exchanger of a type having at least one header, said header having spaced, first and second walls defining a first manifold chamber therebetween, a plurality of tubes extending from said first wall and having first ends cooperating with said first wall to define a first set of tube openings providing open communication between said tubes and said manifold chamber, each of said tube openings of said first set defining a peripheral seating surface, said second wall of said one header being provided with a plurality of bores, respective ones of said bores in said second wall of said one header being in register with respective ones of said tube openings of said first set, said method comprising:
introducing a first tubular member through one of said bores in said second wall of said one header;
bringing said first tubular member into register with one of said tube openings of said first set in register with said bore through which said first tubular member is received;
releasably connecting said first tubular member of said one header to said second wall to establish a first pivot point whereby a force exerted around the first pivot point urges said first tubular member toward said first and second walls of said one header;
exerting said force to effect a substantial seal between said first tubular member and said seating surface; and
introducing a fluidized cleaning medium through said first tubular member into said tube.

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**5,499,640**

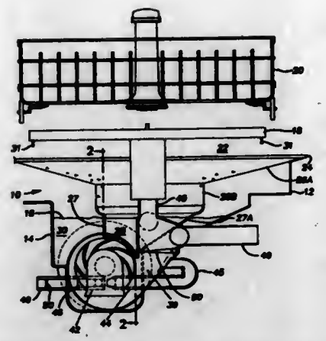
## DISHWASHER WITH VENTURI DRAIN

**Daniel R. Kirkland, Winterville, N.C., assignor to White Consolidated Industries, Inc., Cleveland, Ohio**

**Filed Feb. 24, 1995, Ser. No. 393,729**
**Int. Cl.[6] B08B** *17/02*
**U.S. Cl. 134—56 D** **21 Claims**

21. A dishwasher drain system, comprising:
a sump having first and second sump chambers adapted to hold fluid from a wash chamber of the dishwasher;
a filter separating the wash chamber from the second sump chamber so as to direct food particles to the first sump chamber;
a pump having an inlet disposed in the second sump chamber; and
a jet pump having an inlet in communication with an outlet of the pump, a suction gap in communication with the first sump chamber, and an outlet communicable with a drain, the pump being adapted to create a fluid flow from the second chamber through the jet pump so as to entrain material from the first sump chamber into the jet pump and toward the drain.





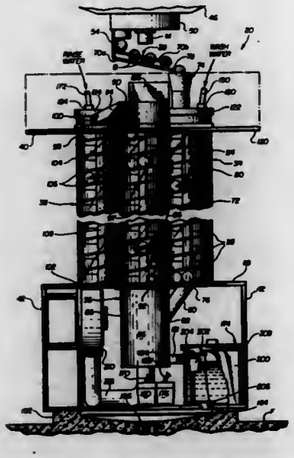
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**5,499,641**

## APPARATUS AND METHOD FOR WASHING BALLS

**Ralph Weimer, Wheaton, and Duane R. Acker, Mundelein, both of Ill., assignors to Discovery Zone, Inc., Chicago, Ill.**

**Continuation-in-part of Ser. No. 827,773, Jan. 29, 1992, Pat. No. 5,353,822. This application Jan. 21, 1994, Ser. No. 184,513**
**Int. Cl.[6] B08B** *3/04*
**U.S. Cl. 134—65** **5 Claims**



1. An apparatus for washing balls in a fluid comprising:
a first elongated transparent housing suitable for receiving the fluid and having a first ball inlet near one longitudinal end, a first ball outlet near the other longitudinal end, and first conveying means for conveying balls from said first ball inlet to said first ball outlet;
a second elongated transparent housing suitable for receiving the fluid and having a second ball inlet near one longitudinal end, a second ball outlet near the other longitudinal end, and second conveying means for conveying balls from said second ball inlet to said second ball outlet;
first transfer means for transferring balls from said first ball outlet to said second ball inlet; and
a first enclosure disposed about said first ball outlet, said second ball inlet and said transfer means so that an observer viewing the ball washer cannot see the transfer of balls between said first and second housings.

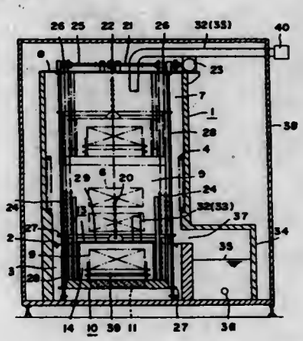
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**5,499,642**

## WASHING APPARATUS

**Masahide Uchino, Tokyo, Japan, assignor to Japan Field Co., Ltd., Tokyo, Japan**

**Continuation of Ser. No. 119,115, Sep. 17, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 474,141**
**Claims priority, application Japan, Jan. 22, 1992, 4-031407**
**Int. Cl.[6] B08B** *3/12;7/04*
**U.S. Cl. 134—95.1** **11 Claims**



1. A washing apparatus comprising a bath, a washing liquid arranged in a lower portion of said bath, a table for receiving articles to be cleaned and a covering member, said covering member and said table are independently movable in a vertical direction within said bath, and said covering member is movable to a position above said table and a position contacting said table for sealing said articles to be cleaned between said covering member and said table at more than one location in said vertical direction.

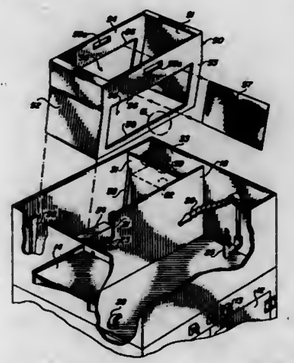
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**5,499,643**

## CLEANING APPARATUS FOR REMOVING OILY WASTE

**C. Elmas Vincent, Jr., 20022 N. 2nd Dr., Phoenix, Ariz. 85027, and Anthony Galanis, 2144 Glacier, Idaho Falls, Id. 83401**

**Filed Apr. 11, 1995, Ser. No. 420,248**
**Int. Cl.[6] B08B** *3/04*
**U.S. Cl. 134—104.4** **17 Claims**



1. An improved cleaning apparatus for removing oily waste from articles to be cleaned using a water based cleaning liquid including, in combination:

(a) a cleaning tank having a bottom wall and a plurality of side walls, and having an outlet and at least one inlet, said cleaning tank serving as means for holding an article in contact with a flow of said cleaning liquid and thereby causing relatively small globules of oleophilic waste material to become suspended in said cleaning solution, the liquid in said cleaning tank defining a first surface when said article is present within said cleaning tank;

(b) a separating tank having a bottom wall and a plurality of side walls, and having an inlet located in proximity to one end said tank and connected to receive cleaning liquid flowing out of the outlet of the cleaning tank and an outlet located in proximity to the opposite end of said tank and to said bottom wall, said separating tank serving as means for holding cleaning liquid received from said cleaning tank for a time sufficient for a substantial fraction of said relatively small globules to coalesce into relatively large globules, the liquid in said separating tank defining a second surface;

(c) a plurality of coalescing plates disposed within said separating tank between the inlet and the outlet thereof, each of said plates having a lower edge and sides that extend into proximity with the bottom and side walls, respectively of the separating tank and having an upper edge, and defining a plurality of openings therethrough;

(d) means for pumping cleaning liquid from the outlet of said separating tank to the inlet of said cleaning tank; and

(e) vertically movable means positioned between the outlet of the cleaning tank and the inlet of the separating tank for allowing cleaning liquid in said cleaning tank to flow into said separating tank when said first surface is higher than said second surface.

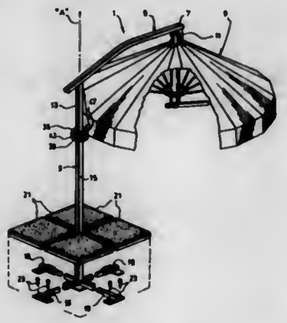
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**5,499,644**

## SUNSHADE ASSEMBLY

**Henry Genicle, Westmount, Canada, assignor to Tye-Sil Corporation, Montreal, Canada**

**Filed May 25, 1995, Ser. No. 451,070**
**Int. Cl.[6] A45B *11/00***
**U.S. Cl. 135—20.1** **14 Claims**



1. In a sunshade assembly of the type comprising:

a vertical stand;

a supporting arm connected to and extending radially from the stand, said supporting arm having a free end distant from said stand; and

a sunshade connected to the free end of the arm, the improvement wherein the vertical stand includes:

an upper part and a lower part that extend upwardly and coaxially one above the other along a vertical axis that is common to each other;

means for rotatably connecting the upper and lower parts of the stand in such a manner that these parts are rotatable with respect to each other about their common vertical axis; and

means for locking said upper and lower parts into a plurality of angular positions with respect to each other about their common vertical axis, said locking means comprising:

a first ring rigidly connected to and radially projecting from a bottom end of said upper part;

a second ring rigidly connected to and radially projecting from a top end of said lower part; and

locking means to lock these first and second rings together.

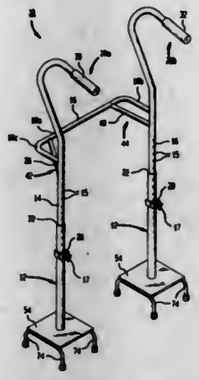
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**5,499,645**

## DUAL STAIR STEP WALKER WITH ASSIST BAR

**Arvind B. Baliga, 405 Valley Forge Ct., Medford, N.J. 08055.**

**Filed Jul. 11, 1995, Ser. No. 500,801**
**Int. Cl.[6] A63H *3/00***
**U.S. Cl. 135—67** **3 Claims**



1. A combination comprising an integral stair climber, lifter, bracer and walker comprising a pair of posts arranged in a vertical parallel relationship with respect to each other, said posts each having an upper end and a lower end, each upper end having an intermediate portion bent forward at approximately a 45 degree angle and an end bent horizontal and covered with a resilient grip, and said walker further comprising a pair of standards, each said lower end adjustably telescopically engaging said corresponding standard, said pair of posts being of the same size, each standard having an enlarged socket at its upper end for telescopically receiving the lower end of said post, there being a plurality of spaced apart registering apertures in each said standard and in each said post, a first securing element extending through said registering apertures in one of said standards and corresponding post and including an enlarged finger engaging portion on an end thereof: a second securing element extending through said registering apertures in the other of said standards and corresponding post and including an enlarged finger engaging portion on an end thereof, a horizontally disposed U-shaped handle extending between the upper ends of said standards and protruding forward in a horizontal plane and secured thereto, a pair of spaced apart support members, one depending from each side of said handle and arranged to extend below said U-shaped handle and permanently connect said handle to a nearby post, the walker further comprising a pair of metal plates, one plate connecting the lower end of one of said standards to a foursome of legs each having lower straightened portions arranged in a substantially equally spaced apart relation with respect to each other, the other plate connecting the lower end of one of said standards to another foursome of legs each having lower straightened portions arranged in a substantially equally spaced apart relation with respect to each other, each said foursome of legs being of the same size, the upper portions of said legs being curved and being secured to said plates, and a horizontally disposed bottom brace extending between pairs of said legs and secured to the plate, said bottom brace being positioned below said plate, said bottom brace lying in the same plane as said legs, said bottom brace being longer than said handle, and resilient cups mounted on the lower end of said legs.



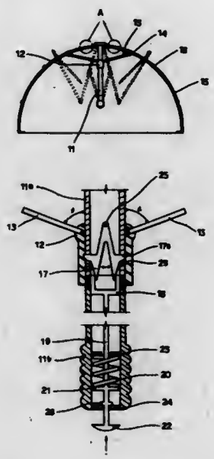
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**5,499,646**

## FOLDABLE TENT

**Woon Lee, 1-303 Keumkang Apartment, 625-8 Shimkokbon-dong, Soea-ku, Buchon-chi, Kyounggi-do, Rep. of Korea**

**Filed Jun. 14, 1994, Ser. No. 261,114**
**Claims priority, application Rep. of Korea, Jun. 14, 1993, 93-10421**
**Int. Cl.[5] E04H *15/28*; A45F *3/00***
**U.S. Cl. 135—121** **10 Claims**



1. A foldable tent comprising:

a cloth tent body;

a plurality of foldable pipe frames having inside end portions, said pipe frames being coupled to each other at said inside end portions and extended to pitch state of the tent, each of said pipe frame comprising a plurality of pipes jointed to each other by a plurality of joints;

a cylindrical center member having a top and a bottom end, said cylindrical center member being coupled to all of said inside end portions of said pipe frame at said top end, said center member including a top cylinder and a bottom cylinder, said top cylinder being coupled to said pipe frames and having a through hole and said bottom cylinder being detachably coupled to said bottom end of said top cylinder;

a cylindrical slider, slidably fitted over said center member, said slider having an inner surface provided with a notch;

an elastic locking member mounted in said top cylinder of the center member for locking said slider, said locking member having a locking projection elastically penetrating said through hole of the top cylinder so as to snap into said notch of the slider and to retain said pitched state of the tent;

means for releasing said locking projection of the locking member from said notch of the slider for folding said pipe frames, said releasing means being received in said bottom cylinder; and

a plurality of ribs having opposite end portions, each of said ribs being hinged to a corresponding pipe frame and said slider at said opposite end portions, respectively, such that an angle formed between said ribs and said top cylinder when the tent is in a pitched state is less than 90°.

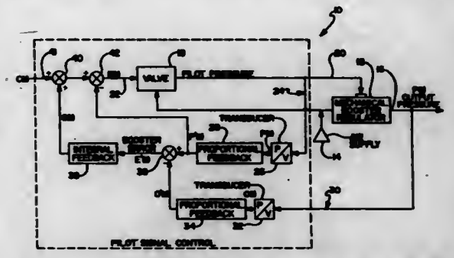
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**5,499,647**

## METHOD AND VALVE ASSEMBLY FOR CONTROLLING A PILOT SIGNAL

**Michael E. Robert, Farmington Hills, Mich., assignor to MAC Valves, Inc., Wixom, Mich.**

**Filed Jan. 12, 1995, Ser. No. 371,766**
**Int. Cl.[6] G05D *16/20***
**U.S. Cl. 137—12** **6 Claims**



4. A method for controlling an output pressure of a booster regulator by a valve having a pilot pressure feedback loop and an output pressure feedback loop, the method comprising the steps of:

opening the valve to create a pilot pressure;

opening the booster regulator based on the fluid received from the valve to create an output flow defining an output pressure;

transforming energy from the output pressure into an output pressure voltage signal;

transforming energy from the pilot pressure into a pilot pressure voltage signal;

subtracting the output pressure voltage signal from the pilot pressure voltage signal to create a difference signal;

integrating the difference signal to create an integrated signal; and

adding the integrated signal to a command signal.

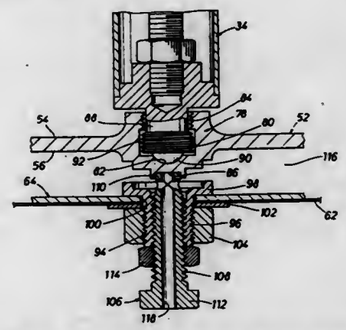
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**5,499,648**

## SEALING MEANS FOR PRESSURE RELIEF VALVES AND METHODS OF ASSEMBLY

**Walter W. Powell, Sugarland, and Louis R. Castaneda, Houston, both of Tex., assignors to Groth Corporation, Houston, Tex.**

**Filed Aug. 30, 1994, Ser. No. 297,802**
**Int. Cl.[5] F16L *55/18*; F16K *31/145***
**U.S. Cl. 137—15** **13 Claims**



1. A method of assembling a flexible membrane in a taut relation between a valve plate and retainer plate of a pressure relief valve for providing a tight seal against a valve seat in the closed position of a relief valve; said method comprising the following steps:

placing the flexible membrane on one side of the generally flat valve plate;

securing an outer marginal portion of said flexible membrane to said valve plate;

providing a bushing for the retainer plate for fitting within a central opening of the retainer plate;

mounting the bushing within said central opening with said flexible membrane extending about the bushing;

securing said flexible membrane against said retainer plate;

mounting an adjustable force exerting member within said bushing between said valve plate and said retainer plate for forcing said plates away from each other; and

adjusting said force exerting member to force said plates away from each other for tensioning said flexible membrane secured between said plates a predetermined amount to provide a taut generally frusto-conical sealing portion of said membrane extending between said plates adapted for sealing against said valve seat.

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**5,499,649**

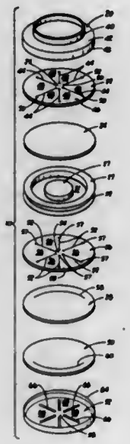
## PRESSURE SURGE RESISTANT RUPTURE DISK ASSEMBLY

**John A. Tomasko, Claremore, and Stephen P. Farwell, Owasso, both of Okla., assignors to BS&B Safety Systems, Inc., Tulsa, Okla.**

**Continuation-in-part of Ser. No. 106,447, Aug. 16, 1993, Pat. No. 5,377,716. This application Nov. 28, 1994, Ser. No. 345,118**

**Int. Cl.[6] F16K** *17/40;47/14*

**U.S. Cl. 137—68.27** **22 Claims**



1. A momentary pressure surge resistant rupture disk assembly adapted to be sealingly clamped across a pressurized fluid containing passageway comprising:

a first rupture member having a predetermined rupture pressure;

a second rupture member having a predetermined rupture pressure and having at least one opening therein for allowing a restricted pressurized fluid flow therethrough, said second rupture member facing said pressurized fluid;

means for providing a space for containing pressurized fluid within said assembly and for supporting said second rupture member against said first rupture member during a momentary pressure surge disposed between said first and second rupture members; and

at least one flow restricting member positioned on the side of said second rupture member facing said pressurized fluid having at least one opening therein for further restricting pressurized fluid flow therethrough and through said second rupture member.

**5,499,650**

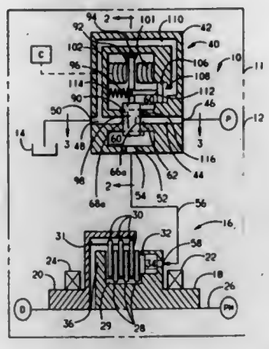
## FLUID CONTROL VALVE FOR A HYDRAULIC SYSTEM OPERATING WITH VARIABLE VISCOSITY, CONTAMINATED, FLUID

**Malcolm J. McArthur, Escondido, Calif., and Harvey Jansen, Tempe, Ariz., assignors to Sundstrand Corporation, Rockford, Ill.**

**Filed Nov. 7, 1994, Ser. No. 335,272**

**Int. Cl.[6] G05D** *16/20*

**U.S. Cl. 137—85** **40 Claims**



1. A hydraulic system comprising, a pressure actuated hydraulic device, a source of pressurized hydraulic fluid, a low pressure reservoir, a source of control signals, and a clevis-type pressure control valve, with said clevis-type pressure control valve including:

means for receiving a flow of pressurized hydraulic fluid from said source of pressurized hydraulic fluid and delivering said flow to said low pressure reservoir; and

means for converting a portion of said flow into a predetermined control pressure corresponding to control signals received from a source of control signals, and applying said control pressure to said pressure actuated hydraulic device; with said means for converting including a clevis-type fluid pressure control stage.

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**5,499,651**

## DEICING SYSTEM FOR A BUTTERFLY VALVE

**Claude Gallo, Le Mee Sur Seine, and Guy E. O. LeClercq, Melun, both of, France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "SNECMA", Paris, France**

**Filed Aug. 16, 1994, Ser. No. 291,550**

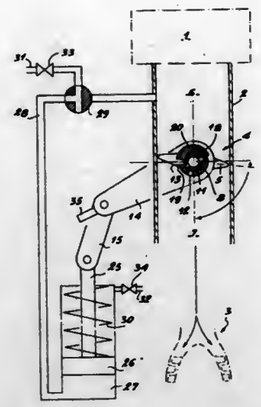
**Claims priority, application France, Aug. 18, 1993, 93 10080**

**Int. Cl.[6] F02G** *5/00*

**U.S. Cl. 137—334** **4 Claims**

1. System having a valve (4) with a butterfly plate (5) in a cold starting device (1, 2, 3) of an engine incorporating a hot gas source, a turbine (3) driven by the gas, a pipe (2) connecting the source to the turbine and on which is placed the valve (4), as well as a control means for the valve, characterized in that the control means is connected to the valve by a pin (11) coaxial to the spindle (8) of the butterfly plate (5), the pin (11) and the spindle (8) being provided with recesses (12, 13) and mounted so as to rotate about one another between two abutment positions (18, 19) positioned so that the recesses (12, 13) are superimposed in one of the abutment positions, obtained after initiating a movement of the control means so as to control the opening of the butterfly plate and linking the portions (6, 7) of the pipe (2) on either side of the butterfly plate (5) and so that the recesses are covered after a movement of the control means in order to control the closing of the butterfly plate.





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**5,499,652**

## DISTRIBUTOR FOR VISCOUS FLUIDS WITH MULTIPLE RADIAL; DISCHARGE

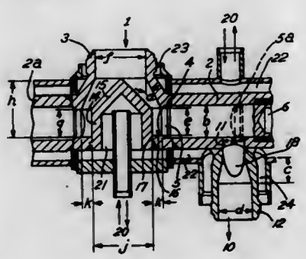
**Walter Schnaus, Rodenbach; Michael Streng; Franz Schoenmeier, both of Maintal, and Stephan Biller, Oberursel, all of, Germany, assignors to Zimmer Aktiengesellschaft, Germany**

**Filed Dec. 15, 1994, Ser. No. 356,141**

**Claims priority, application Germany, Mar. 18, 1994, 44 09 234.2**

**Int. Cl.[6] F16K** *49/00*

**U.S. Cl. 137—340** **9 Claims**



1. In a distributor for viscous fluids, consisting of a central inlet line with an inside diameter of f and at least two valves connected radially to said inlet line, each valve having a cylindrical casing with an inside diameter of b, an outlet opening that opens into an outlet line and a valve spindle having a valve head that moves in the axial direction in said casing, said spindle serving to close off said valve, and said valve head engaging a valve seat having a diameter of e in the wall of said inlet line when the valve is in the closed position, said valve spindle leaving said outlet opening just free when the valve is in the open position, the improvement comprising

a flow displacer of the height h with a cylindrical bottom part having the height g and a conical top part facing the fluid flow inserted centrally into said inlet line in the area of said valve seat to form a ring gap of the width k around the bottom part of said displacer, where

$g=(1.0 \text{ to } 1.1)\cdot e$

$h=(1.0 \text{ to } 1.3)\cdot f$

and

$k=(0.10 \text{ to } 0.25)\cdot f$

said outlet line being enlarged along a length c to an inside diameter of d immediately following said outlet opening, which opening has a diameter of a, where

$a=(0.5 \text{ to } 0.7)\cdot b$

$d=(1.4 \text{ to } 1.9)\cdot a$

and

$c=(0.8 \text{ to } 1.5)\cdot a$.

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**5,499,653**

## SECURITY DEVICES FOR FLUID FLOW LINES

**Malcolm Kerry, 4 Holbeck Towers, Leeds, LS11 4NN, West Yorkshire, England**

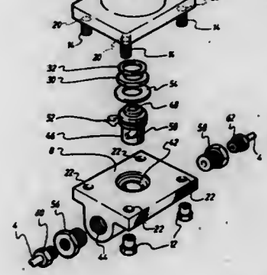
**PCT No. PCT/GB93/00525, § 371 Date Aug. 16, 1994, § 102(e) Date Aug. 16, 1994, PCT Pub. No. WO93/18943, PCT Pub. Date Sep. 30, 1993**

**PCT Filed Mar. 12, 1993, Ser. No. 284,644**

**Claims priority, application United Kingdom, Mar. 14, 1992, 9205605; Feb. 11, 1993, 93002684**

**Int. Cl.[6] F16K** *35/00*

**U.S. Cl. 137—354** **9 Claims**



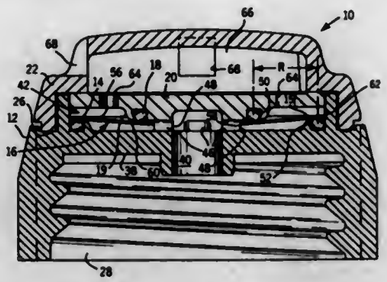
1. A security device for insertion into a fluid flow line of a member, said device comprising a first body member locatable at one side of a floor or wall of said member and a second body member locatable at an opposite, second side of said floor or wall and being securable to said first body member, a rotatable locking device located in said first body member, and a rotatable valve member located in said second body member, said valve member being movable upon rotation of said locking device, from a first position allowing fluid to flow through said valve member to a second position preventing such flow, wherein said first and second body members are securable together by means located at said second side of said floor or wall, and engaging means extending from a surface of said first body member which confronts said floor or wall, said engaging means comprising a plurality of threaded shanks which are secured in blind bores in said surface of said first body member, and which pass through throughbores in said second body member, and are engageable by securing devices; whereby said security device is devoid of any release means at said one side of said floor or wall.

5,499,654

## TWO-WAY VENT VALVE

Peter W. Shefte, Menomonee Falls, Wis., assignor to Applied Power Inc., Butler, Wis.

Filed May 15, 1995, Ser. No. 441,520
Int. Cl.[6] F16K *17/19*
U.S. Cl. 137—493.9 7 Claims



1. A two-way vent valve, comprising:

a housing defining a breather chamber therein, a first passageway opening to a first side of said breather chamber and a second passageway opening to a second side of said breather chamber, said second side being opposite from said first side;

an annular valve disc received in said breather chamber between said first and second sides of said chamber, said disc having a first side facing said first side of said breather chamber, a second side opposite from said first side and facing said second side of said breather chamber, an outer diameter edge and an inner diameter edge; and

a pair of circular seals coaxial with said disc, one of said seals being of one diameter and creating a liquid tight seal with one of said sides of said disc between said passageways and the other said seal being of a different diameter and creating a liquid tight seal against the other side of said disc between said passageways.

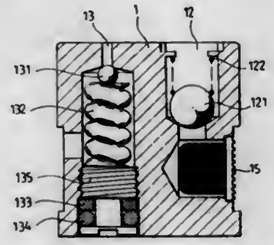
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5,499,655

## ONE-WAY VALVE STRUCTURE FOR A HYDRAULIC JACK

Michael Hung, 9-16, Nan Kan Hsia, Nan Kan, Lu Chu Hsiang, Tao Yuan County, Taiwan

Filed Jan. 4, 1995, Ser. No. 368,613
Int. Cl.[6] B66F *3/24*
U.S. Cl. 137—512.3 1 Claim



1. An improved one-way valve structure for a hydraulic jack having a one-way valve located within a pump seating to control hydraulic fluid flow from an oil reservoir to the pump seating so as to cause the hydraulic fluid to enter a pumping cylinder to consequently drive a piston to rise by pushing a handle at the pump seating, said one-way valve structure comprising:

a cylindrical body with an annular coulisse,

an L-shaped intake passage and a pressure release passage extending between a coulisse wall of said annular coulisse and an end of said body, and an outlet passage passing through said body,

each of said passages having therein a steel ball and a spring,

an end of said pressure release passage having therein a C-ring, an oil seal, and a screw element to adjust tension of the respective said spring,

an inlet end of said said intake passage having a step for fixing of a filter so that a filter cover thereof is positioned flush with said inlet end, said filter being a cup-like structure having a diameter slightly smaller than an inner diameter of said inlet end of said intake passage, and

whereby hydraulic fluid is filtered by said filter at said intake passage while passing through said one-way valve so that foreign particles in the hydraulic fluid from the oil reservoir are completely prevented from entering the pump seating, and consequently clogging of the oil circuit or damage to the cylinder can be prevented.

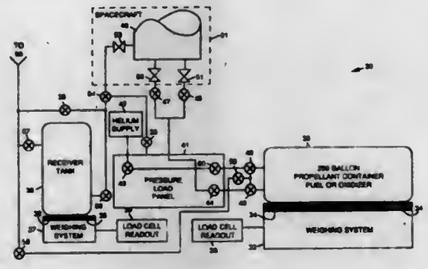
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5,499,656

## INTEGRATED STORAGE AND TRANSFER SYSTEM AND METHOD FOR SPACECRAFT PROPULSION SYSTEMS

L. Scott Stotelmyer, Manhattan Beach, and Don K. Fulkerson, Valencia, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 23, 1993, Ser. No. 173,736
Int. Cl.[6] F16K *24/00*
U.S. Cl. 137—583 5 Claims




1. A container for storing, transporting and transferring propellants to a spacecraft propellant tank of a satellite propulsion system during launch preparation operations, wherein said container is comprised of stainless steel having an interior surface and an exterior surface, and wherein said interior surface is electropolished, and wherein said container further comprises a first valve that is couplable to an inlet of said spacecraft propellant tank of said satellite propulsion system during said launch preparation operations for loading propellant into said container and for transferring propellant out of said container and into said spacecraft propellant tank of said satellite propulsion system during said launch preparation operations, and a second valve that is couplable to an inert gas supply and that comprises a pressure input for supplying pressurized inert gas to said container during said launch preparation operations, which inert gas provides pressure to transfer propellant from said container into said spacecraft propellant tank by way of said first valve.

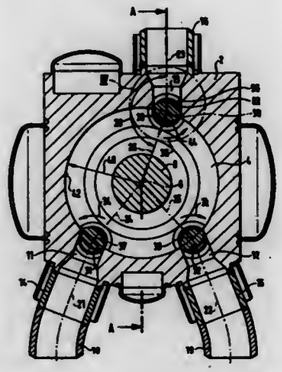


5,499,657

## VALVE ARRANGEMENT

Manfred Schmitt, Friedelsheim, Germany, assignor to Fisher-Guilde Regelarmaturen GmbH & Co. KG, Ludwigshafen, Germany

Filed Mar. 27, 1995, Ser. No. 410,792
Claims priority, application Germany, Mar. 26, 1994, 44 10 567.3
Int. Cl.[6] F16K *11/22*
U.S. Cl. 137—887 19 Claims



1. A valve arrangement comprising a distributor housing containing a distributor duct, an inlet duct leading into the distributor duct, and at least two outlet ducts leading out of the distributor duct, said housing further containing a valve integrated into the distributor housing and associated with each of the respective outlet ducts, each said valve variably defining a flow cross-section for a medium flowing through the inlet duct and the distributor duct and out the respective outlet duct, wherein each said outlet duct has a rectangular cross section where it leads out of the distributor duct, and each said valve comprises a regulating flap arranged proximate where the respective outlet duct leads out of the distributor duct, and each said flap has an axis of rotation arranged such that the flap is situated partially in the distributor duct and partially in the respective outlet duct.

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5,499,658

## ANGLED SEAT VALVE AND FITTING APPARATUS

Willard P. Bridges, 2102 W. Club Rd., Duncan, Okla. 73533

Filed Aug. 16, 1993, Ser. No. 108,101
Int. Cl.[6] F16K *1/02;31/44*
U.S. Cl. 137—886 4 Claims

1. A valve and fitting apparatus to control flow of fluid, which apparatus comprises:

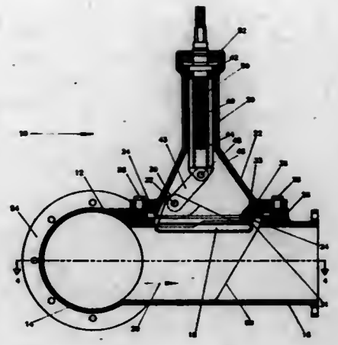
a main line to allow fluid flow therethrough;

a branch, having an internal diameter, in fluid communication with said main line to allow fluid flow through said branch line in a single direction;

a plate pivotally operable to move between an open position and a closed position at an acute angle to said flow in said branch line;

an interior shoulder in said branch line for receiving said plate in said closed position, said shoulder blending into the internal diameter of said branch line; and

means to pivot said plate between said open position and said closed position.



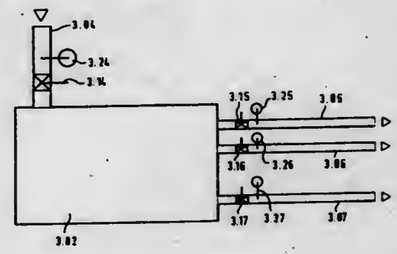
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5,499,659

## PROCESS FOR THE SEALING AND INTERNAL REPAIR OF SYSTEMS OF LAID CONDUITS

Werner Naf, Weingartenstrasse 2, CH-8820 Wadenswil, Switzerland

Division of Ser. No. 838,191, Mar. 3, 1992, abandoned. This application Jan. 25, 1994, Ser. No. 186,440
Claims priority, application Switzerland, Jul. 3, 1990, 02206/90; Jan. 3, 1990, 03188/90
Int. Cl.[6] F16L *57/00*
U.S. Cl. 138—97 24 Claims



1. A process for the sealing and internal repair of at least one leak in a system of laid conduits, the process comprising the following steps:

(a) introducing a sealant into the conduit by means of air;

(b) filling the conduit with a fluid., the fluid cooperating with the sealant to seal the leak;

(c) emptying the fluid from the conduit;

(d) blowing through the emptied conduit compressed air that is charged with particles of an abrasive substance; and

(e) then internally coating the conduit by introducing and blowing into it a solvent-free epoxy resin containing a hardener and fibers, the fibers being selected from the group consisting of cellulose fibers, glass fibers, and a mixture of cellulose fibers and glass fibers.

**5,499,660**

## RELINING PIPE HAVING PIPE ELEMENTS INTERCONNECTED BY PIPE COUPLINGS

**Christer StorgÅrd, Torpankatu 10, FIN-65230 Vaasa, Finland**

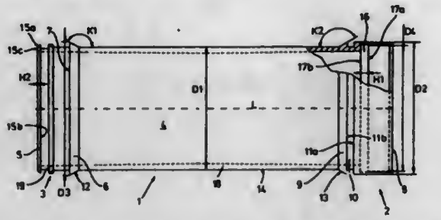
**PCT No. PCT/FI93/00147, § 371 Date Sep. 9, 1994, § 102(e) Date Sep. 9, 1994, PCT Pub. No. WO93/20381, PCT Pub. Date Oct. 14, 1993**

**PCT Filed Apr. 6, 1993, Ser. No. 295,673**

**Claims priority, application Finland, Apr. 7, 1992, 921535**

**Int. Cl.[6] F16L *1/00***

**U.S. Cl. 138—98** **5 Claims**





1. A relining pipe for insertion inside sewer lines and similar pipelines in order to repair them, which comprises:

a plurality of substantially rigid pipe elements (1)

a coupling interconnecting said pipe elements, said coupling having a female sleeve part (2) the outer diameter (D2) of which is greater than the outer diameter (D1) of a wall of the pipe elements, and a male locking part (3) wherein a bottom of the female part and the outer end of the male part have counterparts (5, 16) which snap-lock to each other in order to prevent the pipe elements from being detached from each other under tension;

the pipe elements each having (1), as an extension of the male locking part (3), an integral shoulder ring (6) wherein the outer diameter (D3) of the shoulder ring is substantially the same as the outer diameter (D2) of the female part, and which has a shoulder surface (7) transverse to a length (L) dimension of the pipe element, a stop surface (8) formed by the outer edge of the female part pressing against said shoulder surface (7) when the pipe elements are pressed together, thereby forming a first support surface pair, wherein the bottom of the female part (2) is a shoulder (17*b*) transverse to the length of each of said pipe elements, and wherein a stop surface (15*c*) formed by the outer edge of the male part (3) presses against said shoulder surface (17*b*) when the pipe elements are pressed together, thereby forming a second support surface pair.

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**5,499,661**

## TUBE COMPRISING COMPOSITE LAYERS WITH DIFFERENT MODULII OF ELASTICITY

**Pierre Odru, Fontenay sous Bois; Charles Sparks, Le Vesinet; Marcel Auberon, Le Haillan, and Jacques Behar, Saint Medard en Jalles, all of, France, assignors to Institut Francais du Petrole, Rueil Malmaison, and Aerospatiale, Paris, both of, France**

**Continuation of Ser. No. 794,955, Nov. 20, 1991, abandoned, which is a continuation of Ser. No. 631,868, Dec. 21, 1990, abandoned, which is a continuation of Ser. No. 318,179, Mar. 2, 1989, abandoned. This application May 11, 1995, Ser. No. 438,960**

**Claims priority, application France, Mar. 2, 1988, 88 02560**

**Int. Cl.[6] F16L *9/16***

**U.S. Cl. 138—124** **36 Claims**

1. A hollow tube comprising:

means for transferring or storing water or hydrocarbons under pressure, the means for transferring or storing having an interior surface for contacting the water or hydrocarbons under pressure and an exterior surface separated by a wall thickness with the interior surface being subjected to the pressure of the water or hydrocarbons in a radially outward direction from a center of the means for transferring or storing;

a plurality of pressure resisting means for resisting the radial outward pressure of the water or hydrocarbons on the means for transferring or storing, each pressure resisting means having an interior surface and an exterior surface separated by a wall thickness, an innermost pressure resisting means having its interior surface in surface contact with the exterior surface of the means for transferring or storing and an exterior pressure resisting means being located farthest from the center of the means for transferring or storing;

at least one tractive force resisting means for resisting tractive forces applied to the hollow tube along a longitudinal axis of the tube, each tractive force resisting means having an interior surface and an exterior surface separated by a wall thickness with each tractive force resisting means being disposed between a pair of the plurality of pressure resisting means with the interior surface of each tractive force resisting means being in surface contact with an exterior surface of a different one of the plurality of the pressure resisting means and the exterior surface of each of tractive force resisting means being in surface contact with an interior surface of a different one of the pressure resisting means; and wherein

each of the plurality of pressure resisting means comprises a fiber coated with a matrix to form a composite and is wound at an angle greater than 70° with respect to a longitudinal axis of the tube, each of the at least one tractive force resisting means comprises a fiber coated with a matrix to form a composite and is wound with an angle between 0° and 30° with respect to the longitudinal axis of the tube, a circumferential modulus of elasticity of the exterior pressure resisting means is greater than a circumferential modulus of elasticity of internal pressure resisting means and any pressure resisting means disposed between the innermost and the exterior pressure resisting means has a circumferential modulus of elasticity which is between the circumferential modulii of elasticity of the innermost and exterior pressure resisting means and the means for transferring or storing has a circumferential modulus of elasticity which is greater than a circumferential modulus of elasticity of each pressure resisting means which is inside of the exterior pressure resisting means.



**5,499,662**

## METHOD FOR PREVENTING THE FORMATION OF FABRIC BLEMISHES BY CONTROLLING BEAT-UP IN A LOOM

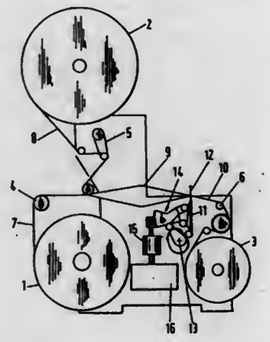
**Rudolf Vogel, Grüt, Switzerland, and Hüsnü Evren, Erenköy/Istanbul, Turkey, assignors to Sulzer Rueti AG, Rueti, Switzerland**

**Filed Oct. 12, 1994, Ser. No. 322,000**

**Claims priority, application European Pat. Off., Jan. 14, 1993, 93810723**

**Int. Cl.[6] D03D *1/00;49/60;39/22***

**U.S. Cl. 139—26** **8 Claims**



1. A method for controlling the beat-up in a loom and for avoiding start-up blemishes in the fabric due to a stop of the loom after it has woven a length of fabric having warp threads and weft threads and terminating in a last weft thread; the loom having a driven reed reciprocating towards and away from cloth fell for beating-up weft threads against the cloth fell by a desired beat-up distance; the method comprising the steps of:

generating one of a stop signal and a signal indicative of weft yarn breakage;

moving the reed towards the last weft thread over a first distance selected to maintain a sufficient spacing between the reed and the last weft thread of the cloth fell, so as to not disturb the relative position of the last weft thread;

stopping the loom;

restarting the loom;

inserting a first weft thread between the warp threads;

moving the reed against the first weft thread and toward the last weft thread over a second beat-up distance which is different than the first beat-up distance and which is selected so that a predetermined distance remains between the first weft thread and the last weft thread;

inserting a second weft thread between the warp threads;

moving the reed against the second weft thread and toward the last weft thread over the second beat-up distance which is different than the first beat-up distance and which is selected so that a predetermined distance remains between the first weft thread and the last weft thread;

inserting a third weft thread between the warp threads;

moving the reed against the third weft thread and together with the second and first weft thread toward the last weft thread over a third beat-up distance which is selected so that a predetermined distance remains between the first weft thread and the last weft thread;

performing a correction procedure so that after moving the reed over the third beat-up distance, the reed, during subsequent reciprocating movements, is again moved over the desired beat-up distance.

**5,499,663**

## TEXTILE MATERIAL FOR INNER LINING OF FIREFIGHTER PROTECTIVE GARMENT

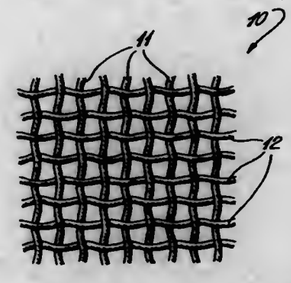
**Claude Barbeau, St. Lambert, and Ross Cochran, Mount Royal, both of, Canada, assignors to Marcanada Inc., Montreal, Canada**

**Continuation-in-part of Ser. No. 31,111, Mar. 12, 1993, Pat. No. 5,323,815. This application Mar. 18, 1994, Ser. No. 214,571**

**The portion of the term of this patent subsequent to Jun. 28, 2011, has been disclaimed.**

**Int. Cl.[6] A41D *1/02;13/00***

**U.S. Cl. 139—420 A** **2 Claims**



1. In combination, a firefighter garment and an inner lining therefor, said inner lining comprising a textile material being selected from the group consisting of at least one of a weave comprising a warp and weft arrangement of yarns and a knitting made of yarns having similar characteristics, said warp and weft arrangement of yarns and said knitting of yarns being multifilamentary aramid, polyimide, polyamide, or polybenzimidazole yarns, or multifilamentary yarns made of cellulose fire retardant material, the yarns providing a slippery inner surface thereby reducing restriction to movement by a wearer and permitting easier and quicker donning and doffing of the garment.

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**5,499,664**

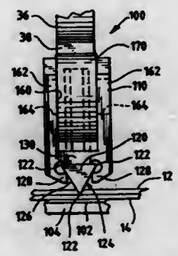
## COMPRESSIVE CUTTING MECHANISM HAVING PLURAL-EDGED CUTTER

**Janusz Figiel, Mount Prospect, and Peter Drabarek, Chicago, both of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.**

**Filed Mar. 7, 1994, Ser. No. 206,848**

**Int. Cl.[6] B21F *11/00***

**U.S. Cl. 140—152** **20 Claims**



1. A cutting mechanism for compressively cutting a workpiece, comprising:

an anvil for supporting a workpiece;

a cutter holder movable toward and away from said anvil;

an elongate cutter removably mounted upon said cutter holder so as to be movable conjointly with said cutter holder toward and

away from said anvil, and having a polygonal cross-sectional configuration comprising a plurality of surfaces disposed at predetermined angles with respect to each other so as to define a plurality of elongate, parallel cutting edges at intersection loci of said surfaces, wherein one of said cutting edges projects toward said anvil when said cutter is mounted within said cutter holder, said cutter being removable from said holder when said cutting edge projecting toward said anvil becomes dull and being remountable within said cutter holder such that another one of said plurality of cutting edges projects toward said anvil; and

mounting means defined upon said cutter holder for engaging said surfaces of said cutter, and recess means defined within said cutter holder for accommodating those cutting edges of said cutter, which do not project toward said anvil and are not being used at a predetermined time for a cutting operation, in such a manner that said cutting edges not being used for a cutting operation are free from contact with said cutter holder such that said cutter holder does not prematurely dull said cutting edges, not being used for a cutting operation, prior to their use in cutting operations.

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**5,499,665**

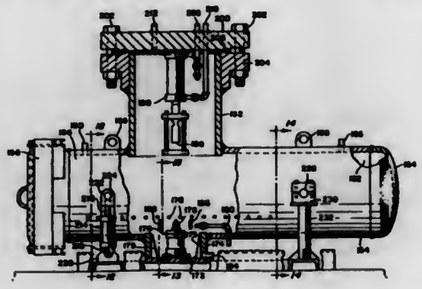
## CYLINDER RUPTURE VESSEL

**Jeffrey W. Gold, Atlanta, Ga., and Dan A. Nickens, Orlando, Fla., assignors to Earth Resources Corporation, Ocoee, Fla.**

**Continuation of Ser. No. 11,865, Feb. 1, 1993, Pat. No. 5,337,793, which is a continuation of Ser. No. 873,481, Feb. 20, 1992, Pat. No. 5,186,219, which is a continuation of Ser. No. 489,234, Mar. 6, 1990, abandoned, which is a continuation of Ser. No. 57,083, Jun. 3, 1987, Pat. No. 4,944,333, which is a continuation-in-part of Ser. No. 669,537, Nov. 8, 1984, Pat. No. 4,690,180. This application Aug. 15, 1994, Ser. No. 290,562**

**Int. Cl.[6] B65B** *31/00*

**U.S. Cl. 141—1** **34 Claims**



1. A system for accessing the contents of a target container comprising:

a first enclosed chamber including an upper housing and a lower housing integral with the upper housing;

a support on which a target container may be supported within the first enclosed chamber, the target container comprising a wall portion and being capable of containing at least one of high pressure gas; high-pressure, reactive gas; and a toxic substance;

a first access member connected to the first enclosed chamber, the target container being loaded into the system through the first access member;

a first seal disposed between the first access member and the first enclosed chamber;

at least one removal port connected to the first enclosed chamber;

at least one pump connected to one of the at least one removal ports, each pump evacuating gas from the first enclosed chamber;

at least one purge connection connected to the first enclosed chamber through which an inert gas is introduced to purge gas from the first enclosed chamber;

a mechanism that enables access to the contents of the target container through the wall portion of the target container; and

wherein the pump is operable to remove gas, contents of the target container and the inert gas from the first enclosed chamber.

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**5,499,666**

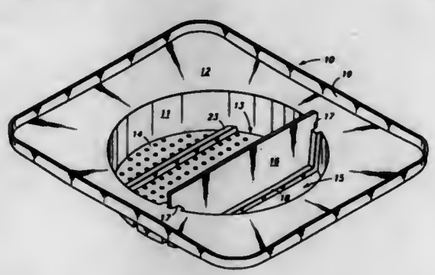
## SANITARY MEAT PURGE ELIMINATOR

**Robert C. Foster, Coeur d'Alene, and Guy D. Forbes, Post Falls, both of Id., assignors to F & F Enterprises, Inc., Coeur d'Alene, Id.**

**Filed Sep. 27, 1994, Ser. No. 312,651**

**Int. Cl.[6] A22C** *17/00*

**U.S. Cl. 141—98** **15 Claims**



1. A waste transfer device for supporting objects across an open container while providing access to the interior of the container for facilitating drainage of liquids and disposal of solids associated with the objects as they are being manually handled, the waste transfer device comprising:

an upright wall structure dimensioned to fit within an upper opening across a container;

a surrounding ledge protruding outwardly from the upright wall structure, the ledge being adapted to rest upon the container while locating the upright wall structure within its upper opening;

a transverse wall extending across the upright wall structure;

the transverse wall including a perforated section to provide support for objects while permitting drainage of fluids into the interior of the container and a discharge opening through which discarded solids can be directed into the interior of the container, the perforated section and the discharge opening of the transverse wall being arranged side-by-side within the area bounded by the upright wall structure; and

a solid divider extending upward from the transverse wall and across the upright wall structure at a position located between the perforated section and the discharge opening of the transverse wall.

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**5,499,667**

## DRILL/CUTTING BIT, AND METHOD OF MAKING STRUCTURAL JOINT

**Teruo Nakanishi, Kyoto, Japan, assignor to Nakanishi Construction Company, Japan**

**Filed Jun. 21, 1994, Ser. No. 263,338**

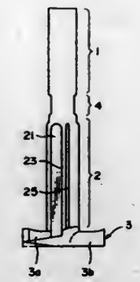
**Int. Cl.[6] B27M** *1/00;* **B27C** *1/00*

**U.S. Cl. 144—365** **14 Claims**

1. A cutting drill for use in forming holes in wood materials to accept insert protrusions of a metal plate connector used to join wooden members, comprising:

a shank;





a body connected to said shank, said body having at least one primary groove with a trailing cutting edge oriented parallel relative to a center longitudinal axis of the bit; and

an end cutting blade connected to said body, said end cutting blade including a side cutting edge and a bottom cutting edge configured for cutting a rectangular groove having a substantially flat bottom, said side cutting edge having a predetermined length and being parallel relative to said trailing cutting edge, said end cutting blade having a greater cutting diameter relative to a cutting diameter of said body.

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**5,499,668**

## PROCESS FOR MAKING ELECTRONIC DEVICE

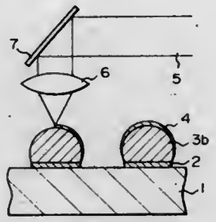
**Kaoru Katayama; Shinichi Kazui; Yasuhiro Iwata; Hiroshi Fukuda, and Toshihiko Ohta, all of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Oct. 27, 1994, Ser. No. 330,380**

**Claims priority, application Japan, Nov. 2, 1993, 5-274421; Jan. 4, 1994, 6-239813**

**Int. Cl.[6] B08B** *3/12*

**U.S. Cl. 134—1** **10 Claims**



1. A process for a solder treatment, which comprises irradiating a surface of a solder bump or layer bonded to a ceramic substrate with a laser beam of lower energy level than energy capable of changing the solder surface structure, thereby cleaning the surface of said solder, and bonding an integrated circuit to said cleaned solder surface, said solder being comprised of Sn—Pb.

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**5,499,669**

## REINFORCED SEMI-PNEUMATIC TIRE

**Terry D. Hardesty, Columbus, Wis., assignor to Deere & Company, Moline, Ill.**

**Filed Jul. 14, 1994, Ser. No. 275,181**

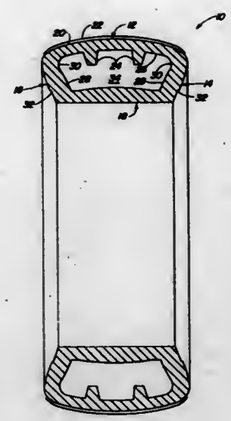
**Int. Cl.[6] B60C** *3/02*

**U.S. Cl. 152—158** **1 Claim**

1. A semi-pneumatic tire, comprising:

a radially inner wall;

first and second side walls operatively coupled with the inner wall;



a radially outer wall operatively coupled with the first and second side walls, said outer wall being adapted to shift radially inwardly under operating loads caused by ground contact;

at least a pair of rib portions extending radially inwardly from the outer wall and toward the inner wall for generally rigidifying said outer wall under operating loads;

wherein said side walls include a radially outer portion and a radially inner portion, said inner portion being thicker and more rigid than the outer portion such that the radially outer wall abuts against the inner portion of the side walls when the outer wall shifts radially inwardly under operating loads, said shifting of the outer wall being thereby limited; and

wherein said ribs reinforce the outer wall for generally hindering the inward shifting of the outer wall, said ribs being spaced from the side walls and radially inner wall for generally acting as T-beams when the radially outer wall abuts against the inner portion of the side walls for generally hindering further inward shifting when the outer wall abuts against the inner portion of the side walls.

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**5,499,670**

## TUBELESS TIRE WITH BEAD PROTECTORS HAVING AIR-IMPERMEABLE LAYER AND METHOD FOR PRODUCING SAME

**Jean Billieres, Clermont-Ferrand, France, assignor to Compagnie Generale Des Etablissements Michelin–Michelin & Cie, Clermont-Ferrand Cedex, France**

**PCT No. PCT/EP92/02972, § 371 Date Jan. 8, 1994, § 102(e) Date Jan. 8, 1994, PCT Pub. No. WO93/12943, PCT Pub. Date Jul. 8, 1993**

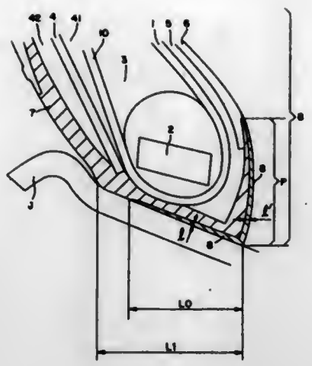
**PCT Filed Dec. 21, 1992, Ser. No. 244,761**

**Claims priority, application France, Dec. 31, 1991, 91 16458**

**Int. Cl.[6] B29D** *30/08;* **B60C** *5/14;15/00;15/06*

**U.S. Cl. 152—543** **9 Claims**

1. A tubeless tire which has a carcass reinforcement (1) turned up around bead rings (2) in beads (B) and is covered on the inside with a layer of rubber of slight stiffness (6) which is impermeable to the inflation air when the tire is inflated, the beads being covered, at least in the part thereof intended to be in contact with the tire's standard mounting rim, by circumferential profiled members (7) known as protectors, formed of non-air-impermeable rubbers of high stiffness, the tire being characterized by the fact that the protectors (7) are partially covered, at least radially to the inside and axially towards the inside, by a layer of air-impermeable rubber mix (8) of a coefficient of permeability to air at 80° C. of less than



$$\frac{21 \times 10^{-17} \times m^2}{s \times Pa}$$

and of a thickness 1 of between 0.1 and 1 mm, covering in each bead the radially inner part of the protector (7) over an axial length L0, such that the ratio L0/L1 of L0 to the axial width L1 of the bead (B) is between 0.2 and 0.7.

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**5,499,671**

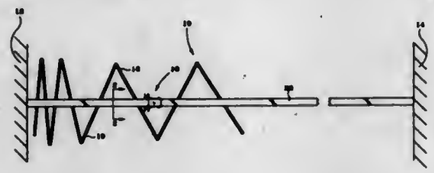
**ANTI-FLOAT SYSTEM FOR OPERABLE PARTITIONS**

**N. Douglas Owens, Lynn, Ind., assignor to Modernfold, Incorporated, New Castle, Ind.**

**Filed Jun. 1, 1994, Ser. No. 251,903**

**Int. Cl.[6] E05D *15/26***

**U.S. Cl. 160—199** **15 Claims**



1. In combination:
an operable partition;
a track;
a trolley coupled to the operable partition, wherein the trolley is movable along the track in a wall stacking direction and a wall extending direction; and
an anti-float apparatus comprising:
a first camming assembly positioned along the track, said first camming assembly comprising a first trolley camming surface and means for biasing said first trolley camming surface inward to a camming position;
a second camming assembly positioned along the track to cooperate with said first camming assembly, said second camming assembly comprising a second trolley camming surface;
wherein said first trolley camming surface, when disposed in said camming position, and said second trolley camming surface define a passageway therebetween, said passageway positioned for passage therethrough of a portion of the trolley when the trolley moves along the track, wherein said passageway is narrower than a width of the trolley portion; and
wherein said first trolley camming-surface is forcible outward from said camming position against a resistance provided by said camming surface biasing means when the trolley portion enters said passageway while traveling in the wall extending direction, whereby motion of the trolley in the wall extending direction is opposed.

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**5,499,672**

**MOLD FOR CONTINUOUS CASTING WHICH COMPRISES A FLAME SPRAYED COATING LAYER OF A TUNGSTEN CARBIDE-BASED WEAR-RESISTANT MATERIAL**

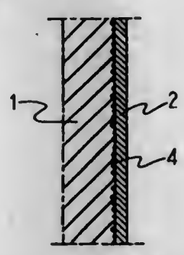
**Kunio Nakashima; Ryoichi Ishigane; Takayuki Tanaka, and Kenzo Yamamoto, all of Toyama, Japan, assignors to Chuetsu Metal Works Co., Ltd., Toyama, Japan**

**Filed Apr. 7, 1995, Ser. No. 418,513**

**Claims priority, application Japan, Jun. 1, 1994, 6-120081; Sep. 9, 1994, 6-242252**

**Int. Cl.[6] B22D *11/04***

**U.S. Cl. 164—418** **18 Claims**



1. A mold for continuous casting which comprises a copper or copper alloy mold substrate and a sprayed coating film formed on non-blasted inner surfaces of the substrate wherein particles of at least one tungsten carbide-based wear-resistant material having a particle size of from 5 μm to 53 μm and having a hardness capable of anchoring in the inner surfaces of the substrate are subjected to high pressure/high velocity oxygen fuel coating under conditions where the particles remain at least partially non-fused on application of heat from a spraying flame, thereby forming a layer directly anchored in the inner surfaces of the substrate at least as one layer of the sprayed coating film formed in a total film thickness of from 0.01 to 6 mm whereby said layer is well bonded to said substrate without resorting to any thermal treatment after completion of the high pressure/high velocity oxygen fuel coating.

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**5,499,673**

**METHOD OF AND APPARATUS FOR CONVEYING AND GUIDING THIN METAL STRIP FORMED BY QUENCHING**

**Nobuo Shiga; Tomohiro Marui; Kiyoshi Shibuya; Toru Sato, all of Chiba; Michiharu Ozawa, Tokyo, and Masao Yukumoto, Chiba, all of, Japan, assignors to Kawasaki Steel Corporation, Japan**

**Continuation of Ser. No. 72,778, Jun. 7, 1993, abandoned. This application Oct. 13, 1994, Ser. No. 322,955**

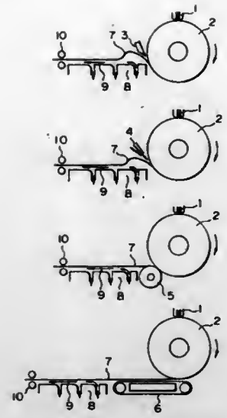
**Claims priority, application Japan, Jun. 8, 1992, 4-147486**

**Int. Cl.[6] B22D *11/06***

**U.S. Cl. 164—463** **15 Claims**

1. In a method of conveying a thin metal strip formed from a molten metal by quenching on a quenching roll, and separating said strip from said quenching roll, the steps which comprise:
(a) forming a fly path from said quenching roll along which the thin metal strip is conducted,
(b) stabilizing said fly path by applying to a surface of said strip a Coanda jet of a fluid, generated by conforming a portion of said jet into a curved convex path and another portion of said jet substantially perpendicular to said fly path, and
(c) causing said fluid to flow along said strip.





7. An apparatus for conveying along a path in a downstream direction a thin metal strip formed from a molten metal by quenching on a quenching roll and conducting said strip to a nip between pinch rolls or to a coiling system, comprising:
a Coanda jet generating device located downstream of said quenching roll and having a slit with an edge having a convex curved surface and having another edge formed substantially perpendicular to both said path and the width of the thin metal strip, said Coanda jet generating device being positioned so that said fluid is caused to flow along said convex curved surface and said other edge, said jet generating device being positioned to stabilize said path.

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**5,499,674**

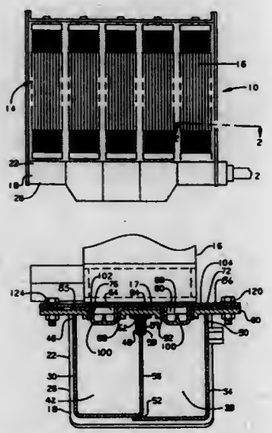
**MODULAR COOLING SYSTEM SEALING**

**John C. Bartz, Fuquay Varina, N.C., and Paul J. Byrne, Peoria, Ill., assignors to Caterpillar Inc., Peoria, Ill.**

**Filed Jan. 13, 1995, Ser. No. 372,528**

**Int. Cl.[6] F28F *7/00;9/04***

**U.S. Cl. 165—76** **5 Claims**



1. A modular cooling system including:
a partially hollow bottom tank having upper and lower portions and a plurality of modules attached to the bottom tank in close proximity to the upper portion;
a top plate positioned between each of the plurality of modules and the bottom tank and connected to the bottom tank at the upper portion, the top plate defining a pair of openings therethrough for fluid communication between the bottom tank and each of the plurality of modules;
a plug disposed within each of selected openings for blocking the fluid communication between the bottom tank and at least one of the plurality of modules; and
means disposed between the plug and the top plate for sealing the plug within the openings.

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**5,499,675**

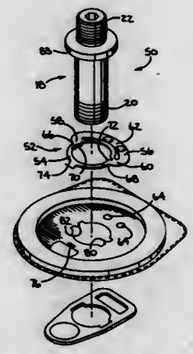
**OIL COOLER WITH A SELF-RETAINING, SELF-ORIENTING PRESSURE RELIEF VALVE**

**James T. Haasch, Bay View, and James J. Cavalluzzi, Big Bend, both of Wis., assignors to Modine Manufacturing Company, Racine, Wis.**

**Filed Mar. 10, 1995, Ser. No. 402,127**

**Int. Cl.[6] F28F *3/12***

**U.S. Cl. 165—38** **15 Claims**



1. In an oil cooler including a housing, a coolant inlet to the housing, and coolant outlet from the housing, a housing surface adapted to be sealed against an oil filter, a plurality of interconnected heat exchange units within said housing, an oil inlet to one of said units, an oil outlet from another of said units, a centrally located opening in said surface for allowing a connector to pass through the oil cooler, an oil bypass through at least some of said units, a bypass outlet in said housing surface and a bypass valve normally closing said bypass outlet, the improvement wherein said bypass valve comprises:
an inner ring;
a sheet-like resilient flapper carried by said inner ring;
a valve element carried by said flapper, sized to close said bypass outlet; and
tab means for loosely mounting said inner ring to said surface to retain said inner ring and flapper during shipment and prior to installation of the oil cooler.

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**5,499,676**

**MULTI-PANELLED HEAT EXCHANGER**

**Anthony J. Cesaroni, 9 Heathmore Court, Unionville, Ontario, Canada, assignor to Anthony J. Cesaroni, Unionville, Canada**

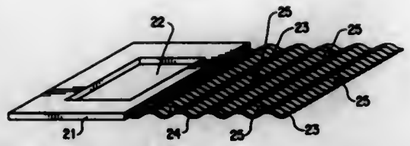
**Filed Jun. 23, 1994, Ser. No. 264,604**

**Claims priority, application United Kingdom, Jun. 24, 1993, 9313093**

**Int. Cl.[6] F28F *3/00;1/32***

**U.S. Cl. 165—166** **13 Claims**

1. A multi-panelled heat exchanger comprising:
a plurality of panels in a laminar stacked arrangement;



each of said panels being formed from a plurality of parallel tubes in a spaced apart side-by-side relationship, said tubes being maintained in the side-by-side relationship by an intervening sheet, thereby forming a panel of tubes and sheet;

each of said panels having an inlet manifold and an outlet manifold at opposed ends thereof, the inlet manifolds of the multi-panelled heat exchanger being interconnected in fluid-flow relationship and the outlet manifolds of the multi-panelled heat exchanger being interconnected in fluid flow relationship;

each of said plurality of tubes of each panel being bonded at opposing ends thereof to said manifolds such that one end of each of said plurality of tubes is in fluid flow communication with the inlet manifold and the other end of each of said plurality of tubes is in fluid flow communication with the outlet manifold;

each panel being wave-like in shape with peaks and troughs extending across the width of the panel;

one face of each panel having at least one nodule located in each of said troughs, each nodule having a size such that it will contact an immediately adjacent panel in the multi-panelled heat exchanger without significantly increasing an overall thickness of the multi-panelled heat exchanger.

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**5,499,677**

**EMULSION IN BLAST FURNACE SLAG MUD SOLIDIFICATION**

**Kenneth M. Cowan, Sugar Land, Tex., assignor to Shell Oil Company, Houston, Tex.**

**Filed Dec. 23, 1994, Ser. No. 372,803**
**Int. Cl.[6] F21B *33/138***
**U.S. Cl. 166—293** **1 Claim**

1. A method for solidifying a drilling fluid in a wellbore comprising:

(a) forming a cementitious slurry by mixing components comprising:

(1) blast furnace slag;

(2) drilling fluid; and

(3) an emulsion having an oil external phase and an aqueous internal phase, said internal phase comprising water and an additive for said cementitious slurry;

(b) displacing said cementitious slurry into said wellbore; and

(c) allowing said cementitious slurry to solidify in situ.

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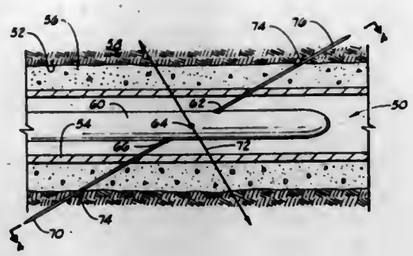
**5,499,678**

**COPLANAR ANGULAR JETTING HEAD FOR WELL PERFORATING**

**Jim B. Surjaatmadja; Timothy W. Helton, and Hazim H. Abass, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.**

**Filed Aug. 2, 1994, Ser. No. 284,961**
**Int. Cl.[6] E21B *43/114***
**U.S. Cl. 166—298** **15 Claims**

1. A jetting apparatus for use in perforating a well bore, said apparatus comprising a housing defining a plurality of jetting openings therein, said jetting openings being substantially in a single plane which is disposed at an angle other than perpendicular with respect to a longitudinal axis of said housing, such that fluid is jetted in said plane from said jetting openings.



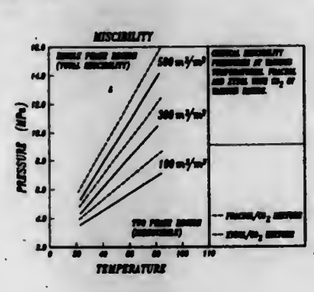
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**5,499,679**

**METHOD OF IMPROVING OIL AND GAS WELL PRODUCTIVITY**

**Dwight N. Loree, 758 Woodpark Rd. SW., Calgary, Alberta, Canada**

**Filed Sep. 16, 1994, Ser. No. 307,901**
**Int. Cl.[6] E21B *43/25;43/26***
**U.S. Cl. 166—308** **11 Claims**




1. A method of improving gas well productivity from a well penetrating a formation in a gas reservoir, the method comprising the steps of:

forming a load fluid by obtaining a hydrocarbon fluid containing a known percentage of aromatics and adding an amount of carbon dioxide to the hydrocarbon fluid;

the amount of carbon dioxide being determined by reference to a predetermine miscibility relationship between the carbon dioxide and the hydrocarbon fluid that establishes the amount of carbon dioxide required to form a bank of carbon dioxide ahead of the load fluid in the formation;

injecting the load fluid into the gas well at a pressure such that carbon dioxide in load fluid within the well bore remains in solution and carbon dioxide in load fluid within the formation comes out of solution and forms a bank of carbon dioxide ahead of the load fluid; and

releasing the surface pressure from the load fluid and flowing the load fluid back out of the gas well.



**5,499,680**

**DIVERTER, DIVERTER RETRIEVING AND RUNNING TOOL AND METHOD FOR RUNNING AND RETRIEVING A DIVERTER**

**Jeffrey S. Walter, Duncan, Okla.; John C. Gano, Carrollton, Tex., and Desmond Jones, Duncan, Okla., assignors to Halliburton Company, Houston, Tex.**

**Continuation-in-part of Ser. No. 296,941, Aug. 26, 1994. This application Jan. 30, 1995, Ser. No. 380,899**
**Int. Cl.[6] E21B *33/10***
**U.S. Cl. 166—377** **40 Claims**



1. A diverter for a subterranean well, comprising:

a body having a lower portion adapted to be coupled to a diverter anchoring structure and an upper portion having a slanted diverting surface, said diverter adapted to be placed within a main borehole of said subterranean well at a predetermined location and orientation proximate a junction of a lateral borehole with said main borehole, said slanted diverting surface adapted to redirect an object having a particular diameter and coming into contact with said diverter into said lateral borehole; and

a compliant spring member associated with said slanted diverter surface, said spring member resiliently retractable toward said slanted diverter surface to allow said object to traverse said junction and enter said lateral borehole, said diverter therefore dynamically adjustable to compensate for an insufficient minimum diameter of a selectable one of said main borehole, junction and lateral borehole.

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**5,499,681**

**CENTRALIZING LINER HANGER METHOD AND SYSTEM FOR SUBTERRANEAN MULTILATERAL WELL DRILLING**

**Pat M. White, and John C. Gano, both of Carrollton, Tex., assignors to Halliburton Company, Houston, Tex.**

**Continuation-in-part of Ser. No. 296,941, Aug. 26, 1994. This application Jan. 30, 1995, Ser. No. 380,905**
**Int. Cl.[6] E21B *23/00;43/00***
**U.S. Cl. 166—382** **58 Claims**

1. A liner hanger for a liner, comprising:

a slip having a gripping surface thereon and adapted to slide axially with respect to said liner between a retracted position and a deployed position; and

a slip housing located radially outwardly of said slip and covering said slip when said slip is in said retracted position, said slip emerging from under said slip housing when moving toward said deployed position, said slip housing preventing said gripping surface of said slip from contacting a casing when said slip is in said retracted position, said slip housing thereby preventing premature movement of said slip toward said deployed position by virtue of said contacting.



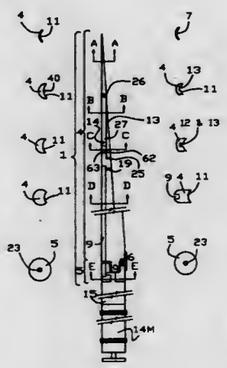
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**5,499,682**

**METHOD FOR SETTING A SLOTTED FACE WELLBORE DEVIATION ASSEMBLY USING A RECTILINEAR SETTING TOOL**

**Bobby G. Sleber, Rte. 1, Arp, Tex. 75750**

**Division of Ser. No. 201,800, Feb. 25, 1994, Pat. No. 5,425,419. This application Apr. 11, 1995, Ser. No. 420,018**
**Int. Cl.[6] E21B *23/00***
**U.S. Cl. 166—382** **15 Claims**



1. A method for setting a whip-anchor assembly, incorporating an elongated setting slot, with a drill string in a wellbore for changing the direction of drilling wherein the whip-anchor assembly is releasably secured within the elongated setting slot to a rectilinear setting tool supported on the drill string comprising the steps of:

(a) lowering the whip-anchor assembly into the wellbore;

(b) orientating the whip-anchor assembly;

(c) anchoring the whip-anchor assembly in the orientated position in the well bore; and

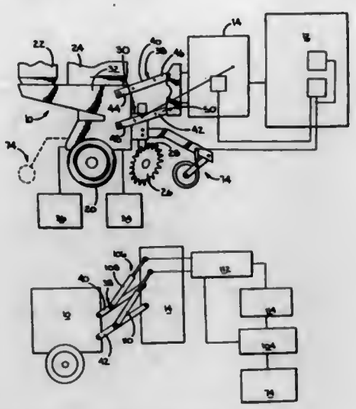
(d) releasing the rectilinear setting tool from the whip-anchor.

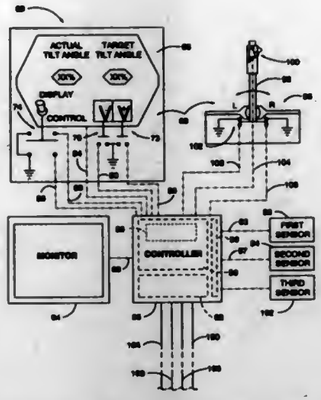
**5,499,683**

## SOIL TREATING SYSTEM WITH HYDRAULICALLY ACTUATED IMPLEMENT CONTROLLER

**James H. Bassett, Sycamore, Ill., assignor to Dawn Equipment Company, Sycamore, Ill.**

**Filed Jul. 27, 1993, Ser. No. 97,977**
**Int. Cl.[6] A01C** *5/00;* **A01B** *63/00*
**U.S. Cl. 172—4** **15 Claims**






1. A soil treating system comprising:

a frame;

a first implement to engage soil to effect treatment thereof;

means for mounting the first implement to the frame in an operative position in which the first implement can be moved vertically relative to the frame; and

first hydraulically actuated means acting between the frame and first implement for exerting a variable downward force on the implement,

wherein there is a second implement to engage soil to effect treatment thereof, there is a second means for mounting the second implement to the frame in an operative position in which the second implement can be moved vertically relative to the frame and a second hydraulically actuated means acting between the frame and second implement for exerting a downward force on the second implement, an accumulator is provided for hydraulic fluid and means are provided for establishing direct fluid communication between the accumulator and each of the first and second force exerting means.

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**5,499,684**

## GEOGRAPHIC SURFACE ALTERING IMPLEMENT CONTROL SYSTEM

**Kenneth L. Stratton, Dunlap, Ill., assignor to Caterpillar Inc., Peoria, Ill.**

**Filed Aug. 16, 1994, Ser. No. 291,263**
**Int. Cl.[6] E02F** *3/76;3/85*
**U.S. Cl. 172—4.5** **27 Claims**

1. A tilt angle control system for a geographic surface altering implement, comprising:

a frame;

first and second fluid operated lift jacks each having first and second end portions and each being connected at said first end portion to said frame and at said second end portion to said implement, said second end portion of the first and second lift jacks being spaced from each other a preselected distance at the implement connection, said second end portion of the first and second lift jacks being movable relative to the first end portion of the first and second lift jacks, respectively, and said implement being movable relative to the frame in response to movement of at least one of the lift jacks second end portion;

first sensing means for sensing the position of the second end portion of the first lift jack relative to the first end portion of the first lift jack and delivering a responsive first position signal;

second sensing means for sensing the position of the second end portion of the second lift jack relative to the first end portion of the second lift jack and delivering a responsive second position signal;

control means for receiving said first and second position signals, determining a magnitude of difference between the relative positions of the second end portion of the first and second lift jacks, calculating a tilt angle based on the relative difference, and delivering a calculated tilt angle signal.

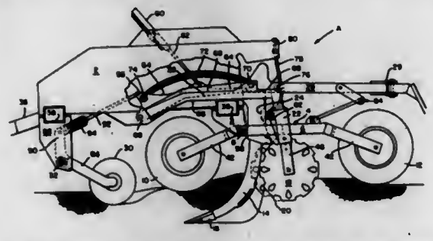
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**5,499,685**

## STRIP TILLAGE SOIL CONDITIONER APPARATUS AND METHOD

**James H. Downing, Jr., P.O. Box 1147, Louisa, Va. 23093**

**Filed Jul. 13, 1993, Ser. No. 90,371**
**Int. Cl.[6] A01B** *49/02;* **A01C** *5/00*
**U.S. Cl. 172—699** **33 Claims**



1. An integrated movable row crop soil conditioner for conditioning soil prior to planting, said integrated movable row crop soil conditioner comprising:

a) carrying means for supporting and moving said row crop soil conditioner along a row to be planted, said carrying means including at least one wheel contacting the soil;

b) tillage means supported by said carrying means for conditioning said soil as said row crop soil conditioner moves along a row to be planted;

c) means for positioning said tillage means and said at least one wheel in longitudinal alignment so that said tillage means follows the directional path of said at least one wheel said carrying means functioning as part of the soil conditioning operation while supporting and moving said row crop soil conditioner along a row to be planted; and



d) means for moving said tillage means into and out of engagement with said soil while said at least one wheel remains engaged with said soil.

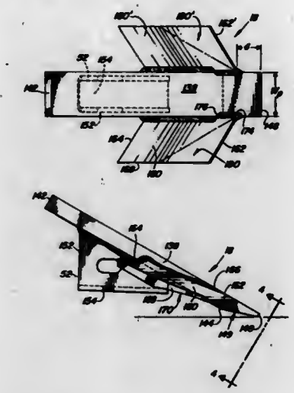
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**5,499,686**

## DEEP TILLAGE WINGED SWEEP

**Paul D. Parker, Ankeny, Iowa, assignor to Deere & Company, Moline, Ill.**

**Filed May 26, 1994, Ser. No. 250,194**
**Int. Cl.[6] A01B** *13/08*
**U.S. Cl. 172—730** **17 Claims**



1. In a deep tillage implement having a shank with a downwardly and forwardly directed tool-receiving end adapted for forward movement under the surface of the ground in a field-working position, a deep tillage sweep comprising:

a central point member having an upper surface sloping downwardly and forwardly to a lowermost and forwardmost point;

wings supported adjacent the point and having hardened leading edges extending in an outward direction from an inward location above and rearwardly of the point to thereby provide a widened tillage zone of soil shattered by the sweep as compared to a point tillage zone produced by the central point member alone;

mounting structure securing the sweep to the tool-receiving end with the point member at a depth of ten inches or more below the surface of the ground and with the leading edges extending parallel to the surface of the ground when the shank is in the field-working position to provide lifting action without a bulldozing effect for minimum soil disturbance on the surface of the ground; and

wherein the leading edges are offset less than approximately one inch above said point so that the widened tillage zone is at approximately the same depth as a point tillage zone for a uniform depth of tillage.

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**5,499,687**

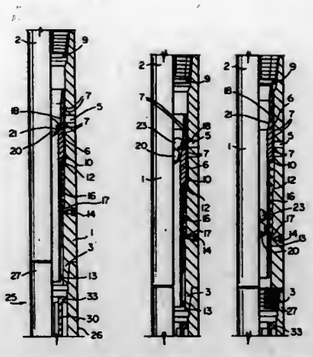
## DOWNHOLE VALVE FOR OIL/GAS WELL

**Paul B. Lee, 1216B - 18 Avenue NW., Calgary, Alberta, Canada**

**Continuation of Ser. No. 454,307, Dec. 26, 1989, abandoned, which is a continuation of Ser. No. 54,713, May 27, 1987, Pat. No. 4,889,199. This application Nov. 18, 1991, Ser. No. 839,015**
**Int. Cl.[6] E21B** *34/14*
**U.S. Cl. 175—317** **4 Claims**

1. Apparatus for controlling wells during drilling operations comprising:

a tubular casing insertable into a drill string;



a shiftable sleeve means disposed within and shiftable with respect to said tubular casing;

spring means for holding said sleeve means in a first location within said tubular casing;

an opening in said sleeve means for passing fluid therethrough;

a first ball means insertable within said opening for closing said opening and precluding fluid from passing therethrough for shifting said sleeve means within said tubular casing;

said first ball means being deformable under increased fluid pressure for being forced through and out of said opening.

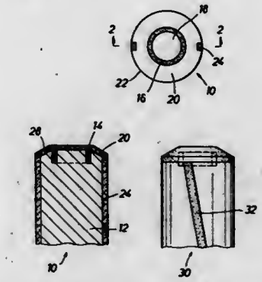
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**5,499,688**

## PDC INSERT FEATURING SIDE SPIRAL WEAR PADS

**Mahlon D. Dennis, Kingwood, Tex., assignor to Dennis Tool Company, Houston, Tex.**

**Continuation-in-part of Ser. No. 108,071, Aug. 17, 1993, Pat. No. 5,379,854. This application Oct. 17, 1994, Ser. No. 324,253**
**Int. Cl.[6] E21B** *10/46;10/56;* **F16C** *33/24*
**U.S. Cl. 175—426** **26 Claims**



1. A wear resistant insert to be fastened in a drill bit wherein the insert is exposed to abrasion and shock loading during use and is subject to wear as a result of use, the insert comprising:

(a) an elongate cylindrical body formed of hard metal and having diamond like material therein wherein said body comprises a portion of a right cylinder with an end face and a cylindrical side face;

(b) a spiraled strip of wear material extending along the side face and into said body so that said body has an exposed face of wear material; and

(c) a wear material layer over said end face wherein said material forms an end face covering and has a radius of curvature to thereby avoid a sharp edge.

8. A wear resistant bearing to be exposed to abrasion and shock loading during use and which is subject to wear as a result of use, the bearing comprising:

(a) a cylindrical body formed of hard metal and having an end face of circular configuration and a side face along said cylindrical body;

(b) at least one spiraled wear material strip extending along the side face and extending into the body so that the strip has an exposed face; and

(c) wherein said strip of wear material is formed of a diamond like material and is crystalline in nature and provides wear resistance on the side face of said body.

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**5,499,689**

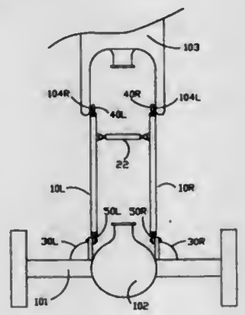
**MOTORCYCLE CONVERSION REAR AXLE MOUNTING SYSTEM**

**Frank L. Johnson, 20839 FM 15, Troup, Tex. 75789**

**Filed Aug. 12, 1994, Ser. No. 289,878**

**Int. Cl.[6] B62K *13/04***

**U.S. Cl. 180—16** **1 Claim**




1. An apparatus for adjustably mounting a rear axle assembly to the existing frame of a two wheeled motorcycle so as to create a three wheeled motorcycle, with the rear axle assembly having a longitudinal axis, a center point, and opposite ends, and with the existing frame having a longitudinal axis and a pair of mounting points symmetrically disposed on either side of the longitudinal axis of the existing frame comprising

a pair of mounting plates interconnected to a rear axle, said rear axle having a longitudinal axis, a center point, and first ands second ends, with one of said mounting plates disposed between said center point of said rear axle and said first end of said rear axle and with the other of said mounting plates disposed between said center point of said rear axle and said second end of said rear axle;

a pair of elongate mounting arms, each of said mounting arms having a first end and a second end, and each of said mounting arms connected between one of said mounting plates and one of the mounting points of an existing motorcycle frame, with said first end mounting arm interconnected to one of said mounting points of said existing frame and with said second end of each mounting arm interconnected to one of said mounting plates such that said mounting arm is generally parallel to said longitudinal axis of said existing frame; and

adjustment means for adjusting the length of said mounting arms for the purpose of adjusting the alignment of said longitudinal axis of said rear axle relative to said longitudinal axis of said existing frame.

**5,499,690**

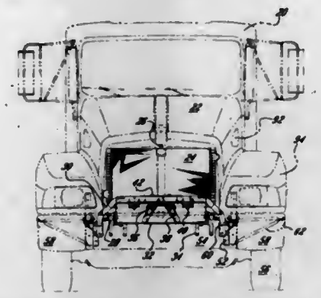
**INTEGRAL HOOD, RADIATOR AND BUMPER SUPPORT APPARATUS**

**Kenneth M. Shearn, Maple Valley; Gordon S. Kranick, Snohomish, and Robert F. Grimstad, Seattle, all of Wash., assignors to PACCAR Inc., Bellevue, Wash.**

**Filed Feb. 3, 1994, Ser. No. 191,858**

**Int. Cl.[6] B60K *11/04***

**U.S. Cl. 180—68.4** **13 Claims**



1. An improved integral hood and radiator support apparatus in a truck, the improvement comprising:

a hood;

a radiator;

two chassis frame rails extending longitudinally fore and aft;

a radiator support tube substantially perpendicular to said chassis frame rails, said radiator support tube located near the front end of said chassis frame rails, said radiator support tube secured to said hood, said radiator support tube having a top portion secured to the bottom portion of said radiator, said radiator support tube substantially integrating relative movement of said hood and said radiator;

fastening means securing the hood to the radiator support tube substantially minimizing relative movement between said hood and said radiator support tube when said hood is closed; and

a horizontal support member between each of said chassis frame rails, said horizontal support member secured to each of said chassis frame rails near the front end of said chassis frame rails, said horizontal support member secured to said radiator support tube near the center of said radiator support tube.

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**5,499,691**

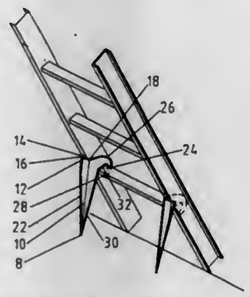
**LADDER EMERGENCY BRAKING SYSTEM**

**Peter J. Fitzpatrick, 467 Kearny Ave., Kearny, N.J. 07032**

**Filed Nov. 25, 1994, Ser. No. 344,889**

**Int. Cl.[6] E06C *5/36***

**U.S. Cl. 182—107** **10 Claims**




1. A ladder braking device comprising:



braking means for pressing against or piercing a surface on which a base of a ladder rests;

rung engagement means for securing said braking means onto a rung of said ladder while allowing said braking means to rotate about said rung; and

locking means for fixing the rotation of said braking means against rotation by pushing against the rail when said braking means contacts said surface.

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**5,499,692**

**ESCAPE LADDER**

**Simon Brook, 16A Pavillion Terrace, Wood Lane, London, W12 OHT, United Kingdom**

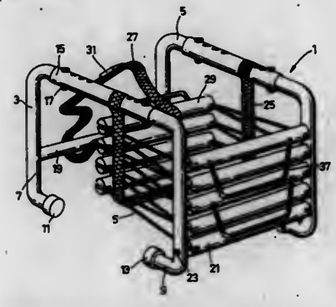
**PCT No. PCT/GB93/00260, § 371 Date Sep. 6, 1994, § 102(e) Date Sep. 6, 1994, PCT Pub. No. WO93/16266, PCT Pub. Date Aug. 19, 1993**

**PCT Filed Feb. 8, 1993, Ser. No. 284,483**

**Claims priority, application United Kingdom, Feb. 6, 1992, 9202506**

**Int. Cl.[6] E06C *9/14***

**U.S. Cl. 182—196** **9 Claims**




1. An escape ladder of collapsible construction, comprising:

a plurality of units attached to one another for forming a chain, each unit of said plurality of units comprising a rung and a pair of resilient side links, said side links extending from the rung and pivotally engaging opposite ends of the rung of an adjacent unit, wherein the rung of said adjacent unit is provided with detent means into which the side links are biassed, in a direction substantially parallel to an axis of the rung, at a predetermined relative orientation of said plurality of units for securing said units against relative rotation; and,

a terminal unit including means for fixing the escape ladder to a structure.

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**5,499,693**

**METHOD AND APPARATUS FOR LUBRICATING THE BEARINGS OF A TURBOCHARGER**

**Markus Widenhorn, Oetwil, Switzerland, assignor to ABB Management AG, Baden, Switzerland**

**Filed Mar. 6, 1995, Ser. No. 399,040**

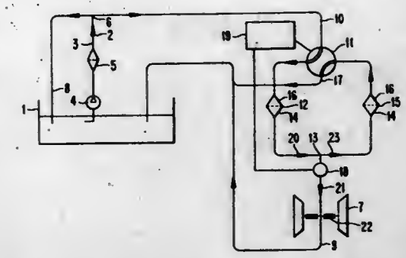
**Claims priority, application Germany, Apr. 2, 1994, 44 11 617.9**

**Int. Cl.[6] F01M *1/10***

**U.S. Cl. 184—6.24** **6 Claims**

1. A method for lubricating bearings of a turbocharger with a portion of the oil flow of an internal combustion engine attached to the turbocharger, in which the oil flow filtered in a coarse filter is pumped into bearings of the internal combustion engine and the bearing of the turbocharger respectively, and after the lubricating operation is drained off to the oil sump in each case via a return line, wherein

a) the coarsely filtered oil flow (2) for the turbocharger (7) is first of all passed through one of at least two fine filters (12, 15) connected alternately and in the process is filtered to a consistency required by the turbocharger (7),




b) a portion of the finely filtered oil flow (20) is fed as lubricating oil (21) into the bearings (22) of the turbocharger (7), another portion is fed as flushing oil (23) into a clean side (14) of the second fine filter (15), and both the lubricating oil (21) and the flushing oil (23) are then drained off into the oil sump (1),

c) if the first fine filter (12) is clogged, the second fine filter (15) flushed beforehand is switched to the oil line (10) of the turbocharger (7) and the first fine filter (12) is cleaned with the flushing oil (23).

4. An apparatus for lubricating bearings of a turbocharger with a portion of oil flow of an internal combustion engine attached to the turbocharger, comprising an oil sump, an oil pump delivering the oil flow from the oil sump into an oil line, a coarse filter, a branch of the oil line leading to the internal combustion engine and the turbocharger respectively, and in each case having a return line to the oil sump, wherein

a) a control valve (11) is arranged in the oil line (10) leading to the turbocharger (7), following which control valve (11) is a first fine filter (12),

b) a branch (13) of the oil line (10) to the turbocharger (7) and respectively a clean side (14) of a second fine filter (15) of the same mesh width as the first fine filter is formed downstream of the first fine filter (12), and

c) a dirty side (16) of the second fine filter (15) is connected via the control valve (11) to a further return line (17) leading to the oil sump (1).

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**5,499,694**

**SELF PROPELLED PASSENGER LIFT VEHICLE**

**Russell J. Dorn, Aurora, Colo., assignor to Stewart & Stevenson Power, Inc., Commerce City, Colo.**

**Filed Aug. 15, 1994, Ser. No. 290,690**

**Int. Cl.[6] B66B *9/08***

**U.S. Cl. 187—200** **20 Claims**

1. A self-propelled passenger lift vehicle for transporting a passenger between a first location and a second location and raised elevation against an aircraft fuselage adjacent an aircraft door, said vehicle comprising in combination:

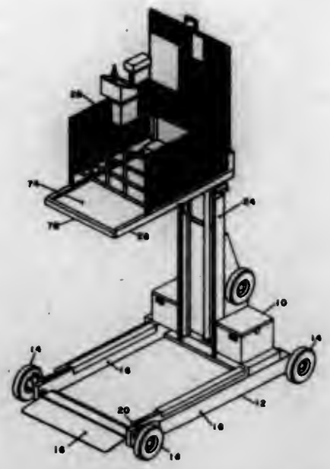
a frame having a plurality of rotatable wheels supporting said frame on a surface;

a generally horizontal platform movably mounted on said frame, said platform having a leading edge portion and a support portion for supporting said passenger;

a drive motor connected to at least one of said wheels through a transaxle assembly for moving said vehicle from said first location to said second location, said assembly including a brake mechanism connected at least to said one wheel for controllably stopping and preventing wheel rotation;

an elevating mechanism mounted on said frame and connected between said frame and said platform for controllably raising and lowering said platform between said first and second elevations; and

a position sensing device in said leading edge portion of said platform for sensing the presence of said aircraft fuselage,



said device being operable to automatically apply said brake mechanism to stop rotation of said at least one drive wheel upon sensing contact with said fuselage.

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**5,499,695**

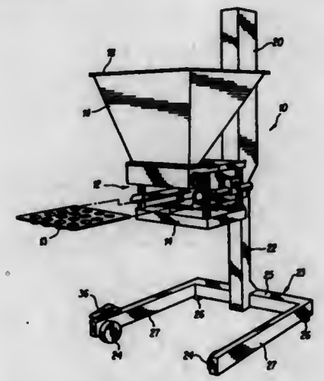
**HOPPER-FED PISTON FILLER AND LIFT ASSEMBLY WORKSTATION**

**Lewis G. Doom, Jr., 28 Acorn La., Stoneybrook, N.Y. 11790**

**Filed Feb. 23, 1994, Ser. No. 200,637**

**Int. Cl.[6] B66B *9/16*; B66F *9/06*; A21C *11/00***

**U.S. Cl. 187—244** **19 Claims**



1. In a workstation for dispensing of a bulk material into a receiving container which can be filled at the workstation, the workstation including a filling device fed by a bulk material container disposed in a relation to the filling device suitable to feed said bulk material into the filling device, the improvement comprising:

support means for mounting the filling device and the bulk material container thereon in a manner suitable for operation of the filling device and of the bulk material container to fill the receiving container, the support means comprising a platform member having an upper surface onto which the filling device is mounted, the upper surface of the platform member comprising a work surface; and,

elevating means mounting the support means including the platform member and thus the filling device and the bulk material container for adjustably displacing the platform member and thus the work surface through a range of vertically related positions to a position suitable for operation of the filling device to fill the receiving container by an operator of the workstation, at least one of said positions being suitable to the height of a given operator for operation of the filling device on the work surface, the platform member mounting the filling device throughout the vertical displacement range of the elevating means, and a relatively lower position at which the bulk material container can be safely and efficiently filled with bulk material, safely and efficiently scraped on the inner walls thereof to charge all bulk material into the filling device, and safely and efficiently cleaned by an operator standing on a floor of a workspace within which the workstation is located.

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**5,499,696**

**DISK BRAKE**

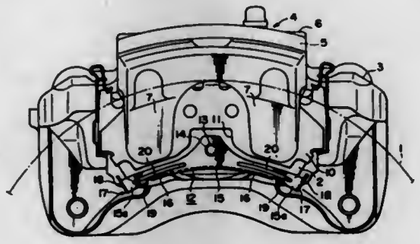
**Kinzo Kobayashi, and Shinji Suzuki, both of Yamanashi, Japan, assignors to Tokico Ltd., Kanagawa, Japan**

**Filed Jul. 26, 1994, Ser. No. 280,530**

**Claims priority, application Japan, Jul. 27, 1993, 5-204793; Jul. 30, 1993, 5-208777**

**Int. Cl.[6] F16D *66/02***

**U.S. Cl. 188—1.11** **11 Claims**



1. A disk brake including an inner pad, a disk, an outer pad, a caliper provided with a cylinder block, said cylinder block having an extension which extends across said inner pad, disk, and outer pad, and has a distal end bifurcated to form a pair of claw portions capable of pressing said outer pad, and

a wear sensor attached to said outer pad at a location between said pair of claw portions, said wear sensor including a mounting portion which is attached to said outer pad, and at least one vibrating piece extending from said mounting portion along a surface of said outer pad, said vibrating piece including an extended portion extending from said mounting portion, and a contact portion formed at a distal end of said extended portion, said contact portion being bent toward said disk so as to extend around an edge of said outer pad, said contact portion having a base end from which the contact portion extends directly from the distal end of said extended portion, and a distal end which is offset, relative to the base end of the contact portion, in the radially outward direction of said disk to such an extent that the entire distal end will, when said outer pad wears a predetermined amount, contact only that portion of the disk which comes into engagement with said outer pad.



**5,499,697**

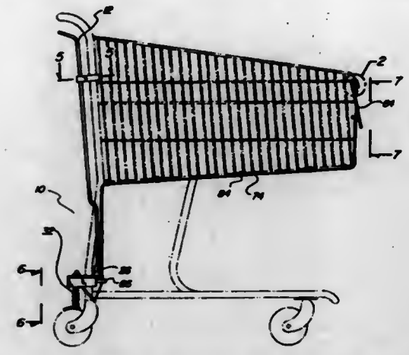
**SHOPPING CART AUTOMATIC DUAL BRAKE**

**Willard R. Trimble; Robin D. Trimble, and Emerson Trimble, all of 114 Greenway Dr., Bloomingdale, Ill. 60108**

**Filed Sep. 15, 1994, Ser. No. 306,405**

**Int. Cl.[6] B62B *5/04***

**U.S. Cl. 188—19** **4 Claims**



1. A new and improved shopping cart automatic dual brake for automatically applying brakes to rear wheels of the shopping cart comprising, in combination:

an inverted U-shaped frame having two arm portions and a handle portion, the two arm portions each having a first end and a second end, the handle portion having two end portions, each first end of the two arm portions integral with the two end portions of the handle portion, the U-shaped frame secured to the shopping cart below a handle thereof by a guide block;

a pair of swivels having an upper end and a lower end pivotally secured theretogether, the upper end secured to each second end of the two arm portions of the U-shaped frame;

a pair of brake components comprised of a right brake component and a left brake component, the pair of brake components having an upper plate extending from the right brake component along a bottom portion of the shopping cart to the left brake component, each of the pair of brake components having a first portion of the upper plate and a second portion of the upper plate, the first portion secured to the lower end of each of the pair of swivels, a lower plate having a first end and a second end, the lower plate aligning with the upper plate with the second end of the lower plate secured to the second portion of the upper plate, an aperture formed through the upper plate and the lower plate, a brake shaft disposed within the aperture, the brake shaft having a first end, a second end, and an intermediate extent therebetween, the first end of the brake shaft extending outwardly of the upper plate, an acorn nut secured to the first end of the brake shaft, a brake shoe secured to the second end of the brake shaft, the brake shoe positioned above the rear wheels of the shopping cart, a spring with a spring guide secured to the intermediate extent of the brake shaft, the spring serving to force the brake shoe onto the wheel;

a front brake release bar having two arm bars and a handle bar, the two arm bars having curved end portions for hanging on a front end of the shopping cart, a securement pin situated through the curved end portions to secure the two arm bars to the front end;

a front brake cable having a first end, a second end, and an intermediate extent therebetween, the first end of the front brake cable secured to one of the two arm bars of the front brake release handle bar by a securement means, the intermediate extent of the front brake cable extending downwardly of the front end and along an underside of the shopping cart and secured thereto by a plurality of clamps;

a front brake component secured to the second end of the front brake cable, the front brake component having a front release bar, the front release bar having a first end and a second end, the first end of the release bar secured to the upper plate adjacent the right brake component, the second end of the release bar having a wire thereattached for securement to the front brake component;

a pair of foot bars secured to the upper plate inward of the right brake component and the left brake component.

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**5,499,698**

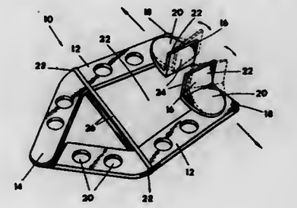
**BICYCLE BRAKE PAD TOE-OUT ADJUSTING TOOL**

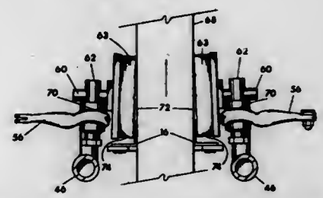
**Mark W. Irvine, 55 Bingham Cir., Sacramento, Calif. 95831**

**Filed Jul. 13, 1995, Ser. No. 501,955**

**Int. Cl.[6] B62L *1/06*; F16F *9/00***

**U.S. Cl. 188—24.19** **4 Claims**





1. A gaping tool for use in setting toe-out angle of a pair of brake pads relative to an adjacent wheel of a bicycle intended to be stopped by the brake pads, comprising;

a first arm member and a second arm member each having a distal end and being hingidly affixed to one another for retaining said arm members together and for allowing the distal ends of the arm members to be capable of being moved directionally toward and away from one another;

a first shim plate supported on the distal end of said first arm member; said first shim plate having an inward facing surface for abutment against a first side of the bicycle wheel, said first shim plate further having an outward facing surface oppositely disposed from said inward facing surface for abutment against by a braking surface of a first brake pad of the pair of brake pads;

a second shim plate supported on the distal end of said second arm member; said second shim plate having an inward facing surface for abutment against a second side of the bicycle wheel oppositely disposed from said first side of the bicycle wheel, said second shim plate further having an outward facing surface oppositely disposed from said inward facing surface of said second shim plate for abutment against by a braking surface of a second brake pad of the pair of brake pads;

the first and second shim plates each extending outward from the respective supporting distal ends of the arm members and in generally the same direction as one another wherein the outward extension of the shim plates is generally perpendicular to the toward and away directional movement capabilities of the arm members;

the first and second shim plates each having a thickness defined between the inward and outward facing surfaces thereof sufficient for abutting the respective brake pads against the outward facing surfaces of the shim plates with the inward facing surfaces of the shim plates simultaneously against the

respective opposite sides of the bicycle wheel wherein toe-out setting of the brake pads is made by a rearward end of the braking surfaces being held further outward away from the wheel sides than forward ends of the braking surfaces by the shim plates.

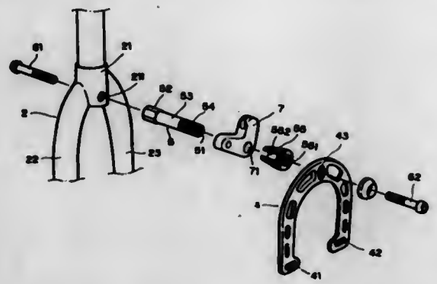
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**5,499,699**

## DEVICE FOR LOCATING REINFORCING PLATE OF BICYCLE BRAKE

**Tse-Min Chen, P.O. Box 1750, Taichung, Taiwan**

**Filed Mar. 25, 1994, Ser. No. 217,650**
**Int. Cl.[6] B62L *1/14***
**U.S. Cl. 188—24.21** **1 Claim**



1. A locating device of a reinforcing plate of a bicycle braking system comprising an upper locating means and two lower support rods, with said upper locating means being intended for locating an upper portion of an inverted U-shaped reinforcing plate of a bicycle braking system, and with said two lower support rods being intended for locating both lower ends of said U-shaped reinforcing plate of said bicycle braking system;

wherein said upper locating means comprises:

a support rod provided therein axially with a threaded through hole which has one end engageable with a fastening bolt and another end engageable with another fastening bolt for fastening securely said support rod to a sleeve of a bicycle fork tube, said support rod further provided with a hexagonal head, a male threaded portion opposite in location to said hexagonal head, and a smooth portion which is located between said hexagonal head and said male threaded portion and is engageable with a base hole of a bicycle brake cable hoisting seat; and

a rotary nut having therein axially a female threaded hole which is engageable with said male threaded portion of said support rod such that said rotary nut can be so rotated on said male threaded portion of said support rod as to adjust the distance between said U-shaped reinforcing plate and said sleeve of said bicycle fork tube.

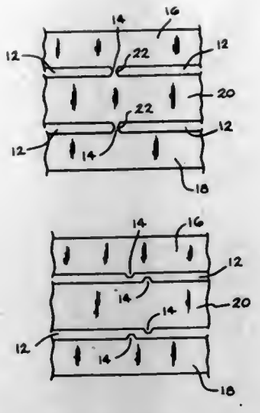
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**5,499,700**

## DOUBLE WRAP BRAKE BAND WITH BREAK-AWAY TIES

**Darrel Richardson, Peotone; Anthony J. Grzesiak, Sauk Village, and David T. Vierk, Lansing, all of Ill., assignors to Borg-Warner Automotive, Inc., Sterling Heights, Mich.**

**Filed Dec. 14, 1994, Ser. No. 356,009**
**Int. Cl.[6] F16D *49/02***
**U.S. Cl. 188—77 W** **9 Claims**



1. A double wrap brake band for use with an automatic transmission having an apply member and a reaction member, comprising in combination:

an elongated strap member having a first band and a second band, the first band being generally parallel to the second band and defining a first slot therebetween, the first and second bands being adjoined together by at least one tie member;

a third band positioned parallel to the first band, the first band being positioned between the second and third bands, the third band being generally parallel to the first band to form a second slot therebetween, the first and third bands being adjoined together by at least one tie member;

wherein the apply member is engaged with at least one of the three bands and the reaction member is engaged with the remaining bands and relative movement of the apply member with respect to the reaction member creates movement of the second and third bands with respect to the first band thereby causing the tie members to shear and release the engagement between the first and second and the first and third band members.

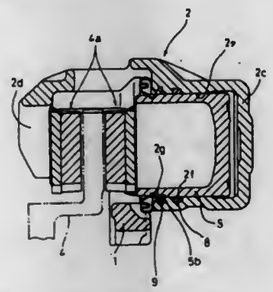
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**5,499,701**

## DISK BRAKE DEVICE HAVING A PISTON WITH AN AIR VENT GROOVE

**Toshiyuki Harinaga, Nagoya, Japan, assignor to Nisshinbo Industries, Inc., Tokyo, Japan**

**Filed Jul. 19, 1995, Ser. No. 504,757**
**Claims priority, application Japan, Jul. 19, 1994, 6-188800**
**Int. Cl.[6] F16D *55/18***
**U.S. Cl. 188—72.4** **1 Claim**



1. A disk brake device comprising:

a rotating disk capable of rotating in tandem with a wheel;

a pair of friction pads sandwiching and pressing against the rotating disk so as to be capable of creating friction;

a caliper which straddles a portion of a circumference of the rotating disk and the friction pads;



a piston housed to slide within a cylinder cavity bored in said caliper and which push the friction pads against the rotating disk;

a seal fitted into a ring-shaped groove provided around an inner face of the cylinder cavity for maintaining a fluid-tight seal with the piston; and

a dust boot installed between an open end of the cylinder cavity and a ring-shaped boot groove provided on a circumference of the piston to seal off sliding surfaces;

wherein an air vent groove extends from the boot groove toward a bottom of the piston, and along an axial length of the piston, wherein a length of a leg of the dust boot that is inserted into the piston is shorter than a length of the air vent groove, and a length from the bottom face of the piston to a rear end of the air vent groove is shorter than a length from the bottom face of the cylinder cavity to a front end of the seal groove.

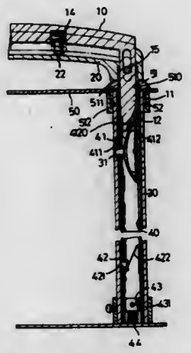
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**5,499,702**

## RETRACTABLE HANDLE ASSEMBLY

**King-Sheng Wang, No. 17, Lane 116, Ta An Gan Rd., Tachia Chen, Taichung Hsien, Taiwan**

**Filed Oct. 7, 1994, Ser. No. 319,945**
**Int. Cl.[6] A45C *5/14;13/26***
**U.S. Cl. 190—115** **3 Claims**



1. A retractable handle assembly of a wheeled suitcase and comprising:

a handle, said handle having two legs each joined at one end by a gripping portion to form an inverted U-shaped configuration, each of said two legs having an inclined end formed on a distal end thereof opposite said one end, a slot defined in each of said legs and at least one recess defined in an under side of said gripping portion of said handle;

a receiving element having two ends, a hole defined in each of said two ends thereof aligned with one of said legs, at least one stud extending upwardly from an upper portion of said receiving element and in alignment with said recess of said handle for a resilient element mounted to said stud and received in said recess;

said suitcase having a pair of first tubes, each one of said first tubes fixedly disposed to each of two sides of said suitcase, each of said two sides of said suitcase having one of a pair of nuts fixedly engaged to an upper portion of said suitcase and one of a pair of receiving cups fixedly disposed to a bottom portion of said suitcase, each of said nuts having an upper central hole defined therein and a lower central hole defined in a bottom portion thereof, said lower central hole having a larger diameter than that of said upper central hole so as to form a shoulder portion on an abutment of said two holes, each of said first tubes having a first end and a second end, said first end of each of said first tubes received in said lower central hole of a respective one of said nuts and abutting said shoulder portion of said respective nut and said second end of each of said first tubes fixedly received in a respective one of said receiving cups by a bolt extending through said respective receiving cup to engage against said second end of said respective first tube and, a hole defined in a periphery of each of said first tubes;

a pair of second tubes each having a first end and a second end and being dimensioned to be retractably received in a respective one of said first tubes, at least one upper hole defined in a periphery of each of said second tubes near said respective first end thereof which extends through said upper central hole of said respective nut and received in a respective one of said holes of said receiving element and each of said legs being inserted in said first end of said respective second tube, a pin extending through said receiving element, said first end of a respective one of said second tubes and said slot of a respective one of said legs; and

said upper hole of each of said second tubes being in alignment with said hole of said respective first tube for an upper stop being inserted therethrough, said upper stop biased by an upper resilient element, said upper resilient element compressedly fixed in an inner periphery of each of said second tubes and having an inclined portion corresponding to said inclined end of said respective leg, each of said second tubes can be extracted out from said first end of said respective first tube by pushing said handle downward to push said inclined end of each of said legs to compress said inclined portion of said respective upper resilient element to disengage said upper stop from said hole of said respective first tube.

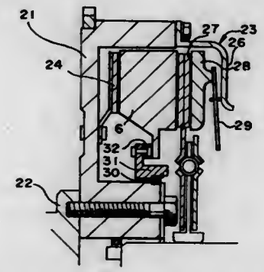
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**5,499,703**

## PEAK TORQUE DECREASING APPARATUS FOR AN AUTOMOBILE POWER TRAIN

**Masayuki Kii; Hiroaki Nimura, and Mitsuhiro Umeyama, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan**

**Filed Oct. 22, 1993, Ser. No. 144,571**
**Claims priority, application Japan, Jan. 23, 1992, 4-285601; Jan. 6, 1993, 5-250277**
**Int. Cl.[6] F16D *13/50*; F16F *15/30***
**U.S. Cl. 192—70.11** **3 Claims**



1. A peak torque decreasing apparatus for an automobile power train comprising:

a drive side assembly;

a driven side assembly including a transmission having a synchromesh;

a clutch, including a clutch disk disposed between the drive side assembly and the driven side assembly for connecting and disconnecting the drive side assembly and the driven side assembly when the clutch is engaged and disengaged respectively, the driven side assembly, the driven side assembly, and the clutch constructing a torque transmittance path from an automobile engine to an automobile wheel; and

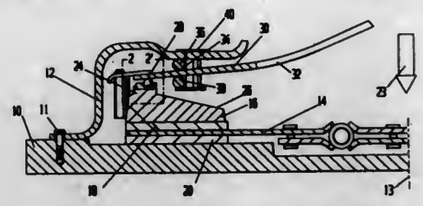
an idler mass member;

means for disengaging said idler mass member from both said drive side assembly and said driven side assembly when said clutch is disengaged; and

means for engaging said idler mass member directly with said clutch disk to engage said idler mass member with said driven side assembly when said clutch is engaged.

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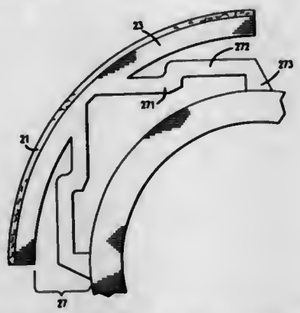
**5,499,704**
**AUTOMOTIVE CLUTCHES**
**Bill J. Hays, 15114 Adams St., Midway City, Calif. 92655**
**Continuation-in-part of Ser. No. 69,388, Jun. 1, 1993, Pat. No. 5,375,688. This application Sep. 26, 1994, Ser. No. 312,281**
**Int. Cl.[6] F16B** *13/50;13/71*
**U.S. Cl. 192—70.27** **20 Claims**



1. In an automotive clutch assembly supported on an automotive flywheel, said assembly having a clutch cover supported on said flywheel along the centerline thereof and surrounding a pressure plate with a spring diaphragm biased between a pressure plate and the clutch cover, a clutch disc located between said pressure plate and flywheel, the improvement which comprises: a subassembly of a plurality of circumferentially spaced-apart balls and a ball retainer ring with a like plurality of recesses, one each receiving one of said balls to maintain said balls in said circumferentially spaced-apart locations, said retainer ring being received between at least one of said pressure plate and clutch cover and said diaphragm to provide the bearing contact surface between said diaphragm and said one of said pressure plate and clutch cover, and said ball retainer has a center locator to orient said subassembly to said center line.

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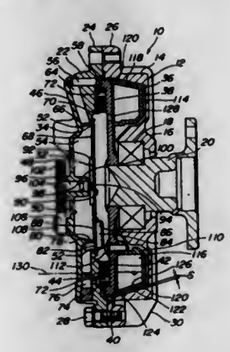
**5,499,705**
**BEAM MOUNTED FRICTION PADS FOR USE IN FRICTION BRAKES AND CLUTCHES**
**Russell D. Ide, P.O. Box 744, 641 Arnold Rd., Coventry, R.I. 02816**
**Division of Ser. No. 40,376, Mar. 30, 1993, Pat. No. 5,377,802, which is a division of Ser. No. 668,216, Mar. 12, 1991, Pat. No. 5,203,438. This application Nov. 23, 1994, Ser. No. 346,299**
**Int. Cl.[6] F16D** *13/14;51/10*
**U.S. Cl. 192—107 T** **15 Claims**



1. A beam mounted friction pad for use in a friction engagement device, the friction pad comprising:
a layer of high friction material having a friction surface;
a curved friction material support surface having a first side and a second side, the first side being convexly curved about an axis of curvature and the second side being concavely curved about an axis of curvature, the support surface supporting the friction material on the first side thereof and the support surface extending circumferentially between first and second circumferentially spaced edges, wherein the support surface extends continuously from the first circumferentially spaced edge to the second circumferentially spaced edge;
and a support structure extending from the second side of the support surface at a location between the first and second circumferentially spaced edges for supporting the high friction material and the friction material support surface for pivoting about a predetermined pivot point located circumferentially between the first and second circumferentially spaced edges so as to orient the pad under load, the pivot being selected to cause uniform wear and uniform temperature distribution across the surface so as to minimize wear.

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**5,499,706**
**VISCOUS FLUID CLUTCH WITH AUXILIARY RESERVOIR**
**Shinichi Kawada, Atsugi, Japan, assignor to Unisia Jecs Corporation, Atsugi, Japan**
**Filed Dec. 30, 1994, Ser. No. 366,767**
**Int. Cl.[6] F16D** *35/02*
**U.S. Cl. 192—58.4** **7 Claims**



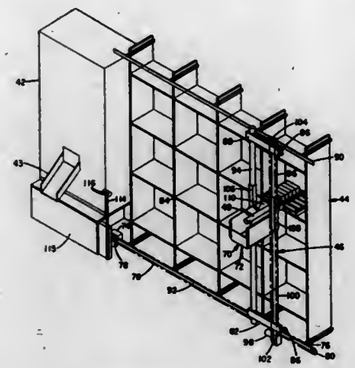
1. A viscous fluid clutch, comprising:
first and second relatively rotatable drive means, said first drive means having an operating chamber and a reservoir;
fluid shear drive means on said first and second drive means located in said operating chamber operable with a fluid medium to provide a shear-type fluid drive between said first and second drive means;
said first drive means having a pump outlet opening communicating between said operating chamber and said reservoir,
said second drive means having wall means defining an auxiliary reservoir,
said first drive means and said auxiliary reservoir defining wall means having opposed spaced surfaces defining therebetween a passage communicating with said operating chamber;
radial opening means for providing communication between said auxiliary reservoir and said passage;
said passage defining surface of said first drive means progressively increasing its radial distance from the axis of rotation of said first drive means such that, during rotation of said first drive means, the fluid medium thrown outwardly from said auxiliary reservoir, owing to the centrifugal force, through said radial opening means into said passage will flow along said passage defining surface of said first drive means into said operating chamber; and



pump means means for pumping the fluid medium from said operating chamber out of said pump outlet opening.

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**5,499,707**
**AUTOMATED MERCHANDISING KIOSK**
**Rudy Steury, College Park, Ga., assignor to Compu-Shop, Inc., Eden Prairie, Minn.**
**Filed Jan. 31, 1995, Ser. No. 381,475**
**Int. Cl.[6] B65G** *1/137;* **G07F** *11/42*
**U.S. Cl. 194—217** **18 Claims**

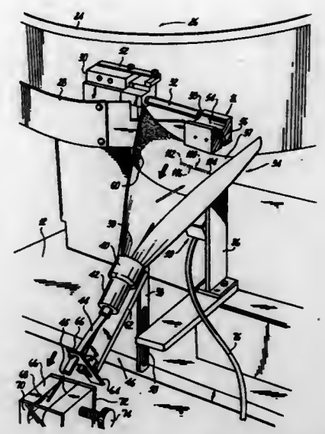


1. A self-service merchandising kiosk comprising:
(a) a portable multi-walled enclosure surrounding a plurality of shelves, wherein said shelves support a plurality of bottomless drawers, and wherein each drawer includes at least one compartment which circumscribes a merchandise storage space;
(b) display means for interactively selecting merchandise at a display panel responsive to non-contacting movement;
(c) means for receiving payment to selected merchandise; and
(d) controller means responsive to said display means for conveying collection means to said drawers, said collection means being adapted for axially withdrawing selected drawers from said shelves to direct contained merchandise into a collection bin and for dispensing the collected merchandise to a tray communicating to the exterior of said enclosure.

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**5,499,708**
**ELONGATE MEMBER ORIENTING RAMP**
**Michael J. Gorecki, Cromwell, and Roger S. Mastrony, New Haven, both of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.**
**Filed Jun. 22, 1994, Ser. No. 263,981**
**Int. Cl.[6] B65G** *47/24*
**U.S. Cl. 198—400** **15 Claims**

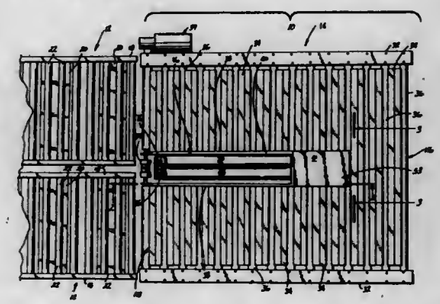
1. An apparatus for orienting an elongate member, the elongate member having a first end with a diameter greater than the diameter of a second end, comprising:
a) a rampway having an elongate member orientating surface, the rampway being arcuate in cross-section and having an inlet end having a greater radius than art outlet end of the rampway;
b) releasing structure positioned adjacent the inlet end of the rampway for releasing at least one elongate member onto the rampway so that the elongate member is released substantially perpendicular to the length of the rampway, and the elongate member initially only contacts the rampway at its first and second ends, the frictional difference between the first and second ends relative to the rampway being,



c) such that the first end of the elongate member at least partially moves ahead of the second end thereby causing the elongate member to assume a first end forward orientation on the rampway.

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**5,499,709**
**CONVEYOR WITH SEPARATOR/ALIGNER**
**Richard L. Easton, St. Peters, Mo., assignor to Alvey, Inc., St. Louis, Mo.**
**Filed Apr. 15, 1994, Ser. No. 228,033**
**Int. Cl.[6] B65G** *13/02*
**U.S. Cl. 198—786** **21 Claims**



1. A roller conveyor with an alignment mechanism, the roller conveyor comprising:
a conveyor frame having a pair of exterior side walls and having an entrance end and an exit end;
a plurality of conveyor rollers, each having a longitudinal axis and mounted to at least one of the exterior side walls at an upper portion of the frame, the conveyor rollers defining a conveyor plane for conveying articles along a path between the entrance end and the exit end;
an opening in the conveyor plane defined by at least one interior secondary side wall spaced from the exterior side walls;
at least some of the conveyor rollers mounted between the at least one interior side wall and the at least one exterior side wall;
at least one aligning roller having a longitudinal axis and mounted in the opening in the conveyor plane, the aligning roller positioned so that the longitudinal axis thereof is substantially perpendicular to the longitudinal axes of the conveyor rollers and is disposed at an acute angle to the conveyor

plane, and at least a portion of the aligning roller extends above the conveyor plane;

a drive motor for rotating the aligning roller in a direction toward the at least one exterior side wall;

whereby any part of an article driven onto the at least one aligning roller is translated laterally toward the at least one exterior side wall and thereby aligning the article in a predetermined orientation with respect to the conveyor rollers.

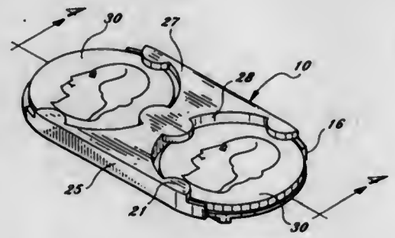
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**5,499,710**

**PORTABLE COIN HOLDER AND DISPENSER**

**Charles Hoffman, 12401 SW. 2nd St., Plantation, Fla. 33325**

**Filed Sep. 23, 1994, Ser. No. 311,564**
**Int. Cl.[6] A45C *11/00***
**U.S. Cl. 206—0.81** **6 Claims**



**1.** A coin holder which readily receives, dependably bolds, and easily releases coins comprising a substantially rigid body having spaced substantially opposing cavity side walls and an intermediate obstruction, said cavity side walls and said intermediate obstruction each connecting upper tabs and a bottom wall and cooperating with said tabs and bottomwall to define cavities, said intermediate obstruction being located between said cavities, each cavity having a diameter defined by said side walls and said obstruction, each cavity also having open ends with flexible protrusions extending inward slightly as to create an opening having a size that is slightly less than said diameter, through which to receive coins to be contained by the holder and to dispense the same, said upper tabs and said opposing walls defining an aperture portion for each said cavity through which coins carried thereby maybe viewed and manipulated; said cavities being adapted to dependably retain coins held in an array and in a respective flat manner whether the coins are in a new or worn condition.

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**5,499,711**

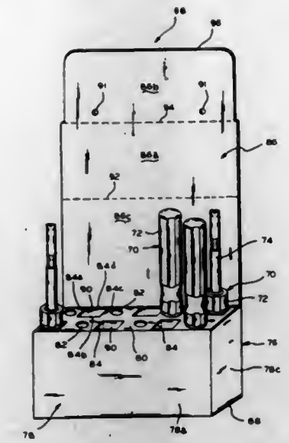
**FOLDABLE CONTAINER FOR DISPLAYING TOOLS**

**Burton Kozak, 1300 N. Lake Shore Dr., #28C, Chicago, Ill. 60610**

**Filed Apr. 12, 1994, Ser. No. 226,674**
**Int. Cl.[6] B65D *85/20***
**U.S. Cl. 206—45.19** **19 Claims**

**1.** A container for displaying a plurality of tools each of which has a handle and a shaft, comprising:

container means defined by a plurality of walls including at least a side wall and a top wall, said top wall having a plurality of openings including a plurality of generally round openings each formed to be of a single, first uniform size to receive and support said shaft of one of said tools to thereby support said tool with said handle positioned thereabove and including a plurality of generally rectangular openings each formed to be of a single, second uniform size to receive and support said handle of one of said tools to thereby support said tool with said shaft positioned thereabove where said generally round and generally rectangular openings are arranged in alternating



fashion, said container means further including a display panel extending to a point above said top wall.

**7.** A container for displaying a plurality of tools each of which has a handle and a shaft, comprising:

a generally rectangular box defined by a plurality of walls including a side wall, a top wall, and a bottom wall, said top wall having a plurality of openings including a plurality of round holes each having a diameter substantially the same as the diameter of said shaft of said tools to receive and support said tools with said handles positioned thereabove and also including a plurality of square cutouts each having a depth and width substantially the same as the diameter of said handle of said tools to receive and support said tools with said shafts positioned thereabove, said generally rectangular box further including a display panel extending to a point above said top panel;

said holes and cutouts being arranged in alternating fashion in at least two rows extending generally parallel to said display panel.

**13.** A foldable container formed of sheet material, comprising:

a single blank including a rectangular box-forming portion and a display panel-forming portion, said rectangular box-forming portion being integral with said display panel-forming portion and including from said display panel-forming portion to an end remote therefrom a back portion of a side wall of a rectangular box, a bottom wall of said rectangular box, and a top wall of said rectangular box, said rectangular box-forming portion also having a pair of side portions of said side wall of said rectangular box;

said side portions of said side wall each being integral with opposite ends of one of said front portion of said side wall, said bottom wall, or said back portion of said side wall;

said top wall having a plurality of openings including a plurality of round holes and also including a plurality of square cutouts.

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**5,499,712**

**BASKET-STYLE CARRIER WITH NON-COLLAPSING END PANELS**

**Glen R. Harrelson, Rowell, Ga., assignor to Riverwood International Corporation, Atlanta, Ga.**

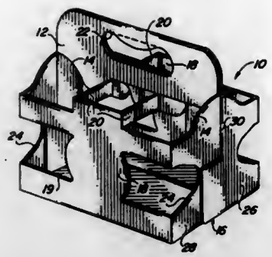
**Filed Oct. 20, 1994, Ser. No. 325,137**
**Int. Cl.[6] B65D *5/46***
**U.S. Cl. 206—172** **28 Claims**

**1.** A basket-style article carrier, comprising:

opposite side panels connected to a bottom panel;

a centrally located handle panel;





means for supporting the handle panel, said means extending downwardly from and lying in substantially the same plane as the handle panel;

opposite end panels connected to the side panels, each end panel being comprised of two end panel sections, each end panel section being foldably connected to one of the opposite side panels;

each end panel section being connected to the handle panel support means along a handle panel support fold line;

one of the end panel sections of each end panel having a portion extending transversely beyond the handle panel support fold line thereof, each transversely extending portion overlapping and being adhered to the associated end panel section, whereby the end panels formed from the overlapping end panel sections cannot collapse about the handle panel support fold lines.

**24.** A blank for forming a basket-style carrier, comprising:

two substantially identical half-blank portions;

each half-blank portion .including an outer handle panel section connected to the outer handle panel section of the other half-blank portion by a central fold line;

each outer handle panel section having opposite end edges extending substantially at right angles to the central fold line and a lower edge extending transversely of the end edges;

an inner handle panel section connected by a fold line to one of the end edges of each of the outer handle panel sections;

a first handle panel support section connected by fold line to the opposite end edge of each of the outer handle panel sections;

a first end panel section adjacent a portion of each of the outer handle panel sections and being connected by fold line to the associated first handle panel support section;

a side panel section adjacent portions of each of the outer handle panel sections and the associated inner handle panel section, the side panel section being connected by a first fold line to the first end panel section;

a second end panel section adjacent a portion of the inner handle panel section and being connected by a second fold line to the side panel section;

a second handle panel support section connected by fold line to the second end panel section; and

the side panel section of at least one of the half-blank portions having a bottom panel flap connected thereto by a fold line;

a portion of one of the end panel sections in each half-blank portion being dimensioned to overlap a portion of the other end panel section in the other half-blank portion in a carrier formed from the blank.

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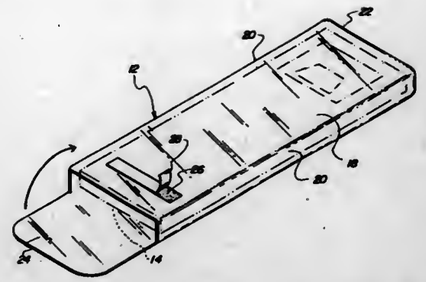
**5,499,713**

**TRANSPARENT REMOTE CONTROL FLEXIBLE ENVELOPE**

**Richard L. Huffer, 454 S. Harrison St., Frankfort, Ind. 46041-2405**

**Filed Nov. 16, 1994, Ser. No. 340,597**
**Int. Cl.[6] B65D *85/38;65/16***
**U.S. Cl. 206—305** **5 Claims**

**1.** A remote control flexible envelope comprising:



a transparent envelope for receiving a remote control, the transparent envelope being shaped so as to define a front wall web spaced from a rear wall web, with a single side wall web extending orthogonally between the front and rear wall webs, a bottom wall web extending across a lower end of the transparent envelope and being oriented so as to extend substantially orthogonally relative to the front and rear wall webs and the side wall web to define a substantially rectangular shape of the transparent envelope, a lateral closing web extending from the rear wall web and projecting outwardly therefrom, and a top closing web projecting from the rear wall web proximal to an open end of the envelope; and,

a plurality of adhesive securing strips, each of said adhesive securing strips being coupled to an outer distal end of an individual one of the closing webs for securing the closing web to the front wall web to capture a remote control within the transparent envelope;

wherein the adhesive securing strips are transparent in construction so as to permit a visual identification of buttons of a remote control positioned beneath the front wall web.

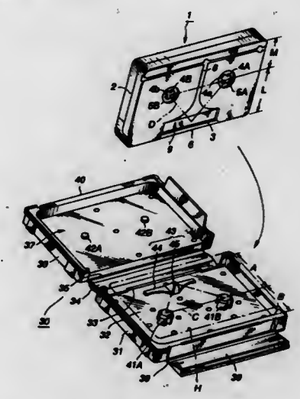
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**5,499,714**

**TAPE CASSETTE CONTAINER CASING**

**Toshikazu Konno, Miyagi, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Filed Aug. 2, 1994, Ser. No. 284,173**
**Claims priority, application Japan, Aug. 20, 1993, 5-206703**
**Int. Cl.[6] B65D *85/672***
**U.S. Cl. 206—387.13** **5 Claims**



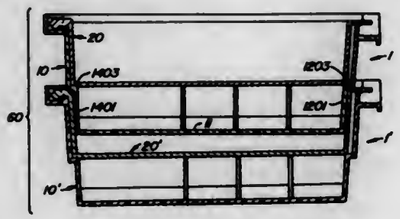
**1.** A tape cassette container casing comprising:

a casing main member having a first tape cassette housing recess having an opening size substantially equal to a size of a tape cassette;

a reel holding protrusion, formed on the bottom surface of the tape cassette housing recess of the casing main member, which is engaged in a reel hole of the tape cassette for inhibiting idle rotation of a tape reel having a magnetic tape wound thereon;
a mistaken housing inhibiting protrusion formed at a position on the bottom surface of the tape cassette housing of the casing main member registering with a mouth portion of the tape cassette for delimiting the loading direction of the tape cassette;
a lateral surface section formed as one with said casing main member via a first hinge;
a lid formed as one with said lateral surface section via a second hinge and comprising a second tape cassette housing recess having an opening size substantially equal to a size of a tape cassette;
an engagement section formed as one with the casing main member via a third hinge and having a wedge shaped free edge;
a mating engagement section having a wedge-shaped cross section formed as one with the lid for connecting with said engagement section when the casing is sealed closed; and
an outer peripheral wall section with a double wall construction.

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**5,499,715**
**FLOPPY DISK CONTAINER WITH NESTING COVER**
**Bradley M. Nemeth, San Francisco, Calif., assignor to Brauner-Nemeth, Inc., Palo Alto, Calif.**
**Filed Dec. 3, 1993, Ser. No. 162,587**
**Int. Cl.[6] B65D *21/04***
**U.S. Cl. 206—505** **25 Claims**

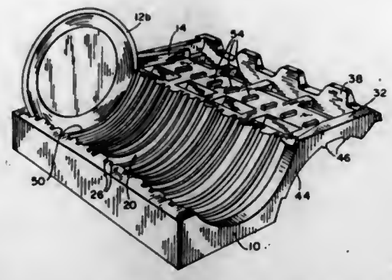



1. A stackable container for computer media, comprising:
a base; and
a removable cover that in a first orientation can be fitted securely atop said base to provide closure of said container and that in a second orientation:
a) can be nested above and completely within said base to provide compact disposition of said container and to protect said cover from physical damage; and
b) can be disposed below said base with at least a portion of said base nested within said cover;
wherein said base is fabricated of a relatively resilient material and said cover is fabricated of a relatively brittle material relative to said base, so that when said cover is removably nested within said base, said base deforms to absorb a horizontal impact prior to transferring a force to said nested cover.

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**5,499,716**
**PAN PACKAGING AND DISPLAY SYSTEM**
**John R. Gardner, Markesan, Wis., assignor to PanGard, Inc., Milwaukee, Wis.**
**Filed Jul. 20, 1994, Ser. No. 277,895**
**Int. Cl.[6] B65D *1/34;21/00***
**U.S. Cl. 206—553** **13 Claims**

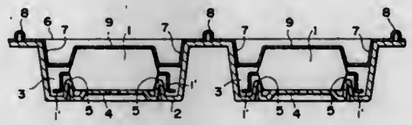
1. A package for shipping and displaying frying pans having handles positioned on edge comprising a plurality of molded bases,




dimensioned to be stacked together in layered formation, there being an uppermost base and a lowermost base,
each of said bases having an upper surface defining a singular row of arcuate pockets having an uppermost locus, said pockets receiving and supporting a portion of a first set of frying pans on edge, the uppermost locus of said pockets merging into a generally horizontally extending land having a topside and an underside, said topside being provided with a series of deformable, raised support cushions for supporting the handles of the first set of frying pans,
the underside of said land formed with an arcuate surface similar to the configuration of said singular row of arcuate pockets for receiving and supporting a portion of a second set of frying pans supported in said singular row of pockets of a cooperating base having a land supporting the handles of the second set of frying pans and a portion of said singular row of arcuate pockets.

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**5,499,717**
**EMBOSSED CARRIER TAPE SYSTEM**
**Toshisumi Hayashi, Tochigi, Japan, assignor to Yayoi Corporation, Tokyo, Japan**
**Filed Sep. 30, 1994, Ser. No. 312,963**
**Claims priority, application Japan, Sep. 30, 1993, 5-268298**
**Int. Cl.[6] B65D *73/02;85/42***
**U.S. Cl. 206—701** **22 Claims**



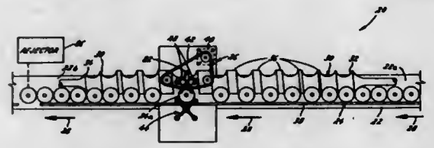

1. An embossed carrier tape system comprising: a reusable carrier tape including
a plurality of equidistantly spaced pockets formed within and longitudinally of said carrier tape for accommodating surface mountable electronic components, each electronic component including a lower surface, an upper surface and generally vertical side surfaces, and each of said pockets having generally vertical side walls, a base floor, and a support floor spaced apart from said base floor for supporting at least a middle portion of the lower surface of the electronic component, and
connector means, formed between adjacent ones of said plurality of pockets, for linearly and serially connecting said plurality of pockets; and
a reusable cover tape extending along the length of and superposed over said carrier tape and facing open sides of said plurality of pockets, said reusable cover tape including
depending engagement walls frictionally mating with the side walls of said pockets, and
buffer means, formed of at least one rib member, extending transversely of the length of said cover tape and superposed



over said connector means, for selectively expanding and contracting longitudinally of the cover tape relative to the connector means of said carrier tape, whereby said cover tape is deformable relative to said carrier tape so as to maintain the frictional mating engagement between said depending engagement walls and the side walls of said pockets.

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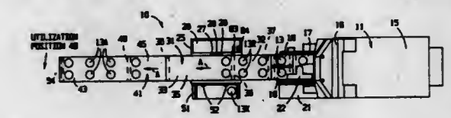
**5,499,718**
**SYSTEM AND METHOD FOR SEEKING AND PRESENTING AN AREA FOR READING WITH A VISION SYSTEM**
**Chandrakant R. Bhatia, Libertyville; Richard J. Kuhns, Crystal Lake; Steven D. Vannice, Wheeling, all of Ill., and Michael E. Stober, Woodland Hills, Calif., assignors to Videojet Systems International Inc., Wood Dale, Ill.**
**Division of Ser. No. 105,299, Aug. 11, 1993, Pat. No. 5,405,015. This application Jan. 20, 1995, Ser. No. 375,821**
**Int. Cl.[6] B07C *5/00***
**U.S. Cl. 209—524** **23 Claims**



1. A system for seeking and sensing a specific area on articles in a stream of articles of manufacture moving at a predetermined speed, comprising:
a sensing station;
means for accelerating each of the articles as they approach the sensing station relative to said predetermined speed whereby the accelerated articles become separated from the others as the accelerated articles approach the sensing station;
means for stopping the separated articles at the sensing station;
means for seeking a selected area on a stopped article including means for manipulating the stopped article and means for determining when the selected area thereon is positioned for sensing, the article being manipulated by the means for manipulating until the means for determining determines that the selected area on the article is oriented in a predetermined sensing position;
means for sensing the stopped article and providing information corresponding thereto; and
means for resuming the predetermined speed of the article.

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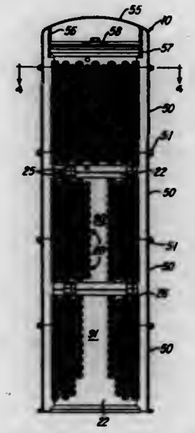
**5,499,719**
**TAKEAWAY/CORRECTION CONVEYOR SYSTEM FOR FOOD PRODUCT MACHINE**
**Scott A. Lindee, New Lenox, and David M. Hansen, Orland Park, both of Ill., assignors to Formax, Inc., Mokena, Ill.**
**Filed Feb. 13, 1995, Ser. No. 387,324**
**Int. Cl.[6] B07C *7/04***
**U.S. Cl. 209—703** **11 Claims**



1. A stand-alone takeaway/correction conveyor system for conveying a series of groups of food products from a food product machine that produces the food product groups to a utilization position, the food product machine including measuring means for measuring the groups to distinguish reject groups from accept groups and including output means for delivering reject groups to a predetermined reject location and accept groups to a predetermined accept location displaced from the reject location, the takeaway/correction conveyor system comprising:
a base;
a reject conveyor mounted on the base and having an input end alignable with the reject location of the food product machine;
an accept conveyor mounted on the base and having an input end alignable with the accept location of the group delivery means of the food product machine and an output end alignable at a preselected utilization position;
a correction receptacle positioned adjacent the reject and accept conveyors, so that an operator can divert reject groups from the reject conveyor to the correction receptacle, correct the reject groups at the correction receptacle to form accept groups therefrom, and deposit the corrected groups on the accept conveyor;
electrically actuated drive means, in the base, for driving the reject conveyor and the accept conveyor at related speeds;
and control means for interrupting operation of the food product machine and the conveyors.

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**5,499,720**
**MULTIPLE HYDROCYCLONE ASSEMBLY**
**Charles W. Bouchillon, Starkville, Miss., and Andrew Franko, Spring Valley, Ohio, assignors to Fluid Quip, Inc., Springfield, Ohio**
**Continuation of Ser. No. 137,431, Oct. 15, 1993, Pat. No. 5,388,708. This application Feb. 13, 1995, Ser. No. 387,248**
**Int. Cl.[6] B04C *7/00***
**U.S. Cl. 209—728** **12 Claims**

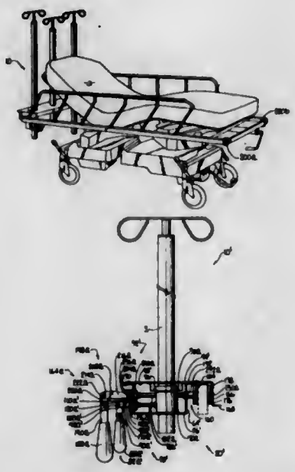



1. A multiple hydrocyclone assembly adapted for separating a material in a liquid carrier, comprising a closed housing, a set of spaced walls within said housing and cooperating with said housing to define a first outlet chamber, a second outlet chamber and an intermediate inlet chamber between said outlet chambers, an inlet conduit connected to said intermediate inlet chamber and corresponding outlet conduits extending from said first and second outlet chambers, a multiplicity of conical hydrocyclones supported within corresponding aligned holes within said spaced walls, each of said hydrocyclones having an apex portion including an apex port and a base portion having a tangentially arranged inlet port and a base outlet port, each of said hydrocyclones being positioned to connect said base port to said second outlet chamber, said inlet port to said intermediate inlet chamber and said apex port to said first outlet chamber, said holes and the corresponding said hydrocyclones being arranged in generally parallel rows, and said hydrocyclones within at least one of said rows closest to said inlet

conduit being omitted and the corresponding said holes being closed for defining a flow channel in said inlet chamber between adjacent said rows to provide for free flow of said suspension to said hydrocyclones more remote from said inlet conduit and for obtaining a more uniform pressure drop across all of said hydrocyclones.

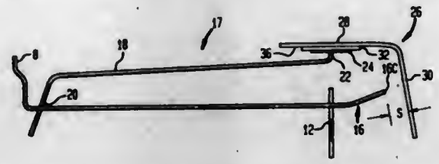
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5,499,721
**SUPPLY STAND CLAMP**
Anlynne M. Hansen, Fremont, Ohio, and Herschel Anderson, Kansas City, Mo., assignors to Schroer Manufacturing Company, Kansas City, Mo.
Filed Jul. 29, 1994, Ser. No. 283,283
Int. Cl.[6] A47F 5/00
U.S. Cl. 211—13 19 Claims



1. A device for securing at least one supply stand having a post to a patient table, said patient table having an adjustable patient support surface which in its standby position is generally parallel to a non-inclined floor, said device comprising:
a. mounting means for removably attaching said device to said patient table;
b. clamping means attached to said mounting means for removably clamping said supply stand to said device, said clamping means comprising:
i. a restraining member having at least one opening for receiving said post of said supply stand perpendicularly to said patient support surface in said standby position;
ii. a shiftable cylinder located proximate to said opening of said restraining member, said shiftable cylinder having a first position and a second position;
iii. a retracting rod for moving said shiftable cylinder from said first position to said second position; and
iv. a manually operable handle attached to said retracting rod for manipulating said retracting rod;
aa. said first position of said shiftable cylinder being such that said shiftable cylinder communicates with said opening of said restraining member allowing said post of said supply stand to be simultaneously inserted into said opening of said restraining member and said shiftable cylinder; and
bb. said second position of said shiftable cylinder being such that said post is rigidly secured by said shiftable cylinder, said opening of said restraining member and said retracting rod.

5,499,722
**PRODUCT DISPENSER INCLUDING FIXED QUANTITY DISPENSING ARRANGEMENT**
Harold B. Goldring, Woodcliff Lake, N.J., assignor to Godring Display Group, Inc., Paramus, N.J.
Filed Oct. 17, 1994, Ser. No. 324,227
Int. Cl.[6] A47F 5/00
U.S. Cl. 211—57.1 6 Claims



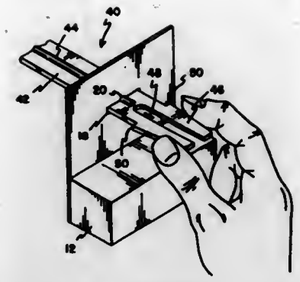
1. A product dispenser for dispensing products which are encapsulated on cards, comprising:
a mounting section;
an elongated card supporting section extending outwardly from the mounting section and supporting a plurality of cards;
a dispensing section extending outwardly from the supporting section and having an extending free end;
a member mounted to the supporting section and extending longitudinally and above the supporting section and substantially parallel thereto;
said member including means for supporting a retaining element at a fixed position relative to the extending free end of the dispensing section, whereby a fixed space is provided between said retaining element and said extending free end;
the retaining element includes a first section extending substantially parallel to said member and a second section extending downwardly from the first section;
the means for supporting the retaining element at a fixed position relative to the extending free end of the dispensing section includes means for supporting the first section of the retaining element;
the fixed space is provided between the second section of the retaining element and said extending free end;
the first section of the retaining element has a pair of downwardly extending parallel tracks;
the means for supporting the first section of the retaining element includes a platform supported by the member mounted to the supporting section and disposed in said pair of parallel tracks so that said retaining element is displaceable forwardly and rearwardly relative to said platform; and
said fixed space being commensurate with a desired fixed quantity of the plurality of cards to be removed from the product dispenser by displacing said fixed quantity of cards forwardly relative to the mounting section along the supporting section and the dispensing section.

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5,499,723
**PINCH-ACTUATED PRODUCT DISTRIBUTION SYSTEM**
Lester A. Morrow, Plymouth, Minn., assignor to Gage In-Store Marketing, LLC, Minneapolis, Minn.
Division of Ser. No. 340,688, Nov. 18, 1994, which is a continuation of Ser. No. 54,675, Apr. 28, 1993, abandoned. This application Jun. 16, 1995, Ser. No. 491,161
Int. Cl.[6] B42F 15/00
U.S. Cl. 211—59.1 8 Claims

1. A display apparatus for supporting a package, comprising:
a substantially horizontal support member having a cross section configured for fitting through a corresponding size orifice in a package, the support member including a widened section comprising a pair of flexible members having a slot formed therebetween, wherein the flexible members are compressible to the width of the cross section of the support member so that the package may slide over the widened section in both directions when compressed; and,

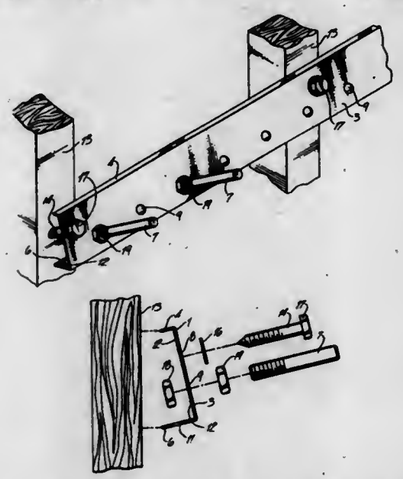




means for mounting the display apparatus to a surface and means for preventing removal of the display apparatus from the mounting surface.

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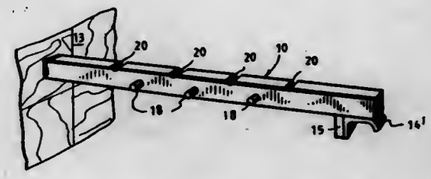
5,499,724
**WALL MOUNTED TOOL RACK FOR THE STORAGE OF HAND TOOLS**
Claude R. Hickman, 1630 Highland Oaks Dr., Arcadia, Calif. 91006
Continuation of Ser. No. 17,499, Jan. 1, 1994, Pat. No. Des. 364,769. This application Aug. 16, 1994, Ser. No. 291,534
Int. Cl.[6] A47F 5/08
U.S. Cl. 211—70.6 10 Claims



1. A tool rack suspended from a wall by fastener members attached to the vertical wall studs comprising:
(a) an elongated frame member having a frontal surface and a rear surface and an axis of elongation;
(b) an axially extending lower flange integrally carried by said frame member and in fixed relationship therewith projecting laterally from said rear surface, said frame member having a plurality of axially spaced holes so dimensioned and proportioned to permit said fastener members to pass in part through said axially spaced holes and to compressively bear against said frontal surface of said frame member thereby allowing said frame member to be rigidly mounted to said vertical wall studs, said frame member further having a plurality of axially spaced cantilever pin openings adjacent said lower flange and extending through both said frontal surface and said rear surface, said lower flange having a multiplicity of void regions adjacent said cantilever pin openings where said void regions are so dimensioned and proportioned to permit access to said rear surface and said cantilever pin openings through said void regions after said frame member is mounted to said wall.

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5,499,725
**REMOVABLE BATH ACCESSORY BAR**
Dominick P. Palumbo, 88 Lyman Ave., N. Patchogue, N.Y. 11772
Filed Aug. 10, 1994, Ser. No. 288,483
Int. Cl.[6] A47F 5/00
U.S. Cl. 211—105.1 1 Claim

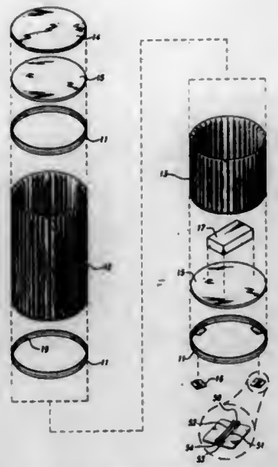


1. A removable bath accessory bar for hanging bath accessories traversally across and above a bathing area between a shower curtain support rod or door support and an opposite wall, comprising:
an elongated support bar of rectangular cross section with vertical side walls and top and bottom horizontal walls configured and dimensioned to generally span the width of said bathing area when secured in a generally horizontal position, the length of support bar being slightly longer that the distance between said opposite wall and said curtain support rod;
said support bar having a first end and an opposite second end;
means for hanging bath accessories on said support bar comprising spaced pegs extending from the vertical sides of said support bar and spaced hanger grooves on the top surface of said support bar; and
said support bar including means for supporting said support bar between the wall of the bathing area and said shower curtain rod comprising a hook shaped member mounted on the bottom horizontal wall of said bar adjacent the first end of said support bar with a flange extending down from said bottom horizontal wall of said support bar to buttress said hook shaped member, said hook shaped member having an end wall flush against said flange and a top wall flush against said bottom horizontal wall and a curved inner surface to engage said curtain rod with a lip curving downwardly adjacent the first end of said support rod, and cushion means mounted on the second end of said support bar, such that said opposite second end of said support bar may be wedged against the opposite wall of said bathing area when said hook shaped member is placed on said curtain rod.

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5,499,726
**MULTIPLE-HEIGHT MODULAR DISPLAY PEDESTAL FOR DISPLAYING MERCHANDISE**
Patrick J. Mitchell, 333 - 112th Ave. SE., Bellevue, Wash. 98004
Filed Apr. 5, 1994, Ser. No. 222,898
Int. Cl.[6] A47F 5/00
U.S. Cl. 211—183 16 Claims

1. A display pedestal for showing merchandise in a store, showroom, or window display, comprising:
lightweight upper and lower connector rings which are ring-shaped with a plurality of radially inwardly extending supports integrally fixed inside to each connector ring for holding a disc or other support means and said rings each having upper and lower substantially U-shaped grooves;



vertical circular tube means pleated with spaced corrugations and having end edges for fitting in one of said connector ring upper and lower grooves so as to form a vertical display pedestal; and

discs or other support means which rest upon the supports in the upper and lower connector rings so as to provide stability, and a lid at the top of said display pedestal to form a solid top surface wherein said lid is seated in an upper groove of the connector ring.

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**5,499,727**

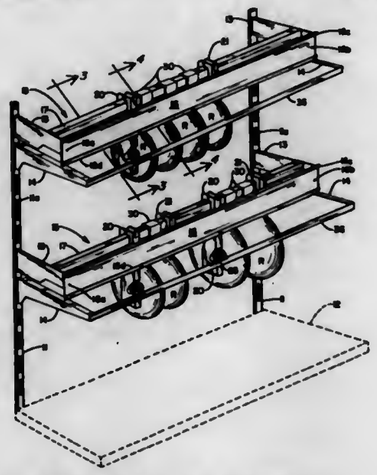
**REEL DISPLAY AND DISPENSING RACK**

**James Koch, 2315 Indian Rd. West, Minnetonka, Minn. 55343, assignor to James Koch, Minneapolis, Minn.**

**Filed Aug. 19, 1994, Ser. No. 293,176**

**Int. Cl.[6] A47B *43/00***

**U.S. Cl. 211—193** **18 Claims**



1. A reel display and dispensing rack including:

a. vertical support means;

b. a first pair of outstanding support arms having one end thereof arranged for vertically shiftable mounting on said support means;

c. a reel hanging bar secured to said support arms in horizontally spaced relation to said vertical support means;

d. at least a pair of reel support members carried by said reel hanging bar and arranged to extend therefrom;

e. said reel support members including axle receiving hook means on one end thereof; and,

f. a reel receiving axle arranged between said reel support members whereby a reel is rotatably mountable on said axle and between said reel support members.

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**5,499,728**

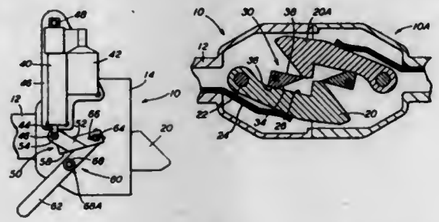
**ELECTRICALLY OPERATED HOOK COUPLER WITH MANUAL OVERRIDE**

**Steven C. Rumsey, Greer, S.C., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.**

**Filed Apr. 5, 1995, Ser. No. 417,036**

**Int. Cl.[6] B61G *3/00***

**U.S. Cl. 213—101** **19 Claims**



1. An electrically operated hook-type coupler for attachment to an end of a railway transit vehicle for joining adjacent ends of a pair of such railway transit vehicles, said hook-type coupler comprising:

(a) a coupler head having a gathering core;

(b) a hook member pivotally mounted within said gathering core, and being pivotal between a latch position and an unlatch position, and adapted to engage a second pivotally mounted hook member in a second hook-type coupler of compatible design, when said gathering core is brought into contact with a second gathering core on said second hook-type coupler of compatible design, and both of said pivotally mounted hook members are pivoted to said latch position;

(c) a spring means within said gathering core having a biasing action for pivotally biasing said pivotally mounted hook member to said latch position;

(d) a drive means within said gathering core for forcibly pivoting said hook member to said unlatch position, thereby overcoming said biasing action of said spring means;

(e) an electrically operated actuator disposed outside of said gathering core having a piston rod, adapted for reciprocal motion in response to an applied electrical current;

(f) a linkage means disposed outside of said gathering core interconnecting said piston rod with said drive means, such that said reciprocal motion of said piston rod will activate said drive means to reciprocate said hook member between said latch position and said unlatch position; and

(g) manual actuating lever means incorporated into said linkage means adapted to permit manual operation of said linkage means to manually activate said drive means within said gathering core for pivoting said hook member to said unlatch position.



**5,499,729**

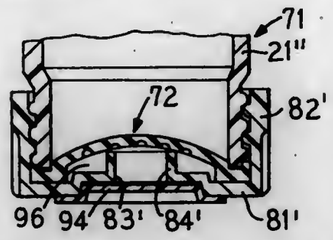
**INFANT FEEDING BOTTLE INCLUDING PRESSURE EQUALIZING DIAPHRAGM**

**Mark H. Greenwood, Arlington Heights, and Marvin Keith, Evanston, both of Ill., assignors to Children On the Go, Inc., Wheeling, Ill.**

**Filed Mar. 15, 1994, Ser. No. 214,614**

**Int. Cl.[6] A61J *9/04***

**U.S. Cl. 215—11.5** **18 Claims**



1. A bottle for feeding a liquid to an infant and the like comprising in combination:

(a) a walled housing defining therewithin a cavity having an opening defined at each one of a pair of opposed ends with each opening having an adjacent cylindrically configured circumferentially extending threaded lip region;

(b) two cap members, each said cap member having a circumferentially extending rim and an associated threaded rim adjacent portion that is threadably matingly engagable with a different respective one of said threaded lip regions, and each said cap member having cap associated means for sealing engagement with the adjacent said lip region when each said cap member is fully threadably engaged with each said so engaged said lip region, and each said cap member having a hole defined generally in a mid-region thereof;

(c) a nipple member positionable at one said opening and having an outwardly extending nipple and circumferential edge portions that are sealingly associatable with portions of one said one cap members adjacent said hole thereof when said one cap member is so fully threadably engaged with said threaded lip region adjacent said one opening; and

(d) a thickened elastomeric diaphragm member positionable at the other said opening, said diaphragm member having a dome configured central portion with opposed concave and convex faces, said diaphragm member having a plurality of discrete apertures defined in said central portion, each said aperture being defined by aperture adjacent regions of said diaphragm member, said apertures individually being in a sealed shut configuration when said diaphragm member is relaxed and being in an open configuration when said diaphragm member is expanded responsive to applied gas pressure, said apertures when in their respective said sealed shut configurations being closed by said aperture adjacent regions of said diaphragm member, said concave face having a dish-like depression defined therein centrally at each one of said apertures, said diaphragm member having circumferential edge portions that are sealingly associatable with portions of the other of said cap members adjacent said hole thereof when said other cap member is so fully threadably engaged with said threaded lip region adjacent said other opening, and said diaphragm member also having said plurality of said apertures positioned so that air can pass through said hole in said other cap member to each of said apertures;

whereby, when said bottle is upright and said apertures are in their respective said sealed shut configurations, said liquid in said bottle is retained by said diaphragm member, and when said bottle is inverted and said liquid is being withdrawn from said bottle through said nipple member, said apertures are in their respective said open configurations and gas passes through said apertures into said bottle.

16. As an article of manufacture, a thickened elastomeric diaphragm member having a dome-configured central portion with opposed concave and convex faces and circumferential, generally flattened edge portions, said central portion having defined therein a plurality of apertures that are in a sealed shut configuration when said diaphragm member is relaxed and are in an open configuration when said diaphragm member is expanded responsive to gas pressure applied against said concave face, said concave face having a dish-like depression defined therein centrally at each one of said apertures, whereby said diaphragm member acts as a gas pressure responsive check valve.

17. A process for equalizing gas pressure in the interior gas space of an oriented container relative to exterior gas pressure as liquid in said oriented container is being withdrawn through a discharge aperture of said container, this process comprising the steps of:

(a) preliminarily associating a thickened elastomeric diaphragm member with said container in a region thereof that is adjacent to said interior gas space when said container is so oriented, said diaphragm member relative to said container being externally concave, said diaphragm member having a dome-configured central portion with opposed concave and convex faces and circumferential, generally flattened edge portions, said central portion having defined therein a plurality of apertures that are in a sealed shut configuration when said diaphragm member is relaxed and are in an open configuration when said diaphragm member is expanded responsive to gas pressure applied against said concave face, said concave face having a dish-like depression defined therein centrally at each one of said apertures, whereby said diaphragm member acts as a gas pressure responsive check valve, and, thereafter,

(b) so orienting said container and so withdrawing said liquid, whereby said exterior gas passes through said openings and so equalizes said interior gas pressure relative to said exterior gas pressure.

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**5,499,730**

**PLASTIC CONTAINER HAVING REINFORCING DEPRESSIONS**

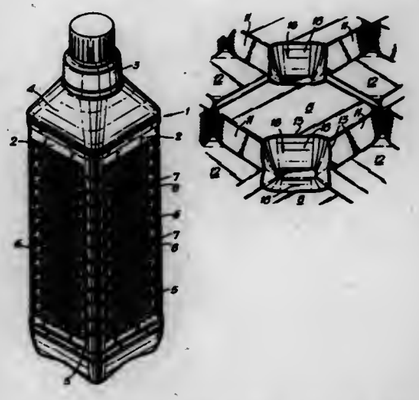
**Richard Harbour, Upton By Chester, Great Britain, assignor to Lever Brothers Company, New York, N.Y.**

**Filed Apr. 26, 1994, Ser. No. 233,490**

**Claims priority, application United Kingdom, Apr. 27, 1993, 9308650**

**Int. Cl.[6] B65D *23/00***

**U.S. Cl. 215—382** **5 Claims**



1. A lightweight plastics bottle having a body wall of substantially constant wall thickness and having a plurality of depressed zones each having a floor portion spaced inwardly of and parallel to the general plane of the body wall, said depressed zones being arranged in a series of horizontal rows, wherein:

the body is non-circular and has a number of body panels and each of said depressed zones has at least one long dimension lying in a direction at right angles to the longitudinal axis of the bottle;

the depressed zones are connected to the body wall by side edges which are inclined to the plane of the wall; and

the depressed zones of each row are in vertically aligned columns, the depressed zones each having a shape to adjoin adjacent depressed zones in each row and column, with the inclined side edges meeting at junctions in a plane other than the plane of the floor portion or the plane of the wall and the junctions of adjacent columns and rows being separated from one another by portions in one of said floor or wall planes.

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**5,499,731**

**SUBSTRATE FOR A MAGNETIC DISC AND MANUFACTURE THEREOF**

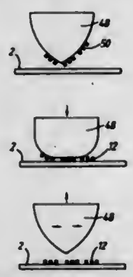
**Paul A. Marshall, Chester, United Kingdom, assignor to Pilkington plc, United Kingdom**

**Filed Jan. 6, 1995, Ser. No. 369,395**

**Claims priority, application United Kingdom, Jan. 7, 1994, 9400259**

**Int. Cl.[6] B44C *1/22*; B41M *1/10***

**U.S. Cl. 216—22** **14 Claims**



1. A process for producing a substrate for a thin film magnetic data storage disc, the process including the steps of:

(a) providing a substrate;

(b) printing a masking pattern of ink dots onto at least a portion of the surface of the substrate by an offset printing process in which the ink to form the masking pattern is transferred from a printing plate to the substrate by an offset printing member and wherein on transfer from the printing plate to the offset member the ink fragments into the ink dots; and

(c) etching the unmasked surface of the substrate thereby to texture the substrate surface.

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**5,499,732**

**METHOD FOR FABRICATING AN OPTICAL DEVICE**

**Hiroshi Nishimoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Jun. 6, 1994, Ser. No. 257,694**

**Claims priority, application Japan, Jun. 8, 1993, 5-136351**

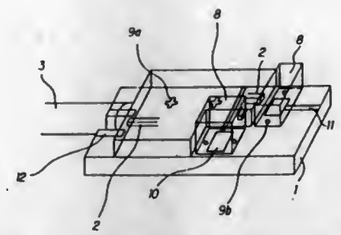
**Int. Cl.[6] B29D *11/00***

**U.S. Cl. 216—24** **6 Claims**

1. A method for fabricating an optical device, comprising the steps of:

providing a semiconductor substrate having a flat main surface;

defining marks for positioning optical parts, marks for aligning light axes of optical waveguide to said optical parts, a mask pattern for etching a groove to be mounted with an optical fiber, and electric interconnections and electric pads to be connected to said optical parts and an electronic device, respectively, on said flat main surface of said semiconductor substrate;



providing said optical waveguides in accordance with said aligning marks on said flat main surface of said semiconductor substrate;

forming said groove for said optical fiber in accordance with said etching pattern on said flat main surface of said semiconductor substrate;

mounting said optical fiber into said groove to optically couple with a corresponding one of optical waveguides;

mounting said optical part on said flat main surface of said substrate in accordance with said aligning marks to be optically coupled to said optical waveguides; and

connecting said optical parts and said electronics device electrically to said electric interconnections and said electric pads.

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**5,499,733**

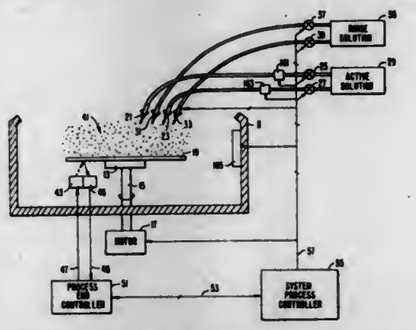
**OPTICAL TECHNIQUES OF MEASURING ENDPOINT DURING THE PROCESSING OF MATERIAL LAYERS IN AN OPTICALLY HOSTILE ENVIRONMENT**

**Herbert E. Litvak, Cupertino, Calif., assignor to Luxtron Corporation, Campbell, Calif.**

**Continuation-in-part of Ser. No. 946,942, Sep. 17, 1992, abandoned. This application Sep. 16, 1993, Ser. No. 122,207**

**Int. Cl.[6] G01N *21/00***

**U.S. Cl. 216—38** **23 Claims**



1. A method of removing at least a portion of a layer that is carried on a first side of a substrate, comprising:

applying a material removing substance to an exposed surface of said layer but not to a second side of the substrate opposite said first side, said substance being characterized by modifying electromagnetic radiation incident thereon, whereby material is removed from said layer exposed surface but not from the second side of the substrate,

directing a first beam of electromagnetic radiation against said second side of the substrate to said layer through said substrate, said first beam of electromagnetic radiation including a wavelength band to which each of said substrate and said layer is substantially transparent,

receiving and detecting a second beam of electromagnetic radiation within said wavelength band that is a portion of said first beam that exits the second substrate side after reflection at boundary surfaces of said layer and said substrate, and



concurrently with material being removed from the exposed surface of the layer, monitoring a varying intensity of a component of the detected second beam which results from an interference between portions of the first beam reflected from said exposed surface and an underlying boundary surface.

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**5,499,734**

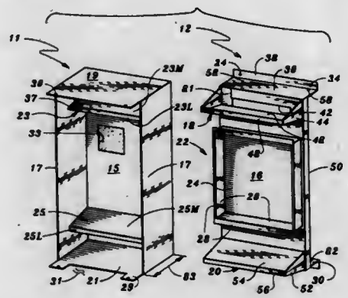
**LABYRINTH BARRIER VENTILATED WATERPROFF ENCLOSURE**

**Wallace D. Tessmer, Sacramento, Calif., assignor to Tesco Controls, Inc., Sacramento, Calif.**

**Filed Apr. 17, 1995, Ser. No. 422,886**

**Int. Cl.[6] H02G *3/08***

**U.S. Cl. 220—4.21** **20 Claims**



1. An air-cooled watertight apparatus for the retention of electrical components in an environment where liquid may be present and which liquid would enter the apparatus, which apparatus comprises:

(1) a front portion and rear portion, the front portion of which is configured as a box having a front wall, spaced sidewalls normal thereto, and spaced top and bottom walls normal to said sidewalls and normal to said front wall,

said front portion having in the interior thereof, a pair of spaced baffles, an upper baffle and a lower baffle, each of which baffles extends rearwardly from the front wall of said first portion;

(2) a rear portion having a base panel which panel has an upper end and a lower end, and which base panel has a transverse slot spaced down from the upper end thereof; and

a box barrier having two pairs of spaced side walls each of which is normal to the next adjacent wall, and each of which projects normally from said base panel to define an open box, and

a pair of spaced barriers one above and one below the box barrier,

one of said barriers being an upper barrier and having a main plate disposed angularly upward from said base panel, and the other being a lower barrier and having a main plate disposed downwardly relative to said base panel,

and wherein the width and elevation of the rear portion are slightly smaller for the rear portion to permit insertion of the rear portion into the front portion, and

stop means to limit the insertion of the rear portion into the front portion.

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**5,499,735**

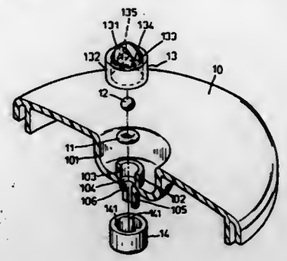
**CLOSURE ASSEMBLY FOR VACUUM SEALED CONTAINERS**

**Cin-Chen Chen, No. 35, Lane 108, Chien Pin 8 Street, Tainan, Taiwan**

**Filed Dec. 20, 1994, Ser. No. 359,750**

**Int. Cl.[6] B65D *51/16***

**U.S. Cl. 220—231** **2 Claims**



1. A closure assembly for releasably sealing a vacuum sealed container comprising:

(a) a cover member for covering an opening of said vacuum sealed container, said cover member having a recessed central portion defined by opposed top and bottom surfaces, said central portion having formed therein a through opening extending in an axial direction, an upper wall projection projecting from said top surface, and a lower wall projection projecting from said bottom surface, the portion of said through opening adjacent said top surface being countersunk, said upper and lower wall projections each having opposed inner and outer wall surfaces, said inner wall surface of each said upper and lower wall projections substantially encircling said through opening about said axial direction, said lower wall projection having formed through said inner and outer wall surfaces thereof at least one air passage slot;

(b) an annular air seal member received on said countersunk portion of said through opening;

(c) an air block member having a substantially spherical contour, said air block member being displaceably received on said air seal member within said inner wall surface of said upper wall projection for blocking passage of air through said through opening;

(d) an air passage actuation member coupled to said upper wall projection, said air passage actuation member having means responsive to manual actuation thereof for contacting and reversibly displacing said air block member to enable said passage of air through said through opening; and,

(e) a dust cover member coupled to said lower wall projection for impeding the passage of dust into said vacuum sealed container.

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**5,499,736**

**RECLOSABLE, REMOVABLE CAP FOR REUSABLE SHAKER DISPENSER BOTTLE**

**Garrett W. Kohl, Harrison, N.Y., assignor to Kraft Foods, Inc., Northfield, Ill.**

**Filed Dec. 28, 1993, Ser. No. 174,558**

**Int. Cl.[6] B65D *51/18;47/00***

**U.S. Cl. 220—254** **11 Claims**



1. A substantially leak-proof, removable and reclosable cap for sealably engaging a top opening portion of a reusable shaker dispenser bottle, said cap comprising:

a cap body including a top wall and a depending peripheral sidewall, means for cooperatively forming a substantially leak-free, fluid tight seal between a top portion of a shaker dispenser bottle and the depending sidewall portion of said cap body, a pouring orifice disposed in said top wall to permit a fluid product to be poured therethrough in a controlled manner in use, an elongate flexible strap having a first end affixed to said cap body and having an opposed free end, said free end including a releasable orifice closure portion for cooperatively closing said pouring orifice in a substantially leak-free, fluid tight sealed manner, and said cap further including a thumb tab at said free end upon which a generally upwardly directed force is exerted to release said orifice closure portion, wherein said first fixed end of the strap extends normally away from said depending peripheral sidewall, from an upper end portion thereof so that when the strap is bent upwardly and inwardly so that its free end overlies said pouring orifice in a generally sideways, U-shaped configuration, a hinge section of the strap is disposed above and located at the depending peripheral sidewall, means for reducing the likelihood of product fling including said hinge section of the strap which is thinned adjacent to its said first end affixed to said cap body in order to reduce development of potential energy in the strap when the orifice closure portion is moved to a closed and locked position about the pouring orifice to thereby substantially reduce the tendency of the strap to resile upwardly and outwardly away from the pouring orifice upon exertion of said generally upwardly directed force onto said thumb tab to achieve said release of the orifice closure portion, and said pouring orifice includes an inverted teardrop configuration including a converging generally V-shaped portion and a spaced and opposed rounded portion, opposite said converging portion, said inverted teardrop orifice being disposed in said top wall such that the converging section is located adjacent the depending peripheral sidewall and said rounded portion is spaced inwardly therefrom.

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**5,499,737**

## RETAINER PLUG

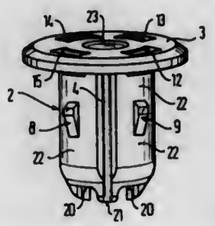
**Willibald Kraus, Grunstadt, Germany, assignor to TRW United Carr GmbH & Co. KG, Enkenbach-Alsenborn, Germany**

**Filed May 26, 1994, Ser. No. 249,846**

**Claims priority, application Germany, Jun. 3, 1993, 43 18 534.7**

**Int. Cl.[6] B65D *39/00***

**U.S. Cl. 220—307** **9 Claims**




1. In a retainer plug formed of plastic and having an elongated bolt-like basic body and a radially extending cover flange, the basic body including a radially outwardly facing wall, at least two longitudinally extending pleat-like, pulled-in areas, stop elements arranged on the outwardly facing wall of the basic body at locations longitudinally spaced from the cover flange and between the pleat-like pulled-in areas, the improvement wherein the basic body (2) has an open end opposite the cover flange (3) and the stop elements are shaped to include a starting ramp (17), a middle area (18) that essentially extends parallel to the basic body (2), and a stop ramp (19) facing the underside of the cover flange (3), and wherein the cover flange (3) is provided with recesses (12, 13, 14, 15), each said recess associated with a stop element, the recesses having a circumferential width (B) and arranged to extend downwardly through the wall (16) of the basic body (2) to a point below the cover flange (3).

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**5,499,738**

## CONTAINER FOR HOLDING PRESSURIZED LIQUIDS

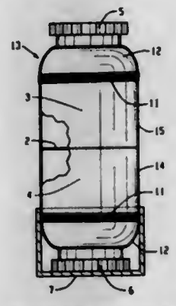
**Howard I. Burleigh, 2 Heroe Grove, Leeds, LS17 8XF, United Kingdom**

**Continuation of Ser. No. 26,984, Mar. 5, 1993, abandoned. This application Mar. 9, 1994, Ser. No. 208,077**

**Claims priority, application United Kingdom, Mar. 11, 1992, 9205277**

**Int. Cl.[6] B65D *1/24***

**U.S. Cl. 220—504** **4 Claims**




1. A container and attachment containing at least one pressurized liquid comprised of:

a single piece, molded body having a generally cylindrical central portion and funnel shaped end portions, said body defining an interior cavity having an opening through each of said end portions;

a wall portion integrally formed within said body dividing the interior cavity into two liquid holding compartments;

a liquid under pressure within one of said liquid holding compartments;

a pair of one piece closure members attachable to said end portions, each closure member be attachable to one of said end portions to form a pressure-tight seal therewith for closing said liquid holding compartment;

external threaded attachment means integrally formed on said cylindrical portion of said single piece, molded body adjacent said end portions; and

a single, detachable transparent cup-shaped attachment having a generally cylindrical body and a planar end portion, said cup shaped attachment receiving one funnel-shaped end portion and having internal threads formed along the inner surface of said cylindrical body, said internal threads matingly receiving the external threaded attachment means on said cylindrical portion of said single piece molded body to secure said attachment to said body.

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**5,499,739**

## THERMOPLASTIC LINER FOR AND METHOD OF OVERWRAPPING HIGH PRESSURE VESSELS

**Darton Greist, III, Clifton, and Irving E. Figge, Sr., Manassas, both of Va., assignors to Atlantic Research Corporation, Gainesville, Va.**

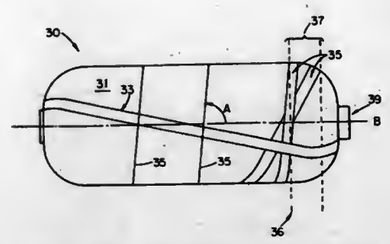
**Filed Jan. 19, 1994, Ser. No. 183,452**

**Int. Cl.[6] B65D *1/16***

**U.S. Cl. 220—589** **8 Claims**

1. In a high pressure vessel liner made of a thermoplastic material, said high pressure vessel liner forming a chamber with at least one opening therein for storing highly pressurized gas, the improvement comprising said thermoplastic material being a material selected from the group consisting of a modified nylon 6 and nylon 11, said high pressure vessel liner exhibiting low permeability to pressurized hydrocarbon gases and acceptable ductility over a temperature range of about –40° F. to 140° F.






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**5,499,740**

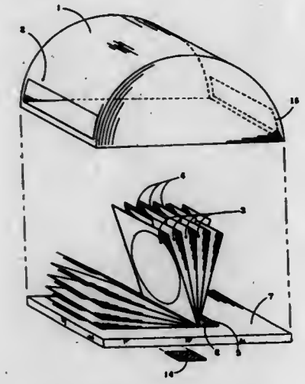
## CONTAINER AND METHOD FOR DISPENSING SEALED ARTICLES

**Mark M. Huck, 231 26th Ave. East, Seattle, Wash. 98112, and Irene E. Barbieri, 3073 S. Abingdon St., Arlington, Va. 22206**

**Continuation-in-part of Ser. No. 189,493, Jan. 31, 1994, Pat. No. 5,435,459. This application Apr. 28, 1995, Ser. No. 430,237**

**Int. Cl.[6] B65H *5/28***

**U.S. Cl. 221—70** **19 Claims**




1. A dispensing apparatus comprising:

at least one package having a bottom and at least one opening;

a plurality of wrapped articles disposed within said package, each of said wrapped articles having a first and second end;

a plurality of pull-tabs, one of each of said pull-tabs being attached to the first end of each of said wrapped articles; and

a plurality of elongated tabs, each of said elongated tabs having opposed ends, one end of each of said elongated tabs being attached to the second end of one of each of said wrapped articles and the other end of each of said plurality of elongated tabs being attached to the bottom of said package, wherein when the pull-tab is pulled outwardly the respective article unwraps and is dispensed through the opening of said package.

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**5,499,741**

## APPARATUS FOR MAKING OR DISPENSING DRINKS

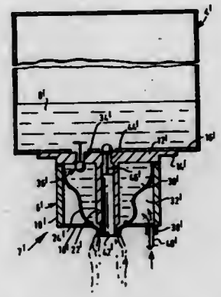
**Alistair Scott, 32 Mill Lane, Impington Cambridge CB4 4XN; Allen J. Pearson, 17 Docksgate, Somersham Cambridge PE17 3NZ, and James T. Collins, 22 Primrose Drive, Yaxley Peterborough, all of, England**

**Division of Ser. No. 778,811, Jan. 23, 1992, abandoned. This application Mar. 9, 1994, Ser. No. 209,425**

**Claims priority, application United Kingdom, Jun. 23, 1989, 8914420; May 2, 1990, 9009947**

**Int. Cl.[6] B67D *5/56***

**U.S. Cl. 222—95** **11 Claims**



1. A device for discharging metered quantities of liquid concentrate comprising a housing having wall means defining a hollow interior, a flexible member dividing the interior of the housing into a first chamber and a second chamber, inlet valve means in communication with the first chamber for permitting flow of concentrate therethrough into the first chamber when the inlet valve means is open and the inlet valve being closeable to resist reverse flow of concentrate therethrough, outlet valve means in communication with the first chamber for discharging concentrate therefrom, and gas inlet means in communication with the second chamber for the supply of gas thereto for pressurization of said hollow interior to cause said flexible member to flex so as to discharge concentrate from the first chamber through said outlet valve means, said outlet valve means comprising an opening in a first portion of said wall means and a valve head carried by a second portion of said wall means, said first and second portions of said wall means being relatively movable for effecting relative movement of the valve head and the valve opening, and being resiliently biased to a first relative position in which the opening is closed by the valve head and being arranged to move in response to said pressurization to a second relative position in which the outlet valve means is open.

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**5,499,742**

## RECIPROCATING TOOTHPASTE DISPENSER

**Kenneth L. Ives, Sr., 101 Loveland Rd., Hebron, Conn. 06248**

**Filed Sep. 8, 1994, Ser. No. 302,174**

**Int. Cl.[6] B65D *35/34***

**U.S. Cl. 222—101** **6 Claims**

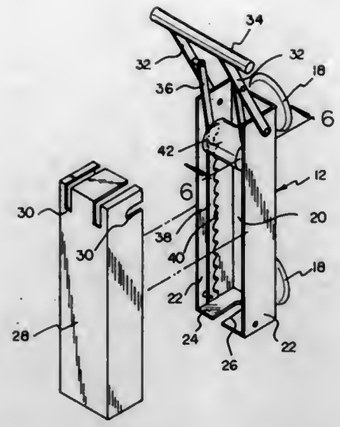
1. A reciprocating toothpaste dispenser comprising:

a frame means for receiving and supporting a toothpaste tube in a substantially vertical orientation;

a collapsing means extending from an upper end of said frame means for effecting compression of said toothpaste tube and subsequent dispensing of said toothpaste therefrom;

a mounting means coupled to said frame means for supporting said frame means relative to a vertical wall surface;

wherein said frame means comprises a channel member having a substantially planer back wall with a pair of spaced side walls orthogonally projecting from said back wall, said side walls being coupled together by a bottom wall extending therebetween at a lower end of said side walls, said bottom wall including an elongated slot directed thereinto which




permits a placement of said toothpaste tube into said channel member so as to reside between said side walls with a dispensing neck of said toothpaste tube projecting through said elongated slot and exterior of said frame means;

and further wherein said collapsing means comprises a pair of racks, each of said racks being pivotally mounted at a lower end thereof to an individual one of said side wall, said racks each including a plurality of semi-circular detents extending along a longitudinal length thereof; a roller of substantially cylindrical configuration; a roller axle extending through said roller, said axle being received and supported within an opposed pair of said detents of said racks such that a first end of said roller axle is received within one of said detents of a first one of said racks, and a second end of said roller axle is received within one of said detents of a second one of said racks to support said roller between said pair of racks for engagement against said toothpaste tube; and means to reciprocate said racks relative to said frame means.

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**5,499,743**

**FLEXIBLE TANK FOR LIQUIDS**

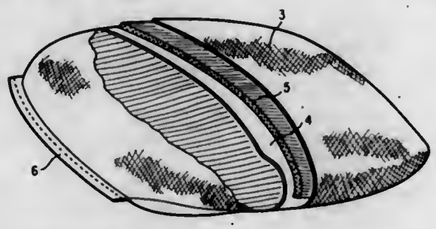
**Jorge L. Blumenkron, 12 sur No. 2916, Colonia Mirador, 72530 Puebla. Pue, Mexico**

**Filed Mar. 8, 1994, Ser. No. 207,170**

**Claims priority, application Germany, Mar. 15, 1993, 9303805 U**

**Int. Cl.[6] B65D *35/14***

**U.S. Cl. 222—107** **21 Claims**




1. A flexible tank for liquids, comprising:

(a) an inner layer for retaining liquids within said tank, said inner layer comprising a first longitudinally seamless tubular segment of thin-walled, flexible foil and first means sealing the ends of said first tubular segment;

(b) an outer layer for reinforcing said inner layer, said outer layer comprising a second longitudinally seamless tubular segment of tear-resistant material and second means sealing the ends of said second tubular segment;

(c) insulating means associated therewith for reducing heat loss from the liquid in said tank, said insulating means comprising an upper insulating layer above said tank resting on said outer layer and a lower insulating layer below said tank with the bottom portion of said outer layer resting on said lower insulating layer, said insulating layer above said tank comprising aluminum foil.

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**5,499,744**

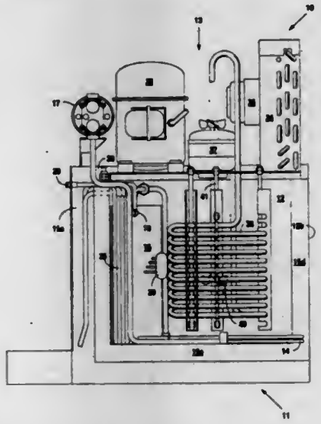
**LOW PROFILE DRINK DISPENSER**

**John T. Hawkins, San Antonio, Tex., assignor to Lancer Corporation, San Antonio, Tex.**

**Filed May 3, 1994, Ser. No. 237,375**

**Int. Cl.[6] B67D *5/56***

**U.S. Cl. 222—129.1** **4 Claims**




1. A beverage dispenser, comprising:

a housing defining a cooling chamber having a cooling fluid contained therein;

dispensing valves mounted on said housing;

a water line for communicating water to said dispensing valves wherein said water line is substantially completely disposed in the bottom of said cooling chamber and has a serpentine configuration defining channels that direct the flow of unfrozen cooling fluid towards a front portion and rear portion of said cooling chamber;

product lines positioned in the front of said cooling chamber for communicating product to said dispensing valves;

a refrigeration unit mounted over said cooling chamber, said refrigeration unit having an evaporator coil extending into said cooling chamber for freezing cooling fluid thereabout; and

an agitator for circulating unfrozen cooling fluid along a circuitous path about the interior and exterior of the cooling fluid slab.



**5,499,745**

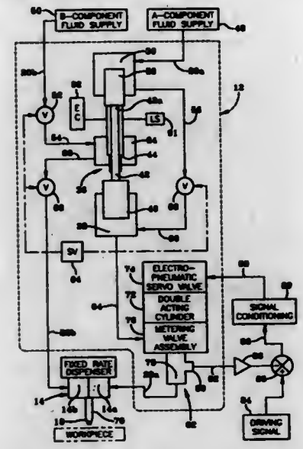
**APPARATUS FOR MIXING AND DISPENSING TWO CHEMICALLY REACTIVE MATERIALS**

**Gary A. Derian, Westlake; Herman E. Turner, Jr., Welington, and Michael W. Fleming, Lorain, all of Ohio, assignors to Nordson Corporation, Westlake, Ohio**

**Filed Feb. 18, 1994, Ser. No. 198,974**

**Int. Cl.[6] B25J *19/00***

**U.S. Cl. 222—136** **18 Claims**




1. An apparatus for mixing and dispensing specified amounts of mixed first and second viscous fluid materials comprising:

a multi-chamber assembly having first, second, and third axially aligned spaced apart chambers, the third chamber disposed between the first and second chambers and including first, second, and third piston means disposed respectively within the first, second and third chambers;

a piston rod mounted for reciprocal movement between the first and second piston means;

an inlet means, carried by the first chamber and adapted for coupling to a source of a pressurized first fluid material;

an inlet means, carried by the third chamber and adapted for coupling to a source of a pressurized second fluid material;

a first fluid passageway for coupling the first and second chambers together to permit a flow of the first fluid material from the first chamber to the second chamber;

the second and third chambers each carrying a discharge outlet;

a mixing and dispensing means coupled to the outlets of both the second and third chambers to receive both first and second fluid material from the respective second and third chambers, to intermix the first and second fluid materials and to dispense the resultant mixture thereof;

means for selectively permitting or preventing the flow of the first material from the first chamber to the second chamber;

wherein the first, second and third pistons are capable of movement to a first position in response to a fluid pressure of the first and second fluid materials on the second and third piston means respectively for filling the second and third chambers with first and second fluid materials respectively; and

wherein the first, second and third pistons are capable of movement to a second position in response to fluid pressure of the first fluid material on the first piston means to cause simultaneous dispensing of the first fluid material from the second chamber and the second fluid respective discharge outlet of each chamber to the mixing and material from the third chamber through the dispensing means.

**5,499,746**

**PROCESS AND APPARATUS FOR LOADING AND UNLOADING POWDER CATALYST**

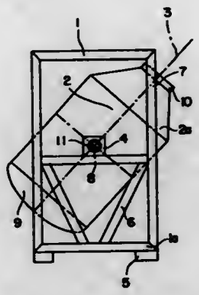
**Georges Berrebi, Bourg Les Valences; Yves Jacquier, Granges Les Valence; Habbo Edens, and Gerrit Middelkoop, both of Puys-Bas, all of, France, assignors to Europeenne de Retraitement de Catalyseurs Eurecat, La Voulte sur Rhone, France**

**Filed Apr. 11, 1994, Ser. No. 225,725**

**Claims priority, application France, Apr. 9, 1993, 93 04358**

**Int. Cl.[6] B67D *5/64***

**U.S. Cl. 222—165** **3 Claims**




1. In combination:

a material selected from the group consisting of pyrophorbic catalysts, self-oxidizing catalysts, self-heating catalysts and adsorbents in solid form as powder, pellets or balls and an apparatus specifically for transporting, loading and unloading the material, the apparatus comprising:

a container for containing the material directly therein, the container having a longitudinal axis and a frustoconical top portion;

a frame for supporting the container;

a base for mounting the frame;

a horizontal trunnion extending from the container to mount the container in the frame for allowing the container to pivot about a horizontal axis which is always perpendicular to the longitudinal axis of the container;

a reverse-lock ratchet in the form of an escapement having pawl and ratchet members with one of the members on the container and the other member on the frame for allowing the container to pivot about the horizontal axis and to maintain position as it is rocked to facilitate loading, transporting and unloading of the material in the container;

the container having a single opening through the frustoconical top portion which is concentric with the longitudinal axis of the container and which faces upwardly when transporting the material and faces laterally when unloading the material, the opening being closed by a fluid-tight valve to seal the container with respect to the atmosphere.

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**5,499,747**

**RETRACTABLE CARRIER FOR, AND IN COMBINATION WITH, A VIAL-TYPE FLUID DISPENSER**

**Bernard R. Quennessen, Qualipac Corporation, 130 Algonquin Pkwy., Whippany, N.J. 07470**

**Filed May 16, 1994, Ser. No. 243,217**

**Int. Cl.[6] B67D *5/64*; B65D *85/20***

**U.S. Cl. 222—167** **13 Claims**

1. A retractable carrier, for a fluid dispenser, comprising:

a cylindrical base;

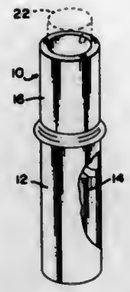
a sleeve slidably disposed in said base; and

a tubular cap; wherein

said base has one open end;

said end has an annular trough formed therein;

said cap has a terminal end which releasably nests, with a frictional engagement, in said trough; and




said base, said sleeve, and said cap have means mutually cooperative for causing said sleeve to translate through said base in response to a relative rotation between said base and said cap; and wherein

said means comprises at least one trackway formed in said sleeve, and a pin extending inwardly from said base and intrusively in one said trackway.

13. In combination, a fluid dispenser and a retractable carrier therefor, comprising:

a cylindrical base;

a sleeve slidably disposed in said base; and

a fluid dispenser confined within said sleeve; wherein

said dispenser is removably engaged with said sleeve; and

a tubular cap coupled to said base; wherein

said cap has a rimmed orifice formed in an end thereof;

said dispenser has an outermost end which closes off said orifice; and

said base and said sleeve have means mutually cooperative for causing, said sleeve (a) to translate through said base, and (b) to elevate said dispenser and raise said outermost end thereof through said orifice.

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**5,499,748**

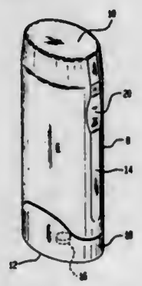
**CLEANING PRODUCT AND RELATED PACKAGING**

**Mark Iaia, West Nyack, N.Y.; Mark Dziersk, Chicago, Ill., and Javier Verdura, Jr., Canton, Conn., assignors to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.**

**Filed Aug. 1, 1994, Ser. No. 283,375**

**Int. Cl.[6] B67D 5/06**

**U.S. Cl. 222—180** **23 Claims**




1. A cleaning product comprising:

(i) a fluid cleaning composition;

(ii) a dispenser for holding said cleaning composition comprising:

a front wall, a rear wall, a closed end wall, a dispensing end wall opposite the closed end wall and a pair of side walls in combination defining a container;

a dispensing opening formed in said dispensing end wall of said container; and

an engagement means for supporting said container, said engagement means being unitarily formed as identical structures on each of said side walls at a position along a length thereof closer to said closed end wall than to said dispensing end wall; and

(iii) a wall mount for receiving and holding said container comprising:

a U-shaped bracket comprising:

a back plate with front and rear surfaces;

left and right arms parallel to one another, each projecting perpendicularly from said front surface of said back plate and structured to form-fittingly couple with said engagement means; and

a retaining tab on each of said arms projecting perpendicularly away from said respective arms and one of said retaining tabs oriented toward said other retaining tab; and

a suction cup joined to said rear surface of said back plate for attaching said wall mount to a wall.

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**5,499,749**

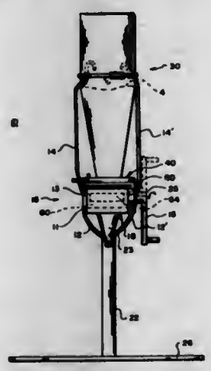
**BULK MATERIAL MEASURING AND DISPENSING SYSTEM**

**Mark Conant, Derry, N.H., assignor to Built On Technology, East Derry, N.H.**

**Filed Jan. 26, 1994, Ser. No. 187,633**

**Int. Cl.[6] G01F 11/10**

**U.S. Cl. 222—233** **18 Claims**




1. A bulk material measuring and dispensing system comprising:

a volumetric measuring and dispensing device, for measuring a predetermined volume of bulk material and for dispensing said predetermined volume of bulk material, said volumetric measuring and dispensing device including a top and bottom region and at least one measuring chamber having a predetermined volume disposed between said top and bottom region;

a bulk material dispensing passageway positioned adjacent said bottom region of said volumetric measuring and dispensing device, for receiving said bulk material from said at least one measuring chamber, and for dispensing said predetermined volume of bulk material into a bulk material receiver;

a dispensing mechanism, coupled to said volumetric measuring and dispensing device, and movable between at least a first and a second position, said first position for allowing said at least one measuring chamber to receive and volumetrically measure said bulk material, said second position for allowing said at least one measuring chamber to dispense said volumetrically measured bulk material to said bulk material dispensing passageway;

a hopper assembly coupled to said top region of said volumetric measuring and dispensing device and including a hopper for holding said bulk material and positioning said bulk material above said volumetric measuring and dispensing device; and



at least a first air vent extending from and fluidly coupling said measuring chamber to an exterior region of said at least one measuring chamber, for facilitating displacement of air in said measuring chamber.

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**5,499,750**

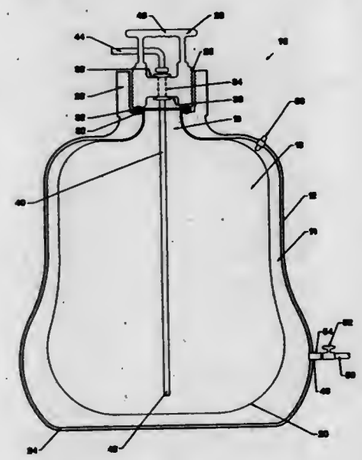
**SPRAYING DEVICE HAVING A REMOVABLE AND REPLACEABLE BLADDER**

**William J. Manifold, 249 John Knox Rd., Tallahassee, Fla. 32303**

**Filed Jan. 17, 1995, Ser. No. 374,034**

**Int. Cl.[6] B67D 5/42**

**U.S. Cl. 222—386.5** **5 Claims**



1. A sprayer device comprising:

a housing having a hollow interior chamber for receiving a removable, collapsible and resilient bladder;

said housing including an enclosed bottom area and an internally threaded open top;

said internally threaded open top receives an enclosed bottom of said bladder to provide for an open top of said bladder to be located in proximity to said internally threaded open top of said housing;

an externally threaded cap is adapted to be removably secured to said internally threaded open top;

a conduit having a first end and a second end extends through a centrally located channel in said externally threaded cap and said first end is received in proximity to said enclosed bottom of said bladder and said second end extends outwardly from said centrally located channel and said second end is adapted to receive a wand;

an inlet is in proximity to said enclosed bottom area and extending into said interior chamber, said inlet including a threaded opening for receiving a pressurized hose line, an on/off valve, and an pressure reducer valve for controlling pressure of a fluid flow of said pressurized hose line; and

a pressure relief valve extending into said interior chamber for relieving the pressure located within said interior chamber after use of said spraying device.

**5,499,751**

**DEVICE FOR STORING A LIQUID MEDICINAL SUBSTANCE AND FOR ADMINISTERING EYE DROPS**

**Gabriel Meyer, La Dullive, CH-1195 Dully, Switzerland**

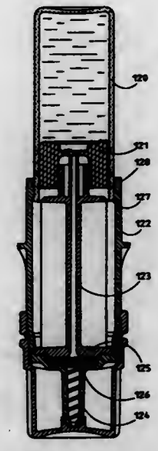
**PCT No. PCT/CH93/00014, § 371 Date Oct. 18, 1993, § 102(e) Date Oct. 18, 1993, PCT Pub. No. WO93/13737, PCT Pub. Date Jul. 22, 1993**

**PCT Filed Jan. 21, 1993, Ser. No. 119,113**

**Claims priority, application France, Jan. 21, 1992, 92 00728; Jun. 9, 1992, 92 07167**

**Int. Cl.[6] B67D 5/42**

**U.S. Cl. 222—386** **9 Claims**




1. A device for storing a liquid medicinal substance and administering eye drops constituted by this substance, comprising a rigid cylindrical reservoir containing said substance and a distributor being connected to one end of said reservoir while the opposite end of said cylindrical reservoir being closed, said distributor having an applicator nozzle including an orifice designed to form and administer said drops to an eye of a patient, said distributor including a flow rate controlling device comprising at least one membrane with calibrated micropores which seals said reservoir, a sliding piston being engaged within said reservoir and being controlled by said device for dispensing liquid medicinal substance from said device, and said flow rate controlling device being connected to asepticization devices having an oligodynamic action on a predetermined volume of medicinal substance situated upstream from said orifice in which the piston contains a rigid retention stop and a flexible sheath defining an internal cavity, said retention stop comprises a supporting stud, and a total height of said stop with the supporting stud is roughly equal, at rest, to a height of the internal cavity.

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**5,499,752**

**SHOULDER BOW CARRIER**

**David A. Johnson, P.O. Box 12204, Salem, Oreg. 97309**

**Filed Jun. 21, 1993, Ser. No. 77,911**

**Int. Cl.[6] A45F 3/14**

**U.S. Cl. 224—258** **6 Claims**

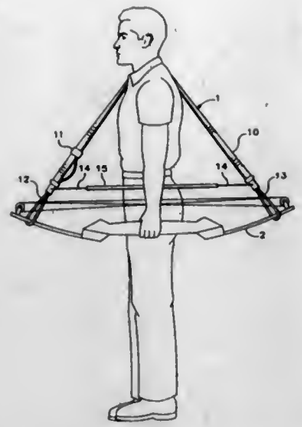
1. A shoulder bow carrier comprising:

a) a shoulder bow;

b) a shoulder strap;

c) an upper connecting means on one end of said shoulder strap and a lower connecting means on the other end of said shoulder strap where said means each loosely receive one end of said shoulder bow;

d) a flexible, stretchable piece of material between the ends of said shoulder strap, fixably attached near each end of said



shoulder strap which serves to constrain said connecting means to said ends of said bow.

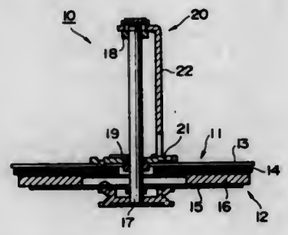
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**5,499,753**

**CAPSTAN MOTOR AND SHEET METAL BEARING HOUSING THEREOF**

**Shigeki Yamazaki; Kazuhiro Kato; Takayuki Ishii, and Hisao Sakai, all of Chiba, Japan, assignors to Sony Corporation, Tokyo, Japan**

**Filed Jul. 19, 1994, Ser. No. 277,515**
**Claims priority, application Japan, Jul. 23, 1993, 5-202624**
**Int. Cl.[6] B65H *20/00***
**U.S. Cl. 226—194** **8 Claims**



1. A bearing housing of a capstan motor, for supporting a rotating shaft of said capstan motor, said bearing housing being formed from sheet metal and having a deep recess for exposing said rotating shaft, wherein said bearing housing comprises:

a flange member;

a housing body extending from said flange member in the axial direction of said rotating shaft;

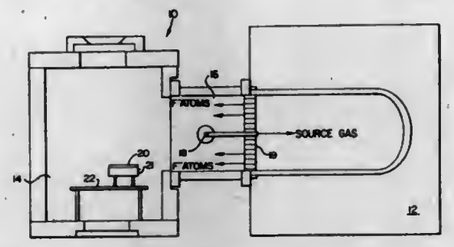
said housing body having opposed side portions directed to form a semi-circular notch with a concave surface facing a pinch roller where the pinch roller is pressed against said rotating shaft, wherein said bearing housing further comprises a bearing collar made of metal mounted on said housing body for rotatably supporting said rotating shaft, said bearing collar having a flange portion abutting against an inside surface of said housing body and a press-fitting portion press-fitted with a mounting hole formed through said housing body, said bearing collar press-fitting portion having an inner diameter greater than that of said bearing collar flange portion.

**5,499,754**

**FLUXLESS SOLDERING SAMPLE PRETREATING SYSTEM**

**Stephen M. Bobbio, Wake Forest; Nicholas G. Koopman, and Sundeep Nangalia, both of Raleigh, all of N.C., assignors to MCNC, Research Triangle Park, N.C.**

**Division of Ser. No. 155,020, Nov. 19, 1993, Pat. No. 5,407,121. This application Nov. 15, 1994, Ser. No. 339,770**
**Int. Cl.[6] C23F *1/02*; B23K *3/08***
**U.S. Cl. 228—42** **22 Claims**




1. A fluxless soldering sample pretreating system, comprising:

a sample chamber having an opening therein;

sample holding means in said sample chamber for holding a sample;

a sample chamber extension, extending outwardly from said opening in said sample chamber, to define a passageway from said sample chamber extension through said opening and into said sample chamber;

fluorine-containing gas supplying means, for supplying fluorine-containing gas into said sample chamber extension;

a microwave oven including a microwave oven cavity, said microwave oven cavity surrounding said sample chamber extension, said microwave oven producing microwave energy in said sample chamber extension to form a plasma therein and dissociate the fluorine-containing gas into atomic fluorine; and

gas permeable plasma containing means in said passageway, for blocking the plasma from traversing said passageway from said sample chamber extension into said sample chamber, while allowing the atomic fluorine to traverse said passageway from said sample chamber extension into said sample chamber, to thereby perform fluorine-containing plasma excitation on said sample.

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**5,499,755**

**PRECISION ALIGNMENT WELDING APPARATUS**

**John E. Myers, Sparks, and Roy W. Procter, Reno, both of Nev., assignors to Torque Converter Rebuilding Systems, Inc., Reno, Nev.**

**Continuation of Ser. No. 870,015, Apr. 17, 1992, abandoned. This application Jan. 27, 1995, Ser. No. 379,145**
**Int. Cl.[6] B23K *37/04*; *37/053***
**U.S. Cl. 228—44.3** **11 Claims**

1. An apparatus for gripping and precision aligning of first and second parts of a separated torque converter, comprising:

a. a platform for supporting the first and second parts of a separated torque converter;

b. a collet closure including an opening therethrough terminating, in an open end which at least partially surrounds the first part of the separated torque converter;

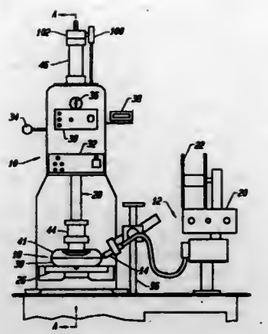
c. constricting means for forcing said collet closure into engagement with the first part of the separated torque converter;

d. a shaft extending through said opening of said collet closure;

e. holding means for forcing said shaft into engagement with the second part of the separated torque converter, said second part of said separated torque converter being supported by said platform relative to an axis; and

f. alignment means for moving the first part of the separated torque converter relative to said axis and into contact with the second part of the separated torque converter.





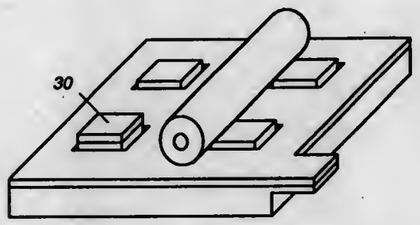
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**5,499,756**

**METHOD OF APPLYING A TACKING AGENT TO A PRINTED CIRCUIT BOARD**

**Kingshuk Banerji, Plantation; Edwin L. Bradley, III, Sunrise, and Francisco Da Costa Alves, Boca Raton, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Feb. 3, 1995, Ser. No. 383,145**
**Int. Cl.[6] B23K *31/02*; H05K *3/34***
**U.S. Cl. 228—214** **9 Claims**




1. A method of applying a tacking agent to a printed circuit board, comprising the steps off

providing a printed circuit board having;

a plurality of interconnect pads on a first face thereof, each interconnect pad having a coating of solder between 0.02 and 0.3 mm thick;

a plastic film having a plurality of apertures corresponding to the plurality of interconnect pads, the plastic film temporarily adhered to the first face of the printed circuit board by a selectively releasing adhesive so that the apertures in the plastic film reveal the solder coated interconnect pads; and

a breakaway tab on the plastic film;

roller coating the plastic film with high viscosity tacking agent so that a layer of the tacking agent is applied to the revealed interconnect pads; and

peeling the roller coated plastic film from the printed circuit board by means of the breakaway tab;

placing an electronic component on the printed circuit board so that solderable pads on the component are aligned with the coated interconnect pads; and

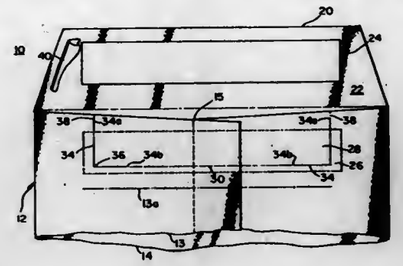
heating the printed circuit board and the electronic component in a manner sufficient to form a solder joint between the interconnect pads and the solderable.

**5,499,757**

**EASY OPEN, TAMPER EVIDENT ENVELOPE**

**Gordon E. Back, Wallingford, Pa., assignor to International Envelope Company, Exton, Pa.**

**Filed Apr. 25, 1994, Ser. No. 232,894**
**Int. Cl.[6] B65D *27/34***
**U.S. Cl. 229—81** **9 Claims**



1. An easy opening, tamper evident package comprising:

a spunbonded olefin sheet package body having a mouth opening to receive materials to be packaged within said package body;

a spunbonded olefin sheet closure flap extending from said package body proximal said mouth opening, said closure flap having an inner surface which faces and overlaps an edge portion of said package body when said closure flap is fully extended over said mouth opening and pressed against said package body to close said mouth opening;

a hot melt adhesive closure permanently adhered to one of said edge portion of said package body and said inner surface and having an adhesive surface facing a remaining one of said closure flap and said edge portion at least when said closure flap is fully extended over said mouth opening and against said package body; and

a breakaway region defined in said package by a continuous line of openings through said package proximal to said mouth opening, at least part of said adhesive closure overlapping at least part of said breakaway region at least when said closure flap is fully extended over said mouth opening and against said package body, whereby said overlapped breakaway region is subject to tear forces applied to said package to separate said closure flap from said adhered edge portion when said package is opened after said closure flap is sealed to said edge portion with said adhesive closure, said continuous line of openings defining at least three sides of the breakaway region and said openings being spaced sufficiently closely to one another along the line that a tear force required to break bridges of the spunbonded olefin sheet left between adjoining openings of the line is less than a tear force required to separate at least one of the closure flap and the breakaway region from the hot melt adhesive closure.

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**5,499,758**

**LIQUID DISPENSER FOR USE WITH CONTAINERS**

**Gerald P. McCann, Los Angeles, and Donald Verley, Lake Elizabeth, both of Calif., assignors to McCann's Engineering & Manufacturing Co., Los Angeles, Calif.**

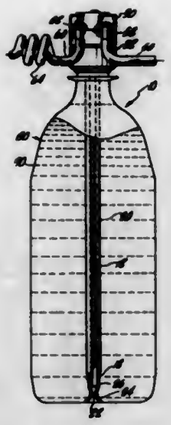
**Filed Aug. 19, 1994, Ser. No. 293,055**
**Int. Cl.[6] B65D *35/28***
**U.S. Cl. 222—386.5** **20 Claims**

1. A liquid dispenser for use with a container containing liquid, comprising:

a housing attachable to the container, the housing including a pressure nozzle and an exit nozzle;

a pressure source connected to the pressure nozzle;

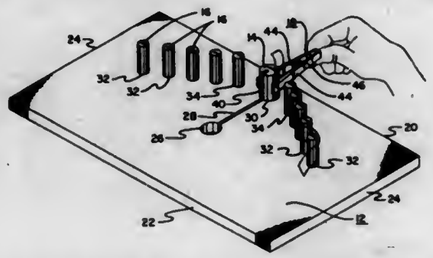
an inflatable bladder adapted to fit within the container, and connected to the pressure nozzle;



a draw tube adapted to fit within the container, and connected to the exit nozzle;
a coiled tube connected to the exit nozzle; and,
a faucet connected to the coiled tube.

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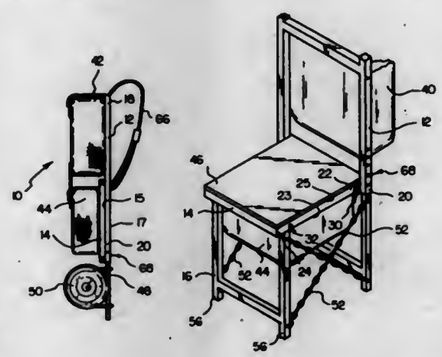
**5,499,759**
**DOWEL BOARD BOW FOLDING DEVICES**
**Tammy M. Richards, 3135 Elizabeth, Canon City, Colo. 81212**
**Filed Sep. 15, 1994, Ser. No. 306,419**
**Int. Cl.[6] A41H *43/00***
**U.S. Cl. 223—46** **2 Claims**



1. A new and improved dowel board bow folding device comprising, in combination:
a base board fabricated of wood and formed in a planar generally rectangular configuration with an upper surface and a lower surface, the apparatus having parallel long side edges and parallel short side edges, the approximate center point of the board having a generally circular shaped aperture extending therethrough, a thin generally rectangular shaped channel extending from the approximate center point of a first long side edge through to the central aperture, the upper surface of the board having a series of eleven bore holes, a first large central bore hole having its center point positioned along the rectangular channel a short distance from the first side edge, the central bore being approximately the same size as the central aperture and extending half way through the thickness of the board, the board having five bore holes positioned at either side of the central bore, each of the side bore holes having a much smaller diameter than the central bore hole, each set of five bore holes being positioned in an angled orientation away from the central bore hole, the first of each series of five bore holes being positioned with its center point in alignment with the center point of the large central bore hole, each remaining bore hole being positioned in an angled orientation toward the second long side edge and each respective short side edge, the bore hole being arranged in an angled orientation of approximately forty-five degrees with respect to each previous bore hole, the fifth and last bore hole of each series being positioned near the approximate center point of each short side edge; and
the apparatus having a series of eleven dowels, a central dowel being the largest and having a diameter slightly less than the central bore hole, the cylindrical side edge of the central dowel having a generally rectangular shaped radial bore extending from one end through to the opposite end, the bore extending radially within the central dowel approximately one third of its diameter, the central dowel adapted to be positioned in the central bore hole of the base board with its radial bore positioned in alignment with the channel, the radial bore facing the central aperture of the board, the board having ten side dowels of equal size, each of the side dowels having a smaller diameter and the same height as the central dowel, each of the dowels adapted to be positioned in a side bore hole in the operative orientation, the central dowels and side dowels adapted to have ribbon or cloth positioned therearound for the purpose of making bows of various shapes, tiers and designs, the apparatus also including a standard clothes pin comprised of two planar generally rectangular shaped components with a tension spring positioned therebetween, the clothespin adapted to be positioned around any of the dowels for the purpose of firmly securing the material which is to be formed into a bow.

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**5,499,760**
**INTERCONVERTIBLE BACKPACK AND CHAIR APPARATUS**
**William P. Pielocik, 421 High St., Clinton, Mass. 01510**
**Filed May 5, 1994, Ser. No. 238,698**
**Int. Cl.[6] A47C *13/00***
**U.S. Cl. 224—155** **7 Claims**



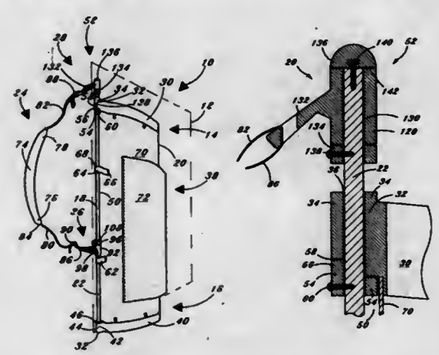
1. A new and improved interconvertible backpack and chair apparatus, comprising:
a first frame assembly which includes a top end, a bottom end, a front side, and a back side, said first frame assembly including a pair of retractable first legs, wherein said first legs are capable of supporting a rolled-up sleeping bag when said apparatus is in a backpack mode, and wherein said first legs are capable of serving as rear legs of a chair when said apparatus is in a chair mode,
a pair of selectable lock assemblies supported by said first frame assembly for selectively locking said retractable first legs in an extended position,
a strap connected to said first frame assembly enabling a person to carry said apparatus on one's back in a backpack mode,
a first storage compartment attached to said top end of said first frame assembly,



a flexible hinge assembly for attaching said first storage compartment to said first frame assembly, wherein said first storage compartment is capable of being located on said front side of said first frame assembly when said apparatus is in a backpack mode, and wherein said first storage compartment is capable of being shifted around said flexible hinge assembly and being located on said back side of said first frame assembly when said apparatus is in a chair mode,
a second frame assembly which includes a back end, a front end, a bottom side, and a top side,
a first hinge assembly which connects said bottom end of said first frame assembly to said back end of said second frame assembly, said first hinge assembly permitting said second frame assembly to be rotated with respect to said first frame assembly when said apparatus is shifted from a backpack mode to a chair mode and vice versa,
a seat assembly attached to said top side of said first frame assembly, wherein said seat assembly is in alignment with said first storage compartment when said apparatus is in a backpack mode, and wherein said seat assembly is oriented at right angles to said first storage compartment when said apparatus is in a chair mode,
a third frame assembly which includes a top end and a bottom end, and
a second hinge assembly which connects said front end of said second frame assembly to said top end of said third frame assembly, said second hinge assembly permitting said third frame assembly to be rotated with respect to said second frame assembly when said apparatus is shifted from a backpack mode to a chair mode and vice versa.

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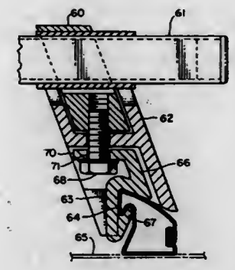
**5,499,761**
**ADJUSTABLE BALANCE GOLF BAG**
**Eric W. Reimers, 1235 Starwood, Missoula, Mont. 59802**
**Filed Jan. 21, 1994, Ser. No. 184,585**
**Int. Cl.[6] A63B *55/00***
**U.S. Cl. 224—202** **13 Claims**



1. A golf bag for transporting golf clubs comprising:
a golf bag body including a longitudinally disposed surrounding wall, the wall defining a bag interior and a bag exterior, the golf clubs being transported within the bag interior, the wall having a spine portion and an opposing front portion, said bag body terminating in an upper end and a lower end;
post securing means spaced longitudinally along the spine portion, for fixedly securing at least one post in a longitudinal direction of said golf bag;
at least one post secured to said golf bag by said post securing means, extending along a substantial longitudinal extent of the spine portion;
at least one strap connector slidably and rotatably mounted about said at least one post, one of said at least one strap connector including locking means having a locked and an unlocked position, said one strap connector further being longitudinally immobilized along said at least one post but rotatable thereabout when said locking means is in the locked position; and
a golf bag strap for carrying the golf bag, said strap having a first strap end and a second strap end, both strap ends being ultimately attached to the golf bag, at least one of the strap ends being attached to said one strap connector.

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**5,499,762**
**AUTO MOUNT FOR BICYCLE RACK**
**Douglas Lee, 8957 Sepulveda Blvd., Sepulveda, Calif. 91343**
**Division of Ser. No. 45,468, Apr. 8, 1993, Pat. No. 5,314,104, which is a continuation-in-part of Ser. No. 765,667, Sep. 26, 1991, Pat. No. 5,201,911. This application Feb. 15, 1994, Ser. No. 196,566**
**Int. Cl.[6] B60R *9/00***
**U.S. Cl. 224—321** **2 Claims**

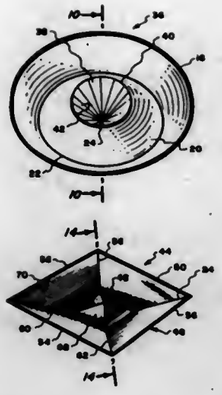


1. A sports rack for mounting a crossbar onto a curved roof of a vehicle comprising:
a standoff of single unitary construction and having a base portion and a rack portion spaced apart in fixed parallel relationship by an intermediate portion angularly disposed with respect to said rack and base portions;
fastener means rotatably carried on said rack portion for retaining said standoff to said crossbar;
anchor means fixedly secured to said standoff;
said anchor means comprising a hook member and is attached to said rack portion by said fastener means; and
an elongated rail adapted to be mounted on said curved roof of vehicle and provided with an inner groove which extends along the length of said rail for insertably receiving said hook member to anchor said base portion to said vehicle roof.

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**5,499,763**
**COLLAPSIBLE CONTAINER**
**Robert A. DeMars, 5000 N. Parkway Calabasas, Ste. 233, Calabasas, Calif. 91302**
**Filed Apr. 25, 1995, Ser. No. 430,507**
**Int. Cl.[6] B65D *3/06;3/24***
**U.S. Cl. 229—114** **2 Claims**

1. A collapsible container comprising:
a thin sheet material body, said body being locatable in a totally collapsed position, said totally collapsed position being essentially flat, said body being unfolded to an intermediate expanded position which is also flat, the size of said body in said totally collapsed position being approximately one-half the size of said body in said intermediate expanded position, said body being movable from said intermediate expanded position to an expanded position, said expanded position locates said body in a first cone shape forming a chamber adapted to contain a quantity of dry small particles of a foodstuff; and



a main center section formed within said body, said main center section having a peripheral edge, said main center section being substantially smaller in size than said chamber, said main center section being deflectable into said chamber when said body is in said expanded position forming a second cone shape, said second cone shape being oriented in an opposite direction from said first cone shape and forming a base upon which said container can rest.

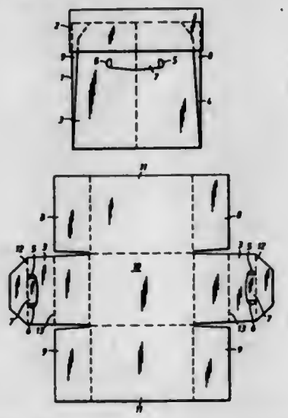
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**5,499,764**

## PACKAGING UNIT FOR SHEET LIKE MATERIAL

**Rolf A. Carlsson, Örnsköldsvik, Sweden, assignor to Mo Och Domsjo Aktiebolag, Ornskoldsvik, Sweden**

**Filed Dec. 7, 1994, Ser. No. 351,276**
**Claims priority, application Sweden, Jun. 9, 1992, 9201748**
**Int. Cl.[6] B65D *5/468***
**U.S. Cl. 229—117.16** **7 Claims**



1. A package unit for sheet like material comprising a box (1) provided with a lid (2), both of rectangular configuration and comprising a centre part, two side parts and two end wall parts and being easily dismountable, wherein each box end wall part (4) has an additional end wall part (3) which is mounted externally on the end wall part (4) and which has a generally rectangular configuration and an area which is 70–100% of the actual or imaginary area of the inwardly lying end wall part (4), characterized in that the additional end wall part (3) is fastened at least partially to a lower region of the inwardly lying end wall part (4); and in that the additional end wall part (3) is provided in an upper half of the additional end wall part with a foldable lip (7) from which material has been removed on at least one side (5, 6), said lip (7) partly enabling an uppermost part of the additional end wall part (3) to be folded outwardly of the lid end wall part and partly, subsequent to being folded, functioning to strengthen and protect the resultant gripping aperture.

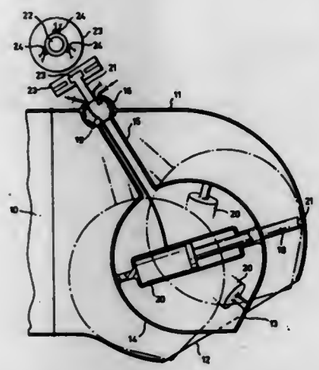
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**5,499,765**

## NOZZLE CAPABLE OF VARYING THE DIRECTION OF DISCHARGE OF FLUID THEREFROM

**Leonard S. Snell, Bristol, United Kingdom, assignor to Rolls-Royce Limited, London, United Kingdom**

**Continuation of Ser. No. 443,301, Sep. 27, 1982, abandoned. This application Oct. 25, 1985, Ser. No. 831,101**
**Claims priority, application United Kingdom, Jan. 13, 1981, 8130909**
**Int. Cl.[6] B63H *11/107***
**U.S. Cl. 239—265.19** **6 Claims**



1. An axi-symmetric fluid nozzle capable of varying the direction of discharge of fluid therefrom comprising:
sidewalls forming a curved nozzle and terminating in a convergent fixed area outlet;
a generally spherical plug disposed within the nozzle, said plug having a conical region projecting through the outlet to define therewith the final discharge area of the nozzle;
a ball-type universal joint mounted to one of said nozzle sidewalls upstream of the plug substantially where a central axis of said outlet intersects said one sidewall;
an arm, one end of which is mounted on said ball-type universal joint and the other end of which has said plug mounted thereon, whereby said plug and arm can be rotated about said universal joint such that said plug can be moved in any direction substantially in the plane of said outlet; and
means for moving said plug.

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**5,499,766**

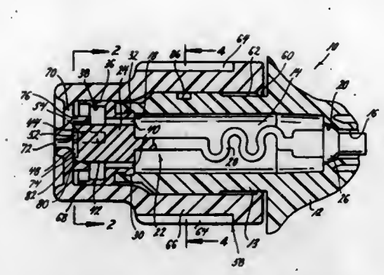
## NOZZLE ASSEMBLY FOR TRIGGER SPRAYER

**Donald D. Foster, St. Charles, and Philip L. Nelson, Ellisville, both of Mo., assignors to Contico International, Inc., St. Louis, Mo.**

**Continuation of Ser. No. 808,168, Dec. 13, 1991, Pat. No. 5,368,234. This application Nov. 29, 1994, Ser. No. 346,394**
**Int. Cl.[6] B05B *1/12;9/043***
**U.S. Cl. 239—333** **18 Claims**

1. A nozzle assembly for a trigger sprayer comprising:
a housing defining a fluid chamber,





an inlet to the fluid chamber for introducing pressurized fluid into the chamber upon actuation of the trigger sprayer,
a spinner defining a wall of the chamber,
a cap mounted on the housing and having a nozzle orifice through it,
passage means through the spinner for establishing fluid communication between the chamber and the nozzle orifice;
a wall configuration on the spinner in communication with the nozzle orifice for imparting a spray pattern to fluid constrained to flow past the wall configuration and through the nozzle orifice,
blocking walls on the cap and spinner moveable respectively into and out of contact upon rotation of the cap relative to the housing for alternately blocking and unblocking fluid flow from the passage means to the wall configuration and for establishing and progressively enlarging a fluid path that bypasses the wall configuration upon progressive axial separation of the cap from the spinner, and
a cam slot and cam follower, one on the housing and the other on the cap with the cam follower extending into the cam slot, the cam slot having a configuration followed by the cam follower upon movement of the cap relative to the housing,
said slot configuration having a first portion that causes the cam follower to initially locate the blocking walls in mutual contact for blocking fluid flow, a first section that causes the cam follower to maintain the moveable walls in axial contact for closing the bypass path while unblocking and Progressively increasing the volume of fluid flow to the wall configuration for imparting and expanding a spray pattern of the fluid, and a second section that causes the cam follower to open and progressively enlarge the bypass path for Progressively changing the fluid discharge pattern from spray to stream.

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**5,499,767**

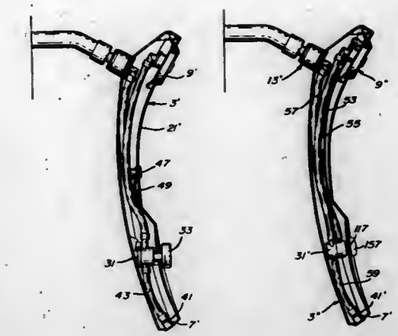
## SHOWER HEAD HAVING ELONGATED ARM, PLURAL NOZZLES, AND PLURAL INLET LINES

**Michel Morand, 4560 Hampton Street, Montreal, Quebec, Canada**

**Filed Aug. 31, 1994, Ser. No. 297,541**
**Claims priority, application United Kingdom, Sep. 3, 1993, 9318302**
**Int. Cl.[6] B05B *1/16;1/08***
**U.S. Cl. 239—383** **18 Claims**

1. A shower head having: an elongated, rigid arm having a front and a back; a shower nozzle provided at one end of the arm, the shower nozzle being at the front of the arm; a swivel joint provided on the arm near the one end of the arm for use in connecting the shower head to a shower pipe, the swivel joint being at the back of the arm; water connection means in the arm between the swivel joint and the shower nozzle for directing water from the shower pipe to the nozzle via the water connection means when the shower head is connected to the shower pipe; the other end of the arm adapted to be manually moved to position the nozzle when the shower head is connected to the shower pipe.

14. A shower head having: a main body; at least two sets of spray openings, for spraying different patterns of water, on the body of the head; a separate water inlet on the body for each set of spray openings; a separate water line leading to each water inlet on the body; a central chamber in the body for directing water form one water inlet to one set of spray openings; an annular chamber in the body, surrounding the central chamber, for directing water from the other water inlet to the other set of spray openings; and a spinner rotatably mounted in the annular chamber for pulsating water from the other set of spray openings.



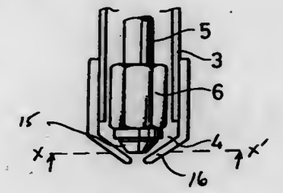
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**5,499,768**

## SPRAY NOZZLE UNIT

**Toshiyuki Tanaka; Akira Kodera, and Shizuo Aishima, all of Yokohama, Japan, assignors to Ohkawara Kakohki Co., Ltd., Japan**

**Continuation-in-part of Ser. No. 194,630, Feb. 10, 1994, abandoned, which is a continuation of Ser. No. 1,766, Jan. 7, 1993, abandoned, which is a continuation of Ser. No. 563,142, Aug. 6, 1990, Pat. No. 5,227,017, which is a continuation of Ser. No. 359,271, May 31, 1989, abandoned. This application Nov. 2, 1994, Ser. No. 335,414**
**Int. Cl.[6] B05B *7/06;7/10***
**U.S. Cl. 239—406** **7 Claims**



1. A nozzle unit for atomizing liquid sprayed under low pressure therethrough, comprising:
a feed liquid conduit;
liquid spraying means for swirling and spraying liquid passed from the feed liquid conduit, said liquid spraying means including a centrifugal pressure nozzle connected to said feed liquid conduit, said centrifugal pressure nozzle having a frustoconical tip having an open end through which the feed liquid is sprayed, said open end having a cross-sectional area equal to $A_L$, said feed liquid conduit and said centrifugal pressure nozzle forming a conduit nozzle structure; and
a tubular member disposed about said conduit nozzle structure to form an area through which a gas stream is passed, said tubular member including a convergent end portion surrounding said frustoconical tip of said centrifugal pressure nozzle, such that a gas-emitting annulus is formed between said convergent end portion and said frustoconical tip along a plane of said cross-sectional area $A_L$, said gas-emitting annulus having an area $A_G$;

wherein a ratio $A_C/A_L$ is within a range of 10–200.

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**5,499,769**

## FUEL INJECTION VALVE INCLUDING AIR PROMOTING ATOMIZATION

**Masanori Namiki; Kazuyoshi Mori, and Hideo Kato, all of Atsugi, Japan, assignors to Unisia Jecs Corporation, Atsugi, Japan**

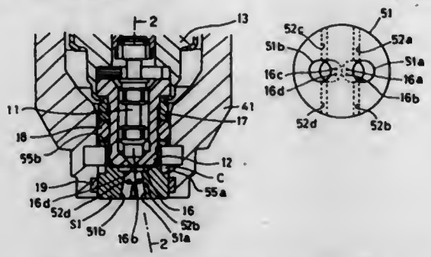
**PCT No. PCT/JP93/00996, § 371 Date Mar. 15, 1994, § 102(e) Date Mar. 15, 1994, PCT Pub. No. WO94/02736, PCT Pub. Date Feb. 3, 1994**

**PCT Filed Jul. 16, 1993, Ser. No. 196,216**

**Claims priority, application Japan, Jul. 16, 1992, 4-189715; Dec. 2, 1992, 4-323480**

**Int. Cl.[6] F02M** *69/00;69/04;61/18;51/06*

**U.S. Cl. 239—409** **7 Claims**



1. A fuel injection valve comprising a fuel injection valve body having at least one fuel injection hole to diffusingly discharge fuel therefrom in a fuel spray towards at least one intake port of an internal combustion engine, atomization promotion means for discharging air towards the fuel spray discharged from the fuel injection valve body and thereby promoting atomization of said fuel spray, and guide means having an opening portion surrounding an outer peripheral portion of the fuel spray which has been subjected to atomization promotion, for controlling the cross-sectional shape and spray direction of the fuel spray wherein said guide means is branched into two opening portions, with an atomization promotion means provided in each of the opening portions, and with L1 as a distance from a lower face of said guide means to a central point of an air discharge portion of said atomization promotion means, θF (θP/2) as ½ an angle between respective central axes of the two opening portions of said guide means, and θP as an angle between respective central axes of the bifurcated intake ports of the internal combustion engine, then said L1 is set to L1' which satisfies the following equation;

$$L1' = L1 \times \tan(\theta P/2 + X) \times \tan(90 - \theta P/2)$$

where:

X is within the range from 2.5~3.5, and L1 is the maximum length without air discharge from the atomization promotion means, at which an inner peripheral wall of the opening portion of the guide means does not interfere with the fuel spray.

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**5,499,770**

## APPARATUS FOR SUSPENSION OF PARTICLES IN AN ULTRASONIC FIELD

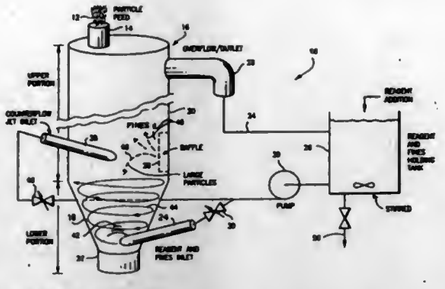
**Edward D. McCullough, Riverside, Calif., assignor to Rockwell International Corp., Seal Beach, Calif.**

**Filed Sep. 6, 1994, Ser. No. 300,778**

**Int. Cl.[6] B02C** *19/00*

**U.S. Cl. 241—1** **6 Claims**

1. A system for the comminution of passivating layers on particles to facilitate particle digestion, comprising:



a) a vessel, comprising:

i) a lower portion having an inner surface with an increasing cross sectional area in the upward direction; and

ii) an upper portion being in fluid communication with said lower portion, said upper portion having an inner surface with a substantially constant cross sectional area;

b) a focused ultrasonic source positioned so as to sonicate material in said lower portion, said focused ultrasonic source providing sufficient energy to effect comminution of passivating layers on particles in said lower portion;

c) at least one fluid inlet so arranged and constructed relative to said lower portion to introduce fluid into a lower section of said lower portion in a tangential manner so as to cause helical, upward circulation of any particles in said lower portion;

d) flow re-direction means positioned in said upper portion so as to stop said helical, upward circulation of said particles and to convert said circulation to an upward, substantially non-circular flow, thereby reducing the velocity of said particles and allowing said particles to either fall back down to said lower portion or to continue upward in said upper portion in accordance with their size;

e) at least one outlet so arranged and constructed relative to said vessel for providing an exit flow of said fluid and particles less than a desired threshold size; and,

f) a particle inlet for adding particles to said vessel.

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**5,499,771**

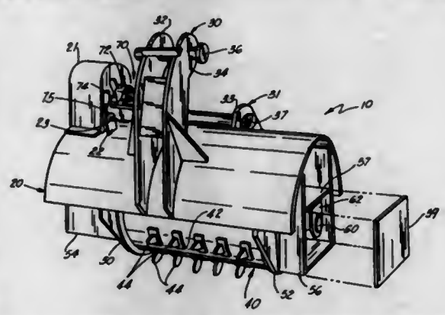
## APPARATUS AND METHOD FOR CUTTING TREES AND GRINDING AND MULCHING TREE STUMPS

**Pasquale A. Esposito; Patsy A. Esposito, Jr., and Wayne J. Esposito, all of P.O. Box 6, Davenport, Fla. 33837**

**Filed Apr. 19, 1995, Ser. No. 425,936**

**Int. Cl.[6] B02C** *13/04;* **A01G** *23/08*

**U.S. Cl. 241—101.74** **9 Claims**



1. An apparatus for cutting and grinding trees and grinding and mulching tree stumps, comprising:

(a) a semi-spherical arcuate shield having a front side and a rear side, a control mount secured to the front side of said semi-spherical arcuate shield and extending upwards, and a foot mount secured to the rear side of said semi-spherical arcuate shield and extending backwards;

(b) a cylindrical drum mounted within said frame such that said cylindrical drum will rotate along its horizontal axis within said frame and said semi-spherical arcuate shield covers the upper surface of said cylindrical drum;

(c) a pair of debris limiting rings, each said debris limiting ring located on an end of said cylindrical drum;

(d) a pair of belt guards, each said belt guard mounted on the end of each said debris limiting ring;

(e) a pair of end plates, each said end plate mounted on the end of each said belt guard;

(f) means for rotating said cylindrical drum relative to said semi-spherical arcuate shield; and

(g) a plurality of grinding tools mounted on the periphery of said cylindrical drum.



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**5,499,772**

## WINDING OPERATION CONTROL METHOD AND APPARATUS FOR AUTOMATIC WINDER

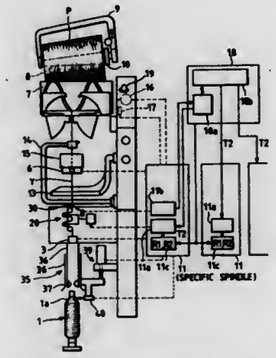
**Yoshiyasu Maeda, Yamatokouriyama, and Norio Kubota, Kyoto, both of, Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan**

**Filed Oct. 12, 1993, Ser. No. 133,867**

**Claims priority, application Japan, Jan. 16, 1992, 4-278978; Feb. 25, 1993, 5-063424**

**Int. Cl.[6] B65H** *54/02;59/12*

**U.S. Cl. 242—35.5 R** **10 Claims**



1. A winding operation control method for an automatic winder having an automatic winder with a large number of winding units arranged in rows, comprising the steps of:

setting at least a unit to be a specific unit which acts for at least some of said winding units;

storing an operation data of said specific unit; and

controlling an operation of said at least some of said winding units other than the specific unit based on the operation data of the specific unit, wherein said specific unit and said at least some of said winding units other than the specific unit operate independently, and wherein said operation data stored for said specific unit is provided to said units other than the specific unit for controlling thereof.

3. A winding operation control apparatus of an automatic winder, comprising:

a tensioning device variably controlled by each of a plurality of spindles of a winding unit;

a yarn tension detecting device for a specific one of said plurality of spindles, said yarn tension detecting device controlling said tensioning device for said specific spindle;

storing means for storing therein data, including data for said tensioning device, for said specific one of said plurality of spindles; and

a control device for controlling said tensioning devices for other ones of said plurality of spindles, which are other than said specific spindle, on the basis of an output value for said tensioning device of said specific spindle,

wherein said yarn tension detecting device controls said tensioning device of said specific spindle independent from the control of said tensioning devices of said other ones of said plurality of spindles.

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**5,499,773**

## YARN GUIDE ROD FOR A MACHINE PRODUCING CROSS-WOUND BOBBINS

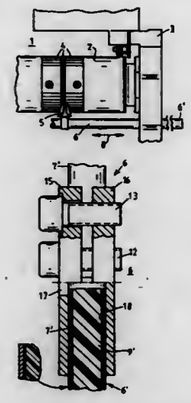
**Hans Raasch, Mönchengladbach, and Willi Wassen, Schwalmtal, both of, Germany, assignors to W. Schlafhorst AG & Co., Monchen-Gladbach, Germany**

**Filed Nov. 15, 1993, Ser. No. 153,226**

**Claims priority, application Germany, Nov. 14, 1992, 42 38 475.3**

**Int. Cl.[6] B65H** *54/00;57/00*

**U.S. Cl. 242—43 R** **10 Claims**



1. In a machine producing cross-wound bobbins or cheeses, a yarn guide rod for supporting multiple yarn guides, comprising:

axially coupled-together partial rods together defining the yarn-guide rod, each of said partial rods including:

a tubular abrasion-proof jacket, and

a compact bar body disposed in and extending throughout said tubular jacket, said compact bar body being formed essentially of fibers embedded in a plastic matrix and being joined to said tubular jacket in a shift-proof manner.

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**5,499,774**

## WIRE PULL-IN APPARATUS

**Heinrich Novak, Graz; Herbert Berthold, Deutschlandsberg; Gerhard Barta, and Hans-Peter Pichler, both of Graz, all of, Austria, assignors to MAG Maschinen, and Apparatebau Gellschaft mbh, both of Graz, Austria**

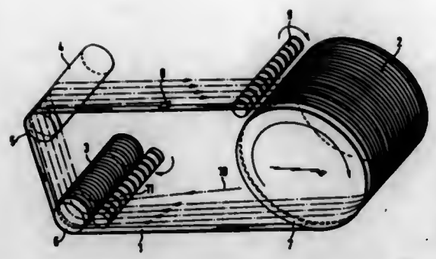
**Filed Mar. 25, 1993, Ser. No. 37,622**

**Claims priority, application European Pat. Off., Mar. 31, 1992, 92105550**

**Int. Cl.[6] B65H** *51/00;51/08*

**U.S. Cl. 242—47.03** **6 Claims**

1. A wire pull-in apparatus for use in combination with a wire enamelling facility wherein wire being pulled in is guided in guide grooves formed around spaced, axially parallel wire guide roller blocks thereby defining wire loops around each wire guide roller block, whereby the wire loops disposed around each wire guide



roller block are held a predetermined spacing interval apart from each other, characterized in that:

a band roller is mounted for rotation in coaxial alignment with each wire guide roller block, respectively;

a flexible wire guide band is looped around each band roller, the wire guide band including a wire holding means for holding one end of the wire being pulled in; and,

a wire shifting roller is mounted adjacent at least one of the wire guide roller blocks, the wire shifting roller being engagable with the lead-in portion of each wire loop for axially shifting each wire loop by one spacing interval before each new wire loop is placed on said at least one wire guide roller block.

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**5,499,775**

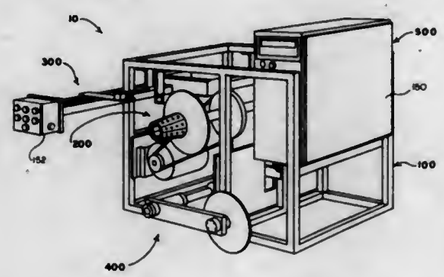
**WINDING MACHINE WITH PROGRAMMABLE TRAVERSE CONTROL**

**Robert L. Vander Groef, North Haledon, N.J., assignor to Communication Cable, Inc., Sanford, N.C.**

**Filed Jul. 26, 1993, Ser. No. 96,460**

**Int. Cl.[6] B65H *54/28***

**U.S. Cl. 242—158 B** **23 Claims**



1. A winding machine for winding a line to form a package comprising:

(a) a spindle;

(b) a spool mounted on the spindle;

(c) a motor for driving the spindle;

(d) a reciprocating traverse for guiding the line onto the spool;

(e) a motor for driving the traverse;

(f) control means for controlling the position of the traverse with respect to the spindle to wind a line in a generally cross-over pattern about the spindle with the cross-over points in each winding progressing around the spool, the control means including:

(1) means for storing a cross-over profile that defines the relative position of the traverse with respect to the angular position of the spindle during the winding process;

(2) a sensor for sensing the angular position of the spindle; and

(3) processing means responsive to the spindle sensor for setting the desired traverse position based on the stored cross-over profile and outputting a control signal to the traverse drive motor for positioning the traverse at the desired position.

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**5,499,776**

**PACKAGE OF TAPE TYPE NON-TWISTED CARBON FIBER BUNDLE**

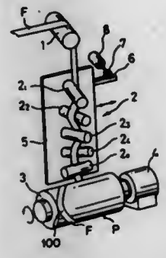
**Hironobu Nojiri; Kazuyuki Yakushiji, both of Ehime; Minoru Yoshinaga, Yokohama, and Hiroyuki Terasaka, Ohtsu, all of, Japan, assignors to Toray Industries, Inc., Tokyo, Japan**

**Continuation of Ser. No. 722,539, May 28, 1991, abandoned. This application Sep. 14, 1992, Ser. No. 944,736**

**Claims priority, application Japan, May 21, 1990, 2-131912**

**Int. Cl.[6] B65H *18/08;55/00***

**U.S. Cl. 242—178** **5 Claims**



1. A wound package of a tape type non-twisted and sized carbon fiber bundle which is composed of a plurality of carbon fiber filaments consolidated into a sheet by a sizing agent, comprising:

a plurality of layers of said carbon fiber bundle formed on a bobbin, each layer extending helically across a longitudinal circumference surface of the bobbin, each layer forming a u-shaped portion at each end of the bobbin without causing folding of said carbon fiber bundle, a width We of u-shaped portions of said fiber bundle which are wound at an end portion of said wound package and a width Wc of portions of said fiber bundle which are wound at an intermediate portion of said wound package are substantially equal to each other.

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**5,499,777**

**REEL DISC DRIVING DEVICE FOR A VIDEO CASSETTE RECORDER**

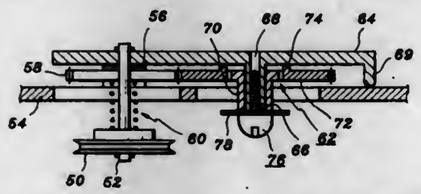
**Seong-Ick Ahn, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea**

**Filed Sep. 12, 1994, Ser. No. 304,059**

**Claims priority, application Rep. of Korea, Sep. 15, 1993, 1993-18537**

**Int. Cl.[6] G03B *1/04;19/04;* G11B *15/32***

**U.S. Cl. 242—356** **6 Claims**



1. A reel disc driving device; for use in a video cassette recorder having a supply reel disc and a take-up reel disc rotatably mounted to a deck of the recorder, said reel disc driving device including a pulley rotatably coupled to a shaft mounted to the deck, a driving gear rotatably coupled to the shaft of the deck, a clutch assembly interconnected between said pulley and said driving gear for transmitting the driving force of the pulley to the driving gear, an idle gear having a rotational axis and meshed with said driving gear and disposed between the supply reel disc and the take-up reel disc for a selective engagement with one of the reel discs, a support plate pivoted at the shaft of the deck for rotatably supporting said idle gear and positioned axially opposed to said idle gear, with a bottom surface of the support plate facing a top surface of the idle gear, and means for driving said pulley to transmit the driving force from the means for driving to said one of the reel discs through said idle gear, the improvement comprising:

a plurality of separate resilient members upwardly projected from the top surface of said idle gear and each formed of a cantilever configuration, each of said resilient members having a fixed end integrally formed with said idle gear and a free end apart from the top surface of said idle gear and in contact with the bottom surface of said support plate each resilient member resiliently bending between said ends due to said cantilever configuration; and

means secured to said support plate for adjusting the frictional force occurring between the support plate and the free ends of the resilient members through the resilient transformation of the resilient members.



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**5,499,778**

**SOUND-DAMPENED PAPER-WINDING MACHINE**

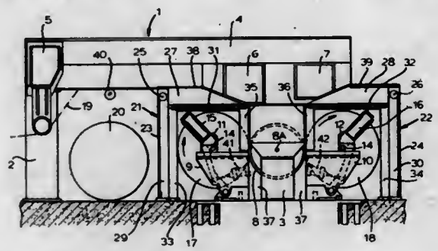
**Reinhard Hehner, Haan, and Georg Müller, Neuss, both of, Germany, assignors to Jagenberg Aktiengesellschaft, Dusseldorf, Germany**

**Filed Nov. 8, 1993, Ser. No. 148,849**

**Claims priority, application Germany, Nov. 7, 1992, 42 37 673.4**

**Int. Cl.[6] B65H *18/14***

**U.S. Cl. 242—541** **5 Claims**



1. A paper-winding machine comprising:

a frame having longitudinal members and overhead transversely extending members connected between the longitudinal members;

a main roller supported in the frame and extending along and rotatable about a horizontal transverse axis below and between the transverse members;

a pair of take-up devices below the transverse members, defining winding stations, longitudinally flanking the main roller, and each having a roll and means for rotating the roll and thereby pulling a strip of paper from a supply and over the main roller to wind up on the respective roll until the respective roll has a predetermined large diameter;

sound-absorbing shields supported on the frame above the stations;

a pair of overhead wind-up rollers mounted on the transverse members and longitudinally flanking the rolls; and

respective sound-absorbing curtains each formed of at least one flexible transparent synthetic-resin foil and each having an overall thickness of at least 4 mm on the wind-up rollers and movable from positions hanging down therefrom and absorbing sound generated at the stations and positions wound up on the respective wind-up rollers.

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**5,499,779**

**METHOD FOR DRUM WINDING A WEB AND A DRUM WINDER**

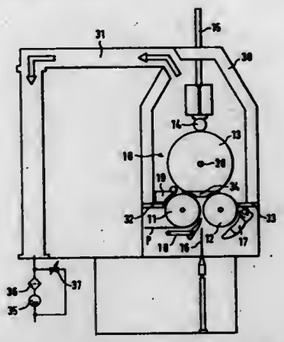
**Vesa Raudaskoski, Järvenpää , Finland, assignor to Valmet Paper Machinery Inc., Helsinki, Finland**

**Filed Jun. 16, 1994, Ser. No. 261,340**

**Claims priority, application Finland, Jun. 30, 1993, 933010**

**Int. Cl.[6] B65H *18/20***

**U.S. Cl. 242—541.4** **19 Claims**



1. Method for drum winding a web onto a roll supported on winding drums, wherein the web is wound over one of the winding drums onto the roll and a first pressure exists in a gap formed between the roll and winding drums, said first pressure being atmospheric pressure, comprising the step of:

subjecting at least a part of the area that surrounds the roll outside of the gap to a second pressure lower than the first pressure to produce a floating effect on the roll, said second pressure being a negative pressure.

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**5,499,780**

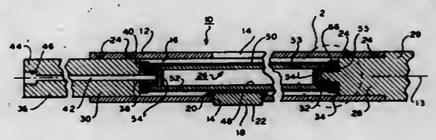
**ROLL BLADDER SUPPORT STRUCTURE**

**Robert P. Gensheimer, Sparta, N.J., assignor to Convertech, Denville, N.J.**

**Filed Sep. 2, 1994, Ser. No. 300,730**

**Int. Cl.[6] B65H *75/24***

**U.S. Cl. 242—571.1** **26 Claims**



1. A roll bladder support structure comprising:

a hollow core cylindrical sleeve extending along a longitudinal axis, said sleeve having opposing ends and a plurality of spaced openings therethrough in communication with the hollow core;

a plurality of lugs, each in a different opening extending radially through the sleeve into the core and arranged for radial displacement in the corresponding opening;

an expandable hollow core cylindrical bladder assembly secured in the sleeve core and having opposing ends, the assembly including an inner rigid tube and an outer flexible tube having a hollow core and being concentric with the inner tube for selectively engaging and radially outwardly displacing the lugs in response to a pressurized fluid applied to the hollow core of said outer tube, said assembly including first and second like coupling means at a respective different assembly end for coupling and securing together the inner and outer tubes in fluid sealing engagement at each end to form a removable integral assembly relative to the cylinder, each

coupling means having a circular cylindrical axially extending bore, the bores being coaxial; and

bladder assembly support means releasably secured to the sleeve in the hollow core of the sleeve comprising a pair of opposing cylindrical bladder assembly support male members each fluid sealingly received in a different bore extending axially toward one another for providing sole radial support for the assembly at said first and second coupling means and for axially securing the assembly in the sleeve core.

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**5,499,781**

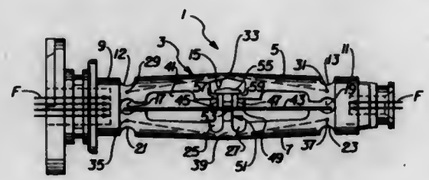
## FILM SPOOL WITH AXIALLY FLEXIBLE CORE TO ENGAGE AND RELEASE FILM END

**Stephen M. Reinke, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Jan. 14, 1994, Ser. No. 181,935**

**Int. Cl.[6] B65H** *19/28;75/28;* **G03B** *17/26*

**U.S. Cl. 242—584.1** **4 Claims**



1. A film spool comprising:

a spool core having first and second external core portions movable away from each other to further open a film receiving slot between them to facilitate insertion of a film end into said slot and removal of the film end from the slot;

film engagement means projecting from said first core portion into said slot for engaging the film end within the slot to secure the film end to said spool core;

film stripper means projecting from said second core portion into said slot for moving the film end out of engagement with said film engagement means when said first and second core portions are moved away from each other to further open the slot; and

respective spaced stops fixed to said first and second core portions to move into abutment with each other when at least one of the core portions is moved away from the other to further open said slot.

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**5,499,782**

## LIGHTNING SHIELD

**Christophe A. Domine, Bristol, United Kingdom, assignor to British Aerospace Public Limited Company, London, England**

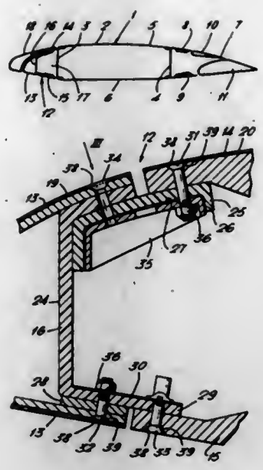
**Filed Jul. 23, 1993, Ser. No. 95,376**

**Claims priority, application United Kingdom, Jul. 24, 1992, 9215827**

**Int. Cl.[6] B64D** *45/02*

**U.S. Cl. 244—1 A** **6 Claims**

1. A lightning shield comprising a fiber reinforced plastics laminate having a series of laminae of fiber reinforcing material held together by plastics matrix material, wherein a layer of electrically conductive material is interposed between an outer lamina and its next adjacent lamina, said lightening shield defining at least one countersunk hole therethrough, the at least one hole being partly defined by a countersink which exposes an edge region of the layer of electrically conductive material for contact with a fastener sized to pass therethrough.



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**5,499,783**

## UNDERFRAME FOR A PASSENGER AIRCRAFT SEAT, THE UNDERFRAME INCLUDING AN ATTACHED ENERGY-ABSORPTION DEVICE

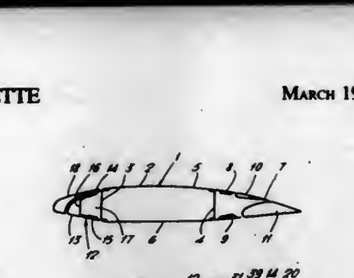
**Robert R. Marechal, Paris, France, assignor to Societe Industrielle et Commericale de Materiel Aeronautique, Issoudun, France**

**Filed May 3, 1994, Ser. No. 237,395**

**Claims priority, application France, May 14, 1993, 93 05865**

**Int. Cl.[6] B64D** *25/04*

**U.S. Cl. 244—122 R** **10 Claims**



1. An underframe for a passenger aircraft seat, the underframe including a front leg and a rear leg, and energy absorption means that are effective when a moving first element of the seat moves relative to a second element of the seat fixedly secured to the floor of the aircraft cabin, under the effect of the seat being subjected to deceleration above a predetermined value, the energy absorption means including an energy absorption device that undergoes irreversible plastic deformation, the device being located between said moving first element and said second element, said energy absorption device including a male part disposed within a female part, one of the female and male parts being attached on and directly connected to said moving first element, the other of said male and female parts being fixedly attached on and directly connected to said second element, whereby a deceleration greater than said predetermined value provokes a plastic deformation of one of said female part and said male part.



**5,499,784**

## FLIGHT REFUELLING SYSTEM

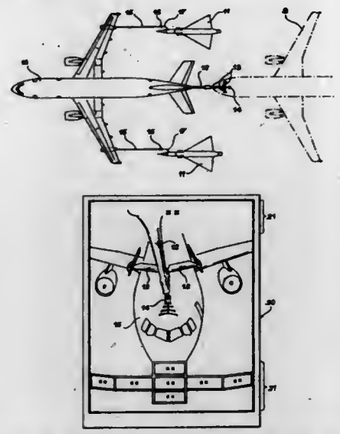
**Henri Crabere, L'Union; Gilbert Mitonneau, Toulouse, and Julien Maury, Balma, all of, France, assignors to Aerospatiale Societe Nationale Industrielle, Paris Cedex 16, France**

**Filed May 11, 1994, Ser. No. 241,018**

**Claims priority, application France, May 12, 1993, 93 05718**

**Int. Cl.[6] G09G** *05/00;* **B64D** *37/00;37/14*

**U.S. Cl. 244—135 A** **8 Claims**



1. System for the flight refueling of at least one first aircraft, equipped with an intermediate fuel intake means connected to at least one fuel tank, by a second aircraft, equipped with an intermediate fuel supply means including refueling means connected to at least one fuel supply tank and connectable to the intermediate fuel intake means so as to permit, with the aid of at least one fuel pump, the transfer of the fuel contained in the supply tank(s) of the second aircraft to the fuel tank(s) of said first aircraft, at least one camera being located below the fuselage of the second aircraft, at least one means for providing symbology information comprising a diagrammatic representation of the relative position of said supply means and fuel intake means and/or fuel data information including the location of fuel quantities for the first aircraft, at least one multimode display being installed in a working station within the second aircraft for displaying an image from the camera and for displaying an image of said symbology information either simultaneously or sequentially and at least one multifunction equipment comprising a screen and means for monitoring on said screen the refueling operation by day or night from said working station and a control keyboard for controlling several operations including the operation of said telescopic tube as well as for providing an operator with refueling information to monitor and assist in the refueling procedure throughout the refueling phase from the working station.

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**5,499,785**

## AUTOJETTISON METHOD AND APPARATUS FOR DUAL-POINT SUSPENSION SYSTEMS

**James P. Roberts, Claymont; James D. Culp, Newark, both of Del.; David G. Miller, Philadelphia, Pa., and Martin R. Sarsfield, Wilmington, Del., assignors to The Boeing Company, Seattle, Wash.**

**Filed Sep. 15, 1994, Ser. No. 306,745**

**Int. Cl.[6] B64D** *1/12*

**U.S. Cl. 244—137.4** **39 Claims**

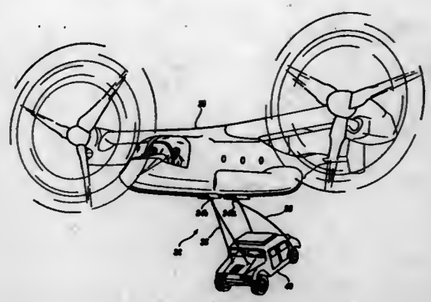
1. A method of automatically jettisoning cargo suspended from a dual-point suspension system when a failure of the suspension system occurs, the dual-point suspension system having two attachment points that each incorporate a load cell generating a signal proportional to a load that is placed on the attachment point, said method comprising the steps of:

(a) determining from the load cell signals the instantaneous load on each of the two attachment points at a given time;

(b) determining from the load cell signals an average value of the load on each of the two attachment points over a preselected period of time;

(c) comparing the average value of the load and the instantaneous value of the load on each of the two attachment points with a first threshold value; and

(d) jettisoning the cargo from the two attachment points if the instantaneous value of the load and the average value of the load at either of the attachment points are both less than the threshold value.



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**5,499,786**

## DEVICE FOR FACILITATING THE RE-POSITIONING OF MOVEABLE RAILS OR RAIL COMPONENTS

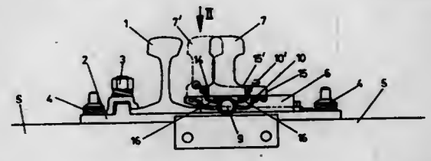
**Gerald Durchschlag, and Herbert Klein, both of Zeltweg, Austria, assignors to Voest-Alpine Eisenbahnsysteme Aktiengesellschaft, Vienna, Austria**

**Filed Oct. 14, 1993, Ser. No. 135,993**

**Claims priority, application Austria, Jan. 16, 1992, 2044/92**

**Int. Cl.[6] B61B** *7/00*

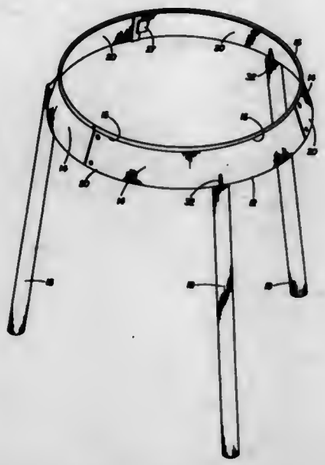
**U.S. Cl. 246—448** **8 Claims**



1. A device for facilitating the repositioning of a rail having a rail base and which is moveable between first and second positions, said device comprising:

roller means forced against an underside of the rail base by the action of spring means when said rail is located between said first and second positions, said roller means being articulated to pivot whereby when said rail base is in at least one of said first and second positions, the roller means is pressed by the force of the spring so as to move in a direction above the underside of the rail base by a distance which is at least one-third of the height of the rail base and engage an edge of the rail base.

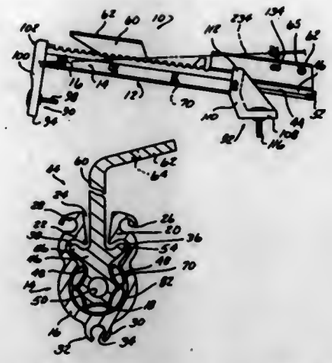
5,499,787
**COLLAPSIBLE HOLDER FOR THIN PLASTIC BAG UTILIZING NON-SLIP TIGHTENING MEANS**
Melvin E. Bonomo, 6483 SW. 107th Pl., Ocala, Fla. 34476-4811
Filed May 16, 1994, Ser. No. 243,159
Int. Cl.[6] A63B 55/04
U.S. Cl. 248—97 31 Claims



6. A bag holder for supporting an open-ended bag of flexible material in position for filling, said bag holder comprising at least three separate segments configured to be releasably joined together to form a ring member having an external, bag contacting surface sloping outwardly and downwardly, and means for supporting said ring member in a substantially horizontal attitude slightly above ground level, each of said separate segments constituting said ring member being essentially flat and of elongate, slightly curved construction, each segment having first and second ends, with each end equipped with joinder means able to be readily interfitted, and at a later time separated, with the first end of a first segment being joinable with the second end of a second segment, and the first end of the second segment being joinable with the second end of a third segment, with such joinder of first and second ends of said segments continuing until the completed ring member is defined, which completed ring member presents the external surface that slopes outwardly and downwardly, over which external surface the open end of the flexible bag can be extended, and tension-applying means surrounding said external surface of said ring member for holding the flexible bag tightly to said external surface of said ring member.

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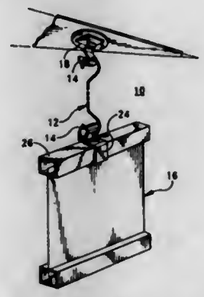
5,499,788
**MANUAL SEAT ADJUSTER**
Richard W. A. Rees, Auburn Hills, Mich., assignor to ITT Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 40,478, Mar. 31, 1993, Pat. No. 5,344,114. This application Dec. 23, 1993, Ser. No. 173,689
The portion of the term of this patent subsequent to Sep. 6, 2011, has been disclaimed.
Int. Cl.[6] F16M 13/00
U.S. Cl. 248—430 42 Claims



1. A seat adjuster for supporting a vehicle seat on a floor of a vehicle comprising:
first and second spaced track assemblies, each of the first and second track assemblies including:
a lower track;
an upper track having a seat support arm connected thereto;
means for anchoring a seat belt to said seat support arm;
means for slidably mounting the upper track to the lower track;
support means connected to the lower track for mounting the lower track to a floor of a vehicle; and
cooperating resisting means, formed in the upper and lower track, for resisting separation of the upper track from the lower track;
a generally U-shaped rod having two legs joined by a central bight portion;
an end of each leg of the U-shaped rod pivotally connected to one of the seat support arms on each upper track, with the two legs extended forwardly to the bight portion extending between the first and second track assemblies;
catch means formed in the seat support arm and the lower track of each of the first and second track assemblies; and
locking means operative in response to movement of the U-shaped rod for engaging the catch means upon pivoting of the U-shaped rod about the ends of the legs to a first position and disengaging the catch means upon pivoting the U-shaped rod to a second, opposite position for releasably locking the upper track against movement relative to the lower track.

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5,499,789
**ANTI ROTATION SIGN HANGING SYSTEM**
Sidney Rose, Marblehead, Mass., assignor to Rose Displays Ltd., Marblehead, Mass.
Filed Nov. 23, 1992, Ser. No. 980,328
Int. Cl.[6] A47G 1/16
U.S. Cl. 248—489 16 Claims

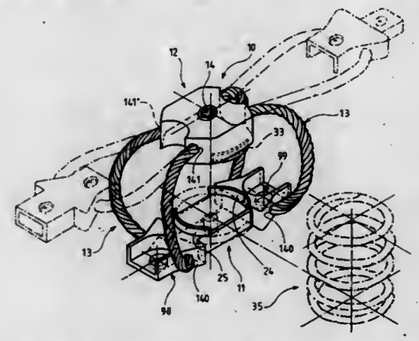


1. A system for supporting a display sign from a horizontal surface of a ceiling or window frame comprising,
an anchor having means for securing itself to said horizontal ceiling or window frame surface, said anchor also comprising a first clip arranged therewith;
an axially elongated rigid suspender rod having two ends with a hook disposed on each of said ends thereof;
a further clip which is attachable to a sign to be supported, said axially elongated rigid rod with said hook on one end being matable with said first clip on said anchor adapted to prevent rotative motion between said first clip and said axially elongated rigid rod, said hook on the other end of said rigid rod being attached to said further clip also adapted to prevent rotative motion between said further clip and said axially elongated rigid rod, said sign thereby being supported from a horizontal support surface without any rotation between the anchor and a sign supported therebeneath, the system thus comprising a rigid rod non-rotatively secured through curved hooks at each end thereof, to an anchor and to a display sign, respectively.



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5,499,790
**ANTIVIBRATION/ANTISHOCK DEVICE AND THE PROCESS FOR THE FABRICATION OF SUCH A DEVICE**
Jean-Yves Hay, Colombes, France, assignor to SOCITEC - Societe pour le Commerce International et les Echanges Techniques, Sartrouville, France
Filed Feb. 14, 1994, Ser. No. 195,228
Claims priority, application France, Feb. 22, 1993, 93 01995
Int. Cl.[6] F16M 13/00
U.S. Cl. 248—570 3 Claims

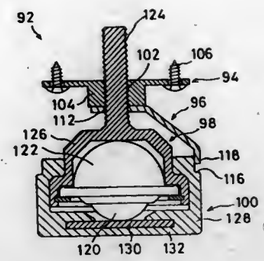


1. An antivibration/antishock device of the type comprising a carrier element and a carried element linked by cable, the carrier and carried elements each comprising at least two anchoring points for the cable, arranged in the neighborhood of the apices of a polygon with n apices, the cable being alternately anchored to a point of the carrier element and to a point of the carried element, and being oriented on the anchoring points of a first at least of said elements in a roughly transverse direction to the radial direction, wherein a modular element is used as the carrier or carried element, said modular element comprising individual anchoring modules, as well as assembly means of these modules.

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5,499,791
**MACHINE HAVING VIBRATION SOURCE**
Kenji Nakagawa; Koichi Yoshizaki; Tadashi Nukaga; Yoshikazu Banba; Shigetaka Hattori, and Kentaro Mochizuki, all of Shiga, Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan
Filed Aug. 26, 1993, Ser. No. 112,853
Claims priority, application Japan, Aug. 31, 1992, 4-230826
Int. Cl.[6] F16M 13/00
U.S. Cl. 248—638 14 Claims

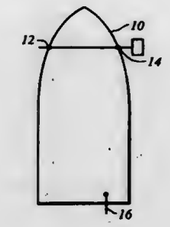
1. The combination comprising:
a machine with a vibration source,
said machine having a frame carrying said vibration source; and
a plurality of mounts for supporting said frame, each of said mounts including



a sphere of rigid material,
a housing for coupling said sphere to the bottom of said frame with free rotation of said sphere, said housing having an opening and said sphere being housed rotation free within said housing with a portion of said sphere projecting from said opening,
a plate of rigid material disposed below said sphere, said projecting portion of the sphere contacting said plate, said sphere in response to a horizontal motion component of said frame moving on said plate in a horizontal direction while in contact with said plate, and
a control member of an elastic material for controlling movement of said sphere by a predetermined amount relative to said plate.

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5,499,792
**ELECTRIC TROLLING MOTOR MOUNT**
Thomas F. Tamiso, 48 Broadbrook Rd., East Windsor, Conn. 06088
Filed Dec. 13, 1994, Ser. No. 354,531
Int. Cl.[6] F16M 1/00
U.S. Cl. 248—643 26 Claims

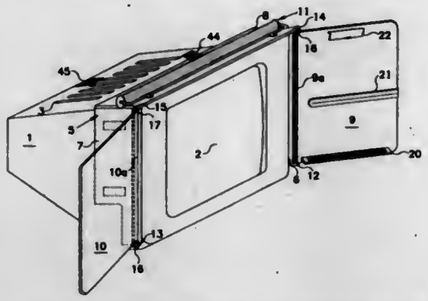


1. A motor mount comprising:
structural support means having opposed first and second ends;
first bracket assembly means attached to said structural support means near said first end thereof, said first bracket assembly means for removable attachment to a first gunwale of a boat;
second bracket assembly means attached to said structural support means near said second end thereof, said second bracket assembly means for removable attachment to a second gunwale of a boat; and

said structural support means having a mounting surface extending outwardly of said first or second bracket assembly means to support an outboard motor adjacent a first or second gunwale of a boat.

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**5,499,793**
**COPY HOLDING DEVICE**
**Charles A. Salansky, 194 Voorhees Ave., Buffalo, N.Y. 14214**
**Filed Oct. 6, 1994, Ser. No. 318,967**
**Int. Cl.[6] A47F *7/14***
**U.S. Cl. 248—442.2** **19 Claims**

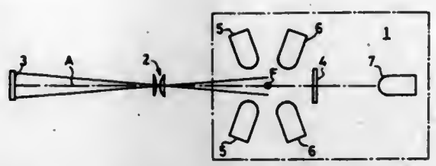


1. A copy holder for attachment to a video monitor, comprising an attachment frame having a generally horizontally arranged elongate upper member and opposing first and second elongate end members extending about perpendicularly downwardly from opposite ends of said upper member; said upper member being arranged for mounting along an upper surface of said monitor and comprising means for pivotally engaging mating means at an upper end of a panel, at about said opposite ends; said opposing end members being arranged for mounting along opposite side surfaces of said monitor and comprising, at about a lower end thereof, means pivotally engaging mating means at a lower end of said panel; first and second panels, comprising respectively at upper and lower ends, mating means engaging said means for pivotally engaging an end of said upper member and an end of an opposing end member in an arrangement wherein said panels have a pivoting end and an opening end in respective opposing relationship to each other; said pivoting end of said first panel being arranged adjacent said first end member and said pivoting end of said second panel being arranged adjacent said second end member; said arrangement of said first and second panels in respect to said end members being such that the opening ends of said first and second panels are pivotal toward and away from each other in a manner such that said panels cover a screen of said monitor when pivoted to a closed position.

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**5,499,794**
**PROCESS AND DEVICE FOR DETECTING FOREIGN SUBSTANCES IN A TEXTILE TEST MATERIAL USING AN ALTERNATING LIGHT AND DARK BACKGROUND**
**Kurt Aeppli, Uster, Switzerland, assignor to Zellweger Luwa AG, Switzerland**
**Filed Aug. 30, 1994, Ser. No. 297,843**
**Claims priority, application Switzerland, Sep. 9, 1993, 02705/93**
**Int. Cl.[6] G01N *21/88***
**U.S. Cl. 250—559.45** **17 Claims**

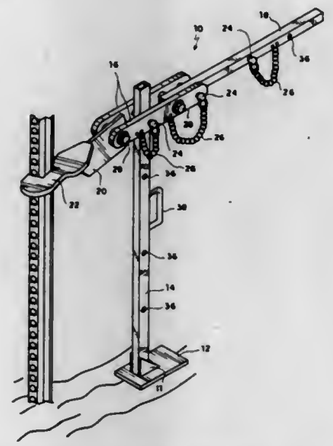
1. A process for detecting in a moving yarn foreign material lighter or darker than the yarn, comprising moving the yarn along a path in front of a background that is dark and light at alternate times, illuminating the portion of the yarn passing in front of the background, and focussing an image of the yarn passing in front of



the background onto a sensor so that a change in reflected light due to the passage of foreign material may be detected.

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**5,499,795**
**POST REMOVER**
**Mitchell L. Mathews, HC1 Box 228, Benson, Ariz. 85602**
**Filed Jan. 20, 1995, Ser. No. 375,715**
**Int. Cl.[6] E21B *19/00***
**U.S. Cl. 254—30** **9 Claims**



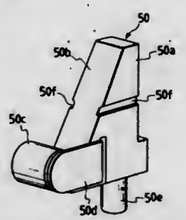
1. A device for removing a post, comprising;
a base plate formed from a generally planar element in engagement with the ground;
a vertical support element having a top and a bottom end;
said bottom end of said vertical support member being permanently attached to said base plate;
an elongated handle structure having a first and a second end;
an engagement plate having symmetrical right and left side members wherein each member has a front and a rear end;
said first end of said elongated handle structure being securably attached to said rear end of said right and left side members of said engagement plate; and
a brace plate having a front and rear end wherein said brace plate forms a generally rectangular configuration having blunted corner portions;
said front end of said right and left side of said engagement plate being pivotably attached to said rear end of said brace plate;
said engagement plate being medially attached to said vertical support element in a pivotable fashion;
there further being a head portion of planar dimensions having a top face and a bottom face and a front end and a rear end;
said head portion having a rectangular notch removed medially from said head portion and extending across a substantial width of said head portion;
said bottom face of said rear end of said head portion being securably mounted to said front end of said brace plate at a substantially a ninety degree angle thereto;



said head portion being angled away from said brace plate beginning at said notch section and returning to a parallel plane at said front end of said head portion.

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**5,499,796**
**APPARATUS FOR EXCHANGING SEAL OF SHOCK ABSORBING APPARATUS**
**Kazuya Kigawa, Yokohama; Kenji Furukawa, Kasugai; Tetsu Deguchi, Nagareyama; Sachiharu Inoue, Sakura; Norikatsu Endo, Ikeda; Tatsuo Yanagisawa, Toyonaka; Shinji Ikegami, Abiko; Yasuyuki Omagari, Yokohama; Koji Kihara, Yokohama; Tachiki Sugawara, Tokyo, and Kenzo Shimizu, Chitose, all of, Japan, assignors to All Nippon Airways Co., Ltd., Tokyo, Japan**
**Division of Ser. No. 166,835, Dec. 15, 1993, Pat. No. 5,419,034, which is a division of Ser. No. 948,321, Sep. 22, 1992, Pat. No. 5,323,522. This application Mar. 21, 1995, Ser. No. 407,658**
**Claims priority, application Japan, Sep. 27, 1991, 3-078342 U; Sep. 27, 1991, 3-248817**
**Int. Cl.[6] B66F *3/00***
**U.S. Cl. 254—133 R** **8 Claims**

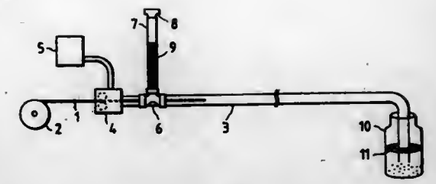


5. An apparatus for exchanging an O-ring type seal of a shock absorbing apparatus having a slant surface which faces downward and an attaching hole formed on a surface transverse to said slant surface, comprising:
a main body having a slant surface;
a cylindrical member provided near a lower end of said slant surface of said main body and axially extending in parallel thereto; and
a coupling member coupling said main body and one end of said cylindrical member,
wherein an outer diameter of said cylindrical member is substantially equal to an inner diameter of the attaching hole of the shock absorbing apparatus, and an inclination of said slant surface of said main body is substantially complementary to an inclination of the slant surface of the shock absorbing apparatus, such that when said cylindrical member is inserted into the attaching hole and said slant surface of said main body is in substantially complementary contact with the slant surface of the shock absorbing apparatus, the shock absorbing apparatus can be elevated while held by said main body by lifting up said main body.

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**5,499,797**
**METHOD FOR INSERTING A COMMUNICATION WIRE THROUGH A PIPELINE BY AIR FLOW**
**Hiroaki Sano; Kinji Taguchi; Akiyoshi Noguchi, and Shigeru Tanaka, all of Kanagawa, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan**
**Filed Apr. 8, 1994, Ser. No. 225,321**
**Claims priority, application Japan, Apr. 10, 1993, 5-107412; Dec. 15, 1993, 5-343568**
**Int. Cl.[6] B65H *59/00***
**U.S. Cl. 254—134.4** **14 Claims**

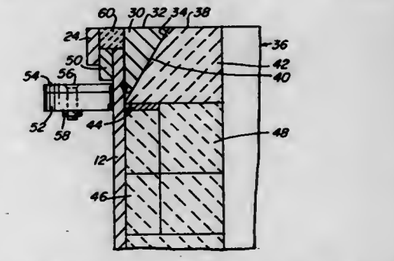
1. A method for inserting a communication wire through a pipeline, comprising the steps of:



inserting the communication wire into said pipeline, propelling the wire through said pipeline by air flow, and sending conductive minute solids into said air flow.

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**5,499,798**
**REFRACTORY RETAINING APPARATUS**
**Jay W. Witter, and Michael Slezak, both of Pittsburgh, Pa., assignors to USX Corporation, Pittsburgh, Pa.**
**Filed Feb. 22, 1994, Ser. No. 199,660**
**Int. Cl.[6] C21C *5/46***
**U.S. Cl. 266—275** **3 Claims**

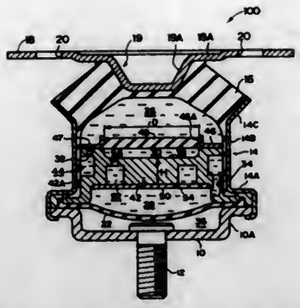


1. In a metallurgical vessel having an essentially cylindrical metal shell with an opening at one end thereof, means for retaining refractory in said cylindrical metal shell, the improvement in which said refractory retaining means comprises:
a metal ring of wedge-shape cross section extending longitudinally along an inner periphery of the cylindrical metal shell adjacent to the opening at one end thereof, said metal ring having a first planar surface extending radially inwardly from the inner periphery of the cylindrical metal shell in a plane substantially parallel to the plane of the opening at one end thereof,
said metal ring having a second planar surface extending angularly at an acute angle from an inner edge of the first planar surface toward the inner periphery of the cylindrical metal shell at a position displaced and remote from the opening at one end thereof, and refractory material having a planar surface extending at an angle complementary to the angle of the second planar surface of said metal ring so as to become abutted thereagainst, thus retaining the refractory material in said cylindrical metal shell.

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**5,499,799**
**VIBRATION ISOLATING APPARATUS**
**Hiroshi Kojima, Yokohama, Japan, assignor to Bridgestone Corporation, Japan**
**Filed Jun. 2, 1995, Ser. No. 458,769**
**Claims priority, application Japan, Jun. 20, 1994, 6-136967**
**Int. Cl.[6] F16F *9/00***
**U.S. Cl. 267—140.13** **24 Claims**

1. A vibration isolating apparatus comprising:
a first mounting member connected to one of a vibration-generating portion and a vibration-receiving portion;



a second mounting member connected to another of the vibration-generating portion and the vibration-receiving portion;

an elastic body mounted in such a manner as to be interposed between said first mounting member and said second mounting member;

a main liquid chamber of which at least a portion of an inner wall is formed of said elastic body and which is filled with a liquid;

a first sub-liquid chamber separated from said main liquid chamber by a partition wall member interposed between said main liquid chamber and said first sub-liquid chamber, at least a portion of an inner wall of said first sub-liquid chamber being provided to be deformable;

a first orifice formed in said partition wall member and provided for communication between said main liquid chamber and said first sub-liquid chamber;

a second sub-liquid chamber formed in said partition wall member so as to face said main liquid chamber;

an elastic membranous body formed into the shape of a membrane and provided to separate said main liquid chamber and said second sub-liquid chamber from each other; and

a second orifice provided for communication between said first sub-liquid chamber and said second sub-liquid chamber and provided such that a transit resistance of a liquid in said second orifice is smaller than that in said first orifice.

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**5,499,801**

**TOOL HOLDING AN ELONGATE PROFILE MATERIAL TO BE SLICED**

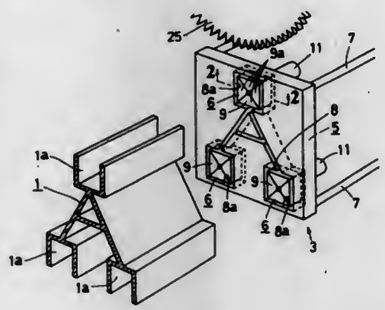
**Yasushi Nakazawa; Kiyotaka Touma, and Masatoshi Enomoto, all of Tochigi, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, and Showa Aluminum Corporation, Osaka, both of, Japan**

**Filed Aug. 2, 1994, Ser. No. 284,788**

**Claims priority, application Japan, Aug. 4, 1993, 5-193636**

**Int. Cl.[6] B23Q *3/14***

**U.S. Cl. 269—48.1** **4 Claims**



1. A tool for holding a longitudinal end of an elongate profile material, said profile material having a body and at least one hollow or semi-hollow portion positioned longitudinally along said body, the tool comprising:

an end holder having a main recess and at least one cavity integral therewith;

the main recess and the at least one cavity being designed to fit on and hold the end of said body and a hollow or semi-hollow portion, respectively, of the profile material for severance of a projecting portion thereof;

a chucking device having at least one chucking segment insertable into the hollow or semi-hollow portion received in the cavity;

means for normally biasing said at least one chucking segment to a release condition with respect to said received portion of said profile material in said cavity, and

means for activating said at least one chucking segment against said biasing means for engaging said received portion of said profile material and temporarily chucking said profile material with respect to said recess.

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**5,499,800**

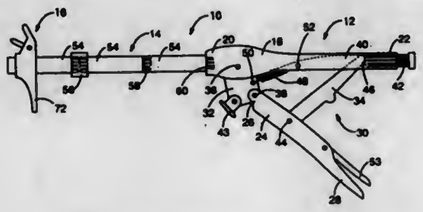
**ADJUSTABLE TOGGLE ACTION QUICK RELEASE LOCKING BAR CLAMP**

**Stephen D. Albin, 610 Rancho, Los Altos, Calif. 94024**

**Filed Aug. 12, 1994, Ser. No. 289,931**

**Int. Cl.[6] B25B *1/24***

**U.S. Cl. 269—6** **24 Claims**



1. A locking bar clamp comprising:

a) a locking pliers mechanism including a fixed handle having a longitudinal axis, a movable handle, and a toggling linkage mechanism coupled between the fixed and moveable handles for toggling the locking pliers from a first open position to a second clamped position;

b) an elongated extension bar having a longitudinal axis and including first and second ends, the first end being connected to and extending from the fixed handle of the locking pliers such that the longitudinal axis of the extension bar is substantially parallel with the longitudinal axis of the fixed handle of the locking pliers;

c) an adjustable outer clamping jaw slidably connected to the extension bar for longitudinal movement along the extension bar, the outer clamping jaw including a disengagable locking mechanism for disengagably locking the outer clamping jaw to the extension bar; and

d) an inner clamping jaw connected to the toggling mechanism such that when the locking pliers are toggled into the clamped position the inner clamping jaw is caused to move in a direction generally aligned with the longitudinal axis of the fixed handle of the locking pliers and the longitudinal axis of the extension bar toward the adjustable outer clamping jaw.



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**5,499,802**

**WORKPIECE-HOLDING SYSTEM**

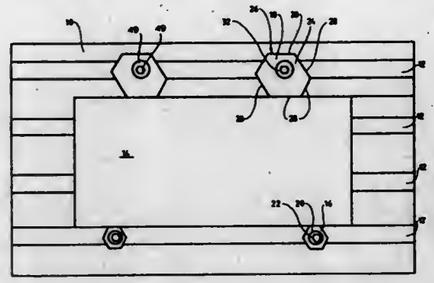
**Rainer Häberle, Laichingen, Germany, assignor to Gerhard Haberle, Laichingen, Germany**

**Filed Feb. 18, 1994, Ser. No. 198,451**

**Claims priority, application Germany, Feb. 20, 1993, 43 05 260.6**

**Int. Cl.[6] B25B *1/08***

**U.S. Cl. 264—99** **18 Claims**



1. A system for holding a workpiece, the system comprising:

a support table having a support surface and formed with an array of anchor seats opening at the support surface;

at least one clamp securable in a one of the seats and having a clamp body displaceable parallel to the support surface;

a stop body normally lying on the surface, having a centering formation formed as a collar projecting from a face of the stop body, engaged in the respective seat, defining an axis generally perpendicular to the support surface, and having a polygonal periphery defined by a plurality of flat sides generally perpendicular to the surface and lying at different spacings from the axis; and

means including an anchor bolt centered on the axis, extending through the stop body, and seated in a one of the seats for securing the stop body to the surface with one of its sides bearing against the workpiece and the stop-body axis fixed relative to the respective seat.

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**5,499,803**

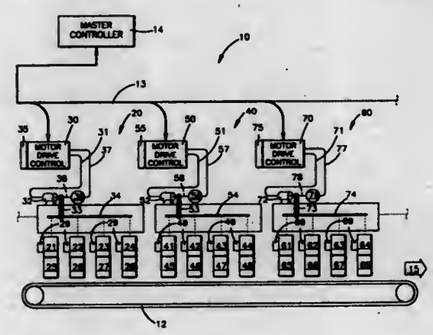
**COLLATOR WITHOUT A MAIN LINE DRIVE SHAFT**

**Alan S. Farr, Huber Heights, Ohio, assignor to AM International, Inc., Mt. Prospect, Ill.**

**Filed Nov. 23, 1994, Ser. No. 344,499**

**Int. Cl.[6] B65H *39/02;3/44***

**U.S. Cl. 270—54** **26 Claims**




1. A collator comprising:

a collating conveyor;

a plurality of hopper sections located along said collating conveyor, each hopper section including (i) at least one signature pile support for holding signatures to be fed to said collating conveyor and (ii) signature feed means for feeding a signature from said at least one signature pile support to said collating conveyor;

each hopper section including its own respective drive motor for driving the associated signature feed means; and

each drive motor including its own respective control means for controlling the associated drive motor to control the feeding of signatures from the associated signature feed means to said collating conveyor.

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**5,499,804**

**PAPER CONVEYING DEVICE AND PAPER CONVEYING METHOD**

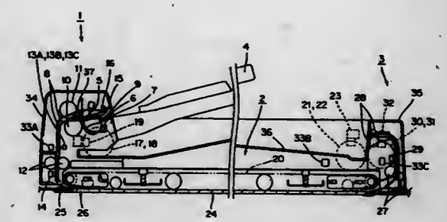
**Hiroyuki Harada, and Yasuhiko Kida, both of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan**

**Filed Jun. 15, 1993, Ser. No. 77,010**

**Claims priority, application Japan, Jun. 15, 1992, 4-155363; Jun. 15, 1992, 4-155364; Jun. 15, 1992, 4-155365**

**Int. Cl.[6] B65H *5/22***

**U.S. Cl. 271—3.02** **14 Claims**



1. A paper conveying device comprising:

paper conveying means moved in a first direction to convey paper in the first direction and moved in a second direction to convey the paper in the second direction;

pulse outputting means for outputting pulses in sychronism with the movement of the paper conveying means;

driving signal outputting means for applying a driving signal to the paper conveying means to move the paper conveying means in the first direction and stopping the application of the driving signal at timing when the paper conveyed in the first direction by the paper conveying means is conveyed to a predetermined position;

counting means for counting a number of pulses outputted from the pulse outputting means after the application of the driving signal from the driving signal outputting means is stopped so as to detect a distance at which the paper conveying means is moved by its inertia even after the application of the driving signal is stopped; and

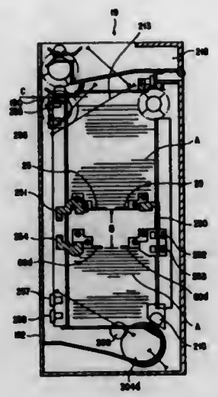
position controlling means for moving the paper conveying means in the second direction by a distance corresponding to the number of pulses counted, said position controlling means including means for moving the paper conveying means in the second direction at a speed proportional to said number of pulses counted and means for varying said number of pulses counted by a number of pulses outputted from the pulse outputting means as the paper conveying means is moved in the second direction, said position controlling means controlling a speed at which the paper conveying means is moved so that the speed is not more than a predetermined speed in the vicinity of a target position where the movement in the second direction is terminated.

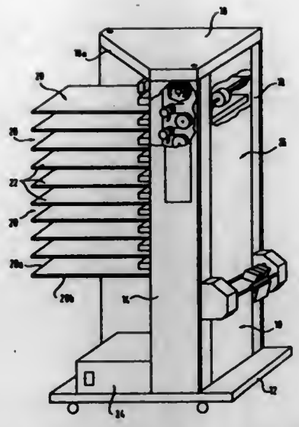
**5,499,805**

## PAPER SHEET STORING APPARATUS

**Hideyuki Anma, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Jun. 27, 1994, Ser. No. 266,374**
**Claims priority, application Japan, Jun. 28, 1993, 5-156452**
**Int. Cl.[6] B65H** *5/22*
**U.S. Cl. 271—3.05** **7 Claims**





1. A paper sheet storing apparatus comprising:

a main body including a stacking section for storing paper sheets in a stack in a predetermined direction, the main body having a paper sheet inlet port arranged at a first end portion of the main body, and a paper sheet outlet port arranged at a second end portion of the main body;

conveying means provided at the main body, for taking paper sheets into the stacking section through the inlet port;

receiving means arranged in the stacking section to be movable in the predetermined direction, for receiving and supporting the paper sheets taken into the stacking section through the inlet port, in a stack;

drive means for moving the receiving means toward the second end portion as the paper sheets are stacked, and for transferring the paper sheets on the receiving means to the second end portion after stacking;

take-out means for taking out the paper sheets stacked in the second end portion through the outlet port;

pressing means arranged in the stacking section to be movable in the predetermined direction, for pressing the paper sheets stacked in the second end portion against the take-out means;

detecting means for detecting an approach state when the receiving means and the pressing means approach each other by a predetermined distance; and

determining means for determining that the stacking section is in a full state with the paper sheets when the detecting means detects the approach state.

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**5,499,806**

## COLLATING MACHINE

**Christian-P. Bourg, Rue de Blanmont 5, 1435 Hevillers, Belgium**

**Filed Mar. 29, 1994, Ser. No. 220,533**
**Claims priority, application France, Apr. 7, 1993, 93 04122**
**Int. Cl.[6] B65H** *3/44;5/26*
**U.S. Cl. 271—9.11** **7 Claims**

1. A collating machine comprising a frame, a plurality of superposed trays in said frame to be loaded with stacks of horizontally aligned sheet of paper, each tray comprising a vertically movable bottom plate and being associated with a device for the ejection of individual sheets and with a transfer device, and a conveyer adjacent to said transfer devices to receive sheets ejected by one of said ejection devices and transferred by the associated transfer device to move each sheet downwardly along said conveyer in an at least substantially vertical direction, wherein each of said ejection devices comprises at least one endless perforated tape, a pair of spaced rolls, and a vacuum chamber surrounded by said tape and having a lower wall wherein apertures for the passage of air are distributed, said lower wall being adjacent to an internal surface portion of a lower run of said tape, said lower tape run having an outer surface portion positioned opposite to a top sheet in a stack of paper in parallelism to said top sheet and at a distance which is maintained essentially constant by said vertically movable bottom plate, said transfer device including a driving roll and at least one nip roll, a nip defined between said driving roll and said nip roll being essentially positioned in a plane defined by said lower run of the perforated tape, said driving roll having a periphery adjacent to a conveyor belt of said conveyor, said conveyor belt having a surface opposite to said driving roll and rested on a support roll, and a deflecting element being associated with the periphery of said driving roll downstream of said nip roll and upstream from said conveyor belt to direct the leading edge of a sheet moved forward by said driving roll, downwardly into a nip defined between the periphery of said driving roll and said conveyor belt.

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**5,499,807**

## PAPER FEEDING APPARATUS HAVING A PAPER SEPARATOR WITH A PRESSURE SENSITIVE AND ELECTRICALLY-CONDUCTIVE MATERIAL

**Hajime Nakamura, and Jun Sakakibara, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Mar. 18, 1994, Ser. No. 210,276**
**Claims priority, application Japan, Apr. 16, 1993, 5-112400**
**Int. Cl.[6] B65H** *3/52*
**U.S. Cl. 271—121** **17 Claims**

1. A paper sheet feeding apparatus comprising:

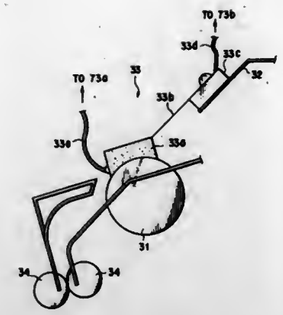
a table for placing a plurality of paper sheets;

pickup means for picking up the paper sheets placed on said table;

roller means for feeding the paper sheets picked up by said pickup means;

separation means, which contacts with said roller means, for separating the paper sheets fed by said roller means, said separation means including a pressure sensitive conductive member, said pressure sensitive conductive member being formed of a pressure-sensitive and electrically-conductive material that has an electrical resistance value which changes in accordance with a pressure condition indicating how the pressure sensitive conductive member is pressed by the paper sheets; and





means for detecting a condition of the paper sheets fed by said roller means, in accordance with the electrical resistance value of said pressure sensitive conductive member.

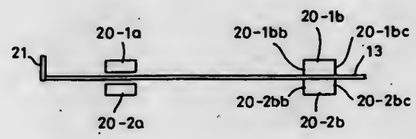
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**5,499,808**

## SHEET FEEDING APPARATUS

**Yoshifumi Nishimoto, and Kenichi Kataoka, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 19,694, Feb. 19, 1993, abandoned, which is a division of Ser. No. 811,911, Dec. 23, 1991, Pat. No. 5,244,202, which is a continuation of Ser. No. 541,399, Jun. 21, 1990, abandoned. This application Nov. 7, 1994, Ser. No. 337,194**
**Claims priority, application Japan, Jun. 22, 1989, 1-160107**
**Int. Cl.[6] B65H** *5/00*
**U.S. Cl. 271—267** **19 Claims**



1. An apparatus for feeding a sheet, comprising:

(a) an annular elastic vibration member having an upper surface, a bottom surface, an inner circumferential portion, and an outer circumferential portion, the upper surface of said vibration member having a first portion in press contact with a sheet being fed and a second portion substantially out of contact with the sheet while the sheet is being fed; and

(b) an electromechanical energy conversion element, provided on the bottom surface of said vibration member for generating a travelling vibration wave at least in the first portion of said vibration member in response to an applied electrical signal, said vibration wave creating a driving force for producing relative linear movement between said vibration member and a sheet in contact with the upper surface of said vibration member.

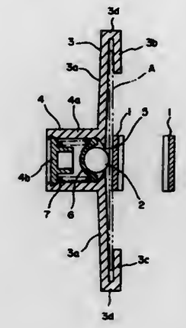
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**5,499,809**

## BANK NOTE CONVEYING APPARATUS

**Takatoshi Takemoto; Toshikazu Chida, both of Tokyo; Noriaki Kano, Hanamaki; Eiji Ito, Hanamaki; Koji Murakami, Hanamaki; Takashi Itagaki, Hanamaki; Koji Sekimoto, Sendai, and Masanori Suzuki, Hanamaki, all of, Japan, assignors to Kabushiki Kaisha Ace Denken, Japan**

**Filed May 26, 1994, Ser. No. 250,755**
**Int. Cl.[6] B65H** *5/02*
**U.S. Cl. 271—274** **8 Claims**



1. A bank note conveying apparatus for conveying a bank note, said apparatus comprising:

an endless conveying belt provided to come into contact with one of two faces of said bank note;

a belt driving mechanism which rotates said endless conveying belt;

a ball provided to come into contact with the opposite face of said two faces of the bank note;

a holder which rotatably supports said ball;

said holder including a casing to house said ball therein while allowing the same to be movable to-and-fro relative to said endless conveying belt, and a coil spring provided within the casing in a compressed condition to urge the ball against the endless belt;

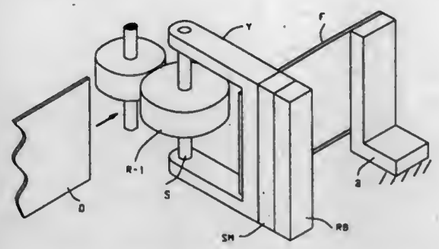
a bank note path forming member which controls the position and the direction of said bank note;

said bank note conveying path forming member including a first bank note thickness-direction-position guide section which extends to oppose one of the two faces of said bank note to control the thickness direction position of the bank note, a second bank note thickness-direction-position guide section which extends to oppose the other face of the two faces of said bank note to control the thickness direction position of the bank note, and a bank note widthwise-position guide section which controls the widthwise position of the bank note;

said first bank note thickness-direction-position guide section facing said one of the two faces of said bank note and being formed with an opening to allow said bank note conveying belt to come into contact with said one face of the bank note; and

said second bank note thickness-direction-position guide section facing said other face of the two faces of the bank note and being formed with an opening having a smaller diameter than that of the ball so that the ball will partly but not completely project out towards the bank note conveying belt through the second bank note thickness-direction-position guide section.

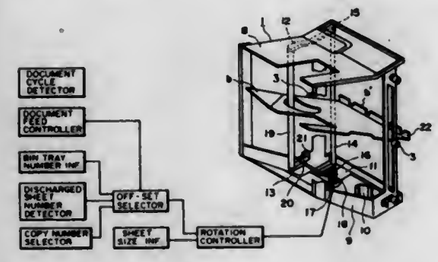
5,499,810
**PINCH-ROLL WITH FLOATING DAMPER**
Michael N. Tranquilla, Livonia, Mich., assignor to Unisys Corporation, Blue Bell, Pa.
Continuation of Ser. No. 167,384, Dec. 14, 1993, abandoned.
This application Aug. 18, 1995, Ser. No. 516,727
Int. Cl.[6] B65H 5/06
U.S. Cl. 271—274 15 Claims



1. A document transport array including pinch roll means, this array arranged to allow for a varied inter-document gap, and for varied-thickness documents, said pinch roll means including a moveable roll mounted on a block means which is mounted only on mount-spring means, to allow said moveable roll to be resiliently thrust away from the document path, said block means also including resilient block absorber means suspended therefrom and adapted to absorb energy and minimize motion developed normal to said path, thus enabling said moveable roll to better maintain contact with a transported document, while yet avoiding need for high pinch force means and for excess flexible material on the pinch rolls themselves.

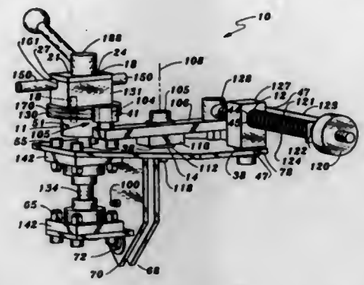
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5,499,811
**SHEET POST-PROCESSING APPARATUS**
Kenichi Hayashi, Tokyo; Kimiaki Hayakawa, and Yoshifumi Takehara, both of Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 977,660, Nov. 17, 1992, abandoned.
This application Sep. 26, 1994, Ser. No. 311,897
Claims priority, application Japan, Nov. 18, 1991, 3-301874
Int. Cl.[6] B65H 39/10
U.S. Cl. 271—293 38 Claims




1. A sorter comprising:
bin trays, for sequentially receiving sheets;
aligning means for aligning sheets on said bin trays; and
control means for controlling said aligning means to provide offset between sets of sheets previously received by said bin trays and sets of sheets of an equal size to each other currently being received by said bin trays, for each bin tray that receives a set of sheets currently being received after receiving a set of sheets previously received.

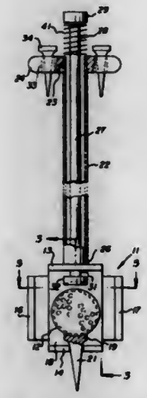
5,499,812
**CAM ARM APPARATUS FOR TRAINING AND MONITORING DEVICES**
Robert L. Staka, 136 Las Colinas Dr., and Steven P. Bokariza, 220 Howell La., both of Watsonville, Calif. 95076
Filed Jun. 22, 1994, Ser. No. 263,821
Int. Cl.[6] A63B 69/40
U.S. Cl. 273—26 E 4 Claims



1. A cam arm apparatus for exercise training and monitoring devices, comprising:
a base plate secured to a pair of angle plates;
means for controlling the position and movement of an arm element comprising a cam operably secured to said base plate; said cam being secured to a cam follower arm pivotally linked to a shaft element operably secured to adjustment means; and
a spindle shaft operably linked to said cam and mounted on said pair of angle plates, whereby said arm element is operably secured to said cam so that the arm element is returned to an initial starting point regardless of the angular positioning of said base plate or the amount of movement of the arm element, thereby allowing the return of the arm element against gravity to said initial starting point even if the base plate is angularly positioned.

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5,499,813
**GOLF BALL TEEING DEVICE**
Joseph Black, 68 Bathurst St., Toronto, Ontario, Canada
Filed Mar. 20, 1995, Ser. No. 406,489
Int. Cl.[6] A63B 57/00
U.S. Cl. 273—32.5 10 Claims



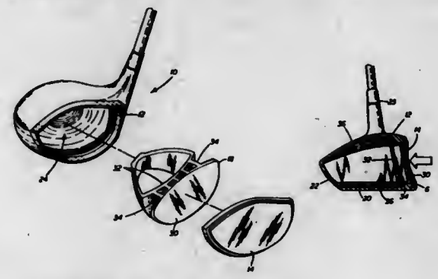
1. A golf ball teeing device comprising a forwardly open receiver for receiving a golf ball, said receiver having a back panel, a top panel, a bottom panel, and two side panels, said side panels



diverging in forward direction at a given angle A, the bottom panel having a slot rearwardly extending from a forward edge of said bottom panel wherein the slot is tapered inward at a given angle B for receiving a stem of a tee with the head of the tee disposed in said receiver, wherein the angle B is smaller than the angle A; a tubular shaft extending upward from said top panel, a push rod slidably disposed in said shaft, said push rod having a bottom end extending through said top panel for clamping a golf ball against the head of the tee and a top end extending above an upper end of said shaft for receiving a clamping force applied to the top end of said shaft.

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5,499,814
**HOLLOW CLUB HEAD WITH DEFLECTING INSERT FACE PLATE**
Clive S. Lu, 282 Newbridge Rd., Hicksville, N.Y. 11801
Filed Sep. 8, 1994, Ser. No. 303,249
Int. Cl.[6] A63B 53/04
U.S. Cl. 273—78 41 Claims

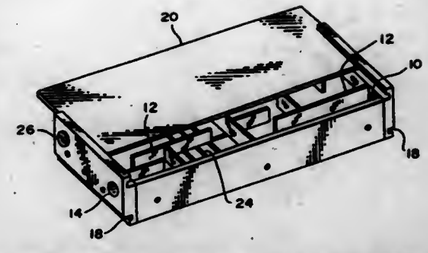


1. A head for a golf club, comprising:
a body shell;
a face plate beld on said body shell for striking a golf ball, said face plate being deflectable from a static position to a striking position as a result of stress produced when striking a golf ball;
an element mounted on said body shell defining a means for reinforcing said face plate by means of physical engagement with said face plate when said face plate is in said striking position; and
means for maintaining a gap between said reinforcing element and said face plate when said face plate is in said static position whereby a cushioning effect is provided immediately upon striking the golf ball.

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5,499,815
**MAZE**
Samuel D. Attaya, 41 W. Torch Pine, The Woodlands, Tex. 77381
Continuation-in-part of Ser. No. 250,905, Jun. 22, 1994, Pat. No. 5,409,223. This application Apr. 13, 1995, Ser. No. 421,829
Int. Cl.[6] A63F 7/04
U.S. Cl. 273—109 19 Claims

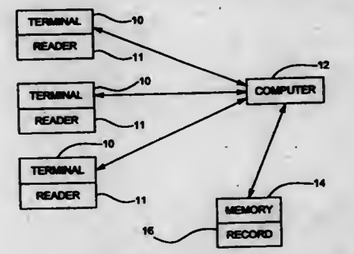
7. A method for using a maze unit, the maze unit comprising a box having a bottom, the bottom having a top surface and a first end spaced apart from a second end and a first side spaced apart from a second side, a first end wall extending upwardly from the first end of the bottom, a second end wall extending upwardly from the second end of the bottom, a first side wall extending upwardly from the first side of the bottom and a second side wall extending upwardly from the second side of the bottom, a plurality of slots in the top surface of the bottom, the slots suitable for receiving and releasably holding maze dividers, a plurality of maze dividers removably disposed in the slots and forming a maze path for a ball



to follow from the entry point to the exit point, the plurality of maze dividers removable from the slots and re-positionable therein to form a different maze path, the slots including a first series of slots spaced apart from each other and a second series of slots spaced apart from each other, the first series of slots parallel to each other, and the second series of slots parallel to each other and at an angle to the slots of the first series of slots, a ball movable through the maze unit, the maze dividers defining a maze path through the maze for the ball, the method comprising
a first person who knows the maze path instructs a second person who does not know the maze path, the first person telling the second person how to move the maze unit to effect movement of the ball along the maze path to an end point of the maze.

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5,499,816
**DYNAMIC LOTTERY TICKET VALIDATION SYSTEM**
Bret Levy, Atlanta, Ga., assignor to Scientific Games Inc., Alpharetta, Ga.
Filed Sep. 29, 1993, Ser. No. 128,926
Int. Cl.[6] A63F 9/00
U.S. Cl. 273—139 35 Claims

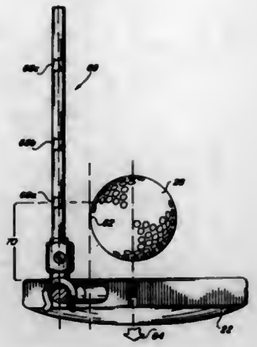



1. A system for storing lottery ticket numbers comprising:
reading means for reading a plurality of ticket numbers from a plurality of lottery tickets;
computational means operationally connected to said reading means for computing from said plurality of ticket numbers a single compressed number and for converting said single compressed number into said plurality of ticket numbers; and
a memory for storing said single compressed number.

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5,499,817
**TRAINING METHOD FOR ACHIEVING A REPEATABLE PUTTING STROKE**
Londa B. Brady, 436 Homer Ave., Longwood, Fla. 32750
Filed Jun. 9, 1994, Ser. No. 257,655
Int. Cl.[6] A63B 69/36
U.S. Cl. 273—194 R 18 Claims

1. A training method for achieving a repeatable putting stroke, the method comprising the steps of:



providing an elongated rod having proximal and distal ends;
removably affixing the elongated rod proximal end to a shaft of a putter proximate a putter head, the head having a ball striking face;
providing an attachment rod having proximal and distal ends;
rotatably affixing the attachment rod proximal end to the elongated rod proximal end for rotating the attachment rod within a plane perpendicular to the elongated rod;
placing the attachment rod proximate the putter face;
aligning the attachment rod parallel to the putter face thereby placing the elongated rod; perpendicular to the ball striking face for placing the elongated rod at a separation distance from a plane passing through a reference point on a ball positioned for being struck by the putter face;
placing the putter face proximate a golf ball;
positioning the ball for being struck by the putter face, the putter face perpendicular to a plane passing through a center of the ball;
displacing the putter head from the ball while keeping the separation distance substantially constant; and
striking the ball by stroking the putter face toward the ball while maintaining the separation distance substantially constant thereby keeping the ball center within the plane perpendicular to the face.

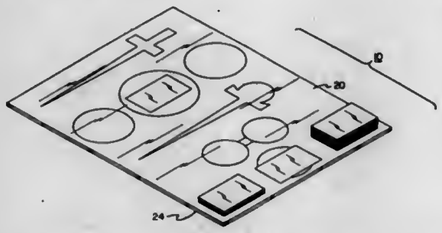
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**5,499,818**

## MYSTICAL ASTROLOGICAL PREDICTIVE-TYPE BOARD GAME

**Al M. Allal, P.O. Box 155, Rosser, Tex. 75157**

**Filed Feb. 3, 1995, Ser. No. 383,598**
**Int. Cl.[6] A63F** *3/02*
**U.S. Cl. 273—161** **6 Claims**



1. A mystical astrological predictive-type board game for formulating predictions about significant and meaningful events in life based on questions posed by players comprising, in combination:
a deck of 108 teliotarotarcane cards, the deck of teliotarotarcane cards including a first sub-deck of 48 minor tarot cards, a second sub-deck of 14 minor shustah cards, a third sub-deck of 22 major tarot cards, a fourth sub-deck of 12 premium cards, and a fifth sub-deck of 12 maximum mystique cards,
the first sub-deck of minor tarot cards further including a first suit of 12 spades, a second suit of 12 clubs, a third suit of 12 hearts, and a fourth suit of 12 diamonds, each suit including a first set of 8 cards bearing numbers thereon from 2 to 9, respectively, and further including a second set of 4 cards bearing a symbol of a jack, a queen, a king, and an ace thereon, respectively, each card of the first set having a point value equal to its respective number, the jack, the queen, and the king having a point value of 11 and with the ace having a point value of 1 or 10 based upon a player's discretion;
the second sub-deck of minor shustah cards further including a first set of 10 cards bearing numbers thereon from 1 to 10, respectively, and a second set of 4 cards bearing a knight, a leader, a prince, and a princess thereon, respectively, each card of the first set having a point value equal to its respective number, the cards of the second set each having a point value of 11;
the third sub-deck of major tarot cards further including 22 cards bearing numbers thereon from 0 to 21, respectively, the cards further bearing a mystic symbol thereon of a joker, a magician, an empress, an emperor, a priestess, a priest, a symbol for or a pair of lovers, a chariot, a depiction of justice, a hermit, a wheel-of-fortune, a depiction of strength, a hanged man, a depiction of death, a depiction of temperance, a devil, a tower, a star, a moon, a sun, a depiction of judgement, and a depiction of the world, respectively, each card having a point value equal to its respective number,
the fourth sub-deck of premium cards further including 12 cards bearing numbers thereon from 0 to 12, respectively, the cards further bearing a zodiac symbol thereon including capricorn, aquarius, pisces, aries, taurus, gemini, cancer, leo, virgo, libra, scorpio, and sagittarius, respectively, each card having a point value equal to its respective number, and
the fifth sub-deck of maximum mystique cards further including 12 cards bearing numbers thereon from 0 to 11, respectively, the cards further bearing elemental symbols thereon with the cards numbered 0 and 10 each further bearing an elemental symbol of metal, the cards numbered "1" and "11" each further bearing an elemental symbol of air, the cards numbered "2" and "3" each further bearing an elemental symbol of water, the cards numbered "4" and "5" each further bearing an elemental symbol of wood, the cards numbered "6" and "7" each further bearing an elemental symbol of fire, and the cards numbered "8" and "9" further bearing an elemental symbol of earth;
a rectangular planar game board having an upper surface, a lower surface, an upper left corner, a lower left corner, an upper right corner, a lower right corner, a periphery formed of a top edge, a bottom edge, a left edge, and a right edge, and an enclosed central portion, the upper surface of the game board bearing indicia of a cross located adjacent to the left edge and with the cross having an upper end adjacent to the upper left corner and a lower end located adjacent to lower left corner, a star with a first rectangle therearound located near the upper right corner, a second rectangle with the word "KEEP" thereon located near the lower right corner, a circle with the symbol "XOAB" thereon located between the first rectangle and second rectangle and adjacent to the right edge, an ankh located on the central portion and aligned in parallel with the cross and with the ankh having an upper end located adjacent to the upper edge and a lower end located adjacent to the lower edge, an encircled eye located between the upper ends of the cross and ankh and with the encircled eye further bearing indicia of "12", "3", "6" and "9" therearound and with the number "12" located above the eye, the number "6" located below the eye, the number "9" located to the left of the eye, and the number "3" located to the right of the eye, an encircled triangle located between the lower ends of the cross and ankh, an encircled star located between the encircled eye and the encircled triangle, and an answer area formed of an upper circle with the symbol "YES" disposed thereon, a lower circle with the symbol "NO" disposed thereon, and a segment interconnecting the upper circle with the lower circle located between the ankh and the circle with the symbol "XOAB" thereon;
a calculator for tallying score values;
and a plurality of score sheets for maintaining a status of score values during play; and
a rule book providing the rules of play.



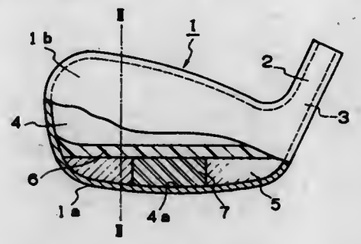
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**5,499,819**

## GOLF CLUB HEAD AND A METHOD FOR PRODUCING THE SAME

**Itsushi Nagamoto, Hamamatsu, Japan, assignor to Yamaha Corporation, Japan**

**Filed Jan. 7, 1994, Ser. No. 178,758**
**Claims priority, application Japan, Jan. 8, 1993, 5-016838**
**Int. Cl.[6] A63B** *53/04*
**U.S. Cl. 273—169** **9 Claims**



1. A golf club head comprising:
a main body having a cavity encompassing substantially the entire volume of the body;
a mass made of solidified low melted point metal and fixed at a selected position within said cavity, said mass filling substantially less than the entire said cavity, and
at least one block made of light metal which is substantially lighter than said low melting point metal and which is fixed at a selected position within said cavity.

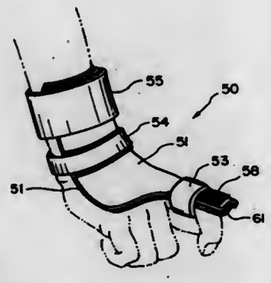
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**5,499,820**

## GOLF SWING TRAINING DEVICE AND METHOD

**Peter S. Albertsson, R.R. 1, Box 1821, Pawlet, Vt. 05761**

**Filed Jun. 7, 1995, Ser. No. 487,510**
**Int. Cl.[6] A63B** *69/36*
**U.S. Cl. 273—189 A** **14 Claims**



1. A golf swing trainer, which comprises:
(a) a rigid or substantially rigid brace having an inner side and an outer side, said inside of said brace being adapted to conform to the top surface of a hand, a wrist and the lower portion of a forearm when the wrist is flexed upwardly;
(b) a first strap attached to the outer surface of said brace, said first strap being adapted to circumscribe the index finger of the hand;
(c) a second strap attached to the outer surface of said brace, said second strap being adapted to circumscribe the forearm immediately next to the wrist; and
(d) a third strap attached to the outer surface of said brace, said third strap being adapted to circumscribe the lower forearm above the second strap.

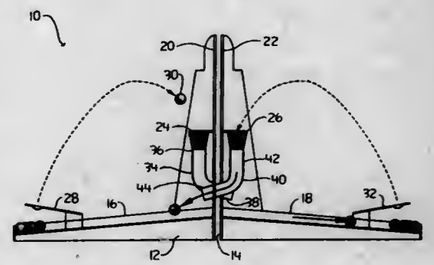
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**5,499,821**

## BASKETBALL GAME AMUSEMENT DEVICE

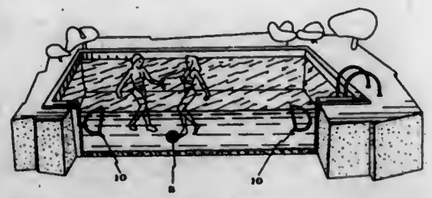
**Vance Rycroft, Box 51, Site 2, R.R. #1, Grande Prairie, Alberta, Canada**

**Filed Jul. 3, 1995, Ser. No. 498,293**
**Int. Cl.[6] A63F** *7/00*
**U.S. Cl. 273—357** **1 Claim**



1. A basketball game amusement device, comprising:
a base;
a partition extending substantially vertically from the base to divide the base into a first court and a second court, the partition having a first side facing the first court and a second side facing the second court;
a first basket secured to the first side of the partition;
a second basket secured to the second side of the partition;
a first projectile launcher positioned on the first court, whereby basketball-like projectiles are launched toward the first basket;
a second projectile launcher positioned on the second court, whereby basketball-like projectiles are launched toward the second basket;
a first conduit having a basket end and a partition end, the basket end being positioned immediately below the first basket such that a projectile passing through the first basket is directed into the first conduit, the partition end passing through the partition from the first court to the second court, the basket end being elevated in relation to the partition end, such that a projectile entering the basket end of the first conduit travels by force of gravity to the partition end where it exits the first conduit onto the second court; and
a second conduit having a basket end and a partition end, the basket end being positioned immediately below the second basket such that a projectile passing through the second basket is directed into the second conduit, the partition end passing through the partition from the second court to the first court, the basket end being elevated in relation to the partition end, such that a projectile entering the basket end of the second conduit travels by force of gravity to the partition end where it exits the second conduit onto the first court.

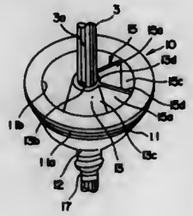
5,499,822
**SOCCER GAME FOR USE IN SWIMMING POOLS**
Guy Sabourin, 63 Bella Vista, St. Basile-le-Grand, Quebec, Canada
Filed Dec. 20, 1994, Ser. No. 359,553
Int. Cl.[6] A63B 67/00
U.S. Cl. 273—411 6 Claims



1. A game kit comprising first and second goals, each of said first and second goals being formed of a material having a density sufficient to remain on the bottom of a swimming pool, a soccer type ball having a cover surrounding an interior space, valve means associated with said ball to permit the introduction of a fluid therein, and valve adaptor means comprising a member having a first end thereof adapted for introduction into said valve means on said ball and having a fluid outlet proximate said first end, a second end of said valve adaptor means being adapted to be connected to a source of water to thereby permit the introduction of water into the interior of said ball.

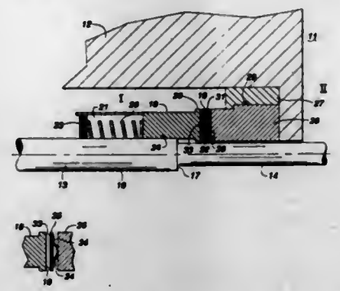
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5,499,823
**GROMMET WITH FILLER INLET OPENING**
Takaaki Fukui, Yokkaichi, Japan, assignor to Sumitomo Wiring Systems, Ltd., Japan
Filed Oct. 28, 1994, Ser. No. 331,203
Claims priority, application Japan, Feb. 17, 1994, 6-020358
Int. Cl.[6] H01B 17/30; H02G 3/22
U.S. Cl. 277—1 19 Claims



1. A grommet comprising a hollow shell, a hollow retaining section, and a hollow member,
said shell having a shell opening at a first end and a reduced diameter opening at a second end, said hollow shell in communication with said retaining section at said second end,
said member having an insertion hole and a member wall extending from said insertion hole, in a direction away from said first end and toward said second end, said member wall terminating at an inner wall of said shell, said member being in communication with said retaining section,
a filler opening in said member wall, filler walls extending from said member and forming a filler inlet in communication with said filler opening,
said filler inlet adapted to receive a filler which flows through said filler opening into said member and surrounds at least one elongated, generally cylindrical object located within said member and said retaining section.

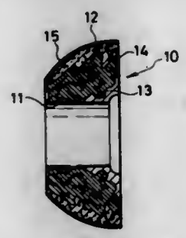
5,499,824
**MECHANICAL SEAL WITH COMPLIANT FACE**
Richard F. Salant, Dunwoody, Ga., assignor to Georgia Tech Research Corporation, Atlanta, Ga.
Filed Mar. 29, 1994, Ser. No. 221,087
Int. Cl.[6] F16J 15/34
U.S. Cl. 277—95 22 Claims



1. A hydrostatic seal for substantially preventing fluid from passing between a rotating shaft and a housing through which the rotating shaft passes, said seal comprising:
a first sealing ring mounted on the shaft for rotation therewith, said first sealing ring having a first substantially flat face seal thereon;
a second sealing ring mounted on the housing, said second sealing ring having a second substantially flat seal face including a foil skin, and having an inside and an outside radius located opposite said first flat seal face with the foil skin of said second seal face adapted to be spaced therefrom in operation;
said second sealing ring having a compliant foundation member thereon for supporting the foil skin of said second substantially flat seal face opposite said first seal face, the compliance of said foundation member continuously varying between an inside radius and an outside radius of said foundation member to promote positive coning between the first seal face and the foil skin of the second seal face.

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5,499,825
**SPHERICAL ANNULAR SEAL**
Takashi Maeda, Fujisawa; Shuichi Kubota, Yokohama; Takeshi Furukido, and Toshiyuki Nishio, both of Yamato, all of, Japan, assignors to Oiles Corporation, Tokyo, Japan
Continuation of Ser. No. 130,198, Oct. 1, 1993, abandoned.
This application Jun. 6, 1995, Ser. No. 465,744
Claims priority, application Japan, Jan. 12, 1992, 4-300551
Int. Cl.[6] F16J 15/12
U.S. Cl. 277—100 5 Claims

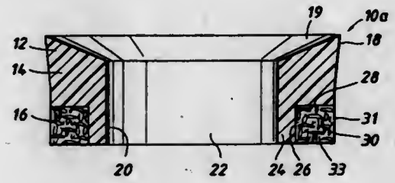


1. A spherical annular seal for use with an exhaust pipe joint, comprising:
an annular base portion including a compressed reinforcing material and a compressed heat-resistant material, said reinforcing material being made of a fine metal wire net, said heat-resistant member being made of material selected from the group consisting of expanded graphite, mica and asbestos; and
an annular outer portion provided unitarily on said base portion and having a partially convex spherical outer surface which is formed smoothly, said outer portion having a lubricating sliding layer, an exposed outer surface of said layer being made of a lubricating composition which is a mixture of 70 to 90 wt. % of boron nitride and 10 to 30 wt. % of material selected from the group consisting of alumina, silica, and mixtures thereof;
said outer surface of said lubricating sliding layer being covered partially with a reinforcing material made of a compressed fine metal wire net which is embedded mixedly unitarily in said sliding layer, said exposed outer surface of the lubricating sliding layer defining said partially convex spherical outer surface.



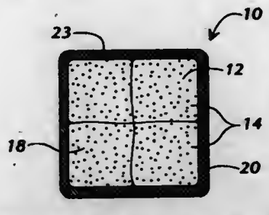
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5,499,826
**ANTI-EXTRUSION LIP SEAL**
Aaron J. Pippert, Houston, and Frederick B. Pippert, Sugar Land, both of Tex., assignors to Utex Industries, Inc., Houston, Tex.
Continuation-in-part of Ser. No. 79,627, Jun. 18, 1993. This application Dec. 15, 1994, Ser. No. 356,684
Int. Cl.[6] F16J 15/00; D04C 1/00
U.S. Cl. 277—188 A 9 Claims



1. An annular sealing element comprising:
an annular body having an annular sealing section and an annular reinforcing section;
said sealing section comprising a resilient material and including an annular lip seal; and
said reinforcing section comprising an annular portion less resilient than said lip seal, said reinforcing section including at least one braided portion being comprised of a plurality of strands and being substantially elongate along a braid axis, said at least one braided portion having four corners with a substantially rectangular cross-section transverse to said braid axis, said four corners including a first pair of opposite corners and a second pair of opposite corners, a first corner strand extending axially along said braid axis and proceeding back and forth between said first pair of opposite corners, and a second corner strand extending axially along said braid axis and proceeding back and forth between said second pair of opposite corners, at least one locking strand proceeding along said braid axis through and around each of said first and second corner strands for locking said first and second corner strands to said at least one braid portion, said reinforcing section being disposed distal said lip seal and forming an annularly extending radially facing surface of said sealing element, said reinforcing section serving to resist extrusion forces on said annular body in a direction generally parallel to said radially facing surface.

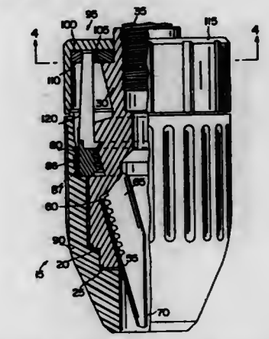
5,499,827
**SEAL FOR SHAFTS AND VALVE STEMS**
Steven M. Suggs, and Reid M. Meyer, both of Atlanta, Ga., assignors to Thermal Dynamics International, Inc.
Filed Jun. 30, 1993, Ser. No. 85,550
Int. Cl.[6] F16J 15/00
U.S. Cl. 277—229 12 Claims



1. An elongated packing material for use in the formation of a seal in fluid flow control equipment, comprising:
an elongated flexible core made of a plurality of interwoven fibers and a binder material; and
a seamless skin element comprising a plurality of discrete expanded intercalated graphite particles dry when being attached to the flexible core and to each other and compressed together.

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5,499,828
**LEVER BAR KEYLESS CHUCK**
Glenn L. Salpaka, Salem, and J. Larry Wilson, Belton, both of S.C., assignors to Power Tool Holders Incorporated, Wilmington, Del.
Filed Mar. 4, 1994, Ser. No. 206,115
Int. Cl.[6] B23B 31/12
U.S. Cl. 279—62 31 Claims



1. A chuck for use with a manual or powered driver having a rotatable drive shaft, said chuck comprising:
a) a generally cylindrical body member having a nose section and a tail section, said tail section adapted to mate with said drive shaft of said driver and said nose section having an axial bore formed therein and a plurality of angularly disposed passageways formed therethrough and intersecting said axial bore;
b) a plurality of jaws slidably positioned in each of said angularly disposed passageways, each of said jaws having a jaw face formed on one side thereof for engaging a tool to be held thereby, and threads formed on the opposite side thereof for engagement with a nut;
c) a nut rotatably mounted on said body member and in engagement with said threads on said jaws;
d) a front sleeve member in driving engagement with said nut and overlying said nose section of said body member so that

when said front sleeve member is rotated with respect to said body member, said jaws will be moved thereby;

e) a supplemental tightening mechanism, said supplemental tightening mechanism including a camming portion rotatable with respect to said body member, said supplemental tightening mechanism further including a plurality of lever bars, one portion of each of said lever bars forming a cam follower and another portion of each of said lever bars operatively associated with said nut so that when said supplemental tightening mechanism is actuated by rotation of said camming portion, said lever bars will force said nut forward to produce an enhanced tightening force on the tool through the jaws;

f) resilient means for preventing said supplemental tightening mechanism from actuating prior to closure of the jaws on said tool;

g) said resilient means including a first member associated with said camming portion and a second member associated with said body member, at least one of said first and second members having a resilient portion which mates with a portion of the other so as to restrain rotational movement between the two until said resilient portion is overcome; and

h) said chuck includes a rear sleeve wherein one of said first and second members is fixedly connected to said rear sleeve and the other of said first and second members is fixedly connected to said body.

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**5,499,829**

**LOCKABLE DRILL CHUCK**

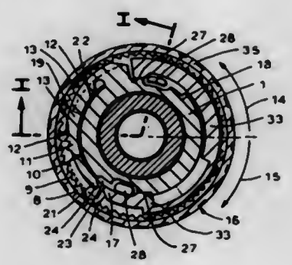
**Günter H. Röhm, Heinrich-Röhm-Strasse 50, D-89567 Sontheim, Germany**

**Filed Mar. 7, 1995, Ser. No. 399,895**

**Claims priority, application Germany, Mar. 9, 1994, 44 07 854.4**

**Int. Cl.[6] B23B *31/12***

**U.S. Cl. 279—62** **12 Claims**



1. A lockable drill chuck comprising:

a chuck body rotatable about an axis;

an adjustment body rotatable on the chuck body relative to the axis and fixed axially thereon, one of the bodies being formed with a plurality of angled guides spaced about the axis and the other body being formed with a screwthread;

respective jaws in the guides having toothed edges meshing with the screwthread, whereby rotation of the adjustment body on the chuck body in a forward closing direction about the axis moves the jaws radially toward one another and opposite rotation in a reverse opening direction moves the jaws radially apart;

an array of radially inwardly directed sawteeth on the adjustment body;

a locking ring on the chuck body having an elastically deformable locking arm having a free outer end and sawteeth offset from the free end and engageable with the adjustment-body teeth, the arm being radially deflectable between an outer meshed position with the locking-arm sawteeth meshing with the adjustment-body sawteeth and an inner out-of-mesh position;

a positioning ring rotatable on the chuck body about the axis between angularly offset locked and unlocked positions and having an actuation part engageable in the locked position with the free end of the locking arm to urge same radially outward into its outer position, the sawteeth being angled such that in the meshed position they positively inhibit rotation of the positioning ring relative to the locking ring in the opening direction while rotation of the positioning ring relative to the locking ring in the closing direction cams the sawteeth radially apart, the arm being sufficiently elastically deformable that, in the locked and meshed positions, rotation of the locking ring in the closing direction relative to the locking ring cams the teeth apart enough to slip angularly relative to one another; and

abutments on the chuck body engageable with the positioning ring and limiting rotation of the positioning ring to movement between its positions.

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**5,499,830**

**KEYLESS CHUCK**

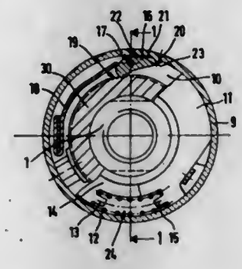
**Albrecht Schnizler, Nürtingen, Germany, assignor to Metabowerke GmbH & Co., Nurtingen, Germany**

**Filed May 5, 1995, Ser. No. 435,840**

**Claims priority, application Germany, May 7, 1994, 44 16 224.3**

**Int. Cl.[6] B23B *31/12***

**U.S. Cl. 279—62** **10 Claims**



1. A keyless chuck comprising:

a chuck body with said chuck body having oblique guide means,

a clamping sleeve, with said clamping sleeve mounted on said chuck body,

tool clamping jaws with said tool clamping jaws held in said oblique guide means and with said tool clamping jaws displaceable as a result of rotation of said chuck body relative to said clamping sleeve,

tightening means, mounted on said chuck body with said tightening means comprising:

a compression spring,

intermediate ring means with said intermediate ring means rotatably mounted with respect to said chuck body and said clamping sleeve, and with said intermediate ring means acted upon by said compression spring,

an unlockable locking means with said unlockable locking means mounted on said intermediate ring means,

an outer gripping sleeve, with said outer gripping sleeve having inner stop means cooperating with said intermediate means,

with said compression spring disposed between said clamping sleeve and said intermediate ring means,

rotation limiting means, with said rotation limiting means limiting rotation of said intermediate ring means with respect to said clamping sleeve,

and with said locking means capable of a locked position in which said chuck body and said intermediate means are locked together thereby preventing loosening of said tool clamping jaws.



**5,499,831**

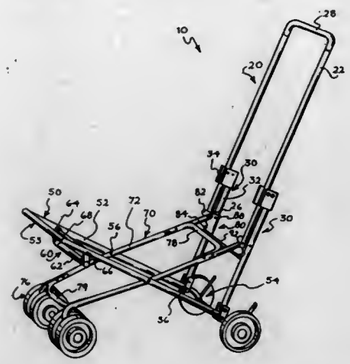
**FOLDING STROLLER FOR CHILD'S CAR SEAT**

**Ronald K. Worth, Menlo Park, and Eric G. Pfaff, Redondo Beach, both of Calif., assignors to Worth Pfaff Innovations, Inc., Manhattan Beach, Calif.**

**Filed Oct. 1, 1993, Ser. No. 130,319**

**Int. Cl.[6] B62B *7/06;7/14***

**U.S. Cl. 280—30** **4 Claims**



1. A stroller for accepting and supporting a child's car seat comprising a collapsible frame, said collapsible frame comprising a locking hinge assembly, said locking hinge assembly comprising at least one locking hinge defining an indenture, at least one locking tab, at least one pivot pin, at least one spring, at least one restricting tab and a locking hinge bar, said at least one locking hinge being connected to said collapsible frame by said at least one pivot pin, said at least one spring is connected to said at least one locking hinge thereby placing a rotational force on said at least one locking hinge creating movement around said at least one pivot pin, said movement being limiting by said at least one restricting tab, said at least one locking tab fitting into said indenture when said at least one locking hinge is placed into a locking position, such that said collapsible frame can be converted from an operational state to a storage state by actuating said locking hinge assembly utilizing a single, one-handed motion.

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**5,499,832**

**WHEEL SUPPORT STRUCTURE AND METHOD OF INSTALLING WHEELS IN MOTOR VEHICLE**

**Fumiya Iwamoto; Masahito Nakayama, and Yoshiyuki Matsumoto, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**

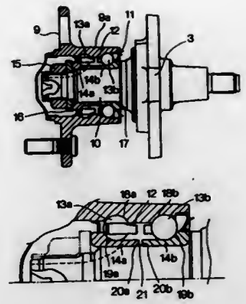
**Continuation of Ser. No. 215,843, Mar. 22, 1994, abandoned. This application Jun. 5, 1995, Ser. No. 461,543**

**Claims priority, application Japan, May 18, 1993, 5-139003**

**Int. Cl.[6] B60B *27/02;* F16C *19/08;33/60***

**U.S. Cl. 280—96.1** **2 Claims**

1. A wheel support structure wherein a double angular bearing is composed of an outer race integrally mounted in one of a hub on which a wheel is mounted and a knuckle to which a suspension arm is installed, double inner races mounted on the other of said hub and said knuckle and balls arranged in double rows between said races, said balls initially being seated in said races with a clearance between abutting ends of said double inner races so that initially said balls and said double inner races are not axially compressed but are subsequently axially compressed by a lock nut threaded on a spindle upon which said other of said hub and said knuckle are mounted.



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**5,499,833**

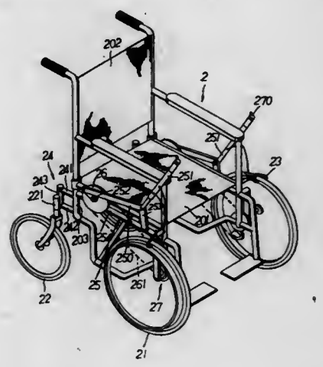
**MANUALLY OPERATED WHEELCHAIR**

**Innchyn Her, Kaohsiung; Ping-Yi Chao, Taipei, and Ming-Jang Huang, Taichung, all of, Taiwan, assignors to National Science Council, Taipei, Taiwan**

**Filed Apr. 21, 1995, Ser. No. 426,575**

**Int. Cl.[6] B62M *1/04;1/14***

**U.S. Cl. 280—247** **6 Claims**

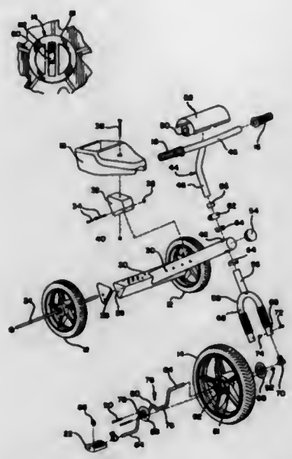


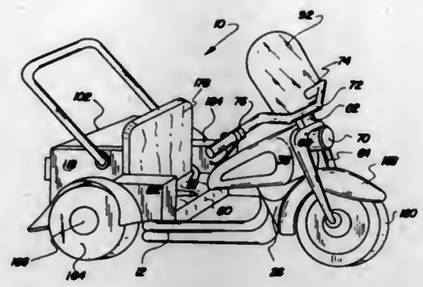
1. A manually-operated wheelchair comprising

a frame to which two front wheels and two rear wheels are fastened pivotally, wherein said frame is provided respectively on both left and right sides thereof with a horizontal fixation rod; and

a connection rod control mechanism provided respectively on both left and right sides of said frame comprising a coupling rod, an operating rod fastened at one end thereof with said coupling rod, a crank fastened pivotally at one end thereof with said coupling rod and at another end thereof with said horizontal fixation rod, a rocking rod fastened pivotally at one end thereof with said coupling rod and at another end thereof with said horizontal fixation rod, a transmission wheel which is mounted on a pivoting point of said fixation rod and said crank and is fastened securely with said crank such that the transmission wheel and the crank can be actuated synchronously, and a transmission means connecting said transmission wheel to an axle of said front wheel for transmitting motion from said transmission wheel to said front wheel.

5,499,834
**TRICYCLE**
Mark Pasin, Oak Park; Roger Tonelli, Elmwood Park, both of Ill., and James B. Easley, Minneapolis, Minn., assignors to Radio Flyer Inc., Chicago, Ill.
Filed Oct. 14, 1994, Ser. No. 324,176
Int. Cl.[6] B60B 37/00
U.S. Cl. 280—282 4 Claims





1. A child's tricycle comprising a pair of rear wheels, a front wheel, a seat positioned between the front and rear wheels, a support for said seat extending between said front and rear wheels, a handle for steering, a steering fork having an upper end for supporting said handle and a bifurcated lower end for supporting said front wheel, said front wheel defining radially extending portions and a rim portion for supporting a tire, and a centrally located opening defined by said front wheel and formed integrally with said radially extending portions, a one-piece crank extending through said opening, said crank having an axis aligned with the axis of the front wheel and defining outer ends disposed on opposite sides of said front wheel, pedals attached to said outer ends whereby a child can propel the tricycle by applying foot pressure to the pedals to thereby turn the crank and associated front wheel, and a driving connection between said crank and front wheel comprising a centrally located bend in said crank, said bend being received within said opening, said bend comprising a first portion of the crank extending outwardly away from the axis of the crank and a second portion of the crank extending inwardly to the axis of the crank, said first and second portions lying in a plane including said axis, said centrally located opening being substantially rectangular with the long dimension thereof formed parallel to said plane and being sufficiently large for receiving said first and second portions, and the short dimension thereof being substantially equal to the diameter of said crank whereby said bend of said crank is snugly received within said centrally located opening.

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5,499,835
**MOTORCYCLE STROLLER**
Samuel Skirchak, Jr., and Jacqueline A. Skirchak, both of 43 Fieldstone Ter., Naugatuck, Conn. 06770
Filed Jun. 22, 1995, Ser. No. 493,642
Int. Cl.[6] B62H 7/00; B62K 9/02
U.S. Cl. 280—293 12 Claims

1. A new and improved motorcycle stroller for transportation of an infant while walking comprising, in combination:

a trike frame having a front end, a rear end and a base therebetween, the base having an upper area and a lower area with a pair of spaced apart brackets spaced from the rear end, the front end having a generally rectangular housing attached thereto and seated on a front section of the upper area of the base, the housing having a front panel and a rear panel, the housing having seated thereon a generally pear-shaped casing forming an interior area within the front and rear panel of the housing, the casing having a front portion and a rear portion integral the rear panel of the housing, the casing further having an upper surface and a cavity therein, the front portion of the casing having attached thereto a throat with a front fork being integral and extending downwardly therefrom, the upper surface having a spaced apart openings;

a handlebar being attached to the throat at a side opposite the front fork, the handlebar having a left handle and a right handle with a throttle spaced from the right handle end, the throttle having a light switch and a sound switch, each handle having a handle cover with a break lever attachment integral the cover, the handlebar further having a windshield extending upward therefrom;

a mini-computer positioned within the cavity of the casing;

a battery casing within the cavity positioned along the upper surface of the casing, the battery casing having an entrance being integral one of the openings of the upper surface of the casing;

a speaker positionable within the cavity along the upper surface of the casing, the speaker having sound exiting another of the openings of the upper surface of the casing;

the rear end of the frame having positioned thereon a box-like storage unit, the storage unit having a bottom wall integral a rear section of the upper area of the base of the frame, a rear wall, a front wall with a short horizontal projection in a plane above the bottom wall and a pair of opposed side walls, the front wall, the rear wall and the pair of opposed side walls of the storage unit having an upper edge that forms a generally rectangular opening in a plane parallel the bottom wall, the rear wall having a recessed top portion, the side walls each having a side opening spaced from the front and adjacent the upper edge;

a generally rectangular lid having a rear edge and a front edge with a flap extending therefrom, the flap having a handle centrally positioned thereon, the rear edge of the lid being hingeably coupled to the horizontal projection of the front wall of the storage unit, the lid capable of being positioned over the rectangular opening of the storage unit to form a flush upper surface;

a pair of tail lights being positioned on the rear wall of the storage unit, each tail light projecting exterior the rear wall and spaced apart;

three wide wheels forming a front wheel and two rear wheels, the front wheel being positionable between the front fork of the frame, the two rear wheels having an axial therebetween, the axial having a length for positioning through the spaced apart brackets of the frame, the three wide wheels support the frame above a recipient surface;



a seat having a back, a lower cushion and a pair of side arm rest, the seat being positionable on the base of the frame, the back leaning against the front wall of the storage unit, the lower cushion resting on the upper area of the base adjacent the rear section of the base, each side arm rest having a bottom panel attached to the base and an interior side next to the lower cushion and the back, the seat having seat belts for securing an infant therein; and

a rigid U-shaped handle having a pair of in turned ends, each end capable of being positioned within one of the side openings of the side wall of the storage unit, the handle being capable of having an exterior force exert a forward motion thereon to move a stroller formed by the frame.

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5,499,836
**SKI DEVICE**
Paul R. Juhasz, P.O. Box 163, Sloatsburg, N.Y. 10974
Continuation of Ser. No. 30,848, Mar. 15, 1993, Pat. No. 5,332,254, which is a continuation of Ser. No. 950,929, Sep. 24, 1992, Pat. No. 5,213,355, which is a continuation of Ser. No. 385,729, Jul. 26, 1989, Pat. No. 5,156,413. This application May 31, 1994, Ser. No. 251,023
The portion of the term of this patent subsequent to Oct. 20, 2009, has been disclaimed.
Int. Cl.[6] A63C 5/00
U.S. Cl. 280—602 44 Claims



1. A ski body comprising:

a bottom member having a front end portion, a rail end portion, and a middle portion, said bottom member having a top surface and defining an opening along said top surface of said middle portion, said opening spanning: along said top surface, widthwise along any point of said opening no more than the width of said bottom member, and spanning, along said ton surface, lengthwise along any point of said opening more than the length of a binding mounting assembly to be used with said ski body.

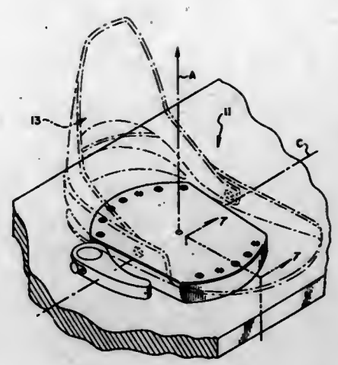
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5,499,837
**SWIVELABLE MOUNT FOR SNOWBOARD AND WAKEBOARD**
Joseph P. Hale, and Robert H. Whyte, both of 3003 Arapahoe St., Denver, Colo. 80205
Filed Jul. 31, 1995, Ser. No. 509,437
Int. Cl.[6] A63C 9/00
U.S. Cl. 280—607 9 Claims

1. A swivelable mount and locking mechanism for ski board binding for providing rotational adjustment of said binding about an axis normal to said board, said mount and locking mechanism including:

a) swivelable housing having an upper wall adapted for supporting said binding, side walls, and bottom wall, and enclosing a vertically oriented cavity, and a bore, concentric with said cavity, in said bottom wall, and a generally upwardly-facing annular contact surface adjacent said bore, and wherein the top of said cavity is defined by a generally downwardly-facing surface characterized by an array of radially extending undulations;

b) a support member for swivelably mounting said housing, and adapted to be affixed to said board, and including a cap portion and a stem portion that extends downwardly from said cap portion, said portions being concentric with said housing cavity, and said cap portion rotatably received in said cavity



and said stem portion rotatably received in said housing bore, said cap portion having a top surface and a generally downwardly-facing annular contact surface that is disposed in opposition to the upwardly-facing annular surface of said housing;

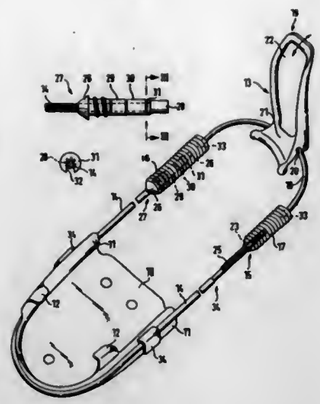
c) a rotatable pressure plate mounted within said cavity in space above said support member, and having a lower surface that slidably engages the top surface of said support member, and having an upper surface that is characterized by an array of radially extending undulations complementary to said cavity top undulations and slidably engageable therewith, and said plate having a first rotational position in which its undulations are substantially meshed with said cavity top undulations, and said plate being rotatable toward a position in which said arrays of undulations are not meshed; and

d) locking means, mounted to said housing, for reversibly rotating said rotatable pressure plate substantially from its first position whereby said plate is moved axially away from said cavity top and said opposing annular contact surfaces are pressed into binding frictional engagement to hold said housing against rotation.

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5,499,838
**CROSS-COUNTRY SKI BINDING**
Bernt-Otto Hauglin, Royken, and Rod Johnson, Asker, both of, Norway, assignors to Rottefella AS, Norway
Continuation-in-part of Ser. No. 821,007, Jan. 15, 1992, abandoned. This application Nov. 12, 1993, Ser. No. 151,345
Claims priority, application Germany, Jan. 17, 1991, 41 01 273.9; Feb. 1, 1991, 41 03 068.0
Int. Cl.[6] A63C 9/06
U.S. Cl. 280—615 4 Claims

3. A cross-country ski binding comprising a toe iron having at least one attachment element for securing the toe iron to a ski, comprising a tension cable adapted to be coupled to said toe iron and having a member adapted to pass about the heel of a ski boot, an adjustable unit connected to said tension cable for varying the effective length thereof, said adjustable unit including a tension spring having a first end connected to said member and having a second end, an outer member secured to said second end and movably mounted on said tension cable, said cable extending into the tension spring and including a stop-unit secured to the cable within said spring, at least one spacer member adapted to be removably mounted on said cable within said tension spring between said outer member and said stop unit, said stop unit includes a stop member secured to said cable and a retaining member releasably secured to the cable between the stop member and said spacer members, said spacer members being slidable on said stop member, and said retaining member being a washer having a slot fitting over the cable adjacent said stop member.



a pole of the connection of the upper wheel carrier support assembly to the vehicle frame defining a control axis,

wherein the transverse control arm with the connected tension strut is arranged below the wheel drive shaft and in front of the tie rod with respect to a forward driving direction of the vehicle,

wherein the tension strut extends forwardly, diagonally inwardly toward a vehicle center line,

wherein the transverse control arm and the tie rod have a positive positioning with respect to one another resulting in a wheel steering pole which is situated outside a vehicle wheel track width and behind a wheel center transverse plane, and

wherein the control axis intersects a wheel road surface contact plane at a position in front of the wheel center transverse plane.

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**5,499,839**

## WHEEL SUSPENSION SYSTEM WITH ELASTOKINEMATIC WHEEL ADJUSTMENT

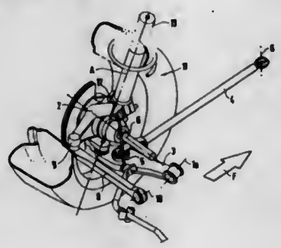
**George Wahl, Pforzheim; Matthias Dietz, Bietigheim-Bissingen; Norbert Schote, Ammerbuch; Robert Klosterhuber, Stuttgart; Karl Sommerer, Wiernsheim; Reinhard Kunert, Weissach, and Fritz Gerber, Walheim, all of, Germany, assignors to Dr. Ing. h.c.F. Porsche AG, Weissach, Germany**

**Filed Nov. 29, 1994, Ser. No. 350,041**

**Claims priority, application Germany, Nov. 29, 1993, 43 40 554.1; Jul. 1, 1994, 44 23 126.1**

**Int. Cl.[6] B60G *3/18***

**U.S. Cl. 280—701** **14 Claims**





1. Wheel suspension for a motor vehicle comprising:

a wheel carrier for carrying a wheel rotatable about a wheel spin axis and drivingly connected to a wheel drive shaft,

a steering gear tie rod connected to the wheel carrier,

a transverse control arm connected to the wheel carrier by a first joint connection and to a vehicle frame by a second joint connection,

a tension strut connected pivotably to the transverse control arm by a third joint connection and to the vehicle frame by a fourth joint connection, and

an upper wheel carrier support assembly connected to the wheel carrier and to the vehicle frame, said first joint connection and

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**5,499,840**

## AUTOMOTIVE SEAT WITH AIR-BAG

**Nobuyuki Nakano, Ayase, Japan, assignor to Ikeda Bussan Co., Ltd., Ayase, Japan**

**Filed Jan. 3, 1995, Ser. No. 367,889**

**Claims priority, application Japan, Mar. 31, 1994, 6-062579; Mar. 31, 1994, 6-062580**

**Int. Cl.[6] B60R *21/22***

**U.S. Cl. 280—730.1** **13 Claims**



1. In a motor vehicle having a body, a floor and a side door pivotally connected to said body,

a seat mounted on said floor adjacent said side door, said seat comprising a seat base mounted on said floor and a seat back pivotally connected to said seat base, said seat back including a seat back frame of metal, a horizontally extending reinforcing rod of metal secured to said seat back frame in such a manner that opposed ends thereof are projected laterally outwardly from two side portions of the seat back frame thereby to provide outwardly and inwardly projected portions, and a cushion pad covering both the seat back frame and said reinforcing rod so that the seat back has outside and inside lateral projections, each having therein the corresponding projected portion of the reinforcing rod, said outwardly projected portion of the reinforcing rod extending toward said side door in closed condition; and

an air-bag unit held by said outwardly projected portion of the reinforcing rod, said air-bag unit including an air-bag which can be inflated between the seat back and the side door upon a vehicle collision.



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**5,499,841**

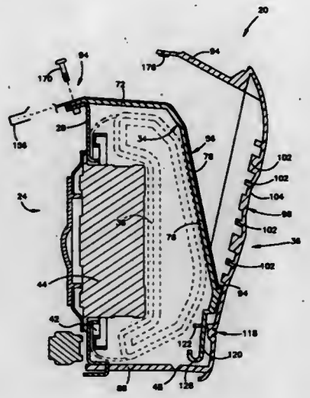
## VEHICLE SAFETY APPARATUS A HOUSING ASSEMBLY FOR AN AIR BAG AND VEHICLE HORN SWITCH

**Donna M. Trojan, Clarkston, Mich., and Michael E. Heidorn, Mesa, Ariz., assignors to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio**

**Continuation of Ser. No. 36,185, Mar. 23, 1993, abandoned. This application Sep. 14, 1994, Ser. No. 306,249**

**Int. Cl.[6] B60R *21/22***

**U.S. Cl. 280—731** **27 Claims**



1. A housing assembly for enclosing an air bag on a steering wheel of a vehicle having a horn, said housing assembly comprising:

a base;

an inner cover which at least partially encloses the air bag;

an outer cover which at least partially encloses said inner cover and the air bag;

a first connector means for releasably connecting said outer cover with said base at a first location;

horn switch means disposed between said inner and outer covers for effecting operation of the horn, said horn switch means including first and second layers of electrically conductive material and an envelope of electrically insulating material enclosing said first and second layers of electrically conductive material, said first and second layers of electrically conductive material and said envelope of electrically insulating material being interconnected for installation in and removal from said housing assembly as a unit;

a second connector means for connecting said outer cover with said inner cover at a second location, said second connector means maintaining a connection between said outer and inner covers upon release of said first connector means, a portion of said outer cover being disposed between said first and second locations, said second connector means including means for permitting manual movement of said outer cover relative to said inner cover to permit removal of said horn switch means upon releasing said first connector means while said second connector means connects said outer cover with said inner cover; and

retainer means for releasably retaining said horn switch means against movement relative to one of said inner and outer covers and permitting removal of said horn switch means from said housing assembly.

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**5,499,842**

## PAD FOR AIR BAG DEVICE

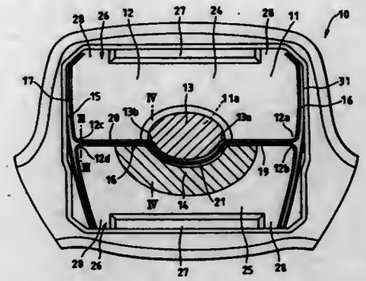
**Tadashi Yamamoto; Katsumi Sakakida; Takanobu Ikeda, and Chisato Masuya, all of Aichi, Japan, assignors to Toyoda Gosei Co., Ltd., Japan**

**Filed Feb. 16, 1995, Ser. No. 390,923**

**Claims priority, application Japan, Feb. 17, 1994, 6-020626**

**Int. Cl.[6] B60R *21/20***

**U.S. Cl. 280—728.3** **14 Claims**



1. A pad for covering an air bag device, comprising:

an outer wall covering a folded air bag, said outer wall having a substantially H-shaped thin-walled seam portion formed therein to break when the air bag expands and an ordinary portion located beyond said thin-walled seam portion;

said H-shaped thin-walled seam portion including a horizontally extending seam portion and two vertically extending seam portions positioned on opposite sides of said horizontal seam portion, said horizontal seam portion including two straight line seam portions, each respectively connected to one of said two vertical seam portions on the left and right sides of said substantially H shaped portion, said horizontal seam portion further including a curved U-shaped seam portion interposed between said straight line seam portions;

said ordinary portion having a thickness adjacent each side of said U-shaped seam portion that is thicker than a thickness of said ordinary portion adjacent the intersections between said vertical seam portions and said straight line seam portions.

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**5,499,843**

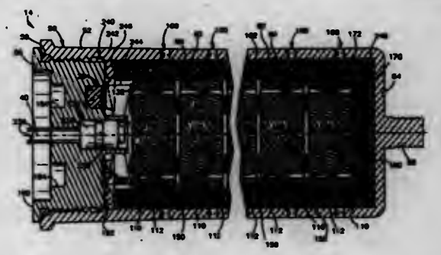
## APPARATUS FOR INFLATING AN INFLATABLE VEHICLE OCCUPANT RESTRAINT

**Ernst M. Faigle, Imlay City; John H. Semchena, Royal Oak, and Richard J. Thompson, Imlay City, all of Mich., assignors to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio**

**Filed Jun. 28, 1994, Ser. No. 267,873**

**Int. Cl.[6] B60R *21/26***

**U.S. Cl. 280—741** **19 Claims**



1. Apparatus for use in inflating an inflatable vehicle occupant restraint, said apparatus comprising:

a body of ignitable gas generating material which, when ignited, generates a volume of gas for inflating the vehicle occupant

restraint, said body of said gas generating material having a surface portion defining a cavity in said body of said gas generating material; and

means for enhancing ignition of said body of said gas generating material, said ignition enhancing means including a body of pyrotechnic material which is more readily ignitable than said gas generating material and which, when ignited, produces and emits combustion products which ignite said body of said gas generating material, said body of said pyrotechnic material being located in said cavity;

said cavity having a width and a depth, said body of said pyrotechnic material being a plug of said pyrotechnic material which extends entirely across said width of said cavity;

said surface portion of said body of said gas generating material includes a first inner surface extending along said depth of said cavity and a second inner surface extending across said width of said cavity.

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**5,499,844**

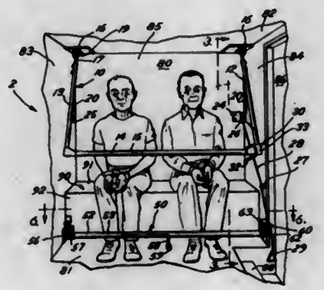
**SAFETY RESTRAINT APPARATUS**

**Ronald L. Dirck, P.O. Box 196, Warsaw, Ind. 46580**

**Continuation-in-part of Ser. No. 48,374, Apr. 15, 1993. This application Apr. 18, 1994, Ser. No. 228,797**

**Int. Cl.[6] B60R *21/02***

**U.S. Cl. 280—748** **7 Claims**



1. A safety restraint apparatus for use in a vehicle, the vehicle including an enclosure having a plurality of side walls, a ceiling, a floor, and an entry door in one of said side walls, the vehicle further including a seat disposed within the enclosure for seating the person, said safety restraint apparatus comprising:

a rigid upper restraint frame pivotally mounted to at least one of the ceiling and the walls, said upper restraint frame including a unitary rigid cross bar and being movable between an entry position wherein said cross bar is disposed adjacent to said ceiling, and a restraint position wherein said cross bar is disposed adjacent an upper body of the person when the person is seated upon the seat;

first locking means for releasably locking said upper restraint frame to one of said side walls when said upper restraint frame is in the restraint position, said first locking means including a pair of cooperating locking members, one of said locking members being mounted on said one side wall, the other locking member being mounted on the upper restraint frame, said first locking means being inaccessible to a person seated on said seat;

a rigid lower restraint frame pivotally mounted to one of said floor and said side walls, and including a unitary rigid cross bar, said lower restraint frame movable between an entry position and a restraint position, said cross bar disposed over the legs of the person when the person is seated upon the seat and when said lower restraint frame is in the restraint position; and

second locking means for releasably locking said lower restraint frame to one of said side walls when said lower restraint frame is in the restraint position, said second locking means including a pair of cooperating locking devices, one of said locking devices being mounted on said one side wall, the other locking devices being located on the lower restraint frame, said second locking means being inaccessible to a person seated on said seat;

wherein said upper restraint frame and said lower restraint frame maintain the person in a seated position on the seat when said upper frame and said lower frame are in said restraint position.

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**5,499,845**

**PRESSURE-FLUID OPERATED RIDE LEVELER**

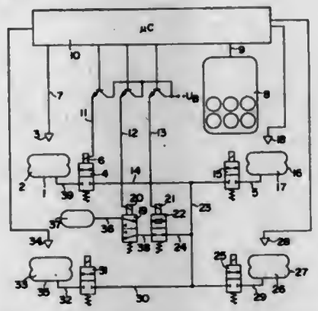
**Hartmut Geiger, Garbsen; Reinhard Gocz, Seelze; Uwe Lentz, Neustadt; Johann Lucas, Hannover, and Dieter Zimpel, Neustadt, all of, Germany, assignors to Wabco Standard GmbH, Hannover, Germany**

**Filed Dec. 14, 1993, Ser. No. 166,525**

**Claims priority, application Germany, Dec. 22, 1992, 42 43 577.3**

**Int. Cl.[6] B60G *11/26***

**U.S. Cl. 280—840** **9 Claims**



1. A pressure fluid operated ride leveler for adjusting an actual level of a vehicle body relative to a vehicle axle to a desired level, said ride leveler comprising,

a pressure fluid source and a pressure fluid sink,

at least one pressure fluid chamber which supports said vehicle body,

a pressure fluid conduit connecting said pressure fluid chamber to said pressure fluid source and said pressure fluid sink, said pressure fluid conduit having a cross-sectional size,

a first controllable valve mechanism disposed in said pressure fluid conduit,

a second controllable valve mechanism disposed in said fluid pressure conduit having means for modifying the cross-sectional size of said pressure fluid conduit, and

control means connected to said first and second valve mechanisms for actuating said first valve mechanism to connect said pressure fluid chamber to said pressure fluid source or to said pressure fluid sink as a function of the difference between said actual level and said desired level, and for actuating said second valve mechanism to reduce said cross-sectional size of said pressure fluid conduit when said difference decreases below a predetermined value.

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**5,499,846**

**PERIODICAL HARDCOVER**

**Jason L. Phillip, P.O. Box 641428, San Francisco, Calif. 94164-1428**

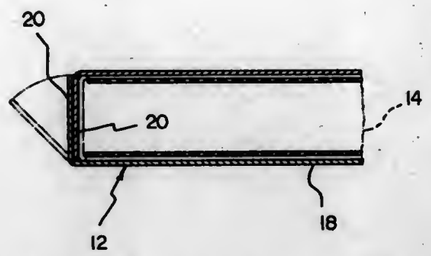
**Filed Jan. 12, 1995, Ser. No. 371,767**

**Int. Cl.[6] B42D *3/00***

**U.S. Cl. 281—29** **4 Claims**

1. A periodical hardcover comprising:





a rear cover means for adhesively securing to a binding of a periodical and for receiving and enclosing a rear cover of the periodical to permit viewing of the rear cover thereof from an exterior of the rear cover means;

and,

a front cover means for adhesively coupling to the rear cover means and for receiving and enclosing a front cover of the periodical to permit viewing of the front cover thereof from an exterior of the front cover means,

wherein the front cover means is substantially similar in design and configuration relative to the rear cover means, with the cover means each comprising a cover envelope means for receiving a cover of the periodical, and a binding panel means pivotally coupled to an edge of the cover envelope means for engaging a binding of the periodical, the binding panel means being integrally coupled to the cover envelope means, with a fold line extending therebetween and permitting pivoting of the binding panel means relative to the cover envelope means, an interior surface of the binding panel means being coated with an adhesive which can be utilized to secure the interior surface of the binding panel means to the binding of the periodical;

and further wherein the cover envelope means of each of the cover means comprises a substantially rectangular rigid inner panel having a transparent outer panel coupled along a peripheral edge thereof, the transparent outer panel being coupled to respectively opposed upper and lower edges of the rigid inner panel and to an outer edge of the rigid inner panel, with an inner edge of the rigid inner panel being spaced and separated from the transparent outer panel such that a rectangular cavity is defined between the rigid inner panel and the transparent outer panel within which the cover of the periodical can be received,

wherein the rigid inner panel is of a first rigidity and the transparent outer panel is of a second rigidity, with the first rigidity being substantially greater than the second rigidity.

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**5,499,847**

**HARDBACK BOOKS**

**Charles P. Smith, The Book House, Yatton Keynell, Chippenham, Wiltshire, England**

**Filed Jun. 6, 1994, Ser. No. 257,692**

**Claims priority, application United Kingdom, Jun. 10, 1993, 9312089**

**Int. Cl.[6] B42D *3/00***

**U.S. Cl. 281—37** **17 Claims**



1. A hardback book comprising a plurality of leaves connected together at the rear of the book so as to form a spine, and two rigid or semi-rigid cover boards rigidly secured to, and covering the front and back leaves respectively, wherein each cover board has a rear edge and projects rearwardly beyond the spine of the book when the book is closed and wherein the spine has two longitudinal edges, and each cover board projects beyond a longitudinal edge of the spine by a distance, which is approximately half the distance between the two longitudinal edges of the spine when the book is fully opened at its center on a flat surface.

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**5,499,848**

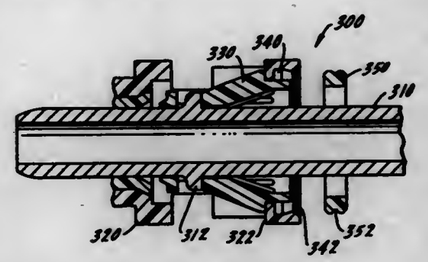
**CONNECTION VERIFIER FOR A QUICK CONNECTOR COUPLING**

**Rick A. Kujawski, Macomb, Mich., assignor to Bundy Corporation, Warren, Mich.**

**Filed Sep. 26, 1994, Ser. No. 312,457**

**Int. Cl.[6] F16L *35/00***

**U.S. Cl. 285—93** **13 Claims**



1. A quick connector coupling comprising:

a hollow female connector body; a male member received in said connector body and having a radially enlarged upset; a retainer associated with said connector body and being contactable with said upset to retain said male member in said connector body; and an indicator associated with said connector body and being selectively movable to indicate whether said male member is retained in said connector body;

said male member being movable relative to said connector body in a first direction to a locked position, wherein contact between said retainer and said upset retains said male member in said connector body, said indicator being fixed relative to said connector body during movement to said locked position, and remaining fixed upon attainment of said locked position; and

said male member being movable from said locked position in a second direction to a verification position, wherein contact between said upset and said retainer continues to retain said male member in said connector body, and said indicator moves relative to said connector body during transition from said locked position to said verification position to indicate a proper coupling.

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**5,499,849**

**DEVICE FOR FORCING TWO CONICAL FLANGES OF A PIPE COUPLING TOGETHER UNDER PRESSURE**

**Heinrich Fend, Zehntenweg 4, CH-9470 Buchs, Switzerland**

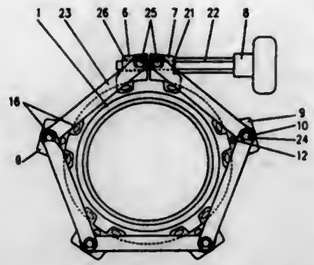
**Filed May 19, 1993, Ser. No. 64,268**

**Claims priority, application European Pat. Off., May 21, 1992, 92810384**

**Int. Cl.[6] F16L *23/08***

**U.S. Cl. 285—367** **8 Claims**

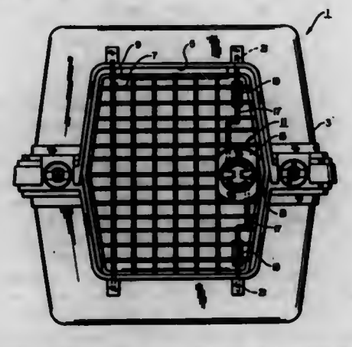
1. Device for forcing two conical flanges (1, 2) of a pipe coupling together under pressure with a seal (3, 4) between said flanges, said device comprising a clamping chain having a plurality of straps (23) directly joined together via hinges (11), and having overlapping ends at said hinges, and thrust pieces (9) each having




two flanks for contacting the conical figures (1, 2), each thrust piece (9) being pivotably supported on only one chain hinge (11) and having on each of said two flanks two mutually spaced supporting zones (16) for contact with each of the two flanges (1, 2).

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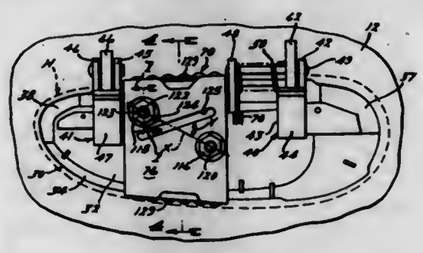
**5,499,850**
**KENNEL DOOR LATCH**
**Douglas J. Sharp, Arlington, Tex., assignor to Doskocil Mfg. Co., Inc., Arlington, Tex.**
**Filed Jun. 1, 1994, Ser. No. 251,908**
**Int. Cl.[6] E05C 1/12;9/04**
**U.S. Cl. 292—42** **11 Claims**



1. A latch system having utility in securing a planar member in a closed position comprising:
a kennel housing having a portal, said portal having a defined periphery with a plurality of apertures within said periphery, said planar member being pivotally mounted in said portal;
a base plate secured to said planar member;
a knob rotatably coupled to said base plate, said knob having a generally circular periphery;
a cover secured to said base plate and including a generally circular aperture having a diameter less than that of said periphery of said knob, wherein upon assembly said generally circular periphery of said knob opposes said generally circular aperture of said cover to rotatably retain said knob on said base plate;
at least one detent protrusion formed on one of said generally circular periphery of said knob and said cover adjacent said diameter of said generally circular aperture;
at least one detent recess formed in the other of said generally circular periphery of said knob and said cover adjacent said diameter of said generally circular aperture and opposing said at least one detent protrusion, said at least one detent protrusion for engagement with said at least one detent recess to temporarily restrain said knob against rotation, said at least one detent recess being beveled such that upon engagement with said at least one detent protrusion purely rotational movement of said knob causes axial movement of said knob relative to said base plate and disengagement of said at least one detent protrusion with said at least one detent recess;
a plurality of elongate members carried on said planar member for reciprocation into and out of engagement with said apertures within said periphery of said portal, said engagement of said elongate members with said apertures within said periphery of said portal restraining said planar member against movement in said portal; and
means coupling said elongate members to said knob for reciprocating said elongate members into and out of engagement with said apertures within said periphery of said portal responsive to rotation of said knob.

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**5,499,851**
**OUTSIDE DOOR HANDLE ATTACHING BRACKET ARRANGEMENT**
**Stephen J. Mitchell, Walled Lake, Mich., assignor to Chrysler Corporation, Highland Park, Mich.**
**Filed Oct. 31, 1994, Ser. No. 331,421**
**Int. Cl.[6] E05C 21/00**
**U.S. Cl. 292—347** **10 Claims**

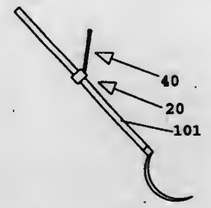


1. In a handle assembly adapted for mounting in an aperture formed in a vehicle panel having exterior and interior surfaces, the assembly having a housing formed with a terminal flange surrounding a central body portion, the terminal flange formed with a backside adapted for seating on a flanged border surrounding the panel aperture, an improved handle assembly panel mounting arrangement comprising:
a housing of plastic material having an inboard facing central body portion formed with integral upper and lower inboard projecting tongues each terminating in an inboard end, said upper tongue having a downwardly facing surface and said lower tongue having an upwardly facing surface, each said upwardly and downwardly facing surface formed with a plurality of laterally extending ribs arranged in vertically opposed spaced relation, each upper and lower laterally extending rib inboard ends sloped in a manner defining outboard converging upper and lower lead-in chamfers;
a C-shaped sheet metal clip having upper and lower parallel legs each extending normally outboard from a clip base portion having at least one attaching hole therein, each upper and lower leg outboard extremity adapted to engage an opposed inboard surface of said panel aperture flanged border;
said clip providing elongated outboard extending upper and lower attaching tabs, said upper tab spaced below and parallel with said upper leg and having an upwardly facing surface, and said lower tab spaced above and parallel with said lower leg and having a downwardly facing surface, said upper and lower tab surfaces in vertically spaced opposed relation and each terminating in a cutting edge adapted to engage associated upper and lower rib lead-in chamfers; and
whereby upon said clip base attaching hole receiving therethrough a threaded fastener extending inboard from said housing central portion said clip tab upper and lower cutting edges are vertically spaced a predetermined dimension, such that upon said clip being manually urged outboard each said upper and lower tab cutting edges adapted to simultaneously shear-off a portion of its associated upper and lower ribs thereby frictionally engaging said clip on the housing in an initial installed position in a self-retained manner.



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**5,499,852**
**SECOND HANDLE ATTACHMENT FOR A TOOL**
**Jay R. Seigendall, 13804 E. 27th Ave., Spokane, Wash. 99216**
**Filed Mar. 15, 1995, Ser. No. 404,327**
**Int. Cl.[6] A01B 1/22; B25G 3/38**
**U.S. Cl. 294—58** **4 Claims**

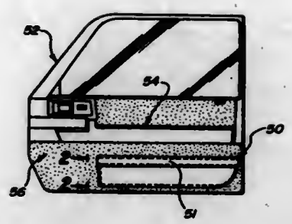



1. A second handle attachment for connection to a tool having a handle shaft, comprising:
(a) left and right clamshell brackets, each bracket comprising a pivot hole, a locking pin hole, an inner securing bolt hole, an outer securing bolt hole, and a notch structure;
(b) a second handle comprising:
(a) a straight end portion having a pivot hole and a locking pin hole, the distance from the pivot hole to the locking pin hole equal to the distance between the pivot hole and locking pin hole of the left and right clamshell brackets;
(b) an angled middle portion; and
(c) a handle grip portion;
(c) a locking pin, carded by the locking pin holes of the left and right clamshell brackets and by the locking pin hole of the second handle, having a cotter pin hole;
(d) locking means for releasably securing the locking pin comprising a cotter pin carried by the cotter pin hole of the locking pin; and
(e) biasing means for biasing the left and right clamshell brackets togethers, whereby the handle shaft of the tool is firmly held, comprising:
(a) an inner securing bolt carried by the inner securing bolt holes of the left and right clamshell brackets;
(b) a spacer having an inner diameter that is incrementally greater than the outer diameter of the inner securing bolt and a length that is incrementally greater than the thickness of the second handle, carried by the inner securing bolt in a position between the left and right clamshell brackets, whereby the second handle may rotate even when the inner securing bolt is tightened; and
(c) an outer securing bolt carried by the outer securing bolt holes of the left and right clamshell brackets.

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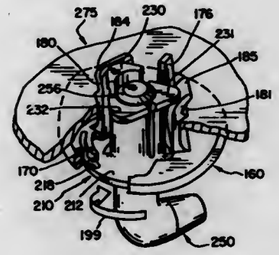
**5,499,853**
**POCKET PART FOR A VEHICLE DOOR**
**Reza R. Pourian, 25 Camphor Ct., Hills Borough, Calif. 94010**
**Filed Aug. 25, 1994, Ser. No. 295,404**
**Int. Cl.[6] B60R 7/04**
**U.S. Cl. 296—37.13** **13 Claims**

1. In a pocket part for a vehicle door constructed to be affixed to the interior structure of such door to form a vehicle door pocket having a U-shaped plastic frame, said frame having an elongate base and a pair of arms upstanding from said base and a pair of metal fasteners carried in the upper ends of said frame arms at the upper corners of said pocket part, the improvement comprising a single elongate metal strap slidable lengthwise of the frame and having its opposite ends held by the heads, respectively, of the pair of fasteners, and a single elastic strap wrapped around the opposite ends of the slidable strap and having its opposite ends held by the shanks, respectively, of the pair of fasteners, the elastic strap being in constant tension so as to maintain the slidable strap in constant compression, whereby to maintain the upper edge of the pocket part biased against said interior door structure.




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**5,499,854**
**MOUNTING BRACKET ASSEMBLY FOR A VEHICLE SUNSHADE AND METHOD OF INSTALLING SAME IN A VEHICLE**
**Willard E. Crotty, III, Quincy, Mich., and Jeffrey L. Beaver, Indianapolis, Ind., assignors to Crotty Corporation, Quincy, Mich.**
**Filed Dec. 6, 1994, Ser. No. 350,409**
**Int. Cl.[6] B60J 3/02**
**U.S. Cl. 296—97.13** **17 Claims**



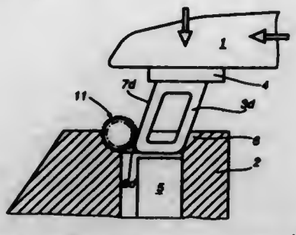

1. A sunshade mounting bracket assembly for mounting a sunshade to an apertured panel comprising:
an outer bracket mountable to the apertured panel and including an inner bracket receiving opening;
an elbow connectable with the sunshade; and
an inner bracket comprising a plurality of resilient locking prongs defining at least a portion of an elbow receiving interior hollow;
wherein said resilient locking prongs are insertable into said inner bracket receiving opening;
wherein said resilient locking prongs, include cam means for engaging outer bracket and radially inwardly compressing said resilient locking prongs when said inner bracket is axially rotated relative to said outer bracket from a first rotational orientation to a second rotational orientation for use; and
whereby said elbow, when disposed within said interior hollow during radial compression of said locking prongs, is compressed between said locking prongs such that rotation of said elbow relative to said inner bracket is frictionally resisted.

**5,499,855**

## LOCKING ARRANGEMENT FOR SECURING A PIVOTING AND SLIDING COVER TO A COUNTER-STRUCTURE OF A VEHICLE BODY

Rudolf Andres, Sindelfingen; Holger Seel, and Kurt Schaible, both of Aidlingen, all of, Germany, assignors to Mercedes-Benz AG, Germany

Filed Apr. 15, 1994, Ser. No. 228,014
Claims priority, application Germany, Apr. 15, 1993, 43 12 323.6
Int. Cl.[6] B60J 7/00
U.S. Cl. 296—121 10 Claims



1. A locking arrangement for securing a pivotable-slidable cover to a counter-structure of a vehicle body, comprising a fastening pin protruding from and arranged relatively fixed to a bottom side of the cover, a catch fastening operatively arranged on the counter-structure and configured to interact with the fastening pin in a locking operation, a notch on the counter-structure configured to operate as an intrusion guide for intrusion of the fastening pin into the catch fastening and an auxiliary mechanism for providing axial advancement of the fastening pin in the notch and causing transverse advancement of the cover, said auxiliary mechanism having deflection elements associated with respective ones of the fastening pin and the catch fastening and one of which deflection elements extends into a cross-section of the catch fastening, for interacting with another of the deflection elements during closing of the cover so as to butt against each other and maintain a transverse advancement of the cover after the deflection elements interact accompanying the axial advancement of the fastening pin.

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**5,499,856**

## FOLDABLE FRONT-ENTRY WALKER HAVING RESISTANCE TO BACKWARD MOTION

Michael R. Sorrell, Longmeadow, Mass.; Lawrence W. Engdahl, Guilford, Conn., and Simon Slootsky, Newton, Mass., assignors to Sorrell Medical, Incorporated, Longmeadow, Mass.

Filed Jun. 13, 1994, Ser. No. 258,703
Int. Cl.[6] A61H 3/04
U.S. Cl. 297—5 19 Claims

1. A foldable safety walker, comprising:

a. a pair of upstanding height-adjustable front legs spaced apart and separate from each other;

b. a pair of hand-gripable handles, each handle being connectable with a corresponding one of the pair of front legs;

c. a pair of lower tension members, each lower tension member being connectable with a corresponding one of the pair of front legs, both lower tension members being connected to each other at a rear portion by a lower tension member wrap around extension;

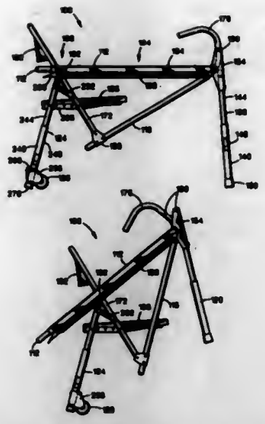
d. a pair of arm members, each arm member being connectable with a corresponding one of the pair of front legs;

e. a seat frame connectable to each lower tension member and to each arm member;

f. a seat back formed within the seat frame;

g. a seat cushion connectable with the seat frame; and

h. a pair of height-adjustable rear legs spaced apart and separate from each other, each rear leg being connectable to the seat cushion and to the seat frame, wherein the front legs, arm



members, lower tension members, handles and seat cushion define a walking space for an upright user of the walker, and wherein each rear leg is pivotally connectable to the seat frame by a corresponding link member.

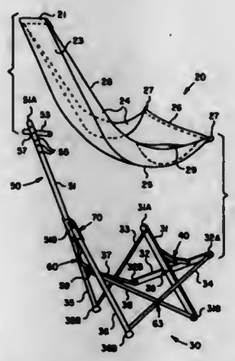
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**5,499,857**

## FOLDING CHAIR

Robert W. Lynch, Jr., 7724 Lake Highland Dr., Fort Worth, Tex. 76179

Filed Nov. 18, 1994, Ser. No. 342,123
Int. Cl.[6] A47C 4/38
U.S. Cl. 297—162 27 Claims



1. A folding chair symmetric about a longitudinal axis and comprising

a transverse X-structure formed by a pair of rigid members pivotally coupled together and having lower ends forming front feet and upper ends forming front seat corners of the chair;

transverse back means disposed rearward the X-structure and forming rear feet;

a transverse inclined V-structure having two rigid spindles coupled to the front feet, and converging rearwardly to form an apex at their rearward ends;

lateral braces on each side of the chair, each brace linking one of the rear feet to one of the front seat corners, the brace further being pivotally coupled to one of the spindles; and

hammock means suspended between the back means and the front seat corners to form a seat.

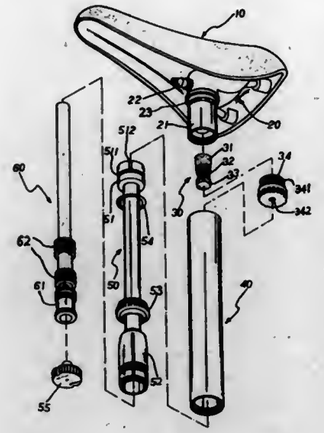


**5,499,858**

## PUMP HIDDEN IN A SEAT TUBE OF A BICYCLE

Jern-Shong Her, Changhua, Taiwan, assignor to Yu Chou Enterprise Corporation, Changhua, Taiwan

Filed Jun. 27, 1994, Ser. No. 266,300
Int. Cl.[6] B62J 1/00
U.S. Cl. 297—195.1 1 Claim



1. A hidden pump able to be housed in a seat tube of a bicycle having a tire and quick fixing means, comprising:

a saddle having an integrally formed seat mount provided with an extended coupling tube fixed thereon;

said seat mount having an air passage disposed internally therein between an end of said coupling tube and an air outlet nozzle extended therefrom;

a check valve disposed in said coupling tube and held therein by a check lid having a through hole, said check lid engaged with the end of said coupling tube so as to confine said check valve in said coupling tube; said check valve having a cushion which is provided with an air passage, a spring, and a cork;

a cylinder tube engaged with said coupling tube;

said coupling tube having a first sealing ring disposed on an end periphery thereof for engaging said cylinder tube;

said coupling tube and said check valve being fixed relative to said cylinder tube during pump use and storage;

a hollow pumping rod having a piston block at a first end and a handle at a second end;

a removable lid slidably disposed in between said piston block and said handle and being secured to a cylinder tube end after said hollow pumping rod is housed in said cylinder tube so as to permit said pumping rod to be repeatedly pulled and pushed inside said cylinder tube;

a flexible air duct having coupling means disposed thereon for securing air duct ends thereof to said air outlet nozzle and to an air inlet of the tire, said flexible air duct being housed inside said hollow pumping rod;

said air duct being removably received inside said hollow pumping rod;

a cover being engaged with a handle end of said pumping rod after said air duct has been housed inside said pumping rod;

said piston block having vertical air passage grooves disposed on a cylindrical periphery thereof and having a second sealing ring disposed next to said passage grooves;

a washer being associated with said removable lid of said pumping rod;

said cylinder tube, with said pumping rod received therein and said flexible air duct received in said pumping rod, being connected with said saddle and capable of being housed in the seat tube of the bicycle;

said pump assembly capable of being secured in place to said seat tube of the bicycle by way of the quick fixing means, permitting said pump assembly to be readily removed with speed.

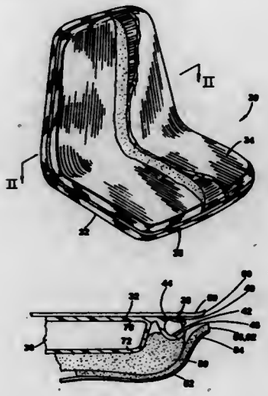
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**5,499,859**

## UPHOLSTERY ATTACHMENT DEVICE AND UPHOLSTERED ARTICLE USING SAME

Robert C. Angell, Spring Lake, Mich., assignor to Steelcase, Inc., Grand Rapids, Mich.

Filed May 4, 1994, Ser. No. 237,855
Int. Cl.[6] A47C 31/00
U.S. Cl. 297—218.3 30 Claims



1. A seating unit comprising:

a support frame; and

an upholstery covering overlaying at least a portion of said support frame, said upholstery covering having a perimeter edge, said support frame including an upholstery attachment device, said upholstery attachment device being located at said upholstery covering perimeter edge, said upholstery attachment device having a first elongated portion extending along at least a length of said upholstery covering perimeter edge and defining a first upholstery covering gripping member, said upholstery attachment device having a second, cooperating elongated portion aligned with said first elongated portion to extend along said at least a portion of said length of said upholstery covering perimeter edge and define a second upholstery covering gripping member, said upholstery covering perimeter edge being interposed between said first and second upholstery covering gripping members, said first and second upholstery covering gripping members defining opposing jaws configured to frictionally engage and clamp against opposing sides of said upholstery covering perimeter edge to securely retain the upholstery covering therebetween.

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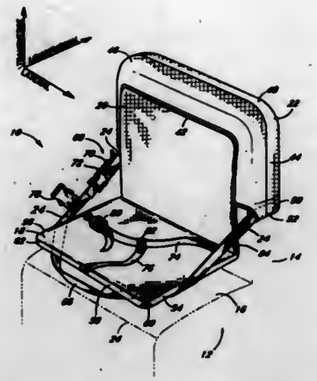
**5,499,860**

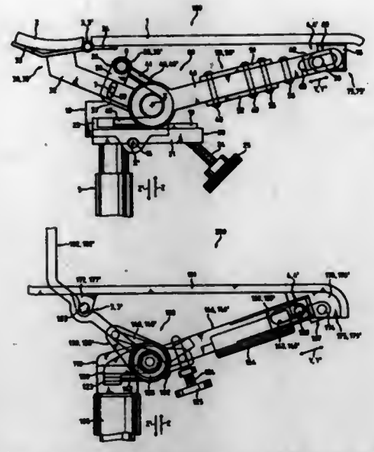
## COLLAPSIBLE CHILD SEAT

Raymond Smith, Los Angeles, and Charles Rocles, Laguna Niguel, both of Calif., assignors to Tricor Seating, Inc., Laguna Beach, Calif.

Filed Jan. 12, 1994, Ser. No. 180,850
Int. Cl.[6] A47C 1/08
U.S. Cl. 297—255 24 Claims

1. A child seat for use with a chair of the type having a backrest and a seat, said child seat being collapsible from a seat position, in which, when attached to the chair, a child seated within the child





seat is raised above the seat of the chair, to a travel position, in which the child seat is collapsed for easy carrying, said child seat comprising:

a generally rectangular bottom panel having a cushioned upper surface and a bottom surface, a first side edge and an opposing second side edge, and a front edge and an opposing rear edge, said front edge and said first side edge intersecting at a first front corner, and said front edge and said second side edge intersecting at a second front corner;

a generally rectangular, cushioned back panel having a bottom edge and a top edge, said bottom edge of said back panel and said rear edge of said bottom panel being hinged together such that said back panel and said bottom panel fold together when said child seat is collapsed into the travel position;

a rear sleeve attached to at least a portion of said top edge of said back panel, said sleeve forming a pocket configured to receive at least an upper portion of the chair backrest through an opening, said sleeve having a strap loop which surrounds at least a portion of said opening of said pocket, said rear sleeve further being invertible to fold from the seat position in which said rear sleeve is positioned on a rear side of said back panel to the travel position in which said rear sleeve is positioned on a front side of said back panel; and

a support strap extending through said strap loop of said rear sleeve, from said rear sleeve to said first side edge of said bottom panel proximate to said first front corner, across said bottom surface of said bottom panel to said second side edge proximate to said second front corner, and from said second side edge to said rear sleeve, said support strap being slidably connected to said rear sleeve and fixedly attached to said first and second side edges of said bottom panel, said support strap further being adjustable in length so as to draw said rear sleeve around the chair backrest and to adjust the position of said bottom panel.

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**5,499,861**

**CHAIR, IN PARTICULAR OFFICE CHAIR**

**Hermann Locher, Schwanden, Switzerland, assignor to Giroflex-Entwicklungs-AG, Koblenz, Switzerland**

**Filed Jul. 14, 1993, Ser. No. 91,673**

**Claims priority, application Switzerland, Jul. 16, 1992, CH02251/92**

**Int. Cl.[6] A47C 3/026**

**U.S. Cl. 297—301.2** **15 Claims**

1. Load-bearing frame for a chair which can be adjusted in terms of its height and inclination, comprising:

a standing column,

a load-bearing and pivoting device arranged on said standing column,

a seat carrier and a backrest carrier,

the seat carrier and the backrest carrier being mounted on the load-bearing and pivoting device by means of two lateral struts arranged on a knee side of a spindle body,

said carriers being pivotable about a horizontal axis of the load-bearing and pivoting device against the restoring force of at least one first, spring element,

said carriers being lockable in any position and being releasable again by a second spring element,

the load-bearing frame further comprising a retaining device, which is arranged at the upper end of the standing column and through which the spindle body passes, and said first spring element including two helical springs which are oriented in the longitudinal direction of said horizontal axis, said springs being arranged between the lateral struts and the retaining device, said springs being mounted on the spindle body and, in order to adjust spring restoring force each being held at a respective one end by a respective spring end piece on a bracing element mounted on the retaining device and, at a respective other end on a bearing element which is operatively connected to the backrest carrier, a knee side of the seat carrier being slidably and pivotably mounted on the struts arranged on the knee side of the spindle body by means of respective second bearing devices, each provided with a bearing pin, which is displaceably guided in a respective said strut, in order to maintain the knee side of the seat carrier at substantially a given height when a user pivots the chair about said horizontal axis.

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**5,499,862**

**TURNTABLE**

**Klaus Janisch, Issy, Germany, assignor to Schmidt & Lenhardt GmbH & Co. eHG, Issy, Germany**

**Filed Jun. 15, 1994, Ser. No. 260,117**

**Claims priority, application European Pat. Off., Jun. 30, 1993, 93110395**

**Int. Cl.[6] A61G 7/10**

**U.S. Cl. 297—311** **10 Claims**




1. Turntable serving as a seat surface for handicapped persons, comprising a bottom plate (16), a top plate (12) pivotably mounted thereon, a padded cushion (18) disposed centrally on said top plate (12), and an integral retaining ring (20) with a circular outline,



releasably fixed to said top plate (12) and overlapping said padded cushion (18) at its circumferential edge, gripping a top and a bottom of an outer edge of said top plate (12) and resting thereon so as to clamp it, characterised in that, closely adjacent to the outer edge of the top plate (12), an annular groove (22) is provided in said top plate (12), which extends along at least part of the periphery and terminates at one of the two surfaces of the top plate (12), defining the top side and the bottom side, and that a thin-walled flexible zone (28) is formed between a bottom of said annular groove (22) and an adjacent surface of the top plate (12), and an annular wall (24) is formed between the annular groove (22) and an outer peripheral surface of the top plate (12), which, by the exertion of radially inward force, can be displaced in this direction with a resilient restoring effect.

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**5,499,863**

**SEAT BACK FRAME**

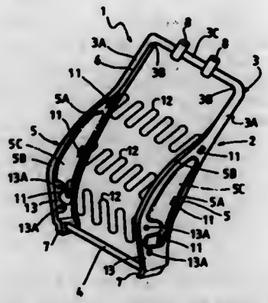
**Hideki Nakane; Yasuhiro Nishii, and Masami Sugiura, all of Kariya, Japan, assignors to Toyota Shatai Kabushiki Kaisha, Japan**

**Filed May 3, 1994, Ser. No. 237,584**

**Claims priority, application Japan, May 17, 1993, 5-139334**

**Int. Cl.[6] A47C 7/40; B60N 2/44**

**U.S. Cl. 297—452.2** **13 Claims**




1. A seat back frame including; a frame body with an upper frame and a lower frame; a pair of side frames each of which is formed between the upper and the lower frame, the side frames supporting a driver from both sides of the seat back frame;

wherein at least the upper frame and the side frames are formed by beading a frame plate which is obtained from a raw flat plate through pressing treatment;

wherein the upper frame is formed into a pipe form having a slit with edge portions and the slit is welded at several positions of the edge portions; and

wherein the lower frame is secured between the pair of side frames.

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**5,499,864**

**BICYCLE WHEEL RIMS**

**Gary G. Klein, and Darrell Voss, both of Chehalis, Wash., assignors to Klein Bicycle Corporation, Chehalis, Wash.**

**Filed Jun. 16, 1993, Ser. No. 77,196**

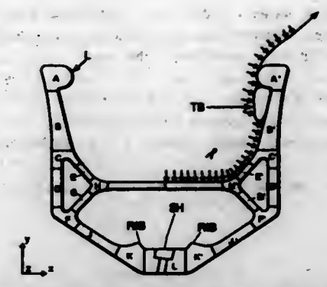
**Int. Cl.[6] B60B 21/02**

**U.S. Cl. 301—95** **17 Claims**

1. In a bicycle wheel having a hub, an annular rim having a spoke connection area, spokes connecting said rim to said hub and extending from said hub to spoke connecting area on said rim, improvements in said rim wherein:

said annular rim having:

a pair of circumferential flanges, each said circumferential flange having inner and outer surfaces and, in radial directions, inside and outside ends, said circumferential flanges




being joined at their inner ends by at least one torque tube, said inner surfaces of said pair of flanges diverging away from each other a first predetermined amount and having tire retaining beads formed at their outside ends, respectively, said outer surfaces diverging outwardly from each other towards said outer ends a second predetermined amount to improve tire stability in cornering and side skid maneuvers,

a substantially flat tension web forming (1) an upper wall of one of said at least one torque tubes and (2) an inner air pressure reacting member, and

annular rib means juxtaposed adjacent said spoke connecting area to provide strength for said rim, support for spoke nipples on the sides and prevent lateral cracks from forming in said area.

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**5,499,865**

**BRAKE FORCE CONTROL DEVICE FOR A VEHICLE**

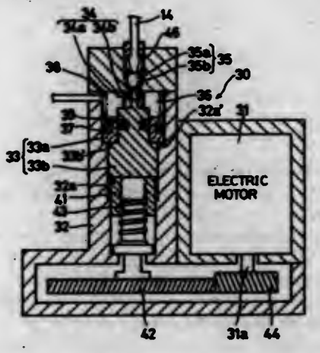
**Masayuki Katagiri, Toyota; Kazuhiko Suzuki, and Mitsunori Takeuchi, both of Kariya, all of, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan**

**Filed Nov. 23, 1994, Ser. No. 346,913**

**Claims priority, application Japan, Nov. 29, 1993, 5-298692**

**Int. Cl.[6] B60T 8/42**

**U.S. Cl. 303—115.2** **11 Claims**




1. A brake force control device for a vehicle comprising:

a master cylinder operable by an operating member of the vehicle;

a wheel brake mountable on a vehicle wheel and connected to the master cylinder through a conduit;

a pressure control chamber connected to the wheel brake;

a displacement actuator that includes a plunger member which varies a capacity of the pressure control chamber, a drive unit which drives the plunger member, a first valve which closes the conduit when the plunger member is operated to decrease the capacity of the pressure control chamber and which opens the conduit when the first valve receives a brake pressure

from the master cylinder which is larger than the pressure in the pressure control chamber with a predetermined value, and a second valve which closes the conduit when the plunger member is operated to increase the capacity of the pressure control chamber and which opens the conduit when the brake pressure in the pressure control chamber is larger than the pressure in the master cylinder with a predetermined value; and

a control unit which controls the displacement actuator.

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5,499,866

## MONITORING METHOD AND DEVICE IN AUTOMATIC BRAKING PROCESS

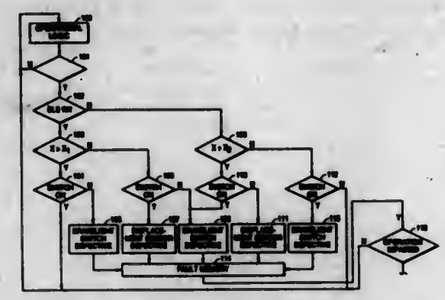
Manfred F. Brugger, Winnenden; Martin Klarer, Kernen; Bernd Knoll, Esslingen; Albrecht Eckl, Stuttgart; Manfred Steiner, Winnenden; Siegfried Raupp, Weinstadt; Joachim Noll, Ostfildern; Frody Echstein, Winnenden; Christoph Stoll, Backnang, and Brian Douglas, Stuttgart, all of, Germany, assignors to Mercedes-Benz AG, Germany

Filed Nov. 8, 1994, Ser. No. 337,426

Claims priority, application Germany, Nov. 8, 1993, 43 38 064.6

Int. Cl.[6] B60T 7/12;17/22

U.S. Cl. 303—122.08 22 Claims



1. A method for monitoring operation of an automatic braking process device comprising a solenoid valve actuator carrying out an automatic braking process, a switch for terminating the automatic braking process under specific switching conditions, a displacement sensor for detecting travel of a brake pedal, a control device for controlling the automatic braking process and a test control device, wherein the method comprises the steps of

(a) brief actuating of the solenoid valve by the test control device taking place under prescribed vehicle states,

(b) determining criteria comprising at least whether switching current of the solenoid actuator valve lies within prescribed limit values and whether a pedal travel has occurred, via the displacement sensor, corresponding to the pedal travel caused by the automatic braking process as criteria as to whether or not an operational fault of the automatic braking process has occurred, and

(c) if the determined criteria are not fulfilled, determining the presence of an operational fault in the automatic braking process device and causing intervention in the automatic braking process.

5,499,867

## METHOD FOR MINIMIZING AMPLITUDE OF PRESSURE MODULATION IN AN ABS

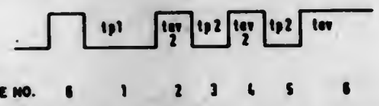
Rüdiger Poppenburg, Vaihingen; Bernd Gressmann, Besigheim, and Eberhard Sonning, Oberriexingen, all of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Jan. 6, 1995, Ser. No. 369,826

Claims priority, application Germany, Jan. 29, 1994, 44 02 652.8

Int. Cl.[6] B60T 8/32

U.S. Cl. 303—159 5 Claims




1. A method for controlling brake pressure at the wheels of a vehicle, comprising

measuring the wheel speeds,

determining a wheel acceleration at each said wheel based on the respective wheel speed,

determining a slip value at each wheel based upon said wheel speeds,

determining a vehicle deceleration based upon said wheel speeds,

generating a first pressure reduction pulse at one of said wheels based upon the slip value at said one of said wheels,

maintaining pressure at said one of said wheels for a duration tp1 following said first pressure reduction pulse, said duration tp1 being based on said slip value at said one of said wheels and said vehicle deceleration, and

triggering a second pressure reduction pulse only when the wheel acceleration of said one of said wheels is less than a predetermined threshold.

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5,499,868

## SELF-SUPPORTING DATA PROCESSING DESK MODULE WITH DETACHABLE AND LONGITUDINALLY SHIFTABLE EXHAUST FAN ASSEMBLLY AND ADJUSTABLE ANGLE, REVERSIBLE VIDEO DECK BRIDGES WITH FRONT AND REAR CONTINUOUS SWEEP GROMMETS

Alfred Schainholz, Englewood, Fla., assignor to Woodtronics, South Williamsport, Pa.

Filed Aug. 31, 1994, Ser. No. 298,752

Int. Cl.[6] A47B 77/08

U.S. Cl. 312—236 6 Claims

1. In a data processing desk comprising:

a generally enclosed cabinet for mounting internally electronic data processing equipment which develops high heat under load,

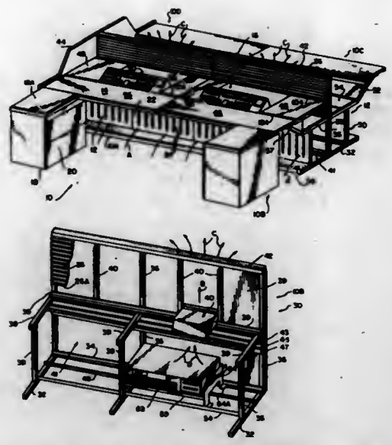
said enclosed cabinet including an apertured wall for passage of cooling air into the interior of the cabinet, means comprising closely spaced vertical walls extending upwardly from the rear of said cabinet defining a vertical chimney and open at a lower end to the interior of said cabinet, the improvement comprising:

a fan assembly including a box like plenum chamber,

an air inlet opening within a wall of said fan assembly proximate to said equipment,

said plenum chamber including an upright outlet duct spaced from said air inlet and sized smaller than the open lower end of said chimney, means for supporting said plenum chamber within the interior of said cabinet with said outlet duct projecting vertically upwardly within said chimney at said lower end thereof, with a front face of said outlet duct abutting the lower end of one of said closely spaced vertical walls proximate to the apertured wall of said cabinet, whereby tilting of the plenum chamber about said support means permits the fan assembly to be detachably mounted within said cabinet and maintained by contact between said outlet duct and said vertical chimney, whereby operation of said fan assembly causes cooling air to enter the apertured wall of said cabinet to pass over and about said electronic processing equipment to be drawn into the fan assembly through said inlet and discharged vertically upwardly through said vertical outlet duct for passage through said chimney to efficiently cool said electronic data processing equipment.





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5,499,869

## DEVICE FOR ADJUSTING THE PRESSURE OF THE PLASTIC MATERIAL IN A SCREW EXTRUDER

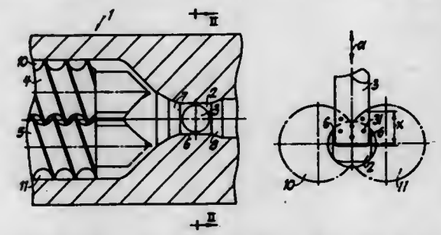
Wolfgang Lauser, Leonberg, Germany, assignor to Werner & Pfleiderer GmbH, Stuttgart, Germany

Filed Oct. 11, 1994, Ser. No. 320,454

Claims priority, application Germany, Jan. 11, 1993, 43 34 564.6

Int. Cl.[6] B28C 7/16; B29C 37/00

U.S. Cl. 366—77 8 Claims



1. Apparatus for adjusting the pressure of plastic material in an extruder comprising a melt channel at an outlet of the extruder for discharge of plastic material received from the extruder, said melt channel having a rectangular cross-section, and a plunger transversely and symmetrically disposed in said melt channel to block off part of the melt channel and form a flow passage for the plastic material between an end of the plunger and the remainder of the melt channel, said plunger being cylindrical and movable transversely in said melt channel to vary said flow passage, and thereby vary pressure of the plastic material in the extruder, said plunger being provided with at least one hole extending transversely through said plunger in the direction of flow of said plastic material for flow of said plastic material through said at least one hole in addition to the flow of the plastic material through said flow passage.

5,499,870

## MULTISCREW, CONTINUOUS MIXING MACHINE FOR PLASTICIZABLE COMPOUNDS

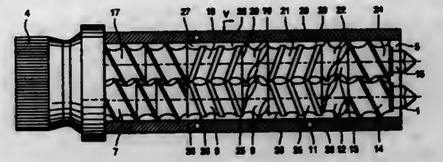
Siegward Rockstedt, Bad Neuenahr, Germany, assignor to Maschinenfabrik S. Rockstedt GmbH, Germany

Continuation of Ser. No. 163,262, Dec. 8, 1993, abandoned. This application Jun. 2, 1995, Ser. No. 466,833

Claims priority, application Germany, Nov. 12, 1993, 43 38 795.0

Int. Cl.[6] B01F 7/08

U.S. Cl. 366—85 6 Claims



1. A multiscrew, continuous mixing machine for plasticizable compounds which comprises a housing (2) having a cylindrical part and two shafts (1, 15) which rotate in the same direction and which penetrate the cylindrical part of the housing (2), wherein said housing and said shafts cooperatively form spaced apart feed and expelling sections and at least one melting and mixing section therebetween, wherein the feed and expelling sections are formed by intermeshing conveying screw segments (7, 17; 14, 24) on said shafts, and the melting and mixing section is formed by mixing segments on said shafts provided with opposed edges (25) which travel past each other with little clearance while rotating, wherein a chamber is formed to extend about the mixing segments such that the edges (25) are spaced a distance from the part of the housing (2) enveloping said edges that is significantly greater than the clearance between said edges, and wherein the mixing segments comprise process screw elements with opposite pitch whose lengths are generally identical such that within the chamber one process screw element feeds forward to a greater extent than the other process screw element feeds backward as plasticizable compounds are fed by said feed section thereby determining the resulting throughput in said chamber.

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5,499,871

## DEVICE FOR PRODUCING LIQUID EMULSION OF — HYDROPHOBIC AND HYDROPHILIC LIQUID

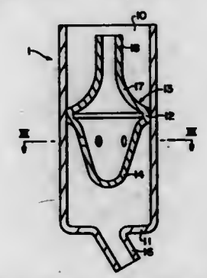
Armando Ulrich, Auw, and Walter H. Ott, deceased, late of Stäfa, both of, Switzerland, assignors to Tecno-Bio Co., Ltd., Tokyo, Japan

Division of Ser. No. 811,251, Dec. 20, 1991, abandoned. This application Aug. 7, 1992, Ser. No. 926,461

Claims priority, application Germany, Apr. 21, 1989, 8905075 U; Japan, Apr. 22, 1989, 1-103268

Int. Cl.[6] B01F 5/06

U.S. Cl. 366—136 3 Claims



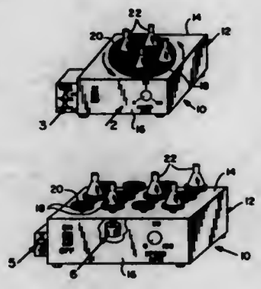
1. A device for producing a liquid emulsion of at least one hydrophobic liquid phase and at least one hydrophilic liquid phase

comprising a recirculation conduit path and a mixing apparatus provided in the recirculation conduit path, said mixing apparatus (1) having a longitudinal axis and comprising a hollow element (13) having a first and a second chamber portion, said first chamber portion having a plurality of tangential inlet openings (15) and having a rotational paraboloid form with a shape that tapers in a first direction, said first chamber portion (14) communicating with said second portion (17) having a shape which tapers in a second direction opposite to said first direction, said second portion (17) having an axial outlet being coaxial with said longitudinal axis of the mixing apparatus, said axial outlet of said second chamber portion (17) defining a cylindrical outlet duct portion (18), said first chamber portion (14) defining a focal line coaxial with said longitudinal axis of said mixing apparatus, the sum of the cross-sections of the inlet openings (15) substantially corresponding to the cross-section of said duct portion (18) and the differences between these cross-sections being at most 1:3,

a pressure equalizing chamber (11) having a bottom wall portion and an axis coaxial with said longitudinal axis of said mixing apparatus and having an aperture in said bottom wall portion located on said axis, said pressure equalizing chamber being provided around said first chamber portion (14) in which a fluid mixture of a hydrophobic liquid and a hydrophilic liquid may be circulated and passed through said tangential inlet openings (15), said pressure equalizing chamber having an inlet duct (16) for said fluid mixture communicating with said aperture and defining an acute angle with said axis of said pressure equalizing chamber (11) at said bottom wall.

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**5,499,872**
**TURNTABLE MIXER APPARATUS**
**Michael Baxter, 127-D Edgewater Park, Bronx, N.Y. 10465**
**Filed Mar. 14, 1994, Ser. No. 209,631**
**Int. Cl.[6] B01F *11/00***
**U.S. Cl. 366—213** **2 Claims**



1. A turntable mixer for mixing a substance consisting of:

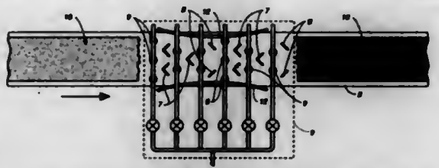
a) a turntable disk which is attached to a motor, said turntable disk being capable of supporting a sample container containing said substance, said motor causing the turntable disk to rotate in a horizontal plane;

b) a cycle timer having a time-on controller adjusting a time-on interval enabling the turntable disk to rotate and a time-off controller for adjusting a time-off interval disabling rotation of the turntable disk, said cycle timer creating a repeated time-on interval and time-off interval to create a mixing cycle;

c) a speed control for controlling the rotation speed of the turntable disk; and

d) a skid resistant pad atop the turntable disk.

**5,499,873**
**METHOD OF MIXING PARTICULATE MATERIAL USING A CONVEYOR BELT MIXING SYSTEM**
**David C. Cummins, Baton Rouge, and David L. Roussel, Hester, both of La., assignors to Kaiser Aluminum & Chemical Corporation, Pleasanton, Calif.**
**Division of Ser. No. 184,532, Jan. 21, 1994, abandoned. This application May 30, 1995, Ser. No. 452,690**
**Int. Cl.[6] B01F *15/02***
**U.S. Cl. 366—348** **5 Claims**



1. A process for mixing two or more particulate materials on a moving endless conveyor belt which comprises:

(a) adding to a first particulate material being conveyed on the belt a second particulate material;

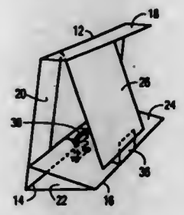
(b) contacting the moving admixture of the first and second material with at least one plow, having a pointed end and a flared end located above the surface of the moving belt, the plow being arranged in such a manner so that the pointed end of the plow faces in a direction opposite the direction of travel of the belt to allow the plow to lift and divert the particulate material being conveyed on the belt towards the side edges of the belt;

(c) providing at least two baffles located above the surface of the belt and positioned in such a manner so as to direct the admixture from the side edges of the belt towards the center of the belt; and

(d) recovering a uniform mixture of the first and second particulate material.

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**5,499,874**
**BAG HAVING EXPANDING APPARATUS THEREIN**
**Hin M. Tang, 10 Banksia Street, Eastwood NSW 2122, Australia**
**Filed Oct. 3, 1994, Ser. No. 317,935**
**Int. Cl.[6] A45C *7/00***
**U.S. Cl. 383—127** **11 Claims**



1. A bag expanding apparatus in combination with a soft bag comprising:

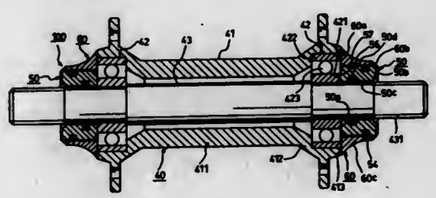
a soft bag having a major surface, a base and an expandable compartment such that the bag can assume a collapsed, flat state or an expanded state;

a bag expanding apparatus inserted in the compartment such that the bag can assume its collapsed shape during shipping in a shipping container, and then be caused to assume its expanded shape upon removal from the shipping container, the bag expanding apparatus comprising a unitary, flat foldable member having resilient actuating means associated therewith for urging the member to fold into a predetermined shape, said member having first, second and third parallel, spaced fold lines so as to form four panels including a first narrow panel, a second, wide panel adjacent to the first panel with the first fold line therebetween, said second panel having a centrally located flap extending the width of the second panel, said flap being hinged at the fold line between said first and second panels, a third panel adjacent the second panel having the second fold line therebetween and having a width so as to fit into the base of the bag; a fourth panel adjacent the third panel and having the third fold line therebetween, said fourth panel having a width about the same as that of the third panel; means for securing an elastic member across the third and fourth panels; an elastic member secured across the third and fourth panels to allow the apparatus to be maintained in a relatively flat state when compressed, and to be urged into an expanded state upon removal of compressive forces.



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**5,499,875**
**BICYCLE HUB ASSEMBLY**
**Chueh-Kuo Fu, No. 74, Sou-Yuch Rd., Tai-Ping Tsun, Hou-Li Hsiang, Taichung Hsien, Taiwan**
**Filed Dec. 23, 1994, Ser. No. 363,693**
**Int. Cl.[6] F16C *19/08***
**U.S. Cl. 384—545** **3 Claims**



1. A bicycle hub assembly, comprising:

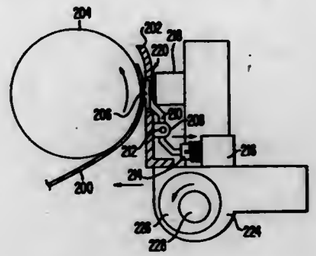
a hollow hub body having two enlarged end portions;

two bearing assemblies mounted respectively in said enlarged end portions, each of said bearing assemblies having an inner ring, an outer ring and bearing elements confined between said inner and outer rings, said outer ring being in tight contact with said hub body;

an elongated shaft passing rotatably through said hub body and fixed to said inner ring of each of said bearing assemblies, said elongated shaft having two ends extending outwardly of said hub body; and

a hub cover sleeved around said elongated shaft adjacent to each of said enlarged end portions of said hub body, said hub cover including an inner annular member sleeved around said elongated shaft adjacent to one of said bearing assemblies and an outer annular member sleeved around said inner annular member, said outer annular member having an axial inner end facing one of said enlarged end portions and an axial outer end opposite to said axial inner end, said inner annular member having an axial inner end, which is in contact with said inner ring and which is kept from contacting said outer ring and said one of said enlarged end portions, and an axial outer end, which is opposite to said axial inner end of said inner annular member and which extends outwardly of said axial outer end of said outer annular member.

**5,499,876**
**PRINTING APPARATUS HAVING HEAD GAP ADJUSTING DEVICE**
**Yoshiaki Hosokawa; Masaki Kaneh; Takashi Maekawa, and Hirofumi Nakayasu, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan**
**Continuation of Ser. No. 173,049, Dec. 27, 1993, abandoned, which is a division of Ser. No. 698,831, Apr. 24, 1991, Pat. No. 5,316,395. This application Sep. 12, 1994, Ser. No. 304,439**
**Claims priority, application Japan, Apr. 25, 1990, 2-109588; Jul. 5, 1990, 2-71113**
**Int. Cl.[6] B41J *11/20***
**U.S. Cl. 400—56** **4 Claims**



1. A printing apparatus comprising:

a carriage having a printing head for moving along and printing on a recording medium;

a platen disposed opposite said printing head;

first shift means for moving said printing head toward or away from said platen;

detecting means for detecting a thickness of the recording medium which is between said printing head and said platen, said detecting means outputting a detecting signal according to the thickness of the recording medium;

second shift means for relatively moving the detecting means toward or away from the surface of the platen;

first control means for variably controlling said first shift means to form a predetermined gap between said printing head and said platen in accordance with the detecting signal from said detecting means; and

second control means for controlling said second shift means to move said detecting means away from the surface of said platen after said detecting means detects the thickness of the recording medium, such that said detecting means does not contact the recording medium during a printing operation.

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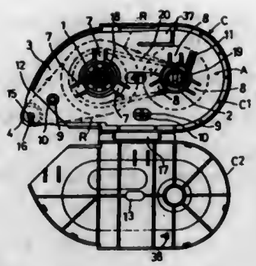
**5,499,877**
**TRANSFER RIBBON CASSETTE, A CASE FOR ENCLOSING THE CASSETTE, AND A PAINT FILM TRANSFER DEVICE HAVING THE SAME**
**Yutaka Sakanishi, and Kotaro Akashiro, both of Osaka, Japan, assignors to Fujicopian Co., Ltd., Japan**
**Filed Apr. 4, 1994, Ser. No. 222,453**
**Claims priority, application Japan, Apr. 6, 1993, 5-079437; Sep. 3, 1993, 5-219491; Sep. 9, 1993, 5-224089; Sep. 16, 1993, 5-229926; Sep. 30, 1993, 5-244934**
**Int. Cl.[6] B41J *35/02;35/28***
**U.S. Cl. 400—193** **20 Claims**

1. A transfer ribbon cartridge formed separately from a case and adapted to be enclosed in said case, said transfer ribbon cartridge comprising:

transfer ribbon;

a feed core for winding a transfer ribbon having a transfer film applied to one surface thereof, one end of a peripheral surface of said feed core having a first group;

a takeup core for taking up said transfer ribbon fed from said feed core, one end of a peripheral surface of said takeup core having a second groove;



a holder detachably held in said case, said holder having first and second engaging holes engaging with said feed core and said takeup core, respectively, said holder further including a first tongue extending in said first engaging hole for elastically engaging said first groove of said feed core, and a second tongue extending in said second engaging hole for elastically engaging said second groove of said takeup core whereby said feed core and said takeup core are rotatably supported by said holder at one end thereof; and

a transfer head provided in said holder for pressing said transfer ribbon upon a receiving surface to transfer said transfer film to said receiving surface.

wherein each of said feed core and said takeup core, when mounted in said case, has a free axial end thereof supported by said case.

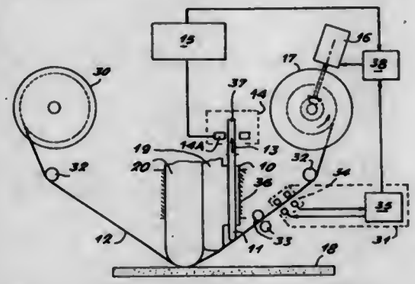
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**5,499,878**

**DEVICE FOR MODIFYING THE TENSION OF A RIBBON WOUND ON A TAKE-UP REEL IN THE EVENT OF THE CLINGING OF THE RIBBON TO A PRINTING MEDIUM**

**Paul Morgavi, La Ciotat, France, assignor to Gemplus Card International, Gemenos, France**

**Filed Apr. 12, 1995, Ser. No. 420,508**
**Claims priority, application France, Apr. 15, 1994, 94 04830**
**Int. Cl.[6] B41J *33/36***
**U.S. Cl. 400—223** **5 Claims**



1. A device for modifying the tension of a ribbon being wound on a take-up reel, a step motor, said take-up reel being driven rotationally by said step motor, a control system for controlling said step motor to obtain a linear speed of the ribbon that is constant irrespectively of the diameter of the ribbon on the take-up reel, said ribbon passing between the thermal printer head and a card to be printed on, so that the inks carried by the ribbon are deposited on the card to be printed on,

wherein said device comprises:

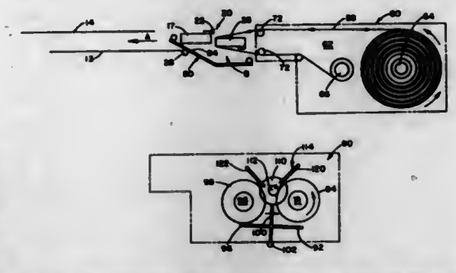
means for detecting the position of the ribbon with respect to its normal running plane and means for modifying the number of steps, per time unit, of the step motor when the ribbon moves away from its normal running plane.

**5,499,879**

**RIBBON CASSETTE DRIVE SYSTEM METHOD AND APPARATUS FOR PORTABLE COPIERS AND PRINTERS**

**Murray O. Meetze, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Apr. 28, 1994, Ser. No. 234,804**
**Int. Cl.[6] B41J *33/52***
**U.S. Cl. 400—234** **35 Claims**



15. A method of printing onto a copy sheet adjacent a print head, method comprising:

providing a ribbon cartridge having a housing, a supply spool, a take-up spool and a length of ribbon mounted upon said supply spool and extending in a path out of said housing and back into said housing to said take-up spool;

while printing with the print head onto the copy sheet, first advancing a first quantity of ribbon between the print head and the copy sheet in a first direction relative to the print head by:

i) driving the take-up spool in a first rotation direction;

ii) holding the supply spool stationary; and,

iii) slidably engaging the ribbon with the print head traversing in a first direction relative to the cartridge;

passing a first portion of said first quantity of ribbon between the print head and the copy sheet in a second direction relative to the print head opposite the first direction by:

i) permitting rotation of the take-up spool in a second rotational direction opposite the first rotation direction;

ii) holding the supply spool stationary; and,

iii) slidably engaging the ribbon with the print head traversing in a second direction relative to the cartridge opposite the first direction; and,

second advancing said first portion of said first quantity of ribbon between the print head and the copy sheet in said first direction relative to the print head by:

i) permitting rotation of the supply spool in a first rotational direction;

ii) holding the take-up spool stationary; and,

iii) slidably engaging the ribbon with the print head traversing in said direction.

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**5,499,880**

**PRINT HEAD INCLUDES DONOR GUIDE AND RECEIVER GUIDE**

**James E. Pickering, Holcomb, and Werner Fassler, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

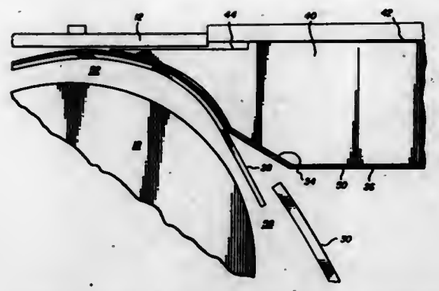
**Filed Mar. 15, 1995, Ser. No. 404,683**
**Int. Cl.[6] B41J *13/10***
**U.S. Cl. 400—642** **10 Claims**

1. A printer adapted to produce an image on a sheet of receiver medium, said printer comprising:

a print head and a platen that together define a print nip;

means defining a path for a sheet of receiver medium, said path leading in a forward direction, to a position at which it proceeds past the nip defined by the head and the platen, said path defining means including a sheet guide disposed along the path;





a transport system (i) for moving the sheet in said forward direction along the paths to the nip until a trailing edge of the sheet has left said sheet guide, whereat an image is produced on the sheet between leading and trailing edges of the sheet and (ii) for moving the sheet in a reverse direction along the path;

a loading guide surface for directing the leading edge of the sheet between the loading guide surface and the platen, toward the nip during an initial loading stage, said loading guide surface terminating short of the nip; and

a rewinding guide surface for directing the trailing edge of the sheet from the platen to the sheet guide during movement of the sheet in the reverse direction.

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**5,499,881**

**WRITING IMPLEMENT WITH CORRECTION SUPPLY**

**Pei-Sheng Chang, P.O. Box 82-144, Taipei, Taiwan**

**Filed Apr. 5, 1994, Ser. No. 223,018**
**Int. Cl.[6] B43K *29/00***
**U.S. Cl. 401—17** **10 Claims**



1. A writing implement with correction function comprising:

a barrel;

a reservoir tube inserted into said barrel and extending out said barrel at an opening; and

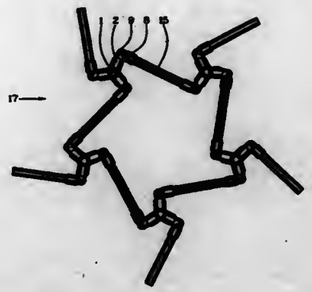
correction fluid filled into said barrel and capable of flowing out of said barrel through said same opening.

**5,499,882**

**REDUNDANT JOINT STRUCTURE AND METHOD**

**Robert W. Waterhouse, 249 E. Hayes Ave., Cocoa Beach, Fla. 32931**

**Filed Aug. 22, 1994, Ser. No. 293,588**
**Int. Cl.[6] A63H *33/10***
**U.S. Cl. 403—171** **7 Claims**



1. A redundant-joint structure comprising:

a plurality of three-sleeve pipe elbows;

inside peripheries of three sleeves of the plurality of three-sleeve pipe elbows having equal design sizes;

reference axes centrally intersecting elbow junctions from which the three sleeves of the pipe elbows are extended;

coupling axes of the three coupling sleeves having a design angle of forty-five degrees of circumferential separation from the reference axes;

a plurality of two-sleeve pipe elbows having ninety degrees of separation between a first coupling sleeve and a second coupling sleeve of each of the plurality of two-sleeve pipe elbows;

a plurality of cylindrical beams having equal outside peripheries that are equal at opposite ends of each of the plurality of cylindrical beams;

the first coupling sleeve of each of the plurality of two-sleeve pipe elbows has an inside periphery in which an outside periphery of an end of one of the plurality of cylindrical beams is positioned snugly;

the second coupling sleeve of each of the plurality of two-sleeve pipe elbows has an outside periphery positioned snugly in the inside periphery of a separate one of the three sleeves of the plurality of three-sleeve pipe elbows respectively; and

a structural assembly of the plurality of three-sleeve pipe elbows, the plurality of two-sleeve pipe elbows and the plurality of cylindrical beams.

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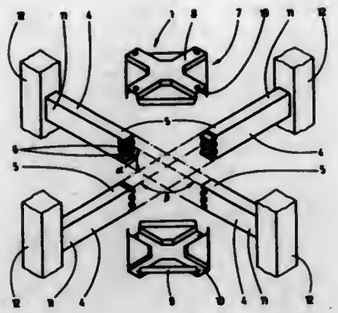
**5,499,883**

**STRETCHER OR CROSSRIB OF WOOD FOR CHAIRS AND TABLES**

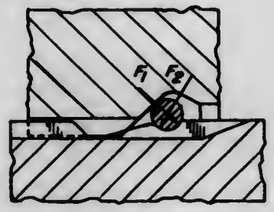
**Eberhard Heinzel, Hallenberg, Germany, assignor to Knoch & Co. Sitzmobelwerke KG., Hallenberg, Germany**

**Filed May 12, 1994, Ser. No. 242,806**
**Claims priority, application Germany, May 13, 1993, 43 15 805.6**
**Int. Cl.[6] F16B *12/10***
**U.S. Cl. 403—219** **4 Claims**

1. A crossrib (1) for seating furniture and tables, said crossrib (1) having four wooden rib parts (4), each of the rib parts having a free end with tenons formed thereon, said free ends of the rib parts being interconnected by the tenons, a connecting element (7) interconnecting the free ends (5) of said rib parts (4) form-fittingly into a cross, said connecting element (7) being composed of top and bottom parts (8 and 9) , said top part (8) and bottom part (9) holding said rib parts (4) in recesses in said top part (8) and bottom part (9), said connecting element (7) being screwed to said rib parts (4).

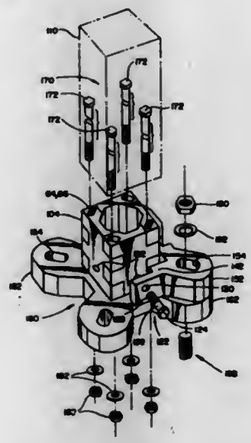


5,499,884
HUB ATTACHMENT ASSEMBLY
Wolfgang Kilsheld, Neu-Isenburg, and Rudolf Beier, Offenbach, both of, Germany, assignors to Lohr & Bromkamp GmbH, Offenbach/Main, Germany
Filed Mar. 8, 1993, Ser. No. 27,375
Claims priority, application Germany, Mar. 12, 1992, 42 07 839.3
Int. Cl.[6] F16B 21/18; F16D 1/06; B23P 19/08
U.S. Cl. 403—359 16 Claims



1. An assembly comprising:
a driveshaft having an axis and external splines at its shaft end;
a slide-on hub having a shaft bore with corresponding internal splines;
axial securing means in the form of a resilient snap ring engaging opposed recesses in the two sets of splines;
a first recess in one of the first of the two sets of splines form-fittingly engaging the snap ring in a substantially axially clearance-free way, said first recess having a first pair of flanks being inclined with respect to said axis;
a second recess in the second of the two sets of splines providing axial clearance for said snap ring when said snap ring engages said first recess, said second recess having a second pair of flanks being inclined with respect to said axis;
a run-on face on the same of the two sets of splines as said first recess said run-on face being enveloped by a conical face, a conical face having an opening angle, said conical face opening angle, relative to a flank angle of a rear flank of said second pair of flanks of said second recess, is so small that no self-inhibition occurs at the axially loaded snap ring when the shaft and hub are inserted into one another, and said run-on face, with reference to the mutual engagement of the two sets of splines, being positioned in front of the said first recess with said run-on face front annular edge, with reference to the mutual engagement of the two sets of splines, cutting more deeply into said first of two sets of splines than the base of the first recess;
a front flank of said second pair of flanks at the second recess having a flank angle, relative to the flank angles of the first pair of flanks of the first recess, such that said inclined flanks when contacting said snap ring generate self-inhibition at the axially loaded snap ring in both axial directions, thus prohibiting destruction-free detaching of the hub and shaft, with the depth of the second recess being dimensioned such that the snap ring may enter said second recess if, with reference to the first of the two sets of splines, the snap ring is positioned between a rear annular edge of the run-on face and the adjoining shoulder line of said first recess.

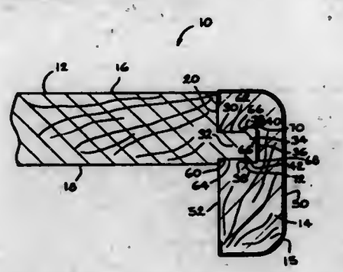
5,499,885
APPARATUS FOR JOINING STRUCTURAL COMPONENTS
William A. Chapman, 2706 S. Horseshoe Dr., Naples, Fla. 33942
Filed May 6, 1993, Ser. No. 58,871
Int. Cl.[6] F16B 1/00; E02D 27/42
U.S. Cl. 403—380 59 Claims



1. Apparatus for joining first and second components when the first component has a passageway formed therein with inner surfaces of the first component extending along the length of and defining the passageway which opens to the exterior of the first component, comprising:
(a) a plurality of members assembled into a coupling device to be placed inside of a passageway of a first component,
(b) means for moving at least one of said plurality of members with respect to the other members after said coupling device is placed in such a passageway so that said members are in engaging contact with inner surfaces of a first component which extend along the length of and define the passageway,
(c) means for securing said members of said coupling device into a unitary structure when said members are in said inner surfaces engaging contact in the passageway to prevent movement of said members with respect to each other in response to changing load conditions and to maintain said members and said unitary structure in a stable inner surfaces engaging contact position, and
(d) means for attaching said unitary structure to a second component.



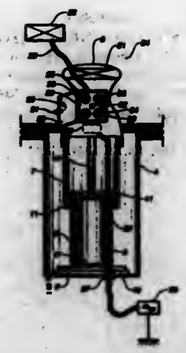
5,499,886
COUPLING ASSEMBLY FOR FURNITURE COMPONENTS
Michael K. Short; Jerry D. Grieser, both of Archbold; Richard A. Nelson, Napoleon; Thomas B. Warner, Archbold, and Ferrel M. Maguire, West Unity, all of Ohio, assignors to Sauder Woodworking Co., Archbold, Ohio
Filed Mar. 2, 1994, Ser. No. 205,592
Int. Cl.[6] F16B 12/08
U.S. Cl. 403—381 10 Claims



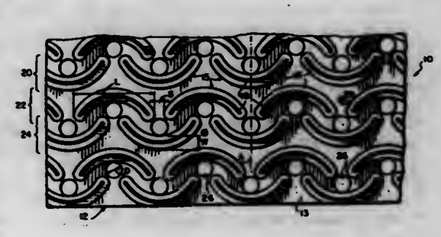
1. A coupling assembly for joining together two ready-to-assemble furniture members comprising, in combination:
a composite furniture member consisting of compressed wood particles having an outwardly projecting tongue, said tongue including a central portion and a single terminal portion including a front wall and two opposed back walls, a top wall and an opposed bottom wall, said front wall being substantially parallel to said back walls, said top wall being substantially parallel to said bottom wall, said front and back walls being substantially perpendicular to said top and bottom walls, said terminal portion having a geometric configuration; and
a composite trim member consisting of compressed wood particles having an exterior side and an interior side, said trim member defining a single groove on said interior side, said groove being defined by opposed first and second central portion receiving walls that extend inwardly perpendicular to said interior side of said trim member, said trim member further defining two back receiving walls opposed to and substantially parallel to a front receiving wall, a top receiving wall opposed to and substantially parallel to a bottom receiving wall, said front and back receiving walls being in a substantially perpendicular relationship to said top and bottom receiving walls, whereby said groove receives said central portion and said terminal portion of said tongue to join together said furniture member and said trim member.

5,499,887
ELECTRIC RETRACTABLE BOUNDARY MARK
Yvan Verra, Merieres-Les-Avignon, France, assignor to Urbaco (S.A.R.L.), Vedene, France
PCT No. PCT/FR93/01250, § 371 Date Jul. 14, 1994, § 102(e) Date Jul. 14, 1994, PCT Pub. No. WO94/15027, PCT Pub. Date Jul. 7, 1994
PCT Filed Dec. 15, 1993, Ser. No. 256,612
Claims priority, application France, Dec. 22, 1992, 92 15754
Int. Cl.[6] E01F 9/00
U.S. Cl. 404—6 8 Claims

1. A retractable boundary mark comprising a movable boundary mark body which can move inside a housing approximately corresponding with a casing whose upper face is open, from a working position wherein said body fixedly extends so that its top is approximately level with an open end of the housing, the movable boundary mark body forming an integrated electric distribution point which is power supplied by a source of electric power in order that at least one consumer being placed on or connected to said movable boundary mark body can work, said boundary mark comprises at least a socket placed in at least one tight housing provided in the body of the boundary mark, said socket enabling an outer consumer to be connected to the source of electric power when said boundary mark is in the working position.

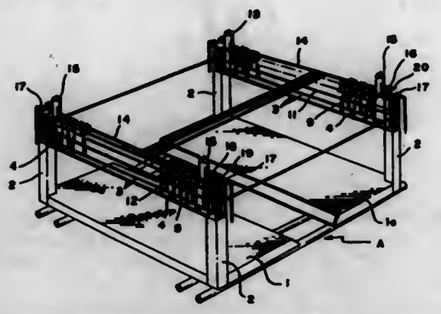


5,499,888
BIDIRECTIONAL ROADWAY FOR WHEELED VEHICLES
E. Gerry Hawkes, R.F.D. 1, Box 247, Wayside Rd., Woodstock, Vt. 05091
Filed Mar. 29, 1995, Ser. No. 413,167
Int. Cl.[6] E01C 11/24
U.S. Cl. 404—19 8 Claims



1. In a roadway for bicycle and other tired wheel vehicles comprising a molded modular, self-supporting track extending longitudinally in the direction of vehicle travel and including a generally rigid roadway base having opposed top and bottom surfaces, a plurality of transversely arranged, arcuate ridges carried by said base and projecting upwardly therefrom above said top surface for engagement with a tire tread, individual arcuate ridges being spaced from each other longitudinally and laterally, the improvement wherein;
said arcuate ridges form alternating lateral rows of longitudinally spaced, oppositely facing arcuate ridges,
said arcuate ridges of a given row being offset laterally from corresponding arcuate ridges of adjacent longitudinally spaced rows by one half the length of an arcuate ridge, and
said arcuate ridges of each lateral row being spaced from each other a distance such that the ends of the arcuate ridges of a given row lie within the concave curve of the arcuate ridges of an adjacent, oppositely facing lateral row, whereby;
a pattern of interlocking traction arcuate ridges minimize vehicle wheel vibration, allow easy rolling of the vehicle and provide slip resistance to the vehicle wheels in all directions, while facilitating bidirectional travel of the vehicles longitudinally over the roadway.

5,499,889
**WAVE POWER GENERATOR**
Myung-Shik Yim, 642 Obeng-li, Hall-myun, Gimpo-gun, Kyungsangnam-do 638-920, Rep. of Korea
Filed Nov. 22, 1994, Ser. No. 345,768
Claims priority, application Rep. of Korea, May 22, 1992, 8731/92
Int. Cl.[6] F03B 13/12
U.S. Cl. 405—76 2 Claims

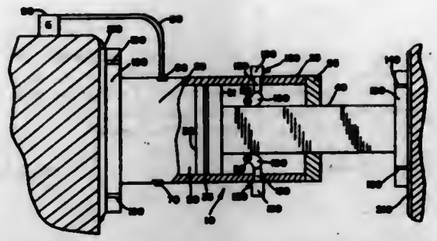


1. A wave motion power generator comprising:
a frame, including ballast members and buoyancy members mounted toward edges of the ballast members;
first cross members extending between opposed buoyancy members;
a plurality of pairs of cylinders, each cylinder having an inlet in a lower end thereof and being mounted on a respective one of the first cross members;
a hollow piston rod associated with each cylinder, the rod having an opening at a lower end thereof and a collapsible piston head arranged to be deployed and to draw water into the cylinder as the rod is moved away from the opening and to collapse as the rod is moved towards the said opening;
second cross members extending between the said opposed buoyancy members;
support bars extending upwardly from the second cross members;
a buoyancy plate having elongate openings through which the support bars extend, the buoyancy plate being connected to the piston rods associated with a pair of the cylinders;
a pressure reservoir;
a manifold connected with the reservoir;
a flexible conduit connected between each piston rod and the manifold; and
an electricity generator driven by liquid discharged from the reservoir.

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5,499,890
**TRENCH SHORING DEVICE WITH LOCKING MECHANISM**
Mitsuhiro Kishi, Tokyo, Japan, assignor to Americ Corporation, Elk Grove Village, Ill.
Filed Jul. 8, 1994, Ser. No. 277,488
Int. Cl.[6] E02D 17/04
U.S. Cl. 405—282 3 Claims

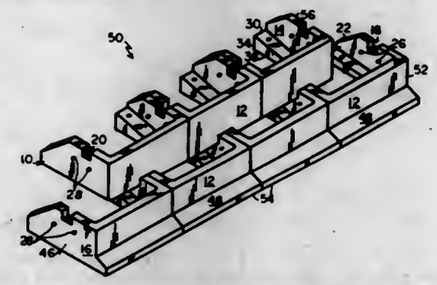
1. A hydraulic treach shoring device comprising:
a cylinder having an initially open end and a closed end;
a piston having a top side and a bottom side, the piston being reciprocal within the cylinder, and the bottom side of the piston forming a pressure chamber with the closed end of the cylinder;
an elongated piston rod having two ends, the first end connected to the top side of the piston and the second end extending radially outwardly from the open end of the cylinder, the elongated piston rod having a generally square cross-sectional geometry;



a cylinder end cap having a portion removed to define an opening, the cylinder cap engaging and forming a slidable seal with the elongated piston rod, and enclosing the open end of the cylinder;
means for introducing hydraulic fluid into the pressure chamber thereby causing the piston to slide within the cylinder and the elongated piston rod to extend radially outwardly from the opening in the cylinder cap; and,
means for locking the elongated piston in an extended position relative to the cylinder and preventing the retraction of the elongated piston rod back into the cylinder, said locking means including:
a pair of camming lobes positioned on opposite sides of the elongated piston rod within the cylinder;
a set of securing pins, each camming lobe being pivotable about a securing pin;
and,
means for exerting a force on each camming lobe such that the camming lobes pivot about the securing pins and make contact with opposing sides of the elongated piston rod thus securing the elongated piston rod in its operable position.

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5,499,891
**EARTH-RETAINING MODULE AND SYSTEM**
Oskar H. Klenert, South Easton, Mass., assignor to Earth Stabilizing Technology, Inc., Raynham, Mass.
Filed Feb. 17, 1994, Ser. No. 198,180
Int. Cl.[6] E02D 29/02
U.S. Cl. 405—284 27 Claims

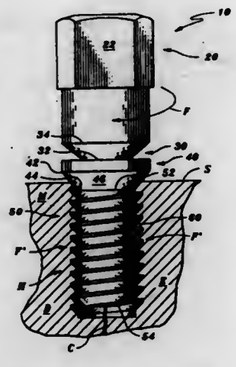


1. In an earth-retaining module adapted for use with other modules to form an interlocked, earth-retaining wall system to stabilize embankments and to reduce erosion, which module comprises:
a) an upright front wall having a top and a bottom, and upright side walls, each having a top, a bottom, front and rear to form a structure open at the top and adapted to receive fill material therein;
b) each of the side walls having at least one open notch on the top of the side walls, the notches generally aligned and of a width to accept in an interlocked manner, the width of the bottom of the froat .wall of a module in the next higher row in a wall system; the improvement which comprises a "dead man" wing side wall means, which comprises a structure which slopes downwardly from the rear of the side walls toward the front of the side walls and positioned on the inside of each of the side walls of the module and extending from about the center of the side walls toward the rear of the side walls and of sufficient weight to place the center of gravity of the module toward the rear of the module.



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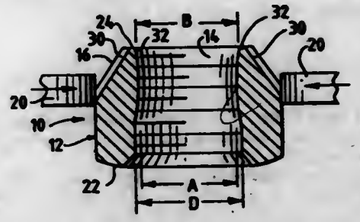
5,499,892
**APPARATUS FOR REPAIRING CRACKS**
Gary J. Reed, Turlock, Calif., assignor to Lock-N-Stitch International, Turlock, Calif.
Continuation-in-part of Ser. No. 77,854, Jun. 16, 1993, Pat. No. 5,379,585. This application Dec. 17, 1993, Ser. No. 174,121
Int. Cl.[6] F16B 31/00;39/28
U.S. Cl. 411—5 12 Claims



1. A pin for location into a threaded hole for cold repair of a crack comprising, in combination:
a hole that straddles the crack in a material having a surface, the hole including a first curved wall on a first side of the crack and a second curved wall on a second side of the crack, said hole including hole threads therein with a major diameter and a minor diameter with a portion of each hole thread adjacent the major diameter closer to the surface than any other portion of the hole threads,
a head on said pin including a means to transfer torque to said pin,
a threaded shaft on said pin extending from said head along a central axis, and at least one of said shaft threads including a crest defining a major diameter of said threaded shaft, a root defining a minor diameter of said threaded shaft, and an upper surface extending from a bottom edge of said root to an upper edge of said crest, said upper surface having a portion thereof extending toward said crest at an angle greater than zero from a reference plane perpendicular to said central axis of said pin, and
means for opposing central axis translation of said pin disposed on said pin and positioned to contact the material near the crack;
said pin is threaded into said hole, said central axis translation opposition means coacts with said threads of said hole and said threads of said pin and causes further rotation of said pin to force the first side of the crack and the second side of the crack together.

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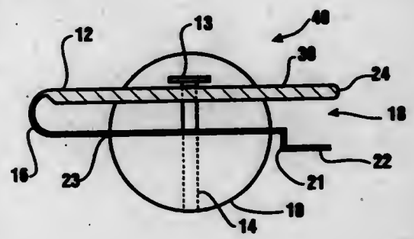
5,499,893
**FLEXIBLE LOCK NUT AND METHOD OF MANUFACTURING**
Raymond L. Thurston, Medina, and Steven H. Schulenberg, Twinsburg, both of Ohio, assignors to Illinois Tool Works Inc., Glenview, Ill.
Filed Dec. 29, 1993, Ser. No. 175,322
Int. Cl.[6] F16B 39/22;39/28
U.S. Cl. 411—282 24 Claims



1. A low profile lock nut for receiving a threaded bolt, comprising:
a body portion having a threaded axial bore extending therethrough, and wherein said body portion and said threaded axial bore have first and second opposite axial ends;
engagement means disposed upon at least one portion of said axial bore and positioned a predetermined distance from each one of said first and second opposite axial ends for lockingly engaging the threads of the bolt upon installation of said bolt within said axial bore without distorting said bolt threads; and
crown means formed upon one of said first and second opposite axial ends of said body portion and comprising thinned portions which extend from said one of said first and second opposite axial ends to an axial position which substantially corresponds to the axial disposition of said engagement means so as to provide said body portion with a predetermined degree of flexibility along the axial extent between said engagement means and said one of said first and second opposite axial ends and in a radial direction with respect to said axial bore such that upon engagement of said engagement means by said bolt when said bolt is threadedly inserted within said threaded axial bore, said thinned portions of said crown means will permit flexure of said body portion defined between said engagement means and said one of said first and second opposite axial ends of said body portion so as to provide said lock nut with a relatively low installation torque and a relatively high removal torque.

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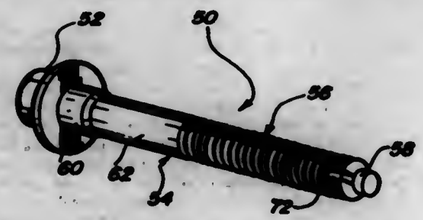
5,499,894
**KEYBOLT FASTENER**
Scott E. Alte; Roger E. Alte, both of Greenwich, and Frank C. Collister, Port Clinton, all of Ohio, assignors to Perma Manufacturing Inc., Greenwich, Ohio
Filed Apr. 29, 1994, Ser. No. 235,058
Int. Cl.[6] F16B 21/00
U.S. Cl. 411—340 6 Claims



1. A Keybolt comprising:
a bolt member having a first end;
a key member movably mounted on said bolt member at said first end wherein said key member is movable in both a longitudinal and rotational direction on said bolt member, and wherein said key member includes a pair of legs, each of said legs having an elongated channel therein, and wherein said bolt member includes a recess at said first end and wherein said keybolt further comprises a rivet member mounted on said bolt member, said rivet member extending in said recess and through each channel of said key member.

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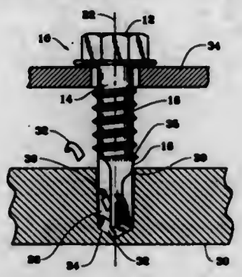
5,499,895
**BOLT INCLUDING A CLEANING THREAD POINT TIP**
John Allen, Clarkston, Mich., assignor to Ring Screw Works, Madison Heights, Mich.
Continuation-in-part of Ser. No. 103,906, Aug. 10, 1993, Pat. No. 5,374,146. This application Sep. 13, 1994, Ser. No. 304,939
Int. Cl.[6] F16B 25/00; 35/04
U.S. Cl. 411—386 4 Claims




1. A fastener comprising:
a shank having two ends;
a head on one end of said shank;
a dog tip at the other end of said shank;
a threaded portion on said shank adjacent said tip; and
a pair of recesses on said shank positioned 180° from one another, said recesses formed substantially flush and continuous with said tip and extending through a second full thread of said threaded portion but not through a third full thread and said recesses have a substantially uniform depth in said shank.

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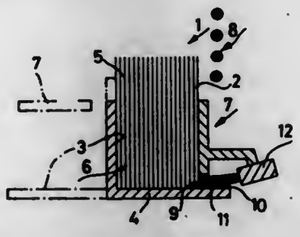
5,499,896
**COMBINED DRILL SCREW WITH REAMER**
Robert S. Cafarelli, 467 Flag Branch Rd., Greeneville, Tenn. 37743
Filed Jun. 23, 1994, Ser. No. 265,379
Int. Cl.[6] F16B 25/00
U.S. Cl. 411—387 7 Claims




1. A drill screw with reamer comprising:
a shank having a head at a first end, a drill bit at a second end and a threaded section therebetween, said threaded section having a continuous screw thread according to right-hand clockwise convention with a bevel means disposed at an end of said screw thread adjoining said drill bit, said drill bit having a counter-clockwise cutting bit being operatively adapted such that drilling with said bit is performed only by rotating said shank in a counter-clockwise rotational direction opposite to that used to screw said threaded section; wherein said drill screw is attached to a solid structure by releasably securing a rotatable tool to said drill screw head placing said second end against the solid structure, rotating said drill screw in a counter-clockwise rotation forms a hole through a with said bevel means preventing said drill bit from entering the formed hole and further providing a reaming of an outer edge of the formed hole, reversing the rotation of said drill screw permits said threaded portion to enter the formed hole allowing securement thereto.

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5,499,897
**ARRANGEMENT FOR MANUFACTURING BOOK BLOCKS FORMED OF ADHESIVELY BOUND PRINTED SHEETS**
Christoph Frei, Frauenfeld, Switzerland, assignor to Grapha-Holding AG, Hergiswil, Switzerland
Filed Sep. 6, 1994, Ser. No. 301,173
Claims priority, application Switzerland, Sep. 24, 1993, 02893/93
Int. Cl.[6] B42C 11/00
U.S. Cl. 412—18 7 Claims



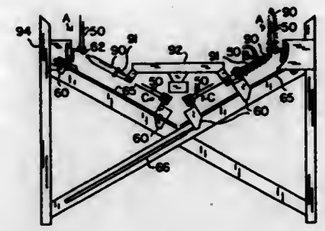

1. An arrangement for manufacturing book blocks formed of stacks of adhesively bound printed sheets, the printed sheets having rear folded edges, the arrangement comprising a guide duct comprising a wound guide wall for moving each stack from an approximately horizontal position into a vertical position, the guide wall having a lower edge, a support element connected to and projecting approximately at a right angle from the lower edge of the guide wall for guiding the stack at the rear folded edges of the printed sheets, and a guide rail, means for adjusting the guide rail in accordance with a height of the stack, an opening being defined between the support element and the guide rail, further comprising a filling element mounted so as to extend into the opening and to contact the support element.

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5,499,898
**APPARATUS FOR TESTING CONDOMS**
Nathan Venier, Hermitage, Tenn., and Jim Whitten, Albany, Ga., assignors to Agri Dynamics, Inc., Albany, Ga.
Filed Nov. 4, 1994, Ser. No. 334,744
Int. Cl.[6] B65G 49/05; 51/02
U.S. Cl. 414—755 11 Claims

1. An apparatus for testing condoms comprising:
(A) retrieving means to deliver condoms to orienting means;
(B) orienting means to orient said condoms into a particular configuration and orientation;
(C) suction means to draw said condoms through said orienting means and into a receiving means;

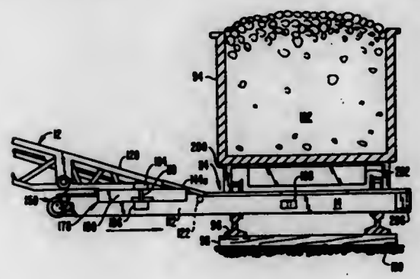





(D) said receiving means for placing said condoms onto a loading means;
(E) said loading means for loading said condoms onto a mandrel.

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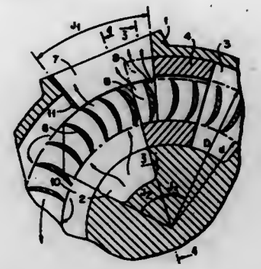
5,499,899
**MOBILE CONVEYOR SYSTEM**
J. C. Hibbs, Santa Cruz, Calif., assignor to Granite Rock Company, Watsonville, Calif.
Division of Ser. No. 967,348, Oct. 28, 1992, Pat. No. 5,360,097. This application Sep. 30, 1994, Ser. No. 315,463
Int. Cl.[6] B65G 67/24
U.S. Cl. 414—786 6 Claims




1. A method of unloading rail cars comprising the steps of:
providing a truck with a conveyor mounted thereto at a coupling and having first and second end portions;
transporting the conveyor with the truck to a rail car to be unloaded;
positioning the conveyor over the truck with the first end portion of the conveyor in the vicinity of a deposit site and the second end portion spaced-apart from the rail car, wherein the conveyor is positioned by horizontal rotation of the conveyor about the coupling;
axially translating the second end portion relative to the first end portion to a position beneath the rail car;
discharging cargo from the rail car to the second end portion of the conveyor; and
conveying the discharged cargo to the first end of the conveyor for transfer to the deposit site.

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5,499,900
**VORTEX FLOW BLOWER**
Vladimir N. Khmara; Ljudmila N. Beletcleva, both of Moscow, and Vladimir N. Sergeev, Moskovskaya, all of, Russian Federation, assignors to Joint Stock Company En & Fi, Moscow, U.S.S.R.
Filed Aug. 26, 1994, Ser. No. 296,819
Claims priority, application Russian Federation, Dec. 29, 1992, 92-015131/06
Int. Cl.[6] F04D 5/00; 29/40
U.S. Cl. 415—55.1 5 Claims

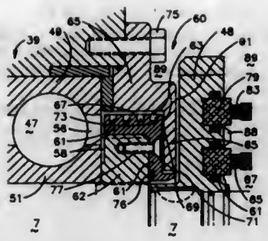


1. A vortex compressor comprising:
(I) a casing having an annular, circumferential working channel;
(II) a rotor,
(A) said rotor having a plurality of blades, and
(B) said rotor rotatably mounted in said casing;
(III) an inlet,
(A) said inlet having an upstream edge and and a downstream edge,
(1) said upstream edge of said inlet defining a radial line;
(IV) an outlet;
(V) an orifice defining a second outlet;
(VI) a stripper seal;
(A) said stripper seal being disposed in said working channel,
(B) said stripper seal having an upstream edge and a downstream edge,
(1) said downstream edge defining a radial line,
(C) said stripper seal having a first radially inward member,
(D) said stripper seal having a second radially outward member,
(E) wherein said first and second members are circumferentially offset from one another;
(VII) wherein said radial line that is defined by said upstream edge of said inlet is the same as the radial line that is defined by said downstream edge of said stripper seal;
(VIII) wherein at least a portion of said inlet lies on a common radial line with said orifice.

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5,499,901
**BEARING FRAME CLEARANCE SEAL CONSTRUCTION FOR A PUMP**
Robert E. Rockwood, Windham, N.H., assignor to Environamics Corporation, Hudson, N.H.
Filed Mar. 17, 1994, Ser. No. 214,320
Int. Cl.[6] F04D 29/12
U.S. Cl. 415—111 13 Claims

7. A clearance seal construction in a pump for simultaneously preventing (i) lubricating fluid from migrating away from a pump shaft bearing frame, and (ii) foreign contaminants from leaking into or reaching said bearing frame, said clearance seal construction comprising:
a clearance sealing passageway disposed adjacent said pump shaft bearing frame, a first elongated portion of said sealing passageway being substantially parallel to and circumferentially surrounding a rotating pump shaft;



said first portion of said sealing passageway being defined by a stationary member and a sealing rotating member, said rotating member being annular in nature and affixed to said pump shaft for rotation therewith, said stationary member circumferentially surrounding the radially outer periphery of said rotating member;

at least one sealing groove defined in said radially outer periphery of said rotating member, said at least one sealing groove creating a sealing air flow in said first portion of said sealing passageway between said stationary member and said rotating member, said sealing air flow preventing said lubricating fluid from migrating away from said bearing frame via said passageway when said rotating member is rotated along with said pump shaft; and

a second portion of said clearance sealing passageway extending radially with respect to said pump shaft and being substantially perpendicular relative to said first portion of said passageway, said rotating member defining a plurality of sealing vanes along said second portion of said sealing passageway, said vanes providing a centripetal action for preventing passage of said foreign contaminants radially outward through said second passageway portion toward said first portion and said bearing frame when said pump shaft is rotated, said rotation of said vanes thereby preventing said foreign contaminants from passing through said sealing passageway and reaching said bearing frame.

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**5,499,902**

**ENVIRONMENTALLY SAFE PUMP INCLUDING SEAL**

**Robert E. Rockwood, Windham, N.H., assignor to Environamics Corporation, Hudson, N.H.**

**Division of Ser. No. 253,664, Jun. 3, 1994, which is a division of Ser. No. 101,940, Aug. 4, 1993, Pat. No. 5,340,273, which is a division of Ser. No. 803,807, Dec. 4, 1991, Pat. No. 5,261,676. This application Jan. 17, 1995, Ser. No. 373,394**

**Int. Cl.[6] F04D *29/14***

**U.S. Cl. 415—113** **9 Claims**



1. A motor driven pump comprising:

a motor housing having disposed therein a motor for rotatably driving a rotating shaft, said rotating shaft extending from said motor and being at least partially located within a pump housing;

said pump housing being connected to said motor housing, said pump housing including a pump chamber in which fluid to be pumped is pumped between a fluid inlet and a fluid outlet;

a pumping member affixed to said rotating shaft and disposed within said pump chamber;

a piston seal located along said shaft between said motor and said pumping member;

a fluid repeller located along and affixed to said shaft between said pump chamber and said piston seal, said fluid repeller including a plurality of radially outward extending portions substantially parallel to one another, said radially outward extending portions working together with a plurality of fixed radially inward extending members so as to resist the flow of fluid from said pump chamber toward said piston seal; and

wherein said piston seal includes:

(a) a rotating annular sealing surface fixedly attached to said shaft for rotation therewith;

(b) a non-rotating annular sealing member opposing said rotating sealing surface; and

(c) a piston for applying pressure to the rear of said non-rotating annular sealing member so that the front of said non-rotating sealing member creates a seal with said rotating sealing surface.

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**5,499,903**

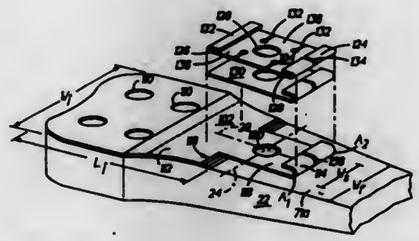
**SNUBBER BEARING MOUNTING ASSEMBLY FOR BEARINGLESS ROTORS**

**David N. Schmaling, Oxford; Frederick J. Miner, Torrington, both of Conn., and Francis E. Byrnes, White Plains, N.Y., assignors to United Technologies Corporation, Hartford, Conn.**

**Filed Oct. 18, 1994, Ser. No. 324,559**

**Int. Cl.[6] B64C *27/00***

**U.S. Cl. 416—134 A** **18 Claims**



1. A mounting assembly (100) for securing a helicopter snubber bearing (70) to a bearingless rotor assembly (10) and for establishing a redundant load path for reacting centrifugal loads acting on tile snubber bearing (70), the bearingless rotor assembly (10) having a flexbeam connector (22) mounted to a torque drive hub member (18), the snubber bearing (70) furthermore having an inner bearing race portion (88), comprising:

a retainer fixture (102) mounted to the flexbeam connector (22), said retainer fixture (102) having an inboard end portion (112), a restraint portion (114) extending radially outboard thereof, and a seat portion (116) disposed therebetween;

a retainer (104) disposed in register with said seat portion (116) of said retainer fixture (102) and having inboard and outboard end portions (122, 124), said outboard end portion (124) abutting said restraint portion (114), said retainer (104) furthermore engaging the inner bearing race portion (88) of the snubber bearing (70); and,

a compliant adhesive (130) for bonding said retainer (104) to said retainer fixture (102).



**5,499,904**

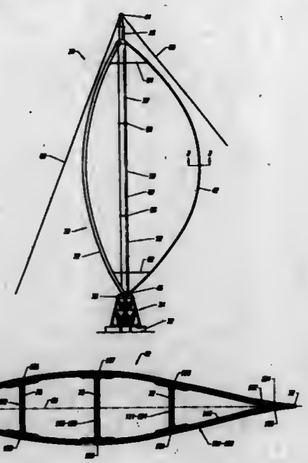
**VERTICAL AXIS WIND TURBINE WITH PULTRUDED BLADES**

**Vernon R. Wallace, Dublin; Michael S. McMullen, Tiburon, and William R. Archibald, Petaluma, all of Calif., assignors to FloWind Corporation, San Rafael, Calif.**

**Division of Ser. No. 90,912, Jul. 12, 1993, Pat. No. 5,375,324. This application Sep. 29, 1994, Ser. No. 314,875**

**Int. Cl.[6] F04D *29/38***

**U.S. Cl. 416—230** **29 Claims**



1. A blade for a Darrieus-type vertical axis wind turbine comprising:

a fiber-reinforced-resin composite structure defining an airfoil shape extending lengthwise between two ends, wherein the fiber-reinforced-resin composite structure has a lengthwise central axis that is nominally straight prior to attachment to the wind turbine and is elastically bent into a curved shape when attached to the wind turbine; and

means for attaching the ends of the fiber-reinforced-resin composite structure to the wind turbine.

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**5,499,905**

**METALLIC COMPONENT OF A GAS TURBINE INSTALLATION HAVING PROTECTIVE COATINGS**

**Friedhelm Schmitz, Dinslaken; Norbert Czech, Essen, and Bruno Deblon, Mülheim/Ruhr, all of, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany**

**Division of Ser. No. 798,871, Nov. 25, 1991, which is a continuation of Ser. No. 593,084, Oct. 5, 1990, abandoned. This application Mar. 20, 1995, Ser. No. 406,662**

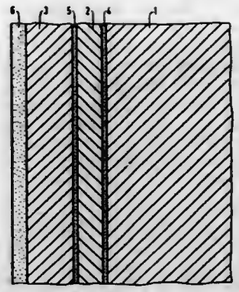
**Claims priority, application Germany, Feb. 5, 1988, 38 03 517.0**

**Int. Cl.[6] F01D *5/28***

**U.S. Cl. 416—241 R** **14 Claims**

10. A metallic gas-turbine blade formed of a nickel-based base material which is cooled on the inside and which is provided, at least in a subregion thereof with:

a) a first coating layer protecting against corrosion at temperatures of 600° to 800° C., said first coating layer being a deposition layer having a composition in percent by weight of 15 to 30% chromium, less than 5% aluminum, 0.5 to 2% of at least one element selected from the group of elements consisting of rare earths, yttrium, tantalum, hafnium, scandium, zirconium, niobium and silicon, and a remainder of at least one of the elements iron and nickel, as well as impurities resulting from manufacturing;



b) a second coating layer superimposed on said first coating layer for protecting against corrosion at temperatures of 800° to 900° C., said second coating layer having a composition in percent by weight of 15 to 40% chromium, substantially 7 to 15% aluminum, 0.2 to 3% of at least one element selected from the group of elements consisting of rare earths, yttrium, tantalum, hafnium, scandium, zirconium, niobium, rhenium and silicon, and a remainder of at least one of the elements cobalt and nickel, as well as impurities resulting from manufacturing; and

c) a diffusion barrier layer disposed between any two of said basic material and said first and said second coating layers for reducing diffusion processes between respective compositions of materials thereof.

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**5,499,906**

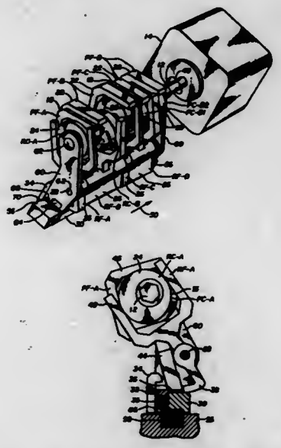
**IV FLUID DELIVERY SYSTEM**

**Stephen H. O'Leary, Encinitas, Calif., assignor to IVAC Corporation, San Diego, Calif.**

**Filed Aug. 8, 1994, Ser. No. 287,624**

**Int. Cl.[6] F04B *43/08***

**U.S. Cl. 417—53** **15 Claims**



15. A method for delivering fluid through a resilient, deformable tube in a pump having first support means and second support means for supporting said tube, drive means for generating a pumping action on said tube, pinching means operatively engaged with said drive means for applying force on said tube to occlude said tube, pumping means operatively engaged with said drive means for applying force on said tube without occluding said tube, restoring means operatively engaged with said drive means for

applying force on said tube against said second support means to urge the restoration of the cross-sectional shape of said tube, said method comprising:

placing said tube against said first support means, advancing said pinching means to occlude said tube under the force of said pinching means and retracting said pinching means, advancing said pumping means on said tube to compress said tube under the force of said pumping means and retracting said pumping means, and urging said occluded or compressed tube to restore its cross-sectional shape under the force of said restoring means.

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**5,499,907**

## ROLLER PUMP FOR HEART-LUNG MACHINES

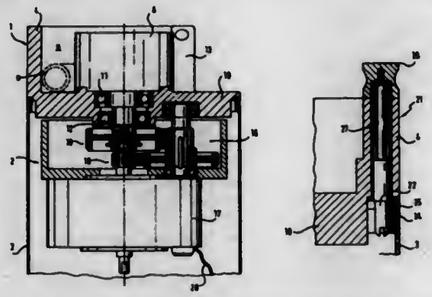
**Erwin Knott, Puing, and Günter Friedmann, Ubersee, both of, Germany, assignors to Stöckert Instrumente GmbH, Munich, Germany**

**Filed Feb. 13, 1995, Ser. No. 387,689**

**Claims priority, application European Pat. Off., Feb. 16, 1994, 94102331**

**Int. Cl.[6] F04B *17/00;43/08***

**U.S. Cl. 417—360** **11 Claims**





1. Roller pump for heart-lung machines including a pump head (1) comprising a pump stator (4) having a pump bed serving as a support for a hose piece (9), and a pump rotor (6) arranged in said pump stator for rotation about a central longitudinal axis of said pump rotor, a roller carrier (7) rotatably supporting rollers (8) on said pump rotor, said rollers traveling along the hose piece which is inserted into the pump head (1) during a rotational movement of the pump rotor (6); a drive unit (2) for producing the rotational movement of the pump rotor (6); a pump housing (3) for supporting the pump head (1) and for receiving the drive unit (2), said drive unit (2) being connected with the pump head (1) such that the pump head (1) is movable relative to the pump housing (3); and a locking device (21) for releasably securing the pump head (1) to the pump housing (3).

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**5,499,908**

## METHOD OF MAKING FOAM IN AN ENERGY EFFICIENT COMPRESSOR

**Raymond J. Schmitz, III, Tecumseh, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.**

**Filed Sep. 30, 1992, Ser. No. 954,265**

**Int. Cl.[6] F04B *21/00;17/00;* F01M *11/08***

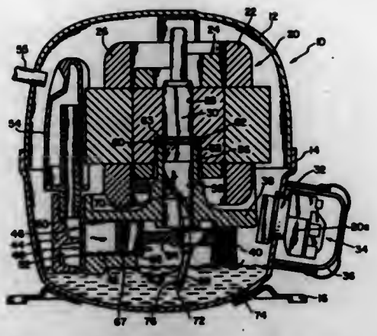
**U.S. Cl. 417—368** **24 Claims**

1. A compressor comprising:

a housing including an oil sump and a hydrofluorocarbon refrigerant therein;

a motor-compressor unit for compressing the hydrofluorocarbon refrigerant, said unit including a rotatable shaft having an oil pickup tube therein;

a polyal ester base lubricant in said oil sump;



a foaming agent mixed with said base lubricant; and

an oil paddle attached to said oil pickup tube, said paddle rotatable in said lubricant, whereby an oil foam layer is created during compressor operation to reduce compressor noise.

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**5,499,909**

## PNEUMATICALLY DRIVEN MICRO-PUMP

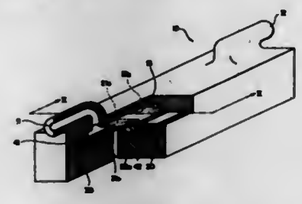
**Takahiro Yamada; Shinji Ando, and Yoshihiro Naruse, all of Ichikawa, Japan, assignors to Aisin Seiki Kabushiki Kaisha of Kariya, Kariya, and Kabushiki Kaisha Shinsangyo-kaihatsu, Tokyo, both of, Japan**

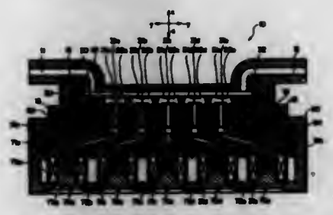
**Filed Nov. 17, 1994, Ser. No. 341,071**

**Claims priority, application Japan, Nov. 17, 1993, 5-287190; Nov. 17, 1993, 5-287191**

**Int. Cl.[6] F07B *43/06***

**U.S. Cl. 417—384** **18 Claims**





1. Pneumatically driven micro-pump comprising

channel means including a first port, a second port and a flow-through space which provides a communication therebetween;

a plurality of diaphragms disposed in an array along the flow-through space in a direction from the first to the second port and each having its front surface exposed to the flow-through space and capable of bulging/retracting with respect to the space;

diaphragm support means disposed on the opposite side of the diaphragms from the flow-through space and including a plurality of actuating gas spaces which are disposed in opposing relationship with the rear surfaces of the respective diaphragms;



a plurality of reciprocatory motion means for individually imparting a pneumatic oscillation to the respective actuating gas spaces;

and drive means for driving each of the reciprocatory motion means for reciprocatory motion with phase differences therebetween such that the reciprocatory motion means which reaches its upper dead center where a high pressure peak is applied to its associated actuating gas space shifts sequentially in a direction from the first to the second port.

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**5,499,910**

## INTERNAL GEAR PUMP HAVING A STOP FOR A SICKLE-SHAPED FILLER PART

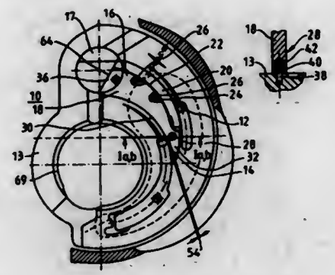
**Gerd Hundt; Franz Arbogast, and Peter Peiz, all of Heidenheim, Germany, assignors to J. M. Voith GmbH, Heidenheim, Germany**

**Filed Aug. 25, 1994, Ser. No. 296,318**

**Claims priority, application Germany, Aug. 26, 1993, 43 28 733.6**

**Int. Cl.[6] F04C *2/10***

**U.S. Cl. 418—126** **12 Claims**



1. An internal gear pump comprising:

an internal gear, said internal gear having two sides;

a thrust plate arranged on each side of the internal gear, said thrust plates having side surfaces;

a powered external pinion arranged eccentrically relative to the internal gear and meshable with said internal gear;

a sickle-shaped, floating filler part, said floating filler part split in peripheral direction and having a blunt end, said blunt end bearing on an axial support pin, said floating filler part having a first segment and a second segment, said first segment having a surface facing the teeth of the pinion, said second segment having a surface facing the teeth of the internal gear, said first and second segments having a parting interface therebetween, said first segment having a greater radial thickness than said second segment, said first segment including at least one axially extending groove arranged at said parting interface for accommodation of a sealing element, said first segment including at least one stop for restricting wear on the surface of said first segment facing the teeth of the pinion.

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**5,499,911**

## APPARATUS FOR SPINNING OF POLYURETHANE ELASTIC FILAMENTS

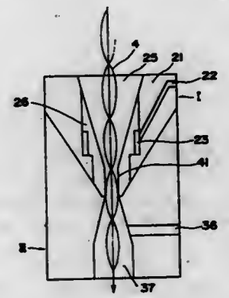
**Kiyoshi Nakata, Tsuruga, and Seishu Hayashi, Otsu, both of, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan**

**Division of Ser. No. 18,534, Feb. 17, 1993, Pat. No. 5,330,338. This application Apr. 7, 1994, Ser. No. 224,578**

**Claims priority, application Japan, Feb. 17, 1992, 4-69264; Feb. 18, 1992, 4-69493; Feb. 18, 1992, 4-69494**

**Int. Cl.[6] D01H *1/11;* D06B *1/08***

**U.S. Cl. 425—94** **14 Claims**



1. An apparatus for spinning of polyurethane elastic filaments, which comprises:

a spinning nozzle through which a polyurethane material is extruded to form a polyurethane elastic filament;

a means for application of a finishing agent to the filament, which is arranged downstream in the running direction of the filament from the spinning nozzle, said means having a groove through which the filament is allowed to pass, at which time the finishing agent supplied to the groove is applied to the passing filament, said groove having a width decreasing with an increase in the distance from the inlet thereof and having a narrowest portion at which the filament is to be brought into contact with the inner surface of the groove, and a lower part of said inner surface of the groove, including the narrowest portion, within a distance of at least 3 mm from the narrowest portion being made of a porous material to supply the finishing agent, wherein the lower part made of a porous material has a mean pore size of 0.1 to 10 μm; and

a roller for winding up the filament thus treated with the finishing agent.

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**5,499,912**

## APPARATUS FOR MARRING FIBER OPTIC SUBSTRATES

**George A. Mezei, Huntington Beach, Calif., assignor to Poly-Optical Products, Inc., Irvine, Calif.**

**Division of Ser. No. 785,130, Oct. 30, 1991, Pat. No. 5,312,569. This application Jan. 7, 1994, Ser. No. 178,950**

**Int. Cl.[6] B29C *59/04***

**U.S. Cl. 425—363** **8 Claims**

1. An apparatus for marring a fiber optic substrate, comprising:

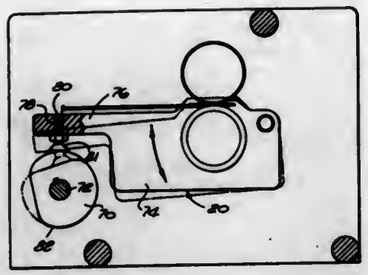
a first roller having a rough surface for marring the fiber optic substrate;

a second roller defining a nip with the first roller;

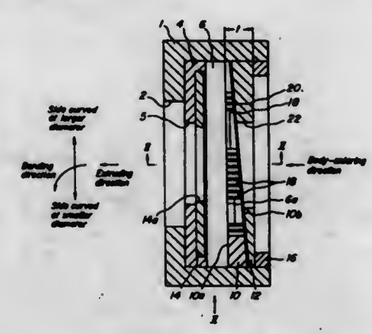
means for driving said rollers synchronously;

means for repeatedly opening and closing said nip to gradually adjust the pressure in the nip and to transmit a repetitive pressure profile to the nip; and

wherein the second roller has a deformable surface.

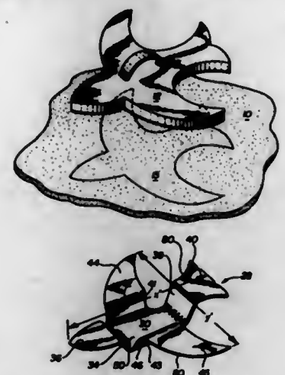


5,499,913
**DEVICE FOR PRODUCING HONEYCOMB STRUCTURAL BODIES**
Tomiaki Hagino, Nagoya; Masaoru Furuta, Toyoake, and Kaname Fukao, Inuyama, all of, Japan, assignors to NGK Insulators, Ltd., Japan
Filed Oct. 27, 1993, Ser. No. 141,534
Claims priority, application Japan, Nov. 26, 1992, 4-317251
Int. Cl.[6] B29C *47/10;47/20;47/30*
U.S. Cl. 425—382.4 8 Claims



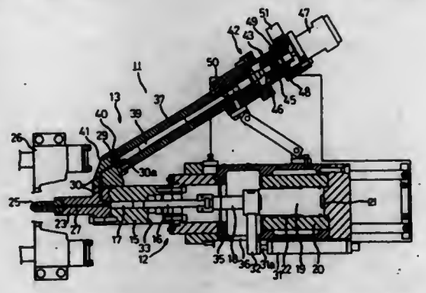
1. A device for producing honeycomb structural bodies from molding material, said device comprising:
an extruding die having a molding material inlet face, a molding material outlet face and a plurality of passages extending in an extruding direction from said inlet face to said outlet face;
a removable porous plate positioned upstream of said inlet face of said extruding die, such that the molding material passes through said porous plate before entering said extruding die, said porous plate having a first end portion and a second end portion opposite to said first end portion, a thickness of said porous plate increasing in a direction from said first end portion towards said second end portion, and means for adjusting resistance to flow of molding material passing through said porous plate, such that the flow resistance is lowest at said first end portion and gradually increases in a direction, substantially perpendicular to the extruding direction, towards said second end portion; and
a press plate stacked on an inlet side of said porous plate, said press plate having a thickness which increases in a direction opposite to the direction in which the thickness of said porous plate increases.

5,499,914
**KIT FOR FORMING A THREE-DIMENSIONAL DECORATIVE ITEM**
Pamela J. Rist, 1200 Ironwood, Normal, Ill. 61761
Division of Ser. No. 194,696, Feb. 10, 1994, Pat. No. 5,437,829. This application Mar. 15, 1995, Ser. No. 404,515
Int. Cl.[6] B29C *33/42;* B26B *3/00*
U.S. Cl. 425—470 5 Claims



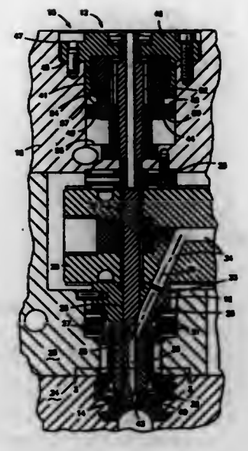
1. A kit for use in forming a three-dimensional, self-supporting decorative member from a material having a plastic stage, said kit comprising:
at least one forming member having an overall length and width for forming a flat, two-dimensional blank having an exterior shape of a desired decorative member; and,
at least one three-dimensional mold having a length, width and depth;
said mold having an overall length and width which are less than the overall length and width of said blank forming member; and,
said mold having substantially the same exterior shape as said exterior shape of said forming member.

5,499,915
**PRE-PLASTICIZING INJECTION MOLDING MACHINE**
Shinji Fujita, Ishikawa, Japan, assignor to Sodick Co., Ltd., Kanagawa, Japan
Filed Jul. 6, 1994, Ser. No. 256,280
Claims priority, application Japan, Nov. 6, 1992, 4-322523
Int. Cl.[6] B29C *45/02*
U.S. Cl. 425—557 11 Claims



1. A pre-plasticizing injection molding machine comprising:
a plasticizing assembly including a heated cylinder, a screw rotatable within said heated cylinder to plasticize synthetic resin material within a plasticizing chamber therein, a transfer passage leading from said plasticizing chamber to transfer plasticized material therefrom, and a drive unit to reciprocate said screw within said heated cylinder between a retreated position, whereat said screw is spaced from said transfer passage to allow plasticized material to pass therethrough, and an advanced position, whereat said screw closes said transfer passage and prevents passage of plasticized material therethrough;
an injection assembly including a cylinder having an inner peripheral wall and a front wall, a plunger reciprocally movable within said cylinder and having a head with an outer peripheral surface in sliding contact with said inner peripheral wall of said cylinder, a shank of a diameter slightly less than that of said head and a front face confronting said front wall of said cylinder and defining therebetween an injection chamber, and a nozzle passage opening in a center of said front wall and leading from said injection chamber to an injection nozzle;
said front face of said plunger head having a conically convex configuration defining an obtusely angled central apex, and said front wall of said cylinder having a conically concave configuration substantially complementary to said configuration of said front face, with said nozzle passage opening in an apex of said concave configuration at said center; and
said transfer passage opening into said injection chamber at a position at the periphery of said front wall immediately adjacent said inner peripheral wall and spaced along said front wall from said nozzle passage, to thereby, when said screw is in said retreated position thereof, introduce plasticized material from said plasticizing chamber into said injection chamber, and to cause the thus introduced plasticized material to flow therein in an annular path around said apex of and following the contour of said conically convex front face of said plunger head to an area of said injection chamber on a side of said nozzle passage opposite said transfer passage, such that said flow of introduced plasticized material agitates and mixes with any plasticized material remaining on said front face in said area from a previous operation cycle, whereafter said plunger is movable toward said front face to inject the thus introduced and mixed plasticized material from said injection chamber through said injection passage to said injection nozzle.

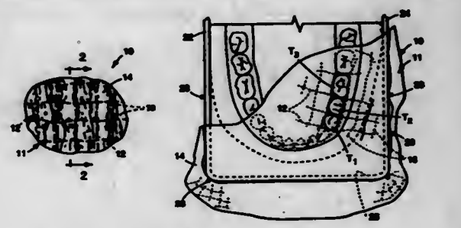




5,499,916
**ROTARY ACTUATED GATE VALVE**
Robert D. Schad, Toronto, and Edward J. Jenko, Bolton, both of, Canada, assignors to Husky Injection Molding Systems Ltd., Bolton, Canada
Filed Oct. 28, 1994, Ser. No. 330,689
Int. Cl.[6] B29C *45/23*
U.S. Cl. 425—564 30 Claims

1. A rotary actuated gate valve system for directing melt from a manifold channel to a mold gate,
a valve stem extending through and rotatable within the manifold, said valve stem including a means for receiving the melt from the manifold channel, wherein the means for receiving is in fluid communication with the manifold channel and is adapted to be rotated into alignment with the mold gate for allowing the melt to flow into the mold gate and the means for receiving is adapted to be rotated out of alignment with the mold gate for blocking the melt from flowing into the mold gate; and
means for rotating the valve stem, said means for rotating positioned coaxially relative to the valve stem.

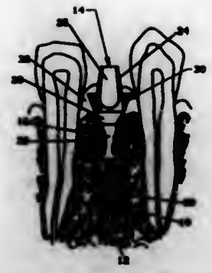
5,499,917
**DENTAL ISOLATION DAM**
Robert L. Erickson, Woodbury; Paul E. Hansen, Lake Elmo; Paul A. Burgio, White Bear Lake; Joel D. Oxman, St. Louis Park, and James D. Christoff, Birchwood, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation of Ser. No. 84,529, Jun. 29, 1993, abandoned. This application Dec. 14, 1994, Ser. No. 355,808
Int. Cl.[6] A61C *5/14*
U.S. Cl. 433—137 37 Claims



1. A dental isolation dam comprising:
a first film;
a second film, at least a portion of one of said films being impervious to the passage of fluids and microorganisms under normal room temperature and pressure conditions; and
a first set of fibers located between said first film and said second film, at least certain fibers of said first set being arranged in adjacent pairs and spaced apart a distance generally equal to the average mesial-distal width of a tooth.

5,499,918
**APPARATUS FOR PRESERVING INTERDENTAL PAPILLA AND METHOD FOR USING**
Vincent J. Morgan, Boston, and Norman J. Shepherd, Merrimack, both of Mass., assignors to Dire, Inc., Boston, Mass.
Filed Aug. 22, 1994, Ser. No. 293,308
Int. Cl.[6] A61C *8/00*
U.S. Cl. 433—173 12 Claims

1. An emergence cuff member for use in preserving the interdental papilla during the procedure of placing an abutment on a root member implanted in the alveolar bone of a patient in which the abutment has a frusto-spherical basal surface portion and a conical



surface portion having a selected height extending therefrom comprising a generally annular member formed of biocompatible synthetic plastic having first and second ends, a bore extending from the first to the second ends, the bore having a taper generally matching that of the conical surface portion of the abutment, the larger end of the bore being at the first end, the outer surface of the annular member forming a feathered edge with the bore at the first end of the annular member, the distance between the first and second ends being less than the height of the conical surface, the second end of the annular member having an outer diameter greater than the diameter of the bore at the first end, and a smooth outer surface extending between the first and second ends.

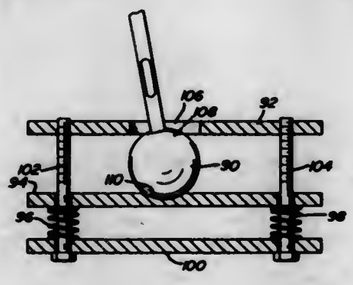
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5,499,919

**AIRCRAFT CONTROL LEVER SIMULATOR**

G. Terry Thomas, Holland, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 4, 1993, Ser. No. 130,950
Int. Cl.[6] G09B 9/08
U.S. Cl. 434—45 18 Claims



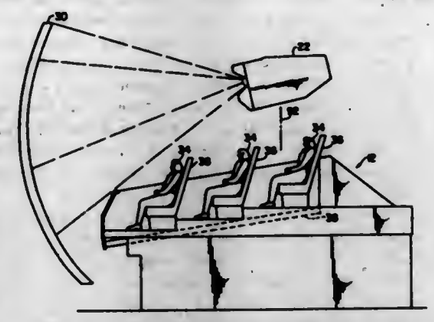
1. An aircraft control lever flight simulator comprising:
a lever having a handle at one end;
a sphere fixed to the lever at a location remote from the handle, said sphere having a center and an outer surface;
a pair of plates having faces opposed to each other on opposite sides of the sphere, which apply opposing forces thereto, said forces being frictional for resisting rotation of the sphere, but permitting rotation of the sphere by manipulation of the handle of the lever;
means for constraining the lever so that its handle can be moved through a predetermined range; and
transducer means, connected to the lever, for generating a lever position signal.

5,499,920

**METHOD OF GENERATING AN EVENT SIMULATION**

Douglas Trumbull, Southfield, Mass., assignor to Ridefilm Corporation, South Lee, Mass.

Division of Ser. No. 14,117, Feb. 5, 1993. This application Jun. 7, 1995, Ser. No. 477,749
Int. Cl.[6] G09B 9/04
U.S. Cl. 434—69 4 Claims



1. A method of generating an event simulation for a simulator including a moveable motion base having a platform for receiving an occupant, said motion base further having displaceable actuators for moving said motion base only along three orthogonal axes in accordance with received actuator drive signals, said method comprising the steps of:
generating a sequence of audio signals to be received by said occupant by means of an audio-visual display means;
generating a sequence of background visual image signals to be received by said occupant by means of said audio-visual display means;
generating a sequence of foreground visual image signals to be received by said occupant by means of said audio-visual display means such that said foreground image is constrained to move only along said three orthogonal axes; and
synchronizing said actuator drive signals with said foreground visual image signals along with said background visual image signals and said audio signals.

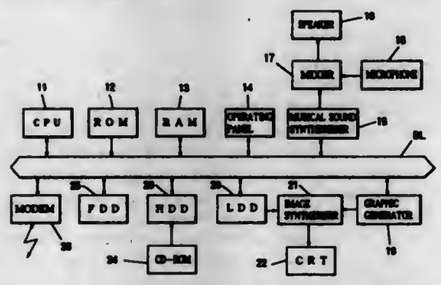
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5,499,921

**KARAOKE APPARATUS WITH VISUAL ASSISTANCE IN PHYSICAL VOCALISM**

Takuro Sone, Hamamatsu, Japan, assignor to Yamaha Corporation, Japan

Filed Sep. 29, 1993, Ser. No. 128,883
Claims priority, application Japan, Sep. 30, 1992, 4-285198
Int. Cl.[6] G10H 1/36; G09B 5/00
U.S. Cl. 434—307 A 5 Claims



1. A Karaoke apparatus for reproducing an automatic instrumental accompaniment of a selected song during the course of a physical vocal performance of the selected song by a singer, the Karaoke apparatus comprising:
register means for registering a prescribed text data of a selected song, containing accompaniment information and word information composed of a sequence of characters;
sound means for reproducing an automatic instrumental accompaniment according to the registered accompaniment information;
graphic means for modifying a graphic shape of plural registered characters in association with a predetermined practical manner of the physical vocal performance; and
display means for displaying a sequence of the characters in the modified graphic shapes concurrently with the reproduction of the automatic instrumental accompaniment so as to visually teach the singer the practical manner during the physical vocal performance.



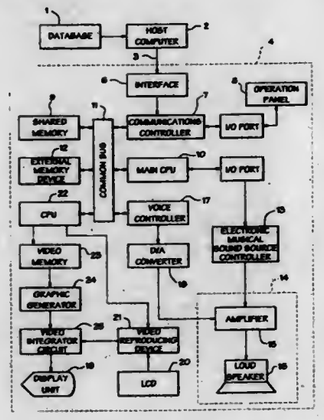
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5,499,922

**BACKING CHORUS REPRODUCING DEVICE IN A KARAOKE DEVICE**

Toshihiko Umeda, Kanagawa, and Itsuma Tsugami, Saitama, both of, Japan, assignors to Ricoh Co., Ltd., Tokyo, and Ricos Co., Ltd., Osaka, both of, Japan

Filed Apr. 21, 1994, Ser. No. 230,765
Claims priority, application Japan, Jul. 27, 1993, 5-285780
Int. Cl.[6] G10H 1/36
U.S. Cl. 434—307 A 4 Claims




1. A backing chorus reproducing device for a karaoke machine comprising:
operating means for inputting an instruction for a music number and a change of scale;
memory means for storing karaoke information;
main controller means for analyzing the karaoke information read from the memory means to decompose the information into header information, song's words information, and musical information, while electronic musical sound data and backing chorus data of the musical information are output in synchronism according to processing type of control data included in the header information;
electronic musical sound reproducing means for reproducing the electronic musical sound data provided by the main controller means;
a voice controller for reading the backing chorus data of a take which corresponds to the processing type extracted by the main controller means;
backing chorus reproducing means including the voice controller for reproducing the backing chorus data; and
image display means for presenting the words information according to instruction given by the main controller means;
wherein the main controller means is capable of receiving a scale indicator specified by the operating means, issuing a change of scale instruction along with the scale indicator to the electronic musical sound reproducing means and the voice controller, and changing the scale of the electronic musical sound data and the backing chorus data to assure synchronism in performance.

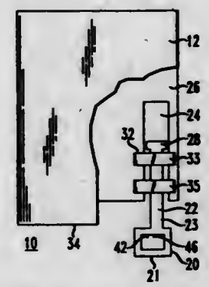
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5,499,923

**COMMUNICATION CARD WITH EXTENDIBLE, ROTATABLE COUPLING**

James L. Archibald, Clearwater, Fla., and Donald R. Laturell, Allentown, Pa., assignors to AT&T Corp., Murray Hill, N.J.

Filed Nov. 9, 1994, Ser. No. 336,633
Int. Cl.[6] H01R 9/09;39/08
U.S. Cl. 439—26 27 Claims



1. A communication card adapted to be inserted into a slot in a computer, comprising:
a housing;
a shank rotatably mounted to the housing, the shank defining an axis along its length around which the shank can rotate; and
an electrical mounted on the shank, the shank and connector being extendable beyond an edge of the housing to an extended position, in the extended position the connector and shank being rotatable relative to the housing about the shank axis.

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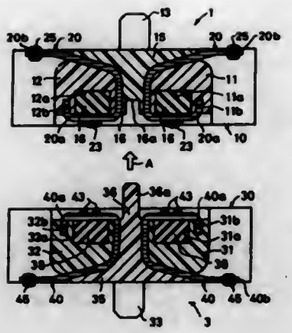
5,499,924

**BUTT JOINT CONNECTOR ASSEMBLY**

Hiroshi Arisaka; Kenji Kawawada, both of Tama, and Kiyoshi Omata, Tokyo, all of, Japan, assignors to Kel Corporation, Tokyo, Japan

Filed Jul. 11, 1994, Ser. No. 273,857
Claims priority, application Japan, Jul. 12, 1993, 5-043134 U; Jul. 12, 1993, 5-195153; Jul. 12, 1993, 5-195154
Int. Cl.[6] H01R 23/66
U.S. Cl. 439—67 11 Claims

1. A butt joint connector assembly having, male and female connector members comprising:
male and female flexible film circuit contact members, respectively, each comprising a flexible insulating film having a series of lead forming conductive paths extending thereacross from a contact portion;
each contact portion comprising a series of contact bumps of conductive material upstanding from a mating face of the film and connected to the conductive paths,
the series of contact bumps of the female film circuit contact member being arranged in sets of pluralities of bumps with the contact bumps of each set being located in closely spaced apart relation to form a female contact bump configuration connected to a respective conductive path and the series of contact bumps of the male film circuit contact member being arranged as single bumps located at a pitch corresponding to a



pitch of the sets of contact bumps forming the female configuration and each forming a male contact bump configuration;

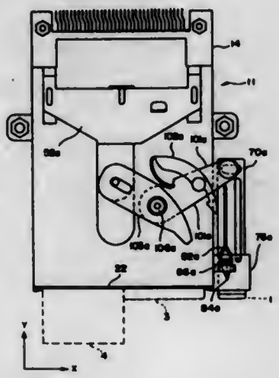
first and second film circuit contact member supporting housings, respectively, having respective mating faces;

means supporting the respective film circuits on respective housings with the respective contact portions extending across respective mating faces substantially perpendicular to a mating direction and with the respective contact bumps outstanding therefrom in the mating direction; and

connector guiding means for guiding the connector members into mating engagement with mating contact portions of respective film circuit contact members extending in face-to-face relation so that contact bumps of the male configuration become interposed between and in contact with adjacent portions of respective contact bumps of the respective sets of contact bumps of the female configuration to effect reliable electrical connection between respective conductive paths of the complementary connectors.

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**5,499,925**
**CONNECTOR DEVICE**
**Nai H. Lwee, Fremont, Calif., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**
**Continuation of Ser. No. 26,711, Mar. 5, 1993, abandoned. This application Mar. 22, 1994, Ser. No. 216,471**
**Claims priority, application Japan, Mar. 6, 1992, 4-011468 U**
**Int. Cl.[6] H01R *13/62***
**U.S. Cl. 439—157** **16 Claims**



1. A connector device for connecting to a data storage medium comprising:

a housing having an opening at a first end and a space for receiving the data storage medium, the space extends from the opening of the housing to a second end of the housing;

a plurality of contacts positioned in the second end of the housing for establishing an electrical interconnection to the data storage medium in the space;

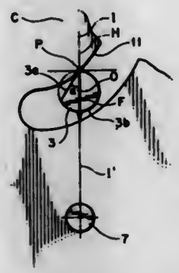
a first movable member movable along the length of the housing and capable of being set to first, second and third extension positions in that order in a direction away from the housing so that, in the first position, the first movable member extends to a zero or slight extent from the first end of the housing;

a transmitting member connected at one end to the first movable member such that, when the first movable member is situated between the first position and the second position, a movement of the first movable member toward the first position is transmitted to the other end of the transmitting member as a normal-direction force directed toward the second end of the housing, such that, when the first movable member is situated between the second position and the third position, the first movable member is latched, and that, when the first movable member is situated in the third position, a movement of the first movable member toward the first position is transmitted to the other end of the transmitting member as a reverse-direction force directed toward the first end of the housing; and

a second movable member connected to the other end of the transmitting member and, together with the data storage medium, movable along the length of the housing in unison such that, when the normal-direction force is received from the transmitting member with the movement of the first movable member to the second end of the housing, the second movable member is moved toward the second end of the housing to allow the data storage medium to be connected to the contacts and, when the reverse-direction force is received from the transmitting member, the second movable member is moved to the first end of the housing to allow the data storage medium to be disconnected from the contacts.

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**5,499,926**
**LEVER-OPERATED CONNECTOR ASSEMBLY**
**Nobuyuki Akeda, Haibara, Japan, assignor to Yazaki Corporation, Tokyo, Japan**
**Filed May 18, 1994, Ser. No. 245,535**
**Claims priority, application Japan, May 19, 1993, 5-116995**
**Int. Cl.[6] H01R *13/62***
**U.S. Cl. 439—157** **2 Claims**



1. A lever-operated connector assembly comprising:

a pair of connectors respectively accommodating therein female and male terminals and adapted to be fitted together,

a lever member adapted to be turned for fitting and releasing said pair of connectors to and from each other, said lever member being provided to one of said pair of connectors, a first connector, with a cam groove therein;

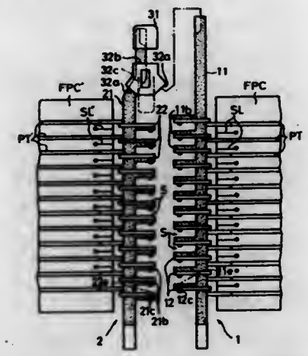
a cam pin provided on a second one of said pair of connectors and adapted to be engaged in said cam groove;



wherein said cam pin has a circular cross-section at a center portion thereof and an outer peripheral surface formed therein with an inclined surface having a predetermined angle with respect to a center line passing through the center of said circular cross-section, and wherein a point of force action thereof is set at a position where the outer peripheral surface add the inclined surface cross together, said point of force action being aligned with or in a vicinity of a fitting axis of said pair of connectors.

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**5,499,927**
**ZIPPER-TYPE ELECTRICAL CONNECTOR**
**Hirofumi Ohno; Fumio Narui, both of Tama, and Shigeru Hayashi, Tokyo, all of, Japan, assignors to Texell Corp., and Kel Corp., both of Tokyo, Japan**
**Filed May 23, 1994, Ser. No. 248,079**
**Claims priority, application Japan, May 21, 1993, 5-143062**
**Int. Cl.[6] H01R *13/28***
**U.S. Cl. 439—285** **8 Claims**



1. An electrical connector of a zipper type comprising first and second elongate connector members each comprising a series of contact elements mounted spaced apart at predetermined intervals in a row on a carrier strip made of flexible insulating material with respective contact portions of the respective contact elements extending transversely, in a common direction from the carrier strip, and at least one series of insulating elements mounted on the carrier strip of at least the first connector member in alternating relation to the contact elements thereof so that respective contact elements and insulating elements of the first connector member can interlock in interdigitating relation with respective contact elements of the second connector member thereby electrically to connect complementary contact faces of respective interlocked contact elements together with the insulating elements interposed therebetween, the improvement residing in that the carrier strip is made of resilient material in which the individual contact elements are in-mold and in that the contact elements have respective lead forming portions extending transversely from the carrier strip in a direction opposite to the common direction.

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**5,499,928**
**FLAT CABLE AND A CONNECTOR COOPERATING THEREWITH**
**Youichi Satoh, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan**
**Filed Jul. 21, 1994, Ser. No. 278,226**
**Claims priority, application Japan, Sep. 22, 1993, 5-236797**
**Int. Cl.[6] H01R *9/00*; H01B *7/00***
**U.S. Cl. 439—492** **11 Claims**

1. A flat cable comprising:



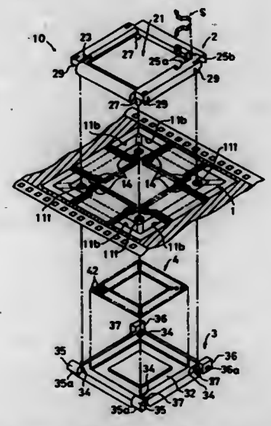
a plurality of cables each including a conductive core and an insulating cover for insulating said conductive core, said plurality of cables being disposed substantially parallel with each other and aligned in a single row when viewed from an elongated direction of said cables, with a mutual separation;

fixture means for holding said plurality of cables such that said plurality of cables are each held with said mutual separation; and

wherein each of said plurality of cables has a cross section such that a lateral size of cables, measured in said cross section, has a first size at a first part where said cable contacts with said fixture means and a second, different size at a second part of said cable opposing to said first part, wherein said second size is larger than said first size.

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**5,499,929**
**SOCKET CONNECTOR FOR ELECTRONIC DEVICES**
**Shuichi Miyazawa, Yamanashi, Japan, assignor to Kel Corporation, Tokyo, Japan**
**Filed Jun. 10, 1994, Ser. No. 257,863**
**Claims priority, application Japan, Jun. 11, 1993, 5-166413**
**Int. Cl.[6] H01R *13/62***
**U.S. Cl. 439—331** **11 Claims**



1. A socket connector for mounting an electronic device of a type having a series of individual electrode lands at predetermined spaced apart locations on a lower, contact surface thereof, on a circuit board comprising:

a film contact comprising an insulating film having upper and lower surfaces and carrying a series of conductive paths with respective board connecting portions extending away from respective individual contact end portions which are located on the upper surface at predetermined spaced apart locations corresponding to the respective locations individual electrode lands;

base means located under the lower surface of the contact in supporting relation thereto;

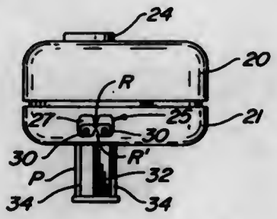
a resiliently compressible biassing sheet located on the base means so as to underlie at least the contact end portions of the film contact, and,

cover means for engagement with an upper surface of the electronic device to retain the electronic device pressed

against the upper surface of the film circuit with resilient compression of the biassing sheet urging respective individual contact end portions of the conductive paths against respective individual electrode lands with sufficient contact pressure to ensure reliable electrical connection therebetween, the cover means comprising means for moving the electronic device relatively across the film contact while urging the electronic device into pressing engagement therewith thereby to produce a wiping action between respective individual electrodes lands and respective individual contact end portions.

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5,499,930
IN-LINE DIMMER SWITCH
Mark A. Cleri, Allentown, Pa., assignor to Lutron Electronics Co., Inc., Coopersburg, Pa.
Filed Apr. 28, 1994, Ser. No. 234,527
Int. Cl.[6] H01R 4/24
U.S. Cl. 439—417 10 Claims

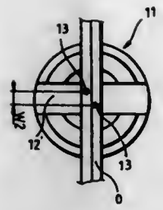



1. A lamp dimmer switch adapted to be connected in-line with a lamp power cord of the type comprising a pair of electrical conductors covered by an insulating sheath, such sheath having a surface defining a pair of opposing grooves extending along the length of the power cord, said dimmer switch comprising:
a housing for enclosing said dimmer switch, said housing defining an internal passageway which communicates with the exterior of said housing through an opening, said passageway being adapted to receive a severed end of the power cord inserted therein through said opening, said passageway comprising wall means defining a pair of spaced, opposing and parallel ribs for engaging the opposing grooves of a received power cord and for guiding said power cord along a predetermined path within said passageway;
a dimming circuit disposed within said housing, said dimming circuit having a plurality of spaced, electrically conductive stab terminals adapted to be connected to said electrical conductors; and
means located along said predetermined path for urging a received and guided power cord into engagement with said stab terminals, whereby said stab terminals pierce said sheath and make electrical contact with said conductors.

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5,499,931
ELECTRICAL-CONDUCTING STRUCTURE OF A LIGHTING FIXTURE
Jerry S. C. Yang, 8F-8, No. 20, Ta Lung Road, Taichung, Taiwan
Filed Aug. 11, 1994, Ser. No. 289,250
Int. Cl.[6] H01R 4/24
U.S. Cl. 439—431 3 Claims

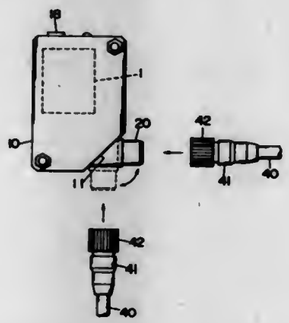
1. An improved lamp conducting structure, wherein a rear end of a lower cylindrical body of the lamp is provided with external thread, and a ring slot with internal thread is installed at a top end face of a lower frame cylindrical body thereby to engage with the external thread of the rear end of the lamp cylindrical body and is characterized in the following:




a bottom face of the lower cylindrical body of the lamp is provided with two inter-crossed slots, wherein the two slots have a different width and depth, whereat the cross junction of the two slots is provided with two diagonally installed metal clips with sharp needle heads, and due to the diagonal installation of the said sharp needle head metal clips, a perpendicular width between the metal slips in the two slots and the power wires can be one or more than one width;
by utilizing the above said structure design, a user can select a narrow slot or a wide slot based on the thickness of a power wire, thereby to let the power wire be placed into the slots through the bottom face of cylindrical body of the lamp, wherein the external thread of the bottom end cylindrical body of the lamp is engaged with the internal thread of the top end ring slot of the lower frame, thereby a power wire is pressed by the top end central cylinder of the lower frame to cause the sharp needle head of the conducting metal clips to cut off the insulation layer of the power wire and to contact with the metal wire of the power wire.

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5,499,932
CONNECTOR ASSEMBLY FOR A PHOTOELECTRIC SENSOR
Takashi Tanaka, Neyagawa; Masaharu Miyazaki, Hirakata; Yasunori Kaibe, and Toshiaki Yoshiyasu, both of Katano, all of, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan
Filed Aug. 18, 1994, Ser. No. 291,923
Claims priority, application Japan, Aug. 26, 1993, 5-211904
Int. Cl.[6] H01R 13/58
U.S. Cl. 439—446 5 Claims



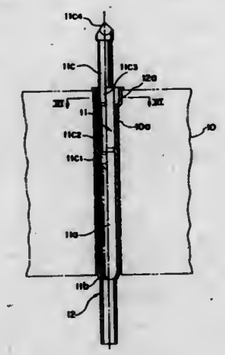

1. The combination of a connector assembly and a photoelectric sensor which comprises:
a casing accommodating the photoelectric sensor;
an angled sensor joint supported by said casing;
an electric cable connecting said photoelectric sensor to an external circuit; and



a cable connector provided at an end of said electric cable and detachably coupled to said sensor joints
said sensor joint having a rotation axis and capable of swiveling about said rotation axis relative to said casing;
latch means by which said sensor joint is secured in a suitable angled position about said rotation axis relative to said casing, said latch means being defined by parts of said casing and of said sensor joint;
said casing including a cylindrical wall extending from a periphery of an opening formed in said casing, and said sensor joint including a sleeve extending through said cylindrical wall into said opening, said latch means comprising a plurality of detents spaced around an inner circumference of said cylindrical wall and at least one cam which projects from said sleeve and rides over said detents to be lockable into any suitable one of said detents;
said cylindrical wall being formed with circumferentially spaced slits by which said cylindrical wall may flex radially outwardly to permit said cam to ride over inclines of said detents and which resiliently returns to bring said cam into lock engagement with said suitable one of said detents.

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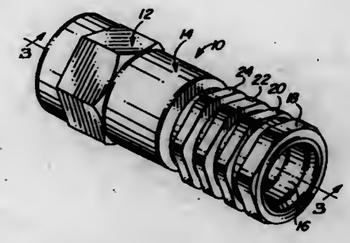
5,499,933
PROBE PINS FOR INSPECTION AND SLIP-ON SOCKETS THEREOF
Hidenobu Sekine, Kashiwashi, Japan, assignor to Kouyou Electronics Appliances Co., Ltd., Chibaken, Japan
Continuation of Ser. No. 151,873, Nov. 15, 1995, abandoned.
This application Mar. 13, 1995, Ser. No. 402,983
Claims priority, application Japan, Mar. 31, 1993, 5-015720 U
Int. Cl.[6] H01R 11/18
U.S. Cl. 439—482 3 Claims




1. An inspection unit having an inspection probe pin for inspecting a printed circuit board, the inspection unit further comprising an insulated holding plate and at least one holding opening provided on said holding plate, said probe pin comprising:
a conductive metallic tube inserted into said holding opening and defining an axial direction, said conductive metallic tube comprising an outer surface defining an outer radial dimension which is substantially equal to an inner radial dimension of said holding opening, an inner radial dimension, and an opening at a top end of said metallic tube;
a plunger means for contacting a contact of the printed circuit, said plunger being received in the opening of said conductive metallic tube and slidably projecting from the top end of the conductive metallic tube;
a resilient means for resiliently acting against said plunger;
wherein a plurality of radially symmetric elongated splines are formed on the conductive metallic tube, said splines extend in said axial direction from said opening of said top end to a lower portion of said metallic tube and project radially beyond said outer radial dimension, and wherein said elongated splines define a hollow portion therein, said hollow portion extending radially beyond said inner radial dimension whereby said probe pin can be pushed into the holding opening with a reduced risk of bending.

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5,499,934
HEXAGONAL CRIMP CONNECTOR
Ingolf G. Jacobsen, and Arvin L. Langham, both of Phoenix, Ariz., assignors to Cabel-Con, Inc., Phoenix, Ariz.
Continuation of Ser. No. 68,435, May 27, 1993, Pat. No. 5,338,225. This application Jul. 7, 1994, Ser. No. 271,840
Int. Cl.[6] H01R 4/24
U.S. Cl. 439—585 24 Claims

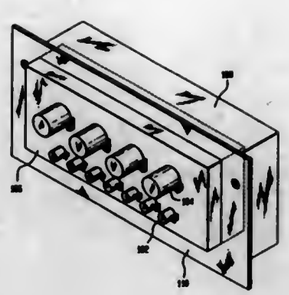



1. A connector for crimped attachment to a coaxial cable having a central conductor disposed within a dielectric sleeve, a braided sheath surrounding the sleeve and a jacket encircling the braided sheath, said connector comprising in combination:
a) an hollow body for penetrable insertion intermediate the sleeve and the braided sheath to locate the conductor and sleeve within said body;
b) a ferrule attached to and extending from said body for enveloping the coaxial cable;
c) said body and said ferrule defining in combination a cylindrical slot for receiving the braided sheath and the jacket; and
d) at least one annular ridge encircling said ferrule, at least one of said ridges having a modified hexagonal perimeter defining three pairs of opposed planar surfaces and curved surfaces interconnecting adjacent ones of said planar surfaces prior to crimped attachment of said connector to the coaxial cable.

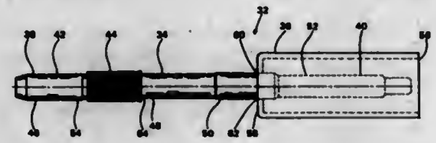
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5,499,935
RF SHIELDED I/O CONNECTOR
Thomas A. Powell, Morristown, N.J., assignor to AT&T Corp., Murray Hill, N.J.
Filed Dec. 30, 1993, Ser. No. 176,374
Int. Cl.[6] H01R 13/66
U.S. Cl. 439—620 12 Claims

1. An electrical device for propagating an electrical signal which emits radio frequency (RF) electromagnetic energy, the electrical device comprising:
a medium for propagating the electrical signal, wherein said medium comprises an electrically conducting pin and an electrically conducting socket for providing an electrical path via said medium;
a lossy dielectric material radially surrounding a portion of said medium, wherein said lossy dielectric material has capacitance (C); and
a coaxial ferrite sleeving positioned between said medium and said lossy dielectric material, wherein said coaxial ferrite sleeving has inductance (L), and wherein said lossy dielectric material and said coaxial ferrite sleeving combine to form a LC low-pass filter for attenuating the RF electromagnetic energy emission generated by the electrical signal.

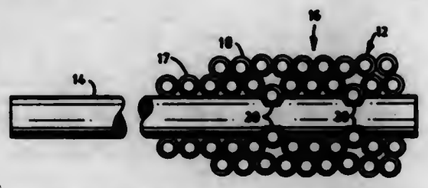


5,499,936
**MONOLITHIC METALLIC DRIVE SHAFTS WHICH ARE RESISTANT TO CORROSION AND WEAR**
Kennedy K. McElroy, Jr., Lindenhurst, Ill.; James Benfield, New Berlin; Dale Boschke, Pewaukee, both of Wis., and Richard A. Krajewski, Calhoun, Ga., assignors to Outboard Marine Corporation, Waukegan, Ill.
Filed Jan. 12, 1995, Ser. No. 371,954
Int. Cl.[6] B63H 23/34
U.S. Cl. 440—83 20 Claims



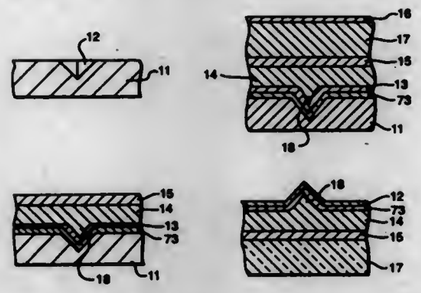
1. A monolithic metallic drive shaft which is resistant to corrosion and which comprises proximal and distal end portions, each of said proximal end distal end portions having a predetermined surface hardness, wherein the surface hardness of one of said proximal and distal end portions is greater than the surface hardness of the other of said proximal and distal end portions.

5,499,937
**CATHODE FOR HIGH INTENSITY DISCHARGE LAMP**
John L. Stevens, 40 Winslow Dr., Dunbarton, N.H. 03045, and Dale A. Strasser, 4 Simpson Ave., Pembroke, N.H. 03275
Division of Ser. No. 299,718, Sep. 1, 1994, Pat. No. 5,451,837.
This application Jun. 5, 1995, Ser. No. 465,880
Int. Cl.[6] H01J 9/02
U.S. Cl. 445—49 2 Claims



1. The method of making a cathode for a discharge lamp, said cathode comprising an elongated central core having a coil wound thereabout, comprising the steps of: providing a section of core material; heating said core material; deforming at least a portion of said core by compression; and winding a coil about said core at least over said deformed portion.

5,499,938
**FIELD EMISSION CATHODE STRUCTURE, METHOD FOR PRODUCTION THEREOF, AND FLAT PANEL DISPLAY DEVICE USING SAME**
Masayuki Nakamoto; Tamio Ono, and Tadashi Sakai, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan
Continuation-in-part of Ser. No. 38,936, Mar. 29, 1993, abandoned. This application Aug. 16, 1994, Ser. No. 291,937
Claims priority, application Japan, Jul. 14, 1992, 4-186753; Aug. 17, 1993, 5-203167; Dec. 27, 1993, 5-332843
Int. Cl.[6] H01J 9/02
U.S. Cl. 445—50 16 Claims

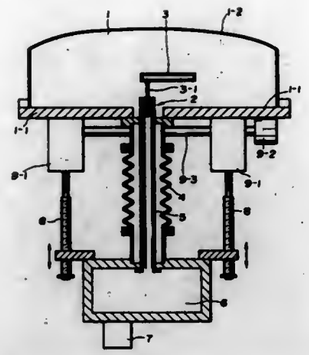


1. A method for the production of a field emission cathode structure, comprising the steps of:
providing a first substrate with holes of a sharp point;
forming an insulating layer on the surface of said first substrate inclusive of the surface of said holes;
forming an emitter material layer on said insulating layer and, at the same time, filling the interiors of said holes with said emitter material;
joining said first substrate covered with said emitter material layer to a second substrate made of a structural substrate through the medium of said emitter material layer, removing said first substrate by etching from said joined substrates so as to expose said insulating layer thereby allowing protrusions made of said emitter material filling the interiors of said holes and possessing said insulating layer as a surface layer thereof to thrust out;
forming a gate electrode layer on said insulating layer inclusive of said protrusions; and
removing part of said insulating layer and said gate electrode layer at the tips of said protrusions thereby giving birth to emitters possessing an exposed tip.

5,499,939
**EVACUATION APPARATUS**
Shigeo Itoh; Mikio Yokoyama; Takashi Tonegawa, and Akira Kadowaki, all of Mobara, Japan, assignors to Futaba Denshi Kogyo K.K., Mobara, Japan
Filed Dec. 21, 1994, Ser. No. 360,284
Claims priority, application Japan, Dec. 22, 1993, 5-345608
Int. Cl.[6] H01J 9/385
U.S. Cl. 445—73 4 Claims

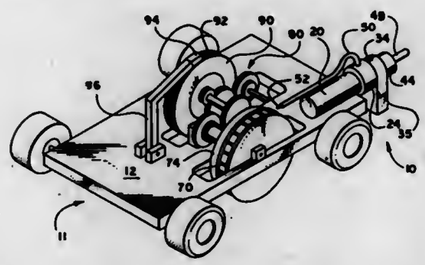
1. An evacuation apparatus comprising:
a chamber which has a desired atmosphere or a vacuum atmosphere formed therein and in which envelopes for vacuum airtight display device containers are held;
an evacuation head holding each of said envelopes in said chamber wherein said evacuation head is located at a central portion of said chamber with a through section connecting said evacuation head to an evacuation unit;
a drive unit accessing said evacuation head to an evacuation section of said envelope; and





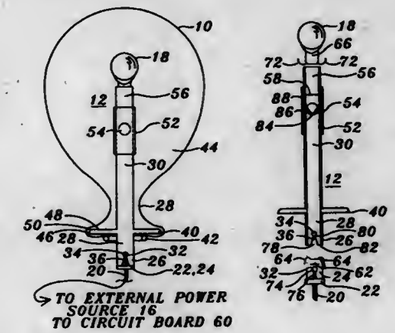
a seal member arranged around said evacuation head so as to isolate an interior of said chamber and an exterior thereof from each other;
whereby evacuation of the envelope to a high vacuum is carried out from said evacuation section through said evacuation head by said evacuation unit.

5,499,940
**FLUID POWERING AND LAUNCHING SYSTEM FOR A TOY VEHICLE**
Lonnie G. Johnson, Smyrna, and John T. Applewhite, Atlanta, both of Ga., assignors to Johnson Research and Development Company, Inc., Smyrna, Ga.
Filed Feb. 16, 1994, Ser. No. 197,511
Int. Cl.[6] A63H 33/40;3/31;29/00
U.S. Cl. 446—180 21 Claims



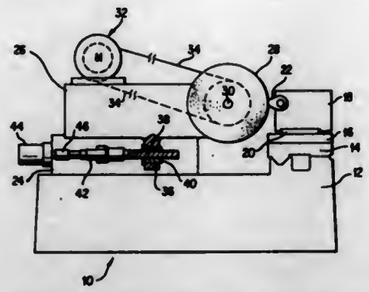
1. A system for powering and launching a toy vehicle comprising:
a vehicle body having a drive train for engaging propulsion means thereof;
a turbine wheel connected to said vehicle body operably communicating with said drive train;
a housing attached to said vehicle body defining a chamber for receiving a fluid;
means for receiving and pressurizing said chamber with said fluid;
means for directing said fluid to said turbine wheel as said chamber is pressurized;
means for suspending said vehicle body in a position which prohibits movement; and
self-actuating means for automatically releasing said vehicle body from said suspended position which, also, prohibits movement when said chamber becomes pressurized with said fluid, said self actuating means being the chamber operatively associated with a latch means which is activated by said fluid when pressurized in order to release said vehicle from said means for receiving and pressurizing upon attainment of sufficient pressure within said chamber.

5,499,941
**BALLOON INFLATION DEVICE WITH LIGHT**
Daniel T. Penjuke, Sr., 64 Albert Ave., Aldan, Pa. 19018
Filed Oct. 11, 1994, Ser. No. 328,856
Int. Cl.[6] A63H 27/10; B60C 29/00
U.S. Cl. 446—222 9 Claims



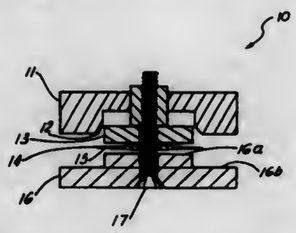

1. A device for inflating purposes comprising:
a tube with an open end, a sealing means sealing the other end, a wall having an exterior surface, and two holes, the holes positioned latitudinally opposite each other in the wall;
an annular flange projecting from the exterior surface, extending radially outward, located between the holes and the open end, having an outside edge, a surface facing the sealed end of the tube, and a chamfered corner located where the outside edge abuts the surface facing the sealed end of the tube,
the sealing means comprising a conical plug, with a point and a conical surface, positioned in the tube such that the point is directed towards the open end of the tube and the conical surface deflects gas entering the tube to the holes, thereby facilitating the gas's exit from the tube;
elastic means on the exterior surface, covering the holes, arranged and configured such that gas cannot enter the tube via the holes in the wall and, when a gas enters the tube from the open end, the elastic means prevents the gas from exiting the tube through the holes until the force of the gas in the tube exceeds the force of the elastic material whereupon the gas exits the tube by traveling first through the holes and then between the elastic material and the exterior surface of the tube;
a light bulb engaged with the sealed end of the tube;
an electrical junction with a first-half attached to the open end of the tube and a second-half locked to the first-half by a locking means that withstands axial tension;
a first electrical conducting means to deliver electrical current from the first-half of the electrical junction to the light bulb; and
a second electrical conducting means adapted to connect to a power source to deliver electrical current to the second-half of the electrical junction.

5,499,942
**HYDROSTATIC NUT AND LEAD SCREW ASSEMBLY, AND METHOD OF FORMING SAID NUT**
William W. Pilager, Waynesboro, Pa., assignor to Western Atlas Inc., Waynesboro, Pa.
Division of Ser. No. 98,859, Jul. 28, 1993, Pat. No. 5,405,282.
This application Dec. 29, 1994, Ser. No. 365,740
Int. Cl.[6] B24B 47/08
U.S. Cl. 451—14 6 Claims



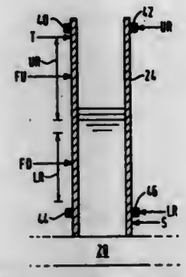
1. A method of forming a hydrostatic nut for use with a lead screw for a machine tool, such method comprising the steps of:
a) inserting a lead screw with at least one helical thread extending therealong into a mold,
b) said mold having at least one helical thread on its inner surface that is complementary to, and spaced from, the helical thread on the exterior of said lead screw,
c) introducing a castable polymer material into said mold to fill the space between the internal thread on said mold and the external thread on said lead screw,
d) curing said polymer material into a rigid mass,
e) forming a helical channel on the outer surfaces of said rigid mass of polymer material in said mold, and
f) introducing pressurized fluid into said helical channel so that said mold floats on a thin film of fluid to function as a hydrostatic nut relative to said lead screw.

5,499,943
**ROTARY CUTTER BLADE SHARPENER**
Alta F. Terris, 4305 Northpointe Way, Pensacola, Fla. 32514-6630
Filed Nov. 25, 1994, Ser. No. 344,877
Int. Cl.[6] B24B 23/08
U.S. Cl. 451—549 2 Claims



1. A hand-held abrasive tool for holding a circular cutting blade along a central axis of the tool and sharpening a cutting edge of said circular cutting blade comprising a platform having a threaded shank disposed along the central axis of the tool for receiving said circular cutting blade, a threaded clamp threadably received on the shank to restrain the blade from rotating, an upper circular casing having a circular opening for receiving the shank and an angled abrasive surface strip spaced radially outward and longitudinally along the axis from the opening for engaging the cutting edge of the circular blade when the upper casing is fitted over the threaded clamp wherein the upper casing is rotated in a clockwise and counter-clockwise motion about the central axis of the tool to cause the abrasive strip to sharpen the cutting edge of the blade.

5,499,944
**CURRENCY HANDLING APPARATUS**
John A. Weston, and John W. Bailey, both of Reading, United Kingdom, assignors to Mars Incorporated, McLean, Va.
PCT No. PCT/GB93/01622, § 371 Date Jan. 27, 1995, § 102(e) Date Jan. 27, 1995, PCT Pub. No. WO94/03874, PCT Pub. Date Feb. 17, 1994
PCT Filed Jul. 30, 1993, Ser. No. 374,653
Claims priority, application United Kingdom, Jul. 30, 1992, 9216172
Int. Cl.[6] G07D 1/06
U.S. Cl. 453—17 14 Claims

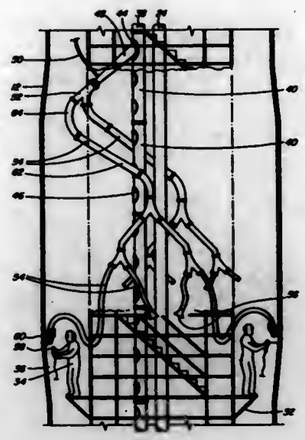


1. Currency handling apparatus comprising at least one store for storing units of currency, means for selectively directing currency units to the store, means for selectively dispensing units from the store, control means which can be enabled by an operator automatically to empty the store to a predetermined, adjustable float level, and means for automatically altering said predetermined float level in response to one or more parameters indicative of the likelihood of the currency units being required for dispensing.

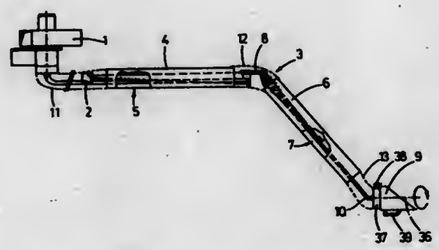
5,499,945
**VENTILATION APPARATUS PROVIDING AIR EXTRACTION ADJACENT SELECTED WORKSTATIONS IN A CONFINED SPACE**
Keith A. Ferlin, 6302 Peach Orchard Road, Summerland, Canada, and Morris P. Kemps, 564 Braid Street, Penticton, Canada
Filed Dec. 1, 1994, Ser. No. 347,867
Int. Cl.[6] B08B 15/02
U.S. Cl. 454—49 5 Claims

1. An exhaust ventilation apparatus to be temporarily mounted in an elongated vessel having an outer casing to draw air from at least a selected one of several possible worksites in the vessel comprising;
(a) an exhaust duct to extend longitudinally in the vessel to an outlet opening in the outer casing of the vessel, the exhaust duct having a plurality of normally closed inlet ports spaced therealong,
(b) at least one air collection conduit to extend from an inlet positioned adjacent said at least one selected worksite and connect to a convenient one of the inlet ports spaced along the exhaust duct, and
(c) at least one venturi type air mover to be connected to the at least one air collection conduit between said inlet and said convenient one of the inlet ports,
whereby air from said at least one selected worksite is continuously drawn into the exhaust duct through the at least one air collection conduit and exhausted out of the vessel through the exhaust duct outlet.



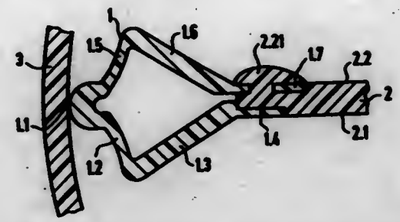


5,499,946
**DEVICE FOR EXHAUSTING GAS OR THE LIKE**
Josef E. P. Valkering, Limmen, Netherlands, assignor to Euromate Industrial Air Cleaning Systems B.V., Alkmaar, Netherlands
Filed Sep. 2, 1994, Ser. No. 300,007
Claims priority, application Netherlands, Sep. 9, 1993, 9301563
Int. Cl.[6] B08B 15/04
U.S. Cl. 454—63 3 Claims



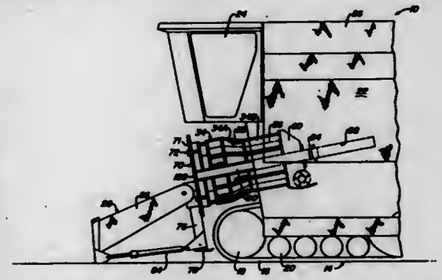
3. A device for exhausting gas-like fluids, comprising:
a support;
at least one exhaust tube movably mounted to the support and having a frame which is connected to the support in a manner pivotable at least in a vertical direction about a pivot point and being provided with a balancing mechanism for the at least one exhaust tube, said balancing mechanism comprising a force producing means, that includes at least two portions having two force components producing opposite variable torques around the pivot point of the frame such that balancing torques, counteracting torque caused by gravitation, are produced, the force producing means comprising a draw spring means and an elongated flexible fastening means connected thereto, said elongated flexible fastening means being guided around a reversing means fixed to the frame, and being mounted with its ends to the support to form cable portions, the flexible fastening means comprising a cable and the reversing means comprising a cable wheel.

5,499,947
**METHOD FOR MANUFACTURING AN AIR DAMPER FOR USE IN A MOTOR VEHICLE TEMPERATURE CONTROL UNIT**
Werner Tauber, Redwitz, Germany, assignor to Siemens Aktiengesellschaft, München, Germany
Filed Sep. 19, 1994, Ser. No. 308,714
Claims priority, application European Pat. Off., Sep. 22, 1993, 93115285
Int. Cl.[6] B60H 1/00
U.S. Cl. 454—69 12 Claims



1. A method for manufacturing an air damper for sealingly abutting a housing partition in a temperature control unit of a motor vehicle, wherein the damper includes a base member with a rubber-elastic hollow sealing section affixed about an edge portion thereof, said method comprising the steps of:
(a) molding the sealing section to form a fixed end injected onto a first surface of the base member, the sealing section having a sealing lug for contacting the housing partition, an unattached end, and wall portions respectively extending from the sealing lug to the fixed end unattached ends, wherein the wall portions have a predetermined shape and thickness; and
(b) mechanically fastening the unattached end of the sealing section to the base member along an edge portion of a second surface of the base member opposing the first surface, said step of fastening including a substep of slip-fitting the unattached end of the sealing section onto the second surface.

5,499,948
**MODULAR THRESHING ASSEMBLY FOR A COMBINE**
Mark R. Underwood, Burr Oak, Kans., assignor to Deere & Company, Moline, Ill.
Filed Sep. 1, 1994, Ser. No. 299,921
Int. Cl.[6] A01F 12/00
U.S. Cl. 460—119 18 Claims



7. In an axial flow combine for harvesting crop, the combine having a longitudinal axis and a framework mounted on wheels, the improvement comprising:
a threshing assembly cavity extending longitudinally within the framework of the combine;
a threshing assembly including a threshing rotor having a longitudinal axis, the threshing assembly locating within the cavity

of the framework of the combine, the threshing assembly having a forward end for receiving crop to be threshed and a rearward end;

a threshing assembly frame to which the threshing assembly is rotatably mounted, the threshing assembly frame having a support leg for engaging a support surface and having a pair of side members which are located on opposite sides of the threshing assembly;

a pair of guide members mounted to the framework, the side members and guide members cooperating with one another to slide the threshing assembly frame and threshing assembly into and out of the cavity between a mounted position and a removed position;

a forward support member pivotally mounted to the frame opposite the threshing assembly, the forward support member being movable between a raised and lowered position, the forward support member engaging the support surface when moved to one of the raised and lowered positions when the threshing assembly frame is in the mounted position so that the threshing assembly frame and threshing assembly can be pulled from the mounted position, the support leg engaging the support surface as the threshing assembly frame and threshing assembly are pulled from the mounted position to a removed position so that the frame and threshing assembly are in a freestanding, self supporting position; and

lift means for moving the forward support member between the raised and lowered position.

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**5,499,949**

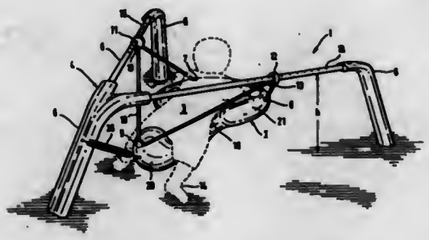
**TEETERING OR ROCKING DEVICE**

**Rainer H. Heubl, Bal der Pfizbuche 116, 89075 Ulm, Germany**

**Filed Aug. 31, 1994, Ser. No. 298,280**

**Int. Cl.[6] A63G *13/08***

**U.S. Cl. 472—105** **16 Claims**



1. A teetering or rocking device for a small child, comprising:

a support including a first, substantially flat portion for supporting the child's chest and arms along approximately a horizontal plane, a second portion that gradually slopes down from the first portion at an angle to the horizontal plane having a curved surface shaped to support the child's stomach and pelvis, and a third portion which narrows in width from the second portion to permit the child's upper thighs to wrap around a fourth portion of the support which angles up from the third portion toward the horizontal plane of the first portion; and

a support device which permits pendulum-like suspension or support of the support at such a height from the floor that the feet of the child can reach the floor.

**5,499,950**

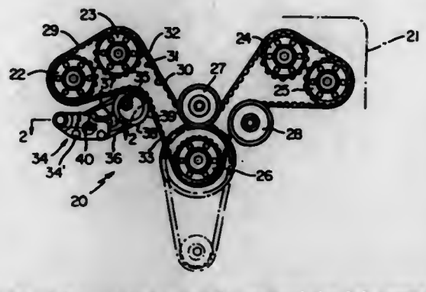
**BELT TENSIONER, ACTUATOR THEREFOR AND METHODS OF MAKING THE SAME**

**M. Michael Tsai, Rochester Hills; David E. Fletcher, Flint, and Joseph W. Zaman, Rochester Hills, all of Mich., assignors to Dayco Products, Inc., Dayton, Ohio**

**Division of Ser. No. 248,134, May 24, 1994, Pat. No. 5,391,118. This application Feb. 13, 1995, Ser. No. 387,521**

**Int. Cl.[6] F16H *7/08***

**U.S. Cl. 474—138** **10 Claims**



1. In a belt tensioner for an endless transmission belt construction arranged to move in a certain path, said tensioner comprising a support means, an arm pivotally mounted to said support means, a pulley rotatably carried by said arm for being disposed in engagement with said belt construction, and an actuator carried by said support means and having opposed ends, said actuator having a movable piston projecting out of one of said opposed ends thereof for being in engagement with said arm to pivot said arm in a direction to urge said pulley into said belt construction as said piston is extended outwardly from said one of said opposed ends of said actuator, said actuator having spring means therein that is operatively associated with said piston for urging said piston outwardly, said actuator having a rotatable shaft means that is operatively interconnected to said spring means and that is provided with opposite end means one of which is operatively interconnected to said piston, said actuator having a casing provided with an internal recess means therein that receives the other of said opposite end means of said shaft means therein, said recess means having end surface means, said spring means being adapted to rotate said shaft means to extend said piston while said other end means of said shaft means rotates in said recess means and bears against said end surface means thereof, said end surface means of said recess means comprising a cup-shaped cap press-fitted into said casing and having a closed end and an open end receiving said other end means of said shaft means therein, said closed end of said cap having an opening means passing therethrough, said other end means of said shaft means having an opening means aligned with said opening means of said cap, the improvement wherein said other end means of said shaft means comprises a thrust washer means assembled to said shaft means to be carried thereby and having an opening means passing therethrough and being aligned with said opening means of said cap and said opening means of said shaft means.

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**5,499,951**

**DYNAMIC RANGE SHIFT TRANSFER CASE WITH ELECTROMAGNETIC CLUTCH FOR COUPLING ONE OUTPUT TO THE INPUT FOR MODULATING TORQUE SPLIT**

**Dan J. Showalter, Plymouth, Mich., assignor to Borg-Warner Automotive, Inc., Sterling Heights, Mich.**

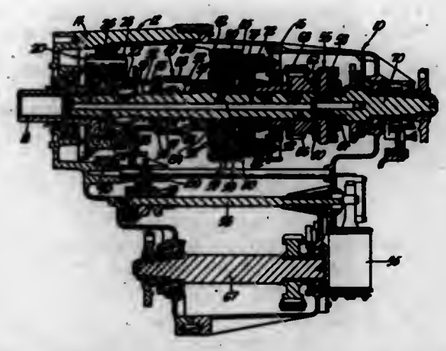
**Filed Aug. 2, 1993, Ser. No. 101,140**

**Int. Cl.[6] F16H *37/08;48/06***

**U.S. Cl. 475—204** **11 Claims**

1. In a transfer case having a speed change gear set, a shift sleeve for engaging different gears of the speed change gear set, a





differential having an input and two outputs for driving front and rear drive axles of a motor vehicle respectively and a main input shaft for providing a first drive path from the shift sleeve to the input of the differential,

the improvement comprising a modulatable friction clutch providing a second drive path between the shift sleeve and one of the two outputs of the differential so as to modulate torque split between the two outputs and assist in dynamic shifts of the shift sleeve between engagements with different gears of the speed change gear set.

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**5,499,952**

**METHOD AND ARRANGEMENT FOR CONTROLLING THE POWER OF A DRIVE UNIT OF A MOTOR VEHICLE**

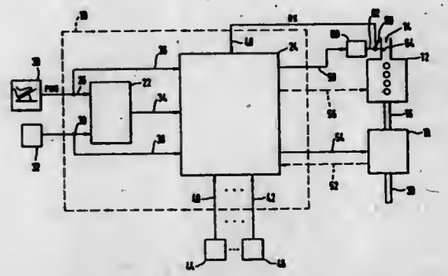
**Werner Huber, Schwalkheim, and Martin Streib, Vaihingen, both of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany**

**Filed Apr. 28, 1994, Ser. No. 233,415**

**Claims priority, application Germany, Apr. 27, 1993, 43 13 746.6**

**Int. Cl.[6] B60K *26/04;28/16;* F02D *11/10;* F16H *59/14***

**U.S. Cl. 477—115** **13 Claims**



1. A method for controlling the power of a drive unit of a motor vehicle driven by a driver, the drive unit including a power-output element which is controlled into a driver-commanded position on the basis of the position of an operator-controlled element actuable by the driver, said power-output element being adjustable to positions different from said driver-commanded position depending upon the operating state of said drive unit, the method comprising the steps of:

detecting an operating variable which represents the operating state of said drive unit;

determining a maximum permissible limit value for the position of said power-output element based upon the position of said operator-controlled element and said operating variable; and,

determining a fault when the position of said power-output element exceeds said maximum permissible limit value.

**5,499,953**

**CONTROL DEVICE HAVING COMPENSATION MEANS FOR CHANGING PREDETERMINED THROTTLE PEDALLING SPEEDS OF AUTOMATIC TRANSMISSION FOR VEHICLE**

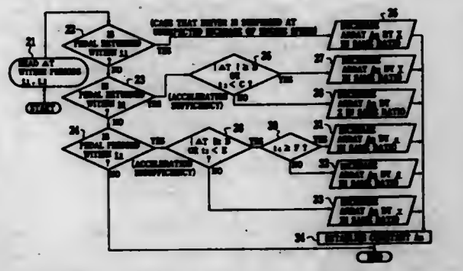
**Keiichi Hayasaki, Ebina, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan**

**Filed May 6, 1994, Ser. No. 238,942**

**Claims priority, application Japan, Jun. 28, 1993, 5-156964**

**Int. Cl.[6] G06F *15/50;* F16H *59/18***

**U.S. Cl. 477—120** **14 Claims**



1. A device for controlling an automatic transmission for a vehicle, said device comprising, in combination:

selecting means for selecting at least one gearshift pattern from a plurality of gearshift patterns corresponding to a result obtained by comparing an actual pedalling speed with at least one of a plurality of predetermined pedalling speeds;

monitoring means for monitoring a driver's pedalling operation for acceleration or deceleration when a gearshift in said automatic transmission is carried out; and

compensating means for compensating said predetermined pedalling speeds in response to said monitoring means.

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**5,499,954**

**CONTROL METHOD AND ARRANGEMENT FOR A REGULATING VARIABLE DETERMINING A MOTOR VEHICLE CLUTCH ROTATIONAL SPEED DIFFERENCE**

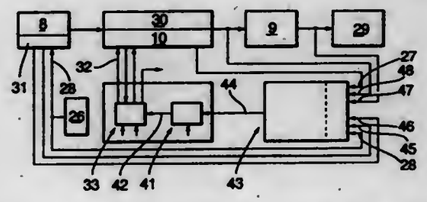
**Gerhard Wagner, Remseck, and Lothar Hein, Fellbach, both of, Germany, assignors to Mercedes-Benz AG, Germany**

**Filed Oct. 31, 1994, Ser. No. 332,517**

**Claims priority, application Germany, Jan. 29, 1993, 43 37 021.7**

**Int. Cl.[6] B60K *23/02;41/22***

**U.S. Cl. 477—174** **16 Claims**



1. An arrangement for controlling a regulating variable which determines a rotational speed difference of a clutch located in a force path between an internal combustion engine and a change-speed gearbox of a motor vehicle, comprising

(a) an electronic control unit configured and arranged to process input signals dependent on influencing variables specific to the motor vehicle and fixed required value characteristics and to provide output signals representative of required values for actuating an element adjusting the regulating variable;

(b) a device configured to record an influencing variable dependent on a speed of an accelerator pedal and operatively associated with the electronic unit;
(c) a device configured to record an influencing variable dependent on a clutch temperature and operatively associated with the electronic unit, wherein, during a transient clutch condition a phase with a variation, determined by a specified time function, of the regulating variable is selectable and a beginning and an end of both the transient clutch condition and the phase being respectively fixed as a function of the influencing variables specific to the vehicle, and
(d) a device configured to record an influencing variable dependent on rate of change of the clutch temperature, wherein at least one of the influencing variables, one of which depends on the rate of change of the clutch temperature and the other of which depends on the speed of the accelerator pedal, is utilizable exclusively to fix the beginning and the end of the phase and to fix a curve, determined by a specified time function, of the regulating variable.

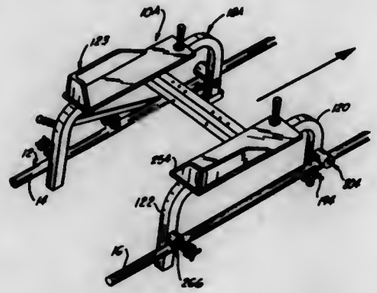
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**5,499,955**

**PATIENT SUPPORT FOR USE WITH PARALLEL BARS**

Danny L. Becker, Kingsley, Iowa; Kevin W. Berk, Sussex, and Carl Krippendorf, Milwaukee, both of Wis., assignors to Smith & Nephew Rolyan, Inc., Germantown, Wis.

Continuation-in-part of Ser. No. 7,151, Jan. 21, 1993, abandoned. This application Jul. 14, 1994, Ser. No. 275,123
Int. Cl.[6] A61H *3/00*
U.S. Cl. 482—51 8 Claims



8. A patient support for use with first and second horizontally spaced apart parallel bars, each parallel bar having end portions, the bars being elevated above a walking surface that is engaged by a patient's feet, with the bars being elevated to a position adjacent a patient's torso, comprising:
(a) a carriage having a front and back end, front and back U-shaped frames having turned-down leg portions, the front and back frames being attached at a center portion of the U-shape, and opposite armrest portions placed along a portion of the front and back frames;
(b) a plurality of guide means placed on the turned-down leg portions of the front and back frames of the carriage for movably mounting the carriage on the parallel bars so that the carriage can travel on the bars and between the end portions of the bars;
(c) the carriage having a configuration that allows the patient to position his or her torso between the parallel bars at the back end of the carriage and support him or herself by grasping the armrest portions with the patient's arms, the carriage and the bars defining a load bearing structure that allows the patient to support a portion of his or her weight while moving the carriage along the parallel bars when engaging the walking surface below the elevated bars with his or her feet;
(d) the carriage further including supports for receiving hands, forearms and elbows of a patient so that the patient can rest his or her hands, forearms and elbows on the supports and support him or herself while moving the carriage along the parallel bars; and
(e) a manually operable braking means attached to a portion of the carriage for providing a selective braking of the carriage as it moves along the parallel bars, the braking means including means for rigidly securing the carriage to at least one of the first or second parallel bars.

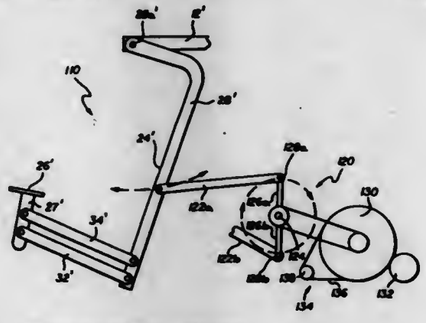
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**5,499,956**

**ARTICULATED LOWER BODY EXERCISER**

Theodore G. Habing, Long Beach, and Robeon L. Splane, Jr., Granada Hills, both of Calif., assignors to NordicTrack, Inc., Chaska, Minn.

Continuation-in-part of Ser. No. 984,301, Dec. 1, 1992, Pat. No. 5,299,993. This application Feb. 22, 1994, Ser. No. 199,665
Int. Cl.[6] A63B *22/00;23/10*
U.S. Cl. 482—52 9 Claims



1. An exercise machine comprising:
(a) a frame;
(b) a pair of laterally spaced apart foot pedals, each pedal coupled to the frame by a respective articulated linkage comprising a generally vertical first linkage pivotally coupled to the frame and a generally horizontal second linkage pivotally coupled to both the first linkage and the respective foot pedal;
(c) a crank assembly coupled to both of the first linkages such that the first linkages move with an alternating reciprocating action;
(d) motor means coupled to the articulated linkage of each foot pedal for regulating movement thereof.

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**5,499,957**

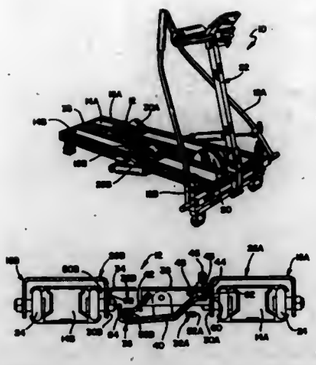
**QUICK CHANGE MECHANISM FOR SYNCHRONOUS/ ASYNCHRONOUS EXERCISE MACHINE**

Jeffrey D. Metcalf, Albion, and Daniel F. Brashear, Olney, both of Ill., assignors to Roadmaster Corporation, Olney, Ill.

Division of Ser. No. 9,717, Jan. 27, 1993, Pat. No. 5,338,273. This application Aug. 10, 1994, Ser. No. 288,329
Int. Cl.[6] A63B *69/18*
U.S. Cl. 482—70 16 Claims

1. A synchronous/asynchronous exercise machine changeable between a synchronous exercise mode and an asynchronous exercise mode, the synchronous/asynchronous exercise machine comprising:
a) a first movable element for accepting force;
b) a second movable element for accepting force;
c) a first drive belt operatively connected to the first movable element such that the first drive belt moves conjointly with the first 10 movable element;
d) a second drive belt operatively connected to the second movable element such that the second drive belt moves conjointly with the second movable element; and





e) a quick change mechanism operatively connected to the first movable element and releasably engagable with the second drive belt for changing the synchronous/asynchronous exercise machine between the synchronous exercise mode and the asynchronous exercise mode.

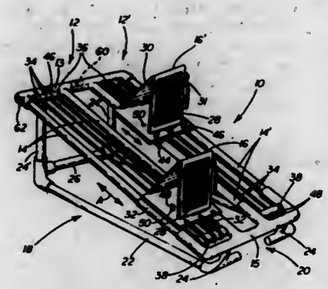
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**5,499,958**

**PORTABLE AND REVERSIBLE LEG EXERCISING APPARATUS**

Daniel F. Hess, 3148 Hyde Park, Lexington, Ky. 40503

Filed Apr. 12, 1995, Ser. No. 421,595
Int. Cl.[6] A63B *22/00*
U.S. Cl. 482—79 21 Claims



1. A reversible, portable leg exercising apparatus, comprising:
an inclined guideway having an upper end and a lower end;
a pedal mounted for relative sliding movement along said guideway;
a first reversing roller mounted adjacent said upper end of said guideway;
a second reversing roller mounted adjacent said lower end of said guideway; and
an elastic means for providing resistance to movement of said pedal, said elastic means including first and second ends and being selectively connectable in a seated exercise position with said first end being held by said pedal and said second end being held by said second reversing roller and in a reclined exercise position with said first end being held by said first reversing roller and said second end being held by said pedal.

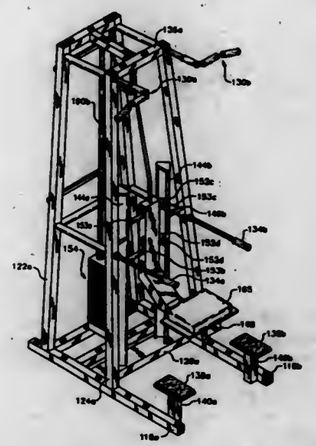
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**5,499,959**

**UPPER BODY EXERCISE APPARATUS**

Fred H. Holmes, Tulsa, Okla.; Robert L. Rawls, Woodinville, and James A. Duncan, Renton, both of Wash., assignors to StairMaster Sports/Medical Products, Inc., Kirkland, Wash.

PCT No. PCT/US92/02522, § 371 Date Jul. 12, 1994, § 102(e) Date Jul. 12, 1994, PCT Pub. No. WO92/19326, PCT Pub. Date Nov. 12, 1992
Continuation-in-part of Ser. No. 685,364, Apr. 15, 1991, abandoned. This PCT application Mar. 31, 1992, Ser. No. 137,878
Int. Cl.[6] A63B *21/06*
U.S. Cl. 482—95 16 Claims



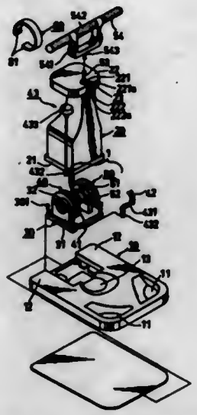
1. A chin-up dip exercise apparatus to assist an exerciser having a body weight in performing chin-ups and dips, comprising:
a frame including a pair of spaced apart, substantially parallel stationary guides oriented in a substantially vertical plane;
an exerciser lifting support platform to support the exerciser thereon, said support platform being horizontally spaced a distance away from said guides and out of said guide vertical plane sufficient to position the body of the exerciser clear of said guides when on said support platform performing chin-ups and dips;
connector guide members connected to said support platform to travel therewith as a unit, said guides each guidingly engaging at least one of said connector guide members to limit movement of said connector guide members to linear movement along said guides, said guides allowing substantially uninhibited vertical movement of said connector guide members but restraining said connector guide members against substantial horizontal movement as said connector guide members move along said guides to provide substantially linear guided vertical movement of said support platform between upper and lower end limits of vertical travel of said support platform without substantial horizontal movement of said support platform, said connector guide members holding said support platform oriented substantially horizontal as said support platform moves vertically toward and away from said upper and lower end limits of travel;
a first handle coupled to said frame for grasping by the exerciser during a chin-up exercise;
a second handle coupled to said frame below said first handle for grasping by the exerciser during a dip exercise; and
a weightstack coupled to said support platform to supply an upward force to said support platform, said weightstack being selectively adjustable to select a magnitude of said upward force supplied to said support platform and thereby at least partially offset the body weight of the exerciser by a selected amount to assist the exerciser when performing chin-ups and dips.

5,499,960

## MULTI-FUNCTIONAL EXERCISE DEVICE

Ping Chen, No. 20, Nan-Mei St., Taichung City, Taiwan

Filed Jun. 15, 1995, Ser. No. 490,584
Int. Cl.[6] A63B 21/22
U.S. Cl. 482—116 8 Claims



1. A multi-functional exercise device, comprising:

a base plate having opposed first and second end portions and an intermediate portion between said first and second end portions;

an upright hollow housing having a bottom end mounted on said base plate at an intermediate section of said first end portion of said base plate so as to form two tread sections on said base plate on two sides of said housing, and a top end which has a top plate mounted thereon, said top plate being formed with a passage unit for access into an interior of said housing, said passage unit includes a longitudinal hemispherical recess which opens at a top surface of said top plate and a transverse hemispherical recess which opens at a side surface of said top plate and which is communicated with said longitudinal hemispherical recess;

said base plate being formed with an elbow-receiving depression at said intermediate portion thereof, said elbow-receiving depression being located between said two tread sections and immediately adjacent said housing;

a driving unit including a horizontal shaft which is disposed inside said housing and which is mounted rotatably on said base plate, a driving rope having a first end portion attached to said horizontal shaft and a second end portion extending out of said housing through said passage unit, a hand-gripping member secured to said second end portion of said driving rope, and biasing means for biasing said horizontal shaft to rotate so as to wind normally said driving rope on said shaft; and

a damping unit, disposed inside said housing and associated operably with said horizontal shaft, for providing resistance to damp rotation of said horizontal shaft.

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5,499,961

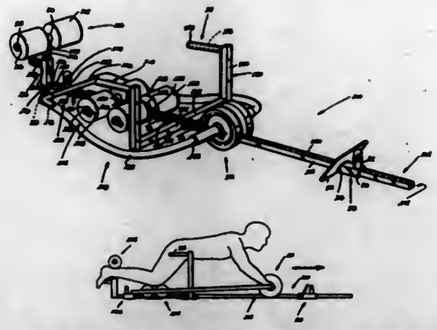
## KNEELING-PRONE-KNEELING EXERCISE DEVICE

Ernest M. Matter, 1640 Leonard St., NW., Grand Rapids, Mich. 49504

Filed Dec. 17, 1993, Ser. No. 169,674
Int. Cl.[6] A63B 21/04;21/055
U.S. Cl. 482—132 20 Claims

1. An exercise device having:

a glide for supporting arms of a user in a forward kneeling position and gliding along a support while extending the body in a forward direction;



a heel brace adapted to be positioned behind and bear against the rear surface of the heels of a user for restraining upward movement of the heels of a user in a forward kneeling position and as the user pushes the glide in the forward direction;

a knee rest for supporting knees of a user in a forward kneeling position as the user glides the glide in the forward direction; and

a connector between the knee rest and the heel brace to maintain the heel brace and the knee rest in a relatively fixed position, at least while the user rests his or her knee on the knee rest and pushes the glide in the forward direction;

whereby as the user pushes the glide in the forward direction, with knees on the knee rest and heels abutting the heel brace, the user can use at least one of back, buttock and leg muscle groups to extend and support his or her body and return his or her body to the kneeling position.

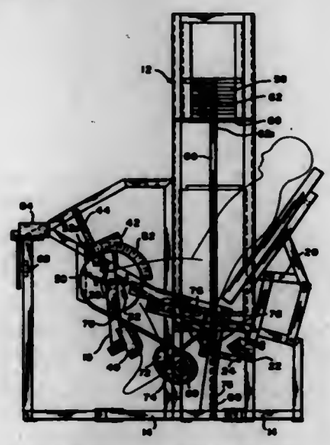
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5,499,962

## LEG EXERCISE MACHINES HAVING RETRACTABLE LEG SUPPORT AND METHODS

Arthur A. Jones, 1155 NE. 77th St., Ocala, Fla. 32670

Division of Ser. No. 921,112, Jul. 29, 1992, Pat. No. 5,338,274, which is a continuation-in-part of Ser. No. 909,658, Jul. 7, 1992, Pat. No. 5,256,125. This application Jul. 5, 1994, Ser. No. 270,594
Int. Cl.[6] A63B 23/04
U.S. Cl. 482—137 4 Claims



1. A machine for exercising leg muscles including in combination, a movement arm rotatable about a generally horizontal axis



and having a portion engageable with one or both legs of the user, a seat for receiving a user with the legs engageable with the movement arm to move the movement arm in one direction about said axis, said movement arm being located forward of the seat, a weight stack including a resistance weight and a stack pin connectable to the resistance weight, drive transmission means between the movement arm and the stack pin to raise the stack pin when the movement arm is rotated in one direction about said axis, said movement arm having a path of movement when being rotated about said axis, said machine including a support frame having a portion located forward of the seat and to one side of the path of movement of the movement arm, and an auxiliary leg support mounted to said frame portion of the machine for movement between a non-use position extending vertically at one side of the path of movement of said movement arm and spaced from the path of movement of the movement arm and a use position extending across a portion of the machine forward of the seat and above said portion of the movement arm for supporting the other leg of the user.

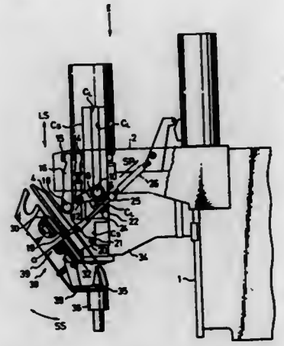
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5,499,963

## AUTOMATIC TOOL CHANGER

Akihiko Fujimoto, Yamanashi; Hisao Ishii, Mitaka; Shinya Okamoto, Yamanashi, and Naoki Sato, Yamanashi, all of, Japan, assignors to Fanuc Ltd., Yamanashi, Japan

PCT No. PCT/JP93/00111, § 371 Date Sep. 28, 1993, § 102(e) Date Sep. 28, 1993, PCT Pub. No. WO93/14901, PCT Pub. Date Aug. 5, 1993
PCT Filed Jan. 29, 1993, Ser. No. 119,221
Claims priority, application Japan, Jan. 29, 1992, 4-014182; Jun. 23, 1992, 4-164927
Int. Cl.[6] B23Q 3/157
U.S. Cl. 483—56 11 Claims



1. An automatic tool changer for a machine tool, comprising:

a column;

a spindle head mounted to the column, said spindle head being slidable in a vertical direction;

a spindle supported in the spindle head and rotatable about a central vertical axis, the spindle being adapted to hold a tool for machining at an end thereof;

a slide member mounted to the column, said slide member being slidable in the vertical direction;

a turret for accommodating a plurality of tools for machining, the turret being rotatable about a center axis thereof to select a tool for a tool change, said turret being connected to said slide member so as to swing about a horizontal axis toward and away from the spindle;

a first cam means provided on the spindle head to move with the spindle head in the vertical direction;

a first cam roller means mounted on the turret to engage the first cam means, the turret swinging about the horizontal axis toward and away from the spindle through engagement between the first cam roller means and the first cam means when the spindle head moves in the vertical direction;

a link means for moving the slide member and the turret in the vertical direction, the link means having an arm member connected to the slide member for moving the slide member in the vertical direction, the arm member being pivotably mounted to the column;

a second cam means mounted to the spindle head to move with the spindle head in the vertical direction;

a second cam roller means mounted to the arm member of the link means so as to engage the second cam means, the arm member of the link means rotates through the engagement between the second cam roller means and the second cam means when the spindle head moves in the vertical direction, wherein a rotation of the arm member moves the slide member and the turret in the vertical direction; and

the vertical movement of the spindle head, for the purpose of changing a tool held at the end of the spindle and a selected one in the turret, makes the turret swing toward and away from the spindle and move in the vertical direction through engagements between the first cam means and the first cam roller means, and the second cam means and the second cam roller means, wherein the vertical movement of the turret reduces a relative velocity between the second cam means and the second cam roller means to reduce a velocity of the swing, whereby shock generated during the tool change is reduced.

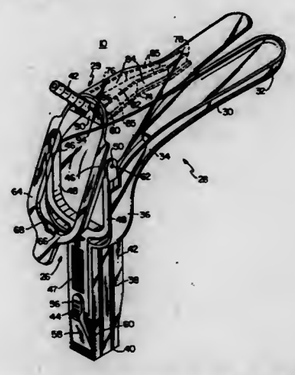
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5,499,964

## SPECULUM WITH SMOKE EVACUATION CHANNEL

Henry Beck, Skaneateles; J. Brian Noll, Marcellus, and Michael D. Lynch, Skaneateles, all of N.Y., assignors to Welch Al lyn, Inc., Skaneateles Falls, N.Y.

Filed Sep. 16, 1994, Ser. No. 307,262
Int. Cl.[6] A61B 1/06;1/303;1/32
U.S. Cl. 600—220 7 Claims



1. An improved vaginal speculum for use during surgery, said speculum comprising:

a lower blade member having a longitudinal axis extending through a distal tip end and being formed of a relatively rigid, transparent plastic material, said lower blade member further including a depending hollow leg portion having a distal end and a proximal end;

a slide member formed of a relatively flexible plastic material, said slide member having a distal end and a forked proximal end, said lower blade member and said slide member having cooperating engagement means for slidably connecting said slide member to the leg portion of the lower blade;

an upper blade member being formed of a relatively rigid, transparent plastic material and pivotally carried by said forked proximal end of said slide member, said upper blade member thereby being rotatably and slidably movable relative to said lower blade member;

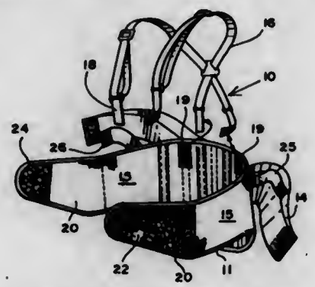
a smoke evacuation passage formed by a U-shaped channel member positioned adjacent a contoured interior surface of said upper blade member, said U-shaped channel member including a forward end, a rearward end, a bottom surface, and a pair of opposed side walls each having a top edge shaped to fit snugly adjacent the contours of the interior surface so that smoke being removed through the evacuation passage travels from said forward end toward said rearward end while being substantially retained within said U-shaped channel member and a pair of retaining walls formed along said contoured interior surface of said upper blade member, said retaining walls providing an interlocking sliding fit with said pair of opposed side walls of said U-shaped channel member.

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## 5,499,965
## SHAPED LIFTING BELT AND METHOD

Ana V. Sanchez, Miami, Fla., assignor to FLA Orthopedics, Inc., Fla.

Filed Dec. 30, 1994, Ser. No. 367,006
Int. Cl.[6] A61F 5/00
U.S. Cl. 602—19 8 Claims



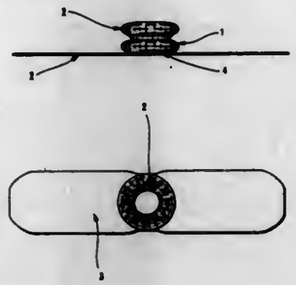

1. A shaped lifting belt comprising, in combination:
a wrap assembly, said wrap assembly including a central lumbar panel having an upper outer portion, a central rear portion and lateral edges, and inelastic straps and pockets, said straps having ends;
side pulls, said side pulls being secured at said central rear portion of said lumbar panel and said side pulls having ends with removable attachment means for securing a shape strap;
a stretchable shape panel provided between said lateral edges of said lumbar panel and said ends of said wrap assembly; and
substantially inelastic shape straps secured to said upper outer portion of said lumbar panel, said shape straps having a length to span said shape panel and ends for being selectively secured to said wrap ends, whereby a user pulls and secures said shape straps to conform said stretchable shape panels to the torso and upper pelvis, and selectively secures said shape straps to said side pulls' ends.

7. The method of securing a shaped lifting belt including a wrap assembly having an outer end; a central lumbar panel having a lateral portion and a rear portion, said lumbar panel having side pulls secured thereto at said rear portion; a shape panel, said shape panel being elastic and located between said wrap ends and said lumbar panel; a shape strap, said shape strap being secured to said lateral portion of said lumbar panel and being of sufficient length to engage removable securable material on said warp ends and having less elasticity than said shape panel, said method comprising the steps of:
securing the wrap assembly of a user in overlapping locked relationship to the wrap ends thereof;
pulling the shape straps and removably securing said shape straps to the wrap ends of said wrap assembly;
pulling said side pulls forwardly to a mid-point on an outer end of said wrap assembly at a central portion of the torso of a wearer.

## 5,499,966
## TUBULAR BANDAGES

John L. Bulley, Padstow, and Stephen I. Gradwell, St. Columb Major, both of, England, assignors to JLB Textiles Limited, Cornwall, England

PCT No. PCT/GB92/01521, § 371 Date Apr. 20, 1994, § 102(e) Date Apr. 20, 1994, PCT Pub. No. WO93/03691, PCT Pub. Date Mar. 4, 1993
PCT Filed Aug. 18, 1992, Ser. No. 196,157
Claims priority, application United Kingdom, Aug. 21, 1991, 9118062
Int. Cl.[6] A61F 13/00;15/00
U.S. Cl. 602—42 20 Claims




1. A tubular bandage comprising
a length of tubular knitted fabric comprising one or more courses of substantially inelastic yarn interknitted with one or more courses of elastic yarn throughout said length, the tubular fabric having a first end portion rolled outwardly from the free end and the other end portion rolled inwardly from the opposite free end to form two rolls; and
a dressing comprised of a separate material adapted to be applied directly to a wound attached to the said first end rolled portion of the fabric which is adapted to placed on top of said dressing.

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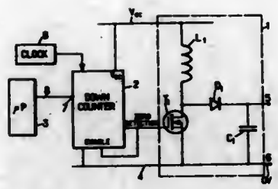
## 5,499,967
## TRANSDERMAL DRUG DELIVERY DEVICE WITH WAVESHAPE GENERATOR

Eric Teillaud, Talant; Bruno Bevan, Chevigny St Sauveur; Claude Mikler, Dijon, all of, France; Paul Reilly, Hardwick, United Kingdom, and Philippe Millot, Dijon, France, assignors to Societe anonyme dite: Laboratoires D'Hygiene Societe anonyme dite: et de Dietetique (L.H.D.), Paris, France

Continuation-in-part of Ser. No. 16,269, Feb. 11, 1993, Pat. No. 5,426,387. This application Jan. 13, 1994, Ser. No. 181,078
Claims priority, application France, Feb. 27, 1992, 92 02276
Int. Cl.[6] A61N 1/30
U.S. Cl. 604—20 6 Claims

1. Apparatus for transdermally and iontophoretically delivering medicinal products comprising at least first and second electrodes designed to be put in contact with two adjacent areas of the skin of a patient, a reservoir of a medicinal product having electrically transportable molecules being arranged against at least the first of the electrodes in order to come into contact with the patient's skin, wherein the electrodes are supplied by a device for generating an electrical voltage of predetermined waveform, comprising a switched-mode power supply having an inductor serially connected to an electronic switching member, the closing of which controls the power supply of the inductor which discharges, when the member reopens, into a capacitor which is connected in parallel with the electronic switching member, the capacitor having terminals which are electrically connected to the electrodes, said device further comprising (a) storage means for recording a sequence of numbers which are images of successive segments of the predetermined waveform, (b) a clocked digital counter, (c) means for





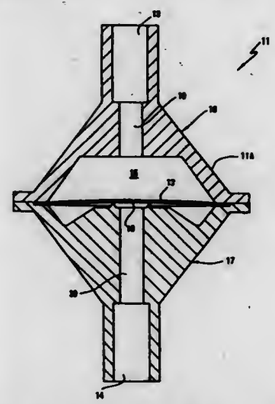

successively loading the counter with each of the numbers of the sequence considered as a bound of the count performed by the counter, and (d) means for reinitializing the counter each time the bound is reached, thereby cyclically controlling the closing of the switching member for a fixed time interval, each time the count performed reaches the bound fixed by the means for successively loading.

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## 5,499,968
## FLOW CONTROLLERS FOR FLUID INFUSION SETS

Zoran Milijasevic, and Graham Bode, both of Turrella, Australia, assignors to Macnaught Pty Limited, Turrella, Australia

Division of Ser. No. 923,927, Oct. 21, 1992, Pat. No. 5,356,376. This application Jul. 8, 1994, Ser. No. 272,232
Claims priority, application Australia, Mar. 8, 1990, P J 9008
Int. Cl.[6] A61M 1/00
U.S. Cl. 604—30 27 Claims



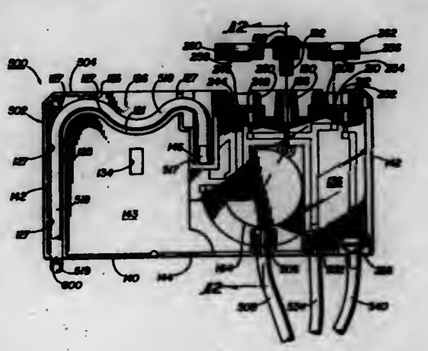

1. An in line fluid flow controller for use with a fluid administration set for infusion of fluid into the body of a patient, the administration set comprising means for connecting the administration set to a reservoir of fluid, said connecting means being connected to a supply line having the flow controller therein, said fluid flow controller comprising:
a housing having a chamber therein, an inlet to and an outlet from said chamber, said housing having therein a flow restrictor plate having planar opposed surfaces and an orifice or orifices extending through the plate and terminating at said planar surfaces configured to control the rate of fluid flow therethrough and into the body of a patient such that the fluid is infused into a patient at a predetermined constant flow rate or at a flow rate within predetermined limits, said housing comprising components forming said chamber and securing said restrictor plate within the housing.

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## 5,499,969
## MICROSURGICAL CASSETTE

Charles E. Beuchat, Irvine; Roger Etherington, Newport Beach; Harold J. Walbrink, Laguna Niguel, all of Calif., and John W. Berkman, Grants Pass, Oreg., assignors to Nestle S.A., Vevey, Switzerland

Division of Ser. No. 135,965, Oct. 13, 1993, Pat. No. 5,364,342, which is a continuation of Ser. No. 831,766, Feb. 5, 1992, abandoned. This application Jul. 14, 1994, Ser. No. 274,935
Int. Cl.[6] A61M 1/00
U.S. Cl. 604—30 25 Claims



1. A cassette for use in combination with a surgical handpiece and a control console for controlling irrigation and aspiration fluid flows in the handpiece, comprising:
a) a housing having an external surface and an interface adapted to be held in operative association with the control console;
b) a means for generating a partial vacuum through interaction with a motive force having an inlet and a discharge line;
c) an aspiration fluid inlet coupling integrally formed in the housing;
d) an irrigation fluid inlet coupling integrally formed in the housing;
e) an irrigation fluid outlet coupling integrally formed in the housing;
f) an aspiration fluid flow passage integrally formed in the housing in fluid communication with the aspiration fluid inlet coupling and the partial vacuum generating means inlet;
g) an irrigation fluid inlet flow passage integrally formed in the housing in communication with the irrigation fluid inlet coupling;
h) an irrigation fluid outlet flow passage integrally formed in the housing in communication with the irrigation fluid inlet flow passage and the irrigation fluid outlet coupling to form a continuous irrigation fluid flow passage between the irrigation fluid inlet coupling and the irrigation fluid outlet coupling; and

i) a valve spaced within the continuous irrigation fluid flow passage between the irrigation fluid inlet flow passage and the irrigation fluid outlet flow passage in operative association with a valve actuator in the console.

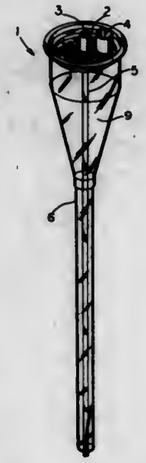
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5,499,970

## DEBRIDEMENT TIP

Daniel H. Olson, Louisville, Ohio, assignor to Zimmer, Inc., Warsaw, Ind.

Filed Aug. 23, 1994, Ser. No. 294,690
Int. Cl.[6] A61M *1/00*
U.S. Cl. 604—35 15 Claims




1. A debridement tip having a proximal end and a distal end, the proximal end having connectors for connecting to an irrigation source and a suction source, the tip comprising:

a base adjacent the proximal end, the base containing a fluid port and a suction port,

an inner cannula attached to the base in communication with the fluid port and defining a fluid path from the proximal end to the distal end;

an outer cannula surrounding the inner cannula, the outer cannula attached to the base in communication with the suction port and defining an annular suction path from the distal end to the proximal end, the paths defined by the inner and outer cannulas being two separate paths extending between the proximal and distal ends of the debridement tip so that fluid is simultaneously discharged from the inner cannula at the distal end of the debridement tip and sucked into the outer cannula at the distal end of the debridement tip; and

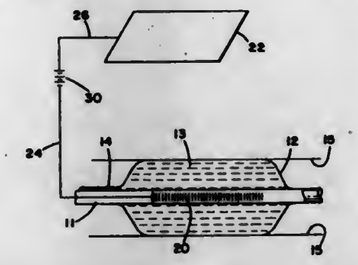
a collection chamber adjacent the proximal end, the collection chamber being an enlargement of the outer cannula such that the collection chamber defines an enlarged portion of the annular suction path.

5,499,971

## METHOD FOR IONTOPHORETICALLY DELIVERING DRUG ADJACENT TO A HEART

James E. Shapland, Shoreview, Minn.; Keith R. Hildebrandt, Houlton, Wis., and Mark B. Knudson, Shoreview, Minn., assignors to Cortrak Medical, Inc., Minneapolis, Minn.

Continuation of Ser. No. 957,209, Oct. 6, 1992, abandoned, which is a continuation-in-part of Ser. No. 937,464, Aug. 28, 1992, abandoned, which is a continuation-in-part of Ser. No. 705,731, May 24, 1991, abandoned, which is a continuation-in-part of Ser. No. 637,299, Jan. 3, 1991, abandoned, which is a continuation-in-part of Ser. No. 538,961, Jun. 15, 1990, abandoned. This application Dec. 14, 1993, Ser. No. 166,737
Int. Cl.[6] A61N *1/30*
U.S. Cl. 604—53 10 Claims




1. A method of delivering a drug to a target area of internal body tissue adjacent to a patient's heart, the method comprising the steps of:

(a) inserting a catheter into said target area of a body, said catheter comprising a distal end for local delivery of said drug, a fluid delivery passageway, an outer wall, a permeable outer membrane portion proximate said distal end, and iontophoresis means proximate said permeable membrane for iontophoretic transport of said drug across said permeable outer membrane without application of pressure;

(b) supplying net flow of electric current in a desired direction to said iontophoresis means to deliver said drug to said target area; and

(c) varying said electric current with time to provide a waveform having a frequency of about 200 Hz or higher such that the rate of iontophoretic transport of said drug is increased and the risk of inducing cardiac arrhythmias during iontophoretic transport is decreased.

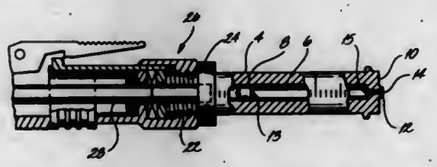
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5,499,972

## HYPODERMIC JET INJECTOR

James S. Parsons, Laguna Niguel, Calif., assignor to Equidyne Systems, Inc., San Clemente, Calif.

Continuation-in-part of Ser. No. 952,562, Sep. 28, 1992, abandoned. This application Sep. 29, 1993, Ser. No. 130,022
Int. Cl.[6] A61M *5/30*
U.S. Cl. 604—68 22 Claims




1. A hand-held, portable apparatus for hypodermically injecting a quantity of liquid comprising:

(a) a shell defining a chamber for containing the quantity of liquid,



(b) an orifice communicating with the chamber, a mouth of the orifice being pressed against an injection site whenever an injection is to take place,

(c) means for converting an applied force to a corresponding pressure applied to the liquid,

(d) means for coupling the shell to the means for converting an applied force,

(e) means for accumulating and storing a suitable amount of energy,

(f) means for manually releasing the stored energy,

(g) safety means connected between the means for manually releasing the stored energy and the shell for preventing release of the stored energy unless a shell is coupled to said means for converting an applied force, wherein the shell automatically engages the safety means by being coupled to said means for converting an applied force, and

(h) means for converting the released energy to the applied force, the amount of stored energy being sufficient to produce enough pressure to cause the liquid to leave the chamber via the orifice at such a velocity that it can be hypodermically injected at an injection site.

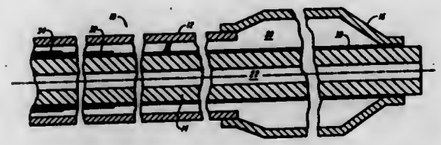
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5,499,973

## VARIABLE STIFFNESS BALLOON DILATATION CATHETERS

Mark A. Saab, 396 Andover St., Lowell, Mass. 01852

Filed Sep. 8, 1994, Ser. No. 302,267
Int. Cl.[6] A61M *29/00*
U.S. Cl. 604—96 82 Claims



1. In a balloon dilatation catheter apparatus comprising generally concentric, coaxial, inner and outer polymeric tubular members, each having proximal and distal ends, and arranged so as to form an annular lumen therebetween in fluid communication with the interior of an inflatable balloon element sealed at its proximal end to said outer tubular member and at its distal end to said inner tubular member, the improvement comprising: at least one heat-shrunk stiffening band surrounding at least some portion of the exterior of said inner tubular member so as to form a tubular sidewall having a first thickness along a first portion of said inner tubular member and at least a second, larger thickness along a second portion, further wherein at least one of said stiffening bands has a wall thickness substantially less than the wall thickness of said inner tubular member and consists essentially of a heat-shrunk polymeric material having a flexural modulus sufficiently greater than that of said inner tubular member such that the portion of said sidewall associated with said stiffening band has a flexural modulus substantially greater than that of said inner tubular member.

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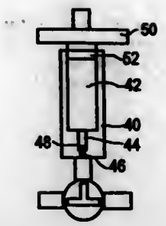
5,499,974

## EXTERNAL PUMP STROKE INDICATOR FOR USE WITH AN IMPLANTED MEDICATION INFUSION SYSTEM

Jan Rosen, Grillby, Sweden, assignor to Siemens Elema AB, Solna, Sweden

Filed Oct. 20, 1994, Ser. No. 326,209
Claims priority, application Sweden, Jan. 22, 1993, 9303485
Int. Cl.[6] A61M *5/48*
U.S. Cl. 604—118 11 Claims

1. A pump stroke indicator for use with an implanted medication infusion system, said implanted medication infusion system including a pump for conveying medication in vivo to a patient in whom the system is implanted, and said pump having an opening covered by a septum disposed at an output of said pump, said pump stroke indicator comprising:




a cylinder composed of a transparent material, said cylinder having a lower end;

means for transcutaneously placing said cylinder in fluid communication with said opening in said pump with said cylinder oriented in a substantially upright attitude;

a liquid contained in said cylinder, said liquid having a density;

a seat disposed in said cylinder; and

a sinker member disposed above said seat in said cylinder and movable in said liquid in said cylinder, said sinker member having a density which is greater than the density of said liquid so that said sinker member normally rests as a consequence of its weight on said seat and being displaced from said seat due to pressure elevations in said liquid occurring due to pump strokes of said pump in said implanted medication infusion system.

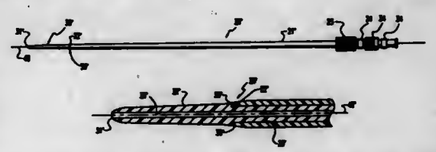
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5,499,975

## SMOOTH TRANSITIONED DILATOR-SHEATH ASSEMBLY AND METHOD

Constantin Cope, Elkins Park, Pa., and Patty J. Arnett, Bloomington, Ind., assignors to Cook Incorporated, Bloomington, Ind.

Continuation-in-part of Ser. No. 924,365, Jul. 31, 1992, Pat. No. 5,292,311, which is a continuation of Ser. No. 606,050, Oct. 30, 1990, abandoned, which is a continuation of Ser. No. 304,667, Jan. 31, 1989, Pat. No. 5,011,478. This application Dec. 17, 1993, Ser. No. 169,508
Int. Cl.[6] A61M *39/00;5/00*
U.S. Cl. 604—165 16 Claims



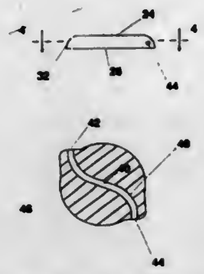
1. A dilator-sheath assembly for use in percutaneous entry comprising:

a sheath having an external surface and one end adapted to be inserted into the body;

a dilator within said sheath and having an external surface and a distal portion extending beyond the one end of the sheath so as to define a transition, said dilator having two ends and a longitudinal passageway extending between said ends, said external surface being formed to include an annular abutment surface against which said one end of said sheath abuts such that said transition from said external surface of said dilator to said external surface of said sheath is smooth, whereby said dilator shields said one end of said sheath when the dilator-sheath assembly is inserted in the body;

wherein said dilator is composed of a material having a lower melting point than said sheath.

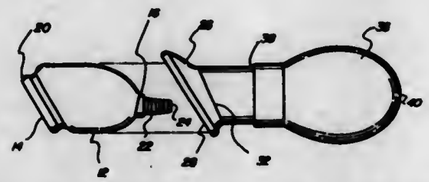
5,499,976
**CATHETER RETAINER**
Michael J. Dalton, 9432 Monticello Ave., Evanston, Ill. 60203
Filed Oct. 5, 1994, Ser. No. 318,264
Int. Cl.[6] A61M 25/02
U.S. Cl. 604—180 20 Claims



1. A one-piece catheter retainer which comprises
(a) a flexible, flat pad of substantially uniform thickness having a smooth top face, a smooth back face and an edge;
(b) a round tunnel sized to pass the catheter and extending completely inside the pad from a first opening on the edge to a second opening on the edge; together with
(c) a normally closed access slit connecting the entire length of said tunnel to the back face of the pad, thereby permitting the catheter to be inserted and retained in the pad.

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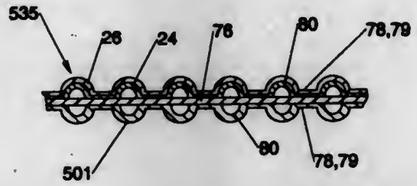
5,499,977
**MALE EXTERNAL CATHETER WITH VACUUM ASSIST**
Sherwood D. Marz, 6478 S. M St., Tacoma, Wash. 98408
Filed Nov. 8, 1994, Ser. No. 335,891
Int. Cl.[6] A61F 5/44
U.S. Cl. 604—352 1 Claim



1. A new and improved male external catheter with vacuum assist for providing a device that can be incorporated onto any male patient without worry of leaking or discomfort comprising, in combination:
a catheter having an open first end, an open second end, and an intermediate extent therebetween, the open first end having a rolled up ring thereattached for securement around a male's organ, the second end having an elongated hollow extension thereattached, the elongated hollow extension having a plurality of annular grooves thereon, the angular grooves adapted for coupling with a plastic tube that is secured to a bag or container for disposing of a male's urine, the intermediate extent constructed of a soft latex for ease of application and comfort;
a plastic tube having an open first end, an open second end, and an intermediate extent therebetween, the open first end having an opening twice that of the open second end, the open first end removably receiving the catheter therein, the rolled up ring of the first end of the catheter optionally rolls atop the open first end for application to a user, the open second end having a securement means thereattached; and
a rubber bulb having an open first end, a closed rounded second end, and a hollow interior, the open first end secured to the securement means of the open second end of the plastic tube, the rubber bulb functioning as a vacuum for the user.

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5,499,978
**ABSORBENT ARTICLE WITH DYNAMIC ELASTIC WAIST FEATURE HAVING A PREDISPOSED RESILIENT FLEXURAL HINGE**
Kenneth B. Buell, Cincinnati; Sandra H. Clear, Maineville, and Danielle T. Falcone, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Continuation of Ser. No. 914,958, Jul. 16, 1992, Pat. No. 5,221,274, which is a continuation of Ser. No. 758,775, Aug. 22, 1991, Pat. No. 5,151,092, which is a continuation-in-part of Ser. No. 715,152, Jun. 13, 1991, abandoned. This application Jun. 17, 1993, Ser. No. 78,538
The portion of the term of this patent subsequent to Sep. 29, 2009, has been disclaimed.
Int. Cl.[6] A61F 13/15;13/20
U.S. Cl. 604—385.2 17 Claims



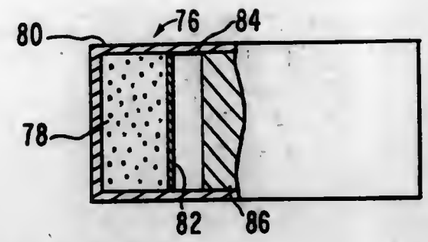
1. A disposable absorbent article having a lateral centerline, a lateral direction parallel to the lateral centerline, a longitudinal centerline, a longitudinal direction parallel to the longitudinal centerline, thickness, and an axial direction parallel to the thickness, the absorbent article comprising:
a containment assembly comprising a topsheet, a backsheet, and an absorbent core positioned between said topsheet and said backsheet, said absorbent core having side edges and waist edges; and an elastic waist feature at least extending longitudinally outwardly from one of said waist edges of said absorbent core, said elastic waist feature comprising an elasticized waistband comprising a portion of said backsheet, a portion of said topsheet, an elastic member, and a resilient member aligned in said axially direction with and joined to at least a portion of said elastic member for providing buckling resistance, shape recovery and bending stiffness to said elasticized waistband.

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5,499,979
**DELIVERY SYSTEM COMPRISING KINETIC FORCES**
Patrick S.-L. Wong, Palo Alto; Felix Theeuwes, and James B. Eckenhoff, both of Los Altos, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.
Continuation-in-part of Ser. No. 905,714, Jun. 29, 1992, abandoned, which is a continuation of Ser. No. 551,711, Jul. 10, 1990, abandoned, which is a continuation of Ser. No. 283,631, Dec. 13, 1988, Pat. No. 4,957,494, which is a continuation-in-part of Ser. No. 270,160, Nov. 14, 1988, abandoned, which is a continuation-in-part of Ser. No. 66,906, Jun. 25, 1987, Pat. No. 4,874,388. This application Mar. 10, 1994, Ser. No. 209,033
Int. Cl.[6] A61K 9/22
U.S. Cl. 604—891.1 6 Claims

1. A dispenser for delivering a drug to an environment comprising a fluid, the dispenser comprising:
(a) a housing;

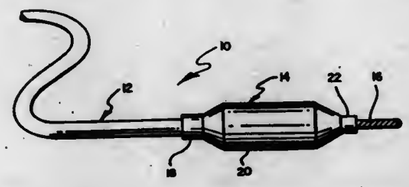




(b) an inlet in the housing;
(c) an outlet in the housing;
(d) a plurality of longitudinally aligned layers in the housing comprising;
(e) a drug formulation layer, which drug formulation layer erodes over time when moved by the gas pressure to a contacting fluid at the outlet of the dispenser,
(f) an inert formulation layer in contacting arrangement with the drug formulation layer, which inert formulation layer is a means for enabling the drug formulation layer to be delivered as a unit dose over time to the environment; and,
(g) a gas generating formulation layer in the housing for generating a gas pressure for moving the drug formulation layer and the inert formulation layer out of the dispenser at a rate that is solely governed by the rate of fluid that enters the housing and the gas generated, said gas generating formulation layer positioned at the inlet in the housing for receiving fluid that enters the dispenser.

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5,499,980
**POLYIMIDE BALLOON CATHETER AND METHOD OF MAKING SAME**
Charles L. Esteneuer, St. Michael, Minn., assignor to SciMed Life Systems, Inc., Maple Grove, Minn.
Continuation of Ser. No. 101,349, Aug. 2, 1993, abandoned, which is a continuation of Ser. No. 847,799, Mar. 6, 1992, abandoned, which is a division of Ser. No. 798,851, Nov. 18, 1991, Pat. No. 5,207,700, which is a continuation of Ser. No. 617,430, Nov. 26, 1990, abandoned, which is a continuation of Ser. No. 364,116, Jun. 12, 1989, abandoned, which is a division of Ser. No. 229,313, Aug. 8, 1988, Pat. No. 4,952,357.
This application Jun. 16, 1994, Ser. No. 260,683
Int. Cl.[6] A61M 25/10
U.S. Cl. 606—28 22 Claims



20. A dilatation balloon catheter for applying pressure and heat to a stenosis within a patient's artery, the catheter comprising:
an elongated flexible shaft having an inflation lumen extending from a proximal end to a distal end; and
an inflatable balloon having a wall thickness of about 0.0003 inches, wherein a portion of the balloon is formed of a polymeric material and including a thin continuous and gapless coating consisting solely of metal formed by deposition upon an outer surface of the polymeric material, wherein the coating heats in response to electromagnetic energy being applied thereto.

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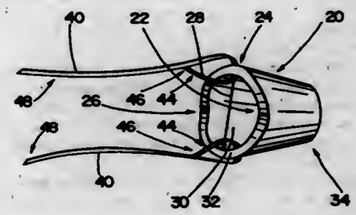
5,499,981
**FLEXIBLE INTERLACED MULTIPLE ELECTRODE ASSEMBLIES**
Thomas F. Kordis, Sunnyvale, Calif., assignor to EP Technologies, Inc., Sunnyvale, Calif.
Continuation-in-part of Ser. No. 33,640, Mar. 16, 1993, abandoned. This application Mar. 4, 1994, Ser. No. 206,133
Int. Cl.[6] A61B 5/04
U.S. Cl. 606—41 23 Claims



1. An electrode assembly comprising a flexible electrode circuit having at least two spaced apart electrodes,
a sleeve having a side wall enclosing an axial bore, at least two pairs of spaced apart slits in the side wall for receiving the flexible electrode circuit, the circuit being laced through the slits to expose an electrode between each pair of slits while enclosing the circuit between the electrodes within the sleeve bore and,
a stiffener member extending through the axial bore of the sleeve to support the sleeve and the flexible electrode circuit, the sleeve being made from a material that has been heat-shrunk in place about the stiffener member.

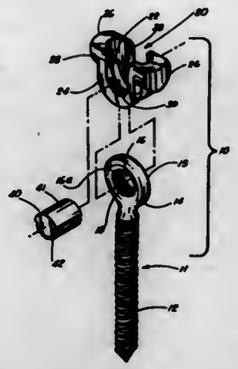
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5,499,982
**SURGICAL PIN PROTECTOR**
Paul H. Adamson, PSC 77 Box 4386, APO AP 96325
Filed Sep. 28, 1993, Ser. No. 128,465
Int. Cl.[6] A61B 17/56
U.S. Cl. 606—53 1 Claim



1. A surgical pin protector for shielding the end of a surgical pin which protrudes from the end of a patient's injured finger or toe comprising:
a flare-shaped body which contains a protective cavity which is adapted to shield said protruding end of said surgical pin; said body including a first end having a first annular opening with an inner diameter of sufficient size so that said protruding end of said surgical pin may enter said protective cavity; said first end having a bottom surface which together with said first annular opening is contoured to said end of said patient's injured finger or toe enabling said body to fit on said end of said finger or toe; said body including a second end having a second annular opening with an inner diameter of sufficient size so that said protruding end of said surgical pin may pass through temporarily if said body is subjected to a severe external force; and
two retaining strips, each of said strips engaged within respective slits in said body.

5,499,983
**VARIABLE ANGLE SPINAL SCREW**
Dean Hughes, Cordova, Tenn., assignor to Smith & Nephew Richards, Inc., Memphis, Tenn.
Filed Feb. 23, 1994, Ser. No. 200,635
Int. Cl.[6] A61B 17/70;17/86
U.S. Cl. 606—61 21 Claims

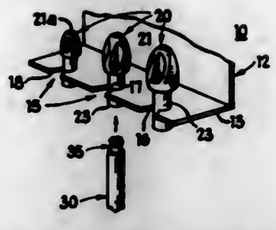


21. A spinal fastening apparatus for use in spinal fixation systems, comprising:
a) an elongated bone screw with (i) a threaded shaft portion configured to be surgically implanted into a patient's bone tissue and (ii) a head extending above the patient's bone tissue when the shaft is implanted;
b) The head including a bore extending therethrough;
c) holding means for holding the head, said holding means including surface portions positioned on opposite sides of the head aligned with said bore;
d) an elongated locking pin sized and shaped for insertion through said bore and being aligned with said surface portions;
e) the pin and the surface portions of the holding means and bore including cooperating gripping means for gripping each other and holding the bone screw in a fixed position relative to the holding means;
f) the holding means having a middle U-shaped portion and exteading end portions with a slot positioned in the middle portion to allow pivoting of the holding means and bone screw relative to each other for adjusting the angulation between the threaded shaft of the bone screw and the holding means; and
g) means for holding the pin against the surface portions of the holding means for locking the bone screw relative to the holding means.

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5,499,984
**UNIVERSAL MODULAR REAMER SYSTEM**
Anton J. Steiner, Wharton; David A. Landsperg, Kinnelon, both of N.J., and Robert A. Winquist, Seattle, Wash., assignors to Snap-on Incorporated, Kenosha, Wis.
Filed Apr. 7, 1994, Ser. No. 224,046
Int. Cl.[6] A61B 17/16
U.S. Cl. 606—80 7 Claims

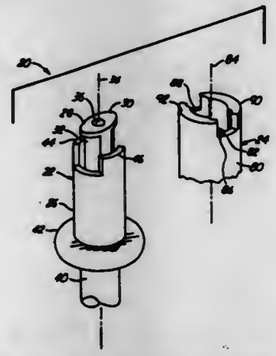
1. A modular medullary rotational reaming apparatus comprising: a flexible shaft having a drive coupling portion at one end thereof for connecting said shaft to a rotational drive element to cause rotation of the shaft and having a first head coupling portion at the other end thereof, first latch structure on said first head coupling portion movable between latching and unlatching conditions; means biasing said first latch structure to the latching condition; a cutting head having a second head coupling portion thereon including second latch structure; and a support for storing



said cutting head in a supported position readily accessible to a user; one of said head coupling portions including a socket having an axis and the other of said head coupling portions including a plug axially receivable in said socket, said first and second head coupling portions being non-rotationally mateably engageable with each other in a coupled condition for interconnecting said head and said shaft, said support including retaining means engageable with said first latch structure for holding it in its unlatching condition when said first and second head coupling portions are engaged in their coupled condition while said cutting head is held on said support, said first latch structure being responsive to removal of said cutting head from said support while said first and second head coupling portions are engaged in their coupled condition for moving to the latching condition, thereby to latch said cutting head to said shaft.

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5,499,985
**DETACHABLE COUPLING SYSTEM FOR SURGICAL INSTRUMENTS**
Todd J. Hein, Minneapolis, and Mike K. Utley, Hopkins, both of Minn., assignors to Orthopaedic Innovations, Inc., Minneapolis, Minn.
Filed Nov. 24, 1993, Ser. No. 157,480
Int. Cl.[6] A61B 17/56
U.S. Cl. 606—99 5 Claims



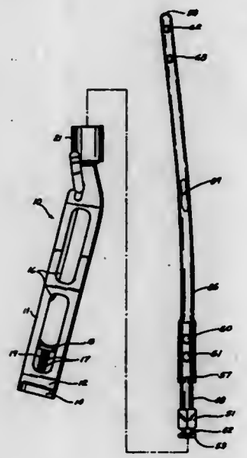
1. A coupling system for detachably connecting a surgical tool head to a driver for the surgical tool head to form a surgical instrument, the coupling system comprising:
a first member having a generally cylindrical body, defining a first axis, with at least one projection protruding from the body;
a second member having a body defining a cylindrical recess, with a second axis, the body enclosing at least one passageway adjacent to the cylindrical recess, and defining at least one undercut recess adjacent to both the cylindrical recess and the passageway; and
means for reversibly blocking rotation of the first member relative to the second member when the members are coaxially aligned and the projection is located in the undercut



recess comprising longitudinally movable, non-rotatable engagement means comprising at least one lug that is one of two bilaterally symmetrical lugs, on one of the members, and non-rotatable, acceptor means on the opposite member wherein the acceptor means has two bilaterally symmetrical lug receiving notches.

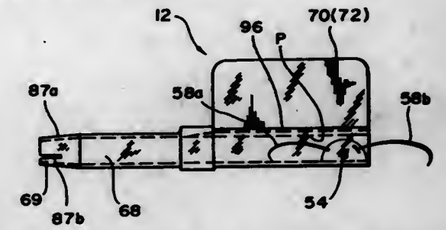
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5,499,986
**QUICK RELEASE HANDLE APPARATUS FOR REMOVING AND INSERTING INTRAMEDULLARY NAILS**
Donna M. Dimarco, Memphis, Tenn., assignor to Smith & Nephew Richards Inc., Memphis, Tenn.
Filed Jan. 7, 1994, Ser. No. 178,771
Int. Cl.[6] A61F 5/00
U.S. Cl. 606—104 25 Claims



1. A combination intramedullary nail and insertion and removal apparatus for inserting and pulling the intramedullary nail having a longitudinal bore from a patient's intramedullary canal, comprising:
a) a handle body having proximal and distal end portions;
b) the handle body supporting a trigger that is movably disposed relative to the handle between locking and releasing positions;
c) the proximal end of the handle body having a socket with a central axis;
d) an intramedullary nail having proximal and distal end portions and a hollow bore;
e) a separate nail puller element having spaced apart proximal and distal end portions, each of said proximal and distal end portions having a connector that enables a connection to be formed respectively with the handle body distal end and the intramedullary nail proximal end portion; and
f) the distal end of the handle body having means for forming a releasable connection with the nail puller at the socket when the trigger is moved between releasing and locking positions by a user.

5,499,987
**DEFORMABLE INTRAOCULAR LENS CARTRIDGE**
Vladimir Feingold, Laguna Niguel, Calif., assignor to Staar Surgical Company, Monrovia, Calif.
Continuation-in-part of Ser. No. 953,251, Sep. 30, 1992, abandoned. This application Feb. 17, 1994, Ser. No. 197,604
Int. Cl.[6] A61B 17/00
U.S. Cl. 606—107 57 Claims



36. A lens cartridge for use in a surgical lens inserting device for implantation of a deformable intraocular lens into the eye through a relatively small incision in the ocular tissue, said lens cartridge comprising:
a lens holding portion; and
a nozzle portion connected to and extending from said lens holding portion, said lens holding portion and said nozzle portion having an inwardly tapering passageway of decreasing cross-sectional size extending therethrough for further folding or compressing the deformable intraocular lens when moving through said inwardly tapering passageway,
wherein the lens cartridge is configured to be accommodated in the lens inserting device and a tip of said nozzle portion is to be inserted through the relatively small incision in the ocular tissue for insertion of the deformable intraocular lens into the eye.

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5,499,988
**SURGICAL CONTAINMENT APPARATUS**
Henry J. Espiner, 2 Clifton Park, Bristol BS8 3BS, and James Howard, Cameron Balloons Limited, St John's Street, Bedminster, Bristol BS3 4NH, both of, United Kingdom
PCT No. PCT/GB91/01408, § 371 Date Nov. 23, 1993, § 102(e) Date Nov. 23, 1993, PCT Pub. No. WO92/16156, PCT Pub. Date Oct. 1, 1992
PCT Filed Aug. 19, 1991, Ser. No. 122,575
Claims priority, application United Kingdom, Mar. 25, 1991, 9106304; Jun. 20, 1991, 9113354
Int. Cl.[6] A61B 17/00
U.S. Cl. 606—114 11 Claims



1. A surgical apparatus comprising a collapsible compartment (10') having a closed distal end and sides and an open proximal end (30'), a first elongate member (20') of a predetermined length and having proximal and distal ends, the distal end of the elongate member being attached to the compartment at its proximal end, an

elongate sleeve (50) disposed on an outside surface of the compartment, the sleeve being closed at one end, and a second flexible elongate member (60) inserted into the sleeve, the first and second elongate members deploying the compartment, and opening and positioning the opening.

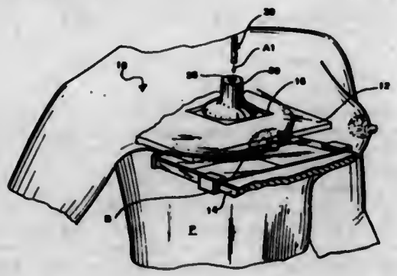
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**5,499,989**

**BREAST BIOPSY APPARATUS AND METHOD OF USE**

**Stephen S. LaBash, 902 W. Columbia Blvd., Oberlin, Kans. 67749**

**Filed Dec. 22, 1994, Ser. No. 360,650**
**Int. Cl.[6] A61B *19/00***
**U.S. Cl. 606—130** **3 Claims**



1. An apparatus for the excision of prelocated, specific tissue located in a bodily protuberance comprising:

means for immobilizing the protuberance, said means to immobilize the protuberance comprising a first and a second compression paddle, said first and second paddles being in an adjustable, spaced apart relationship in respect to one another, and said first and second paddle are parallel to one another, an access opening being included in one of said compression paddles, said access opening dimensioned such that said positioning means can be placed therein, said positioning means thus being in contact with the protuberance;

a hollow cutting tube having a cylindrical interior and an open end, said open end defining a beveled cutting edge;

positioning means for the positioning of said hollow cutting tube such that said hollow cylindrical interior of said cutting tube is coplanar with the specific tissue to be excised, said positioning means including an aperture therethrough, said aperture dimensioned to smoothly receive said cutting tube; and

rotation and advancement means for rotating and advancing said hollow cutting tube through said positioning means aperture and into the protuberance such that the specific tissue is contained within said hollow interior of said cutting tube when said tube is removed from the protuberance.

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**5,499,990**

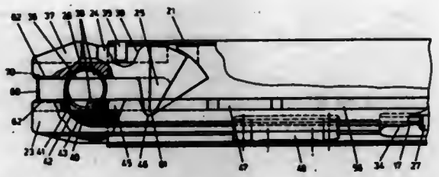
**SUTURING INSTRUMENT**

**Heinrich Schilling, Stutensee; Roland Noth, Waghäusel; Karl Schlipf, Karlsruhe, and Bertram Kuntz, Stelnfeld, all of, Germany, assignors to Forschungszentrum Karlsruhe GmbH, Karlsruhe, Germany**

**Filed Dec. 21, 1994, Ser. No. 361,836**
**Claims priority, application Germany, May 23, 1992, 42 17 202.0**
**Int. Cl.[6] A61B *17/00***
**U.S. Cl. 606—144** **11 Claims**

1. A suturing instrument comprising an instrument shaft having a distal end for insertion into the body of a patient and a proximal end at the opposite end of said instrument shaft,

two oppositely disposed jaws arranged at the distal end of said instrument shaft,



the first one of said jaws being firmly connected with said instrument shaft, and

the second of said jaws being pivotally supported so as to be movable relative to said first jaw,

said instrument shaft including a guide channel for supplying a suturing wire from its proximal end to its distal end which channel ends in the stationary jaw opposite said pivotal jaw,

said instrument shaft further including an outer tube which is axially movable on said instrument shaft and which extends from the proximal end to the distal end of the instrument shaft but leaves the front ends of the jaws exposed, said outer tube engaging said pivotal jaw for pivoting said pivotal jaw by axial movement of said outer tube relative to said instrument shaft between a rest position in which said pivotal jaw is pivoted away from said stationary jaw and an operating position in which said pivotal jaw is disposed essentially parallel to said stationary jaw, said jaws having formed in their opposite jaw surfaces a number of spaced wire guide grooves with groove bases which, in the operating position of the jaws, together define a screw line having a start at the end of said wire guide channel in the stationary jaw for leading said suturing wire through said grooves in said jaws when said suturing wire is advanced through said wire guide channel, and

a multipart handle at the proximal end of said instrument shaft for operating said pivotal jaw, one part of said handle being connected to the proximal end of said instrument shaft and another part of said handle being connected to said outer tube for moving said outer tube relative to said instrument shaft by actuation of said handle.

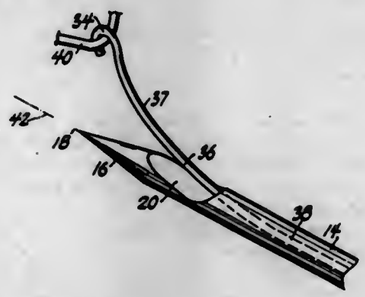
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**5,499,991**

**ENDOSCOPIC NEEDLE WITH SUTURE RETRIEVER**

**Gary Garman, La Verne, Calif., and James C. Y. Chow, Mount Vernon, Ill., assignors to Linvatec Corporation, Largo, Fla.**

**Filed Dec. 19, 1994, Ser. No. 358,421**
**Int. Cl.[6] A61B *17/04;17/28***
**U.S. Cl. 606—148** **9 Claims**



1. A suture retriever comprising:

a handle;

an elongated outer tube attached to and extending from said handle, said tube having a distal end with an axis aligned in a predetermined direction relative to said handle and an opening in the wall of said tube adjacent said distal end and facing in a direction perpendicular to said axis;



an elongated rigid inner support member slidably situated within said outer tube;

means for moving said elongated inner support member between a closed, retracted position in which said elongated inner support member is at the proximal-most end of its range of motion, and an open, extended position in which said elongated inner support member is at the distal-most end of its range of motion; and

a suture capturing member comprising:

a single, elongated flexible support member having a distal end and a proximal end, said flexible support member attached to the distal end of said elongated rigid inner support member and extendable through said opening, said flexible support member being pre-formed in a predetermined shape which enables it to be constrained to conform to the shape of said elongated outer tube when said rigid support member is at its proximal-most position and which enables it to conform to said predetermined shape when said rigid support member is at its distal-most position; and

a curved suture-engaging distal tip attached to the distal end of said flexible support member, said suture-engaging distal tip curved towards said axis whereby said suture-engaging distal tip is automatically positioned and laterally spaced from said opening at increasingly greater lateral distances from said axis as said inner support member is moved distally.

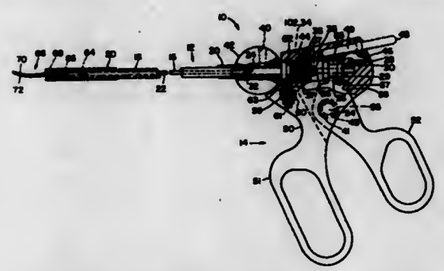
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**5,499,992**

**REUSEABLE ENDOSCOPIC SURGICAL INSTRUMENT**

**John C. Meade, Walpole, and John C. Baccus, Wayland, both of Mass., assignors to Microsurge, Inc., Needham, Mass.**

**Continuation of Ser. No. 4,798, Jan. 14, 1993, abandoned, which is a continuation-in-part of Ser. No. 903,162, Jun. 24, 1992, abandoned. This application Mar. 1, 1995, Ser. No. 396,890**
**Int. Cl.[6] A61B *17/00***
**U.S. Cl. 606—170** **13 Claims**



1. A handle assembly for removable attachment to a surgical tool assembly, the handle assembly comprising:

a base having a longitudinal port adapted to receive the tool assembly and having a spring-biased retaining member biased by a spring into the port and adapted to engage a proximal end of the tool assembly as the tool assembly is inserted into the port, the spring-biased retaining member being adapted to be forced by the spring into engagement with a groove on the tool assembly as the tool assembly is inserted to retain the tool assembly at its proximal end within the handle assembly; and

an actuation trigger member pivotably mounted to said base, said actuation trigger member comprising:

a tab coupled to the actuation trigger member and protruding into the port being adapted to engage the tool assembly, the tab moving within the port when the actuation trigger member is caused to pivot relative to the base to provide longitudinal translational movement to the tool assembly when the tool assembly is retained within the handle assembly;

a shoulder coupled to the actuation trigger member and protruding into the port being adapted to engage the tool assembly as it is inserted into the port to provide rotational movement to the actuation trigger to rotate the tab into engagement with the tool assembly.

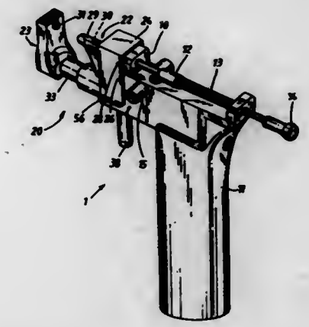
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**5,499,993**

**METHOD AND APPARATUS FOR PIERCING EARS**

**Karl Blomdahl, and Pentus Andreasson, both of Göteborg, Sweden, assignors to Blomdahl Medical Aktiebolag, Halmstad, Sweden**

**PCT No. PCT/SE90/02033, § 371 Date May 6, 1994, § 102(e) Date May 6, 1994, PCT Pub. No. WO92/09219, PCT Pub. Date Jun. 11, 1992**
**PCT Filed Nov. 27, 1990, Ser. No. 64,143**
**Int. Cl.[6] A61B *17/34***
**U.S. Cl. 606—188** **18 Claims**



1. An ear piercing apparatus, comprising:

a pistol and a disposable cassette mounted on said pistol, said pistol including:

a body portion;

a handgrip extending from said body portion;

a spring-biased plunger adapted for displacement on said body portion from a cocked position to a released position;

means for releasing said plunger from said cocked position;

positioning means, including an arm extending from said body portion for engagement with a part of said disposable cassette;

a positioning lever extending from said body portion for displacing said positioning means;

said disposable cassette including:

a stud housing positioned adjacent said pistol body portion for cooperation with said spring-biased plunger, and

a back clasp housing cooperating with the stud housing via a guide member extending from said back clasp housing;

wherein said guide member passes through an opening in the stud housing and cooperates with said positioning means controlled by said positioning lever on said pistol for relative axial displacement of the stud housing and the back clasp housing, with said positioning means engaging with said guide member at a location within said stud housing so that no part of said positioning means or said pistol extends beyond said stud housing.

**5,499,994**

## DILATION DEVICE FOR THE URETHRA

Claude Tihon; John H. Burton; Timothy C. Cook, and David Rhum, all of New York, N.Y., assignors to American Medical Systems, Inc., Minnetonka, Minn.

Continuation-in-part of Ser. No. 99,892, Jul. 30, 1993, abandoned. This application Apr. 28, 1994, Ser. No. 234,196
Int. Cl.[6] A61M *29/00;5/00;* A61F *2/04*
U.S. Cl. 606—192 28 Claims



15. A dilation device for opening a portion of a urethra obstructed as a consequence of a hypertrophied prostate gland, which comprises,

an inner hollow tubular core defining a lumen therewithin, said lumen being a conduit of sufficient diameter to permit urine to flow freely therethrough from the bladder, said core being non-collapsible under pressures that would emanate from the hypertrophied prostate gland and containing access means enabling body fluids to pass through said core in a radially outwardly direction;

an outer confining covering in the form of a collapsible and expandable bag disposed about at least a portion of said core, said bag having on outer elastic surface capable of expanding radially outwardly, said bag having a length, disposed on said core, of at least partially that of the obstructed portion of the urethra; and

hydrophilic material defined between said outer surface of said bag and said core capable of absorbing water and thereupon gradually swelling for a period of at least about 30 minutes, thereby to cause the outer surface of the bag to gradually expand radially outwardly until equilibrium is obtained between the radial pressures of the expanded hydrophilic material and the prostatic tissue, and until dilation of the obstructed portion of the urethra occurs to a desired diameter and configuration.

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**5,499,995**

## BODY PASSAGEWAY CLOSURE APPARATUS AND METHOD OF USE

Paul S. Teirstein, 402 Coast Blvd., South, La Jolla, Calif. 92037

Filed May 25, 1994, Ser. No. 249,521
Int. Cl.[6] A61M *29/00*
U.S. Cl. 606—192 40 Claims

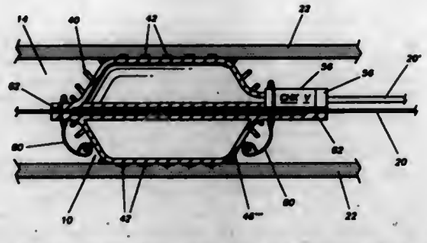
1. A device for closure of a body passageway of a patient, comprising:

an expandable, substantially cylindrical frame;

expansion means for selectively applying force to diametrically expand said frame to embed portions of said frame into a wall of the passageway, for retention of said frame in the passageway;

a flexible sealing membrane permanently retained on said frame to occlude the passageway upon said expansion of said frame; and

delivery means for delivering said frame and said sealing membrane to a selected site in the passageway to be occluded, said delivery means being removable from the passageway after said delivery, leaving said frame and said sealing membrane in place.



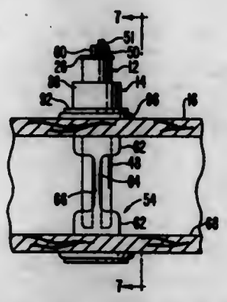
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**5,499,996**

## BLOOD VESSEL OCCLUSION TROCAR

John D. Hill, 2040 Broadway, Apt. 101, San Francisco, Calif. 94115

Division of Ser. No. 808,767, Dec. 17, 1991, Pat. No. 5,330,498. This application Mar. 14, 1994, Ser. No. 209,200
Int. Cl.[6] A61B *17/00;* A61M *29/00*
U.S. Cl. 606—201 21 Claims



1. An occluder apparatus for obstructing the flow of blood in a blood vessel comprising, in combination:

an inflatable diaphragm carried by a diaphragm insertion body in a deflated condition into the interior of said blood vessel for expansion under the influence of fluid pressure into engagement with the interior wall of said blood vessel about substantially the full circumference thereof;

a belt-like pressurizing device adapted to receive said body comprising an inflatable cuff arranged to substantially surround the exterior of said blood vessel, said cuff being expandable under the influence of fluid pressure into engagement with the exterior wall of said blood vessel in substantially opposing relation to said diaphragm when expanded;

means for inflating said diaphragm; and

means for inflating said cuff.

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**5,499,997**

## ENDOSCOPIC TENACULUM SURGICAL INSTRUMENT

Leslie A. Sharpe, Edina, Minn., and Francis C. Peterson, Prescott, Wis., assignors to Sharpe Endosurgical Corporation, St. Paul, Minn.

Continuation of Ser. No. 867,173, Apr. 10, 1992, abandoned. This application Jan. 18, 1994, Ser. No. 186,484
Int. Cl.[6] A61B *17/28*
U.S. Cl. 606—206 5 Claims

1. An endoscopic grasping tool surgical instrument for grasping tissue and the like comprising:





a control handle, having a foregrip and having a rear grip;

a tubular sheath coupled to said control handle;

a connector rod coupled to said control handle, and adapted for reciprocating motion within said tubular sheath;

a first jaw arm, having a first tooth for engaging said tissue;

a second jaw arm, having a second tooth for engaging said tissue;

said first jaw arm and said second jaw arm being coupled to said connector rod, and adapted to be moved to an extended position by motion of said connector rod, and adapted to be moved to a retracted position by motion of said connector rod;

said first jaw arm having a distal first contact pad;

said second jaw arm having a distal second contact pad;

motion toward said retracted position placing said distal first contact pad and said distal second contact pad into contact, said first tooth and said second tooth intermeshing along a line of contact forming a blunt distal end;

a spring located in said control handle to provide biasing force to said first jaw arm and to said second jaw arm to bias said first jaw arm and said second jaw arm into said retracted position; and

said first jaw arm and said second jaw arm having a substantially arcuate shape defining a first apex surface on said first jaw arm and defining a second apex surface of said second jaw arm, said first apex surface and said second apex surface being biased and in abutment to each other during motion toward said retracted position; and

a gas seal within said control handle marked concentrically abut said connector rod.

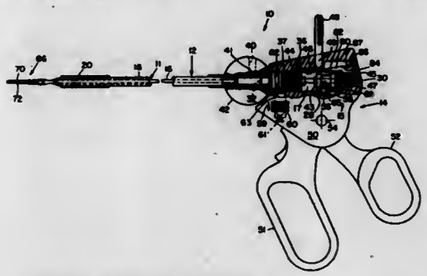
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**5,499,998**

## ENDOSCOPTIC SURGICAL INSTRUMENT WITH GUIDED JAWS AND RATCHET CONTROL

John C. Meade, Walpole, Mass., assignor to Microsurge, Inc., Needham, Mass.

Continuation of Ser. No. 121,157, Sep. 14, 1993, abandoned. This application Mar. 10, 1995, Ser. No. 401,645
Int. Cl.[6] A61B *17/00*
U.S. Cl. 606—207 34 Claims



1. A surgical instrument comprising:

a tool assembly comprising:

an elongate jaw actuation device having a proximal end and a distal end, the jaw actuation device comprising:

an outer sleeve,

an inner rod within the outer sleeve, one of the inner rod and the outer sleeve being longitudinally translatable relative to the other, and

a guide member coupled to the distal end of the jaw actuation device, and

first and second rotatable jaws, each rotatable jaw comprising an arc defining portion shaped to define an arc having a center which is displaced from the jaw, the rotatable jaws being coupled to the distal end of the jaw actuation device and engaging the guide member at the arc defining portions of the rotatable jaws such that, as one of the inner rod and the outer sleeve is longitudinally translated relative to the other, the arc defining portions of the rotatable jaws move relative to the guide member and are guided by the guide member to rotate each rotatable jaw approximately about the center of its respective arc without changing the shape of the rotatable jaw; and

a handle assembly for retaining the tool assembly at its proximal end and translating one of the inner rod and the outer sleeve relative to the other to rotate the rotatable jaws.

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**5,499,999**

**Patent Not Issued For This Number**

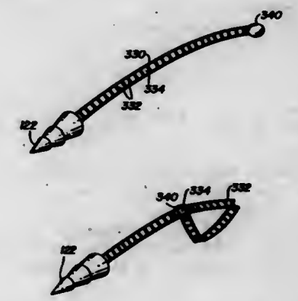
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**5,500,000**

## SOFT TISSUE REPAIR SYSTEM AND METHOD

John Feagin, Durham, and Richard Gibson, Bahama, both of N.C., assignors to United States Surgical Corporation, Norwalk, Conn.

Filed Jul. 1, 1993, Ser. No. 86,290
Int. Cl.[6] A61B *17/04*
U.S. Cl. 606—232 6 Claims



1. A system for repairing soft tissue comprising:

a barbed suture anchoring member configured and dimensioned to be retained within soft tissue, wherein said barbed suture anchoring member has proximal and distal ends and comprises a pointed distal tip portion having a base, and a series of following sections extending proximally from the base of said distal tip portion, each following section having a larger base than the preceding section;

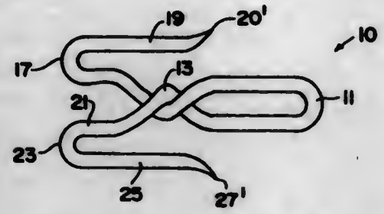
at least one suture member attached to said barbed suture anchoring member, said suture member integrally comprising two elongated members connected by a plurality of cross rails which are spaced apart so as to define a series of apertures, said suture member having a distal end attached to said barbed suture anchoring member and a proximal end portion; suture retaining structure for engaging said at least one suture member, said suture retaining structure comprising an insertion member attached to said proximal end portion of said at least one suture member, said insertion member being insertable through at least one of said apertures of said suture member, said insertion member being .configured and dimensioned to resist withdrawal.

5,500,001

## SUTURE ANCHOR FOR SOFT TISSUE FIXATION

Arthur F. Trott, Largo, Fla., assignor to Linvatec Corporation, Largo, Fla.

Division of Ser. No. 78,987, Jun. 18, 1993, Pat. No. 5,372,604.
This application Aug. 18, 1994, Ser. No. 292,834
Int. Cl.[6] A61B 17/00
U.S. Cl. 606—232 22 Claims




1. A method for inserting a bone anchor into a bone tunnel comprising the steps of:
(a) looping suture material around said bone anchor;
(b) inserting said anchor and said looped suture material axially into said tunnel without interference by the tunnel walls to thereby permit selective withdrawal of the anchor and looped suture material from the tunnel; and
(c) selectively deploying said anchor in said tunnel by applying a deployment force to said anchor to deformably bend pointed legs on said anchor and thereby cause the pointed legs to penetrate the bone tunnel walls in response to withdrawal force exerted on the anchor;
wherein step (c) is characterized by the pointed legs remaining deformably bent after removal of said deployment force and by the absence of hammering and impacting blows during application of said deployment force.

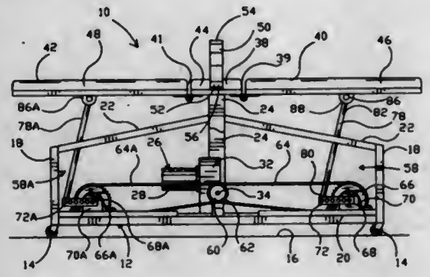
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5,500,002

## CONTINOUS PASSIVE MOTION PHYSICAL THERAPY DEVICE

George E. Riddle, Clinton; Ronnie J. Withrow, Athens, and George M. Cox, LaFollette, all of Tenn., assignors to United Apothecary, Inc., Oak Ridge, Tenn.

Continuation-in-part of Ser. No. 843,805, Feb. 28, 1992, Pat. No. 5,320,640, and Ser. No. 9,788, Jan. 27, 1993, Pat. No. 5,320,641. This application May 23, 1994, Ser. No. 247,248
Int. Cl.[6] A61F 5/00
U.S. Cl. 606—242 11 Claims




1. A device for continuous passive motion physical therapy, said device comprising:
a frame member for structurally supporting said device and any loads applied thereto;
a stationary support member secured to said frame member for supporting the buttocks of a user;
at least one pivoting support member for supporting at least a selected portion of a user's body, said at least one pivoting support member being hingeably attached about one end to said frame member proximate one side of said stationary support member;
at least one actuator for pivoting said at least one pivoting support member about said one end, one of said at least one actuator being in association with one of said at least one pivoting support member;
a drive mechanism for simultaneously driving each of said at least one actuator, said drive mechanism including a selected motor with a drive shaft connected to said at least one actuator, said actuator including an output cam fixed at its distal end to said drive shaft, a first connecting rod being journally connected at its proximal end to a distal end of said output cam and at its distal end to a first actuator cam between the proximal and distal ends thereof, said first actuator cam being fixed at its said proximal end to a first axle secured to said frame member, and a first displacement cam being releasably secured to said first axle; and
a first push rod being journally connected at its proximal end to said first displacement cam and at its distal end to said at least one pivoting support member.

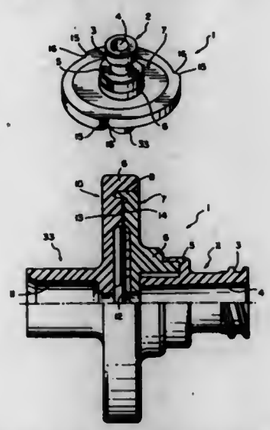
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5,500,003

## TRANSDUCER-PROTECTOR DEVICE FOR BIOMEDICAL HAEMODIALYSIS LINES

Ernesto Gusin, and Gianni Gusin, both of Turin, Italy, assignors to Industrie Berin, S.p.A., Moncalieri, Italy

Filed Nov. 9, 1994, Ser. No. 338,093
Claims priority, application Italy, Nov. 9, 1993, TO93A0844
Int. Cl.[6] A61M 1/00
U.S. Cl. 604—252 3 Claims




1. A transducer-protector device for biomedical haemodialysis lines, comprising a body of moulded plastic material having a first tubular connector of the Luer Lock female type with a conical inner surface and an outer threading, intended to be connected to a tube of a haemodialysis equipment, and a second tubular connector coaxial to said first tubular connector, said first and second connectors being provided with respective first and second radial annular flanges for their mutual permanent sealed connection, and a filtering membrane made of a permeable material and defining an anti-contamination sterile barrier transversely interposed between said first and second tubular connectors and having a peripheral edge clamped between said radial flanges, wherein the entire first tubular connector is made of a material having greater elasticity than the material of the second connector, wherein said first radial flange is provided with a first integral axial attachment part, and wherein the first connector is provided with a second integral axial attachment part fixedly coupled by overmoulding onto said first axial attachment part of said first radial flange.



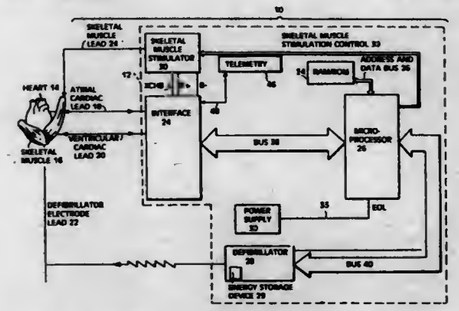
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5,500,004

## CARDIO MYOSTIMULATION SYSTEM WITH DEFIBRILLATION

Megeurditch N. Ansourian, and Peter M. Nickolls, both of Sydney, Australia, assignors to Telectronics Pacing Systems, Inc., Englewood, Colo.

Filed Nov. 8, 1994, Ser. No. 336,189
Int. Cl.[6] A61N 1/368
U.S. Cl. 607—4 20 Claims




1. A heart defibrillator for defibrillating a heart, said heart being filled with a volume of blood, said heart defibrillator comprising:
means for generating a defibrillation request;
means for effecting defibrillation therapy in response to said defibrillation request;
means external of a patient's heart for selectively ejecting said volume of blood from said heart; and
means for activating said blood ejecting means just prior to operation of said generating means to minimize said volume of blood during defibrillation therapy to maximize the effects of said therapy.

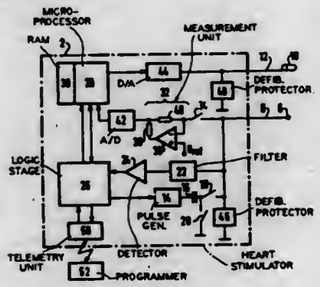
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5,500,005

## ACTIVITY RESPONSIVE HEART STIMULATOR DEPENDENT ON RETURN BLOOD FLOW TO THE HEART

Hans Strandberg, Sundbyberg, and Kurt Hoegnelid, Vaesterhaninge, both of, Sweden, assignors to Pacesetter AB, Solna, Sweden

Filed Jul. 7, 1994, Ser. No. 271,717
Claims priority, application Sweden, Jul. 7, 1993, 9302358
Int. Cl.[6] A61N 1/39
U.S. Cl. 607—17 20 Claims




1. A heart stimulator, for stimulating a heart having a return flow of blood comprising:
regulator means for regulating a variable function in said heart stimulator associated with stimulating said heart;
measurement means for measuring said return flow of blood to the heart and for generating an electrical signal exclusively corresponding thereto; and
control means for generating a control signal dependent on said electrical signal for supply to said regulator means for controlling regulation of said variable directly and exclusively function dependent on said return flow of blood.

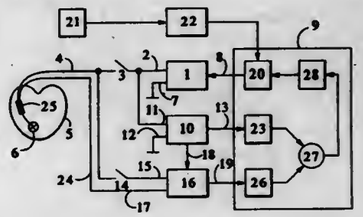
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5,500,006

## ARRANGEMENT, PARTICULARLY A HEART PACEMARKER, FOR ACQUIRING A MEASUREMENT PARAMETER OF THE HEART ACTIVITY

Roland Heinze, Munich, Germany, assignor to Pacesetter AB, Solna, Sweden

PCT No. PCT/EP91/01897, § 371 Date Jun. 4, 1993, § 102(e) Date Jun. 4, 1993, PCT Pub. No. WO92/05836, PCT Pub. Date Apr. 16, 1992
PCT Filed Oct. 4, 1991, Ser. No. 39,190
Claims priority, application Germany, Jun. 4, 1990, 40 31 450.2
Int. Cl.[6] A61N 1/365
U.S. Cl. 607—24 6 Claims




1. A heart pacemaker, comprising:
measuring means for acquiring a measurement parameter M of heart activity;
switch means for evaluating a degree of change of said measurement parameter M resulting from and dependent upon a degree of change of frequency f or duration $t_s$ of a heart cycle in comparison to a preceding heart cycle;
means for providing stimulation pulses;
control means for varying a spacing between two successive stimulation pulses such that 1) there is an immediate reaction of said measurement parameter M, and 2) a general pressure in a circulatory system associated with the heart does not change; and
means for evaluating comprises means for calculating a quotient of two measurement parameter changes $\Delta M1$ and $\Delta M2$ that are measured dependent on different pulse spacing changes $\Delta t_{S1}$ and $\Delta t_{S2}$.

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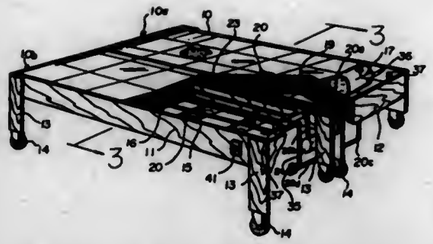
5,500,007

## THERAPEUTIC, PORTABLE WATER BED ASSEMBLY HAVING A WATER HEATING SYSTEM

Yong H. Kim, and Soon J. Kim, both of 1309 Ruppert Rd., Silver Spring, Md. 20903

Filed Jun. 9, 1994, Ser. No. 257,284
Int. Cl.[6] A47C 21/00; A61F 7/00
U.S. Cl. 607—104 8 Claims

1. A therapeutic, portable water heating bed assembly provided with a water heating system, comprising:
at least one bed including,
a bed base member having a bottom support member, an insulating plate, a concrete plate and a laminated paper disposed in sequence on said bottom support member, a pair of longi-



tudinal frames, and a plurality of transverse frames, said longitudinal frames and said transverse frames defining a bed support for said insulating plate, concrete plate and laminated paper,

a straight configured water pipe extending through said concrete plate of the bed base member;

a water pillow which functions as a water tank, said water pillow disposed on said laminated paper and at one end portion of said bed assembly;

a water heater member attached to said base member of the bed assembly, said water heater member communicating with said straight configured water pipes, said water heater member including,

a heater body adapted to contain water and for slidably receiving a heater therewithin, and

a water heater cover for covering the heater body therewithin, and

at least one thermostat attached to said heater body;

connecting means for assembling said bed,

whereby the bed assembly can be easily assembled and heating energy and pressure can warm and treat a human body lying above the laminated paper of the water heating bed assembly.

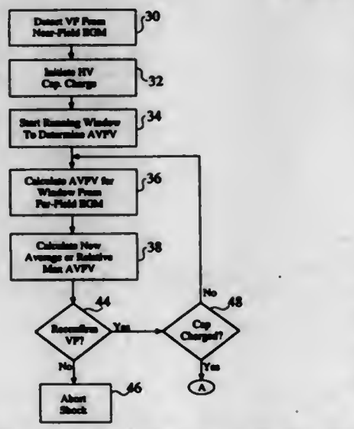
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**5,500,008**

**METHOD AND APPARATUS FOR DELIVERING DEFIBRILLATION SHOCKS WITH IMPROVED EFFECTIVENESS**

**Eric S. Fain, Menlo Park, Calif., assignor to Ventritex, Inc.**

**Filed Mar. 29, 1994, Ser. No. 219,685**
**Int. Cl.[6] A61N *1/39***
**U.S. Cl. 607—5** **12 Claims**




1. A method for defibrillating a patient's heart with an implantable defibrillator having first and second implanted electrodes spaced apart from each other by at least 4 centimeters, comprising the steps of:

(a) detecting fibrillation in said patient's heart;

(b) charging a high voltage capacitor in said implantable defibrillator;

(c) monitoring a fibrillation voltage across said first and second implanted electrodes during at least a portion of said charging step, a waveform of said fibrillation voltage including peaks and troughs;

(d) determining a relative maximum abeolute value of the peaks and troughs of said fibrillation voltages measured during a running window monitored after initiation of said charging step;

(e) calculating an absolute value for the peaks and troughs of said fibrillation voltage following said charging step and comparing said calculation to said relative maximum absolute value; and

(f) after completion of said charging step, delivering a defibrillation shock to said patient's heart during a period of ventricular fibrillation when the absolute values of the peaks and troughs of said fibrillation voltage is within a desired percentile of said determined relative maximum value determined in step (d).

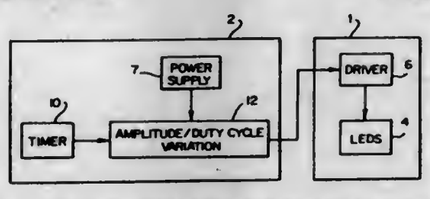
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**5,500,009**

**METHOD OF TREATING HERPES**

**Emanuel Mendes, Petach Tikva, and Avikam Harel, Tel Aviv, both of, Israel, assignors to Amrea, Ltd., Tel Aviv, Israel**

**Continuation-in-part of Ser. No. 615,850, Nov. 15, 1990, Pat. No. 5,259,380. This application Sep. 27, 1993, Ser. No. 126,583**
**Int. Cl.[6] A61N *5/06***
**U.S. Cl. 607—88** **15 Claims**




1. A method of treating herpes with red light radiation, the method comprising the steps of:

(a) providing a plurality of light emitting diodes which generate non-coherent radiation in a narrow bandwidth centered at a wavelength of approximately 660 nm,

(b) driving the diodes to generate the non-coherent radiation in a continuous wave mode,

(c) concentrating and projecting the non-coherent radiation on a dermal area afflicted with herpes without simultaneously illuminating the area with non-coherent light emitting diode radiation centered about a different wavelength and

(d) maintaining the concentrating and projecting step (c) for a prescribed treatment duration.

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**5,500,010**

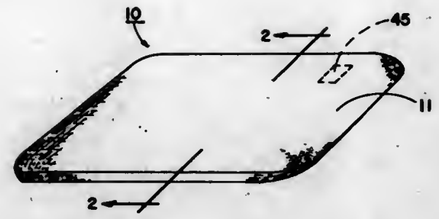
**HEAT APPLICATION METHOD**

**Byron C. Owens, 1920 Dennis St., Asheboro, N.C. 27203**

**Continuation of Ser. No. 85,570, Jun. 30, 1993, Pat. No. 5,300,105, which is a continuation of Ser. No. 871,826, Apr. 21, 1992, abandoned, which is a continuation of Ser. No. 643,344, Jan. 22, 1991, abandoned, which is a continuation-in-part of Ser. No. 486,806, Feb. 26, 1990, abandoned. This application Oct. 14, 1993, Ser. No. 136,021**
**The portion of the term of this patent subsequent to Apr. 5, 2011, has been disclaimed.**
**Int. Cl.[6] A61F *7/00***
**U.S. Cl. 607—114** **7 Claims**

1. A method of applying heat to a selected object comprising the steps of:






(a) forming a microwavable pad having a liquid and a liquid absorbing means sealed within an envelope in which the absorbing means is compressed within the envelope to less than its non-compressed size;

(b) subjecting the pad to microwave radiation; and

(c) placing the irradiated pad against the object to heat the same.

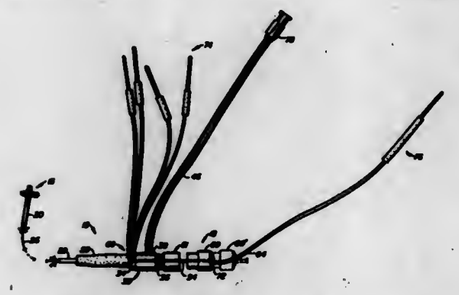
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**5,500,011**

**CATHETER FOR MAPPING AND ABLATION AND METHOD THEREFOR**

**Jawahar M. Desai, 2721 W. Browning, Fresno, Calif. 93711**

**Continuation of Ser. No. 58,427, May 7, 1993, Pat. No. 5,397,339, which is a continuation of Ser. No. 954,278, Sep. 30, 1992, Pat. No. 5,231,995, which is a division of Ser. No. 406,917, Sep. 13, 1989, Pat. No. 5,215,103, which is a division of Ser. No. 68,833, Jun. 30, 1987, Pat. No. 4,940,064, which is a continuation-in-part of Ser. No. 931,696, Nov. 14, 1986, abandoned. This application Nov. 4, 1994, Ser. No. 334,678**
**Int. Cl.[6] A61N *1/04***
**U.S. Cl. 607—116** **8 Claims**



1. A multipolar electrode catheter having an elongated body defining a distal end and an opposite, proximal end, a plurality of electrodes mounted adjacent said distal end, said plurality of electrodes being spaced a first distance from each other, and expansion means for expanding the distance that said electrodes are spaced from each other a second, larger distance, whereby said electrodes may be positioned against a site for mapping or ablation, and wherein the number of said electrodes is four, and wherein said expansion means expands said electrodes into said second distance which is in the same plane, and wherein said electrodes are equally spaced from adjacent electrodes, and further including a fifth electrode centrally disposed intermediate said four electrodes.

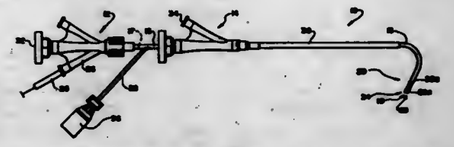
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**5,500,012**

**ABLATION CATHETER SYSTEM**

**Gregory G. Brucker, Minneapolis, and Steven D. Savage, Brooklyn Center, both of Minn., assignors to Angelon Corporation, Plymouth, Minn.**

**Continuation of Ser. No. 913,388, Jul. 15, 1992, abandoned. This application Jul. 8, 1994, Ser. No. 272,268**
**Int. Cl.[6] A61B *17/36***
**U.S. Cl. 607—122** **24 Claims**



1. A guiding/mapping catheter for use with heart tissue, comprising:

(a) a catheter body comprising a central lumen and a non-collapsible tip structure comprising a distal end;

(b) a plurality of electrodes positioned within the catheter body to communicate with tissue at the distal end of the tip structure, for finding arrythmogenic tissue in planar and non-planar tissue surfaces at an identified location via local activation mapping;

(c) monitor means, operatively coupled to the plurality of electrodes, for identifying the arrythmogenic tissue; and

(d) maneuvering means, within the tip structure, for movement of the catheter along the tissue surface.

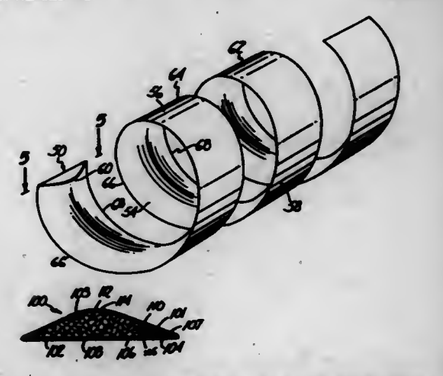
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**5,500,013**

**BIODEGRADABLE DRUG DELIVERY VASCULAR STENT**

**Paul J. Buscemi, Long Lake; Elizabeth A. Stejskal, St. Paul; Donald F. Palme, II, Dayton, and Lixiao Wang, St. Paul, all of Minn., assignors to Scimed Life Systems, Inc., Maple Grove, Minn.**

**Continuation of Ser. No. 42,412, Apr. 2, 1993, abandoned, which is a continuation-in-part of Ser. No. 944,093, Sep. 11, 1992, abandoned, which is a continuation-in-part of Ser. No. 771,655, Oct. 4, 1991, abandoned. This application Jun. 13, 1995, Ser. No. 372,822**
**Int. Cl.[6] A61F *2/06***
**U.S. Cl. 623—1** **8 Claims**



1. A stent having a generally tubular main body formed from a helically coiled strip for insertion into a lumen of a vessel of a living being wherein the tubular main body comprises a substantially biodegradable matrix having voids within the matrix, and a biodegradable strengthening material in contact with the matrix to strengthen the matrix, the tubular main body being essentially saturated with drugs and further having an exterior surface for

contacting the vessel when the main body is placed in a living being, a cambered interior surface for contacting a fluid passing through the lumen of the vessel, a leading end facing a direction of flow and a trailing end wherein the main body has substantially the same thickness at the leading end as at the trailing end.

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5,500,014

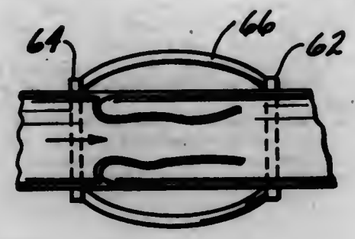
**BIOLOGICAL VALVULAR PROTHESIS**

R. C. Quijano, Laguna Hills; Aws Nashef, Huntington Beach, and Keith Myers, El Toro, all of Calif., assignors to Baxter International Inc., Deerfield, Ill.

Continuation of Ser. No. 500,821, Mar. 28, 1990, abandoned, which is a continuation-in-part of Ser. No. 359,449, May 31, 1989, abandoned. This application May 9, 1994, Ser. No. 240,286

Int. Cl.[6] A61F 2/214

U.S. Cl. 623—2 14 Claims




1. A biological valvular prosthesis comprising:

a chemically fixed conduit derived from a harvested vein segment bearing at least one integrally formed venous valve, said venous valve having at least one valve leaflet, wherein said venous valve is chemically fixed while retaining said valve leaflet in a substantially open position; and

a restriction means positioned about said conduit at either side of said venous for restricting said venous valve from expanding outwardly, wherein said restriction means includes first and second rings positioned at opposite sides of said venous valve, with said rings being connected by one or more struts.

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5,500,015

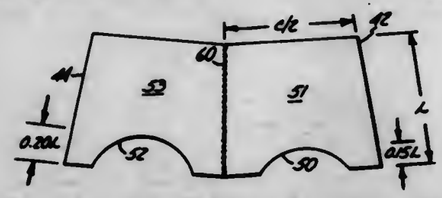
**CARDIAC VALVE**

Radu Deac, Swarthmore, Pa., assignor to Mures Cardiovascular Research, Inc., St. Paul, Minn.

Division of Ser. No. 884,427, May 15, 1992, Pat. No. 5,344,442, which is a continuation-in-part of Ser. No. 701,099, May 16, 1991, abandoned. This application Aug. 17, 1994, Ser. No. 291,717

Int. Cl.[6] A61F 2/06; B26D 1/00

U.S. Cl. 623—2 3 Claims




1. A kit for forming trapezoidal membranes of pericardium tissue for formation of an unsupported cardiac valve, said kit comprising a plurality of pairs of cutting dies for cutting pericardium tissue, each cutting die having a cutting edge defining a generally trapezoidal shape corresponding to a trapezoidal shape of a membrane to be formed, said generally trapezoidal shape defining a long base and a short base joined by opposite sides and an elliptical scallop in said long base thereof, said short base having a length, each of said opposite sides having a length approximately equal to said length of said short base, said long base having a length approximately 1.2 times said length of said short base, and said scallop having a width extending along said length of said long base approximately 0.8 times said length of said short base, the scallop of a first cutting die of said pair of cutting dies having a depth equal to approximately 0.2 times the length of the side of said first cutting die, the scallop of a second cutting die of said pair of cutting dies having a depth equal to approximately 0.15 times the length of the side of said second cutting die, and each of said pairs of cutting dies sized for different lengths of short bases.

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5,500,016

**ARTIFICIAL HEART VALVE**

John Fisher, Yorkshire, United Kingdom, assignor to University of Leeds, Yorkshire, United Kingdom

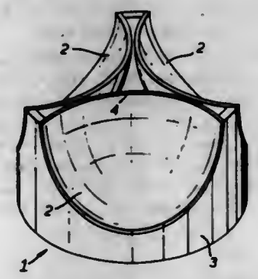
PCT No. PCT/GB93/00568, § 371 Date Sep. 28, 1994, § 102(e) Date Sep. 28, 1994, PCT Pub. No. WO93/18721, PCT Pub. Date Sep. 30, 1993

PCT Filed Mar. 19, 1993, Ser. No. 307,623

Claims priority, application United Kingdom, Mar. 25, 1992, 9206449

Int. Cl.[6] A61F 2/24

U.S. Cl. 623—2 9 Claims




1. A flexible leaflet heart valve for controlling the flow of blood in an artery comprising a substantially rigid frame (3), and a plurality of substantially identical flexible leaflets (2) mounted on the frame (3), characterised in that each flexible leaflet (2) is formed from part of a surface of revolution having its axis of revolution lying in a plane substantially orthogonal to the direction of blood flow through the valve (1), and a shape defined by the equation:

$$z^2+y^2=2R_L(x-g)-\alpha(x-g)^2$$

where:

g is the offset of the leaflet from the axis of the frame;

$R_L$ is the radius of curvature of the leaflet (2) at (g, 0, 0); and

$\alpha$ is the shape parameter and is greater than 0 and less than 1.

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5,500,017

**BREAST IMPLANT DEVICE**

Phillip D. Bretz, 40551 Olympic Dr., and Vincent R. Forshan, 74200 Covered Wagon Trail, both of Palm Desert, Calif. 92260

Filed Nov. 17, 1994, Ser. No. 342,854

Int. Cl.[6] A61F 2/12;2/02

U.S. Cl. 623—8 7 Claims

1. In a breast implant device comprising a non-permeable polymer sac filled with a filling material, and constructed and arranged for human implantation, the improvement comprising utilizing as said filling material a substantially silicone-free aqueous sugar solution having a viscosity of at least 15 cp at 98.6° F.



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5,500,018

**SEALING ELEMENT IN THE FORM OF A STRAP**

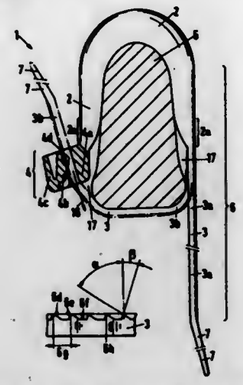
Lorenzo Spotorno, Finale Ligure, Italy; Willi Fick, Wabern, and Roland Willi, Neftenbach, both of, Switzerland, assignors to Protek AG, Bern, Switzerland, and Sulzer Medizinaltechnik AG, Winterthur, Switzerland

Filed Mar. 8, 1994, Ser. No. 207,776

Claims priority, application European Pat. Off., Mar. 23, 1993, 93810207.6

Int. Cl.[6] A61F 2/02; A61K 9/22

U.S. Cl. 623—11 14 Claims



11. A method for introducing a shank of a prosthesis into a bone cavity, the shank having an elongate body with a generally increasing cross-sectional area from a first end to a second end, the method comprising:

wrapping an arcuate portion of a strap around a side surface of the elongate body of the shank;

fastening an end portion of the strap to the arcuate portion to secure the strap around the shank;

filling a portion of the bone cavity with bone cement;

introducing the first end of the shank into the bone cavity thereby forming a gap between the shank and an outer wall of the bone cavity;

substantially sealing the gap between the shank and the outer wall of the bone cavity with the strap to minimize leakage of bone cement from the bone cavity as the shank is introduced into the body cavity.

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5,500,019

**ENDOSCOPIC AUGMENTATION MAMMOPLASTY**

Gerald W. Johnson, 17115 Red Oak, Ste. 211, Houston, Tex. 77090, and Jeffrey Johnson, 1604 Filhiol, Monroe, La. 71203

Continuation-in-part of Ser. No. 832,072, Feb. 6, 1992, Pat. No. 5,258,026. This application Oct. 26, 1993, Ser. No. 141,663

The portion of the term of this patent subsequent to Nov. 2, 2010, has been disclaimed.

Int. Cl.[6] A61F 2/12

U.S. Cl. 623—8 18 Claims




1. A method of surgery for breast augmentation mammoplasty of a human patient comprising the steps of

making an incision at a first point on the body of said patient which is not ordinarily visible,

forming a tunnel in said patient underneath the skin and above the fascia from said incision to a second point behind one breast, then

providing an inflatable hollow prosthetic implant having an elongated filling tube, and inserting said implant through said incision and said tunnel to said point behind said breast,

enlarging said point said breast into a pocket in which said implant is positioned,

filling said implant with saline solution to a selected volume,

removing said filling tube and closing said implant, and

suturing or closing said incision.

**5,500,020**

**PROCESS FOR TITANIUM-BASED MIXED TANNINGS**

**Giacomo Bandino, 2 Glencove Rd., Morris Plains, N.J. 07950**

**Continuation of Ser. No. 137,500, Oct. 15, 1993, abandoned. This application May 23, 1995, Ser. No. 447,681**

**Int. Cl.[6] C14C *3/04***

**U.S. Cl. 8—94.22** **22 Claims**

1. A process for tanning skins using a titanium based treatment, comprising the steps of:

(a) tanning said skins with a titanium-based compound in a percentage between 5 and 10% by weight with respect to the pelt weight of the skins;

(b) basifying the tanned skins;

(c) storing the skins;

(d) samming the skins so as to remove water therefrom, and shaving the skins;

(e) adding an organic acid buffer and a salt, selected from the group consisting of sodium salts and potassium salts, to the sammed and shaved skins, and agitating the skins with the added salt;

(f) adding water to the skins in an amount such as to be completely absorbed by the previously sammed and shaved skins; and

(g) re-tanning the skins.

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**5,500,021**

**OXIDATION DYE COMPOSITION FOR KERATINOUS FIBRES COMPRISING A PARAMINOPHENOL, A META-AMINOPHENOL AND A META-PHENYLENEDIAMINE, AND DYEING PROCESS USING SUCH A COMPOSITION**

**Jean Cotteret, Verneuil-sur-Seine; Marie P. Audousset, Levallois-Perret; Alain LaGrange, Coupvray, and Jean J. Vandenbossche, Sevran, all of, France, assignors to L'Oreal, Paris, France**

**Filed Jul. 13, 1994, Ser. No. 274,560**

**Claims priority, application France, Jul. 13, 1993, 93 08614**

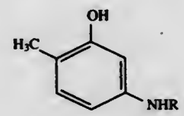
**Int. Cl.[6] A61K *7/13***

**U.S. Cl. 8—408** **22 Claims**

1. A composition for dyeing keratinous fibers comprising in a medium suitable for dyeing said fibers,

(a) an effective amount for dyeing said fibers of at least one oxidation dye precursor selected from the group consisting of 3-methyl-para-aminophenol, 2-methyl-para-aminophenol, 2-hydroxymethyl-para-aminophenol and an acid addition salt thereof;

(b) an effective amount for dyeing said fibers of at least one coupling agent comprising a 2-methyl-5-aminophenol of formula (I):




(I)

wherein

R represents hydrogen, methyl, ethyl, β-hydroxyethyl, or γ-hydroxypropyl or an acid addition salt thereof;

(c) an effective amount for dyeing said fibers of an additional coupling agent comprising at least one metaphenylenediamine selected from the group consisting of:

1-β-hydroxyethyloxy-2,4,-diaminobenzene,

1-(1,2-dihydroxypropyloxy)-2,4-diaminobenzene,

1-(2',4'-diaminophenoxypropyloxy-2,4-diaminobenzene,

1-methoxy-2-amino-4-β-hydroxyethylaminobenzene,

2,4-diaminophenoxyacetic acid,

4,6-bis(2-hydroxyethyloxy)-1,3-diaminobenzene, and an acid addition salt thereof.

**5,500,022**

**PROCESS FOR DYEING KERATINOUS FIBRES WITH 2,6-DIMETHYL-1,4-DIAMINOBENZENE AND/OR 2,3-DIMETHYL-1,4-DIAMINOBENZENE AND/OR 2,6-DIETHYL-1,4-DIAMINOBENZENE IN AN ACID MEDIUM AND COMPOSITIONS EMPLOYED**

**Jean Cotteret, Verneuil-sur-Seine, France, assignor to L'Oreal, Paris, France**

**Continuation of Ser. No. 274,711, Jul. 18, 1994, abandoned, which is a continuation of Ser. No. 996,193, Dec. 23, 1992, abandoned, which is a continuation of Ser. No. 708,300, May 31, 1991, abandoned. This application Apr. 13, 1995, Ser. No. 421,739**

**Claims priority, application France, May 31, 1990, 90 06802**

**Int. Cl.[6] A61K *7/13***

**U.S. Cl. 8—410** **21 Claims**

12. A composition for dyeing keratinous fibers comprising

a component A containing in an aqueous medium suitable for dyeing said fibers at least one oxidation dye precursor selected the group consisting of 2,6-dimethyl-1,4-diaminobenzene, 2,3-dimethyl-1,4-diaminobenzene, 2,6-diethyl-1,4-diaminobenzene and mixtures thereof, said oxidation dye precursor being present in an amount ranging from 0.02 to 10 percent by weight based on the total weight of said component A, said component A not containing iodide ions in an amount sufficient to oxidize said oxidation dye precursor, and

a component B comprising in an aqueous medium suitable for dyeing said fibers, an oxidizing agent present in an amount effective to oxidize said oxidation dye precursor,

and an acid component in a sufficient amount such that a mixture in proportions of 90 to 10% of said component A and of 10 to 90% of said component B, the said composition has a pH less than 7.

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**5,500,023**

**INK-JET PRINTING PROCESS, INK SET FOR USE IN SUCH PROCESS, AND PROCESSED ARTICLE OBTAINED THEREBY**

**Shoji Koike, Yokohama; Masahiro Haruta, Tokyo; Koromo Shirota, Inagi; Tomoya Yamamoto, and Mariko Suzuki, both of Kawasaki, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Apr. 18, 1994, Ser. No. 229,341**

**Claims priority, application Japan, Apr. 21, 1993, 5-094207; Apr. 21, 1993, 5-094208**

**Int. Cl.[6] D06P *5/00*; C09D *11/02*; B41J *2/01***

**U.S. Cl. 8—499** **38 Claims**

35. An ink set suitable in ink-jet textile printing, comprising yellow, magenta, cyan and black inks containing respective reactive dyes, wherein reactive dyes contained in the inks of the respective colors are different from one another in reaction rate, and the dye content in the ink containing a slower-reacting dye is lower.

5,500,024

## ULTRAVIOLET ABSORBING LENSES AND METHODS OF MANUFACTURE THEREOF

William M. Hung, and Kai C. Su, both of Alpharetta, Ga., assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

Division of Ser. No. 91,854, Jul. 14, 1993, Pat. No. 5,399,692, which is a division of Ser. No. 3,674, Jan. 12, 1993, Pat. No. 5,298,833, which is a continuation of Ser. No. 707,515, May 30, 1991, abandoned, which is a continuation-in-part of Ser. No. 468,386, Jan. 22, 1990, Pat. No. 5,098,445, which is a continuation-in-part of Ser. No. 323,354, Mar. 14, 1989, Pat. No. 4,929,258, and Ser. No. 323,327, Mar. 14, 1989, Pat. No. 4,963,160. This application Dec. 22, 1994, Ser. No. 362,673

Int. Cl.[6] D06P 3/52

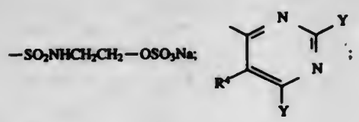
U.S. Cl. 8—509 5 Claims

1. An ultraviolet radiation-absorbing lens comprising an effective amount of an ultraviolet radiation-absorbing agent bonded to a polymeric material selected from the group consisting of cellulose acetate butyrate and polymethylmethacrylate, said ultraviolet radiation-absorbing agent being of the formula A—NH—B,

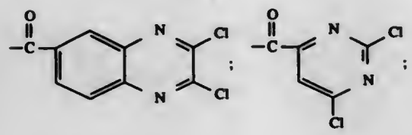
wherein A is an ultraviolet radiation-absorbing component, and

wherein B is a reactive group or moiety containing a reactive group selected from the group consisting of:

$-SO_2CH_2CH_2-X$; $-SO_2CH_2CH_2-OSO_3Na$;



$-SO_2NHCH_2CH_2-OSO_3Na$;



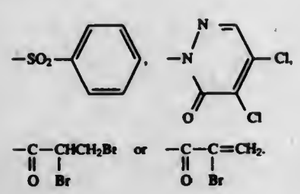
wherein X=a halogen;

$R^4$=H or Cl;

Y=Cl or F;

n=1 or 2; and

Z=a halogen,



5,500,025

## PROCESS FOR DYEING SPANDEX FIBERS

Jai P. Sharma, Hickory, N.C., assignor to UKI Supreme Corporation, Hickory, N.C.

Division of Ser. No. 957,658, Oct. 7, 1992, Pat. No. 5,382,264. This application Oct. 7, 1994, Ser. No. 320,866

Int. Cl.[6] D06P 3/24; C09B 45/00

U.S. Cl. 8—685 1 Claim

1. A dyed spandex textile material having a Class value of greater than 3 when tested according to AATCC Test Method 61-1975 IIA.

5,500,026

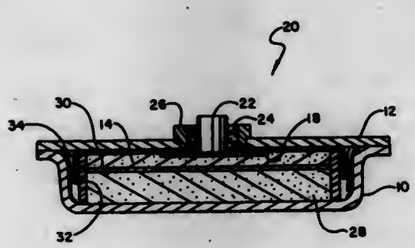
## METHOD OF ASSEMBLING ELECTROCHEMICAL CELLS OF NOVEL CONSTRUCTION

Bernard F. Heller, 143 Crown Rd. Northeast, Fridley, Minn. 55421; Craig L. Schmidt, 4630 Beacon Hill Rd., Eagan, Minn. 55122; Thomas M. Nutzman, 16154 Vintage Dr., Andover, Minn. 55304, and Joseph F. Lessar, 3742 114th Ln. Northwest, Coon Rapids, Minn. 55433

Division of Ser. No. 54,778, Apr. 27, 1993. This application Jun. 2, 1995, Ser. No. 460,608

Int. Cl.[6] H01M 10/04

U.S. Cl. 29—623.1 5 Claims



1. A method of assembling a cell having a flattened shape and of a predetermined configuration, the cell being comprised of stacked members, the steps comprising:

providing top and bottom enclosure portions adapted to be fitted together to form a sealed enclosure;

providing a first cell subassembly including said top enclosure portion, an inverted insulator cup, a feedthrough structure in the top portion, a feedthrough pin extending through the top portion and the insulator cup, and an anode collector attached to the interior end of the pin inside the top portion and insulator cup;

providing a second subassembly including anode and cathode members conforming to the configuration of the cell so as to fit within the top and bottom enclosure portions when they are joined together,

the second subassembly being assembled as follows:

providing a retaining frame member, a holding die including a parting means, anode material, cathode material, associating the die and frame member so as to allow placement of the anode material within the die and frame member following placement of the frame member within the die;

pouring melted cathode material onto the anode within the frame member and die;

allowing it to solidify and removing the second subassembly from the die;

placing the second subassembly within the insulator cup of the first subassembly with the anode surface oriented to contact the anode collector, and

bringing the top and bottom enclosure portions together so as to enclose the subassemblies and welding same said subassemblies together to form a sealed enclosure.



5,500,027

## AEROSOL GENERATOR

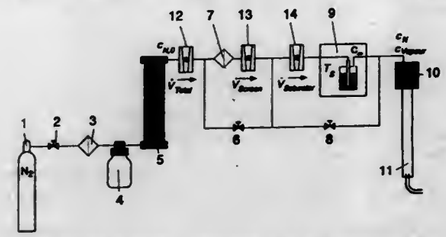
Andreas Rudolph, Dresden; Klaus J. Mueller, Ulberndorf; Christian Peters, Rostock, and Justus Altmann, Dresden, all of, Germany, assignors to Topas GmbH, Dresden, Germany

Filed Apr. 13, 1994, Ser. No. 226,927

Claims priority, application Germany, Apr. 21, 1993, 43 12 983.8

Int. Cl.[6] B01D 35/147

U.S. Cl. 55—223 5 Claims



1. An aerosol generator comprising a nuclei source, a saturator, and a combination of a means for removing nuclei and a means for bypassing the means for removing nuclei parallel to the means for removing nuclei, the combination being between the nuclei source and the saturator.

5,500,028

## REMOVABLE FILTER DEVICE FOR ARTICLE STORING ARRANGEMENT

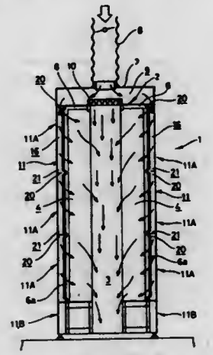
Yukio Iizuka, Komaki, Japan, assignor to Daifuku Co., Ltd., Osaka, Japan

Filed May 2, 1994, Ser. No. 236,263

Claims priority, application Japan, Aug. 6, 1993, 5-195019

Int. Cl.[6] B01D 46/10

U.S. Cl. 55—385.1 2 Claims



1. A removable filter device fitted to the rear of an article storing shelf assembly of an article storing arrangement having a body, said removable filter device comprising:

a mounting frame portion having an opening and removably attached to the body of the article storing arrangement;

a filter having an outer surface and disposed at a position corresponding to the opening in the mounting frame portion; and

a cover covering the outer surface of the filter while keeping a selected clearance therebetween;

said cover having an air inlet portion formed therein:

wherein the removable filter device is divided into a plurality of intercommunicating modular units having communication ports for the introduction of air, each modular unit having a cover member and a filter member, each cover member comprising a portion of said cover and each filter member comprising a portion of said filter.

5,500,029

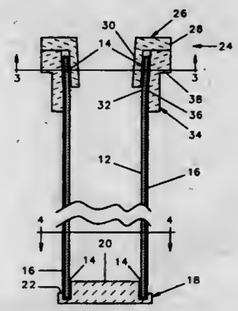
## FILTER ELEMENT AND METHOD OF MANUFACTURE

James F. Zievers; Elizabeth C. Zievers, both of La Grange; Peter Aguilar, Forest View, and Paul Eggerstedt, Plainfield, all of Ill., assignors to Industrial Filter & Pump Mfg. Co., Cicero, Ill.

Filed Apr. 25, 1994, Ser. No. 232,481

Int. Cl.[6] B01D 46/24

U.S. Cl. 55—485 20 Claims



1. A filter element, comprising in combination a porous ceramic support structure,

a filamentary covering disposed over one surface of said support structure, and

a thin ceramic skin enclosing said covering and said one surface, said skin having a finer porosity than that of said support structure, and

said support structure, said filamentary covering, and said skin being bonded together to form a unitary member.

5,500,030

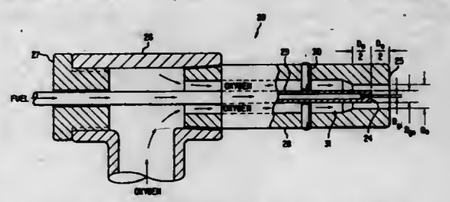
## OXY-GAS FIRED FOREHEARTH BURNER SYSTEM

Mahendra L. Joshi, Altamonte Springs, and Lee Broadway, Eustis, both of Fla., assignors to Combustion Tec, Inc., Apopka, Fla.

Filed Mar. 3, 1994, Ser. No. 205,192

Int. Cl.[6] F23D 14/32

U.S. Cl. 65—346 7 Claims



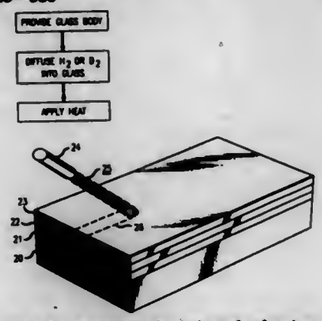
1. An oxy-fuel burner for a forehearth system comprising:

oxygen means for introducing oxygen into said forehearth system, said oxygen means comprising an oxygen conduit;

a fuel conduit disposed concentrically within said oxygen conduit and forming an annulus between said fuel conduit and said oxygen conduit, a fuel firing end of said fuel conduit recessed within said oxygen conduit at a distance from an oxygen firing end of said oxygen conduit; and

a ratio of the inside diameter of said oxygen firing end to the inside diameter of said fuel firing end being in a range of about 2:1 to 8:1.

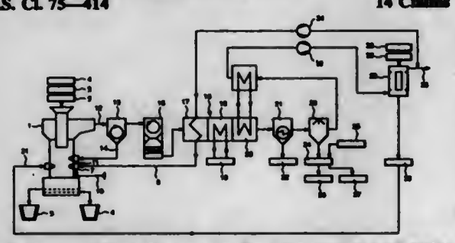
**5,500,831**
**METHOD FOR INCREASING THE INDEX OF REFRACTION OF A GLASSY MATERIAL**
**Robert M. Atkins, Millington; Paul J. Lemaire, Madison; Victor Mizrahi, Bedminster, and Kenneth L. Walker, New Providence, all of N.J., assignors to AT&T Corp., Murray Hill, N.J.**
**Continuation of Ser. No. 56,329, Apr. 30, 1993, abandoned, which is a continuation-in-part of Ser. No. 10,237, Jan. 28, 1993, Pat. No. 5,287,427, which is a continuation-in-part of Ser. No. 878,882, May 5, 1992, Pat. No. 5,235,659. This application Dec. 14, 1994, Ser. No. 357,353**
**Int. Cl.[6] C03B *32/00***
**U.S. Cl. 65—386** **6 Claims**




1. A method for increasing the index of refraction of selected portions of a body comprising glass comprising the steps of:
providing a body comprising glass;
diffusing hydrogen or deuterium into at least the portions of said glass whose refractive index is to be increased wherein said diffusing is effected by exposing said glass to said hydrogen or deuterium at a temperature in the range 21°–150° C.; and
locally selectively heating said portions of said glass to a temperature greater than about 500° C. to selectively increase the refractive index of said portions.

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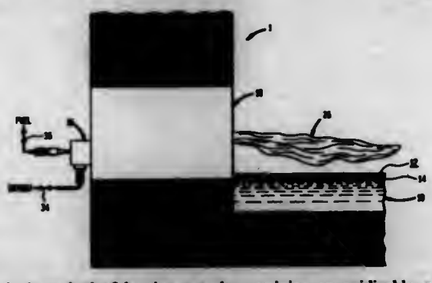
**5,500,832**
**METHOD FOR CONTINUOUSLY MELTING DOWN SCRAP METAL**
**Wolfgang Nieder, Linz; Manfred Winkler, Neuhofen; Gerhard Perchtold, Vienna; Leo Seirlehner, Linz, all of, Austria; Herbert Kohler, Kornwestheim, and Arwed Eberle, Reutlingern, both of, Germany, assignors to Voest-Alpine Industrieanlagenbau GmbH, Linz, Austria, and Mercedes-Benz Aktiengesellschaft, Stuttgart, Germany**
**PCT No. PCT/AT93/00158, § 371 Date Oct. 31, 1994, § 102(e) Date Oct. 31, 1994, PCT Pub. No. WO94/09163, PCT Pub. Date Apr. 28, 1994**
**PCT Filed Oct. 19, 1993, Ser. No. 256,860**
**Claims priority, application Austria, Jan. 19, 1992, 2062/92**
**Int. Cl.[6] C22B *9/16***
**U.S. Cl. 75—414** **14 Claims**



1. A process for continuously melting down scrap metal which contains residual plastic materials comprising:
feeding scrap metal to be melted down to a melt-down reactor;
supplying heat to melt down the scrap metal by direct heating from below using burners arranged close to a tapping point of the reactor;
controlling operation of said reactor to be a reducing process;
drawing process gases off from the reactor;
using excess heat carried by said process gases;
purifying said process gases;
returning a portion of said process gases to the melt-down reactor as a combustion gas; and
venting a remaining portion of said process gases as an output gas.

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**5,500,833**
**MELT HEATING METHOD**
**Loo T. Yap, Princeton, N.J., assignor to The BOC Group, Inc., New Providence, N.J.**
**Continuation-in-part of Ser. No. 376,278, Jan. 23, 1995, abandoned. This application Feb. 27, 1995, Ser. No. 394,866**
**Int. Cl.[6] C22B *21/00***
**U.S. Cl. 75—386** **6 Claims**



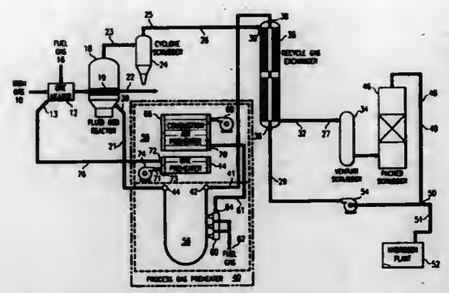
1. A method of heating a melt containing an oxidizable substance, said method comprising:
burning fuel with an oxidant by projecting at least one pair of fuel and oxidant jets over the melt, said oxidant jet being at least partially situated between said fuel jet and said melt;
said fuel and oxidant jets having a fuel jet momentum and an oxidant jet momentum, respectively, and said oxidant jet producing a top oxidation layer located on said top surface of said melt and having a thickness;
determining a threshold momentum at which said top oxidation layer is forced aside by said oxidant jet to expose fresh melt that could potentially be oxidized and increase said thickness of said top oxidation layer;
adjusting said oxidant jet momentum to be below said threshold momentum; and
adjusting said fuel jet momentum so that it is greater than said oxidant jet and said oxidant and fuel form a desired combustible mixture in a mixing layer of the fuel and oxidant.

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**5,500,834**
**METHOD FOR PREHEATING A REACTOR FEED**
**Charles A. Martin, 10310 S. Braden Ave., Tulsa, Tulsa County, Okla. 74101**
**Division of Ser. No. 109,585, Aug. 20, 1993. This application May 5, 1995, Ser. No. 435,674**
**Int. Cl.[6] C21B *13/00***
**U.S. Cl. 75—505** **20 Claims**

1. A method for preheating a reactor feed, comprising:
conveying a cool process gas to an inlet of a furnace;
providing a plurality of tubes from the inlet of the furnace to an outlet of the furnace, each of the tubes forming an elbow between the inlet and the outlet;
distributing the cool process gas in the tubes within the furnace;
heating the cool process gas, uniformly in the tubes, to produce a heated process gas;

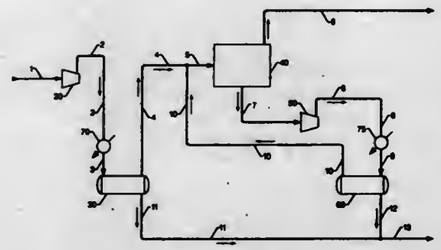




collecting the heated process gas for discharge from the furnace; and
conveying the heated process gas to a reactor.

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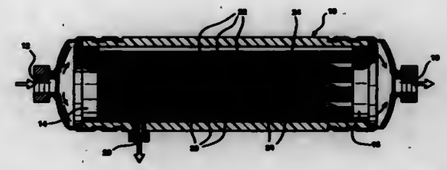
**5,500,835**
**PRESSURE SWING ADSORPTION PROCESS FOR CHLORINE PLANT OFFGAS**
**Andrew S. Zarchy, Amawalk; Chien C. Chao, Millwood, and Richard T. Maurer, Nanuet, all of N.Y., assignors to UOP, Des Plaines, Ill.**
**Continuation-in-part of Ser. No. 103,368, Aug. 9, 1993, Pat. No. 5,376,164. This application Jul. 19, 1994, Ser. No. 276,981**
**Int. Cl.[6] B01D *53/047***
**U.S. Cl. 95—41** **14 Claims**



1. A pressure swing adsorption process for the recovery of chlorine from a chlorine plant offgas stream comprising hydrogen, air, and chlorine, said process comprising the steps of:
a) passing said chlorine plant offgas stream at adsorption conditions including an adsorption temperature and an adsorption pressure to a pressure swing adsorption (PSA) zone, said PSA zone comprising a first adsorption bed of at least two adsorption beds, each of said adsorption beds containing weak adsorbent selective for the adsorption of chlorine to provide a vent gas stream withdrawn at a pressure substantially equal to said adsorption pressure said vent gas stream being essentially free of chlorine and comprising less than 100 ppm-vol chlorine;
b) terminating the passing of said offgas stream to said first adsorption bed, passing said offgas stream to another adsorption bed in said PSA zone, depressurizing said first adsorption bed to a desorption pressure, and withdrawing a tail gas stream comprising chlorine;
c) compressing said tail gas stream to provide a compressed tail gas stream, condensing said compressed tail gas stream and separating said compressed tail gas stream to provide a liquid chlorine product and a reduced chlorine offgas stream; and,
d) repeating steps (a) and (b) to provide a continuous PSA process having a short cycle comprising an adsorption time less than about 6 minutes.

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**5,500,836**
**PRODUCTION OF ENRICHED OXYGEN GAS STREAM UTILIZING HOLLOW FIBER MEMBRANES**
**Dilip G. Kalthod, St. Louis, Mo., assignor to Air Products and Chemicals, Inc., Allentown, Pa.**
**Filed Oct. 17, 1994, Ser. No. 323,968**
**Int. Cl.[6] B01D *53/22;63/02***
**U.S. Cl. 95—54** **13 Claims**



1. A process for obtaining an oxygen-enriched gas stream from a gas containing at least about 15% oxygen comprising:
(a) contacting the gas with hollow fiber membranes contained in a pressure module to provide a feed gas internally of the module;
(b) permeating a major portion of the oxygen in the feed gas through the membranes;
(c) utilizing a portion of the feed gas derived internally of the module to provide a sweep gas internally of the module to the permeate side of the hollow fiber membranes substantially countercurrent to the flow of the feed gas; and
(d) recovering an oxygen-enriched permeate gas stream.

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**5,500,837**
**IMPACT ABSORBER**
**Shaikh G. M. Y. Alhamad, P.O. Box 31590, Riyadh, 11418, Saudi Arabia**
**Continuation-in-part of Ser. No. 784,171, Oct. 25, 1991, abandoned, which is a continuation-in-part of Ser. No. 605,540, Oct. 29, 1990, Pat. No. 5,142,755, which is a division of Ser. No. 417,696, Oct. 5, 1989, Pat. No. 5,001,017, which is a continuation of Ser. No. 280,317, Dec. 6, 1988, abandoned. This application Apr. 13, 1994, Ser. No. 226,955**
**Int. Cl.[6] B01D *35/00***
**U.S. Cl. 96—108** **6 Claims**



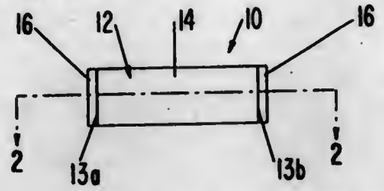
1. A vehicle on-board refueling vapor recovery canister containing adsorptive solids and a quantity of hydrocarbons adsorbed therein, said canister being protected against fracture upon impact, and against spillage of said solids, and against fire, by the presence of a protective covering comprising a contained layer of nested ellipsoids formed from expanded metal sheets made from magnesium alloy foil.

5,500,038

## NON-PARTICULATING COMPACT ADSORBENT FILTER

Edwin G. Dauber, Chesapeake City; William P. Mortimer, Jr., Conowingo, both of Md., and Michael S. Winterling, Newark, Del., assignors to W. L. Gore & Associates, Inc., Newark, Del.

Filed Aug. 30, 1994, Ser. No. 298,484
Int. Cl.[6] B01D 53/04
U.S. Cl. 96—135 23 Claims




1. A sorbent filter for selectively sorbing contaminants present in an enclosure that houses sensitive equipment to protect the sensitive equipment within the enclosure from damage caused by the contaminants, the filter having a height, depth and length, and comprising:

an inner sorbent core including contaminant sorbent material therein;

an outer protective cover wrapped around the inner sorbent core so as to completely contain the sorbent core along its length, and leaving exposed at least one end, the protective cover having a thickness ranging from about 0.00005 to about 0.040 inches;

a sealed seam retaining the protective cover around the sorbent core; and

an end seal for each at least one exposed end, completely encapsulating the sorbent core within the filter, the end seal sealing the sorbent filter such that the sorbent material holding capacity of the filter is not diminished along the length of the filter; and

wherein the sorbent filter is operable to protect the sensitive equipment within the enclosure from damage caused by the contaminants.

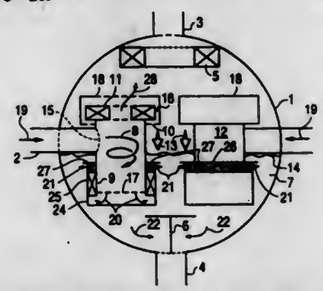
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5,500,039

## GAS-LIQUID SEPARATING APPARATUS

Yasushi Mori; Tokuji Matsuo; Nobuhiro Hokao, all of Nagasaki; Akihiko Fujimoto, Tokyo, and Tsuyoshi Sato, Nagasaki, all of, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 22, 1994, Ser. No. 277,311
Claims priority, application Japan, Jul. 23, 1993, 5-182662
Int. Cl.[6] B01D 19/00
U.S. Cl. 96—209 8 Claims




2. A gas-liquid separation apparatus comprising: a container having a downwardly extending outlet at the bottom thereof; and a separator disposed within said container, said separator including a cylinder having a vertically extending central axis and an open bottom, a primary isolated liquid outlet at the bottom of said cylinder, an inlet opening into said cylinder and extending tangentially to said cylinder such that a gas-liquid mixture flowing into said cylinder from said inlet will swirl around the vertical central axis of the cylinder to effect a centrifugal separation of gas and liquid, a perforated cylindrical plate integral with said cylinder and also having a vertically extending central axis, the perforations of said cylindrical plate extending radially therethrough, the perforations having respective radially inner ends communicating with the open bottom of the cylinder such that the liquid separated in the cylinder and any gas still entrained in the liquid flows through said perforations, and said perforations having respective radially outer ends at which the perforations open directly into the interior of said container such that liquid and any gas still entrained in the liquid flows into the container in the radial direction of said perforated cylindrical plate, thereby facilitating a gravitational separation of said liquid and any gas still entrained in the liquid before the liquid flows out the outlet of said container, an outflow diverting section extending from said primary isolated liquid outlet and comprising a wall disposed in a path extending directly between said primary isolated liquid outlet and said outlet of the container to divert said liquid and any gas entrained in the liquid, and vertically oriented vortex-preventing plates extending in said outflow diverting section in the radial direction of said cylinder, said vortex preventing plates being located between the primary isolated liquid outlet of said cylinder and said perforated cylindrical plate such that said liquid and any gas entrained in the liquid impinges said vortex-preventing plates before passing into said container.

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5,500,040

## ULTRAVIOLET-CURABLE THERMOCHROMIC INK COMPOSITION

Fumiko Fujinami, Daito, Japan, assignor to Sakura Color Products Corporation, Osaka, Japan

Filed May 22, 1995, Ser. No. 445,940
Claims priority, application Japan, May 31, 1994, 6-118245
Int. Cl.[6] C09D 11/02
U.S. Cl. 106—21 A 3 Claims

1. An ultraviolet-curable thermochromic ink composition comprising thermochromic microcapsules and a photo-polymerizable composition as basic components, wherein said thermochromic microcapsule comprises at least one ultraviolet absorber having an absorption wave range of at least about 220–380 nm, and said photo-polymerizable composition comprises at least one photo-initiator having an absorption wave range of at least about 360–450 nm.

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5,500,041

## COMPOSITION FOR PREPARATION OF ARTICLES OF CALCIUM OXIDE

Jean Debuigne, Chanteple, and Serge Prigent, Rennes, both of, France, assignors to Institut National des Science Appliquees de Rennes, Rennes, and Microsteel S.A., Vern Sur Seiche, both of, France

Filed Sep. 30, 1993, Ser. No. 128,569
Claims priority, application France, Jan. 1, 1992, 92 11650
Int. Cl.[6] B28B 7/36
U.S. Cl. 106—38.22 15 Claims

1. A composition for the preparation of articles of calcium oxide, comprising calcined calcium oxide and an organic phase consisting essentially of at least one polyol in a non-aqueous medium, wherein said calcined calcium oxide is present in the amount from 0.5 to 3 kg per liter of the non-aqueous medium.



5,500,042

## FLUOROELASTOMER COMPOSITION WITH IMPROVED BONDING PROPERTIES

Werner M. Grootaert, Oakdale; Robert E. Kolb, St. Paul, and George H. Millet, Stillwater, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 63,116, May 18, 1993, Pat. No. 5,284,611, which is a continuation of Ser. No. 608,216, Nov. 2, 1990, abandoned, which is a division of Ser. No. 369,754, Jun. 22, 1989, abandoned. This application Jan. 21, 1994, Ser. No. 184,268
Int. Cl.[6] C09D 1/00
U.S. Cl. 106—287.11 2 Claims

1. A bonding composition useful for improving the bonding adhesion between a substrate and a cured fluoroelastomeric composition, the bonding composition comprising:

(A) aminosilane compound, and

(B) fluoroaliphatic sulfonyl compound having at least one $—SO_2NH—$ or $—SO_2CH—$ moiety wherein the sulfur atom of said $—SO_2NH—$ or $—SO_2CH—$ moiety is also bonded directly to a carbon atom substituted with at least one strongly electronegative or electron withdrawing group.

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5,500,043

## LUSTROUS PIGMENT AND THE METHOD OF PRODUCING THE SAME

Hidefumi Harada; Takanori Yamasaki; Eizi Sadanaga, and Teruyoshi Okazaki, all of Yamaguchi, Japan, assignors to Titan Kogyo Kabushiki Kaisha, Yamaguchi, Japan

Continuation of Ser. No. 166,627, Dec. 15, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 487,973
Claims priority, application Japan, Dec. 17, 1992, 4-337380
Int. Cl.[6] C09C 1/22
U.S. Cl. 106—456 4 Claims

1. A lustrous flaky iron oxide pigment having a hematite structure characterized in that said pigment contains aluminum and at least one of the elements selected from Zn, Sb and Sn in solid solution and is thicker than 0.8 μm in an average thickness.

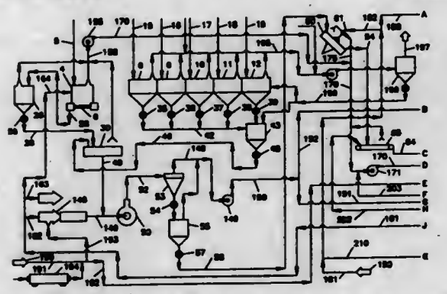
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5,500,044

## PROCESS FOR FORMING AGGREGATE; AND PRODUCT

William D. Meade, Brooklyn Park, Minn., and John W. Pearson, Appelton, Wis., assignors to Greengrove Corporation, Brooklyn Park, Minn.

Filed Oct. 15, 1993, Ser. No. 138,247
Int. Cl.[6] C04B 7/12
U.S. Cl. 106—697 19 Claims



1. A process for preparing a hardened aggregate; said process comprising the steps of:

(a) mixing raw material mixture including a sludge component and an ash component;

(i) said raw material mixture comprising at least 66% by weight, based on dry weight, sludge component; and at least 20%, by weight, based on dry weight, ash component; a ratio of dry weight sludge to ash component being within a range of 3/1 to 4/1; said sludge component being selected from the group consisting of pulp mill sludge, paper mill sludge, and mixtures thereof;

(b) pelletizing said raw material mixture resulting from step (a); and

(c) indurating said pelletized material mixture, wherein said step of indurating (c) directly follows said step of pelletizing (b).

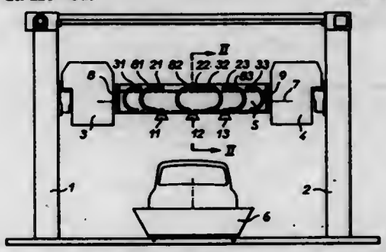
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5,500,045

## ELECTROSTATIC SPRAYING MACHINE FOR COATING PRODUCTS

Pierre Ehinger, Faverges, and Patrice Gory, Meylan, both of, France, assignors to Sames S.A., Meylan, France

Filed Mar. 31, 1994, Ser. No. 220,675
Claims priority, application France, Apr. 1, 1993, 93 03828
Int. Cl.[6] B05B 7/06
U.S. Cl. 118—313 18 Claims




1. Electrostatic spraying machine including a gantry for coating objects, said machine comprising: a horizontal beam consisting of electrical insulating material extending above a path of travel for the objects, said beam being hollow; and at least one coating product sprayer and connected to receive coating product conveyed along said beam.

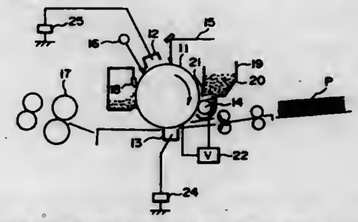
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5,500,046

## TONER FOR DEVELOPING ELECTROSTATIC IMAGES, IMAGE FORMING APPARATUS, APPARATUS UNIT AND FACSIMILE APPARATUS

Kazuyoshi Hagiwara, Tokyo, and Hirohide Tsukawa, Yokohama, both of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 197,555, Feb. 17, 1994, Pat. No. 5,389,484, which is a continuation of Ser. No. 868,966, Apr. 16, 1992, abandoned. This application Nov. 2, 1994, Ser. No. 333,345
Claims priority, application Japan, Apr. 16, 1991, 3-109684; Apr. 26, 1991, 3-097245; Mar. 31, 1992, 4-077447; Apr. 13, 1992, 4-118496
Int. Cl.[6] G03G 15/08
U.S. Cl. 118—653 42 Claims




1. An apparatus unit which is detachable from a body of an image forming apparatus, comprising;

an electrostatic image bearing member which bears an electrostatic image on its surface; and

a developing means for developing the electrostatic image carried on said electrostatic image bearing member;

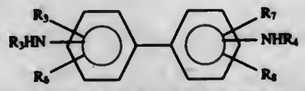
wherein said developing means comprises a toner for developing electrostatic images comprising toner particles each of which contains a binder resin having as a constituent an acid component with an acid value of from 0.5 to 100 mg.KOH/g, a colorant, and at least one compound represented by the following formulas (I), (II) and (III):

Formula (I)

$$R_1HN—Ar—NHR_2$$

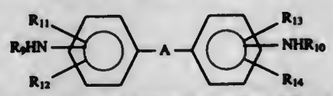
wherein Ar is a substituted or unsubstituted aryl group; and $R_1$ and $R_2$ are the same or different and is a hydrogen atom, an alkyl group or a phenyl group which is substituted or unsubstituted, and a nitrogen-containing ring structure formed be combining at least one of them with Ar or a nitrogen-containing ring structure formed by combining both of them with each other;

Formula (II)



wherein $R_3$ and $R_4$ are the same or different and is a hydrogen atom, an alkyl group or a phenyl group which is substituted or unsubstituted; and $R_5$, $R_6$, $R_7$ and $R_8$ are the same or different and is a hydrogen atom, an alkyl group, a hydroxyl group, an alkoxy group, a mercapto group, an alkylthio group, an amino group, an alkylamino group, a dialkylamino group, a halogen atom, a phenyl group which is substituted or unsubstituted, an alkenyl group, a nitgrogen-containing ring structure formed by combining $R_5$ and $R_6$ with each other and a nitrogen-containing ring structure formed by combining $R_7$ and $R_8$ with each other; and

Formula (III)



wherein A represents a linking group, $R_9$ and $R_{10}$ are the same or different and is hydrogen atom, an alkyl group or a phenyl group, which is substituted or unsubstituted; and $R_{11}$, $R_{12}$, $R_{13}$ and $R_{14}$ are the same or different and is a hydrogen atom, an alkyl group, a hydroxyl group, an alkoxy group, a mercapto group, an alkylthio group, and amino group, an alkyl amino group, a dialkylamino group, a halogen atom, a phenyl group which is substituted or unsubstituted, an alkenyl group, a nitrogen-containing ring structure formed by combining $R_{11}$ and $R_{12}$ with each other, and a nitrogen-containing ring structure formed by combining $R_{13}$ and $R_{14}$ with each other.

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**5,500,047**

**APPARATUS FOR ADSORBING ATOMIC HYDROGEN ON SURFACE**

**Kang-Ho Park; Jeong-Sook Ha; Seong-Ju Park, and El-Hang Lee, all of Daejeon, Rep. of Korea, assignors to Electronics & Telecommunications Research Institute, Daejeon, Rep. of Korea**

**Filed Dec. 6, 1994, Ser. No. 354,037**

**Claims priority, application Rep. of Korea, Nov. 23, 1994, 94-30899**

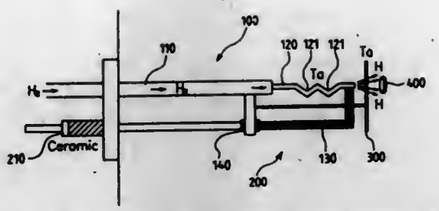
**Int. Cl.[6] C23C *16/00***

**U.S. Cl. 118—724** **5 Claims**

1. A surface adsorption apparatus for dissociating $H_2$ molecules into atomic hydrogen in a vacuum vessel and adsorbing the atomic hydrogen on a sample surface, the apparatus comprising:

a vacuum tube mounted in the vacuum vessel;

a nozzle means combined with the vacuum tube, said nozzle means having a plurality of bent portions, each bent portion being formed with internal sections of the tube meeting to form an internal angle between adjacent internal sections



inside of the tube, and said nozzle means having a first opening joined to an opening of said vacuum tube;

a heating member connected to said nozzle means, said heating member receiving electrical power from a power supply source and heating the nozzle to a predetermined temperature; and

a heat shielding member located in a path of the atomic hydrogen exiting from a second opening of said nozzle means between the second end of the nozzle means and the sample surface for preventing heat from said nozzle means from radiating toward the sample surface; and wherein

said nozzle means causes the $H_2$ molecules to collide with inner wall surfaces of the bent portions to dissociate into the atomic hydrogen and the dissociated atomic hydrogen to propagate toward the sample surface and be adsorbed on the sample surface.

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**5,500,048**

**CLEANING METHODS AND COMPOSITIONS FOR PRODUCE**

**Bruce P. Murch, Cincinnati; Brian J. Roselle, Fairfield, and Kyle D. Jones, West Chester, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio**

**Filed Jul. 5, 1994, Ser. No. 270,696**

**Int. Cl.[6] B08B *9/20***

**U.S. Cl. 134—6** **10 Claims**

1. A method for cleaning surfaces of produce selected from the group consisting of: fruits, vegetables, and mixtures thereof, so that said produce is ready for ingestion, comprising the step of contacting the surfaces of said produce with an aqueous cleaning solution having a basic pH of at least 9.5 and comprising at least 0.1% potassium oleate, and thereafter rinsing, wiping off, or rinsing and wiping off said solution from the surfaces of said produce to clean the surfaces of said produce.

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**5,500,049**

**METHOD FOR APPLYING A SURFACE TREATMENT AGENT ONTO A SURFACE**

**Jay N. Kolinsky, P.O. Box 300, 103 Old Stone Hill Rd., Pound Ridge, N.Y. 10576**

**Continuation-in-part of Ser. No. 12,880, Feb. 3, 1993, Pat. No. 5,387,290, which is a continuation-in-part of Ser. No. 958,608, Oct. 8, 1992, abandoned, which is a continuation of Ser. No. 766,027, Sep. 26, 1991, abandoned. This application Oct. 6, 1994, Ser. No. 319,312**

**Int. Cl.[6] B08B *1/00*; A47L *13/16***

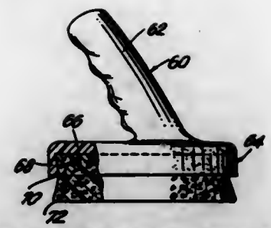
**U.S. Cl. 134—6** **14 Claims**

1. A method of applying a treating agent to a surface utilizing an applicator comprising a pad and a handle that are friction fit together, the applicator and the handle having shapes that cooperate with each other to cause the applicator and the handle to be separable from one another when the friction forces between a working surface of the pad and the surface being treated become great enough to overcome the friction fit forces holding the pad to the handle, the method comprising the steps of:

(a) selecting a surface to be treated;

(b) applying a treating agent to at least one of the working surface of the pad or a portion of the surface to be treated;





(c) spreading the treating agent over the surface while exerting a downward force on the handle thereby producing a friction force between the pad and the surface; and

(d) stopping the application of the agent to the surface to be treated when the pad is separated from the handle upon the friction forces between the working surface of the pad and the surface being treated overcoming the forces holding the pad to the handle.

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**5,500,050**

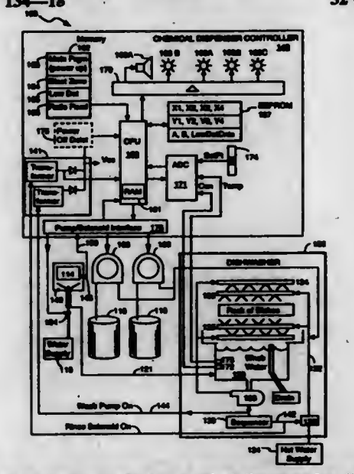
**RATIO FEED DETERGENT CONTROLLER AND METHOD WITH AUTOMATIC FEED RATE LEARNING CAPABILITY**

**Wai Y. C. Chan, and James W. Livingston, both of Santa Cruz, Calif., assignors to Diversey Corporation, Ontario, Canada**

**Filed Jul. 15, 1994, Ser. No. 276,083**

**Int. Cl.[6] B08B *13/00***

**U.S. Cl. 134—18** **32 Claims**



25. A method of controlling a chemical dispenser that dispenses chemical from a chemical supply into a receiving device, wherein the receiving device includes a concentration sensor that generates signals corresponding to chemical concentration in the receiving device, the method comprising the steps of:

receiving said concentration sensor generated signals;

using a programmed digital data processor, performing the steps of:

(A) enabling operation of said chemical dispenser for periods (chemical dispensing periods) of time separated by chemical mixing periods during which operation of said chemical dispenser is disabled;

(B) storing digitized chemical concentration values corresponding to said received concentration sensor generated signals, including digitized chemical concentration values associated with said chemical's concentration before and after each said chemical dispensing period, and computing a first chemical concentration differential value based on said digitized chemical concentrations after and before said chemical dispensing period;

(C) for each of at least a subset of said periods during which said chemical dispenser is enabled, generating a chemical feed factor corresponding to the ratio of each said chemical dispensing period of time to said first chemical concentration differential;

(D) storing said chemical feed factor in a non-volatile memory;

(E) computing an average of said chemical feed factors for a predefined number of said chemical dispenser periods;

(F) computing a second chemical concentration differential value corresponding to a chemical concentration set point and said digitized concentration value prior to each chemical dispensing period;

(G) computing a feed time value corresponding to said average chemical feed factor and said second chemical concentration differential value;

(H) enabling operation of said chemical dispenser for said computed feed time value; and

(I) disabling operation of said chemical dispenser whenever said digitized concentration value corresponds to a chemical concentration at or above said chemical concentration set point.

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**5,500,051**

**PHOTOELECTRIC CONVERSION DEVICE**

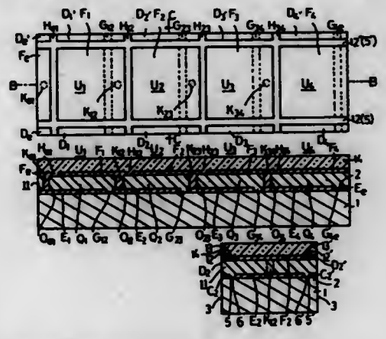
**Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan**

**Division of Ser. No. 13,289, Feb. 1, 1993, Pat. No. 5,332,450, which is a continuation of Ser. No. 839,867, Feb. 20, 1992, abandoned, which is a continuation of Ser. No. 800,666, Nov. 22, 1985, abandoned, which is a division of Ser. No. 630,863, Jul. 12, 1984, Pat. No. 4,594,471. This application Apr. 5, 1994, Ser. No. 222,954**

**Claims priority, application Japan, Jul. 13, 1983, 58-128270; Jan. 31, 1983, 58-204441; Mar. 26, 1984, 59-57713**

**Int. Cl.[6] H01L *31/05***

**U.S. Cl. 136—244** **25 Claims**



1. A photoelectric conversion device comprising:

a substrate having an insulating surface;

a first electrode arrangement comprising a first conductive layer formed on said substrate;

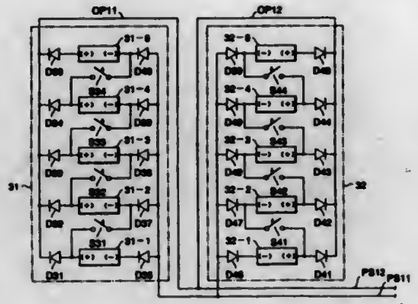
a photoelectric conversion semiconductor layer formed on said first electrode arrangement;

a second electrode arrangement comprising a second conductive layer formed on said semiconductor layer;

at least one hole formed through said photoelectric conversion semiconductor layer, through which said first electrode arrangement is electrically connected to said second electrode arrangement, said hole extending into said first conductive layer; and

a protective layer formed over said second electrode arrangement.

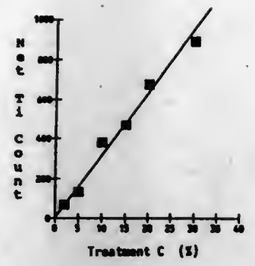
**5,500,052**
**SOLAR PHOTOVOLTAIC POWER GENERATION DEVICE CAPABLE OF ADJUSTING VOLTAGE AND ELECTRIC POWER**
Yasuo Horiuchi, Tokyo, and Hitoshi Kuninaka, Kanagawa, both of, Japan, assignors to NEC Corporation, Japan
Filed May 19, 1994, Ser. No. 245,966
Claims priority, application Japan, May 19, 1993, 5-139953
Int. Cl.[6] H01L *31/05*
U.S. Cl. 136—244 4 Claims




1. A solar photovoltaic power generation device for converting the sun's radiation into electric power, comprising:
first through n-th generation elements, where n represents a positive integer greater than unity, each element having positive and negative electrodes, said first through n-th generation elements being connected in parallel and having their polarity directed in the same direction;
connecting means having active and inactive states for connecting said first through said n-th generation elements in series in said active state;
control means connected to said connecting means for controlling said connecting means to place said connecting means into said active state;
a first group of diodes, each of said first group of diodes being connected in series to a positive electrode of one of said first through n-th generation elements; and
a second group of diodes, each of said second group of diodes being connected in series to a negative electrode of one of said first through n-th generation elements;
said connecting means having first through (n−1)th switch elements, each of said first through (n−1)-th switch elements being connected between said positive electrode of one of said first through said n-th generation elements and said negative electrode of the next one of said first through said n-th generation elements.

**5,500,053**
**COMPOSITION FOR AND METHOD OF MONITORING DRIED-IN-PLACE NON-CHROME POLYACRYLAMIDE BASED TREATMENTS FOR METALS**
Jiangbo Ouyang, Media, and William L. Harpel, Langhorne, both of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.
Division of Ser. No. 307,970, Sep. 16, 1994, Pat. No. 5,451,270, which is a continuation-in-part of Ser. No. 213,414, Mar. 15, 1994, Pat. No. 5,401,333. This application Jun. 16, 1995, Ser. No. 491,055
Int. Cl.[6] C23C *22/34*
U.S. Cl. 427—247 2 Claims

1. An aqueous solution for conversion coating a metal surface consisting essentially of from about 0.05% to 20% an anionic polyacrylamide copolymer, from about 0.05% to 20%. a surfactant and from about 0.1% to 10% ammonium hexafluorotitanate.

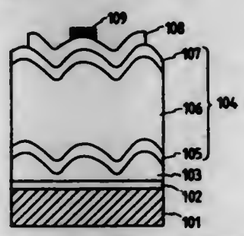



**5,500,054**
**SUPEREMISSIVE LIGHT PIPES AND PHOTOVOLTAIC SYSTEMS INCLUDING SAME**
Mark K. Goldstein, Del Mar, Calif., assignor to Quantum Group, Inc., San Diego, Calif.
Filed Jan. 10, 1995, Ser. No. 370,962
Int. Cl.[6] H01L *31/052*
U.S. Cl. 136—253 29 Claims




1. A superemissive light pipe comprising: an elongated photon transmitting host; means for reflecting photons from surface portions of the host and directing such photons toward end portions of the host;
a superemissive material for emitting photons, wherein the superemissive material is disposed interiorly of the. means for reflecting photons; and
means for thermally energizing the superemissive material to effect emission of photons.
7. The superemissive light pipe as recited in claim 1 wherein at least one end portion of the host is directed toward at least one photovoltaic cell positioned adjacent the end portion.

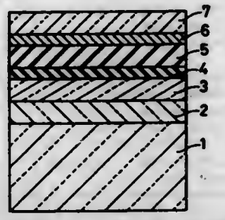
**5,500,055**
**PHOTOVOLTAIC DEVICE**
Noboru Toyama, and Katsumi Nakagawa, both of Nagahama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 13,109, Feb. 3, 1993, abandoned.
This application Nov. 16, 1994, Ser. No. 341,948
Claims priority, application Japan, Feb. 5, 1992, 4-020852
Int. Cl.[6] H01L *31/04;31/02*
U.S. Cl. 136—259 12 Claims




1. A photovoltaic device comprising a substrate; a metal layer with a smooth, flat surface formed on said substrate; a transparent conductive layer formed on said metal layer; and a photoelectric conversion layer formed on said transparent conductive layer; and a transparent electrode formed on said photoelectric conversion layer, wherein said transparent conductive layer has an irregular surface at the side opposite to said smooth, flat surface.

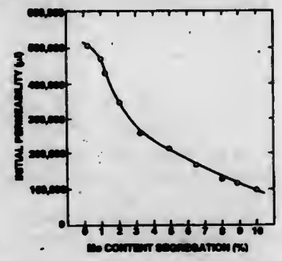


**5,500,056**
**SOLAR CELL CONTAINING LOW MELTING POINT GLASS LAYER**
Takahiro Wada, Katano; Mitsusuke Ikeda, Hirakata; Mikihiko Nishitani; Masaharu Terauchi, both of Nara; Takayuki Negami, Katano, and Naoki Kohara, Takatsuki, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jul. 18, 1994, Ser. No. 274,722
Claims priority, application Japan, Jul. 19, 1993, 5-177882
Int. Cl.[6] H01L *31/04;31/0203;31/0216*
U.S. Cl. 136—259 11 Claims



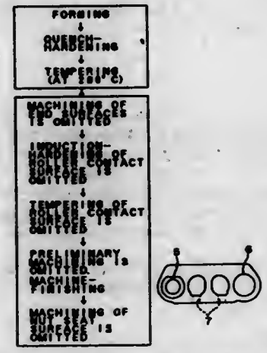

1. A solar cell comprising a compound semiconductor layer and at least one low melting point glass layer, wherein said compound semiconductor layer is a laminated film comprising a plurality of compound semiconductor layers, and wherein said at least one low melting point glass layer has a softening temperature lower than 500° C., and is formed on a soda-lime glass substrate, the compound semiconductor layers being laminated over the low melting point glass layer formed on said soda-lime glass substrate.

**5,500,057**
**NI-FE MAGNETIC ALLOY AND METHOD FOR PRODUCING THEREOF**
Tadashi Inoue; Kiyoshi Tsuru; Shinichi Okimoto; Naokazu Yamamura; Tetsuo Yamamoto, and Hirohisa Haiji, all of Kawasaki, Japan, assignors to NKK Corporation, Tokyo, Japan
Filed Oct. 1, 1993, Ser. No. 130,369
Claims priority, application Japan, Apr. 30, 1993, 5-128496
Int. Cl.[6] H01F *1/04*
U.S. Cl. 148—312 2 Claims




1. A magnetic Ni-Fe alloy having excellent magnetic permeability and excellent hot workability, said alloy consisting essentially of:
77 to 80 wt. % Ni, 3.5 to 5 wt. % Mo, 1.5 to 3 wt. % Cu, 0.1 to 1.1 wt. % Mn, 0.1 wt. % or less Cr, 0.003 wt. % or less S, 0.01 wt. % or less P, 0.005 wt. % or less O, 0.003 wt. % or less N,
0.02 wt. % or less C, 0.001 to 0.5 wt. % Al wt. % or less Si, a weight ratio Ca to S, ( Ca/S ) is 2.6 to 6, and the balance being Fe and inevitable impurities;
said alloy satisfying an equation of:
$3.2 \leq (2.02 \times [Ni] - 11.13 \times [Mo] - 1.25 \times [Cu] - 5.03 \times [Mn]) / (2.13 \times [Fe]) \leq 3.8$ where [Ni] is Ni content, [Mo] is Mo content, [Cu] is Cu content, [Mn] is Mn content, and [Fe] is Fe content; and said alloy having a Mo segregation ratio defined by the segregation equation satisfying 5% or less, the segregation equation being:
|(Mo content in a segregation region–Mo average content)/(Mo average content)|×100%;
said alloy has an initial magnetic permeability ($\mu_i$) of 200,000 or more; and wherein
said alloy is produced by
(a) heating an alloy ingot at 1200° to 1300° C. for 10 to 30 hours;
(b) slabbing the heated ingot at a finishing temperature of 950° C. or more to produce a slab;
(c) heating the slab at 1150° to 1270° C. for 1 to 5 hours; and
(d) hot rolling the heated slab at a finishing temperature of 950° C. or more to produce a hot rolled product.

**5,500,058**
**METHOD FOR PRODUCING A VEHICULAR ENDLESS TRACK LINK**
Tetsuro Hirakawa; Masayoshi Kaneko, and Katsumi Yoshida, all of Chigasaki, Japan, assignors to Topy Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 17, 1995, Ser. No. 390,741
Claims priority, application Japan, Aug. 16, 1994, 6-192417
Int. Cl.[6] C21D *8/00*
U.S. Cl. 148—649 17 Claims




1. A method for producing a vehicular endless track link comprising the steps of:
forging a link material of low-carbon boron steel at a temperature about 1200° C.;
quench-hardening said link material by rapidly cooling said link material from a temperature above about 760° C. so that a metallic crystal structure of said link material is converted to martensite; and
tempering said link material at a temperature of about 200° C.

**5,500,059**
**ANHYDROUS 5-AMINOTETRAZOLE GAS GENERANT COMPOSITIONS AND METHODS OF PREPARATION**
Gary K. Lund, Malad, Id., and Reed J. Blau, Richmond, Utah, assignors to Thiokol Corporation, Ogden, Utah
Continuation-in-part of Ser. No. 101,396, Aug. 2, 1993. This application May 9, 1995, Ser. No. 437,867
Int. Cl.[6] C06B *45/10*
U.S. Cl. 149—19.1 20 Claims

1. A gas generating composition comprising a fuel selected from the group consisting of anhydrous 5-aminotetrazole, anhydrous salts thereof, anhydrous complexes thereof, and mixtures thereof, and an oxidizer, said oxidizer being selected from the group consisting of metal oxides, metal hydroxides, metal nitrates, metal

nitrites, metal chlorates, metal perchlorates, metal peroxides, ammonium nitrate, ammonium perchlorate, and mixtures thereof.

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5,500,060
**ENERGETIC PLASTICIZED PROPELLANT**

Ronald B. Holt, Waltham Abbey, and John C. M. Phillips, Bishops Stortford, both of, England, assignors to Royal Ordnance plc, London, England

Continuation of Ser. No. 754,933, Sep. 3, 1991, abandoned, which is a continuation of Ser. No. 629,111, Dec. 19, 1990, abandoned, which is a continuation of Ser. No. 466,708, Dec. 28, 1989, abandoned, which is a continuation of Ser. No. 308,646, Jan. 5, 1989, abandoned, which is a continuation of Ser. No. 81,799, Jul. 6, 1987, abandoned. This application Mar. 29, 1993, Ser. No. 39,893

Claims priority, application United Kingdom, Jul. 4, 1986, 8616322

Int. Cl.[6] C06B *45/10*

U.S. Cl. 149—19.1 2 Claims

1. An energetic composition comprising the following components in the following relative properties:

Component A: from 5% to 25% by weight of a polymeric binder;

Component B: from 65% to 90% by weight of a highly energetic filler comprising at least one heteroalicyclic nitramine compound; and

Component C: from 1% to 15% by weight of a plasticiser which comprises two or more nitroaromatic compounds; the percentages by weight of Components A, B and C adding to 100%.

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5,500,061
**SILICON AS HIGH PERFORMANCE FUEL ADDITIVE FOR AMMONIUM NITRATE PROPELLANT FORMULATIONS**

Larry C. Warren, and Leo K. Asaoka, Stanley; Robert L., all of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 21, 1994, Ser. No. 215,748

Int. Cl.[6] C06B *45/10*

U.S. Cl. 149—19.4 1 Claim




INCREASES OF (ISP) OF AMMONIUM NITRATE PROPELLANTS WITH SILICON POWDER

1. An ammonium nitrate propellant composition selected from an ammonium nitrate propellant composition containing an inert polymer binder as defined under composition (A) hereinbelow or an ammonium nitrate propellant composition containing an energetic polymer binder as defined under composition (B) and composition (C) hereinbelow, said compositions (A), (B), and (C), consisting in weight percents of the ingredients with functions specified as follows:

| Composition A: | |
|---|---|
| Inert polymer binder, polyglycoladipate | 6.47 |
| Butanetriol trinitrate - plasticizer | 18.79 |
| Trimethylolethane trinitrate - plasticizer | 12.59 |
| Ammonium nitrate - oxidizer | 60.00-54.40 |
| N-methyl para nitroaniline - stabilizer | 0.50 |
| Hexamethylene diisocyanate - curing agent | 1.22, |
| Composition B: | |
| Energetic nitramine polymer binder | 8.00 |
| Butanediol trinitrate - plasticizer | 17.86 |
| Trimethylolethane trinitrate - plasticizer | 11.90 |
| Ammonium nitrate - oxidizer | 59.60-54.00 |
| N-methyl para nitroaniline - stabilizer | 0.50 |
| Triphenylbismuth - cure agent | 0.03 |
| Trisocyanate curing agent | 1.71, |
| and Composition C: | |
| Energetic glycidyl azide polymer binder | 8.00 |
| Butanetriol trinitrate - plasticizer | 18.42 |
| Trimethylolethane trinitrate - plasticizer | 12.28 |
| Ammonium nitrate - oxidizer | 59.60-54.00 |
| N-methyl para nitroaniline - stabilizer | 0.50 |
| hexamethylene diisocyanate - curing agent | 0.77 |
| Triphenylbismuth - cure catalyst | 0.30, |

said compositions (A), (B), and (C) additionally consisting of a silicon powder additive to achieve an improvement in propellant performance Isp, combustion temperature, and combustion efficiency, said silicon powder additive incorporated into said ammonium nitrate propellant composition during propellant mixing in an amount from about 0.40 to about 6.00 weight percent of said silicon powder having a particle size of less than 5 microns average particle size, said improvement based on comparisons of measured specific impulses, density specific impulse, propellant burn temperatures in (degK.), and percent transmittances as determined in signature analysis of exhaust plumes of said ammonium nitrate composition containing said silicon powder as compared with said ammonium nitrate composition containing carbon black additive but no silicon powder, said composition (A) having burn temperatures of 2593 degK. and 2790 degK. with the incorporation of said silicon powder in weight percent of 1 and 6 weight percent, respectively, as compared with 2553 degK. with 0% silicon powder, said composition (B) having burn temperatures of 2660 degK. and 2850 degK. with the incorporation of said silicon powder in weight percent of 1 and 6 weight percent, respectively, as compared with 2620 degK. with 0% silicon powder, and said composition (C) having burn temperatures of 2744 degK. and 2921 degK. with the incorporation of said silicon powder in weight percent of 1 and 6 weight percent, respectively, as compared with 2706 degK. with 0% silicon powder.

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5,500,062
**EMULSION EXPLOSIVE**

Arun K. Chattopadhyay, McMasterville, Canada, assignor to ICI Canada Inc., Ontario, Canada

Filed Aug. 20, 1992, Ser. No. 932,313

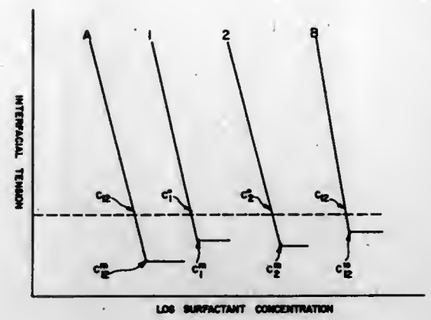
Claims priority, application United Kingdom, Aug. 30, 1991, 9118628

Int. Cl.[6] C06B *31/28;31/30*

U.S. Cl. 149—46 11 Claims

1. An emulsion explosive having a discontinuous oxidizer salt phase, a continuous oil phase, and an emulsifier for stabilization of the emulsion, wherein said emulsifier comprises a surfactant mixture of a branched chain hydrocarbon surfactant and a branched chain hydrocarbon co-surfactant, wherein said surfactant mixture has an interaction parameter (β) with a value of zero or less, said surfactant mixture being one wherein both the surfactant and co-surfactant comprise a poly[alk(en)yl] succinic anhydride based compound, the interfacial tension of said emulsion explosive being less than the interfacial tension of a similar emulsion explosive wherein one of said surfactant and said co-surfactant is lacking.






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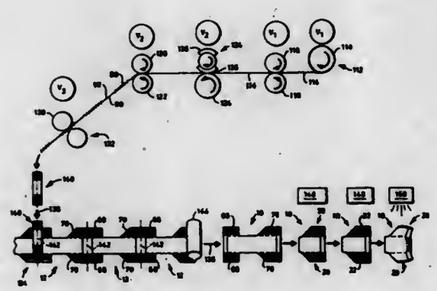
5,500,063
**METHOD OF JOINING AN ELASTIC BAND TO A CONTINUOUSLY MOVING PARTIALLY ELASTIC SUBSTRATE**

James L. Jessup, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jun. 28, 1994, Ser. No. 267,272

Int. Cl.[6] B32B *31/04*

U.S. Cl. 156—85 19 Claims



1. A method of joining a plurality of elastic bands to a continuously moving, partially elastic substrate, comprising the steps of:

continuously moving in a first direction a substrate including a plurality of non-elastic segments and a plurality of elastic segments that are extensible in a second direction different from the first direction,

providing a supply of an elastic band,

tensioning the elastic band.

temporarily inhibiting portions of the tensioned elastic band,

cutting the elastic band into individual elastic bands so that each individual elastic band includes at least one temporarily inhibited portion and at least one elastic portion,

sequentially orienting each individual elastic band so that it is extensible in substantially the same direction as the elastic segments of the continuously moving substrate,

positioning each individual elastic band over the continuously moving substrate so that each elastic portion of the band is over one of the elastic segments of the substrate, and each temporarily inhibited portion of the band is over one of the non-elastic segments of the substrate, and

joining each individual elastic band to the continuously moving substrate.

5,500,064
**METHOD FOR SEALING LEAKS**

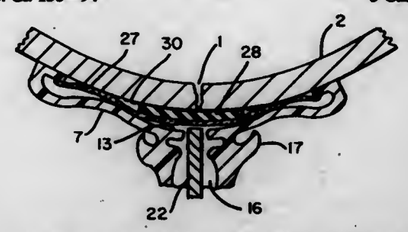
Rainer Schinabeck, Scituate, Mass., assignor to American Velodur Metal, Inc., Scituate, Mass.

Division of Ser. No. 158,695, Dec. 2, 1993, Pat. No. 5,423,932.

This application Jun. 5, 1995, Ser. No. 463,269

Int. Cl.[6] B32B *35/00*

U.S. Cl. 156—94 3 Claims




1. The method of sealing a leak in a fluid containing body comprising the steps of:

A. surrounding a patch with a deformable applicator so as to support one side of said patch within said applicator and expose an opposite side of said patch through an opening defined by an outer surface of said applicator;

B. placing said outer surface of said applicator against a surface of said body adjacent said leak;

C. applying force at an opposite end of said applicator so as to deform said outer surface of said applicator against said surface of said body in an area adjacent said leak;

D. applying sufficient additional force at said opposite end of said applicator to deform said applicator against said one side of said patch;

E. forcing said opposite side of said patch into contact with said area adjacent said leak;

F. molding said patch to conform to the shape of said area adjacent said leak;

G. holding said patch in contact with said area adjacent said leak for sufficient time for said patch to cure and seal said leak; and

H. removing the force at said opposite end of said applicator so as to remove said applicator from contact with said patch and allow said applicator to recover to its original shape while said patch remains in a shape conforming to said area of said body adjacent said leak.

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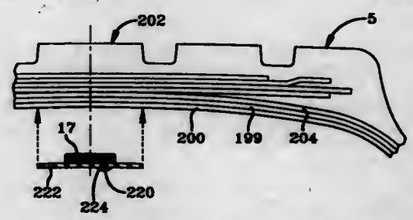
5,500,065
**METHOD FOR EMBEDDING A MONITORING DEVICE WITHIN A TIRE DURING MANUFACTURE**

Russell W. Koch, Hartville, Ohio; John L. Turner, Nashville, Tenn.; Guy J. Walenga, Mt. Juliet, Tenn.; Hiroyoshi Takigawa, Nashville, Tenn., and Keizo Okamoto, Murfreesboro, Tenn., assignors to Bridgestone/Firestone, Inc., Akron, Ohio

Filed Jun. 3, 1994, Ser. No. 253,885

Int. Cl.[6] B32B *1/08;* B29D *30/06;* B29C *70/72*

U.S. Cl. 156—123 6 Claims




1. A method for embedding a monitoring device having a pressure sensor within a tire during manufacture of the tire, comprising the steps of:

prior to curing the tire, placing the monitoring device having a dowel on a tie gum ply without having the monitoring device contact a body ply;
prior to curing the tire, assembling an inner liner ply over said monitoring device and over tie gum ply;
applying pressure to said inner liner ply so that said dowel presses through said inner liner ply;
curing the tire; and
removing said dowel so that an aperture extends through said inner liner ply to said pressure sensor of said monitoring device.

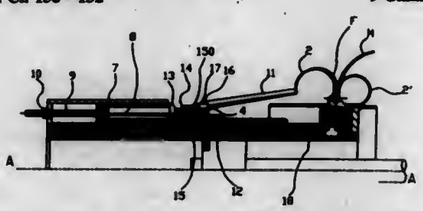
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**5,500,066**

## PROCESS FOR THE BUILDING OF TIRES USING A CLAMPED TURN-UP BLADDER

**Michel Remond, Riom, France, assignor to Compagnie Generale des Etablissements Michelin-Michelin & Cie, Clermont-Ferrand Cedex, France**

**Filed Jul. 29, 1994, Ser. No. 283,285**
**Claims priority, application France, Aug. 4, 1993, 93 09697**
**Int. Cl.[6] B29D *30/32***
**U.S. Cl. 156—132** **9 Claims**



1. A process for the building of a tire having reinforced beads on a shaping building drum having a pair of bead recesses and equipped at each of its ends with at least one bladder having a turn-up portion extending axially outwardly beyond a bead recess, the outer turn-up portion of the bladder being clamped in a circle concentric to the drum by clamping means, said process comprising placing on the drum across the bead recesses a quasi-cylindrical sleeve constituting the blank of a carcass including the bead reinforcements, radially expanding the portion of the sleeve located between the bead recesses while bringing the bead recesses closer together in order to impart a substantially toroidal shape to the portion of the sleeve between the bead recesses, inflating the turn-up portion of the bladder and imposing on said clamping means a combination of axial and radial movements to turn up the bladder and the portion of the sleeve axially to the outside of the bead recess to its placement position in the sidewall of the tire, the unclamped turn-up portion of the bladder between the bead recess and the clamping means forming an annular bulge which protrudes radially outwardly of the clamped portion of the bladder and having a circumference greater than the clamping circle for every axial position of the clamping means during the turn up process.

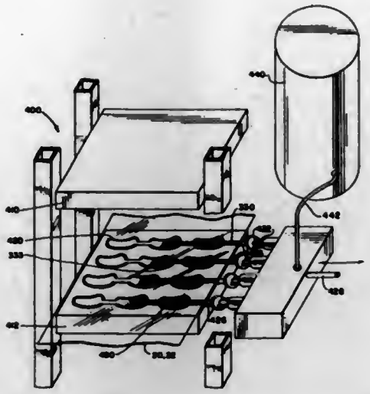
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**5,500,067**

## APPARATUS AND METHODS FOR FORMING, FILLING AND SEALING FLUID FILLED CAVITIES

**Brian D. Jenkner, 22318 Carmack, Marengo, Ill. 60150**

**Continuation-in-part of Ser. No. 769,618, Oct. 1, 1991, abandoned. This application Aug. 31, 1993, Ser. No. 114,561**
**Int. Cl.[5] B29C *51/10;65/14;* B32B *31/10***
**U.S. Cl. 156—146** **24 Claims**



18. A method of manufacturing an article having a filled cavity fabricated from simultaneously fed twin thermoplastic webs comprising the steps of:
simultaneously feeding the twin thermoplastic webs from two separate rolls of thermoplastic film into web engaging means, the web engaging means comprising take off rollers for metered delivery of the twin thermoplastic webs to a transport means and an upper and lower releasable clamp and an upper and lower engaging shoe,
the upper engaging shoe causing the upper releasable clamp to grasp a top one of the twin thermoplastic webs when in operative contact with the upper engaging shoe and the lower engaging shoe causing the lower releasable clamp to engage a bottom one of the twin thermoplastic webs when in operative contact with the lower engaging shoe;
heating the twin thermoplastic webs to a sufficient temperature for thermoforming and molding;
simultaneously vacuum molding the twin heated thermoplastic webs into a cavity;
substantially fusing the cavity about its periphery to create an injection port and an outlet port;
filling the cavity with a fluid;
sealing the injection and the outlet ports of the cavity, and
releasing the twin thermoplastic webs through disengaging means, the disengaging means including the upper and lower releasable clamp and an upper and lower disengaging shoe, the upper disengaging shoe causing the upper releasable clamp to release the top one of the twin thermoplastic webs when in operative contact with the upper disengaging shoe subsequent the step of sealing the injection and the outlet ports of the cavity and the lower disengaging shoe causing the lower releasable clamp to release the bottom one of the twin thermoplastic webs when in operative contact with the lower disengaging shoe subsequent the step of sealing the injection and the outlet ports of the cavity.

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**5,500,068**

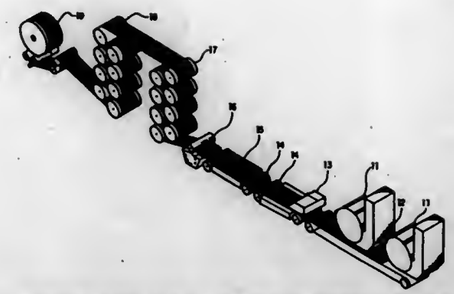
## ABSORBENT, FLUSHABLE, BIO-DEGRADABLE, MEDICALLY-SAFE NONWOVEN FABRIC WITH PVA BINDING FIBERS, AND PROCESS FOR MAKING THE SAME

**Ramesh Srinivasan, Billerica; James Bottomley, Andover, and W. Andrew Coslett, Medfield, all of Mass., assignors to International Paper Company, Purchase, N.Y.**

**Division of Ser. No. 200,597, Feb. 23, 1994. This application Jun. 5, 1995, Ser. No. 463,650**
**Int. Cl.[6] C09J *5/02***
**U.S. Cl. 156—148** **9 Claims**

1. A method for producing a nonwoven fabric comprising the steps of:
blending untreated, water-soluble PVA fibers with a matrix of absorbent fibers;
carding the blended fibers onto a moving web;
adding water to the web in an amount sufficient to soften the PVA fibers for binding to the absorbent fibers while maintaining sufficient web integrity;





heating the wetted web in a first stage of heating cylinders in a temperature range of about 40° C. to 80° C. to bind the PVA fibers to the other absorbent fibers;
then further heating the web in a second stage of heating cylinders in a temperature range of about 60° C. to 100° C. to complete the binding of the fibers and drying of the web.

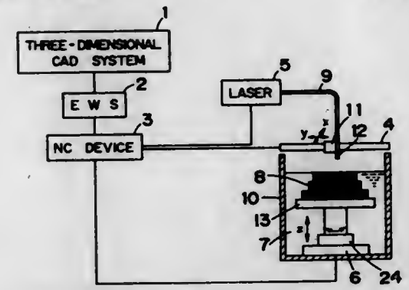
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**5,500,069**

## THREE DIMENSIONAL OBJECT-FORMING METHOD

**Yousuke Ogue, Amagasaki; Takahiro Kuyama, Yawata, and Kazuyuki Kaino, Hirakata, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Apr. 14, 1994, Ser. No. 227,330**
**Claims priority, application Japan, Apr. 14, 1993, 5-087043; Apr. 15, 1993, 5-088310**
**Int. Cl.[6] B32B *31/00***
**U.S. Cl. 264—401** **10 Claims**




1. A three-dimensional object-forming method for forming an object of a three-dimensional shape with photosetting resin, comprising the steps of:
representing the desired three-dimensional shape by a set of data related to sectional shapes of the three-dimensional shape cut at predetermined intervals of distance;
scanning laser light, from above a tank containing liquid of photosetting resin not yet hardened, outward around a predetermined point of each sectional shape in a manner to trace similar figures to an arbitrary shape, to thereby set a surface of a resin layer in a shape corresponding to one sectional shape;
sinking the set resin layer into the liquid of the photosetting resin not yet hardened by a distance of a cross section;
laminating a plurality of the set resin layers of the photosetting resin by repeating the scanning and sinking steps on the basis of the set of data; and
wherein the points between the adjacently-laminated resin layers are different from each other.

7. A three-dimensional object-forming method for forming an object of a three-dimensional shape with photosetting resin, comprising the steps of:
representing the desired three-dimensional shape by a set of data related to sectional shapes of the three-dimensional shape cut at predetermined intervals of distance;
scanning laser light, from above a tank containing liquid of photosetting resin not yet hardened, outward around a predetermined point of each sectional shape in a manner to trace similar figures to an arbitrary shape, to thereby set a surface of a resin layer in a shape corresponding to one sectional shape;
sinking the set resin layer into the liquid of the photosetting resin not yet hardened by a distance of a cross section;
laminating a plurality of the set resin layers of the photosetting resin by repeating the scanning and sinking steps on the basis of the set of data; and
wherein the point is the center of gravity of each sectional shape.

8. A three-dimensional object-forming method for forming an object of a three-dimensional shape with photosetting resin, comprising the steps of:
representing the desired three-dimensional shape by a set of data related to sectional shapes of the three-dimensional shape cut at predetermined intervals of distance;
scanning laser light, from above a tank containing liquid of photosetting resin not yet hardened, at predetermined intervals of distance and in parallel to a direction of each sectional shape, to thereby set a surface of a resin layer in a shape corresponding to one sectional shape;
sinking the set resin layer into the liquid of the photosetting resin not yet hardened by a distance of a cross section; and
laminating a plurality of the set resin layers of the photosetting resin by repeating the scanning and sinking steps on the basis of the set of data, while rotating the set resin layer or layers so that a subsequent scanning direction is different from a scanning direction of the last set resin layer.

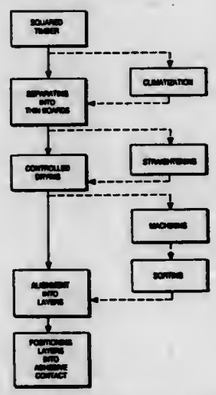
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**5,500,070**

## METHOD OF PREPARING A MULTILAYERED SOLID WOOD PANEL

**Josef Traben, and Siegmar Goenner, both of Oberkirch, Germany, assignors to Firma Gebruder Linck Maschinenfabrik "Gatterlinck" GmbH & Co. KG, Oberkirch, Germany**

**Continuation of Ser. No. 608,973, Nov. 1, 1990, Pat. No. 5,352,317. This application Sep. 27, 1994, Ser. No. 312,882**
**Claims priority, application Germany, Nov. 1, 1989, 39 36 312.0**
**Int. Cl.[6] B32B *31/18***
**U.S. Cl. 156—254** **26 Claims**




1. A method of producing a multilayered wood panel comprising the steps of:
a) separating a squared timber into a plurality of thin boards, wherein the squared timber is supported by a counterpressure element and is advanced against a blade at a velocity which is greater than the normal cracking velocity of the wood of the timber to provide a thin board having a knife side that was in contact with the blade and an opposite side that was in contact with the counterpressure element;

b) drying the thin boards;
c) aligning the thin boards into a layer of thin boards, wherein a longitudinal edge of a thin board is in contact with a longitudinal edge of an adjacent thin board, and wherein one surface of said layer includes the knife side of each thin board and the opposite surface of the layer includes the opposite side of each thin board; and
d) positioning a first layer of thin boards in adhesive contact with a second layer of thin boards to form a multilayered wood panel having external surfaces including the opposite sides of the thin boards.

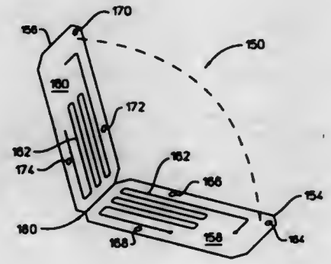
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**5,500,071**

**MINIATURIZED PLANAR COLUMNS IN NOVEL SUPPORT MEDIA FOR LIQUID PHASE ANALYSIS**

**Patrick Kaltenbach, Blachweier, Germany; Laurie Mittelstadt, Belmont, and Sally Swedberg, Los Altos, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed Oct. 19, 1994, Ser. No. 326,111**
**Int. Cl.[6] B32B *31/28***
**U.S. Cl. 156—272.8** **6 Claims**



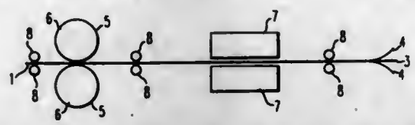

1. A method of forming a miniaturized column device comprising the steps of:
(a) providing a support body having first and second component halves, said support body halves having substantially planar interior surfaces;
(b) forming a compartment in said support body by: (i) laser ablating a first microchannel in the interior surface of said first support body half; (ii) laser ablating a second microchannel in the interior surface of said second support body half, said second microchannel so arranged as to provide the mirror image of said first microchannel; and (iii) aligning said interior surfaces of said support body halves in facing abutment with each other whereby said microchannels define an elongate bore;
(c) forming a plurality of ports in said support body, said ports enabling fluid communication between said compartment and associated external fluid containment means, wherein said step of forming said ports comprises laser ablating a plurality of apertures extending from at least one exterior surface of said support body and communicating with at least one microchannel, said apertures permitting the passage of fluid therethrough; and
(d) forming detection means in said support body by laser ablating apertures through said first and second component halves, said apertures communicating with said compartment.

**5,500,072**

**METHOD AND APPARATUS FOR RECYCLING METAL SHEET-THERMOPLASTIC RESIN LAMINATE COMPOSITES**

**Morio Fujimura; Hiroki Ban, and Janusz Doniewski, all of Virginia Beach, Va., assignors to Mitsubishi Chemical America, Inc., White Plains, N.Y.**

**Filed Oct. 17, 1994, Ser. No. 323,804**
**Int. Cl.[6] B32B *35/00***
**U.S. Cl. 156—344** **20 Claims**




1. A two-stage method for separating a metal sheet-thermoplastic resin laminate composite into separated metal sheet and thermoplastic resin, comprising:
(i) pressing a metal sheet-thermoplastic resin laminate composite having a metal surface between a first roller and a second roller, said first roller and said second roller forming a pair of opposing rollers, wherein said metal surface makes contact with said first roller and said first roller is an embossing roller having projecting pins, to obtain a metal sheet-thermoplastic resin laminate composite having a metal surface with impressions; and
(ii) thereafter heating said metal sheet-thermoplastic resin laminate composite having a metal surface with impressions at a temperature and for a time sufficient to separate said metal sheet and said thermoplastic resin.

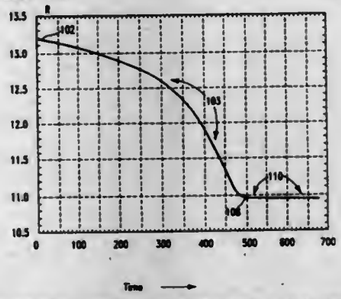
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**5,500,073**

**REAL TIME MEASUREMENT OF ETCH RATE DURING A CHEMICAL ETCHING PROCESS**

**Steven G. Barbee, Dover Plains; Tony F. Heinz, Chappaqua, both of N.Y.; Yiping Hsiao, San Jose, Calif.; Leping Li, Poughkeepsie; Eugene H. Ratzlaff, Hopewell Junction, both of N.Y., and Justin W. Wong, South Burlington, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Division of Ser. No. 269,862, Jun. 30, 1994. This application May 8, 1995, Ser. No. 435,059**
**Int. Cl.[6] H01L *21/00*; B44C *1/22***
**U.S. Cl. 156—345** **15 Claims**




1. A contactless real-time in-situ chemical etch monitor for providing an indication of a condition of an etching process during etching of at least one wafer in a wet chemical etchant bath, said monitor comprising:
a) two conductive electrodes;
b) a means for positioning said two conductive electrodes inside the wet chemical etchant bath proximate to but not in contact with the at least one wafer;
c) a means for monitoring an electrical characteristic between the two electrodes as a function of time in the etchant bath of the at least one wafer, wherein a change in the electrical characteristic is indicative of a state of the etching process; and
d) a means for recording a plurality of values of said electrical characteristic as a function of time during etching.



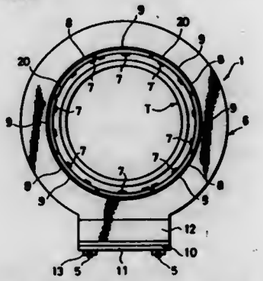
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**5,500,074**

**TREAD RING TRANSFERRING APPARATUS FOR USE IN A GREEN TIRE BUILDING SYSTEM**

**Kazuya Suzuki, Shirakawa, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan**

**Filed Jul. 1, 1994, Ser. No. 265,276**
**Claims priority, application Japan, Jul. 2, 1993, 5-190833**
**Int. Cl.[6] B29D *30/26***
**U.S. Cl. 156—406.2** **4 Claims**




1. A tread ring transferring apparatus for use in a green tire building system, comprising:
a holder frame in the form of a ring;
a plurality of holding segments carried by the holder frame and projecting from an inner surface of the holder frame, each holding segment being movable in radial directions of the holder frame and including (1) an arm member extending and being movable in radial directions of the holder frame, (2) a circumferentially extending supporting member attached on an inner end of the arm member and (3) at least one contact member attached on an inner surface of the supporting member, the contact members being attached at different locations on the inner surfaces of different ones of the supporting members to define different circumferential intervals between the contact members.

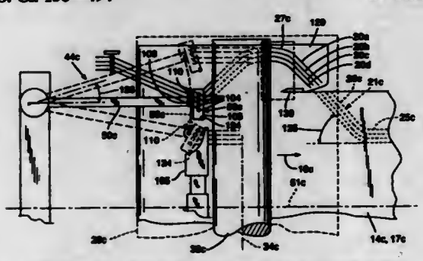
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**5,500,075**

**LEG ELASTIC APPLICATOR WHICH MAINTAINS THE SPACING BETWEEN THE ELASTICS SUBSTANTIALLY CONSTANT**

**Thomas R. Herrmann, Federal Way, Wash., assignor to Paragon Trade Brands, Inc., Federal Way, Wash.**

**Filed Apr. 26, 1994, Ser. No. 233,247**
**Int. Cl.[6] A61F *13/15*; B32B *31/08***
**U.S. Cl. 156—494** **28 Claims**




1. A machine for applying elastic to material, comprising:
a conveyor moving in one direction along a flow path and operable to carry material for garments;
an elastic band storage for providing a plurality of elongate elastic bands; and
an elastic feeder having a feeder head for feeding a plurality of elastic bands directly onto said material carried by the conveyor, the feeder head being movable laterally across the flow path such that the elastic bands are applied to material on the conveyor in a curved contour, the feeder head being operable to feed the elastic bands onto the material while maintaining a selected, substantially constant spacing between individual elastic bands throughout the curved contour.

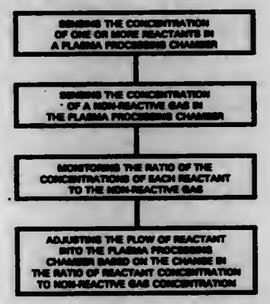
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**5,500,076**

**PROCESS FOR DYNAMIC CONTROL OF THE CONCENTRATION OF ONE OR MORE ETCHANTS IN A PLASMA-ENHANCED ETCH PROCESS FOR FORMATION OF PATTERNED LAYERS OF CONDUCTIVE MATERIAL ON INTEGRATED CIRCUIT STRUCTURES**

**Chris Jerbic, Cupertino, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.**

**Continuation of Ser. No. 80,896, Jun. 22, 1993. This application Sep. 16, 1994, Ser. No. 307,269**
**The portion of the term of this patent subsequent to Sep. 20, 2011, has been disclaimed.**
**Int. Cl.[6] H01L *21/00*; H05H *1/00*; G01N *21/00***
**U.S. Cl. 156—626.1** **10 Claims**




1. In a plasma etch process for etching various patterns of conductive material selected from the group consisting of metal and polysilicon on integrated circuit structures on a semiconductor substrate in a plasma etching chamber, wherein the amount of said conductive material to be removed will vary from substrate to substrate, depending upon the particular pattern of conductive material to be etched, resulting in the need for a change in flow rate of etchant gas into said etching chamber from substrate to substrate, to thereby control the concentration of said etchant gas in said etching chamber, the improvement which comprises:
a) loading into a plasma etch chamber a semiconductor substrate having an integrated circuit structure formed thereon including a layer of said conductive material having a mask thereon to define a desired pattern of said conductive material on said structure;
b) flowing into said plasma etch chamber a mixture of an etchant gas capable of plasma etching said conductive material and a non-reactive gas;
c) igniting a plasma in said chamber to plasma etch said masked layer of conductive material;
d) monitoring the respective optical emissions of said non-reactive gas and said conductive material etchant gas during said etch to determine the mount of said conductive material etchant gas being consumed by said conductive material; and
e) changing the flow of said conductive material etchant gas into said plasma etch chamber to match the amount of said conductive material etchant gas being consumed by the portions of said conductive material exposed by said mask;

whereby the concentration of said conductive material etchant gas in said chamber will remain constant during said etch regardless of the amount of conductive material being etched to provide the particular pattern of conductive material desired for the particular integrated circuit structure.

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**5,500,077**

**METHOD OF POLISHING/FLATTENING DIAMOND**

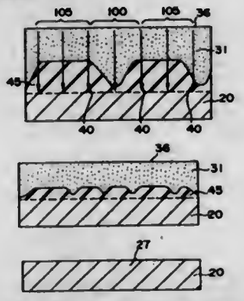
Yoshiki Nishibayashi, and Shinichi Shikata, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Japan

Filed Mar. 8, 1994, Ser. No. 208,169

Claims priority, application Japan, Mar. 10, 1993, 5-049198; May 28, 1993, 5-127230

Int. Cl.[6] B44C *1/22*

U.S. Cl. 156—628.1 17 Claims




1. A method of flattening diamond, comprising:

applying a fluid coating material comprising a material different from diamond onto a surface of diamond having unevenness to form a flat coating on the surface of diamond; and

removing the coating and the unevenness of the surface of diamond by dry etching under a condition such that both of the coating and the diamond can be etched, thereby to smooth the surface of the diamond.

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**5,500,078**

**8-BEAM BRIDGE-TYPE SILICON ACCELERATION SENSOR AND THE FABRICATING METHOD THEREOF**

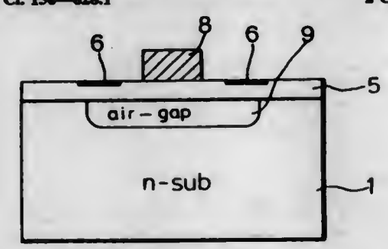
Jong H. Lee, Taegu, Rep. of Korea, assignor to Kyung Pook National University Sensor Technology Research Center, and Mando Machinery Corporation, both of, Rep. of Korea

Filed Dec. 23, 1994, Ser. No. 371,272

Claims priority, application Rep. of Korea, Dec. 24, 1993, 1993-29498

Int. Cl.[6] H01L *21/00*

U.S. Cl. 156—628.1 2 Claims




1. A method for fabricating a bridge-type silicon acceleration sensor having eight beams, the method comprising the steps of:

growing a silicon oxide layer on the top surface of the silicon substrate;

forming an $n^+$ diffusion region in the substrate by successively performing the process of opening a diffusion window in the silicon oxide layer, implanting $n^+$ impurities in the silicon substrate through the diffusion window, and evenly diffusing the $n^+$ impurities into the substrate;

removing the silicon oxide layer, and then growing an epitaxial layer thereon;

forming a plurality of piezo-resistors in the epitaxial layer by successively performing the process of growing an oxide layer on the epitaxial layer, implanting impurities, and then evenly diffusing the impurities;

removing the silicon oxide layer;

forming a porous silicon layer from the $n^+$-diffusion region by performing an anodic reaction in HF solution;

loading a mass on the epitaxial layer; and,

forming an air-gap in the substrate by etching the porous silicon layer.

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**5,500,079**

**DRY ETCHING METHOD**

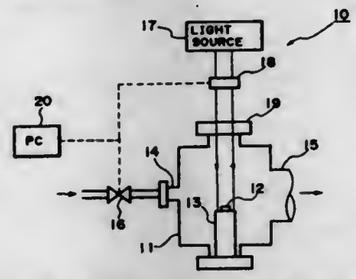
Jun-ichi Nishizawa, Sendai, and Kenji Yamamoto, Chiba, both of, Japan, assignors to Research Development Corporation of Japan, Japan

Continuation of Ser. No. 987,828, Dec. 9, 1992, abandoned. This application May 3, 1994, Ser. No. 237,417

Claims priority, application Japan, Dec. 10, 1991, 3-349647

Int. Cl.[6] H01L *21/00*

U.S. Cl. 156—643.1 5 Claims




1. A method of etching a GaAs monocrystalline material in a reaction chamber, said method comprising:

introducing a first Of two different kinds of reactive etching gases to a concentration into the reaction chamber for a first period of time, said reactive etching gases being of the types which have a crystal plane preference between at least one first coexisting different crystal plane and a second coexisting different crystal plane;

maintaining the monocrystalline material to be etched in a reaction chamber at a temperature at which no spontaneous etching occurs in said concentration of etching gas;

after said maintaining, evacuating said reaction chamber to remove reactive etching gas not adsorbed to said monocrystalline material for a second period of time sufficient to allow said reactive etching gas to be adsorbed on a surface of the crystal;

applying one of two different bands of light of appropriately selected wavelengths and intensities so that no temperature of said monocrystalline material increases beyond a level to said monocrystalline material for a third period of time to preferentially etch one of said crystal planes, said one crystal plane having surfaces A and B, of said monocrystalline material to a crystallographic orientation having a depth on the order of one of a molecular or atomic layer to form a side wall of crystal anisotropy having an intended crystal surface orientation, and wherein a first of said two different kinds of gases introduced in said introducing step etches said surface A of said GaAs substrate, a second of said two different kinds of gases etching said surface B;



repeating the above steps with a second of said two different kinds of reactive etching gases and applying the other of two different bands of light.

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**5,500,080**

**PROCESS OF FORMING CONTACT HOLES**

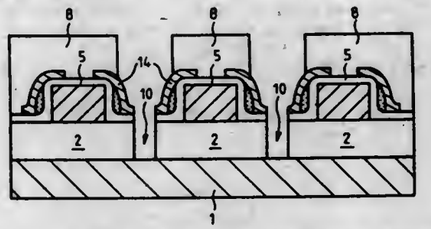
Yang K. Choi, Kyoungki-do, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Kyoungki-do, Rep. of Korea

Filed Jun. 22, 1994, Ser. No. 264,167

Claims priority, application Rep. of Korea, Jun. 22, 1993, 93-11362

Int. Cl.[6] H01L *21/00*

U.S. Cl. 156—644.1 3 Claims




1. A process for forming self-aligned contact holes in a semiconductor device, comprising the steps of:

forming a first insulating layer over a lower conduction layer, forming a conduction wiring over the first insulating layer and sequentially coating a second insulating layer and a conduction layer over the entire exposed upper surface of the resulting structure;

blanket dry etching the conduction layer, thereby forming conduction layer spacers respectively on side walls of the conduction wiring;

growing a selective metal layer over each of the conduction layer spacers such that the selective metal layer overlaps a constant width of both an upper surface portion of the conduction wiring and an upper surface portion of the first insulating layer; and

forming a third insulating layer over the entire exposed upper surface of the resulting structure, etching portions of the third insulating layer corresponding to contact regions by use of a contact mask, and selectively etching both the second insulating layer and the first insulating layer exposed the selective metal layer which is exposed upon etching the third insulating layer and is used as a barrier layer, thereby forming contact holes through which the first conduction layer is partially exposed.

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**5,500,081**

**DYNAMIC SEMICONDUCTOR WAFER PROCESSING USING HOMOGENEOUS CHEMICAL VAPORS**

Eric J. Bergman, 120 Midale, Kalispell, Mont. 59901

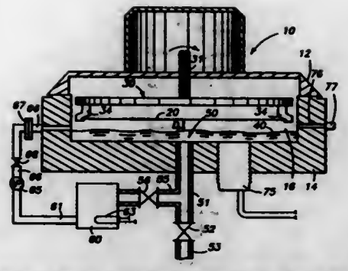
Continuation of Ser. No. 978,929, Nov. 18, 1992, Pat. No. 5,370,741, which is a continuation of Ser. No. 665,609, Mar. 6, 1991, abandoned, which is a continuation-in-part of Ser. No. 526,052, May 21, 1990, abandoned, which is a continuation-in-part of Ser. No. 524,239, May 15, 1990, abandoned, said Ser. No. 665,609is a continuation-in-part of Ser. No. 526,057, May 21, 1990, Pat. No. 5,238,500. This application Dec. 5, 1994, Ser. No. 349,691

Int. Cl.[6] H01L *21/00*

U.S. Cl. 156—646.1 27 Claims

1. A process for etching semiconductor wafers using hydrofluoric acid vapor, comprising:

containing a wafer within a substantially enclosed processing chamber;




providing a liquid etchant source within the substantially enclosed processing chamber; said liquid etchant source including at least hydrofluoric acid and water;

producing a substantially homogeneous vapor mixture from the liquid etchant source; said substantially homogeneous vapor mixture including at least hydrofluoric acid vapor and water vapor to provide a homogeneous etchant gas;

contacting the homogeneous etchant gas against at least one processed surface of the wafer which is to be etched;

rotating the wafer in juxtaposition to the liquid etchant source at a desired rotational speed;

enhancing circulation and transfer of homogeneous etchant gas from the liquid source to the at least one processed surface of the wafer surface by rotating a member within the processing chamber.

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**5,500,082**

**DEINKING OF XEROGRAPHIC PRINTED WASTEPAPER USING LONG CHAIN ALCOHOL**

Hou-Min Chang; Tien-Wang Wu, and John A. Heitmann, all of Raleigh, N.C., assignors to North Carolina State University, Raleigh, N.C.

Filed Apr. 26, 1993, Ser. No. 54,179

Int. Cl.[6] D21C *5/02*

U.S. Cl. 162—5 18 Claims

1. A method of removing ink from xerographically printed paper comprising:

(a) pulping said printed paper in an aqueous slurry, at a pH of about 7 or higher, to a consisteacy of about 8% or less;

(b) adding to said pulp slurry a sufficient amount of long chain alcohol, the long chain alcohol having a melting point above room temperature and being selected from the group consisting of 1-n-tetradecanol, 1-n-hexadecanol, 1-n-octadecanol, 1-n-$CH_3(CH_2)_{21}OH$, diphenylcarbinol, cinnamyl alcohol, and combinations thereof, for a time sufficient with heating at a temperature sufficient, whereby an agglomeration of long chain alcohol and ink particles is formed;

(c) stopping the heating whereby said agglomeration solidifies into particles that settle to the bottom of said pulp slurry; and

(d) removing said solidified agglomeration of particles from said pulp slurry, thereby leaving a remaining aqueous slurry of deinked paper fiber and water.

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**5,500,083**

**METHOD OF FEEDING CELLULOSIC MATERIAL TO A DIGESTER USING A CHIP BIN WITH ONE DIMENSIONAL CONVERGENCE AND SIDE RELIEF**

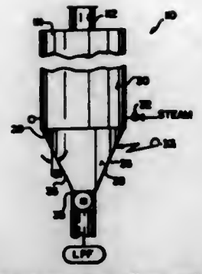
Jerry R. Johansson, San Luis Obispo, Calif., assignor to Kamyr, Inc., Glens Falls, N.Y.

Filed Feb. 1, 1994, Ser. No. 189,546

Int. Cl.[6] D21C *7/06*

U.S. Cl. 162—17 16 Claims

1. A method of feeding comminuted cellulosic material to a digester using a vertical open interior chip bin having a top and bottom, a maximum diameter of at least about twelve feet, and a



discharge operatively connected to a digester, the discharge having a cross-sectional area less than half of the cross-sectional area of the chip bin at the maximum diameter thereof, comprising the steps of:

(a) feeding the comminuted cellulosic material into the top of the chip bin, to flow downwardly in a column in the chip bin toward the bottom;

(b) causing the comminuted cellulosic material to move into a gradually restricting open flow path through a transition having one dimensional convergence and side relief in the open interior of the chip bin, the open interior of the chip bin having a cross-sectional area less than half of the area at the maximum diameter of the chip bin;

(c) without vibrating the chip bin or the chip bin discharge, causing a substantially uniform flow of the comminuted cellulosic material in the gradually restricting open flow path through said transition, substantially without bridging or hangups of the comminuted cellulosic material in the flow path through said transition;

(d) steaming the comminuted cellulosic material while in the chip bin; and

(e) discharging the comminuted cellulosic material from the chip bin discharge and feeding it to the digester.

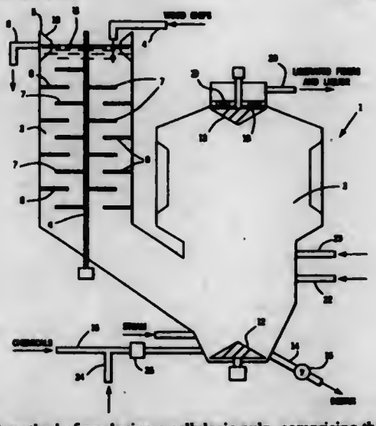
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**5,500,084**

**METHOD AND APPARATUS FOR PULPING CELLULOSIC MATERIAL USING A VESSEL WITH AN IMPERGNATION ZONE AND AN ATTRITION ZONE**

Roger P. Hoffman, Green Bay, Wis., assignor to Hoffman Environmental Systems, Inc., Green Bay, Wis.

Filed Sep. 21, 1994, Ser. No. 310,152
Int. Cl.[6] D21C *3/26*
U.S. Cl. 162—17 18 Claims



1. A method of producing a cellulosic pulp, comprising the steps of impregnating cellulosic particles containing binders and fibers with a cooking liquor to provide a mixture, continuously flowing the mixture through a cooking zone, maintaining the temperature of the mixture in said cooking zone below 125° C. and at a value sufficient to dissolve the binders in said particles and agitating the mixture to liberate cellulosic fibers from said particles, and continuously discharging said liberated fibers and said cooking liquor from said cooking zone while preventing discharge of said particles from said cooking zone to produce said cellulosic pulp.

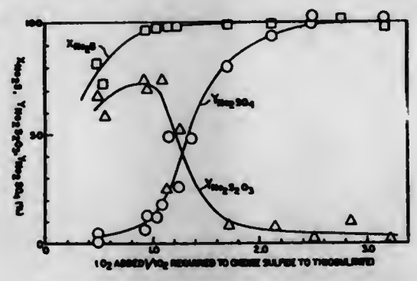
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**5,500,085**

**METHOD FOR PRODUCING FULLY OXIDIZED WHITE LIQUOR**

Vincent L. Magnotta, Wescosville; Varin Ayala, Catasauqua, and John F. Cirucci, Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation of Ser. No. 780,681, Oct. 18, 1991, Pat. No. 5,382,322. This application Nov. 4, 1994, Ser. No. 334,829
Int. Cl.[6] D21C *11/04*
U.S. Cl. 162—30.11 4 Claims



1. A method for producing fully oxidized white liquor from a white liquor feed stream sulfite, comprising the steps of:

(a) contacting a white liquor feed stream consisting essentially of water, sodium hydroxide, and sodium sulfide with an oxygen-rich gas stream in a reactor at a temperature between about 180° F. and about 380° F. utilizing an oxygen supply rate and residence time sufficient to convert at least 80% of said sodium sulfide into sodium sulfate so as to form a fully oxidized white liquor product; and

(b) withdrawing from said reactor said fully oxidized white liquor product;

wherein the oxygen in said oxygen-rich gas stream is supplied to said reactor at a rate between about 2.0 and about 2.6 times the stoichiometric amount required to convert at least 80% of said sodium sulfide into sodium thiosulfate.

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**5,500,086**

**METHOD FOR PRODUCING PULP FROM GREEN ALGAE**

Masayasu Sakai; Touru Sato; Masato Kaneko; Michio Hada, and Toshiaki Kinomoto, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 798,724, Nov. 29, 1991, abandoned. This application Apr. 30, 1993, Ser. No. 54,635
Claims priority, application Japan, Nov. 29, 1990, 2-331797; Nov. 29, 1990, 2-331801
Int. Cl.[6] D21C *9/153*
U.S. Cl. 162—65 8 Claims

1. A method of making a non-wood source of paper making pulp comprising the steps of:

(a) culturing a green alga from Closterium genus; said culture containing assimilable sources of carbon, nitrogen and inorganic substances;

(b) harvesting the alga from the culture;

(c) washing the alga with water; and

(d) drying the alga; and



(e) bleaching the alga to partially destroy the central wall of the body of the alga, to remove most of the internal substances from the body and to completely bleach the chlorophyll to form a paper pulp in the absence of a lignin removal process and a chemical treatment process;

said green alga containing cellulose as a component of a cell wall, containing substantially no lignin and having a long body, whose ratio of body length to body width is 10 to 200; using said pulp to form paper in a paper making process.

3. A method of making a non-wood source of paper making pulp comprising the steps of:

(a) culturing a green alga from Plurotaenium genus; said culture containing assimilable sources of carbon, nitrogen and inorganic substances;

(b) harvesting the alga from the culture;

(c) washing the alga with water; and

(d) drying the alga; and

(e) bleaching the alga to partially destroy the central wall of the body of the alga, to remove most of the internal substances from the body and to completely bleach the chlorophyll to form a paper pulp in the absence of a lignin removal process and a chemical treatment process;

said green alga containing cellulose as a component of a cell wall, containing substantially no lignin and having a long body, whose ratio of body length to body width is 10 to 200; using said pulp to form paper in a paper making process.

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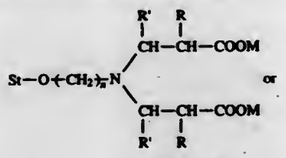
**5,500,087**

**PAPER PRODUCTS USING STARCHES MODIFIED WITH AMINO-MULTICARBOXYLATES**

Karen A. Bernard, Gaithersburg, Md.; John Tsai, Belle Mead, N.J.; Robert L. Billmers, Stockton, N.J., and Robert W. Sweger, Bound Brook, N.J., assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

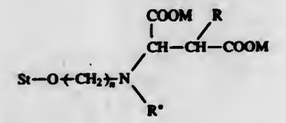
Division of Ser. No. 190,824, Feb. 2, 1994, Pat. No. 5,455,340. This application May 23, 1995, Ser. No. 447,462
Int. Cl.[6] D21H *13/00;15/00*
U.S. Cl. 162—164.6 13 Claims

1. In the method of making paper the improvement comprising adding, to the paper stock at any stage prior to forming a web, the starch ether derivative having the structure:



(I)

or



(Ia)

wherein

St-O represents a starch molecule,

R is H or $CH_3$;

R' is H, $CH_3$ or COOH;

M is a cation;

n is 2 or 3; and

R" is H or alkyl of 1 to 18 carbon atoms.

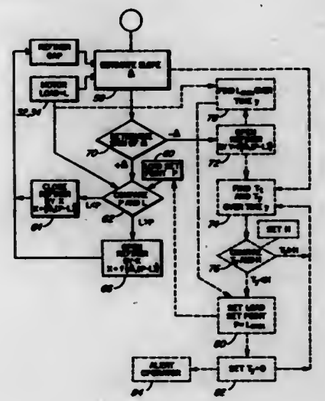
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**5,500,088**

**AUTOMATIC REFINER LOAD CONTROL**

Bruce J. Allison, Vancouver; Joe E. Ciaraiello, Coquitlam; Guy A. Dumont, Vancouver, and Patrick J. Tessier, North Vancouver, all of, Canada, assignors to MacMillan Bloedel Limited, and The University of British Columbia, both of Vancouver, Canada

Continuation of Ser. No. 111,526, Aug. 25, 1993, abandoned. This application Mar. 14, 1995, Ser. No. 405,613
Int. Cl.[6] D02C *25/00;7/14*
U.S. Cl. 162—198 4 Claims



1. A method for adjusting a selected motor load setpoint of a pulp refiner control for a pulp refiner having a pair of plates defining a plate gap therebetween comprising monitoring said motor load, monitoring the width of said plate gap, estimating the slope $\hat{m}$ of a curve of motor load versus plate gap, determining when said slope of said curve changes sign indicating that the motor load has traversed a peak into an unstable operating zone for the refiner, continuously determining totals ($T_y$) of discrete values ($T_i$) obtained over selected periods of historical time (y), each of said discrete values ($T_i$) being a value produced as a result of said motor load being in said unstable operating zone, determining said values $T_y$ based on

$$T_y = \sum_{i=0}^{y-1} T_{i-1} \quad (1)$$

where $T_i$ is based on one of

a) the sign of $\hat{m}_i$ where $\hat{m}_i$ is negative, or

b) the value of $\hat{m}_i$ where $\hat{m}_i$ is negative, or

c) $T_i = \frac{\hat{m}_i}{\sigma_i}$ (2)

where

$\hat{m}_i$ is negative

$\sigma_i$=standard deviation of $\hat{m}_i$,

y=a selected number,

sensing said motor load over each said period of historical time (y) and the maximum motor load $L_{max}$ over each said period of historical time (y) is determined, comparing said total ($T_y$) with a preselected threshold value (H), and changing said selected motor load setpoint to a new lower motor load setpoint when $T_y$ crosses said selected threshold value H and operating said control to achieve said new lower motor load setpoint.

**5,500,089**

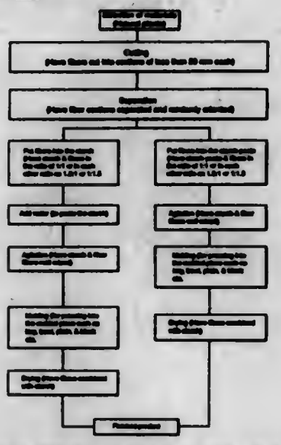
## METHOD FOR MAKING DISPOSABLE BOWLS AND TRAYS

**Frank Huang, 5/F-4, No. 12, Lane 147, Sec 2, Chung-Yi Load, Taipei City, and Chyi-Ying Wu, No. 71, Piao-Fu Load, Mei-Feng Town, Mei-Lino Hsiang, Yunlin County, both of, Taiwan**

**Continuation-in-part of Ser. No. 80,779, Jun. 24, 1993, abandoned. This application Jun. 29, 1994, Ser. No. 267,533**

**Int. Cl.[6] D21J *1/04;3/10***

**U.S. Cl. 162—226** **6 Claims**



1. A method of making a container for food which comprises:
selecting natural herbaceous plants rich in fibers;
compressing the natural herbaceous plants;
cutting the compressed plants into fiber sections;
drying the fiber sections;
adding the dried fiber sections to a container of starch paste containing water;
mixing the dried fiber sections and starch paste to form mixed fiber and starch;
passing a shaping means comprised of a screen containing fine apertures through the container of the mixed fiber and starch to scoop the mixed fiber and starch onto the screen;
draining the water from the mixed fiber and starch through the fine apertures;
placing the shaping means with the mixed fiber and starch in a mold device comprising an upper mold member and a lower mold member;
compressing the mixed fiber and starch between the upper and lower mold members to form the food container;
separating the upper and lower mold members; and
retrieving the food container from the mold device.

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**5,500,090**

## METHOD AND APPARATUS FOR GUIDING A FABRIC IN A PAPER MACHINE

**Jukka Autio, Jyväskylä , Finland, assignor to Valmet Paper Machinery, Inc., Helsinki, Finland**

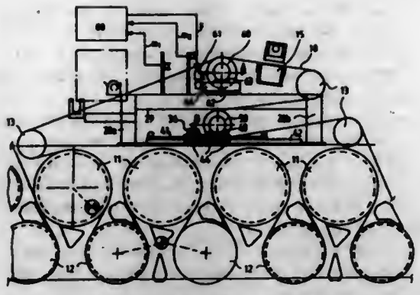
**Filed Jan. 27, 1994, Ser. No. 189,114**

**Claims priority, application Finland, Jan. 29, 1993, 930399**

**Int. Cl.[6] D21F *7/00***

**U.S. Cl. 162—273** **19 Claims**

1. Apparatus for transversely positioning a fabric in a paper machine having a frame part, comprising
an alignment roll for aligning a fabric to a desired transverse position,
bearing supports coupled to said alignment roll for supporting axial ends of said alignment roll on the frame part of the paper machine, and



means coupled to said alignment roll and the frame part for regulating the axial alignment of said alignment roll,
the axial regulating means comprising
a sledge arranged in connection with at least one of said bearing supports,
linear guide means for guiding movement of said sledge in a substantially linear direction, said linear guide means comprising linear guide rails coupled to the frame part and linear ball bearing units arranged in connection with each of said linear guide rails,
an actuator motor, and
a self-holding power transmission arrangement operated by said actuator motor for moving said sledge guided along said linear guide rails of said linear guide means.

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**5,500,091**

## TWIN-WIRE FORMER

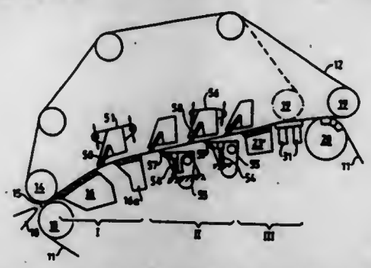
**Rudolf Böck; Dieter Eglhof; Klaus Heusler, all of Heidenheim, Germany; Werner Kade, Neenah, Wis.; Albrecht Meinecke, Heidenheim, Germany; Wilhelm Wenke, Heidenheim, Germany, and Hans-Jürgen Wulz, Heidenheim, Germany, assignors to J. M. Voith GmbH, Germany**

**Continuation of Ser. No. 55,918, Apr. 29, 1993, Pat. No. 5,389,206, which is a continuation of Ser. No. 773,965, Nov. 12, 1991, abandoned. This application Aug. 8, 1994, Ser. No. 286,948**

**Claims priority, application Germany, Aug. 22, 1989, 39 27 597.3**

**Int. Cl.[6] D21F *1/00***

**U.S. Cl. 162—301** **2 Claims**



1. A twin-wire former for the production of a paper web from a fiber suspension, the twin wire former comprising:
first and second web forming wire belts, means for directing the wire belts to travel along a path together for forming a twin wire zone of the twin wire former, with the web between the wire belts as the wire belts travel along the path through the twin wire zone, neither wire belt defining a single wire predrainage zone;
each wire belt forming an endless loop;
the twin wire zone having a first section at the start of the path through the twin wire zone, means for supporting the belts for forming a wedge shaped entrance slot into the first section, a



fiber suspension supplying headbox having an outlet placed and directed for delivering fiber suspension from the headbox to the wedge shaped entrance slot of the first section of the twin wire zone; a curved drainage element in the first section, the curved drainage element having an open surface to enable drainage of water from the fiber suspension and being curved along the path of the belts through the twin wire zone, the curved drainage element being engaged by one of the wire belts, for curving the path of the belts around the curved drainage element after the entrance of the suspension into the entrance slot;
the twin wire zone having a second section following the first section along the path of the belts through the twin wire zone; in the second section, a plurality of first drainage strips are positioned within the loop of the first wire belt and are for contacting the first wire belt; in the second section, a plurality of second drainage strips are positioned within the loop of the second wire belt and are for contacting the second wire belt; the first strips being shifted in position along the path of the wire belts with respect to the second strips so that the first and second strips are offset and in a non-opposing relationship; first support means for resiliently supporting the first drainage strips against the respective wire belt that strip contacts;
second support means supporting the second drainage strips rigidly against the second wire belt;
the first drainage strips being located within the same wire belt loop as the curved drainage element and the second drainage strips being located within the other wire belt loop; the first one of the second drainage strips being located upstream of the first one of the first drainage strips and the last one of the second drainage strips being located downstream of the last one of the first drainage strips;
means for supplying a vacuum in the area of the second drainage strips;
the twin wire zone having a third section following the second section along the path of the wire belts through the twin wire zone; a drainage element in the third section, for being engaged by one of the wire belts as the wire belts travel over the drainage element, the drainage element having an open surface to enable water to be drained through the wire belt in contact therewith; and
the twin wire zone being free of rolls which deflect the twin wire zone.

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**5,500,092**

## PRESS UNIT OF A PAPER MACHINE FOR THE MANUFACTURE OF TISSUE PAPER

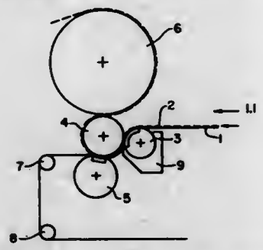
**Christian Schiel, Heidenheim, Germany, assignor to J. M. Voith GmbH, Heidenheim, Germany**

**Filed May 24, 1994, Ser. No. 248,034**

**Claims priority, application Germany, May 29, 1993, 43 18 036.1**

**Int. Cl.[6] D21F *11/14;3/02;5/02***

**U.S. Cl. 162—358.3** **1 Claim**



1. A press system for a paper machine used in the production of a fiber web, comprising:
a crepe drying cylinder
a first press roll having a smooth surface;
an extended shoe press unit;
a second press roll configured as one of a suction roll or a grooved roll;
a felt adapted to run together with the fiber web, said felt disposed adjacent to at least a portion of a periphery of said first press roll, said extended shoe press and said second press roll to receive water therefrom; and
a water collection tub operatively associated with said second press roll;
said first press roll and said second press roll defining a first press gap therebetween;
said first press roll and said extended shoe press defining a second press gap therebetween;
said first press roll and said crepe drying cylinder defining a third press gap therebetween;
said felt extending through said first and second press gaps but not extending through said third press gap.

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**5,500,093**

## OIL PURIFICATION

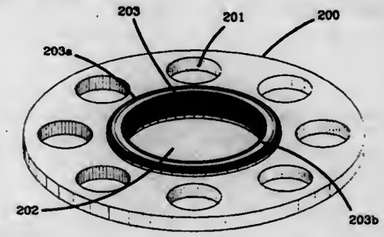
**Alan Marsden, 272 NW. 79th Ter., Margate, Fla. 33063**

**PCT No. PCT/US93/04533, § 371 Date Aug. 9, 1993, § 102(e) Date Aug. 9, 1993, PCT Pub. No. WO93/23507, PCT Pub. Date Nov. 25, 1993**

**Continuation-in-part of Ser. No. 11,954, Feb. 1, 1993, abandoned, which is a continuation-in-part of Ser. No. 954,573, Sep. 30, 1992, abandoned, which is a continuation-in-part of Ser. No. 882,676, May 14, 1992, abandoned. This PCT application May 10, 1993, Ser. No. 98,360**

**Int. Cl.[6] C10G *19/073***

**U.S. Cl. 196—46** **4 Claims**




1. A device for removing acidic impurities from an oil, comprising:
a solid body made of an acid-reactive material for contacting said oil, wherein said body includes a central opening;
a layer of copper or copper alloy in contact with an inner peripheral surface of said central opening;
a coupling ring formed of a high temperature resistant plastic material, said coupling ring having an exterior peripheral surface in contact with an inner peripheral surface of said layer of copper and a central opening for connection to a pipe or rod;
whereby acid impurities in the oil react with said acid-reactive material to form particulate materials that can removed by an oil filter.

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**5,500,094**

## COKE DRUM DEHEADING DEVICE

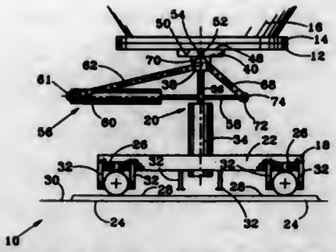
**Joseph Fruchtbaum; Dave P. McCoumby; Daniel J. Quintana, all of Houston, and Harold D. Sloan, Tomball, all of Tex., assignors to The M. W. Kellogg Company, Houston, Tex.**

**Filed Jun. 30, 1994, Ser. No. 268,754**

**Int. Cl.[6] C10B *33/00;43/00***

**U.S. Cl. 202—241** **12 Claims**

1. An unheading device for removing a bottom head from a flange on a lower end of a coke drum, comprising:



a car horizontally movable into and from position below the bottom head;
a vertically adjustable bottom head support member mounted on the car; a bearing plate pivotably mounted at an upper end of the
support member for engaging a lower surface of the bottom head;
a retractable arm having first and second sections hingedly connected at one end and having respective opposite ends secured to the bearing plate and the support member for pivoting the bearing plate and bottom head supported thereon with respect to horizontal;
a plurality of spring-biased wheels for rollably supporting the car on a surface;
a plurality of lugs for engaging a bearing surface for supporting the car thereon to avoid overloading the wheels when the car descends in reaction to a load on the car;
a car-mounted chute operative with the support member, bearing plate, retractable arm and bottom head to receive and direct material falling through the flange from the coke drum to an opening in a floor below the coke drum.

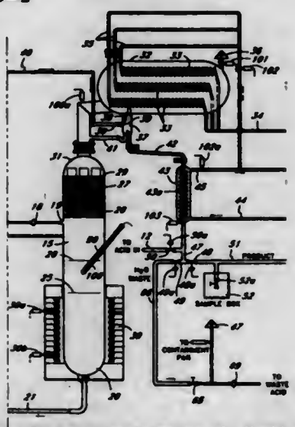
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**5,500,095**

## HIGH EFFICIENCY CHEMICAL PROCESSING

Robert T. Shimagawa, Encinitas; Susan M. Jordan, Danville, and Christopher S. Blatt, La Costa, all of Calif., assignors to Athena Corporation, Oceanside, Calif.

Filed Apr. 8, 1994, Ser. No. 224,956
Int. Cl.[6] B01D *3/42*; C01B *17/90*
U.S. Cl. 203—2 6 Claims



1. A method for batchwise distillation of a liquid product contaminated with a liquid contaminant, comprising the steps of:
directing said contaminated product into a distillation apparatus, said apparatus having only a single distillation column, wherein said product is a mineral acid;
heating the contaminated product in said distillation apparatus; monitoring the temperature and optionally the pressure in the distillation column;
first condensing liquid contaminant from vapor exiting the top of the column, and directing increasing amounts of condensate into the column as reflux as the temperature and/or pressure in the column increases, thereby maintaining the composition of the condensate as primarily the liquid contaminant;
then decreasing the amount of condensate returned as reflux when the temperature and/or pressure in the column indicates that the composition of the liquid in the column has reached a desired value, thereby indicating that a desired amount of contaminant has been removed, thus shifting from contaminant removal to product collection; and then
collecting condensed product.

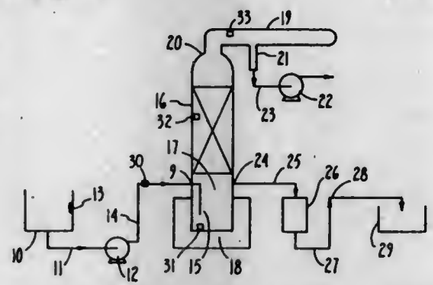
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**5,500,096**

## METHOD OF CONCENTRATING LESS VOLATILE LIQUIDS

Wallace I. Yuan, Irvine, Calif., assignor to Alliance Pharmaceutical Corp., San Diego, Calif.

Division of Ser. No. 22,995, Feb. 26, 1993, Pat. No. 5,443,695.
This application Jun. 7, 1995, Ser. No. 478,193
Int. Cl.[6] B01D *3/16*
U.S. Cl. 203—3 10 Claims



1. A method for removing a liquid contaminant from a chemical compound, wherein the chemical compound is less volatile than the contaminant, comprising the steps of:
providing a feedstock of said contaminated compound having a known concentration of the contaminant;
providing a distillation apparatus having a top, a bottom, and a container at the bottom;
introducing said feedstock into said distillation apparatus between the top and bottom at a constant rate, such that the feedstock collects in said container;
applying heat to said container at a constant rate to vaporize said contaminant;
maintaining a constant reflux ratio by removing the vaporized contaminant at a constant rate so as to maintain a constant reflux ratio within said distillation apparatus; and
removing the chemical compound from which said contaminant has been removed at a constant rate from said container.

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**5,500,097**

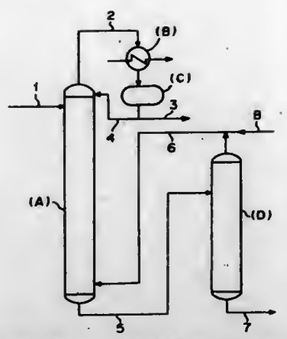
## METHOD FOR REMOVING ORGANIC COMPOUND IN WATER

Shinji Yamamoto; Kazutoshi Itoyama, and Seiichi Fujimaki, all of Kurashiki, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Filed Dec. 28, 1994, Ser. No. 364,996
Claims priority, application Japan, Dec. 28, 1993, 5-349467
Int. Cl.[6] B01D *3/06*; C02F *1/06*
U.S. Cl. 203—11 9 Claims

1. A method for purifying water by removing an organic compound therefrom, which comprises:





(i) introducing water containing an organic compound having a boiling point of from 40° C. to 100° C. or having an azeotropic boiling with water of from 40° C. to 100° C. dissolved in said water or forming a liquid phase with said water into a first distillation column, distilling the organic compound and water ont of the top of said first distillation column and to obtain a first bottom liquor containing said organic compound in a lower amount than present in said water introduced into said first distillation column from the bottom of said first distillation column, and
(ii) introducing said first bottom liquor of said first distillation column into a second distillation column operated at a pressure lower than that in the first distillation column, distilling a vapor overhead containing a larger amount of the organic compound than present in said first bottom liquor out of the top of said second distillation column and to obtain a second bottom liquor containing the organic compound in a lower amount than present in said first bottom liquor introduced into said second distillation column.

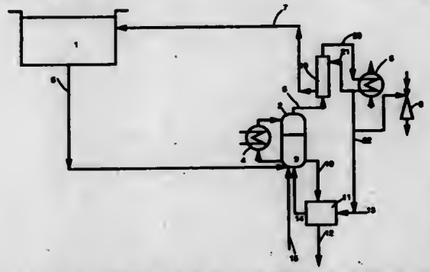
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**5,500,098**

## PROCESS FOR REGENERATION OF VOLATILE ACIDS

Craig J. Brown, Pickering, and Michael A. Sheedy, North York, both of, Canada, assignors to Eco-Tec Limited, Pickering, Canada

Filed Aug. 5, 1993, Ser. No. 102,367
Int. Cl.[6] B01D *1/28;3/34*
U.S. Cl. 203—13 15 Claims



1. A process for regeneration of a volatile acid containing metal salt impurities, comprising the-steps of:
(a) mixing said volatile acid with sulfuric acid to form an acidsmixture;
(b) concentrating the acid mixture in an evaporator to produce a concentrated acid mixture and and acid vapor;
(c) condensing said acid vapor resulting from step (b) to produce a volatile acid solution, and collecting said solution;
(d) feeding the concentrated acid mixture from step (b) to an acid sorption unit in which acid is sorbed from said mixture and metal impurities in the mixture are rejected in a deacidified by-product solution;
(e) eluting acid sorbed in said acid sorption unit with water; and,
(f) recycling acid eluted from said sorption unit back to said evaporator.

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**5,500,099**

## PROCESS FOR THE ELECTROCHEMICAL OXIDATION OF ARYLKETONES

Ricardo E. Borjas, Corpus Christi, Tex.; Carina Arnaiz-McAdams, Wilmington, N.C.; Steven R. Alexander; George A. Blay, both of Corpus Christi, Tex., and Yaw-Hwa Liu, Sugarland, Tex., assignors to Hoechst Celanese Corporation, Summerville, N.J.

Filed May 9, 1995, Ser. No. 437,595
Int. Cl.[6] C25B *3/02*
U.S. Cl. 205—449 22 Claims

1. A process for preparing arylglyoxals which comprises the steps of (a) electrochemically oxidizing an arylketone in a non-aqueous solvent at a pH of less than about seven and at a temperature of from about −20° C. to about 120° C. in the presance of an electrolyte for a sufficient period of time to form an arylacetal, and (b) subjecting said acetal to hydrolysis for a sufficient period of time and under suitable temperature and pressure conditions to form said arylglyoxal.

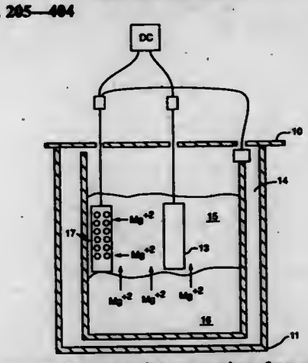
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**5,500,100**

## METHOD FOR REMOVING MAGNESIUM FROM ALUMINUM-MAGNESIUM ALLOYS WITH ENGINEERED SCAVENGER COMPOUND

William D. Riley, Albany, and Bing W. Jong, Corvallis, both of Oreg., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Oct. 3, 1994, Ser. No. 317,850
Int. Cl.[6] C25C *3/04*
U.S. Cl. 205—404 9 Claims



1. A process for recovering magnesium from an aluminum-magnesium (Al—Mg) alloy using a multiple electrode cell comprising a crucible containing a molten salt bath disposed therein, an electrode basket, and a stainless steel electrode disposed within said molten salt bath, and a heating furnace surrounding said multiple electrode cell, said process comprising:
a) placing an engineered scavenger compound in said electrode basket;
b) placing said Al—Mg alloy into said crucible under said molten salt bath;
c) adjusting the temperature of said heating furnace to a temperature below or at the melting point of said Al—Mg alloy;
d) immersing said electrode basket containing said engineered scavenger compound into said molten salt bath and making an electrical connection between said crucible and said electrode basket until said engineered scavenger compound is charged with Mg to a point to cause cessation of flow of voltage and current; and

e) making an electrical connection between said basket electrode containing said engineered scavenger compound and Mg and said stainless steel rod electrode disposed within said molten salt bath, and applying current, through a DC voltage to cause captured Mg to leave said engineered scavenger compound and become electrodeposited on said stainless steel rod.

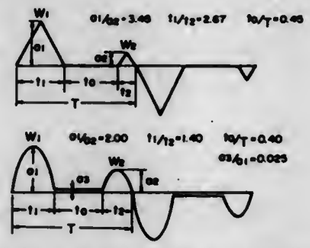
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**5,500,101**

## METHOD OF ETCHING ALUMINUM FOIL FOR ELECTROLYTIC CAPACITOR

**Yoshio Yoneyama, Yamanashi, Japan, assignor to Nihon Chikudenki Kegyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Dec. 9, 1994, Ser. No. 353,424**
**Claims priority, application Japan, Dec. 28, 1993, 5-348929**
**Int. Cl.[6] C25F *3/04***
**U.S. Cl. 205—646** **8 Claims**




1. In a method of eaching aluminum foil for electrolytic capacitors by applying alternating current to the aluminum foil in an electrolytic solution containing chloride ions, the improvement comprising the steps of:

forming two half waves during the positive side half period and the negative side half period of said alternating current with at least one of the waveforms, the amplitudes and the applied times of the two half waves being the same in which the two half waves during the half period of said alternating current are any of sine waves, triangular waves, trapezoidal waves, square waves, or distorted waves and a ratio of the amplitude of the first half wave to the amplitude of the second half wave is in the range of 0.4 to 4.0, and

forming a rest period between the half waves during the positive side half period and the negative side half period of said alternating current with an amplitude thereof being less than or equal to a microcurrent being applied at at most 1/15 of a maximum amplitude of the respective half wave during a half period.

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**5,500,102**

## METHOD OF FORMING DEPOSITED SEMICONDUCTOR FILM

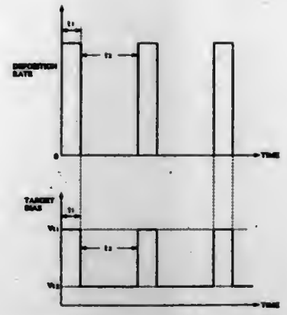
**Takeshi Ichikawa, Tokyo; Hitoshi Shindo, Isehara, and Kazuaki Ohmi, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed May 9, 1994, Ser. No. 239,570**
**Claims priority, application Japan, May 10, 1993, 5-131066**
**Int. Cl.[6] C23C *14/34***
**U.S. Cl. 204—192.25** **4 Claims**

1. A method of forming a deposited semiconductor film on a substrate comprising the steps of:

(a) reactively sputtering an amorphous semiconductor film on said substrate employing (i) a target containing semiconductor material to be deposited, (ii) an inert gas containing at least 0.1 atomic % hydrogen, and (iii) a high frequency sputtering discharge of at least 50 MHz;

(b) irradiating the surface of said amorphous semiconductor film with plasma in an atmosphere containing hydrogen; and




(c) alternately repeating said steps (a) and (b) by changing target bias voltage; wherein said amorphous semiconductor film contains, as a main component, said semiconductor material and said amorphous semiconductor film is no greater than 10 nm in thickness.

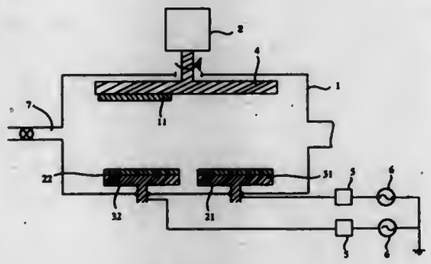
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**5,500,103**

## METHOD FOR PREPARING THIN FILM ELECTRO-LUMINESCENCE ELEMENT

**Hisato Katou, Yokosuka; Tomoyuki Kawashima, Yokohama; Harutaka Taniguchi; Shin'ichi Nakanata, both of Yokosuka, and Kazuyoshi Shibata, Yokohama, all of, Japan, assignors to Fuji Electric Co., Ltd., Japan**

**Continuation of Ser. No. 161,490, Dec. 6, 1993, abandoned.**
**This application May 30, 1995, Ser. No. 452,729**
**Claims priority, application Japan, Dec. 7, 1992, 4-325864**
**Int. Cl.[6] C23C *14/34***
**U.S. Cl. 204—192.26** **10 Claims**




1. A method for preparing a thin-film EL element comprising:

placing a substrate within a reactive chamber;

supplying a sputtering gas mixture at a pressure of about 5 to 20 mTorr to the reactive chamber, said sputtering gas mixture including about 25 to 50 percent by volume hydrogen sulfide and an inactive gas;

heating the substrate to a temperature of about 350°–500° C. and

applying RF power to a sputtering target at a power density of about 2 to 5 W/cm$^2$, said target being located in the reactive chamber to form a light emitting layer comprising zinc sulfide and a doping material on the substrate.

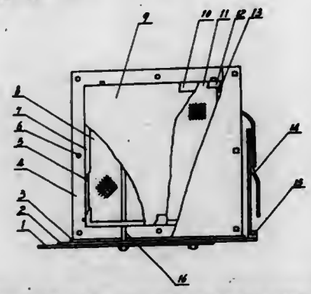


**5,500,104**

## MONO-POLAR PRE-FILTER ELECTROLYZER WITH VERTICAL POWER-SUPPLY RODS

**Guo C. Wang, Mulan XinoquNo.3721, Qixheng Street, Nangang District, Harbin, Heilongjiang Province, China**

**Filed Mar. 23, 1995, Ser. No. 409,055**
**Claims priority, application China, Mar. 23, 1994, 94 1 03112.8**
**Int. Cl.[6] C25B *9/00;11/03***
**U.S. Cl. 204—253** **9 Claims**




1. A mono-polar pre-filter electrolyzer, which comprises:

a plurality of cathode elements, each of which is composed of a cathode element receiver and a cathode screen;

a plurality of anode elements, which are arranged with the cathode elements alternately and face to face, and each of which is composed of an anode element receiver, a conductive anode frame screen having an inner circumferential surface and an outer circumferential surface and received in the anode element receiver, and power-supply rods positioned longitudinally in the conductive anode frame screen with spaces from the inner circumferential surface of the anode frame screen;

a plurality of independent membranes, which each are positioned between one anode element and one cathode element arranged face to face;

a plurality of tension rods, which pass through all above components and fix them together;

an anode bus, which is positioned at the bottom of the electrolyzer; the power-supply rods extend downward from the anode element receivers to electrically connect with the anode bus so that an electric current can be provided in the rods; and

a cathode bus, which is mounted at one side of the electrolyzer and electrically connects with the cathode elements.

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**5,500,105**

## BOWED SHAPE ELECTROFORMS

**Timothy J. Leenhouts, Fairport, and Gary J. Maier, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Dec. 1, 1994, Ser. No. 347,936**
**Int. Cl.[6] C25D *1/00***
**U.S. Cl. 205—67** **3 Claims**




1. A method of forming a curved electroform, comprising:

forming a substantially convex surface along a longitudinal axis of a mandrel by applying a first layer of material having a first thermal coefficient of expansion on the mandrel, applying a second layer of material having a second thermal coefficient of expansion on the first layer, the second thermal coefficient of expansion being greater than the first thermal coefficient of expansion and heating the mandrel to expand the first layer and the second layer of the mandrel, differing amounts creating the convex surface;

plating the convex surface of the mandrel with a material to form the curved electroform; and

separating the curved electroform from the mandrel.

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**5,500,106**

## ELECTROPLATING PROCESS

**Robert L. Goldberg, Sharon, Mass., assignor to Shipley Company, L.L.C., Marlborough, Mass.**

**Continuation-in-part of Ser. No. 206,733, Mar. 4, 1994. This application Jun. 12, 1995, Ser. No. 489,613**
**Int. Cl.[6] C25D *5/54***
**U.S. Cl. 205—166** **18 Claims**

1. A process for plating a nonconducting substrate with a metal, said process comprising the steps of providing a porous coating of carbon particles on said substrate, providing a reducing agent within the pores of the porous coating of said carbon particles, said reducing agent being of a strength sufficient to reduce ions of metal to be plated onto the substrate when in contact with the same, contacting said substrate having said porous coating containing the reducing agent within the coating with an electrolytic metal plating solution to form an initial coating of the metal on the conductive coating by reduction and electroplating the metal over the contacted substrate.

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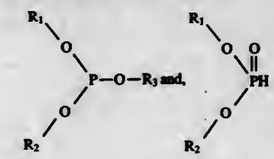
**5,500,107**

## HIGH TEMPERATURE CORROSION INHIBITOR

**James G. Edmondson, Conroe, Tex., assignor to Betz Laboratories, Inc., Trevose, Pa.**

**Filed Mar. 15, 1994, Ser. No. 213,293**
**Int. Cl.[6] C10G *9/12***
**U.S. Cl. 208—47** **4 Claims**

1. A method for inhibiting the naphthenic acid-induced corrosion of the internal metallic surfaces of the equipment used in the processing of crude oil between about 400° and 790° F. comprising adding to the crude oil a corrosion inhibiting amount of an aryl containing phosphite compound excluding nitrogen having a structure selected from the group consisting of:




wherein $R_1$, $R_2$ and $R_3$ are $C_6$ to $C_{12}$ aryl or alkyl and at least one R group is an aryl radical.

5,500,108

## GASOLINE UPGRADING PROCESS

Paul P. Durand, Wilmington, Del., and Hye K. C. Timken, Woodbury, N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 133,403, Oct. 8, 1993, Pat. No. 5,411,658, which is a continuation-in-part of Ser. No. 891,124, Jan. 1, 1992, Pat. No. 5,413,696, which is a continuation-in-part of Ser. No. 850,106, Mar. 12, 1992, Pat. No. 5,409,596, which is a continuation-in-part of Ser. No. 745,311, Aug. 15, 1991, Pat. No. 5,346,609. This application Sep. 9, 1994, Ser. No. 303,908

Int. Cl.[6] C10G 69/02

U.S. Cl. 208—89 20 Claims

1. A process of upgrading a cracked, olefinic sulfur-containing feed fraction boiling in the gasoline boiling range which comprises:

contacting a cracked, olefinic, sulfur-containing feed fraction having a 95 percent point of at least 325° F. with a hydrodesulfurization catalyst in a first reaction zone, operating under a combination of elevated temperature, elevated pressure and an atmosphere comprising hydrogen, to produce an intermediate product comprising a normally liquid fraction which has a reduced sulfur content and a reduced octane number as compared to the feed;

contacting at least the gasoline boiling range portion of the intermediate product in a second reaction zone in the presence of hydrogen with an acidic catalyst comprising an intermediate pore size zeolite in combination with a molybdenum component, to convert the gasoline boiling range portion of the intermediate product to a product comprising a fraction boiling in the gasoline boiling range having a higher octane number than the gasoline boiling range fraction of the intermediate product.

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5,500,109

## METHOD FOR PREPARING CATALYSTS COMPRISING ZEOLITES EXTRUDED WITH AN ALUMINA BINDER

Kathleen M. Keville, Beaumont, Tex.; Hye K. C. Timken, Woodbury, N.J., and Robert A. Ware, Wyndmoor, Pa., assignors to Mobil Oil Corp., Fairfax, Va.

Division of Ser. No. 70,822, Jun. 3, 1993, Pat. No. 5,378,671. This application Oct. 17, 1994, Ser. No. 324,305

Int. Cl.[6] C10G 47/16;47/18;47/20

U.S. Cl. 208—111 21 Claims

1. A process for hydrocracking a hydrocarbon feedstock, said process comprising contacting said feedstock and hydrogen with a hydrocracking catalyst under sufficient hydrocracking conditions, said hydrocracking catalyst comprising a hydrogenation component and an extrudate prepared according to a method for preparing an alumina bound zeolite catalyst, said method comprising the steps of:

(a) determining the silanol content of a zeolite;

(b) mulling together alumina, said zeolite of step (a), and water under conditions sufficient to form an extrudable mass comprising an intimate mixture of alumina and said zeolite;

(c) extruding the extrudable mass of step (b) under conditions sufficient to form a green strength extrudate; and

(d) calcining the green strength extrudate of step (c) under conditions sufficient to increase the crush strength of the extrudate,

wherein said zeolite, which is introduced into mulling step (b), has a silanol content of less than 10%, expressed in terms of silicons included in silanols vs. total silicons.

5,500,110

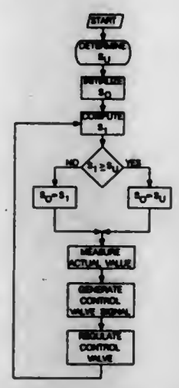
## METHOD FOR CHANGING PARTICULATE TRANSPORT RATES BETWEEN ZONES

Paul A. Sechrist, Des Plaines; Roger R. Lawrence, Elmhurst; Frank T. Mickich, Joliet; Larry D. Richardson, Roselle, and David M. Kazell, Libertyville, all of Ill., assignors to UOP, Des Plaines, Ill.

Filed May 6, 1994, Ser. No. 239,003

Int. Cl.[6] C10G 35/10;35/24

U.S. Cl. 208—173 23 Claims




1. A method for controlling the transport of particles from a source zone to a destination zone comprising:

a) passing a transport stream comprising a fluid to a source zone;

b) withdrawing particles and said source zone, and passing said particles and said fluid through a conduit and to a destination zone;

c) determining a computed value of an indicator that is in response to the rate of transport of said particles from said source zone to said destination zone;

d) comparing said computed value with the actual value of said indicator and generating a control signal that is in response to the difference between said computed value and said actual value;

e) employing said control signal to actuate a means to control the rate of transport of particles from said source zone to said destination zone;

f) increasing or decreasing said computed value in at least two increments to a final value of said indicator;

g) comparing at least two different increased or decreased computed values with the actual value of said indicator and updating said control signal at least twice in response to the difference between said increased or decreased computed values and said actual value to sequentially generate at least two updated control signals; and

h) employing said updated control signals at least twice to actuate said means to control the rate of transport of particles from said source zone to said destination zone so that a steady state rate of transport of particles is attained after each said employment of said updated control signal.

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5,500,111

## BACTERIA SUPPORTING MEDIUM, ESPECIALLY USEFUL FOR PRETREATMENT OF WASTE WATER

Yasuo Fujino, 1-700 Yoshino 170., Katsuyama-shi; Fukui-Ken, Japan

Filed Jan. 21, 1994, Ser. No. 184,148

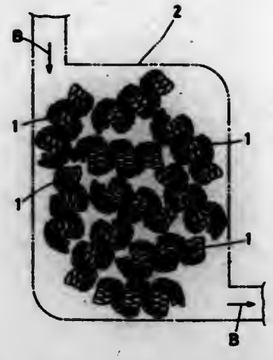
Claims priority, application Japan, Jan. 22, 1993, 5-027477

Int. Cl.[6] C02F 3/10

U.S. Cl. 210—150 15 Claims

1. A bacteria-supporting medium of synthetic resin which has a spiral shape with a relatively small pitch and






comprises plural S-shaped portions continuous with each other and defined at outer boundaries by a continuous winding line,

each of said S-shaped portions extending radially and including an upwardly-expanding part and a downwardly-expanding part,

said upwardly-exteading and downwardly-extending parts being tapered toward a central opening,

one portion of said upwardly-expanding part, as well as one portion of said downwardly-expanding part, slightly bulging out, and

upper and lower segments of said winding line being offset slightly upon dividing said winding line by an inner circumferential line.

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5,500,112

## APPARATUS FOR BIOLOGICAL TREATMENT OF EFFLUENT

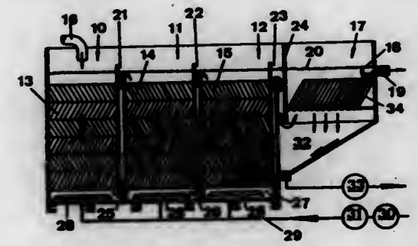
Alistair J. McDonald, Inglewood, Invergordon, Scotland

Continuation of Ser. No. 938,267, Oct. 22, 1992, abandoned. This application Jun. 9, 1995, Ser. No. 488,838

Claims priority, application United Kingdom, Apr. 24, 1990, 9009285

Int. Cl.[6] C02F 3/06;9/00;3/10;3/20

U.S. Cl. 210—151 15 Claims




1. Effluent treatment apparatus, for the treatment of effluent by aerobic bacteria, including a series of bioreactors interconnected such that the effluent is constrained to pass through each bioreactor in turn, and each bioreactor comprises a tank for effluent to be treated, a submerged fixed film matrix defining surfaces for bacterial colonization positioned within said tank below the effluent surface, and aeration means arranged beneath said matrix and entering under substantially the entire horizontal area of said matrix, said aeration means defining very fine openings to discharge very fine air bubbles, and said very fine openings being positioned to direct said very fine air bubbles between substantially all of said surfaces defined by said fixed film matrix.

5,500,113

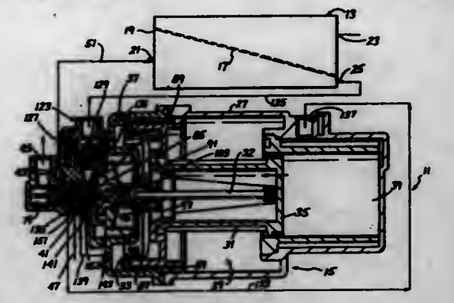
## REVERSE OSMOSIS WATER SYSTEM

E. Dale Hartley, Malibu, and F. Scott Hartley, Camarillo, both of Calif., assignors to Sherlo Pump Manufacturing Co., Santa Ana, Calif.

Filed Oct. 13, 1993, Ser. No. 135,690

Int. Cl.[6] B01D 63/00

U.S. Cl. 210—321.6 22 Claims



1. A reverse osmosis system, comprising:

a module including a reverse osmosis membrane and a plurality of ports, one of said ports being an inlet port connectable to a source of feed water under pressure via a feed water inlet conduit, another of said ports being a flush port operatively associated with the feed side of said reverse osmosis membrane, and another one of said ports comprising a filtered product water outlet port;

a pump coupled into a feed water inlet conduit and comprising a housing having a chamber therein, a reciprocable member having pumping and return strokes in the chamber and having first and second faces exposable to said feed water under pressure;

a valving system responsive to the reciprocable member for controlling the flow of the feed water under pressure to and from the first and second faces so the reciprocable member can be reciprocated in said chamber; and

a flush water conduit between the valving system and the flush port whereby during the pumping stroke, feed water is injected from said pump into said reverse osmosis module through said inlet port to produce product water which exits the module through the product water outlet port and during the return stroke, flush water is delivered from said pump through the flush water conduit and the flush port into said reverse osmosis module, said flush water flushing the membrane and then exiting as brine through said inlet port.

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5,500,114

## SEPARATOR DEVICE

Michael S. Potter, Lickey, and Arthur S. Pittwood, Brewood, both of, Great Britain, assignors to Managed Pollution Systems Limited, Worcestershire, England

PCT No. PCT/GB93/00312, § 371 Date Sep. 1, 1994, § 102(e) Date Sep. 1, 1994, PCT Pub. No. WO93/17775, PCT Pub. Date Sep. 16, 1993

PCT Filed Feb. 15, 1993, Ser. No. 295,756

Claims priority, application United Kingdom, Mar. 6, 1992, 9204979

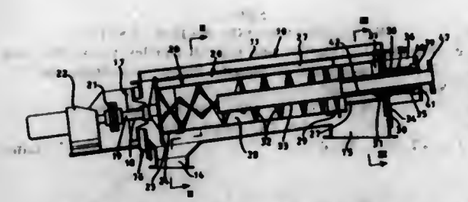
Int. Cl.[6] B01D 33/11

U.S. Cl. 210—394 9 Claims

1. A separator for separating solid material from liquid comprising:

a casing having an end, a solid material outlet for expelling said solid material from the casing, a liquid material outlet for expelling liquid material from the casing, the liquid material outlet being separate from the solid material outlet;

a drum disposed within the casing, the drum having first and second ends and an outlet, being rotatable about a drum axis



at an angle relative to the horizontal and having an apertured surface for liquid to flow out of the drum, one of said first and second ends of the drum being closed;

an inlet member for supplying a mixture of solid material and liquid into the drum, the inlet member being concentric with said drum axis and being rotatable with said drum;

a feed member being fixed relative to the inlet member and concentric therewith for supplying said mixture of solid material and liquid to the inlet member, at least parts of the inlet member and the feed member respectively being disposed one within the other;

a rotary seal disposed between the inlet member and the feed member;

a first journal disposed at said first end of the drum;

a first bearing disposed outside of said end of the casing, the first journal being received in said first bearing and rotating upon rotation of said drum and inlet member, the first bearing supporting the first journal against movement in a radial direction, the inlet member extending centrally through the first bearing;

a drive disposed at said second end of the drum for rotatably driving the drum and inlet member;

a spiral member disposed within the drum for moving said solid material within the drum towards said outlet therefrom where it passes to said solid material outlet of the casing, the spiral member having inner and outer peripheries and being supported for at least part of its length at the outer periphery thereof and for at least part of its length at the inner periphery thereof;

a second journal disposed at said second end of the drum; and

a second bearing in which said second journal at said second end of the drum is received, the bearing supporting the second journal against movement in any radial direction;

wherein the first and second bearing which respectively receive said first and second journals are in line.

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**5,500,115**
**FILTERING STRAINER**

Holger Nehm, and Hermann Grether, both of Mullheim, Germany, assignors to Dieter Wildfang GmbH, Mullheim, Germany

Filed Sep. 29, 1994, Ser. No. 314,635
Claims priority, application Germany, Jan. 1, 1993, 93 14 925.5 U
Int. Cl.[6] B01D *35/02*
U.S. Cl. 210—460 4 Claims



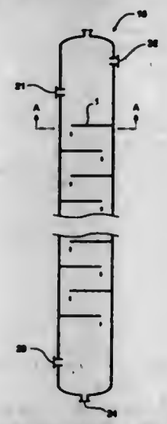
1. A strainer attachment for water outlet fittings comprising a one-piece plastic injection-molded part having a front surface and a flow direction therethrough, the strainer attachment being formed of conical shape with apex directed upstream of the flow direction and with strainer apertures which have a passage length measured in the a direction of flow and are of approximately equal open hexagonal aperture cross sections having a maximum measurement transverse to the flow, the total aperture cross section, as compared to the total front surface of the strainer attachment, being greater than about 40%, the passage length of the strainer apertures being less than twice the largest measure of a strainer aperture, and the opposite faces on common side walls of adjacent strainer apertures being approximately parallel to each other, the strainer attachment having a peripheral collar band extending downstream of the flow direction and being formed on its inside surface with a broad inwardly facing recess.

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**5,500,116**
**LIQUID-LIQUID CONTACTOR**

Takashi Nakayama, Handa, and Hiroshi Segara, Yokohama, both of, Japan, assignors to JGC Corporation, Tokyo, Japan

Filed Jul. 15, 1994, Ser. No. 275,534
Claims priority, application Japan, Jul. 19, 1993, 5-178081
Int. Cl.[6] B01D *12/00*
U.S. Cl. 210—511 7 Claims



1. A liquid-liquid contactor with a top and a bottom for receiving a heavy liquid feed from the top and a light liquid feed from the bottom so as to continuously contact both liquids, one of the two liquids forming a dispersed phase and the other forming a continuous phase in countercurrent flow in the contactor; the contactor comprising trays arranged between the top and bottom and a tower shell surrounding the trays, the trays including column plates and dams, the column plates extending in a horizontal direction in the tower to cover a part of a cross section of the tower so as to form flow channels for the continuous and dispersed phases, the dams extending vertically from free ends of the column plates in a direction of feeding the dispersed phase and having internal openings therein permitting the dispersed phase to flow therethrough so that droplets of the dispersed phase from an upstream column plate stay under a downstream column plate, the droplets coalesce to form a coalesced layer of the dispersed phase .while under the downstream column plate and the coalesced layer flows out in a horizontal direction through the openings in the dams.

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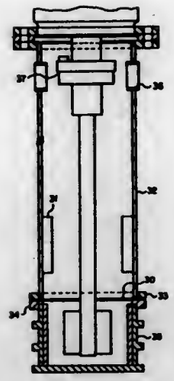
**5,500,117**
**CYCLONE-TURBINES, INTENDED ESPECIALLY FOR FLOTATION SYSTEMS DESIGNED FOR TREATING WATER POLLUTED BY HYDROCARBONS**

Adnan Hamdan, 32, boulevard de la Paix, 64000 Pau, France

Filed Oct. 2, 1992, Ser. No. 957,049
Claims priority, application France, Jan. 3, 1991, 91 12197; Nov. 28, 1991, 91 14721
Int. Cl.[6] B01D *21/26;17/00*
U.S. Cl. 210—512.1 3 Claims

1. A cyclone-turbine comprising a stator cage, a stack thereabove, and a rotor in said stack having mobile blades inside said





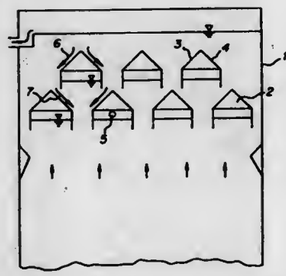
stator cage with fingers of a rectangular section, wherein a throttling disk is positioned between the said stator cage and the stack.

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**5,500,118**
**BIOGAS REACTOR FOR THE ANAEROBIC TREATMENT OF WASTE WATER**

Hubert Coenen, Aarbergen; Helmut Hubert, Wiesbaden, and Michael Zumbragel, Aarbergen, all of, Germany, assignors to Passavant-Werke AG, Germany

Filed Jun. 15, 1994, Ser. No. 261,907
Claims priority, application Germany, Jun. 17, 1993, 43 20 096.6
Int. Cl.[6] C02F *3/28*
U.S. Cl. 210—603 9 Claims



9. A method for anaerobically treating waste water using a biogas reactor comprising a collection hood having a lower portion for holding waste water, an upper portion for holding biogas formed during biological decomposition of the waste water and a roof defining a top end of the upper portion, said method comprising:

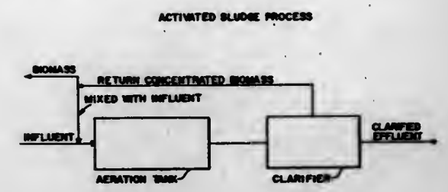
completely submerging said collection hood in the waste water stream and maintaining an oscillation region between the upper and lower portion of the collection hood during biological decomposition of the waste water, said oscillation region comprising a phase-transition interface having a constant horizontal cross-sectional area.

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**5,500,119**
**SUBMERGED FIXED MEDIA FOR NITRIFICATION**

Ernest M. Jenelle, 1711 Fox Run Ct., Vienna, Va. 22182

Continuation of Ser. No. 761,499, Sep. 18, 1991, abandoned. This application Sep. 21, 1993, Ser. No. 124,429
Int. Cl.[6] C02F *3/10*
U.S. Cl. 210—615 9 Claims




1. A method of treating wastewater to improve nitrification as an integral single sludge process, said method comprising:

(a) mixing incoming wastewater with an activated sludge biomass of heterotrophic bacteria and aerating and mixing the mixture;

(b) allowing the heterotrophic bacteria to absorb substantially all carbonaceous material in the waste water; and thereafter

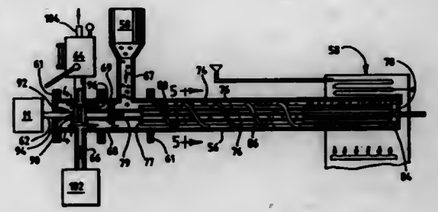
(c) passing the wastewater/biomass mixture over plurality of substantially submerged fixed biological support means which have autotrophic nitrification bacteria disposed thereon.

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**5,500,120**
**AUGER-TYPE CHEMICAL REFORMER**

David L. Baker, 601 S. Skelton, West Frankfort, Ill. 62896

Filed Jan. 31, 1994, Ser. No. 188,708
Int. Cl.[6] B01D *17/00*
U.S. Cl. 210—179 18 Claims



1. Apparatus for chemical reforming of organic materials, which comprises:

a tubular housing having a longitudinal axis;

a tube comprising radially extending projections along essentially the entire length thereof, said tube being rotatably positioned in said tubular housing generally parallel to said axis to form a space therebetween; said radially extending projections comprising hollow, radially extending convolutions which define radially extending spaces both inside and outside of said tube;

a motor for rotating said tube;

first and second access ports adjacent one end of said housing communicating with the space between said tube and housing;

a water source for applying water to fluid material within said housing adjacent an opposed end of said tube and housing;

an apparatus for heating said housing adjacent said opposed end and spaced from said one end;

said tube and housing defining a flow conduit system for causing fluid material within said housing to move in a path between said first and second access ports.

**5,500,121**

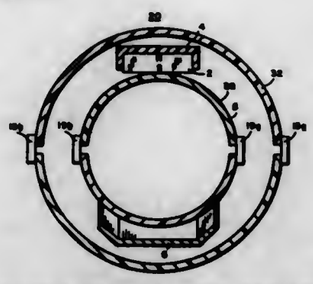
**APPARATUS FOR MAGNETICALLY TREATING FLUIDS**

Henry E. Thornton, 8937 NW. 27th St., Coral Springs, Fla. 33065, and John S. Piacenica, 61 Wayne Rd., Needham, Mass. 02192

Continuation of Ser. No. 104,874, Aug. 10, 1993, abandoned, which is a continuation-in-part of Ser. No. 813,257, Jan. 9, 1992, abandoned. This application Nov. 10, 1994, Ser. No. 337,308

Int. Cl.[6] C02F *1/48*

U.S. Cl. 210—222 1 Claim



1. An apparatus for magnetically treating fluids comprising:

a tubular non-ferromagnetic outer housing having a first longitudinal axis, said outer housing having first and second parts each including first and second longitudinal edges in opposed juxtaposition to form said tubular outer housing, and hinge means attached to at least one set of opposed said first and second longitudinal edges for pivotally connecting said first and second parts together;

a tubular non-ferromagnetic inner housing having a second longitudinal axis, said inner housing being coaxially disposed within said outer housing and adapted to coaxially surround a pipe through which fluid can flow, said inner housing having third and fourth parts each including third and fourth longitudinal edges in opposed juxtaposition to form said tubular inner housing, and hinge means attached at at least one set of opposed said third and fourth longitudinal edges for pivotally connecting said third and fourth parts together;

a series of neodymium bar magnets aligned along an axis parallel to the longitudinal axis of said inner housing and in end to end contact on only one exterior side of said inner housing, said magnets having polar surfaces facing in a direction normal to the longitudinal axis of said inner housing for creating a magnetic field within said pipe, wherein the polarity of the polar surface of each said magnet is opposite to the polarity of the polar surface of an adjacent said magnet;

a ferromagnetic body disposed on an exterior said of said inner housing opposed to said one exterior side on which said magnets are disposed for concentrating the magnetic field about the cross section of said inner housing; and

a non-ferromagnetic retaining strip disposed between said series of bar magnets and said outer housing.

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**5,500,122**

**STACKED FLUID-SEPARATION MEMBRANE DISK MODULE ASSEMBLIES**

A. William Schwartz, Upland, Calif., assignor to UOP, Des Plaines, Ill.

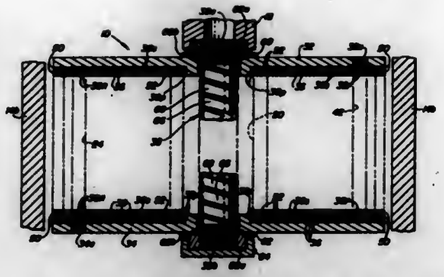
Filed May 11, 1994, Ser. No. 241,370

Int. Cl.[6] B01D *63/00*

U.S. Cl. 210—321.75 8 Claims

1. A fluid separation module comprising:

a plurality of membrane disks each having a central first aperture and a pair of second apertures radially spaced from said central first aperture, said membrane disks being stacked relative to one another so that said central first apertures thereof are registered to establish a central fluid passageway,



and so that said second apertures thereof are registered to establish a respective pair of second fluid passageways;

sealing layers interposed between adjacent stacked membrane disks to fluid isolate said first fluid passageway from said pair of second fluid passageways and to seal a peripheral edge region of said membrane disks surrounding said pair of second fluid passageways; and

a permeate tube positioned coaxially with said central fluid passageway to provide a conduit for fluid in said central fluid passageway, said tube is provided with integral compression means to maintain a compressive force on said stacked membrane disks, whereby repeated pressurization and depressurization of said module may occur by virtue of said compressive force, maintaining said sealing layers in sealing contact with said adjacent membrane disks.

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**5,500,123**

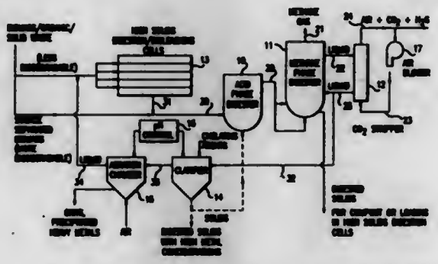
**TWO-PHASE ANAEROBIC DIGESTION OF CARBONACEOUS ORGANIC MATERIALS**

Vipul J. Srivastava, Woodridge, Ill., assignor to Institute of Gas Technology, DesPlaines, Ill.

Continuation of Ser. No. 174,958, Dec. 28, 1993, abandoned. This application Nov. 8, 1994, Ser. No. 336,332

Int. Cl.[6] C02F *3/28*

U.S. Cl. 210—603 13 Claims



1. A process for improved methane production by two-phase anaerobic digestion of organic carbonaceous material comprising the steps of:

introducing said organic carbonaceous material into an acid phase digester;

fermenting said organic carbonaceous material in said acid phase digester under anaerobic conditions, forming a liquid/solids effluent;

passing said liquid/solids effluent to a methane phase digester;

fermenting said liquid/solids effluent in said methane phase digester under anaerobic conditions and withdrawing gas comprising methane from said methane phase digester;

passing a methane phase liquid effluent to a $CO_2$ stripper and stripping $CO_2$ and $H_2S$ from said methane phase liquid effluent; and

introducing a stripper liquid effluent comprising dissolved oxygen into said methane phase digester.



**5,500,124**

**PROCESS FOR THE PURIFYING WORKING-UP OF REACTION MEDIA AND/OR WASH MEDIA OBTAINED DURING PREPARATION OF CELLULOSE ETHERS**

Heinz Wallisch, Eltville; Reinhard Dönges, Bad Soden am Taunus, and Ulrich Meyer-Blumenroth, Idstein, all of, Germany, assignors to Hoechst AG, Germany

Filed Dec. 3, 1992, Ser. No. 984,698

Claims priority, application Germany, Dec. 6, 1991, 41 40 272.3

Int. Cl.[6] C02F *1/44; C08B 11/02; 11/04*

U.S. Cl. 210—651 17 Claims

1. A method for purifying a waste water from the preparation of a cellulose ether from cellulose and an etherifying agent, wherein the waste water is separated into a permeate and a concentrate with an ultrafiltration membrane, said method comprising:

improving the flux rate through the ultrafiltration membrane by carrying out the ultrafiltration of the waste water at a temperature at or above the flocculation temperature of the cellulose ether wherein said flocculation temperature is above 40° C. and wherein the concentrate of the reaction medium and/or wash medium obtained during ultrafiltration is treated with an oxidizing agent such that the dissolved cellulose ether is oxidatively degraded or cellulose ethers insoluble in hot waste water.

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**5,500,125**

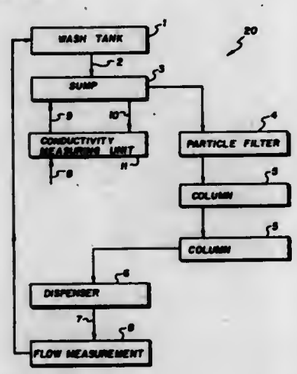
**PROCESS FOR RECYCLING PHOTOGRAPHIC WASH WATER**

Richard R. Horn, Fairport; Christine K. Gaskell, Rochester; Susan R. Krauss, Pittsford, and Michael D. Purol, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 19, 1994, Ser. No. 245,797

Int. Cl.[6] C02F *9/00*

U.S. Cl. 210—668 7 Claims




1. A method of treating and recycling photoprocessing wash water to maintain a conductivity below 35,000 μS/cm, comprising in sequence, the steps of:

A) contacting the wash water with an acrylic anion exchange resin to remove silver thiosulfate complex in the water; and

B) contacting the water from step A) with an oxidizing agent that converts thiosulfate ions to sulfate ions; and

C) recirculating the wash water continuously through the photoprocessing wash tank and steps A) and B).

**5,500,126**

**PROCESS FOR REMOVAL OF METAL IONS FROM AQUEOUS SOLUTIONS**

William Fries, Southampton, Pa., assignor to Rohm and Haas Company, Phila., Pa.

Filed Oct. 20, 1994, Ser. No. 326,443

Int. Cl.[6] B01D *15/04; C02F 1/42*

U.S. Cl. 210—668 8 Claims

1. A process for removal of metal ions from aqueous solutions that comprises:

(a) adding a polyamine to an aqueous solution containing metal ions and a metal complexing agent capable of forming a metal-complex with the metal ions, the complexing agent being present in greater than equimolar amount with respect to metal ion concentration, the polyamine being added in an amount from 0.1 to 0.5 times the metal concentration, the amount of polyamine being effective to release the metal ions from the metal-complex; and

(b) contacting the aqueous solution from step (a) with a cation exchanger.

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**5,500,127**

**PURIFICATION PROCESS**

Richard J. Carey, Sherborn, and James W. Thackeray, Braintree, both of Mass., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Mar. 14, 1994, Ser. No. 212,267

Int. Cl.[6] B01D *15/04*

U.S. Cl. 210—685 11 Claims

1. A method for removal of cationic and anionic contaminants from an organic solution of an acid catalyzed photoresist composition containing one or more acid labile components subject to reaction in the presence of a strong acid, said process comprising the steps of providing said organic solution containing said one or more acid labile components, providing a weak acid cation exchange resin having a $pK_a$ such that the weak acid exchange groups on said resin do not react with acid labile components of the photoresist, providing a strong base anion exchange resin, and contacting said organic solution with said cation exchange resin and said anion exchange resin for a time sufficient to remove essentially all dissolved contaminants from solution without causing reaction between said acid labile components of the photoresist composition and said cation exchange resin.

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**5,500,128**

**HIGH CALCIUM TOLERANT DEPOSIT CONTROL METHOD**

Jennifer J. Robertson, Coatesville, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.

Continuation-in-part of Ser. No. 202,404, Feb. 25, 1994, abandoned. This application Feb. 7, 1995, Ser. No. 384,996

Int. Cl.[6] C02F *5/14*

U.S. Cl. 210—699 7 Claims

1. A method of controlling the deposition of scale imparting precipitates on the structural parts of a gold ore processing system exposed to an aqueous medium having a calcium ion concentration of from about 200 ppm –4000 ppm and a pH of about 10–11, said method comprising adding to said aqueous medium an effective amount for the purpose of a combination of (a) 1-hydroxypropylidene-1,1-diphosphonic acid and (b) a water soluble polymer selected from the group consisting of a polyacrylic acid and an acrylic acid/allyl hydroxpropyl sulfonate ether copolymer, wherein the weight ratio of (a):(b) is from about 1:1 to 1:2.

**5,500,129**

**Patent Not Issued For This Number**

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**5,500,130**

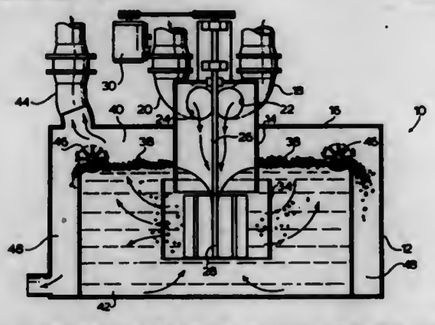
## METHOD FOR EFFECTING GAS-LIQUID CONTACT

**James W. Smith, Toronto; David T. R. Ellenor, Pickering, and John N. Harbinson, Scarborough, all of, Canada, assignors to The University of Toronto Innovations Foundation and Apollo Environmental Systems Corp.**

**Continuation of Ser. No. 313,153, Nov. 29, 1994. This application Jun. 5, 1995, Ser. No. 462,166**

**Int. Cl.[6] C01B *17/16*; B01D *21/26***

**U.S. Cl. 210—703** **6 Claims**



1. A method for the distribution of a gaseous phase in a liquid phase, which comprises:

providing a rotary impeller Comprising a plurality of blades at a submerged location in said liquid phase surrounded by a shroud through which are formed a plurality of openings,

feeding said gaseous phase to said submerged location,

rotating said impeller about a substantially vertical axis at a speed corresponding to a tip Speed ($V_i$) of at least about 500 in/sec. and in such manner as to establish a Shear Effectiveness Index (SEI) value of about 1 to about 10, wherein the SEI value is determined by the relationship:

$$SEI = \frac{Q}{\pi h D_i V_i} \times 100$$

wherein Q is the gas flow rate into the impeller ($m^3/s$), h is the height (m) of the impeller blades, $D_i$ is the outside diameter (m) of the impeller and $V_i$ is the blade tip velocity (m/s), and so as to draw liquid phase into the interior of the shroud and to generate sufficient shear forces between said impeller and said plurality of openings in said shroud to distribute said gaseous phase as bubbles in said liquid phase to the interior of said shroud and to effect intimate contact of said gaseous phase and said liquid phase at said submerged location so as to form a gas-liquid-mixture of bubbles of said gaseous phase in said liquid phase contained within said shroud while effecting shearing of said gas-liquid mixture within said shroud,

flowing said gas-liquid mixture from within interior of said shroud T/rough and in contact with.said openings to external of said shroud at an Effective Shear Index. (ESI) value of from about 1 to about 2500, wherein the ESI value is determined by the relationship:

$$ESI = \frac{GVI}{V_i} \times \frac{(D_i - D_i)}{2} \times 100$$

said gas velocity index (GVI) is determined by the expression:

$$GVI = \frac{QP}{4nA^2}$$

where Q is the volumetric flow rate of gas (ms/s), n is the number of openings in the shroud, A is the area of each opening ($m^2$) and P is the length of the perimeter of each opening (m). $V_i$ is the blade tip velocity (m/s), $D_s$ is the inside diameter (m) of the shroud and $D_f$ is the outside diameter (m) of the impeller, so as to effect further shearing of the gas liquid mixture and further intimate contact of said gaseous phase and said liquid phase.

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**5,500,131**

## COMPOSITIONS AND METHODS FOR WATER TREATMENT

**Jean-Paul Metz, 90-2 Sukhumvit Soi 31, 10012 Bangkok THX**

**Filed Apr. 5, 1994, Ser. No. 223,271**

**Int. Cl.[6] C02F *1/52***

**U.S. Cl. 210—705** **11 Claims**

1. A method for treating water contaminated with algae, suspended solids, or toxic heavy metal compounds, said method comprising the steps:

(a) adding to the water a soluble metal salt flocculent in a quantity of between 5–100 milligrams per liter of the water;

(b) adding to the water 50–2000 milligrams of coccolithic calcium carbonate per liter of water; and

(c) forming a floc including said algae, suspended solids, or toxic heavy metal compounds in said water at a pH of at least about 7.0.

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**5,500,132**

## LIQUID TO LIQUID COALESCING SEPARATOR AND METHOD

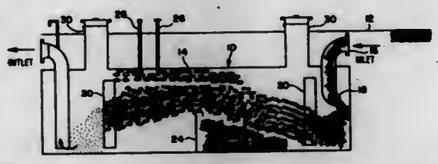
**Hadi Elmi, The Woodlands, Tex., assignor to Modern Welding Company, Inc., Houston, Tex.**

**PCT No. PCT/US93/08087, § 371 Date Feb. 22, 1995, § 102(e) Date Feb. 22, 1995, PCT Pub. No. WO94/05602, PCT Pub. Date Mar. 17, 1994**

**PCT Filed Aug. 27, 1993, Ser. No. 387,886**

**Int. Cl.[6] C02F *1/40***

**U.S. Cl. 210—708** **12 Claims**



8. A method of separating a coalescent liquid first liquid comprising,

flowing the liquids through perforations in upstream side walls of one or more tubes having internal passages with an open top and an open bottom formed of a material on which the coalescent liquid will coalesce in coalesced droplets on inner walls of the tubes until they are large enough to break away from the inner walls and flow by gravity in the inner passages out of the upper open ends of the tubes thereby separating the coalesced droplets from the first liquid, flowing the first liquid free of the coalesced droplets out of the inner passage through the perforations in downstream side walls and bottoms of the tubes, and flowing sludge from the first liquid out of the bottoms of the tubes.



**5,500,133**

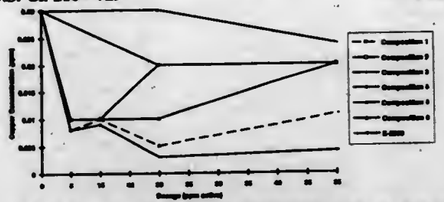
## POLYMERIC DITHIOCARBAMATE ACID SALT COMPOSITIONS AND METHOD OF USE

**William S. Carey, Ridley Park, and Ellen M. Meyer, Doylestown, both of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.**

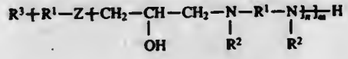
**Filed Feb. 17, 1995, Ser. No. 390,341**

**Int. Cl.[6] C02F *1/62***

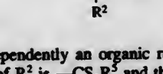
**U.S. Cl. 210—729** **11 Claims**



1. A method for precipitating contaminants from an aqueous solution comprising adding to said solution an amount effective for the purpose of a complexing composition comprising a water soluble, branched polydithiocarbamic acid salt having the formula:



wherein $R^1$ independently is an organic radical or:



wherein $R^4$ is independently an organic radical and x=1 to 5; at least a percentage of $R^2$ is $—CS_2R^5$ and the remainder is —H; $R^5$ is independently H or a cation; $R^3$ is N or a substituted organic radical; Z is independently N—$R^2$, O or S; the sum of n is an integer greater than 10; and m is an integer greater than 2 so as to complex, precipitate and remove metal contaminants from said aqueous solution, said polydithiocarbamic acid salt being formed by reaction of epihalohydrin with a mixture of an amine compound consisting of at least two primary amine functional groups and an amine compound consisting of three primary amine functional groups, then functionalization with carbon disulfide.

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**5,500,134**

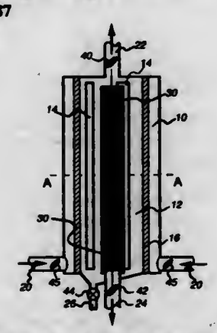
## MICROFILTRATION SYSTEM WITH SWIRLING FLOW AROUND FILTER MEDIUM

**Georges L. Chahine, Montgomery, Md., assignor to Dyna Flow, Inc., Fulton, Md.**

**Filed Mar. 16, 1995, Ser. No. 405,512**

**Int. Cl.[6] B01D *21/26;27/00***

**U.S. Cl. 210—787** **12 Claims**



1. A method for separating particles from a liquid in a device with a longitudinal central axis including an outer fluid containment member with static members within, the outer fluid containment member encompassing an inner swirl chamber with a lateral wall that is substantially cylindrical in shape, at least one elongated porous filter element symmetrically positioned with respect to the central axis, multiple elongated narrow injection slits through the lateral wall, the slits are openings that are substantially coextensive with the at least one elongated porous filter element; the method comprising the steps of:

(a) swirling the liquid about the longitudinal central axis by injecting the liquid through the elongated narrow injection slits, thereby generating a vortex with similar flow characteristics at various cross-sections of the central axis;

(b) collecting filtered liquid at a first outlet from the device which permeates across the at least one filter element; and

(c) collecting a mixture of particles and liquid which does not permeate across the at least one filter element at a second outlet from the device.

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**5,500,135**

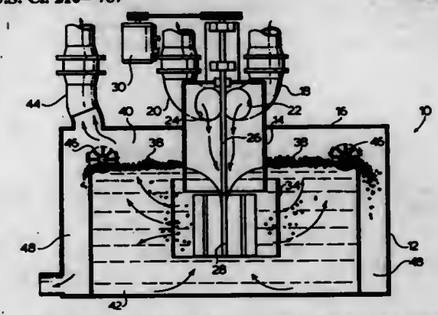
## METHOD FOR EFFECTING GAS-LIQUID CONTACT

**James W. Smith, Toronto; David T. R. Ellenor, Pickering, and John N. Harbinson, Scarborough, all of, Canada, assignors to The University of Toronto Innovations Foundation, and Apollo Environmental Systems Corp.**

**Continuation of Ser. No. 313,153, Nov. 5, 1993, which is a continuation-in-part of Ser. No. 863,720, Apr. 3, 1992, Pat. No. 5,352,421, which is a continuation-in-part of Ser. No. 622,485, Dec. 5, 1990, Pat. No. 5,174,973, which is a continuation-in-part of Ser. No. 582,423, Sep. 14, 1990, abandoned, which is a continuation-in-part of Ser. No. 446,776, Dec. 6, 1989, abandoned. This application Jun. 5, 1995, Ser. No. 462,157**

**Int. Cl.[6] C01B *17/16*; B01D *21/26***

**U.S. Cl. 210—787** **54 Claims**



1. A method of removal of a component from a gas stream containing the component in a liquid medium, which comprises:

feeding said gas stream to a gas-liquid contact zone in which is located said liquid medium,

rotating an impeller comprising a plurality of blades about a generally vertical axis at a submerged location in said liquid medium so as to induce flow of said gas stream along a generally vertical flow path from external to said gas-liquid contact zone to said submerged location,

surrounding said impeller with a shroud through which are formed a plurality of openings while said impeller is rotated at a speed corresponding to a blade tip velocity of at least about 350 in/sec. so as to generate sufficient shear forces between said impeller blades and said plurality of openings in said shroud to distribute said gas stream as gas bubbles in said liquid medium to the interior of said shroud, and to effect intimate contact of said component and liquid medium at said submerged location so as to form a gas-liquid mixture of gas bubbles in said liquid medium contained within the shroud while effecting shearing of said gas-liquid mixture within said shroud and to effect removal of the component from the gas stream into the liquid medium,

flowing said gas-liquid mixture from the shroud through and in contact with the openings therein into the body of the liquid medium external to the shroud at a gas velocity index at approximately atmospheric pressure of at least about 18 per second per opening in said shroud, so as to effect further shearing of the gas-liquid mixture and further intimate contact of said gas stream and liquid medium whereby any removal of component from the gas stream not effected in the interior of the shroud is completed in the region of the liquid medium adjacent to the exterior of the shroud,

said gas velocity index (GVI) is determined by the expression:

$$GVI = \frac{QP}{4nA^2}$$

where Q is the volumetric flow rate of gas ($m^3/s$), n is the number of openings in the shroud, A is the area of each opening ($m^2$) and P is the length of the perimeter of each opening (m), and

venting a component-depleted gas stream from a gas atmosphere above the liquid level in said gas-liquid contact zone;

wherein said method is carried out at an Effective Shear Index (ESI) value of about 1 to about 2500, in which the Effective-Shear Index is determined by the relationship:

$$ESI = \frac{GVI}{V_t} \times \frac{(D_s - D_i)}{2} \times 100$$

in which GVI is the Gas Velocity Index (/s) , $V_t$ is the blade tip velocity (m/s), $D_s$ is the inside diameter (m) of the shroud and $D_i$ is the outside diameter (m) of the impeller, and at a Shear Effectiveness Index (SEI) value of about 1 to about 10, in which the Shear Effectiveness Index is-determined by the relationship:

$$SEI = \frac{Q}{\% hD_i V_t} \times 100$$

in which Q is the gas flow rate to the impeller ($m^3/s$), h is the height (m) of the impeller blades, $D_i$ is the outside diameter (m) of the impeller, and $V_t$ is the impeller blade tip velocity (m/s).

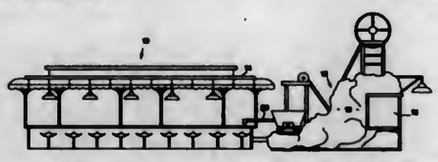
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**5,500,136**

## SIMULATED GOLD AND GEMSTONE MINING OPERATION

**Galen J. Chadwick, 105 South Dixie Ave., Cookeville, Tenn. 38501**

**Filed Aug. 24, 1994, Ser. No. 295,520**
**Int. Cl.[6] B01D** *37/00*
**U.S. Cl. 210—805** **21 Claims**



19. The method of sluicing for precious materials as entertainment, using a self-contained, simulated mining apparatus having:

storage facilities, said storage facilities containing:

a predetermined quantity of water,

a predetermined quantity of ore,

an ore precious material dispensing bin,

water/ore separation means, said separation means separating ore and water,

a precious material holding bin, said material holding bin further comprising measuring means for dispensing a predetermined amount of material,

at least one conveyor,

an ore retaining area, said ore retaining area being proximate said water/ore separation means,

a first water transfer means,

ore measuring means, said ore measuring means being proximate said ore retaining area and said conveyor,

an ore/material dispensing bin,

at least one pumping means,

at least one water dispensing means, said water dispensing means being connected at a first end to said water/ore separation means,

at least one sluicing facility, said at least one sluicing facility having:

at least one trough, said at least one trough having a first end, a second end and a length, said length extending along at least a portion of the periphery of said sluicing facility and being sufficient to seat at least one person, said trough having a 2° decline from said first end to said second end,

at least one water return means, said at least one water return means being proximate said second end of said trough,

multiple sluicing pans, each of said multiple sluicing pans having about flared sides, a chain connecting said pans to said sluicing facility, and a substantially flat perforated base, the perforations in said base being dimensioned slightly larger than said ore,

comprising the steps of:

placing an initial quantity of ore into said ore retaining area bin,

placing an initial quantity of water into said at least one trough, said quantity be sufficient to maintain water constantly moving from said first end to said second end of said at least one trough,

placing an initial quantity of said material into said material holding bin,

placing an initial quantity of ore/material combination in said ore/material dispensing bin

removing a quantity of ore/material combination from said ore/material dispensing bin,

placing said ore/material combination in said sluicing pan and separating said ore from said material by moving said sluicing pan in the moving water within said troughs, said ore filtering through said pan perforations,

retaining said precious material within said sluicing pan,

combining said separated ore with said water within said troughs,

moving the ore/water combination along said troughs to said water return means,

moving said ore/water combination along said water transfer means to said pumping means,

pumping said ore/water combination to said water/ore separation means,

separating said water and ore,

returning said water to said water dispensing means after separation,

returning said ore to said ore retaining area after separation,

whereby users are able to mine for precious materials at said troughs using said sluicing pans.

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**5,500,137**

## FABRIC SOFTENING BAR COMPOSITIONS CONTAINING FABRIC SOFTENER AND ENDURING PERFUME

**Dennis R. Bacon, Milford; Toan Trinh, Maineville; Frederick A. Hartman, and Robert Mermelstein, both of Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio**

**Filed Oct. 20, 1994, Ser. No. 326,574**
**Int. Cl.[6] D06M** *13/00*
**U.S. Cl. 252—8.6** **25 Claims**

1. A low sudsing, fabric softening bar composition comprising:

(A) from about 40% to about 90%, by weight of the composition, of a hydrophobic, fabric softening compound selected from the group consisting of quaternary ammonium compounds, carboxylic acid salts of tertiary amines, carboxylic acid salts of tertiary ester amines, sorbitan esters of fatty



alcohols, glycerol and polyglycerol esters, fatty amines, fatty acids, alkyl or alkenyl succinic acids, and mixtures thereof;

(B) from about 0.01% to about 10% of an enduring perfume composition;

(C) optionally, from about 5% to about 30%, by weight of the composition, of a nonionic surfactant;

(D) optionally, from about 5% to about 30%, by weight of the composition, water; and;

(E) optionally, cellulase, at a level equivalent to an activity from about 1 to about 100 Cellulase Equivalent Viscosity Units/gram (CEVU/gram) of the composition;

wherein when (A) is a sorbitan ester of a fatty alcohol, glycerol ester, or a polyglycerol ester, then (C) cannot also be a sorbitan ester of a fatty alcohol, glycerol ester, or a polyglycerol ester, said composition being essentially free of detergent builders and anionic detergents.

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**5,500,138**

## FABRIC SOFTENER COMPOSITIONS WITH IMPROVED ENVIRONMENTAL IMPACT

**Dennis R. Bacon, Milford, and Toan Trinh, Maineville, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio**

**Filed Oct. 20, 1994, Ser. No. 326,555**
**Int. Cl.[6] D06M** *13/46;13/00*
**U.S. Cl. 252—8.8** **34 Claims**

1. A rinse-added liquid fabric softening composition comprising:

(A) from about 0.5% to about 80% of biodegradable cationic fabric softening compound;

(B) from about 0.01% to about 10% of an enduring perfume which has at least about 70% of components with a ClogP≧3.0 and a boiling point of≧250° C., ClogP being the calculated octanol/water partitioning coefficient (P) expressed as the logarithm to the base 10, logP;

(C) optionally, from about 0% to about 30% of dispersibility modifier; and

(D) the balance comprising a liquid carrier selected from the group consisting of: -water, $C_{1-4}$ monohydric alcohol: $C_{2-6}$ polyhydric alcohol; propylene carbonate; liquid polyethylene glycols; and mixtures thereof;

and wherein the dispersibility modifier affects the viscosity of said liquid fabric softening composition.

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**5,500,139**

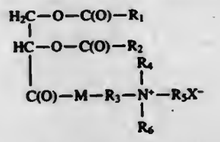
## BIODEGRADABLE FABRIC CONDITIONING MOLECULES BASED ON GLYCERIC ACID

**Mohammad A. Rahman, River Edge; Robert W. R. Humphreys, Annandale, and Shang-Ren Wu, Mahwah, all of N.J., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.**

**Continuation-in-part of Ser. No. 260,641, Jun. 16, 1994, abandoned. This application Feb. 21, 1995, Ser. No. 391,795**
**Int. Cl.[6] D06M** *13/46;* **C07C** *69/52*
**U.S. Cl. 252—8.8** **14 Claims**

8. A composition for conditioning fabrics comprising:

a) 1 to 99% wt. % of a compound having a formula



wherein $R_1$ and $R_2$ are each independently a $C_{15}$ to $C_{28}$ branched or straight chain alkyl, alkenyl or hydroxyalkyl, $R_3$ is a $C_{1-6}$ straight or branched alkyl, alkenyl or aryl, $R_4$, $R_5$ and $R_6$ are each independently a $C_{1-6}$ straight or branched alkyl, alkenyl, aryl or H provided that at least two of $R_4$, $R_5$ and $R_6$ are not H, M is 0, NH or $NR_7$, $R_7$ is a $C_{1-4}$ unsubstituted or hydroxy substituted alkyl or alkenyl and $X^-$ is an anion which is watersoluble; and

b) 99% to 1% wt. water to form a dispersion.

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**5,500,140**

## OIL-SOLUBLE PHOSPHORUS- AND NITROGEN-CONTAINING ADDITIVES

**Joe Hughes, Baldwin, Mo.; Rolfe J. Hartley, Glen Allen, and Vasudevan Balasubramanian, Richmond, both of Va., assignors to Ethyl Corporation, Richmond, Va.**

**Filed Mar. 31, 1995, Ser. No. 422,407**
**Int. Cl.[6] C10M** *125/20*
**U.S. Cl. 252—46.7** **35 Claims**

1. An oil-soluble phosphorus- and nitrogen-containing composition having limited slip properties formed by (i) reacting (a) an O,O-di-hydrocarbyl phosphorodithioic acid wherein at least 50 mole % of the hydrocarbyl groups are secondary acyclic hydrocarbyl groups free of acetylenic unsaturation and the balance, if any, of the hydrocarbyl groups are primary acyclic hydrocarbyl groups free of acetylenic unsaturation with (b) a monoepoxide or mixture of monoepoxides having in the range of 20 to about 30 carbon atoms in the molecule to form a product, (ii) reacting such product with phosphorus pentoxide to produce an acid phosphate intermediate, and (iii) neutralizing at least a major proportion of the intermediate with at least one amine.

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**5,500,141**

## MAGNETIC INK CONCENTRATE

**Claudius Kormann, Schifferstadt; Ekkehard Schwab, Neustadt; Friedrich-Wilhelm Raulfs, Limburgerhof, and Karin H. Beck, Ludwigshafen, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany**

**Continuation of Ser. No. 79,876, Jun. 23, 1993, abandoned, which is a division of Ser. No. 879,011, May 6, 1992, Pat. No. 5,250,207. This application Sep. 13, 1994, Ser. No. 304,821**
**Claims priority, application Germany, May 14, 1991, 41 15 608.0**
**Int. Cl.[6] H01F** *1/00;1/26;* **C09D** *11/00*
**U.S. Cl. 252—62.54** **2 Claims**

1. A magnetic ink concentrate, consisting essentially of a dispersion of superparamagnetic solid particles in water or alcohol in the presence of a dispersant, wherein the dispersant consists of at least one polyelectrolyte having a molecular weight of from 1,000 to 25,000 and selected from the group consisting of polyacrylate, acrylic acid/acrylamide copolymers and polyvinylphosphonic acid and the alkali metal salts of these compounds, said solid particles having a formula $M_vMn_wZn_xFe_yO_z$, where M is Co and/or Ni, v and w are each from 0 to 0.998, x is from 0.001 to 0.998, y is from 2.001 to 2.998, z is from 3.001 to 4, v+ w+ x is from 0.002 to 0.999, v+ w+x+ y is 3, v+ 0, if W= 0 and w+ if V= o, with the proviso that the ink concentrate has a viscosity of < 10 cP, measured at 22° C., and a saturation magnetization of >32 mT.

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**5,500,142**

## PIEZOELECTRIC CERAMICS

**Yoshihisa Ushida, and Hiroshi Mase, both of Sodegaura, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan**

**Filed Nov. 4, 1994, Ser. No. 334,123**
**Claims priority, application Germany, Nov. 4, 1993, 5-275528**
**Int. Cl.[6] C04B** *35/48*
**U.S. Cl. 252—62.9 R** **6 Claims**

1. A piezoelectric ceramic comprising a perovskite-based solid solution represented by the formula:

$$Pb_{1-a}M_a\{(Ni_{1-b}Zn_b)_{1/3}Nb_{2/3}\}_xTi_yZr_zO_3$$

wherein M represents Ba or Sr, x+y+z=1, and
a=0.01 to 0.10
b=0.50 to 0.90
x=0.15 to 0.25
y=0.35 to 0.45 and
z=0.35 to 0.45,
wherein said perovskite-based solid solution comprises at least one metallic ion oxide selected from Group A in combination with at least one metallic ion oxide selected from Group B:
Group A: $La_2O_3$ and $Nd_2O_3$, and
Group B: NiO, $Fe_2O_3$, $SnO_2$ and $Ta_2O_5$.

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**5,500,143**

## CLEANING COMPOSITIONS FOR PRODUCE

**Bruce P. Murch, Cincinnati; Brian J. Roselle, Fairfield, and Kyle D. Jones, West Chester, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio**

**Continuation-in-part of Ser. No. 146,663, Nov. 1, 1993, abandoned, and Ser. No. 224,937, Apr. 8, 1994, abandoned. This application Jul. 5, 1994, Ser. No. 270,707**
**Int. Cl.[6] C11D *9/00;15/00;* B08B *9/20***
**U.S. Cl. 252—108** **8 Claims**

1. A detersive composition with an improved tactile impression for fruits and vegetables, comprising:
(a) at least about 0.75%, by weight, of a $C_{12}$–$C_{18}$ fatty acid or salt thereof;
(b) at least about 0.05%, by weight, of a water-soluble polyethylene glycol having a molecular weight of about 200, or higher, to provide reduced viscosity and to minimize the slick, soapy feel of the composition;
(c) from about 90% to about 98% of water or water-ethanol fluid carrier, said composition having a basic pH between about 11 and about 11.9.

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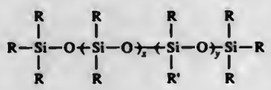
**5,500,144**

## COMPOSITION FOR CLEANING AND WETTING CONTACT LENSES

**Chimpiramma Potini, Methuen; Stanley J. Wrobel; Hong J. Zhang, both of Andover, and Edward J. Ellis, Lynnfield, all of Mass., assignors to Polymer Technology Corporation, Wilmington, Mass.**

**Continuation of Ser. No. 80,427, Jun. 18, 1993, abandoned. This application Apr. 12, 1995, Ser. No. 420,915**
**Int. Cl.[6] C11D *3/37;3/48;9/36;* B08B *7/00***
**U.S. Cl. 252—174.15** **17 Claims**

1. An aqueous composition for cleaning and wetting a contact lens comprising:
(a) silicone polymer represented by the formula:



wherein:
each R is independently selected from the group consisting of $C_1$–$C_{11}$ alkyl and phenyl;
each R' is independently an alkyleneoxide containing radical;
x is 0 or an integer of at least 1; and
y is an integer of at least 1; and
a buffering agent or tonicity adjusting agent.

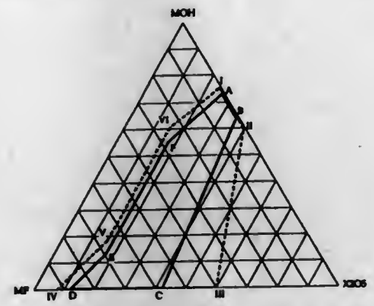
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**5,500,145**

## HYDROTHERMAL AQUEOUS MINERALIZER FOR GROWING OPTICAL-QUALITY SINGLE CRYSTALS

**Lap K. Cheng, Bear, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Division of Ser. No. 843,679, Feb. 28, 1992, Pat. No. 5,264,073. This application Jul. 30, 1993, Ser. No. 199,913**
**Int. Cl.[6] C09K *3/00***
**U.S. Cl. 252—183.14** **5 Claims**




1. An aqueous mineralizer suitable for the hydrothermal production of crystals of $MTiOXO_4$, wherein M is selected from the group consisting of $NH_4$, K, Rb, Tl, mixtures thereof, and mixtures of Cs therewith; and X is selected from the group consisting of P, As and mixtures thereof; said aqueous mineralizer consisting essentially of an aqueous solution of MF and at least one of
a) MOH;
b) $X_2O_5$;
c) $MA_2XO_4$, wherein A is H or F; or
d) $M_2AXO_4$; wherein A is H or F;
in proportions such that the molal concentration in the mineralizer is at least about 1 molal $M^+$, at least about 0.2 molal $X^{+5}$, and at least about 1 molal $F^-$; and wherein the amount of $F^-$ present in the mineralizer is selected to increase the solubility of $MTiOXO_4$ in the mineralizer and to provide an $MTiOXO_4$ solubility in the mineralizer of at least 1% by weight at the operating temperature and pressure selected for hydrothermal production.

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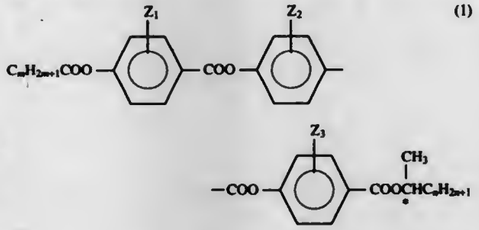
**5,500,146**

## ANTIFERROELECTRIC LIQUID CRYSTAL COMPOSITION

**Kenji Takigawa, Nishio; Naohisa Oyama, and Hitoshi Hayashi, both of Okazaki, all of, Japan, assignors to Nippon Soken Inc., Nishio, Japan**

**Filed Apr. 7, 1995, Ser. No. 418,610**
**Claims priority, application Japan, Apr. 8, 1994, 6-70666**
**Int. Cl.[6] C09K *19/20;* C07C *69/76***
**U.S. Cl. 252—299.67** **6 Claims**

1. An antiferroelectric liquid crystal represented by the following formula (I):






In the formula (1), each of m and n is an integer satisfying $6 \leqq m \leqq 14$ and $2 \leqq n \leqq 10$, and each of $Z_1$, $Z_2$ and $Z_3$ is independently a substituent selected from the group consisting H, F, Cl, Br, CN and $CH_3$.

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**5,500,147**

## SCINTILLATION SOLID AND METHOD OF MEASURING RADIATION

**Brian J. Fitzpatrick, Ossining, N.Y., assignor to Optical Semiconductors, Inc.**

**Filed Oct. 27, 1992, Ser. No. 966,946**
**Int. Cl.[6] C09K *11/54***
**U.S. Cl. 252—301.6 S** **12 Claims**

1. A monolithic solid scintillation body with a monocrystalline or polycrystalline morphology having generally constant luminescence scintillation efficiency from about 25° C. to at least about 200° C. and average crystal domain grain diameters of at least about 5 millimeters and being composed of zinc sulfide doped with copper.

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**5,500,148**

## SILICONE EMULSION COMPOSITION FOR SURFACE RELEASE TREATMENT

**Toshio Ohba; Naomi Sato; Masahiko Ogawa, and Morizo Nakazato, all of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan**

**Filed Jul. 13, 1993, Ser. No. 91,116**
**Claims priority, application Japan, Jul. 14, 1992, 4-209599; Jan. 7, 1992, 4-293898**
**Int. Cl.[6] B01F *17/54;* C08L *83/04;83/10***
**U.S. Cl. 252—315.2** **26 Claims**

1. An aqueous silicone emulsion composition for surface-release treatment comprising:
(a) an organopolysiloxane represented by the average unit formula $R_b^3SiO_{4-b/2}$, in which $R^3$ is an unsubstituted monovalent hydrocarbon group or a monovalent hydrocarbon group substituted by one or more cyano groups or one or more halogen atoms and subscript b is a positive number not exceeding 3, said organopolysiloxane having a viscosity of 100–100,000 centipoise at 25° C., and each molecular chain end of said organopolysiloxane is blocked with a triorganosiloxy group of general formula $R_a^1SiO$—, wherein $R^1$ is a vinyl group, and subscript a is 3;
(b) an organohydrogenpolysiloxane represented by average unit formula $R_c^2H_dSiO_{(4-c-d)/2}$, in which $R^2$ is an unsubstituted monovalent hydrocarbon group free from aliphatic unsaturation or a monovalent hydrocarbon group free from aliphatic unsaturation which is substituted by one or more cyano groups or one or more halogen atoms and subscripts c and d are each a positive number with the proviso that c+d does not exceed 3;
(c) an acid;
(d) a surface active agent;
(e) a platinum compound; and
(f) water as an emulsifying medium of the other components, and which has a value of pH in the range from 5 to 3.

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**5,500,149**

## PROCESSES FOR THE CONVERSION OF METHANE TO SYNTHESIS GAS

**Malcolm L. Green, Oxford, Great Britain; Anthony K. Cheetham, Montecito, Calif.; Patrick D. Vernon, Oxford, and Alexander T. Ashcroft, Lancashire, bot of, Great Britain, assignors to British Gas plc, United Kingdom**

**Division of Ser. No. 81,289, Aug. 20, 1993, Pat. No. 5,431,855. This application Apr. 24, 1995, Ser. No. 427,586**
**Claims priority, application United Kingdom, Dec. 24, 1990, 9028034**
**Int. Cl.[6] C07C *1/02***
**U.S. Cl. 252—373** **1 Claim**

1. A method of converting a reactant gas mixture comprising $CO_2$, $O_2$ and $CH_4$ into a product gas mixture comprising $H_2$ and CO which method comprises bringing the reactant gas mixture at a temperature of from 600°–1000° C. into contact with a solid catalyst of the following formula:
$M_xM'_yO_z$ or $M_xO_z$ or $M'_yO_z$ or
M' on a refractory support
where M is at least one metal selected from the group consisting of Li, Na, K, Rb, Cs, Be, Mg, Ca, Sr, Ba, B, Al, Sc, Y, Ln, Ga, In, Tl, Bi, U, Th and Pb,
Ln is selected from the group consisting of La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu and Y,
M' is at least one metal selected from the group consisting of Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Ga, Ge, Y, Zr, Nb, Mo, Ru, Rh, Pd, Ag, Cd, In, Sn, Hf, Ta, W, Re, Os, Ir, Pt, Au, Hg, Tl, Pb, Bi, Th, and U,
each of the ratios x/z and y/z and (x+y)/z being independently from 0.1 to 8, and wherein $CO_2$, $O_2$ and $CH_4$ are all present in the feedstock gas mixture and the conversion is performed over a single catalyst bed.

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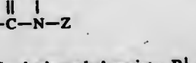
**5,500,150**

## SOLIDFIED DETERGENT ADDITIVE WITH N-ALKOXY POLYHYDROXY FATTY ACID AMIDE AND ALKOXYLATED SURFACTANT

**Jeffrey J. Scheibel; Bruce P. Murch, and Daniel S. Connor, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio**

**Continuation-in-part of Ser. No. 119,258, Sep. 9, 1993, abandoned. This application Jul. 26, 1994, Ser. No. 278,852**
**Int. Cl.[6] C11D *1/18;1/12;1/75;9/32***
**U.S. Cl. 252—544** **12 Claims**

1. A solidified detergent composition comprising:
(a) at least about 1% by weight of an amide surfactant of the formula



wherein R is a $C_7$–$C_{21}$ hydrocarbyl moiety, $R^1$ is a $C_2$–$C_8$ hydrocarbyl moiety, $R^2$ is a $C_1$–$C_8$ hydrocarbyl or oxyhydrocarbyl moiety, and Z is a polyhydroxy hydrocarbyl unit having a linear chain with at least two hydroxyls directly connected to the chain; and
(b) at least about 1% by weight of a member selected from the group consisting of alkoxylated nonionic surfactants, sulfated alkoxylated anionic surfactants, and mixtures thereof.

**5,500,151**

## HEAVY DUTY FABRIC SOFTENING LAUNDRY DETERGENT COMPOSITION

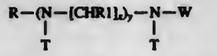
**Hoai-Chau Cao, Liege, and Marie-Christine Houben, Alleur, both of, Belgium, assignors to Colgate-Palmolive Co., New York, N.Y.**

**Continuation of Ser. No. 44,332, Apr. 7, 1993, which is a continuation of Ser. No. 798,450, Nov. 26, 1991, abandoned, which is a continuation of Ser. No. 672,255, Mar. 20, 1991, abandoned, which is a continuation of Ser. No. 490,863, Mar. 9, 1990, abandoned, which is a continuation of Ser. No. 255,817, Oct. 7, 1988, abandoned. This application Aug. 3, 1994, Ser. No. 285,612**

**Int. Cl.[6] C11D *3/12;3/386;* D06M *13/24***

**U.S. Cl. 252—546** **12 Claims**

1. A heavy duty liquid fabric softening laundry detergent composition which is of improved fabric softening and cleaning properties which comprises a surfactant system consisting essentially of an anionic surfactant, nonionic surfactant and an amphoteric surfactant said surfactant system includes 0.5 to 5% of an amphoteric surfactant of the formula



wherein R is a hydrocarbyl group of 8 to 20 carbon atoms, R1 is hydrogen or alkyl of 1 to 6 carbon atoms, R2 is alkylene of 1 to 6 carbon atoms, T is hydrogen or W, W is R2COOM, M is hydrogen, alkali metal, alkaline earth metal, ammonium or substituted ammonium, x is 2 to 3 and y is 2 to 4, said amphoteric surfactant being the sole amphoteric surfactant in the liquid laundry detergent composition; 2 to 15% of an anionic surfactant which is a higher alkyl ether sulfate which is a water-soluble salt of ethoxylated higher fatty alcohol sulfuric acid in which the higher fatty alcohol is of 8 to 20 carbon atoms and is ethoxylated with 2 to 6 moles of ethylene oxide per mole of fatty alcohol; 2 to 8% of an ethoxylated nonionic surfactant, 10 to 25% of water soluble inorganic builder salt; 4 to 15% of bentonite; and 30 to 80% of aqueous medium, with all percentages being by weight, said composition having a pH in the range of 7 to 8 and a viscosity in the range of 1500 to 2500 cps at 25° C.

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**5,500,152**

## DETERGENT COMPOSITION

**John F. Helliwell, Merseyside, United Kingdom, assignor to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.**

**Continuation of Ser. No. 103,467, Aug. 6, 1993, abandoned. This application Apr. 13, 1995, Ser. No. 421,129**

**Claims priority, application United Kingdom, Aug. 7, 1992, 9216854**

**Int. Cl.[6] C11D *1/219;1/90;1/28***

**U.S. Cl. 252—547** **8 Claims**

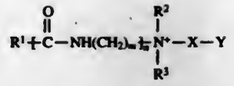
1. A detergent composition in the form of an aqueous liquid or gel comprising:

(1) about 5% by weight total composition of a fatty acyl isethionate or mixtures of fatty acyl isethionates having the formula:

$$RCO_2CH_2CH_2SO_3M$$

wherein R is an alkyl or alkenyl group of 7 to 21 carbon atoms and M is a solubilizing cation selected from the group consisting of sodium, potassium, ammonium and substituted ammonium;

(2) about 8% by weight total composition of a zwitterionic surfactant having the formula:



where $R^1$ is alkyl or alkenyl of 7 to 18 carbon atoms;

$R^2$ and $R^3$ are each independently alkyl, hydroxyalkyl or carboxyalkyl of 1 to 3 carbon atoms;

m is 2 to 4

n is 0 or 1

X is alkylene of 1 to 3 carbon atoms optionally substituted with hydroxyl;

and

Y is $—CO_2^-$ or $—SO_3^-$;

(3) about 2.0% by wt. of total composition alkoxylated or non-alkoxylated alkyl ether sulphate;

(4) 0.5 to 15% by wt. of composition silicone;

(5) 0.01 to 5% by wt. of composition of a cationic polymer selected from the group consisting of cationic cellulose ethers and cationic polygalactomannan gums; and

(6) balance water, electrolyte.

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**5,500,153**

## HANDWASH LAUNDRY DETERGENT COMPOSITION HAVING IMPROVED MILDNESS AND CLEANING PERFORMANCE

**Francisco R. Figueroa, Montalban-Caracas, and Roberto M. Jarrin, Caracas, both of, Venezuela, assignors to The Procter & Gamble Company, Cincinnati, Ohio**

**Filed Jul. 5, 1994, Ser. No. 270,709**

**Int. Cl.[6] C11D *1/29;1/83;1/90;3/37***

**U.S. Cl. 252—548** **6 Claims**

1. A laundry detergent composition for use in handwash operations comprising:

(a) from about 5% to about 50% by weight of a surfactant system including, by weight of said surfactant system,

(i) from about 50% to about 75% of $C_{14}$–$C_{15}$alkyl ethoxy sulfate surfactant having an average degree of etholation of one

(ii) from about 10% to about 40% of a nonionic surfactant mixture containing a polyhydroxy fatty acid amide surfactant and a $C_{12-14}$ dimethyl amine oxide surfactant, wherein the weight ratio of said polyhydroxy fatty acid amide to said amine oxide is from about 1:5 to about 5:1;

(iii) from about 5% to about 10% of cocoamidopropyl betaine surfactant; and

(iv) from about 5% to about 40% of a $C_{12}$–$C_{15}$alkyl ethoxylate having an average degree of ethoxylation of five:

wherein said composition does not contain alkylbenzene sulfonates;

(b) from about 1% to about 50% of a detergency builder;

(c) from about 1% to about 7% of a sodium polyacrylate; and

(d) the balance comprising adjunct detergent ingredients.

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**5,500,154**

## DETERGENT COMPOSITIONS CONTAINING ENDURING PERFUME

**Dennis R. Bacon, Milford, and Toan Trinh, Maineville, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio**

**Filed Oct. 20, 1994, Ser. No. 326,456**

**Int. Cl.[6] C11D *3/386;3/50***

**U.S. Cl. 252—551** **23 Claims**

1. A detergent composition comprising:

(A) from about 0.001% to about 10% by weight of an enduring perfume composition said composition is selected from Perfume A which consists of benzyl salicylate, ethylene brassylate, Galoxide-50%, hexyl cinnamic aldehyde, and tetrahydro linalool or Perfume B which consists of benzyl acetate, benzyl salicylate, Coumarin, ethylene brassylate, Galoxide-50%, hexyl cinnamic aldehyde, lilial, methyl dihydro isojasmonate, gamma-n-Methyl ionone, patchouli alcohol, and tetrahydrolinalool;

(B) from about 0.01% to about 95% of a surfactant system.

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**5,500,155**

## DETERGENT MIXTURES OF FATTY ACID ISETHIONATE SALTS AND FATTY ALCOHOLS

**Manfred Weuthen, Solingen; Karlheinz Hill, Erkrath, and Manfred Biermann, Muelheim, all of, Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany**

**Filed May 13, 1994, Ser. No. 246,897**

**Claims priority, application Germany, Mar. 18, 1994, 44 09 321**

**Int. Cl.[6] C11D *1/68;1/825;1/74;3/22***

**U.S. Cl. 252—557** **8 Claims**

1. A detergent mixture consisting essentially of: (a) 70 to about 95% by weight of a fatty acid isethionate salt; (b) 5 to about 30% by weight of a fatty alcohol; (c) 0 to about 15% by weight of a fatty acid, (d) 0 to about 15% by weight of an alkyl oligoglycoside, an alkenyl oligoglycoside, or a combination thereof; (e) 0 to about 15% by weight of a fatty acid N-alkyl polyhydroxyalkylamide.

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**5,500,156**

## UNSYMMETRICAL SQUARAINES FOR NONLINEAR OPTICAL MATERIALS

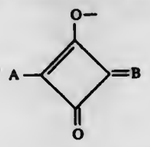
**Seth R. Marder; Chin-Ti Chen, both of Pasadena, Calif., and Lap-Tak Cheng, Newark, Del., assignors to California Institute of Technology, Pasadena, Calif.**

**Filed Apr. 11, 1994, Ser. No. 225,582**

**Int. Cl.[6] F21V *9/00;* C09K *19/00;* H03F *7/00;* C07C *49/293***

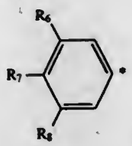
**U.S. Cl. 252—582** **28 Claims**

1. A composition of matter having the formula:

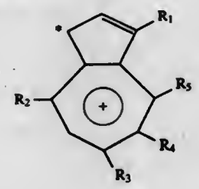


wherein A and B are selected from the group consisting of:

A is

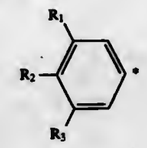


and B is

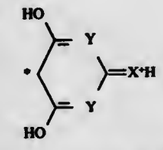


wherein * is the point of attachment, $R_1$ is H or methyl; $R_2$ is H or methyl; $R_3$ is H or methyl; $R_4$ is H or isopropyl; $R_5$ is H or methyl; $R_6$ is H, alkyloxy or aryloxy; $R_7$ is H, $N(CH_3)_2$, alkyloxy or aryloxy; and $R_8$ is H, alkyloxy or aryloxy;

A is

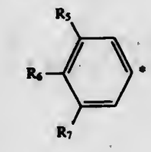


and B is

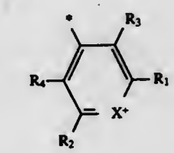


wherein * is the point of attachment, X is O or S; Y is CH or N; $R_1$ is H, alkyloxy or aryloxy; $R_2$ is H, $N(CH_3)_2$, alkyloxy or aryloxy; and $R_3$ is H, alkyloxy or aryloxy;

A is

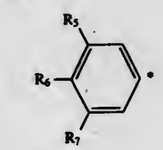


and B is

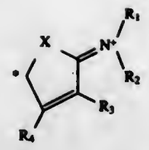


wherein * is the point of attachment, X is NR where R=alkyl, $(CH_2)_nOH$ where n=1–8, or $(CH_2)_nSH$ where n=1–8, or where X is O, S, Se, or Te; $R_1$ and $R_2$ are H, tert-butyl, phenyl 4-toluyl; $R_3$ and $R_4$ are H or $R_1$ and $R_3$ is HC=CH—HC=CH and $R_2$ is phenyl, or $R_1$, $R_3$, $R_2$ and $R_4$ are HC=CH—HC=CH; $R_5$ is H, alkyloxy or aryloxy; $R_6$ is H, $N(CH_3)_2$, alkyloxy or aryloxy; and $R_7$ is H, alkyloxy or aryloxy;

A is

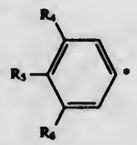


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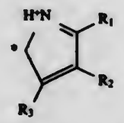


wherein * is the point of attachment, $R_1$ and $R_2$ are $(CH_2)_2O(CH_2)_2$, $(CH_2)_4$, or $(CH_2)_5$; $R_3$ is H, phenyl, or 3-methoxyphenyl; $R_4$ is H, phenyl, 4-bromophenyl, or 2-chlorophenyl; $R_5$ is H, alkyloxy or aryloxy; $R_6$ is H, $N(CH_3)_2$, alkyloxy or aryloxy; $R_7$ is H, alkyloxy or aryloxy; and X is O, S, Se, or Te;

A is

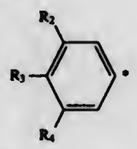


and B is

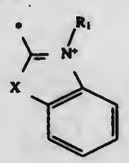


wherein * is the point of attachment, $R_1$ is methyl, $R_2$ is H, alkyl, acetyl, or alkoxycarbonyl; $R_3$ is H or methyl; $R_4$ is H, alkyloxy or aryloxy; $R_5$ is H, $N(CH_3)_2$, alkyloxy or aryloxy; and $R_6$ is H, alkyloxy or aryloxy;

A is

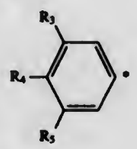


and B is

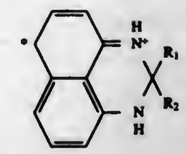


wherein * is the point of attachment, $R_1$ is alkyl; X is HC=CH, $(CH_3)_2C$, O, S, or Se; $R_2$ is H, alkyloxy or aryloxy; $R_3$ is H, $N(CH_3)_2$, alkyloxy or aryloxy; and $R_4$ is H, alkyloxy or aryloxy;

A is



and B is



wherein * is the point of attachment, $R_1$ is H, alkyl, $(CH_2)_nOH$ where n=1–8, $(CH_2)_nSH$ where n=1–8, phenylalkyl, phenyl, phenylcarbonyl, aryl, arylcarbonyl, arylalkyl, alkoxycarbonylalkyl, phenylcarbonylalkyl, or arylcarbonylalkyl.; $R_2$ is H, alkyl, $(CH_2)_nOH$ where n=1–8, $(CH_2)_nSH$ where n=1–8, phenylalkyl, phenyl, phenylcarbonyl, aryl, arylcarbonyl, arylalkyl, alkoxycarbonylalkyl, phenylcarbonylalkyl, or arylcarbonylalkyl.; $R_3$ is H, alkyloxy or aryloxy; $R_4$ is H, $N(CH_3)_2$, alkyloxy or aryloxy; and $R_5$ is H, alkyloxy or aryloxy.

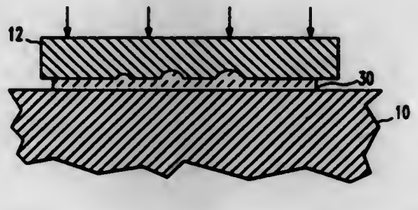
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**5,500,157**

**METHOD OF SHAPING POLYCRYSTALLINE DIAMOND**

John E. Graebner, New York, N.Y.; Sungho Jin, Millington, and Raymond Wolfe, New Providence, both of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Continuation of Ser. No. 38,370, Mar. 29, 1993, abandoned.
This application Jan. 4, 1995, Ser. No. 368,581
Int. Cl.[6] B29D *11/00*
U.S. Cl. 264—1.21 6 Claims




1. Method of making an article that comprises a shaped diamond body, the method comprising:

a) providing a precursor diamond body having a substantially planar surface;

b) forming the shaped diamond body from the precursor body by a process that comprises removing diamond material from the precursor body by contacting said surface of the precursor body with a hot template, said template having weight; and

c) carrying out one or more further steps towards completion of the article;

characterized in that

d) the precursor body is a polycrystalline diamond body;

e) the template comprises a template body that comprises a metal selected from the group consisting of the rare earth metals, Mn and Fe, has a nonplanar surface that comprises a first feature and, during step b), is at a temperature below the melting temperature of said template body; and

f) step b) comprises maintaining the template body in intimate contact with at least a portion of said surface of the precursor body for a time effective for transforming said substantially planar surface of the precursor body into a nonplanar surface that comprises a second feature that substantially is a replica of said first feature, said intimate contact between the polycrystalline diamond body and the template resulting from urging together the polycrystalline diamond body and the template by means of an applied force, said applied force being a force other than the force due to the weight of the template.



**5,500,158**

**UO2 PELLET AND METHOD FOR PRODUCTION THEREOF**

Norikazu Komada; Keiji Nishinaka; Kazunori Adachi, all of Omiya, and Shuji Fujiwara, Naka, all of, Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

Filed Dec. 19, 1994, Ser. No. 358,926
Claims priority, application Japan, Dec. 21, 1993, 5-328769
Int. Cl.[6] G21G *4/00*
U.S. Cl. 252—637 9 Claims

1. A $UO_2$ pellet containing 3–25 ppm of chlorine.

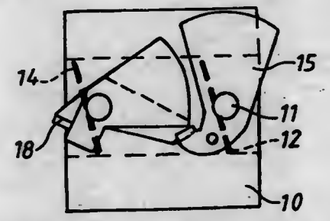
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**5,500,159**

**DEVICE FOR CONTROLLING A CARBURETOR OF AN INTERNAL COMBUSTION ENGINE**

Pär B. G. Martinsson, Huskvarna, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Mar. 15, 1995, Ser. No. 404,418
Claims priority, application Sweden, Jun. 1, 1994, 9401881-9
Int. Cl.[6] F02M *1/02*
U.S. Cl. 261—52 3 Claims




1. Device for controlling a carburetor of an internal combustion engine, comprising a throttle control for controlling a throttle (12), and a choke control for controlling a choke valve (14), characterized in that the throttle control comprises a latch means (15) which in the open position of the throttle prevents closing of the choke valve, and the choke control comprises a corresponding latch means (16) which in the closed position of the choke valve limits the extent of opening of the throttle.

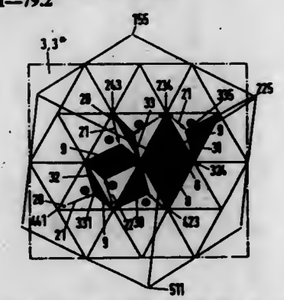
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**5,500,160**

**VORTEX PACKING FOR MASS EXCHANGE COLUMNS AND STATIC MIXERS**

Philipp Sulzer, Neftenbach, Switzerland, assignor to Sulzer Chemtech AG, Winterthur, Switzerland

Filed Feb. 9, 1995, Ser. No. 388,335
Int. Cl.[6] B01F *3/04*
U.S. Cl. 261—79.2 10 Claims




1. Vortex packing for an apparatus designed as a mass exchange column or a static mixer, the apparatus comprising face-shaped structural elements (a,d,k,n) which define a point lattice whose lattice planes, situated in cross-sections of the apparatus, form base grids of quadrilaterals, each of these quadrilaterals representing an equatorial periphery of an octahedron, the polar vertices of these octahedra being positioned at the points of neighbouring lattice planes, and the octahedra have either all open faces or alternately open and closed faces, characterised in that the packing is built of parallel layers of a sheet-like material having substantially triangular elementary areas (8,9), part of these elementary triangles (9) having each on two sides cut edges (30) and being deflected in a flap-like manner about folding edges (15) out of a base area (3;4;5) and the structural elements of the packing are formed by association or connection of the elementary triangles (8,9) in pairs.

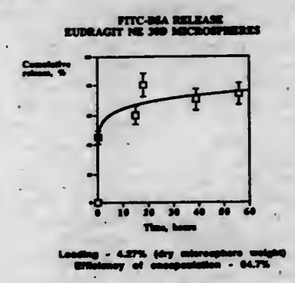
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**5,500,161**

**METHOD FOR MAKING HYDROPHOBIC POLYMERIC MICROPARTICLES**

Alexander K. Andrianov, Belmont, and Robert S. Langer, Newton, both of Mass., assignors to Massachusetts Institute of Technology and Virus Research Institute, Cambridge, Mass.

Filed Sep. 21, 1993, Ser. No. 124,816
Int. Cl.[6] B29B *9/00*
U.S. Cl. 264—8 26 Claims




1. A method for preparing a microparticle, comprising the steps of:

(i) dispersing a hydrophobic polymer in an aqueous solution in which a substance to be delivered is dissolved, dispersed or suspended; and then

(ii) coagulating the polymer together with the substance by impact forces.

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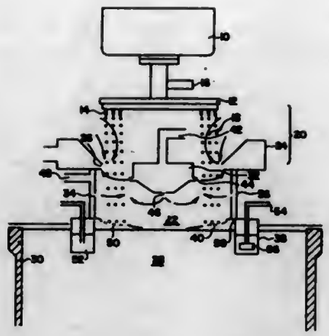
**5,500,162**

**PROCESS AND DEVICE FOR PRODUCING MICROSPHERES**

Wolfgang Theisen; Edwin Braunels, both of Rodenbach, and Bernd Pirstadt, Alzenau, all of, Germany, assignors to Nukem GmbH, Alzenau, Germany

PCT No. PCT/EP93/01082, § 371 Date May 13, 1994, § 102(e) Date May 13, 1994, PCT Pub. No. WO93/22045, PCT Pub. Date Nov. 11, 1993
PCT Filed May 4, 1993, Ser. No. 170,309
Claims priority, application Germany, May 4, 1992, 42 14 272.5
Int. Cl.[6] B29B *9/10*
U.S. Cl. 264—9 16 Claims

1. Method for producing microspheres by means of vibration-stimulated dripping of liquid through a plurality of openings (14) of a nozzle plate (12), the droplets (18) taking on a spherical shape while falling through a first free-fall section (20, S) and then, in a second free-fall section (R), being exposed to a reaction gas to produce gelling, thereafter falling into a reaction liquid (28) which may possess a foam layer (40), in which the same quantity of liquid passes through each opening (14) of the nozzle plate (12) per unit time; that the falling droplets (18) form an envelope around which, in the second free-fall section (R), the reaction gas



flows on all sides; and that reaction gas is introduced inside and extracted outside the envelope, or is introduced outside and extracted inside the envelope.

5. Apparatus for producing microspheres, comprising a nozzle plate (12) which has a plurality of openings (14) for dripping a liquid and can be caused to vibrate; a reaction free-fall section (R), spaced away from the nozzle plate, in which droplets (18) falling from the nozzle plate react with a reaction gas; and a reaction liquid (28), present below the free-fall section in a vessel (30), which if applicable can be covered with a foam (40), in which a gas delivery device (32) delivering the reaction gas is arranged inside the reaction free-fall section inside or outside an envelope formed by apparent attachment of the falling droplets (18); that an extraction device (24, 26) extracting reaction gas is arranged outside the envelope if the gas delivery device (32) is inside, or inside the envelope if the gas delivery device (32) is outside; and that a device (38,72) to generate the foam (40) is arranged inside and/or outside the envelope in the reaction liquid (28), or that a reaction liquid distribution device (74) is arranged and configured, above the liquid level and concentrically with the envelope, in such a way that reaction liquid (78) can be directed onto the falling droplets (78) tangentially or substantially tangentially to and in the same direction as the direction in which the droplets are falling.

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**5,500,163**

**MATERIAL AND SPLINT FOR ORTHOPAEDICAL, SURGICAL AND VETERINARY USE AND METHOD OF MAKING SAME**

Tom P. M. G. Peenet, Statiestraat 92, B-2600 Antwerp, Belgium

PCT No. PCT/EP92/01368, § 371 Date Dec. 7, 1993, § 102(e) Date Dec. 7, 1993, PCT Pub. No. WO93/00117, PCT Pub. Date Jan. 7, 1993
PCT Filed Jun. 16, 1992, Ser. No. 157,146
Claims priority, application Netherlands, Jun. 24, 1991, 9101082
Int. Cl.[6] B29C *35/02*
U.S. Cl. 264—473 5 Claims

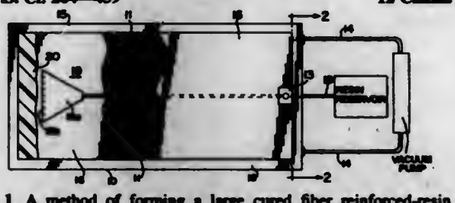
1. A method for the production of a deformable material for orthopaedical, surgical, veterinary and technical applications, based upon poly-ε-caprolactone, wherein equimolecular weight amounts of ε-caprolactone, polyurethane prepared of polyoxypropylene glycol and toluene-di-isocyanate, and ethylene-butylene-styrene-copolymer are reacted together under heating, and with reflux cooling of vapours during said reaction, triallylcyanurate in an amount of 0.3 to 3.5% wt./wt. and slowly oleic acid-imide in an amount of about 1% wt./wt. of the total mass are added, and the reaction product is cooled down, washed and granulated, and brought into the desired surgical or technical shape by injection moulding or extrusion, followed by irradiation with gamma rays of up to 2.5 Mrad, to obtain a solid flexible shape of flexibility and elasticity, as required for practical use.

**5,500,164**

**METHOD AND APPARATUS FOR PRODUCING LARGE FIBER REINFORCED STRUCTURES**

Mark Livesay, El Cajon, Calif., and William Gallup, Orlando, Fla., assignors to Synergistic Composite Systems Inc., Houston, Tex.

Filed May 2, 1994, Ser. No. 236,894
Int. Cl.[6] B29C *70/44*
U.S. Cl. 264—459 12 Claims



1. A method of forming a large cured fiber reinforced-resin composite structure comprising the steps of:

providing at least one reinforcing fiber mat or fabric; enclosing said fiber mat or fabric in a vacuum envelope comprising a fluid impervious material having at least one vacuum port and at least ore resin supply inlet having a gas tight seal and a supply conduit inserted therethrough;

positioning said supply conduit at the opposite end of the vacuum envelope from the vacuum ports;

evacuating said vacuum envelope and introducing a flow of a curable resin composition through said supply conduit at a flow rate up to about the rate of evacuation and to establish and maintain an advancing resin front and withdrawing from said envelope said supply conduit at a rate sufficient to keep equal or ahead of said resin front to uniformly distribute said resin composition to every part of said vacuum envelope until said vacuum envelope is filled; stopping the evacuation when the vacuum envelope is filled with the resin;

withdrawing the supply conduit; and curing said resin to form said composite structure.

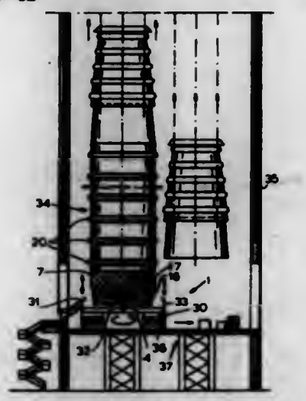
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**5,500,165**

**PROCESS FOR MANUFACTURING A FLUE MADE OF FIBER-REINFORCED PLASTIC, PARTICULARLY OF A STACK FOR DISCHARGING CHEMICALLY AGGRESSIVE FUMES**

Mario Cargnelutti, Gemona del Friuli, Italy, assignor to Gruppo Serpiast S.p.A., Priero Gargallo, Italy

Filed Jun. 2, 1993, Ser. No. 71,287
Int. Cl.[6] B28B *7/22;* B04B *1/16;* F27D *1/16*
U.S. Cl. 264—32 7 Claims



1. A process for manufacturing a flue made of fiber-reinforced plastic in place within a stack for discharging chemically aggressive fumes, said process comprising the steps of:



(a) forming within said stack an inner layer of said flue of fiber-reinforced material spaced from an inner wall of said stack;

(b) raising said inner layer of fiber-reinforced material and applying an outer layer of fiber-reinforced material over said inner layer and spaced from said inner wall of said stack; and

(c) repeating steps (a) and (b) until a complete fiber-reinforced plastic flue is constructed within said stack which is self supporting and spaced from said inner wall of said stack, said flue comprising, an upper end portion which forms a first annular region located above a stationary mold on which said layers are formed and cured and which upper end portion consists of a plurality of layers of material of preset thickness, and wherein below said first annular region of said flue on an upper part of said mold there is at least one second annular region of said flue on said mold having a layer of chemically-resistant material against said mold and a layer of mechanically-resistant material on said layer of chemically-resistant material, below said second annular region there is a third annular region of said flue of substantially the same height as said second annular region and in which said layer of chemically-resistant material lies against said mold, and below said third annular region there is a free surface of said mold of a height substantially equal to the heights of said second and third annular regions of said flue, said process further comprising the steps of:

applying a layer of chemically-resistant material on said free surface of said mold simultaneously with application of a layer of mechanically-resistant material on said layer of chemically-resistant material in said third annular region and application of at least one further layer of material to said layer of mechanically-resistant material of said second annular region;

permitting said layers to cure for a preset time;

sliding said flue upwardly to expose a new free surface of said mold and form new third, second and first annular regions of said flue above said free surface of said mold; and

repeating said application of said layer of chemically resistant material to said free surface, said layer of mechanically-resistant material to said layer of chemically-resistant material of said third annular region and said at least one further layer of material to said layer of mechanically-resistant material of said second annular region until a full height of said flue is built up within said stack.

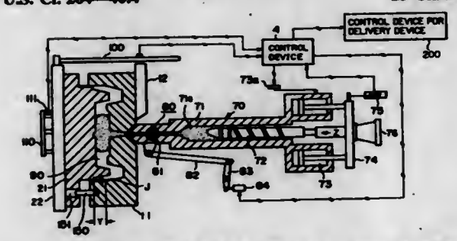
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**5,500,166**

**METHOD FOR CONTROLLING INJECTION VOLUME OF MATERIAL INTO MOLD**

Yosuke Sasaki, Zama, and Hideaki Okubo, Hiratsuka, both of, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Division of Ser. No. 10,562, Jan. 28, 1993, Pat. No. 5,370,518.
This application Sep. 15, 1994, Ser. No. 306,683
Claims priority, application Japan, Jan. 29, 1992, 4-38526; Feb. 7, 1992, 4-56981; Feb. 26, 1992, 4-75532
Int. Cl.[6] B29C *45/08;45/64*
U.S. Cl. 264—40.4 25 Claims




1. A method of controlling the injection volume of molten plastic material in an injection and compression molding apparatus wherein molten plastic material is fed from a heating cylinder through a flow control valve into a mold cavity defined between a stationary die and a movable die, said method comprising the steps of:

providing a reciprocable feed screw in the heating cylinder, the feed screw incorporating a counterflow preventing valve,

retracting the feed screw with the counterflow preventing valve being open so as to feed plastic material through the counterflow preventing valve,

then advancing the feed screw while the flow control valve is maintained in its closed position so as to cause the counterflow preventing valve to close and thereby raise the pressure of the molten plastic material in a portion of the heating cylinder between the counterflow preventing valve and the flow control valve to a predetermined pressure,

determining whether the movable die is at a predetermined distance from the stationary die,

initiating the injection of molten plastic material into the mold cavity by opening the flow control valve after the pressure of the molten plastic material in the portion of the heating cylinder between the counterflow preventing valve and the flow control valve has reached said predetermined pressure and the movable die is at said predetermined distance from the stationary die,

setting as an original point of a determination of the injection volume one of (a) a position of the feed screw at the opening of the flow control valve after the pressure of the molten plastic material reaches the predetermined pressure and (b) a time at the opening of the flow control valve after the pressure of the molten plastic material reaches the predetermined pressure,

injecting the molten plastic material through the thus opened flow control valve into the mold cavity while there is a clearance between the movable die and the stationary die and the mold cavity is open to atmospheric pressure,

determining the injection volume of the molten plastic material fed from the heating cylinder through the flow control valve into the mold cavity which is open to atmospheric pressure by one of (a) ascertaining, as the molten plastic material is being injected into the mold cavity, when a position of the feed screw is at a predetermined distance further advanced from the thus set original point, and (b) ascertaining, as the molten plastic material is being injected into the mold cavity, when the feed screw has been further advanced from the thus set original point for a predetermined time,

actuating the flow control valve to its closed position, to terminate the injection of the molten plastic material into the mold cavity, upon the occurrence of one of (i) the position of the feed screw is ascertained to be at a predetermined distance from the thus set original point and (ii) the feed screw has been further advanced from the thus set original point for a predetermined time, and

after the flow control valve is closed, moving the movable die toward the stationary die until the movable die abuts against the stationary die to compress the plastic material in the mold cavity at a high pressure,

whereby the molten plastic material in the heating cylinder is not exposed to the high pressure of the compressing of the plastic material in the mold cavity.

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**5,500,167**

**METHOD OF PREPARING A SUPPORTED MICROPOROUS FILTRATION MEMBRANE**

Peter J. Degen, Huntington, N.Y., assignor to Pall Corporation, East Hills, N.Y.

Division of Ser. No. 91,152, Jul. 12, 1993, Pat. No. 5,433,859.
This application May 26, 1995, Ser. No. 451,184
Int. Cl.[6] B29C *65/00;* B01D *29/00*
U.S. Cl. 264—41 13 Claims

1. A method of preparing a supported microporous filtration membrane comprising

providing a porous nonwoven support material having first and second sides,



applying a first casting solution onto said first side of said support material to form a first casting solution layer having a substantially smooth surface,

applying a second casting solution onto said substantially smooth surface of said first casting solution layer to form a second casting solution layer prior to the complete formation of a microporous membrane from said first casting solution, and

forming a continuous microporous membrane having first and second zones from the first and second casting solutions such that said first side of said support material is integral with said first zone while not protruding into said second zone, and said first zone has a pore size at least about 50% greater than the pore size of said second zone.

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**5,500,168**

**PARTIAL PAD FOAM MOLDING METHOD**

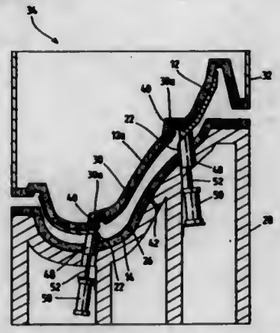
**Hiroshi Suzuki, Anjyo, Japan, assignor to Kabushiki Kaisha Inoac Corporation, Aichi, Japan**

**Filed Sep. 8, 1994, Ser. No. 302,540**

**Claims priority, application Japan, Jun. 7, 1994, 6-150405**

**Int. Cl.[6] B29C *44/06;44/12***

**U.S. Cl. 264—46.5** **1 Claim**



1. A process for molding a pad on an instrument panel by partially covering an intended area of a surface of a panel main body with a surfacing material and then filling a urethane foam undergoing foaming in a space defined between said intended area of the partially covered panel main body and said surfacing material; wherein:

said surfacing material is preliminarily provided with an edge portion which stands from a periphery towards a rear surface of said surfacing material so that said edge portion defines a predetermined shape for said pad; and

said panel main body is provided with a recess in said intended area that is at least partially covered by said surfacing material, said recess allowing said edge portion of said surfacing material to intrude into said recess and being shaped in a same configuration as said edge portion; and wherein

said surfacing material which has said shape for said pad via said edge portion which stands toward said rear surface of said surfacing material is set in such a way that a front surface of said surfacing material is abutted against a cavity of a lower die and said edge portion stands upward, said edge portion being supported in an upward orientation, until closing said lower die relative to an upper die, by descendible supporting members which extend from said cavity to support said edge portion and descend at least to a wall of said cavity upon closing said lower die relative to said upper die;

said panel main body is provided with said recess shaped in a same configuration as said edge portion and is set in such a way that a rear surface of a panel main body is abutted against a core of said upper die and said recess faces downward;

said edge portion of said surfacing material is brought into said recess of said panel main body by closing said lower die relative to said upper die; and then

a urethane stock solution is foamed in a space that is surrounded by said edge portion and defined between said rear surface of said surfacing material and a front surface of said panel main body, thus molding an instrument panel which is partially provided with a pad that has a urethane foam as a core material.

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**5,500,169**

**METHOD AND DIE APPARATUS FOR PRODUCING PLASTIC MOLDING HAVING FOAM WITH SKIN**

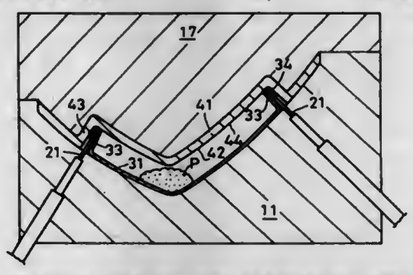
**Tetsuo Kondo, and Akihiko Murakami, both of Anjo, Japan, assignors to Kabushiki Kaisha Inoac Corporation, Aichi, Japan**

**Filed Nov. 8, 1994, Ser. No. 337,433**

**Claims priority, application Japan, May 27, 1994, 6-138320**

**Int. Cl.[6] B29C *65/00;65/78***

**U.S. Cl. 264—46.5** **10 Claims**




1. A method for producing a plastic molding having a foam with a skin on an outer surface of a core wherein a foaming material is foamed in a space defined between a skin member and the core, disposed within a molding die assembly having an upper die and a lower die, comprising the steps of;

disposing the skin member which is provided with side portions and recessed grooves at the edge portions thereof, on the lower die of the molding die assembly, and fitting edge holders projecting from the lower die into the recessed grooves of the skin member to hold the skin member;

disposing the core which is provided with a recess in which the skin member is received, in the molding die assembly;

pouring the foaming material in a space between the skin member and the bottom surface of the core to foam the foaming material; and,

retracting the edge holders into the lower die during the foaming before the foaming is completed.

7. An apparatus for producing a plastic molding including a lower die on which a skin member which is provided with side portions formed by bending the end portions of the skin member backward and recessed grooves at the edge portions thereof, formed by bending the end portions of the side portions forward is disposed, and an upper die on which a core which is provided with a recess in which the skin member is received is disposed, wherein



a foaming material is foamed between the skin member and the bottom surface of the core, comprising;

edge holders provided in the lower die having a die surface, said edge holders being provided with holding members which can be selectively fitted in the recessed grooves of the skin member to hold the skin member, and means to enable the holding members to be projected from and retracted into the die surface of the lower die.

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**5,500,170**

**HEATING AND EXTRUDING METHOD AND DEVICE FOR BULK PREFORM**

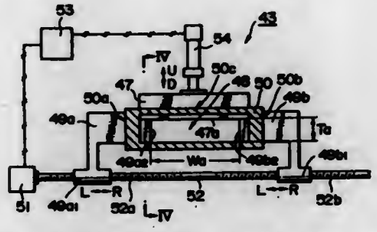
**Toshiaki Okumura; Takao Ekimoto; Satoshi Shimamoto; Katsumi Ogawa; Masahiro Tomita; Yoshitaka Nimura, and Ryosaku Kadowaki, all of Kobe, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan**

**Continuation of Ser. No. 28,194, Mar. 9, 1993, Pat. No. 5,458,838. This application Nov. 28, 1994, Ser. No. 348,159**

**Claims priority, application Japan, Mar. 11, 1992, 4-88024; Jun. 4, 1992, 4-171794**

**Int. Cl.[6] B29B *11/10;11/16;* B29C *47/16***

**U.S. Cl. 264—148** **1 Claim**




1. A method of molding a part, comprising the steps of:

extruding a fiber reinforced composite material in a melted condition from an extruding lip of an extruding machine to a compression molding machine;

adjusting at least one of an extrusion width and an extrusion thickness of the exterior dimension of said melted composite material being extruded from the extruding lip in consideration of a shape and physical properties of a mold for a molded part to be obtained;

cutting said melted composite material to a desired length; and

molding the part in the mold.

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**5,500,171**

**LAMINATING RESINS HAVING LOW ORGANIC EMISSIONS (II)**

**Thomas W. Smeal, Murrysville Boro, and George L. Brownell, Mount Lebanon, both of Pa., assignors to Aristech Chemical Corporation, Pittsburgh, Pa.**

**Continuation-in-part of Ser. No. 24,022, Mar. 1, 1993, abandoned. This application Mar. 3, 1994, Ser. No. 205,233**

**Int. Cl.[6] B29C *41/08;41/12***

**U.S. Cl. 264—309** **6 Claims**

1. Method of laminating a solid formed body comprising (a) providing a forming surface having a desired positive or negative shape, (b) providing a liquid mixture comprising (1) about two parts by weight unsaturated polyester resin, (2) about one part to about four parts by weight alkoxylated bisphenol-A diacrylate or dimethacrylate, (3) about 20% to about 60%, based on the total weight of (1) and (2), of ethylene glycol dimethacrylate, and (4) an effective amount of a polymerization catalyst, (c) applying said mixture to said forming surface at ambient temperatures in layers while permitting said layers incrementally to polymerize, thereby building said shaped article, and wherein no more than 20.0 $g/m^2$ of volatile emissions as measured by Section 1162 of the Regulations of the South Coast (California) Air Quality District are created, and (d) removing the finished solid formed body from said forming surface.

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**5,500,172**

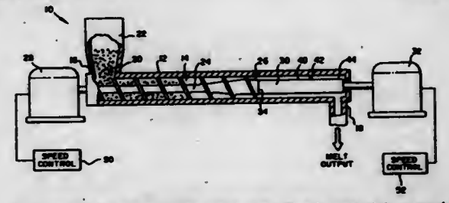
**METHOD FOR PLASTICIZING PARTICULATE PLASTIC MATERIAL**

**Stephen J. Derezinski, Penfield, and Stephen T. Faulkenberry, Conesus, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Division of Ser. No. 942,253, Sep. 9, 1992, Pat. No. 5,358,327. This application Jun. 14, 1994, Ser. No. 259,430**

**Int. Cl.[6] B29B *7/46;* B29C *47/80***

**U.S. Cl. 264—68** **6 Claims**




1. A method of plasticizing particulate plastic material, comprising the steps of:

providing a plasticizer, the plasticizer comprising:

a housing, the housing having a bore therethrough, and the bore having an inlet end and an outlet end;

an auger positioned in the bore, the auger having a discharge end at an intermediate location in the bore; and

a smooth-walled, cylindrical rotor positioned in the bore between the auger and the outlet end, the bore and the rotor defining an annulus therebetween, and the rotor having a first end positioned proximate to the discharge end of the auger, the rotor having an axial length and the annulus extending from the first end along the length of the rotor;

feeding the plastic particulate material into the bore at the inlet end;

rotating the auger at a desired speed and thereby conveying the particulate plastic material at a desired flow rate through the outlet end and frictionally melting the particulate plastic material before passing the discharge end to form a melt; and

rotating the rotor at a desired speed to uniformly heat the melted particulate plastic material passing from the discharge end of the auger and through the annulus to a desired temperature independent of the flow rate of the melted plastic through the annulus.

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**5,500,173**

**METHOD OF MAKING MOLDED MUTICOMPONENT ARTICLES USING A THIN PLATE FLOW DISTRIBUTOR**

**Jeffrey S. Dugan, Asheville, N.C., assignor to BASF Corporation, Mount Olive, N.J.**

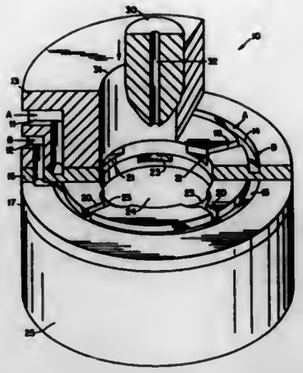
**Filed Feb. 17, 1995, Ser. No. 390,040**

**Int. Cl.[6] B29C *47/04***

**U.S. Cl. 264—75** **40 Claims**

1. A method of making a non-laminated, non-fiber, multicomponent molded article from a plurality of respectively dissimilar fluid components, wherein said molded article comprises said plurality of components in a predetermined spatial, non-laminate configuration, said method comprising the steps of:

(A) providing a molded-article-forming structure comprising: (i) a plurality of mutually-separated feed conduits, each of said feed conduits being disposed to receive and direct one of said plurality of fluid components; (ii) at least one distribution flow plate disposed downstream of and in fluid communication with said feed conduits; (iii) a combining section disposed in fluid communication with said at least one distribu-



tion flow plate; and (iv) a shaping section disposed in fluid communication with said combining section; wherein said at least one distribution flow plate has formed on at least one common facial surface thereof multiple, mutually-separated distribution flow paths having a configuration sufficient to distribute and arrange said fluid components into said predetermined spatial, non-laminate configuration; each flow path having an inlet end disposed in fluid communication with one of said feed conduits and an outlet end disposed in fluid communication with said combining section, wherein each of said flow paths is comprised of at least one distribution channel and one distribution aperture, the at least one distribution channel having a lesser depth than a thickness of said at least one distribution flow plate;

(B) feeding said fluid components through said feed conduits and into said multiple distribution flow paths, each fluid component being fed through a separate feed conduit and into a separate flow path;

(C) directing said fluid components from said flow paths and into said combining section to form a fluid structure having said components arranged in said predetermined spatial, non-laminate configuration; and

(D) directing said fluid structure into said shaping section and therein subjecting said fluid structure to a non-fiber-forming, non-laminate-forming shaping process to form said molded article.

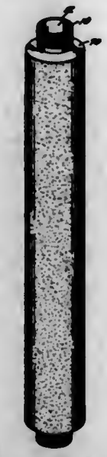
27. A non-fiber-forming, non-laminate-forming, molded article-forming structure for making a non-fiber, non-laminated, multi-component molded article from a plurality of respectively dissimilar fluid components, said molded article comprising said plurality of components in a predetermined spatial, non-laminate configuration, the molded article-forming structure comprising: (i) a plurality of mutually-separated feed conduits, each of said feed conduits being disposed to receive and direct one of said plurality of fluid components; (ii) at least one distribution flow plate disposed downstream of and in fluid communication with said feed conduits; (iii) a combining section disposed in fluid communication with said at least one distribution flow plate; and (iv) a shaping section disposed in fluid communication with said combining section; wherein said at least one distribution flow plate has formed on at least one common facial surface thereof multiple, mutually-separated distribution flow paths having a configuration sufficient to distribute and arrange said fluid components into said predetermined spatial, non-laminate configuration; each flow path having an inlet end disposed in fluid communication with one of said feed conduits and an outlet end disposed in fluid communication with said combining section, wherein each of said flow paths is comprised of at least one distribution channel and one distribution aperture, the at least one distribution channel having a lesser depth than a thickness of said at least one distribution flow plate.

**5,500,174**

## METHOD OF MANUFACTURE OF A PREPACKED RESIN BONDED WELL LINER

Gregory D. Scott, 3107 Singingwood Dr., Torrance, Calif. 90505

Filed Sep. 23, 1994, Ser. No. 311,577
Int. Cl.[6] B29C *35/02*; B32B *1/08*
U.S. Cl. 264—112 13 Claims



1. A method of manufacturing a prepacked resin bonded well liner for a piped well, said method comprising:

(a) forming a layer of particles upon a perforated pipe, said particles being coated with resin which is partially polymerized to form a nontacky coating upon said particles such that said particles remain free flowing at ambient temperatures, said resin being reactive to soften or melt when heated to temperatures above ambient and then cure into an infusible cross-linked state; and

(b) heating said particles above ambient temperature to bond said particles to said perforated pipe.

13. A method of manufacturing a prepacked resin bonded well liner for a piped well, said method comprising:

(a) forming a plurality of apertures in a base pipe to form a perforated pipe, said perforated pipe being substantially cylindrical in configuration with a concentric circular first bore disposed along the axis thereof to define a tubular sidewall, said apertures longitudinally spaced and formed radially therethrough;

(b) positioning an inner mold into said first bore of said perforated pipe to restrict material communication through said apertures, said inner mold being cylindrical in configuration having a diameter substantially equal to the diameter of said perforated pipe first bore to engage the inner sidewall of said perforated pipe to restrict the flow of particulate matter through said apertures;

(c) positioning said perforated pipe in an outer mold, said outer mold including a second circular bore having a diameter larger than the outer diameter of said perforated pipe, said perforated pipe positioned to form an annular space between said outer mold and said perforated pipe;

(d) attaching a first endplate to a first extremity of said outer mold, said first endplate including a circular orifice having a diameter substantially equal to the diameter of said perforated pipe and configured concentric with the axis of said second circular bore for telescopic receipt of a first extremity of said perforated pipe;

(e) filling said annular space with particles, said particles being coated with resin which is partially polymerized to form a nontacky coating upon said particles such that said particles remain free flowing at ambient temperatures, said resin being reactive to soften or melt when heated to temperatures above ambient and then curing into an infusible cross-linked state;



(f) attaching a second endplate to the second extremity of said outer mold, said second endplate including a circular orifice having a diameter substantially equal to the diameter of said perforated pipe and configured concentric with the axis of said second circular bore for telescopic receipt of a second extremity of said perforated pipe;

(g) heating said resin coated particles such that said resin fuses and unites at contact areas between contiguous particles to form a porous matrix having interstices of a predetermined size, said porous matrix affixing to said perforated pipe to define a prepacked resin bonded well liner;

(h) removing said endplates from said first and second extremities of said outer mold;

(i) extracting said outer mold from said prepacked resin bonded well liner; and

(j) extracting said inner mold from said prepacked resin bonded well liner.

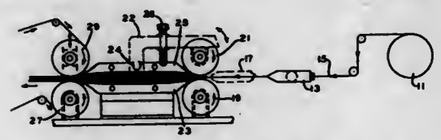
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**5,500,175**

## PROCESS OF PRODUCING HEAT-SOFTENABLE, HOPPER-FEEDABLE PLASTIC PELLETS CONTAINING FOLDED REINFORCING FIBERS

Rexford H. Brandt, 725 E. Fort Wayne St., Warsaw, Ind. 46580

Filed Nov. 2, 1994, Ser. No. 333,504
Int. Cl.[6] B29C *53/02*
U.S. Cl. 264—151 10 Claims



1. The process of producing heat softenable, hopper feedable plastic pellets containing reinforcing fibers comprising the steps of:

forming an elongated web of fiber reinforced plastic material;

moving the web in the direction of web elongation along a path;

impeding the progress of web motion at a selected location along the path so that web speed along the path subsequent to the selected location is less than the web speed along the path prior to the selected location causing the web to wrinkle thereby folding the reinforcing fibers to increase the fiber length per unit of web length; and

subsequently cutting the web into individual pellets.

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**5,500,176**

## PROCESS FOR THE PRODUCTION OF MOLDED PRODUCTS USING INTERNAL MOLD RELEASE AGENTS

Kristen L. Parks, Wexford; Richard W. Miteser, Pittsburgh, and Merle W. Lesko, McDonald, all of Pa., assignors to Bayer Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 123,489, Sep. 17, 1993, abandoned. This application Jul. 14, 1994, Ser. No. 275,687
Int. Cl.[6] B29C *45/00*; *70/12*
U.S. Cl. 264—257 10 Claims

1. In a process for producing a SRIM molded part having a density of from 1.3 to 2.0 g/cc, by reacting a reaction mixture comprising an organic polyisocyanate and at least one organic compound containing isocyanate-reactive hydrogens in the presence of a catalyst and an internal mold release agent in a closed mold to form a SRIM molded part, the improvement wherein said internal mold release agent comprises:

a) from at least 0.2 to 7.5% by weight, based on the weight of said reaction mixture, of mixed esters comprising the reaction product of

i) aliphatic dicarboxylic acids,

ii) aliphatic polyols, and

iii) monocarboxylic acids with 12 to 30 carbon atoms in the molecule;

wherein said reaction product has an acid number of less than 25 and a hydroxyl number of less than 25, with the proviso that said internal mold release agent excludes esters selected from the group consisting of: (1) esters of (i) dicarboxylic acids and (ii) aliphatic monofunctional alcohols of 12 to 30 carbon atoms, (2) esters of (i) aliphatic monofunctional alcohols having 12 to 30 carbon atoms, and (ii) aliphatic hydrocarbon monocarboxylic acids with 12 to 30 carbon atoms, and (3) complete esters or partial esters of (i) aliphatic polyols and (ii) aliphatic hydrocarbon monocarboxylic acids having 12 to 30 carbon atoms.

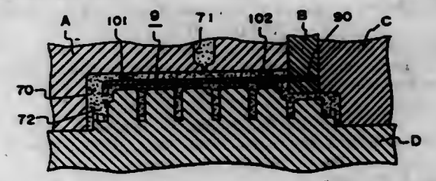
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**5,500,177**

## MANUFACTURING METHOD FOR BATTTERY COVERS

Sachio Uemichi, Takatsuki, and Shuji Takahashi, Wako, both of, Japan, assignors to Yuasa Corporation, Takatsuki, and Honda Giken Kogyo Kabushiki Kaisha, Saitama, both of, Japan

Continuation of Ser. No. 885,636, May 19, 1992, abandoned, which is a division of Ser. No. 808,311, Dec. 16, 1991, Pat. No. 5,208,117. This application Nov. 15, 1993, Ser. No. 151,766
Claims priority, application Japan, Dec. 18, 1990, 2-412008; Apr. 17, 1991, 3-85201; Apr. 24, 1991, 3-122472
Int. Cl.[6] B29C *45/14*; *70/70*
U.S. Cl. 264—277 1 Claim



1. A method of making a battery cover having a convex portion including a filling part on its upper surface and having a pair of tab terminals, one end of each tab terminal projecting from the convex portion, comprising:

providing plural molds which form when closed a mold space corresponding to a desired shape of the cover,

disposing plural U-shaped synthetic resin spacer around each tab terminal pieces spaced along each tab terminal, said U-shaped synthetic resin spacers each having a thickness which fills a portion in a vertical direction of said mold space above and below each tab terminal when said molds are closed such that a distance is provided between top and bottom surfaces of each tab terminal and surfaces defining said mold space;

closing the molds;

filling synthetic resin in the mold space to embed the tab terminals, said U-shaped synthetic resin spacer preventing displacement of the tab terminals during filling of the synthetic resin, said U-shaped spacers being made of the same synthetic resin as the synthetic resin used for filling said mold space, thereby making said battery cover.

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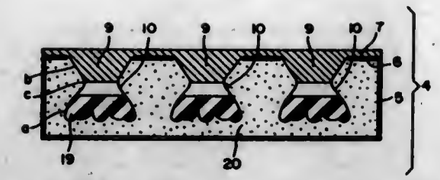
**5,500,178**

## METHOD OF MANUFACTURING HOLLOW MOLDED ARTICLES

Toshihiro Hayashi; Hiroshige Kohno; Akinori Watanabe, all of Tokyo, and Itaru Horiguchi, Ryugasaki, all of, Japan, assignors to Asahi Denka Kogyo Kabushikikaisya, and Okamoto Industries, Inc., both of Tokyo, Japan

Filed Jul. 27, 1993, Ser. No. 97,222
Claims priority, application Japan, Jul. 31, 1992, 4-205370
Int. Cl.[6] A23G *3/12*; A23P *1/00*
U.S. Cl. 264—297.8 13 Claims

1. A method of manufacturing a hollow molded article, which comprises providing a hollow elastic molding die made of an



elastic film having an internal shape and an internal volume, and having an opening port for providing access to the internal volume, feeding a material to be molded in an amount smaller than the internal volume of said elastic molding die into the internal volume of said elastic molding die through said opening port, closing said opening port, wherein an external shape of said elastic molding die is maintained by a fluid or powdery holding member that conforms to the external shape of the elastic molding die and wherein when the elastic molding die is rotated in all directions it is held firm by said holding member, solidifying said material to be molded while said elastic molding die is rotated in all directions to form a solidified hollow molded article, and removing said solidified hollow molded article from said elastic molding die.

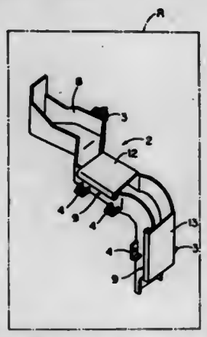
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**5,500,179**

**METHOD OF MANUFACTURING HARNESS PART FOR AUTOMOBILE**

Yasuhiko Onishi; Takashi Yamamori; Yozou Yamashita; Ichiro Suzuki, and Toshiya Aoyama, all of Yokkaichi, Japan, assignors to Sumitomo Wiring Systems, Ltd., Yokkaichi, Japan

Filed Feb. 1, 1994, Ser. No. 189,740
Claims priority, application Japan, Feb. 2, 1993, 5-039438
Int. Cl.[6] B29C *49/04;49/20;49/22*
U.S. Cl. 264—400 1 Claim



1. A method of manufacturing a harness part for an automobile, said method comprising the steps of:

numerically controlled (NC) blow molding a hollow resin product from a resin material by NC blow molding a parison arranged in a metal mold, wherein said NC blow molding step includes co-extruding a different material, which is unbondable to said resin material, into said parison in the form of a stripe for partitioning said resin material along a circumferential direction of said parison in correspondence to a separated position of said hollow resin product, thereby molding said hollow resin product;

laser beam machining said hollow resin product by cutting said hollow resin product with a laser beam thereby manufacturing a solid harness part for an automobile; and

inserting a mounting member in a prescribed position of said metal mold in advance of said NC blow molding step, so that said mounting member is insert-molded by said NC blow molding step;

further comprising the step of forming a suspended extending portion having a substantially U-shaped section so as to extend on one side of said hollow resin product, which includes:

forming the different material, which is unbondable to the resin material, to be arranged in a vertical intermediate position of an inner wall portion of said suspended extending portion,

removing the different material whereby a clearance between the inner wall portion and an outer wall portion of said suspended extending portion is formed to be one of substantially identical to and slightly narrower than a thickness of the inner wall portion, and

fitting a left part of the inner wall portion in the clearance between the inner wall portion and the outer wall portion of said suspended extending portion, whereby a locked state is maintained.

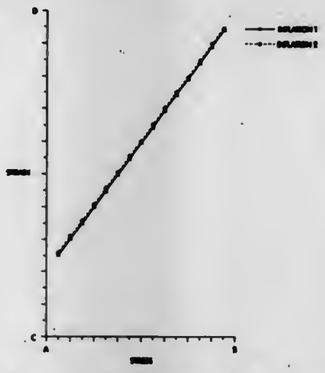
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**5,500,180**

**METHOD OF MAKING A DISTENSIBLE DILATATION BALLOON USING A BLOCK COPOLYMER**

Jere R. Anderson, Newburyport; Louis J. Jandris, Georgetown; Michael D. Barbere, Dunstable, and Richard T. Murphy, Dracut, all of Mass., assignors to C. R. Bard, Inc., Murray Hill, N.J.

Filed Sep. 30, 1992, Ser. No. 954,750
Int. Cl.[6] A61M *29/02;* B29C *49/10*
U.S. Cl. 264—532 6 Claims



1. A process of forming a dilatation balloon for a catheter comprising:

a. providing a parison comprising a block polymer composition including a block copolymer having regions of (i) hard segments defined by regions of intermolecular chain interaction separated by (ii) soft segments regions in which individual polymer portions of chains have the ability to uncoil, said parison having a predetermined initial outer diameter, a predetermined wall thickness and a predetermined length;

b. subjecting said parison to at least one axial stretch step and at least one radial expansion step at temperature $T_1$ which is below the melting temperature of said block copolymer to increase the diameter and length of said parison to at least three times the original diameter and at least two times the original length and to decrease the original wall thickness such that an expanded parison is formed having an internal diameter between about 6 and about 8 times an initial internal diameter of said parison and an outside diameter which is equal to or greater than 3 times an initial outside diameter of said parison;

c. heating said expanded parison to a temperature $T_2$ which is above $T_1$ but below the melting temperature of said block polymer; and

d. cooling said expanded parison to produce said balloon;



wherein the ratio of said hard segments to said soft segments provides said balloon with (a) an elastic stress response not greater than 5.00, (b) a wall tensile strength of at least about 14000 psi and (c) a distensibility of between about 5% and about 20%.

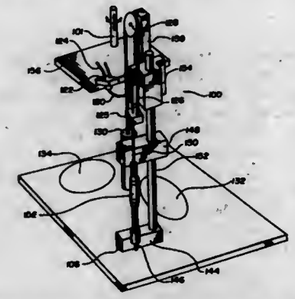
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**5,500,181**

**SHRINKING BALLOON CATHETER HAVING NONLINEAR COMPLIANCE CURVE**

Lixiao Wang, St. Paul, and The T. T. Tran, Coon Rapids, both of Minn., assignors to Scimed Life Systems, Inc., Maple Grove, Minn.

Division of Ser. No. 245,372, May 18, 1994, Pat. No. 5,403,340, which is a division of Ser. No. 953,677, Sep. 29, 1992, Pat. No. 5,348,538. This application Jan. 3, 1995, Ser. No. 368,607
Int. Cl.[6] B29C *49/04;49/14*
U.S. Cl. 264—532 9 Claims



1. A method of producing a balloon catheter including a single layered balloon made from non compliant material such that the balloon will have a hybrid compliance curve, comprising the steps of:

(a) placing an elongated tube made of non compliant material into a balloon blow mold;

(b) constraining a first end of the elongated tube in the balloon blow mold and restricting the flow of fluid through said first end of the tube;

(c) submerging the balloon blow mold in water at about 95° Centigrade and applying pressure to the interior of the elongated tube sufficient to expand the tube such that the tube expands diametrically to thus form a balloon having a specific diameter;

(d) removing the balloon blow mold from the water after it has been submerged for about 45 seconds and submerging it in water at room temperature;

(e) removing the balloon blow mold from the room temperature water after about 10 seconds;

(f) removing the balloon from the balloon blow mold and using it to assemble a balloon catheter;

(g) submerging the balloon catheter in water or air at 30°–80° Centigrade for from 1 to 50 minutes to thereby shrink the balloon to a diameter that is less than its specific diameter.

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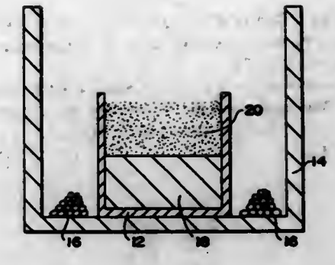
**5,500,182**

**CERAMIC COMPOSITE BODIES WITH INCREASED METAL CONTENT**

Philip J. Roach, Newark, Del., assignor to Lanxide Technology Company, LP, Newark, Del.

PCT No. PCT/US91/04949, § 371 Date Jan. 11, 1993, § 102(e) Date Jan. 11, 1993
PCT Filed Jul. 12, 1991, Ser. No. 960,408
Int. Cl.[6] B22F *9/12*
U.S. Cl. 419—45 18 Claims

1. A method for producing a self-supporting body, comprising:



providing at least one porous self-supporting body which is made by a process comprising: (i) forming an admixture comprising a powdered parent metal and a mass comprising at least one boron donor material, wherein an amount of said mass comprising at least one boron donor material of said admixture is insufficient to react completely with all of said parent metal; (ii) heating said parent metal in a substantially inert atmosphere to a temperature above its melting point to form molten parent metal contacting said mass comprising at least one boron material; (iii) maintaining said temperature for a time sufficient to permit reaction of said molten parent metal with said mass comprising at least one boron donor material to form at least one boron-containing compound; (iv) continuing said reaction for a time sufficient to produce said at least one porous self-supporting body;

contacting at least a portion of said at least one porous self-supporting body with at least one body of molten metal having a composition which is substantially similar to said parent metal;

infiltrating at least a portion of the porosity of said at least one porous self-supporting body with molten metal; and

continuing said infiltration for a time sufficient to infiltrate a desired amount of porosity, thereby forming a self-supporting body which is more dense than said at least one porous self-supporting body.

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**5,500,183**

**SN ALLOY BULLET THEREFOR**

Jan Noordegraaf, Driebergen-Rijsenburg; Martinus A. Oud, Krimpen a/d IJssel; Harry Bekm, and Roelof de Rooy, both of Naarden, all of, Netherlands, assignors to Billiton Witmetaal B.V., Netherlands

Filed Nov. 23, 1994, Ser. No. 344,896
Claims priority, application Netherlands, Nov. 26, 1993, 9302056
Int. Cl.[6] C22C *13/02;* F42B *12/74;30/02*
U.S. Cl. 420—557 20 Claims

1. A bullet for use as a projectile, said bullet formed of a tin alloy, said tin alloy consisting essentially of:

0.2–10% by weight copper;

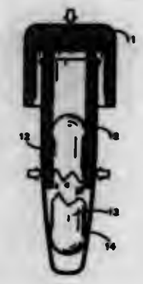
no greater than 20% by weight antimony;

no greater than 1% by weight Eutinal, wherein said Eutinal is 90% by weight zinc, 5% by weight magnesium, and 5% by weight aluminum;

inevitable impurities; and

the balance tin.

**5,500,184**
**SELF-CONTAINED BIOLOGICAL INDICATORS**
Steven G. Palmer, Apex, N.C., assignor to American Sterilizer Company, Erie, Pa.
Continuation of Ser. No. 125,773, Sep. 24, 1993, abandoned. This application Jul. 8, 1994, Ser. No. 273,026
Int. Cl.[6] A61L 2/00; C12Q 1/22
U.S. Cl. 422—2 9 Claims



7. A method of minimizing contamination by residuals in hydrogen peroxide processes, said method including the steps
providing a sterilization treatment process utilizing a sterilant comprising hydrogen peroxide;
providing a biological indicator including an element formed of a predetermined material wherein said predetermined material retains hydrogen peroxide residue at a sufficiently low level to substantially avoid erroneous biological detection results;
carrying out said sterilization treatment process using said biological indicator.

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**5,500,185**
**DEOXYGENATION PROCESS**
Frances M. Cutler, Tustin, and Joseph Covey, Long Beach, both of Calif., assignors to Southern California Edison, Rosemead, Calif.
Filed Jul. 29, 1994, Ser. No. 282,910
Int. Cl.[6] C23F 11/06; C02F 1/70
U.S. Cl. 422—16 20 Claims

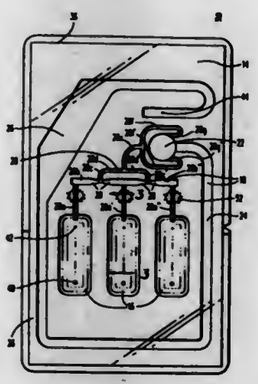
1. A method for deoxygenating water comprising the steps of:
(a) adding an oxygen scavenger selected from the group consisting of hydrazine, carbohydrazide, diethylhydroxylamine, morpholine and mixtures and derivatives thereof to water containing at least about 100 ppb oxygen, the oxygen scavenger being added to the water in an amount sufficient to result in an oxygen scavenger concentration of at least about three times the oxygen concentration;
(b) introducing the water with the oxygen scavenger added thereto into a bed of strong base anion resin selected from the group consisting of hydroxide form strong base anion resins, carbonate form strong base anion resins and carbonate/bicarbonate form strong base anion resins, the bed containing no catalyst for the reaction of the oxygen and the oxygen scavenger except for the anion resin, the water within the bed having a pH greater than about 7, the residence time of the water in the bed being at least about one minute; and
(c) removing from the bed water containing less than about 100 ppb oxygen.

**5,500,186**
**METHOD AND COMPOSITION FOR DISINFECTING CONTACT LENSES**
Mary Mowrey-McKee, Naperville; Kenneth Bilzaik, Lansing, and Ralph Stone, Naperville, all of Ill., assignors to Allergan, Inc., Irvine, Calif.
Division of Ser. No. 78,164, Jun. 17, 1993, Pat. No. 5,422,073, which is a continuation-in-part of Ser. No. 634,994, Dec. 27, 1990, abandoned. This application Mar. 10, 1995, Ser. No. 401,847
Int. Cl.[6] A61L 2/00; 2/16
U.S. Cl. 422—28 19 Claims

1. A method for disinfecting a contact lens comprising contacting said contact lens with an aqueous solution comprising an effective disinfecting amount of a tromethamine component selected from the group consisting of tromethamine, ophthalmologically acceptable salts thereof and mixtures thereof for a time sufficient to disinfect said contact lens.

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**5,500,187**
**DISPOSABLE OPTICAL AGGLUTINATION ASSAY DEVICE AND METHOD FOR USE**
James H. Deems, Glenarm; Daryl S. Milesf; Kevin E. LaCour, both of Jessup; Noe E. Rodriguez, II, Severna Park; Joseph M. Legleus, Silver Spring; Scott D. Johnson, Elkridge; Richard C. Kapraun, Baltimore, and Richard M. Young, Millersville, all of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Dec. 8, 1992, Ser. No. 986,816
Int. Cl.[6] G01N 33/558; 33/94
U.S. Cl. 422—58 20 Claims



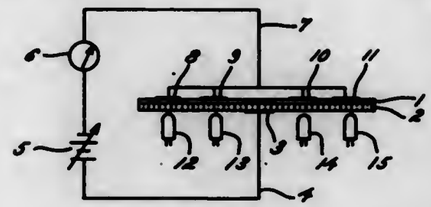
1. An assay device for use in analyzing a sample of unknown substance by mixing assay reagents with the sample, comprising:
(a) a housing having a plurality of storage reservoirs, each containing an assay reagent;
(b) an entry port for receiving a sample suspected of containing a target analyte, into said housing, said entry port having an inlet and an outlet;
(c) a controlling track for mixing and delivering the assay reagents in said reservoirs to said entry port via said inlet, and including a plurality of first portions each connected to a respective one of said reservoirs;
(d) said controlling track including a plurality of second portions each for receiving assay reagent from a respective said first portion;
(e) each said second portion including at least one discharge end in the form of a nozzle, said second portions being arranged that assay reagent discharging from a said nozzle of one of said second portions mixes with assay reagent discharging from a said nozzle of another of said second portions; and



(f) means connected to said entry port to allow analysis of the mixed assay reagents and sample after passing through said entry port to said outlet.

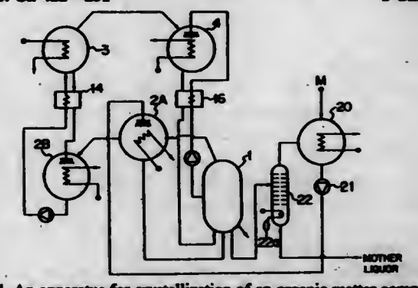
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**5,500,188**
**DEVICE FOR PHOTORESPONSIVE DETECTION AND DISCRIMINATION**
Dean G. Hafeman, Hillsborough; John W. Parce, Palo Alto, and Harden M. McConnell, Stanford, all of Calif., assignors to Molecular Devices Corporation, Sunnyvale, Calif.
Continuation of Ser. No. 664,365, Mar. 4, 1991, abandoned, which is a division of Ser. No. 231,891, Aug. 11, 1988, abandoned, which is a continuation-in-part of Ser. No. 73,763, Jul. 15, 1987, abandoned, which is a continuation-in-part of Ser. No. 834,270, Feb. 27, 1985, abandoned, which is a continuation-in-part of Ser. No. 597,135, Apr. 5, 1984, Pat. No. 4,591,550, which is a continuation-in-part of Ser. No. 585,334, Mar. 1, 1984, abandoned. This application Jan. 24, 1994, Ser. No. 185,492
The portion of the term of this patent subsequent to May 27, 2003, has been disclaimed.
Int. Cl.[6] G01N 21/27;27/07
U.S. Cl. 422—82.02 1 Claim



1. A device for making a determination of one or more substances capable of affecting the photoresponsive characteristics of a photoresponsive element, said device comprising:
one or more photoresponsive elements each having one or more sample surfaces with one or more sample sites, each of said one or more photoresponsive elements having one or more irradiation-receiving surfaces with one or more irradiation sites, each said irradiation site being in close physical relationship with a certain one of said sample sites;
irradiation means for irradiating said one or more irradiation sites on said one or more photoresponsive elements to provide distinguishable signals from each of said one or more irradiation sites;
a counterelectrode;
means for applying a first electrical signal to said photoresponsive element and said counterelectrode;
means for retaining gas, liquid, or solid material in which said substances are to be determined in contact with said one or more sample surfaces such as to affect the photoresponsive characteristics of said photoresponsive elements;
insulating means for preventing the flow of a direct or faradaic current between said photoresponsive elements and said media; and
means for measuring a second electrical signal produced as a result of said first electrical signal and said irradiating of said photoresponsive elements, where said second electrical signal is capacitively coupled across said insulating means.

**5,500,189**
**APPARATUS FOR CRYSTALLIZATION OF ORGANIC MATTER**
Minoru Morita, and Keizo Takagami, both of Tokyo, Japan, assignors to Tsukishima Kikai Co., Ltd., Tokyo, Japan
Division of Ser. No. 876,630, Apr. 30, 1992, Pat. No. 5,409,585. This application Feb. 6, 1995, Ser. No. 383,641
Claims priority, application Japan, Apr. 30, 1991, 3-097889
Int. Cl.[6] C30B 35/00
U.S. Cl. 422—251 1 Claim



1. An apparatus for crystallization of an organic matter comprising:
a crystallizer for performing adiabatic self-evaporation cooling of a refrigerant-solvent containing an organic matter;
means for withdrawing crystals from said crystallizer which crystals are produced by adiabatic self-evaporation cooling;
an absorber in fluid communication with said crystallizer for receiving and condensing an evaporated vapor of the refrigerant-solvent received from said crystallizer, said absorber also receiving a concentrated liquid absorbent solution and contacting the evaporated vapor with the concentrated liquid absorbent solution in order to condense the evaporated vapor and increase the concentration of absorbent in the liquid absorbent solution;
a generator in fluid communication with said absorber for receiving a mixture of condensed evaporated vapor and concentrated liquid absorbent solution and evaporating refrigerant-solvent therefrom and recovering the concentrated liquid absorbent solution which is transferred to said absorber;
a condenser in fluid communication with said generator for receiving and condensing the evaporated refrigerant-solvent vapor evaporated in said generator;
means for supplying the condensed refrigerant-solvent from said condenser to said crystallizer; and
means for circulating the concentrated absorbent solution between said absorber and said generator, which means for circulating returns concentrated absorbent solution, in which the concentration of absorbent is increased by said generator, to said absorber.

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**5,500,190**
**ANION EXCHANGE RESIN COMPOSITIONS CONTAINING ALMOND PASTE FOR TASTE IMPROVEMENT**
James R. Andre, and John A. Collopoulos, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Continuation of Ser. No. 855,327, Mar. 20, 1992, abandoned. This application Sep. 23, 1993, Ser. No. 127,285
Int. Cl.[6] A61K 31/78; 31/785
U.S. Cl. 424—78.1 25 Claims

1. A palatable composition of improved taste and mouthfeel as compared to the same composition not containing almond paste comprising:
(a) from about 1% to about 65% anion exchange resin;
(b) from about 5% to about 80% almond paste wherein said almond paste comprises ground almond, and one or more sweetening agents;

(c) from about 0% to about 85% carrier materials suitable for ingestion,
and wherein further said composition is in a unit dose form.

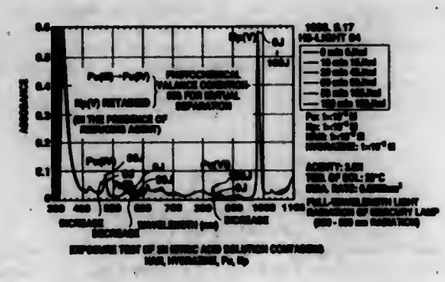
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5,500,191
PAPER COATING COMPOSITION
Michael L. DeMatte, Columbia, Md., assignor to Westvaco Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 327,475, Oct. 26, 1994, abandoned. This application Feb. 3, 1995, Ser. No. 380,341
Int. Cl.[6] B05D 3/02;3/12
U.S. Cl. 427—358 16 Claims

9. An improved method of applying a coating formulation comprising an effective amount of a scratch-healing additive and one or more additives selected from the group consisting of mineral pigments, adhesives, dispersants, lubricants, insolubilizers, viscosity-reducing additives, and viscosity-increasing additives onto paper employing blade applicators wherein the improvement comprises a coating formulation characterized by a solids content greater than 60% and, as the scratch-healing additive, sulfated oleic acid.

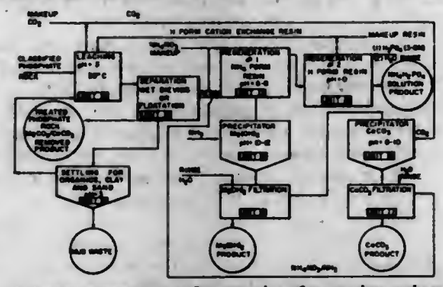
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5,500,192
METHOD OF SEPARATING NEPTUNIUM AND PLUTONIUM
Yukio Wada, Mito; Kyoichi Morimoto, Naka; Takayuki Goibuchi, Katsuta, and Hiroshi Tomiyasu, Yokohama, all of, Japan, assignors to Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo, Japan
Filed Sep. 12, 1994, Ser. No. 304,175
Claims priority, application Japan, Mar. 10, 1994, 6-039551
Int. Cl.[6] C01G 56/00
U.S. Cl. 423—10 7 Claims



1. A method of separating neptunium and plutonium, comprising the steps of:
(a) exposing a nitric acid solution containing neptunium, plutonium and a reducing agent to ultraviolet radiation to adjust valences; and
(b) extracting, after said exposing, the nitric acid solution using a organic phase containing tributylphosphate/n-dodecane to extract plutonium (IV) and plutonium (VI) from the nitric acid solution into the organic phase.

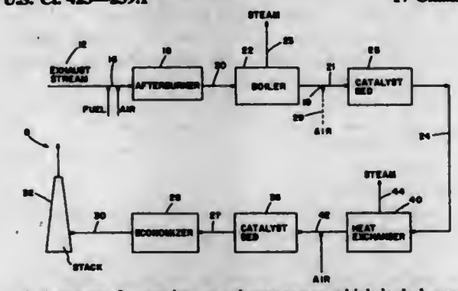
5,500,193
METHOD FOR ION EXCHANGE BASED LEACHING OF THE CARBONATES OF CALCIUM AND MAGNESIUM FROM PHOSPHATE ROCK
Robert F. Benson, St. Petersburg, and Dean F. Martin, Tampa, both of Fla., assignors to University of South Florida, Tampa, Fla.
Continuation-in-part of Ser. No. 76,578, Jun. 14, 1993, abandoned. This application Sep. 15, 1994, Ser. No. 306,810
Int. Cl.[6] C22B 26/00;26/20
U.S. Cl. 423—157 6 Claims



1. A pretreatment process for extraction of magnesium carbonate and calcium carbonate from solid phosphate rock with a strong hydrogen form cation exchange resin, prior to acidulation of the phosphate rock with a mineral acid, which comprises the steps of: (1) classifying the phosphate rock and the cation exchange resin into substantially non-overlapping particle size distributions; (2) forming a slurry consisting of phosphate rock and water and the cation exchange resin; (3) agitating the slurry to leach calcium and magnesium carbonates from the phosphate rock and load calcium and magnesium onto the cation exchange resin, and (4) separating the slurry into a leached phosphate rock composition, and a calcium and magnesium loaded cation exchange resin, and an aqueous solution of dissolved calcium and magnesium carbonates.

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5,500,194
HYBRID LOW $NO_x$ PROCESS FOR DESTRUCTION OF BOUND NITROGEN COMPOUNDS
Ronald D. Bell, Beaumont, Tex., assignor to Petrocon Technologies, Inc., Beaumont, Tex.
Filed May 4, 1994, Ser. No. 237,695
Int. Cl.[6] B01J 8/00
U.S. Cl. 423—239.1 17 Claims

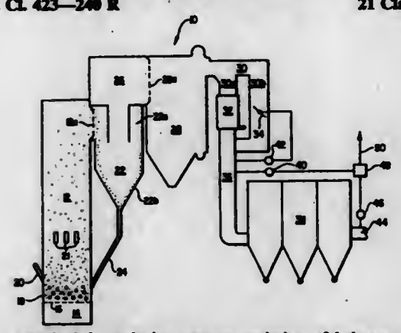



1. A process for treating an exhaust stream which includes one or more noxious compounds containing chemically bound nitrogen, to produce an effluent stream that is reduced in oxides of nitrogen for discharge into the atmosphere; said process comprising:
adding to said exhaust stream a source of oxygen and sufficient fuel to create a fuel-rich mixture, the quantity of fuel being sufficient to react with the available oxygen;
providing said fuel-enriched stream to a thermal reactor and reacting therein said fuel, noxious compounds, and available oxygen, to provide a heated oxygen-depleted stream which includes by-product chemically bound nitrogen compounds;
cooling said oxygen-depleted stream to 800° to 1000° F. by passing same through a first heat exchanger;
adding conversion oxygen to said cooled stream from said first heat exchanger, and passing the cooled oxygen-augmented stream over a first catalyst bed under overall reducing conditions, the quantity of conversion oxygen added being in stoichiometric excess of the amount of chemically bound nitrogen in said stream, but less than the amount of combustibles; whereby the bound nitrogen is first dissociated and oxidized to $NO_2$, and then the $NO_2$ is reduced by the excess combustibles;
cooling said stream from said first catalyst bed to a temperature of about 450° to 550° F. by passing said stream through a second heat exchanger;
adding air to the resulting cooled stream to produce a further cooled stream at a temperature of about 400° to 500° F., and having a stoichiometric excess of oxygen; and
passing said stream having said stoichiometric excess of oxygen over an oxidizing catalyst bed at said temperature of 400° to 500° F. to oxidize any unreacted chemically bound nitrogen compounds, to thereby provide an effluent stream for discharge.



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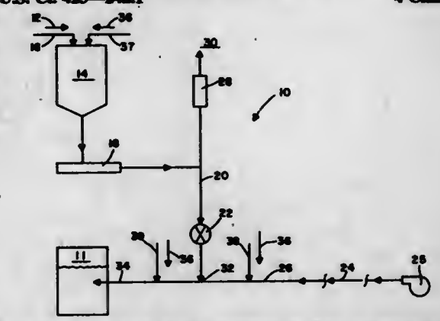
5,500,195
METHOD FOR REDUCING GASEOUS EMISSION OF HALOGEN COMPOUNDS IN A FLUIDIZED BED REACTOR
Juan A. Garcia-Mallol, Morristown, N.J., assignor to Foster Wheeler Energy Corporation, Clinton, N.J.
Continuation of Ser. No. 976,025, Nov. 13, 1992, abandoned. This application Sep. 26, 1994, Ser. No. 312,024
Int. Cl.[6] B01D 53/68;53/81
U.S. Cl. 423—240 R 21 Claims



1. A method for reducing gaseous emission of halogen compounds from a fluidized bed reactor comprising the steps of:
forming a bed of solid particles, including a fuel material and a sorbent material, in said reactor,
introducing air to said bed to fluidized said particles and to promote the combustion of said fuel particles which generates flue gases, containing said halogen compounds,
recovering said flue gases from said reactor, said flue gases containing entrained particles comprising particles of unsulfated limestone and calcined limestone,
separating a portion of said entrained particles from said flue gases,
passing said flue gases with the remaining portion of said entrained particles to a baghouse,
establishing a temporary layer of said remaining portion of entrained particles on the baghouse filter in said baghouse,
monitoring the halogen content of said flue gases leaving the baghouse, and
controlling the temperature of said flue gases and entrained particles entering the baghouse to a temperature from about 525° to about 615° F. and controlling the cycle rate of said baghouse in response to said halogen content so that essentially all of halogen compounds in said flue gases are absorbed by said layer of entrained particles.

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5,500,196
METHOD OF REAGENT AND OXIDATION AIR DELIVERY
Kevin J. Rogers, Wadsworth, and Dennis W. Johnson, Barberton, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.
Filed Aug. 16, 1993, Ser. No. 107,387
Int. Cl.[6] B01D 53/48;53/50
U.S. Cl. 423—242.1 4 Claims

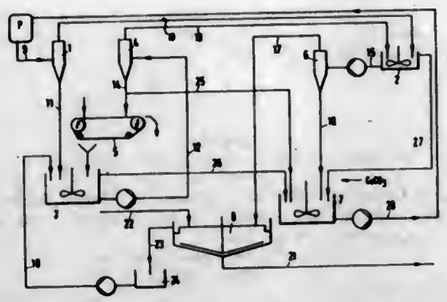


1. In a method of forced oxidation flue gas desulfurization, wherein dry reagent is pneumatically supplied to an absorber vessel containing a liquid slurry through an oxidation air addition system, the improvement comprising:
providing a rate controlled feed supply of dry reagent to a pneumatic conveying pick-up point located within air supply piping used to provide an oxidation air stream from the oxidation air addition system into the absorber vessel;
controlling a feed rate of the dry reagent to the pneumatic conveying pick-up point independently of a feed rate of the oxidation air stream into the absorber vessel;
using the oxidation air addition system air stream to provide oxidation air into the absorber vessel, and to pneumatically convey and inject the dry reagent into the absorber vessel to at least partially desulfurize flue gas provided to the absorber vessel; and
injecting all the oxidation air stream and the dry reagent beneath a liquid surface level of the liquid slurry within the absorber vessel.

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5,500,197
PROCESS OF PURIFYING GYPSUM
Dieter Grüne, Frankfurt am Main, Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany
Filed Oct. 29, 1991, Ser. No. 784,580
Claims priority, application Germany, Jan. 30, 1990, 40 34 497.5
Int. Cl.[6] B04C 5/26; C01B 17/22; C01F 11/46;5/12
U.S. Cl. 423—243.08 9 Claims

1. A process for purifying gypsum using hydrocyclones, comprising the steps of:
a) feeding a gypsum suspension to a first hydrocyclone, said first hydrocyclone being operated to produce an overflow of a first hydrocyclone stage and an underflow of a first hydrocyclone stage with an underflow concentration, and subsequently feeding the overflow of the first hydrocyclone stage to a collecting tank;
b) diluting the underflow of the first hydrocyclone stage in a suspension tank to form another underflow with a lower solids



content and then feeding the other underflow with the lower solids content to a second hydrocyclone to form an overflow of a second hydrocyclone stage and an underflow of a second hydrocyclone stage and subsequently feeding the overflow of the second hydrocyclone stage to the collecting tank receiving the overflow of the first hydrocyclone to form a combined overflow;

c) removing and dewatering a gypsum contained in the underflow of the second hydrocyclone stage; and

d) supplying the combined overflows from the first and second hydrocyclone stages in the collecting tank to a third hydrocyclone to form an overflow of a third hydrocyclone stage and an underflow of a third hydrocyclone stage and subsequently feeding the overflow of the third hydrocyclone stage to a thickener for removal of solid particles in the overflow and to form a clear water portion, and using the clear water portion for the diluting in step b), using the underflow of the third hydrocyclone to form a limestone suspension.

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**5,500,198**

**COMPOSITE CATALYST FOR CARBON MONOXIDE AND HYDROCARBON OXIDATION**

**Wei Liu, Cambridge, and Maria Flytzani-Stephanopoulos, Winchester, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.**

**Filed Oct. 26, 1993, Ser. No. 142,519**

**Int. Cl.[6] C01B *31/18;31/20;* B01D *53/62;53/72***

**U.S. Cl. 423—246** **7 Claims**

1. A method for the oxidation of carbon monoxide to carbon dioxide, comprising:

reacting carbon monoxide with an oxidizing agent in the presence of a metal oxide composite catalyst,

wherein said metal oxide composite catalyst has the following empirical formula:

$$[(FO_2)_{1-\delta}(DO_\delta)_n]_{1-k}M_k$$

wherein:

$FO_2$ is cerium oxide or zirconium oxide

$DO_\delta$ represents a dopant oxide or a mixture thereof selected from oxides of the group consisting of scandium, yttrium, lanthanum, praseodymium, neodymium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, lutetiumand Group IIA metals;

M is copper or a mixture of copper with a transition metal selected from the group consisting of chromium, manganese, iron, cobalt, nickel, molybdenum and silver;

n is a number having a value from 0.0 to about 0.35;

δ is a number having a value from about 1 to about 2; and

k is a number having a value greater than 0.0 to about 0.5.

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**5,500,199**

**BONDED ZEOLITES AND PROCESS FOR PREPARING THEM**

**Giuseppe Bellussi, Piacenza; Franco Buonomo, San Donato Milanese; Antonio Esposito, San Donato Milanese; Mario G. Clerici, San Donato Milanese, and Ugo Romano, Vimercate, all of, Italy, assignors to Enitecnche S.p.A., Milan, Italy**

**Continuation of Ser. No. 964,653, Oct. 21, 1992, abandoned, which is a continuation of Ser. No. 742,150, Aug. 1, 1991, abandoned, which is a continuation of Ser. No. 537,886, Jun. 14, 1990, abandoned, which is a continuation of Ser. No. 110,330, Oct. 20, 1987, abandoned. This application Mar. 24, 1994, Ser. No. 217,872**

**Claims priority, application Italy, Jan. 22, 1986, 22875/86**

**Int. Cl.[6] C01B *33/26;* B01J *29/06***

**U.S. Cl. 423—328.2** **22 Claims**

1. A process for producing a zeolite bonded with oligomeric silica, said process comprising:

(i) mixing a zeolite-in-water suspension with an aqueous solution of oligomeric silica and alkyl-ammonium hydroxide, the percentage of zeolite in the zeolite-in-water suspension being from 20% to 50% by weight, the molar ratio in the aqueous solution between the oligomeric silica and alkyl-ammonium hydroxide being from 0.05 to 0.2, the molar ratio between the oligomeric silica and water in the silica and alkyl-ammonium hydroxide solution being from 0.025 to 0.0125, the weight ratio between the oligomeric silica and zeolite in the mixture of solution and suspension being from 5:95 to 20:80, the zeolite having a pore diameter of from 5 Å to 13 Å, the zeolite being selected from the group consisting of:

(a) a zeolite consisting of Si, Al and B;

(b) a zeolite consisting of Si, Al and Ti;

(c) a zeolite consisting of Si, Ti and Fe;

(d) a zeolite consisting of Si and B;

(e) Zeolite ZSM-5;

(f) Zeolite ZSM-11; and

(g) Zeolite T; and

(ii) drying the mixture obtained in step (i).

2. A zeolite bonded with oligomeric silica, in the form of microspheres, having a weight ratio of oligomeric silica to zeolite within the range of 5:95 to 20:80, wherein the zeolite is selected from the group consisting of:

(a) a zeolite consisting of Si, Al and B;

(b) a zeolite consisting of Si, Al and Ti;

(c) a zeolite consisting of Si, Ti and Fe;

(d) a zeolite consisting of Si and B;

(e) Zeolite ZSM-5;

(f) Zeolite ZSM-11; and

(g) Zeolite T.

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**5,500,200**

**FIBRILS**

**W. Harry Mandeville, Lynnfield; Larry K. Truesdale, N. Andover, both of Mass., and Howard Tennent, Kennett Square, Pa., assignors to Hyperion Catalysis International, Inc., Cambridge, Mass.**

**Continuation of Ser. No. 284,755, Aug. 2, 1994, abandoned, which is a continuation of Ser. No. 746,865, Aug. 12, 1991, abandoned, which is a continuation of Ser. No. 285,817, Dec. 16, 1988, abandoned, which is a continuation-in-part of Ser. No. 149,573, Jan. 28, 1988, abandoned, which is a continuation-in-part of Ser. No. 872,215, Jun. 6, 1986, abandoned, and a continuation-in-part of Ser. No. 871,675, Jun. 6, 1986, abandoned, and a continuation-in-part of Ser. No. 871,676, Jun. 6, 1986, abandoned, which is a continuation-in-part of Ser. No. 678,701, Dec. 6, 1984, Pat. No. 4,663,230.**

**This application Jun. 7, 1995, Ser. No. 479,864**

**Int. Cl.[6] C01B *11/04***

**U.S. Cl. 423—447.3** **23 Claims**

1. In the process of producing carbon fibrils by decomposing a source of carbon at elevated temperatures in contact with a multivalent transition metal and recovering the fibrils formed thereby;



the improvement which comprises injecting catalyst particles having a size of up to 400 microns and comprising at least one multivalent transition metal on a particulate substrate into a reactor heated to a temperature below the thermal decomposition temperature of said source of carbon, and continuously recovering the fibrils formed thereby,

said metal being present on said substrate as a multiplicity of discontinuous catalytic sites which, at least during fibril formation, have a size of about 35 to 700 A which size is measured by measuring the size of transition metal particles recovered along with produced fibrils and said fibrils comprising an inner core region of less ordered carbon atoms surrounded by an outer region of ordered carbon atoms.

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**5,500,201**

**METHOD OF TREATING CARBON BLACK AND CARBON BLACK SO TREATED**

**Michael Binder, Brooklyn, N.Y., and Robert J. Mammone, So Plainfield, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Nov. 22, 1994, Ser. No. 343,805**

**Int. Cl.[6] C09G *1/56***

**U.S. Cl. 423—449.2** **6 Claims**

1. Method of treating carbon black so as to modify its surface properties comprising exposing the carbon black to a room temperature gas plasma wherein the gas plasma is He.

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**5,500,202**

**PROCESS FOR THE MANUFACTURE OF HYDROGEN PEROXIDE BY DIRECT SYNTHESIS FROM HYDROGEN AND OXYGEN**

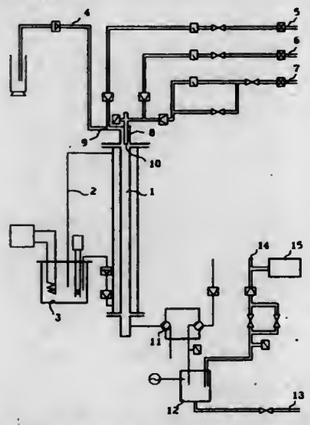
**Albert Germain; Jean-Paul Pirard, both of Liege; Véronique Delattre, Mons; Jacques Van Weynbergh, Brussels, and Claude Vogels, Lasne, all of, Belgium, assignors to Solvay (Société Anonyme), Brussels, Belgium**

**Continuation of Ser. No. 87,129, Jul. 1, 1993, abandoned. This application Nov. 7, 1994, Ser. No. 338,796**

**Claims priority, application Belgium, Jul. 15, 1992, 09200657**

**Int. Cl.[6] C01B *15/01***

**U.S. Cl. 423—584** **19 Claims**



1. A process for the manufacture of an aqueous solution of hydrogen peroxide by direct synthesis from hydrogen and oxygen in a three-phase system, comprising:

continuously reacting a gas phase containing hydrogen and oxygen directly at the surface of a solid heterogeneous catalyst to form hydrogen peroxide, said gas phase reacting in a stationary trickle bed reactor filled with solid catalyst particles, having an average diameter of at least 10 μm and not exceeding 250 μm, forming the stationary bed through which a liquid consisting of an aqueous solution and the gas phase containing hydrogen and oxygen trickle concurrently, said liquid phase flowing as a film at the surface of the catalyst particles, and said gas phase forming the continuous phase, to obtain an aqueous solution of hydrogen peroxide at a concentration from 3 to 5 g $H_2O_2$/100 g of solution, and

recovering aqueous solution of hydrogen peroxide at a concentration from 3 to 5 g $H_2O_2$/100 g of solution.

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**5,500,203**

**Patent Not Issued For This Number**

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**5,500,204**

**NANOPARTICULATE DIAGNOSTIC DIMERS AS X-RAY CONTRAST AGENTS FOR BLOOD POOL AND LYMPHATIC SYSTEM IMAGING**

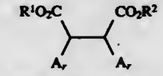
**Ireneeghe K. Osifo, West Norriton, Pa., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Feb. 10, 1995, Ser. No. 386,788**

**Int. Cl.[6] A61K *49/04***

**U.S. Cl. 424—9.453** **16 Claims**

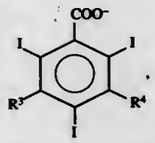
1. A method of medical x-ray diagnostic imaging the blood pool, liver, spleen or lymph system of a mammal comprising administering to the mammal a contrast effective amount of a succinic acid derivative disubstituted with iodobenzoic acid a residue as a contrast agent having the structure



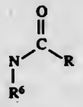
Structure I

$R^1$ and $R^2$ are alkyl of from 2 to 18 carbon atoms;

$A_r$ is



$R^3$ is selected from the group consisting of $NCH_2$, NHAc, and



wherein

R is an alkyl of 1 to 10 carbon atoms;

$R^6$ is H, alkyl of from 1 to 4 carbon atoms;

$R^4$ is selected from the group consisting of





NHC—COH and $CONHCH_3$, having 1 to 10 carbon atoms.

$R^5$ is alkyl having 1 to 18 carbon atoms and $A_c$ is acyl.

5,500,205
LACHRYMATOR AEROSOL FORMULATIONS
Joe L. Abbott, Cumberland, and Michael S. Andrade, Central Falls, both of R.I., assignors to Enviro Pac International, L.L.c., Lincoln, R.I.
Filed Feb. 23, 1994, Ser. No. 200,449
Int. Cl.[6] A61K 9/12
U.S. Cl. 424—401 11 Claims

1. An aerosol lachrymator formulation comprising a lachrymator carrier component comprising capsaicin, isopropanol, and citric acid; and a carbon dioxide propellant generating component comprising an aqueous sodium bicarbonate solution.

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5,500,206
ORAL COMPOSITIONS COMPRISING ACTINOMYCES VISCOSUS FIMBRIAE
Duane L. Charbonneau, Middletown, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Apr. 29, 1994, Ser. No. 236,911
Int. Cl.[6] A61K 7/28;7/16;7/18
U.S. Cl. 424—50 20 Claims

1. A method for inhibiting or preventing growth of dental plaque by blocking or reducing the adherence of *Actinomyces viscosus*, *Streptococcus sanguis*, and *Porphyromonas gingivalis* to tissues within the human oral cavity comprising topical administration, to tissues of a human oral cavity, of a composition comprising a safe and effective amount of *Actinomyces viscosus* fimbriae.

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5,500,207
METHOD OF WHITENING TEETH AND COMPOSITION THEREFORE
Marie-Kateri Goulet, 3605 The Boulevard, Montreal, Quebec, Canada
Filed Nov. 18, 1994, Ser. No. 344,589
Int. Cl.[6] A61K 7/22
U.S. Cl. 424—54 6 Claims

1. Composition for whitening teeth which comprises a chewing gum or wax base and a tooth whitening agent comprising carbamide peroxide.

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5,500,208
ORAL COMPOSITIONS COMPRISING A NOVEL TRIPEPTIDE
Duane L. Charbonneau, Middletown, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Jun. 7, 1994, Ser. No. 255,021
Int. Cl.[6] A61K 7/24
U.S. Cl. 424—55 23 Claims

2. A method for inhibiting growth of dental plaque on tissues within an oral cavity of a human or other animals comprising topical administration, to tissues of such oral cavity, of a composition comprising a safe and effective amount of the tripeptide Alanine-Isoleucine-Valine.

5,500,209
DEODORANT AND ANTIPERSPIRANT COMPOSITIONS CONTAINING POLYAMIDE GELLING AGENT
Michael S. Mendolia, Bridgewater; Anthony Esposito, Roselle; James A. Tanoff, West Caldwell; Lloyd Rose, Hampton; Paul J. Fenock, South Plainfield; Morton L. Barr, East Brunswick, and Paul J. Vincenti, Jefferson, all of N.J., assignors to The Mennen Company, Morristown, N.J.
Filed Mar. 17, 1994, Ser. No. 214,111
Int. Cl.[6] A61K 7/32
U.S. Cl. 424—66 49 Claims

1. A composition for reducing body malodor, comprising:
(1) an active ingredient selected from the group consisting of active deodorant materials and active antiperspirant materials, in an amount effective to reduce body malodor;
(2) a polyamide as a gelling agent for the composition, the gelling agent being included in a sufficient amount such that the composition is a solid composition; and
(3) a solvent system for the polyamide, in an amount such that the polyamide can be dissolved therein, and the polyamide can be gelled therefrom upon cooling, the composition being a gel or stick.

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5,500,210
COMBINED TWO-PART REDUCING AGENT/HUMECTANT SHAVING SYSTEM FOR IMPROVED SHAVING COMFORT
Karla L. Stoner, Frederick, and Charles W. Slife, New Market, both of Md., assignors to The Gillette Company, Boston, Mass.
Filed May 23, 1994, Ser. No. 247,915
Int. Cl.[6] A61K 7/06;7/15;7/155
U.S. Cl. 424—73 10 Claims

1. A method of improving shaving comfort by softening the hair to be shaved so as to reduce the cutting force required to cut it which method comprises carrying out the following sequential steps:
(a) contacting an area of hair to be shaved with a reducing agent that breaks disulfide linkages in hair;
(b) contacting the area of hair treated in step (a) with a humectant and allowing it to dry;
(c) contacting the area treated in step (b) with water to hydrate the hair; and
(d) shaving the hydrated hair of step (c).

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5,500,211
SOAP-FREE SELF-FOAMING SHAVE GEL COMPOSITION
Robert C. George, Newton, Mass., and Andrew M. Lasota, London, England, assignors to The Gillette Company, Boston, Mass.
Filed Sep. 22, 1994, Ser. No. 310,597
Int. Cl.[6] A61K 7/15
U.S. Cl. 424—73 19 Claims

1. A shaving composition in the form of a self-foaming gel comprising, in percent by weight, about 65 to 85% water, about 4 to 16% N-acyl sarcosine wherein the acyl group has 10 to 20 carbon atoms, about 1 to 6% organic amine base sufficient to solubilize the N-acyl sarcosine and provide a pH of about 4 to about 8, about 1 to 8% self-foaming agent, about 1 to 8% of a non-ionic surfactant, and about 1 to 10% non-volatile paraffinic hydrocarbon fluid, said composition being substantially free of soap.



5,500,212
CROSSLINKED ANION EXCHANGE PARTICLES AND METHOD FOR PRODUCING THE PARTICLES
Paul E. Blicm, Pottstown, Pa., and Larry W. Steffler, Cherry Hill, N.J., assignors to Rohm and Haas Company, Philadelphia, Pa.
Division of Ser. No. 384,099, Feb. 6, 1995, which is a division of Ser. No. 185,534, Jan. 24, 1994, Pat. No. 5,414,068. This application Jun. 6, 1995, Ser. No. 467,377
Int. Cl.[6] A61K 31/785
U.S. Cl. 424—78.12 4 Claims

1. A method for lowering blood cholesterol level in a mammal comprising oral administration to the mammal of a therapeutically effective amount of water insoluble bile acid sequestrant polymer particles that have bile acid sequestering efficacy greater than that of cholestyramine, wherein the polymer particles are prepared by a process comprising:
(a) polymerizing a monomer mixture comprised of amine-containing monomers by free radical polymerization and
(b) non-free-radical crosslinking with a polyfunctional amine-reactive compound, provided that the amine-containing monomers contain amine functionality that is not directly attached to a vinyl group in the case where step (b) is conducted after step (a), and further provided that step (b) occurs during step (a) in the case where the monomer mixture of step (a) contains free-radical reactive polyvinyl crossliker monomers.

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5,500,213
GELLED BIOCIDAL TREATMENTS
Donald C. Roe, Tabernacle, N.J., and David M. Polizzotti, Yardley, Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.
Continuation of Ser. No. 105,089, Aug. 10, 1993, Pat. No. 5,391,370, which is a division of Ser. No. 47,728, Apr. 15, 1993, Pat. No. 5,266,218. This application Jan. 10, 1995, Ser. No. 370,915
Int. Cl.[6] C02F 1/50;11/00
U.S. Cl. 424—78.37 2 Claims

1. A gelled biocidal composition comprising a polyethylene glycol, bis(trichloro methyl) sulfone, a quaternary ammonium halide salt and an alkylphenol ethoxylate.

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5,500,214
METHOD FOR TREATING A MAMMAL SUFFERING FROM A T-CELL MEDIATED DISORDER WITH A CHO-GLYCOSYLATED ANTIBODY
Martin J. Page, Beckenham, United Kingdom, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.
Division of Ser. No. 155,864, Nov. 23, 1993, which is a continuation of Ser. No. 46,893, Apr. 15, 1993, abandoned, which is a continuation of Ser. No. 943,146, Sep. 10, 1992, abandoned, which is a continuation of Ser. No. 777,730, Oct. 16, 1991, abandoned. This application Nov. 3, 1994, Ser. No. 335,400
Claims priority, application United Kingdom, Jan. 17, 1990, 9022543
Int. Cl.[6] A61K 35/16;39/00;39/395; C07K 16/00
U.S. Cl. 424—133.1 7 Claims

1. In a method for treating a human suffering from a T-cell mediated disorder comprising administering a therapeutically effective amount of a whole glycosylated recombinant human, chimeric, CDR-grafted or bispecific antibody effective in treating said disorder, wherein the improvement comprises an antibody glycosylated by a Chinese hamster ovary cell.

5,500,215
METHODS FOR THE PRODUCTION OF ANTIBODIES AND INDUCTION OF IMMUNE RESPONSES TO TUMOR-ASSOCIATED GANGLIOSIDES BY IMMUNIZATION WITH GANGLIOSIDE LACTONES
Sen-Itiroh Hakomori, Mercr Island, Wash., assignor to The Biomembrane Institute, Seattle, Wash.
Division of Ser. No. 97,006, Jul. 27, 1993, Pat. No. 5,389,530, which is a division of Ser. No. 996,509, Dec. 21, 1992, Pat. No. 5,308,614, which is a continuation of Ser. No. 173,962, Mar. 28, 1988, abandoned. This application Nov. 3, 1994, Ser. No. 334,357
Int. Cl.[6] A61K 31/70;45/05
U.S. Cl. 424—277.1 7 Claims

1. A method for inducing an antibody response to a ganglioside comprising administering to a host having a tumor expressing said ganglioside, a purified lactone of said ganglioside expressed on said tumor in an amount sufficient to generate an antibody response to said ganglioside and a pharmaceutically acceptable carrier.

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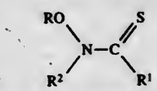
5,500,216
TOPICAL HYDROPHOBIC COMPOSITION AND METHOD
Jorge V. Julian, 7340 Bequette Ave., Pico Rivera, Calif. 90660, and John A. Garruto, 110 Paseo Marguerita, Vista, Calif. 92084
Filed Jun. 18, 1993, Ser. No. 79,333
Int. Cl.[6] A61K 31/74
U.S. Cl. 424—401 15 Claims

1. A method of reducing drag of a swimmer relative to water comprising the steps of:
before swimming, topically applying to body surfaces of a swimmer a dispersion of particles of hydrophobic metal oxide in a pharmacologically acceptable fluid carrier; and
removing the carrier to form a film of hydrophobic metal oxide particles on said surfaces.

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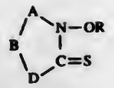
5,500,217
PERSONAL CARE FORMULATIONS
Peter W. Austin, Bury, and Michael Singer, Cheadle Hulme, both of, United Kingdom, assignors to Zeneca Limited, London, England
PCT No. PCT/GB92/00191, § 371 Date Nov. 23, 1993, § 102(e) Date Nov. 23, 1993, PCT Pub. No. WO92/13528, PCT Pub. Date Aug. 20, 1992
PCT Filed Feb. 3, 1992, Ser. No. 98,315
Claims priority, application United Kingdom, Feb. 5, 1991, 9102412; Feb. 3, 1992, 9202235
Int. Cl.[6] A61K 7/48;7/032;7/027;7/075
U.S. Cl. 424—401 10 Claims

1. A personal care formulation which contains
a) an antimicrobial agent of formula (I)



(I)

or a metal complex or salt thereof;
wherein
R is hydrogen, $C_{1-6}$-hydrocarbon carbonyl or —$COOR^3$;
$R^1$ is $C_{1-10}$-alkyl or phenyl;
$R^2$ is $C_{1-10}$-alkyl;
$R^3$ is $C_{1-6}$-alkyl; or
$R^1$ and $R^2$ together with the carbon and nitrogen atoms to which they are attached form a heterocyclic ring and the compound of formula I is a compound of formula II



(II)

wherein

A and B are independently selected from the group consisting of $—C(R^4)_2—$, $—CR^4═$, $>C═NR^4$ and $—N═$;

D is selected from the group consisting of $—C(R^4)_2—$, $—CR^4═$, $>C═NR^4$, $—NR^4—$ and sulphur;

$R^4$ is hydrogen, $C_{1-6}$-alkyl, phenyl or phenyl substituted by halogen; or

A forms part of a cyclohexane ring or two of the groups A, B and D form part of a cyclohexane, cyclohexene or benzene ring; and

b) a component selected from the group consisting of a hand lotion, foundation cream, emollient cream, facial washing cream, shaving cream, after-shave lotion, sunscreen lotion, sunscreen cream, after sun lotion, antiperspirant, deodorant, hair gel, hair mousse, mascara, eye shadow, eyeliner, lipstick, lip gloss, facial blush, rouge, foundation, fragrance, shampoo, shampoo gel, conditioning rinse, foam bath liquid, miscible bath oil or soluble bath oil and liquid soap.

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**5,500,218**

**METHOD OF PREVENTING COLORING OF SKIN ADJACENT THE HAIRLINE DURING DYEING OF HAIR**

Karl-Heinz Klechka, Darmstadt, Germany; Toshimasa Furukawa, Chiba, and Akiyo Maezawa, Tokyo, both of, Japan, assignors to Wella Aktiengesellschaft, Darmstadt, Germany

PCT No. PCT/EP93/00029, § 371 Date Oct. 18, 1993, § 102(e) Date Oct. 18, 1993, PCT Pub. No. WO93/16678, PCT Pub. Date Sep. 2, 1993

PCT Filed Jan. 9, 1993, Ser. No. 137,109

Claims priority, application Germany, Feb. 28, 1992, 42 06 236.5

Int. Cl.[6] A61K 7/40

U.S. Cl. 424—401 2 Claims

1. A process of dyeing hair, consisting of the steps of:

a) uniformly applying to a strip of skin adjoining a hairline of the hair to be dyed a protective composition consisting essentially of 27 to 50 percent by weight polyethylene glycol having an average molecular weight of 2,700 to 7,500; 7 to 14 percent by weight hydrogenated castor oil, said hydrogenated caster oil being ethoxylated with 40 to 60 moles of ethylene oxide; 28 to 42 percent by weight of at least one member selected from the group consisting of glycerin, ethyl hexanediol and polyethylene glycol having a molecular weight of 100 to 300; and 0 to 18 percent by weight water to protect the strip of said skin from coloring when dyeing or tinting hair;

b) then treating the hair to be dyed with a hair dye to dye the hair; and

c) after the treating of the hair with the hair dye, subsequently rinsing or rinsing and shampooing the hair such that said protective composition is simultaneously removed during said rinsing or said rinsing and shampooing the hair.

**5,500,219**

**PESTICIDE COMPOSITIONS CONTAINING BLENDS OF BLOCK COPOLYMERS WITH ANIONIC SURFACTANTS HAVING IMPROVED DISSOLUTION RATES**

Christopher G. Utz, Wyandotte, Mich.; Rebecca P. Hollis, Flemington, N.J., and Johnny M. Sekmistrz, Wyandotte, Mich., assignors to BASF Corporation, Mount Olive, N.J.

Filed Sep. 21, 1993, Ser. No. 124,413

Int. Cl.[6] A01N 25/14;25/12

U.S. Cl. 424—409 13 Claims

1. A granular agricultural pesticide composition, comprising:

a) from about 70 to about 99.9% of a pesticide; and

b) from about 0.1 to about 15 percent of at least one dispersant surfactant/polymer blend with a dissolution rate in water of not greater than about 6.5 minutes, said blend consisting essentially of:

1) about 85 to about 95% EO/PO block copolymers having at least about 70% EO;

2) about 5 to about 15% of one or more polycarboxylates; and

3) about 0.1 to about, 5% of at least one linear alkylbenzenesulfonate.

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**5,500,220**

**BIOLOGICAL AND DUST CONTROL METHODS FOR BULK/GRANULAR SOLIDS**

Donald C. Roe, Burlington, N.J.; Dwight P. Davis, Holland, Pa.; Kevin C. Manning, Richboro, Pa., and Edmund J. Bockowski, Furlong, Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Continuation-in-part of Ser. No. 142,749, Oct. 25, 1993, abandoned, which is a continuation-in-part of Ser. No. 23,465, Feb. 25, 1993, Pat. No. 5,256,419, which is a continuation of Ser. No. 848,783, Mar. 10, 1992, abandoned, which is a continuation of Ser. No. 733,875, Jul. 17, 1991, abandoned, which is a continuation of Ser. No. 451,385, Dec. 15, 1989, abandoned. This application Jan. 17, 1995, Ser. No. 373,709

Int. Cl.[6] A01N 25/24

U.S. Cl. 424—410 4 Claims

1. A method of reducing the dissemination of fugitive dust particles into the atmosphere from grain and controlling biological activity in grain by applying an aqueous foam composition to said grain wherein said composition comprises more than about 0.2% surfactant as foaming agent and a biocidally effective amount of a biocidal control agent to control biological activity in said grain comprising acrolein.

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**5,500,221**

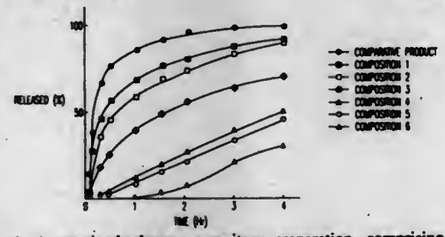
**SUSTAINED RELEASE SUPPOSITORY**

Masami Murata, Narita; Harumi Kishi, Kashiwa; Takashi Narui, Sakura; Shuichi Kasai, Narita, and Akira Iwasa, Yotsukaido, all of, Japan, assignors to SS Pharmaceutical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 946,435, Nov. 18, 1992, abandoned. This application Mar. 18, 1994, Ser. No. 215,970

Int. Cl.[6] A61K 9/02;9/14;9/64

U.S. Cl. 424—436 9 Claims




1. A sustained-release suppository preparation, comprising a therapeutically effective amount of an acidic drug or a pharmaceutically acceptable salt thereof which can be absorbed by rectal administration and an acidic compound or a pH buffering agent mixed in a pharmaceutically acceptable base component, wherein said acidic drug or pharmaceutically acceptable salt thereof is selected from the group consisting of sodium valproate, sodium cromoglycate, alclofenac, clidanac, indomethacin, sulpyrin, flufenamic acid, ketoprofen, sulindac, metiazinic acid, tolmetin sodium, fentiazac, (S)-6-methoxy-α-methyl-2-naphthyleneacetic acid, γ-oxo-( 1,1'-biphenyl)-4-butanoic acid, protizinic acid, α-methyl-5H-(1)benzopyrino(2,3-b)pyridine-7-acetic acid, 2-fluoro-α-methyl( 1,1'-biphenyl)-4-acetic acid, diclofenac sodium, mefenamic acid, α-methyl-4-(2-methylpropyl) benzeneacetic acid and 2-(acetyloxy)benzoic acid.



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**5,500,222**

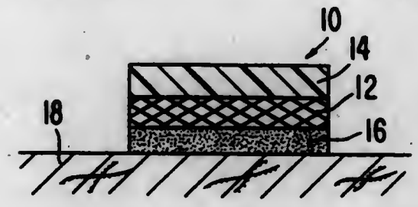
**TRANSDERMAL ADMINISTRATION OF OXYBUTYNIN**

Eun S. Lee, Redwood City; Diane E. Nedberge, and Su I. Yum, both of Los Altos, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Division of Ser. No. 193,661, Feb. 8, 1994, Pat. No. 5,411,740, which is a continuation of Ser. No. 882,652, May 13, 1992, abandoned. This application Feb. 15, 1995, Ser. No. 388,767

Int. Cl.[6] A61F 13/02

U.S. Cl. 424—448 6 Claims




1. A method for the transdermal administration of oxybutynin at a therapeutically effective rate comprising the step of placing an oxybutynin transdermal delivery device onto an area of skin of a person, the oxybutynin transdermal delivery device comprising:

(a) an oxybutynin reservoir comprising oxybutynin base and a permeation enhancing amount of a monoglyceride or mixture of monoglycerides of fatty acids with a total monoesters content of at least 51%;

(b) a backing on or adjacent the skin-distal surface of the oxybutynin reservoir; and

(c) means for maintaining the oxybutynin reservoir in oxybutynin- and permeation enhancer- transmitting relation with the skin; wherein oxybutynin is administered at a therapeutically effective rate and the monoglyceride or mixture of monoglycerides of fatty acids is simultaneously administered to the area of skin at a rate which is sufficient to substantially increase the permeability of the area to the oxybutynin.

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**5,500,223**

**ENCAPSULATING METHOD AND PRODUCTS CONTAINING ENCAPSULATED MATERIAL**

John M. Behan, Ashford; Jeremy N. Nest, Canterbury, and Keith D. Perring, Ashford, all of, Great Britain, assignors to Unilever Patent Holdings B.V., Rotterdam, Netherlands

Continuation of Ser. No. 962,987, Oct. 19, 1992, abandoned, which is a division of Ser. No. 766,788, Sep. 27, 1991, Pat. No. 5,185,155. This application Dec. 21, 1993, Ser. No. 170,989

Claims priority, application United Kingdom, Sep. 27, 1990, 9021061

Int. Cl.[6] A61K 9/48

U.S. Cl. 424—451 24 Claims

1. A micro-encapsulate comprising an outer silica layer encapsulating a water-insoluble hydrophobic material selected from the group consisting of flavors, fragrances and sunscreen actives, said encapsulate being obtained by a process which comprises

providing an aqueous dispersion of silica wherein the silica is in the form of particles substantially all of which have a particle size not greater than 100 nm;

forming an emulsion of said dispersion and said hydrophobic material to be encapsulated by mixing said dispersion and said hydrophobic material under high shear conditions; and

gelling said emulsion containing the hydrophobic material whereby stable silica capsules comprising silica particles around droplets of the hydrophobic material are formed.

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**5,500,224**

**PHARMACEUTICAL COMPOSITIONS CONTAINING NANOCAPSULES**

Henri Vranckx; Martine Demeuniter, both of Brussels, and Michel Deleers, Linkebeek, all of, Belgium, assignors to U C B S.A., Brussels, Belgium

Filed Jan. 10, 1994, Ser. No. 179,205

Claims priority, application United Kingdom, Jan. 18, 1993, 9300875

Int. Cl.[6] A61K 9/51

U.S. Cl. 424—451 19 Claims

1. A pharmaceutical composition in the form of a colloidal suspension of nanocapsules, comprising an oily phase consisting essentially of an oil, wherein the oil is a vegetable oil, a mineral oil or an oily compound selected from benzyl benzoate and glycerides of higher fatty acids, said oil containing dissolved therein a surfactant and, suspended therein, a plurality of nanocapsules having a diameter of less than 500 nanometers, said nanocapsules encapsulating an aqueous phase consisting essentially of a solution or a suspension of a therapeutically active substance and a surfactant in water, whose pH lies between 1 and 7, whereby the walls of said nanocapsules are formed from a poly(alkyl 2-cyanoacrylate) wherein the alkyl radical has 1 to 6 carbon atoms, all constituents of said composition being chosen from pharmaceutically acceptable substances.

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**5,500,225**

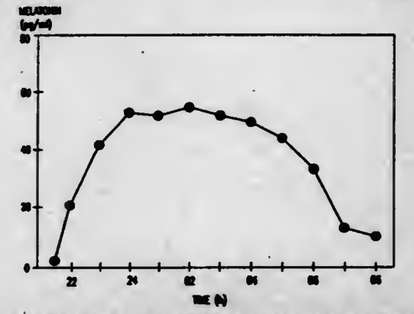
**METHOD FOR DETERMINATION OF URINE COMPONENTS AND FOR PREVENTING SUDDEN INFANT DEATH SYNDROME**

Moshe Landau, Kfar Saba, and Nava Zisapel, Tel Aviv, both of, Israel, assignors to Neurim Pharmaceuticals (1991) Ltd., Tel Aviv, Israel

Continuation-in-part of Ser. No. 697,714, May 9, 1991, abandoned. This application Oct. 19, 1993, Ser. No. 139,404

Int. Cl.[6] A61K 9/20

U.S. Cl. 424—464 18 Claims




1. A method for the determination of non-volatile organic components of interest in the urine of human subjects using diapers, which comprises carrying out the following sequence of steps at least once and up to as many times as the diapers are changed in a

given 24-hour period, namely: providing a diaper which has been used to absorb urine from a human subject, removing the outer cover and any extraneous material so as to leave substantially only diaper pulp having urine absorbed thereon, estimating the amount of water in said used diaper, extracting a weighed portion of the diaper pulp having urine absorbed thereon with a water-miscible organic solvent, in which the diaper pulp is insoluble, to give an extract containing a component of interest, and determining the amount of the component of interest per unit volume of urine which was absorbed on the diaper pulp by assaying an aliquot of said extract.

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**5,500,226**

**PHARMACEUTICAL COMPOSITION HAVING ANALGESIC ACTIVITY**

Federico Stroppolo, Pregassona, Switzerland; Daniele Bonadeo, Varese, Italy; Gian F. Fornasini, Milan, Italy, and Annibale Gazzaniga, Roccaldina, Italy, assignors to Zambon Group S.p.A., Vicenza, Italy

Filed Jun. 7, 1994, Ser. No. 255,776
Claims priority, application Italy, Jun. 21, 1993, MI93A1325
Int. Cl.[6] A61K *9/14;9/20;31/19;31/195*
U.S. Cl. 424—466 6 Claims

1. A pharmaceutical composition useful for the preparation of pharmaceutical dosage forms for oral use consisting of a mixture of arginine and (S)-Ibuprofen in a molar ratio between 1.1 and 1.9.

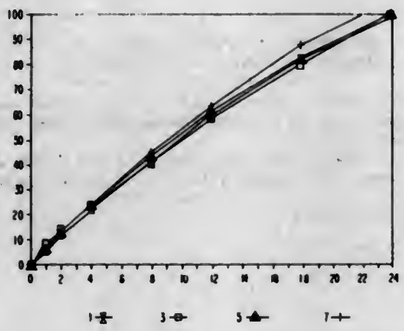
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**5,500,227**

**IMMEDIATE RELEASE TABLET CORES OF INSOLUBLE DRUGS HAVING SUSTAINED-RELEASE COATING**

Benjamin Oshlack, New York, N.Y., and Mark Chasin, Manalapan, N.J., assignors to Euro-Celtique, S.A., Luxembourg

Filed Nov. 23, 1993, Ser. No. 156,460
Int. Cl.[6] A61K *9/32;9/34;9/36;9/42*
U.S. Cl. 424—476 25 Claims




1. A sustained release tablet for oral administration, comprising an immediate release tablet core including an insoluble therapeutically active agent having an aqueous solubility of less than or equal to about 5 mg/ml, said tablet core containing a sufficient amount of said therapeutically active agent to render a therapeutic effect, and

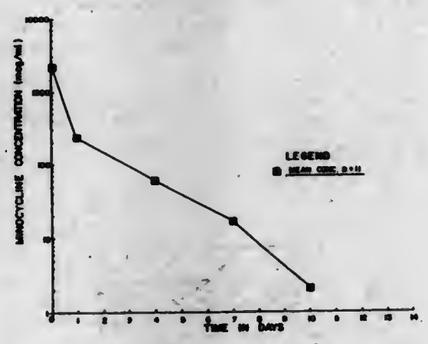
a film coating formed over said core, said film coating comprising a sufficient amount of a hydrophobic material selected from the group consisting of waxes, shellac, zein, fatty alcohols, hydrogenated vegetable oils, water insoluble celluloses, acrylic polymers and mixtures thereof to provide a sustained release of said therapeutically active agent sufficient to provide a duration of effect from about 8 to about 24 hours when said coated tablet is exposed to aqueous solutions.

**5,500,228**

**PHASE SEPARATION-MICROENCAPSULATED PHARMACEUTICALS COMPOSITIONS USEFUL FOR ALLEVIATING DENTAL DISEASE**

James R. Lawter, Goshen, and Michael G. Lanzillotti, Pearl River, both of N.Y., assignors to American Cyanamid Company, Madison, N.J.

Continuation of Ser. No. 288,739, Dec. 22, 1988, abandoned, which is a continuation-in-part of Ser. No. 54,372, May 26, 1987, Pat. No. 5,000,886. This application Nov. 26, 1990, Ser. No. 617,382
The portion of the term of this patent subsequent to Mar. 19, 2008, has been disclaimed.
Int. Cl.[6] A61K *6/00;9/14;9/50;47/30*
U.S. Cl. 424—486 7 Claims




1. Therapeutic agent containing microparticles for alleviating dental disease which comprise:

(i) an effective amount of at least one therapeutic agent dispersed in

(ii) a matrix comprising a biocompatible and biodegradable polymer, said microparticles having been made by a phase separation process using a volatile silicone fluid as the sole hardening agent and having a residual volatile silicone fluid content of less than about 3% by weight.

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**5,500,229**

**COLOSTRUM FRACTION, A PROCESS OF PREPARING IT AND ITS USE AS A SUPPLEMENT IN CELL CULTURE MEDIA**

Jouni Aalto, Kirkkonummi; Raimo Pakkanen, Vantaa; Lea Satama, Helsinki; Jyrki Luopa, Espoo; Timo Allén, Vantaa; Arja Virtanen, and Ari Kanttinen, both of Helsinki, all of, Finland, assignors to Viable Bioproducts, Ltd., Finland

Continuation of Ser. No. 792,818, Nov. 15, 1991, abandoned. This application Dec. 15, 1993, Ser. No. 166,911
Claims priority, application Finland, Jan. 17, 1991, 914911
Int. Cl.[6] A23C *9/12;* C12N *5/00;1/00;1/18*
U.S. Cl. 424—535 4 Claims

1. A colostrum fraction having a low endotoxin, protein and immunoglobulin concentration suitable for use in cell culture media, said colostrum fraction is prepared by:

(a) removing fat from colostrum to obtain a defatted colostrum;

(b) filtrating the defatted colostrum sequentially through 0.8 μm and 0.22 μm filters; and

(c) filtering by one-step ultrafiltration using membrane having a molecular weight cut off of 100,000 daltons, and recovering a filtrate to obtain the colostrum fraction.



**5,500,230**

**METHOD FOR TREATMENT OF GLAUCOMA WITH NITROGEN CONTAINING GUANYLATE CYCLASE ACTIVATORS**

James A. Nathanson, Wellesley, Mass., assignor to The General Hospital Corporation, Boston, Mass.

Continuation of Ser. No. 782,855, Nov. 21, 1990, abandoned, which is a continuation of Ser. No. 147,324, Jan. 22, 1988, abandoned, which is a continuation-in-part of Ser. No. 6,485, Jan. 23, 1987, abandoned. This application Apr. 7, 1993, Ser. No. 43,979
Int. Cl.[6] A61K *33/38;31/50;31/505*
U.S. Cl. 424—619 14 Claims

1. A method of treating glaucoma in an individual, comprising topically administering a therapeutically-effective amount of hydralazine to said individual.

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**5,500,231**

**FERMENTED SOUR DOUGH AND METHOD OF MAKING**

Rudolf Buensow, and Hans Egle, both of Pfaffenhofen, Germany, assignors to Van den Bergh Foods Co., Division of Conopco, Inc., Lisle, Ill.

Continuation of Ser. No. 87,588, Jul. 6, 1993, abandoned. This application Jun. 2, 1995, Ser. No. 459,917
Claims priority, application European Pat. Off., Jul. 7, 1992, 92202055
Int. Cl.[6] A23L *1/105;* A21D *2/14*
U.S. Cl. 426—18 10 Claims

1. Fermented sour dough, comprising at least sour starter material, flour, lactic acid, acetic acid, salt and the balance being water wherein the water content of the total dough is in the range of 25–32 wt %, the pH is less than 4.2, the weight ratio of lactic acid to acetic acid is less than 3.0 and the salt is a food acceptable organic or inorganic salt in amounts of from 2–8% by weight of the dough.

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**5,500,232**

**CALCIUM FORTIFIED BEVERAGES**

Kim R. Keating, Evansville, Ind., assignor to Bristol-Myers Squibb Company, Princeton, N.J.

Filed Oct. 6, 1994, Ser. No. 319,215
Int. Cl.[6] A23L *1/304;2/00*
U.S. Cl. 426—74 11 Claims

1. A calcium fortified, storage-stable beverage consisting essentially of:

(a) an acidulant which comprises about 5 to about 95 weight percent citric acid and about 5 to about 95 weight percent fumaric acid, and,

(b) a calcium source which comprises about 5 to about 95 weight percent calcium hydroxide and about 5 to about 95 weight percent calcium glycerophosphate.

**5,500,233**

**COMPOSITION FOR IMPROVING ADHERENCE OF FAT-BASED COATINGS TO FROZEN FAT-BASED CONFECTIONS**

Gary G. Youcheff, Maytown; Stephen M. Wedke, Lancaster, and Douglas W. Perkins, Mount Joy, all of Pa., assignors to Mars, Incorporated, McLean, Va.

Continuation of Ser. No. 987,576, Dec. 8, 1992, abandoned, which is a continuation of Ser. No. 794,438, Nov. 19, 1991, abandoned, which is a division of Ser. No. 626,387, Dec. 12, 1990, Pat. No. 5,085,877, which is a continuation of Ser. No. 392,104, Aug. 10, 1989, abandoned. This application Jun. 7, 1994, Ser. No. 178,475
The portion of the term of this patent subsequent to Feb. 4, 2009, has been disclaimed.
Int. Cl.[6] A23G *9/00*
U.S. Cl. 426—89 6 Claims

1. A composition for adhering a continuous coating to a frozen fat-based core of a frozen fat-based confection, which reduces bite loss of said continuous coating, comprising an effective amount of maltodextrin, in an aqueous solution, to enhance the adherence of said continuous coating to said frozen fat-based core without substantially affecting the taste and texture of said frozen fat-based confection.

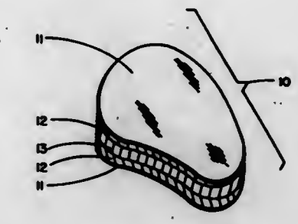
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**5,500,234**

**CRISPY CHIP SANDWICH AND PROCESS OF PRODUCING A SANDWICH PRODUCT**

Peter J. Russo, 150 Rockland Rd., Guilford, Conn. 06437

Filed Oct. 5, 1994, Ser. No. 318,084
Int. Cl.[6] A23G *3/00*
U.S. Cl. 426—103 1 Claim




1. A process of producing an improved multilayered crispy chip type sandwich food product suitable for being packaged and shipped to detail stores substantially without degradation of the crispyness of the chips, consisting of the steps of:

selecting two or more crispy chips (11) from the group consisting of potato chips, corn chips, rice cakes, oat crackers and wheat crackers;

coating at least one side of each said crispy chip with a marshmallow like food product;

aligning said crispy chips in spaced apart disposition;

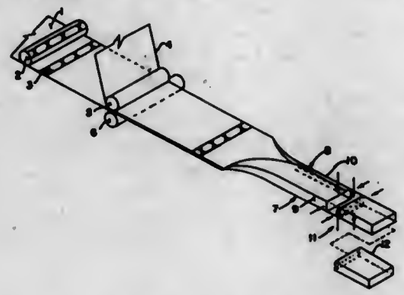
inserting an intermediate filler food product selected from the group consisting of substances generally known as peanut butter, chocolate, coconut, jelly, jams, candy, marmalades, syrups, fruits and extracts, with each selected filler layer being disposed between and bonded to a respective pair of opposite facing said marshmallow like layers to form a substantially united food product of discrete food layers.

5,500,235

## METHOD FOR MAKING A MICROWAVABLE, EXPANDABLE PACKAGE

Abraham H. Mendenhall, Morris County, N.J., and Joseph F. Irace, St. Louis County, Mo., assignors to Packaging Concepts, Inc., St. Louis, Mo.

Continuation of Ser. No. 524,446, May 17, 1990, abandoned, which is a continuation-in-part of Ser. No. 342,747, Apr. 25, 1989, abandoned, which is a continuation-in-part of Ser. No. 129,132, Dec. 7, 1987, abandoned. This application May 3, 1993, Ser. No. 55,792
Int. Cl.[6] B65D 81/34
U.S. Cl. 426—394 1 Claim



1. A method for making a microwavable, expandable package formed from a sheet of laminated material and having sidewalls, gussets and a bottom wall, said sheet of laminated material having an outer layer of flexible paper and an inner layer of heat sealable, fluid impervious thermoplastic resin, the improvement which comprises:

aligning a continuous sheet of flexible paper with a printing roller,

printing a strip of microwave energy absorptive composition onto said continuous sheet of flexible paper by transferring said microwave energy composition from said printer roller to said continuous sheet of flexible paper, said microwave energy absorptive composition comprising a fluid adhesive containing a powdered carbon, said powdered carbon being finely ground such that upon deposition of said microwavable energy absorptive composition on said paper and exposure of said composition to microwave energy, said composition absorbs microwave energy and generates heat as a result of the microwave energy absorption, said fluid adhesive comprising a binder type fluid resin based adhesive and said microwave energy absorptive composition further comprising a conductive enhancing and drying controlling ingredient consisting of sodium chloride and calcium chloride in an amount sufficient to enhance conductivity of the composition as applied and to minimize drying in low humidity conditions, said microwave energy absorptive composition further comprising a refined clay in a temperature control effective amount, and said fluid resin adhesive is selected from the group consisting of polyvinyl alcohol, polyvinyl acrylonitrile and polyvinyl acetate,

after printing said strip of microwave energy absorptive composition onto said continuous sheet of paper, laminating said inner layer of heat sealable, fluid impervious thermoplastic resin onto the roller printed continuous sheet of paper to provide a laminate of paper and thermoplastic resin with the strip of microwave energy absorptive composition secured therebetween,

then cutting and folding the laminate to form discrete packages detached from the continuous sheet such that each package has an outer layer of flexible paper and an inner layer of heat sealable, fluid impervious thermoplastic resin,

said aligning and printing steps being repeated along spaced intervals on said continuous sheet of flexible paper such that after cutting and folding to form discrete packages, each package contains one strip and wherein each strip of microwave energy absorptive composition printed in said printing step is printed on said continuous sheet at a position such that said printing of said sheet and the cutting and folding of said laminate creates discrete packages wherein the microwave energy absorptive composition is located across the bottom wall of each of the packages and partially up the sidewalls of each of the packages such that the printed microwave energy absorptive composition serves as a surrounding heat assist such that more uniform heating of the food product in the packages can be achieved without requiring the food to be uniformly scattered across the bottom wall.

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5,500,236

## NON-FRIED FLAVORED RAMEN NOODLES

Harry E. Miller, New Egypt; Paul Pak, Franklinville; Steven M. Schechter, Manalpan, all of N.J., and Vien-An T. Huynh, Media, Pa., assignors to Campbell Soup Company, Camden, N.J.

Continuation of Ser. No. 262,066, Jun. 17, 1994, abandoned. This application Oct. 5, 1994, Ser. No. 318,436
Int. Cl.[6] A23L 1/16
U.S. Cl. 426—451 52 Claims

1. A method for drying ramen noodles without frying comprising the steps of:

a) mixing flour and water into a dough;

b) shaping the dough into noodles;

c) precooking the noodles in a fluid; and

d) drying the precooked noodles in a flow of high velocity air for less than 30 minutes and at a temperature above 145° C.

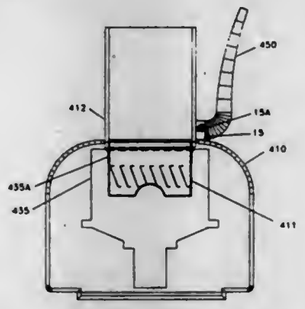
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5,500,237

## REMOVABLE COFFEE ROASTER OVEN CHAMBER

Harold A. Gell, Jr., 13720 Lockdale Rd., Silver Spring, Md. 20906-2117, and Brian Porto, 3225 Grace St., Apt. #206, Washington, D.C. 20009

Filed Mar. 14, 1995, Ser. No. 404,651
Int. Cl.[6] A23F 5/00; A23N 12/00
U.S. Cl. 426—466 20 Claims



12. A method of roasting coffee, including the steps of: placing a removable oven partially into a plenum for heated air via a duct in the top of said plenum;

forcing heated air through said plenum and into said removable oven via openings in the side wall of said removable oven;

creating a fluidized bed of green coffee beans contained within said removable oven by allowing said heated air to escape out of the top of said removable oven;

converting said green coffee beans into roasted coffee beans by heat transfer from said heated air; and

removing said removable oven from said plenum after said green coffee beans have been converted to said roasted coffee beans having a desired degree of roast.

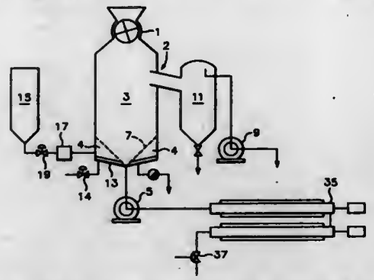


5,500,238

## METHOD AND DEVICES FOR PROCESSING FRESH FOODSTUFFS

Bernard Thienpont, Edelareberg 19, B-9700 Oudenaarde; Belgique, Belgium

PCT No. PCT/BE93/00003, § 371 Date Jul. 28, 1994, § 102(e) Date Jul. 28, 1994, PCT Pub. No. WO93/14651, PCT Pub. Date Aug. 5, 1993
PCT Filed Jan. 19, 1993, Ser. No. 256,840
Claims priority, application Belgium, Jan. 31, 1992, 9200108
Int. Cl.[6] A23B 7/00; A23L 3/00
U.S. Cl. 426—511 14 Claims



1. Method for preservation of bulk fresh foodstuffs by heat treatment, comprising:

introducing the foodstuffs into a reduced-pressure chamber through an air lock thereby maintaining the reduced pressure in the chamber,

moving the foodstuffs in a pre-defined direction of travel in the chamber,

subjecting the foodstuffs in the chamber to a flow of steam wherein the steam flow is in a direction opposite the direction of travel of the foodstuffs, and

providing some of the heat necessary for heating the foodstuffs by allowing steam to condense on the foodstuffs in the chamber.

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5,500,239

## METHOD AND APPARATUS FOR THE MANUFACTURE OF A PET FOOD PRODUCT HAVING A FIBROUS STRIATED STRUCTURAL MATRIX

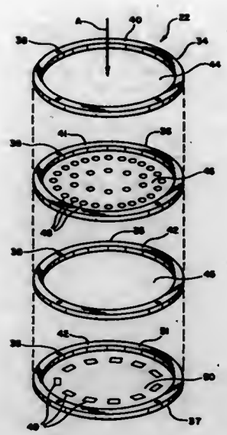
Larry H. Hayward, Topeka, Kans., assignor to Colgate Palmolive Company, New York, N.Y.

Filed Mar. 15, 1995, Ser. No. 404,709
Int. Cl.[6] A23P 1/00; B29C 47/00
U.S. Cl. 426—516 12 Claims

1. A method of producing a pet food product having fibrous striations transversely aligned through the product matrix, the method comprising:

preparing a pet food ingredient mixture containing a fiber bearing ingredient,

feeding the mixture to an inlet of an apparatus comprising an extruder barrel having an outlet through which a stream of the fiber containing food mixture is advanced and to which outlet is affixed a die assembly, the die assembly comprising, in sequence, a first spacer plate having an annular passage positioned to receive the food mixture stream discharged through the outlet, the first spacer plate being of sufficient length to stabilize the food mixture stream flow, a breaker plate positioned to receive the stream of flow stabilized food mixture discharged from the first spacer plate, the breaker plate being provided with a plurality of openings for effecting a first, discontinuous, alignment of the fibers in the stream, a second spacer plate having an annular passage positioned to receive the food mixture stream discharged from the breaker plate, the second spacer plate having a length at least twice that of the first spacer plate, such length being sufficient to further align the fibers in the mixture stream to a continuous aligned state,



and a die plate provided with of a plurality of orifices and positioned to receive the food mixture stream discharged from the second spacer plate,

advancing the fiber containing food mixture stream through each of the spacer and breaker plates and through the orifices of the die plate to induce a state of laminar flow in the food mixture stream to obtain a fiber striated extrudate, and then drying the extrudate discharged from the orifices of the die plate to obtain a pet food product having a transverse fibrous striated matrix.

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5,500,240

## PRODUCTION OF CHIP-LIKE STARCH BASED SNACKS

Kevin Addesso, Ringwood; Theresa E. Dzurenko, Morris Plains, both of N.J.; Mark J. Molsey, Center Valley, Pa.; Harry Levine; Louise Slade, both of Morris Plains, N.J.; James M. Manns, Glenwood, N.J.; Richard D. Fazzolare, Randolph, N.J.; James Ievoleila, New City, N.Y., and Martha Y. Wang, Glen Rock, N.J., assignors to Nabisco, Inc., Parsippany, N.J.

Continuation of Ser. No. 57,918, May 7, 1993, Pat. No. 5,429,834. This application Jun. 6, 1995, Ser. No. 467,668
Int. Cl.[6] A23L 1/10;1/217
U.S. Cl. 426—560 17 Claims

1. A method for the production of a chip-like snack comprising:

a) forming a machinable dough at a temperature of less than about 125° F. by admixing ingredients comprising wheat flour, a no- or low-gluten content starchy material, water, and about 4% by weight to about 40% by weight of a pregelatinized waxy starch, said weight percentage being based upon the weight of said starchy material, wherein a portion of said starchy material and a portion of the water are premixed with the pregelatinized waxy starch to substantially uniformly hydrate the pregelatinized waxy starch, and the remaining portion of said starchy material and the remaining portion of the water are admixed with the hydrated pregelatinized waxy starch to obtain said dough,

b) sheeting the dough,

c) cutting the sheeted dough into pieces having a moisture content of from about 25% by weight to about 60% by weight, and

d) heating said pieces to reduce said moisture content to less than about 4% by weight to obtain pieces having a blistered appearance substantially throughout their surface.

**5,500,241**

## KIWIFRUIT JUICE PRODUCT

Amaranathan Balasingham, 79 Kayus Road, Pukekohe, Auckland, and Patrick J. Clement, 1a Irene Avenue, Mount Eden, Auckland, both of, New Zealand

Continuation of Ser. No. 788,783, Nov. 6, 1991, Pat. No. 5,298,275. This application Jan. 26, 1994, Ser. No. 187,881
Int. Cl.[6] A23L 2/02
U.S. Cl. 426—599 13 Claims

1. A fruit product substantially free of discernible catch which is derived from a fruit of the genus *Actinidia*, comprising a soft-pulped fruit pulp or juice and a sweetening agent, wherein a minor proportion of the seeds present in said product are fragmented, said product having the green color of kiwifruit flesh in the absence of any added coloring agent.

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**5,500,242**

## HIGHLY WATER ABSORBED RICE AND METHOD OF PRODUCING THE SAME, ULTRA-HIGHLY WATER ABSORBED RICE AND A VARIETY OF RICE PRODUCTS UTILIZING THE SAME

Yukio Ishida, 1-15, Kijirihigashi 2-chome, Shimizu-shi, Shizuoka-ken 424, and Hiroyasu Fukuba, Tokyo, both of, Japan, assignors to Yukio Ishida, Shizuoka, and Japan Energy Corporation, Tokyo, both of, Japan

Filed Jul. 27, 1994, Ser. No. 280,988
Claims priority, application Japan, Jul. 28, 1993, 5-204473; Jul. 14, 1994, 6-184129
Int. Cl.[6] A23L 1/182;1/164
U.S. Cl. 426—618 10 Claims

1. Highly water absorbed rice produced by a process comprising:
(1) immersing washed rice in water to obtain immersed rice,
(2) converting immersed rice into water absorbed rice at a water content of 42 to 72 parts by weight to 100 parts by weight of raw rice by using water in a form selected from the group consisting of hot water at a temperature of no less than 65° C. steam and presaurized steam,
(3) immersing the resulting rice into cold water at 0° to 25° C. while the rice is in the state where the temperature of the rice is nearly maintained at the temperature of the water for use in the above heating of the rice, to prepare water absorbed rice at a water content of 50 to 85 parts by weight of water to 100 parts by weight of raw rice, and
(4) charging the water absorbed rice into a liquid selected from the group consisting of water, sauce, soup, soup stock, vinegar, and seasoning broth at a temperature of from 25° to 60° C. to adjust the water content to 75 to 110 parts by weight of water to 100 parts by weight of raw rice.

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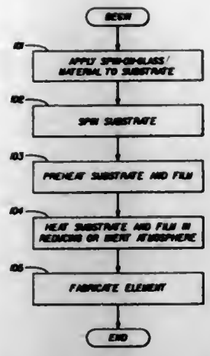
**5,500,243**

## PROCESS FOR PLANARIZING SUBSTRATE SURFACES FOR MAGNETIC THIN FILM HEADS

Danny D. L. Yang, San Diego, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 125,086, Sep. 21, 1993, abandoned. This application Mar. 27, 1995, Ser. No. 410,588
Int. Cl.[6] B05D 5/12
U.S. Cl. 427—126.3 4 Claims

1. A process for forming a dielectric nonmetallic thin film coating on a substrate surface used in magnetic thin film heads, said process comprising the steps of:
applying a silicon solution which includes carbon and oxygen to the surface of a substrate;
spinning said substrate to form a uniform coating of said silicon solution on said surface of said substrate;
preheating said coating to a temperature whereby all solvents are released from said uniform coating;
following said preheating step, heating said coating in a temperature range of 900 degrees C. to 1100 degrees C. in a




reducing or inert atmosphere to form an amorphous nonmetallic, dielectric coating of silicon dioxide and silicon carbide on said surface of said substrate, which is hard and wear resistant and which planarizes said surface of said substrate by eliminating substrate surface pits; and
fabricating said substrate with said amorphous nonmetallic, dielectric coating of silicon dioxide and silicon carbide with a magnetic thin film head.

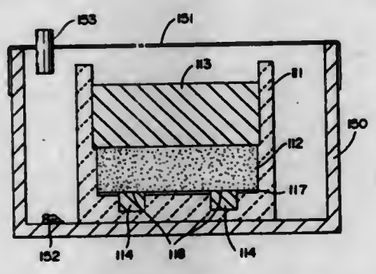
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**5,500,244**

## METHOD FOR FORMING METAL MATRIX COMPOSITE BODIES BY SPONTANEOUSLY INFILTRATING A RIGIDIZED FILLER MATERIAL AND ARTICLES PRODUCED THEREFROM

Michael A. Rocazella, 1285 Spring Valley Rd., Newark, Del. 19711; Kurt J. Becker, 136 Kenmark Rd., Newark, Del. 19713, and Michael K. Aghajanian, 604 Helmsdale Ct., Bel Air, Md. 21014

Continuation of Ser. No. 807,430, Dec. 13, 1991, Pat. No. 5,298,283, which is a continuation of Ser. No. 521,200, May 9, 1990, abandoned. This application Mar. 28, 1994, Ser. No. 218,961
Int. Cl.[6] B05D 7/22
U.S. Cl. 427—181 11 Claims




1. A method for making a metal matrix composite body, comprising:
providing a permeable mass comprising at least one filler material;
placing a loose mass comprising at least one bedding material comprising at least one glass frit around at least a portion of said permeable mass;
partially sintering at least said at least one bedding material to a temperature sufficient and for a time sufficient to rigidize said loose mass of at least one bedding material while maintaining at least some permeability of said permeable mass; and
spontaneously infiltrating at least a portion of said permeable mass with a molten matrix metal.



**5,500,245**

## WATER-REPELLENT EARTH MATERIAL, AND METHODS OF MAKING AND USING THE SAME

Kazumi Toushin, 2105 Hayashi, Kurashiki-shi, Okayama-ken, Japan

Filed Jul. 26, 1994, Ser. No. 280,452
Claims priority, application Japan, Dec. 9, 1993, 5-340850
Int. Cl.[6] B05D 7/00
U.S. Cl. 427—221 5 Claims




1. A method of making a water-repellent earth material comprising the steps of:
heating a starting earth material for drying;
preparing an emulsion of silicone oil in water;
soaking the earth material with the emulsion; and
heating the soaked earth material for drying.

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**5,500,246**

## RESIN COMPOSITION FOR WATER-BASED COATING AND WATER-BASED COATING COMPOSITION

Kenichi Morizono, and Taira Harada, both c/o Mitsui Petrochemical Industries, Ltd., No. 3, Chigusakaigan, Chiba 299-01, Japan

PCT No. PCT/JP93/01844, § 371 Date Aug. 18, 1994, § 102(e) Date Aug. 18, 1994, PCT Pub. No. WO94/14905, PCT Pub. Date Jul. 7, 1994
PCT Filed Dec. 21, 1993, Ser. No. 290,827
Claims priority, application Japan, Dec. 22, 1992, 4-342642
Int. Cl.[6] B05D 7/22
U.S. Cl. 427—239 12 Claims

1. A resin composition for water-based coating which is a resin mixture consisting essentially of:
(1) a reaction product (C) of an aromatic polyol resin (A-1) and a carboxyl group-containing acrylic resin (B);
(2) an aromatic epoxy resin (D); and
(3) an aromatic polyol resin (A-2);
wherein
said aromatic polyol resin (A-1) and said aromatic polyol resin (A-2), which may be the same or different, are obtained by capping the epoxy group of an aromatic epoxy resin,
the weight ratio of component (A-1) to component (B) satisfying the following expression (I), and the proportion of component (D) and component (A-2) satisfying the following expressions (II) and (III) based on 100 parts by weight of the resin mixture:

$$85/15 \geqq (A\text{-}1)/B \geqq 15/85 \quad \text{(I)}$$

$$1 \leqq (D)+(A\text{-}2) \leqq 80 \quad \text{(II)}$$

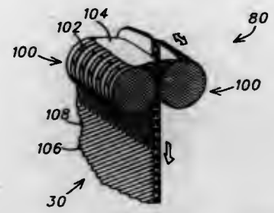
$$1 \leqq (D) \leqq 80 \quad \text{(III)}.$$

**5,500,247**

## METHOD FOR PRODUCTION OF A CONTINUOUS WEB OF FLUID PURIFIER MEMBRANE FILTER STOCK MATERIAL HAVING A LOW PRESSURE SIDE PERMEABLE LAYER SANDWICHED BETWEEN TWO MEMBRANE CARRIER LAYERS HAVING CAST-IN PLACE EXTERNAL MEMBRANES

Peter Hagqvist, Älvsjö, Sweden, assignor to AB Electrolux, Stockholm, Sweden

Filed Nov. 29, 1993, Ser. No. 158,384
Claims priority, application Sweden, Nov. 27, 1992, 9203577
Int. Cl.[6] B05D 1/36;1/40;3/02;3/12
U.S. Cl. 427—244 8 Claims




1. A method for producing a flat membrane filter web for a fluid purifier, comprising:
(a) providing a continuous, flat web having first and second, opposite-side membrane carrier layers which sandwich between them an intermediate spacer layer, said layers having respective first and second longitudinal edge margins, and said membrane carrier layers having opposite outer surfaces;
(b) continuously conducting said web through an edge-sealing station, and therein, on longitudinally successive increments of said web, sealing said first edge margins and sealing said second edge margins, so as to seal-off said intermediate spacer layer from externally of the web at said edge margins and thereby define of said intermediate spacer layer between said edge margins a permeate space for acting as a low pressure side of a filter for a fluid purifier;
(c) continuously conducting said web through a coating station located downstream of said edge-sealing station, and therein, on longitudinally successive increments of said web, applying a membrane-forming casting solution to said opposite outer surfaces of said membrane carrier layers; and
(d) continuously conducting said web through a casting solution gelation station located downstream of said coating station, and therein, on longitudinally successive increments of said web, activating gelling of said casting solution.

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**5,500,248**

## FABRICATION OF AIR BRAZABLE DIAMOND TOOL

Charles D. Iacovangelo, Schenectady, and Elihu C. Jerabek, Glenmont, both of N.Y., assignors to General Electric Company, Worthington, Ohio

Filed Aug. 4, 1994, Ser. No. 286,076
Int. Cl.[6] C23C 16/00; B05D 3/02
U.S. Cl. 427—250 6 Claims

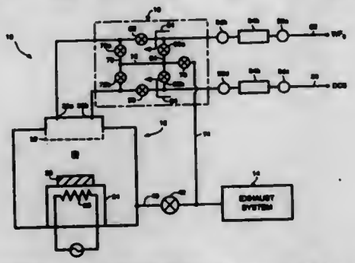
1. A method for manufacturing a diamond article comprising the steps of:
depositing a tungsten and titanium alloy layer on a diamond substrate, said alloy layer and said diamond substrate forming an interface therebetween;
depositing a substantially non-oxidizable protective layer on said alloy layer to form a dual-coated diamond article; and
heating said dual-coated diamond article at a temperature and for a time sufficient to form titanium carbide at the interface between said alloy layer and said diamond substrate to provide adhesion of said alloy layer to said diamond substrate; whereby said diamond article is brazable in air.

**5,500,249**

## UNIFORM TUNGSTEN SILICIDE FILMS PRODUCED BY CHEMICAL VAPOR DEPOSITION

Susan G. Telford, Cupertino; Meng C. Tseng, Saratoga, both of Calif., and Michio Aruga, Chiba, Japan, assignors to Applied Materials, Inc., Santa Clara, Calif.

Continuation-in-part of Ser. No. 995,211, Dec. 22, 1992. This application May 18, 1993, Ser. No. 64,328
Claims priority, application Japan, Apr. 2, 1993, 5-76894
Int. Cl.[6] C23C 16/00
U.S. Cl. 427—255 11 Claims



1. A chemical vapor deposition process for depositing a substantially uniform, substantially fluorine free layer of $WSi_x$ on a substrate, the process comprising the steps of:

(a) placing a substrate within a deposition zone;

(b) during an initial deposition stage, (i) introducing seeding gas, dichlorosilane and tungsten hexa-fluoride into the deposition zone; and (ii) maintaining the deposition zone at process conditions suitable for depositing an interfacial layer of $WSi_x$ having a substantially uniform Si:W ratio directly on the substrate; and

(c) during a second deposition stage, (i) stopping flow of the seeding gas, while continuing to flow dichlorosilane and tungsten hexa-fluoride into the deposition zone; and (ii) maintaining the deposition zone at process conditions suitable for depositing a substantially uniform $WSi_x$ layer on the interfacial $WSi_x$ layer.

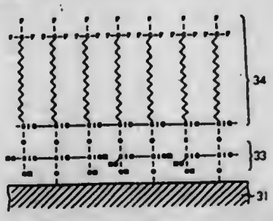
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**5,500,250**

## CHEMICALLY ADSORBED FILM AND METHOD OF MANUFACTURING THE SAME

Kazufumi Ogawa, Hirakata; Norihisa Mino, Settu, and Mamoru Soga, Osaka, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 303,757, Sep. 9, 1994, abandoned, which is a division of Ser. No. 831,486, Feb. 5, 1992, Pat. No. 5,372,888. This application Aug. 7, 1995, Ser. No. 511,912
Claims priority, application Japan, Feb. 6, 1991, 3-038134; Apr. 30, 1991, 3-098902
Int. Cl.[6] B05D 1/18;3/00
U.S. Cl. 427—299 9 Claims




1. A method of forming a chemically adsorbed film on an ornament surface, comprising washing the ornament and dipping the ornament in a solution obtained by dissolving a chlorosilane-based surface active material having a chlorosilane group at one end and a fluorocarbon group at the other end in an organic solvent, washing unreacted surface active material from the ornament surface using a non-aqueous solution, and reacting said material remaining on the ornament surface with water or exposing said remaining surface active material to air containing moisture, thereby forming a chemically adsorbed monomolecular film of said surface active material on the entire surface of the ornament.

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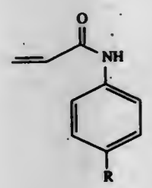
**5,500,251**

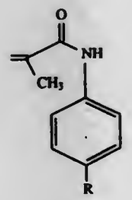
## PROCESS FOR COATING LOW ENERGY SURFACES

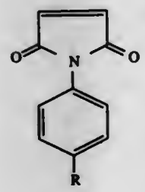
William F. Burgoyne, Jr., Allentown; Wiley E. Daniels, Easton; Dennis Sagi, Bethlehem; Heueh-Chi Lee, Allentown, and Menas S. Vratsanos, Breinigsville, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation of Ser. No. 950,584, Sep. 23, 1992, abandoned, which is a division of Ser. No. 876,940, May 1, 1992, abandoned. This application Jun. 17, 1994, Ser. No. 261,568
Int. Cl.[6] B05D 3/00
U.S. Cl. 427—322 7 Claims

1. In a method for coating a polyolefin surface with a coating material comprising an emulsion polymer derived from acrylates or vinyl acetate/ethylene or a solution polymer derived from methylacrylate, ethylacrylate, butylacrylate, or 2-ethylhexylacrylate, the improvement for enhancing the adhesion of said coating material to the polyolefin surface comprising employing a coating material which comprises said type of emulsion polymer or solution polymer which contains from about to 2 to 25 wt % copolymerized monomer units selected from the group consisting of:




wherein R is a $C_1$-$C_8$ alkyl group.

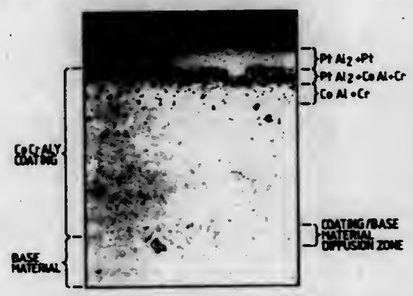


**5,500,252**

## HIGH TEMPERATURE CORROSION RESISTANT COMPOSITE COATINGS

Mehar C. Meelu, Birmingham, England, assignor to Rolls-Royce plc, London, England

Division of Ser. No. 206,818, Mar. 7, 1994, which is a continuation-in-part of Ser. No. 112,985, Aug. 30, 1993, abandoned. This application May 10, 1995, Ser. No. 438,733
Claims priority, application United Kingdom, Sep. 5, 1992, 9218858
Int. Cl.[6] B05D 3/02
U.S. Cl. 427—376.3 6 Claims




1. A process for providing an M-based superalloy base material, where M is at least one of iron, cobalt and nickel, with a multiplex protective coating system containing aluminides in and near its surface, the process comprising the steps of:

applying an MCrAlY alloy coating to the surface of the base material, the Al content of the coating being in the range 4 to 20 weight percent;

chromizing the MCrAlY coating to produce a coating with a chromized top layer having a chromium content of not more than about 40 weight percent;

aluminizing the chromized coating to produce a coating having a surface layer containing aluminides of the M constituent of the coating;

depositing a platinum layer onto the surface of the aluminized coating, and

heating the resulting coating to diffuse the platinum layer into the underlying aluminide containing layer, thereby to produce an MCrAlY coating having a platinum modified aluminide surface layer.

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**5,500,253**

## SUBSTRATE-REACTIVE COATING COMPOSITION

Mohan L. Sandaja, Flushing; Irene Berlina; Carl Horowitz, both of Brooklyn, and Paul Thottathil, New Hyde Park, all of N.Y., assignors to James A. Bolton, Stratford, Conn.

Division of Ser. No. 50,849, Apr. 21, 1993, Pat. No. 5,439,969. This application Jan. 6, 1995, Ser. No. 369,366
Int. Cl.[6] B05D 3/00; C08F 20/02; C08L 75/04
U.S. Cl. 427—385.5 24 Claims

1. A process for forming a protective coating which is bonded to a surface comprising applying a coating composition to said surface and drying said coating, said coating composition being an aqueous dispersion comprising a mixture of:

(a) a water dispersible polymer selected from the group consisting of acrylic polymers, urethane polymers and mixtures thereof;

(b) at least one polyethylenically unsaturated monomer;

(c) an at least partially water-soluble free radical polymerization catalyst; and

(d) a source of cations selected from the group consisting of $Ce^4$, $Ce^3$, $Fe^3$, $Fe^2$, $Co^2$, $Cu^2$ and $Ag^1$;

said coating composition containing from about 40 to about 85% by weight water.

169–178 O.G.–96–11: QL3

**5,500,254**

## COATED POLYMERIC FABRIC HAVING DURABLE WETTABILITY AND REDUCED ADSORPTION OF PROTEIN

Roger B. Quincy, III, Alpharetta; Ronald S. Nohr, Roswell; John G. MacDonald, Decatur; Elizaeth D. Gadsby, Marietta, and Dennis S. Everhart, Alpharetta, all of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Dec. 21, 1993, Ser. No. 170,598
Int. Cl.[6] B32B 27/00;9/00
U.S. Cl. 427—387 2 Claims

1. A method of durably rendering a polymeric fabric wettable and resistant to protein adsorption which comprises:

providing a polyolefin fabric having a surface;

applying to the surface of the polyolefin fabric a composition comprising water and a surfactant; and

drying the polyolefin fabric to which the composition has been applied; in which the surfactant

has a solubility in water at 20° C. no greater than about 5 percent by weight, based on the weight of the water,

is present on the fabric in an amount of at least 0.3 percent by weight, based on the weight of the fabric, to durably render the polyolefin fabric wettable and resistant to protein adsorption; and

has the formula,

$$R_1O(C_3H_6O)_a(C_2H_4O)_b(CH_2)_c-\left(\begin{matrix}R_2\\|\\Si\\|\\R_3\end{matrix}-O\right)_d\begin{matrix}R_4\\|\\Si\\|\\R_5\end{matrix}-(CH_2)_cO(C_2H_4O)_b(C_3H_6O)_aR_6$$

wherein:

each of $R_1$ and $R_6$ independently is selected from the group consisting of hydrogen and $C_1$–$C_8$ alkyl and aryl groups;

each of $R_2$–$R_5$ independently is selected from the group consisting of $C_1$–$C_8$ alkyl and aryl groups;

a represents an integer from about 8 to about 25;

b represents an integer from about 8 to about 25;

the ratio of b to a is in a range of from about 0.7 to about 1.5;

c represents an integer from 1 to about 10;

d represents an integer from about 40 to about 100;

the ratio of d to two times the sum of a and b is in a range of from about 0.7 to about 1.5; and

the number-average molecular weight of the surfactant is in a range of from about 5,000 to about 35,000.

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**5,500,255**

## REMOVAL OF HALOS FROM GLASS-CERAMIC ARTICLES DECORATED WITH A CERAMIC COLOR

Roland Leroux, Stadecken-Elsheim; Erich Rodek, Mainz; Kurt Schaupert, Hofheim-Wallau; Jürgen Thürk, Schornsheim, and Waldemar Weinberg, Mainz, all of, Germany, assignors to Schott Glaswerke, Mainz, Germany

Filed Jan. 11, 1993, Ser. No. 2,761
Claims priority, application Germany, Jan. 10, 1992, 42 00 449.7
Int. Cl.[6] B05D 3/06
U.S. Cl. 427—419.2 9 Claims

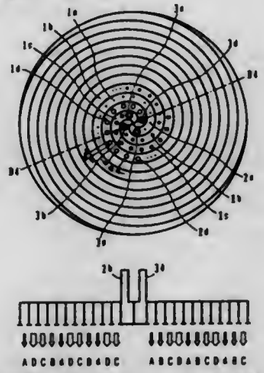
1. A process for removing halos in glass-ceramic articles decorated with a burnt-in ceramic color, comprising, after the glass-ceramic color has been burnt in, applying a layer consisting essentially of $SiO_2$ to the glass-ceramic article to remove the halo and to obtain a sharply defined burnt-in color.

**5,500,256**

## DRY PROCESS APPARATUS USING PLURAL KINDS OF GAS

**Masahiro Watabe, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan**

**Filed May 24, 1995, Ser. No. 449,268**
**Claims priority, application Japan, Aug. 16, 1994, 6-192601**
**Int. Cl.[6] C23C *16/00***
**U.S. Cl. 427—579** **20 Claims**



1. A vapor phase processing system comprising:
a process chamber capable of being evacuated;
a wafer susceptor disposed in the process chamber, the wafer susceptor having a plane on which a wafer to be processed is placed;
a plurality of gas flow paths forming a structure of a plurality of spirals, facing the wafer susceptor, and being disposed along a flat plane generally parallel to the wafer susceptor; and
a plurality of gas supply holes formed in a plane of the gas flow paths facing the wafer susceptor, for and along each gas flow path.

11. A method for a vapor phase process comprising:
a step of placing a wafer to be processed, in a process chamber capable of being evacuated;
a first vapor phase process step of processing the wafer by supplying a first process gas from a first gas flow path group including one or more gas flow paths, the first gas flow path group being selected from a plurality of gas flow paths disposed along a flat plane generally parallel to the wafer and forming a structure of a plurality of spirals, each gas flow path independently supplying a process gas; and
a second vapor phase process step of processing the wafer by supplying out a second process gas from a second gas flow path group including one or more gas flow paths different from the first gas flow path group selected from the plurality of gas flow paths.

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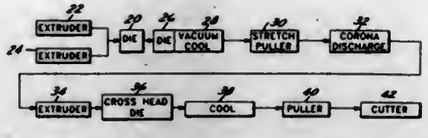
**5,500,257**

## METHOD OF PREPARING A FLUOROPOLYMER COMPOSITE

**Edward K. Krause, Ann Arbor, and Kenneth J. Kuenzel, Grass Lake, both of Mich., assignors to Pilot Industries, Inc., Dexter, Mich.**

**Continuation of Ser. No. 200,941, Feb. 23, 1994, abandoned, which is a continuation of Ser. No. 817,304, Jan. 6, 1992, abandoned. This application Jul. 7, 1995, Ser. No. 499,207**
**Int. Cl.[6] C08F *2/46***
**U.S. Cl. 427—487** **8 Claims**

1. A method of preparing a fluoropolymer composite comprising the steps of:
(1) chemically activating a formed fluoropolymer substrate by subjecting the substrate to a charged gaseous atmosphere formed by electrically ionizing a gas which contacts the substrate; and




(2) thereafter chemically bonding a layer of a polyamide polymer by applying said layer of polyamide polymer to the chemically activated fluoropolymer substrate.

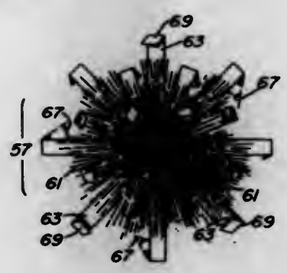
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**5,500,258**

## EDGE-FOLDED GARLAND

**Kevin Young, Bensalem, Pa., assignor to F.C. Young & Co., Inc., Yardley, Pa.**

**Filed Aug. 31, 1994, Ser. No. 298,267**
**Int. Cl.[6] A47G *1/00***
**U.S. Cl. 428—10** **8 Claims**



1. A tinsel garland formed from a cut film web, comprising:
a plurality of needles, each having .a radially-projecting shank and being permanently bent at an angle along a transverse foldline adjacent free ends of said needles; and
a plurality of outward-facing tab portions of said needles beginning at said foldline and terminating at the free ends.

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**5,500,259**

## ARTIFICIAL GRANITE SOLID MATERIAL

**Yoshikazu Kubota, Fujinomiya; Masayasu Kamijo, Fuji; Hiroshi Otsu, and Takashi Kamiya, both of Aichi, all of, Japan, assignors to Kohjin Co., Ltd., and Aica Kogyo Co., Ltd., Japan**

**Continuation of Ser. No. 186,062, Jan. 25, 1994, abandoned,. This application Mar. 16, 1995, Ser. No. 405,456**
**Int. Cl.[6] B44F *9/04***
**U.S. Cl. 428—15** **5 Claims**

1. A paper sheet produced by impregnating a fleck-patterned layer with a thermosetting resin to give a paper containing from 25 to 60% by weight of the resin on a dry basis, comprising
(A) from 20 to 80% by weight of cellulose pulp,
(B) from 2 to 40% by weight of an artificial fiber,
(C) from 10 to 70% by weight of an inorganic filler less than 10 μm in average diameter, and
(D) from 1 to 30% by weight of a fine-grained additive consisting of grains from 10 to 500 μm in average diameter, having a color hue different from that of the inorganic filler (C).



**5,500,260**

## DISPERSIBLE FILM

**Richard W. Halle; Dirk J. Michiels, both of Houston, Tex., and Jeffrey A. Middlesworth, Wauconda, Ill., assignors to Exxon Chemical Patents Inc., Wilmington, Del.**

**Division of Ser. No. 128,927, Sep. 29, 1993, Pat. No. 5,415,905. This application Jun. 17, 1994, Ser. No. 261,550**
**Int. Cl.[6] C08L *23/08;23/16;* B32B *27/32***
**U.S. Cl. 428—35.7** **3 Claims**

1. A package comprising:
a) an article selected from the group consisting of an unvulcanized rubber, a vulcanized rubber, compounding ingredients, and combinations thereof wherein said article is covered with and in contact with a film;
b) said film made from a polymer blend, said polymer blend having:
i) a first ethylene copolymer present in the range of from about 75 to about 99 percent by weight, said percentage based on the total polymer blend weight, said first ethylene copolymer being an ethylene-α-olefin copolymer, wherein said first ethylene copolymer has a density in the range of from about 0.85 to about 0.915 g/cm$^3$, said first ethylene copolymer having a Vicat softening point less than about 100° C., said first ethylene copolymer having a melting point not exceeding about 120° C., said alpha-olefin being selected from the group consisting of propylene, butene, pentene, hexene, octene, and, decene; and
ii) a second ethylene copolymer, containing long chain branching, present in the range of from about 1 to about 25 percent by weight based on the total weight of the polymer blend, said ethylene copolymer having in the range of from about 65 to about 99 percent by weight of ethylene and in the range of from about 1 to about 35 percent by weight of an ethylenically unsaturated acrylic acid ester based on the total weight of the second ethylene copolymer, wherein said polymer blend has a Vicat softening point in the range of from about 10° C. to about 90° C. and a melting point in the range of from about 30° C. to about 110° C.

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**5,500,261**

## RESIN COMPOSITION AND A CONTAINER

**Shinobu Takei, Kanagawa; Shoji Ohtani, Tochigi; Hiroaki Iwasaki, Tochigi; Tetsuhiro Ohsawa, Tochigi, and Yasunori Hosokowa, Wakayama, all of, Japan, assignors to Kao Corporation, Tokyo, Japan**

**Continuation of Ser. No. 313,536, Sep. 27, 1994, abandoned, which is a continuation of Ser. No. 107,207, Aug. 16, 1993, abandoned, which is a continuation-in-part of Ser. No. 887,184, May 20, 1992, abandoned. This application Jun. 6, 1995, Ser. No. 468,086**
**Claims priority, application Japan, May 24, 1991, 3-119823; Apr. 15, 1992, 4-94720**
**Int. Cl.[6] B65D *23/02;23/08;* C08L *67/02***
**U.S. Cl. 428—35.7** **15 Claims**

1. A vessel comprising an inner layer, wherein said inner layer is a blended resin composition comprising: at least one kind of a first polyester resin selected from the group consisting of amorphous polyester resins and polyester resins having a peak area of not more than 20 mJ/g by differential scanning calorimeter measurement, which has a glass-transition temperature not less than 50° C. and at least one kind of a second polyester resin which has a glass-transition temperature not more than 40° C.;
said first polyester resin having a peak A representing a temperature dependency of tan δ which is obtained by dynamic viscoelasticity measurement;
said second polyester resin having a peak B representing said temperature dependency of tan δ which is obtained by dynamic viscoelasticity measurement;
said peak A of said first polyester resin is located at a higher temperature than said peak B of said second polyester resin;
said blended resin composition having a peak A' representing a temperature dependency of tan δ which is obtained by dynamic viscoelasticity measurement and a peak B' representing a temperature dependency of tan δ which is obtained by dynamic viscoelasticity measurement;
said peak A' and peak B' of said blended resin composition are located at a lower temperature than said peak A; and
said peak A' and peak B' of said blended resin composition are located at a higher temperature than said peak B.

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**5,500,262**

## WEEPING HOSE

**Robert L. Richardson, Cookshire, Canada, assignor to Mercedes Textiles Limited, Canada**

**Filed Jan. 18, 1994, Ser. No. 181,909**
**Claims priority, application Canada, Jan. 19, 1993, 20875763**
**Int. Cl.[6] B29D *22/00***
**U.S. Cl. 428—36.1** **4 Claims**

1. A weeping hose comprised of warp yarn and filler yarn having an interior coating, the improvement comprising using a first warp yarn and a second warp yarn having different diameters, the first warp yarn comprising the bulk of the warp yarn in the hose, the second warp yarn is disposed axially about the circumference of the hose, the interior coating of the hose covering the first warp yarn but not covering the second warp yarn.

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**5,500,263**

## MULTILAYER PLASTIC PIPE

**Stefan Röber; Hans Jadamus, both of Marl; Michael Böer, Oer-Erkenschwick; Roland Feinauer, Marl; Hans-Dieter Herrmann, Marl, and Hans Ries, Marl, all of, Germany, assignors to Huels Aktiengesellschaft, Marl, Germany**

**Filed Jan. 28, 1994, Ser. No. 187,504**
**Claims priority, application Germany, Apr. 2, 1993, 43 10 884.9**
**Int. Cl.[6] B32B *1/08***
**U.S. Cl. 428—36.6** **11 Claims**

1. A multilayer plastic pipe comprising,
(I) at least one outer layer,
(II) at least one inner layer comprising a polyvinylidene fluoride molding composition, and
(III) a layer, disposed between said outer layer (I) and said inner layer (II), comprising a molding composition comprising mixture of:
(a) polyamide, and
(b) polyalkyl acrylate,
wherein said layers (I)–(III) are adhesively bonded to one another.

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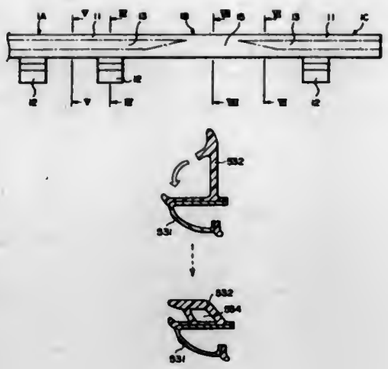
**5,500,264**

## HOLLOW EXTRUDATE

**Yukihiko Yada; Toshikazu Ito, both of Nagoya, and Katuyuki Amano, Handa, all of, Japan, assignors to Tokai Kogyo Kabushiki Kaisha, Ohbu, Japan**

**Division of Ser. No. 99,443, Jul. 30, 1993, Pat. No. 5,433,808. This application Mar. 22, 1995, Ser. No. 408,388**
**Claims priority, application Japan, Jul. 31, 1992, 4-225085; Jul. 31, 1992, 4-225086**
**Int. Cl.[6] B32B *3/06;3/10;* B60J *10/02;* E06B *7/16;7/23***
**U.S. Cl. 428—36.9** **7 Claims**

1. A hollow extrudate which comprises:
a belt-shaped member produced by extrusion and having hollow portions extending in a longitudinal direction of said member wherein an outer surface shape of a cross-section of a wall forming said hollow portion orthogonal to the longitudinal direction has a substantially constant shape in the longitudinal direction; and
wherein said member includes a solid portion extending in the longitudinal direction and interconnecting said hollow portions, said solid portion forming a reinforced portion of the member.



5,500,265
**PEELABLE FILM STRUCTURE**
Benoit Ambroise, Brandeville, and Maurice Petitjean, Williers, both of, France, assignors to Mobil Oil Corporation, Fairfax, Va.
Filed Oct. 7, 1993, Ser. No. 133,715
Claims priority, application United Kingdom, Jul. 21, 1993, 9315122
Int. Cl.[6] B32B *27/08;27/34;27/36;* B28B *3/20*
U.S. Cl. 428—41 22 Claims

1. A peelable film comprising:
(a) a core layer comprising an olefin polymer;
(b) a skin layer on at least one surface of the core layer, consisting essentially of:
(i) a blend of a butylene polymer with another olefin polymer; or
(ii) a polymer of butylene with one other olefin; and
(c) a coating layer comprising a heat-sealable polymer on the skin layer, said peelable film being peelable between said coating layer and said skin layer.

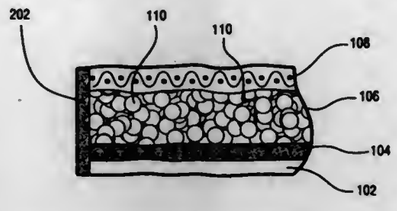
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5,500,266
**SPIN-COATING COMPENSATION FOR AN OPTICAL STORAGE MEDIUM WITH A SUBSTRATE GROOVE PROFILE GRADIENT**
James E. Durnin, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Mar. 10, 1994, Ser. No. 209,149
Int. Cl.[6] B32B *3/00*
U.S. Cl. 428—64.1 10 Claims



1. An optical storage medium comprising:
a substrate having at least one groove, said at least one groove being fabricated on a first surface of said substrate; and
a dye material layer formed on said first surface, wherein said dye material layer is spin-coated on said first surface, said at least one groove having a base dimension which is a function of a distance from a center portion of said substrate.

5,500,267
**SLIP-RESISTANT MAT FOR ABSORBING OIL AND OTHER LIQUIDS**
George Canning, 8874 State Rte. 665, Grove City, Ohio 43123
Filed Aug. 22, 1994, Ser. No. 293,804
Int. Cl.[6] B32B *3/02;* F16N *31/02*
U.S. Cl. 428—68 3 Claims



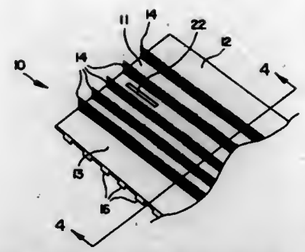
1. A mat for absorbing liquids such as oil, antifreeze, brake fluid drippings, and Christmas tree drippings, wherein said mat comprises:
a first, bottom layer comprising a liquid resistant bottom sheet having a first surface, which is slip-resistant, and a second surface;
a second, adhesive layer being applied to said second surface of said bottom layer;
a third, absorbent layer comprising absorbent material for absorbing the oil and said other liquids, said absorbent layer being disposed upon said adhesive layer;
a fourth, non-absorbent slip-resistant layer being disposed upon said absorbent layer, for permeating said oil and said other liquids therethrough for absorption by said absorbent layer, while retaining a slip-resistant surface upon which to walk after the oil and said other liquids have permeated said slip-resistant layer and have been absorbed by said absorbent layer; and
means for securing said bottom layer, said adhesive layer, said absorbent layer, and said slip-resistant layer, wherein said securing means prevents misalignment of said layers and surrounds the perimeter of said mat defined by respective edges of said bottom layer, said adhesive layer, said absorbent layer, and said slip-resistant layer, and
wherein said securing means comprises heat and pressure applied in combination with an adhesive material to the surrounding edges of said layers, thereby bonding said adhesive material to said layers at said respective edges of said bottom layer, said adhesive layer, said absorbent layer, and said slip-resistant layer; and
wherein said mat is manufactured as a length of mat having a series of linear perforations at regular intervals transversely across the width of said length of mat, thereby defining a plurality of individual mini-mats, along which of said perforations said individual mini-mat may be separated from said length of mat.

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5,500,268
**FASTENER ASSEMBLY WITH MAGNETIC SIDE AND END SEALS AND METHOD**
Patrick J. Billarant, Charlotte, N.C., assignor to Aplix, Inc., Charlotte, N.C.
Filed Jan. 31, 1995, Ser. No. 381,507
Int. Cl.[6] A44B *21/00*
U.S. Cl. 428—100 8 Claims

1. A fastener assembly for being molded into a foam cushion, and comprising:
(a) a base having first and second major surfaces defining first and second opposed ends and first and second opposed side edges;
(b) a multiplicity of attachment members carried by the base and extending outwardly from the first major surface of the base;



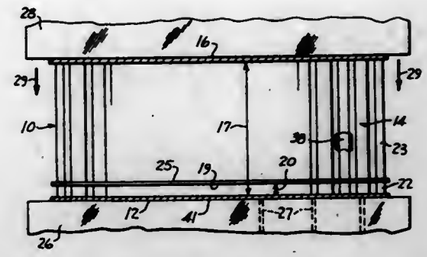


(c) a multiplicity of permanent anchors carried by the base and extending outwardly from the second major surface of the base, the anchors being spaced apart sufficiently to allow foam intrusion between said anchors to permanently attach said fastener assembly to the cushion;
(d) first and second magnetically-attractable side edge sealing members attached to the base adjacent a respective one of said first and second opposing side edges of the base for being attracted to magnets positioned in a mold in which the cushion is molded to form a foam-tight seal between the side edges of the base and the mold to prevent intrusion of liquid foam onto the attachment members of the base during molding of the cushion;
(e) first and second magnetically-attractable end sealing assemblies attached to the base adjacent to respective first and second ends of the base for being attracted to magnets positioned in the mold in which the cushion is molded to form a foam-tight seal between the ends of the base and the mold to prevent intrusion of liquid foam through the ends of the base onto the attachment members of the base during molding of the cushion, each of said first and second end sealing assemblies comprising:
(1) a magnetically-attractable metal staple penetrating through the base from one major surface to the other and cooperating with the base for holding the respective end of the base tightly in the mold; and
(2) a seal positioned on the respective end of the base and engaging with the attachment members on the first major side of the base for preventing liquid foam intrusion onto the first attachment members from the end of the base.

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5,500,269
**HONEYCOMB TABLE MANUFACTURE AND CLEAN-ROOM COMPATIBLE HONEYCOMB TABLES**
Dennis C. Terry, Costa Mesa, Calif., assignor to Newport Corporation, Irvine, Calif.
Continuation-in-part of Ser. No. 591,932, Oct. 2, 1990, Pat. No. 5,154,963, which is a continuation-in-part of Ser. No. 336,893, Apr. 12, 1989, Pat. No. 5,021,282, which is a division of Ser. No. 148,592, Jan. 26, 1988, Pat. No. 4,853,065, which is a continuation-in-part of Ser. No. 890,632, Jul. 30, 1986, abandoned, which is a continuation-in-part of Ser. No. 663,343, Oct. 22, 1984, Pat. No. 4,621,006. This application Jul. 24, 1992, Ser. No. 920,132
The portion of the term of this patent subsequent to Nov. 4, 2013, has been disclaimed.
Int. Cl.[6] B32B *3/12*
U.S. Cl. 428—116 10 Claims

1. A honeycomb table having at least a width dimension comprising:
a top facing sheet perforated with openings having a top surface for supporting components and a bottom surface;
a bottom facing sheet parallel to said top facing sheet;
a section of corrugated sheet material extending beneath said top facing sheet;
a honeycomb core having cells of equal length extending between said section of corrugated sheet material and said bottom facing sheet;



said section of corrugated sheet material being secured between said top facing sheet and said honeycomb core; and
a sealing sheet at the interface between said honeycomb core and said section of corrugated sheet material;
said sealing sheet and section of corrugated sheet material being secured together.

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5,500,270
**CAPILLARY LAMINATE MATERIAL**
Fred M. Langdon; William R. Ouellette, both of Cincinnati, and John B. Burchnall, West Chester, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Mar. 14, 1994, Ser. No. 212,487
Int. Cl.[6] A61F *13/15;* B32B *3/12;7/04*
U.S. Cl. 428—119 47 Claims

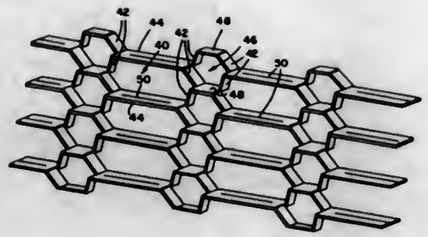


1. A laminate material comprising:
a first sheet and a second sheet, said first sheet being fluid pervious, said first sheet and said second sheet being spaced apart from one another by at least one spacer to define a capillary zone therebetween for the capillary movement of fluid, said spacer connecting said first sheet and said second sheet together to form said laminate material, said spacer maintaining said first sheet and said second sheet at a dimensional spacing sufficient to impart capillary forces to a fluid entering said capillary zone and move said fluid within said capillary zone via capillary pressure.

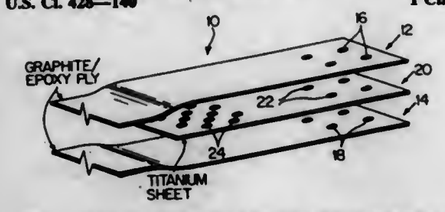
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5,500,271
**PAINT ARRESTOR FORMED FROM SLIT SHEET MATERIAL**
Roger M. Pasch, Windsor, and Kenneth C. Langenecker, Fall River, both of Wis., assignors to Research Products Corporation, Madison, Wis.
Filed Aug. 9, 1994, Ser. No. 287,656
Int. Cl.[6] B01D *39/12;* B32B *3/24*
U.S. Cl. 428—135 14 Claims

1. A paint arrestor for absorbing paint overspray comprising:
a series of layers of sheet material, each of said layers being slit and expanded to define an array of air spaces distributed in columns, said air spaces alternating in size from column to column and repeating in size in every other column; and
means for securing said layers in contiguous, overlying relationship with one another.



5,500,272
**HIGH EFFICIENCY LOAD TRANSFER IN COMPOSITE STRUCTURE**
Vincent T. Padden, Brightwaters, N.Y., assignor to Northrop Grumman Corporation, Los Angeles, Calif.
Filed Jan. 11, 1995, Ser. No. 371,432
Int. Cl.[6] B32B *3/24*
U.S. Cl. 428—140 1 Claim




1. A composite laminated panel having interleaved thin metallic sheets, comprising:
a plurality of spaced overlying plies of non-metallic woven composite material impregnated with epoxy material and forming the outer surfaces of the panel;
at least one sheet of thin metal interleaved between two adjacent plies;
a first series of aligned holes passing through the plies of the sheet for mounting fasteners of a fitting therethrough;
a second series of holes formed in the sheet only;
the epoxy material bonding together confronting surfaces of each ply and the sheet;
at least one edge portion of bonded overlying plies extending beyond the metal sheet;
each of the second series of holes receiving the bonding material to form plugs which grip the plies and the metal sheet thereby facilitating load transfer from the plies to the sheet, in the event of a total delamination between the plies and the adjacent metal sheet.

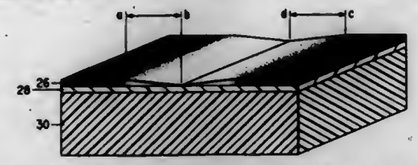
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5,500,273
**ABRASIVE ARTICLES COMPRISING PRECISELY SHAPED PARTICLES**
Gary L. Holmes, Vadnais Heights; Scott R. Culler, Burnsville, both of Minn.; David H. Hardy, New Richmond; William A. Hendrickson, St. Joseph, both of Wis.; Thomas P. Klun, Lakeland, Minn.; Kimberly K. Harmon; Robert V. Heiti, both of Hudson, Wis.; Kathryn M. Spurgeon, River Falls, Wis., and Charles J. Studiner, III, Oakdale, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation of Ser. No. 85,638, Jun. 30, 1993. This application May 19, 1995, Ser. No. 445,364
Int. Cl.[6] D06N *7/04*
U.S. Cl. 428—147 15 Claims

1. An abrasive article comprising a plurality of precisely shaped composites and a bonding medium wherein said precisely shaped composites comprise
(a) a plurality of abrasive grits and
(b) a polymeric binder, said binder formed by exposing a free radically polymerizable binder precursor to radiation energy,
wherein said precisely shaped composites are bonded together by means of said bonding medium to form a shaped mass or wherein said precisely shaped composites are distibuted within a non-woven web and bonded to the web fibers by means of said bonding medium.

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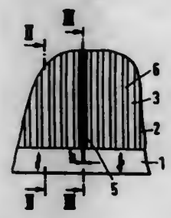
5,500,274
**COMPOSITE COATING OF VARIABLE THICKNESS HAVING A GRADIENT COLORATION IN THE CROSS-WEB DIRECTION**
Debra C. Francis, Sayre, Pa.; Siva V. Vallabhaneni, Voorhees, N.J., and Bert C. Wong, Marietta, Ohio, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
PCT No. PCT/US91/06899, § 371 Date Mar. 22, 1994, § 102(e) Date Mar. 22, 1994, PCT Pub. No. WO93/05946, PCT Pub. Date Apr. 1, 1993
PCT Filed Sep. 27, 1991, Ser. No. 196,221
Int. Cl.[6] B29C *47/04*
U.S. Cl. 428—156 11 Claims




8. A carrier film having a composite coating thereon comprised of a layer of polymeric binder resin having a uniform thickness and a colored polymeric binder resin layer having a variable thickness and a gradient coloration in the cross-web direction when measured either from the center or an edge of the web, said variable thickness tapering from a minimum to a maximum from each edge to the center of said web, said individual layers having a maximum dried coating thickness of about 100 microns.

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5,500,275
**NEEDLE BAR**
Rainer Kemper, Westerwaldstr. 14, 6053 Obertshausen, Germany
Division of Ser. No. 189,112, Jan. 31, 1994, Pat. No. 5,453,146. This application Feb. 22, 1995, Ser. No. 392,383
Claims priority, application Germany, Feb. 20, 1993, 43 02 858.6
Int. Cl.[6] B32B *3/28*; D05B *55/02*
U.S. Cl. 428—167 8 Claims




1. A needle bar comprising:
a carrier; and
a support member adhered to said carrier and having a plurality of needle grooves, said support member being divided into a linearly aligned plurality of individual segments, adjacent ones of said individual segments (a) being spaced to form a gap narrower in width than said needle grooves, (b) having opposing edges, and (c) having adjacent to each of said opposing edges a concavity recessed from each of said opposing edges to form between concavities on opposite sides of said gap, a space having a width equivalent to the needle grooves.



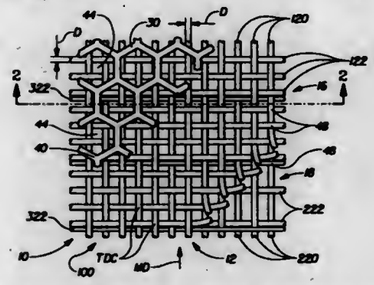
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5,500,276
**SLIDE FASTENER MADE OF SYNTHETIC RESIN**
Ryozo Sawada, Uozu; Masanori Hirasawa, Kurobe; Yoshiharu Yamaguchi, Namerikawa; Shigeru Funakawa, and Masaru Kanayama, both of Toyama, all of, Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan
Filed Jun. 22, 1994, Ser. No. 264,855
Claims priority, application Japan, Jul. 9, 1993, 5-193021
Int. Cl.[6] B32B *23/02*
U.S. Cl. 428—192 8 Claims

1. In an uncolored slide fastener of synthetic resin having regularly spaced elements formed and fixed to an edge of fastener tape by an injection molding of a molten mass of synthetic resin, the improvement comprising the fastener tape formed of polyethylene terephthalate and the elements formed of a polymer alloy of polybutylene terephthalate with polypropylene or polyethylene terephthalate.

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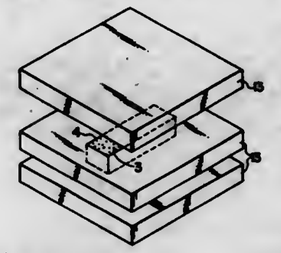
5,500,277
**MULTIPLE LAYER, MULTIPLE OPACITY BACKSIDE TEXTURED BELT**
Paul D. Trokhan, Hamilton, and Glenn D. Boutilier, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Jun. 2, 1994, Ser. No. 252,703
The portion of the term of this patent subsequent to Aug. 2, 2011, has been disclaimed.
Int. Cl.[6] B32B *3/00*
U.S. Cl. 428—196 25 Claims




1. A cellulosic fibrous structure through-air-drying belt comprising:
a reinforcing structure comprising:
a web facing first layer of interwoven machine direction yarns and cross-machine direction yarns, said machine direction and cross-machine direction yarns of said first layer having a first opacity substantially transparent to actinic radiation and being interwoven in a weave;
a machine facing second layer of interwoven machine direction yarns and cross-machine direction yarns, a plurality of said machine direction or said cross-machine direction yarns of said machine facing second layer having a second opacity greater than said first opacity and being substantially opaque to actinic radiation, said machine direction yarns and said cross-machine direction yarns of said second layer being interwoven in a weave,
said first layer and said second layer being tied together by a plurality of tie yarns, said tie yarns having an opacity less than said second opacity and being substantially transparent to actinic radiation; and
a pattern layer extending outwardly from said first layer and into said second layer, wherein said pattern layer provides a web contacting surface facing outwardly from said web facing surface of said first layer, said pattern layer connecting said first layer and said second layer, whereby said pattern layer stabilizes said first layer relative to said second layer during the manufacture of cellulosic fibrous structures thereon, said pattern layer having a backside texture on said machine facing surface of said second layer and registered with said yarns of said second layer having said second opacity, whereby airflow through said cellulosic fibrous structure and through said backside texture removes water from said cellulosic fibrous structure.

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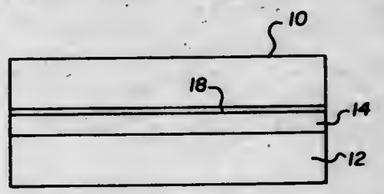
5,500,278
**MULTILAYER SUBSTRATE**
Takashi Nagasaka, Anjo, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan
Continuation-in-part of Ser. No. 914,627, Jul. 17, 1992, abandoned. This application Jan. 28, 1994, Ser. No. 188,322
Claims priority, application Japan, Jul. 17, 1991, 3-177010
Int. Cl.[6] B32B *9/00*
U.S. Cl. 428—210 31 Claims




1. A multilayer substrate comprising:
a plurality of insulating layers having a plurality of through holes which form vertical current paths, one of said plurality of insulating layers having a trench therein extending in a lateral direction of said multilayer substrate; and
wiring material, formed by a conductive material filled in said trench, for providing a lateral current path to electrically connect a first one of said plurality of through holes with a second one of said plurality of through holes.

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5,500,279
**LAMINATED METAL STRUCTURE AND METOD OF MAKING SAME**
Lee Walter, San Diego, and Steven J. Adamson, Poway, both of Calif., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Aug. 26, 1994, Ser. No. 297,194
Int. Cl.[6] B32B *7/02*
U.S. Cl. 428—213 1 Claim




1. A laminate adapted for etching of a pattern thereon, said laminate consisting of:

a) a thick metal sheet of thickness from 1 to several mils, said thick metal sheet having a first surface and a second surface, wherein said first surface is for receiving said pattern thereon,
b) an etch stop coating selected from the group consisting of a metal oxide, metal nitride, metal oxynitride, metal carbide, metal oxycarbide, and $Al_2O_3$, said etch stop coating adherent to said second surface of said sheet,
c) a substrate, and
d) an organic adhesive layer bonding said substrate to said etch stop coating wherein said etch stop coating has an effective thickness to protect the said organic adhesive during etching.

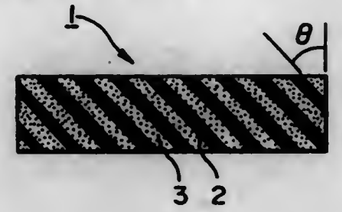
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**5,500,280**

## ELASTOMER-BASED CONNECTOR SHEET

**Kouichi Yamazaki, and Nobuyoshi Ogawa, both of Nagano, Japan, assignors to Shin-Etsu Polymer Co., Ltd., Tokyo, Japan**

**Filed Jul. 12, 1995, Ser. No. 501,586**
**Claims priority, application Japan, Aug. 12, 1994, 6-190585**
**Int. Cl.[6] B32B 9/00**
**U.S. Cl. 428—220** **4 Claims**




1. An elastomer-based connector sheet which comprises, as an integral body in the form of a sheet having a thickness in the range from 0.5 to 2.0 mm:
(a) a matrix in the form of a sheet made from an electrically insulating rubber having a Type A hardness according to JIS K 6301 in the range from 20 to 60; and
(b) a multiplicity of straightly extending wire segments of a metal having a volume resistivity not exceeding $10^{-1}$ ohm.cm at room temperature and having a diameter in the range from 20 to 90 μm embedded in the matrix of the rubber substantially in parallel each with the others in such a direction that the bias angle formed with the direction perpendicular to the surface of the sheet is in the range from 20° to 60° in such a fashion that each of the wire segments has the ends exposed on the surfaces of the matrix sheet and the distance between the surfaces of adjacent wire segments is at least 10 μm, the distribution density of the ends of the wire segments exposed on the surface of the matrix sheet being in the range from 70 to 1000 per $mm^2$.

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**5,500,281**

## ABSORBENT, FLUSHABLE, BIO-DEGRADABLE, MEDICALLY-SAFE NONWOVEN FABRIC WITH PVA BINDING FIBERS, AND PROCESS FOR MAKING THE SAME

**Ramesh Srinivasan, Billerica; James Bottomley, Andover, and W. Andrew Coslett, Medfield, all of Mass., assignors to International Paper Company, Purchase, N.Y.**

**Filed Feb. 23, 1994, Ser. No. 200,597**
**Int. Cl.[6] D04H 1/58**
**U.S. Cl. 428—288** **22 Claims**

1. An absorbent, flushable, bio-degradable, and medically-safe nonwoven fabric comprising from about 2% up to about 10% of untreated, water-soluble polyvinyl alcohol (PVA) fibers that are heat-bonded to a matrix of absorbent fibers such that said fabric



has a wet-to-dry tensile strength ratio of at least 25% in the machine direction (MD) and cross direction (CD) and a drape softness of from 0.5 to 4.0 gmf/gsy in the MD and 0.1 to 0.5 gmf/gsy in the CD.

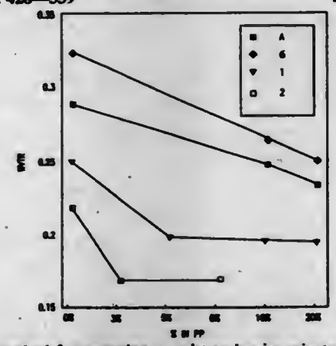
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**5,500,282**

## HIGH MOISTURE BARRIER OPP FILM CONTAINING HIGH CRYSTALLINITY POLYPROPYLENE AND TERPENE POLYMER

**Michael T. Heffelfinger, Fairport; Jay K. Keung, Macedon, and Robert G. Peet, Pittsford, all of N.Y., assignors to Mobil Oil Corporation, Fairfax, Va.**

**Filed Jul. 15, 1994, Ser. No. 272,990**
**Int. Cl.[6] B32B 5/16**
**U.S. Cl. 428—339** **20 Claims**




1. A method for preparing a moisture barrier oriented polypropylene film which comprises
a) blending high crystallinity polypropylene (HCPP) having intermolecular stereoregularity greater than 93% with a moisture barrier improving amount of polyterpene resin to form a base layer precursor;
b) extruding the resulting base layer precursor to form a sheet; and
c) stretching the sheet in both the longitudinal and the transverse directions to obtain the oriented film.

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**5,500,283**

## COATED HOPE FILM AND ITS METHOD OF MANUFACTURE

**Kevin A. Kirk, Macedon; Leland L. Liu, Fairport; Jeffrey J. O'Brien, Walworth, and Robert M. Sheppard, Fairport, all of N.Y., assignors to Mobil Oil Corporation, Fairfax, Va.**

**Filed Dec. 1, 1993, Ser. No. 160,552**
**Int. Cl.[6] B32B 7/12**
**U.S. Cl. 428—349** **20 Claims**

1. A coated film composition comprising:
a) a biaxially oriented high density polyethylene (HDPE) film comprising at least 50 wt. % of HDPE having a density of 0.960 or greater; and



b) a coating which is selected from the group consisting of polyvinylidene chloride polymer, polyvinylidene chloride copolymer, acrylic acid polymer, acrylic acid copolymer and polyvinyl alcohol polymer (PVOH).

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**5,500,284**

## COMPOSITE POLYOLEFIN FILMS SUITABLE FOR PACKAGING

**Emanuele Burgin, Bologna, and Giacinto Serrao, Milan, both of, Italy, assignors to Montell North America Inc., Wilmington, Del.**

**Filed Dec. 19, 1994, Ser. No. 358,281**
**Claims priority, application Italy, Dec. 27, 1993, MI93A2741**
**Int. Cl.[6] B32B 7/12;27/08**
**U.S. Cl. 428—349** **11 Claims**

1. A composite film comprising:
A) a single- or multilayer bioriented film, wherein the single layer or at least one layer of said bioriented film is a propylene crystalline homopolymer; and
B) a single- or multilayer cast film, wherein the single layer or at least one layer of said cast film is a composition comprising a component $B_1$ consisting of: I) 10–60 parts by weight of a propylene crystalline homopolymer with an isotactic index greater than 80, or a crystalline copolymer of propylene with at least one member selected from the group consisting of ethylene and a $C_4$–$C_8$ α-olefin, said crystalline copolymer containing more than 85% by weight of propylene and having an isotactic index greater than 85; II) 5–25 parts by weight of a copolymer fraction containing propylene and ethylene and insoluble in xylene at ambient temperature; III) 20–70 parts by weight of a copolymer of ethylene with at least one member selected from the group consisting of propylene and a $C_4$–$C_8$ α-olefin containing less than 70% by weight of ethylene, and soluble in xylene at ambient temperature.

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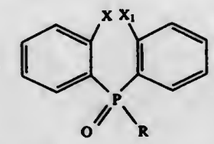
**5,500,285**

## REACTIVE FLAME RETARDANT ADDITIVES CONTAINING PHOSPHINO OXIDE MOIETIES

**Vittorio Carletti, Novara; Gianfranco Longhini, Vercelli; Riccardo Po', Livorno; Roberto Podesta', Lomagna; Anna M. Romano, Novara, and Cecilia Querci, Novara, all of, Italy, assignors to Great Lakes Chemical Italia S.r.l., and Enitricerche S.p.A., both of Milan, Italy**

**Filed Jan. 17, 1995, Ser. No. 373,441**
**Claims priority, application Italy, Jan. 20, 1994, MI94A0070**
**Int. Cl.[6] D02G 3/00**
**U.S. Cl. 428—364** **8 Claims**

1. A compound containing phosphino oxide groups, of formula (I):




(I)

wherein
X and $X_1$ represent a hydrogen atom, or taken together represent an $NR_1$ moiety in which $R_1$ represents a hydrogen atom, a linear or branched $C_{1-5}$ aliphatic moiety, a linear or branched $C_{2-6}$ acyl moiety or phenyl moiety;
R represents a $C_{4-9}$ cyclic or polycyclic moiety containing two carboxyl groups, $C_{4-9}$ cyclic or polycyclic moiety containing two carboxyl groups esterified with univalent alcobols or glycols, a $C_{4-9}$ cyclic or polycyclic moiety containing two carboxyl groups transformed into anhydrides, or two hydroxy groups.

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**5,500,286**

## MULTI-SHELL EMULSION PARTICLE

**Kousuke Someya; Akihiro Yamazaki, both of Yokohama; Futoshi Hoshino, Tokyo, and Takeshi Yanagihara, Chigasaki, all of, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan**

**Division of Ser. No. 189,995, Feb. 1, 1994, Pat. No. 5,409,776, which is a continuation of Ser. No. 730,236, Jul. 15, 1991, abandoned. This application Nov. 18, 1994, Ser. No. 341,110**
**Claims priority, application Japan, Jul. 16, 1990, 1-185323**
**The portion of the term of this patent subsequent to Dec. 28, 2010, has been disclaimed.**
**Int. Cl.[6] B32B 27/30; C08F 265/02;265/04;257/02**
**U.S. Cl. 428—402.24** **13 Claims**



1. A multi-shell emulsion particle prepared by emulsion polymerization of one or more vinyl monomers, comprising a dry state structure having one or more penetrating pore(s) connecting the surface layer of the particle with the interior of the particle and having a particle diameter of from 0.1 to 5.0 μm.

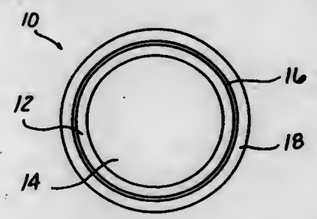
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**5,500,287**

## THERMAL INSULATING MATERIAL AND METHOD OF MANUFACTURING SAME

**Timothy M. Henderson, Ann Arbor, Mich., assignor to Innovation Associates, Inc., Ann Arbor, Mich.**

**Filed Oct. 30, 1992, Ser. No. 969,492**
**Int. Cl.[6] B32B 33/00**
**U.S. Cl. 428—403** **10 Claims**




1. An evacuated microsphere comprising:
a shell surrounding a hollow interior, the shell having a single exterior surface;
the interior of the shell being evacuated of substantially all gases to a pressure $<10^{-4}$ Torr at any temperature;
a first layer of an IR reflective material applied over the exterior surface of the shell having a thickness of 30 to 50 nanometers for an emittance in the infrared range of <0.04; and
a second outer layer of a protective material applied over the first layer;
at least one of the first and second layers having a permeation constant of less than $1\times10^{-19}$ $cm^3$-mm/sec-$cm^2$-cmHg at 25° C. with respect to oxygen to form a permeation barrier to the influx of oxygen through the shell;
the evacuated microsphere produced by the method including the steps of:
forming particles;
dissolving permeant gases into the particles;

heating the gas permeated particles to blow each particle into a shell having a hollow interior containing only the permeant gases in the hollow interior while excluding gases from outside of the shell which cannot be readily out permeated from the hollow interior of the shell at temperatures lower than about 200° C.;

out-permeating the permeant gases from the hollow interior of the shell in a gas atmosphere composed of gases having permeabilities lower than that of the permeant gases within the shell to evacuate the interior of the shell to a pressure of $\leq 10^{-4}$ Torr and to thereby remove substantially all of the gases from the shell at any temperature;

coating the shells with a first exterior layer of an IR reflective material having a thickness of 30 to 50 nanometers for an emittance in the infrared range of ≤0.04;

coating the IR reflective material layer with a second outer protective material layer; and

selecting at least one of the first and second layers having a permeation constant of less than $1\times10^{-19}$ $cm^3$-mm/sec-$cm^2$-cmHg at 25° C. with respect to oxygen to form a permeation barrier to the influx of oxygen through the shell.

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**5,500,288**

**ALUMINUM SURFACE HAVING CHEMICAL CONVERSION COATING AND METHOD OF FORMING THE COATING**

**Yasuaki Isobe, Nagoya, and Hiroyoshi Mizuno, Anjou, both of, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan**

**Continuation of Ser. No. 796,257, Nov. 22, 1991, abandoned. This application Jul. 9, 1993, Ser. No. 88,595**

**Claims priority, application Japan, Nov. 23, 1990, 2-320011**

**Int. Cl.[6] B32B *15/04***

**U.S. Cl. 428—469** **5 Claims**




1. A corrosion resistant chemical conversion coating formed on a surface of an aluminum substrate, comprising a basic double salt including aluminum ions, at least one salt selected from the group consisting of sulfates of alkali metal ions or alkaline earth metal ions, at least one organic compound selected from the group consisting of sodium mercaptobenzothiazole, oxine and sodium benzoate, wherein the coating has a thickness of not less than 0.1 μm; said conversion coating being prepared from an aluminum-treating aqueous solution comprising said sulfates of alkali metal ions or alkaline earth metal ions at a concentration of from about 0.001 M to about 5 M, and said organic compound at a concentration of from about 0.001 M to about 5 M.

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**5,500,289**

**TUNGSTEN-BASED CEMENTED CARBIDE POWDER MIX AND CEMENTED CARBIDE PRODUCTS MADE THEREFROM**

**Ilan Gavish, Karmiel, Israel, assignor to ISCAR Ltd., Israel**

**Filed Jun. 20, 1995, Ser. No. 493,229**

**Claims priority, application Israel, Aug. 15, 1994, 110663**

**Int. Cl.[6] B22F *7/06***

**U.S. Cl. 428—551** **8 Claims**

1. A sinterable powder mix for the production of a tungsten-based cemented carbide material, said powder mix comprising at least 70% by weight of WC, from about 2 to about 15% by weight of an iron group metal binder, and optionally up to about 15% by weight of one or more carbides, nitrides and carbonitrides of metals of the groups IVb, Vb and VIb of the periodic table; characterized in that

said powder mix comprises from about 1 to about 8% by weight of Ta(Nb) oxide and powdered elemental carbon in about the stoichiometric amount required for the reaction:

$$Ta(Nb)_2O_5+7C\rightarrow 2Ta(Nb)C+5CO$$

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**5,500,290**

**SURFACE TREATED STEEL SHEET**

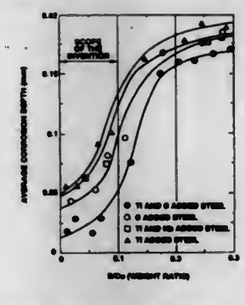
**Satoru Udagawa; Masaki Abe; Satoru Ando; Yasuhiro Matsuki; Toyofumi Watanabe; Yukimitsu Shiohara; Masaya Morita, and Akimasa Kido, all of Kawasaki, Japan, assignors to NKK Corporation, Tokyo, Japan**

**Filed Jun. 24, 1994, Ser. No. 265,239**

**Claims priority, application Japan, Jun. 29, 1993, 5-158502; Jun. 29, 1993, 5-158503; Sep. 2, 1993, 5-218565; Dec. 13, 1993, 5-311937; Apr. 18, 1994, 6-079008; Apr. 18, 1994, 6-079009; Apr. 25, 1994, 6-086709; Apr. 25, 1994, 6-086710; May 31, 1994, 6-119163; May 31, 1994, 6-119164**

**Int. Cl.[6] B32B *15/18***

**U.S. Cl. 428—610** **25 Claims**




1. A surface treated steel sheet comprising:

a steel sheet consisting essentially of:

0.001 to 0.005 wt. % C, 0.1 wt. % or less Si, 0.05 to 0.3 wt. % Mn, 0.02 wt. % or less P, 0.001 to 0.01 wt. % S, 0.004 wt. % or less N, 0.1 wt. % or less sol.Al, 0.05 to 0.3 wt. % Ni, 0.005 to 0.1 wt. % Ti, 0.05 to 0.3 wt. % Cu, 0.0002 to 0.002 wt. % B, and the balance being Fe;

S and Cu satisfying the following equation;

$$(S \text{ wt. \%}/Cu \text{ wt. \%})\leq 0.1;$$

a diffused alloy layer containing Fe, Ni, and P, the diffused alloy layer being formed on at least one surface of the steel sheet.

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**5,500,291**

**LITHIUM ION CONDUCTIVE SOLID ELECTROLYTE AND PROCESS FOR SYNTHESIZING THE SAME**

**Tsutomu Minami, Osakasayama; Masahiro Tatsumisago, Sakai; Kazunori Takada, Osaka, and Shigeo Kondo, Hirakata, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Continuation-in-part of Ser. No. 207,027, Mar. 7, 1994, abandoned. This application Mar. 20, 1995, Ser. No. 406,651**

**Claims priority, application Japan, Mar. 22, 1993, 5-061639**

**Int. Cl.[6] H01M *6/04***

**U.S. Cl. 429—206** **7 Claims**

1. A lithium ion conductive solid electrolyte, which comprises a sulfide-based lithium ion conductive solid electrolyte containing crosslinking oxygen ions and silicon ions combined with the crosslinking oxygen ions and being free from halide ions.



**5,500,292**

**POLYMER ELECTROLYTE HYDROGEN-OXYGEN FUEL CELL WHERE THE POLYMER ELECTROLYTE HAS A WATER REPELLENCY GRADIENT AND A CATALYTICALLY ACTIVE COMPONENT CONCENTRATION GRADIEM ACROSS OXYGEN ELECTRODE**

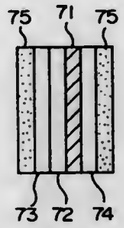
**Yasushi Muranaka, Katsuta; Jinichi Imahashi; Tatsuo Horiba, both of Hitachi, and Shigeoki Nishimura, Katsuta, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Continuation of Ser. No. 28,222, Mar. 9, 1993, abandoned. This application Jul. 11, 1994, Ser. No. 272,618**

**Claims priority, application Japan, Mar. 9, 1992, 4-050365**

**Int. Cl.[6] H01M *4/02;4/90***

**U.S. Cl. 429—209** **10 Claims**




1. A polymer electrolyte, hydrogen-oxygen fuel cell comprising an oxygen electrode having a thickness and a hydrogen electrode which are a pair of gas-permeable electrodes, a polymer electrolyte membrane provided between said oxygen electrode and said hydrogen electrode and electron conductors provided respectively on an opposite side of said electrodes from the electrolyte membrane side, wherein said oxygen electrode comprises a catalytically active component, a carrier for the catalytically active component, and a binder, said oxygen electrode having such a gradient in water repellency across the thickness of the electrode that the water repellency is highest in the area adjacent to the electrolyte membrane and lowest in the area adjacent to the conductor and having such a gradient in the concentration of the catalytically active component across the thickness of the oxygen electrode that the concentration is highest in the area adjacent to the electrolyte membrane and is lowest in the area adjacent to the respective electron conductor.

9. A secondary cell having the fuel cell according claim 1 as a charging source.

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**5,500,293**

**ADHESIVE COMPOSITIONS WITH IMPROVED PLASTICIZER RESISTANCE**

**Felix P. Lau; Timothy D. Bredahl, and George E. Cox, all of Austin, Tex., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Filed Feb. 5, 1993, Ser. No. 14,196**

**Int. Cl.[6] C08L *7/00;53/00***

**U.S. Cl. 428—355** **8 Claims**

1. An adhesive compositions suitable for use in an insulating tape consisting essentially of:

a) from about 13% to about 42% by weight of a polyisoprene homopolymer,

b) from about 13% to about 42% by weight of a styrene-isoprene-styrene block copolymer,

c) from about 25% to about 55% by weight of a solid aliphatic tackifying agent containing from about 4 to about 6 carbon atoms, and

d) from about 2% to about 20% by weight of a reinforcing resin consisting of an aromatic, essentially hydrocarbon resin selected from the group consisting of low molecular weight polymers containing styrene, alpha-methyl styrene, para-methylstyrene, copolymers of styrene and alpha-methylstyrene, copolymers of styrene and para-methylstyrene, and copolymers of alpha-methyl styrene and para-methyl styrene

wherein said adhesive exhibits improved plasticizer resistance.

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**5,500,294**

**ADHESIVE TAPE FOR ELECTRONIC PARTS AND LIQUID ADHESIVE**

**Yukinori Sakumoto; Takeshi Hashimoto; Katsuji Nakabe; Masaharu Kobayashi; Takeshi Nishigaya, and Fumiyoshi Yamanashi, all of Shizuoka, Japan, assignors to Tomoegawa Paper Co., Ltd., Tokyo, Japan**

**Filed Oct. 20, 1994, Ser. No. 326,428**

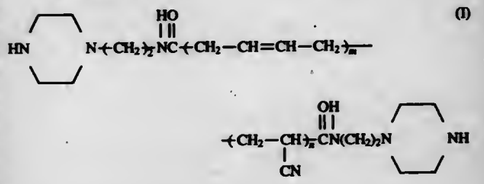
**Claims priority, application Japan, Jan. 22, 1993, 5-286285**

**Int. Cl.[6] C09J *133/20***

**U.S. Cl. 428—355** **10 Claims**

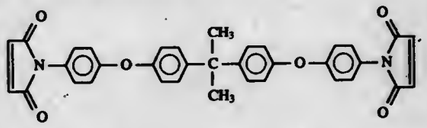
1. An adhesive tape for electronic parts prepared by coating at least one face of a heat resistant film, with an adhesive comprising:

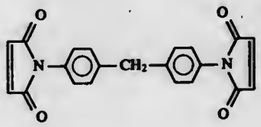
(a) a butadiene-acrylonitrile copolymer having piperazinylethylaminocarbonyl groups at both terminals and having a weight average molecular weight of 1,000–50,000, and an acrylonitrile content of 5–50% by weight, represented by the following formula (I):

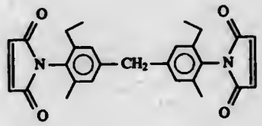


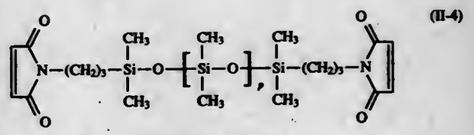

wherein, m=50–95, and n=5–50; and

(b) a compound having at least two maleimide groups selected from the group consisting of compounds represented by the following formulae (II-1) to (II-6):

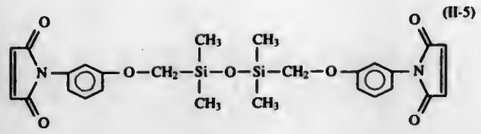


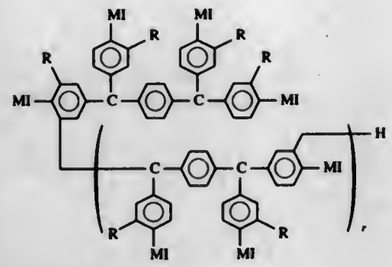




wherein p is an integer of from 0 to 7



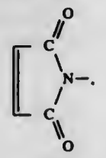
(II-5)

and



(II-6)

wherein MI=



R=H or $CH_3$, and r=1–5 the ratio of component (b) based on 100 parts by weight of component (a) being in the range of 10 to 900 parts by weight.

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**5,500,295**

**FILLINGS AND OTHER ASPECTS OF FIBERS**

**Walter B. Haim, Lippetal, Germany; William J. Jones, Jr., Greenville, N.C.; James F. Kirkbride, Wilmington, Del.; Ilan Marcus, Versoix, Switzerland, and Adrian C. Snyder, Greenville, N.C., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Continuation-in-part of Ser. No. 73,294, Jun. 11, 1993, Pat. No. 5,338,500, which is a division of Ser. No. 820,141, Jan. 13, 1992, Pat. No. 5,238,612, which is a division of Ser. No. 589,960, Sep. 28, 1990, Pat. No. 5,112,684, which is a continuation-in-part of Ser. No. 508,878, Apr. 12, 1990, abandoned, Ser. No. 549,818, Jul. 9, 1990, abandoned, and Ser. No. 549,847, Jul. 9, 1990, abandoned, said Ser. No. 549,818and Ser. No. 549,847, Jul. 9, 0, each , Jul. 9, 0is a continuation-in-part of Ser. No. 290,385, Dec. 27, 1988, Pat. No. 4,940,502, which is a continuation-in-part of Ser. No. 921,644, Oct. 21, 1986, Pat. No. 4,794,038, which is a continuation-in-part of Ser. No. 734,423, May 15, 1985, Pat. No. 4,618,531. This application Jul. 19, 1994, Ser. No. 277,398**

**Int. Cl.[6] D02G *3/00***

**U.S. Cl. 428—357** **7 Claims**

1. A molded structure characterized by fiberballs having a random distribution and entanglement of fibers within each ball, said fibers being a blend of load-bearing fibers and binder fibers which optionally contain a material capable of being heated when subjected to microwaves or a high frequency energy source, characterized in that the fiberballs have an average diameter of about 2 to about 20 mm, and the individual fibers have a length of about 10 to about 100 mm, the load-bearing fibers having primary crimp and a secondary crimp, said primary crimp having a frequency of about 14 to about 40 crimps/10 cm and said secondary crimp having a frequency of about 4 to about 16 crimps/10 era, and whereby the



average amplitude of the secondary crimp is at least 4 times the average amplitude of the primary crimp, said molded structure being in a predetermined shape and in which the binder fibers have been activated by heat.

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**5,500,296**

**MAGNETIC RECORDING MEDIUM, PROCESS FOR PRODUCING MAGNETIC RECORDING MEDIUM, APPARATUS FOR PRODUCING MAGNETIC RECORDING MEDIUM, AND MAGNETIC RECORDING APPARATUS**

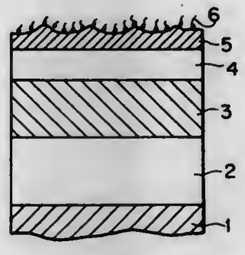
**Youichi Inoue, Ryugasaki; Yoshihiro Sato, Ibaraki; Shinichi Hirose, Tsukuba; Hiroshi Tani, Atsugi; Katsuyuki Tanaka, Ibaraki; Katsuo Abe; Masaki Obura, both of Odawara, and Muneo Mizumoto, Tsuchiura, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Continuation of Ser. No. 903,979, Jun. 26, 1992, abandoned, and a continuation-in-part of Ser. No. 28,600, Mar. 8, 1993, abandoned, which is a continuation of Ser. No. 582,368, Sep. 12, 1990, abandoned. This application Jan. 21, 1994, Ser. No. 183,900**

**Claims priority, application Japan, Sep. 20, 1989, 1-242233; Jun. 26, 1991, 3-154351**

**Int. Cl.[6] B32B *9/00;27/00;* G11B *5/66;* C23C *14/00***

**U.S. Cl. 428—408** **8 Claims**




1. A thin film magnetic recording medium comprising a magnetic film for data recording formed on a non-magnetic substrate and a non-magnetic protective film provided on the magnetic film, wherein the protective film comprises carbon atoms and has a center line surface roughness of not less than 3 nm and not more than 10 nm formed by irradiating a surface of the protective film with atomic ions, said atomic ions having an atomic weight larger than carbon, accelerated in an electric field of 4– 40 kV at a dose of $10^{15}$ to $10^{18}$ ions/$cm^2$.



**5,500,297**

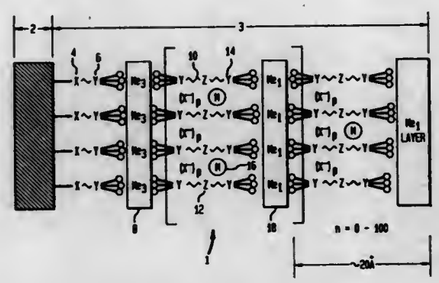
**ELECTRON ACCEPTOR COMPOSITIONS TECHNICAL FIELD**

**Mark E. Thompson, Hamilton Square; Jonathan L. Snover, Mercerville, both of N.J., and Lori A. Vermeulen, Easton, Pa., assignors to The Trustees of Princeton University, Princeton, N.J.**

**Filed Aug. 9, 1993, Ser. No. 103,968**

**Int. Cl.[6] B32B *33/00***

**U.S. Cl. 428—411.1** **39 Claims**




1. An article comprising a supporting substrate having on its surface a photochemically active film comprising

(i) a plurality of a complex of the formula:

$$—O—L—((Y^1O_3—Z—Y^2O_3)Me^1)_k{\cdot}k^+p(X^{2/p-})$$

wherein

L is a divalent linking group;

each of $Y^1$ and $Y^2$, independently of the other, is phosphorus or arsenic;

Z is a divalent group containing two conjugated cationic centers which together have a negative $E°_{red}$ value;

$Me^1$ is a trivalent or tetravalent metal of Group III, IVA, or IVB having an atomic number of at least 21 or a lanthanide;

X is an anion;

k has a value of from 1 to about 100; and

p has a value of 1 or 2;

wherein each of $Y^1$, $Y^2$, Z, and $Me^1$ may be different for each successive k layer;

wherein each of said complexes is bound to said substrate through the free valence bond on the oxygen atom of the —O—L— component of said complex; and,

(ii) colloidal particles of at least one Group VIII metal at zero valence entrapped within said complexes by the $Me^1$ atoms.

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**5,500,298**

**FUSING COMPONENTS CONTAINING TITAMER COMPOSITIONS**

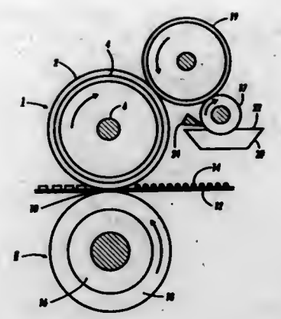
**Santokh S. Badesha, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Jun. 29, 1993, Ser. No. 83,922**

**Int. Cl.[6] B32B *9/00***

**U.S. Cl. 428—411.1** **15 Claims**

1. A fuser member comprising a supporting substrate and a layer comprised of integral interpenetrating networks of haloelastomer and titanium oxide, wherein the titanium atoms have a valency of +4.



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**5,500,299**

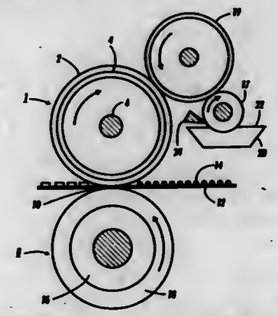
**FUSING COMPONENTS CONTAINING GRAFTED TITAMER COMPOSITIONS**

**Santokh S. Badesha, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Jun. 29, 1993, Ser. No. 84,882**

**Int. Cl.[6] B32B *9/00***

**U.S. Cl. 428—447** **17 Claims**



1. A fuser member comprising a supporting substrate and a layer comprised of integral interpenetrating networks of haloelastomer, titanium oxide, and polyorganosiloxane, wherein the titanium atoms have a valency of +4.

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**5,500,300**

**SILICONE FLUIDS HAVING CHLOROALKYL AND EPOXY GROUPS AND PHOTOCURABLE SILICONE COATING COMPOSITIONS**

**Richard P. Eckberg, Saratoga Springs, N.Y., assignor to General Electric Company, Waterford, N.Y.**

**Filed May 18, 1995, Ser. No. 443,945**

**Int. Cl.[6] B32B *27/06;27/30;27/32***

**U.S. Cl. 428—447** **8 Claims**

1. A composite of a thermoplastic substrate and a cured silicone film resulting from the treatment of the thermoplastic substrate with comprising a photocurable silicone composition followed by a UV cure comprising

(A) an organopolysiloxane fluid having a molecular weight of from about 500 to about 50,000, containing from 0.1% to 50% by weight of chemically combined chlorine, and possessing an epoxy equivalent weight of from about 300 to about 8000, wherein the organopolysiloxane fluid is substituted with $C_{1-13}$ organo radicals attached to silicon by carbon-silicon bonds consisting essentially of a mixture of diorganosiloxy units selected from the group consisting of (i) diorganosiloxy units free of epoxy functional groups and chloroalkyl groups, (ii) diorganosiloxy units containing epoxy

groups, and (iii) diorganosiloxy units having at least one $C_{1-4}$ chloroalkyl radical attached to silicon by carbon-silicon bonds, and

(B) an amount of a photodecomposable diaryliodonium hexafluoro (Group VA) salt sufficient upon photodecomposition to acid catalyze the cure of the photocurable silicone composition.

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**5,500,301**

**A1 ALLOY FILMS AND MELTING A1 ALLOY SPUTTERING TARGETS FOR DEPOSITING A1 ALLOY FILMS**

**Takashi Onishi; Kazuo Yoshikawa; Seiji Nishi, and Seigou Yamamoto, all of Kobe, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan**

**Division of Ser. No. 264,763, Jun. 23, 1994, which is a continuation of Ser. No. 842,556, Feb. 27, 1992, abandoned. This application Jul. 12, 1994, Ser. No. 273,961**

**Claims priority, application Japan, Mar. 7, 1991, 3-41651; Apr. 23, 1991, 3-92250; Apr. 23, 1991, 3-92251; Sep. 10, 1991, 3-230497**

**Int. Cl.[6] B32B *15/04***

**U.S. Cl. 428—457** **2 Claims**

1. A substrate with a reflection film thereon for use as an optical recording medium, said reflection film comprising an Al alloy film consisting of (1) Al and (2) Mn and at least one alloy component selected from the group consisting of Hf and Ta, in a total amount of 0.1 to 10 at %, said alloy film having been deposited upon the substrate by a sputtering process.

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**5,500,302**

**BARRIER FILM AND METHOD**

**Roger W. Phillips; Paul G. Coombs, and Lauren R. Wendt, all of Santa Rosa, Calif., assignors to Flex Products, Inc., Santa Rosa, Calif.**

**Continuation-in-part of Ser. No. 34,728, Mar. 22, 1993, abandoned, which is a continuation-in-part of Ser. No. 818,399, Jan. 2, 1992, abandoned, which is a continuation of Ser. No. 343,900, Apr. 26, 1989, abandoned. This application Apr. 26, 1994, Ser. No. 234,471**

**Claims priority, application Canada, Apr. 24, 1990, 2015308; Japan, Apr. 25, 1990, 2-109936; European Pat. Off., Apr. 26, 1990, 90304533**

**Int. Cl.[6] B32B *27/08***

**U.S. Cl. 428—474.4** **9 Claims**




1. A barrier film having low oxygen and water permeability for use on a flexible plastic substrate comprising a flexible substantially transparent plastic substrate having first and second surfaces, a substantially colorless barrier coating formed on at least one of said surfaces and being formed solely of graphite having a thickness ranging from 50 to 300 Å, said barrier film having a reduced water transmission rate and a reduced oxygen transmission rate with respect to the uncoated substrate and having a visible transparency of 30% or greater and an additional substantially colorless barrier coating substantially identical to the first named barrier coating formed on the other of said first and second surfaces.

**5,500,303**

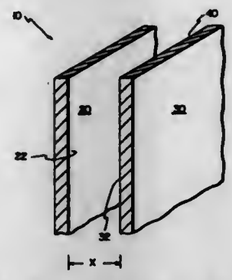
**PACKAGE HAVING IMPROVED BARRIER PROPERTIES**

**George Anderson, Minneapolis, Minn., assignor to The Pillsbury Company, Minneapolis, Minn.**

**Filed Sep. 24, 1992, Ser. No. 950,903**

**Int. Cl.[6] B32B *27/08;27/06***

**U.S. Cl. 428—475.5** **20 Claims**




1. A composite film barrier for packaging an oxygen-sensitive product comprising an inner ply of an oxygen-permeable polymeric material disposed adjacent the product, an outer ply of an oxygen-permeable polymeric material spaced from the inner ply, and a substantially anaerobic space defined by the inner and outer plies.

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**5,500,304**

**SILVER-NICKEL COMPOSITE MATERIAL FOR ELECTRICAL CONTACTS AND ELECTRODES**

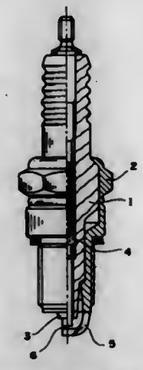
**Otto Löffler, Stuttgart; Werner Niessner, Steinheim; Heinz Ambacher, Benningen, and Friedrich E. Schneider, Pforzheim, all of, Germany, assignors to Beru Ruprecht GmbH & Co. KG, Ludwigsburg, and RAU GmbH & Co., Pforzheim, both of, Germany**

**Continuation of Ser. No. 14,990, Feb. 5, 1993, abandoned. This application Feb. 23, 1995, Ser. No. 393,040**

**Claims priority, application Germany, Feb. 5, 1992, 42 03 250.4**

**Int. Cl.[6] C22C *1/09;1/10;5/06;* H01T *13/39***

**U.S. Cl. 428—614** **5 Claims**




1. Silver-nickel composite material for spark plug electrodes, where silver components of the composite material consist of an oxygen impervious silver alloy and nickel components of the composite material are comprised of nickel or a nickel alloy; wherein the nickel components are formed of nickel or nickel alloy tubes filled with a material which lowers the threshold voltage, said tubes having been finished so as to result in the nickel being present in the composite as a thin fiber, 100–6,000 nickel fibers per $mm^2$ being incorporated into a matrix of the silver alloy.



**5,500,305**

**VACUUM INSULATED PANEL AND METHOD OF MAKING A VACUUM INSULATED PANEL**

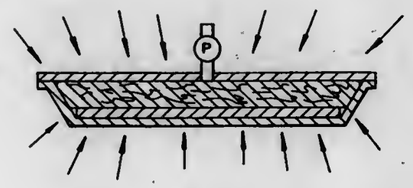
**John A. Bridges, Nashville; Phillip H. Neal, Donelson, and John E. Besser, Franklin, all of Tenn., assignors to Aladdin Industries, Inc., Nashville, Tenn.**

**Continuation of Ser. No. 53,438, Apr. 28, 1993, abandoned, which is a continuation-in-part of Ser. No. 587,344, Sep. 24, 1990, Pat. No. 5,525,408. This application Aug. 16, 1994, Ser. No. 291,021**

**The portion of the term of this patent subsequent to Oct. 12, 2010, has been disclaimed.**

**Int. Cl.[6] B32B *1/06;15/04;15/16***

**U.S. Cl. 428—621** **49 Claims**




1. A vacuum insulated panel comprising first and second wall members joined together to define a cavity, a compressed cake of particulate getter material positioned within said cavity, means for assisting in evacuating said cavity to establish a vacuum within said cavity, and means positioned intermediate said compressed cake of particulate getter material and one of said first and second wall members for preventing said getter material from being evacuated by said means for assisting in evacuating said cavity, said preventing means comprising a gas-permeable getter-impermeable material, said first and second wall members comprising stainless steel members.

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**5,500,306**

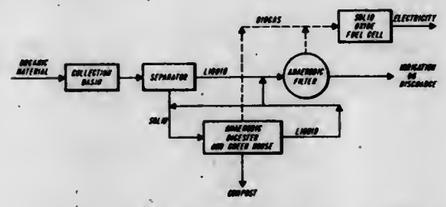
**HIGH EFFICIENCY ENERGY CONVERSION AND TREATMENT OF ORGANIC WASTE**

**Michael S. Hsu, Lincoln, and Irvine W. Wei, Lexington, both of Mass., assignors to Ztek Corporation, Waltham, Mass.**

**Continuation-in-part of Ser. No. 686,687, Apr. 17, 1991, abandoned. This application Oct. 6, 1993, Ser. No. 132,704**

**Int. Cl.[6] H01M *8/06***

**U.S. Cl. 429—17** **34 Claims**




1. A method for high efficiency conversion of organic material to electricity, the method comprising the steps of

collecting a quantity of organic material,

generating an redefined biogas component containing sulfur from said collected quantity of organic material, and

introducing the sulfur-containing unrefined biogas component into a high-temperature sulfur-tolerant fuel cell, the fuel cell converting the biogas component to electricity by an electrochemical process without significantly degrading the performance of the fuel cell.

**5,500,307**

**SOLID OXIDE FUEL CELL**

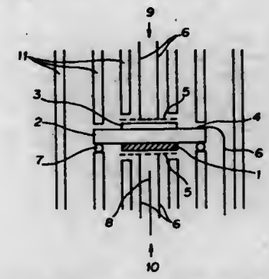
**Iwao Anzai; Shigeki Matsuoka, and Jun Uehara, all of Yokohama, Japan, assignors to Nippon Oil Company, and Petroleum Energy Center Foundation, both of Tokyo, Japan**

**Continuation of Ser. No. 94,878, Jul. 22, 1993, abandoned. This application Jun. 12, 1995, Ser. No. 489,929**

**Claims priority, application Japan, Jul. 27, 1992, 4-219728**

**Int. Cl.[6] H01M *4/90***

**U.S. Cl. 429—30** **6 Claims**




1. A solid oxide fuel cell, which comprises an assembly of a plurality of unit cells each comprising a solid electrolyte, a fuel electrode contacting one side of the solid electrolyte and an air electrode an opposite side of the solid electrolyte, respectively, the fuel electrode comprising ruthenium, nickel and ceramics containing both $CeO_2$ and at least one oxide selected from the group consisting of $Sm_2O_3$, $Eu_2O_3$, $Ho_2O_3$ and $Er_2O_3$.

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**5,500,308**

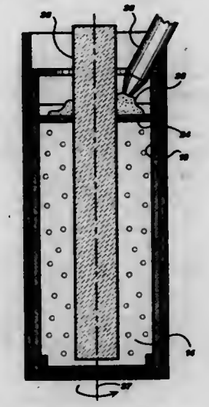
**ELECTROCHEMICAL CELL HAVING AN INNER SEAL MEMBER**

**Jack T. West; James H. Annen, both of McFarland; Daniel A. Schneider, Madison, and Marek K. Kokoszka, Atkinson, all of Wis., assignors to Rayovac Corporation, Madison, Wis.**

**Filed May 2, 1994, Ser. No. 236,578**

**Int. Cl.[6] H01M *2/08***

**U.S. Cl. 429—171** **137 Claims**



1. An electrochemical cell, comprising:

(a) an anode comprising a metal can having a top;

(b) a cathode comprising a quantity of a cathode mix in said metal can, and a current collector in physical contact with said cathode mix, said current collector having a top and said cathode mix having a top;

(c) a separator disposed between said cathode mix and said metal can;

(d) one or more top closure members overlying, and spaced from, said cathode mix, an inner chamber being disposed between said one or more top closure members and said cathode mix; and

(e) an inner seal member comprising seal material extending over said top of said cathode mix, and onto, into, and through said separator, above said cathode mix.

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**5,500,309**

**NI/METALHYDRIDE ACCUMULATOR**

**Frank Lichtenberg, Zeiskam; Klaus Kleinsorgen, Kelkheim, and Günter Hofmann, Hofheim, all of, Germany, assignors to Varta Batterie Aktiengesellschaft, Hanover, Germany**

**Filed Nov. 30, 1994, Ser. No. 346,897**

**Claims priority, application Germany, Dec. 18, 1993, 43 43 321.9**

**Int. Cl.[6] H01M *4/52***

**U.S. Cl. 429—223** **9 Claims**




1. An electric accumulator having a positive nickel-hydroxide electrode, a negative electrode comprised of a hydrogen storage alloy, an interposed separator and an alkaline electrolyte, wherein the positive electrode is comprised of a mixture of nickel hydroxide and an oxidation-resistant graphite having a crystallite size of at least 180 nm, an ash content of less than 0.5% and a BET area of less than 6 $m^2/g$, whereby the charge capacity of the positive electrode is stabilized by the oxidation-resistant graphite.

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**5,500,310**

**HOLOGRAPHIC FLAKE PIGMENT**

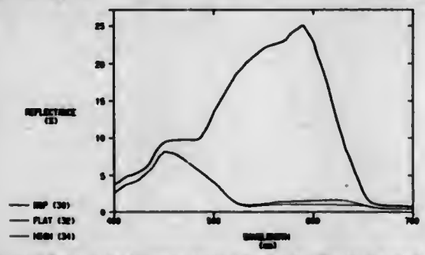
**James G. King, Birmingham, Mich.; Steven R. Mackara, New Castle, Del.; Daniel J. Mickish, Wilmington, Del., and David L. Spooner, Wilmington, Del., assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.**

**Division of Ser. No. 148,448, Nov. 8, 1993, Pat. No. 5,415,950.**

**This application Dec. 29, 1994, Ser. No. 366,273**

**Int. Cl.[6] G03H *1/02***

**U.S. Cl. 430—1** **7 Claims**




1. In a fluid coating composition adapted for the preparation of decorative coatings, said composition comprising (a) a liquid medium; (b) a film forming polymer dispersed or dissolved in the liquid medium; and (c) a holographic pigment dispersed in said liquid medium, the improvement wherein: said holographic pigment comprises particles that (1) comprise an organic polymer having a volume hologram recorded in the organic polymer; (2) have a thickness of about 1 micrometer to about 100 micrometers; (3) have an average diameter of about 10 micrometers to about 300 micrometers, wherein said average diameter of the particles is defined to be that which is determined by sieving operations and which is expressed in micrometers; and (4) the thickness to diameter ratio of said flake particles is about 1:2 to about 1:60.

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**5,500,311**

**HOLOGRAPHIC FLAKE PIGMENT**

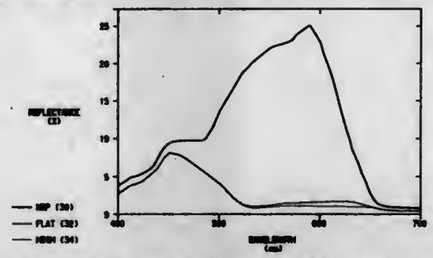
**James G. King, Birmingham, Mich.; Steven R. MacKara, New Castle, Del.; Daniel J. Mickish, Wilmington, Del., and David L. Spooner, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Division of Ser. No. 148,448, Nov. 8, 1993, Pat. No. 5,415,950.**

**This application Dec. 29, 1994, Ser. No. 366,280**

**Int. Cl.[6] G03H *1/02***

**U.S. Cl. 430—1** **3 Claims**




1. A process for preparing a holographic flake pigment, said process comprising:

(A) holographically exposing a film of photosensitive composition to prepare a volume hologram, said film of photosensitive composition comprising a monomer, a binder, and a photoinitiator system, wherein said binder is present in sufficient amount to form a film when the composition is coated; said photoinitiator system is present in sufficient amount to initiate polymerization of the monomer on exposure to actinic radiation; and said monomer is present in sufficient amount to produce image differentiation on polymerization, and

(B) cooling the volume hologram below its glass transition temperature and while at such temperature converting said volume hologram to particles that have a thickness of about 1 micrometer to about 100 micrometers, an average diameter of about 10 micrometers to about 300 micrometers, and a thickness to diameter ratio of about 1:2 to about 1:60.

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**5,500,312**

**MASKS WITH LOW STRESS MULTILAYER FILMS AND A PROCESS FOR CONTROLLING THE STRESS OF MULTILAYER FILMS**

**Lloyd R. Harriott, Gillette; James A. Liddle, Scotch Plains; Cynthia A. Volkert, Springfield; Warren K. Waskiewicz, Clinton, and David L. Windt, Berkeley Heights, all of N.J., assignors to AT&T Corp., Murray Hill, N.J.**

**Filed Oct. 11, 1994, Ser. No. 321,362**

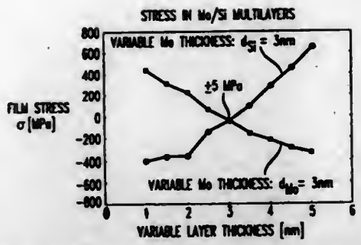
**Int. Cl.[6] G03F *9/00***

**U.S. Cl. 430—5** **13 Claims**

1. A process for fabricating a mask comprising:

forming a multilayer film on a substrate by forming a plurality of periods, each period comprising at least two layers, wherein at least one layer in the period is under compressive stress and at least one layer in the period is under a tensile stress, each layer having a thickness of about 0.5 nm to about 10 nm wherein the thickness of the layers under compressive stress and the thickness of the layers under tensile stress are






selected so that the stress of the resulting multilayer film is about −50 MPa to about 50 MPa and wherein at least one of the layers in the period is a metal layer.

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**5,500,313**

**HOLOGRAPHIC FLAKE PIGMENT**

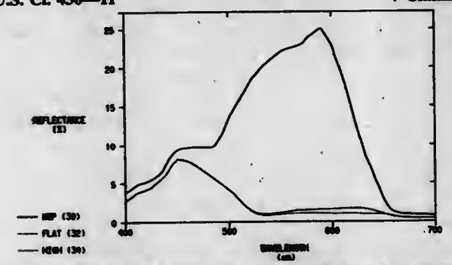
**James G. King, Birgminham, Mich.; Steven R. Mackara, New Castle, Del.; Daniel J. Mickish, and David L. Spooner, both of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**Division of Ser. No. 148,448, Nov. 8, 1993, Pat. No. 5,415,950.**

**This application Dec. 29, 1994, Ser. No. 365,866**

**Int. Cl.[6] G03H *1/02***

**U.S. Cl. 430—11** **7 Claims**




1. In an article comprising a decorative coating on a substrate, said decorative coating comprising a film forming polymer with a holographic pigment, the improvement wherein: said holographic pigment dispersed comprises particles that (1) comprise an organic polymer having a volume hologram recorded in the organic polymer; (2) have a thickness of about 1 micrometer to about 100 micrometers; (3) have an average diameter of about 10 micrometers to about 300 micrometers, wherein said average diameter of the particles is defined to be that which is determined by sieving operations and which is expressed in micrometers; and (4) the thickness to diameter ratio of said flake particles is about 1:2 to about 1:60.

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**5,500,314**

**MATERIAL FOR STORING INFORMATION**

**Jin Mizuguchi, Fribourg, and Gérald Giller, Bulle, both of, Switzerland, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.**

**Division of Ser. No. 26,965, Mar. 5, 1993, Pat. No. 5,382,485.**

**This application Oct. 6, 1994, Ser. No. 319,407**

**Claims priority, application Switzerland, Mar. 11, 1992, 757/92**

**The portion of the term of this patent subsequent to Oct. 4, 2014, has been disclaimed.**

**Int. Cl.[6] G11B *7/24***

**U.S. Cl. 430—14** **18 Claims**

1. A material on which information is written, comprising a substrate coated with at least one recording layer of a pigment selected from the group consisting of a dithioxopyrrolopyrrole, a dithioquinacridone, a phthalocyanine and mixtures thereof, which pigment exhibits an absorption band in the near infrared range and is in contact with a solid organic compound that changes a crystal modification of the pigment upon irradiation with laser light and even before and after irradiation exhibits no absorption in the near infrared range, and said recording layer containing the written information in the form of bits which, compared with an unirradiated environment, have a greater reflectivity and reduced absorption in the near infrared range.

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**5,500,315**

**PROCESSES AND COMPOSITIONS FOR ELECTROLESS METALLIZATION**

**Jeffrey M. Calvert, Burke, Va.; Walter J. Dressick, Fort Washington, Md.; Gary S. Calabrese, North Andover, and Michael Gulla, Millis, both of Mass., assignors to Rohm & Haas Company, Philadelphia, Pa.**

**Continuation of Ser. No. 62,706, May 17, 1993, Pat. No. 5,389,496, which is a continuation-in-part of Ser. No. 691,565, Apr. 25, 1991, abandoned, which is a continuation-in-part of Ser. No. 22,439, Mar. 6, 1987, Pat. No. 5,077,085, and Ser. No. 182,123, Apr. 14, 1988, Pat. No. 5,079,600. This application Oct. 4, 1994, Ser. No. 317,347**

**Int. Cl.[6] G03C *5/58*; G03F *7/038***

**U.S. Cl. 430—16** **5 Claims**

1. An article of manufacture comprising an electroless metal deposit in an image pattern on a substrate, said substrate, at least where coated with said metal deposit, having bonded to its surface one or more multidentate chemical groups ligated by coordination bonding other than by electrostatic interaction with a substantially tin-free, electroless metallization catalyst.

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**5,500,316**

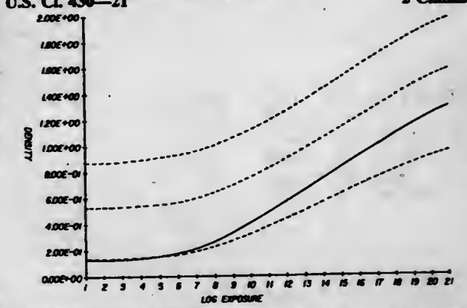
**COLOR NEGATIVE FILM WITH CONTRAST ADJUSTED FOR ELECTRONIC SCANNING**

**Mitchell J. Bogdanowicz, Spencerport, and Christopher L. DuMont, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Dec. 5, 1994, Ser. No. 349,238**

**Int. Cl.[6] G03C *7/22*; *7/26***

**U.S. Cl. 430—21** **2 Claims**




1. In a process for forming a video image with a telecine transfer device comprising:

(a) exposing a color negative photographic film comprising red, green and blue color sensitive records which generate image dyes upon exposure and processing of the film,

(b) processing the exposed film to form a developed image, and

(c) converting the developed image into video signals representative of the developed image with a telecine transfer device,

wherein the peak spectral absorbance wavelength of the image dyes generated by the red color record of the film is substantially more offset from the red peak spectral response of the telecine transfer device than the peak spectral absorbance wavelength of the image dyes generated by the green color

record of the film is offset from the green peak spectral response of the the telecine transfer device,

the improvement comprising using a film wherein the contrast of the red color record relative to the contrast of the green color record is set to compensate for reduced modulation of red dye density relative to green dye density in the telecine transfer device, and to result in a red channel to green channel contrast ratio in the telecine transfer image of at least 0.96 before any independent single channel adjustments.

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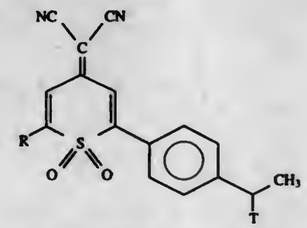
**5,500,317**

## ELECTROPHOTOGRAPHIC ELEMENTS CONTAINING SOLUBLE CYCLIC SULFONE ELECTRON TRANSPORT AGENTS

**Michael R. Detty; John A. Sinicropi, both of Rochester; J. Robin Cowdery-Corvan, Webster, and Ralph H. Young, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Jun. 16, 1994, Ser. No. 260,846**
**Int. Cl.[6] G03G 5/047**
**U.S. Cl. 430—58** **20 Claims**

1. A multilayered electrophotographic element wherein at least one of said layers includes polymeric binder and a charge transport agent having the general structure



wherein R is selected from the group consisting of alkyl and cycloalkly groups having from 1 to about 10 carbons, aryl and heteroaryl groups having a total of carbons and heteroatoms of from 6 to about 12, a furyl group, a selenophene group, and a thienyl group; and T is alkyl having from 1 to 4 carbons.

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**5,500,318**

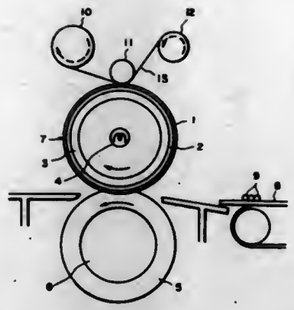
## TONER FOR DEVELOPING ELECTROSTATIC IMAGE AND FIXING METHOD

**Hirohide Tanikawa, Yokohama; Masaki Uchiyama, Ichikawa; Yoshinobu Joh, Kawasaki; Yasutaka Akashi, Yokohama; Masaaki Taya, Kawasaki, and Makoto Unno, Tokyo, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Division of Ser. No. 797,915, Nov. 26, 1991, Pat. No. 5,330,871. This application Jun. 27, 1994, Ser. No. 266,478**
**Claims priority, application Japan, Nov. 29, 1990, 2-332691**
**Int. Cl.[6] G03G 13/20**
**U.S. Cl. 430—99** **33 Claims**

1. A fixing method comprising:

feeding a toner-receiving material carrying a toner image on a surface thereof, the toner comprising a binder resin and a colorant, wherein the binder resin contains (a) a first component of a low molecular weight in amounts of less than 80 wt. % detectable as an extract in 6 hours of extraction, and (b) a second component in amounts of at least 20 wt. % detectable as an extraction residue after 6 hours of extraction, said second component including (c) a third component of a tetrahydrofuran-non-extractable matter in amounts of below 20 wt. % detectable as an extraction residue after 72 hours of extraction; each said extraction being a Soxhlet extraction with tetrahydrofuran, wherein the toner shows a dynamic



modulus and a loss modulus, respectively at 200° C. and 0.1 Hz, which are substantially unchanging with time;

passing the toner-receiving material carrying the toner image between a heated fixing roller and a pressing roller to fix the toner image under heating and pressing onto the surface of the toner-receiving material; and

cleaning the fixing roller surface with a cleaning member.

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**5,500,319**

## TONER FOR A TWO-COMPONENT-TYPE MAGNETIC DEVELOPING AGENT HAVING EXCELLENT SPENT RESISTANCE

**Masatomi Funato; Yoshitake Shimizu; Seijiro Ishimaru, and Kazuya Nagao, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan**

**Filed Aug. 18, 1994, Ser. No. 292,026**
**Claims priority, application Japan, Aug. 19, 1993, 5-205182**
**Int. Cl.[6] G03G 9/083;9/107**
**U.S. Cl. 430—106.6** **21 Claims**

1. A negatively-charged toner for a two-component-type magnetic developing agent having excellent spent resistance, comprising a resin medium for fixing which is a copolymer resin or a resin composition having anionic polar groups bonded to the resin skeleton and dispersed therein a magnetic powder in an amount of from 0.1 to 5 parts by weight per 100 parts by weight of said resin medium, and wherein an extract from which said toner is extracted with methanol exhibits absorbencies which are substantially zero at absorption peaks over wavelengths of from 400 to 700 nm and from 280 to 350 nm.

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**5,500,320**

## HIGH SPEED DEVELOPER COMPOSITIONS WITH FERRITE CARRIERS

**Bijay S. Saha, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Aug. 29, 1994, Ser. No. 297,462**
**Int. Cl.[6] G03G 9/107**
**U.S. Cl. 430—106.6** **5 Claims**

1. A carrier for an electrostatographic developer comprising particles of a hard magnetic ferrite material having a hexagonal crystalline structure of the general formula $MO.6Fe_2O_3$ in which M is strontium, barium or mixtures thereof exhibiting a coercivity of at least 300 Oersteds when magnetically saturated and an induced magnetic moment of at least 20 EMU/g when in an applied magnetic field of 1000 Oersteds and having a number average particle diameter of from 10.0 to 38.0 micrometers.



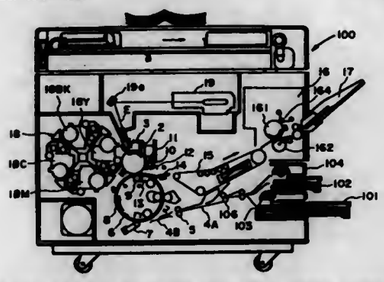
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**5,500,321**

## COLOR TONER FOR DEVELOPING ELECTROSTATIC IMAGE

**Takashige Kasuya, Sohka; Takayuki Nagatsuka, Yokohama; Tatsuya Nakamura, Tokyo; Makoto Kanbayashi, Kawasaki, and Tatsuhiko Chiba, Tokyo, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Division of Ser. No. 936,583, Aug. 28, 1992, Pat. No. 5,354,639. This application Jul. 29, 1994, Ser. No. 282,367**
**Claims priority, application Japan, Aug. 29, 1991, 3-242398; Aug. 21, 1992, 4-222867**
**Int. Cl.[6] G03G 9/00**
**U.S. Cl. 430—109** **15 Claims**



1. A color toner for developing electrostatic images comprising:

color toner particles each comprising a binder resin, a polyalkylene, and a colorant;

wherein each color toner particle has a capsule structure comprising a core substance comprising the polyalkylene and an outer shell covering the core substance as confirmed by observation of a section thereof by stained microtomy through a transmission electron microscope;

wherein the outer shell comprises the binder resin containing a polar polymer or copolymer; and

the polyalkylene has a crystallinity of 10–50% and a melting enthalpy as measured by a differential scanning calorimeter of at most 35 cal/g.

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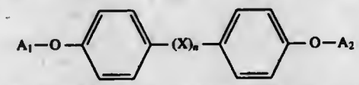
**5,500,322**

## DEVELOPER ADDITIVE, TONER AND DEVELOPER COMPOSITION

**Shingo Tanaka; Tetsuya Ueno; Akito Itoi, and Isao Nishi, all of Wakayama, Japan, assignors to Kao Corporation, Tokyo, Japan**

**Filed Nov. 10, 1994, Ser. No. 338,821**
**Claims priority, application Japan, May 18, 1992, 4-124599; May 18, 1992, 4-124600; May 18, 1992, 4-124601; May 18, 1992, 4-124602; May 18, 1992, 4-124603**
**Int. Cl.[6] C03G 7/057**
**U.S. Cl. 430—110** **12 Claims**

1. A toner composition comprising a developer additive represented by the formula (1), a binder resin and a colorant:



(1)

wherein $A_1$ and $A_2$ each represents an alkyl group, an alkenyl group or an arylalkyl group, n represents 0 or 1, and X is selected from the group consisting of



wherein the amount of developer additive is 0.1 to 10.0% by weight based on the weight of the binder.

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**5,500,323**

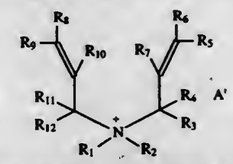
## CHARGE CONTROL WITH CYCLIC POLYSULFONYLDIALLY AMMONIUM SALTS

**Rüdiger Baur, Eppstein/Taunus; Hans-Tobias Macholdt, Darmstadt, and Wilfried Theiss, Flörsheim/Main, all of, Germany, assignors to Hoechst AG, Germany**

**Continuation of Ser. No. 188,283, Jan. 27, 1994, abandoned. This application Apr. 27, 1995, Ser. No. 430,181**
**Claims priority, application Germany, Jan. 30, 1993, 43 02 644.3**
**Int. Cl.[6] G03G 5/00**
**U.S. Cl. 430—110** **11 Claims**

1. A method for providing control over the electrostatic charge of an electrostatically chargeable electrophotographic toner or developer composition or electrostatically chargeable composition for printing stored information or electrostatically chargeable colorproofing composition or electrostatically chargeable powdered coating composition for the coating of a surface of an article, said method comprising: incorporating homogeneously into a said composition as a charge control agent a polysulfonyldiallylammonium salt or mixture or mixed crystal of a said polysulfonyldiallylammonium salt with mixed anions, mixed cations, or mixed anions and cations which has been obtained by

a) copolymerization of a salt of a monomeric diallylammonium component of the formula (I)



(I)

with sulfur dioxide or a compound which liberates sulfur dioxide, the diallylammonium cations being cyclized generally to form a pyrrolidinium ring and being connected to one another by one or more of the divalent radicals $—SO_2—$ to form polymers, and

b) anion exchange, the anions A' of the resulting repeating diallylammonium units being completely or partially replaced by the anions A,

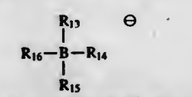
the repeating diallylammonium units being in each case cyclized to give a five- or six-membered ring and being connected to one another by one or more divalent radicals $—SO_2—$ to form polymers,

the polysulfonyldiallylammonium salt having a molecular weight of between 500 and 5,000,000, the ratio of the number of repeating diallylammonium units to the number of divalent $SO_2$ radicals being from 1:0.01 to 1:100,

the radicals $R_1$ to $R_{12}$ being identical or different and being a hydrogen atom, a halogen atom, a hydroxyl radical, a primary, secondary or tertiary amino radical, a carboxyl or carboxylate radical, an acyl radical, a sulfo or sulfonate radical, a cyano or nitro radical, or a radical of a $C_1$–$C_{30}$-aliphatic, $C_7$–$C_{60}$-araliphatic or $C_6$–$C_{30}$-aromatic hydrocarbon optionally interrupted by one or more of the heteroatoms, nitrogen, sulfur or oxygen, and

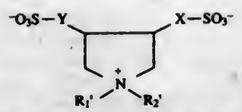
A' is an anion,

A is in each case the stoichiometric anion equivalent of an inorganic anion; of an anion of a heteropolyacid or of a borate of the formula (II)



(II)

the radicals $R_{13}$ to $R_{16}$ being identical or different and being $C_1$–$C_{30}$-aliphatic or $C_3$–$C_{10}$-cycloaliphatic radicals, aryl, heteroaryl or aralkyl radicals optionally substituted by alkyl($C_1$–$C_4$), alkoxy($C_1$–$C_4$) or aryl radicals or by halogen atoms, or being fluorine atoms; or of an organic anion; or of a disulfopyrrolidinium betaine of the formula (III)



(III)

$R_1'$ and $R_2'$ having the meanings given for $R_1$ and $R_2$ and X and Y each being a straight-chain or branched aliphatic, saturated or unsaturated alkylene($C_1$–$C_{18}$) radical or alkoxylene($C_1$–$C_{18}$) radical;

or A is a combination of the abovementioned anions; the anions A' of which have been completely or partially replaced by said anion A.

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**5,500,324**

## PROCESSES FOR LOW MELT CROSSLINKED TONER RESINS AND TONER

**Hadi K. Mahabadi; Enno E. Agur, both of Toronto; T. Brian McAneney, Burlington; Shean V. Kao; Gerald R. Allison, both of Oakville; Michael S. Hawkins, Cambridge, all of, Canada; Bernard Grushkin, Pittsford, N.Y.; J. Stephen Kittelberger, Rochester, N.Y.; Jon T. Chung, Penfield, N.Y., and William H. Hollenbaugh, Jr., Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Oct. 31, 1994, Ser. No. 332,315**

**Int. Cl.[6] G03G *9/087***

**U.S. Cl. 430—137** **16 Claims**

1. A process for preparing low fix temperature toner resins and toner compositions thereof comprising:

(a) reactive melt mixing of a base resin with a chemical initiator, and crosslinking of said base resin to prepare a highly crosslinked precursor resin, said highly crosslinked precursor resin being substantially free of sol, and consisting essentially of uncrosslinked portions and crosslinked portions, said crosslinked portions consisting essentially of high density crosslinked microgel particles; and

(b) melt mixing said highly crosslinked precursor resin with a base resin and toner additives to form a partially crosslinked toner, wherein said resin for said toner is substantially free of sol, and comprises linear uncrosslinked portions and crosslinked portions, said crosslinked portions consisting essentially of high density crosslinked microgel particles.

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**5,500,325**

## DYE MIXTURES FOR OPTICAL RECORDING LAYERS

**Derek D. Chapman, Rochester; Ramanuj Goswami, Webster, and Csaba A. Kovacs, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Continuation of Ser. No. 140,646, Oct. 21, 1993, abandoned. This application Jan. 23, 1995, Ser. No. 376,622**

**Int. Cl.[6] G03C *1/72; G11B 7/24***

**U.S. Cl. 430—270.16** **9 Claims**

1. An optical recording element having a transparent substrate bearing a recording layer that is overcoated with a light reflective layer wherein said recording layer comprises a dye mixture having:

a) a real index of refraction of at least 1.8 in the 780 to 790 nm region of the spectra;

b) an imaginary index (k) between 0.3 and 0.02 in the 780 to 790 nm region of the spectra;

c) a metallized azo dye comprising an azo group linking a substituted 3-hydroxy-pyridine nucleus to a phenyl nucleus wherein the phenyl nucleus has an alkoxy or thioether substituent at its 2-position; and

d) at least a second dye.

**5,500,326**

## METHOD OF PRODUCING MASTER AND WORKING PATTERN PLATES FOR ETCHING AND PHOTOLITHOGRAPHIC APPARATUS THEREFOR

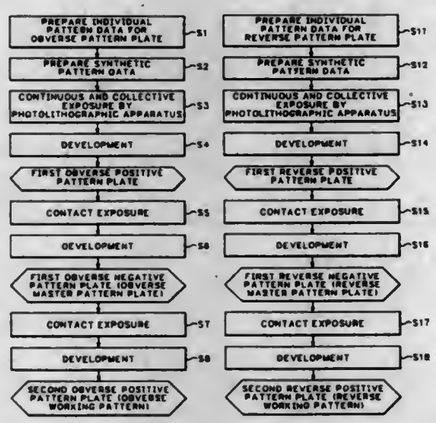
**Kei Kobayashi, and Yoji Shiraishi, both of Tokyo, Japan, assignors to Dai Nippon Printing Co., Ltd., Tokyo, Japan**

**Continuation of Ser. No. 666,351, Mar. 8, 1991, abandoned. This application May 25, 1993, Ser. No. 67,340**

**Claims priority, application Japan, Mar. 9, 1990, 2-58522; Dec. 17, 1990, 2-402613**

**Int. Cl.[6] G03F *7/26;7/00***

**U.S. Cl. 430—300** **9 Claims**




1. A method of producing obverse and reverse master pattern plates as a pair and respective obverse and reverse working pattern plates as a pair for etching obverse and reverse sides of a substrate in accordance with respective pattern plates, comprising:

(a) preparing, for each of said obverse and reverse master pattern plates, individual pattern data required for an etching pattern plate including an alignment mark pattern, a hole pattern, and a frame pattern;

(b) preparing respective synthetic pattern data by subjecting each of said individual pattern data to a logical operation;

(c) employing a photolithographic apparatus in exposing a photosensitive plate in accordance with one of said synthetic pattern data for said obverse and reverse pattern plates so as to form a latent image corresponding to said one synthetic pattern data, and then carrying out reversal development for the pattern portions thereof to produce a negative pattern plate, which is defined as a master pattern plate;

(d) effecting contact exposure by use of said master pattern plate obtained in step (c) to produce a positive pattern plate, which is defined as a working pattern plate;

(e) employing said photolithographic apparatus in exposing a photosensitive plate in accordance with the other of said synthetic pattern data for said obverse and reverse pattern plates so as to form a latent image corresponding to said other synthetic pattern data and then carrying out a developing process to produce a positive pattern;

(f) effecting contact exposure by use of said positive pattern obtained in step (e) to produce a negative pattern plate, which is defined as a complementary master pattern plate; and

(g) effecting contact exposure by use of said master pattern plate obtained in step (f) to produce a positive pattern plate, which is defined as a complementary working pattern plate.



**5,500,327**

## PHOTOSENSITIVE ELEMENT HAVING SUPPORT WITH ADJUSTABLE ADHESION

**Bernard Feinberg, Englishtown, N.J., and Richard P. Pankratz, Circleville, Ohio, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Continuation of Ser. No. 371,737, Jan. 12, 1995, abandoned, which is a division of Ser. No. 161,645, Dec. 6, 1993, Pat. No. 5,407,781, which is a division of Ser. No. 860,865, Mar. 31, 1992, Pat. No. 5,292,617. This application May 1, 1995, Ser. No. 432,373**

**Int. Cl.[6] G03C *1/492;* G03F *7/00***

**U.S. Cl. 430—306** **5 Claims**

1. A process for preparing a flexographic printing plate comprising

(A) imagewise exposing a photosensitive element containing in order:

(1) a support;

(2) a thermally hardened layer containing the reaction product of

(i) either an organic polymer having reactive segements and nonreactive segments or a blend of organic polymers wherein at least one polymer has reactive segments and at least one polymer has nonreactive segments,

(ii) a crosslinking agent, and

(iii) a catalyst; and

(3) a photohardenable layer

(B) applying a washout developer to the exposed element;

(C) drying the plate; and

(D) post-exposing the resulting plate;

wherein prior to the imagewise exposure step (A), the adhesion of the photohardenable layer to the thermally hardened layer is increased by exposing the photosensitive element to ultraviolet radiation, having a wavelength range between about 250 nm and 500 nm, through the polymeric film substrate.

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**5,500,328**

## RECOVERY OF PHOTOGRAPHIC FILM BASE

**Robert G. Surash, and Craig C. Lewis, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Jan. 12, 1995, Ser. No. 372,276**

**Int. Cl.[6] C08B *3/26;* G03C *11/24***

**U.S. Cl. 430—347** **7 Claims**

1. A process of recovering cellulose triacetate from scrap photographic film, using aqueous solutions free of organic solvents, by the steps of:

a) reducing the film to segments of handlable size and combining the segments with water to form an aqueous slurry;

b) oxidizing the film with an oxidizing agent comprising an alkali metal permanganate and a strong acid;

c) oxidizing the slurry resulting from step b) with an alkali metal hypochlorite to remove stain due to iron compound and yellow dye;

d) bleaching the slurry resulting from step c) with an alkali metal metabisulfite in an acidic environment; and

e) recovering cellulose triacetate.

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**5,500,329**

## IMAGE FORMING METHOD EMPLOYING A SCANNING EXPOSURE

**Kiyoshi Kawai, Minami Ashigara, and Masami Hatori, Kanagawa, both of, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

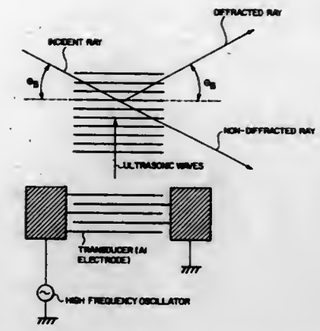
**Continuation of Ser. No. 59,979, May 13, 1993, abandoned. This application Dec. 29, 1994, Ser. No. 366,373**

**Claims priority, application Japan, May 15, 1992, 4-148014**

**Int. Cl.[6] G03C *7/00;5/00;1/08;1/06***

**U.S. Cl. 430—363** **9 Claims**

1. An image forming method, in which a silver halide photographic material having on a waterproofing resin coated support




containing 14 wt % or more of $TiO_2$ in the resin one or more light-sensitive layers each containing surface latent image forming silver halide emulsion grains where at least one light-sensitive layer has been spectrally sensitized to the oscillating wavelength of a laser beam to be used to expose the photographic material, the quantity of the reflection light from the photographic material at the oscillating wavelength of the laser beam being 30% or less of the quantity of the incident light to the same, is exposed for a period of exposure time, per pixel, of $1\times10^{-7}$ second or less with a scanning exposure device equipped with an optical modulator capable of varying the quantity of light in stages, and is then developed in a developing composition containing a developing agent.

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**5,500,330**

## PHOTOGRAPHIC MATERIAL AND PROCESS COMPRISING A THIOL BEACH ASSIST IN THE LOW SENSITIVITY LAYER OF A TRIPLE-COAT

**Richard P. Szajewski, and Allan F. Sowinski, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Continuation of Ser. No. 11,451, Jan. 29, 1993, abandoned. This application Jul. 1, 1994, Ser. No. 269,998**

**Int. Cl.[6] G03C *7/00;5/44;1/46;1/005***

**U.S. Cl. 430—393** **38 Claims**

20. A process for forming a color negative image comprising imagewise exposing a photographic element containing at least three light sensitive silver halide layers spectrally sensitized to the same region of the electromagnetic spectrum wherein the least sensitive such layer, or a nonsensitive layer adjacent thereto, comprises a compound which contains a releasable thiol fragment or a precursor thereof wherein:

A. the amount of the thiol fragment-containing compound or precursor in such layers is both sufficient to increase the extent of silver bleaching during bleaching and is greater than the amount contained in any of the more sensitive layers of the same sensitivity; and

B. the thiol fragment contains a sulfur atom which is not directly bonded to an atom which is a member of an aromatic ring and the thiol fragment also contains a water-solubilizing group;

and then developing said image by a process consisting essentially of contacting said exposed element with a color developing agent whereby a color negative image is formed.

**5,500,331**

## COMMINUTION WITH SMALL PARTICLE MILLING MEDIA

David A. Czekai, Honeoye Falls, and Larry P. Seaman, Mt. Morris, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 25, 1994, Ser. No. 248,774

The portion of the term of this patent subsequent to Dec. 26, 2012, has been disclaimed.

Int. Cl.[6] G03C *1/00*; B02C *17/20*

U.S. Cl. 430—449 11 Claims

1. A method of preparing submicron particles of a compound useful in imaging elements in the presence of rigid milling media having a mean particle size of less than 100 microns.

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**5,500,332**

## BENZOTRIAZOLE BASED UV ABSORBERS AND PHOTOGRAPHIC ELEMENTS CONTAINING THEM

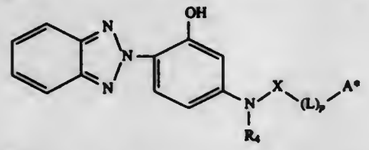
Lal C. Vishwakarma, and Glenn Brown, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 26, 1995, Ser. No. 430,939

Int. Cl.[6] G03C *1/815*

U.S. Cl. 430—512 24 Claims

1. A photographic element comprising at least one light sensitive layer and an ultraviolet absorbing compound of the following structure:



(I)

wherein:

$R_4$ is H or an alkyl group, and the benzo or phenyl ring shown may be further substituted or unsubstituted;

X is —C(O)O— wherein the carbonyl carbon is bonded to the N of $NR_4$, or X is —$SO_2$—;

L is a bivalent linking group;

p is 0 or 1;

A* is an alkyl group having an asymmetric carbon or silicon atom, and;

wherein the ultraviolet absorbing compound of formula (I) is a mixture of two enantiomers about the asymmetric carbon or silicon of A*.

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**5,500,333**

## CLASS OF COMPOUNDS WHICH INCREASES AND STABILIZES PHOTOGRAPHIC SPEED

Jon N. Eikenberry; Roger Lok, and Chung-Yuan Chen, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

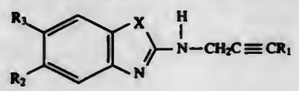
Filed Dec. 16, 1993, Ser. No. 169,478

Int. Cl.[6] G03C *1/09*; *1/10*

U.S. Cl. 430—567 20 Claims

1. A method of sensitizing an emulsion comprising

providing a silver bromoiodide emulsion, during sensitizing of said emulsion, adding to said emulsion dye, gold sensitizer, sulfur sensitizer, thiocyanate, and an amount between about 0.02 and 0.03 mmol/mole of silver of the compound



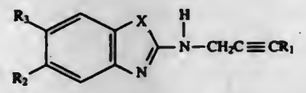
wherein

$R_1$ is alkyl, hydrogen, aryl, p-methoxyphenyl, p-tolyl, or p-chlorophenyl;

X is O or S;

$R_2$ and $R_3$ are hydrogen, halogen, methoxy, alkyl, or aryl, and with the proviso that the silver halide grains of said silver bromoiodide emulsion comprise less than 0.1 microns in thickness, and then heating for chemical sensitization.

11. A photographic element comprising at least one silver bromoiodide emulsion wherein the grains of said emulsion have on their surface between about 0.02 mmol/mole of silver and about 0.03 mmol/mole of silver of the compound



wherein

$R_1$ is alkyl, hydrogen, aryl, p-methoxyphenyl, p-tolyl, or p-chlorophenyl;

X is O or S;

$R_2$ and $R_3$ are hydrogen, methyl, halogen, methoxy, alkyl, or aryl, and with the proviso that the silver halide grains of said silver bromoiodide emulsion comprise less than 0.1 microns in thickness.

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**5,500,334**

## SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL CONTAINING PYRAZOLE-SUBSTITUTED COUPLERS

Yuki Mizukawa; Hideaki Naruse; Toshiyuki Watanabe, and Tadahisa Sato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

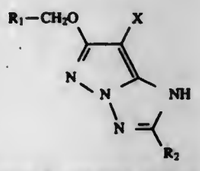
Filed Sep. 4, 1992, Ser. No. 941,179

Claims priority, application Japan, Sep. 6, 1991, 3-254171

Int. Cl.[6] G03C *7/38*

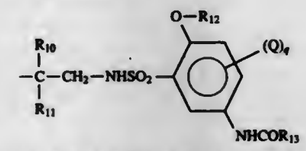
U.S. Cl. 430—558 14 Claims

1. A silver halide color photographic material having at least one silver halide emulsion layer on a support, in which at least one layer constituting the material comprises a coupler having formula (I):



(I)

wherein $R_1$ represents an electron-attracting substituent having a Taft's substituent constant σ* value of +0.52 or more; X represents a pyrazolyl group, and $R_2$ in formula (I) is a group having formula (V):



(V)

wherein $R_{10}$ and $R_{11}$ each represents a hydrogen atom, an alkyl group, or an aryl group, but both $R_{10}$ and $R_{11}$ must not be hydrogen atoms; $R_{12}$ represents an alkyl group or an aryl group; Q represents a substituent; q represents an integer of from 0 to 3; and $R_{13}$ represents an alkyl group or an aryl group.



**5,500,335**

## PHOTOGRAPHIC EMULSION CONTAINING TRANSITION METAL COMPLEXES

Eric L. Bell, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 31, 1994, Ser. No. 331,832

Int. Cl.[6] G03C *1/09*

U.S. Cl. 430—567 23 Claims

1. A photographic silver halide emulsion comprising silver halide grains having incorporated therein a first and second grain surface modifier, and a hexacoordination complex comprising iridium, wherein the first grain surface modifier has the structure:

$$[TE_4(NZ)E']^r$$

where

T is a transition metal selected from the Groups 5 to 10, inclusive, of the periodic table;

Z is oxygen or sulfur, and together with nitrogen forms the nitrosyl or thionitrosyl ligand;

E and E' represent ligands; and

r is zero, −1, −2, or −3; the second grain surface modifier has the structure:

$$[M(CN)_{6-y}L_y]^n$$

where

M is a Group 7 to 10 transition metal other than iridium;

L is a ligand;

y is zero, 1, 2, or 3; and

n is zero, −1, −2, −3, or −4; and the hexacoordination complex comprising iridium has the structure:

$$R_yIrX_6$$

where

R represents a hydrogen atom, an alkali metal atom, or an ammonium radical;

q is 2, 3; or 4; and

X represents a ligand.

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**5,500,336**

## SILVER HALIDE PHOTOGRAPHIC MATERIAL

Hiroyuki Asanuma; Fumitaka Ueda, and Tadaaki Tani, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 798,197, Nov. 26, 1991, abandoned. This application Jan. 28, 1994, Ser. No. 187,997

Claims priority, application Japan, Nov. 27, 1990, 2-323550; Nov. 29, 1990, 2-332803; May 17, 1991, 3-140712

The portion of the term of this patent subsequent to Sep. 5, 2012, has been disclaimed.

Int. Cl.[6] G03C *1/04*

U.S. Cl. 430—570 23 Claims

1. A silver halide photographic material comprising a support having thereon at least one silver halide emulsion layer, wherein at least one silver halide emulsion layer contains a silver halide emulsion obtained by treating a silver halide emulsion containing a dye previously added thereto with a solid adsorbent which is a porous synthetic organic resin without an ion-exchange group to thereby desorb the dye adsorbed.

**5,500,337**

## DYES COMPRISING THIOETHER MACROCYCLES

Rejane Benard, Bois le Roi; Gerard A. D. Friour, Chalon-sur-Saone; Didier J. Martin, and Marcel L. P. Riveccle, both of Givry, all of, France, assignors to Eastman Kodak Company, Rochester, N.Y.

PCT No. PCT/EP92/02359, § 371 Date Apr. 15, 1994, § 102(e) Date Apr. 15, 1994, PCT Pub. No. WO93/08505, PCT Pub. Date Apr. 29, 1993

PCT Filed Oct. 14, 1992, Ser. No. 211,790

Claims priority, application France, Jan. 15, 1991, 91 12942

Int. Cl.[6] G03C *1/12*; *1/14*

U.S. Cl. 430—570 16 Claims

1. A spectral sensitising dye of the polymethine type characterised in that it comprises at least one macrocyclic thioether radical with at least one sulphur atom and at least one oxygen atom, each sulphur or oxygen atom being separated from another sulphur or oxygen atom by an alkylene group comprising at least 2 carbon atoms.

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**5,500,338**

## BLACK AND WHITE PHOTOGRAPHIC ELEMENTS CONTAINING RELEASE COMPOUNDS AND METHOD OF PREPARING PHOTOGRAPHIC EMULSION

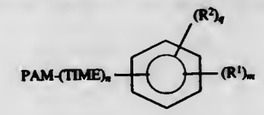
Donald L. Kerr, and Jerome J. Looker, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 31, 1995, Ser. No. 455,944

Int. Cl.[6] G03C *1/34*; *1/42*; *1/38*; *1/43*

U.S. Cl. 430—611 9 Claims

1. A black and white photographic element comprising a support having situated thereon at least one silver halide emulsion, the element containing a release compound that provides a non-imagewise distribution of a photographically active moiety, wherein the release compound is unballasted and has the structure



wherein

$R^1$ is an electron withdrawing moiety;

m is 0, 1, 2 or 3;

$R^2$ is a group containing an aqueous solubilizing group, the aqueous solubilizing group containin a polyether comprising a polyethyleneoxy chain having at least 4 repeating units;

q is 1 or 2;

TIME is a timing group;

n is 0, 1, 2 or 3; and

PAM is a photographically active moiety.

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**5,500,339**

## DNA DENATURATION METHOD

Carl W. Fuller, Cleveland Heights, and Denise A. Pisa-Williamson, Aurora, both of Ohio, assignors to Amersham Life Science, Inc., Cleveland, Ohio

Filed Mar. 30, 1993, Ser. No. 40,304

Int. Cl.[6] C12Q *1/68*

U.S. Cl. 435—6 5 Claims

1. Method for determining the nucleotide base sequence of a double-stranded closed circular DNA, consisting essentially of:

heating a solution comprising said DNA in the presence of a total of at least 20% and 50% (v/v) glycerol and/or ethylene glycol to at least 80° C. to provide denatured DNA, wherein said amount of glycerol and/or ethylene glycol is at most 50% (v/v);

reducing the concentration of said glycerol and/or ethylene glycol in contact with said denatured DNA so that said denatured DNA can be sequenced; and

sequencing said denatured DNA by a chain termination sequencing method.

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**5,500,340**

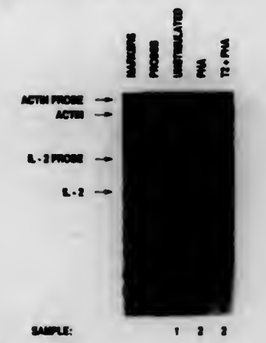
## INHIBITION OF IL-2 PRODUCTION BY +1 TRIPTERYGIUM WILFORDII HOOK F EXTRACT

**Peter E. Lipsky, and Xue-Lian Tao, both of Dallas, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.**

**Division of Ser. No. 862,836, Apr. 3, 1992, Pat. No. 5,294,443, which is a continuation-in-part of Ser. No. 494,113, Mar. 14, 1990, abandoned. This application Oct. 14, 1993, Ser. No. 136,345**

**Int. Cl.[6] C12Q *1/68;* G01N *33/50***

**U.S. Cl. 435—6** **3 Claims**




1. A method of testing for selective inhibition of IL-2 specific mRNA production comprising the steps of:

culturing eukaryotic cells with and separately without a *Tripterygium wilfordii Hook F* T2 extract to provide a test sample and a control sample;

measuring IL-2 mRNA level and a reference mRNA level to provide a test IL-2 mRNA sample, a test reference mRNA sample, a control IL-2 mRNA sample and a control reference mRNA sample;

comparing (test IL-2 mRNA level÷ control IL-2 mRNA level) to (test reference mRNA level÷control reference mRNA level);

wherein when (test IL-2 mRNA level÷control IL-2 mRNA level) is less than one and (test reference mRNA level÷ control reference mRNA level) is about one, selective inhibition of IL-2 mRNA production by T2 is indicated.

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**5,500,341**

## SPECIES-SPECIFIC DETECTION OF +1 MYCOBACTERIUM KANSASII

**Patricia A. Spears, Raleigh, N.C., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.**

**Filed Sep. 19, 1994, Ser. No. 308,892**

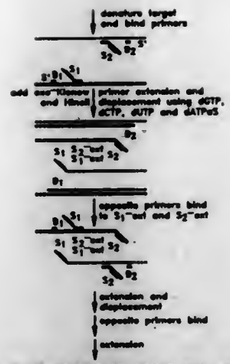
**Int. Cl.[6] C12Q *1/68;* C12P *19/34;* C07H *21/04***

**U.S. Cl. 435—6** **19 Claims**

1. A set of primers for species-specific amplification of *Mycobacterium kansasii* target nucleic acids comprising a first amplification primer consisting of nucleotides 26–38 of SEQ ID NO:5 and a second amplification primer consisting of nucleotides 25–37 of SEQ ID NO:6.

9. A method for species-specific detection of a double stranded *Mycobacterium kansasii* nucleic acid target sequence comprising:

a) hybridizing to the *Mycobacterium kansasii* nucleic acid target sequence, if present, a first amplification primer consisting of




nucleotides 26–38 of SEQ ID NO:5 and a second amplification primer consisting of nucleotides 25–37 of SEQ ID NO:6;

b) amplifying the *Mycobacterium kansaii* nucleic acid target sequence by extending the hybridized first and second amplification primers with polymerase to produce extension products and displacing the extension products, and;

c) detecting the amplified *Mycobacterium kansaii* nucleic acid target sequence.

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**5,500,342**

## METHOD FOR DETERMINING SUGAR CHAIN STRUCTURE

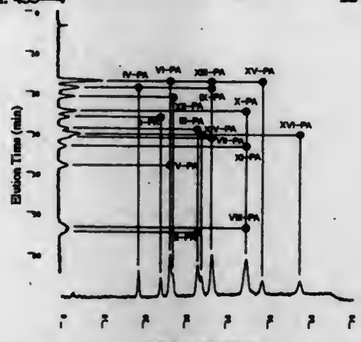
**Tsuyoshi Miyamura, Nishinomiya; Mutsumi Sano, Otsu; Akihiro Kondo, Akashi, and Ikunoshin Kato, Uji, all of, Japan, assignors to Takara Shuzo Co., Ltd., Kyoto, Japan**

**Filed Aug. 11, 1994, Ser. No. 288,768**

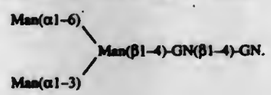
**Claims priority, application Japan, Aug. 23, 1993, 5-227877; Jul. 8, 1994, 6-179748**

**Int. Cl.[6] C12Q *1/00;1/54;* C07G *3/00;* C07H *19/00***

**U.S. Cl. 435—4** **22 Claims**




1. A method for determining the structure of an N-acetyllactosamine sugar chain in a sample containing said sugar chain, which comprises determining the site of linkage and the mode of linkage of sugar residues at the non-reducing terminal side of a β-N-acetylglucosamine residue linked to an α-mannose residue in M3 core by means of detecting the presence of the β-N-acetylglucosamine residue after enzymatic or chemical digestion of said sugar chain, said M3 core having the formula






**5,500,343**

## ALLELIC ASSOCIATION OF THE HUMAN DOPAMINE(D2) RECEPTOR GENE IN COMPULSIVE DISORDERS

**Kenneth Blum, San Antonio, Tex.; E. P. Noble, Los Angeles, Calif., and P. J. Sheridan, San Antonio, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex., and Regents of the University of California, Berkeley, Calif.**

**Continuation-in-part of Ser. No. 826,222, Jan. 23, 1992, Pat. No. 5,210,016, which is a continuation of Ser. No. 477,057, Feb. 7, 1990, abandoned. This application Jun. 24, 1992, Ser. No. 909,383**

**The portion of the term of this patent subsequent to May 11, 2010, has been disclaimed.**

**Int. Cl.[6] C12Q *1/68;* C12P *19/34;* C07H *21/04;* C12N *15/00***

**U.S. Cl. 435—6** **10 Claims**

1. A method of detecting a genetic potential susceptibility to cocaine dependence in a human subject, comprising:

isolating DNA from said subject; and

detecting, in said DNA, a human dopamine $D_2$ receptor gene A1 or B1 allele indicating

a potential susceptibility to cocaine dependence.

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**5,500,344**

## SERINE PROTEASE AND USES THEREOF

**Thomas Sayers, Boonsboro, Md.; Mark J. Smyth, Lower Plenty, Australia; Theresa A. Wiltrout, Frederick, Md.; James C. Powers, Atlanta, Ga.; Raymond Sowder, Frederick, and Louis E. Henderson, Newmarket, both of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.**

**Filed Dec. 3, 1992, Ser. No. 990,301**

**Int. Cl.[6] C12Q *1/68;* C12N *5/10;15/74;* C07H *21/02***

**U.S. Cl. 435—6** **20 Claims**

1. A purified and isolated nucleic acid molecule encoding a serine protease having the amino acid sequence selected from the group consisting of: (a) the amino acid sequence contained in FIGS. 4A and 4B (SEQ ID NO:2); and (b) the amino acid sequence contained in FIGS. 6A and 6B (SEQ ID NO: 4).

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**5,500,345**

## HYBRIDOMAS PRODUCING MONOCLONAL ANTIBODIES SPECIFIC FOR C-REACTIVE PROTEIN AND METHODS FOR DETECTION OF C-REACTIVE PROTEIN

**Gilbu Soe, Inba; Isao Kohno, Funabashi, and Michiyo Tanaka, Sakura, all of, Japan, assignors to Iatron Laboratories, Inc., Tokyo, Japan**

**Continuation of Ser. No. 117,632, Sep. 7, 1993, abandoned, which is a continuation of Ser. No. 635,616, Dec. 21, 1990, abandoned. This application Dec. 16, 1994, Ser. No. 357,540**

**Claims priority, application Japan, Apr. 25, 1989, 1-103471**

**Int. Cl.[6] G01N *33/53;* C12N *5/20;* C07K *16/18***

**U.S. Cl. 435—7.1** **4 Claims**

1. A monoclonal antibody specific for C-reactive protein wherein the monoclonal antibody can agglutinate latex particles to which said monoclonal antibody has been immobilized upon binding of said monoclonal antibody to C-reactive protein, wherein the monoclonal antibody is selected from the group consisting of monoclonal antibody CRP-1 produced by hybridoma cell line CRP-1 (FERM BP-2873), monoclonal antibody CRP-2 produced by hybridoma cell line CRP-2 (FERM BP-2874), monoclonal antibody CRP-3 produced by hybridoma cell line CRP-3 (FERM BP-2875), and monoclonal antibody CRP-4 produced by hybridoma cell line CRP-4 (FERM BP-2876).

**5,500,346**

## MONOCLONAL ANTIBODIES TO HUMAN INFLUX PEPTIDE TRANSPORTER

**Stuart W. Bright, Indianapolis; Anne H. Dantzig, Crawfordsville; Linda B. Tabas, Carmel, all of Ind., and J. Richard Sportsman, Palo Alto, Calif., assignors to Eli Lilly and Company, Indianapolis, Ind.**

**Filed Jun. 29, 1993, Ser. No. 84,686**

**Int. Cl.[6] G01N *33/567;33/53***

**U.S. Cl. 435—7.21** **3 Claims**

1. A method of determining whether an agent is transported into a cell by a human influx peptide transporter which is specifically bound by monoclonal antibodies PTC13G6, PTC12D8, and PTC15F11, wherein said method comprises:

(a) contacting a cell which expresses said human influx peptide transporter with a monoclonal antibody, an antibody fragment or a recombinant antibody which specifically binds said human influx peptide transporter and which inhibits the function of the human influx peptide transporter, in an aqueous solution under conditions that allow the monoclonal antibody, antibody fragment or recombinant antibody to bind to the cell;

(b) adding the agent to be tested to said solution; and

(c) determining whether transport of the agent into the cell is inhibited by the presence of the monoclonal antibody, antibody fragment or recombinant antibody.

2. The method of claim 1 wherein the monoclonal antibody is selected from the group consisting of PTC13G6, PTC12D8, and PTC15F11.

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**5,500,347**

## METHOD FOR THE PURIFICATION OF CYTOKERATIN 20 AND ITS USE FOR THE PRODUCTION OF ANTIBODIES

**Roland Moll, and Werner W. Franke, both of Heidelberg, Germany, assignors to Progen Biotechnik GmbH, Heidelberg, Germany**

**PCT No. PCT/EP91/01407, § 371 Date Jan. 27, 1993, § 102(e) Date Jan. 27, 1993, PCT Pub. No. WO92/02558, PCT Pub. Date Feb. 20, 1992**

**PCT Filed Jul. 26, 1991, Ser. No. 934,656**

**Claims priority, application Germany, Jul. 27, 1990, 40 23 945.1**

**Int. Cl.[6] G01N *33/53;33/574***

**U.S. Cl. 435—7.23** **29 Claims**

16. A process for the production of antibodies specific for CK 20, comprising the steps of:

producing a cytoskeletal fraction from cells containing CK 20,

separating any proteins present by gel electrophoresis, chromatography or by gel electrophoresis and chromatography,

isolating CK 20 from the gel or from the chromatographic fraction containing the CK 20,

then immunizing a suitable animal with said CK 20, and

isolating any polyclonal or monoclonal antibodies produced.

23. A process for the immunological identification of CK 20 or its α-helical central fragment obtained by proteolytic cleavage, in a sample selected from the group consisting of tissue sections, tissue homogenates and body fluids, comprising

contacting said sample with an antibody specific for CK 20 or its α-helical central fragment, and

determining any antibody-antigen complexes formed,

wherein said antibody is prepared according to claim 16.

**5,500,348**

**BASOPHIL-BINDING MONOCLONAL ANTIBODY, METHOD FOR SEPARATION OF BASOPHILS, METHOD FOR CHEMICAL MEDIATOR RELEASE FROM BASOPHILS, AND METHOD FOR TESTING RELEASE OF BASOPHIL-DERIVED CHEMICAL MEDIATORS**

**Shinji Nishimura, Moriguchi; Hiroshi Nishi, Neyagawa, and Masaji Nishimura, Kyoto, all of, Japan, assignors to Shionogi & Co., Ltd., Japan**

**Filed Nov. 2, 1993, Ser. No. 144,447**

**Claims priority, application Japan, Nov. 4, 1992, 4-321164**

**Int. Cl.[6] G01N** *33/543;33/577*

**U.S. Cl. 435—7.24** **9 Claims**

1. A method for detecting chemical mediator release from basophils, comprising:

1) separating leukocytes including basophils from a humoral fluid by contacting said fluid with a reagent comprising a monoclonal antibody immobilized on a solid carrier, wherein the monoclonal antibody has the following properties:

(a) specifically binds to an antigen on the surface of basophils,

(b) retains its specific binding reactivity with leukocytes including basophils even after immobilization onto the solid carrier, so as to provide, upon specific binding to basophils, immobilized basophils in a physiological condition sufficient for a chemical mediator release test,

(c) does not inhibit IgE-mediated specific histamine release from said immobilized basophils,

(d) does not induce nonspecific histamine release from said basophils,

(e) is of an IgG or IgM isotype, and

(f) specifically binds to said antigen through the Fab portion of the antibody;

2) contacting the separated leukocytes including basophils with an allergen or anti-IgE antibody to release a chemical mediator; and

3) detecting the chemical mediator thus released from said leukocytes including basophils.

2. A method for determining amount of release of a chemical mediator from basophils, comprising:

1) separating leukocytes including basophils from a humoral fluid by contacting said fluid with a reagent comprising a monoclonal antibody immobilized on a solid carrier, wherein the monoclonal antibody has the following properties:

(a) specifically binds to an antigen on the surface of basophils,

(b) retains its specific binding reactivity with leukocytes including basophils even after immobilization onto the solid carrier, so as to provide, upon specific binding to basophils, immobilized basophils in a physiological condition sufficient for a chemical mediator release test,

(c) does not inhibit IgE-mediated specific histamine release from said immobilized basophils,

(d) does not induce nonspecific histamine release from said basophils,

(e) is of an IgG or IgM isotype, and

(f) specifically binds to said antigen through the Fab portion of the antibody;

2) contacting the separated leukocytes including basophils with an allergen or anti-IgE antibody to release a chemical mediator; and

3) determining the amount of the chemical mediator thus released from said leukocytes including basophils.

4. The method of claim 1 or 2, wherein said monoclonal antibody is selected from the group consisting of monoclonal antibodies BA101, BA20, BA135 and BA312, produced by hybridoma FERM BP-4004, FERM BP-4005, FERM BP-4006 and FERM BP-4007, respectively.

**5,500,349**

**BLOOD-COAGULATION FACTOR XIIA β MONOCLONAL ANTIBODY AND IMMUNOASSAY**

**Michael P. Emouf, Combe, England, assignor to Coagen Limited, Oxford, United Kingdom**

**Continuation of Ser. No. 730,846, Sep. 17, 1991, abandoned. This application Nov. 17, 1993, Ser. No. 153,800**

**Claims priority, application United Kingdom, Jan. 27, 1989, 8901859**

**Int. Cl.[6] G01N** *33/53;33/68;* **C12N** *5/12;* **C07K** *16/36*

**U.S. Cl. 435—7.4** **20 Claims**

1. A monoclonal antibody which binds to Factor βXIIa and to Factor αXIIa, and which shows a corrected cross-reactivity with Factor XII of 0.1% or less, said Factor βXIIa and Factor αXIIa being

(i) as produced from Factor XII in vitro, or

(ii) a form of Factor βXIIa or Factor αXIIa occurring in vivo and obtainable from natural sources, or

(iii) an analogue of a naturally-occurring Factor βXIIa or Factor αXIIa, which analogue has a modified amino acid sequence, or

(iv) a synthetic copy or synthetic analogue of a naturally-occurring Factor βXIIa or Factor αXIIa, which copy or analogue has been produced by chemical synthesis or by recombinant DNA technology.

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**5,500,350**

**BINDING ASSAY DEVICE**

**Terence S. Baker, Staines; Martin J. Perry, New Malton, and Ian M. Fleming, Southport, all of, England, assignors to Celltech Limited, Slough, England**

**Continuation of Ser. No. 83,329, Jun. 29, 1993, abandoned, which is a continuation of Ser. No. 702,128, May 16, 1991, abandoned, which is a continuation of Ser. No. 347,725, May 5, 1989, abandoned, which is a continuation of Ser. No. 80,565, Jun. 29, 1987, abandoned. This application Apr. 29, 1994, Ser. No. 235,261**

**Claims priority, application United Kingdom, Jan. 30, 1985, 8526741**

**Int. Cl.[6] G01N** *33/53*

**U.S. Cl. 435—7.92** **4 Claims**

1. A test system for performing a binding assay for determining the presence or absence of an analyte in a sample, comprising:

a) an absorbent material in the form of an elongate strip having a sample application zone, upstream of a plurality of transverse reagent zones,

wherein an enzyme-labelled reagent zone includes an enzyme-labelled species, comprising either an enzyme-labelled analyte or an enzyme-labelled reagent that binds to said analyte, such that in use, said enzyme-labelled species is caused to migrate through the strip by passage of a developing solution through the strip, and

wherein an indicator reagent zone includes an immobilized reagent that directly or indirectly binds, and thereby immobilizes, said enzyme-labelled species in an amount dependent on the quantity of said analyte present in said sample; and

b) a developing solution,

wherein said developing solution comprises a signal-producing substrate for the enzyme which is a single color-producing compound or a compound acting as a cofactor with a further compound or compounds to produce a signal in the presence of enzyme, wherein any of said further compound or compounds are present in the developing solution,

wherein said developing solution is initially in contact only with that portion of said absorbent material upstream from said indicator zone but in which ultimately, by capillary action, sequentially contacts all reagent zones of said absorbent material, and

wherein said signal-producing substrate is transported by the developing solution slower than said enzyme-labelled species either by addition to said absorbent material at least one compound that increases the attractive interaction between said absorbent material and said substrate relative to the attractive interaction between said absorbent material and said enzyme-labelled species or by provision of a substrate binding reagent zone which binds said substrate at a location upstream from said enzyme-labelled reagent zone, such that, in use, the substrate is prevented from passing through said binding reagent zone until said binding reagent zone is substantially saturated.



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**5,500,351**

**BIOSENSORS FOR DETECTING METAL IONS CAPABLE OF BEING REDUCED BY REDUCTASE ENZYMES**

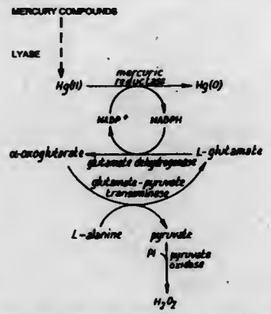
**Harry Eccles; Geoffrey W. Garnham, both of Salwick; Christopher R. Lowe, and Neil C. Bruce, both of Cambridge, all of, United Kingdom, assignors to British Nuclear Fuels PLC, Warrington, United Kingdom**

**Filed Jul. 18, 1994, Ser. No. 276,322**

**Claims priority, application United Kingdom, Jul. 22, 1993, 9315183**

**Int. Cl.[6] C12Q** *1/26;* **C12N** *9/88;* **G01N** *27/00*

**U.S. Cl. 435—25** **18 Claims**




1. A biosensor for detecting ions of a metal capable of being reduced by a metal reductase enzyme, the biosensor comprising:

an immobilized enzyme composition comprising a metal reductase enzyme,

a cofactor having a reduced state and an oxidized state and which is converted from its reduced state to its oxidized state by the reduction of metal ions by said metal reductase enzyme,

a first coenzyme capable of inducing an oxidation reaction in the presence of the cofactor in its said oxidized state, thereby being converted to its reduced state to maintain a supply of the cofactor in its reduced state to permit further reduction of the metal ions by the reductase enzyme, and

means for detecting oxidation induced by the second coenzyme, oxidation by the second coenzyme being a measure of formation of the first coenzyme in its oxidized state which, in turn, is a measure of metal ions reduced by said metal reductase enzyme.

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**5,500,352**

**MEMBRANE FILTRATION PROCESS FOR 6-AMINOPENICILLANIC ACID**

**Jorge L. López, Natick, Mass., assignor to Sepracor, Inc., Marlborough, Mass.**

**Filed Mar. 24, 1993, Ser. No. 36,327**

**Int. Cl.[6] C12P** *37/06;* **C12N** *9/84*

**U.S. Cl. 435—44** **18 Claims**

1. A process for producing 6-aminopenicillanic acid (6-APA) from a 6-acylaminopenicillanic acid (6-AAPA) comprising the steps of:

(a) supplying to a reaction vessel a solution of 6-AAPA or a salt thereof;

(b) supplying a solution of free penicillin acylase to said reaction vessel;

(c) circulating said solution of 6-AAPA and penicillin acylase to produce a homogeneous solution at pH 7.0 to 9.0 and 20° to 40° C.;

(d) continuing circulating said solution until said 6-AAPA is at least 90% converted to a solution of 6-APA;

(e) filtering said solution of 6-APA through a membrane filter until at least 90% of said 6-APA has passed from the first side of said membrane filter to the second side of said membrane filter as a filtrate, while less than 10% of said penicillin acylase has passed from said first side to said second side;

(f) recovering 6-APA from said filtrate; and

(g) circulating a retentate containing said free penicillin acylase back to said reaction vessel.

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**5,500,353**

**BACTERIAL SURFACE PROTEIN EXPRESSION**

**John Smit, Richmond, and Wade H. Bingle, Vancouver, both of, Canada, assignors to The University of British Columbia, Vancouver, Canada**

**Continuation-in-part of Ser. No. 895,367, Jun. 9, 1992, abandoned. This application Feb. 9, 1994, Ser. No. 194,290**

**Int. Cl.[6] C12P** *21/06;* **C07K** *1/00;* **A61K** *38/00;* **C07H** *19/00*

**U.S. Cl. 435—69.1** **5 Claims**

1. A method of expressing and presenting to the environment of a Caulobacter a polypeptide that is heterologous to an S-layer protein of the Caulobacter, which method comprises cloning a coding sequence for a heterologous polypeptide in-frame into a rsaA gene of the Caulobacter whereby the polypeptide is expressed and presented to the environment of the Caulobacter as a fusion product with S-layer protein of the Caulobacter, wherein the heterologous polypeptide lacks the capacity of participating in the formation of a disulphide bond within said fusion product when expressed by the Caulobacter.

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**5,500,354**

**HEPATIC PARENCHYMAL CELL GROWTH FACTOR GENE ENCODING THE SAME, PROCESS FOR PRODUCING THE FACTOR AND TRANSFORMANTS PRODUCING THE FACTOR**

**Naomi Kitamura, Moriguchi; Keiji Miyazawa, Hirakata; Yasushi Daikuhara; Hirohito Tsubouchi, both of Kagoshima; Daiji Naka, Yokohama; Kazuhiro Takahashi, Machida; Rie Matsui, Tokyo; Yoshiko Yoshiyama, and Takehisa Ishii, both of Yokohama, all of, Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan**

**Continuation of Ser. No. 852,758, Mar. 17, 1992, abandoned, which is a continuation of Ser. No. 564,172, Aug. 8, 1990, abandoned. This application Jul. 9, 1993, Ser. No. 89,417**

**Claims priority, application Japan, Aug. 11, 1989, 1-209449; Apr. 3, 1990, 2-88592; Jul. 27, 1990, 2-200898**

**Int. Cl.[6] C12N** *15/16;15/79;5/16;* **C07H** *21/04*

**U.S. Cl. 435—69.4** **17 Claims**

11. An expression vector which comprises a gene coding for human hepatic parenchymal cell growth factor represented by the following amino acid sequence:

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Met | Trp | Val | Thr | Lys | Leu | Leu | Pro | Ala | Leu |
| Leu | Leu | Gln | His | Val | Leu | Leu | His | Leu | Leu |

-continued

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Leu | Leu | Pro | Ile | Ala | Ile | Pro | Tyr | Ala | Glu |
| Gly | Gln | Arg | Lys | Arg | Arg | Asn | Thr | Ile | His |
| Glu | Phe | Lys | Lys | Ser | Ala | Lys | Thr | Thr | Leu |
| Ile | Lys | Ile | Asp | Pro | Ala | Leu | Lys | Ile | Lys |
| Thr | Lys | Lys | Val | Asn | Thr | Ala | Asp | Gln | Cys |
| Ala | Asn | Arg | Cys | Thr | Arg | Asn | Lys | Gly | Leu |
| Pro | Phe | Thr | Cys | Lys | Ala | Phe | Val | Phe | Asp |
| Lys | Ala | Arg | Lys | Gln | Cys | Leu | Trp | Phe | Pro |
| Phe | Asn | Ser | Met | Ser | Ser | Gly | Val | Lys | Lys |
| Glu | Phe | Gly | His | Glu | Phe | Asp | Leu | Tyr | Glu |
| Asn | Lys | Asp | Tyr | Ile | Arg | Asn | Cys | Ile | Ile |
| Gly | Lys | Gly | Arg | Ser | Tyr | Lys | Gly | Thr | Val |
| Ser | Ile | Thr | Lys | Ser | Gly | Ile | Lys | Cys | Gln |
| Pro | Trp | Ser | Ser | Met | Ile | Pro | His | Glu | His |
| Ser | Phe | Leu | Pro | Ser | Ser | Tyr | Arg | Gly | Lys |
| Asp | Leu | Gln | Glu | Asn | Tyr | Cys | Arg | Asn | Pro |
| Arg | Gly | Glu | Glu | Gly | Gly | Pro | Trp | Cys | Phe |
| Thr | Ser | Asn | Pro | Glu | Val | Arg | Tyr | Glu | Val |
| Cys | Asp | Ile | Pro | Gln | Cys | Ser | Glu | Val | Glu |
| Cys | Met | Thr | Cys | Asn | Gly | Glu | Ser | Tyr | Arg |
| Gly | Leu | Met | Asp | His | Thr | Glu | Ser | Gly | Lys |
| Ile | Cys | Gln | Arg | Trp | Asp | His | Gln | Thr | Pro |
| His | Arg | His | Lys | Phe | Leu | Pro | Glu | Arg | Tyr |
| Pro | Asp | Lys | Gly | Phe | Asp | Asp | Asn | Tyr | Cys |
| Arg | Asn | Pro | Asp | Gly | Gln | Pro | Arg | Pro | Trp |
| Cys | Tyr | Thr | Leu | Asp | Pro | His | Thr | Arg | Trp |
| Glu | Tyr | Cys | Ala | Ile | Lys | Thr | Cys | Ala | Asp |
| Asn | Thr | Met | Asn | Asp | Thr | Asp | Val | Pro | Leu |
| Glu | Thr | Thr | Glu | Cys | Ile | Gln | Gly | Gln | Gly |
| Glu | Gly | Tyr | Arg | Gly | Thr | Val | Asn | Thr | Ile |
| Trp | Asn | Gly | Ile | Pro | Cys | Gln | Arg | Trp | Asp |
| Ser | Gln | Tyr | Pro | His | Glu | His | Asp | Met | Thr |
| Pro | Glu | Asn | Phe | Lys | Cys | Lys | Asp | Leu | Arg |
| Glu | Asn | Tyr | Cys | Arg | Asn | Pro | Asp | Gly | Ser |
| Glu | Ser | Pro | Trp | Cys | Phe | Thr | Thr | Asp | Pro |
| Asn | Ile | Arg | Val | Gly | Tyr | Cys | Ser | Gln | Ile |
| Pro | Asn | Cys | Asp | Met | Ser | His | Gly | Gln | Asp |
| Cys | Tyr | Arg | Gly | Asn | Gly | Lys | Asn | Tyr | Met |
| Gly | Asn | Leu | Ser | Gln | Thr | Arg | Ser | Gly | Leu |
| Thr | Cys | Ser | Met | Trp | Asp | Lys | Asn | Met | Glu |
| Asp | Leu | His | Arg | His | Ile | Phe | Trp | Glu | Pro |
| Asp | Ala | Ser | Lys | Leu | Asn | Glu | Asn | Tyr | Cys |
| Arg | Asn | Pro | Asp | Asp | Asp | Ala | His | Gly | Pro |
| Trp | Cys | Tyr | Thr | Gly | Asn | Pro | Leu | Ile | Pro |
| Trp | Asp | Tyr | Cys | Pro | Ile | Ser | Arg | Cys | Glu |
| Gly | Asp | Thr | Thr | Pro | Thr | Ile | Val | Asn | Leu |
| Asp | His | Pro | Val | Ile | Ser | Cys | Ala | Lys | Thr |
| Lys | Gln | Leu | Arg | Val | Val | Asn | Gly | Ile | Pro |
| Thr | Arg | Thr | Asn | Ile | Gly | Trp | Met | Val | Ser |
| Leu | Arg | Tyr | Arg | Asn | Lys | His | Ile | Cys | Gly |
| Gly | Ser | Leu | Ile | Lys | Glu | Ser | Trp | Val | Leu |
| Thr | Ala | Arg | Gln | Cys | Phe | Pro | Ser | Arg | Asp |
| Leu | Lys | Asp | Tyr | Glu | Ala | Trp | Leu | Gly | Ile |
| His | Asp | Val | His | Gly | Arg | Gly | Asp | Glu | Lys |
| Cys | Lys | Gln | Val | Leu | Asn | Val | Ser | Gln | Leu |
| Val | Tyr | Gly | Pro | Glu | Gly | Ser | Asp | Leu | Val |
| Leu | Met | Lys | Leu | Ala | Arg | Pro | Ala | Val | Leu |
| Asp | Asp | Phe | Val | Ser | Thr | Ile | Asp | Leu | Pro |
| Asn | Tyr | Gly | Cys | Thr | Ile | Pro | Glu | Lys | Thr |
| Ser | Cys | Ser | Val | Tyr | Gly | Trp | Gly | Tyr | Thr |
| Gly | Leu | Ile | Asn | Tyr | Asp | Gly | Leu | Leu | Arg |
| Val | Ala | His | Leu | Tyr | Ile | Met | Gly | Asn | Glu |
| Lys | Cys | Ser | Gln | His | His | Arg | Gly | Lys | Val |
| Thr | Leu | Asn | Glu | Ser | Glu | Ile | Cys | Ala | Gly |
| Ala | Glu | Lys | Ile | Gly | Ser | Gly | Pro | Cys | Glu |
| Gly | Asp | Tyr | Gly | Gly | Pro | Leu | Val | Cys | Glu |
| Gln | His | Lys | Met | Arg | Met | Val | Leu | Gly | Val |
| Ile | Val | Pro | Gly | Arg | Gly | Cys | Ala | Ile | Pro |
| Asn | Arg | Pro | Gly | Ile | Phe | Val | Arg | Val | Ala |
| Tyr | Tyr | Ala | Lys | Trp | Ile | His | Lys | Ile | Ile |
| Leu | Thr | Tyr | Lys | Val | Pro | Gln | Ser | • | |

12. A process for producing human hepatic parenchymal cell growth factor, comprising transforming a host cell with the expression vector defined in claim 11, culturing the resulting transformant under conditions suitable for the expression of the growth factor, and recovering the growth factor.

**5,500,355**

## PROTEASE, REVERSE TRANSCRIPTASE AND ENDONUCLEASE OF HIV-1 AND RSV METHOD FOR PRODUCING THESE ENZYMES

**Atsushi Saito, Kagawa; Hideo Shinagawa, Osaka, and Atsuo Nakata, Toyonaka, all of, Japan, assignors to The Research Foundation for Microbial Diseases of Osaka University, Osaka, Japan**

**Continuation of Ser. No. 443,123, Nov. 30, 1989, abandoned. This application Jun. 25, 1993, Ser. No. 82,585**

**Claims priority, application Japan, Dec. 7, 1988, 63-309427; Apr. 6, 1989, 1-88411**

**Int. Cl.[6] C12P** *21/02;* **C12N** *15/48;15/49;15/70*

**U.S. Cl. 435—69.7** **2 Claims**

1. A method for producing retroviral enzymes comprising the steps of:

(a) preparing a cDNA fragment from HIV-1 or RSV pol gene sequences which consists of one or more retroviral genes encoding a retroviral enzyme selected from the group consisting of protease, reverse transcriptase and endonuclease, wherein the retroviral gene or genes are a sequence from the 5'-end to the 3'-end of the cDNA fragment, encoding:
protease;
protease and reverse transcriptase;
reverse transcriptase and protease;
protease and endonuclease; or
protease, reverse transcriptase and endonuclease;

(b) constructing an expression vector by inserting the cDNA fragment into a pUK290 series plasmid DNA series in a matching reading frame with lacZ gene thereof;

(c) introducing the expression vector into a lon-recipient *E. coli* cell to transform the cells; and

(d) culturing the transformed cells under two-stage culturing conditions consisting of a first culturing stage for 1 to 24 hours at 10° to 40° C. prior to induction and a second culturing stage for 1 to 40 hours at 10° to 35° C. following the induction, whereby the retroviral gene or genes are expressed as one or more separate mature enzymes, wherein in the case of an enzyme selected from reverse transcriptase and endonuclease being coexpressed with the protease, the transformed cells are cultured for 3 to 35 hours at 15° to 28° C. under the second culturing stage.

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**5,500,356**

## METHOD OF NUCLEIC ACID SEQUENCE SELECTION

**Wu-Bo Li, N. Potomac; Christian E. Gruber, Frederick; Joel A. Jessee, Mt. Airy, and Jhy-Jhu Lin, Gaithersburg, all of Md., assignors to Life Technologies, Inc., Gaithersburg, Md.**

**Filed Aug. 10, 1993, Ser. No. 103,769**

**Int. Cl.[6] C12N** *15/10;* **C12P** *19/34*

**U.S. Cl. 435—91.1** **20 Claims**

1. A method for obtaining an enriched source of a desired target nucleic acid molecule from an initial sample containing a mixture or library of single-stranded nucleic acid containing said desired molecule, wherein said method comprises the steps:

(A) incubating said initial sample containing said nucleic acid mixture or library in the presence of a biotinylated nucleic acid probe molecule, said probe molecules having a sequence complementary to a nucleotide sequence of said desired target molecule; said incubating being under conditions sufficient to permit said probe to hybridize to said desired target molecule and to thereby generate hybridized molecules wherein said target molecule is bound to said probe;

(B) incubating a sample containing said hybridized molecules of step (A) in the presence of a biotin-binding ligand immobilized to a support; said incubating being sufficient to permit said hybridized molecules to become bound to said biotin-binding ligand of said support;

(C) separating said bound hybridized molecules of step, (B) from Unbound nucleic acid molecules, and recovering said bound hybridized molecules from said support, and then incubating said recovered hybridized molecules under conditions sufficient to separate the strands of double-stranded nucleic acid molecules; said incubating thereby releasing said hybridized target molecule from said biotinylated probe, and generating single-stranded desired target molecules;

(D) incubating said single-stranded desired target molecules in the presence of a nucleotide analog and a primer nucleic acid molecule complementary to a sequence of said desired target molecule; wherein said nucleotide analog confers endonuclease resistance to nucleic acid molecules that contain said analog; said incubating being under conditions sufficient to permit hybridization between said primer and said single-stranded desired target molecule, and further sufficient to permit the template-dependent extension of said primer to thereby generate a double-stranded desired target molecule wherein one strand of said double-stranded desired target molecule contains said incorporated nucleotide analog and is resistant to endonuclease;

(E) incubating said generated double-stranded molecules in the presence of a nuclease capable of degrading nucleic acid that lacks said incorporated endonuclease-resistant nucleotide triphosphate derivatives, but incapable of degrading nucleic acid that contains said incorporated endonuclease-resistant nucleotide triphosphate derivatives; wherein said incubating is conducted under conditions sufficient to degrade nucleic acid that lacks said incorporated endonuclease-resistant nucleotide triphosphate derivatives to thereby form said enriched source of said desired target nucleic acid molecule.

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**5,500,357**

## RNA TRANSCRIPTION SYSTEM USING NOVEL RIBOZYME

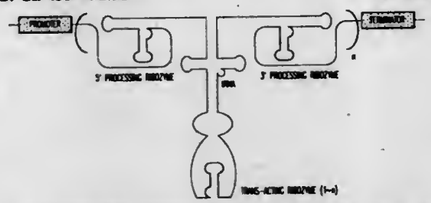
**Kazunari Taira; Satoshi Nishikawa, both of Tsukuba, and Hidekatsu Maeda, Nagareyama, all of, Japan, assignors to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan**

**Continuation-in-part of Ser. No. 677,427, Mar. 29, 1991, abandoned. This application May 3, 1993, Ser. No. 55,390**

**Claims priority, application Japan, Nov. 2, 1990, 2-298383**

**Int. Cl.[6] C12N** *9/22;15/74;15/82;15/85*

**U.S. Cl. 435—91.31** **6 Claims**




1. A recombinant plasmid containing a sequence encoding a trans-acting hammerhead-type ribozyme flanked by 5' and 3' self-cleaving cis-acting hammerhead ribozymes, which produces an RNA transcript that undergoes self-catalyzed cleavage at the 5' and 3' sides of said trans-acting ribozyme.

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**5,500,358**

## ANTIBODY CATALYSIS OF CYCLOHEXADIENONE REARRANGMENTS

**Jean-Louis Reymond, Del Mar; Yuanwei Chen, San Diego, and Richard A. Lerner, La Jolla, all of Calif., assignors to The Scripps Research Institute, La Jolla, Calif.**

**Filed Aug. 18, 1994, Ser. No. 292,934**

**Int. Cl.[6] C12P** *7/22;* **C12N** *9/00*

**U.S. Cl. 435—156** **13 Claims**

1. Antibody molecules or molecules containing antibody combining site portions that catalyze a coupling of an aromatization of a blocked aromatic molecule with a sigmatropic shift of a migratory substituent on said blocked aromatic molecule, said antibody molecules including an antibody combining site portion which, in aqueous solution at physiological pH values, binds to said blocked aromatic molecule and binds to a haptenic piperidinium cation having a quaternary nitrogen substituted with said migratory substituent or an analog thereof.

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**5,500,359**

## METHOD FOR PRODUCING A THERAPEAUTIC COMPOSITION FOR PAPILLOMAVIRUS-INDUCED TUMORS WITH ASPERGILLUS NIGER

**Ernest W. Boyer, and Robert L. Charles, both of Elkhart, Ind., assignors to Solvay Eazymes, Inc., Elkhart, Ind.**

**Filed Sep. 27, 1993, Ser. No. 126,660**

**Int. Cl.[6] C12P** *1/02;* **C12N** *1/14;* **A61K** *35/70*

**U.S. Cl. 435—171** **5 Claims**

1. A method for preparing a therapeutic composition for the treatment of papillomavirus-induced tumors in mammals, the method comprising the steps of:

culturing *Aspergillus niger* on a suitable growth medium, wherein said *Aspergillus niger* is a strain selected from the group consisting of NRRL Accession No. 21139 and NRRL Accession No. 21126,

mixing the culture,

extracting extracellular compounds from the growth medium with water to obtain a liquid fermentation extract, and

filtering the obtained liquid fermentation extract to remove cell biomass and spores, whereby the therapeutic composition is obtained.

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**5,500,360**

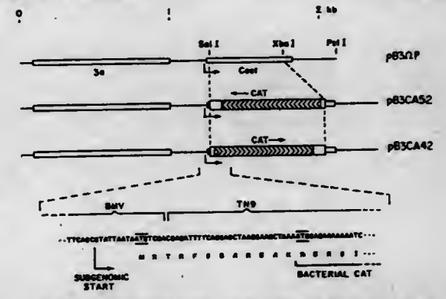
## RNA TRANSFORMATION VECTOR

**Paul G. Ahlquist, and Roy C. French, both of Madison, Wis., assignors to Mycogen Plant Science, Inc., San Diego, Calif.**

**Continuation of Ser. No. 916,799, Jul. 17, 1992, abandoned, which is a continuation of Ser. No. 368,939, Jun. 19, 1989, abandoned, which is a continuation of Ser. No. 709,181, Mar. 7, 1985, abandoned. This application Mar. 14, 1994, Ser. No. 212,330**

**Int. Cl.[6] C12N** *15/33;15/82;15/83;15/69*

**U.S. Cl. 435—172.3** **27 Claims**




13. A method of modifying a host plant cell, genotypically or phenotypically, which method comprises introducing into the cell a capped RNA molecule capable of infecting said host cell, wherein the capped RNA molecule comprises a cis-acting replication element derived from a (+) strand RNA plant virus, wherein the capped RNA molecule has the same capped 5' end as said virus such that there are no extraneous nonviral sequences between the cap site and the 5' terminus of the viral sequence, and wherein the capped RNA molecule further comprises an exogenous RNA segment in a region of said capped RNA molecule able to tolerate said segment without disrupting RNA replication of said capped RNA molecule in the presence of trans-acting replication elements in said host cell, whereby the exogenous RNA segment confers a detectable trait in the host cell, thereby modifying said host cell.

**5,500,361**

**β-KETOACYL-ACP SYNTHETASE II GENES FROM PLANTS**

**Anthony J. Kinney, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**PCT No. PCT/US92/09733, § 371 Date May 10, 1994, § 102(e) Date May 10, 1994, PCT Pub. No. WO93/10240, PCT Pub. Date May 27, 1993**

**Continuation-in-part of Ser. No. 791,921, Nov. 15, 1991, abandoned. This PCT application Nov. 12, 1992, Ser. No. 232,079**

**Int. Cl.[6] C12N *15/29;15/82;5/14;* A01H *5/00***

**U.S. Cl. 435—172.3** **10 Claims**

1. An isolated nucleic acid fragment comprising a nucleotide sequence encoding a soybean seed β-ketoacyl-ACP synthetase II enzyme, said sequence corresponding to nucleotides 1 to 2675 of SEQ ID NO:1, or to any nucleotide sequence which encodes the amino acid sequence of said enzyme, or to any nucleotide sequence encoding said enzyme in which one or more amino acid substitutions have been made that do not affect the functional properties of the encoded enzyme.

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**5,500,362**

**CHIMERIC ANTIBODY WITH SPECIFICITY TO HUMAN B CELL SURFACE ANTIGEN**

**Randy R. Robinson, Los Angeles; Alvin Y. Liu, Santa Monica, both of Calif., and Jeffrey A. Ledbetter, Seattle, Wash., assignors to XOMA Corporation, Berkeley, Calif.**

**Continuation of Ser. No. 195,961, May 13, 1988, abandoned, which is a continuation of Ser. No. 16,202, Jan. 8, 1987, abandoned. This application Mar. 5, 1991, Ser. No. 665,939**

**Int. Cl.[6] A61K *39/395;* C07K *16/30;* G01N *33/574***

**U.S. Cl. 435—7.23** **9 Claims**

1. A chimeric IgG1 antibody molecule comprising two heavy chains and two light chains, each of said chains comprising a human constant region and a variable region, said chimeric antibody being produced in a eukaryotic host, and having specificity for the antigen bound by the antibody produced by hybridoma HB9303 as deposited with the ATCC and said chimeric antibody having cytolytic activity, wherein said cytolytic activity is antibody-dependent cellular cytotoxicity or complement-dependent cytolysis.

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**5,500,363**

**RECOMBINANT THERMOSTABLE DNA POLYMERASE FROM ARCHAEBACTERIA**

**Donald G. Comb, Beverly; Francine Perler, Brookline; Rebecca Kucera, Beverly, and William E. Jack, Wenham, all of Mass., assignors to New England Biolabs, Inc., Beverly, Mass.**

**Continuation of Ser. No. 811,421, Dec. 18, 1991, abandoned, which is a continuation-in-part of Ser. No. 606,340, Apr. 17, 1991, Pat. No. 5,322,785, which is a continuation-in-part of Ser. No. 626,057, Dec. 11, 1990, abandoned, which is a continuation-in-part of Ser. No. 513,994, Apr. 26, 1990, Pat. No. 5,210,036. This application Sep. 7, 1993, Ser. No. 117,491**

**Int. Cl.[6] C12N *9/10;15/11;15/54***

**U.S. Cl. 435—194** **2 Claims**




1. A substantially pure, recombinant thermostable DNA polymerase from thermophilic archaebacteria, which is encoded by an isolated DNA fragment having a DNA which hybridizes in a Southern blot to an isolated DNA fragment selected from the group consisting of a DNA fragment havingg nucleotides 1–1274 of SEQ ID NO:1, a DNA fragment having nucleotides 291–1772 of SE ID NO:1, a DNA fragment having nucleotides 3387–3533 of SEQ ID NO:1, a DNA fragment having nucleotides 4704–5396 of SEQ ID NO:1, and a DNA fragment having nucleotides 4718–5437 of SEQ ID NO:1, wherein hybridization is conducted under the following conditions: a) hybridization: 0.75M NaCl, 0.15 Tris, 10 mM EDTA, 0.1% Sodium Pyrophosphate, 0.1% SLS, 0.03% BSA, 0.03% Ficoll 400, 0.03% PVP and 100 μg/ml boiled calf thymus DNA at 50° C. for about 12 hours and; b) wash: 3×30 minutes with 0.1X SET, 0.1% SDS, 0.1% sodium pyrophospate and 0.1M phosphate buffer at 45° C.

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**5,500,364**

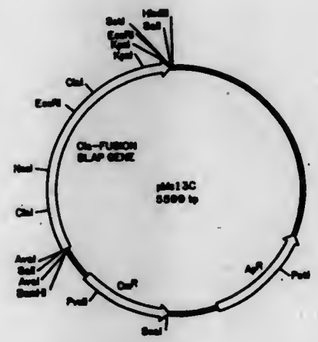
**+I BACILLUS LENTUS ALKALINE PROTEASE VARINTS WITH ENHANCED STABILITY**

**Teresa Christiansen, Cotati; Dean Goddette, Rohnert Park; Beth F. Ladin, Santa Rosa; Maria R. Lau, Fairfield; Christian Paech, Santa Rosa; Robert B. Reynolds, Santa Rosa; Charles R. Wilson, Santa Rosa, and Shiow-Shong Yang, Santa Rosa, all of Calif., assignors to Cognis, Inc., Santa Rosa, Calif.**

**Division of Ser. No. 706,691, May 29, 1991, Pat. No. 5,340,735. This application Jun. 2, 1994, Ser. No. 254,021**

**Int. Cl.[6] C12N *9/54;15/57;15/62;15/75***

**U.S. Cl. 435—221** **54 Claims**




1. A substantially pure mutant *Bacillus lentus* DSM 5483 protease derived by replacement of at least one amino acid residue of the mature form of the *Bacillus lentus* DSM 5483 alkaline protease shown in SEQ ID NO: 52 wherein the positions for replacement of amino acids and the amino acids chosen as substituents are selected from the group consisting of:

| | |
|---|---|
| Serine 36 | to Alanine (S36A), |
| Threonine 69 | to Valine (T69V), |
| Alanine 101 | to Threonine (A101T), |
| Serine 104 | to Threonine (S104T), |
| Alanine 120 | to Valine (A120V) or to Serine (A120S), |
| Serine 139 | to Tyrosine (S139Y), to Threonine (S139T), or to Alanine (S139A), |
| Serine 157 | to Threonine (S157T), |
| Glycine 205 | to Valine (G205V), |
| Alanine 224 | to Valine (A224V), |
| Serine 236 | to Threonine (S236T) or to Alanine (236A), |
| Aspargine 242 | to Alanine (N242A), and, |
| Histidine 243 | to Alanine (H243A). |



**5,500,365**

**SYNTHETIC PLANT GENES**

**David A. Fischhoff, Webster Groves, and Frederick J. Perlak, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.**

**Continuation of Ser. No. 476,661, Feb. 12, 1990, abandoned, which is a continuation-in-part of Ser. No. 315,355, Feb. 24, 1989, abandoned. This application Oct. 9, 1992, Ser. No. 959,506**

**Int. Cl.[6] C12N *15/32;15/82***

**U.S. Cl. 435—240.4** **12 Claims**

11. A transformed plant cell comprising a modified chimeric gene which comprises a promoter which functions in plant cells operably linked to a structural coding sequence and a 3' non-translated region comprising a polyadenylation signal which functions in plants to cause the addition of polyadenylate nucleotides to the 3' end of the RNA, wherein said structural coding sequence encodes a toxin protein derived from a *Bacillus thuringiensis* protein, wherein said structural coding sequence comprises a DNA sequence which differs from the naturally occurring DNA sequence encoding said *Bacillus thuringiensis* protein and has characteristics comprising the following:

said naturally occurring DNA sequence comprises a region having the following sequence:

TTAATTAACCAAAGAATAGAAGAATTCGCTAGGAAC
1 5 10 15 20 25 30 35

and where said structural coding sequence comprises modifications so that at least said region contains at least one fewer sequence selected from the group consisting of plant polyadenylation sequences and an ATTTA sequence.

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**5,500,366**

**POLYNUCLEOTIDE ENCODING T-CELL EPITOPES OF THE PROTEIN TRAT**

**Gregory J. Russell-Jones, Middle Cove, and Andrew F. Geczy, Neutral Bay, both of, Australia, assignors to Biotech Australia Pty. Ltd., Roseville, Australia**

**PCT No. PCT/AU91/00429, § 371 Date Mar. 16, 1993, § 102(e) Date Mar. 16, 1993, PCT Pub. No. WO92/05192, PCT Pub. Date Apr. 2, 1992**

**PCT Filed Sep. 17, 1991, Ser. No. 987,286**

**Claims priority, application Australia, Sep. 18, 1990, PK2361**

**Int. Cl.[6] C12N *15/31;15/62;5/10;* A61K *39/08***

**U.S. Cl. 435—252.3** **10 Claims**

1. A polynucleotide molecule consisting of a nucleotide sequence encoding an amino acid sequence selected from the group consisting of:

(a) Gly Ala Met Ser Thr Ala Ile Lys Lys Arg Asn Leu Glu Val Lys Thr Gln Met Ser Glu Thr Ile Trp Leu Glu (SEQ ID NO: 1);

(b) Gly Leu Gln Gly Lys Ile Ala Asp Ala Val Lys Ala Lys Gly (SEQ ID NO:2);

(c) Gly Leu Ala Ala Gly Leu Val Gly Met Ala Ala Asp Ala Met Val Glu Asp Val Asn (SEQ ID NO:4);

(d) Ser Thr Glu Thr Gly Asn Gln His His Tyr Gln Thr Arg Val Val Ser Asn Ala Asn Lys (SEQ ID NO:6); and

(e) Ser Thr Glu Thr Gly Asn Gln His Lys Tyr Gln Thr Arg Val Val Ser Asn Ala Asn Lys (SEQ ID NO:25),

wherein said amino acid sequence is a T cell epitope.

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**5,500,367**

**STILBENE SYNTHASE GENES FROM GRAPEVINE**

**Rüdiger Hain, Langenfeld; Hans-Jörg Reif, Cologne, and Klaus Stenzel, Duesseldorf, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany**

**Continuation of Ser. No. 718,507, Jun. 20, 1991, abandoned. This application Sep. 24, 1993, Ser. No. 127,097**

**Claims priority, application Germany, Jun. 29, 1990, 40 20 648.3; Mar. 8, 1991, 41 07 396.7**

**Int. Cl.[6] C12N *1/20;15/00;* C07H *19/00;21/00***

**U.S. Cl. 435—252.3** **28 Claims**

1. A DNA isolated from grapevine (Vitis) and selected from the group consisting of:

(i) a restriction enzyme digestion fragment of genomic grapevine DNA, said fragment encoding a resveratrol synthase, being approximately 4900 base pairs in size and being obtainable from plasmid pVSt12t3 by cleavage with EcoRI;

(ii) a cDNA encoding said resveratrol synthase of (i); and

(iii) a degenerate variant of the DNA of (i) that encodes the resveratrol synthase; or a synthetic DNA comprising (i), (ii) or (iii).

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**5,500,368**

**FINELY DIVIDED ANTHRAQUINONE FORMULATIONS AS INHIBITORS OF SULFIDE PRODUCTION FROM SULFATE-REDUCING BACTERIA**

**Robert E. Tatnall, Chadds Ford, Pa., assignor to Bio-Technical Resources, Manitowoc, Wis.**

**Continuation-in-part of Ser. No. 122,614, Sep. 21, 1993, abandoned, which is a continuation-in-part of Ser. No. 955,623, Oct. 2, 1992, abandoned. This application Oct. 21, 1994, Ser. No. 327,331**

**Int. Cl.[6] B09B *3/00;* C12N *1/00***

**U.S. Cl. 435—262** **21 Claims**

1. A method for inhibiting sulfide production in a medium containing sulfate-reducing bacteria, the method comprising adding to the medium, in a quantity sufficient to inhibit sulfide production, particles of a sulfide production-inhibiting anthraquinone, wherein the particles have an average particle size of about 0.1–2.5 microns.

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**5,500,369**

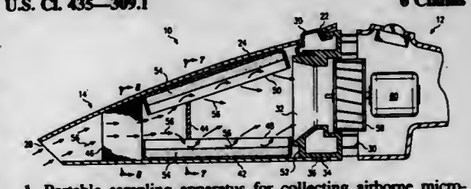
**AIR SAMPLER**

**Dale V. Kiplinger, Carrollton, Tex., assignor to NCH Corporation, Irving, Tex.**

**Filed Oct. 12, 1993, Ser. No. 135,793**

**Int. Cl.[6] G01N *5/02;* G01F *1/68;* C12M *1/26;1/00***

**U.S. Cl. 435—309.1** **6 Claims**



1. Portable sampling apparatus for collecting airborne microorganisms comprising, in combination:

an air inlet housing section having top and bottom housing portions and first and second side portions defining a chamber having an anterior inlet port and a posterior vacuum attachment port and having an air flow path therebetween;

an air deflector plate secured in a fixed position between the first and second side portions of the air inlet housing section, the air deflector plate being spaced from the top and bottom portions and extending across the air flow path, thereby defining first and second separate airflow openings;

at least one culture dish containing nutrient media disposed within said chamber, said at least one culture dish and nutrient

media being disposed generally parallel to the airflow path and upstream of the posterior vacuum attachment port whereby ambient air drawn into the inlet port and through the airflow path flows across the nutrient media before the air exits through the posterior vacuum attachment port; and,

an outlet housing section releasably coupled to the inlet housing section including air suction apparatus having an airflow impeller for drawing ambient air into the inlet port and through the airflow path and having means for disconnecting and reconnecting the inlet and the outlet housing sections whereby culture dishes located in the inlet housing section may be quickly removed and fresh culture dishes inserted.

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**5,500,370**

**THERMOSTABLE RIBONUCLEASE H AND GENETIC CONSTRUCTS THEREFORE**

**Jerome J. Jendrisak; Robert E. Smith, and Gary A. Dahl, all of Madison, Wis., assignors to Epicentre Technologies, Madison, Wis.**

**Division of Ser. No. 163,181, Dec. 6, 1993, which is a continuation-in-part of Ser. No. 815,895, Dec. 27, 1991, Pat. No. 5,268,289. This application Jan. 5, 1995, Ser. No. 465,161**

**Int. Cl.[6] C12N *9/22;15/55;15/62***

**U.S. Cl. 435—320.1** **6 Claims**

1. An isolated DNA molecule which encodes *Thermus flavus* RNase H.

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**5,500,371**

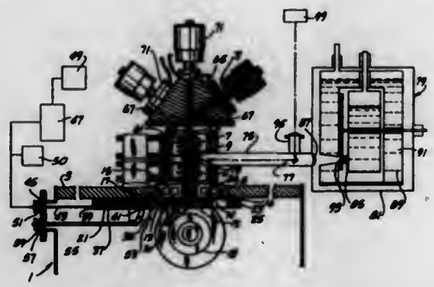
**METHOD FOR STUDY AND ANALYSIS OF PRODUCTS OF CATALYTIC REACTION**

**John T. Gleaves, 225 Urbauer Hall, St. Louis, Mo. 63130, assignor to John T. Gleaves, St. Louis, Mo.**

**Division of Ser. No. 56,124, Apr. 30, 1993, Pat. No. 5,376,335. This application Oct. 31, 1994, Ser. No. 332,344**

**Int. Cl.[6] G01N *31/10***

**U.S. Cl. 436—37** **2 Claims**



1. A process comprising:

providing a reaction zone containing a solid catalyst and having an inlet and outlet;

introducing a reactant gas into said catalytic reaction zone;

passing the gas through said catalytic reaction zone to produce a reaction product gas;

impinging electromagnetic radiation on said catalytic reaction zone while said gas is passed therethrough;

detecting the wave length and amplitude of electromagnetic radiation reflected from said catalytic reaction zone while said gas is passed therethrough; and

simultaneously with the detection of the wave length and amplitude of said reflected radiation, analyzing the reaction product gas in real time, thereby providing information on characteristics of the catalyst and/or the reaction catalyzed by said catalyst.

**5,500,372**

**METHOD OF DETERMINING RENAL CLEARANCES**

**Michael Kell, Atlanta, Ga., assignor to Private Clinic Laboratories Inc., Atlanta, Ga.**

**Filed Jul. 25, 1994, Ser. No. 279,400**

**Int. Cl.[6] G01N *33/50***

**U.S. Cl. 436—98** **4 Claims**

1. A method of determining creatinine clearance for detecting and monitoring renal dysfunction comprising the steps of:

(a) obtaining spot samples of urine and blood from a person;

(b) measuring specific gravity and creatinine concentration of the urine sample;

(c) measuring creatinine concentration of plasma of the blood sample; and

(d) calculating creatinine clearance as a function of the measured urine specific gravity, the measured urine creatinine concentration and the measured plasma creatinine concentration.

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**5,500,373**

**METHODS FOR DETERMINING THE CONCENTRATION OF CYANIDE IN SOUR AQUEOUS SYSTEMS**

**Scott E. Lehrer, Houston, Tex., assignor to Betz Laboratories, Inc., Trevose, Pa.**

**Filed Mar. 24, 1995, Ser. No. 410,241**

**Int. Cl.[6] G01N *31/00***

**U.S. Cl. 436—169** **9 Claims**

1. A method for determining the concentration of cyanide in an aqueous system where thiocyanate and sulfide are present comprising:

a) determining the background thiocyanate concentration (SCN background) in a background sample by

i) adding to said background sample a sufficient amount of a metal salt to precipitate sulfide but not strongly complex thiocyanate;

ii) removing the precipitated metal sulfide from the background sample;

iii) measuring the thiocyanate concentration in said background sample;

b) determining the final thiocyanate concentration (SCN final) in a final sample by

i) adding to said final sample a sufficient amount of a polysulfide compound to convert the cyanide present to thiocyanate and allowing for sufficient time for said polysulfide to convert said cyanide;

ii) adding to said final sample a sufficient amount of a metal salt to precipitate sulfide but not strongly complex thiocyanate;

iii) measuring the thiocyanate concentration in said final sample;

c) calculating the cyanide concentration in said aqueous system using the formula:

Concentration=(SCN final–SCN background)×0.448 of cyanide

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**5,500,374**

**METHOD FOR DIAGNOSING DIABETES MELLITUS AND DEVICE THEREFOR**

**Hu Wenzhi, Nagoya, Japan, assignor to Soichi Inoue, Nagoya, Japan**

**Filed Aug. 17, 1993, Ser. No. 107,122**

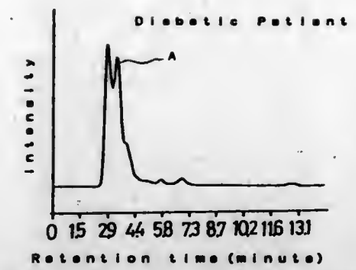
**Claims priority, application Japan, Jan. 5, 1992, 4-290740**

**Int. Cl.[6] G01N *30/02***

**U.S. Cl. 436—161** **1 Claim**

1. A method for aiding in the diagnosis of diabetes mellitus comprising injecting a saliva sample from a patient suspected of having diabetes mellitus into a stationary phase in a separation column, thereafter eluting a phosphate buffer as an eluent to separate analytes contained in the saliva sample, subsequently






detecting the individual separated analytes with a UV detector and producing a chromatogram, and then identifying the presence or absence of a chromato-peak A of FIG. 5, said chromato-peak A representing a diabetes mellitus-specific component, wherein said stationary phase is a zwitterionic stationary phase comprising a support carrier and a zwitterionic charged layer selected from 3-[(3-cholamidepropyl)dimethyl ammonio]-1-propanesulfonate and 3-[(3-cholamidepropyl)dimethyl ammonio]-2-hydroxy-1-propanesulfonate.

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**5,500,375**

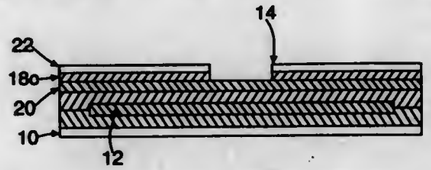
**INTEGRATED PACKAGING-HOLDER DEVICE FOR IMMUNOCHROMATOGRAPHIC ASSAYS IN FLOW-THROUGH OR DIPSTICK FORMATS**

**F. Victor Lee-Own, Bedminster, and Judith Fitzpatrick, Tenafly, both of N.J., assignors to Serex, Inc., Maywood, N.J.**

**Filed Apr. 13, 1993, Ser. No. 47,256**

**Int. Cl.[6] G01N *33/543;33/558***

**U.S. Cl. 436—514** **27 Claims**




1. An immunochromatographic assay device comprising:

a) means for conducting an immunochromatographic assay to detect the presence of an analyte in a sample, which assay means define a detection zone; and

b) means for sealing the assay means in a substantially air-tight and a substantially fluid-tight manner, said sealing means contacting and supporting said assay means wherein said assay means is laminated within said sealing means, and said sealing means being adapted to expose the assay means to a liquid sample;

wherein said assay means sealed in said sealing means behaves as a hydrogel.

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**5,500,376**

**METHOD FOR FABRICATING PLANAR AVALANCHE PHOTODIODE ARRAY**

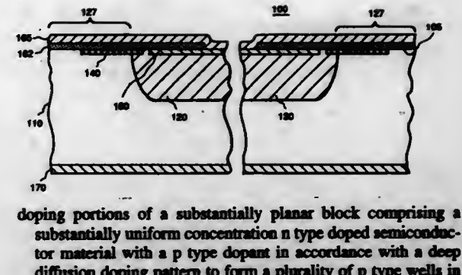
**Ahmad N. Ishaque, Albany, and Donald E. Castleberry, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Division of Ser. No. 235,052, Apr. 29, 1994, Pat. No. 5,438,217. This application Feb. 6, 1995, Ser. No. 383,622**

**Int. Cl.[6] H01L *31/18***

**U.S. Cl. 437—3** **16 Claims**

1. A method of forming a deep diffused monolithic planar avalanche photodiode (APD) array, the method comprising the steps of:




doping portions of a substantially planar block comprising a substantially uniform concentration n type doped semiconductor material with a p type dopant in accordance with a deep diffusion doping pattern to form a plurality of p type wells in said block, each of said p type wells being disposed so as to respectively adjoin a first surface of said planar block and such that a respective p-n junction is formed between said p type doped semiconductor material in said wells and surrounding portions of the n type material planar block not diffused with the p type dopant, each of said p-n junctions comprising a parallel segment disposed substantially parallel to a second surface of said planar block and a sidewall segment, said second surface being disposed opposite said first surface of said block, each well corresponding to an APD pixel in said array; and

processing said planar block in accordance with a depletion layer profile modification technique so as to modify the profile of the depletion layer profile associated with each respective p-n junction such that the peak surface electric field of each of said wells at said first surface is less than the bulk electric field of said well whereby, upon application of breakdown potential across said p-n junction, said APD pixel does not break down across said surface electrical field before it electrically breaks down across said parallel segment or said sidewall segment of said p-n junction.

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**5,500,377**

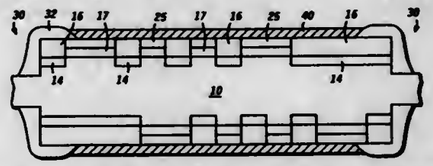
**METHOD OF MAKING SURGE SUPPRESSOR SWITCHING DEVICE**

**Emmanuel S. Flores, and Juan L. D. V. Padilla, both of Jalisco, Mexico, assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Sep. 6, 1994, Ser. No. 300,905**

**Int. Cl.[6] H01L *49/00***

**U.S. Cl. 437—6** **8 Claims**




1. A method of making a semiconductor device, comprising the steps of:

providing a semiconductor material of a first conductivity type having a top surface and a bottom surface;

forming a plurality of anode regions of a second conductivity type in a portion of the semiconductor material, a first set of the plurality of anode regions extending from the top surface into a portion of the semiconductor material and a second set of the plurality of anode regions extending from the bottom surface into a portion of the semiconductor material, the plurality of anode regions having a more heavily doped portion near the top surface and the bottom surface of the semiconductor material;

forming a plurality of gate regions of the second conductivity type in the semiconductor material between the plurality of anode regions, a first set of the plurality of gate regions extending from below the top surface into a portion of the semiconductor material and a second set of the plurality of

gate regions extending from below the bottom surface into a portion of the semiconductor material;

forming a plurality of cathode regions of the first conductivity type in the semiconductor material in between the plurality of anode regions, a first set of the plurality of cathode regions extending from the top surface into the semiconductor material and extending from the bottom surface into a portion of the semiconductor material; and

forming an interconnect to make electrical contact to the plurality of cathode regions and the plurality of anode regions.

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**5,500,378**

**PROCESS FOR FORMING A BIPOLAR TYPE SEMICONDUCTOR DEVICE**

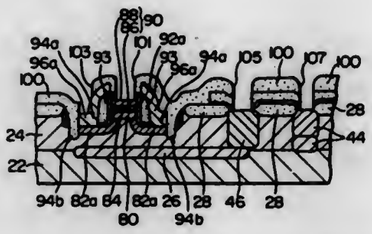
**Ikuo Yoshihara, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Division of Ser. No. 164,794, Dec. 10, 1993, Pat. No. 5,403,758. This application Jan. 6, 1995, Ser. No. 369,660**

**Claims priority, application Japan, Dec. 14, 1992, 4-353495**

**Int. Cl.[6] H01L** *21/265;49/00*

**U.S. Cl. 437—31** **9 Claims**




1. A production process of a bipolar type semiconductor device, comprising the steps of:

forming an epitaxial layer of a first conductivity type as a collector region on a surface of a semiconductor substrate;

forming an impurity diffusion region of a second conductivity type as an intrinsic base region on the surface of the epitaxial layer, an upper portion of said intrinsic base region later becoming an emitter region;

laying a conductive layer as an emitter take-out electrode on said impurity diffusion region, said conductive layer as the emitter take-out electrode containing an impurity of the first conductivity type;

forming a column-like projection portion having a lateral cross-section corresponding in lateral extent to said emitter region by etching through the conductive layer as the emitter take-out electrode, the impurity diffusion region, and a portion of said collector region with a pattern corresponding to the emitter region and forming a trench in the epitaxial layer at a periphery of the column-like projection portion;

forming an insulation side wall on a side wall of said column-like projection for insulating the emitter region from a graft base to be later formed at a bottom portion of said trench;

forming in said bottom portion of said trench said graft base connected to said intrinsic base region; and

forming the emitter region by diffusing said impurity of the first conductivity type contained in the conductive layer as the emitter take-out electrode into said upper portion of said intrinsic base region.

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**5,500,379**

**METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE**

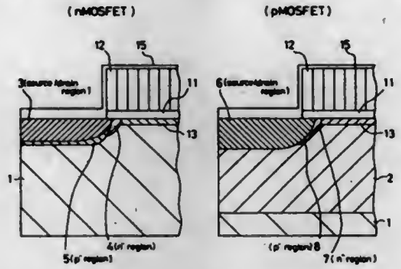
**Yoshinori Odake; Teruhito Ohnishi, both of Osaka, and Minoru Fujii, Hyogo, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Jun. 24, 1994, Ser. No. 265,104**

**Claims priority, application Japan, Jun. 25, 1993, 5-155089**

**Int. Cl.[6] H01L** *21/265;21/8238*

**U.S. Cl. 437—34** **9 Claims**




1. A method of manufacturing a CMOS transistor with a n-MOSFET and a p-MOSFET on a semiconductor substrate, comprising the steps of:

introducing an impurity for controlling threshold value into at least a part to be a channel region of the n-MOSFET of the semiconductor substrate;

introducing an impurity for controlling threshold value into at least a part to be a channel region of the p-MOSFET of the semiconductor substrate;

forming a gate electrode of the n-MOSFET and a gate electrode of the p-MOSFET on the semiconductor substrate;

conducting low-dose ion implant of a p-type impurity to both of the n-MOSFET and the p-MOSFET, using the gate electrodes of the n-MOSFET and the p-MOSFET as masks to form $p^-$ regions;

conducting low-dose ion implant of a n-type impurity to both of the n-MOSFET and the p-MOSFET, using the gate electrodes of the n-MOSFET and the p-MOSFET as masks to form $n^-$ regions;

forming source/drain regions at the n-MOSFET by heavily introducing a n-type impurity after the steps of low-dose ion implant of the p-type and n-type impurities; and

forming source/drain regions at the p-MOSFET by heavily introducing a p-type impurity after the steps of low-dose ion implant of the p-type and n-type impurities,

wherein $p^-$ regions to be local punch through stoppers are formed between the source/drain regions and the channel region of the n-MOSFET, and $n^-$ regions to be local punch through stoppers are formed between the source/drain regions and the channel regions of the p-MOSFET.

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**5,500,380**

**METHOD FOR FABRICATING THIN FILM TRANSISTOR**

**Dong G. Kim, Kyungki-do, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea**

**Filed Apr. 14, 1994, Ser. No. 227,661**

**Claims priority, application Rep. of Korea, Apr. 16, 1993, 6431/1993 U**

**Int. Cl.[6] H01L** *21/336;21/28*

**U.S. Cl. 437—409** **15 Claims**

1. A method for fabricating a thin film transistor, comprising the steps of:

forming a gate electrode having sloped edges on a substrate;

depositing a silicon oxide film as a gate insulation film on the substrate on which the gate electrode is formed;

performing a nitrogen plasma treatment process on the surface of the silicon oxide film to form a silicon nitride film at the surface of the gate insulation film and thus to form the gate insulation film completely;

depositing an amorphous silicon film on the gate insulation film to form an active layer;

depositing a n+ type amorphous silicon film over the amorphous silicon film to form an ohmic layer;

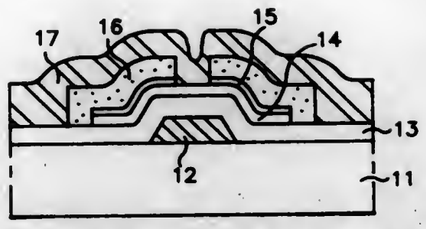
etching the n+ type amorphous silicon film and the amorphous silicon film in this order to leave the n+ type amorphous silicon film and the amorphous silicon film only on a portion of the gate insulation layer;

depositing a metal film on the n+ type amorphous silicon film and patterning said metal film to form source and drain electrodes;

removing a portion of the n+ type amorphous silicon film which is exposed between the source and drain electrodes; and

forming a protection film over the whole surface of the substrate.






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**5,500,381**

**FABRICATION METHOD OF FIELD-EFFECT TRANSISTOR**

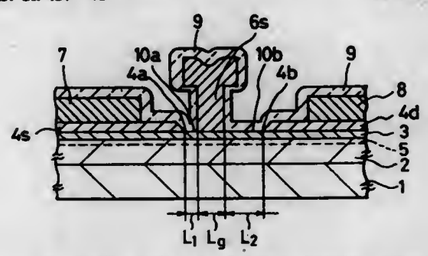
**Takayoshi Yoshida, and Yasunobu Nashimoto, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan**

**Filed Mar. 30, 1995, Ser. No. 413,616**

**Claims priority, application Japan, Mar. 30, 1994, 6-061692**

**Int. Cl.[6] H01L** *21/338*

**U.S. Cl. 437—41** **16 Claims**




1. A fabrication method of a field-effect transistor having an asymmetrical recess structure, said method comprising the steps of:

(a) preparing a semiconductor substructure containing a semiconductor substrate, a first semiconductor layer formed on or over said substrate, and a second semiconductor layer formed on said first semiconductor layer;

(b) forming an insulator layer on said second semiconductor layer;

(c) patterning said insulator layer to produce a first window at a corresponding position to a gate electrode of said transistor, exposing said second semiconductor layer through said first window;

(d) selectively removing said second semiconductor layer using said insulator layer patterned as a mask by a first isotropically etching process in which an etch rate of said second semiconductor layer is higher than that of said first semiconductor layer so that said second semiconductor layer is divided into a first section and a second section, producing a symmetrical recess on said first semiconductor layer at a corresponding position to said first window, said first section having a first end and said second section having a second end opposite to said first end, and said first end and said second end being positioned symmetrically with respect to said first window;

(e) selectively removing said second end of said second section without removing said first end of said first section by a second isotropically etching process in which an etch rate of said second semiconductor layer is higher than that of said first semiconductor layer, so that an asymmetrical recess is produced from said symmetrical recess, said first section acting as a source electrode of said transistor and said second section acting as a drain electrode of said transistor;

(f) forming a conductor layer on said insulator layer patterned to be contacted with said first semiconductor layer through said first window at a bottom of said asymmetrical recess;

(g) selectively removing said conductor layer so that said conductor layer remains in said asymmetrical recess and said first window, said remaining conductor layer forming said gate electrode that is in Schottky contact with said first semiconductor layer; and

(h) removing said insulator layer patterned from said second semiconductor layer after said step (g);

wherein a source-side bottom length of said recess between source-side bottom edge of said recess and an opposite bottom edge of said gate electrode is longer than a drain-side bottom length thereof between a drain-side edge of said recess and an opposite bottom edge of said gate electrode, forming said asymmetrical recess structure.

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**5,500,382**

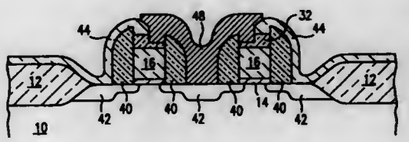
**SELF-ALIGNED CONTACT PROCESS**

**Che-Chia Wei, Plano, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.**

**Division of Ser. No. 116,050, Sep. 2, 1993, Pat. No. 5,369,303, which is a continuation of Ser. No. 786,019, Oct. 31, 1991, abandoned. This application Aug. 19, 1994, Ser. No. 293,140**

**Int. Cl.[6] H01L** *21/768*

**U.S. Cl. 437—44** **39 Claims**




1. A method for forming a self-aligned contact for a device, comprising the steps of:

forming a gate electrode having a first insulating layer and a barrier layer on the upper surface thereof, wherein the barrier layer is comprised of a material having a high etch selectivity to a material in the first insulating layer;

forming sidewall spacers alongside the gate electrode, wherein the barrier layer protects the gate electrode during formation of the sidewall spacers;

depositing a second insulating layer over the device; and

opening a via through the second insulating layer.

**5,500,383**

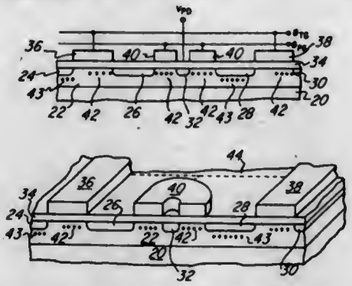
## METHOD FOR FABRICATING A CCD IMAGE SENSOR WITH ACTIVE TRANSISTOR PIXEL

**Jaroslav Hynecek, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.**

**Division of Ser. No. 48,838, Apr. 14, 1993, Pat. No. 5,436,476. This application Mar. 29, 1995, Ser. No. 412,820**

**Int. Cl.[6] H01L** *21/04;21/265*

**U.S. Cl. 437—53** **1 Claim**



1. A method for fabricating an active transistor pixel charge coupled device comprising:

forming a semiconductor substrate of a first conductivity type;

forming a semiconductor layer of a second conductivity type in the substrate;

forming virtual phase regions of the first conductivity type in the semiconductor layer, the virtual phase regions forming virtual phase potential wells for carriers of the second conductivity type;

forming a transistor source region of a first conductivity type in the semiconductor layer and spaced apart from the virtual phase regions;

forming an insulating layer on the semiconductor layer;

forming a transistor gate electrode on the insulating layer and located above the semiconductor layer surrounding the transistor source region and between virtual phase regions, the transistor gate electrode forming a transistor potential well for carriers of the second conductivity type in response to a voltage;

forming transfer gate electrodes above the insulating layer and separated from the transistor gate electrode by the virtual phase regions, the transfer gate electrodes forming transfer potential wells for carriers of the second conductivity type in response to a voltage.

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**5,500,384**

## METHOD FOR MANUFACTURING A BIT LINE VIA HOLE IN A MEMORY CELL

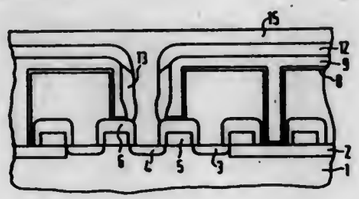
**Hanno Melzner, Grosshelfendorf, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany**

**Filed Aug. 23, 1994, Ser. No. 294,333**

**Claims priority, application Germany, Sep. 8, 1993, 43 30 471.0**

**Int. Cl.[6] H01L** *21/70;27/00*

**U.S. Cl. 437—60** **13 Claims**



1. A method for manufacturing a bit line via hole of a memory cell, wherein a transistor of the memory cell is comprised of first and second source/drain regions and a gate region, the first source/drain region being connected to a lower capacitor plate and the second source/drain region having a space above its surface, said method comprising the steps of:

applying a conductive layer over the space above the second source/drain region and lower capacitor plate to form a depressed portion of the conductive layer over the second source/drain region;

applying a self-aligned bit line via hole mask, which is self-aligned relative to the second source/drain region, to the conductive layer other than at the depressed portion; and

etching a bit line via hole in the depressed portion of the conductive layer.

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**5,500,385**

## METHOD FOR MANUFACTURING A SILICON CAPACITOR BY THINNING

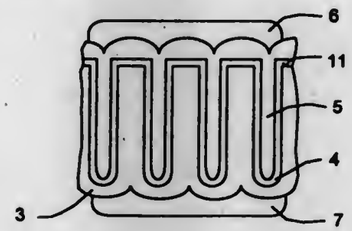
**Hermann Wendt, Grasbrunn; Josef Willer, Riemerling; Hans Reisinger, Gruenwald, and Volker Lehmann, Munich, all of, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany**

**Filed May 26, 1995, Ser. No. 451,534**

**Claims priority, application Germany, May 26, 1994, 44 18 430.1**

**Int. Cl.[6] H01L** *21/762*

**U.S. Cl. 437—60** **9 Claims**



1. A method for manufacturing a silicon capacitor comprising the steps of:

producing a plurality of hole openings on a first principal surface of an n-doped silicon substrate by electrochemical etching, said hole openings defining a hole opening surface;

generating a $p^+$-doped region along said hole opening surface;

applying a dielectric layer on said hole opening surface;

applying an electrically conductive layer on said dielectric layer;

thinning said silicon substrate by etching proceeding from a second principal surface of said silicon substrate, opposite said first principal surface, with an etchant which attacks silicon selectively relative to $p^+$-doped silicon and said etching stopping at a surface of said $p^+$-doped region; and

attaching respective electrical contracts to said $p^+$-doped region and to said electrically conductive layer.

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**5,500,386**

## MANUFACTURING METHOD OF SEMICONDUCTOR DEVICES

**Shoji Matsumoto, Kyoto; Hideo Nikou, Shiga, and Satoshi Nakagawa, Kyoto, all of, Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan**

**Division of Ser. No. 364,115, Dec. 27, 1994. This application Jun. 7, 1995, Ser. No. 478,340**

**Int. Cl.[6] H01L** *21/70*

**U.S. Cl. 437—60** **1 Claim**

1. A semiconductor device manufacturing method, wherein a capacitance element is formed by:

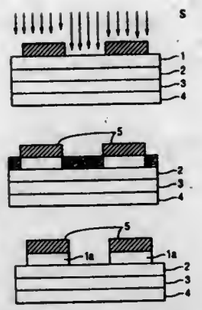
providing, on top of a substrate having already-completed circuit element and wiring, an insulation layer, a bottom electrode Pt layer, a dielectric film and a top electrode Pt layer;

selectively dry etching said top electrode Pt layer and said dielectric film; thereafter

selectively dry etching said bottom electrode Pt layer; and before conducting dry etching on said Pt consisting bottom electrode or top electrode,

implanting S ions into said Pt layer by means of ion implantation to compose S and Pt compound, and then dry etching the S/Pt compound thus composed.





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**5,500,387**

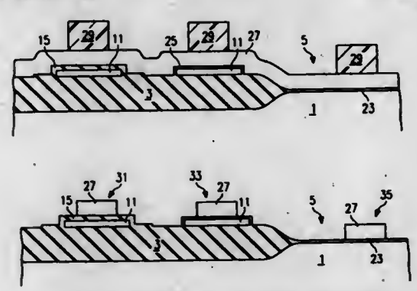
## METHOD OF MAKING HIGH PERFORMANCE CAPACITORS AND/OR RESISTORS FOR INTEGRATED CIRCUITS

**Yingsheng Tung, Plano; Robert E. Dixon, Garland, and Shih-Hsin Ying, Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Feb. 16, 1994, Ser. No. 197,439**

**Int. Cl.[6] H01L** *21/8242*

**U.S. Cl. 437—60** **9 Claims**



1. A method of making an integrated circuit comprising the steps of:

(a) providing a semiconductor substrate having a masked active surface region and an inactive surface region defining said active region;

(b) forming a first layer of doped polysilicon on said inactive region;

(c) patterning and etching said first layer;

(d) removing the mask from said masked active region;

(e) forming a layer of electrically insulating material over said first layer of doped polysilicon;

(f) forming a second layer of heavily doped polysilicon having a sheet resistance of from about 10 ohms/square to about 15 ohms/square on said electrically insulating material;

(g) forming a first capacitor from said first layer and said second layer by forming contacts on said first layer and on said second layer; and

(h) forming a second capacitor having a capacitance different from that of said first capacitor by the steps of forming said first layer of doped polysilicon on two spaced apart portions of said inactive region, removing said layer of electrically insulating material over said first layer of doped polysilicon from one of said two spaced apart portions of said inactive region, forming a second layer of electrically insulating material over said two spaced apart portions of said inactive region so that the layer of electrically insulating material over one of said two spaced apart portions is now thicker than the layer of electrically insulating material over the other of said two spaced apart portions and then forming said second layer of heavily doped polysilicon on said electrically insulating material.

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**5,500,388**

## HEAT TREATMENT PROCESS FOR WAFERS

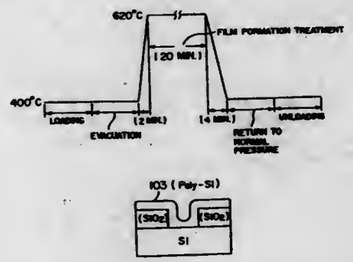
**Reiji Niino, Kofu; Tomoyuki Ohbu; Hiroaki Ikegawa, both of Nirasaki; Ken Nakao, Sagamihara; Yoshiyuki Fujita, Kofu; Tsutomu Haraoka; Makoto Kobayashi, both of Sagamihara; Naoya Kaneda, Machida, and Hiroshi Kunaeda, Yokohama, all of, Japan, assignors to Tokyo Electron Kabushiki Kaisha, Tokyo, and Tokyo Electron Tohoku Kabushiki Kaisha, Iwate, both of, Japan**

**Filed Feb. 28, 1994, Ser. No. 202,457**

**Claims priority, application Japan, Jun. 30, 1993, 5-216823; Jun. 30, 1993, 5-216824**

**Int. Cl.[6] H01L** *21/20*

**U.S. Cl. 437—89** **13 Claims**



1. A heat treatment process including the steps of loading articles to be treated into a reaction tube and forming films on surfaces of said articles to be treated within said reaction tube, said process comprising the steps of:

before said step of loading articles to be treated, setting within said reaction tube a temperature equal to or below a temperature capable of suppressing a rapid growth of natural oxidation films on the surfaces of said articles to be treated;

after said step of loading articles to be treated, raising the temperature within said reaction tube in a vacuum up to a predetermined treatment temperature at a rate of 50° to 100° C. per minute; and

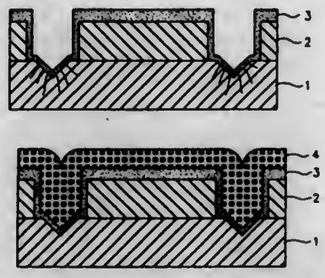
after said step of loading articles to be treated, supplying a treatment gas into said reaction tube to form a film on a surface of each of said articles to be treated.

5,500,389

## PROCESS FOR FORMATION FOR HETERO JUNCTION STRUCTURED FILM UTILIZING V GROOVES

Seung-Chang Lee; Sun-Jin Yun; Bo-Woo Kim, and Sang-Won Kang, all of Daejeon, Rep. of Korea, assignors to Electronics & Telecommunications Research Institute, Daejeon, Rep. of Korea

Filed Nov. 17, 1994, Ser. No. 342,831
Claims priority, application Rep. of Korea, Dec. 3, 1993, 93-26318
Int. Cl.[6] H01L 21/20
U.S. Cl. 437—90 12 Claims



1. A process for formation of a hetero junction structured film utilizing V grooves, comprising the first to third steps of:

forming a pattern having V grooves repeatedly formed with certain intervals on a monocrystalline film, and then, etching said pattern;

growing a hetero epitaxial film having said V grooves misfited with said etched monocrystalline film on said film, and then, depositing an oxide layer upon said hereto film; and

carrying out a selective dry etching to remove the portions of said hereto film and said oxide layer on which dislocations are concentrated, and then, removing the residue oxide layer,

whereby a non-stress non-dislocation hetero junction structure is formed.

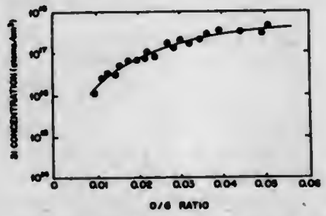
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5,500,390

## METHOD FOR CONTROL OF SI CONCENTRATION IN GALLIUM PHOSPHIDE SINGLE CRYSTAL LAYER BY LIQUID PHASE EPITAXIAL GROWTH TECHINIQUE

Manehisa Yanagisawa; Yuki Tamura, and Norihide Kokubu, all of Gunma, Japan, assignors to Shin-Etsu Handotai Co., Ltd., Tokyo, Japan

Filed Jan. 1, 1995, Ser. No. 457,184
Claims priority, application Japan, Jun. 16, 1994, 6-158002
Int. Cl.[6] H01L 21/208
U.S. Cl. 437—120 2 Claims




1. A method for controlling the Si concentration in a GaP single crystal layer grown in liquid phase epitaxial growth comprising the steps of: first measuring the Si concentration in the GaP single crystal layer grown in a preceding run of liquid phase epitaxial growth; determining the additional Si amount required for a Ga solution to refresh the effective Si concentration thereof with the use of the Si concentration in the preceding run as a reference, wherein one and the same Ga solution is repeatedly used during a series of runs liquid phase epitaxial growth; and thereafter in the same manner as above mentioned the additional Si amounts are successively determined during a series of the runs, characterized in that the Si concentrations in the GaP single crystal layers grown in preceding runs are measured by means of a photoluminescence spectroscopic analysis at room temperature, where each of the GaP single crystal layers is illuminated by a laser beam to excite photoluminescence; a photolumunescence spectrum is prepared based on the radiation from the layer; the spectrum is observed to determine the ratio of the photoluminescent spectral peak intensity around the wavelength of 6300 Å to the other photoluminescent spectral peak intensity around the wavelength of 5540 Å (hereafter referred to as O/G ratio); the Si concentration in the GaP liquid phase epitaxial growth layer is determined with the help of the correlation between the O/G ratio of a GaP layer and the Si concentration therein.

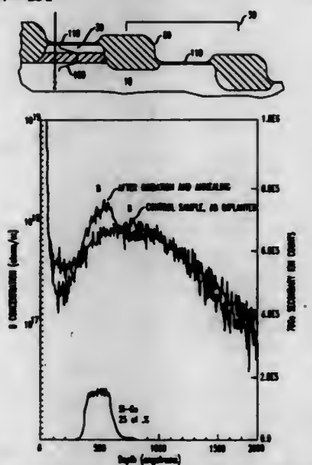
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5,500,391

## METHOD FOR MAKING A SEMICONDUCTOR DEVICE INCLUDING DIFFUSION CONTROL

Jose Bevk, Summit; Leonard C. Feldman, Berkeley Heights; Hans-Joachim L. Gossmann, Summit, all of N.J.; Henry S. Luftman, Emmaus, Pa., and Ran-Hong Yan, Holmdel, N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Aug. 9, 1994, Ser. No. 287,989
Int. Cl.[6] H01L 29/161
U.S. Cl. 437—131 5 Claims



1. A process for making a MOS device on a silicon substrate, comprising the steps of:

a) forming sequentially on the substrate a lower boundary layer, a pulse-doped layer that substantially comprises silicon, an upper boundary layer, and a silicon channel layer, wherein each of the upper and lower boundary layers comprises germanium in a mole fraction of at least about 75%, the thickness of each boundary layer is eight or fewer monolayers, and the thickness of each boundary layer is no more than the critical thickness for silicon-germanium epitaxial layers containing said germanium mole fraction;

b) lithographically patterning the pulse-doped layer and the silicon channel layer such that at least one active region is collectively defined in them;

c) during (a) or after (b), doping the pulse-doped layer with boron at a concentration of at least about $10^{17}$ $cm^{-3}$ but not more than about $10^{19}$ $cm^{-3}$;

d) after (b) and (c), heating the substrate to at least about 750° C. but not more than about 950° C.; and

e) during at least a portion of the heating step, exposing the substrate to an oxidizing atmosphere such that an oxide layer



at least about 10 Å thick, but not more than about 500 Å thick, is grown on the silicon channel layer, wherein the doping, heating, and exposing steps are carded out such that near each of said boundary layers, there is a region at least 100 Å thick in which the boron concentration decreases, in the direction leading away from the pulse-doped layer, at an average logarithmic rate greater than 1 decade per 500 Å.

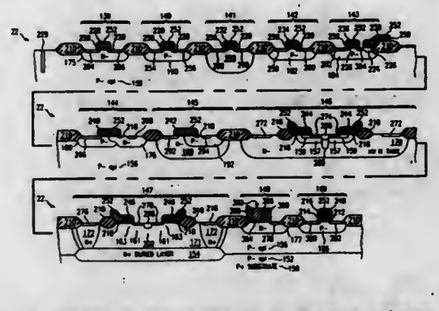
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5,500,392

## PLANAR PROCESS USING COMMON ALIGNMENT MARKS FOR WELL IMPLANTS

James Reynolds, Dallas, and Michael C. Smayling, Missouri City, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 114,431, Aug. 31, 1993, abandoned, which is a continuation of Ser. No. 857,533, Mar. 25, 1992, abandoned. This application Jun. 13, 1994, Ser. No. 259,268
Int. Cl.[6] H01L 21/22
U.S. Cl. 437—151 4 Claims



1. A method of forming a device on a semiconductor substrate of a first conductivity type, said method comprising the steps of:

forming a semiconducting layer on said substrate;

etching alignment marks in said semiconducting layer;

forming a first mask on said semiconducting layer to expose portions of said semiconducting layer;

introducing dopants of a second conductivity type opposite said first conductivity type into said exposed portions of said semiconducting layer to form high-voltage tanks;

removing said first mask;

annealing said dopants introduced to form high-voltage tanks of a second conductivity type;

forming a second mask on said semiconducting layer to expose second portions of said semiconducting layer;

introducing dopants of a second conductivity type into said exposed second portions of said semiconducting layer to form low-voltage tanks;

removing said second mask;

forming a third mask on said semiconducting layer to expose third portions of said semiconducting layer;

introducing dopants of a first conductivity type into said exposed third portions of said semiconducting layer to form high-voltage tanks;

removing said third mask;

forming a fourth mask on said semiconducting layer to expose fourth portions of said semiconducting layer;

introducing dopants of a first conductivity type into said exposed fourth portions of said semiconducting layer to form low-voltage tanks; and

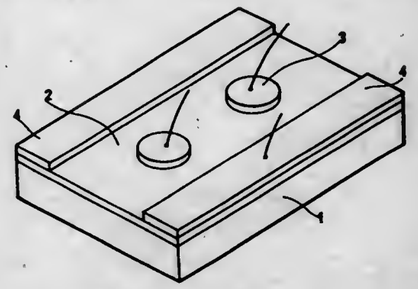
annealing dopants introduced to form high-voltage and low-voltage tanks of said first and second conductivity types.

5,500,393

## METHOD FOR FABRICATING A SCHOTTKY JUNCTION

Yoshiki Nishibayashi; Hiroumi Shioni, and Naoji Fujimori, all of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 908,570, Jun. 30, 1992, abandoned, which is a continuation of Ser. No. 702,498, May 20, 1991, abandoned. This application Jan. 21, 1994, Ser. No. 184,105
Claims priority, application Japan, May 21, 1990, 2-131591
Int. Cl.[6] H01L 21/28
U.S. Cl. 437—175 15 Claims



1. A method for fabricating a Schottky junction comprising diamond and a metal layer deposited directly on the diamond, the method comprising the steps of:

producing a halogen plasma by exciting a gas comprising one of $CCl_4$ and HCl;

pretreating a surface of the diamond with the halogen plasma to change an original superlattice structure of the surface of the diamond to a normal lattice structure, the original superlattice structure having a first periodicity twice as long as a second periodicity of the normal lattice structure; and

depositing the metal layer directly on the pretreated surface of the diamond to form the Schottky junction.

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5,500,394

## FIRE-RESISTANT AND THERMAL SHOCK-RESISTANT COMPOSITE CERAMIC MATERIAL AND METHOD OF MAKING SAME

Stanislav F. Kondakov, Chernogolovka, Russian Federation, assignor to Composite Materials, Inc., Fairfax, Va.

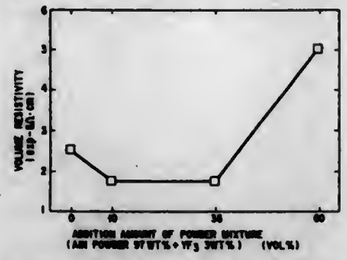
Filed Dec. 22, 1994, Ser. No. 362,349
Int. Cl.[6] C04B 35/56;35/58
U.S. Cl. 501—89 5 Claims

1. A sintered ceramic composite material consisting essentially of:

A consolidated blend of constituent powders of silicon carbide, titanium carbide, titanium boride, aluminum oxide and titanium oxide,

wherein the constituent powders are present in the amounts of 70–80 wt. % silicon carbide, 5–10 wt. % titanium carbide, 6–10 wt. % titanium boride, 5–10 wt. % aluminum oxide, and 2–5 wt. % titanium oxide.

5,500,395
METHOD FOR MANUFACTURING AN ALUMINUM NITRIDE SINTERED BODY
Fumio Ueno, Yokohama; Mitsuo Kasori, Kawasaki; Akihiro Horiguchi, Fujisawa, and Katsuyoshi Ok-Ishi, Kawasaki, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Division of Ser. No. 153,970, Nov. 18, 1993, Pat. No. 5,409,869. This application Oct. 11, 1994, Ser. No. 320,758
Claims priority, application Japan, Nov. 18, 1992, 4-308664; Nov. 18, 1992, 4-308665; Nov. 18, 1992, 4-309023; Nov. 18, 1992, 4-309024; Mar. 12, 1993, 5-051708
Int. Cl.[6] C04B 35/581
U.S. Cl. 501—98 12 Claims




1. A method for manufacturing an aluminum nitride sintered body, comprising the steps of:
adding a halogen-containing rare earth element compound, as a sintering agent, to an aluminum nitride powder with an average primary grain size of 0.05 to 0.3 μm and an impurity oxygen amount of 0.1 to 2.5 wt %;
molding the resultant material to form a molded body; and
sintering said molded body in a non-oxidizing atmosphere at 1,000° to 1,600° C. to produce said aluminum nitride sintered body having an average grain size of aluminum nitride grains of not more than 2 μm.

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5,500,396
PROCESS TO MAKE SMALL, DISCRETE, SPHERICAL ADDUCTS
Joel L. Martin, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed Feb. 9, 1995, Ser. No. 385,619
Int. Cl.[6] B01J 35/08
U.S. Cl. 502—8 14 Claims

1. A process to make a small, discrete, spherical magnesium dihalide/alcohol adduct said process comprising:
(a) contacting a magnesium dihalide and an alcohol in a high-viscosity liquid that consists of hydrocarbons and that has a viscosity above 50 cSt at 40° C., to obtain a dispersion;
(b) heating and agitating the dispersion to obtain a molten dispersion;
(c) cooling the molten dispersion to form said small, discrete, spherical magnesium dihalide/alcohol adduct.

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5,500,397
COMPONENTS AND CATALYSTS FOR THE POLYMERIZATION OF ETHYLENE
Illaro Cuffiani, Ferrara, and Umberto Zucchini, deceased, late of Ferrara, both of, Italy, assignors to Montell North America Inc., Wilmington, Del.
Filed Jan. 13, 1994, Ser. No. 181,283
Claims priority, application Italy, Jan. 13, 1993, MI93A0026
Int. Cl.[6] B01J 31/38
U.S. Cl. 502—102 16 Claims

1. A solid catalyst component for the polymerization of ethylene comprising the product of the reaction between:
(1) the product obtained by reacting:
1A) a halide, halogen alcoholate or alcoholate of a transition metal selected from the group consisting of titanium, vanadium and zirconium; and
1B) water, said water being present in an amount from 0.1 to 0.5 moles per mole of transition metal; and
(2) a complex having general formula:

$$MgX_2 \cdot nAlRX_2 \cdot pAlX3$$

where X is chlorine or bromine; R is a hydrocarbon radical containing from 1 to 20 carbon atoms; n is a number from 1 to 4; p is a number from 0 to 1; and n+p is from 1 to 4;
said catalyst component being in the form of particles having a diameter less than or equal to 20 micrometers, and an average diameter less than or equal to 10 micrometers.

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5,500,398
HOMOGENEOUS α-OLEFIN DIMERIZATION CATALYSTS
Tobin J. Marks, and Xinmin Yang, both of Evanston, Ill., assignors to Northwestern University, Evanston, Ill.
Filed Nov. 9, 1994, Ser. No. 336,864
Int. Cl.[6] B01J 31/38
U.S. Cl. 502—103 2 Claims

1. A catalytic complex consisting essentially of the structure:
$(L_2MR')^+X^-$ where
L=$R_2(C_5H_3)$; R=a $C_3$–$C_{20}$ tert-alkyl; R'=a $C_1$–$C_{20}$ alkyl group or H;
M=Ti, Zr or Hf;
$X^-$=$RB(C_5F_3)_3$, or the negative anion of methylalumoxane, where R*=a $C_1$–$C_{20}$ alkyl group or H.

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5,500,399
SILICON ALLOY CONTAINING ALUMINUM, CALCIUM AND COPPER FOR THE SYNTHESIS OF ALKYL OR ARYL HALOGENOSILANES
Pierre Faure, Annecy, and Thomas Margaria, Passy, both of, France, assignors to Pechiney Electrometallurgie, Courbevoie, France
Filed May 15, 1995, Ser. No. 440,929
Claims priority, application France, May 31, 1994, 94 06863
Int. Cl.[6] B01J 21/12
U.S. Cl. 502—244 7 Claims

1. A silicon alloy for the production of alkyl or aryl halogenosilanes comprising, in percent by weight:
0.05<Al<0.30;
0.01<Ca<0.30;
0.02<$O_2$<0.20;
0.10<Fe<0.50;
0.01<Ti<0.15;
x<Cu<2+x
where x=3.2 ( % Ca )+9.4 (% Al); and
the remainder, silicon.



5,500,400
CATALYST FOR PRODUCING 1,1,1,2-TETRAFLUOROETHANE AND METHOD FOR PREPARING THE SAME
Hoon Sik Kim; Byung Gwon Lee; Hoaggon Kim, and Kun You Park, all of Seoul, Rep. of Korea, assignors to Korea Institute of Science and Technology, Seoul, Rep. of Korea
Filed Sep. 8, 1994, Ser. No. 302,636
Claims priority, application Rep. of Korea, Dec. 9, 1993, 1993-27091
Int. Cl.[6] B01J 23/26
U.S. Cl. 502—306 6 Claims

1. A method for preparing a catalyst for the production of 1,1,1,2-tetrafluoroethane, comprising the steps of:
producing an admixture of a composition comprising chromium hydroxide hydrate and magnesium chloride or calcium chloride in a weight ratio of Cr to Mg or Ca ranging from 1:0.3 to 1:10 with an aqueous metal salt solution selected from the group consisting of cerium chloride, zinc chloride, nickel chloride, and aluminum chloride;
reacting the admixture in the liquid phase with an aqueous HF solution to give a paste; and
sintering the paste.

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5,500,401
METHOD FOR SELECTIVE HYDRODENITROGENATION OF RAW OILS
Chakka Sudhakar, Wappingers Falls; Gerald G. Sandford, Glenham, and Frank Dolfinger, Jr., Poughkeepsie, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.
Division of Ser. No. 132,415, Oct. 4, 1993, Pat. No. 5,389,241, which is a continuation-in-part of Ser. No. 810,086, Dec. 19, 1991, abandoned. This application Nov. 21, 1994, Ser. No. 342,512
Int. Cl.[6] B01J 23/84
U.S. Cl. 502—316 3 Claims

1. A catalyst composition, useful for selectively removing nitrogen from a raw hydrocarbon oil which consists essentially of from about 0.05 to about 30 wt % of Mo and from 0.1 to about 10 wt % Fe, measured as metals, on an activated carbon support characterized by a BET surface area of at least about 650 $m^2/g$, a pore volume for nitrogen of at least about 0.3 cc/g, and an average pore diameter of at least about 0.8 nanometers, with the average pore diameter ranging from about 1.98 to 2.24 nm measured from nitrogen physisorption data, and wherein said catalyst is sulfided, and wherein said catalyst is prepared using conventional techniques comprising depositing said Fe and Mo metal compounds on the carbon support and heat treating at temperatures in the range of from about 20° C. to about 500° C.

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5,500,402
METHOD FOR THE MANUFACTURE OF A CONTACT BODY FOR THE EXCHANGE OF MOISTURE OR HEAT
Håkan Vangbo, Järfälla, Sweden, assignor to AB Carl Munters, Sollentuna, Sweden
PCT No. PCT/SE92/00770, § 371 Date Apr. 26, 1994, § 102(e) Date Apr. 26, 1994, PCT Pub. No. WO93/08910, PCT Pub. Date May 13, 1993
PCT Filed Sep. 6, 1992, Ser. No. 232,040
Claims priority, application Sweden, Nov. 8, 1991, 9103305
Int. Cl.[6] B01J 20/10
U.S. Cl. 502—408 16 Claims

1. A method for treating a contact body for the exchange of heat or moisture, comprising the steps of:
a) impregnating the contact body with waterglass to obtain an impregnated body;
b) treating the impregnated body with acid to convert the waterglass to a silica gel;
c) exposing the treated impregnated body to a basic chemical solution to increase the pore size of the silica gel; and
d) stabilizing the pore structure by exposing the silica gel to a stabilizing solution containing water soluble inorganic salts.

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5,500,403
LIQUID FORMULATIONS AND PROCESS FOR EXTENDING THE VASE LIFE OF CUT FLOWERS
Warren E. Shafer, Libertyville; Derek D. Woolard, Waukegan; Neyyan K. P. Samuel, Vernon Hills; Gregory D. Venburg, Deerfield; Bala N. Devisetty, Buffalo Grove, and Daniel F. Heiman, Libertyville, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.
Filed Jun. 14, 1994, Ser. No. 259,596
Int. Cl.[6] A01N 3/02
U.S. Cl. 504—115 6 Claims

1. An aqueous cut flower preservative formulation comprising
(a) from about 55 parts by weight to about 98 parts by weight of a sugar,
(b) from about 0.05 part by weight to about 1 part by weight of an ACC synthase inhibitor selected from L-trans-2-amino-4-(2-aminoethoxy)-3-butenoic acid and carboxymethoxylamine,
(c) from about 0.1 part by weight to about 5 parts by weight of an antimicrobial agent,
(d) from about 1 part by weight to about 5 parts by weight of aluminum sulfate, and
(e) from about 0.1 part by weight to about 5 parts by weight of an acidifying/clarifying agent selected from the group consisting of maleic acid, malonic acid, malic acid, salicyclic acid, and tartaric acid.

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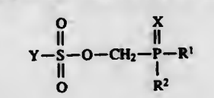
5,500,404
METHOD FOR DWARFING LILIES AND LILY BULBS OBTAINED FROM THE DWARFING TREATMENT
Junko Daimon, and Yasuo Takeda, both of Oyama, Japan, assignors to Japan Tobacco Inc., Tokyo, Japan
Filed Jan. 27, 1994, Ser. No. 187,868
Claims priority, application Japan, Jan. 28, 1993, 5-031126
Int. Cl.[6] A01N 43/653;43/54;37/30;33/12
U.S. Cl. 504—174 8 Claims

1. A method for lily bulb dwarfing treatment which comprises subjecting a lily bulb to conditions which cause sprouting, and then soaking the sprouted lily bulb in a dwarfing agent, wherein the sprout of said sprouted lily bulb has a length in the range of 0.5 cm to 5.0 cm.

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5,500,405
PHOSPHOSULFONATE HERBICIDES
Robert E. Rosen, Melrose Park; Damian G. Weaver, Lansdale, both of Pa.; Jane W. Corvalle, Plymouth, Minn., and Lori A. Spangler, Churchville, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.
Continuation-in-part of Ser. No. 862,008, Apr. 1, 1992, Pat. No. 5,272,128. This application Sep. 22, 1993, Ser. No. 125,379
The portion of the term of this patent subsequent to Dec. 21, 2010, has been disclaimed.
Int. Cl.[6] A01N 31/04;57/02; C07F 9/02
U.S. Cl. 504—195 8 Claims

1. A method for controlling unwanted plants which comprises applying to the plant or growth medium therefore a composition comprising a compound of the formula



wherein

(1) Y is selected from phenyl; naphthyl; benzyl; ($C_5$–$C_8$)cycloalkyl; a 5-membered heteroaromatic ring having 1, 2, 3, or 4 heteroatoms independently selected from the group consisting of nitrogen, oxygen and sulfur atoms provided no more than one heteroatom is oxygen or sulfur; a 6-membered heteroaromatic ring having 1, 2 or 3 nitrogen atoms; a fused 5,6-membered heteroaromatic ring having 1–4 heteroatoms independently selected from the group consisting of nitrogen, oxygen and sulfur atoms provided no more than one heteroatom is oxygen or sulfur; or a fused 6,6-membered heteroaromatic ring having 1–4 heteroatoms independently selected from the group consisting of nitrogen, oxygen and sulfur atoms provided no more than one heteroatom is oxygen or sulfur;

wherein each of said Y is substituted with up to three substituents each independently selected from halo, cyano, nitro, alkoxy, haloalkoxy, alkyl, haloalkyl, phenyl, alkylcarbonyloxy, dialkylcarbamoyl and alkoxycarbonyl, provided

(a) there is at most one of said substituents on said Y when Y is a thiadiazolyl ring or a tetrazolyl ring,

(b) there is at most two of said substituents when Y is a triazolyl ring, a thiazolyl ring, or an isothiazolyl ring, and

(c) when Y is phenyl, naphthyl or benzyl, there can be four or five of said substituents selected from halo, acetoxy, methyl, methoxy and halomethoxy but no more than two substituents are selected from acetoxy, methyl, methoxy, and halomethoxy;

(2) X is an oxygen or a sulfur atom; and

(3) $R^1$ and $R^2$ are each independently selected from alkyl, alkoxy, alkylthio, alkenyloxy, alkynyloxy, haloalkoxy, cyanoalkoxy, alkoxyalkoxy, cycloalkyloxy, cycloalkylalkoxy, alkylideneiminooxy, chloro and amino with one or two substituents selected from the group consisting of alkyl, alkenyl and phenyl; provided that there is no more than one phenyl group on the amino group, and provided that $R^1$ may be selected additionally from phenyl or phenoxy; and provided that $R^1$ and $R^2$ both can be alkoxy, taken together with the phosphorus atom to form a 6-membered oxygen-containing ring; and

an agronomically acceptable carrier.

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**5,500,406**

## IMINOSULFONYLUREA DIRIVATIVES AND HERBICIDES

**Kenzi Makino; Shigeaki Akiyama; Hideaki Suzuki; Takeshi Nagaoka; Toshio Niki, all of Funabashi; Koichi Suzuki, Shiraoka; Tsutomu Nawamaki, Shiraoka; Shigeomi Watanabe, Shiraoka, and Kimihiro Ishikawa, Shiraoka, all of, Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan**

**PCT No. PCT/JP92/00808, § 371 Date Apr. 15, 1994, § 102(e) Date Apr. 15, 1994, PCT Pub. No. WO93/00336, PCT Pub. Date Jul. 1, 1993**

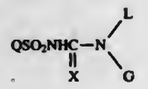
**PCT Filed Jun. 25, 1992, Ser. No. 170,222**

**Claims priority, application Japan, Jun. 28, 1991, 3-158106; Aug. 14, 1991, 3-204294; Sep. 25, 1991, 3-245876; Dec. 3, 1991, 3-319422; Jan. 20, 1992, 4-007397; Mar. 24, 1992, 4-066277; Apr. 30, 1992, 4-111494**

**Int. Cl.[6] C07D** *403/12;413/12;* **H01N** *43/54*

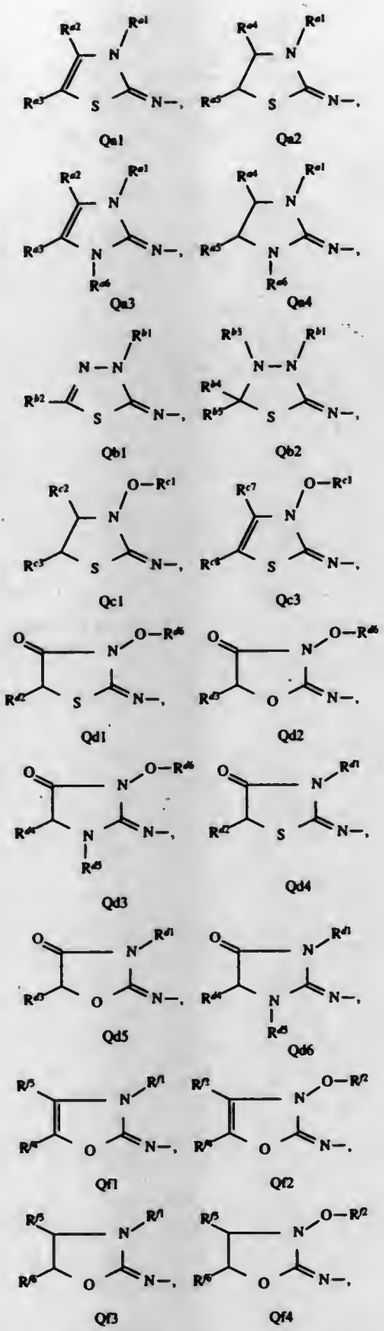
**U.S. Cl. 504—215** **18 Claims**

1. An iminosulfonylurea derivative of formula (I) or its salt:



(1)

wherein Q is



Qa1 Qa2 Qa3 Qa4 Qb1 Qb2 Qc1 Qc3 Qd1 Qd2 Qd3 Qd4 Qd5 Qd6 Qf1 Qf2 Qf3 Qf4

$R^{a1}$ is a $C_{1-8}$ alkyl group, a $C_{3-7}$ cycloalkyl group, a $C_{1-6}$ alkyl group substituted by a $C_{2-7}$ cycloalkyl group, a $C_{3-7}$ cycloalkenyl group, a $C_{1-6}$ alkyl group substituted by a $C_{3-7}$ cycloalkenyl group, a $C_{2-8}$ alkenyl group, a $C_{2-8}$ alkynyl group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkoxy group, a $C_{1-6}$ alkyl group substituted by a $C_{2-6}$ alkenyloxy group, a $C_{1-6}$ alkyl group substituted by a $C_{2-6}$ alkynyloxy group, a $C_{1-6}$ alkyl group substituted by a mono-, di- or poly-halogeno $C_{1-6}$ alkoxy group, a $C_{1-6}$ alkyl group substituted by a mono-, di- or poly-halogeno $C_{2-6}$ alkenyloxy group, a $C_{1-6}$ alkyl group substituted by a mono-, di- or poly-halogeno $C_{2-6}$ alkynyloxy group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkylthio group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkylsulfinyl group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkylsulfonyl group, a mono-, di- or poly-halogeno $C_{1-8}$ alkyl group, a mono-, di- or poly-halogeno $C_{2-8}$ alkenyl group, a mono-, di- or poly-halogeno $C_{2-8}$ alkynyl group, a $C_{1-6}$ alkyl group substituted by a cyano group, a $C_{2-6}$ alkenyl group substituted by a cyano group, a $C_{2-6}$ alkynyl group substituted by a cyano group, a $C_{1-6}$ alkyl group substituted by a nitro group, a $C_{2-6}$ alkenyl group substituted by a nitro group, a $C_{2-6}$ alkynyl group substituted by a nitro group, a $C_{1-6}$ alkyl group substituted by a $C_{2-7}$ alkoxycarbonyl group, a $C_{2-6}$ alkenyl group substituted by a $C_{2-7}$ alkoxycarbonyl group, a $C_{2-6}$ alkynyl group substituted by a $C_{2-7}$ alkoxycarbonyl group, a $C_{1-6}$ alkyl group substituted by a $C_{2-7}$ alkylcarbonyl group, a $C_{1-6}$ alkyl group substituted by a mono-, di- or poly-halogeno $C_{2-7}$ alkylcarbonyl group, a $C_{1-6}$ alkyl group substituted by a $C_{3-7}$ alkenylcarbonyl group, a $C_{1-6}$ alkyl group substituted by a $C_{3-7}$ alkynylcarbonyl group, a $C_{1-6}$ alkyl group substituted by a $C_{2-5}$ alkylcarbonyl group substituted by a $C_{1-6}$ alkoxy group, a $C_{1-6}$ alkyl group substituted by a $C_{2-5}$ alkylcarbonyl group substituted by a $C_{1-4}$ alkylthio group, a $C_{1-6}$ alkyl group substituted by a $C_{2-5}$ alkylcarbonyl group substituted by a $C_{1-4}$ alkylsulfinyl group, a $C_{1-6}$ alkyl group substituted by a $C_{2-5}$ alkylcarbonyl group substituted by a $C_{1-4}$ alkylsulfonyl group, a $C_{2-6}$ alkenyl group substituted by a $C_{2-7}$ alkylcarbonyl group, a $C_{2-6}$ alkynyl group substituted by a $C_{2-7}$ alkylcarbonyl group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkylsulfamoyl group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkoxysulfamoyl group, a $C_{1-6}$ alkyl group substituted by a di($C_{1-3}$ alkyl)sulfamoyl group, a $C_{1-6}$ alkyl group substituted by an N-($C_{1-3}$ alkyl)-N-($C_{1-3}$ alkoxy)sulfamoyl group, a $C_{1-6}$ alkyl group substituted by a $C_{2-7}$ alkylcarbamoyl group, a $C_{1-6}$ alkyl group substituted by a di($C_{1-3}$ alkyl)carbamoyl group, a $C_{1-6}$ alkyl group substituted by a $C_{2-7}$ alkoxycarbamoyl group, a $C_{1-6}$ alkyl group substituted by an N-($C_{1-3}$ alkyl)-N-($C_{1-3}$ alkoxy)carbamoyl group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkylamino group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkoxyamino group, a $C_{1-6}$ alkyl group substituted by a di($C_{1-3}$ alkyl)amino group, a $C_{1-6}$ alkyl group substituted by an N-($C_{1-3}$ alkyl)-N-($C_{1-3}$ alkoxy)amino group, a $C_{1-6}$ alkyl group substituted by an N-($C_{2-7}$ alkylcarbonyl)-N-($C_{1-6}$ alkyl)amino group, a $C_{1-6}$ alkyl group substituted by an N-($C_{2-7}$ alkylcarbonyl)-N-($C_{1-6}$ alkoxy)amino group, a $C_{1-6}$ alkyl group substituted by an N-($C_{1-6}$ alkylsulfonyl)-N-($C_{1-6}$ alkyl)amino group, a $C_{1-6}$ alkyl group substituted by an N-($C_{1-6}$ alkylsulfonyl)-N-($C_{1-6}$ alkoxy)amino group, a phenyl group (provided that such a phenyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a phenyl group (provided that such a phenyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{2-7}$ alkenyl group substituted by a phenyl group (provided that such a phenyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{2-6}$ alkynyl group substituted by a phenyl group (provided that such a phenyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a phenoxy group (provided that such a phenoxy group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a phenylthio group (provided that such a phenylthio group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a phenylsulfinyl group (provided that such a phenylsulfinyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a phenylsulfonyl group (provided that such a phenylsulfonyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a benzyloxy group (provided that the phenyl group of such a benzyloxy group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a benzylthio group (provided that the phenyl group of such a benzylthio group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a benzylsulfinyl group (provided that the phenyl group of such a benzylsulfinyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a benzylsulfonyl group (provided that the phenyl group of such a benzylsulfonyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group; a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a pheaylcarbonyl group (provided that such a phenylcarbonyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a benzylcarbonyl group (provided that the phenyl group of such a benzylcarbonyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by an amino group substituted by a $C_{1-4}$ alkylsulfonyl group, or a $C_{1-6}$ alkyl group substituted by an amino group substituted by a $C_{2-6}$ alkylcarbonyl group,

each of $R^{a2}$ and $R^{a3}$ which are independent of each other, is a hydrogen atom, a $C_{1-6}$ alkyl group, a mono-, di- or poly-halogeno $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group, a mono-, di or poly-halogeno $C_{1-6}$ alkoxy group, a $C_{1-6}$ alkylthio group, a $C_{1-6}$ alkylsulfinyl group, a $C_{1-6}$ alkylsulfonyl group, a $C_{2-7}$ alkoxycarbonyl group, a $C_{2-7}$ alkylcarbonyl group, a halogen atom, a nitro group, a cyano group, or a phenyl group (provided that such a phenyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group),

each of $R^{a4}$ and $R^{a5}$ which are independent of each other, is a hydrogen atom, a $C_{1-8}$ alkyl group, a $C_{2-8}$ alkenyl group, a $C_{2-8}$ alkynyl group, or a phenyl group (provided that such a phenyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group),

$R^{a6}$ is a $C_{1-6}$ alkyl group, a $C_{2-6}$ alkenyl group, a $C_{2-6}$ alkynyl group or a phenyl group (provided that such a phenyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group),

$R^{b1}$ is a $C_{1-6}$ alkyl group, a $C_{3-7}$ cycloalkyl group, a $C_{1-6}$ alkyl group substituted by a $C_{3-7}$ cycloalkyl group, a $C_{3-7}$ cycloalkenyl group, a $C_{1-6}$ alkyl group substituted by a $C_{3-7}$ cycloalkenyl group, a $C_{2-6}$ alkenyl group, a $C_{2-6}$ alkynyl group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkoxy group, a $C_{1-6}$ alkyl group substituted by a $C_{2-6}$ alkenyloxy group, a $C_{1-6}$ alkyl group substituted by a $C_{2-6}$ alkynyloxy group, a $C_{1-6}$ alkyl group substituted by a mono-, di or poly-halogeno $C_{1-6}$ alkoxy group, a $C_{1-6}$ alkyl group substituted by a mono-, di- or poly-halogeno $C_{2-6}$ alkenyloxy group, a $C_{1-6}$ alkyl group substituted by a mono-, di- or poly-halogeno $C_{2-6}$ alkynyloxy group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkylthio group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkylsulfinyl group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkylsulfonyl group, a mono-, di- or poly-halogeno $C_{1-6}$ alkyl group, a mono-, di- or poly-halogeno $C_{2-6}$ alkenyl group, a mono-, di- or poly-halogeno $C_{2-6}$ alkynyl group, a $C_{1-6}$ alkyl group substituted by a cyano group, a $C_{2-6}$ alkenyl group substituted by a cyano group, a $C_{2-6}$ alkynyl group substituted by a cyano group, a $C_{1-6}$ alkyl group substituted by a nitro group, a $C_{2-6}$ alkenyl group substituted by a nitro group, a $C_{2-6}$ alkynyl group substituted by a nitro group, a $C_{1-6}$ alkyl group substituted by a $C_{2-7}$ alkoxycarbonyl group, a $C_{2-6}$ alkenyl group substituted by a $C_{2-7}$ alkoxycarbonyl group, a $C_{2-6}$ alkynyl group substituted by a $C_{2-7}$ alkoxycarbonyl group, a $C_{1-6}$ alkyl group substituted by a $C_{2-7}$ alkylcarbonyl group, a $C_{1-6}$ alkyl group substituted by a mono-, di- or poly-halogeno $C_{2-7}$ alkylcarbonyl group, a $C_{1-6}$ alkyl group substituted by a $C_{3-7}$ alkenylcarbonyl group, a $C_{1-6}$ alkyl group substituted by a $C_{3-7}$ alkynylcarbonyl group, a $C_{1-6}$ alkyl group substituted by a $C_{2-5}$ alkylcarbonyl group substituted by a $C_{1-4}$ alkoxy group, a $C_{1-6}$ alkyl group substituted by a $C_{2-5}$ alkylcarbonyl group substituted by a $C_{1-4}$ alkylthio group, a $C_{1-6}$ alkyl group substituted by a $C_{2-5}$ alkylcarbonyl group substituted by a $C_{1-4}$ alkylsulfinyl group, a $C_{1-6}$ alkyl group substituted by a $C_{2-5}$ alkylcarbonyl group substituted by a $C_{1-4}$ alkylsulfonyl group, a $C_{2-6}$ alkenyl group substituted by a $C_{2-7}$ alkylcarbonyl group, a $C_{2-6}$ alkynyl group substituted by a $C_{2-7}$ alkylcarbonyl group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkylsulfamoyl group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkoxysulfamoyl group, a $C_{1-6}$ alkyl group substituted by a di($C_{1-3}$ alkyl)sulfamoyl group, a $C_{1-6}$ alkyl group substituted by an N-($C_{1-3}$ alkyl)-N-($C_{1-3}$ alkoxy)sulfamoyl group, a $C_{1-6}$ alkyl group substituted by a $C_{2-7}$ alkylcarbamoyl group, a $C_{1-6}$ alkyl group substituted by a di($C_{1-3}$ alkyl)carbamoyl group, a $C_{1-6}$ alkyl group substituted by a $C_{2-7}$ alkoxycarbamoyl group, a $C_{1-6}$ alkyl group substituted by an N-($C_{1-3}$ alkyl)-N-($C_{1-3}$ alkoxy)carbamoyl group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkylamino group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkoxyamino group, a $C_{1-6}$ alkyl group substituted by a di($C_{1-3}$ alkyl)amino group, a $C_{1-6}$ alkyl group substituted by an N-($C_{1-3}$ alkyl)-N-($C_{1-3}$ alkoxy)amino group, a $C_{1-6}$ alkyl group substituted by an N-($C_{2-7}$ alkylcarbonyl)-N-($C_{1-6}$ alkyl)amino group, a $C_{1-6}$ alkyl group substituted by an N-($C_{2-7}$ alkylcarbonyl)-N-($C_{1-6}$ alkoxy)amino group, a $C_{1-6}$ alkyl group substituted by an N-($C_{1-6}$ alkylsulfonyl)-N-($C_{1-6}$ alkyl)amino group, a $C_{1-6}$ alkyl group substituted by an N-($C_{1-6}$ alkylsulfonyl)-N-($C_{1-6}$ alkoxy)amino group, a phenyl group (provided that such a phenyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a phenyl group (provided that such a phenyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{2-7}$ alkenyl group substituted by a phenyl group (provided that such a phenyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{2-6}$ alkynyl group substituted by a phenyl group (provided that such a phenyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a phenoxy group (provided that such a phenoxy group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a phenylthio group (provided that such a phenylthio group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a phenylsulfinyl group (provided that such a phenylsulfinyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a phenylsulfonyl group (provided that such a phenylsulfonyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a benzyloxy group (provided that the phenyl group of such a benzyloxy group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a benzylthio group (provided that the phenyl group of such a benzylthio group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a benzylsulfinyl group (provided that the phenyl group of such a benzylsulfinyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a benzylsulfonyl group (provided that the phenyl group of such a benzylsulfonyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a phenylcarbonyl group (provided that such a phenylcarbonyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a benzylcarbonyl group (provided that the phenyl group of such a benzylcarbonyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by an amino group substituted by a $C_{1-4}$ alkylsulfonyl group, or a $C_{1-6}$ alkyl group substituted by an amino group substituted by a $C_{2-6}$ alkylcarbonyl group,

$R^{b2}$ is a hydrogen atom, a $C_{1-6}$ alkyl group, a mono-, di- or poly-halogeno $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group, a mono-, di- or poly-halogeno $C_{1-6}$ alkoxy group, a $C_{1-6}$ alkylthio group, a $C_{1-6}$ alkylsulfinyl group, a $C_{1-6}$ alkylsulfonyl group, a $C_{2-7}$ alkoxycarbonyl group, a $C_{2-7}$ alkylcarbonyl group, a halogen atom, a nitro group, a cyano group, or a phenyl group (provided that such a phenyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a



nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group),

$R^{b3}$ is a $C_{1-6}$ alkyl group, a $C_{2-6}$ alkenyl group or a $C_{2-6}$ alkynyl group,

$R^{b4}$ is a hydrogen atom, or a $C_{1-6}$ alkyl group,

$R^{b5}$ is a hydrogen atom, or a $C_{1-6}$ alkyl group,

$R^{c1}$ is a $C_{1-6}$ alkyl group, a $C_{3-7}$ cycloalkyl group, a $C_{1-6}$ alkyl group substituted by a $C_{3-7}$ cycloalkyl group, a $C_{3-7}$ cycloalkenyl group, a $C_{1-6}$ alkyl group substituted by a $C_{3-7}$ cycloalkenyl group, a $C_{2-6}$ alkenyl group, a $C_{2-6}$ alkynyl group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkoxy group, a $C_{1-6}$ alkyl group substituted by a $C_{2-6}$ alkenyloxy group, a $C_{1-6}$ alkyl group substituted by a $C_{2-6}$ alkynyloxy group, a $C_{1-6}$ alkyl group substituted by a mono-, di- or poly-halogeno $C_{1-6}$ alkoxy group, a $C_{1-6}$ alkyl group substituted by a mono-, di- or poly-halogeno $C_{2-6}$ alkenyloxy group, a $C_{1-6}$ alkyl group substituted by a mono-, di- or poly-halogeno $C_{2-6}$ alkynyloxy group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkylthio group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkylsulfinyl group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkylsulfonyl group, a mono-, di- or poly-halogeno $C_{1-6}$ alkyl group, a mono-, di- or poly-halogeno $C_{2-6}$ alkenyl group, a mono-, di- or poly-halogeno $C_{2-6}$ alkynyl group, a $C_{1-6}$ alkyl group substituted by a cyano group, a $C_{2-6}$ alkenyl group substituted by a cyano group, a $C_{2-6}$ alkynyl group substituted by a cyano group, a $C_{1-6}$ alkyl group substituted by a nitro group, a $C_{2-6}$ alkenyl group substituted by a nitro group, a $C_{2-6}$ alkynyl group substituted by a nitro group, a $C_{1-6}$ alkyl group substituted by a $C_{2-7}$ alkoxycarbonyl group, a $C_{2-6}$ alkenyl group substituted by a $C_{2-7}$ alkoxycarbonyl group, a $C_{2-6}$ alkynyl group substituted by a $C_{2-7}$ alkoxycarbonyl group, a $C_{1-6}$ alkyl group substituted by a $C_{2-7}$ alkylcarbonyl group, a $C_{1-6}$ alkyl group substituted by a mono-, di- or poly-halogeno $C_{2-7}$ alkylcarbonyl group, a $C_{1-6}$ alkyl group substituted by a $C_{3-7}$ alkenylcarbonyl group, a $C_{1-6}$ alkyl group substituted by a $C_{3-7}$ alkynylcarbonyl group, a $C_{1-6}$ alkyl group substituted by a $C_{2-5}$ alkylcarbonyl group substituted by a $C_{1-4}$ alkoxy group, a $C_{1-6}$ alkyl group substituted by a $C_{2-5}$ alkylcarbonyl group substituted by a $C_{1-4}$ alkylthio group, a $C_{1-6}$ alkyl group substituted by a $C_{2-5}$ alkylcarbonyl group substituted by a $C_{1-4}$ alkylsulfinyl group, a $C_{1-6}$ alkyl group substituted by a $C_{2-5}$ alkylcarbonyl group substituted by a $C_{1-4}$ alkylsulfonyl group, a $C_{2-6}$ alkenyl group substituted by a $C_{2-7}$ alkylcarbonyl group, a $C_{2-6}$ alkynyl group substituted by a $C_{2-7}$ alkylcarbonyl group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkylsulfamoyl group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkoxysulfamoyl group, a $C_{1-6}$ alkyl group substituted by a di($C_{1-3}$ alkyl)sulfamoyl group, a $C_{1-6}$ alkyl group substituted by an N-($C_{1-3}$ alkyl)-N-($C_{1-3}$ alkoxy)sulfamoyl group, a $C_{1-6}$ alkyl group substituted by a $C_{2-7}$ alkylcarbamoyl group, a $C_{1-6}$ alkyl group substituted by a di($C_{1-3}$ alkyl)carbamoyl group, a $C_{1-6}$ alkyl group substituted by a $C_{2-7}$ alkoxycarbamoyl group, a $C_{1-6}$ alkyl group substituted by an N-($C_{1-3}$ alkyl)-N-($C_{1-3}$ alkoxy)carbamoyl group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkylamino group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkoxyamino group, a $C_{1-6}$ alkyl group substituted by a di($C_{1-3}$ alkyl)amino group, a $C_{1-6}$ alkyl group substituted by an N-($C_{1-3}$ alkyl)-N-($C_{1-3}$ alkoxy)amino group, a $C_{1-6}$ alkyl group substituted by an N-($C_{2-7}$ alkylcarbonyl)-N-($C_{1-6}$ alkyl)amino group, a $C_{1-6}$ alkyl group substituted by an N-($C_{2-7}$ alkylcarbonyl)-N-($C_{1-6}$ alkoxy)amino group, a $C_{1-6}$ alkyl group substituted by an N-($C_{1-6}$ alkylsulfonyl)-N-($C_{1-6}$ alkyl)amino group, a $C_{1-6}$ alkyl group substituted by an N-($C_{1-6}$ alkylsulfonyl)-N-($C_{1-6}$ alkoxy)amino group, a phenyl group (provided that such a phenyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a phenyl group (provided that such a phenyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{2-7}$ alkenyl group substituted by a phenyl group (provided that such a phenyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{2-6}$ alkynyl group substituted by a phenyl group (provided that such a phenyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a phenoxy group (provided that such a phenoxy group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a phenylthio group (provided that such a phenylthio group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a phenylsulfinyl group (provided that such a phenylsulfinyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a phenylsulfonyl group (provided that such a phenylsulfonyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a benzyloxy group (provided that the phenyl group of such a benzyloxy group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a benzylthio group (provided that the phenyl group of such a benzylthio group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a benzylsulfinyl group (provided that the phenyl group of such a benzylsulfinyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a benzylsulfonyl group (provided that the phenyl group of such a benzylsulfonyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a phenylcarbonyl group (provided that such a phenylcarbonyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a benzylcarbonyl group (provided that the phenyl group of such a benzylcarbonyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by an amino group substituted by a $C_{1-4}$ alkylsulfonyl group, or a $C_{1-6}$ alkyl group substituted by an amino group substituted by a $C_{2-6}$ alkylcarbonyl group,

each of $R^{c2}$ and $R^{c3}$ which are independent of one another, is a hydrogen atom, a $C_{1-6}$ alkyl group, a $C_{2-6}$ alkenyl group, a $C_{2-6}$ alkynyl group, or a phenyl group (provided that such a phenyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group),

each of $R^{c7}$ and $R^{c8}$ which are independent of one another, is a hydrogen atom, a $C_{1-6}$ alkyl group, a mono-, di- or poly-

halogeno $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group, a mono, di- or poly-halogeno $C_{1-6}$ alkoxy group, a $C_{1-6}$ alkylthio group, a $C_{1-6}$ alkylsulfinyl group, a $C_{1-6}$ alkylsulfonyl group, a $C_{2-7}$ alkoxycarbonyl group, a $C_{2-7}$ alkylcarbonyl group, a halogen atom, a nitro group, a cyano group, or a phenyl group (provided that such a phenyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group),

$R^{41}$ is a $C_{1-6}$ alkyl group, a $C_{3-7}$ cycloalkyl group, a $C_{1-6}$ alkyl group substituted by a $C_{3-7}$ cycloalkyl group, a $C_{3-7}$ cycloalkenyl group, a $C_{1-6}$ alkyl group substituted by a $C_{3-7}$ cycloalkenyl group, a $C_{2-6}$ alkenyl group, a $C_{2-6}$ alkynyl group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkoxy group, a $C_{1-6}$ alkyl group substituted by a $C_{2-6}$ alkenyloxy group, a $C_{1-6}$ alkyl group substituted by a $C_{2-6}$ alkynyloxy group, a $C_{1-6}$ alkyl group substituted by a mono-, di or poly-halogeno $C_{1-6}$ alkoxy group, a $C_{1-6}$ alkyl group substituted by a mono-, di- or poly-halogeno $C_{2-6}$ alkenyloxy group, a $C_{1-6}$ alkyl group substituted by a mono-, di- or poly-halogeno $C_{2-6}$ alkynyloxy group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkylthio group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkylsulfinyl group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkylsulfonyl group, a mono-, di- or poly-halogeno $C_{1-6}$ alkyl group, a mono-, di- or poly-halogeno $C_{2-6}$ alkenyl group, a mono-, di- or poly-halogeno $C_{2-6}$ alkynyl group, a $C_{1-6}$ alkyl group substituted by a cyano group, a $C_{2-6}$ alkenyl group substituted by a cyano group, a $C_{2-6}$ alkynyl group substituted by a cyano group, a $C_{1-6}$ alkyl group substituted by a nitro group, a $C_{2-6}$ alkenyl group substituted by a nitro group, a $C_{2-6}$ alkynyl group substituted by a nitro group, a $C_{1-6}$ alkyl group substituted by a $C_{2-7}$ alkoxycarbonyl group, a $C_{2-6}$ alkenyl group substituted by a $C_{2-7}$ alkoxycarbonyl group, a $C_{2-6}$ alkynyl group substituted by a $C_{2-7}$ alkoxycarbonyl group, a $C_{1-6}$ alkyl group substituted by a $C_{2-7}$ alkylcarbonyl group, a $C_{1-6}$ alkyl group substituted by a mono-, di- or poly-halogeno $C_{2-7}$ alkylcarbonyl group, a $C_{1-6}$ alkyl group substituted by a $C_{3-7}$ alkenylcarbonyl group, a $C_{1-6}$ alkyl group substituted by a $C_{3-7}$ alkynylcarbonyl group, a $C_{1-6}$ alkyl group substituted by a $C_{2-5}$ alkylcarbonyl group substituted by a $C_{1-4}$ alkoxy group, a $C_{1-6}$ alkyl group substituted by a $C_{2-5}$ alkylcarbonyl group substituted by a $C_{1-4}$ alkylthio group, a $C_{1-6}$ alkyl group substituted by a $C_{2-5}$ alkylcarbonyl group substituted by a $C_{1-4}$ alkylsulfinyl group, a $C_{1-6}$ alkyl group substituted by a $C_{2-5}$ alkylcarbonyl group substituted by a $C_{1-4}$ alkylsulfonyl group, a $C_{2-6}$ alkenyl group substituted by a $C_{2-7}$ alkylcarbonyl group, a $C_{2-6}$ alkynyl group substituted by a $C_{2-7}$ alkylcarbonyl group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkylsulfamoyl group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkoxysulfamoyl group, a $C_{1-6}$ alkyl group substituted by a di($C_{1-3}$ alkyl)sulfamoyl group, a $C_{1-6}$ alkyl group substituted by an N-($C_{1-3}$ alkyl)-N-($C_{1-3}$ alkoxy)sulfamoyl group, a $C_{1-6}$ alkyl group substituted by a $C_{2-7}$ alkylcarbamoyl group, a $C_{1-6}$ alkyl group substituted by a di($C_{1-3}$ alkyl)carbamoyl group, a $C_{1-6}$ alkyl group substituted by a $C_{2-7}$ alkoxycarbamoyl group, a $C_{1-6}$ alkyl group substituted by an N-($C_{1-3}$ alkyl)-N-($C_{1-3}$ alkoxy)carbamoyl group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkylamino group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkoxyamino group, a $C_{1-6}$ alkyl group substituted by a di($C_{1-3}$ alkyl)amino group, a $C_{1-6}$ alkyl group substituted by an N-($C_{1-3}$ alkyl)-N-($C_{1-3}$ alkoxy)amino group, a $C_{1-6}$ alkyl group substituted by an N-($C_{2-7}$ alkylcarbonyl)-N-($C_{1-6}$ alkyl)amino group, a $C_{1-6}$ alkyl group substituted by an N-($C_{2-7}$ alkylcarbonyl)-N-($C_{1-6}$ alkoxy)amino group, a $C_{1-6}$ alkyl group substituted by an N-($C_{1-6}$ alkylsulfonyl)-N-(C 1–6alkyl)amino group, a $C_{1-6}$ alkyl group substituted by an N-($C_{1-6}$ alkylsulfonyl)-N-($C_{1-6}$ alkoxy)amino group, a phenyl group (provided that such a phenyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a phenyl group (provided that such a phenyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{2-7}$ alkenyl group substituted by a phenyl group (provided that such a phenyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{2-6}$ alkynyl group substituted by a phenyl group (provided that such a phenyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a phenylthio group (provided that such a phenylthio group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a phenylsulfinyl group (provided that such a phenylsulfinyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a phenylsulfonyl group (provided that such a phenylsulfonyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a benzyloxy group (provided that the phenyl group of such a benzyloxy group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a benzylthio group (provided that the phenyl group of such a benzylthio group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a benzylsulfinyl group (provided that the phenyl group of such a benzylsulfinyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a benzylsulfonyl group (provided that the phenyl group of such a benzylsulfonyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a phenylcarbonyl group (provided that such a phenylcarbonyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a benzylcarbonyl group (provided that the phenyl group of such a benzylcarbonyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by an amino group substituted by a $C_{1-4}$ alkylsulfonyl group, or a $C_{1-6}$ alkyl group substituted by an amino group substituted by a $C_{2-4}$ alkylcarbonyl group,

each of $R^{42}$, $R^{43}$ and $R^{44}$ which are independent of one another, is a hydrogen atom, a $C_{1-6}$ alkyl group, a $C_{2-6}$ alkenyl group, a $C_{2-6}$ alkynyl group, or a phenyl group (provided that such a phenyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a



trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group),

$R^{45}$ is a $C_{1-6}$ alkyl group, a $C_{2-6}$ alkenyl group, a $C_{2-6}$ alkynyl group, or a phenyl group (provided that such a phenyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group),

$R^{46}$ is a $C_{1-6}$ alkyl group, a $C_{2-6}$ alkenyl group, a $C_{2-6}$ alkynyl group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkylthio group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkylsulfinyl group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkylsulfonyl group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkoxy group, a $C_{1-6}$ alkyl group substituted by a $C_{2-7}$ alkoxycarbonyl group, a $C_{1-6}$ alkyl group substituted by a $C_{2-7}$ alkylcarbonyl group, a $C_{1-6}$ alkyl group substituted by a cyano group, a phenyl group (provided that such a phenyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), or a $C_{1-6}$ alkyl group substituted by a phenyl group (provided that such a phenyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group),

$R^{41}$ is a $C_{1-6}$ alkyl group, a $C_{3-7}$ cycloalkyl group, a $C_{1-6}$ alkyl group substituted by a $C_{3-7}$ cycloalkyl group, a $C_{3-7}$ cycloalkenyl group, a $C_{1-6}$ alkyl group substituted by a $C_{3-7}$ cycloalkenyl group, a $C_{2-6}$ alkenyl group, a $C_{2-6}$ alkynyl group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkoxy group, a $C_{1-6}$ alkyl group substituted by a $C_{2-6}$ alkenyloxy group, a $C_{1-6}$ alkyl group substituted by a $C_{2-6}$ alkynyloxy group, a $C_{1-6}$ alkyl group substituted by a mono-, di- or poly-halogeno $C_{1-6}$ alkoxy group, a $C_{1-6}$ alkyl group substituted by a mono-, di- or poly-halogeno $C_{2-6}$ alkenyloxy group, a $C_{1-6}$ alkyl group substituted by a mono-, di- or poly-halogeno $C_{2-6}$ alkynyloxy group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkylthio group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkylsulfinyl group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkylsulfonyl group, a mono-, di- or poly-halogeno $C_{1-6}$ alkyl group, a mono-, di- or poly-halogeno $C_{2-6}$ alkenyl group, a mono-, di- or poly-halogeno $C_{2-6}$ alkynyl group, a $C_{1-6}$ alkyl group substituted by a cyano group, a $C_{2-6}$ alkenyl group substituted by a cyano group, a $C_{2-6}$ alkynyl group substituted by a cyano group, a $C_{1-6}$ alkyl group substituted by a nitro group, a $C_{2-6}$ alkenyl group substituted by a nitro group, a $C_{2-6}$ alkynyl group substituted by a nitro group, a $C_{1-6}$ alkyl group substituted by a $C_{2-7}$ alkoxycarbonyl group, a $C_{2-6}$ alkenyl group substituted by a $C_{2-7}$ alkoxycarbonyl group, a $C_{2-6}$ alkynyl group substituted by a $C_{2-7}$ alkoxycarbonyl group, a $C_{1-6}$ alkyl group substituted by a $C_{2-7}$ alkylcarbonyl group, a $C_{1-6}$ alkyl group substituted by a mono-, di- or poly-halogeno $C_{2-7}$ alkylcarbonyl group, a $C_{1-6}$ alkyl group substituted by a $C_{3-7}$ alkenylcarbonyl group, a $C_{1-6}$ alkyl group substituted by a $C_{3-7}$ alkynylcarbonyl group, a $C_{1-6}$ alkyl group substituted by a $C_{2-5}$ alkylcarbonyl group substituted by a $C_{1-4}$ alkoxy group, a $C_{1-6}$ alkyl group substituted by a $C_{2-5}$ alkylcarbonyl group substituted by a $C_{1-4}$ alkylthio group, a $C_{1-6}$ alkyl group substituted by a $C_{2-5}$ alkylcarbonyl group substituted by a $C_{1-4}$ alkylsulfinyl group, a $C_{1-6}$ alkyl group substituted by a $C_{2-5}$ alkylcarbonyl group substituted by a $C_{1-4}$ alkylsulfonyl group, a $C_{2-6}$ alkenyl group substituted by a $C_{2-7}$ alkylcarbonyl group, a $C_{2-6}$ alkynyl group substituted by a $C_{2-7}$ alkylcarbonyl group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkylsulfamoyl group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkoxysulfamoyl group, a $C_{1-6}$ alkyl group substituted by a di($C_{1-3}$ alkyl)sulfamoyl group, a $C_{1-6}$ alkyl group substituted by an N-($C_{1-3}$ alkyl)-N-($C_{1-3}$ alkoxy)sulfamoyl group, a $C_{1-6}$ alkyl group substituted by a $C_{2-7}$ alkylcarbamoyl group, a $C_{1-6}$ alkyl group substituted by a di($C_{1-3}$ alkyl)carbamoyl group, a $C_{1-6}$ alkyl group substituted by a $C_{2-7}$ alkoxycarbamoyl group, a $C_{1-6}$ alkyl group substituted by an N-($C_{1-3}$ alkyl)-N-($C_{1-3}$ alkoxy)carbamoyl group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkylamino group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkoxyamino group, a $C_{1-6}$ alkyl group substituted by a di($C_{1-3}$ alkyl)amino group, a $C_{1-6}$ alkyl group substituted by an N-($C_{1-3}$ alkyl)-N-($C_{1-3}$ alkoxy)amino group, a $C_{1-6}$ alkyl group substituted by an N-($C_{2-7}$ alkylcarbonyl)-N-($C_{1-6}$ alkyl)amino group, a $C_{1-6}$ alkyl group substituted by an N-($C_{2-7}$ alkylcarbonyl)-N-($C_{1-6}$ alkoxy)amino group, a $C_{1-6}$ alkyl group substituted by an N-($C_{1-6}$ alkylsulfonyl)-N-($C_{1-6}$ alkyl)amino group, a $C_{1-6}$ alkyl group substituted by an N-($C_{1-6}$ alkylsulfonyl)-N-($C_{1-6}$ alkoxy)amino group, a phenyl group (provided that such a phenyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a phenyl group (provided that such a phenyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{2-7}$ alkenyl group substituted by a phenyl group (provided that such a phenyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{2-6}$ alkynyl group substituted by a phenyl group (provided that such a phenyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a phenoxy group (provided that such a phenoxy group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a phenylthio group (provided that such a phenylthio group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a phenylsulfinyl group (provided that such a phenylsulfinyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a phenylsulfonyl group (provided that the phenyl group of such a benzylsulfonyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a benzylthio group (provided that the phenyl group of such a benzylthio group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a benzylsulfinyl group (provided that the phenyl group of such a benzylsulfinyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a benzylsulfonyl group (provided that the phenyl group of such a benzylsulfonyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a phenylcarbonyl group (provided that such a phenylcarbonyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group,

nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by a benzylcarbonyl group (provided that the phenyl group of such a benzylcarbonyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), a $C_{1-6}$ alkyl group substituted by an amino group substituted by a $C_{1-4}$ alkylsulfonyl group, or a $C_{1-6}$ alkyl group substituted by an amino group substituted by a $C_{2-4}$ alkylcarbonyl group,

$R^{2}$ is a $C_{1-6}$ alkyl group, a $C_{2-6}$ alkenyl group, a $C_{2-6}$ alkynyl group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkylthio group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkylsulfinyl group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkylsulfonyl group, a $C_{1-6}$ alkyl group substituted by a $C_{1-6}$ alkoxy group, a $C_{1-6}$ alkyl group substituted by a $C_{2-7}$ alkoxycarbonyl group, a $C_{1-6}$ alkyl group substituted by a $C_{2-7}$ alkylcarbonyl group, a $C_{1-6}$ alkyl group substituted by a cyano group, a phenyl group (provided that such a phenyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group), or a $C_{1-6}$ alkyl group substituted by a phenyl group (provided that such a phenyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group),

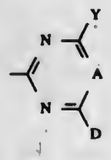
each of $R^{3}$ and $R^{4}$ which are independent of one another, is a hydrogen atom, a $C_{1-6}$ alkyl group, a mono-, di- or poly-halogeno $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group, a mono-, di- or poly-halogeno $C_{1-6}$ alkoxy group, a $C_{1-6}$ alkylthio group, a $C_{1-6}$ alkylsulfinyl group, a $C_{1-6}$ alkylsulfonyl group, a $C_{2-7}$ alkoxycarbonyl group, a $C_{2-7}$ alkylcarbonyl group, a halogen atom, a nitro group, a cyano group, or a phenyl group (provided that such a phenyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group),

each of $R^{5}$ and $R^{6}$ which are independent of one another, is a hydrogen atom, a $C_{1-6}$ alkyl group, a $C_{2-6}$ alkenyl group, a $C_{2-6}$ alkynyl group, or a phenyl group (provided that such a phenyl group may be substituted by one or more substituents selected from the group consisting of a halogen atom, a trifluoromethyl group, a nitro group, a $C_{1-6}$ alkyl group, a $C_{1-6}$ alkoxy group and a $C_{2-7}$ alkoxycarbonyl group),

X is an oxygen atom or a sulfur atom,

L is a hydrogen atom, a $C_{1-6}$ alkyl group, a $C_{2-6}$ alkenyl group or a $C_{2-6}$ alkynyl group,

G is



A is a CH group and

each of γ and D which are independent of each other, is a $C_{1-4}$ alkyl group, a $C_{1-4}$ alkoxy group, a mono-, di- or poly-halogeno $C_{1-4}$ alkyl group, a mono-, di- or poly-halogeno $C_{1-4}$ alkoxy group, a halogen atom, a $C_{1-4}$ alkylamino group, or a di($C_{1-4}$ alkyl)amino group.

**5,500,407**

**TRIAZOLOPYRIMIDINE HERBICIDES**

**Hermann Rempfler, Ettingen, Switzerland, assignor to Ciba-Geigy Corporation, Tarrytown, N.Y.**

**PCT No. PCT/EP94/00778, § 371 Date Nov. 21, 1994, § 102(e) Date Nov. 21, 1994, PCT Pub. No. WO94/21640, PCT Pub. Date Sep. 29, 1994**

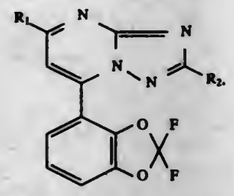
**PCT Filed Mar. 14, 1994, Ser. No. 341,586**

**Claims priority, application Switzerland, Mar. 25, 1993, 907/93**

**Int. Cl.[6] C07D 487/04; A01N 43/90**

**U.S. Cl. 504—241** **20 Claims**

1. A compound of formula



(I)

wherein

$R_1$ is hydrogen, $C_1$–$C_6$alkyl or $C_1$–$C_6$haloalkyl; and

$R_2$ is $C_1$–$C_6$alkyl, $C_1$–$C_6$haloalkyl, $C_1$–$C_6$alkoxy, $C_1$–$C_6$haloalkoxy, $C_1$–$C_6$alkylthio, $C_1$–$C_6$haloalkylthio, $C_1$–$C_6$alkoxy-$C_1$–$C_6$alkyl, $C_1$–$C_6$alkoxy-$C_{1}$–$C_4$alkoxy, $C_1$–$C_6$alkoxy-$C_1$–$C_6$alkylthio, halogen, amino, $C_1$–$C_6$alkylamino or $C_1$–$C_6$dialkylamino.

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**5,500,408**

**THIADIAZOLE DERIVATIVES AND HERBICIDE COMPOSITIONS CONTAINING THE SAME**

**Yasuaki Hanesaki; Kazuaki Tsukada; Hiroyuki Watanabe; Kenji Tsuzuki; Mitsuyuki Murakami, and Noritoshi Niisai, all of Shimamoto, Japan, assignors to Tosoh Corporation, Yamaguchi, Japan**

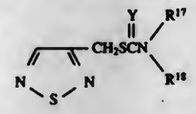
**Division of Ser. No. 266,702, Jun. 28, 1994, which is a division of Ser. No. 27,579, Mar. 5, 1993, Pat. No. 5,482,916, which is a continuation of Ser. No. 633,348, Dec. 27, 1990, abandoned, which is a continuation-in-part of Ser. No. 570,638, Aug. 22, 1990, abandoned. This application Mar. 9, 1995, Ser. No. 401,269**

**Claims priority, application Japan, Aug. 22, 1989, 1-215489; Jan. 30, 1989, 1-27925; Nov. 22, 1989, 1-302258; Dec. 25, 1989, 1-332875**

**Int. Cl.[6] C07D 285/10; A01N 43/832**

**U.S. Cl. 504—261** **2 Claims**

1. A thiadiazole derivative represented by the formula [II]



(II)

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**5,500,409**

**METHOD FOR INHIBITING COLLAGEN SYNTHESIS BY KELOID FIBROBLASTS**

**Elaine M. L. Tan, and Joanl J. Utto, both of Gladwyne, Pa., assignors to Thomas Jefferson University, Philadelphia, Pa.**

**Continuation of Ser. No. 591,407, Oct. 1, 1990, abandoned. This application Mar. 17, 1993, Ser. No. 32,714**

**Int. Cl.[6] A61K 38/18**

**U.S. Cl. 514—2** **6 Claims**

1. A method for inhibiting collagen synthesis by keloid skin fibroblasts comprising providing to said keloid skin fibroblasts an amount of a composition effective to inhibit said collagen synthesis, said composition consisting essentially of endothelial cell growth factor.



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**5,500,410**

**SUBSTITUTED ALKYLAMIDE DERIVATIVES OF TEICOPLANIN**

**Adriano Malabarba, Binasco; Pierfausto Seneci, Brescia; Jürgen K. Kettenring, Varese, and Romeo Ciabatti, Novate Milanese, all of, Italy, assignors to Gruppo Lepetit S.p.A., Gerenzano, Italy**

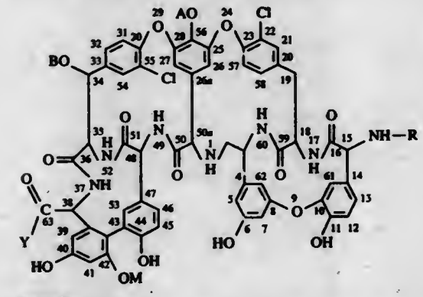
**Continuation of Ser. No. 263,160, Jun. 20, 1994, abandoned, which is a continuation of Ser. No. 761,806, Sep. 20, 1991, abandoned. This application Jun. 5, 1995, Ser. No. 461,208**

**Claims priority, application European Pat. Off., Mar. 29, 1989, 89105525**

**Int. Cl.[6] A61K 38/08;38/12;38/14; C07K 9/00**

**U.S. Cl. 514—8** **19 Claims**

1. A teicoplanin amide derivative of formula I



I

wherein

R represents hydrogen or a protecting group of the amine function;

Y represents a compound of formula

$$—NR_1—alk_1—[X—alk_2]_p—[T—alk_3]_q—W$$

wherein

$R_1$ represents hydrogen or ($C_1$–$C_4$)alkyl;

$alk_1$, $alk_2$ and $alk_3$ each independently represents a linear or branched alkylene of 2 to 10 carbon atoms;

p represents an integer ranging from 1 to 50;

q represents an integer ranging from 0 to 12;

X represents a —$NR_2$— group or an oxygen atom wherein $R_2$ represents hydrogen, ($C_1$–$C_4$)alkyl, a group $alk_4NR_3R_4$ wherein $alk_4$ represents a linear or branched alkylene of 2 to 4 atoms, $R_3$ is hydrogen or ($C_1$–$C_4$)alkyl and $R_4$ is hydrogen, ($C_1$–$C_4$)alkyl or a 5–6 membered cycloalkyl; or $R_1$ and $R_2$ taken together represent a ($C_2$–$C_4$)alkylene moiety connecting the two nitrogen atoms with the proviso that in such case p is 1;

T represents a —$NR_5$— group or an oxygen atom wherein $R_5$ is hydrogen, ($C_1$–$C_4$)alkyl, a group $alk_5NR_6R_7$ wherein $alk_5$ represents a linear or branched alkylene of 2 to 4 atoms, $R_6$ is hydrogen or ($C_1$–$C_4$)alkyl and $R_7$ is hydrogen, ($C_1$–$C_4$)alkyl or a 5–6 membered cycloalkyl; or $R_2$ and $R_5$ taken together represent a ($C_2$–$C_4$)alkylene moiety connecting the two nitrogen atoms with the proviso that in such case both p and q are 1;

W represents hydroxy, $NR_8R_9$ or $N^{\oplus}R_{11}R_{12}R_{13}An^{\ominus}$, $R_8$ represents hydrogen or ($C_1$–$C_6$)alkyl, $R_9$ represents hydrogen, ($C_1$–$C_6$)alkyl, ($C_5$–$C_6$)cycloalkyl or $COOR_{10}$, $R_{10}$ represents ($C_1$–$C_6$)acyloxy($C_1$–$C_4$)alkyl, and, $R_{11}$, $R_{12}$, and $R_{13}$ each independently represents ($C_1$–$C_4$)alkyl and $An^{\ominus}$ is an anion derived from a pharmaceutically acceptable acid; with the proviso that when simultaneously X is $NR_2$, p is 1 and q is zero, then W is not represented by hydroxy;

A represents H or —N[($C_9$–$C_{12}$)aliphatic acyl]- beta-D-2-deoxy-2-aminoglucopyranosyl,

B represents hydrogen or N-acetyl-beta-D-2-deoxy-2-aminoglucopyranosyl;

M represents hydrogen or alpha-D-mannopyranosyl or the pharmaceutically addition salt thereof;

with the further proviso that B represents hydrogen only when A and M are simultaneously hydrogen (SEQ ID NO 1).

17. A method for the treatment of bacterial infections comprising administering to a patient in need thereof an antibacterially effective amount of a compound according to claim 1.

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**5,500,411**

**METHOD FOR TREATING THROMBOEMBOLIC CONDITIONS BY INHIBITING REOCCLUSION VIA THE USE OF MULTIPLE BOLUS ADMINISTRATION OF THROMBOLYTICALLY ACTIVE PROTEINS**

**Ulrich Martin, Mannheim, and Reinhard Koenig, Grunstadt, both of, Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany**

**PCT No. PCT/EP92/00851, § 371 Date Jun. 30, 1994, § 102(e) Date Jun. 30, 1994, PCT Pub. No. WO92/18157, PCT Pub. Date Oct. 29, 1992**

**PCT Filed Apr. 15, 1992, Ser. No. 137,116**

**Claims priority, application Germany, Apr. 16, 1991, 41 12 398.0; Jul. 18, 1991, 41 23 845.1**

**Int. Cl.[6] A61K 38/00;38/48**

**U.S. Cl. 514—12** **6 Claims**

1. Method for treatment of a thromboembolic condition, comprising administering to a subject with a thromboembolic condition an amount of a thrombolytically active protein consisting of SEQ ID NO: 1, wherein said thrombolytically active protein is administered in an amount sufficient to prevent reocclusion, and is administered in the form of two or more boli.

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**5,500,412**

**THROMBIN DERIVED POLYPEPTIDES; COMPOSITIONS AND METHODS FOR USE**

**Darrell H. Carney, 5020 Cedar Creek, Dickinson, Tex. 77539, and Kevin C. Glenn, 12480 Glengate Dr., Maryland Heights, Mo. 63043**

**Division of Ser. No. 925,201, Oct. 31, 1986, Pat. No. 5,352,664. This application Jan. 21, 1993, Ser. No. 7,173**

**Int. Cl.[6] A61K 38/16**

**U.S. Cl. 514—13** **6 Claims**

1. A method for promoting wound healing comprising

applying to a wound a therapeutically effective amount of a purified thrombin derivative peptide of 23 amino acids in length wherein said peptide includes a

a thrombin receptor binding domain having the sequeace Arg-Gly-Asp-Ala;

a thrombin receptor binding domain having the sequence of Arg-Gly-Asp-Ala;

a serine esterase conserved sequence; and

wherein the Asp-Ala of the thrombin receptor binding domain comprise the first two amino acids of the serine esterase conserved sequence.

**5,500,413**

## PROCESS FOR MANUFACTURE OF 1-DEAMINO-8-D-ARGININE VASOPRESSIN

**Krister Larsson; Thomas Mellbrand; Birgitta Mörnstam, all of Malmö; Jan Roschester, Lund, and Jan-Åke Sköldbäck, Malmö, all of, Sweden, assignors to Ferring AB, Malmo, Sweden**

**Filed Jun. 29, 1993, Ser. No. 84,847**
**Int. Cl.[6] A61K** *38/00;* **C07K** *5/00;7/00;17/00*
**U.S. Cl. 514—15** **15 Claims**

1. A method for synthesis of 1-deamino-8-D-arginine vasopressin, comprising the steps of:

a) preparing the heptapeptide: Mpa($R^1$)-Tyr-Phe-Gln-Asn-Cys($R^2$)-Pro-OH (SEQ ID NO:1), where $R^1$ and $R^2$ are sulfhydryl-protecting groups;

b) condensing the heptapeptide from step (a) with the dipeptide: ($R^3$)-D-Arg(HCl)-Gly-$NH_2$, where $R^3$ is an acid-sensitive, amino-protecting group;

c) forming the nonapeptide: Mpa($R^1$)-Tyr-Phe-Gln-Asn-Cys($R^2$)-Pro-D-Arg(HCl)-Gly-$NH_2$ (SEQ ID NO: 1); and

d) oxidizing the nonapeptide from step (c) with iodine in a protic solvent.

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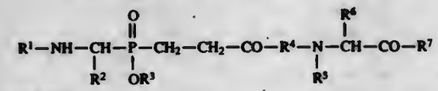
**5,500,414**

## DERIVATIVES OF PEPTIDES USABLE AS INHIBITORS OF BACTERIAL COLLAGENASES

**Vincent Dive, Vincennes; Flavio Toma, Clamart, both of, France, and Athanasios Yiotakis, Athens, Greece, assignors to Commissariat a l'Energie Atomique, Paris, France**

**Continuation of Ser. No. 877,109, May 1, 1992, abandoned. This application Jun. 22, 1994, Ser. No. 264,198**
**Claims priority, application France, May 2, 1991, 91 05403**
**Int. Cl.[6] A61K** *38/00;* **C07K** *5/00;7/00;17/00*
**U.S. Cl. 514—18** **18 Claims**

1. A peptide derivative of the formula



(I)

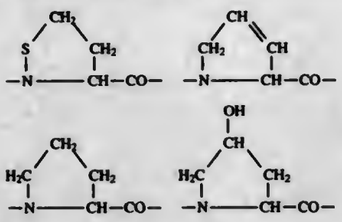
wherein

$R^1$ represents a t-butoxycarbonyl group, a benzyloxycarbonyl group, a cinnamoyl group, a pivaloyl group, a N-9-fluorenylmethoxycarbonyl group, or a group obtained by removing OH from the carboxy terminus of an amino acid or dipeptide whose amino terminus is blocked by a t-butoxycarbonyl group, a benzyloxycarbonyl group, a cinnamoyl group, a pivaloyl group or a N-9-fluorenylmethoxycarbonyl group,

$R^2$ is the side chain of an α-amino acid,

$R^3$ is a hydrogen atom or a metal atom,

$R^4$ is a divalent radical derived from an α-amino acid selected from the group consisting of proline, hydroxyproline, thiazolidine and dehydroproline of formula:



connected to CO by its nitrogen atom,

$R^5$ is a hydrogen atom,

$R^6$ is a $C_1$ to $C_3$ alkyl group and

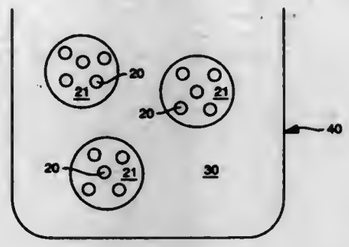
$R^7$ represents $OR^8$ with $R^8$ representing a hydrogen atom or a metal atom.

**5,500,415**

## PROCESS FOR THE PREPARATION OF SPHERULES OF ACTIVE PRINCIPLES AND EMULSIONS CONTAINING THE SPHERULES

**Jean-Marie Dollat, Montlucon; Marc Molin, Neris Les Bains, and Pascal Theullier, Montlucon, all of, France, assignors to Rhone-Poulenc Nutrition Animale, Antony, France**

**Filed Mar. 31, 1994, Ser. No. 220,358**
**Claims priority, application France, Mar. 31, 1993, 93 03728**
**Int. Cl.[6] A61K** *9/16;9/64;* **C07K** *1/32;14/435*
**U.S. Cl. 514—21** **22 Claims**




1. A process for preparing spherules of at least one active principle selected from alimentary principles and medicinal principles which comprises the steps of:

(a) forming a primary oil-in-water emulsion comprising:

particles containing at least one of said active principles in oily form suspended in water, said water containing at least one protein;

(b) achieving controlled division of said primary oil-inwater emulsion by combining said primary oil-in-water emulsion with a water-immiscible solvent to create a second emulsion containing spherules of said primary oil-in-water emulsion;

(c) crosslinking said at least one protein contained in the epherules of said second emulsion by contacting said spherules with a crosslinking agent, wherein said crosslinking agent consists of glutaraldehyde; and

drying said spherules after said step (c) of crosslinking.

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**5,500,416**

## PERCUTANEOUS ABSORPTION PROMOTING AGENT AND DERMATOLOGIC PREPARATION CONTAINING THE SAME

**Kiyoshi Miyazawa; Tadahiro Chiba; Yuhei Iwata; Ubei Tamura; Isao Murotani, and Shuya Tamaki, all of Yokohama, Japan, assignors to Shiseido Company Ltd., Tokyo, Japan**

**Continuation of Ser. No. 850,325, Mar. 10, 1992, abandoned, which is a division of Ser. No. 298,610, Oct. 5, 1988, Pat. No. 5,120,716. This application Sep. 10, 1993, Ser. No. 120,141**
**Claims priority, application Japan, Feb. 23, 1987, 62-39756; Feb. 26, 1987, 62-43954; Mar. 19, 1987, 62-65297; Mar. 19, 1987, 62-65298**
**The portion of the term of this patent subsequent to Jun. 2, 2009, has been disclaimed.**
**Int. Cl.[6] A61K** *31/70;31/66;31/56;31/52;31/505;31/40*
**U.S. Cl. 514—23** **13 Claims**

1. In a dermatological preparation containing a dermatological base, a drug, and a percutaneous absorption promoting agent, the improvement wherein the percutaneous absorption promoting agent comprises (A) at least one anionic surfactant and (B) at least one surfactant having a nitrogen atom in the molecule other than anionic and cationic surfactants as the active ingredients, the mole ratio of the components (A)/(B) being 20/1 to 1/20.



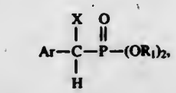
**5,500,417**

## ARYLMETHYLPHOSPHONATES AND PHOSPHONIC ACIDS USEFUL AS ANTI-INFLAMMATORY AGENTS

**Roy A. Johnson, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.**

**Continuation-in-part of Ser. No. 964,618, Oct. 22, 1992, abandoned, which is a continuation-in-part of Ser. No. 954,093, Sep. 30, 1992, abandoned, which is a continuation-in-part of Ser. No. 65,056, May 20, 1993, abandoned, which is a continuation of Ser. No. 949,738, Sep. 23, 1992, abandoned. This application Mar. 16, 1995, Ser. No. 403,229**
**Int. Cl.[6] A61K** *31/66;31/675;31/685*
**U.S. Cl. 514—89** **15 Claims**

1. A method for treating arthritis or inflammation comprising administering a therapeutically effective amount of a compound of Formula I



(I)

wherein

$R_1$ is independently selected from the group consisting of hydrogen, $Na^+$, $K^+$, $NH_4^+$, $(R_2)_4N^+$, $C_1$–$C_{10}$ alkyl, $—CH_2C_6H_5$, $—C_6H_5$ or adjacent $R_1$ can be taken together to form $—CH_2(CH_2)_pCH_2—$ or $—CH_2C(CH_3)_2CH_2—$(where p is 0–2);

Ar is

(a) 1- or 2-naphthyl, 2-, 3-, or 4-pyridinyl, 1-, 2-, or 9-anthryl, 1-, 2-, 3-, 4-, or 9-phenanthryl, 1-, 2-, or 4-pyrenyl, biphenyl,

(b) phenyl substituted with 1 through 5 —F,

(c) phenyl substituted with 1 through 3 –Cl, —Br, $—R_2$, or $—OR_2$,

(d) phenyl substituted with $—CF_3$, —COOH, $—COOR_2$, $—OCOR_2$, $—SO_2NH_2$, $—SO_2NR_2$, $—N(R_2)_2$, $—NHSO_2R_2$, $—NHCOOR_2$, —CN,

(e) 1- or 2-naphthyl substituted with —F, —Cl, —Br, —I, $—R_2$, —OH, $—CF_3$, —COOH, $—COOR_2$, $—OCOR_2$, $—SO_2NH_2$, $—NHSO_2R_2$, or $—NHCOR_2$;

X is independently hydrogen, —OH, —Br, —F or —Cl; and

$R_2$ is $C_1$–$C_{18}$ alkyl;

to a patient in need thereof.

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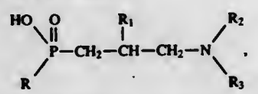
**5,500,418**

## AMINOALKANEPHOSPHINIC ACIDS AND SALTS THEREOF

**Stuart J. Mickel, Lausen, Switzerland, assignor to Ciba-Geigy Corporation, Tarrytown, N.Y.**

**Division of Ser. No. 979,513, Nov. 19, 1992, Pat. No. 5,376,684. This application Sep. 16, 1994, Ser. No. 308,040**
**Claims priority, application Switzerland, Nov. 21, 1991, 3404/91**
**Int. Cl.[6] A61K** *31/665;* **C07F** *9/30;* **C07D** *221/00*
**U.S. Cl. 514—100** **9 Claims**

1. A compound of formula I



(I)

wherein

R is cyclohexylmethyl, $R_1$ is hydroxy and $R_2$ is 3,4-methylenedioxybenzyl, or 1-(3,4-methylenedioxyphenyl)ethyl, and $R_3$ is hydrogen, or

R is benzyl, $R_1$ is hydroxy, $R_2$ is 1-(3,4-methylenedioxyphenyl) ethyl, and $R_3$ is hydrogen,

or a salt thereof.

**5,500,419**

## NMDA ANTAGONISTS

**Jeffrey P. Whitten, and Bruce M. Baron, both of Cincinnati, Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio**

**Continuation of Ser. No. 229,250, Apr. 18, 1994, abandoned, which is a division of Ser. No. 917,723, Jul. 20, 1992, Pat. No. 5,326,756, which is a continuation of Ser. No. 790,291, Nov. 8, 1991, abandoned, which is a division of Ser. No. 553,431, Jul. 20, 1990, Pat. No. 5,095,009, which is a continuation-in-part of Ser. No. 508,333, Apr. 11, 1990, abandoned, which is a continuation-in-part of Ser. No. 409,478, Sep. 19, 1989, abandoned. This application Dec. 20, 1994, Ser. No. 359,678**
**Int. Cl.[6] A61K** *31/675*
**U.S. Cl. 514—114** **1 Claim**

1. A pharmaceutical composition for preventing or minimizing damage to nervous tissues contained within the central nervous system resulting from exposure to ischemic or hypoxic conditions comprising R-4-oxo-5-phosphononorvaline, a pharmaceutically acceptable acid addition salt thereof, a pharmaceutically acceptable basic addition salt thereof, or a tautomer thereof; in admixture with a pharmaceutically acceptable carrier and said R- 4-oxo-5-phosphononorvaline is present in an amount effective to prevent or minimize said damage.

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**5,500,420**

## METABOTROPIC GLUTAMATE RECEPTOR AGONISTS IN THE TREATMENT OF CEREBRAL ISCHEMIA

**Kenneth Maiese, New York, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.**

**Filed Dec. 20, 1993, Ser. No. 169,651**
**Int. Cl.[6] A61K** *31/66;31/41;31/42;31/13*
**U.S. Cl. 514—131** **15 Claims**

1. A method of treatment of a subject currently afflicted with a stroke or previously afflicted with an ischemic event, said method comprising administering to said subject of a therapeutically effective amount of a metabotropic glutamate receptor agonist.

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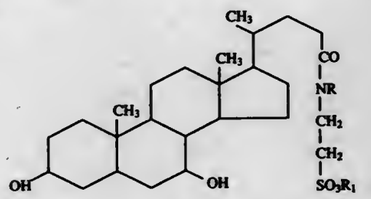
**5,500,421**

## N-ALKYL-TAUROURODEOXYCHOLIC ACIDS AND THEIR THERAPEUTICALLY ACTIVE DERIVATIVES

**Massimo Parenti, Novi Ligure (Alessandria), Italy, assignor to Prodotti Chimici Alimentari SPA, Basaluzzo, Italy**

**Continuation of Ser. No. 870,372, Apr. 17, 1992, abandoned. This application Feb. 15, 1994, Ser. No. 196,790**
**Claims priority, application Italy, Apr. 17, 1991, MI91A1059**
**Int. Cl.[6] A61K** *31/575;* **C07J** *9/00*
**U.S. Cl. 514—182** **3 Claims**

1. A conjugated derivative of tauroursodeoxycholic acid of the formula



wherein R is $C_2$–$C_4$ alkyl and $R_1$ is hydrogen, an alkali metal, an alkaline earth metal or a radical of a basic amino acid.

5,500,422

## BENZAMIDE DERIVATIVE

Yasuo Ito, Katsuyama; Hideo Kato, Fukui; Shingo Yasuda, Katsuyama; Nobuhiko Iwasaki, Katsuyama; Hiroyuki Nishino, Katsuyama, and Makoto Takeshita, Katsuyama, all of, Japan, assignors to Hokuriku Seiyaku Co. Ltd., Katsuyama, Japan

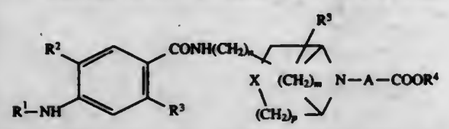
Division of Ser. No. 104,095, Aug. 11, 1993, Pat. No. 5,395,832. This application Nov. 28, 1994, Ser. No. 348,808

Claims priority, application Japan, Feb. 15, 1991, 3-42425; Aug. 22, 1991, 3-233756

Int. Cl.[6] C07D *211/36;* A61K *31/445*

U.S. Cl. 514—212 6 Claims

1. A benzamide derivative represented by the following formula:



wherein, $R^1$ represents a hydrogen atom or a lower alkanoyl group; $R^2$ represents a hydrogen atom or a halogen atom; $R^3$ represents a lower alkoxy group; $R^4$ represents a hydrogen atom or a lower alkyl group; $R^5$ represents a hydrogen atom, a lower alkyl group, or a lower alkoxy group; A represents $C_1$–$C_7$ alkylene group which may optionally be substituted with a lower alkyl group; X represents a methylene group, an oxygen atom, or a sulfur atom; m represents an integer of n represents an integer of from 0 to 3; and p represents an integer of from 0 to 2, and a pharmacologically acceptable salt thereof.

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5,500,423

## 5,6-DIHYDRO-4H-IMIDAZO[4,5,1-IJ]QUINOLINES

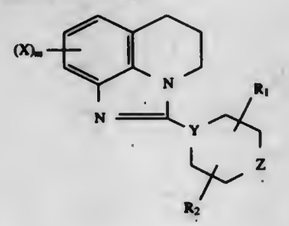
Edward J. Glamkowski, Warren, and Brian S. Freed, Phillipsburg, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Sep. 9, 1994, Ser. No. 304,041

Int. Cl.[6] A61K *31/54;31/535;31/495;* C07D *471/06*

U.S. Cl. 514—228.2 27 Claims

1. A compound of the formula

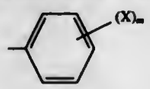


wherein

(a) X is hydrogen, loweralkyl, loweralkoxy, halogen, or trifluoromethyl, and m is 1 or 2 when X is other than hydrogen;

(b) $R_1$ is hydrogen or loweralkyl;

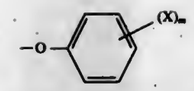
(c) $R_2$ is hydrogen, loweralkyl, or a group of the formula



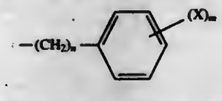
wherein X and m are as above;

(d) Y is CH or N;

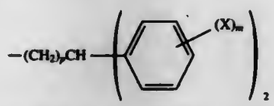
(e) Z is O, S, $CHR_3$, wherein $R_3$ is hydrogen, a group of the formula



wherein X and m are as above, or a group of the formula $N(R_4)_2$ wherein $R_4$ is loweralkyl, or Z is $NR_5$ wherein $R_5$ is hydrogen, loweralkyl, a group of the formula



wherein X and m are as above and n is 0, 1, or 2, a group of the formula



wherein X and m are as above and p is 0, 1, 2 or 3, a group of the formula $R_6CO$— wherein $R_6$ is hydrogen or loweralkyl, or a group of the formula $R_7OCO$— wherein R7 is loweralkyl; with the provisos that when Y is N, X is not loweralkoxy and when Y is CH, Z is not $CHR_3$ wherein $R_3$ is hydrogen; a pharmaceutically acceptable salt thereof, or the geometric or the optical isomers thereof.

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5,500,424

## PYRIMIDINE AND PYRIDINE DERIVATIVES, THEIR PRODUCTION AND USE

Masashi Nagamine, Gose; Kenji Yamamoto, Kawachinagano; Kenji Horiuchi, Daito; Yoshimitsu Matsui, Kawachinagano, and Masanori Yoshida, Hashimoto, all of, Japan, assignors to Nihon Nohyaku Co., Ltd., Tokyo, Japan

Filed Aug. 12, 1994, Ser. No. 288,699

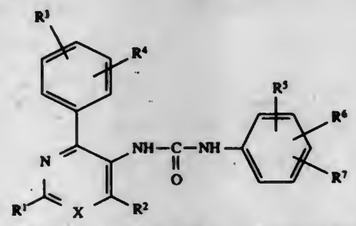
Claims priority, application Japan, Aug. 13, 1993, 5-222085

Int. Cl.[6] A61K *31/535;31/54;31/495;31/505;31/44;* C07D *417/00;413/00;403/00;213/02;401/00;211/72*

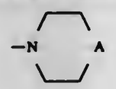
U.S. Cl. 514—235.5 6 Claims

1. A pyrimidine or pyridine derivative represented by the formula (I):

(I)



wherein $R^1$ is a lower alkyl group, a lower cycloalkyl group, a lower alkoxy group, an aliphatic cyclic amino group which may be substituted by one or more lower alkyl groups, the said aliphatic cyclic amino group is selected from the group consisting of pyrrolidino, piperidino, and the group represented by the formula





wherein A represents —O—, —S—, —N(R)— in which R represents hydrogen atom or a lower alkyl group, or a phenyl group which may be substituted by one or more halogen atoms provided that $R^1$ is a group other than said aliphatic cyclic amino group when X is =CH—, $R^2$ is a hydrogen atom or a lower alkyl group, $R^3$ and $R^4$, which may be the same or different, are hydrogen atoms, halogen atoms, lower alkyl groups, lower haloalkyl groups, lower alkoxy groups or lower alkylthio groups, $R^5$, $R^6$ and $R^7$, which may be the same or different, are hydrogen atoms, halogen atoms, lower alkyl groups, lower haloalkyl groups, lower alkoxy groups, lower alkylthio groups or lower dialkylamino groups, and X is =N— or =CH—; or

a pharmaceutically acceptable salt thereof.

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5,500,425

## CHROMAN DERIVATIVES AND A METHOD OF TREATING 5-HT MEDIATED DISORDERS

Lars-Gunnar Larsson, Hölö ; Lucy A. Renyl, Skärholmen; Svante B. Ross; Daniel D. Sohn, both of Södertälje, and Seth-Olov Thorberg, Järna, all of, Sweden, assignors to Aktiebolaget Astra, Sodertalje, Sweden

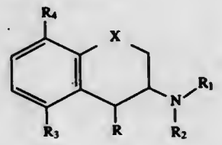
Continuation of Ser. No. 144,671, Oct. 28, 1993, Pat. No. 5,420,151, which is a continuation-in-part of Ser. No. 957,214, Oct. 6, 1992, abandoned, and Ser. No. 780,531, Oct. 18, 1991, abandoned, which is a continuation-in-part of Ser. No. 633,247, Dec. 21, 1990, abandoned, said Ser. No. 957,214is a continuation-in-part of Ser. No. 780,531, Dec. 21, 0. This application Sep. 9, 1994, Ser. No. 304,108

Claims priority, application Sweden, Dec. 22, 1989, 8904361; Jan. 8, 1991, 9102905; Jun. 29, 1992, 9202000

Int. Cl.[6] A61K *31/535;31/495;31/50;31/40*

U.S. Cl. 514—233.5 5 Claims

1. A compound of the formula



wherein

X is O;

R is hydrogen, or $C_1$–$C_6$ alkyl;

$R_1$ is hydrogen, $C_1$–$C_6$ alkyl or $C_2$–$C_6$ alkenyl;

$R_2$ is hydrogen, $C_1$–$C_6$ alkyl, $C_2$–$c_6$ alkenyl, or $C_1$–$C_4$ alkylaryl wherein the aryl moiety may contain 1 or 2 heteroatoms selected from the group consisting of N, O and S and may optionally be substituted by halogen, CN, $CF_3$, $C_1$–$C_6$ alkyl, $C_2$–$C_6$ alkenyl or $C_1$–$C_4$ alkoxy;

$R_3$ is a 5- or 6-membered aryl which contains 1 or 2 heteroatoms selected from the group consisting of N, O or S and which is optionally substituted by one or more substituents independently selected from the group consisting of halogen, CN, $CF_3$, $C_1$–$C_6$ alkyl, $C_2$–$C_6$ alkenyl and $C_1$–$C_4$ alkoxy; or an enantiomer or a salt thereof;

$R_4$ is hydrogen;

or an enantiomer or a salt thereof.

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5,500,426

## SUBSTITUTED PIPERAZINES FOR TREATMENT OF NON-INSULIN-DEPENDANT DIABETES

Jean-Jacques Godfroid, Paris; Azzdine Lamouri, Bagneux; Estera Touboul, Paris; Xuan Wang, L'Hay les Roses; Pierre Renard, Versailles; Bruno Pfeiffer, Esaubonne, and Béatrice Guardiola, Saint Cloud, all of, France, assignors to Adir et Compagnie, Courbevoie, France

Division of Ser. No. 278,396, Jul. 21, 1994. This application Apr. 19, 1995, Ser. No. 425,953

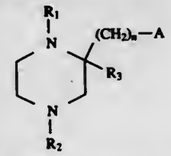
Claims priority, application France, Jul. 23, 1993, 93 09088

Int. Cl.[6] A61K *31/495;31/535;* C07D *403/04;413/04*

U.S. Cl. 514—252 7 Claims

1. A method for treating a mammal afflicted with a disease requiring a compound which improves glucose tolerance, resulting from non-insulin-dependent diabetes, comprising the step of administering to said mammal an amount of a compound selected from those of formula (I):

(I)



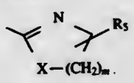
in which

$R_1$ and $R_2$, each independently of the other, are selected from hydrogen, alkyl, cycloalkyl, monocyclo-alkylalkyl, dicycloalkylalkyl, aryl, and arylalkyl, each of those radicals being optionally substituted,

$R_3$ is selected from hydrogen and alkyl,

n has a value selected from 0, 1 and 2, and

A represents



in which

X is N—$R_4$,

m has a value selected from 1 and 2,

$R_4$ is selected from hydrogen and optionally substituted alkyl, alkoxycarbonyl and aryloxycarbonyl, and

$R_5$ is selected from hydrogen and alkyl,

wherein:

the terms "alkyl", "alkoxy", "monocyclo-alkylalkyl", "dicycloalkylalkyl", "arylalkyl" and "alkoxycarbonyl" denote radicals the hydrocarbon chain of which has 1 to 10 carbon atoms inclusive in a straight or branched chain,

the term "cycloalkyl" denotes a cyclic hydrocarbon radical having 3 to 8 carbon atoms inclusive,

the terms "aryl", "arylalkyl", and "aryloxycarbonyl" relate to radicals the aromatic part of which is selected from phenyl and naphthyl, and

the expression "optionally substituted" means that the radicals so described may be substituted by one or more chemical entities selected from alkyl, hydroxy, alkoxy, halogen haloalkyl, polyhaloalkyl, nitro, amino, alkylamino, and polyalkylamino, their stereoisomers, N-oxides, and pharmaceutically-acceptable acid or base addition salts, which is effective for alleviation of said disease.

**5,500,427**

## CYCLIC COMPOUNDS AND THEIR USE

**Keiji Kubo, Osaka; Yoshiyuki Inada, and Takehiko Naka, both of Hyogo, all of, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan**

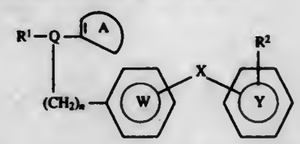
**Filed Sep. 14, 1993, Ser. No. 120,450**

**Claims priority, application Japan, Sep. 14, 1992, 4-245308; Dec. 24, 1992, 4-343855**

**Int. Cl.[6] C07D 413/12; A61K 31/41**

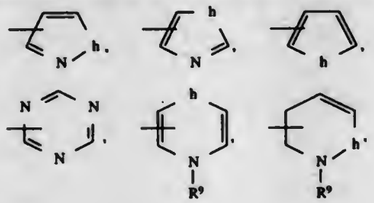
**U.S. Cl. 514—256** **34 Claims**

1. Compounds represented by the formula

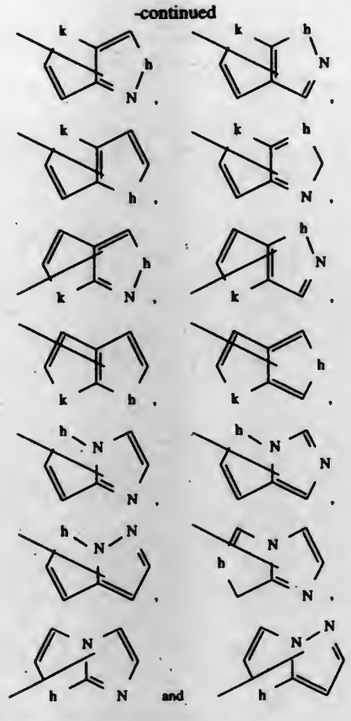


wherein $R^1$ is a $C_{1-8}$ alkyl, $C_{2-8}$ alkenyl, $C_{2-8}$ alkynyl, $C_{3-6}$ cycloalkyl or $C_{3-6}$ cycloakenyl which may be substituted with hydroxy, amino, N—$C_{1-4}$ alkylamino, N,N—di—$C_{1-4}$ alkylamino, halogen, $C_{1-4}$ alkoxy or $C_{1-4}$ alkylthio, aryl or aralkyl group which may be substituted with halogen, nitro, an optionally substituted amino, $C_{1-4}$ alkoxy, $C_{1-4}$ alkythio or $C_{1-4}$ alkyl and which may be bound through a group of the formula: —N(R)[9]— wherein $R^9$ is hydrogen or an optionally substituted $C_{1-4}$ alkyl group, —O— or —S(O)$_m$— wherein m is an integer of 0 to 2, or a $C_{1-8}$ alkanoyl, $C_{3-8}$ alkenoyl, $C_{3-8}$ alkynoyl, or $C_{4-7}$ cycloalkylcarbonyl group which may be substituted with hydroxyl, amino, N—$C_{1-4}$ alkylamino, N,N—di—$C_{1-4}$ alkylamino, halogen, $C_{1-4}$ alkoxy or $C_{1-4}$ alkylthio group; $R^2$ is a 5–7 membered heterocyclic residue having, as a group capable of constituting the ring, a carbonyl group, thiocarbonyl group, or an optionally oxidized sulfur atom which may be substituted with a group of the formula:

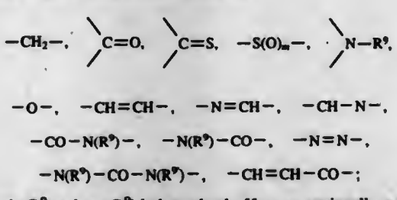
1) —CH($R^4$)—OCO$R^5$, wherein $R^4$ is hydrogen, $C_{1-6}$ alkyl, $C_{2-6}$ alkenyl or $C_{3-8}$ cycloalkyl, and $R^5$ is $C_{1-6}$ alkyl, $C_{2-6}$ alkenyl, $C_{3-8}$ cycloalkyl, $C_{1-3}$ alkyl substituted with $C_{3-8}$ cycloalkyl, $C_{2-3}$ alkenyl substituted with $C_{3-8}$ cycloalkyl, optionally substituted aryl $C_{1-6}$ alkoxy, $C_{2-8}$ alkenyloxy, $C_{3-8}$ cycloalkoxy, $C_{1-3}$ alkoxy substituted with $C_{3-8}$ cycloalkyl, $C_{2-3}$ alkenyloxy substituted with $C_{3-8}$ cycloalkyl or optionally substituted aryloxy,
2) an optionally substituted alkyl,
3) acyl,
4) halogen,
5) nitro,
6) cyano,
7) $C_{1-4}$ alkoxy or 8) optionally substituted amino; Q is CH or N; X is a direct bond or a divalent atomic chain having a straight chain of an atomic length of two or less between the ring Y and the ring W, and may have a side chain; rings W and Y are each an aromatic hydrocarbon residue or 4–7 membered hetero-cyclic residue containing one or more of N, S or O, which may be substituted with halogen, nitro, cyano, $C_{1-4}$ alkoxy or an optionally substituted amino group; n is an integer of 1 or 2; the ring A is a 5–8 membered cyclic hydrocarbon residue or heterocyclic ring having at least one unsaturated bond selected from the group consisting of



-continued



wherein h and k independently stand for



wherein $R^9$ and are $R^{9a}$ independently H or an optionally substituted $C_{1-4}$ alkyl group and m is an integer of 1to 2, which may be substituted with

1) an optionally esterified or amidated carboxyl, tetrazolyl, trifluoro-methanesulfonic acid amide, phosphoric acid or sulfonic acid, wherein said groups may be protected with an optionally substituted lower alkyl group or acyl group,
2) halogen,
3) nitro,
4) cyano,
5) optionally substituted amino,
6) a group represented by the formula: —U—$R^6$, wherein U stands for a bond, — O—, —S— or —CO— and $R^6$ stands for hydrogen, an optionally substituted lower alkyl group, a group represented by the formula: —($CH_2$)$_r$—CO—D', wherein D' stands for hydrogen, hydroxyl group, amino, N—$C_{1-4}$ alkylamino, N-N-di-$C_{1-4}$ alkylamino, $C_{1-6}$ alkoxy group whose alkyl moiety is optionally substituted with hydroxyl, optionally substituted amino, halogen, $C_{1-6}$ alkoxy, $C_{1-6}$ alkylthio, optionally substituted dioxolenyl, or a group represented by the formula —O—CH($R^7$)OCO$R^8$, wherein $R^7$ stands for hydrogen, $C_{1-6}$ alkyl group or $C_{3-7}$ cycloalkyl group, and $R^8$ stands for $C_{1-6}$ alkyl group, $C_{2-8}$ alkenyl group, $C_{5-7}$ cycloalkyl group, $C_{1-3}$ alkyl group substituted with $C_{5-7}$ cycloalkyl group or aryl group, $C_{2-3}$ alkenyl group substituted with $C_{5-7}$ cycloalkyl or aryl group, optionally substituted aryl group, $C_{1-6}$ alkoxy group, $C_{2-8}$ alkenyloxy group, $C_{5-7}$ cycloalkoxy group, $C_{1-3}$ alkoxy group substituted with $C_{5-7}$ cycloalkyl or aryl group, $C_{2-3}$ alkenyloxy group substituted with $C_{5-7}$ cycloalkyl or aryl group or aryloxy group, and l denotes 0 or 2, and two of the substituents are optionally bonded to each other to form a ring; or a salt thereof.



**5,500,428**

## FURYL-SUBSTITUTED PURINES AND ADENOSINE ANTAGONISTS

**Michael H. Block, Congleton; Alison Harrison, Broken Cross, and Rodney B. Hargreaves, Poynton, all of, England, assignors to Imperial Chemical Industries PLC, London, England**

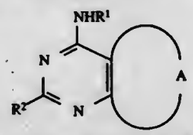
**Division of Ser. No. 979,019, Nov. 20, 1992, Pat. No. 5,300,509. This application Jan. 13, 1994, Ser. No. 181,202**

**Claims priority, application United Kingdom, Nov. 25, 1991, 9125001**

**Int. Cl.[6] A61K 31/52; C07D 473/34**

**U.S. Cl. 514—266** **9 Claims**

1. A compound of the formula I wherein:



(I)

$R^1$ is hydrogen, (1–6C)alkyl, or (1–4C)alkanoyl;
$R^2$ is hydrogen, cyano or a group of formula $R^3X$;
$R^3$ (when not as hereinbelow defined together with X) is (3–12C)cycloalkyl, (3–6C)alkenyl, phenyl(3–6C)alkenyl, 5- or 6-membered heteroaryl, optionally substituted (1–6C)alkyl or optionally substituted phenyl,
said optionally substituted alkyl being unsubstituted or substituted by one of (3–6C)cycloalkyl, optionally substituted 5- or 6-membered heteroaryl, optionally substituted phenyl and a group of formula $R^4(CO)_nX_a(CO)_m$ in which $R^4$ is (1–6C)alkyl, (3–6C)cycloalkyl, optionally substituted phenyl or optionally substituted phenyl(1–4C)alkyl, n and m are each 0 or 1, provided that n+m is 0 or 1, and that when m is 0, X and $X_a$ are separated by at least two carbon atoms, $X_a$ is oxy, thio, sulphinyl, sulphonyl or an imino group of formula —NRb in which Rb is hydrogen, (1–6C)alkyl or together with $R^4$ and the adjacent nitrogen atom forms a 4 to 6-membered saturated heterocyclic ring,
said optionally substituted 5- or 6-membered heteroaryl being unsubstituted or substituted by 1 or 2 of (1–4C)alkyl, (1–4C)alkoxy and halogeno,
and any of said optionally substituted phenyl being unsubstituted or substituted by (1–4C)alkylenedioxy or by 1,2 or 3 of halogeno, cyano, trifluoromethyl, (1–4C)alkoxycarbonyl, hydroxy, hydroxymethyl, amino, (1–4C)alkanoylamino, (1–4C)alkoxymethyl, (1–4C)alkanoyloxy, benzyloxy, halogenobenzyloxy, (1–4C)alkylsulphonylamino, (1–4C)haloalkylsulphonylamino, nitro, and (1–4C)alkyl or alkoxy optionally bearing a group of formula $R^5CO$ in which $R^5$ is (1–4C)alkoxy, (3–6C)alkylamino, (3–6C)cycloalkylamino or (N-(1–4C)alkyl) (N-(1–4C) dialkylamino(1–4C)alkyl)amino, and sulphamoyl of formula —$SO_2$.$NR^6R^7$ in which $R^6$ and $R^7$ are independently hydrogen or (1–4C)alkyl, or $R^6$ is hydrogen and $R^7$ is ((2–5C)alkoxycarbonyl)-($CH_2$)q—, carbamoyl($CH_2$)q or (N-(1–4C)alkylcarbamoyl) ($CH_2$) q, in which q is 0 or an integer of from 1 to 4 or $R^6$ is (1–4C)alkyl and $R^7$ is di(1–4C)alkylamino (1–4C)alkyl; and
X is a direct bond or oxy, thio, sulphinyl, sulphonyl or an imino group of formula —NRa— in which Ra is hydrogen, (1–6C)alkyl or together with $R^3$ and the adjacent nitrogen atom forms a 4 to 6-membered saturated heterocyclic ring;
A is —N=CQ—NR[8]—;
Q is 2-furyl; and
$R^8$ is hydrogen or (1–4C)alkyl; provided that when $R^1$ and $R^2$ are hydrogen and A is —N=CQ—NR[8]—, $R^8$ is not hydrogen; or a pharmaceutically acceptable salt thereof.

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**5,500,429**

## CALCIUM UPTAKE INHIBITORS

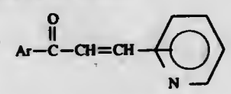
**Robert J. Dinerstein; Michael L. Edwards, both of Cincinnati; David M. Stemerick, Fairfield, and Keith A. Dickenna, West Chester, all of Ohio, assignors to Merrell Pharmaceuticals Inc., Cincinnati, Ohio**

**Continuation of Ser. No. 892,681, Jun. 1, 1992, abandoned, which is a continuation of Ser. No. 585,412, Sep. 20, 1990, abandoned. This application Nov. 17, 1993, Ser. No. 154,146**

**Int. Cl.[6] A61K 31/44; C07D 471/04;213/50;213/643**

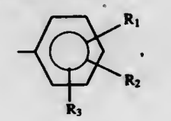
**U.S. Cl. 514—277** **20 Claims**

1. A compound of the formula:



(1)

wherein:
Ar is a radical of the formulae:



wherein
$R_1$, $R_2$ and $R_3$ are each halogen; or $R_1$, $R_2$ and $R_3$ represents hydrogen with the proviso that one of said terms represents trifluoromethyl $C_1$–$C_6$ alkyl-sulfide or — $N(Y_1)(Y_2)$, wherein $Y_1$ and $Y_2$ independently represent a $C_1$–$C_6$ alkyl; or is a pharmaceutically acceptable salt thereof.

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**5,500,430**

## AMIDIC DERIVATIVES OF GLUTAMIC, ASPARTIC AND 2-AMINO ADIPIC ACIDS, A PROCESS FOR PREPARING SAME, AND ANTI-GASTRIN COMPOSITION CONTAINING THE DERIVATIVES

**Francesco Makovec; Luigi A. Rovati, and Lucio C. Rovati, all of Monza, Italy, assignors to Rotta Research Laboratorium S.p.A., Milan, Italy**

**PCT No. PCT/EP91/02342, § 371 Date Jun. 10, 1993, § 102(e) Date Jun. 10, 1993, PCT Pub. No. WO92/10479, PCT Pub. Date Jun. 25, 1992**

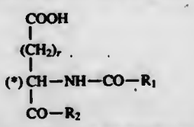
**PCT Filed Dec. 6, 1991, Ser. No. 74,818**

**Claims priority, application Italy, Dec. 11, 1990, 67995 A/90**

**Int. Cl.[6] A61K 31/46; C07D 221/20**

**U.S. Cl. 514—278** **10 Claims**

1. A compound represented by the following formula (I):



(I)

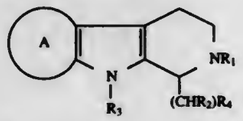
wherein r is from 1 to 3, $R_1$ is an substituted or unsubstituted aryl group, $R_2$ is a 8-azaspiro(4.5)decan 8-yl group or a 3-azaspiro(5.5)undecan-3-yl group, wherein said compound has a chiral center marked with an asterisk in said formula (I), thus forming a racemic (R,S) form or an isomeric form, or a pharmaceutically acceptable salt thereof.

## 5,500,431
## TETRAHYDRO-β-CARBOLINES

James E. Audia; James J. Droste, both of Indianapolis, Ind.; Deborah A. Evrard, Cambridge, Mass.; Pawel Fludzinski, Berkshire, United Kingdom; Gwyn L. Murdoch, Greenwood, and David L. Nelson, Carmel, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

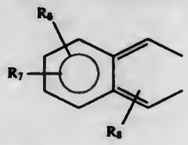
Continuation-in-part of Ser. No. 48,544, Apr. 14, 1993, abandoned. This application Mar. 11, 1994, Ser. No. 206,839
Int. Cl.[6] A61K *31/44*; C07D *471/04*
U.S. Cl. 514—280 9 Claims

1. A compound of the formula (I)



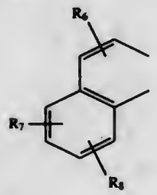
(I)

wherein:
$R_1$ is hydrogen or $C_1$–$C_3$ alkyl;
$R_2$ is hydrogen or $C_1$–$C_6$ alkyl;
$R_3$ is hydrogen or $C_1$–$C_3$ alkyl;
$R_4$ is $C_5$–$C_8$ cycloalkyl, substituted $C_5$–$C_8$ cycloalkyl, $C_5$–$C_8$ cycloalkenyl, substituted $C_5$–$C_8$ cycloalkenyl;
A is selected from the group consisting of



(II)

and



(III)

wherein
$R_6$ is selected from the group consisting of hydrogen, $C_1$–$C_6$ alkyl, $C_2$–$C_6$ alkenyl, halo, halo($C_1$–$C_6$)alkyl, halo($C_2$–$C_6$)alkenyl, $COR_5$, $C_1$–$C_{10}$ alkanoyl, $CO_2R_5$, $(C_1$–$C_6$ alkyl)$_m$ amino, $NO_2$, —$SR_5$, or $OR_5$;
each $R_5$ is independently hydrogen or $C_1$–$C_4$ alkyl;
$R_7$ is $C_1$–$C_4$ alkyl;
$R_8$ is further selected from the group consisting of an $R_6$ group, substituted $C_3$–$C_8$ cycloalkyl, $C_5$–$C_8$ cycloalkyl, $C_5$–$C_8$ cycloalkyl-($C_1$–$C_3$)alkyl, $C_5$–$C_8$ cycloalkenyl, substituted $C_5$–$C_8$ cycloalkenyl, $C_5$–$C_8$ cycloalkenyl-($C_1$–$C_3$)alkyl, $C_7$–$C_{16}$ arylalkyl; or
$R_6$ and $R_7$ together with the carbon atoms of group A form a 5- to 8-member carbon ring; and
m is 1 or 2; or
a pharmaceutically acceptable salt or solvate thereof.

## 5,500,432
## INDUCTION AND INHIBITION OF APOPTOSIS

K. C. Nicolaou, La Jolla; Andrew Hiatt, San Diego, and Wolfgang Wrasidlo, La Jolla, all of Calif., assignors to The Scripps Research Institute, La Jolla, Calif.

Continuation-in-part of Ser. No. 939,104, Sep. 1, 1992, Pat. No. 5,281,710, which is a continuation-in-part of Ser. No. 886,984, May 21, 1992, Pat. No. 5,276,159, which is a continuation-in-part of Ser. No. 788,225, Nov. 5, 1991, abandoned, which is a continuation-in-part of Ser. No. 734,613, Jul. 23, 1991, abandoned, which is a continuation-in-part of Ser. No. 673,199, Mar. 21, 1991, abandoned, which is a continuation-in-part of Ser. No. 562,269, Aug. 1, 1990, abandoned. This application Apr. 14, 1993, Ser. No. 46,626
Int. Cl.[6] A61K *31/44*
U.S. Cl. 514—281 4 Claims

1. A method for inducing apoptosis within a leukocyte, the method employing the step of contacting the leukocyte with an unstable dynemicin-like enediyne for inducing apoptosis of the leukocyte, apoptosis of the leukocyte being induced by binding the unstable dynemicin-like enediyne to a proteinaceous material within the leukocyte and triggering a Bergman reaction,
the unstable dynemicin-like enediyne including an enediyne susceptible to the Bergman reaction upon triggering,
the unstable dynemicin-like enediyne including a trigger attached thereto for triggering the Bergman reaction within the unstable dynemicin-like enediyne, the trigger being activatable at intracellular alkaline pH,
the unstable dynemicin-like enediyne having a binding specificity for a proteinaceous material within the leukocyte.

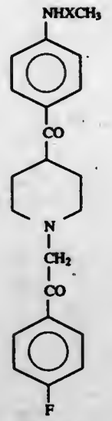
## 5,500,433
## METHOD OF TREATING DRUG ABUSE

Albert A. Carr; Richard C. Dage; John E. Koerner; Tung Li, all of Cincinnati; Francis P. Miller, Loveland; Thaddeus R. Nieduzak, Golf Manor; Mark W. Dudley, Somerville; Christopher J. Schmidt, Oregonia, and Robert A. Frank, Cincinnati, all of Ohio, assignors to Merrell Pharmaceuticals Inc., Cincinnati, Ohio

Continuation of Ser. No. 220,411, Mar. 30, 1994, abandoned, which is a continuation of Ser. No. 52,848, Apr. 26, 1993, abandoned, which is a continuation of Ser. No. 930,490, Aug. 14, 1992, abandoned, which is a continuation of Ser. No. 819,550, Jan. 10, 1992, abandoned, which is a division of Ser. No. 673,888, Mar. 22, 1991, abandoned, which is a continuation-in-part of Ser. No. 604,651, Nov. 1, 1990, abandoned, which is a continuation-in-part of Ser. No. 454,497, Dec. 21, 1989, abandoned. This application Jan. 10, 1995, Ser. No. 371,063
Int. Cl.[6] A61K *31/445*
U.S. Cl. 514—330 3 Claims

1. A method for the treatment of drug abuse comprising administering a compound of the formula:





FORMULA I

in which X is represented by CO or $SO_2$, or a pharmaceutically acceptable acid addition salt thereof, to a patient in need thereof wherein said drug of abuse is alcohol, nicotine an opiate or a psychostimulant.

## 5,500,434
## COMBINATION OF ANGIOTENSIN-CONVERTING ENZYME INHIBITORS WITH CALCIUM ANTAGONISTS AS WELL AS THEIR USE IN DRUGS

Reinhard Becker, Wiesbaden; Henning: Rainer, Hattersheim am Main; Wolfgang Rüger, Kelkheim; Volker Teetz, Hofheim am Taunus, and Hansjörg Urbach, Kronberg/Taunus, all of, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 811,149, Dec. 20, 1991, abandoned, which is a division of Ser. No. 358,427, May 30, 1989, Pat. No. 5,098,910, which is a continuation of Ser. No. 102,660, Sep. 30, 1987, abandoned. This application Apr. 11, 1994, Ser. No. 225,762
Claims priority, application Germany, Jan. 2, 1986, 36 33 496.0
Int. Cl.[6] A61K *31/44*;*31/40*
U.S. Cl. 514—356 5 Claims

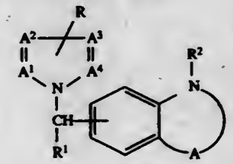
1. A pharmaceutical composition, comprising a) 1-[N-(1-S-1-[N-(1-S-ethoxycarbonyl-3-phenylpropyl)-S-alanyl]-(2S,3aR,7aS)-octahydro[1H]indole-2-S-carboxylic acid (trandolapril) or a physiologically acceptable salt thereof in combination with b) 4-( 2,3-dichlorophenyl)-2,6-dimethyl-3-methoxycarbonyl-5-ethoxycarbonyl- 1,4-dihydropyridine (felodine) or a physiologically acceptable salt thereof, wherein a) and b) are present in a combined amount more effective to lower blood pressure than the individual amounts of either a) or b) administered separately.

## 5,500,435
## METHOD OF TREATING EPITHELIAL DISORDERS

Jean P. F. Van Wauwe, and Alfons H. M. Raeymaekers, both of Beerse, Belgium, assignors to Janssen Pharmaceutica, N.V., Beerse, Belgium

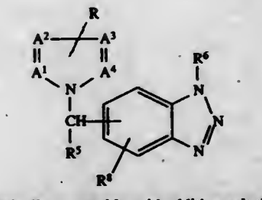
Division of Ser. No. 233,491, Apr. 26, 1994, Pat. No. 5,420,147, which is a division of Ser. No. 927,571, Aug. 10, 1992, Pat. No. 5,342,957, which is a division of Ser. No. 434,962, Nov. 13, 1989, Pat. No. 5,157,046, which is a continuation-in-part of Ser. No. 277,152, Nov. 29, 1988, abandoned. This application Mar. 23, 1995, Ser. No. 409,369
Int. Cl.[6] A61K *31/415*
U.S. Cl. 514—394 12 Claims

1. A method of treating subjects suffering from psoriasis which comprises the systemic administration to said subjects of an effective amount of a compound of formula



(I)

or



(II)

a pharmaceutically acceptable acid addition salt thereof or a stereochemically isomeric form thereof, wherein
R, $R^1$, $R^2$, $—A^1=A^2—A^3=A^4—$ and A in formula (I) have the following meaning
$—A^1=A^2—A^3=A^4—$ is a bivalent radical having the formula

—CH=N—CH=CH— (x);

—CH=N—CH=N— (y); or

—CH=N—N=CH— (z);

R is hydrogen or $C_{1-6}$alkyl;
$R^1$ is hydrogen; $C_{1-10}$alkyl; $C_{3-7}$cycloalkyl; $Ar^1$ or $Ar^1$—$C_{1-6}$alkyl;
$R^2$ is hydrogen; $C_{3-7}$cycloalkyl; $Ar^1$; $C_{1-10}$alkyl; $C_{1-6}$alkyl substituted with $Ar^1$ or $C_{3-7}$cycloalkyl; hydroxy; $C_{1-10}$alkyloxy; $C_{1-6}$alkyloxy substituted with $Ar^1$ or $C_{3-7}$cycloalkyl; $C_{3-6}$alkenyloxy optionally substituted with $Ar^2$; $C_{3-6}$alkynyloxy optionally substituted with $Ar^2$; or $Ar^1$-oxy;
A is a bivalent radical having the formula

$—CR^3=N—$ or (a)

$—C(=X)—NR^4—$, (b)

wherein the carbon atom in the bivalent radical (a) and (b) is connected to $—NR^2$;
said $R^3$ being hydrogen; halo; $C_{1-4}$alkyl substituted with up to 4 halo atoms; $C_{3-7}$cycloalkyl; $Ar^1$; quinolinyl; indolinyl; $C_{1-10}$alkyl; $C_{1-6}$alkyl substituted with $Ar^1$, $C_{3-7}$cycloalkyl, quinolinyl; indolinyl or hydroxy; $C_{1-10}$alkyloxy; $C_{1-6}$alkyloxy substituted with $Ar^1$ or $C_{3-7}$cycloalkyl; $C_{2-6}$alkenyl optionally substituted with $Ar^1$; $Ar^2$-oxy; $C_{1-6}$alkyloxycarbonyl; carboxyl; $C_{1-6}$alkylcarbonyl; $Ar^1$-carbonyl or $Ar^1$—(CHOH)—;
said X being O or S;
said $R^4$ being hydrogen, $C_{1-6}$alkyl or $Ar^2$—$C_{1-6}$alkyl;

wherein $Ar^1$ is phenyl, substituted phenyl, pyridinyl, aminopyridinyl, imidazolyl, thienyl, halothienyl, furanyl, halofuranyl or thiazolyl; and $Ar^2$ is phenyl or substituted phenyl; said substituted phenyl in $Ar^1$ and $Ar^2$ being phenyl substituted with 1, 2 or 3 substituents each independently selected from halo, hydroxy, trifluoromethyl, $C_{1-6}$alkyl, $C_{1-6}$alkyloxy, cyano, amino, mono- and di($C_{1-6}$alkyl)amino, nitro, carboxyl, formyl and $C_{1-6}$alkyloxycarbonyl; and wherein

R, $R^3$, $R^6$, $R^7$ and $—A^1=A^2—A^3=A^4—$ in formula (II) have the following meaning

$—A^1=A^2—A^3=A^4—$ is a bivalent radical having the formula

$—CH=N—CH=CH—$ (x);

$—CH=N—CH=N—$ (y); or

$—CH=N—N=CH—$ (z);

R is hydrogen or $C_{1-6}$alkyl;

$R^5$ is hydrogen; $C_{1-10}$alkyl; $C_{3-7}$cycloalkyl; $Ar^3$; $Ar^4—C_{1-6}$alkyl; $C_{2-6}$ alkenyl or $C_{2-6}$alkynyl;

$R^6$ is hydrogen; $C_{1-10}$alkyl optionally substituted with $Ar^3$, $C_{3-7}$cycloalkyl, hydroxy or $C_{1-6}$alkyloxy; $Ar^3$; $C_{2-6}$alkenyl; $C_{2-6}$alkynyl; $C_{3-7}$cycloalkyl; bicyclo[2.2.1] heptan-2-yl; 2,3-dihydro-1H-indenyl; 1,2,3,4-tetrahydronaphthalenyl; or a radical of formula $OR^7$,

$R^7$ is hydrogen; $C_{2-6}$alkenyl optionally substituted with $Ar^4$; $C_{2-6}$alkynyl; pyrimidinyl, di($Ar^4$)methyl; 1-$C_{1-6}$alkyl-4-piperidinyl; or $C_{1-10}$alkyl optionally substituted with halo, hydroxy, $C_{1-6}$alkyloxy, amino, mono- and di($C_{1-6}$alkyl)-amino, trifluoromethyl, carboxyl, $C_{1-6}$alkyloxycarbonyl, $Ar^3$, $Ar^4—O—$, $Ar^4—S—$, $C_{3-7}$cycloalkyl, 2,3-dihydro-1,4-benzodioxinyl, 1H-benzimidazolyl, $C_{1-6}$alkyl substituted 1H-benzimidazolyl, (1,1'-biphenyl)-4-yl or with 2,3-dihydro-2-oxo-1H-benzimidazolyl;

$R^8$ is hydrogen, nitro, amino, mono- and di($C_{1-6}$alkyl)amino, halo, $C_{1-6}$alkyl, hydroxy or $C_{1-6}$alkyloxy;

wherein $Ar^3$ is phenyl, substituted phenyl, naphthalenyl, pyridinyl, aminopyridinyl, imidazolyl, triazolyl, halothienyl, furanyl, $C_{1-6}$alkylfuranyl, halofuranyl or thiazolyl; $Ar^4$ is phenyl, substituted phenyl or pyridinyl, said subetituted phenyl in $Ar^3$ and $Ar^4$ being phenyl substituted with up to 3 substituents each independently selected from halo, hydroxy, hydroxymethyl, trifluoromethyl, $C_{1-6}$alkyl, $C_{1-6}$alkyloxy, $C_{1-6}$alkyloxycarbonyl, carboxyl, formyl, (hydroxyimino)methyl, cyano, amino, mono- and di($C_{1-6}$alkyl)amino and nitro.

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**5,500,436**

**2-(N-(2-AMINOMETHYL)AMINO)ACETIC ACID DERIVATIVES TO INHIBIT ADVANCED GLYCOSYLATION**

**Karl Schönafinger, Alzenau; Ursula Schindler, Bad Soden, and Eckhard Schraven, Frankfurt am Main, all of, Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Germany**

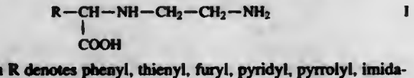
**Continuation of Ser. No. 89,780, Jul. 9, 1993, abandoned. This application Nov. 10, 1994, Ser. No. 337,851**

**Claims priority, application Germany, Jul. 13, 1992, 42 22 900.4**

**Int. Cl.[6] A61K** *31/415;31/40;31/38;31/195*

**U.S. Cl. 514—397** **3 Claims**

1. Process for inhibiting the formation of advanced glycosylation end products of proteins comprising administering to a patient in need thereof an effective dose of a 2-(N-(2-aminoethyl)amino)acetic acid compound of the formula I



I

in which R denotes phenyl, thienyl, furyl, pyridyl, pyrrolyl, imidazolyl or thiazolyl, or phenyl, thienyl, furyl, pyridyl, pyrrolyl, imidazolyl or thiazolyl which is monosubstituted or polysubstituted by halogen, alkyl, alkoxy, dialkylaminoalkoxy or alkoxyalkoxy, and their pharmacologically acceptable acid addition salts as pharmacological active compounds.

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**5,500,437**

**MICROBICIDES**

**Yasuhiko Saitoh, Atsugi; Yasuo Iwata; Seiichi Kuzuma, both of Sagamihara; Yoshihide Nakajima, Akashi, and Kanji Yokomizo, Nishinomiya, all of, Japan, assignors to Ciba-Geigy, AG, Basle, Switzerland; Ube Industries Limited, Yamaguchi, and Hokko Chemical Industry Co., Ltd., Tokyo, both of, Japan**

**Continuation of Ser. No. 205,747, Mar. 4, 1994, abandoned. This application Apr. 24, 1995, Ser. No. 427,722**

**Claims priority, application Japan, Mar. 4, 1993, 5-069283**

**Int. Cl.[6] A01N** *43/36;43/50*

**U.S. Cl. 514—397** **7 Claims**

1. A microbicidal composition which comprises A) 4-(2,2-difluoro- 1,3-benzodioxol-4-yl)pyrrole-3-carbonitrile and B) penta-4-enyl-N-furfuryl-N-imidazol-1-yl-carbonyl-DL-homoalaninate, said components A) and B) being present in the composition in a weight ratio which exhibits synergistically enhanced activity of 1 part of A) to 0.1–20 parts of B), and a suitable carrier.

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**5,500,438**

**ARTHROPODICIDAL ANILIDES**

**William E. Barnette, West Chester, Pa.; Charles R. Harrison, Newark, Del.; George P. Lahm, Wilmington, Del.; David W. Piotrowski, Bear, Del., and Keith D. Wing, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

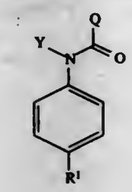
**PCT No. PCT/US92/03880, § 371 Date Nov. 22, 1993, § 102(e) Date Nov. 22, 1993, PCT Pub. No. WO92/20682, PCT Pub. Date Nov. 26, 1992**

**Continuation-in-part of Ser. No. 812,208, Dec. 20, 1991, abandoned, which is a continuation-in-part of Ser. No. 744,759, Aug. 14, 1991, abandoned, which is a continuation-in-part of Ser. No. 705,428, May 24, 1991, abandoned. This PCT application May 15, 1992, Ser. No. 146,210**

**Int. Cl.[6] A01N** *43/90;* **C07D** *491/048*

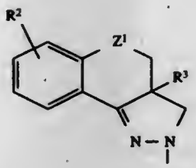
**U.S. Cl. 514—403** **7 Claims**

1. A compound of the formula



wherein

Q is



Q-1

$R^1$ is selected from the group Cl, Br, $CF_3$, $OCF_3$, $OCF_2H$ and $OSO_2CF_3$;

$R^2$ is selected from the group H, F, Cl, Br, $CF_3$, $OCF_3$, $OCF_2H$ and $OCH_2CF_3$;

Y is selected from the group $NR^6R^7$, $N=CR^8R^9$, and $OR^6$;



$R^3$ is selected from the group $CO_2Me$, $CO_2Et$, Ph, 4-F-Ph, 4-Cl-Ph and $C_1$–$C_3$ alkyl;

$R^4$ is $C_1$–$C_3$ alkyl;

$R^6$ is selected from the group H, $C_1$–$C_4$ alkyl, $C_1$–$C_4$ haloalkyl, $C_2$–$C_4$ alkenyl, $C_2$–$C_4$ alkynyl, $SO_2NR^8R^9$ $SO_2R^{10}$, $COR^8$, $CONR^8R^9$, $CO_2R^8$, phenyl optionally substituted with halogen or $C_1$–$C_4$ alkoxy, and benzyl optionally substituted with halogen;

$R^7$ is selected from the group H, $C_1$–$C_4$ alkyl and $COR^8$;

$R^8$ is selected from the group H, $C_1$–$C_4$ alkyl, $C_1$–$C_4$ haloalkyl and phenyl optionally substituted by a group selected from halogen, CN, $NO_2$, $CF_3$ and $OCF_3$;

$R^9$ is selected from the group H and $C_1$–$C_4$ alkyl;

$R^8$ and $R^9$ can be taken together as $—CH_2CH_2CH_2—$, $—CH_2CH_2CH_2CH_2—$ and $—CH_2CH_2CH_2CH_2CH_2—$;

R10 is selected from the group $C_1$–$C_4$ alkyl and $C_1$–$C_4$ haloalkyl; and

$Z^1$ is O.

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**5,500,439**

**AMINOPYRAZOLES**

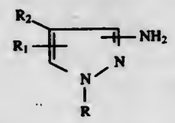
**Peter C. Ulrich, Old Tappan, N.J., and Dilip R. Wagle, Valley Cottage, N.Y., assignors to Alteon Inc., Ramsey, N.J.**

**Filed Dec. 9, 1993, Ser. No. 164,466**

**Int. Cl.[6] A61K** *31/415*

**U.S. Cl. 514—404** **18 Claims**

1. A method for inhibiting the advanced glycosylation of a target protein comprising contacting the target protein with an effective amount of composition comprising a compound selected from the group consisting of compounds of the formula



(I)

wherein

R is hydrogen, a lower alkyl or hydroxy lower alkyl group;

$R_1$ is hydrogen, hydroxy a lower alkoxy group, a lower alkyl group or an aryl group;

$R_2$ is hydrogen or an amino group;

and their biologically or pharmaceutically acceptable acid addition salts; and mixtures thereof, and a carrier therefor.

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**5,500,440**

**Patent Not Issued For This Number**

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**5,500,441**

**FUNGICIDAL MIXTURES**

**Horst Wingert; Hubert Sauter, both of Mannheim; Eberhard Ammermann, Heppenheim; Gisela Lorenz, Neustadt; Reinhold Saur, Böhl-Iggelheim; Klaus Scheiberger, Gönnheim, and Manfred Hampel, Neustadt, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany**

**Filed Sep. 23, 1994, Ser. No. 311,190**

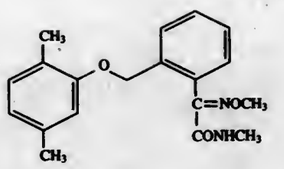
**Claims priority, application Germany, Sep. 24, 1993, 43 32 577.7**

**Int. Cl.[6] A01N** *37/18;43/38*

**U.S. Cl. 514—412** **16 Claims**

1. The fungicidal mixture containing a synergistically fungicidally effective amount of

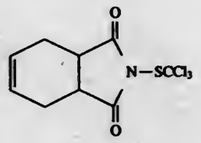
(a) the oxime ether carboxamide of the formula I



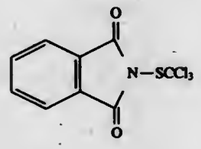
I

and

(b) a phthalimide selected from the group consisting of compounds II and III



II



III

in a synergistically fungicidally effective weight ratio from 1:1 to 1:300.

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**5,500,442**

**CYCLOBUT-3-ENE-1,2-DIONE DERIVATIVES AS SMOOTH MUSCLE RELAXANTS**

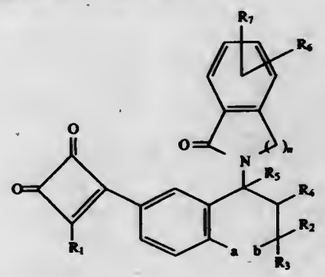
**Richard M. Soll, Lawrenceville, N.J.; Paul J. Dollings, Newtown, and William A. Kinney, Churchville, both of Pa., assignors to American Home Products Corporation, Madison, N.J.**

**Filed Jun. 10, 1994, Ser. No. 257,998**

**Int. Cl.[6] A61K** *31/40;* **C07D** *209/34*

**U.S. Cl. 514—414** **15 Claims**

1. A compound according to the formula:



wherein:

$R_1$ is $C_{1-6}$ perfluoroalkoxyl, $C_{1-6}$ perfluoroalkyl, $C_{1-6}$ alkyl, $C_{3-10}$ cycloalkyl, $C_{2-6}$ alkenyl, $C_{6-10}$ aryl, H, $C_{1-6}$ alkoxy, hydroxy, $C_{1-6}$ alkoxycarbonyl, amino, pyrrolidine, piperidine, morpholine, $C_{1-12}$ mono or di-alkylamino optionally substituted with hydroxy or $C_{1-6}$ alkoxy, or mono or bicyclic heteroaryl selected from quinoline, pyridine, indole, pyrrole,

quinazoline, pyrazine, pyrimidine, thiophene, furan, benzofuran, benzimidazole, pyrazole, benzoxazole, and benzothiophene;

a and b together form an —O— linkage, C=O, or a direct bond;

$R_2$ and $R_3$, independent from each other, are H or $C_{1-6}$ alkyl, optionally substituted by fluorine;

either $R_4$ is hydrogen, hydroxy, $C_{1-6}$ alkanoyloxy, $C_{7-11}$ aroyloxy, carbamoyloxy, $C_{1-6}$ alkoxycarbonyloxy, mono or di $C_{1-12}$ alkylcarbamoyloxy, and $R_5$ is hydrogen; or $R_4$ and $R_5$ together are a bond;

$R_6$ and $R_7$, independent from each other, are selected from the group consisting of $C_{1-6}$ perfluoroalkoxy, $C_{1-6}$ perfluoroalkyl, $C_{1-6}$ alkyl, $C_{1-6}$ alkoxy, hydroxy, $C_{1-4}$ alkoxycarbonyl, nitro, cyano, halogeno, $C_{1-6}$ alkylsulfonamido, $C_{1-6}$ perfluoroalkylsulfonamido, amino, $C_{1-6}$ acylamino, $C_{1-6}$ perfluoroacylamino, $C_{1-2}$ mono or di-alkylamino, $C_{1-6}$ alkylsulfonyl, $C_{6-10}$ arylsulfonyl, carboxy, $C_{1-12}$ mono or dialkylaminocarbonyl, and hydrogen;

and n is 1 to 3.

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**5,500,443**

**NEW BENZODIOXANE COMPOUNDS**

**Gilbert Lavielle, La Celle Saint Cloud; Patrick Hautefaye, Servon Brie Comte Robert; Olivier Muller, Ennery; Mark Millan, and Mauricette Brocco, both of Paris, all of, France, assignors to Adir et Compagnie, Courbevoie, France**

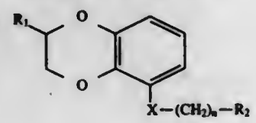
**Filed Feb. 22, 1995, Ser. No. 392,283**

**Claims priority, application France, Feb. 25, 1994, 94 02161**

**Int. Cl.[6] C07D *207/04***

**U.S. Cl. 514—422** **8 Claims**

1. A compound of formula (I):



(I)

in which:

X represents oxygen or methylene,

n represents 1, 2 or 3,

$R_1$ represents hydrogen, aminocarbonyl or hydroxymethyl,

$R_2$ represents:



in which:

either $R_3$ represents hydrogen or linear or branched ($C_1$–$C_6$) alkyl, and $R_4$ represents:

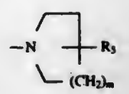
linear or branched ($C_1$–$C_4$) alkyl

which is unsubstituted or substituted with phenyl (which is unsubstituted or substituted with one or more halogen or linear or branched ($C_1$–$C_4$) alkyl, linear or branched ($C_1$–$C_4$) alkoxy, trihalomethyl or hydroxyl), on condition that, in these cases, $R_1$ is other than hydrogen,

or which is substituted with benzoylamino (which is unsubstituted or substituted on the phenyl ring with one or more halogen or linear or branched ($C_1$–$C_4$) alkyl, linear or branched ($C_1$–$C_4$) alkoxy, trihalomethyl or hydroxyl),

or benzoyl (which is unsubstituted or substituted with one or more halogen or linear or branched ($C_1C_4$) alkyl, linear or branched ($C_1$–$C_4$) alkoxy, trihalomethyl or hydroxyl),

or $R_3$ and $R_4$ form, together with the nitrogen to which they are attached:



in which

m represents 1, 2 or 3,

$R_5$ represents benzoyl (which is unsubstituted or substituted with one or more halogen or linear or branched ($C_1$–$C_4$) alkyl, linear or branched ($C_1$–$C_4$) alkoxy, hydroxyl or trihalomethyl),

benzoylmethyl (which is unsubstituted or substituted on the phenyl ring with one or more halogen or linear or branched ($C_1$–$C_4$) alkyl, linear or branched ($C_1$–$C_4$) alkoxy, hydroxyl or trihalomethyl),

2-oxo-(3H)-benzimidazol-1-yl,

1H-indazol-3-yl methyl (which is unsubstituted or substituted on the phenyl ring with halogen),

or 1,2-benzisoxazol-3-yl methyl (which is unsubstituted or substituted on the phenyl ring with halogen),

an enantiomer, diastereoisomer or epimer thereof, or an addition salt thereof with a pharmaceutically-acceptable acid or base.

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**5,500,444**

**CARDIOPROTECTIVE TOCOPHEROL ANALOGS**

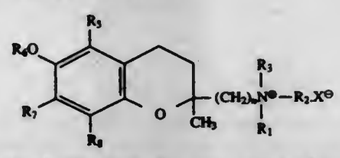
**J. Martin Grisar, Wissembourg; Margaret A. Petty, Strasbourg, both of, France, and Frank Bolkenius, Kehl, Germany, assignors to Hoechst Marion Roussel, Inc., Cincinnati, Ohio**

**Continuation of Ser. No. 120,146, Sep. 10, 1993, abandoned, which is a continuation-in-part of Ser. No. 65,058, May 20, 1993, abandoned, which is a continuation of Ser. No. 985,501, Dec. 1, 1992, abandoned, which is a continuation of Ser. No. 840,482, Feb. 24, 1992, abandoned, which is a continuation-in-part of Ser. No. 774,125, Oct. 11, 1991, abandoned, which is a continuation of Ser. No. 686,008, Apr. 12, 1991, abandoned, which is a continuation of Ser. No. 564,670, Aug. 6, 1990, abandoned, which is a continuation of Ser. No. 436,398, Nov. 14, 1989, abandoned. This application Sep. 27, 1994, Ser. No. 313,657**

**Int. Cl.[6] A61K *31/35*; C07D *311/58***

**U.S. Cl. 514—456** **25 Claims**

1. A compound of the formula



I

the (R)and (S) enantiomers and racemic mixtures thereof wherein

$R_1$, $R_2$ and $R_3$, each individually is a $C_{1-6}$ lower alkyl,

X is a halide or $R_4SO_3^{\ominus}$ with $R_4$ being H, $C_{1-6}$ alkyl, aryl, or aralkyl,

$R_5$ is H or $C_{1-6}$ alkyl,

$R_6$ is H or —C(O)R, R being H or $C_{1-9}$ alkyl,

$R_7$ is H or $C_{1-6}$ alkyl,

$R_8$ is H or $C_{1-6}$ alkyl and n is an integer of 1 to 6.



**5,500,445**

**INTRAOCULAR IRRIGATING AND ENUCLEATED EYEBALL PRESERVATIVE COMPOSITION**

**Takahiro Matsumoto, Akashi; Shogo Sameshima, and Kenichi Yoshida, both of Kobe, all of, Japan, assignors to Senju Pharmaceutical Co., Ltd., Osaka, Japan**

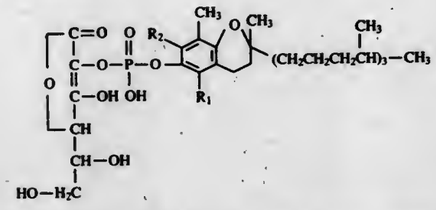
**Filed Feb. 16, 1994, Ser. No. 197,325**

**Claims priority, application Japan, Feb. 22, 1993, 5-31650; Apr. 26, 1993, 5-99416**

**Int. Cl.[6] A61K *31/34***

**U.S. Cl. 514—474** **4 Claims**

1. A method for protecting cornea tissues from physiological damage during an ophthalmic operation which comprises irrigating such tissues during such operation with an intraocular irrigating composition which comprises an effective amount of a compound of the formula



wherein $R_1$ and $R_2$ are the same or different and each represents a hydrogen atom or a methyl group, or a pharmacologically acceptable salt thereof.

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**5,500,446**

**FUNGICIDAL MIXTURES**

**Horst Wingert; Hubert Sauter, both of Mannheim; Eberhard Ammermann, Heppenheim; Gisela Lorenz, Neustadt; Reinhold Saur, Böhl-Iggelheim; Klaus Scheiberger, Gönnheim, and Manfred Hampel, Neustadt, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany**

**Filed Sep. 15, 1994, Ser. No. 305,339**

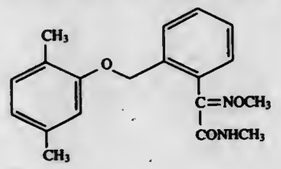
**Claims priority, application Germany, Sep. 24, 1993, 43 32 628.5**

**Int. Cl.[6] A01N *37/18;47/10***

**U.S. Cl. 514—483** **7 Claims**

1. A fungicidal mixture containing in a synergistically effective amount:

a) the oxime ether carboxamide of the formula I



and

b) a dithiocarbamate (II) selected from the group consisting of

- manganese ethylenebis(dithiocarbamate) (zinc complex) (IIa),
- manganese ethylenebis(dithiocarbamate) (IIb)
- zinc ammoniate ethylenebis(dithiocarbamate) (IIc) and
- zinc ethylenebis(dithiocarbamate) (IId),

wherein the weight ratio of the compound II to the compound I is about 10:1.

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**5,500,447**

**ANIONIC POLYMERIZATION INITIATORS CONTAINING ADDUCTS OF CYCLIC SECONDARY AMINES AND CONJUGATED DIENES, AND PRODUCTS THEREFROM**

**David F. Lawson, Uniontown; Thomas A. Antkowiak, Wadsworth; James E. Hall, Mogadore, and Mark L. Stayer, Jr., Suffield, all of Ohio, assignors to Bridgestone Corporation, Tokyo, Japan**

**Division of Ser. No. 175,294, Dec. 29, 1993. This application Jun. 6, 1995, Ser. No. 469,125**

**Int. Cl.[6] C08F *4/46***

**U.S. Cl. 524—571** **3 Claims**

1. A tire having at least one component formed from a vulcanizable elastomer;

said vulcanizable elastomer formed by compounding a polymer with from about 5 to about 80 parts by weight of carbon black, per 100 parts by weight of said polymer;

wherein said polymer is prepared by polymerizing a solution of one or more anionically polymerizable monomers in a hydrocarbon solvent with an anionic polymerization initiator comprising:

a carbon lithio salt of the adduct of a cyclic secondary amine with a conjugated diene.

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**5,500,448**

**RECURRENT APHTHOUS ULCER TREATMENT METHOD**

**Diane Cummins, West Kirby; Franciscus J. Van Der Ouderaa, Neston, and Michael D. Traudt, Spital, all of, Great Britain, assignors to Chesebrough-Pond's USA Co., Division of Conopoco, Inc., Greenwich, Conn.**

**Filed May 12, 1994, Ser. No. 241,827**

**Claims priority, application European Pat. Off., May 13, 1993, 93303712**

**Int. Cl.[6] A61K *31/075;31/05;33/30;31/315***

**U.S. Cl. 514—717** **6 Claims**

1. A method for reducing and/or inhibiting and/or preventing recurrent aphthous ulcers in an afflicted patient, comprising applying Triclosan to said ulcers.

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**5,500,449**

**PROCESS FOR THE PRODUCTION OF HYDROCARBONS**

**Charles B. Benham, Arvada; Mark S. Bohn, Golden, and Dennis L. Yakobson, Westminster, all of Colo., assignors to Rentech, Inc., Denver, Colo.**

**Division of Ser. No. 212,735, Mar. 14, 1994, which is a continuation-in-part of Ser. No. 867,456, Apr. 13, 1992, Pat. No. 5,324,335, which is a continuation-in-part of Ser. No. 806,267, Dec. 13, 1991, abandoned, which is a continuation-in-part of Ser. No. 528,499, May 25, 1990, abandoned, which is a continuation of Ser. No. 861,535, May 8, 1986, abandoned. This application Jun. 6, 1995, Ser. No. 470,497**

**Int. Cl.[6] C07C *27/00;27/26***

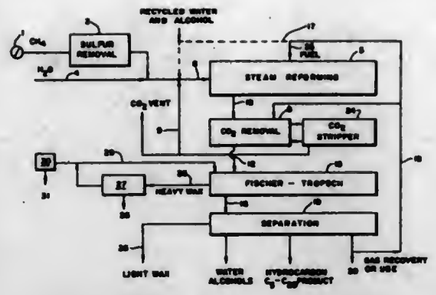
**U.S. Cl. 518—700** **2 Claims**

1. A method of cracking a wax produced by a Fischer Tropsch synthesis reaction utilizing a promoted iron-based catalyst in a slurry reaction comprising the steps of:

converting carbonaceous material in the presence of carbon dioxide and water into hydrogen and carbon monoxide in the ratio of from about 0.5 to about 2.5 parts of hydrogen to one part of carbon monoxide by volume;

removing carbon dioxide from the hydrogen and carbon monoxide produced by the step of converting;

reacting the hydrogen and carbon monoxide in the said ratios in a Fischer-Tropsch synthesis reaction vessel, in the presence of a hydrocarbon slurry containing a catalyst consisting essen-




tially of a promoted iron catalyst at a sufficient temperature, pressure and space velocity to promote the formation of predominately hydrocarbons having more than five carbon atoms, said hydrocarbon slurry containing from between about 5% by weight to about 20% by weight of said promoted iron catalyst;

separately recovering gaseous and liquid hydrocarbon products produced by said Fischer-Tropsch reaction;

recycling at least a portion of the carbon dioxide in the recovered gaseous products back to the first converting step;

separating a light wax fraction from the liquid hydrocarbon products;

separately recovering a heavy wax fraction produced by said Fischer-Tropsch reaction; and

heating the wax to a temperature of about 770° F. (410° C.) for a sufficient period of time to produce a diesel fraction, and a naphtha fraction.

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**5,500,450**

**ULTRA-LOW DENSITY MICROCELLULAR POLYMER FOAM AND METHOD**

**Ronald F. Simandl, Farragut, and John D. Brown, Harriman, both of Tenn., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.**

**Filed Apr. 5, 1995, Ser. No. 417,366**

**Int. Cl.[6] C08J *9/28***

**U.S. Cl. 521—64** **17 Claims**

1. A method for making an ultra-low density, microcellular open-celled polymer from a member selected from the group consisting of an acetate end capped polyacetal and a (4-methyl-1-pentene)polymer foam, comprising the steps of:

a) dissolving a polymer in a heated solution consisting essentially of at least one solvent for the dissolution of said polymer in said heated solution and the phase inversion of said dissolved polymer to a liquid gel upon sufficient cooling of said heated solution;

b) containing said heated solution including said dissolved polymer in a containment means provided with a nucleating promoting means having a relatively rough surface formed of fixed nucleating sites wherein said nucleating sites are in the range of from about 0.1 microns to 400 microns;

c) cooling said heated solution in said containment means for a period of time sufficient to form said liquid gel of said polymer by phase inversion; and

d) forming a porous foam from said liquid gel, said porous foam having a density of less than about 12.0 mg/cm$^3$ and open porosity provided by well interconnected strut morphology.

**5,500,451**

**USE OF POLYGLYCEROL ALIPHATIC ETHER EMULSIFIERS IN MAKING HIGH INTERNAL PHASE EMULSIONS THAT CAN BE POLYMERIZED TO PROVIDE ABSORBENT FOAMS**

**Stephen A. Goldman, and Jeffrey J. Scheibel, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio**

**Continuation of Ser. No. 378,920, Jan. 10, 1995. This application Aug. 9, 1995, Ser. No. 514,346**

**Int. Cl.[6] C08J *9/28***

**U.S. Cl. 521—64** **25 Claims**

1. A process for the preparation of an high internal phase emulsion, which comprises the step of forming a water-in-oil emulsion from:

A) an oil phase comprising:

1) from about 65 to about 98% by weight of a monomer component capable of forming a polymer having a Tg of about 35° C. or lower and comprising:

a) from about 30 to about 85% by weight of at least one substantially water-insoluble monofunctional monomer capable of forming an atactic amorphous polymer having a Tg of about 25° C. or lower;

b) from 0 to about 40% by weight of at least one substantially water-insoluble monofunctional comonomer; and

c) from about 5 to about 40% by weight of at least one substantially water-insoluble, polyfunctional crosslinking agent; and

2) from about 2 to about 35% by weight of an emulsifier component which is soluble in the oil phase and which is suitable for forming a stable water-in-oil emulsion, said emulsifier component comprising at least about 40% linear diglycerol monoaliphatic ethers and at least about 60% polyglycerol aliphatic ethers having $C_{10}$–$C_{24}$ aliphatic groups; and

B) a water phase comprising an aqueous solution containing:

1) from about 0.2 to about 20% by weight of a water-soluble electrolyte; and

2) an effective amount of a polymerization initiator;

C) a volume to weight ratio of the water phase to the oil phase in the range of from about 12:1 to about 125:1.

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**5,500,452**

**SOFT, LOW DENSITY FLEXIBLE POLYURETHANE FOAM**

**Otis M. Baker, Jr.; Frank E. Critchfeld, both of South Charleston, and Paul M. Westfall, St. Albans, all of W. Va., assignors to ARCO Chemical Technology, L.P., Greenville, Del.**

**Filed Sep. 23, 1994, Ser. No. 311,378**

**Int. Cl.[6] C08G *18/10;18/12***

**U.S. Cl. 521—130** **25 Claims**

1. A flexible polyurethane foam formulation comprising a first polyol, a second polyol, an unhindered primary diamine or its corresponding carbamate, a diol, water, at least one catalyst, a foam stabilizer, and isocyanate wherein,

a) the first polyol is a polyether polyol having 80% or more primary hydroxyl groups, a nominal functionality of at least 3, and an oxyethylene content of from about 10 to about 30% by weight;

b) the second polyol is a polymer/polyol formed by the in situ polymerization of at least one ethylenically unsaturated monomer in a third polyol;

c) the third polyol is a polyether polyol having 80% or more primary hydroxyl groups, a nominal functionality of at least 3, and an oxyethylene content of from about 10 to about 30% by weight;

d) the unhindered primary diamine or its corresponding carbamate is present in an amount of from about 0.1 to about 1.0 part per each 100 parts of total first and second polyol;

e) the diol has a molecular weight of 300 or less and is present in an amount of from about 1 to about 10 parts per each 100 parts of total first and second polyols;



f) the water is present in an amount of from about 4 to about 20 parts per each 100 parts of total first and second polyols;

g) the isocyanate is a mixture of toluene diisocyanate and either diphenylmethane diisocyanate or a polymeric diphenylmethane diisocyanate, or both; having an isocyanate index of about 50 to about 75

h) only the carbon dioxide which is generated by the catalyzed reaction of the isocyanate with the water is used to blow the foam formulation, and;

wherein the foam formulation, upon foaming, produces a foam having a density of less than about 2 pounds per cubic foot and a 25% Indentation Force Deflection value of less than about 10 pounds per 50 square inches, both measured in accordance with ASTM D-3574.

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**5,500,453**

**(OXO)SULFONIUM COMPLEX, POLYMERIZABLE COMPOSITION CONTAINING THE COMPLEX, AND METHOD OF POLYMERIZING THE COMPOSITION**

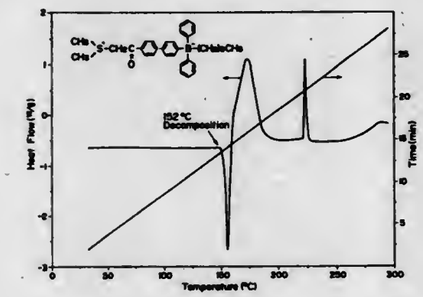
**Yasumasa Toba; Madoka Yasuike, and Yamaguchi Takeo, all of Tokyo, Japan, assignors to Toyo Ink Manufacturing Co., Ltd., Tokyo, Japan**

**Continuation-in-part of Ser. No. 13,724, Feb. 3, 1993, abandoned. This application Aug. 4, 1994, Ser. No. 284,981**

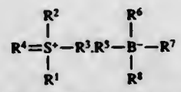
**Claims priority, application Japan, Feb. 7, 1992, 4-056831; Mar. 16, 1992, 4-090185**

**Int. Cl.[6] C07F *5/02;9/02;2/50***

**U.S. Cl. 522—25** **8 Claims**




1. A sulfonium complex or oxosulfonium complex of the formula (1),



(1)

wherein $R^1$ is a benzyl group, a substituted benzyl group, a phenacyl group, a substituted phenacyl group, an aryloxy group, a substituted aryloxy group, an alkenyl group or a substituted alkenyl group, each of $R^2$ and $R^3$ is independently any one of groups defined as $R^1$ an alkyl group, a substituted alkyl group, an aryl group, a substituted aryl group, an aralkyl group, a substituted aralkyl group, an alkynyl group, a substituted alkynyl group, an alicyclic group, a substituted alicyclic group, an alkoxyl group, a substituted alkoxyl group, an alkylthio group, a substituted alkylthio group, an amino group or a substituted amino group, or $R^2$ and $R^3$ may bond together forming a ring structure, $R^4$ is an oxygen atom or lone pair, and each of $R^5$, $R^6$, $R^7$ and $R^8$ is independently an alkyl group, a substituted alkyl group, an aryl group, a substituted aryl group, an aralkyl group, a substituted aralkyl group, an alkenyl group or a substituted alkenyl group, provided that not all of $R^5$, $R^6$, $R^7$ and $R^8$ are aryl groups or substituted aryl groups.

**5,500,454**

**DENTURE BASE SEPARATING MATERIAL**

**Jinichi Obana; Shigeru Hanatani; Junichi Okada; Yukari Nasu, and Ryoji Nakazato, all of Tokyo, Japan, assignors to GC Corporation, Tokyo, Japan**

**Division of Ser. No. 229,430, Apr. 12, 1994, abandoned. This application Sep. 20, 1994, Ser. No. 309,547**

**Claims priority, application Japan, Apr. 26, 1993, 5-120461**

**Int. Cl.[6] A61K *6/02; C08L 33/10***

**U.S. Cl. 523—120** **4 Claims**

1. A method for adhering a tissue conditioner with a denture base material such that said tissue conditioner is firmly fixed to said denture base, but readily removed manually after use, the method comprising:

applying to a denture base material a film of a separating material comprising an aqueous emulsion obtained by emulsion polymerization of a methacrylic ester, an acrylic ester, or an acrylonitrile alone, or a mixture of two or more thereof, in the presence of a water-soluble radical polymerization initiator and a surfactant, the monomer composition being adjusted to provide a minimum film forming temperature (MFT) of 23° C. or lower; and

applying a polymer soft liner tissue conditioner to said film.

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**5,500,455**

**CORRECTION FLUID COMPOSITION CONTAINING ACRYLIC RESIN**

**Yukio Terakawa, Machashi, Japan, assignor to Mitsubishi Pencil Kabushiki Kaisha, Tokyo, Japan**

**PCT No. PCT/JP93/00806, § 371 Date Feb. 17, 1994, § 102(e) Date Feb. 17, 1994, PCT Pub. No. WO93/25626, PCT Pub. Date Dec. 23, 1993**

**PCT Filed Jun. 16, 1993, Ser. No. 196,246**

**Claims priority, application Japan, Jun. 17, 1992, 4-181551; Jun. 8, 1993, 5-137744**

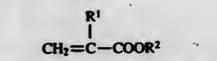
**Int. Cl.[6] C09D *10/00***

**U.S. Cl. 523—161** **7 Claims**

1. A correction fluid composition comprising:

(a) an acrylic synthetic resin obtained by copolymerizing

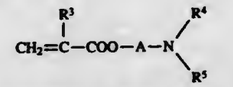
(i) 93 to 99.6% by weight of a (meth)acrylate represented by the formula (I)



(I)

wherein $R^1$ is hydrogen or a methyl group, and $R^2$ is an aliphatic hydrocarbon group, a cyclic aliphatic hydrocarbon group or a partially aromatic group-substituted aliphatic hydrocarbon group having 1 to 18 carbon atoms,

(ii) not less than 0.4% by weight to less than 2% by weight of a basic nitrogen-containing monomer represented by the formula (II)



(II)

wherein $R^3$ is hydrogen or a methyl group; each of $R^4$ and $R^5$ is independently a methyl group or an ethyl group; and A is an alkylene group having 1 to 4 carbon atoms, and

(iii) optionally, up to 5% by weight of a styrene monomer;

(b) a pigment containing titanium dioxide as the main component; and

(c) a non-polar solvent containing 50% or less by weight of n-heptane, 2,2,4-trimethylpentane, or a mixture of n-heptane and 2,2,4-trimethylpentane.

**5,500,456**

## TIRE SEALER AND INFLATOR

**Paul D. Hughett, Jacksonville, Fla., and Montfort A. Johnsen, Danville, Ill., assignors to Snap Products, Inc., Durham, N.C.**

**Filed Jan. 26, 1994, Ser. No. 186,780**
**Int. Cl.[6] B29C** *73/16;* **C08L** *1/02;* **C08K** *5/06;3/36*
**U.S. Cl. 523—166** **10 Claims**

1. A tire sealant and inflator composition comprising:
(a) 4 to 30 wt. % of a modified terpolymeric latex sealant (solids basis), wherein the sealant is a heat sensitizable, carboxylated terpolymer of butadiene, styrene and acrylonitrile, dispersed in pure water and able to be cross-linked at ambient temperatures using conventiohal rubber vulcanizing techniques, or by other carbonyl reactive cross-linking materials;
(b) 2 to 9 wt. % of an alkylene glycol;
(c) 0.3 to 3.5 wt. % of softwood flour;
(d) 0.1 to 0.5 wt. % of pyrog :nically formed silica powder;
(e) 0.2 to 1.0 wt. % of a non-ionic surfactant;
(f) 0.2 to 1.0 wt. % of ammonium hydroxide (29.4 weight percent ammonia in water basis);
(g) 4 to 30 wt. % of trichloroethylene;
(h) 10 to 30 wt. % of dimethyl ether;
(i) 0.1 to 0.4 wt. % of nitrogen gas;
(j) balance, pure water;
together with minor ingredients selected from the group consisting of corrosion inhibitors, alkanolamine and sodium fluorescein.

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**5,500,457**

## WATER BASED TONER RECEPTIVE CORE/SHELL LATEX COMPOSITIONS

**Manisha Sarkar, Austin, Tex., and Ying-Yuh Lu, Woodbury, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Filed Nov. 18, 1994, Ser. No. 342,158**
**Int. Cl.[6] C08F** *267/02;* **C08L** *51/00;33/08;33/10*
**U.S. Cl. 523—201** **8 Claims**

1. A water-based toner-receptive composition suitable for electrophotographic or xerographic imaging, comprising:
a) from about 65 to about 99 parts of a transparent film-forming core/shell latex polymer, wherein the ratio of core to shell of said core/sbell latex polymer ranges from about 10/90 to about 90/10, with the core having a lower $T_g$ than the shell, wherein said polymer comprises
1) a core formed from:
i) from about 60 to 100 parts of at least one α,β-ethylenically unsaturated monomer having from about 1 to about 12 carbon atoms; and
ii) 0 to about 40 parts of at least one monomer selected from the group consisting of bicyclic alkyl(meth)acrylates and aromatic (meth)acrylates; and
2) a shell formed from:
i) 0 to about 65 parts of at least one monomer selected from the group consisting of bicyclic alkyl (meth)acrylates and aromatic (meth)acrylates; and
ii) about 35 to 100 parts of at least one α,β-ethylenically unsaturated monomer having from about 1 to about 8 carbon atoms;
b) from about 1 to about 15 parts polymeric particles having an average particle size of from about 0.25 μm to about 15 μm, comprising:
1) at least about 20 parts by weight polymerized diol di(meth)acrylate having a formula

$$H_2C{=}CR^2COOC_nH_{2n}OOCR^2{=}CH$$

wherein $R^2$ is hydrogen or a methyl group, and n is an integer from about 4 to about 18,

$$H_2C{=}CR^2COOC_mH_{2m+1}$$

wherein $R^2$ is hydrogen or a methyl group and m is an integer of from about 12 to about 40, and
3) from 0 to about 30 parts of at least one copolymerized ethylenically unsaturated monomer selected from the group consisting of vinyl esters, acrylic esters, methacrylic esters, styrene, derivatives thereof, and mixtures thereof, a, b and c having a total of 100 parts, and having an average particle size of from about 0.25 μm to about 15 μm and; and
c) from 0 to about 20 parts of an antistatic agent selected from the group consisting of cationic agents, anionic agents, fluorinated agents, and nonionic agents.

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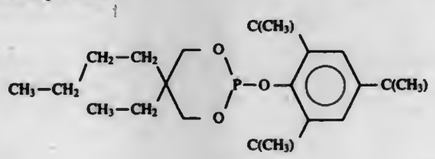
**5,500,458**

## PHOSPHITE COATED POLYMERIC PARTICLES

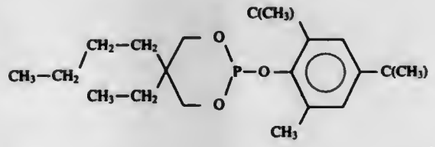
**James A. Mahood, Morgantown, W. Va., assignor to General Electric Company, Pittsfield, Mass.**

**Filed Sep. 30, 1994, Ser. No. 316,692**
**Int. Cl.[6] C08K** *5/527*
**U.S. Cl. 523—205** **4 Claims**

1. A process for producing stabilized polymeric polyolefin particles comprising applying a liquid phosphite to a the outer surface of a polymeric bead to absorb said phosphite into an outer zone of said bead, said phosphite having a melting temperature of less than 120° C., said phosphite having a solubility, saturation value at 25° C. of at least 500 ppm in the stabilized polymer wherein an outer zone of said particle adjacent the outer surface has a phosphite loading of at least 100 ppm and an inner zone substantially free of said phosphite and said phosphite has a formula selected from the following formula:



and



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**5,500,459**

## HEAT-SEALING OF SEMICRYSTALLINE POLYMERS WITH METALS

**Alfred Hagemeyer, Ludwigshafen; Hartmut Hibst, Schriesheim, both of, Germany; Dieter Bacuerle, Altenberg, Austria, and Johannes Heitz, Freiburg, Germany, assignors to BASF Magnetics GmbH, Mannheim, Germany**

**Continuation of Ser. No. 124,029, Sep. 21, 1993, abandoned. This application Jun. 30, 1995, Ser. No. 497,337**
**Claims priority, application Germany, Sep. 23, 1992, 42 31 810.6**
**Int. Cl.[6] C08J** *3/28;* **B29C** *65/06;* **B05D** *3/06*
**U.S. Cl. 523—300** **6 Claims**

1. A process for heat-sealing semicrystalline polymers with bonded metal which comprises: exposing the surface of the semicrystalline polymers to UV radiation produced by the decomposition of excimers in the wavelength range of from 120 to 400 nm with an energy density below the ablation threshold and thereafter bonding metal to the treated surface of the polymers under pressure and at a temperature between the glass transition temperature and the softening temperature of the polymer.



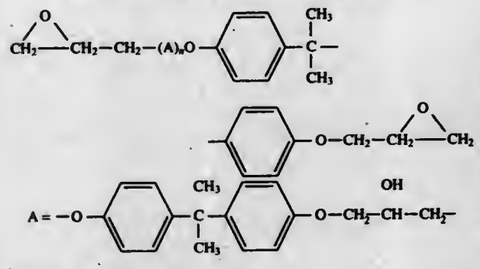
**5,500,460**

## COMPOSITION AND PROCESS FOR AND ARTICLE WITH IMPROVED AUTODEPOSITED SURFACE COATING BASED ON EPOXY RESIN

**Bashir M. Ahmed, Ambler; Rohitha M. Jayasuriya, Quakertown, and Thomas R. Hopkins, Wycombe, all of Pa., assignors to Henkel Corporation, Plymouth Meeting, Pa.**

**Continuation of Ser. No. 346,992, Nov. 30, 1994, abandoned, which is a continuation of Ser. No. 264,585, Jun. 23, 1994, abandoned, which is a continuation of Ser. No. 416,167, Oct. 2, 1989, abandoned. This application May 2, 1995, Ser. No. 434,115**
**Int. Cl.[6] C08K** *3/20;* **C08L** *63/00;* **C08F** *283/00*
**U.S. Cl. 523—402** **12 Claims**

1. An autodeposition bath composition suitable for depositing by autodeposition a coating on an active metal surface of solid objects having surfaces constituted predominately of active metals contacted with the composition, consisting essentially of a mixture of:
(A) from about 1 to about 20% by weight of an epoxy resin component consisting of molecules having formula I:



and n is an integer from 0 to 20;
(B) an emulsifying component consisting essentially of anionic surfactant in an amount that does not reduce the corrosion protection afforded to the underlying metal by a coating formed by autodeposition from said autodeposition bath composition and from about 0.1 to about 1.0 g/L of fluoroaliphatic polymeric ester emulsifying component, this amount being sufficient to stably emulsify component A;
(C) from about 0.1 to about 20% by weight of a crosslinking component selected from one or both of the following molecular types:
(1) molecules containing at least two functional groups capable of addition reactions to epoxy groups when mixed with molecules of formula I and heated to a temperature of at least 100° C.; and
(2) molecules containing at least two blocked isocyanate groups;
(D) an accelerator in sufficient amount to cause the dissolution of active metals from solid objects, having surfaces constituted predominantly of active metals, that are introduced into the composition at a temperature of at least 20° C. at a rate of at least about 0.02 gram equivalent weights of metal ions per hour per square decimeter of bare metal surface introduced into the bath; and, optionally,
(F) pigments, dyes, or other chemically stable colorant materials;
(G) finely divided solids suitable as fillers in the coatings to be formed from the composition; and
(H) water to form the balance of the composition.

169–178 O.G.–96–13: QL3

**5,500,461**

## STABLE WATERBORNE EPOXY RESIN DISPERSION CONTAINING MICRONIZED DICY

**Glenda C. Young, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.**

**Filed Apr. 19, 1995, Ser. No. 424,846**
**Int. Cl.[6] C08L** *63/02*
**U.S. Cl. 523—404** **10 Claims**

1. A process for preparing a stable epoxy resin dispersion comprising:
a) mixing an epoxy resin with water in the presence of a surfactant prepared by reacting 2 moles of polyoxyethylene glycol with 1 mole of a glycidyl polyether of BPA having an epoxy equivalent weight of about 468 to form a predispersed resin, then
b) adding a micronized dicyandiamide curing agent to said predispersed resin to form a predispersed resinous mass, and
c) stirring said mass at a temperature between about 70 and 190 degrees F for a time sufficient to convert said predispersed resinous mass to a stable epoxy resin dispersion having a number average particle size no greater than about 2.0 microns,
wherein said dispersion is a one-pack system prepared substantially without the presence of organic solvents.

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**5,500,462**

## STABLE WATERBORNE EPOXY RESIN DISPERSION CONTAINING MICRONIZED DICY

**Glenda C. Young, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.**

**Division of Ser. No. 424,846, Apr. 19, 1995. This application Jun. 7, 1995, Ser. No. 474,350**
**Int. Cl.[6] C08L** *63/02*
**U.S. Cl. 523—404** **4 Claims**

1. A method for using a stable epoxy resin dispersion composition comprising:
a) an aqueous medium,
b) an epoxy resin as a dispersed phase in said aqueous medium,
c) a surfactant prepared by reacting 2 moles of polyoxyethylene glycol with 1 mole of a glycidyl ether of BPA having an epoxy equivalent of about 468,
d) a micronized dicyandiamide curing agent, wherein said surfactant and said dicyandiamide are each present in said dispersion of resin and aqueous medium in an amount sufficient to retain the number average particle size of said stable epoxy resin dispersion at no greater than about 2.0 microns and said dispersion is a one-pack system prepared substantially without the presence of organic solvents;
said method comprising applying said dispersion to a substrate.

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**5,500,463**

## AQUEOUS RESIN COMPOSITION AND METHOD FOR FORMING COATING FILM ON CAN BODY

**Satoshi Nishimura, Sagamihara; Hidekimi Hirasawa, Kawasaki, and Tamio Iimure, Omiya, all of, Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan**

**Continuation of Ser. No. 897,660, Jun. 11, 1992, abandoned, which is a continuation-in-part of Ser. No. 847,282, Mar. 10, 1992, abandoned. This application Dec. 30, 1993, Ser. No. 176,288**
**Claims priority, application Japan, Mar. 11, 1991, 3-069376; Mar. 11, 1991, 3-069427; Nov. 20, 1991, 3-329762**
**Int. Cl.[6] C08K** *3/20;* **C08L** *63/02*
**U.S. Cl. 523—400** **13 Claims**

1. An aqueous resin composition comprising
a base material comprising an acrylic resin (A) and an epoxy resin (B) wherein said resin (A) has an acid value of from greater than 0 to 30, and wherein said resin (B) is partially reacted to said resin (A),

an acrylic resin (C) having an acid value of from 100 to 500 which is partially bound to said base material or to said resin (B), and

(D) at least one compound from the group consisting of resol phenol resins and aminoplast resins,

wherein (A), (B), (C) and (D) are dispersed in an aqueous solution (E) comprising a volatile base.

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**5,500,464**

## TWO PACK TYPE CURABLE COMPOSITION COMPRISING EPOXY RESIN AND SILICON-CONTAINING ELASTOMERIC POLYMER

**Michihide Homma, Takasago; Atsuko Yoshihara, Kobe; Hiroshi Wakabayashi, Kobe, and Katsuhiko Inuyama, Kobe, all of, Japan, assignors to Kanegafuchi Chemical Industry Co., Ltd., Osaka, Japan**

**Continuation of Ser. No. 444,879, Nov. 21, 1989, abandoned. This application Jan. 10, 1994, Ser. No. 180,797**

**Claims priority, application Japan, Nov. 21, 1988, 63-293928**

**Int. Cl.[6] C08K** *3/26*

**U.S. Cl. 523—435** **11 Claims**

1. A two-pack type curable composition comprising:

A. a first liquid containing (1) an organic elastomeric polymer having, in a molecule, at least one silicon-containing group to the silicon atom of which a hydroxyl group and/or a hydrolyzable group are bonded and which is cross linkable through formation of a siloxane linkage and (2) a curing agent for an epoxy resin, and

B. a second liquid containing an epoxy resin, at least one organic tin compound selected from the group consisting of compounds of the formulae:

$$R^1_2Sn(OCOR^2)_2 \quad (I)$$

and

$$(R^1_2Sn)_2O \quad (II)$$

$$\qquad\qquad |$$

$$\qquad\quad OCO-R^2$$

wherein $R^1$ is a monovalent hydrocarbon group, and $R^2$ is a monovalent aliphatic hydrocarbon group having 7 to 19 carbon atoms, and at least one inorganic filler which is calcium carbonate.

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**5,500,465**

## BIODEGRADABLE MULTI-COMPONENT POLYMERIC MATERIALS BASED ON UNMODIFIED STARCH-LIKE POLYSACCHARIDES

**Mohan Krishnan, and Ramani Narayan, both of Okemos, Mich., assignors to Board of Trustees operating Michigan State University, East Lansing, Mich.**

**Filed Mar. 10, 1994, Ser. No. 208,563**

**Int. Cl.[6] C08L** *3/04;67/04*

**U.S. Cl. 524—47** **47 Claims**



1. A composition comprising a blend of an unmodified polysaccharide containing alpha-D-glucopyranosyl units containing less than about 1 percent by weight water, optionally a plasticizer for the polysaccharide, a biodegradable hydrophobic aliphatic polyester polymer, and optionally one or more other biodegradable polymers that may be hydrophobic, which has been blended in the absence of water at elevated temperatures, wherein the polysaccharide is a dispersed phase in the polyester polymer as the continuous phase and is 25 to 60% by weight of the composition and wherein an organic peroxide has been provided with the polyester polymer in an amount to provide improved melt strength as compared to the composition without the peroxide.

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**5,500,466**

## ISOCYANATE REACTIVE BLENDS AND INTERNAL MOULD RELEASE COMPOSITES

**Herbert R. Gillis, Sterling Heights, Mich., assignor to Imperial Chemical Industries PLC, London, England**

**Division of Ser. No. 320,655, Oct. 11, 1994, which is a division of Ser. No. 117,641, Sep. 8, 1993, Pat. No. 5,384,351, which is a continuation of Ser. No. 760,191, Sep. 16, 1991, abandoned. This application May 17, 1995, Ser. No. 442,881**

**Claims priority, application United Kingdom, Jan. 3, 1990, 9021524**

**Int. Cl.[6] C08K** *5/04;5/34;* **C10M** *105/08*

**U.S. Cl. 524—92** **8 Claims**

1. An isocyanate-reactive composition comprising at least one compound having a plurality of organic groups which are reactive with isocyanates having dissolved or dispersed therein an effective amount of an internal mould release composition comprising

a) a metal salt of carboxylic acid having 10–24 carbon atoms, said metal being selected from Groups IA, IB, IIA and IIB of the Periodic Table or chromium, molybdenum, iron, cobalt, nickel, aluminum, tin, lead, bismuth, antimony, and zinc, and

a polysiloxane polymer having organic groups which are reactive with isocyanates.

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**5,500,467**

## POLYOLEFIN FIBER AND FILM RESISTANT TO GAS FADE

**James A. Mahood, Morgantown, W. Va., assignor to General Electric Company, Pittsfield, Mass.**

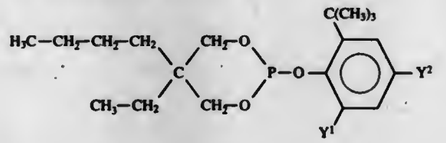
**Continuation-in-part of Ser. No. 307,545, Sep. 16, 1994, Pat. No. 5,424,348, which is a continuation of Ser. No. 96,530, Jul. 22, 1993, abandoned. This application Dec. 21, 1994, Ser. No. 360,495**

**Int. Cl.[6] C08K** *5/527*

**U.S. Cl. 524—100** **13 Claims**

1. A polyolefin fiber comprising a polyolefin and in an amount effective to provide thermal and UV light stabilization, a stabilizer composition comprising:

(a) a phosphite of the formula:



wherein $Y^1$ is an alkyl, and $Y^2$ is selected from t-butyl and sec-butyl,

(b) an additive selected from the group consisting of a hindered phenolic antioxidant and a hindered amine light stabilizer.



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**5,500,468**

## PROCESS FOR STABILIZING POLYMERIC MATERIAL

**James A. Mahood, Morgantown, W. Va., assignor to General Electric Company, Pittsfield, Mass.**

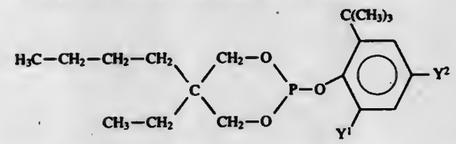
**Continuation-in-part of Ser. No. 307,545, Sep. 16, 1994, Pat. No. 5,424,348, which is a continuation of Ser. No. 96,530, Jul. 22, 1993, abandoned. This application Dec. 21, 1994, Ser. No. 361,786**

**Int. Cl.[6] C08K** *5/527*

**U.S. Cl. 524—117** **13 Claims**

1. A polymerization process comprising:

(a) introducing a carrier solution into a vinylic monomeric reaction mass, said carrier solution comprising a liquid organic solvent and a phosphite of the formula:



wherein $Y^1$ is an alkyl and $Y^2$ is selected from tert-butyl and sec-butyl,

(b) polymerizing said monomeric reaction mass to produce a phosphite stabilized polymeric material.

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**5,500,469**

## PREPARATION OF A NOVEL ARTICLE FROM A THERMALLY GELLABLE ARTIFICIAL LATEX

**Kenneth E. Johnsen, Newport, R.I., and Ronald R. Pelletier, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.**

**Filed Sep. 22, 1994, Ser. No. 310,822**

**Int. Cl.[6] C08K** *5/41;* **C08L** *81/08*

**U.S. Cl. 524—157** **19 Claims**

1. A process for preparing an artificial latex article comprising the steps of:

a) immersing a preheated mold into a bath of an artificial latex having a gellation point, the latex comprising a stable aqueous colloidal dispersion of a multiblock copolymer, the particles being stabilized by a stabilizing amount of a sulfate of an ethoxylated phenol, the mold being preheated to a temperature above the gellation point of the latex so that a gelled latex adheres to the mold, the multiblock copolymer having the formula:

$$A-B-X_m-(B-A)_n$$

wherein each A comprises independently a polymer block of an alkenyl aromatic hydrocarbon, the total A being at least 5 weight percent of the total weight of the polymer; X is the remnant of a multifunctional coupling agent; m is 0 or 1; n is an integer from 1 to 5; and B comprises a polymer block of a conjugated diene; and the sulfate of the ethoxylated phenol having the formula:

$$X'-\Phi-O-(CH_2-CH_2-O)_{n'}-SO_3-Z^+$$

wherein X' is a $C_6$–$C_{18}$ linear or branched alkyl group; $\Phi$ is phenylene; n' is from 4 to 32; and Z is sodium, potassium, or ammonium;

b) removing the mold and the gelled latex adhering thereto from the bath; and

c) drying the gelled latex at a temperature above the gellation point of the latex.

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**5,500,470**

## COMPOSITION FOR UTILIZING SYNTHETIC POLYMER PACKAGES

**Srinivas K. Mirle, Ellicott City, and Eugene E. Carney, Sykesville, both of Md., assignors to W.R. Grace & Co.-Conn., New York, N.Y.**

**Filed Sep. 6, 1994, Ser. No. 300,887**

**Int. Cl.[6] C08K** *5/04;5/16*

**U.S. Cl. 524—204** **9 Claims**

1. A water-based bonding agent for single use on synthetic polymer surfaces consisting essentially of

(a) one or more acrylic polymer or copolymer emulsion(s) in water, the polymer or copolymer having hydrophobic and hydrophilic segments and film forming properties;

(b) a drying agent comprising a metal carboxylate complexed with an amine wherein the metal carboxylate is selected from the group consisting of stannous octoate, cobalt neodecanoate, cobalt napthenate, manganese neodecanoate and manganese napthenate and blends thereof;

(c) a surfactant having an HLB of <20:

(d) optionally, a preservative;

(e) water.

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**5,500,471**

## POLYARYLENE SULFIDE RESIN COMPOSITION

**Katsumi Uota, Shizuoka, Japan, assignor to Polyplastics Co., Ltd., Osaka, Japan**

**Continuation of Ser. No. 19,289, Feb. 18, 1993, abandoned. This application Mar. 27, 1995, Ser. No. 412,085**

**Claims priority, application Japan, Feb. 19, 1992, 4-32015**

**Int. Cl.[6] C08K** *5/24*

**U.S. Cl. 524—262** **19 Claims**

1. A polyarylene sulfide resin composition having both excellent mechanical properties and improved conductivity and antistatic properties which consists of:

(A) 100 parts by weight of a polyarylene sulfide resin,

(B) 3 to 50 parts by weight of a conductive material consisting essentially of expandable graphite having an average particle diameter of 5 to 800 μm,

(C) 0.01 to 5 parts by weight of an alkoxysilane compound,

(D) 0 to 300 parts by weight of a filler other than the component (B) which is selected from among fibrous, powdery and platy fillers, and

(E) 0.5 to 30 parts by weight of one or more olefinic copolymers selected from among (a) copolymers of ethylene with an α-olefin having 3 or more carbon atoms, (b) olefinic copolymers of an α-olefin with an α,β-unsaturated acid or ester thereof and (c) a graft copolymer comprising the copolymers (a) or (b) and a polymer or copolymer comprising at least one of styrene, acrylonitrile, α,β-unsaturated carboxylic acids and esters thereof which are chemically bonded to the copolymers (a) or (b).

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**5,500,472**

## LOW APPLICATION TEMPERATURE HOT MELT ADHESIVE

**Ingrid Liedermooy, Bridgewater, N.J.; Julie Birch, Surrey, Great Britain; Daniel C. Stauffer, Flemington, and Paul P. Puletti, Pittstown, both of N.J., assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.**

**Filed Feb. 17, 1995, Ser. No. 390,725**

**Int. Cl.[6] C08J** *5/00;* **C08L** *91/06;77/00;* **C08K** *5/01*

**U.S. Cl. 524—272** **16 Claims**

1. A carton, case or tray formed utilizing a hot melt adhesive composition, said adhesive consisting essentially of:

a) 15 to 45% by weight of at least one ethylene n-butyl acrylate copolymer containing 15 to 40% by weight n-butyl acrylate and having a melt index of at least 600;
b) 25 to 55% of a terpene phenolic tackifying resin or a hydrogenated derivative thereof, the resin having a Ring and Ball softening point less than 125° C.;
c) 15 to 40% by weight of a low melting point synthetic Fischer-Tropsch wax having a melting point less than 100° C.; and
d) 0 to 1.5% stabilizer.

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**5,500,473**

**MINERAL FILLED COPOLYAMIDE COMPOSITIONS**

**Rolf B. Wiesmann, Vesenaz, Switzerland, assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**Continuation-in-part of Ser. No. 54,208, Apr. 30, 1993, abandoned. This application Apr. 19, 1994, Ser. No. 230,052**

**Int. Cl.[6] C08K *3/34***

**U.S. Cl. 524—447** **18 Claims**

1. A polymeric composition having a glass transition temperature within the range of from about 80° C. to about 117° C. as measured by Dynamic Mechanical Analysis and having an exothennic cold crystallization peak temperature within the range of from about 100° C. to about 160° C. as measured by Differential Scanning Colorimetry; said polymeric composition comprising (a) a first polyamide prepared from an aromatic carboxylic acid component and an aliphatic diamine component, said aliphatic diamine component being a mixture of hexamethylene diamine and 2-methyl-1,5-pentamethylene diamine; (b) a second polyamide selected from the group consisting of aliphatic polyamides, semi-aromatic polyamides, and mixtures or blends thereof; and (c) a mineral filler.

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**5,500,474**

**STABLE CONDUCTING POLYMER AND PROCESSES FOR THE PREPARATION THEREOF**

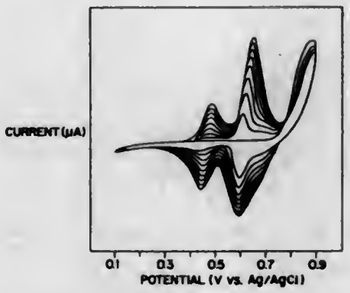
**Suh B. Rhee; Myong-Hoon Lee, both of Doryong-Dong; Chang-Jin Lee, Doma-Dong, and Bong S. Moon, Yongsan-Gu, all of, Rep. of Korea, assignors to Korea Research Institute of Chemical Technology, Daejun, Rep. of Korea**

**Division of Ser. No. 162,620, Dec. 7, 1993. This application Jul. 6, 1995, Ser. No. 498,858**

**Claims priority, application Rep. of Korea, Dec. 10, 1992, 92-23786**

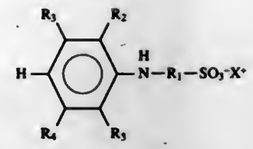
**Int. Cl.[6] C08K *5/16***

**U.S. Cl. 524—714** **13 Claims**

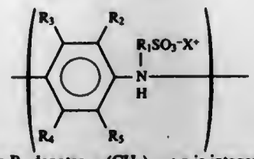



1. A conductive high polymer having repeating units of formula (II) and prepared from aniline derivatives of formula (I),

Formula (I)



Formula (II)



wherein $R_1$ denotes $-(CH_2)_n-$; n is integer between 2 and 12; $R_2$, $R_3$, $R_4$ and $R_5$ denote hydrogens, or one or two of $R_2$, $R_3$, $R_4$ and $R_5$ denote a halogen atom, methyl, methoxy or nitro groups and the remainder of $R_2$, $R_3$, $R_4$ and $R_5$ denote a hydrogen atom; and X denotes hydrogen, an alkali metal ion, an ammonium ion, an alkyl ammonium ion selected from the group consisting of tetramethylammonium ion, tetraethylammonium ion and tetrabutylammonium ion, or an anilinium ion.

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**5,500,475**

**POLYURETHANE-BASED THICKENERS**

**Ulrich Eicken, Korschenbroich; Herbert Fischer, Duesseldorf; Wolfgang Gress, Wuppertal; Rainer Hoefer, Duesseldorf; Doris Oberkobusch, Duesseldorf, and Ludwig Schieferstein, Ratingen, all of, Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany**

**PCT No. PCT/EP92/02526, § 371 Date May 10, 1994, § 102(e) Date May 10, 1994, PCT Pub. No. WO93/10166, PCT Pub. Date Mar. 22, 1989**

**PCT Filed Nov. 4, 1992, Ser. No. 240,729**

**Claims priority, application Germany, Nov. 13, 1991, 41 37 247.6**

**Int. Cl.[6] C08J *3/00*; C08K *3/20*; C08L *75/00*; C08G *18/28***

**U.S. Cl. 524—591** **36 Claims**

1. A composition of matter useful as a thickener comprising an aqueous preparation of a nonionic, water-dispersible or water-soluble polyurethane obtained from the reaction of a reaction mixture comprised of a polyfunctional isocyanate, a polyether polyol and a monohydric alcohol, wherein said monohydric alcohol contains at least one polar group which is not reactive to isocyanates and said monohydric alcohol is selected from the group consisting of castor oil fatty acid esters and monohydric alcohols containing an oxazoline group.

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**5,500,476**

**THERMOPLASTIC MIXTURE COMPRISING AN AGENT TO IMPROVE THE LACQUER BONDING**

**Robertus E. de Jong, and Jacobus J. C. van der Kort, both of Bergen op Zoom, Netherlands, assignors to General Electric Company, Pittsfield, Mass.**

**Continuation of Ser. No. 975,151, Nov. 12, 1992, Pat. No. 5,382,454, which is a continuation of Ser. No. 682,769, Apr. 9, 1990, abandoned. This application Nov. 18, 1994, Ser. No. 342,200**

**Claims priority, application Netherlands, Apr. 10, 1990, 9000838**

**Int. Cl.[6] C08K *5/06*; C08L *51/04*;*53/00*;*67/02***

**U.S. Cl. 524—377** **5 Claims**

1. A polymer mixture comprising A) a polyalkylene phthalate ester, B) a copolyether ester block copolymer, C) a polymeric agent to improve impact strength and D) an agent to improve the bonding of aqueous lacquer systems upon the surface of articles moulded out of the polymer mixture, wherein, the polymer mixture comprises as an agent to improve said bonding a polyalkylene glycol polymer or a polyalkylene glycol copolymer.

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**5,500,477**

**POLYACETAL MOLDING MATERIALS HAVING HIGH IMPACT RESISTANCE, A PROCESS FOR THEIR PREPARATION, AND THEIR USE**

**Gerhard Reuschel, Bibis; Dietrich Fleischer, Darmstadt, both of, Germany; Kaoru Yamamoto, and Shuichi Chino, both of Fuji, Japan, assignors to Hoechst Aktiengesellschaft, Germany**

**Continuation of Ser. No. 131,291, Oct. 4, 1993, abandoned. This application Apr. 26, 1995, Ser. No. 430,888**

**Claims priority, application Germany, Jan. 3, 1992, 42 33 308.8**

**Int. Cl.[6] C08L *61/02***

**U.S. Cl. 525—398** **10 Claims**

1. A high-impact strength polyoxymethylene molding composition without a thermoplastic elastomer consisting essentially of linear polyoxymethylene copolymers having a melt flow index MFI in the range of from about 0.1 g/10 min. to <0.8 g/10 min. for a weight of 2.16 kg and a measuring temperature of 190° C., and a notch impact strength $a_n$, measured in accordance with DIN 53453 at 23° C. of greater than 10 mJ/mm$^2$.

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**5,500,478**

**HOUSING AND RESIN COMPOSITION INCLUDING POLYETHER ESTER AMIDE, POLYCARBONATE RESIN AND MODIFIED VINYL POLYMER**

**Tadao Fukumoto, Tsushima; Masatoshi Iwamoto, and Akihiko Kishimoto, both of Nagoya, all of, Japan, assignors to Toray Industries, Inc., Japan**

**Division of Ser. No. 980,106, Nov. 23, 1992, Pat. No. 5,338,795, which is a continuation of Ser. No. 747,469, Aug. 13, 1991, abandoned, which is a continuation of Ser. No. 295,239, Jan. 9, 1989, abandoned, which is a division of Ser. No. 36,088, Apr. 9, 1987, abandoned. This application May 10, 1994, Ser. No. 240,270**

**Claims priority, application Japan, Apr. 14, 1986, 61-84338; May 20, 1986, 61-115528; May 14, 1986, 61-108503**

**Int. Cl.[6] C08L *77/12*; C08G *69/44***

**U.S. Cl. 525—66** **8 Claims**

1. An intrinsically antistatic resin composition, comprising (A) 1 to 40 weight % of a polyether ester amide, (B) 99 to 60 weight % of a thermoplastic resin which is a mixture of a polycarbonate resin and a styrene based resin which is free of carboxyl groups, and (C) 0.1 to 20 weight % of a vinyl polymer containing carboxyl groups, said weight % of said polyether ester amide and said thermoplastic resin being 100 weight % and said weight % of said vinyl polymer being based on said 100 weight % of the entire composition.

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**5,500,479**

**POLYETHERSULFONE/POLYESTER BLOCK COPOLYMERS AND A PROCESS FOR THEIR PREPARATION**

**Aaron D. Meltzer, Pittsburgh, Pa., and Alexander Karbach, Krefeld, Germany, assignors to Bayer Corporation, Pittsburgh, Pa., and Bayer Aktiengesellschaft, Leverkusen, Germany**

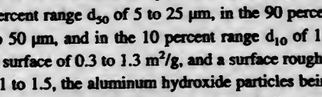
**Filed Sep. 23, 1994, Ser. No. 311,621**

**Int. Cl.[6] C08F *20/00***

**U.S. Cl. 525—437** **5 Claims**

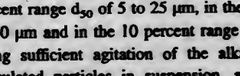
1. A process for preparing a block copolymer comprising reactively blending in the melt at a temperature above 250° C. and for a time of at least 0.5 minutes,

(i) an ester-containing polyethersulfone containing structural units conforming to



wherein m is about 1 to 100, and

a thermoplastic polyester containing structural units conforming to



where

A and Z independently one of the other denote the residue of a $C_6$–$C_{24}$ aromatic dicarboxylic acid,

B is the residue of an aliphatic or cycloaliphatic $C_2$–$C_6$diol,

$E_2$ denotes the residue of a dihaloaryl sulfone, and

$E_1$ denotes the residue of a aromatic dihydroxy compound, at molar amounts of 90 to 10 percent of said (i) and 10 to 90 percent of said (ii).

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**5,500,480**

**PROCESS FOR THE PRODUCTION OF AN ALUMINUM HYDROXIDE $AL(OH)_3$ HAVING ROUNDED GRAIN SURFACES**

**Neil Brown, Bergheim/Erft, and Detlef V. Pelj, Bedburg, both of, Germany, assignors to Martinswerk G.m.b.H. für chemische und metallurgische Produktion, Bergheim, Germany**

**Continuation of Ser. No. 370,813, Jan. 10, 1995, which is a continuation of Ser. No. 120,785, Sep. 15, 1993, abandoned. This application Jun. 26, 1995, Ser. No. 494,784**

**Claims priority, application Germany, Sep. 23, 1992, 42 31 874.2**

**Int. Cl.[6] C08K *3/10*; C01F *7/34*;*7/02***

**U.S. Cl. 524—437** **2 Claims**

1. A flame-retarded polymeric composition comprising a polymeric material which contains aluminum hydroxide particles, the aluminum hydroxide particles having rounded grain surfaces, the particles of the aluminum hydroxide having a grain diameter in the 50 percent range $d_{50}$ of 5 to 25 μm, in the 90 percent range $d_{90}$ of 10 to 50 μm, and in the 10 percent range $d_{10}$ of 1.0 to 4.5 μm, a BET surface of 0.3 to 1.3 m$^2$/g, and a surface roughness coefficient of 1.1 to 1.5, the aluminum hydroxide particles being produced by the process comprising inoculating an alkaline solution which is derived from the Bayer process and which has a molar ratio of $Na_2O$ to $Al_2O_3$ of 2.0 to 2.3, with 25 to 500 g/l of an aluminum hydroxide, the particles of which have a grain diameter in the 50 percent range $d_{50}$ of 5 to 25 μm, in the 90 percent range $d_{90}$ of 10 to 50 μm and in the 10 percent range $d_{10}$ of 1.0 to 4.5 μm, there being sufficient agitation of the alkaline solution to keep the inoculated particles in suspension, and the inoculated alkaline solution being maintained a sufficient amount of time to achieve sufficient particle growth to provide solid aluminum hydroxide with rounded grain surfaces, the particles of which have a grain diameter in the 50 percent range $d_{50}$ of 5 to 25 μm, in the 90 percent range $d_{90}$ of 10 to 50 μm and in the 10 percent range $d_{10}$ of 1.0 to 4.5μ, and then is precipitated at constant temperature or by normal cooling or by cooling at a specific temperature profile of said alkaline solution until a molar ratio of $Na_2O$ to $Al_2O_3$ of 2.6 to 3.1 has been reached in said alkaline solution, and then said solid aluminum hydroxide with rounded grain surfaces is filtered off.

**5,500,481**

**COMPOSITIONS CONTAINING EPOXIDIZED MONOHYDROXYLATED DIENE POLYMERS, AMINO RESINS, AND REACTIVE REINFORCEMENT AGENTS**

**David J. St. Clair, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.**

**Filed May 17, 1995, Ser. No. 444,080**
**Int. Cl.[6] C08L** *53/00;53/02;61/28;61/24*
**U.S. Cl. 525—92 K** **6 Claims**

1. A crosslinkable composition comprising from 30 to 90 percent by weight of an epoxidized monohydroxylated polydiene polymer containing from 0.2 to 0.7 meq of epoxy per gram of polymer and having the formula

$$(HO)_z—A—S_x—B—(OH)_y$$

wherein A and B are polymer blocks of homopolymer blocks of conjugated diolefin monomers, compolymer blocks of conjugated diolefin monomers, or copolymer blocks of diolefin monomers and monoalkenyl aromatic hydrocarbon monomers, S is a vinyl aromatic block, x and y are 0 or 1 and either x and y must be 1 but only one at a time can be 1, and z is 0 or 1, from 8 to 60 percent by weight of an amino resin crosslinking agent, and from 2 to 40 percent by weight of a reinforcing agent having at least two functional groups reactive with the amino resin selected from the group consisting of primary and secondary alcohols and carboxylic acids.

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**5,500,482**

**RUBBER COMPOSITION FOR TIRE TREAD**

**Takao Muraki, Shinshiro, and Yasuhiro Ishikawa, Hiratsuka, both of, Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan**

**Filed Sep. 16, 1994, Ser. No. 306,954**
**Claims priority, application Japan, Sep. 20, 1993, 5-233754**
**Int. Cl.[6] C08K** *7/02;9/06*
**U.S. Cl. 525—98** **4 Claims**

1. A rubber composition for a tire tread comprising (i) 100 parts by weight of a rubber component comprising (a) natural rubber and (b) a styrene-butadiene copolymer rubber terminally modified with at least one compound selected from the group consisting of N,N-dimethylnicotine amide, N,N,N',N'-tetramethylurea, N,N,N',N'-tetramethylaminoacetoamide, N-methyl-2-pyrolidone, N-methyl-ε-caprolactam, 4,4'-bis(diethylaminobenzophenone), and diphenylmethanediisocyanate and having a vinyl content in the butadiene portion of 35 to 80% by weight and a styrene content of 10 to 40% by weight wherein the total amount of these rubbers is at least 80% by weight of the total rubber component and wherein the amount of the styrene-butadiene copolymer rubber is 20 to 60% by weight of the total rubber component, (ii) 20 to 70 parts by weight of silica and (iii) 20 to 70 parts by weight of carbon black.

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**5,500,483**

**+1 PICHIA PASTORIS ALCOHOL OXIDASE ZZA1 REGULATORY REGION FOR HETEROLOGOUS GENE EXPRESSION**

**Mento H. Kumagai, Davis, and Genadie G. Sverlow, Vacaville, both of Calif., assignors to Biosource Technologies, Inc., Vacaville, Calif.**

**Filed Mar. 25, 1993, Ser. No. 37,618**
**Int. Cl.[6] C12N** *15/11;1/19*
**U.S. Cl. 536—24.1** **2 Claims**

1. An isolated polynucleotide comprising the regulatory region of alcohol oxidase gene ZZA1 wherein said polynucleotide comprises the non-coding region of the nucleotide sequence of FIG. 9 (SEQ ID. NO.: 1).

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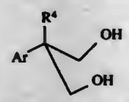
**5,500,484**

**2-ALKOXY- OR ACYLOXY-2-ARYL-1,3-PROPANEDIOL OR DIOXANE DERIVATIVE, AND PROCESS FOR ITS PRODUCTION**

**Hideharu Iwasaki, Ibaraki; Koichi Yoneda, Chiba; Yoichi Kido, Ibaraki; Takeo Hosogai, Saitama; Kazuo Itoi, Okayama, and Masahiko Kitayama, Ibaraki, all of, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan**

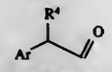
**Filed Aug. 26, 1994, Ser. No. 297,112**
**Claims priority, application Japan, Aug. 26, 1993, 5-234242; Aug. 26, 1993, 5-234243; Nov. 8, 1993, 5-302401; Nov. 30, 1993, 5-326161; Nov. 30, 1993, 5-326162**
**Int. Cl.[6] C07C** *43/13*
**U.S. Cl. 568—660** **1 Claim**

1. A process for producing the compound of Formula (1a)



(1a)

said process comprising the step of allowing a compound represented by Formula (5):



(5)

wherein Ar represents an aryl group and $R^4$ represents an alkoxy group having 1 to 10 carbon atoms; to react with formalin in the presence of a basic catalyst.

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**5,500,485**

**MANUFACTURE OF N-PHOSPHONOMETHYLGLYCINE AND ITS SALTS**

**Ian Hodgkinson, 1 Bankfield Drive, Holmbridge, Huddersfield, Yorkshire HD7 1PH, United Kingdom**

**Filed Jun. 20, 1994, Ser. No. 261,792**
**Claims priority, application United Kingdom, Jun. 21, 1993, 9312740; Dec. 14, 1993, 9325546**
**Int. Cl.[6] C07F** *9/38*
**U.S. Cl. 562—18** **12 Claims**

1. A process for the manufacture of N-phosphonomethylglycine and its salts which comprises hydrolysing N-phosphonomethyl-2-oxazolidinone in an aqueous medium and thereafter oxidising the hydrolysis product in an aqueous alkaline medium using an oxygen-containing gas in the presence of an oxidation catalyst at a temperature of from ambient to 100° C.

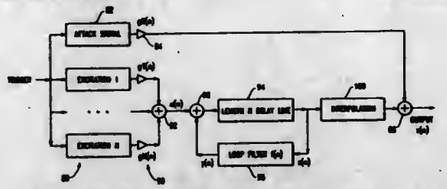


**5,500,486**

**PHYSICAL MODEL MUSICAL TONE SYNTHESIS SYSTEM EMPLOYING FILTERED DELAY LOOP**

**Julius O. Smith, III, Palo Alto, Calif., assignor to The Board of Trustees of the Leland Stanford Junior University, Palo Alto, Calif.**

**Filed Jul. 13, 1993, Ser. No. 90,783**
**Int. Cl.[6] G10H** *1/06;7/00*
**U.S. Cl. 84—622** **36 Claims**



1. A tone synthesis system for synthesizing a tone simulating a tone produced by a vibrating element in conjunction with a resonant member to which the vibrating element is acoustically coupled, comprising:

a closed loop including an input for receiving an excitation signal, a delay for delaying a signal circulating in the loop, and a filter for filtering a signal circulating in the loop and an output from the closed loop for providing a synthesized tone, wherein the amount of delay in the loop corresponds to the pitch of a tone to be synthesized; and

excitation means for providing an excitation signal to the input, said excitation signal including a portion thereof corresponding to an impulse response of said resonant member.

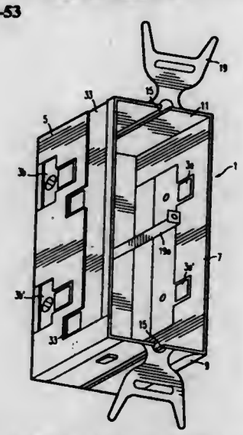
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**5,500,487**

**MODULAR PULL-OUT ASSEMBLY**

**George S. Leon, Trujillo Alto, Puerto Rico, assignor to Commonwealth of Puerto Rico, San Juan, Puerto Rico**

**Filed Oct. 12, 1993, Ser. No. 133,863**
**Int. Cl.[6] H02G** *3/18*
**U.S. Cl. 174.—53** **6 Claims**



1. A modular pull-out assembly comprising:

a receptacle having first and second opposing walls which comprise opposing electrical contacts, one of said first and second opposing walls comprising a ground means, the receptacle further comprising opposing third and fourth walls each having receiving portions which extend substantially along a length of each of said third and fourth walls; and

at least one switch or plug which is removably inserted into said receptacle;

wherein:

said at least one switch or plug comprises first and second opposing surfaces with opposing electrical contacts and a ground, a third surface with an indented portion and a fourth surface opposed to said third surface with a protruding portion, the switch or plug being removably slidable into the receptacle such that said opposing electrical contacts on said first and second walls of said receptacle respectively contact said opposing electrical contacts on said first and second opposing surfaces of said switch or plug, and one of said indented or protruding portions on said third and fourth surfaces of said switch or plug is respectively slidably fitted on one of said receiving portions on said third and fourth walls of said receptacle.

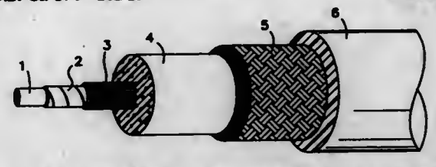
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**5,500,488**

**WIDE BAND HIGH FREQUENCY COMPATIBLE ELECTRICAL COAXIAL CABLE**

**Konrad Buckel, Nördliche Ringstrasse 21, 91781 Weissenburg, Germany**

**Filed Jul. 21, 1994, Ser. No. 278,731**
**Int. Cl.[6] H01B** *7/34*
**U.S. Cl. 174—102 R** **9 Claims**



1. A wide-band high frequency compatible electrical coaxial cable comprising:

a. an outer conductor;

b. a dielectric located between the outer conductor and an inner conductor; and

c. the inner conductor disposed concentrically within the outer conductor wherein the inner conductor is arranged around a plastic core and wherein the inner conductor further comprises two layers with an inner layer in the form of an overlappingly and helically wrapped electrical conductive film and an outer layer in the form of a plurality of twisted round conductors that are in electrical contact with the inner layer.

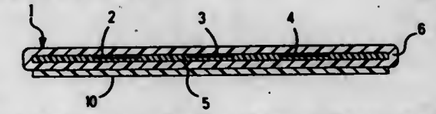
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**5,500,489**

**CABLE FOR ELECTRONIC RETAILING APPLICATIONS**

**Dinesh T. Shah, Kernersville, and Michael J. Rubera, Greensboro, both of N.C., assignors to The Whitaker Corporation, Wilmington, Del.**

**Filed Jul. 26, 1994, Ser. No. 280,629**
**Int. Cl.[6] H01B** *7/08*
**U.S. Cl. 174—117 FF** **5 Claims**



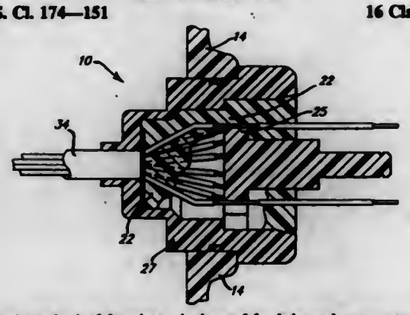
1. A flat cable comprising: a ribbon of dielectric material, electrical conductors on one side only of the ribbon and on an external surface of the ribbon, a jacket of flame resistant insulative material enclosing the ribbon and the conductors, the ribbon and the conductors being cut to a first length, the jacket being cut to a second length shorter than the first length, and exposed ends of the conductors and also of the ribbon projecting from opposite ends of the jacket for connection to electrical connectors.

5,500,490

## METHOD AND APPARATUS FOR FORMING LEAKPROOF FEED-THROUGH CONNECTOR

Chester E. Moyers, and Robert L. Lenz, both of Sterling, Ill., assignors to Borg-Warner Automotive, Inc., Sterling Heights, Mich.

Filed Jan. 10, 1994, Ser. No. 178,711
Int. Cl.[6] H02G 3/22
U.S. Cl. 174—151 16 Claims




1. A method of forming a leakproof feed-through connector for use with wires having a center conductor and having an outer concentric sheath, comprising:

removing a portion of the sheath around a medial section of a wire to expose an annular surface of the conductor and to define an adjacent surface of the sheath;

placing the wire in a supporting structure having a recess of a predefined diameter, the wire being placed so that the exposed annular surface is disposed within said recess;

fabricating a sealing material to define an outer diameter larger than the predefined diameter of said recess and passing the wire through said sealing material;

causing said sealing material to be secured by force-fit in contact with said annular surface and said adjacent surface of the sheath, such that the annular surface, the adjacent surface of the sheath and the sealing material coact to define a serpentine boundary to inhibit fluid leakage along the wire.

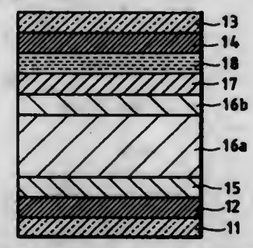
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5,500,491

## OPTICAL WRITING TYPE ELECTRO-OPTICAL DEVICE

Masao Watanabe, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Oct. 19, 1994, Ser. No. 325,620
Claims priority, application Japan, Nov. 10, 1993, 5-303227
Int. Cl.[6] G08C 21/00; G02F 1/1335;1/135
U.S. Cl. 178—18 11 Claims




1. An optical writing type electro-optical device comprising:

two transparent electrodes opposed to each other;

an optical modulation member having a memory function to which information is to be written by using an optical signal, the optical modulation member being disposed between the two transparent electrodes; and

a photoconductive member comprising an amorphous silicon type photoconductive layer disposed adjacent to the optical modulation member, and a thin film disposed between the photoconductive layer and one of the two transparent electrode and made of a material having a band gap of not less than 3 eV.

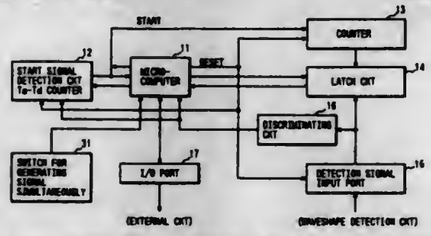
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5,500,492

## COORDINATE INPUT APPARATUS

Katsuyuki Kobayashi, Yokohama; Shinnosuke Tsuiishi; Atsushi Tanaka, both of Kawasaki; Yuichiro Yoshimura, Kamakura; Kiyoshi Kaneko, Yokohama; Ryoso Yanagisawa, Matsudo, and Masaki Tokioka, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 981,436, Nov. 25, 1992, abandoned. This application Oct. 24, 1994, Ser. No. 327,806
Claims priority, application Japan, Nov. 27, 1991, 3-311218; Jan. 10, 1992, 4-002526; Jan. 13, 1992, 4-003627
Int. Cl.[6] G08C 21/00
U.S. Cl. 178—18 7 Claims




3. A coordinate input apparatus for detecting vibration inputted from vibration input means by using vibration detecting means provided on a vibration transmitting member to measure a vibration transmission time to said vibration input means to derive coordinates at a constant period on the basis of a result of the measuring, said apparatus comprising:

detecting means provided in said vibration input means for detecting input of information except the coordinates; and

driving means for outputting vibration representing a condition of said detecting means at a period during vibration outputting for deriving the coordinates and vibration outputting for deriving the coordinates at a next period.

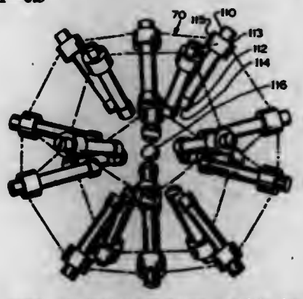
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5,500,493

## ACOUSTIC BEAM LEVITATION

Jacques Y. Guigné, Paradise, Canada; Martin B. Barmatz, LaCañada; Henry W. Jackson, Laverne, both of Calif., and Sergei V. Kopteako, Paradise, Canada, assignors to Guigne International Ltd., Paradise, Canada

Filed Nov. 2, 1994, Ser. No. 333,514
Int. Cl.[6] G10K 15/00
U.S. Cl. 181—0.5 17 Claims




1. An acoustic levitation apparatus which includes gas-containing walls largely surrounding an object levitation position where an object can lie, and an acoustic transducer apparatus for generating acoustic energy to levitate the object thereat, characterized by:

said acoustic transducer apparatus includes a plurality of transducer devices having sound emitting parts constructed to direct separate acoustic beams substantially at said levitation position, with said plurality of transducer devices being spaced about said levitation position so the acoustic beam from each of said transducer devices applies an individual force in a different direction to said object to at least control its position, and with said plurality: of transducer devices being constructed so said plurality of acoustic beams are of different frequencies to avoid interference.



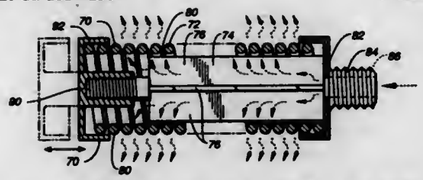
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5,500,494

## SYSTEM FOR MODIFYING OPERATION OF PNEUMATIC TOOL

Gary A. Ligman, 3914 Beechwood Dr., Concord, Calif. 94519

Continuation-in-part of Ser. No. 201,214, Feb. 24, 1994, abandoned, which is a continuation of Ser. No. 20,120, Feb. 19, 1993, abandoned. This application Apr. 13, 1995, Ser. No. 421,090
Int. Cl.[6] F01N 3/02
U.S. Cl. 181—230 5 Claims




1. Apparatus for use in combination with a compressed air powered tool having an air exit port to modify the sound of the compressed air powered tool during operation of the compressed air powered tool, said apparatus comprising, in combination:

a helical coil compression spring defining a plenum and comprised of a plurality of integral, axially aligned coil spring segments normally spaced from one another to define a plurality of radially disposed, restricted flow paths in fluid-flow communication with said plenum, said helical coil compression spring having spaced spring ends; and

a spring support for the helical coil compression spring extending through the interior of said helical coil compression spring and projecting from the spring ends, said spring support including spring support ends spaced from one another and a spring engaging surface in continuous engagement with and continuously bearing against a spring end of said helical coil compression spring exerting compressive forces on said helical coil compression spring to continuously maintain said helical coil compression spring under compression, one of said spring support ends for connecting the helical coil compression spring to a compressed air powered tool with the plenum of the helical coil compression spring in communication with an air exit port of the compressed air powered tool, said spring support additionally including a rigid support segment within the plenum of the helical coil compression spring adjacent to said coil spring segments and cooperable with said helical coil compression spring to prevent bending of the helical coil compression spring and maintain the coil spring segments in axial alignment, and adjustment means for moving said spring engaging surface relative to said rigid support segment to simultaneously move said coil spring segments, vary the length of said helical coil compression spring, and vary the size of said restricted flow paths.

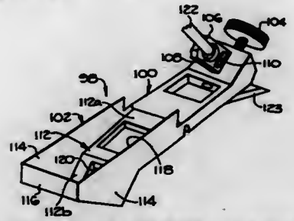
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5,500,495

## CIRCUIT BREAKER LOCKOUT DEVICE FOR ATTACHMENT TO SOLID SWITCH STEM

Steven J. Benda, Cokato, Minn., and John P. Pearson, Milwaukee, Wis., assignors to Brady USA, Inc., Milwaukee, Wis.

Continuation-in-part of Ser. No. 9,168, Jan. 26, 1993, abandoned. This application Jan. 18, 1994, Ser. No. 183,925
Int. Cl.[6] H01H 9/28
U.S. Cl. 200—43.14 8 Claims




1. A block-out device, for positioning over a switch, having a switch stem with solid portion and a switch base, the block-out device having structure forming an aperture for receiving a lock, the block-out device comprising:

a base having two angular surfaces joined at an apex and having an opening for receiving the switch stem when the base is positioned on the switch base with the angular surfaces each forming an acute angle with the switch base;

a screw insertable through a portion of the base, the screw having a shaft disposed along a path of motion of the switch stem and the screw having an operational end for manual operation of the screw without the use of tools for movement of the screw between a withdrawn position and a clamping position in which the screw exerts a clamping action against said solid portion o the switch stem; and

an angular cover which is movable between an open position and a closed position, wherein the cover forms an opening through which the structure forming the aperture projects when the cover is in the closed position, wherein the cover has two adjacent angular walls and side flap portions extending from the two adjacent angular walls, wherein the cover closes over the two angular surfaces of the base and the operational end of the screw to shield the operational end of the screw from access when the cover is in the closed position, and wherein the cover is secured in the closed position when a lock is positioned and is secured in said aperture.

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5,500,496

## HANDLE ASSEMBLY FOR A CIRCUIT BREAKER

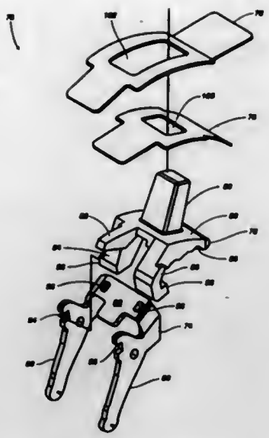
Donald R. Venzke, Cedar Rapids; Teresa I. Hood, Coralville, and W. Russell Emerick, Cedar Rapids, all of Iowa, assignors to Square D Company, Palatine, Ill.

Filed Feb. 14, 1994, Ser. No. 195,958
Int. Cl.[6] H01H 3/06
U.S. Cl. 200—339 12 Claims

1. A handle assembly for a circuit breaker, comprising:

a unitary handle including a base, a shaft and a first pair of legs, said shaft extending from an upper surface of said base and said first pair of legs extending from a lower surface of said base, said first pair of legs forming respective first mating portions; and

a unitary handle arm including a second pair of legs and a lateral plate bridging said second pair of legs, said second pair of legs forming respective second mating portions, said first mating portions slidably interlocking with respective ones of said second mating portions in response to common lateral movement of said first mating portions relative to each other so as to mount said handle to said handle arm.



5,500,497

## RUBBER DOME/MYLAR SWITCH

Roger A. Merriman, Lakewood, Colo., assignor to AT&T Corp., Murray Hill, N.J.

Continuation of Ser. No. 164,115, Dec. 7, 1993, abandoned. This application Dec. 15, 1994, Ser. No. 356,859
Int. Cl.[6] H01H *1/10*
U.S. Cl. 200—512 15 Claims



1. A pressure actuated switch and circuit board assembly comprising, in combination,

a base member having a first surface with a switch footprint thereon and one or more circuit components connected in circuit with said switch footprint;

a first sheet of contamination resistant flexible plastic non-conducting material overlying said base member and at least some of the circuit components thereon, said first sheet being apertured to expose said switch footprint, said first sheet being in contact with and separable from said base member;

a second sheet of contamination resistant flexible plastic non-conducting material overlying said first sheet in contact with said first sheet and separable therefrom, said second sheet having a switch pad on the surface thereof adjacent said first sheet in registry with said switch footprint;

a third sheet of an elastic material overlying said second sheet in contact with said second sheet and separable therefrom, said third sheet having formed thereon a pressure responsive switch actuation member, said switch actuation member having a bearing surface thereon adapted to bear against and depress said second sheet to move said switch pad into contact with said footprint upon application of pressure to said switch actuation member;

a faceplate member defining first and second apertures, and overlying said third sheet, the actuation member being aligned with the first aperture in said faceplate member;

means for aligning said first, second, and third sheets;

means for clamping and holding each of said first, second and third sheets in contact with adjacent sheets with said first sheet in contact with said first surface of said base member;

indicator means associated with said switch actuation member, for indicating contact of said switch footprint and said switch pad, said indicator means including a light-emitting diode; and

viewing means communicating with said indicator means, for permitting viewing of said indicator means, said viewing means including a light pipe extending through said first, second and third sheets, the light pipe being aligned with the second aperture defined in said faceplate member.

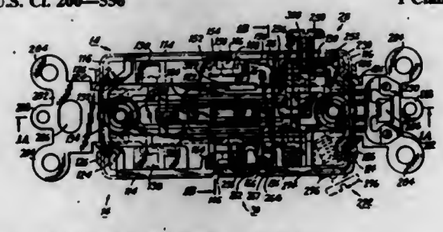
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5,500,498

## ROCKER-TYPE ELECTRICAL SWITCH

Stephen R. Kurek, Rego Park, N.Y., and David Schroeder, El Paso, Tex., assignors to Liviton Manufacturing Co., Inc., Little Neck, N.Y.

Continuation of Ser. No. 976,873, Nov. 13, 1992, Pat. No. 5,382,768. This application Jan. 17, 1995, Ser. No. 373,687
Int. Cl.[6] H01H *3/20*
U.S. Cl. 200—556 1 Claim



1. An electrical rocker switch comprising:

a manually movable rocker cover;

actuator means including a first and second end, wherein said first end is attached to said rocker cover such that said actuator means is movable in response to movement of said rocker cover;

slider means which responds to movement induced in said actuator means by sliding in one of two opposite directions;

a fixed terminal assembly including a first fixed contact;

a movable brush assembly including a first movable electrical contact, wherein said movable brush assembly responds to said slider means movement in a first direction by forcing said first movable contact to mate with said first fixed contact of said fixed terminal assembly to electrically close said switch and wherein said movable brush assembly responds to slider means movement in a second direction by causing said first movable contact to disengage from said mated position with said first fixed contact of said fixed terminal assembly to electrically open said switch;

a cam spring positioned adjacent to and contacting said second end of said actuator means to oppose movement thereof; and

a switch base having chambers therein for housing said slider means, said cam spring, said fixed terminal assembly, and said movable brush assembly,

wherein said cam spring is substantially symmetrical about a center plane and comprises: a) a small center well with sides which rise to a pair of apices, b) a pair of downward ramp portions joined to said well sides at said pair of apices, respectively, c) a pair of horizontal support portions joined to the ends of said pair of



downwardly ramp portions remote from said apices, respectively, and a d) pair of folded under end portions joined to ends of said pair of horizontal support portions respectively.

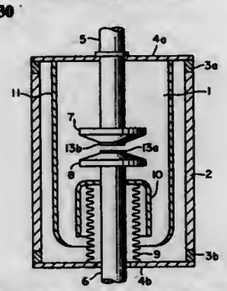
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5,500,499

## CONTACTS MATERIAL FOR VACUUM VALVE

Tsuneyo Seki, Tokyo; Tsutomu Okutomi, Kanagawa, and Atsushi Yamamoto, Tokyo, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 13, 1994, Ser. No. 181,085
Claims priority, application Japan, Feb. 2, 1993, 5-015060
Int. Cl.[6] H01H *33/66*
U.S. Cl. 218—130 7 Claims



1. A contacts material for a vacuum valve, comprising;

an arc-proof constituent comprising at least one selected from the group consisting of chromium, titanium, zirconium, vanadium and yttrium;

a conductive constituent comprising at least one selected from the group consisting of copper and silver;

an auxiliary constituent which does not react with said conductive constituent and which comprises at least one selected from the group consisting of tantalum, niobium, tungsten and molybdenum, said auxiliary constituent being formed to surround a periphery of said arc-proof constituent in said contacts material; and

an amount of said arc-proof constituent being from 10% to 70% by volume;

a total amount of said arc-proof constituent together with said auxiliary constituent being not more than 75% by volume; and

an amount of said conductive constituent being the balance.

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5,500,500

## PROCESS AND APPARATUS FOR ELECTRIC DISCHARGE POSITION DETECTION

Naotake Mohri, Nagoya, and Hideo Moronuki, Toyota, both of, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Mar. 9, 1995, Ser. No. 401,244
Claims priority, application Japan, Mar. 17, 1994, 6-047134
Int. Cl.[6] B23H *1/02*
U.S. Cl. 219—69.17 6 Claims

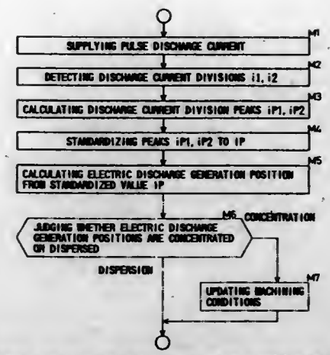
1. A process of detecting the position of generation of electric discharge between a discharge electrode of an electric discharge machine and a work, comprising the steps of:

branching a pulse discharge current into two or more branch power supply lines and supplying discharge current divisions to a discharge electrode from two or more points through the respective branch power supply lines;

detecting the discharge current divisions in the branch power supply lines;

calculating the peak value of each of the discharge current divisions at the time of rising of the pulse discharge current;

standardizing the peak value of each of the discharge current divisions; and




calculating electric discharge generation position according to the standardized peak value.

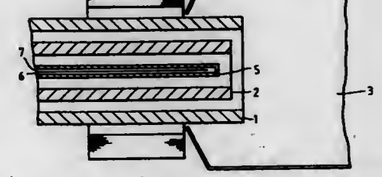
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5,500,501

## TORCH DEVICE FOR CHEMICAL PROCESSES

Steinar Lynum; Kjell Haugsten, both of Oslo; Ketil Hox, Trondheim; Jan Hugdahl, Trondheim, and Nils Myklebust, Trondheim, all of, Norway, assignors to Kvaerner Engineering A.S., Lysaker, Norway

PCT No. PCT/NO92/00199, § 371 Date Jan. 10, 1995, § 102(e) Date Jan. 10, 1995, PCT Pub. No. WO93/12635, PCT Pub. Date Jun. 24, 1993
PCT Filed Dec. 11, 1992, Ser. No. 244,300
Claims priority, application Norway, Dec. 12, 1991, 914910
Int. Cl.[6] B23K *10/00*
U.S. Cl. 219—121.48 3 Claims



1. A plasma torch device comprising hollow bodies which are generally concentric about a central axis and defining respectively anode and cathode elements, an axial-magnetic field generator, said bodies having operating ends, surrounded by said field generator, which are open and which generate an arc during the operation of the plasma torch device, another body of ferromagnetic material in the form of a hollow rod located along said central axis and including cooling channels for a cooling medium, said ferromagnetic body being moveable along said axis to adjust the operation parameters of said arc.

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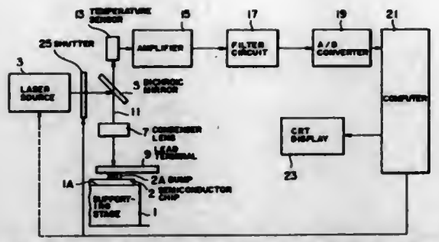
5,500,502

## BONDING METHOD AND APPARATUS

Manabu Horita; Masaharu Yoshida, and Masataka Takehara, all of Fukuoka, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 28, 1993, Ser. No. 82,500
Claims priority, application Japan, Jun. 30, 1992, 4-172891
Int. Cl.[6] B23K *26/00*
U.S. Cl. 219—121.63 17 Claims

1. An apparatus for bonding a first member to a second member comprising:




laser irradiation means for producing a laser beam for bonding together first and second members by irradiation with the laser beam, said irradiation means including a laser source for emitting the laser beam, a spectrally selective reflection/transmission mirror for reflecting the laser beam toward the first and second members, and a condenser lens for focusing the laser beam at a focal point at which the first and second members are disposed;

means for checking the contact between the first and second members prior to bonding the first and second members together;

temperature sensor means for detecting temperature of a bond formed by laser irradiation; and

decision means for deciding quality of a bond from a detection signal supplied by said temperature sensor means.

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**5,500,503**

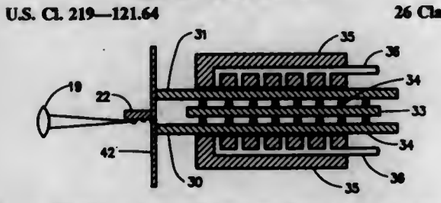
**SIMULTANEOUS LASER CUTTING AND WELDING OF METAL FOIL TO EDGE OF A PLATE**

**John C. Peraicka, Fort Collins; David K. Benson, and C. Edwin Tracy, both of Golden, all of Colo., assignors to Midwest Research Institute, Kansas City, Mo.**

**Filed Aug. 4, 1994, Ser. No. 285,700**

**Int. Cl.[6] B23K *26/00;26/02***

**U.S. Cl. 219—121.64** **26 Claims**




1. A method of welding an ultra-thin metal foil to the edge of a metal plate to form a vacuum tight weld comprising

a) providing an ultra-thin foil having a thickness of less than 0.002 inches,

b) providing at least one metal plate having a thickness greater than that of the ultra-thin foil, wherein the plate has a top surface, a bottom surface and an edge between the top and bottom surface defining the thickness of the plate,

c) placing the ultra-thin foil against the edge of the plate,

d) clamping the ultra-thin foil against the edge of the plate,

e) providing a laser having a focused beam,

f) directing the beam of the laser onto the ultra-thin foil to weld the ultra-thin foil to the edge of the plate at a weld line while simultaneously cutting the edge of the foil along one of the surfaces of the plate.

**5,500,504**

**NOZZLE FOR A TOOL FOR THE WORKING OF MATERIAL**

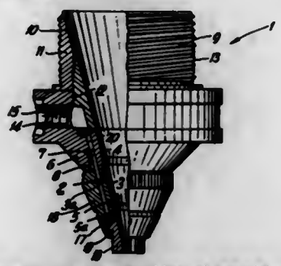
**Manfred Jagiella, Karlsruhe; Wolf Wiesemann, Gaggenau; Peter Schubert, Neukirch; Michael Holzmann, Rastatt, and Georg Spörl, Gaggenau, all of, Germany, assignors to C. A. Weidmüller GmbH & Co., Detmold, Germany**

**Filed Nov. 7, 1991, Ser. No. 788,864**

**Claims priority, application Germany, Nov. 7, 1990, 40 35 403.2; Nov. 7, 1990, 40 35 404.0; Jun. 11, 1991, 41 19 244.3; Jan. 7, 1991, 41 33 198.2**

**Int. Cl.[6] B23K *26/14***

**U.S. Cl. 219—121.67** **29 Claims**




1. A nozzle for a tool for working of material, comprising a nozzle body composed of electrically conductive material, the nozzle body having a tip region that carries a nozzle electrode, the tip region of the nozzle body and a remaining region of the nozzle body being formed by separate parts; the nozzle electrode being in direct contact with the tip region, and the tip region being electrically insulated from and fixed to the remaining region of the nozzle body by an electrically insulating adhesive.

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**5,500,505**

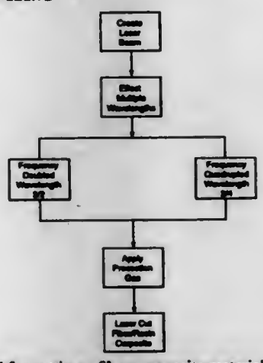
**METHOD FOR CUTTING EPOXY/CARBON FIBER COMPOSITE WITH LASERS**

**Marshall G. Jones, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Filed May 9, 1994, Ser. No. 240,051**

**Int. Cl.[6] B23K *26/00***

**U.S. Cl. 219—121.72** **11 Claims**




1. A method for cutting a fiber composite material having a fiber and a resin, the method comprising the steps of:

operating a laser in a high peak power Q-switch mode at high pulse rates to create a laser beam;

effecting different and multiple wavelengths in said laser beam, with a first wavelength for increasing coupling efficiency with said fiber, and a second wavelength for increasing coupling efficiency with said resin; and

applying the laser beam to the composite material to cut both said fiber and said resin.



**5,500,506**

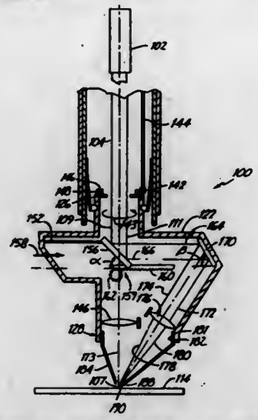
**OPTICAL SYSTEM FOR POSITIONING LASER BEAMS IN A STRAIGHT OR ANGULAR POSITION**

**William E. Lawson, Somerset, Wis., assignor to Laser Machining, Inc., Somerset, Wis.**

**Filed Jul. 13, 1994, Ser. No. 274,239**

**Int. Cl.[6] B23K *26/02***

**U.S. Cl. 219—121.67** **14 Claims**




10. An apparatus for cutting a workpiece, the apparatus comprising:

an energy source for providing a beam of energy; and

directing means for directing the beam of energy from the energy source to a focal point, the directing means including:

a frame mounted with respect to the energy source such that the beam of energy travels through the frame;

first focusing means disposed along the first axis for focusing the beam of energy to the focal point; and

means for intercepting the beam of energy and directing the beam of energy along the second axis, the means for intercepting including means for reflecting and focusing the beam of energy disposed along the second axis for focusing the beam of energy to the focal point, the means for intercepting being mounted within the frame and being movable between a first intercepting beam position and a second non-intercepting beam position.

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**5,500,507**

**LASER BEAM MACHINING DEVICE AND LASER BEAM MACHINING METHOD**

**Banzawa Yoshiaki, Toyama, Japan, assignor to Nippei Toyama Corporation, Tokyo, Japan**

**PCT No. PCT/JP92/01256, § 371 Date Oct. 18, 1993, § 102(e) Date Oct. 18, 1993, PCT Pub. No. WO93/06963, PCT Pub. Date Apr. 15, 1993**

**PCT Filed Sep. 30, 1992, Ser. No. 66,154**

**Claims priority, application Japan, Sep. 30, 1991, 3-252529; Jun. 30, 1992, 4-173289**

**Int. Cl.[6] B23K *26/02***

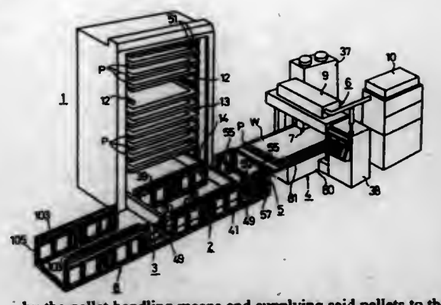
**U.S. Cl. 219—121.82** **15 Claims**

1. Laser beam machining apparatus having a stocker for storing a plurality of pallets in a shelved manner, each of said pallets securely carrying a single workpiece thereon, wherein the pallets are transferred to and machined by a laser processing machine one by one, said laser beam machining apparatus comprising:

pallet handling means for selectively drawing a pallet out of the stocker and replacing a pallet into the stocker;

an intermediate transport station disposed between the stocker and a laser processing machine, said intermediate transport station selectively receiving pallets drawn out of the stocker by the pallet handling means and supplying said pallets to the laser processing machine;

transfer means for automatically transferring pallets from the intermediate transport station to the laser processing machine before the workpiece is machined and from the laser processing machine to the intermediate transfer station after the workpiece is machined, wherein the workpiece is kept free from direct contact with the transfer means.




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**5,500,508**

**OVEN, PARTICULARLY WITH AN APPARATUS FOR PYROLTIC SELF CLEANING**

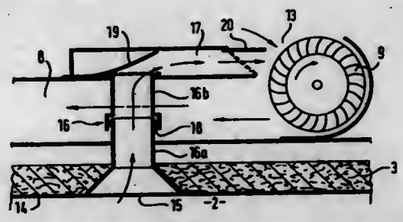
**Josef Gerl, Palling, Germany, assignor to Bosch-Siemens Hausgeraete GmbH, Munich, Germany**

**Filed Nov. 16, 1993, Ser. No. 153,299**

**Claims priority, application Germany, Nov. 16, 1992, 42 38 660.8**

**Int. Cl.[6] H05B *6/64*; F24C *7/02***

**U.S. Cl. 219—400** **15 Claims**




1. An oven, comprising an oven wall having an exhaust opening formed therein through which exhaust produced during oven operation can flow out to the outside, and a throttle located at the exhaust opening adjusting an exhaust flow cross section as a function of at least one parameter selected from the group consisting of temperature and humidity of the exhaust; said throttle being a bimetallic element enlarging the exhaust flow cross section in the event of a relatively low heat production in the oven and decreasing the exhaust flow cross section with increasing heat production in the oven.

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**5,500,509**

**MICROPROCESSOR BASED UNIVERSAL DIGITAL PRESSURE SENSOR**

**Carl R. Vogt, Raleigh, N.C., assignor to Borg-Warner Automotive, Inc., Sterling Heights, Mich.**

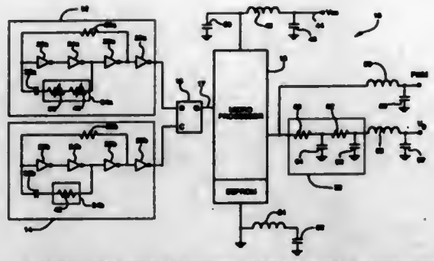
**Filed Mar. 1, 1994, Ser. No. 204,116**

**Int. Cl.[6] H05B *1/02***

**U.S. Cl. 219—501** **26 Claims**

1. A digital pressure sensor comprising:

a first oscillator circuit providing an oscillating pressure signal having a frequency varying in accordance with a sensed



pressure, said sensed pressure signal having a temperature based frequency component;

a second oscillator circuit providing an oscillating temperature signal having a frequency varying in accordance with a sensed temperature;

temperature compensation gating means coupled to said first and second oscillators, the gating means performing frequency domain subtraction of said pressure signal having frequency corresponding to the difference between the frequencies of said first and second oscillators; and

a microprocessor providing an output signal varying in accordance with said temperature compensated signal, said microprocessor having stored, predetermined calibration values which adjustably vary said temperature compensated signal to yield said output signal.

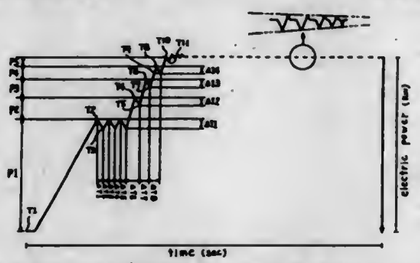
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**5,500,510**

**METHOD OF AUTOMATICALLY CONTROLLING THE FUSION PROCESS BETWEEN THERMOPLASTIC ARTICLES**

**Masaru Kumagai, Yao, Japan, assignor to Toua Kokyu Tugitevarubu Seizo Co., and Tokushu Kougyo Co., both of, Japan**

**Filed Nov. 2, 1994, Ser. No. 332,789**
**Int. Cl.[6] H05B *1/02***
**U.S. Cl. 219—505** **5 Claims**




1. A method of automatically controlling the fusion process of thermoplastic articles, including the steps of:

(1) supplying a resistor with an electric current in response to a start signal indicating the start of fusion process, the resistor serving as a heater to fuse together thermoplastic resin surface layers facing one another and in close contact with each other, calculating the electrical characteristics of the resistor upon increase of the electric power to a predetermined level, and also calculating specific heat of the resin by conducting ON-OFF control of the resistor;

(2) subsequently raising the electric power stepwise at successive stages and based on the values of electrical characteristics and specific heat which are already measured at the first step (1), so as to detect a variation coefficient of electrical characteristics at each stage, and also detecting a variation coefficient of specific heat at each stage by further conducting ON-OFF control of the resistor; and

(3) finally discontinuing to increase the electric power when the variation coefficient of specific heat measured at the second step (2) will have reached or become smaller than a prescribed value, with the ON-OFF control being continued until the specific heat itself becomes equal to or lower than a prescribed level so that the supply of electric power is ceased.

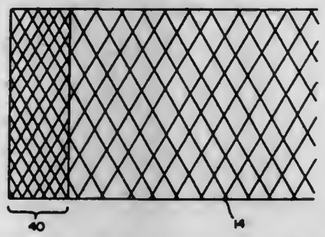
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**5,500,511**

**TAILORED SUSCEPTORS FOR INDUCTION WELDING OF THERMOPLASTIC**

**Karl A. Hansen, Seattle, and C. David Lunden, Federal Way, both of Wash., assignors to The Boeing Company, Seattle, Wash.**

**Continuation-in-part of Ser. No. 68,520, May 27, 1993, abandoned, which is a continuation-in-part of Ser. No. 777,889, Oct. 18, 1991, abandoned. This application Aug. 5, 1994, Ser. No. 286,360**
**Int. Cl.[6] H05B *6/10***
**U.S. Cl. 219—633** **22 Claims**




1. A susceptor for use in thermoplastic welding of composite parts, comprising a sheet of electrically conductive material having a thickness of about 0.075–0.25 mm and having a uniform distribution of substantially uniform size, diamond-shaped openings extending through the material, said openings having a length and a width defined by straight lines of the material of approximately uniform thickness of about 0.18 mm, the aspect ratio of the length to the width being greater than 1.0 to provide a longitudinal impedance along the susceptor less than the transverse impedance so that the susceptor heats more uniformly than susceptors with uniform longitudinal and transverse impedance when subjected to the varying magnetic field created with a cup coil induction coil.

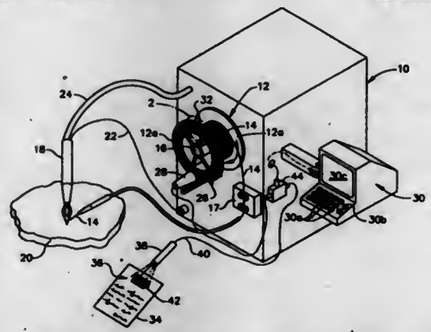
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**5,500,512**

**WELDING WIRE VERIFICATION CONTROL SYSTEM**

**Barry Goldblatt, Danvers, Mass., assignor to General Electric Company, Cincinnati, Ohio**

**Filed Dec. 16, 1994, Ser. No. 357,955**
**Int. Cl.[6] G06F *17/00***
**U.S. Cl. 235—375** **10 Claims**



1. A control system for verifying propriety of a welding wire for welding a part comprising:



a spool containing said welding wire having a pair of opposite endcaps, at least one of said endcaps having a label fixedly joined thereto identifying said welding wire contained on said spool;

a welding machine having a spindle receiving said spool, and a welding torch for receiving said welding wire from said spool;

a scanner positioned adjacent to said spool for automatically reading said spool label; and

a controller operatively joined to said welding machine for controlling welding start-up and a specified welding operation of said part requiring a specified welding wire, and also operatively joined to said scanner for automatically reading said spool label to identify said welding wire thereon, said controller being configured for comparing said specified welding wire with said identified welding wire on said spool and preventing said welding start-up unless said identified welding wire matches said specified welding wire.

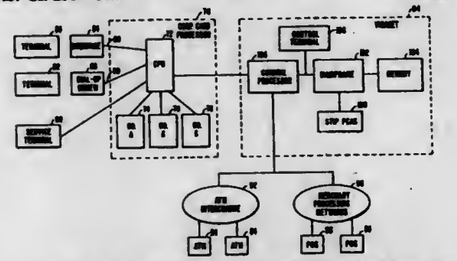
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**5,500,513**

**AUTOMATED PURCHASING CONTROL SYSTEM**

**Stephen Langhans, San Francisco; Laurence M. Goodman, Foster City, and Sigmun Shapiro, Alamo, all of Calif., assignors to Visa International, Foster City, Calif.**

**Filed May 11, 1994, Ser. No. 241,106**
**Int. Cl.[6] G06F *17/60***
**U.S. Cl. 235—380** **15 Claims**



1. A method for authorizing transactions for distributing currency or purchasing goods and services, comprising the following steps:

generating a plurality of card numbers, each card number including an account number and a bank identification number (BIN), corresponding to card numbers encoded on a plurality of cards;

creating a database on a central computer having at least a first field for said BIN and a second field for said account number;

assigning a billing hierarchial position to each of said account numbers in said database;

assigning a reporting hierarchial position to each of said account numbers in said database, said reporting hierarchial position being independent of said billing hierarchial position;

assigning an authorization hierarchial position to each of said account numbers in said database, said authorization hierarchial position being independent of said billing and reporting hierarchial positions;

creating a plurality of distinct authorization tests, each of said account numbers being subject to at least one of said authorization tests, said authorization tests varying according to the hierarchial position of an individual account number;

subsequently receiving, from a remote terminal, a transmitted card number and a debit amount;

determining, from said BIN in said transmitted card number, a location of said database;

determining, from the transmitted account number in said transmitted card number, the hierarchial authorization tests applicable to said transmitted account number;

applying said hierarchial tests to said debit amount;

transmitting to said remote terminal an authorization message if said hierarchial tests are passed;

transmitting to said remote terminal a message in accordance with a predetermined failure response option if said hierarchial tests are failed;

generating reports of said transmitting steps organized according to said reporting hierarchy; and

generating invoices for debit amounts corresponding to authorization messages organized according to said billing hierarchy.

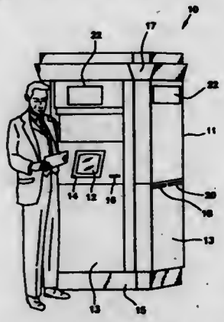
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**5,500,514**

**METHOD AND APPARATUS FOR GENERATING GIFT CERTIFICATES**

**William J. Veeneman, Minneapolis; Karla J. Alexander, Minnetonka; Thomas J. Doyle, Minneapolis; Phillip R. Brooks, Eagan, and Robert H. Hamilton, Edina, all of Minn., assignors to The Gift Certificate Center, Minneapolis, Minn.**

**Continuation-in-part of Ser. No. 760,875, Sep. 16, 1991, abandoned, which is a continuation-in-part of Ser. No. 664,930, Mar. 5, 1991, Pat. No. 5,243,174. This application Jan. 21, 1993, Ser. No. 7,807**
**The portion of the term of this patent subsequent to Sep. 7, 2010, has been disclaimed.**
**Int. Cl.[6] G06K *7/08***
**U.S. Cl. 235—381** **3 Claims**



1. A method of printing, under control of a user, from a certificate dispenser a negotiable certificate useful for obtaining goods and services, said dispenser including a computer, as well as display means, user interface means, payment means, and printing and dispensing means controlled by said computer, said method comprising the steps of:

displaying on said display means a menu of goods and services providers;

receiving from said user through said user interface means a choice of said goods and services providers;

displaying on said display means a series of monetary values;

receiving from said user through said user interface means a choice of one of said monetary values;

receiving with said payment means payment for said certificate from said user;

printing with said printing and dispensing means a certificate including the choice of the providers and the monetary value chosen; and

dispensing said certificate.

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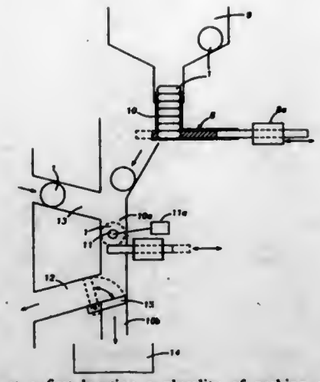
**5,500,515**

**METHOD OF USING A PARKING CARD FOR OPERATING A PARKING BARRIER FOR PAY PARKING**

**Johann Farmont, Talstrasse 1,, 4000 Dusseldorf 1, Germany**

**Continuation of Ser. No. 84,545, Jun. 29, 1993, abandoned. This application Dec. 14, 1994, Ser. No. 357,546**
**Int. Cl.[6] G07B *15/02***
**U.S. Cl. 235—384** **10 Claims**

1. A method for operating a parking concession comprising the steps of:



storing at a first location a plurality of parking cards, each comprising a round, flat piece of material with a front and reverse side, containing a non-contact machine-readable data medium for storing parking data;

determining when a parking customer is present at an entrance to a parking area;

selecting one of said plurality of parking cards or inserting a selected parking card of a past use into first location by a parking customer;

reading a card code from said selected parking card independent of the position of said parking card and electronically storing parking data within said parking card;

issuing said selected parking card to said parking customer;

opening an entrance barrier to said parking area allowing said parking customer to enter;

when said parking customer desires to exit said parking area, receiving from said parking customer said selected parking card into a payment location; and

reading said parking data from said selected card in order to determine the associated parking fee.

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**5,500,516**

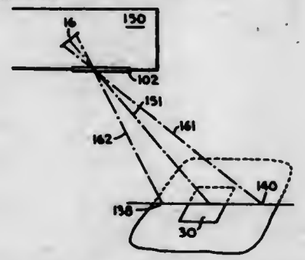
**PORTABLE OBLIQUE OPTICAL READER SYSTEM AND METHOD**

**Dennis A. Durbin, Cedar Rapids, Iowa, assignor to Norand Corporation, Cedar Rapids, Iowa**

**Continuation-in-part of Ser. No. 300,178, Sep. 2, 1994, abandoned, which is a continuation-in-part of Ser. No. 298,257, Aug. 30, 1994, abandoned. This application Nov. 22, 1994, Ser. No. 343,754**

**Int. Cl.[6] G06K 7/10**

**U.S. Cl. 235—472** **13 Claims**



1. An apparatus for reading optical indicia on a target surface, comprising:

a) a portable terminal unit of tablet configuration having an optical window at an underside thereof and defining a major plane;

b) an optical reader having an optical axis directed through said window and having a given depth of field and field of view at a given range from said window;

c) said optical reader having an optical axis directed obliquely to said major plane such that at least a portion of said field of view is horizontally displaced from said terminal unit as said terminal unit is disposed with said major plane horizontally oriented; and

d) said optical reader having an area-type image sensor defining a sensor plane and said image sensor positioned to intersect the optical axis of the optical reader and to receive light reflected from that portion of a target surface contained within the optical reader's field of view and depth of field.

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**5,500,517**

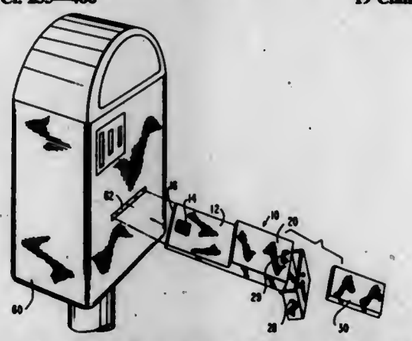
**APPARATUS AND METHOD FOR DATA TRANSFER BETWEEN STAND ALONE INTEGRATED CIRCUIT SMART CARD TERMINAL AND REMOTE COMPUTER OF SYSTEM OPERATOR**

**Charles W. Cagliostro, Hopewell Junction, N.Y., assignor to Gemplus Card International, Gemenos, France**

**Filed Sep. 2, 1994, Ser. No. 300,049**

**Int. Cl.[6] G06K 7/00**

**U.S. Cl. 235—486** **19 Claims**



1. A data collection device for an off-line vending machine which is operable by smart integrated circuit chip cards, which has a chip card reader, and which stores data as to the sale of goods/services from the machine, said data collection device comprising

(a) a first portion adapted to mechanically fit into the chip card reader of the vending machine and having electric contacts to make electrical connections with electrical contacts of said chip card reader in order to access data stored in said chip card reader,

(b) a second portion extending outward from and remaining outside of said reader when said first portion is in said reader, having an opening therein with electric contacts to receive and mechanically support and make electric connection with electric contacts of a PCMCIA card,

(c) a program installed in said data collection device to interrogate and retrieve the data stored in said reader when said first position is inserted in said reader, and transfer said retrieved data to said electric contacts of said second portion, whereby said data is transferred to a PCMCIA card connected in said second portion, and

(d) said first and second portions being rigidly joined to one another forming a unitary assembly and said second portion securely mechanically holding said PCMCIA card in said second portion with said second portion's electric contacts in contact with said PCMCIA electric contacts, and said second portion being a handle for gripping said device.



**5,500,518**

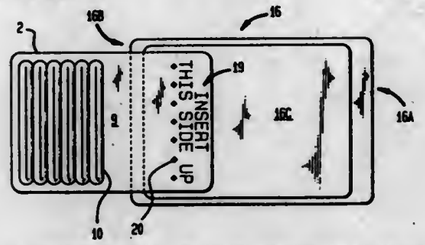
**MEMORY CARD INCLUDING EXTRACTION/RETENTION ARRANGEMENT**

**Richard A. Oizak, Kirkland; James L. Collier, Renton, and Robert D. Casey, Maple Valley, all of Wash., assignors to AlliedSignal Inc., Morristown, N.J.**

**Filed Nov. 17, 1994, Ser. No. 341,383**

**Int. Cl.[6] G06K 7/10**

**U.S. Cl. 235—492** **10 Claims**




1. A computer memory card extraction/retention arrangement, comprising:

a flexible tag having one surface and an opposite adhesive surface;

the tag having first and second sections separated by a natural hinge, whereby the adhesive surfaces of the first and second sections are displaceable toward each other;

each of said first and second sections having finger grip means on the one surface thereof, each of said finger grip means extending outwardly from the natural hinge toward a respective end of the tag;

said tag being folded around a memory card when the adhesive surfaces of the first and second tag sections are displaced toward each other, whereupon said adhesive surfaces adhere to a top and a bottom of the memory card on an end of said card opposite a socket end, and each of said finger grip means is joined via the adhesive surfaces to form a unitary finger grip area extending beyond the opposite card end for grasping the card and for hand extracting said card from a computer drive unit; and

means disposed on the one tag surface for lodging behind an internal lip of the computer drive unit for inhibiting accidental extraction of the card from said unit.

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**5,500,519**

**FOCUS DETECTION DEVICE AND METHOD OF ADJUSTING FOCUS DETECTION DEVICE COMPRISING INDEPENDENT PUPIL ADJUSTMENT OF MOVEABLE FIELD LENSES**

**Naoki Kitaoka, Chiba, and Keiji Ohsawa, Tokyo, both of, Japan, assignors to Nikon Corporation, Tokyo, Japan**

**Filed Dec. 20, 1994, Ser. No. 360,054**

**Claims priority, application Japan, Dec. 27, 1993, 5-330797**

**Int. Cl.[6] G03B 13/36; G02B 7/09**

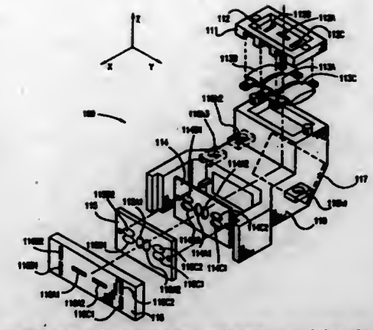
**U.S. Cl. 250—201.8** **13 Claims**

1. A phase difference focus detection device that detects focus in a plurality of regions in a photo taking field from light passing through a photographic lens having a first optical axis, the phase difference focus detection device comprising:

a plurality of field lenses each independently collecting light corresponding to each of said plurality of regions;

a pair of reimaging lenses receiving light transmitted through each of the plurality of field lenses, each pair of reimaging lenses forming a subject image in each of said plurality of regions by reimaging light corresponding to each of said plurality of regions;

a pair of diaphragm masks positioned near each pair of reimaging lenses, each pair of diaphragm masks regulating light coming through the pair of reimaging lenses; and



a pair of rows of photosensitive elements receiving the subject image corresponding to each of said plurality of regions, wherein a second optical axis from the plurality of field lenses to the pair of reimaging lenses and the first optical axis of the photographic lens are made to coincide, and wherein eccentricity adjustment can be performed independently on each of the plurality of field lenses.

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**5,500,520**

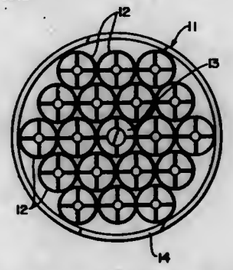
**COMPACT LARGE APERTURE OPTICAL TRANSMITTER/RECEIVER FOR LIDARS EMPLOYING A PLURALITY OF CASSEGRAIN OPTICS AND OPTICAL FIBERS**

**Hiroshi Komine, Torrance, Calif., assignor to Northrop Grumman Corporation, Los Angeles, Calif.**

**Filed Sep. 15, 1994, Ser. No. 306,799**

**Int. Cl.[6] G01C 21/02**

**U.S. Cl. 250—203.1** **6 Claims**



1. A compact large aperture optical transmitter/receiver system for illuminating and receiving light reflected from targets in a target area and providing an electric signal indicative thereof, comprising:

a plurality of light concentrators, each of said light concentrators having a fiber optic cable, a secondary mirror for reflecting and focusing light into the proximal end of said fiber optic cable and a primary mirror for reflecting light received by said light concentrator onto said secondary mirror;

an optical detector responsive to light appearing at the distal end of the fiber optic cable of all of said light concentrators and providing an electrical signal in response thereto; and

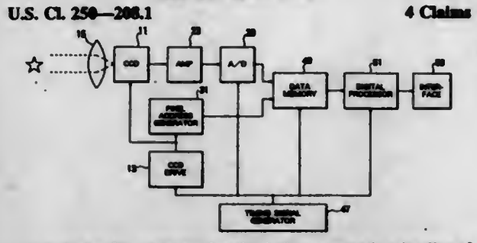
transmitter optics separate from said light concentrators disposed in said array for transmitting light toward a target area from which light is to be reflected to said light concentrators.

**5,500,521**

## OPTICAL SENSOR ARRANGEMENT FOR TRACKING A STAR, WITH DARK CURRENT PIXEL BY PIXEL SENSOR COMPENSATION

Naoshi Suzuki, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Dec. 8, 1993, Ser. No. 164,026
Claims priority, application Japan, Dec. 8, 1992, 4-328210
Int. Cl.[6] H01L 27/00
U.S. Cl. 250—208.1 4 Claims



1. A device for compensating for dark currents of a plurality of optical sensor elements receiving light of an object star in an optical sensor or an optical sensor arrangement, said device comprising:

projecting means for projecting a real image of at least one star on several elements of said optical sensor to make said optical sensor produce sensor output signals a few incidence of time; and

a processor unit for processing said sensor output signals into compensating data for use in compensating for said dark current, said processor unit being effective for compensating for a dark current of the individual output signals of the optical sensor elements on a pixel-by-pixel basis.

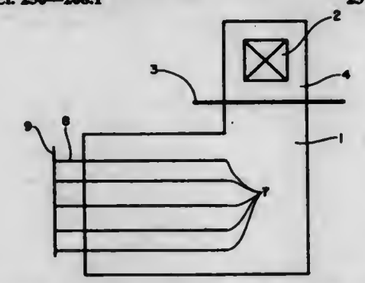
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**5,500,522**

## GALLIUM ARSENIDE MESFET IMAGER

Kamran Eshraghian, Panorama, and Derek Abbott, Magill, both of, Australia, assignors to Luminis Pty. Limited, Adelaide, Australia

PCT No. PCT/AU92/00524, § 371 Date May 27, 1994, § 102(e) Date May 27, 1994, PCT Pub. No. WO93/07643, PCT Pub. Date Apr. 15, 1993
PCT Filed Sep. 25, 1992, Ser. No. 211,373
Claims priority, application Australia, Sep. 30, 1991, PK8660
Int. Cl.[6] H01L 27/146
U.S. Cl. 250—208.1 23 Claims



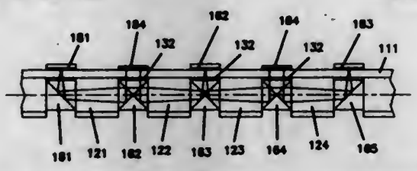
1. A pixel comprising a Field Effect Transistor formed on a gallium arsenide substrate wherein a source of the Field Effect Transistor is a photoresponsive element, a gate of the Field Effect Transistor is shielded from light and acts as a switch to enable/disable readout and a drain of the Field Effect Transistor is connected to a readout line.

**5,500,523**

## OPTICAL INFORMATION TRANSMITTING DEVICE AND METHOD OF MANUFACTURING SAME

Kenjiro Hamanaka, Osaka, Japan, assignor to Nippon Sheet Glass Co. Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 5,755, Jan. 19, 1993, Pat. No. 5,362,961, which is a division of Ser. No. 764,005, Sep. 23, 1991, Pat. No. 5,282,567. This application Apr. 25, 1994, Ser. No. 232,777
Claims priority, application Japan, Sep. 21, 1990, 2-253829; Sep. 21, 1990, 2-253830; Sep. 21, 1990, 2-253831; Nov. 9, 1990, 2-304552; Nov. 9, 1990, 2-304553; Feb. 26, 1991, 3-53949; Feb. 26, 1991, 3-53950; Mar. 1, 1991, 3-59764
Int. Cl.[6] H01J 3/14
U.S. Cl. 250—216 13 Claims



1. An optical information transmitting device for transmitting information on a light beam emitted by a light source, comprising:

a transparent mounting substrate having a first surface positioned opposite from a second surface;

a coaxial lens array of spaced-apart lenses arranged along a generally straight line and mounted along the first surface of the transparent mounting substrate, with conjugate focusing planes of the lenses being of equal magnification;

an optical element attached to the second surface of the transparent mounting substrate and optically coupled to the coaxial lens array, the optical element being offset from the generally straight line of the coaxial lens array; and

optical coupling means for optically coupling the coaxial lens array to the optical element, the optical coupling means directing optical pattern information provided in one of the conjugate focusing planes of the axial lens array through the transparent mounting substrate to the optical element.

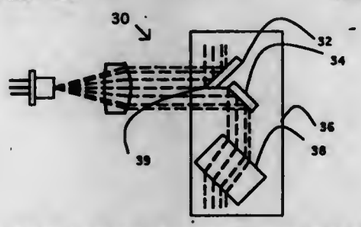
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**5,500,524**

## DIODE LASER CO-LINEAR LIGHT BEAM GENERATOR

Joseph F. Rando, Los Altos Hills, Calif., assignor to LeveLite Technology, Inc., Mountain View, Calif.

Filed Sep. 23, 1994, Ser. No. 311,671
Int. Cl.[6] G01B 11/26
U.S. Cl. 250—216 22 Claims



1. An alignment system of two essentially co-linear light beams comprising:

a diode laser source providing a beam which diverges at two substantially different rates on two perpendicular beam axes,

lens means for converting the diverging beam into a substantially collimated beam of substantially different dimensions on the two axes, a greater dimension on a long axis and a smaller dimension on a short axis,

two reflective surfaces positioned in the path of the substantially collimated beam and at substantially 90° to each other and oriented to produce two parallel beams of light projected in opposite directions from the single beam, by dividing the single beam through the long axis.



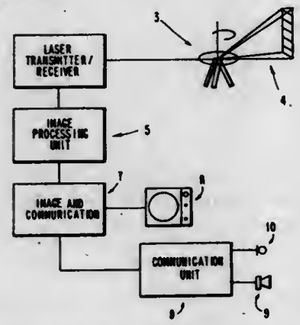
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**5,500,525**

## AREA SURVEYING APPARATUS AND COMMUNICATION SYSTEM

Izhak Saban, Haifa, Israel, assignor to State of Israel, Ministry of Defence, Rafael-Armaments Development Authority, Haifa, Israel

Filed Jul. 29, 1994, Ser. No. 282,713
Claims priority, application Israel, Aug. 1, 1993, 106544
Int. Cl.[6] G01V 9/04; H04B 9/00
U.S. Cl. 250—221 14 Claims




1. A method of protecting a predetermined area, comprising the steps of:

a) providing a base station positioned essentially at the center of the area to be protected, said base station being provided with a scanning laser beam generating and receiving means, image and signal processing units, a memory means, a voice receiving and transmitting means and an image viewing means;

b) causing a laser beam generated from the base station to be reflected from the surveyed area into the receiving means of the base station;

c) processing the received reflected light to generate an image of the surveyed area;

d) storing one or more scanned images in memory means, to be used as reference images;

e) at any given time, comparing a real-time scanned image with one or more stored reference image(s), to determine changes which have occurred on the image, which exceed predetermined threshold values, and alerting the operator of the base station of any such changes;

f) providing one or more moving station(s) comprising an emitting/receiving laser generating means and a signal processing means, and causing the said moving station to generate an emitted signal which identifies it;

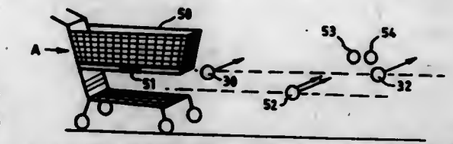
g) providing recognition means within the signal processing means of the base station, to recognize the signal generated by the moving station as a friendly signal, and to alert the operator of the base station whether a change in the image of the scanned area belongs to a friendly or to an unfriendly force.

**5,500,526**

## MONITORING DEVICE FOR MONITORING THE PASSAGE OF OBJECTS THROUGH PASSAGE

Ram Shalvi, and Christopher A. W. Kleinau, both of Hong Kong, Hong Kong, assignors to Solar Wide Industries, Ltd., Kwai Chung, Hong Kong

Filed May 26, 1994, Ser. No. 249,853
Claims priority, application European Pat. Off., Jun. 11, 1993, 93304548
Int. Cl.[6] G01V 9/04
U.S. Cl. 250—222.1 10 Claims



1. A monitoring device for monitoring passage of objects comprising three radiation transmitter/receivers arranged to transmit and receive respective beams of radiation in the same general direction but laterally spaced apart so as to detect objects passing the device in the lateral direction and which interrupt the radiation in use, in which the device is arranged in use to be activated for detecting the objects by interruption of the beam of the first transmitter/receiver, to detect thereafter any object which interrupts the beam of the second transmitter/receiver while the device is activated, and be deactivated by interruption of the beam of the third transmitter/receiver.

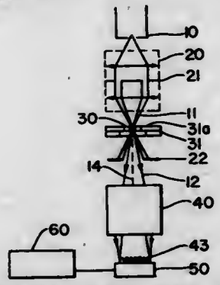
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**5,500,527**

## ELECTRON/ION MICROSCOPE WITH IMPROVED RESOLUTION

Alexander Zarubin, Friedrich-Ebert-Str. 43, D-48153 Munster, Germany

Filed Dec. 27, 1994, Ser. No. 365,043
Int. Cl.[6] H01J 37/26
U.S. Cl. 250—306 18 Claims



1. A microscope having a source means (10) for producing charged particles and a condenser means (20) to form an electron or ion particle beam incident on a specimen (30) thereby forming a scattered particle beam having an optical axis (14) and comprising a specimen holder (31) and a detector (50), characterized in that:

the source means (10) and the condenser means (20) form a dark-field illumination system with an incident beam whose spatial coherence radius is less than the transverse dimensions of the specimen (30), and in that the microscope comprises

an interferometer means (40) positioned along the optical axis for forming interference fringes by superposing two lateral areas of the scattered particle beam which are separated by a variable shear distance;

rotation means for turning the direction of shear, produced by the interferometer, relative to the scattered beam around said optical axis;

the detector (50) being positioned to take recordings of said interference fringes, and

data processor means (60) for evaluating the visibility and the phase shift of said interference fringes from said recordings for obtaining Fourier components of an image of the specimen and to synthesize the specimen image from said Fourier components.

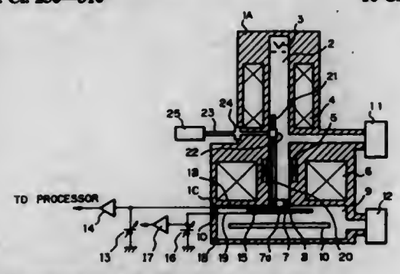
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**5,500,528**

## SCANNING ELECTRON MICROSCOPE

**Hidenobu Matsui, Saitama, and Mitsuru Hiura, Kanagawa, both of, Japan, assignors to Nikon Corporation, Tokyo, Japan**

**Filed Mar. 23, 1995, Ser. No. 408,839**
**Claims priority, application Japan, Mar. 24, 1994, 6-053711**
**Int. Cl.[6] H01J *37/256;37/244***
**U.S. Cl. 250—310** **10 Claims**




1. A scanning electron microscope comprising:
an electron gun for emitting an electron beam;
a passage for the electron beam to pass through;
an electron lens disposed around said passage;
a deflection electrode for deflecting the electron beam;
a sample chamber communicating with said passage through a pressure limiting aperture and containing a sample therein;
a detector for detecting secondary electrons reflected from the sample and gas magnified by gas in said sample chamber, said detector being disposed in said sample chamber and having at least an inner electrode and an outer electrode disposed outside said inner electrode; and
said inner electrode being capable of moving in opposite directions along a path of the electron beam.

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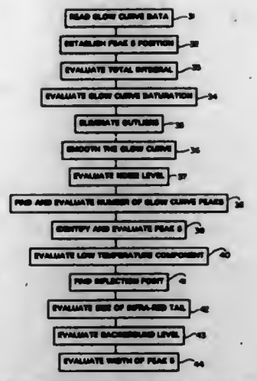
**5,500,529**

## APPARATUS AND METHOD FOR SCREENING ABNORMAL GLOW CURVES

**Riad A. Tawil, Kirtland, Ohio; Yao Tan, Genova, Italy, and Joseph Rotunda, Cuyahoga Falls, Ohio, assignors to Saint-Gobain/Norton Industrial Ceramics Corporation, Worcester, Mass.**

**Filed Jun. 28, 1994, Ser. No. 270,902**
**Int. Cl.[6] G01T *1/115***
**U.S. Cl. 250—337** **6 Claims**

1. A method of evaluating glow curve data obtained with a thermoluminescent dosimetry reader wherein such glow curve data is composed of the superposition of plural overlapping glow peaks plus instrumental and dosimeter background, comprising the steps of:
(a) acquiring composite glow curve-data of at least one field dosimeter to be evaluated and at least one quality control dosimeter of the same type as the field dosimeter, the quality control dosimeter having been exposed to a predetermined quantity of radiation for providing a predictable glow curve, and
(b) evaluating the composite glow curve data of the field dosimeter to ascertain the presence of an abnormal condition, said evaluating step including the steps of:
(i) automatically using the glow curve data of the quality control dosimeter to establish a standard against which a




corresponding value of the glow curve data of the field dosimeter is compared, and
(ii) automatically comparing the corresponding value of the glow curve data against the standard and reporting an abnormal condition if the corresponding value falls outside a predetermined tolerance window.

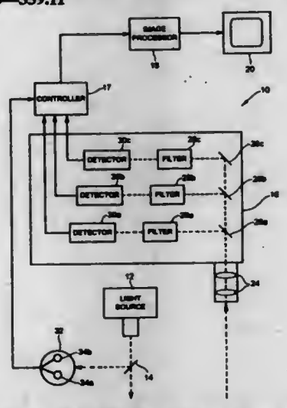
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**5,500,530**

## ELECTRO-OPTIC ICE DETECTION

**Dennis J. Gregoris, Etobicoke, Canada, assignor to SPAR Aerospace Limited, Brampton, Canada**

**Filed Oct. 31, 1994, Ser. No. 332,100**
**Int. Cl.[6] G01N *21/35***
**U.S. Cl. 250—339.11** **24 Claims**




1. A method of indicating the presence of ice on a surface, comprising the following steps:
detecting the intensity of reflected light from said surface at a first lower wavelength band, said lower band being within a band extending from about 1.1 microns to about 1.3 microns;
detecting the intensity of reflected light from said surface at a second upper wavelength band having substantially the same bandwidth as said lower band, said upper band being within a band extending from about 1.16 microns to about 1.3 microns; and
determining the presence or absence of ice on said surface based upon the intensity of reflected light at said first band and the intensity of reflected light at said second band.

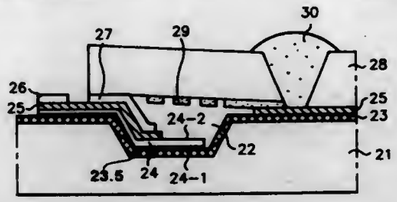


**5,500,531**

## SENSOR FOR DETECTING ULTRA-VIOLET RAYS

**Jong U. Bu, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea**

**Filed Aug. 3, 1994, Ser. No. 285,509**
**Claims priority, application Rep. of Korea, Sep. 14, 1993, 18442/1993**
**Int. Cl.[6] H01J *47/00***
**U.S. Cl. 250—372** **16 Claims**




1. A sensor for detecting ultra-violet rays comprising:
a lower semiconductor substrate having a cavity; an upper glass substrate; a photocathode formed on the lower semiconductor substrate; an anode formed on the upper glass substrate, wherein said lower semiconductor substrate is adhered to the upper glass so that said photocathode and said anode are positioned to face each other across the cavity.

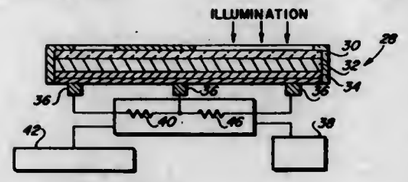
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**5,500,532**

## PERSONAL ELECTRONIC DOSIMETER

**Michael N. Kozicki, Phoenix, Ariz., assignor to Arizona Board of Regents, Tempe, Ariz.**

**Filed Aug. 18, 1994, Ser. No. 292,398**
**Int. Cl.[6] G01J *1/42***
**U.S. Cl. 250—372** **18 Claims**



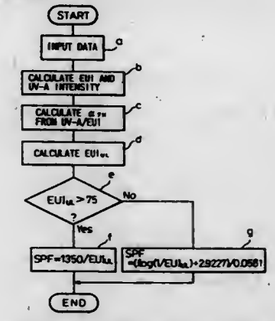

1. A dosimeter comprising:
a transparent substrate, said substrate comprised of a non-conducting material incapable of creating a measurable electrical resistance;
a chalcogenide layer bonded directly to said transparent substrate in a layering manner;
a metal-containing film bonded directly to said chalcogenide material in a layering manner so as to cumulatively form a layered light sensitive material;
a protective covering having said light sensitive layered material substantially enclosed within, said protective covering capable of exposing a first portion of said light sensitive material and shielding a second portion of said light sensitive material from exposure;
a power source for creation of a current through said metal-containing film;
means for measuring a change in electrical resistance of said metal-containing film;
means for converting said change in electrical resistance of said metal-containing film to a cumulative exposure dosage value; and
means for outputting said cumulative exposure dosage value.

**5,500,533**

## METHOD AND APPARATUS FOR MEASURING ULTRAVIOLET PROTECTION EFFECTIVENESS

**Katsuki Ogawa; Shigenori Kumagai, and Harumi Odagiri, all of Yokohama, Japan, assignors to Shiseido Company, Ltd., Tokyo, Japan**

**Filed Sep. 27, 1994, Ser. No. 313,460**
**Claims priority, application Japan, Sep. 27, 1993, 5-239875**
**Int. Cl.[6] G01N *21/33***
**U.S. Cl. 250—372** **15 Claims**




1. A method of measuring ultraviolet protection effectiveness of a sample, comprising the steps of:
a) measuring the intensities of ultraviolet radiation at a plurality of wavelength sections of the ultraviolet radiation transmitted through the sample;
b) calculating an erythema-inducing UV intensity by multiplying the intensities measured at said plurality of wavelength sections by erythemal effectiveness coefficients associated with the respective wavelength sections and by summing the resulting products;
c) calculating a transmitted UV-A intensity by summing the intensities at the respective wavelength sections that lie within the wavelength range of UV-A;
d) calculating a photoaugmentative effectiveness from said transmitted UV-A intensity;
f) calculating an ultimate erythema-inducing UV intensity by multiplying said erythema-inducing UV intensity by said photoaugmentative effectiveness; and
g) calculating an SPF value from said ultimate erythema-inducing UV intensity.

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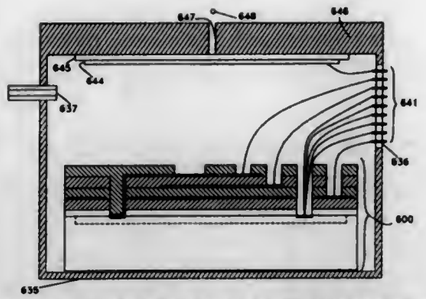
**5,500,534**

## INTEGRATED ENERGY-SENSITIVE AND POSITION-SENSITIVE X-RAY DETECTION SYSTEM

**Douglas S. Robinson; Terrence C. Jensen, and Joseph N. Gray, all of Ames, Iowa, assignors to Iowa State University Research Foundation, Ames, Iowa**

**Filed Mar. 31, 1994, Ser. No. 220,913**
**Int. Cl.[6] G01T *1/185***
**U.S. Cl. 250—385.1** **31 Claims**

1. An integrated apparatus, comprising:
a wafer;
an x-ray detector fabricated on said wafer having a housing, a plurality of anodes and a gas contained in said housing, wherein at least a portion of said housing passes x-ray photons which partially ionize said gas thereby producing at least one pulse at one of said plurality of anodes;
a plurality of active signal processing circuits integrated into said wafer and respectively coupled to said plurality of anodes, wherein a respective one of said plurality of signal processing circuits receives and processes said at least one pulse to yield a digital signal indicating location of said one of said plurality of anodes and amplitude of said pulse; and



an electrically isolating layer for electrically isolating said x-ray detector from said plurality of active signal processing circuits.

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**5,500,535**

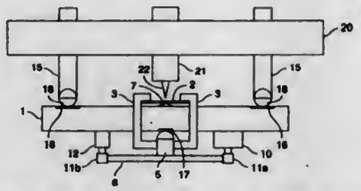
**STRESS CELL FOR A SCANNING PROBE MICROSCOPE**

**Tianwei Jing, Tempe, Ariz., assignor to Molecular Imaging Corporation, Tempe, Ariz.**

**Filed Mar. 7, 1995, Ser. No. 399,969**

**Int. Cl.[6] H01J** *37/20*

**U.S. Cl. 250—440.11** **9 Claims**



1. A stress cell for holding and applying stress to a sample surface to be scanned by a scanning probe microscope, said stress cell comprising:

a sample stage having an upper and a lower surface and including at least two apertures connecting said upper and lower surface;

a stress inducing unit fixedly mounted with respect to said upper surface of said stage;

a clamp for holding a sample surface over and in contact with said stress inducing unit, said clamp including at least two arms, each of said arms having a first end and a second end, and each of said arms extending through one of said apertures, said first ends of said arms of said clamp adapted to receive and hold the sample surface;

a micrometer including a threaded plate and a threaded rod, said second ends of said arms of said clamp fixedly attached to said threaded plate, said threaded rod adapted to engage said lower surface of said stage and thereby pull the sample surface into contact with said stress inducing unit.

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**5,500,536**

**SPECTROFLUOROMETER**

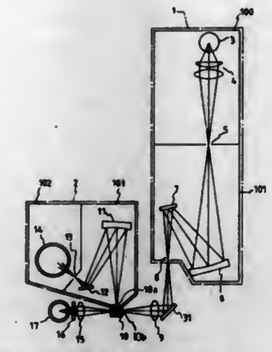
**Taro Nogami, Katsuta; Shunichi Matsuura, Ibaraki, and Akira Kuroda, Mito, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Mar. 21, 1994, Ser. No. 215,233**

**Claims priority, application Japan, Mar. 22, 1993, 5-061580**

**Int. Cl.[6] G01N** *21/01*

**U.S. Cl. 250—458.1** **17 Claims**



1. A spectrofluorometer comprising:

a) a sample cell including:

i) a sample chamber to hold a sample;

ii) an excitation light port to direct excitation light to said sample chamber;

iii) a fluorescence output port to derive fluorescence emitted from the sample in the said sample chamber; and

iv) light-shielding members arranged to sandwich said excitation light port and said fluorescent output port therebetween;

b) an excitation side monochronometer to derive the excitation light to be directed to said sample;

c) a fluorescence side monochronometer to analyze the fluorescence from said sample cell;

d) a fluorescence detector to detect the fluorescence from said fluorescence side monochronometer; and

e) the output port of said sample chamber forming an entrance slit for said fluorescence side monochronometer.

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**5,500,537**

**FIELD-EFFECT TRANSISTOR WITH AT LEAST TWO DIFFERENT SEMICONDUCTIVE ORGANIC CHANNEL COMPOUNDS**

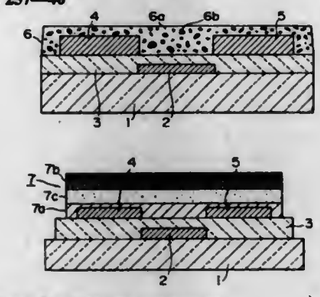
**Akira Tsumura; Hiroyuki Fuchigami; Hideharu Nobutoki, and Hiroshi Koezuka, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 785,163, Oct. 31, 1991, abandoned, which is a continuation of Ser. No. 562,561, Aug. 3, 1990, abandoned. This application Jul. 30, 1993, Ser. No. 372,219**

**Claims priority, application Japan, Aug. 17, 1989, 1-211739; Aug. 17, 1989, 1-211740; Jan. 29, 1990, 2-19464; Jun. 19, 1990, 2-160629**

**Int. Cl.[6] H01L** *35/24;51/00*

**U.S. Cl. 257—40** **14 Claims**



1. A field effect transistor comprising:

a gate electrode;

a source electrode;

a drain electrode; and

a channel electrically connecting the source electrode and the drain electrode and comprising a mixture of a first organic compound and a second organic compound, said first organic compound and said second organic compound being two different organic compounds, said first organic compound having semiconductor properties, said second organic compound having an electrical conductivity greater than or equal to that of a semiconductor, the gate electrode being electrically coupled with the channel to control the electrical conductivity of the channel, wherein said first organic compound is a π-conjugated polymer.

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**5,500,538**

**ELECTRO-OPTICAL DEVICE AND METHOD OF DRIVING THE SAME**

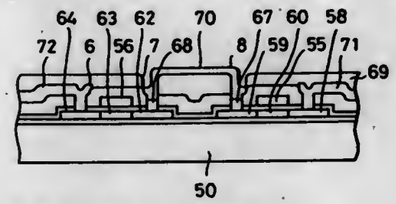
**Shunpei Yamazaki, Tokyo, and Akira Mase, Aichi, both of, Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan**

**Division of Ser. No. 104,935, Aug. 12, 1993, Pat. No. 5,383,041, which is a continuation of Ser. No. 805,521, Dec. 13, 1991, abandoned. This application Sep. 29, 1994, Ser. No. 314,714**

**Claims priority, application Japan, Dec. 20, 1990, 2-418664; Dec. 29, 1990, 2-418291**

**Int. Cl.[6] H01L** *29/04;31/036;21/0376*

**U.S. Cl. 257—49** **23 Claims**



1. An electro-optical device comprising:

a substrate having an insulating surface; and

at least two thin film transistors formed on said substrate,

wherein at least a channel of each of said thin film transistors contains oxygen at $4\times10^{19}$ to $4\times10^{21}$ atoms/cm$^3$.

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**5,500,539**

**METHOD OF DEPOSITING DIAMOND AND DIAMOND LIGHT EMITTING DEVICE**

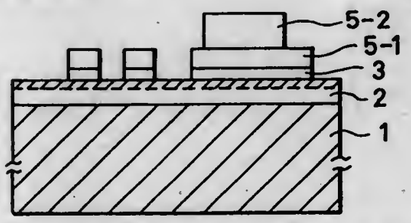
**Masaya Kadono, Atsugi, and Shunpei Yamazaki, Tokyo, both of, Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan**

**Continuation of Ser. No. 751,954, Aug. 29, 1991, abandoned, which is a division of Ser. No. 523,408, May 15, 1990, Pat. No. 5,106,452. This application Oct. 13, 1994, Ser. No. 322,379**

**Claims priority, application Japan, Jun. 5, 1989, 1-143554; Jun. 5, 1989, 1-143555; Jun. 12, 1989, 1-149177**

**Int. Cl.[6] H01L** *31/0312*

**U.S. Cl. 257—77** **12 Claims**



1. A diamond laminate body including a layer for an electronic device comprising:

a semiconductor substrate having a p-type conductivity for providing a first electrode arrangement;

a p-type diamond layer formed on said substrate;

a n-type semiconductor layer formed on said p-type diamond layer, said semiconductor comprising a material selected from the group consisting of diamond, silicon carbide and silicon; and

a second electrode arrangement formed on said n-type semiconductor layer,

wherein current passes through said p-type diamond layer and said n-type semiconductor layer when a voltage is applied across said first and second electrode arrangements.

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**5,500,540**

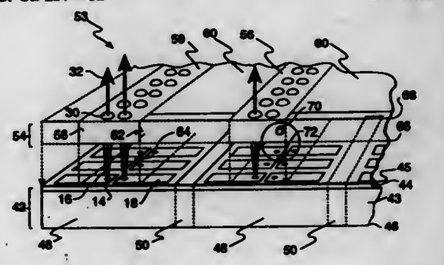
**WAFER SCALE OPTOELECTRONIC PACKAGE**

**Jack L. Jewell; William E. Quinn; Stan E. Swirhun, and Robert P. Bryan, all of Boulder, Colo., assignors to Photonics Research Incorporated, Broomfield, Colo.**

**Filed Apr. 15, 1994, Ser. No. 228,202**

**Int. Cl.[6] H01L** *33/00;25/03*

**U.S. Cl. 257—82** **22 Claims**



1. An optoelectronic package comprising:

at least a portion of a first layer having at least a top surface which contains at least two optoelectronic chip regions, each of said optoelectronic chip regions containing at least one optoelectronic element which receives or emits at least one beam of light and receives or emits at least one electronic signal, each of said optoelectronic chip regions containing at least one electrical contact;

means for separating said optoelectronic chip regions; and

a medium comprising medium regions integrated with and aligned with said optoelectronic chip regions, each of said medium regions containing modifying elements which modify said at least one beam of light or said at least one electronic signal, at least one of said medium regions comprising at least a portion of a second layer having at least a top surface which contains at least two electronic chip regions, each of said electronic chip regions containing at least one electronic element electrically connected to said at least one optoelectronic element, each of said electronic chip regions containing at least one electrical contact;

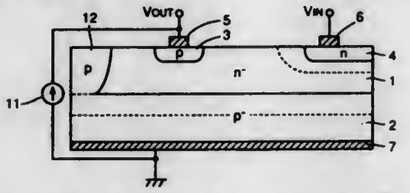
characterized in that said medium regions are commonly mounted when integrated to said optoelectronic chip regions, and that said at least one electrical contact is electrically accessible.

**5,500,541**

## SEMICONDUCTOR DEVICE HAVING VOLTAGE SENSING ELEMENT

**Tomohide Terashima, Hyogo, and Masanori Fukunaga, Fukuoka, both of, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Nov. 17, 1994, Ser. No. 343,945**
**Claims priority, application Japan, Apr. 27, 1994, 6-089462**
**Int. Cl.[6] A01L** *29/861;31/107*
**U.S. Cl. 257—105** **14 Claims**




1. A semiconductor device having a voltage sensing element for sensing an output voltage, said voltage sensing element comprising:

a first semiconductor layer of a first conductivity type having a front surface and a rear surface;

a first semiconductor region of a second conductivity type formed in a prescribed region at the front surface of said first semiconductor layer;

a second semiconductor region of the first conductivity type formed at the front surface of said first semiconductor layer, spaced apart from said first semiconductor region by a prescribed distance;

a second semiconductor layer of the second conductivity type formed on the rear surface of said first semiconductor layer;

a first electrode formed in contact with said first semiconductor region;

a second electrode formed in contact with said second semiconductor region; and

a third electrode formed in contact with said second semiconductor layer, wherein

said first electrode comprises an output terminal of said voltage sensing element, and said second electrode comprises an input terminal of said voltage sensing element, and a constant-current source is connected to said first electrode to increase a voltage on said output terminal with respect to a voltage on said input terminal.

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**5,500,542**

## SEMICONDUCTOR INTEGRATED CIRCUIT WITH PROTECTION CIRCUIT AGAINST ELECTROSTATIC BREAKDOWN AND LAYOUT DESIGN METHOD THEREFOR

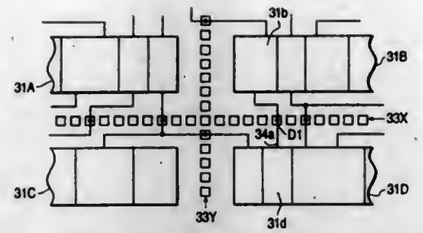
**Takashi Iida; Satoru Sumi; Hiroshi Shimizu; Akinori Tahara; Isao Amano, and Tetsuya Nakajima, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Filed Feb. 14, 1994, Ser. No. 194,968**
**Claims priority, application Japan, Feb. 12, 1993, 5-023119; Mar. 18, 1993, 5-058469; Sep. 2, 1993, 5-218863**
**Int. Cl.[6] H01L** *27/10;23/62*
**U.S. Cl. 257—210** **2 Claims**

1. A semiconductor integrated circuit with a protection circuit for protecting against electrostatic breakdown, wherein cells having MIS transistors are arranged on a substrate, a specific circuit being made by interconnections between the cells, comprising:

diode rows arranged at an interval, each of the diode rows including:

a pn junction row having pn junctions along a track perpendicular to interconnection tracks, said pn junctions being on each of said interconnection tracks, each of said pn junctions being formed between a first conduction type region formed on the substrate and a second conduction type region, said second conduction type being opposite to said first conduction type, formed around said first conduction type region in the substrate; and




electrodes each being in a contact hole exposing the surface of said first conduction type region, said electrodes being formed from a metal wiring layer used for the interconnections so as to automatically connect said first conduction type region to the interconnection by wiring the interconnections along said interconnection tracks,

said interval at which said diode rows are arranged being such that a wiring length between a gate of said MIS transistor and said electrode automatically becomes lower than an upper limit for preventing electrostatic breakdown at a gate insulator of the MIS transistor in a process of fabricating the semiconductor integrated circuit.

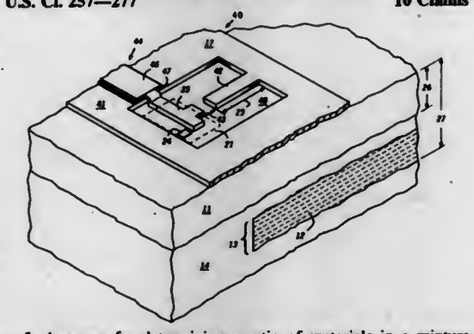
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**5,500,543**

## SENSOR FOR DETERMINING A RATIO OF MATERIALS IN A MIXTURE AND METHOD

**Michael Dydyk, Scottsdale, and John S. Escher, Paradise Valley, both of Ariz., assignors to Motorola, Schaumburg, Ill.**

**Filed Apr. 4, 1994, Ser. No. 223,068**
**Int. Cl.[6] G01R** *27/04;* **H01L** *29/80*
**U.S. Cl. 257—277** **10 Claims**



1. A sensor for determining a ratio of materials in a mixture comprising:

a semiconductor substrate having a first surface and a second surface that is parallel to the first surface;

a conductor strip on the first surface, the conductor strip having a first end and a second end;

a transistor formed on the first surface, the transistor having an input coupled to the first end of the conductor strip; and

a conductor plane on the first surface, the conductor plane having an opening wherein the conductor strip and the transistor are within the opening and wherein the second end of the conductor strip is electrically isolated from the conductor plane at D.C. frequencies.

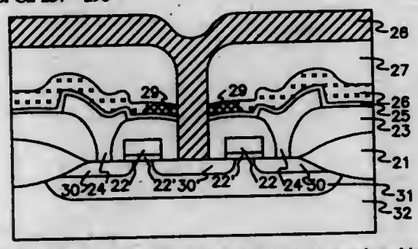


**5,500,544**

## DYNAMIC RANDOM ACCESS MEMORY CELL AND METHOD FOR FABRICATING THE SAME

**Chan K. Park; Yo H. Koh; Seong M. Hwang, and Kwang M. Roh, all of Ichonkun, Rep. of Korea, assignors to Hyundai Electronics Industries Co., Ltd., Rep. of Korea**

**Filed Apr. 15, 1994, Ser. No. 228,021**
**Claims priority, application Rep. of Korea, Apr. 16, 1993, 1993-6462**
**Int. Cl.[6] H01L** *27/108;21/265*
**U.S. Cl. 257—296** **4 Claims**




1. A DRAM cell comprising: a bit line having a topology higher than a polysilicon plate electrode atop a dielectric film formed on a charge storage electrode, said cell including an insulating film separating a portion of said bit line and said plate electrode, said bit line being connected with a drain region and also with an oxide film, said oxide film being an oxidized extension of said plate electrode and being located above said drain region, said oxide film and said insulating film insulating said plate electrode from said bit line.

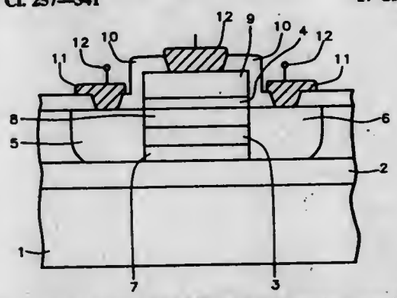
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**5,500,545**

## DOUBLE SWITCHING FIELD EFFECT TRANSISTOR AND METHOD OF MANUFACTURING IT

**Kuang-Chung Cheng, Hsinchu; Meng-Jia Tsai, Kaohsiung; Ta-Chi Kuo, and Kuo-Jaan Su, Hsinchu, all of, Taiwan, assignors to United Microelectronics Corporation, Hsinchu, Taiwan**

**Filed Feb. 27, 1995, Ser. No. 394,585**
**Int. Cl.[6] H01L** *21/36;21/26*
**U.S. Cl. 257—341** **17 Claims**




1. A double switching field effect transistor device comprising:

a semiconductor body of a given conductivity type;

source and drain regions imbedded within said semiconductor body and being of opposite conductivity type to said semiconductor body;

two active regions comprised of first and second layers of semiconducting material, of opposite conductivity type to said source and drain regions, that connect said source and drain regions to one another, said active regions being separated from each other by a first layer of insulating material;

second and third layers of insulating material lying on those surfaces of the two active regions that face away from said first layer of insulating material;

a third layer of semiconducting material lying on the surface of the layer of insulating material that is furthest from said semiconductor body;

a fourth layer of insulating material that covers and thereby passivates said source and drain regions as well as said third layer of semiconducting material; and

via holes through said fourth layer of insulating material, said via holes being filled with conductive material for the purpose of making electrical contact to said source and drain regions as well as to said third layer of semiconducting material.

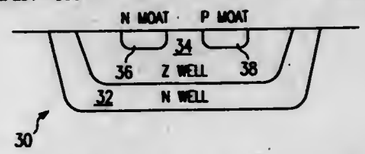
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**5,500,546**

## ESD PROTECTION CIRCUITS USING ZENER DIODES

**Steven E. Maruna, Sherman, Tex., and Karl-Heinz Kraus, Freising, Germany, assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Sep. 16, 1994, Ser. No. 308,005**
**Int. Cl.[6] H01L** *23/62;* **H02H** *9/00*
**U.S. Cl. 257—358** **13 Claims**




1. An electrostatic discharge protection circuit coupled between an input pad and operational circuitry that is susceptible to damage due to electrostatic discharge, comprising:

a primary clamp circuit coupled to the input pad, wherein the primary clamp clamps an electrostatic discharge voltage to a first voltage value;

a current limit circuit coupled to the primary clamp circuit; and

a first zener diode coupled between the current limit circuit and a ground potential, wherein the first zener diode has cathode terminal coupled to the current limit circuit and an anode terminal coupled to the ground potential, wherein the first zener diode further clamps a voltage across the operational circuitry, and further wherein the second voltage is less than 10 V, thereby protecting the operational circuitry from damage due to electrostatic discharge.

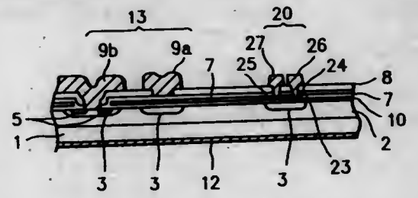
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**5,500,547**

## INTEGRATED SEMICONDUCTOR DEVICE WITH TEMPERATURE SENSING CIRCUIT AND METHOD FOR OPERATING SAME

**Kazumi Yamaguchi; Masami Sawada; Manabu Yamada, and Keizo Hagimoto, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan**

**Filed Dec. 27, 1994, Ser. No. 364,240**
**Claims priority, application Japan, Dec. 28, 1993, 5-335188**
**Int. Cl.[6] H01L** *31/058*
**U.S. Cl. 257—359** **4 Claims**




1. An integrated semiconductor device comprising:

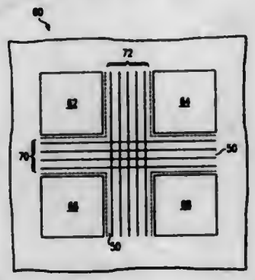
a semiconductive element formed therein;

an insulation film formed on the semiconductive element;

a polycrystalline silicon layer formed on the insulation film;
a two-way conductive directional circuit formed in the silicon layer; and
the directional circuit being one-way biased for sensing a temperature of the semiconductive element.

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**5,500,548**
**NON-EPITAXIAL CMOS STRUCTURES AND PROCESSORS**
**Michael C. Smayling, Missouri City, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.**
**Filed Jan. 5, 1995, Ser. No. 368,939**
**Int. Cl.[6] H01L 29/76**
**U.S. Cl. 257—371** **8 Claims**

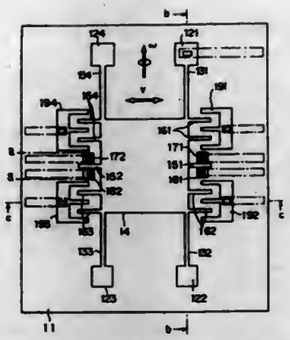


1. An integrated circuit device formed on a semiconductor substrate having a first conductivity type, the device comprising:
a first field effect transistor having a channel of the first conductivity type, a gate coupled to an input voltage, a source coupled to a first supply voltage, a drain coupled to $V_{OUT}$ and a backgate contact coupled to the first supply voltage;
a second field effect transistor having a channel of second conductivity type, a gate coupled to an input voltage, a source coupled to a second supply voltage, a drain coupled to $V_{OUT}$ and a backgate contact coupled to the second supply voltage;
the first field effect transistor formed in a region of the substrate doped with impurities of the second conductivity type;
a current sink region formed in the substrate doped with impurities of the first conductivity type and coupled to the second supply voltage such that latchup of the device is prevented by conducting charges from the substrate to the second supply voltage to keep the voltage level of the substrate near the voltage level of the second supply voltage.

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**5,500,549**
**SEMICONDUCTOR YAW RATE SENSOR**
**Yukihiro Takeuchi, Seto; Koso Shibata, Kariya; Yoshinori Ohtsuka, Okazaki; Kazuhiko Kano, Obu, and Toshimasa Yamamoto, Bisai, all of, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan**
**Filed Dec. 13, 1994, Ser. No. 357,258**
**Claims priority, application Japan, Dec. 13, 1993, 5-311762**
**Int. Cl.[6] H01L 29/82**
**U.S. Cl. 257—415** **27 Claims**

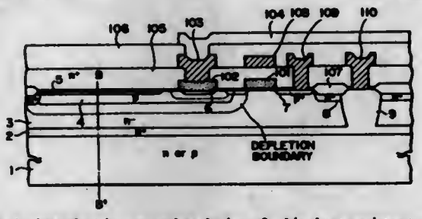
1. A semiconductor yaw rate sensor comprising:
a semiconductor substrate;
a movable electrode having a beam structure disposed upon said semiconductor substrate at a specified interval therefrom;
a first fixed electrode for excitation use disposed via a specified gap with said movable electrode to cause vibration of said movable electrode at a specified cycle by means of electrostatic force; and
a second fixed electrode for current detection use provided on said semiconductor substrate opposing said movable electrode;



wherein when yaw rate to be detected, which has as an axis a direction intersecting a direction of excitation of said movable electrode, acts upon said movable electrode, said yaw rate is detected based on a change in current produced at said second fixed electrode by means of a change in relative position of said movable electrode and said second fixed electrode.

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**5,500,550**
**PHOTOELECTRIC CONVERTING DEVICE**
**Masakazu Morishita, Atsugi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**
**Continuation of Ser. No. 289,376, Mar. 14, 1994, abandoned, which is a continuation of Ser. No. 75,346, Jun. 14, 1993, abandoned, which is a continuation of Ser. No. 627,581, Dec. 14, 1990, abandoned. This application Nov. 10, 1994, Ser. No. 339,287**
**Claims priority, application Japan, Dec. 15, 1989, 1-324988**
**Int. Cl.[6] H01L 27/14;31/00**
**U.S. Cl. 257—461** **27 Claims**

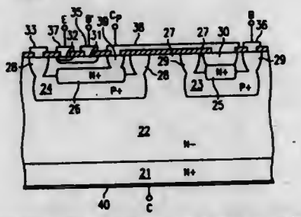


1. A photoelectric converting device of a bipolar transistor type comprising:
a first semiconductor area of a first conductivity type;
a second semiconductor area of a second conductivity type, wherein said first semiconductor area takes out charges, formed by light irradiation on said second semiconductor area, after amplification;
a third semiconductor area of the first conductivity type; and
a fourth semiconductor area of the first conductivity type, arranged in contact with said second semiconductor area, at a light incident side, but not in contact with said first semiconductor area, and positioned corresponding to said third semiconductor area, wherein said second semiconductor region is sandwiched between said third and fourth semiconductor areas,
wherein said fourth semiconductor area is arranged such that, in operation of said device, a depletion layer extending from an interface between said second and fourth semiconductor areas reaches a depletion layer extending from an interface of said third and second semiconductor areas,
and wherein said third semiconductor region is in an electrical contact with said fourth semiconductor region and said first semiconductor region is not in electrical contact with said fourth semiconductor region.



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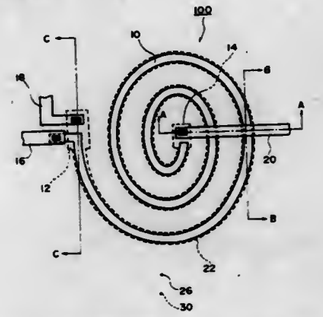
**5,500,551**
**INTEGRATED EMITTER SWITCHING CONFIGURATION USING BIPOLAR TRANSISTORS**
**Santo Puzzolo, Catania; Raffaele Zambrano, and Mario Paparo, both of San Giovanni La Punta, all of, Italy, assignors to SGS-Thomson Microelectronics, S.r.l., Agrate Brianza, and Consorzio per la Ricerca Sulla Microelettronica nel Mezzogiorno, Catania Ct, both of, Italy**
**Division of Ser. No. 812,704, Dec. 23, 1991, Pat. No. 5,376,821. This application Jul. 11, 1994, Ser. No. 273,589**
**Claims priority, application Italy, Dec. 31, 1990, 22577/90**
**Int. Cl.[6] H01L 29/00**
**U.S. Cl. 257—500** **12 Claims**



1. An integrated circuit structure integrated in a single chip of semiconductor material and comprising a bipolar power transistor and a low voltage bipolar transistor connected in an emitter switching configuration, said chip having a front face and a back face and being characterized by the presence in combination of:
a first semiconductor substrate,
a first region in said first substrate, said first region having a first type of conductivity and constituting the collector of said power transistor,
a second region in said first substrate, said first region being positioned between said back face and said second region, said second region having a second type of conductivity which is opposite said first type of conductivity, said second region constituting the base region of said power transistor,
a third region in said first substrate, said first region being positioned between said back face and said third region, said third region having said second type of conductivity, said second region constituting an isolation region of said low voltage transistor,
a fourth region, said second region being positioned between said first region and said fourth region, said fourth region having said first type of conductivity, said fourth region constituting the emitter of said power transistor,
a fifth region, said third region being positioned between said first region and said fifth region, said fifth region having said first type of conductivity, said fifth region constituting the collector of said low voltage transistor,
an epitaxial layer bridging said first, second, third, fourth, and fifth regions on the side thereof closest to said front face, said epitaxial layer containing a sixth region, a seventh region, an eighth region, a ninth region, a tenth region, an eleventh region, and a twelfth region,
said sixth region having said first type of conductivity,
said seventh region having said second type of conductivity and being positioned so as to surround a portion of said epitaxial layer, said eighth region constituting the base of said low voltage transistor,
said ninth region having said first type of conductivity, said ninth region being positioned on the side of said eighth region closest to said front face, said ninth region constituting the emitter of said low voltage transistor,
said tenth region having said second type of conductivity and being positioned in said epitaxial layer to extend from the front face of the chip to abut with said second region along the contour of said second region, to connect the base of said power transistor to the front face of the chip,
said eleventh region having said first type of conductivity and being positioned in a portion of said epitaxial layer which is surrounded by said tenth region, to bring the emitter region of said power transistor to the front face of the chip,
said twelfth region having said first type of conductivity and being positioned in a portion of said epitaxial layer which is surrounded by said seventh region, to connect the collector region of said low voltage transistor to the front face of the chip,
a first metallization on said front face of the chip in contact with said ninth region and constituting the emitter electrode of said low voltage transistor,
a second metallization on said front face of the chip in contact with said eighth region and constituting the base electrode of said low voltage transistor,
a third metallization on said front face of the chip in contact with said tenth region and constituting the base electrode of said power transistor,
a metallic track connecting said eleventh region to said twelfth region to thereby connect the collector of said low voltage transistor to the emitter of said power transistor, and
a fourth metallization, said fourth metallization being on the back face of the chip and constituting the collector electrode of said power transistor.

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**5,500,552**
**LC ELEMENT, SEMICONDUCTOR DEVICE AND LC ELEMENT MANUFACTURING METHOD**
**Takeshi Ikeda; Tsutomu Nakanishi, both of Tokyo, and Akira Okamoto, Ageo, all of, Japan, assignors to T.I.F. Co., Ltd., Tokyo, Japan**
**Filed Jul. 22, 1994, Ser. No. 282,046**
**Claims priority, application Japan, Jul. 26, 1993, 5-203623; Jan. 29, 1993, 5-294282; Dec. 10, 1993, 5-341476; May 24, 1994, 6-133639**
**Int. Cl.[6] H01L 29/00**
**U.S. Cl. 257—531** **77 Claims**



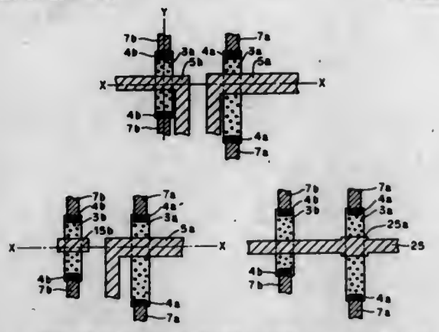
1. An LC element comprising:
a gate electrode having a given inductance formed on a semiconductor substrate,
an insulation layer formed between said gate electrode and said semiconductor substrate,
a first diffusion region formed near one end of a channel formed in correspondence to said gate electrode within said semiconductor substrate, and
a second diffusion region formed near the other end of said channel within said semiconductor substrate, wherein
said gate electrode and said channel function as inductors,
said gate electrode inductance and said channel inductance and a capacitance formed between these exist as distributed constants, and
at a minimum said channel is used as a signal transmission line.

5,500,553

## SEMICONDUCTOR DEVICE HAVING POLYSILICON RESISTORS WITH A SPECIFIC RESISTANCE RATIO RESISTANT TO MANUFACTURING PROCESSES

Masaaki Ikegami, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 96,917, Jul. 26, 1993, abandoned.
This application Sep. 30, 1994, Ser. No. 316,380
Claims priority, application Japan, Aug. 12, 1992, 4-215120; Apr. 8, 1993, 5-081967
Int. Cl.[6] H01L 29/00
U.S. Cl. 257—538 7 Claims



1. A semiconductor device having a linear circuit controlling an output by adjusting the resistance ratio of a first and a second resistor, comprising:

a first resistor layer of polycrystalline silicon serving as the first resistor and having a upper surface area,

a second resistor layer of polycrystalline silicon serving as the second resistor and having an upper surface area different from the upper surface area of the first resistor layer,

a first metal layer (i) formed to only partially overlap said first resistor layer and (ii) having an area overlapping said first resistor layer which is related to said first resistor upper surface area by a predetermined overlapping area ratio,

a second metal layer (i) formed to only partially overlap said second resistor layer and (ii) having an area overlapping said second resistor layer which is related to said second resistor upper surface area by an overlapping area ratio substantially equal to said predetermined overlapping area ratio, and

a nitride film formed to cover said first and second metal layers and including hydrogen components.

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5,500,554

## BIPOLAR TRANSISTOR HAVING REDUCED BASE-COLLECTOR CAPACITANCE WHILE MAINTAINING IMPROVED CUT-OFF FREQUENCY

Fumihiko Sato, Tokyo, Japan, assignor to NEC Corporation, Japan

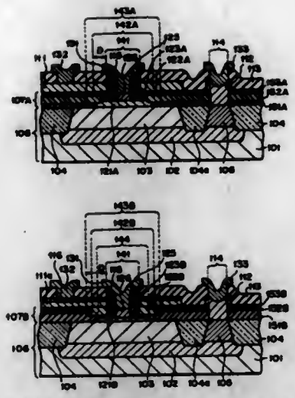
Filed Dec. 28, 1994, Ser. No. 364,964
Claims priority, application Japan, Dec. 28, 1993, 5-336646
Int. Cl.[6] H01L 27/082;29/41
U.S. Cl. 257—588 12 Claims

1. A semiconductor device, comprising:

a single crystal silicon substrate of one conduction type, which has selectively on its surface a buried layer of reverse conduction type, at least part of the top surface of which is covered by a silicon epitaxial layer of reverse conduction type;

a first silicon oxide film which is provided on the surface of said single crystal silicon substrate and which has a first opening which reaches said silicon epitaxial layer;

a silicon nitride film which is provided on the surface of said first silicon oxide film, and which has a second opening which is connected to said first opening and is of a form enclosing said first opening;



a second silicon oxide film which is provided on said silicon nitride film, and which has a third opening which is connected to said second opening and has substantially the same shape as said first opening;

a base drawing electrode which is provided on the surface of said second silicon oxide film at least in the vicinity of said third opening, which base drawing electrode has a protrusion of a prescribed width extending from an end of said third opening and has a fourth opening of a form such that said fourth opening is enclosed by said third opening, at least a bottom layer of said base drawing electrode comprises a first polycrystalline semiconductor film of one conduction type;

a third silicon oxide film which directly covers said base drawing electrode and which has said fourth opening;

a first spacer comprising a fourth silicon oxide film which directly covers a side surface of said third silicon oxide film and a side surface of said base drawing electrode, which constitute a side wall of said fourth opening;

a second polycrystalline semiconductor film of one conduction type, which is provided inside said second opening with a prescribed width, which said second polycrystalline semiconductor film directly covers a lower surface of said second silicon oxide film and a top surface of said first silicon oxide film which are exposed by said second opening, and which said second polycrystalline semiconductor film directly covers a side surface of said silicon nitride film constituting a side wall of said second opening;

a third polycrystalline semiconductor film of one conduction type, which is connected directly to a lower surface of said first polycrystalline semiconductor film which is exposed by said third opening, which said third polycrystalline semiconductor film directly covers a side surface of said second silicon oxide film constituting a side wall of said third opening, and which is directly connected to a top surface of said second polycrystalline semiconductor film which is exposed by said third opening, and part of a side surface of said second polycrystalline semiconductor film which is exposed inside said second opening;

a first single crystal semiconductor layer of one conduction type, which is directly connected to a top surface of said silicon epitaxial layer which is exposed by said first opening, which said first single crystal semiconductor layer is directly connected to at least a lower surface of said third polycrystalline semiconductor film and to said second polycrystalline semiconductor film, and which fills at least part of said first opening;

a second spacer comprising a fifth silicon oxide film which directly covers at least part of a side surface of said first spacer, a lower surface of said first spacer which is exposed by said third opening, and a side surface of said third polycrystalline semiconductor film which is exposed at least inside said second opening and said third opening, and which second spacer directly covers part of a top surface of said first single crystal semiconductor layer which is exposed inside said second opening; and

a second single crystal semiconductor layer of reverse conduction type which directly covers at least part of a side surface of said second spacer and which is directly connected to the top surface of said first single crystal semiconductor layer which is not covered by said second spacer.



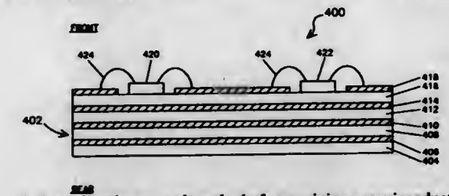
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5,500,555

## MULTI-LAYER SEMICONDUCTOR PACKAGE SUBSTRATE WITH THERMALLY-CONDUCTIVE PREPEG LAYER

Tom Ley, Santa Clara, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.

Filed Apr. 11, 1994, Ser. No. 225,860
Int. Cl.[6] H01L 23/053;23/12;23/14
U.S. Cl. 257—700 5 Claims



1. A semiconductor package body for receiving a semiconductor device, including a multi-layer substrate comprising:

a first, bottom-most planar core layer;

a second, next higher planar prepeg layer formed as a sandwich structure of two BT-resin films with a copper screen interleaved between the two BT-resin films;

a third next higher layer is a planar core layer having a first opening extending through a central region thereof, said first opening being of sufficient dimension to accommodate a semiconductor device disposed in the first opening, co-planar with the third layer and resting upon said second layer;

a fourth next higher layer is a planar prepeg layer having a second opening extending through a central region thereof, said second opening being larger than said first opening; and

a fifth next higher, top-most layer is a planar core layer having a third opening extending therethrough, said third opening being larger than said second opening.

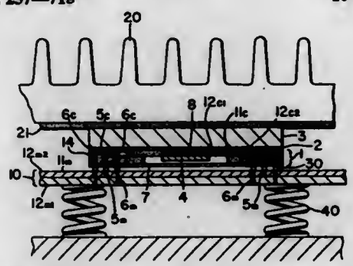
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5,500,556

## PACKAGING STRUCTURE FOR MICROWAVE CIRCUIT

Yuhei Kosugi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 11, 1994, Ser. No. 273,116
Claims priority, application Japan, Jul. 12, 1993, 5-171725
Int. Cl.[6] H01L 23/24
U.S. Cl. 257—718 10 Claims



1. A packaging structure for a microwave circuit comprising:

a circuit module having a semiconductor element;

a mother substrate accommodating said circuit module thereon;

thermal spreading means mounted on said circuit module for receiving heat from said circuit module;

radiating means receiving heat from said thermal spreading means for radiating said heat;

a heat conductive elastomer disposed between said thermal spreading means and said radiating means; and

means for pressing said mother substrate in the direction of said radiating means, wherein said circuit module includes:

a multilayered substrate accommodating said semiconductor element thereon, said multilayered substrate having two first grounding conductive layers and a first center conductive layer between said two first grounding conductive layers, said first center conductive layer having a first connecting line pattern,

a first center conductive via for leading said first connecting line pattern to a surface of a said circuit module, and

a plurality of first grounding conductive vias connecting said two first grounding conductive layers, said plurality of first grounding conductive vias being arranged around said first center conductive via and around said semiconductor element.

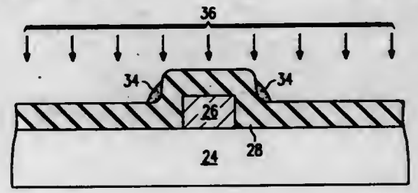
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5,500,557

## STRUCTURE AND METHOD FOR FABRICATING INTEGRATED CIRCUITS

Tsiu C. Chan, Carrollton; Frank R. Bryant, Dentos; Lan-Tseng Lu, Carrollton, all of Tex., and Che-Chia Wei, Singapore, Singapore, assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Continuation of Ser. No. 876,405, Apr. 30, 1992, abandoned.
This application Sep. 24, 1993, Ser. No. 126,673
Int. Cl.[6] H01L 23/48
U.S. Cl. 257—758 20 Claims



1. A structure in an integrated circuit, comprising:

a first interconnect layer;

an insulating layer overlying the first interconnect layer the insulating layer having an upper surface over a lower region;

a second interconnect layer overlying portions of the insulating layer; and

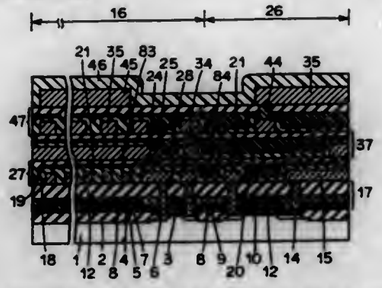
residual conductive material which lies adjacent to vertical sidewalls of the first interconnect layer, wherein the residual conductive material connects one section of the second interconnect layer to another section of the second interconnect layer, wherein the upper surface of the insulating layer and the residual conductive material are doped with an N-type impurity to enhance the conductivity of the residual conductive material and the upper surface of the insulating layer is more highly doped than the lower region of the insulating layer.

**5,500,558**

## SEMICONDUCTOR DEVICE HAVING A PLANARIZED SURFACE

Yoshio Hayashide, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 31, 1994, Ser. No. 298,296
Claims priority, application Japan, Feb. 23, 1994, 6-025220
Int. Cl.[6] H01L 21/321;23/522
U.S. Cl. 257—758 1 Claim




1. A semiconductor device having a planarized surface, comprising:

a semiconductor substrate;

an interconnection layer portion provided on a surface of said semiconductor substrate and having a plurality of elements of at least one interconnection layer spreading horizontally, comprising a high density portion having a relatively high number of interconnection elements and a low density portion comprising a relatively low number of said interconnection elements;

a first interlayer insulating film provided on said semiconductor substrate to cover both said high interconnection density portion and said low interconnection density portion and having an insulating film surface;

a second interlayer insulating film provided over said first interlayer insulating film; wherein

at said high interconnection density portion, each of said first and second interlayer insulating films comprises a first silicon oxide film, a silicon nitride film and a second silicon oxide film, formed in this order relative to said substrate surface;

at said low interconnection density portion, said first interlayer insulating film includes said first silicon oxide film, said silicon nitride film, a PSG film and said second silicon oxide film, formed in this order relative to said substrate surface;

variations in height, as determined from said surface of said semiconductor substrate to said first insulating film surface extending over said high and said low interconnection density portions are limited to be within a range of ±0.3 μm.

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**5,500,559**

## SEMICONDUCTOR DEVICE AND METHOD FOR MANUFACTURING THE SAME

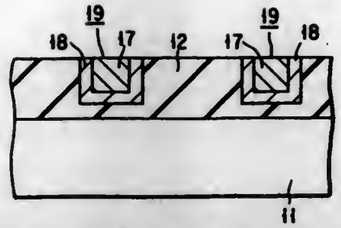
Masahiro Miyata, Urayasu; Hirokazu Ezawa; Naoaki Ogure, both of Tokyo; Manabu Tsujimura, Yokohama; Takeyuki Ohdaira, Fujisawa; Hiroaki Inoue, Machida, and Yukio Ikeda, Tokyo, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, and Ebara Corporation, Tokyo, both of, Japan

Filed May 25, 1994, Ser. No. 249,127
Claims priority, application Japan, May 28, 1993, 5-127117; Mar. 30, 1994, 6-060933
Int. Cl.[6] H01L 31/06
U.S. Cl. 257—762 5 Claims

1. A semiconductor device comprising:

a substrate;

an insulating film on the substrate, the insulating film having a wiring groove portion; and




a wiring layer embedded in the wiring groove portion, and including an intermetallic compound layer comprising a first metal and a second metal and a metal layer comprising a third metal on the intermetallic compound layer, wherein said third metal layer comprises silver wherein the third metal is capable of forming a continuous solid solution with the second metal.

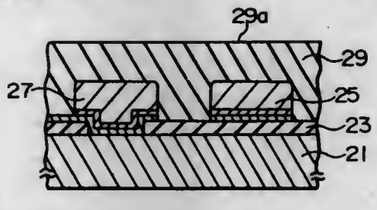
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**5,500,560**

## SEMICONDUCTOR DEVICE HAVING LOW RESISTANCE VALUES AT CONNECTION POINTS OF CONDUCTOR LAYERS

Isao Kano, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 12, 1992, Ser. No. 974,719
Claims priority, application Japan, Nov. 12, 1991, 3-295319
Int. Cl.[6] H01L 23/48;23/52;29/40
U.S. Cl. 257—767 14 Claims




1. A semiconductor device comprising:

a semiconductor substrate having a principal surface;

a first insulator layer overlying said principal surface and having a first upper insulator surface;

a first conductor layer overlying said first upper insulator surface and having a first upper conductor surface leaving a surrounding area of said first upper insulator surface exposed;

a second insulator layer overlying said first upper conductor surface and said surrounding area of the first upper insulator surface and having a second upper insulator surface, said second insulator layer having a recessed surface which defines a contact perforation exposing a predetermined area of said first upper conductor surface: and

a second conductor layer overlying said second upper insulator surface, said recessed surface, and said predetermined area, said second conductor layer comprising a primary conductor film having a primary upper surface, a secondary conductor film having a secondary upper surface, and a ternary conductor film, said primary conductor film overlying said second upper insulator surface, said secondary conductor film overlying said predetermined area, said recessed surface, and said primary upper surface, said secondary conductor film being brought into contact with said predetermined area, said ternary conductor film overlying said secondary upper surface, said primary conductor film having a primary resistance value, said secondary conductor film having a secondary resistance value which is lower than said primary resistance value.

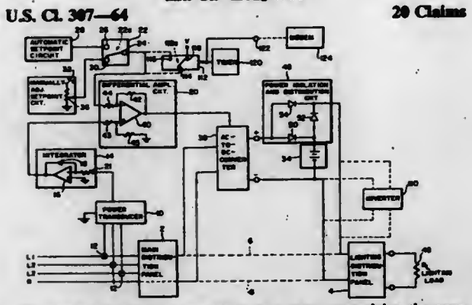


**5,500,561**

## CUSTOMER SIDE POWER MANAGEMENT SYSTEM AND METHOD

William G. Wilhelm, 295 Vista Pl., Cutchogue, N.Y. 11973

Continuation of Ser. No. 129,575, Sep. 29, 1993, abandoned, which is a continuation of Ser. No. 944,796, Sep. 14, 1992, abandoned, which is a continuation of Ser. No. 638,637, Jan. 8, 1991, abandoned. This application Oct. 24, 1994, Ser. No. 328,574
Int. Cl.[6] H02J 9/06
U.S. Cl. 307—64 20 Claims



1. An electrical power management system comprising the combination of:

AC electrical connection means including AC input conductors receiving AC electrical energy from a public utility, and AC electrical load means connected to the input conductors for routing AC electrical power within the power management system to a plurality of electrical loads associated therewith, and at least one DC load means associated with the power management system,

said power management system comprising at least two DC power supply entities including an AC-to-DC first power supply means dedicated to said one DC load means and connected to said AC input conductors for converting AC electrical power to constitute a first DC power supply means and at least one direct current power supply means also dedicated to said one DC load means and consisting of a direct current source, said direct current source and said first DC power supply means being isolated from each other and each being capable of supplying said one DC load means with all of the power required to power it, and

circuit means interconnecting said first DC power supply means, said direct current power supply means and said one DC load means for operation in one of three modes, 1) a mode in which said first DC power supply means supplies all of the power for said one DC load means, 2) a mode in which said first DC power supply means and said direct current power supply means share power to said one DC load means, and 3) a mode in which the direct current power supply means supplies all the power for said one DC load means.

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**5,500,562**

## POWER SWITCH ARRANGEMENT

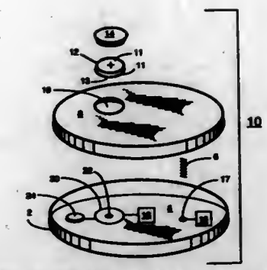
Paul H. Kelley, Boca Raton, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 14, 1994, Ser. No. 212,097
Int. Cl.[6] H02J 9/04
U.S. Cl. 307—66 20 Claims

1. A split battery contact arrangement for a low voltage portable electronic product having a light resistive load portion and a relatively higher resistive load portion, comprising:

a split positive battery contact having a first positive contact point selectively isolatable from a second positive contact point, the relatively higher resistive load portion being selectively coupled to the second positive contact point when a battery is inserted between the first and second positive contact point, the relatively higher resistive load portion being completely isolated from the light resistive load portion when the battery is removed: and

a back-up energy source and the light resistive load portion coupled to the first positive contact point.



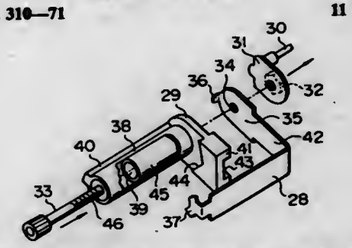

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**5,500,563**

## STRUCTURE FOR CONNECTING ELECTRODES OF MOTOR UNIT AND MOTOR DRIVER UNIT

Kenji Kawaguchi, Wako, and Yoshiyuki Miyaki, Hanno, both of, Japan, assignors to Honda Motor Co., Ltd., and Shindengen Electric Manufacturing Co., Ltd., both of Tokyo, Japan

Filed Feb. 17, 1994, Ser. No. 197,833
Claims priority, application Japan, Mar. 12, 1993, 5-016500
U
Int. Cl.[6] H02K 11/00
U.S. Cl. 310—71 11 Claims




1. A structure for electrically connecting a motor unit comprising a motor and a motor driver unit for driving said motor, said structure comprising:

a fixing bolt;

an electrode terminal which is for being connected to a coil of the motor unit and which is provided with fixing means for screwedly engaging with the fixing bolt;

a substantially L-shaped electrode plate having a first end and a second end and formed at the first end with a terminal portion for being connected and secured to the motor driver unit and at the second end with a contact portion to which the electrode terminal is connected, said contact portion being formed with an attachment hole; and

a substantially L-shaped resin electrode base for attaching said electrode plate to a frame of the motor driver unit under an insulating condition, said electrode base including an elongated hole for attachment of the fixing bolt to be engaged with the insertion hole of the electrode plate;

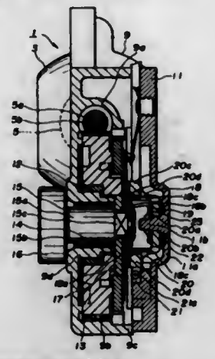
said bolt extending through the elongated hole of the electrode base and through the attachment hole so as to be screwedly engaged with the fixing means of said electrode terminal, so that the electrode terminal is electrically connected to the electrode plate.

5,500,564

## ELECTRIC MOTOR WITH ROTATION DETECTING MECHANISM

Manabu Sano, and Shuji Sekine, both of Yokohama, Japan, assignors to Jidosha Denki Kogyo Kabushiki Kaisha, Yokohama, Japan

Filed Oct. 12, 1994, Ser. No. 321,525
Claims priority, application Japan, Jan. 14, 1993, 5-055613 U
Int. Cl.[6] H02K 7/10
U.S. Cl. 310—83 8 Claims



1. An electric motor comprising:
a motor case fixed with a field magnet on an inner periphery thereof;
an armature provided with a shaft formed with a worm and rotatably supported in said motor case at one end thereof;
a gear case connected to said motor case and rotatably supporting another end of the shaft of said armature;
a gear cover disposed to cover an opening part of said gear case;
an output shaft rotatably supported in said gear case;
a worm wheel secured to said output shaft and housed in said gear case rotatably to be meshed with the worm formed on the shaft of said armature;
a rotary magnet disposed on said gear cover rotatably about a coaxial line of said output shaft;
a rotation detector for detecting rotation of said output shaft according to alteration of magnetic force caused by rotation of said rotary magnet; and
an intervenient member existing between the output shaft and the rotary magnet for forming a predetermined play between said output shaft and said rotary magnet and for transmitting the rotation of the output shaft to the rotary magnet through the play.

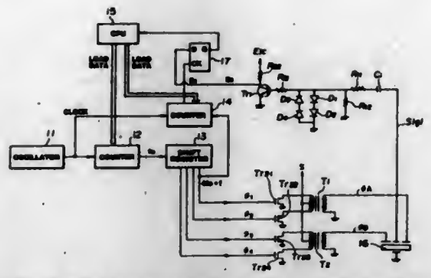
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5,500,565

## DRIVE CIRCUIT FOR AN ULTRASONIC MOTOR

Mitsumasa Okubo, Hino, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 24,070, Feb. 24, 1993, abandoned.
This application Aug. 4, 1994, Ser. No. 285,891
Claims priority, application Japan, Feb. 26, 1992, 4-039677; Dec. 25, 1992, 4-347021
Int. Cl.[6] H02N 2/00
U.S. Cl. 310—316 37 Claims



1. A drive circuit for an ultrasonic motor, comprising:
an oscillator;
a periodic signal generating means for dividing a frequency of a clock sent from said oscillator to generate a periodic signal having a specified frequency;
an ac voltage generating means responsive to said periodic signal to generate an ac voltage for driving said ultrasonic motor;
a monitor means for providing a monitor output signal indicating an operating state of said ultrasonic motor;
a timing signal generating means responsive to said ac voltage generating means for generating a timing signal at a time the monitor output is expected to reach a specified value within a given period thereof and corresponding to a desired operating state of said ultrasonic motor;
a means that in response to said timing signal sent from said timing signal generating means, compares said monitor means output with a specified voltage value which is not zero; and
a frequency control means for controlling the specified frequency of said periodic signal generating means to operate said ultrasonic motor at said desired operating state, responsive to a state of an output of said comparing means.

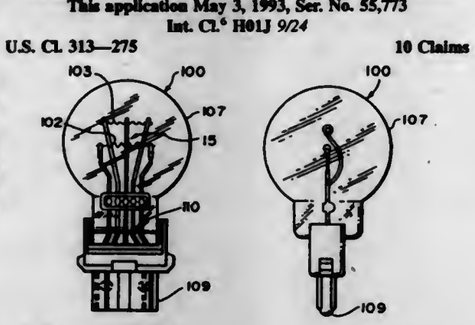
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5,500,566

## LIGHT BULB FILAMENT DAMPENING SYSTEM

Guenter E. Talmon-Gros, Sparta, Tenn.; Donald H. Freeman, Morris Plains, N.J.; Thomas A. Flight, Poquoson, Va.; Raymond M. McCarthy, Succasunna, N.J., and Anthony E. Kendall, Cookeville, Tenn., assignors to Cooper Industries, Inc., Houston, Tex.

Continuation of Ser. No. 803,879, Dec. 9, 1991, abandoned.
This application May 3, 1993, Ser. No. 55,773
Int. Cl.[6] H01J 9/24
U.S. Cl. 313—275 10 Claims



1. A lamp, comprising:
a glass envelope having a bulbous portion and a press portion;
a first lamp filament contained within said glass envelope;
a plurality of first lead wires extending substantially in an axial direction from said first filament within said bulbous portion and into said press portion;
a second lamp filament contained within said glass envelope;
a plurality of second lead wires extending from said second filament through said bulbous portion and through said press portion, said second lead wires being longer than said first lead wires;
a bridge member formed around said first and second lead wires;
said first lamp filament said second lamp filament and said bridge member are aligned in a plane extending through a center of the lamp in the axial direction wherein the plane is coplanar with the press portion; and
said second lead wires are arcked around said first lamp filament;



a dampening wire extending from the second lamp filament through the bridge member to said press portion, said dampening wire being arcked around said first lamp filament; and
said first and second lead wires and said dampening wire enter said press portion along the plane.

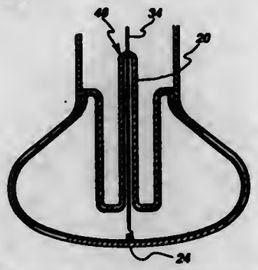
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5,500,567

## APPARATUS FOR SECURING AN AMALGAM AT THE APEX OF AN ELECTRODELESS FLUORESCENT LAMP

Ronald H. Wilson, Schenectady; Douglas A. Doughty, West Charlton, and John P. Cocoma, Clifton Park, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 10, 1994, Ser. No. 194,549
Int. Cl.[6] H01J 61/28; H05B 41/00
U.S. Cl. 313—490 8 Claims



1. A solenoidal electric field (SEF) fluorescent discharge lamp, comprising:
a light-transmissive envelope containing an ionizable, gaseous fill for sustaining an arc discharge when subjected to a radio frequency magnetic field and for emitting ultraviolet radiation as a result thereof, said envelope having an interior phosphor coating for emitting visible radiation when excited by said ultraviolet radiation, said envelope having an apex portion, said envelope further having a re-entrant cavity formed therein;
an excitation coil contained within said re-entrant cavity for providing said radio frequency magnetic field when excited by a radio frequency power supply;
an exhaust tube extending through said re-entrant cavity;
an amalgam support for supporting an amalgam within said envelope, said amalgam support comprising a rod extending through said exhaust tube and being sealed thereto, said rod having a metal support member at one end thereof for holding said amalgam and positioning said amalgam substantially at said apex portion of said envelope.

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5,500,568

## ORGANIC EL DEVICE

Hiroaki Nakamura, and Tadashi Kusumoto, both of Sodegaura, Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

PCT No. PCT/JP93/01020, § 371 Date Mar. 4, 1994, § 102(e) Date Mar. 4, 1994, PCT Pub. No. WO94/03032, PCT Pub. Date Feb. 3, 1994
PCT Filed Jul. 22, 1993, Ser. No. 199,255
Claims priority, application Japan, Jul. 23, 1992, 4-197272; Jan. 8, 1992, 4-270573
Int. Cl.[6] H05B 33/26
U.S. Cl. 313—503 10 Claims

1. An organic Electroluminescence device comprising a cathode, an anode and an organic light-emitting material disposed between said cathode and said anode, wherein said cathode is formed by a vapor deposited film containing (a) at least one metal A selected from the group consisting of Pb, Sn and Bi and (b) at least one metal B selected from the group consisting of Li, Ba, La, Ca, Na, K, Y, Mg and Yb, said cathode having a metal A content of 95 to 99.99 at. %.

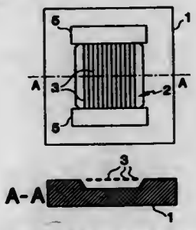
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5,500,569

## ELECTRICALLY MODULATABLE THERMAL RADIANT SOURCE AND METHOD FOR MANUFACTURING THE SAME

Martti Blomberg, Vantaa; Markku Orpana, Espoo; Ari Lehto, and Anssi Korhonen, both of Helsinki, all of, Finland, assignors to Instrumentarium Oy, and Vaisala Oy, both of Helsinki, Finland

Filed Mar. 31, 1994, Ser. No. 220,696
Claims priority, application Finland, Apr. 7, 1993, 931570
Int. Cl.[6] H01K 1/04
U.S. Cl. 313—578 13 Claims



1. An electrically modulatable radiant source comprising:
an essentially planar substrate having
a well or hole formed into the substrate,
at least one incandescent filament mounted to the substrate, said filament being aligned at said well or hole,
contact pads formed onto the substrate, to both ends of the incandescent filament, for feeding electric current to the incandescent filament, and wherein
each of the incandescent filaments is doped with phosphorus to an impurity concentration of at least $5\times10^{19}$ atoms/cm$^3$.

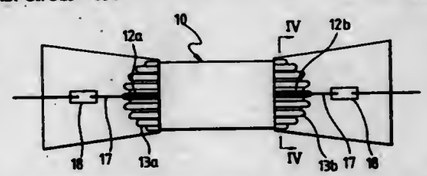
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5,500,570

## HIGH-INTENSITY DISCHARGE LAMP WITH PLEATED ENDS

Eui-seon Jeong, Suwon, Rep. of Korea, assignor to Samsung Display Devices Co., Ltd., Kyungki, Rep. of Korea

Filed Jul. 26, 1994, Ser. No. 280,544
Claims priority, application Rep. of Korea, Aug. 21, 1993, 93-16314
Int. Cl.[6] H01J 61/30;61/33
U.S. Cl. 313—634 15 Claims



1. A high-intensity discharge lamp comprising a luminous tube in which a rare gas and a metal are sealed and a pair of electrodes provided at first and second ends of the luminous tube, a transverse cross section of the tube surrounding each electrode having an inner peripheral surface with undulations for internally reflecting light from the electrodes.

**5,500,571**

## METAL VAPOR DISCHARGE LAMP

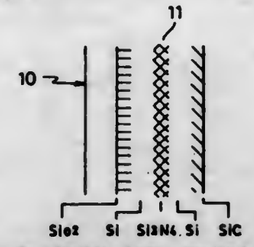
**Atsunori Okada; Shigeaki Wada; Shigekazu Kusanagi, and Tohru Fujioka, all of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan**

**Filed Jun. 27, 1994, Ser. No. 265,784**

**Claims priority, application Japan, Jun. 29, 1993, 5-159447**

**Int. Cl.[6] H01J** *17/16;61/35;61/36;17/18*

**U.S. Cl. 313—635** **5 Claims**




1. A metal vapor discharge lamp comprising an arc tube, a luminous material consisting of a rare earth metal halide and enclosed in the interior discharge space of said arc tube, and a coating of a multi-layer construction covering the inner surface of said arc tube, said coating including at least a layer formed on the inner surface of the arc tube with silicon nitride for shielding water emitted from the arc tube, and an innermost layer exposed to the interior discharge space of the arc tube and formed with boron nitride as a strongly covalent bond material.

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**5,500,572**

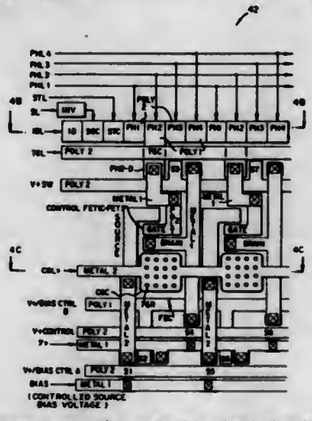
## HIGH RESOLUTION IMAGE SOURCE

**Constantine N. Anagnostopoulos, Meudon, and Jon K. Edwards, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Division of Ser. No. 815,466, Dec. 31, 1991, Pat. No. 5,237,180. This application Mar. 11, 1993, Ser. No. 29,725**

**Int. Cl.[6] H05B** *37/02*

**U.S. Cl. 315—169.1** **26 Claims**




1. An image source for converting plural electrical charges representative of image information to a respective imagewise pattern of light, comprising:

a CCD emitter having:

a) charge-coupled means for storage and transfer of the electrical charges in respective phase cells therein,

b) plural field emission cells,

c) plural charge amplification means each having a gate operatively coupled to a selected phase cell and a channel operatively coupled to a selected field emission cell, such that current in the channel is conducted to the field emission cell for emission therefrom according to the charge level in the cell;

a substrate for supporting the charge coupled means, field emission cells, and charge amplification means;

luminescent means, aligned with the field emission means, for converting the electron emissions to the imagewise pattern of light; and

means for attracting the electrons emitted from the field emission cells to the luminescent means.

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**5,500,573**

## DIMMER CIRCUIT FOR GAS DISCHARGE LAMPS HAVING ELECTRONIC BALLASTS

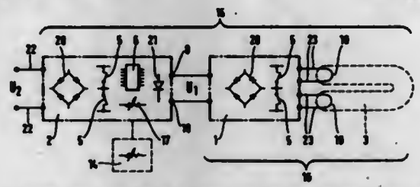
**Reinhard Schulz, Immenstaad, Germany, assignor to Hilite Lighting and Electronics Ltd., Mosta, Malta**

**Filed Feb. 23, 1995, Ser. No. 392,502**

**Claims priority, application Germany, Feb. 24, 1994, 44 06 000.9**

**Int. Cl.[6] H05B** *37/00*

**U.S. Cl. 315—247** **14 Claims**




1. Dimmer circuit for gas discharge lamps with an electronic ballast comprising:

a first converter circuit which transforms an applied voltage by means of switching transistors into a first high-frequency alternating voltage which is fed indirectly or directly to the gas discharge lamp; and

a second converter circuit connected upstream with respect to the first converter circuit, said second converter circuit being arranged so as to transform an input voltage into a second high-frequency alternating voltage and also being arranged so as to rectify said second high-frequency alternating voltage to produce a rectified output voltage which is fed to the first converter circuit as said applied voltage, said second converter circuit including switching means which, operated manually or by remote control, influence the magnitude of the rectified output voltage from the second converter circuit.

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**5,500,574**

## INDUCTIVELY COUPLED SUBSTANTIALLY FLAT FLUORESCENT LIGHT SOURCE

**Oleg Popov, Needham, and Jakob Maya, Brookline, both of Mass., assignors to Matsushita Electric Works R&D Laboratory, Inc., Woburn, Mass.**

**Filed Sep. 28, 1994, Ser. No. 313,760**

**Int. Cl.[6] H05B** *41/16*

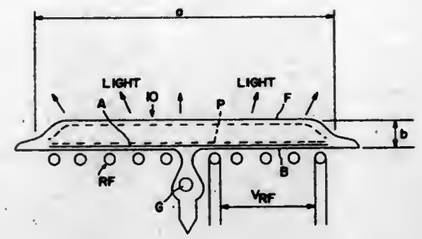
**U.S. Cl. 315—248** **9 Claims**

1. A fluorescent lamp device comprising:

(a) a substantially flat, vacuum fight glass vessel having an aspect ratio of greater than about 2 filled with a gas at pressure below 300 Torr and having at least a portion of its interior walls coated with $Al_2O_3$ or other diffuse reflecting material and some surface portions coated with only phosphor or phosphor on top of said diffuse reflecting layer; and

(b) means for providing and inductively coupling RF energy into the gas mixture to generate light efficiently, the frequency of the RF being from 30 KHz to 915 MHz.






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**5,500,575**

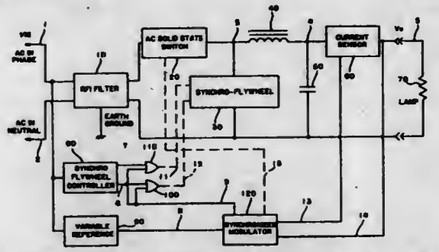
## SWITCHMODE AC POWER CONTROLLER

**Adrian Ionescu, Patchogue, N.Y., assignor to Lighting Control, Inc., Aston, Pa.**

**Filed Oct. 27, 1993, Ser. No. 143,338**

**Int. Cl.[6] G05F** *1/00*

**U.S. Cl. 315—307** **13 Claims**




1. A switchmode AC power controller for connection to an AC power line having a neutral terminal for producing and controlling the amplitude of a sinusoidal output voltage, comprising:

an RFI filter connected to said AC power line and said neutral terminal

an AC solid state switch having an off cycle and connected between said RFI filter and an output filter inductor to control the amplitude of the output voltage;

a synchro-flywheel connected between the filter inductor and said RFI filter,

wherein said inductor is adapted to be charged during the on cycle and discharged through a load connected to receive said output voltage during the off cycle of the AC solid state switch and said output voltage is in phase with said power line.

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**5,500,576**

## LOW HEIGHT BALLAST FOR FLUORESCENT LAMPS

**Randy G. Russell, Glen Ellyn; Kent E. Crouse, Hanover Park; Peter W. Shackle, Arlington Heights, and Ronald J. Bezdon, Antioch, all of Ill., assignors to Energy Savings, Inc., Schaumburg, Ill.**

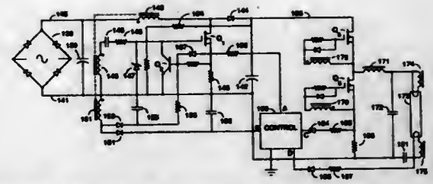
**Continuation-in-part of Ser. No. 148,295, Nov. 8, 1993. This application Apr. 15, 1994, Ser. No. 227,953**

**Int. Cl.[6] H05B** *37/02*

**U.S. Cl. 315—307** **13 Claims**

1. An electronic ballast for powering a gas discharge lamp from an AC input voltage, said ballast having a height equal to or less than one inch, a power factor≧0.9, and a harmonic distortion≦10 percent, said ballast comprising:

a converter for converting said AC input voltage into pulses of direct current at a high voltage, said converter including means for varying the current drawn by said converter in phase with said AC input voltage by changing the frequency of said pulses;




a capacitor coupled to the output of said converter for storing said high voltage;

a driven, half-bridge inverter powered by the energy stored in said capacitor, said inverter having a series resonant, direct coupled output for connection to said lamp;

wherein said converter includes a first magnetic and said inverter includes a second magnetic and said first magnetic and said second magnetic have separate cores.

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**5,500,577**

## RASTER FORMAT CONVERTER CIRCUIT

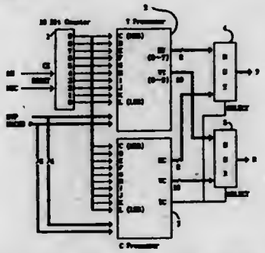
**Beom S. Kim, Seoul; Jin H. Lee, Kyungki-do, and Kyoung B. Koo, Seoul, all of, Rep. of Korea, assignors to Hyundai Electronics Industries Co., Ltd., Kyungki-DO, Rep. of Korea**

**Filed Dec. 22, 1993, Ser. No. 171,613**

**Claims priority, application Rep. of Korea, Dec. 31, 1992, 92-27241**

**Int. Cl.[6] H01J** *29/70;29/72;* **H04N** *7/01*

**U.S. Cl. 315—364** **11 Claims**




1. Raster format converter circuit for an HDTV system and in which a composing raster format converter is used as an address generator in a frame memory when using block transformation, comprising:

a bit counter for counting individual macroblocks in response to an ON signal appearing during a data existing period while disappearing during a non-existing period to count only during a data existing period;

a macroblock start signal for resetting said bit counter at the starting point of a macroblock;

a Y processor for generating horizontal illuminance and vertical address signals from the outputs of said ten bit counter and the SVP and Macro # signals;

a C processor responsive to the outputs of said bit counter and the SVP and Macro # signals for generating color difference horizontal and vertical address signals;

a first multplexer circuit for generating vertical address signals during an illuminance period and using said C address during a color difference period; and

a second multiplexer circuit for generating horizontal address signals using the Y address during the illuminance period and the C address during the color difference period.

5,500,578

## CONTROLLER FOR A VIBRATION WAVE MOTOR

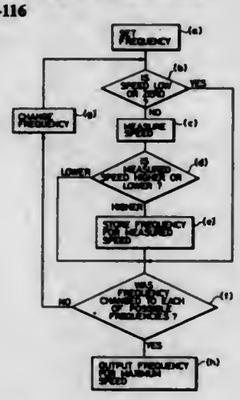
Masaharu Kawamura, c/o Canon Kabushiki Kaisha, Tamagawa-Jigyosho 770, Shimonoge, Takatsu-ku, Kawasaki-shi, Kanagawa-ken, Japan

Continuation of Ser. No. 341,447, Nov. 16, 1994, abandoned, which is a continuation of Ser. No. 959,488, Oct. 9, 1992, abandoned, which is a continuation of Ser. No. 780,703, Sep. 25, 1985, abandoned, which is a continuation of Ser. No. 716,509, Mar. 25, 1985, abandoned, which is a continuation of Ser. No. 579,586, Feb. 13, 1984, abandoned. This application Jun. 7, 1995, Ser. No. 479,821

Claims priority, application Japan, Feb. 23, 1983, 58-28877; Feb. 23, 1983, 58-28878; Mar. 25, 1983, 58-51344; Mar. 25, 1983, 58-51345; Mar. 25, 1983, 58-51346; Mar. 25, 1983, 58-51347

Int. Cl.[6] H01L 41/08

U.S. Cl. 318—116 24 Claims




1. A vibration wave motor apparatus comprising:

a vibration member for generating a traveling wave, said member including a first electro-mechanical energy conversion element and a second electro-mechanical energy conversion element phase-differently arranged on said member with respect to said first element;

a member contacted to said vibration member, said member being pushed by said traveling vibration wave generated in said vibration member;

a control circuit for applying periodic voltage phase-differently to said first and second electro-mechanical energy conversion elements, a frequency of said periodic voltage being controlled by said control circuit so that said vibration member reaches a resonance state;

wherein said control circuit comprises oscillation means for applying a periodic voltage to said first and second electro-mechanical conversion elements to generate a traveling vibration wave in said vibration member, said oscillation means sequentially changing a frequency of said periodic voltage;

detection means for detecting speed of said contact member and relative speed between said vibration member and said contact member at the changing frequencies; and

processing means for changing the frequency of said oscillation means, storing, in accordance with the speed detected by said detection means, a frequency which results in a maximum of one of the speeds detected by said detection means and setting the frequency of said oscillation means to the stored frequency.

5,500,579

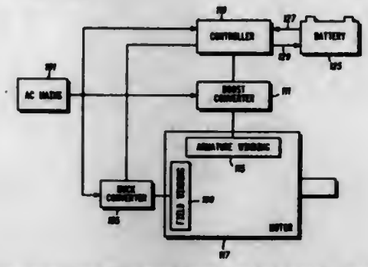
## ELECTRIC MOTOR CONTROL WITH INTEGRAL BATTERY CHARGER

Sang H. Kim, Hoffman Estates; Edward Li, Roselle, and Ralph M. Mitchell, Elgin, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 3, 1995, Ser. No. 368,064

Int. Cl.[6] H02K 23/52; H02J 7/14

U.S. Cl. 318—493 12 Claims




1. An electric motor control with integral battery charger for charging a battery from a power source using an armature winding and a field winding of an electric motor, the battery charger comprising:

battery terminals for connection to a to be provided battery;

a boost converter circuit coupled to the armature winding of the electric motor, the boost converter circuit having an input coupled to the power source and a boost output;

a conversion circuit coupled to the field winding of the electric motor, the conversion circuit having an input coupled to the power source and a buck output; and

a controller coupled to the battery terminals and the power source, the controller for coupling the boost output of the boost converter circuit to the battery terminals while a terminal voltage of the power source is lower than a terminal voltage of the battery, and for coupling the buck output of the conversion circuit to the battery terminals while the terminal voltage of the power source is higher than the terminal voltage of the battery.

5,500,580

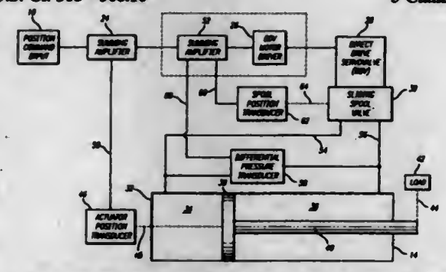
## INTEGRATED COMPLIANCE SERVOVALVE

Stephen J. Tranovich, Valencia, Calif., assignor to HR Textron Inc., Valencia, Calif.

Filed Sep. 19, 1994, Ser. No. 308,713

Int. Cl.[6] F15B 9/09

U.S. Cl. 318—568.16 5 Claims




1. An integrated subsystem for use in a position control system for providing the ability to dynamically alter the apparent stiffness of the position control system including an actuator by providing a feedback signal completely independent of actuator position feedback loop gain, the integrated subsystem comprising:

a direct drive servovalve including a spool valve reciprocally disposed within a cylinder and movable responsive to electrical signals applied to a drive motor to control the flow of hydraulic fluid under pressure from a source thereof to a pair of cylinder ports for connecting said fluid flow to a load;

means for providing a first electrical feedback signal proportional to the forces applied by and to said actuator by sensing the differential pressure appearing across said cylinder ports;

means for providing a second electrical feedback signal representative of the position of said spool valve;

means for summing said first and second electrical feedback signals to provide a resultant spool valve position feedback electrical signal; and

means for applying said resultant spool valve position feedback electrical signal to said drive motor.



4. An integrated subsystem having an electrohydraulic servovalve including a spool valve reciprocally disposed within a cylinder and movable responsive to electrical signals applied to a drive motor to control the flow of hydraulic fluid under pressure from a source thereof to a pair of cylinder ports for connecting said fluid flow to a load, said servovalve having integrated compliance comprising:

a housing defining said cylinder,

a manifold defining first and second passageways coupled to said ports,

means for mounting said housing upon said manifold,

means for sensing the pressure appearing at said cylinder ports and providing a first electrical feedback signal proportional thereto including a separate pressure transducer disposed within said manifold and coupled to each of said first and second passage ways;

means for sensing the position of said spool valve in said cylinder and providing a second electrical feedback signal proportional thereto;

means for coupling said first feedback signal to said drive motor; and

means for coupling said second feedback signal to said drive motor.

5,500,581

## HIGH-EFFICIENCY POWER SUPPLY CONTROL APPARATUS FOR VARIABLE-SPEED INDUCTION MOTOR

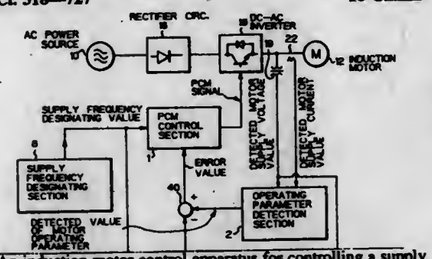
Takefumi Hatanaka, and Naruto Kuwahara, both of Tokyo, Japan, assignors to Arex Electronics Corporation, Tokyo, Japan

Filed Mar. 7, 1994, Ser. No. 206,775

Claims priority, application Japan, Mar. 8, 1993, 5-085050

Int. Cl.[6] H02P 1/24

U.S. Cl. 318—727 18 Claims




1. An induction motor control apparatus for controlling a supply of power from an AC power source to an induction motor comprising:

a rectifier circuit for converting an AC voltage from said AC power source to a DC voltage;

DC-to-AC inverter means for converting said DC voltage to an AC supply voltage for driving said induction motor wherein said AC supply voltage has a level controlled by an inverter control signal;

frequency source means for generating a drive frequency signal having a drive frequency selectable from one of a plurality of drive frequencies for the induction motor;

a modulation means for generating said inverter control signal, said modulation means being responsive to said drive frequency signal to supply said AC supply voltage at said drive frequency and being responsive to a modulation control signal to control the level of said AC supply voltage; and

means for generating said modulation control signal in accordance with a function of the level of said AC supply voltage supplied to the induction motor and said drive frequency, said function setting said modulation control signal to a level that varies the motor supply voltage along a plurality of curves for respectively different values of said drive frequency between lower and upper limit values in accordance with the motor load to operate the induction motor at a predetermined slip.

5,500,582

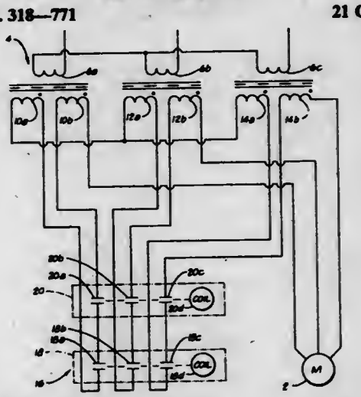
## MULTIPHASE LOAD CONTROL SYSTEM WITH SWITCH CONNECTED SPLIT SOURCES OF PHASE VOLTAGE

Donald W. Owen, 5100 NW. 26th, Oklahoma City, Okla. 73127

Filed Jun. 13, 1994, Ser. No. 261,178

Int. Cl.[6] H02P 1/26

U.S. Cl. 318—771 21 Claims




1. A system for operating a three-phase load with a three-phase voltage up to a predetermined maximum voltage, said system comprising:

transformer means for providing a three-phase voltage not exceeding a predetermined maximum voltage, said transformer means including:

a first secondary winding having a first section and a second section therein;

a second secondary winding having a first section and a second section therein; and

a third secondary winding having a first section and a second section therein; and

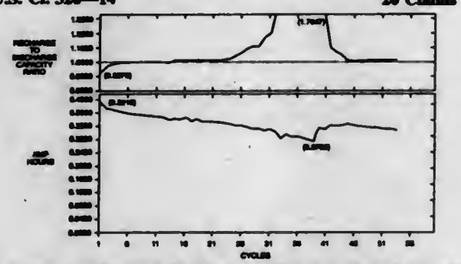
switch means, electrically connected between said first and second sections of each of said first, second and third secondary windings, for selectably connecting and disconnecting said first and second sections of said first, second and third secondary windings to close and open a drive circuit for a three-phase load connected to said second sections of said first, second and third secondary windings.

**5,500,583**

## METHODS FOR EXTENDING THE CYCLE LIFE OF SOLID, SECONDARY ELECTROLYTIC CELLS DURING RECHARGE OF THE ELECTROLYTIC CELLS

James Buckley, 270 Smith Valley Rd., Los Gatos, Calif. 95030; William Masuda, 17499 Blue Jay Dr., Morgan Hill, Calif. 95037, and Joseph Lundquist, 1470 Long Meadow, Gilroy, Calif. 94020

Continuation of Ser. No. 49,217, Apr. 19, 1993, abandoned. This application Aug. 13, 1993, Ser. No. 106,103
Int. Cl.[6] H02J 7/10
U.S. Cl. 320—14 20 Claims



1. A method for extending the cycle life of an electrolytic cell comprising a lithium anode, a cathode comprising recyclable cathodic material which provides for an electrolytic cell potential after fabrication of at least 2.0 volts when used in combination with the lithium anode, and a solid, single-phase, solvent-containing electrolyte which comprises a solid polymeric matrix, an alkali salt, and an electrolytic solvent, wherein the electrolyte is interposed between the anode and the cathode, which method comprises:

(a) charging the electrolytic cell in ifs discharged state at a rate of from at least about 0. 1 to about 0.5 milliamp per square centimeter until the potential of the cell increases by at least 0.5 volts as compared to the potential of the discharged cell;

b) interrupting charging procedure (a) and conducting a high magnitude discharge on said cell of from about 10 seconds to 2 minutes in duration; and

(c) reestablishing and maintaining the charging ram of charging procedure (a) until the potential of the electrolytic cell increases by at least 0.6 volts as compared to the potential of the discharged cell prior to recharging step (a).

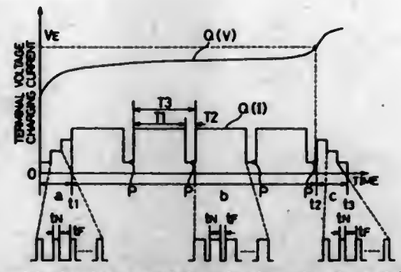
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**5,500,584**

## BATTERY CHARGING METHOD AND APPARATUS USING INITIAL CHARGING STEP WITH GRADUALLY INCREASING CHARGING CURRENT, QUICK CHARGING STEP WITH LARGE CHARGING CURRENT AND FINAL CHARGING STEP WITH DECREASING CHARGING CURRENT

Kenkichi Shimomoto, Osaka, Japan, assignor to Kiyomi Hanashiro, Osaka, Japan

PCT No. PCT/JP92/00959, § 371 Date Nov. 3, 1993, § 102(e) Date Nov. 3, 1993, PCT Pub. No. WO93/16518, PCT Pub. Date Aug. 19, 1993
PCT Filed Jul. 27, 1992, Ser. No. 129,153
Claims priority, application Japan, Feb. 17, 1992, 4-79440; May 13, 1992, 4-148121
Int. Cl.[6] H01M 10/44;10/46
U.S. Cl. 320—20 4 Claims




1. A battery charging method comprising the steps of:

an initial charging step of applying a first gradually increasing charging current, to start charging of a battery,

a monitoring step of monitoring the charging current in the initial charging step after elapse of a predetermined charging time, to provide a detected value,

a comparing step of comparing said detected value with a predetermined value,

a quick charging step of thereafter intermittently applying a second charging current which is larger than the first charging current, while monitoring a terminal voltage of the battery, to charge the battery to a charge-end voltage, when said detected value is greater than said predetermined value in said comparing step, said quick charging step including the steps alternately repeating:

a charging period during which an intermittent supply of the second charging current is continued, and

a charging suspension period during which the intermittent supply of the second charging current is suspended,

until the terminal voltage of the battery reaches the charge-end voltage, and

a final charging step of thereafter applying a gradually decreasing charging current, to finish charging of the battery.

2. A battery charging apparatus comprising:

a charging circuit for causing a charging current to flow to a battery;

a control switch connected to said charging circuit for selectively passing and cutting off the charging current flowing through said charging circuit to the battery;

a charging current detector connected to said charging circuit for detecting the charging current flowing through said charging circuit;

a terminal voltage detector connected to the battery for detecting a terminal voltage of the battery; and

a control unit which controls current supply to the charging circuit by supplying control signals to the control switch in response to detection by the charging current detector and the terminal voltage detector, said control unit including:

first signal generating means for controlling said control switch to cause a first gradually increasing charging current, to be supplied through the charging circuit to the battery, to start charging of the battery,

first judging means for comparing a value of said first charging current detected by the charging current detector with a reference value to determine a defect of the battery,

second signal generating means for controlling said control switch to intermittently cause a second charging current larger than the first charging current to be supplied through the charging circuit to the battery when the first gradually increasing charging current is greater than said reference value after elapse of a predetermined amount of time, to charge the battery to a charge-end voltage,

period setting means connected with the control switch for alternately setting a charging period during which the intermittent supply of said second charging current is continued, and a charging suspension period during which the intermittent supply of said second charging current is suspended, until the terminal voltage of the battery reaches the charge-end voltage, and

third signal generating means for controlling said control switch to cause a third gradually decreasing charging current, to be supplied through the charging circuit to the battery after said charge-end voltage has been reached by said second charging current, to finish charging of the battery.

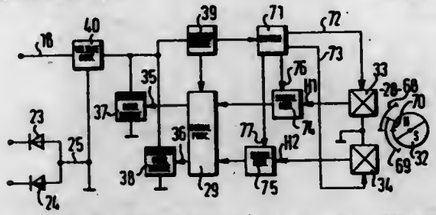


**5,500,585**

## DEVICE FOR DETECTING THE SPEED AND DIRECTION OF A MOVABLE COMPONENT USING A SINGLE SIGNAL LINE

Volker Aab, Sasbach, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 20, 1993, Ser. No. 138,093
Claims priority, application Germany, Jan. 21, 1992, 42 35 471.4; Mar. 13, 1993, 43 08 031.6
Int. Cl.[6] G01P 3/52;13/00; G01B 7/14; G08B 21/00
U.S. Cl. 324—165 13 Claims




1. A device for detecting movement of a movable component, said device comprising:

a sensor arrangement including

a first position sensor for outputting a first signal corresponding to a first position range of the movable component,

a second position sensor for outputting a second signal corresponding to at least a second position range of the movable component, with the two position ranges having an overlapping region,

signal processing means, to which the first and second signals output by said sensors are fed, for deriving a direction signal and a speed signal based on the first and second signals, with the direction signal and the speed signal each having separate discrete values, and

means for adding the separate discrete values of the speed and direction signals to form an added signal and for feeding the added signal to a signal line; and

an evaluation arrangement connected to said signal line for receiving and evaluating the added signal on said signal line for determining a direction and a speed of the movable component.

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**5,500,586**

## STORM MONITOR

John S. Youngquist, 899 Niagara Blvd., Ft. Erie, Ontario, Canada

Division of Ser. No. 115,183, Aug. 31, 1993, Pat. No. 5,408,175, which is a division of Ser. No. 708,487, May 31, 1991, Pat. No. 5,245,274. This application Mar. 15, 1995, Ser. No. 404,898
Int. Cl.[6] G01W 1/16
U.S. Cl. 324—72 4 Claims

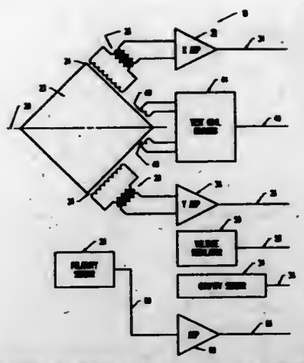
1. Storm monitoring apparatus mounted with respect to a heading axis and an operator compartment, said apparatus locating lightning occurrences evoking an electromagnetic field including a magnetic H-field component and an electrostatic, E-field component, comprising:

a first H-field antenna, including a first coil structure having a first array of windings oriented at a select angle with respect to said heading axis and deriving a first antenna response to said H-field component;

a second H-field antenna, including a second coil structure having a second array of windings orthogonally disposed with respect to said first array and deriving a second antenna response to said H-field component;

control means responsive to said first and second antenna responses for deriving a lightning occurrence range and bearing information output;

a visual readout, having a lens portion carrying vertically oriented indicia representing said heading axis, a pixel generator



having pixel locations defined by row and column elements aligned in parallel, respectively, with first and second orthogonally disposed axes and selectively energizable in response to said information output to generate light emitting rectangularly shaped pixels, said first and second orthogonally disposed axes being oriented at an angle of about 45° with respect to said vertically oriented indicia so as to effect a perception of said light emitting pixels as having a diamond shape.

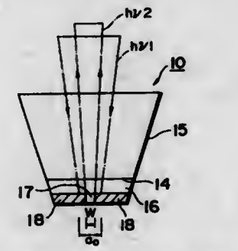
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**5,500,587**

## E-O PROBE

Hironori Takahashi; Shinichiro Aoshima, and Isuke Hirano, all of Hamamatsu, Japan, assignors to Hamamatsu Photonics K.K., Hamamatsu, Japan

Filed Sep. 9, 1993, Ser. No. 118,257
Claims priority, application Japan, Sep. 10, 1992, 4-242134
Int. Cl.[6] G01R 31/00
U.S. Cl. 324—96 15 Claims




1. An E-O probe for measuring a voltage by applying a beam of radiation, comprising:

a base part which is penetrated by said beam of radiation;

an electro-optic material which is attached to an end face of said base part, having an index of refraction which varies in response to an intensity of an electric field; and

a reflecting face formed on an end face of said electro-optic material, which reflects said beam of radiation penetrating said electro-optic material from said base part and incident on said reflecting face, wherein said beam of radiation has a predetermined thickness and the size of said reflecting face is such that a substantially entire area of said reflecting face is irradiated by said beam of radiation having said predetermined thickness, and wherein said beam of radiation is a radiation focused by an optical system including an objective

lens having a numerical aperture, NA, and the size of said reflecting face is such that said substantially entire area of said reflecting face is encloseable by a circle having a diameter approximately equal to a theoretical minimum beam diameter, $(2\lambda)/(\pi NA)$, wherein $\lambda$ denotes a wave length of said beam of radiation.

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**5,500,588**

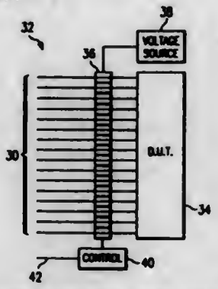
## METHOD AND APPARATUS FOR TESTING INTEGRATED CIRCUIT DEVICES

**James L. Werley, Flower Mound, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.**

**Division of Ser. No. 786,504, Nov. 1, 1991, Pat. No. 5,391,984. This application Jul. 20, 1994, Ser. No. 277,562**

**Int. Cl.[6] G01R *31/28***

**U.S. Cl. 324—158.1** **11 Claims**




1. A method for testing integrated circuit devices, comprising the steps of:

placing integrated circuit devices to be tested into a plurality of test fixtures;

stressing the integrated circuit devices using local voltage sources separate from a single central tester; and

at selected times, selectively coupling a single device to the central parametric tester and testing such device, wherein the local voltage sources are independent of a power source for the parametric tester.

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**5,500,589**

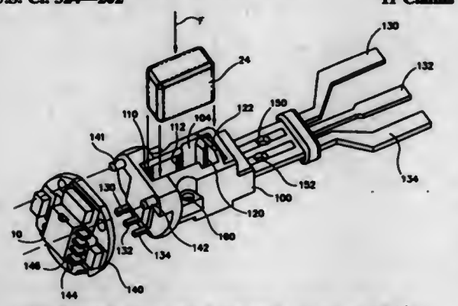
## METHOD FOR CALIBRATING A SENSOR BY MOVING A MAGNET WHILE MONITORING AN OUTPUT SIGNAL FROM A MAGNETICALLY SENSITIVE COMPONENT

**Gustavo L. Sumcad, Freeport, Ill., assignor to Honeywell Inc., Minneapolis, Minn.**

**Filed Jan. 18, 1995, Ser. No. 374,942**

**Int. Cl.[6] G01R *35/00***

**U.S. Cl. 324—202** **11 Claims**




1. A calibration process for a magnetic sensor, comprising:

providing a carrier;

providing a cavity within said carrier;

attaching a magnetically sensitive component to a substrate;

attaching said substrate to said carrier;

disposing a ferromagnetic target within a detection zone of said magnetically sensitive component;

inserting a magnet into said cavity;

exerting a force against said magnet to push said magnet into said cavity in a direction generally parallel to the plane of said substrate;

monitoring a preselected output signal from said magnetically sensitive component as said magnet is pushed into said cavity;

removing said force when a predetermined status of said preselected output signal is sensed;

providing a resisting element which retains said magnet in position within said cavity when said force is removed; and

providing a plurality of deformable guide ribs to control the alignment of said magnet as it is pushed into said cavity.

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**5,500,590**

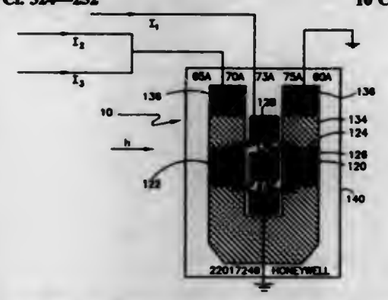
## APPARATUS FOR SENSING MAGNETIC FIELDS USING A COUPLED FILM MAGNETORESISTIVE TRANSDUCER

**Bharat B. Pant, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.**

**Filed Jul. 20, 1994, Ser. No. 277,856**

**Int. Cl.[6] G01R *33/09*; H01L *43/08***

**U.S. Cl. 324—252** **10 Claims**




1. Apparatus for sensing magnetic field components, comprising:

first and second magnetically coupled film magnetic field sensing elements arranged to change resistance in response to said magnetic field components in a first direction when said elements are biased by a first current through said first and second elements;

a current carrying conductor located to set a direction of magnetization in a first direction in said first element and in a second direction in said second element when a second current is passed through said conductor;

third and fourth resistive elements, said first and second magnetic field sensing elements and said third and fourth resistive elements arranged in a four leg bridge having an output terminating region;

means for applying a voltage to said bridge, said voltage establishing said first current;

said apparatus having a transfer function relating said sensed magnetic field components to an output signal at said output terminating region; and



means for providing a third current through said current carrying conductor for adjusting said transfer function by varying said third current.

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**5,500,591**

## METHODS AND APPARATUS FOR DETECTING SUBSTANCES CONTAINING NUCLEI OF A FIRST AND SECOND KIND

**John A. S. Smith, London, England, and Julian D. Shaw, Encinitas, Calif., assignors to British Technology Group Ltd., London, England**

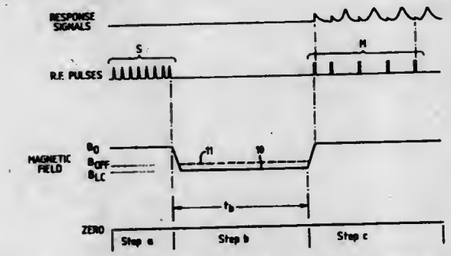
**PCT No. PCT/GB92/00798, § 371 Date Mar. 21, 1994, § 102(e) Date Mar. 21, 1994, PCT Pub. No. WO92/19979, PCT Pub. Date Nov. 12, 1992**

**PCT Filed Apr. 30, 1992, Ser. No. 140,082**

**Claims priority, application United Kingdom, May 2, 1991, 9109592**

**Int. Cl.[6] G01R *33/20***

**U.S. Cl. 324—307** **20 Claims**




1. A method for detecting a presence of a specific substance in an object, said specific substance containing a first type nuclei which exhibits nuclear magnetic resonance effects and a second type nuclei which exhibits nuclear quadrupole resonance effects, by a cyclic test comprising a plurality of cycles, each cycle of said cyclic test comprising steps of:

applying a saturating signal to said object;

exposing said object to a magnetic field having a level-crossing field strength with respect to said specific substance to be detected for a set time, said magnetic field having said level-crossing strength causing energy to be exchanged between said first type nuclei and said second type nuclei of said specific substance; and

detecting nuclear magnetic resonance signals from said object.

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**5,500,592**

## ABSOLUTE METABOLITE CONCENTRATIONS FROM POORLY SPATIALLY-RESOLVED MR RESPONSE SIGNALS

**Paul A. Bottomley, Columbia, Md., assignor to General Electric Company, Schenectady, N.Y.**

**Filed Oct. 31, 1994, Ser. No. 332,318**

**Int. Cl.[6] G01R *33/46***

**U.S. Cl. 324—307** **14 Claims**

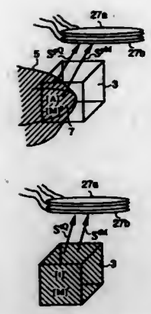
8. A magnetic resonance (MR) system for determining the concentration of a chemical entity (CE) having a preselected resonant nuclei within a subject comprising:

a) a static magnet for applying a substantially uniform magnetic field over said subject;

b) an RF transmit means for transmitting RF energy into said subject of a selected duration, amplitude and frequency to cause nutation of selected nuclei within said subject;

c) a gradient means for varying the amplitude of the magnetic field in at least one spatial dimension over time;

d) a marker receive coil capable of detecting an MR response signal from a naturally occurring marker material of known concentration $[M]^r$ abundant in a desired tissue in at least one voxel of said subject $S^{sM}$, and from at least one voxel of a test phantom $S^{tM}$ having a known volume and concentration of a marker material $[M]^r$ and a known concentration [t] of the same resonant nuclei of said CE;




e) a CE receive coil tuned to receive an MR response signal $S^{sO}$ from said CE within said subject, and receive an MR response signal $S^{tO}$ from the voxel of the test phantom;

f) receive means coupled to the RF receive coils for receiving the detected MR response signals;

g) a controller means connected to the RF transmit means, the receive means, the calculation means and the gradient means, for activating the RF transmit means, the receive means, the calculation means and the gradient means each according to a predetermined MR pulse sequence and for determining said concentration [A] of said CE from the MR response signals.

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**5,500,593**

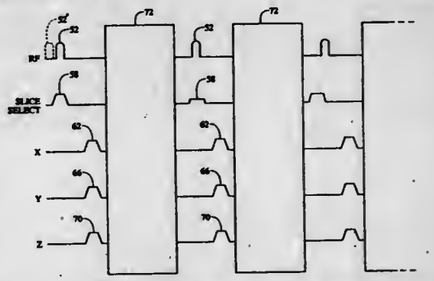
## PHASE ROTATED SPOILING FOR SPATIAL AND SPECTRAL SATURATION TECHNIQUES

**Mark J. Loncar, Willoughby Hills; James B. Murdoch, Solon, and Rao P. Gullapalli, Richmond Heights, all of Ohio, assignors to Picker International, Inc., Highland Heights, Ohio**

**Filed Nov. 23, 1994, Ser. No. 344,372**

**Int. Cl.[6] G01V *3/00*; *3/14***

**U.S. Cl. 324—307** **13 Claims**




1. In a magnetic resonance method in which at least a portion of a subject is disposed in an examination region of a temporally constant magnetic field and in which the subject portion in the examination region is examined by cyclically (a) applying a pre-saturation RF pulse focused to saturate only selected material in the subject portion, (b) applying spoiler gradients, and (c) applying a magnetic resonance sequence for generating magnetic resonance signals from non-saturated material in the examination region, which magnetic resonance signals are received and processed, the improvement comprising causing spectrally selective presaturation in the selected material by:

in each cyclic repetition, changing the phase of the presaturation radio frequency pulse independently of the phase of radio frequency pulses in the magnetic resonance sequence.

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**5,500,594**

## RF QUADRATURE COIL SYSTEM

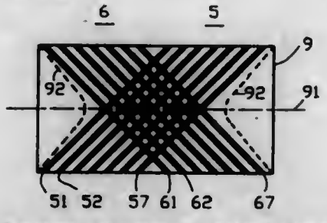
**Christoph G. Leussler, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.**

**Continuation of Ser. No. 533,561, Jun. 5, 1990, abandoned. This application Sep. 30, 1992, Ser. No. 954,948**

**Claims priority, application Germany, Jun. 8, 1989, 39 18 743.8**

**Int. Cl.[6] G01R *33/28***

**U.S. Cl. 324—318** **9 Claims**




1. An rf quadrature coil system for a magnetic resonance examination apparatus, comprising:

two like rf coils adapted to be connected to a selected one of an rf receiver and rf transmitter and which coils are offset 90° with respect to one another, the two rf coils each comprise a plurality of turns lying only in mutually parallel planes, the planes of the turns of one rf coil extending perpendicular to the planes of the turns of the other rf coil, wherein the turns each comprise annular portions, each turn being formed as a resonator including a capacitive coupling at its ends, all resonators being tuned to the same frequency, the resonators of each rf coil being only inductively coupled to one another.

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**5,500,595**

## SURFACE COIL HOLDER FOR MAGNETIC RESONANCE IMAGING

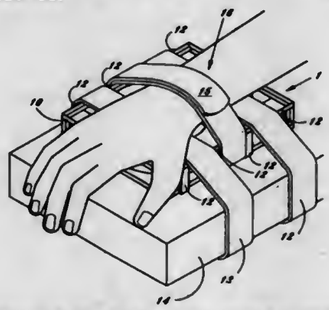
**Edward M. Burton, 3540 Bermuda Dr., Birmingham, Ala. 35210**

**Continuation of Ser. No. 10,059, Jan. 28, 1993, Pat. No. 5,329,234. This application Jul. 11, 1994, Ser. No. 273,405**

**The portion of the term of this patent subsequent to Jul. 12, 2011, has been disclaimed.**

**Int. Cl.[6] G01R *33/34***

**U.S. Cl. 324—318** **2 Claims**




1. A surface coil holder for magnetic resonance imaging comprising, a rectangular, electromagnetically transparent box having a bottom wall, a pair of side walls, a pair of end walls, and a removable rectangular top, a conventional surface coil contained in said box, said side walls and said end walls spaced for engagement with a conventional 5" surface coil for anchoring said surface coil relative to said side walls and said end walls, an opening in one of the end walls on the box through which the surface coil cable extends for connection to a MRI scanner, a foot integral with each corner of the top and depending therefrom, each foot being received within the four corners of the box and frictionally held therein;

an insert sized for being removably mounted within said box, said insert comprising a rectangular sheet of electromagnetically transparent material, said insert capable of being selectively mounted within said box and supported on the bottom wall of said box, the peripheral edges of the insert engaging the side and end walls of the box, said rectangular sheet having a cut-out portion configured to the corresponding dimension of a conventional 3" surface coil such that a 3" surface coil may be removably inserted in said cut-out, whereby the holder is adapted to selectively contain and anchor a conventional 5" surface coil without the insert being in the box or a conventional 3" surface coil with the insert being in the box.

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**5,500,596**

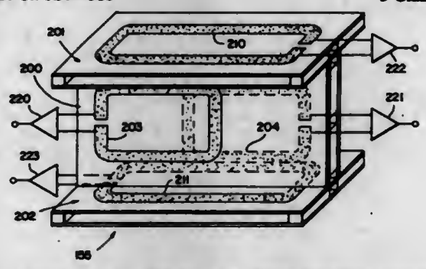
## LOCAL COIL ARRAY FOR MAGNETIC RESONANCE IMAGING OF THE LOWER EXTREMITIES

**Thomas M. Grist, and Marcus T. Alley, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.**

**Filed Apr. 28, 1994, Ser. No. 234,888**

**Int. Cl.[6] G01R *33/28***

**U.S. Cl. 324—318** **5 Claims**




1. A local coil for acquiring NMR signals produced by excited spins in the legs of a patient, the combination comprising:

a central coil disposed in a first plane and positioned between the patient's legs, and extending along the lengthwise dimension of the legs, the central coil being operable to produce a signal in response to NMR signals emanating from the legs;

a first flange coil disposed in a second plane substantially perpendicular to the first plane and positioned to extend over the top of both of the patient's legs, and extending along the lengthwise dimension substantially coextensively with the central coil, the first flange coil being operable to produce a second signal in response to NMR signals emanating from the patient's leg;

a second flange coil disposed in a third plane substantially perpendicular to the first plane and positioned to extend beneath both of the patient's legs, and extending along the lengthwise dimension substantially coextensively with the central coil, the second flange coil being operable to produce a third signal in response to NMR signals emanating from the patient's legs; and

means for combining the signals acquired from said three coils to produce an image of the patient's leg.



**5,500,597**

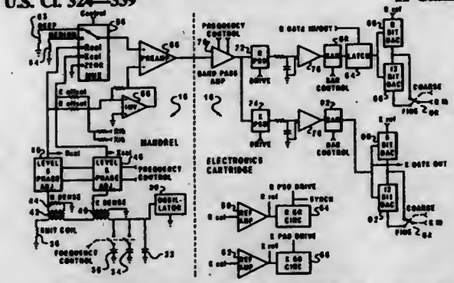
## MULTIPLE TRANSMIT FREQUENCY INDUCTION LOGGING SYSTEM WITH CLOSED LOOP CONVERSION CIRCUITRY FOR PHASE AND GAIN VARIATION ELIMINATION

**Edward B. Tickell, Jr., Crowley; Peter J. Schoch, Fort Worth; Lonnie M. Moseley, Arlington, and Dwight A. Bloomfield, Benbrook, all of Tex., assignors to Computalog Research, Inc., Fort Worth, Tex.**

**Filed Jul. 30, 1993, Ser. No. 99,621**

**Int. Cl.[6] G01V *3/18;3/10***

**U.S. Cl. 324—339** **11 Claims**




1. An induction logging tool for operation in a borehole in association with surface electronic equipment for measuring a characteristic of subsurface formations, said logging tool including a transmitter coil which induces formation currents to flow in response to a transmitter signal and a receiver coil which generates a signal characteristic of the formation in response to those currents, said logging tool comprising:

an oscillator for generating a excitation signal;

a variable resonant tuning circuit coupling said oscillator to said transmitter coil, said variable resonant tuning circuit repetitively and sequentially altering said excitation signal to one of at least three transmitter frequencies in response to a command signal;

a drive circuit for generating a reference phase signal in response to each of said at least three transmitter frequencies;

a phase sensitive detector coupled to said receiver coil and responsive to said signal characteristic of said formation and said reference phase signal for generating an output signal indicative of the magnitude of a component of said signal characteristic of said formation that is in phase with said reference phase signal; and

a closed loop conversion circuit coupled to said phase sensitive detector for accurately determining said output signal of said receiver coil, said closed loop conversion circuit comprising a variable feedback generation circuit and control means for selectively altering said variable feedback to achieve a null output of said phase sensitive detector for each of said three transmitter frequencies.

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**5,500,598**

## APPARATUS FOR TESTING ELECTRICAL COMPONENTS WHICH HAVE WINDINGS

**John S. Ford, Oxon, United Kingdom, assignor to Voltech Instruments Limited, Oxon, United Kingdom**

**PCT No. PCT/GB92/02104, § 371 Date Jul. 27, 1994, § 102(e) Date Jul. 27, 1994, PCT Pub. No. WO93/10465, PCT Pub. Date May 27, 1993**

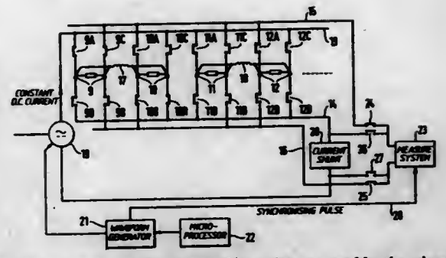
**PCT Filed Nov. 13, 1992, Ser. No. 256,947**

**Claims priority, application United Kingdom, Nov. 16, 1991, 9124428**

**Int. Cl.[6] G01R *31/06***

**U.S. Cl. 324—547** **14 Claims**

1. An apparatus for testing a wound component, comprising: a plurality of connection points for connecting the testing apparatus to the component to be tested; signal generating means; a first set of switches for selectively connecting the signal generating means




to one or more of the connection points to enable the signal generating means to apply a variety of different test signals to the component to be tested; measuring means; a second set of switches for selectively connecting the measuring means to one or more of the connection points to enable the measuring means to measure a variety of different outputs from the component to be tested; and control means for controlling the first and second set of switches so as to control which of the connection points are connected to the signal generating means and which of the connection points are connected to the measuring means, for controlling the signals applied by the signal generating means to the selected connection points, and for controlling operation of the measuring means to enable the signal generating means and the measuring means to be operated so as to carry out a variety of different forms of tests on the component to be tested, wherein the signal generating means is connected to the measuring means and is arranged to provide a synchronising signal thereto, and wherein the measuring means is arranged to calculate the phase relationship between signals measured at different times by comparing the phase relationships of those signals with the synchronising signal.

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**5,500,599**

## METHOD AND APPARATUS FOR THE MEASUREMENT OF THE DIELECTRIC CONSTANT OF SAMPLE MATERIALS

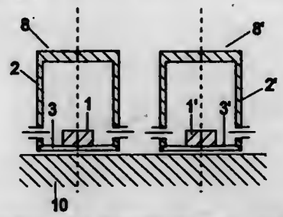
**Gerd Stange, Nortorf, Germany, assignor to Nu-Tech GmbH, Germany**

**Filed Nov. 28, 1994, Ser. No. 348,153**

**Claims priority, application Germany, Dec. 8, 1993, 43 42 505.4**

**Int. Cl.[6] G01R *27/26***

**U.S. Cl. 324—634** **19 Claims**




1. An apparatus for the measurement of the complex dielectric constant of a material by analysis of the amount of detuning of an rf resonator introduced by the presence of the material, the apparatus comprising rf transmitting means to transmit electromagnetic fields of variable high frequency to a rf resonator, receiving means for the resonator field and measurement means connected thereto, which allow determination of the amplitude of the received rf signals, characterised in that

two rf resonators of identical construction (8,8') are provided, each of which comprises a dielectric solid state resonator (1,1') in a case having a first section (2,2'), which surrounds the solid state resonator with conductive material in at least one hemisphere, and a second section (3,3'), which is permeable for electromagnetic alternating fields, and means for adjusting the resonance frequency of the rf resonator,

said two rf resonators are adapted to be arranged with respect to each other in such a way that their conductive case sections (2,2') shield them against mutual interference and that their sections permeable for electromagnetic fields (3,3') are directed towards the material (10) to be measured, and

control and analysis means are provided which are adapted to control the rf transmission means and/or the rf resonators in such a way, that both rf resonators are supplied with rf fields of the same frequency (ω) which, in the absence of the material to be measured, is centered between the differently pre-adjusted resonance frequencies ($\omega_{01}$, $\omega_{02}$) of the first and the second rf resonator (8, 8'), and to receive the measured amplitude values of each of the received rf signals and to determine, on the basis of their sum and difference values determines of said measured amplitude values, the complex dielectric constant.

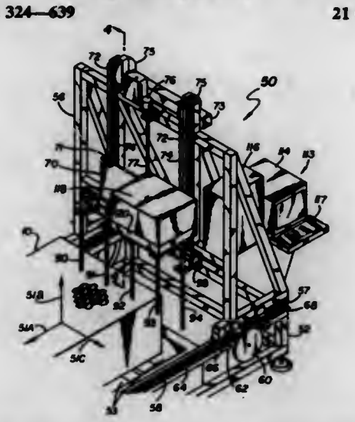
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**5,500,600**

**APPARATUS FOR MEASURING THE ELECTRICAL PROPERTIES OF HONEYCOMB CORE**

Tom S. Moyes, Valencia, Calif., assignor to Lockheed Corporation, Calabasas, Calif.

Filed Jul. 5, 1994, Ser. No. 270,970
Int. Cl.[6] G01R *27/04*
U.S. Cl. 324—639 21 Claims



1. An apparatus for measuring the attenuation of electromagnetic radiation between cells of honeycomb core that includes a plurality of individual cells that extend from a top surface to a bottom surface thereof, the apparatus comprising:

at least two antennas at a discrete distance from each other, each antenna operable in both an electromagnetic radiation transmitting and receiving mode;

a positioning system for positioning said at least two antennas at a plurality of discrete positions within separate cells of the core between the top surface and bottom surface thereof; and

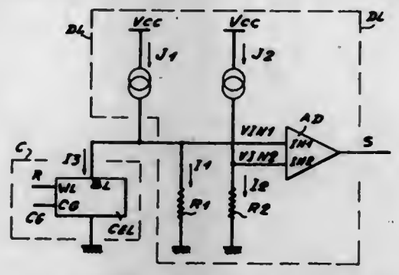
means coupled to said at least two antennas for operating one of said antennas in a radiating mode and a second in a receiving mode and measuring the attenuation of the radiated electromagnetic radiation therebetween.

**5,500,601**

**DEVICE FOR DETECTING THE LOGIC STATE OF A MEMORY CELL**

Mathieu Lisart, Aix en Provence, and Richard Fournel, Trets, both of, France, assignors to SGS-Thomson Microelectronics, S.A., United Kingdom

Filed Feb. 21, 1992, Ser. No. 839,618
Claims priority, application France, Feb. 21, 1991, 91 02090
Int. Cl.[6] G04R *27/08;31/26;* G11C *29/00*
U.S. Cl. 324—713 11 Claims




1. A device to detect the logic state of a memory cell whose impedance varies depending on whether its logic state is a programmed or erased state, the device including:

current generation means to maintain the current consumption of the device constant regardless of the state of the memory cell,

voltage generation means to generate a measurement voltage proportional to the current consumed by the memory cell, and

measurement means to measure said voltage, wherein the measurement means include means to generate a reference voltage and comparison means to compare the voltage to be measured with the reference voltage,

wherein the voltage generation means include a first resistor and the comparison means include a differential amplifier in which the voltage across the terminals of the first resistor are applied to one amplifier input and the voltage across the terminals of the second resistor are applied to the second amplifier input, the amplifier output having a signal which changes from one logic state to the complementary logic state depending on the logic state of the memory cell.

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**5,500,602**

**STORM MONITOR**

John S. Youngquist, 899 Niagara Blvd., Ft. Erie, Ontario, Canada

Division of Ser. No. 115,183, Aug. 31, 1993, Pat. No. 5,408,175, which is a division of Ser. No. 708,487, May 31, 1991, Pat. No. 5,245,274. This application Mar. 15, 1995, Ser. No. 404,896
Int. Cl.[6] G01W *1/16*
U.S. Cl. 324—72 5 Claims

1. The method for locating the site of a lightning occurrence with respect to a heading axis, said lightning occurrence evoking an electromagnetic field including an H-field component and an E-field component, comprising the steps of:

providing a first H-field antenna including a first coil structure having a first array of windings oriented at a select angle with respect to said heading axis and deriving a first response to said H-field component;

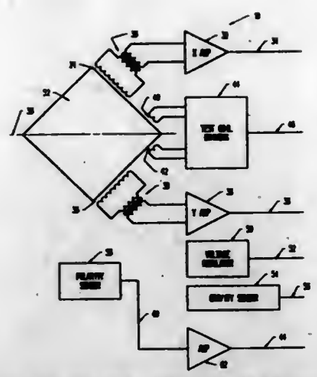
providing a second H-field antenna including a second coil structure having a second array of windings orthogonally disposed with respect to said first array and deriving a second response to said H-field component;

converting said first and second response to X-channel and Y-channel binary numerical values;

acquiring said binary numerical values in memory;

accessing said memory for said binary numerical values;





treating said accessed binary numerical values to derive bearing and range information corresponding with said lightning occurrence; and

publishing said bearing and range information as a visually perceptible readout.

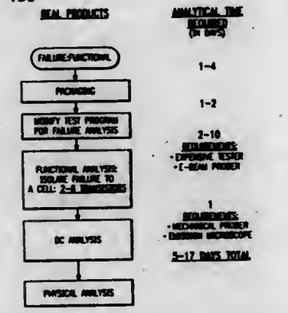
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**5,500,603**

**METHODOLOGY TO QUICKLY ISOLATE FUNCTIONAL FAILURES ASSOCIATED WITH INTEGRATED CIRCUIT MANUFACTURING DEFECTS**

Tam T. Le, Garland, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Aug. 31, 1994, Ser. No. 299,238
Int. Cl.[6] G01R *31/28;* G06F *11/00*
U.S. Cl. 324—751 20 Claims




1. A method for quickly assessing the functionality and defect density of an integrated circuit device, comprising the steps of:

performing a functional analysis of an integrated circuit device using a test chip by locating a defective node comprised of a first transistor and a second transistor, wherein the integrated circuit device has a defect density which may be measured and the test chip has a plurality of elements and wherein the functional analysis uses an Electron Beam (E-Beam) to locate the defective node on the test chip; and

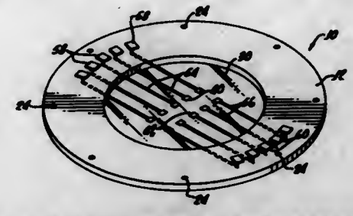
assessing the defect density of the integrated circuit device.

**5,500,604**

**RADIAL TENSIONING LAMINATION FIXTURE FOR MEMBRANE TEST PROBE**

David B. Swarbrick, Mission Viejo, and Jack H. Pike, Dana Point, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 15, 1994, Ser. No. 275,480
Int. Cl.[6] G01R *31/02*
U.S. Cl. 324—754 18 Claims



1. In a membrane test probe having a flexible membrane that is used in testing integrated circuit chips, a method of laminating said flexible membrane to a probe substrate having an annular securing section encircling a substrate opening, wherein said membrane spans said opening, said method comprising the steps of:

providing a rigid pressure plate,

positioning said membrane on said substrate with an inner portion of said membrane spanning said opening, and a radially outer portion of said membrane adjacent said substrate,

pressing said rigid pressure plate against said membrane and substrate with said membrane between said substrate and pressure plate,

causing the pressure of said pressure plate against said membrane to apply radially outwardly directed tension to said membrane,

bonding said membrane to said substrate while the pressure of said pressure plate applies tension to said membrane, and

removing said pressure plate from said membrane after said bonding.

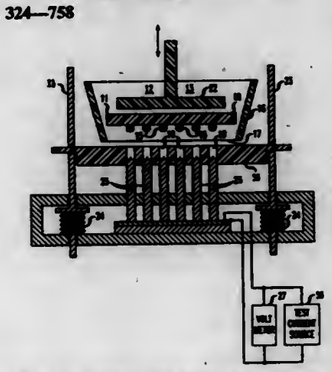
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**5,500,605**

**ELECTRICAL TEST APPARATUS AND METHOD**

David D. C. Chang, Princeton, N.J., assignor to AT&T Corp., Murray Hill, N.J.

Filed Sep. 17, 1993, Ser. No. 121,850
Int. Cl.[6] G01R *1/073*
U.S. Cl. 324—758 9 Claims



1. A method for testing an electronic device having on one side thereof an array of solder bumps arranged in a first configuration comprising the steps of:

forming an array of spring-loaded conductive probes arranged in said first configuration;

forming an insulative template comprising an array of apertures arranged in said first configuration;
aligning the apertures of the template with the spring-loaded conductive probes;
inserting the electronic device in a funnel having a lower opening and an upper opening larger than the lower opening, the lower opening located in proximity to the template and having the approximate configuration of the outer periphery of the electronic device;
forcing the electronic device against the template such that each solder bump projects into an aperture thereof to contact a spring-loaded conductive probe;
and passing electrical current through at least part of the electronic device, at least some of the solder bumps, and at least some of the conductive probes to test electrically the electronic device.

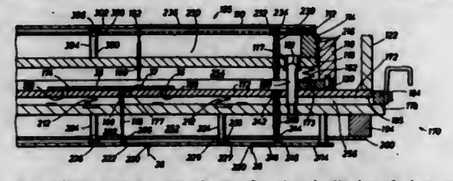
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**5,500,606**

## COMPLETELY WIRELESS DUAL-ACCESS TEST FIXTURE

**Frederick J. Holmes, Houston, Tex., assignor to Compaq Computer Corporation, Houston, Tex.**

**Filed Sep. 16, 1993, Ser. No. 122,246**
**Int. Cl.[6] G01R *31/02***
**U.S. Cl. 324—761** **2 Claims**



1. A wireless dual-access fixture for electrically interfacing test pads located on a first and a second side of a PCB under test to I/O pins of a tester, the fixture comprising:
a first interface PCB for electrically interfacing the I/O pins of the tester with the test pads of the PCB under test, comprising:
a first set of test pads for electrically interfacing the test pads located on the first side of the PCB under test,
a first set of transfer pads for electrically interfacing the test pads located on the second side of the PCB, under test
a plurality of I/O pads for electrically engaging the I/O pins of the tester, and
electrical traces for electrically connecting said first set of test pads and said first set of transfer pads to said plurality of I/O pads;
a first probe plate, comprising:
a first set of test pins, each having a first end for electrically engaging a corresponding one of said first set of test pads of said first interface PCB and a second end for electrically engaging a corresponding test pad located on the first side of the PCB under test, and
a first set of transfer pins, each having a first end for electrically engaging a corresponding one of said first set of transfer pads of said first interface PCB and a second end;
a second probe plate, comprising:
a second set of test pins, each having a first end for electrically engaging a corresponding test pad located on the second side of the PCB under test and a second end,
a second set of transfer pins, each having a first end for electrically engaging said second end of a corresponding one of said first set of transfer pins and a second end; and
a second interface PCB for electrically interfacing the I/O pins of the tester with the test pads located on the second side of the PCB under test, comprising:
a second set of test pads, each for electrically engaging said second end of a corresponding one of said second set of test pins,
a second set of transfer pads, each for electrically engaging said second end of a corresponding one of said second set of transfer pins, and
electrical traces for electrically connecting said second set of test pads to said second set of transfer pads.

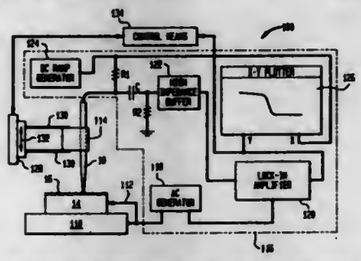
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**5,500,607**

## PROBE-OXIDE-SEMICONDUCTOR METHOD AND APPARATUS FOR MEASURING OXIDE CHARGE ON A SEMICONDUCTOR WAFER

**Roger L. Verkuil, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 22, 1993, Ser. No. 173,320**
**Int. Cl.[6] G01R *31/02;1/067***
**U.S. Cl. 324—761** **33 Claims**



1. A method of forming a probe suitable for Probe-Oxide-Semiconductor (POS) electrical characterization measurements of a dielectric layer on a semiconductor substrate, the dielectric layer having a smooth surface, said method comprising the steps of:
a) providing an electrically conductive probe needle, the needle having a rounded tip end of a first radius, the rounded tip end further being suitable for undergoing a plastic deformations; and,
b) positioning the needle above the dielectric layer on the semiconductor substrate and forcing the needle tip down onto the smooth surface of the dielectric layer in a controlled manner for causing the needle tip to undergo a plastic deformation in which an outer portion of the rounded tip end is maintained at the first radius and an inner portion of the rounded tip end is increased to a second radius, the second radius being larger than the first.

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**5,500,608**

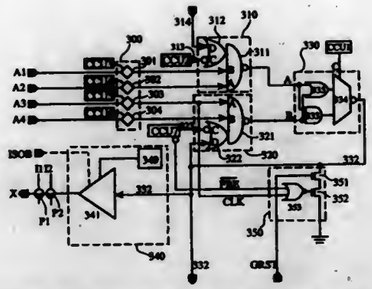
## LOGIC CELL FOR FIELD PROGRAMMABLE GATE ARRAY HAVING OPTIONAL INTERNAL FEEDBACK AND OPTIONAL CASCADE

**F. Erich Goetting, Cupertino, and Stephen M. Trimberger, San Jose, both of Calif., assignors to Xilinx, Inc., San Jose, Calif.**

**Division of Ser. No. 919,658, Jul. 23, 1992, Pat. No. 5,365,125. This application Nov. 14, 1994, Ser. No. 339,435**
**Int. Cl.[6] H03K *19/177;19/173***
**U.S. Cl. 326—39** **15 Claims**

6. A logic cell comprising:
an interconnect structure;
an input buffer stage for receiving a plurality of input signals from said interconnect structure;
a cascade-in combinational stage for receiving a signal from another logic cell, a first enabling/disabling signal, and a first plurality of buffered signals from said input buffer stage;
a feedback combinational stage for receiving a feedback signal, a second enabling/disabling signal, and a second plurality of buffered signals from said input buffer stage; and
a logic circuit for receiving the output signals of said cascade-in combinational stage and said feedback combinational stage,





wherein said logic circuit provides an input signal to said feedback combinational stage and a cascade signal to another logic cell.

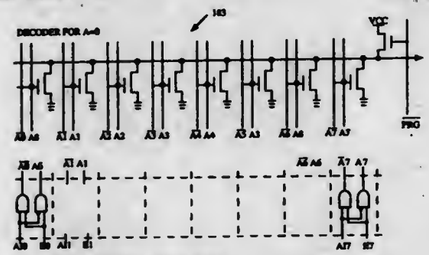
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**5,500,609**

## WILDCARD ADDRESSING STRUCTURE FOR CONFIGURABLE CELLULAR ARRAY

**Thomas A. Kean, Edinburgh, Scotland, assignor to Xilinx, Inc., San Jose, Calif.**

**Division of Ser. No. 148,793, Nov. 5, 1993. This application Jun. 6, 1995, Ser. No. 486,175**
**Claims priority, application United Kingdom, Nov. 5, 1992, 9223226**
**Int. Cl.[6] H03K *19/177***
**U.S. Cl. 326—41** **2 Claims**



1. A logic structure comprising:
an array of memory cells arranged in rows and columns;
a plurality of decoders, one decoder for each row or each column, each decoder receiving both true and complemented values for each address bit;
a pair of logic gates associated with each address bit, wherein said pair of logic gates provide said true and complemented values for each address bit; and
a wildcard register providing one enable bit for each address bit, wherein both of said logic gates receive said enable bit from said wildcard register, one of said logic gates receives said address bit, and the other of said logic gates receives the complement of said address bit.

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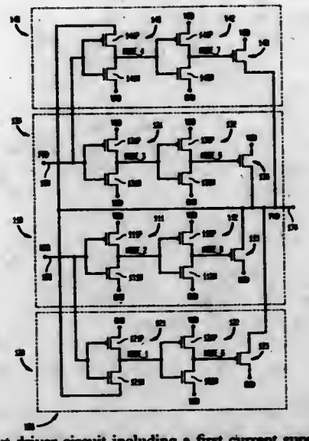
**5,500,610**

## VERY HIGH CURRENT INTEGRATED CIRCUIT OUTPUT BUFFER WITH SHORT CIRCUIT PROTECTION AND REDUCED POWER BUS SPIKES

**Steven Burstein, Smithtown, N.Y., assignor to Standard Microsystems Corp., Hauppauge, N.Y.**

**Filed Oct. 8, 1993, Ser. No. 134,571**
**Int. Cl.[6] H03K *17/16***
**U.S. Cl. 326—85** **18 Claims**

1. An output buffer circuit for supplying a current to an output pad of an integrated circuit comprising:
an output driver circuit including a first current supply element for supplying a first relatively small current to said output pad in response to an input logic signal voltage, and
a feedback circuit including a second current supply element for supplying a second relatively large current to said output pad and a circuit for generating a feedback voltage which is responsive to said input logic signal voltage and which inversely follows an output pad voltage after said output pad voltage crosses from a first side to a second side of a predetermined threshold for turning on said second current supply element and for immediately disabling said second current supply element from supplying current when said output pad voltage crosses from said second side to said first side of said threshold.



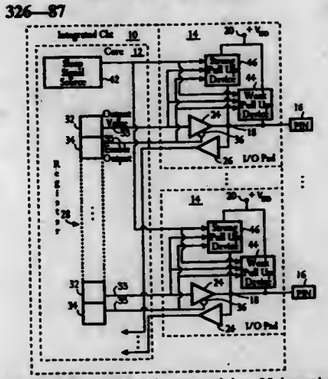
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**5,500,611**

## INTEGRATED CIRCUIT WITH INPUT/OUTPUT PAD HAVING PULLUP OR PULLDOWN

**Kaushik Popat, Pleasanton; William Ip, Saratoga, and David Sherman, Fremont, all of Calif., assignors to Cirrus Logic, Inc., Fremont, Calif.**

**Filed Sep. 30, 1994, Ser. No. 316,178**
**Int. Cl.[6] H03K *19/0944***
**U.S. Cl. 326—87** **15 Claims**



1. An integrated circuit chip comprising N input/output pads, one for each of N pins of an integrated circuit package in which the chip is to be located, pad i having a first terminal, the first terminal of pad i adapted to be connected to pin i, where N is an integer greater than 1 and i is selectively 1 . . . N, core circuitry for performing binary signal processing functions, the core circuitry

including circuitry for pad i for deriving a first binary signal having a level for determining the value of an output bit to be coupled through the pad to the first terminal of pad i and a second binary signal having a level for controlling whether or not an output signal is to be coupled from pad i to circuitry external to the integrated circuit chip; pad i including a device for selectively pulling the first terminal of pad i to a voltage at a second terminal in response to the levels of the first and second signals for pad i; further circuitry for causing the voltage at the first terminal of pad i to be at different predetermined voltages respectively associated with first and second binary values in response to the first signal for pad i respectively signifying that the first and second binary values are to be coupled to pin i from the chip and the second signal for pad i signifying that pad i is to be enabled for outputting a signal; the pulling device of pad i responding to the first and second signals for (1) pulling the voltage at the first terminal of pad i to the voltage at the second terminal to prevent floating of the terminal of pad i when no signal is to be applied to the first terminal of pad i by the further circuitry or by circuitry external to the integrated circuit and (2) decoupling the first terminal of pad i from the second terminal so the voltage at the first terminal of pad i is not controlled by the voltage at the second terminal when a signal is to be applied to the terminal of pad i from circuitry external to the integrated circuit or by the further circuitry.

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**5,500,612**

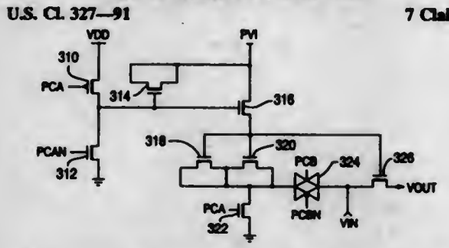
## CONSTANT IMPEDANCE SAMPLING SWITCH FOR AN ANALOG TO DIGITAL CONVERTER

**Donald J. Sauer, Monmouth, N.J., assignor to David Sarnoff Research Center, Inc., Princeton, N.J.**

**Filed May 20, 1994, Ser. No. 247,156**

**Int. Cl.[6] H03K *17/16*; G11C *27/02***

**U.S. Cl. 327—91** **7 Claims**




1. A constant impedance sampling switch which presents a substantially constant impedance to an input signal substantially regardless of the instantaneous level of the input signal comprising:

an electrically controlled switch responsive to a control signal to selectively couple the input signal to a sampling circuit;

a terminal which receives a switching signal to initiate a sampling sequence by the constant impedance sampling switch;

precharging circuitry which generates a stored potential responsive to a first delayed switching signal; and

bootstrapping circuitry which couples the stored potential to the input signal, responsive to a second delayed switching signal, to generate the control signal for the electrically controlled switch.

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**5,500,613**

## METHOD FOR PRODUCING A DIGITAL SINE WAVE SIGNAL WITH A GIVEN SAMPLING RATE, AND CIRCUIT CONFIGURATION FOR CARRYING OUT THE METHOD

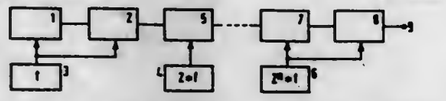
**Lajos Gazsi, Düsseldorf, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany**

**Filed Feb. 22, 1995, Ser. No. 392,874**

**Claims priority, application Germany, Mar. 11, 1994, 44 08 323.8**

**Int. Cl.[6] H03K *5/08***

**U.S. Cl. 327—107** **8 Claims**




1. A method for generating a digital sine wave signal having a predetermined sampling rate, which comprises:

a) generating a pulse train at a sampling frequency having a predetermined sampling rate frequency divided by $2^n$;

b) generating an envelope curve;

c) doubling the sampling rate;

d) repeating the doubling of the sampling rate until generation of a desired sine wave signal in an unfiltered spectrum of the generated signal;

e) filtering out undesired frequency components; and

f) optionally re-increasing the sampling rate by oversampling a previously generated signal.

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**5,500,614**

## SEMICONDUCTOR MEMORY DEVICE

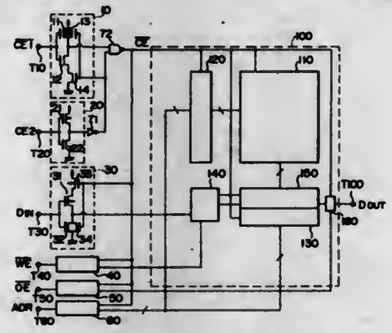
**Noboru Egawa, Tokyo, Japan, assignor to OKI Electric Industry Co., Ltd., Tokyo, Japan**

**Filed Sep. 16, 1994, Ser. No. 306,916**

**Claims priority, application Japan, Sep. 22, 1993, 5-236879**

**Int. Cl.[6] H03K *17/16*; G06F *13/00***

**U.S. Cl. 327—107** **24 Claims**




1. A semiconductor memory device comprising:

a first input buffer outputting a signal having a CMOS level in response to a chip enable signal having a TTL level, and having a plurality of transistors whose gate lengths are set to first dimensions; and



a second input buffer activated in response to both an input signal having a TTL level other than the chip enable signal and the signal having the CMOS level and having a plurality of transistors whose gate lengths are set to second dimensions greater than said first dimensions.

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**5,500,615**

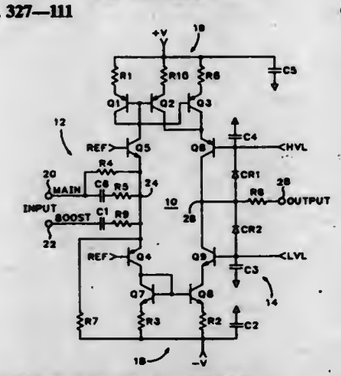
## LOW POWER CCD DRIVER WITH SYMMETRICAL OUTPUT DRIVE SIGNAL

**Archie M. Barter, Beaverton, Oreg., assignor to Tektronix, Inc., Wilsonville, Oreg.**

**Continuation of Ser. No. 316,412, Oct. 13, 1993, abandoned, which is a continuation of Ser. No. 989,452, Dec. 4, 1992, abandoned, which is a continuation of Ser. No. 802,983, Dec. 6, 1991, abandoned. This application Mar. 28, 1995, Ser. No. 412,352**

**Int. Cl.[6] H03K *17/14***

**U.S. Cl. 327—111** **6 Claims**




1. A CCD gate driver circuit comprising:

an input circuit having a pair of emitter coupled complementary transistors for receiving an input clock signal at a first input terminal and a compensation signal at a second input terminal, the first and second input terminals being coupled to the emitters at an input node to produce a switching current at the collectors of the transistors during transitions of the input clock signal and to produce a compensating current pulse in response to transitions of another clock signal provided as the compensation signal, the other clock signal being associated with another gate of the CCD driver to compensate for overlap capacitance between the gates;

an output circuit for providing an output drive signal in response to a current input signal, the output drive signal having levels determined by a pair of output voltage rails; and

means between the collectors and the output circuit for coupling the switching current from the input circuit as the current input signal for the output circuit so that the output drive signal follows the input clock signal.

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**5,500,616**

## OVERVOLTAGE CLAMP AND DESATURATION DETECTION CIRCUIT

**Sam S. Ochi, Cupertino, Calif., assignor to IXYS Corporation, Santa Clara, Calif.**

**Filed Jan. 13, 1995, Ser. No. 372,638**

**Int. Cl.[6] H03K *17/08*; H02H *3/26***

**U.S. Cl. 327—310** **26 Claims**

1. An apparatus for suppressing voltage transients and for detecting desaturation conditions in power transistor systems, comprising:

a first transistor having a first terminal, a second terminal, a drive terminal, an avalanche breakdown voltage rating between the first and second terminals, the first terminal for coupling to a load, and the second terminal being coupled to ground;

a first diode having an anode and a cathode, the cathode of the first diode being coupled to the first terminal of the first transistor, the first diode having a reverse breakdown voltage which is less than the avalanche breakdown voltage rating;

a second diode having an anode and a cathode, the anode of the second diode being coupled to the anode of the first diode, and the cathode of the second diode being coupled to the drive terminal of the first transistor;

driver circuitry coupled to the drive terminal of the first transistor, the driver circuitry for providing a drive signal to the first transistor;

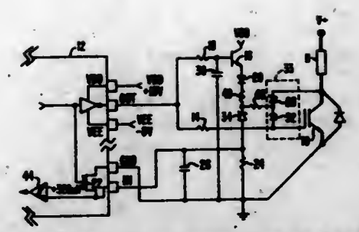
a first resistor;

a second transistor having a collector terminal, an emitter terminal, and a base terminal, the base terminal of the second transistor being coupled to the driver circuitry by means of the first resistor, the collector terminal for coupling to a power supply;

a first capacitor coupled between the base terminal of the second transistor and ground;

a third diode having an anode, a cathode, and a reverse breakdown voltage rating, the cathode of the third diode being coupled to the emitter of the second transistor, the cathode of the third diode also being coupled to the anodes of the first and second diodes, and the anode of the third diode being coupled to ground; and

a comparator circuit coupled between the anode of the third diode and are reference voltage for sensing a desaturation condition of the first transistor.



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**5,500,617**

## CLAMPING CIRCUIT FOR ADJUSTING A LEVEL OF A TRANSMITTED SIGNAL AT A PREDETERMINED VOLTAGE

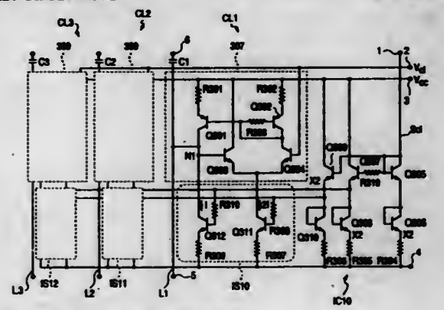
**Masami Tsugita, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Jun. 30, 1994, Ser. No. 269,132**

**Claims priority, application Japan, Jun. 30, 1993, 5-183391**

**Int. Cl.[6] H03G *11/00*; H03K *5/08***

**U.S. Cl. 327—321** **10 Claims**




1. A clamping circuit, comprising:

an input terminal supplied with an input voltage signal;

an output terminal for outputting an output voltage signal;
transfer means coupled between said input and output terminals for transferring said input voltage signal to said output terminal;
a clamp voltage terminal supplied with a clamp voltage;
a clamping section coupled to said output terminal and said clamp voltage terminal and, when activated, forming a first current path between said output terminal and a first power supply line, said first current path having a first current capability responsive to a difference between a voltage at said output terminal and said clamp voltage; and
a current control section coupled between said output terminal and a second power supply line and, when activated, forming a second current path therebetween, said second current path having a second current capability that is substantially constant and independent of said difference;
wherein said output voltage signal at said output terminal is clamped to said clamp voltage when said clamping section and said current control section are activated, and said output voltage signal is changed in accordance with said input voltage signal when said clamping section and said current control section are deactivated.

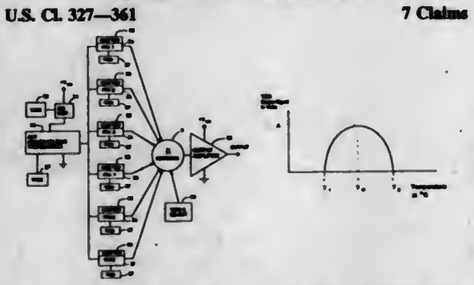
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**5,500,618**

## OPERATIONAL FUNCTION GENERATOR

**Donald T. Comer, Middletown, Pa., assignor to Oak Industries Inc., Waltham, Mass.**

**Filed Sep. 29, 1994, Ser. No. 314,520**
**Int. Cl.[6] G06G 7/42; H03H 11/26**
**U.S. Cl. 327—361** **7 Claims**



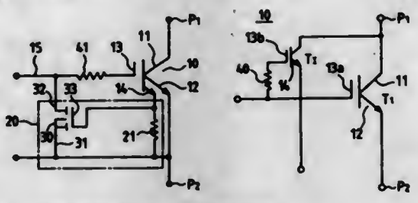
1. An apparatus for producing a composite electrical signal output of arbitrary value having direct correspondence to an analog signal input, comprising:
one or more signal generating means, said signal generating means in turn comprising
an input responsive to the analog signal such that an output signal is produced over a selectable range of the analog signal
means for establishing a lower limit within the range of the analog signal below which the input is not responsive
means for establishing an upper limit within the range of the analog signal, above which the input is not responsive
means for selecting the polarity of the output signal
means for establishing the magnitude of the output signal
summing means, responsive to the plurality of signal generating means, for summing the outputs of the signal generating means.

**5,500,619**

## SEMICONDUCTOR DEVICE

**Tadashi Miyasaka, Kawasaki, Japan, assignor to Fuji Electric Co., Ltd., Kanagawa, Japan**

**Continuation-in-part of Ser. No. 33,779, Mar. 17, 1993. This application Sep. 16, 1993, Ser. No. 121,470**
**Claims priority, application Japan, Mar. 18, 1992, 4-62254; Mar. 24, 1992, 4-65960; May 19, 1992, 4-125214; Mar. 10, 1993, 5-048435**
**Int. Cl.[6] H03K 17/687**
**U.S. Cl. 327—427** **15 Claims**



1. A semiconductor device, comprising:
a main insulated gate type switching element having a gate electrode and controllable by a gate voltage applied to said gate electrode;
a current detecting insulated gate type switching element connected in parallel to said main insulated gate type switching element;
a detecting resistor means for detecting a current flowing in said current detecting insulated gate type switching element;
a gate controlling element for controlling said gate voltage by means of a drop voltage in said detecting resistor means, wherein a threshold voltage of said gate controlling element is set equal to or less than a saturation voltage of said main insulated gate type switching element; and
a gate control relieving means for relieving a varying speed of said gate voltage varied based on an operation of said gate controlling element.

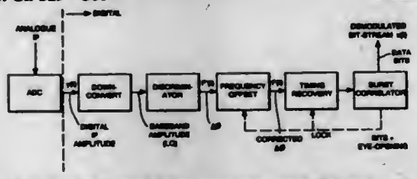
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**5,500,620**

## TIMING RECOVERY FOR DIGITAL DEMODULATION

**Geoffrey B. D. Brown, Bishops Stortford, United Kingdom, and David W. Park, Ottawa, Canada, assignors to Northern Telecom Limited, Montreal, Canada**

**Filed Apr. 11, 1994, Ser. No. 226,008**
**Int. Cl.[6] H03D 3/00; H04L 7/00**
**U.S. Cl. 329—300** **4 Claims**



1. A method of demodulating an oversampled digitised analogue signal F(t) wherein n samples per bit of the digitised signal represent the instantaneous frequency and/or phase of the signal, the method including the steps of selecting a sequence of bits containing bit value transitions, determining the magnitude of F(t) within the sequence so that all the extrema are maxima (or minima), whereby the maxima (or minima) of |F(t)| provide a defined timing position in relation to the bits of the sequence, averaging the value of |F(t)| over a succession of said bits and deriving therefrom a timing control signal for demodulation of the digitised analogue signal.

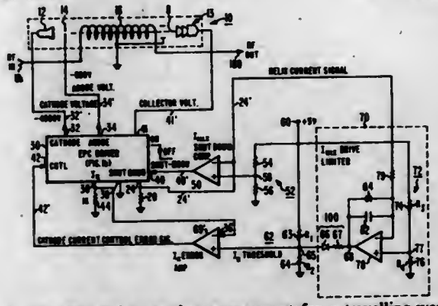


**5,500,621**

## TRAVELLING-WAVE TUBE PROTECTION ARRANGEMENT

**Allen Katz, Robbinsville; Herbert J. Wolkstein, Livingston, and James J. Meighan, III, Hamilton Square, all of N.J., assignors to Martin Marietta Corp., East Windsor, N.J.**

**Filed Apr. 3, 1995, Ser. No. 416,111**
**Int. Cl.[6] H03F 3/58**
**U.S. Cl. 330—43** **6 Claims**



1. A power and protective arrangement for a travelling-wave tube including a cathode, an anode, and a helix, said arrangement comprising:
cathode current sensing means coupled to said cathode for generating a cathode current signal representative of the cathode current of said travelling-wave tube;
helix current sensing means coupled to said helix for generating a helix current signal representative of the helix current of said travelling-wave tube;
controllable voltage generating means including a cathode current control input port and a shut-down input port, and also including output ports coupled to said cathode and said anode of said travelling-wave tube, for coupling between said cathode and said anode of said travelling-wave tube an operating voltage which is controllable in response to a cathode current control signal applied to said cathode current control input port, and which operating voltage is reduced to zero in response to a shut-down signal applied to said shut-down input port;
shut-down signal generating means coupled to said helix current sensing means and to said shut-down input port of said controllable cathode current generating means, for comparing said helix current signal with a reference signal, and for generating said shut-down signal when said helix current signal exceeds a particular value;
cathode current reference signal generating means including a control input port, for generating a cathode current reference signal;
cathode current controlling means coupled to said cathode voltage control input port of said controllable voltage generating means, to said cathode current sensing means, and to said cathode current reference signal generating means, for comparing said cathode current signal with said cathode current reference signal, and for generating a cathode current control error signal representing the difference between said cathode current signal and said cathode current reference signal, and for applying said cathode current control error signal to said cathode current control input port of said controllable cathode voltage generating means with a polarity selected to form a degenerative feedback loop which tends to maintain a constant ratio between said cathode current signal and said cathode current reference signal; and
helix current drive limiting means coupled to said helix current sensing means and to said control input port of said cathode current reference signal generating means, for comparing said helix current signal with a reference value, for generating a cathode current reference threshold adjustment signal, and for coupling said cathode current reference threshold adjustment signal to said control input port of said cathode current reference signal generating means with a polarity selected for forming a degenerative feedback loop which tends to reduce said cathode current when said helix current increases, whereby, in the absence of an arc, the helix current tends to be limited to a value less than said particular value.

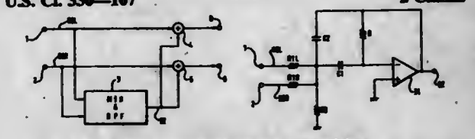
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**5,500,622**

## AUDIO SIGNAL PROCESSING CIRCUIT

**Yasuhiro Muramatsu, Saitama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Jul. 26, 1994, Ser. No. 286,741**
**Claims priority, application Japan, Jul. 27, 1993, 5-184623**
**Int. Cl.[6] H03F 1/134**
**U.S. Cl. 330—107** **2 Claims**



1. An audio signal processing circuit, comprising:
an amplifier having a non-inverted input terminal, an inverted input terminal and an output terminal;
an RC filter connecting the output terminal and the inverted input terminal;
means for supplying first and second audio signals to the inverted input terminal of the amplifier through a first input resistor of which one end is connected to a first audio signal input terminal and a second resistor of which one end is connected to a second audio signal input terminal, respectively;
a grounding resistor connected between a connection node of the first and the second input resistors and a reference potential source;
means for supplying left channel audio signals to the first audio signal input terminal;
means for supplying right channel audio signals to the second audio signal input terminal;
first adding means for adding the output signals from the amplifier to the left channel audio signals; and
second adding means for adding the output signals from the amplifier to the right channel audio signals.

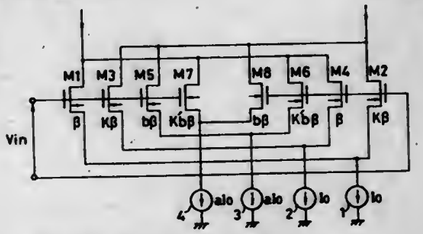
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**5,500,623**

## DIFFERENTIAL AMPLIFIER CIRCUIT WITH ALMOST LINEAR TRANSCONDUCTANCE

**Katsuji Kimura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Dec. 8, 1993, Ser. No. 162,960**
**Claims priority, application Japan, Dec. 8, 1992, 4-351747**
**Int. Cl.[6] H03F 3/45**
**U.S. Cl. 330—252** **14 Claims**




1. A differential amplifier circuit comprising:
a first differential pair formed of first and second transistors, which is driven by a first constant current source;

a ratio (W/L) of a gate-width W and a gate-length L of said second transistor being $K_1$ times as much as that of said first transistor where $K_1 \neq 1$;

a second differential pair formed of third and fourth transistors, which is driven by a second constant current source whose current value is equal to that of said first constant current source;

a ratio (W/L) of a gate-width W and a gate-length L of said third transistor being $K_2$ times as much as that of said fourth transistor where $K_2 \neq 1$;

gates of said first and third transistors being coupled together and gates of said second and fourth transistors being coupled together;

drains of said first and fourth transistors being coupled together and drains of said second and third transistors being coupled together;

a third differential pair formed of fifth and sixth transistors, which is driven by a third constant current source;

a ratio (W/L) of a gate-width W and a gate-length L of said sixth transistor being $K_3$ times as much as that of said fifth transistor where $K_3 \neq 1$;

a fourth differential pair formed of seventh and eighth transistors, which is driven by a fourth constant current source whose current value is equal to that of said third constant current source;

a ratio (W/L) of a gate-width W and a gate-length L of said seventh transistor being $K_4$ times as much as that of said eighth transistor where $K_4 \neq 1$;

gates of said fifth and seventh transistors being coupled together and gates of said sixth and eighth transistors being coupled together; and

drains of said fifth and eighth transistors being coupled together and drains of said sixth and seventh transistors being coupled together;

wherein said gates of said first and third transistors and said gates of said fifth and seventh transistors are coupled together to form one of differential input ends, and said gates of said second and fourth transistors and said gates of said sixth and eighth transistors are coupled together to form the other of said differential input ends;

said drains of said first and fourth transistors and said drains of said sixth and seventh transistors are coupled together to form one of differential output ends, and said drains of said second and third transistors and said drains of said fifth and eighth transistors are coupled together to form the other of said differential output ends; and

at least one of said ratios (W/L) of said fifth and eighth transistors is different from at least one of said ratios (W/L) of said first and fourth transistors.

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**5,500,624**

**INPUT STAGE FOR CMOS OPERATIONAL AMPLIFIER AND METHOD THEREOF**

**David J. Anderson, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.**

**Filed Nov. 2, 1994, Ser. No. 333,466**
**Int. Cl.[6] H03F 3/45**
**U.S. Cl. 330—253** **19 Claims**

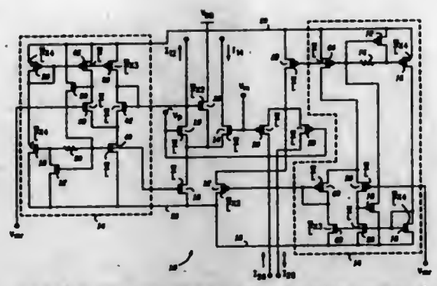
17. A method of establishing matched transconductances for differentially coupled transistor pairs, comprising the steps of:

providing a first transistor pair differentially coupled for receiving a differential input signal having a common mode voltage;

varying current flow through said first transistor pair to establish a first transconductance in response to a first control signal that is dependent on temperature and process variation;

providing a second transistor pair differentially coupled for receiving said differential input signal having a common mode voltage; and

varying current flow through said second transistor pair to establish a second transconductance in response to a second control signal that is dependent on temperature and process variation where said second transconductance is matched to said first transconductance, where varying current flow through the second transistor pair is independent of varying current flow through the first transistor pair.



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**5,500,625**

**CONTROLLED CURRENT OUTPUT STAGE AMPLIFIER CIRCUIT AND METHOD**

**Gabriel A. Rincon, Margate, Fla.; Nicolas Salamina, and Marco Corsi, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Dec. 1, 1994, Ser. No. 348,662**
**Int. Cl.[6] H03F 3/26**
**U.S. Cl. 330—273** **20 Claims**



1. An output stage of an amplifier circuit also having an input amplifier stage, said output stage comprising:

circuitry operable to source an output current to an external load;

circuitry coupled to said sourcing circuitry and operable to sink current from the external load, said sourcing circuitry and said sinking circuitry having a common output node;

circuitry coupled to said sinking circuitry and operable to mirror the current in said sinking circuitry, said mirroring circuitry controlled by an output of said input amplifier stage;

a current source coupled to provide current to both said mirroring circuitry and said sourcing circuitry;

a voltage clamp circuit coupled to said mirroring circuitry for establishing a predetermined lower voltage limit for said mirroring circuitry to prevent said mirroring circuitry from interfering with said sinking circuitry during a sinking operation;

said mirroring circuitry operable to draw current from said current source away from said sourcing circuitry when said sinking circuitry sinks current from the external load in response to a first predetermined output of said input amplifier stage; and

said mirroring circuitry operable to cause said current source to provide current to said sourcing circuitry such that said sourcing circuitry provides current to the external load in response to a second predetermined output of said input amplifier stage.

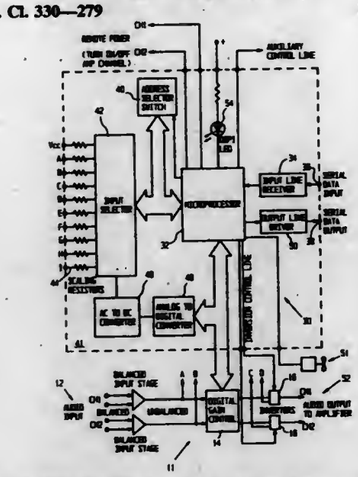


**5,500,626**

**INDEPENDENT AMPLIFIER CONTROL MODULE**

**Clayton C. Barclay, Jr., Elkhart, Ind., assignor to Crown International, Inc., Elkhart, Ind.**

**Filed Oct. 11, 1994, Ser. No. 320,450**
**Int. Cl.[6] H03G 3/30**
**U.S. Cl. 330—279** **24 Claims**



1. An amplifier control unit for controlling the operation of an amplifier in conjunction with a computer, said amplifier control unit comprising:

conversion means for converting an analog signal from the amplifier to a digital signal;

communications means for transmitting a signal to the computer;

processor means for generating control signals for the amplifier, said processor means connected to said conversion means and said communications means; and

a program stored in a memory accessible by said processor means, said program including a plurality of instructions for said processor to generate said control signals responsive to said digital signals from said conversion means, said program including instructions for operation of said amplifier control unit in a stand alone mode of operation independent of said computer.

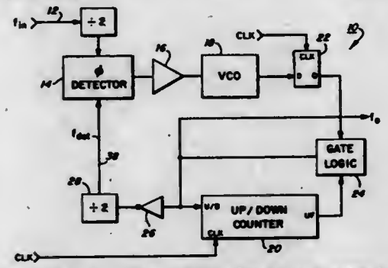
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**5,500,627**

**PRECISION DUTY CYCLE PHASE LOCK LOOP**

**Rand H. Hulsing, II, Redmond, Wash., assignor to AlliedSignal Inc., Morristown, N.J.**

**Filed Jan. 19, 1994, Ser. No. 184,090**
**Int. Cl.[6] H03K 9/06**
**U.S. Cl. 331—1 A** **14 Claims**



1. A precision demodulator, for providing a demodulated output signal in response to an input signal, comprising:

means for receiving an input signal at a predetermined frequency;

clock means including a clock for providing clock pulses;

a bi-directional counter coupled to said clock means;

control means responsive to said input signal for providing a control signal causing said bi-directional counter to count a predetermined number of pulses in a first direction in response to said input signal and an equal number of pulses in a second direction immediately thereafter; and

means responsive to said control signal for providing said demodulated output signal at a substantially constant duty cycle independent of changes in the frequency of the input signal.

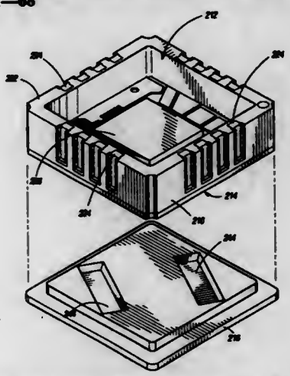
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**5,500,628**

**DOUBLE-SIDED OSCILLATOR PACKAGE AND METHOD OF COUPLING COMPONENTS THERETO**

**Thomas Knecht, Algonquin, Ill., assignor to Motorola, Inc., Schaumburg, Ill.**

**Filed Jan. 24, 1995, Ser. No. 378,135**
**Int. Cl.[6] H03B 5/04;5/36; H01L 41/053; H05K 7/02**
**U.S. Cl. 331—68** **18 Claims**



1. A double-sided temperature compensated oscillator package, comprising:

a platform including a central portion and an outer portion;

sidewalls extending substantially upwardly and substantially downwardly from the outer portion of the platform, the upwardly extending sidewalls terminate at a surface mountable end portion, the surface mountable end portion includes a plurality of contacts adapted to facilitate connection to an electrical device;

the upwardly extending sidewalls and the platform forming an open-top receptacle adapted to receive at least one electronic component and the downwardly extending sidewalls and the platform forming an open-bottom receptacle adapted to receive at least one piezoelectric component; and

a cover coupled with the open-bottom receptacle defining a hermetic environment.

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**5,500,629**

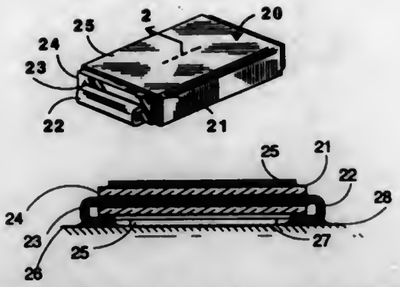
**NOISE SUPPRESSOR**

**Dennis R. Meyer, 17830 2nd. Ave., Plymouth, Minn. 55447**

**Continuation-in-part of Ser. No. 119,989, Sep. 10, 1993, abandoned. This application Mar. 2, 1995, Ser. No. 398,050**
**Int. Cl.[6] H03H 7/01**
**U.S. Cl. 333—181** **12 Claims**

1. An electrical noise suppressing component comprising:

a) a body made from a sintered polycrystalline body material having cohesively integrated metal oxide grains, wherein magnetic, dielectric, and resistive properties are substantially




evenly distributed throughout the body, providing a minimum body permittivity of 4,000,000 at 1 KHz, and a body resistivity less than 1 MΩ per cm.;

b) at least one noise suppressing element formed by the body, comprising a first surface being separated from a second surface by an intermediate section of the body material;

c) a first electrode disposed upon the first surface, defining a first area of electrical contact with the intermediate section;

d) a second electrode disposed upon the second surface, defining a second area of electrical contact with the intermediate section.

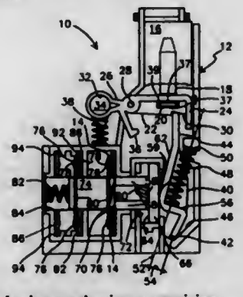
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**5,500,630**

**SOLID STATE OVERLOAD RELAY MECHANISM**

**Stanley H. Edwards, Jr.; Richard Marshall, and Tony R. Robbins, all of Raleigh, N.C., assignors to Square D Company, Palatine, Ill.**

**Filed Oct. 13, 1994, Ser. No. 322,630**
**Int. Cl.[6] H01H** *67/02*
**U.S. Cl. 335—132** **24 Claims**



1. An overload relay mechanism comprising:

at least one pair of stationary electrical contacts carried by a base member;

a solenoid including a plunger and being carried by said base member, said solenoid being in communication with a stored power source, said plunger being retracted when the stored power source discharges through said solenoid in response to a sensed overload current in a protected circuit;

a latch engaged with a distal end of said plunger and pivotally mounted to said base member, said latch defining a notch proximate a proximal end thereof;

a latch biasing member engaged between said base member and said latch for biasing said latch to an orientation such that said plunger is maintained in an extended position;

a lever pivotally supported by said base member at a proximal end thereof, a distal end thereof being engageable with said notch defined by said latch;

a lever biasing member engaged between said base member and said lever for biasing said distal end of said lever toward a distal end of said latch, said lever biasing member maintaining engagement between said notch and said lever distal end while said plunger is extended;

a contact carrier slidably received within a contact carrier receptor defined by said base member, said contact carrier carrying at least one contact blade, each of said at least one contact blade carrying a pair of movable contacts, one each of said pairs of movable contacts being in contact with said at least one pair of stationary electrical contacts when said lever distal end is engaged with said notch defined by said latch; and

a contact carrier biasing member for biasing said one each of said pairs of movable contacts toward said at least one pair of stationary electrical contacts to maintain contact when said lever distal end is engaged with said notch defined by said latch.

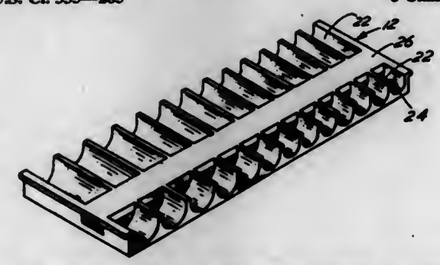
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**5,500,631**

**MAGNETIC SOCKET HOLDER**

**Joel A. Negus, Clarinda, Iowa, assignor to Lisle Corporation, Clarinda, Iowa**

**Continuation-in-part of Ser. No. 72,478, Jun. 4, 1993, Pat. No. 5,343,181, which is a continuation-in-part of Ser. No. 1,534, Jan. 7, 1993, Pat. No. 5,313,181. This application Jul. 7, 1994, Ser. No. 271,868**
**Int. Cl.[6] H01F** *7/20;* **A45F** *5/00;* **A45C** *11/26;* **B25B** *11/00*
**U.S. Cl. 335—285** **8 Claims**




1. An improved magnetic socket holder comprising, in combination:

a molded socket tray including a mounting surface, opposite ends, a tray cross member connecting the ends, a plurality of parallel troughs arrayed between the ends along at least one side of the cross member and extending from the tray cross member, each adjacent parallel trough being laterally separated from the next adjacent parallel trough, said tray cross member defining a magnet support channel which is open to an end of each trough;

at least one magnet mounted in the support channel, said magnet exposed to at least one trough at the end open to the cross member, said magnet including a first region of one polarity and a second region of another polarity, said magnet positioned in the channel so as to magnetically interact with a magnetizable metal socket in the trough to complete a magnetic circuit between the regions with said socket.

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**5,500,632**

**WIDE BAND AUDIO TRANSFORMER WITH MULTIFILAR WINDING**

**Joseph G. Halser, III, 5905 S. Howell Ave., Milwaukee, Wis. 53207**

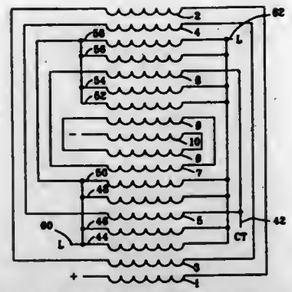
**Filed May 11, 1994, Ser. No. 241,203**
**Int. Cl.[6] H01F** *27/28*
**U.S. Cl. 336—180** **1 Claim**

1. A wide band audio transformer comprising:

a common core;

a plurality of continuous magnet wires wound simultaneously as a multifilar ribbon resulting in a plurality of ribbon turns in each of several successive layers, each magnet wire making a plurality of continuous turns per layer, and each layer being separated by insulating material;





the ribbon containing two primary groups of wires, each primary group representing a half primary for a push-pull circuit, and two secondary groups of wires, the wires of each primary group are connected in series re-entry so that after the first winding of the primary group each successive primary winding alternates away therefrom, and the wires of the secondary groups are connected in parallel.

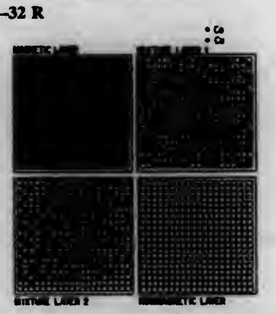
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**5,500,633**

**MAGNETORESISTANCE EFFECT ELEMENT**

**Yoshiaki Saito; Koichiro Inomata, both of Yokohama; Shiho Okuno, Fujisawa, and Yoshinori Takahashi, Yokohama, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Continuation-in-part of Ser. No. 100,427, Aug. 2, 1993, Pat. No. 5,365,212. This application Oct. 17, 1994, Ser. No. 323,809**
**Claims priority, application Japan, Aug. 3, 1992, 4-206441; Aug. 3, 1992, 4-206442; Feb. 26, 1993, 5-061225**
**Int. Cl.[6] H01L** *43/00*
**U.S. Cl. 338—32 R** **31 Claims**



1. A magnetoresistance effect element comprising a multilayer stack of alternating magnetic and non-magnetic layers, and having a mixture layer constituted by a mixture of a ferromagnetic element and a non-ferromagnetic element interposed between adjacent stacked magnetic and non-magnetic layers so as to exhibit a magnetoresistance effect, wherein said multilayer stack includes at least two said magnetic layers, at least two said mixture layers, and at least one said non-magnetic layer, and wherein $2(X_1/X_n)/n$ is larger than 1.1 where n is the number of atomic layers of said mixture layer, $X_1$ is an atomic concentration (%) of said ferromagnetic element of an atomic layer closest to said magnetic layer, and $X_n$ is an atomic concentration (%) of said ferromagnetic element of the n-th atomic layer closest to said non-magnetic layer.

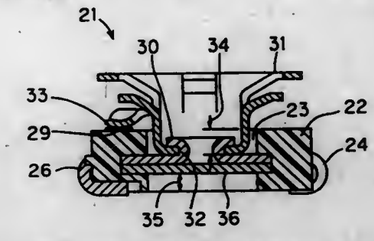
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**5,500,634**

**VARIABLE RESISTOR**

**Yukinori Ueda, Kyoto, Japan, assignor to Murata Manufacturing Co., Ltd., Japan**

**Filed Jan. 26, 1994, Ser. No. 187,110**
**Claims priority, application Japan, Jan. 29, 1993, 5-034830**
**Int. Cl.[6] H01C** *10/34*
**U.S. Cl. 338—174** **12 Claims**




1. A variable resistor comprising: a substrate of an electrically insulating material having first and second major surfaces defining a thickness-directional dimension therebetween and a through hole passing through the same along said thickness direction;

a fixed side terminal of a conductive material mounted on said substrate;

a resistor film being formed on said first major surface of said substrate and electrically connected to said fixed side terminal;

a slider terminal of a conductive material mounted on said substrate and having an engaging portion inwardly extending from an inner peripheral surface defining said through hole;

a slider of a conductive material mounted so as to be rotatable with respect to said substrate about the central axis of said through hole while engaging said engaging portion, said slider having a contactor arranged for sliding along said resistor film by said rotation; and

a blocking member for blocking said through hole, structured and arranged in a position closer to said second major surface than said engaging portion and separated from said second major surface, in a direction toward said first major surface, by a first prescribed distance, thereby defining a first gap said first gap coacting with said blocking member to interfere with passage of fluid from said second major surface to said engaging portion.

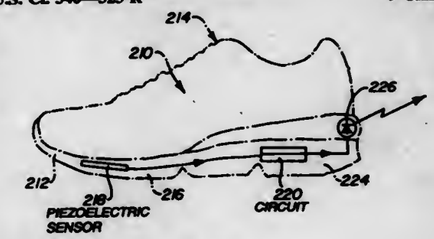
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**5,500,635**

**PRODUCTS INCORPORATING PIEZOELECTRIC MATERIAL**

**Jonathan C. Mott, NorthBrook Lodge, Bentley, Farnham, Surrey GU10 5EU, England**

**Continuation of Ser. No. 866,171, Jun. 26, 1992, abandoned. This application Nov. 10, 1994, Ser. No. 337,320**
**Claims priority, application United Kingdom, Feb. 20, 1990, 9003810; May 24, 1990, 9011681; Jul. 12, 1991, 9115196**
**Int. Cl.[6] G08B** *23/00*
**U.S. Cl. 340—323 R** **9 Claims**



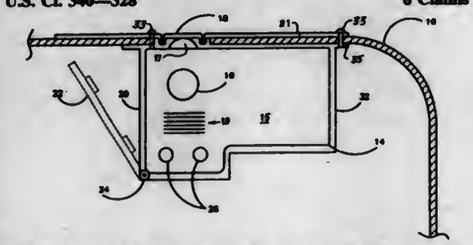

1. A shoe that lights, comprising

a sole;

pressure sensor means incorporated within the sole comprising piezoelectric material for generating trigger signals upon application of pressure to the material, the sole imparting pressure to the material when impressed against a surface;
a light emitting diode (LED);
power means for powering the LED;
monstable multivibrator circuit means interconnecting the pressure sensor means, the LED and the power means, wherein the circuit means responds to the trigger signals to control the power means to power the LED in response to the pressure imparted by the sole on the material;
wherein the circuit means comprises
input means for accepting the trigger signals from the pressure sensor means and transmitting the trigger signals to the circuit means, the input means including sensitivity resistive means across which the trigger signals are applied for controlling the sensitivity of the piezoelectric material;
output leads for transmitting a signal generated by the circuit means to the LED, including a first resistive means for limiting the current through the LED;
a second resistive means coupled with a capacitive means to form a resistive-capacitive (R-C) combination timing means for determining the length of time the signal is generated by circuit means; and
means for applying the voltage developed across the capacitive means of the R-C timing circuit means to the input of the monostable multivibrator circuit means.

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**5,500,636**
**TALKING LUGGAGE**
**John D. Mitchell, 2299 Donovan Dr., Eugene, Oreg. 97401**
**Filed Jun. 20, 1995, Ser. No. 498,569**
**Int. Cl.[6] G08B *3/00***
**U.S. Cl. 340—328** **6 Claims**

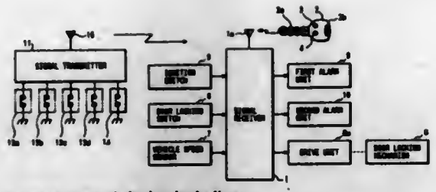


1. For use with luggage, an audible luggage identifier comprising:
a player/recorder having record, playback and reset features;
a player/recorder pouch container, permanently installed within luggage, for receiving said player/recorder;
means permitting temporary securement of said player/recorder within said pouch; and
player/recorder message playback activation means accessible externally of said luggage, for playing an audible message prerecorded on said player/recorder.

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**5,500,637**
**ABNORMAL CONDITION SIGNAL TRANSMITTING DEVICE FOR A ROTATING BODY**
**Sadao Kokubu, Aichi, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan**
**Filed Feb. 22, 1994, Ser. No. 199,951**
**Claims priority, application Japan, Feb. 22, 1993, 5-005833 U; Feb. 22, 1993, 5-005834 U; Feb. 22, 1993, 5-031625**
**Int. Cl.[6] B60C *23/00***
**U.S. Cl. 340—447** **6 Claims**

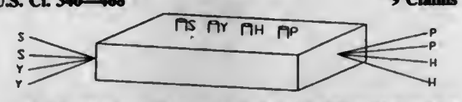
1. A tire abnormal condition alarming system for a vehicle comprising:



a remote control device including:
a signal receiver for receiving a door unlocking or locking aerial propagation signal from an operating key;
a door locking mechanism operated according to the signal reception of the signal receiver, to unlock or lock a door;
a signal transmitter coupled to a tire of the motor vehicle, the signal transmitter detecting an abnormal condition of the tire to transmit an abnormal condition detection signal as an aerial propagation signal to the signal receiver; and
alarming means for performing a warning operation to inform the occurrence of the abnormal condition of the tire by operating the signal receiver upon reception of the abnormal condition detection signal from the signal transmitter.

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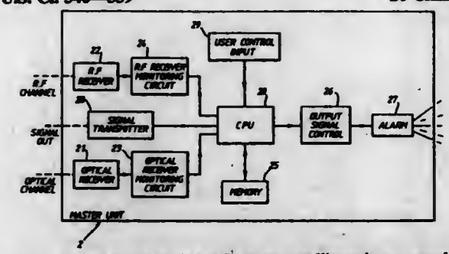
**5,500,638**
**VEHICULAR GOODWILL MESSAGE SYSTEM**
**Ikoma A. V. George, P.O. Box 8825, 547 N. Oliver #208, Wichita, Kans. 67208**
**Filed Jan. 26, 1994, Ser. No. 186,433**
**Int. Cl.[6] B60Q *1/26***
**U.S. Cl. 340—468** **9 Claims**



1. A vehicular goodwill message system for displaying messages comprising:
(a) a logic circuit comprising a plurality of logic gates for receiving at least four timed signals and for supplying at least seven output signals and for electrically communicating with a timing means and a display means;
(b) a control means (**30**) for regulating at least four switch lines in electrical communication with a timing means comprising a control box for supporting at least four switch members; said control means additionally comprising a first switch member (S), a second switch member (Y), a third switch member (H), and a fourth switch member (P);
(c) a timing means for receiving said least four switch lines and communicating with said least four switch lines and for providing at least four timed signals therefrom corresponding to said least four switch lines and for establishing an energizing interval for said least four timed signals and for electrically communicating with said logic circuit and said control means;
(d) a display means consisting of a plurality of light emitting diodes for receiving said least seven output signals and said least four timed signals responsive to and in communication with said least four timed signals of said timing means and said least seven output signals of said logic circuit such that said display means is caused to operate when one of said least four timed signals is energized and at least one of said least seven output signals is energized for displaying messages; and
(e) a housing for supporting said logic circuit, said timing means, and said display means, and comprising a translucent front panel member wherethrough the displayed messages are visable.



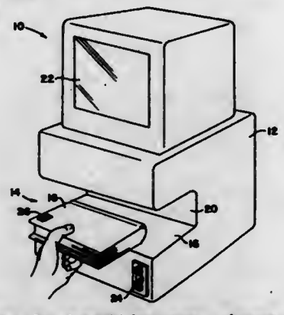
**5,500,639**
**SATELLITE UNIT IDENTIFICATION SYSTEM**
**Ian M. Walley, Gloucester, and Timothy R. F. Hankins, Herefordshire, both of, England, assignors to Scantronic Limited, Greenford, England**
**Filed May 27, 1994, Ser. No. 249,981**
**Claims priority, application European Pat. Off., May 27, 1993, 93304147**
**Int. Cl.[6] G08B *1/08***
**U.S. Cl. 340—539** **26 Claims**



9. A system for registering at least one satellite unit as a member of an alarm system including a master unit, comprising:
(a) means included in said satellite unit for transmitting a satellite unit identification signal over a radio frequency channel;
(b) means for transmitting signals including the satellite unit identification signal over a line-of-sight communication channel;
means included in said master unit for receiving signals on radio frequency and line-of-sight communications channels;
(d) means for recovering satellite unit identification signals from the received signals; and
(e) means for registering identification signals received on the line-of-sight channel, when in a satellite unit registration mode, as identification signals of satellite units belonging to the system.

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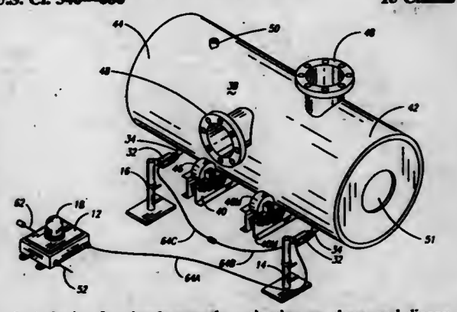
**5,500,640**
**METHOD AND APPARATUS FOR AUTOMATICALLY DESENSITIZING SENSOR ELEMENTS OF PROTECTED ARTICLES**
**Peter Y. Zhou, Smithtown; Christopher R. Paul, Bayport, and Dexing Pang, Hauppauge, all of N.Y., assignors to Knogo North America Inc., Hauppauge, N.Y.**
**Continuation of Ser. No. 145,645, Nov. 4, 1993, abandoned.**
**This application Apr. 25, 1995, Ser. No. 429,229**
**Int. Cl.[6] G06F *7/08***
**U.S. Cl. 340—572** **22 Claims**



1. Apparatus for desensitizing sensor elements which are mounted on protected articles, said apparatus comprising: a sensor element detector; a scanning mechanism which moves said detector to produce a scan along a surface adjacent to which multiple sensor elements may be placed, the movement of the detector being in a direction such that, during said scan, said detector passes directly over each of said sensor elements in succession and successively detects the presence of each of said sensor elements; a sensor element desensitizing mechanism arranged to be operated to desensitize said sensor elements adjacent said surface; and a control apparatus connected to operate the desensitizing mechanism following a scan in response to the detection of a predetermined number of sensor elements during said scan.

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**5,500,641**
**SAFETY SWITCH DEVICE FOR USE IN MANUFACTURE OF ROUND CYLINDRICAL VESSELS**
**Wayne L. Roberts, Tulsa, Okla., assignor to Glens'Sen, Tulsa, Okla.**
**Filed Jul. 22, 1994, Ser. No. 279,041**
**Int. Cl.[6] G08B *21/00***
**U.S. Cl. 340—686** **18 Claims**

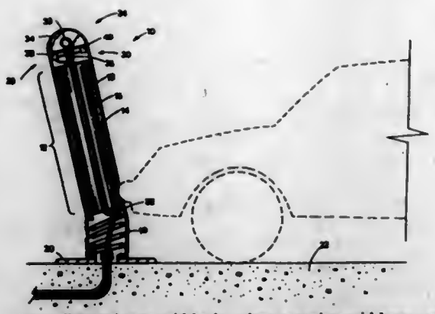


1. A device for simultaneously activating an alarm and disconnecting power to turning rolls used in rotating a horizontally oriented vessel whenever the vessel rises off one of its turning rolls, comprising:
a control box for receiving power in from an external power source and for providing power out to a motor which drives a turning roll on which a vessel rotatably rests;
at least two switches positionable relative to said vessel such that all said switches are closed when the vessel is resting properly on its turning rolls and such that the switches open independently of each other whenever the vessel moves upward relative to said switches; and
said switches being connected to a power source by a series circuit, said series circuit being provided with a first leg connecting to a means for reversibly disconnecting power to said motor, said series circuit being provided with a second leg connecting to a warning device so that power is simultaneously connected to said motor and disconnected from said warning device whenever all said switches are closed and so that power is simultaneously disconnected from the motor and connected to the warning device whenever at least one said switch is open.

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**5,500,642**
**PROTECTIVE WARNING POST**
**Larry D. Battle, 36 Snow Meadow La., Stafford, Va. 22554**
**Filed Jun. 6, 1994, Ser. No. 254,511**
**Int. Cl.[6] B60Q *1/48***
**U.S. Cl. 340—932.2** **6 Claims**

1. A protective warning post comprising:
a base mountable to a surface;
an elongated body having a rigid internal structural member and a protective resilient member surrounding said internal structural member;
hinge means for yieldingly attaching said body to said base; and
a visible alarm comprising electrical circuitry for connection to a power source said electrical circuitry including a flasher, a



lamp disposed atop said body, a lens covering said lamp, and means for actuating said alarm, whereby

upon incidental contact by a motor vehicle with the post said protective resilient member prevents damage to the motor vehicle; said rigid internal structure retains its configuration and pivots about said base on said hinge means, whereupon actuation of said visible alarm causes said lamp to light intermittently; and said hinge means returns said body to its original orientation upon removal of the contact by the motor vehicle.

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**5,500,643**

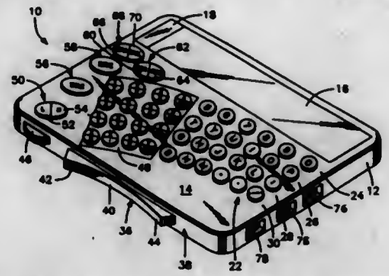
**ONE-HAND PREHENSILE KEYBOARD**

**Alan H. Grant, 3208 Woodhollow Dr., Chevy Chase, Md. 20815**

**Filed Aug. 26, 1993, Ser. No. 112,195**

**Int. Cl.[6] B41J 5/10**

**U.S. Cl. 341—22** **12 Claims**



1. A keyboard for use by one hand of an operator, said keyboard comprising:

a housing including an upper surface, two side surfaces, a top surface and bottom surface,

display means on said upper surface of said housing for display of indicia,

a plurality of keys located on said upper surface in a QWERTY keyboard pattern with rows of said keys arranged in an arc initiating from one of said two side surfaces and terminating adjacent to the other of said two side surfaces and said bottom surface for actuation by the fingers on one hand of an operator,

some of said plurality of keys including a letter of the alphabet and numeric indicia,

means for switching actuation of said some of said plurality of keys between causing a letter of the alphabet display on said display means in a first mode and numeric display on said display means in a second mode, and

a switch located on said bottom surface for actuation by a thumb of the operator in a prehensile position when the fingers of the operator are located on said plurality of keys, said switch performing different functions dependant upon the mode selected by said means for switching.

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**5,500,644**

**PROCEDURE AND DEVICE FOR SELF-CALIBRATING ANALOG-TO-DIGITAL CONVERSION**

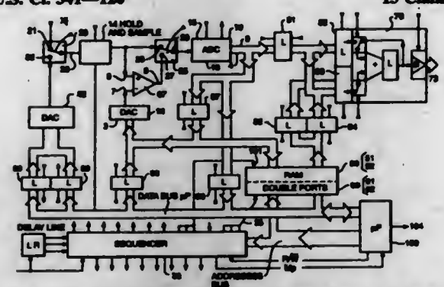
**Jean Deajean, Leognan, and Jean-Pierre Mann, Gradignan, both of, France, assignors to Thomson-CSF, Paris, France**

**Filed Nov. 4, 1993, Ser. No. 145,545**

**Claims priority, application France, Nov. 6, 1992, 92 13398**

**Int. Cl.[6] H03M 1/10**

**U.S. Cl. 341—120** **13 Claims**



1. Process for conversion of an analog value X, which can range between limits $X_1$ and $X_2$, into a numeric value N ranging between limits $N_1$ and $N_{2^n}$ and comprising a sequence of bits, each bit having a weight depending on its position in the sequence, the values $N_1$ and $N_{2^n}$ corresponding to the values $X_1$ and $X_2$ and $2^n-1$ intermediate values $N_i$ between $N_1$ and $N_{2^n}$ each corresponding to an intermediate value Xi, the pth numeric value after $N_1$ corresponding to the value:

$$X_p = X_{1+p}\left(\frac{X_2 - X_1}{2^n}\right).$$

the process being implemented using a measuring circuit to which is input an instantaneous value $X_j$ of the analog value X and which outputs a corresponding numeric value $N_j$, the process being of the type in which a previous calibration is used to assign a correction value $h_j$ to each output numeric value $N_j$, wherein the calibration measurements are repeated throughout the conversion process without interrupting the conversion measurements, and wherein two distinct sets of correction values are created, a first and a second, the first created with the correction values $h_{j1}$ of a previous calibration and the second created with the correction values $h_{j2}$ of a current calibration, a current calibration being completed when all the correction values $h_j$, that created the second set have been settled and wherein the first and second sets are swapped each time when a calibration is completed.

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**5,500,645**

**ANALOG-TO-DIGITAL CONVERTERS USING MULTISTAGE BANDPASS DELTA SIGMA MODULATORS WITH ARBITRARY CENTER FREQUENCY**

**David B. Ribner, and David H. K. Hoe, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.**

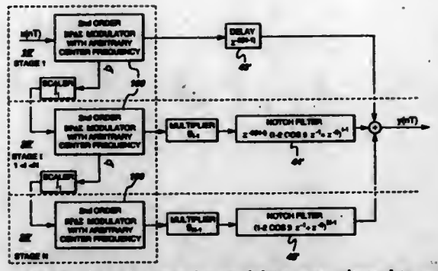
**Filed Mar. 14, 1994, Ser. No. 209,348**

**Int. Cl.[6] H03M 1/06;3/00**

**U.S. Cl. 341—143** **14 Claims**

1. An improved oversampling delta-sigma analog-to-digital converter system for high-frequency, narrow-band signals, said system having a plurality of delta-sigma modulator stages having an arbitrary band-pass frequency $F_{bp}$ situated below at least one half of a sampling frequency Fs for providing respective digital output signals responsive to respective analog input signals, each of said modulator stages including an analog-to-digital converter and having a digital-to-analog converter in a feedback loop, said improved oversampling converter system comprising:





a resonator in each respective modulator stage situated to provide analog signals to said analog-to-digital converter in said stage and having a z transform transfer function

$$\frac{z^{-1}}{1 - 2\cos\theta z^{-1} + z^{-2}}$$

wherein θ is a phase angle defined as $\theta = 2\pi(F_{bp}/F_2)$; and

means for combining the digital output signals of said plurality of delta-sigma modulator stages to suppress, in a resulting combined highly stable signal, quantization noise arising in at least one of said stages.

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**5,500,646**

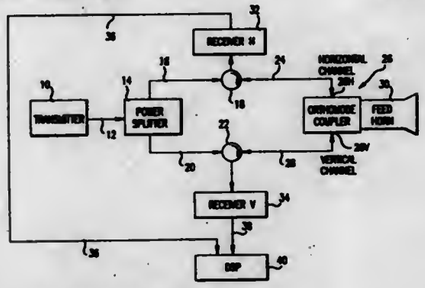
**SIMULTANEOUS DIFFERENTIAL POLYMETRIC MEASUREMENTS AND CO-POLAR CORRELATION COEFFICIENT MEASUREMENT**

**Dusan S. Zrnic, Norman, Okla., assignor to The United States of America as represented by the Department of Commerce, Washington, D.C.**

**Filed Jul. 29, 1994, Ser. No. 282,630**

**Int. Cl.[6] G01S 13/95**

**U.S. Cl. 342—188** **9 Claims**



4. A radar apparatus comprising:

a transmitter for transmitting a pulse train at a predetermined frequency and power level;

a power splitter for splitting said pulse train into a first component and a second component;

coupler means for (i) converting said first component into a horizontal polarization waveform, (ii) converting said second component into a vertical polarization waveform, and (iii) combining said vertical and horizontal polarization waveforms to output a composite polarization waveform;

an antenna for receiving and transmitting said composite waveform;

a first circulator connected between a first output of said power splitter and a first input of said coupler means;

a second circulator connected between a second output of said power splitter and a second input of said coupler means;

a first receiver having an input connected to said first circulator and an output;

a second receiver having an input connected to said second circulator and an output;

a calculation means connected to receive said output from said first receiver and said output from said second receiver,

wherein upon reception of a reflection of said composite waveform:

said coupler means separates said reflected waveform into a reflected horizontal component and a reflected vertical component and outputs said reflected horizontal component to said first circulator and outputs said reflected vertical component to said second circulator,

said first circulator supplies said reflected horizontal component to said first receiver, said second circulator supplies said reflected vertical component to said second receiver,

said first and second receiver convert, respectively, said reflected horizontal and vertical components into first and second information signals, and

said calculation means performs various calculations in accordance with said first and second information signals.

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**5,500,647**

**METHOD FOR DETERMINING THE RANK OF DISTANCE AMBIGUITY OF RADAR ECHOES**

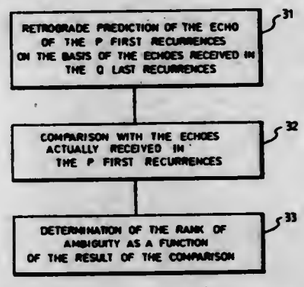
**Bruno Carrara, Meudon, France, assignor to Thomson-CSF, Paris, France**

**Filed Nov. 2, 1994, Ser. No. 333,987**

**Claims priority, application France, Nov. 2, 1993, 93 12997**

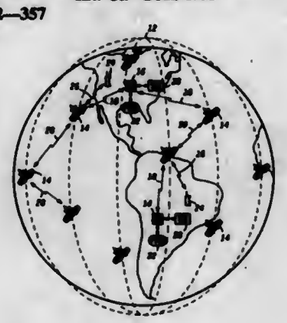
**Int. Cl.[6] G01S 7/292**

**U.S. Cl. 342—195** **9 Claims**




1. A method for the determining of the rank of ambiguity in terms of distance of radar echoes within a sequence comprising a given number N of recurrences, wherein said method consists, in a first step, in making a retrograde prediction of an echo for the P first recurrences on the basis of the echoes received in the Q last recurrences, in a second step in comparing the echoes actually received in the P first recurrences with the predicted echo and in a third step in determining the rank of ambiguity in terms of distance as a function of the result of the comparison of the second step, the rank of ambiguity of an echo being the integer immediately greater than the highest rank of the first recurrences where the difference between the predicted echo and the actually received echo exceeds a threshold that is at least equal to the prediction noise multiplied by a factor of adjustment.

**5,500,648**
**GEOLOCATION RESPONSIVE RADIO TELECOMMUNICATION SYSTEM AND METHOD THEREFOR**
**Kristine P. Maine, Phoenix; Keith A. Olds, Mesa, both of Ariz., and Gerald J. Davieau, Eldersburg, Md., assignors to Motorola, Inc., Schaumburg, Ill.**
**Filed Aug. 11, 1993, Ser. No. 105,730**
**Int. Cl.[6] G01S 5/02**
**U.S. Cl. 342—357** **20 Claims**

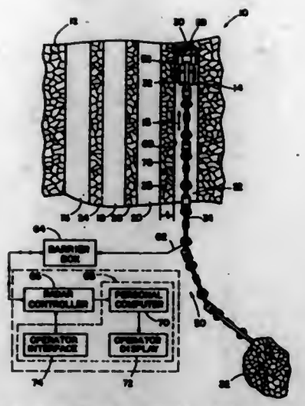


1. A method of operating a radio telecommunication system having at least one satellite moving in an orbit around the earth and having at least one subscriber unit located proximate the earth's surface, said method comprising the steps of:
determining a Doppler component of an electromagnetic signal traveling between said satellite and said subscriber unit;
determining a location of said subscriber unit relative to the earth in response to said Doppler component; and
granting access to communication services provided by said radio telecommunication system for said subscriber unit in response to said location.

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**5,500,649**
**METHOD AND APPARATUS FOR MONITORING THE THICKNESS OF A COAL RIB DURING RIB FORMATION**
**Gary L. Mowrey, Jefferson Boro; Carl W. Ganoe, Pittsburgh, and William D. Monaghan, Dravosburg, all of Pa., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.**
**Filed Oct. 28, 1994, Ser. No. 326,301**
**Int. Cl.[6] G01S 13/02**
**U.S. Cl. 342—22** **12 Claims**

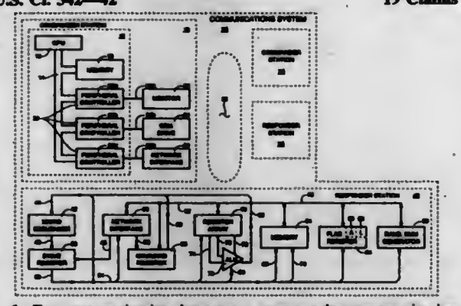
1. Apparatus for monitoring the position of a mining machine cutting a new entry in a coal seam relative to an adjacent, previously cut entry to determine the distance between a near face of the adjacent previously cut entry and a new face adjacent thereto of a new entry being cut by the mining machine which together define the thickness of a coal rib being formed between said new entry and said adjacent previously cut entry during the new entry-cutting operation, comprising:
(a) transmitting means mounted on said mining machine and spaced inwardly from said new face of said coal rib for transmitting radio energy towards said coal rib so that one portion of said radio energy is reflected by said new face which is defined at an air-coal interface between said new entry and said coal rib and another portion of said radio energy is reflected by said near face which is defined at an air-coal interface between said coal rib and said adjacent previously cut entry;
(b) receiving means mounted on said mining machine and spaced inwardly from said new face of said coal rib for receiving said one portion of said radio energy reflected by said new face and for receiving said another portion of said radio energy reflected by said near face; and




(c) processor means for determining a first elapsed time period equal to the time required for said one portion of said radio energy reflected by said new face to travel between said transmitting means and said receiving means and for determining a second elapsed time period equal to the time required for said another portion of said radio energy reflected by said near face to travel between said transmitting means and said receiving means and for calculating the thickness of said coal rib as a function of the difference between said first and second elapsed time periods.

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**5,500,650**
**DATA COMMUNICATION METHOD USING IDENTIFICATION PROTOCOL**
**Charles K. Snodgrass, Boise, Id.; David H. Allen, Rochester, Minn.; John R. Tuttle, Boise, Id.; Robert R. Rotzoll, Boise, Id., and George E. Pax, Boise, Id., assignors to Micron Technology, Inc., Boise, Id.**
**Filed Dec. 15, 1992, Ser. No. 990,915**
**Int. Cl.[6] G01S 13/76**
**U.S. Cl. 342—42** **19 Claims**



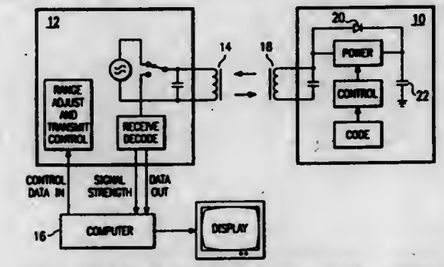
1. For communication between a commander communication transceiver and a plurality of responder communication transceivers, a method for each responder transceiver to establish an address number so that it can be individually addressed by the commander transceiver, comprising the steps of:
a) establishing a set of possible addresses for responder transceivers;
b) the commander transceiver transmitting a generate message requesting responder transceivers who receive the message to select a new address; and
c) upon receipt of the generate message, each responder transceiver choosing a random address from the set of possible addresses, wherein each responder transceiver chooses its address independently of addresses chosen by all other responder transceivers;



d) whereby the addresses chosen by the responder transceivers are randomly distributed within the set of possible addresses, and whereby the commander transceiver controls when the responder transceivers choose new addresses.

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**5,500,651**
**SYSTEM AND METHOD FOR READING MULTIPLE RF-ID TRANSPONDERS**
**Josef Schuermann, Oberhummel, Germany, assignor to Texas Instruments Incorporated, Dallas, Tex.**
**Filed Jun. 24, 1994, Ser. No. 265,545**
**Int. Cl.[6] G01S 13/75**
**U.S. Cl. 342—42** **22 Claims**

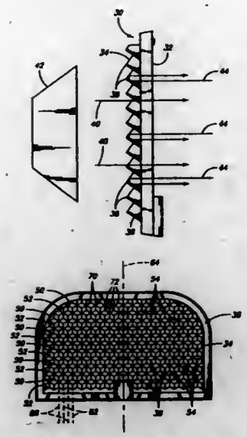



17. A method for identifying each object within a plurality of objects, said method comprising:
providing a plurality of transponders;
associating one of said transponders with each object such that each of said transponders is disposed near one of said objects;
directing a first interrogation signal toward at least two of said plurality of objects, said first interrogation signal having a first read range;
transmitting a first response signal from at least one of said transponders in response to said first interrogation signal;
receiving said first response signal at a reader;
transmitting a second interrogation signal from said reader, said second interrogation signal having a second read range which is different than said first read range;
directing a second interrogation signal toward at least two of said plurality of objects, said second interrogation signal having a second read range;
transmitting a second response signal from at least one transponders in response to said second interrogation signal;
receiving said second response signal at said reader; and
comparing said first response signal to said second response signal to determine a correct response signal.

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**5,500,652**
**DISPLAY ELEMENT WITH REFLECTIVE LENS**
**Terrence D. Huber, and Mark E. Huber, both of Spokane, Wash., assignors to American Electronic Sign Company, Spokane, Wash.**
**Continuation of Ser. No. 188,602, Jan. 27, 1994, abandoned, which is a continuation of Ser. No. 978,987, Nov. 19, 1992, abandoned. This application Oct. 28, 1994, Ser. No. 331,261**
**Int. Cl.[6] G09G 3/34**
**U.S. Cl. 345—84** **1 Claim**

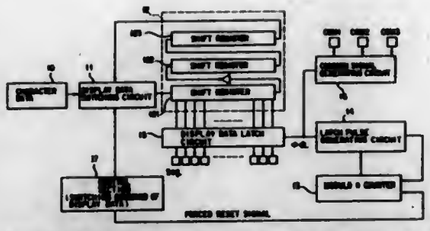
1. A pixel for use in a visual matrix display comprising:
a frame having a front and a rear surface and defining an aperture;
a flap pivotally borne by the front surface of the frame and moveable along a given path of travel between a first position, wherein the flap covers the aperture and renders the pixel nonoperational, to a second position which renders the pixel operational, and wherein the flap has at least one retroreflective surface which is positioned in a light reflecting orientation when the flap is located in the second position, and wherein the retroreflective surface is about one-half of the surface area of the operational pixel;
means borne by the frame for selectively moving the flap along the given path of travel;
a light source positioned rearwardly of the frame and operable to emit light in the direction of the aperture;
means for selectively energizing the light source when the flap is in the second position; and
a substantially planar, retroreflective lens borne by the frame and positioned in occluding relation relative to the aperture, the retroreflective lens having a uniformly translucent main body with a front surface which is substantially planar, and a rear surface which has a plurality of uniformly spaced polyhedron cells having hexagonal bases, and parallelogram faces, the retroflective lens being about one-half of the surface area of the operational pixel, and which forms in combination with the retroreflective surface of the flap, an operational pixel which is substantially uniformly retroreflective, the retroreflective lens retroreflecting light striking the retroreflective lens and which originates from locations in front of the retroreflective lens, the operational pixel, under conditions of darkness, and in a deenergized state, reflecting artificial light striking the retroreflective surface of the flap, and the front surface of the retroreflective lens such that the pixel remains visibly discernible notwithstanding the deenergized state of the light source.



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**5,500,653**
**CHARACTER DATA WRITING DEVICE**
**Toshio Kamihata, Nagoya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**
**Filed Sep. 28, 1994, Ser. No. 313,896**
**Claims priority, application Japan, Sep. 29, 1993, 5-242559**
**Int. Cl.[6] G09G 3/36**
**U.S. Cl. 345—98** **2 Claims**

1. A character data writing device comprising:
a latch pulse generating section for generating clock pulses and a latch pulse;
a display data holding circuit for holding character data, and serially outputting said character data;
a display data switching circuit for inputting the character data outputted from said display data holding circuit into said display data holding circuit again and for receiving a switching command of display data, thereby switching character data outputted from said display data holding circuit to new character data to be inputted to said display data holding circuit;



a display data latching circuit for latching character data outputted from said display data holding circuit in synchronism with the latch pulse and for supplying the latched character data to a character data display section;

a modulo N counter for counting a number of clock pulses generated by said latch pulse generating section and for generating a reset pulse every time a count of N clock pulses is ended, and said modulo N counter receiving a forced reset signal, and also generating a reset pulse upon receiving said forced reset signal, said latch pulse generating section generating said latch pulse upon each generation of said reset pulse by said modulo N counter; and

a control section for supplying the switching command of said display data to said display data switching circuit, and for supplying the forced reset signal to said modulo N counter at the same time, whereby a latch pulse is immediately generated and character data is immediately latched in said display data latching circuit.

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**5,500,654**

**VGA HARDWARE WINDOW CONTROL SYSTEM**

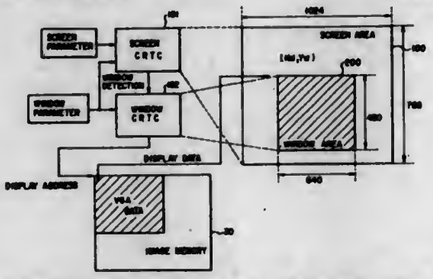
**Akihisa Fujimoto, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Nov. 16, 1994, Ser. No. 341,058**

**Claims priority, application Japan, Dec. 27, 1993, 5-347243**

**Int. Cl.[6] G09G 5/00**

**U.S. Cl. 345—132** **17 Claims**



1. A display control apparatus for controlling a display monitor of a computer system, comprising:

an image memory for storing, from a predetermined storage start position, display data formed by an application program executed by said computer system;

programmable parameter registers in which various parameter values designated by said system are set, said parameter registers being arranged such that a screen parameter for designating a size of an entire display screen area which can be displayed on said display monitor, and a window parameter for designating a display start position and a size of a window area to be displayed in said entire display screen area are set;

a first display control circuit for controlling said entire display screen area in accordance with the screen parameter, said first display control circuit including means for generating horizontal and vertical sync signals of said display monitor in response to a scanning timing for displaying said entire display screen area on said display monitor, means for generating a coordinate address indicating a scanning position on said entire display screen area in response to the scanning timing, and means for comparing a window area display start position designated by the window parameter with a value of the coordinate address to generate, on the basis of a comparison result, a window area detection signal indicating that the scanning position on said entire display screen area reaches the display start position of said window area;

a second display control circuit for controlling said window area in accordance with the window parameter, said second display control circuit including means for generating a display enable signal indicating a display period corresponding to said window area in response to the window area detection signal, and means for generating a memory address for reading out the display data from the storage start position of said image memory in response to the window area detection signal;

means for reading out the display data from the storage start position of said image memory in accordance with the memory address generated by said second display control circuit to convert the display data into video data which is to be supplied to said display monitor; and

means for supplying the video data to said display monitor in the display period designated by the display enable signal such that the display data formed by the application program is displayed in said window area.

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**5,500,655**

**TERMINAL KEY LOCKING SYSTEM**

**Minae Isawa; and Yumiko Nakamura, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

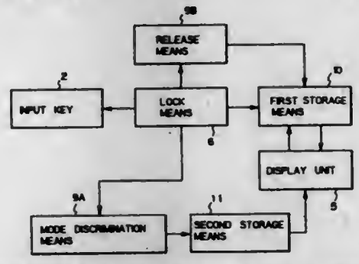
**Continuation of Ser. No. 956,179, Oct. 5, 1992, abandoned.**

**This application Aug. 26, 1994, Ser. No. 296,971**

**Claims priority, application Japan, Jan. 3, 1991, 3-256079**

**Int. Cl.[6] G09G 3/02**

**U.S. Cl. 345—168** **14 Claims**




1. An information processor equipment in use for a terminal key locking system, comprising:

an input key device for inputting data, including switches with marked keytops that, when pressed manually, generate a code representing individual characters;

a terminal key locking unit, operably connected to said input key device, for locking said input keys and for generating a plurality of mode signals concurrently with said locking of said input keys;

a plurality of gates, operably connected to said input key device, for receiving said mode signals corresponding to said gates, said gates being connected to a plurality of controllers the output of which is connected to a display control unit;

a display unit, operably connected to said display controller, for displaying picture signals;

a first memory device, operably connected to said display control unit, for saving current display information when said terminal key locking unit locks said input keys, placing said equipment in a mode based on one of said plurality of mode signals concurrently generated with said locking of said input keys; and



a second memory device, operably connected to said display control unit, for storing in advance picture signals representing each discriminated mode signal, wherein said previously stored picture signals are displayed in correspondence to one of said modes and when the lock is released, said current display information stored in the first memory device is returned to the display unit, and wherein said gates are respectively operated according to incoming mode signals.

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**5,500,656**

**DEVICE FOR CLAMPING AND RELEASING FILM MATERIAL AND OPERATION OF SAID DEVICE**

**Gunnar Behrens, Kiel; Gerhard Blöhdorn, Schönkirchen, and Hans Penza, Preetz, all of, Germany, assignors to Linotype-Heil AG, Eschborn, Germany**

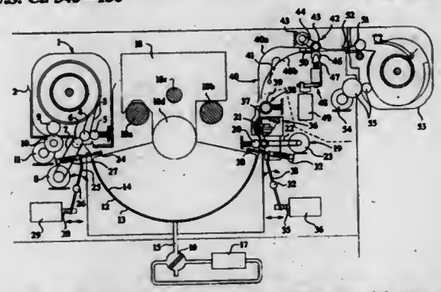
**PCT No. PCT/DE92/00491, § 371 Date Mar. 18, 1993, § 102(e) Date Mar. 18, 1993, PCT Pub. No. WO93/01936, PCT Pub. Date Feb. 4, 1993**

**PCT Filed Jun. 13, 1992, Ser. No. 30,374**

**Claims priority, application Germany, Jul. 19, 1991, 41 24 004.9**

**Int. Cl.[6] H04N 1/08; 1/06; B41B 19/00**

**U.S. Cl. 346—136** **10 Claims**



1. A device for clamping and releasing film material onto and from a stationary holder, comprising:

said stationary holder comprising an exposure trough having a curved shape, said exposure trough having an inside surface at which vacuum grooves are provided connected to a vacuum means for producing an air cushion for supporting the film material during conveyance through the trough and for producing a vacuum for clamping the film material when the film material is no longer being conveyed;

a conveying channel being formed along said inside surface of said exposure trough, said conveying channel having a film entry and a film outlet;

a supply cassette containing the film material arranged at said film entry of said conveying channel, said supply cassette having a film outlet gap;

a take-up cassette for storing exposed film material, said take-up cassette being positioned after said film outlet of said conveying channel;

conveying roller means arranged inside said supply cassette adjacent said film outlet gap for delivering the film material to the film entry of the conveying channel and for conveying the film through the conveying channel;

positioning means for positioning the film material against the inside surface of the exposure trough prior to application of said vacuum, said positioning means including outlet roller means at the film outlet and driving means for driving the film outlet roller means in a forward direction to receive a leading nip of the film material as said film material is conveyed through the conveying channel by the roller means in the supply cassette and for reversing rotation when the roller means in the supply cassette stop so as to cause a pressing of the film material against said inside surface, at which time said vacuum means produces said vacuum for clamping the film material.

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**5,500,657**

**AIR-BUBBLE DETECTION APPARATUS OF INK JET RECORDING HEAD, AND METHOD AND APPARATUS FOR RESTORING INK JET RECORDING HEAD**

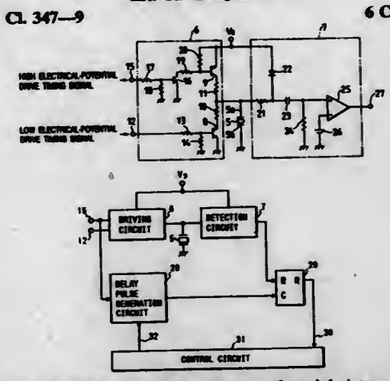
**Hitoshi Yauchi; Koichi Sugiyama; Akihiko Miyashita, all of Morioka; Nakatoshi Satoh; Tatsuo Sugawara, both of Takizawa; Hiroyuki Sato, and Takashi Onozato, both of Morioka, all of, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan**

**Filed Nov. 3, 1992, Ser. No. 971,497**

**Claims priority, application Japan, Nov. 11, 1991, 3-294246; Nov. 11, 1991, 3-294247; Dec. 6, 1991, 3-322691**

**Int. Cl.[6] B41J 2/01**

**U.S. Cl. 347—9** **6 Claims**




1. An air-bubble detection apparatus of an ink jet recording head, the ink jet recording head including an ink passage having a nozzle, the ink jet recording head also including an electrostrictive vibrator which contracts in response to a drive signal, wherein a contraction changes a volume of the ink passage in an absence of air bubbles such that ink is forced from the ink passage through the nozzle, said air-bubble detection apparatus further comprising:

a driving circuit for generating the drive signal applied to the electrostrictive vibrator, the drive signal including maximum voltage level;

air-bubble detecting means, connected to the driving circuit and to the electrostatic vibrator, for detecting an occurrence of air bubbles in the ink passage by measuring a vibrator voltage generated across the electrostrictive vibrator after contraction of the electrostrictive vibrator, and for generating an output signal only when the vibrator voltage exceeds the maximum voltage level by a predetermined amount;

a pulse generating circuit for generating pulses in response to the drive signal;

output judgment means for detecting a duration of the output signal generated by the air-bubble detecting means by identifying a start pulse and a stop pulse of the pulses generated by the pulse generating means which correspond with the output signal;

control means for computing an average time of the output signal based on the start and stop pulses, and for generating a timing signal after the calculated average time following each drive signal; and

means for comparing the output signal and the timing signal and for generating a comparison signal when the timing signal coincides with the output signal.

**5,500,658**

## INK JET RECORDING APPARATUS HAVING A HEATING MEMBER AND MEANS FOR REDUCING MOISTURE NEAR AN INK DISCHARGE PORT OF A RECORDING HEAD

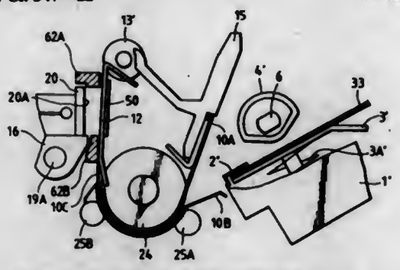
**Yoshifumi Hattori, Yamato; Genji Inada, Atsugi, and Kenjiro Watanabe, Tokyo, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 976,663, Nov. 16, 1992, abandoned, which is a continuation of Ser. No. 789,545, Nov. 8, 1991, abandoned, which is a continuation of Ser. No. 541,194, Jun. 22, 1990, abandoned, which is a continuation of Ser. No. 242,913, Sep. 12, 1988, abandoned. This application Jul. 20, 1994, Ser. No. 275,744**

**Claims priority, application Japan, Sep. 11, 1987, 62-226621; Sep. 11, 1987, 62-226622; Sep. 9, 1988, 63-224575**

**Int. Cl.[6] B41J *2/01***

**U.S. Cl. 347—22** **35 Claims**




1. An ink jet recording apparatus comprising:

a recording head having at least one discharge port in a recording surface;

a heating member for heating a recording medium to expedite the fixation of liquid ink, discharged from one or more ink discharge ports in said recording surface of of said recording head and adhered to the recording medium, by promoting evaporation of the liquid ink adhered to the recording medium; and

a moisture condensing member near the surface of the recording head in which the ink discharge ports are provided for decreasing the moisture in the area of the recording head created by the evaporation of the liquid ink, said moisture condensing member being maintained at a lower temperature than said recording surface of said recording head and more readily condensing moisture than said recording surface of said recording head.

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**5,500,659**

## METHOD AND APPARATUS FOR CLEANING A PRINTHEAD MAINTENANCE STATION OF AN INK JET PRINTER

**Donald P. Curran, Jr.; Lonnie J. Pollocks, Jr., both of Rochester; David P. Breemes, Sr., Palmyra; Leonard M. Carreira, Penfield, and Thomas J. Trenchard, Macedon, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Nov. 15, 1993, Ser. No. 152,626**

**Int. Cl.[6] B41J *2/165***

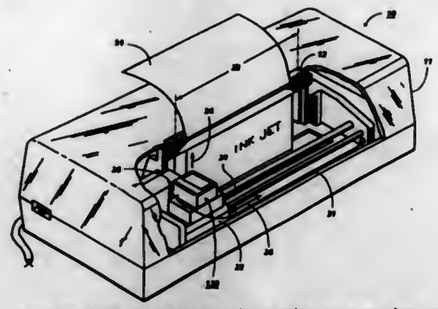
**U.S. Cl. 347—28** **16 Claims**

1. An ink jet printer comprising:

(a) first support means for supporting a recording medium, said first support means defining a printing zone;

(b) second support means for supporting an ink-supplied printhead in printing relation with a supported recording medium;

(c) a printhead service or maintenance station located spaced from said printing zone for maintaining printheads supported on said second support means, said service or maintenance station including cleaning means for removing waste ink and other contaminants from a printhead supported on said second support means, and vacuum pressure applying means for




sucking cleaning fluid from said cleaning apparatus into said service or maintenance station; and

(d) a cleaning apparatus loadable on said second support means for dissolving and removing accumulated waste ink and other contaminants from said service or maintenance station, said cleaning apparatus including a cleaning fluid comprising ink dissolving compositions.

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**5,500,660**

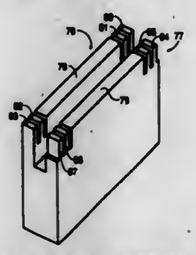
## WIPER FOR INKJET PRINTHEAD NOZZLE MEMBER

**Winthrop D. Childers, San Diego, Calif., and Ronald S. Gompertz, Vancouver, Wash., assignors to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed Jun. 24, 1993, Ser. No. 82,198**

**Int. Cl.[6] B41J *2/165***

**U.S. Cl. 347—33** **7 Claims**




7. A method for wiping an inkjet printhead in an inkjet printer, said printhead including a nozzle member having nozzles formed in a planar nozzle member surface and between two raised insulator portions disposed near opposite ends of said nozzle member surface for encapsulating conductors bonded to a substrate affixed to an underside of said nozzle member, said two raised insulator portions being substantially perpendicular to one or more linear arrays of nozzles formed in said nozzle member surface, said method comprising the steps of:

moving a carriage, containing said printhead, in a direction parallel to said two raised insulator portions, to be in contact with a wiper;

wiping said nozzle member surface with a first wiper blade to wipe a first portion of said nozzle member surface;

wiping said nozzle member surface with a second wiper blade to wipe a second portion of said nozzle member surface, where said first portion and said second portion are different from one another; and

said wiper being aligned with respect to said nozzle member surface so that said first wiper blade and said second wiper blade together wipe each of said nozzles formed in said nozzle member surface despite an end portion of said first wiper blade or said second wiper blade riding over one of said two raised insulator portions when said wiper wipes said nozzle member surface;

wherein said first wiper blade has a first central portion between two ends of said first wiper blade and at least one split portion



at each of said two ends of said first wiper blade, said at least one split portion being separated from said first central portion and from an adjacent split portion by a gap having a first width, and wherein said second wiper blade has second central portion between two ends of said second wiper blade and at least one split portion at each of said two ends of said second wiper blade, said at least one split portion of said second wiper blade being aligned with an associated gap formed in said first wiper blade.

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**5,500,661**

## INK JET RECORDING METHOD

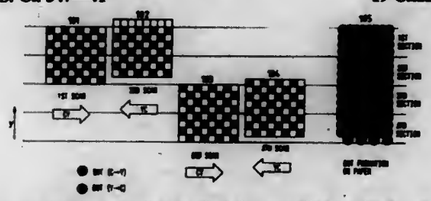
**Miyuki Matsubara, Tokyo; Hiromitsu Hirabayashi, Yokohama; Shigeyasu Nagoshi, Kawasaki; Noribumi Koitabashi, Yokohama; Hitoshi Sugimoto, Kawasaki; Fumihiro Gotoh, Yokohama, and Masaya Uetuki, Kawasaki, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 83,542, Jun. 30, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 484,912**

**Claims priority, application Japan, Jul. 6, 1992, 4-178391**

**Int. Cl.[6] B41J *2/01***

**U.S. Cl. 347—41** **19 Claims**




1. An ink jet recording method for recording an image on a recording medium by performing a main scan in a predetermined direction by recording means comprising a plurality of recording elements for ejecting an ink, and by performing a sub-scan by moving the recording means relative to the recording medium in a direction different from the predetermined direction after the end of the main scan, said method comprising the steps of:

thinning a portion of all pixels on an area recordable in a single main scan of the recording means in accordance with a predetermined thinning arrangement pattern; and

recording an image obtained by thinning the portion of the pixels and an image corresponding to the portion of the pixels in the area in a plurality of main scans and sub-scans, such that a sub-scan is performed in a direction opposite to a normal sub-scan direction at a predetermined period.

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**5,500,662**

## INK JET RECORDING METHOD FOR RECORDING IN PLURAL SCANS

**Kenjiro Watanabe, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 689,091, Apr. 22, 1991, abandoned, which is a continuation of Ser. No. 369,861, Jun. 22, 1989, abandoned. This application Mar. 9, 1993, Ser. No. 29,945**

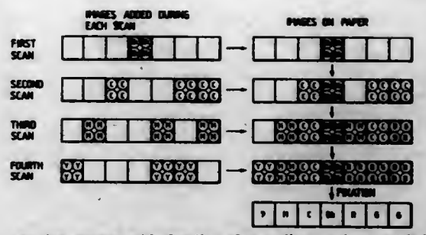
**Claims priority, application Japan, Jun. 22, 1988, 63-152160**

**Int. Cl.[6] B41J *2/21;2/05***

**U.S. Cl. 347—43** **6 Claims**

1. A method for recording a color image on a recording medium, using a recording apparatus which performs a main scan by relatively moving recording means with respect to the recording medium, the recording means having a plurality of recording sections, each discharging ink of different colors, said method comprising the steps of:

performing a first main scan for recording an image of a first color on a predetermined area of the recording medium by utilizing a first recording section for discharging ink of the first color, recording sections other than said first recording




section among said plurality of recording sections not being driven during the first main scan;

performing, after termination of the first main scan, a second main scan for recording an image of a second color on the predetermined area of the recording medium by utilizing a second recording section, recording sections other than said second recording section among said plurality of recording sections not being driven during the second main scan; and

performing, after termination of the second main scan, a third main scan for recording an image of a third color on the predetermined area of the recording medium by utilizing a third recording section, recording sections other than said third recording section among said plurality of recording sections not being driven during the third main scan,

wherein a lightness of the first color is lower than a lightness of the second color and the lightness of the second color is lower than a lightness of the third color.

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**5,500,663**

## RECORDING INK CONTAINER WITH AN AIR VENT VALVE

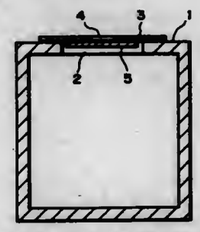
**Toshihiko Ujita, Yamato; Kazuhiro Nakajima; Yohei Sato, both of Yokohama, and Shuichi Murakami, Tokyo, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Feb. 22, 1993, Ser. No. 20,412**

**Claims priority, application Japan, Feb. 24, 1992, 4-036263; Mar. 13, 1992, 4-054901; Jun. 5, 1992, 4-145585; Jun. 30, 1992, 4-173236; Jun. 30, 1992, 4-173258**

**Int. Cl.[6] B41J *2/175***

**U.S. Cl. 347—86** **7 Claims**




1. A liquid container for containing liquid, comprising:

a first container for containing the liquid;

a second container for containing said first container therein;

a passage for supplying the liquid out from said first and second containers; and

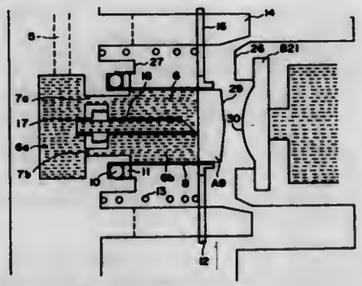
a valve mechanism, provided in said second container, having supporting means with a first opening, a first thin film, having a second opening smaller than the first opening, for covering the first opening, and a second thin film for covering the second opening, wherein said first thin film is seated on said supporting means with a sealing material therebetween, and said second thin film is seated on a side of said first thin film closer to said supporting means with said sealing material therebetween.

**5,500,664**

## INK JET RECORDING APPARATUS AND DETACHABLY MOUNTABLE INK JET CARTRIDGE

Etsuro Suzuki, Yokohama; Yoshifumi Hattori, Yamato; Masashi Kitani, Yokohama; Hideo Saikawa, Kawasaki; Masami Kajima; Kenji Kawano, both of Tokyo; Koichi Tamo, and Kenji Aono, both of Kawasaki, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 825,588, Jan. 24, 1992, abandoned.
This application Nov. 14, 1994, Ser. No. 339,882
Claims priority, application Japan, Jan. 25, 1991, 3-007759; Jan. 25, 1991, 3-007760; Jan. 25, 1991, 3-007761; Jan. 25, 1991, 3-007769; Jan. 25, 1991, 3-007770
Int. Cl.[6] B41J 2/175
U.S. Cl. 347—86 8 Claims



1. An ink jet apparatus comprising:
a recording head portion including a recording head with ink ejection outlets for effecting recording and a hermetically sealed first ink container in fluid communication with said recording head, said first ink container being at least partly constituted by a first elastic member;
a second ink container for containing ink to be supplied to said first ink container, said second ink container being at least partly constituted by a second elastic member;
an ink connecting member for establishing fluid communication between said first and second ink containers to supply ink to said first ink container from said second ink container, wherein said ink connecting member is entirely contained in said first ink container before being placed in fluid communication with said second ink container;
communicating means for permitting said ink connecting member to be placed in fluid communication with said second ink container through said first and second elastic members, wherein said communicating means includes urging means for urging said first elastic member in a direction preventing fluid communication with said second ink container; and
a carriage for carrying said recording head portion and said second ink container.

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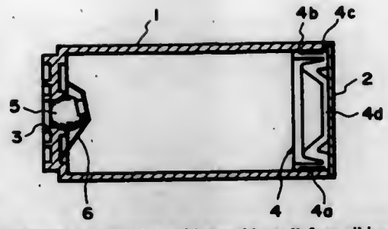
**5,500,665**

## INK CONTAINER AND INK JET RECORDING APPARATUS USING SAME

Toshihiko Ujita, Yamato, and Haruyuki Matsumoto, Yokohama, both of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 933,318, Aug. 21, 1992, abandoned.
This application Sep. 26, 1994, Ser. No. 311,887
Claims priority, application Japan, Aug. 30, 1991, 3-244897
Int. Cl.[6] B41J 2/175
U.S. Cl. 347—86 5 Claims

1. An ink container comprising:
a container body for containing ink; and
a movable wall movable along an inside surface of said container body, said movable wall having a sealing portion in sealing contact with the inside surface of said container body and at least three circumferentially separated tilt preventing portions for preventing said movable wall from tilting, said tilt preventing portions being spaced from said sealing portion and contactable with the inside surface of said container body.



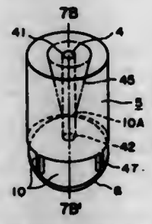
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**5,500,666**

## CAPPING MEMBER FOR INDIRECTLY VENTING THE INTERIOR OF AN INK CONTAINER, AND RECORDING CARTRIDGE AND APPARATUS USING SAME

Yoshifumi Hattori, Yamato; Seiichiro Karita, Yokohama; Hideo Saikawa, Kawasaki; Toshio Kashino, Chigasaki; Akio Saito, Hadano; Hiroshi Nakagomi, Yamato; Teruo Arashima, Yokohama; Makiko Kimura, Sagamihara; Hiroshi Sugitani, Machida; Masami Ikeda, Tokyo; Ano Saito, Yokohama; Kazuaki Masuda, Sagamihara, and Tsuyoshi Orikasa, Kazukabe, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 963,530, Oct. 20, 1992, abandoned, which is a continuation of Ser. No. 583,340, Sep. 17, 1990, abandoned. This application Aug. 9, 1994, Ser. No. 288,216
Claims priority, application Japan, Sep. 18, 1989, 1-241042; Aug. 3, 1990, 2-206592
Int. Cl.[6] B41J 2/175
U.S. Cl. 347—87 24 Claims



1. A recording head cartridge comprising:
a recording head for ejecting recording liquid;
a container having therein a porous material for containing the recording liquid and an air supply space, said ink container being connected to said recording head for supplying the recording liquid thereto;
communicating means having an inside opening for substantially balancing pressure in said container with an ambient pressure;
a blocking plate disposed in said air supply space of said container and adjacent to and facing said inside opening and said porous material for preventing direct communication between the interior of said container and said inside opening, said blocking plate being out of contact with said porous material; and
connectors supporting said blocking plate relative to said communicating means with a predetermined distance between said blocking plate and said communicating means, wherein said connectors provide a space therebetween and an opening not facing said porous material for indirectly communicating along said blocking plate said air supply space with said inside opening.

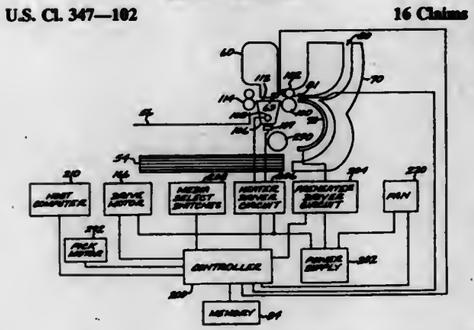


**5,500,667**

## METHOD AND APPARATUS FOR HEATING PRINT MEDIUM IN AN INK-JET PRINTER

William H. Schwiebert, Cardiff, Calif.; Corrina A. E. Hall, Blodgett, Oreg.; Damon W. Broder, Austin, Tex., and Shelley I. Moore, San Diego, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 56,039, Apr. 30, 1993, Pat. No. 5,406,321. This application Apr. 29, 1994, Ser. No. 235,772
Int. Cl.[6] B41J 2/01
U.S. Cl. 347—102 16 Claims



1. In an ink-jet printer employing a media path along which a print medium is passed to a print area at which printing operations are conducted to print said print medium, the printer medium along a portion of said path prior to reaching said print area and a print area heater for heating a portion of said print medium disposed at said print area, and wherein said media path includes an unheated portion between a preheating portion along which said preheating apparatus is disposed and said print area, a method for preconditioning said print medium prior to commencing printing operations to minimize paper shrinkage print defects, comprising a sequence of the following steps:
energizing said preheating apparatus and said print area heater;
advancing a print medium along said medium path to a forward position at which a leading edge margin of said medium is disposed over said print area;
allowing said print medium to remain at said forward position for a first time interval to allow said leading edge margin to be exposed to heat from said print area heater and thereby precondition said leading edge margin, an intermediate portion of said medium adjacent said leading edge margin being disposed over said unheated portion while said print medium is disposed at said forward position;
upon the expiration of said first time interval, withdrawing said print medium from said forward position to a partially withdrawn position wherein said leading edge margin is now disposed over said unheated path portion and said intermediate medium portion is disposed over said preheating apparatus;
allowing said print medium to remain at said partially withdrawn position for a second time interval to allow said intermediate medium portion to be exposed to heat from said preheating apparatus and thereby precondition said intermediate portion; and
upon expiration of said second time interval, advancing said print medium to said print area and commencing print operations.

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**5,500,668**

## RECORDING SHEETS FOR PRINTING PROCESSES USING MICROWAVE DRYING

Shadi L. Malhotra, Mississauga, Canada; Kurt B. Gundlach, Pittsford, and Richard L. Colt, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 15, 1994, Ser. No. 196,669
Int. Cl.[6] B41J 2/05
U.S. Cl. 347—105 20 Claims

19. A printing process which comprises the steps of (a) providing a recording sheet which comprises a substrate and at least one monomeric salt; (b) applying an aqueous recording liquid to the recording sheet in an imagewise pattern; and (c) thereafter exposing the substrate to microwave radiation, thereby drying the recording liquid on the recording sheet, wherein the recording sheet also contains betaine.

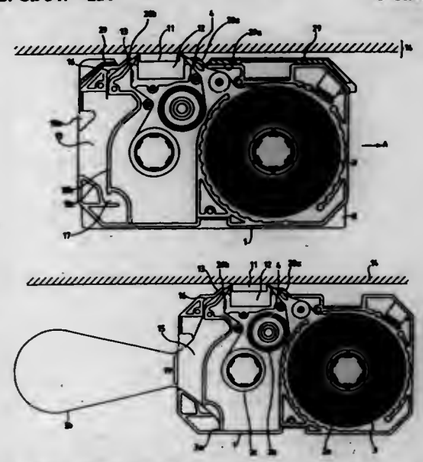
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**5,500,669**

## LABEL CREATION CASSETTE

Akio Yamashita, Takizawa; Kazutaka Suzuki, Tamayama; Toshiaki Amano, and Kazuhiko Hatakeyama, both of Morioka, all of, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Sep. 1, 1993, Ser. No. 115,401
Claims priority, application Japan, Sep. 11, 1992, 4-269787; Mar. 30, 1993, 5-093836; Jul. 1, 1993, 5-188999
Int. Cl.[6] B41J 32/00
U.S. Cl. 347—214 8 Claims



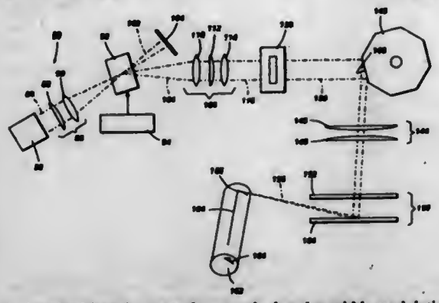
5. A label creation cassette for mounting on a thermal printer, the thermal printer including a thermal head for generating thermal energy, the label creation cassette comprising:
a case;
an image transfer tape mounted in the case;
a thermal transfer ink ribbon mounted in the case and having ink which is selectively transferred to the image transfer tape upon generation of the thermal energy by the thermal head during a print operation;
an accommodation unit formed in the case for accommodating at least a portion of said image transfer tape to which the print operation has been executed by the thermal head; and
a holding unit for holding a leading end of said portion of said image transfer tape and a first opening for taking out said image transfer tape held by said holding unit therethrough while curving a trailing end of said portion of said image transfer tape.

**5,500,670**

## ASYMMETRIC SPATIAL FILTERING FOR PULSED IMAGING, PULSE WIDTH MODULATION RASTER OUTPUT SCANNER WITH TRI-LEVEL EXPOSURE

Anthony Ang, Long Beach, and Chye S. Tan, Ontario, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 7, 1993, Ser. No. 116,930
Int. Cl.[6] B41J 2/47
U.S. Cl. 347—253 6 Claims



1. A pulsed imaging, non-facet tracked, pulse width modulation raster output scanner for creating tri-level exposures without overshoot on a recording medium comprising:

means for providing a coherent, focused beam of radiant energy,

control circuit means for converting an image bit map video data stream into a composite analog video image data stream,

an acousto-optic modulator for modulating said beam in response to said analog image video data stream simultaneously applied to the modulator to provide a modulated optical output,

an optical means for performing a Fourier transformation of the modulated optical output,

an asymmetric spatial filtering means for limiting predetermined frequencies of the fourier transformed modulated optical output to produce a filtered optical output, and

a rotatable scanning elemeat interposed between said recording medium and said radiant energy source, said scanning element having a plurality of facets for intercepting the filtered optical output and repeatedly scanning said output across the surface of said recording medium to form the tri-level exposures.

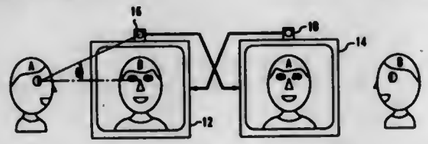
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**5,500,671**

## VIDEO CONFERENCE SYSTEM AND METHOD OF PROVIDING PARALLAX CORRECTION AND A SENSE OF PRESENCE

Russell L. Andersson, Manalapan; Tsuhan Chen, Middletown, and Barin G. Haskell, Tinton Falls, all of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Oct. 25, 1994, Ser. No. 328,640
Int. Cl.[6] H04N 7/14; H04M 11/00
U.S. Cl. 348—15 10 Claims



1. A method for establishing a video conference between a plurality of remotely located conference rooms each containing at least one conferee, a video camera, and an image receiver, the image receiver, video camera, and eyes of each conferee associated therewith defining a parallax angle of said each conferee, comprising the steps of:

generating, with a first video camera, a video signal representative of a sequence of input image frames of a first conferee;

analyzing said input conferee image frames, in real time, to determine a parallax angle in each frame;

generating a corresponding sequence of parallax-compensated image frames; and

transmitting a signal indicative of said sequence of parallax-compensated image flames to an image receiver viewed by a second conferee, whereby eye contact is provided between said second conferee and a displayed image of said first conferee.

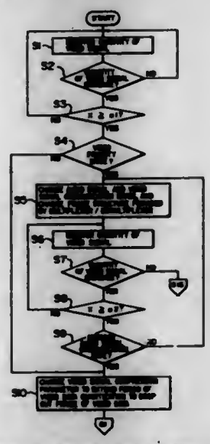
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**5,500,672**

## MULTI-MEDIA COMMUNICATION APPARATUS FOR TRANSMITTING AUDIO INFORMATION, VIDEO INFORMATION AND CHARACTER INFORMATION SIMULTANEOUSLY

Toshiyuki Fujii, Kanaga, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 2, 1994, Ser. No. 204,606
Claims priority, application Japan, Mar. 8, 1993, 5-047005
Int. Cl.[6] H04N 7/12
U.S. Cl. 348—17 11 Claims



1. A multi-media communication apparatus comprising:

line interface means for controlling communication through a communication line;

call control/processing means for controlling calls incoming and outgoing through said line interface means;

multiplexing means for multiplexing video information and audio information to transmit the multiplexed information through said line interface means;

audio codec means for encoding an audio signal to transmit the encoded audio signal to said multiplexing means;

moving picture data encoding means for encoding a video signal;

video data buffer means for temporarily storing the video signal compressed in said moving picture data encoding means to transmit the compressed video signal to said multiplexing means;

buffer control means for detecting the quantity of the compressed video signal stored in a memory of said video data buffer means and controlling the video signal compression scheme in said moving picture data encoding means; and

frame control means for detecting the quantity of the video signal stored in said video data buffer means on the basis of the information supplied from said buffer control means, said frame control means acting, when the quantity of the stored video signal exceeds a predetermined threshold, (a) to decrease the value of the audio signal communication rate to that of a predetermined non-zero rate and (b) to change over the audio signal compression scheme in said audio codec means to that based on the value of said predetermined non-zero rate, thereby changing over the channel allocation scheme in said multiplexing means to allocate less channels to the audio signal and to allocate more channels to the video signal, said communication rate of the audio signal including levels of 56 kbps, 48 kbps and 16 kbps which are set when a channel of said communication line is allocated to the audio signal, and the audio signal being encoded in accordance with an encoding scheme for one of said communication rates of 16, 48 and 56 kbps.



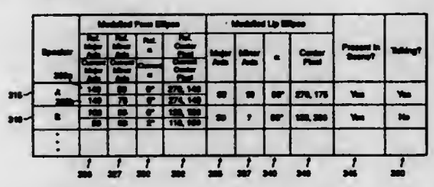
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**5,500,673**

## LOW BIT RATE AUDIO-VISUAL COMMUNICATION SYSTEM HAVING INTEGRATED PERCEPTUAL SPEECH AND VIDEO CODING

Yong Zhou, Washington Township, N.J., assignor to AT&T Corp., Murray Hill, N.J.

Division of Ser. No. 223,983, Apr. 6, 1994. This application May 31, 1995, Ser. No. 455,472
Int. Cl.[6] H04N 7/18
U.S. Cl. 348—156 2 Claims



1. A method for determining if a person in front of a camera is looking in the direction of said camera at a given time, said camera generating a video signal representing a view of said person, said person having a face and lips, said method comprising the steps of:

performing a face location detection subroutine at a reference time when said person is known to be looking in the direction of said camera in order to detect and model said face, said face being modelled with an ellipse defined by parametric values including a major axis and a minor axis, said major axis divided by said minor axis resulting in a reference aspect ratio;

performing said face location detection subroutine on said video signal at said given time to measure said major axis and said minor axis of said modelled face ellipse at said given time, said measured major axis divided by said measured minor axis resulting in a current measured aspect ratio; and

concluding that said person is not looking in said general direction of said camera at said given time if one of said following conditions occur:

said face location detection subroutine performed at said given time has determined that there is no face in said video signal; or

the difference between said current measured aspect ratio and said reference aspect ratio exceeds a predefined threshold.

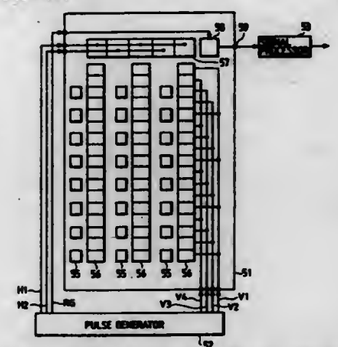
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**5,500,674**

## METHOD OF DRIVING SOLID-STATE IMAGE SENSOR AND SOLID-STATE IMAGING APPARATUS

Satoshi Takase; Takuya Imaide, both of Yokohama; Toshiro Kinugasa, Hiratsuka, and Ryuji Nishimura, Yokohama, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 239,857, May 9, 1994, Pat. No. 5,402,169, which is a continuation of Ser. No. 892,994, Jun. 3, 1992, abandoned. This application Jan. 9, 1995, Ser. No. 370,175
Claims priority, application Japan, Jun. 3, 1991, 3-157412; Jun. 4, 1991, 3-159441
Int. Cl.[6] H04N 5/335
U.S. Cl. 348—208 2 Claims



1. A method of driving a solid-state image sensor having an effective pixel area constituted by M×N pixels disposed in a matrix array having M pixels in the vertical direction and N pixels in the horizontal direction, wherein a scanning pixel area constituted by m pixels in the vertical direction and n pixels in the horizontal direction (where M>m, N≥n) is established within said effective pixel area, and wherein charges stored in the pixels in said scanning pixel area are transferred by vertical CCDs driven with a first scanning pulse to a horizontal CCD and the charges transferred to said horizontal CCD are transferred by said horizontal CCD driven with a second scanning pulse to an output portion of said horizontal CCD, said method comprising the steps of:

stopping the driving of said horizontal CCD;

driving said vertical CCDs with a third scanning pulse having a higher frequency than the frequency of said first scanning pulse so that charges stored in the pixels in said effective pixel area which are outside said scanning pixel area are transferred at high speed to said horizontal CCD while the driving of said horizontal CCD is stopped; and

driving said horizontal CCD with said second scanning pulse so that the charges transferred from the pixels in said effective pixel area which are outside said scanning pixel area to said horizontal CCD are transferred to said output portion of said horizontal CCD.

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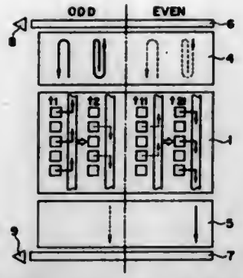
**5,500,675**

## METHOD OF DRIVING SOLID-STATE IMAGE SENSING DEVICE

Kenichi Arakawa, Yokohama; Nobusuke Sasano, Tokyo; Tomoaki Iizuka, Yokohama; Miho Kobayashi, Yokohama; Tetsuo Yamada, Yokohama, and Hideki Metoyama, Chigasaki, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Feb. 14, 1994, Ser. No. 195,176
Claims priority, application Japan, Feb. 15, 1993, 5-047120
Int. Cl.[6] H04N 5/335
U.S. Cl. 348—319 8 Claims

1. A method of driving a solid-state image sensing device having a photosensitive region, photosensitive pixels arranged in a two-dimensional matrix on the photosensitive region, vertical transfer paths on the photosensitive region for transferring signal charges




generated in the photosensitive pixels, first and second accumulation regions flanking either end of the photosensitive region, the first accumulation region having a cyclic transfer path therein, a first horizontal transfer path for transferring signal changes received from the first accumulation region, a second horizontal transfer path for transferring signal charges received from the second accumulation region, a first charge detecting means provided at one end of the first horizontal transfer path, and a second charge detecting means provided at one end of the second horizontal transfer path, the method comprising the steps of:

(1) effecting a first field operation by

(a) transferring first signal charges generated in an odd-numbered photosensitive pixel column to the first accumulation region,

(b) transferring second signals charges generated in an even-numbered photosensitive pixel column to the second accumulation region, and

(c) reverse ordering the first signal charges in the first accumulation region during transfer of the second signal charges to second accumulation region;

(2) effecting a second field operation by

(a) transferring the first signal charges to the second accumulation region,

(b) transferring the second signal charges to the first accumulation region, and

(c) reverse ordering the second signal charges in the first accumulation region during transfer of the first signal charges to the second accumulation region; and

(3) alternately repeating step 1 with step 2.

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**5,500,676**

**METHOD OF ENCODING AND MULTIPLEXING PICTURE SIGNALS AND APPARATUS UTILIZING THE SAME**

**Takayuki Tanaka; Ryu Watanabe, both of Tokyo; Yuuichi Ocnaini, Iruma, and Yoshizumi Eto, Sagamihara, all of, Japan, assignors to Nippon Hoso Kyokai, and Hitachi Denshi Kabushiki Kaisha, both of Tokyo, Japan**

**Filed Jul. 21, 1994, Ser. No. 278,239**

**Claims priority, application Japan, Jul. 22, 1993, 5-180965**

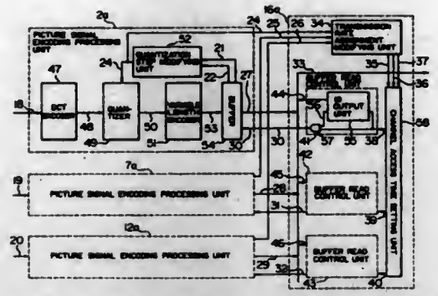
**Int. Cl.[6] H04N 7/12**

**U.S. Cl. 348—387** **5 Claims**

1. A picture signal encoding multiplexing method in which a plurality of picture signals are supplied to a plurality of picture signal encoding processing units, respectively, each of which has a quantization step modifying unit and a quantizing unit controlled by the output of said quantization step modifying unit, and the encoded data from said picture signal encoding processing units is multiplexed in a channel multiplexing unit having a transmission rate assignment modifying unit for controlling the respective output of said picture signal encoding processing units, said method comprising the steps of:

detecting a quantization step signal of each of said quantizing units in each of said quantization step modifying units;

generating transmission rate control signals corresponding to said quantization step signals in said transmission rate assignment modifying unit, said transmission rate control signals



being so controlled that said respective quantization step signals from said quantization step modifying unit become substantially equal to one another; and

controlling said encoded data transmitted from said picture signal encoding processing units to said channel multiplexing unit in accordance with said transmission rate control signals.

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**5,500,677**

**DEVICE FOR ENCODING DIGITAL SIGNALS REPRESENTING IMAGES, AND CORRESPONDING DECODING DEVICE**

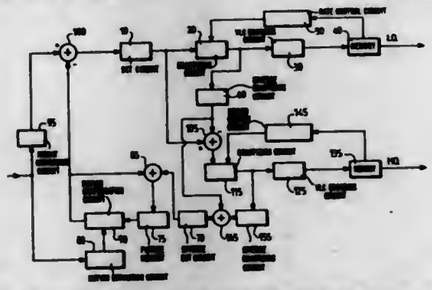
**Etienne Fert, Paris, France, assignor to U.S. Philips Corporation, New York, N.Y.**

**Continuation of Ser. No. 143,793, Oct. 27, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 483,916**

**Claims priority, application France, Jan. 28, 1992, 92 12880**

**Int. Cl.[6] H04N 7/40**

**U.S. Cl. 348—402** **4 Claims**



1. An encoding device for encoding a digital signal corresponding to images subdivided into blocks, comprising:

a discrete cosine transform circuit for processing a first digital signal to obtain first coefficients;

a first quantizing circuit for quantizing the first coefficients to obtain first quantized values, said first quantizing circuit having a first quantization step;

a first encoding circuit for encoding the first quantized values to obtain first encoded signals having a first quality level;

a first inverse quantization circuit for dequantizing the first quantized values to obtain first dequantized coefficients;

a first subtracter for subtracting the first dequantized coefficients from the first coefficients to obtain second coefficients;

a second quantizing circuit provided in cascade with the first quantizing circuit for quantizing the second coefficients to obtain second quantized values, said second quantizing circuit having a second quantization step which is finer than the first quantization step;

a second encoding circuit for encoding the second quantized values to obtain second encoded signals having a second quality level, which is higher than the first quality level;



a second inverse quantization circuit for dequantizing the second quantized values to obtain second dequantized coefficients;

a first adder circuit for adding the first dequantized coefficients and the second dequantized coefficients to obtain third coefficients;

an inverse discrete cosine transform circuit for processing the third coefficients to obtain a third digital signal;

a second adder circuit for adding the third digital signal and a predicted digital signal to obtain a fourth digital signal;

a picture memory for storing and supplying the fourth digital signal;

a motion compensation stage for operating on the fourth digital signal to produce the predicted digital signal; and

a second subtracter circuit for subtracting the predicted digital signal from the digital signal to obtain the first digital signal.

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**5,500,678**

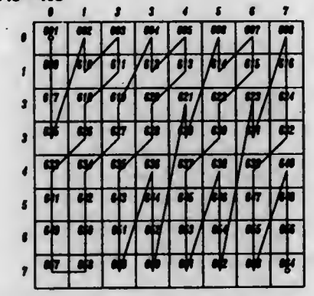
**OPTIMIZED SCANNING OF TRANSFORM COEFFICIENTS IN VIDEO CODING**

**Atul Puri, Riverdale, N.Y., assignor to AT&T Corp., Murray Hill, N.J.**

**Filed Mar. 18, 1994, Ser. No. 215,532**

**Int. Cl.[6] H04N 7/50**

**U.S. Cl. 348—408** **19 Claims**



1. A method of encoding a video signal, comprising the steps of:

generating a set of frequency coefficient signals, the set representing the video signal, and corresponding to an N×M matrix, wherein each of the frequency coefficient signals corresponds to a predetermined horizontal coordinate and a predetermined vertical coordinate in the matrix;

scanning a first subset of the frequency coefficient signals within the set in a predetermined first subset scanning order, as represented by the following list of coordinate pairs, each pair representing a horizontal and vertical coordinate in the matrix, to create an ordered set of frequency coefficient signals:

(0, 0), (0, 1), (0, 2), (0, 3), (1, 0), (1, 1), (2, 0), (2, 1), (1, 2), (1, 3), (0, 4), (0, 5), (0, 6), (0, 7) (1, 7);

and

generating an encoded video signal, the encoded video signal including the ordered set of frequency coefficient signals.

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**5,500,679**

**METHOD AND APPARATUS FOR DERIVING A VIDEO SIGNAL CORRESPONDING TO A STANDARD DEFINITION SIGNAL FROM A HIGH DEFINITION SIGNAL**

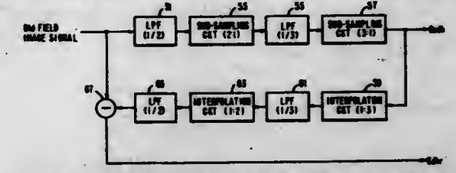
**Seiji Higurashi, Fuchu; Yasuhiko Terashishi, Kanagawa; Yasuaki Yamada, Kanagawa, and Takeo Ohishi, Kanagawa, all of, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan**

**Filed Sep. 28, 1994, Ser. No. 314,518**

**Claims priority, application Japan, Sep. 30, 1993, 5-268441**

**Int. Cl.[6] H04N 7/01**

**U.S. Cl. 348—432** **11 Claims**



1. An image signal processing method in which high definition image signals of interlaced fields are divided into standard definition corresponding image signals and additional image signals whereby reproduction of the high definition image is possible by adding the additional image signals to the standard definition corresponding image signal comprising the steps of:

sub-sampling vertical lines of first fields of the high definition image signal at a ratio of N:1, where N is an odd number greater than 1; and

sub-sampling vertical lines of the remaining fields of the high definition image signal at a ratio of N:1, where N is an odd number greater than 1 such that the sub-sampling first fields are interlaced with the sub-sampled remaining fields.

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**5,500,680**

**CAPTION DISPLAY CONTROLLING DEVICE AND THE METHOD THEREOF FOR SELECTIVELY SCROLLING AND DISPLAYING A CAPTION FOR SEVERAL SCENES**

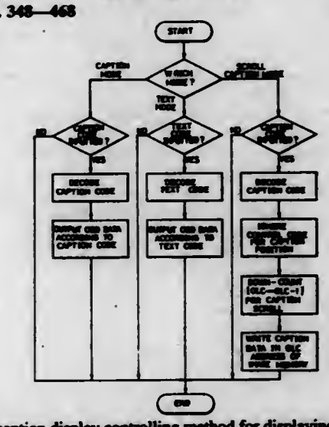
**Eun P. Lee, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea**

**Filed Oct. 8, 1993, Ser. No. 134,820**

**Claims priority, application Rep. of Korea, Jan. 12, 1992, P92-18745**

**Int. Cl.[6] H04N 7/087**

**U.S. Cl. 348—468** **3 Claims**



1. A caption display controlling method for displaying characters from extracted caption and text data encoded in a video composite signal on a video display screen comprising the steps of:

discriminating one mode selected from (1) a caption mode, wherein characters from extracted caption data are displayed in a display region of the screen defined by a fixed number of video screen lines at a screen location determined from the extracted caption data; (2) a text mode, wherein characters from extracted text data are displayed over the entire video display screen; and (3) a scroll caption mode, wherein characters from extracted caption data are displayed in a display region of the screen defined by a variable number of screen lines, said characters being displayed including characters associated with the current video scene being displayed and previous displayed video scenes;

decoding caption data encoded in an input composite video signal and displaying the characters decoded from said caption data in a predetermined portion of a screen when said caption mode is selected;

decoding text data encoded in an input composite video signal and displaying the characters decoded from said text data on the overall screen when said text mode is selected; and

decoding caption data and sequentially scrolling up and displaying the characters decoded from said caption data for a current scene together with captions for previous scenes on a display region of the screen defined by a variable number of video screen lines up to the overall number of video screen lines of the screen when the scroll caption mode is selected.

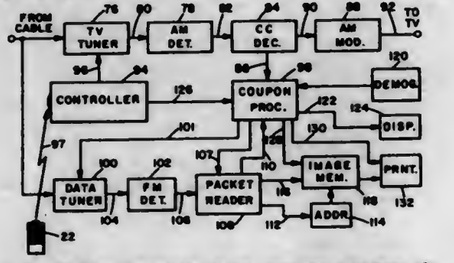
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**5,500,681**

**APPARATUS AND METHOD FOR GENERATING PRODUCT COUPONS IN RESPONSE TO TELEVISED OFFERS**

**Charles P. Jones, 3278 Jamul Highlands Rd., Jamul, Calif. 91935**

**Filed May 24, 1994, Ser. No. 248,484**
**Int. Cl.[6] H04N 7/08**
**U.S. Cl. 348—473** **21 Claims**




1. A method for generating a token, comprising the steps of:

providing video imagery having an embedded token identifier;

monitoring said video imagery to detect said embedded token identifier;

retrieving a token packet from a memory in response to detection of said embedded token identifier, said token packet corresponding to said embedded token identifier, said token packet including token information;

transmitting said video imagery over a first communication channel to a remote site for a first predetermined time period;

transmitting said token packet over a second communication channel to said remote site for a second predetermined time period, said second predetermined time period beginning at the same time as said first predetermined time period;

receiving said first communication channel at said remote site;

displaying said received video imagery at said remote site;

monitoring said first communication channel at said remote site to detect said embedded token identifier;

receiving said second communication channel at said remote site;

monitoring said second communication channel to detect said token packet corresponding to a detected embedded token identifier;

monitoring a user input device at said remote site to detect a user input during said second time period; and

outputting said token information of a received token packet in response to a detected user input.

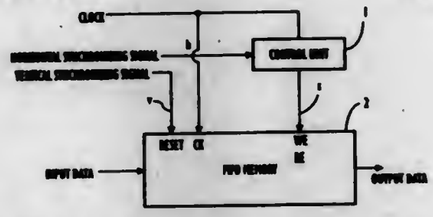
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**5,500,682**

**MEMORY EQUIPMENT FOR WRITING/READING A DEFECTIVE VIDEO SIGNAL IN A FIFO MEMORY DEVICE CONSECTIVELY**

**Kouichirou Fuo, Takatsuki; Yosuke Inawa, Ibaraki, and Naoji Okumura, Minou, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Continuation of Ser. No. 113,690, Aug. 31, 1993, abandoned. This application Feb. 6, 1995, Ser. No. 386,134**
**Claims priority, application Japan, Sep. 4, 1992, 4-237080**
**Int. Cl.[6] H04N 5/95**
**U.S. Cl. 348—497** **1 Claim**




1. Video signal memory equipment comprising:

a FIFO memory for writing a specified number of video data from the beginning of the video data of video signals per horizontal scanning period into said FIFO memory and reading the written specified video data from said FIFO memory, said FIFO memory having an input for receiving video data to be written, an output for sending out the read video data, another input for receiving a clock signal, a further input for receiving control signals for writing and reading a specified number of pieces of video data per horizontal scanning period according to said clock signal, and a still further input for receiving a vertical synchronous signal; and

a control unit for producing said control signals for controlling the writing and reading of said video data in said FIFO memory, said control unit having an input for receiving a horizontal synchronous signal, another input for receiving a clock signal, and an output for sending control signals to said FIFO memory control signal input, said control signals being produced by said control unit in synchronism with every horizontal synchronous signal according to said clock signal;

wherein said FIFO memory writes said specified number of video data from the beginning per horizontal line sequentially at every vertical synchronous signal set by said clock signal into the FIFO memory in response to a write control signal from said control unit, and

wherein said FIFO memory reads the specified number of video data per horizontal scanning period in written sequence at every vertical synchronous signal set by said clock signal into the FIFO memory in response to a read control signal from said control unit,

thereby storing and producing video data for a video screen.

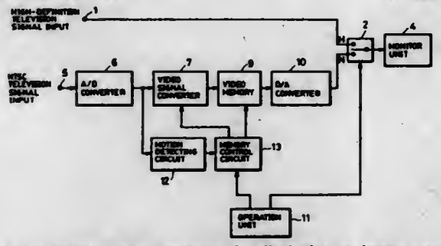


**5,500,683**

**IMAGE DISPLAY APPARATUS**

**Toshiya Yatomi, Kawasaki, and Masahiko Enari, Yokohama, both of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 221,971, Apr. 4, 1994, abandoned, which is a continuation of Ser. No. 672,125, Mar. 19, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 498,800**
**Claims priority, application Japan, Mar. 26, 1990, 2-77492; Apr. 26, 1990, 2-108987**
**Int. Cl.[6] H04N 7/010**
**U.S. Cl. 348—565** **6 Claims**




1. An image display apparatus for displaying an image corresponding to an image signal, comprising:

an image display unit for displaying an image corresponding to an aspect ratio of a first image signal;

motion detection means for selectively inputting the first image signal and a second image signal having an aspect ratio different from that of the first image signal and for detecting an amount of image motion produced in an image corresponding to the second input image signal when the second image signal is input; and

image signal forming means for forming an image signal having an aspect ratio equal to that of the first image signal from the second input image signal in accordance with the result of the detection by said motion detecting means, and supplying the image signal to said image display unit.

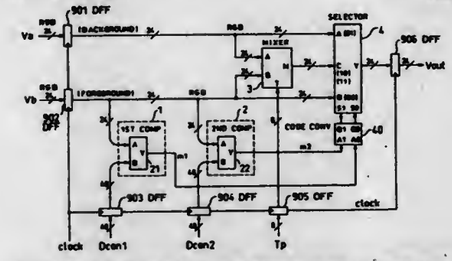
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**5,500,684**

**CROMA-KEY LIVE-VIDEO COMPOSITING CIRCUIT**

**Masaru Uya, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Dec. 9, 1994, Ser. No. 354,877**
**Claims priority, application Japan, Dec. 10, 1993, 5-310012**
**Int. Cl.[6] H04N 5/275**
**U.S. Cl. 348—592** **12 Claims**




1. A chroma-key live-video compositing circuit for combining a foreground live-video image with a background live-video image to produce a mixed live-video image in real time comprising:

a first means for receiving pixel data of said background live-video image and pixel data of said foreground live-video image in synchronism with a clock signal;

a second means for generating a first binary signal indicative of whether or not said pixel data of said foreground live-video image meets a first condition;

a third means for generating a second binary signal indicative of whether or not said pixel data of said foreground live-video image meets a second condition;

a fourth means for selectively providing either said pixel data of said background live-video image, said pixel data of said foreground live-video image, or pixel data that is obtained by multiplying each of said pixel data of said background live-video image and said pixel data of said foreground live-video image by a respective weight and summing each product of said multiplication, in order to produce a totally transparent composition effect, an opaque composition effect, and a translucent composition effect according to a code made up of said first and said second binary signal; and

a fifth means for providing said selectively-provided pixel data from said fourth means as pixel data of said mixed live-video image in synchronism with said clock signal.

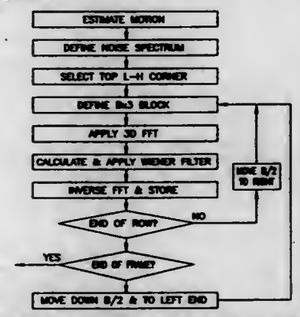
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**5,500,685**

**WIENER FILTER FOR FILTERING NOISE FROM A VIDEO SIGNAL**

**Anil C. Kokaram, Cambridge, United Kingdom, assignor to AVT Communications Limited, London, United Kingdom**

**Filed Oct. 14, 1994, Ser. No. 323,507**
**Claims priority, application United Kingdom, Jan. 15, 1993, 9321372**
**Int. Cl.[6] H04N 5/213**
**U.S. Cl. 348—620** **27 Claims**




13. A method of removing noise from a current frame f of an image sequence having a plurality of frames, the method comprising the steps of:

(a) applying a motion compensation process to at least one of a frame preceding and a frame succeeding the current frame in said image sequence;

(b) selecting a zone in said current frame;

(c) selecting, using motion compensation data from step (a), substantially the same zone of the at least one of the said preceding and succeeding frames, thus to define with said zone of the current frame a three-dimensional data set of pixels;

(d) converting the data set to the frequency domain by applying a 3D fast Fourier transform (FFT) process to the said data set to produce a plurality of frequency components (bins) thereof;

(e) applying a Wiener filtering operation to attenuate the said frequency components (bins);

(f) applying the inverse of the said 3D FFT process to produce restored pixels of the said current frame f.

23. A method of removing noise from a current frame f of an image sequence having a plurality of frames, the method comprising:

Fourier transforming the values of a plurality of pixels in the current frame f to obtain a data set;

applying a Wiener filtering operation to said data set to attenuate frequency components within the data set as a function of the difference between the spectral power density of $P_{\eta\eta}$ of a noise signal associated with each frequency component and

the spectral power density $P_{ss}$ of the data set when $P_{ss}$ is greater than $\beta P_{\eta\eta}$, where $\beta$ is a constant greater than 1; and when $P_{ss}$ is less than $\beta P_{\eta\eta}$ attenuating said frequency components by a non-negative factor which reduces as $P_{ss}$ reduces.

25. A digital filter for removing noise from a current frame f of an image sequence having a plurality of frames, the filter comprising:

(a) means for applying a motion compensation process to at least one of a frame preceding and a frame succeeding the current frame in said image sequence;

(b) means for selecting a zone in said current frame;

(c) means for selecting, using motion compensation data from said applying means, substantially the same zone of the at least one of the said preceding and succeeding frames to define with said zone of the current frame a three-dimensional data set of pixels;

(d) means for converting the data set to the frequency domain by applying a 3D fast Fourier transform (FFT) process to the said data set to produce a plurality of frequency components (bins) thereof;

(e) means for applying a Wiener filtering operation to attenuate the said frequency components (bins); and

(f) means for applying the inverse of the said 3D FFT process to produce restored pixels of the said current frame f.

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**5,500,686**

**MOTION ADAPTIVE LUMINANCE SIGNAL/ CHROMINANCE SIGNAL SEPARATION FILTER**

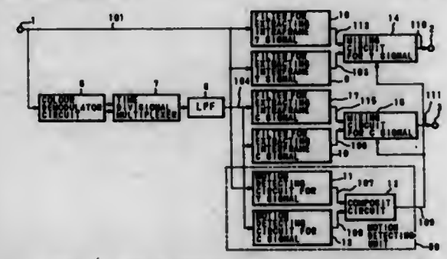
**Noriyuki Yamaguchi; Takuji Kurashita; Mitsuru Ishizuka; Junko Kijima, and Masaharu Yae, all of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 939,437, Sep. 4, 1992, abandoned, which is a continuation of Ser. No. 675,269, Mar. 26, 1991, abandoned. This application Jun. 7, 1994, Ser. No. 255,797**

**Claims priority, application Japan, Mar. 27, 1990, 2-77596; Jul. 16, 1990, 2-189930; Feb. 28, 1991, 3-026290**

**Int. Cl.[6] H04N 9/78**

**U.S. Cl. 348—663** **43 Claims**




1. A filter for motion adaptive Y/C separation for taking out Y signal and C signal independently from V signal of interlace scanning in which C signal is frequency-multiplexed in high frequency band of Y signal, comprising:

a motion detecting unit for detecting motion of images partially by utilizing interframe correlation;

a filter for extracting interframe Y signal for outputting Y signal by interframe Y/C separation, by carrying out separation utilizing interframe correlation when said motion detecting unit detects static image;

a filter for extracting intraframe Y signal for outputting Y signal by intraframe Y/C separation, by carrying out separation utilizing interfield correlation when said motion detecting unit detects motion images;

a Y signal mixing circuit for outputting Y signal by motion adaptive Y/C separation, by mixing said Y signal by interframe Y/C separation with said Y signal by intraframe Y/C separation on the basis of the output of said motion detecting unit;

a color demodulator for color-demodulating a signal from V signal to color difference signal;

a filter for extracting interframe C signal for outputting C signal by interframe Y/C separation, by carrying out separation utilizing interframe correlation when said motion detecting unit detects static images;

a filter for extracting intraframe C signal for outputting C signal by intraframe Y/C separation, by carrying out separation utilizing interfield correlation when said motion detecting unit detects motion images; and

a C signal mixing circuit for outputting C signal by motion adaptive Y/C separation, by mixing said C signal by interframe Y/C separation with said C signal by intraframe Y/C separation according to output of said motion detecting unit.

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**5,500,687**

**CHROMINANCE SIGNAL SEPARATOR USING CHROMINANCE SIGNAL CORRELATION**

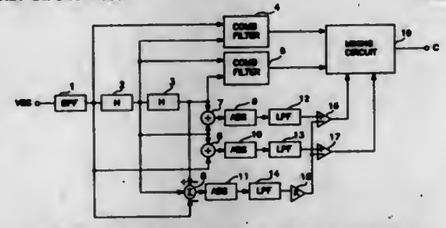
**Takahisa Hatano, Sapporo, and Yoshihisa Nishigori, Itami, both of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Oct. 21, 1994, Ser. No. 327,317**

**Claims priority, application Japan, Jan. 22, 1993, 5-264594**

**Int. Cl.[6] H04N 9/78**

**U.S. Cl. 348—663** **1 Claim**




1. A chrominance signal separating apparatus comprising:

a cascade connection of a plurality of delay means, wherein a first delay means receives a composite color television signal and delays the composite color television signal by a horizontal period and each succeeding delay means, other than said first delay means, delays an output signal generated by a preceding delay means by the horizontal period and a signal output by one of said plurality of delay means is a reference signal;

a plurality of comb filters for receiving said composite color television signal and output signals from said plurality of delay means and for separating a chrominance signal from said composite color television signal;

a plurality of correlation detecting means for receiving said composite color television signal and the output signals from said plurality of delay means and for calculating correlation values between said reference signal and a signal at the vertical vicinity of said reference signal on a screen;

level detecting means for receiving said composite color television signal and the output signals from said plurality of delay means and for detecting a chrominance signal level;

a plurality of comparing means for comparing the outputs of said correlation detecting means with the output of said level detecting means; and

mixing means for mixing the outputs of said comb filters according to the outputs of said plurality of comparing means.



**5,500,688**

**SYNCHRONIZING SIGNAL CLAMPING CIRCUIT OF IMAGE SIGNAL PROCESSING INTEGRATED CIRCUIT**

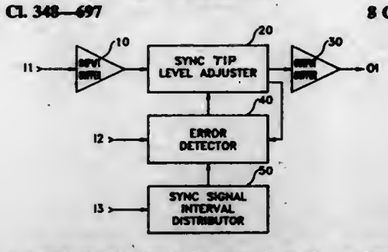
**Do-sang Mok, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea**

**Filed Feb. 28, 1994, Ser. No. 202,650**

**Claims priority, application Rep. of Korea, Feb. 26, 1993, 1993-2976**

**Int. Cl.[6] H04N 5/18**

**U.S. Cl. 348—697** **8 Claims**




1. A synchronizing signal clamping circuit for an integrated image signal processing circuit, comprising:

an input buffer circuit receiving a composite image signal applied to a first input terminal;

a level clamping circuit for clamping a synchronizing signal tip level of said composite image signal received by said input buffer circuit to a clamped synchronizing signal having a clamped tip level in response to an error detecting signal, said level clamping circuit including:

input means receiving said error detecting signal, and

a current mirror adjusting said synchronizing signal tip level to a certain level, in response to a current signal corresponding to said error detecting signal input to said input means;

an output buffer circuit receiving said clamped synchronizing signal tip level and outputting the result to an output terminal;

an error detecting circuit detecting a difference between a reference voltage signal provided to a second input terminal and said clamped synchronizing signal tip level and outputting said difference as said error detecting signal, in response to a control signal; and

a synchronizing signal interval distributor circuit generating said control signal to control said error detecting circuit so that said error detecting circuit detects said difference between said reference voltage signal and said clamped synchronizing signal tip level only for a period of time shorter than an interval of time during which a synchronizing signal applied to a third input terminal is at an active level.

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**5,500,689**

**SYSTEM FOR DETECTING A VIDEO SIGNAL IMAGE INTENSITY GRADIENT**

**Wai-Man Lam, Carmel, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.**

**Filed Oct. 26, 1994, Ser. No. 329,563**

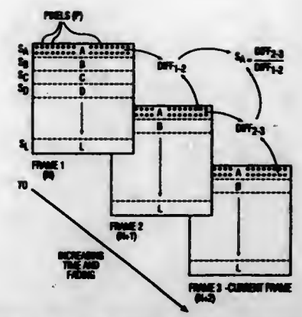
**Int. Cl.[6] H04N 7/28**

**U.S. Cl. 348—699** **7 Claims**

1. In a system for processing an image representative signal, a method for detecting an image intensity gradient among a plurality of image frames including first and second adjacent pairs of adjacent frames, said method comprising the steps of:

(A) partitioning each of said plurality of frames into a predetermined similar arrangement of segments;

(B) summing pixel intensity differences between similarly located pixels for a given segment of a first adjacent pair of said adjacent frames, for producing a first difference signal;




(C) summing pixel intensity differences between similarly located pixels for said given segment of a second adjacent pair of said adjacent frames, for producing a second difference signal;

(D) determining the ratio of the values of said first and second difference signals;

(E) repeating steps (B)–(D) for remaining ones of said segments (B–L); and

(F) generating an indicator signal when said ratio is substantially constant for a predetermined number of said segments.

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**5,500,690**

**TELEVISION APPARATUS PROVIDED WITH A DEVICE FOR SELECTING DIFFERENT SOURCES**

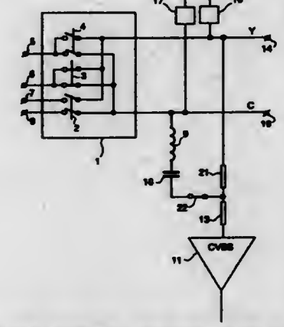
**Philippe Vilard, Houilles, France, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Sep. 28, 1994, Ser. No. 314,561**

**Claims priority, application France, Sep. 29, 1993, 93 11610**

**Int. Cl.[6] H04N 5/268**

**U.S. Cl. 348—706** **22 Claims**




1. A television apparatus comprising: means for selecting a plurality of television signals available from different signal sources, certain signals of which are composite signals which comprise a mixture of a luminance signal and a chrominance signal carried by a subcarrier, whereas other signals are "Y-C" signals in the form of a separate luminance signal and a separate chrominance signal, while at least one of the television apparatus circuits which is to receive one of these signals is adapted to utilize signals in the form of a separate luminance signal and a separate chrominance signal, at least a further one of the television apparatus circuits being adapted to utilize a composite signal, wherein the selection means comprise a switching device comprising;

a plurality of inputs including at least an input having an input terminal "Y" and an input terminal "C" for "Y-C" type signals, and at least a further input having only one terminal for the composite signal,

switches for selecting one of the inputs,

and two separate outputs, one an output "Y" and the other an output "C",

said switches being operated to connect the input terminal "Y" to the output "Y" of the switching device and to connect the input terminal "C" to the output "C" of the switching device when an input of the "Y-C" type is selected, and to connect said further input simultaneously to the two outputs "Y" and "C" when an input of the composite type is selected.

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**5,500,691**

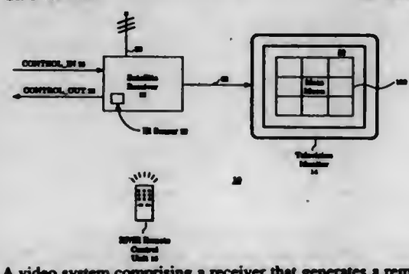
**REMOTE CONTROL IDENTIFIER SETUP IN A VIDEO SYSTEM HAVING BOTH IR AND RF TRANSMITTERS**

**Jeffrey A. Martin, Escondido, and Toshikazu Ide, San Diego, both of Calif., assignors to Sony Corporation, Tokyo, Japan, and Sony Electronics, Inc., Park Ridge, N.J.**

**Filed Jan. 4, 1995, Ser. No. 368,373**

**Int. Cl.[6] H04N *5/44***

**U.S. Cl. 348—734** **12 Claims**



1. A video system comprising a receiver that generates a remote identifier setup display on a television monitor and further comprising a remote control unit having a radio frequency transmitter and an infrared transmitter that enables a user to enter a remote control identifier for the radio frequency transmitter through the remote identifier setup display using the infrared transmitter.

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**5,500,692**

**IMAGE PROJECTING APPARATUS FOR PRODUCING AN IMAGE FOR DISPLAY ON A PROJECTION SCREEN**

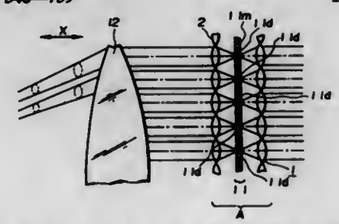
**Kuniharu Onozaka, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Filed Dec. 27, 1993, Ser. No. 173,043**

**Claims priority, application Japan, Dec. 28, 1992, 4-360122**

**Int. Cl.[6] H04N *9/31*; G02F *1/1335***

**U.S. Cl. 348—759** **15 Claims**



1. An image projecting apparatus for producing an image for display on a projection screen, said apparatus comprising:

means for supplying light;

first lens means having a plurality of first microlenses each adapted to receive light from said light means and to respectively project the received light therefrom;

a liquid crystal display having a plurality of pixels arranged in matrix form and a shielding mask arranged adjacent to said plurality of pixels so as to separate each of said pixels, each of said pixels respectively adapted to receive light from one of said first microlenses and project therefrom respective image light;

second lens means having a plurality of second microlenses each receiving the image light from a respective one of said plurality of pixels in said liquid crystal display for projecting parallel image light therefrom;

projection lens means receiving the parallel image light from each of said second microlenses for projecting the same onto said projection screen, said projection lens means including a projection lens having a diameter and an optical center axis; and

means for moving said projection lens in a direction normal to said optical center axis;

said first lens means, said liquid crystal display and said second lens means form an image information radiating unit having a length associated therewith which is smaller than said diameter of said projection lens; and

said first lens means, said liquid crystal display, said second lens means and said projection lens means are integrally arranged so as to form a single unit.

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**5,500,693**

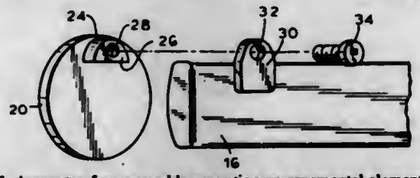
**ORNAMENTAL ELEMENT MOUNTING MEANS**

**Dean M. Friedman, 283 Long Beach Rd., Island Park, N.Y.**

**Filed Oct. 24, 1994, Ser. No. 327,902**

**Int. Cl.[6] G02L *11/02***

**U.S. Cl. 351—52** **6 Claims**



1. Apparatus for removably mounting an ornamental element on the exterior surface of a temple piece of an eyeglass frame, the apparatus comprising a first part to which the ornamental element is fixed, said first part having an internally threaded aperture and a surface adapted to abut the temple piece to orient the ornamental element relative to said temple piece, a second part fixed to and having a portion extending beyond the interior surface of the temple piece, a non-threaded aperture in said extending portion of said second part and an externally threaded screw, said screw being adapted to extend through said aperture in said second part and engage said internally threaded aperture in said first part to removably secure the ornamental element.

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**5,500,694**

**SPECTACLE ASSEMBLY WITH REMOVABLE LENSES**

**Stanley Reever, Lighthouse Point, and Joel Frank, North Miami Beach, both of Fla., assignors to Quick Release, Lighthouse, Fla.**

**Filed Nov. 22, 1993, Ser. No. 155,235**

**Int. Cl.[6] G02C *1/08***

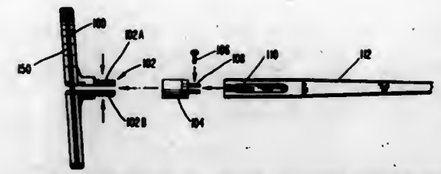
**U.S. Cl. 351—97** **11 Claims**

11. A spectacle assembly comprising:

a spectacle frame for holding a pair of corrective lenses, said frame having left and right eyewires for mounting a left and right eye lens, respectively, said left and right eyewires being partially split into two portions to enable replacement of a lens;

a left and right temple stem attachable to said left and right eyewires, respectively;





a right and left connector element projecting perpendicularly from the plane of the eyewire for clamping together said two portions of said right and left eyewires to secure said right and left lens, and for attaching said left and right temple stems to said spectacle frame;

wherein the spectacle frame is shaped so that left and right eye lenses are interchangeable with other.

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**5,500,695**

**TORIC LENS WITH ORIENTATION WAVE FORMS**

**Steve Newman, 7 Imray St., Sunnybank Hills, QLD 4109, Australia**

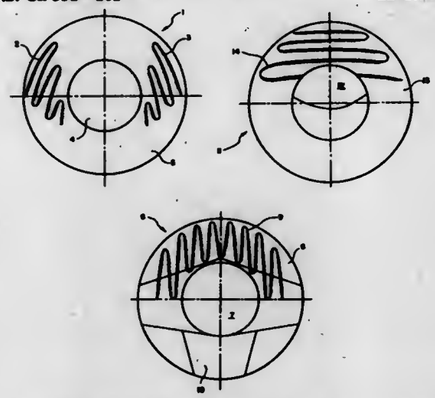
**PCT No. PCT/AU92/00290, § 371 Date Jan. 18, 1994, § 102(e) Date Jan. 18, 1994, PCT Pub. No. WO92/22845, PCT Pub. Date Dec. 23, 1992**

**PCT Filed Jun. 16, 1992, Ser. No. 167,823**

**Claims priority, application Australia, Jun. 17, 1991, PK6713**

**Int. Cl.[6] G02C *7/04***

**U.S. Cl. 351—161** **22 Claims**



1. A contact lens having an optic zone and an outer radial planar zone, the lens comprising an array of contours which are defined by at least one waveform comprising crests and troughs on at least one of the back and front surfaces of the lens, said at least one waveform providing means to enable proper location and orientation of the lens on the eye of a wearer by interaction between said lens, said eye and an eyelid and allowing sufficient gas transmission through said lens.

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**5,500,696**

**OPHTHALMIC APPARATUS INCLUDING AN APPARATUS CONTROL MECHANISM HAVING MULTIPLE MODES**

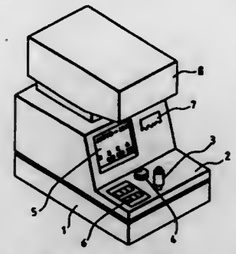
**Takashi Masuda, Yamato; Toshiaki Okumura, Yokohama; Koji Uchida, Yokohama, and Osamu Yamamoto, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Jun. 24, 1994, Ser. No. 265,138**

**Claims priority, application Japan, Jul. 2, 1993, 5-164669**

**Int. Cl.[6] A61B *3/10***

**U.S. Cl. 351—205** **26 Claims**



1. An ophthalmic apparatus comprising:

an apparatus control mechanism for performing an ophthalmic operation for an eye to be examined, said control mechanism having multiple modes; and

a rotary mechanism for inputting information to said control mechanism, said rotary mechanism serving as input means for performing different control operations respectively corresponding to each of the modes.

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**5,500,697**

**OPHTHALMIC APPARATUS FOR MEASURING REFRACTIVE CHARACTERISTIC OF EYE TO BE MEASURED**

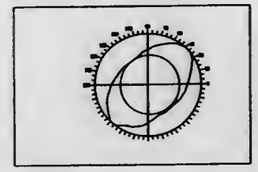
**Masanao Fujieda, Toyohashi, Japan, assignor to Nidek Co., Ltd., Japan**

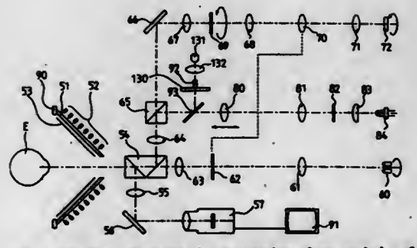
**Filed Jul. 25, 1994, Ser. No. 280,192**

**Claims priority, application Japan, Jul. 30, 1993, 5-208434; Jan. 29, 1993, 5-294407**

**Int. Cl.[6] A61B *3/10***

**U.S. Cl. 351—212** **14 Claims**





1. An ophthalmic apparatus for measuring characteristic of an eye to be measured, the ophthalmic apparatus comprising:

projection means for projecting a target onto a fundus of the eye in many meridional directions in a cornea of the eye so as to substantially cover all over the cornea in substantially all meridional directions of 360 degrees;

detecting means for detecting a position of a target image projected onto the fundus by the projection means;

calculation means for calculating refractive power values in the meridional directions based on a detected result through the detection means; and

display means for graphically displaying distribution of the refractive power values calculated by the calculation means.

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**5,500,698**

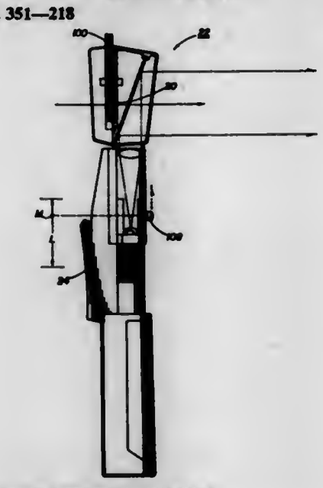
**OPTICAL INSTRUMENTS SUCH AS RETINOSCOPES WHICH MAY INCORPORATE MULTIPLE LENS ASSEMBLIES AND METHODS OF CALIBRATING SUCH INSTRUMENTS**

**Clinton N. Sims, 3432 West Riverside Dr., Ft. Myers, Fla. 33901**

**Continuation-in-part of Ser. No. 101,402, Aug. 3, 1993, Pat. No. 5,430,508, which is a continuation-in-part of Ser. No. 893,245, Jun. 3, 1992, Pat. No. 5,285,224, which is a continuation-in-part of Ser. No. 526,395, May 21, 1990, Pat. No. 5,120,124, which is a continuation-in-part of Ser. No. 427,724, Oct. 27, 1989, Pat. No. 5,104,214, which is a continuation-in-part of Ser. No. 310,334, Feb. 13, 1989, Pat. No. 4,943,162, which is a continuation-in-part of Ser. No. 116,322, Nov. 2, 1987, Pat. No. 4,840,479, which is a continuation-in-part of Ser. No. 23,900, Mar. 16, 1987, Pat. No. 4,820,040, which is a continuation-in-part of Ser. No. 670,398, Nov. 9, 1984, abandoned. This application Jan. 21, 1994, Ser. No. 184,828**

**Int. Cl.[6] A61B *3/10***

**U.S. Cl. 351—218** **5 Claims**



2. An optical instrument comprising:

a. a housing having a length;

b. a lens positioned within the housing;

c. a light source positioned within the housing so as to be moveable along its length relative to the lens; and

d. means, adjustable when the optical instrument is in use, for limiting movement of the light source along the length of the housing beyond a selected location.

**5,500,699**

**SPATIAL FREQUENCY AND CONTRAST SENSITIVITY TEST CHART AND PROTOCOL**

**Arthur P. Ginsburg, 130 Ryan Industrial Ct., #105, San Ramon, Calif. 94583**

**Division of Ser. No. 628,786, Dec. 17, 1990, Pat. No. 5,414,479. This application Mar. 8, 1995, Ser. No. 400,913**

**Int. Cl.[6] A61B *3/02***

**U.S. Cl. 351—239** **2 Claims**

[redacted]

1. Vision sensitivity evaluation apparatus including:

means for presenting a perceivable multiplicity of distinctly separated information areas;

each of said information areas comprising successively dimmer regions between successive edges of said information areas, the regions of which have a substantially linear character and the contrast level and/or spatial frequencies or size of occurrence of which differ in different information areas;

the edges of each information area successively tapered in said contrast level and/or frequency and/or size of occurrence to approach the level of a surround;

the surround of said information areas having a value of mean luminance which tapers to the mean luminance of the information area being interrogated;

indicia immediate the boundary of the location of each information area against said surround for indicating to the subject or system being tested the location of the information area for interrogation; and

whereby successive information areas are presented in a range of contrasting luminance and spatial frequency or size of occurrence therein of the light and dark regions which upon observation by a person or system may be used as an accurate basis for determining the sensitivity and range of perception.

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**5,500,700**

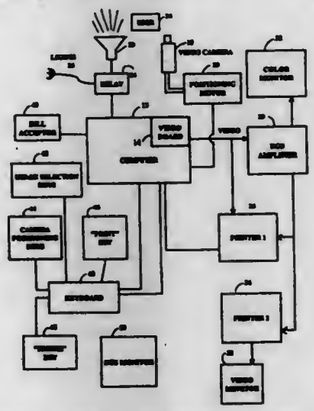
**METHOD OF CREATING A COMPOSITE PRINT INCLUDING THE USER'S IMAGE**

**Yefim Massarsky, Newton, Mass., assignor to Foto Fantasy, Inc., Newton, Mass.**

**Filed Nov. 16, 1993, Ser. No. 153,674**

**Int. Cl.[6] G03B *29/00***

**U.S. Cl. 354—76** **19 Claims**



1. A method of creating a composite print including a preestablished background portion and a live portion, comprising the steps of:

providing a plurality of different preestablished background images;

allowing a user to select one background image at a time;

automatically accepting a first sum of money;

obtaining with an imaging device an image of the user;

providing an electronic display device;

creating an electronic composite image or the selected background image and the obtained user image;

displaying on the display device the composite image, but only after the acceptance of the first sum of money;

providing an image printing device;

automatically accepting a second sum of money; and

enabling the printing of the composite image on the image printing device, but only after automatically accepting the second sum of money.



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**5,500,701**

**DATA RECORDING MODULE DEVICE FOR CAMERA AND CAMERA SYSTEM USING THE SAME**

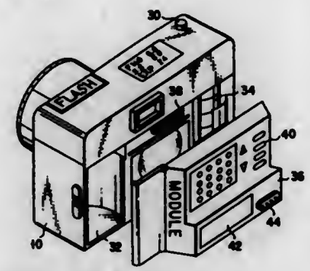
**Junichi Itoh, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan**

**Filed Oct. 25, 1993, Ser. No. 142,855**

**Claims priority, application Japan, Jan. 26, 1992, 4-287829**

**Int. Cl.[6] C03B *17/24***

**U.S. Cl. 354—106** **13 Claims**




1. A camera system comprising:

a camera body including:

a first microcomputer incorporated in said camera body, said microcomputer being capable of transmitting data to the outside of said camera body, and

a film feed mechanism controlled by said first microcomputer to feed a film loaded in said camera body; and

a rear cover module completely detachable with respect to said camera body and including:

a second microcomputer incorporated in said rear cover module,

a storage unit for storing the data, transmitted from said first microcomputer, in accordance with a control command from said second microcomputer,

a magnetic head for magnetically recording data on a magnetic recording portion formed on the film, and

a magnetic recording circuit for reading out the data stored in said storage unit in accordance with a control signal from said second microcomputer, and recording the data on the magnetic recording portion,

wherein said first microcomputer is prohibited from transmitting data to said rear cover module when said first microcomputer detects that said rear cover module is not engaged with said camera body.

**5,500,702**

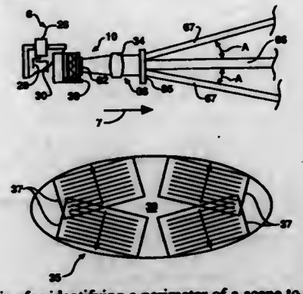
**DEVICE FOR IDENTIFYING A PERIMETER OF A SCENE TO BE RECORDED BY AN IMAGE RECORDING APPARATUS**

**Mark M. Meyers, Hamlin, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed May 27, 1994, Ser. No. 250,867**

**Int. Cl.[6] G03B *13/20***

**U.S. Cl. 354—165** **7 Claims**



1. A device for identifying a perimeter of a scene to be recorded by an image recording apparatus, comprising:

means for effecting a plurality of visible radiation beams which are arranged to impinge on a scene substantially along a perimeter of the scene, said beam effecting means including a radiation emitter for emitting visible radiation and means for dividing visible radiation emitted from said emitter into a plurality of visible radiation beams, said dividing means including one or more holographic and/or diffractive optical elements; and

means for activating said beam effecting means.

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**5,500,703**

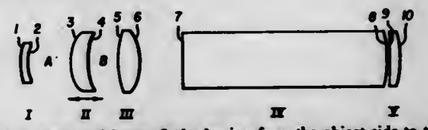
**REAL IMAGE ZOOM VIEWFINDER**

**William T. Gosney, Jr., Fairport, and Lee R. Estelle, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Jan. 22, 1994, Ser. No. 263,844**

**Int. Cl.[6] G03B *13/10***

**U.S. Cl. 354—222** **8 Claims**



8. A zoom real image finder having from the object side to the eye side a zoom portion consisting of a fixed negative element and a positive element movable for zooming, a single element field lens, inverting optics and an eyepiece, wherein the single movable element in the zoom portion provides a zoom ratio of 2:1 with an apparent accommodation at the eye which never deviates more than a total of 0.5 diopters.

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**5,500,704**

**APPARATUS FOR PARTIALLY INTERCEPTING LIGHT IN FINDER OF CAMERA**

**Kiyoshi Kawano, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

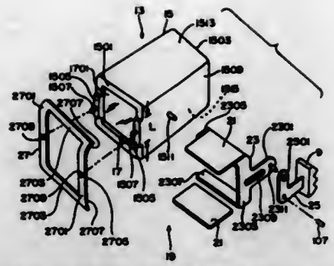
**Filed May 17, 1995, Ser. No. 443,263**

**Claims priority, application Japan, May 17, 1994, 6-126795**

**Int. Cl.[6] G03B *13/10***

**U.S. Cl. 354—222** **11 Claims**

1. An apparatus for partially intercepting light in a viewfinder of a camera, comprising:



a finder block associated with a camera body;
a mask member for varying a size of a field frame of the viewfinder, said mask member comprising a flexible light intercepting thin material;
a selection swiech actuatable to move said mask member to vary the size of the field frame of said viewfinder;
a power transmission mechanism which moves said mask member along a surface of said finder block responsive to actuation of said selection switch; and,
a guide member provided along a side of the finder block to guide the movement of said mask member in a direction perpendicular to the optical axis of the viewfinder along the side of said finder block.

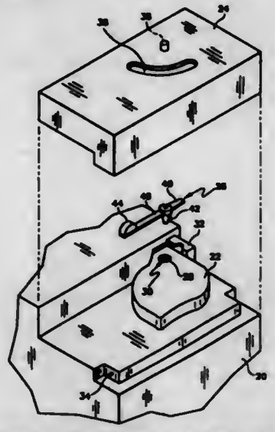
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**5,500,705**

**APPARATUS AND METHOD FOR SECURING A THRUST FILM CARTRIDGE**

Stanley W. Stephenson, III, Spencerport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 9, 1995, Ser. No. 370,885
Int. Cl.[6] G03B *17/02;19/10;17/26*
U.S. Cl. 354—288 21 Claims



1. An apparatus for receiving a thrust film cartridge and for moving a film door between open and closed positions, said apparatus comprising:
(a) a camera body having a cartridge compartment adapted to receive a thrust film cartridge;
(b) a camera door interconnectable with said camera body, said camera door being movable relative to said camera body between an open position, to allow insertion and removal of a thrust film cartridge from said cartridge compartment, and a closed position, to form a substantially light tight seal over said cartridge compartment; and
(c) an actuating device comprising:
(i) a latch member movable between a locked position, to lock said camera door in said closed position, and an unlocked position, to allow said camera door to move between said open and closed positions;
(ii) a lug member operatively associated with said latch member, said lug member being engageable with a film door of a thrust film cartridge to move the film door between open and closed positions;
(iii) a handle member operatively associated with said latch member, said handle member being movable by a user of said apparatus to provide an unlocking force to said latch member and to move said latch member from said locked position to said unlocked position; and
(iv) force limiting means for limiting the force which can be applied by said handle member on said latch member.

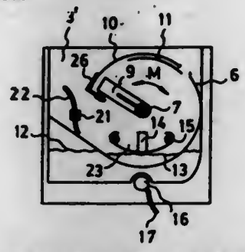
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**5,500,706**

**DEVELOPING PROCEDURE AND MACHINE TO CARRY OUT THE PROCEDURE**

Gregorio R. Felipe, Vitoria-Gasteiz, Spain, assignor to F.M. Control, S.L., Victoria-Gasteiz, Spain

Filed Oct. 4, 1994, Ser. No. 317,562
Claims priority, application Spain, Jan. 6, 1993, 9302091
Int. Cl.[6] G03D *3/02*
U.S. Cl. 354—326 8 Claims



1. A developing procedure, of the type in which material to be developed is housed in an interior of a liquid vessel, into which a first liquid is introduced so that the material can be immersed in the first liquid for a certain time, with the vessel then being emptied after the certain time, followed by introduction and later draining of a second liquid, so that total developing of the material can be thus carried out in successive operations, the procedure comprising:
arranging the material to be developed on an end of a material holder secured to an end of a carrier arm connected to a shaft which can rotate alternately in one direction and an other direction, with the material holder having appropriate guides;
feeding developing liquid into a bottom of an interior of a fixed tank which is approximately cylindrical in shape and whose centre coincides with that of the shaft of the two-directional carrier arm, with the shaft being horizontal and the tank being kept at a suitable temperature;
making the material holder with the material turn alternately in the one direction and the other direction, so that for a period of time the material passes through the first liquid;
extracting or draining the first liquid from the tank and feeding the second liquid into the bottom of the tank, making the material holder and the material pass in the first direction and the second direction through the second liquid;
repeating cycles of feeding a developing liquid into the tank, alternate rotating of the material holder with the material to be developed through the developing liquid, and draining of the developing liquid, until the material is developed;
controlling a height of each developing liquid in a tank interior of the tank by means of a maximum-minimum probe.

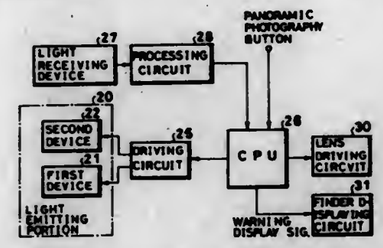


**5,500,707**

**AUTOFOCUSING CONTROLLING APPARATUS FOR CAMERA**

Hideo Yoshida, Omiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

Division of Ser. No. 953,127, Sep. 29, 1992, Pat. No. 5,321,460.
This application Feb. 16, 1994, Ser. No. 197,339
Claims priority, application Japan, Jan. 4, 1991, 3-284217; Jan. 15, 1991, 3-296270; Jan. 15, 1991, 3-296271
Int. Cl.[6] G03B *13/36;17/18;37/00*
U.S. Cl. 354—403 17 Claims



1. An autofocusing controlling apparatus for a panoramic camera comprising:
a light emitting portion including a light emitting device for projecting a light beam onto an object of photography in a panoramic photography region and a light emitting device for projecting a light beam onto a portion of said object outside the panoramic photography region;
a light receiving device for receiving the beams reflected from said object of photography in and outside the panoramic photography region so as to measure distance of said object outside the panoramic photography region;
a detecting circuit used when a panoramic mode is selected for detecting a whether or not said object in the panoramic photography region extends beyond the panoramic photography region, and which receives light reception signals from said light receiving device.

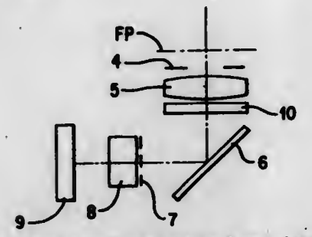
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**5,500,708**

**FOCUS DETECTION DEVICE HAVING INFRARED FILTER**

Keiji Ohsawa, Tokyo, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Oct. 19, 1994, Ser. No. 325,569
Claims priority, application Japan, Jan. 19, 1993, 5-260571
Int. Cl.[6] G03B *3/00*
U.S. Cl. 354—406 23 Claims



1. A focus detection device that detects focus using light rays transmitted through an imaging lens having a predetermined focusing plane, said focus detection device comprising:
a field lens positioned near said predetermined focusing plane;
at least one pair of secondary imaging lenses;
an infrared reduction filter that reduces infrared light rays, said infrared reduction filter being positioned between said field lens and said at least one pair of secondary imaging lenses, said infrared reduction filter located closer to said field lens than to said at least one pair of secondary lenses; and
a photo sensor, wherein the light rays transmitted through said imaging lens travel sequentially through said field lens, said infrared reduction filter and said at least one pair of secondary imaging lenses, whereby said at least one pair of secondary imaging lenses forms said light rays into images on said photo sensor.

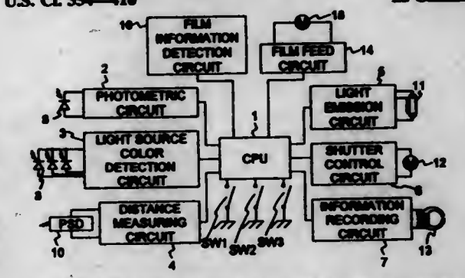
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**5,500,709**

**LIGHT SOURCE COLOR INFORMATION RECORDING APPARATUS**

Kazuyuki Kazami, Tokyo; Norikazu Yokoyama, Yokohama; Youichi Yamazaki, and Hideo Hibino, both of Kawasaki, all of, Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Dec. 21, 1994, Ser. No. 360,448
Claims priority, application Japan, Dec. 22, 1993, 5-324392
Int. Cl.[6] G03B *15/05;17/24*
U.S. Cl. 354—416 22 Claims



1. A light source color information recording apparatus comprising;
a recording control device that records light source color information related to a color of light illuminating a photographic subject detected by a light source color information detection device, in a specific information recording medium for each photographic frame, and
a prohibiting device that prohibits recording of said light source color information performed by said recording control device, for photographic frames on which photographing using a flash device, has been performed.

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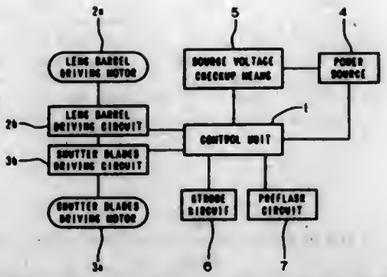
**5,500,710**

**SOURCE VOLTAGE MONITOR FOR A PHOTOGRAPHIC CAMERA**

Tatuo Saito, and Haruo Onozuka, both of Ohmiya, Japan, assignors to Fuji Photo Optical Co., Ltd., Ohmiya, Japan

Continuation of Ser. No. 81,526, Jun. 23, 1993, abandoned.
This application Dec. 15, 1994, Ser. No. 357,091
Claims priority, application Japan, Jun. 25, 1992, 4-191669
Int. Cl.[6] G03B *7/26;15/02*
U.S. Cl. 354—484 18 Claims

1. A camera, comprising:
a film transporting circuit having a film transporting motor;
a lens barrel driving circuit having a lens barrel driving motor used to move the lens barrel, which holds an objective therein, selectively forward or backward to change a focal distance of the objective;
a shutter blade driving circuit having a shutter blade driving motor used to open and close shutter blades for every exposure;
a built-in strobe circuit;
a common power source;
a photographing mode selector for selecting one of a plurality of different photographing modes, the selected photographing mode requiring a particular power source voltage level during exposure;




a controller coupled to said mode selector and to said circuits for selectively enabling one or more particular ones of said circuits according to the mode of photographing selected by said selector in order to apply a load to the power source that will result in a power draw that is related to the selected photographing mode; and

a monitor coupled to said common power source, said monitor determining, prior to exposure, whether the source voltage is at a level sufficiently high for a selected mode of photographing, wherein said determination is performed by said monitor with said controller enabling said one or more particular ones of said circuits according to the selected mode of photographing, whereby the power drawn from said common power source is varied during testing according to the mode of photographing selected and wherein said monitor circuit determines whether the source voltage level is greater than a fixed reference voltage predetermined independently of the selected mode of photographing to check said source voltage.

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**5,500,711**

**CAMERA EQUIPPED WITH WARNING FUNCTION AND METHOD**

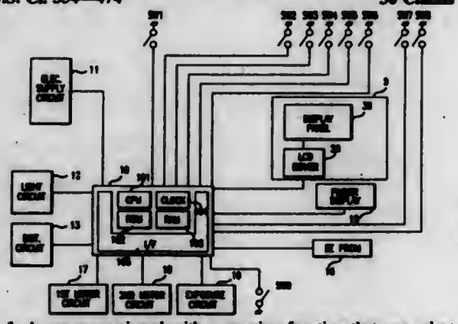
**Nobuaki Sasagaki, and Takashi Soeguan, both of Kanagawa, Japan, assignors to Nikon Corporation, Tokyo, Japan**

**Filed Jan. 25, 1995, Ser. No. 377,604**

**Claims priority, application Japan, Feb. 4, 1994, 6-013028**

**Int. Cl.[6] G03B 17/18**

**U.S. Cl. 354—474** **30 Claims**



1. A camera equipped with a warning function that can select and display a target parameter from among multiple parameters that have been prepared in advance, comprising:

a display device with a dot matrix display component capable of displaying a first display screen showing multiple selection branches used for parameter selection, displaying a second display screen when a particular parameter has been selected and confirmed, and displaying a warning display indicative of an appropriate warning; and

a controller that controls the action of the camera including monitoring of each of several camera components and determination of serious and not serious warning conditions;

wherein when the result of the camera monitoring reveals a condition that requires a warning, the controller controls display of the warning display in both the first and second display screens if the warning relates to a condition that has been determined in advance to be a serious condition, the warning display being displayed only in the second display screen if the warning relates to a condition that is not serious.

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**5,500,712**

**METHOD AND EQUIPMENT FOR PRINTING 3-D STEREOGRAPH**

**Hiroshi Miyawaki, Wakayama; Mitsuhiko Itojima, Naga; Takayuki Oka, Wakayama; Kazuyoshi Yamamoto, Kainan; Toshiro Akira, Wakayama, and Masaaki Tsuji, Hannan, all of, Japan, assignors to Noritsu Koki Co., Ltd., Wakayama, Japan**

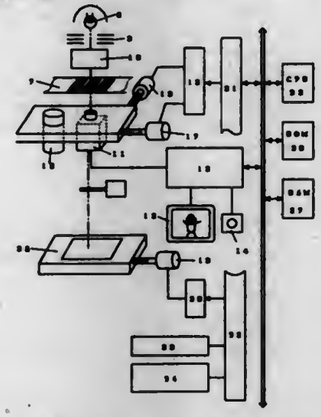
**PCT No. PCT/JP93/00890, § 371 Date Feb. 28, 1994, § 102(e) Date Feb. 28, 1994, PCT Pub. No. WO94/00798, PCT Pub. Date Jan. 6, 1994**

**PCT Filed Jun. 29, 1993, Ser. No. 199,222**

**Claims priority, application Japan, Jun. 30, 1992, 4-195974; Jul. 2, 1992, 4-199209**

**Int. Cl.[6] G03B 27/32**

**U.S. Cl. 355—22** **1 Claim**



1. A three dimensional (3D) photographic printing method in which a lenticular sheet is used and exposure done, said photographic printing method comprising the steps of:

measuring by means of a negative detection device a position shift of a key subject for a multiple of negatives that constitute basic substances for composing a single 3D photograph, the key subject being set on a principal object for photographing;

comparing the position shift of a key subject with a predetermined threshold value;

introducing a correction for regulating the spacial parallax of a background object in the event that the shift in said key-subject set on the principal object exceeds the threshold value; and

introducing a correction for regulating the spacial parallax of a foreground object in the event that the shift in the key-subject set on the principal object is below a threshold value.



**5,500,713**

**COLOR PRINTER FOR PRINTING PHOTOGRAPHS**

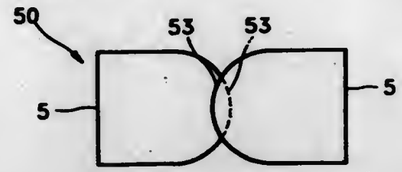
**Masahiko Kuwayama, Urawa, and Yoshihiro Yamamoto, Tokyo, both of, Japan, assignors to Samsung Aerospace Industries, Ltd., Changwon, Rep. of Korea**

**Filed Sep. 23, 1994, Ser. No. 310,872**

**Claims priority, application Japan, Sep. 24, 1993, 5-056527 U**

**Int. Cl.[6] G03B 27/60**

**U.S. Cl. 355—27** **1 Claim**




1. A photograph-printing printer comprising:

an exposing portion for performing an exposure on a sheet of photographic paper;

a processing portion for developing and fixing the exposed photographic paper;

a collecting portion for collecting processing photographic paper;

an optical system for projecting light toward said exposing portion;

said optical system comprising a light source, color filters for color-correcting light from said light source in a light passing area, and a light diffusion box for diffusing the light transmitted from said color filters;

said color filters each having a pair of opposing filter members interposing said light passing area;

said pair of filter members being installed so as to be straightly movable across the optical axis of said light passing area to thereby be superposed with each other; and

wherein the central portion of the opposing front ends of said pair of filter members are protruded in the direction of superposition of said pair of filter members, so that the superposition begins from the center of said light passing area.

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**5,500,714**

**PROCESS CARTRIDGE, METHOD FOR ASSEMBLING PROCESS CARTRIDGE AND IMAGE FORMING APPARARATUS**

**Masahiko Yashiro, Yokohama; Shinichi Sasaki, Fujisawa; Isao Ikemoto, Kawasaki; Koji Miura, Sagamihara; Toshiyuki Karakama, Tokyo, and Atsushi Numagami, Hadano, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 70,704, Jun. 2, 1993, abandoned. This application Sep. 16, 1994, Ser. No. 307,045**

**Claims priority, application Japan, Sep. 4, 1992, 4-260613; Sep. 24, 1992, 4-277761**

**Int. Cl.[6] G03G 15/00**

**U.S. Cl. 355—200** **84 Claims**

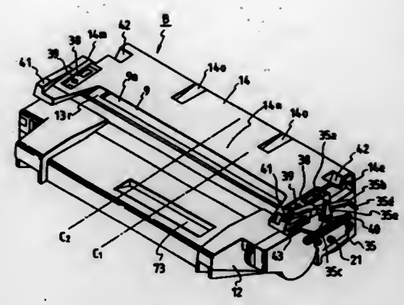
1. A process cartridge removably mountable to a main body of an image forming apparatus, said process cartridge comprising:

a frame;

an image bearing member;

process means acting on said image bearing member; and

a gripper portion for gripping the process cartridge, said gripper portion being provided on said frame at a position offset from a longitudinal center of said frame toward a side of the process cartridge that is subjected to a greater mounting resistance generated by engagement between the process cartridge and an engaging member provided on the main body, when the process cartridge is mounted onto the main body.



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**5,500,715**

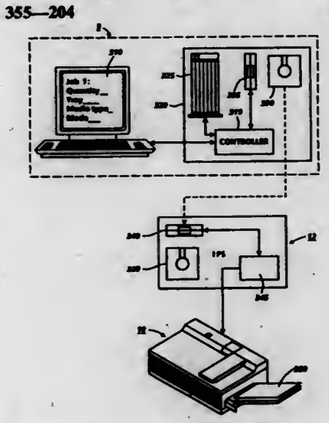
**PRINT JOB HANDLING MENU SELECTION APPARATUS AND METHOD**

**Luong N. Ta; Robert J. Pesar, and Walter F. Wafler, all of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Jun. 3, 1994, Ser. No. 253,455**

**Int. Cl.[6] G03G 21/00**

**U.S. Cl. 355—204** **24 Claims**




1. An apparatus for assembling printing option menu selections to form a final set of printing instructions to a printer for a print job, comprising:

a first means for accepting a first set of printing instructions;

a second means for accepting a second set of printing instructions; and

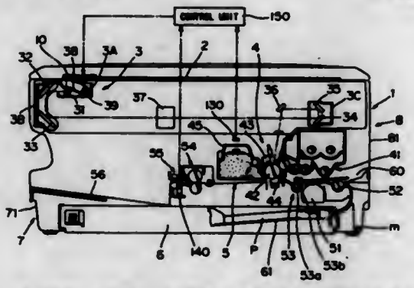
a processor for maintaining a default set of printing instructions at a printer, said processor being associated with said first accepting means and said second accepting means to combine the first set of printing instructions, the second set of printing instructions and the default set of printing instructions so as to compile the final set of printing instructions for completing the print job.

**5,500,716**

**APPARATUS WHICH DETECTS WHEN MORE THAN A PREDETERMINED AMOUNT OF WASTE TONER ACCUMULATES BEFORE THE EXPIRATION OF THE PHOTOCONDUCTIVE DRUM MATERIAL SERVICE LIFE**

Hiroki Morishita; Susumu Taniguchi, and Shinichi Kotera, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Mar. 8, 1995, Ser. No. 400,815
Claims priority, application Japan, Mar. 15, 1994, 6-044221
Int. Cl.[6] G03G *15/00;21/10*
U.S. Cl. 355—206 3 Claims



1. An image forming apparatus utilizing a photoconductive material having a predetermined service life, said apparatus comprising:

a toner collecting box in which toner waste removed by cleaning from said photoconductive material after image transfer is collected, said collecting box having a capacity exceeding the maximum volume of toner that would be used under normal conditions by the time that the service life of said photoconductive material expires;

life expiry detecting means for detecting the expiration of the service life of said photoconductive material;

fullness detecting means for detecting when said toner collecting box is full of toner; and

abnormality warning means for indicating an abnormality when said fullness detecting means detects that said toner collecting box is full before said life expiry detecting means detects the expiration of the service life of said photoconductive material.

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**5,500,717**

**JOB STORAGE/RETRIEVAL SYSTEM AND METHOD FOR REPRODUCTION APPARATUS**

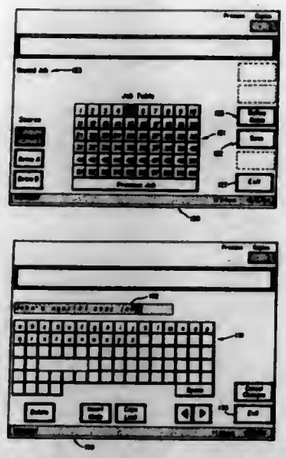
Frederick E. Altrieth, III, Scottsville, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 3, 1995, Ser. No. 398,467
Int. Cl.[6] G03G *21/00*
U.S. Cl. 355—209 14 Claims

1. In reproduction apparatus of the kind having a plurality of operating features for producing copy jobs and an operator control communication interface including: (1) display means for indicating selectable operating features on a selection screen, (2) signal means for generating a set of signals in accord with selections on the selection screen of said display means, (3) control means responsive to said signals set for actuating said apparatus to produce a copy job in accord with said selections and (4) memory means for storing copy data including the signal sets indicative of the selected job operating features and a job number retrieval code, the improvement wherein said control communication interface further comprises:

(i) means for addressing said display means with a job naming screen indicating a plurality of selectable job description characters;

(ii) means responsive to operator selections of said job description characters for recording a multicharacter job description;



(iii) means for storing said recorded job description in said memory means, in association with the related job number retrieval code and corresponding operating features signals set; and

(iv) means, responsive to address by said job number retrieval code, for displaying said recorded job description.

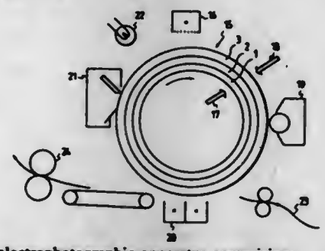
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**5,500,718**

**ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER AND ELECTROPHOTOGRAPHIC DEVICE USING THE SAME**

Yuichi Hashimoto, Tokyo; Shoji Amamiya, Sagamihara, and Teigo Sakakibara, Tokyo, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 985,438, Dec. 3, 1992, Pat. No. 5,338,632, which is a continuation of Ser. No. 591,761, Oct. 2, 1990, abandoned. This application Jun. 30, 1994, Ser. No. 269,360
Claims priority, application Japan, Jan. 2, 1989, 1-255324
Int. Cl.[6] G03G *13/00;15/00;15/30*
U.S. Cl. 355—210 15 Claims



1. An electrophotographic apparatus comprising:

an electrophotographic photosensitive member and at least two image exposure means,

said electrophotographic photosensitive member comprising a light-transmissive electroconductive substrate and a photosensitive layer on said substrate, said photosensitive layer comprising a charge generating material and a charge transporting material, photoconductive carriers formed by said charge generating material and said substrate being more in number than photoconductive carriers formed by said charge generating material and said charge transporting material,

said image exposure means being means which irradiate image exposure light from a side of said substrate and from said photosensitive layer side, wherein photosensitivity of the electrophotographic photosensitive member to light irradiated from the substrate side is different from photosensitivity of the electrophotographic photosensitive member to light irradiated from the photosensitive layer side.



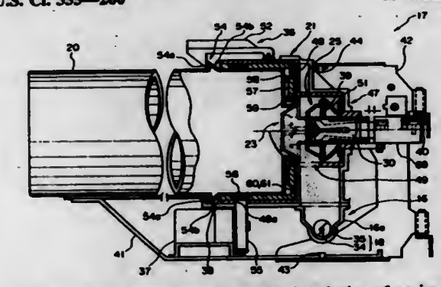
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**5,500,719**

**DEVELOPER REPLENISHING DEVICE AND DEVELOPER CONTAINER FOR USE THEREWITH**

Hideo Ichikawa, Numazu; Takeshi Saito, Tokyo; Sunao Ikeda, Numazu; Nobuhiro Makita, Numazu; Seiji Ozawa, Numazu; Shigeru Yoshiki, Kawasaki, and Takaaki Yanagisawa, Yokohama, all of, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 174,698, Dec. 28, 1993, Pat. No. 5,455,662. This application Feb. 10, 1995, Ser. No. 386,875
Claims priority, application Japan, Dec. 30, 1992, 4-361012
Int. Cl.[6] G03G *15/06*
U.S. Cl. 355—260 35 Claims



1. A device for replenishing a developing device of an image forming apparatus with a developer, comprising:

a developer container containing a developer and having a mouth portion;

holding means communicated to a developer replenishing section for holding said developer container while orienting said mouth portion toward said developer replenishing section;

a lid holding said mouth portion closed; and

detaching means for detaching said lid from said mouth portion of said developer container while said developer container is held by said holding means.

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**5,500,720**

**BIAS APPLICATION CONTROL DEVICE FOR IMAGE FORMING APPARATUS USING REVERSE DEVELOPMENT**

Kazunori Karasawa, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 29, 1993, Ser. No. 175,126
Claims priority, application Japan, Dec. 30, 1992, 4-361014
Int. Cl.[6] G03G *15/08*
U.S. Cl. 355—265 9 Claims

6. An image forming apparatus comprising:

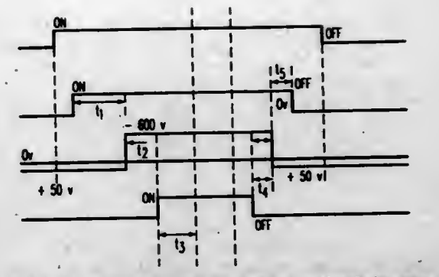
charging means for charging a surface of an image carrier;

exposure means for a forming latent image on an area of the surface of the image carrier;

development means, including at least one toner carrier device, for developing the latent image by supplying toner from said at least one toner carrier device;

bias application means for applying bias voltage to the at least one toner carrier device, including first means for applying a first polarity development bias voltage and second means for applying a second polarity bias voltage having a polarity opposite that of the first polarity and opposite that of toner carrier; and

control means for controlling the bias application means so that the application of the second polarity bias voltage starts before the operation of the image carrier starts, so that the application of the bias voltage of the second polarity stops when the application of the first polarity development bias voltage starts, and so that application of the bias voltage of the first polarity starts a predetermined time after said charging means charges the surface of the image carrier and stops a predetermined time before said charging means stops charging the surface of said image carrier.



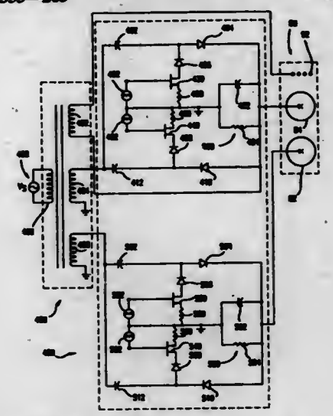
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**5,500,721**

**POWER SUPPLY TOPOLOGY ENABLING BIPOLAR VOLTAGE OUTPUT FROM A SINGLE VOLTAGE INPUT**

John M. Randall, Webster, N.Y., and Clifford K. Friend, Tehachapi, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 3, 1995, Ser. No. 367,608
Int. Cl.[6] G03G *15/00*; H02M *3/00*
U.S. Cl. 355—265 35 Claims



1. A power supply circuit comprising:

a first capacitor having a first end connected to a first input connector;

a first diode having an anode connected to a second end of the first capacitor and a cathode connected to an output connector;

a second diode having a cathode connected to the anode of the first diode;

a first current control means having a current path between an anode of the second diode and a reference connector, a controller of the first current control means being connected to a second input connector;

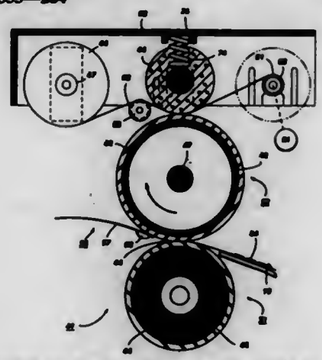
a second capacitor having a first end connected to the first input connector;

a third diode having a cathode connected to a second end of the second capacitor and an anode connected to the output connector;

a fourth diode having an anode connected to the second end of the second capacitor;
a second current control means having a current path between a cathode of the fourth diode and the reference connector, a controller of the second current control means being connected to a third input connector; and
an RC circuit connected between the output connector and the reference connector, the RC circuit having a third capacitor and a first resistor connected in parallel.

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**5,500,722**
**WEB WITH TUBE OIL APPLICATOR**
**Robert M. Jacobs, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.**
**Filed Aug. 3, 1992, Ser. No. 923,651**
**Int. Cl.[6] G03G *15/20***
**U.S. Cl. 355—284** **8 Claims**

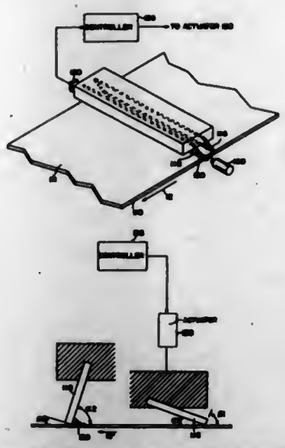


1. Apparatus for applying offset preventing liquid to a fuser roll including:
a supply member;
a rotatable take-up member;
an oil impregnated web member having one end attached to said supply member and its other end attached to said take-up member, said oil impregnated web member containing a predetermined quantity of oil for delivering a predetermined amount of oil to the surface of said fuser member;
a pressure roll in engagement with said oil impregnated web member and positioned to provide a contact nip for said oil impregnated web member with said fuser roll;
and means for applying oil to said oil impregnated web member such that said oil impregnated web member can selectively deliver a quantity of oil in excess of said predetermined amount of oil to the surface of said fuser member.

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**5,500,723**
**METHOD AND APPARATUS EMPLOYING VARIABLE PRESSURE TO CLEAN A SUBSTRATE IN A PRINTING APPARATUS**
**Ronald E. Godlove, Bergen, N.Y., assignor to Xerox Corporation, Stamford, Conn.**
**Filed Dec. 30, 1993, Ser. No. 176,448**
**Int. Cl.[6] G03G *21/00***
**U.S. Cl. 355—296** **14 Claims**

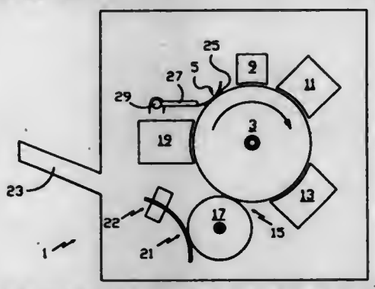
9. An apparatus comprising:
a substrate;
a cleaning member configured to remove residual particles from the substrate;
means for moving the substrate relative to the cleaning member;
means for generating a signal indicating an amount of residual particles on the substrate, the generating means including:



a light source for directing light across and above a surface of the substrate toward a target, so that an amount of residual particles on the substrate at least partially blocks the light,
a sensor for detecting the amount of light received by the target; and
means, responsive to the signal, for causing the cleaning member to apply a variable pressure to the substrate.

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**5,500,724**
**PHOTOCONDUCTOR FOR ABRASION IN LIQUID SYSTEMS**
**Alan S. Campbell; Donald L. Elbert; William C. McCornack, and Eric L. Ziercher, all of Lexington, Ky., assignors to Lexmark International, Inc., Greenwich, Conn.**
**Continuation of Ser. No. 239,883, May 9, 1994, abandoned.**
**This application Mar. 23, 1995, Ser. No. 409,622**
**Int. Cl.[6] G03G *21/00***
**U.S. Cl. 355—297** **3 Claims**



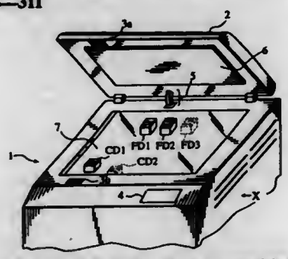
1. An imaging apparatus comprising an endless member having a photosensitive surface ending at an outer boundary, a charging station positioned at a first location to charge said photosensitive surface as said photosensitive surface is moved, an imaging station positioned at a second location past said first location to discharge said photosensitive surface in an image pattern as said photosensitive surface is moved, a liquid toning station positioned at a third location past said second location to develop said image on said photosensitive member with liquid toner, a transfer station positioned at a fourth location past said third location to transfer said toned image from said photosensitive surface for ultimate transfer of said toned image to paper or other substrate for delivery out of said imaging apparatus, a cleaning station positioned at a fifth location past said fourth location, said cleaning station substantially drying and smoothing said photosensitive surface by removing liquid and loose particles from said photosensitive surface, and



an abrasive particles containing abrasive member positioned between said fifth location and said first location and pressing said outer boundary of said photosensitive surface sufficient for said abrasive particles to physically disturb said photosensitive surface while not roughening said photosensitive surface.

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**5,500,725**
**ORIGINAL DOCUMENT READING DEVICE CAPABLE OF AUTOMATICALLY DETECTING THE SIZE OF AN ORIGINAL DOCUMENT**
**Akira Takasu, Toyokawa, and Tatsuya Eguchi, Toyohashi, both of, Japan, assignors to Minolta Co., Ltd., Osaka, Japan**
**Filed Sep. 27, 1994, Ser. No. 313,345**
**Claims priority, application Japan, Sep. 28, 1993, 5-241841; Feb. 28, 1994, 6-030707; Mar. 10, 1994, 6-039485; Jul. 19, 1994, 6-167197; Jul. 19, 1994, 6-167198**
**Int. Cl.[6] H04N *1/00*; G03G *15/00***
**U.S. Cl. 355—311** **29 Claims**

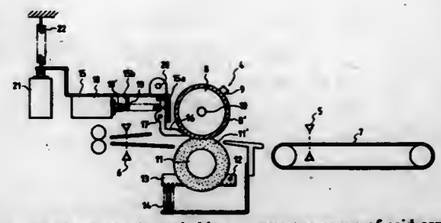


1. An original document reading device comprising:
a transparent original document table which has an area onto which an original document is disposed:
a reading means for reading an image of the original document disposed on the original document table;
a plurality of distance sensors each for measuring distance as for a certain position of the original document table which corresponds to size of the original document disposed on the original document table, then outputting measuring value;
a threshold value setting means for setting threshold value according to the measuring value from each distance sensor;
an original document size deciding means for comparing the measuring value from each distance sensor with the threshold value set by the threshold value setting means, and deciding the size of the original document disposed on the original document table according to data representing the compared result; and
a reading controlling means for controlling the reading of the reading means according to the decided result from the original document size deciding means.

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**5,500,726**
**FIXING DEVICE WITH SEPARATION MEMBER CAPABLE OF VARYING CONTACT PRESSURE**
**Takeshi Aoyama, Yokohama, and Yasumi Yoshida, Kawasaki, both of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**
**Filed Dec. 22, 1993, Ser. No. 168,504**
**Claims priority, application Japan, Dec. 28, 1992, 4-358602**
**Int. Cl.[6] G03G *15/20***
**U.S. Cl. 355—315** **6 Claims**

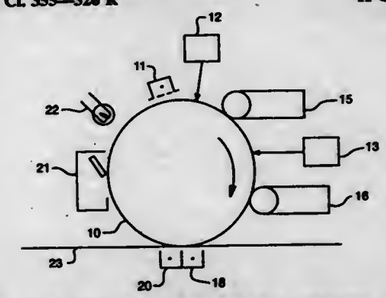
1. A fixing device comprising:
a rotating member for performing a fixing operation while a recording medium supporting an unfixed image is pinched and carried;
a separation member pressed against a surface of said rotating member to separate the recording medium from said rotating member; and



switching means for switching a contact pressure of said separation member against the surface of said rotating member between a first contact pressure and a second contact pressure less than the first contact pressure, wherein said switching means switches the contact pressure from the first contact pressure to the second contact pressure during the separation of the recording medium from the rotating member, and after separating a front edge of the recording medium.

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**5,500,727**
**MULTI-COLOR IMAGE FORMATION APPARATUS AND METHOD FOR PREVENTING THE CONTAMINATION OF A RECHARGER AND PREVENTING COLOR MIXING IN AN IMAGE**
**Kazuo Maruyama, and Tsuneo Nonmi, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan**
**Filed Jul. 16, 1993, Ser. No. 92,618**
**Claims priority, application Japan, Jul. 17, 1992, 4-213403**
**Int. Cl.[6] G03G *15/01***
**U.S. Cl. 355—326 R** **11 Claims**



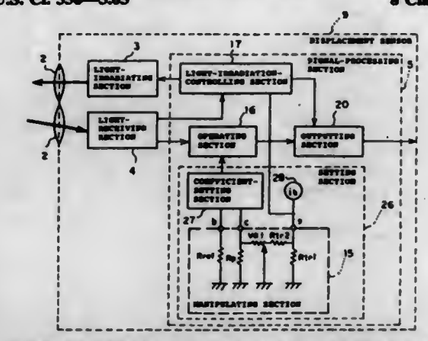
11. A multi-color image formation method comprising:
providing an electrostatic latent image formation member on which electrostatic latent images may be formed, each electrostatic latent image having an image portion with a potential having an absolute value, said latent image forming member further being capable of maintaining portions which are free of electrostatic latent images, each of said portions which are free of electrostatic latent images having a potential having an absolute value;
forming a first electrostatic latent image on said electrostatic latent image formation member;
developing said first electrostatic latent image with a first toner;
forming a second electrostatic latent image on said electrostatic latent image formation member
by reducing the absolute value of the potential of an image portion of said second electrostatic latent image and also reducing the absolute value of the potential of the portions which are free of said first and said second electrostatic latent images; and
developing said second electrostatic latent image with a second toner after forming the second image.

5,500,728

## PHOTOELECTRIC DISTANCE SENSOR

Ikuo Nishimoto, Kanagawa, Japan, assignor to Yamatake-Honeywell Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1993, Ser. No. 172,634
Claims priority, application Japan, Aug. 3, 1993, 5-192616
Int. Cl.[6] G01C 3/00; G03B 3/00
U.S. Cl. 356—3.03 8 Claims



1. A photoelectric distance sensor comprising in combination:
light-irradiating means for forming a light spot on an object;
light responsive sensor means having a light-receiving surface and means for forming an image of said light spot on said light-receiving surface, said light responsive sensor means generating a first output signal indicative of the position of said light spot on said light responsive sensor means and a second output signal indicative of the amount of light forming said image;
means responsive to said first output signal for generating a distance signal indicative of the distance between said light responsive sensor means and said object;
means for generating a target value for said amount of light forming said image, said target value increasing with a decreasing distance between said light responsive sensor means and said object, said distance being indicated by said distance signal from said light responsive sensor means;
means for comparing said target value and said second output signal to generate an error signal; and
means responsive to said error signal to control said light-irradiating means so that the amount of light forming said image corresponds to said target value.

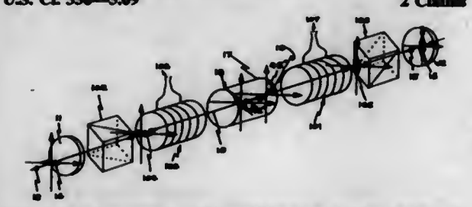
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5,500,729

## MAGNETO-OPTICAL ARRANGEMENT FOR LASER RADAR

Brian C. Redman, Alexandria; Dallas N. Barr, Woodbridge, and John E. Nettleton, Fairfax Station, all of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 16, 1994, Ser. No. 307,214
Int. Cl.[6] G01C 3/08
U.S. Cl. 356—5.09 2 Claims



1. A laser resonator cavity configuration for the substantial elimination of multi-moding and resulting in a local oscillator (LO) and received beam alignment insensitivity, including:
a pair of cavity end partial reflectors on an optical axis which define a resonator cavity;
a laser rod within the cavity on the optical axis;
a means for pumping the lasing rod to produce an unpolarized spontaneous emission in all directions;
a pair of polarizers, on the optical axis within the resonator cavity, for polarizing the unpolarized spontaneous emission in a first polarization direction which is partially reflected toward opposite directions by the cavity reflectors and passed back through its respective polarizer without any change in polarization state as a counterpropagating wave, with all radiation not polarized in the first polarization direction reflected out of the resonator cavity;
a pair of magneto-optic polarization rotators on the optical axis, each inbetween the laser rod and the respective polarizer, which rotates each counterpropagating wave in a polarization direction by 45 degrees to the perpendicular of the optical axis such that the counterpropagating waves' direction of polarization are still crossed with respect to each other, each resultant counterpropagating wave stimulates laser emission as a stimulating wave that is co-polarized with and propagating in the same direction as the stimulating wave as each wave propagates through the laser rod, and as the resultant counterpropagating wave propagates towards an end reflector, the resultant counterpropagating wave passes through the magneto-optic polarization rotator which rotates the polarization by 45 degrees so that each waves' polarization is in the first direction for transmission through the polarizer, such that there is building up laser emission in the resonator cavity as long as gain in the laser rod is greater than cavity losses, so that out of one cavity resonator end is emitted LO and received beams, and out of the other cavity end is emitted transmitted and received beams, thereby resulting in the substantial elimination of multi-moding and also resulting in a local oscillator (LO) and received beam alignment insensitivity.

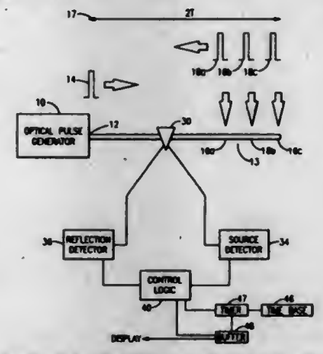
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5,500,730

## METHOD AND APPARATUS FOR DETERMINING THE DISTANCE TO A REFLECTIVE EVENT

Robert W. Johnson, Marcy, N.Y., assignor to Laser Precision Corp., Utica, N.Y.

Continuation of Ser. No. 19,265, Feb. 16, 1993, abandoned.
This application Aug. 30, 1994, Ser. No. 298,370
Int. Cl.[6] G01N 21/00
U.S. Cl. 356—73.1 15 Claims



1. An apparatus for detecting a reflective event in an optical fiber, said apparatus comprising:
generator means for injecting discrete pulses of optical energy into an optical fiber at a first point thereof, each of said discrete pulses having a transit time of travel within said optical fiber;
means releasably disposed at a second point of said optical fiber for detecting light traveling therewithin while said optical fiber remains intact, and for determining a longitudinal direction of said light, said second point being at a user selectable location intermediate said first point and the reflective event to be detected; and
timer means, coupled to said means for detecting, for measuring a time interval that is defined by detection of a first light pulse of said discrete pulses of optical energy traveling generally in a first longitudinal direction, and detection of a second light pulse of said discrete pulses of optical energy traveling generally in a second longitudinal direction.



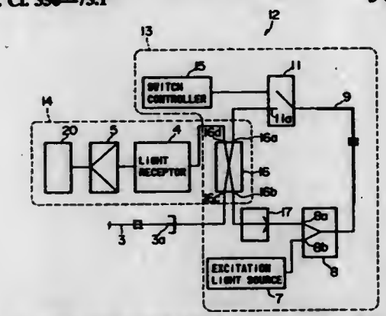
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5,500,731

## OPTICAL TIME DOMAIN REFLECTOMETER USING RING LASER LIGHT SOURCE

Mitsuhisa Sato; Mikio Maeda, both of Tokyo, and Shinichi Furukawa, Mito, all of, Japan, assignors to Ando Electric Co., Ltd., and Nippon Telegraph and Telephone Corporation, both of Tokyo, Japan

Filed Oct. 28, 1994, Ser. No. 330,801
Claims priority, application Japan, Jan. 29, 1993, 5-272678
Int. Cl.[6] G01N 21/84; G01J 5/08
U.S. Cl. 356—73.1 3 Claims



1. An optical time domain reflectometer wherein a light pulse is incident on an input end of an optical cable, and response light corresponding to back-scattering or reflection in the optical cable is detected at the input end, the optical time domain reflectometer comprising:
an excitation light source for generating continuous light having a predetermined frequency;
a light pulse generator comprising a closed loop light path and a switch inserted into the light path, the closed loop light path for receiving the continuous light from the excitation light source and amplifying the continuous light, the light pulse generator for generating and amplifying the light pulse by controlling the on/off state of the switch;
a light receptor for receiving the response light; and
a light branch device inserted into the closed loop light path, for making the amplified light pulse to be incident on the input end of the optical cable and also for receiving the response light and making the response light to be incident on the light receptor.

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5,500,732

## LENS INSPECTION SYSTEM AND METHOD

James Ebel; Mary L. Dolan; Russell J. Edwards, all of Jacksonville, Fla., and Peter W. Sites, Knoxville, Tenn., assignors to Johnson & Johnson Vision Products, Inc., Jacksonville, Fla.

Filed Jan. 10, 1994, Ser. No. 257,857
Int. Cl.[6] G01B 9/00
U.S. Cl. 356—124 16 Claims

1. A system for inspecting ophthalmic lenses, comprising:
a transport subsystem for moving the lenses into an inspection position;
an illumination subsystem to generate a light beam and to direct the light beam through the lenses in the inspection position;
an imaging subsystem to generate a set of signals representing selected portions of the light beam transmitted through the lenses; and
an image processing subsystem to receive said signals from the imaging subsystem and to process said signals according to a predetermined program to identify at least one condition of each of said lenses;
wherein the illumination subsystem includes
i) a light source to generate the light beam,
ii) means to direct the light beam generally in a first direction and through lenses in the inspection position,
iii) a diffuser located in the path of the light beam to form the light beam with a generally uniform intensity across a transverse cross-section of the light beam,
iv) a lens assembly to focus a portion of the light beam passing through the lenses onto an image plane, and to focus a portion of the light beam onto a focal point in front of the image plane to form a diffuse background pattern on the image plane.

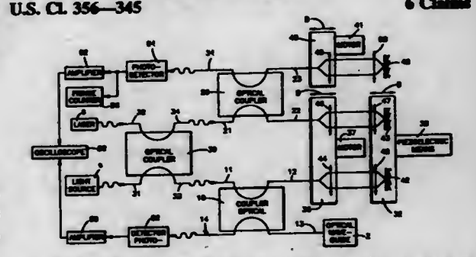
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5,500,733

## INTERFEROMETRIC SYSTEM FOR THE DETECTION AND LOCATION OF REFLECTING FAULTS OF LIGHT-GUIDING STRUCTURES

Christian Boisrobert, Perros Guirec; Jean-Francois Lucas, Caoennec, and Michel Dontenwille, Corlay, all of, France, assignors to France Telecom, Paris, France

PCT No. PCT/FR93/00763, § 371 Date Mar. 24, 1994, § 102(e) Date Mar. 24, 1994, PCT Pub. No. WO94/02823, PCT Pub. Date Feb. 3, 1994
PCT Filed Jul. 26, 1993, Ser. No. 211,220
Claims priority, application France, Jul. 27, 1993, 92 09225
Int. Cl.[6] G01B 9/02
U.S. Cl. 356—345 6 Claims



1. Interferometric system for the detection and location of reflecting faults of a light guiding structure (2), said system comprising:
an incoherent light source (4),
a monomode laser source (6), whose wavelength is substantially equal to a central wavelength of the incoherent source,

first (10) and second (20) optical couplers, each of said first and second couplers (10, 20) having first and second branches, said first branches (11, 21) being optically coupled to the incoherent light source and to the laser source,
a first support (36) displaceable in translation in a given direction and to which are fixed ends of the second branches (12, 22) of the first and second couplers,
a second support (38) adapted to oscillate in said given direction,
first (42) and second (43) light reflectors fixed to the second support (38) and respectively placed facing the ends of the second branches (12, 22) of the first and second couplers in order to reflect the light passing out of the same,
a third support (40) displaceable in translation in the given direction and to which is fixed an end of a third branch (23) of the second coupler (20),
a third light reflector (48) fixed and positioned facing said end of the third branch (23) of the second coupler (20) in order to reflect the light passing out of the end of the third branch of the second coupler, a third branch (13) of the first coupler (10) being optically coupled to the guiding structure (2),
first (52) and second (54) photodetectors respectively optically coupled to fourth branches (14, 24) of the first (10) and second (20) couplers,
an interference fringe counter (56) having an input which receives signals from the second photodetector (54) and
means (58) for analyzing signals supplied by the first and second photodetectors (52, 54), said analyzing means serving to locate reflecting faults of the guiding structure (2), with the aid of appropriate displacements of the first, second and third supports and the counter.

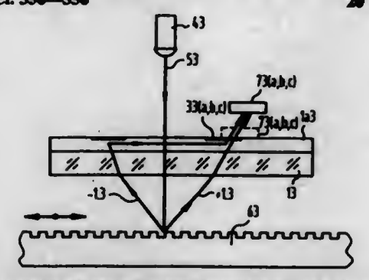
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**5,500,734**

## PHOTOELECTRIC POSITION MEASURING SYSTEM WITH INTEGRAL OPTICAL CIRCUIT HAVING PHASE SHIFTED INTERFERENCE GRATINGS

**Erwin Spanner, Traunstein, Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Germany**

**Filed May 19, 1994, Ser. No. 246,306**
**Claims priority, application European Pat. Off., May 21, 1993, 93108246**
**Int. Cl.[6] G01B *11/02*; G02B *6/00***
**U.S. Cl. 356—356** **20 Claims**




1. A position measuring system for measuring with position of a first object relative to a second object comprising:
a first grating for diffracting a beam of light into a first and second diffracted partial beam; and
a substrate comprising:
a waveguide formed in a plane of the substrate;
a second grating communicating with the waveguide;
a third grating spatially separated from the second grating, communicating with the waveguide, the third grating including a plurality of partial gratings which are offset with reference to each other in with measuring direction,
wherein the first diffracted partial beam is coupled into the waveguide by the second grating and supplied to the third grating and the second diffracted beam is coupled into the waveguide by the third grating where it is brought into interference with the first diffracted partial beam; and
a plurality of detectors communicating with the waveguide, the detectors converting the interfering first and second diffracted partial beams into phase-shifted electrical signals.

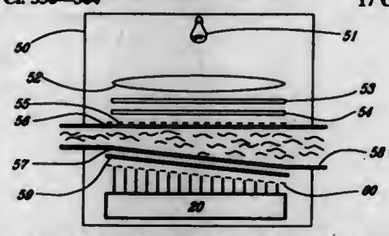
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**5,500,735**

## METHOD AND APPARATUS FOR ON-LINE MEASUREMENT OF PULP FIBER SURFACE DEVELOPMENT

**Roger G. Bentley, Pierrefonds; R. Keith Hamilton; J. Stewart Jack, both of Pointe Claire, and Robert L. Barron, Surrey, all of, Canada, assignors to Pulp and Paper Research Institute of Canada, Pointe Claire, Canada**

**Filed Jul. 18, 1994, Ser. No. 276,801**
**Int. Cl.[5] G01N *21/21*; *21/05***
**U.S. Cl. 356—364** **17 Claims**




1. A method of determining the degree of refining in a stock of fibrous pulp comprising:
i) determining a peak light transmission for each of plurality of pulp samples subjected to different known degrees of refining and establishing a relationship between peak light transmission and degree of pulp refining;
ii) a) providing a sample flow path and an optical path intersecting said sample flow path,
b) conveying a sample of a stock of fibrous pulp along said sample flow path,
c) establishing a gradual variation, by progressive increase or progressive decrease, in the mass of fibers at the intersection of said sample flow path and said optical path, while transmitting polarized light having a first plane of polarization through said stock, along said optical path,
d) polarizing the light exiting said stock in said optical path along a second plane of polarization perpendicular to said first plane,
e) measuring the intensities of the transmitted light from d), during conveyance of said sample along said sample flow path, at different masses of the fibers in step c), and
f) determining the peak light transmission for the sample from the measurements in step e), and
iii) determining the degree of refining of said stock by comparison of said peak light transmission in step
ii) f) and said relationship in step i).

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**5,500,736**

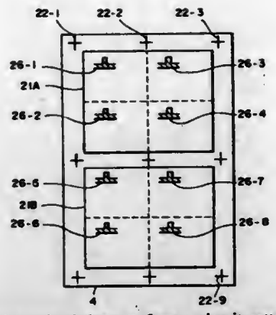
## METHOD OF DETECTING POSITIONS

**Hideki Kokubuchi, Tokyo; Masamitsu Yanagihara, and Junji Hazama, both of Yokohama, all of, Japan, assignors to Nikon Corporation, Tokyo, Japan**

**Continuation of Ser. No. 95,018, Jul. 23, 1993, abandoned. This application Nov. 7, 1994, Ser. No. 339,284**
**Claims priority, application Japan, Jul. 29, 1992, 4-222158**
**Int. Cl.[6] G01B *11/00***
**U.S. Cl. 356—375** **2 Claims**

1. A method of detecting position of a substrate formed with at least one pattern field in which a plurality of pattern elements






having a predetermined shape to form a circuit pattern are repeatedly disposed at a predetermined interval, said method comprising the steps of:
(a) imaging, as a first processed image, a part of said at least one pattern field;
(b) storing, as a reference image, at least one first video signal of images of said pattern elements within said first processed image and obtaining a position of said first video signal in said first processed image;
(c) imaging a part of said at least one pattern field including a pattern element different from said pattern elements in step (b) by moving said substrate by a distance corresponding to said predetermined interval and detecting a second video signal as a second processed image;
(d) detecting a video signal corresponding to said reference image from said second video signal and detecting a position of said corresponding video signal in said second processed image; and
(e) detecting a position of said substrate based on a position of said first video signal and a position of said corresponding video signal.

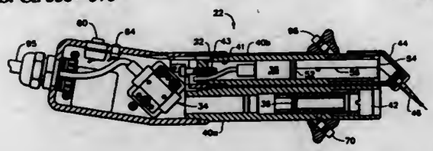
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**5,500,737**

## METHOD FOR MEASURING THE CONTOUR OF A SURFACE

**Charles W. Donaldson; Kenneth E. Miller; John J. Lestage, all of Cincinnati, and Randall C. Gantner, Dayton, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio**

**Filed Jul. 21, 1993, Ser. No. 94,680**
**Int. Cl.[6] G01B *11/24***
**U.S. Cl. 356—376** **1 Claim**




1. A method for measuring the contour of a surface, comprising the steps of:
(a) projecting a line of light on the surface to illuminate a selected contour feature of the surface:
(b) generating an image of the selected contour feature illuminated by the line of light by imaging an off-axis projection of light reflected from the illuminated contour feature; and
(c) evaluating the selected contour feature by comparing the image against a predetermined specification;
wherein any distortion and keystone effect in the image caused by off-axis imaging of the illuminated contour feature is corrected by the steps of;
positioning a square grid within the field of view of an image generating means to provide an off-axis image of the square grid;
superimposing an electronically produced grid corresponding to the square grid over the off-axis image of the square grid;
adjusting the vertical and horizontal grid lines of the electronically produced grid to match the convergence of the vertical and horizontal grid lines of the off-axis square grid image;
storing a vertical and a horizontal convergence adjustment parameter corresponding to a displacement of the electronically produced grid lines to match the grid lines of the off-axis image;
adjusting the vertical and horizontal grid lines of the electronically produced grid to match the spacing between the vertical and horizontal grid lines of the off-axis square grid image; and
storing a vertical and horizontal spacing adjustment parameter corresponding to a displacement of the electronically produced grid lines to match the grid lines of the off-axis image, the convergence adjustment parameters and the spacing adjustment parameters being used to correct the off-axis image of the illuminated contour feature.

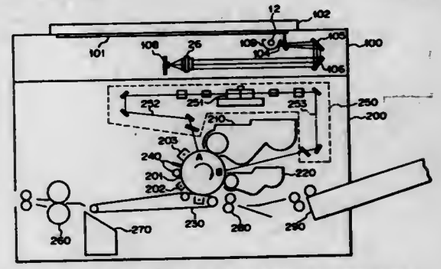
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**5,500,738**

## ELECTROPHOTOGRAPHIC DIGITAL COPIER FOR PROVIDING BICOLOR COPIES BY A SINGLE IMAGE TRANSFER

**Koichi Noguchi, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan**

**Continuation of Ser. No. 288,891, Aug. 10, 1994, abandoned, which is a continuation of Ser. No. 836,693, Feb. 18, 1992, abandoned. This application Jun. 5, 1995, Ser. No. 465,572**
**Claims priority, application Japan, Feb. 18, 1991, 3-045881**
**Int. Cl.[6] H04N *1/29*; G03G *15/01***
**U.S. Cl. 358—300** **13 Claims**




1. An electrophotographic digital photocopier comprising:
a photoconductive element;
scanning means for optically scanning a printed image to be copied and for outputting a first optical signal and a second optical signal;
image processing means for receiving said first optical signal and said second optical signal and for outputting a first record signal and a second record signal, said first record signal and said second record signal respectively representing intensities of a first color and a second color present in said printed image;
first writing means for writing first image data onto said photoconductive element in accordance with said first record signal to thereby form a first latent image;
first developing means for developing said first latent image to thereby form a first toner image;
second writing means for writing second image data onto said photoconductive element in accordance with said second record signal to thereby electrostatically form a second latent image superimposed on said first toner image;
second developing means for developing said second latent image to thereby form a second toner image;
image transferring means for simultaneously transferring said first toner image and said second toner image to a recording medium;

signal detecting means for determining whether or not said image processing means has received said second record signal and for outputting a detection signal; and

control means for controlling both a start timing and a stop timing of a driving of said second developing means in accordance with a timing of outputting of said detection signal from said signal detecting means such that said second developing means is driven only during time periods when said second color is being developed,

wherein said second image data is written onto said photoconductive element after said first developing means has developed said first latent image, but before said first toner image is transferred to said recording medium.

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**5,500,739**

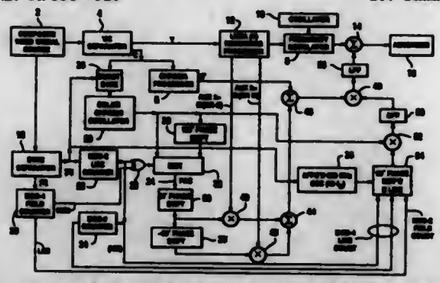
**FREQUENCY-MULTIPLEXING FM LUMA SIGNAL WITH COLOR AND 2ND UNDER SIGNALS HAVING OVERLAPPING FREQUENCY SPECTRA**

**Christopher H. Strolle, Glenside, Pa.; Chandrakant B. Patel, Hopewell, N.J.; Werner F. Wedam, Lawrenceville, N.J.; Raymond Schaltzler, Highland Park, N.J.; Hermann J. Wockenbrock, Bordentown, N.J.; Jung W. Ko, Lawrenceville, N.J.; Jong K. Yun, Suwon, Rep. of Korea, and Allen L. Limberg, Ringoes, N.J., assignors to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea**

**Continuation-in-part of Ser. No. 531,070, May 31, 1990, abandoned, Ser. No. 27,772, Mar. 8, 1993, abandoned, Ser. No. 8,813, Jan. 25, 1993, and Ser. No. 787,690, Nov. 4, 1991, which is a continuation-in-part of Ser. No. 635,197, Jan. 2, 1991, abandoned, which is a continuation-in-part of Ser. No. 569,029, Aug. 17, 1990, Pat. No. 5,113,262, said Ser. No. 8,813is a continuation-in-part of Ser. No. 604,494, Oct. 26, 1990, abandoned. This application May 11, 1993, Ser. No. 59,765**

**Int. Cl.[6] H04N *9/79***

**U.S. Cl. 358—310** **160 Claims**



1. A system for processing a video signal having horizontal scan lines and having a chroma carrier modulated with chroma information, said system comprising:

means, responsive to said chroma carrier, for generating a first unmodulated phase alternating carrier of essentially constant amplitude, wherein said first unmodulated phase alternating carrier and said chroma carrier are in a first timing relationship during each of a first set of alternate scan lines and are in a second timing relationship 180° out-of-phase respective to said first timing relationship during each of a second set of alternate scan lines, said 180° being respective to cycles of said chroma carrier;

means for supplying a first auxiliary signal at a frequency lower than a frequency of said first unmodulated phase alternating cartier, said first auxiliary signal not having its polarity switched between each scan line and a succeeding scan line;

a first modulator, responding to said first auxiliary signal and to said first unmodulated phase alternating carrier supplied thereto as respective input signals thereof, for generating a first modulated carrier in which said first auxiliary signal is modulated on said first unmodulated phase alternating carrier; and

means for adding said first modulated carrier to said chroma carrier modulated with said chroma information at a given phase angle.

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**5,500,740**

**VIDEO SIGNAL PROCESSING WITH COMMON DELAY LINE FOR LUMINANCE INTERPOLATION AND COLOR CONVERSION**

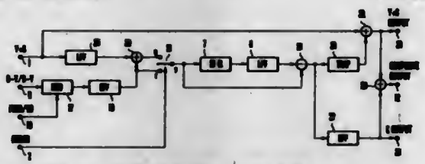
**Tomotaka Muramoto, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 318,528, Oct. 5, 1994, abandoned, which is a continuation of Ser. No. 175,488, Dec. 29, 1993, abandoned, which is a continuation of Ser. No. 915,411, Jul. 16, 1992, abandoned, which is a division of Ser. No. 690,509, Apr. 24, 1991, abandoned. This application May 30, 1995, Ser. No. 453,898**

**Claims priority, application Japan, May 1, 1990, 2-111832**

**Int. Cl.[6] H04N *9/79***

**U.S. Cl. 358—327** **9 Claims**



1. A signal processing apparatus, comprising:

(a) input means for receiving a luminance signal for one field and a color-difference line-sequential signal;

(b) signal processing means for obtaining a signal for interpolation and for providing simultaneous line-sequential color-difference signals, said signal processing means having means for providing an added output of said luminance signal and said line-sequential color-difference signal, a single CCD delay line and switch means for selectively feeding said added output of said luminance signal and line-sequential color-difference signal or said line-sequential color-difference signal to said CCD delay line;

(c) control means for controlling switching operation of said switch means; and

(d) means for obtaining a composite signal containing an interpolated luminance signal and a simultaneously converted signal by adding the output of the signal processing means and the luminance signal obtained through the input means.

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**5,500,741**

**VCR HAVING CAPABILITY OF DISPLAYING TIME SIGNAL RECEIVED FROM BROADCASTING STATIONS**

**Bok H. Baik, Kyunghi-do; Jung H. Hur, Seoul, and Dae S. Shim, Inchun-si, all of, Rep. of Korea, assignors to Goldstar Co., Ltd., Seoul, Rep. of Korea**

**Filed Oct. 5, 1993, Ser. No. 132,181**

**Claims priority, application Rep. of Korea, Feb. 18, 1993, 1993-2245**

**Int. Cl.[6] H04N *5/76;5/78;7/00;11/00***

**U.S. Cl. 358—335** **7 Claims**

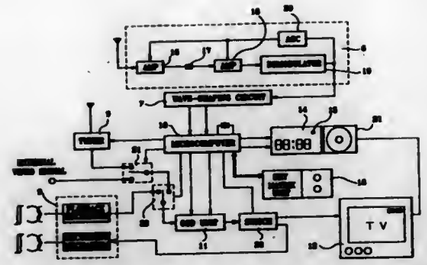
1. A VCR comprising:

receiving means for receiving a current time signal of radio wave from a broadcasting station and for demodulating the received current time signal;

wave-shaping means for converting the demodulated current time signal from said receiving means to a digital signal and for outputting a resultant current time data;

tuning means for receiving audio and video signals of radio wave from the broadcasting station and for tuning the received audio and video signals to a reference frequency;





means for recording and playing back the audio and video signals and the current time signal from the broadcasting station;

control means for controlling the operation of the VCR, for determining logic states of the digital signal from said wave-shaping means in accordance with a duty cycle of the digital signal and for converting the current time data to the current time in accordance with the determined logic states;

on-screen display means for superimposing the current time on the video signal from said tuning means under control by said control means and for outputting a resultant signal to one of said recording and playing back means and an external display means;

character display means for displaying the current time from said control means; and

key matrix means for applying function signals to said control means according to a user's selection.

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**5,500,742**

**CONTROL UNIT OF FLASH MEMORY AND FACSIMILE MACHINE USING SUCH CONTROL UNIT**

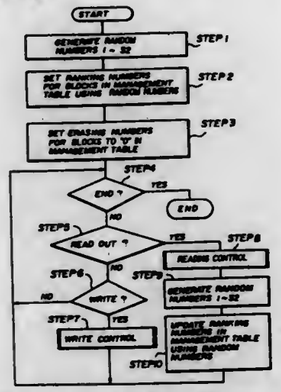
**Eiji Kamijo, Isehara, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan**

**Filed Jun. 11, 1993, Ser. No. 74,536**

**Claims priority, application Japan, Jun. 12, 1992, 4-179196; Mar. 2, 1993, 5-066049**

**Int. Cl.[5] H04N *1/40***

**U.S. Cl. 358—448** **10 Claims**




1. A control unit for controlling a flash memory in which a recording area is divided into a plurality of blocks, said control unit comprising:

priority setting means for setting priority of each of the blocks, at random, in which information is to be written; and

selecting means for selecting, in accordance with the priority set by said priority setting means, a block in which information is to be written from among said plurality of blocks in the recording area of said flash memory, wherein the information is recorded in the block selected by said selecting means in said flash memory.

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**5,500,743**

**IMAGE REPRODUCTION APPARATUS**

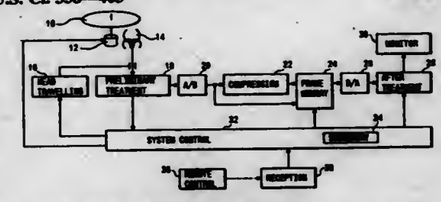
**Yuji Sakaegi, Kawasaki; Nobuyuki Suzuki, and Yoshinobu Sato, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 934,228, Aug. 25, 1992, abandoned. This application Feb. 6, 1995, Ser. No. 384,222**

**Claims priority, application Japan, Aug. 27, 1991, 3-215484; Aug. 27, 1991, 3-215615; Aug. 28, 1991, 3-217021; Aug. 28, 1991, 3-217022**

**Int. Cl.[6] H04N *1/387***

**U.S. Cl. 358—403** **5 Claims**



1. A reproduction apparatus comprising:

reproduction means for simultaneously displaying a plurality of still images reproduced from a medium;

mode selecting means for selecting one of a following multi-reproduction mode and a preceding multi-reproduction mode; and

control means for controlling said reproduction means such that, when the following multi-reproduction mode is selected, a predetermined number of images following a selected single image are multi-reproduced, and when the preceding multi-reproduction mode is selected, a predetermined number of images preceding the selected single image are multi-reproduced, wherein

the predetermined number of images preceding the selected single image or the predetermined number of images following the selected single image include an image different from the selected single image.

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**5,500,744**

**METHOD AND APPPARATUS FOR IMAGE SCALING USING PARALLEL INCREMENTAL INTERPOLATION**

**Jerrold Sabath, Andover, Mass., assignor to Miles Inc., Wilmington, Mass.**

**Filed Aug. 5, 1994, Ser. No. 286,302**

**Int. Cl.[6] H04N *1/405***

**U.S. Cl. 358—456** **29 Claims**

18. An apparatus for IMAGE SCALING and HALFTONE PROCESSING of HALFTONE PIXELS corresponding to a CONTONE IMAGE having a CONTONE RESOLUTION, said apparatus comprising:

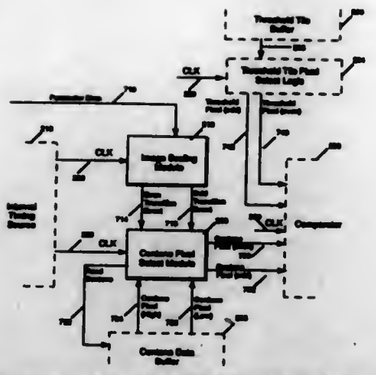
(A) Means for obtaining an ACCUMULATION CONSTANT and a TRANSITION VALUE using the CONTONE RESOLUTION of said CONTONE IMAGE together with the OUTPUT RESOLUTION of an OUTPUT DEVICE;

(B) Means for determining initial values for each of a plurality of ACCUMULATION SUMS;

(C) Means for selecting a CONTONE DATA VALUE for each of said plurality of ACCUMULATION SUMS;

(D) Means for identifying a HALFTONE PIXEL corresponding to each of said plurality of ACCUMULATION SUMS;

(E) Means for HALFTONE PROCESSING for each of said identified HALFTONE PIXELS using said selected CONTONE DATA VALUES;



(F) Means for adding said ACCUMULATION CONSTANT to each of said plurality of ACCUMULATION SUMS thereby generating new values for each of said plurality of ACCUMULATION SUMS;

(G) Means for determining a TRANSITION EVENT for each of said new values for each of said plurality of ACCUMULATION SUMS;

(H) Means for determining an adjusted value for each of said plurality of ACCUMULATION SUMS using said TRANSITION EVENTS with said TRANSITION VALUE; and,

(I) Means for selecting one or more CONTONE DATA VALUES of said CONTONE IMAGE for processing.

23. An apparatus for INCREMENTAL INTERPOLATION for generating a sequence of events at a first frequency from a sequence of events occurring at a second frequency, said apparatus comprising:

(A) Means for obtaining an ACCUMULATION CONSTANT and a TRANSITION VALUE using said first frequency together with said second frequency;

(B) Means for determining initial values for each of a plurality of ACCUMULATION SUMS;

(C) Means for selecting an event of said first sequence of events for each of said plurality of ACCUMULATION SUMS;

(D) Means for selecting an event of said second sequence of events corresponding to each of said ACCUMULATION SUMS;

(E) Means for adding said ACCUMULATION CONSTANT to each of said plurality of ACCUMULATION SUMS thereby generating new values for each of said plurality of ACCUMULATION SUMS;

(F) Means for determining a TRANSITION EVENT for each of said new values for each of said plurality of ACCUMULATION SUMS;

(G) Means for determining an adjusted value for each of said plurality of ACCUMULATION SUMS using said TRANSITION EVENTS with said TRANSITION VALUE; and,

(H) Means for selecting one or more events of said first frequency sequence of events.

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**5,500,745**

**IMAGE READING DEVICE CAPABLE OF PERFORMING SHADING CORRECTION**

**Fumio Ishibe; Shinji Ishida; Masatoshi Ikeda, all of Mie, and Kunihiro Takahashi, Kanagawa, all of, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan**

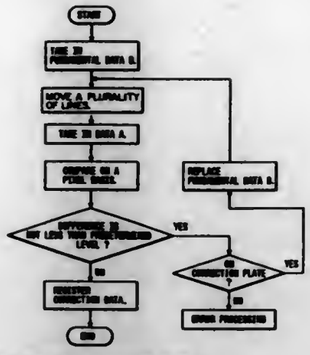
**Continuation of Ser. No. 832,346, Feb. 7, 1992, abandoned. This application Dec. 8, 1993, Ser. No. 162,975**

**Claims priority, application Japan, Feb. 15, 1991, 3-022206**

**Int. Cl.[6] H04N *1/40***

**U.S. Cl. 358—461** **14 Claims**

13. A method for reading an image on an original, comprising the steps of:



providing a shading correction plate;

reading a first line of the shading correction plate;

storing the first line in a memory;

reading a second line spaced apart from the first line by a plurality of lines;

determining whether the second line is from the shading correction plate or the original;

comparing each pixel in the first line with each pixel in the second line in consecutive order; and

determining whether the differences between the first and second lines are less than a predetermined value to detect whether a defect exists on the shading correction plate.

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**5,500,746**

**COLOR IMAGE INPUT APPARATUS**

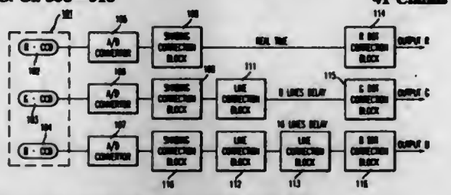
**Midori Aida, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan**

**Filed May 18, 1994, Ser. No. 245,658**

**Claims priority, application Japan, May 19, 1993, 5-141525**

**Int. Cl.[6] G03F *3/08*; H04N *1/46***

**U.S. Cl. 358—518** **41 Claims**



1. A color image input apparatus, comprising:

three color input devices which input three color images and convert the three color images to three analog electric signals;

three analog/digital convertors, respectively connected to the three color input devices, which convert the analog electric signals to digital signals;

three shading correction devices, respectively connected to the three analog/digital converters, which execute shading correction for the signals;

plural line correction devices, connected respectively to at least two of said three shading correction devices, which execute line delays for the signals in a sub-scanning direction;

three color dot correction devices, respectively connected to one of the plural line connection devices and the shading correction devices, which shift a position of each dot of each color within ±1 dot in the main scanning direction, using correction coefficients of each position of re-sampling, and each of the three color dot correction devices uses a cubical function convolution to determine a correction of each dot; and

three color output devices, respectively connected to the three-color dot correction devices, which output three color images.



**5,500,747**

**ULTRA-WIDE ANGLE LIQUID CRYSTAL PROJECTOR SYSTEM**

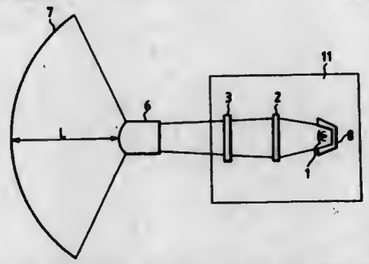
**Hideo Tanide; Masayuki Muranaka, both of Yokohama; Shigeru Mori, Chigasaki; Kiyoshi Wada, Yokohama; Isao Yoshizaki, Yokohama, and Naoyuki Ogura, Yokohama, all of, Japan, assignors to Hitachi, Ltd., and Sega Enterprises, Ltd., both of Tokyo, Japan**

**Filed Aug. 23, 1994, Ser. No. 294,509**

**Claims priority, application Japan, Aug. 24, 1993, 5-209064**

**Int. Cl.[6] G02F *1/1335***

**U.S. Cl. 359—40** **15 Claims**



1. An ultra-wide angle liquid crystal projector system comprising a light source, a liquid crystal panel, a curved screen, and a projection lens for projecting in accordance with light emitted by the light source an image formed on the liquid crystal panel onto the curved screen, the projection lens having a curvature of field substantially conforming to the shape of the curved screen and having an angle of projection of at least 120 degrees, the projection lens being disposed with respect to the curved screen so that a distance along an optical axis from an exit surface of the projection lens to the curved screen is less than 3 meters.

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**5,500,748**

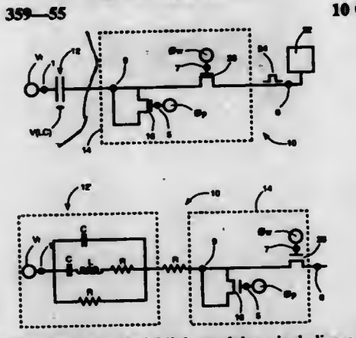
**LIQUID CRYSTAL SPATIAL LIGHT MODULATOR INCLUDING AN INTERNAL VOLTAGE BOOSTER**

**Stephen D. Gaalema, Colorado Springs, and Mark A. Handschy, Boulder, both of Colo., assignors to Displaytech, Inc., Boulder, Colo.**

**Filed Jan. 26, 1994, Ser. No. 187,592**

**Int. Cl.[6] G02F *1/1343***

**U.S. Cl. 359—55** **10 Claims**



10. In a liquid crystal spatial light modulator including a layer of liquid crystal material which acts on light in certain ways in response to predetermined changes in voltage across the layer, whereby to modulate the light so acted upon, an arrangement for applying a light modulating voltage across said layer of liquid crystal material and for modulating said voltage during a given modulation period in order to modulate the light acted upon by the liquid crystal material during said period, said arrangement comprising:

(a) a non-linear capacitor which has one side electrically connected with one side of said layer of liquid crystal material such that the light modulating voltage across the layer at any given point in time during the modulation period is a function of a capacitor voltage across said capacitor at the given point in time,

(b) means for applying an addressing voltage to said one side of said capacitor during the given modulation period while a second, opposite side of the capacitor is at a particular voltage; and

(c) means for changing the voltage at the opposite side of said capacitor during the given modulation period.

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**5,500,749**

**FERROELECTRIC LIQUID CRYSTAL ELEMENT WITH AN AC HOLDING VOLTAGE BELOW THE LEVEL AT WHICH THE MOLECULES MIGRATE**

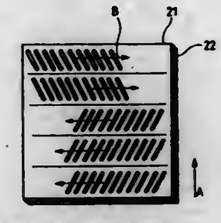
**Yutaka Inaba, Kawaguchi; Shinjiro Okada, Hiratsuka; Osamu Taniguchi, Chigasaki, and Hirosobu Mizuno, Hiratsuka, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 816,577, Jan. 3, 1992, abandoned. This application Jul. 26, 1994, Ser. No. 280,583**

**Claims priority, application Japan, Jan. 8, 1991, 3-011529**

**Int. Cl.[6] G02F *1/13;1/1343***

**U.S. Cl. 359—56** **3 Claims**



1. A liquid crystal device, comprising:

a pair of substrates;

a chiral smectic liquid crystal disposed between said pair of substrates, the chiral smectic liquid crystal having its inherent spiral structure suppressed and exhibiting a plurality of surface stabilization states according to the polarity of an electric field applied thereto, said liquid crystal device having an effective display area comprising a bent molecular layer formed by a plurality of molecules of said chiral smectic liquid crystal contacting said pair of substrates at a pre-tilt angle, wherein the direction of spontaneous polarization of said surface stabilization state is constant through the thickness of said chiral smectic liquid crystal, said bent molecular layer forming a chevron pattern in which a chiral smectic liquid crystal at one side of said bent molecular layer adjacent one of said substrates is inclined in a clockwise direction, wherein liquid crystal molecules at an interface between said bent molecular layer and said substrate invert their spontaneous polarization direction with regard to said substrate, and said chiral smectic liquid crystal at the other side of said bent molecular layer adjacent the other of said substrates is applied in a counterclockwise direction; and

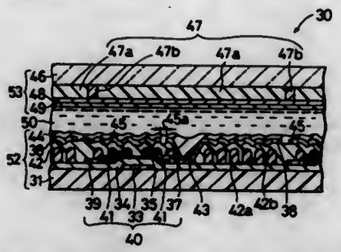
voltage application means for applying a voltage onto said chiral smectic liquid crystal, the voltage application means including means for applying a reversal signal to a pixel on a scanning line selected during a matrix drive for making a transition among said surface stabilization states and means for applying to a pixel on a scanning line not selected during the matrix drive an alternating voltage which does not make said transition among said surface stabilization states at below a voltage level at which the liquid crystal molecules are caused to migrate.

5,500,750

## MANUFACTURING METHOD OF REFLECTION TYPE LIQUID CRYSTAL DISPLAY DEVICES HAVING LIGHT SHIELD ELEMENTS AND REFLECTIVE ELECTRODES FORMED OF SAME MATERIAL

Makoto Kanbe, Tenri, and Seiichi Mitsui, Nara, both of, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 23, 1994, Ser. No. 216,628
Claims priority, application Japan, Mar. 24, 1993, 5-65653
Int. Cl.[6] G02F 1/136;1/1335;1/1343
U.S. Cl. 359—58 3 Claims




1. A method for manufacturing a reflection type liquid crystal display device wherein one of a pair of substrate members confronting each other through a liquid crystal layer includes an insulating substrate, a picture element electrode which is formed in each of plural picture element regions on the liquid crystal layer side of the insulating substrate and functions as a reflector for reflecting light entering from the other light transmitting substrate member side, and a switching element portion for applying a voltage for displaying to the picture element electrode, the switching element portion which is arranged individually for each picture element region, the method comprising the steps of:

forming an insulating film having a contact hole on the switching element portion on the insulating substrate wherein the switching element portion is formed;

forming a metallic film having a light reflecting property on the entire surface of the insulating film; and

patterning the metallic film to form a light shield element and the picture element electrode in such a manner that the picture element electrode is contacted with the switching element portion via the contact hole, and the light shield element is disposed above the switching element portion and is separated from the picture element electrode by a gap.

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5,500,751

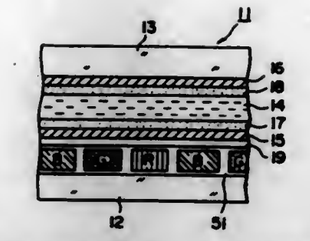
## FERROELECTRIC LIQUID CRYSTAL COLOR FILTER SURROUNDED BY A HEAT FUSIBLE RESIN

Hideaki Takao, Sagamihara; Tetsuo Murata, Atsugi; Junichiro Kanbe; Miki Tamura, both of Yokohama; Masaru Kamio, Atsugi; Nobuyuki Sekimura, Kawasaki, and Yoshiki Kikuchi, Sagamihara, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 352,756, Dec. 5, 1994, which is a division of Ser. No. 238,345, May 5, 1994, Pat. No. 5,398,126, which is a continuation of Ser. No. 806,099, Dec. 11, 1991, abandoned, which is a division of Ser. No. 416,034, Oct. 2, 1989, Pat. No. 5,101,289, which is a division of Ser. No. 90,783, Aug. 28, 1987, Pat. No. 4,917,471. This application Apr. 28, 1995, Ser. No. 430,418
Claims priority, application Japan, Aug. 30, 1986, 61-202746; Aug. 30, 1986, 61-202747; Aug. 30, 1986, 61-202748; Aug. 30, 1986, 61-202749; Nov. 28, 1986, 61-275352; Jan. 23, 1987, 62-014923
Int. Cl.[6] G02F 1/1335;1/1333; C09K 19/02
U.S. Cl. 359—68 15 Claims

1. A liquid crystal device comprising:

(a) a pair of transparent electrodes having a plurality of confronting portions formed therebetween;




(b) a pair of substrates, one of said pair substrates supporting each of said pair of transparent electrodes;

(c) a plurality of color filters arranged on the innerside of at least one of the above pair of substrates and arranged at positions corresponding to each of said plurality of confronting portions;

(d) a heat-fusible resin film arranged at the gaps between adjacent color filters, and wherein the heat-fusible resin is above and below the color filters; and

(e) a ferroelectric liquid crystal arranged between said pair of substrates.

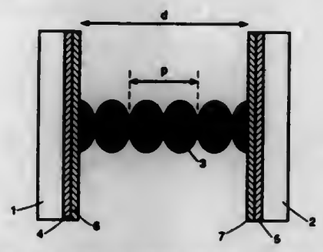
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5,500,752

## METHOD FOR GIVING CHOLESTERIC LIQUID CRYSTALS A PLANAR ORIENTATION FREE FROM FAULTY INCLINATION

Martin Schadt, Seltisberg, Switzerland, and Hubert Seiberle, Rümmingen, Germany, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 223,121, Apr. 5, 1994, abandoned, which is a continuation of Ser. No. 14,897, Feb. 8, 1993, abandoned. This application Jan. 17, 1995, Ser. No. 373,875
Claims priority, application Switzerland, Feb. 21, 1992, 536/92
Int. Cl.[6] G02F 1/1337;1/13
U.S. Cl. 359—76 8 Claims




1. A method of planar orienting cholesteric liquid crystals to produce cholesteric liquid crystals free from faulty inclination lines between two parallel plates comprising the steps of:

mixing a cholesteric liquid crystal material with a nematic or smectic liquid crystal material having negative dielectric anisotropy,

filling the parallel plates with the mixed liquid crystal materials to form a liquid crystal cell having at least one faulty inclination line,

subjecting the liquid crystal cell to an electric field at right angles to the plates to produce planar orientation of the cholesteric liquid crystals which is free from faulty inclination lines, and

removing the electric field,

wherein the liquid crystal cell remains free of faulty inclination lines after the electric field is removed.

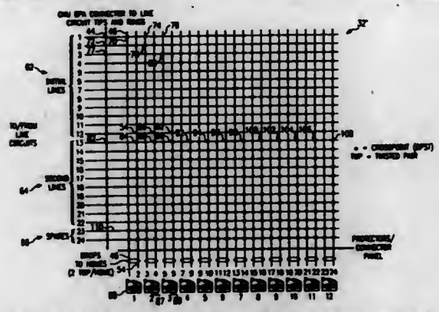


5,500,753

## METHOD AND SYSTEM FOR CONNECTING AN OPTICAL NETWORK UNIT WITH A PLURALITY OF USER SITES

Joseph E. Sutherland, Raleigh, N.C., assignor to Alcatel Network Systems, Inc., Richardson, Tex.

Filed Sep. 14, 1993, Ser. No. 122,712
Int. Cl.[6] H04B 10/08;3/38; H04M 3/00
U.S. Cl. 359—125 15 Claims



1. A method for connecting an optical network unit with a plurality of user sites, comprising the steps of:

connecting a cross-connect matrix with a plurality of line circuits of an optical network unit;

connecting a plurality of drop connectors between the cross-connect matrix and a plurality of user sites, wherein each of a first set of line circuits is cross-point connectable only to a corresponding one of a first set of drop connectors and each of a second set of line circuits is cross-point connectable to more than one of a second set of drop connectors; and

controlling the cross-connect matrix to connect selected ones of the line circuits with selected ones of the drop connectors to associate the optical network unit with the plurality of user sites.

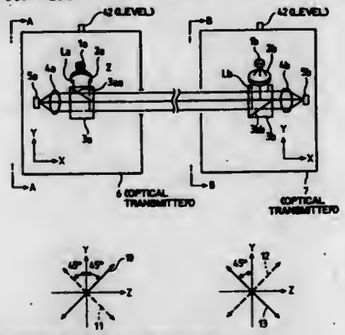
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5,500,754

## OPTICAL TRANSMITTER-RECEIVER

Kanjo Orino; Mikio Sakai, both of Kawasaki, and Tetsuo Sakanaka, Sagamihara, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 12, 1992, Ser. No. 974,997
Claims priority, application Japan, Nov. 15, 1991, 3-328086
Int. Cl.[6] H04B 10/00
U.S. Cl. 359—156 6 Claims




1. A transmitter-receiver comprising:

light projecting means for projecting light;

light receiving means for receiving light; and

optical means for transmitting therethrough or reflecting the light projected by said light projecting means and also reflecting or transmitting light received by said light receiving means therethrough to thereby direct the light received by said light receiving means to said light receiving means;

the optical axis of said light projecting means or the optical axis of said light receiving means being oriented at an angle within the range of 45°±20° with respect to the vertical direction and wherein said optical means is a polarizing beam splitter.

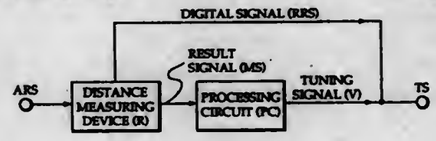
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5,500,755

## COMPENSATION DEVICE

Christiaan H. J. Sierens, Kontich, Belgium; Ulrich Steigenberger, Stuttgart, Germany; Werner Berger, Ditzingen, Germany; Stephen Harnisch, Stuttgart, Germany; Gert Van Der Plas, Merchtem, and Denis J. G. Mestdagh, Brussels, both of, Belgium, assignors to Alcatel SEL Aktiengesellschaft, Stuttgart, Germany

Filed Apr. 18, 1994, Ser. No. 228,729
Claims priority, application European Pat. Off., Apr. 27, 1993, 93201222
Int. Cl.[6] H04B 10/18
U.S. Cl. 359—161 9 Claims




C

1. Compensation device coupled to an optical fiber network and including a tunable compensation means (VD) which is tuned so as to compensate for the distortion an analog optical signal undergoes when being generated by a laser and transmitted over a distance through said fiber network, said distortion being caused by laser chirp of said laser and by fiber dispersion due to said transmission, and being dependent on said distance, wherein said compensation device moreover includes an automatic distance measuring device (R) providing a result signal (MS) indicative of said distance, and a processing circuit (PC) having a stored function indicative of laser chirp of said laser as a function of distance and which in response to said result signal provides a tuning signal (V) for said tunable compensation means.

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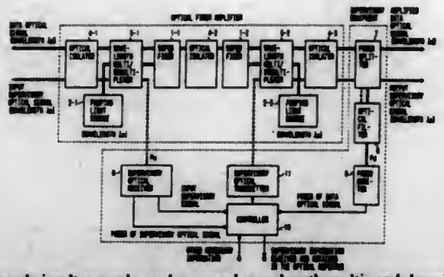
5,500,756

## OPTICAL FIBER TRANSMISSION SYSTEM AND SUPERVISION METHOD OF THE SAME

Hideaki Tsushima, Wakou; Shinya Sasaki, Kodaira; Yukio Nakano, Zama; Hiroyuki Nakano, Asaka; Ryoji Tateyari, Koganei; Hironari Matsuda; Kenji Tomeoka, both of Yokohama; Naohiro Sakakida, Kawasaki; Shin Nishimura; Yoshihiro Yano, both of Yokohama; Youichi Igarashi, Yokosuka; Satoshi Aoki, Chigasaki; Masahiro Takatori, Hachiouji; Tohru Kazawa, Kokubunji, and Yoshihiro Aoki, Yokohama, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 26, 1993, Ser. No. 23,546
Claims priority, application Japan, Feb. 28, 1992, 4-042835; Apr. 7, 1992, 4-085314; Apr. 8, 1992, 4-087247; Apr. 8, 1992, 4-087361
Int. Cl.[6] H04B 10/02
U.S. Cl. 359—174 13 Claims

1. An optical repeater for amplifying a data optical signal (with a wavelength of λd) comprising: an optical fiber amplifier including at least a doped fiber, first and second pumping light sources (with a wavelength of about λp) for outputting first and second pumping lights, a first wavelength multi- and demultiplexer, which is mounted before said doped fiber, for demultiplexing a supervisory optical signal 1 (with a wavelength of about λp) which is multiplexed with said data optical signal and for multiplexing the first pumping light in the same direction as that of said data optical



signal simultaneously, and a second wavelength multi- and demultiplexer, which is mounted behind said doped fiber, for multiplexing the second pumping light in the opposite direction to that of said amplified data optical signal and for multiplexing a supervisory optical signal 2 (with a wavelength of about λp) in the same direction as that of said data optical signal simultaneously; and a supervisory equipment including a supervisory optical receiver coupled to the first wavelength multi- and demultiplexer, for receiving said supervisory optical signal 1 and outputting a supervisory electric signal 1, a controller for adding supervisory information to said supervisory electric signal 1 and outputting a supervisory electric signal 2, and a supervisory optical transmitter coupled to the second wavelength multi- and demultiplexer, for convening said supervisory electric signal 2 to said supervisory optical signal.

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**5,500,757**

## OPTICAL RECEIVING SYSTEM

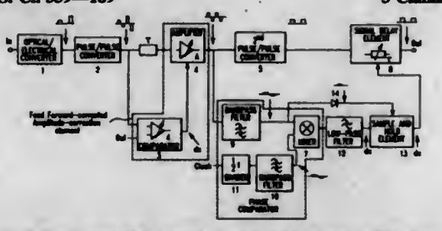
**Cornelis M. De Blok, Hazerswoude-Rijndijk, Netherlands, assignor to Koninklijke PTT Nederland N.V., Netherlands**

**Filed May 31, 1994, Ser. No. 251,581**

**Claims priority, application Netherlands, Jun. 11, 1993, 9301026**

**Int. Cl.[6] H04B *10/04***

**U.S. Cl. 359—189** **3 Claims**



1. Optical receiving system, comprising an optical/electrical converter for converting optical input pulses into electrical output pulses, wherein:

a first pulse/pulse converter (2), such as a delay line differentiator, converts output pulses of the optical receiver (1) into pulses having a pulse width which is small compared to that of the original pulses, and having constantly alternating polarity, whose appearance times correspond to the appearance times of leading and trailing edges of the original pulses and whose amplitudes are equal to the amplitudes of the original pulses;

a feed-forward-connected amplitude-correction element (3,4) which converts the output pulses of the said pulse/pulse converter into pulses of constant top amplitude; a second pulse/pulse converter (5), such as an integrator, which converts the bipolar output pulses of the amplitude-correction element into unipolar pulses—replicas of the original pulses—of which the appearance times of the leading and trailing edges correspond to the appearance times of the output pulses, whose polarity alternates, of the amplitude-correction element;

a phase comparator (9,10,11,7) which compares the phase of the pulses emitted by the said optical/electrical converter (1), or of representatives thereof, with the phase of the pulses emitted by a system clock generator and emits, as a function of the comparison result, a control signal to a delay element (8), there being presented, to a first input of the phase comparator, the output pulses of the optical/electrical converter or representatives thereof, and, at a second input, the pulses emitted by a system clock generator, while the said control signal is taken off an output of that phase comparator, the delay time of the said delay element being controlled in such a way by that control signal originating from the phase comparator that the pulses presented to that delay element are delayed in accordance with the difference between the phase of those pulses originating from the optical/electrical converter and the phase of the clock pulse generator; and

wherein the output bipolar output pulses of the amplitude-correction element (4) are presented to the said first input (9) of the phase comparator.

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**5,500,758**

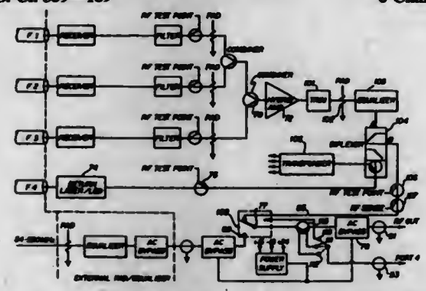
## METHOD AND APPARATUS FOR TRANSMITTING BROADBAND AMPLITUDE MODULATED RADIO FREQUENCY SIGNALS OVER OPTICAL LINKS

**Leo Thompson, Lilburn; Frank Little, Alpharetta, and Rezin E. Pidgeon, Jr., Atlanta, all of Ga., assignors to Scientific-Atlanta, Inc., Norcross, Ga.**

**Continuation of Ser. No. 998,208, Dec. 30, 1992, Pat. No. 5,379,141, and Ser. No. 446,461, Dec. 4, 1989, Pat. No. 5,191,459. This application Oct. 11, 1994, Ser. No. 321,234**

**Int. Cl.[6] H04B *10/06***

**U.S. Cl. 359—189** **6 Claims**



2. An optical receiver for receiving intensity-modulated optical signals over optical links to produce a plurality of radiofrequency channels covering more than one octave of bandwidth, comprising:

at least three optoelectronic receivers for receiving at least three intensity-modulated optical signals over optical links and for demodulating each received intensity-modulated optical signal to produce a corresponding group of modulated radiofrequency carrier signals;

at least three filters, each said filter corresponding to one of said optoelectronic receivers, for filtering the group of modulated radiofrequency carrier signals produced by its corresponding optoelectronic receiver to roll off noise and distortion products thereby producing respective groups of modulated radiofrequency carrier signals, each group of modulated radiofrequency carrier signals having a bandwidth of contiguous radiofrequency channels covering less than one octave; and

a signal combiner, coupled to said filters, for combining the groups of modulated radiofrequency carrier signals to produce a single signal having a plurality of radiofrequency channels covering more than one octave of bandwidth.



**5,500,759**

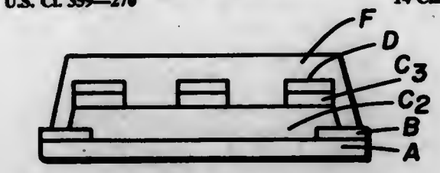
## ELECTROCHROMIC MATERIALS AND DISPLAYS

**James P. Coleman, Maryland Heights, Mo., assignor to Monsanto Company, St. Louis, Mo.**

**Division of Ser. No. 994,813, Dec. 22, 1992. This application Aug. 25, 1994, Ser. No. 296,372**

**Int. Cl.[6] G02F *1/153***

**U.S. Cl. 359—270** **14 Claims**




2. An electrochromic display laminate comprising:

(a) a substrate coated in one or more areas with a layer of an electrically conductive material forming electrode areas on said substrate;

(b) an ionically isolative layer of an electrically conductive, essentially ionically isolative material on said electrode areas;

(c) a layer of ionically conductive material on said ionically isolative layer;

wherein electrochromic material is present at an interfacial zone between said ionically isolative layer and said ionically conductive layer, said electrochromic material being dispersed or dissolved in said ionically isolative material, in said ionically conductive material, in both of said ionically isolative and ionically conductive materials or is present in a separate layer in said interfacial zone; and wherein said laminate has electrode areas adapted to provide an electrical potential across said interfacial zone to generate an electrochromic effect at said interfacial zone.

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**5,500,760**

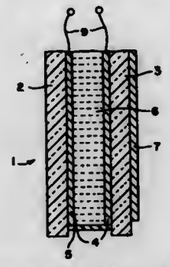
## ELECTROCHEMICHROMIC SOLUTIONS, PROCESSES FOR PREPARING AND USING THE SAME, AND DEVICES MANUFACTURED WITH THE SAME

**Desaraju V. Varaprasad, Holland, Mich.; Steven D. Leeman, Salt Lake City, Utah; Mingtang Zhao, Holland, Mich.; Hamid R. Habibi, Holland, Mich., and Niall R. Lynam, Holland, Mich., assignors to Donnelly Corporation, Holland, Mich.**

**Continuation-in-part of Ser. No. 756,342, Sep. 6, 1991, Pat. No. 5,239,405. This application Aug. 27, 1992, Ser. No. 935,784**

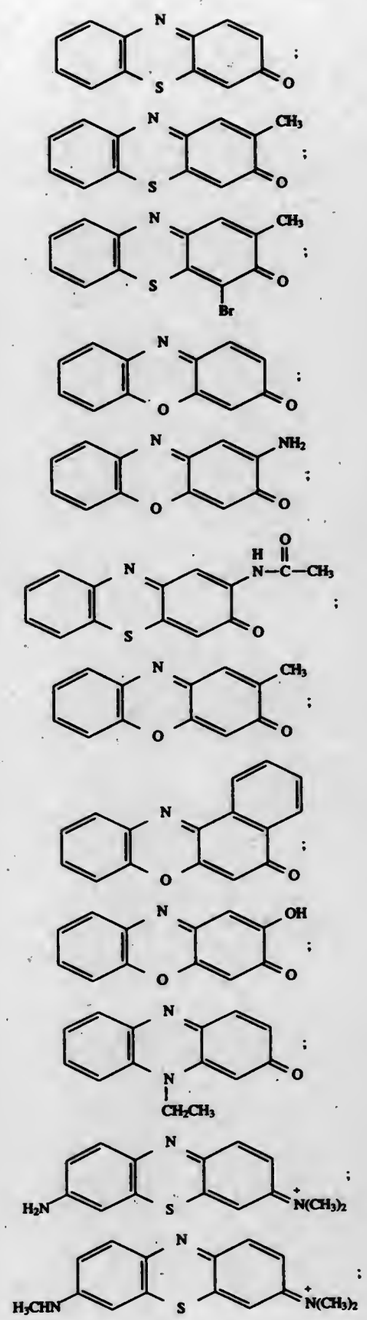
**Int. Cl.[6] G02F *1/153***

**U.S. Cl. 359—272** **90 Claims**

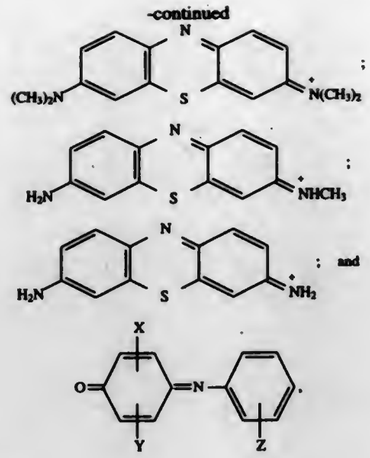



1. An electrochemichromic solution capable of color change when an applied potential is introduced thereto, said electrochemichromic solution comprising:

(a) at least one anodic compound, said anodic compound having been previously contacted with a redox agent such that said anodic compound exists in a different valence state than prior to having been contacted with said redox agent, wherein said anodic compound may be a member selected from the class of chemical compounds consisting of the following formulae:



-continued



wherein

X and Y may be the same or different and each may be selected from the group consisting of H, any halogen and $NRR_1$, wherein R and $R_1$ may be the same or different and each may be selected from the group consisting of H or any straight- or branched-chain alkyl constituent having from about one carbon atom to about three carbon atoms; or X and Y, taken together, represent an aromatic ring structure having six carbon ring atoms when viewed in conjunction with the ring carbon atoms to which they are attached; and

Z is OH or $NRR_1$, or salts thereof;

and combinations thereof

(b) at least one cathodic compound; and

(c) a solvent wherein the redox potential of said at least one anodic compound in said different valence state is greater than the redox potential of said at least one cathodic compound while contacted with said solvent.

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**5,500,761**

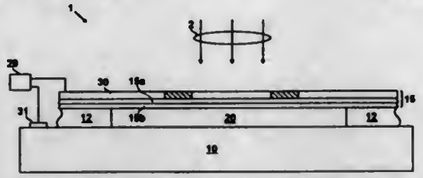
**MICROMECHANICAL MODULATOR**

**Keith W. Goossen, Aberdeen, and James A. Walker, Howell, both of N.J., assignors to AT&T Corp., Murray Hill, N.J.**

**Filed Jan. 27, 1994, Ser. No. 187,676**

**Int. Cl.[6] G02B *26/00***

**U.S. Cl. 359—290** **55 Claims**



1. A modulator for modulating an optical signal comprising:

a conductive substrate;

a conductive membrane comprising at least a first layer of material, the first layer having a refractive index which is approximately equal to the square root of the refractive index of the substrate, and a thickness approximately equal to one-quarter of a wavelength of the optical signal, as measured within the first layer, the membrane further having an optically transparent portion;

a flexible support for positioning the membrane in a first position wherein the membrane is oriented in spaced and superposed relation to the substrate, defining an air gap which is approximately equal to an integer multiple of one-quarter of a wavelength of the optical signal, as measured in air; and

a means for supplying bias;

where, under the action of bias, the membrane moves to a second position, changing the air gap by approximately one-quarter of a wavelength of the optical signal, as measured in air, where the change from the first to the second position causes a change in the amount of the optical signal that is reflected from the membrane.

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**5,500,762**

**LIGHT FREQUENCY CONTROL APPARATUS**

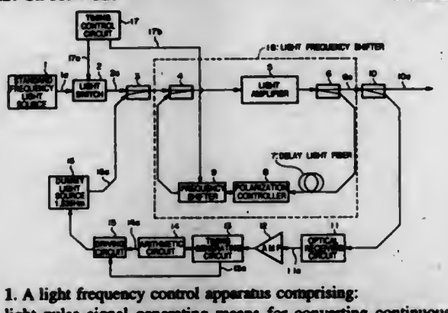
**Haruyoshi Uchiyama; Tekken Lee; Nobunari Takeuchi, all of Tokyo; Kaoru Shimizu; Tsuneo Horiguchi, both of Mito, and Yahei Koyamada, Tokyo, all of, Japan, assignors to Ando Electric Co., Ltd., and Nippon Telegraph and Telephone Corporation, both of Tokyo, Japan**

**Filed Dec. 27, 1994, Ser. No. 364,327**

**Claims priority, application Japan, Dec. 28, 1993, 5-338668**

**Int. Cl.[6] H01S *3/10***

**U.S. Cl. 359—326** **1 Claim**



1. A light frequency control apparatus comprising:

light pulse signal generating means for converting continuous light into a light pulse signal, and outputting said light pulse signal;

light signal generating means for repeatedly generating at predetermined cycles, a light signal, in which a light frequency. component therein is shifted to form a staircase shape based on the number of cycles of a loop within which said light pulse signal circulates; said loop formed from a light amplifying means for amplifying said light pulse signal outputted from said light pulse signal generating means; light delay means for delaying said light pulse signal a fixed amount; and frequency shifting means for shifting the frequency of said light pulse signal; and

dummy light generating means for generating dummy light at a timing such that the level of said light signal becomes zero, and supplying said dummy light to said light amplifying means.

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**5,500,763**

**TRANSMITTER-RECEIVER AND OPTICAL AMPLIFIER FOR OPTICAL COMMUNICATION**

**Takeshi Ota, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan**

**Filed Oct. 11, 1994, Ser. No. 320,264**

**Claims priority, application Japan, Nov. 5, 1993, 5-276397**

**Int. Cl.[6] H01S *3/00***

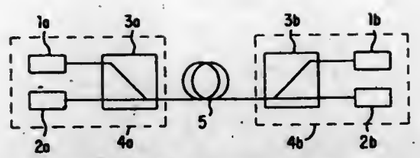
**U.S. Cl. 359—333** **5 Claims**

1. A transmitter-receiver for optical communication, comprising:

an optical signal generation section for generating an optical signal to be transmitted;

an optical signal reception section for receiving an optical signal; and





optical signal branching and combining means for sending an optical signal from said optical signal generation section to a communication optical fiber and for sending an optical signal from said communication optical fiber to said optical signal reception section;

said optical signal branching and combining means being formed as an asymmetrically Y-shaped optical branching path member which has a single waveguide mode.

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**5,500,764**

**OPTICAL WAVEGUIDE AMPLIFIER**

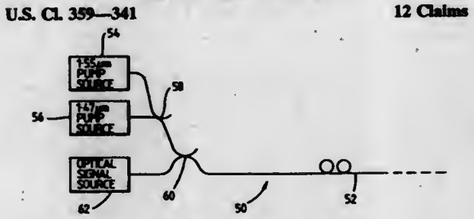
**Jonathan R. Armitage, Ipswich; Richard Wyatt, Felixstowe, and Jennifer F. Massicott, Ipswich, all of, England, assignors to British Telecommunicaions Public Limited Company, London, England**

**Filed Jan. 12, 1993, Ser. No. 961,710**

**Claims priority, application United Kingdom, Jul. 24, 1990, 9016181**

**Int. Cl.[6] H01S *3/06;3/30***

**U.S. Cl. 359—341** **12 Claims**



1. An optical waveguide amplifier comprising:

an optical waveguide doped with an active species providing a three level laser transition, which transition exhibits a primary fluorescence peak at a first wavelength;

input means for coupling input optical signals to be amplified to the optical waveguide;

output means for signals amplified in the waveguide; and

a pump source coupled to the waveguide, the pump source providing optical pump power at a second wavelength which is longer than the first wavelength, whereby to produce amplification of the input signals in the waveguide.

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**5,500,765**

**CONVERTIBLE 2D/3D AUTOSTEREOSCOPIC DISPLAY**

**Jesse B. Eichenlaub, Penfield, N.Y., assignor to Dimension Technologies Inc., Rochester, N.Y.**

**Filed May 11, 1994, Ser. No. 241,008**

**Int. Cl.[6] G02B *27/22;27/10***

**U.S. Cl. 359—463** **32 Claims**

1. A 3D autostereoscopic image display having a display screen, the improvement for converting the 3D display to a 2D display, comprising:

a first lens sheet selectively positionable on the display screen for converting the display from a 3D autostereoscopic display mode to a 2D display mode.

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**5,500,766**

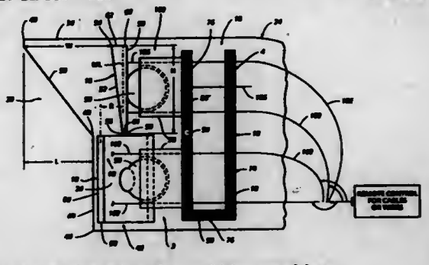
**BLIND SPOT SIDE MIRROR**

**Bob Stonecypher, 1383 Fahlander Dr. S., Columbus, Ohio 43229**

**Filed May 4, 1995, Ser. No. 433,746**

**Int. Cl.[6] G02B *5/08;7/182;* B60R *1/06***

**U.S. Cl. 359—605** **18 Claims**



1. A rear view mirror for a vehicle comprising:

A) a housing which includes

1) mounting means on said housing for mounting said housing on a vehicle,

2) a forward end, and

3) a rear end;

B) a top having a forward portion at said forward end and extending toward a rear end of the vehicle when said housing is mounted on the vehicle and a rear rim located at a rearmost location on said top;

C) a bottom having a forward portion at said forward end and extending toward the rear end of the vehicle when said housing is mounted on the vehicle and a rear corner located at a rearmost location on said bottom, said rear rim being spaced from said rear corner in the rearward direction of the vehicle whereby said rear rim and bottom corner are offset from each other in both a horizontal plane and in a vertical plane when said housing is mounted on the vehicle;

D) a top aft edge having a top edge thereof attached to said rear rim and extending downwardly from said rear rim and toward said forward portion to be slanted downwardly and forwardly when said housing is mounted on the vehicle;

E) a bottom aft edge having a bottom edge thereof connected to said rear corner and extending upwardly from said bottom corner when said housing is mounted on the vehicle;

F) said top aft edge and said bottom aft edge intersecting each other at a location spaced from said top and from said bottom and at a location spaced both vertically and horizontally from said rear rim;

G) a day/night mirror located inside said housing and spaced from said rear aft edge;

H) a blind spot mirror located inside said housing and spaced from said day/night mirror;

I) a support means mounted in said housing for supporting said day/night mirror and said blind spot mirror;

J) day/night mirror moving means connected to said day/night mirror for moving said day/night mirror with respect to said blind spot mirror;

K) blind spot mirror moving means connected to said blind spot mirror for moving said blind spot mirror with respect to said day/night mirror; and

L) control means connected to said day/night mirror moving means and to said blind spot mirror moving means for controlling movement of said day/night mirror and said blind spot mirror independently of each other.

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**5,500,767**

**OBJECTIVE LENS AND METHOD OF MEASURING ITS PERFORMANCE**

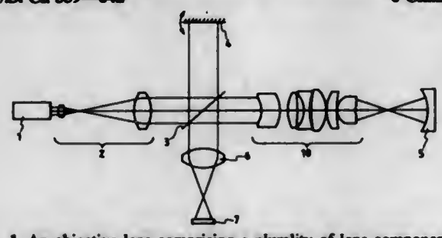
**Koichi Maruyama; Syun'itirou Wakamiya; Makoto Iwaki, and Masahiro Ono, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 877,233, May 1, 1992, abandoned. This application Jul. 11, 1994, Ser. No. 272,616**

**Claims priority, application Japan, May 2, 1991, 3-282604**

**Int. Cl.[6] G02B *9/00;9/62;* G01B *11/00***

**U.S. Cl. 359—642** **6 Claims**



1. An objective lens comprising a plurality of lens components wherein said objective lens has an amount of spherical aberration developed at a first wavelength in the ultraviolet wavelength range which is substantially equal to an amount of spherical aberration developed at a second wavelength in the visible wavelength range wherein said second wavelength is the wavelength of a He-Ne laser beam.

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**5,500,768**

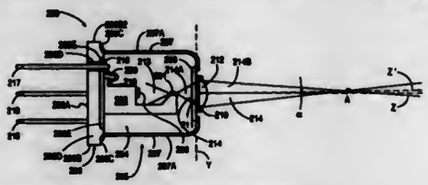
**LASER DIODE/LENS ASSEMBLY**

**David F. Doggett, Sunnyvale, Calif., and Bruce W. McCaul, 1370 Lincoln Ave., Palo Alto, both of Calif. 94301, assignors to Bruce McCaul, Palo Alto, Calif.**

**Filed Apr. 16, 1993, Ser. No. 48,611**

**Int. Cl.[6] G02B *3/00;7/02***

**U.S. Cl. 359—652** **17 Claims**



1. A laser diode/lens assembly, comprising:

a laser diode;

a housing having an outside surface, said laser diode being disposed inside said housing and being fixed with respect to said housing;

a lens disposed with respect to said housing such that a first beam of laser radiation emitted from said laser diode passes through said lens to form a second beam of laser radiation with altered divergence; and

an adhesive securing said lens to a portion of said outside surface of said housing, said adhesive contacting said lens and contacting said outside surface.

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**5,500,769**

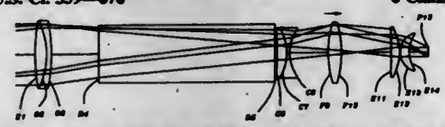
**WIDE ANGLE BINOCULAR SYSTEM WITH VARIABLE POWER CAPABILITY**

**Ellis I. Betensky, Redding, Conn., assignor to BenOpcon, Inc., Cincinnati, Ohio**

**Division of Ser. No. 28,413, Mar. 9, 1993, Pat. No. 5,371,626. This application Nov. 9, 1994, Ser. No. 336,787**

**Int. Cl.[6] G02B *15/14***

**U.S. Cl. 359—676** **6 Claims**



1. An optical system for magnifying an object comprising a positive first lens unit for forming an intermediate image of the object, a positive second lens unit in the vicinity of said intermediate image, a positive third lens unit for reimaging the intermediate image as modified by the positive second lens unit, and means for moving the positive second lens unit in the vicinity of the intermediate image to change the magnification of the object, said movement of the positive second lens unit being the sole source of magnification change in the system other than incidental magnification changes which may be associated with a compensator unit which compensates for changes in the system's overall focus as a result of movement of the positive second lens unit.

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**5,500,770**

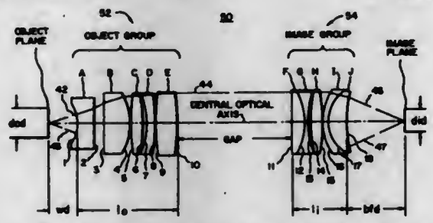
**MACROLENS SYSTEM FOR EMISSION MICROSCOPY**

**J. Robert Zinter, Rochester, and Paul L. Ruben, Penfield, both of N.Y., assignors to Amarel Precision Instruments, Rochester, N.Y.**

**Filed Dec. 30, 1994, Ser. No. 366,524**

**Int. Cl.[6] G02B *9/04;21/00;21/02***

**U.S. Cl. 359—793** **10 Claims**




1. A multiple lens element macrolens system operative as a single lens with a high light transmission value therethrough, the system comprising:

an object group of multiple lens elements having a common central optical axis and extending therealong by a distance $l_o$ and providing a numerical aperture (NAO) value in the range of from 0.32 to 0.40, a field of view of at least 15 mm×15 mm of an object to be viewed in an object plane, and an object working distance (wd) in the range of from 20–32.33 mm, the object group of lens elements producing at an output thereof substantially collimated rays of light from rays of light originating from the object in the object plane at a point on the central optical axis of the system; and

an image group of multiple lens elements disposed along the common central optical axis and extending therealong by a distance $l_i$, a first lens element of the image group separated from a last element of the object group by a gap dimension of at least 95 mm along the central optical axis, the image group



accepting at an input thereof the substantially collimated rays of light provided by the object group, and providing a focal point at a back focal distance (bfd) of at least 47 mm onto an image plane at a total magnification in the range of from 0.8 to 1.0 whereby a light transmission value sufficient for emission microscopy is achieved through the macrolens system.

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**5,500,771**

**BIAXIAL ACTUATOR FOR OPTICAL PICKUP**

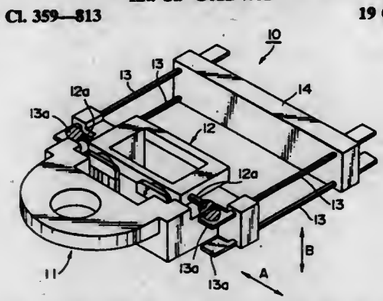
**Takamichi Tomiyama, Chiba, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Filed Mar. 11, 1994, Ser. No. 208,834**

**Claims priority, application Japan, Mar. 23, 1993, 5-088101**

**Int. Cl.[6] G02B *7/02***

**U.S. Cl. 359—813** **19 Claims**



1. An objective lens driving actuator for moving an objective lens in a focusing direction and a tracking direction relative to a recording medium, comprising:

a movable portion for holding said objective lens;

a coil bobbin mounted on said movable portion and supporting a focusing coil and a tracking coil wound therearound, said coil bobbin having a plurality of terminal pins to which wire ends of said focusing coil and said tracking coil are connected;

a plurality of electrically-conductive elastic members for movably supporting said movable portion, said electrically-conductive elastic members being substantially parallel and having enlarged first ends for supplying power to said focusing coil and said tracking coil, said terminal pins of said coil bobbin being directly connected to said enlarged first ends of said electrically-conductive elastic members; and

a supporting portion for fixedly supporting second ends of said elastic members to a fixed member.

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**5,500,772**

**LENS BARREL FOR DIFFERENT KINDS OF TV CAMERAS**

**Tadayoshi Ishii, Tokyo, Japan, assignor to Asahi Seimitsu Kabushiki Kaisha, Tokyo, Japan**

**Filed Jul. 6, 1994, Ser. No. 267,937**

**Claims priority, application Japan, Jul. 9, 1993, 5-170625**

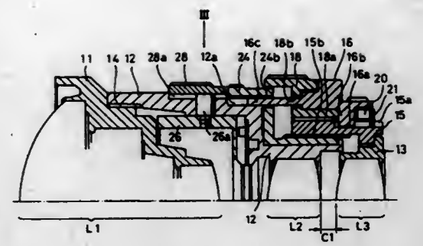
**Int. Cl.[6] G02B *7/02***

**U.S. Cl. 359—822** **17 Claims**

1. A common lens barrel which can be detachably attached to a plurality of TV camera bodies, each of the plurality of TV camera bodies having at least one filter provided in front of the image pickup device, the filters of the respective camera bodies having different thicknesses, and the common lens barrel having a plurality of lens groups, the common lens barrel comprising:

focusing means for focusing an image formed by said plurality of lens groups; and

switching means for varying a distance between specific lens groups of the plurality of lens groups in accordance with the thickness of the filter of the camera body to which the common lens barrel is attached.



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**5,500,773**

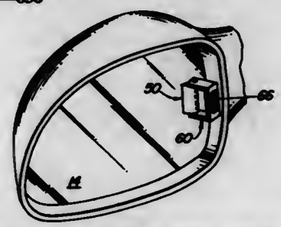
**VEHICLE MIRROR ALIGNMENT DEVICE**

**Basil O. Easter, 301 W. 28th Ave., Milan, Ill. 61264**

**Filed Feb. 28, 1994, Ser. No. 203,114**

**Int. Cl.[6] G02B *5/08;7/182;* B60R *1/06;* G01C *3/00***

**U.S. Cl. 359—838** **3 Claims**



1. A device for use in aligning a vehicle exterior mirror, comprising:

(a) a vehicle exterior mirror; and

(b) means, affixed to said mirror, for aligning said mirror, wherein said mirror alignment means comprises an alignment sight and an alignment target affixed to said vehicle exterior mirror, said alignment target including a base secured to the front of said mirror, said base supporting said alignment sight in a spaced apart relation from said target, wherein said alignment sight is pivotally attached to said base.

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**5,500,774**

**CURRENT SETTING CIRCUIT TO PROVIDE A WRITE CURRENT TO A RECORDING APPARATUS**

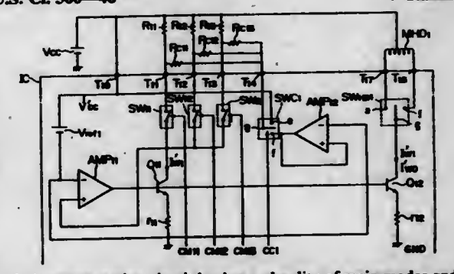
**Shinichi Watanabe; Norio Shoji, both of Kanagawa, and Michiya Sako, Kagoshima, all of, Japan, assignors to Sony Corporation, Tokyo, Japan**

**Filed Jun. 3, 1994, Ser. No. 253,697**

**Claims priority, application Japan, Jun. 8, 1993, 5-137861**

**Int. Cl.[6] G11B *5/09;15/12***

**U.S. Cl. 360—46** **7 Claims**



1. A current setting circuit having a plurality of main modes and at least one sub-mode for correction of the main modes, switching connections between an internal power source line provided in an

integrated circuit, and a plurality of resistance elements so as to define write current in accordance with individual modes,

said current setting circuit comprising:

a reference power source;

a plurality of main mode terminals provided in said integrated circuit corresponding to said main modes;

a single sub-mode terminal provided in said integrated circuit;

a plurality of main mode resistance elements, one terminal of each of which is connected to a said main mode terminal, and the other terminal of which is connected to said reference power source;

a plurality of sub-mode resistance elements connected between connection points between said main mode terminals and said one terminals of said main mode resistance elements, and said sub-mode terminal;

a main mode switch circuit comprising a plurality of main mode switches and selectively switching said connection of said reference power source with said main mode resistance elements in accordance with an input of one of main mode control signals,

a reference voltage level holding circuit for holding the output at a reference voltage level of said first reference power source; and

a single sub-mode switch circuit for selectively switching the connection of the sub-mode terminal between said first power source line and said output terminal of said reference voltage level holding circuit in accordance with the input of said sub-mode control signal,

to thereby output a current depending on said main mode and said sub-mode through said main mode switch circuit.

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**5,500,775**

**DATA RECORDING AND REPRODUCING APPARATUS**

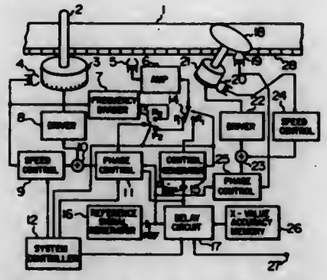
**Kouji Fujita, Yokohama; Shigemitsu Higuchi, Fujisawa; Toshiro Aizawa, Ebina; Atsuo Suga, Kamagaya, and Minoru Kosuge, Odawara, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Oct. 13, 1993, Ser. No. 136,641**

**Claims priority, application Japan, Jan. 15, 1992, 4-277373**

**Int. Cl.[6] G11B *21/04***

**U.S. Cl. 360—70** **8 Claims**



1. A data recording and reproducing apparatus of a helical scanning system, comprising:

means for recording and reproducing an information signal in an oblique information track on a magnetic tape by a rotary magnetic head;

means for generating a reference signal;

means for generating a control signal in synchronism with said reference signal;

means for recording said control signal on the magnetic tape in a longitudinal direction of the magnetic tape;

means for reproducing said control signal from said magnetic tape;

tracking control signal generating means for generating a tracking control signal to control said reference signal and said reproduced control signal to attain a predetermined phase relationship therebetween;

means for determining a difference between a predetermined value and a distance between a record starting position of said information track and a recorded position of said control signal;

means for storing said determined difference; and

means for changing said predetermined phase relationship in accordance with said difference stored in said memory means.

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**5,500,776**

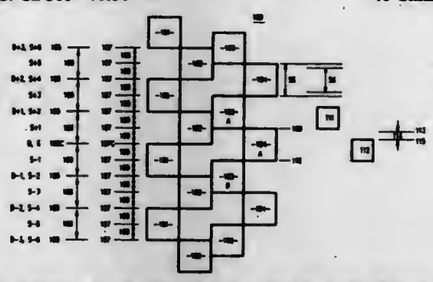
**SELF-CALIBRATION FOR COMPUTER DISK READ/WRITE OFFSETS**

**Robert F. Smith, San Jose, Calif., assignor to Seagate Technology, Inc., Scotts Valley, Calif.**

**Filed Dec. 16, 1993, Ser. No. 169,714**

**Int. Cl.[6] G11B *5/596***

**U.S. Cl. 360—77.04** **40 Claims**



1. Method for self-calibration of a read to write offset of a hard-disk drive, the hard-disk drive having at least one disk, at least one dual element head assembly for each said disk and a servocontrol system, the dual element head assembly having a separate, spaced apart reader element and writer element, the method comprising the steps of:

writing servo information to tracks on the disk, the servo information including a first, a second, and a third servo burst, the first and the second servo burst forming a first servo burst pair, the second and the third servo burst forming a second servo burst pair;

moving and aligning the reader element to the first servo burst pair;

reading the servo information from the first servo burst pair with the reader element;

writing a first servo offset burst to the disk with the writer element while the reader element is aligned to the first servo burst pair, the first servo offset burst being written at a same frequency as the first servo burst pair, the first servo offset burst indicating where the writer element was when the reader element was reading the servo information from the first servo burst pair;

moving and aligning the reader element to the second servo burst pair;

reading the servo information from the second servo burst pair with the reader element;

writing a second servo offset burst to the disk with the writer element while the reader element is aligned to the second servo burst pair, the second servo offset burst being written at a same frequency as the second servo burst pair, the second servo offset burst indicating where the writer element was when the reader element was reading the servo information from the second servo burst pair;

determining an error value from the first servo offset burst and the second servo offset burst; and

comparing the error value with a servo value from the servo information to determine the read to write offset as between the reader element and the writer element.



**5,500,777**

**MAGNETIC HEAD DRIVE WHICH USES INDEPENDENTLY CONTROLLED PIEZO-ELECTRIC ELEMENTS**

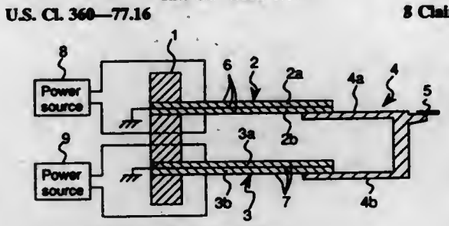
**Kenji Hasegawa, Kadoma, and Hiroshi Yohda, Hirakata, both of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed May 18, 1994, Ser. No. 243,935**

**Claims priority, application Japan, May 19, 1993, 5-117354; Feb. 28, 1994, 6-029599**

**Int. Cl.[6] G11B *5/592***

**U.S. Cl. 360—77.16** **8 Claims**




1. A magnetic head drive comprising:

a support member;

a pair of first and second longitudinal bimorph elements fixed to said support member with a prescribed distance between the first and second bimorph elements, which first and second bimorph elements comprising electrodes for distorting the bimorph elements according to electric voltages applied thereto;

a flexible bridge member comprising first and second portions, which first and second portions being connected to free ends of said first and second bimorph elements respectively so that said first and second bimorph elements are parallel from the fixed end to the free end when no voltages are applied to the electrodes thereof and said first second bimorph elements are distorted in a plane including said first and second bimorph elements when voltages are applied to the electrodes thereof;

a magnetic head mounted to said bridge member, which magnetic head extending in a direction opposite to said first and second bimorph elements; and

a pair of first and second electric sources for independently supplying electric voltages to the electrodes of said first and second bimorph elements, respectively.

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**5,500,778**

**CASSETTE LID PRE-OPENING DEVICE**

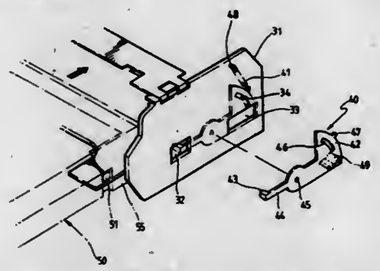
**Seong-Ick Ahn, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea**

**Filed Sep. 15, 1994, Ser. No. 306,905**

**Claims priority, application Rep. of Korea, Sep. 15, 1993, 93-18536**

**Int. Cl.[6] G11R *15/675***

**U.S. Cl. 360—96.5** **1 Claim**



1. A cassette lid pre-opening device for use in a video cassette recorder to release a locking lug of a cassette inserted into the video cassette recorder and pre-open a cassette lid of the cassette, said device comprising:

an actuating lever having a folded-in end for biasing the locking lug of the cassette to a release position and a fan-shaped end having a protrusion for pre-opening the cassette lid, the protrusion being provided with a slope to allow the cassette lid to ride on and to advance along the slope;

a cassette holder, with the actuating lever pivotally mounted on a side thereof, having a pair of rectangular apertures through which the folded-in end and the protrusion are inserted; and

a coil spring, one end thereof being connected to a portion of the actuating lever and the other end thereof being connected to a portion of the cassette holder.

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**5,500,779**

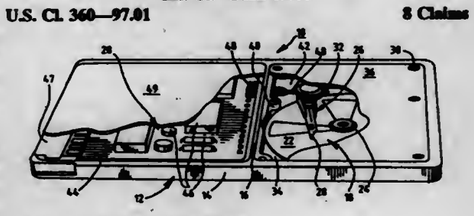
**DISK DRIVE MEMORY CARD ELECTRICAL INTERCONNECT**

**Mark Diel, Boulder, Colo., assignor to Maxtor Corporation, San Jose, Calif.**

**Filed Mar. 9, 1994, Ser. No. 209,292**

**Int. Cl.[6] G11B *5/012***

**U.S. Cl. 360—97.01** **8 Claims**



1. A hard disk drive, comprising:

a disk;

a spin motor that rotates said disk;

an actuator arm assembly coupled to said disk;

a flexible circuit that has a conductive pad connected to said actuator arm assembly;

a printed circuit board that has a conductive pad;

a frame that separates said printed circuit board from said disk, actuator arm assembly and flexible circuit; and,

a substantially rigid contact mounted to said frame, said contact having a pair of spring fingers extending outwardly from said frame in opposite directions and biased onto said conductive pads of said flexible circuit board and said printed circuit board to electrically couple said flexible circuit board to said printed circuit board.

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**5,500,780**

**DISK DRIVE SPINDLE MOTOR HAVING SPLIT WINDINGS FOR EACH PHASE**

**Zine-Eddine Boutaghou, and Kevin J. Erickson, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Aug. 5, 1994, Ser. No. 286,760**

**Int. Cl.[6] G11B *17/02***

**U.S. Cl. 360—99.08** **8 Claims**

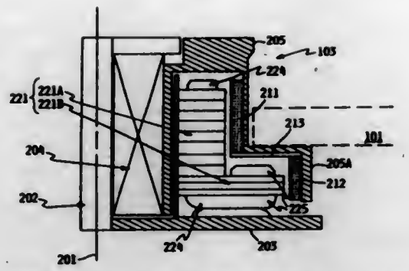
1. A rotating disk data storage device, comprising:

a disk drive base;

at least one disk for recording data, said disk being adapted to rotate about an axis of rotation, said disk having a circular aperture at its center for mounting said disk on a rotatable hub assembly;

at least one transducer head for reading data stored on said disk;

a moveable actuator mounted on said disk drive base for positioning said transducer head to read data recorded on said disk, said transducer head being attached to said moveable actuator; and




a spindle motor mounted on said disk drive base for rotating said at least one disk about said axis of rotation, said spindle motor comprising:

(a) a rotor housing adapted to rotate about said axis of rotation, said rotor housing having a substantially cylindrical main body portion, said main body portion having a diameter less than the diameter of said aperture of said disk, and a substantially cylindrical flange portion extending radially outward from said main body portion, said flange portion having a diameter greater than the diameter of said aperture of said disk, said flange portion supporting said disk;

(b) a first set of permanent magnets mounted within said cylindrical main body portion of said rotor housing and surrounding said axis of rotation at a first radial distance;

(c) a second set of permanent magnets mounted within said flange portion of said rotor housing and surrounding said axis of rotation at a second radial distance, said second radial distance being greater than said first radial distance; and

(d) an electromagnetic stator assembly rigidly mounted to said disk drive base and surrounding said axis of rotation, said electromagnetic stator assembly including a first stator portion for driving said first set of permanent magnets, and a second stator portion for driving said second set of permanent magnets.

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**5,500,781**

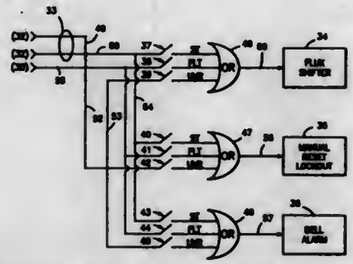
**DIGITAL CIRCUIT INTERRUPTER WITH MULTIPLE ACCESSORY FUNCTION**

**Esteban Santos, Windsor; John A. Pellman, Seymour, and Paul H. Singer, West Hartford, all of Conn., assignors to General Electric Company, New York, N.Y.**

**Filed May 9, 1994, Ser. No. 239,822**

**Int. Cl.[6] H02H *3/00***

**U.S. Cl. 361—96** **10 Claims**




1. An electronic circuit interrupter comprising:

transformer means arranged for connection with an electrical distribution system;

a processor circuit connecting with said transformer means receiving sample current signals to determine the occurrence of an overcurrent condition;

an output circuit connecting with said processor circuit to interrupt current transfer through an electrical distribution circuit;

a plurality of electrical accessories interconnected with said output circuit, said accessories being arranged for selective operation in response to external operating signals applied to said output circuit: and

a first plurality of switches connecting with a first electronic gate for operating a first of said accessories.

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**5,500,782**

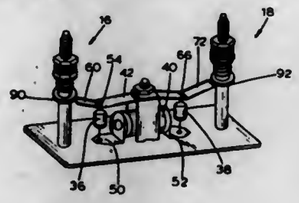
**HYBRID SURGE PROTECTOR**

**Hans-Wolfgang Oertel, and David L. Martin, both of Goleta, Calif., assignors to Joslyn Electronic Systems Corporation, Goleta, Calif.**

**Filed Oct. 29, 1993, Ser. No. 145,337**

**Int. Cl.[6] H02H *3/20***

**U.S. Cl. 361—120** **32 Claims**




1. A protector arrangement comprising:

first and second protector terminals;

a gas discharge tube electrically coupled to the first and second protector terminals;

a metal oxide varistor; and,

means for electrically coupling the metal oxide varistor to the first and second protector terminals such that the first and second protector terminals are automatically shorted in response to a thermal overload condition.

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**5,500,783**

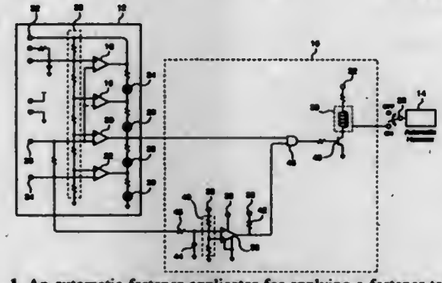
**CIRCUIT AND METHOD FOR CONTROLLING FASTENER APPLICATION**

**Gary G. Warda, 3325 Fort St., Trenton, Mich. 48183, and Kenneth J. Cook, Troy, Mich., assignors to Gary G. Warda, Brighton, Mich.**

**Continuation of Ser. No. 10,427, Jan. 28, 1993, Pat. No. 5,406,441. This application Jan. 5, 1995, Ser. No. 368,951**

**Int. Cl.[6] H01H *47/02*; B27F *7/02***

**U.S. Cl. 361—179** **12 Claims**



1. An automatic fastener applicator for applying a fastener to a surface and a support, the applicator comprising:

a sensor for sensing and generating an input signal indicative of the presence of the support beneath the surface;

an interface circuit for processing the input signal and generating a driver control signal; and



a driver for applying the fastener to the surface and the support in response to receipt of the driver control signal;

wherein the sensor, interface circuit and driver together form a hand-held unit such that the hand-held unit is disposed on one side of the surface during operation.

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**5,500,784**

**ELECTRICAL DEVICE, IN PARTICULAR SWITCHING OR CONTROLLING DEVICE FOR MOTOR VEHICLE**

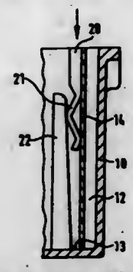
**Gerhard Thomas, Fuerth; Karl Wutz, Seugenthal, and Klaus Lechner, Eckental, all of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany**

**Filed Sep. 6, 1994, Ser. No. 301,294**

**Claims priority, application Germany, Dec. 18, 1993, 43 43 355.3**

**Int. Cl.[6] H05K *7/20***

**U.S. Cl. 361—704** **11 Claims**




1. An electrical device for motor vehicle, comprising a housing having an insertion opening and a bottom; a printed board carrying an electric circuit and arranged in said housing, said housing having an inner wall provided with a plurality of webs abutting said printed board, a plurality of elastic elements located on between said printed board, pressing said printed board on said webs and a plurality of guiding elements located so that said elastic elements are arranged between said printed board and said guiding elements and slide along said guiding elements, said webs and said guiding elements being spaced from one another by a distance which reduces in a direction from said insertion opening toward said bottom inwardly of said housing.

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**5,500,785**

**CIRCUIT BOARD HAVING IMPROVED THERMAL RADIATION**

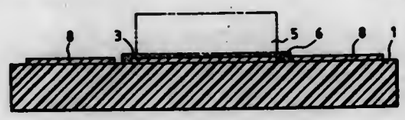
**Masao Funada, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan**

**Filed Feb. 24, 1994, Ser. No. 201,130**

**Claims priority, application Japan, Feb. 24, 1993, 5-035377**

**Int. Cl.[6] H05H *7/20***

**U.S. Cl. 361—720** **7 Claims**




1. A circuit board, comprising:

an insulating substrate;

a die bonding pad for fixedly bonding a semiconductor element onto said insulating substrate;

a thermally conductive adhesive layer connecting the semiconductor element to the die bonding pad;

a plurality of wire bonding pads on said insulating substrate; and

a heat conducting/radiating layer thermally connected to said die bonding pad and said adhesive layer to provide a first heat transmission path from the semiconductor element through said adhesive layer and said die bonding pad to said heat conducting/radiating layer and a second heat transmission path from the semiconductor element through said adhesive layer to said heat conducting/radiating layer, said heat conducting/radiating layer being located on the portion of the surface of said insulating substrate where said wire bonding pads and said die bonding pad are not located.

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**5,500,786**

**INSULATING ELEMENT HAVING HEIGHT GREATER THAN HEIGHTS OF NEIGHBORING COMPONENTS**

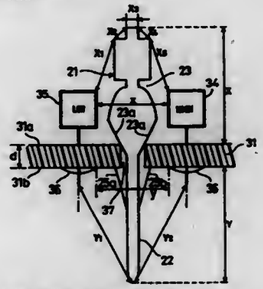
**Tsuyoshi Ono, Kawasaki, Japan, assignor to Fujitsu Ltd., Kawasaki, Japan**

**Filed Jul. 14, 1994, Ser. No. 274,843**

**Claims priority, application Japan, Jan. 8, 1993, 5-253341**

**Int. Cl.[6] H05K *7/02***

**U.S. Cl. 361—760** **17 Claims**




1. An insulating element comprising:

an insertion portion extending form a first surface of a circuit board when the insulating element is inserted into a through hole formed in the circuit board, the insertion portion having a first height measured from the first surface, said first height being greater than heights of leads of components arranged at side portions of the insulating element; and

a holding portion connected to the insertion portion, said holding portion having a second height measured from a second surface of the circuit board, said second height being greater than heights of the components arranged at the side portions of the insulating element.

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**5,500,787**

**ELECTRODES ON A MOUNTING SUBSTRATE AND A LIQUID CRYSTAL DISPLAY APPARATUS INCLUDING SAME**

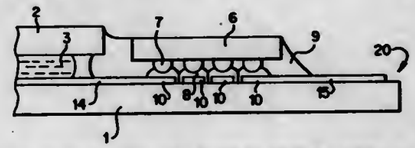
**Hirokazu Yoshida, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan**

**Continuation of Ser. No. 897,604, Jun. 10, 1992, abandoned, which is a continuation of Ser. No. 594,301, Oct. 9, 1990, abandoned. This application Jul. 29, 1993, Ser. No. 100,072**

**Claims priority, application Japan, Jan. 9, 1989, 1-263478**

**Int. Cl.[6] H05K *7/02*; G02F *1/133*; *1/1343***

**U.S. Cl. 361—779** **2 Claims**




1. An electrode wiring on a mounting substrate adapted for use in liquid crystal display apparatus, the electrode wiring comprising:

pads of Mo to which bumps of an integrated circuit are connected through conductive paste, said Mo pads being arranged at intervals;
an input circuit pattern wiring and an output circuit pattern wiring both of which are made of the same materials, and
an anti-moisture resin filled in the spots between the integrated circuit and the substrate;
wherein said input circuit pattern wiring and said output circuit pattern wiring are made of Mo, and said Mo pads are disposed on and formed integrally with said Mo input circuit pattern wiring and said Mo output circuit pattern wiring; and
wherein the mounting substrate is a substrate of a liquid crystal display panel.

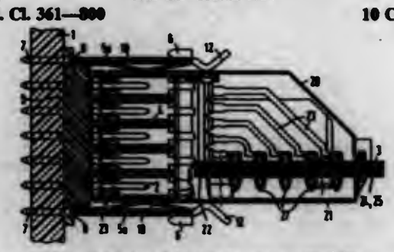
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**5,500,788**

**PRINTED CIRCUIT BOARD PLUG CONNECTOR WITH TWO SHIELDED CONTACT BANKS DISPOSED ON MUTUALLY PERPENDICULAR PRINTED CIRCUIT BOARDS**

**Jacques Longueville, Oostkamp, and Johan Vanbesien, Izegem, both of, Belgium, assignors to Siemens Aktiengesellschaft, Munich, Germany**

**Filed Aug. 8, 1994, Ser. No. 286,938**
**Claims priority, application Germany, Aug. 6, 1993, 93 11 782.5**
**Int. Cl.[6] H05K *7/14***
**U.S. Cl. 361—800** **10 Claims**



1. A printed circuit board plug connector, comprising:
a) a first printed circuit board, and a second printed circuit board perpendicular to said first printed circuit board and having opposite sides with upper and lower surfaces and an edge region with a longitudinal edge;
b) a first contact bank disposed on said first printed circuit board and having sides, and a second contact bank disposed in said edge region and protruding at said longitudinal edge of said second printed circuit board, said second contact bank having a plug-in area and having a body with a lower surface and electrical connections protruding from said lower surface of said second printed circuit board;
c) a metal shielding element attached to said first printed circuit board, said metal shielding element being a rigid, rectangular, circumferentially closed frame shieldingly surrounding said sides of said first contact bank, said frame having longitudinal walls and transverse walls with inner surfaces, and metal sheets being feathered at narrow intervals and attached circumferentially to all of said inner surfaces of said walls of said frame in the form of inwardly curved, resilient, inner contact elements;
d) insert pins plugging said metal shielding element into bores formed in said first printed circuit board for attaching said metal shielding element to said first printed circuit board;
e) two metal shielding shells attached to said second printed circuit board and enclosing said second contact bank, insert pins plugging said shielding shells into bores formed in said second printed circuit board for attaching said shielding shells to said opposite sides of said second printed circuit board;
f) one of said shielding shells completely enclosing said second contact bank on said upper surface of said second printed circuit board except for said plug-in area; and
g) the other of said shielding shells being attached to said lower surface of said second printed circuit board and completely covering said lower surface of said second contact bank body including said electrical connections, except for said plug-in area;
h) said metal shielding element together with said two metal shielding shells completely surrounding and shielding the plug connector when said first and second contact banks are plugged together.

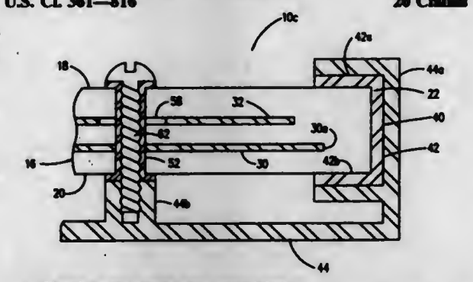
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**5,500,789**

**PRINTED CIRCUIT BOARD EMI SHIELDING APPARATUS AND ASSOCIATED METHODS**

**Kevin L. Miller, Austin; Robert L. McMahan, Cedar Park, and Todd W. Steigerwald, Austin, all of Tex., assignors to Dell USA, L.P., Austin, Tex.**

**Filed Dec. 12, 1994, Ser. No. 354,344**
**Int. Cl.[6] H05K *9/00***
**U.S. Cl. 361—816** **20 Claims**



1. Circuit board apparatus comprising:
a substrate structure having first and second opposite sides, and a side edge portion extending between said first and second opposite sides;
a ground plane disposed within said substrate structure in a parallel relationship with said first and second opposite sides;
a power plane disposed within said substrate structure in a spaced apart, parallel, facing relationship with said ground plane,
said circuit board apparatus, during operation thereof, creating transverse electromagnetic mode wave radiation between said ground and power planes; and
shield means, exteriorly carried by said substrate structure and having a body portion facing said side edge portion of said substrate structure, for intercepting transverse electromagnetic mode radiation passing outwardly through said side edge portion of said substrate structure, said body portion being groundable to said ground plane to conductively return the intercepted radiation thereto.

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**5,500,790**

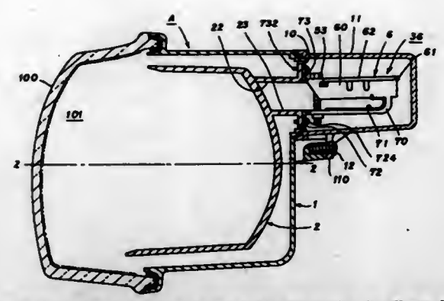
**DEVICE FOR CONFIRMING OPTICAL-AXIS ADJUSTMENT OF AUTOMOTIVE HEADLAMP**

**Akira Chikada; Shigeteru Ohgiri, both of Isehara, and Hiroe Ito, Fujisawa, all of, Japan, assignors to Ichikoh Industries, Ltd., Tokyo, Japan**

**PCT No. PCT/JP92/01525, § 371 Date Apr. 30, 1993, § 102(e) Date Apr. 30, 1993**
**PCT Filed Nov. 20, 1992, Ser. No. 39,441**
**Claims priority, application Japan, Nov. 21, 1991, 3-095619 U; Feb. 7, 1992, 4-004664 U; Feb. 20, 1992, 4-007130 U**
**Int. Cl.[6] B60Q *1/04*; F21M *3/22***
**U.S. Cl. 362—66** **14 Claims**

1. In an automotive headlamp having a mount body, a to-be-adjusted body mounted pivotally on the mount body, a lamp bulb fixed to the to-be-adjusted body, and an optical-axis adjuster to





vertically adjust an optical axis of the automotive headlamp by pivoting the to-be-adjusted body vertically with respect to the mount body,
a device for confirming the adjustment of the optical axis of the automotive headlamp, comprising:
a level including a casing and a bubble tube which is housed and held in the casing, the vertical adjustment of the optical axis of a to-be-adjusted body being confirmed by visually checking a movement of a bubble in said bubble tube;
a mounting member which fixes the level to the to-be-adjusted body;
a resilient member interposed between the level and the mounting member, the resilient member being formed in a plate-like shape and integrally with the casing of the level and the mounting member, for urging the casing of the level in a predetermined direction which is associated with the movement of the bubble; and
an adjusting screw for initially setting the level with respect to the mounting member and for keeping a posture of the level, after initially set, against a resilience of the resilient member.

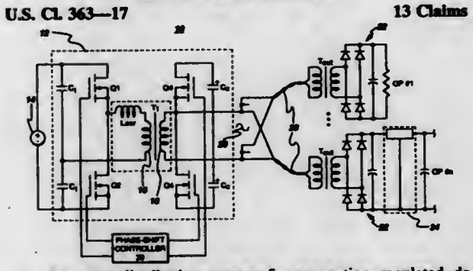
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**5,500,791**

**POWER DISTRIBUTION SYSTEM FOR GENERATING REGULATED DC OUTPUT VOLTAGES USING A DUAL ACTIVE BRIDGE CONVERTER DRIVEN FROM AN UNREGULATED DC SOURCE**

**Mustansir H. Kheraluwala, Niskayuna, and Michael J. Schutten, Rotterdam, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Filed Oct. 21, 1994, Ser. No. 326,905**
**Int. Cl.[6] H02M *3/335*; *3/24***
**U.S. Cl. 363—17** **13 Claims**



1. A power distribution system for generating regulated dc output voltages from an unregulated dc voltage source, comprising:
a dual active bridge converter comprising a primary-side connection of switching devices and a secondary-side connection of switching devices, said primary-side connection of switching devices and said secondary-side connection of switching devices being coupled by an intermediate high-frequency transformer, said primary-side connection of switching devices being adapted for connection to said unregulated dc voltage source;
an intermediate high-frequency ac distribution bus connected to said secondary-side connection of switching devices;
a controller for controlling a phase shift between said primary-side connection of switching devices and said secondary-side connection of switching devices to provide a regulated ac voltage on said intermediate high-frequency ac distribution bus; and
a plurality of point-of-load converters each coupled to said high-frequency ac distribution bus via an output transformer and a low-impedance distribution bus for converting said regulated ac voltage to said regulated dc voltages.

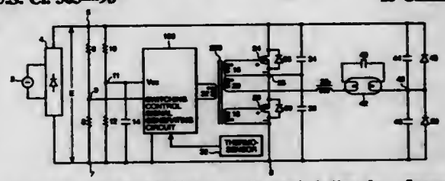
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**5,500,792**

**ZERO-VOLTAGE SWITCHING TYPE ELECTRONIC BALLAST FOR FLUORESCENT LAMP**

**Dal-Young Jeon; Kyung-Ha Jee; Nak-Choon Choi; Bok-Ki Song, and Dong-Myeong Shin, all of Bucheon, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea**

**Filed Jun. 24, 1994, Ser. No. 265,847**
**Claims priority, application Rep. of Korea, Jun. 24, 1993, 93-11624; Jan. 27, 1993, 93-22585; Nov. 15, 1993, 93-24241; Dec. 21, 1993, 93-28899**
**Int. Cl.[6] H02M *7/537*; H05B *37/02***
**U.S. Cl. 363—98** **13 Claims**



1. A zero-voltage switching type electronic ballast for a fluorescent lamp comprising:
a DC power source providing DC power to first and second nodes;
a first and second capacitor connected in series between said first and second nodes of said DC power source and being connectable therebetween to a first side of said flourescent lamp;
a first and second switching device having current paths connected in series between said first and second nodes of said DC power source and having a switching device connection node therebetween;
a third capacitor connected in parallel across said current path of said first switching device;
a fourth capacitor connected in parallel across said current path of said second switching device;
a driving transformer having first, second, third and fourth windings, said first winding being connected between a first switching device control line to said first switching device and said switching device connection node, said second winding being connected to said switching device connection node, and said third winding being connected between a second switching device control line to said second switching device and said second node of said DC power source;
a load resonant circuit connected to said third winding and connectable to a second side of said flourescent lamp; and
switching control signal generating means connected to said fourth winding of said driving transformer, for comparing a comparison signal of a predetermined high frequency with first and second reference signals, and for interposing a predetermined dead time therebetween, said switching control signal generating means driving said fourth winding so that said first and second windings of said driving transformer alternately control said first and second switching devices, respectively, to switch when a voltage applied across said current paths of said first and second switching devices is zero, said switching control signal generating means comprising:

sawtooth wave signal generator means connected to said DC power source for generating a comparison signal having a first frequency for a predetermined time, and after said predetermined time, having a second frequency,

square wave signal generator means connected to said sawtooth wave signal generator means, for comparing said comparison signal to a reference voltage, and for generating a square wave signal,

driving signal generator means connected to said square wave signal generator means, for receiving said square wave signal and for generating a driving signal,

driving circuit means connected to said driving signal generator means, for driving said fourth winding of said driving transformer in forward and reverse directions with a dead time interposed therebetween, said dead time guaranteeing a zero-voltage switching of said first and second switching devices,

overheating prevention means connected to said sawtooth wave signal generator means, for detecting a temperature of said first and second switching devices, and for shutting down said square wave signal generator means if said detected temperature is above a predetermined temperature, and

over-current prevention means connected to said driving signal generator means, for detecting a current regenerated via said fourth winding, and for shutting down said square wave signal generator means if said detected current is above a predetermined value.

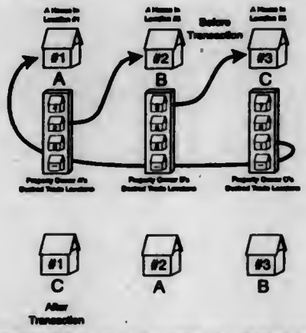
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**5,500,793**

## COMPUTERIZED SYSTEM FOR DEVELOPING MULTI-PARTY PROPERTY EQUITY EXCHANGE SCENARIOS

**Robert F. Deming, Jr., Malibu, and Stephen E. Deming, Pasadena, both of Calif., assignors to Equitrade, Los Angeles, Calif.**

**Filed Sep. 2, 1993, Ser. No. 116,343**
**Int. Cl.[6] G06F *19/00***
**U.S. Cl. 364—401** **40 Claims**




1. An automated process for developing multi-party property equity exchange scenarios, comprising the steps of:

providing an electronic data base of properties available for trade;

accessing the electronic data base of properties utilizing a computer;

identifying a base property within the electronic data base of properties for which a trade is desired;

defining criteria for matching properties in the electronic data base relative to the base property;

comparing properties in the electronic data base utilizing the criteria;

automatically creating possible trade scenarios involving the base property and one or more other properties in the electronic data base utilizing the computer; and

displaying the possible trade scenarios.

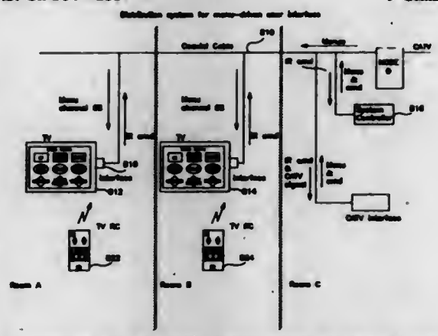
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**5,500,794**

## DISTRIBUTION SYSTEM AND METHOD FOR MENU-DRIVEN USER INTERFACE

**Yosuke Fujita, Allendale, and Steve P. Lam, Cranbury, both of N.J., assignors to Panasonic Technologies, Inc., Princeton, N.J.**

**Filed Mar. 31, 1994, Ser. No. 221,685**
**Int. Cl.[6] G05B *15/02***
**U.S. Cl. 364—188** **9 Claims**




1. Apparatus for distributing control menus throughout a home:

multiple video channel distribution network;

control means for centrally generating at least one control menu in the form of a video signal on an available channel of the distribution network and for executing commands received over the distribution network;

display means for receiving the control menu in the form of a video signal and displaying the control menu on the channel selected by the control means; and

receiver means, located proximate to the display means, for receiving user commands related to the displayed menu and for delivering the user commands, via the distribution network, to the control processor.

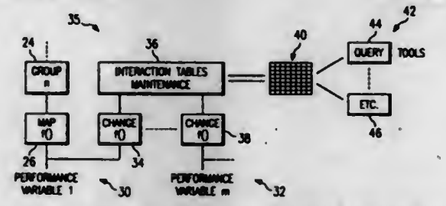
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**5,500,795**

## METHOD AND SYSTEM FOR MONITORING AND CONTROLLING THE PERFORMANCE OF A CALL PROCESSING CENTER

**Michael C. Powers, Irving; Greg A. Bliss, Colleyville, both of Tex., and Shioupyn Shen, Milpitas, Calif., assignors to Teknekron Infoswitch Corporation, Fort Worth, Tex.**

**Continuation of Ser. No. 96,595, Jul. 22, 1993, abandoned, which is a continuation-in-part of Ser. No. 922,210, Jul. 30, 1992, abandoned. This application Jul. 6, 1994, Ser. No. 271,228**
**Int. Cl.[6] G06F *17/60***
**U.S. Cl. 364—401** **21 Claims**




1. A method, to be carried out on a computer having a memory and a processor, for generating a performance report on the efficiency of a call processing center, the method comprising the steps of:

defining a plurality of performance variables for the call processing center, said performance variables having a measurable property for the call processing center;

storing said performance variable definitions in the computer's memory;

collecting data for each of said performance variables for a period of time;

storing the time period's variable performance data in the computer's memory;

mapping, with the computer's processor, the data for each of said plurality of performance variables for the time period to a normalized performance variable having a neutral value and at least one inflection point within a normalized range of values, said inflection point describing varying effects of said normalized performance variable on the call processing center's efficiency;

storing said plurality of normalized performance variables in the computer's memory;

inputting into the computer's memory a weighting factor for each of said performance variables, said weighting factor relating to the importance of each of said performance variables to the efficiency of the call processing center;

retrieving said plurality of normalized performance variables and said variable weighting factors from the computer's memory to the computer's processor and calculating a plurality of weighted normalized performance variables;

storing said weighted normalized performance variables in the computer's memory;

calculating with the computer's processor the efficiency of the call processing center as a function of said plurality of weighted normalized performance variables; and

providing the performance report from the computer showing the call processing center's calculated efficiency for the time period.



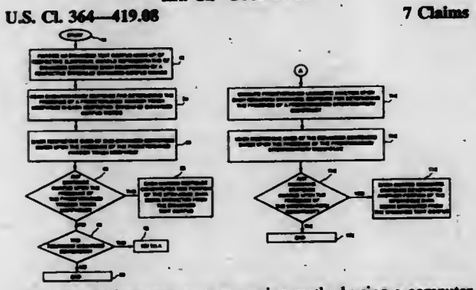
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**5,500,796**

## METHOD FOR EXTRACTING OPEN-ISSUE DATA FROM TEXTUAL SPECIFICATIONS USING NATURAL LANGUAGE TEXT PROCESSING

**James E. Black, Jr., Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Filed Jul. 22, 1993, Ser. No. 94,740**
**Int. Cl.[6] G06F *17/27***
**U.S. Cl. 364—419.08** **7 Claims**



1. A natural language text processing method using a computer for extracting open-issue data from a textual specification, said method comprising the steps of:

providing an enhanced text corpus based upon said textual specification to said computer, said enhanced text corpus comprising electrical signals representative of enhanced sentences each constituted of a stream of enhanced corpus words;

scanning each of said enhanced sentences for determining the presence of a predetermined trigger token morpheme in each said stream of enhanced corpus words;

marking said enhanced sentences having the presence of said predetermined trigger token morpheme, the marked enhanced sentences indicative of one portion of said open-issue data;

executing predetermined linguistic analysis upon each remaining unmarked sentence for determining the presence of a predetermined interrogatory construct in said remaining sentences;

marking said remaining sentences having the presence of said interrogatory construct, the marked remaining sentences indicative of another portion of said open-issue data; and

extracting the marked portions indicative of said open-issue data.

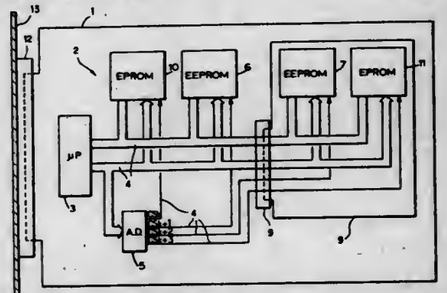
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**5,500,797**

## DEVICE FOR MAKING USE OF INFORMATION RELATED TO THE BREAKDOWN DETECTED BY ONE OR MORE CENTRAL UNITS OF AN AIRCRAFT

**Joël Noger, Colomiers, France, assignor to Aerospatiale Societe Nationale Industrielle, Paris, France**

**Continuation of Ser. No. 978,257, Nov. 18, 1992, abandoned. This application May 17, 1995, Ser. No. 443,095**
**Claims priority, application France, Nov. 22, 1991, 91 14381**
**Int. Cl.[6] G06F *17/40***
**U.S. Cl. 364—424.04** **12 Claims**




1. A device, adapted to be used in an aircraft, for generating and storing aircraft breakdown data, comprising:

means for detecting an aircraft breakdown condition and generating aircraft breakdown data in response thereto;

first memory means for storing said aircraft breakdown data at a number of addresses beginning at a first address, said first memory means being coupled to said detecting means via an address and data bus;

second memory means connectable to and removable from said address and data bus, said second memory means being non-volatile;

presence testing means for determining whether said second memory means is connected to said address and data bus;

means for generating a request that said aircraft breakdown data be copied from said first memory means to said second memory means so that said second memory means can be removed and moved to a location remote from said first memory means after said aircraft breakdown data has been copied into said second memory means;

means for copying said aircraft breakdown data from said first memory means to a number of addresses beginning with a second address in said second memory means upon said generation of said request, said copying means including:

means for reading and storing said first address beginning at which said aircraft breakdown data is stored in said first memory means, said second address beginning at which said aircraft breakdown data is to be stored in said second memory means, and said number of addresses of said aircraft breakdown data to be copied from said first memory means to said second memory means;

means for transferring a portion of said aircraft breakdown data stored in said first memory means at said first address to said second memory means at said second address;

means for periodically incrementing said first address in said first memory means and said second address in said second memory means; and

means for determining whether all of said aircraft breakdown data stored in said first memory means has been copied to said second memory means.

**5,500,798**

## HYDRAULIC ACTIVE SUSPENSION CONTROLLED WITH SIDE FORCE COMPENSATION AT RESPECTIVE VEHICLE WHEELS

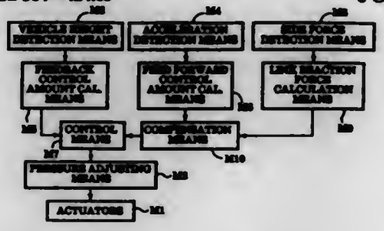
Syouji Inagaki, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 22, 1994, Ser. No. 293,513

Claims priority, application Japan, Sep. 14, 1993, 5-252286; Sep. 16, 1993, 5-253795

Int. Cl.[6] B60G 17/015

U.S. Cl. 364—424.05 6 Claims




1. A hydraulic active suspension of a vehicle body suspended on a plurality of vehicle wheels of a vehicle, comprising:

a plurality of suspension links each suspending a portion of said vehicle body relative to an associated one of said plurality of vehicle wheels;

a plurality of actuators each having a working fluid chamber, wherein one actuator in said plurality of actuators is associated with a corresponding one of said vehicle wheels to increase or decrease a suspension force of said corresponding vehicle wheel according to an increase or a decrease of a pressure in said working fluid chamber;

pressure adjusting means for adjusting said pressure in each of said working fluid chambers;

vehicle height detection means for detecting a height of said portion of said vehicle body corresponding to each of said vehicle wheels;

acceleration detection means for detecting an acceleration of said vehicle body;

feedback control amount calculation means for determining whether said vehicle height at each of said portions of said vehicle body is within acceptable parameters and for calculating feedback control amounts based on a result of said vehicle height determination;

feed forward control amount calculation means for determining vertical forces acting on said vehicle body at said portion of said vehicle body associated with each of said vehicle wheels based on said acceleration detected by said acceleration detecting means and for calculating feed forward control amounts based upon said determined vertical forces;

side force detection means for detecting a side force acting on each of said vehicle wheels from a ground surface;

link reaction force calculation means for calculating a vertical link reaction force acting through each of said suspension links between each of said vehicle wheels and each of said vehicle body portions corresponding thereto based on each of said side forces corresponding to said associated vehicle wheels; compensation means for compensating said feed forward control amounts based upon said link reaction forces calculated by said link reaction force calculation means; and

control means for controlling said pressure adjusting means based upon said feedback control amounts and said feed forward control amounts compensated by said link reaction forces via said compensation means.

**5,500,799**

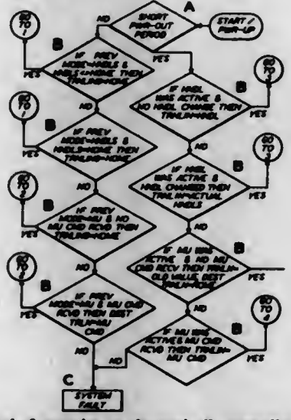
## METHOD OF OPERATING A LOCOMOTIVE MOUNTED THROTTLE CONTROLLER BETWEEN TWO MODES OF OPERATION INCLUDING A TRANSITION BETWEEN SUCH TWO MODES

Gregory S. Bolukin, and Daniel J. Wolf, both of Pittsburgh, Pa., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Nov. 16, 1994, Ser. No. 340,237

Int. Cl.[6] B60L 15/20

U.S. Cl. 364—426.05 20 Claims




1. A method of operating an electronically controlled locomotive mounted throttle controller between a first handle mode of operation, and a second RMU mode of operation, including a transition between such first handle mode and such second RMU mode, said method comprising the steps of:

(a) powering up an electronics package;

(b) determining if one of a short term power outage period, a long term power outage period and a loss of CPU control in one of a short term and a long term had occurred;

(c) determining, after step (b), position of throttle handle, dynamic brake handle and reverser handle operatively connected to such throttle controller;

(d) distinguishing a previous mode of operation of such throttle controller between said first handle mode of operation and said second RMU mode of Operation; in order to determine a current mode of operation of such throttle controller;

(e) adjusting an output signal to trainlines according to handles when it is determined, in step (d) that such throttle controller is operating in said first handle mode of operation;

(f) determining if an RMU command has been received by such throttle controller, during step (e);

(g) positioning outputs of such throttle handle, such dynamic brake handle and such reverser handle to home position when it is determined in step (f) that a command has been received from such RMU;

(h) imposing a predetermined delay when such outputs of such throttle handle, such dynamic brake handle and such reverser handle are in a home position, in step (g), after positioning of such throttle handle, such dynamic brake handle and such reverser handle into said home position by an operator of such locomotive and before exiting a first handle mode and entering a second RMU mode for operation of such throttle controller;

(i) determining if an RMU command was received by such throttle controller after exiting said first handle mode; and

(j) adjusting said output signals to such trainlines when it is determined, in step (i), that an RMU command has been received by such throttle controller.



**5,500,800**

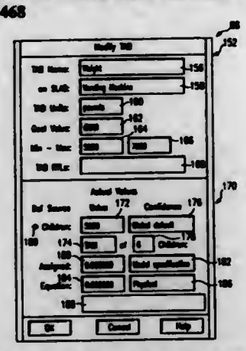
## METHOD AND APPARATUS FOR TRACKING ALLOCATABLE REQUIREMENTS

Marvin T. Talbott, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 965,984, Oct. 23, 1992, abandoned, which is a continuation of Ser. No. 661,360, Feb. 26, 1991, abandoned. This application Dec. 5, 1994, Ser. No. 349,700

Int. Cl.[6] G06F 19/00;15/00;17/50

U.S. Cl. 364—468 13 Claims



1. A method of tracking allocatable requirements including goals and limits associated with a system design using a computer, wherein the computer performs the following steps comprising:

hierarchically decomposing the system design into a plurality of objects, each of said objects defining a portion of the system design, each of said objects having a parent-child relationship, wherein a child object of said objects defines a portion of a parent object;

apportioning the allocatable requirements of said goals and said limits as contributions among said objects according to said parent-child relationships;

comparing said contributions to measured actual values associated with said objects;

identifying a portion of said objects in response to said comparison having contributions outside a portion of said measured actual values corresponding to said identified objects;

reallocating said goals and limits based on said contributions outside said portion of said measured actual values for said identified portion of said objects; and

collecting said contributions of each of said objects to generate system level actual values through said parent-child relationships.

**5,500,801**

## DEVICE FOR COMPENSATING FOR DEVIATIONS IN REGISTER IN PRINTED PRODUCTS

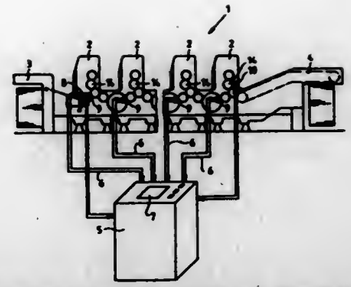
Gerhard Löffler, Walldorf, Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Germany

Filed Oct. 17, 1994, Ser. No. 324,405

Claims priority, application Germany, Jan. 16, 1993, 43 35 351.7

Int. Cl.[6] B41F 5/06

U.S. Cl. 364—469 7 Claims



the printing units connected to said computer/control device for compensating for the deviations in register between said color separations in the printing direction, transversely to the printing direction, and diagonally across the printed product, by shifting a respective printing form in accordance with said determined adjustment data of said computer/control device; said sensor device including means for obtaining measured values from at least two regions on the printed product located transversely offset relative to one another representing deviations in register caused by shrunken and/or swollen printing transferred to the printed product in the respective printing units; and a sheet compensator device connected to said computer/control device effecting a deformation of the printed product for compensating for deviations in register caused by shrunken and/or swollen printing.

1. Device for compensating for deviations in register in a printed product produced in a sheet-fed rotary printing press having a plurality of printing units with printing forms, comprising at least one opto-electrical sensor device for detecting measured values from at least two image regions of a printed product, the measured values providing information regarding deviations in register in a printing direction, transversely to the printing direction, and diagonally across the printed product; a computer/control device connected to said sensor device for receiving therefrom data regarding the measured values, for ascertaining from said data deviations in register between color separations, and for determining corresponding compensating adjustment data; and adjusting devices in

**5,500,802**

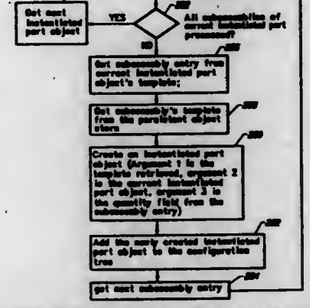
## SYSTEM AND METHOD FOR CREATING CONFIGURATORS USING TEMPLATES

James M. Morris, 828 Bay St., Mountain View, Calif. 94041, and John G. Cleary, R.R. 2, Box 405, La Honda, Calif. 94020

Filed May 31, 1994, Ser. No. 250,817

Int. Cl.[6] G06F 17/50

U.S. Cl. 364—474.24 14 Claims




1. A system including a computer for creating a set of end product configurations from a series of intermediate configurations, each said end product comprising a subassembly of instantiated parts, each said instantiated part belonging to a class, said class being represented by a prestored template capable of being displayed on a display, said instantiated parts comprising a set of resources, needs and attributes, each said instantiated part optionally comprising a subassembly of instantiated parts and each said instantiated part selectable by said system according to a set of user-supplied descriptions and a set of said instantiated part's needs and resources, said system comprising:

a storage means for storing said user-supplied descriptions of the class of instantiated parts;

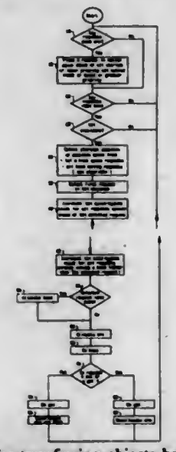
a retrieval means for retrieving said prestored templates from said storage means, said templates providing said user-supplied descriptions;
display means for displaying said templates on a display;
a first processor means for creating instantiated parts from said templates; and
a second processor means for combining a plurality of said instantiated parts together to form said intermediate configurations for storage and later retrieval.

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**5,500,803**
**MOTION OPTIMIZATION FOR A TAPE STORAGE SYSTEM**

**Frederick Munro, 2315 Ridge Cir., Broomfield, Colo. 80020; Aaron Dalley, 2727 Folsom St., Apt. 317, Boulder, Colo. 80304; Richard Defouw, 805 17th St., Boulder, Colo. 80303, and David Trachy, 124 S. Carter Ct., Louisville, Colo. 80027**

**Filed Nov. 23, 1993, Ser. No. 156,493**
**Int. Cl.[6] G06F *17/00*; G11B *15/68*; B65G *1/00***
**U.S. Cl. 364—478** **28 Claims**



1. An apparatus for transferring objects between locations in a multi-dimensional storage array in response to n pending requests to transfer objects, where $n \geq 2$, comprising:
a robot for transferring said objects between locations in said storage array; and
a library controller having:
means for controlling said robot in response to the pending requests to transfer objects; and
means for determining the shortest possible time to execute m pending requests, where $2 \leq m \leq n$, by considering the time to execute differently ordered sequences of the m pending requests.

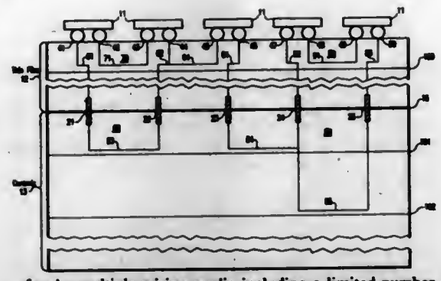
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**5,500,804**
**METHOD TO OPTIMIZE THE WIRING OF MULTIPLE WIRING MEDIA PACKAGES**

**Philip S. Honsinger, Poughkeepsie; Lucy Lim, Wappingers Falls, and Vinod Narayanan, Fishkill, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 8, 1993, Ser. No. 163,979**
**Int. Cl.[6] G06F *17/50***
**U.S. Cl. 364—488** **9 Claims**

1. A method of optimizing the wiring of multi-chip modules using multiple wiring media comprising the steps of:
inputting data models for a network composed of multiple chips and the multiple wiring media, said wiring media having differing electrical and geometric characteristics, a data model



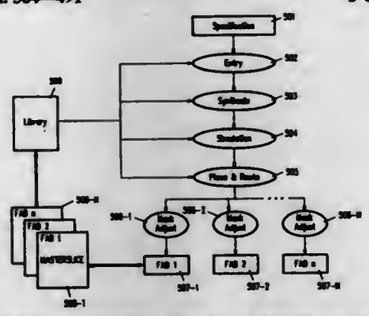
for the multiple wiring media including a limited number of interface vias making connections between different media of the multiple wiring media;
assigning connections to different media of the package based on characteristics and constraints required for connections and available resources of the media using a global router to establish estimates for each connection;
breaking connections into sub-connections for portions of the network required to pass from one medium through another medium by modeling those portions of the network as a list of original pins of the multiple chips augmented by a list of interface vias, each potential sub-connection consisting of a paired network pin and interface via;
associating a cost with each potential interface via and sub-connection, said cost considering the demands of said characteristics and constraints across said package;
selecting interface vias to resolve assignment problems by considering all connections together; and
performing detailed routing on each media of the package based on the selection of interface vias.

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**5,500,805**
**MULTIPLE SOURCE EQUALIZATION DESIGN UTILIZING METAL INTERCONNECTS FOR GATE ARRAYS AND EMBEDDED ARRAYS**

**Ven L. Lee, Los Altos Hills; William M. Dawson, San Jose, both of Calif., and Donald L. Doud, Spring, Tex., assignors to Nsoft Systems, Inc., Santa Clara, Calif., and Compaq Computer Corporation, Houston, Tex.**

**Continuation of Ser. No. 132,520, Oct. 6, 1993, abandoned. This application Sep. 2, 1994, Ser. No. 300,637**
**Int. Cl.[6] G06F *17/50***
**U.S. Cl. 364—491** **3 Claims**



1. A method for fabricating a plurality of integrated circuits from a plurality of alternate sources, each of said plurality of integrated circuits performing substantially identically regardless of inherent process differences of said plurality of alternate sources, comprising the steps of:
designing a circuit to perform a desired electrical function;



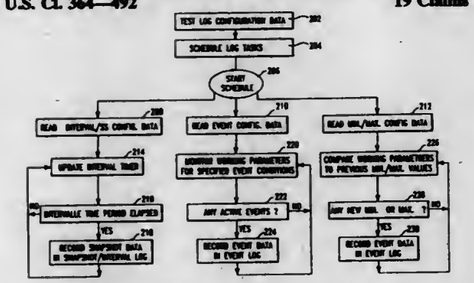
determining a first characteristic capacitance for a given electrical interconnect routing for an integrated circuit produced by a first alternate source using a first fabrication process;
determining a second characteristic capacitance for a similar electrical interconnect routing for an integrated circuit produced by a second alternate source using a second fabrication process;
determining a difference in said first and second characteristic capacitances;
laying out said circuit to provide a first layout for fabrication by a first alternate source using said first fabrication process; and
adjusting said first layout to adapt for said difference in said first and second characteristic capacitances to provide a second layout for fabrication by said second alternate source using said second fabrication process, by adjusting said first layout to provide said second layout by adjusting electrical interconnect widths to alter the capacitance associated therewith to compensate for said difference in characteristic capacitances.

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**5,500,806**
**DATA LOGGING IN A VOLTAGE REGULATOR CONTROLLER**

**Michael A. Bellin, Brandon, Miss.; Carl Laplace, Raleigh, N.C.; John J. Trainor, Wake Forest, N.C., and Mark Hoffmann, Chapel Hill, N.C., assignors to Siemens Energy & Automation, Inc., Alpharetta, Ga.**

**Filed Nov. 18, 1993, Ser. No. 154,315**
**Int. Cl.[6] G06G *7/63*; G05F *1/14***
**U.S. Cl. 364—492** **19 Claims**



4. A method of operating a voltage regulator controller of a type used to control a step-type regulator having an internal multi-tap transformer, comprising the steps of:
(a) receiving configuration data selected by an operator of the voltage regulator controller, the configuration data including specifications of log triggering conditions, wherein the log triggering conditions include:
(i) occurrence of an event relating to regulator control; and
(ii) elapse of a recurring time interval;
(b) monitoring the voltage regulator controller and the voltage regulator transformer for occurrence of the log triggering condition;
(c) monitoring electrical parameters present in the regulator transformer; and,
(d) capturing data indicative of at least some of the electrical parameters in a memory when the log triggering condition is detected.

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**5,500,807**
**SELECTION METHOD FOR PHARMACOLOGICALLY ACTIVE COMPOUNDS**

**Thomas N. Lavin, Sausalito; Mark F. Norman, Petaluma; Teri E. Klein, and George Seibel, both of San Francisco, all of Calif., assignors to The Regents of the University of California, Oakland, Calif.**

**Continuation of Ser. No. 462,608, Jan. 9, 1990, abandoned, which is a continuation of Ser. No. 294,372, Jan. 6, 1989, abandoned, and a continuation-in-part of Ser. No. 295,041, Jan. 6, 1989, abandoned. This application Feb. 21, 1992, Ser. No. 839,170**
**Int. Cl.[6] G06F *17/11***
**U.S. Cl. 364—496** **10 Claims**

1. A method for selecting and evaluating pharmacological activity of an experimental chemical compound, which method comprises steps:
(a) selecting a standard chemical compound having known chemical structure and known pharmacological activity and preparing a three dimensional spatial atom arrangement model of the standard chemical compound wherein the standard chemical compound is spatially defined as a volume by conventional cartesian three dimensional x, y, z coordinate space axes planes;
(b) choosing an experimental chemical compound structure to be evaluated;
(c) preparing a computer created three dimensional spatial atom arrangement model of the experimental compound of step (b) wherein the experimental compound is also defined by a conventional cartesian three dimensional x, y, z coordinate space axes planes;
(d) displaying and superimposing the model of the experimental chemical compound of step (c) over the model of the standard chemical compound of step (a) on the computer screen;
(e) determining three-dimensional spatial similarities or dissimilarities of the standard chemical compound structure of step (a) with the experimental chemical compound structure to be evaluated of step (c) by manipulating both models on the computer screen;
(f) determining that the spatial atom arrangement of the experimental chemical compound fits maximizing the overlap with the cartesian three dimensional x, y, z coordinate volume defined by the standard compound of step (a) producing a positive or negative matching result and when the spatial matching result is positive;
(g) performing a known pharmacological test, in which the standard compound of step (b) to determine whether or not the experimental compound is active in said known pharmacological test producing a positive or negative result; and
(h) selecting for further pharmacological evaluation only the experimental chemical compound wherein step (f) and step (g) have positive results,
wherein the models of a standard chemical compound structure and the chosen experimental compound chemical structure to be evaluated are prepared by:
(A) obtaining coordinates of the models of the standard and experimental compounds from the computer which uses at least one computer operating system and at least one computer software program;
(B) entering the coordinates of both the standard compound and the compound to be evaluated into the computer;
(C) performing energy refinement using the computer software program;
(D) modeling both compounds in extended conformation using standard geometries;
(E) displaying coordinates x, y, z on the screen and manipulating these coordinates in real time with the computer software program on a graphic system;
(F) superimposing the volume model of the experimental compound to be evaluated over the volume model of the standard compound;
(G) manipulating both models on the computer screen by displaying their structural models with their respective computer generated Van der Waals surfaces around individual atoms;

(H) rotating both models 360° through space along the vertical axis;
(I) observing and recording similarities along the x, y, z axes;
(J) evaluating the experimental compound as having structural similarity or dissimilarity with the standard compound;
(K) determining that the spatial atom arrangement of the experimental chemical compound fits maximizing the overlap with the cartesian three dimensional x, y, z coordinate volume defined by the standard compound of step (A) producing a positive or negative matching result and when the spatial matching result is positive;
(i) performing a known pharmacological test, in which the standard compound of step (A) is active, on the experimental compound of step (B) to determine whether or not the experimental compound is active in said known pharmacological test producing a positive or negative result; and
(j) selecting for further pharmacological evaluation only the experimental chemical compound wherein step (K) and step (i) have positive results, wherein the three dimensional model of experimental compound is superimposed over the three dimensional model of the standard compound and both structures are oriented along their vertical y axis until their spatial similarities or dissimilarities are shown.

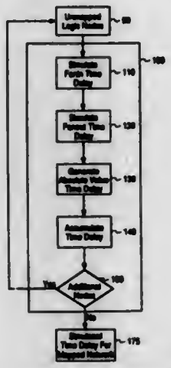
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**5,500,808**

## APPARATUS AND METHOD FOR ESTIMATING TIME DELAYS USING UNMAPPED COMBINATIONAL LOGIC NETWORKS

**Albert R. Wang, Fremont, Calif., assignor to Synopsys, Inc., Mountain View, Calif.**

**Continuation of Ser. No. 645,903, Jan. 24, 1991, abandoned. This application Mar. 23, 1995, Ser. No. 409,627**
**Int. Cl.[6] G06F 17/50**
**U.S. Cl. 364—578** **21 Claims**




15. In a computer, a simulator for generating delay times in a mapped and optimized logic network in a target technology, said mapped and optimized logic network corresponding an unmapped logic network comprising:

means, operatively coupled to said unmapped logic network, for converting a fanin or a logic node in said unmapped logic network to a first time delay in said mapped and optimized logic network, without generating said mapped and optimized logic network, to thereby generate a simulated first time delay; and

means, operatively coupled to said unmapped logic network, or converting a fanout or said logic node in said unmapped logic network to a second time delay in said mapped and optimized logic network, without generating said mapped and optimized logic network, to thereby generate a simulated second time delay.

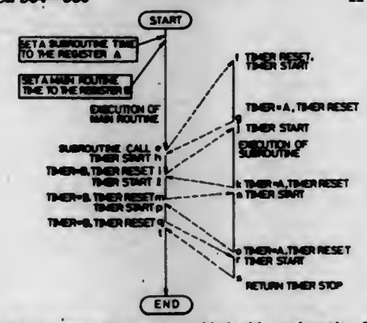
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**5,500,809**

## MICROCOMPUTER SYSTEM PROVIDED WITH MECHANISM FOR CONTROLLING OPERATION OF PROGRAM

**Toshifumi Nakai, Ichihara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Jul. 29, 1993, Ser. No. 98,904**
**Claims priority, application Japan, Aug. 31, 1992, 4-231651**
**Int. Cl.[6] G06F 9/46**
**U.S. Cl. 364—580** **11 Claims**




1. A microcomputer system provided with a subroutine function, comprising:

first measuring means for measuring an actual execution time of a subroutine;

first detecting means for detecting that the actual execution time of said subroutine measured by said first measuring means reaches a first predetermined time period;

first interrupting means responsive to first detecting means for interrupting the execution of said subroutine following the execution thereof for said first predetermined time period;

first shifting means responsive to first interrupting means for shifting said subroutine execution to execution of a main routine after the interruption of the execution of said subroutine;

monitoring means for monitoring events to be monitored during execution of said main routine;

second measuring means for measuring an actual execution time of said main routine, starting from said shifting to the execution of said main routine;

second detecting means for detecting that the actual execution time of said main routine measured by said second measuring means reaches a second predetermined time period;

second interrupting means responsive to second detecting means for interrupting execution of said main routine following the execution thereof for said second predetermined time period; and

second shifting means responsive to second interrupting means for shifting said main routine execution to said subroutine execution following execution of said main routine,

wherein execution of a subroutine of said first predetermined time period and execution of said main routine of said second predetermined time period are alternately repeated, unless execution of said subroutine is completed, so that events are monitored by said monitoring means during execution of said main routine.



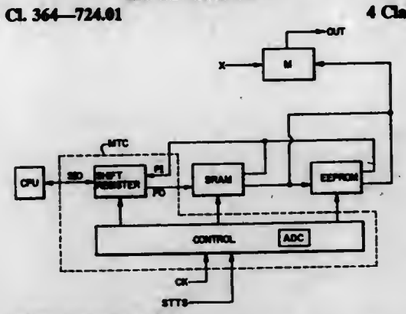
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**5,500,810**

## FILTER DEVICE WITH MEMORY TEST CIRCUIT

**Guoliang Shou; Weikang Yang; Sunao Takatori, and Makoto Yamamoto, all of Tokyo, Japan, assignors to Yozan Inc., and Sharp Corporation, both of Tokyo, Japan**

**Continuation-in-part of Ser. No. 216,826, Mar. 23, 1994. This application Apr. 25, 1994, Ser. No. 231,766**
**Claims priority, application Japan, Apr. 28, 1993, 5-125878**
**Int. Cl.[6] G06F 15/31**
**U.S. Cl. 364—724.01** **4 Claims**




1. A filter device comprising:

a multiplication circuit for multiplying input data by at least one of a plurality of multipliers;

a memory means for storing said plurality of multipliers;

a shift register having a single input/output data pin, said shift register being operatively connected to an external circuit via said single input/output data pin and operatively connected to said memory means, said shift register converting said multipliers between a parallel data format and a serial data format; and

a control circuit for generating addresses of said memory means and for selecting a read/write status of said memory means.

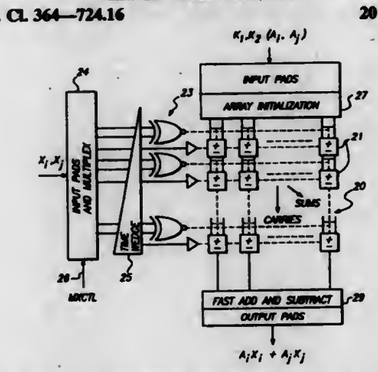
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**5,500,811**

## FINITE IMPULSE RESPONSE FILTER

**Alan G. Corry, Santa Clara, Calif., assignor to MicroUnity Systems Engineering, Inc., Sunnyvale, Calif.**

**Filed Jan. 23, 1995, Ser. No. 377,096**
**Int. Cl.[6] G06F 15/31;7/38**
**U.S. Cl. 364—724.16** **20 Claims**




1. A method of calculating output data points of a polyphase Finite Impulse Response filter using a complex multiplier, comprising the steps of:

a) applying to the complex multiplier a pair of constants $K_1$ and $K_2$ different from but related to a pair of filter coefficients $A_i$ and $A_j$;

b) applying to the complex multiplier a pair of input operands $X_i$ and $X_j$; and

c) operating the complex multiplier to form the quantity $A_iX_i + A_jX_j$.

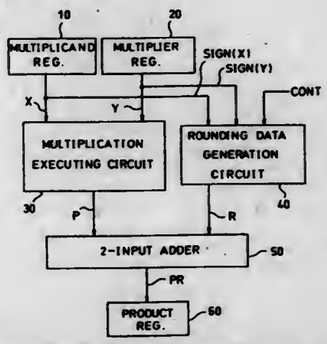
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**5,500,812**

## MULTIPLICATION CIRCUIT HAVING ROUNDING FUNCTION

**Mana Seishi, Fukuoka, and Takayuki Minemaru, Osaka, both of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Jun. 13, 1994, Ser. No. 258,991**
**Claims priority, application Japan, Jun. 14, 1993, 5-141727**
**Int. Cl.[6] G06F 7/52**
**U.S. Cl. 364—745** **6 Claims**




1. A multiplication circuit for calculating a product comprising:

multiplication means for calculating at least one intermediate product from a multiplicand and a multiplier factor;

rounding data generation means for generating a rounding data corresponding to a sign of the product to be calculated based on the multiplicand and the multiplier factor; and

addition means for adding the thus generated rounding data to the thus calculated at least one intermediate product.

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**5,500,813**

## CIRCUIT FOR ADDING MULTIPLE-BIT BINARY NUMBERS

**Sang-won Song, Seoul, and Chan-sik Kim, Bucheon, both of, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea**

**Filed May 20, 1993, Ser. No. 63,785**
**Claims priority, application Rep. of Korea, May 20, 1992, 92-8571**
**Int. Cl.[6] G06F 7/50**
**U.S. Cl. 364—787** **7 Claims**

1. An adder comprising:

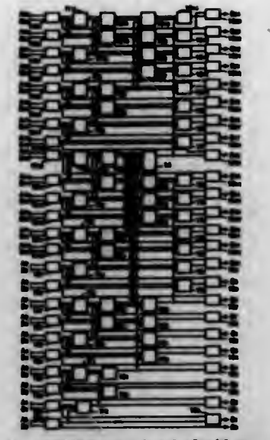
carry generation & propagation circuits for inputting two 16-bit data signals to output carry generating & propagating signals;

1st-first cells for respectively inputting 3rd & 4th, 5th & 6th, 7th & 8th, 9th & 10th, 11th & 12th, 13th & 14th and 15th & 16th output signals from said carry generation & propagation circuits to perform an operation;

a 1st-second cell for inputting 1st and 2nd output signals of said carry generation & propagation circuits to perform an operation;

2nd-second cells for respectively inputting an output signal of said 1st-second cell, a 3rd output signal of said carry generation & propagation circuits, and a 1st output signal of said 1st-first cells to perform operations;

2nd-first cells for respectively inputting a 2nd output signal of said 1st-first cells, a 7th output signal of said carry generation & propagation circuits and a 3rd output signals of said 1st-first cells, respectively inputting a 4th output signal of said



1st-first cells, an 11th output signal of said carry generation & propagation circuits and a 5th output signal of said 1st-first cells, and respectively inputting a 6th output signal of said 1st-first cells, a 15th output signal of said carry generation & propagation circuits and a 7th output signal of said 1st-first cells, to perform respective operations;

3rd-first cells for respectively inputting a 2nd output signal of said 2nd-second cells, a 5th output signal of said carry generation & propagation circuits, a 2nd output signal of said 1st-first cells, 1st & 2nd output signals of said 2nd-first cells, and respectively inputting a 4th output signal of said 2nd-first cells, a 13th output signal of said carry generation & propagation circuits, a 6th output signal of said 1st-first cells and a 5th output signal of said 2nd-first cells, to perform respective operations;

3rd-second cells for respectively inputting a 2nd output signal of said 2nd-second cells, a 5th output signal of said carry generation & propagation circuits, a 2nd output signal of said 1st-first cells, and a 1st output signal of said 2nd-first cells, to perform an operation;

a third cell for inputting 1st, 2nd, 4th and 6th output signals of said 2nd-first cells and a 2nd output signal of said 2nd-second cells, to perform an operation;

4th-second cells for respectively inputting a 4th output signal of said 3rd-second cells, a 9th output signal of said carry generation & propagation circuits, a 4th output signal of said 1st-first cells, 3rd and 4th output signals of said 2nd-first cells, and 1st, 2nd and 3rd output signals of said 3rd-first cells; and

final sum circuits for respectively inputting said output signals from said carry generation & propagation circuits and first, second and third cells to output a final sum.

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**5,500,814**

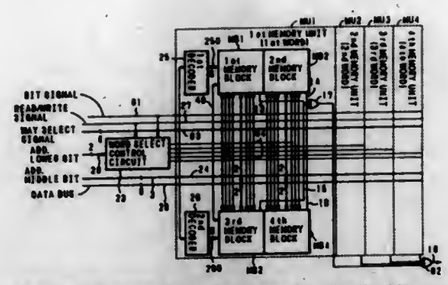
**MEMORY SYSTEM AND CACHE MEMORY SYSTEM**

**Itsuko Kinoshita, and Akitoshi Ooaki, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Aug. 4, 1994, Ser. No. 286,119**
**Claims priority, application Japan, Aug. 5, 1993, 5-194764**
**Int. Cl.[6] G11C *11/413;15/04***
**U.S. Cl. 365—49** **1 Claim**

1. A cache memory system of plurality-way set associative type, comprising:

data storing means for storing data in plural-way unit including a plurality of ways, the data being the one in which one word is composed of a predetermined number of bits and one way is composed of a predetermined number of words, and from which data is read out;



parity storing means for storing a plurality of parity bits corresponding to data of plural-bit unit;

writing/reading means for writing data from data bus to a plurality of ways of said data storing means, and for reading simultaneously a predetermined number of data among data of said plurality of ways from said data storing means to said data bus;

way selecting means for selecting way for which data is to be read or written by said writing/reading means;

word selecting means for selecting word data to be read or written by said writing/reading means to the way selected by said way selecting means; and

parity calculating means for calculating the parity of the data of a plural-bit unit written in said data storing means and writing the parity to said parity storing means, and for calculating the parity of the data of a plural-bit unit read out from said data storing means for comparing with a corresponding parity stored in said parity storing means;

wherein said data storing means is configured so that the data of plural-bit unit for which parity is calculated by said parity calculating means occupy respectively identical bit positions as those of the word data in a corresponding word in the plurality of ways, and

further comprising connecting means for connecting selectively to said data bus the bit positions of the word data selected by the word selecting means of the way selected by the way selecting means.

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**5,500,815**

**SEMICONDUCTOR MEMORY**

**Satoru Takase, Yokohama, and Tohru Furuyama, Tokyo, both of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Nov. 25, 1992, Ser. No. 981,541**
**Claims priority, application Japan, Nov. 27, 1991, 3-312398**
**Int. Cl.[6] G11C *11/24;11/40***
**U.S. Cl. 365—149** **39 Claims**

1. A semiconductor memory device comprising:

a memory cell array formed of a plurality of dynamic memory cell units on a semiconductor substrate, each of said dynamic memory cell units including:

a first data node;

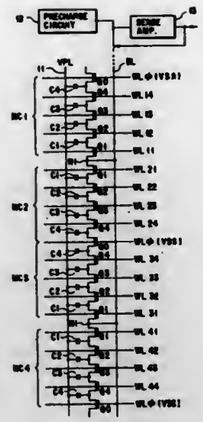
a first cascade gate connected to said first data node and including a plurality of first MOS transistors which are connected in cascade;

a plurality of data storage capacitors each having a first electrode respectively connected to a corresponding one of said first MOS transistors at an end of said corresponding one of said first MOS transistors which is remote from said first data node;

word lines each respectively connected to a gate of a corresponding one of said first MOS transistors for supplying signals to control the ON/OFF switching of said first MOS transistors; and

isolation MOS transistors respectively transistor formed between dynamic memory cell units which are arranged side by side on said semiconductor substrate.





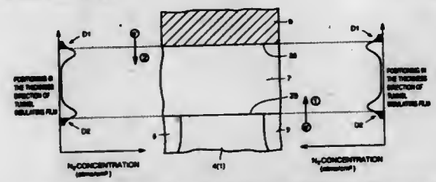
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**5,500,816**

**NON-VOLATILE SEMICONDUCTOR MEMORY DEVICE AND MANUFACTURING METHOD THEREOF**

**Kiyoteru Kobayashi, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Feb. 28, 1994, Ser. No. 203,074**
**Claims priority, application Japan, Jul. 30, 1993, 5-190259**
**Int. Cl.[6] G11C *16/04***
**U.S. Cl. 365—185** **7 Claims**



1. A non-volatile semiconductor memory device, comprising:

a semiconductor substrate of a first conductivity type having a main surface;

an impurity region of a second conductivity type formed at the main surface of said semiconductor substrate;

a nitrided oxide or re-oxidized nitrided oxide tunnel insulating film formed on said impurity region; and

an electrode for storing charges formed on said tunnel insulating film; wherein

said electrode for storing charges comprises a nitride portion in contact with said tunnel insulating film in an area within a tunnel region where electrons are moved by tunnel effect to and from said impurity region and said electrode for storing charges.

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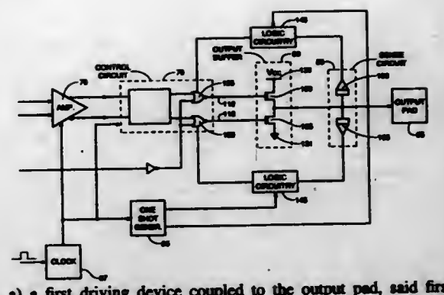
**5,500,817**

**TRUE TRISTATE OUTPUT BUFFER AND A METHOD FOR DRIVING A POTENTIAL OF AN OUTPUT PAD TO THREE DISTINCT CONDITIONS**

**Loren L. McLaury, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.**

**Filed Jan. 21, 1993, Ser. No. 7,291**
**Int. Cl.[6] G11C *7/00***
**U.S. Cl. 365—189.05** **16 Claims**

1. A tristate circuit for driving three distinct potential ranges to an output pad, said three distinct potential ranges designated as a first condition, a second condition and a third condition, the circuit comprising:



a) a first driving device coupled to the output pad, said first driving device capable of driving the output pad to the first condition when activated;

b) a second driving device coupled to the output pad, said second driving device capable of driving the output pad to the second condition when activated;

c) a sense circuit, coupled to said output pad, for sensing a potential at the output pad and for generating a first sense signal in response to said first condition being on the output pad and for generating a second sense signal in response to said second condition being on the output pad;

d) a logic circuit, coupled to said sense circuit, for receiving said first and second sense signals and capable of generating an override signal in response to said first and second sense signals when enabled;

e) a one shot generator, coupled to said logic circuit, for generating a pulse, said pulse enabling said logic circuit; and

f) a control circuit, coupled to said first and second driving devices and coupled to said logic circuit, said control circuit controlling an activation and deactivation of said first and second driving devices, said control circuit responding to said override signal such that said first driving device is activated to drive the output pad to said third condition when said second condition is on said output pad and such that said second driving device is activated to drive the output pad to said third condition when said first condition is on the output pad.

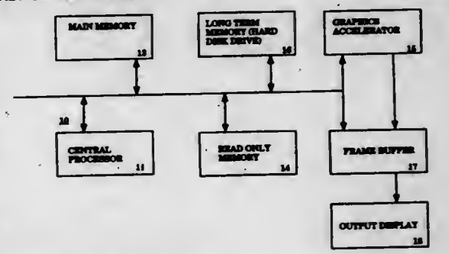
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**5,500,818**

**METHOD AND APPARATUS FOR PROVIDING ACCURATE T(ON) AND T(OFF) TIMES FOR THE OUTPUT OF A MEMORY ARRAY**

**Shuen C. Chang, San Jose; Hai D. Ho, Milpitas, and Szu C. Sun, Mountain View, all of Calif., assignors to Sun Microsystems, Inc., Mountain View, and Samsung Semiconductor, Inc., San Jose, both of Calif.**

**Filed Oct. 29, 1993, Ser. No. 145,373**
**Int. Cl.[6] G11C *7/00***
**U.S. Cl. 365—189.05** **20 Claims**



1. A frame buffer comprising:

an array of memory cells;

access circuitry, coupled to the memory array, for accessing pixel data from a selected memory cell of the array of memory cells and for converting the pixel data into an input data signal; and

output circuitry, coupled to the access circuitry, for producing a first output data signal at an output port based on the input data signal, said output circuitry includes control circuitry for controlling a rise time and a fall time of the first output data signal, said control circuitry including a delay circuit being selected to provide a minimum delay between the first output data signal and a second output data signal produced after the first output data signal such that said minimum delay is equal to the difference between a minimum rise time of the second output data signal and a maximum fall time of the first output data signal.

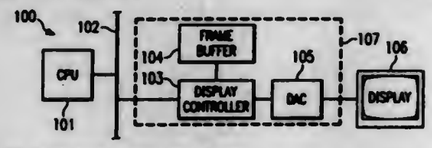
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**5,500,819**

## CIRCUITS, SYSTEMS AND METHODS FOR IMPROVING PAGE ACCESSES AND BLOCK TRANSFERS IN A MEMORY SYSTEM

**Michael E. Runas, McKinney, Tex., assignor to Cirrus Logic, Inc., Fremont, Calif.**

**Filed Sep. 30, 1994, Ser. No. 315,934**
**Int. Cl.[6] G11C *11/40***
**U.S. Cl. 365—189.05** **19 Claims**




12. A memory system comprising:

an array of memory cells arranged in rows and columns, each said row associated with a conductive wordline and each said column associated with a conductive bitline;

a bank of master sense amplifiers coupled to said bitlines;

a plurality of banks of slave sense amplifiers coupled to said master sense amplifiers;

a column decoder coupled to each of the plurality of banks of slave sense amplifiers; and

said control circuitry including mode control circuitry coupled to said row decoder and said master sense amplifiers and multiplexer control circuitry coupled to said mode control circuitry and said first and second banks of slave sense amplifiers, said control circuitry operable during a block move operation to:

control sensing by said master sense amplifiers of data from a said row in said array selected by said row decoder;

control transfer of said data from said master sense amplifiers to a selected one of said banks of slave sense amplifiers;

control shifting of said data from a first set of slave sense amplifiers to a second set of slave sense amplifiers within said selected bank of slave amplifiers; and

control writing of said data through said master sense amplifiers to ones of said cells along said selected said row associated with said bitlines coupled to said second set of slave sense amplifiers.

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**5,500,820**

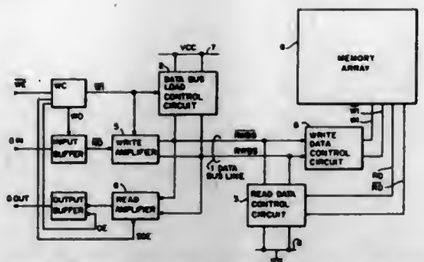
## SEMICONDUCTOR MEMORY DEVICE

**Yuji Nakaoka, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Sep. 30, 1993, Ser. No. 129,362**
**Claims priority, application Japan, Sep. 30, 1992, 4-262382**
**Int. Cl.[6] G11C *7/00***
**U.S. Cl. 365—189.01** **12 Claims**

12. A semiconductor memory device comprising:

a memory bank, a data bus line associated with said memory bank for transferring read and write data, said data bus line being equipped with a read circuit block and a write circuit block, said read circuit block driving said data bus line according to said read data from said memory bank to transport a read data signal, said read data signal taking a first voltage level when said read data is a first logic level and a second voltage level when said read data is a second logic level, said first voltage level being different from said second voltage level, and said write circuit block driving said data bus line according to said write data to be supplied to said memory bank to transport a write data signal, said write data signal taking a third voltage level when said write data is one of said first and second logic levels and a fourth voltage level when said write data is the other of said first and second logic levels, said third voltage level being higher than each of said first and second voltage levels and said fourth voltage level being lower than each of said first and second voltage levels.



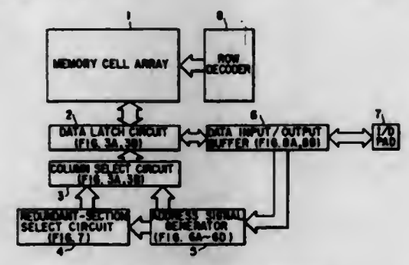

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**5,500,821**

## SEMICONDUCTOR MEMORY DEVICE

**Tomoharu Tanaka, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Continuation of Ser. No. 308,421, Sep. 19, 1994, abandoned.**
**This application Feb. 9, 1995, Ser. No. 386,179**
**Claims priority, application Japan, Sep. 20, 1993, 5-233657**
**Int. Cl.[6] G11C *7/00;8/00***
**U.S. Cl. 365—200** **19 Claims**




1. A semiconductor memory device comprising:

a memory cell array in which memory cells are arranged in a matrix fashion and an order of their addresses is determined in advance when being accessed;

redundant memory cells in said memory cell array for relieving defective memory cells;

means for storing the address n cycles previous to a cycle to be accessed according to the address of said defective memory cell in said memory cell array;

means for comparing said address stored in said address storing means with a address signal, and outputting relief information indicating that said redundant memory cells are accessed instead of said defective memory cells when they coincide with each other;

means for outputting said relief information to the cycle accessed according to said address of said defective memory cells; and



means for accessing serially said memory cells according to addresses of predetermined order, and accessing said redundant memory cells instead of said defective memory cells according to said relief information when said relief information are outputted.

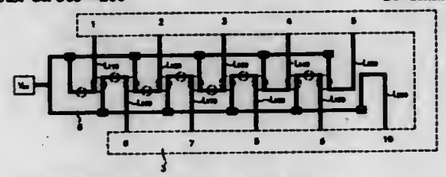
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**5,500,822**

## ADDRESS DECODER FOR REPAIR OF MEMORY DEVICE

**Byoung Y. Han, Chungcheongbuk, Rep. of Korea, assignor to LG Semicon Co., Ltd., Seoul, Rep. of Korea**

**Continuation of Ser. No. 110,870, Aug. 24, 1993, abandoned.**
**This application Dec. 5, 1994, Ser. No. 349,473**
**Claims priority, application Rep. of Korea, Aug. 24, 1992, 15195/1992**
**Int. Cl.[6] G11C *13/00***
**U.S. Cl. 365—200** **10 Claims**



1. A repair address decoder comprising:

a conductive line having first and second substantially parallel legs;

a matrix address decoder;

first and second repair links operatively connected to said first leg and extending towards said second leg; and

a third repair link operatively connected to said second leg, extending towards said first leg and disposed between said first and second repair links;

wherein each of said first, second and third links is operatively connected at one end thereof to said matrix address decoder; and

wherein said matrix address decoder defines a U-shape with an open end and said first and second legs extend into said open end.

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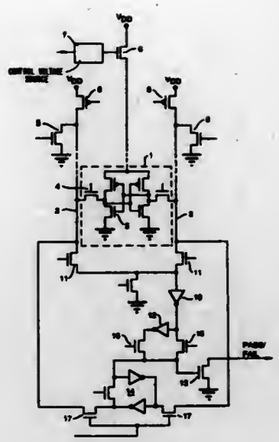
**5,500,823**

## MEMORY DEFECT DETECTION ARRANGEMENT

**Alan Martin, Plymouth, and Richard Albon, Tavistock, both of, United Kingdom, assignors to Plessey Semiconductors Limited, United Kingdom**

**Filed Mar. 31, 1994, Ser. No. 221,874**
**Claims priority, application United Kingdom, Apr. 14, 1993, 9307648**
**Int. Cl.[6] G11C *29/00***
**U.S. Cl. 365—201** **4 Claims**

1. In a semiconductor integrated circuit static random access memory including a plurality of memory cells arranged in rows and columns, each memory cell comprising respective first and second inverters, and respective first and second bit lines associated with each column of said memory cells, a testing arrangement for defects in individual said inverters comprising: means for applying to each of the memory cells of a column a supply voltage selectively of a first or normal operating supply voltage value and a second or test supply voltage value lower than said first value; means selectively for applying a sequence of test signal voltages to said first bit line associated with the column of memory cells; detector circuit means; and means operatively connected to said detector circuit means, and operative for selectively connecting said second bit line associated with said column of memory cells to apply to said detector circuit means any change in signal voltage on said second bit line in response to said sequence of test signal voltages.



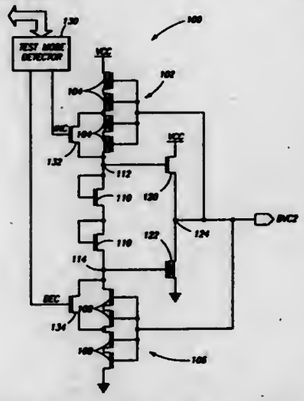
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**5,500,824**

## ADJUSTABLE CELL PLATE GENERATOR

**William M. Fink, Princeton Junction, N.J., assignor to Micron Technology, Inc., Boise, Id.**

**Filed Jan. 18, 1995, Ser. No. 374,840**
**Int. Cl.[6] G11C *7/00***
**U.S. Cl. 365—201** **19 Claims**




1. A dynamic random access memory device comprising;

a plurality of dynamic memory cells, each dynamic memory cell being formed at least in part by a cell plate which is connected to a reference voltage, the dynamic memory cells being operated by upper and lower supply voltages;

a cell plate generator which normally produces the reference voltage at a nominal intermediate operating value between the upper and lower supply voltages;

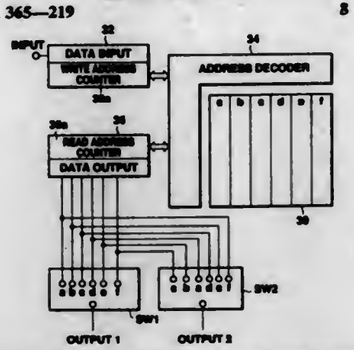
a voltage adjustment circuit which is responsive to a first test mode signal to adjust the reference voltage from its nominal intermediate operating value to a first adjusted intermediate testing value without requiring an externally-supplied adjusted reference voltage, the first adjusted intermediate testing value being between the upper and lower supply voltages.

5,500,825

## PARALLEL DATA OUTPUTTING STORAGE CIRCUIT

Masato Osaya, and Susumu Yamada, both of Ora, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Jun. 28, 1994, Ser. No. 268,165
Claims priority, application Japan, Jun. 30, 1993, 5-189094
Int. Cl.[6] G11C 7/00
U.S. Cl. 365—219 8 Claims




1. A storage circuit usable in a delay circuit, comprising:

a memory for storing data,

write means for sequentially writing input data into the memory in an order of address,

read means for dividing the memory into a plurality of groups and for reading the data from the respective memory groups to output the data stored in locations spaced away from one another in a parallel manner,

first selection means for receiving a plurality of outputs from the read means, selecting a data element associated with a first one of the memory groups from one of the plurality of outputs from the read means, providing the selected data element to an output terminal of the first selection means, and sequentially changing the output of the read means from which a next data element is selected; and

second selection means for receiving a plurality of outputs from the read means, selecting a data element associated with a second one of the memory groups from one of the plurality of outputs from the read means, providing the selected data element to an output terminal of the second selection means, and sequentially changing the output of the read means from which a next data element is selected.

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5,500,826

## SOLID STATE PERIPHERAL STORAGE DEVICE

Juei-Chi Hsu; Ching S. Jeng, both of San Jose, and Ping Wang, Saratoga, all of Calif., assignors to Silicon Storage Technology, Inc., Sunnyvale, Calif.

Division of Ser. No. 237,682, May 4, 1994, Pat. No. 5,432,748, which is a division of Ser. No. 977,697, Nov. 13, 1992, Pat. No. 5,359,570. This application Feb. 28, 1995, Ser. No. 395,841
Int. Cl.[6] G11C 11/40
U.S. Cl. 365—230.01 9 Claims

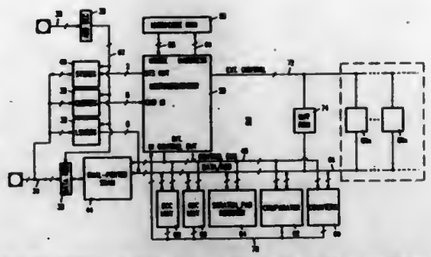
1. A solid state peripheral storage device for interfacing with a computer providing a command signal, a first address signal and a data signal; said device comprising:

first register means for storing said command signal and said first address signal;

second register means for storing said data signal;

first memory means for storing a table of conversion of said first address signal into a second address signal, said first memory means comprising a plurality of floating gate storage cells;

a dual port memory means having two ports, a first port and a second port with said first port in communication with said second register means;



second memory means for storing said data signal, said second memory means comprising a plurality of floating gate storage cells; and

sequencer means for receiving said command signal and said first address signal, and connected to said first memory means for converting said first address signal into said second address signal; said sequencer having means for addressing said second memory means with said second address signal to store said data signals therein, or to retrieve stored data signals therefrom; said sequencer further having means for correcting said stored data signals and to provide said corrected stored data signals to said second port of said dual port memory means.

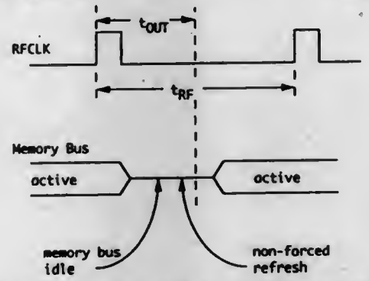
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5,500,827

## METHOD AND APPARATUS FOR IMPROVED DRAM REFRESH OPERATION

Farid A. Yazdy, Belmont, and Michael J. Dhuey, Cupertino, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Continuation of Ser. No. 326,793, Oct. 20, 1994, which is a continuation of Ser. No. 215,284, Mar. 21, 1994, abandoned, which is a continuation of Ser. No. 850,479, Mar. 12, 1992, abandoned. This application Aug. 11, 1995, Ser. No. 514,367
Int. Cl.[6] G11C 11/24; 11/40
U.S. Cl. 365—222 22 Claims




1. An improved refresh method for performing a refresh operation on a Dynamic Random Access Memory (DRAM), coupled to a memory bus, during a refresh cycle, said improved refresh method comprising the following steps:

a) determining whether said DRAM is idle by monitoring said memory bus for signals during a predetermined time period immediately following a beginning of a refresh cycle;

b) if said DRAM becomes idel during said predetermined time period following the beginning of said refresh cycle, then voluntarily performing said refresh operation beginning during said predetermined time; and

c) if said DRAM does not become idle during said predetermined time period following the beginning of said refresh cycle, then mandatorily performing said refresh operation after completion of any DRAM transaction in process at the end of said predetermined time period.

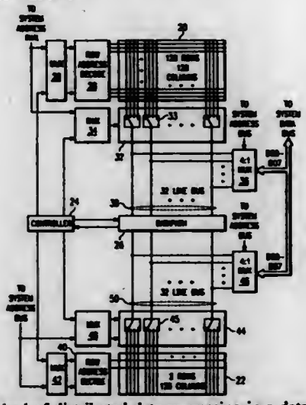


5,500,828

## APPARATUS, SYSTEM AND METHODS FOR DISTRIBUTED SIGNAL PROCESSING

George D. Doddington, McLean, Va.; Basavaraj Pawate, Dallas; Shivaling Mahant-Shetti, Richardson, both of Tex., and Derek Smith, Lafayette, La., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 68,908, May 28, 1993. This application Jun. 7, 1995, Ser. No. 474,602
Int. Cl.[6] G11C 13/00
U.S. Cl. 365—230.03 2 Claims



1. A method of distributed data processing in a data processing system including a central processing unit coupled to at least one active memory device comprising the steps of:

writing data into a first memory in the active memory device using the central processing unit;

writing control instructions into a second memory in the active memory device using the central processing unit;

performing a first operation on first and second words of data retrieved from the first memory in accordance with control instructions retrieved from the second memory using computing circuitry in the active memory device;

performing a second operation on the result from the first operation and a stored result from a previous operation in accordance with control instructions from the second memory using the computing circuitry in the active memory device;

storing a result from the performance of the second operation in the data memory.

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5,500,829

## SEMICONDUCTOR MEMORY DEVICE

Haruki Toda; Shozo Saito, and Knoru Tokushige, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 775,602, Oct. 15, 1991, Pat. No. 5,313,437. This application Apr. 5, 1994, Ser. No. 223,222
Claims priority, application Japan, Jan. 15, 1990, 2-273170; Jan. 2, 1991, 3-255354
Int. Cl.[6] G11C 8/00
U.S. Cl. 365—230.08 16 Claims

1. A semiconductor memory device, comprising:

first, second, third and fourth bit lines;

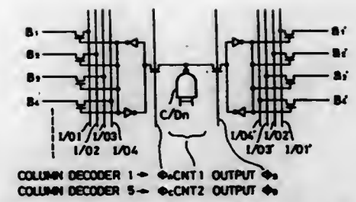
first, second, third and fourth I/O lines;

a first transistor connected between the first bit line and the first I/O line;

a second transistor connected between the second bit line and the second I/O line;

a third transistor connected between the third bit line and the third I/O line;

a fourth transistor connected between the fourth bit line and the fourth I/O line;




a first flip flop circuit connected to gates of the first, the second, the third and the fourth transistors;

a decoding circuit having an output terminal, the decoding circuit receiving internal address signals and generating a decoded signal at the output terminal; and

a fifth transistor connected between the first flip flop circuit and the output terminal of the decoding circuit.

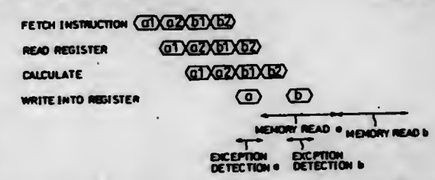
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5,500,830

## MEMORY ACCESS DEVICE

Ichiro Okabayashi, Takatsuki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 17, 1994, Ser. No. 322,507
Claims priority, application Japan, Jan. 18, 1993, 5-259835
Int. Cl.[6] G06F 13/00
U.S. Cl. 365—230.08 6 Claims




1. A memory access device having an address generating means for generating an address for access to an external device, an address buffer for storing each of the addresses generated by said address generating means, and an address latch for latching each output of the address generating means, said external device being accessed based on an address supplied from said address buffer, said memory access device characterized in that:

said address generating means is adapted to proceed to the next address generating operation upon completion of the operation of storing a current address in said address buffer, and

said memory access device further comprises an exception detecting means for carrying out an exception detecting operation on each address supplied from said address generating means while the address is being latched by said address latch,

said exception detecting operation being carried out before the address is supplied to said external device by said address buffer,

said exception detecting means being adapted to indicate the occurrence of an exception if generated in an address to be supplied by said address buffer,

said address buffer has an address field for storing each address latched by said address latch, and an exception field for storing each result of exception detection conducted by said exception detecting means; and

the result of exception detection conducted by said exception detecting means is written in said exception field of said address buffer at the same time when the address is transferred from said address latch to said address field of said address buffer.

**5,500,831**

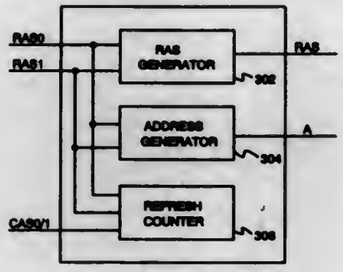
**RAS ENCODED GENERATOR FOR A MEMORY BANK**

**Roger Chen, and Kenneth K. Kinsey, Jr., both of San Jose, Calif., assignors to Advanced Peripherals Labs, Inc., San Jose, Calif.**

**Continuation of Ser. No. 347,967, Dec. 1, 1994, Pat. No. 5,465,237. This application Jun. 2, 1995, Ser. No. 458,940**

**Int. Cl.[6] G11C *8/00***

**U.S. Cl. 365—233** **8 Claims**




300

1. A circuit for providing an encoded row address strobe (RAS) in accordance with a first predetermined addressing scheme to a memory module which has a second predetermined addressing scheme within a computer, the circuit comprising:

an RAS generator means for receiving a first plurality of row address strobe (RAS) signals and generating a second RAS signal to the memory module; and

an address generator means for receiving the first plurality of RAS signals, and for generating a plurality of address signals based upon the first plurality of RAS signals and for providing the plurality of address signals to indicate which portion of the memory module is to be accessed; so as to allow the memory module to operate in accordance with the first predetermined addressing scheme.

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**5,500,832**

**METHOD OF PROCESSING SEISMIC DATA FOR MIGRATION**

**John R. Berryhill, Austin, Tex., assignor to Exxon Production Research Company, Houston, Tex.**

**Filed Oct. 13, 1993, Ser. No. 135,808**

**Int. Cl.[6] G01V *1/28;1/36***

**U.S. Cl. 367—51** **17 Claims**

1. A method of processing seismic data, comprising the following steps:

a. acquiring a plurality of CMP gathers of seismic data traces in the offset domain, with each trace of each gather characterized by a specific value of offset SGD; and

b. converting the seismic data in the CMP gathers to a second domain, defined by a quantity dependent on travel time and the first power of velocity of reflected seismic waves, by:

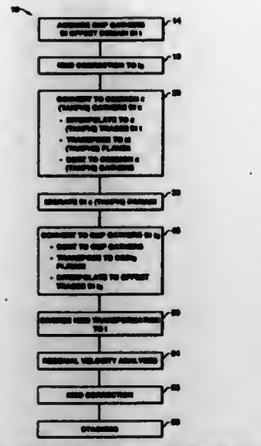
i. forming the seismic data in each CMP gather into traces with each trace characterized by a specific value of the quantity defining the second domain; and

ii. sorting the traces in the second domain into gathers characterized by common values of the quantity defining the second domain;

c. grating the seismic data in the gathers of common values of the quantity defining the second domain;

d. converting the migrated seismic data from the second domain to the offset domain by:

i. sorting the traces in the second domain into CMP gathers with each CMP gather comprising one or more traces with each trace characterized by a specific value of the quantity defining the second domain; and



ii. forming the seismic data in each CMP gather into traces with each trace characterized by a specific value of offset SGD.

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**5,500,833**

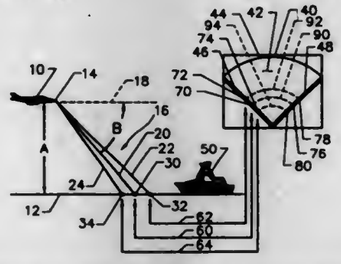
**BEAM POSITION INDICATOR FOR DIRECTIONAL RADAR**

**Robert J. Olson, Peoria, Ariz., assignor to Honeywell Inc., Minneapolis, Minn.**

**Filed Dec. 1, 1993, Ser. No. 160,985**

**Int. Cl.[6] G01S *13/08***

**U.S. Cl. 342—182** **8 Claims**




1. Apparatus for displaying to an aircraft pilot the intersection of a radar beam with the surface over which the aircraft is flying comprising:

means producing signals indicative of the altitude of the aircraft over the surface the beam width of the radar and the tilt angle of the radar beam;

computer means connected to receive the signals, to compute the intersection of the center and the two beam width points and to produce an output indicative thereof, and

display means connected to receive the output and display the three points.



**5,500,834**

**DEVICE FOR MEASURING TIME LAPSE AFTER TURN OFF OF POWER SOURCE AND METHOD THEREOF**

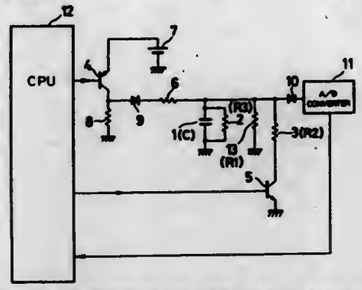
**Eihiro Sakaki, Choufu; Yoshimi Ogasawara, Yokohama, and Eiichiro Teshima, Kawasaki, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Aug. 29, 1994, Ser. No. 296,179**

**Claims priority, application Japan, Sep. 3, 1993, 5-219789**

**Int. Cl.[6] G04F *8/00***

**U.S. Cl. 368—9** **18 Claims**




1. A method for measuring time lapse comprising the steps of:

a) charging a capacitor up to a first predetermined voltage while a power source of an equipment is turned on;

b) discharging the electric charge in the capacitor through a first resistor having a first resistance when the power source of the equipment is turned off;

c) measuring and storing in a memory the voltage of the capacitor at the time when the power source of the equipment is turned on;

d) charging the capacitor to a second predetermined voltage, then discharging the electric charge in the capacitor through a second resistor having a second resistance;

e) measuring a time of discharge from the beginning of the discharging of the capacitor in step until the voltage of the capacitor reduces to the same voltage value stored in the memory at step (c); and

f) calculating a time lapse between turning off and turning on the power source of the equipment by using the time of discharge measured at step (e) and the respective first and second resistance of the first and second resistors.

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**5,500,835**

**WEATHER FORECASTING WATCH**

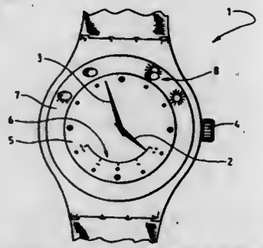
**Jean-Jacques Born, Morges, Switzerland, assignor to Asulab S.A., Bienne, Switzerland**

**Filed Feb. 17, 1995, Ser. No. 390,547**

**Claims priority, application Switzerland, Mar. 4, 1994, 00643/94**

**Int. Cl.[6] G04B *47/06***

**U.S. Cl. 368—11** **7 Claims**




1. An analogue timepiece for indicating an atmospheric pressure variation comprising:

at least two hands (2, 3) for providing time information,

a watch movement (12) for driving said hands, said watch movement including an electronic control means for controlling the watch movement for driving said hands,

conversion means (30) electrically connected to said electronic control means, and

a pressure sensor (13, 13a) for measuring the atmospheric pressure variation and providing to said conversion means indications of said atmospheric pressure variation,

wherein one of the hands (2, 3) is driven by the movement (12) to indicate said measured pressure variation in response to pressure information provided by said conversion means to said electronic control means, while at the same time another one of said hands (3, 2) is driven by the movement to indicate a weather forecast which is a function of said measured variation and which is determined by said electronic control means.

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**5,500,836**

**CIRCUIT FOR SUPPRESSING THE EFFECT OF REBOUNDS AND PARASITIC COMMUTATIONS OF A CONTACTOR**

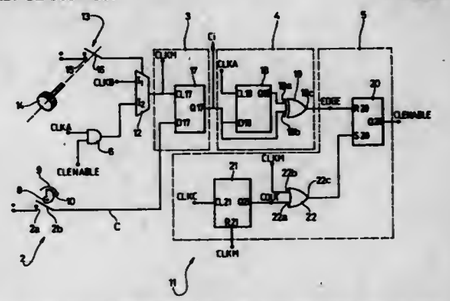
**Nicolas Jeannet, Colombier, Switzerland, assignor to Eta SA Fabriques d'Ebauches, Grenchen, Switzerland**

**Filed Mar. 14, 1994, Ser. No. 213,143**

**Claims priority, application Switzerland, Mar. 18, 1993, 00820/93**

**Int. Cl.[6] G09C *9/00***

**U.S. Cl. 368—187** **9 Claims**




1. A circuit for suppressing the effect of rebounds and parasitic commutations of a contactor (2) on a control signal (C) produced by said contactor (2), having open and closed positions, said contactor (2) ideally changing from one of its two positions to the other of its two positions and remaining in said other position for a predetermined time, characterised in that said circuit comprises:

sampling means (3) for sampling said control signal (C) at a first sampling rate (CLKA) and providing a output signal ($C_1$) being in either a first state corresponding to an open position of the contactor or a second state corresponding to a closed position of the contactor,

detecting means (4) for determining a change of said output signal ($C_1$) from one of said states to the other state, and

sampling prevention means (5) for preventing said sampling means (3) from sampling said control signal (C) for said predetermined time in response to the change in state of said output signal ($C_1$), in order that said output signal ($C_1$) remains in said other state for at least said predetermined time.

**5,500,837**

## WRISTWATCH IN PLASTIC MATERIAL INCLUDING A METALLIC REINFORCING ARMATURE USED AS BASEPLATE

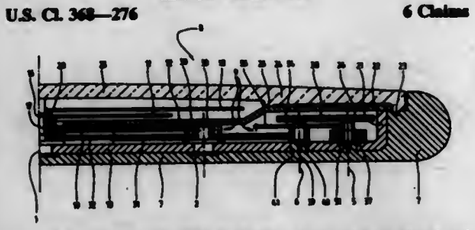
**Ronald Flury, Longeau, Switzerland, assignor to ETA SA Fabriques d'Ebauches, Grenchen, Switzerland**

**Filed Jun. 19, 1995, Ser. No. 492,432**

**Claims priority, application Switzerland, Jun. 30, 1994, 2082/94**

**Int. Cl.[6] G04B *37/00***

**U.S. Cl. 368—276** **6 Claims**



1. An ultra-thin wristwatch including a back cover-caseband and a crystal formed in plastic material, a movement, hands surmounting a dial and a metallic reinforcing armature sunk into the back cover-caseband and serving, inter alia, as attachment points for a bracelet, said metallic reinforcing armature additionally serving as base plate onto which is secured at least one central stud around which pivots a cannon pinion carrying a minutes hand, a cannon wheel carrying an hours hand in turn pivoting on said cannon pinion.

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**5,500,838**

## PHOTOMAGNETIC DISC RECORD/REPRODUCTION APPARATUS INCLUDING IMPROVED MAGNETIC HEAD LIFTING MECHANISM

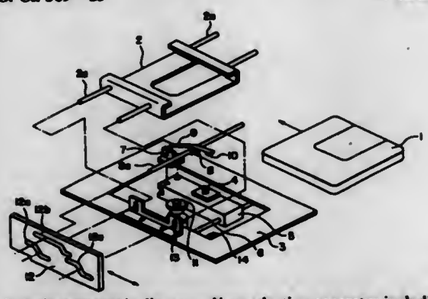
**Motoyoshi Matsumoto, Fuzoa, and Tomomi Matsumura, Hino, both of, Japan, assignors to Kabushiki Kaisha Kenwood, Tokyo, Japan**

**Filed Dec. 3, 1993, Ser. No. 160,910**

**Claims priority, application Japan, Dec. 10, 1992, 4-352621; Dec. 10, 1992, 4-352622**

**Int. Cl.[6] G11B *11/00;33/02***

**U.S. Cl. 369—13** **4 Claims**



1. A photomagnetic disc record/reproduction apparatus including a disc loading mechanism for mounting on a turntable a photomagnetic disc accommodated in a cartridge, an optical pickup for applying a laser spot to a signal record track of said disc, and a magnetic head for applying a magnetic field to the back surface of said disc where said laser spot is applied,

characterized by a magnetic head lifting mechanism for making said magnetic head contact said disc or separate from said disc, said magnetic head lifting mechanism being connected to said disc loading mechanism and operated by a drive source provided to said disc loading mechanism, and

a detector means for discriminating an outer shape of the cartridge of said mounted disc to detect whether said mounted disc is allowed to record data,

at least one cam which connects said disc loading mechanism and said magnetic head lifting mechanism,

wherein said magnetic head lifting mechanism responds to both the detection result obtained by said detector means and record/reproduction mode information to operate said magnetic head so that said magnetic head is brought into contact with said disc only when said mounted disc is allowed to record data and a record mode is set, and wherein said at least one cam is adapted to take three positions to provide a first state where said disc is spaced apart from said turntable, a second state where said disc is mounted on said turntable and said magnetic head is spaced apart from said disc, and a third state where said disc is mounted on said turntable and said magnetic head is made in contact with said disc, so that it is allowed to move to said third state when said mounted disc is allowed to record data and a record mode is set.

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**5,500,839**

## MULTIPLE COIL MAGNETIC HEAD FOR MAGNETIC OPTICAL RECORDING DEVICE

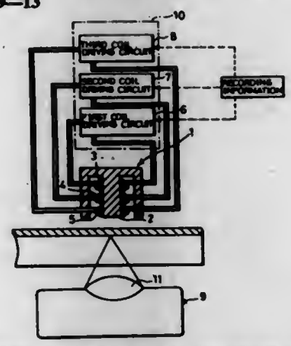
**Tomoyuki Miyake, Nara; Toshiharu Inui, Yamatokoriyama; Jun Akiyama, Kashihara, and Kunio Kojima, Nabari, all of, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Dec. 22, 1994, Ser. No. 362,135**

**Claims priority, application Japan, Dec. 24, 1993, 5-328840**

**Int. Cl.[6] G11B *11/00***

**U.S. Cl. 369—13** **13 Claims**



1. A magneto-optical recording and reproducing apparatus, for recording information on a storage medium by modulating a magnetic field in response to a recording signal,

magnetic head means having a plurality of coils;

at least one coil driving means for driving at least one of said coils, and for reversing a direction of the magnetic field generated by said driven coil in response to the input recording signal; and

selection means for selecting said coil driving means in accordance with a selection request so as to transmit the recording signal only to the selected coil driving means, and for causing the coils corresponding to the selected coil driving means to generate a magnetic field strength which varies depending on the number of the selected coil driving means.



**5,500,840**

## METHOD AND APPARATUS FOR ACCESSING READING AND/OR WRITING MEANS TO A DESIRED REGION ON AN INFORMATION RECORDING MEDIUM ON WHICH A PLURALITY OF TRACKS ARE SPIRALLY FORMED, IN ACCORDANCE WITH AN ESTIMATED ARRIVAL POSITION

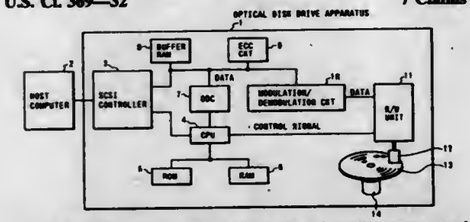
**Yutaka Ogasawara, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Dec. 10, 1992, Ser. No. 988,878**

**Claims priority, application Japan, Dec. 13, 1991, 3-351375**

**Int. Cl.[6] G11B *17/22***

**U.S. Cl. 369—32** **7 Claims**




1. A method of accessing at least one of reading means and writing means to a desired region of an information recording medium on which a plurality of tracks are spirally formed, said method comprising the steps of:

rotating the medium;

estimating an arrival position when at least one of the reading means and the writing means is accessed to the track having the desired region;

accessing at least one of the reading means and the writing means to the track having the desired region when the estimated position lies within the desired region; and

accessing at least one of the reading means and the writing means to one-preceding track of the track having the desired region when the estimated position is located after the desired region.

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**5,500,841**

## INFORMATION STORAGE AND RETRIEVAL DEVICE

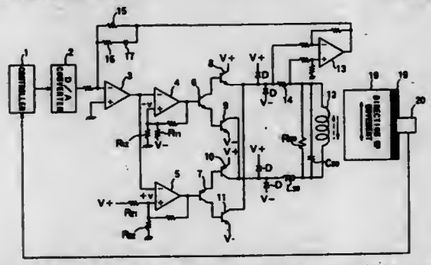
**Keijirou Fujino, Tokorozawa, and Koichi Yamazaki, Sakado, both of, Japan, assignors to Nippon Conlux, Ltd., Tokyo, Japan**

**Filed Dec. 12, 1994, Ser. No. 354,363**

**Claims priority, application Japan, Dec. 28, 1993, 5-351236**

**Int. Cl.[6] G11B *7/00***

**U.S. Cl. 369—44.26** **2 Claims**



1. An information storage and retrieval device comprising a card conveyor mount for supporting and conveying a card-type information storage medium; a drive means having a linear motor, for reciprocatingly driving said card conveyor mount; an electrical power control circuit having switching elements, for providing power to said linear motor; a speed detection means for detecting the speed at which said card conveyor mount is moving; a speed command means for calculating an indicated speed corresponding to an output from said speed detection means, shaping a speed command therefrom, and sending said command to said electrical power control circuit; and an optical head for irradiating a laser beam onto said information storage medium; whereby information is written to said information storage medium by said optical head irradiating said laser beam onto said information storage medium, and information is read therefrom by detecting laser light reflected from said information storage medium; said information storage and retrieval device further comprising:

a comparison means having a pair of comparators having identical threshold values of different polarities, for comparing said speed command with each of said threshold values and shaping a pair of outputs that are on during the period that said command exceeds said threshold values; wherein:

powering currents of said linear motor are controlled and thus drive control of said card conveyor mount is enabled by controlling switching elements in said electrical power control circuit to turn on and off in accordance with said outputs from said comparison means.

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**5,500,842**

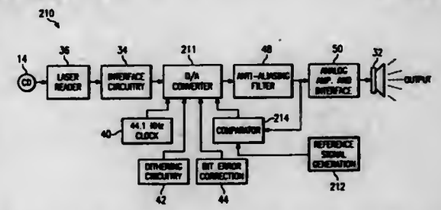
## METHOD AND APPARATUS FOR CORRECTING DISTORTION IN COMPACT DISC RECORDING AND PLAYBACK SYSTEM

**John H. Dunlavy, Colorado Springs, Colo., assignor to Haynes and Boone, L.L.P., Dallas, Tex.; J. D. Technologies, Inc., Colorado Springs, Colo., and Donald M. Feferman, Corpus Christi, Tex.**

**Division of Ser. No. 128,349, Sep. 28, 1993, Pat. No. 5,444,686. This application Mar. 24, 1995, Ser. No. 410,322**

**Int. Cl.[6] G11B *7/00***

**U.S. Cl. 369—48** **16 Claims**




1. An apparatus for correcting distortion in a compact disc (CD) recording and playback system, the apparatus comprising:

a first circuit for generating an inaudible first reference signal connected to an input of an analog-to-digital (A/D) converter of a recording portion of said system;

a second circuit for generating a second signal reference identical to said first reference signal; and;

a comparator circuit connected to an output of a digital-to-analog (D/A) converter of a playback portion of said system and to an output of said second circuit for comparing the first reference signal output by said D/A converter with said second reference signal and generating a difference information signal to an input of said D/A converter,

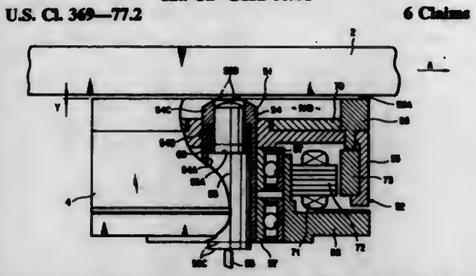
wherein said difference information signal is used by said D/A converter to linearize amplitude and frequency responses of said system.

**5,500,843**

## INFORMATION PROCESSING APPARATUS WITH MOVABLE SPINDLE SHAFTS

Masaru Ishii, Kamakura, and Keichi Nagai, Kawasaki, both of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 22, 1994, Ser. No. 215,577
Claims priority, application Japan, May 26, 1993, 5-124446
Int. Cl.[6] G11B *33/02*
U.S. Cl. 369—77.2 6 Claims



1. An information processing apparatus for reproducing data from a disk-shaped optical information recording medium having a center portion on which a hub is provided, the hub being formed of a magnetic material and having a center hole, the apparatus comprising:

a turntable for supporting the recording medium, the turntable including a bearing surface on which the recording medium is to be placed, the bearing surface having a recess formed therein for storing the hub of the recording medium when the recording medium is placed on the bearing surface, and a magnet arranged in the recess for magnetically attracting the hub so that the recording medium placed on the bearing surface is in tight contact with the bearing surface;

means having a rotating shaft portion, for rotating the turntable together with the recording medium placed on the bearing surface, the rotating shaft portion including a cylindrical first shaft projecting from a center of a bottom of the recess and having an upper end substantially flush with the bearing surface, for engaging the center hole of the hub stored in the recess, and a second shaft having an upper end portion and movable in the first shaft between a first position in which the upper end portion of the second shaft projects from the upper end of the first shaft to engage the center hole of the hub of the recording medium placed on the bearing surface and a second position in which the upper end portion of the second shaft is recessed in the first shaft to disengage from the center hole; and

means for moving the second shaft from the first position to the second position as the recording medium is to be placed on and removed from the bearing surface.

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**5,500,844**

## DEVICE FOR DRIVING MINIDISK PLAYER

Kwang Kim, and Heui Sik Seo, both of Seoul, Rep. of Korea, assignors to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Jun. 3, 1994, Ser. No. 253,743
Claims priority, application Rep. of Korea, Jun. 4, 1993, 10081/1993
Int. Cl.[6] G11B *17/04;3/36*
U.S. Cl. 369—77.2 10 Claims

1. A device for driving a minidisk player, comprising:

a deck;

a drive motor mounted on said deck;

a power transmission gear coupled to said drive motor and rotated by said drive motor;

a friction gear in surface contact with said power transmission gear;

a link in surface contact with said friction gear, said link being turned one of clockwise and counterclockwise directions by said friction gear depending on the rotational direction of said power transmission gear;

an idle gear rotatably mounted on said link and rotated by a rotational force of said power transmission gear;

a disk loading gear placed in turning range of said link, said loading gear engaging said idle gear during a disk loading/unloading operation;

a pickup drive gear placed in the turning range of said link, said pickup drive gear engaging said idle gear during a pickup driving operation to drive a pickup;

a solenoid mounted on said deck for generating a magnetic force;

a first locking projection provided on one side of said link and turned in opposed directions depending on opposed directional turning motion of said link;

a first stopper mounted on said deck and selectively engaged with said first locking projection when said idle gear engages said disk loading gear for carrying out the disk loading/unloading operation;

a first turning member rotatably mounted on said deck and turned about a hinged shaft by the magnetic force of said solenoid so as to be closer to said first stopper when said first locking projection is engaged with said first stopper;

a second locking projection provided on the other side of said link and turned in opposed directions depending on opposed directional turning motion of said link;

a second stopper mounted on said deck and selectively engaged with said second locking projection when said idle gear engages said pickup drive gear for carrying out said pickup driving operation; and

a second turning member rotatably mounted on said deck and turned about a hinged shaft so as to be closer to said second stopper when the second locking projection is engaged with the second stopper.

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**5,500,845**

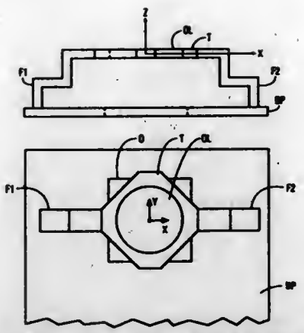
## RESILIENT SCANNING HEAD SUPPORT MADE OF DEFORMABLE MATERIAL

Hans-Robert Kühn, St. Georgen; Dieter Storz, Lauterbach; Engelbert Läufer, St. Georgen; Peter Hoch, Triberg, and Friedrich Fildner, Villingen-Schwenningen, all of, Germany, assignors to Deutsche Thomson-Brandt GmbH, Villingen-Schwenningen, Germany

PCT No. PCT/EP92/02406, § 371 Date Jul. 21, 1994, § 102(e) Date Jul. 21, 1994, PCT Pub. No. WO93/09534, PCT Pub. Date May 13, 1993
PCT Filed Oct. 21, 1992, Ser. No. 211,874
Claims priority, application Germany, Jan. 31, 1991, 41 35 908.9
Int. Cl.[6] G11B *7/00*
U.S. Cl. 369—112 10 Claims

1. Apparatus for suspending a pickup head in a disc player or recorder comprising:





at least one symmetrically arranged resilient molded part having a step like shape and being resiliently deformable in at least one direction and through an angle in such a way that the head is deflectable both in straight lines and at least one angle relative to a plane defined by said straight lines.

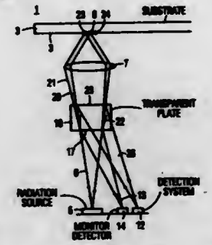
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**5,500,846**

## RADIATION SOURCE-DETECTION UNIT EMPLOYING A GRATING HAVING TWO GRATING STRUCTURES, AND A DEVICE INCLUDING THAT UNIT

Willem G. Ophey, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 29, 1993, Ser. No. 174,869
Claims priority, application European Pat. Off., Jan. 4, 1993, 93200002
Int. Cl.[6] G11B *7/00*
U.S. Cl. 369—116 19 Claims



1. A device for optically scanning a surface, the device comprising:

focussing means for focusing a radiation beam on the surface; and

a radiation source-detection unit including:

a radiation source for supplying the radiation beam;

a grating having a first grating structure for forming at least a deflected beam from the radiation beam or from radiation reflected by the surface, and a second grating structure for forming a monitor beam from radiation reflected by said second grating structure, the first and second grating structures being located throughout substantially the same area;

a radiation-sensitive detector system for converting the radiation reflected by the surface into electric signals; and

a monitor detector for converting the monitor beam into an electrical signal for controlling said radiation source.

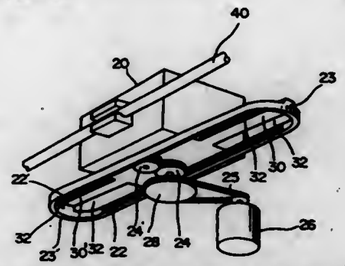
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**5,500,847**

## PICKUP CARRIAGE FEEDING APPARATUS OF A DISC PLAYER

Kwangsik Han, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Dec. 27, 1993, Ser. No. 173,101
Claims priority, application Rep. of Korea, Dec. 31, 1992, 92-28269
Int. Cl.[6] G11B *21/02*
U.S. Cl. 369—219 1 Claim



1. A pickup carriage feeding apparatus of a disc player wherein a pickup carriage is guided by a guide bar when performing a feeding operation, the pickup carriage feeding apparatus comprising:

a driving motor;

a pair of opposite racks connected to each other which are formed in parallel on a lower surface of the pickup carriage, wherein the pair of racks are connected in an arch shape to form an arch shape part in their ends, respectively, and wherein the arch-shape parts in the ends of the racks are connected by rack supports to lower parts of two opposite sides of the pickup carriage that the arch-shape parts and the rack-supports are formed in one body;

a pair of driving gears located between the racks, the driving gears being meshed with each other and each of the driving gears being meshed with each of the racks; and

a belt pulley in coaxial connection with one of the gears, the belt pulley being connected to the driving motor through a belt for transmitting a driving force of the driving motor,

space is provided between the rack supports and the racks to exert an elastic force on the driving gears during the feeding operation in order to prevent a backlash in the feeding operation.

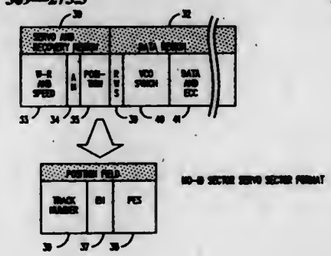
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**5,500,848**

## SECTOR SERVO DATA RECORDING DISK HAVING DATA REGIONS WITHOUT IDENTIFICATION (ID) FIELDS

John S. Best, San Jose, and Steven R. Hetzler, Sunnyvale, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 727,680, Jul. 10, 1991, abandoned.
This application Jun. 23, 1993, Ser. No. 882,826
Int. Cl.[6] G11B *5/76;5/09*
U.S. Cl. 369—275.3 15 Claims



1. A data recording disk having a pattern of radially spaced tracks and a plurality of circumferentially spaced angular sectors having prerecorded servo positioning information for identifying track and sector locations, each of the plurality of sectors including only a data region for recording user data and, preceding the data region in the circumferential direction, a servo-and-recovery region which provides the prerecorded servo positioning information to uniquely identify the sector and track, wherein the servo-and-recovery region includes a write-to-read-recovery and speed-compensation field, an error handling field, a position-error-signal field, a start-of-sector indicating mark, and a track number field, but no data region identification (ID) field, wherein the data region includes, in sequence, a read-to-write-recovery and speed-compensation field and a synchronization field, and wherein one of the plurality of sectors also includes a start-of-track indicating mark.

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**5,500,849**

**CONSTRUCTION OF OPTICAL DISK**

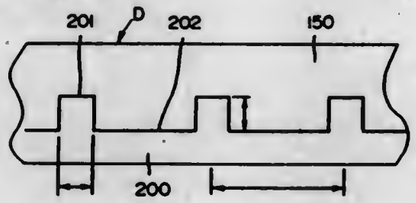
**Masato Noguchi, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 107,165, Aug. 17, 1993, Pat. No. 5,365,504, which is a continuation of Ser. No. 781,413, Oct. 23, 1991, abandoned. This application Feb. 8, 1994, Ser. No. 193,527**

**Claims priority, application Japan, Jan. 23, 1990, 2-286439; Mar. 5, 1991, 3-123235**

**Int. Cl.[6] G11B *7/24***

**U.S. Cl. 369—275.4** **7 Claims**




1. A magneto-optic disk adapted to reflect a light beam, comprising:

a recording layer for recording data on said magneto-optic disk, said recording layer comprising a plurality of grooves spaced predetermined distances apart from one another and a plurality of data recording land areas formed between each of said grooves; and

a transparent layer which covers an outer surface of said recording layer;

said grooves being arranged as diffracting means for diffracting the light beam such that a phase difference of first order diffracted light with respect to zero order diffracted light in the reflected light beam is equal to $N\pi$, where N is an integer.

**5,500,850**

**OPTICAL DISK WITH GROOVES AND PITS OF DIFFERENT DEPTHS**

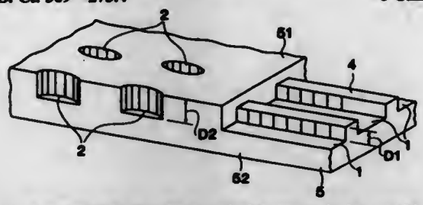
**Kazuo Van; Kenji Ohta; Tetsuya Inui; Toshikazu Nagaura; Hirotoshi Takemori, all of Nara, and Hirotaka Toki, Kashihara, all of, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Division of Ser. No. 32,540, Mar. 17, 1993, Pat. No. 5,399,461, which is a continuation of Ser. No. 679,997, Apr. 1, 1991, abandoned, which is a continuation of Ser. No. 233,540, Aug. 18, 1988, abandoned. This application Nov. 22, 1994, Ser. No. 346,173**

**Claims priority, application Japan, Aug. 21, 1987, 62-208948; Feb. 5, 1988, 63-26237; Aug. 3, 1988, 63-194164**

**Int. Cl.[6] G11B *7/24***

**U.S. Cl. 369—275.4** **6 Claims**




1. An optical disk for use in optical memory device capable of recording and reproducing information by irradiation of a light beam, the disk comprising:

a disk plate having a first surface and a second surface;

an array of pits, arranged on a first top portion of the first surface, for storing information regarding the disk, each of the pits having a first depth which is defined by a bottom surface of each pit and the first top portion; and

a plurality of guide grooves, formed on a second top portion of the first surface, for guiding the light beam so as to attain a guide tracking, each of the guide grooves having a second depth which is defined by a bottom surface of each guide groove and the second top portion;

wherein the first top portion is spaced a greater distance from the second surface than the second top portion, and the bottom surfaces of the pits and the guide grooves are equidistant from the second surface, thereby the first depth being greater than the second depth.

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**5,500,851**

**FIXED-LENGTH PACKET SWITCHING SYSTEM ADAPTED FOR FUNCTION TEST**

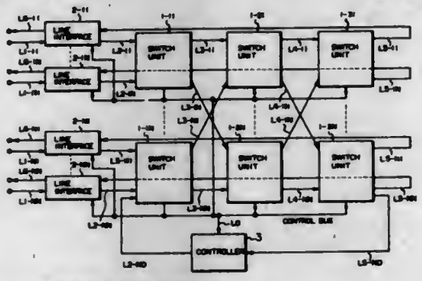
**Takahiko Kozaki, Kogenei; Nobuhiro Horie, Fujisawa, and Kenichi Asano, Akishima, all of, Japan, assignors to Hitachi, Ltd., and Hitachi ULSI Engineering Corp., both of Tokyo, Japan**

**Filed Sep. 1, 1994, Ser. No. 297,566**

**Claims priority, application Japan, Sep. 1, 1993, 5-217203**

**Int. Cl.[6] H04J *1/16*; H04L *12/56***

**U.S. Cl. 370—13** **20 Claims**




1. A switching system comprising:



switching means including a plurality of input ports and output ports for selectively transferring input packets received from said input ports to one of said output ports specified in accordance with header information of the input packets;

a plurality of line interface circuits each connected with a pair of an input line and an output line for transferring fixed length input packets each having a header field ahead of an information field received from the input line to one of the input ports of the switching means after rewriting the header information in the header field of the input packet and for transferring output packets derived from one of the output ports of the switching means to the output line connected therewith; and

call control means for performing a call control for the packet communication carried out through the switching means and for supplying control information to the switching means and the line interface circuits;

wherein said switching means includes:

buffer memory means for storing a plurality of packets temporarily,

buffer control means for writing input packets received from the input ports into the buffer memory means and for selectively reading out the packets from the buffer memory means to deliver the read out packets to one of the output ports specified by the header information of the packet, respectively, and

testing means for writing a test packet at a specific address of the buffer memory means in accordance with a first instruction from said call control means and for reading out the test packet from the buffer memory means in accordance with a second instruction from the call control means.

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**5,500,852**

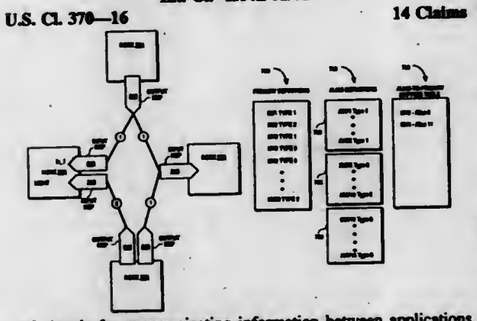
**METHOD AND APPARATUS FOR NETWORK VARIABLE ALIASING**

**Glen M. Riley, Saratoga, Calif., assignor to Echelon Corporation, Palo Alto, Calif.**

**Filed Aug. 31, 1994, Ser. No. 299,283**

**Int. Cl.[6] H04L *12/02***

**U.S. Cl. 370—16** **14 Claims**



6. Anode for communicating information between applications in a network, the node comprising:

an input/output coupled to at least one node on the network by a first connection;

a network connection point coupled to at least one node on the network by a second connection, wherein the second connection is different from said first connection;

memory containing

an application which defines a network variable;

a first indicator indicating that the network variable corresponds to the input/output;

a second indicator indicating that the input/output corresponds to the first connection;

a third indicator indicating that the network variable corresponds to the network connection point; and

a fourth indicator indicating that the network connection point corresponds to the second connection;

a transmit mechanism for transmitting a first message over said first connection and a second message over said second connection when said network variable is updated if said network variable is an output network variable; and

an update mechanism for updating said network variable responsive to messages over said first connection and responsive to messages over said second connection if said network variable is an input network variable.

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**5,500,853**

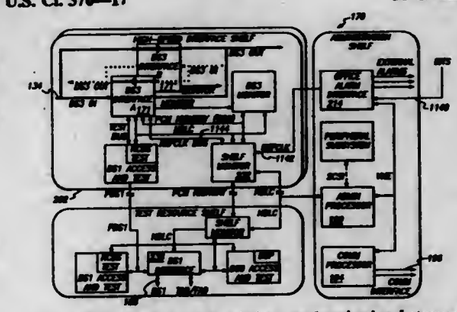
**RELATIVE SYNCHRONIZATION SYSTEM FOR A TELEPHONE NETWORK**

**Thomas L. Engdahl, Escondido; Edward Tyburski, San Diego, and Paul R. Hartmann, Escondido, all of Calif., assignors to Applied Digital Access, Inc., San Diego, Calif.**

**Continuation-in-part of Ser. No. 994,883, Dec. 22, 1992, abandoned, which is a continuation-in-part of Ser. No. 862,470, Apr. 2, 1992, abandoned. This application Nov. 23, 1993, Ser. No. 157,900**

**Int. Cl.[6] H04J *3/14***

**U.S. Cl. 370—17** **30 Claims**



1. A system for measuring relative synchronization between a plurality of DS1 channels in one or more DS3 signals, the system comprising:

means for simultaneously accessing the DS1 channels wherein each DS1 channel comprises a plurality of bits;

means for counting the bits in the accessed DS1 channels; and

means for comparing a bit count in one of the DS1 channels with a bit count in another of the DS1 channels.

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**5,500,854**

**DATA TRANSMISSION SYSTEM AND EQUIPMENT**

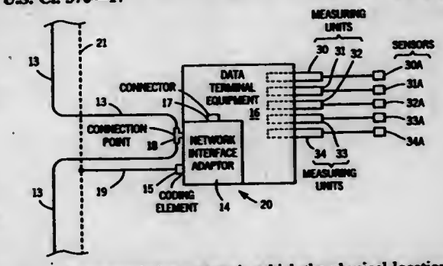
**Pekka A. Uotila, Helsinki, Finland, assignor to Instrumentarium Corporation, Finland**

**Filed Dec. 22, 1993, Ser. No. 173,501**

**Claims priority, application Finland, Dec. 23, 1992, 925859**

**Int. Cl.[6] H04L *12/24***

**U.S. Cl. 370—17** **22 Claims**




1. A data transmission system in which the physical location of a data terminal means connected to the system can be identified, said system comprising:

a data transmission network (13) having a plurality of data communication connection points (18) for transmitting and/or receiving data, each of said connection points being located at a physical location served by said data transmission network;

at least one data terminal means (16) connectable to the data transmission network at a selected one of said connection points (18) for receiving and/or transmitting to or from the network; and

means for providing, to the data transmission network, an identification of the physical location of the selected connection point to which the data terminal means is connected, said means comprising a coding element (15) located at said selected connection point, said coding element being non-integral with said connection point, said coding element having contained therein an encoded address identifying the physical location of the selected connection point, said coding element being connectable to said data terminal means when said data terminal means is connected to said selected connection point for supplying said encoded address to said data terminal means for provision to the data transmission network as the identification of the physical location of the selected connection point to which the data terminal means is connected, said coding element being non-integral with said connection point when said data terminal means is disconnected from said selected connection point.

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**5,500,855**

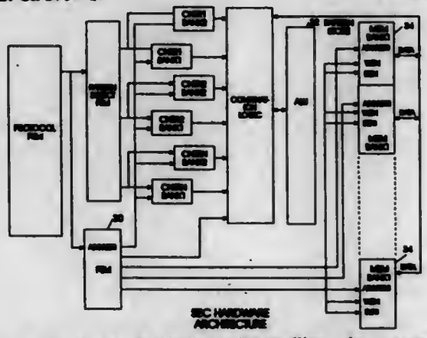
**REALTIME EVENT CLASSIFICATION FOR A DATA COMMUNICATIONS NETWORK**

**Paul C. Hershey, Manassas, Va., and John G. Waclawsky, Frederick, Md., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jan. 26, 1994, Ser. No. 187,950**

**Int. Cl.[6] H04J 3/14**

**U.S. Cl. 370—17** **10 Claims**



1. In a system for monitoring and controlling a data communications network which communicates a serial stream of binary bits having a characteristic pattern, comprising:

a base Event Driven Interface having an input coupled to said data communications network, programmed to process the serial stream and identify event bit patterns in said serial bit stream whose occurrence is an event to be counted, for outputting an event signal in response to identifying and selecting an event bit pattern;

an extension Event Driven Interface having an input coupled to said data communications network, programmed to process the serial data stream simultaneously and in parallel with the event driven interface to identify category bit patterns in said serial bit stream, which are significant bit patterns for one of a plurality of categories of data frames in said serial bit stream, for outputting a selection signal in response to identifying a one category bit pattern;

a plurality of event vector counters in levels, each level corresponding to a respective one of said plurality of categories, each counter thereof having an event input selectively coupled to said output of said base Event Driven Interface, for receiving said event signal, and each counter having a selection input coupled to said output of said extension Event Driven Interface, for enabling the counter to receive said event signal in response to said selection signal.

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**5,500,856**

**TRANSMISSION DE-CORRELATOR FOR ELIMINATING INTERFERENCE IN A CDMA COMMUNICATION SYSTEM**

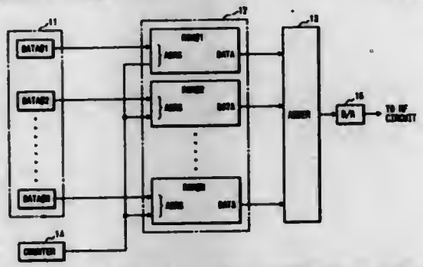
**Taku Nagase, Tokyo; Roland Go, Yokohama, both of, Japan; Tadashi Matsumoto, Walnut Creek, Calif., and Akihiro Higashi, Yokosuka, Japan, assignors to Matsushita Communication Industrial Co., Ltd., Yokohama, and NTT Mobile Communications Network, Inc., Tokyo, both of, Japan**

**Filed Jul. 28, 1994, Ser. No. 281,640**

**Claims priority, application Japan, Jul. 30, 1993, 5-190646**

**Int. Cl.[6] H04J 13/02; H04B 7/216;15/00**

**U.S. Cl. 370—18** **3 Claims**



1. In a base station of a CDMA communication system, a transmission de-correlator for eliminating interferences between communication channels of a downlink, comprising:

a memory means for storing a set of data representative of the products of transmission information bits for the respective channels, and the sums of the products of the spread code data sequences for the respective channels, and the elements of an inverse matrix with respect to a predetermined matrix of a cross-correlation between the spread code data sequences for the respective channels, wherein said sums correspond to additions of the products along the columns of said inverse matrix or to additions of the products along the rows of the inverse matrix;

a counting means connected to an address input of said memory means for causing the memory means to sequentially output the data therefrom; and

an adder connected to receive data from said memory means for calculating a sum of the data received from the memory means.

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**5,500,857**

**INTER-NODAL COMMUNICATION METHOD AND SYSTEM USING MULTIPLEXING**

**Toru Nakata, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Nov. 15, 1993, Ser. No. 151,986**

**Claims priority, application Japan, Nov. 16, 1992, 4-330023; Dec. 16, 1992, 4-354646**

**Int. Cl.[6] H04J 14/02;14/08;4/00**

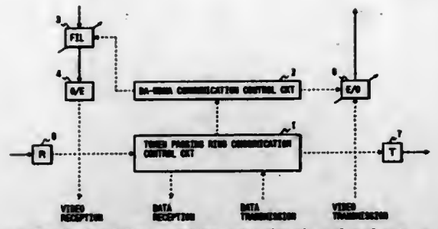
**U.S. Cl. 370—50** **22 Claims**

1. A communication system comprising:

a plurality of nodes;

a data signal line, coupling said plurality of nodes to each other, for performing communication by using a signal multiplexed by a wavelength-division multiplexing scheme, a time-division multiplexing scheme, or both; and





a control signal line coupling said plurality of nodes to each other so as to circulate a control signal including a management table indicating which, if any, time slot and which, if any, wavelength is currently being used for communication in said data signal line,

wherein each node inputs the control signal circulating through said control signal line, selects at least one of a time slot and a wavelength not currently being used for communication, on the basis of the management table of the input control signal, performs communication through said data signal line by using the selected time slot, wavelength or both, and updates the management table and outputs the table to said control signal line.

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**5,500,858**

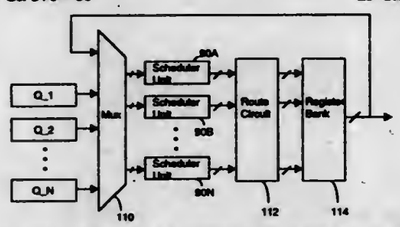
**METHOD AND APPARATUS FOR SCHEDULING CELLS IN AN INPUT-QUEUED SWITCH**

**Nicholas W. McKeown, Berkeley, Calif., assignor to The Regents of the University of California, Berkeley, Calif.**

**Filed Dec. 20, 1994, Ser. No. 359,890**

**Int. Cl.[6] H04L 12/56**

**U.S. Cl. 370—60** **23 Claims**



1. A switch of the type that includes a set of input queues, each of said input queues including at least one stored cell with an output device designation signal and a data signal, said output device designation signals of said stored cells being routed to a request delivery circuit that conveys said output device designation signals to a set of grant scheduler units, each grant scheduler unit corresponding to an output device specified by one or more of said output device designation signals, each of said grant scheduler units arbitrating between a set of received output device designation signals and generating an input device grant signal, said input device grant signals from said grant scheduler units being conveyed to a grant delivery circuit that conveys said input device grant signals to a set of accept scheduler units, each accept scheduler unit arbitrating between a set of received input device grant signals and selecting an input/output match signal, said input/output match signal being processed by a switching device that connects a selected stored cell in said set of input queues with an output device specified by said output device designation signal of said selected stored cell, the improvement comprising:

a set of rotating priority grant scheduler units, each of said rotating priority grant scheduler units producing a selected input device grant signal from said set of output device designation signals according to a grant scheduler priority designation signal; and

a set of rotating priority accept scheduler units, each of said rotating priority accept scheduler units producing an input/output match signal from said set of received input device grant signals according to an accept scheduler priority designation signal;

wherein said rotating priority grant scheduler units each include a grant scheduler register that stores said grant scheduler priority designation signal, said grant scheduler priority designation signal being revised when said selected input device grant signal results in an input/output match signal at one of said rotating priority accept scheduler units; and

wherein said rotating priority accept scheduler units each include an accept scheduler priority designation register that stores said accept scheduler priority designation signal, said accept scheduler priority designation signal being updated when said input/output match signal is selected.

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**5,500,859**

**VOICE AND DATA TRANSMISSION SYSTEM**

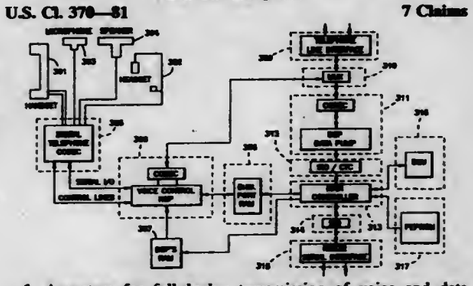
**Raghu Sharma, North Oaks; Jeffrey P. Davis, Ham Lake; Timothy D. Gunn, Mounds View, and Ping Li, New Brighton, all of Minn., assignors to Multi-Tech Systems, Inc., Mounds View, Minn.**

**Division of Ser. No. 2,467, Jan. 8, 1993, Pat. No. 5,452,289.**

**This application Aug. 11, 1994, Ser. No. 289,384**

**Int. Cl.[6] H04J 3/17**

**U.S. Cl. 370—81** **7 Claims**



1. A system for full-duplex transmission of voice and data information for use with a personal computer, comprising:

data interface means connected for transferring data to and from the personal computer;

telephone line interface means for connection to a telephone line;

voice interface means for receiving local voice signals from a local user and for conveying remote voice signals from a remote user to the local user;

full-duplex conversion means connected to the voice interface means for converting the local voice signals into outgoing digital voice data and for converting incoming digital voice data into the remote voice signals;

digital signal processor means connected to the full-duplex conversion means the data interface means and the telephone interface means for compressing the outgoing digital voice data into compressed outgoing digital voice data packets and for decompressing compressed incoming digital voice data packets into the incoming digital voice data;

quiet detection means for detecting quiet periods in which the local voice signals are below a predetermined threshold and for producing therefrom a quiet signal;

main control means connected for receiving the compressed outgoing digital voice data from the digital signal processor means, connected for receiving outgoing computer digital data from the personal computer through the data interface means, and for multiplexing and transmitting compressed outgoing digital voice data and outgoing computer digital data when the quiet signal indicates the presence of the local voice signals and for transmitting only outgoing computer digital data when the quiet signal indicates the absence of the local voice signals; and

the main control means further operable for receiving multiplexed incoming data which contains incoming computer

digital data multiplexed with the compressed incoming digital voice data, for demultiplexing the incoming computer digital data and the compressed incoming digital voice data, and for sending the incoming computer digital data to the personal computer through the data interface means and for sending the compressed incoming digital voice data to the digital signal processor means.

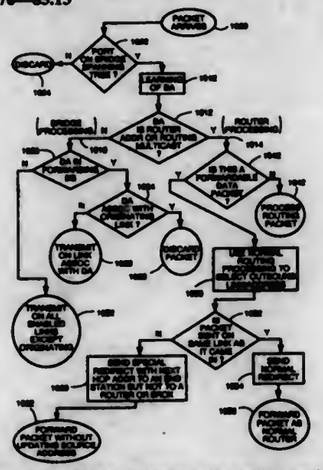
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**5,500,860**

## ROUTER USING MULTIPLE HOP REDIRECT MESSAGES TO ENABLE BRIDGE LIKE DATA FORWARDING

**Radia J. Perlman, Acton, Mass.; Alan J. Kirby, Hollis; Floyd J. Backes, Temple, both of N.H., and Charles W. Kaufman, Northborough, Mass., assignors to Digital Equipment Corporation, Maynard, Mass.**

**Filed Jun. 14, 1991, Ser. No. 716,827**
**Int. Cl.[6] H04J 3/02;3/24**
**U.S. Cl. 370—85.13** **6 Claims**



1. A packet forwarding apparatus, physically coupled with a plurality of LANs by a corresponding plurality of ports, comprising:

receiving means for receiving a first packet from a first one of said plurality of ports, said first one of said plurality of ports coupled;

packet discarding means, responsive to said receiving means, for discarding said first packet when said first one of said plurality of ports is not within a spanning tree of the apparatus, said spanning tree of the apparatus containing a list indicating which of said plurality of ports are active;

learning means, responsive to said packet discarding means not discarding said first packet, for storing a data link source address of said first packet in a forwarding database for said first LAN;

testing means, responsive to said learning means, for determining if a data link destination address field value of said first packet is equal to either a data link address of said apparatus, or to a routing multicast address;

router processing means, responsive to said testing means determining that said data link destination address field value of said first packet is equal to either a data link address of said apparatus or to a routing multicast address, for forwarding said first packet based on addressing information in a network layer header and a data link header in said first packet; and

bridge processing means, responsive to said testing means determining said data link destination address field value of said first packet is not equal to either a data link address of said apparatus or to a routing multicast address, for forwarding said first packet based on addressing information in a data link header in said first packet.

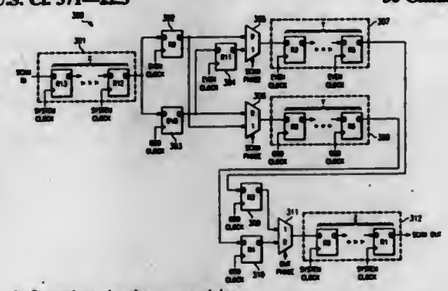
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**5,500,861**

## SCANNING, CIRCUITS, SYSTEMS AND METHODS

**Douglas A. Oppedahl, Garland, Tex., assignor to Convex Computer Corporation, Richardson, Tex.**

**Filed Jan. 27, 1994, Ser. No. 188,154**
**Int. Cl.[6] G06F 11/00**
**U.S. Cl. 371—22.3** **30 Claims**



1. Scanning circuitry comprising:

first input circuitry operable to transfer bits of received data in response to a first clock signal;

second input circuitry operable to transfer said bits of received data in response to a second clock signal;

at least one first storage device operable to transfer bits of data received from said first input circuitry in response to said first clock signal;

at least one second storage device operable to transfer bits of data received from said second input circuitry in response to said second clock signal;

first and second output circuitry, said first output circuitry operable to transfer bits of data received from said at least one first storage device in response to said second clock signal and said second output circuitry shifting bits of data received from said at least one second storage device in response to said second clock signal; and

a multiplexer selecting between bits of data received from said first output circuitry and bits of data received from said second output circuitry in response to respective first and second states of a control signal.

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**5,500,862**

## MULTI-LAYER DIGITAL CIRCUIT BOARD WITH A TEST PATTERN SECTION

**Hajime Kawamura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Oct. 28, 1994, Ser. No. 331,174**
**Claims priority, application Japan, Jan. 29, 1993, 5-272258**
**Int. Cl.[6] H04B 17/00**
**U.S. Cl. 371—22.3** **16 Claims**

1. A multi-layer digital circuit board for mounting an edge connector having a plurality of connector terminals and a large-scale integrated (LSI) circuit having a plurality of LSI terminals, comprising:

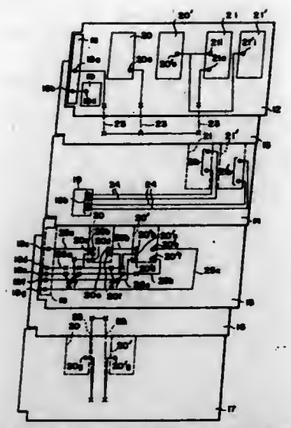
an edge connector having a plurality of connector terminals;

a large-scale integrated (LSI) circuit having a plurality of LSI terminals;

a circuit mounting section having a circuit upper face on which the edge connector and the LSI circuit are mounted, said circuit mounting section having a circuit back face opposite to the circuit upper face, said circuit mounting section having a plurality of terminal through holes, the connector terminals including connector test terminals for use in testing the LSI circuit, and the LSI terminals including LSI test terminals for use in testing the LSI circuit, the terminal through holes having ends connected to the connector test terminals and to the LSI test terminals and having other ends which reach to the circuit back face; and

a test pattern section having a test upper face which is in contact with the circuit back face and on which test conductive patterns are formed, the test conductive patterns being for use in testing the LSI circuit and connecting the LSI test terminals with the connector test terminals via the terminal through holes.





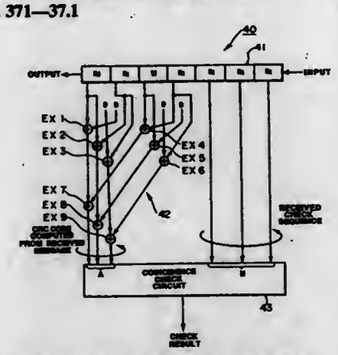
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**5,500,863**

## CRC OPERATIONAL SYSTEM

**Norimasa Kudoh, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Continuation of Ser. No. 647,935, Jan. 30, 1991, abandoned. This application Nov. 1, 1994, Ser. No. 331,877**
**Claims priority, application Japan, Jan. 30, 1990, 2-19934**
**Int. Cl.[6] H03M 13/00**
**U.S. Cl. 371—37.1** **5 Claims**



1. A cyclic redundancy check system comprising:

data storing means having an (N+n)-bit storage area for serially receiving and sequentially storing packet data while shifting data storage positions thereof, the packet data having a header part which is composed of an (N+n)-bit code sequence, the (N+n)-bit code sequence being composed of an N-bit message sequence constituting header data and an n-bit check bit sequence following the N-bit message sequence, the n-bit check bit sequence having been obtained by applying a predetermined polynomial to the N-bit message sequence;

an operation circuit for fetching in parallel the N-bit message sequence at an output side of the data storing means when the data storage position of the data storing means is shifted and carrying out an operation specified by the predetermined polynomial so as to calculate as an output an n-bit check bit sequence corresponding to the parallel N-bit message sequence; and

coincidence check circuit coupled to said operation circuit and said data storing means for receiving outputs of the operating circuit and the n-bit data at an input side of the data storing means, for checking for coincidence between said outputs and said n-bit data,

and for detecting a header position of the packet data at a timing when the coincidence check circuit outputs a coincidence output.

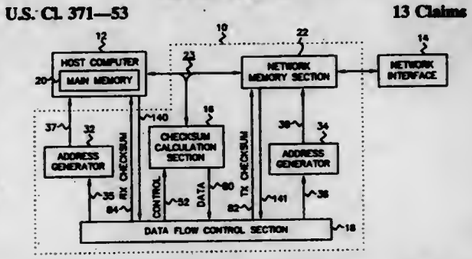
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**5,500,864**

## CHECKSUM CALCULATION UNIT AND METHOD FOR ERROR DETECTION ON DATA PACKETS

**Patrick S. Gonia, Maplewood, and James F. Hoff, Shoreview, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.**

**Continuation of Ser. No. 574,822, Aug. 29, 1990, abandoned. This application Jun. 14, 1993, Ser. No. 76,827**
**Int. Cl.[6] G06F 11/10**
**U.S. Cl. 371—53** **13 Claims**



1. A data communication system interactive so as to facilitate a flow of data between at least a main memory and network memory, said data communication system comprising:

an adder unit having at least one partial adder for calculating checksum values and inputs,

a checksum calculating means comprises an n-bit data byte delivery means to deliver a series of n-bit data bytes (which is called "checksum calculation results"), derived from input data, to the inputs of said adder unit, and a first direct memory accessing address generator connected to the main memory and a second direct memory accessing address generator connected to the network memory to move data in a form of data packets, each data packet having a first plurality of bytes which specify protocol information, a second plurality of bytes which specify checksum information and a third plurality of bytes which specify a block of data, to flow in one of either of two directions: from the network memory to main memory and simultaneously to checksum calculating means, or

alternatively, from main memory to network memory and simultaneously to said checksum calculating means; and

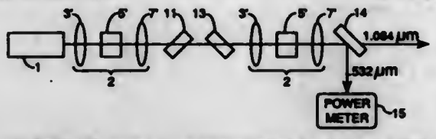
means of calculating values from the checksum calculation results and placing these values into the data packets.

**5,500,865**

## PHASED CASCADING OF MULTIPLE NONLINEAR OPTICAL ELEMENTS FOR FREQUENCY CONVERSION

Stephen H. Chakmakjian, Sandia Park; Mark T. Gruneisen, Tijeras; Karl W. Koch, III, and Gerald T. Moore, both of Albuquerque, all of N.M., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 13, 1994, Ser. No. 308,109
Int. Cl.[6] H01S 3/109
U.S. Cl. 372—22 21 Claims




16. Optical frequency conversion apparatus having a system output portion comprising:

(a) a source of coherent radiation;

(b) a plurality of discreet nonlinear light transmissive devices positioned in series between the source of coherent radiation and the system output portion; and

(c) a non-absorbing phase shifting means positioned between said plurality of discreet nonlinear light transmissive devices for altering the phase of light wavefronts passing therethrough.

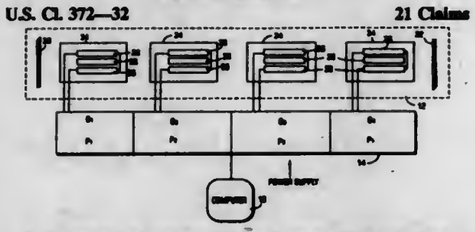
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**5,500,866**

## LASER RESONATOR BALANCING

Walther A. E. Goethals, Rugby, United Kingdom, assignor to Lumonics Ltd., United Kingdom

Filed Mar. 31, 1994, Ser. No. 221,081
Int. Cl.[6] H01S 3/13
U.S. Cl. 372—32 21 Claims



1. A method of operating a laser resonator incorporating a plurality of active laser gain elements, each of which is excited by means of an individual power supply means having a respective amplifier of variable gain and provided with gain adjusting means, the laser resonator providing a laser beam at an output power in response to input power provided to the laser elements from the power supply means, wherein a plot of laser output power against input power forms an output curve for the laser resonator, which output curve exhibits instability points corresponding to dips in the output curve, each dip associated with a respective input power, said method comprising the steps of:

(a) measuring laser output power over a range of input power,

(b) determining a point of laser resonator output instability and identifying the input power at which such point occurs; and

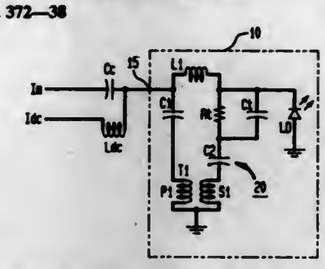
(c) operating the laser resonator at said identified input power while selectively varying the gain of each of the amplifiers so as to maximize output power at said input power and substantially eliminate a dip in the output curve corresponding to said instability point.

**5,500,867**

## LASER PACKAGE HAVING AN IMPEDANCE MATCHING TRANSFORMER

Stephen B. Krasulick, Fogelsville, Pa., assignor to AT&T Corp., Murray Hill, N.J.

Filed Sep. 13, 1994, Ser. No. 304,997
Int. Cl.[6] H01S 3/00
U.S. Cl. 372—38 11 Claims




1. A semiconductor laser package, comprising:

a semiconductor laser;

an interface configured for interfacing said laser to a laser drive source, said interface includes a transformer for impedance matching said laser drive source with said laser;

a housing for enclosing said laser and said interface; wherein said laser has an input impedance of around 5 ohms and said laser drive source has an output impedance of around 75 ohms.

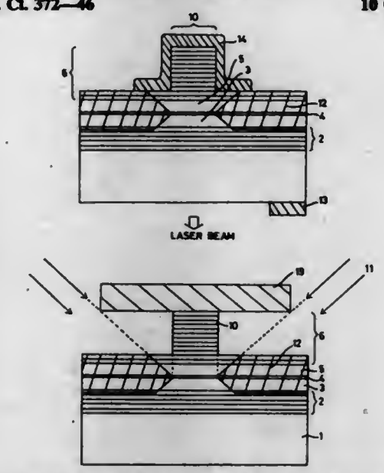
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**5,500,868**

## VERTICAL-TO-SURFACE TRANSMISSION ELECTRO-PHOTONIC DEVICE WITH ION IMPLANTED CURRENT CONTROL REGIONS

Kaori Kurihara, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 1, 1994, Ser. No. 190,242
Claims priority, application Japan, Feb. 1, 1993, 5-014548
Int. Cl.[6] H01S 3/18
U.S. Cl. 372—46 10 Claims




1. A vertical-to-surface transmission electro-photonic semiconductor device comprising:

a semiconductor substrate;

a bottom light reflective mirror formed on said semiconductor substrate for reflecting a light propagating in a vertical direction;



an intermediate multilayer structure formed on said bottom light reflective mirror, said intermediate multilayer structure including top and bottom epitaxial cladding layers sandwiching a quantum well active layer which shows a photoluminescence when carriers are injected into said active region, said top and bottom epitaxial cladding layers and said active layer being surrounded by both an impurity implanted region within which an impurity is implanted and a semiconductor crystal-damaged region overlying said impurity implanted region and said semiconductor crystal-damaged region having a high resistivity increased by crystal damages due to the fact that the impurity has passed therethrough for the purpose of an implantation of impurities into said impurity implanted region;

a top light reflective mirror of a mesa structure formed on said intermediate multilayer structure for reflecting a light propagating in a vertical direction; and

an electrode comprising a first part provided on said mesa structure and a second part provided on a peripheral region of said mesa structure;

wherein said semiconductor crystal-damaged region and said impurity implanted region are formed by an impurity implantation at a predetermined oblique angle so that, just under said second part of said electrode, a region free of any crystal damage in said epitaxial cladding layer is positioned and further said semiconductor crystal-damaged region and said impurity implanted region have a linearly sloped boundary extending at said oblique angle from a first position at edges of said second part of said electrode to a second position having the same level to said active layer and positioned just under vertical side walls of said semiconductor mesa structure to restrict a usable area of said active layer within the same area as said mesa structure to thereby allow that the majority of said carriers flows from said second part of said electrode through said crystal damage free region into said usable part of said active layer without passing through any part of said semiconductor crystal-damaged region.

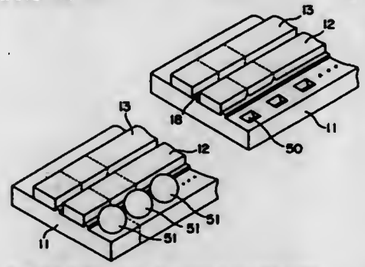
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**5,500,869**

## SEMICONDUCTOR LASER ARRAY DEVICE, SEMICONDUCTOR LASER DEVICE, AND PRODUCTION METHODS THEREFOR

Yasuaki Yoshida; Yasuo Nakajima, and Masao Aiga, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 23, 1994, Ser. No. 216,609
Claims priority, application Japan, Mar. 23, 1993, 5-063607; Sep. 16, 1993, 5-230392
Int. Cl.[6] H01S 3/18;3/25;3/025
U.S. Cl. 372—50 18 Claims




1. A semiconductor laser array device comprising:

a semiconductor laser chip array comprising a plurality of semiconductor laser chips arranged repetitively in an array having a period, each laser chip having a prescribed chip width and an optical axis;

a bar-shaped supporting substrate having an array direction parallel to a length direction of said supporting substrate, said semiconductor laser chip array being mounted on said supporting substrate;

a monitor photodiode array comprising a plurality of monitor photodiodes arranged in an array with a period that is the same period as said semiconductor laser chip array, said monitor photodiode array being mounted on said supporting substrate, having an array direction parallel to the length direction of said supporting substrate, and having a determined position along the optical axis directions of said laser chips and in the length direction and a height direction of said support substrate, wherein positions of said semiconductor laser chip array and said monitor photodiode array are determined in the optical axis direction of said laser chip by either of a groove in or a projection on said supporting substrate and extending along the length direction of said supporting substrate; and

a plurality of lenses mounted on said supporting substrate arranged in an array in the length direction of said supporting substrate with a period that is the same period as said semiconductor laser chip array, said plurality of lenses having positions determined along the optical axis directions of said laser chips and in the length direction and the height direction of said supporting substrate by hollows in said supporting substrate along one of the optical axis directions of said laser chips, respective semiconductor laser chips, monitor photodiodes, and lenses constituting individual semiconductor laser devices, wherein said supporting substrate includes a semiconductor substrate having a dopant impurity concentration, an etch stopping layer disposed on said semiconductor substrate, and a semiconductor layer having a thickness and the same composition and dopant impurity concentration as said semiconductor substrate disposed on said etch stopping layer, the hollows being produced by selectively etching said semiconductor layer of said supporting substrate to a depth reaching said etch stopping layer so that said etch stopping layer is exposed in the hollows, said plurality of lenses being disposed in contact with said etch stopping layer exposed in the hollows and determined in position in the height direction of said supporting substrate by said etch stopping layer exposed in the hollows.

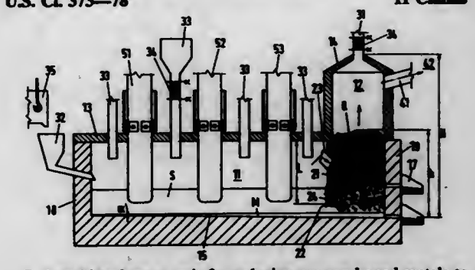
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**5,500,870**

## PROCESS AND DEVICE FOR THE EXTRACTION OF VALUABLE SUBSTANCES

Heribert König, Duisburg, and Heinz Stark, Essen, both of, Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Germany

Filed Nov. 15, 1994, Ser. No. 339,777
Claims priority, application Germany, Nov. 15, 1993, 43 39 226.1
Int. Cl.[6] F27D 23/00
U.S. Cl. 373—78 11 Claims



7. A melting furnace unit for reducing oxygen-bound metals to extract valuable substances, comprising: a furnace vessel; a roof member over the furnace vessel; a separating wall arranged so as to extend from the roof member into the vessel to separate the furnace vessel into a first part and a second part; means for

supplying heat energy to the first vessel part; means for feeding charge material to the furnace vessel for melting to form slag and molten metal; means for removing melt from the furnace vessel; means for connecting the second part of the furnace vessel to a gas purifier, the separating wall having a length from the roof member so as to define a separating wall mouth that extends into the slag during a melting operation to a point near an upper level of the molten metal, the separating wall further having an opening defined therein which passes from the first furnace vessel pan to the second furnace vessel part near the roof member, the second furnace vessel pan having a shaft-like form with a shaft height which extends above a height of a column of reducing agent in the second furnace part, and a top end at which the gas purifier connection means is provided; burners arranged and adapted to extend laterally into the second vessel furnace part in a region above the melt; and means for supplying energy to the burners.

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**5,500,871**

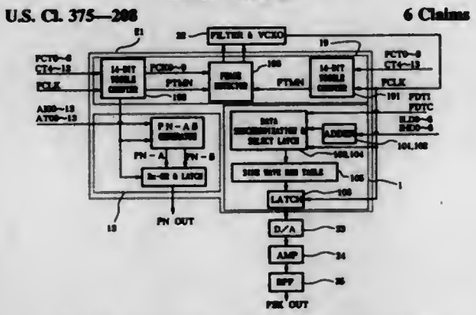
## SPREAD SPECTRUM COMMUNICATION TRANSMITTER AN LSI THEREFOR

**Shunji Kato, and Hiromitsu Miyajima, both of Ageo, Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Nihonbashi-Muromachi, Japan**

**Filed Apr. 8, 1994, Ser. No. 225,252**

**Int. Cl.[6] H04B *1/69***

**U.S. Cl. 375—208** **6 Claims**




1. A spread spectrum communication transmitter comprising:

FSK modulation means for performing FSK modulation for switching frequency in correspondence with whether a binary level of each bit of the serial digital data to be transmitted is high or low, and

SS modulation means for performing spread spectrum modulation of a resultant FSK-modulated signal and transmitting resultant data,

wherein said FSK modulation means comprises a direct digital synthesizer and synchronizes an FSK modulation signal having a frequency corresponding to at least one binary level of said each bit with a PN code for the spread spectrum modulation, said PN code having a period which does not vary based upon a ratio of a number of said high level bits of said serial data to a number of said low level bits of said serial data.

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**5,500,872**

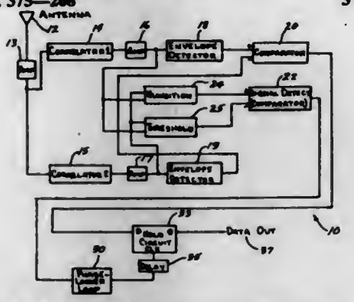
## SPREAD SPECTRUM BASE BAND PROCESSOR

**Patick W. Kinney; Ronald L. Mahany, and Steven E. Koenck, all of Cedar Rapids, Iowa, assignors to Norand Corporation, Cedar Rapids, Iowa**

**Continuation-in-part of Ser. No. 229,532, Apr. 19, 1994, which is a continuation-in-part of Ser. No. 129,876, Sep. 30, 1993, abandoned, which is a continuation of Ser. No. 974,731, Nov. 13, 1992, abandoned. This application Sep. 19, 1994, Ser. No. 308,810**

**Int. Cl.[6] H04L *27/30***

**U.S. Cl. 375—208** **3 Claims**



error correcting means responsive to the first and second output signals of said plurality of comparator means for providing channel reversals and bit reversals on the received P- and Q-channel baseband signals.

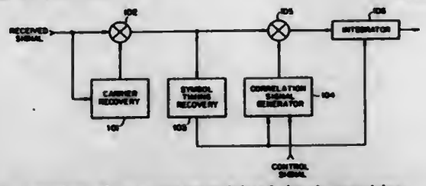
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**5,500,877**

## RECEIVER FOR A SUPERPOSE MODULATED SIGNAL

Il-keun Park, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki, Rep. of Korea

Filed Aug. 26, 1992, Ser. No. 112,832
Int. Cl.[6] H03D 1/00; H04L 27/14
U.S. Cl. 375—343 13 Claims




1. A receiver of a superpose modulated signal comprising:

symbol timing recovery means for receiving the superpose modulated signal and extracting timing information therefrom to produce a symbol timing signal with being synchronized;

correlation signal generating means for generating a correlation signal as $B+(P-B)\cos(2\pi t/T)$ based on said symbol timing signal, where B is a parameter to be adjustable, P is a predetermined maximum value and T refers to the symbol duration;

correlation multiplying means for multiplying the superpose modulated signal by said correlation signal; and

means for integrating the output of said correlation multiplying means per each symbol period.

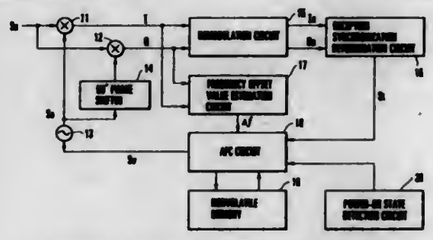
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**5,500,878**

## AUTOMATIC FREQUENCY CONTROL APPARATUS AND METHOD THEREFOR

Motoya Iwasaki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 8, 1994, Ser. No. 255,367
Claims priority, application Japan, Jun. 8, 1993, 5-164070
Int. Cl.[6] H03J 7/00; H04L 27/06;7/04
U.S. Cl. 375—344 6 Claims



1. An automatic frequency control apparatus comprising:

local oscillation means for outputting a local oscillation signal having an oscillation frequency controlled by a frequency control voltage;

quadrature detection means for quadrature-detecting a received signal using the local oscillation signal received from said local oscillation means;

frequency offset value estimation means for estimating a frequency offset value of the received signal from quadrature detection signals received from said quadrature detection means;

demodulation means for demodulating the quadrature detection signals received from said quadrature detection means and outputting demodulated signals;

synchronization determination means, coupled to said demodulation means, for determining reception synchronization according to said demodulated signals received from said demodulation means to output a synchronization determination signal when reception synchronization with a single received frequency is established;

frequency control means, coupled to said local oscillation means and to said synchronization determination means, for generating said frequency control voltage and outputting said frequency control voltage to said local oscillation means;

non-volatile memory means, coupled to said frequency control means, for storing a frequency control voltage received from said frequency control means obtained when said reception synchronization is established; and

said frequency control means being also coupled to said frequency offset value estimation means, for repeatedly changing a frequency control voltage to said local oscillation means according to the frequency offset value received from said frequency offset value estimation means until reception synchronization is established when no synchronization determination signal is output from said synchronization determination means, and controlling the oscillation frequency of said local oscillation means by the frequency control voltage read out from said non-volatile memory means when a power supply is turned on, said frequency control means effecting storing of the frequency control voltage into said memory means when the synchronization determination signal is output from said synchronization determination means to said frequency control means.

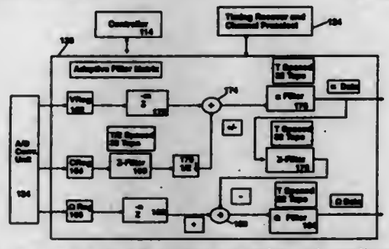
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**5,500,879**

## BLIND SIGNAL SEPARATION AND EQUALIZATION OF FULL-DUPLEX AMPLITUDE MODULATED SIGNALS ON A SIGNAL TRANSMISSION LINE

Mark A. Webster, Palm Bay; Keith R. Baldwin, Melbourne Beach, and Richard D. Roberts, Palm Bay, all of Fla., assignors to Adtran, Huntsville, Ala.

Continuation-in-part of Ser. No. 969,788, Oct. 29, 1992, abandoned, which is a continuation-in-part of Ser. No. 930,728, Aug. 14, 1992, Pat. No. 5,425,042. This application Mar. 16, 1994, Ser. No. 213,886
Int. Cl.[6] H03K 7/02
U.S. Cl. 375—353 10 Claims



1. An apparatus for blind signal separation and equalization of two pulse amplitude modulated (PAM) signals conveyed over a transmission line, said two pulse amplitude modulated signals including a stronger PAM signal designated as an alpha ($\alpha$) signal and a weaker PAM signal designated as an omega ($\Omega$) signal, comprising:

an $\alpha$ signal detector, coupled to said transmission line and being operative to provide at its output said $\alpha$ signal;

an $\alpha$ signal subtraction unit, coupled to said transmission line and to said output of said $\alpha$ signal detector, and being operative to subtract the effect of said $\alpha$ signal from the signal on the transmission line; and



an $\Omega$ signal detector, coupled to the output of said $\alpha$ signal subtraction unit, and being operative to provide at its output said $\Omega$ signal.

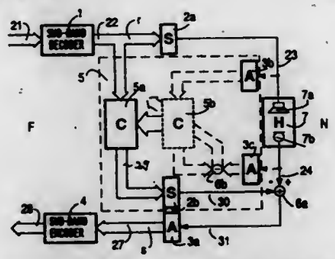
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**5,500,880**

## TRANSMISSION SYSTEM COMPRISING A SUB-BAND ECHO CANCELLER WHICH INCLUDES A SUB-BAND CODING ARRANGEMENT

Walter Kellermann, Nürnberg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 106,008, Aug. 13, 1993. This application Dec. 16, 1994, Ser. No. 359,327
Claims priority, application Germany, Aug. 18, 1992, 42 27 327.7
Int. Cl.[6] H04L 23/00; H04M 1/24; H04J 1/00
U.S. Cl. 375—377 20 Claims



1. A transmission system for transmitting signals between at least two transceiver stations, each said transceiver station comprising:

(a) at least one sub-band encoding-decoding arrangement for multi-sub-band encoded signals including a sub-band decoder and a sub-band encoder,

(b) at least one sub-band echo canceller coupled to the sub-band encoding-decoding arrangement,

(c) said sub-band encoding-decoding arrangement comprising:

(i) at least one synthesis filter bank for receiving a decoded sub-band signal from the sub-band decoder and forming a full-band speech signal,

(ii) at least one analysis filter bank for analysing a full-band speech signal and forming therefrom a sub-band signal to be sent to the sub-band encoder,

(d) the synthesis filter bank and the analysis filter bank being connected for processing signals of the sub-band encoding-decoding arrangement,

(e) the synthesis filter bank and the analysis filter bank also being connected for processing signals of the sub-band echo canceller.

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**5,500,881**

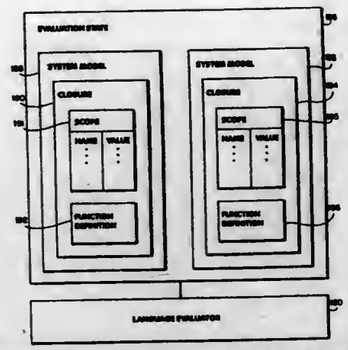
## LANGUAGE SCOPING FOR MODULAR, FLEXIBLE, CONCISE, CONFIGURATION DESCRIPTIONS

Roy Levin, Palo Alto, and Christine B. Hanna, Woodside, both of Calif., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jul. 12, 1993, Ser. No. 90,844
Int. Cl.[6] G06F 9/44
U.S. Cl. 395—700 16 Claims

1. In a computer system for processing a computer program, said computer program including a plurality of functions including a plurality of variables, a method for defining said variables comprising the steps of:

A) storing in a static scope a first plurality of variable names corresponding to a first plurality of said variables and a plurality of first values associated with said first plurality of variable names;



B) storing a dynamic scope a second plurality of variable names corresponding to a second plurality of said variables and a plurality of second values associated with said second plurality of said variable names;

C) binding at least one of said first and second values to each said variable during evaluation of said functions, said binding step including, with respect to each said variable, the steps of

i) searching for the variable name corresponding to said variable in said static scope and, if found, binding to said variable the one of said first values associated with said corresponding variable name in said static scope; and

ii) if said corresponding variable name is not found in said static scope, searching for said corresponding variable name in said dynamic scope and, if found, binding to said variable the one of said second values associated with said variable name in said dynamic scope,

whereby said static scope takes precedence over said dynamic scope in evaluating said functions.

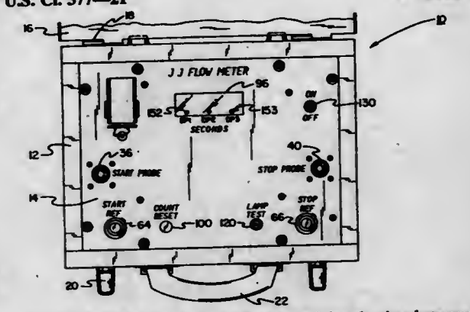
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**5,500,882**

## PORTABLE FLOW TIMER DEVICE

John W. Elfert, 6001 Eurith Ave., Baltimore, Md. 21206

Filed Dec. 20, 1994, Ser. No. 359,913
Int. Cl.[6] G01F 3/00
U.S. Cl. 377—21 6 Claims




1. A portable flow timer device for determining the time between two successive fluid flow detection signals input thereto by a pair of spaced fluid detection probes extended within a fluid line comprising, in combination:

a hollow rectangular rigid box-shaped container having a bottom wall, four side walls extended upwards from the bottom wall to define a hollow interior and a top opening, and a control panel disposed over the opening with its periphery coupled to the side walls;

a rigid lid pivotally coupled to a side wall with a hinge and positionable over the control panel in facing contact;

latch means for removably coupling the lid to the container to thereby preclude access to the control panel;

electric timer means disposed within the container and further comprising:

input probe connector means extended through the control panel for receiving fluid flow detection signals from a pair of external fluid detection probes coupleable thereto;

bridge circuit means coupled to the input probe connector means for receiving a fluid flow detection signal and transmitting a timer activation signal and for receiving a succeeding fluid flow detection signal and transmitting a timer de-activation signal, the bridge circuit means including amplifying means for amplifying the fluid flow detection signals to a set level and calibration means coupled to the amplifying means for allowing the set level to be adjusted;

resetable count-down logic means coupled to the bridge circuit means for transmitting a plurality of timer signals at a set timing interval based upon receipt of the timer activation signal and for preventing transmission of the timer signals based upon receipt of the timer de-activation signal;

oscillator means coupled to the count-down logic means for setting the timing interval at which the timer signals are transmitted and with the timing interval set at 1/10th of a second;

display means coupled to the count-down logic means for receiving the timer signals therefrom and for displaying from the control panel the elapsed time from receipt of timer signals up to their cessation; and

timer reset switch means coupled to the count-down logic means and extended through the control panel for resetting the count-down logic means and thereby resetting the display means at an initial value;

removable battery means coupled to the bridge circuit means, the count-down logic means, the oscillator means, the display means, and the timer reset switch means for supplying electric energy for operation; and

lamp test means coupled to the display means and battery means for checking their operability; and,

power switch means coupled between the battery means and the bridge circuit means, the count-down logic means, the oscillator means, the display means, and the timer reset switch means and extended through the control panel, the power switch means having one orientation for allowing electrical energy to be delivered for operation and another orientation for preventing such delivery.

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**5,500,884**

**DENTAL X-RAY DIAGNOSTIC INSTALLATION FOR PRODUCING PANORAMA X-RAY EXPOSURES OF THE SKULL OF A PATIENT**

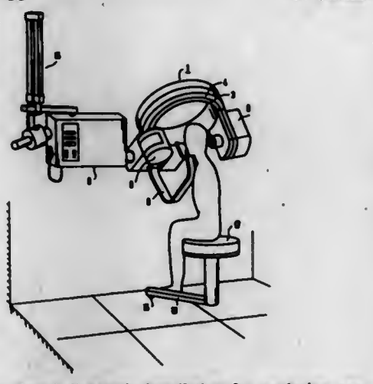
**Werner Guenther, Benscheim; Dieter Molitor, Buerstadt, and Leonhard Werner, Hemsbach, all of, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany**

**Filed Feb. 1, 1995, Ser. No. 382,210**

**Claims priority, application Germany, Feb. 14, 1994, 44 04 640.5**

**Int. Cl.[6] A61B 6/14**

**U.S. Cl. 378—38** **14 Claims**



1. An x-ray dental diagnostic installation for producing panorama exposures of the skull of a patient, comprising:

an x-ray source;

an x-ray pick-up unit;

rotary means, on which said x-ray source and said x-ray pick-up unit are mounted opposite each other, for rotating said x-ray source and said x-ray pick-up unit around the head of a patient;

positioning means for reproducibly fixing a position of the head of said patient;

boom means, including a horizontal shaft, for supporting said rotary means and said positioning means cantilevered from said shaft and for permitting swiveling of said rotary means and said positioning means around said shaft through a plurality of swiveled positions respectively corresponding to different sizes of patients for initially positioning said positioning means in one of said swivel positions relative to a patient and for subsequently positioning said rotary unit in a fixed position allocated to the position of said positioning means; and

means for operating said x-ray source and said x-ray pick-up unit to produce a panorama tomogram of the head of said patient with said positioning means in said one of said swivel positions and said rotary means in said fixed position.

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**5,500,885**

**MOUNTING ASSEMBLY FOR AN AXLE IN A HOUSING**

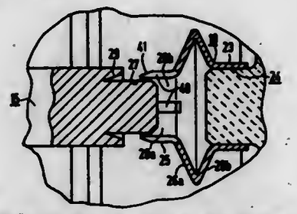
**Roland Schmidt, Erlangen; Hans Strechlein, Nuremberg, and Thomas Weller, Erlangen, all of, Germany, assignors to Siemens Aktiengesellschaft, Tokyo, Japan**

**Filed Mar. 19, 1993, Ser. No. 34,774**

**Claims priority, application Germany, Mar. 27, 1992, 42 10 146.8**

**Int. Cl.[6] H01J 35/10**

**U.S. Cl. 378—128** **17 Claims**



1. A mounting assembly for an axle of a rotating anode in a vacuum housing of an X-ray tube wherein at least one end of an axle is connected to the housing, said assembly comprising a mounting part having a first sleeve section for telescopically receiving an end of the axle and a second sleeve section for telescopically receiving a housing projection, one section of said first and second sleeve sections receiving the respective axle or housing projection with radial play during assembly and the assembly having clamp means provided for acting on said one section to cause a substantially play-free engagement between the one section and the respective axle or housing projection.

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**5,500,886**

**X-RAY POSITION MEASURING AND CALIBRATION DEVICE**

**Eric A. Duff, San Diego, Calif., assignor to ThermoSpectra, Franklin, Mass.**

**Filed Apr. 6, 1994, Ser. No. 224,634**

**Int. Cl.[6] G01D 18/00**

**U.S. Cl. 378—207** **66 Claims**

1. A calibration system for determining the angular directions $\theta$, $\phi$ of a beam of radiation, said system comprising:

a radiation source generating said beam of radiation at said angular direction $\theta$ measured with respect to a first direction;

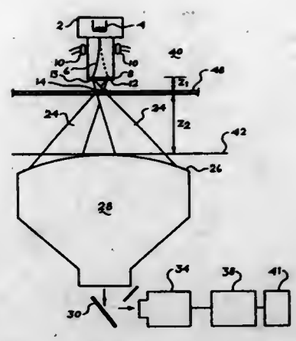
a first reference element exposed to said beam of radiation and separated from said radiation source by a distance of approximately $Z_1$;

a second reference element exposed to said beam of radiation and separated from said first reference element by a predetermined distance H;

an image detector producing a first image of said first reference element and a second image of said second reference element; and

an angle measurement device calculating said angle $\theta$ from said distances H and $Z_1$.





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**5,500,887**

**DATA ACCESS METHOD FOR SUBSCRIBER LOCATION INFORMATION**

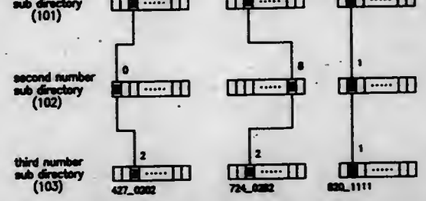
**Hak-Seong Jeon, and Sung-Hee Kim, both of Daejeon, Rep. of Korea, assignors to Electronics & Telecommunications Research Institute, Daejeon, Rep. of Korea**

**Filed Dec. 2, 1994, Ser. No. 353,233**

**Claims priority, application Rep. of Korea, May 14, 1994, 94-10567**

**Int. Cl.[6] H04Q 7/38**

**U.S. Cl. 379—58** **1 Claim**




1. A data access method for subscriber location information in a digital mobile communication network comprising:

a data search step for searching the subscriber location information including:

a first determination step for determining whether a first index is allotted in a root directory using a root directory index;

a first acquisition step for acquiring a first sub directory in case where the first index is allotted as a result of carrying out the first determination step;

a second determination step for determining whether a second index is allotted in the first sub directory using the first index;

a second acquisition step for acquiring a second sub directory index in case where the second index is allotted as a result of carrying out the second determination step;

a third determination, step for determining whether a third index is allotted in a second sub directory using a second index;

a third acquisition step for acquiring a third sub directory index in case where the third index is allotted as a result of carrying out of the third determination step;

a fourth determination step for determining whether a data index is allotted in the third sub directory using the third index;

a fourth acquisition step for acquiring a data index in case where the data index is allotted as a result of carrying out the fourth determination step; and

a procedure completion step for completing the procedure in case where each indexes is allotted each directories as a result of carrying out said first to fourth determination steps;

a data addition step for adding the subscriber location information including:

a first determination step for determining whether a first index is allotted in a root directory using a root directory index;

a first acquisition step for acquiring a first sub directory index in case where the first index is allotted as a result of carrying out the first determination step;

a first allot step for allotting an index number of new sub directory as the first index in case where the first index is not allotted as a result of carrying out the first determination step;

a second determination step for determining whether a second index is allotted in the first sub directory using the first index;

a second acquisition step for acquiring a second sub directory index in case where the second index is allotted as a result of carrying out the second determination step;

a second allot step for allotting an index number of new sub directory as the second index in case where the second index is not allotted as a result of carrying out the second determination step;

a third determination step for determining whether a third index is allotted in a second sub directory using a second index;

a third acquisition step for acquiring a third sub directory index in case where the third index is allotted as a result of carrying out the third determination step;

a third allot step for allotting an index number of new sub directory as the third index in case where the third index is not allotted as a result of carrying out the third determination step;

a fourth determination step for determining whether a data index is allotted in the third sub directory using the third index;

a fourth allot step for allotting a location number for storing new data as the data index in case where the data index is not allotted as a result of carrying out the fourth determination step; and

a procedure completion step for completing the procedure in case where each indexes is allotted each directories as a result of carrying out of the fourth determination step; and

a data deletion step for deleting the subscriber location information including:

a first determination step for determining whether a first index is allotted in a root directory using a root directory index;

a first deletion step for deleting a first sub directory index in case where the first index is allotted as a result of carrying out the first determination step;

a second determination step for determining whether a second index is allotted in the first sub directory using the first index;

a second deletion step for deleting a second sub directory index in case where the second index is allotted as a result of carrying out the second determination step;

a third determination step for determining whether a third index is allotted in a second sub directory using a second index;

a third deletion step for deleting a third sub directory index in case where the third index is allotted as a result of carrying out the third determination step;

a fourth determination step for determining whether a data index is allotted in the third sub directory using the third index;

a fourth deletion step for deleting the data index in case where the data index is allotted as a result of carrying out the fourth determination step; and a procedure completion step for completing the procedure in case where each indexes is not allotted as a result of carrying out the fourth determination step.

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**5,500,888**

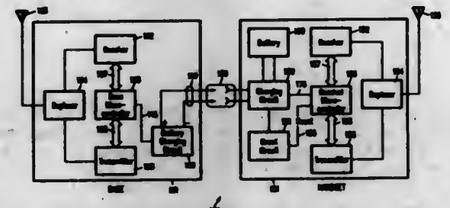
## CORDLESS TELEPHONE SECURITY CODE INITIATION AND PREVENTION SYSTEM

**Wai T. Chiu, and Kwong Y. Wong, both of Kowloon, Hong Kong, assignors to National Semiconductor Corporation, Santa Clara, Calif.**

**Continuation of Ser. No. 64,372, May 19, 1993, abandoned, which is a continuation of Ser. No. 664,774, Mar. 5, 1991, abandoned. This application Oct. 25, 1994, Ser. No. 328,610**

**Int. Cl.[6] H04Q 7/38**

**U.S. Cl. 379—61** **18 Claims**



17. A cordless telephone having a base unit and a handset unit comprising:

a first one of said base and said handset units including a first storage location for storing a first security code;

a second one of said base and said handset units including a second storage location for storing a second security code;

authorization circuitry allowing communication between said first one of said base and said handset units and said second one of said base and said handset units when said first security code and said second security code are set to corresponding values;

a security code update signal including a change security code command and a new security code, said security code update signal transmitted by said first one of said base and said handset units to said second one of said base and said handset units in order to update said security codes in both said first and said second ones of said base and said handset units;

means for initiating the transmission of said security code update signal, said initiating means responsive to one or more events including elapsed time, handset removal, usage, call completion depression of a handset key;

an update acknowledgment signal transmitted by said second one of said base and said handset units responsive to said security code update signal from said first one of said base and said handset units; and

means for preventing the updating of said first and said second security codes with said new security code, said prevention means disabling the updating of said security code upon the non-receipt of said acknowledqment signal and the expiration of a first timeout period;

said first and second security codes updated in both said first and said second ones of said base and said handset units upon receipt of said update acknowledgment signal by said first one of said base and said handset units conditioned upon the non-intervention of said prevention means.

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**5,500,889**

## METHOD AND APPARATUS FOR PRIORITIZING A TELEPHONE CALL ACCORDING TO A LEVEL OF SERVICE OF AN ORIGINATOR

**Mark C. Baker, Lisle; William E. Hagermann, Naperville; Jack R. Penrod, Bolingbrook, all of Ill., and Nancy S. Stevens, Mount Laurel, N.J., assignors to AT&T Corp., Murray Hill, N.J.**

**Filed Jun. 9, 1994, Ser. No. 257,619**

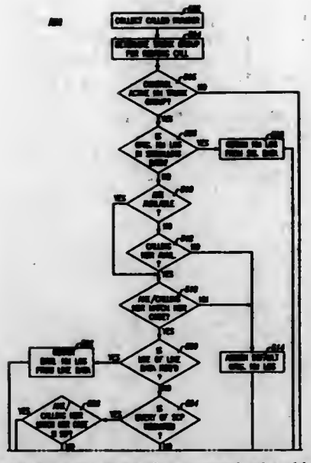
**Int. Cl.[6] H04M 7/00**

**U.S. Cl. 379—67** **21 Claims**

9. A method for using a trunk group control to manage a telephone call comprising the steps of:

a. collecting a called number of this call;





b. determining a trunk group for communicating this call;

c. determining if a trunk group control is active for a trunk group communicating the telephone call and if a trunk group control is not active proceeding to step n, while if a trunk group control is active proceeding to step d;

d. determining if ANI is available for this call and if ANI is not available proceeding to step e and if ANI is available proceeding to step f;

e. determining if calling number is available and if it is not available proceeding to step m, while if it is available proceeding to step f;

f. obtaining NM LOS for this call;

g. determining from ANI or calling number if this telephone call matches a number code and if there is a not a match proceeding to step m, while if there is a match proceeding to step h;

h. determining if query of an SCP database is required to obtain NM LOS and if a query is required proceeding to step i, while if a query is not required proceeding to step l;

i. querying SCP database with either ANI or calling number to obtain NM LOS;

j. determining if the query is successful in finding a match in the SCP database and if a match is found obtaining the NM LOS from the SCP database and proceeding to step m, while if a match is not found proceeding to step k;

k. assigning a default NM LOS to this call and proceed to step m;

l. obtain NM LOS from a LOS table for this ANI or calling number;

m. applying a trunk group control based upon NM LOS and determining if this call is allowed to be completed; and

n. if the call is allowed to be completed routing the call to its destination and if the call is not allowed to be completed, routing the call to an announcement.

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**5,500,890**

## POINT-OF-SALE SYSTEM USING MULTI-THREADED TRANSACTIONS AND INTERLEAVED FILE TRANSFER

**Stanley A. Rogge, Houston, and Christophe K. Cooper, Kingwood, both of Tex., assignors to Exxon Research and Engineering Company, Florham Park, N.J.**

**Filed Aug. 19, 1993, Ser. No. 109,164**

**Int. Cl.[6] H04M 11/00**

**U.S. Cl. 379—91** **25 Claims**

1. A method for authorizing transactions using a multi-threaded protocol in a point-of-sale system that includes a terminal and a network, the terminal being coupled to the network, comprising the steps of:



transmitting a first authorization request corresponding to a first transaction from the terminal to the network;

transmitting a first response to said first authorization request from the network to the terminal, said first response including a first approval status for the first transaction;

transmitting a second authorization request corresponding to a second transaction from the terminal to the network before said first response to said first authorization request has been transmitted from the network to the terminal; and

transmitting a second response to said second authorization request from the network to the terminal, said second response including a second approval status for the second transaction.

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**5,500,891**

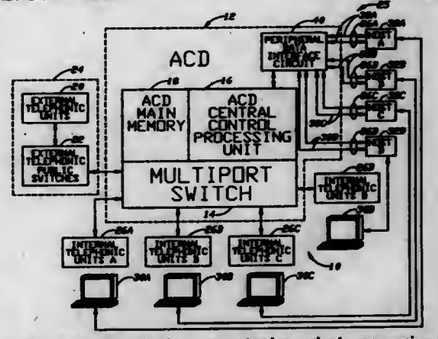
## TELECOMMUNICATION SYSTEM WITH MULTILINK HOST COMPUTER CALL CONTROL INTERFACE SYSTEM AND METHOD

**Noreen A. Harrington, 1818 Appaloosa Dr., Naperville, Ill. 60565, and Mark J. Michelson, 2 N 678 Mulburn Dr., Elburn, Ill. 60119**

**Filed Sep. 30, 1994, Ser. No. 316,695**

**Int. Cl.[6] H04M 1/64**

**U.S. Cl. 379—265** **18 Claims**




1. In a telecommunication system having a single automatic call distributor with a multiport switch controlled by a central control processing unit and an associated memory for selectively interconnecting telephonic calls between external telephonic units of an external telephonic network and internal telephonic units coupled with the multiport switch, the improvement being a multilink host computer call control interface system, comprising:

a plurality of host computers coupled to the automatic call distributor; and

means for enabling communication between the single automatic call distributor and the plurality of host computers to provide the plurality of host computers with control of call handling operations performed at the automatic call distributor in which said call handling operations include at least one of

(a) sign-in of internal telephonic units,
(b) sign-out of internal telephonic units, and
(c) initiation of an out-dial call for connection at an internal telephonic unit.

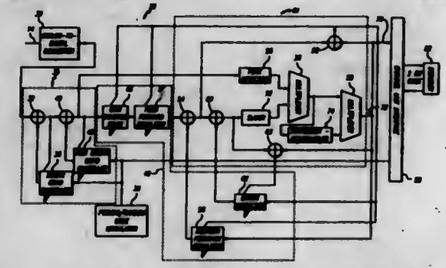
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**5,500,892**

## ECHO CANCELLER

Daniel L. Essig, La Jolla, Calif., assignor to Brooktree Corporation, San Diego, Calif.

Filed Feb. 14, 1994, Ser. No. 195,267
Int. Cl.[6] H04B 3/23
U.S. Cl. 379—345 42 Claims



1. Apparatus for use at a receiver for receiving through telephone lines from a transmitter analog signals corresponding to digital signals representing data in accordance with a plurality of analog levels and modulated in a first pseudo random code involving the analog levels, the received signals including echoes of analog signals transmitted from the receiver to the transmitter and reflected from the transmitter back to the receiver and modulated in a second pseudo random code different from the first pseudo random code, including,

first means at the receiver for converting the analog signals received in the first and second pseudo random codes from the transmitter to digital signals representing the analog signals,

second means at the receiver for providing digital signals modulated in the second pseudo random code,

third means at the receiver, the third means being responsive to the digital signals from the second means and to the digital signals from the first means for eliminating from the digital signals from the first means the modulated digital signals reflected in the second pseudo random code from the transmitter back to the receiver,

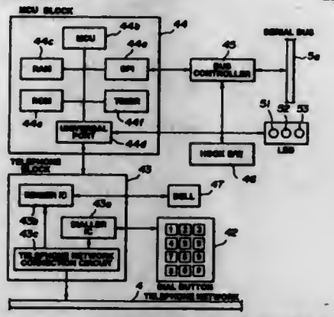
the second means including an echo canceller having a plurality of successive terminals and providing for a shift of the digital signals in the second pseudo random code from the second means to the successive terminals and having adjustable coefficients at the successive terminals for adjusting the digital signals in the second pseudo random code the third means including fourth means for comparing the digital signals from the first means and the adjusted digital signals at the successive terminals in the echo canceller to obtain digital signals representing the results of such comparison and for adjusting the digital signals representing the adjustable coefficients for the successive terminals in the echo canceller in accordance with the results of such comparison, the second means further including memory means for storing the adjusted digital signals representing the adjustable coefficients at the successive terminals in the echo canceller and for storing the digital signals from the second means.

**5,500,893**

## TELEPHONE APPARATUS, INFORMATION PROCESSING APPARATUS AND INFORMATION COMMUNICATION TERMINAL

Kazunobu Onosaka, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 8, 1994, Ser. No. 302,406
Claims priority, application Japan, Sep. 14, 1993, 5-252303
Int. Cl.[6] H04M 11/00
U.S. Cl. 379—396 12 Claims



1. An information communication terminal operable by a single operator for communicating between other information communication terminals or other communication devices by way of a telephone network, said terminal comprising:

informational processing means for performing data communication by way of said telephone network, said informational processing means having a first display device for displaying information thereon and means for generating status signals and command signals including a disconnect command signal when said informational processing means is performing data communication and for transmitting said status and command signals therefrom; and

telephone means for communicating between operators by way of said telephone network, said telephone means having a second display device, means for receiving said status signals and for providing a display on said second display device corresponding to the received status signals so as to provide an indication of the status to the operator of said telephone device, and means responsive to said disconnect command signal for disconnecting said telephone means from said telephone network when said informational processing means is performing data communication by way of said telephone network.

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**5,500,894**

## TELEPHONE LINE INTERFACE WITH AC AND DC TRANSCONDUCTANCE LOOPS

Russell A. Hershberger, Nevada City, Calif., assignor to Silicon Systems, Inc., Tustin, Calif.

Filed Dec. 3, 1993, Ser. No. 161,740
Int. Cl.[6] H04M 7/04
U.S. Cl. 379—399 3 Claims

2. A telephone line interface comprising:

an AC transconductance loop for controlling AC characteristics, said AC transconductance loop deriving a power supply voltage from a telephone line, wherein said AC transconductance loop comprises:

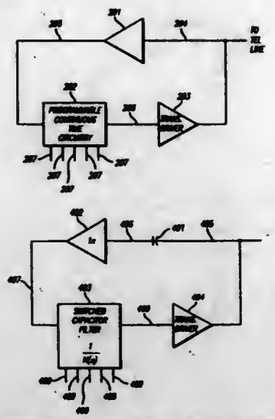
an AC coupling component;

a first switched capacitor filter for receiving a telephone line input signal and for providing a first filter output signal;

a transconductance driver for receiving said first filter output signal and for providing a first telephone line output signal; said telephone line interface further comprising:

a DC transconductance loop for controlling DC characteristics, wherein said DC transconductance loop comprises:





a programmable continuous time filter for receiving a telephone line input signal and for providing a second filter output signal;

a transconductance driver for receiving said second filter output signal and for providing a second telephone line output signal.

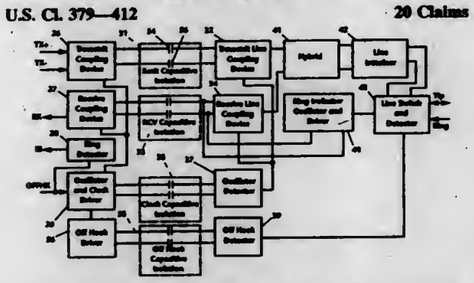
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**5,500,895**

## TELEPHONE ISOLATION DEVICE

Gerald J. Yurgelites, 2133 Asilomar Dr., Antioch, Calif. 94509

Filed May 24, 1994, Ser. No. 248,226
Int. Cl.[6] H04M 1/76
U.S. Cl. 379—412 20 Claims



1. An isolation circuit for connecting a user device to a communication line pair for full duplex communication on the line pair while providing an electrical isolation barrier between the user side and the line side of the isolation circuit, comprising:

a pair of capacitors connected across said electrical isolation barrier, each of said capacitors having like first ends connected to said one side of said isolation circuit and like second ends connected to the other side of said isolation circuit; and,

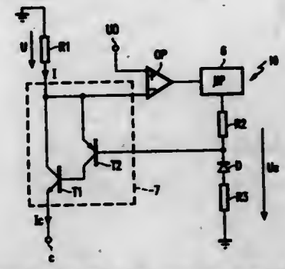
means for transmitting an information signal across said capacitors from said one side to said other side, including means for differentially charging said like first ends of said pair of capacitors with said information signal, means for receiving said differential charge on said like second ends of said pair of capacitors, and means for converting said differential charge on said second end to a restored information signal.

**5,500,896**

## CODE CONVERTER COMPRISING PROTECTION CIRCUIT

Wilfried Hache, Lehn, and Jost Kawczyk, Lübeck, Germany, assignors to U. S. Philips Corporation, New York, N.Y.

Filed Jul. 19, 1994, Ser. No. 277,445
Claims priority, application Germany, Aug. 19, 1993, 43 27 922.2
Int. Cl.[6] H04M 7/00
U.S. Cl. 379—412 4 Claims



4. A protection circuit for a code converter for processing switching information signals, to limit a current flowing in a telephone exchange wire, said protection circuit comprising:

a switch arranged in series with a telephone exchange wire for forming a switching path, said switch further having a control input;

a first resistor having a first terminal thereof arranged in series with said switch on a side remote from the telephone exchange wire along the switching path, an opposite terminal of said first resistor being connected to a ground potential, whereby the current flowing in the telephone exchange wire flows through said first resistor when said switch is closed, thereby causing a voltage, which is derived from the current, to be developed across said first resistor;

an evaluation circuit for causing said switch to open if the current, or a voltage signal derived from the current, reaches a threshold value, wherein the evaluation circuit comprises a comparator having first and second inputs, wherein a threshold voltage is applied to the first input and the voltage developed across said first resistor is applied to the second input, the evaluation circuit further having an output for generating a control voltage with respect to the ground potential, and

a series combination of a second resistor, a diode, and a third resistor connected to the evaluation circuit output, wherein a junction of the second resistor and a cathode of the diode is coupled to the control input of said switch and the series combination of the diode and the third resistor is arranged between the control input of said switch and the ground potential, whereby the diode effects a compensation of a temperature dependence of said switch.

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**5,500,897**

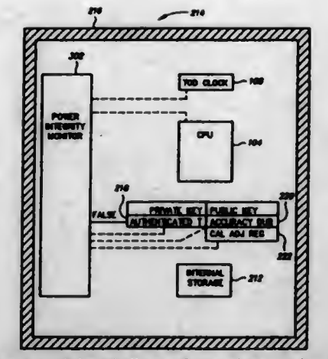
## CLIENT/SERVER BASED SECURE TIMEKEEPING SYSTEM

Robert C. Hartman, Jr., Woodside, Calif., assignor to International Business Machines Corporation, New York, N.Y.

Division of Ser. No. 96,132, Jul. 22, 1993, Pat. No. 5,444,780.
This application Dec. 29, 1994, Ser. No. 365,654
Int. Cl.[6] H04L 9/00
U.S. Cl. 380—25 11 Claims

1. A secure timekeeping facility for use in a computer system that includes a central processing unit and electronic storage located in a physically secure package, comprising:

a time-of-day (TOD) clock including a time clock and a date calendar;




an authenticated-time indicator for storing a value indicating whether the TOD clock contains an authenticated time and date;

an accuracy-duration register for storing a value indicating a time duration for which the TOD clock is considered accurate;

an input for receiving any of time, date, and accuracy duration values; and

an output for providing unencrypted time and date values from the TOD clock and a value from the authenticated-time indicator.

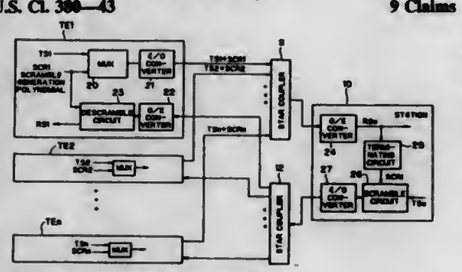
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**5,500,898**

## SCRAMBLE COMMUNICATION SYSTEM MULTIPLEXING/DEMULTIPLEXING SCRAMBLE GENERATION POLYNOMIAL

**Nagahiko Nankaku, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Mar. 31, 1995, Ser. No. 414,114**
**Int. Cl.[6] H04L 9/00**
**U.S. Cl. 380—43** **9 Claims**




1. A communication system comprising:

a station;

a plurality of terminals connected to the station; each the terminal comprising:

multiplexing means for multiplexing a specific scramble generation polynomial with a first transmission signal to output a multiplex signal, each the terminal having the specific scramble generation polynomial different from each other;

first transmitting means for transmitting the multiplex signal to the station; and

descrambling means for descrambling a scramble signal received from the station using the specific scramble generation polynomial,

the station comprising:

receiving means for receiving the multiplex signal from each the terminal;

dividing means for dividing the multiplex signal into the specific scramble generation polynomial and the first transmission signal; and

scrambling means for scrambling a second transmission signal by using the specific scramble generation polynomial to output the scramble signal; and

second transmitting means for transmitting the scramble signal to all the terminals.

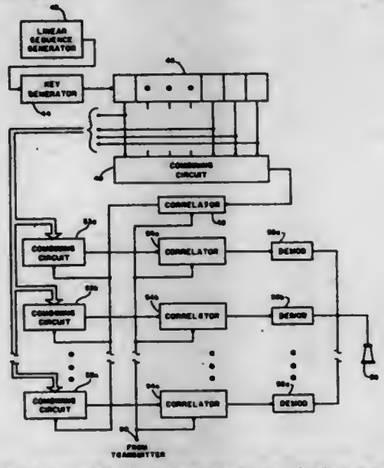
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**5,500,899**

## SECURE VOICE CONFERENCING APPARATUS

**Brian D. Snow, Laurel, Md., assignor to The United States of America as represented by the Director, NSA, Washington, D.C.**

**Filed May 20, 1982, Ser. No. 382,270**
**Int. Cl.[6] H04L 9/14**
**U.S. Cl. 380—47** **6 Claims**




1. In a secure digital conferencing communications apparatus wherein each of a plurality of messages is encoded with a distinct key and then combined for simultaneous communication over a common channel,

(a) a plurality of transmitters, each comprising:

means for generating a common, synchronous first key stream;

means for providing a unique identifier;

means for mixing said unique identifier with said first key stream to provide a first unique key steam;

means for providing a first data stream, and

means for mixing said unique key stream with said data stream to produce a unique encrypted stream,

(b) transmission means for combining a plurality of said encrypted streams and for communicating them simultaneously over a common channel, and

(c) a plurality of receivers, each comprising:

means for receiving said combined encrypted streams;

means for generating a common second key stream identical to and in synchronism with said first key stream;

means for providing all of said unique identifiers;

means for mixing each of said unique identifiers with said second key stream to provide a plurality of second unique key streams, each identical to each of said first unique key streams, and

means for correlating each of said second unique key streams with said combined encrypted stream to provide a plurality of second data streams, each identical to each of said first data streams.

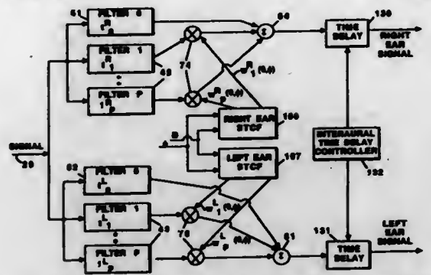


**5,500,900**

## METHODS AND APPARATUS FOR PRODUCING DIRECTIONAL SOUND

**Jiashu Chen, Madison; Barry P. VanVeen, McFarland, and Kurt E. Hecox, Madison, all of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.**

**Continuation of Ser. No. 968,562, Oct. 29, 1992, abandoned.**
**This application Sep. 23, 1994, Ser. No. 311,213**
**Int. Cl.[6] H04S 5/00**
**U.S. Cl. 381—17** **27 Claims**




1. A method of modifying a signal representing a sound which is to be applied as a sound to a listener's ear to simulate the origin of that sound at a selected position in space with respect to the listener's ear, comprising the steps of:

(a) measuring the filter function for sound originating from a sound source at a plurality of discrete positions in the space surrounding an origin position at which the sound is measured, the measurement position corresponding to the position of a listener's ear;

(b) determining a model filter function for each position at which sound originates which approximates in both magnitude and phase the actual measured filter function at each position, the model filter function formed as a sum of a selected number of basic filter functions which are functions only of frequency or time and not of position, with each basic filter function multiplied by a weighting factor for that basic filter function which is a function only of the position at which the sound originated and not of frequency or time;

(c) applying the filter function for a selected position as a filter to the signal representing sound to produce a filtered signal; and

(d) converting the filtered signal to a sound and applying the sound to the ear of a listener.

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**5,500,901**

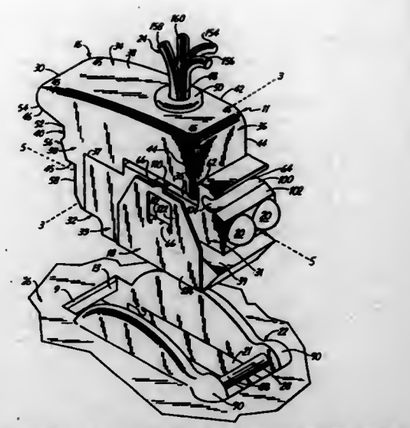
## FREQUENCY RESPONSE ADJUSTING DEVICE

**Michael P. Geraci, Lino Lakes; Donald R. Hagen, and Arman E. Sundquist, both of Brooklyn Park, all of Minn., assignors to Resistance Technology, Inc., Arden Hills, Minn.**

**Continuation of Ser. No. 839,484, Feb. 20, 1992, abandoned.**
**This application Aug. 9, 1994, Ser. No. 287,720**
**Int. Cl.[6] H04R 25/00**
**U.S. Cl. 381—68.2** **10 Claims**

1. A device for use with a programming station for adjusting frequency response of a hearing aid, the hearing aid including an opening for receiving a battery and a battery door operable with the opening for releasably maintaining the battery in the opening when the battery door is closed, the device comprising:

a module removably connected to the hearing aid for releasably securing the module substantially within the opening when the battery is not in the opening and when the battery door is open, such that the hearing aid remains in a user's ear during adjustment of the frequency response, the module includes a first housing releasably secured to a second housing, the second housing being hingedly and removably connected to the hearing aid;



means for delivering electrical current from the module to the hearing aid thereby providing power to the hearing aid, the means for delivering electrical current being positioned on the second housing and accessible by removal of the first housing; and

means for delivering frequency response adjusting signals from the module to the hearing aid thereby allowing the frequency response of the hearing aid to be adjusted, the means for delivering frequency response being positioned on the second housing and accessible by removal of the first housing.

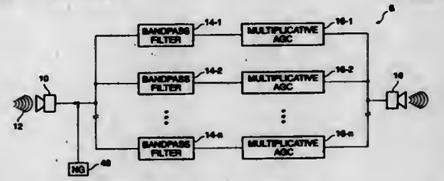
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**5,500,902**

## HEARING AID DEVICE INCORPORATING SIGNAL PROCESSING TECHNIQUES

**Thomas G. Stockham, Jr., 1100 Vista View Dr., Salt Lake City, Utah 84108, and Douglas M. Chabries, 90 E. Spring Dr., Woodland Hills, Utah 84653**

**Filed Jul. 8, 1994, Ser. No. 272,927**
**Int. Cl.[6] H04R 25/00**
**U.S. Cl. 381—68.4** **12 Claims**




1. A hearing compensation system comprising:

an input transducer for converting acoustical information at an input thereof to electrical signals at an output thereof;

an output transducer for converting electrical signals at an input thereof to acoustical information at an output thereof;

a plurality of bandpass filters, each bandpass filter having an input connected to said output of said input transducer;

a plurality of AGC circuits, each individual AGC circuit associated with a different one of said bandpass filters and having an input connected to the output of its associated bandpass filter and an output summed with the outputs of all other ones of said AGC circuits to form a summed output, said summed output connected to the input of said output transducer, wherein each of said AGC circuits comprises a first amplifier element having an input and an output, said first amplifier element having a having a gain of $1/e_{max}$, where $e_{max}$ is the maximum value of an audio envelope to be presented to said AGC circuit for which AGC amplification is to result, a logarithmic element having an input connected to said output of said first amplifier element, said logarithmic element hav-

ing a first output carrying a signal indicating the sign of a signal at said input of said logarithic element and a second output carrying a signal proportional to the logarithm of the absolute value of said signal at said input, a filter having an input connected to said second output of said logarithmic element and an output, said filter having a throughput delay, a delay element having an input connected to said first output of said logarithmic element and an output, said delay element having a delay equal to said throughput delay, an exponential element having a first input connected to said output of said delay element, a second input connected to said output of said filter element, and an output, and a second amplifier element having an input and an output, said input of said second amplifier element connected to said output of said exponential element, said second amplifier having a gain of $e_{max}$.

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**5,500,903**

**METHOD FOR VECTORIAL NOISE-REDUCTION IN SPEECH, AND IMPLEMENTATION DEVICE**

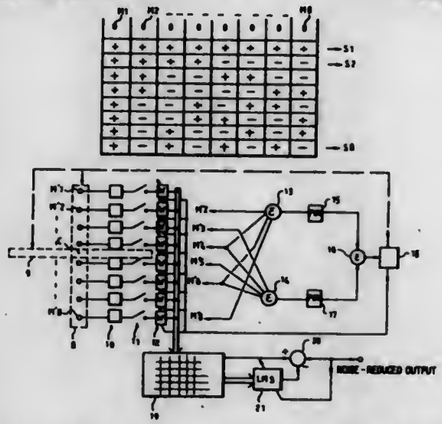
**Christian Gulli, St Medard en Jalles, France, assignor to Sextant Avionique, Meudon la Foret, France**

**Filed Dec. 28, 1993, Ser. No. 174,420**

**Claims priority, application France, Dec. 30, 1992, 92 15904**

**Int. Cl.[6] H04R 3/00**

**U.S. Cl. 381—92** **9 Claims**




1. A method for vectorial noise-reduction for a source of sound signals that is substantially a point source, comprising the steps of:

vectorially picking up sound signals by means of at least four equally spaced out microphones positioned in a plane before the source of sound signals

forming linear combinations from the sound signals by additions and subtractions of the sound signals from said microphones;

wherein the sum of all the sound signals from the microphones represents the noisy signal each of the other linear combinations of sound signals comprises as many subtractions as additions of the sound signals and represent noise only signals;

processing the linear combinations of the sound signals from the microphones that have as many subtractions as additions with a vectorial adaptive filter to produce an estimate of the noise of the noisy signal; and

subtracting said estimate of the noise of the noisy signal from the noisy signal.

**5,500,904**

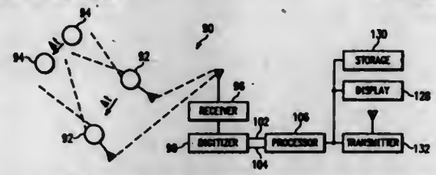
**SYSTEM AND METHOD FOR INDICATING A CHANGE BETWEEN IMAGES**

**Vishal Markandey, Dallas, and Anthony Reid, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Apr. 22, 1992, Ser. No. 873,932**

**Int. Cl.[6] G06K 9/00**

**U.S. Cl. 382—103** **36 Claims**




1. A system for indicating a change between a first image and a second image of a target represented by electrical signals, comprising:

first means for sensing a sequence of images of the target including the first image, the second image and an additional image previous in said sequence to the first image and the second image, the first image being previous in said sequence to the second image, and for generating and transmitting said electrical signals representing said first image and said second image;

second means coupled to said first means for receiving said electrical signals transmitted by said first means;

third means coupled to said second means for digitizing said electrical signals;

fourth means responsive to said electrical signals and coupled to said third means for determining a first processed image in response to assigning a respective weight to each image previous in said sequence to the second image, determining a second processed image in response to said first processed image and the second image and determining an optical flow field in response to said first processed image and said second processed image, said optical flow field indicating the change between the first image and the second image;

fifth means coupled to said fourth means for indicating a change in the target in response to said optical flow field; and

sixth means coupled to said fifth means and to said first means for controlling said first means in response to said indicated change in the target.

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**5,500,905**

**PATTERN RECOGNITION NEURAL NETWORK WITH SACCADE-LIKE OPERATION**

**Gale L. Martin; James A. Pittman, and Mosfeq Rashid, all of Austin, Tex., assignors to Microelectronics and Computer Technology Corporation, Austin, Tex.**

**Continuation-in-part of Ser. No. 714,200, Jun. 12, 1991, abandoned. This application Mar. 16, 1992, Ser. No. 851,841**

**Int. Cl.[6] G06K 9/62**

**U.S. Cl. 382—157** **39 Claims**

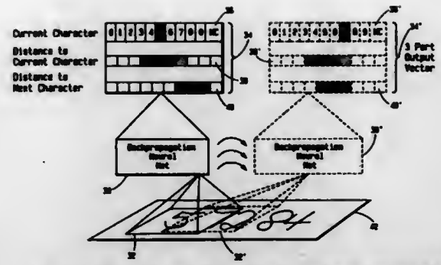
1. A multi-layered neural network for pattern recognition, comprising:

an input layer for mapping into a two-dimensional scan window, said scan window defining an input space that can be scanned over objects, and which input contains at least two adjacent ones of said objects;

an output layer comprised of at least a first output node with an associated activation energy that is activated to represent the presence of a desired object substantially centered in said scan window, the activation energy thereof having a variable level, which level represents the proximity of the object to the substantial center of said scan window, and a second output node with an associated activation energy that is activated to represent a desired distance from a frame of reference in said scan window to another and adjacent one of said objects when the activation energy thereof is raised above a predetermined threshold; and

a hidden layer having local receptor fields and interconnected with said input layer and said output layer for mapping said input layer to said output layer, said hidden layer providing a representation of the position of the desired one of said objects relative to the substantial center of said scan window such that said first output node is activated in response thereto, said hidden layer providing a representation of the desired distance when the adjacent one of said objects is separated from said frame of reference in said scan window by substantially said desired distance such that said second output node is activated in response thereto.






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**5,500,906**

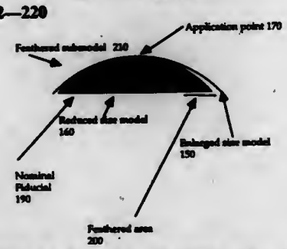
**LOCATING CURVILINEAR OBJECTS USING FEATHERED FIDUCIALS**

**Lea L. Picard, Wilmington, and Frederic Barber, Beverly, both of Mass., assignors to Cognex Corporation, Natick, Mass.**

**Filed Jan. 14, 1994, Ser. No. 181,328**

**Int. Cl.[6] G06K 9/62**

**U.S. Cl. 382—220** **22 Claims**




1. A method for locating a curvilinear object in a digitized image, comprising:

a) defining a range of scale variations;

b) generating an enlarged submodel having dimensions larger than those expected for said curvilinear object within said range of scale variations;

c) generating a reduced size submodel of said curvilinear object having dimensions smaller than those expected for said curvilinear object and within said range of scale variations;

d) disposing said reduced size submodel within said enlarged submodel and tangent to said enlarged submodel;

e) generating a feathered submodel by varying pixel grey scale values between said enlarged and said reduced size submodels;

f) conducting a correlation search of said digitized image of said curvilinear object using said feathered submodel, whereby the point in said digitized image reported by said correlation search as having the highest correlation to said feathered submodel is deemed to be at an edge of said curvilinear object and used to compute a center of said curvilinear object to locate it.

**5,500,907**

**IMAGE SIGNAL ANALYZING SYSTEM**

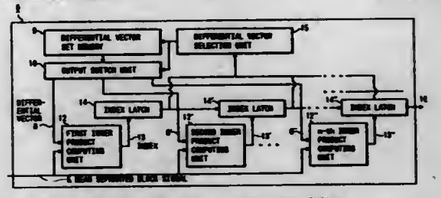
**Setsu Kunitake; Koh Kamizawa; Yutaka Koshi, and Kazuhiro Suzuki, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan**

**Filed Jun. 24, 1992, Ser. No. 903,284**

**Claims priority, application Japan, Jun. 25, 1991, 3-202129**

**Int. Cl.[6] H04N 11/02**

**U.S. Cl. 382—240** **11 Claims**




1. An image signal analyzing system comprising:

a block extracting means for sequentially extracting blocks including a predetermined number of pixels from an input image;

a storage means for storing a set of differential representative vectors, each obtained from a difference between representative vectors at a same stage of a binary tree having a plurality of stages of said representative vectors;

a plurality of stages of inner product computing means for performing computation of inner products between said extracted blocks and said respective differential representative vectors of said plurality of stages; and

an inner product result holding means for holding results of said inner products obtained for every stage of said binary tree by said inner product computing means, as an index expressing a shape of said input image.

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**5,500,908**

**OPTICAL SWITCH AND TRANSMITTER AND RECEIVER FOR A MULTIPLEX TRANSMISSION SYSTEM INCLUDING SUCH A SWITCH**

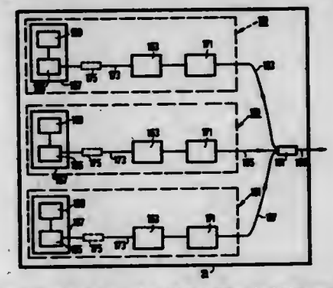
**Coen T. H. F. Liedenbaum, and John J. E. Reid, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Mar. 2, 1995, Ser. No. 397,591**

**Claims priority, application European Pat. Off., Apr. 14, 1994, 94201018; Jun. 30, 1994, 94201892**

**Int. Cl.[6] G02F 1/295; G02B 6/26**

**U.S. Cl. 385—5** **17 Claims**



1. An optical switch which is switchable via light comprising:

an optical wave-guiding structure whose refractive index is variable via light intensity, and having at least one entrance gate to which a light signal can be applied and at least one exit gate; and

a radiation source unit whose radiation can be injected into the wave-guiding structure, the radiation source unit comprising at least one pulsed laser for supplying a pulse series having a repetition time T and a pulse duration p and a medium for

transporting the radiation supplied by the laser for injection into the wave-guiding structure, characterized in that the radiation source unit is further provided with a setting means for stabilizing a wavelength of the laser at a number n of selected wavelength bands from a number N of possibly selectable wavelength bands within one and the same pulse supplied by the laser, further in that the medium is dispersive with a wavelength-dependent travel time $t_D$ in which the selected wavelength bands, upon transport, are separable in time as a result of a dispersion.

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**5,500,909**

## SENSOR HEAD FOR A FIBER-OPTIC CURRENT MEASURING DEVICE

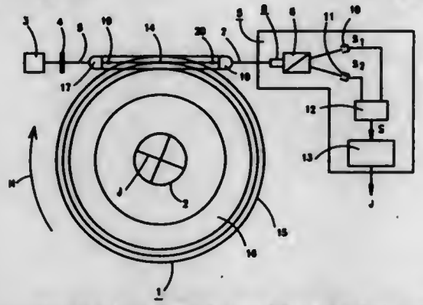
**Markus Meier, Aarau, Switzerland, assignor to ABB Research Ltd., Zurich, Switzerland**

**Filed Feb. 4, 1994, Ser. No. 191,587**

**Claims priority, application Germany, Feb. 17, 1993, 43 04 762.9**

**Int. Cl.[6] G02B *6/00*; G01R *31/00*; G01J *4/00***

**U.S. Cl. 385—12** **19 Claims**



1. A sensor head for a fiber-optic current measuring device with a twisted low-birefringence fiber, guided around a current conductor and serving to conduct polarized light, for detecting rotation of the polarized light which is caused by the magnetic field of the current to be measured, wherein the low-birefringence fiber has two ends, said low-birefringence fiber being spliced at said two ends in each instance with one of two polarization-conserving, light-conducting fibers, one of which supplies the polarized light, and wherein the two polarization-conserving fibers are secured in each instance in a vicinity of two splice locations with absorption of torsional force generated by the twisting of the low-birefringence fiber.

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**5,500,910**

## PASSIVELY ALIGNED HOLOGRAPHIC WDM

**Robert A. Boudreau, Hummelstown; Terry P. Bowen, Etters; Hongtao Han, Mechanicsburg; John R. Rowlette, Sr., Hummelstown, all of Pa., and Jared D. Stack, Charlotte, N.C., assignors to The Whitaker Corporation, Wilmington, Del.**

**Filed Jun. 30, 1994, Ser. No. 269,304**

**Int. Cl.[6] G02B *6/28***

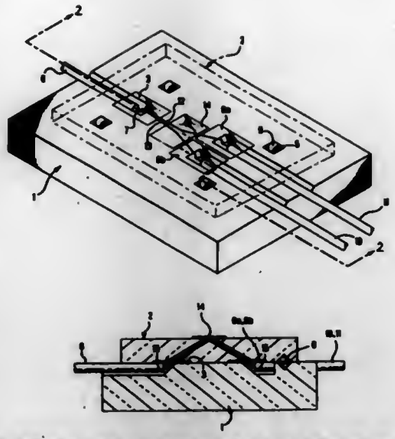
**U.S. Cl. 385—24** **40 Claims**

1. A bidirectional optical interconnect, comprising:

(a.) A substrate having a selected thickness between top and bottom surfaces;

(b.) A lid having a selected thickness between top and bottom surfaces, said bottom surface of said lid mounted on said top surface of said substrate;

(c.) A groove etched into said top surface of said substrate on a first end of said substrate, and at least two substantially parallel grooves etched into a second end of said top surface of said substrate, said grooves having optical waveguides disposed therein;



(d.) Reflective surfaces disposed at an end of each of said grooves for reflecting light to and from said waveguides;

(e.) At least one optical element disposed on said bottom surface of said lid and substantially above each of said reflective surfaces; and

(f.) A reflector disposed on said top surface of said lid for reflecting light to and from selected optical elements, whereby light transmitted through said waveguide disposed in said groove in said first end is reflected off one of said reflective surfaces to one of said optical elements, is transmitted through said lid, is reflected off said reflector to one of said optical elements, is transmitted to one of said reflective surfaces and is reflected into at least one of said waveguides on said second end of said substrate.

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**5,500,911**

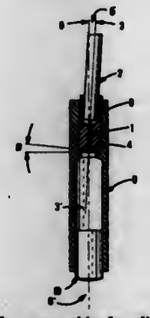
## LENSED OPTICAL FIBER ASSEMBLY AND PROCESS FOR ALIGNMENT WITH AN ACTIVE DEVICE

**Robert W. Roff, Westfield, N.J., assignor to The Whitaker Corporation, Wilmington, Del.**

**Filed Aug. 5, 1994, Ser. No. 286,723**

**Int. Cl.[6] G02B *6/32***

**U.S. Cl. 385—33** **14 Claims**



1. An optical fiber/lens assembly for alignment with an active optical device, comprising:

an elongated assembly housing having an outer surface substantially parallel to the longitudinal axis of said housing and a first cylindrical void disposed coincident to the longitudinal axis therein, said first void extending from a first end portion of said assembly housing and communicating with a second cylindrical void disposed at a preselected angle, θ, relative to said longitudinal axis, said second void terminating at a second end portion of said assembly housing;



at least one lens disposed within said first cylindrical void; and

an optical fiber disposed within said second cylindrical void, such that the optical axis of said optical fiber is disposed at said preselected angle, said optical fiber having a first end-face disposed at an angle, ϕ, to a plane orthogonal to the fiber axis and said end-face being positioned at a point in close proximity to where said first void communicates with said second void.

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**5,500,912**

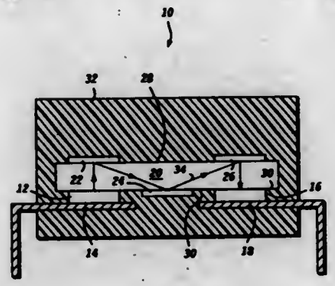
## HOLOGRAPHIC OPTICAL ISOLATOR UTILIZING OPTO-ELECTRONIC TRANSMITTER AND RECEIVER DISPOSED IN A PACKAGE

**Paul G. Alonas, Scottsdale, Ariz.; Jang-Hun Yeh, Streamwood, and Austin V. Harton, Oak Park, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed May 2, 1995, Ser. No. 433,886**

**Int. Cl.[6] G02B *6/32***

**U.S. Cl. 385—37** **20 Claims**



1. An optical isolator comprising:

a first leadframe portion and a second leadframe portion, wherein said first leadframe portion and said second leadframe portion are electrically isolated and disposed in a substantially common plane;

an opto-electronic transmitter disposed on said first leadframe portion;

a first opto-electronic receiver disposed on said second leadframe portion;

a planar optical waveguide having a top surface and a bottom surface, wherein said bottom surface is disposed on said transmitter and said first opto-electronic receiver;

a first holographic element disposed on said top surface of said optical waveguide and aligned with said transmitter so that a beam of light emitted from said transmitter is reflected by said first holographic element into said optical waveguide;

a second holographic element disposed on said bottom surface of said optical waveguide and aligned relative to said first holographic element so that said beam of light is reflected by said second holographic element into said optical waveguide;

a third holographic element disposed on said top surface of said optical waveguide and aligned relative to both said second holographic element and said first opto-electronic receiver so that said beam of light is reflected by said third holographic element onto said first opto-electronic receiver; and

a package encapsulating at least said first leadframe portion, said second leadframe portion, said transmitter, and said first opto-electronic receiver.

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**5,500,913**

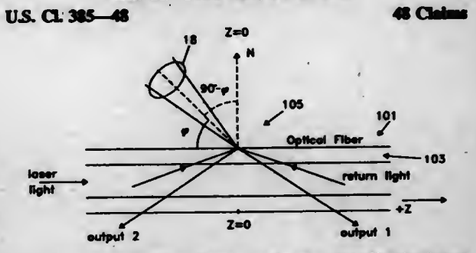
## APPARATUS AND METHOD OF FABRICATING DIRECTIONAL FIBER OPTIC TAPS, SENSORS AND OTHER DEVICES WITH VARIABLE ANGLE OUTPUT

**Susan D. Allen, Iowa City, and Changhun Lee, Coralville, both of Iowa, assignors to Administrators of the Tulane Educational Fund, New Orleans, La.**

**Filed Mar. 15, 1993, Ser. No. 31,364**

**Int. Cl.[6] G02B *6/26*; B23K *26/00***

**U.S. Cl. 385—48** **48 Claims**



1. An apparatus for fabricating a tap in an optical fiber having an optical axis, comprising:

an energy source for outputting a beam of energy equal to or greater than a threshold power;

beam directing means for directing said beam of energy toward said optical fiber at an angle ϕ from the optical axis of the fiber, wherein said angle ϕ is not equal to approximately 90 degrees.

3. A method for fabricating a tap in an optical fiber having an optical axis, comprising the steps of:

outputting a beam of energy at a threshold power;

directing said beam of energy toward said fiber at an angle ϕ from the optical axis of the fiber, wherein said angle ϕ is not equal to approximately 90 degrees.

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**5,500,914**

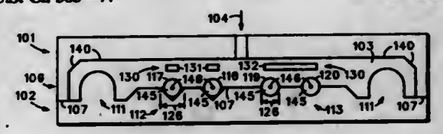
## OPTICAL INTERCONNECT UNIT AND METHOD OR MAKING

**Barbara M. Foley, Phoenix; David Galloway, Tempe; Shun-Meen Kuo, Chandler, and Christopher K. Y. Chun, Gilbert, all of Ariz., assignors to Motorola, Schaumburg, Ill.**

**Filed May 3, 1994, Ser. No. 237,524**

**Int. Cl.[6] G02B *6/36***

**U.S. Cl. 385—77** **18 Claims**



6. A molded optical interconnect unit comprising:

a first molded portion having a plurality of optical fibers attached thereto;

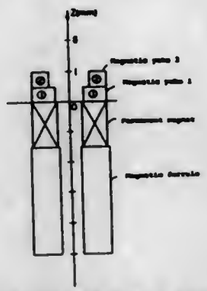
a first plurality of electrically conductive members molded and positioned in the first molded portion so that a portion from one of the plurality of optical fibers and a portion from one of the first plurality of electrically conductive members are parallel and adjacent in position; and

a second molded portion with a second plurality of electrically conductive members positioned so that the second plurality of electrically conductive members align adjacent on another side of the plurality of optical fibers.

### 5,500,915
### OPTICAL FIBER TERMINAL FITTED WITH OPTICAL ISOLATOR

Shinji Iwatsuka, Ounishiraoto; Masaaki Kobayashi, Narita, and Kenjiro Hata, Matsudo, all of, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Mar. 9, 1995, Ser. No. 401,743
Claims priority, application Japan, Mar. 18, 1994, 6-072800
Int. Cl.[6] G02B 6/26
U.S. Cl. 385—78 9 Claims



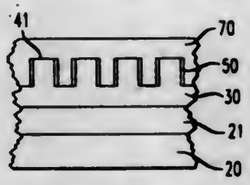

1. An optical fiber terminal fitted with an optical isolator in close proximity in a unitary structure which comprises:
- an optical fiber;
- a ferrule which holds the optical fiber in position;
- at least one magneto-optical element located as aligned with the optical fiber; and
- a cylindrical permanent magnet that applies a magnetic field to the magneto-optical element,
- said magneto-optical element being disposed axially outside of said magnet, with the end face of said optical fiber being located in the hollow of said magnet or in the space between said magnet and said magneto-optical element.

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### 5,500,916
### METHOD FOR MAKING BRAGG REFLECTORS FOR WAVEGUIDES

Raymond A. Cirelli, Hillsborough; Charles H. Henry, Skillman; Edward J. Laskowski, Scotch Plains, all of N.J.; Michele A. Millbrodt, Macungie, Pa., and Henry H. Yaffe, Dunwoody, Ga., assignors to AT&T Corp., Murray Hill, N.J.

Filed Sep. 9, 1994, Ser. No. 303,913
Int. Cl.[6] G02B 6/34; H01L 21/70
U.S. Cl. 385—37 9 Claims

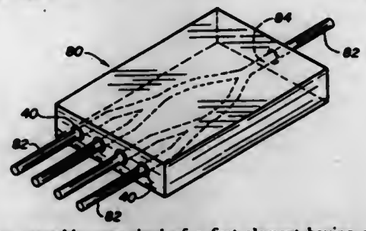



1. In a method for making an optical waveguide Bragg reflector comprising the steps of providing a substrate including an undercladding layer, forming a waveguide core layer extending in a longitudinal direction, etching periodic grooves having parallel and perpendicular surfaces into the core and applying an outer cladding layer, the improvement wherein:
- said perpendicular surfaces are selectively coated with a layer of material having a thickness less than 25% of the groove width and an index of refraction higher than the core material.

### 5,500,917
### OPTICAL ASSEMBLY/HOUSING FOR SECURING OPTICAL FIBER COMPONENTS, DEVICES AND FIBERS TO THE SAME OR TO MOUNTING FIXTURES

Hani S. Daniel, Rockville, and Douglas R. Moore, Severna Park, both of Md., assignors to Gould Electronics Inc., Eastlake, Ohio

Filed Apr. 18, 1994, Ser. No. 229,023
Int. Cl.[6] G02B 6/255
U.S. Cl. 385—99 27 Claims



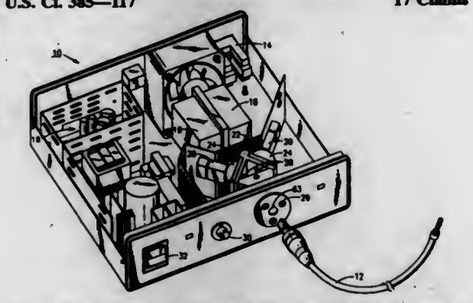

1. An assembly comprised of a first element having a glass-based portion, a second element having a glass-based portion and a glass-based compound comprised primarily of metal oxides bonded to said glass-based portions of said first and second elements, said assembly formed by the steps of:
- positioning said glass-based portion of said first glass-based element relative to said glass-based portion of said second element;
- applying a glass-based compound comprised primarily of metal oxides about said glass-based portions of said first and said second elements; and
- applying sufficient heat to said glass-based compound to cause said glass-based compound to soften, wet the surfaces of said glass-based portions of said elements and bond thereto.

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### 5,500,918
### BIFURCATED FIBER BUNDLE IN SINGLE HEAD LIGHT CABLE FOR USE WITH MULTI-SOURCE LIGHT BOX

Michael J. Pileski, Skaneateles; Robert J. Wood, Syracuse, and Connie R. Walts, Auburn, all of N.Y., assignors to Welch Allyn, Inc., Skaneatles Falls, N.Y.

Filed Dec. 28, 1994, Ser. No. 364,951
Int. Cl.[6] G02B 6/06; A61B 1/00
U.S. Cl. 385—117 17 Claims




1. A light cable for transmitting light from a light source to a distal end of an imaging tool requiring a beam of directed light to illuminate a working area or target object, said light cable comprising:
- a flexible outer cable member including at least one layer of protective material;
- a bundle of optic fibers contained within said flexible outer cable member;
- first adaptor means, connected to a first end of the light cable, for securely connecting said first end of the light cable to a respective imaging tool; and



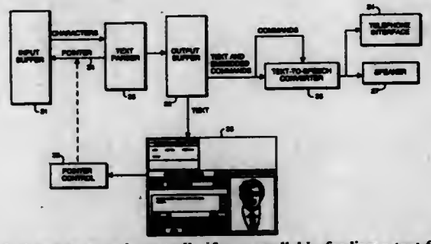
- second adaptor means, connected to a second end of the light cable, for securely connecting said second end of the light cable to a light box including at least two sources of illumination,
- wherein said bundle of optic fibers is split, at a light receiving end of said bundle proximate to said second end of the light cable, into at least two end segments, such that light from each one of said at least two sources of illumination directed into a respective one of said at least two end segments at said light receiving end of said bundle is transmitted to a same light emitting end of said bundle proximate to said first end of the light cable, and
- wherein said second adaptor means includes:
- a base member secured to said second end of the light cable;
- a hollow shaft member extending from said base member, said hollow shaft member having a distal end and a proximal end secured to said base member; and
- a head member secured within the distal end of said hollow shaft member, said bundle of optic fibers extending through said base member and said hollow shaft member, and into said head member which is provided with an exterior head surface for each of said at least two end segments, each of said end segments terminating with an end surface being substantially coplanar with its respective head surface.

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### 5,500,919
### GRAPHICS USER INTERFACE FOR CONTROLLING TEXT-TO-SPEECH CONVERSION

Willis J. Luther, Irvine, Calif., assignor to Canon Information Systems, Inc., Costa Mesa, Calif.

Filed Nov. 18, 1992, Ser. No. 977,680
Int. Cl.[6] G10L 9/00
U.S. Cl. 395—2.69 70 Claims




1. A text-to-speech controller for controllably feeding a text file from a text buffer to a text-to-speech converter, the text file being comprised by text characters organized into words, including:
- an interface for inputting user commands which indicate how the text characters in the text file are fed from the text buffer to the text-to-speech converter; and
- a controller for effectuating the user commands at interword text boundaries such that the text characters are fed at interword text boundaries from the text buffer to the text-to-speech converter in accordance with the user commands.

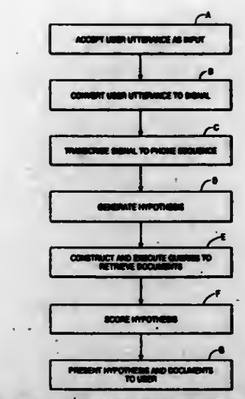
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### 5,500,920
### SEMANTIC CO-OCCURRENCE FILTERING FOR SPEECH RECOGNITION AND SIGNAL TRANSCRIPTION APPLICATIONS

Julian M. Kupiec, Cupertino, Calif., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 126,170, Sep. 23, 1993, abandoned.
This application Sep. 30, 1994, Ser. No. 316,619
Int. Cl.[6] G10L 9/00
U.S. Cl. 395—2.79 22 Claims

2. In the operation of a system comprising a processor, an input transducer, an output facility, and a corpus comprising at least one document comprising words represented in a first form, a method




for transcribing an input question by transforming the input question from a sequence of words represented in a second form, subject to misinterpretation by the processor, into a sequence of words represented in the first form, the method comprising the steps of:
- accepting the input question into the system, the question comprising a sequence of words represented in the second form;
- converting the input question into a signal with the input transducer;
- converting the signal into a sequence of symbols with the processor;
- generating a set of hypotheses from the sequence of symbols with the processor, the hypotheses of the set comprising sequences of words represented in the first form, the set of hypotheses including alternative interpretations of at least one of the words to account for possible misinterpretation of the input question;
- producing with the processor an initial evaluation of the hypotheses;
- automatically constructing a query from hypotheses of the set with the processor;
- executing the constructed query by searching with the processor in the corpus for co-occurrences of hypothesized words for the hypotheses;
- analyzing the co-occurrences and the initial evaluation with the processor to produce a revised evaluation of the hypotheses of the set;
- automatically and explicitly selecting a preferred hypothesis from the set with the processor responsively to the revised evaluation, the preferred hypothesis comprising a preferred sequence of words in the first form and thus a preferred transcription of the sequence of words of the input question; and
- outputting the preferred hypothesis with the output facility.

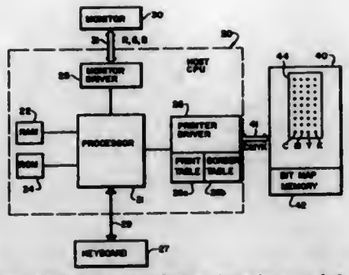
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### 5,500,921
### METHOD AND APPARATUS FOR PRINTING HIGH FIDELITY COLOR REPRODUCTIONS OF COLORS DISPLAYED ON A MONITOR

Brigitte Ruetz, San Bruno, Calif., assignor to Canon Information Systems, Inc., Costa Mesa, Calif.

Filed Oct. 5, 1992, Ser. No. 956,300
Int. Cl.[6] G06K 15/00; H04N 1/46
U.S. Cl. 395—109 94 Claims

1. A printer driver for providing color output values to a color printer in response to input color coordinates, said printer driver comprising:
- a memory for storing a printer table and a border table, the printer table being comprised by a rectangular grid in input color coordinate space that includes the gray axis, the printer table providing color output values in response to color coor-




dinates within a gamut of the color printer, and the border table providing color output values in response to color coordinates outside the printer table; and

means for selecting exactly one of the printer table and the border table in accordance with whether input color coordinates are within the printer table or outside the printer table.

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**5,500,922**

**PRINTER APPARATUS FOR ENLARGING OR REDUCING THE SIZE OF CHARACTERS**

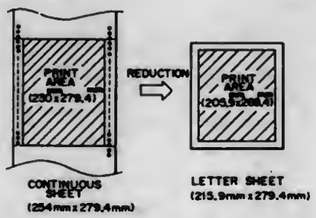
**Akihiro Shimura; Satoshi Nagata, and Shigeru Ueda, all c/o Canon Kabushiki Kaisha, 30-2, 3-chome, Shimomaruko, Ohta-ku, Tokyo, Japan**

**Continuation of Ser. No. 89,063, Jul. 9, 1993, abandoned, which is a continuation of Ser. No. 586,975, Sep. 24, 1990, abandoned. This application Feb. 6, 1995, Ser. No. 384,219**

**Claims priority, application Japan, Sep. 26, 1989, 1-251211**

**Int. Cl.[6] G06T *3/40***

**U.S. Cl. 395—110** **8 Claims**




1. A printer apparatus for printing data prepared for a continuous sheet on a cut sheet, said apparatus comprising:

means for storing a pattern of a character represented by non-dot matrix data;

means for converting the pattern of the character stored in said storing means into a printable dot image of an arbitrary size so as to enable printing of data prepared for a continuous sheet; and

means for controlling said converting means to convert the pattern of the character into a reduced dot image of the character in accordance with reduction ratios of a character pitch and a line pitch upon printing the data prepared for the continuous sheet on the cut sheet.

**5,500,923**

**IMAGE PROCESSING APPARATUS UTILIZING THE JBIG METHOD, HAVING A COMPRESSION/EXPANSION CIRCUIT TO MANAGE MEMORY MORE EFFECTIVELY**

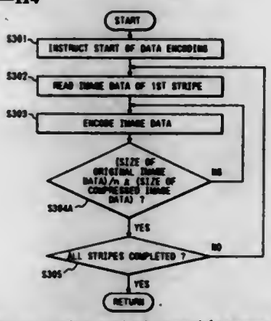
**Masashi Kuroshima, Yokohama; Hiroyuki Hara, Kawasaki, and Haruo Machida, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Feb. 23, 1993, Ser. No. 21,112**

**Claims priority, application Japan, Feb. 28, 1992, 4-043843; Feb. 28, 1992, 4-043844; Feb. 28, 1992, 4-043882**

**Int. Cl.[6] H04N *1/00***

**U.S. Cl. 395—114** **11 Claims**




9. An image processing method comprising steps of:

entering image data;

compressing the entered image data a predetermined number of times to form compressed image data;

comparing image data before compression with image data after compression;

generating encoded data based on the result of said comparison;

storing said compressed image data and the encoded data in memory means; and

supplying said compressed image data to output means.

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**5,500,924**

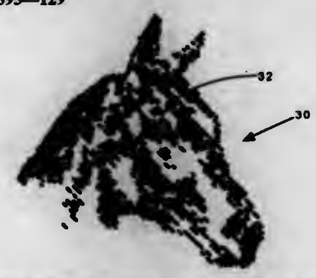
**METHOD FOR VECTOR PLOTTING A BITMAP WITH A REDUCED NUMBER OF LINES**

**Mahinda K. deSilva, Santa Clara, and L. Bayles Holt, San Jose, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.**

**Filed May 7, 1992, Ser. No. 880,134**

**Int. Cl.[6] G06T *5/00***

**U.S. Cl. 395—129** **12 Claims**




3. A method of drawing using a vector graphics device, comprising:

partitioning an image into a rectangular first matrix of grayscale elements, each grayscale element having one of a predetermined plurality of grayscale values;

applying a filter to said matrix to provide a rectangular second matrix of halftone elements, each halftone element thereof in one of two binary states, said filter being characterized by a filter matrix of threshold values having about the same magnitude along any one of a set of parallel matrix diagonals;



generating from said second matrix, coordinates of each end of each one of an array of diagonal parallel lines, each line joining adjacent elements in the same binary state;

communicating said coordinates to the vector graphics device; and

drawing said array of parallel lines with the vector graphics device to form a graphic representation of said image.

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**5,500,925**

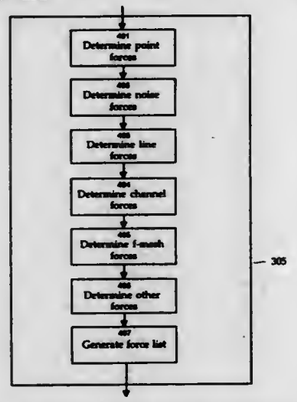
**DYNAMIC IMAGE PROCESSING USING PARTICLE SYSTEMS**

**Michael Tolson, Mill Valley, Calif., assignor to Xaos Tools, San Francisco, Calif.**

**Filed Dec. 1, 1992, Ser. No. 983,894**

**Int. Cl.[6] G06T *11/80***

**U.S. Cl. 395—131** **28 Claims**




1. A dynamic image processing system, comprising:

a display field for displaying a source image;

means for providing a plurality of virtual particles, each virtual particle having a virtual position within the display field;

means for associating a dynamic image processing element having a plurality of image processing attributes with each particle, the image processing element for selectively transforming a portion of the source image related to the virtual position in response to the image processing attributes of the element, to produce a transformed image;

means for providing one or more virtual forces for influencing the virtual position of the particles;

a storage device for storing the particles and the image processing attributes;

a user input device, coupled to the storage device, for accepting user specification of the particles and the image processing elements; and

an output device, coupled to the storage device, for outputting the transformed image.

**5,500,926**

**MECHANISM CONCEPTUAL DRAWING OPERATION DISPLAY APPARATUS, TRANSMISSION APPARATUS AND MECHANISM CONCEPTUAL DRAWING FORMATION APPARATUS**

**Eiji Matsuo, and Yoshinori Kakuta, both of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

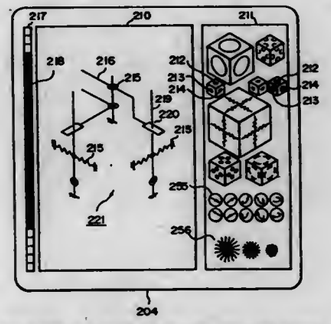
**PCT No. PCT/JP92/00718, § 371 Date Feb. 3, 1993, § 102(e) Date Feb. 3, 1993, PCT Pub. No. WO92/22038, PCT Pub. Date Dec. 10, 1992**

**PCT Filed Jun. 3, 1992, Ser. No. 971,845**

**Claims priority, application Japan, Jun. 3, 1991, 3-131019; Jun. 3, 1991, 3-131020**

**Int. Cl.[6] G06F *15/16***

**U.S. Cl. 395—133** **24 Claims**




1. An apparatus for forming mechanism conceptual views for expressing an operation of a machine, comprising:

an arithmetic device;

a memory device connected to the arithmetic device;

a display device connected to the memory device;

a drawing formation device connected to the arithmetic device; and

an input device composed of a coordinate position indicating device and a key board, and connected to the arithmetic device; and wherein

said arithmetic device and said input device cooperatively operate to recognize movable parts and fixed parts of a machine using conceptual view data, said conceptual view data formed in an apparatus for forming a mechanism view for expressing an operation of a machine, said conceptual view data representing at least one conceptual view of said machine;

said arithmetic device and said input device cooperatively operate to separate the conceptual view data representing at least one conceptual view of at least a portion of the movable parts of said machine from the conceptual view data representing at least one conceptual view of the fixed parts of said machine;

said arithmetic device and said memory device cooperatively operate to generate additional conceptual view data which represents a plurality of conceptual views of said movable parts based on said conceptual view data representing at least one conceptual view of at least a portion of said movable parts of said machine, said plurality of conceptual views of said movable parts representing motion of said movable parts;

said arithmetic device synthesizes said additional conceptual view data and the conceptual view data representing said conceptual view of said fixed parts to produce a plurality of mechanism conceptual views of said machine; and

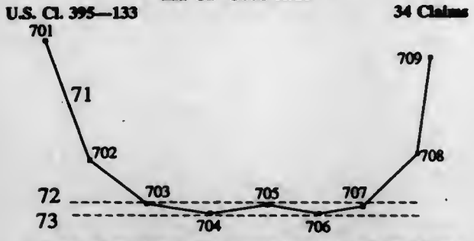
said memory device, said display device, and said drawing formation device cooperatively operate to dynamically display motion of said machine by sequential display of said mechanism conceptual views according to an elapsed time using output of said synthesis operation performed by said arithmetic device.

**5,500,927**

## SYSTEM AND METHOD FOR SIMPLIFYING A COMPUTER-GENERATED PATH

**Brian Sander-Cederlof, Dallas, and John B. Ahlquist, Garland, both of Tex., assignors to Macromedia, Inc., San Francisco, Calif.**

**Filed Mar. 18, 1993, Ser. No. 33,498**
**Int. Cl.[6] G06T 11/20**
**U.S. Cl. 395—133** **34 Claims**




1. A method implemented in a computer system of simplifying a graphical figure, said method comprising the steps of:

inputting and storing a computer-generated graphical figure having a path into said computer system;

receiving at least one tolerance value from an external source, said tolerance value determining an amount a more simplified path to be generated may deviate from said computer-generated path;

parsing said computer-generated path to characterize information specific to said computer-generated path at points to be generated along said simplified path, the number of said points dependent upon said tolerance value, said method generating and storing a set of points for inputting to a curve-fitting routine for producing said simplified path, wherein said parsing step further comprises the steps of:

analyzing individual line segments of said computer-generated path, wherein said line segments are comprised of straight and curved segments and said curved segments are divided at local extrema points;

creating a list of points for each of said line segments;

classifying each of said points based in part on said analyzation of said line segments;

dividing into sections said list of points based upon said classifications of said points;

inputting said sections of said list of points into said curve-fitting routine; and

displaying on a display device coupled to said computer system a simplified graphical figure having a simplified path using said sections of points input into said curve-fitting routine.

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**5,500,928**

## DIGITAL PRINTING SYSTEM AND PROCESS USING ADAPTIVE COMPRESSION

**Craig C. Cook, Wayland; Thomas P. Blumer, Cambridge; Theodore B. Packard, Arlington, all of Mass.; Geoffrey A. Dreher, Nashua, N.H., and Thomas A. Schuneman, Lincoln, Mass., assignors to Xionics Document Technologies, Inc., Burlington, Mass.**

**Continuation-in-part of Ser. No. 24,532, Mar. 1, 1993, abandoned. This application Apr. 13, 1994, Ser. No. 226,944**
**Int. Cl.[6] G06F 15/62**
**U.S. Cl. 395—133** **8 Claims**

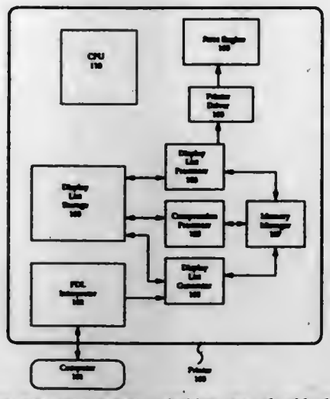
1. A computer-implemented process of drawing an image on an imaging area of a computer output device in response to commands generated by a computer, the process comprising:

spatially dividing the imaging area into a plurality of sections;

creating a plurality of display lists, each of the display lists corresponding to one of the sections;

determining, for a current one of the commands, a subset of the sections to which said current command pertains;

generating a graphic primitive for a selected one of the subset of sections;




updating with said graphic primitive one of said plurality of display lists corresponding to said selected section;

adaptively reducing a subset of said plurality of display lists responsive to a memory requirement exceeding an available memory capacity by determining a type for each display list responsive to presence therein of a pixel representation and responsive to presence therein of a graphic primitive representation; and

drawing said image responsive to said updated display list.

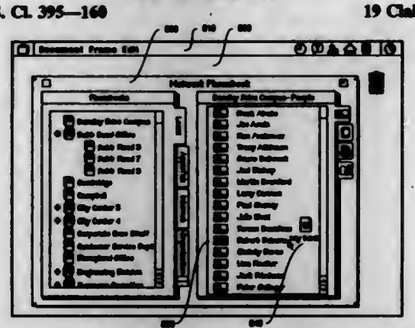
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**5,500,929**

## SYSTEM FOR BROWSING A NETWORK RESOURCE BOOK WITH TABS ATTACHED TO PAGES

**Robert D. Dickinson, Hayward, Calif., assignor to Taligent, Inc., Cupertino, Calif.**

**Filed Aug. 30, 1993, Ser. No. 113,623**
**Int. Cl.[6] G06F 3/00**
**U.S. Cl. 395—160** **19 Claims**



1. A system for selecting one of a plurality of computer resources, each of the plurality of computer resources having one of a plurality of attribute types, the system being operable with computer apparatus having a workstation including a display and a computer network connecting the plurality of computer resources and the workstation, the system comprising:

(a) first means for displaying a first window and a second window on the display;

(b) second means for displaying a plurality of resource book graphics in the first window, each of the plurality of resource book graphics representative of one of a plurality of resource books, each of the plurality of resource books having an attribute name and an attribute type of at least one of the plurality of computer resources;

(c) third means for selecting one of the plurality of resource books by selecting the corresponding resource book graphic displayed in the first window;



(d) fourth means for displaying a plurality of resource graphics in the second window, each of the plurality of resource graphics being associated with the selected resource book and representative of a computer resource, each computer resource having the same attribute type; and

(e) fifth means for displaying a plurality of tab icons in the second window, each of the plurality of tab icons being representative of one of the plurality of attribute types of the computer resources and corresponding to one of a plurality of resource pages.

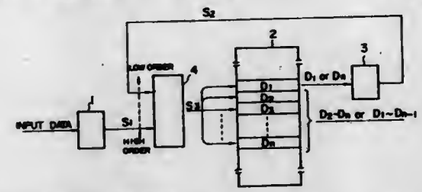
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**5,500,930**

## SYSTEM TO DECODE INSTRUCTIONS INDICATING THE ADDRESSES OF CONTROL CODES AND PROVIDING PATTERNS TO DIRECT AN ELECTRON BEAM EXPOSURE APPARATUS

**Shunsuke Fueki, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan**

**Continuation of Ser. No. 431,896, Nov. 6, 1989, abandoned. This application Feb. 14, 1994, Ser. No. 194,802**
**Claims priority, application Japan, Nov. 4, 1988, 63-279606**
**Int. Cl.[6] G06F 3/00;9/312;19/00**
**U.S. Cl. 395—141** **31 Claims**




1. A decoder, comprising:

a storage unit having a storage block related to an instruction code and sequentially storing control codes corresponding to the instruction code and indication data indicating a number of the control codes, the indication data being stored in a predetermined portion of the storage block; and

address generating means for generating an address signal specifying the indication data stored in the predetermined portion in response to receipt of input data including the instruction code and then sequentially specifying the control codes by one of incrementing and decrementing an address represented by the address signal, the control codes being serially read out from said storage unit in response to receipt of the instruction code,

said input data including data representing a shape of a pattern to be drawn on a wafer by an electron beam exposure apparatus, information on a starting point on said wafer from which exposure is started and information on a size of said pattern to be exposed.

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**5,500,931**

## SYSTEM FOR APPLYING FONT STYLE CHANGES TO MULTI-SCRIPT TEXT

**Russell Sonnenschein, San Jose, Calif., assignor to Taligent, Inc., Cupertino, Calif.**

**Continuation of Ser. No. 43,178, Apr. 5, 1993, abandoned. This application Jul. 10, 1995, Ser. No. 500,020**
**Int. Cl.[6] G06F 17/21**
**U.S. Cl. 395—144** **20 Claims**

1. A system for applying a first font style to a text string comprised of a plurality of characters, each of the plurality of characters having an associated font style and the text string containing at least one predetermined special character, the apparatus being operable in a computer with a storage for storing the text string, the system comprising:

(a) means for sequentially examining each of the plurality of characters to detect predetermined special characters;




(b) first means controlled by the examining means for applying the first font style to each examined character which is not a special character;

(c) means controlled by the examining means for determining a current font style associated with an each examined special character;

(d) means responsive to an examined special character for obtaining a previous font style associated with a character preceding the examined special character and for obtaining a next font style associated with a character following the examined special character; and

(e) second means responsive to the previous font style, the next font style and the current font style for applying the first font style to the examined special character.

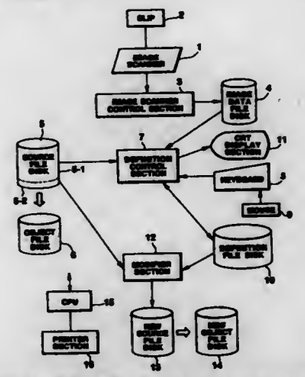
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**5,500,932**

## SLIP OUTPUT APPARATUS

**Miyoshi Sasakura, Higashiyamato; Osamu Ohkura, Oome; Takehiko Mizoguchi; Satoru Hori, both of Hamura, and Satoshi Yoshida, Akigawa, all of, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan**

**Filed Mar. 25, 1993, Ser. No. 37,095**
**Claims priority, application Japan, May 29, 1992, 4-161789**
**Int. Cl.[6] G06F 17/00**
**U.S. Cl. 395—149** **2 Claims**




1. A method for generating an application program specific to a user in a slip processing apparatus having a first source file storing an application program comprising a processing program defining processes of item data corresponding to each of a plurality of items on a slip of a predetermined form, an output program defining output areas in one-to-one correspondence with the plurality of items on the slip of a predetermined form, and an item list defining an item name of each item included in the output program, the method comprising the steps of:

(A) inputting an image of a user's slip by scanning the user's slip which a user desires, by an image scanner;

(B) displaying the image of the inputted user's slip on a display screen and displaying, on the display screen as a list, a plurality of item names included in the item list of the application program stored in the first source file;

(C) selecting a desired item name from the plurality of item names displayed in a list on the display screen and designating the output area corresponding to the selected item name on the displayed image of the user's slip displayed on the display screen;
(D) storing area data indicating the designated output area in a definition file in correspondence with the item determined by the selected item name;
(E) repeating the steps (C) and (D) until an end command is input;
(F) copying the application program stored in the first source file into a second source file; and
(G) generating a customized application program specific to the user by modifying, by using the area data of each item stored in the definition file, the definition of each output area corresponding to each item of the output program included in the application program copied into the second source file.

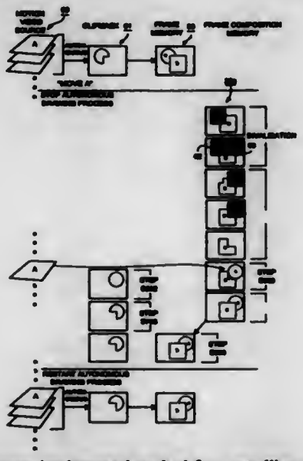
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**5,500,933**

**DISPLAY SYSTEM WHICH DISPLAYS MOTION VIDEO OBJECTS COMBINED WITH OTHER VISUAL OBJECTS**

**Peter Schnorf, Palo Alto, Calif., assignor to Canon Information Systems, Inc., Costa Mesa, Calif.**

**Continuation of Ser. No. 53,352, Apr. 28, 1993, abandoned. This application Dec. 20, 1994, Ser. No. 360,122**
**Int. Cl.[6] G06T 7/20**
**U.S. Cl. 395—154** **38 Claims**



1. A computer-implemented method for controlling a hardware video interface so as to combinedly display a motion video object and other visual objects in a windowing display system comprising the steps of:
controlling the hardware video interface to execute an autonomous hardware loop in which successive frames of analog motion video information are received, the successive frames of analog motion video information are each converted to successive frames of digital motion video information, and the successive frames of digital motion video information are each stored through a clipmask to a memory so as to constitute a motion video object, whereby at least one motion video object is automatically displayed through a corresponding clipmask onto a screen;
stopping execution of the autonomous hardware loop in response to initiation of a screen update cycle;
drawing the motion video object and another visual object to the memory, wherein for each motion video object, said drawing step includes the steps of initializing a clipmask in the shape of the motion video object, drawing to the memory a bit map image corresponding to one frame of the motion video object, and updating the clipmask to reflect how overlapping objects affect the motion video object;
displaying the memory on the screen; and
re-starting execution of the autonomous hardware loop using the clipmask obtained in said drawing step.

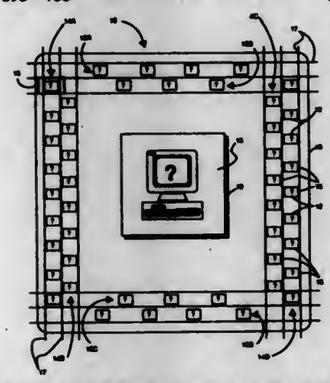
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**5,500,934**

**DISPLAY AND CONTROL SYSTEM FOR CONFIGURING AND MONITORING A COMPLEX SYSTEM**

**Jon O. Austin, Cary; Joni G. Byrne, Apex; Carole A. Bohn, Raleigh, all of N.C.; Arlindo Chiavegatto, Jr., Campinas-SP, Brazil; Jeffrey L. Smith, and Raymond L. Zeisz, Jr., both of Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Continuation of Ser. No. 754,772, Sep. 4, 1991, abandoned. This application Oct. 4, 1994, Ser. No. 317,423**
**Int. Cl.[6] G06F 3/14**
**U.S. Cl. 395—755** **20 Claims**



1. For use with a first networking component in a communications network having a plurality of networking components wherein data may be conveyed between said networking components in said communications network, said first networking component having a primary function of passing data to and from said communications network and having a configurable relationship with other networking components so that a communication link may exist between said first networking component and another networking component so that data may be conveyed over said communication link, and wherein said communication link may be starting between said first networking component and another networking component in that communication activity is initializing between said first networking component and said another networking component, a display and control system for monitoring and configuring said first networking component with respect to the communications activity with the remainder of said communications network, said display and control system comprising:
a plurality of icons for selectively representing said first networking component and said other networking components;
a screen for displaying said plurality of icons, said screen having a matrix of display elements for producing a display image, said matrix comprising a plurality of columns and rows of said display elements;
a predefined array of areas on said screen defining a plurality of locations for said icons to be positioned, each icon having a predetermined location in said array, said predefined array of areas comprising a plurality of columns and rows, each column and row of said predefined array of areas comprising a plurality of columns and rows of said display elements;
control means for defining and establishing a relationship solely between said first networking component and said other networking components; and
means for indicating on said screen the status of relationships solely between said fast networking component and said other networking components comprising means for indicating that said communication link is starting.



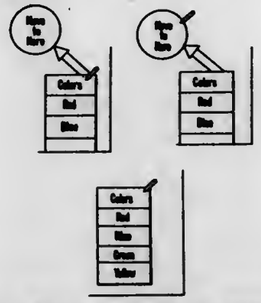
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**5,500,935**

**APPARATUS AND METHOD FOR TRANSLATING GRAPHIC OBJECTS AND COMMANDS WITH DIRECT TOUCH INPUT IN A TOUCH BASED INPUT SYSTEM**

**Thomas P. Moran, Palo Alto, and Gordon P. Kurtenbach, Mountain View, both of Calif., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Dec. 30, 1993, Ser. No. 175,846**
**Int. Cl.[6] G06F 15/62;15/46**
**U.S. Cl. 395—156** **22 Claims**



1. A graphic editing system including a surface and a user controllable means for contacting said surface, comprising:
means for displaying first information within a given peripheral region on said surface wherein said given peripheral region is only large enough to display a portion of said first information;
first means responsive to a first user action contacting said surface with said user controllable means at least within said given peripheral region of said surface for displaying second information at a first position in a second region of said surface different from said peripheral region, said second information indicating to a user how to modify, said display of said first information so that all of said first information is displayed; and
second means responsive to a second user action contacting said surface with said user controllable means at least at said first position for selectively modifying said display of said first information on said surface to display all of said first information.

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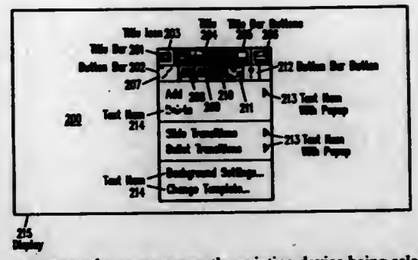
**5,500,936**

**MULTI-MEDIA SLIDE PRESENTATION SYSTEM WITH A MOVEABLE, TRACKED POPUP MENU WITH BUTTON AND TITLE BARS**

**Paul G. Allen, Bellevue; Stephen P. Bard, Redmond, and Robert W. Gallup, Seattle, all of Wash., assignors to Asymetrix Corporation, Bellevue, Wash.**

**Filed Mar. 12, 1993, Ser. No. 30,944**
**Int. Cl.[6] G06F 36/00**
**U.S. Cl. 395—156** **1 Claim**

1. A system for providing a moveable, tracked popup menu comprising:
a programmed computer including an operating system;
a monitor coupled to the programmed computer for providing a display;
a pointing device coupled to the computer for positioning a cursor on the display, the cursor being generating by the programmed computer on the display, the pointing device having a first and a second button, a first button to select objects and icons and to initiate an action and a second button to actuate the popup menu, the pointing device being selected from a group consisting of a mouse and a trackball;
a plurality of multi-media devices coupled to the computer and operable from the popup menu for providing a multi-media slide presentation with the programmed computer, the multi-media devices include a sound system, a video disc drive, a compact disc read only memory, a photo compact disc drive, an video cassette recorder, the multi-media presentation including both visual an auditory information presented with aid of the programmed computer;
a graphical user interface for cooperating with the operating system for providing the multi-media slide presentation;
the popup menu displayed on the display by actuation and release of the second control button provided the cursor is positioned directly over an object on a slide of the multi-media slide presentation on the display, the popup menu having various graphical elements including text strings, icons, a button bar, a title bar, textual menu items with at least one menu item associated with a second popup menu, title bar icons associated with at least some of the icons, and title bar buttons, the button bar including a plurality of buttons, each button bar button and textual menu item corresponding to a user selectable operation on the object, the popup menu being context sensitive, the graphical user interface operative with the programmed computer for providing an operating environment in which to provide a visual image of the popup menu on the display, the popup menu not being anchored to appear at a same place on the display every time the popup menu is invoked;
the popup menu automatically sized to display the text strings and icons without overlap;
a keyboard coupled to the programmed computer for providing input for a user to shift focus from various graphical elements in the popup menu; and
the popup menu being moved about the display after the popup menu has been invoked and while the popup menu is displayed on the display by actuation and holding the first or second control button.



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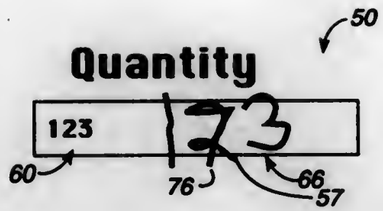
**5,500,937**

**METHOD AND APPARATUS FOR EDITING AN INKED OBJECT WHILE SIMULTANEOUSLY DISPLAYING ITS RECOGNIZED OBJECT**

**John Thompson-Rohrlich, Santa Fe, N.M., assignor to Apple Computer, Inc., Cupertino, Calif.**

**Filed Sep. 8, 1993, Ser. No. 118,034**
**Int. Cl.[6] G06F 3/00**
**U.S. Cl. 395—161** **32 Claims**

17. A method for displaying information in a computer system comprising:
displaying a recognized object on a screen of a computer system;
selecting said recognized object; and
displaying an original ink object at about its original position and in about its original configuration while simultaneously displaying said recognized object, such that said original ink object can be edited.

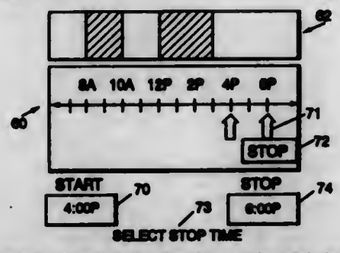



**5,500,938**

## METHOD AND APPARATUS FOR DIRECTLY SELECTING AND SIGNALLING START AND STOP TIMES IN AN ELECTRONIC CALENDAR

**Leslie M. Cahill, Grapevine; David R. Miller, Keller, and David J. Schell, Trophy Club, all of Tex., assignors to International Business Machines, Corporation, Armonk, N.Y.**

**Filed Mar. 7, 1994, Ser. No. 207,334**
**Int. Cl.[6] G06F *3/00***
**U.S. Cl. 395—161** **14 Claims**




1. An improved method for directly selecting and signalling a start time and a stop time for a new event being scheduled by a user on an electronic calendar of a data processing system which includes a pointing device, comprising the steps of:

positioning a pointer associated with the pointing device in a predesignated time selection area of the calendar;

automatically displaying user oriented instructions on said pointer upon entrance of said pointer to said selection area;

selecting a desired start time with said pointer from a time line of the electronic calendar for the event being scheduled;

automatically displaying new user oriented instructions on said pointer subsequent to selecting said start time; and

selecting a desired stop time with said pointer from said time line of the electronic calendar for said event.

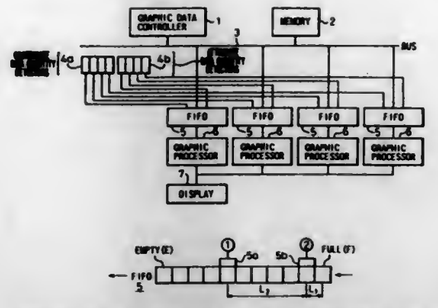
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**5,500,939**

## GRAPHIC DATA PARALLEL PROCESSING AND DISPLAYING APPARATUS WITH INCREASED DATA STORAGE EFFICIENCY

**Katsuhide Kurihara, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan**

**Filed Jul. 18, 1994, Ser. No. 274,725**
**Claims priority, application Japan, Jan. 7, 1993, 5-251805**
**Int. Cl.[6] G06F *15/16***
**U.S. Cl. 395—163** **10 Claims**




1. A graphic data parallel processing and displaying apparatus having a plurality of graphic processors for simultaneously processing graphic data and defining a corresponding graphic image and for displaying the corresponding graphic image on a display, the graphic data for each graphic image being of first and second, different types and of relatively and respectively larger and smaller quantities and requiring relatively and respectively smaller and greater processing times, comprising:

a plurality of FIFO memories respectively associated with the plurality of graphic processors and receiving distributed graphic data for supply to, and for processing by, the respectively associated plurality of graphic processors;

a plurality of sets of data quantity detectors respectively associated with the pluralities of FIFO memories, each set of data quantity detectors comprising first and second data quantity detectors which detect the quantity of data remaining in the respective FIFO memory at corresponding, first and second different detection points correlated to the first and second different types of graphic data and representing corresponding first and second amounts of free memory space for receiving and storing therein the corresponding, first and second types and amounts of graphic data and producing corresponding first and second detector outputs; and

control means, responsive to the type of graphic data to be transferred to the FIFO memories, for selecting the corresponding one of the first and second data quantity detectors, selecting each FIFO memory having sufficient space to receive data of the type to be transferred according to the detector output of the selected quantity detector, and writing the graphic data into each corresponding FIFO memory.

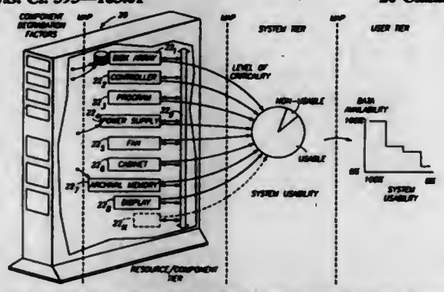
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**5,500,940**

## METHOD FOR EVALUATING FAILURE IN AN ELECTRONIC DATA STORAGE SYSTEM AND PREEMPTIVE NOTIFICATION THEREOF, AND SYSTEM WITH COMPONENT FAILURE EVALUATION

**Tom A. Skeie, Boise, Id., assignor to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed Apr. 25, 1994, Ser. No. 233,024**
**Int. Cl.[6] G06F *11/30***
**U.S. Cl. 395—183.01** **20 Claims**




1. A method for evaluating failure in an electronic data storage system, the method comprising the following steps:

providing a data storage system having multiple storage components operably interconnected to store and retrieve electronic data, individual storage components being capable of failure where a failure of one storage component disrupts operation of the data storage system;

detecting a failed storage component;



evaluating the failed storage component to derive a degree of failure;

assessing importance of the failed storage component to the operation of the data storage system based at least in part on the degree of failure of the failed storage component; and

assigning a level of criticality to the failed storage component indicative of the disruption to operation of the data storage system caused by the failed storage component, the level of criticality being selected from a range of levels where higher levels of criticality represent that the failed storage component causes significant disruption to the operation of the data storage system and lower levels of criticality represent that the failed storage component does not cause significant disruption to the operation of the data storage system.

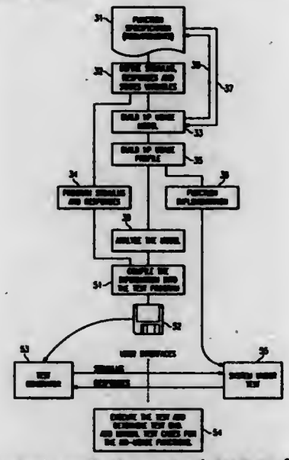
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**5,500,941**

## OPTIMUM FUNCTIONAL TEST METHOD TO DETERMINE THE QUALITY OF A SOFTWARE SYSTEM EMBEDDED IN A LARGE ELECTRONIC SYSTEM

**Luis Gil, Madrid, Spain, assignor to Ericsson, S.A., Madrid, Spain**

**Filed Jul. 6, 1994, Ser. No. 271,422**
**Int. Cl.[6] G06F *11/00***
**U.S. Cl. 395—183.14** **15 Claims**




1. An electronic media for a stored program for electronic systems wherein said stored program performs the method of performing validation testing to determine the quality of a software system embedded in a large electronic system having associated test equipment, said method comprising the steps of:

defining a set of functional requirements for said software system;

constructing a Markov chain, said constructing step further comprising the steps of,

identifying a plurality of states through which said software system transitions when performing said functional requirements;

defining a plurality of stimuli which cause said software system to transition from one of said plurality of states to another;

identifying a response, comprising at least one state transition, which occurs in response to each of said plurality of stimuli for each of said plurality of states; and

calculating the probability of occurrence of each of said state transitions;

identifying a plurality of usage cases, each of said usage cases comprising a set of state transitions beginning at an invocation state and ending at a termination state of said software system;

building a Usage Model for said software system, said Usage Model comprising a plurality of usage cases;

calculating the probability of occurrence of each of said usage cases;

building a Usage Profile for said software system by listing said usage cases in order of descending probability of occurrence;

automatically compiling said Usage Profile, said stimuli, and said responses into an automated test program;

providing a stored program media containing the programming for said associated test equipment with said automated test program to generate a set of test cases;

executing said set of test cases on said software system;

determining the end of said set of test cases; and

analyzing and reporting said software system quality.

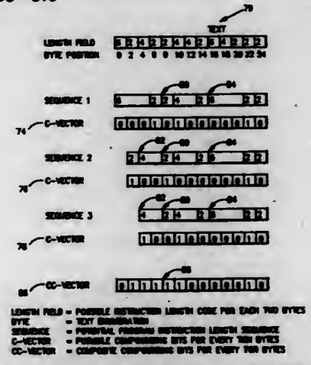
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**5,500,942**

## METHOD OF INDICATING PARALLEL EXECUTION COMPOUNDABILITY OF SCALAR INSTRUCTIONS BASED ON ANALYSIS OF PRESUMED INSTRUCTIONS

**Richard J. Eickemeyer, Endicott, and Stamatis Vassiliadis, Vestal, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Continuation of Ser. No. 184,891, Jan. 21, 1994, abandoned, which is a continuation of Ser. No. 15,272, Feb. 5, 1993, abandoned, which is a continuation of Ser. No. 519,382, May 4, 1990, abandoned. This application Jun. 1, 1995, Ser. No. 457,765**
**Int. Cl.[6] G06F *9/38***
**U.S. Cl. 395—375** **24 Claims**




1. A method of processing instructions in an instruction stream in a data processing system, said instruction stream having no known instruction boundary reference points, to identify adjacent scalar instructions which are capable of parallel execution in a particular computer configuration, including operating said data processing system to perform the following steps:

generating different sequences of presumed instructions starting at different possible instruction boundaries; at least one of said sequences being a sequence of real instructions;

encoding said presumed instructions with identifier tags indicating the capability of adjacent presumed instructions of being executed in parallel and;

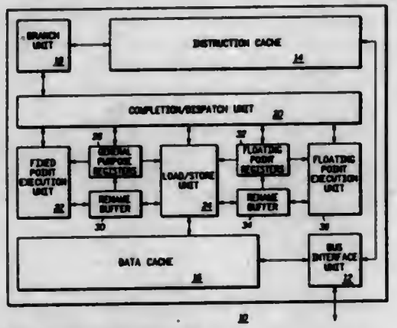
controlling the execution of said real instructions to be serial or in parallel in accordance with said identifier tags.

**5,500,943**

## DATA PROCESSOR WITH RENAME BUFFER AND FIFO BUFFER FOR IN-ORDER INSTRUCTION COMPLETION

Ying-wai Ho, and Bradley G. Burgess, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 144,390, Nov. 2, 1993, abandoned.
This application May 17, 1995, Ser. No. 442,913
Int. Cl.[6] G06F 9/30
U.S. Cl. 395—375 10 Claims




1. A data processor comprising:

first calculation circuitry generating a plurality of pairs of results from a plurality of sets of supplied operands and received programmed instructions, each one of the plurality of pairs of results comprising a first and a second result, the received programmed instructions being a subset of an instruction stream, the first calculation circuitry generating the plurality of pairs of results in an out-of-order sequence with respect to a sequence of the instruction stream;

a rename buffer coupled to the first calculation circuitry, the rename buffer storing a series of first results received from the first calculation circuitry, the rename buffer outputting the series of first results to a first predetermined register according to the sequence of the instruction stream; and

a queue coupled to the first calculation circuitry, the queue storing the series of second results, the queue outputting the series of second results to a second predetermined register according to the sequence of the instruction stream.

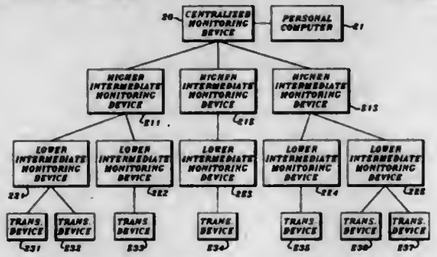
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**5,500,944**

## FAULT INDICATION SYSTEM IN A CENTRALIZED MONITORING SYSTEM

Kojun Yoshida, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 19, 1994, Ser. No. 277,328
Claims priority, application Japan, Jan. 10, 1994, 6-013243
Int. Cl.[6] G06F 11/00
U.S. Cl. 395—184.01 6 Claims




1. A fault indication system in a centralized monitoring system which detects fault conditions in multiple devices to be monitored comprising:

hierarchial multiple intermediate monitoring devices each connected to a selected plurality of the devices to be monitored; and

a centralized monitoring device connected to said hierarchial multiple intermediate monitoring devices;

said centralized monitoring device having a computer with memory, said memory having a time management table for each of said multiple devices to be monitored and said hierarchial multiple intermediate monitoring devices, said centralized monitoring device recording in said time management tables the latest information indicating a fault occurrence in the monitored devices, said computer obtaining the latest information indicating the fault by reading said time management tables in said memory and processing said information in said time management tables to identify the latest information indicating a fault occurrence in time order.

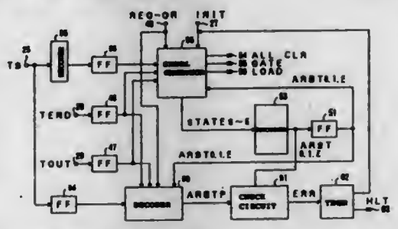
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**5,500,945**

## APPARATUS AND METHOD FOR CONTROLLING A SYSTEM BUS OF A MULTIPROCESSOR SYSTEM

Ikuo Maeda, and Hirohide Sugahara, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 166,023, Dec. 14, 1993, abandoned.
This application Jul. 31, 1995, Ser. No. 512,440
Claims priority, application Japan, Dec. 17, 1992, 4-337646
Int. Cl.[6] G06F 13/36;11/00
U.S. Cl. 395—185.09 6 Claims




1. A bus arbiter connected to a system bus of a multi-processor system, a plurality of modules respectively having processors being connected to the system bus, said bus arbiter comprising:

first means for detecting an abnormality in the multi-processor system on the basis of an internal state of the bus arbiter and a predetermined signal transferred via the system bus;

second means for initializing the internal state of the bus arbiter to restart the bus arbiter when said first means detects the abnormality; and

third means for determining whether or not said first means detects another abnormality within a period of time after said first means detects the abnormality and for stopping an operation of the system bus when said first means detects said another abnormality within the period of time.

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**5,500,946**

## INTEGRATED DUAL BUS CONTROLLER

Philip Roden, Plano; Khodor Elnashar; Brian T. Deng, both of Richardson; Steve Thang, Dallas, all of Tex., and William Saperstein, San Mateo, Calif., assignors to Texas Instruments Incorporated, Dallas, Tex.

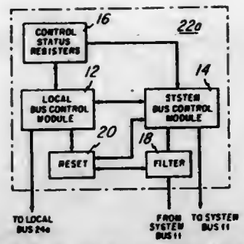
Continuation of Ser. No. 981,657, Nov. 25, 1992, abandoned.
This application Jan. 27, 1995, Ser. No. 380,453
Int. Cl.[6] G06F 13/14
U.S. Cl. 395—308 5 Claims

1. A bus controller, comprising:

a system bus control module connected to a system bus; and

a local bus control module connected to the system bus control module and a local bus, wherein the system bus control module and the local bus control module provide simulta-






neous, autonomous activity with both the local bus and the system bus and allow the bus controller to resolve bus collisions caused by the bus controller attempting to be a slave on the local bus and the system bus simultaneously by asserting a "back-off" signal to discontinue attempts by other components on a system board to obtain mastership of a bus until completion of a higher priority task and further allow the bus controller to resolve "live-lock" conditions by confining "back-off" signals to local buses, thereby circumventing situations where multiple boards alternatively back each other off the system bus.

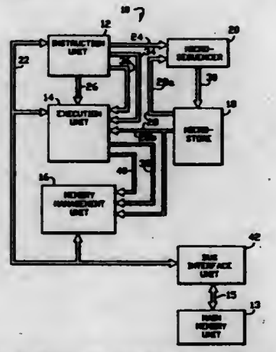
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**5,500,947**

## OPERAND SPECIFIER PROCESSING BY GROUPING SIMILAR SPECIFIER TYPES TOGETHER AND PROVIDING A GENERAL ROUTINE FOR EACH

George M. Uhler, Marlborough, and John F. Brown, III, Northborough, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 681,434, Apr. 3, 1991, abandoned, which is a continuation of Ser. No. 212,348, Jun. 27, 1988, abandoned. This application Jul. 1, 1994, Ser. No. 269,991
Int. Cl.[6] G06F 9/24
U.S. Cl. 395—375 20 Claims




1. A method of specifying operands for an instruction executed in a microcoded CPU, where each of said operands uses one of a plurality of different generic operand addressing modes, and where a plurality of different data lengths and different access types may be used with at least some of said plurality of different generic operand addressing modes, the microcoded CPU including a single micro-store containing a microprogram having a set of generic microinstruction sequences, the method comprising the steps of:

grouping operand types having a similar one of said plurality of different generic operand addressing modes, and defining a generic microinstruction sequence in said set of generic microinstruction sequences for each of said groups of operand types,

decoding said instruction in said CPU to select one of a set of dispatch addresses for selecting one of said generic microinstruction sequences in said set of generic microinstruction sequences,

addressing said micro-store in said CPU beginning at an entry point determined by said selected dispatch address and continuing to address said micro-store without conditional branching to produce said selected one of said generic microinstruction sequences,

applying said selected one of said generic microinstruction sequences from said micro-store to an execution unit of the CPU to fetch or select operands for said instruction, from a register in said CPU, or from a memory separate from said CPU, said operands being fetched or selected in response to said one of said plurality of different generic operand addressing modes, and

separately decoding said instruction in said CPU to generate control bits separate from said dispatch address and apart from said micro-store to select a specific operand mode from a set of a plurality of specific operand modes, each one of said set of specific operand modes producing one of said plurality of different data lengths and different access types, and applying said control bits to said execution unit of said CPU separately from said sequence of microinstructions, said execution unit selecting a specific operand mode in response to said control bits for said fetch or select of operands.

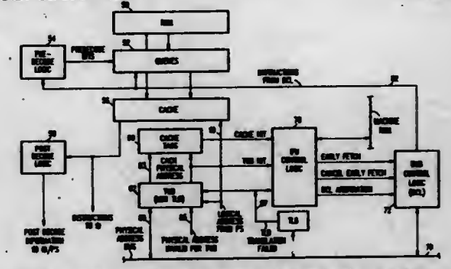
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**5,500,948**

## TRANSLATING INSTRUCTION POINTER VIRTUAL ADDRESSES TO PHYSICAL ADDRESSES FOR ACCESSING AN INSTRUCTION CACHE

Glenn J. Hinton, Portland, and Robert M. Riches, Jr., Hillsboro, both of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 784,568, Oct. 29, 1991, abandoned.
This application Jul. 13, 1994, Ser. No. 274,214
Int. Cl.[6] G06F 12/00
U.S. Cl. 395—415 4 Claims




1. In a data processing system comprised of a memory, an instruction cache for storing frequently used instructions, said instruction cache being connected to said memory, a translation lookaside buffer (TLB) providing access to said memory, and a two entry translation write buffer (TWB) providing fast access to said cache, a method comprising steps of:

A. storing a first entry in said TWB, said first entry being stored in a first logical register and an associated first physical address register;

B. storing a second entry in said TWB, said second entry being stored in a second logical register and an associated second physical address register, each of said registers having stored values therein;

C. presenting an instruction pointer to said TWB, said instruction pointer comprised of logical address bits including upper order bits, lower order bits, and a single bit having a first value or a second value, said single bit providing for translation of even-number page addresses for which said single bit has said first value and for odd-number page addresses for which said single bit has said second value;

D. comparing said upper order bits of said logical address with said stored values in said first and second logical registers in said TWB resulting in a first hit signal with respect to said first logical register or a second hit signal with respect to said second logical register;

E. selecting upon a first condition that said upper order bits of said logical address equal a stored value in said first or second logical register in said TWB, said first hit signal if said single bit has said first value and said second hit signal if said single bit has said second value, resulting in a selected hit signal; and,

F. gating to a physical address bus a stored value in one of said first or second physical address registers associated with said selected hit signal.

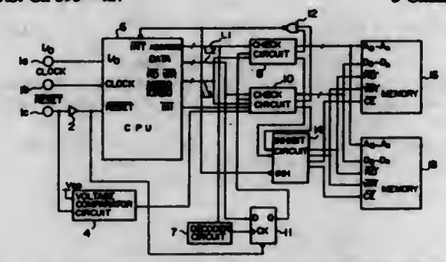
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**5,500,949**

**MICROPROCESSOR SYSTEM FOR INHIBITING ACCESS TO MEMORY BY CHECKING SPECIFIC ADDRESS AND SPECIFIC CODES**

Yasuo Saito, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 676,110, Mar. 27, 1991, abandoned.
This application May 3, 1994, Ser. No. 237,416
Claims priority, application Japan, Mar. 27, 1990, 2-77447
Int. Cl.[6] G06F *12/00;12/14*
U.S. Cl. 395—427 3 Claims




1. A microprocessor system including user programming limits for inhibiting access to a memory by checking specific addresses and codes, comprising:

a first memory which stores main programs and predetermined specific codes, said main programs and said predetermined specific codes being installed during manufacture of said microprocessor system, execution of said predetermined specific codes by users being prohibited;

a second memory which stores user programs written by users after manufacture of said microprocessor system;

a CPU which controls writing programs to said first and second memories and controls reading stored programs from said first and second memories;

check means connected between said CPU and said first and second memories, for checking whether said predetermined specific codes exist in a user program and inhibiting execution of said predetermined specific codes when said predetermined specific codes are detected during writing and reading of said user program controlled by said CPU,

wherein said check means includes,

a first check circuit that produces an access inhibit signal to inhibit access to said first memory when an access instruction supplied by said CPU designates a specific address where access by said users is prohibited;

a second check circuit that checks whether codes supplied by said CPU and said predetermined specific codes read out from said first memory are equal and generates a coincidence output signal; and

an inhibit circuit which inhibits access to said first and second memories in response to said access inhibit signal from said first check circuit and said coincidence output signal from said second check circuit, and

decode means for decoding an address signal supplied by said CPU to output a decoded signal, wherein an inhibit operation of said check means is triggered by said decoded signal of said specific address and includes means for producing a user program execution flag when said codes supplied by said CPU is one or more of said predetermined specific codes and operations of said first and second check circuits begin when said user program execution flag is produced.

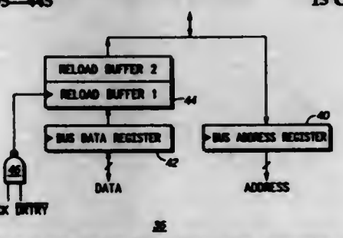
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**5,500,950**

**DATA PROCESSOR WITH SPECULATIVE DATA TRANSFER AND ADDRESS-FREE RETRY**

Michael C. Becker; Charles R. Moore; John S. Muhich, and Robert J. Reese, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 29, 1993, Ser. No. 11,824
Int. Cl.[6] G06F *12/00;13/00*
U.S. Cl. 395—445 13 Claims




9. A method of transferring data within a data processing system comprising the steps of:

generating a plurality of address bits in a data processor, the address bits associated with a data block;

transmitting the plurality of address bits to a memory device;

at a first time, receiving the data block from the memory device at an input of the data processor;

storing the received data block in the data processor;

comparing a tag indexed by the plurality of address bits to a predetermined value;

at a second time subsequent to the first time, receiving a first signal and a second signal at the input of the data processor from the memory device, the first signal representative of the validity or invalidity of the received data block;

discarding the received data block responsive to the first signal;

at a third time subsequent to the second time, receiving the data block at the input of the data processor from the memory device responsive to the second signal without retransmitting the plurality of address bits to the memory device.

# DESIGNS

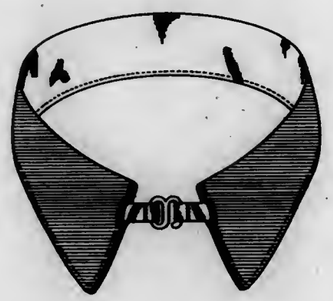
MARCH 19, 1996

**367,951**

**REVERSIBLE COLLAR**

Chiara Cupples, and Terry Cupples, both of 1427 Rimrock, Richland, Wash. 99352

Filed Apr. 22, 1994, Ser. No. 21,719
Term of patent 14 years
U.S. Cl. D2—602



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**367,952**

**SHOE DESIGN**

Joseph Shea, Boston, Mass., assignor to SRL, Inc., Wilmington, Del.

Filed Apr. 3, 1995, Ser. No. 37,033
Term of patent 14 years
U.S. Cl. D2—908



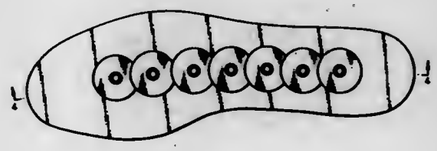
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**367,953**

**INSOLE FOR A SHOE**

Peter King, 34 Peel Street, London W8 7PD, United Kingdom

Filed Nov. 4, 1993, Ser. No. 15,807
Claims priority, application United Kingdom, May 5, 1993, 2030850
Term of patent 14 years
U.S. Cl. D2—961



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**367,954**

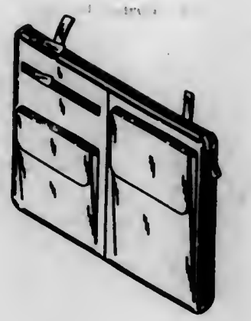
**SEQUENTIALLY ILLUMINATED SHOELACE DISPLAY**

Larry Dion, Rydal, Pa., assignor to LaMi Products, Inc., Willow Grove, Pa.

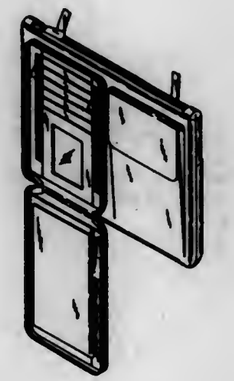
Filed May 6, 1993, Ser. No. 8,043
Term of patent 14 years
U.S. Cl. D2—978



367,955
**POCKETBOOK**
Jean Peters, New York, N.Y., assignor to B. H. Smith, Inc., New York, N.Y.
Filed Dec. 22, 1994, Ser. No. 32,631
Term of patent 14 years
U.S. Cl. D3—233



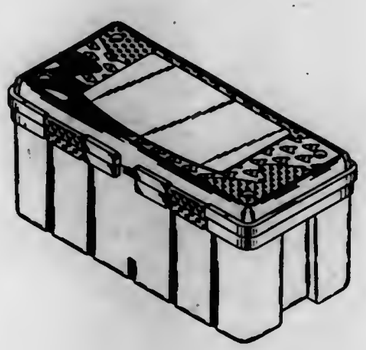
367,956
**POCKETBOOK**
Jean Peters, New York, N.Y., assignor to B. H. Smith, Inc., New York, N.Y.
Filed Dec. 22, 1994, Ser. No. 32,632
Term of patent 14 years
U.S. Cl. D3—233



367,957
**JEWELRY GRINDING STONE CARRYING CASE**
William F. Lambert, and Charles C. Gilbert, both of Colorado Springs, Colo., assignors to Gary A. Smith, and Sharee E. Smith, both of Colorado Springs, Colo.
Filed May 27, 1994, Ser. No. 23,599
Term of patent 14 years
U.S. Cl. D3—273

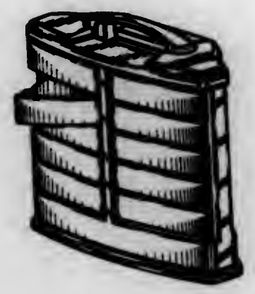


367,958
**FOOTLOCKER**
Thomas A. Tiebo, Barrington Hills; Stephen P. Whitehead, Elgin, and Michael G. Ulfner, Naperville, all of Ill., assignors to Suncast Corporation, Batavia, Ill.
Filed Aug. 3, 1994, Ser. No. 26,717
Term of patent 14 years
U.S. Cl. D3—273

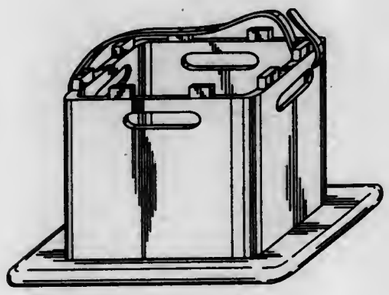




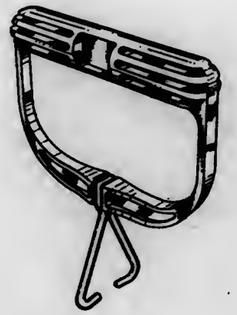
367,959
**STORAGE BIN**
Randall Calmeise, Oakwood Village, and John A. Vura, Wooster, both of Ohio, assignors to Rubbermaid Incorpated, Wooster, Ohio
Filed Aug. 12, 1994, Ser. No. 27,856
Term of patent 14 years
U.S. Cl. D3—283



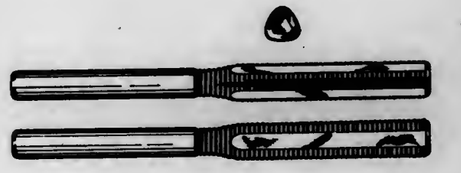
367,960
**SAFETY PROPANE TANK CARRIER**
George Werbesky, Jr., 18 Jackson Pl., Darien, Conn. 06820
Filed Sep. 1, 1994, Ser. No. 27,787
Term of patent 14 years
U.S. Cl. D3—316



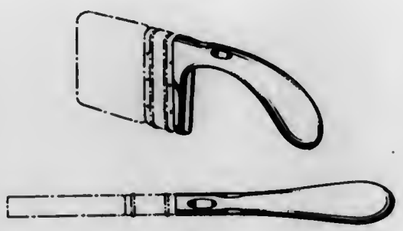
367,961
**SKATE CARRIER**
Micheal McNamara, 11 Riverwood Close S.E., Calgary, Alberta, Canada
Filed Aug. 29, 1994, Ser. No. 27,729
Term of patent 14 years
U.S. Cl. D3—317



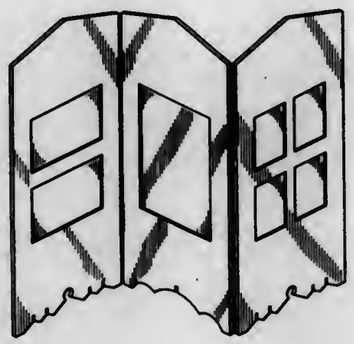
367,962
**HANDLE FOR A ROUND BRUSH**
Stuart M. Leslie, Brooklyn, N.Y., assignor to Goody Products, Inc., Kearny, N.J.
Filed Jan. 25, 1995, Ser. No. 34,023
Term of patent 14 years
U.S. Cl. D4—138



367,963
PAINTBRUSH HANDLE
Stephen L. Mayer, 527 SE. Claremont, Lee's Summit, Mo. 64063
Filed Mar. 13, 1995, Ser. No. 36,877
Term of patent 14 years
U.S. Cl. D4—138



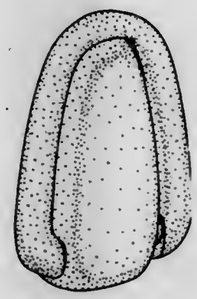
367,964
PICTURE FRAME
Elaine W. Baker; Lin Howard; Michele Bottaro, and Ralph Skidmore, all of 3300 Coffey La., Santa Rosa, Calif. 95403
Filed Mar. 14, 1995, Ser. No. 36,155
Term of patent 14 years
U.S. Cl. D6—302



367,965
PICTURE FRAME
Elaine W. Baker, 3300 Coffey La., Santa Rosa, Calif. 95403
Filed Mar. 14, 1995, Ser. No. 36,159
Term of patent 14 years
U.S. Cl. D6—303

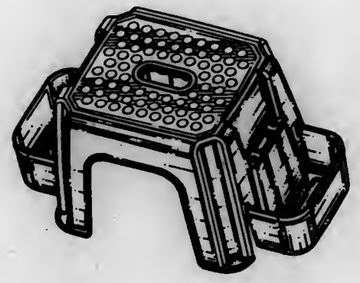


367,966
GARMENT HANGER FOR A VEHICLE
David D. Rieden, Lake Orin; Joseph A. Polizzi, Mt. Clemens, and Kurt M. Mitschke, Sterling Heights, all of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Aug. 22, 1994, Ser. No. 27,466
Term of patent 14 years
U.S. Cl. D6—323

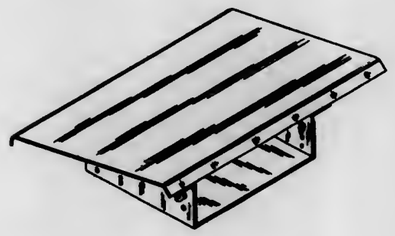




367,967
STEP STOOL
Randall W. Calmelat, Oakwood Village, and David L. O'Neal, North Canton, both of Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio
Filed Apr. 19, 1995, Ser. No. 37,724
Term of patent 14 years
U.S. Cl. D6—336



367,968
FOOTREST
David M. Hatcher, Buffalo, N.Y., assignor to Mead-Hatcher, Inc., Buffalo, N.Y.
Continuation of Ser. No. 142,582, Oct. 25, 1993, Pat. No. 5,419,618. This application May 10, 1995, Ser. No. 38,638
Term of patent 14 years
U.S. Cl. D6—353



367,969
ARM CHAIR
Leo Martin, Coconut Grove, Fla., assignor to Miami Metal Products, Inc., Miami, Fla.
Filed May 8, 1995, Ser. No. 38,566
Term of patent 14 years
U.S. Cl. D6—376



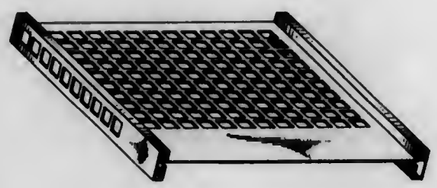
367,970
SECTIONAL OFFICE FURNITURE INFORMATION DESK UNIT
Spencer L. Rhoads, Radisson, N.Y., assignor to The Croydon Company, Inc., Liverpool, N.Y.
Filed Mar. 2, 1993, Ser. No. 5,377
Term of patent 14 years
U.S. Cl. D6—397



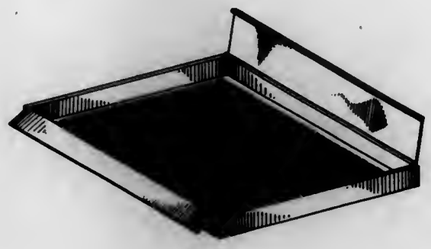
367,971
MUSIC STAND
Harold R. Lynn, 685 Coy La., Chagrin Falls, Ohio 44022
Filed Aug. 12, 1994, Ser. No. 27,134
Term of patent 14 years
U.S. Cl. D6—419



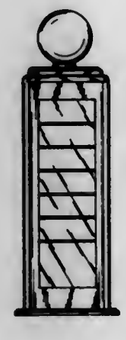
367,972
EYEWEAR PRODUCTS DISPLAY TRAY
William H. Valls, Harwinton; David W. Schweitzer, West Hartford, and Jonathan C. Hamilton, Tariffville, all of Conn., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed Apr. 4, 1996, Ser. No. 37,202
Term of patent 14 years
U.S. Cl. D6—468



367,973
EYEWEAR PRODUCTS DISPLAY TRAY
William H. Valls, Harwinton; David W. Schweitzer, West Hartford, and Jonathan C. Hamilton, Tariffville, all of Conn., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed Apr. 4, 1995, Ser. No. 37,203
Term of patent 14 years
U.S. Cl. D6—468



367,974
DISPLAY CABINET
Michael J. Inman, 21626 Kuder Ave., Perris, Calif. 92570
Filed Sep. 28, 1994, Ser. No. 29,052
Term of patent 14 years
U.S. Cl. D6—470

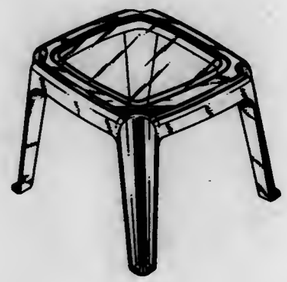




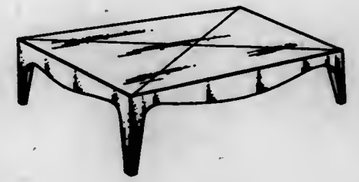
367,975
MERCHANDISING DISPLAY COOLER
J. David Robertson, Atlanta; John P. Woods, Lula, and Stephen M. Mobley, Marietta, all of Ga., assignors to The Mead Corporation, Dayton, Ohio
Filed Oct. 21, 1994, Ser. No. 30,028
Term of patent 14 years
U.S. Cl. D6—470



367,976
TABLE
Ralph VanSkiver, and Shannon R. Bynum, both of Arlington, Tex., assignors to Denkocil Mfg. Co., Inc., Arlington, Tex.
Filed Aug. 11, 1994, Ser. No. 27,016
Term of patent 14 years
U.S. Cl. D6—484



367,977
COFFEE TABLE
Sally S. Lewis, 715 N. Canon Dr., Beverly Hills, Calif. 90210
Filed Feb. 6, 1995, Ser. No. 36,121
Term of patent 14 years
U.S. Cl. D6—484



367,978
SIDE TABLE
Sally S. Lewis, 715 N. Canon Dr., Beverly Hills, Calif. 90210
Filed Feb. 6, 1995, Ser. No. 36,122
Term of patent 14 years
U.S. Cl. D6—484



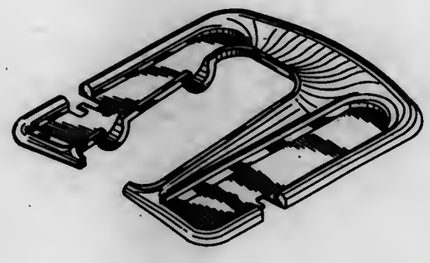
367,979
DINING TABLE
Sally S. Lewis, 715 N. Canon Dr., Beverly Hills, Calif. 90210
Filed Feb. 6, 1995, Ser. No. 36,123
Term of patent 14 years
U.S. Cl. D6—486



367,980
CHAIR SEAT
David N. Hodge, The Sea Ranch, Calif.; Michael L. Diemen; David C. Jenkins, both of Grand Rapids, Mich.; Michael L. Mercier, Grandville, Mich.; Donald K. Sandberg, Ada, Mich., and David S. Teppo, East Grand Rapids, Mich., assignors to Steelcase, Inc., Grand Rapids, Mich.
Continuation-in-part of Ser. No. 15,411, Nov. 16, 1993, Pat. No. Des. 360,316. This application Feb. 1, 1994, Ser. No. 18,224
Term of patent 14 years
U.S. Cl. D6—500



367,981
CHAIR BOTTOM COVER
Ogden R. Olson, Muscatine, Iowa, assignor to Hon Industries Inc., Muscatine, Iowa
Filed Jan. 10, 1994, Ser. No. 24,264
Term of patent 14 years
U.S. Cl. D6—500



367,982
BLOW MOLDED SEAT
Michael F. Stirling, and Michael J. Katje, both of Spring Lake, Mich., assignors to Brunswick Bowling & Billiards Corporation, Muskegon, Mich.
Filed Jan. 5, 1995, Ser. No. 33,135
Term of patent 14 years
U.S. Cl. D6—500

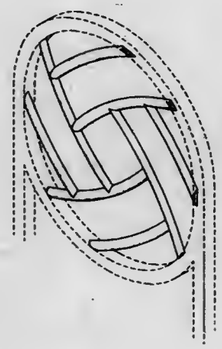




367,983
CHAIR ARMREST
Ogden R. Olson, Muscatine, Iowa, assignor to Hon Industries Inc., Muscatine, Iowa
Filed Apr. 15, 1994, Ser. No. 21,407
Term of patent 14 years
U.S. Cl. D6—501



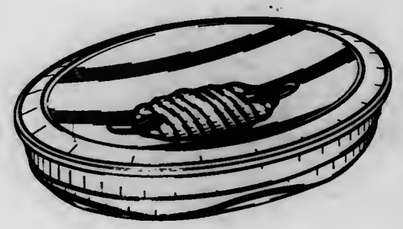
367,984
CHAIR BACK
Peter Barile, Morristown, Tenn., assignor to Shelby Williams Industries, Inc., Morristown, Tenn.
Filed Nov. 8, 1994, Ser. No. 30,787
Term of patent 14 years
U.S. Cl. D6—502



367,985
MULTIPLE-USE HANGING ACCESSORY HOLDER
Cheryl A. Hale, 1566 Kingswood Trail, Nekoosa, Wis. 54457
Filed Oct. 31, 1994, Ser. No. 38,472
Term of patent 14 years
U.S. Cl. D6—514



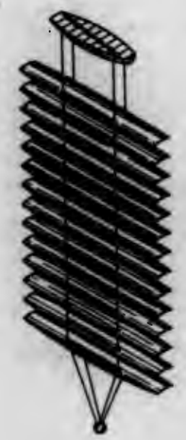
367,986
SOAP DISH
Vincent L. Haley, Orrville, Ohio, and David W. Kaiser, North Haven, Conn., assignors to Rubbermaid Incorporated, Wooster, Ohio
Filed May 17, 1995, Ser. No. 39,107
Term of patent 14 years
U.S. Cl. D6—536



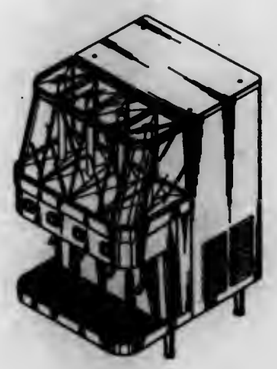
367,987
**BUSINESS CARD DISPLAY AND DISPENSING UNIT**
Lorene E. Farrell, 709-B W. Rusk #323, Rockwall, Tex. 75087
Filed Aug. 8, 1994, Ser. No. 26,873
Term of patent 14 years
U.S. Cl. D6—570



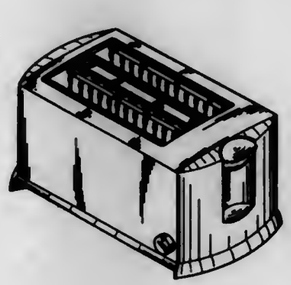
367,988
**VENETIAN BLIND FOR COLLECTING, EMPLOYING OR DISTRIBUTING SOLAR ENERGY**
Eric P. Chan, New York, and Jeffrey F. Miller, Mount Vernon, both of N.Y., assignors to Ecco Design, Inc., New York, N.Y.
Filed May 19, 1994, Ser. No. 23,182
Term of patent 14 years
U.S. Cl. D6—577



367,989
**BEVERAGE DISPENSER**
Jeffrey P. Mills, Georgetown; Gary F. Sardynski, Medford, and Leonard Jacobs, Chestnut Hill, all of Mass., assignors to Jet Spray Corp., Norwood, Mass.
Filed Nov. 8, 1994, Ser. No. 30,791
Term of patent 14 years
U.S. Cl. D7—308

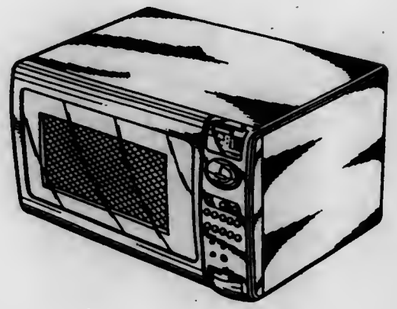


367,990
**TOASTER**
Gilles Rose, Selongey, France, assignor to SEB, Selongey, France
Filed Jan. 6, 1995, Ser. No. 33,230
Claims priority, application France, Jul. 6, 1994, 94 4017
Term of patent 14 years
U.S. Cl. D7—330

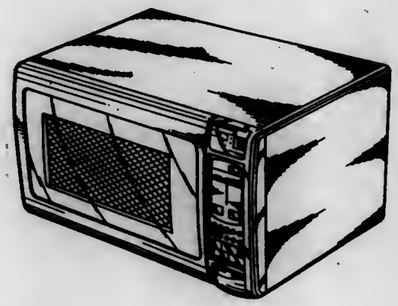




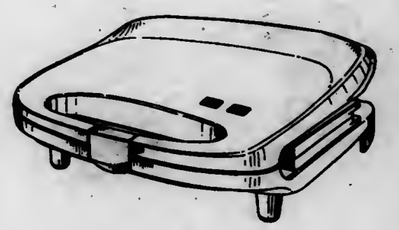
367,991
**MICROWAVE OVEN**
Tadahiko Saimen, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Mar. 22, 1995, Ser. No. 36,573
Claims priority, application Japan, Sep. 22, 1994, 6-28943
Term of patent 14 years
U.S. Cl. D7—351



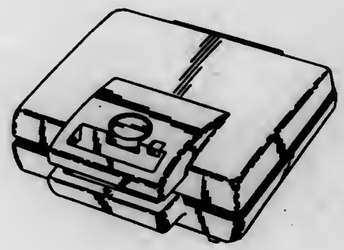
367,992
**MICROWAVE OVEN**
Tadahiko Saimen, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Mar. 22, 1995, Ser. No. 36,574
Claims priority, application Japan, Sep. 22, 1994, 6-28944
Term of patent 14 years
U.S. Cl. D7—351



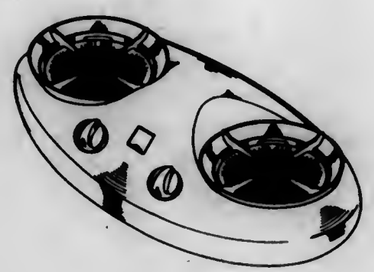
367,993
**SANDWICH TOASTER**
John W. McClean, Sydney, Australia, assignor to Breville Pty Ltd., Sydney, Australia
Filed Oct. 26, 1994, Ser. No. 30,291
Claims priority, application Australia, Apr. 28, 1994, 1321/94
Term of patent 14 years
U.S. Cl. D7—352



367,994
**WAFFLE BAKER**
Clinton Bloom, Lawrence, Kans., and Donald L. Avise, Lake Lotawana, Mo., assignors to Dazey Corporation, New Century, Kans.
Filed Feb. 13, 1995, Ser. No. 34,811
Term of patent 14 years
U.S. Cl. D7—352

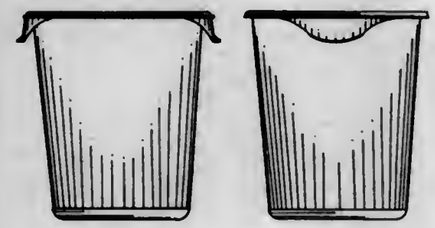


367,995
**STREAMLINED GAS RANGE**
Chih-Huang Hu, 2F, No 43, Niu-Pu E. Road, Hsinchu City, Taiwan
Filed Jun. 30, 1994, Ser. No. 25,344
Term of patent 14 years
U.S. Cl. D7—364



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367,996
**FOOD STORAGE CONTAINER**
Kevin Rausch, Cross Junction, Va., assignor to Rubbermaid Commercial Products Inc., Winchester, Va.
Filed Apr. 17, 1995, Ser. No. 37,562
Term of patent 14 years
U.S. Cl. D7—602



367,997
**CUPHOLDER FOR ATTACHMENT TO FURNITURE**
John Ayotte, Eagan, and Peter W. A. Bergin, Hopkins, both of Minn., assignors to MTS Northwest Sound, Inc., Minneapolis, Minn.
Continuation-in-part of Ser. No. 5,318, Feb. 26, 1993, abandoned. This application Aug. 4, 1994, Ser. No. 26,729
Term of patent 14 years
U.S. Cl. D7—620



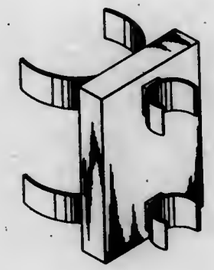
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367,998
**SELF-LEVELING BEVERAGE HOLDER**
William P. Graw, 2507 Valley Dr., Hermosa Beach, Calif. 90254, and H. Douglas Eastman, 2053 38th St., Manhattan Beach, Calif. 90266
Filed Jan. 6, 1995, Ser. No. 33,186
Term of patent 14 years
U.S. Cl. D7—620





367,999
**WATER BOTTLE HOLDER**
Fraser S. McCallum, Iona Station, Canada, assignor to Zermar Manufacturing Inc., Ontario, Canada
Filed Jan. 19, 1995, Ser. No. 33,773
Claims priority, application Canada, Jul. 28, 1994, 1994-1415
Term of patent 14 years
U.S. Cl. D7—620

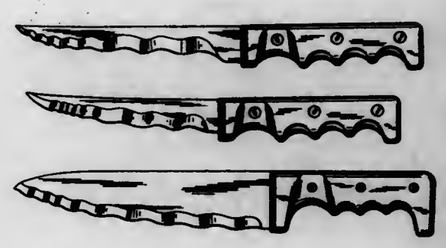


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368,000
**DECORATIVE WINE BOTTLE VEST**
Ronald Mazza, and Denise Mazza, both of 26021 McNatt Ct., Lake Forest, Calif. 92630
Filed Apr. 10, 1995, Ser. No. 37,295
Term of patent 14 years
U.S. Cl. D7—625



368,001
**KNIFE**
Milton L. Cohen, Hewlett Bay Park, and Jeff Siegel, Great Neck, both of N.Y., assignors to Lifetime Hoan Corporation, Westbury, N.Y.
Filed Apr. 18, 1994, Ser. No. 21,430
Term of patent 14 years
U.S. Cl. D7—693

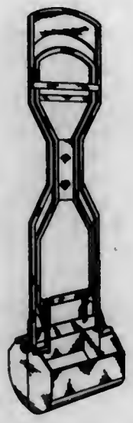


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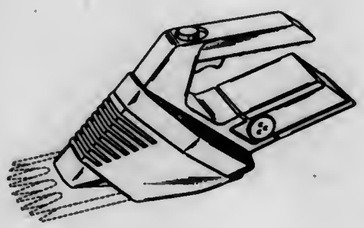
368,002
**FENCE EDGE**
Victor C. Henson, 532 24th Ave., Rock Island, Ill. 61201
Filed Sep. 7, 1994, Ser. No. 28,106
Term of patent 14 years
U.S. Cl. D8—1



368,003
**LITTER RETRIEVER**
Allen Simon, East Northport, N.Y., assignor to Four Paws Products, Ltd., Hauppauge, N.Y.
Filed Nov. 23, 1994, Ser. No. 31,375
Term of patent 14 years
U.S. Cl. D8—4



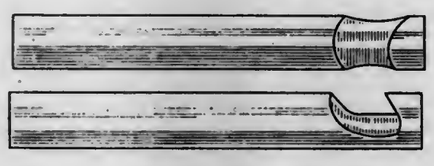
368,004
**HOUSING FOR ELECTRIC GARDEN SHEARS**
Karl T. Lemcke, Mannheim, Germany, assignor to Lematec Haus- und Gartentechnik Vertriebs-GmbH, Mannheim, Germany
Filed Oct. 28, 1994, Ser. No. 30,439
Claims priority, application Germany, May 24, 1994, 94 04 115.6
Term of patent 14 years
U.S. Cl. D8—8



368,005
**ELECTRIC TRIMMER**
Karl T. Lemcke, Mannheim, Germany, assignor to Lematec Haus- und Gartentechnik Vertriebs-GmbH, Mannheim, Germany
Filed Oct. 28, 1994, Ser. No. 30,440
Claims priority, application Germany, May 24, 1994, 94 04 115.6
Term of patent 14 years
U.S. Cl. D8—8

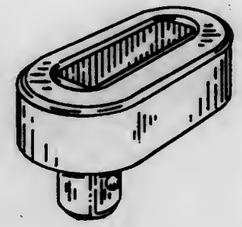


368,006
**WIRE CLIP FENCING TOOL**
Danny D. Aldrich, P.O. Box 765, Nucla, Colo. 81424
Filed Feb. 13, 1995, Ser. No. 34,758
Term of patent 14 years
U.S. Cl. D8—14

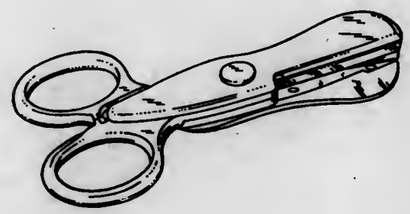




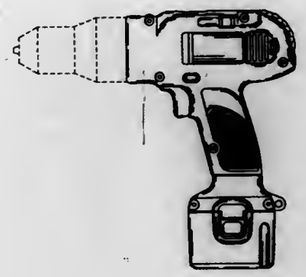
368,007
**RATCHET WRENCH ADAPTER**
Richard J. Macor, Greenwich Township, Warren County, N.J., assignor to Properietary Technologies, Inc., Stewartsville, N.J.
Filed May 15, 1995, Ser. No. 38,808
Term of patent 14 years
U.S. Cl. D8—25



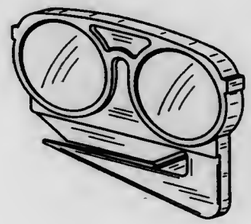
368,008
**SCISSORS**
Michele Golinelli, Mirandola, and Matteo Righi, Caselle, both of, Italy, assignors to VICOM S.r.l., Milan, Italy
Filed May 27, 1994, Ser. No. 23,634
Term of patent 14 years
U.S. Cl. D8—57



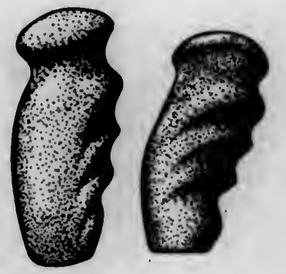
368,009
**CORDLESS POWER TOOL HOUSING**
Donald W. Zarwelle, 805 Jamieson Rd., Lutherville, Md. 21093
Continuation of Ser. No. 11,813, Aug. 13, 1993, abandoned. This application Nov. 3, 1994, Ser. No. 333,960
Term of patent 14 years
U.S. Cl. D8—68



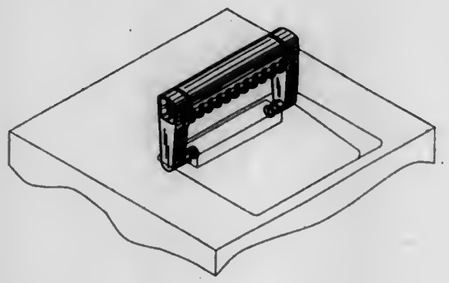
368,010
**ENVELOPE OPENER CONTAINING LENSES**
David P. Lage, and John G. Goessling, Jr., both of St. Louis County, Mo., assignors to Quick Point, Inc., Fenton, Mo.
Continuation-in-part of Ser. No. 23,726, May 31, 1994. This application Aug. 1, 1994, Ser. No. 26,606
Term of patent 14 years
U.S. Cl. D8—103



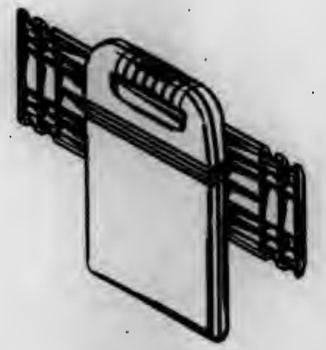
368,011
**GEAR SHIFT HANDLE**
Paul A. McCoy, 2250 Overlook Dr., Augusta, Ga. 30906
Filed Oct. 17, 1994, Ser. No. 29,787
Term of patent 14 years
U.S. Cl. D8—383



368,012
**HOLLOW HANDLE**
Thomas Dickinson, and Bradley D. Gale, both of St. Louis, Mo., assignors to Centico International, Inc., St. Louis, Mo.
Filed Nov. 14, 1994, Ser. No. 30,983
Term of patent 14 years
U.S. Cl. D8—386



368,013
**EXTENDIBLE HANDLE FOR WHEELED LUGGAGE**
James Tsai, 103, Tz Ming 1 Rd., Tung Pao Tsun, Tan Tzu Hsiang, Taichung Hsien, Taiwan
Filed Nov. 15, 1994, Ser. No. 31,232
Term of patent 14 years
U.S. Cl. D8—313

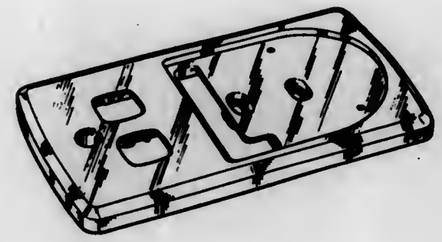


368,014
**PULL**
Frances G. H. Ainscough, McHenry, Ill., assignor to Newell Operating Company, Freeport, Ill.
Filed Aug. 3, 1994, Ser. No. 26,678
Term of patent 14 years
U.S. Cl. D8—318

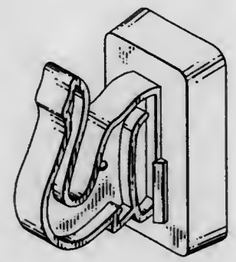




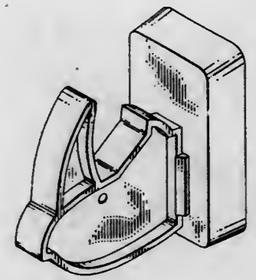
368,015
**FASCIA PLATE**
Charles L. Cookson, 12 Cavendish Street, West Beach, State of South Australia, Australia
Filed Nov. 30, 1994, Ser. No. 31,525
Claims priority, application Australia, Jun. 6, 1994, 1754/94
Term of patent 14 years
U.S. Cl. D8—353



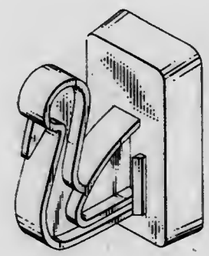
368,016
**ELEPHANT HOOK**
Sean McDowell; Tim Cunningham; Christopher Stygar, and Matthew Beale, all of Pittsburgh, Pa., assignors to Adams Mfg. Corp., Portersville, Pa.
Filed Jan. 13, 1995, Ser. No. 33,498
Term of patent 14 years
U.S. Cl. D8—367



368,017
**RHINOCEROS HOOK**
Sean McDowell; Tim Cunningham; Christopher Stygar, and Matthew Beale, all of Pittsburgh, Pa., assignors to Adams Mfg. Corp., Portersville, Pa.
Filed Jan. 13, 1995, Ser. No. 33,506
Term of patent 14 years
U.S. Cl. D8—367



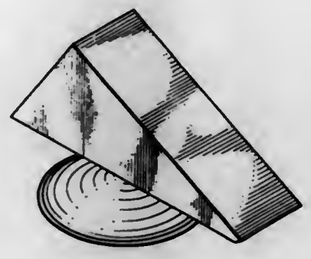
368,018
**BIRD HOOK**
Sean McDowell; Tim Cunningham; Christopher Stygar, and Matthew Beale, all of Pittsburgh, Pa., assignors to Adams Mfg. Corp., Portersville, Pa.
Filed Jan. 13, 1995, Ser. No. 34,787
Term of patent 14 years
U.S. Cl. D8—367



368,019
ADJUSTING SCREW
Yasushi Ohtsuka, Shizuoka, Japan, assignor to Koito Manufacturing Co., Ltd., Tokyo, Japan
Filed Sep. 19, 1994, Ser. No. 28,569
Claims priority, application Japan, Mar. 18, 1994, 6-6912
Term of patent 14 years
U.S. Cl. D8—382



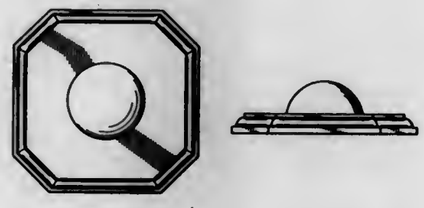
368,021
SLIDING DOOR OR WINDOW JAMMING LOCK
Andrew Mikiel, 1142 Manhattan Ave., #157, Manhattan Beach, Calif. 90266
Filed Jan. 25, 1994, Ser. No. 17,976
Term of patent 14 years
U.S. Cl. D8—402



368,020
SELF-LOCKING NUT
Katutada Shirai, Shizuoka, Japan, assignor to Koito Manufacturing Co., Ltd., Tokyo, Japan
Filed Sep. 19, 1994, Ser. No. 28,575
Claims priority, application Japan, Mar. 18, 1994, 6-6911
Term of patent 14 years
U.S. Cl. D8—397



368,022
WALL MOUNTED DOOR STOP
Steve R. Angle, 5824 S. Jordan Canal Rd., Sandy, Utah 84118
Filed Jul. 8, 1994, Ser. No. 25,691
The portion of the term of this patent subsequent to Feb. 17, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D8—402

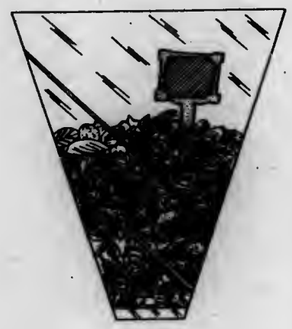




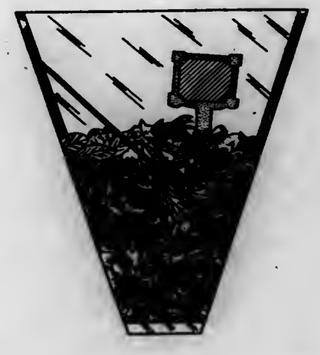
368,023
DISPENSER
Ken Leung, 854 Walker Ave., Oakland, Calif. 94610
Filed Sep. 22, 1994, Ser. No. 28,779
Term of patent 14 years
U.S. Cl. D9—300



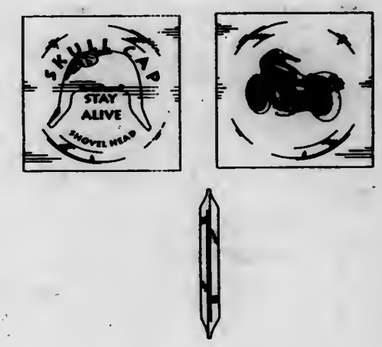
368,024
FLORAL WRAPPING MATERIAL
Deborah L. Sekerak, Berea, and Scott R. Gilbert, Hinckley, both of Ohio, assignors to Professional Package Company, Strongsville, Ohio
Filed May 23, 1994, Ser. No. 23,349
Term of patent 14 years
U.S. Cl. D9—305



368,025
FLORAL WRAPPING MATERIAL
Deborah L. Sekerak, Berea, and Scott R. Gilbert, Hinckley, both of Ohio, assignors to Professional Package Company, Strongsville, Ohio
Filed Jul. 19, 1994, Ser. No. 26,806
Term of patent 14 years
U.S. Cl. D9—305



368,026
CONDOM PACKAGE
Brian Fields, Rte. 8, 56th St., Box 263-6, Live Oak, Fla. 32060
Filed Jan. 4, 1995, Ser. No. 33,076
Term of patent 14 years
U.S. Cl. D9—305



368,027
PACKAGE FOR A SLENDER OBJECT
Jay J. Baker, Mayville, N.Y., assignor to Jamestown Plastics, Inc., Brocton, N.Y.
Filed Oct. 27, 1994, Ser. No. 30,352
Term of patent 14 years
U.S. Cl. D9—415



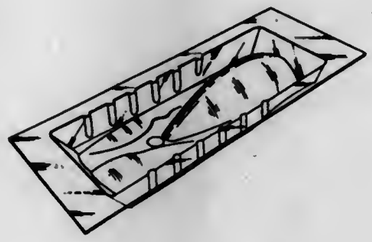
368,029
PACKAGE FOR A SLENDER OBJECT
Jay J. Baker, Mayville, N.Y., assignor to Jamestown Plastics, Inc., Brocton, N.Y.
Filed Nov. 10, 1994, Ser. No. 30,882
Term of patent 14 years
U.S. Cl. D9—415



368,028
PACKAGE FOR A SLENDER OBJECT
Jay J. Baker, Mayville, N.Y., assignor to Jamestown Plastics, Inc., Brocton, N.Y.
Filed Nov. 10, 1994, Ser. No. 30,881
Term of patent 14 years
U.S. Cl. D9—415



368,030
COVER FOR A LOBSTER CONTAINER
Gabriel Elbaz, 32 Surrey Gardens, Westmount, Canada
Filed Mar. 23, 1995, Ser. No. 36,632
Claims priority, application Canada, Feb. 27, 1995, 1995-0475
Term of patent 14 years
U.S. Cl. D9—425





368,031
PACKAGE
Khaled Chahed, Paris, France, assignor to Parfums Jean-Jacques Vivier, Saint-Maur-des-Fosses, France
Filed Jul. 12, 1994, Ser. No. 27,153
Term of patent 14 years
U.S. Cl. D9—432



368,033
CORK
Ernest Gladstone, 721 Avenue O, Brooklyn, N.Y. 11230
Filed Dec. 15, 1994, Ser. No. 32,241
Term of patent 14 years
U.S. Cl. D9—439



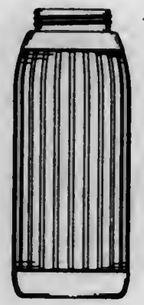
368,032
DISPOSABLE MOUTH-PIECE FOR BEVERAGE CANS
Gilberto De Castro Couto, Rua João Pontoni, 128, apt. 1902, Cristo Rei, Curitiba, Parana, Brazil
Filed Nov. 29, 1994, Ser. No. 31,873
Claims priority, application Brazil, May 30, 1994, 5400708-9
Term of patent 14 years
U.S. Cl. D9—435



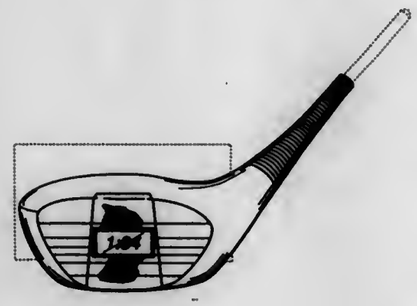
368,034
CONTAINER
Bernie Lewin, 566 Whalley Ave., New Haven, Conn. 06511
Filed May 4, 1995, Ser. No. 38,368
Term of patent 14 years
U.S. Cl. D9—528



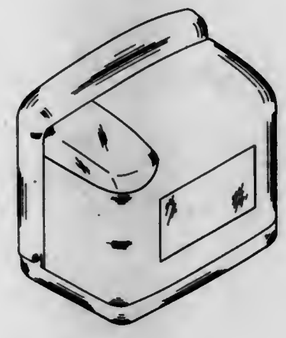
368,035
**BOTTLE**
Richard B. Ahern, Jr., Akron, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed May 5, 1995, Ser. No. 38,425
Term of patent 14 years
U.S. Cl. D9—556



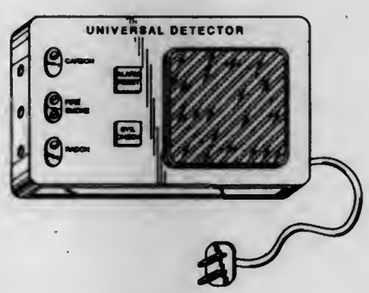
368,036
**COMBINED CLOCK, CARD HOLDER, PEN HOLDER AND PAPERWEIGHT**
Daniel G. Tronolone, Jr., 800 Crosby Bldg., Buffalo, N.Y. 14202
Filed Mar. 20, 1995, Ser. No. 36,373
Term of patent 14 years
U.S. Cl. D10—2



368,037
**TIME STAMP**
Robert B. Staubitz, Collinsville; Timothy C. Repp, New Hartford, both of Conn.; Russ S. Camacho, Nashua, N.H., and Walter P. Gauthier, Westford, Mass., assignors to Simplex Time Recorder Company, Gardner, Mass.
Filed Jan. 5, 1995, Ser. No. 33,129
Term of patent 14 years
U.S. Cl. D10—41

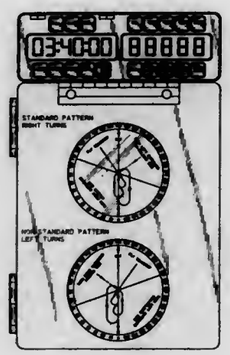


368,038
**HAZARD DETECTOR**
Juan M. Velazquez, 2218 N. Le Claire Ave., Chicago, Ill. 60639
Filed Apr. 20, 1995, Ser. No. 37,777
Term of patent 14 years
U.S. Cl. D10—47

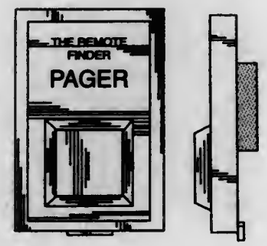




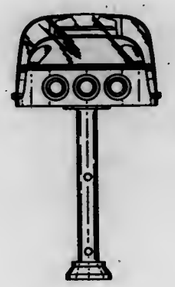

368,039
**NAVIGATIONAL AID FOR AN AIRPLANE PILOT**
Jeffrey M. Tessier, 19455 Kings Deer, Monument, Colo. 80132
Filed Oct. 24, 1994, Ser. No. 30,236
Term of patent 14 years
U.S. Cl. D10—65




368,040
**RECEIVER FOR A LOSE REMOTE CONTROL UNIT ATTACHABLE TO A CABLE BOX**
Joseph A. Morin, and Tanya G. Morin, both of 55 Winship Rd., Barre, Mass. 01005
Filed Aug. 31, 1994, Ser. No. 27,763
Term of patent 14 years
U.S. Cl. D10—104




368,041
**SMOKE DETECTOR**
Jonas Skog, Central, Hong Kong, assignor to Calectro AB, Sweden
Filed May 5, 1994, Ser. No. 22,486
Claims priority, application Sweden, Nov. 26, 1993, 93 2652
Term of patent 14 years
U.S. Cl. D10—106



368,042
**COMBINED MOTION DETECTOR AND AUDIBLE ALARM**
Kam-Wah Pun, Hong Kong, Hong Kong, assignor to Styling City Limited, Kowloon Bay, Hong Kong
Filed Feb. 27, 1995, Ser. No. 35,388
Term of patent 14 years
U.S. Cl. D10—106



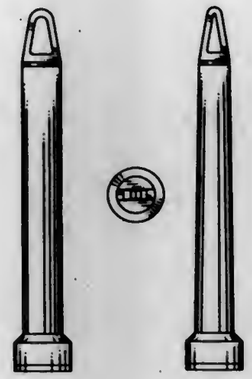
368,043
COMBINED MOTION DETECTOR AND AUDIBLE ALARM
Kam-Wah Pun, Kowloon, Hong Kong, assignor to Styling City Limited, Kowloon Bay, Hong Kong
Filed Feb. 27, 1995, Ser. No. 35,389
Term of patent 14 years
U.S. Cl. D10—106



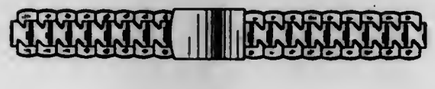
368,044
COMBINED BICYCLE REFLECTOR AND BRACKET
Anthony L. Heying, Celina, and Robert L. Ice, St. Mary's, both of Ohio, assignors to Huffy Corporation, Miamisburg, Ohio
Division of Ser. No. 23,410, May 24, 1994, abandoned. This application Dec. 5, 1994, Ser. No. 31,746
Term of patent 14 years
U.S. Cl. D10—111



368,045
CHEMILUMINESCENT LIGHT STICK
Raymond F. Akers, Sr., Mantua, N.J., assignor to Akers Laboratories Inc., Thorofare, N.J.
Filed Jan. 24, 1995, Ser. No. 33,964
Term of patent 14 years
U.S. Cl. D10—114

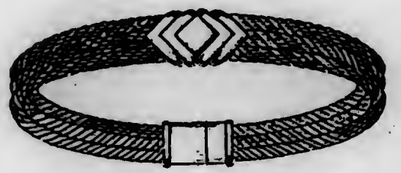


368,046
WATCH BAND
Hideo Fujisawa, Kashiwa, Japan, assignor to Zippo Manufacturing Company, Bradford, Pa.
Filed May 18, 1994, Ser. No. 23,122
Term of patent 14 years
U.S. Cl. D11—3





368,047
BRACELET
Henri Samuel, Paris, France, assignor to Fred, S.A., Paris, France
Filed Apr. 25, 1995, Ser. No. 37,964
Claims priority, application WIPO, Nov. 7, 1994, DM/031236
Term of patent 14 years
U.S. Cl. D11—3



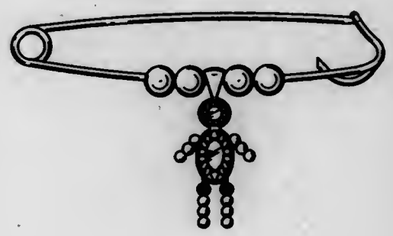
368,048
JEWELRY CHAIN
David Rozenwasser, Savion, Israel, assignor to David Rozenvasser, Petach-Tikva, Israel
Filed Jan. 4, 1995, Ser. No. 33,056
Claims priority, application Israel, Sep. 8, 1994, 23263
Term of patent 14 years
U.S. Cl. D11—13



368,049
JEWELRY CHAIN
David Rozenwasser, Savion, Israel, assignor to David Rozenvasser, Petach-Tikva, Israel
Filed Jan. 4, 1995, Ser. No. 33,057
Claims priority, application Israel, Jul. 5, 1994, 22891
Term of patent 14 years
U.S. Cl. D11—13



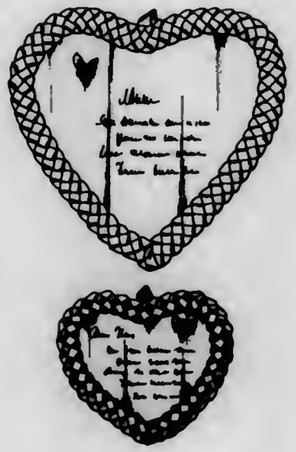
368,050
JEWELRY PIN
Laurie Hayslip, 275 E. Euclid St., Valley Stream, N.Y. 11580
Filed Nov. 3, 1994, Ser. No. 30,624
Term of patent 14 years
U.S. Cl. D11—44



368,851
HOLIDAY ORNAMENT
Elizabeth L. Snoddy, 1006 Moores Mill Rd., Auburn, Ala. 36830
Filed Apr. 28, 1995, Ser. No. 38,081
Term of patent 14 years
U.S. Cl. D11—121



368,852
PLAQUE
Alfa I. Méndez, New York, N.Y., assignor to Alfa Iris Mendez, New York, N.Y.
Filed Oct. 12, 1993, Ser. No. 14,859
Term of patent 14 years
U.S. Cl. D11—133



368,853
BOAT TRAILER
Daniel M. Gallagher, 10351 Highway 301 South, Dade City, Fla. 33525
Filed Mar. 6, 1995, Ser. No. 35,757
Term of patent 14 years
U.S. Cl. D12—101

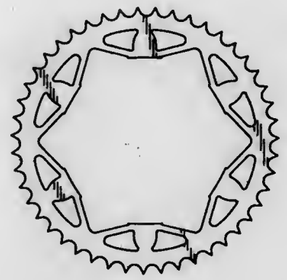


368,854
BICYCLE SUSPENSION FORK
Steven J. Behrens, Canyon Country; Scott M. Boyer, Valencia, both of Calif., and E. Douglas Bradbury, Colorado Springs, Colo., assignors to Answer Products, Inc., Valencia, Calif.
Filed Apr. 17, 1995, Ser. No. 37,549
Term of patent 14 years
U.S. Cl. D12—118





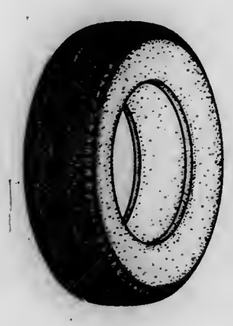
368,855
CYCLE SPROCKET
Jean J. Jouret, Sequedin, France, assignor to Ets Jouret Vanoverschelde, Lomme Cedex, France
Filed Feb. 18, 1994, Ser. No. 18,959
Term of patent 14 years
U.S. Cl. D12—123



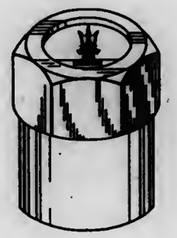
368,856
AUTOMOBILE TIRE
Hisaya Morishita; Hirohisa Hazama; Toshihiko Suzuki, all of Hiratsuka; Izumi Kuramochi, and Hiroshi Tokizaki, both of Tokyo, all of, Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan
Filed May 26, 1994, Ser. No. 23,559
Claims priority, application Japan, Dec. 7, 1993, 5-36878
Term of patent 14 years
U.S. Cl. D12—147



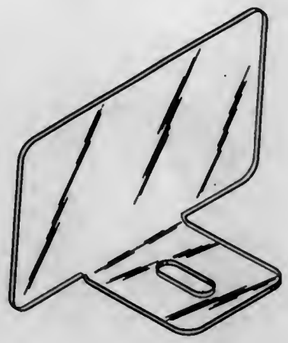
368,857
AUTOMOBILE TIRE
Kenichi Shirai; Sadakazu Takei, both of Hiratsuka; Toshihiko Suzuki, Tokyo; Hiroshi Tokizaki, Tokyo, and Izumi Kuramochi, Tokyo, all of, Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan
Filed Jun. 29, 1994, Ser. No. 25,297
Claims priority, application Japan, Feb. 3, 1994, 6-2095
Term of patent 14 years
U.S. Cl. D12—147



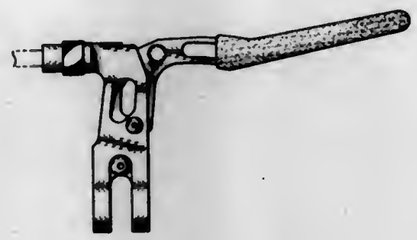
368,858
AUTOMOTIVE VALVE CAP WITH DISPLAY DIMPLE
Robert R. Robinson, 695 Blaine Way, Hayward, Calif. 94544
Filed Dec. 7, 1994, Ser. No. 31,863
Term of patent 14 years
U.S. Cl. D12—153



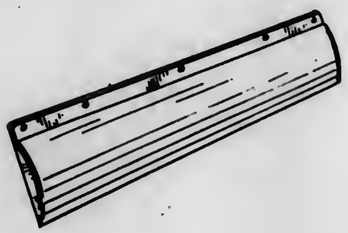
368,059
TRAILER HITCH GUARD
Robert K. Barth, 11763 82nd Ter. N., Seminole, Fla. 34642
Filed Jan. 6, 1995, Ser. No. 33,238
Term of patent 14 years
U.S. Cl. D12—162



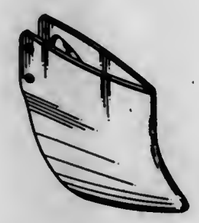
368,061
MOUNTAIN BICYCLE BRAKE LEVER
Greg Burns, 3756 Green Cir., Carson City, Nev. 89705
Filed Jan. 5, 1995, Ser. No. 33,119
Term of patent 14 years
U.S. Cl. D12—179



368,060
GARAGE WALL MOUNTED CAR DOOR PROTECTOR
Richard I. Perlman, 4694 Alvarado Canyon Rd., Ste. A, San Diego, Calif. 92120
Filed Apr. 10, 1995, Ser. No. 37,290
Term of patent 14 years
U.S. Cl. D12—167

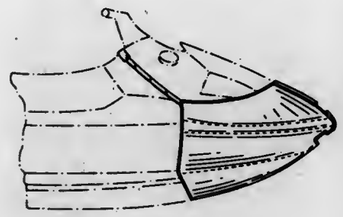


368,062
OUTBOARD MOTOR PROP ATTACHMENT
Scott S. Porta, 117 Wilkinson Dr., Edgewater, Fla. 32132
Filed Mar. 13, 1995, Ser. No. 36,890
Term of patent 14 years
U.S. Cl. D12—317

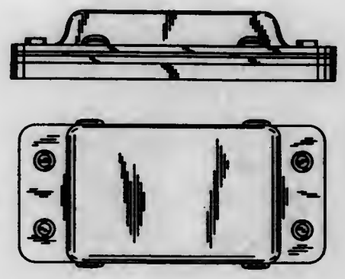




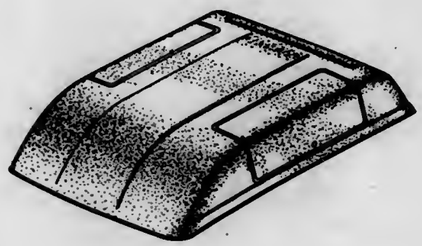
368,063
BOAT PROTECTIVE COVER
Donald R. Newton, 3901 N. Kickapoo, No. 11, Shawnee, Okla. 74801
Filed May 16, 1995, Ser. No. 39,279
Term of patent 14 years
U.S. Cl. D12—317



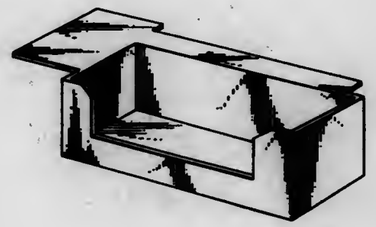
368,065
VEHICLE ROOF MOUNTABLE CONTAINER FOR RELEASABLE EMERGENCY SIGNALING BALLOON
Harvey Webb, 6050 Beresford, Burnaby BC, Canada
Filed Sep. 6, 1994, Ser. No. 27,983
Term of patent 14 years
U.S. Cl. D12—412



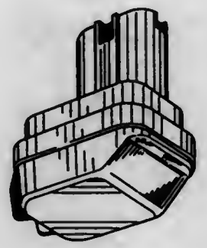
368,064
OPEN-BOTTOMED COVER FOR MOUNTING ON THE ROOF OF A MOTOR VEHICLE
Donald R. Speece, 1130 E. Gene Autry Way, Anaheim, Calif. 92805-6714
Filed May 15, 1995, Ser. No. 38,895
Term of patent 14 years
U.S. Cl. D12—404



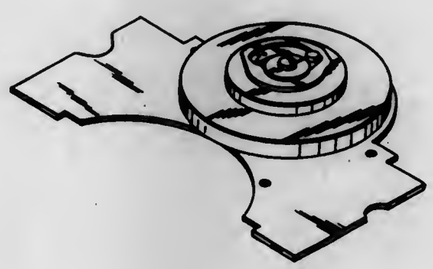
368,066
LETTER RECEPTACLE FOR A VEHICLE
Clarence E. Boles, 3593 Idle Creek Dr., Decatur, Ga. 30034
Filed Jun. 13, 1994, Ser. No. 24,371
Term of patent 14 years
U.S. Cl. D12—425



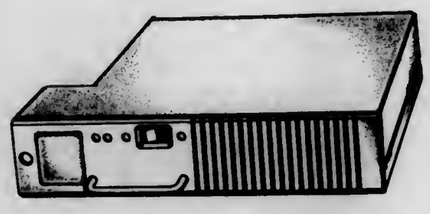
368,067
BATTERY PACK
Michio Okumura, Anjo, Japan, assignor to Makita Corporation, Japan
Filed Sep. 19, 1994, Ser. No. 28,641
Claims priority, application Japan, Mar. 23, 1994, 6-7723
Term of patent 14 years
U.S. Cl. D13—183



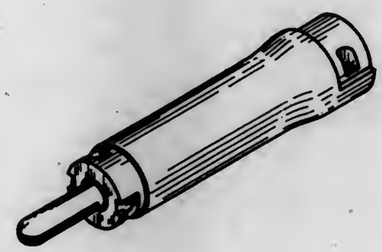
368,069
COMBINED ELECTRIC MOTOR AND BRACKET
Hiroshi Sakashita; Norihide Yoshida, and Katsuyoshi Miyasaka, all of Nagano, Japan, assignors to Sankyo Seiki Mfg. Co., Ltd., Nagano, Japan
Division of Ser. No. 17,875, Jan. 3, 1994, abandoned. This application Mar. 9, 1995, Ser. No. 35,915
Claims priority, application Japan, Jul. 7, 1993, 5-28797; Jul. 7, 1993, 5-28798
Term of patent 14 years
U.S. Cl. D13—112



368,068
PLUG-IN POWER CONVERSION UNIT HOUSING
Tor A. Alden, Bernardsville, N.J.; Michael R. Buskmiller, Dallas, and Edward C. Fontana, Rockwall, both of Tex., assignors to AT&T Corp., Murray Hill, N.J.
Filed Mar. 4, 1994, Ser. No. 19,530
Term of patent 14 years
U.S. Cl. D13—110

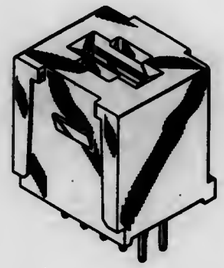


368,070
ELECTRICAL PLUG
William G. Krekeagger, Chatsworth, Calif., assignor to Mole-Richardson Co., Hollywood, Calif.
Filed Dec. 5, 1994, Ser. No. 31,770
Term of patent 14 years
U.S. Cl. D13—133

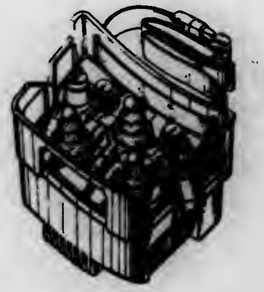




368,071
PERPENDICULAR MOUNTING HYBRID MODULAR ELECTRICAL POWER CONNECTOR
Larry D. Eaton, Fremont, Calif., assignor to TVM, Inc., Fremont, Calif.
Filed Sep. 22, 1994, Ser. No. 28,822
Term of patent 14 years
U.S. Cl. D13—147



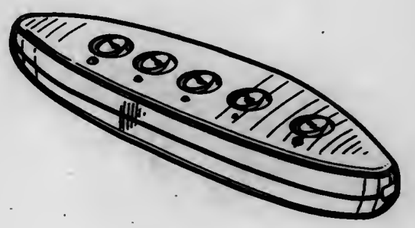
368,073
REMOTE CONTROL
Gianfranco Zalian, Noventa Padovana, Italy, assignor to Autec S.r.l., Caldogno, Italy
Filed Nov. 24, 1993, Ser. No. 15,752
Claims priority, application Italy, May 27, 1993, VI9300053
Term of patent 14 years
U.S. Cl. D13—168



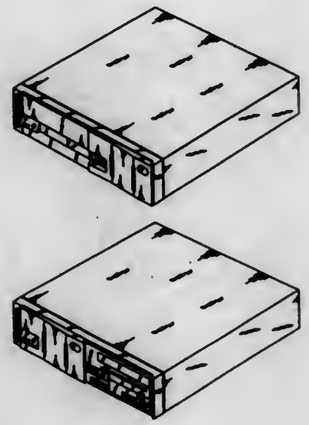
368,072
FUSE
Hisashi Hanazaki; Hiroki Kondo; Toshiharu Kudo, and Mitsuhiko Totsuka, all of Shizuoka, Japan, assignors to Yazaki Corporation, Japan
Filed Jun. 20, 1994, Ser. No. 24,730
Term of patent 14 years
U.S. Cl. D13—161



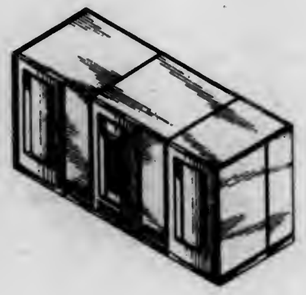
368,074
PUSHBUTTON CONTROLLER
Stuart H. Lee, Brooklyn, and Tucker Viemeister, New York, both of N.Y., assignors to Kaz, Incorporated, New York, N.Y.
Filed Jun. 12, 1995, Ser. No. 40,147
Term of patent 14 years
U.S. Cl. D13—168



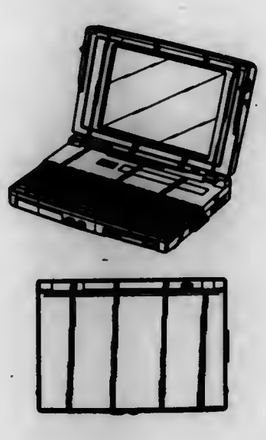
368,075
DESKTOP COMPUTER
Toshitaka Imai, Sagamihara, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 7, 1995, Ser. No. 35,845
Claims priority, application Japan, Sep. 7, 1994, 6-27152
Term of patent 14 years
U.S. Cl. D14—100



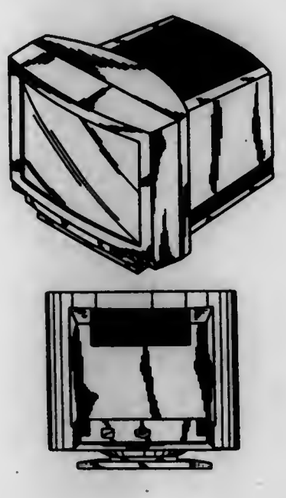
368,076
ELECTRONIC COMPUTER
Yuji Kuramitsu; Kazuo Maruyama; Hiroyuki Tsuzuki; Eiji Hori, all of Tokyo; Hiromu Sano, Yamanashi, and Toshiaki Mizushima, Tokyo, all of, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed May 2, 1995, Ser. No. 38,291
Claims priority, application Japan, Nov. 2, 1994, 6-33542
Term of patent 14 years
U.S. Cl. D14—100



368,077
ELECTRONIC COMPUTER
Masaaki Iino, Saitama, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan
Filed Mar. 13, 1995, Ser. No. 36,886
Claims priority, application Japan, Sep. 30, 1994, 6-29545
Term of patent 14 years
U.S. Cl. D14—106

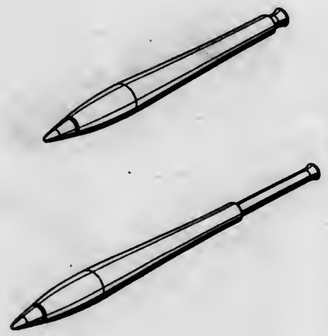


368,078
MONITOR FOR USE WITH A COMPUTER
Wun S. Back, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Rep. of Korea
Filed Jun. 13, 1994, Ser. No. 24,380
Claims priority, application Rep. of Korea, Jan. 18, 1994, 940/1994
Term of patent 14 years
U.S. Cl. D14—113

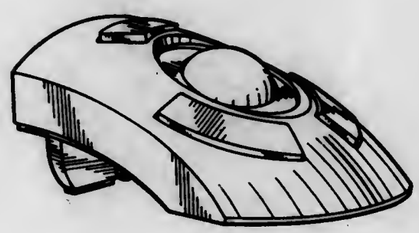




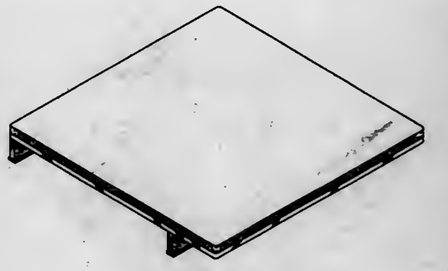
368,079
STYLUS FOR A HANDHELD COMPUTER
Jonathan P. Ive, San Francisco, and Ronald J. Moller, Boulder Creek, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.
Filed Mar. 2, 1994, Ser. No. 19,472
Term of patent 14 years
U.S. Cl. D14—114



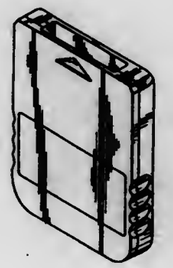
368,080
COMPUTER MOUSE
Daniel Aeschbacher, Montreux, and Wolfgang Jönsson, La Tour-de-Peilz, both of, Switzerland, assignors to Logitech SA, Romanel s/Morges, Switzerland
Filed May 31, 1994, Ser. No. 23,693
Claims priority, application Hague Agreement, Nov. 30, 1993, DM/028570
Term of patent 14 years
U.S. Cl. D14—114



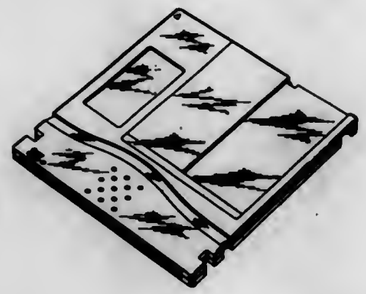
368,081
COMPUTER MOUSE PLATFORM FOR ATTACHMENT TO A KEYBOARD
Carolyn E. Comley, 35 Weehawken Cir., Taylors, S.C. 29687
Filed Aug. 25, 1994, Ser. No. 27,593
Term of patent 14 years
U.S. Cl. D14—114



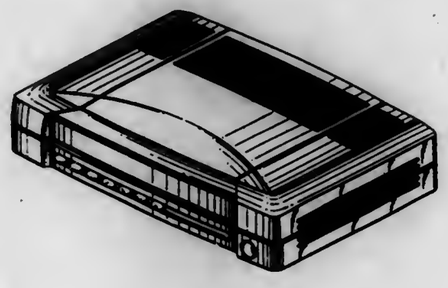
368,082
MEMORY CARD
Teiyu Goto, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Nov. 4, 1994, Ser. No. 30,139
Claims priority, application Japan, May 7, 1994, 6-12894
Term of patent 14 years
U.S. Cl. D14—114



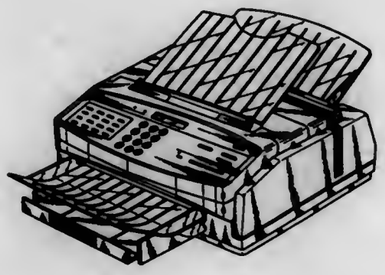
368,083
OPTICAL DISK CARTRIDGE
Takayuki Hayami; Masahiko Moriwaki; Yutaka Kohno, and Yuji Takahashi, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Mar. 17, 1995, Ser. No. 36,324
Claims priority, application Japan, Sep. 19, 1994, 6-22547
Term of patent 14 years
U.S. Cl. D14—114



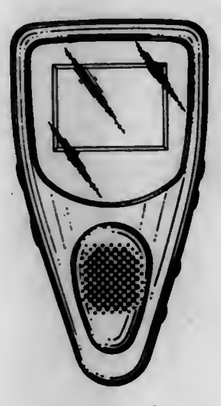
368,085
SET TOP TELEVISION CONVERTER
Faquir C. Mittal, Audubon; Doris Witzman, Philadelphia, both of Pa., and Stephen G. Miggels, Wyckoff, N.J., assignors to General Instrument Corporation of Delaware, Chicago, Ill.
Filed Apr. 24, 1995, Ser. No. 37,923
Term of patent 14 years
U.S. Cl. D14—125



368,084
FACSIMILE
Takuji Kaneko, Nara, Japan, assignor to Funai Electric Co., Ltd., Osaka, Japan
Filed Apr. 12, 1995, Ser. No. 37,404
Claims priority, application Japan, Jan. 17, 1994, 6-31545
Term of patent 14 years
U.S. Cl. D14—118

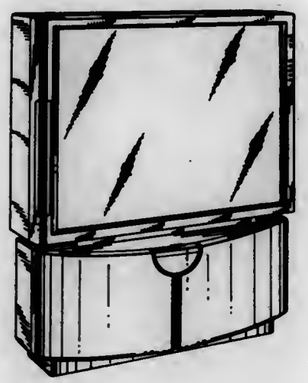


368,086
LIQUID CRYSTAL DISPLAY TELEVISION RECEIVER
Shigeyuki Kazama, Ramsey, N.J., assignor to Sony Corporation of America, Park Ridge, N.J.
Filed Mar. 16, 1995, Ser. No. 36,238
Term of patent 14 years
U.S. Cl. D14—126

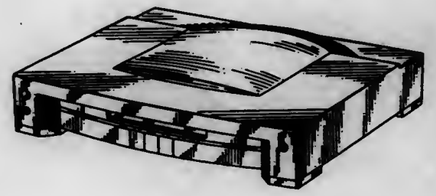




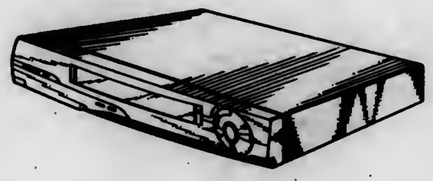
368,087
REAR PROJECTION TELEVISION RECEIVER
Richard Gioscia, Mahwah, N.J., assignor to Sony Corporation of America, Park Ridge, N.J.
Filed Apr. 19, 1995, Ser. No. 37,700
Term of patent 14 years
U.S. Cl. D14—128



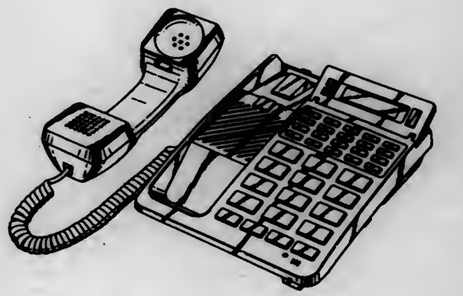
368,089
VIDEO DISK PLAYER
Hiroshi Goshima, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Mar. 24, 1995, Ser. No. 36,982
Claims priority, application Japan, Sep. 26, 1994, 6-29877
Term of patent 14 years
U.S. Cl. D14—136



368,088
VIDEO CASSETTE RECORDER
Kang H. Cha, Inchon, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea
Filed Aug. 2, 1994, Ser. No. 26,647
Claims priority, application Rep. of Korea, Mar. 8, 1994, 4321/1994
Term of patent 14 years
U.S. Cl. D14—135



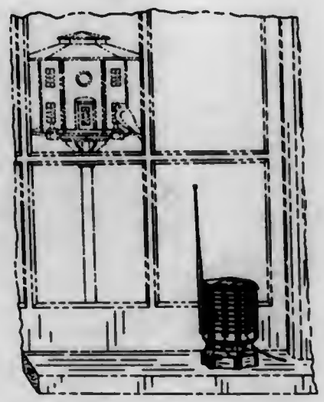
368,090
TELEPHONE SET
Josh Zeitman, Brooklyn, N.Y., assignor to Lenoxx Electronics Corp., Brooklyn, N.Y.
Filed Apr. 18, 1995, Ser. No. 37,669
Term of patent 14 years
U.S. Cl. D14—151



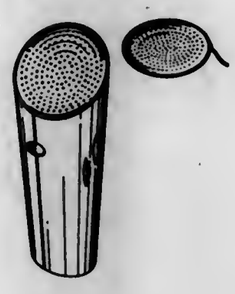
368,091
TELEPHONE
Asai Yoshihiko, Tokyo, and Kotani Satoru, Kanagawa, both of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Apr. 26, 1995, Ser. No. 38,010
Claims priority, application Japan, Jan. 26, 1994, 6-32755
Term of patent 14 years
U.S. Cl. D14—151



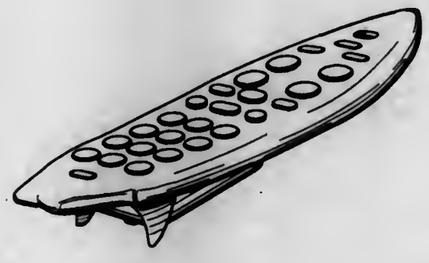
368,092
RECEIVER FOR NATIVE MONITOR
John R. Nottingham, Hunting Valley; John J. Pastrick, University Heights, and John W. Spirk, Jr., Moreland Hills, all of Ohio, assignors to County Line Limited Partnership, Inc., Warrensville Heights, Ohio
Division of Ser. No. 13,662, Sep. 29, 1993, Pat. No. Des. 361,873, which is a continuation-in-part of Ser. No. 931,934, Aug. 18, 1992, abandoned. This application May 31, 1995, Ser. No. 39,617
Term of patent 14 years
U.S. Cl. D14—188



368,093
RADIO APPARATUS
Philippe Starck, Paris, France, assignor to Thomson Consumer Electronics (Societe Anonyme), Courbevoie, France
Filed Aug. 2, 1994, Ser. No. 26,661
Claims priority, application France, Feb. 4, 1994, 940627
Term of patent 14 years
U.S. Cl. D14—195

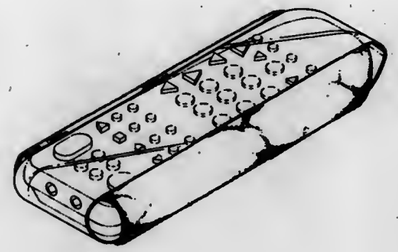


368,094
REMOTE CONTROL
Paul S. Turin, Berkeley; Robert G. Ulrich, Alameda; Robert D. Wilkes, Berkeley, and Lawrence Hitchcock, San Francisco, all of Calif., assignors to Kaleva Design Inc., San Leandro, Calif.
Filed Apr. 28, 1994, Ser. No. 21,994
Term of patent 14 years
U.S. Cl. D14—218

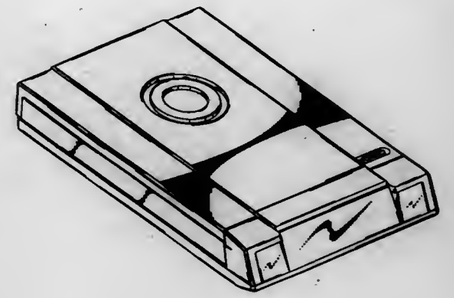




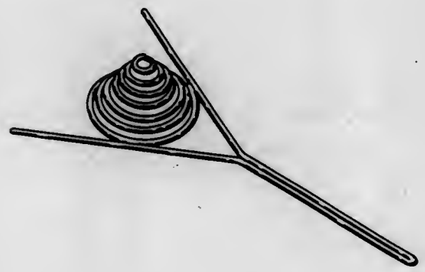
368,095
REMOTE CONTROL COVER
Myron R. McCallister, III, 3635 S. Mann Way, West Valley City, Utah 84120
Filed Aug. 1, 1994, Ser. No. 26,573
Term of patent 14 years
U.S. Cl. D14—218



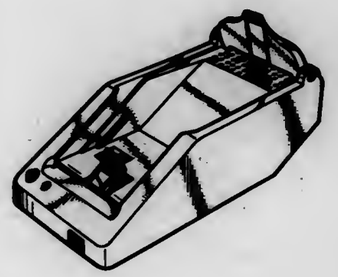
368,097
MODEM
James R. Heberling, Lawrenceville, and Samuel W. Harris, Norcross, both of Ga., assignors to Hayes Microcomputer Products, Inc., Norcross, Ga.
Filed Jun. 5, 1995, Ser. No. 39,728
Term of patent 14 years
U.S. Cl. D14—242



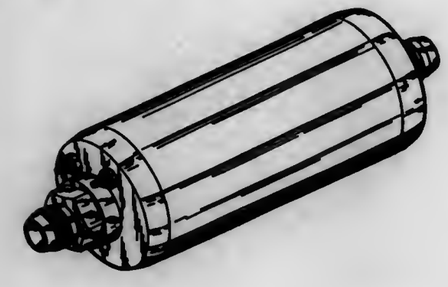
368,096
ANTENNA
Mira R. Krol, and Wolfgang P. Krol, both of 3794 Hampton Avenue, Montreal, Quebec, Canada
Filed Mar. 14, 1995, Ser. No. 36,176
Term of patent 14 years
U.S. Cl. D14—230



368,098
MOBILE PHONE HOLDER AND RECHARGER WITH EXTERNAL SPEAKER/MICROPHONE SYSTEM
Deng-Jraan Su, Taipei, Taiwan, assignor to Leng Ja Electronic Industrial Co., Ltd., Taipei, Taiwan
Filed Apr. 19, 1995, Ser. No. 37,760
Term of patent 14 years
U.S. Cl. D14—253



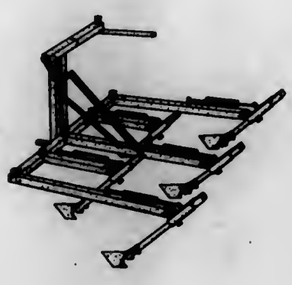
368,099
FUEL PUMP
Eric A. Stenberg, High Ridge; James H. Garrard, Kirkwood, and Steven M. Matusek, St. Charles, all of Mo., assignors to Essex Industries, Inc., St. Louis, Mo.
Filed Jan. 14, 1994, Ser. No. 24,413
Term of patent 14 years
U.S. Cl. D15—9.1



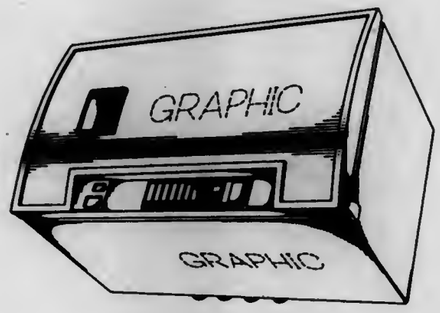
368,100
FEEDER FOR SUPPLYING A FIXED QUANTITY OF PARTICLES
Osamu Yoshikawa, 2-713 Higasi-chaboji-cho, and Hirofumi Yoshikawa, 1-2274 Miyanchi-cho, both of Sendai City, Kagoshima Pref., Japan
Filed Nov. 25, 1994, Ser. No. 31,581
Term of patent 14 years
U.S. Cl. D15—13



368,101
TILLING PLOW FOR GARDEN AND LAWN TRACTORS
Furney M. Eubanks, 750 Plantation Rd., Trenton, N.C. 28585
Filed Apr. 19, 1994, Ser. No. 21,587
Term of patent 14 years
U.S. Cl. D15—27

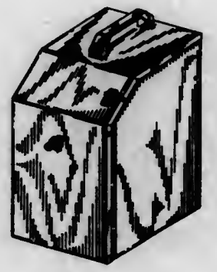


368,102
REFRIGERATOR HAVING FRONT AND SIDE PANELS WHICH RESEMBLE A VENDING MACHINE
Christopher C. Bidwell, Dunwoody, and Stephen R. Burns, Duluth, both of Ga., assignors to Circle R Central, Inc., Atlanta, Ga.
Filed Aug. 16, 1994, Ser. No. 27,234
Term of patent 14 years
U.S. Cl. D15—81

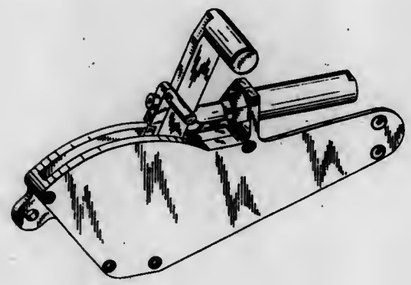




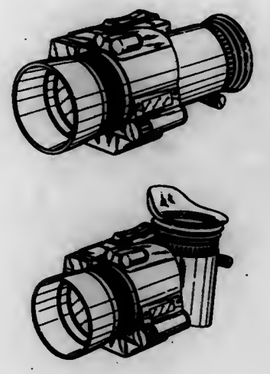

368,103
AIR TURBINE SPRAY DEVICE
Fred Zwicker, Canfield, Ohio, assignor to Truman's Inc., Canfield, Ohio
Filed May 22, 1995, Ser. No. 39,293
Term of patent 14 years
U.S. Cl. D15—124



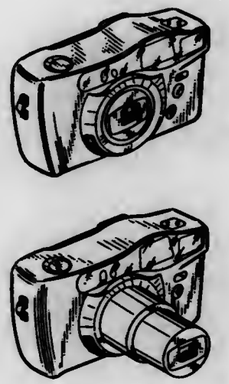
368,104
GEAR SHIFTER
James T. Pfister, 77 Parkwood Dr., Mastic Beach, N.Y. 11951, and John DeBlasio, 118 Arlington St., Patchogue, N.Y. 11772
Filed Nov. 16, 1994, Ser. No. 31,051
Term of patent 14 years
U.S. Cl. D15—149



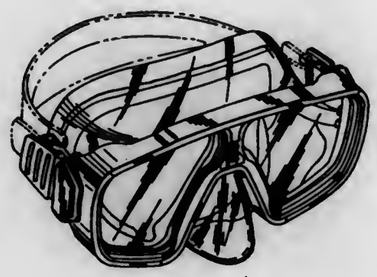
368,105
VIDEO CAMERA WITH VIDEO TAPE RECORDER
Yoichi Takahashi, Kyoto; Mitsuo Takanaga, Nara, and Kiyoshi Suzuki, Osaka, all of, Japan, assignors to Matsushita Electric Industrial Co. Ltd., Osaka, Japan
Filed Mar. 8, 1995, Ser. No. 35,867
Claims priority, application Japan, Sep. 8, 1994, 6-27522
Term of patent 14 years
U.S. Cl. D16—202



368,106
COMPACT CAMERA
Noriko Katayama, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Sep. 12, 1994, Ser. No. 28,316
Claims priority, application Japan, Mar. 17, 1994, 6-7093
Term of patent 14 years
U.S. Cl. D16—209



368,107
DIVING MASK WITH TWO WINDOWS
James R. Lutz, Round Lake; Russell Robertson, Chicago, and Craig Scherer, Wilmette, all of Ill., assignors to Decor Corporation, Northfield, Ill.
Filed Sep. 23, 1994, Ser. No. 28,888
Term of patent 14 years
U.S. Cl. D16—311



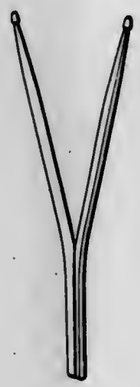
368,108
EYEGLASS
Tony Lei, 1F, No. 24, Lane 285, Chung Shan Rd., Tainan City, Taiwan
Filed May 30, 1995, Ser. No. 39,412
Term of patent 14 years
U.S. Cl. D16—326



368,109
EYEGLASS
Tony Lei, 1F, No. 24, Lane 285, Chung Shan Rd., Tainan City, Taiwan
Filed May 30, 1995, Ser. No. 39,413
Term of patent 14 years
U.S. Cl. D16—326



368,110
PERCUSSION INSTRUMENT
Jan Roos, Betesvägen 58, S-263 54 Höganäs, Sweden
Filed Oct. 21, 1994, Ser. No. 30,167
Claims priority, application Sweden, Apr. 29, 1994, 940989
Term of patent 14 years
U.S. Cl. D17—22

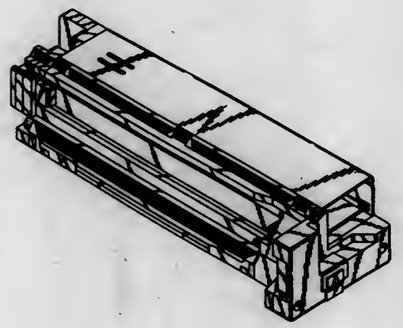




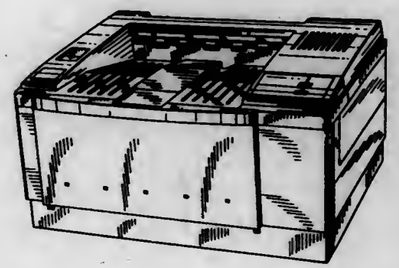
368,111
ELECTRONIC CALCULATOR
Tomoshige Komatsu, Tokyo, and Toru Suzuki, Sagamihara, both of, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan
Filed Feb. 15, 1995, Ser. No. 34,912
Term of patent 14 years
U.S. Cl. D18—7



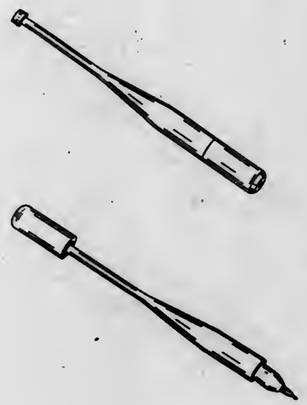
368,112
DEVELOPING UNIT FOR A REPROGRAPHIC APPARATUS
Susumu Komaki, Kobe, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan
Filed Jul. 8, 1994, Ser. No. 25,677
Claims priority, application Japan, Jan. 14, 1994, 6-422
Term of patent 14 years
U.S. Cl. D18—43



368,113
PRINTER FOR A PERSONAL COMPUTER
Mitsuo Tanaka, and Toshihiro Hayakawa, both of Nagano, Japan, assignors to Seiko Epson Corporation, Japan
Filed Nov. 22, 1994, Ser. No. 31,307
Claims priority, application Japan, May 25, 1994, 6-15001
Term of patent 14 years
U.S. Cl. D18—55



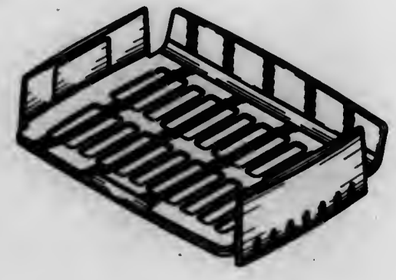
368,114
BASEBALL BAT PEN
Urho K. Hyvonen, 21 SE. 8th St., Pompano Beach, Fla. 33060
Filed Sep. 5, 1995, Ser. No. 43,435
Term of patent 14 years
U.S. Cl. D19—42



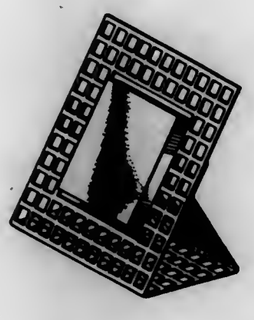
368,115
CORRECTION TAPE DISPENSER
Yoshinori Konda, Tokyo, Japan, assignor to Tombow Pencil Co., Ltd., Tokyo, Japan
Filed Apr. 10, 1995, Ser. No. 37,283
Claims priority, application Germany, Jan. 10, 1994, 94 00 662.3
Term of patent 14 years
U.S. Cl. D19—69



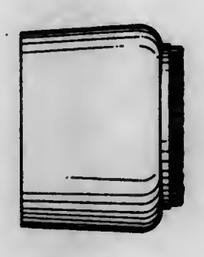
368,116
LETTER TRAY
Maria J. Kono, Maryville, Tenn., assignor to Rubbermaid Office Products Inc., Maryville, Tenn.
Filed Jul. 12, 1995, Ser. No. 41,353
Term of patent 14 years
U.S. Cl. D19—92



368,117
DISPLAY PLAQUE HOLDER
William H. Valls, Harwinton; David W. Schweitzer, West Hartford, and Jonathan C. Hamilton, Tariffville, all of Conn., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed Apr. 4, 1995, Ser. No. 37,204
Term of patent 14 years
U.S. Cl. D20—40



368,118
TOY POP GUN PROJECTILE
Joseph E. Batcham, 332 N. County Line Rd., Sylvester, Ga. 31791
Continuation-in-part of Ser. No. 857,284, Mar. 23, 1992, abandoned. This application Jul. 11, 1994, Ser. No. 25,768
Term of patent 14 years
U.S. Cl. D21—2

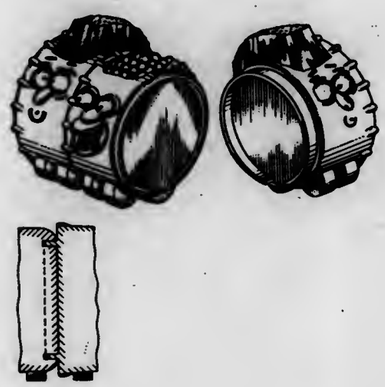




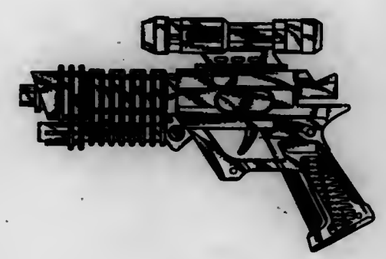
368,119
GOLF GAME
Gerald R. Hourie, 80 Templeson Crescent NE, Calgary, Alberta, Canada
Filed Nov. 23, 1994, Ser. No. 31,574
Term of patent 14 years
U.S. Cl. D21—27



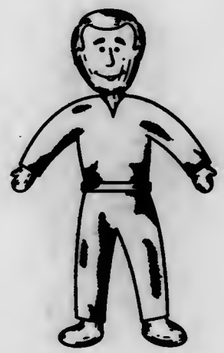
368,120
ROLLING TOY
John Hamlin, Redondo Beach, Calif., assignor to Namkung Promotions Inc., Costa Mesa, Calif.
Filed Mar. 6, 1995, Ser. No. 35,738
Term of patent 14 years
U.S. Cl. D21—59



368,121
TOY GUN
Tak-Man Lam, Kowloon, Hong Kong, assignor to Chap Mei Plastic Toys Mfy. Ltd., Hong Kong, Hong Kong
Filed Jan. 15, 1994, Ser. No. 24,580
Term of patent 14 years
U.S. Cl. D21—147



368,122
DOLL
John T. Nelson, 909 S. Quintard, Anniston, Ala. 36201
Filed Oct. 17, 1994, Ser. No. 29,838
Term of patent 14 years
U.S. Cl. D21—171



368,123
DOLL
Elonne Dantzer, 28030 Palos Verdes Dr. East, Rancho Palos Verdes, Calif. 90275, and Lawrence T. Jones, 3915 Freshwind Cir., Westlake Village, Calif. 91361
Filed May 15, 1995, Ser. No. 38,968
Term of patent 14 years
U.S. Cl. D21—171



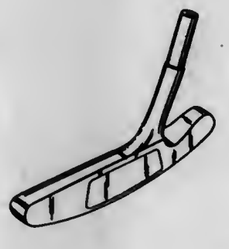
368,124
DOLL
Elonne Dantzer, 28030 Palos Verdes Dr. East, Rancho Palos Verdes, Calif. 90275, and Lawrence T. Jones, 3915 Freshwind Cir., Westlake Village, Calif. 91361
Filed May 15, 1995, Ser. No. 38,970
Term of patent 14 years
U.S. Cl. D21—171



368,125
EXERCISE SANDBAG
Todd A. Wiseman, 14722 Tall Tree Dr., Tampa, Fla. 33613
Filed Apr. 11, 1994, Ser. No. 21,147
Term of patent 14 years
U.S. Cl. D21—196

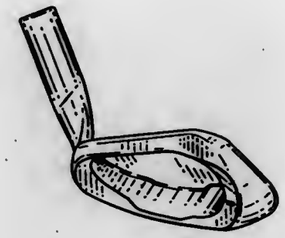


368,126
GOLF PUTTER HEAD WITH INSERT
Michael L. Magerman, Carlsbad; Bradley V. Adams, San Marcos, and Brian R. Pond, Carlsbad, all of Calif., assignors to Odyssey Sports, Inc., Carlsbad, Calif.
Filed Jul. 27, 1994, Ser. No. 26,421
Term of patent 14 years
U.S. Cl. D21—219

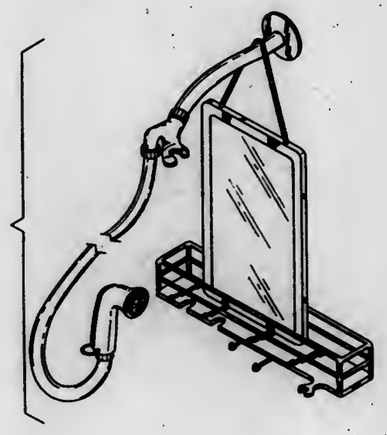




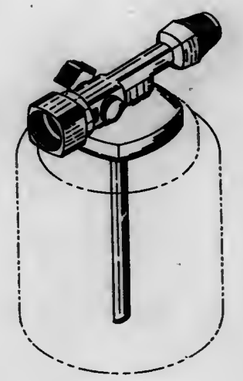
368,127
WEDGE GOLF CLUB HEAD
John A. Solheim, Phoenix, Ariz., assignor to Karsten Manufacturing Corporation, Phoenix, Ariz.
Filed Dec. 23, 1994, Ser. No. 32,696
Term of patent 14 years
U.S. Cl. D21—220



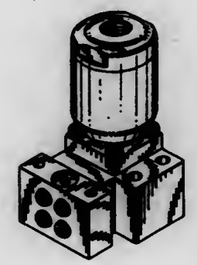
368,128
COMBINED HAND SHOWER, MIRROR AND ARTICLE HOLDER
Bill G. McCarthy, 1203 4th Ave. SE., Cascade, Iowa 52033-9568
Filed Feb. 22, 1995, Ser. No. 35,219
Term of patent 14 years
U.S. Cl. D23—213



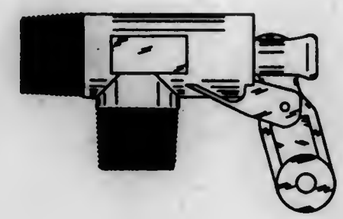
368,129
CHEMICAL DISPENSER VALVE FOR A BOAT ENGINE FLUSHER
Leo F. Peeples, 2200 NW. 32nd Ter., Lauderdale Lakes, Fla. 33311
Filed Jan. 26, 1995, Ser. No. 34,041
Term of patent 14 years
U.S. Cl. D23—225



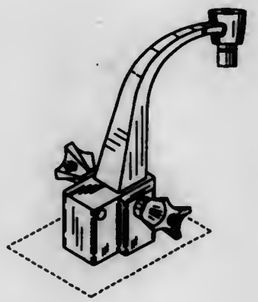
368,130
AIR OPERATED VALVE
Hiroshi Itafuji, Kasugai, Japan, assignor to CKD Kabushiki Kaisha, Komaki, Japan
Filed Mar. 8, 1995, Ser. No. 35,852
Claims priority, application Japan, Nov. 11, 1994, 6-35561
Term of patent 14 years
U.S. Cl. D23—233



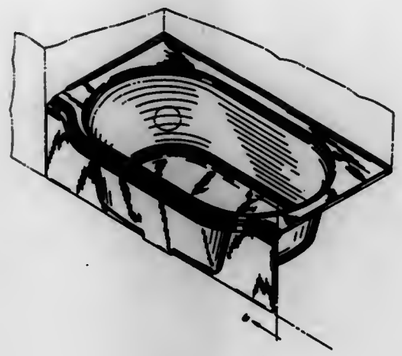
368,131
FLOAT VALVE
Harley E. Stone, III, 6310 Harlow Blvd., Jacksonville, Fla. 32210
Filed Dec. 29, 1994, Ser. No. 32,819
Term of patent 14 years
U.S. Cl. D23—236



368,132
FIXTURE FOR A LABORATORY TABLE
Wilton R. Errington, Crystal Springs, Miss., assignor to General Equipment Manufacturers, Inc., Jackson, Miss.
Filed Jun. 6, 1994, Ser. No. 24,844
Term of patent 14 years
U.S. Cl. D23—241



368,133
TUB FOR BATHING
Mary J. Reid, and Todd D. Dannenberg, both of Sheboygan, Wis., assignors to Kohler Co., Kohler, Wis.
Filed Jan. 21, 1994, Ser. No. 17,726
Term of patent 14 years
U.S. Cl. D23—277

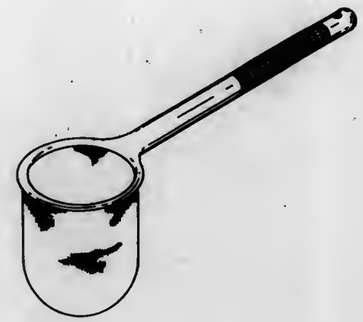


368,134
WATER CLOSET
Mary J. Reid, Sheboygan, Wis., assignor to Kohler Co., Kohler, Wis.
Filed Apr. 26, 1995, Ser. No. 38,041
Term of patent 14 years
U.S. Cl. D23—301

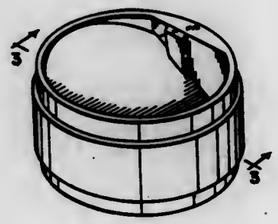




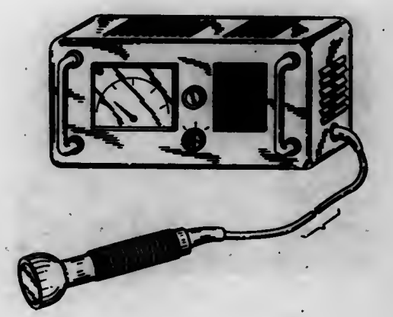
368,135
URINE SAMPLE CUP HOLDER
Felila Vanai, P.O. Box 37886, Honolulu, Hi. 96837
Filed Sep. 20, 1994, Ser. No. 28,685
Term of patent 14 years
U.S. Cl. D24—122



368,136
HEART VALVE PIVOT ARRANGEMENT
Thomas H. Reif, St. Lucie, Fla., assignor to Republic Medical Products Inc., Vero Beach, Fla.
Division of Ser. No. 873,061, Apr. 24, 1992, Pat. No. Des. 358,648. This application Nov. 10, 1994, Ser. No. 30,864
Term of patent 14 years
U.S. Cl. D24—155



368,137
FOREIGN OBJECT DETECTOR FOR HUMAN OR OTHER ANIMAL BODY
Eugene S. Gregg, III, 20 Sail Port Rd., Hilton Head Island, S.C. 29928
Filed Aug. 12, 1994, Ser. No. 27,112
Term of patent 14 years
U.S. Cl. D24—186



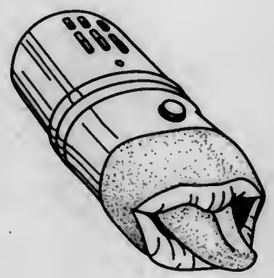
368,138
BABY BOTTLE
John S. Hamilton, Perth, United Kingdom, assignor to Gleneagles Spring Waters Company Limited, Perthshire, United Kingdom
Filed Sep. 8, 1994, Ser. No. 28,190
Claims priority, application United Kingdom, Mar. 11, 1994, 2037675
Term of patent 14 years
U.S. Cl. D24—197



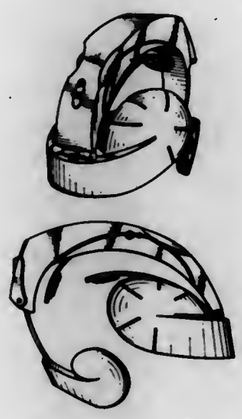
368,139
ABACUS MASSAGER
Kam S. Yim, and Kwong T. Tsang, both of Flat/Room B 6/F, High Win Factory Building, 47 Hoi Yuen Road, Kwun Tong, Kowloon, Hong Kong
Filed Aug. 12, 1994, Ser. No. 27,188
Claims priority, application United Kingdom, Feb. 12, 1994, 2037124
Term of patent 14 years
U.S. Cl. D24—212



368,140
PORTABLE HAND-HELD VIBRATORY FEMININE STIMULATOR
George Hopper, 8340 Greensboro Dr. #402, McLean, Va. 22182
Filed Aug. 11, 1994, Ser. No. 27,015
Term of patent 14 years
U.S. Cl. D24—215



368,141
HUMAN SCALP MASSAGER
Gustavo R. Rabin, 4927 Rhodes Ave., and Pablo Trench, 12419 Huston St., both of Valley Village, Calif. 91607
Filed Mar. 23, 1995, Ser. No. 36,635
Term of patent 14 years
U.S. Cl. D24—215

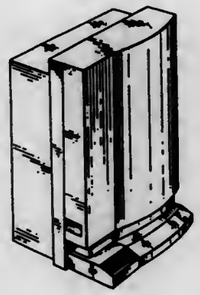


368,142
MULTI TIP LIQUID TRANSFER PIPETTE
Don Malinoff, Granada Hills, and Ara Martirosian, Woodland Hills, both of Calif., assignors to DBM Scientific Corporation, Valencia, Calif.
Filed Apr. 18, 1994, Ser. No. 21,459
Term of patent 14 years
U.S. Cl. D24—222

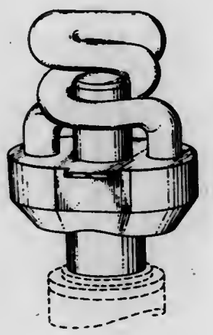




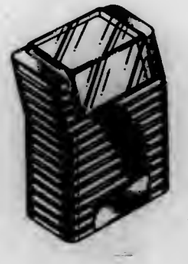
368,143
DNA SEQUENCING CABINET
Keith S. Willows, Palo Alto; Gilbert Y. Wong, San Francisco, and Max K. Yoshimoto, San Mateo, all of Calif., assignors to LI-Cor, Inc., Lincoln, Nebr.
Continuation of Ser. No. 753,888, Aug. 29, 1991, abandoned. This application May 24, 1994, Ser. No. 25,981
Term of patent 14 years
U.S. Cl. D24—233



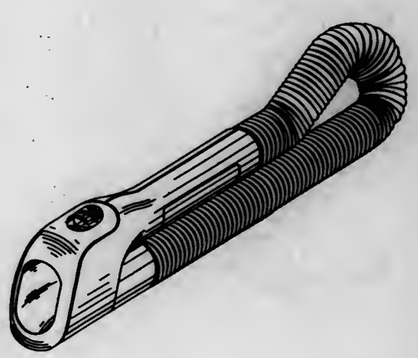
368,144
COMPACT FLUORESCENT LAMP
Walter Holzer, Drosteweg 19, D-88709 Meersburg, Germany
Filed Mar. 14, 1994, Ser. No. 19,922
Claims priority, application Germany, Sep. 16, 1993, DM/027389
Term of patent 14 years
U.S. Cl. D26—3



368,145
STROBE LIGHT
Wayne E. Smith, 1501 Sunset Dr., Lake Charles, La. 70605
Filed Jun. 30, 1994, Ser. No. 25,447
Term of patent 14 years
U.S. Cl. D26—39



368,146
FLASHLIGHT
Richard J. Carbone, Southbury, Conn., assignor to Black & Decker Inc., Newark, Del.
Filed Feb. 6, 1995, Ser. No. 34,585
The portion of the term of this patent subsequent to Aug. 15, 2009, has been disclaimed.
Term of patent 14 years
U.S. Cl. D26—43



368,147
FLASHLIGHT
David J. Bamber, Wichita, Kans.; Benson Leung, and Vincent Leung, both of Kowloon, Rep. of Korea, assignors to The Coleman Company, Inc., Wichita, Kans.
Filed Nov. 8, 1994, Ser. No. 30,621
Term of patent 14 years
U.S. Cl. D26—49



368,148
CEILING LAMP
Jimmy Lee, Taipei Hsien, Taiwan, assignor to Shan Hsing Lighting Decortion Co., Ltd., Taipei Hsien, Taiwan
Filed Feb. 6, 1995, Ser. No. 34,490
Term of patent 14 years
U.S. Cl. D26—86



368,149
TABLE LAMP
Alexander Yu, 10F-1, No. 1, Lane 550, Ming-Chuan E. Rd., Taipei City, Taiwan
Filed Apr. 11, 1995, Ser. No. 37,375
Term of patent 14 years
U.S. Cl. D26—110



368,150
HAIR STYLER FOR MAKING FRENCH ROLLS
Kimberli Pereira, 112 Cedar St., Mansfield, Tex. 76063
Filed Jul. 27, 1994, Ser. No. 26,765
Term of patent 14 years
U.S. Cl. D28—10



# LIST OF PATENTEES

TO WHOM

## PATENTS WERE ISSUED ON THE 19th DAY OF MARCH, 1996

NOTE— Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).


Aah, Volker, to Robert Bosch GmbH. Device for detecting the speed and direction of a movable component using a single signal line. 5,500,585, Cl. 324-165.000.

Aalto, Jouni; Pakkanen, Raimo; Satama, Lea; Luopa, Jyrki; Allén, Timo; Virtanen, Arja; and Kauttinen, Ari, to Viable Bioproducts, Ltd. Colostrum fraction, a process of preparing it and its use as a supplement in cell culture media. 5,500,229, Cl. 424-535.000.

AB Carl Munters: *See*—
Vaagbo, Håkan, 5,500,402, Cl. 502-408.000.

AB Electrolux: *See*—
Hagqvist, Peter, 5,500,247, Cl. 427-244.000.

Abass, Hazim H.: *See*—
Surjaatmadja, Jim B.; Helton, Timothy W.; and Abass, Hazim H., 5,499,678, Cl. 166-298.000.

ABB Management AG: *See*—
Widenhorn, Markus, 5,499,693, Cl. 184-6.240.

ABB Research Ltd.: *See*—
Meier, Markus, 5,500,909, Cl. 385-12.000.

Abbott, Derek: *See*—
Esfarghian, Kasaran; and Abbott, Derek, 5,500,522, Cl. 250-208.100.

Abbott, Joe L.; and Andrade, Michael S., to Enviro Pac International, L.Lc. Lachrymator aerosol formulations. 5,500,205, Cl. 424-401.000.

Abbott Laboratories: *See*—
Shafer, Warren E.; Woolard, Derek D.; Samuel, Neyyan K. P.; Veasburg, Gregory D.; Devisetty, Bala N.; and Heimsa, Daniel F., 5,500,403, Cl. 504-115.000.

Abe, Katsuo: *See*—
Inoue, Youichi; Sato, Yoshihiro; Hirose, Shinichi; Tani, Hiroshi; Tanaka, Katsuyuki; Abe, Katsuo; Ohara, Masaki; and Mizumoto, Muneo, 5,500,296, Cl. 428-408.000.

Abe, Kenji: *See*—
Hiki, Susumu; Kondo, Mitsu; and Abe, Kenji, 5,499,630, Cl. 128-662.050.

Abe, Masaki: *See*—
Udagawa, Satoru; Abe, Masaki; Aado, Satoru; Matsuki, Yasuhiro; Watanabe, Toyofumi; Shichara, Yukimitsu; Morita, Masaya; and Kido, Akimasa, 5,500,290, Cl. 428-610.000.

Acker, Duane R.: *See*—
Weimer, Ralph; and Acker, Duane R., 5,499,641, Cl. 134-65.000.

Adachi, Kazunori: *See*—
Komada, Noriharu; Nishisaka, Keiji; Adachi, Kazunori; and Fujiwara, Shuji, 5,500,158, Cl. 252-637.000.

Adams, Harold F.; Suarez, Roderick A.; and Eagle, Lewis H., to Interface, Inc. Low profile raised panel flooring with metal support structure. 5,499,476, Cl. 52-220.100.

Adamson, Paul H. Surgical pin protector. 5,499,982, Cl. 606-53.000.

Adamson, Steven J.: *See*—
Walter, Lee; and Adamson, Steven J., 5,500,279, Cl. 428-213.000.

Addesso, Kevin; Dzurenko, Theresa E.; Moisey, Mark J.; Levine, Harry; Slade, Louise; Manna, James M.; Fazzolare, Richard D.; Ievolella, James; and Wang, Martha Y., to Nabisco, Inc. Production of chip-like starch based snacks. 5,500,240, Cl. 426-560.000.

Adir et Compagnie: *See*—
Godfroid, Jean-Jacques; Lamouri, Aazdine; Touboul, Esera; Wang, Xuan; Renard, Pierre; Pfeiffer, Bruno; and Guardiola, Béatrice, 5,500,426, Cl. 514-252.000.
Lavielle, Gilbert; Hautefaye, Patrick; Muller, Olivier; Millan, Mark; and Brocco, Mauricette, 5,500,443, Cl. 514-422.000.

Adtran: *See*—
Webster, Mark A.; Baldwin, Keith R.; and Roberts, Richard D., 5,500,879, Cl. 375-353.000.

Advanced Peripherals Labs, Inc.: *See*—
Chen, Roger; and Kinsey, Kenneth K., Jr., 5,500,831, Cl. 365-233.000.

Aeppli, Kurt, to Zellweger Luwa AG. Process and device for detecting foreign substances in a textile test material using an alternating light and dark background. 5,499,794, Cl. 250-559.450.

Aerospace Societe Nationale Industrielle: *See*—
Tournier, Gilles; Roques, Serge; and Ballenghien, Jean-Luc, 5,499,448, Cl. 29-863.000.

Aerospatiale: *See*—
Odru, Pierre; Sparks, Charles; Auberon, Marcel; and Behar, Jacques, 5,499,661, Cl. 138-124.000.

Aerospatiale Societe Nationale Industrielle: *See*—
Crabere, Henri; Mitonneau, Gilbert; and Maury, Julien, 5,499,784, Cl. 244-135.00A.
Noger, Joël, 5,500,797, Cl. 364-424.040.

Aeschlimann, William M. Universal open ended socket wrench. 5,499,560, Cl. 81-63.200.

Agency of Industrial Science & Technology, Ministry of International Trade & Industry: *See*—
Thira, Kazunari; Nishikawa, Satoshi; and Maeda, Hidekatsu, 5,500,357, Cl. 435-91.310.

Aghajanian, Michael K.: *See*—
Rocazella, Michael A.; Becker, Kurt J.; and Aghajanian, Michael K., 5,500,244, Cl. 427-181.000.

Agri Dynamics, Inc.: *See*—
Vosier, Nathan; and Whitten, Jim, 5,499,898, Cl. 414-755.000.

Aguilar, Peter: *See*—
Zievers, James F.; Zievers, Elizabeth C.; Aguilar, Peter; and Eggerstedt, Paul, 5,500,029, Cl. 55-485.000.

Agur, Enno E.: *See*—
Mahabadi, Hadi K.; Agur, Enno E.; McAneney, T. Brian; Kao, Shean V.; Allison, Gerald R.; Hawkins, Michael S.; Gruskin, Bernard; Kittelberger, J. Stephen; Chang, Joo T.; and Hollenbaugh, William H., Jr., 5,500,324, Cl. 430-137.000.

Ahlquist, John B.: *See*—
Sander-Cederlof, Brian; and Ahlquist, John B., 5,500,927, Cl. 395-133.000.

Ahlquist, Paul G.; and French, Roy C., to Mycogen Plant Science, Inc. RNA transformation vector. 5,500,360, Cl. 435-172.300.

Ahmed, Bashir M.; Jayasuriya, Rohitha M.; and Hopkins, Thomas R., to Henkel Corporation. Composition and process for and article with improved autodeposited surface coating based on epoxy resin. 5,500,460, Cl. 523-402.000.

Ahn, Seong-Ick, to Daewoo Electronics Co., Ltd. Reel disc driving device for a video cassette recorder. 5,499,777, Cl. 242-356.000.

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Aica Kogyo Co., Ltd.: *See*—
Kubota, Yoshikazu; Kasujo, Masayasu; Otsu, Hiroshi; and Kamiya, Takashi, 5,500,259, Cl. 428-15.000.

Aida, Midori, to Ricoh Company, Ltd. Color image input apparatus. 5,500,746, Cl. 358-518.000.

Aiga, Masao: *See*—
Yoshida, Yasushi; Nakajima, Yasuo; and Aiga, Masao, 5,500,869, Cl. 372-50.000.

Air Products and Chemicals, Inc.: *See*—
Burgoyne, William F., Jr.; Daniels, Wiley E.; Segl, Dennis; Lee, Heuch-Chi; and Vratsanos, Menas S., 5,500,251, Cl. 427-322.000.
Kalthod, Dilip G., 5,500,036, Cl. 95-54.000.
Magnotta, Vincent L.; Ayala, Varia; and Cirucci, John F., 5,500,085, Cl. 162-30.110.

Aishima, Shizuo: *See*—
Tanaka, Toshiyuki; Kodera, Akira; and Aishima, Shizuo, 5,499,768, Cl. 239-406.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Katagiri, Masayoshi; Suzuki, Kazuhiko; and Takeuchi, Mitsunari, 5,499,865, Cl. 303-115.200.

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Yamada, Takahiro; Aado, Shinji; and Naruse, Yoshihiro, 5,499,909, Cl. 417-384.000.

Aizawa, Toshiro: *See*—
Fujita, Kouji; Higuchi, Shigemitsu; Aizawa, Toshiro; Saga, Atsuo; and Kosuge, Minoru, 5,500,775, Cl. 360-70.000.

Akashi, Yasutaka: *See*—
Tanikawa, Hirohide; Uchiyama, Masaki; Joh, Yoshinobu; Akashi, Yasutaka; Taya, Masaki; and Unno, Makoto, 5,500,318, Cl. 430-99.000.

Akashiro, Kotaro: *See*—
Sakamishi, Yutaka; and Akashiro, Kotaro, 5,499,877, Cl. 400-193.000.

Akeda, Nobuyuki, to Yazaki Corporation. Lever-operated connector assembly. 5,499,926, Cl. 439-157.000.

Akira, Toshiro: *See*—
Miyawaki, Hiroshi; Inojima, Mitsuhiko; Ota, Takayuki; Yamamoto, Kazuyoshi; Akira, Toshiro; and Tsuji, Masaaki, 5,500,712, Cl. 355-22.000.

Akiyama, Jun: *See*—
Miyake, Tomoyuki; Inui, Toshiharu; Akiyama, Jun; and Kojima, Kunio, 5,500,839, Cl. 369-13.000.

Akiyama, Shigeaki: *See*—
Makino, Kenzi; Akiyama, Shigeaki; Suzuki, Hideaki; Nagaoka, Takashi; Niki, Toshio; Suzuki, Koichi; Nawamaki, Tsutomu; Watanabe, Shigeomi; and Ishikawa, Kimihiro, 5,500,406, Cl. 504-215.000.

Aktiebolaget Astra: *See*—

Larsson, Lars-Gunnar; Renyl, Lucy A.; Ross, Svante B.; Sohn, Daniel D.; and Thorberg, Seth-Olov, 5,500,425, Cl. 514-233.500.
Aktiebolaget Electrolux: *See*—
Andersson, Sven-Erik; and Kornelind, Johnny S., 5,499,516, Cl. 62-494.000.
Martinsson, Pär B. G., 5,500,159, Cl. 261-52.000.
Aladdin Industries, Inc.: *See*—
Bridges, John A.; Neal, Philip H.; and Besser, John E., 5,500,305, Cl. 428-621.000.
Albertsson, Peter S. Golf swing training device and method. 5,499,820, Cl. 273-189.00A.
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Albon, Richard: *See*—
Martin, Alan; and Albon, Richard, 5,500,823, Cl. 365-201.000.
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Sutherland, Joseph E., 5,500,753, Cl. 359-125.000.
Alcatel SEL Aktiengesellschaft: *See*—
Sierens, Christiaan H. J.; Steigenberger, Ulrich; Berger, Werner; Harnisch, Stephen; Van Der Plas, Gert; and Mestdeagh, Denis J. G., 5,500,755, Cl. 359-161.000.
Alexander, Karla J.: *See*—
Veeneman, William J.; Alexander, Karla J.; Doyle, Thomas J.; Brooks, Phillip R.; and Hamilton, Robert H., 5,500,514, Cl. 235-381.000.
Alexander, Steven R.: *See*—
Borjas, Ricardo E.; Araullo-McAdams, Carina; Alexander, Steven R.; Blay, George A.; and Liu, Yaw-Hwa, 5,500,099, Cl. 205-449.000.
Alhamad, Shaikh G. M. Y. Impact Absorber. 5,500,037, Cl. 96-108.000.
All Nippon Airways Co., Ltd.: *See*—
Kigawa, Kazuya; Furukawa, Kenji; Deguchi, Tetsu; Inoue, Sachiharu; Endo, Norikatsu; Yanagisawa, Tatsuo; Ikegami, Shinji; Omagari, Yasuyuki; Kihara, Koji; Sogawara, Tachiki; and Shimizu, Kenzo, 5,499,796, Cl. 254-133.00R.
Allal, Al M. Mystical astrological predictive-type board game. 5,499,818, Cl. 273-161.000.
Allen, David H.: *See*—
Snodgrass, Charles K.; Allen, David H.; Tuttle, John R.; Rotzoll, Robert R.; and Pax, George E., 5,500,650, Cl. 342-42.000.
Allen, John, to Ring Screw Works. Bolt including a cleaning thread point tip. 5,499,895, Cl. 411-386.000.
Allen, Paul G.; Bard, Stephen P.; and Gallup, Robert W., to Asymetrix Corporation. Multi-media slide presentation system with a moveable, tracked popup menu with button and title bars. 5,500,936, Cl. 395-156.000.
Allen, Susan D.; and Lee, Chaugham, to Tulane Educational Fund, Administrators of the. Apparatus and method of fabricating directional fiber optic taps, seasors and other devices with variable angle output. 5,500,913, Cl. 385-48.000.
Allén, Timo: *See*—
Aalto, Jouni; Pakkanen, Raimo; Satama, Lea; Luopa, Jyrki; Allén, Timo; Virtanen, Arja; and Kanttinen, Ari, 5,500,229, Cl. 424-535.000.
Allergan, Inc.: *See*—
Mowrey-McKee, Mary; Bliznik, Kenneth; and Stone, Ralph, 5,500,186, Cl. 422-28.000.
Alley, Marcus T.: *See*—
Grist, Thomas M.; and Alley, Marcus T., 5,500,596, Cl. 324-318.000.
Alliance Pharmaceutical Corp.: *See*—
Yuan, Wallace L., 5,500,096, Cl. 203-3.000.
AlliedSignal Inc.: *See*—
Hulsing, Rand H., II, 5,500,627, Cl. 331-1.00A.
Olzak, Richard A.; Collier, James L.; and Caney, Robert D., 5,500,518, Cl. 235-492.000.
Allison, Bruce J.; Ciarniello, Joe E.; Dumont, Guy A.; and Tessier, Patrick J., to MacMillan Bloedel Limited; and University of British Columbia, The. Automatic refiner load control. 5,500,088, Cl. 162-198.000.
Allison, Gerald R.: *See*—
Mahabadi, Hadi K.; Agur, Enno E.; McAneney, T. Brian; Kao, Sheau V.; Allison, Gerald R.; Hawkins, Michael S.; Grushkin, Bernard; Kittelberger, J. Stephen; Chung, Joo T.; and Hollenbeugh, William H., Jr., 5,500,324, Cl. 430-137.000.
Alonas, Paul G.; Yeh, Jang-Hun; and Harton, Austin V., to Motorola, Inc. Holographic optical isolator utilizing opto-electronic transmitter and receiver disposed in a package. 5,500,912, Cl. 385-37.000.
Alps Electric Co., Ltd.: *See*—
Yamashita, Akio; Suzuki, Kazutaka; Amano, Toshiaki; and Hatakeyama, Kazuhiko, 5,500,669, Cl. 347-214.000.
Yauchi, Hitoshi; Sugiyama, Koichi; Miyashita, Akihiko; Satoh, Nakatoshi; Sugawara, Tatsuo; Sato, Hiroyuki; and Onozato, Takashi, 5,500,657, Cl. 347-9.000.
Alteon Inc.: *See*—
Ulrich, Peter C.; and Wagle, Dilip R., 5,500,439, Cl. 514-404.000.
Altmann, Justus: *See*—
Rudolph, Andreas; Mueller, Klaus J.; Peters, Christian; and Altmann, Justus, 5,500,027, Cl. 55-223.000.
Alto, Roger E.: *See*—
Alto, Scott E.; Alto, Roger E.; and Collister, Frank C., 5,499,894, Cl. 411-340.000.
Alto, Scott E.; Alto, Roger E.; and Collister, Frank C., to Perma Manufacturing Inc. Keybolt fastener. 5,499,894, Cl. 411-340.000.
Altrieth, Frederick E., III, to Eastman Kodak Company. Job storage/retrieval system and method for reproduction apparatus. 5,500,717, Cl. 355-209.000.
Alvey, Inc.: *See*—
Easton, Richard L., 5,499,709, Cl. 198-786.000.
Alza Corporation: *See*—
Lee, Eun S.; Nedberge, Diane E.; and Yum, Su I., 5,500,222, Cl. 424-448.000.
Wong, Patrick S.-L.; Theeuwes, Felix; and Eckenhoff, James B., 5,499,979, Cl. 604-891.100.
AM International, Inc.: *See*—
Farr, Alan S., 5,499,803, Cl. 270-54.000.
Amada Metrecs Company, Limited: *See*—
Endo, Shigeru; and Sugizaki, Fumitaka, 5,499,566, Cl. 83-636.000.
Amamiya, Shoji: *See*—
Hashimoto, Yuichi; Amamiya, Shoji; and Sakakibara, Teigo, 5,500,718, Cl. 355-210.000.
Amano, Akira; Matsuzaki, Kazuo; and Sakai, Toshiaki, to Fuji Electric Co., Ltd. Pressure sensor and temperature sensor. 5,499,535, Cl. 73-717.000.
Amano, Isao: *See*—
Iida, Takashi; Sumi, Satoru; Shimizu, Hiroshi; Tahara, Akinori; Amano, Isao; and Nakajima, Tetsuya, 5,500,542, Cl. 257-210.000.
Amano, Katuyuki: *See*—
Yada, Yukihiko; Ito, Tosikazu; and Amano, Katuyuki, 5,500,264, Cl. 428-36.900.
Amano, Toshiaki: *See*—
Yamashita, Akio; Suzuki, Kazutaka; Amano, Toshiaki; and Hatakeyama, Kazuhiko, 5,500,669, Cl. 347-214.000.
Amarel Precision Instruments: *See*—
Zinter, J. Robert; and Ruben, Paul L., 5,500,770, Cl. 359-793.000.
Ambacher, Heinz: *See*—
Löffler, Otto; Niessner, Werner; Ambacher, Heinz; and Schneider, Friedrich E., 5,500,304, Cl. 428-614.000.
Ambrogi, Christine J. M.; Ansart, Denis R. H.; Lancelot, Eric J. S.; and Meunier, Serge M., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Cladded combustion chamber construction. 5,499,499, Cl. 60-39.320.
Ambroise, Benoit; and Petitjean, Maurice, to Mobil Oil Corporation. Peelable film structure. 5,500,265, Cl. 428-41.000.
Americ Corporation: *See*—
Kishi, Mitsuhiro, 5,499,890, Cl. 405-282.000.
American Cyanamid Company: *See*—
Lawter, James R.; and Lanzilotti, Michael G., 5,500,228, Cl. 424-486.000.
American Electronic Sign Company: *See*—
Huber, Terrence D.; and Huber, Mark E., 5,500,652, Cl. 345-84.000.
American Home Products Corporation: *See*—
Soll, Richard M.; Dollings, Paul J.; and Kinney, William A., 5,500,442, Cl. 514-414.000.
American Medical Systems, Inc.: *See*—
Tihon, Claude; Burton, John H.; Cook, Timothy C.; and Rhum, David, 5,499,994, Cl. 606-192.000.
American Standard Inc.: *See*—
Harold, Robert G.; and Leary, John W., 5,499,509, Cl. 62-117.000.
American Sterilizer Company: *See*—
Palmer, Steven G., 5,500,184, Cl. 422-2.000.
American Velodur Metal, Inc.: *See*—
Schinabeck, Rainer, 5,500,064, Cl. 156-94.000.
Amersham Life Science, Inc.: *See*—
Fuller, Carl W.; and Pisa-Williamson, Denise A., 5,500,339, Cl. 435-6.000.
Ammermann, Eberhard: *See*—
Wingert, Horst; Sauter, Hubert; Ammermann, Eberhard; Lorenz, Gisela; Saur, Reinhold; Schelberger, Klaus; and Hampel, Manfred, 5,500,441, Cl. 514-412.000.
Wingert, Horst; Sauter, Hubert; Ammermann, Eberhard; Lorenz, Gisela; Saur, Reinhold; Schelberger, Klaus; and Hampel, Manfred, 5,500,446, Cl. 514-483.000.
Amron, Ltd.: *See*—
Mendes, Emanuel; and Harel, Avikam, 5,500,009, Cl. 607-88.000.
Anagnostopoulos, Constantine N.; and Edwards, Jon K., to Eastman Kodak Company. High resolution image source. 5,500,572, Cl. 315-169.100.
Analogic Corporation: *See*—
McKenna, Gilbert W., 5,499,415, Cl. 5-601.000.
Anderson, David J., to Motorola, Inc. Input stage for CMOS operational amplifier and method thereof. 5,500,624, Cl. 330-253.000.
Anderson, George, to Pillsbury Company, The. Package having improved barrier properties. 5,500,303, Cl. 428-475.500.
Anderson, Herschel: *See*—
Hansen, Aalyane M.; and Anderson, Herschel, 5,499,721, Cl. 211-13.000.
Anderson, Jere R.; Jandris, Louis J.; Barbere, Michael D.; and Murphy, Richard T., to C. R. Bard, Inc. Method of making a distensible dilatation balloon using a block copolymer. 5,500,180, Cl. 264-532.000.
Andersson, Russell L.; Chen, Tsuhan; and Haskell, Barin G., to AT&T Corp. Video conference system and method of providing parallax correction and a sense of presence. 5,500,671, Cl. 348-15.000.
Andersson, Sven-Erik; and Kornelind, Johnny S., to Aktiebolaget Electrolux. Absorber for an absorption refrigerating apparatus. 5,499,516, Cl. 62-494.000.
Ando Electric Co., Ltd.: *See*—
Ota, Yasunori; and Fujita, Nobuhide, 5,499,443, Cl. 29-741.000.
Sato, Mitsuhisa; Maeda, Mikio; and Furukawa, Shinichi, 5,500,731, Cl. 356-73.100.



Uchiyama, Haruyoshi; Lee, Tekken; Takeuchi, Nobunari; Shimizu, Kaoru; Horiguchi, Tsuneo; and Koyamada, Yahei, 5,500,762, Cl. 359-326.000.
Ando, Satoru: *See*—
Udagawa, Satoru; Abe, Masaki; Ando, Satoru; Matsuki, Yasuhiro; Watanabe, Toyofumi; Shiohara, Yukimitsu; Morita, Masaya; and Kido, Akimasa, 5,500,290, Cl. 428-610.000.
Ando, Shinji: *See*—
Yamada, Takahiro; Ando, Shinji; and Naruse, Yoshihiro, 5,499,909, Cl. 417-384.000.
Andrade, Michael S.: *See*—
Abbott, Joe L.; and Andrade, Michael S., 5,500,205, Cl. 424-401.000.
Andre, James R.; and Colliopoulos, John A., to Procter & Gamble Company, The. Anion exchange resin compositions containing almond paste for taste improvement. 5,500,190, Cl. 424-78.100.
Andreasson, Pontus: *See*—
Blomdahl, Karl; and Andreasson, Pontus, 5,499,993, Cl. 606-188.000.
Andres, Rudolf; Seel, Holger; and Schaible, Kurt, to Mercedes-Benz AG. Locking arrangement for securing a pivoting and sliding cover to a counter-structure of a vehicle body. 5,499,855, Cl. 296-121.000.
Andrianov, Alexander K.; and Langer, Robert S., to Massachusetts Institute of Technology and Virus Research Institute. Method for making hydrophobic polymeric microparticles. 5,500,161, Cl. 264-8.000.
Ang, Anthony; and Tan, Chye S., to Xerox Corporation. Asymmetric spatial filtering for pulsed imaging, pulse width modulation raster output scanner with tri-level exposure. 5,500,670, Cl. 347-253.000.
Angeion Corporation: *See*—
Brucker, Gregory G.; and Savage, Steven D., 5,500,012, Cl. 607-122.000.
Angell, Robert C., to Steelcase, Inc. Upholstery attachment device and upholstered article using same. 5,499,859, Cl. 297-218.300.
Angermaier, Anton: *See*—
Wier, Manfred; Krebs, Stefan; Reupke, Wolfgang; and Angermaier, Anton, 5,499,536, Cl. 73-117.300.
Anma, Hideyuki, to Kabushiki Kaisha Toshiba. Paper sheet storing apparatus. 5,499,805, Cl. 271-3.050.
Annea, James H.: *See*—
West, Jack T.; Annea, James H.; Schneider, Daniel A.; and Kokoszka, Marek K., 5,500,308, Cl. 429-171.000.
Ansart, Denis R. H.: *See*—
Ambrogi, Christine J. M.; Ansart, Denis R. H.; Lancelot, Eric J. S.; and Meunier, Serge M., 5,499,499, Cl. 60-39.320.
Ansourian, Megeurditch N.; and Nickolls, Peter M., to Telectronics Pacing Systems, Inc. Cardio myostimulation system with defibrillation. 5,500,004, Cl. 607-4.000.
Antkowiak, Thomas A.: *See*—
Lawson, David F.; Antkowiak, Thomas A.; Hall, James E.; and Stayer, Mark L., Jr., 5,500,447, Cl. 524-571.000.
Anzai, Iwao; Matsuoka, Shigeki; and Uehara, Jun, to Nippon Oil Company; and Petroleum Energy Center Foundation. Solid oxide fuel cell. 5,500,307, Cl. 429-30.000.
Aoki, Satoshi: *See*—
Tsushima, Hideaki; Sasaki, Shinya; Nakano, Yukio; Nakano, Hiroyuki; Tateyari, Ryoji; Matsuda, Hironari; Tomooka, Kenji; Sakakida, Naohiro; Nishimura, Shin; Yano, Yoshihiro; Igarashi, Youichi; Aoki, Satoshi; Takatori, Masahiro; Kazawa, Tohru; and Ashi, Yoshihiro, 5,500,756, Cl. 359-174.000.
Aoki, Takuya: *See*—
Kato, Hiroaki; Shimasaki, Yuichi; Saito, Akihisa; Komatsuda, Takashi; Oketani, Toshikazu; Haccho, Seiji; Matsumoto, Seiji; Aoki, Takuya; and Miyashita, Yukio, 5,499,501, Cl. 60-286.000.
Aono, Kenji: *See*—
Suzuki, Etsurou; Hatori, Yoshifumi; Kitani, Masashi; Saikawa, Hideo; Kojima, Masami; Kawano, Kenji; Tano, Koichi; and Aono, Kenji, 5,500,664, Cl. 347-86.000.
Aoshima, Shinichiro: *See*—
Takahashi, Hironori; Aoshima, Shinichiro; and Hirano, Isuke, 5,500,587, Cl. 324-96.000.
Aoyama, Takeshi; and Yoshida, Yasumi, to Canon Kabushiki Kaisha. Fixing device with separation member capable of varying contact pressure. 5,500,726, Cl. 355-315.000.
Aoyama, Toshiya: *See*—
Onishi, Yasuhiko; Yamamori, Takashi; Yamashita, Youzou; Suzuki, Ichiro; and Aoyama, Toshiya, 5,500,179, Cl. 264-400.000.
Aplix, Inc.: *See*—
Billarant, Patrick J., 5,500,268, Cl. 428-100.000.
Apollo Environmental Systems Corp.: *See*—
Smith, James W.; Ellenor, David T. R.; and Harbinson, John N., 5,500,129, Cl. 210-703.000.
Smith, James W.; Ellenor, David T. R.; and Harbinson, John N., 5,500,135, Cl. 210-787.000.
Apparatebau Gellschaft mbH: *See*—
Novak, Heinrich; Berthold, Herbert; Barta, Gerhard; and Pichler, Hans-Peter, 5,499,774, Cl. 242-47.030.
Apple Computer, Inc.: *See*—
Thompson-Rohrlich, John, 5,500,937, Cl. 395-161.900.
Yazdy, Farid A.; and Dhuey, Michael J., 5,500,827, Cl. 365-222.000.
deSilva, Mahinda K.; and Holt, L. Bayles, 5,500,924, Cl. 395-129.000.
Applewhite, John T.: *See*—
Johnson, Lonnie G.; and Applewhite, John T., 5,499,940, Cl. 446-180.000.
Applied Digital Access, Inc.: *See*—
Engdahl, Thomas L.; Tyburski, Edward; and Hartmann, Paul R., 5,500,853, Cl. 370-17.000.
Applied Materials, Inc.: *See*—
Telford, Susan G.; Tzeng, Meng C.; and Aruga, Michio, 5,500,249, Cl. 427-255.000.
Applied Power Inc.: *See*—
Sheffe, Peter W., 5,499,654, Cl. 137-493.900.
Aqua Max Pty Ltd.: *See*—
Tribey, John M., 5,499,621, Cl. 126-361.000.
Aquaform Inc.: *See*—
Roper, Ralph E., 5,499,520, Cl. 72-58.000.
Arai, Yasuhiro; Sano, Tetsuo; Yamashita, Tetsuji; Iwanaga, Takaki; and Goto, Koichi, to Kabushiki Kaisha Toshiba. Air conditioner. 5,499,508, Cl. 62-114.000.
Arakawa, Kenichi; Sasano, Nobusuke; Iizuka, Tomoaki; Kobayashi, Miho; Yamada, Tetsuo; and Motoyama, Hideki, to Kabushiki Kaisha Toshiba. Method of driving solid-state image sensing device. 5,500,675, Cl. 348-319.000.
Arashima, Teruo: *See*—
Hattori, Yoshifumi; Karita, Seiichiro; Saikawa, Hideo; Kashino, Toshio; Saito, Akio; Nakagomi, Hiroshi; Arashima, Teruo; Kimura, Makiko; Sugitani, Hiroshi; Ikeda, Masami; Saito, Asao; Masuda, Kazuaki; and Oviawa, Tsuyoshi, 5,500,666, Cl. 347-87.000.
Araullo-McAdams, Carina: *See*—
Borjas, Ricardo E.; Araullo-McAdams, Carina; Alexander, Steven R.; Blay, George A.; and Liu, Yaw-Hwa, 5,500,099, Cl. 205-449.000.
Arbogast, Franz: *See*—
Hundt, Gerd; Arbogast, Franz; and Peiz, Peter, 5,499,910, Cl. 418-126.000.
Archibald, James L.; and Laturell, Donald R., to AT&T Corp. Communication card with extendible, rotatable coupling. 5,499,923, Cl. 439-26.000.
Archibald, William R.: *See*—
Wallace, Vernon R.; McMullen, Michael S.; and Archibald, William R., 5,499,904, Cl. 416-230.000.
ARCO Chemical Technology, L.P.: *See*—
Baker, Otis M., Jr.; Critchfield, Frank E.; and Westfall, Paul M., 5,500,452, Cl. 521-130.000.
Arex Electronics Corporation: *See*—
Hatanaka, Takefumi; and Kuwahara, Naruto, 5,500,581, Cl. 318-727.000.
Arisaka, Hiroshi; Kawawada, Kenji; and Omata, Kiyoshi, to Kel Corporation. Butt joint connector assembly. 5,499,924, Cl. 439-67.000.
Aristech Chemical Corporation: *See*—
Smeal, Thomas W.; and Brownell, George L., 5,500,171, Cl. 264-309.000.
Arizona Board of Regents: *See*—
Kozicki, Michael N., 5,500,532, Cl. 250-372.000.
Ark, Inc.: *See*—
Sanborn, Charles H., III; and Classon, Joel D., 5,499,564, Cl. 83-23.000.
Armitage, Jonathan R.; Wyatt, Richard; and Massicott, Jennifer F., to British Telecommunications Public Limited Company. Optical waveguide amplifier. 5,500,764, Cl. 359-341.000.
Arnett, Patty J.: *See*—
Cope, Constantin; and Arnett, Patty J., 5,499,975, Cl. 604-165.000.
Aruga, Michio: *See*—
Telford, Susan G.; Tzeng, Meng C.; and Aruga, Michio, 5,500,249, Cl. 427-255.000.
Asahi Denka Kogyo Kabushikikaisya: *See*—
Hayashi, Toshihiro; Kohno, Hirotsige; Watanabe, Akinori; and Horiguchi, Itaru, 5,500,178, Cl. 264-297.800.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Kawano, Kiyoshi, 5,500,704, Cl. 354-222.000.
Maruyama, Koichi; Wakamiya, Syun'itirou; Iwaki, Makoto; and Oono, Masahiro, 5,500,767, Cl. 359-642.000.
Noguchi, Masato, 5,500,849, Cl. 369-275.400.
Asahi Seimitsu Kabushiki Kaisha: *See*—
Ishii, Tadayoshi, 5,500,772, Cl. 359-822.000.
Asano, Kenichi: *See*—
Kozaki, Takahiko; Horie, Nobuhiro; and Asano, Kenichi, 5,500,851, Cl. 370-13.000.
Asanuma, Hiroyuki; Ueda, Fumitaka; and Tani, Tadaaki, to Fuji Photo Film Co., Ltd. Silver halide photographic material. 5,500,336, Cl. 430-570.000.
Asaoka, Leo K.: *See*—
Warren, Larry C.; and Asaoka, Leo K., 5,500,061, Cl. 149-19.400.
Ashcroft, Alexander T.: *See*—
Green, Malcolm L.; Cheetham, Anthony K.; Vernon, Patrick D.; and Ashcroft, Alexander T., 5,500,149, Cl. 252-373.000.
Ashi, Yoshihiro: *See*—
Tsushima, Hideaki; Sasaki, Shinya; Nakano, Yukio; Nakano, Hiroyuki; Tateyari, Ryoji; Matsuda, Hironari; Tomooka, Kenji; Sakakida, Naohiro; Nishimura, Shin; Yano, Yoshihiro; Igarashi, Youichi; Aoki, Satoshi; Takatori, Masahiro; Kazawa, Tohru; and Ashi, Yoshihiro, 5,500,756, Cl. 359-174.000.
Asia Optical Co., Ltd.: *See*—
Tomita, Saburo, 5,499,456, Cl. 33-245.000.
Assink, Bernardus A. T. F., to Koninklijke Auping B.V. Coupling device for a mattress. 5,499,410, Cl. 5-411.000.
Asulab S.A.: *See*—
Bora, Jean-Jacques, 5,500,835, Cl. 368-11.000.
Asymetrix Corporation: *See*—

Allen, Paul G.; Bard, Stephen P.; and Gallup, Robert W., 5,500,936, Cl. 395-156.000.

AT&T Corp.: *See*—
Andersson, Russell L.; Chen, Tsuhan; and Haskell, Barin G., 5,500,671, Cl. 348-15.000.
Archibald, James L.; and Laturell, Donald R., 5,499,923, Cl. 439-26.000.
Atkins, Robert M.; Lemaire, Paul J.; Mizrahi, Victor; and Walker, Kenneth L., 5,500,031, Cl. 65-386.000.
Baker, Mark C.; Hagerman, William E.; Penrod, Jack R.; and Stevens, Nancy S., 5,500,889, Cl. 379-67.000.
Bevk, Jozo; Feldman, Leonard C.; Gossmann, Hans-Joachim L.; Luftman, Henry S.; and Yan, Ran-Hong, 5,500,391, Cl. 437-131.000.
Chang, David D. C., 5,500,605, Cl. 324-158.000.
Cirelli, Raymond A.; Henry, Charles H.; Laskowski, Edward J.; Milbrodt, Michele A.; and Yaffe, Henry H., 5,500,916, Cl. 385-37.000.
Goossen, Keith W.; and Walker, James A., 5,500,761, Cl. 359-290.000.
Graebner, John E.; Jin, Sungho; and Wolfe, Raymond, 5,500,157, Cl. 264-1.210.
Harriott, Lloyd R.; Liddle, James A.; Volkert, Cynthia A.; Waskiewicz, Warren K.; and Windt, David L., 5,500,312, Cl. 430-5.000.
Krasulick, Stephen B., 5,500,867, Cl. 372-38.000.
Merriman, Roger A., 5,500,497, Cl. 200-512.000.
Powell, Thomas A., 5,499,935, Cl. 439-620.000.
Puri, Atul, 5,500,678, Cl. 348-408.000.
Zhou, Yong, 5,500,673, Cl. 348-156.000.

Athens Corporation: *See*—
Shinagawa, Robert T.; Jordan, Susan M.; and Blatt, Christopher S., 5,500,095, Cl. 203-2.000.

Atkins, Robert M.; Lemaire, Paul J.; Mizrahi, Victor; and Walker, Kenneth L., to AT&T Corp. Method for increasing the index of refraction of a glassy material. 5,500,031, Cl. 65-386.000.

Atlantic Research Corporation: *See*—
Greisz, Darton, III; and Figge, Irving E., Sr., 5,499,739, Cl. 220-589.000.

Attaya, Samuel D. Maze. 5,499,815, Cl. 273-109.000.

Atwell, Michael J.; and O'Donnell, Thomas J., to Ohio Mattress Company Licensing and Components Group. Space-saving bedding system display device. 5,499,407, Cl. 5-1.000.

Auberon, Marcel: *See*—
Odru, Pierre; Sparks, Charles; Auberon, Marcel; and Behar, Jacques, 5,499,661, Cl. 138-124.000.

Audia, James E.; Droste, James J.; Evrard, Deborah A.; Fludzinski, Pawel; Murdoch, Gwyn L.; and Nelson, David L., to Eli Lilly and Company. Tetrahydro-β-carbolines. 5,500,431, Cl. 514-280.000.

Audousset, Marie P.: *See*—
Cotteret, Jean; Audousset, Marie P.; LaGrange, Alain; and Vandenbossche, Jean J., 5,500,021, Cl. 8-408.000.

Austin, Ion G.; Byrne, Jani G.; Bohn, Carole A.; Chiavegatto, Artindo, Jr.; Smith, Jeffrey L.; and Zeisz, Raymond L., Jr., to International Business Machines Corporation. Display and control system for configuring and monitoring a complex system. 5,500,934, Cl. 395-755.000.

Austin, Peter W.; and Singer, Michael, to Zeneca Limited. Personal care formulations. 5,500,217, Cl. 424-401.000.

Autio, Jukka, to Valmet Paper Machinery, Inc. Method and apparatus for guiding a fabric in a paper machine. 5,500,090, Cl. 162-273.000.

Automated Packaging Systems, Inc.: *See*—
Lerner, Bernard; Hess, Richard W.; Cronauer, William M.; Wehrmann, Rick S.; and Kramer, James D., 5,499,485, Cl. 53-459.000.

AVT Communications Limited: *See*—
Kokaram, Asil C., 5,500,685, Cl. 348-620.000.

Ayala, Varin: *See*—
Magnotta, Vincent L.; Ayala, Varin; and Cirucci, John P., 5,500,085, Cl. 162-30.110,

Baba, Yasutoshi: *See*—
Nakayama, Masaaki; Baba, Yasutoshi; Terada, Takehiko; Sakakibara, Shuji; and Yamamoto, Kenji, 5,499,537, Cl. 73-117.300.

Babcock & Wilcox Company, The: *See*—
Rogers, Kevin J.; and Johnson, Dennis W., 5,500,196, Cl. 423-242.100.
Whaley, Hubert L.; Powers, Thomas; and MacLauchlan, Daniel T., 5,499,540, Cl. 73-761.000.

Baccus, John C.: *See*—
Meade, John C.; and Baccus, John C., 5,499,992, Cl. 606-170.000.

Back, Gordon E., to International Envelope Company. Easy open, tamper evident envelope. 5,499,757, Cl. 229-81.000.

Backes, Floyd J.: *See*—
Perlman, Radia J.; Kirby, Alan J.; Backes, Floyd J.; and Kaufman, Charles W., 5,500,860, Cl. 370-85.130.

Bacon, Dennis R.; Trinh, Toan; Hartman, Frederick A.; and Mermelstein, Robert, to Procter & Gamble Company, The. Fabric softening bar compositions containing fabric softener and enduring perfume. 5,500,137, Cl. 252-8.600.

Bacon, Dennis R.; and Trinh, Toan, to Procter & Gamble Company, The. Fabric softener compositions with improved environmental impact. 5,500,138, Cl. 252-8.800.

Bacon, Dennis R.; and Trinh, Toan, to Procter & Gamble Company, The. Detergent compositions containing enduring perfume. 5,500,154, Cl. 252-551.000.

Badesha, Santokh S., to Xerox Corporation. Fusing components containing titanate compositions. 5,500,298, Cl. 428-411.100.

Badesha, Santokh S., to Xerox Corporation. Fusing components containing grafted titanate compositions. 5,500,299, Cl. 428-447.000.

Baechler, François; Strehler, Klaus; Harzenmoser, Isidor; and Zehr, Jürg, to Zellweger Luwa AG. Method of measuring the mass of fiber slivers. 5,499,546, Cl. 73-865.000.

Baeuerle, Dieter: *See*—
Hagemeyer, Alfred; Hibst, Hartmut; Baeuerle, Dieter; and Heitz, Johannes, 5,500,459, Cl. 523-300.000.

Baggett, James D., Jr.; Clark, David A.; Cowling, Patrick C.; Uhl, Richard G.; and Wrenn, Susan E., to Philip Morris Incorporated. Cigarette for electrical smoking system. 5,499,636, Cl. 131-374.000.

Bahar, Bamdad, to W. L. Gore & Associates, Inc. Apparatus for measuring hot gas contest. 5,499,528, Cl. 73-23.200.

Baik, Bok H.; Hur, Jung H.; and Shim, Dae S., to Goldstar Co., Ltd. VCR having capability of displaying time signal received from broadcasting stations. 5,500,741, Cl. 358-335.000.

Bailey, John W.: *See*—
Weston, John A.; and Bailey, John W., 5,499,944, Cl. 453-17.000.

Baker, David L. Auger-type chemical reformer. 5,500,120, Cl. 210-179.000.

Baker, Mark C.; Hagerman, William E.; Penrod, Jack R.; and Stevens, Nancy S., to AT&T Corp. Method and apparatus for prioritizing a telephone call according to a level of service of an originator. 5,500,889, Cl. 379-67.000.

Baker, Otis M., Jr.; Critchfield, Frank E.; and Westfall, Paul M., to ARCO Chemical Technology, L.P. Soft, low density flexible polyurethane foam. 5,500,452, Cl. 521-130.000.

Baker, Terence S.; Perry, Martin J.; and Fleming, Ian M., to Celltech Limited. Binding assay device. 5,500,350, Cl. 435-7.920.

Balasingham, Amarnasothas; and Clement, Patrick J. Kiwifruit juice product. 5,500,241, Cl. 426-599.000.

Balasubramaniam, Vasudevan: *See*—
Hughes, Joe; Hartley, Rolfe J.; and Balasubramaniam, Vasudevan, 5,500,140, Cl. 252-46.700.

Baldwin, Keith R.: *See*—
Webster, Mark A.; Baldwin, Keith R.; and Roberts, Richard D., 5,500,879, Cl. 375-353.000.

Baliga, Arvind B. Dual stair step walker with assist bar. 5,499,645, Cl. 135-67.000.

Ballenghien, Jean-Luc: *See*—
Tournier, Gilles; Roques, Serge; and Ballenghien, Jean-Luc, 5,499,448, Cl. 29-863.000.

Balukin, Gregory S.; and Wolf, Daniel J., to Westinghouse Air Brake Company. Method of operating a locomotive mounted throttle controller between two modes of operation including a transition between such two modes. 5,500,799, Cl. 364-426.050.

Ban, Hiroki: *See*—
Fujimura, Morio; Ban, Hiroki; and Doniewski, Janusz, 5,500,072, Cl. 156-344.000.

Banba, Yoshikazu: *See*—
Nakagawa, Kenji; Yoshizaki, Koichi; Nukaga, Tadashi; Banba, Yoshikazu; Hattori, Shigetaka; and Mochizuki, Kentaro, 5,499,791, Cl. 248-638.000.

Bandino, Giacomo. Process for titanium-based mixed tannings. 5,500,020, Cl. 8-94.220.

Banerji, Kingshuk; Bradley, Edwin L., III; and Da Costa Alves, Francisco, to Motorola, Inc. Method of applying a tacking agent to a printed circuit board. 5,499,756, Cl. 228-214.000.

Baranowski, Edwin M. Facilitator for assisting wheelchair challenged persons up and/or down inclines traversed by a pathway access system. 5,499,419, Cl. 14-69.500.

Barbeau, Claude; and Cochran, Ross, to Marcanada Inc. Textile material for inner lining of firefighter protective garment. 5,499,663, Cl. 139-420.00A.

Barbee, Steven G.; Heinz, Tony P.; Hsiao, Yiping; Li, Leping; Ratzlaff, Eugene H.; and Wong, Justin W., to International Business Machines Corporation. Real time measurement of etch rate during a chemical etching process. 5,500,073, Cl. 156-345.000.

Barber, Frederic: *See*—
Picard, Len L.; and Barber, Frederic, 5,500,906, Cl. 382-220.000.

Barbere, Michael D.: *See*—
Anderson, Jere R.; Jandris, Louis J.; Barbere, Michael D.; and Murphy, Richard T., 5,500,180, Cl. 264-532.000.

Barbieri, Irene E.: *See*—
Hack, Mark M.; and Barbieri, Irene E., 5,499,740, Cl. 221-70.000.

Barclay, Clayton C., Jr., to Crown International, Inc. Independent amplifier control module. 5,500,626, Cl. 330-279.000.

Bard, Stephen P.: *See*—
Allen, Paul G.; Bard, Stephen P.; and Gallup, Robert W., 5,500,936, Cl. 395-156.000.

Barmatz, Martin B.: *See*—
Guigné, Jacques Y.; Barmatz, Martin B.; Jackson, Henry W.; and Kopteenko, Sergei V., 5,500,493, Cl. 181-0.500.

Barnette, William E.; Harrison, Charles R.; Lahm, George P.; Piotrowski, David W.; and Wing, Keith D., to Du Pont de Nemours, E. I., and Company. Arthropodicidal anilides. 5,500,438, Cl. 514-403.000.

Baron, Bruce M.: *See*—
Whitten, Jeffrey P.; and Baron, Bruce M., 5,500,419, Cl. 514-114.000.

Barr, Dallas N.: *See*—
Redman, Brian C.; Barr, Dallas N.; and Nettleton, John E., 5,500,729, Cl. 356-5.090.

Barr, Morton L.: *See*—
Mendolia, Michael S.; Esposito, Anthony; Tassoff, James A.; Ross, Lloyd; Fessock, Paul J.; Barr, Morton L.; and Vincenti, Paul J., 5,500,209, Cl. 424-66.000.

Barron, Robert L.: *See*—





Bentley, Roger G.; Hamilton, R. Keith; Jack, J. Stewart; and Barron, Robert L., 5,500,735, Cl. 356-364.000.

Barta, Gerhard: *See*—
Novak, Heinrich; Berthold, Herbert; Barta, Gerhard; and Pichler, Hans-Peter, 5,499,774, Cl. 242-47.030.

Barter, Archie M., to Tektronix, Inc. Low power CCD driver with symmetrical output drive signal. 5,500,615, Cl. 327-111.000.

Bartz, John C.; and Byrne, Paul J., to Caterpillar Inc. Modular cooling system sealing. 5,499,674, Cl. 165-76.000.

BASF Aktiengesellschaft: *See*—
Kormann, Claudius; Schwab, Ekkehard; Raulfs, Friedrich-Wilhelm; and Beck, Karin H., 5,500,141, Cl. 252-62.540.
Wingert, Horst; Sauter, Hubert; Ammermann, Eberhard; Lorenz, Gisela; Saur, Reinhold; Schelberger, Klaus; and Hampel, Manfred, 5,500,441, Cl. 514-412.000.
Wingert, Horst; Sauter, Hubert; Ammermann, Eberhard; Lorenz, Gisela; Saur, Reinhold; Schelberger, Klaus; and Hampel, Manfred, 5,500,446, Cl. 514-483.000.

BASF Corporation: *See*—
Dugan, Jeffrey S., 5,500,173, Cl. 264-75.000.
Utz, Christopher G.; Hollis, Rebecca P.; and Sekmistrz, Johnny M., 5,500,219, Cl. 424-409.000.

BASF Magnetics GmbH: *See*—
Hagemeyer, Alfred; Hibst, Hartmut; Baeuerle, Dieter; and Heitz, Johannes, 5,500,459, Cl. 523-300.000.

Bass, Kenneth R. Lightweight metal truss and frame system. 5,499,480, Cl. 52-653.100.

Bassett, James H., to Dawn Equipment Company. Soil treating system with hydraulically actuated implement controller. 5,499,683, Cl. 172-4.000.

Batagianis, Donna L.: *See*—
Bruner, Dennis R.; and Batagianis, Donna L., 5,499,610, Cl. 119-166.000.

Battle, Larry D. Protective warning post. 5,500,642, Cl. 340-932.200.

Baur, Rüdiger; Macholdt, Hans-Tobias; and Theiss, Wilfried, to Hoechst AG. Charge control with cyclic polysulfoxyldially ammonium salts. 5,500,323, Cl. 430-110.000.

Baxter International Inc.: *See*—
Quijano, R. C.; Nashef, Aws; and Myers, Keith, 5,500,014, Cl. 623-2.000.

Baxter, Michael. Turntable mixer apparatus. 5,499,872, Cl. 366-213.000.

Bayer Aktiengesellschaft: *See*—
Hain, Rüdiger; Reif, Hans-Jörg; and Steuzel, Klaus, 5,500,367, Cl. 435-252.300.
Meltzer, Aaron D.; and Karbach, Alexander, 5,500,479, Cl. 525-437.000.

Bayer Corporation: *See*—
Meltzer, Aaron D.; and Karbach, Alexander, 5,500,479, Cl. 525-437.000.
Parks, Kristen L.; Mitenser, Richard W.; and Lesko, Marie W., 5,500,176, Cl. 264-257.000.

Bayerle, Klaus; and Pfleger, Hartmut, to Siemens Aktiengesellschaft. Method for monitoring a tank venting system that traps fuel vapors and feeds them to an internal combustion engine. 5,499,613, Cl. 123-520.000.

Beaver, Jeffrey L.: *See*—
Crotty, Willard E., III; and Beaver, Jeffrey L., 5,499,854, Cl. 296-97.130.

Beck, Henry; Noll, J. Brian; and Lynch, Michael D., to Welch Al Iya, Inc. Speculum with smoke evacuation channel. 5,499,964, Cl. 600-220.000.

Beck, Karin H.: *See*—
Kormann, Claudius; Schwab, Ekkehard; Raulfs, Friedrich-Wilhelm; and Beck, Karin H., 5,500,141, Cl. 252-62.540.

Becker, Danny L.; Bork, Kevin W.; and Krippendorf, Carl, to Smith & Nephew Rolyan, Inc. Patient support for use with parallel bars. 5,499,955, Cl. 482-51.000.

Becker, Kurt J.: *See*—
Rocuzzello, Michael A.; Becker, Kurt J.; and Aghajanian, Michael K., 5,500,244, Cl. 427-181.000.

Becker, Michael C.; Moore, Charles R.; Muhich, John S.; and Reese, Robert J., to Motorola, Inc. Data processor with speculative data transfer and address-free retry. 5,500,950, Cl. 395-445.000.

Becker, Reinhard; Henning, Rainer; Rüger, Wolfgang; Teetz, Volker; and Urbach, Hansjörg, to Hoechst Aktiengesellschaft. Combination of angiotensin-converting enzyme inhibitors with calcium antagonists as well as their use in drugs. 5,500,434, Cl. 514-356.000.

Becton, Dickinson and Company: *See*—
Spears, Patricia A., 5,500,341, Cl. 435-6.000.

Behan, John M.; Ness, Jeremy N.; and Perring, Keith D., to Unilever Patent Holdings B.V. Encapsulating method and products containing encapsulated material. 5,500,223, Cl. 424-451.000.

Behar, Jacques: *See*—
Odru, Pierre; Sparks, Charles; Auberon, Marcel; and Behar, Jacques, 5,499,661, Cl. 138-124.000.

Behm, Harry: *See*—
Noordegraaf, Jan; Oud, Martinus A.; Behm, Harry; and de Rooy, Roelof, 5,500,183, Cl. 420-557.000.

Behrens, Gunnar; Blöhdorn, Gerhard; and Penza, Hans, to Linotype-Hell AG. Device for clamping and releasing film material and operation of said device. 5,500,656, Cl. 346-136.000.

Beier, Rudolf: *See*—
Kühnhold, Wolfgang; and Beier, Rudolf, 5,499,884, Cl. 403-359.000.

Bell, Eric L., to Eastman Kodak Company. Photographic emulsion containing transition metal complexes. 5,500,335, Cl. 430-567.000.

Bell, Ronald D., to Petrocon Technologies, Inc. Hybrid low $NO_x$ process for destruction of bound nitrogen compounds. 5,500,194, Cl. 423-239.100.

Bellia, Michael A.; Laplace, Carl; Trainor, John J.; and Hoffmann, Mark, to Siemens Energy & Automation, Inc. Data logging in a voltage regulator controller. 5,500,806, Cl. 364-492.000.

Bellussi, Giuseppe; Buonomo, Franco; Esposito, Antonio; Clerici, Mario G.; and Romano, Ugo, to Enitricerche S.p.A. Bonded zeolites and process for preparing them. 5,500,199, Cl. 423-328.200.

Belostelova, Ljudmila N.: *See*—
Khmara, Vladimir N.; Belostelova, Ljudmila N.; and Sergeev, Vladimir N., 5,499,900, Cl. 415-55.100.

Benard, Rejane; Prioux, Gerard A. D.; Martin, Didier J.; and Riveccic, Marcel L. P., to Eastman Kodak Company. Dyes comprising thioether macrocycles. 5,500,337, Cl. 430-570.000.

Benda, Steven J.; and Pearson, John P., to Brady USA, Inc. Circuit breaker lockout device for attachment to solid switch stem. 5,500,495, Cl. 200-43.140.

Benham, Charles B.; Bohn, Mark S.; and Yakobson, Dennis L., to Resetch, Inc. Process for the production of hydrocarbons. 5,500,449, Cl. 518-700.000.

BenOpcon, Inc.: *See*—
Betensky, Ellis I., 5,500,769, Cl. 359-676.000.

Benson, David K.: *See*—
Pernicka, John C.; Benson, David K.; and Tracy, C. Edwin, 5,500,503, Cl. 219-121.640.

Benson, Robert F.; and Martin, Dean F., to University of South Florida. Method for ION exchange based leaching of the carbonates of calcium and magnesium from phosphate rock. 5,500,193, Cl. 423-157.000.

Bentley, Roger G.; Hamilton, R. Keith; Jack, J. Stewart; and Barron, Robert L., to Pulp and Paper Research Institute of Canada. Method and apparatus for on-line measurement of pulp fiber surface development. 5,500,735, Cl. 356-364.000.

Bergelin, Klaus; Hartmann, Willi; Saalbach, Kurt; and Low, Peter, to ITT Automotive Europe GmbH. Piston with piston rod being latchable through a retaining member. 5,499,570, Cl. 92-84.000.

Berger, Werner: *See*—
Sierens, Christiaan H. J.; Steigenberger, Ulrich; Berger, Werner; Harnisch, Stephen; Van Der Plas, Gert; and Mestdagh, Denis J. G., 5,500,755, Cl. 359-161.000.

Bergman, Eric J. Dynamic semiconductor wafer processing using homogeneous chemical vapors. 5,500,081, Cl. 156-646.100.

Berkman, John W.: *See*—
Beuchat, Charles E.; Etherington, Roger; Walbrink, Harold J.; and Berkman, John W., 5,499,969, Cl. 604-30.000.

Berkowitz, Steven A., to Kinetic Concepts, Inc. Pressure relief air mattress and related system. 5,499,412, Cl. 5-453.000.

Berlina, Irene: *See*—
Sanduja, Mohan L.; Berlina, Irene; Horowitz, Carl; and Thottathil, Paul, 5,500,253, Cl. 427-385.500.

Bernard, Karen A.; Tsai, John; Billmers, Robert L.; and Sweger, Robert W., to National Starch and Chemical Investment Holding Corporation. Paper products using starches modified with amino-multicarboxylates. 5,500,087, Cl. 162-164.600.

Berrebi, Georges; Jacquier, Yves; Edeas, Habbo; and Middelkoop, Gerrit, to Europeenne de Retraitement de Catalyseurs Eurecat. Process and apparatus for loading and unloading powder catalyst. 5,499,746, Cl. 222-165.000.

Berryhill, John R., to Exxon Production Research Company. Method of processing seismic data for migration. 5,500,832, Cl. 367-51.000.

Berthold, Herbert: *See*—
Novak, Heinrich; Berthold, Herbert; Barta, Gerhard; and Pichler, Hans-Peter, 5,499,774, Cl. 242-47.030.

Beru Ruprecht GmbH & Co. KG: *See*—
Löffler, Otto; Niessner, Werner; Ambacher, Heinz; and Schneider, Friedrich E., 5,500,304, Cl. 428-614.000.

Besser, John E.: *See*—
Bridges, John A.; Neal, Philip H.; and Besser, John E., 5,500,305, Cl. 428-621.000.

Best, John S.; and Hetzler, Steven R., to International Business Machines Corporation. Sector servo data recording disk having data regions without identification (ID) fields. 5,500,848, Cl. 369-275.300.

Betensky, Ellis I., to BenOpcon, Inc. Wide angle binocular system with variable power capability. 5,500,769, Cl. 359-676.000.

Betz Laboratories, Inc.: *See*—
Carey, William S.; and Meyer, Ellen M., 5,500,133, Cl. 210-729.000.
Edmondson, James G., 5,500,107, Cl. 208-47.000.
Lehrer, Scott E., 5,500,373, Cl. 436-109.000.
Ouyang, Jiangbo; and Harpel, William L., 5,500,053, Cl. 427-247.000.
Robertson, Jennifer J., 5,500,128, Cl. 210-699.000.
Roe, Donald C.; and Polizzotti, David M., 5,500,213, Cl. 424-78.370.
Roe, Donald C.; Davis, Dwight P.; Manning, Kevin C.; and Bockowski, Edmund J., 5,500,220, Cl. 424-410.000.

Beuchat, Charles E.; Etherington, Roger; Walbrink, Harold J.; and Berkman, John W., to Nestle S.A. Microsurgical cassette. 5,499,969, Cl. 604-30.000.

Bevan, Bruno: *See*—
Teilland, Eric; Bevan, Bruno; Mikler, Claude; Reilly, Paul; and Millot, Philippe, 5,499,967, Cl. 604-20.000.

Bevk, Jozo; Feldman, Leonard C.; Gossmann, Hans-Joachim L.; Luftman, Henry S.; and Yan, Ran-Hong, to AT&T Corp. Method for making a semiconductor device including diffusion control. 5,500,391, Cl. 437-131.000.

Beydon, Ronald J.: *See*—
Russell, Randy G.; Crouse, Kent E.; Shackle, Peter W.; and Beydon, Ronald J., 5,500,576, Cl. 315-307.000.

Bhatia, Chandrakant R.; Kuhns, Richard J.; Vannice, Steven D.; and Stober, Michael E., to Videojet Systems International Inc. System and method for seeking and presenting an area for reading with a vision system. 5,499,718, Cl. 209-524.000.

Biermann, Manfred: *See*—
Westhea, Manfred; Hill, Karlheinz; and Biermann, Manfred, 5,500,155, Cl. 252-557.000.

Billerat, Patrick J., to Aplix, Inc. Fastener assembly with magnetic side and end seals and method. 5,500,268, Cl. 428-100.000.

Biller, Stephan: *See*—
Schnaus, Walter; Streng, Michael; Schoenmeier, Franz; and Biller, Stephan, 5,499,652, Cl. 137-340.000.

Billieres, Jean, to Compagnie Generale des Etablissements Michelin–Michelin & Cie. Tubeless tire with bead protectors having air-impermeable layer and method for producing same. 5,499,670, Cl. 152-543.000.

Billiton Witmetaal B.V.: *See*—
Noordegraaf, Jan; Oud, Martinus A.; Behm, Harry; and de Rooy, Roelof, 5,500,183, Cl. 420-557.000.

Billmers, Robert L.: *See*—
Bernard, Karen A.; Tsai, John; Billmers, Robert L.; and Sweger, Robert W., 5,500,087, Cl. 162-164.600.

Binder, Michael; and Mammone, Robert J., to United States of America, Army. Method of treating carbon black and carbon black so treated. 5,500,201, Cl. 423-449.200.

Bingle, Wade H.: *See*—
Smit, John; and Bingle, Wade H., 5,500,353, Cl. 435-69.100.

Bio-Technical Resources: *See*—
Tatnall, Robert E., 5,500,368, Cl. 435-262.000.

Biomembrane Institute, The: *See*—
Hakomori, Sen-itiroh, 5,500,215, Cl. 424-277.100.

Biosource Technologies, Inc.: *See*—
Kumagai, Monto H.; and Sverlow, Genadie G., 5,500,483, Cl. 536-24.100.

Biotech Australia Pty. Ltd.: *See*—
Russell-Jones, Gregory J.; and Geczy, Andrew F., 5,500,366, Cl. 435-252.300.

Birch, Julie: *See*—
Liedermooy, Ingrid; Birch, Julie; Stauffer, Daniel C.; and Puletti, Paul P., 5,500,472, Cl. 524-272.000.

Black, James E., Jr., to General Electric Company. Method for extracting open-issue data from textual specifications using natural language text processing. 5,500,796, Cl. 364-419.080.

Black, Joseph. Golf ball teeing device. 5,499,813, Cl. 273-32.500.

Blaser Die Casting Co.: *See*—
Bowman, Myrlen L., 5,499,427, Cl. 16-121.000.

Blatt, Christopher S.: *See*—
Shinagawa, Robert T.; Jordan, Susan M.; and Blatt, Christopher S., 5,500,095, Cl. 203-2.000.

Blau, Reed J.: *See*—
Lund, Gary K.; and Blau, Reed J., 5,500,059, Cl. 149-19.100.

Blay, George A.: *See*—
Borjas, Ricardo E.; Arzullo-McAdams, Carina; Alexander, Steven R.; Blay, George A.; and Liu, Yaw-Hwa, 5,500,099, Cl. 205-449.000.

Blieux, Paul E.; and Stoffler, Larry W., to Rohm and Haas Company. Crosslinked anion exchange particles and method for producing the particles. 5,500,212, Cl. 424-78.120.

Bliss, Greg A.: *See*—
Powers, Michael C.; Bliss, Greg A.; and Shen, Shioupyn, 5,500,795, Cl. 364-401.000.

Blizaik, Kenneth: *See*—
Mowrey-McKee, Mary; Blizaik, Kenneth; and Stone, Ralph, 5,500,186, Cl. 422-28.000.

Block, Michael H.; Harrison, Alison; and Hargreaves, Rodney B., to Imperial Chemical Industries PLC. Furyl-substituted purines and adenosine antagonists. 5,500,428, Cl. 514-266.000.

Blöhdorn, Gerhard: *See*—
Behrens, Gunnar; Blöhdorn, Gerhard; and Penza, Hans, 5,500,656, Cl. 346-136.000.

Blomberg, Martti; Orpana, Markku; Lehto, Ari; and Korhonen, Assi, to Instrumentarium Oy; and Vaisala Oy. Electrically modulatable thermal radiant source and method for manufacturing the same. 5,500,569, Cl. 313-578.000.

Blomdahl, Karl; and Andreasson, Pontus, to Blomdahl Medical Aktiebolag. Method and apparatus for piercing ears. 5,499,993, Cl. 606-188.000.

Blomdahl Medical Aktiebolag: *See*—
Blomdahl, Karl; and Andreasson, Pontus, 5,499,993, Cl. 606-188.000.

Bloomfield, Dwight A.: *See*—
Tickell, Edward B., Jr.; Schoch, Peter J.; Moseley, Lonnie M.; and Bloomfield, Dwight A., 5,500,597, Cl. 324-339.000.

Blum, Kenneth; Noble, E. P.; and Sheridan, P. J., to Board of Regents, The University of Texas System; and University of California, Regents of the. Allelic association of the human dopamine(D2) receptor gene in compulsive disorders. 5,500,343, Cl. 435-6.000.

Blümel, Gottfried, to Magnetbahn GmbH. Railway switch. 5,499,583, Cl. 104-130.030.

Blumenkron, Jorge L. Flexible tank for liquids. 5,499,743, Cl. 222-107.000.

Blumer, Thomas P.: *See*—
Cook, Craig C.; Blumer, Thomas P.; Packard, Theodore B.; Dreher, Geoffrey A.; and Schmeenau, Thomas A., 5,500,928, Cl. 395-133.000.

Board of Regents, The University of Texas System: *See*—
Blum, Kenneth; Noble, E. P.; and Sheridan, P. J., 5,500,343, Cl. 435-6.000.
Lipsky, Peter E.; and Tao, Xue-Lian, 5,500,340, Cl. 435-6.000.

Board of Trustees operating Michigan State University: *See*—
Krishnan, Mohan; and Narayan, Ramani, 5,500,465, Cl. 524-47.000.

Bobbio, Stephen M.; Koopman, Nicholas G.; and Nangalia, Sundeep, to MCNC. Fluxless soldering sample pretreating system. 5,499,754, Cl. 228-42.000.

BOC Group, Inc., The: *See*—
Yap, Loo T., 5,500,033, Cl. 75-386.000.

Bockowski, Edmund J.: *See*—
Roe, Donald C.; Davis, Dwight P.; Manning, Kevin C.; and Bockowski, Edmund J., 5,500,220, Cl. 424-410.000.

Bode, Graham: *See*—
Milijasevic, Zoran; and Bode, Graham, 5,499,968, Cl. 604-30.000.

Boehringer Mannheim GmbH: *See*—
Martin, Ulrich; and Koenig, Reinhard, 5,500,411, Cl. 514-12.000.

Boeing Company, The: *See*—
Hansen, Karl A.; and Lunden, C. David, 5,500,511, Cl. 219-633.000.
Roberts, James P.; Culp, James D.; Miller, David G.; and Sarsfield, Martin R., 5,499,785, Cl. 244-137.400.

Böer, Michael: *See*—
Röber, Stefan; Jadamus, Hans; Böer, Michael; Feinauer, Roland; Hermann, Hans-Dieter; and Ries, Hans, 5,500,263, Cl. 428-36.600.

Bogdanowicz, Mitchell J.; and DuMont, Christopher L., to Eastman Kodak Company. Color negative film with contrast adjusted for electronic scanning. 5,500,316, Cl. 430-21.000.

Bohn, Carole A.: *See*—
Austin, Jon O.; Byrne, Jani G.; Bohn, Carole A.; Chiavegatto, Arlindo, Jr.; Smith, Jeffrey L.; and Zeisz, Raymond L., Jr., 5,500,934, Cl. 395-755.000.

Bohn, Mark S.: *See*—
Benham, Charles B.; Bohn, Mark S.; and Yakobson, Dennis L., 5,500,449, Cl. 518-700.000.

Boisrobert, Christian; Lucas, Jean-Francois; and Dousteswille, Michel, to France Telecom. Interferometric system for the detection and location of reflecting faults of light-guiding structures. 5,500,733, Cl. 356-345.000.

Bokariza, Steven P.: *See*—
Staka, Robert L.; and Bokariza, Steven P., 5,499,812, Cl. 273-26.00E.

Boland, Bernhard, to Braun Aktiengesellschaft. Brush holder for a toothbrush. 5,499,420, Cl. 15-22.100.

Bolkenius, Frank: *See*—
Grisar, J. Martin; Petty, Margaret A.; and Bolkenius, Frank, 5,500,444, Cl. 514-456.000.

Bolton, James A.: *See*—
Sandhu, Mohan L.; Berlina, Irene; Horowitz, Carl; and Thottathil, Paul, 5,500,253, Cl. 427-385.500.

Bonadeo, Daniele: *See*—
Stroppolo, Federico; Bonadeo, Daniele; Fornasini, Gian F.; and Gazzaniga, Annibale, 5,500,226, Cl. 424-466.000.

Bonifield, James: *See*—
McElroy, Kennedy K., Jr.; Bonifield, James; Boschke, Dale; and Krajewski, Richard A., 5,499,936, Cl. 440-83.000.

Bonomo, Melvin E. Collapsible holder for thin plastic bag utilizing non-slip tightening means. 5,499,787, Cl. 248-97.000.

Borg-Warner Automotive, Inc.: *See*—
Moyers, Chester E.; and Leaz, Robert L., 5,500,490, Cl. 174-151.000.
Richardson, Darrel; Grzesiak, Anthony J.; and Vierk, David T., 5,499,700, Cl. 188-77.00W.
Showalter, Dan J., 5,499,951, Cl. 475-204.000.
Vogt, Carl R., 5,500,509, Cl. 219-501.000.

Borjas, Ricardo E.; Arzullo-McAdams, Carina; Alexander, Steven R.; Blay, George A.; and Liu, Yaw-Hwa, to Hoechst Celanese Corporation. Process for the electrochemical oxidation of arylketones. 5,500,099, Cl. 205-449.000.

Bork, Kevin W.: *See*—
Becker, Danny L.; Bork, Kevin W.; and Krippendorf, Carl, 5,499,955, Cl. 482-51.000.

Born, Jean-Jacques, to Asulab S.A. Weather forecasting watch. 5,500,835, Cl. 368-11.000.

Bös, Michael; Wichmann, Jürgen; and Widmer, Ulrich, to Hoffmann-La Roche Inc. Tricyclic pyrrole derivatives useful as 5-HT selective agents. 5,500,440, Cl. 514-411.000.

Bosch-Siemens Hausgeraete GmbH: *See*—
Gerl, Josef, 5,500,508, Cl. 219-400.000.

Boschke, Dale: *See*—
McElroy, Kennedy K., Jr.; Bonifield, James; Boschke, Dale; and Krajewski, Richard A., 5,499,936, Cl. 440-83.000.

Bothell, Gregory A.; and Sagraves, Charles R., to White Consolidated Industries, Inc. Lawn mower discharge chute. 5,499,494, Cl. 56-320.100.

Bottomley, James: *See*—
Srinivasan, Ramesh; Bottomley, James; and Coslett, W. Andrew, 5,500,068, Cl. 156-148.000.
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Bottomley, Paul A., to General Electric Company. Absolute metabolite concentrations from poorly spatially-resolved MR response signals. 5,500,592, Cl. 324-307.000.

Bouchillon, Charles W.; and Franko, Andrew, to Fluid Quip, Inc. Multiple hydrocyclone assembly. 5,499,720, Cl. 209-728.000.





Boudreau, Robert A.; Bowen, Terry P.; Han, Hongtao; Rowlette, John R., Sr.; and Stack, Jared D., to Whitaker Corporation, The. Passively aligned holographic WDM. 5,500,910, Cl. 385-24.000.

Bourdeau, Joël: *See*—
Danezin, Bruno; Bourdeau, Joël; and Sence, Olivier, 5,499,461, Cl. 36-117.000.

Bourg, Christian-P. Collating machine. 5,499,806, Cl. 271-9.110.

Boutaghou, Zine-Eddine; and Erickson, Kevin J., to International Business Machines Corporation. Disk drive spindle motor having split windings for each phase. 5,500,780, Cl. 360-99.080.

Boutilier, Glenn D.: *See*—
Trakhan, Paul D.; and Boutilier, Glenn D., 5,500,277, Cl. 428-196.000.

Bowe-Passat Reinigungs Und: *See*—
Geiger, Friedrich, 5,499,464, Cl. 38-46.000.

Bowen, Terry P.: *See*—
Boudreau, Robert A.; Bowen, Terry P.; Han, Hongtao; Rowlette, John R., Sr.; and Stack, Jared D., 5,500,910, Cl. 385-24.000.

Bowman, Myrlen L., to Blaser Die Casting Co. Drawer knob assembly. 5,499,427, Cl. 16-121.000.

Boyer, Ernest W.; and Charles, Robert L., to Solvay Enzymes, Inc. Method for producing a therapeutic composition for papillomavirus-induced tumors with aspergillus niger. 5,500,359, Cl. 435-171.000.

Boyle, Steven R.; Proebsting, Robert J.; and Heradon, William H., to Intergraph Corporation. Method of making a multi-layer to package. 5,499,445, Cl. 29-830.000.

Bradley, Edwin L., III: *See*—
Banerji, Kingshuk; Bradley, Edwin L., III; and Da Costa Alves, Francisco, 5,499,756, Cl. 228-214.000.

Bradt, Rexford H. Process of producing heat-softenable, hopper-feedable plastic pellets containing folded reinforcing fibers. 5,500,175, Cl. 264-151.000.

Brady, Londa B. Training method for achieving a repeatable putting stroke. 5,499,817, Cl. 273-194.00R.

Brady USA, Inc.: *See*—
Beada, Steven J.; and Pearson, John P., 5,500,495, Cl. 200-43.140.

Brashear, Daniel F.: *See*—
Metcalf, Jeffrey D.; and Brashear, Daniel F., 5,499,957, Cl. 482-70.000.

Branchitsch, Nelson F. Synthetic resin toilet flange cutting tool. 5,499,453, Cl. 30-105.000.

Braun Aktiengesellschaft: *See*—
Boland, Bernhard, 5,499,420, Cl. 15-22.100.

Brauneis, Edwin: *See*—
Theisen, Wolfgang; Brauneis, Edwin; and Pirstadt, Bernd, 5,500,162, Cl. 264-9.000.

Brauner-Nemeth, Inc.: *See*—
Nemeth, Bradley M., 5,499,715, Cl. 206-505.000.

Bredahl, Timothy D.: *See*—
Lau, Felix P.; Bredahl, Timothy D.; and Cox, George E., 5,500,293, Cl. 428-355.000.

Breemes, David P., Sr.: *See*—
Curran, Donald P., Jr.; Pollocks, Lonnie J., Jr.; Breemes, David P., Sr.; Carreira, Leonard M.; and Trenchard, Thomas J., 5,500,659, Cl. 347-28.000.

Bretz, Phillip D.; and Forshan, Vincent R. Breast implant device. 5,500,017, Cl. 623-8.000.

Brice, Michael F. Twin-headed toothbrush. 5,499,421, Cl. 15-167.100.

Bridges, John A.; Neal, Philip H.; and Besser, John E., to Aladdin Industries, Inc. Vacuum insulated panel and method of making a vacuum insulated panel. 5,500,305, Cl. 428-621.000.

Bridges, Willard P. Angled seat valve and fitting apparatus. 5,499,658, Cl. 137-886.000.

Bridgestone Corporation: *See*—
Kojima, Hiroshi, 5,499,799, Cl. 267-140.130.
Lawson, David P.; Antkowiak, Thomas A.; Hall, James E.; and Stayer, Mark L., Jr., 5,500,447, Cl. 524-571.000.

Bridgestone/Firestone, Inc.: *See*—
Koch, Russell W.; Turner, John L.; Walenga, Guy J.; Takigawa, Hiroyoshi; and Okamoto, Keizo, 5,500,065, Cl. 156-123.000.

Bright, Stuart W.; Dantzig, Anne H.; Tabas, Linda B.; and Sportsman, J. Richard, to Eli Lilly and Company. Monoclonal antibodies to human influx peptide transporter. 5,500,346, Cl. 435-7.210.

Bristol-Myers Squibb Company: *See*—
Keating, Kim R., 5,500,232, Cl. 426-74.000.

British Aerospace Public Limited Company: *See*—
Domine, Christophe A., 5,499,782, Cl. 244-1.00A.

British Gas plc: *See*—
Green, Malcolm L.; Cheetham, Anthony K.; Vernon, Patrick D.; and Ashcroft, Alexander T., 5,500,149, Cl. 252-373.000.

British Nuclear Fuels PLC: *See*—
Eccles, Harry; Garnham, Geoffrey W.; Lowe, Christopher R.; and Bruce, Neil C., 5,500,351, Cl. 435-25.000.

British Technology Group Ltd.: *See*—
Smith, John A. S.; and Shaw, Julian D., 5,500,591, Cl. 324-307.000.

British Telecommunications Public Limited Company: *See*—
Armitage, Jonathan R.; Wyatt, Richard; and Massicott, Jennifer F., 5,500,764, Cl. 359-341.000.

Broadway, Lee: *See*—
Joshi, Mahendra L.; and Broadway, Lee, 5,500,030, Cl. 65-346.000.

Brocco, Mauricette: *See*—
Lavielle, Gilbert; Hautefaye, Patrick; Muller, Olivier; Millan, Mark; and Brocco, Mauricette, 5,500,443, Cl. 514-422.000.

Broder, Damon W.: *See*—
Schwiebert, William H.; Hall, Corrina A. E.; Broder, Damon W.; and Moore, Shelley L., 5,500,667, Cl. 347-102.000.

Brook, Simon. Escape ladder. 5,499,692, Cl. 182-196.000.

Brooks, Phillip R.: *See*—
Veeneman, William J.; Alexander, Karla J.; Doyle, Thomas J.; Brooks, Phillip R.; and Hamilton, Robert H., 5,500,514, Cl. 235-381.000.

Brooktree Corporation: *See*—
Essig, Daniel L., 5,500,892, Cl. 379-345.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Kyuno, Mitsuyasu; Mizuno, Masahiro; Futamura, Masao; and Muto, Yukiyoshi, 5,499,589, Cl. 112-102.500.

Brown, Craig J.; and Sheedy, Michael A., to Eco-Tec Limited. Process for regeneration of volatile acids. 5,500,098, Cl. 203-13.000.

Brown, Gayle C.; Campo, Juan J.; Heiser, Philip F.; and McKnight, Steven M., to McDermott International, Inc. Marine vessel launch apparatus utilizing explosive triggers. 5,499,596, Cl. 114-375.000.

Brown, Geoffrey B. D.; and Park, David W., to Northern Telecom Limited. Timing recovery for digital demodulation. 5,500,620, Cl. 329-300.000.

Brown, Glenn: *See*—
Vishwakarma, Lal C.; and Brown, Glenn, 5,500,332, Cl. 430-512.000.

Brown, John D.: *See*—
Sinandil, Ronald F.; and Brown, John D., 5,500,450, Cl. 521-64.000.

Brown, John P., III: *See*—
Ubler, George M.; and Brown, John P., III, 5,500,947, Cl. 395-375.000.

Brown, Neil; and Peij, Detlef V., to Martinswerk G.m.b.H. für chemische und metallurgische Produktion. Process for the production of an aluminum hydroxide $Al(OH)_3$ having rounded grain surfaces. 5,500,480, Cl. 524-437.000.

Brownell, George L.: *See*—
Smeal, Thomas W.; and Brownell, George L., 5,500,171, Cl. 264-309.000.

Bruce, Neil C.: *See*—
Eccles, Harry; Garnham, Geoffrey W.; Lowe, Christopher R.; and Bruce, Neil C., 5,500,351, Cl. 435-25.000.

Brucker, Gregory G.; and Savage, Steven D., to Angeion Corporation. Ablation catheter system. 5,500,012, Cl. 607-122.000.

Brugger, Manfred F.; Klarer, Martin; Knoff, Bernd; Eckl, Albrecht; Steiner, Manfred; Rump, Siegfried; Nell, Joachim; Eckstein, Fredy; Steffi, Christoph; and Douglas, Brian, to Mercedes-Benz AG. Monitoring method and device in automatic braking process. 5,499,866, Cl. 303-122.080.

Bruner, Dennis R.; and Bataglinsis, Donna L. Plural receptacle filtering litter box system. 5,499,610, Cl. 119-166.000.

Brunier, Régis G.; Cotto, Dominique J.; Joly, Richard G. A.; Kornacis, Stéphane M.; and Silvestrelli, Michel F. F., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "SNECMA". Device for shot-blasting surfaces inaccessible by a straight pipe. 5,499,519, Cl. 72-53.000.

Bryan, Robert P.: *See*—
Jewell, Jack L.; Quinn, William E.; Swirbus, Stan E.; and Bryan, Robert P., 5,500,540, Cl. 257-82.000.

Bryant, Frank R.: *See*—
Chen, Tsin C.; Bryant, Frank R.; Lu, Lan-Tseng; and Wei, Che-Chia, 5,500,557, Cl. 257-758.000.

Bryant, Yvonne G.; and Colvin, David P. Moldable foam insole with reversible enhanced thermal storage properties. 5,499,460, Cl. 36-43.000.

BS&B Safety Systems, Inc.: *See*—
Tomasko, John A.; and Farwell, Stephen P., 5,499,649, Cl. 137-68.270.

Bu, Jong U., to Goldstar Co., Ltd. Sensor for detecting ultra-violet rays. 5,500,531, Cl. 250-372.000.

Buck Chemische-Technische Werke GmbH & Co.: *See*—
Schiessl, Alois; Steinicke, Wolfgang; Trede, Wolfgang; and Krone, Hartmut, 5,499,582, Cl. 102-334.000.

Bück, Rudolf; Egelhof, Dieter; Hensler, Klaus; Kade, Werner; Meinecke, Albrecht; Wanke, Wilhelm; and Wolz, Hans-Jürgen, to J. M. Voith GmbH. Twin-wire former. 5,500,091, Cl. 162-301.000.

Buckel, Konrad. Wide band high frequency compatible electrical coaxial cable. 5,500,488, Cl. 174-102.00R.

Buckley, James; Masuda, William; and Lundquist, Joseph. Methods for extending the cycle life of solid, secondary electrolytic cells during recharge of the electrolytic cells. 5,500,583. Cl. 320-14.000.

Buell, Kenneth B.; Clear, Sandra H.; and Falcone, Daniella T., to Procter & Gamble Company, The. Absorbent article with dynamic elastic waist feature having a predisposed resilient flexural hinge. 5,499,978, Cl. 604-385.200.

Buenaow, Rudolf; and Egle, Hans, to Van den Bergh Foods Co., Division of Conopco, Inc. Fermented sour dough and method of making. 5,500,231, Cl. 426-18.000.

Buhl, Reinhard: *See*—
Westphal, Paul; and Buhl, Reinhard, 5,499,550, Cl. 74-422.000.

Built On Technology: *See*—
Conant, Mark, 5,499,749, Cl. 222-233.000.

Bulley, John L.; and Gradwell, Stephen L. to JLB Textiles Limited. Tubular bandages. 5,499,966, Cl. 602-42.000.

Bullock, Donald C. Collapsible tension-compression variable hull structure. 5,499,594, Cl. 114-354.000.

Bundy Corporation: *See*—
Kujawski, Rick A., 5,499,848, Cl. 285-93.000.

Buonomo, Franco: *See*—
Bellussi, Giuseppe; Buonomo, Franco; Esposito, Antonio; Clerici, Mario G.; and Romano, Ugo, 5,500,199, Cl. 423-328.200.

Burchnall, John B.: *See*—

Langdon, Fred M.; Ouellette, William R.; and Burchsall, John B., 5,500,270, Cl. 428-119.000.

Burgess, Bradley G.: *See*—
Ho, Ying-wai; and Burgess, Bradley G., 5,500,943, Cl. 395-375.000.

Burgio, Emanuele; and Serrao, Giacinto, to Monsell North America Inc. Composite polyolefin films suitable for packaging. 5,500,284, Cl. 428-349.000.

Burgio, Paul A.: *See*—
Erickson, Robert L.; Hansen, Paul E.; Burgio, Paul A.; Oxman, Joel D.; and Christoff, James D., 5,499,917, Cl. 433-137.000.

Burgoyne, William F., Jr.; Daniels, Wiley E.; Sagi, Dennis; Lee, Heueh-Chi; and Vratsanos, Menas S., to Air Products and Chemicals, Inc. Process for coating low energy surfaces. 5,500,251, Cl. 427-322.000.

Burleigh, Howard I. Container for holding pressurized liquids. 5,499,738, Cl. 220-504.000.

Burroughs Wellcome Co.: *See*—
Page, Martin J., 5,500,214, Cl. 424-133.100.

Burstein, Steven, to Standard Microsystems Corp. Very high current integrated circuit output buffer with short circuit protection and reduced power bus spikes. 5,500,610, Cl. 326-85.000.

Burton, Edward M. Surface coil holder for magnetic resonance imaging. 5,500,595, Cl. 324-318.000.

Burton, John H.: *See*—
Tihon, Claude; Burton, John H.; Cook, Timothy C.; and Rhum, David, 5,499,994, Cl. 606-192.000.

Busato, Murray P.; Perry, Paul D.; and Cook, John E., to Siemens Elecric Limited. Means and method for operating evaporative emission system leak detection pump. 5,499,614, Cl. 123-520.000.

Buscemi, Paul J.; Sajdzal, Elizabeth A.; Palme, Donald F., II; and Wang, Lixiao, to Scimed Life Systems, Inc. Biodegradable drug delivery vascular stent. 5,500,013, Cl. 623-1.000.

Bustos, Rafael T., to L&P Property Management Company. Refrigerated shelf merchandiser. 5,499,513, Cl. 62-252.000.

Buthcreit, Werner: *See*—
Kuehn, Edmund; Sieber, Tilo; and Buthcreit, Werner, 5,499,527, Cl. 73-4.008.

Byrne, Jani G.: *See*—
Austin, Jon O.; Byrne, Jani G.; Bohn, Carole A.; Chiavegatto, Arlindo, Jr.; Smith, Jeffrey L.; and Zeisz, Raymond L., Jr., 5,500,934, Cl. 395-755.000.

Byrne, Paul J.: *See*—
Bartz, John C.; and Byrne, Paul J., 5,499,674, Cl. 165-76.000.

Byrnes, Francis E.: *See*—
Schmaling, David N.; Miner, Frederick J.; and Byrnes, Francis E., 5,499,903, Cl. 416-134.00A.

C. A. Weidmueller GmbH & Co.: *See*—
Jagiella, Manfred; Wiesemann, Wolf; Schubert, Peter; Holzmann, Michael; and Spörl, Georg, 5,500,504, Cl. 219-121.670.

C. R. Bard, Inc.: *See*—
Anderson, Jere R.; Jandris, Louis J.; Barbere, Michael D.; and Murphy, Richard T., 5,500,180, Cl. 264-532.000.

Cabel-Con, Inc.: *See*—
Jacobsen, Ingolf G.; and Langham, Arvin L., 5,499,934, Cl. 439-585.000.

Cadieux, James R.: *See*—
Kronberg, James W.; and Cadieux, James R., 5,499,529, Cl. 73-40.700.

Cafarelli, Robert S. Combined drill screw with reamer. 5,499,896, Cl. 411-387.000.

Cagliostro, Charles W., to Gemplus Card International. Apparatus and method for data transfer between stand alone integrated circuit smart card terminal and remote computer of system operator. 5,500,517, Cl. 235-486.000.

Cahill, Leslie M.; Miller, David R.; and Schell, David J., to International Business Machines, Corporation. Method and apparatus for directly selecting and signalling start and stop times in an electronic calendar. 5,500,938, Cl. 395-161.000.

Calabrese, Gary S.: *See*—
Calvert, Jeffrey M.; Dressick, Walter J.; Calabrese, Gary S.; and Gulla, Michael, 5,500,315, Cl. 430-16.000.

California Institute of Technology: *See*—
Marder, Seth R.; Chen, Chin-Ti; and Cheng, Lap-Tak, 5,500,156, Cl. 252-582.000.

Calvert, Jeffrey M.; Dressick, Walter J.; Calabrese, Gary S.; and Gulla, Michael, to Rohm & Haas Company. Processes and compositions for electroless metallization. 5,500,315, Cl. 430-16.000.

Campbell, Alan S.; Elbert, Donald L.; McCornack, William C.; and Ziercher, Eric L., to Lexmark International, Inc. Photoconductor for abrasion in liquid systems. 5,500,724, Cl. 355-297.000.

Campbell Soup Company: *See*—
Miller, Harry E.; Pak, Paul; Schechter, Steven M.; and Huynh, Vien-An T., 5,500,236, Cl. 426-451.000.

Campo, Juan J.: *See*—
Brown, Gayle C.; Campo, Juan J.; Heiser, Philip F.; and McKnight, Steven M., 5,499,596, Cl. 114-375.000.

Cascarb Limited: *See*—
Hurtot, Donald, 5,499,477, Cl. 52-604.000.

Casey, Robert D.: *See*—
Olzak, Richard A.; Collier, James L.; and Casey, Robert D., 5,500,518, Cl. 235-492.000.

Canning, George. Slip-resistant mat for absorbing oil and other liquids. 5,500,267, Cl. 428-68.000.

Canon Information Systems, Inc.: *See*—
Luther, Willis J., 5,500,919, Cl. 395-2.690.
Raetz, Brigitte, 5,500,921, Cl. 395-109.000.
Schnorf, Peter, 5,500,933, Cl. 395-154.000.

Canon Kabushiki Kaisha: *See*—
Aoyama, Takeshi; and Yoshida, Yasumi, 5,500,726, Cl. 355-315.000.
Hagiwara, Kazuyoshi; and Tanikawa, Hirohide, 5,500,046, Cl. 118-653.000.
Hashimoto, Yuichi; Amamiya, Shoji; and Sakakibara, Teigo, 5,500,718, Cl. 355-210.000.
Hattori, Yoshifumi; Inada, Genji; and Watanabe, Kenjiro, 5,500,658, Cl. 347-22.000.
Hattori, Yoshifumi; Karita, Seiichiro; Saikawa, Hideo; Kashino, Toshio; Saito, Akio; Nakagomi, Hiroshi; Arashima, Teruo; Kimura, Mekiko; Sugitani, Hiroshi; Inada, Masami; Saito, Aano; Masuda, Kazuaki; and Orikasa, Tsuyoshi, 5,500,666, Cl. 347-87.000.
Hayashi, Kenichi; Hayakawa, Kimiaki; and Takehara, Yoshifumi, 5,499,811, Cl. 271-293.000.
Ichikawa, Takeshi; Shindo, Hitoshi; and Ohmi, Kazuaki, 5,500,102, Cl. 204-192.250.
Inaba, Yutaka; Okada, Shinjiro; Taniguchi, Osamu; and Mizuno, Hironobu, 5,500,749, Cl. 359-56.000.
Kasuya, Takashige; Nagatsuka, Takayuki; Nakamura, Tatsuya; Kanbeyashi, Makoto; and Chiba, Tatsuhiko, 5,500,321, Cl. 430-109.000.
Kobayashi, Katsuyuki; Tamiishi, Shinnosuke; Tanaka, Atsushi; Yoshimura, Yuichiro; Kaneko, Kiyoshi; Yanagisawa, Ryozo; and Tokioka, Masaki, 5,500,492, Cl. 178-18.000.
Koike, Shoji; Haruta, Masahiro; Shirota, Koromo; Yamamoto, Tomoya; and Suzuki, Mariko, 5,500,023, Cl. 8-499.000.
Kuroshima, Masashi; Hara, Hiroyuki; and Machida, Haruo, 5,500,923, Cl. 395-114.000.
Masuda, Takashi; Okumura, Toshiaki; Uchida, Koji; and Yamamoto, Osamu, 5,500,696, Cl. 351-205.000.
Matsubara, Miyuki; Hirabayashi, Hirotsuru; Nagoshi, Shigeyasu; Koitabashi, Noribumi; Sugimoto, Hitoshi; Gotoh, Fumihiro; and Uetuki, Masaya, 5,500,661, Cl. 347-41.000.
Morishita, Masakazu, 5,500,550, Cl. 257-461.000.
Muramoto, Tomosaka, 5,500,740, Cl. 358-327.000.
Nakata, Toru, 5,500,857, Cl. 370-50.000.
Nishimoto, Yoshifumi; and Kataoka, Kenichi, 5,499,808, Cl. 271-267.000.
Ogasawara, Yutaka, 5,500,840, Cl. 369-32.000.
Orino, Kanjo; Sakai, Mikio; and Sakanaka, Tetsuo, 5,500,754, Cl. 359-156.000.
Sakaegi, Yuji; Suzuki, Nobuyuki; and Sato, Yoshinobu, 5,500,743, Cl. 358-403.000.
Sakaki, Eihiro; Ogasawara, Yoshimi; and Teshima, Eiichiro, 5,500,834, Cl. 368-9.000.
Suzuki, Etsurou; Hattori, Yoshifumi; Kitani, Masashi; Saikawa, Hideo; Kojima, Masami; Kawano, Kenji; Tanno, Koichi; and Aono, Kenji, 5,500,664, Cl. 347-86.000.
Takao, Hideaki; Murata, Tatsuo; Kaabe, Junichiro; Tamura, Miki; Kamio, Masaru; Sekimura, Nobuyuki; and Kikuchi, Yoshiki, 5,500,751, Cl. 359-68.000.
Tanikawa, Hirohide; Uchiyama, Masaki; Joh, Yoshinobu; Akashi, Yasutaka; Taya, Masashi; and Unno, Makoto, 5,500,318, Cl. 430-99.000.
Toyama, Noboru; and Nakagawa, Katsumi, 5,500,055, Cl. 136-259.000.
Ujita, Toshihiko; Nakajima, Kazuhiro; Sato, Yohei; and Murakami, Shuichi, 5,500,663, Cl. 347-86.000.
Ujita, Toshihiko; and Matsumoto, Haruyuki, 5,500,665, Cl. 347-86.000.
Watanabe, Kenjiro, 5,500,662, Cl. 347-43.000.
Yashiro, Masahiko; Sasaki, Shinichi; Ikenoto, Isao; Miura, Koji; Karakama, Toshiyuki; and Numagami, Atsushi, 5,500,714, Cl. 355-200.000.
Yasomi, Toshiya; and Enari, Masahiko, 5,500,683, Cl. 348-565.000.

Canvik A/S: *See*—
Hansen, Kim, 5,499,563, Cl. 82-112.000.

Cao, Hosi-Chau; and Houben, Marie-Christine, to Colgate-Palmolive Co. Heavy duty fabric softening laundry detergent composition. 5,500,151, Cl. 252-546.000.

Capper, Valerie A.: *See*—
Tan, Sze W.; and Capper, Valerie A., 5,499,418, Cl. 5-655.000.

Card-Monroe Corp.: *See*—
Card, Roy T.; and Hall, Wilton, 5,499,588, Cl. 112-80.410.

Card, Roy T.; and Hall, Wilton, to Card-Monroe Corp. Method and apparatus for producing tufts in longitudinal lines. 5,499,588, Cl. 112-80.410.

Carey, Richard J.; and Thackerey, James W., to Rohm and Haas Company. Purification process. 5,500,127, Cl. 210-685.000.

Carey, William S.; and Meyer, Ellen M., to Betz Laboratories, Inc. Polymeric dithiocarbamate acid salt compositions and method of use. 5,500,133, Cl. 210-729.000.

Cargnelutti, Mario, to Gruppo Sarplast S.p.A. Process for manufacturing a flue made of fiber-reinforced plastic, particularly of a stack for discharging chemically aggressive fumes. 5,500,165, Cl. 264-32.000.

Carletti, Vittorio; Longhini, Gianfranco; Po', Riccardo; Podesta', Roberto; Romano, Anna M.; and Querci, Cecilia, to Great Lakes Chemical Italia S.r.l.; and Bairicerche S.p.A. Reactive flame retardant additives containing phosphino oxide moieties. 5,500,285, Cl. 428-364.000.

Carlsson, Rolf A., to Mo Och Domsjo Aktiebolag. Packaging unit for sheet like material. 5,499,764, Cl. 229-117.160.

Carney, Darrell H.; and Glenn, Kevin C. Thrombin derived polypeptides; compositions and methods for use. 5,500,412, Cl. 514-13.000.





Carney, Eugene E.: *See*—
Mirle, Srinivas K.; and Carney, Eugene E., 5,500,470, Cl. 524-204.000.

Carr, Albert A.; Dage, Richard C.; Koerner, John E.; Li, Tung; Miller, Francis P.; Nieduzak, Thaddeus R.; Dudley, Mark W.; Schmidt, . Christopher J.; and Frank, Robert A., to Merrell Pharmaceuticals Inc. Method of treating drug abuse. 5,500,433, Cl. 514-330.000.

Carrara, Bruno, to Thomson-CSF. Method for determining the rank of distance ambiguity of radar echoes. 5,500,647, Cl. 342-195.000.

Carrazza, Jose: *See*—
Rodriquez, Domingo; Payne, Roy; Gomez, Cebers; Carrazza, Jose; and Kramlich, John, 5,499,587, Cl. 110-342.000.

Carreira, Leonard M.: *See*—
Carras, Donald P., Jr.; Pollocks, Lonnie J., Jr.; Breemes, David P., Sr.; Carreira, Leonard M.; and Trenchard, Thomas J., 5,500,659, Cl. 347-28.000.

Carter, Brad: *See*—
Carter, Warren; and Carter, Brad, 5,499,449, Cl. 29-882.000.

Carter, Warren; and Carter, Brad, to Molded Metal Services, Inc. Method of manufacturing battery terminals. 5,499,449, Cl. 29-882.000.

Casio Computer Co., Ltd.: *See*—
Sasakura, Miyoshi; Ohkura, Osamu; Mizoguchi, Takehiko; Hori, Satoru; and Yoshida, Satoshi, 5,500,932, Cl. 395-149.000.

Cassella Aktiengesellschaft: *See*—
Schlosafinger, Karl; Schindler, Ursula; and Schraven, Eckhard, 5,500,436, Cl. 514-397.000.

Castaneda, Louis R.: *See*—
Powell, Walter W.; and Castaneda, Louis R., 5,499,648, Cl. 137-15.000.

Castleberry, Donald E.: *See*—
Ishaque, Ahmad N.; and Castleberry, Donald E., 5,500,376, Cl. 437-3.000.

Castro, Michael; and Toso, Kenneth E., to United States Surgical Corporation. Everting forceps with locking mechanism. 5,499,999, Cl. 606-208.000.

Caterpillar Inc.: *See*—
Bartz, John C.; and Byrne, Paul J., 5,499,674, Cl. 165-76.000.
Haughney, Michael A.; Mojarrad, Mehrdad; Tornow, Devin C.; and Wiemken, Norval J., 5,499,612, Cl. 123-470.000.
Lawrence, Keith E.; Suda, Kenneth J.; and Hays, William J., 5,499,615, Cl. 123-526.000.
Meister, Steven F.; and Miller, Charles R., 5,499,608, Cl. 123-467.000.
Stratton, Kenneth L., 5,499,684, Cl. 172-4.500.

Cavalluzzi, James J.: *See*—
Hasch, James T.; and Cavalluzzi, James J., 5,499,675, Cl. 165-38.000.

Celltech Limited: *See*—
Baker, Terence S.; Perry, Martin J.; and Fleming, Ian M., 5,500,350, Cl. 435-7.920.

Cesaroni, Anthony J., to Cesaroni, Anthony J. Multi-panelled heat exchanger. 5,499,676, Cl. 165-166.000.

Chabries, Douglas M.: *See*—
Stockham, Thomas G., Jr.; and Chabries, Douglas M., 5,500,902, Cl. 381-68.400.

Chadwick, Galen J. Simulated gold and gemstone mining operation. 5,500,136, Cl. 210-805.000.

Chahine, Georges L., to Dyna Flow, Inc. Microfiltration system with swirling flow around filter medium. 5,500,134, Cl. 210-787.000.

Chakmakjian, Stephen H.; Gruneisen, Mark T.; Koch, Karl W., III; and Moore, Gerald T., to United States of America, Air Force. Phased cascading of multiple nonlinear optical elements for frequency conversion. 5,500,865, Cl. 372-22.000.

Chalberg, Philip E.; and Kenchel, Paul N., to Hydrabaths, Inc. Safety suction assembly for use in whirlpool baths and the like. 5,499,406, Cl. 4-541.200.

Chan, Anthony S. B., to Lucas Industries Public Limited Company. Signal processing circuit for engine control system. 5,499,534, Cl. 73-116.000.

Chan, Tsiu C.; Bryant, Frank R.; Lu, Lun-Tseng; and Wei, Che-Chia, to SGS-Thomson Microelectronics, Inc. Structure and method for fabricating integrated circuits. 5,500,557, Cl. 257-758.000.

Chan, Wai Y. C.; and Livingston, James W., to Diversey Corporation. Ratio feed detergent controller and method with automatic feed rate learning capability. 5,500,050, Cl. 134-18.000.

Chang, David D. C., to AT&T Corp. Electrical test apparatus and method. 5,500,605, Cl. 324-758.000.

Chang, Hou-Min; Wu, Tien-Wang; and Heitmann, John A., to North Carolina State University. Deinking of xerographic printed wastepaper using long chain alcohol. 5,500,082, Cl. 162-5.000.

Chang, Pei-Sheng. Writing implement with correction supply. 5,499,881, Cl. 401-17.000.

Chang, Shuen C.; Ho, Hai D.; and Sun, Szu C., to Sun Microsystems, Inc.; and Samsung Semiconductor, Inc. Method and apparatus for providing accurate T(on) and T(off) times for the output of a memory array. 5,500,818, Cl. 365-189.050.

Chao, Chien C.: *See*—
Zarchy, Andrew S.; Chao, Chien C.; and Maurer, Richard T., 5,500,035, Cl. 95-41.000.

Chao, Ping-Yi: *See*—
Her, Imchyn; Chao, Ping-Yi; and Huang, Ming-Jang, 5,499,833, Cl. 280-247.000.

Chapman, Derek D.; Goswami, Ramanuj; and Kovacs, Csaba A., to Eastman Kodak Company. Dye mixtures for optical recording layers. 5,500,325, Cl. 430-270.160.

Chapman, William A. Apparatus for joining structural components. 5,499,885, Cl. 403-380.000.

Charbonneau, Duane L., to Procter & Gamble Company, The. Oral compositions comprising actinomyces viscosus fimbriae. 5,500,206, Cl. 424-50.000.

Charbonneau, Duane L., to Procter & Gamble Company, The. Oral compositions comprising a novel tripeptide. 5,500,208, Cl. 424-55.000.

Charles, Robert L.: *See*—
Boyer, Ernest W.; and Charles, Robert L., 5,500,359, Cl. 435-171.000.

Chasin, Mark: *See*—
Oshlack, Benjamin; and Chasin, Mark, 5,500,227, Cl. 424-476.000.

Chattopadhyay, Arun K., to ICI Canada Inc. Emulsion explosive. 5,500,062, Cl. 149-46.000.

Cheetham, Anthony K.: *See*—
Green, Malcolm L.; Cheetham, Anthony K.; Vernon, Patrick D.; and Ashcroft, Alexander T., 5,500,149, Cl. 252-373.000.

Chen, Chin-Ti: *See*—
Marder, Seth R.; Chen, Chin-Ti; and Cheng, Lap-Tak, 5,500,156, Cl. 252-582.000.

Chen, Chung-Yuan: *See*—
Eikenberry, Jon N.; Lok, Roger; and Chen, Chung-Yuan, 5,500,333, Cl. 430-567.000.

Chen, Cin-Chen. Closure assembly for vacuum sealed containers. 5,499,735, Cl. 220-231.000.

Chen, Jiashu; VanVoen, Barry P.; and Hecox, Kurt E., to Wisconsin Alumni Research Foundation. Methods and apparatus for producing directional sound. 5,500,900, Cl. 381-17.000.

Chen, Ping. Multi-functional exercise device. 5,499,960, Cl. 482-116.000.

Chen, Roger; and Kinsey, Kenneth K., Jr., to Advanced Peripherals Labs, Inc. RAS encoded generator for a memory bank. 5,500,831, Cl. 365-233.000.

Chen, Tse-Min. Device for locating reinforcing plate of bicycle brake. 5,499,699, Cl. 188-24.210.

Chen, Tsuhan: *See*—
Andersson, Russell L.; Chen, Tsuhan; and Haskell, Barin G., 5,500,671, Cl. 348-15.000.

Chen, Yuanwei: *See*—
Reymond, Jean-Louis; Chen, Yuanwei; and Lerner, Richard A., 5,500,358, Cl. 435-156.000.

Cheng, Kuang-Cheng; Tsai, Meng-Jin; Kuo, Ta-Chi; and Su, Kuo-Juan, to United Microelectronics Corporation. Double switching field effect transistor and method of manufacturing it. 5,500,545, Cl. 257-341.000.

Cheng, Lap K., to Du Post de Nemours, E. I., and Company. Hydrothermal aqueous mineralizer for growing optical-quality single crystals. 5,500,145, Cl. 252-183.140.

Cheng, Lap-Tak: *See*—
Marder, Seth R.; Chen, Chin-Ti; and Cheng, Lap-Tak, 5,500,156, Cl. 252-582.000.

Chesebrough-Pond's USA Co., Division of Conopco, Inc.: *See*—
Isia, Mark; Dzierak, Mark; and Verdura, Javier, Jr., 5,499,748, Cl. 222-180.000.

Chesebrough-Pond's USA Co., Division of Conopoco, Inc.: *See*—
Cummins, Diane; Van Der Ouderaa, Franciscus J.; and Trandt, Michael D., 5,500,448, Cl. 514-717.000.

Chiavegatto, Arlindo, Jr.: *See*—
Austin, Jon O.; Byrne, Jani G.; Bohn, Carole A.; Chiavegatto, Arlindo, Jr.; Smith, Jeffrey L.; and Zeisz, Raymond L., Jr., 5,500,934, Cl. 395-755.000.

Chiba, Tadahiro: *See*—
Miyazawa, Kiyoshi; Chiba, Tadahiro; Iwata, Yuhei; Tamura, Uhei; Murotani, Isao; and Tanaki, Shuya, 5,500,416, Cl. 514-23.000.

Chiba, Tatsuhiko: *See*—
Kasuya, Takashige; Nagatsuka, Takayuki; Nakamura, Tatsuya; Kanbeyashi, Makoto; and Chiba, Tatsuhiko, 5,500,321, Cl. 430-109.000.

Chida, Toshikazu: *See*—
Takemoto, Takatoshi; Chida, Toshikazu; Kano, Noriaki; Ito, Eiji; Murakami, Koji; Inagaki, Takashi; Sekimoto, Koji; and Suzuki, Masanori, 5,499,809, Cl. 271-274.000.

Chikada, Akira; Obgiri, Shigetoru; and Ito, Hiroe, to Ichikoh Industries, Ltd. Device for confirming optical-axis adjustment of automotive headlamp. 5,500,790, Cl. 362-66.000.

Childers, Winthrop D.; and Gompertz, Ronald S., to Hewlett-Packard Company. Wiper for inkjet printhead nozzle member. 5,500,660, Cl. 347-33.000.

Children On the Go, Inc.: *See*—
Greenwood, Mark H.; and Keith, Marvin, 5,499,729, Cl. 215-11.500.

Chino, Shuichi: *See*—
Reuschel, Gerhard; Fleischer, Dietrich; Yamamoto, Kaoru; and Chino, Shuichi, 5,500,477, Cl. 525-398.000.

Chippas, Laura L. Mooring device for boats. 5,499,591, Cl. 114-230.000.

Chiu, Wai T.; and Wong, Kwong Y., to National Semiconductor Corporation. Cordless telephone security code initiation and prevention system. 5,500,888, Cl. 379-61.000.

Cho, Byung J., to Hyundai Electronics Industries Co., Ltd. Apparatus for manufacturing a semiconductor layer using rapid thermal processing. 5,499,602, Cl. 118-712.000.

Choi, Nak-Choon: *See*—
Jeon, Dal-Young; Jee, Kyung-Ha; Choi, Nak-Choon; Song, Bok-Ki; and Shin, Dong-Myeong, 5,500,792, Cl. 363-98.000.

Choi, Yang K., to Hyundai Electronics Industries Co., Ltd. Process of forming contact holes. 5,500,080, Cl. 156-644.100.

Chow, James C. Y.: *See*—
Garmen, Gary; and Chow, James C. Y., 5,499,991, Cl. 606-148.000.

Christianson, Teresa; Goddette, Dean; Ladia, Beth F.; Lau, Maria R.; Paech, Christian; Reynolds, Robert B.; Wilson, Charles R.; and Yang, Shiow-Shong, to Cognis, Inc. *Bacillus lentus* alkaline protease variats with enhanced stability. 5,500,364, Cl. 435-221.000.
Christoff, James D.: *See*—
Erickson, Robert L.; Hansen, Paul E.; Burgio, Paul A.; Oxman, Joel D.; and Christoff, James D., 5,499,917, Cl. 433-137.000.
Chrysler Corporation: *See*—
Mitchell, Stephen J., 5,499,851, Cl. 292-347.000.
Vondell, Edward P.; Mobley, Juliana; Nunez, Joseph M.; Maas, Charles A.; Stuch, Donald; and Yu, Jiaquan, 5,499,530, Cl. 73-49.700.
Zdral, Julian, 5,499,434, Cl. 29-220.000.
Chuetsu Metal Works Co., Ltd.: *See*—
Nakashima, Kunio; Ishigane, Ryoichi; Tanaka, Takayuki; and Yamamoto, Kenzo, 5,499,672, Cl. 164-418.000.
Chui, Granger K.: *See*—
Glidewell, John M.; Chui, Granger K.; and Yang, Woong-Chul, 5,499,538, Cl. 73-119.00A.
Chun, Christopher K. Y.: *See*—
Foley, Barbara M.; Galloway, David; Kuo, Shun-Meen; and Chun, Christopher K. Y., 5,500,914, Cl. 385-77.000.
Chung, Joo T.: *See*—
Mahabadi, Hadi K.; Agur, Enno E.; McAneney, T. Brian; Kao, Sheau V.; Allison, Gerald R.; Hawkins, Michael S.; Grushkin, Bernard; Kittelberger, J. Stephen; Chung, Joo T.; and Hollenbaugh, William H., Jr., 5,500,324, Cl. 430-137.000.
Ciabatti, Romeo: *See*—
Malaberba, Adriano; Senesi, Pierfausto; Kettearing, Jürgen K.; and Ciabatti, Romeo, 5,500,410, Cl. 514-8.000.
Ciarniello, Joe E.: *See*—
Allison, Bruce J.; Ciarniello, Joe E.; Dumont, Guy A.; and Tessier, Patrick J., 5,500,088, Cl. 162-198.000.
Ciba-Geigy, AG: *See*—
Saitoh, Yasuhiko; Iwata, Yasuo; Kuzuma, Seiichi; Nakajima, Yoshihide; and Yokomizo, Kanji, 5,500,437, Cl. 514-397.000.
Ciba-Geigy Corporation: *See*—
Hung, William M.; and Su, Kai C., 5,500,024, Cl. 8-509.000.
Mickel, Stuart J., 5,500,418, Cl. 514-100.000.
Mizuguchi, Jin; and Giller, Gérald, 5,500,314, Cl. 430-14.000.
Rempfler, Hermann, 5,500,407, Cl. 504-241.000.
Cieri, Mark A., to Lutron Electronics Co., Inc. In-line dimmer switch. 5,499,930, Cl. 439-417.000.
Cirelli, Raymond A.; Henry, Charles H.; Laskowski, Edward J.; Milbrodt, Michele A.; and Yaffe, Henry H., to AT&T Corp. Method for making Bragg reflectors for waveguides. 5,500,916, Cl. 385-37.000.
Cirrus Logic, Inc.: *See*—
Popat, Kaushik; Ip, William; and Sherman, David, 5,500,611, Cl. 326-87.000.
Runas, Michael E., 5,500,819, Cl. 365-189.050.
Cirucci, John P.: *See*—
Magnotta, Vincent L.; Ayala, Varin; and Cirucci, John F., 5,500,085, Cl. 162-30.110.
Clanton, Joel D.: *See*—
Sanborn, Charles H., III; and Clanton, Joel D., 5,499,564, Cl. 83-23.000.
Clark, David A.: *See*—
Baggett, James D., Jr.; Clark, David A.; Cowling, Patrick C.; Uhl, Richard G.; and Wrenn, Susan E., 5,499,636, Cl. 131-374.000.
Clear, Sandra H.: *See*—
Buell, Kenneth B.; Clear, Sandra H.; and Falcone, Daniella T., 5,499,978, Cl. 604-385.200.
Cleary, John G.: *See*—
Morris, James M.; and Cleary, John G., 5,500,802, Cl. 364-474.240.
Clement, Patrick J.: *See*—
Balasingham, Amarasathan; and Clement, Patrick J., 5,500,241, Cl. 426-399.000.
Clerici, Mario G.: *See*—
Bellussi, Giuseppe; Buonomo, Franco; Esposito, Antonio; Clerici, Mario G.; and Romano, Ugo, 5,500,199, Cl. 423-328.200.
Coagen Limited: *See*—
Esnouf, Michael P., 5,500,349, Cl. 435-7.400.
Cobble, Daniel L. Bi-tech piston. 5,499,572, Cl. 92-212.000.
Cochran, Ross: *See*—
Barbeau, Claude; and Cochran, Ross, 5,499,663, Cl. 139-420.00A.
Cocoma, John P.: *See*—
Wilson, Ronald H.; Doughty, Douglas A.; and Cocoma, John P., 5,500,567, Cl. 313-490.000.
Coenen, Hubert; Hubert, Helmut; and Zumbragel, Michael, to Passavant-Werke AG. Biogas reactor for the anaerobic treatment of waste water. 5,500,118, Cl. 210-603.000.
Coesen, Inc.: *See*—
Doane, Howard, Jr.; Covino, Alfred F.; and Waite, John M., 5,499,444, Cl. 29-830.000.
Cognex Corporation: *See*—
Picard, Lea L.; and Barber, Frederic, 5,500,906, Cl. 382-220.000.
Cognis, Inc.: *See*—
Christianson, Teresa; Goddette, Dean; Ladia, Beth F.; Lau, Maria R.; Paech, Christian; Reynolds, Robert B.; Wilson, Charles R.; and Yang, Shiow-Shong, 5,500,364, Cl. 435-221.000.
Coleman, James P., to Monsanto Company. Electrochromic materials and displays. 5,500,759, Cl. 359-270.000.
Colgate-Palmolive Co.: *See*—
Cao, Hoai-Chau; and Houben, Marie-Christine, 5,500,151, Cl. 252-546.000.
Hayward, Larry H., 5,500,239, Cl. 426-516.000.
Collier, James L.: *See*—
Olzak, Richard A.; Collier, James L.; and Casey, Robert D., 5,500,518, Cl. 235-492.000.
Collins, James T.: *See*—
Scott, Alistair; Pearson, Allen J.; and Collins, James T., 5,499,741, Cl. 222-95.000.
Collins, William T. Urinal. 5,499,405, Cl. 4-306.000.
Colliopoulos, John A.: *See*—
Andre, James R.; and Colliopoulos, John A., 5,500,190, Cl. 424-78.100.
Collister, Frank C.: *See*—
Alto, Scott E.; Alto, Roger E.; and Collister, Frank C., 5,499,894, Cl. 411-340.000.
Colt, Richard L.: *See*—
Malhotra, Shadi L.; Gundlach, Kurt B.; and Colt, Richard L., 5,500,668, Cl. 347-105.000.
Colvin, David P.: *See*—
Bryant, Yvonne G.; and Colvin, David P., 5,499,460, Cl. 36-43.000.
Comb, Donald G.; Perler, Francine; Kucera, Rebecca; and Jack, William E., to New England Biolabs, Inc. Recombinant thermostable DNA polymerase from archaebacteria. 5,500,363, Cl. 435-194.000.
Combustion Tec, Inc.: *See*—
Joshi, Mahendra L.; and Broadway, Lee, 5,500,030, Cl. 65-346.000.
Comer, Donald T., to Oak Industries Inc. Operational function generator. 5,500,618, Cl. 327-361.000.
Commissariat a l'Energie Atomique: *See*—
Dive, Vincent; Toma, Flavio; and Yiotakis, Athanasios, 5,500,414, Cl. 514-18.000.
Commonwealth of Puerto Rico: *See*—
Leon, George S., 5,500,487, Cl. 174.-53.000.
Communication Cable, Inc.: *See*—
Vander Groef, Robert L., 5,499,775, Cl. 242-158.00B.
Compagnie Generale des Etablissements Michelin-Michelin & Cie: *See*—
Renaud, Michel, 5,500,066, Cl. 156-132.000.
Compagnie Generale des Etablissements Michelin–Michelin & Cie: *See*—
Billieres, Jean, 5,499,670, Cl. 152-543.000.
Compaq Computer Corporation: *See*—
Holmes, Frederick J., 5,500,606, Cl. 324-761.000.
Lee, Ven L.; Dawson, William M.; and Doud, Donald L., 5,500,805, Cl. 364-491.000.
Composite Materials, Inc.: *See*—
Kondakov, Stanislav F., 5,500,394, Cl. 501-89.000.
Compton, Dorothy G. Buttonhole scissors. 5,499,454, Cl. 30-120.000.
Compu-Shop, Inc.: *See*—
Steury, Rudy, 5,499,707, Cl. 194-217.000.
Computalog Research, Inc.: *See*—
Tickell, Edward B., Jr.; Schoch, Peter J.; Moseley, Lonnie M.; and Bloomfield, Dwight A., 5,500,597, Cl. 324-339.000.
Conant, Mark, to Built On Technology, Bulk material measuring and dispensing system. 5,499,749, Cl. 222-233.000.
Connor, Daniel S.: *See*—
Scheibel, Jeffrey J.; Murch, Bruce P.; and Connor, Daniel S., 5,500,150, Cl. 252-544.000.
Consorzio per la Ricerca Sulla Microelettronica nel Mezzogiorno: *See*—
Puzzolo, Sanzo; Zambrano, Raffaele; and Paparo, Mario, 5,500,551, Cl. 257-500.000.
Contico International, Inc.: *See*—
Foster, Donald D.; and Nelson, Philip L., 5,499,766, Cl. 239-333.000.
Convertech: *See*—
Geasheimer, Robert P., 5,499,780, Cl. 242-571.100.
Convex Computer Corporation: *See*—
Oppedahl, Douglas A., 5,500,861, Cl. 371-22.300.
Cook, Craig C.; Blumer, Thomas P.; Packard, Theodore B.; Dreher, Geoffrey A.; and Schuneman, Thomas A., to Xionics Document Technologies, Inc. Digital printing system and process using adaptive compression. 5,500,928, Cl. 395-133.000.
Cook Incorporated: *See*—
Cope, Constantin; and Arnett, Patty J., 5,499,975, Cl. 604-165.000.
Cook, John E.: *See*—
Busato, Murray F.; Perry, Paul D.; and Cook, John E., 5,499,614, Cl. 123-520.000.
Cook, Kenneth J.: *See*—
Warda, Gary G.; and Cook, Kenneth J., 5,500,783, Cl. 361-179.000.
Cook, Timothy C.: *See*—
Tihon, Claude; Burton, John H.; Cook, Timothy C.; and Rhum, David, 5,499,994, Cl. 606-192.000.
Coombs, Paul G.: *See*—
Phillips, Roger W.; Coombs, Paul G.; and Wendt, Lauren R., 5,500,302, Cl. 428-474.400.
Cooper, Christophe K.: *See*—
Rogge, Stanley A.; and Cooper, Christophe K., 5,500,890, Cl. 379-91.000.
Cooper Industries, Inc.: *See*—
Talmon-Gros, Guenter E.; Freeman, Donald H.; Flight, Thomas A.; McCarthy, Raymond M.; and Kendall, Anthony E., 5,500,566, Cl. 313-275.000.
Cope, Constantin; and Arnett, Patty J., to Cook Incorporated. Smooth transitioned dilator-sheath assembly and method. 5,499,975, Cl. 604-165.000.



Cornell Research Foundation, Inc.: *See*—
Maiese, Kenneth, 5,500,420, Cl. 514-131.000.
Cornille, Jane W.: *See*—
Roesa, Robert E.; Weaver, Damian G.; Cornille, Jane W.; and Spangler, Lori A., 5,500,405, Cl. 504-195.000.
Corry, Alan G., to MicroUnity Systems Engineering, Inc. Finite impulse response filter. 5,500,811, Cl. 364-724.160.
Corsi, Marco: *See*—
Rincon, Gabriel A.; Salamina, Nicolas; and Corsi, Marco, 5,500,625, Cl. 330-273.000.
Cortrak Medical, Inc.: *See*—
Shapland, James E.; Hildebrandt, Keith R.; and Knudson, Mark B., 5,499,971, Cl. 604-53.000.
Coslett, W. Andrew: *See*—
Srinivasan, Ramesh; Bottomley, James; and Coslett, W. Andrew, 5,500,068, Cl. 156-148.000.
Srinivasan, Ramesh; Bottomley, James; and Coslett, W. Andrew, 5,500,281, Cl. 428-288.000.
Cotteret, Jean; Audousset, Marie P.; LaGrange, Alain; and Vandenbossche, Jean J., to L'Oreal. Oxidation dye composition for keratinous fibres comprising a paraminophenol, a meta-aminophenol and a meta-phenylenediamine, and dyeing process using such a composition. 5,500,021, Cl. 8-408.000.
Cotteret, Jean, to L'Oreal. Process for dyeing keratinous fibres with 2,6-dimethyl-1,4-diaminobenzene and/or 2,3-dimethyl-1,4-diaminobenzene and/or 2,6-diethyl-1,4-diaminobenzene in an acid medium and compositions employed. 5,500,022, Cl. 8-410.000.
Cotto, Dominique J.: *See*—
Brunier, Régis G.; Cotto, Dominique J.; Joly, Richard G. A.; Kerneis, Stéphane M.; and Silvestrelli, Michel F. P., 5,499,519, Cl. 72-53.000.
Court, Melvin T.; and Monte, Alec V., to Newcourt, Inc. Door seal. 5,499,475, Cl. 49-495.100.
Covey, Joseph: *See*—
Cutler, Frances M.; and Covey, Joseph, 5,500,185, Cl. 422-16.000.
Covino, Alfred F.: *See*—
Doane, Howard, Jr.; Covino, Alfred F.; and Waite, John M., 5,499,444, Cl. 29-830.000.
Cowan, Kenneth M., to Shell Oil Company. Emulsion in blast furnace slag mud solidification. 5,499,677, Cl. 166-293.000.
Cowdery-Corvan, J. Robin: *See*—
Deity, Michael R.; Sinicropi, John A.; Cowdery-Corvan, J. Robin; and Young, Ralph H., 5,500,317, Cl. 430-58.000.
Cowling, Patrick C.: *See*—
Baggett, James D., Jr.; Clark, David A.; Cowling, Patrick C.; Uhl, Richard G.; and Wrenn, Susan E., 5,499,636, Cl. 131-374.000.
Cox, George E.: *See*—
Lau, Felix P.; Bredahl, Timothy D.; and Cox, George E., 5,500,293, Cl. 428-355.000.
Cox, George M.: *See*—
Riddle, George E.; Withrow, Ronnie J.; and Cox, George M., 5,500,002, Cl. 606-242.000.
Crabere, Henri; Mitonneau, Gilbert; and Maury, Julien, to Aerospatiale Societe Nationale Industrielle. Flight refuelling system. 5,499,784, Cl. 244-135.00A.
Crawford Fitting Company: *See*—
Luikart, Myron E.; Pezak, Edward A.; Kuhns, Howard C. B.; and Volcansek, Steven J., 5,499,521, Cl. 72-157.000.
Critchfeld, Frank E.: *See*—
Baker, Otis M., Jr.; Critchfeld, Frank E.; and Westfall, Paul M., 5,500,452, Cl. 521-130.000.
Cronauer, William M.: *See*—
Lerner, Bernard; Hess, Richard W.; Cronauer, William M.; Wehrmann, Rick S.; and Kramer, James D., 5,499,485, Cl. 53-459.000.
Crotty Corporation: *See*—
Crotty, Willard E., III; and Beaver, Jeffrey L., 5,499,854, Cl. 296-97.130.
Crotty, Willard E., III; and Beaver, Jeffrey L., to Crotty Corporation. Mounting bracket assembly for a vehicle sunshade and method of installing same in a vehicle. 5,499,854, Cl. 296-97.130.
Crouse, Kent E.: *See*—
Russell, Randy G.; Crouse, Kent E.; Shackle, Peter W.; and Bezdon, Ronald J., 5,500,576, Cl. 315-307.000.
Crown International, Inc.: *See*—
Barclay, Clayton C., Jr., 5,500,626, Cl. 330-279.000.
Cuffiani, Illaro; Zacchini, Umberto, deceased (by Maria Stagni, Silvia Zacchini, Chiara Zacchini, heiresses), to Montell North America Inc. Components and catalysts for the polymerization of ethylene. 5,500,397, Cl. 502-102.000.
Culler, Scott R.: *See*—
Holmes, Gary L.; Culler, Scott R.; Hardy, David H.; Hendrickson, William A.; Klun, Thomas P.; Harmon, Kimberly K.; Heiti, Robert V.; Spurgeon, Kathryn M.; and Stadtner, Charles J., III, 5,500,273, Cl. 428-147.000.
Culp, James D.: *See*—
Roberts, James P.; Culp, James D.; Miller, David G.; and Sarsfield, Martin R., 5,499,785, Cl. 244-137.400.
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Curran, Donald P., Jr.; Pollocks, Lonnie J., Jr.; Breemes, David P., Sr.; Carreira, Leonard M.; and Treachard, Thomas J., to Xerox Corporation. Method and apparatus for cleaning a printhead maintenance station of an ink jet printer. 5,500,659, Cl. 347-28.000.
Cutler, Frances M.; and Covey, Joseph, to Southern California Edison. Deoxygenation process. 5,500,185, Cl. 422-16.000.
Czech, Norbert: *See*—
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Czeksi, David A.; and Seaman, Larry P., to Eastman Kodak Company. Comminution with small particle milling media. 5,500,331, Cl. 430-449.000.
Da Costa Alves, Francisco: *See*—
Banerji, Kingshuk; Bradley, Edwin L., III; and Da Costa Alves, Francisco, 5,499,756, Cl. 228-214.000.
Daewoo Electronics Co., Ltd.: *See*—
Ahn, Seong-Ick, 5,499,777, Cl. 242-356.000.
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Han, Kwangsik, 5,500,847, Cl. 369-219.000.
Dage, Richard C.: *See*—
Carr, Albert A.; Dage, Richard C.; Koerner, John E.; Li, Tung; Miller, Francis P.; Nieduzak, Thaddeus R.; Dudley, Mark W.; Schmidt, Christopher J.; and Frank, Robert A., 5,500,433, Cl. 514-330.000.
Dahl, Gary A.: *See*—
Jendrisak, Jerome J.; Smith, Robert E.; and Dahl, Gary A., 5,500,370, Cl. 435-320.100.
Dai Nippon Printing Co., Ltd.: *See*—
Kobayashi, Kei; and Shiraishi, Yoji, 5,500,326, Cl. 430-300.000.
Daifuku Co., Ltd.: *See*—
Iizuka, Yukio, 5,500,028, Cl. 55-385.100.
Daikuhara, Yasushi: *See*—
Kitamura, Naomi; Miyazawa, Keiji; Daikuhara, Yasushi; Tsubouchi, Hirohito; Naka, Daiji; Takahashi, Kazuhiro; Matsui, Rie; Yoshiyama, Yoshiko; and Ishii, Takehisa, 5,500,354, Cl. 435-69.400.
Dailey, Aaron: *See*—
Munro, Frederick; Dailey, Aaron; Defouw, Richard; and Trachy, David, 5,500,803, Cl. 364-478.000.
Daimon, Junko; and Takeda, Yasuo, to Japan Tobacco Inc. Method for dwarfing lilies and lily bulbs obtained from the dwarfing treatment. 5,500,404, Cl. 504-174.000.
Dalton, Michael J. Catheter retainer. 5,499,976, Cl. 604-180.000.
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Daniel, Hani S.; and Moore, Douglas R., to Gould Electronics Inc. Optical assembly/housing for securing optical fiber components, devices and fibers to the same or to mounting fixtures. 5,500,917, Cl. 385-99.000.
Danieli United, Inc.: *See*—
Ginzburg, Vladimir B., 5,499,523, Cl. 72-203.000.
Daniels, Wiley E.: *See*—
Burgoyne, William F., Jr.; Daniels, Wiley E.; Sagl, Dennis; Lee, Heuch-Chi; and Vratsanos, Menas S., 5,500,251, Cl. 427-322.000.
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Bright, Stuart W.; Dantzig, Anne H.; Tabas, Linda B.; and Sportsman, J. Richard, 5,500,346, Cl. 435-7.210.
Daouk, Antar. Floating stretcher designed, in particular, for the recovery of injured persons at sea. 5,499,416, Cl. 5-625.000.
Dauber, Edwin G.; Mortimer, William P., Jr.; and Winterling, Michael S., to W. L. Gore & Associates, Inc. Non-particulating compact adsorbent filter. 5,500,038, Cl. 96-135.000.
David Sarnoff Research Center, Inc.: *See*—
Sauer, Donald J., 5,500,612, Cl. 327-91.000.
Daviean, Gerald J.: *See*—
Maine, Kristine P.; Olds, Keith A.; and Daviean, Gerald J., 5,500,648, Cl. 342-357.000.
Davis, Dwight P.: *See*—
Roe, Donald C.; Davis, Dwight P.; Manning, Kevin C.; and Bockowski, Edmund J., 5,500,220, Cl. 424-410.000.
Davis, Glean: *See*—
Hill, E. Richard, III; Davis, Glean; and Farley, Brian, 5,499,632, Cl. 128-772.000.
Davis, Jeffrey P.: *See*—
Sharma, Raghu; Davis, Jeffrey P.; Gunn, Timothy D.; and Li, Ping, 5,500,859, Cl. 370-81.000.
Davis, Kenneth W., to Material Processing, Inc. Soil decontamination and remediation system. 5,499,586, Cl. 110-246.000.
Dawn Equipment Company: *See*—
Bassett, James H., 5,499,683, Cl. 172-4.000.
Dawson, William M.: *See*—
Lee, Ven L.; Dawson, William M.; and Doud, Donald L., 5,500,805, Cl. 364-491.000.
Dayco Products, Inc.: *See*—
Tsai, M. Michael; Fletcher, David E.; and Zamm, Joseph W., 5,499,950, Cl. 474-138.000.
Deac, Radu, to Mures Cardiovascular Research, Inc. Cardiac valve. 5,500,015, Cl. 623-2.000.
De Blok, Cornelis M., to Koninktijke PTT Nederland N.V. Optical receiving system. 5,500,757, Cl. 359-189.000.
Deblon, Bruno: *See*—
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Debuigne, Jean; and Prigent, Serge, to Institut National des Science Appliquees de Rennes; and Microsteel S.A. Composition for preparation of articles of calcium oxide. 5,500,041, Cl. 106-38.220.
Deere & Company: *See—*
Deutsch, Timothy A.; and Warnaholz, Gary L., 5,499,491, Cl. 56-10.20H.
Hardesty, Terry D., 5,499,669, Cl. 152-158.000.
Parker, Paul D., 5,499,686, Cl. 172-730.000.
Underwood, Mark R., 5,499,948, Cl. 460-119.000.
Defouw, Richard: *See—*
Munro, Frederick; Dailey, Aaron; Defouw, Richard; and Trachy, David, 5,500,803, Cl. 364-478.000.
DePreitas, Dennis M., to Simmonds Precision Engine Systems. Temperature detector and control for an igniter. 5,499,497, Cl. 60-39.060.
Degen, Peter J., to Pall Corporation. Method of preparing a supported microporous filtration membrane. 5,500,167, Cl. 264-41.000.
Deguchi, Tetsu: *See—*
Kigawa, Kazuya; Furukawa, Kenji; Deguchi, Tetsu; Inoue, Sachiharu; Endo, Norifutsu; Yanagisawa, Tatsuo; Ikegami, Shinji; Omagari, Yasuyuki; Kihara, Koji; Sugawara, Tachiki; and Shimizu, Kenzo, 5,499,796, Cl. 254-133.00R.
de Jong, Robertus E.; and van der Kort, Jacobus J. C., to General Electric Company. Thermoplastic mixture comprising an agent to improve the lacquer bonding. 5,500,476, Cl. 524-377.000.
Delattre, Veronique: *See—*
Germain, Albert; Pirard, Jean-Paul; Delattre, Veronique; Van Weyenbergh, Jacques; and Vogels, Claude, 5,500,202, Cl. 423-584.000.
Deleers, Michel: *See—*
Vranckx, Henri; Demoustier, Martine; and Deleers, Michel, 5,500,224, Cl. 424-451.000.
Dell USA, L.P.: *See—*
Miller, Kevin L.; McMahan, Robert L.; and Steigerwald, Todd W., 5,500,789, Cl. 361-816.000.
DeMarn, Robert A. Collapsible container. 5,499,763, Cl. 229-114.000.
DeMatte, Michael L., to Westvaco Corporation. Paper coating composition. 5,500,191, Cl. 427-358.000.
Deming, Stephen E.: *See—*
Deming, Robert F., Jr.; and Deming, Stephen E., 5,500,793, Cl. 364-401.000.
Deming, Robert F., Jr.; and Deming, Stephen E., to Equitrade. Computerized system for developing multi-party property equity exchange scenarios. 5,500,793, Cl. 364-401.000.
Demoustier, Martine: *See—*
Vranckx, Henri; Demoustier, Martine; and Deleers, Michel, 5,500,224, Cl. 424-451.000.
Deng, Brian T.: *See—*
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Denjean, Jean; and Mana, Jean-Pierre, to Thomson-CSF. Procedure and device for self-calibrating analog-to-digital conversion. 5,500,644, Cl. 341-120.000.
Dennis, Mahlon D., to Dennis Tool Company. PDC insert featuring side spiral wear pads. 5,499,688, Cl. 175-426.000.
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Dennis, Mahlon D., 5,499,688, Cl. 175-426.000.
Deome, James H.; Mileaf, Daryl S.; LaCour, Kevin E.; Rodriguez, Noe E., II; Leginus, Joseph M.; Johnson, Scott D.; Kapraun, Richard C.; and Young, Richard M., to Westinghouse Electric Corporation. Disposable optical agglutination assay device and method for use. 5,500,187, Cl. 422-58.000.
Derezinski, Stephen J.; and Faulkenberry, Stephen T., to Eastman Kodak Company. Method for plasticizing particulate plastic material. 5,500,172, Cl. 264-68.000.
Derian, Gary A.; Turner, Herman E., Jr.; and Fleming, Michael W., to Nordson Corporation. Apparatus for mixing and dispensing two chemically reactive materials. 5,499,745, Cl. 222-136.000.
de Rooy, Roelof: *See—*
Noordegraaf, Jan; Oud, Martinus A.; Behm, Harry; and de Rooy, Roelof, 5,500,183, Cl. 420-557.000.
Desai, Jawahar M. Catheter for mapping and ablation and method therefor. 5,500,011, Cl. 607-116.000.
deSilva, Mahinda K.; and Holt, L. Bayles, to Apple Computer, Inc. Method for vector plotting a bitmap with a reduced number of lines. 5,500,924, Cl. 395-129.000.
Detty, Michael R.; Sinicropi, John A.; Cowdery-Corvan, J. Robin; and Young, Ralph H., to Eastman Kodak Company. Electrophotographic elements containing soluble cyclic sulfone electron transport agents. 5,500,317, Cl. 430-58.000.
Deutsch, Timothy A.; and Warnaholz, Gary L., to Deere & Company. Cotton harvester. 5,499,491, Cl. 56-10.20H.
Deutsche Thomson-Brandt GmbH: *See—*
Kühn, Hans-Robert; Storz, Dieter; Läufer, Engelbert; Hoch, Peter; and Fuldner, Friedrich, 5,500,845, Cl. 369-112.000.
Devices for Vascular Intervention: *See—*
Hill, E. Richard, III; Davis, Glenn; and Farley, Brian, 5,499,632, Cl. 128-772.000.
Devisetty, Bala N.: *See—*
Shafer, Warren E.; Woolard, Derek D.; Samuel, Neyyan K. P.; Veaburg, Gregory D.; Devisetty, Bala N.; and Heiman, Daniel F., 5,500,403, Cl. 504-115.000.
Dhuey, Michael J.: *See—*
Yazdy, Farid A.; and Dhuey, Michael J., 5,500,827, Cl. 365-222.000.
Dickinson, Robert D., to Taligent, Inc. System for browsing a network resource book with tabs attached to pages. 5,500,929, Cl. 395-160.000.
Dickema, Keith A.: *See—*
Dinerstein, Robert J.; Edwards, Michael L.; Stemerick, David M.; and Dickema, Keith A., 5,500,429, Cl. 514-277.000.
Diel, Mark, to Maxtor Corporation. Disk drive memory card electrical interconnect. 5,500,779, Cl. 360-97.010.
Dieter Wildfang GmbH: *See—*
Nehm, Holger; and Grether, Hermann, 5,500,115, Cl. 210-460.000.
Dietz, Matthias: *See—*
Wahl, George; Dietz, Matthias; Schote, Norbert; Klosterhuber, Robert; Sommerer, Karl; Kunert, Reinhard; and Gerber, Fritz, 5,499,839, Cl. 280-701.000.
Digital Equipment Corporation: *See—*
Levin, Roy; and Hanna, Christine B., 5,500,881, Cl. 395-700.000.
Perlman, Radia J.; Kirby, Alan J.; Backes, Floyd J.; and Kaufman, Charles W., 5,500,860, Cl. 370-85.130.
Uhler, George M.; and Brown, John P., III, 5,500,947, Cl. 395-375.000.
Dillon, Paul J., to Simmons Company. Innerspring construction including improved edge characteristics. 5,499,414, Cl. 5-474.000.
Dimarco, Donna M., to Smith & Nephew Richards Inc. Quick release handle apparatus for removing and inserting intramedullary nails. 5,499,986, Cl. 606-104.000.
Dimension Technologies Inc.: *See—*
Eichenlaub, Jesse B., 5,500,765, Cl. 359-463.000.
Dinerstein, Robert J.; Edwards, Michael L.; Stemerick, David M.; and Dickema, Keith A., to Merrell Pharmaceuticals Inc. Calcium uptake inhibitors. 5,500,429, Cl. 514-277.000.
Dirck, Ronald L. Safety restraint apparatus. 5,499,844, Cl. 280-748.000.
Director-General Of Agency Of Industrial Science And Technology: *See—*
Kaiho, Mamoru; and Yasuda, Hajime, 5,499,532, Cl. 73-76.000.
Diro, Inc.: *See—*
Morgan, Vincent J.; and Shepherd, Norman J., 5,499,918, Cl. 433-173.000.
Discovery Zone, Inc.: *See—*
Weimer, Ralph; and Acker, Duane R., 5,499,641, Cl. 134-65.000.
Displaytech, Inc.: *See—*
Gaalema, Stephen D.; and Handschy, Mark A., 5,500,748, Cl. 359-55.000.
Dive, Vincent; Toma, Flavio; and Yiotakis, Athanasios, to Commissariat a l'Energie Atomique. Derivatives of peptides usable as inhibitors of bacterial collagenases. 5,500,414, Cl. 514-18.000.
Diversey Corporation: *See—*
Chan, Wai Y. C.; and Livingston, James W., 5,500,050, Cl. 134-18.000.
Dixon, Robert E.: *See—*
Tung, Yingsheng; Dixon, Robert E.; and Ying, Shih-Hsin, 5,500,387, Cl. 437-60.000.
Donne, Howard, Jr.; Covino, Alfred F.; and Waite, John M., to Coesen, Inc. Method of manufacturing a rigid flex printed circuit board. 5,499,444, Cl. 29-830.000.
Doddington, George D.; Pawate, Basavaraj; Mahant-Shetti, Shivaling; and Smith, Derek, to Texas Instruments Incorporated. Apparatus, system and methods for distributed signal processing. 5,500,828, Cl. 365-230.030.
Doggett, David F.; and McCaul, Bruce W., to McCaul, Bruce. Laser diode/lens assembly. 5,500,768, Cl. 359-652.000.
Dolan, Mary L.: *See—*
Ebel, James; Dolan, Mary L.; Edwards, Russell J.; and Sites, Peter W., 5,500,732, Cl. 356-124.000.
Dolfinger, Frank, Jr.: *See—*
Sadhakar, Chakka; Sandford, Gerald G.; and Dolfinger, Frank, Jr., 5,500,401, Cl. 502-316.000.
Dollat, Jean-Marie; Molin, Marc; and Thealier, Pascal, to Rhone-Poulenc Nutrition Animale. Process for the preparation of spherules of active principles and emulsions containing the spherules. 5,500,415, Cl. 514-21.000.
Dollings, Paul J.: *See—*
Soll, Richard M.; Dollings, Paul J.; and Kinney, William A., 5,500,442, Cl. 514-414.000.
Domine, Christophe A., to British Aerospace Public Limited Company. Lightning shield. 5,499,782, Cl. 244-1.00A.
Donaldson, Charles W.; Miller, Kenneth E.; Lestage, John J.; and Gantner, Randall C., to General Electric Company. Method for measuring the contour of a surface. 5,500,737, Cl. 356-376.000.
Dönges, Reinhard: *See—*
Wallisch, Heinz; Dönges, Reinhard; and Meyer-Blumenroth, Ulrich, 5,500,124, Cl. 210-651.000.
Doniewski, Janusz: *See—*
Fujimura, Morio; Ban, Hiroki; and Doniewski, Janusz, 5,500,072, Cl. 156-344.000.
Donnelly Corporation: *See—*
Varaprasad, Desaraju V.; Looman, Steven D.; Zhao, Mingtang; Habibi, Hamid R.; and Lynam, Niall R., 5,500,760, Cl. 359-272.000.
Dontenwille, Michel: *See—*
Boisrobert, Christian; Lucas, Jean-Francois; and Dontenwille, Michel, 5,500,733, Cl. 356-345.000.
Doom, Lewis G., Jr. Hopper-fed piston filler and lift assembly workstation. 5,499,695, Cl. 187-244.000.
Dorn, Russell J., to Stewart & Stevenson Power, Inc. Self propelled passenger lift vehicle. 5,499,694, Cl. 187-200.000.
Dorner Mfg. Corp.: *See—*
Hansen, Kenneth N.; and Ertel, Daniel E., 5,499,565, Cl. 83-452.000.



Dorninger, Frank P., to Technoplast Kunststoffechnik Gesellschaft m.b.H. Apparatus for cooling plastic profiles. 5,499,507, Cl. 62-63.000.
Doryokuro Kakunenryo Kaihatsu Jigyodan: *See—*
Wada, Yukio; Morimoto, Kyoichi; Goibuchi, Takayuki; and Tomiyasu, Hiroshi, 5,500,192, Cl. 423-10.000.
Doskocil Mfg. Co., Inc.: *See—*
Sharp, Douglas J., 5,499,850, Cl. 292-42.000.
Doud, Donald L.: *See—*
Lee, Ven L.; Dawson, William M.; and Doud, Donald L., 5,500,805, Cl. 364-491.000.
Doughty, Douglas A.: *See—*
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Douglas, Brian: *See—*
Brugger, Manfred F.; Klarer, Martin; Knoff, Bernd; Eckl, Albrecht; Steiner, Manfred; Rump, Siegfried; Nell, Joachim; Eckstein, Fredy; Steffi, Christoph; and Douglas, Brian, 5,499,866, Cl. 303-122.080.
Dow Chemical Company, The: *See—*
Johnsen, Kenneth E.; and Pelletier, Ronald R., 5,500,469, Cl. 524-157.000.
Downing, James H., Jr. Strip tillage soil conditioner apparatus and method. 5,499,685, Cl. 172-699.000.
Doyle, Thomas J.: *See—*
Veeneman, William J.; Alexander, Karla J.; Doyle, Thomas J.; Brooks, Phillip R.; and Hamilton, Robert H., 5,500,514, Cl. 235-381.000.
Dr. Ing. h.c.F. Porsche AG: *See—*
Wahl, George; Dietz, Matthias; Schote, Norbert; Klosterhuber, Robert; Sommerer, Karl; Kunert, Reinhard; and Gerber, Fritz, 5,499,839, Cl. 280-701.000.
Dr. Johannes Heidenhain GmbH: *See—*
Spanner, Erwin, 5,500,734, Cl. 356-356.000.
Drabarek, Peter: *See—*
Figiel, Janusz; and Drabarek, Peter, 5,499,664, Cl. 140-152.000.
Drägerwerk AG: *See—*
Krüger, Edmund; and Neuber, Thomas, 5,499,624, Cl. 128-204.260.
Pasternack, Adalbert, 5,499,623, Cl. 128-201.210.
Dreher, Geoffrey A.: *See—*
Cook, Craig C.; Blumer, Thomas P.; Packard, Theodore B.; Dreher, Geoffrey A.; and Schuneman, Thomas A., 5,500,928, Cl. 395-133.000.
Dreiman, Nelik I., to Tecumseh Products Company. Wrist pin - piston assembly. 5,499,571, Cl. 92-187.000.
Dresser Industries, Inc.: *See—*
Enright, Bernard P., 5,499,616, Cl. 123-572.000.
Dressick, Walter J.: *See—*
Calvert, Jeffrey M.; Dressick, Walter J.; Calabrese, Gary S.; and Gulla, Michael, 5,500,315, Cl. 430-16.000.
Droste, James J.: *See—*
Audia, James E.; Droste, James J.; Evrard, Deborah A.; Fludzinski, Pawel; Murdoch, Gwyn L.; and Nelson, David L., 5,500,431, Cl. 514-280.000.
Du Pont de Nemours, E. I., and Company: *See—*
Barnette, William E.; Harrison, Charles R.; Lahm, George P.; Piotrowski, David W.; and Wing, Keith D., 5,500,438, Cl. 514-403.000.
Cheng, Lap K., 5,500,145, Cl. 252-183.140.
Feinberg, Bernard; and Pankratz, Richard P., 5,500,327, Cl. 430-306.000.
Francis, Debra C.; Vallabhaneni, Siva V.; and Wong, Bert C., 5,500,274, Cl. 428-156.000.
Halm, Walter B.; Jones, William J., Jr.; Kirkbride, James F.; Marcus, Ilan; and Snyder, Adrian C., 5,500,295, Cl. 428-357.000.
King, James G.; Mackara, Steven R.; Mickish, Daniel J.; and Spooner, David L., 5,500,310, Cl. 430-1.000.
King, James G.; MacKara, Steven R.; Mickish, Daniel J.; and Spooner, David L., 5,500,311, Cl. 430-1.000.
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Kinney, Anthony J., 5,500,361, Cl. 435-172.300.
Lwee, Nai H., 5,499,925, Cl. 439-157.000.
Wissmann, Rolf B., 5,500,473, Cl. 524-447.000.
Dudley, Mark W.: *See—*
Carr, Albert A.; Dage, Richard C.; Koerner, John E.; Li, Tung; Miller, Francis P.; Nieduzak, Thaddeus R.; Dudley, Mark W.; Schmidt, Christopher J.; and Frank, Robert A., 5,500,433, Cl. 514-330.000.
Duff, Eric A., to ThermoSpectra. X-ray position measuring and calibration device. 5,500,886, Cl. 378-207.000.
Dugan, Jeffrey S., to BASF Corporation. Method of making molded multi-component articles using a thin plate flow distributor. 5,500,173, Cl. 264-75.000.
DuMont, Christopher L.: *See—*
Bogdanowicz, Mitchell J.; and DuMont, Christopher L., 5,500,316, Cl. 430-21.000.
Dumont, Guy A.: *See—*
Allison, Brice J.; Ciarniello, Joe E.; Dumont, Guy A.; and Tessier, Patrick J., 5,500,088, Cl. 162-198.000.
Duncan, James A.: *See—*
Holmes, Fred H.; Rawls, Robert L.; and Duncan, James A., 5,499,959, Cl. 482-95.000.
Dunlavy, John H., to Haynes and Boone, L.L.P.; J. D. Technologies, Inc.; and Feferman, Donald M. Method and apparatus for correcting distortion in compact disc recording and playback system. 5,500,842, Cl. 369-48.000.
Dunton, Thomas P.; Hall, Walter L.; and Teutsch, Erich O., to General Electric Company. Continuous extrusion impregnation molded article process. 5,499,441, Cl. 29-527.200.
Durand, Paul P.; and Timken, Hye K. C., to Mobil Oil Corporation. Gasoline upgrading process. 5,500,108, Cl. 208-89.000.
Durbin, Dennis A., to Norand Corporation. Portable oblique optical reader system and method. 5,500,516, Cl. 235-472.000.
Durchschlag, Gerald; and Klein, Herbert, to Voest-Alpine Eisenbahnsysteme Aktiengesellschaft. Device for facilitating the re-positioning of moveable rails or rail components. 5,499,786, Cl. 246-448.000.
Durnin, James E., to Eastman Kodak Company. Spin-coating compensation for an optical storage medium with a substrate groove profile gradient. 5,500,266, Cl. 428-64.100.
Dydyk, Michael; and Escher, John S., to Motorola. Sensor for determining a ratio of materials in a mixture and method. 5,500,543, Cl. 257-277.000.
Dyna Flow, Inc.: *See—*
Chahine, Georges L., 5,500,134, Cl. 210-787.000.
Dziersk, Mark: *See—*
Iaia, Mark; Dziersk, Mark; and Verdura, Javier, Jr., 5,499,748, Cl. 222-180.000.
Dzurenko, Theresa E.: *See—*
Addesso, Kevin; Dzurenko, Theresa E.; Moisey, Mark J.; Levine, Harry; Slade, Louise; Manna, James M.; Fazzolare, Richard D.; Ievolella, James; and Wang, Martha Y., 5,500,240, Cl. 426-560.000.
Earth Resources Corporation: *See—*
Gold, Jeffrey W.; and Nickens, Dan A., 5,499,665, Cl. 141-1.000.
Earth Stabilizing Technology, Inc.: *See—*
Klenert, Oskar H., 5,499,891, Cl. 405-284.000.
Easley, James B.: *See—*
Pasin, Mark; Tonelli, Roger; and Easley, James B., 5,499,834, Cl. 280-282.000.
Easter, Basil O. Vehicle mirror alignment device. 5,500,773, Cl. 359-838.000.
Eastman Kodak Company: *See—*
Altrieth, Frederick E., III, 5,500,717, Cl. 355-209.000.
Anagnostopoulos, Constantine N.; and Edwards, Jon K., 5,500,572, Cl. 315-169.100.
Bell, Eric L., 5,500,335, Cl. 430-567.000.
Benard, Rejane; Friour, Gerard A. D.; Martin, Didier J.; and Riveccie, Marcel L. P., 5,500,337, Cl. 430-570.000.
Bogdanowicz, Mitchell J.; and DuMont, Christopher L., 5,500,316, Cl. 430-21.000.
Chapman, Derek D.; Goswami, Ramanuj; and Kovacs, Csaba A., 5,500,325, Cl. 430-270.160.
Czekai, David A.; and Seaman, Larry P., 5,500,331, Cl. 430-449.000.
Derezinski, Stephen J.; and Faulkenberry, Stephen T., 5,500,172, Cl. 264-68.000.
Detty, Michael R.; Sinicropi, John A.; Cowdery-Corvan, J. Robin; and Young, Ralph H., 5,500,317, Cl. 430-58.000.
Durnin, James E., 5,500,266, Cl. 428-64.100.
Eikenberry, Jon N.; Lok, Roger; and Chen, Chung-Yuan, 5,500,333, Cl. 430-567.000.
Goosey, William T., Jr.; and Estelle, Lee R., 5,500,703, Cl. 354-222.000.
Green, Andrew; and Ward, Paul C., 5,499,488, Cl. 53-474.000.
Horn, Richard R.; Gaskell, Christine K.; Krauss, Susan R.; and Purol, Michael D., 5,500,125, Cl. 210-668.000.
Kerr, Donald L.; and Looker, Jerome J., 5,500,338, Cl. 430-611.000.
Manico, Joseph A., 5,499,465, Cl. 40-152.000.
Merle, Thomas C.; Ryan, Dale W.; and Rowden, David L., 5,499,436, Cl. 29-270.000.
Meyers, Mark M., 5,500,702, Cl. 354-165.000.
Osifo, Irenengbe K., 5,500,204, Cl. 424-9.453.
Pickering, James E.; and Fassler, Werner, 5,499,880, Cl. 400-642.000.
Reinke, Stephen M., 5,499,781, Cl. 242-584.100.
Saha, Bijay S., 5,500,320, Cl. 430-106.600.
Stephenson, Stanley W., III, 5,500,705, Cl. 354-288.000.
Surash, Robert G.; and Lewis, Craig C., 5,500,328, Cl. 430-347.000.
Szajewski, Richard P.; and Sowinski, Allan F., 5,500,330, Cl. 430-393.000.
Vishwakarma, Lal C.; and Brown, Glenn, 5,500,332, Cl. 430-512.000.
Walter, Lee; and Adamson, Steven J., 5,500,279, Cl. 428-213.000.
Yang, Danny D. L., 5,500,243, Cl. 427-126.300.
Easton, Richard L., to Alvey, Inc. Conveyor with separator/aligner. 5,499,709, Cl. 198-786.000.
Ebara Corporation: *See—*
Miyata, Masahiro; Ezawa, Hirokazu; Ogure, Naoaki; Tsujimura, Manabu; Ohdaira, Takeyuki; Inoue, Hiroaki; and Ikeda, Yukio, 5,500,559, Cl. 257-762.000.
Ebel, James; Dolan, Mary L.; Edwards, Russell J.; and Sites, Peter W., to Johnson & Johnson Vision Products, Inc. Lens inspection system and method. 5,500,732, Cl. 356-124.000.
Eberle, Arwed: *See—*
Nieder, Wolfgang; Winkler, Manfred; Perchaold, Gerhard; Seirlehner, Leo; Kohler, Herbert; and Eberle, Arwed, 5,500,032, Cl. 75-414.000.
Eccles, Harry; Garnham, Geoffrey W.; Lowe, Christopher R.; and Bruce, Neil C., to British Nuclear Fuels PLC. Biosensors for detecting metal ions capable of being reduced by reductase enzymes. 5,500,351, Cl. 435-25.000.
Echelon Corporation: *See—*
Riley, Glen M., 5,500,852, Cl. 370-16.000.

Eckberg, Richard P., to General Electric Company. Silicone fluids having chloroalkyl and epoxy groups and photocurable silicone coating compositions. 5,500,300, Cl. 428-447.000.

Eckenhoff, James B.: *See*—
Wong, Patrick S.-L.; Thanawee, Felix; and Eckenhoff, James B., 5,499,979, Cl. 604-891.100.

Eckl, Albrecht: *See*—
Brugger, Manfred P.; Klaver, Martin; Knoff, Bernd; Eckl, Albrecht; Steiner, Manfred; Rump, Siegfried; Nell, Joachim; Eckstein, Fredy; Steffl, Christoph; and Douglas, Brian, 5,499,866, Cl. 303-122.000.

Eckstein, Fredy: *See*—
Brugger, Manfred P.; Klaver, Martin; Knoff, Bernd; Eckl, Albrecht; Steiner, Manfred; Rump, Siegfried; Nell, Joachim; Eckstein, Fredy; Steffl, Christoph; and Douglas, Brian, 5,499,866, Cl. 303-122.000.

Eco-Tec Limited: *See*—
Brown, Craig J.; and Sheedy, Michael A., 5,500,098, Cl. 203-13.000.

Edens, Habbo: *See*—
Berrebi, Georges; Jacquier, Yves; Edens, Habbo; and Middelkoop, Gerrit, 5,499,746, Cl. 222-165.000.

Edmondson, James G., to Betz Laboratories, Inc. High temperature corrosion inhibitor. 5,500,107, Cl. 208-47.000.

Edwards, Jon K.: *See*—
Anagnostopoulos, Constantine N.; and Edwards, Jon K., 5,500,572, Cl. 315-169.100.

Edwards, Michael L.: *See*—
Dinerstein, Robert J.; Edwards, Michael L.; Stemerick, David M.; and Diekema, Keith A., 5,500,429, Cl. 514-277.000.

Edwards, Russell J.: *See*—
Ebel, James; Dolan, Mary L.; Edwards, Russell J.; and Sites, Peter W., 5,500,732, Cl. 356-124.000.

Edwards, Stanley H., Jr.; Marshall, Richard; and Robbins, Tony R., to Square D Company. Solid state overload relay mechanism. 5,500,630, Cl. 335-132.000.

Egawa, Noboru, to OKI Electric Industry Co., Ltd. Semiconductor memory device. 5,500,614, Cl. 327-107.000.

Egelhof, Dieter: *See*—
Böck, Rudolf; Egelhof, Dieter; Heasler, Klaus; Kade, Werner; Meinecke, Albrecht; Wanke, Wilhelm; and Walz, Hans-Jürgen, 5,500,091, Cl. 162-301.000.

Eggerstedt, Paul: *See*—
Zievers, James F.; Zievers, Elizabeth C.; Aguilar, Peter; and Eggerstedt, Paul, 5,500,029, Cl. 55-485.000.

Egle, Hans: *See*—
Buenaow, Rudolf; and Egle, Hans, 5,500,231, Cl. 426-18.000.

Eguchi, Tatsuya: *See*—
Takase, Akira; and Eguchi, Tatsuya, 5,500,725, Cl. 355-311.000.

Ehinger, Pierre; and Gory, Patrice, to Sames S.A. Electrostatic spraying machine for coating products. 5,500,045, Cl. 118-313.000.

Eichenlaub, Jesse B., to Dimension Technologies Inc. Convertible 2D/3D autostereoscopic display. 5,500,765, Cl. 359-463.000.

Eickemeyer, Richard J.; and Vassiliadis, Stamatis, to International Business Machines Corporation. Method of indicating parallel execution compoundability of scalar instructions based on analysis of presumed instructions. 5,500,942, Cl. 395-375.000.

Eichen, Ulrich; Fischer, Herbert; Gress, Wolfgang; Hoefer, Rainer; Oberkobusch, Doris; and Schieferstein, Ludwig, to Henkel Kommanditgesellschaft auf Aktien. Polyurethane-based thickeners. 5,500,475, Cl. 524-591.000.

Eifert, John W. Portable flow timer device. 5,500,882, Cl. 377-21.000.

Eikenberry, Jon N.; Lok, Roger; and Chen, Chung-Yuan, to Eastman Kodak Company. Class of compounds which increases and stabilizes photographic speed. 5,500,333, Cl. 430-567.000.

Ekimoto, Takao: *See*—
Okamura, Toshiaki; Ekimoto, Takao; Shimamoto, Satoshi; Ogawa, Katsumi; Tomita, Masahiro; Nimura, Yoshitaka; and Kadowaki, Ryosaku, 5,500,170, Cl. 264-148.000.

Elbert, Donald L.: *See*—
Campbell, Alan S.; Elbert, Donald L.; McCormack, William C.; and Zierdner, Eric L., 5,500,724, Cl. 355-297.000.

Electronics & Telecommunications Research Institute: *See*—
Jeon, Hak-Seong; and Kim, Sang-Hee, 5,500,887, Cl. 379-58.000.
Lee, Seung-Chang; Yun, Sun-Jin; Kim, Bo-Woo; and Kang, Sang-Won, 5,500,389, Cl. 437-90.000.
Park, Kang-Ho; Ha, Jeong-Sook; Park, Seong-Ju; and Lee, El-Hang, 5,500,047, Cl. 118-724.000.

Eli Lilly and Company: *See*—
Audia, James E.; Droste, James J.; Evrard, Deborah A.; Fludzinski, Pawel; Murdoch, Gwyn L.; and Nelson, David L., 5,500,431, Cl. 514-280.000.
Bright, Stuart W.; Dantzig, Anne H.; Tabas, Linda B.; and Sportsman, J. Richard, 5,500,346, Cl. 435-7.210.

Ellenor, David T. R.: *See*—
Smith, James W.; Ellenor, David T. R.; and Harbinson, John N., 5,500,129, Cl. 210-703.000.
Smith, James W.; Ellenor, David T. R.; and Harbinson, John N., 5,500,130, Cl. 210-703.000.
Smith, James W.; Ellenor, David T. R.; and Harbinson, John N., 5,500,135, Cl. 210-787.000.

Ellis, Edward J.: *See*—
Potini, Chimpiramma; Wrobel, Stanley J.; Zhang, Hong J.; and Ellis, Edward J., 5,500,144, Cl. 252-174.150.

Elmi, Hadi, to Modern Welding Company, Inc. Liquid to liquid coalescing separator and method. 5,500,132, Cl. 210-708.000.

Elsashar, Khodor: *See*—
Rodea, Philip; Elsashar, Khodor; Deng, Brian T.; Thang, Steve; and Saperstein, William, 5,500,946, Cl. 395-308.000.

Emerick, W. Russell: *See*—
Venzke, Donald R.; Hood, Teresa L.; and Emerick, W. Russell, 5,500,496, Cl. 200-339.000.

Enari, Masahiko: *See*—
Yazumi, Toshiya; and Enari, Masahiko, 5,500,683, Cl. 348-565.000.

Endo, Norikazu: *See*—
Kigawa, Kazuya; Furukawa, Kenji; Deguchi, Tetsu; Inoue, Sachiharu; Endo, Norikazu; Yanagisawa, Tatsuo; Ikegami, Shinji; Onogari, Yasuyuki; Kihara, Koji; Segawa, Tachibi; and Shimizu, Keizo, 5,499,796, Cl. 254-133.000.

Endo, Shigeru; and Sugizaki, Fumitaka, to Amada Metrecs Company, Limited. Follow-up stopping tool. 5,499,566, Cl. 83-636.000.

Endress + Hauser GmbH + Co.: *See*—
Glienke, Horst; and Maier, Winfried, 5,499,539, Cl. 73-756.000.

Energy Savings, Inc.: *See*—
Russell, Randy G.; Crouse, Kent E.; Shackle, Peter W.; and Beadon, Ronald J., 5,500,576, Cl. 315-307.000.

Engdahl, Lawrence W.: *See*—
Sorrell, Michael R.; Engdahl, Lawrence W.; and Slootsky, Simon, 5,499,856, Cl. 297-5.000.

Engdahl, Thomas L.; Tyburski, Edward; and Hartmann, Paul R., to Applied Digital Access, Inc. Relative synchronization system for a telephone network. 5,500,853, Cl. 370-17.000.

Engle, Lewis H.: *See*—
Adams, Harold P.; Suarez, Roderick A.; and Engle, Lewis H., 5,499,476, Cl. 52-220.100.

Esaircerche S.p.A.: *See*—
Bellussi, Giuseppe; Buonomo, Franco; Esposito, Antonio; Clerici, Mario G.; and Romano, Ugo, 5,500,199, Cl. 423-328.200.
Carletti, Vittorio; Longhini, Gianfranco; Po', Riccardo; Podesta', Roberto; Romano, Anna M.; and Querci, Cecilia, 5,500,285, Cl. 428-364.000.

Enomoto, Masatoshi: *See*—
Nakazawa, Yasushi; Touma, Kiyotaka; and Enomoto, Masatoshi, 5,499,801, Cl. 269-48.100.

Enright, Bernard F., to Dresser Industries, Inc. Crankcase pressure regulation system for an internal combustion engine. 5,499,616, Cl. 123-572.000.

Ensign-Bickford Company, The: *See*—
Sutula, Daniel P., Jr., 5,499,581, Cl. 102-275.120.

Enviro Pac International, L.L.c.: *See*—
Abbott, Joe L.; and Andrade, Michael S., 5,500,205, Cl. 424-401.000.

Environamics Corporation: *See*—
Rockwood, Robert E., 5,499,901, Cl. 415-111.000.
Rockwood, Robert E., 5,499,902, Cl. 415-113.000.

EP Technologies, Inc.: *See*—
Kordis, Thomas P., 5,499,981, Cl. 606-41.000.

Epicenre Technologies: *See*—
Jendrisak, Jerome J.; Smith, Robert E.; and Dahl, Gary A., 5,500,370, Cl. 435-320.100.

Equidyne Systems, Inc.: *See*—
Parsons, James S., 5,499,972, Cl. 604-68.000.

Equitrade: *See*—
Deming, Robert F., Jr.; and Deming, Stephen E., 5,500,793, Cl. 364-401.000.

Erickson, Kevin J.: *See*—
Boutaghou, Zine-Eddine; and Erickson, Kevin J., 5,500,780, Cl. 360-99.080.

Erickson, Robert L.; Hansen, Paul E.; Burgio, Paul A.; Oxman, Joel D.; and Christoff, James D., to Minnesota Mining and Manufacturing Company. Dental isolation dam. 5,499,917, Cl. 433-137.000.

Ericsson, S.A.: *See*—
Gil, Luis, 5,500,941, Cl. 395-183.140.

Ertel, Daniel E.: *See*—
Hansen, Kenneth N.; and Ertel, Daniel E., 5,499,565, Cl. 83-452.000.

Escher, John S.: *See*—
Dydyk, Michael; and Escher, John S., 5,500,543, Cl. 257-277.000.

Esfaraghian, Kamran; and Abbott, Derek, to Luminis Pty. Limited. Gallium arsenide MESFET imager. 5,500,522, Cl. 250-208.100.

Esnouf, Michael P., to Coagen Limited. Blood-coagulation factor XIIIA β monoclonal antibody and immunoassay. 5,500,349, Cl. 435-7.400.

Espiner, Henry J.; and Howard, James. Surgical containment apparatus. 5,499,988, Cl. 606-114.000.

Esposito, Anthony: *See*—
Meandolia, Michael S.; Esposito, Anthony; Tassoff, James A.; Ross, Lloyd; Fessock, Paul J.; Barr, Morton L.; and Vinceati, Paul J., 5,500,209, Cl. 424-66.000.

Esposito, Antonio: *See*—
Bellussi, Giuseppe; Buonomo, Franco; Esposito, Antonio; Clerici, Mario G.; and Romano, Ugo, 5,500,199, Cl. 423-328.200.

Esposito, Michael. Vertically oriented duel grill. 5,499,574, Cl. 99-339.000.

Esposito, Pasquale A.; Esposito, Patsy A., Jr.; and Esposito, Wayne J. Apparatus and method for cutting trees and grinding and mulching tree stumps. 5,499,771, Cl. 241-101.740.

Esposito, Patsy A., Jr.: *See*—
Esposito, Pasquale A.; Esposito, Patsy A., Jr.; and Esposito, Wayne J., 5,499,771, Cl. 241-101.740.





Esposito, Wayne J.: *See*—
Esposito, Pasquale A.; Esposito, Patsy A., Jr.; and Esposito, Wayne J., 5,499,771, Cl. 241-101.740.

Essig, Daniel L., to Brooktree Corporation. Echo canceller. 5,500,892, Cl. 379-345.000.

Estelle, Lee R.: *See*—
Gooney, William T., Jr.; and Estelle, Lee R., 5,500,703, Cl. 354-222.000.

ETA SA Fabriques d'Ebauches: *See*—
Flury, Ronald, 5,500,837, Cl. 368-276.000.
Jeannet, Nicolas, 5,500,836, Cl. 368-187.000.

Etherington, Roger: *See*—
Beuchat, Charles E.; Etherington, Roger; Walbrink, Harold J.; and Bertman, John W., 5,499,969, Cl. 604-30.000.

Ethyl Corporation: *See*—
Hughes, Joe; Hartley, Rolfe J.; and Balasubramaniam, Vasudevan, 5,500,140, Cl. 252-46.700.

Eto, Yoshizumi: *See*—
Tanaka, Takayuki; Watanabe, Ryu; Oonami, Yuuichi; and Eto, Yoshizumi, 5,500,676, Cl. 348-387.000.

Euro-Celtique, S.A.: *See*—
Oshlack, Benjamin; and Chasin, Mark, 5,500,227, Cl. 424-476.000.

Euromate Industrial Air Cleaning Systems B.V.: *See*—
Valkering, Jozef E. P., 5,499,946, Cl. 454-63.000.

Europeenne de Retraitement de Catalyseurs Eurecat: *See*—
Berrebi, Georges; Jacquier, Yves; Edens, Habbo; and Middelkoop, Gerrit, 5,499,746, Cl. 222-165.000.

Euteneuer, Charles L., to SciMed Life Systems, Inc. Polyimide balloon catheter and method of making same. 5,499,980, Cl. 606-28.000.

Evans, JuliAnn; Gundo, Daniel P.; Harper, Jennifer S.; Mulenburg, Gerald M.; and Skundberg, Thomas L., to United States of America, National Aeronautics and Space Administration. Low spillage metabolic feeder. 5,499,609, Cl. 119-61.000.

Everhart, Dennis S.: *See*—
Quincy, Roger B., III; Nohr, Ronald S.; MacDonald, John G.; Gadsby, Elizaeth D.; and Everhart, Dennis S., 5,500,254, Cl. 427-387.000.

Evrard, Deborah A.: *See*—
Audia, James E.; Droste, James J.; Evrard, Deborah A.; Fludzinski, Pawel; Murdoch, Gwyn L.; and Nelson, David L., 5,500,431, Cl. 514-280.000.

Evren, Hüsnü: *See*—
Vogel, Rudolf; and Evren, Hüsnü, 5,499,662, Cl. 139-26.000.

Exner, Vincent A.: *See*—
Exner, Walter R.; Exner, Vincent A.; and Foucher, Urbin L., 5,499,556, Cl. 76-83.000.

Exner, Walter R.; Exner, Vincent A.; and Foucher, Urbin L., to Exner, Walter R.; Exner, Vincent A.; and Foucher, Urbin L. Portable ice skate blade sharpener. 5,499,556, Cl. 76-83.000.

Exxon Chemical Patents Inc.: *See*—
Halle, Richard W.; Michels, Dirk J.; and Middlesworth, Jeffrey A., 5,500,260, Cl. 428-35.700.

Exxon Production Research Company: *See*—
Berryhill, John R., 5,500,832, Cl. 367-51.000.

Exxon Research and Engineering Company: *See*—
Rogge, Stanley A.; and Cooper, Christophe K., 5,500,890, Cl. 379-91.000.

Ezawa, Hirokazu: *See*—
Miyata, Masahiro; Ezawa, Hirokazu; Ogure, Naoaki; Tsujimura, Masaru; Ohdaira, Takeyuki; Inoue, Hiroaki; and Ikeda, Yukio, 5,500,559, Cl. 257-762.000.

F & F Enterprises, Inc.: *See*—
Foster, Robert C.; and Forbes, Guy D., 5,499,666, Cl. 141-98.000.

F.C. Young & Co., Inc.: *See*—
Young, Kevin, 5,500,258, Cl. 428-10.000.

F.M. Control, S.L.: *See*—
Felipe, Gregorio R., 5,500,706, Cl. 354-326.000.

Faigle, Ernst M.; Semcheau, John H.; and Thompson, Richard J., to TRW Vehicle Safety Systems Inc. Apparatus for inflating an inflatable vehicle occupant restraint. 5,499,843, Cl. 280-741.000.

Pain, Eric S., to Ventritex, Inc. Method and apparatus for delivering defibrillation shocks with improved effectiveness. 5,500,008, Cl. 607-5.000.

Falcone, Danielia T.: *See*—
Buell, Kenneth B.; Clear, Sandra H.; and Falcone, Danielia T., 5,499,978, Cl. 604-385.200.

Fanuc Ltd.: *See*—
Fujimoto, Akihiko; Ishii, Hisao; Okamoto, Shinya; and Sato, Naoki, 5,499,963, Cl. 483-56.000.

Farley, Brian: *See*—
Hill, E. Richard, III; Davis, Glenn; and Farley, Brian, 5,499,632, Cl. 128-772.000.

Farmont, Johann. Method of using a parking card for operating a parking barrier for pay parking. 5,500,515, Cl. 235-384.000.

Parr, Alan S., to AM International, Inc. Collator without a main line drive shaft. 5,499,803, Cl. 270-54.000.

Farwell, Stephen P.: *See*—
Tomasko, John A.; and Farwell, Stephen P., 5,499,649, Cl. 137-68.270.

Fassler, Werner: *See*—
Pickering, James E.; and Fassler, Werner, 5,499,880, Cl. 400-642.000.

Faulkenberry, Stephen T.: *See*—
Derezinski, Stephen J.; and Faulkenberry, Stephen T., 5,500,172, Cl. 264-68.000.

Faure, Pierre; and Margaria, Thomas, to Pechiney Electrometallurgie. Silicon alloy containing aluminum, calcium and copper for the synthesis of alkyl or aryl halogenosilanes. 5,500,399, Cl. 502-244.000.

Fazzolare, Richard D.: *See*—
Addesso, Kevin; Dzurenko, Theresa E.; Moisey, Mark J.; Levine, Harry; Slade, Louise; Manna, James M.; Fazzolare, Richard D.; Ievolella, James; and Wang, Martha Y., 5,500,240, Cl. 426-560.000.

Feagin, John; and Glisson, Richard, to United States Surgical Corporation. Soft tissue repair system and method. 5,500,000, Cl. 606-232.000.

Feferman, Donald M.: *See*—
Dunlavy, John H., 5,500,842, Cl. 369-48.000.

Feinauer, Roland: *See*—
Röber, Stefan; Jadamus, Hans; Böer, Michael; Feinauer, Roland; Herrmann, Hans-Dieter; and Ries, Hans, 5,500,263, Cl. 428-36.600.

Feinberg, Bernard; and Pankratz, Richard P., to Du Pont de Nemours, E. I., and Company. Photosensitive element having support with adjustable adhesion. 5,500,327, Cl. 430-306.000.

Feingold, Vladimir, to Staar Surgical Company. Deformable intraocular lens cartridge. 5,499,987, Cl. 606-107.000.

Feldman, Leonard C.: *See*—
Bevk, Joze; Feldman, Leonard C.; Goesmann, Hans-Joachim L.; Luftman, Henry S.; and Yan, Ran-Hong, 5,500,391, Cl. 437-131.000.

Felipe, Gregorio R., to F.M. Control, S.L. Developing procedure and machine to carry out the procedure. 5,500,706, Cl. 354-326.000.

Fend, Heinrich. Device for forcing two conical flanges of a pipe coupling together under pressure. 5,499,849, Cl. 285-367.000.

Feng, Yee-Chung. Exchangeable type screwdriver with work-head storage module(s). 5,499,562, Cl. 81-177.400.

Fenton, Douglas F. Anti-snoring device with adjustable upper and lower relational members. 5,499,633, Cl. 128-848.000.

Fertin, Keith A.; and Kemps, Morris P. Ventilation apparatus providing air extraction adjacent selected workstations in a confined space. 5,499,945, Cl. 454-49.000.

Ferring AB: *See*—
Larsson, Krister; Mellbrand, Thomas; Mörnstam, Birgita; Roschester, Jan; and Sköldbäck, Jan-Åke, 5,500,413, Cl. 514-15.000.

Fert, Etienne, to U.S. Philips Corporation. Device for encoding digital signals representing images, and corresponding decoding device. 5,500,677, Cl. 348-402.000.

Fessock, Paul J.: *See*—
Meandolia, Michael S.; Esposito, Anthony; Tassoff, James A.; Ross, Lloyd; Fessock, Paul J.; Barr, Morton L.; and Vinceati, Paul J., 5,500,209, Cl. 424-66.000.

Fick, Willi: *See*—
Spotorno, Lorenzo; Fick, Willi; and Willi, Roland, 5,500,018, Cl. 623-11.000.

Fields, Larry D.: *See*—
Lacich, Todd C.; Krome, Edward F., Jr.; Howe, Michael G.; Fields, Larry D.; and Mihelick, Joseph R., 5,499,437, Cl. 29-402.030.

Figge, Irving E., Sr.: *See*—
Greist, Darton, III; and Figge, Irving E., Sr., 5,499,739, Cl. 220-589.000.

Figiel, Janusz; and Drabarek, Peter, to Illinois Tool Works Inc. Compressive cutting mechanism having plural-edged cutter. 5,499,664, Cl. 140-152.000.

Figueroa, Francisco R.; and Jarria, Roberto M., to Procter & Gamble Company, The. Handwash laundry detergent composition having improved mildness and cleaning performance. 5,500,153, Cl. 252-548.000.

Fink, E. David: *See*—
Fraas, Michael; Freazer, Reinhard; Long, Gregor; Kline, John S.; Sheridan, David S.; Fink, E. David; and Toppass, Anthony N., 5,499,625, Cl. 128-207.150.

Fink, William M., to Micron Technology, Inc. Adjustable cell plate generator. 5,500,824, Cl. 365-201.000.

Firma Gebruder Linck Maschinenfabrik "Gatterlinck" GmbH & Co. KG: *See*—
Traben, Josef; and Goesmer, Siegmar, 5,500,070, Cl. 156-254.000.

Fischer & Porter GmbH: *See*—
Nissen, Peter; and Schäfer, Klaus, 5,499,543, Cl. 73-861.160.

Fischer, Herbert: *See*—
Eicken, Ulrich; Fischer, Herbert; Gress, Wolfgang; Hoefer, Rainer; Oberkobusch, Doris; and Schiefersteln, Ludwig, 5,500,475, Cl. 524-591.000.

Fischhoff, David A.; and Perlak, Frederick J., to Monsanto Company. Synthetic plant genes. 5,500,365, Cl. 435-240.400.

Fisher-Guilde Regelarmaturen GmbH & Co. KG: *See*—
Schmitt, Manfred, 5,499,657, Cl. 137-887.000.

Fisher, John, to University of Leeds. Artificial heart valve. 5,500,016, Cl. 623-2.000.

Fitzpatrick, Brian J., to Optical Semiconductors, Inc. Scintillation solid and method of measuring radiation. 5,500,147, Cl. 252-301.60S.

Fitzpatrick, Judith: *See*—
Lee-Own, F. Victor; and Fitzpatrick, Judith, 5,500,375, Cl. 436-514.000.

Fitzpatrick, Peter J. Ladder emergency braking system. 5,499,691, Cl. 182-107.000.

FLA Orthopedics, Inc.: *See*—
Sanchez, Ana V., 5,499,965, Cl. 602-19.000.

Fleischer, Dietrich: *See*—
Reuschel, Gerhard; Fleischer, Dietrich; Yamamoto, Kaoru; and Chino, Shuichi, 5,500,477, Cl. 525-398.000.

Fleming, Ian M.: *See*—
Baker, Terence S.; Perry, Martin J.; and Fleming, Ian M., 5,500,350, Cl. 435-7.920.

Fleming, Michael W.: *See*—
Derian, Gary A.; Turner, Herman E., Jr.; and Fleming, Michael W., 5,499,745, Cl. 222-136.000.
Fletcher, David E.: *See*—
Tsai, M. Michael; Fletcher, David E.; and Zamm, Joseph W., 5,499,950, Cl. 474-138.000.
Flex Products, Inc.: *See*—
Phillips, Roger W.; Coombs, Paul G.; and Wendt, Lauren R., 5,500,302, Cl. 428-474.400.
Flight, Thomas A.: *See*—
Talmon-Gros, Guenter E.; Freeman, Donald H.; Flight, Thomas A.; McCarthy, Raymond M.; and Kendall, Anthony E., 5,500,566, Cl. 313-275.000.
Flores, Emmanuel S.; and Padilla, Juan L. D. V., to Motorola, Inc. Method of making surge suppressor switching device. 5,500,377, Cl. 437-6.000.
FloTool International, Inc.: *See*—
Quinn, Gregory F., 5,499,561, Cl. 81-124.600.
FloWind Corporation: *See*—
Wallace, Vernon R.; McMullen, Michael S.; and Archibald, William R., 5,499,904, Cl. 416-230.000.
Fludzinski, Pawel: *See*—
Audia, James E.; Droste, James J.; Evrard, Deborah A.; Fludzinski, Pawel; Murdoch, Gwyn L.; and Nelson, David L., 5,500,431, Cl. 514-280.000.
Fluid Quip, Inc.: *See*—
Bouchillon, Charles W.; and Franko, Andrew, 5,499,720, Cl. 209-728.000.
Flury, Ronald, to ETA SA Fabriques d'Ebauches. Wristwatch in plastic material including a metallic reinforcing armature used as baseplate. 5,500,837, Cl. 368-276.000.
Flytzani-Stephanopoulos, Maria: *See*—
Liu, Wei; and Flytzani-Stephanopoulos, Maria, 5,500,198, Cl. 423-246.000.
FMC Corporation: *See*—
Turner, James R., 5,499,568, Cl. 89-36.080.
Foley, Barbara M.; Galloway, David; Kuo, Shun-Meen; and Chun, Christopher K. Y., to Motorola. Optical interconnect unit and method or making. 5,500,914, Cl. 385-77.000.
Forbes, Guy D.: *See*—
Foster, Robert C.; and Forbes, Guy D., 5,499,666, Cl. 141-98.000.
Ford, John S., to Voltech Instruments Limited. Apparatus for testing electrical components which have windings. 5,500,598, Cl. 324-547.000.
Ford Motor Company: *See*—
Glidewell, John M.; Chui, Granger K.; and Yang, Woong-Chul, 5,499,538, Cl. 73-119.00A.
Hansburg, Douglas R.; and Logothetis, Eleftherios M., 5,499,500, Cl. 60-274.000.
Formax, Inc.: *See*—
Lindee, Scott A.; and Hansen, David M., 5,499,719, Cl. 209-703.000.
Fornasini, Gian F.: *See*—
Stroppolo, Federico; Bonadeo, Daniele; Fornasini, Gian F.; and Gazzaniga, Annibale, 5,500,226, Cl. 424-466.000.
Forschungszentrum Karlsruhe GmbH: *See*—
Schäfken, Heinrich; Neeb, Roland; Schlipf, Karl; and Kuntz, Bertram, 5,499,990, Cl. 606-144.000.
Forsdahl, Sixten; and Törner, Håkan. Method and device to scatter a preheated material on a surface. 5,499,462, Cl. 37-227.000.
Forshaw, Vincent R.: *See*—
Bretz, Phillip D.; and Forshaw, Vincent R., 5,500,017, Cl. 623-8.000.
Foster, Donald D.; and Nelson, Philip L., to Conico International, Inc. Nozzle assembly for trigger sprayer. 5,499,766, Cl. 239-333.000.
Foster, Robert C.; and Forbes, Guy D., to F & F Enterprises, Inc. Sanitary meat purge eliminator. 5,499,666, Cl. 141-98.000.
Foster Wheeler Energia Oy: *See*—
Isaksson, Juhani, 5,499,498, Cl. 60-39.120.
Foster Wheeler Energy Corporation: *See*—
Garcia-Mallol, Juan A., 5,500,195, Cl. 423-240.00R.
Foti, Anthony. Applicator for hair coloring and the like. 5,499,637, Cl. 132-200.000.
Foto Fantasy, Inc.: *See*—
Massarsky, Yefim, 5,500,700, Cl. 354-76.000.
Foucher, Urbin L.: *See*—
Exner, Walter R.; Exner, Vincent A.; and Foucher, Urbin L., 5,499,556, Cl. 76-83.000.
Fournel, Richard: *See*—
Lisart, Mathieu; and Fournel, Richard, 5,500,601, Cl. 324-713.000.
Foutch, John J.: *See*—
Foutch, Michael J.; and Foutch, John J., 5,499,471, Cl. 43-42.310.
Foutch, Michael J.; and Foutch, John J. Rattle for fishing lure. 5,499,471, Cl. 43-42.310.
France Telecom: *See*—
Boisrobert, Christian; Lucas, Jean-Francois; and Donteuwille, Michel, 5,500,733, Cl. 356-345.000.
Francis, Debra C.; Vallabhaneni, Siva V.; and Wong, Bert C., to Du Pont de Nemours, E. I., and Company. Composite coating of variable thickness having a gradient coloration in the cross-web direction. 5,500,274, Cl. 428-156.000.
Frank, Joel: *See*—
Roever, Stanley; and Frank, Joel, 5,500,694, Cl. 351-97.000.
Frank, Robert A.: *See*—
Carr, Albert A.; Dage, Richard C.; Koerner, John E.; Li, Tung; Miller, Francis P.; Nieduzak, Thaddeus R.; Dudley, Mark W.; Schmidt, Christopher J.; and Frank, Robert A., 5,500,433, Cl. 514-330.000.
Franke, Werner W.: *See*—
Moll, Roland; and Franke, Werner W., 5,500,347, Cl. 435-7.230.
Franko, Andrew: *See*—
Bouchillon, Charles W.; and Franko, Andrew, 5,499,720, Cl. 209-728.000.
Frass, Michael; Freazer, Reinhard; Long, Gregor; Kline, John S.; Sheridan, David S.; Fink, E. David; and Toppses, Anthony N., to Kendall Company, The. Esophageal-tracheal double lumen airway. 5,499,625, Cl. 128-207.150.
Freed, Brian S.: *See*—
Glamkowski, Edward J.; and Freed, Brian S., 5,500,423, Cl. 514-228.200.
Freeman, Donald H.: *See*—
Talmon-Gros, Guenter E.; Freeman, Donald H.; Flight, Thomas A.; McCarthy, Raymond M.; and Kendall, Anthony E., 5,500,566, Cl. 313-275.000.
Frei, Christoph, to Grapha-Holding AG. Arrangement for manufacturing book blocks formed of adhesively bound printed sheets. 5,499,897, Cl. 412-18.000.
French, Roy C.: *See*—
Ahlquist, Paul G.; and French, Roy C., 5,500,360, Cl. 435-172.300.
Freazer, Reinhard: *See*—
Frass, Michael; Freazer, Reinhard; Long, Gregor; Kline, John S.; Sheridan, David S.; Fink, E. David; and Toppses, Anthony N., 5,499,625, Cl. 128-207.150.
Friedman, Dean M. Ornamental element mounting means. 5,500,693, Cl. 351-52.000.
Friedmann, Günter: *See*—
Knott, Erwin; and Friedmann, Günter, 5,499,907, Cl. 417-360.000.
Friend, Clifford K.: *See*—
Randall, John M.; and Friend, Clifford K., 5,500,721, Cl. 355-265.000.
Fries, William, to Rohm and Haas Company. Process for removal of metal ions from aqueous solutions. 5,500,126, Cl. 210-668.000.
Frieur, Gerard A. D.: *See*—
Benard, Rejane; Frieur, Gerard A. D.; Martin, Didier J.; and Riveccic, Marcel L. P., 5,500,337, Cl. 430-570.000.
Fruchtbaum, Joseph; McConathy, Dave P.; Quintana, Daniel J.; and Sloan, Harold D., to M. W. Kellogg Company, The. Coke drum deheading device. 5,500,094, Cl. 202-241.000.
Fry, James K. Drain plug removing device. 5,499,557, Cl. 81-57.290.
Fu, Chueh-Kuo. Bicycle hub assembly. 5,499,875, Cl. 384-545.000.
Fuchigami, Hiroyuki: *See*—
Tsumura, Akira; Fuchigami, Hiroyuki; Nobutoki, Hideharu; and Koezuka, Hiroshi, 5,500,537, Cl. 257-40.000.
Fue, Kouichirou; Izawa, Yosuke; and Okumura, Naoji, to Matsushita Electric Industrial Co., Ltd. Memory equipment for writing/reading a defective video signal in a FIFO memory device consectively. 5,500,682, Cl. 348-497.000.
Fueki, Shunsuke, to Fujitsu Limited. System to decode instructions indicating the addresses of control codes and providing patterns to direct an electron beam exposure apparatus. 5,500,930, Cl. 395-141.000.
Fuji Electric Co., Ltd.: *See*—
Amano, Akira; Matsuzaki, Kazuo; and Sakai, Toshiaki, 5,499,535, Cl. 73-717.000.
Katou, Hisato; Kawashima, Tomoyuki; Taniguchi, Harutaka; Nakamata, Shin'ichi; and Shibata, Kazuyoshi, 5,500,103, Cl. 204-192.260.
Miyasaka, Tadashi, 5,500,619, Cl. 327-427.000.
Fuji Photo Film Co., Ltd.: *See*—
Asanuma, Hiroyuki; Ueda, Fumitaka; and Tani, Tadaaki, 5,500,336, Cl. 430-570.000.
Kawai, Kiyoshi; and Hatori, Masami, 5,500,329, Cl. 430-363.000.
Mizukawa, Yuki; Naruse, Hideaki; Watanabe, Toshiyuki; and Sato, Tadahisa, 5,500,334, Cl. 430-558.000.
Fuji Photo Optical Co. Ltd.: *See*—
Hiki, Susumu; Kondo, Mitsuo; and Abe, Kenji, 5,499,630, Cl. 128-662.050.
Saito, Tatsuo; and Onozuka, Haruo, 5,500,710, Cl. 354-484.000.
Yoshida, Hideo, 5,500,707, Cl. 354-403.000.
Fuji Xerox Co., Ltd.: *See*—
Funada, Masao, 5,500,785, Cl. 361-720.000.
Iishiba, Fumio; Ishida, Shinji; Ikeda, Masatoshi; and Takahashi, Kunihiro, 5,500,745, Cl. 358-461.000.
Kunitake, Setsu; Kamizawa, Koh; Koshi, Yutaka; and Suzuki, Kazuhiro, 5,500,907, Cl. 382-240.000.
Maruyama, Kazuo; and Noami, Tsuneo, 5,500,727, Cl. 355-326.00R.
Ota, Takeshi, 5,500,763, Cl. 359-333.000.
Watanabe, Masao, 5,500,491, Cl. 178-18.000.
Fujicopian Co., Ltd.: *See*—
Sakanishi, Yutaka; and Akashiro, Kotaro, 5,499,877, Cl. 400-193.000.
Fujieda, Masanao, to Nidek Co., Ltd. Ophthalmic apparatus for measuring refractive characteristic of eye to be measured. 5,500,697, Cl. 351-212.000.
Fujii, Minoru: *See*—
Odake, Yoshinori; Ohnishi, Teruhito; and Fujii, Minoru, 5,500,379, Cl. 437-34.000.
Fujii, Toshiyuki, to Matsushita Electric Industrial Co., Ltd. Multi-media communication apparatus for transmitting audio information, video information and character information simultaneously. 5,500,672, Cl. 348-17.000.





Fujimaki, Seiichi: *See*—
Yamamoto, Shinji; Ikoyama, Kazutoshi; and Fujimaki, Seiichi, 5,500,097, Cl. 203-11.000.
Fujimori, Naoji: *See*—
Inui, Takahiro; Tsuno, Takashi; Yamamoto, Yoshiyuki; and Fujimori, Naoji, 5,499,601, Cl. 117-84.000.
Nishibayashi, Yoshiki; Shioni, Hiromu; and Fujimori, Naoji, 5,500,393, Cl. 437-175.000.
Fujimoto, Akihiko; Ishii, Hisao; Okamoto, Shinya; and Sato, Naoki, to Fanuc Ltd. Automatic tool changer. 5,499,963, Cl. 483-56.000.
Fujimoto, Akihiko: *See*—
Mori, Yasushi; Matsuo, Tokuji; Hokao, Nobuhiro; Fujimoto, Akihiko; and Sato, Tsuyoshi, 5,500,039, Cl. 96-209.000.
Fujimoto, Akihisa, to Kabushiki Kaisha Toshiba. VGA hardware window control system. 5,500,654, Cl. 345-132.000.
Fujimura, Mario; Bas, Hiroki; and Doniewski, Janusz, to Mitsubishi Chemical America, Inc. Method and apparatus for recycling metal sheet-thermoplastic resin laminate composites. 5,500,072, Cl. 156-344.000.
Fujinami, Fumiko, to Sakura Color Products Corporation. Ultraviolet-curable thermochromic ink composition. 5,500,040, Cl. 106-21.00A.
Fujino, Keijirou; and Yamazaki, Koichi, to Nippon Conlux, Ltd. Information storage and retrieval device. 5,500,841, Cl. 369-44.260.
Fujino, Yasuo. Bacteria supporting medium, especially useful for pretreatment of waste water. 5,500,111, Cl. 210-150.000.
Fujioka, Tohru: *See*—
Okada, Atsunori; Wada, Shigeaki; Kusanagi, Shigekazu; and Fujioka, Tohru, 5,500,571, Cl. 313-635.000.
Fujita, Kouji; Higuchi, Shigenitsu; Aizawa, Toshiro; Suga, Atsuo; and Kosuge, Minoru, to Hitachi, Ltd. Data recording and reproducing apparatus. 5,500,775, Cl. 360-70.000.
Fujita, Nobuhide: *See*—
Ota, Yasunori; and Fujita, Nobuhide, 5,499,443, Cl. 29-741.000.
Fujita, Shinji, to Sodick Co., Ltd. Pre-plasticizing injection molding machine. 5,499,915, Cl. 425-557.000.
Fujita, Yoshiyuki: *See*—
Niino, Reiji; Obbu, Tomoyuki; Ikegawa, Hiroaki; Nakao, Ken; Fujita, Yoshiyuki; Haraoka, Tsutomu; Kobayashi, Makoto; Kaneda, Naoya; and Kumada, Hiroshi, 5,500,388, Cl. 437-89.000.
Fujita, Yosuke; and Lam, Steve P., to Panasonic Technologies, Inc. Distribution system and method for menu-driven user interface. 5,500,794, Cl. 364-188.000.
Fujitsu Limited: *See*—
Fueki, Shunsuke, 5,500,930, Cl. 395-141.000.
Hosokawa, Yoshiaki; Kanoh, Masaki; Maekawa, Takashi; and Nakayasu, Hirofumi, 5,499,876, Cl. 400-56.000.
Iida, Takashi; Sumi, Satoru; Shimizu, Hiroshi; Tahara, Akinori; Amano, Isao; and Nakajima, Tetsuya, 5,500,542, Cl. 257-210.000.
Isawa, Minae; and Nakamura, Yumiko, 5,500,655, Cl. 345-168.000.
Kurihara, Katsuhide, 5,500,939, Cl. 395-163.000.
Maeda, Ikuo; and Sagahara, Hirohide, 5,500,945, Cl. 395-185.090.
Ono, Tsuyoshi, 5,500,786, Cl. 361-760.000.
Satoh, Youichi, 5,499,928, Cl. 439-492.000.
Watabe, Masahiro, 5,500,256, Cl. 427-579.000.
Yoshida, Kojun, 5,500,944, Cl. 395-184.010.
Fujiwara, Shuji: *See*—
Komada, Norikazu; Nishinaka, Keiji; Adachi, Kazunori; and Fujiwara, Shuji, 5,500,158, Cl. 252-637.000.
Fukao, Kaname: *See*—
Hagino, Tomiaki; Furuta, Mamoru; and Fukao, Kaname, 5,499,913, Cl. 425-382.400.
Fukuba, Hiroyasu: *See*—
Ishida, Yukio; and Fukuba, Hiroyasu, 5,500,242, Cl. 426-618.000.
Fukuda, Hiroshi: *See*—
Katayama, Kaoru; Kazui, Shinichi; Iwata, Yasuhiro; Fukuda, Hiroshi; and Ohta, Toshihiko, 5,499,668, Cl. 134-1.000.
Fukui, Takaaki, to Sumitomo Wiring Systems, Ltd. Grommet with filler inlet opening. 5,499,823, Cl. 277-1.000.
Fukumoto, Tadao; Iwamoto, Masatoshi; and Kishimoto, Akihiko, to Toray Industries, Inc. Housing and resin composition including polyether ester amide, polycarbonate resin and modified vinyl polymer. 5,500,478, Cl. 525-66.000.
Fukunaga, Masanori: *See*—
Terashima, Tomohide; and Fukunaga, Masanori, 5,500,541, Cl. 257-105.000.
Fuldner, Friedrich: *See*—
Kiba, Hans-Robert; Storz, Dieter; Läufer, Engelbert; Hoch, Peter; and Fuldner, Friedrich, 5,500,845, Cl. 369-112.000.
Fulkerson, Don K.: *See*—
Stoteimyer, L. Scott; and Fulkerson, Don K., 5,499,656, Cl. 137-583.000.
Fuller, Carl W.; and Piasa-Williamson, Denise A., to Amersham Life Scieace, Inc. DNA denaturation method. 5,500,339, Cl. 435-6.000.
Funada, Masao, to Fuji Xerox Co., Ltd. Circuit board having improved thermal radiation. 5,500,785, Cl. 361-720.000.
Funakawa, Shigeru: *See*—
Sawada, Ryozo; Hirasawa, Masanori; Yamaguchi, Yoshiharu; Funakawa, Shigeru; and Kanayama, Masaru, 5,500,276, Cl. 428-192.000.
Funato, Masatomi; Shimizu, Yoshitake; Ishimaru, Seijiro; and Nagao, Kazuya, to Mita Industrial Co., Ltd. Toner for a two-component-type magnetic developing agent having excellent spent resistance. 5,500,319, Cl. 430-106.600.
Furukawa, Kenji: *See*—
Kigawa, Kazuya; Furukawa, Kenji; Deguchi, Totsu; Inoue, Sachiharu; Endo, Norikatsu; Yanagisawa, Tatsuo; Ikegami, Shinji; Omagari, Yasuyuki; Kihara, Koji; Sugawara, Tachiki; and Shimizu, Kenzo, 5,499,796, Cl. 254-133.00R.
Furukawa, Shinichi: *See*—
Sato, Mitsuhisa; Maeda, Mikio; and Furukawa, Shinichi, 5,500,731, Cl. 356-73.100.
Furukawa, Toshimasa: *See*—
Kischka, Karl-Heinz; Furukawa, Toshimasa; and Maezawa, Akiyo, 5,500,218, Cl. 424-401.000.
Furukido, Takeshi: *See*—
Maeda, Takashi; Kubota, Shuichi; Furukido, Takeshi; and Nishio, Toshiyuki, 5,499,825, Cl. 277-100.000.
Furuta, Mamoru: *See*—
Hagino, Tomiaki; Furuta, Mamoru; and Fukao, Kaname, 5,499,913, Cl. 425-382.400.
Furuyama, Tohru: *See*—
Takase, Satoru; and Furuyama, Tohru, 5,500,815, Cl. 365-149.000.
Futaba Denshi Kogyo K.K.: *See*—
Itoh, Shigeo; Yokoyama, Mikio; Tonegawa, Takeshi; and Kadowaki, Akira, 5,499,939, Cl. 445-73.000.
Futamura, Masao: *See*—
Kyuno, Mitsuyasu; Mizuno, Masahiro; Futamura, Masao; and Muto, Yukiyoshi, 5,499,589, Cl. 112-102.500.
Gaalema, Stephen D.; and Handschy, Mark A., to Displaytech, Inc. Liquid crystal spatial light modulator including an internal voltage booster. 5,500,748, Cl. 359-55.000.
Gadsby, Elizaeth D.: *See*—
Quincy, Roger B., III; Nohr, Ronald S.; MacDonald, John G.; Gadsby, Elizaeth D.; and Everhart, Dennis S., 5,500,254, Cl. 427-387.000.
Gage In-Store Marketing, LLC: *See*—
Morrow, Lester A., 5,499,723, Cl. 211-59.100.
Galanis, Anthony: *See*—
Vincent, C. Elmas, Jr.; and Galanis, Anthony, 5,499,643, Cl. 134-104.400.
Gallo, Claude; and LeClercq, Guy E. O., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "SNECMA". Deicing system for a butterfly valve. 5,499,651, Cl. 137-334.000.
Galloway, David: *See*—
Foley, Barbara M.; Galloway, David; Kuo, Shun-Meen; and Chun, Christopher K. Y., 5,500,914, Cl. 385-77.000.
Gallup, Robert W.: *See*—
Allen, Paul G.; Bard, Stephen P.; and Gallup, Robert W., 5,500,936, Cl. 395-156.000.
Gallup, William: *See*—
Livesay, Mark; and Gallup, William, 5,500,164, Cl. 264-459.000.
Gano, John C.: *See*—
Walter, Jeffrey S.; Gano, John C.; and Jones, Desmond, 5,499,680, Cl. 166-377.000.
White, Pat M.; and Gano, John C., 5,499,681, Cl. 166-382.000.
Ganoe, Carl W.: *See*—
Mowrey, Gary L.; Ganoe, Carl W.; and Monaghan, William D., 5,500,649, Cl. 342-22.000.
Gantner, Gebhard: *See*—
Koreuskamp, Jürgen; Gantner, Gebhard; and Winkler, Walter, 5,499,435, Cl. 29-235.000.
Gantner, Randall C.: *See*—
Donaldson, Charles W.; Miller, Kenneth E.; Lestage, John J.; and Gantner, Randall C., 5,500,737, Cl. 356-376.000.
Garcia-Mallol, Juan A., to Foster Wheeler Energy Corporation. Method for reducing gaseous emission of halogen compounds in a fluidized bed reactor. 5,500,195, Cl. 423-240.00R.
Gardner, John R., to PanGard, Inc. Pan packaging and display system. 5,499,716, Cl. 206-553.000.
Garman, Gary; and Chow, James C. Y., to Linvatec Corporation. Endoscopic needle with suture retriever. 5,499,991, Cl. 606-148.000.
Garnham, Geoffrey W.: *See*—
Eccles, Harry; Garnham, Geoffrey W.; Lowe, Christopher R.; and Bruce, Neil C., 5,500,351, Cl. 435-25.000.
Garruto, John A.: *See*—
Julian, Jorge V.; and Garruto, John A., 5,500,216, Cl. 424-401.000.
Gaskell, Christine K.: *See*—
Horn, Richard R.; Gaskell, Christine K.; Krauss, Susan R.; and Purol, Michael D., 5,500,125, Cl. 210-668.000.
Gavish, Ilan, to ISCAR Ltd. Tungsten-based cemented carbide powder mix and cemented carbide products made therefrom. 5,500,289, Cl. 428-551.000.
Gay, Jordan L. Distillate fuel oil/air-fired, rapid-fire cannon. 5,499,567, Cl. 89-7.000.
Gazsi, Lajos, to Siemens Aktiengesellschaft. Method for producing a digital sine wave signal with a given sampling rate, and circuit configuration for carrying out the method. 5,500,613, Cl. 327-107.000.
Gazzaniga, Annibale: *See*—
Stroppolo, Federico; Bonadeo, Daniele; Fornasini, Gian F.; and Gazzaniga, Annibale, 5,500,226, Cl. 424-466.000.
GC Corporation: *See*—

Obana, Jinichi; Hanatani, Shigeru; Okada, Junichi; Nasu, Yukari; and Nakazato, Ryoji, 5,500,454, Cl. 523-120.000.

Geczy, Andrew F.: *See*—
Russell-Jones, Gregory J.; and Geczy, Andrew F., 5,500,366, Cl. 435-252.300.

Geiger, Friedrich, to Bowe-Passat Reinigungs Und. Compensation for friction force in a laundry mangle. 5,499,464, Cl. 38-46.000.

Geiger, Hartmut; Gocz, Reinhard; Lentz, Uwe; Lucas, Johann; and Zimpel, Dieter, to Wabco Standard GmbH. Pressure-fluid operated ride leveler. 5,499,845, Cl. 280-840.000.

Gell, Harold A., Jr.; and Porto, Brian. Removable coffee roaster oven chamber. 5,500,237, Cl. 426-466.000.

Gemplus Card International: *See*—
Cagliostro, Charles W., 5,500,517, Cl. 235-486.000.
Morgavi, Paul, 5,499,878, Cl. 400-223.000.

General Electric Company: *See*—
Black, James E., Jr., 5,500,796, Cl. 364-419.080.
Bottomley, Paul A., 5,500,592, Cl. 324-307.000.
Donaldson, Charles W.; Miller, Kenneth E.; Lestage, John J.; and Gautner, Randall C., 5,500,737, Cl. 356-376.000.
Dunton, Thomas P.; Hall, Walter L.; and Teutsch, Erich O., 5,499,441, Cl. 29-527.200.
Eckberg, Richard P., 5,500,300, Cl. 428-447.000.
Goldblatt, Barry, 5,500,512, Cl. 235-375.000.
Hsiao, Meng-Ling; Tsm, Kwok C.; and Hudacko, Edward A., 5,500,883, Cl. 378-4.000.
Iacovangelo, Charles D.; and Jerabek, Elihu C., 5,500,248, Cl. 427-250.000.
Ishaque, Ahmad N.; and Castleberry, Donald E., 5,500,376, Cl. 437-3.000.
Jones, Marshall G., 5,500,505, Cl. 219-121.720.
Kheraluwala, Mustansir H.; and Schutten, Michael J., 5,500,791, Cl. 363-17.000.
Mahood, James A., 5,500,458, Cl. 523-205.000.
Mahood, James A., 5,500,467, Cl. 524-100.000.
Mahood, James A., 5,500,468, Cl. 524-117.000.
Ribner, David B.; and Hoe, David H. K., 5,500,645, Cl. 341-143.000.
Santos, Esteban; Pollman, John A.; and Singer, Paul H., 5,500,781, Cl. 361-96.000.
Wilson, Ronald H.; Doughty, Douglas A.; and Cocoma, John P., 5,500,567, Cl. 313-490.000.
de Jong, Robertus E.; and van der Kort, Jacobus J. C., 5,500,476, Cl. 524-377.000.

General Hospital Corporation, The: *See*—
Nathanson, James A., 5,500,230, Cl. 424-619.000.

Geniele, Henry, to Tye-Sil Corporation. Sunshade assembly. 5,499,644, Cl. 135-20.100.

Gensheimer, Robert P., to Convertech. Roll bladder support structure. 5,499,780, Cl. 242-571.100.

George, Ikoma A. V. Vehicular goodwill message system. 5,500,638, Cl. 340-468.000.

George, Robert C.; and Lasota, Andrew M., to Gillette Company, The. Soap-free self-foaming shave gel composition. 5,500,211, Cl. 424-73.000.

Georgia Tech Research Corporation: *See*—
Salant, Richard F., 5,499,824, Cl. 277-95.000.

Geraci, Michael P.; Hagen, Donald R.; and Sundquist, Arman E., to Resistance Technology, Inc. Frequency response adjusting device. 5,500,901, Cl. 381-68.200.

Gerber, Fritz: *See*—
Wahl, George; Dietz, Matthias; Schote, Norbert; Klosterhuber, Robert; Sommerer, Karl; Kunert, Reinhard; and Gerber, Fritz, 5,499,839, Cl. 280-701.000.

Gerl, Josef, to Bosch-Siemens Hausgeraete GmbH. Oven, particularly with an apparatus for pyrolitic self cleaning. 5,500,508, Cl. 219-400.000.

Germain, Albert; Pirard, Jean-Paul; Delattre, Véronique; Van Weyenbergh, Jacques; and Vogels, Claude, to Solvay (Société Anonyme). Process for the manufacture of hydrogen peroxide by direct synthesis from hydrogen and oxygen. 5,500,202, Cl. 423-584.000.

Gift Certificate Center, The: *See*—
Veeneman, William J.; Alexander, Karla J.; Doyle, Thomas J.; Brooks, Phillip R.; and Hamilton, Robert H., 5,500,514, Cl. 235-381.000.

Gil, Luis, to Ericsson, S.A. Optimum functional test method to determine the quality of a software system embedded in a large electronic system. 5,500,941, Cl. 395-183.140.

Giller, Gérald: *See*—
Mizuguchi, Jin; and Giller, Gérald, 5,500,314, Cl. 430-14.000.

Gillette Company, The: *See*—
George, Robert C.; and Lasota, Andrew M., 5,500,211, Cl. 424-73.000.
Stoner, Karla L.; and Slife, Charles W., 5,500,210, Cl. 424-73.000.

Gillis, Herbert R., to Imperial Chemical Industries PLC. Isocyanate reactive blends and internal mould release composites. 5,500,466, Cl. 524-92.000.

Ginsburg, Arthur P. Spatial frequency and contrast sensitivity test chart and protocol. 5,500,699, Cl. 351-239.000.

Ginzburg, Vladimir B., to Danieli United, Inc.; and International Rolling Mill Consultants, Inc. Method for producing metal strips having different thicknesses from a single slab. 5,499,523, Cl. 72-203.000.

Girard, Mario P.: *See*—
Schott, Allan N.; and Girard, Mario P., 5,499,553, Cl. 74-526.000.

Groß-Entwicklungs-AG: *See*—
Locher, Hermann, 5,499,861, Cl. 297-301.200.

Gistau-Baguer, Guy, to L'Air Liquide Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Helium refrigerator with compressor drive control. 5,499,505, Cl. 62-9.000.

Glamkowski, Edward J.; and Freed, Brian S., to Hoechst-Roussel Pharmaceuticals Inc. 5,6-dihydro-4H-imidazo[4,5,1-ij]quinolines. 5,500,423, Cl. 514-228.200.

Gleaves, John T., to Gleaves, John T. Method for study and analysis of products of catalytic reaction. 5,500,371, Cl. 436-37.000.

Glenn, Kevin C.: *See*—
Carney, Darrell H.; and Glenn, Kevin C., 5,500,412, Cl. 514-13.000.

Glenn, William K., III, to Ryobi Motor Products. Height adjustment mechanism for an upright vacuum cleaner. 5,499,425, Cl. 15-354.000.

Glens'Son: *See*—
Roberts, Wayne L., 5,500,641, Cl. 340-686.000.

Glidewell, John M.; Chui, Granger K.; and Yang, Woong-Chul, to Ford Motor Company. On-board detection of fuel pump malfunction. 5,499,538, Cl. 73-119.00A.

Gliemke, Horst; and Maier, Winfried, to Endress + Hauser GmbH + Co. Metallic connecting flange for ceramic pressure sensing elements. 5,499,539, Cl. 73-756.000.

Glisson, Richard: *See*—
Feagin, John; and Glisson, Richard, 5,500,000, Cl. 606-232.000.

Go, Roland: *See*—
Nagase, Taku; Go, Roland; Matsumoto, Tadashi; and Higashi, Akihiro, 5,500,856, Cl. 370-18.000.

Gocz, Reinhard: *See*—
Geiger, Hartmut; Gocz, Reinhard; Lentz, Uwe; Lucas, Johann; and Zimpel, Dieter, 5,499,845, Cl. 280-840.000.

Goddette, Dean: *See*—
Christianson, Teresa; Goddette, Dean; Ladin, Beth F.; Lee, Maria R.; Pasch, Christian; Reynolds, Robert B.; Wilson, Charles R.; and Yang, Shiow-Shong, 5,500,364, Cl. 435-221.000.

Godec, Maksimilijan; and Lawson, James L., to Torrington Company, The. Method of making retainers for ball bearings. 5,499,452, Cl. 29-898.067.

Godfroid, Jean-Jacques; Lamouri, Aazdine; Touboul, Estera; Wang, Xuan; Renard, Pierre; Pfeiffer, Bruno; and Guardiola, Béatrice, to Adir et Compagnie. Substituted piperazines for treatment of non-insulin-dependent diabetes. 5,500,426, Cl. 514-252.000.

Godlove, Ronald E., to Xerox Corporation. Method and apparatus employing variable pressure to clean a substrate in a printing apparatus. 5,500,723, Cl. 355-296.000.

Godring Display Group, Inc.: *See*—
Goldring, Harold B., 5,499,722, Cl. 211-57.100.

Goeaner, Siegmar: *See*—
Trabea, Josef; and Goeaner, Siegmar, 5,500,070, Cl. 156-254.000.

Goethals, Walther A. E., to Lumonics Ltd. Laser resonator balancing. 5,500,866, Cl. 372-32.000.

Goetting, F. Erich; and Trimberger, Stephen M., to Xilinx, Inc. Logic cell for field programmable gate array having optional internal feedback and optional cascade. 5,500,608, Cl. 326-39.000.

Goff, Todd A., to PTMW, Incorporated. Structure and method for encapsulating an existing building. 5,499,482, Cl. 52-742.130.

Goibuchi, Takayuki: *See*—
Wada, Yukio; Morimoto, Kyoichi; Goibuchi, Takayuki; and Tomiyasu, Hiroshi, 5,500,192, Cl. 423-10.000.

Gold, Jeffrey W.; and Nickras, Dan A., to Earth Resources Corporation. Cylinder rupture vessel. 5,499,665, Cl. 141-1.000.

Goldberg, Robert L., to Shipley Company, L.L.C. Electroplating process. 5,500,106, Cl. 205-166.000.

Goldblatt, Barry, to General Electric Company. Welding wire verification control system. 5,500,512, Cl. 235-375.000.

Goldman, Stephen A.; and Scheibel, Jeffrey J., to Procter & Gamble Company, The. Use of polyglycerol aliphatic ether emulsifiers in making high internal phase emulsions that can be polymerized to provide absorbent foams. 5,500,451, Cl. 521-64.000.

Goldring, Harold B., to Godring Display Group, Inc. Product dispenser including fixed quantity dispensing arrangement. 5,499,722, Cl. 211-57.100.

Goldstar Co., Ltd.: *See*—
Baik, Bok H.; Hur, Jung H.; and Shim, Dae S., 5,500,741, Cl. 358-335.000.
Bu, Jong U., 5,500,531, Cl. 250-372.000.
Kim, Dong G., 5,500,380, Cl. 437-409.000.
Kim, Kwang; and Seo, Heui Sik, 5,500,844, Cl. 369-77.200.
Lee, Eun P., 5,500,680, Cl. 348-468.000.

Goldstein, Mark K., to Quantum Group, Inc. Superemissive light pipes and photovoltaic systems including same. 5,500,054, Cl. 136-253.000.

Gomez, Cebers: *See*—
Rodriquez, Domingo; Payne, Roy; Gomez, Cebers; Carrazza, Jose; and Krmalich, John, 5,499,587, Cl. 110-342.000.

Gompertz, Ronald S.: *See*—
Childers, Winthrop D.; and Gompertz, Ronald S., 5,500,660, Cl. 347-33.000.

Gonia, Patrick S.; and Hoff, James P., to Honeywell Inc. Checksum calculation unit and method for error detection on data packets. 5,500,864, Cl. 371-53.000.

Goodman, Laurence M.: *See*—
Langhans, Stephen; Goodman, Laurence M.; and Shapiro, Sigman, 5,500,513, Cl. 235-380.000.

Goosey, William T., Jr.; and Estelle, Lee R., to Eastman Kodak Company. Real image zoom viewfinder. 5,500,703, Cl. 354-222.000.





Goossen, Keith W.; and Walker, James A., to AT&T Corp. Micromechanical modulator. 5,500,761, Cl. 359-290.000.

Gorecki, Michael J.; and Mastrony, Roger S., to United States Surgical Corporation. Elongate member orienting ramp. 5,499,708, Cl. 198-400.000.

Gory, Patrice: *See*—
Ehinger, Pierre; and Gory, Patrice, 5,500,045, Cl. 118-313.000.

Gossmann, Hans-Joachim L.: *See*—
Bevk, Jozo; Feldman, Leonard C.; Gossmann, Hans-Joachim L.; Luftman, Henry S.; and Yan, Ran-Hong, 5,500,391, Cl. 437-131.000.

Goswami, Ramanuj: *See*—
Chapman, Derek D.; Goswami, Ramanuj; and Kovacs, Csaba A., 5,500,325, Cl. 430-270.160.

Goto, Koichi: *See*—
Arai, Yasuhiro; Sano, Tetsuo; Yamashita, Tetsuji; Iwanaga, Takaki; and Goto, Koichi, 5,499,508, Cl. 62-114.000.

Gotoh, Fumihiro: *See*—
Matsubara, Miyuki; Hirabayashi, Hiromitsu; Nagoshi, Shigeyasu; Koitabashi, Noribumi; Sugimoto, Hitoshi; Gotoh, Fumihiro; and Uetuki, Masaya, 5,500,661, Cl. 347-41.000.

Gould Electronics Inc.: *See*—
Daniel, Hani S.; and Moore, Douglas R., 5,500,917, Cl. 385-99.000.

Goulet, Marie-Kateri. Method of whitening teeth and composition therefore. 5,500,207, Cl. 424-54.000.

Gradwell, Stephen I.: *See*—
Bulley, John L.; and Gradwell, Stephen I., 5,499,966, Cl. 602-42.000.

Graebner, John E.; Jin, Sungho; and Wolfe, Raymond, to AT&T Corp. Method of shaping polycrystalline diamond. 5,500,157, Cl. 264-1.210.

Granite Rock Company: *See*—
Hibbs, J. C., 5,499,899, Cl. 414-786.000.

Grant, Alan H. One-hand prehensile keyboard. 5,500,643, Cl. 341-22.000.

Grapha-Holding AG: *See*—
Frei, Christoph, 5,499,897, Cl. 412-18.000.

Gray, Joseph N.: *See*—
Robinson, Douglas S.; Jensen, Terrence C.; and Gray, Joseph N., 5,500,534, Cl. 250-385.100.

Great Lakes Chemical Italia S.r.l.: *See*—
Carletti, Vittorio; Longhini, Gianfranco; Po', Riccardo; Podesta', Roberto; Romano, Anna M.; and Querci, Cecilia, 5,500,285, Cl. 428-364.000.

Green, Andrew; and Ward, Paul C., to Eastman Kodak Company. Material supply. 5,499,488, Cl. 53-474.000.

Green, Malcolm L.: Cheetham, Anthony K.; Vernon, Patrick D.; and Ashcroft, Alexander T., to British Gas plc. Processes for the conversion of methane to synthesis gas. 5,500,149, Cl. 252-373.000.

Greengrove Corporation: *See*—
Meade, William D.; and Pearson, John W., 5,500,044, Cl. 106-697.000.

Greenwood, Mark H.; and Keith, Marvin, to Children On the Go, Inc. Infant feeding bottle including pressure equalizing diaphragm. 5,499,729, Cl. 215-11.500.

Gregoris, Dennis J., to SPAR Aerospace Limited. Electro-optic ice detection. 5,500,530, Cl. 250-339.110.

Greist, Darton, III; and Figge, Irving E., Sr., to Atlantic Research Corporation. Thermoplastic liner for and method of overwrapping high pressure vessels. 5,499,739, Cl. 220-589.000.

Gress, Wolfgang: *See*—
Eicken, Ulrich; Fischer, Herbert; Gress, Wolfgang; Hoefer, Rainer; Oberkobusch, Doris; and Schieferstein, Ludwig, 5,500,475, Cl. 524-591.000.

Grether, Hermann: *See*—
Nehm, Holger; and Grether, Hermann, 5,500,115, Cl. 210-460.000.

Grieser, Jerry D.: *See*—
Short, Michael K.; Grieser, Jerry D.; Nelson, Richard A.; Warner, Thomas B.; and Maguire, Ferrol M., 5,499,886, Cl. 403-381.000.

Grimstad, Robert F.: *See*—
Shearn, Kenneth M.; Kranick, Gordon S.; and Grimstad, Robert F., 5,499,690, Cl. 180-68.400.

Grisar, J. Martin; Petty, Margaret A.; and Bolkenius, Frank, to Hoechst Marion Roussel, Inc. Cardioprotective tocopherol analogs. 5,500,444, Cl. 514-456.000.

Grist, Thomas M.; and Alley, Marcus T., to Wisconsin Alumni Research Foundation. Local coil array for magnetic resonance imaging of the lower extremities. 5,500,596, Cl. 324-318.000.

Grüne, Dieter, to Metallgesellschaft Aktiengesellschaft. Process of purifying gypsum. 5,500,197, Cl. 423-243.080.

Grootaert, Werner M.; Kolb, Robert E.; and Millet, George H., to Minnesota Mining and Manufacturing Company. Fluoroelastomer composition with improved bonding properties. 5,500,042, Cl. 106-287.110.

Grossardt, Bernd: *See*—
Poggenburg, Rüdiger; Grossardt, Bernd; and Sonntag, Eberhard, 5,499,867, Cl. 303-159.000.

Groth Corporation: *See*—
Powell, Walter W.; and Castaneda, Louis R., 5,499,648, Cl. 137-15.000.

Gruber, Christian E.: *See*—
Li, Wu-Bo; Gruber, Christian E.; Jessee, Joel A.; and Lin, Jhy-Jhu, 5,500,356, Cl. 435-91.100.

Grunder, Roger. Tabletop device for the preparation of meals. 5,499,576, Cl. 99-421.00H.

Gruneisen, Mark T.: *See*—
Chakmakjian, Stephen H.; Gruneisen, Mark T.; Koch, Karl W., III; and Moore, Gerald T., 5,500,865, Cl. 372-22.000.

Gruppo Lepetit S.p.A.: *See*—
Malabarba, Adriano; Senaci, Pierfausto; Kettenring, Jürgen K.; and Ciabatti, Romeo, 5,500,410, Cl. 514-8.000.

Gruppo Sarplast S.p.A.: *See*—
Cargnelutti, Mario, 5,500,165, Cl. 264-32.000.

Grushkin, Bernard: *See*—
Mahabadi, Hadi K.; Agur, Enno E.; McAneney, T. Brian; Kao, Sheau V.; Allison, Gerald R.; Hawkins, Michael S.; Grushkin, Bernard; Kinselberger, J. Stephen; Chung, Joo T.; and Hollenbaugh, William H., Jr., 5,500,324, Cl. 430-137.000.

Grzesiak, Anthony J.: *See*—
Richardson, Darrel; Grzesiak, Anthony J.; and Vierk, David T., 5,499,700, Cl. 188-77.00W.

Guala, Ernesto; and Guala, Gianni, to Industrie Borla, S.p.A. Transducer-protector device for biomedical haemodialysis lines. 5,500,003, Cl. 604-252.000.

Guala, Gianni: *See*—
Guala, Ernesto; and Guala, Gianni, 5,500,003, Cl. 604-252.000.

Guardiola, Béatrice: *See*—
Godfroid, Jean-Jacques; Lamouri, Aazdine; Touboul, Estera; Wang, Xuan; Renard, Pierre; Pfeiffer, Bruno; and Guardiola, Béatrice, 5,500,426, Cl. 514-252.000.

Guenther, Werner; Molitor, Dieter; and Werner, Leonhard, to Siemens Aktiengesellschaft. Dental x-ray diagnostic installation for producing panorama x-ray exposures of the skull of a patient. 5,500,884, Cl. 378-38.000.

Guigne International Ltd.: *See*—
Guigné, Jacques Y.; Barnsley, Martin B.; Jackson, Henry W.; and Koptenko, Sergei V., 5,500,493, Cl. 181-0.500.

Guigné, Jacques Y.; Barnsley, Martin B.; Jackson, Henry W.; and Koptenko, Sergei V., to Guigne International Ltd. Acoustic beam levitation. 5,500,493, Cl. 181-0.500.

Guilford Mills, Inc.: *See*—
Moghaddassi, Majid; and Nielsen, Arne, 5,499,433, Cl. 26-2.00R.

Guillemette, Jean-Guy. Fish hook setting device. 5,499,469, Cl. 43-16.000.

Gulla, Michael: *See*—
Calvert, Jeffrey M.; Dressick, Walter J.; Calabrese, Gary S.; and Gulla, Michael, 5,500,315, Cl. 430-16.000.

Gullapalli, Rao P.: *See*—
Loncar, Mark J.; Murdoch, James B.; and Gullapalli, Rao P., 5,500,593, Cl. 324-307.000.

Gulli, Christian, to Sextant Avionique. Method for vectorial noise-reduction in speech, and implementation device. 5,500,903, Cl. 381-92.000.

Gundlach, Kurt B.: *See*—
Malhotra, Shadi L.; Gundlach, Kurt B.; and Colt, Richard L., 5,500,668, Cl. 347-105.000.

Gundo, Daniel P.: *See*—
Evans, JuliAnn; Gundo, Daniel P.; Harper, Jennifer S.; Mulenburg, Gerald M.; and Skundberg, Thomas L., 5,499,609, Cl. 119-61.000.

Gunn, Timothy D.: *See*—
Sharma, Raghu; Davis, Jeffrey P.; Gunn, Timothy D.; and Li, Ping, 5,500,859, Cl. 370-81.000.

H. H. Brown Shoe Company, Inc.: *See*—
Tomaro, Rita, 5,499,459, Cl. 36-10.000.

Ha, Jeong-Sook: *See*—
Park, Kang-Ho; Ha, Jeong-Sook; Park, Seong-Ju; and Lee, El-Hang, 5,500,047, Cl. 118-724.000.

Haasch, James T.; and Cavalluzzi, James J., to Modine Manufacturing Company. Oil cooler with a self-retaining, self-orienting pressure relief valve. 5,499,675, Cl. 165-38.000.

Haberle, Gerhard: *See*—
Häberle, Rainer, 5,499,802, Cl. 264-99.000.

Häberle, Rainer, to Haberle, Gerhard. Workpiece-holding system. 5,499,802, Cl. 264-99.000.

Habibi, Hamid R.: *See*—
Varaprasad, Desaraju V.; Looman, Steven D.; Zhao, Mingtang; Habibi, Hamid R.; and Lynam, Niall R., 5,500,760, Cl. 359-272.000.

Habing, Theodore G.; and Splane, Robson L., Jr., to NordicTrack, Inc. Articulated lower body exerciser. 5,499,956, Cl. 482-52.000.

Haccho, Seiji: *See*—
Kato, Hiroaki; Shimasaki, Yuichi; Saito, Akihisa; Komatsuda, Takashi; Oketani, Toshikazu; Haccho, Seiji; Matsumoto, Seiji; Aoki, Takuya; and Miyashita, Yukio, 5,499,501, Cl. 60-286.000.

Hache, Wilfried; and Kawczyk, Jost, to U. S. Philips Corporation. Code converter comprising protection circuit. 5,500,896, Cl. 379-412.000.

Hada, Michio: *See*—
Sakai, Masayasu; Seto, Touru; Kaneko, Masato; Hada, Michio; and Kinomoto, Toshiaki, 5,500,086, Cl. 162-65.000.

Hafeman, Dean G.; Parce, John W.; and McConnell, Hardea M., to Molecular Devices Corporation. Device for photoresponsive detection and discrimination. 5,500,188, Cl. 422-82.020.

Hagemeyer, Alfred; Hibst, Hartmut; Baeuerle, Dieter; and Heitz, Johannes, to BASF Magnetics GmbH. Heat-sealing of semicrystalline polymers with metals. 5,500,459, Cl. 523-300.000.

Hagen, Donald R.: *See*—
Geraci, Michael P.; Hagen, Donald R.; and Sundquist, Arman E., 5,500,901, Cl. 381-68.200.

Hagerman, William E.: *See*—
Baker, Mark C.; Hagerman, William E.; Penrod, Jack R.; and Stevens, Nancy S., 5,500,889, Cl. 379-67.000.

Hagimoto, Keizo: *See*—

Yamaguchi, Kazumi; Sawada, Masumi; Yamada, Masahe; and Hagimoto, Keizo, 5,500,547, Cl. 257-359.000.

Hagino, Tomiaki; Furuta, Mamoru; and Fukao, Kaname, to NGK Insulators, Ltd. Device for producing honeycomb structural bodies. 5,499,913, Cl. 425-382.400.

Hagiwara, Kazuyoshi; and Tsukawa, Hirohide, to Canon Kabushiki Kaisha. Toner for developing electrostatic images, image forming apparatus, apparatus unit and facsimile apparatus. 5,500,046, Cl. 118-653.000.

Hagqvist, Peter, to AB Electrolux. Method for production of a continuous web of fluid purifier membrane filter stock material having a low pressure side permeable layer sandwiched between two membrane carrier layers having cast-in place external membranes. 5,500,247, Cl. 427-244.000.

Haiji, Hirohisa: *See*—
Inoue, Tadashi; Tsuru, Kiyoshi; Okimoto, Shinichi; Yamamura, Naokazu; Yamamoto, Tetsuo; and Haiji, Hirohisa, 5,500,057, Cl. 148-312.000.

Hain, Rüdiger; Reif, Hans-Jörg; and Stenzel, Klaus, to Bayer Aktiengesellschaft. Stilbene synthase genes from grapevine. 5,500,367, Cl. 435-252.300.

Hakomori, Sen-itiroh, to Biomembrane Institute, The. Methods for the production of antibodies and induction of immune responses to tumor-associated gangliosides by immunization with ganglioside lactones. 5,500,215, Cl. 424-277.100.

Hale, Joseph P.; and Whyte, Robert H. Swivelable mount for snowboard and wakeboard. 5,499,837, Cl. 280-607.000.

Hall, Corrian A. E.: *See*—
Schwiebert, William H.; Hall, Corrian A. E.; Broder, Damon W.; and Moore, Shelley L, 5,500,667, Cl. 347-102.000.

Hall, James E.: *See*—
Lawson, David F.; Astkowiak, Thomas A.; Hall, James E.; and Stayer, Mark L., Jr., 5,500,447, Cl. 524-571.000.

Hall, Walter L.: *See*—
Dunton, Thomas P.; Hall, Walter L.; and Toutsch, Erich O., 5,499,441, Cl. 29-527.200.

Hall, Wilton: *See*—
Card, Roy T.; and Hall, Wilton, 5,499,588, Cl. 112-80.410.

Halle, Richard W.; Michiels, Dirk J.; and Middlesworth, Jeffrey A., to Exxon Chemical Patents Inc. Dispersible film. 5,500,260, Cl. 428-35.700.

Halliburton Company: *See*—
Surjaatmadja, Jim B.; Helton, Timothy W.; and Abass, Hazim H., 5,499,678, Cl. 166-298.000.
Walter, Jeffrey S.; Gano, John C.; and Jones, Desmond, 5,499,680, Cl. 166-377.000.
White, Pat M.; and Gano, John C., 5,499,681, Cl. 166-382.000.

Halm, Walter B.; Jones, William J., Jr.; Kirkbride, James F.; Marcus, Ilan; and Snyder, Adrian C., to Du Pont de Nemours, E. I., and Company. Fillings and other aspects of fibers. 5,500,295, Cl. 428-357.000.

Halser, Joseph G., III. Wide band audio transformer with multifilar winding. 5,500,632, Cl. 336-180.000.

Hamamatsu Photonics K.K.: *See*—
Takahashi, Hironori; Aoshima, Shinichiro; and Hirano, Isuke, 5,500,587, Cl. 324-96.000.

Hamanaka, Kenjiro, to Nippon Sheet Glass Co. Ltd. Optical information transmitting device and method of manufacturing same. 5,500,523, Cl. 250-216.000.

Hamburg, Douglas R.; and Logothetis, Eleftherios M., to Ford Motor Company. Engine air/fuel control system with catalytic converter and exhaust gas oxygen sensor monitoring. 5,499,500, Cl. 60-274.000.

Hamdan, Adnan. Cyclone-turbines, intended especially for flotation systems designed for treating water polluted by hydrocarbons. 5,500,117, Cl. 210-512.100.

Hamilton, R. Keith: *See*—
Bentley, Roger G.; Hamilton, R. Keith; Jack, J. Stewart; and Barron, Robert L., 5,500,735, Cl. 356-364.000.

Hamilton, Robert H.: *See*—
Veeneman, William J.; Alexander, Karla J.; Doyle, Thomas J.; Brooks, Phillip R.; and Hamilton, Robert H., 5,500,514, Cl. 235-381.000.

Hampel, Manfred: *See*—
Wingert, Horst; Sauter, Hubert; Ammermann, Eberhard; Lorenz, Gisela; Saur, Reinhold; Scheiberger, Klaus; and Hampel, Manfred, 5,500,441, Cl. 514-412.000.
Wingert, Horst; Sauter, Hubert; Ammermann, Eberhard; Lorenz, Gisela; Saur, Reinhold; Scheiberger, Klaus; and Hampel, Manfred, 5,500,446, Cl. 514-483.000.

Han, Byoung Y., to LG Semicon Co., Ltd. Address decoder for repair of memory device. 5,500,822, Cl. 365-200.000.

Han, Hongtao: *See*—
Boudreau, Robert A.; Bowen, Terry P.; Han, Hongtao; Rowlette, John R., Sr.; and Stack, Jared D., 5,500,910, Cl. 385-24.000.

Han, Kwangsik, to Daewoo Electronics Co., Ltd. Pickup carriage feeding apparatus of a disc player. 5,500,847, Cl. 369-219.000.

Hanasaki, Yasuaki; Tsukuda, Kazuaki; Watanabe, Hiroyuki; Tsuzuki, Kenji; Murakami, Mitsuyuki; and Niimi, Noritoshi, to Tosoh Corporation. Thiadiazole derivatives and herbicide compositions containing the same. 5,500,408, Cl. 504-261.000.

Hanashiro, Kiyomi: *See*—
Shimomoto, Kenichi, 5,500,584, Cl. 320-20.000.

Hanatani, Shigeru: *See*—
Obana, Junichi; Hanatani, Shigeru; Okada, Junichi; Nasu, Yukari; and Nakazato, Ryoji, 5,500,454, Cl. 523-120.000.

Hanatani, Yasuyuki: *See*—
Kimoto, Keizo; Hanatani, Yasuyuki; Sakai, Hiroaki; Oki, Tsuneo; and Uemura, Mamoru, 5,499,486, Cl. 53-465.000.

Handel, Gary A.; Jonovic, John A.; and Krueger, Otto L., to Oscar Mayer Foods Corporation. Food loaf shaping and texturizing rack. 5,499,575, Cl. 99-349.000.

Handschy, Mark A.: *See*—
Gunkima, Stephen D.; and Handschy, Mark A., 5,500,748, Cl. 359-55.000.

Hanin, Yukio; Ishida, Shinji; and Koshimizu, Michio, to Nippondenso Co., Ltd. Secondary air supplying system having a motor-driven air pump. 5,499,502, Cl. 60-290.000.

Hankins, Timothy R. F.: *See*—
Walley, Ian M.; and Hankins, Timothy R. F., 5,500,639, Cl. 340-539.000.

Hanna, Christine B.: *See*—
Levin, Roy; and Hanna, Christine B., 5,500,881, Cl. 395-700.000.

Hansen, Aaiyane M.; and Anderson, Herschel, to Schroer Manufacturing Company. Supply stand clamp. 5,499,721, Cl. 211-13.000.

Hansen, David M.: *See*—
Lindee, Scott A.; and Hansen, David M., 5,499,719, Cl. 209-703.000.

Hansen, Karl A.; and Landau, C. David, to Boeing Company, The. Tailored susceptors for induction welding of thermoplastic. 5,500,511, Cl. 219-633.000.

Hansen, Kenneth N.; and Ertel, Daniel E., to Dorner Mfg. Corp. Belt cutting apparatus. 5,499,565, Cl. 83-452.000.

Hansen, Kim, to Canvik A/S. On-car disc brake lathe. 5,499,563, Cl. 82-112.000.

Hansen, Paul E.: *See*—
Erickson, Robert L.; Hansen, Paul E.; Burgio, Paul A.; Oxman, Joel D.; and Christoff, James D., 5,499,917, Cl. 433-137.000.

Hara, Hiroyuki: *See*—
Kuroshima, Masashi; Hara, Hiroyuki; and Machida, Haruo, 5,500,923, Cl. 395-114.000.

Hara, Junichiro; and Matsuoka, Takayoshi, to Nissan Motor Co., Ltd. Heat pump type air conditioner for vehicle. 5,499,511, Cl. 62-180.000.

Harada, Hidefumi; Yamauchi, Takanori; Sadanaga, Eizi; and Okazaki, Teruyoshi, to Toyo Kogyo Kabushiki Kaisha. Lustrous pigment and the method of producing the same. 5,500,043, Cl. 106-456.000.

Harada, Hiroyuki; and Kida, Yasuhito, to Mita Industrial Co., Ltd. Paper conveying device and paper conveying method. 5,499,804, Cl. 271-3.020.

Harada, Taira: *See*—
Morizono, Kenichi; and Harada, Taira, 5,500,246, Cl. 427-239.000.

Haraoka, Tsutomu: *See*—
Niino, Reiji; Obba, Tomoyuki; Ikegawa, Hiroaki; Nakao, Ken; Fujita, Yoshiyuki; Haraoka, Tsutomu; Kobayashi, Makoto; Kaneda, Naoya; and Kumada, Hiroshi, 5,500,388, Cl. 437-89.000.

Harbinson, John N.: *See*—
Smith, James W.; Ellenor, David T. R.; and Harbinson, John N., 5,500,129, Cl. 210-703.000.
Smith, James W.; Ellenor, David T. R.; and Harbinson, John N., 5,500,130, Cl. 210-703.000.
Smith, James W.; Ellenor, David T. R.; and Harbinson, John N., 5,500,135, Cl. 210-787.000.

Harbour, Richard, to Lever Brothers Company. Plastic container having reinforcing depressions. 5,499,730, Cl. 215-382.000.

Hardesty, Terry D., to Deere & Company. Reinforced semi-pneumatic tire. 5,499,669, Cl. 152-158.000.

Hardy, David H.: *See*—
Holmes, Gary L.; Caller, Scott R.; Hardy, David H.; Hendrickson, William A.; Klun, Thomas P.; Harmon, Kimberly K.; Heisi, Robert V.; Spurgeon, Kathryn M.; and Studiner, Charles J., III, 5,500,273, Cl. 428-147.000.

Harel, Avikam: *See*—
Meadea, Emanuel; and Harel, Avikam, 5,500,009, Cl. 607-88.000.

Hargreaves, Rodney B.: *See*—
Block, Michael H.; Harrison, Alison; and Hargreaves, Rodney B., 5,500,428, Cl. 514-266.000.

Harinaga, Toshiyuki, to Nishimbo Industries, Inc. Disk brake device having a piston with an air vent groove. 5,499,701, Cl. 188-72.400.

Harmon, Kimberly K.: *See*—
Holmes, Gary L.; Caller, Scott R.; Hardy, David H.; Hendrickson, William A.; Klun, Thomas P.; Harmon, Kimberly K.; Heisi, Robert V.; Spurgeon, Kathryn M.; and Studiner, Charles J., III, 5,500,273, Cl. 428-147.000.

Harnisch, Stephen: *See*—
Sierens, Christiaan H. J.; Steigenberger, Ulrich; Berger, Werner; Harnisch, Stephen; Van Der Plas, Gert; and Meutdeagh, Denis J. G., 5,500,755, Cl. 359-161.000.

Harnischfeger Corporation: *See*—
Profio, Richard L.; and Loeber, Frederick W., 5,499,463, Cl. 37-398.000.

Harold, Robert G.; and Leary, John W., to American Standard Inc. Noise control in a centrifugal chiller. 5,499,509, Cl. 62-117.000.

Harpel, William L.: *See*—
Ouyang, Jiangbo; and Harpel, William L., 5,500,053, Cl. 427-247.000.

Harper, Jennifer S.: *See*—
Evans, JuliAnn; Gundo, Daniel P.; Harper, Jennifer S.; Mulenburg, Gerald M.; and Stundberg, Thomas L., 5,499,609, Cl. 119-61.000.

Harrelson, Glen R., to Riverwood International Corporation. Basket-style carrier with non-collapsing end panels. 5,499,712, Cl. 206-172.000.

Harrigan, Lora. Disposable pocket for animal treats. 5,499,403, Cl. 2-247.000.





Harrington, Noreen A.; and Michelson, Mark J. Telecommunication system with multilink host computer call control interface system and method. 5,500,891, Cl. 379-265.000.

Harriot, Lloyd R.; Liddle, James A.; Volkert, Cynthia A.; Waskiewicz, Warren K.; and Windt, David L., to AT&T Corp. Masks with low stress multilayer films and a process for controlling the stress of multilayer films. 5,500,312, Cl. 430-5.000.

Harris, David H.: *See*—
Stoner, Robert R.; and Harris, David H., 5,499,627, Cl. 128-633.000.

Harrison, Alison: *See*—
Block, Michael H.; Harrison, Alison; and Hargreaves, Rodney B., 5,500,428, Cl. 514-266.000.

Harrison, Charles R.: *See*—
Bernotte, William E.; Harrison, Charles R.; Lahm, George P.; Piotrowski, David W.; and Wing, Keith D., 5,500,438, Cl. 514-403.000.

Hartley, E. Dale; and Hartley, F. Scott, to Sharflo Pump Manufacturing Co. Reverse osmosis water system. 5,500,113, Cl. 210-321.600.

Hartley, F. Scott: *See*—
Hartley, E. Dale; and Hartley, F. Scott, 5,500,113, Cl. 210-321.600.

Hartley, Rolfe J.: *See*—
Hughes, Joe; Hartley, Rolfe J.; and Balasubramaniam, Vasudevan, 5,500,140, Cl. 252-46.700.

Hartman, Frederick A.: *See*—
Bacon, Dennis R.; Trinh, Toan; Hartman, Frederick A.; and Mermelstein, Robert, 5,500,137, Cl. 252-8.600.

Hartman, Robert C., Jr., to International Business Machines Corporation. Client/server based secure timekeeping system. 5,500,897, Cl. 380-25.000.

Hartmann, Paul R.: *See*—
Engdahl, Thomas L.; Tyburski, Edward; and Hartmann, Paul R., 5,500,853, Cl. 370-17.000.

Hartmann, Willi: *See*—
Bergelin, Klaus; Hartmann, Willi; Saalbach, Kurt; and Low, Peter, 5,499,570, Cl. 92-84.000.

Harton, Austin V.: *See*—
Alonas, Paul G.; Yeh, Jang-Hun; and Harton, Austin V., 5,500,912, Cl. 385-37.000.

Haruta, Masahiro: *See*—
Koike, Shoji; Haruta, Masahiro; Shirota, Koromo; Yamamoto, Tomoya; and Suzuki, Mariko, 5,500,023, Cl. 8-499.000.

Haruzono, Teruo, to Japan Tobacco Inc. Tobacco harvester. 5,499,635, Cl. 131-290.000.

Harzenmoser, Isidor: *See*—
Baechler, François; Strehler, Klaus; Harzenmoser, Isidor; and Zehr, Jürg, 5,499,546, Cl. 73-865.000.

Hasegawa, Kenji; and Yohda, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Magnetic head drive which uses independently controlled piezoelectric elements. 5,500,777, Cl. 360-77.160.

Hashimoto, Mitsuru: *See*—
Kawamura, Chuichi; Kasugai, Ichiro; Hashimoto, Mitsuru; and Ida, Masahiro, 5,499,515, Cl. 62-470.000.

Hashimoto, Takeshi: *See*—
Sakumoto, Yukinori; Hashimoto, Takeshi; Nakaba, Katsuji; Kobayashi, Masaharu; Nishigaya, Takeshi; and Yamanashi, Fumiyoshi, 5,500,294, Cl. 428-355.000.

Hashimoto, Yuichi; Amamiya, Shoji; and Sakakibara, Teigo, to Canon Kabushiki Kaisha. Electrophotographic photosensitive member and electrophotographic device using the same. 5,500,718, Cl. 355-210.000.

Haskell, Barin G.: *See*—
Andersson, Russell L.; Chen, Tsuhan; and Haskell, Barin G., 5,500,671, Cl. 348-15.000.

Hassoun, Marwan M.: *See*—
William, Richard L.; Weber, Robert J.; and Hassoun, Marwan M., 5,499,626, Cl. 128-630.000.

Hata, Kenjiro: *See*—
Iwatsuka, Shinji; Kobayashi, Masaaki; and Hata, Kenjiro, 5,500,915, Cl. 385-78.000.

Hatakeyama, Kazuhiko: *See*—
Yamashita, Akio; Suzuki, Kazutaka; Amano, Toshiaki; and Hatakeyama, Kazuhiko, 5,500,669, Cl. 347-214.000.

Hatanaka, Takefumi; and Kawahara, Naruto, to Arex Electronics Corporation. High-efficiency power supply control apparatus for variable-speed induction motor. 5,500,581, Cl. 318-727.000.

Hatano, Takahisa; and Nishigori, Yoshihisa, to Matsushita Electric Industrial Co., Ltd. Chrominance signal separator using chrominance signal correlation. 5,500,687, Cl. 348-663.000.

Hatori, Masami: *See*—
Kawai, Kiyoshi; and Hatori, Masami, 5,500,329, Cl. 430-363.000.

Hattori, Shigetaka: *See*—
Nakagawa, Kenji; Yoshizaki, Koichi; Nukaga, Tadashi; Basba, Yoshikazu; Hattori, Shigetaka; and Mochizuki, Kentaro, 5,499,791, Cl. 248-638.000.

Hattori, Yoshifumi; Inada, Genji; and Watanabe, Kenjiro, to Canon Kabushiki Kaisha. Ink jet recording apparatus having a heating member and means for reducing moisture near an ink discharge port of a recording head. 5,500,658, Cl. 347-22.000.

Hattori, Yoshifumi; Karita, Seiichiro; Saikawa, Hideo; Kashino, Toshio; Saito, Akio; Nakagomi, Hiroshi; Arashima, Teruo; Kimura, Makiko; Sugitani, Hiroshi; Ikeda, Masami; Saito, Asao; Masuda, Kazuaki; and Orikasa, Tsuyoshi, to Canon Kabushiki Kaisha. Capping member for indirectly venting the interior of an ink container, and recording cartridge and apparatus using same. 5,500,666, Cl. 347-87.000.

Hattori, Yoshifumi: *See*—
Suzuki, Etsuzou; Hattori, Yoshifumi; Kitani, Masashi; Saikawa, Hideo; Kojima, Masami; Kawano, Kenji; Tuzuo, Koichi; and Aono, Kenji, 5,500,664, Cl. 347-86.000.

Haughney, Michael A.; Mojarrad, Mehrdad; Tornow, Devin C.; and Wiesshuu, Norval J., to Caterpillar Inc. Dual-function clamping assembly adapted for a hydraulically-actuated fuel injector. 5,499,612, Cl. 123-470.000.

Hauglin, Berat-Otto; and Johnson, Rod, to Rottefella AS. Cross-country ski binding. 5,499,838, Cl. 280-615.000.

Haugsten, Kjell: *See*—
Lyssen, Steinar; Haugsten, Kjell; Hox, Ketil; Hagdahl, Jan; and Myklebust, Nils, 5,500,501, Cl. 219-121.480.

Hautefaye, Patrick: *See*—
Lavielle, Gilbert; Hautefaye, Patrick; Muller, Olivier; Millan, Mark; and Brocco, Mauricette, 5,500,443, Cl. 514-422.000.

Hawkes, E. Gerry. Bidirectional roadway for wheeled vehicles. 5,499,888, Cl. 404-19.000.

Hawkins, John T., to Lancer Corporation. Low profile drink dispenser. 5,499,744, Cl. 222-129.100.

Hawkins, Michael S.: *See*—
Mahabadi, Hadi K.; Agar, Esso E.; McAneney, T. Brian; Kao, Shaun V.; Allison, Gerald R.; Hawkins, Michael S.; Grushkin, Bernard; Kitzelberger, J. Stephen; Chung, Joo T.; and Hollenbaugh, William H., Jr., 5,500,324, Cl. 430-137.000.

Hay, Jean-Yves, to SOCITEC - Societe pour le Commerce International et les Echanges Techniques. Antivibration/antishock device and the process for the fabrication of such a device. 5,499,790, Cl. 248-570.000.

Hayakawa, Kimiaki: *See*—
Hayashi, Kenichi; Hayakawa, Kimiaki; and Takehara, Yoshifumi, 5,499,811, Cl. 271-293.000.

Hayasaki, Koichi, to Nissan Motor Co., Ltd. Control device having compensation means for changing predetermined throttle pedalling speeds of automatic transmission for vehicle. 5,499,953, Cl. 477-120.000.

Hayashi, Hitoshi: *See*—
Takigawa, Kenji; Oyama, Nachisa; and Hayashi, Hitoshi, 5,500,146, Cl. 252-299.670.

Hayashi, Kenichi; Hayakawa, Kimiaki; and Takehara, Yoshifumi, to Canon Kabushiki Kaisha. Sheet post-processing apparatus. 5,499,811, Cl. 271-293.000.

Hayashi, Seishu: *See*—
Nakata, Kiyoshi; and Hayashi, Seishu, 5,499,911, Cl. 425-94.000.

Hayashi, Shigeru: *See*—
Ohno, Hirofumi; Narui, Fumio; and Hayashi, Shigeru, 5,499,927, Cl. 439-285.000.

Hayashi, Toshihiro; Kohno, Hiroshige; Watanabe, Akinori; and Horiguchi, Itaru, to Asahi Denka Kogyo Kabushikikaisya; and Okamoto Industries, Inc. Method of manufacturing hollow molded articles. 5,500,178, Cl. 264-297.800.

Hayashi, Toshiumi, to Yayoi Corporation. Embossed carrier tape system. 5,499,717, Cl. 206-701.000.

Hayashide, Yoshio, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device having a planarized surface. 5,500,558, Cl. 257-758.000.

Haynes and Boone, L.L.P.: *See*—
Dunlavy, John H., 5,500,842, Cl. 369-48.000.

Hays, Bill J. Automotive clutches. 5,499,704, Cl. 192-70.270.

Hays, William J.: *See*—
Lawrence, Keith E.; Suda, Kenneth J.; and Hays, William J., 5,499,615, Cl. 123-526.000.

Hayward, Larry H., to Colgate Palmolive Company. Method and apparatus for the manufacture of a pet food product having a fibrous striated structural matrix. 5,500,239, Cl. 426-516.000.

Hazama, Junji: *See*—
Koitabashi, Hideki; Yanagihara, Masamitsu; and Hazama, Junji, 5,500,736, Cl. 356-375.000.

Hecox, Kurt E.: *See*—
Chen, Jiashu; VanVeen, Barry P.; and Hecox, Kurt E., 5,500,900, Cl. 381-17.000.

Heffelfinger, Michael T.; Keung, Jay K.; and Peet, Robert G., to Mobil Oil Corporation. High moisture barrier OPP film containing high crystallinity polypropylene and terpene polymer. 5,500,282, Cl. 428-339.000.

Hehner, Reinhard; and Müller, Georg, to Jagenberg Aktiengesellschaft. Sound-dampened paper-winding machine. 5,499,778, Cl. 242-541.000.

Heidelberger Druckmaschinen AG: *See*—
Löffler, Gerhard, 5,500,801, Cl. 364-469.000.

Heidorn, Michael E.: *See*—
Trojan, Donna M.; and Heidorn, Michael E., 5,499,841, Cl. 280-731.000.

Heiman, Daniel F.: *See*—
Shafer, Warren E.; Woolard, Derek D.; Samuel, Neyyan K. P.; Vealsey, Gregory D.; Deviatty, Bala N.; and Heiman, Daniel F., 5,500,403, Cl. 504-115.000.

Hein, Lothar: *See*—
Wagner, Gerhard; and Hein, Lothar, 5,499,954, Cl. 477-174.000.

Hein, Todd J.; and Utley, Mike K., to Orthopaedic Innovations, Inc. Detachable coupling system for surgical instruments. 5,499,985, Cl. 606-99.000.

Heimmiller, Helen. Insulated head warmer with a collapsible wall and retaining means. 5,499,401, Cl. 2-208.000.

Heinz, Tony F.: *See*—
Barbee, Steven G.; Heinz, Tony F.; Haiao, Yiping; Li, Leping; Ratzlaff, Eugene H.; and Wong, Justin W., 5,500,073, Cl. 156-345.000.

Heinze, Roland, to Pacesetter AB. Arrangement, particularly a heart pacemarker, for acquiring a measurement parameter of the heart activity. 5,500,006, Cl. 607-24.000.
Heinzel, Eberhard, to Kusch & Co. Sitzmobelwerke KG. Stretcher or crossrib of wood for chairs and tables. 5,499,883, Cl. 403-219.000.
Heiser, Philip F.: *See*—
Brown, Gayle C.; Campo, Juan J.; Heiser, Philip F.; and McKnight, Steven M., 5,499,596, Cl. 114-375.000.
Heisman, Richard A.; Mosley, Keith; and Vos, Stephen J., to Murray, Inc. Lawn mower having adjustable air vents. 5,499,495, Cl. 56-320.100.
Heiti, Robert V.: *See*—
Holmes, Gary L.; Caller, Scott R.; Hardy, David H.; Hendrickson, William A.; Khan, Thomas P.; Harmon, Kimberly K.; Heiti, Robert V.; Spurgeon, Kathryn M.; and Studiner, Charles J., III, 5,500,273, Cl. 428-147.000.
Heitmann, John A.: *See*—
Chang, Hou-Min; Wu, Tien-Wang; and Heitmann, John A., 5,500,082, Cl. 162-5.000.
Heitz, Johannes: *See*—
Hagemeyer, Alfred; Hibst, Hartmut; Baeuerle, Dieter; and Heitz, Johannes, 5,500,459, Cl. 523-300.000.
Heller, Bernard F.; Schmidt, Craig L.; Nutzman, Thomas M.; and Lessar, Joseph F. Method of assembling electrochemical cells of novel construction. 5,500,026, Cl. 29-623.100.
Helliwell, John F., to Lever Brothers Company, Division of Conopco, Inc. Detergent composition. 5,500,152, Cl. 252-547.000.
Helton, Timothy W.: *See*—
Surjaatmadja, Jim B.; Helton, Timothy W.; and Abass, Hazim H., 5,499,678, Cl. 166-298.000.
Henderson, James K., to Mitre Corporation, The. System and method for determining volatile constituents, vapor pressure and vapor emissions of liquids. 5,499,531, Cl. 73-64.450.
Henderson, Louis E.: *See*—
Sayers, Thomas; Smyth, Mark J.; Wiltrout, Theresa A.; Powers, James C.; Sowder, Raymond; and Henderson, Louis E., 5,500,344, Cl. 435-6.000.
Henderson, Timothy M., to Innovation Associates, Inc. Thermal insulating material and method of manufacturing same. 5,500,287, Cl. 428-403.000.
Hendrickson, William A.: *See*—
Holmes, Gary L.; Caller, Scott R.; Hardy, David H.; Hendrickson, William A.; Khan, Thomas P.; Harmon, Kimberly K.; Heiti, Robert V.; Spurgeon, Kathryn M.; and Studiner, Charles J., III, 5,500,273, Cl. 428-147.000.
Henkel Corporation: *See*—
Ahmed, Bashir M.; Jayasuriya, Rohitha M.; and Hopkins, Thomas R., 5,500,460, Cl. 523-402.000.
Henkel Kommanditgesellschaft auf Aktien: *See*—
Eicken, Ulrich; Fischer, Herbert; Gress, Wolfgang; Hoefer, Rainer; Oberkobusch, Doris; and Schieferstein, Ludwig, 5,500,475, Cl. 524-591.000.
Weuthen, Manfred; Hill, Karlheinz; and Biermann, Manfred, 5,500,155, Cl. 252-557.000.
Henning: Rainer: *See*—
Becker, Reinhard; Henning: Rainer; Rüger, Wolfgang; Teetz, Volker; and Urbech, Hansjörg, 5,500,434, Cl. 514-356.000.
Henry, Charles H.: *See*—
Cirelli, Raymond A.; Henry, Charles H.; Laskowski, Edward J.; Milbrodt, Michele A.; and Yaffe, Henry H., 5,500,916, Cl. 385-37.000.
Henry, Jesse E. Identification bracelet. 5,499,468, Cl. 40-633.000.
Hensler, Klaus: *See*—
Bück, Rudolf; Egelhof, Dieter; Hensler, Klaus; Kade, Werner; Meinecke, Albrecht; Wanke, Wilhelm; and Wulz, Hans-Jürgen, 5,500,091, Cl. 162-301.000.
Her, Innchyn: Chao, Ping-Yi; and Huang, Ming-Jang, to National Science Council. Manually operated wheelchair. 5,499,833, Cl. 280-247.000.
Her, Jern-Shong, to Yu Chou Enterprise Corporation. Pump hidden in a seat tube of a bicycle. 5,499,858, Cl. 297-195.100.
Herndon, William H.: *See*—
Boyle, Steven R.; Proebsting, Robert J.; and Herndon, William H., 5,499,445, Cl. 29-830.000.
Herrin, Melvin B., to Klearfold, Inc. Display container. 5,499,484, Cl. 53-458.000.
Herrmann, Dale. Cigarette snuffer. 5,499,634, Cl. 131-256.000.
Herrmann, Hans-Dieter: *See*—
Röber, Stefan; Jadamus, Hans; Böer, Michael; Feinauer, Roland; Herrmann, Hans-Dieter; and Ries, Hans, 5,500,263, Cl. 428-36.600.
Herrmann, Thomas R., to Paragon Trade Brands, Inc. Leg elastic applicator which maintains the spacing between the elastics substantially constant. 5,500,075, Cl. 156-494.000.
Hershberger, Russell A., to Silicon Systems, Inc. Telephone line interface with AC and DC transconductance loops. 5,500,894, Cl. 379-399.000.
Hershey, Paul C.; and Waclawsky, John G., to International Business Machines Corporation. Realtime event classification for a data communications network. 5,500,855, Cl. 370-17.000.
Hess, Daniel P. Portable and reversible leg exercising apparatus. 5,499,958, Cl. 482-79.000.
Hess, Richard W.: *See*—
Lerner, Bernard; Hess, Richard W.; Cronauer, William M.; Wehrmann, Rick S.; and Kramer, James D., 5,499,485, Cl. 53-459.000.
Hetzler, Steven R.: *See*—
Best, John S.; and Hetzler, Steven R., 5,500,848, Cl. 369-275.300.
Heubl, Rainer H. Teetering or rocking device. 5,499,949, Cl. 472-105.000.
Hewlett-Packard Company: *See*—
Childers, Winthrop D.; and Gompertz, Ronald S., 5,500,660, Cl. 347-33.000.
Kaltenbach, Patrick; Mittelstadt, Laurie; and Swedberg, Sally, 5,500,071, Cl. 156-272.800.
Schwiebert, William H.; Hall, Corrina A. E.; Broder, Damon W.; and Moore, Shelley L., 5,500,667, Cl. 347-102.000.
Skeie, Tom A., 5,500,940, Cl. 395-183.010.
Hiatt, Andrew: *See*—
Nicolaou, K. C.; Hiatt, Andrew; and Wrasidlo, Wolfgang, 5,500,432, Cl. 514-281.000.
Hibbs, J. C., to Granite Rock Company. Mobile conveyor system. 5,499,899, Cl. 414-786.000.
Hibino, Hideo: *See*—
Kazami, Kazuyuki; Yokonuma, Norikazu; Yamazaki, Youichi; and Hibino, Hideo, 5,500,709, Cl. 354-416.000.
Hibst, Hartmut: *See*—
Hagemeyer, Alfred; Hibst, Hartmut; Baeuerle, Dieter; and Heitz, Johannes, 5,500,459, Cl. 523-300.000.
Hickman, Claude R. Wall mounted tool rack for the storage of hand tools. 5,499,724, Cl. 211-70.600.
Higashi, Akihiro: *See*—
Nagase, Taku; Go, Roland; Matsumoto, Tadashi; and Higashi, Akihiro, 5,500,856, Cl. 370-18.000.
Higginbotham, Sandra, to Motorola, Inc. Pager clip having aperture for fastening to an external article. 5,499,429, Cl. 24-3.110.
Higuchi, Shigemitsu: *See*—
Pujita, Kouji; Higuchi, Shigemitsu; Aizawa, Toshiro; Suga, Atsuo; and Kosuge, Minoru, 5,500,775, Cl. 360-70.000.
Higurashi, Seiji; Terauishi, Yasuhiko; Yamada, Yasuaki; and Ohishi, Takeo, to Victor Company of Japan, Ltd. Method and apparatus for deriving a video signal corresponding to a standard definition signal from a high definition signal. 5,500,679, Cl. 348-432.000.
Hiki, Susumu; Kondo, Mituo; and Abe, Kenji, to Kabushiki Kaisha Toshiba; and Fuji Photo Optical Co. Ltd. Catheter type ultrasound probe. 5,499,630, Cl. 128-662.050.
Hildebrandt, Keith R.: *See*—
Shapland, James E.; Hildebrandt, Keith R.; and Knudson, Mark B., 5,499,971, Cl. 604-53.000.
Hilite Lighting and Electronics Ltd.: *See*—
Schulz, Reinhard, 5,500,573, Cl. 315-247.000.
Hill, E. Richard, III; Davis, Glenn; and Farley, Brian, to Devices for Vascular Intervention. Guide wire migration controller. 5,499,632, Cl. 128-772.000.
Hill, John D. Blood vessel occlusion trocar. 5,499,996, Cl. 606-201.000.
Hill, Karlheinz: *See*—
Weuthen, Manfred; Hill, Karlheinz; and Biermann, Manfred, 5,500,155, Cl. 252-557.000.
Hilti Aktiengesellschaft: *See*—
Kortenkamp, Jürgen; Gantner, Gebhard; and Winkler, Walter, 5,499,435, Cl. 29-235.000.
Hinton, Glenn J.; and Riches, Robert M., Jr., to Intel Corporation. Translating instruction pointer virtual addresses to physical addresses for accessing an instruction cache. 5,500,948, Cl. 395-415.000.
Hirabayashi, Hiromitsu: *See*—
Matsubara, Miyuki; Hirabayashi, Hiromitsu; Nagoshi, Shigeyasu; Koitabashi, Noribumi; Sugimoto, Hitoshi; Gotoh, Fumihiro; and Uetuki, Masaya, 5,500,661, Cl. 347-41.000.
Hirakawa, Tetsuro; Kaneko, Masayoshi; and Yoshida, Katumi, to Topy Kogyo Kabushiki Kaisha. Method for producing a vehicular endless track link. 5,500,058, Cl. 148-649.000.
Hirano, Isuke: *See*—
Takahashi, Hironori; Aoshima, Shinichiro; and Hirano, Isuke, 5,500,587, Cl. 324-96.000.
Hirasawa, Hidekimi: *See*—
Nishimura, Satoshi; Hirasawa, Hidekimi; and Iimure, Tamio, 5,500,463, Cl. 523-408.000.
Hirasawa, Masanori: *See*—
Sawada, Ryozo; Hirasawa, Masanori; Yamaguchi, Yoshiharu; Funakawa, Shigeru; and Kanayama, Masaru, 5,500,276, Cl. 428-192.000.
Hirose, Shinichi: *See*—
Inoue, Youichi; Sato, Yoshihiro; Hirose, Shinichi; Tani, Hiroshi; Tanaka, Katsuyuki; Abe, Katsuo; Ohura, Masaki; and Mizumoto, Muneo, 5,500,296, Cl. 428-408.000.
Hitachi Denshi Kabushiki Kaisha: *See*—
Tanaka, Takayuki; Watanabe, Ryu; Oonami, Yuuichi; and Eto, Yoshizumi, 5,500,676, Cl. 348-387.000.
Hitachi, Ltd.: *See*—
Fujita, Kouji; Higuchi, Shigemitsu; Aizawa, Toshiro; Suga, Atsuo; and Kosuge, Minoru, 5,500,775, Cl. 360-70.000.
Inoue, Youichi; Sato, Yoshihiro; Hirose, Shinichi; Tani, Hiroshi; Tanaka, Katsuyuki; Abe, Katsuo; Ohura, Masaki; and Mizumoto, Muneo, 5,500,296, Cl. 428-408.000.
Katayama, Kaoru; Kazui, Shinichi; Iwata, Yasuhiro; Fukuda, Hiroshi; and Ohta, Toshihiko, 5,499,668, Cl. 134-1.000.
Kozaki, Takahiko; Horie, Nobuhiro; and Asano, Kenichi, 5,500,851, Cl. 370-13.000.
Muranaka, Yasushi; Imahashi, Jinichi; Horiba, Tatsuo; and Nishimura, Shigeoki, 5,500,292, Cl. 429-209.000.



Nogami, Taro; Matsuura, Shunichi; and Kuroda, Akira, 5,500,536, Cl. 250-458.100.
Takase, Satoshi; Imaide, Takuya; Kinugasa, Toshiro; and Nishimura, Ryuji, 5,500,674, Cl. 348-208.000.
Tanide, Hideo; Murasaka, Masayuki; Mori, Shigeru; Wada, Kiyoshi; Yoshizaki, Isao; and Ogura, Naoyuki, 5,500,747, Cl. 359-40.000.
Tsushima, Hideaki; Sasaki, Shinya; Nakano, Yukio; Nakano, Hiroyuki; Taeyasi, Ryoji; Matsuda, Hironari; Tomooka, Kenji; Sakakida, Naohiro; Nishimura, Shin; Yano, Yoshihiro; Igarashi, Youichi; Aoki, Satoshi; Takatori, Masahiro; Kazawa, Tohru; and Ashi, Yoshihiro, 5,500,756, Cl. 359-174.000.
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Hitachi Shimizu: *See*—
Yoshida, Satoru; Sato, Keiji; Mochizuki, Masamichi; Watanabe, Masashi; and Kato, Takashi, 5,499,510, Cl. 62-175.000.
Hitachi ULSI Engineering Corp.: *See*—
Kozaki, Takahiko; Horie, Nobuhiro; and Asano, Kenichi, 5,500,851, Cl. 370-13.000.
Hiura, Mitsuru: *See*—
Matsui, Hideaobu; and Hiura, Mitsuru, 5,500,528, Cl. 250-310.000.
Ho, Hai D.: *See*—
Chang, Shuen C.; Ho, Hai D.; and Sun, Szu C., 5,500,818, Cl. 365-189.050.
Ho, Robert K., to Whirlpool Corporation. Defrost water drain system for a refrigerator. 5,499,514, Cl. 62-291.000.
Ho, Ying-wai; and Burgess, Bradley G., to Motorola, Inc. Data processor with reasme buffer and FIFO buffer for in-order instruction completion. 5,500,943, Cl. 395-375.000.
Hoch, Peter: *See*—
Kiba, Hans-Robert; Storz, Dieter; Läufer, Engelbert; Hoch, Peter; and Füldner, Friedrich, 5,500,845, Cl. 369-112.000.
Hodgkinson, Ian. Manufacture of N-phosphonomethylglycine and its salts. 5,500,485, Cl. 562-18.000.
Hoe, David H. K.: *See*—
Ribner, David B.; and Hoe, David H. K., 5,500,645, Cl. 341-143.000.
Hoechst AG: *See*—
Baur, Rüdiger; Macholdt, Hans-Tobias; and Theiss, Wilfried, 5,500,323, Cl. 430-110.000.
Wallisch, Heinz; Dönges, Reinhard; and Meyer-Blumenroth, Ulrich, 5,500,124, Cl. 210-651.000.
Hoechst Aktiengesellschaft: *See*—
Becker, Reinhard; Henning: Rainer; Rüger, Wolfgang; Teetz, Volker; and Urbech, Hansjörg, 5,500,434, Cl. 514-356.000.
Reuschel, Gerhard; Fleischer, Dietrich; Yamamoto, Kaoru; and Chino, Shuichi, 5,500,477, Cl. 525-398.000.
Hoechst Celanese Corporation: *See*—
Borjas, Ricardo E.; Araullo-McAdams, Carina; Alexander, Steven R.; Blay, George A.; and Liu, Yaw-Hwa, 5,500,099, Cl. 205-449.000.
Hoechst Marion Roussel, Inc.: *See*—
Grisar, J. Martin; Petty, Margaret A.; and Bolkenius, Frank, 5,500,444, Cl. 514-456.000.
Hoechst-Roussel Pharmaceuticals Inc.: *See*—
Glamkowski, Edward J.; and Freed, Brian S., 5,500,423, Cl. 514-228.200.
Hoefer, Rainer: *See*—
Eicken, Ulrich; Fischer, Herbert; Gress, Wolfgang; Hoefer, Rainer; Oberkobusch, Doris; and Schieferstein, Ludwig, 5,500,475, Cl. 524-591.000.
Hoegnelid, Kurt: *See*—
Strandberg, Hans; and Hoegnelid, Kurt, 5,500,005, Cl. 607-17.000.
Hoff, James F.: *See*—
Gonia, Patrick S.; and Hoff, James F., 5,500,864, Cl. 371-53.000.
Hoffman, Charles. Portable coin holder and dispenser. 5,499,710, Cl. 206-0.810.
Hoffman Environmental Systems, Inc.: *See*—
Hoffman, Roger P., 5,500,084, Cl. 162-17.000.
Hoffman, Roger P., to Hoffman Environmental Systems, Inc. Method and apparatus for pulping cellulosic material using a vessel with an impregnation zone and an attrition zone. 5,500,084, Cl. 162-17.000.
Hoffmann, Eduard; Winterholler, Johann; and Prem, Wolfgang, to MAN Roland Druckmaschinen AG. Process for fabricating a sleeve shaped printing form. 5,499,580, Cl. 101-375.000.
Hoffmann-La Roche Inc.: *See*—
Bös, Michael; Wichmann, Jürgen; and Widmer, Ulrich, 5,500,440, Cl. 514-411.000.
Schadt, Martin; and Seiberle, Hubert, 5,500,752, Cl. 359-76.000.
Hoffmann, Mark: *See*—
Bellin, Michael A.; Laplace, Carl; Trainor, John J.; and Hoffmann, Mark, 5,500,806, Cl. 364-492.000.
Hofmann, Günter: *See*—
Lichtenberg, Frank; Kleinsorgen, Klaus; and Hofmann, Günter, 5,500,309, Cl. 429-223.000.
Hokao, Nobuhiro: *See*—
Mori, Yasushi; Matsuo, Tokuji; Hokao, Nobuhiro; Fujimoto, Akihiko; and Sato, Tsuyoshi, 5,500,039, Cl. 96-209.000.
Hokko Chemical Industry Co., Ltd.: *See*—
Seitoh, Yasuhiko; Iwata, Yasuo; Kuzuma, Seiichi; Nakajima, Yoshihide; and Yokomizo, Kanji, 5,500,437, Cl. 514-397.000.
Hokuriku Seiyaku Co. Ltd.: *See*—
Ito, Yasuo; Kato, Hideo; Yasuda, Shingo; Iwasaki, Nobuhiko; Nishino, Hiroyuki; and Takeshita, Makoto, 5,500,422, Cl. 514-212.000.
Hollenbaugh, William H., Jr.: *See*—
Mahabadi, Hadi K.; Agur, Enno E.; McAneney, T. Brian; Kao, Shenu V.; Allison, Gerald R.; Hawkins, Michael S.; Grushkin, Bernard; Kittelberger, J. Stephen; Chung, Joo T.; and Hollenbaugh, William H., Jr., 5,500,324, Cl. 430-137.000.
Hollis, Rebecca P.: *See*—
Utz, Christopher G.; Hollis, Rebecca P.; and Sekmistrz, Johnny M., 5,500,219, Cl. 424-409.000.
Holmes, Fred H.; Rawls, Robert L.; and Duncan, James A., to StairMaster Sports/Medical Products, Inc. Upper body exercise apparatus. 5,499,959, Cl. 482-95.000.
Holmes, Frederick J., to Compaq Computer Corporation. Completely wireless dual-access test fixture. 5,500,606, Cl. 324-761.000.
Holmes, Gary L.; Caller, Scott R.; Hardy, David H.; Hendrickson, William A.; Khan, Thomas P.; Harmon, Kimberly K.; Heiti, Robert V.; Spurgeon, Kathryn M.; and Studiner, Charles J., III, to Minnesota Mining and Manufacturing Company. Abrasive articles comprising precisely shaped particles. 5,500,273, Cl. 428-147.000.
Holt, L. Bayles: *See*—
deSilva, Mahinda K.; and Holt, L. Bayles, 5,500,924, Cl. 395-129.000.
Holt, Ronald B.; and Phillips, John C. M., to Royal Ordnance plc. Energetic plasticized propellant. 5,500,060, Cl. 149-19.100.
Holzmann, Michael: *See*—
Jagiella, Manfred; Wieczorrek, Wolf; Schubert, Peter; Holzmann, Michael; and Spörl, Georg, 5,500,504, Cl. 219-121.670.
Homma, Michitoshi; Yoshihara, Atsuko; Wakabayashi, Hiroshi; and Isoyama, Katsuhiko, to Kanegafuchi Chemical Industry Co., Ltd. Two pack type curable composition comprising epoxy resin and silicon-containing elastomeric polymer. 5,500,464, Cl. 523-435.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Iwamoto, Fumiya; Nakayama, Masahito; and Matsumoto, Yoshiyuki, 5,499,832, Cl. 280-96.100.
Kato, Hiroaki; Shimasaki, Yuichi; Saito, Akihisa; Komatsuda, Takashi; Oketani, Toshikazu; Haccho, Seiji; Matsumoto, Seiji; Aoki, Takuya; and Miyashita, Yukio, 5,499,501, Cl. 60-286.000.
Kitajima, Shinichi; Muranatsu, Hiroaki; and Kobayashi, Yoshihiko, 5,499,617, Cl. 123-698.000.
Nakazawa, Yasushi; Tozuka, Kiyotaka; and Enomoto, Masatoshi, 5,499,801, Cl. 269-48.100.
Uemichi, Sachio; and Takahashi, Shuji, 5,500,177, Cl. 264-277.000.
Honda Motor Co., Ltd.: *See*—
Kawaguchi, Kenji; and Miyaki, Yoshiyuki, 5,500,563, Cl. 310-71.000.
Honeywell Inc.: *See*—
Gonia, Patrick S.; and Hoff, James F., 5,500,864, Cl. 371-53.000.
Olson, Robert J., 5,500,833, Cl. 342-182.000.
Pant, Bharat B., 5,500,590, Cl. 324-252.000.
Samcad, Gustavo L., 5,500,589, Cl. 324-202.000.
Honsinger, Philip S.; Lim, Lacy; and Narayanan, Vinod, to International Business Machines Corporation. Method to optimize the wiring of multiple wiring media packages. 5,500,804, Cl. 364-488.000.
Hood, Teresa L.: *See*—
Venzke, Donald R.; Hood, Teresa L.; and Emerick, W. Russell, 5,500,496, Cl. 200-339.000.
Hopf, Gerald; Ziegenbein, Botho; and Maihoefer, Bernd, to Robert Bosch GmbH. Piezoelectric force sensor. 5,499,541, Cl. 73-763.000.
Hopkins, Thomas R.: *See*—
Ahmed, Bashir M.; Jayasuriya, Rohitha M.; and Hopkins, Thomas R., 5,500,460, Cl. 523-402.000.
Hori, Satoru: *See*—
Sasakura, Miyoshi; Ohkura, Osamu; Mizoguchi, Takehiko; Hori, Satoru; and Yoshida, Satoshi, 5,500,932, Cl. 395-149.000.
Horiba, Tatsuo: *See*—
Muranaka, Yasushi; Imahashi, Jinichi; Horiba, Tatsuo; and Nishimura, Shigeoki, 5,500,292, Cl. 429-209.000.
Horie, Nobuhiro: *See*—
Kozaki, Takahiko; Horie, Nobuhiro; and Asano, Kenichi, 5,500,851, Cl. 370-13.000.
Horiguchi, Akihiro: *See*—
Ueno, Fumio; Kasori, Mitsuo; Horiguchi, Akihiro; and Oh-Ishi, Katsuyoshi, 5,500,395, Cl. 501-98.000.
Horiguchi, Itaru: *See*—
Hayashi, Toshihiro; Kohno, Hiroshige; Watanabe, Akinori; and Horiguchi, Itaru, 5,500,178, Cl. 264-297.800.
Horiguchi, Tsuneo: *See*—
Uchiyama, Haruyoshi; Lee, Tekkan; Takeuchi, Nobunari; Shimizu, Kaoru; Horiguchi, Tsuneo; and Koyamada, Yahei, 5,500,762, Cl. 359-326.000.
Horita, Manabu; Yoshida, Masaharu; and Takehara, Masataka, to Mitsubishi Denki Kabushiki Kaisha. Bonding method and apparatus. 5,500,502, Cl. 219-121.630.
Horita, Yoshiyuki: *See*—
Terada, Yasuharu; Suzuki, Tsuneo; Matsushima, Hideyuki; and Horita, Yoshiyuki, 5,499,432, Cl. 24-599.200.
Horiuchi, Kenji: *See*—
Nagamine, Masashi; Yamamoto, Kenji; Horiuchi, Kenji; Matsui, Yoshimitsu; and Yoshida, Masanori, 5,500,424, Cl. 514-235.500.
Horiuchi, Yasuo; and Kuninaka, Hitoshi, to NEC Corporation. Solar photovoltaic power generation device capable of adjusting voltage and electric power. 5,500,052, Cl. 136-244.000.

Horn, Richard R.; Gaskell, Christine K.; Krauss, Susan R.; and Purol, Michael D., to Eastman Kodak Company. Process for recycling photographic wash water. 5,500,125, Cl. 210-668.000.
Horowitz, Carl: *See*—
Sandaja, Mohan L.; Berlina, Irene; Horowitz, Carl; and Thottathil, Paul, 5,500,253, Cl. 427-385.500.
Hoshino, Futoshi: *See*—
Someya, Kousuke; Yamazaki, Akihiro; Hoshino, Futoshi; and Yanagihara, Takashi, 5,500,286, Cl. 428-402.240.
Hosogai, Takeo: *See*—
Iwasaki, Hidehara; Yoneda, Koichi; Kido, Yoichi; Hosogai, Takeo; Itoi, Kazuo; and Kitayama, Masahiro, 5,500,484, Cl. 568-660.000.
Hosokawa, Yoshiaki; Kanoh, Masaki; Maekawa, Takashi; and Nakayasu, Hirofumi, to Fujitsu Limited. Printing apparatus having head gap adjusting device. 5,499,876, Cl. 400-56.000.
Hosokowa, Yasunori: *See*—
Takei, Shinobu; Ohtani, Shoji; Iwasaki, Hiroaki; Ohsawa, Tetsuhiro; and Hosokowa, Yasunori, 5,500,261, Cl. 428-35.700.
Houben, Marie-Christine: *See*—
Cao, Hoai-Chau; and Houben, Marie-Christine, 5,500,151, Cl. 252-546.000.
House, Thomas A. Method and apparatus for monitoring garment usage. 5,499,466, Cl. 40-322.000.
Howard, James: *See*—
Espiner, Henry J.; and Howard, James, 5,499,988, Cl. 606-114.000.
Howe, Michael G.: *See*—
Lucich, Todd C.; Krouse, Edward F., Jr.; Howe, Michael G.; Fields, Larry D.; and Mihelick, Joseph R., 5,499,437, Cl. 29-402.030.
Hox, Ketil: *See*—
Lynum, Steinar; Haugsten, Kjell; Hox, Ketil; Hugdahl, Jan; and Myklebust, Nils, 5,500,501, Cl. 219-121.480.
HR Textron Inc.: *See*—
Trasovich, Stephen J., 5,500,580, Cl. 318-568.160.
Hsiao, Meng-Ling; Tam, Kwok C.; and Hudacko, Edward A., to General Electric Company. Method and system for efficiently generating radon derivative data in a cone beam computerized tomography implementation. 5,500,883, Cl. 378-4.000.
Hsiao, Yiping: *See*—
Barbee, Steven G.; Heinz, Tony F.; Hsiao, Yiping; Li, Leping; Ratzlaff, Eugene H.; and Wong, Justin W., 5,500,073, Cl. 156-345.000.
Hsieh, Dick M. Retractable handle device for a wheeled suitcase. 5,499,426, Cl. 16-115.000.
Hsu, Juei-Chi; Jeng, Ching S.; and Wang, Ping, to Silicon Storage Technology, Inc. Solid state peripheral storage device. 5,500,826, Cl. 365-230.010.
Hsu, Michael S.; and Wei, Irvine W., to Zink Corporation. High efficiency energy conversion and treatment of organic waste. 5,500,306, Cl. 429-17.000.
Huang, Frank; and Wu, Chyi-Ying. Method for making disposable bowls and trays. 5,500,089, Cl. 162-226.000.
Huang, Ming-Jang: *See*—
Her, Imchyn; Chao, Ping-Yi; and Huang, Ming-Jang, 5,499,833, Cl. 280-247.000.
Huber, Mark E.: *See*—
Huber, Terrence D.; and Huber, Mark E., 5,500,652, Cl. 345-84.000.
Huber, Terrence D.; and Huber, Mark E., to American Electronic Sign Company. Display element with reflective lens. 5,500,652, Cl. 345-84.000.
Huber, Werner; and Streib, Martin, to Robert Bosch GmbH. Method and arrangement for controlling the power of a drive unit of a motor vehicle. 5,499,952, Cl. 477-115.000.
Hubert, Helmut: *See*—
Coenen, Hubert; Hubert, Helmut; and Zumbragel, Michael, 5,500,118, Cl. 210-603.000.
Huck, Mark M.; and Barbieri, Irene E. Container and method for dispensing sealed articles. 5,499,740, Cl. 221-70.000.
Hudacko, Edward A.: *See*—
Hsiao, Meng-Ling; Tam, Kwok C.; and Hudacko, Edward A., 5,500,883, Cl. 378-4.000.
Huels Aktiengesellschaft: *See*—
Röber, Stefan; Jadamus, Hans; Böer, Michael; Feinauer, Roland; Herrmann, Hans-Dieter; and Ries, Hans, 5,500,263, Cl. 428-36.600.
Huffer, Richard L. Transparent remote control flexible envelope. 5,499,713, Cl. 206-305.000.
Hugdahl, Jan: *See*—
Lynum, Steinar; Haugsten, Kjell; Hox, Ketil; Hugdahl, Jan; and Myklebust, Nils, 5,500,501, Cl. 219-121.480.
Hughes Aircraft Company: *See*—
Stoelmyer, L. Scott; and Fulkerson, Don K., 5,499,656, Cl. 137-583.000.
Swarbrick, David B.; and Pike, Jack H., 5,500,604, Cl. 324-754.000.
Hughes, Dean, to Smith & Nephew Richards, Inc. Variable angle spinal screw. 5,499,983, Cl. 606-61.000.
Hughes, Joe; Hartley, Rolfe J.; and Balasubramaniam, Vasudevan, to Ethyl Corporation. Oil-soluble phosphorus- and nitrogen-containing additives. 5,500,140, Cl. 252-46.700.
Hughes, Paul D.; and Johnson, Montfort A., to Saap Products, Inc. Tire sealer and inflator. 5,500,456, Cl. 523-166.000.
Hulsing, Rand H., II, to AlliedSignal Inc. Precision duty cycle phase lock loop. 5,500,627, Cl. 331-1.00A.
Humphreys, Robert W. R.: *See*—
Rahman, Mohammad A.; Humphreys, Robert W. R.; and Wu, Shang-Ren, 5,500,139, Cl. 252-8.800.
Hundt, Gerd; Arbogast, Franz; and Peiz, Peter, to J. M. Voith GmbH. Internal gear pump having a stop for a sickle-shaped filler part. 5,499,910, Cl. 418-126.000.
Hung, Michael. One-way valve structure for a hydraulic jack. 5,499,655, Cl. 137-512.300.
Hung, William M.; and Su, Kai C., to Ciba-Geigy Corporation. Ultraviolet absorbing leases and methods of manufacture thereof. 5,500,024, Cl. 8-509.000.
Hur, Jung H.: *See*—
Baik, Bok H.; Hur, Jung H.; and Shim, Dae S., 5,500,741, Cl. 358-335.000.
Hurlot, Donald, to Cancarb Limited. Carbon black refractory system. 5,499,477, Cl. 52-604.000.
Husky Injection Molding Systems Ltd.: *See*—
Schad, Robert D.; and Jenko, Edward J., 5,499,916, Cl. 425-564.000.
Huynh, Vien-An T.: *See*—
Miller, Harry E.; Pak, Paul; Schechter, Steven M.; and Huynh, Vien-An T., 5,500,236, Cl. 426-451.000.
Hwang, Seong M.: *See*—
Park, Chan K.; Koh, Yo H.; Hwang, Seong M.; and Roh, Kwang M., 5,500,544, Cl. 257-296.000.
Hydrabatha, Inc.: *See*—
Chalberg, Phillip E.; and Kenchel, Paul N., 5,499,406, Cl. 4-541.200.
Hynecek, Jaroslav, to Texas Instruments Incorporated. Method for fabricating a CCD image sensor with active transistor pixel. 5,500,383, Cl. 437-53.000.
Hyperion Catalysis International, Inc.: *See*—
Mandeville, W. Harry; Truesdale, Larry K.; and Tennent, Howard, 5,500,200, Cl. 423-447.300.
Hyundai Electronics Industries Co., Ltd.: *See*—
Cho, Byung J., 5,499,602, Cl. 118-712.000.
Choi, Yang K., 5,500,080, Cl. 156-644.100.
Kim, Beom S.; Lee, Jin H.; and Koo, Kyoung B., 5,500,577, Cl. 315-364.000.
Park, Chan K.; Koh, Yo H.; Hwang, Seong M.; and Roh, Kwang M., 5,500,544, Cl. 257-296.000.
Iacovangelo, Charles D.; and Jerabek, Elihu C., to General Electric Company. Fabrication of air brazable diamond tool. 5,500,248, Cl. 427-250.000.
Iaia, Mark; Dzierzak, Mark; and Verdura, Javier, Jr., to Chesebrough-Pond's USA Co., Division of Conopco, Inc. Cleaning product and related packaging. 5,499,748, Cl. 222-180.000.
Iatron Laboratories, Inc.: *See*—
Soe, Gilbu; Kohno, Isao; and Tanaka, Michiyo, 5,500,345, Cl. 435-7.100.
Ichikawa, Hideo; Saito, Takeshi; Ikeda, Sunao; Makita, Nobuhiro; Ozawa, Seiji; Yoshiki, Shigeru; and Yanagisawa, Takaaki, to Ricoh Company, Ltd. Developer replenishing device and developer container for use therewith. 5,500,719, Cl. 355-260.000.
Ichikawa, Takeshi; Shindo, Hitoshi; and Ohmi, Kazuaki, to Canon Kabushiki Kaisha. Method of forming deposited semiconductor film. 5,500,102, Cl. 204-192.250.
Ichikoh Industries, Ltd.: *See*—
Chikada, Akira; Obgiri, Shigeteru; and Ito, Hiroe, 5,500,790, Cl. 362-66.000.
ICI Canada Inc.: *See*—
Chattopadhyay, Arun K., 5,500,062, Cl. 149-46.000.
Ida, Masahiro: *See*—
Kawamura, Chuichi; Kasugai, Ichiro; Hashimoto, Mitsuru; and Ida, Masahiro, 5,499,515, Cl. 62-470.000.
Ide, Russell D. Beam mounted friction pads for use in friction brakes and clutches. 5,499,705, Cl. 192-107.00T.
Idemitsu Kosan Co., Ltd.: *See*—
Nakamura, Hiroaki; and Kusumoto, Tadashi, 5,500,568, Cl. 313-503.000.
Ido, Toshikazu: *See*—
Martin, Jeffrey A.; and Ido, Toshikazu, 5,500,691, Cl. 348-734.000.
Ievolella, James: *See*—
Addesso, Kevin; Dzurcako, Theresa E.; Moisey, Mark J.; Levine, Harry; Slade, Louise; Manna, James M.; Pazzolare, Richard D.; Ievolella, James; and Wang, Martha Y., 5,500,240, Cl. 426-560.000.
Igarashi, Youichi: *See*—
Tsushima, Hideaki; Sasaki, Shinya; Nakano, Yukio; Nakano, Hiroyuki; Tateyari, Ryoji; Matsuda, Hironari; Tomooka, Kenji; Sakakida, Naohiro; Nishimura, Shin; Yano, Yoshihiro; Igarashi, Youichi; Aoki, Satoshi; Takatori, Masahiro; Kazawa, Tohru; and Ashi, Yoshihiro, 5,500,756, Cl. 359-174.000.
Iida, Takashi; Sasai, Satoru; Shimizu, Hiroshi; Tahara, Akinori; Amano, Isao; and Nakajima, Tetsuya, to Fujitsu Limited. Semiconductor integrated circuit with protection circuit against electrostatic breakdown and layout design method therefor. 5,500,542, Cl. 257-210.000.
Iimure, Tamio: *See*—
Nishimura, Satoshi; Hirasawa, Hidekimi; and Iimure, Tamio, 5,500,463, Cl. 523-408.000.
Iishiba, Fumio; Ishida, Shinji; Ikeda, Masatoshi; and Takahashi, Kunihiro, to Fuji Xerox Co., Ltd. Image reading device capable of performing shading correction. 5,500,745, Cl. 358-461.000.
Iizuka, Tomoaki: *See*—
Arakawa, Kenichi; Sasano, Nobusuke; Iizuka, Tomoaki; Kobayashi, Mibo; Yamada, Tetsuo; and Motoyama, Hideki, 5,500,675, Cl. 348-319.000.



Iizuka, Yukio, to Daifuku Co., Ltd. Removable filter device for article storing arrangement. 5,500,028, Cl. 55-385.100.
Ikeda Bussan Co., Ltd.: *See*—
Nakano, Nobuyuki, 5,499,840, Cl. 280-730.100.
Ikeda, Masami: *See*—
Hattori, Yoshifumi; Karita, Seiichiro; Saikawa, Hideo; Kashino, Toshio; Saito, Akio; Nakagomi, Hiroshi; Arashima, Teruo; Kimura, Makiko; Sugitani, Hiroshi; Ikeda, Masami; Saito, Asao; Masuda, Kazuaki; and Orikasa, Tsuyoshi, 5,500,666, Cl. 347-87.000.
Ikeda, Masatoshi: *See*—
Iishiba, Fumio; Ishida, Shinji; Ikeda, Masatoshi; and Takahashi, Kunihiro, 5,500,745, Cl. 358-461.000.
Ikeda, Mitsusuke: *See*—
Wada, Takahiro; Ikeda, Mitsusuke; Nishitani, Mikihiko; Terauchi, Masaharu; Negami, Takayuki; and Kohara, Naoki, 5,500,056, Cl. 136-259.000.
Ikeda, Sunao: *See*—
Ichikawa, Hideo; Saito, Takeshi; Ikeda, Sunao; Makita, Nobuhiro; Ozawa, Seiji; Yoshiki, Shigeru; and Yanagisawa, Takaaki, 5,500,719, Cl. 355-260.000.
Ikeda, Takanobu: *See*—
Yamamoto, Tadashi; Sakakida, Katsumi; Ikeda, Takanobu; and Masuya, Chisao, 5,499,842, Cl. 280-728.300.
Ikeda, Takeshi; Nakanishi, Tsutomu; and Okamoto, Akira, to T.I.F. Co., Ltd. LC element, semiconductor device and LC element manufacturing method. 5,500,552, Cl. 257-531.000.
Ikeda, Yukio: *See*—
Miyata, Masahiro; Ezawa, Hirokazu; Ogure, Naoaki; Tsujimura, Manabu; Ohdaira, Takeyuki; Inoue, Hiroaki; and Ikeda, Yukio, 5,500,559, Cl. 257-762.000.
Ikegami, Masaaki, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device having polysilicon resistors with a specific resistance ratio resistant to manufacturing processes. 5,500,553, Cl. 257-538.000.
Ikegami, Shinji: *See*—
Kigawa, Kazuya; Furukawa, Kenji; Deguchi, Tetsu; Inoue, Sachiharu; Endo, Norikatsu; Yanagisawa, Tatsuo; Ikegami, Shinji; Omagari, Yasuyuki; Kihara, Koji; Sugawara, Tachiki; and Shimizu, Kenzo, 5,499,796, Cl. 254-133.00R.
Ikegawa, Hiroaki: *See*—
Niino, Reiji; Obbu, Tomoyuki; Ikegawa, Hiroaki; Nakao, Ken; Fujita, Yoshiyuki; Haraoka, Tsutomu; Kobayashi, Makoto; Kaneda, Naoya; and Kumada, Hiroshi, 5,500,388, Cl. 437-89.000.
Ikemoto, Isao: *See*—
Yashiro, Masahiko; Sasaki, Shinichi; Ikemoto, Isao; Miura, Koji; Karakama, Toshiyuki; and Numagami, Atsushi, 5,500,714, Cl. 355-200.000.
Illinois Tool Works Inc.: *See*—
Figiel, Janusz; and Drabarek, Peter, 5,499,664, Cl. 140-152.000.
Thurston, Raymond L.; and Schuleuburg, Steven H., 5,499,893, Cl. 411-282.000.
Ilyes, Ivan. Nut wrench device, especially for loosening or tightening wheel nuts or similar. 5,499,554, Cl. 81-55.000.
Imahashi, Jinichi: *See*—
Murasaka, Yasushi; Imahashi, Jinichi; Horiba, Tatsuo; and Nishimura, Shigeoki, 5,500,292, Cl. 429-209.000.
Imai, Takahiro; Tsuno, Takashi; Yamamoto, Yoshiyuki; and Fujimori, Naoji, to Sumitomo Electric Industries, Ltd. Method for vapor phase synthesis of diamond. 5,499,601, Cl. 117-84.000.
Imaide, Takuya: *See*—
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Block, Michael H.; Harrison, Alison; and Hargreaves, Rodney B., 5,500,428, Cl. 514-266.000.
Gillis, Herbert R., 5,500,466, Cl. 524-92.000.
In-Line Diagnostics Corporation: *See*—
Steuer, Robert R.; and Harris, David H., 5,499,627, Cl. 128-633.000.
Inaba, Yutaka; Okada, Shinjiro; Taniguchi, Osamu; and Mizuno, Hironobu, to Canon Kabushiki Kaisha. Ferroelectric liquid crystal element with an AC holding voltage below the level at which the molecules migrate. 5,500,749, Cl. 359-56.000.
Inada, Genji: *See*—
Hattori, Yoshifumi; Inada, Genji; and Watanabe, Kenjiro, 5,500,658, Cl. 347-22.000.
Inada, Yoshiyuki: *See*—
Kubo, Keiji; Inada, Yoshiyuki; and Naka, Takehiko, 5,500,427, Cl. 514-256.000.
Inagaki, Syouji, to Toyota Jidosha Kabushiki Kaisha. Hydraulic active suspension controlled with side force compensation at respective vehicle wheels. 5,500,798, Cl. 364-424.050.
Industrial Filter & Pump Mfg. Co.: *See*—
Zievers, James F.; Zievers, Elizabeth C.; Aguilar, Peter; and Eggerstedt, Paul, 5,500,029, Cl. 55-485.000.
Industrie Borla, S.p.A.: *See*—
Guala, Ernesto; and Guala, Gianni, 5,500,003, Cl. 604-252.000.
Innovation Associates, Inc.: *See*—
Henderson, Timothy M., 5,500,287, Cl. 428-403.000.
Inomata, Koichiro: *See*—
Saito, Yoshiaki; Inomata, Koichiro; Okuno, Shibo; and Takahashi, Yoshinori, 5,500,633, Cl. 338-32.00R.
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Inoue, Sachiharu: *See*—
Kigawa, Kazuya; Furukawa, Kenji; Deguchi, Tetsu; Inoue, Sachiharu; Endo, Norikatsu; Yanagisawa, Tatsuo; Ikegami, Shinji; Omagari, Yasuyuki; Kihara, Koji; Sugawara, Tachiki; and Shimizu, Kenzo, 5,499,796, Cl. 254-133.00R.
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Wenzhi, Hu, 5,500,374, Cl. 436-161.000.
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Kimura, Akira; Watanabe, Tadashi; Inoue, Tsuyoshi; and Nakanishi, Keiichi, 5,499,545, Cl. 73-864.180.
Inoue, Yoichi; Sato, Yoshihiro; Hirose, Shinichi; Tani, Hiroshi; Tanaka, Katsuyuki; Abe, Katsuo; Ohara, Masaki; and Mizumoto, Mamoo, to Hitachi, Ltd. Magnetic recording medium, process for producing magnetic recording medium, apparatus for producing magnetic recording medium, and magnetic recording apparatus. 5,500,296, Cl. 428-408.000.
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Odru, Pierre; Sparfel, Charles; Auberon, Marcel; and Behar, Jacques, 5,499,661, Cl. 138-124.000.
Institut National des Science Appliquees de Rennes: *See*—
Debuigne, Jean; and Prigent, Serge, 5,500,041, Cl. 106-38.220.
Institute of Gas Technology: *See*—
Srivastava, Vipul J., 5,500,123, Cl. 210-603.000.
Instrumentarium Corporation: *See*—
Uotila, Pekka A., 5,500,854, Cl. 370-17.000.
Instrumentarium Oy: *See*—
Blomberg, Martti; Orpana, Markku; Lehto, Ari; and Korhonen, Anssi, 5,500,569, Cl. 313-578.000.
Intel Corporation: *See*—
Hinton, Glenn J.; and Riches, Robert M., Jr., 5,500,948, Cl. 395-415.000.
Interface, Inc.: *See*—
Adams, Harold F.; Suarez, Roderick A.; and Eagle, Lewis H., 5,499,476, Cl. 52-220.100.
Intergraph Corporation: *See*—
Boyle, Steven R.; Procebting, Robert J.; and Herndon, William H., 5,499,445, Cl. 29-830.000.
International Business Machines Corporation: *See*—
Austin, Jon O.; Byrne, Jani G.; Boha, Carole A.; Chiavegatto, Arlindo, Jr.; Smith, Jeffrey L.; and Zeisz, Raymond L., Jr., 5,500,934, Cl. 395-755.000.
Barbee, Steven G.; Heinz, Tony F.; Hsiao, Yiping; Li, Leping; Ratzlaff, Eugene H.; and Wong, Justin W., 5,500,073, Cl. 156-345.000.
Best, John S.; and Hetzler, Steven R., 5,500,848, Cl. 369-275.300.
Boutaghou, Zine-Eddine; and Erickson, Kevin J., 5,500,780, Cl. 360-99.080.
Cahill, Leslie M.; Miller, David R.; and Schell, David J., 5,500,938, Cl. 395-161.000.
Eickemeyer, Richard J.; and Vassiliadis, Stamatis, 5,500,942, Cl. 395-375.000.
Hartman, Robert C., Jr., 5,500,897, Cl. 380-25.000.
Hershey, Paul C.; and Waclawsky, John G., 5,500,855, Cl. 370-17.000.
Hossinger, Phillip S.; Lim, Lucy; and Narayanan, Vinod, 5,500,804, Cl. 364-488.000.
Verkuil, Roger L., 5,500,607, Cl. 324-761.000.
International Envelope Company: *See*—
Back, Gordon E., 5,499,757, Cl. 229-81.000.
International Paper Company: *See*—
Srinivasan, Ramesh; Bottomley, James; and Coslett, W. Andrew, 5,500,068, Cl. 156-148.000.
Srinivasan, Ramesh; Bottomley, James; and Coslett, W. Andrew, 5,500,281, Cl. 428-288.000.
International Rolling Mill Consultants, Inc.: *See*—
Ginzburg, Vladimir B., 5,499,523, Cl. 72-203.000.
Intevep, S.A.: *See*—
Rodriquez, Domingo; Payne, Roy; Gomez, Cebers; Carrazza, Jose; and Kramlich, John, 5,499,587, Cl. 110-342.000.
Inui, Tetsuya: *See*—
Vau, Kazuo; Ohta, Kenji; Inui, Tetsuya; Nagaura, Toshikazu; Takemori, Hirotoshi; and Toki, Hirotaka, 5,500,850, Cl. 369-275.400.
Inui, Toshiharu: *See*—
Miyake, Tomoyuki; Inui, Toshiharu; Akiyama, Jun; and Kojima, Kunio, 5,500,839, Cl. 369-13.000.
Ionescu, Adrian, to Lighting Control, Inc. Switchmode AC power controller. 5,500,575, Cl. 315-307.000.
Iowa Mold Tooling Company, Inc.: *See*—
Stoychoff, Terry A., 5,499,503, Cl. 60-469.000.
Iowa State University Research Foundation: *See*—
Robinson, Douglas S.; Jensen, Terrence C.; and Gray, Joseph N., 5,500,534, Cl. 250-385.100.
Ip, William: *See*—
Popat, Kaushik; Ip, William; and Sherman, David, 5,500,611, Cl. 326-87.000.
Irace, Joseph F.: *See*—
Mendenhall, Abraham H.; and Irace, Joseph F., 5,500,235, Cl. 426-394.000.

Irvine, Mark W. Bicycle brake pad toe-out adjusting tool. 5,499,698, Cl. 188-24.190.
Isaksson, Johnni, to Foster Wheeler Energia Oy. Pressurized fluidized bed reactor. 5,499,498, Cl. 60-39.120.
Isawa, Misao; and Nakazawa, Yasuko, to Fujitsu Limited. Terminal key locking system. 5,500,655, Cl. 345-168.000.
Isayama, Katsuhiko: *See*—
Hosoma, Michihide; Yoshihara, Atsuko; Wakabayashi, Hiroshi; and Isayama, Katsuhiko, 5,500,464, Cl. 523-435.000.
ISCAR Ltd.: *See*—
Gavish, Ilan, 5,500,289, Cl. 428-551.000.
Ishaque, Ahmad N.; and Castleberry, Donald E., to General Electric Company. Method for fabricating planar avalanche photodiode array. 5,500,376, Cl. 437-3.000.
Ishida, Shinji: *See*—
Hasita, Yukio; Ishida, Shinji; and Koshimizu, Michio, 5,499,502, Cl. 60-290.000.
Ishiba, Fumio; Ishida, Shinji; Ikeda, Masatoshi; and Takahashi, Kunihiro, 5,500,745, Cl. 358-461.000.
Ishida, Yukio; and Fukuba, Hiroyasu, to Ishida, Yukio; and Japan Energy Corporation. Highly water absorbed rice and method of producing the same, ultra-highly water absorbed rice and a variety of rice products utilizing the same. 5,500,242, Cl. 426-618.000.
Ishigane, Ryoichi: *See*—
Nakashima, Kunio; Ishigane, Ryoichi; Tanaka, Takayuki; and Yamamoto, Kozo, 5,499,672, Cl. 164-418.000.
Ishii, Hisao: *See*—
Fujimoto, Akihiko; Ishii, Hisao; Okamoto, Shinya; and Sato, Naoki, 5,499,963, Cl. 483-56.000.
Ishii, Masaru; and Nagai, Koichi, to Kabushiki Kaisha Toshiba. Information processing apparatus with movable spindle shafts. 5,500,843, Cl. 369-77.200.
Ishii, Tadayoshi, to Asahi Seimitsu Kabushiki Kaisha. Lens barrel for different kinds of TV cameras. 5,500,772, Cl. 359-822.000.
Ishii, Takayuki: *See*—
Yamazaki, Shigeki; Kato, Kazuhiro; Ishii, Takayuki; and Sakai, Hisao, 5,499,753, Cl. 226-194.000.
Ishii, Takehisa: *See*—
Kitamura, Naomi; Miyazawa, Keiji; Daikuhara, Yasushi; Tsubouchi, Hirohito; Naka, Daiji; Takahashi, Kazuhiro; Matsui, Rie; Yoshiyama, Yoshiko; and Ishii, Takehisa, 5,500,354, Cl. 435-69.400.
Ishikawa, Kimihiro: *See*—
Makino, Kenzi; Akiyama, Shigeaki; Suzuki, Hideaki; Nagaoka, Takeshi; Niki, Toshio; Suzuki, Koichi; Nawanaki, Tsutomu; Watanabe, Shigeomi; and Ishikawa, Kimihiro, 5,500,406, Cl. 504-215.000.
Ishikawa, Yasuhiro: *See*—
Muraki, Takao; and Ishikawa, Yasuhiro, 5,500,482, Cl. 525-98.000.
Ishimaru, Seijiro: *See*—
Funato, Masatomi; Shimizu, Yoshitake; Ishimaru, Seijiro; and Nagao, Kazuya, 5,500,319, Cl. 430-106.600.
Ishizuka, Mitsuru: *See*—
Yamaguchi, Noriyuki; Kurashita, Takuji; Ishizuka, Mitsuru; Kijima, Junko; and Yao, Masahara, 5,500,686, Cl. 348-663.000.
Isobe, Yasuaki; and Mizuno, Hiroyoshi, to Nippondenso Co., Ltd. Aluminum surface having chemical conversion coating and method of forming the coating. 5,500,288, Cl. 428-469.000.
Itagaki, Takashi: *See*—
Takemoto, Takatoshi; Chida, Toshikazu; Kano, Noriaki; Ito, Eiji; Murakami, Koji; Itagaki, Takashi; Sekimoto, Koji; and Suzuki, Masanori, 5,499,809, Cl. 271-274.000.
Ito, Eiji; Suzuki, Tetsushi; Ito, Kaoru; and Kawakubo, Hiroyuki, to Toyota Jidosha Kabushiki Kaisha. Positive crank ventilation apparatus for an engine system. 5,499,604, Cl. 123-41.860.
Ito, Eiji: *See*—
Takemoto, Takatoshi; Chida, Toshikazu; Kano, Noriaki; Ito, Eiji; Murakami, Koji; Itagaki, Takashi; Sekimoto, Koji; and Suzuki, Masanori, 5,499,809, Cl. 271-274.000.
Ito, Hiroe: *See*—
Chikada, Akira; Ohgiri, Shigeteru; and Ito, Hiroe, 5,500,790, Cl. 362-66.000.
Ito, Kaoru: *See*—
Ito, Eiji; Suzuki, Tetsushi; Ito, Kaoru; and Kawakubo, Hiroyuki, 5,499,604, Cl. 123-41.860.
Ito, Tosikazu: *See*—
Yada, Yukihiko; Ito, Tosikazu; and Amano, Katuyuki, 5,500,264, Cl. 428-36.900.
Ito, Yasuo; Kato, Hideo; Yasuda, Shingo; Iwasaki, Nobuhiko; Nishino, Hiroyuki; and Takeshita, Makoto, to Hokuriku Seiyaku Co. Ltd. Benzamide derivative. 5,500,422, Cl. 514-212.000.
Itoh, Junichi, to Olympus Optical Co., Ltd. Data recording module device for camera and camera system using the same. 5,500,701, Cl. 354-106.000.
Itoh, Shigeo; Yokoyama, Mikio; Tonegawa, Takeshi; and Kadowaki, Akira, to Futaba Denshi Kogyo K.K. Evacuation apparatus. 5,499,939, Cl. 445-73.000.
Itoi, Akito: *See*—
Tanaka, Shingo; Ueno, Tetsuya; Itoi, Akito; and Nishi, Isao, 5,500,322, Cl. 430-110.000.
Itoi, Kazuo: *See*—
Iwasaki, Hideharu; Yoneda, Koichi; Kido, Yoichi; Hosogai, Takeo; Itoi, Kazuo; and Kitayama, Masahiko, 5,500,484, Cl. 568-660.000.
Itojima, Mitsuhiko: *See*—
Miyawaki, Hiroshi; Itojima, Mitsuhiko; Oka, Takayuki; Yamamoto, Kazuyoshi; Akira, Toshiro; and Tsuji, Masaaki, 5,500,712, Cl. 355-22.000.
Itoyama, Kazutoshi: *See*—
Yamamoto, Shinji; Itoyama, Kazutoshi; and Fujimaki, Seiichi, 5,500,097, Cl. 203-11.000.
ITT Automotive Europe GmbH: *See*—
Bergedis, Klaus; Hartmann, Willi; Saalbach, Kurt; and Low, Peter, 5,499,570, Cl. 92-84.000.
ITT Corporation: *See*—
Rees, Richard W. A., 5,499,788, Cl. 248-430.000.
IVAC Corporation: *See*—
O'Leary, Stephen H., 5,499,906, Cl. 417-53.000.
Ives, Kenneth L., Sr. Reciprocating toothpaste dispenser. 5,499,742, Cl. 222-101.000.
Iwaki, Makoto: *See*—
Maruyama, Koichi; Wakamiya, Syun'itirou; Iwaki, Makoto; and Ono, Masahiro, 5,500,767, Cl. 359-642.000.
Iwamoto, Fumiya; Nakayama, Masahito; and Matsumoto, Yoshiyuki, to Honda Gijen Kogyo Kabushiki Kaisha. Wheel support structure and method of installing wheels in motor vehicle. 5,499,832, Cl. 280-96.100.
Iwamoto, Masatoshi: *See*—
Fukumoto, Tadao; Iwamoto, Masatoshi; and Kishimoto, Akihiko, 5,500,478, Cl. 525-66.000.
Iwanaga, Takaki: *See*—
Arai, Yasuhiro; Sano, Tetuso; Yamashita, Tetsuji; Iwanaga, Takaki; and Goto, Koichi, 5,499,508, Cl. 62-114.000.
Iwasa, Akira: *See*—
Murata, Masami; Kishi, Haruni; Narui, Takashi; Kasai, Shuichi; and Iwasa, Akira, 5,500,221, Cl. 424-436.000.
Iwasaki, Hideharu; Yoneda, Koichi; Kido, Yoichi; Hosogai, Takeo; Itoi, Kazuo; and Kitayama, Masahiko, to Kuraray Co., Ltd. 2-alkoxy- or acyloxy-2-aryl-1,3-propanediol or dioxane derivative, and process for its production. 5,500,484, Cl. 568-660.000.
Iwasaki, Hiroaki: *See*—
Takei, Shinobu; Ohtani, Shoji; Iwasaki, Hiroaki; Ohsawa, Tetsuhiro; and Hosokawa, Yasunori, 5,500,261, Cl. 428-35.700.
Iwasaki, Motoya, to NEC Corporation. Automatic frequeacy control apparatus and method therefor. 5,500,878, Cl. 375-344.000.
Iwasaki, Nobuhiko: *See*—
Ito, Yasuo; Kato, Hideo; Yasuda, Shingo; Iwasaki, Nobuhiko; Nishino, Hiroyuki; and Takeshita, Makoto, 5,500,422, Cl. 514-212.000.
Iwata, Yasuhiro: *See*—
Katayama, Kaoru; Kazui, Shinichi; Iwata, Yasuhiro; Fukuda, Hiroshi; and Ohta, Toshihiko, 5,499,668, Cl. 134-1.000.
Iwata, Yasuo: *See*—
Saitoh, Yasuhiko; Iwata, Yasuo; Kuzuma, Seiichi; Nakajima, Yoshihide; and Yokomizo, Kanji, 5,500,437, Cl. 514-397.000.
Iwata, Yuhei: *See*—
Miyazawa, Kiyoshi; Chiba, Tadahiro; Iwata, Yuhei; Tamura, Uhei; Murotani, Isao; and Tanaki, Shuya, 5,500,416, Cl. 514-23.000.
Iwatsuka, Shinji; Kobayashi, Masaaki; and Hata, Kenjiro, to TDK Corporation. Optical fiber terminal pitted with optical isolator. 5,500,915, Cl. 385-78.000.
IXYS Corporation: *See*—
Ochi, Sam S., 5,500,616, Cl. 327-310.000.
Izawa, Yosuke: *See*—
Fue, Kouichirou; Izawa, Yosuke; and Okumura, Naoji, 5,500,682, Cl. 348-497.000.
J. D. Technologies, Inc.: *See*—
Dunlavy, John H., 5,500,842, Cl. 369-48.000.
J. M. Voith GmbH: *See*—
Bück, Rudolf; Egelhof, Dieter; Heusler, Klaus; Kade, Werner; Meinecke, Albrecht; Wanke, Wilhelm; and Wulz, Hans-Jürgen, 5,500,091, Cl. 162-301.000.
Hundt, Gerd; Arbogast, Franz; and Peiz, Peter, 5,499,910, Cl. 418-126.000.
Schiel, Christian, 5,500,092, Cl. 162-358.300.
Jack, J. Stewart: *See*—
Bentley, Roger G.; Hamilton, R. Keith; Jack, J. Stewart; and Barron, Robert L., 5,500,735, Cl. 356-364.000.
Jack, William E.: *See*—
Comb, Donald G.; Perler, Francine; Kucera, Rebecca; and Jack, William E., 5,500,363, Cl. 435-194.000.
Jackson, Henry W.: *See*—
Guigné, Jacques Y.; Barmatz, Martin B.; Jackson, Henry W.; and Kopeanko, Sergei V., 5,500,493, Cl. 181-0.500.
Jacobs, Robert M., to Xerox Corporation. Web with tube oil applicator. 5,500,722, Cl. 355-284.000.
Jacobsen, Ingolf G.; and Langham, Arvin L., to Cabel-Con, Inc. Hexagonal crimp connector. 5,499,934, Cl. 439-585.000.
Jacoby, John. Method of manufacturing a multiple pin heatsink device. 5,499,450, Cl. 29-890.030.
Jacquier, Yves: *See*—
Berrebi, Georges; Jacquier, Yves; Edens, Habbo; and Middelkoop, Gerrit, 5,499,746, Cl. 222-165.000.
Jadamus, Hans: *See*—
Röber, Stefan; Jadamus, Hans; Böer, Michael; Feinauer, Roland; Herrmann, Hans-Dieter; and Ries, Hans, 5,500,263, Cl. 428-36.600.
Jagenberg Aktiengesellschaft: *See*—
Heimer, Reinhard; and Müller, Georg, 5,499,778, Cl. 242-541.000.



Jagiella, Manfred; Wiesemann, Wolf; Schubert, Peter; Holzmann, Michael; and Spörl, Georg, to C. A. Weidmüller GmbH & Co. Nozzle for a tool for the working of material. 5,500,504, Cl. 219-121.670.
Jameson, Eddie A. Lawn mower cleaning method and attachment. 5,499,492, Cl. 56-12.100.
Jandris, Louis J.: *See*—
Anderson, Jere R.; Jandris, Louis J.; Barbere, Michael D.; and Murphy, Richard T., 5,500,180, Cl. 264-532.000.
Janisch, Klaus, to Schmidt & Leuhardt GmbH & Co. oHG. Turntable. 5,499,862, Cl. 297-311.000.
Janson, Harvey: *See*—
McArthur, Malcolm J.; and Janson, Harvey, 5,499,650, Cl. 137-85.000.
Janssen Pharmaceutica, N.V.: *See*—
Van Wauwe, Jean P. F.; and Raeymaekers, Alfons H. M., 5,500,435, Cl. 514-394.000.
Japan Energy Corporation: *See*—
Ishida, Yukio; and Fukuba, Hiroyasu, 5,500,242, Cl. 426-618.000.
Japan Field Co., Ltd.: *See*—
Uchino, Masahide, 5,499,642, Cl. 134-95.100.
Japan Tobacco Inc.: *See*—
Daimon, Junko; and Takeda, Yasuo, 5,500,404, Cl. 504-174.000.
Haruzono, Teruo, 5,499,635, Cl. 131-290.000.
Jarrin, Roberto M.: *See*—
Figueroa, Francisco R.; and Jarrin, Roberto M., 5,500,153, Cl. 252-548.000.
Jayasuriya, Rohitha M.: *See*—
Ahmed, Bashir M.; Jayasuriya, Rohitha M.; and Hopkins, Thomas R., 5,500,460, Cl. 523-402.000.
Jeanset, Nicolas, to Bta SA Fabriques d'Ebauches. Circuit for suppressing the effect of rebounds and parasitic commutations of a contactor. 5,500,836, Cl. 368-187.000.
Jee, Kyung-Ha: *See*—
Jeon, Dal-Young; Jee, Kyung-Ha; Choi, Nak-Choon; Song, Bok-Ki; and Shin, Dong-Myeong, 5,500,792, Cl. 363-98.000.
Jeadrinek, Jerome J.; Smith, Robert E.; and Dahl, Gary A., to Epicentre Technologies. Thermostable ribonuclease H and genetic constructs therefore. 5,500,370, Cl. 435-320.100.
Jeanelle, Ernest M. Submerged fixed media for nitrification. 5,500,119, Cl. 210-615.000.
Jeng, Ching S.: *See*—
Hsu, Juei-Chi; Jeng, Ching S.; and Wang, Ping, 5,500,826, Cl. 365-230.010.
Jeakner, Brian D. Apparatus and methods for forming, filling and sealing fluid filled cavities. 5,500,067, Cl. 156-146.000.
Jeako, Edward J.: *See*—
Schad, Robert D.; and Jeako, Edward J., 5,499,916, Cl. 425-564.000.
Jeasea, Terrence C.: *See*—
Robinson, Douglas S.; Jeasea, Terrence C.; and Gray, Joseph N., 5,500,534, Cl. 250-385.100.
Jeon, Dal-Young; Jee, Kyung-Ha; Choi, Nak-Choon; Song, Bok-Ki; and Shin, Dong-Myeong, to Samsung Electronics Co., Ltd. Zero-voltage switching type electronic ballast for fluorescent lamp. 5,500,792, Cl. 363-98.000.
Jeon, Hak-Seong; and Kim, Sung-Hee, to Electronics & Telecommunications Research Institute. Data access method for subscriber location information. 5,500,887, Cl. 379-58.000.
Jeong, Eui-seon, to Samsung Display Devices Co., Ltd. High-intensity discharge lamp with pleated ends. 5,500,570, Cl. 313-634.000.
Jerabek, Elihu C.: *See*—
Iacovangelo, Charles D.; and Jerabek, Elihu C., 5,500,248, Cl. 427-250.000.
Jerbic, Chris, to LSI Logic Corporation. Process for dynamic control of the concentration of one or more etchants in a plasma-enhanced etch process for formation of patterned layers of conductive material on integrated circuit structures. 5,500,076, Cl. 156-626.100.
Jessee, Joel A.: *See*—
Li, Wu-Bo; Gruber, Christian E.; Jessee, Joel A.; and Lin, Jhy-Jhu, 5,500,356, Cl. 435-91.100.
Jessup, James L., to Kimberly-Clark Corporation. Method of joining an elastic band to a continuously moving partially elastic substrate. 5,500,063, Cl. 156-85.000.
Jewell, Jack L.; Quinn, William E.; Swirhun, Stan E.; and Bryan, Robert P., to Photonics Research Incorporated. Wafer scale optoelectronic package. 5,500,540, Cl. 257-82.000.
JGC Corporation: *See*—
Nakayama, Takashi; and Sagara, Hiroshi, 5,500,116, Cl. 210-511.000.
Jidosha Denki Kogyo Kabushiki Kaisha: *See*—
Sano, Masabu; and Sekine, Shuji, 5,500,564, Cl. 310-83.000.
Jin, Sungho: *See*—
Graebner, John E.; Jin, Sungho; and Wolfe, Raymond, 5,500,157, Cl. 264-1.210.
Jing, Tianwei, to Molecular Imaging Corporation. Stress cell for a scanning probe microscope. 5,500,535, Cl. 250-440.110.
JLB Textiles Limited: *See*—
Bailey, John L.; and Gradwell, Stephen I., 5,499,966, Cl. 602-42.000.
Joh, Yoshinobu: *See*—
Tanikawa, Hirohide; Uchiyama, Masaki; Joh, Yoshinobu; Akashi, Yasutaka; Taya, Masaaki; and Uano, Makoto, 5,500,318, Cl. 430-99.000.
Johanson, Jerry R., to Kasyr, Inc. Method of feeding cellulosic material to a digester using a chip bin with one dimensional convergence and side relief. 5,500,083, Cl. 162-17.000.
Johnson, Kenneth E.; and Pelletier, Ronald R., to Dow Chemical Company, The. Preparation of a novel article from a thermally gellable artificial latex. 5,500,469, Cl. 524-157.000.
Johnson, Montfort A.: *See*—
Haghost, Paul D.; and Johnson, Montfort A., 5,500,456, Cl. 523-166.000.
Johnson & Johnson Vision Products, Inc.: *See*—
Ebel, James; Dolan, Mary L.; Edwards, Russell J.; and Sites, Peter W., 5,500,732, Cl. 356-124.000.
Johnson, David A. Shoulder bow carrier. 5,499,752, Cl. 224-258.000.
Johnson, Dennis W.: *See*—
Rogers, Kevin J.; and Johnson, Dennis W., 5,500,196, Cl. 423-242.100.
Johnson, Frank L. Motorcycle conversion rear axle mounting system. 5,499,689, Cl. 180-16.000.
Johnson, Gerald W.; and Johnson, Jeffrey. Endoscopic augmentation mammoplasty. 5,500,019, Cl. 623-8.000.
Johnson, Jeffrey: *See*—
Johnson, Gerald W.; and Johnson, Jeffrey, 5,500,019, Cl. 623-8.000.
Johnson, Lonnie G.; and Applewhite, John T., to Johnson Research and Development Company, Inc. Fluid powering and launching system for a toy vehicle. 5,499,940, Cl. 446-180.000.
Johnson Research and Development Company, Inc.: *See*—
Johnson, Lonnie G.; and Applewhite, John T., 5,499,940, Cl. 446-180.000.
Johnson, Robert W., to Laser Precision Corp. Method and apparatus for determining the distance to a reflective event. 5,500,730, Cl. 356-73.100.
Johnson, Rod: *See*—
Hanglin, Bernt-Otto; and Johnson, Rod, 5,499,838, Cl. 280-615.000.
Johnson, Roy A., to Upjohn Company, The. Arylmethylphosphonates and phosphonic acids useful as anti-inflammatory agents. 5,500,417, Cl. 514-89.000.
Johnson, Scott D.: *See*—
Deems, James H.; Mileaf, Daryl S.; LaCour, Kevin E.; Rodriguez, Noe E., II; Legions, Joseph M.; Johnson, Scott D.; Kapraun, Richard C.; and Young, Richard M., 5,500,187, Cl. 422-58.000.
Joint Stock Company Ea & Fi: *See*—
Khusara, Vladimir N.; Belotelova, Ljudmila N.; and Sergeev, Vladimir N., 5,499,900, Cl. 415-55.100.
Joly, Richard G. A.: *See*—
Brunier, Régis G.; Cotto, Dominique J.; Joly, Richard G. A.; Kerneis, Stéphane M.; and Silvestrelli, Michel P. F., 5,499,519, Cl. 72-53.000.
Jones, Arthur A. Leg exercise machines having retractable leg support and methods. 5,499,962, Cl. 482-137.000.
Jones, Charles P. Apparatus and method for generating product coupons in response to televised offers. 5,500,681, Cl. 348-473.000.
Jones, Desmond: *See*—
Walter, Jeffrey S.; Gano, John C.; and Jones, Desmond, 5,499,680, Cl. 166-377.000.
Jones, Jay A.: *See*—
Weiler, Edward B.; Jones, Jay A.; Stefanile, Joseph P.; and Miles, Steven G., 5,499,457, Cl. 33-512.000.
Jones, Kyle D.: *See*—
Murch, Bruce P.; Roselle, Brian J.; and Jones, Kyle D., 5,500,048, Cl. 134-6.000.
Murch, Bruce P.; Roselle, Brian J.; and Jones, Kyle D., 5,500,143, Cl. 252-108.000.
Jones, Marshall G., to General Electric Company. Method for cutting epoxy/carbon fiber composite with lasers. 5,500,505, Cl. 219-121.720.
Jones, William J., Jr.: *See*—
Halm, Walter B.; Jones, William J., Jr.; Kirkbride, James P.; Marcus, Ilan; and Snyder, Adrian C., 5,500,295, Cl. 428-357.000.
Jong, Bing W.: *See*—
Riley, William D.; and Jong, Bing W., 5,500,100, Cl. 205-404.000.
Jonovic, John A.: *See*—
Handel, Gary A.; Jonovic, John A.; and Krueger, Otto L., 5,499,575, Cl. 99-349.000.
Joo, Jae-Man; and Kim, Yong-Woo, to Samsung Electronics Co., Ltd. Noise control apparatus for vacuum cleaner. 5,499,423, Cl. 15-319.000.
Jordan, Susan M.: *See*—
Shinagawa, Robert T.; Jordan, Susan M.; and Blatt, Christopher S., 5,500,095, Cl. 203-2.000.
Joshi, Mahendra L.; and Broadway, Lee, to Combustion Tec, Inc. Oxy-gas fired forehearth burner system. 5,500,030, Cl. 65-346.000.
Joslyn Electronic Systems Corporation: *See*—
Oertel, Hans-Wolfgang; and Martin, David L., 5,500,782, Cl. 361-120.000.
Juhasz, Paul R. Ski device. 5,499,836, Cl. 280-602.000.
Julian, Jorge V.; and Gerrato, John A. Topical hydrophobic composition and method. 5,500,216, Cl. 424-401.000.
Junkers, John K. Fluid operated tool for elongating and relaxing a threaded connector. 5,499,558, Cl. 81-57.390.
Jurewicz, Romuald M.; Wong, Albert C. K.; and Wirth, Verlon J., to Thermo King Corporation. Methods and apparatus for converting a manually operable refrigeration unit to remote operation. 5,499,512, Cl. 62-229.000.
Kabushiki Kaisha Ace Denkea: *See*—
Takemoto, Takatoshi; Chida, Toshikazu; Kano, Noriaki; Ito, Eiji; Murakami, Koji; Itagaki, Takashi; Sekimoto, Koji; and Suzuki, Masanori, 5,499,809, Cl. 271-274.000.
Kabushiki Kaisha Inoac Corporation: *See*—
Kondo, Tetsuo; and Murakami, Akihiko, 5,500,169, Cl. 264-46.500.
Suzuki, Hiroshi, 5,500,168, Cl. 264-46.500.
Kabushiki Kaisha Kenwood: *See*—

Matsumoto, Motoyoshi; and Matsumura, Tomomi, 5,500,838, Cl. 369-13.000.

Kabushiki Kaisha Kobe Seiko Sho: *See*—
Okumura, Toshiaki; Ekimoto, Takao; Shimamoto, Satoshi; Ogawa, Katsumi; Tomita, Masahiro; Nimura, Yoshitaka; and Kadowaki, Ryosaku, 5,500,170, Cl. 264-148.000.
Onishi, Takashi; Yoshikawa, Kazuo; Nishi, Seiji; and Yamamoto, Seigou, 5,500,301, Cl. 428-457.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Sasaki, Yosuke; and Okubo, Hideaki, 5,500,166, Cl. 264-40.400.

Kabushiki Kaisha Shinsangyokaihatsu: *See*—
Yamada, Takahiro; Ando, Shinji; and Naruse, Yoshihiro, 5,499,909, Cl. 417-384.000.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Kokubu, Sadao, 5,500,637, Cl. 340-447.000.

Kabushiki Kaisha Toshiba: *See*—
Anma, Hideyuki, 5,499,805, Cl. 271-3.050.
Arai, Yasuhiro; Sano, Tetsuo; Yamashita, Tetsuji; Iwanaga, Takaki; and Goto, Koichi, 5,499,508, Cl. 62-114.000.
Arakawa, Kenichi; Sasano, Nobusuke; Iizuka, Tomoaki; Kobayashi, Miho; Yamada, Tetsuo; and Motoyama, Hideki, 5,500,675, Cl. 348-319.000.
Fujimoto, Akihisa, 5,500,654, Cl. 345-132.000.
Hiki, Susumu; Kondo, Mituo; and Abe, Kenji, 5,499,630, Cl. 128-662.050.
Ishii, Masaru; and Nagai, Koichi, 5,500,843, Cl. 369-77.200.
Kamihata, Toshio, 5,500,653, Cl. 345-98.000.
Kudoh, Norimasa, 5,500,863, Cl. 371-37.100.
Miyata, Masahiro; Ezawa, Hirokazu; Ogure, Naoaki; Tsujimura, Manabu; Ohdaira, Takeyuki; Inoue, Hiroaki; and Ikeda, Yukio, 5,500,559, Cl. 257-762.000.
Muramatsu, Yasuhiro, 5,500,622, Cl. 330-107.000.
Nakamoto, Masayuki; Ono, Tomio; and Sakai, Tadashi, 5,499,938, Cl. 445-50.000.
Nakamura, Hajime; and Sakakibara, Jun, 5,499,807, Cl. 271-121.000.
Saito, Yasuo, 5,500,949, Cl. 395-427.000.
Saito, Yoshiaki; Inomata, Koichiro; Okuno, Shiho; and Takahashi, Yoshinori, 5,500,633, Cl. 338-32.00R.
Seki, Tsuneyo; Okutomi, Tsutomu; and Yamamoto, Atsushi, 5,500,499, Cl. 218-130.000.
Takase, Satoru; and Furuyama, Tohru, 5,500,815, Cl. 365-149.000.
Tanaka, Tomoharu, 5,500,821, Cl. 365-200.000.
Toda, Haruki; Saito, Shozo; and Tokushige, Kaoru, 5,500,829, Cl. 365-230.080.
Ueno, Fumio; Kasori, Mitsuo; Horiguchi, Akihiro; and Oh-Ishi, Katsuyoshi, 5,500,395, Cl. 501-98.000.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Kawamura, Chuichi; Kasugai, Ichiro; Hashimoto, Mitsuru; and Ida, Masahiro, 5,499,515, Cl. 62-470.000.

Kade, Werner: *See*—
Bück, Rudolf; Egelhof, Dieter; Hensler, Klaus; Kade, Werner; Meinecke, Albrecht; Wanke, Wilhelm; and Wulz, Hans-Jürgen, 5,500,091, Cl. 162-301.000.

Kadono, Masaya; and Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Method of depositing diamond and diamond light emitting device. 5,500,539, Cl. 257-77.000.

Kadowaki, Akira: *See*—
Itoh, Shigeo; Yokoyama, Mikio; Tonegawa, Takeshi; and Kadowaki, Akira, 5,499,939, Cl. 445-73.000.

Kadowaki, Ryosaku: *See*—
Okumura, Toshiaki; Ekimoto, Takao; Shimamoto, Satoshi; Ogawa, Katsumi; Tomita, Masahiro; Nimura, Yoshitaka; and Kadowaki, Ryosaku, 5,500,170, Cl. 264-148.000.

Kaiho, Mamoru; and Yasuda, Hajime, to Director-General Of Agency Of Industrial Science And Technology. Aquameter. 5,499,532, Cl. 73-76.000.

Kaino, Kazuyuki: *See*—
Ogue, Yousuke; Kuyama, Takahiro; and Kaino, Kazuyuki, 5,500,069, Cl. 264-401.000.

Kaiser Aluminum & Chemical Corporation: *See*—
Cummins, David C.; and Roussel, David L., 5,499,873, Cl. 366-348.000.

Kakuta, Yoshinori: *See*—
Matsuo, Eiji; and Kakuta, Yoshinori, 5,500,926, Cl. 395-133.000.

Kaltenbach, Patrick; Mittelstadt, Laurie; and Swedberg, Sally, to Hewlett-Packard Company. Miniaturized planar columns in novel support media for liquid phase analysis. 5,500,071, Cl. 156-272.800.

Kalthod, Dilip G., to Air Products and Chemicals, Inc. Production of enriched oxygen gas stream utilizing hollow fiber membranes. 5,500,036, Cl. 95-54.000.

Kamewada, Makoto; and Kojima, Shinji, to Singer Company N.V., The. Thread guide holder device for sewing machine. 5,499,590, Cl. 112-302.000.

Kamihata, Toshio, to Kabushiki Kaisha Toshiba. Character data writing device. 5,500,653, Cl. 345-98.000.

Kamijo, Eiji, to Ricoh Company, Ltd. Control unit of flash memory and facsimile machine using such control unit. 5,500,742, Cl. 358-448.000.

Kamijo, Masayasu: *See*—
Kubota, Yoshikazu; Kamijo, Masayasu; Otsu, Hiroshi; and Kamiya, Takashi, 5,500,259, Cl. 428-15.000.

Kamio, Masaru: *See*—
Takao, Hideaki; Murata, Tatsuo; Kanbe, Junichiro; Tamura, Miki; Kamio, Masaru; Sekimura, Nobuyuki; and Kikuchi, Yoshiki, 5,500,751, Cl. 359-68.000.

Kamiya, Takashi: *See*—
Kubota, Yoshikazu; Kamijo, Masayasu; Otsu, Hiroshi; and Kamiya, Takashi, 5,500,259, Cl. 428-15.000.

Kamizawa, Koh: *See*—
Kunitake, Setsu; Kamizawa, Koh; Koshi, Yutaka; and Suzuki, Kazuhiro, 5,500,907, Cl. 382-240.000.

Kamyr, Inc.: *See*—
Johansson, Jerry R., 5,500,083, Cl. 162-17.000.

Kanagawa Academy of Science and Technology: *See*—
Okuno, Yasuo; Tomita, Shotaro; and Kato, Hiroyuki, 5,499,600, Cl. 117-68.000.

Kanayama, Masaru: *See*—
Sawada, Ryozo; Hirasawa, Masanori; Yamaguchi, Yoshiharu; Funakawa, Shigeru; and Kanayama, Masaru, 5,500,276, Cl. 428-192.000.

Kanbayashi, Makoto: *See*—
Kasuya, Takashige; Nagatsuka, Takayuki; Nakamura, Tatsuya; Kanbayashi, Makoto; and Chiba, Tatsuhiko, 5,500,321, Cl. 430-109.000.

Kanbe, Junichiro: *See*—
Takao, Hideaki; Murata, Tatsuo; Kanbe, Junichiro; Tamura, Miki; Kamio, Masaru; Sekimura, Nobuyuki; and Kikuchi, Yoshiki, 5,500,751, Cl. 359-68.000.

Kanbe, Makoto; and Mitsui, Seiichi, to Sharp Kabushiki Kaisha. Manufacturing method of reflection type liquid crystal display devices having light shield elements and reflective electrodes formed of same material. 5,500,750, Cl. 359-58.000.

Kaneda, Naoya: *See*—
Niino, Reiji; Ohbu, Tomoyuki; Ikegawa, Hiroaki; Nakao, Ken; Fujita, Yoshiyuki; Haraoka, Tsutomu; Kobayashi, Makoto; Kaneda, Naoya; and Kamada, Hiroshi, 5,500,388, Cl. 437-89.000.

Kanegafuchi Chemical Industry Co., Ltd.: *See*—
Homma, Michihide; Yoshihara, Atsuko; Wakabayashi, Hiroshi; and Isayama, Katsuhiko, 5,500,464, Cl. 523-435.000.

Kaneko, Kiyoshi: *See*—
Kobayashi, Katsuyuki; Taniishi, Shinnosuke; Tanaka, Atsushi; Yoshimura, Yuichiro; Kaneko, Kiyoshi; Yanagisawa, Ryozo; and Tokioka, Masaki, 5,500,492, Cl. 178-18.000.

Kaneko, Masato: *See*—
Sakai, Masayasu; Seto, Touru; Kaneko, Masato; Hada, Michio; and Kinomoto, Toshiaki, 5,500,086, Cl. 162-65.000.

Kaneko, Masayoshi: *See*—
Hirakawa, Tetsuro; Kaneko, Masayoshi; and Yoshida, Katumi, 5,500,058, Cl. 148-649.000.

Kang, Sang-Won: *See*—
Lee, Seung-Chang; Yun, Sun-Jin; Kim, Bo-Woo; and Kang, Sang-Won, 5,500,389, Cl. 437-90.000.

Kano, Isao, to NEC Corporation. Semiconductor device having low resistance values at connection points of conductor layers. 5,500,560, Cl. 257-767.000.

Kano, Kazuhiko: *See*—
Takeuchi, Yukihiro; Shibata, Kozo; Ohtsuka, Yoshinori; Kano, Kazuhiko; and Yamamoto, Toshimasa, 5,500,549, Cl. 257-415.000.

Kano, Noriaki: *See*—
Takemoto, Takatoshi; Chida, Toshikazu; Kano, Noriaki; Ito, Eiji; Murakami, Koji; Itagaki, Takashi; Sekimoto, Koji; and Suzuki, Masanori, 5,499,809, Cl. 271-274.000.

Kanoh, Masaki: *See*—
Hosokawa, Yoshiaki; Kanoh, Masaki; Maekawa, Takashi; and Nakayasu, Hirofumi, 5,499,876, Cl. 400-56.000.

Kanttinen, Ari: *See*—
Aalto, Jouni; Pakkanen, Raimo; Satama, Lea; Luopa, Jyrki; Allén, Timo; Virtanen, Arja; and Kanttinen, Ari, 5,500,229, Cl. 424-535.000.

Kao Corporation: *See*—
Takei, Shinobu; Ohtani, Shoji; Iwasaki, Hiroaki; Ohsawa, Tetsuhiro; and Hosokowa, Yasunori, 5,500,261, Cl. 428-35.700.
Tanaka, Shingo; Ueno, Tetsuya; Itoi, Akito; and Nishi, Isao, 5,500,322, Cl. 430-110.000.

Kao, Sheau V.: *See*—
Mahabadi, Hadi K.; Agur, Enno E.; McAneney, T. Brian; Kao, Sheau V.; Allison, Gerald R.; Hawkins, Michael S.; Orushkin, Bernard; Kittelberger, J. Stephen; Chung, Joo T.; and Hollenbaugh, William H., Jr., 5,500,324, Cl. 430-137.000.

Kapraun, Richard C.: *See*—
Deems, James H.; Mileaf, Daryl S.; LaCour, Kevin E.; Rodriguez, Noe E., II; Leginus, Joseph M.; Johnson, Scott D.; Kapraun, Richard C.; and Young, Richard M., 5,500,187, Cl. 422-58.000.

Karakama, Toshiyuki: *See*—
Yashiro, Masahiko; Sasaki, Shinichi; Ikemoto, Isao; Miura, Koji; Karakama, Toshiyuki; and Numagami, Atsushi, 5,500,714, Cl. 355-200.000.

Karasawa, Kazunori, to Ricoh Company, Ltd. Bias application control device for image forming apparatus using reverse development. 5,500,720, Cl. 355-265.000.

Karbach, Alexander: *See*—
Meltzer, Aaron D.; and Karbach, Alexander, 5,500,479, Cl. 525-437.000.

Karita, Seiichiro: *See*—
Hattori, Yoshifumi; Karita, Seiichiro; Saikawa, Hideo; Kashino, Toshio; Saito, Akio; Nakagomi, Hiroshi; Arashima, Teruo; Kimura, Makiko; Sugitani, Hiroshi; Ikeda, Masami; Saito, Asao; Masuda, Kazuaki; and Orikasa, Tsuyoshi, 5,500,666, Cl. 347-87.000.

Kasai, Shuichi: *See*—
Murata, Masami; Kishi, Harumi; Narui, Takashi; Kasai, Shuichi; and Iwasa, Akira, 5,500,221, Cl. 424-436.000.

Kashino, Toshio: *See*—
Hattori, Yoshifumi; Karita, Seiichiro; Saikawa, Hideo; Kashino, Toshio; Saito, Akio; Nakagomi, Hiroshi; Arashima, Teruo; Kimura, Makiko; Sugitani, Hiroshi; Ikeda, Masami; Saito, Asao; Masuda, Kazuaki; and Orikasa, Tsuyoshi, 5,500,666, Cl. 347-87.000.

Kasho, Yasunori: *See*—
Tanaka, Takashi; Miyazaki, Masaharu; Kasho, Yasunori; and Yoshiyasu, Toshiaki, 5,499,932, Cl. 439-446.000.

Kasori, Mitsuo: *See*—
Ueno, Fumio; Kasori, Mitsuo; Horiguchi, Akihiro; and Oh-Ishi, Katsuyoshi, 5,500,395, Cl. 501-98.000.

Kasugai, Ichiro: *See*—
Kawamura, Chuichi; Kasugai, Ichiro; Hashimoto, Mitsuru; and Ida, Masahiro, 5,499,515, Cl. 62-470.000.

Kasuya, Takashige; Nagatsuka, Takayuki; Nakamura, Tatsuya; Kanbayashi, Makoto; and Chiba, Tatsuhiko, to Canon Kabushiki Kaisha. Color toner for developing electrostatic image. 5,500,321, Cl. 430-109.000.

Katagiri, Masayoshi; Suzuki, Kazuhiko; and Takeuchi, Mitsunari, to Aisin Seiki Kabushiki Kaisha. Brake force control device for a vehicle. 5,499,865, Cl. 303-115.200.

Kataoka, Kenichi: *See*—
Nishimoto, Yoshifumi; and Kataoka, Kenichi, 5,499,808, Cl. 271-267.000.

Katayama, Kaoru; Kazui, Shinichi; Iwata, Yasuhiro; Fukuda, Hiroshi; and Ohta, Toshihiko, to Hitachi, Ltd. Process for making electronic device. 5,499,668, Cl. 134-1.000.

Kato, Hideo: *See*—
Ito, Yasuo; Kato, Hideo; Yasuda, Shingo; Iwasaki, Nobuhiko; Nishino, Hiroyuki; and Takeshita, Makoto, 5,500,422, Cl. 514-212.000.
Namiki, Masanori; Mori, Kazuyoshi; and Kato, Hideo, 5,499,769, Cl. 239-409.000.

Kato, Hiroaki; Shimasaki, Yuichi; Saito, Akihisa; Komatsuda, Takashi; Otetani, Toshikazu; Haccho, Seiji; Matsumoto, Seiji; Aoki, Takuya; and Miyashita, Yukio, to Honda Giken Kogyo Kabushiki Kaisha. Engine exhaust emission control system. 5,499,501, Cl. 60-286.000.

Kato, Hiroyuki: *See*—
Okuno, Yasuo; Tomita, Shotaro; and Kato, Hiroyuki, 5,499,600, Cl. 117-68.000.

Kato, Ikunoshin: *See*—
Miyamura, Tsuyoshi; Sano, Mutsumi; Kondo, Akihiro; and Kato, Ikunoshin, 5,500,342, Cl. 435-4.000.

Kato, Kazuhiro: *See*—
Yamazaki, Shigeki; Kato, Kazuhiro; Ishii, Takayuki; and Sakai, Hisao, 5,499,753, Cl. 226-194.000.

Kato, Shunji; and Miyajima, Hiromitsu, to Mitsui Mining & Smelting Co., Ltd. Spread spectrum communication transmitter an LSI therefor. 5,500,871, Cl. 375-208.000.

Kato, Takashi: *See*—
Yoshida, Satoru; Sato, Keiji; Mochizuki, Masamichi; Watanabe, Masashi; and Kato, Takashi, 5,499,510, Cl. 62-175.000.

Katou, Hisato; Kawashima, Tomoyuki; Tsuiguchi, Harutaka; Nakamata, Shin'ichi; and Shibata, Kazuyoshi, to Fuji Electric Co., Ltd. Method for preparing thin film electro-luminescence element. 5,500,103, Cl. 204-192.260.

Katz, Allen; Wolkstein, Herbert J.; and Meighan, James J., III, to Martin Marietta Corp. Travelling-wave tube protection arrangement. 5,500,621, Cl. 330-43.000.

Kaufman, Charles W.: *See*—
Perlman, Radia J.; Kirby, Alan J.; Backes, Floyd J.; and Kaufman, Charles W., 5,500,860, Cl. 370-85.130.

Kawada, Shinichi, to Unisia Jecs Corporation. Viscous fluid clutch with auxiliary reservoir. 5,499,706, Cl. 192-58.400.

Kawaguchi, Kenji; and Miyaki, Yoshiyuki, to Honda Motor Co., Ltd.; and Shindengen Electric Manufacturing Co., Ltd. Structure for connecting electrodes of motor unit and motor driver unit. 5,500,563, Cl. 310-71.000.

Kawai, Kiyoshi; and Hatori, Masami, to Fuji Photo Film Co., Ltd. Image forming method employing a scanning exposure. 5,500,329, Cl. 430-363.000.

Kawakubo, Hiroyuki: *See*—
Ito, Eiji; Suzuki, Tetsushi; Ito, Kaoru; and Kawakubo, Hiroyuki, 5,499,604, Cl. 123-41.860.

Kawamura, Chuichi; Kasugai, Ichiro; Hashimoto, Mitsuru; and Ida, Masahiro, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Rotary vane-type compressor. 5,499,515, Cl. 62-470.000.

Kawamura, Hajime, to NEC Corporation. Multi-layer digital circuit board with a test pattern section. 5,500,862, Cl. 371-22.300.

Kawamura, Masaharu. Controller for a vibration wave motor. 5,500,578, Cl. 318-116.000.

Kawano, Kenji: *See*—
Suzuki, Etsurou; Hattori, Yoshifumi; Kitani, Masashi; Saikawa, Hideo; Kojima, Masami; Kawano, Kenji; Tsuno, Koichi; and Aono, Kenji, 5,500,664, Cl. 347-86.000.

Kawano, Kiyoshi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Apparatus for partially intercepting light in finder of camera. 5,500,704, Cl. 354-222.000.

Kawasaki Steel Corporation: *See*—
Shiga, Nobuo; Marui, Tomohiro; Shibuya, Kiyoshi; Sano, Toru; Ozawa, Michiharu; and Yokomoto, Masao, 5,499,673, Cl. 164-463.000.

Kawashima, Tomoyuki: *See*—
Katou, Hisato; Kawashima, Tomoyuki; Tsuiguchi, Harutaka; Nakamata, Shin'ichi; and Shibata, Kazuyoshi, 5,500,103, Cl. 204-192.260.

Kawawada, Kenji: *See*—
Arisaka, Hiroshi; Kawawada, Kenji; and Omata, Kiyoshi, 5,499,924, Cl. 439-67.000.

Kawczyk, Jost: *See*—
Hache, Wilfried; and Kawczyk, Jost, 5,500,896, Cl. 379-412.000.

Kazami, Kazuyuki; Yokoumura, Noritaza; Yamazaki, Yoichi; and Hibino, Hideo, to Nikon Corporation. Light source color information recording apparatus. 5,500,709, Cl. 354-416.000.

Kazawa, Tohru: *See*—
Tsuchima, Hideaki; Sasaki, Shinya; Nakano, Yukio; Nakano, Hiroyuki; Taeyari, Ryoji; Matsuda, Hirouari; Tomooka, Kenji; Sakaide, Naohiro; Nishimura, Shin; Yano, Yoshihiro; Igarashi, Youichi; Aoki, Satoshi; Takatori, Masahiro; Kazawa, Tohru; and Ashi, Yoshihiro, 5,500,756, Cl. 359-174.000.

Kazell, David M.: *See*—
Sechrist, Paul A.; Lawrence, Roger R.; Micklich, Frank T.; Richardson, Larry D.; and Kazell, David M., 5,500,110, Cl. 208-173.000.

Kazui, Shinichi: *See*—
Katayama, Kaoru; Kazui, Shinichi; Iwata, Yasuhiro; Fukuda, Hiroshi; and Ohta, Toshihiko, 5,499,668, Cl. 134-1.000.

Kean, Thomas A., to Xilinx, Inc. Wildcard addressing structure for configurable cellular array. 5,500,609, Cl. 326-41.000.

Keating, Kim R., to Bristol-Myers Squibb Company. Calcium fortified beverages. 5,500,232, Cl. 426-74.000.

Keith, Marvin: *See*—
Greenwood, Mark H.; and Keith, Marvin, 5,499,729, Cl. 215-11.500.

Kel Corporation: *See*—
Arisaka, Hiroshi; Kawawada, Kenji; and Omata, Kiyoshi, 5,499,924, Cl. 439-67.000.

Kel Corporation: *See*—
Miyazawa, Shuichi, 5,499,929, Cl. 439-331.000.
Ohno, Hirofumi; Narui, Fumio; and Hayashi, Shigeru, 5,499,927, Cl. 439-285.000.

Kell, Michael, to Private Clinic Laboratories Inc. Method of determining renal clearances. 5,500,372, Cl. 436-98.000.

Keller, Wilhelm A. Manually operated actuating device. 5,499,548, Cl. 74-96.000.

Kellermann, Walter, to U.S. Philips Corporation. Transmission system comprising a sub-band echo canceller which includes a sub-band coding arrangement. 5,500,880, Cl. 375-377.000.

Kelley, Paul H., to Motorola, Inc. Power switch arrangement. 5,500,562, Cl. 307-66.000.

Kemper, Rainer. Needle bar. 5,500,275, Cl. 428-167.000.

Kemps, Morris P.: *See*—
Ferlin, Keith A.; and Kemps, Morris P., 5,499,945, Cl. 454-49.000.

Kenchel, Paul N.: *See*—
Chalberg, Philip E.; and Kenchel, Paul N., 5,499,406, Cl. 4-541.200.

Kendall, Anthony E.: *See*—
Talmon-Gros, Guenter E.; Freeman, Donald H.; Flight, Thomas A.; McCarthy, Raymond M.; and Kendall, Anthony E., 5,500,566, Cl. 313-275.000.

Kendall Company, The: *See*—
Fraas, Michael; Freazer, Reinhard; Long, Gregor; Kline, John S.; Sheridan, David S.; Fink, E. David; and Toppeza, Anthony N., 5,499,625, Cl. 128-207.150.

Kerneis, Stéphane M.: *See*—
Brunier, Régis G.; Cotto, Dominique J.; Joly, Richard G. A.; Kerneis, Stéphane M.; and Silvestrelli, Michel F. F., 5,499,519, Cl. 72-53.000.

Kerr, Adam B.; and Pauly, John M., to Leland Stanford Junior University, Board of Trustees of the. Slice profile stabilization for segmented k-space magnetic resonance imaging. 5,499,629, Cl. 128-653.200.

Kerr, Donald L.; and Looker, Jerome J., to Eastman Kodak Company. Black and white photographic elements containing release compounds and method of preparing photographic emulsion. 5,500,338, Cl. 430-611.000.

Kerry, Malcolm. Security devices for fluid flow lines. 5,499,653, Cl. 137-354.000.

Kettenring, Jürgen K.: *See*—
Malaborba, Adriano; Senaci, Pierfausto; Kettenring, Jürgen K.; and Ciabatti, Romeo, 5,500,410, Cl. 514-8.000.

Keung, Jay K.: *See*—
Heffelfinger, Michael T.; Keung, Jay K.; and Peet, Robert G., 5,500,282, Cl. 428-339.000.

Keville, Kathleen M.; Timkra, Hye K. C.; and Ware, Robert A., to Mobil Oil Corp. Method for preparing catalysts comprising zeolites extruded with an alumina binder. 5,500,109, Cl. 208-111.000.

Kheraluwala, Mustansir H.; and Schuttea, Michael J., to General Electric Company. Power distribution system for generating regulated DC output voltages using a dual active bridge converter driven from an unregulated DC source. 5,500,791, Cl. 363-17.000.

Khmara, Vladimir N.; Belotelova, Ljudmila N.; and Sergeev, Vladimir N., to Joint Stock Company En & Fi. Vortex flow blower. 5,499,900, Cl. 415-55.100.

Kida, Yasuhiko: *See*—
Harada, Hiroyuki; and Kida, Yasuhiko, 5,499,804, Cl. 271-3.020.

Kido, Akimasa: *See*—

Udagawa, Satoru; Abe, Masaki; Ando, Satoru; Matsuki, Yasuhiro; Watanabe, Toyofumi; Shiohara, Yukimitsu; Morita, Masaya; and Kido, Akimasa, 5,500,290, Cl. 428-610.000.

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Iwasaki, Hidetaru; Yonada, Koichi; Kido, Yoichi; Hosogai, Takeo; Itoi, Kazuo; and Kitayama, Masahiko, 5,500,484, Cl. 568-660.000.

Kigawa, Kazuya; Furukawa, Kenji; Deguchi, Tetsu; Inoue, Sachiharu; Endo, Noritatsu; Yanagisawa, Tatsuo; Ikegami, Shinji; Omagari, Yasuyuki; Kihara, Koji; Sugawara, Tachiki; and Shimizu, Kenzo, to All Nippon Airways Co., Ltd. Apparatus for exchanging seal of shock absorbing apparatus. 5,499,796, Cl. 254-133.00R.

Kihara, Koji: *See*—
Kigawa, Kazuya; Furukawa, Kenji; Deguchi, Tetsu; Inoue, Sachiharu; Endo, Noritatsu; Yanagisawa, Tatsuo; Ikegami, Shinji; Omagari, Yasuyuki; Kihara, Koji; Sugawara, Tachiki; and Shimizu, Kenzo, 5,499,796, Cl. 254-133.00R.

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Kijima, Junko: *See*—
Yamaguchi, Noriyuki; Kurashita, Takuji; Ishizuka, Mitsuru; Kijima, Junko; and Yao, Masahara, 5,500,686, Cl. 348-663.000.

Kikuchi, Yoshiki: *See*—
Takao, Hideaki; Murata, Tatsuo; Kashe, Junichiro; Tamura, Miki; Kanno, Masaru; Sekimura, Nobuyuki; and Kikuchi, Yoshiki, 5,500,751, Cl. 359-68.000.

Kim, Beom S.; Lee, Jin H.; and Koo, Kyoung B., to Hyundai Electronics Industries Co., Ltd. Raster format converter circuit. 5,500,577, Cl. 315-364.000.

Kim, Bo-Woo: *See*—
Lee, Seung-Chang; Yun, Sun-Jin; Kim, Bo-Woo; and Kang, Sang-Won, 5,500,389, Cl. 437-90.000.

Kim, Chan-sik: *See*—
Song, Sang-won; and Kim, Chan-sik, 5,500,813, Cl. 364-787.000.

Kim, Dong G., to Goldstar Co., Ltd. Method for fabricating thin film transistor. 5,500,380, Cl. 437-409.000.

Kim, Honggon: *See*—
Kim, Hoon Sik; Lee, Byung Gwon; Kim, Honggon; and Park, Kun You, 5,500,400, Cl. 502-306.000.

Kim, Hoon Sik; Lee, Byung Gwon; Kim, Honggon; and Park, Kun You, to Korea Institute of Science and Technology. Catalyst for producing 1,1,1,2-tetrafluoroethane and method for preparing the same. 5,500,400, Cl. 502-306.000.

Kim, Kwang; and Seo, Heui Sik, to Goldstar Co., Ltd. Device for driving minidisk player. 5,500,844, Cl. 369-77.200.

Kim, Sang H.; Li, Edward; and Mitchell, Ralph M., to Motorola, Inc. Electric motor control with integral battery charger. 5,500,579, Cl. 318-493.000.

Kim, Soon J.: *See*—
Kim, Yong H.; and Kim, Soon J., 5,500,007, Cl. 607-104.000.

Kim, Sung-Hee: *See*—
Jeon, Hak-Seong; and Kim, Sung-Hee, 5,500,887, Cl. 379-58.000.

Kim, Yong H.; and Kim, Soon J. Therapeutic, portable water bed assembly having a water heating system. 5,500,007, Cl. 607-104.000.

Kim, Yong-Woo: *See*—
Joo, Jae-Man; and Kim, Yong-Woo, 5,499,423, Cl. 15-319.000.

Kimberly-Clark Corporation: *See*—
Jessup, James L., 5,500,063, Cl. 156-85.000.
Quincy, Roger B., III; Nohr, Ronald S.; MacDonald, John G.; Gadsby, Elizabeth D.; and Everhart, Dennis S., 5,500,254, Cl. 427-387.000.

Kimoto, Keizo; Hanatani, Yasuyuki; Sakai, Hiroaki; Oki, Tsuneo; and Uemura, Mamoru, to Mita Industrial Co., Ltd. Process for packing electrophotographic photoreceptor. 5,499,486, Cl. 53-465.000.

Kimura, Akira; Watanabe, Tadashi; Inoue, Tsuyoshi; and Nakamachi, Keiichi, to Sony Corporation. Pipetting device and method therefore. 5,499,545, Cl. 73-864.180.

Kimura, Katsuji, to NEC Corporation. Differential amplifier circuit with almost linear transconductance. 5,500,623, Cl. 330-252.000.

Kimura, Makiko: *See*—
Hattori, Yoshifumi; Karita, Seiichiro; Saikawa, Hideo; Kashino, Toshio; Saito, Akio; Nakagomi, Hiroshi; Arashima, Teruo; Kimura, Makiko; Sugitani, Hiroshi; Ikeda, Masami; Saito, Asao; Masuda, Kazuaki; and Orikasa, Tsuyoshi, 5,500,666, Cl. 347-87.000.

Kinetic Concepts, Inc.: *See*—
Berkowitz, Steven A., 5,499,412, Cl. 5-453.000.

King, James G.; MacKara, Steven R.; Micktish, Daniel J.; and Spooner, David L., to Du Pont de Nemours, E. I., and Company. Holographic flake pigment. 5,500,310, Cl. 430-1.000.

King, James G.; MacKara, Steven R.; Micktish, Daniel J.; and Spooner, David L., to Du Pont de Nemours, E. I., and Company. Holographic flake pigment. 5,500,311, Cl. 430-1.000.

King, James G.; MacKara, Steven R.; Micktish, Daniel J.; and Spooner, David L., to Du Pont de Nemours, E. I., and Company. Holographic flake pigment. 5,500,313, Cl. 430-11.000.

Kinney, Anthony J., to Du Pont de Nemours, E. I., and Company. β-ketoacyl-ACP synthetase II genes from plants. 5,500,361, Cl. 435-172.300.

Kinney, Patick W.; Mahany, Ronald L.; and Koenck, Steven E., to Norand Corporation. Spread spectrum base band processor. 5,500,872, Cl. 375-208.000.

Kinney, William A.: *See*—
Soll, Richard M.; Dollings, Paul J.; and Kinney, William A., 5,500,442, Cl. 514-414.000.

Kinoonoto, Toshiaki: *See*—
Sakai, Masayasu; Seto, Toura; Kaneko, Masao; Hada, Michio; and Kinoonoto, Toshiaki, 5,500,086, Cl. 162-65.000.

Kinoshita, Itsuko; and Osaki, Akitoshi, to Mitsubishi Denki Kabushiki Kaisha. Memory system and cache memory system. 5,500,814, Cl. 365-49.000.

Kinsey, Kenneth K., Jr.: *See*—
Chen, Roger; and Kinsey, Kenneth K., Jr., 5,500,831, Cl. 365-233.000.

Kinugasa, Toshiro: *See*—
Takase, Satoshi; Imaide, Takuya; Kinugasa, Toshiro; and Nishimura, Ryuji, 5,500,674, Cl. 348-208.000.

Kiplinger, Dale V., to NCH Corporation. Air sampler. 5,500,369, Cl. 435-309.100.

Kirby, Alan J.: *See*—
Perlman, Radia J.; Kirby, Alan J.; Backes, Floyd J.; and Kaufman, Charles W., 5,500,860, Cl. 370-85.130.

Kirt, Kevin A.; Lin, Leland L.; O'Brien, Jeffrey J.; and Sheppard, Robert M., to Mobil Oil Corporation. Coated hope film and its method of manufacture. 5,500,283, Cl. 428-349.000.

Kirkbride, James F.: *See*—
Hahn, Walter B.; Jones, William J., Jr.; Kirkbride, James F.; Marcus, Ilan; and Sayder, Adrian C., 5,500,295, Cl. 428-357.000.

Kirkland, Daniel R., to White Consolidated Industries, Inc. Dishwasher with venturi drain. 5,499,640, Cl. 134-56.00D.

Kischka, Karl-Heinz; Furukawa, Toshimasa; and Maerzawa, Akiyo, to Wella Aktiengesellschaft. Method of preventing coloring of skin adjacent the hairline during dyeing of hair. 5,500,218, Cl. 424-401.000.

Kishi, Haruni: *See*—
Murata, Masami; Kishi, Haruni; Narui, Takashi; Kasai, Shuichi; and Iwasa, Akira, 5,500,221, Cl. 424-436.000.

Kishi, Mitsuhiro, to Americ Corporation. Trench shoring device with locking mechanism. 5,499,890, Cl. 405-282.000.

Kishimoto, Akihiko: *See*—
Fukumoto, Tadao; Iwamoto, Masatoshi; and Kishimoto, Akihiko, 5,500,478, Cl. 525-66.000.

Kitajima, Shinichi; Muramatsu, Hiroaki; and Kobayashi, Yoshihiko, to Honda Giken Kogyo Kabushiki Kaisha. Evaporative fuel control system in internal combustion engine. 5,499,617, Cl. 123-698.000.

Kitamura, Naomi; Miyazawa, Keiji; Daikohara, Yasushi; Tsubouchi, Hiroshi; Naka, Daiji; Takahashi, Kazuhiro; Matsui, Rie; Yoshiyama, Yoshiko; and Ishii, Takehisa, to Mitsubishi Kasei Corporation. Hepatic parenchymal cell growth factor gene encoding the same, process for producing the factor and transformants producing the factor. 5,500,354, Cl. 435-69.400.

Kitani, Masashi: *See*—
Suzuki, Etsurou; Hattori, Yoshifumi; Kitani, Masashi; Saikawa, Hideo; Kojima, Masami; Kawano, Kenji; Tanno, Koichi; and Aono, Kenji, 5,500,664, Cl. 347-86.000.

Kitaoka, Naoki; and Ohsawa, Keiji, to Nikon Corporation. Focus detection device and method of adjusting focus detection device comprising independent pupil adjustment of moveable field leases. 5,500,519, Cl. 250-201.800.

Kitayama, Masahiko: *See*—
Iwasaki, Hidetaru; Yonada, Koichi; Kido, Yoichi; Hosogai, Takeo; Itoi, Kazuo; and Kitayama, Masahiko, 5,500,484, Cl. 568-660.000.

Kittelberger, J. Stephen: *See*—
Mahabadi, Hadi K.; Agur, Enno E.; McAneney, T. Brian; Kao, Shenu V.; Allison, Gerald R.; Hawkins, Michael S.; Grushkin, Bernard; Kittelberger, J. Stephen; Chung, Joo T.; and Hollenbaugh, William H., Jr., 5,500,324, Cl. 430-137.000.

Klarer, Martin: *See*—
Brugger, Manfred F.; Klarer, Martin; Knoff, Bernd; Eckl, Albrecht; Steiner, Manfred; Rump, Siegfried; Nell, Joachim; Eckstein, Fredy; Steffl, Christoph; and Douglas, Brian, 5,499,866, Cl. 303-122.080.

Klearfold, Inc.: *See*—
Herria, Melvin B., 5,499,484, Cl. 53-458.000.

Klein Bicycle Corporation: *See*—
Klein, Gary G.; and Voss, Darrell, 5,499,864, Cl. 301-95.000.

Klein, Gary G.; and Voss, Darrell, to Klein Bicycle Corporation. Bicycle wheel rims. 5,499,864, Cl. 301-95.000.

Klein, Herbert: *See*—
Durchschlag, Gerald; and Klein, Herbert, 5,499,786, Cl. 246-448.000.

Klein, Teri E.: *See*—
Lavin, Thomas N.; Norman, Mark F.; Klein, Teri E.; and Seibel, George, 5,500,807, Cl. 364-496.000.

Kleinau, Christopher A. W.: *See*—
Shalvi, Ram; and Kleinau, Christopher A. W., 5,500,526, Cl. 250-222.100.

Kleinsorgen, Klaus: *See*—
Lichtenberg, Frank; Kleinsorgen, Klaus; and Hofmann, Günter, 5,500,309, Cl. 429-223.000.

Klenert, Oskar H., to Earth Stabilizing Technology, Inc. Earth-retaining module and system. 5,499,891, Cl. 405-284.000.

Kline, John S.: *See*—
Frass, Michael; Frenzer, Reinhard; Long, Gregor; Kline, John S.; Sheridan, David S.; Fink, E. David; and Toppees, Anthony N., 5,499,625, Cl. 128-207.150.

Klosterhuber, Robert: *See*—
Wahl, George; Dietz, Matthias; Schote, Norbert; Klosterhuber, Robert; Sommerer, Karl; Kunert, Reinhard; and Gerber, Fritz, 5,499,839, Cl. 280-701.000.

Klun, Thomas P.: *See*—
Holmes, Gary L.; Culler, Scott R.; Hardy, David H.; Hendrickson, William A.; Klun, Thomas P.; Harmon, Kimberly K.; Heiti, Robert V.; Spurgeon, Kathryn M.; and Studiner, Charles J., III, 5,500,273, Cl. 428-147.000.

Knecht, Thomas, to Motorola, Inc. Double-sided oscillator package and method of coupling components thereto. 5,500,628, Cl. 331-68.000.

Knoff, Bernd: *See*—
Brugger, Manfred F.; Klarer, Martin; Knoff, Bernd; Eckl, Albrecht; Steiner, Manfred; Rump, Siegfried; Nell, Joachim; Eckstein, Fredy; Steffl, Christoph; and Douglas, Brian, 5,499,866, Cl. 303-122.080.

Knogo North America Inc.: *See*—
Zhou, Peter Y.; Paul, Christopher R.; and Pang, Dexing, 5,500,640, Cl. 340-572.000.

Knoolhuizen, Louis D. Method and apparatus for liquid application. 5,499,474, Cl. 47-1.500.

Knott, Erwin; and Friedmann, Günter, to Stöckert Instrumente GmbH. Roller pump for heart-lung machines. 5,499,907, Cl. 417-360.000.

Knudson, Mark B.: *See*—
Shapland, James E.; Hildebrandt, Keith R.; and Knudson, Mark B., 5,499,971, Cl. 604-53.000.

Ko, Jung W.: *See*—
Stroile, Christopher H.; Patel, Chandrakant B.; Wedam, Werner F.; Schmitzler, Raymond; Weckenbrock, Hermann J.; Ko, Jung W.; Yun, Jong K.; and Limberg, Allen L., 5,500,739, Cl. 358-310.000.

Kobayashi, Katsuyuki; Tsuiishi, Shinnosuke; Tanaka, Atsushi; Yoshimura, Yuichiro; Kaneko, Kiyoshi; Yanagisawa, Ryozo; and Tokioka, Masaki, to Canon Kabushiki Kaisha. Coordinate input apparatus. 5,500,492, Cl. 178-18.000.

Kobayashi, Kei; and Shiraishi, Yoji, to Dai Nippon Printing Co., Ltd. Method of producing master and working pattern plates for etching and photolithographic apparatus therefor. 5,500,326, Cl. 430-300.000.

Kobayashi, Kinzo; and Suzuki, Shinji, to Tokico Ltd. Disk brake. 5,499,696, Cl. 188-1.110.

Kobayashi, Kiyoteru, to Mitsubishi Denki Kabushiki Kaisha. Non-volatile semiconductor memory device and manufacturing method thereof. 5,500,816, Cl. 365-185.000.

Kobayashi, Makoto: *See*—
Niino, Reiji; Ohbu, Tomoyuki; Ikegawa, Hiroaki; Nakao, Ken; Fujita, Yoshiyuki; Haraoka, Tsutomu; Kobayashi, Makoto; Kaneda, Naoya; and Kumada, Hiroshi, 5,500,388, Cl. 437-89.000.

Kobayashi, Masaaki: *See*—
Iwatsuka, Shinji; Kobayashi, Masaaki; and Hata, Kenjiro, 5,500,915, Cl. 385-78.000.

Kobayashi, Masaharu: *See*—
Sakumoto, Yukinori; Hashimoto, Takeshi; Nakaba, Katsuji; Kobayashi, Masaharu; Nishigaya, Takeshi; and Yamanashi, Fumiyoshi, 5,500,294, Cl. 428-355.000.

Kobayashi, Miho: *See*—
Arakawa, Kenichi; Sasano, Nobusuke; Iizuka, Tomoaki; Kobayashi, Miho; Yamada, Tetsuo; and Motoyama, Hideki, 5,500,675, Cl. 348-319.000.

Kobayashi, Yoshihiko: *See*—
Kitajima, Shinichi; Muramatsu, Hiroaki; and Kobayashi, Yoshihiko, 5,499,617, Cl. 123-698.000.

Koch, James, to Koch, James. Reel display and dispensing rack. 5,499,727, Cl. 211-193.000.

Koch, Karl W., III: *See*—
Chakmakjian, Stephen H.; Gruneisen, Mark T.; Koch, Karl W., III; and Moore, Gerald T., 5,500,865, Cl. 372-22.000.

Koch, Russell W.; Turner, John L.; Walenga, Guy J.; Takigawa, Hiroyoshi; and Okamoto, Keizo, to Bridgestone/Firestone, Inc. Method for embedding a monitoring device within a tire during manufacture. 5,500,065, Cl. 156-123.000.

Kodera, Akira: *See*—
Tanaka, Toshiyuki; Kodera, Akira; and Aishima, Shizuo, 5,499,768, Cl. 239-406.000.

Koenck, Steven E.: *See*—
Kinney, Patick W.; Mahany, Ronald L.; and Koenck, Steven E., 5,500,872, Cl. 375-208.000.

Koenig, Reinhard: *See*—
Martin, Ulrich; and Koenig, Reinhard, 5,500,411, Cl. 514-12.000.

Koerner, John E.: *See*—
Carr, Albert A.; Dage, Richard C.; Koerner, John E.; Li, Tung; Miller, Francis P.; Nieduzak, Thaddeus R.; Dudley, Mark W.; Schmidt, Christopher J.; and Frank, Robert A., 5,500,433, Cl. 514-330.000.

Koezuka, Hiroshi: *See*—
Tsumura, Akira; Fuchigami, Hiroyuki; Nobutoki, Hideharu; and Koezuka, Hiroshi, 5,500,537, Cl. 257-40.000.

Koh, Yo H.: *See*—
Park, Chan K.; Koh, Yo H.; Hwang, Seong M.; and Roh, Kwang M., 5,500,544, Cl. 257-296.000.

Kohara, Naoki: *See*—
Wada, Takahiro; Ikeda, Mitsusuke; Nishitani, Mikihiko; Terauchi, Masaharu; Negami, Takayuki; and Kohara, Naoki, 5,500,056, Cl. 136-259.000.

Kohjin Co., Ltd.: *See*—
Kubota, Yoshikazu; Kamijo, Masayasu; Otsu, Hiroshi; and Kamiya, Takashi, 5,500,259, Cl. 428-15.000.

Kohl, Garrett W., to Kraft Foods, Inc. Reclosable, removable cap for reusable shaker dispenser bottle. 5,499,736, Cl. 220-254.000.

Kohler, Herbert: *See*—
Nieder, Wolfgang; Winkler, Manfred; Perchtold, Gerhard; Seirlehner, Leo; Kohler, Herbert; and Eberle, Arwed, 5,500,032, Cl. 75-414.000.

Kohno, Hiroshige: *See*—
Hayashi, Toshihiro; Kohno, Hiroshige; Watanabe, Akinori; and Horiguchi, Itaru, 5,500,178, Cl. 264-297.800.

Kohno, Isao: *See*—
Soe, Gilbu; Kohno, Isao; and Tanaka, Michiyo, 5,500,345, Cl. 435-7.100.

Koike, Shoji; Haruta, Masahiro; Shirota, Koromo; Yamamoto, Tomoya; and Suzuki, Mariko, to Canon Kabushiki Kaisha. Ink-jet printing process, ink set for use in such process, and processed article obtained thereby. 5,500,023, Cl. 8-499.000.

Koitabashi, Hideki; Yanagihara, Masamitsu; and Hazama, Junji, to Nikon Corporation. Method of detecting positions. 5,500,736, Cl. 356-375.000.

Koitabashi, Noribumi: *See*—
Matsubara, Miyuki; Hirabayashi, Hironitsu; Nagoshi, Shigeyasu; Koitabashi, Noribumi; Sagimoto, Hitoshi; Gotoh, Fumihiro; and Uetuki, Masaya, 5,500,661, Cl. 347-41.000.

Kojima, Hiroshi, to Bridgestone Corporation. Vibration isolating apparatus. 5,499,799, Cl. 267-140.130.

Kojima, Kunio: *See*—
Miyake, Tomoyuki; Inui, Toshiharu; Akiyama, Jun; and Kojima, Kunio, 5,500,839, Cl. 369-13.000.

Kojima, Masami: *See*—
Suzuki, Etsurou; Hattori, Yoshifumi; Kitani, Masashi; Saikawa, Hideo; Kojima, Masami; Kawano, Kenji; Tanno, Koichi; and Aono, Kenji, 5,500,664, Cl. 347-86.000.

Kojima, Shinji: *See*—
Kanewada, Makoto; and Kojima, Shinji, 5,499,590, Cl. 112-302.000.

Kokaram, Anil C., to AVT Communications Limited. Wiener filter for filtering noise from a video signal. 5,500,685, Cl. 348-620.000.

Kokoszka, Marek K.: *See*—
West, Jack T.; Annen, James H.; Schneider, Daniel A.; and Kokoszka, Marek K., 5,500,308, Cl. 429-171.000.

Kokubu, Norihide: *See*—
Yanagisawa, Masahisa; Tamura, Yuki; and Kokubu, Norihide, 5,500,390, Cl. 437-120.000.

Kokubu, Sadao, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Abnormal condition signal transmitting device for a rotating body. 5,500,637, Cl. 340-447.000.

Kolb, Robert E.: *See*—
Grootaert, Werner M.; Kolb, Robert E.; and Millet, George H., 5,500,042, Cl. 106-287.110.

Kolinsky, Jay N. Method for applying a surface treatment agent onto a surface. 5,500,049, Cl. 134-6.000.

Komada, Norikazu; Nishinaka, Keiji; Adachi, Kazunori; and Fujiwara, Shuji, to Mitsubishi Materials Corporation. UO2 pellet and method for production thereof. 5,500,158, Cl. 252-637.000.

Komatsuda, Takashi: *See*—
Kato, Hiroaki; Shimazaki, Yuichi; Saito, Akihisa; Komatsuda, Takashi; Okutani, Toshikazu; Haccho, Seiji; Matsumoto, Seiji; Aoki, Takuya; and Miyashita, Yukio, 5,499,501, Cl. 60-286.000.

Komine, Hiroshi, to Northrop Grumman Corporation. Compact large aperture optical transmitter/receiver for lidars employing a plurality of cassegrain optics and optical fibers. 5,500,520, Cl. 250-203.100.

Kondakov, Stanislav F., to Composite Materials, Inc. Fire-resistant and thermal shock-resistant composite ceramic material and method of making same. 5,500,394, Cl. 501-89.000.

Kondo, Akihiro: *See*—
Miyamura, Tsuyoshi; Sano, Mutsumi; Kondo, Akihiro; and Kato, Ikuoshin, 5,500,342, Cl. 435-4.000.

Kondo, Mitsuo: *See*—
Hiki, Susumu; Kondo, Mitsuo; and Abe, Kenji, 5,499,630, Cl. 128-662.050.

Kondo, Shigeo: *See*—
Minami, Tsutomu; Tatsumisago, Masahiro; Takada, Kazunori; and Kondo, Shigeo, 5,500,291, Cl. 429-206.000.

Kondo, Tetsuo; and Murakami, Akihiko, to Kabushiki Kaisha Inoac Corporation. Method and die apparatus for producing plastic molding having foam with skin. 5,500,169, Cl. 264-46.500.

König, Heribert; and Stark, Heinz, to Mannesmann Aktiengesellschaft. Process and device for the extraction of valuable substances. 5,500,870, Cl. 373-78.000.

Koninklijke Auping B.V.: *See*—
Assink, Bernardus A. T. F., 5,499,410, Cl. 5-411.000.

Koninklijke PTT Nederland N.V.: *See*—
De Blok, Cornelis M., 5,500,757, Cl. 359-189.000.

Konno, Toshikazu, to Sony Corporation. Tape cassette container casing. 5,499,714, Cl. 206-387.130.

Koo, Kyoung B.: *See*—
Kim, Beom S.; Lee, Jin H.; and Koo, Kyoung B., 5,500,577, Cl. 315-364.000.

Koopman, Nicholas G.: *See*—
Bobbio, Stephen M.; Koopman, Nicholas G.; and Nangalia, Sundeep, 5,499,754, Cl. 228-42.000.

Koptenko, Sergei V.: *See*—
Guigné, Jacques Y.; Barnatz, Martin B.; Jackson, Henry W.; and Koptenko, Sergei V., 5,500,493, Cl. 181-0.500.

Kordak, Rolf; Reinert, Michael; and Maxeiner, Thassilo, to Mannesmann Rexroth GmbH. Hydraulic drive for a sheet metal forming press. 5,499,525, Cl. 72-453.030.

Kordis, Thomas F., to EP Technologies, Inc. Flexible interlaced multiple electrode assemblies. 5,499,981, Cl. 606-41.000.
Korea Institute of Science and Technology: *See*—
Kim, Hoon Sik; Lee, Byung Gwon; Kim, Honggon; and Park, Kun You, 5,500,400, Cl. 502-306.000.
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Rhee, Sah B.; Lee, Myong-Hoon; Lee, Chang-Jin; and Moon, Bong S., 5,500,474, Cl. 524-714.000.
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Sekine, Hidenobu, 5,499,933, Cl. 439-482.000.
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Handel, Gary A.; Jonovic, John A.; and Krueger, Otto L., 5,499,575, Cl. 99-349.000.
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Kudoh, Norimasa, to Kabushiki Kaisha Toshiba. CRC operational system. 5,500,863, Cl. 371-37.100.
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Kuenzel, Kenneth J.: *See*—
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Horiuchi, Yasuo; and Kuninaka, Hitoshi, 5,500,052, Cl. 136-244.000.
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Kuo, Shun-Meen: *See*—
Foley, Barbara M.; Galloway, David; Kuo, Shun-Meen; and Chun, Christopher K. Y., 5,500,914, Cl. 385-77.000.
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Cheng, Kuang-Chung; Tsai, Meng-Jin; Kuo, Ta-Chi; and Su, Kuo-Juan, 5,500,545, Cl. 257-341.000.
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Iwasaki, Hideharu; Yoneda, Koichi; Kido, Yoichi; Hosogai, Takeo; Itoi, Kazuo; and Kitayama, Masahiko, 5,500,484, Cl. 568-660.000.
Kurashita, Takuji: *See*—
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Kurek, Stephen R.; and Schroeder, David, to Liviton Manufacturing Co., Inc. Rocker-type electrical switch. 5,500,498, Cl. 200-556.000.
Kurihara, Kaori, to NEC Corporation. Vertical-to-surface transmission electro-photonic device with ion implanted current control regions. 5,500,868, Cl. 372-46.000.
Kurihara, Katsuhide, to Fujitsu Limited. Graphic data parallel processing and displaying apparatus with increased data storage efficiency. 5,500,939, Cl. 395-163.000.
Kuroda, Akira: *See*—
Nogami, Taro; Matsuura, Shunichi; and Kuroda, Akira, 5,500,536, Cl. 250-458.100.
Kuroshima, Masashi; Hara, Hiroyuki; and Machida, Haruo, to Canon Kabushiki Kaisha. Image processing apparatus utilizing the JBIG method, having a compression/expansion circuit to manage memory more effectively. 5,500,923, Cl. 395-114.000.
Kurtenbach, Gordon P.: *See*—
Morse, Thomas P.; and Kurtenbach, Gordon P., 5,500,935, Cl. 395-156.000.
Kusanagi, Shigekazu: *See*—
Okada, Atsunori; Wada, Shigeaki; Kusanagi, Shigekazu; and Fujioka, Tohru, 5,500,571, Cl. 313-635.000.
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Heinzel, Eberhard, 5,499,883, Cl. 403-219.000.
Kusumoto, Tadashi: *See*—
Nakamura, Hiroaki; and Kusumoto, Tadashi, 5,500,568, Cl. 313-503.000.
Kuwahara, Naruo: *See*—
Hatasaka, Takefumi; and Kuwahara, Naruo, 5,500,581, Cl. 318-727.000.
Kuwayama, Masahiko; and Yamamoto, Yoshihiro, to Samsung Aerospace Industries, Ltd. Color printer for printing photographs. 5,500,713, Cl. 355-27.000.
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Kuznetsov, Edward S.; and Kuznetsov, Maxim E. Information display stand. 5,499,467, Cl. 40-504.000.
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Lynum, Steinar; Haugsten, Kjell; Hox, Ketil; Hugdahl, Jan; and Myklebust, Nils, 5,500,501, Cl. 219-121.480.
Kyung Pook National University Sensor Technology Research Center: *See*—
Lee, Joog H., 5,500,078, Cl. 156-628.100.
Kyuno, Mitsuyasu; Mizuno, Masahiro; Futamura, Masao; and Muto, Yukiyoshi, to Brother Kogyo Kabushiki Kaisha. Method and apparatus for producing image data to be used by embroidery data processing apparatus. 5,499,589, Cl. 112-102.500.
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Bustos, Rafael T., 5,499,513, Cl. 62-252.000.
LaBash, Stephen S. Breast biopsy apparatus and method of use. 5,499,989, Cl. 606-130.000.
LaCour, Kevin E.: *See*—
Deoms, James H.; Mileaf, Daryl S.; LaCour, Kevin E.; Rodriguez, Noe E., II; Leginus, Joseph M.; Johnson, Scott D.; Kapraun, Richard C.; and Young, Richard M., 5,500,187, Cl. 422-58.000.
Ladin, Beth F.: *See*—
Christianson, Teresa; Goddette, Dean; Ladin, Beth F.; Lau, Maria R.; Paech, Christian; Reynolds, Robert B.; Wilson, Charles R.; and Yang, Shiow-Shong, 5,500,364, Cl. 435-221.000.
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Cotteret, Jean; Audousset, Marie P.; LaGrange, Alain; and Vandenbosche, Jean J., 5,500,021, Cl. 8-408.000.
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Barnette, William E.; Harrison, Charles R.; Lahm, George P.; Piotrowski, David W.; and Wing, Keith D., 5,500,438, Cl. 514-403.000.
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Gistau-Baguer, Guy, 5,499,505, Cl. 62-9.000.
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Nagamura, Takashi; and Tomita, Shinji, 5,499,506, Cl. 62-11.000.
Lam, Steve P.: *See*—
Fujita, Yosuke; and Lam, Steve P., 5,500,794, Cl. 364-188.000.
Lam, Wai-Man, to Thomson Consumer Electronics, Inc. System for detecting a video signal image intensity gradient. 5,500,689, Cl. 348-699.000.
Lamouri, Aazdine: *See*—
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Ambrogi, Christine J. M.; Anaart, Denis R. H.; Lancelot, Eric J. S.; and Meunier, Serge M., 5,499,499, Cl. 60-39.320.
Lancer Corporation: *See*—
Hawkins, John T., 5,499,744, Cl. 222-129.100.
Landspurg, David A.: *See*—
Steiner, Anton J.; Landspurg, David A.; and Winquist, Robert A., 5,499,984, Cl. 606-80.000.
Langdon, Fred M.; Ouellette, William R.; and Burchnall, John B., to Procter & Gamble Company, The. Capillary laminate material. 5,500,270, Cl. 428-119.000.
Langenecker, Kenneth C.: *See*—
Paach, Roger M.; and Langenecker, Kenneth C., 5,500,271, Cl. 428-135.000.
Langer, Robert S.: *See*—
Andrianov, Alexander K.; and Langer, Robert S., 5,500,161, Cl. 264-8.000.
Langham, Arvin L.: *See*—
Jacobsen, Ingolf G.; and Langham, Arvin L., 5,499,934, Cl. 439-585.000.
Langhans, Stephen; Goodman, Laureace M.; and Shapiro, Sigman, to Visa International. Automated purchasing control system. 5,500,513, Cl. 235-380.000.
Lanxide Technology Company, LP: *See*—
Roach, Philip J., 5,500,182, Cl. 419-45.000.
Lanzilotti, Michael G.: *See*—
Lawter, James R.; and Lanzilotti, Michael G., 5,500,228, Cl. 424-486.000.
Laplace, Carl: *See*—
Bellin, Michael A.; Laplace, Carl; Trainor, John J.; and Hoffmann, Mark, 5,500,806, Cl. 364-492.000.
Larsson, Krister; Meilbrand, Thomas; Mörnstam, Birgitta; Roechester, Jan; and Sköldblick, Jan-Åke, to Ferring AB. Process for manufacture of 1-deamino-8-D-arginine vasopressin. 5,500,413, Cl. 514-15.000.
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Lawson, William E., 5,500,506, Cl. 219-121.670.
Laser Precision Corp.: *See*—
Johnson, Robert W., 5,500,730, Cl. 356-73.100.
Laskowski, Edward J.: *See*—
Cirelli, Raymond A.; Henry, Charles H.; Laskowski, Edward J.; Milbrodt, Michele A.; and Yaffe, Henry H., 5,500,916, Cl. 385-37.000.
Lasota, Andrew M.: *See*—
George, Robert C.; and Lasota, Andrew M., 5,500,211, Cl. 424-73.000.
Laturell, Donald R.: *See*—
Archibald, James L.; and Laturell, Donald R., 5,499,923, Cl. 439-26.000.
Lau, Alfred T., to Sensen Investments Limited. Cleaning device for hard and flat surfaces. 5,499,424, Cl. 15-322.000.
Lau, Felix P.; Bredahl, Timothy D.; and Cox, George E., to Minnesota Mining and Manufacturing Company. Adhesive compositions with improved plasticizer resistance. 5,500,293, Cl. 428-355.000.
Lau, Maria R.: *See*—
Christianson, Teresa; Goddette, Dean; Ladin, Beth F.; Lau, Maria R.; Paech, Christian; Reynolds, Robert B.; Wilson, Charles R.; and Yang, Shiow-Shong, 5,500,364, Cl. 435-221.000.
Laudon, Moshe; and Zisapel, Nava, to Neurim Pharmaceuticals (1991) Ltd. Method for determination of urine components and for preventing sudden infant death syndrome. 5,500,225, Cl. 424-464.000.
Läufer, Engelbert: *See*—
Kühn, Hans-Robert; Storz, Dieter; Läufer, Engelbert; Hoch, Peter; and Fildner, Friedrich, 5,500,845, Cl. 369-112.000.
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Oikawa, Yoshio, 5,499,483, Cl. 53-53.000.
Lauser, Wolfgang, to Werner & Pfleiderer GmbH. Device for adjusting the pressure of the plastic material in a screw extruder. 5,499,869, Cl. 366-77.000.
Lavazoli, Rudi. Rotating head tooth brush. 5,499,422, Cl. 15-167.100.
Lavielle, Gilbert; Hautefaye, Patrick; Muller, Olivier; Millan, Mark; and Brocco, Mauricette, to Adir et Compagnie. New benzodioxane compounds. 5,500,443, Cl. 514-422.000.
Lavin, Thomas N.; Norman, Mark F.; Klein, Teri E.; and Seibel, George, to University of California, The Regents of the. Selection method for pharmacologically active compounds. 5,500,807, Cl. 364-496.000.
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Sechrist, Paul A.; Lawreace, Roger R.; Micklich, Frank T.; Richardson, Larry D.; and Kazell, David M., 5,500,110, Cl. 208-173.000.
Lawson, David F.; Antkowiak, Thomas A.; Hall, James E.; and Stayer, Mark L., Jr., to Bridgestone Corporation. Anionic polymerization initiators containing adducts of cyclic secondary amines and conjugated dienes, and products therefrom. 5,500,447, Cl. 524-571.000.
Lawson, James L.: *See*—
Godec, Maksimilijan; and Lawson, James L., 5,499,452, Cl. 29-898.067.
Lawson, William E., to Laser Machining, Inc. Optical system for positioning laser beams in a straight or angular position. 5,500,506, Cl. 219-121.670.

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Le, Tam T., to SGS-Thomson Microelectronics, Inc. Methodology to quickly isolate functional failures associated with integrated circuit manufacturing defects. 5,500,603, Cl. 324-751.000.

Leary, John W.: *See*—
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Thomas, Gerhard; Wutz, Karl; and Lechner, Klaus, 5,500,784, Cl. 361-704.000.

LeClercq, Guy E. O.: *See*—
Gallo, Claude; and LeClercq, Guy E. O., 5,499,651, Cl. 137-334.000.

Ledbetter, Jeffrey A.: *See*—
Robinson, Randy R.; Liu, Alvin Y.; and Ledbetter, Jeffrey A., 5,500,362, Cl. 435-7.230.

Lee, Byung Gwon: *See*—
Kim, Hoon Sik; Lee, Byung Gwon; Kim, Honggon; and Park, Kun You, 5,500,400, Cl. 502-306.000.

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Allen, Susan D.; and Lee, Changhun, 5,500,913, Cl. 385-48.000.

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Park, Kang-Ho; Ha, Jeong-Sook; Park, Seong-Ju; and Lee, El-Hang, 5,500,047, Cl. 118-724.000.

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Rhee, Suh B.; Lee, Myong-Hoon; Lee, Chang-Jin; and Moon, Bong S., 5,500,474, Cl. 524-714.000.

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Leenhouts, Timothy J.; and Maier, Gary J., to Xerox Corporation. Bowed shape electroforms. 5,500,105, Cl. 205-67.000.

Lee-Own, F. Victor; and Fitzpatrick, Judith, to Serex, Inc. Integrated packaging-holder device for immunochromatographic assays in flow-through or dipstick formats. 5,500,375, Cl. 436-514.000.

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Wendt, Hermann; Willer, Josef; Reisinger, Hans; and Lehmann, Volker, 5,500,385, Cl. 437-60.000.

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Kerr, Adam B.; and Pauly, John M., 5,499,629, Cl. 128-653.200.
Smith, Julius O., III, 5,500,486, Cl. 84-622.000.

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Atkins, Robert M.; Lemaire, Paul J.; Mizrahi, Victor; and Walker, Kenneth L., 5,500,031, Cl. 65-386.000.

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Westphal, Paul; and Buhl, Reinhard, 5,499,550, Cl. 74-422.000.

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Lenz, Robert L.: *See*—
Moyers, Chester E.; and Lenz, Robert L., 5,500,490, Cl. 174-151.000.

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Raymond, Jean-Louis; Chen, Yunwei; and Lerner, Richard A., 5,500,358, Cl. 435-156.000.

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Donaldson, Charles W.; Miller, Kenneth E.; Lestage, John J.; and Gassner, Randall C., 5,500,737, Cl. 356-376.000.

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Rando, Joseph F., 5,500,524, Cl. 250-216.000.

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Harbour, Richard, 5,499,730, Cl. 215-382.000.

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Helliwell, John F., 5,500,152, Cl. 252-547.000.
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Suresh, Robert G.; and Lewis, Craig C., 5,500,328, Cl. 430-347.000.

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Ley, Tom, to LSI Logic Corporation. Multi-layer semiconductor package substrate with thermally-conductive prepeg layer. 5,500,555, Cl. 257-700.000.

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Han, Byoung Y., 5,500,822, Cl. 365-200.000.

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Kim, Sang H.; Li, Edward; and Mitchell, Ralph M., 5,500,579, Cl. 318-493.000.

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Barbee, Steven G.; Heinz, Tony F.; Haiso, Yiping; Li, Leping; Ratzlaff, Eugene H.; and Wong, Justin W., 5,500,073, Cl. 156-345.000.

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Carr, Albert A.; Dage, Richard C.; Koerner, John E.; Li, Tung; Miller, Francis P.; Niedzwiak, Thaddeus R.; Dudley, Mark W.; Schmidt, Christopher J.; and Frank, Robert A., 5,500,433, Cl. 514-330.000.

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Liedenbaum, Coen T. H. F.; and Reid, John J. E., to U.S. Philips Corporation. Optical switch and transmitter and receiver for a multiplex transmission system including such a switch. 5,500,908, Cl. 385-5.000.

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Ionescu, Adrian, 5,500,575, Cl. 315-307.000.





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Strolle, Christopher H.; Patel, Chandrakant B.; Wedam, Werner F.; Schnitzler, Raymond; Weckenbrock, Hermann J.; Ko, Jung W.; Yun, Jong K.; and Limberg, Allen L., 5,500,739, Cl. 358-310.000.

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Behrens, Gunnar; Blöhdorn, Gerhard; and Penza, Hans, 5,500,656, Cl. 346-136.000.

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Garman, Gary; and Chow, James C. Y., 5,499,991, Cl. 606-148.000.
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Liu, Leland L.: *See*—
Kirk, Kevin A.; Liu, Leland L.; O'Brien, Jeffrey J.; and Sheppard, Robert M., 5,500,283, Cl. 428-349.000.

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Chan, Wai Y. C.; and Livingston, James W., 5,500,050, Cl. 134-18.000.

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Kurek, Stephen R.; and Schroeder, David, 5,500,498, Cl. 200-556.000.

Locher, Hermann, to Giroflex-Entwicklungs-AG. Chair, in particular office chair. 5,499,861, Cl. 297-301.200.

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Reed, Gary J., 5,499,892, Cl. 411-5.000.

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Profio, Richard L.; and Loeber, Frederick W., 5,499,463, Cl. 37-398.000.

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Hamburg, Douglas R.; and Logothetis, Eleftherios M., 5,499,500, Cl. 60-274.000.

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Kühnhold, Wolfgang; and Beier, Rudolf, 5,499,884, Cl. 403-359.000.

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Carletti, Vittorio; Longhini, Gianfranco; Po', Riccardo; Podesta', Roberto; Romano, Anna M.; and Querci, Cecilia, 5,500,285, Cl. 428-364.000.

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López, Jorge L., to Separacor, Inc. Membrane filtration process for 6-aminopenicillanic acid. 5,500,352, Cl. 435-44.000.

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Cotteret, Jean; Andounet, Marie P.; LaGrange, Alain; and Vandenbooche, Jean J., 5,500,021, Cl. 8-408.000.
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Wingert, Horst; Sauter, Hubert; Ammermann, Eberhard; Lorenz, Gisela; Saur, Reinhold; Schelberger, Klaus; and Hampel, Manfred, 5,500,441, Cl. 514-412.000.
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Low, Peter: *See*—
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Eccles, Harry; Garnham, Geoffrey W.; Lowe, Christopher R.; and Bruce, Neil C., 5,500,351, Cl. 435-25.000.

Lowndes, Douglas H.; and McCamy, James W., to Martin Marietta Energy Systems, Inc. Method for continuous control of composition and doping of pulsed laser deposited films by pressure control. 5,499,599, Cl. 117-50.000.

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Jerbic, Chris, 5,500,076, Cl. 156-626.100.
Ley, Tom, 5,500,555, Cl. 257-700.000.

Lu, Clive S. Hollow club head with deflecting insert face plate. 5,499,814, Cl. 273-78.000.

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Chen, Tsiu C.; Bryant, Frank R.; Lu, Lun-Tseng; and Wei, Che-Chia, 5,500,557, Cl. 257-758.000.

Lu, Ying-Yuh: *See*—
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Lucas Industries Public Limited Company: *See*—
Chan, Anthony S. B., 5,499,534, Cl. 73-116.000.
Willacy, Stephen J., 5,499,549, Cl. 74-422.000.

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Lucich, Todd C.; Krome, Edward F., Jr.; Howe, Michael G.; Fields, Larry D.; and Mihelick, Joseph R., to Reliance Electric Industrial Company. Method of assembling a maintenance friendly variable speed belt drive. 5,499,437, Cl. 29-402.030.

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Bevk, Jose; Feldman, Leonard C.; Gossmann, Hans-Joachim L.; Luftman, Henry S.; and Yan, Ran-Hong, 5,500,391, Cl. 437-131.000.

Luikart, Myron E.; Pezak, Edward A.; Kuhns, Howard C. B.; and Volcansek, Steven J., to Crawford Fitting Company. Tube bender apparatus. 5,499,521, Cl. 72-157.000.

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Eshraghian, Kamran; and Abbott, Derek, 5,500,522, Cl. 250-208.100.

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Goethals, Walther A. E., 5,500,866, Cl. 372-32.000.

Lund, Gary K.; and Blau, Reed J., to Thiokol Corporation. Anhydrous 5-aminotetrazole gas generant compositions and methods of preparation. 5,500,059, Cl. 149-19.100.

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Luopa, Jyrki: *See*—
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Luther, Willis J., to Canon Information Systems, Inc. Graphics user interface for controlling text-to-speech conversion. 5,500,919, Cl. 395-2.690.

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Cieri, Mark A., 5,499,930, Cl. 439-417.000.

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Litvak, Herbert E., 5,499,733, Cl. 216-38.000.

Lwee, Nai H., to Du Pont de Nemours, E. I., and Company. Connector device. 5,499,925, Cl. 439-157.000.

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Lynch, Robert W., Jr. Folding chair. 5,499,857, Cl. 297-162.000.
Lysum, Steinar; Haugsten, Kjell; Hox, Ketil; Hugdahl, Jan; and Myklebust, Nils, to Kvaerner Engineering A.S. Torch device for chemical processes. 5,500,501, Cl. 219-121.480.
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Maas, Charles A.: *See—*
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MAC Valves, Inc.: *See—*
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MacDonald, John G.: *See—*
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Machida, Haruo: *See—*
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Macholdt, Hans-Tobias: *See—*
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Mackara, Steven R.: *See—*
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MacLauchlan, Daniel T.: *See—*
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Macromodia, Inc.: *See—*
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Maeda, Hidekatsu: *See—*
Tsira, Kazunari; Nishikawa, Satoshi; and Maeda, Hidekatsu, 5,500,357, Cl. 435-91.310.
Maeda, Ikuo; and Sugahara, Hirohide, to Fujitsu Limited. Apparatus and method for controlling a system bus of a multiprocessor system. 5,500,945, Cl. 395-185.090.
Maeda, Mikio: *See—*
Sato, Mitsuhisa; Maeda, Mikio; and Furukawa, Shinichi, 5,500,731, Cl. 356-73.100.
Maeda, Takashi; Kubota, Shuichi; Furukido, Takashi; and Nishio, Toshiyuki, to Oiles Corporation. Spherical annular seal. 5,499,825, Cl. 277-100.000.
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Maekawa, Takashi: *See—*
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MAG Maschinen: *See—*
Novak, Heinrich; Berthold, Herbert; Barta, Gerhard; and Pichler, Hans-Peter, 5,499,774, Cl. 242-47.030.
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Mahebadi, Hadi K.; Agur, Enso E.; McAneney, T. Brian; Kao, Shaw V.; Allison, Gerald R.; Hawkins, Michael S.; Grushkin, Bernard; Kittelberger, J. Stephen; Chung, Joo T.; and Hollenbaugh, William H., Jr., to Xerox Corporation. Processes for low melt crosslinked toner resins and toner. 5,500,324, Cl. 430-137.000.
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Mahood, James A., to General Electric Company. Phosphite coated polymeric particles. 5,500,458, Cl. 523-205.000.
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Maiese, Kenneth, to Cornell Research Foundation, Inc. Metabotropic glutamate receptor agonists in the treatment of cerebral ischemia. 5,500,420, Cl. 514-131.000.
Maiboefer, Bernd: *See—*
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Maine, Kristine P.; Olds, Keith A.; and Daviesn, Gerald J., to Motorola, Inc. Geolocation responsive radio telecommunication system and method therefor. 5,500,648, Cl. 342-357.000.
Makino, Kenzi; Akiyama, Shigeaki; Suzuki, Hideaki; Nagaoka, Takeshi; Niki, Toshio; Suzuki, Koichi; Nawanaki, Tutomu; Watanabe, Shigeomi; and Ishikawa, Kimihiro, to Nissan Chemical Industries Ltd. Iminosulfonylurea dirivatives and herbicides. 5,500,406, Cl. 504-215.000.
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Makovec, Francesco; Rovati, Luigi A.; and Rovati, Lucio C., to Rotta Research Laboratorium S.p.A. Amidic derivatives of glutamic, aspartic and 2-amino adipic acids, a process for preparing same, and anti-gastrin composition containing the derivatives. 5,500,430, Cl. 514-278.000.
Malaberba, Adriano; Senaci, Pierfausto; Kettenring, Jürgen K.; and Ciabatti, Romeo, to Gruppo Lepetit S.p.A. Substituted alkylamide derivatives of teicoplanin. 5,500,410, Cl. 514-8.000.
Malhotra, Shadi L.; Gundlach, Kurt B.; and Colt, Richard L., to Xerox Corporation. Recording sheets for printing processes using microwave drying. 5,500,668, Cl. 347-105.000.
Mammone, Robert J.: *See—*
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MAN Roland Druckmaschinen AG: *See—*
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Managed Pollution Systems Limited: *See—*
Potter, Michael S.; and Pitwood, Arthur S., 5,500,114, Cl. 210-394.000.
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Mando Machinery Corporation: *See—*
Lee, Jong H., 5,500,078, Cl. 156-628.100.
Manico, Joseph A., to Eastman Kodak Company. Pressure-sensitive switch for talking picture frame. 5,499,465, Cl. 40-152.000.
Manifold, William J. Spraying device having a removable and replaceable bladder. 5,499,750, Cl. 222-386.500.
Mann, Jean-Pierre: *See—*
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König, Heribert; and Stark, Heinz, 5,500,870, Cl. 373-78.000.
Mannesmann Rexroth GmbH: *See—*
Kordak, Rolf; Reinert, Michael; and Maxeiner, Thassilo, 5,499,525, Cl. 72-453.030.
Manning, Kevin C.: *See—*
Roe, Donald C.; Davis, Dwight P.; Manning, Kevin C.; and Bockowski, Edmund J., 5,500,220, Cl. 424-410.000.
Manns, James M.: *See—*
Addesso, Kevin; Dzurenko, Theresa E.; Moisey, Mark J.; Levine, Harry; Slade, Louise; Manns, James M.; Fazzolare, Richard D.; Ievolella, James; and Wang, Martha Y., 5,500,240, Cl. 426-560.000.
Marconi Inc.: *See—*
Barbeau, Claude; and Cochran, Ross, 5,499,663, Cl. 139-420.00A.
Marchiorello, Piero. Article of men's underwear having shirred frontal fly opening. 5,499,404, Cl. 2-403.000.
Marcus, Ilan: *See—*
Halm, Walter B.; Jones, William J., Jr.; Kirtbride, James F.; Marcus, Ilan; and Snyder, Adrian C., 5,500,295, Cl. 428-357.000.
Marder, Seth R.; Chen, Chin-Ti; and Cheng, Lap-Tak, to California Institute of Technology. Unsymmetrical squarines for nonlinear optical materials. 5,500,156, Cl. 252-582.000.
Marechal, Robert R., to Societe Industrielle et Commerciale de Materiel Aeronautique. Underframe for a passenger aircraft seat, the underframe including an attached energy-absorption device. 5,499,783, Cl. 244-122.00R.
Margaria, Thomas: *See—*
Faure, Pierre; and Margaria, Thomas, 5,500,399, Cl. 502-244.000.
Martandey, Vishal; and Reid, Anthony, to Texas Instruments Incorporated. System and method for indicating a change between images. 5,500,904, Cl. 382-103.000.
Marks, Tobin J.; and Yang, Xinmin, to Northwestern University. Homogeneous α-olefin dimerization catalysts. 5,500,398, Cl. 502-103.000.
Mars Incorporated: *See—*
Weston, John A.; and Bailey, John W., 5,499,944, Cl. 453-17.000.
Youcheff, Gary G.; Wodke, Stephen M.; and Perkins, Douglas W., 5,500,233, Cl. 426-89.000.
Marsden, Alan. Oil purification. 5,500,093, Cl. 196-46.000.
Marshall, Paul A., to Pilkington plc. Substrate for a magnetic disc and manufacture thereof. 5,499,731, Cl. 216-22.000.
Marshall, Richard: *See—*
Edwards, Stanley H., Jr.; Marshall, Richard; and Robbins, Tony R., 5,500,630, Cl. 335-132.000.
Martin, Alan; and Albon, Richard, to Plessey Semiconductors Limited. Memory defect detection arrangement. 5,500,823, Cl. 365-201.000.
Martin, Charles A. Method for preheating a reactor feed. 5,500,034, Cl. 75-505.000.



Martin, David L.: *See—*
Oertel, Hans-Wolfgang; and Martin, David L., 5,500,782, Cl. 361-120.000.
Martin, Dean F.: *See—*
Benson, Robert F.; and Martin, Dean F., 5,500,193, Cl. 423-157.000.
Martin, Didier J.: *See—*
Benard, Rejane; Friour, Gerard A. D.; Martin, Didier J.; and Riveccie, Marcel L. P., 5,500,337, Cl. 430-570.000.
Martin, Gale L.; Pittman, James A.; and Rashid, Mosfeq, to Microelectronics and Computer Technology Corporation. Pattern recognition neural network with saccade-like operation. 5,500,905, Cl. 382-157.000.
Martin, Jeffrey A.; and Ido, Toshikazu, to Sony Corporation; and Sony Electronics, Inc. Remote control identifier setup in a video system having both IR and RF transmitters. 5,500,691, Cl. 348-734.000.
Martin, Joel L., to Phillips Petroleum Company. Process to make small, discrete, spherical adducts. 5,500,396, Cl. 502-8.000.
Martin Marietta Corp.: *See—*
Katz, Allen; Wolkstein, Herbert J.; and Meighan, James J., III, 5,500,621, Cl. 330-43.000.
Martin Marietta Energy Systems, Inc.: *See—*
Lowndes, Douglas H.; and McCamy, James W., 5,499,599, Cl. 117-50.000.
Martin, Ulrich; and Koenig, Reinhard, to Boehringer Mannheim GmbH. Method for treating thromboembolic conditions by inhibiting reocclusion via the use of multiple bolus administration of thrombolytically active proteins. 5,500,411, Cl. 514-12.000.
Martinsson, Pär B. G., to Aktiebolaget Electrolux. Device for controlling a carburetor of an internal combustion engine. 5,500,159, Cl. 261-52.000.
Martinswerk G.m.b.H. für chemische und metallurgische Produktion: *See—*
Browa, Neil; and Peij, Detlef V., 5,500,480, Cl. 524-437.000.
Marui, Tomohiro: *See—*
Shiga, Nobuo; Marui, Tomohiro; Shibuya, Kiyoshi; Sato, Toru; Ozawa, Michiharu; and Yukumoto, Masao, 5,499,673, Cl. 164-463.000.
Marum, Steven E.; and Kraus, Karl-Heinz, to Texas Instruments Incorporated. ESD protection circuits using Zener diodes. 5,500,546, Cl. 257-358.000.
Maruyama, Kazuo; and Noami, Tsuneo, to Fuji Xerox Co., Ltd. Multi-color image formation apparatus and method for preventing the contamination of a recharger and preventing color mixing in an image. 5,500,727, Cl. 355-326.00R.
Maruyama, Koichi; Wakamiya, Syun'itirou; Iwaki, Makoto; and Oono, Masahiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Objective lens and method of measuring its performance. 5,500,767, Cl. 359-642.000.
Marx, Sherwood D. Male external catheter with vacuum assist. 5,499,977, Cl. 604-352.000.
Maschinenfabrik S. Rockstedt GmbH: *See—*
Rockstedt, Siegward, 5,499,870, Cl. 366-85.000.
Mase, Akira: *See—*
Yamazaki, Shunpei; and Mase, Akira, 5,500,538, Cl. 257-49.000.
Mase, Hiroshi: *See—*
Ushida, Yoshihisa; and Mase, Hiroshi, 5,500,142, Cl. 252-62.90R.
Massachusetts Institute of Technology: *See—*
Liu, Wei; and Flytzani-Stephanopoulos, Maria, 5,500,198, Cl. 423-246.000.
Massachusetts Institute of Technology and Virus Research Institute: *See—*
Andrianov, Alexander K.; and Langer, Robert S., 5,500,161, Cl. 264-8.000.
Massarsky, Yefim, to Foto Fantasy, Inc. Method of creating a composite print including the user's image. 5,500,700, Cl. 354-76.000.
Massicott, Jennifer F.: *See—*
Armitage, Jonathan R.; Wyatt, Richard; and Massicott, Jennifer F., 5,500,764, Cl. 359-341.000.
Mastrony, Roger S.: *See—*
Gorecki, Michael J.; and Mastrony, Roger S., 5,499,708, Cl. 198-400.000.
Masuda, Haruyuki; and Takata, Yasuo, to Nankai Technart Corporation. Work gloves and manufacture thereof. 5,499,400, Cl. 2-161.600.
Masuda, Kazuaki: *See—*
Hattori, Yoshifumi; Karita, Seiichiro; Saikawa, Hideo; Kashino, Toshio; Saito, Akio; Nakagomi, Hiroshi; Arashima, Teruo; Kimura, Makiko; Sugitani, Hiroshi; Ikeda, Masami; Saito, Asao; Masuda, Kazuaki; and Orikasa, Tsuyoshi, 5,500,666, Cl. 347-87.000.
Masuda, Takashi; Okumura, Toshiaki; Uchida, Koji; and Yamamoto, Osamu, to Canon Kabushiki Kaisha. Ophthalmic apparatus including an apparatus control mechanism having multiple modes. 5,500,696, Cl. 351-205.000.
Masuda, William: *See—*
Buckley, James; Masuda, William; and Lundquist, Joseph, 5,500,583, Cl. 320-14.000.
Masuya, Chisato: *See—*
Yamamoto, Tadashi; Sakakida, Katsumi; Ikeda, Takanobu; and Masuya, Chisato, 5,499,842, Cl. 280-728.300.
Material Processing, Inc.: *See—*
Davis, Kenneth W., 5,499,586, Cl. 110-246.000.
Mathews, Mitchell L. Post remover. 5,499,795, Cl. 254-30.000.
Matsubara, Miyuki; Hirabayashi, Hiromitsu; Nagoshi, Shigeyasu; Koitabashi, Noribumi; Sugimoto, Hitoshi; Gotoh, Fumihiro; and Uetuki, Masaya, to Canon Kabushiki Kaisha. Ink jet recording method. 5,500,661, Cl. 347-41.000.
Matsuda, Hironari: *See—*
Tsushima, Hideaki; Sasaki, Shinya; Nakano, Yukio; Nakano, Hiroyuki; Tateyari, Ryoji; Matsuda, Hironari; Tomooka, Kenji; Sakakida, Naohiro; Nishimura, Shin; Yano, Yoshihiro; Igarashi, Youichi; Aoki, Satoshi; Takatori, Masahiro; Kazawa, Tohru; and Ashi, Yoshihiro, 5,500,756, Cl. 359-174.000.
Matsui, Hidenobu; and Hiura, Mitsuru, to Nikon Corporation. Scanning electron microscope. 5,500,528, Cl. 250-310.000.
Matsui, Rie: *See—*
Kitamura, Naoesi; Miyazawa, Keiji; Daikuhara, Yasushi; Tsubouchi, Hirohiso; Naka, Deiji; Takahashi, Kazuhiro; Matsui, Rie; Yoshiyama, Yoshiko; and Ishii, Takehisa, 5,500,354, Cl. 435-69.400.
Matsui, Yoshimitsu: *See—*
Nagamine, Masashi; Yamamoto, Kenji; Horiuchi, Kenji; Matsui, Yoshimitsu; and Yoshida, Masanori, 5,500,424, Cl. 514-235.500.
Matsuki, Yasuhiro: *See—*
Udagawa, Satoru; Abe, Masaki; Ando, Satoru; Matsuki, Yasuhiro; Watanabe, Toyofumi; Shichara, Yukimitsu; Morita, Masaya; and Kido, Akimasa, 5,500,290, Cl. 428-610.000.
Matsumoto, Haruyuki: *See—*
Ujita, Toshihiko; and Matsumoto, Haruyuki, 5,500,665, Cl. 347-86.000.
Matsumoto, Motoyoshi; and Matsumura, Tomomi, to Kabushiki Kaisha Kenwood. Photomagnetic disc record/reproduction apparatus including improved magnetic head lifting mechanism. 5,500,838, Cl. 369-13.000.
Matsumoto, Seiji: *See—*
Kato, Hiroaki; Shimasaki, Yuichi; Saito, Akihisa; Komatsuda, Takashi; Okutani, Toshikazu; Haccho, Seiji; Matsumoto, Seiji; Aoki, Takuya; and Miyashita, Yukio, 5,499,501, Cl. 60-286.000.
Matsumoto, Shoji; Nikou, Hideo; and Nakagawa, Satoshi, to Matsushita Electronics Corporation. Manufacturing method of semiconductor devices. 5,500,386, Cl. 437-60.000.
Matsumoto, Tadashi: *See—*
Nagase, Taku; Go, Roland; Matsumoto, Tadashi; and Higashi, Akihiro, 5,500,856, Cl. 370-18.000.
Matsumoto, Takahiro; Samashima, Shogo; and Yoshida, Kenichi, to Senju Pharmaceutical Co., Ltd. Intraocular irrigating and enucleated eyeball preservative composition. 5,500,445, Cl. 514-474.000.
Matsumoto, Yoshiyuki: *See—*
Iwamoto, Fumiya; Nakayama, Masahito; and Matsumoto, Yoshiyuki, 5,499,832, Cl. 280-96.100.
Matsumura, Tomomi: *See—*
Matsumoto, Motoyoshi; and Matsumura, Tomomi, 5,500,838, Cl. 369-13.000.
Matsuo, Eiji; and Kakuta, Yoshinori, to Mitsubishi Denki Kabushiki Kaisha. Mechanism conceptual drawing operation display apparatus, transmission apparatus and mechanism conceptual drawing formation apparatus. 5,500,926, Cl. 395-133.000.
Matsuo, Tokuji: *See—*
Mori, Yasushi; Matsuo, Tokuji; Hokao, Nobuhiro; Fujimoto, Akihiko; and Sato, Tsuyoshi, 5,500,039, Cl. 96-209.000.
Matsuoka, Shigeki: *See—*
Anzai, Iwao; Matsuoka, Shigeki; and Uehara, Jun, 5,500,307, Cl. 429-30.000.
Matsuoka, Takayoshi: *See—*
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Matsushima, Hideyuki: *See—*
Terada, Yasuharu; Suzuki, Tsuneo; Matsushima, Hideyuki; and Horita, Yoshiyuki, 5,499,432, Cl. 24-599.200.
Matsushita Communication Industrial Co., Ltd.: *See—*
Nagase, Taku; Go, Roland; Matsumoto, Tadashi; and Higashi, Akihiro, 5,500,856, Cl. 370-18.000.
Matsushita Electric Industrial Co., Ltd.: *See—*
Fue, Kouichirou; Izawa, Yosuke; and Okumura, Naoji, 5,500,682, Cl. 348-497.000.
Fujii, Toshiyuki, 5,500,672, Cl. 348-17.000.
Hasegawa, Kenji; and Yohda, Hiroshi, 5,500,777, Cl. 360-77.160.
Hatano, Takahisa; and Nishigori, Yoshihisa, 5,500,687, Cl. 348-663.000.
Minami, Tsutomu; Tatsumisago, Masahiro; Takada, Kazunori; and Kondo, Shigeo, 5,500,291, Cl. 429-206.000.
Odake, Yoshinori; Ohnishi, Teruhito; and Fujii, Minoru, 5,500,379, Cl. 437-34.000.
Ogawa, Kazufumi; Mino, Norihisa; and Soga, Mamoru, 5,500,250, Cl. 427-299.000.
Ogue, Yousuke; Kuyama, Takahiro; and Kaino, Kazuyuki, 5,500,069, Cl. 264-401.000.
Okabayashi, Ichiro, 5,500,830, Cl. 365-230.080.
Saishi, Mana; and Minemaru, Takayuki, 5,500,812, Cl. 364-745.000.
Uya, Masaru, 5,500,684, Cl. 348-592.000.
Wada, Takahiro; Ikeda, Mitsusuke; Nishitani, Mikihiko; Terauchi, Masaharu; Negami, Takayuki; and Kohara, Naoki, 5,500,056, Cl. 136-259.000.
Matsushita Electric Works, Ltd.: *See—*
Okada, Atsunori; Wada, Shigeaki; Kusanagi, Shigekazu; and Fujioka, Tohru, 5,500,571, Cl. 313-635.000.
Tanaka, Takashi; Miyazaki, Masaharu; Kasho, Yasunori; and Yoshiyasu, Toshiaki, 5,499,932, Cl. 439-446.000.
Matsushita Electric Works R&D Laboratory, Inc.: *See—*
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Matsushita Electronics Corporation: *See—*
Matsumoto, Shoji; Nikou, Hideo; and Nakagawa, Satoshi, 5,500,386, Cl. 437-60.000.
Matsuura, Shunichi: *See—*

Nogami, Taro; Matsuura, Shunichi; and Kuroda, Akira, 5,500,536, Cl. 250-458.100.
Matsuzaki, Kazuo: *See*—
Amano, Akira; Matsuzaki, Kazuo; and Sakai, Toshiaki, 5,499,535, Cl. 73-717.000.
Mattox, Ernest M. Kneeling-prone-kneeling exercise device. 5,499,961, Cl. 482-132.000.
Maurer, Richard T.: *See*—
Zarchy, Andrew S.; Chao, Chien C.; and Maurer, Richard T., 5,500,035, Cl. 95-41.000.
Maury, Julien: *See*—
Crabere, Henri; Mitonneau, Gilbert; and Maury, Julien, 5,499,784, Cl. 244-135.00A.
Maxeiner, Thassilo: *See*—
Kordak, Rolf; Reinert, Michael; and Maxeiner, Thassilo, 5,499,525, Cl. 72-453.030.
Maxtor Corporation: *See*—
Diel, Mark, 5,500,779, Cl. 360-97.010.
Maya, Jakob: *See*—
Popov, Oleg; and Maya, Jakob, 5,500,574, Cl. 315-248.000.
McAneney, T. Brian: *See*—
Mahabadi, Hadi K.; Agur, Eano E.; McAneney, T. Brian; Kao, Sheau V.; Allison, Gerald R.; Hawkins, Michael S.; Grushkin, Bernard; Kittelberger, J. Stephen; Chung, Joo T.; and Hollenbaugh, William H., Jr., 5,500,324, Cl. 430-137.000.
McArthur, Malcolm J.; and Jansen, Harvey, to Sundstrand Corporation. Fluid control valve for a hydraulic system operating with variable viscosity, contaminated, fluid. 5,499,650, Cl. 137-85.000.
McCamy, James W.: *See*—
Lowndes, Douglas H.; and McCamy, James W., 5,499,599, Cl. 117-50.000.
McCann, Gerald P.; and Verley, Donald, to McCann's Engineering & Manufacturing Co. Liquid dispenser for use with containers. 5,499,758, Cl. 222-386.500.
McCann's Engineering & Manufacturing Co.: *See*—
McCann, Gerald P.; and Verley, Donald, 5,499,758, Cl. 222-386.500.
McCarthy, Raymond M.: *See*—
Talmon-Gros, Guenter E.; Freeman, Donald H.; Flight, Thomas A.; McCarthy, Raymond M.; and Kendall, Anthony E., 5,500,566, Cl. 313-275.000.
McCaul, Bruce: *See*—
Doggett, David P.; and McCaul, Bruce W., 5,500,768, Cl. 359-652.000.
McCaul, Bruce W.: *See*—
Doggett, David P.; and McCaul, Bruce W., 5,500,768, Cl. 359-652.000.
McConathy, Dave P.: *See*—
Fruchtbaum, Joseph; McConathy, Dave P.; Quintana, Daniel J.; and Sloan, Harold D., 5,500,094, Cl. 202-241.000.
McConnell, Harden M.: *See*—
Hafeman, Dean G.; Parce, John W.; and McConnell, Harden M., 5,500,188, Cl. 422-82.020.
McCornack, William C.: *See*—
Campbell, Alan S.; Elbert, Donald L.; McCornack, William C.; and Ziercher, Eric L., 5,500,724, Cl. 355-297.000.
McCraw, Scottland D. Rolling gate stopping and locking system. 5,499,517, Cl. 70-95.000.
McCullough, Edward D., to Rockwell International Corp. Apparatus for suspension of particles in an ultrasonic field. 5,499,770, Cl. 241-1.000.
McDermott International, Inc.: *See*—
Brown, Gayle C.; Campo, Juan J.; Heiser, Philip F.; and McKnight, Steven M., 5,499,596, Cl. 114-375.000.
McDonald, Alistair J. Apparatus for biological treatment of effluent. 5,500,112, Cl. 210-151.000.
McElroy, Kennedy K., Jr.; Bonifield, James; Boschke, Dale; and Krajewski, Richard A., to Outboard Marine Corporation. Monolithic metallic drive shafts which are resistant to corrosion and wear. 5,499,936, Cl. 440-83.000.
McGill, Scott D., to Vanguard Automation, Inc. Method and apparatus for filling a ball grid array. 5,499,487, Cl. 53-473.000.
McKenna, Gilbert W., to Analogic Corporation. Stabilized, cantilevered, patient trauma table system. 5,499,415, Cl. 5-601.000.
McKeown, Nicholas W., to University of California, The Regents of the. Method and apparatus for scheduling cells in an input-queued switch. 5,500,858, Cl. 370-60.000.
McKnight, Steven M.: *See*—
Brown, Gayle C.; Campo, Juan J.; Heiser, Philip F.; and McKnight, Steven M., 5,499,596, Cl. 114-375.000.
McLaury, Loren L., to Micron Technology, Inc. True tristate output buffer and a method for driving a potential of an output pad to three distinct conditions. 5,500,817, Cl. 365-189.050.
McMahan, Robert L.: *See*—
Miller, Kevin L.; McMahan, Robert L.; and Steigerwald, Todd W., 5,500,789, Cl. 361-816.000.
McMullen, Michael S.: *See*—
Wallace, Vernon R.; McMullen, Michael S.; and Archibald, William R., 5,499,904, Cl. 416-230.000.
MCNC: *See*—
Bobbio, Stephen M.; Koopman, Nicholas G.; and Nangalia, Sundeep, 5,499,754, Cl. 228-42.000.
Meade, John C.; and Baccus, John C., to Microsurge, Inc. Reuseable endoscopic surgical instrument. 5,499,992, Cl. 606-170.000.
Meade, John C., to Microsurge, Inc. Endoscoptic surgical instrument with guided jaws and ratchet control. 5,499,998, Cl. 606-207.000.
Meade, William D.; and Pearson, John W., to Greengrove Corporation. Process for forming aggregate; and product. 5,500,044, Cl. 106-697.000.
Meelu, Mehar C., to Rolls-Royce plc. High temperature corrosion resistant composite coatings. 5,500,252, Cl. 427-376.300.
Meetze, Murray O., to Xerox Corporation. Ribbon cassette drive system method and apparatus for portable copiers and printers. 5,499,879, Cl. 400-234.000.
Meier, Markus, to ABB Research Ltd. Sensor head for a fiber-optic current measuring device. 5,500,909, Cl. 385-12.000.
Meighan, James J., III: *See*—
Katz, Allen; Wolkstein, Herbert J.; and Meighan, James J., III, 5,500,621, Cl. 330-43.000.
Meinecke, Albrecht: *See*—
Böck, Rudolf; Egelhof, Dieter; Hensler, Klaus; Kade, Werner; Meinecke, Albrecht; Wanke, Wilhelm; and Wulz, Hans-Jürgen, 5,500,091, Cl. 162-301.000.
Meister, Steven F.; and Miller, Charles R., to Caterpillar Inc. Method of staged activation for electronically actuated fuel injectors. 5,499,608, Cl. 123-467.000.
Mellbrand, Thomas: *See*—
Larsson, Krister; Mellbrand, Thomas; Mörnstam, Birgitta; Roechester, Jan; and Sköldbäck, Jan-Åke, 5,500,413, Cl. 514-15.000.
Meltzer, Aaron D.; and Karbach, Alexander, to Bayer Corporation; and Bayer Aktiengeesellschaft. Polyethersulfone/polyester block copolymers and a process for their preparation. 5,500,479, Cl. 525-437.000.
Melzner, Hanno, to Siemens Aktiengesellschaft. Method for manufacturing a bit line via hole in a memory cell. 5,500,384, Cl. 437-60.000.
Mendenhall, Abraham H.; and Irace, Joseph P., to Packaging Concepts, Inc. Method for making a microwavable, expandable package. 5,500,235, Cl. 426-394.000.
Mendes, Emanuel; and Harel, Avikam, to Amron, Ltd. Method of treating herpes. 5,500,009, Cl. 607-88.000.
Mendolia, Michael S.; Esposito, Anthony; Tassoff, James A.; Ross, Lloyd; Fessock, Paul J.; Barr, Morton L.; and Vincenti, Paul J., to Mennen Company, The. Deodorant and antiperspirant compositions containing polyamide gelling agent. 5,500,209, Cl. 424-66.000.
Mennen Company, The: *See*—
Mendolia, Michael S.; Esposito, Anthony; Tassoff, James A.; Ross, Lloyd; Fessock, Paul J.; Barr, Morton L.; and Vincenti, Paul J., 5,500,209, Cl. 424-66.000.
Mercedes-Benz AG: *See*—
Andres, Rudolf; Seel, Holger; and Schaible, Kurt, 5,499,855, Cl. 296-121.000.
Brugger, Manfred F.; Klarer, Martin; Knoff, Bernd; Eckl, Albrecht; Steiner, Manfred; Rump, Siegfried; Nell, Joachim; Eckstein, Fredy; Steffi, Christoph; and Douglas, Brian, 5,499,866, Cl. 303-122.080.
Wagner, Gerhard; and Hein, Lothar, 5,499,954, Cl. 477-174.000.
Mercedes-Benz Aktiengesellschaft: *See*—
Nieder, Wolfgang; Winkler, Manfred; Perchtold, Gerhard; Seirlehner, Leo; Kohler, Herbert; and Eberle, Arwed, 5,500,032, Cl. 75-414.000.
Mercedes Textiles Limited: *See*—
Richardson, Robert L., 5,500,262, Cl. 428-36.100.
Merle, Thomas C.; Ryan, Dale W.; and Rowden, David L., to Eastman Kodak Company. Tool for filmstrip attachment or detachment. 5,499,436, Cl. 29-270.000.
Mermelstein, Robert: *See*—
Bacon, Dennis R.; Trinh, Toan; Hartman, Frederick A.; and Mermelstein, Robert, 5,500,137, Cl. 252-8.600.
Merrell Dow Pharmaceuticals Inc.: *See*—
Whitten, Jeffrey P.; and Baron, Bruce M., 5,500,419, Cl. 514-114.000.
Merrell Pharmaceuticals Inc.: *See*—
Carr, Albert A.; Dage, Richard C.; Koerner, John E.; Li, Tung; Miller, Francis P.; Nieduzak, Thaddeus R.; Dudley, Mark W.; Schmidt, Christopher J.; and Frank, Robert A., 5,500,433, Cl. 514-330.000.
Dinerstein, Robert J.; Edwards, Michael L.; Stemerick, David M.; and Diekema, Keith A., 5,500,429, Cl. 514-277.000.
Merriman, Roger A., to AT&T Corp. Rubber dome/mylar switch. 5,500,497, Cl. 200-512.000.
Mestdeagh, Denis J. G.: *See*—
Sierens, Christiaan H. J.; Steigenberger, Ulrich; Berger, Werner; Harnisch, Stephen; Van Der Plas, Gert; and Mestdeagh, Denis J. G., 5,500,755, Cl. 359-161.000.
Metabowerke GmbH & Co.: *See*—
Schnizler, Albrecht, 5,499,830, Cl. 279-62.000.
Metallgesellschaft Aktiengesellschaft: *See*—
Gröne, Dieter, 5,500,197, Cl. 423-243.080.
Metcalf, Jeffrey D.; and Brashear, Daniel F., to Roadmaster Corporation. Quick change mechanism for synchronous/asynchronous exercise machine. 5,499,957, Cl. 482-70.000.
Metz, Jean-Paul. Compositions and methods for water treatment. 5,500,131, Cl. 210-705.000.
Meunier, Serge M.: *See*—
Ambrogi, Christine J. M.; Ansart, Denis R. H.; Lancelot, Eric J. S.; and Meunier, Serge M., 5,499,499, Cl. 60-39.320.
Meyer, Dennis R. Noise suppressor. 5,500,629, Cl. 333-181.000.
Meyer, Ellen M.: *See*—
Carey, William S.; and Meyer, Ellen M., 5,500,133, Cl. 210-729.000.
Meyer, Gabriel. Device for storing a liquid medicinal substance and for administering eye drops. 5,499,751, Cl. 222-386.000.
Meyer, Reid M.: *See*—
Suggs, Steven M.; and Meyer, Reid M., 5,499,827, Cl. 277-229.000.



Meyer-Blumenroth, Ulrich: *See*—
Walliach, Heinz; Dönges, Reinhard; and Meyer-Blumenroth, Ulrich, 5,500,124, Cl. 210-651.000.
Meyers, Mark M., to Eastman Kodak Company. Device for identifying a perimeter of a scene to be recorded by an image recording apparatus. 5,500,702, Cl. 354-165.000.
Mezei, George A., to Poly-Optical Products, Inc. Apparatus for marring fiber optic substrates. 5,499,912, Cl. 425-363.000.
Michelson, Mark J.: *See*—
Harrington, Noreen A.; and Michelson, Mark J., 5,500,891, Cl. 379-265.000.
Michiels, Dirk J.: *See*—
Halle, Richard W.; Michiels, Dirk J.; and Middlesworth, Jeffrey A., 5,500,260, Cl. 428-35.700.
Mickel, Stuart J., to Ciba-Geigy Corporation. Aminoalkanephosphinic acids and salts thereof. 5,500,418, Cl. 514-100.000.
Mickish, Daniel J.: *See*—
King, James G.; Mackara, Steven R.; Mickish, Daniel J.; and Spooner, David L., 5,500,310, Cl. 430-1.000.
King, James G.; MacKara, Steven R.; Mickish, Daniel J.; and Spooner, David L., 5,500,311, Cl. 430-1.000.
King, James G.; Mackara, Steven R.; Mickish, Daniel J.; and Spooner, David L., 5,500,313, Cl. 430-11.000.
Micklich, Frank T.: *See*—
Sechrist, Paul A.; Lawrence, Roger R.; Micklich, Frank T.; Richardson, Larry D.; and Kazell, David M., 5,500,110, Cl. 208-173.000.
Microelectronics and Computer Technology Corporation: *See*—
Martin, Gale L.; Pittman, James A.; and Rashid, Mosfeq, 5,500,905, Cl. 382-157.000.
Micron Medical Products, Inc.: *See*—
Wright, Richard A., 5,499,628, Cl. 128-641.000.
Micron Technology, Inc.: *See*—
Fink, William M., 5,500,824, Cl. 365-201.000.
McLaury, Loren L., 5,500,817, Cl. 365-189.050.
Saodgrass, Charles K.; Allen, David H.; Tuttle, John R.; Rotzoll, Robert R.; and Pax, George E., 5,500,650, Cl. 342-42.000.
Microsteel S.A.: *See*—
Debuigne, Jean; and Prigent, Serge, 5,500,041, Cl. 106-38.220.
Microsurge, Inc.: *See*—
Meade, John C.; and Baccus, John C., 5,499,992, Cl. 606-170.000.
Meade, John C., 5,499,998, Cl. 606-207.000.
MicroUnity Systems Engineering, Inc.: *See*—
Corry, Alan G., 5,500,811, Cl. 364-724.160.
Middelkoop, Gerrit: *See*—
Berrebi, Georges; Jacquier, Yves; Edens, Habbo; and Middelkoop, Gerrit, 5,499,746, Cl. 222-165.000.
Middlesworth, Jeffrey A.: *See*—
Halle, Richard W.; Michiels, Dirk J.; and Middlesworth, Jeffrey A., 5,500,260, Cl. 428-35.700.
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Pernicka, John C.; Benson, David K.; and Tracy, C. Edwin, 5,500,503, Cl. 219-121.640.
Mihelick, Joseph R.: *See*—
Lucich, Todd C.; Krome, Edward P., Jr.; Howe, Michael G.; Fields, Larry D.; and Mihelick, Joseph R., 5,499,437, Cl. 29-402.030.
Mikler, Claude: *See*—
Teilland, Eric; Bevan, Bruno; Mikler, Claude; Reilly, Paul; and Millot, Philippe, 5,499,967, Cl. 604-20.000.
Milbrodt, Michele A.: *See*—
Cirelli, Raymond A.; Henry, Charles H.; Laskowski, Edward J.; Milbrodt, Michele A.; and Yaffe, Henry H., 5,500,916, Cl. 385-37.000.
Mileaf, Daryl S.: *See*—
Decens, James H.; Mileaf, Daryl S.; LaCour, Kevin E.; Rodriguez, Noe E., II; Leginus, Joseph M.; Johnson, Scott D.; Kapraun, Richard C.; and Young, Richard M., 5,500,187, Cl. 422-58.000.
Miles Inc.: *See*—
Sabath, Jerrold, 5,500,744, Cl. 358-456.000.
Miles, Steven G.: *See*—
Weiler, Edward B.; Jones, Jay A.; Stefanile, Joseph P.; and Miles, Steven G., 5,499,457, Cl. 33-512.000.
Milijasevic, Zoran; and Bode, Graham, to Macnaught Pty Limited. Flow controllers for fluid infusion sets. 5,499,968, Cl. 604-30.000.
Mill, Peter D.; and Tice, Richard, to Scots Pine Enterprises Ltd., c/o Perly-Robertson Panet, Hill & McDougall. Desk mounted personal environment system. 5,499,504, Cl. 62-3.300.
Millan, Mark: *See*—
Lavielle, Gilbert; Hautefaye, Patrick; Muller, Olivier; Millan, Mark; and Brocco, Mauricette, 5,500,443, Cl. 514-422.000.
Miller, Charles R.: *See*—
Meister, Steven F.; and Miller, Charles R., 5,499,608, Cl. 123-467.000.
Miller, David G.: *See*—
Roberts, James P.; Culp, James D.; Miller, David G.; and Sarsfield, Martin R., 5,499,785, Cl. 244-137.400.
Miller, David R.: *See*—
Cahill, Leslie M.; Miller, David R.; and Schell, David J., 5,500,938, Cl. 395-161.000.
Miller, Francis P.: *See*—
Carr, Albert A.; Dage, Richard C.; Koerner, John E.; Li, Tung; Miller, Francis P.; Nieduzak, Thaddeus R.; Dudley, Mark W.; Schmidt, Christopher J.; and Frank, Robert A., 5,500,433, Cl. 514-330.000.
Miller, Harry E.; Pak, Paul; Schechter, Steven M.; and Huyah, Viea-An T., to Campbell Soup Company. Non-fried flavored ramen noodles. 5,500,236, Cl. 426-451.000.
Miller, Kenneth E.: *See*—
Donaldson, Charles W.; Miller, Kenneth E.; Lestage, John J.; and Gantner, Randall C., 5,500,737, Cl. 356-376.000.
Miller, Kevin L.; McMahan, Robert L.; and Steigerwald, Todd W., to Dell USA, L.P. Printed circuit board EMI shielding apparatus and associated methods. 5,500,789, Cl. 361-816.000.
Miller, Mark; and Miller, Thomas W. Downhole pressure gauge converter. 5,499,533, Cl. 73-152.000.
Miller, Thomas W.: *See*—
Miller, Mark; and Miller, Thomas W., 5,499,533, Cl. 73-152.000.
Millet, George H.: *See*—
Grootaert, Werner M.; Kolb, Robert E.; and Millet, George H., 5,500,042, Cl. 106-287.110.
Millot, Philippe: *See*—
Teilland, Eric; Bevan, Bruno; Mikler, Claude; Reilly, Paul; and Millot, Philippe, 5,499,967, Cl. 604-20.000.
Minami, Tsutomu; Tatsumisago, Masahiro; Takada, Kazunori; and Kondo, Shigeo, to Matsushita Electric Industrial Co., Ltd. Lithium ion conductive solid electrolyte and process for synthesizing the same. 5,500,291, Cl. 429-206.000.
Minemaru, Takayuki: *See*—
Saishi, Mana; and Minemaru, Takayuki, 5,500,812, Cl. 364-745.000.
Miner, Frederick J.: *See*—
Schmaling, David N.; Miner, Frederick J.; and Byrnes, Francis E., 5,499,903, Cl. 416-134.00A.
Minnesota Mining and Manufacturing Company: *See*—
Erickson, Robert L.; Hansen, Paul E.; Burgio, Paul A.; Oxman, Joel D.; and Chrisoff, James D., 5,499,917, Cl. 433-137.000.
Grootaert, Werner M.; Kolb, Robert E.; and Millet, George H., 5,500,042, Cl. 106-287.110.
Holmes, Gary L.; Culler, Scott R.; Hardy, David H.; Hendrickson, William A.; Klua, Thomas P.; Harmon, Kimberly K.; Heiti, Robert V.; Spurgeon, Kathryn M.; and Studiner, Charles J., III, 5,500,273, Cl. 428-147.000.
Lau, Felix P.; Bredahl, Timothy D.; and Cox, George E., 5,500,293, Cl. 428-355.000.
Sarkar, Manisha; and Lu, Ying-Yuh, 5,500,457, Cl. 523-201.000.
Minnich, Walter W. Aqua farming. 5,499,490, Cl. 56-9.000.
Mino, Norihisa: *See*—
Ogawa, Kazufumi; Mino, Norihisa; and Soga, Mamoru, 5,500,250, Cl. 427-299.000.
Minolta Co., Ltd.: *See*—
Takasu, Akira; and Eguchi, Tatsuya, 5,500,725, Cl. 355-311.000.
Mirle, Srinivas K.; and Carney, Eugene E., to W.R. Grace & Co.-Conn. Composition for utilizing synthetic polymer packages. 5,500,470, Cl. 524-204.000.
Mita Industrial Co., Ltd.: *See*—
Funato, Masatomi; Shimizu, Yoshitake; Ishimaru, Seijiro; and Nagao, Kazuya, 5,500,319, Cl. 430-106.600.
Harada, Hiroyuki; and Kida, Yasuhiko, 5,499,804, Cl. 271-3.020.
Kimoto, Keizo; Hanatani, Yasuyuki; Sakai, Hiroaki; Oki, Tsuneo; and Uemura, Mamoru, 5,499,486, Cl. 53-465.000.
Morishita, Hiroki; Taniguchi, Susumu; and Kotera, Shinichi, 5,500,716, Cl. 355-206.000.
Mitchell, John D. Talking luggage. 5,500,636, Cl. 340-328.000.
Mitchell, Patrick J. Multiple-height modular display pedestal for displaying merchandise. 5,499,726, Cl. 211-183.000.
Mitchell, Ralph M.: *See*—
Kim, Sang H.; Li, Edward; and Mitchell, Ralph M., 5,500,579, Cl. 318-493.000.
Mitchell, Stephen J., to Chrysler Corporation. Outside door handle attaching bracket arrangement. 5,499,851, Cl. 292-347.000.
Mitesser, Richard W.: *See*—
Parks, Kristen L.; Mitesser, Richard W.; and Lesko, Merle W., 5,500,176, Cl. 264-257.000.
Mitonneau, Gilbert: *See*—
Crabere, Henri; Mitonneau, Gilbert; and Maury, Julien, 5,499,784, Cl. 244-135.00A.
Mitre Corporation, The: *See*—
Henderson, James K., 5,499,531, Cl. 73-64.450.
Mitsubishi Chemical America, Inc.: *See*—
Fujimura, Morio; Ban, Hiroki; and Doniewski, Janusz, 5,500,072, Cl. 156-344.000.
Mitsubishi Chemical Corporation: *See*—
Yamamoto, Shinji; Inoyama, Kazutoshi; and Fujimaki, Seiichi, 5,500,097, Cl. 203-11.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Hayashide, Yoshio, 5,500,558, Cl. 257-758.000.
Horita, Masabo; Yoshida, Masaharu; and Takehara, Masataka, 5,500,502, Cl. 219-121.630.
Ikegami, Masaaki, 5,500,553, Cl. 257-538.000.
Kinoshita, Itsuko; and Ozaki, Akitoshi, 5,500,814, Cl. 365-49.000.
Kobayashi, Kiyotaru, 5,500,816, Cl. 365-185.000.
Matsuo, Eiji; and Kakuta, Yoshinori, 5,500,926, Cl. 395-133.000.
Terashima, Tomohide; and Fukunaga, Masanori, 5,500,541, Cl. 257-105.000.
Tsumura, Akira; Fuchigami, Hiroyuki; Nobutoki, Hidcharu; and Koezuka, Hiroshi, 5,500,537, Cl. 257-40.000.

Yamaguchi, Noriyuki; Kurashita, Takuji; Ishizuka, Mitsuru; Kijima, Junko; and Yao, Masaharu, 5,500,686, Cl. 348-663.000.
Yoshida, Yasuaki; Nakajima, Yasuo; and Aiga, Masao, 5,500,869, Cl. 372-50.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Mori, Yasushi; Matsuo, Tokuji; Hokao, Nobuhiro; Fujimoto, Akihiko; and Sato, Tsuyoshi, 5,500,039, Cl. 96-209.000.
Sakai, Masayasu; Seto, Touru; Kaneko, Masato; Hada, Michio; and Kinomoto, Toshiaki, 5,500,086, Cl. 162-65.000.

Mitsubishi Kasei Corporation: *See*—
Kitamura, Naomi; Miyazawa, Keiji; Daikuhara, Yasushi; Tsubouchi, Hirohito; Naka, Daiji; Takahashi, Kazuhiro; Matsui, Ric; Yoshiyama, Yoshiko; and Ishii, Takehisa, 5,500,354, Cl. 435-69.400.

Mitsubishi Materials Corporation: *See*—
Komada, Norikazu; Nishisaka, Keiji; Adachi, Kazunori; and Fujiwara, Shuji, 5,500,158, Cl. 252-637.000.

Mitsubishi Pencil Kabushiki Kaisha: *See*—
Terakawa, Yukio, 5,500,455, Cl. 523-161.000.

Mitsui Mining & Smelting Co., Ltd.: *See*—
Kato, Shunji; and Miyajima, Hiromitsu, 5,500,871, Cl. 375-208.000.

Mitsui Petrochemical Industries, Ltd.: *See*—
Ushida, Yoshihisa; and Mase, Hiroshi, 5,500,142, Cl. 252-62.90R.

Mitsui, Seiichi: *See*—
Kanbe, Makoto; and Mitsui, Seiichi, 5,500,750, Cl. 359-58.000.

Mitsui Toatsu Chemicals, Incorporated: *See*—
Someya, Kousuke; Yamazaki, Akihiro; Hoshino, Futoshi; and Yanagihara, Takeshi, 5,500,286, Cl. 428-402.240.

Mittelstadt, Laurie: *See*—
Kalteabech, Patrick; Mittelstadt, Laurie; and Swedberg, Sally, 5,500,071, Cl. 156-272.800.

Miura, Koji: *See*—
Yashiro, Masahiko; Sasaki, Shinichi; Ikemoto, Isao; Miura, Koji; Karakama, Toshiyuki; and Numagami, Atsushi, 5,500,714, Cl. 355-200.000.

Miyajima, Hiromitsu: *See*—
Kato, Shunji; and Miyajima, Hiromitsu, 5,500,871, Cl. 375-208.000.

Miyake, Tomoyuki; Inui, Toshiharu; Akiyama, Jun; and Kojima, Kunio, to Sharp Kabushiki Kaisha. Multiple coil magnetic head for magnetic optical recording device. 5,500,839, Cl. 369-13.000.

Miyaki, Yoshiyuki: *See*—
Kawaguchi, Kenji; and Miyaki, Yoshiyuki, 5,500,563, Cl. 310-71.000.

Miyamura, Tsuyoshi; Sano, Mutsumi; Kondo, Akihiro; and Kato, Ikunoshin, to Takara Shuzo Co., Ltd. Method for determining sugar chain structure. 5,500,342, Cl. 435-4.000.

Miyasaka, Tadashi, to Fuji Electric Co., Ltd. Semiconductor device. 5,500,619, Cl. 327-427.000.

Miyashita, Akihiko: *See*—
Yauchi, Hitoshi; Sugiyama, Koichi; Miyashita, Akihiko; Satoh, Nakatoshi; Sugawara, Tatsuo; Sato, Hiroyuki; and Onozato, Takashi, 5,500,657, Cl. 347-9.000.

Miyashita, Yukio: *See*—
Kato, Hiroaki; Shimasaki, Yuichi; Saito, Akihisa; Komatsuda, Takashi; Oketani, Toshikazu; Haccho, Seiji; Matsumoto, Seiji; Aoki, Takuya; and Miyashita, Yukio, 5,499,501, Cl. 60-286.000.

Miyata, Masahiro; Ezawa, Hirokazu; Ogure, Naoaki; Tsujimura, Masabu; Ohdaira, Takeyuki; Inoue, Hiroaki; and Ikeda, Yukio, to Kabushiki Kaisha Toshiba; and Ebara Corporation. Semiconductor device and method for manufacturing the same. 5,500,559, Cl. 257-762.000.

Miyawaki, Hiroshi; Itojima, Mitsuhiko; Oka, Takayuki; Yamamoto, Kazuyoshi; Akira, Toshiro; and Tsuji, Masaaki, to Noritsu Koki Co., Ltd. Method and equipment for printing 3-D stereograph. 5,500,712, Cl. 355-22.000.

Miyazaki, Masaharu: *See*—
Tanaka, Takashi; Miyazaki, Masaharu; Kasho, Yasunori; and Yoshiyasu, Toshiaki, 5,499,932, Cl. 439-446.000.

Miyazawa, Keiji: *See*—
Kitamura, Naomi; Miyazawa, Keiji; Daikuhara, Yasushi; Tsubouchi, Hirohito; Naka, Daiji; Takahashi, Kazuhiro; Matsui, Rie; Yoshiyama, Yoshiko; and Ishii, Takehisa, 5,500,354, Cl. 435-69.400.

Miyazawa, Kiyoshi; Chiba, Tadahiro; Iwata, Yubei; Tamura, Uhei; Murotani, Isao; and Tamaki, Shuya, to Shiseido Company Ltd. Percutaneous absorption promoting agent and dermatologic preparation containing the same. 5,500,416, Cl. 514-23.000.

Miyazawa, Shuichi, to Kel Corporation. Socket connector for electronic devices. 5,499,929, Cl. 439-331.000.

Mizoguchi, Takehiko: *See*—
Sasakura, Miyoshi; Ohkura, Osamu; Mizoguchi, Takehiko; Hori, Satoru; and Yoshida, Satoshi, 5,500,932, Cl. 395-149.000.

Mizrahi, Victor: *See*—
Atkins, Robert M.; Lemaire, Paul J.; Mizrahi, Victor; and Walker, Kenneth L., 5,500,031, Cl. 65-386.000.

Mizuguchi, Jin; and Giller, Gérald, to Ciba-Geigy Corporation. Material for storing information. 5,500,314, Cl. 430-14.000.

Mizukawa, Yuki; Naruse, Hideaki; Watanabe, Toshiyuki; and Sato, Tadahisa, to Fuji Photo Film Co., Ltd. Silver halide color photographic material containing pyrazole-substituted couplers. 5,500,334, Cl. 430-558.000.

Mizumoto, Muneo: *See*—
Inoue, Youichi; Sato, Yoshihiro; Hirose, Shinichi; Tani, Hiroshi; Tanaka, Katsuyuki; Abe, Katsuo; Ohura, Masaki; and Mizumoto, Muneo, 5,500,296, Cl. 428-408.000.

Mizuno, Hironobu: *See*—
Iaaba, Yutaka; Okada, Shinjiro; Taniguchi, Osamu; and Mizuno, Hironobu, 5,500,749, Cl. 359-56.000.

Mizuno, Hiroyoshi: *See*—
Isobe, Yasuaki; and Mizuno, Hiroyoshi, 5,500,288, Cl. 428-469.000.

Mizuno, Masahiro: *See*—
Kyuno, Mitsuyasu; Mizuno, Masahiro; Futamura, Masao; and Muto, Yukiyoshi, 5,499,589, Cl. 112-102.500.

Mo Och Domsjo Aktiebolag: *See*—
Carlsson, Rolf A., 5,499,764, Cl. 229-117.160.

Mobil Oil Corporation: *See*—
Ambroise, Benoit; and Petitjean, Maurice, 5,500,265, Cl. 428-41.000.
Durnad, Paul P.; and Timken, Hye K. C., 5,500,108, Cl. 208-89.000.
Heffelfinger, Michael T.; Keung, Jay K.; and Peet, Robert G., 5,500,282, Cl. 428-339.000.
Keville, Kathleen M.; Timken, Hye K. C.; and Ware, Robert A., 5,500,109, Cl. 208-111.000.
Kirk, Kevin A.; Liu, Leland L.; O'Brien, Jeffrey J.; and Sheppard, Robert M., 5,500,283, Cl. 428-349.000.

Mobley, Juliana: *See*—
Vondell, Edward P.; Mobley, Juliana; Nunez, Jospeh M.; Maas, Charles A.; Stuch, Donald; and Yu, Jinquan, 5,499,530, Cl. 73-49.700.

Mochizuki, Kentaro: *See*—
Nakagawa, Kenji; Yoshizaki, Koichi; Nukaga, Tadashi; Banba, Yoshikazu; Hattori, Shigetaka; and Mochizuki, Kentaro, 5,499,791, Cl. 248-638.000.

Mochizuki, Masamichi: *See*—
Yoshida, Satoru; Sato, Keiji; Mochizuki, Masamichi; Watanabe, Masashi; and Kato, Takashi, 5,499,510, Cl. 62-175.000.

Modern Welding Company, Inc.: *See*—
Elmi, Hadi, 5,500,132, Cl. 210-708.000.

Modernfold, Incorporated: *See*—
Owens, N. Douglas, 5,499,671, Cl. 160-199.000.

Modine Manufacturing Company: *See*—
Hasch, James T.; and Cavalluzzi, James J., 5,499,675, Cl. 165-38.000.

Moghaddasi, Majid; and Nielsen, Arne, to Guilford Mills, Inc. Apparatus for surface treatment of pile and plush fabrics. 5,499,433, Cl. 26-2.00R.

Mohri, Naotake; and Moronuki, Hideo, to Toyota Jidosha Kabushiki Kaisha. Process and apparatus for electric discharge position detection. 5,500,500, Cl. 219-69.170.

Moisey, Mark J.: *See*—
Addesso, Kevin; Dzurenko, Theresa E.; Moisey, Mark J.; Levine, Harry; Slade, Louise; Manns, James M.; Fazzolare, Richard D.; Ievolella, James; and Wang, Martha Y., 5,500,240, Cl. 426-560.000.

Mojarrad, Mehrdad: *See*—
Haughney, Michael A.; Mojarrad, Mehrdad; Tornow, Devin C.; and Wiemken, Norval J., 5,499,612, Cl. 123-470.000.

Mok, Do-sang, to Samsung Electronics Co., Ltd. Synchronizing signal clamping circuit of image signal processing integrated circuit. 5,500,688, Cl. 348-697.000.

Molded Metal Services, Inc.: *See*—
Carter, Warren; and Carter, Brad, 5,499,449, Cl. 29-882.000.

Molecular Devices Corporation: *See*—
Hafeman, Dean G.; Parce, John W.; and McConnell, Harden M., 5,500,188, Cl. 422-82.020.

Molecular Imaging Corporation: *See*—
Jing, Tianwei, 5,500,535, Cl. 250-440.110.

Molin, Marc: *See*—
Dollat, Jean-Marie; Molin, Marc; and Theallier, Pascal, 5,500,415, Cl. 514-21.000.

Molitor, Dieter: *See*—
Guenther, Werner; Molitor, Dieter; and Werner, Leonhard, 5,500,884, Cl. 378-38.000.

Molitor, Mark R.: *See*—
Robnett, James T.; and Molitor, Mark R., 5,499,606, Cl. 123-90.120.

Moll, Roland; and Franke, Werner W., to Progen Biotechnik GmbH. Method for the purification of cytokeratin 20 and its use for the production of antibodies. 5,500,347, Cl. 435-7.230.

Monaghan, William D.: *See*—
Mowrey, Gary L.; Ganoe, Carl W.; and Monaghan, William D., 5,500,649, Cl. 342-22.000.

Monfort, Robert W. Aquatic amusement device. 5,499,592, Cl. 114-244.000.

Monsanto Company: *See*—
Coleman, James P., 5,500,759, Cl. 359-270.000.
Fischhoff, David A.; and Perlak, Frederick J., 5,500,365, Cl. 435-240.400.

Monte, Alec V.: *See*—
Court, Melvin T.; and Monte, Alec V., 5,499,475, Cl. 49-495.100.

Montell North America Inc.: *See*—
Burgin, Emanuele; and Serrao, Giacinto, 5,500,284, Cl. 428-349.000.
Cuffiani, Illaro; Zacchini, Umberto, deceased, 5,500,397, Cl. 502-102.000.

Moon, Bong S.: *See*—
Rhee, Suh B.; Lee, Myong-Hoon; Lee, Chang-Jin; and Moon, Bong S., 5,500,474, Cl. 524-714.000.

Moore, Charles R.: *See*—
Becker, Michael C.; Moore, Charles R.; Muhich, John S.; and Reese, Robert J., 5,500,950, Cl. 395-445.000.

Moore, Douglas R.: *See*—
Daniel, Hani S.; and Moore, Douglas R., 5,500,917, Cl. 385-99.000.

Moore, Gerald T.: *See*—





Chakmakjian, Stephen H.; Gruneisen, Mark T.; Koch, Karl W., III; and Moore, Gerald T., 5,500,865, Cl. 372-22.000.

Moore, Shelley I.: *See*—
Schwiebert, William H.; Hall, Corrina A. E.; Broder, Damon W.; and Moore, Shelley I., 5,500,667, Cl. 347-102.000.

Moran, Thomas P.; and Kurtenbach, Gordon P., to Xerox Corporation. Apparatus and method for translating graphic objects and commands with direct touch input in a touch based input system. 5,500,935, Cl. 395-156.000.

Morand, Michel. Shower head having elongated arm, plural nozzles, and plural inlet lines. 5,499,767, Cl. 239-383.000.

Morgan, Vincent J.; and Shepherd, Norman J., to Diro, Inc. Apparatus for preserving interdental papilla and method for using. 5,499,918, Cl. 433-173.000.

Morgavi, Paul, to Gemplus Card International. Device for modifying the tension of a ribbon wound on a take-up reel in the event of the clinging of the ribbon to a printing medium. 5,499,878, Cl. 400-223.000.

Mori, Kazuyoshi: *See*—
Namiki, Masanori; Mori, Kazuyoshi; and Kato, Hideo, 5,499,769, Cl. 239-409.000.

Mori, Shigeru: *See*—
Tanide, Hideo; Muranaka, Masayuki; Mori, Shigeru; Wada, Kiyoshi; Yoshizaki, Isao; and Ogura, Naoyuki, 5,500,747, Cl. 359-40.000.

Mori, Yasushi; Matsuo, Tokuji; Hokao, Nobuhiro; Fujimoto, Akihiko; and Sato, Tsuyoshi, to Mitsubishi Jukogyo Kabushiki Kaisha. Gas-liquid separating apparatus. 5,500,039, Cl. 96-209.000.

Morimoto, Kyoichi: *See*—
Wada, Yukio; Morimoto, Kyoichi; Goibuchi, Takayuki; and Tomiyasu, Hiroshi, 5,500,192, Cl. 423-10.000.

Morishita, Hiroki; Taniguchi, Susumu; and Kotera, Shinichi, to Mita Industrial Co., Ltd. Apparatus which detects when more than a predetermined amount of waste toner accumulates before the expiration of the photoconductive drum material service life. 5,500,716, Cl. 355-206.000.

Morishita, Masakazu, to Canon Kabushiki Kaisha. Photoelectric converting device. 5,500,550, Cl. 257-461.000.

Morita, Masaya: *See*—
Udagawa, Satoru; Abe, Masaki; Ando, Satoru; Matsuki, Yasuhiro; Watanabe, Toyofumi; Shiohara, Yukimitsu; Morita, Masaya; and Kido, Akimasa, 5,500,290, Cl. 428-610.000.

Morita, Minoru; and Takegami, Keizo, to Tsukishima Kikai Co., Ltd. Apparatus for crystallization of organic matter. 5,500,189, Cl. 422-251.000.

Morizono, Kenichi; and Harada, Taira. Resin composition for water-based coating and water-based coating composition. 5,500,246, Cl. 427-239.000.

Morlan, David E., to Westinghouse Electric Corporation. Diametral force sensor. 5,499,542, Cl. 73-818.000.

Mörnstam, Birgitta: *See*—
Larsson, Krister; Mellbrand, Thomas; Mörnstam, Birgitta; Roschester, Jan; and Sköldbäck, Jan-Åke, 5,500,413, Cl. 514-15.000.

Moronuki, Hideo: *See*—
Mohri, Naotake; and Moronuki, Hideo, 5,500,500, Cl. 219-69.170.

Morris, James M.; and Cleary, John G. System and method for creating configurators using templates. 5,500,802, Cl. 364-474.240.

Morrison-Knudsen Corporation: *See*—
Krivda, John; and Phebus, Raymond L., Jr., 5,499,451, Cl. 29-897.200.

Morrow, Lester A., to Gage In-Store Marketing, LLC. Pinch-actuated product distribution system. 5,499,723, Cl. 211-59.100.

Mortensen, Donald W.: *See*—
Mortensen, Erik D.; and Mortensen, Donald W., 5,499,431, Cl. 24-543.000.

Mortensen, Erik D.; and Mortensen, Donald W. Spring clip for holding garments. 5,499,431, Cl. 24-543.000.

Mortimer, William P., Jr.: *See*—
Dauber, Edwin G.; Mortimer, William P., Jr.; and Winterling, Michael S., 5,500,038, Cl. 96-135.000.

Moseley, Lonnie M.: *See*—
Tickell, Edward B., Jr.; Schoch, Peter J.; Moseley, Lonnie M.; and Bloomfield, Dwight A., 5,500,597, Cl. 324-339.000.

Mosley, Keith: *See*—
Heisman, Richard A.; Mosley, Keith; and Vos, Stephen J., 5,499,495, Cl. 56-320.100.

Motorola: *See*—
Dydyk, Michael; and Escher, John S., 5,500,543, Cl. 257-277.000.
Foley, Barbara M.; Galloway, David; Kuo, Shun-Meen; and Chun, Christopher K. Y., 5,500,914, Cl. 385-77.000.

Motorola, Inc.: *See*—
Alonas, Paul G.; Yeh, Jang-Hun; and Harton, Austin V., 5,500,912, Cl. 385-37.000.
Anderson, David J., 5,500,624, Cl. 330-253.000.
Banerji, Kingshuk; Bradley, Edwin L., III; and Da Costa Alves, Francisco, 5,499,756, Cl. 228-214.000.
Becker, Michael C.; Moore, Charles R.; Muhich, John S.; and Reese, Robert J., 5,500,950, Cl. 395-445.000.
Flores, Emmanuel S.; and Padilla, Juan L. D. V., 5,500,377, Cl. 437-6.000.
Higginbotham, Sandra, 5,499,429, Cl. 24-3.110.
Ho, Ying-wai; and Burgess, Bradley G., 5,500,943, Cl. 395-375.000.
Kelley, Paul H., 5,500,562, Cl. 307-66.000.
Kim, Sang H.; Li, Edward; and Mitchell, Ralph M., 5,500,579, Cl. 318-493.000.
Knecht, Thomas, 5,500,628, Cl. 331-68.000.
Maine, Kristine P.; Olds, Keith A.; and Daviceu, Gerald J., 5,500,648, Cl. 342-357.000.

Motoyama, Hideki: *See*—
Arakawa, Kenichi; Sasano, Nobusuke; Iizuka, Tomoaki; Kobayashi, Miho; Yamada, Tetsuo; and Motoyama, Hideki, 5,500,675, Cl. 348-319.000.

Mott, Jonathan C. Products incorporating piezoelectric material. 5,500,635, Cl. 340-323.00R.

Mowrey, Gary L.; Ganoe, Carl W.; and Monaghan, William D., to United States of America, Interior. Method and apparatus for monitoring the thickness of a coal rib during rib formation. 5,500,649, Cl. 342-22.000.

Mowrey-McKee, Mary; Bliznik, Kenneth; and Stone, Ralph, to Allergan, Inc. Method and composition for disinfecting contact lenses. 5,500,186, Cl. 422-28.000.

Moyers, Chester E.; and Leaz, Robert L., to Borg-Warner Automotive, Inc. Method and apparatus for forming leakproof feed-through connector. 5,500,490, Cl. 174-151.000.

Moyes, Tom S., to Lockheed Corporation. Apparatus for measuring the electrical properties of honeycomb core. 5,500,600, Cl. 324-639.000.

Mueller, Klaus J.: *See*—
Rudolph, Andreas; Mueller, Klaus J.; Peters, Christian; and Altmann, Justus, 5,500,027, Cl. 55-223.000.

Muhich, John S.: *See*—
Becker, Michael C.; Moore, Charles R.; Muhich, John S.; and Reese, Robert J., 5,500,950, Cl. 395-445.000.

Mulenburg, Gerald M.: *See*—
Evans, JuliAnn; Gundo, Daniel P.; Harper, Jennifer S.; Mulenburg, Gerald M.; and Skundberg, Thomas L., 5,499,609, Cl. 119-61.000.

Müller, Georg: *See*—
Hebner, Reinhard; and Müller, Georg, 5,499,778, Cl. 242-541.000.

Muller, Olivier: *See*—
Lavielle, Gilbert; Hautefaye, Patrick; Muller, Olivier; Millan, Mark; and Brocco, Mauricette, 5,500,443, Cl. 514-422.000.

Multi-Tech Systems, Inc.: *See*—
Sharma, Raghu; Davis, Jeffrey P.; Gunn, Timothy D.; and Li, Ping, 5,500,859, Cl. 370-81.000.

Munro, Frederick; Dailey, Aaron; Defouw, Richard; and Trachy, David. Motion optimization for a tape storage system. 5,500,803, Cl. 364-478.000.

Murakami, Akihiko: *See*—
Kondo, Tetsuo; and Murakami, Akihiko, 5,500,169, Cl. 264-46.500.

Murakami, Koji: *See*—
Takemoto, Takatoshi; Chida, Toshikazu; Kano, Noriaki; Ito, Eiji; Murakami, Koji; Itagaki, Takashi; Sekimoto, Koji; and Suzuki, Masanori, 5,499,809, Cl. 271-274.000.

Murakami, Mitsuyuki: *See*—
Hanasaki, Yasuaki; Tsukuda, Kazuaki; Watanabe, Hiroyuki; Tsuzuki, Kenji; Murakami, Mitsuyuki; and Niimi, Noritoshi, 5,500,408, Cl. 504-261.000.

Murakami, Shuichi: *See*—
Ujita, Toshihiko; Nakajima, Kazuhiro; Sato, Yohei; and Murakami, Shuichi, 5,500,663, Cl. 347-86.000.

Murakami, Tomoo, to NEC Corporation. Method for manufacturing printed circuit board with through-hole. 5,499,446, Cl. 29-852.000.

Murakami, Tomoo, to NEC Corporation. Method for manufacturing a printed circuit board having electrodes on end surface of substrate. 5,499,447, Cl. 29-852.000.

Muraki, Takao; and Ishikawa, Yasuhiro, to Yokohama Rubber Co., Ltd., The. Rubber compositios for tire tread. 5,500,482, Cl. 525-98.000.

Muramatsu, Hiroaki: *See*—
Kitajima, Shinichi; Muramatsu, Hiroaki; and Kobayashi, Yoshihiko, 5,499,617, Cl. 123-698.000.

Muramatsu, Yasuhiro, to Kabushiki Kaisha Toshiba. Audio signal processing circuit. 5,500,622, Cl. 330-107.000.

Muramoto, Tomotaka, to Canon Kabushiki Kaisha. Video signal processing with common delay line for luminance interpolation and color conversion. 5,500,740, Cl. 358-327.000.

Muranaka, Masayuki: *See*—
Tanide, Hideo; Muranaka, Masayuki; Mori, Shigeru; Wada, Kiyoshi; Yoshizaki, Isao; and Ogura, Naoyuki, 5,500,747, Cl. 359-40.000.

Muranaka, Yasushi; Imahashi, Jinichi; Horiba, Tatsuo; and Nishimura, Shigeoki, to Hitachi, Ltd. Polymer electrolyte hydrogen-oxygen fuel cell where the polymer electrolyte has a water repellency gradient and a catalytically active component concentration gradient across oxygen electrode. 5,500,292, Cl. 429-209.000.

Murata Kikai Kabushiki Kaisha: *See*—
Maeda, Yoshiyasu; and Kubota, Norio, 5,499,772, Cl. 242-35.50R.

Murata Manufacturing Co., Ltd.: *See*—
Ueda, Yukinori, 5,500,634, Cl. 338-174.000.

Murata, Masaaki; Kishi, Harumi; Narui, Takashi; Kasai, Shuichi; and Iwasa, Akira, to SS Pharmaceutical Co., Ltd. Sustained release suppository. 5,500,221, Cl. 424-436.000.

Murata, Tatsuo: *See*—
Takao, Hideaki; Murata, Tatsuo; Kanbe, Junichiro; Tamura, Miki; Kamio, Masaru; Sekimura, Nobuyuki; and Kikuchi, Yoshiki, 5,500,751, Cl. 359-68.000.

Murch, Bruce P.; Roselle, Brian J.; and Jones, Kyle D., to Procter & Gamble Company, The. Cleaning methods and compositions for produce. 5,500,048, Cl. 134-6.000.

Murch, Bruce P.; Roselle, Brian J.; and Jones, Kyle D., to Procter & Gamble Company, The. Cleaning compositions for produce. 5,500,143, Cl. 252-108.000.

Murch, Bruce P.: *See*—
Scheibel, Jeffrey J.; Murch, Bruce P.; and Connor, Daniel S., 5,500,150, Cl. 252-544.000.

Murdoch, Gwyn L.: *See*—
Audia, James E.; Droste, James J.; Evrard, Deborah A.; Fludzinski, Pawel; Murdoch, Gwyn L.; and Nelson, David L., 5,500,431, Cl. 514-280.000.

Murdoch, James B.: *See*—
Loscar, Mark J.; Murdoch, James B.; and Gullapalli, Rao P., 5,500,593, Cl. 324-307.000.

Mures Cardiovascular Research, Inc.: *See*—
Dase, Radu, 5,500,015, Cl. 623-2.000.

Muro, Hideo, to Nissan Motor Co., Ltd. Semiconductor sensor self-checking circuit. 5,499,526, Cl. 73-1.00D.

Murotani, Isao: *See*—
Miyazawa, Kiyoshi; Chiba, Tadahiro; Iwata, Yuhei; Tamura, Uhei; Murotani, Isao; and Tamaki, Shuya, 5,500,416, Cl. 514-23.000.

Murphy, Richard T.: *See*—
Anderson, Jere R.; Jandris, Louis J.; Barbere, Michael D.; and Murphy, Richard T., 5,500,180, Cl. 264-532.000.

Murray, Inc.: *See*—
Heisman, Richard A.; Mosley, Keith; and Vos, Stephen J., 5,499,495, Cl. 56-320.100.

Muto, Yukiyoshi: *See*—
Kyuno, Mitsuyasu; Mizuno, Masahiro; Futamura, Masao; and Muto, Yukiyoshi, 5,499,589, Cl. 112-102.500.

Mycogen Plant Science, Inc.: *See*—
Ahlquist, Paul G.; and French, Roy C., 5,500,360, Cl. 435-172.300.

Myers, John E.; and Procter, Roy W., to Torque Converter Rebuilding Systems, Inc. Precision alignment welding apparatus. 5,499,755, Cl. 228-44.300.

Myers, Keith: *See*—
Quijano, R. C.; Nashef, Aws; and Myers, Keith, 5,500,014, Cl. 623-2.000.

Myklebust, Nils: *See*—
Lysum, Steinar; Haugsten, Kjell; Hox, Ketil; Hugdahl, Jan; and Myklebust, Nils, 5,500,501, Cl. 219-121.480.

Nabisco, Inc.: *See*—
Addesso, Kevin; Dzurenko, Theresa E.; Moisey, Mark J.; Levine, Harry; Slade, Louise; Manna, James M.; Pazzolare, Richard D.; Ievolella, James; and Wang, Martha Y., 5,500,240, Cl. 426-560.000.

Naf, Werner. Process for the sealing and internal repair of systems of laid conduits. 5,499,659, Cl. 138-97.000.

Nagai, Koichi: *See*—
Ishii, Masaru; and Nagai, Koichi, 5,500,843, Cl. 369-77.200.

Nagai, Shigekazu; Saitoh, Akio; and Sugiyama, Toru, to SMC Kabushiki Kaisha. Actuator. 5,499,547, Cl. 74-89.150.

Nagamine, Masashi; Yamamoto, Kenji; Horiuchi, Kenji; Matsui, Yoshimitsu; and Yoshida, Masanori, to Nihon Nohyaku Co., Ltd. Pyrimidine and pyridine derivatives, their production and use. 5,500,424, Cl. 514-235.500.

Nagamoto, Izushi, to Yamaha Corporation. Golf club head and a method for producing the same. 5,499,819, Cl. 273-169.000.

Nagamura, Takashi; and Tomita, Shinji, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Expolitation des Procedes Georges Claude. Ultra-high purity monosilane producing process and unit. 5,499,506, Cl. 62-11.000.

Nagao, Kazuya: *See*—
Funato, Masatomi; Shimizu, Yoshitake; Ishimaru, Seijiro; and Nagao, Kazuya, 5,500,319, Cl. 430-106.600.

Nagaoka, Takeshi: *See*—
Mekino, Kenzi; Akiyama, Shigeaki; Suzuki, Hideaki; Nagaoka, Takeshi; Niki, Toshio; Suzuki, Koichi; Nawamaki, Tsutomu; Watanabe, Shigeomi; and Ishikawa, Kimihiro, 5,500,406, Cl. 504-215.000.

Nagasaka, Takashi, to Nippondenso Co., Ltd. Multilayer substrate. 5,500,278, Cl. 428-210.000.

Nagase, Taku; Go, Roland; Matsumoto, Tadashi; and Higashi, Akihiro, to Matsushita Communication Industrial Co., Ltd.; and NTT Mobile Communications Network, Inc. Transmission de-correlator for eliminating interference in a CDMA communication system. 5,500,856, Cl. 370-18.000.

Nagata, Kazuyuki, to NEC Corporation. Phase error canceller for QPSK signals using unique word detectors. 5,500,876, Cl. 375-332.000.

Nagata, Satoshi: *See*—
Shimura, Akihiro; Nagata, Satoshi; and Ueda, Shigeru, 5,500,922, Cl. 395-110.000.

Nagatsuka, Takayuki: *See*—
Kasuya, Takashige; Nagatsuka, Takayuki; Nakamura, Tatsuya; Kasbeyashi, Makoto; and Chiba, Tatsuhiko, 5,500,321, Cl. 430-109.000.

Nagaura, Toshikazu: *See*—
Van, Kazuo; Ohta, Kenji; Inui, Tetsuya; Nagaura, Toshikazu; Takemori, Hirotoshi; and Toki, Hirotaka, 5,500,850, Cl. 369-275.400.

Nagoshi, Shigeyasu: *See*—
Matsubara, Miyuki; Hirabayashi, Hiromitsu; Nagoshi, Shigeyasu; Koitabashi, Noribumi; Sugimoto, Hitoshi; Gotoh, Fumihiro; and Uetuki, Masaya, 5,500,661, Cl. 347-41.000.

Naka, Daiji: *See*—
Kitamura, Naomi; Miyazawa, Keiji; Daikuhara, Yasushi; Tsubouchi, Hirohito; Naka, Daiji; Takahashi, Kazuhiro; Matsui, Rie; Yoshiyama, Yoshiko; and Ishii, Takehisa, 5,500,354, Cl. 435-69.400.

Naka, Takehiko: *See*—
Kubo, Keiji; Inada, Yoshiyuki; and Naka, Takehiko, 5,500,427, Cl. 514-256.000.

Nakaba, Katsuji: *See*—
Sakumoto, Yukinori; Hashimoto, Takeshi; Nakaba, Katsuji; Kobayashi, Masaharu; Nishigaya, Takeshi; and Yamanashi, Fumiyoshi, 5,500,294, Cl. 428-355.000.

Nakagawa, Katsumi: *See*—
Toyama, Noboru; and Nakagawa, Katsumi, 5,500,055, Cl. 136-259.000.

Nakagawa, Kenji; Yoshizaki, Koichi; Nukaga, Tadashi; Bamba, Yoshikazu; Hattori, Shigetaka; and Mochizuki, Kentaro, to Sanyo Electric Co., Ltd. Machine having vibration source. 5,499,791, Cl. 248-638.000.

Nakagawa, Satoshi: *See*—
Matsumoto, Shoji; Nikou, Hideo; and Nakagawa, Satoshi, 5,500,386, Cl. 437-60.000.

Nakagomi, Hiroshi: *See*—
Hattori, Yoshifumi; Karita, Seiichiro; Saikawa, Hideo; Kashino, Toshio; Saito, Akio; Nakagomi, Hiroshi; Arashima, Terso; Kimura, Makiko; Sugitani, Hiroshi; Ikeda, Masami; Saito, Asao; Masuda, Kazuaki; and Orikasa, Tsuyoshi, 5,500,666, Cl. 347-87.000.

Nakai, Toshifumi, to Sharp Kabushiki Kaisha. Microcomputer system provided with mechanism for controlling operation of program. 5,500,809, Cl. 364-580.000.

Nakajima, Kazuhiro: *See*—
Ujita, Toshihiko; Nakajima, Kazuhiro; Sato, Yohei; and Murakami, Shuichi, 5,500,663, Cl. 347-86.000.

Nakajima, Tetsuya: *See*—
Iida, Takashi; Sumi, Satoru; Shimizu, Hiroshi; Tahara, Akinori; Amano, Isao; and Nakajima, Tetsuya, 5,500,542, Cl. 257-210.000.

Nakajima, Yasuo: *See*—
Yoshida, Yasuaki; Nakajima, Yasuo; and Aiga, Masao, 5,500,869, Cl. 372-50.000.

Nakajima, Yoshihide: *See*—
Saitoh, Yasuhiko; Iwata, Yasuo; Kuzuma, Seiichi; Nakajima, Yoshihide; and Yokoumino, Kenji, 5,500,437, Cl. 514-397.000.

Nakamachi, Keiichi: *See*—
Kimura, Akira; Watanabe, Tadashi; Inoue, Tsuyoshi; and Nakamachi, Keiichi, 5,499,545, Cl. 73-864.180.

Nakamata, Shin'ichi: *See*—
Katoe, Hisato; Kawashima, Tomoyuki; Taniguchi, Harutaka; Nakamata, Shin'ichi; and Shibata, Kazuyoshi, 5,500,103, Cl. 204-192.260.

Nakamoto, Masayuki; Ono, Tomio; and Sakai, Tadashi, to Kabushiki Kaisha Toshiba. Field emission cathode structure, method for production thereof, and flat panel display device using same. 5,499,938, Cl. 445-50.000.

Nakamura, Hajime; and Sakakibara, Jun, to Kabushiki Kaisha Toshiba. Paper feeding apparatus having a paper separator with a pressure sensitive and electrically-conductive material. 5,499,807, Cl. 271-121.000.

Nakamura, Hiroaki; and Kanamoto, Tadashi, to Idemitsu Kosan Co., Ltd. Organic El device. 5,500,568, Cl. 313-503.000.

Nakamura, Nakabe; and Kosaki, Makoto, to Sansuma Co., Ltd. Delay line device and method of manufacturing the same. 5,499,442, Cl. 29-600.000.

Nakamura, Tatsuya: *See*—
Kasuya, Takashige; Nagatsuka, Takayuki; Nakamura, Tatsuya; Kasbeyashi, Makoto; and Chiba, Tatsuhiko, 5,500,321, Cl. 430-109.000.

Nakamura, Yumiko: *See*—
Isawa, Minae; and Nakamura, Yumiko, 5,500,655, Cl. 345-168.000.

Nakane, Hideki; Nishii, Yasuhiro; and Sugiura, Masami, to Toyota Shatai Kabushiki Kaisha. Seat back frame. 5,499,863, Cl. 297-452.200.

Nakanishi Construction Company: *See*—
Nakanishi, Teruo, 5,499,667, Cl. 144-365.000.

Nakanishi, Teruo, to Nakanishi Construction Company. Drill/cutting bit, and method of making structural joint. 5,499,667, Cl. 144-365.000.

Nakanishi, Tsutomu: *See*—
Ikeda, Takeshi; Nakanishi, Tsutomu; and Okamoto, Akira, 5,500,552, Cl. 257-531.000.

Nakano, Hiroyuki: *See*—
Tsushima, Hideaki; Sasaki, Shinya; Nakano, Yukio; Nakano, Hiroyuki; Taeyari, Ryoji; Matsuda, Hironari; Tomooka, Kenji; Sakakida, Naohiro; Nishimura, Shin; Yano, Yoshihiro; Igarashi, Youichi; Aoki, Satoshi; Takatori, Masahiro; Kazawa, Tohru; and Ashi, Yoshihiro, 5,500,756, Cl. 359-174.000.

Nakano, Nobuyuki, to Ikeda Bussan Co., Ltd. Automotive seat with air-bag. 5,499,840, Cl. 280-730.100.

Nakano, Yukio: *See*—
Tsushima, Hideaki; Sasaki, Shinya; Nakano, Yukio; Nakano, Hiroyuki; Taeyari, Ryoji; Matsuda, Hironari; Tomooka, Kenji; Sakakida, Naohiro; Nishimura, Shin; Yano, Yoshihiro; Igarashi, Youichi; Aoki, Satoshi; Takatori, Masahiro; Kazawa, Tohru; and Ashi, Yoshihiro, 5,500,756, Cl. 359-174.000.

Nakao, Ken: *See*—
Niino, Reiji; Obbu, Tomoyuki; Ikegawa, Hiroaki; Nakao, Ken; Fujita, Yoshiyuki; Haraoka, Tsutomu; Kobayashi, Makoto; Kaneda, Naoya; and Kumada, Hiroshi, 5,500,388, Cl. 437-89.000.

Nakaoka, Yuji, to NEC Corporation. Semiconductor memory device. 5,500,820, Cl. 365-189.010.

Nakashima, Kunio; Ishigane, Ryoichi; Tanaka, Takayuki; and Yamamoto, Kenzo, to Chuetsu Metal Works Co., Ltd. Mold for continuous casting which comprises a flame sprayed coating layer of a tungsten carbide-based wear-resistant material. 5,499,672, Cl. 164-418.000.

Nakata, Atsuo: *See*—
Saito, Atsushi; Shinagawa, Hideo; and Nakata, Atsuo, 5,500,355, Cl. 435-69.700.





Nakata, Kiyoshi; and Hayashi, Seishu, to Toyo Boseki Kabushiki Kaisha. Apparatus for spinning of polyurethane elastic filaments. 5,499,911, Cl. 425-94.000.

Nakata, Toru, to Canon Kabushiki Kaisha. Inter-nodal communication method and system using multiplexing. 5,500,857, Cl. 370-50.000.

Nakayama, Masaaki; Baba, Yasutoshi; Terada, Takehiko; Sakakibara, Shuji; and Yamamoto, Kenji, to Nippondenso Co., Ltd. Apparatus for detecting misfire in internal combustion engine. 5,499,537, Cl. 73-117.300.

Nakayama, Masahito: *See*—
Iwamoto, Fumiya; Nakayama, Masahito; and Matsumoto, Yoshiyuki, 5,499,832, Cl. 280-96.100.

Nakayama, Takashi; and Sagara, Hiroshi, to JGC Corporation. Liquid-liquid contactor. 5,500,116, Cl. 210-511.000.

Nakayasu, Hirofumi: *See*—
Hosokawa, Yoshiaki; Kanoh, Masaki; Mackawa, Takashi; and Nakayasu, Hirofumi, 5,499,876, Cl. 400-56.000.

Nakazato, Morizo: *See*—
Obba, Toshio; Sato, Naomi; Ogawa, Masahiko; and Nakazato, Morizo, 5,500,148, Cl. 252-315.200.

Nakazato, Ryoji: *See*—
Obana, Jinichi; Hanatani, Shigeru; Okada, Junichi; Nasu, Yukari; and Nakazato, Ryoji, 5,500,454, Cl. 523-120.000.

Nakazawa, Yasushi; Touma, Kiyotaka; and Enomoto, Masatoshi, to Honda Giken Kogyo Kabushiki Kaisha; and Showa Aluminum Corporation. Tool holding an elongate profile material to be sliced. 5,499,801, Cl. 269-48.100.

Namiki, Masanori; Mori, Kazuyoshi; and Kato, Hideo, to Unisia Jecs Corporation. Fuel injection valve including air promoting atomization. 5,499,769, Cl. 239-409.000.

Nangalia, Sundeep: *See*—
Bobbio, Stephen M.; Koopman, Nicholas G.; and Nangalia, Sundeep, 5,499,754, Cl. 228-42.000.

Nankai Technart Corporation: *See*—
Masuda, Haruyuki; and Takata, Yasuo, 5,499,400, Cl. 2-161.600.

Nankaku, Nagahiko, to NEC Corporation. Scramble communication system multiplexing/demultiplexing scramble generation polynomial. 5,500,898, Cl. 380-43.000.

Narayan, Ramani: *See*—
Krishnan, Mohan; and Narayan, Ramani, 5,500,465, Cl. 524-47.000.

Narayanan, Vinod: *See*—
Honsinger, Philip S.; Lim, Lucy; and Narayanan, Vinod, 5,500,804, Cl. 364-488.000.

Narui, Fumio: *See*—
Ohno, Hirofumi; Narui, Fumio; and Hayashi, Shigeru, 5,499,927, Cl. 439-285.000.

Narui, Takashi: *See*—
Murata, Masami; Kishi, Harumi; Narui, Takashi; Kasai, Shuichi; and Iwasa, Akira, 5,500,221, Cl. 424-436.000.

Naruse, Hideaki: *See*—
Mizukawa, Yuki; Naruse, Hideaki; Watanabe, Toshiyuki; and Sato, Tadahisa, 5,500,334, Cl. 430-558.000.

Naruse, Yoshihiro: *See*—
Yamada, Takahiro; Ando, Shinji; and Naruse, Yoshihiro, 5,499,909, Cl. 417-384.000.

Nashef, Aws: *See*—
Quijano, R. C.; Nashef, Aws; and Myers, Keith, 5,500,014, Cl. 623-2.000.

Nashimoto, Yasunobu: *See*—
Yoshida, Takayoshi; and Nashimoto, Yasunobu, 5,500,381, Cl. 437-41.000.

Nasu, Yukari: *See*—
Obana, Jinichi; Hanatani, Shigeru; Okada, Junichi; Nasu, Yukari; and Nakazato, Ryoji, 5,500,454, Cl. 523-120.000.

Nathanson, James A., to General Hospital Corporation, The. Method for treatment of glaucoma with nitrogen containing guanylate cyclase activators. 5,500,230, Cl. 424-619.000.

National Science Council: *See*—
Her, Inachyn; Chao, Ping-Yi; and Huang, Ming-Jang, 5,499,833, Cl. 280-247.000.

National Semiconductor Corporation: *See*—
Chiu, Wai T.; and Wong, Kwong Y., 5,500,888, Cl. 379-61.000.

National Starch and Chemical Investment Holding Corporation: *See*—
Bernard, Karen A.; Thai, John; Billmers, Robert L.; and Sweger, Robert W., 5,500,087, Cl. 162-164.600.
Liedermooy, Ingrid; Birch, Julie; Stauffer, Daniel C.; and Puletti, Paul P., 5,500,472, Cl. 524-272.000.

Nawamaki, Tsutomu: *See*—
Mekino, Kenzi; Akiyama, Shigeaki; Suzuki, Hideaki; Nagaoka, Takeshi; Niki, Toshio; Suzuki, Koichi; Nawamaki, Tsutomu; Watanabe, Shigeomi; and Ishikawa, Kimihiro, 5,500,406, Cl. 504-215.000.

NCH Corporation: *See*—
Kiplinger, Dale V., 5,500,369, Cl. 435-309.100.

Neal, Philip H.: *See*—
Bridges, John A.; Neal, Philip H.; and Besser, John E., 5,500,305, Cl. 428-621.000.

NEC Corporation: *See*—
Horiuchi, Yasuo; and Kuninaka, Hitoshi, 5,500,052, Cl. 136-244.000.
Iwasaki, Motoya, 5,500,878, Cl. 375-344.000.
Kano, Isao, 5,500,560, Cl. 257-767.000.
Kawamura, Hajime, 5,500,862, Cl. 371-22.300.
Kimura, Katsuji, 5,500,623, Cl. 330-252.000.
Kosugi, Yuhei, 5,500,556, Cl. 257-718.000.
Kurihara, Kaori, 5,500,868, Cl. 372-46.000.
Murakami, Tomoo, 5,499,446, Cl. 29-852.000.
Murakami, Tomoo, 5,499,447, Cl. 29-852.000.
Nagata, Kazuyuki, 5,500,876, Cl. 375-332.000.
Nakaoka, Yuji, 5,500,820, Cl. 365-189.010.
Nankaku, Nagahiko, 5,500,898, Cl. 380-43.000.
Nishimoto, Hiroshi, 5,499,732, Cl. 216-24.000.
Sato, Fumihiko, 5,500,554, Cl. 257-588.000.
Suzuki, Naoshi, 5,500,521, Cl. 250-208.100.
Tsugita, Masami, 5,500,617, Cl. 327-321.000.
Yamaguchi, Kazumi; Sawada, Masumi; Yamada, Masahiro; and Hagimoto, Keizo, 5,500,547, Cl. 257-359.000.
Yoshida, Takayoshi; and Nashimoto, Yasunobu, 5,500,381, Cl. 437-41.000.

Nedberge, Diane E.: *See*—
Lee, Eun S.; Nedberge, Diane E.; and Yum, Su I., 5,500,222, Cl. 424-448.000.

Neeb, Roland: *See*—
Schilkra, Heinrich; Neeb, Roland; Schlipf, Karl; and Kuntz, Bertram, 5,499,990, Cl. 606-144.000.

Negami, Takayuki: *See*—
Wada, Takahiro; Ikeda, Mitsunuke; Nishitani, Mikihiko; Terauchi, Masaharu; Negami, Takayuki; and Kohara, Naoki, 5,500,056, Cl. 136-259.000.

Negus, Joel A., to Lisle Corporation. Magnetic socket holder. 5,500,631, Cl. 335-285.000.

Nehm, Holger; and Grether, Hermann, to Dieter Wildfang GmbH. Filtering strainer. 5,500,115, Cl. 210-460.000.

Nell, Joachim: *See*—
Brugger, Manfred P.; Klarer, Martin; Kaoff, Bernd; Eckl, Albrecht; Steiner, Manfred; Rump, Siegfried; Nell, Joachim; Eckstein, Fredy; Steffi, Christoph; and Douglas, Brian, 5,499,866, Cl. 303-122.080.

Nelson, David L.: *See*—
Audia, James E.; Droste, James J.; Evrard, Deborah A.; Fludzinski, Pawel; Murdoch, Gwyn L.; and Nelson, David L., 5,500,431, Cl. 514-280.000.

Nelson, Philip L.: *See*—
Foster, Donald D.; and Nelson, Philip L., 5,499,766, Cl. 239-333.000.

Nelson, Richard A.: *See*—
Short, Michael K.; Grieser, Jerry D.; Nelson, Richard A.; Warner, Thomas B.; and Maguire, Ferrol M., 5,499,886, Cl. 403-381.000.

Nemeth, Bradley M., to Brauner-Nemeth, Inc. Floppy disk container with nesting cover. 5,499,715, Cl. 206-505.000.

Ness, Jeremy N.: *See*—
Behan, John M.; Ness, Jeremy N.; and Perring, Keith D., 5,500,223, Cl. 424-451.000.

Nestle S.A.: *See*—
Beuchat, Charles E.; Etherington, Roger; Walbrink, Harold J.; and Berkman, John W., 5,499,969, Cl. 604-30.000.

Nettleton, John E.: *See*—
Redman, Brian C.; Barr, Dallas N.; and Nettleton, John E., 5,500,729, Cl. 356-5.090.

Neuber, Thomas: *See*—
Krüger, Edmund; and Neuber, Thomas, 5,499,624, Cl. 128-204.260.

Neurim Pharmaceuticals (1991) Ltd.: *See*—
Laudon, Moshe; and Zisapel, Nava, 5,500,225, Cl. 424-464.000.

New England Biolabs, Inc.: *See*—
Comb, Donald G.; Perler, Francine; Kucera, Rebecca; and Jack, William E., 5,500,363, Cl. 435-194.000.

New Holland North America, Inc.: *See*—
Schott, Allan N.; and Girard, Mario P., 5,499,553, Cl. 74-526.000.

Newcourt, Inc.: *See*—
Court, Melvin T.; and Monte, Alec V., 5,499,475, Cl. 49-495.100.

Newman, Steve. Toric lens with orientation wave forms. 5,500,695, Cl. 351-161.000.

Newport Corporation: *See*—
Terry, Dennis C., 5,500,269, Cl. 428-116.000.

NGK Insulators, Ltd.: *See*—
Hagino, Tomiaki; Furuta, Mamoru; and Fukao, Kaname, 5,499,913, Cl. 425-382.400.

Nickeas, Dan A.: *See*—
Gold, Jeffrey W.; and Nickeas, Dan A., 5,499,665, Cl. 141-1.000.

Nickolls, Peter M.: *See*—
Ansourian, Megeurditch N.; and Nickolls, Peter M., 5,500,004, Cl. 607-4.000.

Nicolaou, K. C.; Hiatt, Andrew; and Wrasidlo, Wolfgang, to Scripps Research Institute, The. Induction and inhibition of apoptosis. 5,500,432, Cl. 514-281.000.

Nidek Co., Ltd.: *See*—
Fujieda, Masanao, 5,500,697, Cl. 351-212.000.

Nieder, Wolfgang; Winkler, Manfred; Perchtold, Gerhard; Seirlehner, Leo; Kohler, Herbert; and Eberle, Arwed, to Voest-Alpine Industrieanlagenbau GmbH; and Mercedes-Benz Aktiengesellschaft. Method for continuously melting down scrap metal. 5,500,032, Cl. 75-414.000.

Nieduzak, Thaddeus R.: *See*—
Carr, Albert A.; Dage, Richard C.; Koerner, John E.; Li, Tung; Miller, Francis P.; Nieduzak, Thaddeus R.; Dudley, Mark W.; Schmidt, Christopher J.; and Frank, Robert A., 5,500,433, Cl. 514-330.000.

Nielsen, Arne: *See*—
Moghaddassi, Majid; and Nielsen, Arne, 5,499,433, Cl. 26-2.00R.

Niessner, Werner: *See*—

Löffler, Otto; Niessner, Werner; Ambacher, Heinz; and Schneider, Friedrich E., 5,500,304, Cl. 428-614.000.
Nihon Chikudenki Kogyo Kabushiki Kaisha: *See*—
Yoneyama, Yoshio, 5,500,101, Cl. 205-646.000.
Nihon Nohyaku Co., Ltd.: *See*—
Nagamine, Masashi; Yamamoto, Kenji; Horiuchi, Kenji; Matsui, Yoshimitsu; and Yoshida, Masanori, 5,500,424, Cl. 514-235.500.
Niimi, Noritoshi: *See*—
Hamasaki, Yasuaki; Tsukada, Kazuaki; Watanabe, Hiroyuki; Tsuzaki, Kenji; Murakami, Mitsuyuki; and Niimi, Noritoshi, 5,500,408, Cl. 504-261.000.
Niino, Reiji; Ohbu, Tomoyuki; Ikegawa, Hiroaki; Nakao, Kea; Fujita, Yoshiyuki; Haraoka, Tsutomu; Kobayashi, Makoto; Kaneda, Naoya; and Kumada, Hiroshi, to Tokyo Electron Kabushiki Kaisha; and Tokyo Electron Tohoku Kabushiki Kaisha. Heat treatment process for wafers. 5,500,388, Cl. 437-89.000.
Niki, Toshio: *See*—
Makino, Kenzi; Akiyama, Shigeaki; Suzuki, Hideaki; Nagaoka, Takeshi; Niki, Toshio; Suzuki, Koichi; Nawamaki, Tsutomu; Watanabe, Shigeomi; and Ishikawa, Kimihiro, 5,500,406, Cl. 504-215.000.
Nikon Corporation: *See*—
Kazami, Kazuyuki; Yokotsuma, Norikazu; Yamazaki, Youichi; and Hibino, Hideo, 5,500,709, Cl. 354-416.000.
Kitaoka, Naoki; and Ohsawa, Keiji, 5,500,519, Cl. 250-201.800.
Koitabashi, Hideki; Yanagihara, Masamitsu; and Hazama, Junji, 5,500,736, Cl. 356-375.000.
Matsui, Hidenobu; and Hirai, Mitsuru, 5,500,528, Cl. 250-310.000.
Ohsawa, Keiji, 5,500,708, Cl. 354-406.000.
Sasagaki, Nobuaki; and Saegusa, Takashi, 5,500,711, Cl. 354-474.000.
Nikos, Hideo: *See*—
Matsumoto, Shoji; Nikos, Hideo; and Nakagawa, Satoshi, 5,500,386, Cl. 437-60.000.
Nimura, Hiroaki: *See*—
Kii, Masayuki; Nimura, Hiroaki; and Umeyama, Mitsuhiro, 5,499,703, Cl. 192-70.110.
Nimura, Yoshitaka: *See*—
Okumura, Toshiaki; Ekimoto, Takao; Shimamoto, Satoshi; Ogawa, Katsumi; Tomita, Masahiro; Nimura, Yoshitaka; and Kadowaki, Ryosaku, 5,500,170, Cl. 264-148.000.
Nippei Toyama Corporation: *See*—
Yoshiaki, Banzawa, 5,500,507, Cl. 219-121.820.
Nippon Conlux, Ltd.: *See*—
Fujino, Keijirou; and Yamazaki, Koichi, 5,500,841, Cl. 369-44.260.
Nippon Hoso Kyokai: *See*—
Tanaka, Takayuki; Watanabe, Ryu; Oonami, Yuuichi; and Eto, Yoshizumi, 5,500,676, Cl. 348-387.000.
Nippon Oil Company: *See*—
Aozai, Iwao; Matsuoka, Shigeki; and Uehara, Jun, 5,500,307, Cl. 429-30.000.
Nippon Paint Co., Ltd.: *See*—
Nishimura, Satoshi; Hirasawa, Hidekimi; and Iimure, Tamio, 5,500,463, Cl. 523-408.000.
Nippon Sheet Glass Co. Ltd.: *See*—
Hamanaka, Kenjiro, 5,500,523, Cl. 250-216.000.
Nippon Soken Inc.: *See*—
Takigawa, Kenji; Oyama, Naohisa; and Hayashi, Hitoshi, 5,500,146, Cl. 252-299.670.
Nippon Telegraph and Telephone Corporation: *See*—
Sato, Mitsuhisa; Maeda, Mikio; and Furukawa, Shinichi, 5,500,731, Cl. 356-73.100.
Uchiyama, Haruyoshi; Lee, Tekken; Takeuchi, Nobunari; Shimizu, Kaoru; Horiguchi, Tsuneo; and Koyamada, Yahei, 5,500,762, Cl. 359-326.000.
Nippondenso Co., Ltd.: *See*—
Hania, Yukio; Ishida, Shinji; and Koshimizu, Michio, 5,499,502, Cl. 60-290.000.
Isobe, Yasushi; and Mizuno, Hiroyoshi, 5,500,288, Cl. 428-469.000.
Nagaoka, Takashi, 5,500,278, Cl. 428-210.000.
Nakayama, Masaaki; Baba, Yasutoshi; Terada, Takehiko; Sakakibara, Shuji; and Yamamoto, Kenji, 5,499,537, Cl. 73-117.300.
Takeuchi, Yukihiro; Shibata, Kozo; Ohtsuka, Yoshinori; Kano, Kazuhiko; and Yamamoto, Toshimasa, 5,500,549, Cl. 257-415.000.
Nishi, Hiroshi: *See*—
Nishimura, Shinji; Nishi, Hiroshi; and Nishimura, Masaji, 5,500,348, Cl. 435-7.240.
Nishi, Isao: *See*—
Tanaka, Shingo; Ueno, Tetsuya; Itoi, Akito; and Nishi, Isao, 5,500,322, Cl. 430-110.000.
Nishi, Seiji: *See*—
Onishi, Takashi; Yoshikawa, Kazuo; Nishi, Seiji; and Yamamoto, Seigou, 5,500,301, Cl. 428-457.000.
Nishibayashi, Yoshiki; and Shikata, Shinichi, to Sumitomo Electric Industries, Ltd. Method of polishing/flattening diamond. 5,500,077, Cl. 156-628.100.
Nishibayashi, Yoshiki; Shiomi, Hiromu; and Fujimori, Naoji, to Sumitomo Electric Industries, Ltd. Method for fabricating a schottky junction. 5,500,393, Cl. 437-175.000.
Nishigaya, Takeshi: *See*—
Sakamoto, Yukinori; Hashimoto, Takeshi; Nakabe, Katsuji; Kobayashi, Masaharu; Nishigaya, Takeshi; and Yamanashi, Fumiyoshi, 5,500,294, Cl. 428-355.000.
Nishigori, Yoshihisa: *See*—
Hatano, Takahisa; and Nishigori, Yoshihisa, 5,500,687, Cl. 348-663.000.
Nishii, Yasuhiro: *See*—
Nakane, Hideki; Nishii, Yasuhiro; and Sugiura, Masami, 5,499,863, Cl. 297-452.200.
Nishikawa, Satoshi: *See*—
Taira, Kazunari; Nishikawa, Satoshi; and Maeda, Hidekatsu, 5,500,357, Cl. 435-91.310.
Nishimoto, Hiroshi, to NBC Corporation. Method for fabricating an optical device. 5,499,732, Cl. 216-24.000.
Nishimoto, Ikuo, to Yamatake-Honeywell Co., Ltd. Photoelectric distance sensor. 5,500,728, Cl. 356-3.030.
Nishimoto, Yoshifumi; and Kataoka, Kenichi, to Canon Kabushiki Kaisha. Sheet feeding apparatus. 5,499,808, Cl. 271-267.000.
Nishimura, Masaji: *See*—
Nishimura, Shinji; Nishi, Hiroshi; and Nishimura, Masaji, 5,500,348, Cl. 435-7.240.
Nishimura, Ryuji: *See*—
Takase, Satoshi; Imaide, Takuya; Kinugasa, Toshiro; and Nishimura, Ryuji, 5,500,674, Cl. 348-208.000.
Nishimura, Satoshi; Hirasawa, Hidekimi; and Iimure, Tamio, to Nippon Paint Co., Ltd. Aqueous resin composition and method for forming coating film on can body. 5,500,463, Cl. 523-408.000.
Nishimura, Shigeoki: *See*—
Muranaka, Yasushi; Imahashi, Jinichi; Horiba, Tatsuo; and Nishimura, Shigeoki, 5,500,292, Cl. 429-209.000.
Nishimura, Shin: *See*—
Tsushima, Hideaki; Sasaki, Shinya; Nakano, Yukio; Nakano, Hiroyuki; Tateyari, Ryoji; Matsuda, Hironari; Tomooka, Kenji; Sakakida, Naohiro; Nishimura, Shin; Yano, Yoshihiro; Igarashi, Yoichi; Aoki, Satoshi; Takatori, Masahiro; Kazawa, Tohru; and Ashi, Yoshihiro, 5,500,756, Cl. 359-174.000.
Nishimura, Shinji; Nishi, Hiroshi; and Nishimura, Masaji, to Shionogi & Co., Ltd. Basophil-binding monoclonal antibody, method for separation of basophils, method for chemical mediator release from basophils, and method for testing release of basophil-derived chemical mediators. 5,500,348, Cl. 435-7.240.
Nishisaka, Keiji: *See*—
Komada, Norikazu; Nishisaka, Keiji; Adachi, Kazunori; and Fujiwara, Shuji, 5,500,158, Cl. 252-637.000.
Nishino, Hiroyuki: *See*—
Ito, Yasuo; Kato, Hideo; Yasuda, Shingo; Iwasaki, Nobuhiko; Nishino, Hiroyuki; and Takeshita, Makoto, 5,500,422, Cl. 514-212.000.
Nishio, Toshiyuki: *See*—
Maeda, Takashi; Kubota, Shuichi; Furukido, Takeshi; and Nishio, Toshiyuki, 5,499,825, Cl. 277-100.000.
Nishitani, Mikihiko: *See*—
Wada, Takahiro; Ikeda, Mitsusuke; Nishitani, Mikihiko; Terauchi, Masahara; Negami, Takayuki; and Kohara, Naoki, 5,500,056, Cl. 136-259.000.
Nishizawa, Jun-ichi; and Yamamoto, Kenji, to Research Development Corporation of Japan. Dry etching method. 5,500,079, Cl. 156-643.100.
Nissan Chemical Industries Ltd.: *See*—
Makino, Kenzi; Akiyama, Shigeaki; Suzuki, Hideaki; Nagaoka, Takeshi; Niki, Toshio; Suzuki, Koichi; Nawamaki, Tsutomu; Watanabe, Shigeomi; and Ishikawa, Kimihiro, 5,500,406, Cl. 504-215.000.
Nissan Motor Co., Ltd.: *See*—
Hara, Junichiro; and Matsuoka, Takayoshi, 5,499,511, Cl. 62-180.000.
Hayasaki, Koichi, 5,499,953, Cl. 477-120.000.
Muro, Hideo, 5,499,526, Cl. 73-1.00D.
Nissen, Peter; and Schäfer, Klaus, to Fischer & Porter GmbH. Device for measuring the flow of fluid through a measuring pipe. 5,499,543, Cl. 73-861.160.
Nisshinbo Industries, Inc.: *See*—
Harinaga, Toshiyuki, 5,499,701, Cl. 188-72.400.
Nix, John W. Apparatus for lifting invalids. 5,499,408, Cl. 5-85.100.
NKK Corporation: *See*—
Inoue, Tadashi; Tsuru, Kiyoshi; Okimoto, Shinichi; Yamamura, Naokazu; Yamamoto, Tetsuo; and Haiji, Hirohisa, 5,500,057, Cl. 148-312.000.
Udagawa, Satoru; Abe, Masaki; Ando, Satoru; Matsuki, Yasuhiro; Watanabe, Toyofumi; Shiohara, Yukimitsu; Morita, Masaya; and Kido, Akimasa, 5,500,290, Cl. 428-610.000.
Noami, Tuneo: *See*—
Maruyama, Kazuo; and Noami, Tsuneo, 5,500,727, Cl. 355-326.00R.
Noble, E. P.: *See*—
Blum, Kenneth; Noble, E. P.; and Sheridan, P. J., 5,500,343, Cl. 435-6.000.
Nobutoki, Hideharu: *See*—
Tsumura, Akira; Fuchigami, Hiroyuki; Nobutoki, Hideharu; and Koezuka, Hiroshi, 5,500,537, Cl. 257-40.000.
Nogami, Taru; Matsuura, Shunichi; and Kuroda, Akira, to Hitachi, Ltd. Spectrofluorometer. 5,500,536, Cl. 250-458.100.
Noger, Joël, to Aerospatiale Societe Nationale Industrielle. Device for making use of information related to the breakdown detected by one or more central units of an aircraft. 5,500,797, Cl. 364-424.040.
Noguchi, Akiyoshi: *See*—
Sano, Hiroshi; Taguchi, Kinji; Noguchi, Akiyoshi; and Tanaka, Shigeru, 5,499,797, Cl. 254-134.400.



Noguchi, Koichi, to Ricoh Company, Ltd. Electrophotographic digital copier for providing bicolor copies by a single image transfer. 5,500,738, Cl. 358-300.000.
Noguchi, Masato, to Asahi Kogaku Kogyo Kabushiki Kaisha. Construction of optical disk. 5,500,849, Cl. 369-275.400.
Nohr, Ronald S.: *See*—
Quincy, Roger B., III; Nohr, Ronald S.; MacDonald, John G.; Gadsby, Elizaeth D.; and Everhart, Dennis S., 5,500,254, Cl. 427-387.000.
Nojiri, Hironobu; Yakushiji, Kazuyuki; Yoshinaga, Minoru; and Terasaka, Hiroyuki, to Toray Industries, Inc. Package of tape type non-twisted carbon fiber bundle. 5,499,776, Cl. 242-178.000.
Noll, J. Brian: *See*—
Beck, Henry; Noll, J. Brian; and Lynch, Michael D., 5,499,964, Cl. 600-220.000.
Noordegraaf, Jan; Oud, Martinus A.; Behm, Harry; and de Rooy, Roelof, to Billiton Witmetaal B.V. Sa alloy bullet therefor. 5,500,183, Cl. 420-557.000.
Norand Corporation: *See*—
Durbin, Dennis A., 5,500,516, Cl. 235-472.000.
Kinney, Patick W.; Mahany, Ronald L.; and Koenck, Steven E., 5,500,872, Cl. 375-208.000.
NordicTrack, Inc.: *See*—
Habing, Theodore G.; and Splane, Robson L., Jr., 5,499,956, Cl. 482-52.000.
Nordson Corporation: *See*—
Derian, Gary A.; Turner, Herman E., Jr.; and Fleming, Michael W., 5,499,745, Cl. 222-136.000.
Noritsu Koki Co., Ltd.: *See*—
Miyawaki, Hiroshi; Itojima, Mitsuhiko; Oka, Takayuki; Yamamoto, Kazuyoshi; Akira, Toshiro; and Tsuji, Masaaki, 5,500,712, Cl. 355-22.000.
Norman, Mark F.: *See*—
Lavin, Thomas N.; Norman, Mark F.; Klein, Teri E.; and Seibel, George, 5,500,807, Cl. 364-496.000.
North Carolina State University: *See*—
Chang, Hou-Min; Wu, Tien-Wang; and Heitmann, John A., 5,500,082, Cl. 162-5.000.
Northern Telecom Limited: *See*—
Brown, Geoffrey B. D.; and Park, David W., 5,500,620, Cl. 329-300.000.
Northrop Grumman Corporation: *See*—
Komine, Hiroshi, 5,500,520, Cl. 250-203.100.
Padden, Vincent T., 5,500,272, Cl. 428-140.000.
Northwestern University: *See*—
Marks, Tobin J.; and Yang, Xinmin, 5,500,398, Cl. 502-103.000.
Novak, Heinrich; Berthold, Herbert; Barta, Gerhard; and Pichler, Hans-Peter, to MAG Maschinen; and Apparatebau Gellschaft mbH. Wire pull-in apparatus. 5,499,774, Cl. 242-47.030.
Nsoft Systems, Inc.: *See*—
Lee, Ven L.; Dawson, William M.; and Doud, Donald L., 5,500,805, Cl. 364-491.000.
NTT Mobile Communications Network, Inc.: *See*—
Nagase, Taku; Go, Roland; Matsumoto, Tadashi; and Higashi, Akihiro, 5,500,856, Cl. 370-18.000.
Nu-Tech GmbH: *See*—
Stange, Gerd, 5,500,599, Cl. 324-634.000.
Nukaga, Tadashi: *See*—
Nakagawa, Kenji; Yoshizaki, Koichi; Nukaga, Tadashi; Banba, Yoshikazu; Hattori, Shigetaka; and Mochizuki, Kentaro, 5,499,791, Cl. 248-638.000.
Nukem GmbH: *See*—
Theisen, Wolfgang; Brauneis, Edwin; and Pirstadt, Bernd, 5,500,162, Cl. 264-9.000.
Numagami, Atsushi: *See*—
Yashiro, Masahiko; Sasaki, Shinichi; Ikemoto, Isao; Miura, Koji; Karakama, Toshiyuki; and Numagami, Atsushi, 5,500,714, Cl. 355-200.000.
Nunez, Jospeh M.: *See*—
Vondell, Edward P.; Mobley, Juliana; Nunez, Jospeh M.; Maas, Charles A.; Stuch, Donald; and Yu, Jinquan, 5,499,530, Cl. 73-49.700.
Nutzman, Thomas M.: *See*—
Heller, Bernard F.; Schmidt, Craig L.; Nutzman, Thomas M.; and Lessar, Joseph F., 5,500,026, Cl. 29-623.100.
O.M.G. di Giorgio Pessina e Aldo Perobelli S.n.c.: *See*—
Perobelli, Aldo; and Pessina, Giorgia, 5,499,489, Cl. 53-540.000.
Oak Industries Inc.: *See*—
Comer, Donald T., 5,500,618, Cl. 327-361.000.
Obana, Jinichi; Hanatani, Shigeru; Okada, Junichi; Nasu, Yukari; and Nakazato, Ryoji, to GC Corporation. Denture base separating material. 5,500,454, Cl. 523-120.000.
Oberkobusch, Doris: *See*—
Eicken, Ulrich; Fischer, Herbert; Gress, Wolfgang; Hoefer, Rainer; Oberkobusch, Doris; and Schieferstein, Ludwig, 5,500,475, Cl. 524-591.000.
O'Brien, Jeffrey J.: *See*—
Kirk, Kevin A.; Liu, Leland L.; O'Brien, Jeffrey J.; and Sheppard, Robert M., 5,500,283, Cl. 428-349.000.
Ochi, Sam S., to DXYS Corporation. Overvoltage clamp and desaturation detection circuit. 5,500,616, Cl. 327-310.000.
Oda, Hiroyuki, to Tokuyama Corporation. Method for producing a silicon rod. 5,499,598, Cl. 117-49.000.
Odagiri, Harumi: *See*—
Ogawa, Katsuki; Kumagai, Shigenori; and Odagiri, Harumi, 5,500,533, Cl. 250-372.000.
Odake, Yoshinori; Ohnishi, Teruhito; and Fujii, Minoru, to Matsushita Electric Industrial Co., Ltd. Method of manufacturing semiconductor device. 5,500,379, Cl. 437-34.000.
O'Donnell, Thomas J.: *See*—
Atwell, Michael J.; and O'Donnell, Thomas J., 5,499,407, Cl. 5-1.000.
Odru, Pierre; Sparks, Charles; Auberon, Marcel; and Behar, Jacques, to Institut Francais du Petrole; and Aerospatiale. Tube comprising composite layers with different modulii of elasticity. 5,499,661, Cl. 138-124.000.
Oertel, Hans-Wolfgang; and Martin, David L., to Joslyn Electronic Systems Corporation. Hybrid surge protector. 5,500,782, Cl. 361-120.000.
Ogasawara, Yoshimi: *See*—
Sakaki, Eihiro; Ogasawara, Yoshimi; and Teshima, Eiichiro, 5,500,834, Cl. 368-9.000.
Ogasawara, Yutaka, to Canon Kabushiki Kaisha. Method and apparatus for accessing reading and/or writing means to a desired region on an information recording medium on which a plurality of tracks are spirally formed, in accordance with an estimated arrival position. 5,500,840, Cl. 369-32.000.
Ogawa, Katsuki; Kumagai, Shigenori; and Odagiri, Harumi, to Shiseido Company, Ltd. Method and apparatus for measuring ultraviolet protection effectiveness. 5,500,533, Cl. 250-372.000.
Ogawa, Katsumi: *See*—
Okumura, Toshiaki; Ekimoto, Takao; Shimamoto, Satoshi; Ogawa, Katsumi; Tomita, Masahiro; Nimura, Yoshitaka; and Kadowaki, Ryosaku, 5,500,170, Cl. 264-148.000.
Ogawa, Kazufumi; Miao, Norihisa; and Soga, Mamoru, to Matsushita Electric Industrial Co., Ltd. Chemically adsorbed film and method of manufacturing the same. 5,500,250, Cl. 427-299.000.
Ogawa, Masahiko: *See*—
Ohba, Toshio; Sato, Naomi; Ogawa, Masahiko; and Nakazato, Morizo, 5,500,148, Cl. 252-315.200.
Ogawa, Nobuyoshi: *See*—
Yamazaki, Kouichi; and Ogawa, Nobuyoshi, 5,500,280, Cl. 428-220.000.
Ogue, Yousuke; Kuyama, Takahiro; and Kaino, Kazuyuki, to Matsushita Electric Industrial Co., Ltd. Three dimensional object-forming method. 5,500,069, Cl. 264-401.000.
Ogura, Naoyuki: *See*—
Tanide, Hideo; Muranaka, Masayuki; Mori, Shigeru; Wada, Kiyoshi; Yoshizaki, Isao; and Ogura, Naoyuki, 5,500,747, Cl. 359-40.000.
Ogure, Naoaki: *See*—
Miyata, Masahiro; Ezawa, Hirokazu; Ogure, Naoaki; Tsujimura, Manabu; Ohdaira, Takeyuki; Inoue, Hiroaki; and Ikeda, Yukio, 5,500,559, Cl. 257-762.000.
Ohba, Toshio; Sato, Naomi; Ogawa, Masahiko; and Nakazato, Morizo, to Shin-Etsu Chemical Co., Ltd. Silicone emulsion composition for surface release treatmeat. 5,500,148, Cl. 252-315.200.
Ohbu, Tomoyuki: *See*—
Niino, Reiji; Ohbu, Tomoyuki; Ikegawa, Hiroaki; Nakao, Kea; Fujita, Yoshiyuki; Haraoka, Tsutomu; Kobayashi, Makoto; Kaneda, Naoya; and Kumada, Hiroshi, 5,500,388, Cl. 437-89.000.
Ohdaira, Takeyuki: *See*—
Miyata, Masahiro; Ezawa, Hirokazu; Ogure, Naoaki; Tsujimura, Manabu; Ohdaira, Takeyuki; Inoue, Hiroaki; and Ikeda, Yukio, 5,500,559, Cl. 257-762.000.
Ohgiri, Shigeteru: *See*—
Chikada, Akira; Ohgiri, Shigeteru; and Ito, Hiroe, 5,500,790, Cl. 362-66.000.
Ohio Mattress Company Licensing and Components Group: *See*—
Atwell, Michael J.; and O'Donnell, Thomas J., 5,499,407, Cl. 5-1.000.
Oh-Ishi, Katsuyoshi: *See*—
Ueno, Fumio; Kasori, Mitsuo; Horiguchi, Akihiro; and Oh-Ishi, Katsuyoshi, 5,500,395, Cl. 501-98.000.
Ohishi, Takeo: *See*—
Higurashi, Seiji; Teranishi, Yasuhiko; Yamada, Yasuaki; and Ohishi, Takeo, 5,500,679, Cl. 348-432.000.
Ohkawara Kakohki Co., Ltd.: *See*—
Tanaka, Toshiyuki; Kodera, Akira; and Aishima, Shizuo, 5,499,768, Cl. 239-406.000.
Ohkura, Osamu: *See*—
Sasakura, Miyoshi; Ohkura, Osamu; Mizoguchi, Takehiko; Hori, Satoru; and Yoshida, Satoshi, 5,500,932, Cl. 395-149.000.
Ohmi, Kazuaki: *See*—
Ichikawa, Takeshi; Shindo, Hitoshi; and Ohmi, Kazuaki, 5,500,102, Cl. 204-192.250.
Ohnishi, Teruhito: *See*—
Odake, Yoshinori; Ohnishi, Teruhito; and Fujii, Minoru, 5,500,379, Cl. 437-34.000.
Ohno, Hirofumi; Narui, Fumio; and Hayashi, Shigeru, to Texell Corp.; and Kel Corp. Zipper-type electrical connector. 5,499,927, Cl. 439-285.000.
Ohsuma, Tetsuya: *See*—
Satoh, Masatoshi; and Ohsuma, Tetsuya, 5,499,440, Cl. 29-512.000.
Ohsawa, Keiji, to Nikon Corporation. Focus detection device having infrared filter. 5,500,708, Cl. 354-406.000.
Ohsawa, Keiji: *See*—
Kitaoka, Naoki; and Ohsawa, Keiji, 5,500,519, Cl. 250-201.800.
Ohsawa, Tetsuhiro: *See*—
Takei, Shinobu; Ohtani, Shoji; Iwasaki, Hiroaki; Ohsawa, Tetsuhiro; and Hosokowa, Yasunori, 5,500,261, Cl. 428-35.700.

Ohta, Kenji: *See—*
Van, Kazuo; Ohta, Kenji; Inui, Tetsuya; Nagaura, Toshikazu; Takemori, Hirotoshi; and Toki, Hirotaka, 5,500,850, Cl. 369-275.400.
Ohta, Toshihiko: *See—*
Katayama, Kaoru; Kazui, Shinichi; Iwata, Yasuhiro; Fukuda, Hiroshi; and Ohta, Toshihiko, 5,499,668, Cl. 134-1.000.
Ohtani, Shoji: *See—*
Takei, Shinobu; Ohtani, Shoji; Iwasaki, Hiroaki; Ohsawa, Tetsuhiro; and Hosokowa, Yasunori, 5,500,261, Cl. 428-35.700.
Ohtsuka, Yoshinori: *See—*
Takeuchi, Yukihiro; Shibata, Kozo; Ohtsuka, Yoshinori; Kano, Kazuhiko; and Yamamoto, Toshimasa, 5,500,549, Cl. 257-415.000.
Obura, Masaki: *See—*
Inoue, Youichi; Sato, Yoshihiro; Hirose, Shinichi; Tasi, Hiroshi; Tanaka, Katsuyuki; Abe, Katsuo; Obura, Masaki; and Mizumoto, Muneo, 5,500,296, Cl. 428-408.000.
Oikawa, Yoshio, to Laurel Bank Machines Co., Ltd. Coin wrapping apparatus. 5,499,483, Cl. 53-53.000.
Oiles Corporation: *See—*
Maeda, Takashi; Kubota, Shuichi; Furukido, Takeshi; and Nishio, Toshiyuki, 5,499,825, Cl. 277-100.000.
Oka, Takayuki: *See—*
Miyawaki, Hiroshi; Itojima, Mitsuhiko; Oka, Takayuki; Yamamoto, Kazuyoshi; Akira, Toshiro; and Tsuji, Masaaki, 5,500,712, Cl. 355-22.000.
Okabayashi, Ichiro, to Matsushita Electric Industrial Co., Ltd. Memory access device. 5,500,830, Cl. 365-230.080.
Okada, Atsunori; Wada, Shigeaki; Kusanagi, Shigekazu; and Fujioka, Tohru, to Matsushita Electric Works, Ltd. Metal vapor discharge lamp. 5,500,571, Cl. 313-635.000.
Okada, Junichi: *See—*
Obana, Jinichi; Hanatani, Shigeru; Okada, Junichi; Nasu, Yukari; and Nakazato, Ryoji, 5,500,454, Cl. 523-120.000.
Okada, Paul M. Flush hinge for athletic court doors. 5,499,428, Cl. 16-387.000.
Okada, Shinjiro: *See—*
Inaba, Yutaka; Okada, Shinjiro; Taniguchi, Osamu; and Mizuno, Hironobu, 5,500,749, Cl. 359-56.000.
Okamoto, Akira: *See—*
Ikeda, Takeshi; Nakanishi, Tsutomu; and Okamoto, Akira, 5,500,552, Cl. 257-531.000.
Okamoto Industries, Inc.: *See—*
Hayashi, Toshihiro; Kohno, Hiroshige; Watanabe, Akinori; and Horiguchi, Itaru, 5,500,178, Cl. 264-297.800.
Okamoto, Keizo: *See—*
Koch, Russell W.; Turner, John L.; Walenga, Guy J.; Takigawa, Hiroyoshi; and Okamoto, Keizo, 5,500,065, Cl. 156-123.000.
Okamoto, Shinya: *See—*
Fujimoto, Akihiko; Ishii, Hisao; Okamoto, Shinya; and Sato, Naoki, 5,499,963, Cl. 483-56.000.
Okazaki, Teruyoshi: *See—*
Harada, Hidefumi; Yamasaki, Takanori; Sadanaga, Eizi; and Okazaki, Teruyoshi, 5,500,043, Cl. 106-456.000.
Oketani, Toshikazu: *See—*
Kato, Hiroaki; Shimasaki, Yuichi; Saito, Akihisa; Komatsuda, Takashi; Oketani, Toshikazu; Haccho, Seiji; Matsumoto, Seiji; Aoki, Takuya; and Miyashita, Yukio, 5,499,501, Cl. 60-286.000.
OKI Electric Industry Co., Ltd.: *See—*
Egawa, Noboru, 5,500,614, Cl. 327-107.000.
Oki, Tsuneo: *See—*
Kimoto, Keizo; Hanatani, Yasuyuki; Sakai, Hiroaki; Oki, Tsuneo; and Uemura, Mamoru, 5,499,486, Cl. 53-465.000.
Okimoto, Shinichi: *See—*
Inoue, Tadashi; Tsuru, Kiyoshi; Okimoto, Shinichi; Yamamura, Naokazu; Yamamoto, Tetsuo; and Haiji, Hirohisa, 5,500,057, Cl. 148-312.000.
Okubo, Hideaki: *See—*
Sasaki, Yosuke; and Okubo, Hideaki, 5,500,166, Cl. 264-40.400.
Okubo, Mitsumasa, to Olympus Optical Co., Ltd. Drive circuit for an ultrasonic motor. 5,500,565, Cl. 310-316.000.
Okumura, Naoji: *See—*
Fue, Kouichirou; Izawa, Yosuke; and Okumura, Naoji, 5,500,682, Cl. 348-497.000.
Okumura, Toshiaki; Ekimoto, Takao; Shimamoto, Satoshi; Ogawa, Katsumi; Tomita, Masahiro; Nimura, Yoshitaka; and Kadowaki, Ryosaku, to Kabushiki Kaisha Kobe Seiko Sho. Heating and extruding method and device for bulk preform. 5,500,170, Cl. 264-148.000.
Okumura, Toshiaki: *See—*
Masuda, Takashi; Okumura, Toshiaki; Uchida, Koji; and Yamamoto, Osamu, 5,500,696, Cl. 351-205.000.
Okuno, Shibo: *See—*
Saito, Yoshiaki; Inomata, Koichiro; Okuno, Shiho; and Takahashi, Yoshinori, 5,500,633, Cl. 338-32.00R.
Okuno, Yasuo; Tomita, Shotaro; and Kato, Hiroyuki, to Stanley Electric Co., Ltd.; and Kanagawa Academy of Science and Technology. Methods for compound semiconductor crystal growth from solution. 5,499,600, Cl. 117-68.000.
Okutomi, Tsutomu: *See—*
Seki, Tsuneyo; Okutomi, Tsutomu; and Yamamoto, Atsushi, 5,500,499, Cl. 218-130.000.
Olds, Keith A.: *See—*
Maine, Kristine P.; Olds, Keith A.; and Davieau, Gerald J., 5,500,648, Cl. 342-357.000.
O'Leary, Stephen H., to IVAC Corporation. IV fluid delivery system. 5,499,906, Cl. 417-53.000.
Olson, Daniel H., to Zimmer, Inc. Debridement tip. 5,499,970, Cl. 604-35.000.
Olson, Robert J., to Honeywell Inc. Beam position indicator for directional radar. 5,500,833, Cl. 342-182.000.
Olympic Arms, Inc.: *See—*
Schuetz, Brian D., 5,499,569, Cl. 89-197.000.
Olympic Medical Group: *See—*
Weiler, Edward B.; Jones, Jay A.; Stefanile, Joseph P.; and Miles, Steven G., 5,499,457, Cl. 33-512.000.
Olympus Optical Co., Ltd.: *See—*
Itoh, Junichi, 5,500,701, Cl. 354-106.000.
Okubo, Mitsumasa, 5,500,565, Cl. 310-316.000.
Olzak, Richard A.; Collier, James L.; and Caney, Robert D., to AlliedSignal Inc. Memory card including extraction/retention arrangement. 5,500,518, Cl. 235-492.000.
Omagari, Yasuyuki: *See—*
Kigawa, Kazuya; Furukawa, Kenji; Deguchi, Tetsu; Inoue, Sachiharu; Endo, Norikatsu; Yanagisawa, Tatsuo; Ikegami, Shinji; Omagari, Yasuyuki; Kihara, Koji; Sugawara, Tachiki; and Shimizu, Kenzo, 5,499,796, Cl. 254-133.00R.
Omata, Kiyoshi: *See—*
Ariaska, Hiroshi; Kawawada, Kenji; and Omata, Kiyoshi, 5,499,924, Cl. 439-67.000.
Onaya, Masato; and Yamada, Susumu, to Sanyo Electric Co., Ltd. Parallel data outputting storage circuit. 5,500,825, Cl. 365-219.000.
Onishi, Takashi; Yoshikawa, Kazuo; Nishi, Seiji; and Yamamoto, Seigou, to Kabushiki Kaisha Kobe Seiko Sho. Al alloy films and melting Al alloy sputtering targets for depositing Al alloy films. 5,500,301, Cl. 428-457.000.
Onishi, Yasuhiko; Yamamori, Takashi; Yamashita, Youzou; Suzuki, Ichiro; and Aoyama, Toshiya, to Sumitomo Wiring Systems, Ltd. Method of manufacturing harness part for automobile. 5,500,179, Cl. 264-400.000.
Ono, Tomio: *See—*
Nakamoto, Masayuki; Ono, Tomio; and Sakai, Tadashi, 5,499,938, Cl. 445-50.000.
Ono, Tsuyoshi, to Fujitsu Ltd. Insulating element having height greater than heights of neighboring components. 5,500,786, Cl. 361-760.000.
Onosaka, Kazunobu, to Sony Corporation. Telephone apparatus, information processing apparatus and information communication terminal. 5,500,893, Cl. 379-396.000.
Onozato, Takashi: *See—*
Yauchi, Hitoshi; Sugiyama, Koichi; Miyashita, Akihiko; Satoh, Nakatoshi; Sugawara, Tatsuo; Sato, Hiroyuki; and Onozato, Takashi, 5,500,657, Cl. 347-9.000.
Onozuka, Haruo: *See—*
Saito, Tatsuo; and Onozuka, Haruo, 5,500,710, Cl. 354-484.000.
Onozuka, Kuniharu, to Sony Corporation. Image projecting apparatus for producing an image for display on a projection screen. 5,500,692, Cl. 348-759.000.
Oonami, Yuuichi: *See—*
Tanaka, Takayuki; Watanabe, Ryu; Oonami, Yuuichi; and Eto, Yoshizumi, 5,500,676, Cl. 348-387.000.
Oono, Masahiro: *See—*
Maruyama, Koichi; Wakamiya, Syun'itirou; Iwaki, Makoto; and Oono, Masahiro, 5,500,767, Cl. 359-642.000.
Opbey, Willem G., to U.S. Philips Corporation. Radiation source-detection unit employing a grating having two grating structures, and a device including that unit. 5,500,846, Cl. 369-116.000.
Oppedahl, Douglas A., to Convex Computer Corporation. Scanning, circuits, systems and methods. 5,500,861, Cl. 371-22.300.
Optical Semiconductors, Inc.: *See—*
Fitzpatrick, Brian J., 5,500,147, Cl. 252-301.60S.
Orikasa, Tsuyoshi: *See—*
Hattori, Yoshifumi; Karita, Seiichiro; Saikawa, Hideo; Kashino, Toshio; Saito, Akio; Nakagomi, Hiroshi; Arashima, Teruo; Kimura, Makiko; Sugitani, Hiroshi; Ikeda, Masami; Saito, Asao; Masuda, Kazuaki; and Orikasa, Tsuyoshi, 5,500,666, Cl. 347-87.000.
Orino, Kanjo; Sakai, Mikio; and Sakanaka, Tetsuo, to Canon Kabushiki Kaisha. Optical transmitter-receiver. 5,500,754, Cl. 359-156.000.
Orpana, Markku: *See—*
Bloomberg, Martti; Orpana, Markku; Lehto, Ari; and Korhonen, Anssi, 5,500,569, Cl. 313-578.000.
Orthopaedic Innovations, Inc.: *See—*
Hein, Todd J.; and Utley, Mike K., 5,499,985, Cl. 606-99.000.
Osaki, Akitoshi: *See—*
Kinoshita, Itsuko; and Osaki, Akitoshi, 5,500,814, Cl. 365-49.000.
Oscar Mayer Foods Corporation: *See—*
Handel, Gary A.; Jonovic, John A.; and Krueger, Otto L., 5,499,575, Cl. 99-349.000.
Oshlack, Benjamin; and Chasin, Mark, to Euro-Celtique, S.A. Immediate release tablet cores of insoluble drugs having sustained-release coating. 5,500,227, Cl. 424-476.000.
Osifo, Irennegbe K., to Eastman Kodak Company. Nanoparticulate diagnostic dimers as x-ray contrast agents for blood pool and lymphatic system imaging. 5,500,204, Cl. 424-9.453.
Ota, Takeshi, to Fuji Xerox Co., Ltd. Transmitter-receiver and optical amplifier for optical communication. 5,500,763, Cl. 359-333.000.



Ota, Yasunori; and Fujita, Nobuhide, to Ando Electric Co., Ltd. Connector press-fitting apparatus. 5,499,443, Cl. 29-741.000.
Otsu, Hiroshi: *See—*
Kubota, Yoshikazu; Kamijo, Masayasu; Otsu, Hiroshi; and Kamiya, Takashi, 5,500,259, Cl. 428-15.000.
Ott, Walter H., deceased: *See—*
Ulrich, Armando; and Ott, Walter H., deceased, 5,499,871, Cl. 366-136.000.
Oud, Martinus A.: *See—*
Noordegraaf, Jan; Oud, Martinus A.; Behm, Harry; and de Rooy, Roelof, 5,500,183, Cl. 420-557.000.
Ouellette, William R.: *See—*
Langdon, Fred M.; Ouellette, William R.; and Burchnall, John B., 5,500,270, Cl. 428-119.000.
Outboard Marine Corporation: *See—*
McElroy, Kennedy K., Jr.; Bonifield, James; Boschke, Dale; and Krajewski, Richard A., 5,499,936, Cl. 440-83.000.
Ouyang, Jiangbo; and Harpel, William L., to Betz Laboratories, Inc. Composition for and method of monitoring dried-in-place non-chrome polyacrylamide based treatments for metals. 5,500,053, Cl. 427-247.000.
Owen, Donald W. Multiphase load control system with switch connected split sources of phase voltage. 5,500,582, Cl. 318-771.000.
Owens, Byron C. Heat application method. 5,500,010, Cl. 607-114.000.
Owens, N. Douglas, to Modernfold, Incorporated. Anti-float system for operable partitions. 5,499,671, Cl. 160-199.000.
Oxman, Joel D.: *See—*
Erickson, Robert L.; Hansen, Paul E.; Burgio, Paul A.; Oxman, Joel D.; and Christoff, James D., 5,499,917, Cl. 433-137.000.
Oyama, Naohisa: *See—*
Takigawa, Kenji; Oyama, Naohisa; and Hayashi, Hitoshi, 5,500,146, Cl. 252-299.670.
Ozawa, Michiharu: *See—*
Shiga, Nobuo; Marui, Tomohiro; Shibuya, Kiyoshi; Sato, Toru; Ozawa, Michiharu; and Yukumoto, Masao, 5,499,673, Cl. 164-463.000.
Ozawa, Seiji: *See—*
Ichikawa, Hideo; Saito, Takeshi; Ikeda, Sunao; Makita, Nobuhiro; Ozawa, Seiji; Yoshiki, Shigeru; and Yanagisawa, Takaaki, 5,500,719, Cl. 355-260.000.
PACCAR Inc.: *See—*
Shearn, Kenneth M.; Kranick, Gordon S.; and Grimstad, Robert F., 5,499,690, Cl. 180-68.400.
Pacesetter AB: *See—*
Heiaze, Roland, 5,500,006, Cl. 607-24.000.
Strandberg, Hans; and Hoegnelid, Kurt, 5,500,005, Cl. 607-17.000.
Packaging Concepts, Inc.: *See—*
Mendenhall, Abraham H.; and Irace, Joseph F., 5,500,235, Cl. 426-394.000.
Packard, Theodore B.: *See—*
Cook, Craig C.; Blumer, Thomas P.; Packard, Theodore B.; Dreher, Geoffrey A.; and Schuneman, Thomas A., 5,500,928, Cl. 395-133.000.
Padden, Vincent T., to Northrop Grumman Corporation. High efficiency load transfer in composite structure. 5,500,272, Cl. 428-140.000.
Padilla, Juan L. D. V.: *See—*
Flores, Emmanuel S.; and Padilla, Juan L. D. V., 5,500,377, Cl. 437-6.000.
Paech, Christian: *See—*
Christianson, Teresa; Goddette, Dean; Ladin, Beth F.; Lau, Maria R.; Paech, Christian; Reynolds, Robert B.; Wilson, Charles R.; and Yang, Shiow-Shong, 5,500,364, Cl. 435-221.000.
Page, Martin J., to Burroughs Wellcome Co. Method for treating a mammal suffering from a T-cell mediated disorder with a CHO-glycosylated antibody. 5,500,214, Cl. 424-133.100.
Pak, Paul: *See—*
Miller, Harry E.; Pak, Paul; Schechter, Steven M.; and Huynh, Vien-An T., 5,500,236, Cl. 426-451.000.
Pakkanen, Raimo: *See—*
Aalto, Jouni; Pakkanen, Raimo; Satama, Lea; Luopa, Jyrki; Allén, Timo; Virtanen, Arja; and Kanttinen, Ari, 5,500,229, Cl. 424-535.000.
Palitex Project-Company GmbH: *See—*
Steinmann, Heinz, 5,499,496, Cl. 57-406.000.
Pall Corporation: *See—*
Degen, Peter J., 5,500,167, Cl. 264-41.000.
Palme, Donald F., II: *See—*
Buscemi, Paul J.; Stejskal, Elizabeth A.; Palme, Donald F., II; and Wang, Lixiao, 5,500,013, Cl. 623-1.000.
Palmer, Michael R. Portable reticle alignment device for firearms. 5,499,455, Cl. 33-233.000.
Palmer, Steven G., to American Sterilizer Company. Self-contained biological indicators. 5,500,184, Cl. 422-2.000.
Palumbo, Dominick P. Removable bath accessory bar. 5,499,725, Cl. 211-105.100.
Panasonic Technologies, Inc.: *See—*
Fujita, Yosuke; and Lam, Steve P., 5,500,794, Cl. 364-188.000.
Pang, Dexing: *See—*
Zhou, Peter Y.; Paul, Christopher R.; and Pang, Dexing, 5,500,640, Cl. 340-572.000.
PanGard, Inc.: *See—*
Gardner, John R., 5,499,716, Cl. 206-553.000.
Pankratz, Richard P.: *See—*
Feinberg, Bernard; and Pankratz, Richard P., 5,500,327, Cl. 430-306.000.
Pant, Bharat B., to Honeywell Inc. Apparatus for sensing magnetic fields using a coupled film magnetoresistive transducer. 5,500,590, Cl. 324-252.000.
Paparo, Mario: *See—*
Puzzolo, Sasto; Zambrano, Raffaele; and Paparo, Mario, 5,500,551, Cl. 257-500.000.
Paragon Trade Brands, Inc.: *See—*
Herrmann, Thomas R., 5,500,075, Cl. 156-494.000.
Parce, John W.: *See—*
Hafeman, Dean G.; Parce, John W.; and McConnell, Harden M., 5,500,188, Cl. 422-82.020.
Parenti, Massimo, to Prodotti Chimici Alimentari SPA. N-alkyltaurourodeoxycholic acids and their therapeutically active derivatives. 5,500,421, Cl. 514-182.000.
Park, Chan K.; Koh, Yo H.; Hwang, Seong M.; and Roh, Kwang M., to Hyundai Electronics Industries Co., Ltd. Dynamic random access memory cell and method for fabricating the same. 5,500,544, Cl. 257-296.000.
Park, David W.: *See—*
Brown, Geoffrey B. D.; and Park, David W., 5,500,620, Cl. 329-300.000.
Park, Il-keun, to Samsung Electronics Co., Ltd. Receiver for a superpose modulated signal. 5,500,877, Cl. 375-343.000.
Park, Kang-Ho; Ha, Jeong-Sook; Park, Seong-Ju; and Lee, El-Hang, to Electronics & Telecommunications Research Institute. Apparatus for adsorbing atomic hydrogen on surface. 5,500,047, Cl. 118-724.000.
Park, Kun You: *See—*
Kim, Hoon Sik; Lee, Byung Gwon; Kim, Honggon; and Park, Kun You, 5,500,400, Cl. 502-306.000.
Park, Seong-Ju: *See—*
Park, Kang-Ho; Ha, Jeong-Sook; Park, Seong-Ju; and Lee, El-Hang, 5,500,047, Cl. 118-724.000.
Parker, Paul D., to Deere & Company. Deep tillage winged sweep. 5,499,686, Cl. 172-730.000.
Parks, Kristen L.; Miesner, Richard W.; and Lesko, Merle W., to Bayer Corporation. Process for the production of molded products using internal mold release agents. 5,500,176, Cl. 264-257.000.
Parsons, James S., to Equidyne Systems, Inc. Hypodermic jet injector. 5,499,972, Cl. 604-68.000.
Pasch, Roger M.; and Langenecker, Kenneth C., to Research Products Corporation. Paint arrestor formed from slit sheet material. 5,500,271, Cl. 428-135.000.
Pasin, Mark; Tonelli, Roger; and Easley, James B., to Radio Flyer Inc. Tricycle. 5,499,834, Cl. 280-282.000.
Passavant-Werke AG: *See—*
Coenen, Hubert; Hubert, Helmut; and Zumbragel, Michael, 5,500,118, Cl. 210-603.000.
Pasternack, Adalbert, to Dragerwerk AG. Gas mask and breathing equipment with liquefied respiration gas. 5,499,623, Cl. 128-201.210.
Patel, Chandrakant B.: *See—*
Strolle, Christopher H.; Patel, Chandrakant B.; Wedam, Werner F.; Schnitzler, Raymond; Weckenbrock, Hermann J.; Ko, Jung W.; Yun, Jong K.; and Limberg, Allen L., 5,500,739, Cl. 358-310.000.
Paul, Christopher R.: *See—*
Zhou, Peter Y.; Paul, Christopher R.; and Pang, Dexing, 5,500,640, Cl. 340-572.000.
Pauly, John M.: *See—*
Kerr, Adam B.; and Pauly, John M., 5,499,629, Cl. 128-653.200.
Pawate, Basavaraj: *See—*
Doddington, George D.; Pawate, Basavaraj; Mahant-Shetti, Shivaling; and Smith, Derek, 5,500,828, Cl. 365-230.030.
Pax, George E.: *See—*
Snodgrass, Charles K.; Allen, David H.; Tuttle, John R.; Rotzoll, Robert R.; and Pax, George E., 5,500,650, Cl. 342-42.000.
Payne, Patricia K. Sausage cutter. 5,499,578, Cl. 99-537.000.
Payne, Roy: *See—*
Rodriquez, Domingo; Payne, Roy; Gomez, Cebers; Carrazza, Jose; and Kramlich, John, 5,499,587, Cl. 110-342.000.
Pearson, Allen J.: *See—*
Scott, Alistair; Pearson, Allen J.; and Collins, James T., 5,499,741, Cl. 222-95.000.
Pearson, John P.: *See—*
Beada, Steven J.; and Pearson, John P., 5,500,495, Cl. 200-43.140.
Pearson, John W.: *See—*
Meade, William D.; and Pearson, John W., 5,500,044, Cl. 106-697.000.
Pechiney Electrometallurgie: *See—*
Faure, Pierre; and Margaria, Thomas, 5,500,399, Cl. 502-244.000.
Peet, Robert G.: *See—*
Heffelfinger, Michael T.; Keung, Jay K.; and Peet, Robert G., 5,500,282, Cl. 428-339.000.
Peij, Detlef V.: *See—*
Brown, Neil; and Peij, Detlef V., 5,500,480, Cl. 524-437.000.
Peiz, Peter: *See—*
Hundt, Gerd; Arbogast, Franz; and Peiz, Peter, 5,499,910, Cl. 418-126.000.
Pelletier, Ronald R.: *See—*
Johnsen, Kenneth E.; and Pelletier, Ronald R., 5,500,469, Cl. 524-157.000.
Penjuke, Daniel T., Sr. Balloon inflation device with light. 5,499,941, Cl. 446-222.000.
Penrod, Jack R.: *See—*
Baker, Mark C.; Hagerman, William E.; Penrod, Jack R.; and Stevens, Nancy S., 5,500,889, Cl. 379-67.000.

Penza, Hans: *See—*
Behreas, Gunnar; Blöhdorn, Gerhard; and Penza, Hans, 5,500,656, Cl. 346-136.000.
Perchtold, Gerhard: *See—*
Nieder, Wolfgang; Winkler, Manfred; Perchtold, Gerhard; Seirlehner, Leo; Kohler, Herbert; and Eberle, Arwed, 5,500,032, Cl. 75-414.000.
Perkins, Douglas W.: *See—*
Youcheff, Gary G.; Wodke, Stephen M.; and Perkins, Douglas W., 5,500,233, Cl. 426-89.000.
Perlak, Frederick J.: *See—*
Fischhoff, David A.; and Perlak, Frederick J., 5,500,365, Cl. 435-240.400.
Perler, Francine: *See—*
Comb, Donald G.; Perler, Francine; Kucera, Rebecca; and Jack, William E., 5,500,363, Cl. 435-194.000.
Perlman, Radia J.; Kirby, Alan J.; Backes, Floyd J.; and Kaufman, Charles W., to Digital Equipment Corporation. Router using multiple hop redirect messages to enable bridge like data forwarding. 5,500,860, Cl. 370-85.130.
Perma Manufacturing Inc.: *See—*
Alto, Scott E.; Alto, Roger E.; and Collister, Frank C., 5,499,894, Cl. 411-340.000.
Pernicka, John C.; Benson, David K.; and Tracy, C. Edwin, to Midwest Research Institute. Simultaneous laser cutting and welding of metal foil to edge of a plate. 5,500,503, Cl. 219-121.640.
Perobelli, Aldo; and Pessina, Giorgia, to O.M.G. di Giorgio Pessina e Aldo Perobelli S.a.c. Machine for making bundles of wrapped sheets. 5,499,489, Cl. 53-540.000.
Perring, Keith D.: *See—*
Behan, John M.; Ness, Jeremy N.; and Perring, Keith D., 5,500,223, Cl. 424-451.000.
Perry, Martin J.: *See—*
Baker, Terence S.; Perry, Martin J.; and Fleming, Ian M., 5,500,350, Cl. 435-7.920.
Perry, Paul D.: *See—*
Busato, Murray F.; Perry, Paul D.; and Cook, John E., 5,499,614, Cl. 123-520.000.
Pesar, Robert J.: *See—*
Ta, Luong N.; Pesar, Robert J.; and Wafler, Walter F., 5,500,715, Cl. 355-204.000.
Pessina, Giorgia: *See—*
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Peters, Christian: *See—*
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Peterson, Francis C.: *See—*
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Petitjean, Maurice: *See—*
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Petrocon Technologies, Inc.: *See—*
Bell, Ronald D., 5,500,194, Cl. 423-239.100.
Petroleum Energy Center Foundation: *See—*
Anzai, Iwao; Matsuoka, Shigeki; and Uehara, Jun, 5,500,307, Cl. 429-30.000.
Petty, Margaret A.: *See—*
Grisar, J. Martin; Petty, Margaret A.; and Bolkenius, Frank, 5,500,444, Cl. 514-456.000.
Pezak, Edward A.: *See—*
Luikart, Myron E.; Pezak, Edward A.; Kuhns, Howard C. B.; and Volcansek, Steven J., 5,499,521, Cl. 72-157.000.
Pfaff, Eric G.: *See—*
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Pfeiffer, Bruno: *See—*
Godfroid, Jean-Jacques; Lamouri, Aazdine; Touboul, Estera; Wang, Xuan; Renard, Pierre; Pfeiffer, Bruno; and Guardiola, Béatrice, 5,500,426, Cl. 514-252.000.
Pflager, William W., to Western Atlas Inc. Hydrostatic nut and lead screw assembly, and method of forming said nut. 5,499,942, Cl. 451-14.000.
Pfleger, Hartmut: *See—*
Bayerle, Klaus; and Pfleger, Hartmut, 5,499,613, Cl. 123-520.000.
Phebus, Raymond L., Jr.: *See—*
Krivda, John; and Phebus, Raymond L., Jr., 5,499,451, Cl. 29-897.200.
Philip Morris Incorporated: *See—*
Baggett, James D., Jr.; Clark, David A.; Cowling, Patrick C.; Uhl, Richard G.; and Wrean, Susan E., 5,499,636, Cl. 131-374.000.
Phillip, Jason L. Periodical hardcover. 5,499,846, Cl. 281-29.000.
Phillips, John C. M.: *See—*
Holt, Ronald B.; and Phillips, John C. M., 5,500,060, Cl. 149-19.100.
Phillips Petroleum Company: *See—*
Martin, Joel L., 5,500,396, Cl. 502-8.000.
Phillips, Roger W.; Coombs, Paul G.; and Wendt, Lauren R., to Flex Products, Inc. Barrier film and method. 5,500,302, Cl. 428-474.400.
Photonics Research Incorporated: *See—*
Jewell, Jack L.; Quinn, William E.; Swirhun, Stan E.; and Bryan, Robert P., 5,500,540, Cl. 257-82.000.
Picard, Lea L.; and Barber, Frederic, to Cognex Corporation. Locating curvilinear objects using feathered fiducials. 5,500,906, Cl. 382-220.000.
Pichler, Hans-Peter: *See—*
Novak, Heinrich; Berthold, Herbert; Barta, Gerhard; and Pichler, Hans-Peter, 5,499,774, Cl. 242-47.030.
Picker International, Inc.: *See—*
Loncar, Mark J.; Murdoch, James B.; and Gullapalli, Rao P., 5,500,593, Cl. 324-307.000.
Pickering, James E.; and Fassler, Werner, to Eastman Kodak Company. Print head includes donor guide and receiver guide. 5,499,880, Cl. 400-642.000.
Pidgeon, Rezin E., Jr.: *See—*
Thompson, Leo; Little, Frank; and Pidgeon, Rezin E., Jr., 5,500,758, Cl. 359-189.000.
Pielocik, William P. Interconvertible backpack and chair apparatus. 5,499,760, Cl. 224-155.000.
Pike, Jack H.: *See—*
Swarbrick, David B.; and Pike, Jack H., 5,500,604, Cl. 324-754.000.
Pileski, Michael J.; Wood, Robert J.; and Walts, Connie R., to Welch Allyn, Inc. Bifurcated fiber bundle in single head light cable for use with multi-source light box. 5,500,918, Cl. 385-117.000.
Pilkington plc: *See—*
Marshall, Paul A., 5,499,731, Cl. 216-22.000.
Pillsbury Company, The: *See—*
Anderson, George, 5,500,303, Cl. 428-475.500.
Pilot Industries, Inc.: *See—*
Krause, Edward K.; and Kneazel, Kenneth J., 5,500,257, Cl. 427-487.000.
Pioneer Electric Corporation: *See—*
Satoh, Masatoshi; and Ohsuma, Tetsuya, 5,499,440, Cl. 29-512.000.
Piotrowski, David W.: *See—*
Barnette, William E.; Harrison, Charles R.; Lahm, George P.; Piotrowski, David W.; and Wing, Keith D., 5,500,438, Cl. 514-403.000.
Pippert, Aaron J.; and Pippert, Frederick B., to Utex Industries, Inc. Anti-extrusion lip seal. 5,499,826, Cl. 277-188.00A.
Pippert, Frederick B.: *See—*
Pippert, Aaron J.; and Pippert, Frederick B., 5,499,826, Cl. 277-188.00A.
Pirard, Jean-Paul: *See—*
Germain, Albert; Pirard, Jean-Paul; Delattre, Véronique; Van Weynbergh, Jacques; and Vogels, Claude, 5,500,202, Cl. 423-584.000.
Pirstadt, Bernd: *See—*
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Piza-Williamson, Denise A.: *See—*
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Pittman, James A.: *See—*
Martin, Gale L.; Pittman, James A.; and Rashid, Mosfeq, 5,500,905, Cl. 382-157.000.
Pittwood, Arthur S.: *See—*
Potter, Michael S.; and Pittwood, Arthur S., 5,500,114, Cl. 210-394.000.
Placanica, John S.: *See—*
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Plessey Semiconductors Limited: *See—*
Martin, Alan; and Albon, Richard, 5,500,823, Cl. 365-201.000.
Po', Riccardo: *See—*
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Podesta', Roberto: *See—*
Carletti, Vittorio; Longhini, Gianfranco; Po', Riccardo; Podesta', Roberto; Romano, Anna M.; and Querci, Cecilia, 5,500,285, Cl. 428-364.000.
Poggenburg, Rüdiger; Grossardt, Bernd; and Sonntag, Eberhard, to Robert Bosch GmbH. Method for minimizing amplitude of pressure modulation in an ABS. 5,499,867, Cl. 303-159.000.
Polizzotti, David M.: *See—*
Roe, Donald C.; and Polizzotti, David M., 5,500,213, Cl. 424-78.370.
Pollen, Randall P. Personal water craft with rear mounting means. 5,499,595, Cl. 114-362.000.
Pollman, John A.: *See—*
Santos, Esteban; Pollman, John A.; and Singer, Paul H., 5,500,781, Cl. 361-96.000.
Pollocks, Lonnie J., Jr.: *See—*
Curran, Donald P., Jr.; Pollocks, Lonnie J., Jr.; Breemes, David P., Sr.; Carreira, Leonard M.; and Trenchard, Thomas J., 5,500,659, Cl. 347-28.000.
Poly-Optical Products, Inc.: *See—*
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Polymer Technology Corporation: *See—*
Potini, Chimpiramma; Wrobel, Stanley J.; Zhang, Hong J.; and Ellis, Edward J., 5,500,144, Cl. 252-174.150.
Polyplastics Co., Ltd.: *See—*
Uota, Katsumi, 5,500,471, Cl. 524-262.000.
Poanet, Tom P. M. G. Material and splint for orthopaedical, surgical and veterinary use and method of making same. 5,500,163, Cl. 264-473.000.
Popat, Kaushik; Ip, William; and Sherman, David, to Cirrus Logic, Inc. Integrated circuit with input/output pad having pullup or pulldown. 5,500,611, Cl. 326-87.000.
Pope, David J., to Signal Processing Associates Pty Limited. QAM encoding. 5,500,875, Cl. 375-261.000.
Popov, Oleg; and Maya, Jakob, to Matsushita Electric Works R&D Laboratory, Inc. Inductively coupled substantially flat fluorescent light source. 5,500,574, Cl. 315-248.000.
Porto, Brian: *See—*
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Potini, Chimpiramma; Wrobel, Stanley J.; Zhang, Hong J.; and Ellis, Edward J., to Polymer Technology Corporation. Composition for cleaning and wetting contact lenses. 5,500,144, Cl. 252-174.150.
Potter, Michael S.; and Pittwood, Arthur S., to Managed Pollution Systems Limited. Separator device. 5,500,114, Cl. 210-394.000.
Pourian, Reza R. Pocket part for a vehicle door. 5,499,853, Cl. 296-37.130.
Powell, Thomas A., to AT&T Corp. RF shielded I/O connector. 5,499,935, Cl. 439-620.000.
Powell, Walter W.; and Castaneda, Louis R., to Groth Corporation. Sealing means for pressure relief valves and methods of assembly. 5,499,648, Cl. 137-15.000.
Power Tool Holders Incorporated: *See—*
Salpaka, Glenn L.; and Wilson, J. Larry, 5,499,828, Cl. 279-62.000.
Powers, James C.: *See—*
Sayers, Thomas; Smyth, Mark J.; Wiltrout, Theresa A.; Powers, James C.; Sowder, Raymond; and Henderson, Louis E., 5,500,344, Cl. 435-6.000.
Powers, Michael C.; Bliss, Greg A.; and Shen, Shioupyn, to Teknekron Infoswitch Corporation. Method and system for monitoring and controlling the performance of a call processing center. 5,500,795, Cl. 364-401.000.
Powers, Thomas: *See—*
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Prem, Wolfgang: *See—*
Hoffmann, Eduard; Winterholler, Johann; and Prem, Wolfgang, 5,499,580, Cl. 101-375.000.
Prigent, Serge: *See—*
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Bacon, Dennis R.; Trinh, Toan; Hartman, Frederick A.; and Mermelstein, Robert, 5,500,137, Cl. 252-8.600.
Bacon, Dennis R.; and Trinh, Toan, 5,500,138, Cl. 252-8.800.
Bacon, Dennis R.; and Trinh, Toan, 5,500,154, Cl. 252-551.000.
Buell, Kenneth B.; Clear, Sandra H.; and Falcone, Danielia T., 5,499,978, Cl. 604-385.200.
Charbonneau, Duane L., 5,500,206, Cl. 424-50.000.
Charbonneau, Duane L., 5,500,208, Cl. 424-55.000.
Figueroa, Francisco R.; and Jarrin, Roberto M., 5,500,153, Cl. 252-548.000.
Goldman, Stephen A.; and Scheibel, Jeffrey J., 5,500,451, Cl. 521-64.000.
Langdon, Fred M.; Ouellette, William R.; and Burchnall, John B., 5,500,270, Cl. 428-119.000.
Murch, Bruce P.; Roselle, Brian J.; and Jones, Kyle D., 5,500,048, Cl. 134-6.000.
Murch, Bruce P.; Roselle, Brian J.; and Jones, Kyle D., 5,500,143, Cl. 252-108.000.
Scheibel, Jeffrey J.; Murch, Bruce P.; and Connor, Daniel S., 5,500,150, Cl. 252-544.000.
Trakhan, Paul D.; and Boutilier, Glenn D., 5,500,277, Cl. 428-196.000.
Procter, Roy W.: *See—*
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Prodotti Chimici Alimentari SPA: *See—*
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Proebsting, Robert J.: *See—*
Boyle, Steven R.; Proebsting, Robert J.; and Herndon, William H., 5,499,445, Cl. 29-830.000.
Profio, Richard L.; and Loeber, Frederick W., to Harnischfeger Corporation. Power shovel with variable pitch braces. 5,499,463, Cl. 37-398.000.
Progen Biotechnik GmbH: *See—*
Moll, Roland; and Franke, Werner W., 5,500,347, Cl. 435-7.230.
Protek AG: *See—*
Spotorno, Lorenzo; Fick, Willi; and Willi, Roland, 5,500,018, Cl. 623-11.000.
PTMW, Incorporated: *See—*
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Puletti, Paul P.: *See—*
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Pulp and Paper Research Institute of Canada: *See—*
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Puri, Atul, to AT&T Corp. Optimized scanning of transform coefficients in video coding. 5,500,678, Cl. 348-408.000.
Purol, Michael D.: *See—*
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Puzzolo, Santo; Zambrano, Raffaele; and Paparo, Mario, to SGS-Thomson Microelectronics, S.r.l.; and Consorzio per la Ricerca Sulla Microelettronica nel Mezzogiorno. Integrated emitter switching configuration using bipolar transistors. 5,500,551, Cl. 257-500.000.
Quantum Group, Inc.: *See—*
Goldstein, Mark K., 5,500,054, Cl. 136-253.000.
Quennessen, Bernard R. Retractable carrier for, and in combination with, a vial-type fluid dispenser. 5,499,747, Cl. 222-167.000.
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Quijano, R. C.; Nashef, Aws; and Myers, Keith, to Baxter International Inc. Biological valvular prothesis. 5,500,014, Cl. 623-2.000.
Quincy, Roger B., III; Nohr, Ronald S.; MacDonald, John G.; Gadsby, Elizabeth D.; and Everhart, Dennis S., to Kimberly-Clark Corporation. Coated polymeric fabric having durable wettability and reduced adsorption of protein. 5,500,254, Cl. 427-387.000.
Quinn, Gregory F., to FloTool International, Inc. Oil filter wrench and packaging therefor. 5,499,561, Cl. 81-124.600.
Quinn, William E.: *See—*
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Quintana, Daniel J.: *See—*
Fruchtbaum, Joseph; McConathy, Dave P.; Quintana, Daniel J.; and Sloan, Harold D., 5,500,094, Cl. 202-241.000.
Raab, Manfred. Boat hull. 5,499,593, Cl. 114-271.000.
Raasch, Hans; and Wassen, Willi, to W. Schlafhorst AG & Co. Yarn guide rod for a machine producing cross-wound bobbins. 5,499,773, Cl. 242-43.00R.
Radio Flyer Inc.: *See—*
Pasin, Mark; Tonelli, Roger; and Easley, James B., 5,499,834, Cl. 280-282.000.
Raeymaekers, Alfons H. M.: *See—*
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Rahman, Mohammad A.; Humphreys, Robert W. R.; and Wu, Shang-Rea, to Lever Brothers Company, Division of Conopco, Inc. Biodegradable fabric conditioning molecules based on glyceric acid. 5,500,139, Cl. 252-8.800.
Ramberg, Clifford F. Divided bait container. 5,499,473, Cl. 43-55.000.
Randall, John M.; and Friend, Clifford K., to Xerox Corporation. Power supply topology enabling bipolar voltage output from a single voltage input. 5,500,721, Cl. 355-265.000.
Rando, Joseph F., to LeveLite Technology, Inc. Diode laser co-linear light beam generator. 5,500,524, Cl. 250-216.000.
Rashid, Mosfeq: *See—*
Martin, Gale L.; Pittman, James A.; and Rashid, Mosfeq, 5,500,905, Cl. 382-157.000.
Ratzlaff, Eugene H.: *See—*
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RAU GmbH & Co.: *See—*
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Raudaskoski, Vesa, to Valmet Paper Machinery Inc. Method for drum winding a web and a drum winder. 5,499,779, Cl. 242-541.400.
Raulfs, Friedrich-Wilhelm: *See—*
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Rayovac Corporation: *See—*
West, Jack T.; Annen, James H.; Schneider, Daniel A.; and Kokoszka, Marek K., 5,500,308, Cl. 429-171.000.
Redman, Brian C.; Barr, Dallas N.; and Nettleton, John E., to United States of America, Army. Magneto-optical arrangement for laser radar. 5,500,729, Cl. 356-5.090.
Reed, Andrew J. Fishing lure. 5,499,470, Cl. 43-42.130.
Reed, Gary J., to Lock-N-Stitch International. Apparatus for repairing cracks. 5,499,892, Cl. 411-5.000.
Rees, Richard W. A., to ITT Corporation. Manual seat adjuster. 5,499,788, Cl. 248-430.000.
Reese, Robert J.: *See—*
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Reid, Anthony: *See—*
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Reid, John J. E.: *See—*
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Reif, Hans-Jörg: *See—*
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Reilly, Paul: *See—*
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Reimers, Eric W. Adjustable balance golf bag. 5,499,761, Cl. 224-202.000.
Reinert, Michael: *See—*
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Reinke, Stephen M., to Eastman Kodak Company. Film spool with axially flexible core to engage and release film end. 5,499,781, Cl. 242-584.100.
Reisinger, Hans: *See—*
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Remond, Michel, to Compagnie Generale des Etablissements Michelin-Michelin & Cie. Process for the building of tires using a clamped turn-up bladder. 5,500,066, Cl. 156-132.000.
Rempfler, Hermann, to Ciba-Geigy Corporation. Triazolopyrimidine herbicides. 5,500,407, Cl. 504-241.000.
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Renatech, Inc.: *See*—
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Renyl, Lucy A.: *See*—
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Research Development Corporation of Japan: *See*—
Nishizawa, Jun-ichi; and Yamamoto, Kenji, 5,500,079, Cl. 156-643.100.
Research Foundation for Microbial Diseases of Osaka University, The: *See*—
Saito, Atsushi; Shimagawa, Hideo; and Nakata, Atsuo, 5,500,355, Cl. 435-69.700.
Research Products Corporation: *See*—
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Resistance Technology, Inc.: *See*—
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Reupke, Wolfgang: *See*—
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Reuschel, Gerhard; Fleischer, Dietrich; Yamamoto, Kaoru; and Chino, Shuichi, to Hoechst Aktiengesellschaft. Polyacetal molding materials having high impact resistance, a process for their preparation, and their use. 5,500,477, Cl. 525-398.000.
Reymond, Jean-Louis; Chen, Yuanwei; and Lerner, Richard A., to Scripps Research Institute, The. Antibody catalysis of cyclohexadienone rearrangements. 5,500,358, Cl. 435-156.000.
Reynolds, James; and Smayling, Michael C., to Texas Instruments Incorporated. Planar process using common alignment marks for well implants. 5,500,392, Cl. 437-151.000.
Reynolds, Robert B.: *See*—
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Rhee, Sub B.; Lee, Myong-Hoon; Lee, Chang-Jin; and Moon, Bong S., to Korea Research Institute of Chemical Technology. Stable conducting polymer and processes for the preparation thereof. 5,500,474, Cl. 524-714.000.
Rheintechnik Weiland & Kasper KG Maschinenfabrik: *See*—
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Rhone-Poulenc Nutrition Animale: *See*—
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Rhum, David: *See*—
Tihon, Claude; Burton, John H.; Cook, Timothy C.; and Rhum, David, 5,499,994, Cl. 606-192.000.
Ribner, David B.; and Hoe, David H. K., to General Electric Company. Analog-to-digital converters using multistage bandpass delta sigma modulators with arbitrary center frequency. 5,500,645, Cl. 341-143.000.
Richards, Tammy M. Dowel board bow folding devices. 5,499,759, Cl. 223-46.000.
Richardson, Darrel; Grzesiak, Anthony J.; and Vierk, David T., to Borg-Warner Automotive, Inc. Double wrap brake band with break-away ties. 5,499,700, Cl. 188-77.00W.
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Richardson, Robert L., to Mercedes Textiles Limited. Weeping hose. 5,500,262, Cl. 428-36.100.
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Ricoh Company, Ltd.: *See*—
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Ichikawa, Hideo; Saito, Takeshi; Ikeda, Sunao; Makita, Nobuhiro; Ozawa, Seiji; Yoshiki, Shigeru; and Yanagisawa, Takaaki, 5,500,719, Cl. 355-260.000.
Kamijo, Eiji, 5,500,742, Cl. 358-448.000.
Karasawa, Kazunori, 5,500,720, Cl. 355-265.000.
Noguchi, Koichi, 5,500,738, Cl. 358-300.000.
Umeda, Toshihiko; and Tsugami, Itsuma, 5,499,922, Cl. 434-307.00A.
Ricos Co., Ltd.: *See*—
Umeda, Toshihiko; and Tsugami, Itsuma, 5,499,922, Cl. 434-307.00A.
Riddle, George E.; Withrow, Ronnie J.; and Cox, George M., to United Apothecary, Inc. Continous passive motion physical therapy device. 5,500,002, Cl. 606-242.000.
Ridefilm Corporation: *See*—
Trumbull, Douglas, 5,499,920, Cl. 434-69.000.
Ries, Hans: *See*—
Röber, Stefan; Jadamus, Hans; Böer, Michael; Feinauer, Roland; Herrmann, Hans-Dieter; and Ries, Hans, 5,500,263, Cl. 428-36.600.
Riley, Glen M., to Echelon Corporation. Method and apparatus for network variable aliasing. 5,500,852, Cl. 370-16.000.
Riley, William D.; and Jong, Bing W., to United States of America, Interior. Method for removing magnesium from aluminum-magnesium alloys with engineered scavenger compound. 5,500,100, Cl. 205-404.000.
Rimmele, Raimund. Lightweight vertically perforated brick. 5,499,478, Cl. 52-606.000.
Rincon, Gabriel A.; Salamina, Nicolas; and Corsi, Marco, to Texas Instruments Incorporated. Controlled current output stage amplifier circuit and method. 5,500,625, Cl. 330-273.000.
Ring Screw Works: *See*—
Allen, John, 5,499,895, Cl. 411-386.000.
Ripley, Jamie R. Hair holding device. 5,499,638, Cl. 132-273.000.
Rist, Pamela J. Kit for forming a three-dimensional decorative item. 5,499,914, Cl. 425-470.000.
Riveccie, Marcel L. P.: *See*—
Benard, Rejane; Prioux, Gerard A. D.; Martin, Didier J.; and Riveccie, Marcel L. P., 5,500,337, Cl. 430-570.000.
Riverwood International Corporation: *See*—
Harrelson, Glen R., 5,499,712, Cl. 206-172.000.
Roach, Philip J., to Lanxide Technology Company, LP. Ceramic composite bodies with increased metal content. 5,500,182, Cl. 419-45.000.
Roadmaster Corporation: *See*—
Metcalf, Jeffrey D.; and Brashear, Daniel F., 5,499,957, Cl. 482-70.000.
Robbins, Tony R.: *See*—
Edwards, Stanley H., Jr.; Marshall, Richard; and Robbins, Tony R., 5,500,630, Cl. 335-132.000.
Röber, Stefan; Jadamus, Hans; Böer, Michael; Feinauer, Roland; Herrmann, Hans-Dieter; and Ries, Hans, to Huels Aktiengesellschaft. Multilayer plastic pipe. 5,500,263, Cl. 428-36.600.
Robert Bosch GmbH: *See*—
Aab, Volker, 5,500,585, Cl. 324-165.000.
Hopf, Gerald; Ziegenbein, Botho; and Maihoefer, Bernd, 5,499,541, Cl. 73-763.000.
Huber, Werner; and Streib, Martin, 5,499,952, Cl. 477-115.000.
Poggensburg, Rüdiger; Grossardt, Bernd; and Sonntag, Eberhard, 5,499,867, Cl. 303-159.000.
Thomas, Gerhard; Wutz, Karl; and Lechner, Klaus, 5,500,784, Cl. 361-704.000.
Robert, Michael E., to MAC Valves, Inc. Method and valve assembly for controlling a pilot signal. 5,499,647, Cl. 137-12.000.
Roberts, James P.; Culp, James D.; Miller, David G.; and Sarsfield, Martin R., to Boeing Company, The. Autojettison method and apparatus for dual-point suspension systems. 5,499,785, Cl. 244-137.400.
Roberts, Richard D.: *See*—
Webster, Mark A.; Baldwin, Keith R.; and Roberts, Richard D., 5,500,879, Cl. 375-353.000.
Roberts, Wayne L., to Gleas'Son. Safety switch device for use in manufacture of round cylindrical vessels. 5,500,641, Cl. 340-686.000.
Robertson, Jennifer J., to Betz Laboratories, Inc. High calcium tolerant deposit control method. 5,500,128, Cl. 210-699.000.
Robinson, Douglas S.; Jensen, Terrence C.; and Gray, Joseph N., to Iowa State University Research Foundation. Integrated energy-sensitive and position-sensitive x-ray detection system. 5,500,534, Cl. 250-385.100.
Robinson, Randy R.; Liu, Alvin Y.; and Ledbetter, Jeffrey A., to XOMA Corporation. Chimeric antibody with specificity to human B cell surface antigen. 5,500,362, Cl. 435-7.230.
Robnett, James T.; and Molitor, Mark R., to Siemens Automotive Corporation. Variable timing of multiple engine cylinder valves. 5,499,606, Cl. 123-90.120.
Rocazella, Michael A.; Becker, Kurt J.; and Aghajanian, Michael K. Method for forming metal matrix composite bodies by spontaneously infiltrating a rigidized filler material and articles produced therefrom. 5,500,244, Cl. 427-181.000.
Rockstedt, Siegward, to Maschinenfabrik S. Rockstedt GmbH. Multiscrew, continuous mixing machine for plasticizable compounds. 5,499,870, Cl. 366-85.000.
Rockwell International Corp.: *See*—
McCullough, Edward D., 5,499,770, Cl. 241-1.000.
Rockwood, Robert E., to Environamics Corporation. Bearing frame clearance seal construction for a pump. 5,499,901, Cl. 415-111.000.
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Rodek, Erich: *See*—
Leroux, Roland; Rodek, Erich; Schaupert, Kurt; Thürk, Jürgen; and Weinberg, Waldemar, 5,500,255, Cl. 427-419.200.
Roden, Philip; Ebrashar, Khodor; Deng, Brian T.; Tsang, Steve; and Saperstein, William, to Texas Instruments Incorporated. Integrated dual bus controller. 5,500,946, Cl. 395-308.000.
Rodriguez, Noe E., II: *See*—
Deoms, James H.; Mileaf, Daryl S.; LaCour, Kevin E.; Rodriguez, Noe E., II; Leginus, Joseph M.; Johnson, Scott D.; Kapraun, Richard C.; and Young, Richard M., 5,500,187, Cl. 422-58.000.
Rodriquez, Domingo; Payne, Roy; Gomez, Cebers; Carrazza, Jose; and Kramlich, John, to Intevep, S.A. Sulfur-sorbent promoter for use in a process for the in-situ production of a sorbent-oxide aerosol used for removing effluents from a gaseous combustion stream. 5,499,587, Cl. 110-342.000.
Roe, Donald C.; and Polizzotti, David M., to Betz Laboratories, Inc. Gelled biocidal treatments. 5,500,213, Cl. 424-78.370.
Roe, Donald C.; Davis, Dwight P.; Manning, Kevin C.; and Bockowski, Edmund J., to Betz Laboratories, Inc. Biological and dust control methods for bulk/granular solids. 5,500,220, Cl. 424-410.000.



Roelen, Charles: *See*—
Smith, Raymond; and Roelen, Charles, 5,499,860, Cl. 297-255.000.
Roever, Stanley; and Frank, Joel, to Quick Release. Spectacle assembly with removable lenses. 5,500,694, Cl. 351-97.000.
Roff, Robert W., to Whitaker Corporation, The. Leased optical fiber assembly and process for alignment with an active device. 5,500,911, Cl. 385-33.000.
Rogers, Kevin J.; and Johnson, Dennis W., to Babcock & Wilcox Company, The. Method of reagent and oxidation air delivery. 5,500,196, Cl. 423-242.100.
Rogge, Stanley A.; and Cooper, Christophe K., to Exxon Research and Engineering Company. Point-of-sale system using multi-threaded transactions and interleaved file transfer. 5,500,890, Cl. 379-91.000.
Roh, Kwang M.: *See*—
Park, Chan K.; Koh, Yo H.; Hwang, Seong M.; and Roh, Kwang M., 5,500,544, Cl. 257-296.000.
Rohm and Haas Company: *See*—
Bliem, Paul E.; and Steffler, Larry W., 5,500,212, Cl. 424-78.120.
Calvert, Jeffrey M.; Dressick, Walter J.; Calabrese, Gary S.; and Gulla, Michael, 5,500,315, Cl. 430-16.000.
Carey, Richard J.; and Thackeray, James W., 5,500,127, Cl. 210-685.000.
Fries, William, 5,500,126, Cl. 210-668.000.
Rosen, Robert E.; Weaver, Damian G.; Cornille, Jane W.; and Spangler, Lori A., 5,500,405, Cl. 504-195.000.
Röhm, Günter H. Lockable drill chuck. 5,499,829, Cl. 279-62.000.
Rolls-Royce Limited: *See*—
Snell, Leonard S., 5,499,765, Cl. 239-265.190.
Rolls-Royce plc: *See*—
Meelu, Mehar C., 5,500,252, Cl. 427-376.300.
Romano, Anna M.: *See*—
Carletti, Vittorio; Longhini, Gianfranco; Po', Riccardo; Podesta', Roberto; Romano, Anna M.; and Querci, Cecilia, 5,500,285, Cl. 428-364.000.
Romano, Ugo: *See*—
Bellussi, Giuseppe; Buonomo, Franco; Esposito, Antonio; Clerici, Mario G.; and Romano, Ugo, 5,500,199, Cl. 423-328.200.
Roper, Ralph E., to Aquaform Inc. Apparatus for forming a tubular frame member. 5,499,520, Cl. 72-58.000.
Roques, Serge: *See*—
Tournier, Gilles; Roques, Serge; and Ballenghien, Jean-Luc, 5,499,448, Cl. 29-863.000.
Roschester, Jan: *See*—
Larsson, Krister; Mellbrand, Thomas; Mörnstam, Birgitta; Roschester, Jan; and Sköldbäck, Jan-Åke, 5,500,413, Cl. 514-15.000.
Rose Displays Ltd.: *See*—
Rose, Sidney, 5,499,789, Cl. 248-489.000.
Rose, Michael J. Attachment to adjustable strap on baseball caps. 5,499,402, Cl. 2-209.130.
Rose, Sidney, to Rose Displays Ltd. Anti rotation sign hanging system. 5,499,789, Cl. 248-489.000.
Roselle, Brian J.: *See*—
Murch, Bruce P.; Roselle, Brian J.; and Jones, Kyle D., 5,500,048, Cl. 134-6.000.
Murch, Bruce P.; Roselle, Brian J.; and Jones, Kyle D., 5,500,143, Cl. 252-108.000.
Rosen, Jan, to Siemens Elema AB. External pump stroke indicator for use with an implanted medication infusion system. 5,499,974, Cl. 604-118.000.
Rosen, Robert E.; Weaver, Damian G.; Cornille, Jane W.; and Spangler, Lori A., to Rohm and Haas Company. Phosphosulfonate herbicides. 5,500,405, Cl. 504-195.000.
Ross, Lloyd: *See*—
Mendolia, Michael S.; Esposito, Anthony; Tassoff, James A.; Ross, Lloyd; Fessock, Paul J.; Barr, Morton L.; and Vincenti, Paul J., 5,500,209, Cl. 424-66.000.
Ross, Svante B.: *See*—
Larsson, Lars-Gunnar; Renyl, Lucy A.; Ross, Svante B.; Sohn, Daniel D.; and Thorberg, Seth-Olov, 5,500,425, Cl. 514-233.500.
Rosset, René R. Fruit harvester. 5,499,493, Cl. 56-13.300.
Rotta Research Laboratorium S.p.A.: *See*—
Makovec, Francesco; Rovati, Luigi A.; and Rovati, Lucio C., 5,500,430, Cl. 514-278.000.
Rottefella AS: *See*—
Hauglin, Bernt-Otto; and Johnson, Rod, 5,499,838, Cl. 280-615.000.
Rotunda, Joseph: *See*—
Tawil, Riad A.; Tan, Yao; and Rotunda, Joseph, 5,500,529, Cl. 250-337.000.
Rotzoll, Robert R.: *See*—
Snodgrass, Charles K.; Allen, David H.; Tuttle, John R.; Rotzoll, Robert R.; and Pax, George E., 5,500,650, Cl. 342-42.000.
Roussel, David L.: *See*—
Cummins, David C.; and Roussel, David L., 5,499,873, Cl. 366-348.000.
Rovati, Lucio C.: *See*—
Makovec, Francesco; Rovati, Luigi A.; and Rovati, Lucio C., 5,500,430, Cl. 514-278.000.
Rovati, Luigi A.: *See*—
Makovec, Francesco; Rovati, Luigi A.; and Rovati, Lucio C., 5,500,430, Cl. 514-278.000.
Rowden, David L.: *See*—
Merle, Thomas C.; Ryan, Dale W.; and Rowden, David L., 5,499,436, Cl. 29-270.000.
Rowlette, John R., Sr.: *See*—
Boudrean, Robert A.; Bowen, Terry P.; Han, Hongtao; Rowlette, John R., Sr.; and Stack, Jared D., 5,500,910, Cl. 385-24.000.
Royal Ordnance plc: *See*—
Holt, Ronald B.; and Phillips, John C. M., 5,500,060, Cl. 149-19.100.
Ruben, Paul L.: *See*—
Zinter, J. Robert; and Ruben, Paul L., 5,500,770, Cl. 359-793.000.
Rubera, Michael J.: *See*—
Shah, Dinesh T.; and Rubera, Michael J., 5,500,489, Cl. 174-117.0FF.
Rudolph, Andreas; Mueller, Klaus J.; Peters, Christian; and Altmann, Justus, to Topas GmbH. Aerosol generator. 5,500,027, Cl. 55-223.000.
Ruetz, Brigitte, to Canon Information Systems, Inc. Method and apparatus for printing high fidelity color reproductions of colors displayed on a monitor. 5,500,921, Cl. 395-109.000.
Rüger, Wolfgang: *See*—
Becker, Reinhard; Henning: Rainer; Rüger, Wolfgang; Teetz, Volker; and Urbach, Hansjörg, 5,500,434, Cl. 514-356.000.
Rump, Siegfried: *See*—
Brugger, Manfred F.; Klarer, Martin; Knoff, Bernd; Eckl, Albrecht; Steiner, Manfred; Rump, Siegfried; Nell, Joachim; Eckstein, Fredy; Steffi, Christoph; and Douglas, Brian, 5,499,866, Cl. 303-122.080.
Rumsey, Steven C., to Westinghouse Air Brake Company. Electrically operated hook coupler with manual override. 5,499,728, Cl. 213-101.000.
Runas, Michael E., to Cirrus Logic, Inc. Circuits, systems and methods for improving page accesses and block transfers in a memory system. 5,500,819, Cl. 365-189.050.
Russell, Randy G.; Crouse, Kent E.; Shackle, Peter W.; and Bezdon, Ronald J., to Energy Savings, Inc. Low height ballast for fluorescent lamps. 5,500,576, Cl. 315-307.000.
Russell-Jones, Gregory J.; and Geczy, Andrew F., to Biotech Australia Pty. Ltd. Polynucleotide encoding T-cell epitopes of the protein TraT. 5,500,366, Cl. 435-252.300.
Russo, Peter J. Crispy chip sandwich and process of producing a sandwich product. 5,500,234, Cl. 426-103.000.
Ryan, Dale W.: *See*—
Merle, Thomas C.; Ryan, Dale W.; and Rowden, David L., 5,499,436, Cl. 29-270.000.
Rycroft, Vance. Basketball game amusement device. 5,499,821, Cl. 273-357.000.
Ryobi Motor Products: *See*—
Glenn, William K., III, 5,499,425, Cl. 15-354.000.
Saab, Mark A. Variable stiffness balloon dilatation catheters. 5,499,973, Cl. 604-96.000.
Saalbach, Kurt: *See*—
Bergeim, Klaus; Hartmann, Willi; Saalbach, Kurt; and Low, Peter, 5,499,570, Cl. 92-84.000.
Saban, Izhak, to State of Israel, Ministry of Defence, Rafael-Armaments Development Authority. Area surveying apparatus and communication system. 5,500,525, Cl. 250-221.000.
Sabath, Jerrold, to Miles Inc. Method and appparatus for image scaling using parallel incremental interpolation. 5,500,744, Cl. 358-456.000.
Sabourin, Guy. Soccer game for use in swimming pools. 5,499,822, Cl. 273-411.000.
Sadanaga, Eizi: *See*—
Harada, Hidefumi; Yamasaki, Takanori; Sadanaga, Eizi; and Okazaki, Teruyoshi, 5,500,043, Cl. 106-456.000.
Saegusa, Takashi: *See*—
Sasagaki, Nobuaki; and Saegusa, Takashi, 5,500,711, Cl. 354-474.000.
Sagara, Hiroshi: *See*—
Nakayama, Takashi; and Sagara, Hiroshi, 5,500,116, Cl. 210-511.000.
Sagl, Dennis: *See*—
Burgoyne, William F., Jr.; Daniels, Wiley E.; Sagl, Dennis; Lee, Heueh-Chi; and Vratsanos, Menas S., 5,500,251, Cl. 427-322.000.
Sagraves, Charles R.: *See*—
Boshell, Gregory A.; and Sagraves, Charles R., 5,499,494, Cl. 56-320.100.
Saha, Bijay S., to Eastman Kodak Company. High speed developer compositions with ferrite carriers. 5,500,320, Cl. 430-106.600.
Saikawa, Hideo: *See*—
Hattori, Yoshifumi; Karita, Seiichiro; Saikawa, Hideo; Kashino, Toshio; Saito, Akio; Nakagomi, Hiroshi; Arashima, Teruo; Kimura, Makiko; Sugitani, Hiroshi; Ikeda, Masami; Saito, Asao; Masuda, Kazuaki; and Orikasa, Tsuyoshi, 5,500,666, Cl. 347-87.000.
Suzuki, Etsurou; Hattori, Yoshifumi; Kitani, Masashi; Saikawa, Hideo; Kojima, Masami; Kawano, Kenji; Tanno, Koichi; and Aono, Kenji, 5,500,664, Cl. 347-86.000.
Saint-Gobain/Norton Industrial Ceramics Corporation: *See*—
Tawil, Riad A.; Tan, Yao; and Rotunda, Joseph, 5,500,529, Cl. 250-337.000.
Saishi, Mana; and Minemaru, Takayuki, to Matsushita Electric Industrial Co., Ltd. Multiplication circuit having rounding function. 5,500,812, Cl. 364-745.000.
Saito, Akihisa: *See*—
Kato, Hiroaki; Shimasaki, Yuichi; Saito, Akihisa; Komatsuda, Takashi; Oketani, Toshikazu; Haccho, Seiji; Matsumoto, Seiji; Aoki, Takuya; and Miyashita, Yukio, 5,499,501, Cl. 60-286.000.
Saito, Akio: *See*—
Hattori, Yoshifumi; Karita, Seiichiro; Saikawa, Hideo; Kashino, Toshio; Saito, Akio; Nakagomi, Hiroshi; Arashima, Teruo; Kimura, Makiko; Sugitani, Hiroshi; Ikeda, Masami; Saito, Asao; Masuda, Kazuaki; and Orikasa, Tsuyoshi, 5,500,666, Cl. 347-87.000.
Saito, Asao: *See*—

Hattori, Yoshifumi; Karita, Seiichiro; Saikawa, Hideo; Kashino, Toshio; Saito, Akio; Nakagomi, Hiroshi; Arashima, Teruo; Kimura, Makiko; Sugitani, Hiroshi; Ikeda, Masami; Saito, Asao; Masuda, Kazuaki; and Orikasa, Tsuyoshi, 5,500,666, Cl. 347-87.000.

Saito, Atsushi; Shinagawa, Hideo; and Nakata, Atsuo, to Research Foundation for Microbial Diseases of Osaka University, The. Protease, reverse transcriptase and endonuclease of HIV-1 and RSV method for producing these enzymes. 5,500,355, Cl. 435-69.700.

Saito, Shozo: *See*—
Toda, Haruki; Saito, Shozo; and Tokushige, Kaoru, 5,500,829, Cl. 365-230.080.

Saito, Takeshi: *See*—
Ichikawa, Hideo; Saito, Takeshi; Ikeda, Sunao; Makita, Nobuhiro; Ozawa, Seiji; Yoshiki, Shigeru; and Yanagisawa, Takaaki, 5,500,719, Cl. 355-260.000.

Saito, Tatsuo; and Onozuka, Haruo, to Fuji Photo Optical Co., Ltd. Source voltage monitor for a photographic camera. 5,500,710, Cl. 354-484.000.

Saito, Yasuo, to Kabushiki Kaisha Toshiba. Microprocessor system for inhibiting access to memory by checking specific address and specific codes. 5,500,949, Cl. 395-427.000.

Saito, Yoshiaki; Inomata, Koichiro; Otsuo, Shiho; and Takahashi, Yoshinori, to Kabushiki Kaisha Toshiba. Magnetoresistance effect elemeat. 5,500,633, Cl. 338-32.00R.

Saitoh, Akio: *See*—
Nagai, Shigekazu; Saitoh, Akio; and Sugiyama, Toru, 5,499,547, Cl. 74-89.150.

Saitoh, Yasuhiko; Iwata, Yasuo; Kuzuma, Seiichi; Nakajima, Yoshihide; and Yokomizo, Kanji, to Ciba-Geigy, AG; Ube Industries Limited; and Hokko Chemical Industry Co., Ltd. Microbicides. 5,500,437, Cl. 514-397.000.

Sakaegi, Yuji; Suzuki, Nobuyuki; and Sato, Yoshiaobu, to Canon Kabushiki Kaisha. Image reproduction apparatus. 5,500,743, Cl. 358-403.000.

Sakai, Hiroaki: *See*—
Kimoto, Keizo; Hanatani, Yasuyuki; Sakai, Hiroaki; Oki, Tsuneo; and Uemura, Mamoru, 5,499,486, Cl. 53-465.000.

Sakai, Hisao: *See*—
Yamazaki, Shigeki; Kato, Kazuhiro; Ishii, Takayuki; and Sakai, Hisao, 5,499,753, Cl. 226-194.000.

Sakai, Masayasu; Seto, Touru; Kaneko, Masato; Hada, Michio; and Kinomoto, Toshiaki, to Mitsubishi Jukogyo Kabushiki Kaisha. Method for producing pulp from green algae. 5,500,086, Cl. 162-65.000.

Sakai, Mikio: *See*—
Orino, Kanjo; Sakai, Mikio; and Sakanaka, Tetsuo, 5,500,754, Cl. 359-156.000.

Sakai, Tadashi: *See*—
Nakamoto, Masayuki; Ono, Tomio; and Sakai, Tadashi, 5,499,938, Cl. 445-50.000.

Sakai, Toshiaki: *See*—
Amano, Akira; Matsuzaki, Kazuo; and Sakai, Toshiaki, 5,499,535, Cl. 73-717.000.

Sakaki, Eihiro; Ogasawara, Yoshimi; and Teshima, Eiichiro, to Canon Kabushiki Kaisha. Device for measuring time lapse after turn off of power source and method thereof. 5,500,834, Cl. 368-9.000.

Sakakibara, Jun: *See*—
Nakamura, Hajime; and Sakakibara, Jun, 5,499,807, Cl. 271-121.000.

Sakakibara, Shuji: *See*—
Nakayama, Masaaki; Baba, Yasutoshi; Terada, Takehiko; Sakakibara, Shuji; and Yamamoto, Kenji, 5,499,537, Cl. 73-117.300.

Sakakibara, Teigo: *See*—
Hashimoto, Yuichi; Amamiya, Shoji; and Sakakibara, Teigo, 5,500,718, Cl. 355-210.000.

Sakakida, Katsumi: *See*—
Yamamoto, Tadashi; Sakakida, Katsumi; Ikeda, Takanobu; and Masuya, Chisato, 5,499,842, Cl. 280-728.300.

Sakakida, Naohiro: *See*—
Tsushima, Hideaki; Sasaki, Shinya; Nakano, Yukio; Nakano, Hiroyuki; Tateyari, Ryoji; Matsuda, Hironari; Tomooka, Kenji; Sakakida, Naohiro; Nishimura, Shin; Yano, Yoshihiro; Igarashi, Yosichi; Aoki, Satoshi; Takatori, Masahiro; Kazawa, Tohru; and Ashi, Yoshihiro, 5,500,756, Cl. 359-174.000.

Sakanaka, Tetsuo: *See*—
Orino, Kanjo; Sakai, Mikio; and Sakanaka, Tetsuo, 5,500,754, Cl. 359-156.000.

Sakanishi, Yutaka; and Akashiro, Kotaro, to Fujicopian Co., Ltd. Transfer ribbon cassette, a case for enclosing the cassette, and a paint film transfer device having the same. 5,499,877, Cl. 400-193.000.

Sako, Michiya: *See*—
Watanabe, Shinichi; Shoji, Norio; and Sako, Michiya, 5,500,774, Cl. 360-46.000.

Sakumoto, Yukiseori; Hashimoto, Takeshi; Nakaba, Katsuji; Kobayashi, Masaharu; Nishigaya, Takeshi; and Yamanashi, Fumiyoshi, to Tomoegawa Paper Co., Ltd. Adhesive tape for electronic parts and liquid adhesive. 5,500,294, Cl. 428-355.000.

Sakura Color Products Corporation: *See*—
Fujisami, Fumiko, 5,500,040, Cl. 106-21.00A.

Salamina, Nicolas: *See*—
Rincon, Gabriel A.; Salamina, Nicolas; and Corsi, Marco, 5,500,625, Cl. 330-273.000.

Salansky, Charles A. Copy holding device. 5,499,793, Cl. 248-442.200.

Salant, Richard F., to Georgia Tech Research Corporation. Mechanical seal with compliant face. 5,499,824, Cl. 277-95.000.

Salomon S.A.: *See*—
Danezin, Bruno; Bourdeau, Joël; and Senee, Olivier, 5,499,461, Cl. 36-117.000.

Salpeka, Glenn L.; and Wilson, J. Larry, to Power Tool Holders Incorporated. Lever bar keyless chuck. 5,499,828, Cl. 279-62.000.

Sames S.A.: *See*—
Ehinger, Pierre; and Gory, Patrice, 5,500,045, Cl. 118-313.000.

Sameshima, Shogo: *See*—
Matsumoto, Takahiro; Sameshima, Shogo; and Yoshida, Kenichi, 5,500,445, Cl. 514-474.000.

Samsung Aerospace Industries, Ltd.: *See*—
Kuwayama, Masahito; and Yamamoto, Yoshihiro, 5,500,713, Cl. 355-27.000.

Samsung Display Devices Co., Ltd.: *See*—
Jeong, Eui-seon, 5,500,570, Cl. 313-634.000.

Samsung Electronics Co., Ltd.: *See*—
Jeon, Dal-Young; Jee, Kyung-Ha; Choi, Nak-Choon; Song, Bok-Ki; and Shin, Dong-Myeong, 5,500,792, Cl. 363-98.000.
Joo, Jae-Man; and Kim, Yong-Woo, 5,499,423, Cl. 15-319.000.
Mok, Do-sang, 5,500,688, Cl. 348-697.000.
Park, Il-keun, 5,500,877, Cl. 375-343.000.
Song, Sang-won; and Kim, Chan-sik, 5,500,813, Cl. 364-787.000.
Strolle, Christopher H.; Patel, Chandrakant B.; Wedara, Werner F.; Schnitzler, Raymond; Weckenbrock, Hermann J.; Ko, Jung W.; Yun, Joag K.; and Limberg, Allen L., 5,500,739, Cl. 358-310.000.

Samsung Semiconductor, Inc.: *See*—
Chang, Shuen C.; Ho, Hai D.; and Sun, Szu C., 5,500,818, Cl. 365-189.050.

Samuel, Neyyan K. P.: *See*—
Shafer, Warren E.; Woolard, Derek D.; Samuel, Neyyan K. P.; Venburg, Gregory D.; Devisetty, Bala N.; and Heiman, Daniel F., 5,500,403, Cl. 504-115.000.

Sanborn, Charles H., III; and Clanton, Joel D., to Ark, Inc. Method and apparatus for forming a spread. 5,499,564, Cl. 83-23.000.

Sanchez, Ana V., to FLA Orthopedics, Inc. Shaped lifting belt and method. 5,499,965, Cl. 602-19.000.

Sander-Cederlof, Brian; and Ahlquist, John B., to Macromedia, Inc. System and method for simplifying a computer-generated path. 5,500,927, Cl. 395-133.000.

Sandford, Gerald G.: *See*—
Sudhakar, Chakka; Sandford, Gerald G.; and Dolfinger, Frank, Jr., 5,500,401, Cl. 502-316.000.

Sandoja, Mohan L.; Berlias, Irene; Horowitz, Carl; and Thottathil, Paul, to Bolton, James A. Substrate-reactive coating composition. 5,500,253, Cl. 427-385.500.

Sano, Hiroaki; Taguchi, Kinji; Noguchi, Akiyoshi; and Tanaka, Shigeru, to Sumitomo Electric Industries, Ltd. Method for inserting a communication wire through a pipeline by air flow. 5,499,797, Cl. 254-134.400.

Sano, Manabu; and Sekine, Shuji, to Jidosha Denki Kogyo Kabushiki Kaisha. Electric motor with rotation detecting mechanism. 5,500,564, Cl. 310-83.000.

Sano, Mutsumi: *See*—
Miyamura, Tsuyoshi; Sano, Mutsumi; Kondo, Akihiro; and Kato, Ikunoshia, 5,500,342, Cl. 435-4.000.

Sano, Tetsuo: *See*—
Arai, Yasuhiro; Sano, Tetsuo; Yamashita, Tetsuji; Iwanaga, Takaki; and Goto, Koichi, 5,499,508, Cl. 62-114.000.

Santos, Esteban; Pollman, John A.; and Singer, Paul H., to General Electric Company. Digital circuit interrupter with multiple accessory function. 5,500,781, Cl. 361-96.000.

Sanyo Electric Co., Ltd.: *See*—
Nakagawa, Kenji; Yoshizaki, Koichi; Nukaga, Tadashi; Banba, Yoshikazu; Hattori, Shigetaka; and Mochizuki, Kentaro, 5,499,791, Cl. 248-638.000.
Onaya, Masato; and Yamada, Susumu, 5,500,825, Cl. 365-219.000.

Saperstein, William: *See*—
Rodea, Philip; Elnashar, Khodor; Deng, Brian T.; Tsang, Steve; and Saperstein, William, 5,500,946, Cl. 395-308.000.

Sarkar, Manisha; and Lu, Ying-Yuh, to Minnesota Mining and Manufacturing Company. Water based toner receptive core/shell latex compositions. 5,500,457, Cl. 523-201.000.

Sarsfield, Martin R.: *See*—
Roberts, James P.; Culp, James D.; Miller, David G.; and Sarsfield, Martin R., 5,499,785, Cl. 244-137.400.

Sasagaki, Nobuaki; and Saegusa, Takashi, to Nikon Corporation. Camera equipped with warning function and method. 5,500,711, Cl. 354-474.000.

Sasaki, Shinichi: *See*—
Yashiro, Masahiko; Sasaki, Shinichi; Ikemoto, Isao; Miura, Koji; Karakama, Toshiyuki; and Numagami, Atsushi, 5,500,714, Cl. 355-200.000.

Sasaki, Shinya: *See*—
Tsushima, Hideaki; Sasaki, Shinya; Nakano, Yukio; Nakano, Hiroyuki; Tateyari, Ryoji; Matsuda, Hironari; Tomooka, Kenji; Sakakida, Naohiro; Nishimura, Shin; Yano, Yoshihiro; Igarashi, Yosichi; Aoki, Satoshi; Takatori, Masahiro; Kazawa, Tohru; and Ashi, Yoshihiro, 5,500,756, Cl. 359-174.000.

Sasaki, Yosuke; and Okubo, Hideaki, to Kabushiki Kaisha Komatsu Seisakusho. Method for controlling injection volume of material into mold. 5,500,166, Cl. 264-40.400.

Sasakura, Miyoshi; Ohkura, Osamu; Mizoguchi, Takehiko; Hori, Satoru; and Yoshida, Satoshi, to Casio Computer Co., Ltd. Slip output apparatus. 5,500,932, Cl. 395-149.000.





Sasano, Nobusuke: *See*—
Arakawa, Kenichi; Sasano, Nobusuke; Iizuka, Tomoaki; Kobayashi, Miho; Yamada, Tetsuo; and Motoyama, Hideki, 5,500,675, Cl. 348-319.000.

Satama, Lea: *See*—
Aalto, Jouni; Pakkanen, Raimo; Satama, Lea; Luopa, Jyrki; Allén, Timo; Virtanen, Arja; and Kanttinen, Ari, 5,500,229, Cl. 424-535.000.

Sato, Fumihiko, to NEC Corporation. Bipolar transistor having reduced base-collector capacitance while maintaining improved cut-off frequency. 5,500,554, Cl. 257-588.000.

Sato, Hiroyuki: *See*—
Yaschi, Hitoshi; Sugiyama, Koichi; Miyashita, Akihiko; Satoh, Nakatoshi; Sugawara, Tatsuo; Sato, Hiroyuki; and Onozato, Takashi, 5,500,657, Cl. 347-9.000.

Sato, Keiji: *See*—
Yoshida, Satoru; Sato, Keiji; Mochizuki, Masamichi; Watanabe, Masashi; and Kato, Takashi, 5,499,510, Cl. 62-175.000.

Sato, Mitsuhisa; Maeda, Mikio; and Furukawa, Shinichi, to Ando Electric Co., Ltd.; and Nippon Telegraph and Telephone Corporation. Optical time domain reflectometer using ring laser light source. 5,500,731, Cl. 356-73.100.

Sato, Naoki: *See*—
Fujimoto, Akihiko; Ishii, Hisao; Okamoto, Shinya; and Sato, Naoki, 5,499,963, Cl. 483-56.000.

Sato, Naomi: *See*—
Ohba, Toshio; Sato, Naomi; Ogawa, Masahiko; and Nakazato, Morizo, 5,500,148, Cl. 252-315.200.

Sato, Tadahisa: *See*—
Mizukawa, Yuki; Naruse, Hideaki; Watanabe, Toshiyuki; and Sato, Tadahisa, 5,500,334, Cl. 430-558.000.

Sato, Toru: *See*—
Shiga, Nobuo; Marui, Tomohiro; Shibuya, Kiyoshi; Sato, Toru; Ozawa, Michiharu; and Yukumoto, Masao, 5,499,673, Cl. 164-463.000.

Sato, Tsuyoshi: *See*—
Mori, Yasushi; Matsuo, Tokuji; Hokao, Nobuhiro; Fujimoto, Akihiko; and Sato, Tsuyoshi, 5,500,039, Cl. 96-209.000.

Sato, Yohei: *See*—
Ujita, Toshihiko; Nakajima, Kazuhiro; Sato, Yohei; and Murakami, Shuichi, 5,500,663, Cl. 347-86.000.

Sato, Yoshihiro: *See*—
Inoue, Yousichi; Sato, Yoshihiro; Hirose, Shinichi; Tsui, Hiroshi; Tanaka, Katsuyuki; Abe, Katsuo; Obara, Masaki; and Mizamoto, Museo, 5,500,296, Cl. 428-408.000.

Sato, Yoshinobu: *See*—
Sakaegi, Yuji; Suzuki, Nobuyuki; and Sato, Yoshinobu, 5,500,743, Cl. 358-403.000.

Satoh, Masatoshi; and Ohsuma, Tetsuya, to Pioneer Electric Corporation. Staking method. 5,499,440, Cl. 29-512.000.

Satoh, Nakatoshi: *See*—
Yaschi, Hitoshi; Sugiyama, Koichi; Miyashita, Akihiko; Satoh, Nakatoshi; Sugawara, Tatsuo; Sato, Hiroyuki; and Onozato, Takashi, 5,500,657, Cl. 347-9.000.

Satoh, Youichi, to Fujitsu Limited. Flat cable and a connector cooperating therewith. 5,499,928, Cl. 439-492.000.

Sauder Woodworking Co.: *See*—
Short, Michael K.; Grieser, Jerry D.; Nelson, Richard A.; Warner, Thomas B.; and Maguire, Ferrol M., 5,499,886, Cl. 403-381.000.

Sauer, Donald J., to David Sarnoff Research Center, Inc. Constant impedance sampling switch for an analog to digital converter. 5,500,612, Cl. 327-91.000.

Saur, Reinhold: *See*—
Wingert, Horst; Sauter, Hubert; Ammermann, Eberhard; Lorenz, Gisela; Saur, Reinhold; Schelberger, Klaus; and Hampel, Manfred, 5,500,441, Cl. 514-412.000.
Wingert, Horst; Sauter, Hubert; Ammermann, Eberhard; Lorenz, Gisela; Saur, Reinhold; Schelberger, Klaus; and Hampel, Manfred, 5,500,446, Cl. 514-483.000.

Sauter, Hubert: *See*—
Wingert, Horst; Sauter, Hubert; Ammermann, Eberhard; Lorenz, Gisela; Saur, Reinhold; Schelberger, Klaus; and Hampel, Manfred, 5,500,441, Cl. 514-412.000.
Wingert, Horst; Sauter, Hubert; Ammermann, Eberhard; Lorenz, Gisela; Saur, Reinhold; Schelberger, Klaus; and Hampel, Manfred, 5,500,446, Cl. 514-483.000.

Savage, Steven D.: *See*—
Brucker, Gregory G.; and Savage, Steven D., 5,500,012, Cl. 607-122.000.

Sawada, Masami: *See*—
Yamaguchi, Kazumi; Sawada, Masami; Yamada, Manabu; and Hagimoto, Keizo, 5,500,547, Cl. 257-359.000.

Sawada, Ryozo; Hirasawa, Masanori; Yamaguchi, Yoshiharu; Funakawa, Shigeru; and Kanayama, Masaru, to Yoshida Kogyo K.K. Slide fastener made of synthetic resin. 5,500,276, Cl. 428-192.000.

Sayers, Thomas; Smyth, Mark J.; Wilkrout, Theresa A.; Powers, James C.; Sowder, Raymond; and Henderson, Louis E., to United States of America, Health and Human Services. Serine protease and uses thereof. 5,500,344, Cl. 435-6.000.

Scanstronic Limited: *See*—
Walley, Ian M.; and Hankins, Timothy R. F., 5,500,639, Cl. 340-539.000.

Schad, Robert D.; and Jenko, Edward J., to Husky Injection Molding Systems Ltd. Rotary actuated gate valve. 5,499,916, Cl. 425-564.000.

Schadt, Martin; and Seiberle, Hubert, to Hoffmann-La Roche Inc. Method for giving cholesteric liquid crystals a planar orientation free from faulty inclination. 5,500,752, Cl. 359-76.000.

Schäfer, Klaus: *See*—
Nissen, Peter; and Schäfer, Klaus, 5,499,543, Cl. 73-861.160.

Schaible, Kurt: *See*—
Andres, Rudolf; Seel, Holger; and Schaible, Kurt, 5,499,855, Cl. 296-121.000.

Schainholz, Alfred, to Woodtronics. Self-supporting data processing desk module with detachable and longitudinally shiftable exhaust fan assembly and adjustable angle, reversible video deck bridges with front and rear continuous sweep grommets. 5,499,868, Cl. 312-236.000.

Schampert, Kurt: *See*—
Leroux, Roland; Rodek, Erich; Schampert, Kurt; Thäck, Jürgen; and Weinberg, Waldemar, 5,500,255, Cl. 427-419.200.

Schechter, Steven M.: *See*—
Miller, Harry E.; Pak, Paul; Schechter, Steven M.; and Huynh, Vien-An T., 5,500,236, Cl. 426-451.000.

Scheibel, Jeffrey J.; Murch, Bruce P.; and Connor, Daniel S., to Procter & Gamble Company, The. Solidified detergent additive with a-alkoxy polyhydroxy fatty acid amide and alkoxylated surfactant. 5,500,150, Cl. 252-544.000.

Scheibel, Jeffrey J.: *See*—
Goldman, Stephen A.; and Scheibel, Jeffrey J., 5,500,451, Cl. 521-64.000.

Schelberger, Klaus: *See*—
Wingert, Horst; Sauter, Hubert; Ammermann, Eberhard; Lorenz, Gisela; Saur, Reinhold; Schelberger, Klaus; and Hampel, Manfred, 5,500,441, Cl. 514-412.000.
Wingert, Horst; Sauter, Hubert; Ammermann, Eberhard; Lorenz, Gisela; Saur, Reinhold; Schelberger, Klaus; and Hampel, Manfred, 5,500,446, Cl. 514-483.000.

Schell, David J.: *See*—
Cahill, Leslie M.; Miller, David R.; and Schell, David J., 5,500,938, Cl. 395-161.000.

Schieferstein, Ludwig: *See*—
Eichna, Ulrich; Fischer, Herbert; Gress, Wolfgang; Hoefer, Rainer; Oberkobusch, Doris; and Schieferstein, Ludwig, 5,500,475, Cl. 524-591.000.

Schiel, Christian, to J. M. Voith GmbH. Press unit of a paper machine for the manufacture of tissue paper. 5,500,092, Cl. 162-358.300.

Schiesel, Alois; Steinicke, Wolfgang; Trede, Wolfgang; and Krone, Hartmut, to Buck Chemische-Technische Werke GmbH & Co. Projectile. 5,499,582, Cl. 102-334.000.

Schinabeck, Rainer, to American Velodur Metal, Inc. Method for sealing leaks. 5,500,064, Cl. 156-94.000.

Schindler, Ursula: *See*—
Schlumpf, Karl; Schindler, Ursula; and Schraven, Eckhard, 5,500,436, Cl. 514-397.000.

Schlipf, Karl: *See*—
Schattken, Heinrich; Nesh, Roland; Schlipf, Karl; and Kuntz, Bertram, 5,499,990, Cl. 606-144.000.

Schmaling, David N.; Miner, Frederick J.; and Byrnes, Francis E., to United Technologies Corporation. Snubber bearing mounting assembly for bearingless rotors. 5,499,903, Cl. 416-134.00A.

Schmidt & Leuhardt GmbH & Co. oHG: *See*—
Janisch, Klaus, 5,499,862, Cl. 297-311.000.

Schmidt, . Christopher J.: *See*—
Carr, Albert A.; Dage, Richard C.; Koerner, John E.; Li, Tung; Miller, Francis P.; Nieduzak, Thaddeus R.; Dudley, Mark W.; Schmidt, . Christopher J.; and Frank, Robert A., 5,500,433, Cl. 514-330.000.

Schmidt, Craig L.: *See*—
Heller, Bernard P.; Schmidt, Craig L.; Nutzman, Thomas M.; and Lesser, Joseph P., 5,500,026, Cl. 29-623.100.

Schmidt, Roland; Strochlein, Hans; and Weller, Thomas, to Siemens Aktiengesellschaft. Mounting assembly for an axle in a housing. 5,500,885, Cl. 378-128.000.

Schmitt, Manfred, to Fisher-Guide Regelarmaturen GmbH & Co. KG. Valve arrangement. 5,499,657, Cl. 137-887.000.

Schmitz, Friedhelm; Czech, Norbert; and Deblon, Bruno, to Siemens Aktiengesellschaft. Metallic component of a gas turbine installation having protective coatings. 5,499,905, Cl. 416-241.00R.

Schmitz, Raymond J., III, to Tecumseh Products Company. Method of making foam in an energy efficient compressor. 5,499,908, Cl. 417-368.000.

Schnaus, Walter; Streag, Michael; Schoenmeier, Franz; and Biller, Stephan, to Zimmer Aktiengesellschaft. Distributor for viscous fluids with multiple radial; discharge. 5,499,652, Cl. 137-340.000.

Schneider, Daniel A.: *See*—
West, Jack T.; Annen, James H.; Schneider, Daniel A.; and Kokoszka, Marek K., 5,500,308, Cl. 429-171.000.

Schneider, Friedrich E.: *See*—
Löffler, Otto; Niesauer, Werner; Ambacher, Heinz; and Schneider, Friedrich E., 5,500,304, Cl. 428-614.000.

Schnitzler, Raymond: *See*—
Strolle, Christopher H.; Patel, Chandrakant B.; Wedara, Werner F.; Schnitzler, Raymond; Weckenbrock, Hermann J.; Ko, Jung W.; Yun, Joag K.; and Limberg, Allen L., 5,500,739, Cl. 358-310.000.

Schnitzler, Albrecht, to Metabowerke GmbH & Co. Keyless chuck. 5,499,830, Cl. 279-62.000.

Schnorf, Peter, to Canon Information Systems, Inc. Display system which displays motion video objects combined with other visual objects. 5,500,933, Cl. 395-154.000.
Schoch, Peter J.: *See*—
Tickell, Edward B., Jr.; Schoch, Peter J.; Moseley, Lonnie M.; and Bloomfield, Dwight A., 5,500,597, Cl. 324-339.000.
Schoenmeier, Franz: *See*—
Schaans, Walter; Streng, Michael; Schoenmeier, Franz; and Biller, Stephan, 5,499,652, Cl. 137-340.000.
Schönafinger, Karl; Schindler, Ursula; and Schraven, Eckhard, to Cassella Aktiengesellschaft. 2-(N-(2-aminoethyl)amino)acetic acid derivatives to inhibit advanced glycosylation. 5,500,436, Cl. 514-397.000.
Schote, Norbert: *See*—
Wahl, George; Dietz, Matthias; Schote, Norbert; Klosterhuber, Robert; Sommerer, Karl; Kunert, Reinhard; and Gerber, Fritz, 5,499,839, Cl. 280-701.000.
Schott, Allan N.; and Girard, Mario P., to New Holland North America, Inc. Control lever lockout mechanism. 5,499,553, Cl. 74-526.000.
Schott Glaswerke: *See*—
Leroux, Roland; Rodek, Erich; Schaupert, Kurt; Thärk, Jürgen; and Weinberg, Waldemar, 5,500,255, Cl. 427-419.200.
Schraven, Eckhard: *See*—
Schönafinger, Karl; Schindler, Ursula; and Schraven, Eckhard, 5,500,436, Cl. 514-397.000.
Schroeder, David: *See*—
Kurek, Stephen R.; and Schroeder, David, 5,500,498, Cl. 200-556.000.
Schroer Manufacturing Company: *See*—
Hansen, Anlynne M.; and Anderson, Herschel, 5,499,721, Cl. 211-13.000.
Schubert, Peter: *See*—
Jagiella, Manfred; Wiesemann, Wolf; Schubert, Peter; Holzmann, Michael; and Spörl, Georg, 5,500,504, Cl. 219-121.670.
Schuermann, Josef, to Texas Instruments Incorporated. System and method for reading multiple RF-ID transponders. 5,500,651, Cl. 342-42.000.
Schuetz, Brian D., to Olympic Arms, Inc. Gas-operated rifle system. 5,499,569, Cl. 89-197.000.
Schulenburg, Steven H.: *See*—
Thurston, Raymond L.; and Schulenburg, Steven H., 5,499,893, Cl. 411-282.000.
Schülken, Heinrich; Neeb, Roland; Schlipf, Karl; and Kuntz, Bertram, to Forschungszentrum Karlsruhe GmbH. Suturing instrument. 5,499,990, Cl. 606-144.000.
Schulz, Reinhard, to Hilite Lighting and Electronics Ltd. Dimmer circuit for gas discharge lamps having electronic ballasts. 5,500,573, Cl. 315-247.000.
Schuneman, Thomas A.: *See*—
Cook, Craig C.; Blumer, Thomas P.; Packard, Theodore B.; Dreher, Geoffrey A.; and Schuneman, Thomas A., 5,500,928, Cl. 395-133.000.
Schutten, Michael J.: *See*—
Kharabwala, Mustansir H.; and Schutten, Michael J., 5,500,791, Cl. 363-17.000.
Schutz, Udo. Process for the production of a pallet container. 5,499,438, Cl. 29-407.010.
Schwab, Ekkehard: *See*—
Kormann, Claudius; Schwab, Ekkehard; Raulfs, Friedrich-Wilhelm; and Beck, Karin H., 5,500,141, Cl. 232-62.540.
Schwartz, A. William, to UOP. Stacked fluid-separation membrane disk module assemblies. 5,500,122, Cl. 210-321.750.
Schwarze, Rigobert. Double-head pipe bending machine. 5,499,522, Cl. 72-157.000.
Schwiebert, William H.; Hall, Corriaa A. E.; Broder, Damon W.; and Moore, Shelley L, to Hewlett-Packard Company. Method and apparatus for heating print medium in an ink-jet printer. 5,500,667, Cl. 347-102.000.
Scientific-Atlanta, Inc.: *See*—
Thompson, Leo; Little, Frank; and Pidgeon, Rezin E., Jr., 5,500,758, Cl. 359-189.000.
Scientific Games Inc.: *See*—
Levy, Bret, 5,499,816, Cl. 273-139.000.
Scimed Life Systems, Inc.: *See*—
Buscemi, Paul J.; Siejakal, Elizabeth A.; Palme, Donald F., II; and Wang, Lixiao, 5,500,013, Cl. 623-1.000.
Eutenauer, Charles L., 5,499,980, Cl. 606-28.000.
Wang, Lixiao; and Tran, The T. T., 5,500,181, Cl. 264-532.000.
Scots Pine Enterprises Ltd., c/o Perly-Robertson Panet, Hill & McDougall: *See*—
Mill, Peter D.; and Tice, Richard, 5,499,504, Cl. 62-3.300.
Scott, Alistair; Pearson, Allen J.; and Collins, James T. Apparatus for making or dispensing drinks. 5,499,741, Cl. 222-95.000.
Scott, Gregory D. Method of manufacture of a prepacked resin bonded well liner. 5,500,174, Cl. 264-112.000.
Scripps Research Institute, The: *See*—
Nicolaou, K. C.; Hiatt, Andrew; and Wrasidlo, Wolfgang, 5,500,432, Cl. 514-281.000.
Reymond, Jean-Louis; Chen, Yuanwei; and Lerner, Richard A., 5,500,358, Cl. 435-156.000.
Seagate Technology, Inc.: *See*—
Smith, Robert F., 5,500,776, Cl. 360-77.040.
Seaman, Larry P.: *See*—
Czeksi, David A.; and Seaman, Larry P., 5,500,331, Cl. 430-449.000.
Sechrist, Paul A.; Lawrence, Roger R.; Micklich, Frank T.; Richardson, Larry D.; and Kazell, David M., to UOP. Method for changing particulate transport rates between zones. 5,500,110, Cl. 208-173.000.
Seel, Holger: *See*—
Andres, Rudolf; Seel, Holger; and Schaible, Kurt, 5,499,855, Cl. 296-121.000.
Sega Enterprises, Ltd.: *See*—
Taside, Hideo; Muranaka, Masayuki; Mori, Shigeru; Wada, Kiyoshi; Yoshizaki, Isao; and Ogura, Naoyuki, 5,500,747, Cl. 359-40.000.
Seibel, George: *See*—
Lavin, Thomas N.; Norman, Mark F.; Klein, Teri E.; and Seibel, George, 5,500,807, Cl. 364-496.000.
Seiberle, Hubert: *See*—
Schadt, Martin; and Seiberle, Hubert, 5,500,752, Cl. 359-76.000.
Seigendall, Jay R. Second handle attachment for a tool. 5,499,852, Cl. 294-58.000.
Seirlehner, Leo: *See*—
Nieder, Wolfgang; Winkler, Manfred; Perchtold, Gerhard; Seirlehner, Leo; Kohler, Herbert; and Eberle, Arwed, 5,500,032, Cl. 75-414.000.
Seki, Tsuneyo; Okutomi, Tsutomu; and Yamamoto, Atsushi, to Kabushiki Kaisha Toshiba. Contacts material for vacuum valve. 5,500,499, Cl. 218-130.000.
Sekimoto, Koji: *See*—
Takemoto, Takatoshi; Chida, Toshikazu; Kano, Noriaki; Ito, Eiji; Murakami, Koji; Itagaki, Takashi; Sekimoto, Koji; and Suzuki, Masanori, 5,499,809, Cl. 271-274.000.
Sekimura, Nobuyuki: *See*—
Takao, Hideaki; Murata, Tatsuo; Kanbe, Junichiro; Tamura, Miki; Kamio, Masaru; Sekimura, Nobuyuki; and Kikuchi, Yoshiki, 5,500,751, Cl. 359-68.000.
Sekine, Hideaobu, to Kouyou Electronics Appliances Co., Ltd. Probe pins for inspection and slip-on sockets thereof. 5,499,933, Cl. 439-482.000.
Sekine, Shuji: *See*—
Sano, Masabu; and Sekine, Shuji, 5,500,564, Cl. 310-83.000.
Sekmistrz, Johnny M.: *See*—
Utz, Christopher G.; Hollis, Rebecca P.; and Sekmistrz, Johnny M., 5,500,219, Cl. 424-409.000.
Semchena, John H.: *See*—
Faigle, Ernst M.; Semchena, John H.; and Thompson, Richard J., 5,499,843, Cl. 280-741.000.
Semiconductor Energy Laboratory Co., Ltd.: *See*—
Kadono, Masaya; and Yamazaki, Shunpei, 5,500,539, Cl. 257-77.000.
Yamazaki, Shunpei, 5,500,051, Cl. 136-244.000.
Yamazaki, Shunpei; and Mase, Akira, 5,500,538, Cl. 257-49.000.
Seneci, Pierfausto: *See*—
Malsaberba, Adriano; Seneci, Pierfausto; Ketteuring, Jürgen K.; and Ciabatti, Romeo, 5,500,410, Cl. 514-8.000.
Senee, Olivier: *See*—
Danezin, Bruno; Bourdeau, Joël; and Senee, Olivier, 5,499,461, Cl. 36-117.000.
Senju Pharmaceutical Co., Ltd.: *See*—
Matsumoto, Takahiro; Sameshima, Shogo; and Yoshida, Kenichi, 5,500,445, Cl. 514-474.000.
Season Investments Limited: *See*—
Lau, Alfred T., 5,499,424, Cl. 15-322.000.
Seo, Heui Sik: *See*—
Kim, Kwang; and Seo, Heui Sik, 5,500,844, Cl. 369-77.200.
Sepracor, Inc.: *See*—
López, Jorge L., 5,500,352, Cl. 435-44.000.
Serex, Inc.: *See*—
Lee-Own, F. Victor; and Fitzpatrick, Judith, 5,500,375, Cl. 436-514.000.
Sergeev, Vladimir N.: *See*—
Khmara, Vladimir N.; Belotelova, Ljudmila N.; and Sergeev, Vladimir N., 5,499,900, Cl. 415-55.100.
Serrao, Giacinto: *See*—
Burgio, Emanuele; and Serrao, Giacinto, 5,500,284, Cl. 428-349.000.
Seto, Touru: *See*—
Sakai, Masayasu; Seto, Touru; Kaneko, Masato; Hada, Michio; and Kinomoto, Toshiaki, 5,500,086, Cl. 162-65.000.
Sextant Avionique: *See*—
Gulli, Christian, 5,500,903, Cl. 381-92.000.
SGS-Thomson Microelectronics, Inc.: *See*—
Chan, Thiu C.; Bryant, Frank R.; Lu, Lun-Tseng; and Wei, Che-Chia, 5,500,557, Cl. 257-758.000.
Le, Tam T., 5,500,603, Cl. 324-751.000.
Wei, Che-Chia, 5,500,382, Cl. 437-44.000.
Worley, James L., 5,500,588, Cl. 324-158.100.
SGS-Thomson Microelectronics, S.A.: *See*—
Lisart, Mathieu; and Fournel, Richard, 5,500,601, Cl. 324-713.000.
SGS-Thomson Microelectronics, S.r.l.: *See*—
Puzzolo, Sante; Zambrano, Raffaele; and Paparo, Mario, 5,500,551, Cl. 257-500.000.
Shackle, Peter W.: *See*—
Russell, Randy G.; Crouse, Kent E.; Shackle, Peter W.; and Bezdon, Ronald J., 5,500,576, Cl. 315-307.000.
Shafer, Warren E.; Woolard, Derek D.; Samuel, Neyyan K. P.; Venburg, Gregory D.; Devisetty, Bala N.; and Heiman, Daniel F., to Abbott Laboratories. Liquid formulations and process for extending the vase life of cut flowers. 5,500,403, Cl. 504-115.000.
Shah, Dinesh T.; and Rubera, Michael J., to Whitaker Corporation, The. Cable for electronic retailing applications. 5,500,489, Cl. 174-117.0FF.
Shalvi, Ram; and Kleiman, Christopher A. W., to Solar Wide Industries, Ltd. Monitoring device for monitoring the passage of objects through passage. 5,500,526, Cl. 250-222.100.



Shapiro, Sigman: *See*—
Langhans, Stephen; Goodman, Laurence M.; and Shapiro, Sigman, 5,500,513, Cl. 235-380.000.
Shapland, James E.; Hildebrandt, Keith R.; and Knudson, Mark B., to Cortrak Medical, Inc. Method for iontophoretically delivering drug adjacent to a heart. 5,499,971, Cl. 604-53.000.
Sharma, Jai P., to UKI Supreme Corporation. Process for dyeing spandex fibers. 5,500,025, Cl. 8-685.000.
Sharma, Raghu; Davis, Jeffrey P.; Gunn, Timothy D.; and Li, Ping, to Multi-Tech Systems, Inc. Voice and data transmission system. 5,500,859, Cl. 370-81.000.
Sharp Corporation: *See*—
Shou, Guoliang; Yang, Weikang; Takatori, Sunao; and Yamamoto, Makoto, 5,500,810, Cl. 364-724.010.
Sharp, Douglas J., to Dostocil Mfg. Co., Inc. Kennel door latch. 5,499,850, Cl. 292-42.000.
Sharp Kabushiki Kaisha: *See*—
Kanbe, Makoto; and Mitsui, Seiichi, 5,500,750, Cl. 359-58.000.
Miyake, Tomoyuki; Inui, Toshiharu; Akiyama, Jun; and Kojima, Kunio, 5,500,839, Cl. 369-13.000.
Naksi, Toshifumi, 5,500,809, Cl. 364-580.000.
Van, Kazuo; Ohta, Kenji; Inui, Tetsuya; Nagaura, Toshikazu; Takemori, Hirotoshi; and Toki, Hirotaka, 5,500,850, Cl. 369-275.400.
Yoshida, Hirokazu, 5,500,787, Cl. 361-779.000.
Sharpe Endosurgical Corporation: *See*—
Sharpe, Leslie A.; and Peterson, Francis C., 5,499,997, Cl. 606-206.000.
Sharpe, Leslie A.; and Peterson, Francis C., to Sharpe Endosurgical Corporation. Endoscopic tenaculum surgical instrument. 5,499,997, Cl. 606-206.000.
Shaw, Julian D.: *See*—
Smith, John A. S.; and Shaw, Julian D., 5,500,591, Cl. 324-307.000.
Shearn, Kenneth M.; Kranick, Gordon S.; and Grimstad, Robert F., to PACCAR Inc. Integral hood, radiator and bumper support apparatus. 5,499,690, Cl. 180-68.400.
Sheedy, Michael A.: *See*—
Brown, Craig J.; and Sheedy, Michael A., 5,500,098, Cl. 203-13.000.
Shefte, Peter W., to Applied Power Inc. Two-way vent valve. 5,499,654, Cl. 137-493.900.
Shell Oil Company: *See*—
Cowan, Kenneth M., 5,499,677, Cl. 166-293.000.
St. Clair, David J., 5,499,409, Cl. 525-92.00H.
St. Clair, David J., 5,500,481, Cl. 525-92.00K.
Young, Glenda C., 5,500,461, Cl. 523-404.000.
Young, Glenda C., 5,500,462, Cl. 523-404.000.
Shen, Shioupyn: *See*—
Powers, Michael C.; Bliss, Greg A.; and Shen, Shioupyn, 5,500,795, Cl. 364-401.000.
Shepherd, Norman J.: *See*—
Morgan, Vincent J.; and Shepherd, Norman J., 5,499,918, Cl. 433-173.000.
Sheppard, Robert M.: *See*—
Kirk, Kevin A.; Liu, Leland L.; O'Brien, Jeffrey J.; and Sheppard, Robert M., 5,500,283, Cl. 428-349.000.
Sheridan, David S.: *See*—
Fraas, Michael; Frenzer, Reinhard; Long, Gregor; Kline, John S.; Sheridan, David S.; Fink, E. David; and Toppses, Anthony N., 5,499,625, Cl. 128-207.150.
Sheridan, P. J.: *See*—
Blum, Kenneth; Noble, E. P.; and Sheridan, P. J., 5,500,343, Cl. 435-6.000.
Sherman, David: *See*—
Popat, Kaushik; Ip, William; and Sherman, David, 5,500,611, Cl. 326-87.000.
Shibata, Kazuyoshi: *See*—
Kasou, Hisato; Kawashima, Tomoyuki; Taniguchi, Harutaka; Nakamata, Shin'ichi; and Shibata, Kazuyoshi, 5,500,103, Cl. 204-192.260.
Shibata, Kozo: *See*—
Takeuchi, Yukihiro; Shibata, Kozo; Ohtsuka, Yoshiaori; Kano, Kazuhiko; and Yamamoto, Toshimasa, 5,500,549, Cl. 257-415.000.
Shibuya, Kiyoshi: *See*—
Shiga, Nobuo; Marui, Tomohiro; Shibuya, Kiyoshi; Sato, Toru; Ozawa, Michiharu; and Yukumoto, Masao, 5,499,673, Cl. 164-463.000.
Shieh, Jin-Ren. Multistepped disk brake lock for motorcycle. 5,499,518, Cl. 70-233.000.
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Shikata, Shinichi: *See*—
Nishibayashi, Yoshiki; and Shikata, Shinichi, 5,500,077, Cl. 156-628.100.
Shim, Dae S.: *See*—
Baik, Bok H.; Hur, Jung H.; and Shim, Dae S., 5,500,741, Cl. 358-335.000.
Shimamoto, Satoshi: *See*—
Okumura, Toshiaki; Ekimoto, Takao; Shimamoto, Satoshi; Ogawa, Katsumi; Tomita, Masahiro; Nimura, Yoshitaka; and Kadowaki, Ryosaku, 5,500,170, Cl. 264-148.000.
Shimasaki, Yuichi: *See*—
Kato, Hiroaki; Shimasaki, Yuichi; Saito, Akihisa; Komatsuda, Takashi; Okutani, Toshikazu; Haccho, Seiji; Matsumoto, Seiji; Aoki, Takuya; and Miyashita, Yukio, 5,499,501, Cl. 60-286.000.
Shimizu, Hiroshi: *See*—
Iida, Takashi; Sumi, Satoru; Shimizu, Hiroshi; Tahara, Akinori; Amano, Isao; and Nakajima, Tetsuya, 5,500,542, Cl. 257-210.000.
Shimizu, Kaoru: *See*—
Uchiyama, Haruyoshi; Lee, Tekkee; Takeuchi, Nobunari; Shimizu, Kaoru; Horiguchi, Tsuneo; and Koyanada, Yahei, 5,500,762, Cl. 359-326.000.
Shimizu, Keazo: *See*—
Kigawa, Kazuya; Furukawa, Kenji; Deguchi, Tetsu; Inoue, Sachiharu; Endo, Norikatsu; Yanagisawa, Tatsuo; Ikegami, Shinji; Onogari, Yasuyuki; Kihara, Koji; Sugawara, Tachiki; and Shimizu, Keazo, 5,499,796, Cl. 254-133.00R.
Shimizu, Yoshitake: *See*—
Funato, Masatomi; Shimizu, Yoshitake; Ishimaru, Seijiro; and Nagao, Kazuya, 5,500,319, Cl. 430-106.600.
Shimomoto, Kenkichi, to Haneshiro, Kiyomi. Battery charging method and apparatus using initial charging step with gradually increasing charging current, quick charging step with large charging current and final charging step with decreasing charging current. 5,500,584, Cl. 320-20.000.
Shimura, Akihiro; Nagata, Satoshi; and Ueda, Shigeru. Printer apparatus for enlarging or reducing the size of characters. 5,500,922, Cl. 395-110.000.
Shin, Dong-Myeong: *See*—
Jeon, Dal-Young; Jee, Kyung-Ha; Choi, Nak-Choon; Song, Bok-Ki; and Shin, Dong-Myeong, 5,500,792, Cl. 363-98.000.
Shin-Etsu Chemical Co., Ltd.: *See*—
Ohba, Toshio; Sato, Naomi; Ogawa, Masahiko; and Nakazato, Moriso, 5,500,148, Cl. 252-315.200.
Shin-Etsu Handotai Co., Ltd.: *See*—
Yanagisawa, Munehisa; Tamura, Yuki; and Kokubu, Norihide, 5,500,390, Cl. 437-120.000.
Shin-Etsu Polymer Co., Ltd.: *See*—
Yamazaki, Kouichi; and Ogawa, Nobuyoshi, 5,500,280, Cl. 428-220.000.
Shinagawa, Hideo: *See*—
Saito, Atsushi; Shinagawa, Hideo; and Nakata, Atsuo, 5,500,355, Cl. 435-69.700.
Shinagawa, Robert T.; Jordan, Susan M.; and Blatt, Christopher S., to Athens Corporation. High efficiency chemical processing. 5,500,095, Cl. 203-2.000.
Shindengen Electric Manufacturing Co., Ltd.: *See*—
Kawaguchi, Kenji; and Miyaki, Yoshiyuki, 5,500,563, Cl. 310-71.000.
Shindo, Hitoshi: *See*—
Ichikawa, Takeshi; Shindo, Hitoshi; and Ohmi, Kazuaki, 5,500,102, Cl. 204-192.250.
Shiohara, Yukimitsu: *See*—
Udagawa, Satoru; Abe, Masaki; Ando, Satoru; Matsuki, Yasuhiro; Watanabe, Toyofumi; Shiohara, Yukimitsu; Morita, Masaya; and Kido, Akimasa, 5,500,290, Cl. 428-610.000.
Shiomi, Hiromu: *See*—
Nishibayashi, Yoshiki; Shiomi, Hiromu; and Fujimori, Naoji, 5,500,393, Cl. 437-175.000.
Shionogi & Co., Ltd.: *See*—
Nishimura, Shinji; Nishi, Hiroshi; and Nishimura, Masaji, 5,500,348, Cl. 435-7.240.
Shipley Company, L.L.C.: *See*—
Goldberg, Robert L., 5,500,106, Cl. 205-166.000.
Shiraishi, Yoji: *See*—
Kobayashi, Kei; and Shiraishi, Yoji, 5,500,326, Cl. 430-300.000.
Shirota, Koromo: *See*—
Koike, Shoji; Haruta, Masahiro; Shirota, Koromo; Yamamoto, Tomoya; and Suzuki, Mariko, 5,500,023, Cl. 8-499.000.
Shiseido Company Ltd.: *See*—
Miyazawa, Kiyoshi; Chiba, Tadahiro; Iwata, Yuhei; Tamura, Ubei; Murotani, Isao; and Tanaki, Shuya, 5,500,416, Cl. 514-23.000.
Ogawa, Katsuki; Kumagai, Shigesori; and Odagiri, Haruni, 5,500,533, Cl. 250-372.000.
Shoji, Norio: *See*—
Watanabe, Shinichi; Shoji, Norio; and Sako, Michiya, 5,500,774, Cl. 360-46.000.
Short, Michael K.; Grieser, Jerry D.; Nelson, Richard A.; Warner, Thomas B.; and Maguire, Ferrol M., to Sauder Woodworking Co. Coupling assembly for furniture components. 5,499,886, Cl. 403-381.000.
Shou, Guoliang; Yang, Weikang; Takatori, Sunao; and Yamamoto, Makoto, to Yozan Inc.; and Sharp Corporation. Filter device with memory test circuit. 5,500,810, Cl. 364-724.010.
Showa Aluminum Corporation: *See*—
Nakazawa, Yasushi; Touma, Kiyotaka; and Enomoto, Masatoshi, 5,499,801, Cl. 269-48.100.
Showalter, Dan J., to Borg-Warner Automotive, Inc. Dynamic range shift transfer case with electromagnetic clutch for coupling one output to the input for modulating torque split. 5,499,951, Cl. 475-204.000.
Shurflo Pump Manufacturing Co.: *See*—
Hartley, E. Dale; and Hartley, F. Scott, 5,500,113, Cl. 210-321.600.
Sieber, Bobby G. Method for setting a slotted face wellbore deviation assembly using a rectilinear setting tool. 5,499,682, Cl. 166-382.000.
Sieber, Tilo: *See*—
Kneba, Edmund; Sieber, Tilo; and Buthereit, Werner, 5,499,527, Cl. 73-4.00R.

Siemens Aktiengesellschaft: *See*—
Bayerle, Klaus; and Pfleger, Hartmut, 5,499,613, Cl. 123-520.000.
Gazsi, Lajos, 5,500,613, Cl. 327-107.000.
Guenther, Werner; Molitor, Dieter; and Werner, Leonhard, 5,500,884, Cl. 378-38.000.
Kuehn, Edmund; Sieber, Tilo; and Butkereit, Werner, 5,499,527, Cl. 73-4.00R.
Longueville, Jacques; and Vanbesien, Johan, 5,500,788, Cl. 361-800.000.
Melzner, Hanno, 5,500,384, Cl. 437-60.000.
Schmidt, Roland; Stroehlein, Hans; and Weller, Thomas, 5,500,885, Cl. 378-128.000.
Schmitz, Friedhelm; Czech, Norbert; and Deblon, Bruno, 5,499,905, Cl. 416-241.00R.
Tauber, Werner, 5,499,947, Cl. 454-69.000.
Wendt, Hermann; Willer, Josef; Reisinger, Hans; and Lehmann, Volker, 5,500,385, Cl. 437-60.000.
Wier, Manfred; Krebs, Stefan; Reupke, Wolfgang; and Angermaier, Anton, 5,499,536, Cl. 73-117.300.
Siemens Automotive Corporation: *See*—
Robertt, James T.; and Molitor, Mark R., 5,499,606, Cl. 123-90.120.
Siemens Electric Limited: *See*—
Buonio, Murray F.; Perry, Paul D.; and Cook, John E., 5,499,614, Cl. 123-520.000.
Siemens Elema AB: *See*—
Rosen, Jan, 5,499,974, Cl. 604-118.000.
Siemens Energy & Automation, Inc.: *See*—
Bellin, Michael A.; Laplace, Carl; Trainor, John J.; and Hoffmann, Mark, 5,500,806, Cl. 364-492.000.
Sierens, Christiaan H. J.; Steigenberger, Ulrich; Berger, Werner; Harnisch, Stephen; Van Der Pias, Gert; and Meatdeagh, Denis J. G., to Alcatel SEL Aktiengesellschaft. Compensation device. 5,500,755, Cl. 359-161.000.
Signal Processing Associates Pty Limited: *See*—
Pope, David J., 5,500,875, Cl. 375-261.000.
Signal Processors Limited: *See*—
Terrell, Peter M., 5,500,874, Cl. 375-232.000.
Silicon Storage Technology, Inc.: *See*—
Hsu, Juei-Chi; Jeng, Ching S.; and Wang, Ping, 5,500,826, Cl. 365-230.010.
Silicon Systems, Inc.: *See*—
Hershberger, Russell A., 5,500,894, Cl. 379-399.000.
Silvestrelli, Michel F. F.: *See*—
Brunier, Régis G.; Cotto, Dominique J.; Joly, Richard G. A.; Kerneis, Stéphane M.; and Silvestrelli, Michel F. F., 5,499,519, Cl. 72-53.000.
Simandl, Ronald F.; and Brown, John D., to United States of America, Energy. Ultra-low density microcellular polymer foam and method. 5,500,450, Cl. 521-64.000.
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DePreitas, Dennis M., 5,499,497, Cl. 60-39.060.
Simmons Company: *See*—
Dillon, Paul J., 5,499,414, Cl. 5-474.000.
Sims, Clinton N. Optical instruments such as retinoscopes which may incorporate multiple lens assemblies and methods of calibrating such instruments. 5,500,698, Cl. 351-218.000.
Singer Company N.V., The: *See*—
Kamewada, Makoto; and Kojima, Shinji, 5,499,590, Cl. 112-302.000.
Singer, Michael: *See*—
Austin, Peter W.; and Singer, Michael, 5,500,217, Cl. 424-401.000.
Singer, Paul H.: *See*—
Santos, Esteban; Pollman, John A.; and Singer, Paul H., 5,500,781, Cl. 361-96.000.
Sisicropi, John A.: *See*—
Detty, Michael R.; Sisicropi, John A.; Cowdery-Corvan, J. Robin; and Young, Ralph H., 5,500,317, Cl. 430-58.000.
Sites, Peter W.: *See*—
Ebel, James; Dolan, Mary L.; Edwards, Russell J.; and Sites, Peter W., 5,500,732, Cl. 356-124.000.
Skeie, Tom A., to Hewlett-Packard Company. Method for evaluating failure in an electronic data storage system and preemptive notification thereof, and system with component failure evaluation. 5,500,940, Cl. 395-183.010.
Skirchak, Jacqueline A.: *See*—
Skirchak, Samuel, Jr.; and Skirchak, Jacqueline A., 5,499,835, Cl. 280-293.000.
Skirchak, Samuel, Jr.; and Skirchak, Jacqueline A. Motorcycle stroller. 5,499,835, Cl. 280-293.000.
Sköldbäck, Jan-Åke: *See*—
Larsson, Krister; Mellbrand, Thomas; Mörnstam, Birgitta; Roschester, Jan; and Sköldbäck, Jan-Åke, 5,500,413, Cl. 514-15.000.
Skundberg, Thomas L.: *See*—
Evans, JuliAnn; Guado, Daniel P.; Harper, Jennifer S.; Mulenburg, Gerald M.; and Skundberg, Thomas L., 5,499,609, Cl. 119-61.000.
Slade, Louise: *See*—
Addesso, Kevin; Dzurenko, Theresa E.; Moisey, Mark J.; Levine, Harry; Slade, Louise; Manns, James M.; Fazzolare, Richard D.; Ievolella, James; and Wang, Martha Y., 5,500,240, Cl. 426-560.000.
Slezak, Michael: *See*—
Witter, Jay W.; and Slezak, Michael, 5,499,798, Cl. 266-275.000.
Slife, Charles W.: *See*—
Stoner, Karla L.; and Slife, Charles W., 5,500,210, Cl. 424-73.000.
Sloan, Harold D.: *See*—
Fruchtbaum, Joseph; McConathy, Dave P.; Quintana, Daniel J.; and Sloan, Harold D., 5,500,094, Cl. 202-241.000.
Slootsky, Simon: *See*—
Sorrell, Michael R.; Engdahl, Lawrence W.; and Slootsky, Simon, 5,499,856, Cl. 297-5.000.
Smayling, Michael C., to Texas Instruments Incorporated. Non-epitaxial CMOS structures and processors. 5,500,548, Cl. 257-371.000.
Smayling, Michael C.: *See*—
Reynolds, James; and Smayling, Michael C., 5,500,392, Cl. 437-151.000.
SMC Kabushiki Kaisha: *See*—
Nagai, Shigekazu; Saitoh, Akio; and Sugiyama, Toru, 5,499,547, Cl. 74-89.150.
Sneeal, Thomas W.; and Brownell, George L., to Aristech Chemical Corporation. Laminating resins having low organic emissions (II). 5,500,171, Cl. 264-309.000.
Smit, John; and Bingle, Wade H., to University of British Columbia, The. Bacterial surface protein expression. 5,500,353, Cl. 435-69.100.
Smith & Nephew Richards Inc.: *See*—
Dimarco, Donna M., 5,499,986, Cl. 606-104.000.
Hughes, Dean, 5,499,983, Cl. 606-61.000.
Smith & Nephew Rolyan, Inc.: *See*—
Becker, Danny L.; Bork, Kevin W.; and Krippendorf, Carl, 5,499,955, Cl. 482-51.000.
Smith, Charles P. Hardback books. 5,499,847, Cl. 281-37.000.
Smith, Derek: *See*—
Doddington, George D.; Pawate, Basavaraj; Mahant-Shetti, Shivaling; and Smith, Derek, 5,500,828, Cl. 365-230.030.
Smith, James W.; Ellenor, David T. R.; and Harbinson, John N., to Universtiy of Toronto Innovations Foundation, The; and Apollo Environmental Systems Corp. Method for effecting gas-liquid contact. 5,500,129, Cl. 210-703.000.
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Smith, Jeffrey L.: *See*—
Austin, Jon O.; Byrne, Jani G.; Bohn, Carole A.; Chiavegatto, Arlindo, Jr.; Smith, Jeffrey L.; and Zeisz, Raymond L., Jr., 5,500,934, Cl. 395-755.000.
Smith, John A. S.; and Shaw, Julian D., to British Technology Group Ltd. Methods and apparatus for detecting substances containing nuclei of a first and second kind. 5,500,591, Cl. 324-307.000.
Smith, Julius O., III, to Leland Stanford Junior University, The Board of Trustees of the. Physical model musical tone synthesis system employing filtered delay loop. 5,500,486, Cl. 84-622.000.
Smith, Raymond; and Roelen, Charles, to Tricor Seating, Inc. Collapsible child seat. 5,499,860, Cl. 297-255.000.
Smith, Robert E.: *See*—
Jendrisak, Jerome J.; Smith, Robert E.; and Dahl, Gary A., 5,500,370, Cl. 435-320.100.
Smith, Robert F., to Seagate Technology, Inc. Self-calibration for computer disk read/write offsets. 5,500,776, Cl. 360-77.040.
Smyth, Mark J.: *See*—
Sayers, Thomas; Smyth, Mark J.; Wiltrout, Theresa A.; Powers, James C.; Sowder, Raymond; and Henderson, Louis E., 5,500,344, Cl. 435-6.000.
Snap-on Incorporated: *See*—
Steiner, Anton J.; Landspurg, David A.; and Winquist, Robert A., 5,499,984, Cl. 606-80.000.
Snap Products, Inc.: *See*—
Hughett, Paul D.; and Johnsen, Montfort A., 5,500,456, Cl. 523-166.000.
Snell, Leonard S., to Rolls-Royce Limited. Nozzle capable of varying the direction of discharge of fluid therefrom. 5,499,765, Cl. 239-265.190.
Snodgrass, Charles K.; Allen, David H.; Tuttle, John R.; Rotzoll, Robert R.; and Pax, George E., to Micron Technology, Inc. Data communication method using identification protocol. 5,500,650, Cl. 342-42.000.
Snover, Jonathan L.: *See*—
Thompson, Mark E.; Snover, Jonathan L.; and Vermeulen, Lori A., 5,500,297, Cl. 428-411.100.
Snow, Brian D., to United States of America, Director, NSA. Secure voice conferencing apparatus. 5,500,899, Cl. 380-47.000.
Snyder, Adrian C.: *See*—
Halm, Walter B.; Jones, William J., Jr.; Kirkbride, James F.; Marcus, Ilan; and Snyder, Adrian C., 5,500,295, Cl. 428-357.000.
Societe anonyme dite: Laboratoires d'Hygiene Societe anonyme dite: et de Dietetique (L.H.D.): *See*—
Teilland, Eric; Bevan, Bruno; Mikler, Claude; Reilly, Paul; and Millot, Philippe, 5,499,967, Cl. 604-20.000.
Societe Industrielle et Commerciale de Materiel Aeronautique: *See*—
Marechal, Robert R., 5,499,783, Cl. 244-122.00R.
Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See*—
Ambrogi, Christine J. M.; Ansart, Denis R. H.; Lancelot, Eric J. S.; and Meunier, Serge M., 5,499,499, Cl. 60-39.320.
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Brunier, Régis G.; Cotto, Dominique J.; Joly, Richard G. A.; Kerneis, Stéphane M.; and Silvestrelli, Michel F. F., 5,499,519, Cl. 72-53.000.
Gallo, Claude; and LeClercq, Guy E. O., 5,499,651, Cl. 137-334.000.
SOCITEC - Societe pour le Commerce International et les Echanges Techniques: *See*—
Hay, Jean-Yves, 5,499,790, Cl. 248-570.000.
Sodick Co., Ltd.: *See*—
Fujita, Shinji, 5,499,915, Cl. 425-557.000.
Soe, Gilbu; Kohno, Isao; and Tanaka, Michiyo, to Istron Laboratories, Inc. Hybridomas producing monoclonal antibodies specific for C-reactive protein and methods for detection of C-reactive protein. 5,500,345, Cl. 435-7.100.
Soga, Mamoru: *See*—
Ogawa, Kazufumi; Mino, Norihisa; and Soga, Mamoru, 5,500,250, Cl. 427-299.000.
Sohn, Daniel D.: *See*—
Larsson, Lars-Gunnar; Reayl, Lucy A.; Ross, Svante B.; Sohn, Daniel D.; and Thorberg, Seth-Olov, 5,500,425, Cl. 514-233.500.
Solar Wide Industries, Ltd.: *See*—
Shalvi, Ram; and Kleinsu, Christopher A. W., 5,500,526, Cl. 250-222.100.
Soll, Richard M.; Dollings, Paul J.; and Kinney, William A., to American Home Products Corporation. Cyclobut-3-ene-1,2-dione derivatives as smooth muscle relaxants. 5,500,442, Cl. 514-414.000.
Solvay (Société Anonyme): *See*—
Germain, Albert; Pirard, Jean-Paul; Delattre, Véronique; Van Weynbergh, Jacques; and Vogels, Claude, 5,500,202, Cl. 423-584.000.
Solvay Enzymes, Inc.: *See*—
Boyer, Ernest W.; and Charles, Robert L., 5,500,359, Cl. 435-171.000.
Someya, Kousuke; Yamazaki, Akihiro; Hoshino, Futoshi; and Yanagihara, Takeshi, to Mitsui Toatsu Chemicals, Incorporated. Multi-shell emulsion particle. 5,500,286, Cl. 428-402.240.
Sommerer, Karl: *See*—
Wahl, George; Dietz, Matthias; Schote, Norbert; Klosterhuber, Robert; Sommerer, Karl; Kunert, Reinhard; and Gerber, Fritz, 5,499,839, Cl. 280-701.000.
Sone, Takurou, to Yamaha Corporation. Karaoke apparatus with visual assistance in physical vocalism. 5,499,921, Cl. 434-307.00A.
Song, Bok-Ki: *See*—
Jeon, Dal-Young; Jee, Kyung-Ha; Choi, Nak-Choon; Song, Bok-Ki; and Shin, Dong-Myeong, 5,500,792, Cl. 363-98.000.
Song, Sang-won; and Kim, Chan-sik, to Samsung Electronics Co., Ltd. Circuit for adding multiple-bit binary numbers. 5,500,813, Cl. 364-787.000.
Sonnenschein, Russell, to Taligent, Inc. System for applying font style changes to multi-script text. 5,500,931, Cl. 395-144.000.
Sonntag, Eberhard: *See*—
Poggenburg, Rüdiger; Grossardt, Bernd; and Sonntag, Eberhard, 5,499,867, Cl. 303-159.000.
Sony Corporation: *See*—
Kimura, Akira; Watanabe, Tadashi; Inoue, Tsuyoshi; and Nakamachi, Keiichi, 5,499,545, Cl. 73-864.180.
Konno, Toshikazu, 5,499,714, Cl. 206-387.130.
Martin, Jeffrey A.; and Ido, Toshikazu, 5,500,691, Cl. 348-734.000.
Onosaka, Kazunobu, 5,500,893, Cl. 379-396.000.
Onozuka, Kunihara, 5,500,692, Cl. 348-759.000.
Tomiyama, Takamichi, 5,500,771, Cl. 359-813.000.
Watanabe, Shinichi; Shoji, Norio; and Sako, Michiya, 5,500,774, Cl. 360-46.000.
Yamazaki, Shigeki; Kato, Kazuhiro; Ishii, Takayuki; and Sakai, Hisao, 5,499,753, Cl. 226-194.000.
Yoshihara, Ikuo, 5,500,378, Cl. 437-31.000.
Sony Electronics, Inc.: *See*—
Martin, Jeffrey A.; and Ido, Toshikazu, 5,500,691, Cl. 348-734.000.
Sorrell Medical, Incorporated: *See*—
Sorrell, Michael R.; Engdahl, Lawrence W.; and Slootsky, Simon, 5,499,856, Cl. 297-5.000.
Sorrell, Michael R.; Engdahl, Lawrence W.; and Slootsky, Simon, to Sorrell Medical, Incorporated. Foldable front-entry walker having resistance to backward motion. 5,499,856, Cl. 297-5.000.
Southern California Edison: *See*—
Cutler, Frances M.; and Covey, Joseph, 5,500,185, Cl. 422-16.000.
Southwest Research Institute: *See*—
Thring, Robert H., 5,499,605, Cl. 123-70.00R.
Sowder, Raymond: *See*—
Sayers, Thomas; Smyth, Mark J.; Wiltrout, Theresa A.; Powers, James C.; Sowder, Raymond; and Henderson, Louis E., 5,500,344, Cl. 435-6.000.
Sowinski, Allan F.: *See*—
Szajewski, Richard P.; and Sowinski, Allan F., 5,500,330, Cl. 430-393.000.
Spangler, Lori A.: *See*—
Rosen, Robert E.; Weaver, Damian G.; Cornille, Jane W.; and Spangler, Lori A., 5,500,405, Cl. 504-195.000.
Spanner, Erwin, to Dr. Johannes Heidenhain GmbH. Photoelectric position measuring system with integral optical circuit having phase shifted interference gratings. 5,500,734, Cl. 356-356.000.
SPAR Aerospace Limited: *See*—
Gregoris, Dennis J., 5,500,530, Cl. 250-339.110.
Sparks, Charles: *See*—
Odru, Pierre; Sparks, Charles; Auberon, Marcel; and Behar, Jacques, 5,499,661, Cl. 138-124.000.
Spears, Patricia A., to Becton, Dickinson and Company. Species-specific detection of *Mycobacterium kansasii*. *5,500,341, Cl. 435-6.000.*
Splane, Robeon L., Jr.: *See*—
Habing, Theodore G.; and Splane, Robeon L., Jr., 5,499,956, Cl. 482-52.000.
Spooner, David L.: *See*—
King, James G.; Mackara, Steven R.; Mickish, Daniel J.; and Spooner, David L., 5,500,310, Cl. 430-1.000.
King, James G.; MacKara, Steven R.; Mickish, Daniel J.; and Spooner, David L., 5,500,311, Cl. 430-1.000.
King, James G.; Mackara, Steven R.; Mickish, Daniel J.; and Spooner, David L., 5,500,313, Cl. 430-11.000.
Spörl, Georg: *See*—
Jagiella, Manfred; Wiesemann, Wolf; Schubert, Peter; Holzmann, Michael; and Spörl, Georg, 5,500,504, Cl. 219-121.670.
Sportsman, J. Richard: *See*—
Bright, Stuart W.; Dantzig, Anne H.; Tabas, Linda B.; and Sportsman, J. Richard, 5,500,346, Cl. 435-7.210.
Spotorno, Lorenzo; Fick, Willi; and Willi, Roland, to Protek AG; and Sulzer Medizinaltechnik AG. Sealing element in the form of a strap. 5,500,018, Cl. 623-11.000.
Spurgeon, Kathryn M.: *See*—
Holmes, Gary L.; Caller, Scott R.; Hardy, David H.; Hendrickson, William A.; Khan, Thomas P.; Harmon, Kimberly K.; Hiciti, Robert V.; Spurgeon, Kathryn M.; and Studiner, Charles J., III, 5,500,273, Cl. 428-147.000.
Square D Company: *See*—
Edwards, Stanley H., Jr.; Marshall, Richard; and Robbins, Tony R., 5,500,630, Cl. 335-132.000.
Venzke, Donald R.; Hood, Teresa I.; and Emerick, W. Russell, 5,500,496, Cl. 200-339.000.
Srinivasan, Ramesh; Bottomley, James; and Coslett, W. Andrew, to International Paper Company. Absorbent, flushable, bio-degradable, medically-safe nonwoven fabric with PVA binding fibers, and process for making the same. 5,500,068, Cl. 156-148.000.
Srinivasan, Ramesh; Bottomley, James; and Coslett, W. Andrew, to International Paper Company. Absorbent, flushable, bio-degradable, medically-safe nonwoven fabric with PVA binding fibers, and process for making the same. 5,500,281, Cl. 428-288.000.
Srivastava, Vipul J., to Institute of Gas Technology. Two-phase anaerobic digestion of carbonaceous organic materials. 5,500,123, Cl. 210-603.000.
SS Pharmaceutical Co., Ltd.: *See*—
Murata, Masami; Kishi, Harumi; Narui, Takashi; Kasai, Shuichi; and Iwasa, Akira, 5,500,221, Cl. 424-436.000.
Staar Surgical Company: *See*—
Feingold, Vladimir, 5,499,987, Cl. 606-107.000.
Stack, Jared D.: *See*—
Boudreau, Robert A.; Bowen, Terry P.; Han, Hongtao; Rowlette, John R., Sr.; and Stack, Jared D., 5,500,910, Cl. 385-24.000.
Stagni, Maria, Silvia Zucchini, Chiara Zucchini, heiresses: *See*—
Cuffiani, Illaro; Zucchini, Umberto, deceased, 5,500,397, Cl. 502-102.000.
StairMaster Sports/Medical Products, Inc.: *See*—
Holmes, Fred H.; Rawls, Robert L.; and Duncan, James A., 5,499,959, Cl. 482-95.000.
Staka, Robert L.; and Bokariza, Steven P. Cam arm apparatus for training and monitoring devices. 5,499,812, Cl. 273-26.00E.
Standard Microsystems Corp.: *See*—
Burstein, Steven, 5,500,610, Cl. 326-85.000.
Stange, Gerd, to Nu-Tech GmbH. Method and apparatus for the measurement of the dielectric constant of sample materials. 5,500,599, Cl. 324-634.000.
Stanley Electric Co., Ltd.: *See*—
Okuno, Yasuo; Tomita, Shotaro; and Kato, Hiroyuki, 5,499,600, Cl. 117-68.000.
Stark, Heinz: *See*—
König, Heribert; and Stark, Heinz, 5,500,870, Cl. 373-78.000.
State of Israel, Ministry of Defence, Rafael-Armaments Development Authority: *See*—
Saban, Izhak, 5,500,525, Cl. 250-221.000.
Stauffer, Daniel C.: *See*—
Liedermooy, Ingrid; Birch, Julie; Stauffer, Daniel C.; and Puletti, Paul P., 5,500,472, Cl. 524-272.000.
Stayer, Mark L., Jr.: *See*—
Lawson, David F.; Antkowiak, Thomas A.; Hall, James E.; and Stayer, Mark L., Jr., 5,500,447, Cl. 524-571.000.
St. Clair, David J., to Shell Oil Company. Epoxidized polydiene block polymer with epoxy resins. 5,499,409, Cl. 525-92.00H.
St. Clair, David J., to Shell Oil Company. Compositions containing epoxidized monohydroxylated diene polymers, amino resins, and reactive reinforcement agents. 5,500,481, Cl. 525-92.00K.
Steelcase, Inc.: *See*—
Angell, Robert C., 5,499,859, Cl. 297-218.300.
Stefanile, Joseph P.: *See*—
Weiler, Edward B.; Jones, Jay A.; Stefanile, Joseph P.; and Miles, Steven G., 5,499,457, Cl. 33-512.000.
Steffi, Christoph: *See*—
Brugger, Manfred F.; Klarer, Martin; Knoff, Bernd; Eckl, Albrecht; Steiner, Manfred; Rump, Siegfried; Nell, Joachim; Eckstein, Fredy; Steffi, Christoph; and Douglas, Brian, 5,499,866, Cl. 303-122.080.

Steffler, Larry W.: *See*—
Bliem, Paul E.; and Steffler, Larry W., 5,500,212, Cl. 424-78.120.

Steigenberger, Ulrich: *See*—
Siereas, Christiaan H. J.; Steigenberger, Ulrich; Berger, Werner; Harnisch, Stephen; Van Der Plas, Gert; and Mestdeagh, Denis J. G., 5,500,755, Cl. 359-161.000.

Steigerwald, Todd W.: *See*—
Miller, Kevin L.; McMahan, Robert L.; and Steigerwald, Todd W., 5,500,789, Cl. 361-816.000.

Steiner, Anton J.; Landspurg, David A.; and Winquist, Robert A., to Snap-on Incorporated. Universal modular reasner system. 5,499,984, Cl. 606-80.000.

Steiner, Manfred: *See*—
Brugger, Manfred F.; Klarer, Martin; Knoff, Bernd; Eckl, Albrecht; Steiner, Manfred; Rump, Siegfried; Nell, Joachim; Eckstein, Fredy; Steffl, Christoph; and Douglas, Brian, 5,499,866, Cl. 303-122.080.

Steinicke, Wolfgang: *See*—
Schiesal, Alois; Steinicke, Wolfgang; Trede, Wolfgang; and Krone, Hartmut, 5,499,582, Cl. 102-334.000.

Stejskal, Elizabeth A.: *See*—
Buscemi, Paul J.; Stejskal, Elizabeth A.; Palme, Donald F., II; and Wang, Lixiao, 5,500,013, Cl. 623-1.000.

Stemerick, David M.: *See*—
Dinerstein, Robert J.; Edwards, Michael L.; Stemerick, David M.; and Diekema, Keith A., 5,500,429, Cl. 514-277.000.

Stenmans, Heinz, to Palitex Project-Company GmbH. Method and device for manufacturing a twisted yarn. 5,499,496, Cl. 57-406.000.

Steuzel, Klaus: *See*—
Hain, Rüdiger; Reif, Hans-Jörg; and Steuzel, Klaus, 5,500,367, Cl. 435-252.300.

Stephenson, Stanley W., III, to Eastman Kodak Company. Apparatus and method for securing a thrust film cartridge. 5,500,705, Cl. 354-288.000.

Steuer, Robert R.; and Harris, David H., to In-Line Diagnostics Corporation. System for noninvasive hematocrit monitoring. 5,499,627, Cl. 128-633.000.

Steury, Rudy, to Compu-Shop, Inc. Automated merchandising kiosk. 5,499,707, Cl. 194-217.000.

Stevens, John L.; and Strassner, Dale A. Cathode for high intensity discharge lamp. 5,499,937, Cl. 445-49.000.

Stevens, Nancy S.: *See*—
Baker, Mark C.; Hagerman, William E.; Penrod, Jack R.; and Stevens, Nancy S., 5,500,889, Cl. 379-67.000.

Stewart & Stevenson Power, Inc.: *See*—
Dora, Russell J., 5,499,694, Cl. 187-200.000.

Stober, Michael E.: *See*—
Bhatia, Chandrakant R.; Kuhns, Richard J.; Vannice, Steven D.; and Stober, Michael E., 5,499,718, Cl. 209-524.000.

Stöckert Instrumente GmbH: *See*—
Knott, Erwin; and Friedmann, Günter, 5,499,907, Cl. 417-360.000.

Stockham, Thomas G., Jr.; and Chabries, Douglas M. Hearing aid device incorporating signal processing techniques. 5,500,902, Cl. 381-68.400.

Stone, Ralph: *See*—
Mowrey-McKee, Mary; Blizniik, Kenneth; and Stone, Ralph, 5,500,186, Cl. 422-28.000.

Stonecypher, Bob. Blind spot side mirror. 5,500,766, Cl. 359-605.000.

Stoner, Karla L.; and Slife, Charles W., to Gillette Company, The. Combined two-part reducing agent/humectant shaving system for improved shaving comfort. 5,500,210, Cl. 424-73.000.

StorgÅrd, Christer. Relining pipe having pipe elements interconnected by pipe couplings. 5,499,660, Cl. 138-98.000.

Storz, Dieter: *See*—
Kühn, Hans-Robert; Storz, Dieter; Läufer, Engelbert; Hoch, Peter; and Püldner, Friedrich, 5,500,845, Cl. 369-112.000.

Stotelmyer, L. Scott; and Fulkerson, Don K., to Hughes Aircraft Company. Integrated storage and transfer system and method for spacecraft propulsion systems. 5,499,656, Cl. 137-583.000.

Stoychoff, Terry A., to Iowa Mold Tooling Company, Inc. Hydraulic swing circuit. 5,499,503, Cl. 60-469.000.

Strandberg, Hans; and Hoegnelid, Kurt, to Pacesetter AB. Activity responsive heart stimulator dependent on return blood flow to the heart. 5,500,005, Cl. 607-17.000.

Strassner, Dale A.: *See*—
Stevens, John L.; and Strassner, Dale A., 5,499,937, Cl. 445-49.000.

Stratton, Kenneth L., to Caterpillar Inc. Geographic surface altering implement control system. 5,499,684, Cl. 172-4.500.

Strazar, Andrew A. Hose clamp with supplemental holding fingers. 5,499,430, Cl. 24-279.000.

Strehler, Klaus: *See*—
Baechler, François; Strehler, Klaus; Harzenmoser, Isidor; and Zehr, Jürg, 5,499,546, Cl. 73-865.000.

Streib, Martin: *See*—
Huber, Werner; and Streib, Martin, 5,499,952, Cl. 477-115.000.

Streng, Michael: *See*—
Schnaus, Walter; Streng, Michael; Schoenmeier, Franz; and Biller, Stephan, 5,499,652, Cl. 137-340.000.

Stroehlein, Hans: *See*—
Schmidt, Roland; Stroehlein, Hans; and Weller, Thomas, 5,500,885, Cl. 378-128.000.

Strolle, Christopher H.; Patel, Chandrakant B.; Wedam, Werner F.; Schnitzler, Raymond; Weckenbrock, Hermann J.; Ko, Jung W.; Yun, Jong K.; and Limberg, Allen L., to SamSung Electronics Co., Ltd. Frequency-multiplexing FM luma signal with color and 2nd under signals having overlapping frequency spectra. 5,500,739, Cl. 358-310.000.

Stroppolo, Federico; Bonadeo, Daniele; Fornasini, Gian F.; and Gazzaniga, Annibale, to Zambon Group S.p.A. Pharmaceutical composition having analgesic activity. 5,500,226, Cl. 424-466.000.

Stuch, Donald: *See*—
Voadell, Edward P.; Mobley, Juliana; Nunez, Jospeh M.; Maas, Charles A.; Stuch, Donald; and Yu, Jinquan, 5,499,530, Cl. 73-49.700.

Studiner, Charles J., III: *See*—
Holmes, Gary L.; Culler, Scott R.; Hardy, David H.; Hendrickson, William A.; Klus, Thomas P.; Harmon, Kimberly K.; Heiti, Robert V.; Spurgeon, Kathryn M.; and Studiner, Charles J., III, 5,500,273, Cl. 428-147.000.

Su, Kai C.: *See*—
Hung, William M.; and Su, Kai C., 5,500,024, Cl. 8-509.000.

Su, Kuo-Jaan: *See*—
Cheng, Kuang-Chung; Tsai, Meng-Jin; Kuo, Ta-Chi; and Su, Kuo-Jaan, 5,500,545, Cl. 257-341.000.

Suarez, Roderick A.: *See*—
Adams, Harold P.; Suarez, Roderick A.; and Engle, Lewis H., 5,499,476, Cl. 52-220.100.

Suda, Kenneth J.: *See*—
Lawrence, Keith E.; Suda, Kenneth J.; and Hays, William J., 5,499,615, Cl. 123-526.000.

Sudhakar, Chakka; Sandford, Gerald G.; and Dolfinger, Frank, Jr., to Texaco Inc. Method for selective hydrodealkogenation of raw oils. 5,500,401, Cl. 502-316.000.

Süess, Philipp, to Sulzer Chemtech AG. Vortex packing for mass exchange columns and static mixers. 5,500,160, Cl. 261-79.200.

Suga, Atsuo: *See*—
Fujita, Kouji; Higuchi, Shigeamitsu; Aizawa, Toshiro; Suga, Atsuo; and Kosuge, Minoru, 5,500,775, Cl. 360-70.000.

Sugahara, Hirohide: *See*—
Maeda, Ikuo; and Sugahara, Hirohide, 5,500,945, Cl. 395-185.090.

Sugawara, Tachiki: *See*—
Kigawa, Kazuya; Furukawa, Kenji; Deguchi, Tetsu; Inoue, Sachiharu; Endo, Norikatsu; Yanagisawa, Tatsuo; Ikegami, Shinji; Omagari, Yasuyuki; Kihara, Koji; Sugawara, Tachiki; and Shimizu, Kenzo, 5,499,796, Cl. 254-133.00R.

Sugawara, Tatsuo: *See*—
Yauchi, Hitoshi; Sugiyama, Koichi; Miyashita, Akihiko; Satoh, Nakatoshi; Sugawara, Tatsuo; Sato, Hiroyuki; and Onozato, Takashi, 5,500,657, Cl. 347-9.000.

Suggs, Steven M.; and Meyer, Reid M., to Thermal Dynamics International, Inc. Seal for shafts and valve stems. 5,499,827, Cl. 277-229.000.

Sugimoto, Hitoshi: *See*—
Matsubara, Miyuki; Hirabayashi, Hironitsu; Nagoshi, Shigeyasu; Koitabashi, Noribumi; Sagimoto, Hitoshi; Gotoh, Fumihiro; and Uetuki, Masaya, 5,500,661, Cl. 347-41.000.

Sugitani, Hiroshi: *See*—
Hattori, Yoshifumi; Karita, Seiichiro; Saikawa, Hideo; Kashino, Toshio; Saito, Akio; Nakagomi, Hiroshi; Arashima, Teruo; Kimura, Makiko; Sugitani, Hiroshi; Ikeda, Masami; Saito, Asao; Masuda, Kazuaki; and Orikasa, Tsuyoshi, 5,500,666, Cl. 347-87.000.

Sugiura, Masami: *See*—
Nakane, Hideki; Nishii, Yasuhiro; and Sugiura, Masami, 5,499,863, Cl. 297-452.200.

Sugiyama, Koichi: *See*—
Yauchi, Hitoshi; Sugiyama, Koichi; Miyashita, Akihiko; Satoh, Nakatoshi; Sugawara, Tatsuo; Sato, Hiroyuki; and Onozato, Takashi, 5,500,657, Cl. 347-9.000.

Sugiyama, Toru: *See*—
Nagai, Shigekazu; Saitoh, Akio; and Sugiyama, Toru, 5,499,547, Cl. 74-89.150.

Sugizaki, Fumitaka: *See*—
Endo, Shigeru; and Sugizaki, Fumitaka, 5,499,566, Cl. 83-636.000.

Sulzer Chemtech AG: *See*—
Süess, Philipp, 5,500,160, Cl. 261-79.200.

Sulzer Medizinaltechnik AG: *See*—
Spotorno, Lorenzo; Fick, Willi; and Willi, Roland, 5,500,018, Cl. 623-11.000.

Sulzer Rueti AG: *See*—
Vogel, Rudolf; and Evrea, Hitasti, 5,499,662, Cl. 139-26.000.

Sumcad, Gustavo L., to Honeywell Inc. Method for calibrating a sensor by moving a magnet while monitoring an output signal from a magnetically sensitive component. 5,500,589, Cl. 324-202.000.

Sumi, Satoru: *See*—
Iida, Takashi; Sumi, Satoru; Shimizu, Hiroshi; Tahara, Akinori; Amano, Isao; and Nakajima, Tetsuya, 5,500,542, Cl. 257-210.000.

Sumitomo Electric Industries, Ltd.: *See*—
Imai, Takahiro; Tsuno, Takashi; Yamamoto, Yoshiyuki; and Fujimori, Naoji, 5,499,601, Cl. 117-84.000.
Nishibayashi, Yoshiki; and Shikata, Shinichi, 5,500,077, Cl. 156-628.100.
Nishibayashi, Yoshiki; Shiomi, Hiromu; and Fujimori, Naoji, 5,500,393, Cl. 437-175.000.
Sano, Hiroaki; Taguchi, Kinji; Noguchi, Akiyoshi; and Tanaka, Shigeru, 5,499,797, Cl. 254-134.400.



Sumitomo Rubber Industries, Ltd.: *See*—
Suzuki, Kazuya, 5,500,074, Cl. 156-406.200.

Sumitomo Wiring Systems, Ltd.: *See*—
Fukui, Takaaki, 5,499,823, Cl. 277-1.000.
Onishi, Yasuhiko; Yamamori, Takashi; Yamashita, Youzou; Suzuki, Ichiro; and Aoyama, Toshiya, 5,500,179, Cl. 264-400.000.

Summers, Gregory E. Center nock for archery bow string. 5,499,620, Cl. 124-91.000.

Sun Microsystems, Inc.: *See*—
Chang, Shuen C.; Ho, Hai D.; and Sun, Szu C., 5,500,818, Cl. 365-189.050.

Sun, Szu C.: *See*—
Chang, Shuen C.; Ho, Hai D.; and Sun, Szu C., 5,500,818, Cl. 365-189.050.

Sundquist, Arman E.: *See*—
Geraci, Michael P.; Hagen, Donald R.; and Sundquist, Arman E., 5,500,901, Cl. 381-68.200.

Sundstrand Corporation: *See*—
McArthur, Malcolm J.; and Jansen, Harvey, 5,499,650, Cl. 137-85.000.

Surash, Robert G.; and Lewis, Craig C., to Eastman Kodak Company. Recovery of photographic film base. 5,500,328, Cl. 430-347.000.

Surjaatmadja, Jim B.; Helton, Timothy W.; and Abass, Hazim H., to Halliburton Company. Coplanar angular jetting head for well perforating. 5,499,678, Cl. 166-298.000.

Susumu Co., Ltd.: *See*—
Nakamura, Nakaba; and Kosaki, Makoto, 5,499,442, Cl. 29-600.000.

Sutherland, Joseph E., to Alcatel Network Systems, Inc. Method and system for connecting an optical network unit with a plurality of user sites. 5,500,753, Cl. 359-125.000.

Sutula, Daniel P., Jr., to Ensign-Bickford Company, The. Molded article having integral displaceable member or members and method of use. 5,499,581, Cl. 102-275.120.

Suzuki, Etsurou; Hattori, Yoshifumi; Kitani, Masashi; Saikawa, Hideo; Kojima, Masami; Kawano, Kenji; Tanno, Koichi; and Aono, Kenji, to Canon Kabushiki Kaisha. Ink jet recording apparatus and detachably mountable ink jet cartridge. 5,500,664, Cl. 347-86.000.

Suzuki, Hideaki: *See*—
Makino, Kenzi; Akiyama, Shigeaki; Suzuki, Hideaki; Nagaoka, Takeshi; Niki, Toshio; Suzuki, Koichi; Nawamaki, Tsutomu; Watanabe, Shigeomi; and Ishikawa, Kimihiro, 5,500,406, Cl. 504-215.000.

Suzuki, Hiroshi, to Kabushiki Kaisha Inoac Corporation. Partial pad foam molding method. 5,500,168, Cl. 264-46.500.

Suzuki, Ichiro: *See*—
Onishi, Yasuhiko; Yamamori, Takashi; Yamashita, Youzou; Suzuki, Ichiro; and Aoyama, Toshiya, 5,500,179, Cl. 264-400.000.

Suzuki, Kazuhiko: *See*—
Katagiri, Masayoshi; Suzuki, Kazuhiko; and Takeuchi, Mitsunari, 5,499,865, Cl. 303-115.200.

Suzuki, Kazuhiro: *See*—
Kunitake, Setsu; Kamizawa, Koh; Koshi, Yutaka; and Suzuki, Kazuhiro, 5,500,907, Cl. 382-240.000.

Suzuki, Kazutaka: *See*—
Yamashita, Akio; Suzuki, Kazutaka; Amano, Toshiaki; and Hatakeyama, Kazuhiko, 5,500,669, Cl. 347-214.000.

Suzuki, Kazuya, to Sumitomo Rubber Industries, Ltd. Tread ring transferring apparatus for use in a green tire building system. 5,500,074, Cl. 156-406.200.

Suzuki, Koichi: *See*—
Makino, Kenzi; Akiyama, Shigeaki; Suzuki, Hideaki; Nagaoka, Takeshi; Niki, Toshio; Suzuki, Koichi; Nawamaki, Tsutomu; Watanabe, Shigeomi; and Ishikawa, Kimihiro, 5,500,406, Cl. 504-215.000.

Suzuki, Mariko: *See*—
Koike, Shoji; Haruta, Masahiro; Shirota, Koromo; Yamamoto, Tomoya; and Suzuki, Mariko, 5,500,023, Cl. 8-499.000.

Suzuki, Masanori: *See*—
Takemoto, Takatoshi; Chida, Toshikazu; Kano, Noriaki; Ito, Eiji; Murakami, Koji; Itagaki, Takashi; Sekimoto, Koji; and Suzuki, Masanori, 5,499,809, Cl. 271-274.000.

Suzuki, Naoshi, to NEC Corporation. Optical sensor arrangement for tracking a star, with dark current pixel by pixel sensor compensation. 5,500,521, Cl. 250-208.100.

Suzuki, Nobuyuki: *See*—
Sakaegi, Yuji; Suzuki, Nobuyuki; and Sato, Yoshinobu, 5,500,743, Cl. 358-403.000.

Suzuki, Shinji: *See*—
Kobayashi, Kinzo; and Suzuki, Shinji, 5,499,696, Cl. 188-1.110.

Suzuki, Tetsushi: *See*—
Ito, Eiji; Suzuki, Tetsushi; Ito, Kaoru; and Kawakubo, Hiroyuki, 5,499,604, Cl. 123-41.860.

Suzuki, Tsuneo: *See*—
Terada, Yasuharu; Suzuki, Tsuneo; Matsushima, Hideyuki; and Horita, Yoshiyuki, 5,499,432, Cl. 24-599.200.

Sverlow, Genadie G.: *See*—
Kumagai, Monto H.; and Sverlow, Genadie G., 5,500,483, Cl. 536-24.100.

Swagelok Quick-Connect Co.: *See*—
Zaborszki, Stephen J.; and Kreczko, Gregory, 5,499,439, Cl. 29-508.000.

Swarbrick, David B.; and Pike, Jack H., to Hughes Aircraft Company. Radial tensioning lamination fixture for membrane test probe. 5,500,604, Cl. 324-754.000.

Swedberg, Sally: *See*—
Kaltenbach, Patrick; Mittelstadt, Laurie; and Swedberg, Sally, 5,500,071, Cl. 156-272.800.

Sweger, Robert W.: *See*—
Bernard, Karen A.; Tsai, John; Billmers, Robert L.; and Sweger, Robert W., 5,500,087, Cl. 162-164.600.

Swirbun, Stan E.: *See*—
Jewell, Jack L.; Quinn, William E.; Swirbun, Stan E.; and Bryan, Robert P., 5,500,540, Cl. 257-82.000.

Synergistic Composite Systems Inc.: *See*—
Livesay, Mark; and Gallup, William, 5,500,164, Cl. 264-459.000.

Synopsys, Inc.: *See*—
Wang, Albert R., 5,500,808, Cl. 364-578.000.

Szajewski, Richard P.; and Sowinski, Allen F., to Eastman Kodak Company. Photographic material and process comprising a thiol beach assist in the low sensitivity layer of a triple-coat. 5,500,330, Cl. 430-393.000.

T.I.F. Co., Ltd.: *See*—
Ikeda, Takeshi; Nakanishi, Tsutomu; and Okamoto, Akira, 5,500,552, Cl. 257-531.000.

Ta, Luong N.; Pesar, Robert J.; and Wafler, Walter F., to Xerox Corporation. Print job handling menu selection apparatus and method. 5,500,715, Cl. 355-204.000.

Tabas, Linda B.: *See*—
Bright, Stuart W.; Dantzig, Anne H.; Tabas, Linda B.; and Sportsman, J. Richard, 5,500,346, Cl. 435-7.210.

Taguchi, Kinji: *See*—
Sano, Hiroaki; Taguchi, Kinji; Noguchi, Akiyoshi; and Tanaka, Shigeru, 5,499,797, Cl. 254-134.400.

Tahara, Akinori: *See*—
Iida, Takashi; Sumi, Satoru; Shimizu, Hiroshi; Tahara, Akinori; Amano, Isao; and Nakajima, Tetsuya, 5,500,542, Cl. 257-210.000.

Taira, Kazunari; Nishikawa, Satoshi; and Maeda, Hidekatsu, to Agency of Industrial Science & Techology, Ministry of International Trade & Industry. RNA transcription system using novel ribozyme. 5,500,357, Cl. 435-91.310.

Takada, Kazunori: *See*—
Minami, Tsutomu; Tatsumisago, Masahiro; Takada, Kazunori; and Kondo, Shigeo, 5,500,291, Cl. 429-206.000.

Takahashi, Hironori; Aoshima, Shinichiro; and Hirano, Isuke, to Hamamatsu Photonics K.K. E-O probe. 5,500,587, Cl. 324-96.000.

Takahashi, Kazuhiro: *See*—
Kitamura, Naomi; Miyazawa, Keiji; Daikuhara, Yasushi; Tsubouchi, Hirohito; Naka, Daiji; Takahashi, Kazuhiro; Matsui, Rie; Yoshiyama, Yoshiko; and Ishii, Takehisa, 5,500,354, Cl. 435-69.400.

Takahashi, Kunihiro: *See*—
Iishiba, Fumio; Ishida, Shinji; Ikeda, Masatoshi; and Takahashi, Kunihiro, 5,500,745, Cl. 358-461.000.

Takahashi, Shuji: *See*—
Uemichi, Sachio; and Takahashi, Shuji, 5,500,177, Cl. 264-277.000.

Takahashi, Yoshinori: *See*—
Saito, Yoshiaki; Inomata, Koichiro; Okuno, Shibo; and Takahashi, Yoshinori, 5,500,633, Cl. 338-32.00R.

Takao, Hideaki; Murata, Tatsuo; Kanbe, Junichiro; Tamura, Miki; Kamio, Masaru; Sekimura, Nobuyuki; and Kikuchi, Yoshiki, to Canon Kabushiki Kaisha. Ferroelectric liquid crystal color filter surrounded by a heat fusible resin. 5,500,751, Cl. 359-68.000.

Takara Shuzo Co., Ltd.: *See*—
Miyamura, Tsuyoshi; Sano, Mutsumi; Kondo, Akihiro; and Kato, Ikunoshin, 5,500,342, Cl. 435-4.000.

Takase, Satoru; and Furuyama, Tohru, to Kabushiki Kaisha Toshiba. Semiconductor memory. 5,500,815, Cl. 365-149.000.

Takase, Satoshi; Imaide, Takuya; Kinugasa, Toshiro; and Nishimura, Ryuji, to Hitachi, Ltd. Method of driving solid-state image sensor and solid-state imaging apparatus. 5,500,674, Cl. 348-208.000.

Takasu, Akira; and Eguchi, Tatsuya, to Minolta Co., Ltd. Original document reading device capable of automatically detecting the size of an original document. 5,500,725, Cl. 355-311.000.

Takata, Yasuo: *See*—
Masuda, Haruyuki; and Takata, Yasuo, 5,499,400, Cl. 2-161.600.

Takatori, Masahiro: *See*—
Tsushima, Hideaki; Sasaki, Shiuya; Nakano, Yukio; Nakano, Hiroyuki; Tateyari, Ryoji; Matsuda, Hironari; Tomooka, Kenji; Sakakida, Naohiro; Nishimura, Shin; Yano, Yoshihiro; Igarashi, Yosichi; Aoki, Satoshi; Takatori, Masahiro; Kazawa, Tohru; and Ashi, Yoshihiro, 5,500,756, Cl. 359-174.000.

Takatori, Sunao: *See*—
Shou, Guoliang; Yang, Weikang; Takatori, Sunao; and Yamamoto, Makoto, 5,500,810, Cl. 364-724.010.

Takeda Chemical Industries, Ltd.: *See*—
Kubo, Keiji; Inada, Yoshiyuki; and Naka, Takehiko, 5,500,427, Cl. 514-256.000.

Takeda, Yasuo: *See*—
Daimon, Junko; and Takeda, Yasuo, 5,500,404, Cl. 504-174.000.

Takegami, Keizo: *See*—
Morita, Minoru; and Takegami, Keizo, 5,500,189, Cl. 422-251.000.

Takehara, Masataka: *See*—
Horita, Manabu; Yoshida, Masaharu; and Takehara, Masataka, 5,500,502, Cl. 219-121.630.

Takehara, Yoshifumi: *See*—
Hayashi, Kenichi; Hayakawa, Kimiaki; and Takehara, Yoshifumi, 5,499,811, Cl. 271-293.000.

Takei, Shinobu; Ohtani, Shoji; Iwasaki, Hiroaki; Ohsawa, Tetsuhiro; and Hosokowa, Yasunori, to Kao Corporation. Resin composition and a container. 5,500,261, Cl. 428-35.700.
Takemori, Hirotoshi: *See*—
Van, Kazuo; Ohta, Kenji; Inui, Tetsuya; Nagaura, Toshikazu; Takemori, Hirotoshi; and Toki, Hirotaka, 5,500,850, Cl. 369-275.400.
Takemoto, Takatoshi; Chida, Toshikazu; Kano, Noriaki; Ito, Eiji; Murakami, Koji; Itagaki, Takashi; Sekimoto, Koji; and Suzuki, Masanori, to Kabushiki Kaisha Ace Denken. Bank note conveying apparatus. 5,499,809, Cl. 271-274.000.
Takeo, Yamaguchi: *See*—
Toba, Yasumasa; Yasuike, Madoka; and Takeo, Yamaguchi, 5,500,453, Cl. 522-25.000.
Takeshita, Makoto: *See*—
Ito, Yasuo; Kato, Hideo; Yasuda, Shingo; Iwasaki, Nobuhiko; Nishino, Hiroyuki; and Takeshita, Makoto, 5,500,422, Cl. 514-212.000.
Takeuchi, Mitsunari: *See*—
Katagiri, Masayoshi; Suzuki, Kazuhiko; and Takeuchi, Mitsunari, 5,499,865, Cl. 303-115.200.
Takeuchi, Nobunari: *See*—
Uchiyama, Haruyoshi; Lee, Tekken; Takeuchi, Nobunari; Shimizu, Kaoru; Horiguchi, Tsuneo; and Koyamada, Yahei, 5,500,762, Cl. 359-326.000.
Takeuchi, Yukihiro; Shibata, Kozo; Ohtsuka, Yoshinori; Kano, Kazuhiko; and Yamamoto, Toshimasa, to Nippondenso Co., Ltd. Semiconductor yaw rate sensor. 5,500,549, Cl. 257-415.000.
Takigawa, Hiroyoshi: *See*—
Koch, Russell W.; Turner, John L.; Waleaga, Guy J.; Takigawa, Hiroyoshi; and Okamoto, Keizo, 5,500,065, Cl. 156-123.000.
Takigawa, Kenji; Oyama, Naohisa; and Hayashi, Hitoshi, to Nippon Soken Inc. Antiferroelectric liquid crystal composition. 5,500,146, Cl. 252-299.670.
Talbott, Marvin T., to Texas Instruments Incorporated. Method and apparatus for tracking allocatable requirements. 5,500,800, Cl. 364-468.000.
Taligent, Inc.: *See*—
Dickinson, Robert D., 5,500,929, Cl. 395-160.000.
Sonnenschein, Russell, 5,500,931, Cl. 395-144.000.
Talmon-Gros, Guenter E.; Freeman, Donald H.; Flight, Thomas A.; McCarthy, Raymond M.; and Kendall, Anthony E., to Cooper Industries, Inc. Light bulb filament dampening system. 5,500,566, Cl. 313-275.000.
Tam, Kwok C.: *See*—
Hsiao, Meng-Ling; Tam, Kwok C.; and Hudacko, Edward A., 5,500,883, Cl. 378-4.000.
Tamaki, Shuya: *See*—
Miyazawa, Kiyoshi; Chiba, Tadahiro; Iwata, Yuhei; Tamura, Uhei; Murotani, Isao; and Tamaki, Shuya, 5,500,416, Cl. 514-23.000.
Tamiso, Thomas F. Electric trolling motor mount. 5,499,792, Cl. 248-643.000.
Tamura, Miki: *See*—
Takao, Hideaki; Murata, Tatsuo; Kanbe, Junichiro; Tamura, Miki; Kamio, Masaru; Sekimura, Nobuyuki; and Kikuchi, Yoshiki, 5,500,751, Cl. 359-68.000.
Tamura, Uhei: *See*—
Miyazawa, Kiyoshi; Chiba, Tadahiro; Iwata, Yuhei; Tamura, Uhei; Murotani, Isao; and Tamaki, Shuya, 5,500,416, Cl. 514-23.000.
Tamura, Yuki: *See*—
Yanagisawa, Munehisa; Tamura, Yuki; and Kokubu, Norihide, 5,500,390, Cl. 437-120.000.
Tan, Chye S.: *See*—
Ang, Anthony; and Tan, Chye S., 5,500,670, Cl. 347-253.000.
Tan, Elaine M. L.; and Uitto, Jouni J., to Thomas Jefferson University. Method for inhibiting collagen synthesis by keloid fibroblasts. 5,500,409, Cl. 514-2.000.
Tan, Sze W.; and Capper, Valerie A. Body support for a baby. 5,499,418, Cl. 5-655.000.
Tan, Yao: *See*—
Tawil, Riad A.; Tan, Yao; and Rotunda, Joseph, 5,500,529, Cl. 250-337.000.
Tanaka, Atsushi: *See*—
Kobayashi, Katsuyuki; Taniishi, Shinnosuke; Tanaka, Atsushi; Yoshimura, Yuichiro; Kaneko, Kiyoshi; Yanagisawa, Ryozo; and Tokioka, Masaki, 5,500,492, Cl. 178-18.000.
Tanaka, Katsuyuki: *See*—
Inoue, Yousichi; Sato, Yoshihiro; Hirose, Shinichi; Tani, Hiroshi; Tanaka, Katsuyuki; Abe, Katsuo; Obura, Masaki; and Mizumoto, Muneo, 5,500,296, Cl. 428-408.000.
Tanaka, Michiyo: *See*—
Soe, Gilbu; Kohno, Isao; and Tanaka, Michiyo, 5,500,345, Cl. 435-7.100.
Tanaka, Shigeru: *See*—
Sano, Hiroaki; Taguchi, Kinji; Noguchi, Akiyoshi; and Tanaka, Shigeru, 5,499,797, Cl. 254-134.400.
Tanaka, Shingo; Ueno, Tetsuya; Itoi, Akito; and Nishi, Isao, to Kao Corporation. Developer additive, toner and developer composition. 5,500,322, Cl. 430-110.000.
Tanaka, Takashi; Miyazaki, Masaharu; Kasho, Yasunori; and Yoshiyasu, Toshiaki, to Matsushita Electric Works, Ltd. Connector assembly for a photoelectric sensor. 5,499,932, Cl. 439-446.000.
Tanaka, Takayuki; Watanabe, Ryu; Oonami, Yuuichi; and Eto, Yoshizumi, to Nippon Hoso Kyokai; and Hitachi Denshi Kabushiki Kaisha. Method of encoding and multiplexing picture signals and apparatus utilizing the same. 5,500,676, Cl. 348-387.000.
Tanaka, Takayuki: *See*—
Nakashima, Kunio; Ishigane, Ryoichi; Tanaka, Takayuki; and Yamamoto, Kenzo, 5,499,672, Cl. 164-418.000.
Tanaka, Tomoharu, to Kabushiki Kaisha Toshiba. Semiconductor memory device. 5,500,821, Cl. 365-200.000.
Tanaka, Toshiyuki; Kodera, Akira; and Aishima, Shizuo, to Ohkawara Kakohki Co., Ltd. Spray nozzle unit. 5,499,768, Cl. 239-406.000.
Tang, Hin M. Bag having expanding apparatus therein. 5,499,874, Cl. 383-127.000.
Tani, Hiroshi: *See*—
Inoue, Youichi; Sato, Yoshihiro; Hirose, Shinichi; Tani, Hiroshi; Tanaka, Katsuyuki; Abe, Katsuo; Obura, Masaki; and Mizumoto, Muneo, 5,500,296, Cl. 428-408.000.
Tani, Tadaaki: *See*—
Asanuma, Hiroyuki; Ueda, Fumitaka; and Tani, Tadaaki, 5,500,336, Cl. 430-570.000.
Taside, Hideo; Muranaka, Masayuki; Mori, Shigeru; Wada, Kiyoshi; Yoshizaki, Isao; and Ogura, Naoyuki, to Hitachi, Ltd.; and Sega Enterprises, Ltd. Ultra-wide angle liquid crystal projector system. 5,500,747, Cl. 359-40.000.
Taniguchi, Harutaka: *See*—
Katou, Hisato; Kawashima, Tomoyuki; Taniguchi, Harutaka; Nakamata, Shin'ichi; and Shibata, Kazuyoshi, 5,500,103, Cl. 204-192.260.
Taniguchi, Osamu: *See*—
Inaba, Yutaka; Okada, Shinjiro; Taniguchi, Osamu; and Mizuno, Hironobu, 5,500,749, Cl. 359-56.000.
Taniguchi, Susumu: *See*—
Morishita, Hiroki; Taniguchi, Susumu; and Kotera, Shinichi, 5,500,716, Cl. 355-206.000.
Taniishi, Shinnosuke: *See*—
Kobayashi, Katsuyuki; Taniishi, Shinnosuke; Tanaka, Atsushi; Yoshimura, Yuichiro; Kaneko, Kiyoshi; Yanagisawa, Ryozo; and Tokioka, Masaki, 5,500,492, Cl. 178-18.000.
Tanikawa, Hirohide; Uchiyama, Masaki; Joh, Yoshinobu; Akashi, Yasutaka; Taya, Masaaki; and Unno, Makoto, to Canon Kabushiki Kaisha. Toner for developing electrostatic image and fixing method. 5,500,318, Cl. 430-99.000.
Tanikawa, Hirohide: *See*—
Hagiwara, Kazuyoshi; and Tanikawa, Hirohide, 5,500,046, Cl. 118-653.000.
Tanno, Koichi: *See*—
Suzuki, Etsurou; Hattori, Yoshifumi; Kitani, Masashi; Saikawa, Hideo; Kojima, Masami; Kawano, Kenji; Tanno, Koichi; and Aono, Kenji, 5,500,664, Cl. 347-86.000.
Tao, Xue-Lian: *See*—
Lipsky, Peter E.; and Tao, Xue-Lian, 5,500,340, Cl. 435-6.000.
Targetti, Giampalo. Sectional network structure for lighting. 5,499,481, Cl. 52-654.100.
Tarta, Joseph A. Underwater dart gun. 5,499,619, Cl. 124-57.000.
Tassoff, James A.: *See*—
Mendolia, Michael S.; Esposito, Anthony; Tassoff, James A.; Ross, Lloyd; Fessock, Paul J.; Barr, Morton L.; and Vincenti, Paul J., 5,500,209, Cl. 424-66.000.
Tateyari, Ryoji: *See*—
Tsushima, Hideaki; Sasaki, Shinya; Nakano, Yukio; Nakano, Hiroyuki; Tateyari, Ryoji; Matsuda, Hironari; Tomooka, Kenji; Sakakida, Naohiro; Nishimura, Shin; Yano, Yoshihiro; Igarashi, Youichi; Aoki, Satoshi; Takatori, Masahiro; Kazawa, Tohru; and Ashi, Yoshihiro, 5,500,756, Cl. 359-174.000.
Tatnall, Robert E., to Bio-Technical Resources. Finely divided anthraquinone formulations as inhibitors of sulfide production from sulfate-reducing bacteria. 5,500,368, Cl. 435-262.000.
Tatsumisago, Masahiro: *See*—
Minami, Tsutomu; Tatsumisago, Masahiro; Takada, Kazunori; and Kondo, Shigeo, 5,500,291, Cl. 429-206.000.
Tauber, Werner, to Siemens Aktiengesellschaft. Method for manufacturing an air damper for use in a motor vehicle temperature control unit. 5,499,947, Cl. 454-69.000.
Tawil, Riad A.; Tan, Yao; and Rotunda, Joseph, to Saint-Gobain/Norton Industrial Ceramics Corporation. Apparatus and method for screening abnormal glow curves. 5,500,529, Cl. 250-337.000.
Taya, Masaaki: *See*—
Tsuikawa, Hirohide; Uchiyama, Masaki; Joh, Yoshinobu; Akashi, Yasutaka; Taya, Masaaki; and Unno, Makoto, 5,500,318, Cl. 430-99.000.
Taylor, Michael J. Retractable adjustable shelf apparatus. 5,499,584, Cl. 108-96.000.
TDK Corporation: *See*—
Iwasaka, Shinji; Kobayashi, Masaki; and Hata, Kenjiro, 5,500,915, Cl. 385-78.000.
Technoplast Kunststofftechnik Gesellschaft m.b.H.: *See*—
Dorninger, Frank P., 5,499,507, Cl. 62-63.000.
Tecno-Bio Co., Ltd.: *See*—
Ulrich, Armando; and Ou, Walter H., deceased, 5,499,871, Cl. 366-136.000.
Tecumseh Products Company: *See*—
Dreiman, Nelik I., 5,499,571, Cl. 92-187.000.
Schmitz, Raymond J., III, 5,499,908, Cl. 417-368.000.



Teetz, Volker: *See*—
Becker, Reinhard; Henning: Rainer; Räger, Wolfgang; Teetz, Volker; and Urbach, Hansjörg, 5,500,434, Cl. 514-356.000.
Teillaud, Eric; Bevan, Bruno; Milder, Claude; Reilly, Paul; and Millot, Philippe, to Societe anonyme dite: Laboratoires d'Hygiene Societe anonyme dite: et de Dietetique (L.H.D.). Transdermal drug delivery device with waveshape generator. 5,499,967, Cl. 604-20.000.
Teirstein, Paul S. Body passageway closure apparatus and method of use. 5,499,995, Cl. 606-192.000.
Teknekron Infowitch Corporation: *See*—
Powers, Michael C.; Bliss, Greg A.; and Shen, Shioupya, 5,500,795, Cl. 364-401.000.
Tektronix, Inc.: *See*—
Barter, Archie M., 5,500,615, Cl. 327-111.000.
Telectronics Pacing Systems, Inc.: *See*—
Anaourian, Megeurditch N.; and Nickolls, Peter M., 5,500,004, Cl. 607-4.000.
Telescope Casual Furniture Co.: *See*—
Vandermindeu, Robert D., Sr., 5,499,585, Cl. 108-153.000.
Telford, Susan G.; Theng, Meng C.; and Aruga, Michio, to Applied Materials, Inc. Uniform tungsten silicide films produced by chemical vapor deposition. 5,500,249, Cl. 427-255.000.
Tennent, Howard: *See*—
Mandeville, W. Harry; Truesdale, Larry K.; and Tennent, Howard, 5,500,200, Cl. 423-447.300.
Terada, Takehiko: *See*—
Nakayama, Masaaki; Baba, Yasutoshi; Terada, Takehiko; Sakakibara, Shuji; and Yamamoto, Kenji, 5,499,537, Cl. 73-117.300.
Terada, Yasuharu; Suzuki, Tsuneo; Matsushima, Hideyuki; and Horita, Yoshiyuki, to Yoshida Kogyo K.K. Fastening device. 5,499,432, Cl. 24-599.200.
Terakawa, Yukio, to Mitsubishi Pencil Kabushiki Kaisha. Correction fluid composition containing acrylic resin. 5,500,455, Cl. 523-161.000.
Teranishi, Yasuhiko: *See*—
Higurashi, Seiji; Teranishi, Yasuhiko; Yamada, Yasuaki; and Ohishi, Takeo, 5,500,679, Cl. 348-432.000.
Terasaka, Hiroyuki: *See*—
Nojiri, Hironobu; Yakushiji, Kazuyuki; Yoshinaga, Minoru; and Terasaka, Hiroyuki, 5,499,776, Cl. 242-178.000.
Terashima, Tomohide; and Fukunaga, Masanori, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device having voltage sensing element. 5,500,541, Cl. 257-105.000.
Terauchi, Masaharu: *See*—
Wada, Takahiro; Ikeda, Mitsunuke; Nishitani, Mikihiko; Terauchi, Masaharu; Negami, Takayuki; and Kohara, Naoki, 5,500,056, Cl. 136-259.000.
Terrell, Peter M., to Signal Processors Limited. Digital filtering, data rate conversion and modem design. 5,500,874, Cl. 375-232.000.
Terris, Alta F. Rotary cutter blade sharpener. 5,499,943, Cl. 451-549.000.
Terry, Dennis C., to Newport Corporation. Honeycomb table manufacture and clean-room compatible honeycomb tables. 5,500,269, Cl. 428-116.000.
Tesco Controls, Inc.: *See*—
Tessmer, Wallace D., 5,499,734, Cl. 220-4.210.
Teshima, Eiichiro: *See*—
Sakaki, Eihiro; Ogasawara, Yoshimi; and Teshima, Eiichiro, 5,500,834, Cl. 368-9.000.
Tessier, Patrick J.: *See*—
Allison, Bruce J.; Ciarniello, Joe E.; Dumont, Guy A.; and Tessier, Patrick J., 5,500,088, Cl. 162-198.000.
Tessmer, Wallace D., to Tesco Controls, Inc. Labyrinth barrier ventilated waterproff enclosure. 5,499,734, Cl. 220-4.210.
Teutsch, Erich O.: *See*—
Dunton, Thomas P.; Hall, Walter L.; and Teutsch, Erich O., 5,499,441, Cl. 29-527.200.
Texaco Inc.: *See*—
Sudhakar, Chakka; Sandford, Gerald G.; and Dolfinger, Frank, Jr., 5,500,401, Cl. 502-316.000.
Texas Instruments Incorporated: *See*—
Doddington, George D.; Pawate, Basavaraj; Mahant-Shetti, Shivaling; and Smith, Derek, 5,500,828, Cl. 365-230.030.
Hynecek, Jaroslav, 5,500,383, Cl. 437-53.000.
Markandey, Vishal; and Reid, Anthony, 5,500,904, Cl. 382-103.000.
Marum, Steven E.; and Kraus, Karl-Heinz, 5,500,546, Cl. 257-358.000.
Reynolds, James; and Smayling, Michael C., 5,500,392, Cl. 437-151.000.
Rincon, Gabriel A.; Salamina, Nicolas; and Corsi, Marco, 5,500,625, Cl. 330-273.000.
Rodea, Philip; Elnashar, Khodor; Deng, Brian T.; Tsang, Steve; and Saperstein, William, 5,500,946, Cl. 395-308.000.
Schuermann, Josef, 5,500,651, Cl. 342-42.000.
Smayling, Michael C., 5,500,548, Cl. 257-371.000.
Talbott, Marvin T., 5,500,800, Cl. 364-468.000.
Tung, Yingsheng; Dixon, Robert E.; and Ying, Shih-Hsin, 5,500,387, Cl. 437-60.000.
Texell Corp.: *See*—
Ohno, Hirofumi; Narui, Fumio; and Hayashi, Shigeru, 5,499,927, Cl. 439-285.000.
Thackeray, James W.: *See*—
Carey, Richard J.; and Thackeray, James W., 5,500,127, Cl. 210-685.000.
Theallier, Pascal: *See*—
Dollat, Jean-Marie; Molin, Marc; and Theallier, Pascal, 5,500,415, Cl. 514-21.000.
Theeuwes, Felix: *See*—
Wong, Patrick S.-L.; Theeuwes, Felix; and Eckenhoff, James B., 5,499,979, Cl. 604-891.100.
Theisen, Wolfgang; Braunecis, Edwin; and Pirstadt, Bernd, to Nukem GmbH. Process and device for producing microspheres. 5,500,162, Cl. 264-9.000.
Theiss, Wilfried: *See*—
Baur, Rüdiger; Macholdt, Hans-Tobias; and Theiss, Wilfried, 5,500,323, Cl. 430-110.000.
Thermal Dynamics International, Inc.: *See*—
Suggs, Steven M.; and Meyer, Reid M., 5,499,827, Cl. 277-229.000.
Thermo King Corporation: *See*—
Jurewicz, Romuald M.; Wong, Albert C. K.; and Wirth, Verlon J., 5,499,512, Cl. 62-229.000.
ThermoSpectra: *See*—
Duff, Eric A., 5,500,886, Cl. 378-207.000.
Thiempont, Bernard. Method and devices for processing fresh foodstuffs. 5,500,238, Cl. 426-511.000.
Thiokol Corporation: *See*—
Land, Gary K.; and Blau, Reed J., 5,500,059, Cl. 149-19.100.
Thomas, Gerhard; Wutz, Karl; and Lechner, Klaus, to Robert Bosch GmbH. Electrical device, in particular switching or controlling device for motor vehicle. 5,500,784, Cl. 361-704.000.
Thomas, G. Terry, to United States of America, Navy. Aircraft control lever simulator. 5,499,919, Cl. 434-45.000.
Thomas Jefferson University: *See*—
Tan, Elaine M. L.; and Uitto, Jouni J., 5,500,409, Cl. 514-2.000.
Thomas, Stephen P. Litter box slatted spacing shelf. 5,499,611, Cl. 119-166.000.
Thompson, George E. Lever action archery bow. 5,499,618, Cl. 124-25.600.
Thompson, Leo; Little, Frank; and Pidgeon, Rezin E., Jr., to Scientific-Atlanta, Inc. Method and apparatus for transmitting broadband amplitude modulated radio frequency signals over optical links. 5,500,758, Cl. 359-189.000.
Thompson, Mark E.; Snover, Jonathan L.; and Vermeulen, Lori A., to Trustees of Princeton University, The. Electron acceptor compositions technical field. 5,500,297, Cl. 428-411.100.
Thompson, Richard J.: *See*—
Faigle, Ernst M.; Senschena, John H.; and Thompson, Richard J., 5,499,843, Cl. 280-741.000.
Thompson-Rohrlich, John, to Apple Computer, Inc. Method and apparatus for editing an inked object while simultaneously displaying its recognized object. 5,500,937, Cl. 395-161.000.
Thomson Consumer Electronics, Inc.: *See*—
Lam, Wai-Man, 5,500,689, Cl. 348-699.000.
Thomson-CSF: *See*—
Carrara, Bruno, 5,500,647, Cl. 342-195.000.
Desjean, Jean; and Mann, Jean-Pierre, 5,500,644, Cl. 341-120.000.
Thorberg, Seth-Olov: *See*—
Larsson, Lars-Gunnar; Ranyl, Lucy A.; Ross, Svante B.; Soha, Daniel D.; and Thorberg, Seth-Olov, 5,500,425, Cl. 514-233.500.
Thornton, Henry E.; and Placanica, John S. Apparatus for magnetically treating fluids. 5,500,121, Cl. 210-222.000.
Thottathil, Paul: *See*—
Sanduja, Mohan L.; Berlina, Irene; Horowitz, Carl; and Thottathil, Paul, 5,500,253, Cl. 427-385.500.
Thring, Robert H., to Southwest Research Institute. Regenerative internal combustion engine. 5,499,605, Cl. 123-70.00R.
Thürk, Jürgen: *See*—
Leroux, Roland; Rodek, Erich; Schaupert, Kurt; Thürk, Jürgen; and Weinberg, Waldemar, 5,500,255, Cl. 427-419.200.
Thurston, Raymond L.; and Schulenburg, Steven H., to Illinois Tool Works Inc. Flexible lock nut and method of manufacturing. 5,499,893, Cl. 411-282.000.
Tice, Richard: *See*—
Mill, Peter D.; and Tice, Richard, 5,499,504, Cl. 62-3.300.
Tickell, Edward B., Jr.; Schoch, Peter J.; Moseley, Lonnie M.; and Bloomfield, Dwight A., to Computalog Research, Inc. Multiple transmit frequency induction logging system with closed loop conversion circuitry for phase and gain variation elimination. 5,500,597, Cl. 324-339.000.
Tihon, Claude; Burton, John H.; Cook, Timothy C.; and Rhuna, David, to American Medical Systems, Inc. Dilation device for the urethra. 5,499,994, Cl. 606-192.000.
Timken, Hye K. C.: *See*—
Durand, Paul P.; and Timken, Hye K. C., 5,500,108, Cl. 208-89.000.
Keville, Kathleen M.; Timken, Hye K. C.; and Ware, Robert A., 5,500,109, Cl. 208-111.000.
Titan Kogyo Kabushiki Kaisha: *See*—
Harada, Hidefumi; Yamasaki, Takanori; Sadanaga, Eizi; and Okazaki, Teruyoshi, 5,500,043, Cl. 106-456.000.
Toba, Yasumasa; Yasuike, Madoka; and Takeo, Yamaguchi, to Toyo Ink Manufacturing Co., Ltd. (Oxo)sulfonium complex, polymerizable composition containing the complex, and method of polymerizing the composition. 5,500,453, Cl. 522-25.000.
Toda, Haruki; Saito, Shozo; and Tokushige, Kaoru, to Kabushiki Kaisha Toshiba. Semiconductor memory device. 5,500,829, Cl. 365-230.080.
Tokai Kogyo Kabushiki Kaisha: *See*—
Yada, Yukihiko; Ito, Tosikazu; and Amano, Katuyuki, 5,500,264, Cl. 428-36.900.
Toki, Hirotaka: *See*—

Vaa, Kazuo; Obta, Kenji; Inui, Tetsuya; Nagaura, Toshikazu; Takemori, Hirotoshi; and Toki, Hirotaka, 5,500,850, Cl. 369-275.400.
Tokico Ltd.: *See*—
Kobayashi, Kinzo; and Suzuki, Shinji, 5,499,696, Cl. 188-1.110.
Tokiota, Masaki: *See*—
Kobayashi, Katsuyuki; Taniishi, Shinnosuke; Tanaka, Atsushi; Yoshimura, Yuichiro; Kaneko, Kiyoshi; Yanagisawa, Ryozo; and Tokiota, Masaki, 5,500,492, Cl. 178-18.000.
Tokushige, Kaoru: *See*—
Toda, Haruki; Saito, Shozo; and Tokushige, Kaoru, 5,500,829, Cl. 365-230.080.
Tokushu Kougyo Co.: *See*—
Kumagai, Masaru, 5,500,510, Cl. 219-505.000.
Tokuyama Corporation: *See*—
Oda, Hiroyuki, 5,499,598, Cl. 117-49.000.
Tokyo Electron Kabushiki Kaisha: *See*—
Niino, Reiji; Ohbu, Tomoyuki; Ikegawa, Hiroaki; Nakao, Kea; Fujita, Yoshiyuki; Haraoka, Tsutomu; Kobayashi, Makoto; Kaneda, Naoya; and Kumada, Hiroshi, 5,500,388, Cl. 437-89.000.
Tokyo Electron Tohoku Kabushiki Kaisha: *See*—
Niino, Reiji; Ohbe, Tomoyuki; Ikegawa, Hiroaki; Nakao, Kea; Fujita, Yoshiyuki; Haraoka, Tsutomu; Kobayashi, Makoto; Kaneda, Naoya; and Kumada, Hiroshi, 5,500,388, Cl. 437-89.000.
Tolson, Michael, to Xaos Tools. Dynamic image processing using particle systems. 5,500,925, Cl. 395-131.000.
Toma, Flavio: *See*—
Dive, Vincent; Toma, Flavio; and Yiotakis, Athanasios, 5,500,414, Cl. 514-18.000.
Tomaro, Rita, to H. H. Brown Shoe Company, Inc. Footwear with replaceable, watertight bootie. 5,499,459, Cl. 36-10.000.
Tomasko, John A.; and Farwell, Stephen P., to BS&B Safety Systems, Inc. Pressure surge resistant rupture disk assembly. 5,499,649, Cl. 137-68.270.
Tomisawa, Naoki, to Unisia Jecs Corporation. Fuel characteristic detecting system for internal combustion engine. 5,499,607, Cl. 123-435.000.
Tomita, Masahiro: *See*—
Okumura, Toshiaki; Ekimoto, Takao; Shimamoto, Satoshi; Ogawa, Katsumi; Tomita, Masahiro; Nimura, Yoshitaka; and Kadowaki, Ryosaku, 5,500,170, Cl. 264-148.000.
Tomita, Saburo, to Asia Optical Co., Ltd. Sight scope. 5,499,456, Cl. 33-245.000.
Tomita, Shinji: *See*—
Nagasawa, Takashi; and Tomita, Shinji, 5,499,506, Cl. 62-11.000.
Tomita, Shotaro: *See*—
Okuno, Yasuo; Tomita, Shotaro; and Kato, Hiroyuki, 5,499,600, Cl. 117-68.000.
Tomiyama, Takamichi, to Sony Corporation. Biaxial actuator for optical pickup. 5,500,771, Cl. 359-813.000.
Tomiyasu, Hiroshi: *See*—
Wada, Yukio; Morimoto, Kyoichi; Goibuchi, Takayuki; and Tomiyasu, Hiroshi, 5,500,192, Cl. 423-10.000.
Tommasini, Stelvio, to Zanussi Grandi Impianti S.p.A. Automatic self-cleaning arrangement of a cooking oven. 5,499,577, Cl. 99-476.000.
Tonegawa Paper Co., Ltd.: *See*—
Sakamoto, Yukinori; Hashimoto, Takeshi; Nakaba, Katsuji; Kobayashi, Masaharu; Nishigaya, Takeshi; and Yamanashi, Fumiyoshi, 5,500,294, Cl. 428-355.000.
Tomooka, Kenji: *See*—
Tsushima, Hideaki; Sasaki, Shinya; Nakano, Yukio; Nakano, Hiroyuki; Tateyari, Ryoji; Matsuda, Hironari; Tomooka, Kenji; Sakakida, Naohiro; Nishimura, Shin; Yano, Yoshihiro; Igarashi, Youichi; Aoki, Satoshi; Takatori, Masahiro; Kazawa, Tohru; and Ashi, Yoshihiro, 5,500,756, Cl. 359-174.000.
Tonegawa, Takeshi: *See*—
Ioh, Shigeo; Yokoyama, Mikio; Tonegawa, Takeshi; and Kadowaki, Akira, 5,499,939, Cl. 445-73.000.
Tonelli, Roger: *See*—
Pasin, Mark; Tonelli, Roger; and Easley, James B., 5,499,834, Cl. 280-282.000.
Topas GmbH: *See*—
Rudolph, Andreas; Mueller, Klaus J.; Peters, Christian; and Altmann, Justus, 5,500,027, Cl. 55-223.000.
Toppaes, Anthony N.: *See*—
Fraas, Michael; Frenzer, Reinhard; Long, Gregor; Kline, John S.; Sheridan, David S.; Fink, E. David; and Toppaes, Anthony N., 5,499,625, Cl. 128-207.150.
Topy Kogyo Kabushiki Kaisha: *See*—
Hirakawa, Tetsuro; Kaneko, Masayoshi; and Yoshida, Katumi, 5,500,058, Cl. 148-649.000.
Toray Industries, Inc.: *See*—
Fukumoto, Tadao; Iwamoto, Masatoshi; and Kishimoto, Akihiko, 5,500,478, Cl. 525-66.000.
Nojiri, Hironobu; Yakushiji, Kazuyuki; Yoshinaga, Minoru; and Terasaka, Hiroyuki, 5,499,776, Cl. 242-178.000.
Törner, Håkan: *See*—
Forsdahl, Sixten; and Törner, Håkan, 5,499,462, Cl. 37-227.000.
Tornow, Devin C.: *See*—
Haughney, Michael A.; Mojarrad, Mehrdad; Tornow, Devin C.; and Wiemkes, Norval J., 5,499,612, Cl. 123-470.000.
Torque Converter Rebuilding Systems, Inc.: *See*—
Myers, John E.; and Procter, Roy W., 5,499,755, Cl. 228-44.300.
Torrington Company, The: *See*—
Godec, Maksimilijan; and Lawson, James L., 5,499,452, Cl. 29-898.067.
Toso, Kenneth E.: *See*—
Castro, Michael; and Toso, Kenneth E., 5,499,999, Cl. 606-208.000.
Tosoh Corporation: *See*—
Hasasaki, Yasuaki; Tsukuda, Kazuaki; Watanabe, Hiroyuki; Tsuzuki, Kenji; Murakami, Mitsuyuki; and Niimi, Noriaoshi, 5,500,408, Cl. 504-261.000.
Toua Kokyu Tugitevarubu Seizo Co.: *See*—
Kumagai, Masaru, 5,500,510, Cl. 219-505.000.
Touboul, Estera: *See*—
Godfroid, Jean-Jacques; Lamouri, Aazdine; Touboul, Estera; Wang, Xuan; Renard, Pierre; Pfeiffer, Bruno; and Guardiola, Béatrice, 5,500,426, Cl. 514-252.000.
Touma, Kiyotaka: *See*—
Nakazawa, Yasushi; Touma, Kiyotaka; and Enomoto, Masatoshi, 5,499,801, Cl. 269-48.100.
Tournier, Gilles; Roques, Serge; and Ballenghien, Jean-Luc, to Aerospace Societe Nationale Industrielle. Process for connecting an electric cable to an end member. 5,499,448, Cl. 29-863.000.
Toushin, Kazumi. Water-repellent earth material, and methods of making and using the same. 5,500,245, Cl. 427-221.000.
Toyama, Nobuo; and Nakagawa, Katsumi, to Canon Kabushiki Kaisha. Photovoltaic device. 5,500,055, Cl. 136-259.000.
Toyo Boseki Kabushiki Kaisha: *See*—
Nakata, Kiyoshi; and Hayashi, Seishu, 5,499,911, Cl. 425-94.000.
Toyo Ink Manufacturing Co., Ltd.: *See*—
Tobe, Yasumasa; Yasuike, Madoka; and Takeo, Yamaguchi, 5,500,453, Cl. 522-25.000.
Toyoda Gosei Co., Ltd.: *See*—
Yamamoto, Tadashi; Sakakida, Katsumi; Ikeda, Takanobu; and Masuya, Chiaaso, 5,499,842, Cl. 280-728.300.
Toyota Jidosha Kabushiki Kaisha: *See*—
Inagaki, Syouji, 5,500,798, Cl. 364-424.050.
Ito, Eiji; Suzuki, Tetsushi; Ito, Kaoru; and Kawakubo, Hiroyuki, 5,499,604, Cl. 123-41.860.
Kii, Masayuki; Nimura, Hiroaki; and Umeyama, Mitsuhiro, 5,499,703, Cl. 192-70.110.
Mohri, Naotake; and Morouaki, Hideo, 5,500,500, Cl. 219-69.170.
Toyota Shatai Kabushiki Kaisha: *See*—
Nakase, Hideki; Nishii, Yasuhiro; and Sugiura, Masami, 5,499,863, Cl. 297-452.200.
Traben, Josef; and Goenner, Siegmar, to Firma Gebruder Linck Maschinenfabrik "Gasterlinck" GmbH & Co. KG. Method of preparing a multilayered solid wood panel. 5,500,070, Cl. 156-254.000.
Trachy, David: *See*—
Munro, Frederick; Dailey, Aaron; Defouw, Richard; and Trachy, David, 5,500,803, Cl. 364-478.000.
Tracy, C. Edwin: *See*—
Pernicka, John C.; Benson, David K.; and Tracy, C. Edwin, 5,500,503, Cl. 219-121.640.
Trainor, John J.: *See*—
Bellin, Michael A.; Laplace, Carl; Trainor, John J.; and Hoffmann, Mark, 5,500,806, Cl. 364-492.000.
Trakhan, Paul D.; and Boutilier, Glenn D., to Procter & Gamble Company, The. Multiple layer, multiple opacity backside textured belt. 5,500,277, Cl. 428-196.000.
Tran, The T. T.: *See*—
Wang, Lixiao; and Tran, The T. T., 5,500,181, Cl. 264-532.000.
Transovich, Stephen J., to HR Textron Inc. Integrated compliance servovalve. 5,500,580, Cl. 318-568.160.
Trasquilla, Michael N., to Unisys Corporation. Pinch-roll with floating damper. 5,499,810, Cl. 271-274.000.
Traudt, Michael D.: *See*—
Cummins, Diane; Van Der Ouderaa, Franciscus J.; and Traudt, Michael D., 5,500,448, Cl. 514-717.000.
Trede, Wolfgang: *See*—
Schiessl, Alois; Steinicke, Wolfgang; Trede, Wolfgang; and Krone, Hartmut, 5,499,582, Cl. 102-334.000.
Treachard, Thomas J.: *See*—
Curran, Donald P., Jr.; Pollocks, Lonnie J., Jr.; Breemes, David P., Sr.; Carreira, Leonard M.; and Treachard, Thomas J., 5,500,659, Cl. 347-28.000.
Tricor Seating, Inc.: *See*—
Smith, Raymond; and Roelea, Charles, 5,499,860, Cl. 297-255.000.
Trihey, John M., to Aqua Max Pty Ltd. Hot water heaters. 5,499,621, Cl. 126-361.000.
Trimberger, Stephen M.: *See*—
Goetting, F. Erich; and Trimberger, Stephen M., 5,500,608, Cl. 326-39.000.
Trimble, Emerson: *See*—
Trimble, Willard R.; Trimble, Robin D.; and Trimble, Emerson, 5,499,697, Cl. 188-19.000.
Trimble, Robin D.: *See*—
Trimble, Willard R.; Trimble, Robin D.; and Trimble, Emerson, 5,499,697, Cl. 188-19.000.
Trimble, Willard R.; Trimble, Robin D.; and Trimble, Emerson. Shopping cart automatic dual brake. 5,499,697, Cl. 188-19.000.
Trinh, Toan: *See*—
Bacon, Dennis R.; Trinh, Toan; Hartman, Frederick A.; and Mermelstein, Robert, 5,500,137, Cl. 252-8.600.
Bacon, Dennis R.; and Trinh, Toan, 5,500,138, Cl. 252-8.800.



Bacon, Dennis R.; and Trinh, Toan, 5,500,154, Cl. 252-551.000.
Trojan, Donna M.; and Heidorn, Michael E., to TRW Vehicle Safety Systems Inc. Vehicle safety apparatus a housing assembly for an air bag and vehicle horn switch. 5,499,841, Cl. 280-731.000.
Trott, Arthur P., to Linvatec Corporation. Suture anchor for soft tissue fixation. 5,500,001, Cl. 606-232.000.
Truesdale, Larry K.: *See*—
Mandeville, W. Harry; Truesdale, Larry K.; and Tennent, Howard, 5,500,200, Cl. 423-447.300.
Trumbull, Douglas, to Ridefilm Corporation. Method of generating an event simulation. 5,499,920, Cl. 434-69.000.
Trustees of Princeton University, The: *See*—
Thompson, Mark E.; Seover, Jonathan L.; and Vermeulen, Lori A., 5,500,297, Cl. 428-411.100.
TRW United Carr GmbH & Co. KG: *See*—
Kraus, Willibald, 5,499,737, Cl. 220-307.000.
TRW Vehicle Safety Systems Inc.: *See*—
Paigle, Ernst M.; Semchesa, John H.; and Thompson, Richard J., 5,499,843, Cl. 280-741.000.
Trojan, Donna M.; and Heidorn, Michael E., 5,499,841, Cl. 280-731.000.
Tsai, John: *See*—
Bernard, Karen A.; Tsai, John; Billmers, Robert L.; and Sweger, Robert W., 5,500,087, Cl. 162-164.600.
Tsai, Meng-Jin: *See*—
Cheng, Kuang-Chung; Tsai, Meng-Jin; Kuo, Ta-Chi; and Su, Kuo-Jaan, 5,500,545, Cl. 257-341.000.
Tsai, M. Michael; Fletcher, David E.; and Zamm, Joseph W., to Dayco Products, Inc. Belt tensioner, actuator therefor and methods of making the same. 5,499,950, Cl. 474-138.000.
Tsang, Steve: *See*—
Rodea, Philip; Elnashar, Khodor; Deng, Brian T.; Tsang, Steve; and Saperstein, William, 5,500,946, Cl. 395-308.000.
Tseng, Meng C.: *See*—
Telford, Susan G.; Tseng, Meng C.; and Aruga, Michio, 5,500,249, Cl. 427-255.000.
Tsubouchi, Hirohito: *See*—
Kitamura, Naomi; Miyazawa, Keiji; Daikuhara, Yasushi; Tsubouchi, Hirohito; Naka, Daiji; Takahashi, Kazuhiro; Matsui, Rie; Yoshiyama, Yoshiko; and Ishii, Takehisa, 5,500,354, Cl. 435-69.400.
Tsugami, Itsuma: *See*—
Umeda, Toshihiko; and Tsugami, Itsuma, 5,499,922, Cl. 434-307.00A.
Tsugita, Masami, to NEC Corporation. Clamping circuit for adjusting a level of a transmitted signal at a predetermined voltage. 5,500,617, Cl. 327-321.000.
Tsuji, Masaaki: *See*—
Miyawaki, Hiroshi; Itojima, Mitsuhiko; Oka, Takayuki; Yamamoto, Kazuyoshi; Akira, Toshiro; and Tsuji, Masaaki, 5,500,712, Cl. 355-22.000.
Tsujimura, Manabu: *See*—
Miyata, Masahiro; Ezawa, Hirokazu; Ogure, Naoaki; Tsujimura, Manabu; Obdaira, Takeyuki; Inoue, Hiroaki; and Ikeda, Yukio, 5,500,559, Cl. 257-762.000.
Tsukishima Kikai Co., Ltd.: *See*—
Morita, Minoru; and Takegami, Keizo, 5,500,189, Cl. 422-251.000.
Tsukuda, Kazuaki: *See*—
Hasasaki, Yasuaki; Tsukuda, Kazuaki; Watanabe, Hiroyuki; Tsuzuki, Kenji; Murakami, Mitsuyuki; and Niimi, Noritoshi, 5,500,408, Cl. 504-261.000.
Tsumura, Akira; Fuchigami, Hiroyuki; Nobutoki, Hidcharu; and Koezuka, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Field-effect transistor with at least two different semiconductive organic channel compounds. 5,500,537, Cl. 257-40.000.
Tsuno, Takashi: *See*—
Imai, Takahiro; Tsuno, Takashi; Yamamoto, Yoshiyuki; and Fujimori, Naoji, 5,499,601, Cl. 117-84.000.
Tsuru, Kiyoshi: *See*—
Inoue, Tadashi; Tsuru, Kiyoshi; Okimoto, Shinichi; Yamamura, Naokazu; Yamamoto, Tetsuo; and Haiji, Hirobisa, 5,500,057, Cl. 148-312.000.
Tsushima, Hideaki; Sasaki, Shinya; Nakano, Yukio; Nakano, Hiroyuki; Tateyari, Ryoji; Matsuda, Hironari; Tomooka, Kenji; Sakakida, Naohiro; Nishimura, Shin; Yano, Yoshihiro; Igarashi, Youichi; Aoki, Satoshi; Takatori, Masahiro; Kazawa, Tohru; and Ashi, Yoshihiro, to Hitachi, Ltd. Optical fiber transmission system and supervision method of the same. 5,500,756, Cl. 359-174.000.
Tsuzuki, Kenji: *See*—
Hasasaki, Yasuaki; Tsukuda, Kazuaki; Watanabe, Hiroyuki; Tsuzuki, Kenji; Murakami, Mitsuyuki; and Niimi, Noritoshi, 5,500,408, Cl. 504-261.000.
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Allen, Susan D.; and Lee, Changhun, 5,500,913, Cl. 385-48.000.
Tung, Yingsheng; Dixon, Robert E.; and Ying, Shih-Hsin, to Texas Instruments Incorporated. Method of making high performance capacitors and/or resistors for integrated circuits. 5,500,387, Cl. 437-60.000.
Turner, Herman E., Jr.: *See*—
Derian, Gary A.; Turner, Herman E., Jr.; and Fleming, Michael W., 5,499,745, Cl. 222-136.000.
Turner, James R., to FMC Corporation. Modular protection system. 5,499,568, Cl. 89-36.080.
Turner, John L.: *See*—
Koch, Russell W.; Turner, John L.; Waleaga, Guy J.; Takigawa, Hiroyoshi; and Okamoto, Keizo, 5,500,065, Cl. 156-123.000.
Tuttle, John R.: *See*—
Saadgrass, Charles K.; Allen, David H.; Tuttle, John R.; Rotzoll, Robert R.; and Pax, George E., 5,500,650, Cl. 342-42.000.
Tyburski, Edward: *See*—
Bagdahl, Thomas L.; Tyburski, Edward; and Hartmann, Paul R., 5,500,853, Cl. 370-17.000.
Tye-Sil Corporation: *See*—
Genicle, Henry, 5,499,644, Cl. 135-20.100.
U C B S.A.: *See*—
Vrancken, Henri; Demoustier, Martine; and Deleers, Michel, 5,500,224, Cl. 424-451.000.
U. S. Philips Corporation: *See*—
Hache, Wilfried; and Kawczyk, Jost, 5,500,896, Cl. 379-412.000.
Ube Industries Limited: *See*—
Saitoh, Yasuhiko; Iwata, Yasuo; Kazama, Seiichi; Nakajima, Yoshihide; and Yokomizo, Kanji, 5,500,437, Cl. 514-397.000.
Uchida, Koji: *See*—
Masuda, Takashi; Okumura, Toshiaki; Uchida, Koji; and Yamamoto, Osamu, 5,500,696, Cl. 351-205.000.
Uchino, Masahide, to Japan Field Co., Ltd. Washing apparatus. 5,499,642, Cl. 134-95.100.
Uchiyama, Haruyoshi; Lee, Tekhee; Takeuchi, Nobunari; Shimizu, Kaoru; Horiguchi, Tsuneo; and Koyamada, Yahei, to Ando Electric Co., Ltd.; and Nippon Telegraph and Telephone Corporation. Light frequency control apparatus. 5,500,762, Cl. 359-326.000.
Uchiyama, Masaki: *See*—
Tanikawa, Hirohide; Uchiyama, Masaki; Joh, Yoshinobu; Akashi, Yasutaka; Taya, Masaaki; and Unno, Makoto, 5,500,318, Cl. 430-99.000.
Udagawa, Satoru; Abe, Masaki; Ando, Satoru; Matsuki, Yasuhiro; Watanabe, Toyofumi; Shiohara, Yukimitsu; Morita, Masaya; and Kido, Akimasa, to NKK Corporation. Surface treated steel sheet. 5,500,290, Cl. 428-610.000.
Ueda, Fumitaka: *See*—
Asanuma, Hiroyuki; Ueda, Fumitaka; and Tani, Tadaaki, 5,500,336, Cl. 430-570.000.
Ueda, Shigeru: *See*—
Shimura, Akihiro; Nagata, Satoshi; and Ueda, Shigeru, 5,500,922, Cl. 395-110.000.
Ueda, Yukinori, to Murata Manufacturing Co., Ltd. Variable resistor. 5,500,634, Cl. 338-174.000.
Uehara, Jun: *See*—
Anzai, Iwao; Matsuoka, Shigeki; and Uehara, Jun, 5,500,307, Cl. 429-30.000.
Uemichi, Sachio; and Takahashi, Shuji, to Yuasa Corporation; and Honda Gikea Kogyo Kabushiki Kaisha. Manufacturing method for battery covers. 5,500,177, Cl. 264-277.000.
Uemura, Mamoru: *See*—
Kimoto, Keizo; Hanatani, Yasuyuki; Sakai, Hiroshi; Oki, Tsuneo; and Uemura, Mamoru, 5,499,486, Cl. 53-465.000.
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Ueno, Tetsuya: *See*—
Tanaka, Shingo; Ueno, Tetsuya; Itoi, Akito; and Nishi, Isao, 5,500,322, Cl. 430-110.000.
Uetuki, Masaya: *See*—
Matsubara, Miyuki; Hirabayashi, Hiromitsu; Nagoshi, Shigeyasu; Koitabashi, Noribumi; Sugimoto, Hitoshi; Gotoh, Fumihiro; and Uetuki, Masaya, 5,500,661, Cl. 347-41.000.
Uhl, Richard G.: *See*—
Baggett, James D., Jr.; Clark, David A.; Cowling, Patrick C.; Uhl, Richard G.; and Wrona, Susan E., 5,499,636, Cl. 131-374.000.
Uhler, George M.; and Brown, John F., III, to Digital Equipment Corporation. Operand specifier processing by grouping similar specifier types together and providing a general routine for each. 5,500,947, Cl. 395-375.000.
Uitto, Jouni J.: *See*—
Tan, Elaine M. L.; and Uitto, Jouni J., 5,500,409, Cl. 514-2.000.
Ujita, Toshihiko; Nakajima, Kazuhiro; Sato, Yohei; and Murakami, Shuichi, to Canon Kabushiki Kaisha. Recording ink container with an air vent valve. 5,500,663, Cl. 347-86.000.
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UKI Supreme Corporation: *See*—
Sharma, Jai P., 5,500,025, Cl. 8-685.000.
Ulrich, Armando; and Ott, Walter H., deceased, to Tecno-Bio Co., Ltd. Device for producing liquid emulsion of hydrophobic and hydrophilic liquid. 5,499,871, Cl. 366-136.000.
Ulrich, Peter C.; and Wegle, Dilip R., to Alteon Inc. Aminopyrazoles. 5,500,439, Cl. 514-404.000.
Umeda, Toshihiko; and Tsugami, Itsuma, to Ricoh Co., Ltd.; and Ricos Co., Ltd. Backing chorus reproducing device in a karaoke device. 5,499,922, Cl. 434-307.00A.
Umeyama, Mitsuhiro: *See*—
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Underwood, Mark R., to Deere & Company. Modular threshing assembly for a combine. 5,499,948, Cl. 460-119.000.
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Behan, John M.; Ness, Jeremy N.; and Perring, Keith D., 5,500,223, Cl. 424-451.000.

Unisia Jecs Corporation: *See—*
Kawada, Shinichi, 5,499,706, Cl. 192-58.400.
Namiki, Masanori; Mori, Kazuyoshi; and Kato, Hideo, 5,499,769, Cl. 239-409.000.
Tomisawa, Naoki, 5,499,607, Cl. 123-435.000.

Unisys Corporation: *See—*
Tranquilla, Michael N., 5,499,810, Cl. 271-274.000.

United Apothecary, Inc.: *See—*
Riddle, George E.; Withrow, Ronnie J.; and Cox, George M., 5,500,002, Cl. 606-242.000.

United Microelectronics Corporation: *See—*
Cheng, Kuang-Chung; Tsai, Meng-Jia; Kuo, Ta-Chi; and Su, Kuo-Jaan, 5,500,545, Cl. 257-341.000.

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Air Force: *See—*
Chakmakjian, Stephen H.; Gruneisen, Mark T.; Koch, Karl W., III; and Moore, Gerald T., 5,500,865, Cl. 372-22.000.
Army: *See—*
Binder, Michael; and Mammone, Robert J., 5,500,201, Cl. 423-449.200.
Redman, Brian C.; Barr, Dallas N.; and Nettleton, John E., 5,500,729, Cl. 356-5.090.
Warren, Larry C.; and Assoka, Leo K., 5,500,061, Cl. 149-19.400.
Department of Commerce: *See—*
Zrnic, Dusan S., 5,500,646, Cl. 342-188.000.
Director, NSA: *See—*
Snow, Brian D., 5,500,899, Cl. 380-47.000.
Energy: *See—*
Kronberg, James W.; and Cadieux, James R., 5,499,529, Cl. 73-40.700.
Simandl, Ronald F.; and Brown, John D., 5,500,450, Cl. 521-64.000.
Health and Human Services: *See—*
Sayers, Thomas; Smyth, Mark J.; Wiltrout, Theresa A.; Powers, James C.; Sowder, Raymond; and Henderson, Louis E., 5,500,344, Cl. 435-6.000.
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Mowrey, Gary L.; Ganoe, Carl W.; and Monaghan, William D., 5,500,649, Cl. 342-22.000.
Riley, William D.; and Jong, Bing W., 5,500,100, Cl. 205-404.000.
National Aeronautics and Space Administration: *See—*
Evans, JuliAnn; Gundo, Daniel P.; Harper, Jennifer S.; Mulenburg, Gerald M.; and Skundberg, Thomas L., 5,499,609, Cl. 119-61.000.
Navy: *See—*
Thomas, G. Terry, 5,499,919, Cl. 434-45.000.

U.S. Philips Corporation: *See—*
Fert, Etienne, 5,500,677, Cl. 348-402.000.
Kellermann, Walter, 5,500,880, Cl. 375-377.000.
Leusler, Christoph G., 5,500,594, Cl. 324-318.000.
Liedenbaum, Coen T. H. F.; and Reid, John J. E., 5,500,908, Cl. 385-5.000.
Opbey, Willem G., 5,500,846, Cl. 369-116.000.
Vilard, Philippe, 5,500,690, Cl. 348-706.000.

United States Surgical Corporation: *See—*
Castro, Michael; and Toso, Kenneth E., 5,499,999, Cl. 606-208.000.
Feagin, John; and Glisson, Richard, 5,500,000, Cl. 606-232.000.
Gorecki, Michael J.; and Mastrony, Roger S., 5,499,708, Cl. 198-400.000.

United Technologies Corporation: *See—*
Schmaling, David N.; Miner, Frederick J.; and Byrnes, Francis E., 5,499,903, Cl. 416-134.00A.

Universal Propulsion Company, Inc.: *See—*
Lewis, Donald J., 5,499,579, Cl. 102-331.000.

University of British Columbia, The: *See—*
Allison, Bruce J.; Ciarniello, Joe E.; Dumont, Guy A.; and Tessier, Patrick J., 5,500,088, Cl. 162-198.000.
Smit, John; and Bingle, Wade H., 5,500,353, Cl. 435-69.100.

University of California, Regents of the: *See—*
Blum, Kenneth; Noble, E. P.; and Sheridan, P. J., 5,500,343, Cl. 435-6.000.
Lavin, Thomas N.; Norman, Mark P.; Klein, Teri E.; and Seibel, George, 5,500,807, Cl. 364-496.000.
McKeown, Nicholas W., 5,500,858, Cl. 370-60.000.

University of Leeds: *See—*
Fisher, John, 5,500,016, Cl. 623-2.000.

University of South Florida: *See—*
Benson, Robert F.; and Martin, Dean F., 5,500,193, Cl. 423-157.000.

University of Toronto Innovations Foundation, The: *See—*
Smith, James W.; Elleaor, David T. R.; and Harbinson, John N., 5,500,135, Cl. 210-787.000.

University of Toronto Innovations Foundation and Apollo Enviroamental Systems Corp., The: *See—*
Smith, James W.; Elleaor, David T. R.; and Harbinson, John N., 5,500,130, Cl. 210-703.000.

Universtiy of Toronto Innovations Foundation, The: *See—*
Smith, James W.; Elleaor, David T. R.; and Harbinson, John N., 5,500,129, Cl. 210-703.000.

Unno, Makoto: *See—*
Tanikawa, Hirohide; Uchiyama, Masaki; Joh, Yoshinobu; Akashi, Yasutaka; Taya, Masaaki; and Unno, Makoto, 5,500,318, Cl. 430-99.000.

UOP: *See—*
Schwartz, A. William, 5,500,122, Cl. 210-321.750.
Sechrist, Paul A.; Lawrence, Roger R.; Micklich, Frank T.; Richardson, Larry D.; and Kazell, David M., 5,500,110, Cl. 208-173.000.
Zarchy, Andrew S.; Chao, Chien C.; and Maurer, Richard T., 5,500,035, Cl. 95-41.000.

Uota, Katsumi, to Polyplastics Co., Ltd. Polyarylene sulfide resin composition. 5,500,471, Cl. 524-262.000.

Uotila, Pekka A., to Instrumentarium Corporation. Data transmission system and equipment. 5,500,854, Cl. 370-17.000.

Upjohn Company, The: *See—*
Johnson, Roy A., 5,500,417, Cl. 514-89.000.

Urbach, Hansjörg: *See—*
Becker, Reinhard; Heaning: Rainer; Rüger, Wolfgang; Teetz, Volker; and Urbach, Hansjörg, 5,500,434, Cl. 514-356.000.

Urbaco (S.A.R.L.): *See—*
Verra, Yvan, 5,499,887, Cl. 404-6.000.

Ushida, Yoshihisa; and Mase, Hiroshi, to Mitsui Petrochemical Industries, Ltd. Piezoelectric ceramics. 5,500,142, Cl. 252-62.90R.

USX Corporation: *See—*
Witter, Jay W.; and Slezak, Michael, 5,499,798, Cl. 266-275.000.

Utex Industries, Inc.: *See—*
Pippert, Aaron J.; and Pippert, Frederick B., 5,499,826, Cl. 277-188.00A.

Utley, Mike K.: *See—*
Hein, Todd J.; and Utley, Mike K., 5,499,985, Cl. 606-99.000.

Utz, Christopher G.; Hollis, Rebecca P.; and Sekmistrz, Johnny M., to BASF Corporation. Pesticide compositions containing blends of block copolymers with anionic surfactants having improved dissolution rates. 5,500,219, Cl. 424-409.000.

Uya, Masaru, to Matsushita Electric Industrial Co., Ltd. Croma-key live-video compositing circuit. 5,500,684, Cl. 348-592.000.

Vaisala Oy: *See—*
Blomberg, Martti; Orpana, Markku; Lehto, Ari; and Korhonen, Anssi, 5,500,569, Cl. 313-578.000.

Valkering, Josef E. P., to Euromate Industrial Air Cleaning Systems B.V. Device for exhausting gas or the like. 5,499,946, Cl. 454-63.000.

Vallabhaneni, Siva V.: *See—*
Francis, Debra C.; Vallabhaneni, Siva V.; and Wong, Bert C., 5,500,274, Cl. 428-156.000.

Valmet Paper Machinery, Inc.: *See—*
Autio, Jukka, 5,500,090, Cl. 162-273.000.
Raudeskoski, Vesa, 5,499,779, Cl. 242-541.400.

Van den Bergh Foods Co., Division of Conopco, Inc.: *See—*
Buensow, Rudolf; and Egle, Hans, 5,500,231, Cl. 426-18.000.

Van, Kazuo; Obta, Kenji; Inui, Tetsuya; Nagaura, Toshikazu; Takemori, Hirotoshi; and Toki, Hirotaka, to Sharp Kabushiki Kaisha. Optical disk with grooves and pits of different depths. 5,500,850, Cl. 369-275.400.

Vanbesien, Johan: *See—*
Longueville, Jacques; and Vanbesien, Johan, 5,500,788, Cl. 361-800.000.

Vandeaboache, Jean J.: *See—*
Cotteret, Jean; Audousset, Marie P.; LaGrange, Alain; and Vandenbosche, Jean J., 5,500,021, Cl. 8-408.000.

Vander Groef, Robert L., to Communication Cable, Inc. Winding machine with programmable traverse control. 5,499,775, Cl. 242-158.00B.

van der Kort, Jacobus J. C.: *See—*
de Jong, Robertus E.; and van der Kort, Jacobus J. C., 5,500,476, Cl. 524-377.000.

Vanderminden, Robert D., Sr., to Telescope Casual Furniture Co. Trestle table. 5,499,585, Cl. 108-153.000.

Van Der Ouderaa, Franciscus J.: *See—*
Cummins, Diane; Van Der Ouderaa, Franciscus J.; and Traudt, Michael D., 5,500,448, Cl. 514-717.000.

Van Der Plas, Gert: *See—*
Sierens, Christiaan H. J.; Steigenberger, Ulrich; Berger, Werner; Harnisch, Stephen; Van Der Plas, Gert; and Mestdeagh, Denis J. G., 5,500,755, Cl. 359-161.000.

Vangbo, Håkan, to AB Carl Munters. Method for the manufacture of a contact body for the exchange of moisture or heat. 5,500,402, Cl. 502-408.000.

Vanguard Automation, Inc.: *See—*
McGill, Scott D., 5,499,487, Cl. 53-473.000.

Van Hekken, Hendrik R., to Westinghouse Electric Corporation. Composite foam chair cushion and method. 5,499,413, Cl. 5-464.000.

Vannice, Steven D.: *See—*
Bhatia, Chandrakant R.; Kuhns, Richard J.; Vannice, Steven D.; and Stober, Michael E., 5,499,718, Cl. 209-524.000.

VanVeen, Barry P.: *See—*
Chen, Jiasbu; VanVeen, Barry P.; and Hecox, Kurt E., 5,500,900, Cl. 381-17.000.

Van Wauwe, Jean P. P.; and Raeymaekers, Alfons H. M., to Janssen Pharmaceutica, N.V. Method of treating epithelial disorders. 5,500,435, Cl. 514-394.000.

Van Weynbergh, Jacques: *See—*
Germain, Albert; Pirard, Jean-Paul; Delattre, Véronique; Van Weynbergh, Jacques; and Vogels, Claude, 5,500,202, Cl. 423-584.000.

Varaprasad, Desaraju V.; Lozman, Steven D.; Zhao, Miagtang; Habibi, Hamid R.; and Lynam, Niall R., to Donnelly Corporation. Electrochemichromic solutions, processes for preparing and using the same, and devices manufactured with the same. 5,500,760, Cl. 359-272.000.

Varta Batterie Aktiengesellschaft: *See—*





Lichtenberg, Frank; Kleinsorgen, Klaus; and Hofmann, Günter, 5,500,309, Cl. 429-223.000.

Vassiliadis, Stamatis: *See—*
Eichenseyer, Richard J.; and Vassiliadis, Stamatis, 5,500,942, Cl. 395-375.000.

Veeneman, William J.; Alexander, Karla J.; Doyle, Thomas J.; Brooks, Phillip R.; and Hamilton, Robert H., to Gift Certificate Center, The. Method and apparatus for generating gift certificates. 5,500,514, Cl. 235-381.000.

Venburg, Gregory D.: *See—*
Shafer, Warren E.; Woolard, Derek D.; Samuel, Neyyan K. P.; Venburg, Gregory D.; Devisetty, Bala N.; and Heiman, Daniel F., 5,500,403, Cl. 504-115.000.

Ventritex, Inc.: *See—*
Fain, Eric S., 5,500,008, Cl. 607-5.000.

Venzke, Donald R.; Hood, Teresa I.; and Emerick, W. Russell, to Square D Company. Handle assembly for a circuit breaker. 5,500,496, Cl. 200-339.000.

Verdura, Javier, Jr.: *See—*
Iaia, Mark; Dziersk, Mark; and Verdura, Javier, Jr., 5,499,748, Cl. 222-180.000.

Verkuil, Roger L., to International Business Machines Corporation. Probe-oxide-semiconductor method and apparatus for measuring oxide charge on a semiconductor wafer. 5,500,607, Cl. 324-761.000.

Verley, Donald: *See—*
McCann, Gerald P.; and Verley, Donald, 5,499,758, Cl. 222-386.500.

Vermeulen, Lori A.: *See—*
Thompson, Mark E.; Snover, Jonathan L.; and Vermeulen, Lori A., 5,500,297, Cl. 428-411.100.

Vermillion, James H. Ski sharpening guide with file-support platforms. 5,499,555, Cl. 76-83.000.

Vernon, Patrick D.: *See—*
Green, Malcolm L.; Cheetham, Anthony K.; Vernon, Patrick D.; and Ashcroft, Alexander T., 5,500,149, Cl. 252-373.000.

Verra, Yvan, to Urbaco (S.A.R.L.). Electric retractable boundary mark. 5,499,887, Cl. 404-6.000.

Viable Bioproducts, Ltd.: *See—*
Aalto, Jouni; Paktanen, Raimo; Satama, Lea; Luopa, Jyrki; Allén, Timo; Virtanen, Arja; and Kanttinen, Ari, 5,500,229, Cl. 424-535.000.

Victor Company of Japan, Ltd.: *See—*
Higurashi, Seiji; Teranishi, Yasuhiko; Yamada, Yasuaki; and Ohishi, Takeo, 5,500,679, Cl. 348-432.000.

Videojet Systems International Inc.: *See—*
Bhatia, Chandrakant R.; Kuhns, Richard J.; Vannice, Steven D.; and Stober, Michael E., 5,499,718, Cl. 209-524.000.

Vierk, David T.: *See—*
Richardson, Darrel; Grzesiak, Anthony J.; and Vierk, David T., 5,499,700, Cl. 188-77.00W.

Vilard, Philippe, to U.S. Philips Corporation. Television apparatus provided with a device for selecting different sources. 5,500,690, Cl. 348-706.000.

Vincent, C. Elmas, Jr.; and Galanis, Anthony. Cleaning apparatus for removing oily waste. 5,499,643, Cl. 134-104.400.

Vincenti, Paul J.: *See—*
Mendolia, Michael S.; Esposito, Anthony; Tassoff, James A.; Ross, Lloyd; Fessock, Paul J.; Barr, Morton L.; and Vincenti, Paul J., 5,500,209, Cl. 424-66.000.

Vinokur, Michael. Liquid injection system for internal combustion engine. 5,499,603, Cl. 123-25.00E.

Virtanen, Arja: *See—*
Aalto, Jouni; Paktanen, Raimo; Satama, Lea; Luopa, Jyrki; Allén, Timo; Virtanen, Arja; and Kanttinen, Ari, 5,500,229, Cl. 424-535.000.

Visa International: *See—*
Langhans, Stephen; Goodman, Laurence M.; and Shapiro, Sigman, 5,500,513, Cl. 235-380.000.

Vishwakarma, Lal C.; and Brown, Glenn, to Eastman Kodak Company. Benzotriazole based UV absorbers and photographic elements containing them. 5,500,332, Cl. 430-512.000.

Voest-Alpine Eisenbahnsysteme Aktiengesellschaft: *See—*
Durchschlag, Gerald; and Klein, Herbert, 5,499,786, Cl. 246-448.000.

Voest-Alpine Industrieanlagenbau GmbH: *See—*
Nieder, Wolfgang; Winkler, Manfred; Perchtold, Gerhard; Seirlehner, Leo; Kohler, Herbert; and Eberle, Arwed, 5,500,032, Cl. 75-414.000.

Vogel, Rudolf; and Evrea, Hünsll, to Sulzer Rueti AG. Method for preventing the formation of fabric blemishes by controlling beat-up in a loom. 5,499,662, Cl. 139-26.000.

Vogels, Claude: *See—*
Germain, Albert; Pirard, Jean-Paul; Delattre, Véronique; Van Weynbergh, Jacques; and Vogels, Claude, 5,500,202, Cl. 423-584.000.

Vogt, Carl R., to Borg-Warner Automotive, Inc. Microprocessor based universal digital pressure sensor. 5,500,509, Cl. 219-501.000.

Volcansek, Steven J.: *See—*
Lulkart, Myron E.; Pezak, Edward A.; Kuhns, Howard C. B.; and Volcansek, Steven J., 5,499,521, Cl. 72-157.000.

Volkert, Cynthia A.: *See—*
Harriott, Lloyd R.; Liddle, James A.; Volkert, Cynthia A.; Waskiewicz, Warren K.; and Windt, David L., 5,500,312, Cl. 430-5.000.

Voltech Instruments Limited: *See—*
Ford, John S., 5,500,598, Cl. 324-547.000.

Vondell, Edward P.; Mobley, Juliana; Nunez, Joseph M.; Maas, Charles A.; Stuch, Donald; and Yu, Jinquan, to Chrysler Corporation. Pneumatic tester for engine oil pumps. 5,499,530, Cl. 73-49.700.

Vonier, Nathan; and Whitten, Jim, to Agri Dynamics, Inc. Apparatus for testing condoms. 5,499,898, Cl. 414-755.000.

Vos, Stephen J.: *See—*
Heisman, Richard A.; Mosley, Keith; and Vos, Stephen J., 5,499,495, Cl. 56-320.100.

Voss, Darrell: *See—*
Klein, Gary G.; and Voss, Darrell, 5,499,864, Cl. 301-95.000.

Vranckx, Henri; Demoustier, Martine; and Deleers, Michel, to U C B S.A. Pharmaceutical compositions containing nanocapsules. 5,500,224, Cl. 424-451.000.

Vratsanos, Means S.: *See—*
Burgoyne, William P., Jr.; Daniels, Wiley E.; Sagl, Dennis; Lee, Heuch-Chi; and Vratsanos, Means S., 5,500,251, Cl. 427-322.000.

W. L. Gore & Associates, Inc.: *See—*
Baker, Bamdad, 5,499,528, Cl. 73-23.200.
Dauber, Edwin G.; Mortimer, William P., Jr.; and Winterling, Michael S., 5,500,038, Cl. 96-135.000.

W.R. Grace & Co.-Conn.: *See—*
Mirle, Srinivas K.; and Carney, Eugene E., 5,500,470, Cl. 524-204.000.

W. Schlafhorst AG & Co.: *See—*
Rasch, Hans; and Wassen, Willi, 5,499,773, Cl. 242-43.00R.

Wabco Standard GmbH: *See—*
Geiger, Hartmut; Gocz, Reinhard; Lentz, Uwe; Lucas, Johann; and Zimpel, Dieter, 5,499,845, Cl. 280-840.000.

Waclawsky, John G.: *See—*
Hershey, Paul C.; and Waclawsky, John G., 5,500,855, Cl. 370-17.000.

Wada, Kiyoshi: *See—*
Taside, Hideo; Maruaaka, Masayuki; Mori, Shigeru; Wada, Kiyoshi; Yoshizaki, Isao; and Ogura, Naoyuki, 5,500,747, Cl. 359-40.000.

Wada, Shigeaki: *See—*
Okada, Atsunori; Wada, Shigeaki; Kasanagi, Shigekazu; and Fujioka, Tohru, 5,500,571, Cl. 313-635.000.

Wada, Takahiro; Ikeda, Mitsunake; Nishitani, Mikihiko; Terauchi, Masaharu; Negami, Takayuki; and Kohara, Naoki, to Matsushita Electric Industrial Co., Ltd. Solar cell containing low melting point glass layer. 5,500,056, Cl. 136-259.000.

Wada, Yukio; Morimoto, Kyoichi; Goibuchi, Takayuki; and Tomiyasu, Hiroshi, to Doryokuro Kakunenryo Kaihatsu Jigyodan. Method of separating neptunium and plutonium. 5,500,192, Cl. 423-10.000.

Wafler, Walter F.: *See—*
Ta, Lacng N.; Pesar, Robert J.; and Wafler, Walter F., 5,500,715, Cl. 355-204.000.

Wagle, Dilip R.: *See—*
Ulrich, Peter C.; and Wagle, Dilip R., 5,500,439, Cl. 514-404.000.

Wagner, Gerhard; and Hein, Lother, to Mercedes-Benz AG. Control method and arrangement for a regulating variable determining a motor vehicle clutch rotational speed difference. 5,499,954, Cl. 477-174.000.

Wahl, George; Dietz, Matthias; Schote, Norbert; Klosterhuber, Robert; Sommerer, Karl; Kunert, Reinhard; and Gerber, Fritz, to Dr. Ing. h.c.F. Porsche AG. Wheel suspension system with elastokinematic wheel adjustment. 5,499,839, Cl. 280-701.000.

Waite, John M.: *See—*
Doane, Howard, Jr.; Covino, Alfred F.; and Waite, John M., 5,499,444, Cl. 29-830.000.

Wakabayashi, Hiroshi: *See—*
Homma, Michihide; Yoshihara, Atsuko; Wakabayashi, Hiroshi; and Isayama, Katsuhiko, 5,500,464, Cl. 523-435.000.

Wakamiya, Syun'itirou: *See—*
Maruyama, Koichi; Wakamiya, Syun'itirou; Iwaki, Makoto; and Oono, Masahiro, 5,500,767, Cl. 359-642.000.

Walbrink, Harold J.: *See—*
Beuchat, Charles E.; Etherington, Roger; Walbrink, Harold J.; and Berkman, John W., 5,499,969, Cl. 604-30.000.

Walenga, Guy J.: *See—*
Koch, Russell W.; Turner, John L.; Walenga, Guy J.; Takigawa, Hiroyoshi; and Okamoto, Keizo, 5,500,065, Cl. 156-123.000.

Walker, James A.: *See—*
Goossen, Keith W.; and Walker, James A., 5,500,761, Cl. 359-290.000.

Walker, Kenneth L.: *See—*
Atkins, Robert M.; Lemaire, Paul J.; Mizrahi, Victor; and Walker, Kenneth L., 5,500,031, Cl. 65-386.000.

Wallace, Vernon R.; McMullen, Michael S.; and Archibald, William R., to FloWind Corporation. Vertical axis wind turbine with pultruded blades. 5,499,904, Cl. 416-230.000.

Walley, Ian M.; and Hankins, Timothy R. F., to Scantronic Limited. Satellite unit identification system. 5,500,639, Cl. 340-539.000.

Wallisch, Heinz; Dönges, Reinhard; and Meyer-Blumenroth, Ulrich, to Hoechst AG. Process for the purifying working-up of reaction media and/or wash media obtained during preparation of cellulose ethers. 5,500,124, Cl. 210-651.000.

Walter, Jeffrey S.; Gano, John C.; and Jones, Desmond, to Halliburton Company. Diverter, diverter retrieving and running tool and method for running and retrieving a diverter. 5,499,680, Cl. 166-377.000.

Walter, Lee; and Adamson, Steven J., to Eastman Kodak Company. Laminated metal structure and metod of making same. 5,500,279, Cl. 428-213.000.

Walts, Connie R.: *See—*
Pilcski, Michael J.; Wood, Robert J.; and Walts, Connie R., 5,500,918, Cl. 385-117.000.

Wang, Albert R., to Synopsys, Inc. Apparatus and method for estimating time delays using unmapped combinational logic networks. 5,500,808, Cl. 364-578.000.
Wang, Chih C. Multipurpose inflatable floating pillow. 5,499,417, Cl. 5-652.000.
Wang, Guo C. Mono-polar pre-filter electrolyzer with vertical power-supply rods. 5,500,104, Cl. 204-253.000.
Wang, King-Sheng. Retractable handle assembly. 5,499,702, Cl. 190-115.000.
Wang, Lixiao; and Tran, The T. T., to Scimed Life Systems, Inc. Shrinking balloon catheter having nonlinear compliance curve. 5,500,181, Cl. 264-532.000.
Wang, Lixiao: *See*—
Buscemi, Paul J.; Stajduhar, Elizabeth A.; Palme, Donald F., II; and Wang, Lixiao, 5,500,013, Cl. 623-1.000.
Wang, Martha Y.: *See*—
Addesso, Kevin; Dzurenko, Theresa E.; Moisey, Mark J.; Levine, Harry; Slade, Louise; Mauss, James M.; Fazzolare, Richard D.; Ievolella, James; and Wang, Martha Y., 5,500,240, Cl. 426-560.000.
Wang, Ping: *See*—
Hsu, Just-Chi; Jeng, Ching S.; and Wang, Ping, 5,500,826, Cl. 365-230.010.
Wang, Xuan: *See*—
Godfroid, Jean-Jacques; Lamouri, Aazdine; Touboul, Estera; Wang, Xuan; Renard, Pierre; Pfeiffer, Bruno; and Guardiola, Béatrice, 5,500,426, Cl. 514-252.000.
Wanke, Wilhelm: *See*—
Bäck, Rudolf; Egelhof, Dieter; Hensler, Klaus; Kade, Werner; Meinecke, Albrecht; Wanke, Wilhelm; and Walz, Hans-Jürgen, 5,500,091, Cl. 162-301.000.
Ward, Paul C.: *See*—
Green, Andrew; and Ward, Paul C., 5,499,488, Cl. 53-474.000.
Warda, Gary G.; and Cook, Kenneth J., to Warda, Gary G. Circuit and method for controlling fastener application. 5,500,783, Cl. 361-179.000.
Ware, Robert A.: *See*—
Keville, Kathleen M.; Timken, Hye K. C.; and Ware, Robert A., 5,500,109, Cl. 208-111.000.
Warner, Thomas B.: *See*—
Short, Michael K.; Grieser, Jerry D.; Nelson, Richard A.; Warner, Thomas B.; and Maguire, Ferrol M., 5,499,886, Cl. 403-381.000.
Warnsholz, Gary L.: *See*—
Deutsch, Timothy A.; and Warnsholz, Gary L., 5,499,491, Cl. 56-10.20H.
Warren, Larry C.; and Asaoka, Leo K., to United States of America, Army. Silicon as high performance fuel additive for ammonium nitrate propellant formulations. 5,500,061, Cl. 149-19.400.
Waskiewicz, Warren K.: *See*—
Harriott, Lloyd R.; Liddle, James A.; Volkert, Cynthia A.; Waskiewicz, Warren K.; and Windt, David L., 5,500,312, Cl. 430-5.000.
Wassen, Willi: *See*—
Raasch, Hans; and Wassen, Willi, 5,499,773, Cl. 242-43.00R.
Watabe, Masahiro, to Fujitsu Limited. Dry process apparatus using plural kinds of gas. 5,500,256, Cl. 427-579.000.
Watanabe, Akinori: *See*—
Hayashi, Toshihiro; Kohno, Hiroshige; Watanabe, Akinori; and Horiguchi, Haru, 5,500,178, Cl. 264-297.800.
Watanabe, Hiroyuki: *See*—
Hasegawa, Yasuaki; Tsukada, Kazuaki; Watanabe, Hiroyuki; Tsuzuki, Kenji; Murakami, Mitsuyuki; and Niimi, Noritoshi, 5,500,408, Cl. 504-261.000.
Watanabe, Kenjiro, to Canon Kabushiki Kaisha. Ink jet recording method for recording in plural scans. 5,500,662, Cl. 347-43.000.
Watanabe, Kenjiro: *See*—
Hattori, Yoshifumi; Inada, Genji; and Watanabe, Kenjiro, 5,500,658, Cl. 347-22.000.
Watanabe, Masao, to Fuji Xerox Co., Ltd. Optical writing type electro-optical device. 5,500,491, Cl. 178-18.000.
Watanabe, Masashi: *See*—
Yoshida, Satoru; Sato, Keiji; Mochizuki, Masamichi; Watanabe, Masashi; and Kato, Takashi, 5,499,510, Cl. 62-175.000.
Watanabe, Ryu: *See*—
Tanaka, Takayuki; Watanabe, Ryu; Oonami, Yuuichi; and Eto, Yoshizumi, 5,500,676, Cl. 348-387.000.
Watanabe, Shigeomi: *See*—
Makino, Kenzi; Akiyama, Shigeaki; Suzuki, Hideaki; Nagaoka, Takeshi; Niki, Toshio; Suzuki, Koichi; Nawamaki, Tsutomu; Watanabe, Shigeomi; and Ishikawa, Kimihiro, 5,500,406, Cl. 504-215.000.
Watanabe, Shinichi; Shoji, Norio; and Sako, Michiya, to Sony Corporation. Current setting circuit to provide a write current to a recording apparatus. 5,500,774, Cl. 360-46.000.
Watanabe, Tadashi: *See*—
Kimura, Akira; Watanabe, Tadashi; Inoue, Tsuyoshi; and Nakamachi, Keiichi, 5,499,545, Cl. 73-864.180.
Watanabe, Toshiyuki: *See*—
Mizukawa, Yuki; Naruse, Hideaki; Watanabe, Toshiyuki; and Sato, Tadahisa, 5,500,334, Cl. 430-558.000.
Watanabe, Toyofumi: *See*—
Udagawa, Satoru; Abe, Masaki; Ando, Satoru; Matsuki, Yasuhiro; Watanabe, Toyofumi; Shiohara, Yukinitsu; Morita, Masaya; and Kido, Akimasa, 5,500,290, Cl. 428-610.000.
Waterhouse, Robert W. Redundant joint structure and method. 5,499,882, Cl. 403-171.000.
Weaver, Damian G.: *See*—
Rosen, Robert E.; Weaver, Damian G.; Cornille, Jane W.; and Spangler, Lori A., 5,500,405, Cl. 504-195.000.
Weber, Robert J.: *See*—
Willman, Richard L.; Weber, Robert J.; and Hassoun, Marwan M., 5,499,626, Cl. 128-630.000.
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Curras, Donald P., Jr.; Pollocks, Lonnie J., Jr.; Broemes, David P., Sr.; Carreira, Leonard M.; and Trenchard, Thomas J., 5,500,659, Cl. 347-28.000.
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Lombardo, Timothy J.; and Maier, Gary J., 5,500,105, Cl. 205-67.000.
Mahabadi, Hadi K.; Agur, Enno E.; McAneney, T. Brian; Kao, Sheen V.; Allison, Gerald R.; Hawkins, Michael S.; Granikin, Bernard; Kistelberger, J. Stephen; Chung, Joo T.; and Hollenbaugh, William H., Jr., 5,500,324, Cl. 430-137.000.
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Someya, Kousuke; Yamazaki, Akihiro; Hoshino, Futoshi; and Yanagihara, Takeshi, 5,500,286, Cl. 428-402.240.
Yamazaki, Koichi: *See*—
Fujino, Keijirou; and Yamazaki, Koichi, 5,500,841, Cl. 369-44.260.
Yamazaki, Kouichi; and Ogawa, Nobuyoshi, to Shin-Etsu Polymer Co., Ltd. Elastomer-based connector sheet. 5,500,280, Cl. 428-220.000.
Yamazaki, Shigeki; Kato, Kazuhiro; Ishii, Takayuki; and Saitai, Hisao, to Sony Corporation. Capstan motor and sheet metal bearing housing thereof. 5,499,753, Cl. 226-194.000.
Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Photoelectric conversion device. 5,500,051, Cl. 136-244.000.
Yamazaki, Shunpei; and Mase, Akira, to Semiconductor Energy Laboratory Co., Ltd. Electro-optical device and method of driving the same. 5,500,538, Cl. 257-49.000.
Yamazaki, Shunpei: *See*—
Kadono, Masaya; and Yamazaki, Shunpei, 5,500,539, Cl. 257-77.000.
Yamazaki, Youichi: *See*—
Kazami, Kazuyuki; Yokonuma, Norikazu; Yamazaki, Youichi; and Hibino, Hideo, 5,500,709, Cl. 354-416.000.
Yan, Ran-Hong: *See*—
Bevk, Jose; Feldman, Leonard C.; Gossmann, Hans-Joachim L.; Luftman, Henry S.; and Yan, Ran-Hong, 5,500,391, Cl. 437-131.000.
Yanagihara, Masamitsu: *See*—
Koitabashi, Hideki; Yanagihara, Masamitsu; and Hazama, Junji, 5,500,736, Cl. 356-375.000.
Yanagihara, Takeshi: *See*—
Someya, Kousuke; Yamazaki, Akihiro; Hoshino, Futoshi; and Yanagihara, Takeshi, 5,500,286, Cl. 428-402.240.



Yanagisawa, Ken. Two dimensional drive system. 5,499,552, Cl. 74-471.0XY.
Yanagisawa, Munehisa; Tamura, Yuki; and Kokubo, Norihide, to Shin-Etsu Handotai Co., Ltd. Method for control of Si concentration in gallium phosphide single crystal layer by liquid phase epitaxial growth technique. 5,500,390, Cl. 437-120.000.
Yanagisawa, Ryozo: *See*—
Kobayashi, Katsuyuki; Taniishi, Shinnosuke; Tanaka, Atsushi; Yoshimura, Yuichiro; Kaneko, Kiyoshi; Yanagisawa, Ryozo; and Tokioka, Masaki, 5,500,492, Cl. 178-18.000.
Yanagisawa, Takaaki: *See*—
Ichikawa, Hideo; Saito, Takeshi; Ikeda, Sunao; Makita, Nobuhiro; Ozawa, Seiji; Yoshiki, Shigeru; and Yanagisawa, Takaaki, 5,500,719, Cl. 355-260.000.
Yanagisawa, Tatsuo: *See*—
Kigawa, Kazuya; Furukawa, Kenji; Deguchi, Tetsu; Inoue, Sachiharu; Endo, Norikatsu; Yanagisawa, Tatsuo; Ikegami, Shinji; Omagari, Yasuyuki; Kihara, Koji; Sugawara, Tachiki; and Shimizu, Kenzo, 5,499,796, Cl. 254-133.00R.
Yang, Danny D. L., to Eastman Kodak Company. Process for planarizing substrate surfaces for magnetic thin film heads. 5,500,243, Cl. 427-126.300.
Yang, Jerry S. C. Electrical-conducting structure of a lighting fixture. 5,499,931, Cl. 439-431.000.
Yang, Shiow-Shong: *See*—
Christianson, Teresa; Goddette, Dena; Ladia, Beth F.; Lau, Maria R.; Pasch, Christian; Reynolds, Robert B.; Wilson, Charles R.; and Yang, Shiow-Shong, 5,500,364, Cl. 435-221.000.
Yang, Tai-Her. Double-acting type dynamic back clearance relief driving system. 5,499,551, Cl. 74-427.000.
Yang, Weikang: *See*—
Shou, Guoliang; Yang, Weikang; Takatori, Sunao; and Yamamoto, Makoto, 5,500,810, Cl. 364-724.010.
Yang, Woong-Chul: *See*—
Glidewell, John M.; Chui, Granger K.; and Yang, Woong-Chul, 5,499,538, Cl. 73-119.00A.
Yang, Xinmin: *See*—
Marks, Tobin J.; and Yang, Xinmin, 5,500,398, Cl. 502-103.000.
Yano, Yoshihiro: *See*—
Tsushima, Hideaki; Sasaki, Shinya; Nakano, Yukio; Nakano, Hiroyuki; Tateyari, Ryoji; Matsuda, Hironari; Tomooka, Kenji; Sakakida, Naohiro; Nishimura, Shin; Yano, Yoshihiro; Igarashi, Youichi; Aoki, Satoshi; Takatori, Masahiro; Kazawa, Tohru; and Ashi, Yoshihiro, 5,500,756, Cl. 359-174.000.
Yao, Masaharu: *See*—
Yamaguchi, Noriyuki; Kurashita, Takuji; Ishizuka, Mitsuru; Kijima, Junko; and Yao, Masaharu, 5,500,686, Cl. 348-663.000.
Yap, Loo T., to BOC Group, Inc., The. Melt heating method. 5,500,033, Cl. 75-386.000.
Yashiro, Masahiko; Sasaki, Shinichi; Ikemoto, Isao; Miura, Koji; Karakama, Toshiyuki; and Numagami, Atsushi, to Canon Kabushiki Kaisha. Process cartridge, method for assembling process cartridge and image forming appararatus. 5,500,714, Cl. 355-200.000.
Yasuda, Hajime: *See*—
Kaiho, Mamoru; and Yasuda, Hajime, 5,499,532, Cl. 73-76.000.
Yasuda, Shingo: *See*—
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Yasuike, Madoka: *See*—
Toba, Yasumasa; Yasuike, Madoka; and Takeo, Yamaguchi, 5,500,453, Cl. 522-25.000.
Yatomi, Toshiya; and Enari, Masahiko, to Canon Kabushiki Kaisha. Image display apparatus. 5,500,683, Cl. 348-565.000.
Yauchi, Hitoshi; Sugiyama, Koichi; Miyashita, Akihiko; Satoh, Nakatoshi; Sugawara, Tatsuo; Sato, Hiroyuki; and Onozato, Takashi, to Alps Electric Co., Ltd. Air-bubble detection apparatus of ink jet recording head, and method and apparatus for restoring ink jet recording head. 5,500,657, Cl. 347-9.000.
Yayoi Corporation: *See*—
Hayashi, Toshisumi, 5,499,717, Cl. 206-701.000.
Yazaki Corporation: *See*—
Akeda, Nobuyuki, 5,499,926, Cl. 439-157.000.
Yazdy, Farid A.; and Dhuey, Michael J., to Apple Computer, Inc. Method and apparatus for improved DRAM refresh operation. 5,500,827, Cl. 365-222.000.
Yeh, Jang-Hun: *See*—
Alonas, Paul G.; Yeh, Jang-Hun; and Harton, Austin V., 5,500,912, Cl. 385-37.000.
Yim, Myung-Shik. Wave power generator. 5,499,889, Cl. 405-76.000.
Ying, Shih-Hsin: *See*—
Tang, Yingsheng; Dixon, Robert E.; and Ying, Shih-Hsin, 5,500,387, Cl. 437-60.000.
Yiotakis, Athanasios: *See*—
Dive, Vincent; Toma, Flavio; and Yiotakis, Athanasios, 5,500,414, Cl. 514-18.000.
Yohda, Hiroshi: *See*—
Hasegawa, Kenji; and Yohda, Hiroshi, 5,500,777, Cl. 360-77.160.
Yokohama Rubber Co., Ltd., The: *See*—
Muraki, Takao; and Ishikawa, Yasuhiro, 5,500,482, Cl. 525-98.000.
Yokomizo, Kanji: *See*—
Saitoh, Yasuhiko; Iwata, Yasuo; Kuzuma, Seiichi; Nakajima, Yoshihide; and Yokomizo, Kanji, 5,500,437, Cl. 514-397.000.
Yokonuma, Norikazu: *See*—
Kazami, Kazuyuki; Yokonuma, Norikazu; Yamazaki, Youichi; and Hibino, Hideo, 5,500,709, Cl. 354-416.000.
Yokoyama, Mikio: *See*—
Itoh, Shigeo; Yokoyama, Mikio; Tonegawa, Takeshi; and Kadowaki, Akira, 5,499,939, Cl. 445-73.000.
Yoneda, Koichi: *See*—
Iwasaki, Hidehara; Yoneda, Koichi; Kido, Yoichi; Hosogai, Takeo; Itoi, Kazuo; and Kitayama, Masahiko, 5,500,484, Cl. 568-660.000.
Yoneyama, Yoshio, to Nihon Chikudenki Kogyo Kabushiki Kaisha. Method of etching aluminum foil for electrolytic capacitor. 5,500,101, Cl. 205-646.000.
Yoshiki, Banzawa, to Nippei Toyama Corporation. Laser beam machining device and laser beam machining method. 5,500,507, Cl. 219-121.820.
Yoshida, Hideo, to Fuji Photo Optical Co., Ltd. Autofocusing controlling apparatus for camera. 5,500,707, Cl. 354-403.000.
Yoshida, Hirokazu, to Sharp Kabushiki Kaisha. Electrodes on a mounting substrate and a liquid crystal display apparatus including same. 5,500,787, Cl. 361-779.000.
Yoshida, Katsumi: *See*—
Hirakawa, Tetsuro; Kaneko, Masayoshi; and Yoshida, Katsumi, 5,500,058, Cl. 148-649.000.
Yoshida, Kenichi: *See*—
Matsumoto, Takahiro; Sameshima, Shogo; and Yoshida, Kenichi, 5,500,445, Cl. 514-474.000.
Yoshida Kogyo K.K.: *See*—
Sawada, Ryozo; Hirasawa, Masanori; Yamaguchi, Yoshiharu; Funakawa, Shigeru; and Kanayama, Masaru, 5,500,276, Cl. 428-192.000.
Terada, Yasuharu; Suzuki, Tsuneo; Matsushima, Hideyuki; and Horita, Yoshiyuki, 5,499,432, Cl. 24-599.200.
Yoshida, Kojun, to Fujitsu Limited. Fault indication system in a centralized monitoring system. 5,500,944, Cl. 395-184.010.
Yoshida, Masaharu: *See*—
Horita, Manabu; Yoshida, Masaharu; and Takehara, Masataka, 5,500,502, Cl. 219-121.630.
Yoshida, Masanori: *See*—
Nagamine, Masashi; Yamamoto, Kenji; Horiuchi, Kenji; Matsui, Yoshimitsu; and Yoshida, Masanori, 5,500,424, Cl. 514-235.500.
Yoshida, Satoru; Sato, Keiji; Mochizuki, Masamichi; Watanabe, Masashi; and Kato, Takashi, to Hitachi, Ltd.; and Hitachi Shimizu. Multiple type air conditioner system and address setting method thereof. 5,499,510, Cl. 62-175.000.
Yoshida, Satoshi: *See*—
Sasakura, Miyoshi; Ohkura, Osamu; Mizoguchi, Takehiko; Hori, Satoru; and Yoshida, Satoshi, 5,500,932, Cl. 395-149.000.
Yoshida, Takayoshi; and Nashimoto, Yasunobu, to NEC Corporation. Fabrication method of field-effect transistor. 5,500,381, Cl. 437-41.000.
Yoshida, Yasuaki; Nakajima, Yasuo; and Aiga, Masao, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor laser array device, semiconductor laser device, and production methods therefor. 5,500,869, Cl. 372-50.000.
Yoshida, Yasumi: *See*—
Aoyama, Takeshi; and Yoshida, Yasumi, 5,500,726, Cl. 355-315.000.
Yoshihara, Atsuko: *See*—
Homma, Michihide; Yoshihara, Atsuko; Wakabayashi, Hiroshi; and Isayama, Katsuhiko, 5,500,464, Cl. 523-435.000.
Yoshihara, Ikuo, to Sony Corporation. Process for forming a bipolar type semiconductor device. 5,500,378, Cl. 437-31.000.
Yoshikawa, Kazuo: *See*—
Onishi, Takashi; Yoshikawa, Kazuo; Nishi, Seiji; and Yamamoto, Seigou, 5,500,301, Cl. 428-457.000.
Yoshiki, Shigeru: *See*—
Ichikawa, Hideo; Saito, Takeshi; Ikeda, Sunao; Makita, Nobuhiro; Ozawa, Seiji; Yoshiki, Shigeru; and Yanagisawa, Takaaki, 5,500,719, Cl. 355-260.000.
Yoshimura, Yuichiro: *See*—
Kobayashi, Katsuyuki; Taniishi, Shinnosuke; Tanaka, Atsushi; Yoshimura, Yuichiro; Kaneko, Kiyoshi; Yanagisawa, Ryozo; and Tokioka, Masaki, 5,500,492, Cl. 178-18.000.
Yoshinaga, Minoru: *See*—
Nojiri, Hironobu; Yakushiji, Kazuyuki; Yoshinaga, Minoru; and Terasaka, Hiroyuki, 5,499,776, Cl. 242-178.000.
Yoshiyama, Yoshiko: *See*—
Kitamura, Naomi; Miyazawa, Keiji; Daikubara, Yasushi; Tsubouchi, Hirohito; Naka, Daiji; Takahashi, Kazuhiro; Matsui, Rie; Yoshiyama, Yoshiko; and Ishii, Takehisa, 5,500,354, Cl. 435-69.400.
Yoshiyasu, Toshiaki: *See*—
Tanaka, Takashi; Miyazaki, Masaharu; Kasho, Yasunori; and Yoshiyasu, Toshiaki, 5,499,932, Cl. 439-446.000.
Yoshizaki, Isao: *See*—
Taside, Hideo; Muranaka, Masayuki; Mori, Shigeru; Wada, Kiyoshi; Yoshizaki, Isao; and Ogura, Naoyuki, 5,500,747, Cl. 359-40.000.
Yoshizaki, Koichi: *See*—
Nakagawa, Kenji; Yoshizaki, Koichi; Nukaga, Tadashi; Bamba, Yoshikazu; Hattori, Shigetaka; and Mochizuki, Kentaro, 5,499,791, Cl. 248-638.000.
Youcheff, Gary G.; Wodke, Stephen M.; and Perkins, Douglas W., to Mars, Incorporated. Composition for improving adherence of fat-based coatings to frozen fat-based confections. 5,500,233, Cl. 426-89.000.
Young, Glenda C., to Shell Oil Company. Stable waterborne epoxy resin dispersion containing micronized DICY. 5,500,461, Cl. 523-404.000.

Young, Glenda C., to Shell Oil Company. Stable waterborne epoxy resin dispersion containing micronized dicy. 5,500,462, Cl. 523-404.000.
Young, Kevin, to P.C. Young & Co., Inc. Edge-folded garland. 5,500,258, Cl. 428-10.000.
Young, Ralph H.: *See*—
Dotty, Michael R.; Sinicropi, John A.; Cowdery-Corvan, J. Robin; and Young, Ralph H., 5,500,317, Cl. 430-58.000.
Young, Richard M.: *See*—
Deems, James H.; Mileaf, Daryl S.; LaCour, Kevin E.; Rodriguez, Noe E., II; Legianes, Joseph M.; Johnson, Scott D.; Kapraun, Richard C.; and Young, Richard M., 5,500,187, Cl. 422-58.000.
Youngquist, John S. Storm monitor. 5,500,586, Cl. 324-72.000.
Youngquist, John S. Storm monitor. 5,500,602, Cl. 324-72.000.
Yozan Inc.: *See*—
Shou, Guoliang; Yang, Weikang; Takatori, Sunao; and Yamamoto, Makoto, 5,500,810, Cl. 364-724.010.
Yu Chou Enterprise Corporation: *See*—
Her, Jern-Shong, 5,499,858, Cl. 297-195.100.
Yu, Jinquan: *See*—
Vondell, Edward P.; Mobley, Juliana; Nunez, Joseph M.; Maas, Charles A.; Stach, Donald; and Yu, Jinquan, 5,499,530, Cl. 73-49.700.
Yuan, Wallace L, to Alliance Pharmaceutical Corp. Method of concentrating less volatile liquids. 5,500,096, Cl. 203-3.000.
Yuasa Corporation: *See*—
Uemichi, Sachio; and Takahashi, Shuji, 5,500,177, Cl. 264-277.000.
Yukumoto, Masao: *See*—
Shiga, Nobuo; Marui, Tomohiro; Shibuya, Kiyoshi; Sato, Toru; Ozawa, Michiharu; and Yukumoto, Masao, 5,499,673, Cl. 164-463.000.
Yun, Su I.: *See*—
Lee, Eun S.; Nedberge, Diane E.; and Yun, Su I., 5,500,222, Cl. 424-448.000.
Yun, Jong K.: *See*—
Strolle, Christopher H.; Patel, Chandrakant B.; Wedam, Werner F.; Schnitzler, Raymond; Wechzenbrock, Hermann J.; Ko, Jung W.; Yun, Jong K.; and Limberg, Allen L., 5,500,739, Cl. 358-310.000.
Yun, Sun-Jin: *See*—
Lee, Seung-Chang; Yun, Sun-Jin; Kim, Bo-Woo; and Kang, Sang-Woa, 5,500,389, Cl. 437-90.000.
Yurgelites, Gerald J. Telephone isolation device. 5,500,895, Cl. 379-412.000.
Zaborszki, Stephen J.; and Kreczko, Gregory, to Swagelok Quick-Connect Co. Method of forming a flexible metal hose connector. 5,499,439, Cl. 29-508.000.
Zambon Group S.p.A.: *See*—
Stroppolo, Federico; Bonadeo, Daniele; Fornasini, Gian F.; and Gazzaniga, Annibale, 5,500,226, Cl. 424-466.000.
Zambrano, Raffaele: *See*—
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Zamm, Joseph W.: *See*—
Tsai, M. Michael; Fletcher, David E.; and Zamm, Joseph W., 5,499,950, Cl. 474-138.000.
Zanussi Grandi Impianti S.p.A.: *See*—
Tommasini, Stelvio, 5,499,577, Cl. 99-476.000.
Zarchy, Andrew S.; Chao, Chien C.; and Maurer, Richard T., to UOP. Pressure swing adsorption process for chlorine plant offgas. 5,500,035, Cl. 95-41.000.
Zarubin, Alexander. Electron/ion microscope with improved resolution. 5,500,527, Cl. 250-306.000.
Zdral, Julian, to Chrysler Corporation. Valve spring compressor tool. 5,499,434, Cl. 29-220.000.
Zehr, Jürg: *See*—
Baechler, François; Strehler, Klaus; Harzenmoser, Isidor; and Zehr, Jürg, 5,499,546, Cl. 73-865.000.
Zeisz, Raymond L., Jr.: *See*—
Austin, Jon O.; Byrne, Jani G.; Bohn, Carole A.; Chiavegatto, Arlindo, Jr.; Smith, Jeffrey L.; and Zeisz, Raymond L., Jr., 5,500,934, Cl. 395-755.000.
Zellweger Luwa AG: *See*—
Aeppli, Kurt, 5,499,794, Cl. 250-559.450.
Baechler, François; Strehler, Klaus; Harzenmoser, Isidor; and Zehr, Jürg, 5,499,546, Cl. 73-865.000.
Zeneca Limited: *See*—
Austin, Peter W.; and Singer, Michael, 5,500,217, Cl. 424-401.000.
Zhang, Hong J.: *See*—
Potini, Chimpiramma; Wrobel, Stanley J.; Zhang, Hong J.; and Ellis, Edward J., 5,500,144, Cl. 252-174.150.
Zhao, Mingtang: *See*—
Varaprasad, Desaraju V.; Looman, Steven D.; Zhao, Mingtang; Habibi, Hamid R.; and Lyann, Niall R., 5,500,760, Cl. 359-272.000.
Zhou, Peter Y.; Paul, Christopher R.; and Pang, Dexing, to Knogo North America Inc. Method and apparatus for automatically desensitizing sensor elements of protected articles. 5,500,640, Cl. 340-572.000.
Zhou, Yong, to AT&T Corp. Low bit rate audio-visual communication system having integrated perceptual speech and video coding. 5,500,673, Cl. 348-156.000.
Ziegenbein, Botho: *See*—
Hopf, Gerald; Ziegenbein, Botho; and Maihoefer, Bernd, 5,499,541, Cl. 73-763.000.
Ziercher, Eric L.: *See*—
Campbell, Alan S.; Elbert, Donald L.; McCornack, William C.; and Ziercher, Eric L., 5,500,724, Cl. 355-297.000.
Zievers, Elizabeth C.: *See*—
Zievers, James F.; Zievers, Elizabeth C.; Aguilar, Peter; and Eggerstedt, Paul, 5,500,029, Cl. 55-485.000.
Zievers, James F.; Zievers, Elizabeth C.; Aguilar, Peter; and Eggerstedt, Paul, to Industrial Filter & Pump Mfg. Co. Filter element and method of manufacture. 5,500,029, Cl. 55-485.000.
Zimmer Aktiengesellschaft: *See*—
Schnaus, Walter; Streng, Michael; Schoenmeier, Franz; and Biller, Stephan, 5,499,652, Cl. 137-340.000.
Zimmer, Inc.: *See*—
Olson, Daniel H., 5,499,970, Cl. 604-35.000.
Zimpel, Dieter: *See*—
Geiger, Hartmut; Gocz, Reinhard; Lentz, Uwe; Lucas, Johann; and Zimpel, Dieter, 5,499,845, Cl. 280-840.000.
Zinter, J. Robert; and Rubea, Paul L., to Amarel Precision Instruments. Macroless system for emission microscopy. 5,500,770, Cl. 359-793.000.
Zisapel, Nava: *See*—
Laudon, Moshe; and Zisapel, Nava, 5,500,225, Cl. 424-464.000.
Znic, Dusan S., to United States of America, Department of Commerce. Simultaneous differential polymetric measurements and co-polar correlation coefficient measurement. 5,500,646, Cl. 342-188.000.
Zsek Corporation: *See*—
Hsu, Michael S.; and Wei, Irvine W., 5,500,306, Cl. 429-17.000.
Zucchini, Umberto, deceased (by Maria Stagni, Silvia Zucchini, Chiara Zucchini, heiresses): *See*—
Cuffiani, Illaro; Zucchini, Umberto, deceased, 5,500,397, Cl. 502-102.000.
Zumbragel, Michael: *See*—
Coenen, Hubert; Hubert, Helmut; and Zumbragel, Michael, 5,500,118, Cl. 210-603.000.

# LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 19th DAY OF MARCH, 1996

NOTE— Arranged in accordance with the first significant character or word if the name (in accordance with city and telephone directory practice).

Bell-Fruit Manufacturing Company Limited: *See*—
Howard, Terence, Re. 35,182, Cl. 273-143.00R.
Cohesive Technologies, Inc.: *See*—
Kolesinski, Henry S., Re. 35,185, Cl. 526-263.000.
Kolesinski, Henry S., Re. 35,186, Cl. 526-263.000.
Delaware Capital Formation, Inc.: *See*—
Paufve, Eldred H.; and Porterfield, Richard, Re. 35,180, Cl. 219-85.160.
Howard, Terence, to Bell-Fruit Manufacturing Company Limited. Gaming and amusement machines and reels for them. Re. 35,182, Cl. 273-143.00R.
Hudz, Paul H. Thermo-magnetic vaporizer carburetor. Re. 35,181, Cl. 261-142.000.
Iwasaki, Katsuyo: *See*—
Ose, Toshio; Yoshida, Toshifumi; and Iwasaki, Katsuyo, Re. 35,183, Cl. 315-370.000.
Khu, Kenneth F. Engine air intake vortex plate. Re. 35,179, Cl. D15-5.000.
Kolesinski, Henry S., to Cohesive Technologies, Inc. Separation media containing acyl diazepines. Re. 35,185, Cl. 526-263.000.
Kolesinski, Henry S., to Cohesive Technologies, Inc. Separation media containing acyl diazepines. Re. 35,186, Cl. 526-263.000.
Matsushita Electronics Corporation: *See*—
Ose, Toshio; Yoshida, Toshifumi; and Iwasaki, Katsuyo, Re. 35,183, Cl. 315-370.000.
Ose, Toshio; Yoshida, Toshifumi; and Iwasaki, Katsuyo, to Matsushita Electronics Corporation. Deflection yoke for use in color cathode ray tubes. Re. 35,183, Cl. 315-370.000.
Paufve, Eldred H.; and Porterfield, Richard, to Delaware Capital Formation, Inc. High frequency thermode driven device employing one-turn-secondary transformers. Re. 35,180, Cl. 219-85.160.
Porterfield, Richard: *See*—
Paufve, Eldred H.; and Porterfield, Richard, Re. 35,180, Cl. 219-85.160.
Walker, Mark E. Remote transaction system. Re. 35,184, Cl. 364-479.000.
Yoshida, Toshifumi: *See*—
Ose, Toshio; Yoshida, Toshifumi; and Iwasaki, Katsuyo, Re. 35,183, Cl. 315-370.000.

# LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

AT&T Bell Laboratories: *See*—
Bowker, Duane O.; Ganley, John T.; and James, J. H., B1 5,195,132, Cl. 379-410.000.
Bowker, Duane O.; Ganley, John T.; and James, J. H., to AT&T Bell Laboratories. Telephone network speech signal enhancement. B1 5,195,132, Cl. 379-410.000.
Browning Arms Company: *See*—
Larson, Marlow W., B1 4,748,962, Cl. 124-25.600.
Fohst, Manfred, to Lohmann GmbH & Co. KG. Shoe inner sole, particularly insole or welt. B1 4,926,570, Cl. 36-43.000.
Ganley, John T.: *See*—
Bowker, Duane O.; Ganley, John T.; and James, J. H., B1 5,195,132, Cl. 379-410.000.
Hoffmann-La Roche, Inc.: *See*—
Pestka, Sidney; and Rubinstein, Menachem, B1 4,503,035, Cl. 424-85.700.
James, J. H.: *See*—
Bowker, Duane O.; Ganley, John T.; and James, J. H., B1 5,195,132, Cl. 379-410.000.
Larson, Marlow W., to Browning Arms Company. Compound archery bows. B1 4,748,962, Cl. 124-25.600.
Lohmann GmbH & Co. KG: *See*—
Fohst, Manfred, B1 4,926,570, Cl. 36-43.000.
MAECORP Incorporated: *See*—
Pal, Dhiraj; and Yost, Karl, B1 5,193,936, Cl. 405-128.000.
Pal, Dhiraj; and Yost, Karl, to MAECORP Incorporated. Fixation and stabilization of lead in contaminated soil and solid waste. B1 5,193,936, Cl. 405-128.000.
Pestka, Sidney; and Rubinstein, Menachem, to Hoffmann-La Roche, Inc. Protein purification process and product. B1 4,503,035, Cl. 424-85.700.
Rubinstein, Menachem: *See*—
Pestka, Sidney; and Rubinstein, Menachem, B1 4,503,035, Cl. 424-85.700.
Yost, Karl: *See*—
Pal, Dhiraj; and Yost, Karl, B1 5,193,936, Cl. 405-128.000.

# LIST OF DESIGN PATENTEES

Adams, Bradley V.: *See*—
Magerman, Michael L.; Adams, Bradley V.; and Pond, Brian R., 368,126, Cl. D21-219.000.
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Lee, Stuart H.; and Viennister, Tucker, 368,074, Cl. D13-168.000.
Vura, John A.: *See*—
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Tiebo, Thomas A.; Whitehead, Stephen P.; and Uffner, Michael G., 367,958, Cl. D3-273.000.
Wilkes, Robert D.: *See*—
Turia, Paul S.; Ullrich, Robert G.; Wilkes, Robert D.; and Hitchcock, Lawrence, 368,094, Cl. D14-218.000.
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Witzman, Doris: *See*—
Mittal, Paquir C.; Witzman, Doris; and Miggels, Stephen G., 368,085, Cl. D14-125.000.
Wong, Gilbert Y.: *See*—
Willows, Keith S.; Wong, Gilbert Y.; and Yoshimoto, Max K., 368,143, Cl. D24-233.000.
Woods, John P.: *See*—
Robertson, J. David; Woods, John P.; and Mobley, Stephen M., 367,975, Cl. D6-470.000.
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Hasezaki, Hisashi; Kondo, Hiroki; Kudo, Toshiharu; and Totsuka, Mitsuhiko, 368,072, Cl. D13-161.000.
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Morishita, Hisaya; Hazama, Hirohisa; Suzuki, Toshihiko; Kuramochi, Izumi; and Tokizaki, Hiroshi, 368,056, Cl. D12-147.000.
Shirai, Kenichi; Takei, Sadakazu; Suzuki, Toshihiko; Tokizaki, Hiroshi; and Kuramochi, Izumi, 368,057, Cl. D12-147.000.
Yoshida, Norihide: *See*—
Sakashita, Hiroshi; Yoshida, Norihide; and Miyasaka, Katsuyoshi, 368,069, Cl. D13-112.000.
Yoshihiko, Asai; and Satora, Kotani, to Matsushita Electric Industrial Co., Ltd. Telephone. 368,091, Cl. D14-151.000.
Yoshikawa, Hirofumi: *See*—
Yoshikawa, Osamu; and Yoshikawa, Hirofumi, 368,100, Cl. D15-13.000.
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McCallum, Fraser S., 367,999, Cl. D7-620.000.
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Fujisawa, Hideo, 368,046, Cl. D11-3.000.
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# CLASSIFICATION OF PATENTS

## ISSUED MARCH 19, 1996

NOTE—First number, class; second number, subclass; third number, patent number

### CLASS 2

161.6 5,499,400
208 5,499,401
209.13 5,499,402
247 5,499,403
403 5,499,404

### CLASS 4

306 5,499,405
541.2 5,499,406

### CLASS 5

1 5,499,407
83.1 5,499,408
411 5,499,410
417 5,499,411
453 5,499,412
464 5,499,413
474 5,499,414
601 5,499,415
625 5,499,416
652 5,499,417
655 5,499,418

### CLASS 8

94.22 5,500,020
408 5,500,021
410 5,500,022
499 5,500,023
509 5,500,024
685 5,500,025

### CLASS 14

69.5 5,499,419

### CLASS D15

5 Re.35,179
22.1 5,499,420
167.1 5,499,421
5,499,422
319 5,499,423
322 5,499,424
354 5,499,425

### CLASS 16

115 5,499,426
121 5,499,427
387 5,499,428

### CLASS 24

3.11 5,499,429
279 5,499,430
543 5,499,431
599.2 5,499,432

### CLASS 26

2 R 5,499,433

### CLASS 29

220 5,499,434
235 5,499,435
270 5,499,436
402.03 5,499,437
407.01 5,499,438
508 5,499,439
512 5,499,440
527.2 5,499,441
600 5,499,442
623.1 5,500,026
741 5,499,443
830 5,499,444
5,499,445
852 5,499,446
5,499,447
863 5,499,448
882 5,499,449
890.03 5,499,450
897.2 5,499,451
898.067 5,499,452

### CLASS 30

105 5,499,453
120 5,499,454

### CLASS 33

233 5,499,455
245 5,499,456
512 5,499,457

### CLASS 36

7.6 5,499,458
10 5,499,459
43 5,499,460
B1 4,926,570
117 5,499,461

### CLASS 37

227 5,499,462
398 5,499,463

### CLASS 38

46 5,499,464

### CLASS 40

152 5,499,465
322 5,499,466
504 5,499,467
633 5,499,468

### CLASS 43

16 5,499,469
42.15 5,499,470
42.31 5,499,471
44.97 5,499,472
55 5,499,473

### CLASS 47

1.5 5,499,474

### CLASS 49

495.1 5,499,475

### CLASS 52

220.1 5,499,476
604 5,499,477
606 5,499,478
653.1 5,499,480
654.1 5,499,481
742.13 5,499,482

### CLASS 53

53 5,499,483
458 5,499,484
459 5,499,485
465 5,499,486
473 5,499,487
474 5,499,488
540 5,499,489

### CLASS 55

223 5,500,027
385.1 5,500,028
485 5,500,029

### CLASS 56

9 5,499,490
10.2 H 5,499,491
12.1 5,499,492
13.3 5,499,493
320.1 5,499,494
5,499,495

### CLASS 57

406 5,499,496

### CLASS 60

39.06 5,499,497
39.12 5,499,498
39.32 5,499,499
274 5,499,500
286 5,499,501
290 5,499,502
469 5,499,503

### CLASS 62

3.3 5,499,504
9 5,499,505
11 5,499,506
63 5,499,507
114 5,499,508
117 5,499,509
175 5,499,510
180 5,499,511
229 5,499,512
252 5,499,513
291 5,499,514
470 5,499,515
494 5,499,516

### CLASS 65

346 5,500,030
386 5,500,031

### CLASS 70

95 5,499,517
233 5,499,518

### CLASS 72

53 5,499,519
58 5,499,520
157 5,499,521
5,499,522
203 5,499,523
420 5,499,524
453.03 5,499,525

### CLASS 73

1 D 5,499,526
4 R 5,499,527
23.2 5,499,528
40.7 5,499,529
49.7 5,499,530
64.45 5,499,531
76 5,499,532
116 5,499,534
117.3 5,499,536
5,499,537
119 A 5,499,538
152 5,499,533
717 5,499,535
756 5,499,539
761 5,499,540
763 5,499,541
818 5,499,542
861.16 5,499,543
861.56 5,499,544
864.18 5,499,545
865 5,499,546

### CLASS 74

89.15 5,499,547
96 5,499,548
422 5,499,549
5,499,550
427 5,499,551
471 XY 5,499,552
526 5,499,553

### CLASS 75

386 5,500,033
414 5,500,032
505 5,500,034

### CLASS 76

83 5,499,555
5,499,556

### CLASS 81

55 5,499,554
57.29 5,499,557
57.39 5,499,558
59.1 5,499,559
63.2 5,499,560
124.6 5,499,561
177.4 5,499,562

### CLASS 82

112 5,499,563

### CLASS 83

23 5,499,564
452 5,499,565
636 5,499,566

### CLASS 84

622 5,500,486

### CLASS 89

7 5,499,567
36.08 5,499,568
197 5,499,569

### CLASS 92

84 5,499,570
187 5,499,571
212 5,499,572

### CLASS 95

41 5,500,035
54 5,500,036

### CLASS 96

108 5,500,037
135 5,500,038
209 5,500,039

### CLASS 99

337 5,499,573
339 5,499,574
349 5,499,575
421 H 5,499,576
476 5,499,577
537 5,499,578

### CLASS 101

375 5,499,580

### CLASS 102

275.12 5,499,581
331 5,499,579
334 5,499,582

### CLASS 104

130.03 5,499,583

### CLASS 106

21 A 5,500,040
38.22 5,500,041
287.11 5,500,042
456 5,500,043
697 5,500,044

### CLASS 108

96 5,499,584
153 5,499,585

### CLASS 110

246 5,499,586
342 5,499,587

### CLASS 112

80.41 5,499,588
102.5 5,499,589
302 5,499,590

### CLASS 114

230 5,499,591
244 5,499,592
271 5,499,593
354 5,499,594
362 5,499,595
375 5,499,596

### CLASS 116

216 5,499,597

### CLASS 117

49 5,499,598
50 5,499,599
68 5,499,600
84 5,499,601

### CLASS 118

313 5,500,045
653 5,500,046
712 5,499,602
724 5,500,047

### CLASS 119

61 5,499,609
166 5,499,610
5,499,611

### CLASS 123

25 E 5,499,603
41.86 5,499,604
70 R 5,499,605
90.12 5,499,606
435 5,499,607
467 5,499,608
470 5,499,612
520 5,499,613
5,499,614
526 5,499,615
572 5,499,616
698 5,499,617

### CLASS 124

25.6 5,499,618
B1 4,748,962
57 5,499,619
91 5,499,620

### CLASS 126

361 5,499,621
500 5,499,622

### CLASS 128

201.21 5,499,623
204.26 5,499,624
207.15 5,499,625
630 5,499,626
633 5,499,627
641 5,499,628
653.2 5,499,629
662.05 5,499,630
734 5,499,631
772 5,499,632
848 5,499,633

### CLASS 131

256 5,499,634
290 5,499,635
374 5,499,636

### CLASS 132

200 5,499,637
273 5,499,638

### CLASS 134

1 5,499,668
6 5,500,048
5,500,049
7 5,499,639
18 5,500,050
56 D 5,499,640
65 5,499,641
95.1 5,499,642
104.4 5,499,643

### CLASS 135

20.1 5,499,644
67 5,499,645
121 5,499,646

### CLASS 136

244 5,500,051
5,500,052
253 5,500,054
259 5,500,055
5,500,056

### CLASS 137

12 5,499,647
15 5,499,648
68.27 5,499,649
85 5,499,650
334 5,499,651
340 5,499,652
354 5,499,653
493.9 5,499,654
512.3 5,499,655
583 5,499,656
886 5,499,658
887 5,499,657

### CLASS 138

97 5,499,659
98 5,499,660
124 5,499,661

### CLASS 139

26 5,499,662
420 A 5,499,663

### CLASS 140

152 5,499,664

### CLASS 141

1 5,499,665
98 5,499,666

### CLASS 144

365 5,499,667

### CLASS 148

312 5,500,057
649 5,500,058

### CLASS 149

19.1 5,500,059
5,500,060
19.4 5,500,061
46 5,500,062

### CLASS 152

158 5,499,669
543 5,499,670

### CLASS 156

85 5,500,063
94 5,500,064
123 5,500,065
132 5,500,066
146 5,500,067
148 5,500,068
254 5,500,070
272.8 5,500,071
344 5,500,072
345 5,500,073
406.2 5,500,074
494 5,500,075
626.1 5,500,076
628.1 5,500,077
5,500,078
643.1 5,500,079
644.1 5,500,080
646.1 5,500,081

### CLASS 160

199 5,499,671

### CLASS 162

5 5,500,082
17 5,500,083
5,500,084
30.11 5,500,085
65 5,500,086
164.6 5,500,087
198 5,500,088
226 5,500,089
273 5,500,090
301 5,500,091
358.3 5,500,092

### CLASS 164

418 5,499,672
463 5,499,673

### CLASS 165

38 5,499,675
76 5,499,674
166 5,499,676

### CLASS 166

293 5,499,677
298 5,499,678
308 5,499,679
377 5,499,680
382 5,499,681
5,499,682

### CLASS 172

4 5,499,683
4.5 5,499,684
699 5,499,685
730 5,499,686

### CLASS 174

53 5,500,487
102 R 5,500,488
117 FF 5,500,489
151 5,500,490

### CLASS 175

317 5,499,687
426 5,499,688

### CLASS 178

18 5,500,491
5,500,492

### CLASS 180

16 5,499,689
68.4 5,499,690

### CLASS 181

0.5 5,500,493
230 5,500,494

### CLASS 182

107 5,499,691
196 5,499,692

### CLASS 184

6.24 5,499,693

### CLASS 187

200 5,499,694
244 5,499,695

### CLASS 188

1.11 5,499,696
19 5,499,697
24.19 5,499,698
24.21 5,499,699
72.4 5,499,701
77 W 5,499,700

**CLASS 190**
115 5,499,702

**CLASS 192**
58.4 5,499,706
70.11 5,499,703
70.27 5,499,704
107 T 5,499,705

**CLASS 194**
217 5,499,707

**CLASS 196**
46 5,500,093

**CLASS 198**
400 5,499,708
786 5,499,709

**CLASS 200**
43.14 5,500,495
339 5,500,496
512 5,500,497
556 5,500,498

**CLASS 202**
241 5,500,094

**CLASS 203**
2 5,500,095
3 5,500,096
11 5,500,097
13 5,500,098

**CLASS 204**
192.25 5,500,102
192.26 5,500,103
253 5,500,104

**CLASS 205**
67 5,500,105
166 5,500,106
404 5,500,100
449 5,500,099
646 5,500,101

**CLASS 206**
0.81 5,499,710
45.19 5,499,711
172 5,499,712
305 5,499,713
387.13 5,499,714
505 5,499,715
553 5,499,716
701 5,499,717

**CLASS 208**
47 5,500,107
89 5,500,108
111 5,500,109
173 5,500,110

**CLASS 209**
524 5,499,718
705 5,499,719
728 5,499,720

**CLASS 210**
150 5,500,111
151 5,500,112
179 5,500,120
222 5,500,121
321.6 5,500,113
321.75 5,500,122
394 5,500,114
460 5,500,115
511 5,500,116
512.1 5,500,117
603 5,500,118
5,500,123
615 5,500,119
631 5,500,124
668 5,500,125
5,500,126
685 5,500,127
699 5,500,128
703 5,500,129
5,500,130
705 5,500,131
708 5,500,132
729 5,500,133
787 5,500,134
5,500,135
805 5,500,136

**CLASS 211**
13 5,499,721
57.1 5,499,722
59.1 5,499,723
70.6 5,499,724
105.1 5,499,725
183 5,499,726
193 5,499,727

**CLASS 213**
101 5,499,728

**CLASS 215**
11.5 5,499,729
382 5,499,730

**CLASS 216**
22 5,499,731
24 5,499,732
38 5,499,733

**CLASS 218**
130 5,500,499

**CLASS 219**
69.17 5,500,500
85.16 Re.35,180
121.48 5,500,501
121.63 5,500,502
121.64 5,500,503
121.67 5,500,504
5,500,506
121.72 5,500,505
121.82 5,500,507
400 5,500,508
501 5,500,509
505 5,500,510
633 5,500,511

**CLASS 220**
4.21 5,499,734
231 5,499,735
254 5,499,736
307 5,499,737
504 5,499,738
589 5,499,739

**CLASS 221**
70 5,499,740

**CLASS 222**
95 5,499,741
101 5,499,742
107 5,499,743
129.1 5,499,744
136 5,499,745
165 5,499,746
167 5,499,747
180 5,499,748
253 5,499,749
386 5,499,751
386.5 5,499,750
5,499,758

**CLASS 223**
46 5,499,759

**CLASS 224**
155 5,499,760
202 5,499,761
258 5,499,752
321 5,499,762

**CLASS 226**
194 5,499,753

**CLASS 228**
42 5,499,754
44.3 5,499,755
214 5,499,756

**CLASS 229**
81 5,499,757
114 5,499,763
117.16 5,499,764

**CLASS 235**
373 5,500,512
380 5,500,513
381 5,500,514
384 5,500,515
472 5,500,516
486 5,500,517
492 5,500,518

**CLASS 239**
265.19 5,499,765
333 5,499,766
383 5,499,767
406 5,499,768
409 5,499,769

**CLASS 241**
1 5,499,770
101.74 5,499,771

**CLASS 242**
35.5 R 5,499,772
43 R 5,499,773
47.03 5,499,774
158 B 5,499,775
178 5,499,776
356 5,499,777
541 5,499,778
541.4 5,499,779
371.1 5,499,780
384.1 5,499,781

**CLASS 244**
1 A 5,499,782
122 R 5,499,783
135 A 5,499,784
137.4 5,499,785

**CLASS 246**
448 5,499,786

**CLASS 248**
97 5,499,787
430 5,499,788
442.2 5,499,793
489 5,499,789
570 5,499,790
638 5,499,791
643 5,499,792

**CLASS 250**
201.8 5,500,519
203.1 5,500,520
208.1 5,500,521
5,500,522
216 5,500,523
5,500,524
221 5,500,525
222.1 5,500,526
306 5,500,527
310 5,500,528
337 5,500,529
339.11 5,500,530
372 5,500,531
5,500,532
5,500,533
385.1 5,500,534
440.11 5,500,535
458.1 5,500,536
559.45 5,499,794

**CLASS 252**
8.6 5,500,137
8.8 5,500,138
5,500,139
46.7 5,500,140
62.54 5,500,141
62.9 R 5,500,142
108 5,500,143
174.15 5,500,144
183.14 5,500,145
299.67 5,500,146
301.6 S 5,500,147
315.2 5,500,148
373 5,500,149
544 5,500,150
546 5,500,151
547 5,500,152
548 5,500,153
551 5,500,154
557 5,500,155
582 5,500,156
637 5,500,158

**CLASS 254**
30 5,499,795
133 R 5,499,796
134.4 5,499,797

**CLASS 257**
40 5,500,537
49 5,500,538
77 5,500,539
82 5,500,540
105 5,500,541
210 5,500,542
277 5,500,543
296 5,500,544
341 5,500,545
358 5,500,546
359 5,500,547
371 5,500,548
415 5,500,549
461 5,500,550
500 5,500,551
531 5,500,552
538 5,500,553
588 5,500,554
700 5,500,555
718 5,500,556
758 5,500,557
5,500,558
762 5,500,559
767 5,500,560

**CLASS 261**
52 5,500,159
79.2 5,500,160
142 Re.35,181

**CLASS 264**
1.21 5,500,157
8 5,500,161
9 5,500,162
32 5,500,165
40.4 5,500,166
41 5,500,167
46.5 5,500,168
5,500,169
68 5,500,172
75 5,500,173
99 5,499,802
112 5,500,174
148 5,500,170
151 5,500,175
257 5,500,176
277 5,500,177
297.8 5,500,178
309 5,500,171
400 5,500,179
401 5,500,069
459 5,500,164
473 5,500,163
532 5,500,180
5,500,181

**CLASS 266**
275 5,499,798

**CLASS 267**
140.13 5,499,799

**CLASS 269**
6 5,499,800
48.1 5,499,801

**CLASS 270**
54 5,499,803

**CLASS 271**
3.02 5,499,804
3.05 5,499,805
9.11 5,499,806
121 5,499,807
267 5,499,808
274 5,499,809
5,499,810
293 5,499,811

**CLASS 273**
26 E 5,499,812
32.5 5,499,813
78 5,499,814
109 5,499,815
139 5,499,816
143 R Re.35,182
161 5,499,818
169 5,499,819
189 A 5,499,820
194 R 5,499,817
357 5,499,821
411 5,499,822

**CLASS 277**
1 5,499,823
95 5,499,824
100 5,499,825
188 A 5,499,826
229 5,499,827

**CLASS 279**
62 5,499,828
5,499,829
5,499,830

**CLASS 280**
30 5,499,831
96.1 5,499,832
247 5,499,833
282 5,499,834
293 5,499,835
602 5,499,836
607 5,499,837
615 5,499,838
701 5,499,839
728.3 5,499,842
730.1 5,499,840
731 5,499,841
741 5,499,843
748 5,499,844
840 5,499,845

**CLASS 281**
29 5,499,846
37 5,499,847

**CLASS 285**
93 5,499,848
367 5,499,849

**CLASS 292**
42 5,499,850
347 5,499,851

**CLASS 294**
58 5,499,852

**CLASS 296**
37.13 5,499,853
97.13 5,499,854
121 5,499,855

**CLASS 297**
5 5,499,856
162 5,499,857
195.1 5,499,858
218.3 5,499,859
255 5,499,860
301.2 5,499,861
311 5,499,862
452.2 5,499,863

**CLASS 301**
95 5,499,864

**CLASS 303**
115.2 5,499,865
122.08 5,499,866
159 5,499,867

**CLASS 307**
64 5,500,561
66 5,500,562

**CLASS 310**
71 5,500,563
83 5,500,564
316 5,500,565

**CLASS 312**
236 5,499,868

**CLASS 313**
275 5,500,566
490 5,500,567
503 5,500,568
578 5,500,569
634 5,500,570
635 5,500,571

**CLASS 315**
169.1 5,500,572
247 5,500,573
248 5,500,574
307 5,500,575
5,500,576
364 5,500,577
370 Re.35,183

**CLASS 318**
116 5,500,578
493 5,500,579
568.16 5,500,580
727 5,500,581
771 5,500,582

**CLASS 320**
14 5,500,583
20 5,500,584

**CLASS 324**
72 5,500,586
5,500,602
96 5,500,587
158.1 5,500,588
165 5,500,585
202 5,500,589
252 5,500,590
307 5,500,591
5,500,592
5,500,593
318 5,500,594
5,500,595
5,500,596
339 5,500,597
547 5,500,598
634 5,500,599
639 5,500,600
713 5,500,601
751 5,500,603
754 5,500,604
758 5,500,605
761 5,500,606
5,500,607

**CLASS 326**
39 5,500,608
41 5,500,609
85 5,500,610
87 5,500,611

**CLASS 327**
91 5,500,612
107 5,500,613
5,500,614
111 5,500,615
310 5,500,616
321 5,500,617
361 5,500,618
427 5,500,619

**CLASS 329**
300 5,500,620

**CLASS 330**
43 5,500,621
107 5,500,622
252 5,500,623
253 5,500,624
273 5,500,625
279 5,500,626

**CLASS 331**
1 A 5,500,627
68 5,500,628

**CLASS 333**
181 5,500,629

**CLASS 335**
132 5,500,630
285 5,500,631

**CLASS 336**
180 5,500,632

**CLASS 338**
32 R 5,500,633
174 5,500,634

**CLASS 340**
323 R 5,500,635
328 5,500,636
447 5,500,637
468 5,500,638
539 5,500,639
572 5,500,640
686 5,500,641
932.2 5,500,642

**CLASS 341**
22 5,500,643
120 5,500,644
143 5,500,645

**CLASS 342**
22 5,500,649
42 5,500,650
5,500,651
182 5,500,833
188 5,500,646
195 5,500,647
357 5,500,648

**CLASS 345**
84 5,500,652
98 5,500,653
132 5,500,654
168 5,500,655

**CLASS 346**
136 5,500,656

**CLASS 347**
9 5,500,657
22 5,500,658
28 5,500,659
33 5,500,660
41 5,500,661
43 5,500,662
86 5,500,663
5,500,664
5,500,665
87 5,500,666
102 5,500,667
105 5,500,668
214 5,500,669
253 5,500,670

**CLASS 348**
15 5,500,671
17 5,500,672
156 5,500,673
208 5,500,674
319 5,500,675
387 5,500,676
402 5,500,677
408 5,500,678
432 5,500,679
468 5,500,680
473 5,500,681
497 5,500,682
565 5,500,683
592 5,500,684
620 5,500,685
663 5,500,686
5,500,687
697 5,500,688
699 5,500,689
706 5,500,690



734 5,500,691
759 5,500,692

**CLASS 351**
52 5,500,693
97 5,500,694
161 5,500,695
205 5,500,696
212 5,500,697
218 5,500,698
239 5,500,699

**CLASS 354**
76 5,500,700
106 5,500,701
165 5,500,702
222 5,500,703
5,500,704
288 5,500,705
326 5,500,706
403 5,500,707
406 5,500,708
416 5,500,709
474 5,500,711
484 5,500,710

**CLASS 355**
22 5,500,712
27 5,500,713
200 5,500,714
204 5,500,715
206 5,500,716
209 5,500,717
210 5,500,718
260 5,500,719
265 5,500,720
5,500,721
284 5,500,722
296 5,500,723
297 5,500,724
311 5,500,725
315 5,500,726
326 R 5,500,727

**CLASS 356**
3.03 5,500,728
5.09 5,500,729
73.1 5,500,730
5,500,731
124 5,500,732
345 5,500,733
356 5,500,734
364 5,500,735
375 5,500,736
376 5,500,737

**CLASS 358**
300 5,500,738
310 5,500,739
327 5,500,740
335 5,500,741
403 5,500,743
448 5,500,742
456 5,500,744
461 5,500,745
518 5,500,746

**CLASS 359**
40 5,500,747
55 5,500,748
56 5,500,749
58 5,500,750
68 5,500,751
76 5,500,752
125 5,500,753
156 5,500,754
161 5,500,755
174 5,500,756
189 5,500,757
5,500,758
270 5,500,759
272 5,500,760
290 5,500,761
326 5,500,762
333 5,500,763
341 5,500,764
463 5,500,765
605 5,500,766
642 5,500,767
652 5,500,768
676 5,500,769
793 5,500,770
813 5,500,771
822 5,500,772
838 5,500,773

**CLASS 360**
46 5,500,774
70 5,500,775
77.04 5,500,776
77.16 5,500,777
96.5 5,500,778
97.01 5,500,779
99.08 5,500,780

**CLASS 361**
96 5,500,781
120 5,500,782
179 5,500,783
704 5,500,784
720 5,500,785
760 5,500,786
779 5,500,787
800 5,500,788
816 5,500,789

**CLASS 362**
66 5,500,790

**CLASS 363**
17 5,500,791
98 5,500,792

**CLASS 364**
188 5,500,794
401 5,500,793
5,500,795
419.08 5,500,796
424.04 5,500,797
424.05 5,500,798
426.05 5,500,799
468 5,500,800
469 5,500,801
474.24 5,500,802
478 5,500,803
479 Re.35,184
488 5,500,804
491 5,500,805
492 5,500,806
496 5,500,807
578 5,500,808
580 5,500,809
724.01 5,500,810
724.16 5,500,811
745 5,500,812
787 5,500,813

**CLASS 365**
49 5,500,814
149 5,500,815
185 5,500,816
189.01 5,500,820
189.05 5,500,817
5,500,818
5,500,819
200 5,500,821
5,500,822
201 5,500,823
5,500,824
219 5,500,825
222 5,500,827
230.01 5,500,826
230.03 5,500,828
230.08 5,500,829
5,500,830
233 5,500,831

**CLASS 366**
77 5,499,869
85 5,499,870
136 5,499,871
213 5,499,872
348 5,499,873

**CLASS 367**
51 5,500,832

**CLASS 368**
9 5,500,834
11 5,500,835
187 5,500,836
276 5,500,837

**CLASS 369**
13 5,500,838
5,500,839
32 5,500,840
44.26 5,500,841
48 5,500,842
77.2 5,500,843
5,500,844
5,500,845
116 5,500,846
219 5,500,847
275.3 5,500,848
275.4 5,500,849
5,500,850

**CLASS 370**
13 5,500,851
16 5,500,852
17 5,500,853
5,500,854
5,500,855
18 5,500,856
50 5,500,857
60 5,500,858
81 5,500,859
85.13 5,500,860

**CLASS 371**
22.3 5,500,861
5,500,862
37.1 5,500,863
53 5,500,864

**CLASS 372**
22 5,500,865
32 5,500,866
38 5,500,867
46 5,500,868
50 5,500,869

**CLASS 373**
78 5,500,870

**CLASS 375**
208 5,500,871
5,500,872
5,500,874
232 5,500,875
261 5,500,876
332 5,500,877
343 5,500,878
344 5,500,879
353 5,500,880
377 5,500,880

**CLASS 377**
21 5,500,882

**CLASS 378**
4 5,500,883
38 5,500,884
128 5,500,885
207 5,500,886

**CLASS 379**
58 5,500,887
61 5,500,888
67 5,500,889
91 5,500,890
265 5,500,891
345 5,500,892
396 5,500,893
5,500,894
399 5,500,895
410 B1 5,195,132
412 5,500,896

**CLASS 380**
25 5,500,897
43 5,500,898
47 5,500,899

**CLASS 381**
17 5,500,900
68.2 5,500,901
68.4 5,500,902
92 5,500,903

**CLASS 382**
103 5,500,904
157 5,500,905
220 5,500,906
240 5,500,907

**CLASS 383**
127 5,499,874

**CLASS 384**
545 5,499,875

**CLASS 385**
5 5,500,908
12 5,500,909
24 5,500,910
33 5,500,911
37 5,500,912
5,500,916
48 5,500,913
77 5,500,914
78 5,500,915
99 5,500,917
117 5,500,918

**CLASS 395**
2.69 5,500,919
2.79 5,500,920
109 5,500,921
110 5,500,922
114 5,500,923
129 5,500,924
131 5,500,925
133 5,500,926
5,500,927
5,500,928
141 5,500,930
144 5,500,931
149 5,500,932
154 5,500,933
156 5,500,935
5,500,936
160 5,500,929
161 5,500,937
5,500,938
163 5,500,939
183.01 5,500,940
183.14 5,500,941
184.01 5,500,944
185.09 5,500,945
308 5,500,946
375 5,500,942
5,500,943
5,500,947
415 5,500,948
427 5,500,949
445 5,500,950
700 5,500,881
755 5,500,934

**CLASS 400**
56 5,499,876
193 5,499,877
223 5,499,878
234 5,499,879
642 5,499,880

**CLASS 401**
17 5,499,881

**CLASS 403**
171 5,499,882
219 5,499,883
359 5,499,884
380 5,499,885
381 5,499,886

**CLASS 404**
6 5,499,887
19 5,499,888

**CLASS 405**
76 5,499,889
128 B1 5,193,936
282 5,499,890
284 5,499,891

**CLASS 411**
5 5,499,892
282 5,499,893
340 5,499,894
386 5,499,895
387 5,499,896

**CLASS 412**
16 5,499,897

**CLASS 414**
755 5,499,898
786 5,499,899

**CLASS 415**
55.1 5,499,900
111 5,499,901
113 5,499,902

**CLASS 416**
134 A 5,499,903
230 5,499,904
241 R 5,499,905

**CLASS 417**
53 5,499,906
360 5,499,907
368 5,499,908
384 5,499,909

**CLASS 418**
126 5,499,910

**CLASS 419**
45 5,500,182

**CLASS 420**
557 5,500,183

**CLASS 422**
2 5,500,184
16 5,500,185
28 5,500,186
58 5,500,187
82.02 5,500,188
251 5,500,189

**CLASS 423**
10 5,500,192
157 5,500,193
239.1 5,500,194
240 R 5,500,195
242.1 5,500,196
243.08 5,500,197
246 5,500,198
328.2 5,500,199
447.3 5,500,200
449.2 5,500,201
584 5,500,202

**CLASS 424**
9.453 5,500,204
50 5,500,206
54 5,500,207
55 5,500,208
66 5,500,209
73 5,500,210
5,500,211
78.1 5,500,190
78.12 5,500,212
78.37 5,500,213
85.7 B1 4,503,035
133.1 5,500,214
277.1 5,500,215
401 5,500,205
5,500,216
5,500,217
5,500,218
409 5,500,219
410 5,500,220
436 5,500,221
448 5,500,222
451 5,500,223
5,500,224
464 5,500,225
466 5,500,226
476 5,500,227
486 5,500,228
535 5,500,229
619 5,500,230

**CLASS 425**
94 5,499,911
363 5,499,912
382.4 5,499,913
470 5,499,914
557 5,499,915
564 5,499,916

**CLASS 426**
18 5,500,231
74 5,500,232
89 5,500,233
103 5,500,234
394 5,500,235
451 5,500,236
466 5,500,237
511 5,500,238
516 5,500,239
560 5,500,240
599 5,500,241
618 5,500,242

**CLASS 427**
126.3 5,500,243
181 5,500,244
221 5,500,245
239 5,500,246
244 5,500,247
247 5,500,053
250 5,500,248
255 5,500,249
299 5,500,250
322 5,500,251
358 5,500,191
376.3 5,500,252
385.5 5,500,253
387 5,500,254
419.2 5,500,255
487 5,500,257
579 5,500,256

**CLASS 428**
10 5,500,258
15 5,500,259
35.7 5,500,260
5,500,261
36.1 5,500,262
36.6 5,500,263
36.9 5,500,264
41 5,500,265
64.1 5,500,266
68 5,500,267
100 5,500,268
116 5,500,269
119 5,500,270
135 5,500,271
140 5,500,272
147 5,500,273
156 5,500,274
167 5,500,275
192 5,500,276
196 5,500,277
210 5,500,278
213 5,500,279
220 5,500,280
288 5,500,281
339 5,500,282
349 5,500,283
5,500,284
355 5,500,293
5,500,294
357 5,500,295
364 5,500,285
402.24 5,500,286
403 5,500,287
408 5,500,296
411.1 5,500,297
5,500,298
447 5,500,299
5,500,300
457 5,500,301
469 5,500,288
474.4 5,500,302
475.5 5,500,303
551 5,500,289
610 5,500,290
614 5,500,304
621 5,500,305

**CLASS 429**
1 5,500,306
5,500,307
5 5,500,312
11 5,500,313
14 5,500,314
16 5,500,315
21 5,500,316
58 5,500,317
99 5,500,318
106.6 5,500,319
5,500,320
109 5,500,321
110 5,500,322
5,500,323
137 5,500,324
270.16 5,500,325
300 5,500,326
306 5,500,327
347 5,500,328
363 5,500,329
393 5,500,330
449 5,500,331
512 5,500,332
558 5,500,334
567 5,500,333
5,500,335
570 5,500,336
5,500,337
611 5,500,338

**CLASS 433**
137 5,499,917
173 5,499,918

**CLASS 434**
45 5,499,919
69 5,499,920
307 A 5,499,921
5,499,922

**CLASS 435**
4 5,500,342
6 5,500,339
5,500,340
5,500,341
5,500,343
5,500,344
7.1 5,500,345
7.21 5,500,346
7.23 5,500,347
5,500,362
7.24 5,500,348
7.4 5,500,349
7.92 5,500,350
25 5,500,351
64 5,500,352
69.1 5,500,353
69.4 5,500,354
69.7 5,500,355
91.1 5,500,356
91.31 5,500,357
156 5,500,358
171 5,500,359
172.3 5,500,360
5,500,361
194 5,500,363
221 5,500,364
240.4 5,500,365
252.3 5,500,366
5,500,367
262 5,500,368
309.1 5,500,369

| | |
|---|---|
| 320.1 | 5,500,370 |
| **CLASS 436** | |
| 37 | 5,500,371 |
| 98 | 5,500,372 |
| 109 | 5,500,373 |
| 161 | 5,500,374 |
| 514 | 5,500,375 |
| **CLASS 437** | |
| 3 | 5,500,376 |
| 6 | 5,500,377 |
| 31 | 5,500,378 |
| 34 | 5,500,379 |
| 41 | 5,500,381 |
| 44 | 5,500,382 |
| 53 | 5,500,383 |
| 60 | 5,500,384 |
| | 5,500,385 |
| | 5,500,386 |
| | 5,500,387 |
| 89 | 5,500,388 |
| 90 | 5,500,389 |
| 120 | 5,500,390 |
| 131 | 5,500,391 |
| 151 | 5,500,392 |
| 175 | 5,500,393 |
| 409 | 5,500,380 |
| **CLASS 439** | |
| 26 | 5,499,923 |
| 67 | 5,499,924 |
| 157 | 5,499,925 |
| | 5,499,926 |
| 285 | 5,499,927 |
| 331 | 5,499,929 |
| 417 | 5,499,930 |
| 431 | 5,499,931 |
| 446 | 5,499,932 |
| 482 | 5,499,933 |
| 492 | 5,499,928 |
| 585 | 5,499,934 |
| 620 | 5,499,935 |
| **CLASS 440** | |
| 83 | 5,499,936 |
| **CLASS 445** | |
| 49 | 5,499,937 |
| 50 | 5,499,938 |
| 73 | 5,499,939 |
| **CLASS 446** | |
| 180 | 5,499,940 |
| 222 | 5,499,941 |
| **CLASS 451** | |
| 14 | 5,499,942 |
| 549 | 5,499,943 |
| **CLASS 453** | |
| 17 | 5,499,944 |
| **CLASS 454** | |
| 49 | 5,499,945 |
| 63 | 5,499,946 |
| 69 | 5,499,947 |
| **CLASS 460** | |
| 119 | 5,499,948 |
| **CLASS 472** | |
| 105 | 5,499,949 |
| **CLASS 474** | |
| 138 | 5,499,950 |
| **CLASS 475** | |
| 204 | 5,499,951 |
| **CLASS 477** | |
| 115 | 5,499,952 |
| 120 | 5,499,953 |
| 174 | 5,499,954 |
| **CLASS 482** | |
| 51 | 5,499,955 |
| 52 | 5,499,956 |
| 70 | 5,499,957 |
| 79 | 5,499,958 |
| 95 | 5,499,959 |
| 116 | 5,499,960 |
| 132 | 5,499,961 |
| 137 | 5,499,962 |
| **CLASS 483** | |
| 56 | 5,499,963 |
| **CLASS 501** | |
| 89 | 5,500,394 |
| 98 | 5,500,395 |
| **CLASS 502** | |
| 8 | 5,500,396 |
| 102 | 5,500,397 |
| 103 | 5,500,398 |
| 244 | 5,500,399 |
| 306 | 5,500,400 |
| 316 | 5,500,401 |
| 408 | 5,500,402 |
| **CLASS 504** | |
| 115 | 5,500,403 |
| 174 | 5,500,404 |
| 195 | 5,500,405 |
| 215 | 5,500,406 |
| 241 | 5,500,407 |
| 261 | 5,500,408 |
| **CLASS 514** | |
| 2 | 5,500,409 |
| 8 | 5,500,410 |
| 12 | 5,500,411 |
| 13 | 5,500,412 |
| 15 | 5,500,413 |
| 18 | 5,500,414 |
| 21 | 5,500,415 |
| 23 | 5,500,416 |
| 89 | 5,500,417 |
| 100 | 5,500,418 |
| 114 | 5,500,419 |
| 131 | 5,500,420 |
| 182 | 5,500,421 |
| 212 | 5,500,422 |
| 228.2 | 5,500,423 |
| 233.5 | 5,500,423 |
| 235.5 | 5,500,424 |
| 252 | 5,500,426 |
| 256 | 5,500,427 |
| 266 | 5,500,428 |
| 277 | 5,500,429 |
| 278 | 5,500,430 |
| 280 | 5,500,431 |
| 281 | 5,500,432 |
| 330 | 5,500,433 |
| 356 | 5,500,434 |
| 394 | 5,500,435 |
| 397 | 5,500,436 |
| | 5,500,437 |
| 403 | 5,500,438 |
| 404 | 5,500,439 |
| 411 | 5,500,440 |
| 412 | 5,500,441 |
| 414 | 5,500,442 |
| 422 | 5,500,443 |
| 456 | 5,500,444 |
| 474 | 5,500,445 |
| 483 | 5,500,446 |
| 717 | 5,500,448 |
| **CLASS 518** | |
| 700 | 5,500,449 |
| **CLASS 521** | |
| 64 | 5,500,450 |
| | 5,500,451 |
| 130 | 5,500,452 |
| **CLASS 522** | |
| 25 | 5,500,453 |
| **CLASS 523** | |
| 120 | 5,500,454 |
| 161 | 5,500,455 |
| 166 | 5,500,456 |
| 201 | 5,500,457 |
| 205 | 5,500,458 |
| 300 | 5,500,459 |
| 402 | 5,500,460 |
| 404 | 5,500,461 |
| | 5,500,462 |
| 408 | 5,500,463 |
| 435 | 5,500,464 |
| **CLASS 524** | |
| 47 | 5,500,465 |
| 92 | 5,500,466 |
| 100 | 5,500,467 |
| 117 | 5,500,468 |
| 157 | 5,500,469 |
| 204 | 5,500,470 |
| 262 | 5,500,471 |
| 272 | 5,500,472 |
| 377 | 5,500,476 |
| 437 | 5,500,480 |
| 447 | 5,500,473 |
| 571 | 5,500,447 |
| 591 | 5,500,475 |
| 714 | 5,500,474 |
| **CLASS 525** | |
| 66 | 5,500,478 |
| 92 H | 5,499,409 |
| 92 K | 5,500,481 |
| 98 | 5,500,482 |
| 398 | 5,500,477 |
| 437 | 5,500,479 |
| **CLASS 526** | |
| 263 | Re.35,185 |
| | Re.35,186 |
| **CLASS 536** | |
| 24.1 | 5,500,483 |
| **CLASS 562** | |
| 18 | 5,500,485 |
| **CLASS 568** | |
| 660 | 5,500,484 |
| **CLASS 600** | |
| 220 | 5,499,964 |
| **CLASS 602** | |
| 19 | 5,499,965 |
| 42 | 5,499,966 |
| **CLASS 604** | |
| 20 | 5,499,967 |
| 30 | 5,499,968 |
| | 5,499,969 |
| 35 | 5,499,970 |
| 53 | 5,499,971 |
| 68 | 5,499,972 |
| 96 | 5,499,973 |
| 118 | 5,499,974 |
| 165 | 5,499,975 |
| 180 | 5,499,976 |
| 252 | 5,500,003 |
| 352 | 5,499,977 |
| 385.2 | 5,499,978 |
| 891.1 | 5,499,979 |
| **CLASS 606** | |
| 28 | 5,499,980 |
| 41 | 5,499,981 |
| 53 | 5,499,982 |
| 61 | 5,499,983 |
| 80 | 5,499,984 |
| 99 | 5,499,985 |
| 104 | 5,499,986 |
| 107 | 5,499,987 |
| 114 | 5,499,988 |
| 130 | 5,499,989 |
| 144 | 5,499,990 |
| 148 | 5,499,991 |
| 170 | 5,499,992 |
| 188 | 5,499,993 |
| 192 | 5,499,994 |
| | 5,499,995 |
| 201 | 5,499,996 |
| 206 | 5,499,997 |
| 207 | 5,499,998 |
| 208 | 5,499,999 |
| 232 | 5,500,000 |
| | 5,500,001 |
| 242 | 5,500,002 |
| **CLASS 607** | |
| 4 | 5,500,004 |
| 5 | 5,500,008 |
| 17 | 5,500,005 |
| 24 | 5,500,006 |
| 88 | 5,500,009 |
| 104 | 5,500,007 |
| 114 | 5,500,010 |
| 116 | 5,500,011 |
| 122 | 5,500,012 |
| **CLASS 623** | |
| 1 | 5,500,013 |
| 2 | 5,500,014 |
| | 5,500,015 |
| | 5,500,016 |
| 8 | 5,500,017 |
| | 5,500,019 |
| 11 | 5,500,018 |

## CLASSIFICATION OF DESIGNS

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D2— | 602 | 367,951 | | 514 | 367,985 | | 382 | 368,019 | D12— | 101 | 368,053 | | 128 | 368,087 | | 147 | 368,121 |
| | 908 | 367,952 | | 536 | 367,986 | | 397 | 368,020 | | 118 | 368,054 | | 135 | 368,088 | | 171 | 368,122 |
| | 961 | 367,953 | | 570 | 367,987 | | 402 | 368,021 | | 123 | 368,055 | | 136 | 368,089 | | | 368,123 |
| | 978 | 367,954 | | 577 | 367,988 | | | 368,022 | | 147 | 368,056 | | 151 | 368,090 | | | 368,124 |
| D3— | 233 | 367,955 | D7— | 308 | 367,989 | D9— | 300 | 368,023 | | | 368,057 | | | 368,091 | | 196 | 368,125 |
| | | 367,956 | | 330 | 367,990 | | 305 | 368,024 | | 153 | 368,058 | | 188 | 368,092 | | 219 | 368,126 |
| | 273 | 367,957 | | 351 | 367,991 | | | 368,025 | | 162 | 368,059 | | 195 | 368,093 | | 220 | 368,127 |
| | | 367,958 | | | 367,992 | | | 368,026 | | 167 | 368,060 | | 218 | 368,094 | D23— | 213 | 368,128 |
| | 283 | 367,959 | | 352 | 367,993 | | 415 | 368,027 | | 179 | 368,061 | | | 368,095 | | 225 | 368,129 |
| | 316 | 367,960 | | | 367,994 | | | 368,028 | | 317 | 368,062 | | 230 | 368,096 | | 233 | 368,130 |
| | 317 | 367,961 | | 364 | 367,995 | | | 368,029 | | | 368,063 | | 242 | 368,097 | | 236 | 368,131 |
| D4— | 138 | 367,962 | | 602 | 367,996 | | 425 | 368,030 | | 404 | 368,064 | | 253 | 368,098 | | 241 | 368,132 |
| | | 367,963 | | 620 | 367,997 | | 432 | 368,031 | | 412 | 368,065 | D15— | 9.1 | 368,099 | | 277 | 368,133 |
| D6— | 302 | 367,964 | | | 367,998 | | 435 | 368,032 | | 425 | 368,066 | | 13 | 368,100 | | 301 | 368,134 |
| | 303 | 367,965 | | | 367,999 | | 439 | 368,033 | D13— | 103 | 368,067 | | 27 | 368,101 | D24— | 122 | 368,135 |
| | 323 | 367,966 | | 625 | 368,000 | | 528 | 368,034 | | 110 | 368,068 | | 81 | 368,102 | | 155 | 368,136 |
| | 336 | 367,967 | | 693 | 368,001 | | 556 | 368,035 | | 112 | 368,069 | | 124 | 368,103 | | 186 | 368,137 |
| | 353 | 367,968 | D8— | 1 | 368,002 | D10— | 2 | 368,036 | | 133 | 368,070 | | 149 | 368,104 | | 197 | 368,138 |
| | 376 | 367,969 | | 4 | 368,003 | | 41 | 368,037 | | 147 | 368,071 | D16— | 202 | 368,105 | | 212 | 368,139 |
| | 397 | 367,970 | | 8 | 368,004 | | 47 | 368,038 | | 161 | 368,072 | | 209 | 368,106 | | 215 | 368,140 |
| | 419 | 367,971 | | | 368,005 | | 65 | 368,039 | | 168 | 368,073 | | 311 | 368,107 | | | 368,141 |
| | 468 | 367,972 | | 14 | 368,006 | | 104 | 368,040 | | | 368,074 | | 326 | 368,108 | | 222 | 368,142 |
| | | 367,973 | | 25 | 368,007 | | 106 | 368,041 | D14— | 100 | 368,075 | | | 368,109 | | 233 | 368,143 |
| | 470 | 367,974 | | 57 | 368,008 | | | 368,042 | | | 368,076 | D17— | 22 | 368,110 | D26— | 3 | 368,144 |
| | | 367,975 | | 68 | 368,009 | | | 368,043 | | 106 | 368,077 | D18— | 7 | 368,111 | | 39 | 368,145 |
| | 484 | 367,976 | | 103 | 368,010 | | 111 | 368,044 | | 113 | 368,078 | | 43 | 368,112 | | 43 | 368,146 |
| | | 367,977 | | 303 | 368,011 | | 114 | 368,045 | | 114 | 368,079 | | 55 | 368,113 | | 49 | 368,147 |
| | | 367,978 | | 306 | 368,012 | D11— | 3 | 368,046 | | | 368,080 | D19— | 42 | 368,114 | | 86 | 368,148 |
| | 486 | 367,979 | | 313 | 368,013 | | | 368,047 | | | 368,081 | | 69 | 368,115 | | 110 | 368,149 |
| | 500 | 367,980 | | 318 | 368,014 | | 13 | 368,048 | | | 368,082 | | 92 | 368,116 | D28— | 10 | 368,150 |
| | | 367,981 | | 353 | 368,015 | | | 368,049 | | | 368,083 | D20— | 40 | 368,117 | | | |
| | | 367,982 | | 367 | 368,016 | | 44 | 368,050 | | 118 | 368,084 | D21— | 2 | 368,118 | | | |
| | 501 | 367,983 | | | 368,017 | | 121 | 368,051 | | 125 | 368,085 | | 27 | 368,119 | | | |
| | 502 | 367,984 | | | 368,018 | | 133 | 368,052 | | 126 | 368,086 | | 59 | 368,120 | | | |



## CLASSIFICATION OF PLANTS

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P.— | 46.2 | 9,477 I | | | 77 | 9,478 I | | | 78 | 9,479 I | | | 79 | 9,480 I | | | 80 | 9,481 I | | | | | | |

# GEOGRAPHICAL INDEX

# OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)


| | | | | | |
|---|---|---|---|---|---|
| Alabama | 1 | Kentucky | 21 | Oregon | 41 |
| Alaska | 2 | Louisiana | 22 | Pennsylvania | 42 |
| American Samoa | 3 | Maine | 23 | Puerto Rico | 43 |
| Arizona | 4 | Maryland | 24 | Rhode Island | 44 |
| Arkansas | 5 | Massachusetts | 25 | South Carolina | 45 |
| California | 6 | Michigan | 26 | South Dakota | 46 |
| Canal Zone | 7 | Minnesota | 27 | Tennessee | 47 |
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| Connecticut | 9 | Missouri | 29 | Utah | 49 |
| Delaware | 10 | Montana | 30 | Vermont | 50 |
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| Florida | 12 | Nevada | 32 | Virgin Islands | 52 |
| Georgia | 13 | New Hampshire | 33 | Washington | 53 |
| Guam | 14 | New Jersey | 34 | West Virginia | 54 |
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| Iowa | 19 | Ohio | 39 | U.S. Navy | 59 |
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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

## PATENTS


| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 : | 5,500,061 | | 5,499,860 | | 5,500,494 | | 5,500,931 | | 5,499,943 | | 5,499,718 |
| | 5,500,595 | | 5,499,892 | | 5,500,513 | | 5,500,933 | | 5,499,962 | | 5,499,719 |
| 04 : | 5,499,487 | | 5,499,899 | | 5,500,520 | | 5,500,935 | | 5,499,965 | | 5,499,729 |
| | 5,499,579 | | 5,499,904 | | 5,500,524 | 08 : | 5,499,428 | | 5,500,001 | | 5,499,834 |
| | 5,499,643 | | 5,499,906 | | 5,500,555 | | 5,499,544 | | 5,500,030 | | 5,499,914 |
| | 5,499,795 | | 5,499,912 | | 5,500,580 | | 5,499,694 | | 5,500,093 | | 5,499,936 |
| | 5,499,934 | | 5,499,925 | | 5,500,583 | | 5,499,759 | | 5,500,121 | | 5,499,957 |
| | 5,500,532 | | 5,499,956 | | 5,500,591 | | 5,499,837 | | 5,500,193 | | 5,499,976 |
| | 5,500,535 | | 5,499,969 | | 5,500,600 | | 5,500,449 | | 5,500,456 | | 5,500,029 |
| | 5,500,543 | | 5,499,972 | | 5,500,604 | | 5,500,497 | | 5,500,562 | | 5,500,067 |
| | 5,500,624 | | 5,499,979 | | 5,500,608 | | 5,500,503 | | 5,500,625 | | 5,500,110 |
| | 5,500,648 | | 5,499,981 | | 5,500,611 | | 5,500,540 | | 5,500,694 | | 5,500,120 |
| | 5,500,833 | | 5,499,987 | | 5,500,616 | | 5,500,748 | | 5,500,698 | | 5,500,123 |
| | 5,500,912 | | 5,499,991 | | 5,500,660 | | 5,500,779 | | 5,500,732 | | 5,500,186 |
| | 5,500,914 | | 5,499,995 | | 5,500,667 | | 5,500,803 | | 5,500,879 | | 5,500,398 |
| 06 : | Re.35,179 | | 5,499,996 | | 5,500,670 | | 5,500,842 | 13 : | 5,499,414 | | 5,500,403 |
| | Re.35,181 | | 5,500,008 | | 5,500,681 | 09 : | 5,499,403 | | 5,499,476 | | 5,500,490 |
| | 5,499,402 | | 5,500,011 | | 5,500,691 | | 5,499,452 | | 5,499,515 | | 5,500,576 |
| | 5,499,406 | | 5,500,014 | | 5,500,699 | | 5,499,581 | | 5,499,542 | | 5,500,579 |
| | 5,499,445 | | 5,500,017 | | 5,500,768 | | 5,499,708 | | 5,499,665 | | 5,500,599 |
| | 5,499,466 | | 5,500,050 | | 5,500,776 | | 5,499,742 | | 5,499,707 | | 5,500,628 |
| | 5,499,472 | | 5,500,054 | | 5,500,782 | | 5,499,792 | | 5,499,712 | | 5,500,773 |
| | 5,499,480 | | 5,500,071 | | 5,500,793 | | 5,499,835 | | 5,499,816 | | 5,500,869 |
| | 5,499,517 | | 5,500,076 | | 5,500,802 | | 5,499,903 | | 5,499,824 | | 5,500,891 |
| | 5,499,561 | | 5,500,083 | | 5,500,805 | | 5,499,999 | | 5,499,827 | | 5,193,936 |
| | 5,499,568 | | 5,500,095 | | 5,500,807 | | 5,500,234 | | 5,499,940 | 18 : | 5,499,514 |
| | 5,499,587 | | 5,500,096 | | 5,500,808 | | 5,500,769 | | 5,500,024 | | 5,499,520 |
| | 5,499,609 | | 5,500,113 | | 5,500,811 | | 5,500,781 | | 5,500,254 | | 5,499,595 |
| | 5,499,618 | | 5,500,122 | | 5,500,818 | 10 : | 5,499,785 | | 5,500,372 | | 5,499,610 |
| | 5,499,629 | | 5,500,149 | | 5,500,826 | | 5,500,108 | | 5,500,758 | | 5,499,671 |
| | 5,499,632 | | 5,500,156 | | 5,500,827 | | 5,500,145 | 16 : | 5,499,555 | | 5,499,715 |
| | 5,499,633 | | 5,500,164 | | 5,500,831 | | 5,500,182 | | 5,499,666 | | 5,499,844 |
| | 5,499,650 | | 5,500,174 | | 5,500,848 | | 5,500,244 | | 5,500,059 | | 5,500,175 |
| | 5,499,656 | | 5,500,185 | | 5,500,852 | | 5,500,361 | | 5,500,650 | | 5,500,232 |
| | 5,499,698 | | 5,500,188 | | 5,500,853 | 12 : | 5,499,429 | | 5,500,817 | | 5,500,346 |
| | 5,499,704 | | 5,500,216 | | 5,500,856 | | 5,499,557 | | 5,500,940 | | 5,500,359 |
| | 5,499,715 | | 5,500,222 | | 5,500,858 | | 5,499,567 | 17 : | 5,499,430 | | 5,500,431 |
| | 5,499,724 | | 5,500,243 | | 5,500,881 | | 5,499,591 | | 5,499,451 | | 5,500,626 |
| | 5,499,735 | | 5,500,249 | | 5,500,886 | | 5,499,592 | | 5,499,471 | | 5,500,689 |
| | 5,499,734 | | 5,500,269 | | 5,500,892 | | 5,499,710 | | 5,499,608 | 19 : | 5,499,491 |
| | 5,499,758 | | 5,500,279 | | 5,500,894 | | 5,499,750 | | 5,499,612 | | 5,499,503 |
| | 5,499,762 | | 5,500,302 | | 5,500,895 | | 5,499,756 | | 5,499,615 | | 5,499,626 |
| | 5,499,763 | | 5,500,358 | | 5,500,897 | | 5,499,771 | | 5,499,641 | | 5,499,686 |
| | 5,499,770 | | 5,500,362 | | 5,500,919 | | 5,499,787 | | 5,499,664 | | 5,499,955 |
| | 5,499,800 | | 5,500,364 | | 5,500,920 | | 5,499,817 | | 5,499,683 | | 5,500,496 |
| | 5,499,812 | | 5,500,432 | | 5,500,921 | | 5,499,868 | | 5,499,684 | | 5,500,516 |
| | 5,499,831 | | 5,500,483 | | 5,500,924 | | 5,499,882 | | 5,499,697 | | 5,500,534 |
| | 5,499,846 | | 5,500,486 | | 5,500,925 | | 5,499,885 | | 5,499,700 | | 5,500,631 |
| | 5,499,853 | | 5,500,493 | | 5,500,929 | | 5,499,923 | | 5,499,711 | | 5,500,872 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 5,500,913 | | 5,500,311 | | 5,500,824 | | 5,500,770 | | 5,499,942 | | 5,500,457 |
| 20 : | 5,499,482 | | 5,500,313 | | 5,500,911 | | 5,500,791 | | 5,499,975 | | 5,500,461 |
| | 5,499,948 | | 5,500,417 | | 5,500,916 | | 5,500,796 | | 5,500,015 | | 5,500,462 |
| | 5,499,989 | | 5,500,465 | | 4,903,035 | | 5,500,804 | | 5,500,055 | | 5,500,481 |
| | 5,500,239 | | 5,500,466 | | 5,195,132 | | 5,500,883 | | 5,500,085 | | 5,500,546 |
| | 5,500,638 | | 5,500,760 | 35 : | 5,500,865 | | 5,500,918 | | 5,500,126 | | 5,500,548 |
| 21 : | 5,499,958 | | 5,500,783 | | 5,500,937 | | 5,500,942 | | 5,500,128 | | 5,500,557 |
| | 5,500,724 | 27 : | 5,499,473 | 36 : | Re.35,180 | 37 : | 5,499,408 | | 5,500,133 | | 5,500,588 |
| 22 : | 5,499,551 | | 5,499,512 | | 5,499,421 | | 5,499,433 | | 5,500,171 | | 5,500,597 |
| | 5,499,596 | | 5,499,575 | | 5,499,422 | | 5,499,460 | | 5,500,176 | | 5,500,603 |
| | 5,499,873 | | 5,499,723 | | 5,499,436 | | 5,499,640 | | 5,500,204 | | 5,500,606 |
| 23 : | 5,499,492 | | 5,499,727 | | 5,499,441 | | 5,499,674 | | 5,500,212 | | 5,500,789 |
| 24 : | 5,499,528 | | 5,499,917 | | 5,499,455 | | 5,499,754 | | 5,500,233 | | 5,500,795 |
| | 5,499,584 | | 5,499,971 | | 5,499,465 | | 5,500,000 | | 5,500,251 | | 5,500,800 |
| | 5,500,007 | | 5,499,980 | | 5,499,497 | | 5,500,010 | | 5,500,258 | | 5,500,819 |
| | 5,500,038 | | 5,499,985 | | 5,499,574 | | 5,500,025 | | 5,500,274 | | 5,500,832 |
| | 5,500,087 | | 5,499,997 | | 5,499,585 | | 5,500,082 | | 5,500,348 | | 5,500,861 |
| | 5,500,134 | | 5,500,012 | | 5,499,625 | | 5,500,173 | | 5,500,405 | | 5,500,890 |
| | 5,500,187 | | 5,500,013 | | 5,499,695 | | 5,500,184 | | 5,500,409 | | 5,500,904 |
| | 5,500,191 | | 5,500,026 | | 5,499,725 | | 5,500,268 | | 5,500,438 | | 5,500,905 |
| | 5,500,210 | | 5,500,042 | | 5,499,736 | | 5,500,295 | | 5,500,460 | | 5,500,927 |
| | 5,500,237 | | 5,500,044 | | 5,499,748 | | 5,500,341 | | 5,500,479 | | 5,500,938 |
| | 5,500,344 | | 5,500,181 | | 5,499,781 | | 5,500,489 | | 5,500,618 | | 5,500,943 |
| | 5,500,356 | | 5,500,273 | | 5,499,793 | | 5,500,509 | | 5,500,649 | | 5,500,946 |
| | 5,500,470 | | 5,500,303 | | 5,499,814 | | 5,500,630 | | 5,500,739 | | 5,500,950 |
| | 5,500,592 | | 5,500,495 | | 5,499,836 | | 5,500,753 | | 5,500,799 | 49 : | 5,499,627 |
| | 5,500,643 | | 5,500,514 | | 5,499,872 | | 5,500,934 | | 5,500,867 | | 5,500,902 |
| | 5,500,882 | | 5,500,590 | | 5,499,879 | 39 : | 5,499,407 | | 5,500,910 | | 4,748,962 |
| | 5,500,899 | | 5,500,629 | | 5,499,880 | | 5,499,419 | 44 : | 5,499,705 | 50 : | 5,499,820 |
| | 5,500,917 | | 5,500,780 | | 5,499,964 | | 5,499,430 | | 5,500,205 | | 5,499,888 |
| 25 : | Re.35,185 | | 5,500,859 | | 5,499,994 | | 5,499,485 | | 5,500,469 | 51 : | 5,499,401 |
| | 5,499,415 | | 5,500,864 | | 5,500,035 | | 5,499,490 | 45 : | 5,499,425 | | 5,499,540 |
| | 5,499,444 | | 5,500,901 | | 5,500,049 | | 5,499,521 | | 5,499,437 | | 5,499,620 |
| | 5,499,628 | 28 : | 5,499,720 | | 5,500,073 | | 5,499,638 | | 5,499,454 | | 5,499,636 |
| | 5,499,760 | | 5,500,806 | | 5,500,105 | | 5,499,721 | | 5,499,458 | | 5,499,685 |
| | 5,499,789 | 29 : | 5,499,709 | | 5,500,125 | | 5,499,743 | | 5,499,494 | | 5,499,739 |
| | 5,499,856 | | 5,499,766 | | 5,500,147 | | 5,499,803 | | 5,499,529 | | 5,500,072 |
| | 5,499,891 | | 5,500,036 | | 5,500,157 | | 5,499,886 | | 5,499,597 | | 5,500,119 |
| | 5,499,918 | | 5,500,140 | | 5,500,167 | | 5,499,893 | | 5,499,728 | | 5,500,315 |
| | 5,499,920 | | 5,500,365 | | 5,500,172 | | 5,499,894 | | 5,499,828 | | 5,500,642 |
| | 5,499,973 | | 5,500,371 | | 5,500,201 | | 5,499,970 | 47 : | 5,499,449 | | 5,500,729 |
| | 5,499,992 | | 5,500,759 | | 5,500,227 | | 5,499,978 | | 5,499,495 | | 5,500,828 |
| | 5,499,998 | 30 : | 5,499,761 | | 5,500,228 | | 5,500,048 | | 5,499,564 | | 5,500,855 |
| | 5,500,064 | | 5,500,081 | | 5,500,248 | | 5,500,065 | | 5,499,588 | 53 : | 5,499,405 |
| | 5,500,068 | 32 : | 5,499,755 | | 5,500,253 | | 5,500,137 | | 5,499,589 | | 5,499,457 |
| | 5,500,106 | 33 : | Re.35,186 | | 5,500,266 | | 5,500,138 | | 5,499,896 | | 5,499,569 |
| | 5,500,127 | | 5,499,450 | | 5,500,272 | | 5,500,143 | | 5,499,898 | | 5,499,572 |
| | 5,500,144 | | 5,499,459 | | 5,500,282 | | 5,500,150 | | 5,499,983 | | 5,499,611 |
| | 5,500,161 | | 5,499,594 | | 5,500,283 | | 5,500,154 | | 5,499,986 | | 5,499,690 |
| | 5,500,180 | | 5,499,749 | | 5,500,298 | | 5,500,190 | | 5,500,002 | | 5,499,726 |
| | 5,500,198 | | 5,499,901 | | 5,500,299 | | 5,500,196 | | 5,500,136 | | 5,499,740 |
| | 5,500,200 | | 5,499,902 | | 5,500,300 | | 5,500,206 | | 5,500,305 | | 5,499,852 |
| | 5,500,211 | | 5,499,937 | | 5,500,316 | | 5,500,208 | | 5,500,450 | | 5,499,864 |
| | 5,500,230 | 34 : | 5,499,411 | | 5,500,317 | | 5,500,267 | | 5,500,566 | | 5,499,977 |
| | 5,500,281 | | 5,499,558 | | 5,500,320 | | 5,500,270 | 48 : | Re.35,184 | | 5,500,075 |
| | 5,500,306 | | 5,499,619 | | 5,500,324 | | 5,500,277 | | 5,499,409 | | 5,500,215 |
| | 5,500,352 | | 5,499,637 | | 5,500,325 | | 5,500,339 | | 5,499,412 | | 5,500,511 |
| | 5,500,363 | | 5,499,645 | | 5,500,328 | | 5,500,419 | | 5,499,468 | | 5,500,518 |
| | 5,500,512 | | 5,499,691 | | 5,500,330 | | 5,500,429 | | 5,499,470 | | 5,500,627 |
| | 5,500,574 | | 5,499,722 | | 5,500,331 | | 5,500,433 | | 5,499,475 | | 5,500,652 |
| | 5,500,700 | | 5,499,747 | | 5,500,332 | | 5,500,447 | | 5,499,605 | | 5,500,936 |
| | 5,500,744 | | 5,499,775 | | 5,500,333 | | 5,500,451 | | 5,499,639 | 54 : | 5,499,578 |
| | 5,500,860 | | 5,499,780 | | 5,500,335 | | 5,500,529 | | 5,499,648 | | 5,500,452 |
| | 5,500,906 | | 5,499,935 | | 5,500,338 | | 5,500,593 | | 5,499,677 | | 5,500,458 |
| | 5,500,928 | | 5,499,984 | | 5,500,376 | | 5,500,737 | | 5,499,681 | | 5,500,467 |
| | 5,500,947 | | 5,500,020 | | 5,500,401 | | 5,500,766 | | 5,499,682 | | 5,500,468 |
| 26 : | 5,499,434 | | 5,500,031 | | 5,500,420 | 40 : | 5,499,622 | | 5,499,688 | 55 : | 5,499,431 |
| | 5,499,474 | | 5,500,033 | | 5,500,498 | | 5,499,649 | | 5,499,689 | | 5,499,463 |
| | 5,499,500 | | 5,500,139 | | 5,500,505 | | 5,499,658 | | 5,499,744 | | 5,499,509 |
| | 5,499,530 | | 5,500,195 | | 5,500,517 | | 5,499,678 | | 5,499,815 | | 5,499,565 |
| | 5,499,538 | | 5,500,209 | | 5,500,561 | | 5,499,680 | | 5,499,818 | | 5,499,616 |
| | 5,499,560 | | 5,500,213 | | 5,500,567 | | 5,499,959 | | 5,499,826 | | 5,499,634 |
| | 5,499,571 | | 5,500,220 | | 5,500,572 | | 5,500,034 | | 5,499,850 | | 5,499,654 |
| | 5,499,606 | | 5,500,235 | | 5,500,575 | | 5,500,396 | | 5,499,857 | | 5,499,669 |
| | 5,499,647 | | 5,500,236 | | 5,500,607 | | 5,500,582 | | 5,500,019 | | 5,499,675 |
| | 5,499,788 | | 5,500,240 | | 5,500,610 | | 5,500,641 | | 5,500,094 | | 5,499,716 |
| | 5,499,810 | | 5,500,297 | | 5,500,640 | | 5,500,646 | | 5,500,099 | | 5,500,063 |
| | 5,499,841 | | 5,500,312 | | 5,500,645 | 41 : | 5,499,427 | | 5,500,107 | | 5,500,084 |
| | 5,499,843 | | 5,500,327 | | 5,500,659 | | 5,499,752 | | 5,500,109 | | 5,500,091 |
| | 5,499,848 | | 5,500,375 | | 5,500,668 | | 5,500,100 | | 5,500,132 | | 5,500,271 |
| | 5,499,851 | | 5,500,391 | | 5,500,678 | | 5,500,615 | | 5,500,194 | | 5,500,308 |
| | 5,499,854 | | 5,500,423 | | 5,500,693 | | 5,500,636 | | 5,500,260 | | 5,500,360 |
| | 5,499,859 | | 5,500,439 | | 5,500,702 | | 5,500,948 | | 5,500,293 | | 5,500,370 |
| | 5,499,895 | | 5,500,442 | | 5,500,703 | 42 : | 5,499,413 | | 5,500,340 | | 5,500,506 |
| | 5,499,908 | | 5,500,472 | | 5,500,705 | | 5,499,484 | | 5,500,343 | | 5,500,596 |
| | 5,499,950 | | 5,500,605 | | 5,500,715 | | 5,499,523 | | 5,500,369 | | 5,500,632 |
| | 5,499,951 | | 5,500,612 | | 5,500,717 | | 5,499,533 | | 5,500,373 | | 5,500,900 |
| | 5,499,961 | | 5,500,621 | | 5,500,721 | | 5,499,757 | | 5,500,382 | 56 : | 5,499,586 |
| | 5,500,219 | | 5,500,671 | | 5,500,722 | | 5,499,798 | | 5,500,383 | | |
| | 5,500,257 | | 5,500,673 | | 5,500,723 | | 5,499,919 | | 5,500,387 | | |
| | 5,500,287 | | 5,500,761 | | 5,500,730 | | 5,499,930 | | 5,500,392 | | |
| | 5,500,310 | | 5,500,794 | | 5,500,765 | | 5,499,941 | | 5,500,412 | | |

## DESIGN PATENTS

| | | | | | | | | | | | |
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| 01 : | 368,051 | | 368,122 | 04 : | 368,127 | 06 : | 367,964 | | 367,963 | | 367,974 |



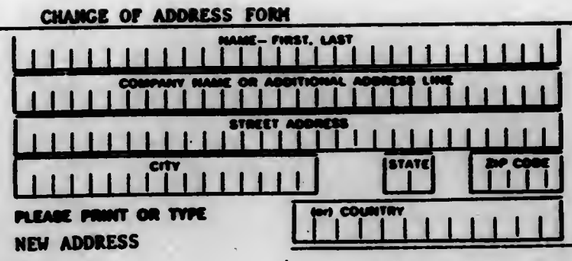
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| | 367,977 | | 368,143 | | 368,011 | | 367,982 | | 368,028 | | 368,016 |
| | 367,978 | 08 : | 367,957 | | 368,066 | 27 : | 367,997 | | 368,029 | | 368,017 |
| | 367,979 | | 368,006 | | 368,097 | 28 : | 368,132 | | 368,033 | | 368,018 |
| | 367,980 | | 368,039 | | 368,102 | 29 : | 367,963 | | 368,036 | | 368,085 |
| | 367,998 | 09 : | 367,960 | | 368,118 | | 368,010 | 45 : | 368,050 | | 368,081 |
| | 368,000 | | 367,972 | 15 : | 368,135 | | 368,012 | | 368,052 | | 368,137 |
| | 368,021 | | 367,973 | 17 : | 367,958 | | 368,099 | 47 : | 368,074 | | 367,984 |
| | 368,023 | | 368,034 | | 368,002 | 32 : | 368,061 | | 368,090 | | 368,116 |
| | 368,054 | | 368,037 | | 368,014 | 34 : | 368,007 | | 368,104 | 48 : | 367,976 |
| | 368,058 | | 368,117 | | 368,038 | | 368,045 | 37 : | 368,101 | | 367,987 |
| | 368,060 | | 368,146 | | 368,107 | | 368,068 | 39 : | 367,999 | | 368,150 |
| | 368,064 | 12 : | 367,969 | 19 : | 367,981 | | 368,086 | | 367,967 | 49 : | 368,022 |
| | 368,070 | | 368,026 | | 367,983 | | 368,087 | | 367,971 | | 368,095 |
| | 368,071 | | 368,053 | | 368,128 | 36 : | 367,955 | | 367,986 | 51 : | 367,996 |
| | 368,079 | | 368,059 | 20 : | 367,994 | | 367,956 | | 368,024 | | 368,140 |
| | 368,094 | | 368,062 | | 368,147 | | 367,962 | | 368,025 | 53 : | 367,951 |
| | 368,120 | | 368,114 | 22 : | 368,145 | | 367,968 | | 368,035 | 55 : | 367,965 |
| | 368,123 | | 368,125 | 24 : | 368,009 | | 367,970 | | 368,044 | | 368,133 |
| | 368,124 | | 368,129 | 25 : | 367,952 | | 367,988 | | 368,092 | | 368,134 |
| | 368,126 | | 368,131 | | 367,989 | | 368,001 | | 368,103 | | |
| | 368,141 | | 368,136 | | 368,040 | | 368,003 | 40 : | 368,063 | | |
| | 368,142 | 13 : | 367,975 | 26 : | 367,966 | | 368,027 | 42 : | 367,954 | | |

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| | | | | | | | | | | | |
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| 06 : | 9,478 | | 9,479 | | 9,480 | | 9,481 | | | | |

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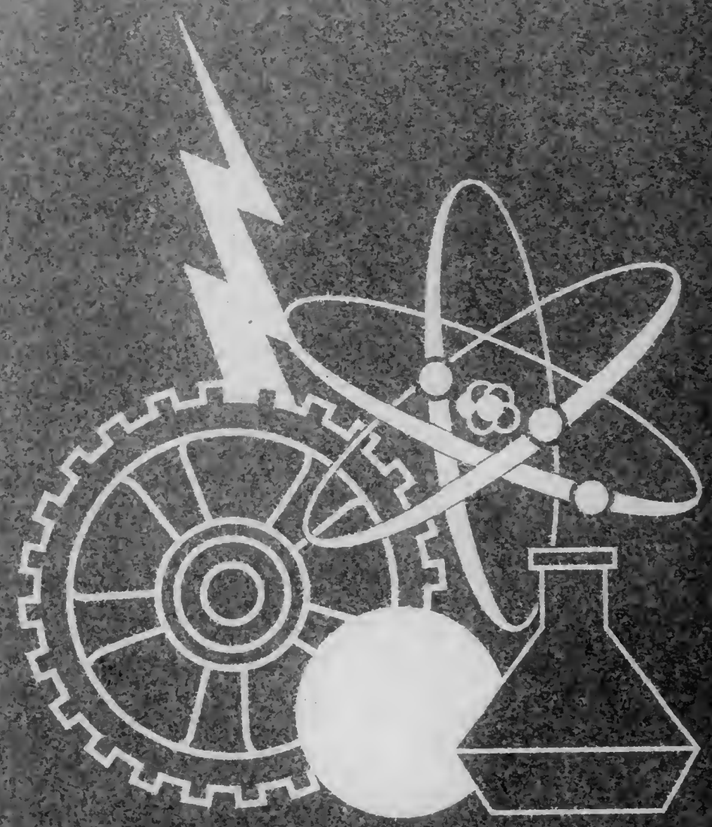
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### Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1181 O.G. 50, on December 19, 1995.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on September 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987, and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed, effective June 20, 1995, due to a change in the exchange rate of the U.S. dollar with regard to the German mark, and was announced in the *Official Gazette* at 1181 O.G. 49, on December 19, 1995.

International fees were changed, effective on January 1, 1996, due to a change in the exchange rate of the U.S. dollar with regard to the Swiss franc, and were announced in the *Official Gazette* at 1181 O.G. 49, on December 19, 1995.

Certain domestic PCT fees and charges for International Search and Preliminary Examination were changed, effective October 1, 1995, and were announced in the *Official Gazette* at 1177 O.G. 171, on August 29, 1995.

The schedule of PCT fees (in U.S. dollars), effective January 1, 1996, is as follows:

| | |
|---|---|
| **International Application (PCT Chapter I) fees:** | |
| Transmittal fee | 220.00 |
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| U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA) | |
| —No corresponding prior U.S. national application filed | 660.00 |
| —Corresponding prior U.S. national application filed | 430.00 |
| —Supplemental search fee, per additional invention (payable only upon invitation) | 190.00 |
| European Patent Office as ISA | 1700.00 |
| **International fees** | |
| Basic fee | 677.00 |
| Basic Supplemental fee (for each page over 30) | 13.00 |
| Designation fee per country or region | |
| —For the first 11 national or regional offices designated | 164.00 |
| —For each designation in excess of 11 offices | No Charge |
| Precautionary designation fee and confirmation fee for each precautionary designation confirmed (PCT Rule 15.5) | |
| —Designation fee | 164.00 |
| —Confirmation fee | 82.00 |
| **International Applicatior. (PCT Chapter II) fees associated with filing a Demand for Preliminary Examination:** | |
| Handling fee | 207.00 |
| Preliminary examination fee | |
| USPTO as International Preliminary Examining Authority (IPEA) | |
| —USPTO was ISA in PCT Chapter I | 470.00 |
| —Additional examination fee, per additional invention (payable only upon invitation) | 140.00 |
| —USPTO was not ISA in PCT Chapter I | 710.00 |
| —Additional examination fee, per additional invention (payable only upon invitation) | 250.00 |

| U.S. National Stage Fees | Small Entity | Regular |
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| **Basic National fee** | | |
| USPTO was IPEA | | |
| —All claims presented satisfied provisions of PCT Article 33(2) to (4) | 47.00 | 94.00 |
| —All claims presented did not satisfy provisions of PCT Article 33(2) to (4) | 340.00 | 680.00 |
| USPTO was ISA but not IPEA | 375.00 | 750.00 |
| USPTO was neither ISA nor IPEA | | |
| —Search report has not been prepared by the European Patent Office or the Japanese Patent Office | 505.00 | 1010.00 |
| —Search report has been prepared by the European Patent Office or the Japanese Patent Office | 440.00 | 880.00 |
| **Other National fees** | | |
| —For each independent claim in excess of 3 | 39.00 | 78.00 |
| —For each claim in excess of 20 | 11.00 | 22.00 |
| —For each application containing a multiple dependent claim | 125.00 | 250.00 |
| —Surcharge for filing oath or declaration after the time limit applicable under PCT Article 22 or 39(l) | 65.00 | 130.00 |
| —Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(l) | 130.00 | 130.00 |

Nov. 27, 1995

BRUCE A. LEHMAN
*Assistant Secretary of Commerce and Commissioner of Patents and Trademarks*

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### Notice of Maintenance Fees Payable

Title 37 Code of Federal Regulations (CFR), Section 1.362(d) provides that maintenance fees may be paid without surcharge for the six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in the patent requiring such payment the patent will expire on the 4th, 8th, or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on March 23, 1993 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,195,187 through 5,197,990
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on March 21, 1989 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,813,079 through 4,815,143
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on March 19, 1985 for which maintenance fees due at 11 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,506,389 through 4,507,800
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after Dec. 12, 1980, but before Aug. 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months, 7 years and six months, and 11 years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1994, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9(f)) ..... $495.00
By other than a small entity ..... $990.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9(f)) ..... $995.00
By other than a small entity ..... $1,990.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

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By other than a small entity ..... $2,990.00

The amount of the surcharge for paying the maintenance fee during the grace period or after expiration of the patent are set forth in 37 CFR 1.20(h), and (i) which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980:

By a small entity (§ 1.9(f)) ..... $65.00
By other than a small entity ..... $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been:

(1) unavoidable ..... $660.00
(2) unintentional ..... $1,550.00

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## Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

*PATENTS WHICH EXPIRED January 10, 1996*
*DUE TO FAILURE TO PAY MAINTENANCE FEES*

| Patent Number | Serial Number | Issue Date |
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### Reissue Applications Filed

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.12(b)).

**4,759,749**, Re. S.N. 08/571,706, Dec. 6, 1995, Cl. 604, HEATER FOR PHYSIOLOGICAL FLUIDS, Wesley H. Verkaart, Owner of Record: *Level I Technologies, Inc., Plymouth, Mass.*, Attorney or Agent: Conrad J. Clark, Ex. Gp.: 3306

**4,823,070**, Re. S.N. 08/558,024, Nov. 16, 1995, Cl. 323, SWITCHING VOLTAGE REGULATOR CIRCUIT, Carl T. Nelson, Owner of Record: *Linear Technology Corp., Milpit, Calif.*, Attorney or Agent: Mark D. Rowland, Ex. Gp.: 2111

**4,942,452**, Re. S.N. 08/448,881, May 24, 1995, Cl. 257/666, LEAD FRAME AND SEMICONDUCTOR DEVICE, Makoto Kitano, et. al., Owner of Record: *Hitachi LTD., Tokyo, Japan*, Attorney or Agent: Alan E. Schiovelli, Ex. Gp.: 2503

**4,948,769**, Re. S.N. 08/505,410, July 21, 1995, Cl. 502/68, CATALYST, Andrew P. Chapple, Owner of Record: *Unilever Patent Holdings, B.V., Vlaardingen, Netherlands*, Attorney or Agent: Paul N. Kokulis, Ex. Gp.: 1106

**4,959,812**, Re. S.N. 08/430,271, Apr. 28, 1995, Cl. 365/185, ELECTRICALLY ERASABLE PROGRAMMABLE READ-ONLY MEMORY WITH NAND CELL STRUCTURE, Masaki Momodomi, et. al., Owner of Record: *Kabushiki Kaisha Toshiba, Kawasaki-Shi, Japan*, Attorney or Agent: Edward H. Knesters, Ex. Gp.: 2511

**5,014,810**, Re. S.N. 08/516,730, Aug. 18, 1995, Cl. 180/268, METHOD FOR CONTROLLING THE RELEASE OF PASSENGER RESTRAINT SYSTEMS, Bernhard Mattes, et. al., Owner of Record: *Robert Bosch Gmbh, Stuttgart, Federal Republic of Germany*, Attorney or Agent: Richard L. Mayer, Ex. Gp.: 3106

**5,032,305**, Re. S.N. 08/585,960, Jan. 16, 1996, Cl. 252, LUBRICANT FOR REFRIGERANT, Tamiji Kamakura, et. al., Owner of Record: *Asahi Denka Kogyo K.K., Tokyo, Japan*, Attorney or Agent: Terryeance F. Chapman, Ex. Gp.: 1105

**5,041,885**, Re. S.N. 08/575,846, Dec. 21, 1995, Cl. 257, SURFACE FIELD EFFECT TRANSISTOR WITH DEPRESSED SOURCE AND/OR DRAIN AREAS FOR ULSI INTEGRATED DEVICES, Fabio Gualandris, et. al., Owner of Record: *SGS-Thomson Microelectronics SRL, Milan, Italy*, Attorney or Agent: Robert S. Groover, Ex. Gp.: 2503

**5,075,112**, Re. S.N. 08/517,711, Aug. 21, 1995, Cl. 424/434, METHOD OF AND DOSAGE UNIT FOR INHIBITING ANGIOGENESIS OR VASCULARIZATION IN AN ANIMAL USING SHARK CARTILAGE, Irwin W. Lane, Owner of Record: *Cartilage Technologies, Inc., St. Michael, Barbados*, Attorney or Agent: None, Ex. Gp.: 1502

**5,198,467**, Re. S.N. 08/574,194, Dec. 18, 1995, Cl. 514/553, INSECTICIDE FOR IMPORTED FIRE ANTS AND OTHER INSECT PESTS, Robert R. Milks, Owner of Record: *Inventor*, Attorney or Agent: Charles L. Gholz, Ex. Gp.: 1209

**5,215,754**, Re. S.N. 08/459,075, June 2, 1995, SWALLOWABLE TABLE CONTAINING POLYCARBOPHIL, Joseph J. Valoroso, et. al., Owner of Record: *American Cyanamid Co., Stamford, Conn*, Attorney or Agent: Steven H. Flynn, Ex. Gp.: 1502

**5,217,226**, Re. S.N. 08/301,545, Sept. 6, 1994, Cl. 273/157R, THREE DIMENSIONAL MODEL ATMOSPHERE PUZZLE, Anthony F. Christopher, Owner of Record: *Inventor*, Attorney or Agent: None, Ex. Gp.: 3304

**5,230,036**, Re. S.N. 08/504,227, July 19, 1995, Cl. 395/2, SPEECH CODING SYSTEM UTILIZING A RECURSIVE COMPUTATION TECHNIQUE FOR IMPROVEMENT IN PROCESSING SPEED, Masami Akamine, et. al., Owner of Record: *Kabushiki Kaisha Toshiba, Kawasaki-Shi, Japan*, Attorney or Agent: Gregory J. Maier, Ex. Gp.: 2308

**5,235,633**, Re. S.N. 08/552,486, Nov. 9, 1995, Cl. 379/60, CELLULAR TELEPHONE SYSTEM THAT USES POSITION OF A MOBILE UNIT TO MAKE CALL MANAGEMENT DECISIONS, Everett Dennison, et. al., Owner of Record: *Sygnet Communications, Inc., Youngstown, Ohio*, Attorney or Agent: Terry M. Gernstein, Ex. Gp.: 2608

**5,247,658**, Re. S.N. 08/531,460, Sept. 21, 1995, Cl. 395/600, METHOD AND SYSTEM FOR TRAVELING LINKED LIST RECORD BASED UPON WRITE-ONCE PREDETERMINED BIT VALUE OF SECONDARY POINTERS, Phillip L. Barrett, Owner of Record: *Microsoft Corp., Redmond, Wash.*, Attorney or Agent: Maurice J. Pirio, Ex. Gp.: 2315

**5,253,209**, Re. S.N. 08/542,360, Oct. 12, 1995, Cl. 365/201, INTEGRATED SEMICONDUCTOR MEMORY, Kurt Koffman, et. al., Owner of Record: *Siemens Aktiengesellschaft, Muenchen, Germany*, Attorney or Agent: Laurence A. Greenberg, Ex. Gp.: 2511

**5,262,654**, Re. S.N. 08/558,544, Nov. 16, 1995, Cl 257/53, DEVICE FOR READING AN IMAGE HAVING A COMMON SEMICONDUCTOR LAYER, Shunpei Yamazaki, Owner of Record: *Semiconductor Energy Laboratory Co. Ltd., Kanagawa, Japan,* Attorney or Agent: Donald R. Studebaker, Ex. Gp.: 2506

**5,278,699**, Re. S.N. 08/584,309, Jan. 11, 1996, Cl. 359/692, ZOOM LENS SYSTEM, Takayuki Ito, et. al., Owner of Record: *Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan,* Attorney or Agent: Bruce H. Bernstein, Ex. Gp.: 2516

**5,286,501**, Re. S.N. 08/599,510, Jan. 25, 1996, Cl. 426/3, PETROLEUM WAX-FREE CHEWING GUMS HAVING IMPROVED FLAVOR RELEASE, Michael A. Reed, Owner of Record: *WM. Wrigley Jr. Co., Chicago, Ill.,* Attorney or Agent: Maxwell J. Petersen, Ex. Gp.: 1302

**5,316,587**, Re. S.N. 08/549,954, Oct. 30, 1995, Cl. 134/7, WATER SOLUBLE BLAST MEDIA CONTAINING SURFACTANT, Benny S. Yam, et. al., Owner of Record: *Church & Dwight Co., Inc., Princeton, N.J.,* Attorney or Agent: Stuart D. Frenkel, Ex. Gp.: 1307

**5,319,516**, Re. S.N. 08/558,285, Nov. 13, 1995, Cl. 361/220, ELECTROSTATICALLY PROTECTED IC CARD, Carl C. Perkins, Owner of Record: *ITT Corp., Secaucus, N.J.,* Attorney or Agent: Leon D. Rosen, Ex. Gp.: 2104

**5,335,971**, Re. S.N. 08/583,853, Jan. 11, 1996, Cl. 297/378.12, FOLDABLE CHAIR, James O. Kelley, Owner of Record: *Sligh Furniture Co., Holland, Mich.,* Attorney or Agent: James E. Bartek, Ex. Gp.: 3507

**5,373,840**, Re. S.N. 08/585,410, Jan. 11, 1996, Cl. 128/4, ENDOSCOPE AND METHOD FOR VEIN REMOVAL, David R. Knighton, Owner of Record: *Embro Corp., St. Louis Park, Minn.,* Attorney or Agent: Terry L. Wiles, Ex. Gp.: 3302

**5,374,190**, Re. S.N. 08/553,222, Nov. 7, 1995, Cl. 434/82, WAX CRAFT PRODUCT AND METHOD OF MANUFACTURING, Paul E. Brokaw, et. al., Owner of Record: *The Chenille Kraft Co., Chicago, Ill.,* Attorney or Agent: John E. Miller, Ex. Gp.: 3303

**5,385,380**, Re. S.N. 08/551,309, Nov. 1, 1995, Cl. 296/84.1, SPLIT WINDSHIELD ASSEMBLY FOR RECREATION VEHICLE, Edward J. Heavner, Owner of Record: *Plastics Manufacturing, Inc., Harrisburg, N.C.,* Attorney or Agent: Jeffrey J. Schwartz, Ex. Gp.: 3102

**5,457,505**, Re. S.N. 08/588,204, Jan. 19, 1996, Cl. 351/120, PROTECTIVE EYEGLASSES CONSTRUCTION, Richard W. Canavan, et. al., Owner of Record: *Uvex Safety, Inc., Smithfield, R.I.,* Attorney or Agent: Stephen J. Holmes, Ex. Gp.: 2515

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### Requests for Reexaminations Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

**4,697,932**, Reexam. No. 90/004,145, Feb. 9, 1996, Cl. 368/255, MULTI-SIGNAL ALARM, Miroslav Matievic, Owner of Record: *Yosemite Investments, Inc., Indianapolis, Ind.,* Attorney or Agent: Robert F. Meyer, Speedway, Ind., Ex. Gp.: 2107, Requester: Floyd Bell Associates, c/o Frank H. Foster, Kremblas, Foster, Millard & Pollick, Reynoldsburg, Ohio

**4,703,991**, Reexam. No. 90/004,139, Feb. 14, 1996, Cl. 439/676, LOW PROFILE JACK, Walter M. Philippson, Owner of Record: *Stewart Connector Systems, Inc., Glen Rock, Pa.,* Attorney or Agent: Martin G. Raskin, Steinberg Raskin & Davidson, New York, N.Y., Ex. Gp.: 3202, Requester: Owner

**4,878,553**, Reexam. No. 90/004,140, Feb. 16, 1996, Cl. 178/018, POSITION DETECTING APPARATUS, Tsuguya Yamanami, et. al., Owner of Record: *Wacom Co., Ltd., Saitama, Japan,* Attorney or Agent: Moriss Liss Pollock Vande Sande & Priddy, Washington, D.C., Ex. Gp.: 2614, Requester: Barnes & Thornburg, Washington, D.C.

**4,887,622**, Reexam. No. 90/004,135, Feb. 12, 1996, Cl. 132/320, BRUSH FOR THE APPLICATION OF MASCARA TO THE EYELASHES, Jean-Louis Gueret, Owner of Record: *Societe L'Oreal, Paris, France,* Attorney or Agent: Norman H. Stepno, Burns, Doane, Swecker & Mathis, Alexandria, Va., Ex. Gp.: 3507, Requester: Owner

**4,978,213**, Reexam. No. 90/004,136, Feb. 13, 1996, Cl. 351/212, APPARATUS FOR DETERMINING THE CONTOUR OF THE CORNEA OF A HUMAN EYE, Sami G. El Hage, Owner of Record: *Alcon Laboratories, Inc., Ft. Worth, Tex.,* Attorney or Agent: John S. Pratt, Kilpatrick & Cody, Atlanta, Ga., Ex. Gp.: 2507, Requester: Owner

**5,000,991**, Reexam. No. 90/004,143, Feb. 20, 1996, Cl. 428/365, PROCESS FOR PRODUCING POLYESTER RESIN FOAM AND POLYESTER RESIN FOAM SHEET, Motoshige Hayashi, et. al., Owner of Record: *Sekisui Kaseihin Kogyo Kabushiki Kaisha, Nara-Shi, Japan,* Attorney or Agent: David T. Nikaido, Nikaido Marmelstein Murray & Oram, Wash., D.C., Ex. Gp.: 1513, Requester: Jeffrey A. Linderman, Luedeka Neely & Graham, Knoxville, Tenn.

**5,042,001**, Reexam. No. 90/004,138, Feb. 12, 1996, Cl. 364/736, METHOD AND APPARATUS FOR PERFORMING MATHEMATICAL FUNCTIONS USING POLYNOMIAL APPROXIMATION AND A RECTANGULAR ASPECT RATIO MULTIPLIER, Thomas B. Brightman, et. al., Owner of Record: *Cyrix Corp., Richardson, Tex.,* Attorney or Agent: Andrew S. Vigor, Cyrix Corp., Richardson, Tex., Ex. Gp.: 2304, Requester: David R. Halvorson, Blakely Sokoloff Taylor & Zafman, Los Angeles, Calif.

**5,244,624**, Reexam. No. 90/004,141, Feb. 20, 1996, Cl. 264/516, METHOD OF INSTALLING A NEW PIPE INSIDE AN EXISTING CONDUIT BY PROGRESSIVE ROUNDING, Campbell H. Steketee, Jr., Owner of Record: *Nu-Pipe, Inc., Salem, Oreg.,* Attorney or Agent: Michael I. Wolfson, Cowan Liebowitz & Latman, New York, N.Y., Ex. Gp.: 1307, Requester: Charles J. Brown, Brown, Kelleher, Zwickel & Wilhelm, Windham, N.Y.; James R. Muldoon, Bond, Schoeneck & King, Syracuse, N.Y.

**5,280,135**, Reexam. No. 90/004,132, Feb. 9, 1996, Cl. 174/067, OUTDOOR ELECTRICAL OUTLET COVER, Donald M. Berlin, et. al., Owner of Record: *Intermatic, Inc., Spring Grove, Ill.,* Attorney or Agent: Willian Brinks Olds Hofer Gilson & Lione, Chicago, Ill., Ex. Gp.: 2109, Requester: James W. McKee, Fay Sharpe Beall Fagan Minnich & McKee, Cleveland, Ohio

**5,367,085**, Reexam. No. 90/004,137, Feb. 13, 1996, Cl. 549/206, PREPARATION OF $TiCl_3$ COORDINATION COMPLEXES, Jamie R. Strickler, Owner of Record: *Albermarle Corp., Richmond, Va.,* Attorney or Agent: Albermarle Corp., Richmond, Va., Ex. Gp.: 1206, Requester: Edward S. Irons, 555 Thirteenth Street, NW, Suite 701, East Tower, Wash., D.C. 20004

**5,368,809**, Reexam. No. 90/004,142, Feb. 20, 1996, Cl. 264/516, METHOD OF INSTALLING A NEW PIPE INSIDE AN EXISTING CONDUIT BY PROGRESSIVE ROUNDING, Campbell H. Steketee, Jr., Owner of Record: *Nu-Pipe, Inc., Salem, Oreg.,* Attorney or Agent: Michael I. Wolfson, Cowan Liebowitz & Latman, New York, N.Y., Ex. Gp.: 1307, Requester: Charles J. Brown, Brown, Kelleher, Zwickel &



Wilhelm, Winchma, N.Y., James R. Muldoon, Bond, Schoeneck & King, Syracuse, N.Y.

**5,382,207**, Reexam. No. 90/004,144, Feb. 20, 1996, Cl. 482/054, EXERCISE TREADMILL, Richard E. Skowronski, et. al., Owner of Record: *Life Fitness, Franklin Park, Ill.,* Attorney or Agent: Life Fitness, Franklin Park, Ill., Ex. Gp.: 3302, Requester: Mark A. Krull, Merchant Gould Smith Edell Welter & Schmidt, St. Paul, Minn.

**5,384,314**, Reexam. No. 90/004,133, Jan. 31, 1996, Cl. 514/167, 1A-FLUORO-25-HYDROXY-16-ENE-23-YNE-CHOLECALCIFEROL, Thomas I. Doran, et. al., Owner of Record: *Hoffman-La Roche Inc., Nutley, N.J.,* Attorney or Agent: Robert A. Silverman, Ex. Gp.: 1206, Requester: Owner

**5,398,142**, Reexam. No. 90/004,134, Feb. 9, 1996, Cl. 360/48, METHOD FOR ELIMINATING FILE FRAGMENTATION AND REDUCING AVERAGE SEEK TIMES IN A MAGNETIC DISK MEDIA ENVIRONMENT, William Davy, Owner of Record: *Raxco, Inc., Rockville, Md.,* Attorney or Agent: James G. Gatto, Baker & Botts, Wash., D.C., Ex. Gp.: 2513, Requester: Owner

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### Notice of Expiration of Trademark Registrations Due To Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

TRADEMARK REGISTRATIONS WHICH EXPIRED DECEMBER 18, 1995
DUE TO FAILURE TO RENEW

| Reg. Number | Serial Number | Reg. Date |
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| 103,004 | 71/082,301 | 03/16/1915 |
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| 103,022 | 71/082,614 | 03/16/1915 |
| 103,068 | 71/071,687 | 03/16/1915 |
| 103,085 | 71/082,090 | 03/16/1915 |
| 103,086 | 71/082,091 | 03/16/1915 |
| 103,087 | 71/082,093 | 03/16/1915 |
| 103,088 | 71/082,095 | 03/16/1915 |
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### Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceeding sent by certified mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will proceed as in the case of default.

Synthesis Software Solutions, Inc., Sunnyvale, Calif., Reg. No. 1,615,219 for the mark SYNTHESIS SOFTWARE SOLUTIONS, Canc. No. 24,616.

Associated Credit Service, Inc., Fayetteville, N.C., Reg. No. 1,100,965, for the mark "ASSOCIATED CREDIT SERVICE, INC.", Canc. No. 23,839.

Associated Credit Service, Inc., Fayetteville, N.C., Reg. No. 1,100,965, for the mark "ASSOCIATED CREDIT SERVICE, INC.", Canc. No. 23,840.

Webster Clothes, Inc., Baltimore, Md., Reg. No. 1,265,062, for the mark "STOCKBRIDGE LTD.", Canc. No. 24,054.

Koro Inc. dba Omega Medical Systems, South Hackensack, N.J., Reg. No. 641,095, for the mark "STERISTAT", Canc. No. 24,195.

H. Cotler Company, Inc., New York, N.Y., Reg. No. 1,437,371, for the mark "KAMIKAZE", Canc. No. 24,197.

Osmond Brothers, Orem, Utah, Reg. No. 1,056,291, for the mark "THE OSMONDS", Canc. No. 24,366.

New York, Urban Coalition Inc., New York, N.Y., Reg. No. 1,120,989, for the mark "NEIGHBORHOOD", Canc. No. 24,416.

Chas. Hollenbach, Inc., Chicago, Ill., Reg. No. 1,198,109, for the mark "OLD CHICAGO", Canc. No. 24,419.

Mildred Sara Holson, Oakland, Calif., Reg. No. 1,057,185, for the mark "MEDICLAIM", Canc. No. 24,436.

Mimosa Restaurants, Inc., New York, N.Y., Reg. No. 1,075,258, for the mark "MIMOSA", Canc. No. 24,444.

Sun System Prefabricated Solar Greenhouses, Inc., Commack, N.Y., Reg. No. 1,474,171, for the mark "SUN SYSTEM", Canc. No. 22,891.

Ion Track Instruments, Inc., Reg. No. 1,131,239, for the mark "OPTOMAX", Canc. No. 23,178.

Ship Oar Shore, Inc., Hilton Head Island, S.C., Reg. No. 1,571,034, for the mark "FIRST WAVE AND DESIGN", Canc. No. 23,970.

Wayne L. Rich, Hermosa Beach, Calif., Reg. No. 1,606,471, for the mark "SURF BOARDS BY JACOBS AND DESIGN", Canc. No. 24,039.

API Acquisition Corporation, Bellevue, Wash., Reg. No. 1,060,353, for the mark "PENTIMENTO AND DESIGN", Canc. No. 24,043.

Fame Shirtmakers, Ltd., New York, N.Y., Reg. No. 1,105,188, for the mark "ARTURO", Canc. No. 24,087.

View Communications, Inc., New York, N.Y., Reg. No. 1,559,788, for the mark "VIEW", Canc. No. 24,141.

Stars & Stripes Gold, Inc., Cranston, R.I., Reg. No. 1,476,762, for the mark "STARS & STRIPES" (STYLIZED), Canc. No. 24,145.

Foremost Dairies, Inc., La Jolla, Calif., Reg. No. 604,037, for the mark "BIG DIP", Canc. No. 24,210.

Societe Arnex S.A.R.L., Paris, France, Reg. No. 1,639,798 for the mark "SEQUOIA & DESIGN", Canc. No. 23,885.

JEAN BROWN
*Technical Support Manager,*
Trademark Trial
and Appeal Board, for
ROBERT M. ANDERSON
*Deputy Assistant Commissioner*
*for Trademarks*

### Registration To Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office who have been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office until their registration certificates are mailed to them. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before May 10, 1996.

Bates, Owen J., 22044 Lakeland Ave., Lake Forest, Calif. 92630

Katopis, Chris J., 1713 U St., N.W., #3, Washington, D.C. 20009

February 23, 1996 KAREN L. BOVARD, *Director*
Office of Enrollment and Discipline

### Department of Commerce
### Patent and Trademark Office

### Grant of Certificate of Interim Extension of the term of U.S. Patent No. 4,062,848; REMERON.

*Agency:* Patent and Trademark Office, Commerce.
*Action:* Notice of Term Extension
*Summary:* The Patent and Trademark Office has issued a certificate under 35 U.S.C. § 156 (d)(5) for a one-year interim extension of the term of U.S. Patent No. 4,062,848 that claims the active ingredient of the human drug product "REMERON."
*For Information Contact:* Hiram A. Bernstein by telephone at (703) 305-9285; by mail marked to his attention and addressed to the Assistant Commissioner for Patents, Box DAC, Washington, D.C. 20231; or by fax marked to his attention at (703) 308-6916.
*Supplementary Information:* Section 156 of Title 35, United States Code, generally provides that the term of a patent may be extended for a period of up to 5 years if the patent claims a product, or a method of making or using a product, that has been subject to certain defined regulatory review. Under § 156, a patent is eligible for term extension only if regulatory review of the claimed product was completed before the original patent term expired.

On December 3, 1993, § 156 was amended by Pub. L. No. 103-179 to provide that if the owner of record of the patent or its agent reasonably expects the applicable regulatory review

period to extend beyond the expiration of the patent, the owner or its agent may submit an application to the Commissioner of Patents and Trademarks for an interim extension of the patent term. If the Commissioner determines that, except for permission to market or use the product commercially, the patent would be eligible for a statutory extension of the patent term, the Commissioner shall issue to the applicant a certificate of interim extension for a period of not more that one year.

On November 13, 1995, Alzona Incorporated, owner of record in the Patent and Trademark Office of U.S. Patent No. 4,062,848, filed an application for interim extension of the term of this patent under 35 U.S.C. § 156(d)(5). The application states that the patent claims a compound comprising the active ingredient of the drug product "REMERON." The application states that the product is currently undergoing a regulatory review before the Food and Drug Administration for permission to market or use the product commercially. The original term of the patent expired on December 13, 1994. On December 5, 1994, the patent was granted a first interim extension under 35 U.S.C. § 156(d)(5) for a period of one year. Applicant now requests another interim extension of the term of the patent for a period of one year.

Review of the application indicates that except for permission to market or use the product commercially, the subject patent would be eligible for an extension of the patent term under 35 U.S.C. § 156. Since it is apparent that the regulatory review period may extend beyond the date of expiration of the patent, as extended by the first interim extension, a second and final interim extension of the patent term under 35 U.S.C. § 156(d)(5) is appropriate. Accordingly, an interim extension under 35 U.S.C. § 156(d)(5) of the term of U.S. Patent No. 4,062,848 has been granted for a period of one year from the extended expiration date of the patent term in effect.

February 21, 1996 BRUCE A. LEHMAN
*Assistant Secretary of Commerce and Commissioner of Patents and Trademarks*

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**Guidance on Treatment of Product and Process Claims in light of *In re Ochiai*, *In re Brouwer* and 35 U.S.C. § 103(b)**

The purpose of this Notice is to provide guidance to Patent and Trademark Office personnel and to the public on the proper consideration of certain claims in light of *In re Ochiai*, 71 F. 3d 1565, 37 USPQ2d 1127 (Fed. Cir. 1995) and *In re Brouwer*, ** F.3d **, 37 USPQ2d 1663 (Fed. Cir. 1996) and the passage of 35 U.S.C. § 103(b), which became effective November 1, 1995. *Ochiai*, *Brouwer* and § 103(b) relate to how process claims directed to making or using nonobvious products are to be treated.

The Court in *Ochiai* and *Brouwer* addressed the issue of whether an otherwise conventional process could be patented if it were limited to making or using a nonobvious product. In both cases, the Federal Circuit held that the use of *per se* rules is improper in applying the test for obviousness under the 35 U.S.C. § 103. Rather, § 103 requires a highly fact-dependent analysis involving taking the claimed subject matter *as a whole* and comparing it to the prior art. To support a rejection under § 103, the collective teachings of the prior art must have suggested to one of ordinary skill in the art that, at the time the invention was made, applicant's claimed invention would have been obvious. In applying this test to the claims on appeal, the Court held that there simply was no suggestion or motivation in the prior art to make or use the nonobvious products to which the claims were limited and consequently overturned the rejections based upon § 103.

Interpreting a claimed invention as a whole requires consideration of *all* claim limitations. Thus, language in a process claim which recites making or using a nonobvious product must be treated as a material limitation, and a motivation to make or use the nonobvious product must be present in the prior art for a § 103 rejection to be sustained.

In light of *Ochiai* and *Brouwer*, Office personnel will consider all claim limitations when analyzing process claims which make or use nonobvious products under § 103. Office personnel will focus on treating claims as a whole and follow the analysis set forth in *Graham v. John Deere*, 383 U.S. 1, 148 USPQ 459 (1966).

Accordingly, to facilitate examination under § 103, where product and process claims are presented in the same application, applicant may be called upon under 35 U.S.C. § 121 to elect claims to either the product or process. The claims to the non-elected invention will be withdrawn from further consideration. However, in the case of an elected product claim, rejoinder will be permitted when a product claim is found allowable and the withdrawn process claim depends from or otherwise includes all the limitations of an allowed product claim. Withdrawn process claims not commensurate in scope with an allowed product claim will not be rejoined. In the event of rejoinder, the rejoined process claims will be fully examined for patentability in accordance with 37 CFR 1.104 - 1.106. If the application containing the rejoined claims is not in condition for allowance, the subsequent Office action may be made final, or, if the application was already under final rejection, the next Office action may be an advisory action.

35 U.S.C. § 103(b) is applicable to biotechnological processes only. Section 103(b) precludes a rejection of process claims which involve the use or making of certain nonobvious biotechnological compositions of matter under § 103(a). Section 103(b) requires that:

1. the biotechnological process and composition of matter be contained in either the same application or in separate applications having the same effective filing date;

2. both the biotechnological process and composition of matter be owned or subject to an assignment to the same person at the time the process was invented;

3. a patent issued on the process also contain the claims to the composition of matter used in or made by the process, or, if the process and composition of matter are in different patents, the patents expire on the same date;

4. the biotechnological process falls within the definition set forth in § 103(b); and

5. a timely election be made to proceed under the provisions of § 103(b).

In view of the Federal Circuit's decisions in *Ochiai* and *Brouwer*, an applicant's need to rely upon § 103(b) should be rare. Consequently, the Patent and Trademark Office will treat § 103(b) elections on a case-by-case basis by way of petition under 37 CFR 1.182. That petition must establish that all the requirements set forth in § 103(b) have been satisfied. An election will normally be considered timely if it is made no later than the earlier of either (1) the payment of the issue fee, or (2) the filing of an appeal brief in an application which contains a composition of matter claim which has not been rejected under 35 U.S.C. §§ 102 or 103.

In an application where at least one composition of matter claim has not been rejected under 35 U.S.C. §§ 102 or 103, a § 103(b) election may be made by submitting the petition and an amendment requesting entry of process claims which correspond to the composition of matter claim.

For applications pending on or after November 1, 1995, in which the issue fee has been paid prior to the date of this Notice, the timeliness requirement for an election under § 103(b) will be considered satisfied if the conditions of 37 CFR 1.312(b) are met. However, if a patent is granted on an application entitled to the benefit of § 103(b) without an election having been made as a result of error without deceptive intent, patentees may file a reissue application to permit consideration of process claims which qualify for § 103 (b) treatment.

Any questions, comments or suggestions regarding petitions under 37 CFR 1.182 filed pursuant to this Notice should be directed to the Special Program Law Office, attention: Hiram Bernstein, Senior Legal Advisor. All other questions, comments or suggestions regarding this Notice should be directed to the Solicitor's Office, attention: Craig Kaufman, Associate Solicitor.

February 28, 1996 BRUCE A. LEHMAN
*Assistant Secretary of Commerce and Commissioner of Patents and Trademarks*



**Disclaimer and Dedication**

D 353,644—Robert D. Hirsch, Oceanside; Richard J. Liesz, Cardiff; Mark McClure, Carlsbad; Christopher Best, Encinitas, all of Calif. GOLF CLUB HEAD. Patent dated December 20, 1994. Disclaimer and dedication filed October 13, 1995, by the assignee, Cobra Golf Incorporated.

Hereby disclaims and dedicates to the public the entire term of said patent.

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**Department of Commerce**
**Patent and Trademark Office**
**[Docket No. 950531144-5304-02]**
**RIN 0651-XX02**

**Examination Guidelines for Computer-Related Inventions**

*Agency:* Patent and Trademark Office, Commerce.
*Action:* Notice.
*Summary:* The Patent and Trademark Office ("Office") is publishing the final version of the guidelines to be used in examination of computer-related inventions.
*Effective Date:* March 29, 1996.
*For Further Information Contact:* Karen A. Buchanan by telephone at (703) 305-8607, by facsimile at (703) 305-9373, by electronic mail at buchanan@uspto.gov, or by mail marked to her attention addressed to Office of the Solicitor, P.O. Box 15667, Arlington, Va. 22215.
*Supplementary Information:*

**A. Discussion of Public Comments**

The Office received forty-six comments in response to the "Request for Public Comment on the Proposed Examination Guidelines for Computer-Implemented Inventions" published on June 2, 1995 (60 FR 28778) and the supporting legal analysis issued on October 3, 1995. The Office has carefully considered all of the comments, and a number of changes have been made in response

These changes include: (1) merging the guidelines and the legal analysis in support of the guidelines into a single document, (2) changing the subject title of the document from "computer-implemented" inventions to "computer-related" inventions, (3) clarifying the legal requirements for statutory subject matter, (4) segmenting the guidelines into separate statutory requirements for patentability, and (5) ensuring that the guidelines treated computer-related inventions in the same manner as inventions in other technologies to avoid creation of an artificial distinction between hardware-implemented and software-implemented inventions

Several suggestions have not been adopted. These include: (1) determining that claims for data structures per se and computer programs per se are statutory subject matter, (2) determining that claims for non-functional descriptive material embodied on computer-readable media are statutory subject matter, and (3) treating claims that infer functional descriptive material is embodied on computer-readable medium as claims limited to computer-readable medium embodying the functional descriptive material. The first two suggestions are addressed in detail in Section IV.B.1(a)-(c) and the last suggestion is addressed in detail in Section IV.B.2(d).

Several commentors encouraged the Office to improve its ability to conduct effective prior art searches. Such encouragement is consistent with the current Office plan to use automated search tools to effectively conduct such prior art searches

**B. Examination Guidelines for Computer-Related Inventions**

**I. Introduction**

These "Examination Guidelines for Computer-Related Inventions"[1] ("Guidelines") are to assist Office personnel in the examination of applications drawn to computer-related inventions.[2] The Guidelines are based on the Office's current understanding of the law and are believed to be fully consistent with binding precedent of the Supreme Court, the Federal Circuit and the Federal Circuit's predecessor courts.

These Guidelines do not constitute substantive rulemaking and hence do not have the force and effect of law. These Guidelines have been designed to assist Office personnel in analyzing claimed subject matter for compliance with substantive law. Rejections will be based upon the substantive law and it is these rejections which are appealable. Consequently, any failure by Office personnel to follow the Guidelines is neither appealable nor petitionable.

The Guidelines alter the procedures Office personnel will follow when examining applications drawn to computer-related inventions and are equally applicable to claimed inventions implemented in either hardware or software. The Guidelines also clarify the Office's position on certain patentability standards related to this field of technology. Office personnel are to rely on these Guidelines in the event of any inconsistent treatment of issues between these Guidelines and any earlier provided guidance from the Office.

The Freeman-Walter-Abele[3] test may additionally be relied upon in analyzing claims directed solely to a process for solving a mathematical algorithm.

Office personnel have had difficulty in properly treating claims directed to methods of doing business. Claims should not be categorized as methods of doing business. Instead, such claims should be treated like any other process claims, pursuant to these Guidelines when relevant.[4]

The appendix includes a flow chart of the process Office personnel will follow in conducting examinations for computer-related inventions.

**II. Determine What Applicant Has Invented and Is Seeking to Patent**

It is essential that patent applicants obtain a prompt yet complete examination of their applications. Under the principles of compact prosecution, each claim should be reviewed for compliance with every statutory requirement for patentability in the initial review of the application, even if one or more claims are found to be deficient with respect to some statutory requirement. Thus, Office personnel should state all reasons and bases for rejecting claims in the first Office action. Deficiencies should be explained clearly, particularly when they serve as a basis for a rejection. Whenever practicable, Office personnel should indicate how rejections may be overcome and how problems may be resolved. A failure to follow this approach can lead to unnecessary delays in the prosecution of the application.

Prior to focusing on specific statutory requirements, Office personnel must begin examination by determining what, precisely, the applicant has invented and is seeking to patent,[5] and how the claims relate to and define that invention. Consequently, Office personnel will no longer begin examination by determining if a claim recites a "mathematical algorithm." Rather, they will review the complete specification, including the detailed description of the invention, any specific embodiments that have been disclosed, the claims and any specific utilities that have been asserted for the invention.

**A. Identify and Understand Any Practical Application Asserted for the Invention**

The subject matter sought to be patented must be a "useful" process, machine, manufacture or composition of matter, i.e., it must have a practical application. The purpose of this requirement is to limit patent protection to inventions that possess a certain level of "real world" value, as opposed to subject matter that represents nothing more than an idea or concept, or is simply a starting point for future investigation or research.[6] Accordingly, a complete disclosure should contain some indication of the practical application for the claimed invention, i.e., why the applicant believes the claimed invention is useful.

The utility of an invention must be within the "technological" arts.[7] A computer-related invention is within the technological arts. A practical application of a computer-related invention is statutory subject matter. This requirement can be discerned from the variously phrased prohibitions against the patenting of abstract ideas, laws of nature or natural phenomena. An invention that has a practical application in the technological arts satisfies the utility requirement.[8]

The applicant is in the best position to explain why an invention is believed useful. Office personnel should therefore focus their efforts on pointing out statements made in the specification that identify all practical applications for the invention. Office personnel should rely on such statements throughout the examination when assessing the invention for compliance with all statutory criteria. An applicant may assert more than one practical application, but only one is necessary to satisfy the utility requirement. Office personnel should review the entire disclosure to determine the features necessary to accomplish at least one asserted practical application.

**B. Review the Detailed Disclosure and Specific Embodiments of the Invention to Determine What the Applicant Has Invented**

The written description will provide the clearest explanation of the applicant's invention, by exemplifying the invention, explaining how it relates to the prior art and explaining the relative significance of various features of the invention. Accordingly, Office personnel should begin their evaluation of a computer-related invention as follows:

— determine what the programmed computer does when it performs the processes dictated by the software (i.e., the functionality of the programmed computer);[9]

— determine how the computer is to be configured to provide that functionality (i.e., what elements constitute the programmed computer and how those elements are configured and interrelated to provide the specified functionality); and

— if applicable, determine the relationship of the programmed computer to other subject matter outside the computer that constitutes the invention (e.g., machines, devices, materials, or process steps other than those that are part of or performed by the programmed computer).[10]

Patent applicants can assist the Office by preparing applications that clearly set forth these aspects of a computer-related invention.

**C. Review the Claims**

The claims define the property rights provided by a patent, and thus require careful scrutiny. The goal of claim analysis is to identify the boundaries of the protection sought by the applicant and to understand how the claims relate to and define what the applicant has indicated is the invention. Office personnel must thoroughly analyze the language of a claim before determining if the claim complies with each statutory requirement for patentability.

Office personnel should begin claim analysis by identifying and evaluating each claim limitation. For processes, the claim limitations will define steps or acts to be performed. For products[11], the claim limitations will define discrete physical structures. The discrete physical structures may be comprised of hardware or a combination of hardware and software.

Office personnel are to correlate each claim limitation to all portions of the disclosure that describe the claim limitation. This is to be done in all cases, i.e., whether or not the claimed invention is defined using means or step plus function language. The correlation step will ensure that Office personnel correctly interpret each claim limitation.

The subject matter of a properly construed claim is defined by the terms that limit its scope. It is this subject matter that must be examined. As a general matter, the grammar and intended meaning of terms used in a claim will dictate whether the language limits the claim scope. Language that suggests or makes optional but does not require steps to be performed or does not limit a claim to a particular structure does not limit the scope of a claim or claim limitation.[12]

Office personnel must rely on the applicant's disclosure to properly determine the meaning of terms used in the claims.[13] An applicant is entitled to be his or her own lexicographer, and in many instances will provide an explicit definition for certain terms used in the claims. Where an explicit definition is provided by the applicant for a term, that definition will control interpretation of the term as it is used in the claim. Office personnel should determine if the original disclosure provides a definition consistent with any assertions made by applicant.[14] If an applicant does not define a term in the specification, that term will be given its "common meaning."[15]

If the applicant asserts that a term has a meaning that conflicts with the term's art-accepted meaning, Office personnel should encourage the applicant to amend the claim to better reflect what applicant intends to claim as the invention. If the application becomes a patent, it becomes prior art against subsequent applications. Therefore, it is important for later search purposes to have the patentee employ commonly accepted terminology, particularly for searching text-searchable databases.

Office personnel must always remember to use the perspective of one of ordinary skill in the art. Claims and disclosures are not to be evaluated in a vacuum. If elements of an invention are well known in the art, the applicant does not have to provide a disclosure that describes those elements. In such a case the elements will be construed as encompassing any and every art-recognized hardware or combination of hardware and software technique for implementing the defined requisite functionalities.

Office personnel are to give claims their broadest reasonable interpretation in light of the supporting disclosure.[16] Where means plus function language is used to define the characteristics of a machine or manufacture invention, claim limitations must be interpreted to read on only the structures or materials disclosed in the specification and "equivalents thereof."[17] Disclosure may be express, implicit or inherent. Thus, at the outset, Office personnel must attempt to correlate claimed means to elements set forth in the written description. The written description includes the specification and the drawings. Office personnel are to give the claimed means plus function limitations their broadest reasonable interpretation consistent with all corresponding structures or materials described in the specification and their equivalents. Further guidance in interpreting the scope of equivalents is provided in the "Examination Guidelines For Claims Reciting A Means or Step Plus Function Limitation In Accordance With 35 U.S.C. 112, 6th Paragraph" ("Means Plus Function Guidelines").[18]

While it is appropriate to use the specification to determine what applicant intends a term to mean, a positive limitation from the specification cannot be read into a claim that does not impose that limitation. A broad interpretation of a claim by Office personnel will reduce the possibility that the claim, when issued, will be interpreted more broadly than is justified or intended. An applicant can always amend a claim during prosecution to better reflect the intended scope of the claim.

Finally, when evaluating the scope of a claim, every limitation in the claim must be considered.[19] Office personnel may not dissect a claimed invention into discrete elements and then evaluate the elements in isolation. Instead, the claim as a whole must be considered.

**III. Conduct a Thorough Search of the Prior Art**

Prior to classifying the claimed invention under § 101, Office personnel are expected to conduct a thorough search of the prior art. Generally, a thorough search involves reviewing both U.S. and foreign patents and non-patent literature. In many cases, the result of such a search will contribute to Office personnel's understanding of the invention. Both claimed and unclaimed aspects of the invention described in the specification should be searched if there is a reasonable expectation that the unclaimed aspects may be later claimed. A search must take into account any structure or material described in the specification and its equivalents which correspond to the claimed means plus function limitation, in accordance with 35 U.S.C. § 112, sixth paragraph and the Means Plus Function Guidelines.[20]

**IV. Determine Whether the Claimed Invention Complies with 35 U.S.C. § 101**

**A. Consider the Breadth of 35 U.S.C. § 101 Under Controlling Law**

As the Supreme Court has held, Congress chose the expansive language of § 101 so as to include "anything under the sun that is made by man."[21] Accordingly, § 101 of title 35, United States Code, provides:



> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.[22]

As cast, § 101 defines four categories of inventions that Congress deemed to be the appropriate subject matter of a patent; namely, processes, machines, manufactures and compositions of matter. The latter three categories define "things" while the first category defines "actions" (i.e., inventions that consist of a series of steps or acts to be performed).[23]

Federal courts have held that § 101 does have certain limits. First, the phrase "anything under the sun that is made by man" is limited by the text of § 101, meaning that one may only patent something that is a machine, manufacture, composition of matter or a process.[24] Second, § 101 requires that the subject matter sought to be patented be a "useful" invention. Accordingly, a complete definition of the scope of § 101, reflecting Congressional intent, is that any new and useful process, machine, manufacture or composition of matter under the sun that is made by man is the proper subject matter of a patent. Subject matter not within one of the four statutory invention categories or which is not "useful" in a patent sense is, accordingly, not eligible to be patented.

The subject matter courts have found to be outside the four statutory categories of invention is limited to abstract ideas, laws of nature and natural phenomena. While this is easily stated, determining whether an applicant is seeking to patent an abstract idea, a law of nature or a natural phenomenon has proven to be challenging. These three exclusions recognize that subject matter that is not a practical application or use of an idea, a law of nature or a natural phenomenon is not patentable.[25]

Courts have expressed a concern over "preemption" of ideas, laws of nature or natural phenomena.[26] The concern over preemption serves to bolster and justify the prohibition against the patenting of such subject matter. In fact, such concerns are only relevant to claiming a scientific truth or principle. Thus, a claim to an "abstract idea" is non-statutory because it does not represent a practical application of the idea, not because it would preempt the idea.

**B. Classify the Claimed Invention as to Its Proper Statutory Category**

To properly determine whether a claimed invention complies with the statutory invention requirements of § 101, Office personnel should classify each claim into one or more statutory or non-statutory categories. If the claim falls into a non-statutory category, that should not preclude complete examination of the application for satisfaction of all other conditions of patentability. This classification is only an initial finding at this point in the examination process that will be again assessed after the examination for compliance with §§ 102, 103 and 112 is completed and before issuance of any Office action on the merits.

If the invention as set forth in the written description is statutory, but the claims define subject matter that is not, the deficiency can be corrected by an appropriate amendment of the claims. In such a case, Office personnel should reject the claims drawn to non-statutory subject matter under § 101, but identify the features of the invention that would render the claimed subject matter statutory if recited in the claim.

**1. Non-Statutory Subject Matter**

Claims to computer-related inventions that are clearly non-statutory fall into the same general categories as non-statutory claims in other arts, namely natural phenomena such as magnetism, and abstract ideas or laws of nature which constitute "descriptive material." Descriptive material can be characterized as either "functional descriptive material" or "non-functional descriptive material." In this context, "functional descriptive material" consists of data structures[27] and computer programs which impart functionality when encoded on a computer-readable medium. "Non-functional descriptive material" includes but is not limited to music, literary works and a compilation or mere arrangement of data.

Both types of "descriptive material" are non-statutory when claimed as descriptive material per se. When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases.[28] When non-functional descriptive material is recorded on some computer-readable medium, it is not structurally and functionally interrelated to the medium but is merely carried by the medium. Merely claiming non-functional descriptive material stored in a computer-readable medium does not make it statutory. Such a result would exalt form over substance.[29] Thus, non-statutory music does not become statutory by merely recording it on a compact disk. Protection for this type of work is provided under the copyright law.

Claims to processes that do nothing more than solve mathematical problems or manipulate abstract ideas or concepts are more complex to analyze and are addressed below. See sections IV.B.2(d) and IV.B.2(e).

**(a) Functional Descriptive Material: "Data Structures" Representing Descriptive Material Per Se or Computer Programs Representing Computer Listings Per Se**

Data structures not claimed as embodied in computer-readable media are descriptive material per se and are not statutory because they are neither physical "things" nor statutory processes.[30] Such claimed data structures do not define any structural and functional interrelationships between the data structure and other claimed aspects of the invention which permit the data structure's functionality to be realized. In contrast, a claimed computer-readable medium encoded with a data structure defines structural and functional interrelationships between the data structure and the medium which permit the data structure's functionality to be realized, and is thus statutory.

Similarly, computer programs claimed as computer listings per se, i.e., the descriptions or expressions of the programs, are not physical "things," nor are they statutory processes, as they are not "acts" being performed. Such claimed computer programs do not define any structural and functional interrelationships between the computer program and other claimed aspects of the invention which permit the computer program's functionality to be realized. In contrast, a claimed computer-readable medium encoded with a computer program defines structural and functional interrelationships between the computer program and the medium which permit the computer program's functionality to be realized, and is thus statutory. Accordingly, it is important to distinguish claims that define descriptive material per se from claims that define statutory inventions.

Computer programs are often recited as part of a claim. Office personnel should determine whether the computer program is being claimed as part of an otherwise statutory manufacture or machine. In such a case, the claim remains statutory irrespective of the fact that a computer program is included in the claim. The same result occurs when a computer program is used in a computerized process where the computer executes the instructions set forth in the computer program. Only when the claimed invention taken as a whole is directed to a mere program listing, i.e., to only its description or expression, is it descriptive material per se and hence non-statutory.

Since a computer program is merely a set of instructions capable of being executed by a computer, the computer program itself is not a process and Office personnel should treat a claim for a computer program, without the computer-readable medium needed to realize the computer program's functionality, as non-statutory functional descriptive material. When a computer program is claimed in a process where the computer is executing the computer program's instructions, Office personnel should treat the claim as a process claim. See Sections IV.B.2(b)-(e). When a computer program is recited in conjunction with a physical structure, such as a computer memory, Office personnel should treat the claim as a product claim. See Section IV.B.2(a).

**(b) Non-Functional Descriptive Material**

Descriptive material that cannot exhibit any functional interrelationship with the way in which computing processes are performed does not constitute a statutory process, machine, manufacture or composition of matter and should be rejected under § 101. Thus, Office personnel should consider the claimed

invention as a whole to determine whether the necessary functional interrelationship is provided.

Where certain types of descriptive material, such as music, literature, art, photographs and mere arrangements or compilations of facts or data,[31] are merely stored so as to be read or outputted by a computer without creating any functional interrelationship, either as part of the stored data or as part of the computing processes performed by the computer, then such descriptive material alone does not impart functionality either to the data as so structured, or to the computer. Such "descriptive material" is not a process, machine, manufacture or composition of matter.

The policy that precludes the patenting of non-functional descriptive material would be easily frustrated if the same descriptive material could be patented when claimed as an article of manufacture.[32] For example, music is commonly sold to consumers in the format of a compact disc. In such cases, the known compact disc acts as nothing more than a carrier for non-functional descriptive material. The purely non-functional descriptive material cannot alone provide the practical application for the manufacture.

Office personnel should be prudent in applying the foregoing guidance. Non-functional descriptive material may be claimed in combination with other functional descriptive material on a computer-readable medium to provide the necessary functional and structural interrelationship to satisfy the requirements of § 101. The presence of the claimed non-functional descriptive material is not necessarily determinative of non-statutory subject matter. For example, a computer that recognizes a particular grouping of musical notes read from memory and upon recognizing that particular sequence, causes another defined series of notes to be played, defines a functional interrelationship among that data and the computing processes performed when utilizing that data, and as such is statutory because it implements a statutory process.

**(c) Natural Phenomena Such as Electricity and Magnetism**

Claims that recite nothing but the physical characteristics of a form of energy, such as a frequency, voltage, or the strength of a magnetic field, define energy or magnetism, per se, and as such are non-statutory natural phenomena.[33] However, a claim directed to a practical application of a natural phenomenon such as energy or magnetism is statutory.[34]

**2. Statutory Subject Matter**

**(a) Statutory Product Claims[35]**

If a claim defines a useful machine or manufacture by identifying the physical structure of the machine or manufacture in terms of its hardware or hardware and software combination, it defines a statutory product.[36]

A machine or manufacture claim may be one of two types: (1) a claim that encompasses any and every machine for performing the underlying process or any and every manufacture that can cause a computer to perform the underlying process, or (2) a claim that defines a specific machine or manufacture. When a claim is of the first type, Office personnel are to evaluate the underlying process the computer will perform in order to determine the patentability of the product.

**(i) Claims that Encompass Any Machine or Manufacture Embodiment of a Process**

Office personnel must treat each claim as a whole. The mere fact that a hardware element is recited in a claim does not necessarily limit the claim to a specific machine or manufacture.[37] If a product claim encompasses any and every computer implementation of a process, when read in light of the specification, it should be examined on the basis of the underlying process. Such a claim can be recognized as it will:

— define the physical characteristics of a computer or computer component exclusively as functions or steps to be performed on or by a computer, and
— encompass any and every product in the stated class (e.g., computer, computer-readable memory) configured in any manner to perform that process.

Office personnel are reminded that finding a product claim to encompass any and every product embodiment of a process invention simply means that the Office will presume that the product claim encompasses any and every hardware or hardware platform and associated software implementation that performs the specified set of claimed functions. Because this is interpretive and nothing more, it does not provide any information as to the patentability of the applicant's underlying process or the product claim.

When Office personnel have reviewed the claim as a whole and found that it is not limited to a specific machine or manufacture, they shall identify how each claim limitation has been treated and set forth their reasons in support of their conclusion that the claim encompasses any and every machine or manufacture embodiment of a process. This will shift the burden to applicant to demonstrate why the claimed invention should be limited to a specific machine or manufacture.

If a claim is found to encompass any and every product embodiment of the underlying process, and if the underlying process is statutory, the product claim should be classified as a statutory product. By the same token, if the underlying process invention is found to be non-statutory, Office personnel should classify the "product" claim as a "non-statutory product." If the product claim is classified as being a non-statutory product on the basis of the underlying process, Office personnel should emphasize that they have considered all claim limitations and are basing their finding on the analysis of the underlying process.

**(ii) Product Claims—Claims Directed to Specific Machines and Manufactures**

If a product claim does not encompass any and every computer-implemenatation of a process, then it must be treated as a specific machine or manufacture. Claims that define a computer-related invention as a specific machine or specific article of manufacture must define the physical structure of the machine or manufacture in terms of its hardware or hardware and "specific software."[38] The applicant may define the physical structure of a programmed computer or its hardware or software components in any manner that can be clearly understood by a person skilled in the relevant art. Generally a claim drawn to a particular programmed computer should identify the elements of the computer and indicate how those elements are configured in either hardware or a combination of hardware and specific software.

To adequately define a specific computer memory, the claim must identify a general or specific memory and the specific software which provides the functionality stored in the memory.

A claim limited to a specific machine or manufacture, which has a practical application in the technological arts, is statutory. In most cases, a claim to a specific machine or manufacture will have a practical application in the technological arts.

**(iii) Hypothetical Machine Claims Which Illustrate Claims of the Types Described in Sections IV.B.2(a)(i) and (ii)**

Two applicants present a claim to the following process:

A process for determining and displaying the structure of a chemical compound comprising:

(a) solving the wavefunction parameters for the compound to determine the structure of a compound; and
(b) displaying the structure of the compound determined in step (a).

Each applicant also presents a claim to the following apparatus:

A computer system for determining the three dimensional structure of a chemical compound comprising:

(a) means for determining the three dimensional structure of a compound; and
(b) means for creating and displaying an image representing a three-dimensional perspective of the compound.

In addition, each applicant provides the noted disclosures to support the claims:



| | Applicant A | Applicant B |
|---|---|---|
| Disclosure | The disclosure describes specific software, i.e., specific program code segments, that are to be employed to configure a general purpose microprocessor to create specific logic circuits. These circuits are indicated to be the "means" corresponding to the claimed means limitations. | The disclosure states that it would be a matter of routine skill to select an appropriate conventional computer system and implement the claimed process on that computer system. The disclosure does not have specific disclosure that corresponds to the two "means" limitations recited in the claim (i.e., no specific software or logic circuit). The disclosure does have an explanation of how to solve the wavefunction equations of a chemical compound, and indicates that the solutions of those wavefunction equations can be employed to determine the physical structure of the corresponding compound. |
| Result | Claim defines specific computer, patentability stands independently from process claim. | Claim encompasses any computer embodiment of process claim; patentability stands or falls with process claim. |
| Explanation | Disclosure identifies the specific machine capable of performing the indicated functions. | Disclosure does not provide any information to distinguish the "implementation" of the process on a computer from the factors that will govern the patentability determination of the process per se. As such, the patentability of this apparatus claim will stand or fall with that of the process claim. |

**(b) Statutory Process Claims**

A claim that requires one or more acts to be performed defines a process. However, not all processes are statutory under § 101. To be statutory, a claimed computer-related process must either: (1) result in a physical transformation outside the computer for which a practical application in the technological arts is either disclosed in the specification or would have been known to a skilled artisan (discussed in (i) below),[39] or (2) be limited by the language in the claim to a practical application within the technological arts (discussed in (ii) below).[40] The claimed practical application must be a further limitation upon the claimed subject matter if the process is confined to the internal operations of the computer. If a physical transformation occurs outside the computer, it is not necessary to claim the practical application. A disclosure that permits a skilled artisan to practice the claimed invention, i.e., to put it to a practical use, is sufficient. On the other hand, it is necessary to claim the practical application if there is no physical transformation or if the process merely manipulates concepts or converts one set of numbers into another.

A claimed process is clearly statutory if it results in a physical transformation outside the computer, i.e., falls into one or both of the following specific categories ("safe harbors").

**(i) Safe Harbors**

**— Independent Physical Acts (Post-Computer Process Activity)**

A process is statutory if it requires physical acts to be performed outside the computer independent of and following the steps to be performed by a programmed computer, where those acts involve the manipulation of tangible physical objects and result in the object having a different physical attribute or structure.[41] Thus, if a process claim includes one or more post-computer process steps that result in a physical transformation outside the computer (beyond merely conveying the direct result of the computer operation, see Section IV.B.2(d)(iii)), the claim is clearly statutory.

Examples of this type of statutory process include the following:

— A method of curing rubber in a mold which relies upon updating process parameters, using a computer processor to determine a time period for curing the rubber, using the computer processor to determine when the time period has been reached in the curing process and then opening the mold at that stage.
— A method of controlling a mechanical robot which relies upon storing data in a computer that represents various types of mechanical movements of the robot, using a computer processor to calculate positioning of the robot in relation to given tasks to be performed by the robot, and controlling the robot's movement and position based on the calculated position.

**— Manipulation of Data Representing Physical Objects or Activities (Pre-Computer Process Activity)**

Another statutory process is one that requires the measurements of physical objects or activities to be transformed outside of the computer into computer data,[42] where the data comprises signals corresponding to physical objects or activities external to the computer system, and where the process causes a physical transformation of the signals which are intangible representations of the physical objects or activities.[43]

Examples of this type of claimed statutory process include the following:

— A method of using a computer processor to analyze electrical signals and data representative of human cardiac activity by converting the signals to time segments, applying the time segments in reverse order to a high pass filter means, using the computer processor to determine the amplitude of the high pass filter's output, and using the computer processor to compare the value to a predetermined value. In this example the data is an intangible representation of physical activity, i.e., human cardiac activity. The transformation occurs when heart activity is measured and an electrical signal is produced. This process has real world value in predicting vulnerability to ventricular tachycardia immediately after a heart attack.
— A method of using a computer processor to receive data representing Computerized Axial Tomography ("CAT") scan images of a patient, performing a calculation to determine the difference between a local value at a data point and an average value of the data in a region surrounding the point, and displaying the difference as a gray scale for each point in the image, and displaying the resulting image. In this example the data is an intangible representation of a physical object, i.e., portions of the anatomy of a patient. The transformation occurs when the condition of the human body is measured with X-rays and the X-rays are converted into electrical digital signals

that represent the condition of the human body. The real world value of the invention lies in creating a new CAT scan image of body tissue without the presence of bones.
— A method of using a computer processor to conduct seismic exploration, by imparting spherical seismic energy waves into the earth from a seismic source, generating a plurality of reflected signals in response to the seismic energy waves at a set of receiver positions in an array, and summing the reflection signals to produce a signal simulating the reflection response of the earth to the seismic energy. In this example, the electrical signals processed by the computer represent reflected seismic energy. The transformation occurs by converting the spherical seismic energy waves into electrical signals which provide a geophysical representation of formations below the earth's surface. Geophysical exploration of formations below the surface of the earth has real world value.

If a claim does not clearly fall into one or both of the safe harbors, the claim may still be statutory if it is limited by the language in the claim to a practical application in the technological arts.

**(ii) Computer-Related Processes Limited to a Practical Application in the Technological Arts**

There is always some form of physical transformation within a computer because a computer acts on signals and transforms them during its operation and changes the state of its components during the execution of a process. Even though such a physical transformation occurs within a computer, such activity is not determinative of whether the process is statutory because such transformation alone does not distinguish a statutory computer process from a non-statutory computer process. What is determinative is not how the computer performs the process, but what the computer does to achieve a practical application.[44]

A process that merely manipulates an abstract idea or performs a purely mathematical algorithm is non-statutory despite the fact that it might inherently have some usefulness.[45] For such subject matter to be statutory, the claimed process must be limited to a practical application of the abstract idea or mathematical algorithm in the technological arts.[46] For example, a computer process that simply calculates a mathematical algorithm that models noise is non-statutory. However, a claimed process for digitally filtering noise employing the mathematical algorithm is statutory.

Examples of this type of claimed statutory process include the following:

— A computerized method of optimally controlling transfer, storage and retrieval of data between cache and hard disk storage devices such that the most frequently used data is readily available.
— A method of controlling parallel processors to accomplish multi-tasking of several computing tasks to maximize computing efficiency.[47]
— A method of making a word processor by storing an executable word processing application program in a general purpose digital computer's memory, and executing the stored program to impart word processing functionality to the general purpose digital computer by changing the state of the computer's arithmetic logic unit when program instructions of the word processing program are executed.
— A digital filtering process for removing noise from a digital signal comprising the steps of calculating a mathematical algorithm to produce a correction signal and subtracting the correction signal from the digital signal to remove the noise.

**(c) Non-Statutory Process Claims**

If the "acts" of a claimed process manipulate only numbers, abstract concepts or ideas, or signals representing any of the foregoing, the acts are not being applied to appropriate subject matter. Thus, a process consisting solely of mathematical operations, i.e., converting one set of numbers into another set of numbers, does not manipulate appropriate subject matter and thus cannot constitute a statutory process.

In practical terms, claims define non-statutory processes if they:

— consist solely of mathematical operations without some claimed practical application (i.e., executing a "mathematical algorithm"); or
— simply manipulate abstract ideas, e.g., a bid[48] or a bubble hierarchy,[49] without some claimed practical application.

A claimed process that consists solely of mathematical operations is non-statutory whether or not it is performed on a computer. Courts have recognized a distinction between types of mathematical algorithms, namely, some define a "law of nature" in mathematical terms and others merely describe an "abstract idea."[50]

Certain mathematical algorithms have been held to be non-statutory because they represent a mathematical definition of a law of nature or a natural phenomenon. For example, a mathematical algorithm representing the formula $E=mc^2$ is a "law of nature"—it defines a "fundamental scientific truth" (i.e., the relationship between energy and mass). To comprehend how the law of nature relates to any object, one invariably has to perform certain steps (e.g., multiplying a number representing the mass of an object by the square of a number representing the speed of light). In such a case, a claimed process which consists solely of the steps that one must follow to solve the mathematical representation of $E=mc^2$ is indistinguishable from the law of nature and would "preempt" the law of nature. A patent cannot be granted on such a process.

Other mathematical algorithms have been held to be non-statutory because they merely describe an abstract idea. An "abstract idea" may simply be any sequence of mathematical operations that are combined to solve a mathematical problem. The concern addressed by holding such subject matter non-statutory is that the mathematical operations merely describe an idea and do not define a process that represents a practical application of the idea.

Accordingly, when a claim reciting a mathematical algorithm is found to define non-statutory subject matter the basis of the § 101 rejection must be that, when taken as a whole, the claim recites a law of nature, a natural phenomenon, or an abstract idea.

**(d) Certain Claim Language Related to Mathematical Operation Steps of a Process**

**(i) Intended Use or Field of Use Statements**

Claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim, particularly when only presented in the claim preamble. Thus, Office personnel should be careful to properly interpret such language.[51] When such language is treated as non-limiting, Office personnel should expressly identify in the Office action the claim language that constitutes the intended use or field of use statements and provide the basis for their findings. This will shift the burden to applicant to demonstrate why the language is to be treated as a claim limitation.

**(ii) Necessary Antecedent Step to Performance of a Mathematical Operation or Independent Limitation on a Claimed Process**

In some situations, certain acts of "collecting" or "selecting" data for use in a process consisting of one or more mathematical operations will not further limit a claim beyond the specified mathematical operation step(s). Such acts merely determine values for the variables used in the mathematical formulae used in making the calculations.[52] In other words, the acts are dictated by nothing other than the performance of a mathematical operation.[53]

If a claim requires acts to be performed to create data that will then be used in a process representing a practical application of one or more mathematical operations, those acts must be treated as further limiting the claim beyond the mathematical operation(s) per se. Such acts are data gathering steps not dictated by the algorithm but by other limitations which require certain antecedent steps and as such constitute an independent limitation on the claim.

Examples of acts that independently limit a claimed process involving mathematical operations include:



— a method of conducting seismic exploration which requires generating and manipulating signals from seismic energy waves before "summing" the values represented by the signals;[54] and
— a method of displaying X-ray attenuation data as a signed gray scale signal in a "field" using a particular algorithm, where the antecedent steps require generating the data using a particular machine (e.g., a computer tomography scanner).[55]

Examples of steps that do not independently limit one or more mathematical operation steps include:

— "perturbing" the values of a set of process inputs, where the subject matter "perturbed" was a number and the act of "perturbing" consists of substituting the numerical values of variables;[56] and
— selecting a set of arbitrary measurement point values.[57]

Such steps do not impose independent limitations on the scope of the claim beyond those required by the mathematical operation limitation.

**(iii) Post-Mathematical Operation Step Using Solution or Merely Conveying Result of Operation**

In some instances, certain kinds of post-solution "acts" will not further limit a process claim beyond the performance of the preceding mathematical operation step even if the acts are recited in the body of a claim. If, however, the claimed acts represent some "significant use" of the solution, those acts will invariably impose an independent limitation on the claim. A "significant use" is any activity which is more than merely outputting the direct result of the mathematical operation. Office personnel are reminded to rely on the applicant's characterization of the significance of the acts being assessed to resolve questions related to their relationship to the mathematical operations recited in the claim and the invention as a whole.[58] Thus, if a claim requires that the direct result of a mathematical operation be evaluated and transformed into something else, Office personnel cannot treat the subsequent steps as being indistinguishable from the performance of the mathematical operation and thus not further limiting on the claim. For example, acts that require the conversion of a series of numbers representing values of a wavefunction equation for a chemical compound into values representing an image that conveys information about the three-dimensional structure of the compound and the displaying of the three-dimensional structure cannot be treated as being part of the mathematical operations.

Office personnel should be especially careful when reviewing claim language that requires the performance of "post-solution" steps to ensure that claim limitations are not ignored.

Examples of steps found not to independently limit a process involving one or more mathematical operation steps include:

— step of "updating alarm limits" found to constitute changing the number value of a variable to represent the result of the calculation;[59]
— final step of magnetically recording the result of a calculation;[60]
— final step of "equating" the process outputs to the values of the last set of process inputs found to constitute storing the result of calculations;[61]
— final step of displaying result of a calculation "as a shade of gray rather than as simply a number" found to not constitute distinct step where the data were numerical values that did not represent anything;[62] and
— step of "transmitting electrical signals representing" the result of calculations.[63]

**(e) Manipulation of Abstract Ideas Without a Claimed Practical Application**

A process that consists solely of the manipulation of an abstract idea without any limitation to a practical application is non-statutory.[64] Office personnel have the burden to establish a prima facie case that the claimed invention taken as a whole is directed to the manipulation of abstract ideas without a practical application.

In order to determine whether the claim is limited to a practical application of an abstract idea, Office personnel must analyze the claim as a whole, in light of the specification, to understand what subject matter is being manipulated and how it is being manipulated. During this procedure, Office personnel must evaluate any statements of intended use or field of use, any data gathering step and any post-manipulation activity. See section IV.B.2(d) above for how to treat various types of claim language. Only when the claim is devoid of any limitation to a practical application in the technological arts should it be rejected under § 101. Further, when such a rejection is made, Office personnel must expressly state how the language of the claims has been interpreted to support the rejection.

**V. Evaluate Application for Compliance with 35 U.S.C. § 112**

Office personnel should begin their evaluation of an application's compliance with § 112 by considering the requirements of § 112, second paragraph. The second paragraph contains two separate and distinct requirements: (1) that the claim(s) set forth the subject matter applicants regard as the invention, and (2) that the claim(s) particularly point out and distinctly claim the invention. An application will be deficient under § 112, second paragraph when (1) evidence including admissions, other than in the application as filed, shows applicant has stated that he or she regards the invention to be different from what is claimed, or when (2) the scope of the claims is unclear.

After evaluation of the application for compliance with § 112, second paragraph, Office personnel should then evaluate the application for compliance with the requirements of § 112, first paragraph. The first paragraph contains three separate and distinct requirements: (1) adequate written description, (2) enablement, and (3) best mode. An application will be deficient under § 112, first paragraph when the written description is not adequate to identify what the applicant has invented, or when the disclosure does not enable one skilled in the art to make and use the invention as claimed without undue experimentation. Deficiencies related to disclosure of the best mode for carrying out the claimed invention are not usually encountered during examination of an application because evidence to support such a deficiency is seldom in the record.

If deficiencies are discovered with respect to § 112, Office personnel must be careful to apply the appropriate paragraph of § 112.

**A. Determine Whether the Claimed Invention Complies with 35 U.S.C. § 112, Second Paragraph Requirements**

**1. Claims Setting Forth the Subject Matter Applicant Regards as Invention**

Applicant's specification must conclude with claim(s) that set forth the subject matter which the applicant regards as the invention. The invention set forth in the claims is presumed to be that which applicant regards as the invention, unless applicant considers the invention to be something different from what has been claimed as shown by evidence, including admissions, outside the application as filed. An applicant may change what he or she regards as the invention during the prosecution of the application.

**2. Claims Particularly Pointing Out and Distinctly Claiming the Invention**

Office personnel shall determine whether the claims set out and circumscribe the invention with a reasonable degree of precision and particularity. In this regard, the definiteness of the language must be analyzed, not in a vacuum, but always in light of the teachings of the disclosure as it would be interpreted by one of ordinary skill in the art. Applicant's claims, interpreted in light of the disclosure, must reasonably apprise a person of ordinary skill in the art of the invention. However, the applicant need not explicitly recite in the claims every feature of the invention. For example, if an applicant indicates that the invention is a particular computer, the claims do not have to recite every element or feature of the computer. In fact, it is preferable for claims to be drafted in a form that emphasizes

what the applicant has invented (i.e., what is new rather than old).

A means plus function limitation is distinctly claimed if the description makes it clear that the means corresponds to well-defined structure of a computer or computer component implemented in either hardware or software and its associated hardware platform. Such means may be defined as:

— a programmed computer with a particular functionality implemented in hardware or hardware and software;
— a logic circuit or other component of a programmed computer that performs a series of specifically identified operations dictated by a computer program; or
— a computer memory encoded with executable instructions representing a computer program that can cause a computer to function in a particular fashion.

The scope of a "means" limitation is defined as the corresponding structure or material (e.g., a specific logic circuit) set forth in the written description and equivalents.[6] Thus, a claim using means plus function limitations without corresponding disclosure of specific structures or materials that are not well-known fails to particularly point out and distinctly claim the invention. For example, if the applicant discloses only the functions to be performed and provides no express, implied or inherent disclosure of hardware or a combination of hardware and software that performs the functions, the application has not disclosed any "structure" which corresponds to the claimed means. Office personnel should reject such claims under § 112, second paragraph. The rejection shifts the burden to the applicant to describe at least one specific structure or material that corresponds to the claimed means in question, and to identify the precise location or locations in the specification where a description of at least one embodiment of that claimed means can be found. In contrast, if the corresponding structure is disclosed to be a memory or logic circuit that has been configured in some manner to perform that function (e.g., using a defined computer program), the application has disclosed "structure" which corresponds to the claimed means.

When a claim or part of a claim is defined in computer program code, whether in source or object code format, a person of skill in the art must be able to ascertain the metes and bounds of the claimed invention. In certain circumstances, as where self-documenting programming code is employed, use of programming language in a claim would be permissible because such program source code presents "sufficiently high-level language and descriptive identifiers" to make it universally understood to others in the art without the programmer having to insert any comments.[6] Applicants should be encouraged to functionally define the steps the computer will perform rather than simply reciting source or object code instructions.

### B. Determine Whether the Claimed Invention Complies with 35 U.S.C. § 112, First Paragraph Requirements

#### 1. Adequate Written Description

The satisfaction of the enablement requirement does not satisfy the written description requirement.[7] For the written description requirement, an applicant's specification must reasonably convey to those skilled in the art that the applicant was in possession of the claimed invention as of the date of invention. The claimed invention subject matter need not be described literally, i.e., using the same terms, in order for the disclosure to satisfy the description requirement.

#### 2. Enabling Disclosure

An applicant's specification must enable a person skilled in the art to make and use the claimed invention without undue experimentation. The fact that experimentation is complex, however, will not make it undue if a person of skill in the art typically engages in such complex experimentation. For a computer-related invention, the disclosure must enable a skilled artisan to configure the computer to possess the requisite functionality, and, where applicable, interrelate the computer with other elements to yield the claimed invention, without the exercise of undue experimentation. The specification should disclose how to configure a computer to possess the requisite functionality or how to integrate the programmed computer with other elements of the invention, unless a skilled artisan would know how to do so without such disclosure.[8]

For many computer-related inventions, it is not unusual for the claimed invention to involve more than one field of technology. For such inventions, the disclosure must satisfy the enablement standard for each aspect of the invention.[9] As such, the disclosure must teach a person skilled in each art how to make and use the relevant aspect of the invention without undue experimentation. For example, to enable a claim to a programmed computer that determines and displays the three-dimensional structure of a chemical compound, the disclosure must

— enable a person skilled in the art of molecular modeling to understand and practice the underlying molecular modeling processes; and
— enable a person skilled in the art of computer programming to create a program that directs a computer to create and display the image representing the three-dimensional structure of the compound.

In other words, the disclosure corresponding to each aspect of the invention must be enabling to a person skilled in each respective art.

In many instances, an applicant will describe a programmed computer by outlining the significant elements of the programmed computer using a functional block diagram. Office personnel should review the specification to ensure that along with the functional block diagram the disclosure provides information that adequately describes each "element" in hardware or hardware and its associated software and how such elements are interrelated.[10]

### VI. Determine Whether the Claimed Invention Complies with 35 U.S.C. §§ 102 and 103

As is the case for inventions in any field of technology, assessment of a claimed computer-related invention for compliance with § 102 and § 103 begins with a comparison of the claimed subject matter to what is known in the prior art. If no differences are found between the claimed invention and the prior art, the claimed invention lacks novelty and is to be rejected by Office personnel under § 102. Once distinctions are identified between the claimed invention and the prior art, those distinctions must be assessed and resolved in light of the knowledge possessed by a person of ordinary skill in the art. Against this backdrop, one must determine whether the invention would have been obvious at the time the invention was made. If not, the claimed invention satisfies § 103. Factors and considerations dictated by law governing § 103 apply without modification to computer-related inventions.

If the difference between the prior art and the claimed invention is limited to descriptive material stored on or employed by a machine, Office personnel must determine whether the descriptive material is functional descriptive material or non-functional descriptive material, as described supra in Section IV. Functional descriptive material is a limitation in the claim and must be considered and addressed in assessing patentability under § 103. Thus, a rejection of the claim as a whole under § 103 is inappropriate unless the functional descriptive material would have been suggested by the prior art. Non-functional descriptive material cannot render non-obvious an invention that would have otherwise been obvious.[11]

Common situations involving non-functional descriptive material are:

— a computer-readable storage medium that differs from the prior art solely with respect to non-functional descriptive material, such as music or a literary work, encoded on the medium,
— a computer that differs from the prior art solely with respect to non-functional descriptive material that cannot alter how the machine functions (i.e., the descriptive material does not reconfigure the computer), or
— a process that differs from the prior art only with respect to non-functional descriptive material that cannot alter how the process steps are to be performed to achieve the utility of the invention.



Thus, if the prior art suggests storing a song on a disk, merely choosing a particular song to store on the disk would be presumed to be well within the level of ordinary skill in the art at the time the invention was made. The difference between the prior art and the claimed invention is simply a rearrangement of non-functional descriptive material.

### VII. Clearly Communicate Findings, Conclusions and Their Bases

Once Office personnel have concluded the above analyses of the claimed invention under all the statutory provisions, including §§ 101, 112, 102 and 103, they should review all the proposed rejections and their bases to confirm their correctness. Only then should any rejection be imposed in an Office action. The Office action should clearly communicate the findings, conclusions and reasons which support them.

[1] These Guidelines are final and replace the "Proposed Examination Guidelines for Computer-Implemented Inventions," 60 FR 28,778 (June 2, 1995) and the supporting legal analysis issued on October 3, 1995.

[2] "Computer-related inventions" include inventions implemented in a computer and inventions employing computer-readable media.

[3] *In re Abele*, 684 F.2d 902, 905-07, 214 USPQ 682, 685-87 (CCPA 1982); *In re Walter*, 618 F.2d 758, 767, 205 USPQ 397, 406-07 (CCPA 1980); *In re Freeman*, 573 F.2d 1237, 1245, 197 USPQ 464, 471 (CCPA 1978).

[4] See, e.g., *In re Toma*, 575 F.2d 872, 877-78, 197 USPQ 852, 857 (CCPA 1978); *In re Musgrave*, 431 F.2d 882, 893, 167 USPQ 280, 289-90 (CCPA 1970). See also *In re Schrader*, 22 F.3d 290, 297-98, 30 USPQ2d 1455, 1461-62 (Fed. Cir. 1994) (Newman, J., dissenting); *Paine, Webber, Jackson & Curtis, Inc. v. Merrill Lynch, Pierce, Fenner & Smith, Inc.*, 564 F. Supp. 1358, 1368-69, 218 USPQ 212, 220 (D. Del. 1983).

[5] As the courts have repeatedly reminded the Office: "The goal is to answer the question "'What did applicants invent?'" *Abele*, 684 F.2d at 907, 214 USPQ at 687. Accord, e.g., *Arrhythmia Research Tech. v. Corazonix Corp., 958 F.2d 1053, 1059, 22 USPQ2d 1033, 1038 (Fed. Cir. 1992).*

[6] *Brenner v. Manson*, 383 U.S. 519, 528-36, 148 USPQ 689, 693-96 (1966); *In re Ziegler*, 992 F.2d 1197, 1200-03, 26 USPQ2d 1600, 1603-06 (Fed. Cir. 1993).

[7] See, e.g., *Musgrave*, 431 F.2d at 893, 167 USPQ at 289-90, cited with approval in *Schrader*, 22 F.3d at 297, 30 USPQ2d at 1461 (Newman, J., dissenting). The definition of "technology" is the "application of science and engineering to the development of machines and procedures in order to enhance or improve human conditions, or at least to improve human efficiency in some respect." Computer Dictionary 384 (Microsoft Press, 2d ed. 1994).

[8] E.g., *In re Alappat*, 33 F.3d 1526, 1543, 31 USPQ2d 1545, 1556-57 (Fed. Cir. 1994) (in banc) (quoting *Diamond v. Diehr*, 450 U.S. 175, 192, 209 USPQ 1, 10 (1981)). See also id. at 1569, 31 USPQ2d at 1578-79 (Newman, J., concurring) ("unpatentability of the principle does not defeat patentability of its practical applications") (citing *O'Reilly v. Morse*, 56 U.S. (15 How.) 62, 114-19 (1854)); *Arrhythmia*, 958 F.2d at 1056, 22 USPQ2d at 1036; *Musgrave*, 431 F.2d at 893, 167 USPQ at 289-90 ("All that is necessary, in our view, to make a sequence of operational steps a statutory 'process' within 35 U.S.C. 101 is that it be in the technological arts so as to be in consonance with the Constitutional purpose to promote the progress of 'useful arts.' Const. Art. 1, sec. 8.").

[9] *Arrhythmia*, 958 F.2d at 1057, 22 USPQ2d at 1036:
It is of course true that a modern digital computer manipulates data, usually in binary form, by performing mathematical operations, such as addition, subtraction, multiplication, division, or bit shifting, on the data. But this is only how the computer does what it does. Of importance is the significance of the data and their manipulation in the real world, i.e., what the computer is doing.

[10] Many computer-related inventions do not consist solely of a computer. Thus, Office personnel should identify those claimed elements of the computer-related invention that are not part of the programmed computer, and determine how those elements relate to the programmed computer. Office personnel should look for specific information that explains the role of the programmed computer in the overall process or machine and how the programmed computer is to be integrated with the other elements of the apparatus or used in the process.

[11] Products may be either machines, manufactures or compositions of matter. Product claims are claims that are directed to either machines, manufactures or compositions of matter.

[12] Examples of language that may raise a question as to the limiting effect of the language in a claim:

(a) statements of intended use or field of use,
(b) "adapted to" or "adapted for" clauses,
(c) "wherein" clauses, or
(d) "whereby" clauses.

This list of examples is not intended to be exhaustive.

[13] *Markman v. Westview Instruments*, 52 F.3d 967, 980, 34 USPQ2d 1321, 1330 (Fed. Cir.) (in banc), cert. granted, 116 S. Ct. 40 (1995).

[14] See, e.g., *In re Paulsen*, 30 F.3d 1475, 1480, 31 USPQ2d 1671, 1674 (Fed. Cir. 1994) (inventor may define specific terms used to describe invention, but must do so "with reasonable clarity, deliberateness, and precision" and, if done, must "'set out his uncommon definition in some manner within the patent disclosure' so as to give one of ordinary skill in the art notice of the change" in meaning) (quoting *Intellicall, Inc. v. Phonometrics, Inc.*, 952 F.2d 1384, 1387-88, 21 USPQ2d 1383, 1386 (Fed. Cir. 1992)).

[15] *Id.* at 1480, 31 USPQ2d at 1674.

[16] See, e.g., *In re Zletz*, 893 F.2d 319, 321-22, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989) ("During patent examination the pending claims must be interpreted as broadly as their terms reasonably allow . . . The reason is simply that during patent prosecution when claims can be amended, ambiguities should be recognized, scope and breadth of language explored, and clarification imposed . . . An essential purpose of patent examination is to fashion claims that are precise, clear, correct, and unambiguous. Only in this way can uncertainties of claim scope be removed, as much as possible, during the administrative process.").

[17] Two in banc decisions of the Federal Circuit have made clear that the Office is to interpret means plus function language according to 35 U.S.C. § 112, sixth paragraph. In the first, *In re Donaldson*, 16 F.3d 1189, 1193, 29 USPQ2d 1845, 1848 (Fed. Cir. 1994), the court held:

The plain and unambiguous meaning of paragraph six is that one construing means-plus-function language in a claim must look to the specification and interpret that language in light of the corresponding structure, material, or acts described therein, and equivalents thereof, to the extent that the specification provides such disclosure. Paragraph six does not state or even suggest that the PTO is exempt from this mandate, and there is no legislative history indicating that Congress intended that the PTO should be. Thus, this court must accept the plain and precise language of paragraph six.

Consistent with *Donaldson*, in the second decision, *Alappat*, 33 F.3d at 1540, 31 USPQ2d at 1554, the Federal Circuit held:

Given Alappat's disclosure, it was error for the Board majority to interpret each of the means clauses in claim 15 so broadly as to "read on any and every means for performing

the function" recited, as it said it was doing, and then to conclude that claim 15 is nothing more than a process claim wherein each means clause represents a step in that process. Contrary to suggestions by the Commissioner, this court's precedents do not support the Board's view that the particular apparatus claims at issue in this case may be viewed as nothing more than process claims.

[18] 1162 O.G. 59 (May 17, 1994).

[19] See, e.g., *Diamond v. Diehr*, 450 U.S. at 188-89, 209 USPQ at 9 ("In determining the eligibility of respondents' claimed process for patent protection under § 101, their claims must be considered as a whole. It is inappropriate to dissect the claims into old and new elements and then to ignore the presence of the old elements in the analysis. This is particularly true in a process claim because a new combination of steps in a process may be patentable even though all the constituents of the combination were well known and in common use before the combination was made.").

[20] See supra note 18 and accompanying text.

[21] *Diamond v. Chakrabarty*, 447 U.S. 303, 308-09, 206 USPQ 193, 197 (1980):

In choosing such expansive terms as "manufacture" and "composition of matter," modified by the comprehensive "any," Congress plainly contemplated that the patent laws would be given wide scope. The relevant legislative history also supports a broad construction. The Patent Act of 1793, authored by Thomas Jefferson, defined statutory subject matter as "any new and useful art, machine, manufacture, or composition of matter, or any new or useful improvement [thereof]." Act of Feb. 21, 1793, § 1, 1 Stat. 319. The Act embodied Jefferson's philosophy that "ingenuity should receive a liberal encouragement." 5 Writings of Thomas Jefferson 75-76 (Washington ed. 1871). See *Graham v. John Deere Co.*, 383 U.S. 1, 7-10 (1966). Subsequent patent statutes in 1836, 1870, and 1874 employed this same broad language. In 1952, when the patent laws were recodified, Congress replaced the word "art" with "process," but otherwise left Jefferson's language intact. The Committee Reports accompanying the 1952 Act inform us that Congress intended statutory subject matter to "include anything under the sun that is made by man." S. Rep. No. 1979, 82d Cong., 2d Sess. 5 (1952); H.R. Rep. No. 1923, 82d Cong., 2d Sess. 6 (1952).

This perspective has been embraced by the Federal Circuit:

The plain and unambiguous meaning of § 101 is that any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may be patented if it meets the requirements for patentability set forth in Title 35, such as those found in §§ 102, 103, and 112. The use of the expansive term "any" in § 101 represents Congress's intent not to place any restrictions on the subject matter for which a patent may be obtained beyond those specifically recited in § 101 and the other parts of Title 35 . . . Thus, it is improper to read into § 101 limitations as to the subject matter that may be patented where the legislative history does not indicate that Congress clearly intended such limitations. [*Alappat*, 33 F.3d at 1542, 31 USPQ2d at 1556.]

[22] 35 U.S.C. § 101 (1994).

[23] See 35 U.S.C. § 100(b) ("The term 'process' means process, art, or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material.").

[24] E.g., *Alappat*, 33 F.3d at 1542, 31 USPQ2d at 1556; *In re Warmerdam*, 33 F.3d 1354, 1358, 31 USPQ2d 1754, 1757 (Fed. Cir. 1994).

[25] See, e.g., *Rubber-Tip Pencil Co. v. Howard*, 87 U.S. 498, 507 (1874) ("idea of itself is not patentable, but a new device by which it may be made practically useful is"); *Mackay Radio & Telegraph Co. v. Radio Corp. of America*, 306 U.S. 86, 94 (1939) ("While a scientific truth, or the mathematical expression of it, is not patentable invention, a novel and useful structure created with the aid of knowledge of scientific truth may be."); *Warmerdam*, 33 F.3d at 1360, 31 USPQ2d at 1759 ("steps of 'locating' a medial axis, and 'creating' a bubble hierarchy . . . describe nothing more than the manipulation of basic mathematical constructs, the paradigmatic 'abstract idea'").

[26] The concern over preemption was expressed as early as 1852. See *Le Roy v. Tatham*, 55 U.S. 156, 175 (1852) ("A principle, in the abstract, is a fundamental truth; an original cause; a motive; these cannot be patented, as no one can claim in either of them an exclusive right."); *Funk Brothers Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 132, USPQ 280, 282 (1948) (combination of six species of bacteria held to be non-statutory subject matter).

[27] The definition of "data structure" is "a physical or logical relationship among data elements, designed to support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993).

[28] Compare *In re Lowry*, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994) (claim to data structure that increases computer efficiency held statutory) and *Warmerdam*, 33 F.3d at 1360-61, 31 USPQ2d at 1759 (claim to computer having specific memory held statutory product-by-process claim) with *Warmerdam*, 33 F.3d at 1361, 31 USPQ2d at (claim to a data structure per se held non-statutory).

[29] *In re Sarkar*, 588 F.2d 1330, 1333, 200 USPQ 132, 137 (CCPA 1978):

[E]ach invention must be evaluated as claimed; yet semantogenic considerations preclude a determination based solely on words appearing in the claims. In the final analysis under § 101, the claimed invention, as a whole, must be evaluated for what it is.

Quoted with approval in *Abele*, 684 F.2d at 907, 214 USPQ at 687. See also *In re Johnson*, 589 F.2d 1070, 1077, 200 USPQ 199, 206 (CCPA 1978) ("form of the claim is often an exercise in drafting").

[30] See, e.g., *Warmerdam*, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held non-statutory).

[31] Computer Dictionary 210 (Microsoft Press, 2d ed. 1994):

Data consists of facts, which become information when they are seen in context and convey meaning to people. Computers process data without any understanding of what that data represents.

[32] See supra note 29.

[33] *O'Reilly v. Morse*, 56 U.S. (15 How.) at 112-14.

[34] *Id.* at 114-19.

[35] Products may be either machines, manufactures or compositions of matter.

A machine is:

a concrete thing, consisting of parts or of certain devices and combinations of devices.

*Burr v. Duryee*, 68 U.S. (1 Wall.) 531, 570 (1863).

A manufacture is:

the production of articles for use from raw or prepared materials by giving to these materials new forms, qualities, properties or combinations, whether by hand-labor or by machinery.

*Diamond v. Chakrabarty*, 447 U.S. at 308, 206 USPQ at 196-97 (quoting *American Fruit Growers, Inc. v. Brogdex Co.*, 283 U.S. 1, 11 (1931).

A composition of matter is:



a composition[] of two or more substances [or] . . . a[] composite article[], whether . . . [it] be the result of chemical union, or of mechanical mixture, whether . . . [it] be [a] gas[], fluid[], powder[], or solid[].

*Diamond v. Chakrabarty*, 447 U.S. at 308, 206 USPQ at 197 (quoting *Shell Development Co. v. Watson*, 149 F. Supp. 279, 280, 113 USPQ 265, 266 (D.D.C. 1957), aff'd per curiam, 252 F.2d 861, 116 USPQ 428 (D.C. Cir. 1958).

[36] See, e.g., *Lowry*, 32 F.3d at 1583, 32 USPQ2d at 1034-35; *Warmerdam*, 33 F.3d at 1361-62, 31 USPQ2d at 1760.

[37] Cf. *In re Iwahashi*, 888 F.2d 1370, 1374-75, 12 USPQ2d 1908, 1911-12 (Fed. Cir. 1989), cited with approval in *Alappat*, 33 F.3d at 1544 n.24, 31 USPQ2d at 1558 n.24.

[38] "Specific software" is defined as a set of instructions implemented in a specific program code segment. See Computer Dictionary 78 (Microsoft Press, 2d ed. 1994) for definition of "code segment."

[39] See *Diamond v. Diehr*, 450 U.S. at 183-84, 209 USPQ at 6 (quoting *Cochrane v. Deener*, 94 U.S. 780, 787-88 (1877) ("A [statutory] process is a mode of treatment of certain materials to produce a given result. It is an act, or a series of acts, performed upon the subject-matter to be transformed and reduced to a different state or thing . . . . The process requires that certain things should be done certain substances, and in a certain order; but the tools to be used in doing this may be of secondary consequence.").

[40] See *Alappat*, 33 F.3d at 1543, 31 USPQ2d at 1556-57 (quoting *Diamond v. Diehr*, 450 U.S. at 192, 209 USPQ at 10). see also *id.* at 1569, 31 USPQ2d at 1578-79 (Newman, J., concurring) ("unpatentability of the principle does not defeat patentability of its practical applications") (citing *O'Reilly v. Morse*, 56 U.S. (15 How.) at 114-19).

[41] *Diamond v. Diehr*, 450 U.S. at 187, 209 USPQ at 8.

[42] See *In re Gelnovatch*, 595 F.2d 32, 41 n.7, 201 USPQ 136, 145 n.7 (CCPA 1979) (data-gathering step did not measure physical phenomenon).

[43] *Schrader*, 22 F.3d at 294, 30 USPQ2d at 1459 citing with approval *Arrhythmia*, 958 F.2d at 1058-59, 22 USPQ2d at 7-38; *Abele*, 684 F.2d at 909, 214 USPQ at 688; *In re Taner*, 681 F.2d 787, 790, 214 USPQ 678, 681 (CCPA 1982).

[44] See supra note 9.

[45] In *Sarkar*, 588 F.2d at 1335, 200 USPQ at 139, the court explained why this approach must be followed:

No mathematical equation can be used, as a practical matter, without establishing and substituting values for the variables expressed therein. Substitution of values dictated by the formula has thus been viewed as a form of mathematical step. If the steps of gathering and substituting values were alone sufficient, every mathematical equation, formula, or algorithm having any practical use would be per se subject to parenting as a "process" under § 101. Consideration of whether the substitution of specific values is enough to convert the disembodied ideas present in the formula into an embodiment of those ideas, or into an application of the formula, is foreclosed by the current state of the law.

[46] See supra note 40.

[47] See, e.g., *In re Bernhart*, 417 F.2d 1395, 1400, 163 USPQ 611, 616 (CCPA 1969).

[48] *Schrader*, 22 F.3d at 293-94, 30 USPQ2d at 1458-59.

[49] *Warmerdam*, 33 F.3d at 1360, 31 USPQ2d at 1759.

[50] See, e.g., *In re Meyer*, 688 F.2d 789, 794-95, 215 USPQ 193, 197 (CCPA 1982) ("Scientific principles, such as the relationship between mass and energy, and laws of nature, such as the acceleration of gravity, namely, a=32 ft./sec.$^2$, can be represented in mathematical format. However, some mathematical algorithms and formulae do not represent scientific principles or laws of nature; they represent ideas or mental processes and are simply logical vehicles for communicating possible solutions to complex problems. The presence of a mathematical algorithm or formula in a claim is merely an indication that a scientific principle, law of nature, idea or mental process may be the subject matter claimed and, thus, justify a rejection of that claim under 35 USC § 101; but the presence of a mathematical algorithm or formula is only a signpost for further analysis."). Cf. *Alappat*, 33 F.3d at 1543 n.19, 31 USPQ2d at 1556 n.19 in which the Federal Circuit recognized the confusion:

The Supreme Court has not been clear . . . as to whether such subject matter is excluded from the scope of § 101 because it represents laws of nature, natural phenomena, or abstract ideas. See *Diehr*, 450 U.S. at 186 (viewed mathematical algorithm as a law of nature); *Benson*, 409 U.S. at 71-72 (treated mathematical algorithm as an "idea"). The Supreme Court also has not been clear as to exactly what kind of mathematical subject matter may not be patented. The Supreme Court has used, among others, the terms "mathematical algorithm," "mathematical formula," and "mathematical equation" to describe types of mathematical subject matter not entitled to patent protection standing alone. The Supreme Court has not set forth, however, any consistent or clear explanation of what it intended by such terms or how these terms are related, if at all.

[51] *Walter*, 618 F.2d at 769, 205 USPQ at 409 (Because none of the claimed steps were explicitly or implicitly limited to their application in seismic prospecting activities, the court held that "[a]lthough the claim preambles relate the claimed invention to the art of seismic prospecting, the claims themselves are not drawn to methods of or apparatus for seismic prospecting; they are drawn to improved mathematical methods for interpreting the results of seismic prospecting."). Cf. *Alappat*, 33 F.3d at 1544, 31 USPQ2d at 1558.

[52] *Walter*, 618 F.2d at 769-70, 205 USPQ at 409.

[53] See supra note 45.

[54] *Taner*, 681 F.2d at 788, 214 USPQ at 679.

[55] *Abele*, 684 F.2d at 908, 214 USPQ at 687 ("The specification indicates that such attenuation data is available only when an X-ray beam is produced by a CAT scanner, passed through an object, and detected upon its exit. Only after these steps have been completed is the algorithm performed, and the resultant modified data displayed in the required format.").

[56] *Gelnovatch*, 595 F.2d at 41 n.7, 201 USPQ at 145 n.7 ("Appellants' claimed step of perturbing the values of a set of process inputs (step 3), in addition to being a mathematical operation, appears to be a data-gathering step of the type we have held insufficient to change a nonstatutory method of calculation into a statutory process . . . In this instance, the perturbed process inputs are not even measured values of physical phenomena, but are instead derived by numerically changing the values in the previous set of process inputs.").

[57] *Sarkar*, 588 F.2d at 1331, 200 USPQ at 135.

[58] See *Sarkar*, 588 F.2d at 1332 n.6, 200 USPQ at 136 n.6 ("post-solution" construction that was being modeled by the mathematical process not considered in deciding § 101 question because applicant indicated that such construction was not a material element of the invention).

[59] *Parker v. Flook*, 437 U.S. 584, 585, 198 USPQ 193, 195 (1978).

[60] *Walter*, 618 F.2d at 770, 205 USPQ at 409 ("If § 101 could be satisfied by the mere recordation of the results of a nonstatutory process on some record medium, even the most unskilled patent draftsman could provide for such a step.").

[61] *Gelnovatch*, 595 F.2d at 41 n.7, 201 USPQ at 145 n.7.

[62] *Abele*, 684 F.2d at 909, 214 USPQ at 688 ("This claim presents no more than the calculation of a number and display of the result, albeit in a particular format. The specification provides no greater meaning to 'data in a field' than a matrix of numbers regardless of by what method generated. Thus, the algorithm is neither explicitly nor implicitly applied to any certain process. Moreover, that the result is displayed as a shade of gray rather than as simply a number provides no greater or better information, considering the broad range of applications encompassed by the claim.").

[63] *In re De Castelet*, 562 F.2d 1236, 1244, 195 USPQ 439, 446 (CCPA 1977) ("That the computer is instructed to transmit electrical signals, representing the results of its calculations, does not constitute the type of 'post solution activity' found in *Flook*, [437 U.S. 584, 198 USPQ 193 (1978)], and does not transform the claim into one for a process merely using an algorithm. The final transmitting step constitutes nothing more than reading out the result of the calculations.").

[64] E.g., *Warmerdam*, 33 F.3d at 1360, 31 USPQ2d at 1759. See also *Schrader*, 22 F.3d at 295, 30 USPQ2d at 1459.

[65] See supra note 18 and accompanying text.

[66] Computer Dictionary 353 (Microsoft Press, 2d ed. 1994) (definition of "self-documenting code").

[67] See *In re Barker*, 559 F.2d 588, 591, 194 USPQ 470, 472 (CCPA 1977), cert. denied, *Barker v. Parker*, 434 U.S. 1064 (1978) (a specification may be sufficient to enable one skilled in the art to make and use the invention, but still fail to comply with the written description requirement). See also *In re DiLeone*, 436 F.2d 1404, 1405, 168 USPQ 592, 593 (CCPA 1971).

[68] See, e.g., *Northern Telecom v. Datapoint Corp.*, 908 F.2d 931, 941-43, 15 USPQ2d 1321, 1328-30 (Fed. Cir.), cert. denied, *Datapoint Corp. v. Northern Telecom*, 498 U.S. 920 (1990) (judgment of invalidity reversed for clear error where expert testimony on both sides showed that a programmer of reasonable skill could write a satisfactory program with ordinary effort based on the disclosure); *DeGeorge v. Bernier*, 768 F.2d 1318, 1324, 226 USPQ 758, 762-63 (Fed. Cir. 1985) (superseded by statute with respect to issues not relevant here) (invention was adequately disclosed for purposes of enablement even though all of the circuitry of a word processor was not disclosed, since the undisclosed circuitry was deemed inconsequential because it did not pertain to the claimed circuit); *In re Phillips*, 608 F.2d 879, 882-83, 203 USPQ 971, 975 (CCPA 1979) (computerized method of generating printed architectural specifications dependent on use of glossary of predefined standard phrases and error-checking feature enabled by overall disclosure generally defining errors); *In re Donohue*, 550 F.2d 1269, 1271, 193 USPQ 136, 137 (CCPA 1977) ("Employment of block diagrams and descriptions of their functions is not fatal under 35 U.S.C. 112, first paragraph, providing the represented structure is conventional and can be determined without undue experimentation."); *In re Knowlton*, 481 F.2d 1357, 1366-68, 178 USPQ 486, 493-94 (CCPA 1973) (examiner's contention that a software invention needed a detailed description of all the circuitry in the complete hardware system reversed).

[69] See *In re Naquin*, 398 F.2d 863, 866, 158 USPQ 317, 319 (CCPA 1968) ("When an invention, in its different aspects, involves distinct arts, that specification is adequate which enables the adepts of each art, those who have the best chance of being enabled, to carry out the aspect proper to their specialty."); Ex parte *Zechnall*, 194 USPQ 461, 461 (Bd. App. 1973) ("appellants' disclosure must be held sufficient if it would enable a person skilled in the electronic computer art, in cooperation with a person skilled in the fuel injection art, to make and use appellants' invention").

[70] See *In re Scarbrough*, 500 F.2d 560, 565, 182 USPQ 298, 301-02 (CCPA 1974) ("It is not enough that a person skilled in the art, by carrying on investigations along the line indicated in the instant application, and by a great amount of work eventually might find out how to make and use the instant invention. The statute requires the application itself to inform, not to direct others to find out for themselves (citation omitted)."); *Knowlton*, 481 F.2d at 1367, 178 USPQ at 493 (disclosure must constitute more than a "sketchy explanation of flow diagrams or a bare group of program listings together with a reference to a proprietary computer on which they might be run"). See also *In re Gunn*, 537 F.2d 1123, 1127-28, 190 USPQ 402, 405 (CCPA 1976); *In re Brandstadter*, 484 F.2d 1395, 1406-07, 17 USPQ 286, 294 (CCPA 1973); and *In re Ghiron*, 442 F.2d 985, 991, 169 USPQ 723, 727-28 (CCPA 1971).

[71] Cf. *In re Gulack*, 703 F.2d 1381, 1385, 217 USPQ 401, 404 (Fed. Cir. 1983) (when descriptive material is not functionally related to the substrate, the descriptive material will not distinguish the invention from the prior art in terms of patentability).



**Appendix to Examination Guidelines for Computer-Related Inventions**

**Computer-Related Inventions**

II. Determine What Applicant Has Invented and is Seeking to Patent

A. Identify and Understand Any Practical Application Asserted for the Invention

B. Review the Detailed Disclosure and Specific Embodiments of the Invention to Determine What the Applicant Has Invented

C. Review the Claims

↓

III. Conduct a Thorough Search of the Prior Art

↓

IV. Determine Whether the Claimed Invention Complies with 35 U.S.C. § 101 (See next chart)

↓

V. Evaluate Application for Compliance with 35 U.S.C. § 112

A. Determine Whether the Claimed Invention Complies with 35 U.S.C. § 112, Second Paragraph

1. Claims Setting Forth the Subject Matter Applicant Regards as Invention

2. Claims Particularly Pointing Out and Distinctly Claiming the Invention

B. Determine Whether the Claimed Invention Complies with 35 U.S.C. § 112, First Paragraph

1. Adequate Written Description

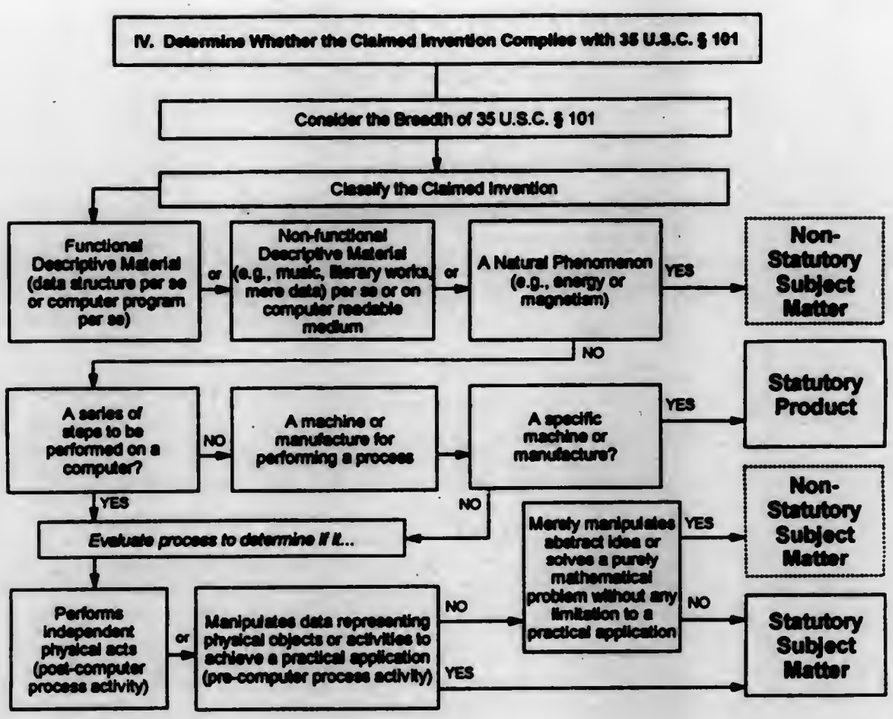
2. Enabling Disclosure

↓

VI. Determine Whether the Claimed Invention Complies with 35 U.S.C. § § 102 and 103

↓

VII. Clearly Communicate Findings, Conclusions and Their Bases




February 16, 1996

BRUCE A. LEHMAN
*Assistant Secretary of Commerce*
*and Commissioner of Patents and Trademarks*

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From a **MEMORANDUM TO ALL EMPLOYEES**

from Bruce A. Lehman, Commissioner
of Patents and Trademarks
February 13, 1995

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Patent Search Room (Crystal Plaza 3, 1A03) ..... 308-0595
(Hours: Weekdays, 8:00 a.m. to 8:00 p.m., EST/EDT)

Patent Image Retrieval (Crystal Mall 1, 1A02) ..... 308-6001
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Patent Assignment Search Room (Crystal Plaza 3, 2C03) ..... 308-2768
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Trademark Search Branch (South Tower, 2B30) ..... 308-9800
(Hours: Weekdays, 8:00 a.m. to 5:30 p.m., EST/EDT)

Secrecy Orders ..... 308-1720

Security ..... 305-8183

Sequence Information Submissions (37 C.F.R. 1.821-1.825)

Sequence Rules ..... 308-1123
CRF Submissions (STIC) ..... 308-4212

Patentin Program Support (S&IRA) ..... 308-6856

Simultaneous Issuances ..... 305-8594

Solicitor ..... 305-9035

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Arlington, VA 22215

Status

Patent Applications ..... Appropriate Examining Group or 305-1801
Issued Patents ..... 305-1801

Status of Trademark Registrations and Applications via Automated Voice System
(Requires Touch-Tone Telephone; Hours: Weekdays, 6:30 a.m. to 12:00 midnight, EST/EDT) ..... 305-8747

Status of Patent Files in Official Search ..... 305-1801

Statutory Invention Registrations (SIRs) ..... 308-0766

Subclass Listings ..... 306-2600

Subscription Information

CD-ROM Products ..... 306-2600
MPEP on CD-ROM or Diskette ..... 306-2600
MPEP (Paper Version) ..... Government Printing Office (202) 512-1800
Official Gazette ..... Government Printing Office (202) 512-1800
Patent and Trademark Office Notices ..... Government Printing Office (202) 512-1800
Patent Copy Sales ..... 305-8716
Patent Subclass Listings ..... 305-8263

Technology Assessment and Forecast Program

Patent Statistics ..... 306-2600

Telecommunication Devices for the Deaf (TDD)

Office of Civil Rights ..... 305-8059
Office of Finance ..... 308-6695
Office of Human Resources ..... 308-6645
Office of Procurement ..... 305-8018
Office of Public Records ..... 308-7172
General Information Services Division ..... 305-7785

Terminal Disclaimers

General ..... 305-8408

To Overcome Obvious-Type Double Patenting

Rejection.....Appropriate Examining Group

**Trademark Applications**
See Applications, Trademarks

**Trademark Assistance Center**.....308-9000

**Trademark Manual of Examining Procedure (TMEP)**.....308-9000

**Trademark Products on Magnetic Tape**.....306-2600

**Training**

Employee/Career Development.....305-8431
Public Users of Automated Systems.....308-3040

**Translations**
See Foreign Patents


**Federal Government Holidays, 1996**

| | |
|---|---|
| Monday, January 1 | New Year's Day |
| Monday, January 15 | Martin Luther King, Jr.'s Birthday |
| Monday, February 19 | Presidents' Day |
| Monday, May 27 | Memorial Day |
| Thursday, July 4 | Independence Day |
| Monday, September 2 | Labor Day |
| Monday, October 14 | Columbus Day |
| Monday, November 11 | Veterans' Day |
| Thursday, November 28 | Thanksgiving Day |
| Wednesday, December 25 | Christmas Day |

**Certificate of Correction Issued March 26, 1996**

| | | | |
|---|---|---|---|
| P. 09,131 | 5,346,508 | 5,393,852 | 5,431,626 |
| Re. 35,086 | 5,354,075 | 5,394,924 | 5,431,991 |
| Re. 35,107 | 5,356,810 | 5,395,816 | 5,433,470 |
| D. 361,883 | 5,360,645 | 5,399,261 | 5,433,714 |
| D. 362,432 | 5,361,923 | 5,399,673 | 5,434,563 |
| D. 364,119 | 5,362,742 | 5,408,146 | 5,435,835 |
| D. 364,245 | 5,362,819 | 5,409,762 | 5,436,128 |
| D. 365,533 | 5,363,312 | 5,410,470 | 5,437,651 |
| 4,839,342 | 5,364,111 | 5,410,892 | 5,437,985 |
| 4,943,560 | 5,364,529 | 5,411,717 | 5,438,444 |
| 5,098,286 | 5,367,608 | 5,415,073 | 5,438,520 |
| 5,098,827 | 5,371,013 | 5,415,102 | 5,438,901 |
| 5,103,392 | 5,376,567 | 5,415,644 | 5,439,957 |
| 5,111,416 | 5,376,639 | 5,418,149 | 5,440,526 |
| 5,131,786 | 5,377,042 | 5,418,800 | 5,441,068 |
| 5,187,528 | 5,378,460 | 5,420,657 | 5,441,818 |
| 5,193,805 | 5,378,581 | 5,422,032 | 5,441,943 |
| 5,204,174 | 5,381,295 | 5,422,078 | 5,442,352 |
| 5,206,805 | 5,382,109 | 5,422,189 | 5,442,955 |
| 5,218,688 | 5,382,157 | 5,422,368 | 5,443,500 |
| 5,226,115 | 5,384,119 | 5,423,681 | 5,444,222 |
| 5,244,570 | 5,384,840 | 5,424,697 | 5,444,236 |
| 5,246,546 | 5,388,103 | 5,425,557 | 5,444,402 |
| 5,291,645 | 5,388,419 | 5,425,604 | 5,444,646 |
| 5,297,514 | 5,388,521 | 5,426,572 | 5,445,477 |
| 5,299,156 | 5,389,920 | 5,427,095 | 5,445,480 |
| 5,299,281 | 5,391,828 | 5,427,663 | 5,446,284 |
| 5,309,367 | 5,392,246 | 5,428,564 | 5,447,000 |
| 5,322,098 | 5,392,776 | 5,429,193 | 5,447,208 |
| 5,328,470 | 5,393,713 | 5,430,478 | 5,448,127 |
| 5,336,545 | 5,393,780 | 5,430,537 | 5,448,542 |
| 5,448,819 | 5,461,494 | 5,469,021 | 5,476,590 |
| 5,448,925 | 5,461,723 | 5,469,305 | 5,476,821 |
| 5,449,742 | 5,461,965 | 5,469,542 | 5,476,826 |
| 5,450,194 | 5,462,003 | 5,469,673 | 5,476,914 |
| 5,450,746 | 5,462,217 | 5,469,828 | 5,476,929 |
| 5,451,180 | 5,462,568 | 5,469,973 | 5,477,282 |
| 5,451,202 | 5,462,913 | 5,469,988 | 5,477,643 |
| 5,451,405 | 5,463,018 | 5,470,076 | 5,477,806 |
| 5,451,789 | 5,463,211 | 5,470,568 | 5,477,890 |
| 5,451,919 | 5,463,225 | 5,470,726 | 5,478,370 |
| 5,452,007 | 5,463,497 | 5,471,025 | 5,478,394 |
| 5,452,058 | 5,463,557 | 5,471,100 | 5,478,741 |
| 5,452,122 | 5,463,881 | 5,471,292 | 5,478,812 |
| 5,452,129 | 5,464,019 | 5,471,433 | 5,478,929 |
| 5,452,976 | 5,464,066 | 5,471,459 | 5,479,010 |
| 5,453,014 | 5,464,383 | 5,471,469 | 5,480,637 |
| 5,453,205 | 5,464,426 | 5,471,854 | 5,480,652 |
| 5,453,206 | 5,464,433 | 5,472,285 | 5,480,685 |
| 5,453,246 | 5,464,463 | 5,472,446 | 5,480,764 |
| 5,453,629 | 5,464,750 | 5,472,566 | 5,481,008 |
| 5,453,969 | 5,464,837 | 5,472,778 | 5,481,030 |
| 5,454,002 | 5,465,116 | 5,472,875 | 5,481,251 |
| 5,454,573 | 5,465,141 | 5,472,910 | 5,481,482 |
| 5,455,912 | 5,465,528 | 5,473,162 | 5,481,537 |
| 5,456,133 | 5,465,588 | 5,473,295 | 5,482,043 |
| 5,456,439 | 5,466,228 | 5,473,817 | 5,482,176 |
| 5,457,047 | 5,466,631 | 5,473,845 | 5,482,179 |
| 5,457,485 | 5,467,116 | 5,474,013 | 5,482,881 |
| 5,457,512 | 5,467,158 | 5,474,021 | 5,483,066 |
| 5,457,954 | 5,467,597 | 5,474,146 | 5,483,128 |
| 5,458,119 | 5,468,003 | 5,474,245 | 5,483,196 |
| 5,458,265 | 5,468,224 | 5,474,250 | 5,483,390 |
| 5,458,407 | 5,468,287 | 5,474,417 | 5,483,412 |
| 5,458,988 | 5,468,353 | 5,474,765 | 5,484,036 |
| 5,459,000 | 5,468,497 | 5,474,827 | 5,484,597 |
| 5,459,072 | 5,468,620 | 5,474,941 | 5,484,841 |
| 5,459,378 | 5,468,737 | 5,475,105 | 5,485,446 |
| 5,459,972 | 5,468,861 | 5,475,308 | 5,486,386 |
| 5,460,766 | 5,468,872 | 5,475,987 | 5,486,732 |
| 5,461,380 | 5,468,954 | | |



**Summary of Final Decisions Issued by the Trademark Trial and Appeal Board December 25-29, 1996**

| Date Issued | Type of Case[1] | Proceeding or App'n No. | Party/Parties | Issue | TTAB Decision | Opposer's/ Petitioner's Mark and Goods/Services | Applicant's/ Respondent's Mark and Goods/Services | Mark and Goods Cited by Examining Attorney | Recommended for Publication |
|---|---|---|---|---|---|---|---|---|---|
| 12-28 | OPP | 92,040 | Kendall Co. v. DPT Laboratories, Inc. | 2(d) | Opposition Dismissed | "CURITY"; "CURAD"; "CURASILK"; and "CURI-STRIP" [dressing, bandages, ointments, adhesive tape, etc.] | "CURASOL" [pharmaceutical preparations for the treatment of dermatological, wound, or incontinent conditions or diseases] | | No |
| 12-28 | EX | 74/335,133 | Westheimer Corp. | 2(d) | Refusal Affirmed | | "REGAL" [guitars and guitar accessories, namely, guitar strings, guitar straps and guitar pickups] | "REGAL CORPS" [drumsticks and drum mallets and percussion musical instruments]; "REGAL TIP" (and design) [drumsticks] | No |
| 12-29 | OPP | 89,841 | Gaylord Container Corp. v. Dunn & Co., Inc. of Iowa | 2(d) | Opposition Sustained | "ROADRUNNER" [corrugated pallets] | "ROADRUNNER" [manually powered hand pallet lifting jacks] | | No |

[1]EX = EX PARTE APPEAL; OPP = OPPOSITION; CANC = CANCELLATION; CU = CONCURRENT USE; (R) = REQ. FOR RECONSIDERATION

**DEPARTMENT OF COMMERCE**

**Patent and Trademark Office**

**Notice of Hearings and Request for Comments on Issues Relating to Patent Protection for Nucleic Acid Sequences**

**AGENCY:** Patent and Trademark Office, Commerce.

**ACTION:** Notice of Hearings and Request for Comments.

**SUMMARY:** The Patent and Trademark Office (PTO) will hold public hearings, and it requests comments, on issues relating to patent protection for nucleic acid sequences. Interested members of the public are invited to testify at public hearings and to present written comments on any of the topics outlined in the supplementary information section of this notice.

**DATES:** Public hearings will be held on Tuesday, April 16, 1996, from 9:00 a.m. until 1:00 p.m., and Tuesday, April 23, 1996, from 9:00 a.m. until 1:00 p.m.

Those wishing to present oral testimony at any of the hearings must request an opportunity to do so no later than Friday, April 12, 1996, for the April 16 hearing, or Friday, April 19, 1996, for the April 23 hearing.

Speakers may provide a written copy of their testimony for inclusion in the record of the proceedings no later than Monday, May 6, 1996.

Written comments will be accepted by the PTO until April 23, 1996.

Written comments and transcripts of the hearings will be available for public inspection on or about Monday, May 13, 1996.

**ADDRESSES:** The April 16 hearing will be held from 9:00 a.m. until 1:00 p.m. at the University of California, San Diego, International Center, 9500 Gilman Drive, La Jolla, California.

The April 23 public hearing will be held from 9:00 a.m. until 1:00 p.m. in Suite 912, Commissioner's Conference Room, Crystal Park Two, 2121 Crystal Drive, Arlington, Virginia.

Requests to testify should be sent to Esther Kepplinger by telephone at (703) 308-2339, by facsimile transmission at (703) 305-3601, or by mail marked to her attention addressed to the Assistant Commissioner for Patents, Box Comments-Patents, Washington, D.C. 20231. No request for oral testimony will be accepted through electronic mail.

Written comments should be addressed to the Assistant Commissioner for Patents, Box Comments-Patents, Washington, D.C. 20231, marked to the attention of Esther Kepplinger. Comments may also be submitted by facsimile transmission at (703) 305-3601, with a confirmation copy mailed to the above address, or by electronic mail over the Internet to sequences@uspto.gov.

Written comments and transcripts of the hearings will be maintained for public inspection in Suite 520 of Crystal Park One, 2011 Crystal Drive, Arlington, Virginia. Transcripts and comments provided in machine readable format will also be available through anonymous file transfer protocol (ftp) via the Internet (address: sequences@uspto.gov).



**FOR FURTHER INFORMATION CONTACT:** Esther Kepplinger by telephone at (703) 308-2339, by facsimile transmission to (703) 305-3601, by electronic mail at ekepplin@uspto.gov, or by mail marked to her attention addressed to the Assistant Commissioner for Patents, Box Comments-Patents, Washington, D.C. 20231.

**SUPPLEMENTARY INFORMATION:**

**I. Background**

Biotechnology is projected to be an important growth industry from now until well into the twenty-first century, particularly in the United States, which has been a leader in this rapidly developing industry. The PTO has taken a very active role in working together with its customers to simplify and standardize PTO policies and procedures and to encourage and promote the growth of this industry. Nevertheless, PTO needs to continue to seek ways to improve its responsiveness to its customers and to more effectively address the needs of the industry. In order to address both current and future challenges, the PTO is seeking the assistance and advice of the public.

With the growth of the biotechnology industry have come significant changes in the process of research, development and commercialization of biotechnology inventions. For at least a decade, patent applications claiming nucleic acid sequences, such as genes composed of deoxyribonucleic acid ("DNA"), have been examined and granted patent rights by the PTO pursuant to 35 U.S.C. 131. These sequences typically encode known proteins or proteins for which an applicant has discovered a function. Scientific and technological advances have permitted researchers to identify large numbers of gene fragments rapidly. The ease of using automated techniques for sequencing large numbers of random nucleic acid fragments has resulted in the filing of a growing number of patent applications each claiming thousands of nucleic acid sequences. Handling patent applications containing large numbers of sequences creates a significant processing problem for the PTO. While the PTO has acquired sophisticated and costly computer hardware and software necessary to process and search applications containing such sequences, the search and examination of the sequences will significantly overtax the existing system and may necessitate the acquisition of many additional, expensive, massively parallel processor computers to complete the search of the prior art and examination in a reasonable time. Human resources to analyze the computer search results greatly exceeds the computer time necessary to run the search.

PTO estimates that the computer search time for one hundred sequences, each of which do not exceed several hundred nucleotides in length, is about fifteen hours and the examiner time for evaluating the sequence search results is about sixty-five hours. Based on searching 100,000 sequences a year, the estimated cost for computer search time for one hundred sequences is $1,800. Although the number of cases involving large numbers of sequences presently before the PTO is relatively small, it is estimated that the cost to search and examine these cases alone will be $12 million. These estimates represent searches of

commercially available databases by a massively parallel processor computer.

As in any technology, the PTO must search the entire scope of the claimed invention. Typical biotechnology patent applications drawn to DNA sequences claim the exact sequence disclosed but include various other broader claims. For example, typical claims include the sequence and any sequence having a certain percentage identity or homology to the sequence or any sequence which hybridizes to the sequence, with or without the conditions of binding being recited. Others recite the sequence or any fragment of the sequence having a particular length of nucleotides. These claims are largely responsible for the lengthy search and evaluation times and the high resultant costs to the PTO. Additionally, the presence of thousands of individual sequences per application represents an enormous search and examination challenge. This is particularly true if the sequences represent different proteins because the search for one sequence provides no useful data for another sequence.

The number of applications with large numbers of nucleic acid sequences continues to grow and, because of technological advances in the identification of genes, it is believed that the growth will continue.

Applications that claim excessively long sequences present similar challenges, since the claimed sequence must be broken up into numerous smaller sequences in order to be searched.

Appropriate policies must be established to address these challenges in ways that help protect the inventions of all applicants without creating an imbalance in the appropriation of resources within and among the technologies and Examining Groups of the PTO. These policies must permit the timely and thorough examination of all applications which require the same physical and human resources for completion.

**II. Issues for Public Comment**

Interested members of the public are invited to testify or to present written comments related to the above topics, including the following issues:

1. Is there a more cost-effective way to search and examine applications containing large numbers of sequences or excessively long sequences, in view of the PTO's limited human and computer resources?

2. How should the significantly higher cost associated with searching applications claiming large numbers of sequences or very long sequences be underwritten? For example:
   a) By fees from all applications?
   b) By fees from the biotechnology industry applications only?
   c) By fees from those specific applications involving large numbers of sequences or extraordinarily long sequences?

3. To assist PTO in addressing the described challenges, do you have any specific suggestions which would facilitate the implementation of short-term solutions? Do you have any suggestions on how the PTO can address long-term solutions?



**III. Guidelines for Oral Testimony**

Individuals wishing to testify at the hearings must adhere to the following guidelines:

1. Requests to testify must include the speaker's name, affiliation, title, phone number, fax number, mailing address, and Internet mail address (if available).

2. Speakers will be provided between seven and fifteen minutes to present their remarks. The exact amount of time allocated per speaker will be determined after the final number of parties testifying has been determined. All efforts will be made to accommodate requests presented before the day of the hearing for additional time for testimony.

3. Requests to testify may be accepted on the date of the hearing if sufficient time is available on the schedule. No one will be permitted to testify without prior approval.

A schedule providing approximate times for testimony will be provided to all speakers the morning of the day of the hearing.

Speakers are advised that the schedule for testimony may be subject to change during the course of the hearings.

**IV. Guidelines for Written Comments**

Written comments should include the following information:

1. Name and affiliation of the individual responding.

2. If applicable, an indication of whether comments offered represent views of the respondent's organization or are the respondent's personal views.

3. If applicable, information on the respondent's organization, including the type of organization (e.g., business, trade group, university, non-profit organization) and general areas of interest.

Information that is provided pursuant to this notice will be made part of the public record. In view of this, parties should not provide information they do not wish publicly disclosed. Parties who would like to rely on confidential information to illustrate a point being made are requested to summarize or otherwise provide the information in a way that will permit its public disclosure.

Parties offering testimony or written comments should provide their comments in machine readable format, if possible. Such submissions should be provided by electronic mail messages over the Internet, or on a 3.5" floppy disk formatted for use in either a Macintosh or MS-DOS based computer. Machine readable submissions should be provided as unformatted text (e.g., ACSII or plain text), or as formatted text in one of the following file formats: Microsoft Word (Macintosh, DOS or Windows versions) or WordPerfect (Macintosh, DOS or Windows versions).

V. Guidelines for Comments via Internet

Comments received via the Internet should include the same information requested in the guidelines set out for written comments.

VI. Other Information

Questions regarding the facilities and lodging in the La Jolla, California, area should be directed to the University of California, San Diego, Special Events, by telephone at (619) 534-6386, or by fax to (619) 534-0905. Parking permits are required for on-campus parking and may be purchased in advance through the Parking Office or on April 16 at Information booths at the university. Questions regarding parking should be directed to the Special Events Parking Office at (619) 534-9682, or by fax to (619) 534-9685.

March 6, 1996

BRUCE A. LEHMAN
Assistant Secretary of Commerce and
Commissioner of Patents and Trademarks



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| Box AF | Expedited procedure for processing amendments and other responses after final rejection. |
| Box Comments Patents | Public comments regarding patent related regulations and procedures. |
| Box DAC | Petitions decided by the Office of Petitions including petitions to revive and petitions to accept late payment of issue fees or maintenance fees. |
| Box DD | Disclosure Documents or materials related to the Disclosure Document Program. |
| Box FWC | Requests for File Wrapper Continuation Applications (under 37 CFR 1.62). |
| Box Interference | Communications relating to interferences and applications and patents involved in interference. |
| Box Issue Fee | All communications following the receipt of a PTOL-85, "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments are the exception. Assignments should be submitted in a separate envelope and not be sent to Box Issue Fee. |
| Box M Fee | Correspondence related to a patent that is subject to the payment of a maintenance fee. |
| Box MPEP | Submissions concerning the Manual of Patent Examining Procedures. |
| Box Non-Fee-Amendment | Non-fee amendments to patent applications. (Use Box AF for responses after final rejection). |
| Box PATENT APPLICATION | New patent applications and associated papers and fees. |
| Box Patent Ext. | Applications for patent term extension. |
| Box PCT | Mail related to applications filed under the Patent Cooperation Treaty. |
| Box Provisional Patent Application | The filing of all provisional patent applications and any communications relating thereto. |
| Box Reconstruction | Correspondence pertaining to the reconstruction of lost patent files. |
| Box Reexam | Requests for Reexamination for *original* request papers *only*. |
| Box Sequence | Submission of diskette for biotechnical application. |
| Box SN | For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications *prior* to the Office's standard notification (return postcard or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application"). |

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2900 Crystal Drive
Arlington, Virginia 22202-3513

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|---|---|
| Box NEW APP FEE | New trademark applications and fees. |
| Box ITU FEE | Statements of Use (SOU's), and extension requests. |
| Box TTAB FEE | Oppositions, cancellation petitions, and ex parte appeals. |
| Box TTAB NO FEE | Interferences, motions, and extension requests. |
| Box STATUS NO FEE | Written status inquiries. |
| Box POST REG FEE | Affidavits, renewals, corrections, and amendments. |
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|---|---|
| Box 3 | Mail for the Office of Personnel from NPC. |
| Box 4 | Mail for the Deputy Assistant Secretary of Commerce and Deputy Commissioner of Patents and Trademarks; Office of Legislative and International Affairs. |
| Box 6 | Mail for the Office of Procurement. |
| Box 8 | All papers for the Office of the Solicitor *except* communications relating to *pending litigation and disciplinary proceedings*: papers relating to pending litigation in court cases shall be mailed only to Office of the Solicitor, P.O. Box 15667, Arlington, Virginia 22215 and papers relating to pending disciplinary proceedings before the Administrative Law Judge or the Commissioner shall be mailed only to the Office of the Solicitor, P.O. Box 16116, Arlington, Virginia 22215. |
| Box 9 | Coupon orders for U.S. patent and trademark copies. |
| Box 10 | Orders for certified copies of PTO documents. |
| Box 11 | Electronic Ordering Service (EOS). |
| Box 13 | Mail for the Employee and Labor Relations Division. |
| Box 14 | Mail directed to the APS Contracts Office. |
| Box 16 | Deposit Account Replenishment Checks. |
| Box 17 | Invoices directed to the Office of Finance. |
| Box 171 | Vacancy Announcement Applications. |
| Box Assignment | All assignment documents except those filed with new applications. |
| Box EEO | Mail for the Office of Civil Rights. |
| Box OED | Mail for the Office of Enrollment and Discipline. |

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All information is available for use by the public free of charge.

In addition, each PTDL offers reference publications which outline and provide access to the patent and trademark classification systems, as well as other documents and publications which supplement the basic search tools. PTDLs provide technical staff assistance in using all materials. Facilities for making paper copies of patent and trademark information are generally provided for a fee.

Since there are variations in the scope of patent and trademark collections among the PTDLs, and their hours of service to the public vary, anyone contemplating use of these collections at a particular library is urged to contact that library in advance about its collections, services, and hours in order to avert possible inconvenience.

| *State* | *Name of Library* | *Telephone Contact* |
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| Alabama | Auburn University Libraries | (205) 844-1747 |
| | Birmingham Public Library | (205) 226-3620 |
| Alaska | Anchorage: Z.J. Loussac Public Library | (907) 562-7323 |
| Arizona | Tempe: Noble Library, Arizona State University | (602) 965-7010 |
| Arkansas | Little Rock: Arkansas State Library | (501) 682-2053 |
| California | Los Angeles Public Library | (213) 228-7220 |
| | Sacramento: California State Library | (916) 654-0069 |
| | San Diego Public Library | (619) 236-5813 |
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| PATENT EXAMINING GROUPS | Phone number Area Code 703 | New Case Date* |
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| **CHEMICAL EXAMINING GROUPS** | | |
| GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, ENGINEERING AND DESIGNS, GROUP 1100—JOHN E. KITTLE, Director | 308-0661 | 08/04/94 |
| ORGANIC CHEMISTRY, DRUG, BIO-AFFECTING AND BODY TREATING COMPOSITION, GROUP 1200—RICHARD V. FISHER, Director | 308-1235 | 07/05/94 |
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| COMPUTER SYSTEMS AND COMPUTER APPLICATION, GROUP 2300—BOBBY R. GRAY, Director | 305-9600 | 08/05/93 |
| SPECIAL COMPUTER APPLICATIONS: COMPUTER GRAPHICS, BUSINESS PRACTICES, & DIAGNOSTIC TESTING, GROUP 2400—GERALD GOLDBERG, Director | 305-3800 | 04/07/94 |
| ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500—JANICE A. HOWELL, Director | 308-0956 | 08/16/94 |
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| MEDICAL INSTRUMENTS, DIAGNOSTIC EQUIPMENT AND TREATMENT DEVICES; SURGERY AND SURGICAL SUPPLIES; AMUSEMENT AND EXERCISING DEVICES; ANIMAL HUSBANDRY; SPORTING GOODS; TOBACCO PRODUCTS AND MANUFACTURING EQUIPMENT; AND PRINTING, GROUP 3300—J.J. LOVE, Director | 308-0858 | 12/19/94 |
| SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400—DONALD G. KELLY, Director | 308-0861 | 11/17/94 |
| GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500—A.L. SMITH, Director | 308-1021 | 08/02/94 |

*A communication from the examiner should have been received in most applications filed prior to this date.

**Patents will Expire as Follows:**
(1) The term of any utility or plant patent that is in force on or results from an application filed before June 8, 1995 is the greater of the 20 year term provided in 35 U.S.C. 154(a)(2) or 17 years from grant subject to any terminal disclaimers. 35 U.S.C. 154(c)(1).
(2) All utility and plant patents granted on applications having an actual United States filing date on or after June 8, 1995 are granted for a term which begins on the date on which the patent is granted and ends 20 years from the date on which the application was filed in the United States. If the application contains a specific reference to an earlier application under 35 U.S.C. 120, 121 or 365(c), the patent term ends twenty years from that date on which the earliest application was filed. 35 U.S.C. 154(a)(2).
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## TRADEMARK OPERATION

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Philip G. Hampton, II, Assistant Commissioner
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Condition of Trademark Applications as of February 1, 1996

| Law Office | Oldest Date New* | Oldest Date Amendment Filed |
|---|---|---|
| Law Office 101—Ron Sussman, Acting Managing Attorney, (703) 308–9101—4th Floor<br>Foods, Beverages, Wines & Spirits—Int. Classes 29, 30, 31, 32, 33<br>Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 06/28/95 | 11/03/95 |
| Law Office 102—Myra Kurzbard, Managing Attorney, (703) 308–9102—5th Floor<br>Scientific Equipment & Furniture—Int. Classes 9, 20<br>Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 08/11/95 | 10/03/95 |
| Law Office 103—Kathryn Brekus, Managing Attorney, (703) 308–9103—5th Floor<br>Scientific Equipment & Furniture—Int. Classes 9, 20<br>Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 07/25/95 | 01/04/96 |
| Law Office 104—Sidney Moskowitz, Managing Attorney, (703) 308–9104—6th Floor<br>Unwrought metals, Industrial Equipment, Tools, Installation, Vehicles, Firearms, Musical Instruments, Building Materials & Floor Coverings—Int. Classes 6, 7, 8, 11, 12, 13, 15, 19, 27 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 07/10/95 | 11/20/95 |
| Law Office 105—Thomas Howell, Managing Attorney, (703) 308–9105—6th Floor<br>Chemicals, Paints, Lubricants, Pharmaceuticals, Medical Apparatus & Tobacco—Int. Classes 1, 2, 4, 5, 10, 34 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 08/17/95 | 08/31/95 |
| Law Office 106—Mary Sparrow, Managing Attorney, (703) 308–9106—7th Floor<br>Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 08/11/95 | 07/25/95 |
| Law Office 107—Thomas Lamone, Managing Attorney, (703) 308–9107—7th Floor<br>Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 08/11/95 | 10/18/95 |
| Law Office 108—David Shallant, Managing Attorney, (703) 308–9108—8th Floor<br>Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26<br>Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 08/18/95 | 10/25/95 |
| Law Office 109—Deborah Cohn, Managing Attorney, (703) 308–9109—8th Floor<br>Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26<br>Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42 | 09/18/95 | 11/15/95 |
| **Collective Marks—Class 200<br>**Certification Marks—Classes A & B | | |
| Office of Trademark Services—John Walker, Director, (703) 308-9100<br>Trademark Assistance Center—(703) 308-9000<br>Pre-Examination—Alan Lambert, Supervisor, (703) 308-9401 ext. 188<br>Intent-To-Use—(ITU)—(703) 308-9500<br>Post Registration Section—Mary Bowman, Supervisor, (703) 308-9500 ext. 126<br>Affidavits Under Sections 8 & 15 (All Classes)<br>Renewals (All Classes)<br>Section 12(c) Publications (All Classes) | 06/05/95<br>10/20/95<br>08/14/95 | —0—<br>—0—<br>—0— |

1. ** Assigned to all Law Office

2. Applicants with inquiries concerning the status of their applications and a touch telephone should call (703) 305–8747 from 6:30 a.m. to Midnight EST, Monday through Friday. This automated voice system will provide the current status of your application. Applicants are urged not to file unnecessary inquiries concerning the status of their applications. See SECTION 411 of the TRADEMARK MANUAL OF EXAMINING PROCEDURE.

3. * These dates identify the oldest unassigned new case in each Law Office. All cases with earlier dates have either been examined and made the subject of an action or are currently being worked on by the assigned examining attorney.

# REEXAMINATIONS

## MARCH 26, 1996

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

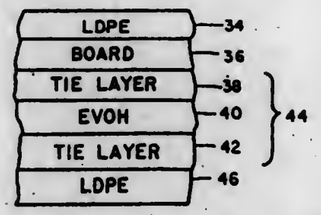
### B1 Re. 33,376 (2821st)
### NON-FOIL COMPOSITE STRUCTURES FOR PACKAGING JUICE

**Charles E. Gibbons; Cynthia L. Tanner, and Allan A. Whillock, all of Mobile, Ala., assignors to International Paper Company, New York, N.Y.**

**Reexamination Request No. 90/003,408, Apr. 15, 1994.**
**Reexamination Certificate for Reissue Patent Re. 33,376, issued Oct. 9, 1990, Ser. No. 434,636, Nov. 13, 1989.**
**Original No. 4,789,575, dated Dec. 6, 1988, Ser. No. 55,629, May 29, 1987. Continuation of Ser. No. 373,964, Jun. 27, 1989, abandoned.**

**Int. Cl.[6] B65D *85/00***

**U.S. Cl. 428—34.2**




AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–42 is confirmed.

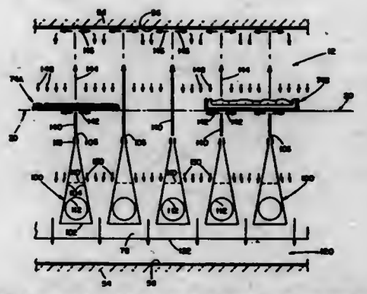
1. A container for liquids containing essential oils and flavors, said container having an interior and an exterior, said container constructed from a laminate comprising:

(a) a paperboard substrate with inner and outer surfaces, said inner surface being closer to the interior of the container than said outer surface;

(b) a 12 lb. outer layer of a heat-sealable low density polyethylene polymer exterior to to said outer surface of said paperboard substrate;

(c) a coextruded sandwich layer comprising a 4.5 lb. tie layer, a 4.0 lb. heat-sealable ethylene vinyl alcohol copolymer layer and a 4.5 lb. tie layer interior to said inner surface of said paperboard substrate; and

(d) a product-contact layer of a 10 lb. heat-sealable low density polyethylene polymer interior to said outer surface of said inner sandwich layer of tie layer—ethylene vinyl alcohol copolymer—tie layer whereby said laminate can be heat-sealed on conventional equipment at temperatures ranging from 250° F.–500° F.



Claims 2–6, dependent on an amended claim, are determined to be patentable.

1. A process for cooking food substances such as pizza products comprising the steps of:

positioning a food product to be cooked on a predominately open support surface in a thermally insulated treatment zone,

cooking the food product by flowing an array of spaced streams of heated air upwardly with substantial velocity towards said support surface for heat exchange interaction with the bottom surface of the food product on said support surface with a portion of the upwardly flowing streams bypassing said food product, and redirecting the bypassed portion of said upwardly flowing streams against a planar deflection surface that is spaced above and extends parallel to said support surface for downward countercurrent flow [an] *and* impingment on the top surface of the food product on said support surface at a velocity greater than one percent and substantially less than the upward flow velocity of said spaced streams, and

exhausting the heated air from said treatment zone at a point below said support surface.

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### B1 4,471,000 (2822nd)
### METHOD OF COOKING FOODS

**Ernest C. Brown, Danvers, and Walter E. Buske, Amesbury, both of Mass., assignors to Kansallis-Osake-Pankki, New York, N.Y.**

**Reexamination Request No. 90/003,721, Feb. 13, 1995.**
**Reexamination Certificate for Patent 4,471,000, issued Sep. 11, 1984, Ser. No. 407,736, Aug. 13, 1982.**
**Division of Ser. No. 266,199, May 22, 1981, Pat. No. 4,377,109.**

**Int. Cl.[6] A23L *1/01*; A21D *8/06***

**U.S. Cl. 426—523**

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim 10 is confirmed.

Claims 1, 7, 8 and 9 are determined to be patentable as amended.

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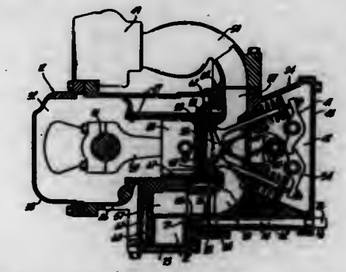
### B1 4,621,595 (2823rd)
### WATER-COOLED FOUR-CYCLE INTERNAL COMBUSTION ENGINE FOR OUTBOARD MOTORS

**Tomonori Suzuki, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan**

**Reexamination Request No. 90/002,383, Jun. 3, 1991.**
**Reexamination Certificate for Patent 4,621,595, issued Nov. 11, 1986, Ser. No. 643,647, Aug. 23, 1984.**
**Claims priority, application Japan, Aug. 25, 1983, 58-154174**

**Int. Cl.[6] F01P *3/12***

**U.S. Cl. 123—41.72**



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–4 and 6–9 are cancelled.

Claims 5, 10 and 11 are determined to be patentable as amended.

Claim 12, dependent on an amended claim, is determined to be patentable.

5. In a water cooled internal combustion engine [as set forth in claim 4 wherein] *having a cylinder block, a cylinder head affixed to said cylinder block and forming a combustion chamber therewith, said cylinder head having a surface engaged with a corresponding surface of said cylinder block, a cooling jacket formed in said cylinder head and said cylinder block, an exhaust passage formed integrally in said cylinder head and said cylinder block and extending through said cylinder head from said combustion chamber through said cylinder head surface and said cylinder block for discharge of exhaust gases from said engine, said cooling jacket being positioned at least in part adjacent and in direct heat exchanging relation with portions of said exhaust passage extending through both said cylinder head and said cylinder block on one side of said exhaust passage and extending through said cylinder head surface, the improvement comprising an additional cooling jacket in proximity at least in part to the port of said exhaust passage formed in said cylinder head and in direct heat exchanging relation therewith on the other said of said exhaust passage and supplied with coolant from the cooling jacket,* wherein the additional cooling jacket discharges coolant independently of the discharge of the coolant from the cooling jacket.

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**B1 5,096,933 (2824th)**

**PROCESS FOR THE PREPARATION OF POLYURETHANE RIGID FOAMS HAVING A LOW THERMAL CONDUCTIVITY AND THEIR USE**

**Otto Volkert, Weisenheim, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Germany**

**Reexamination Request No. 90/003,558, Aug. 30, 1994.**
**Reexamination Certificate for Patent 5,096,933, issued Mar. 17, 1992, Ser. No. 577,174, Sep. 4, 1990.**
**Claims priority, application Germany, Jan. 6, 1989, 3933335**
**Int. Cl.[6] C08K *5/00*; C11D *7/30*; C08G *18/14***
**U.S. Cl. 521—131**

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 3, 12, 19 and 26 are cancelled.

Claims 1, 4, 8 and 32 are determined to be patentable as amended.

Claims 2, 5–7, 9–11, 13–18, 20–25 and 27–31, dependent on an amended claim, are determined to be patentable.

New claims 33–58 are added and determined to be patentable.

1. A process for the preparation of polyurethane rigid foams [having a low thermal conductivity], comprising reacting:

a) organic and/or modified organic polyisocyanates with:

b) at least one higher molecular weight compound having at least two reactive hydrogen atoms, and optionally;

c) lower molecular weight, chain extending agents, and/or crosslinking agents;

in the presence of:

d) blowing agents;

e) catalysts and optionally;

f) auxiliaries and/or additives;

*to produce a closed-cell rigid polyurethane foam having a thermal conductivity of 0.024 W/m*K. or less,* wherein;

d1) cyclopentane; or

d2) mixtures comprising:

d2i) cyclopentane, cyclohexane, or a mixture of these cycloalkanes; and,

d2ii) low boiling point compounds, homogeneously miscible with cyclopentane and/or cyclohexane

are used in conjunction with water as said blowing agent (d).

# REISSUES

## MARCH 26, 1996

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

**Re. 35,187**

**FLUID DISPENSING APPARATUS WITH PRESTRESSED BLADDER**

**Norman Gortz, 111 Granville Dr., Newport Beach, Calif. 92660**

**Original No. 4,953,753, dated Sep. 4, 1990, Ser. No. 285,158, Jun. 10, 1988. Application for reissue Sep. 4, 1992, Ser. No. 940,625**
**Int. Cl.[6] B65D *35/56***
**U.S. Cl. 222—105** **36 Claims**



*19. A fluid dispenser having an inlet end and an outlet end with a flow restrictor and flow tube associated with the outlet end, comprising*

*a container body,*

*a mandrel comprising a first end comprising a fill end,*

*a second end comprising an exit end, the exit end providing an exit connection,*

*an elongated middle portion between the first and second end portions, the middle portion comprising at least three fins joined longitudinally along a common inner edge, the fins extending radially outward from the common inner edge and being angularaly spaced from each other forming substantilly equal flow passages therebetween,*

*the first and second ends being in fluid communication with the passages between the fins and the first and second ends having outer sealing surfaces,*

*a fill valve mechanism connected with the fill end of a mandrel,*

*a resilient bladder of generally tubular shape having a first open end providing a fill opening therethrough, and the bladder having a second open end configured to allow the bladder to be slid over the mandrel with the first end of the bladder disposed about the sealing surface of the first end of the mandrel and the second end of the bladder being disposed about the sealing surface of the second end of the mandrel, and the bladder having dimension of at least one of its length and diameter less than that of the mandrel to cause the mandrel to exert at least one of axial and longitudinal stresses on the bladder when the bladder is in an empty condition,*

*means for securing the first and second ends of the bladder to the respective sealing surface of the first and second ends of the mandrel, and*

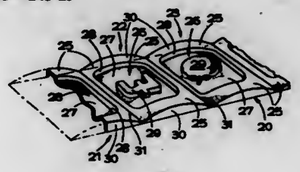
*means attached to the second end of the mandrel for enabling fluid to be dispensed from the fluid dispenser.*

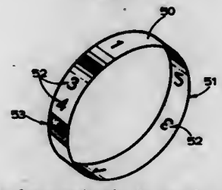
**Re. 35,188**

**GAMING AND AMUSEMENT MACHINES AND REELS FOR THEM**

**Terence Howard, Nottingham, England, assignor to Bell-Fruit Manufacturing Company Limited, Nottingham, England**

**Original No. 5,228,693, dated Jul. 20, 1993, Ser. No. 833,855, Feb. 11, 1992. Application for reissue Oct. 25, 1994, Ser. No. 328,900**
**Claims priority, application United Kingdom, Aug. 10, 1990, 8918448**
**Int. Cl.[6] G07F *17/34***
**U.S. Cl. 273—143 R** **12 Claims**





12. A two layer reel strip for use in a reel or a gaming or amusement machine comprising a first reel strip and a second reel strip, said second reel strip being positioned above said first reel strip, said first and said second reel strip being provided with indicia or symbols, wherein said first reel strip and said second reel strip are fixed relative to one another wherein the symbols on said first reel strip and the symbols on said second reel strip remain in a fixed superimposed position relative to one another at all times.

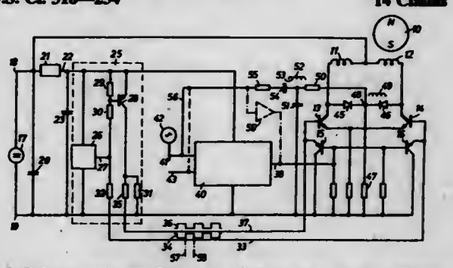
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**Re. 35,189**

**DRIVE ARRANGEMENT WITH COLLECTORLESS D.C. MOTOR**

**Rolf Müeller, Munich, Germany, assignor to Papst Licensing GmbH, Spaichingen, Germany**

**Original No. 4,620,138, dated Oct. 28, 1986, Ser. No. 714,220, Mar. 21, 1985. Continuation of Ser. No. 265,211, Oct. 28, 1988, abandoned. Application for reissue Apr. 20, 1993, Ser. No. 49,591**
**Int. Cl.[6] H02P *6/02***
**U.S. Cl. 318—254** **14 Claims**



*8. Drive arrangement having a collectorless d.c. motor comprising*

*a permanent-magnet rotor and*

*a stator winding arrangement;*

*an angular-position transducer arrangement which during operation furnishes angular-position signals that are a function of the angular position of the rotor,*

*an electrical commutation arrangement which receives the angular-position signals and selectively connects the stator winding arrangement to a current source;*

*a motor-operation sensing arrangement for generating an actual-value signal having a value corresponding to a predetermined aspect of rotor rotation;*

*a desired-value signal generator for furnishing a desired-value signal corresponding to the desired value of said predetermined aspect of rotor rotation;*

*an rpm-regulating arrangement having input means for receipt of signals from which information can be derived concerning the deviation of said desired value from said actual value and having output means, and operative for generating a regulator signal which appears at said output means and which is a function of said deviation, and which controls the supply of current to the stator winding arrangement in a manner maintaining the rpm of said rotor at a predetermined value; and*

*an arrangement for modulating the regulator signal by superimposing a modulating signal separate from the actual-value signal and the desired-value signal and in synchronism with the rotor's rotation, in such a fashion that the current flowing in the stator winding arrangement between each two successive commutation operations initially builds up beginning at a point in time at least approximately coinciding with the point in time at which the commutation occurs, and then drops off again until a point in time at least approximately coinciding with the point in time at which the next-following commutation occurs.*

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**Re. 35,190**

**PLUG-IN POWER SUPPLY**

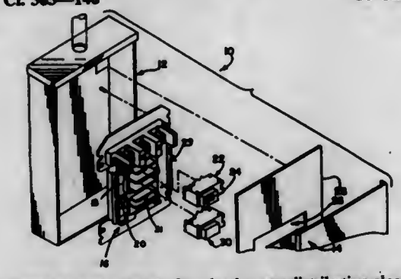
**Henry J. Zylstra, Alburnett, Iowa, and Kenneth W. Erickson, Bensalem, Pa., assignors to Square D Company, Palatine, Ill.**

**Original No. 4,901,219, dated Feb. 13, 1990, Ser. No. 136,587, Dec. 22, 1987. Application for reissue Feb. 13, 1992, Ser. No. 835,756**

**The portion of the term of this patent subsequent to May 13, 2005, has been disclaimed.**

**Int. Cl.[6] H02M *1/00***

**U.S. Cl. 363—146** **38 Claims**



**1.** A plug-in power supply for a load center distributing electrical power from line terminals to load terminals of at least one branch circuit, said load center having a mounting panel having line and load terminals accessible through said panel and grouped at regularly spaced intervals normally for accepting circuit breakers, and having an A.C. power source in communication with said line terminals, said power supply comprising a housing dimensioned to be inserted into an interval normally occupied by a circuit breaker, said housing having input terminals [adapted to engage] *for engaging* said line terminals through said mounted panel to receive said A.C. power, and circuit means within said housing providing a regulated source of D.C. electrical power to output terminals from said A.C. power.

**Re. 35,191**

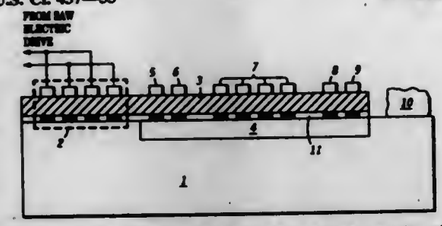
**METHOD [AND APPARATUS]FOR REDUCING HETEROSTRUCTURE ACOUSTIC CHARGE TRANSPORT DEVICE SAW DRIVE POWER REQUIREMENTS**

**Fred S. Hickernell, Phoenix; Frederick Y. Cho, Scottsdale, and Frederick M. Fliegel, Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.**

**Original No. 5,047,363, dated Sep. 10, 1991, Ser. No. 618,207, Nov. 26, 1990. Division of Ser. No. 577,180, Sep. 4, 1990. Application for reissue Oct. 26, 1992, Ser. No. 966,650**

**Int. Cl.[6] H01L *21/70***

**U.S. Cl. 437—53** **13 Claims**




**1.** A method for increasing the charge carrying capacity of a heterostructure acoustic charge transport device, comprising the steps of:

providing a semiconductor substrate having a surface;

fabricating an interdigital metallic surface acoustic wave transducer along said surface of said semiconductor substrate;

providing a channel including epitaxial layers of semiconductor material along said surface of said semiconductor substrate; *and*

depositing a [thin-film] layer of piezoelectric material along said channel of said semiconductor substrate [said thin-layer of dielectric material being more strongly dielectric than said semiconductor substrate;

providing electric charge to said channel of said substrate; and

transporting said electric charge through said channel.], *wherein said layer of piezoelectric material is more strongly piezoelectric than said semiconductor substrate.*

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**Re. 35,192**

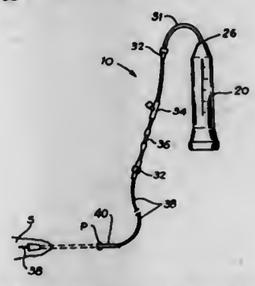
**POST-SURGICAL ANESTHESIA AT A CONTINUOUS AND PROGRESSIVELY DECREASING ADMINISTRATION RATE**

**H. William Reese, Tempe, Ariz., assignor to Phoenix Surgical Products, Inc., Peoria, Ariz.**

**Original No. 5,078,679, dated Jan. 7, 1992, Ser. No. 611,976, Nov. 13, 1990. Continuation of Ser. No. 78,632, Jun. 21, 1993, abandoned. Application for reissue Oct. 6, 1994, Ser. No. 319,148**

**Int. Cl.[6] A61M *31/00***

**U.S. Cl. 604—51** **16 Claims**




*8. A method for the direct, low-flow-rate dispensation of post-surgical analgesia nonsystematically, at a progressively decreasing*



*administration rate, into a cavity of a surgical site in a patient for the localized relief of pain in that site only, comprising the following steps:*

*(a) providing a spring-loaded syringe for dispensing analgesic medication, said syringe having sufficient capacity to hold a predetermined amount of analgesic medication as required for an administration of post-surgical analgesia and being adapted for administration at a progressively decreasing rate;*

*(b) providing a delivery means connected to said syringe for delivering the analgesic medication directly into the surgical site; and*

*(c) controlling the flow of analgesic medication into the cavity of the surgical site from said syringe and through said* delivery means at a progressively decreasing rate not to exceed 25 ml per 24-hour period for a required treatment period.

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# PLANT PATENTS

## GRANTED MARCH 26, 1996

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

9,482

### MINIATURE ROSE PLANT NAMED 'POULPRIMA'

Mogens N. Olesen, and Pernille Olesen, both of Fredensborg, Denmark, assignors to Bear Creek Gardens, Inc., Medford, Oreg.

Filed Mar. 24, 1995, Ser. No. 409,754
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—10 1 Claim

1. A new and distinct variety of rose plant of the miniature class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its long shelf life as a pot rose; its compact habit; its clustering ability; its ease of propagation by softwood cuttings; and its slightly larger flowers and leaves than POULvic.

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9,483

### MINIATURE ROSE PLANT NAMED 'POULHAPPY'

Mogens N. Olesen, and Pernille Olesen, both of Fredensborg, Denmark, assignors to Bear Creek Gardens, Inc., Medford, Oreg.

Filed Mar. 24, 1995, Ser. No. 410,359
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—10 1 Claim

1. A new and distinct variety of rose plant of the miniature class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its long shelf life as a flowering pot plant, its uniform, compact, well-branched habit of growth, its attractive red flowers and its clustering flower habit.

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9,484

### ILEX HYBRID VARIETY NAMED 'CONED'

Jack M. Magee, Hwy. 26 W. Rte. 1 Box 297, Poplarville, Miss. 39470, assignor to Jack Mitchell Magee, Poplarville, Miss., and Flowerwood Nsy Inc., Mobile, Ala.

Filed Mar. 6, 1995, Ser. No. 400,031
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—65 1 Claim

1. A new and unique variety of Ilex plant named Ilex Hybrid 'Coned' as herein shown and described, is characterized by its upright, dense, and globose growth habit, unique juvenile foliage coloration, lustrous mature leaves, distinctly arranged leaf serrations, orange-red fruit, fast growth rate, resistance to pests, and tolerance of heat, drought, and soil type.

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9,485

### ILEX HYBRID VARIETY NAMED 'CONAL'

Jack M. Magee, Hwy 26 Rt 1 Box 297, Poplarville, Miss. 39470, assignor to Jack Mitchell Magee, Poplarville, Miss., and Flowerwood Wsy Inc., Mobile, Ala.

Filed Mar. 10, 1995, Ser. No. 402,350
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—65 1 Claim

1. A new and unique variety of Ilex plant named Ilex Hybrid 'Conal' as herein shown and described, is characterized by its dense, upright, and pyramidal growth habit, unique juvenile foliage coloration, semi-glossy mature leaves, distinctly arranged leaf serrations, red fruit, fast growth rate, resistance to pests, and tolerance of heat, drought, and soil type.

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9,486

### ILEX HYBRID VARIETY NAMED 'CONIN'

Jack M. Magee, Poplarville, Miss., assignor to Jack Mitchell Magee, Poplarville, Miss., and Flowerwood Nay Inc., Mobile, Ala.

Filed Mar. 14, 1995, Ser. No. 404,105
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—65 1 Claim

1. A new and unique variety of Ilex plant named Ilex Hybrid 'Conin' as herein shown and described, is characterized by its dense, upright, and pyramidal growth habit, unique juvenile foliage coloration, semi-glossy mature leaves, distinctly arranged leaf serrations, orange-red fruit, fast growth rate, resistance to pest, and tolerance of heat, drought, and soil type.

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9,487

### ILEX HYBRID VARIETY NAMED 'CONAF'

Jack M. Magee, Poplarville, Miss., assignor to Jack Mitchell Magee, Poplarville, Miss., and Flowerwood Nay Inc., Mobile, Ala.

Filed Mar. 22, 1995, Ser. No. 408,541
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—65 1 Claim

1. A new and unique variety of Ilex plant named Ilex Hybrid 'Conaf' as herein shown and described, is characterized by its upright and pyramidal growth habit, perfect flowers which produce an abundance of pollen, dull mature leaves, distinctly arranged leaf serrations, orange-red fruit, fast growth rate, resistance to pests, and tolerance of heat, drought, and soil type.

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9,488

### GERANIUM PLANT NAMED LORCA

Gerd Endisch, Geranienweg, D-76767, Hagenbach; Ursula Endisch-Burmeister, Bad Kreuznach, both of, Germany, and Wolf Endisch, Tenerifla, Spain, assignors to Gerd Endisch, Hagenbach, Germany

Filed Feb. 6, 1995, Ser. No. 384,008
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—87.12 1 Claim

1. A new and distinct cultivar of geranium plant known as 'Lorca', as described and illustrated and particularly characterized by a pink with red/purple flower color, a semi-double flower form, medium green foliage, medium height, large umbels and early flower response.

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9,489

### GERANIUM PLANT NAMED FARO

Gerd Endisch, Geranienweg, D-76767 Hagenbach; Ursula Endisch-Burmeister, Bad Kreuznach, both of, Germany, and Wolf Endisch, Valle Guerra/Tenerifla, Spain, assignors to Gerd Endisch, Hagenbach, Germany

Filed Feb. 6, 1995, Ser. No. 384,010
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—87.12 1 Claim

1. A new and distinct cultivar of Geranium plant known as 'Faro', as described and illustrated and particularly characterized

by a signal red flower color, a semi-double flower forum, dark foliage, medium height, large umbel, long pedicel, medium flower response and good heat and rain resistance.

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9,490

GERANIUM PLANT NAMED 'ARENO'

Gerd Endisch, Geraniumweg, D-76767 Hagenbach; Ursula Endisch-Burmeister, Bad Kreuznach, both of, Germany, and Wolf Endisch, Valle Guerra/Tenerife, Spain, assignors to Gerd Endisch, Hagenbach, Germany

Filed Feb. 6, 1995, Ser. No. 384,160
Int. Cl.[6] A01H 5/00
U.S. Cl. Plt.—87.12 1 Claim

1. A new and distinct cultivar of geranium plant known as 'Areno', as described and illustrated and particularly characterized by a pink flower color, a dark red eye on all pedals, dark foliage without zonation, a compact habit, early flower response and heat tolerance.

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9,491

FICUS PLANT NAMED INDIGO

J. van Geest, JP's Gravenzande, Netherlands, assignor to The Plantenkwekerij P. Van Geest B.V., Netherlands

Filed Jan. 31, 1995, Ser. No. 382,363
Int. Cl.[6] A01H 5/00
U.S. Cl. Plt.—88.9 1 Claim

1. A new and distinct cultivar of *Ficus benjamina* named 'Indigo', substantially as illustrated and described.

# PATENTS

## GRANTED MAR. 26, 1996

### ERRATA

| For CLASS | See PATENT NO. |
|---|---|
| 602–019 | 5,500,959 |
| 062–323 | 5,501,088 |
| 600–121 | 5,501,211 |
| 164–113 | 5,501,266 |
| 169–054 | 5,501,284 |
| 188–024 | 5,501,298 |
| 222–521 | 5,501,377 |
| 242–596 | 5,501,415 |
| 267–226 | 5,501,438 |
| 374–126 | 5,501,637 |
| 474–268 | 5,501,643 |
| 601–061 | 5,501,682 |
| 424–489 | 5,501,863 |
| 029–830 | 5,502,023 |
| 521–064 | 5,502,092 |
| 521–064 | 5,502,092 |
| 524–537 | 5,502,134 |
| 528–393 | 5,502,137 |
| 428–359 | 5,502,160 |
| 204–454 | 5,502,169 |
| 174–113 | 5,502,288 |
| 174–266 | 5,502,289 |
| 310–040 | 5,502,359 |
| 318–281 | 5,502,367 |
| 315–291 | 5,502,423 |
| 337–176 | 5,502,427 |
| 356–356 | 5,502,466 |
| 358–296 | 5,502,490 |

## ERRATA–CONTINUED

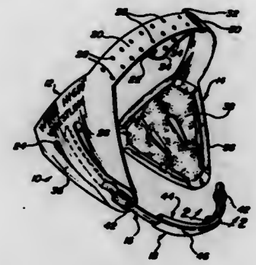
| For CLASS | See PATENT NO. |
|---|---|
| 358–447 | 5,502,495 |
| 361–760 | 5,502.631 |
| 395–182 | 5,502,728 |

# PATENTS

GRANTED MARCH 26, 1996

## GENERAL AND MECHANICAL

**5,500,951**
**SHOCK ABSORBING STRAP COVER**
**John L. Marchello, Ann Arbor, Mich., assignor to Danmar Products, Inc., Ann Arbor, Mich.**
**Filed Mar. 14, 1994, Ser. No. 209,401**
**Int. Cl.[6] A41D *13/00*; A42B *3/08***
**U.S. Cl. 2—2** **7 Claims**





**1.** A shock absorbing cover for a chin strap for placement under the chin of a,wearer, said strap cover comprising:

a cushioned pad and mounting means for mounting said pad to a chin strap, said pad including a surface defining a contact face on one side of said pad and facing away from the strap when said strap cover is mounted thereto for engagement with the skin of the wearer, said pad also including a surface defining a non-contact face on the opposing side of said pad facing toward the strap when said strap cover is mounted thereto, said pad further including a plurality of individually resilient cylindrical elements located in side-by-side joined relation to one another and cooperating to define said contact face and said non-contact face, said resilient elements being hollow and capable of individually compressing in a direction between said contact face and said non-contact face in response to a load applied through the strap, said resilient elements being resiliently biased to resist the load and thereby cushion the load applied through the strap, said resilient cylindrical elements having a longitudinal direction extending parallel to the chin strap and extending the length of said pad, the cylindrical shape of said resilient elements forming ventilation channels extending the length of the cover in said contact face enabling air and perspiration to be drawn therethrough and away from the skin of the wearer of said strap cover.

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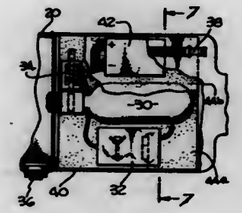
**5,500,952**
**HIP INFLATABLE PROTECTION DEVICE**
**Marshall J. Keyes, 3920 Kingswood Rd., Sherman Oaks, Calif. 91403**
**Filed Oct. 28, 1994, Ser. No. 331,085**
**Int. Cl.[6] A41D *13/00***
**U.S. Cl. 2—2** **15 Claims**

**10.** A protective system for preventing injuries to at least one of the hips, pelvis, buttocks and coccyx of a user, the system comprising:

an elongate inflatable airbag assembly;

a belt for supporting said airbag assembly around the waist of a user, said belt having a cavity associated therewith and said airbag assembly being housed substantially within said cavity when uninflated;



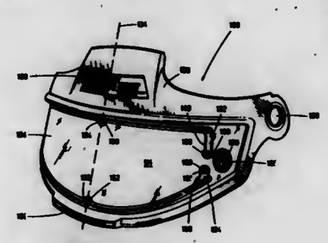


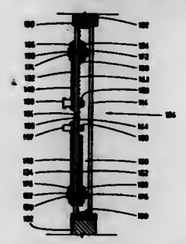
sensing means for sensing acceleration and angular movement and for producing a signal indicative of a predetermined combination of acceleration and angular movement, the predetermined combination corresponding to a fall; and

inflating means for inflating said airbag assembly to an expanded configuration in response to said signal.

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**5,500,953**
**DOUBLE LENS ELECTRIC SHIELD**
**Douglas A. Reuber, Lindsay, and Amsey Buehler, Cobourg, both of, Canada, assignors to 546401 Ontario Limited, Lindsay, Canada**
**Continuation-in-part of Ser. No. 25,873, Mar. 3, 1993, Pat. No. 5,351,339. This application Feb. 17, 1994, Ser. No. 198,137**
**Claims priority, application Canada, Feb. 3, 1993, 2090085**
**Int. Cl.[6] A42B *3/24***
**U.S. Cl. 2—9** **20 Claims**





**1.** For a helmet face shield, a face lens comprising:

a first layer having an inner surface and an outer surface;

a first electrode extending along a first margin of said outer surface of said first layer and a second electrode extending along a second margin of said outer surface of said first layer opposite said first electrode;

a first contact electrically connected to said first electrode and extending from said outer surface through said first layer to said inner surface of said first layer to a first conductor, said first conductor extending from an end along a first margin of said inner surface of said first layer and generally along said first electrode, toward an end of said first electrode;

a second contact electrically connected to said second electrode and extending from said outer surface through said first layer to said inner surface of said first layer to a second conductor, said second conductor extending from an end along a second margin of said inner surface of said first layer opposite said first conductor and generally along said second electrode toward an end of said second electrode;

a transparent electrical conductive film extending between said first and second electrodes on said outer surface of said first layer;

means for connecting a terminal connector to said first conductor at a first connection point and to said second conductor at a second connection point, said first and second connection points located proximate one another, said terminal connector for connection to a source of electrical power; and

said film having sufficient electrical resistance to create heat effective to inhibit formation of fog, ice or frost over said first layer between said electrodes when a terminal connector is connected to said first and second conductors and to a source of electricity.

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**5,500,954**

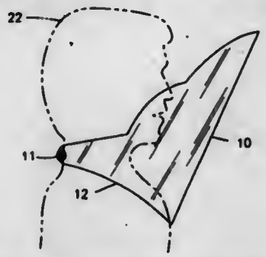
## SAFETY SHIELD SYSTEM

**Jack V. Smith, St. Petersburg, and Jesse M. Carter, Tampa, both of Fla., assignors to J. Prime Industries, Inc., St. Petersburg, Fla.**

**Continuation of Ser. No. 970,037, Nov. 2, 1992, abandoned. This application Apr. 29, 1994, Ser. No. 236,656**

**Int. Cl.[6] A41D *13/00*; A61F *9/04***

**U.S. Cl. 2—9** **1 Claim**




1. A one piece portable safety shield free from attachment to a wearer's head, configured to protect the wearer's upper thorax region and full face from biological or chemical liquids or aerosols and physical projectiles, the safety shield comprising

a continuous thin flexible transparent curved body having bottom, top and opposed side edges,

the bottom edge conforming in shape to an upper thorax and a shoulder region of the wearer and resting on the wearer's upper thorax and shoulders,

the top edge extending beyond the top of the wearer's head,

the opposed side edges extending beyond ears of the wearer to a point distal from a front of the curved body, the side edges juxtaposed to each other behind a neck of the wearer, and opposed distal portions of the safety shield with respect to a front of the curved body connected together by an elastic member behind the neck of the wearer to hold the safety shield in position.

**5,500,955**

## KNEE PAD FOR ATHLETES

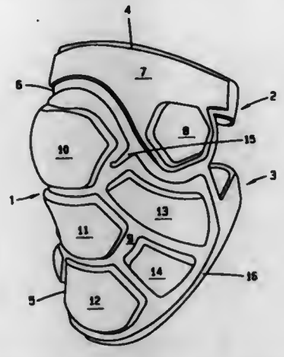
**Adrian-Marius Gongea, Köln, Germany, assignor to J.G. Karl Schmidt GmbH & Co., Solingen, Germany**

**Filed Mar. 8, 1994, Ser. No. 207,923**

**Claims priority, application Germany, Mar. 9, 1993, 93 03 436 U**

**Int. Cl.[6] A41D *13/06***

**U.S. Cl. 2—24** **18 Claims**




1. A knee pad for athletes, the knee pad comprising:

a cushion part which covers the front and side of the kneel and fastening means which surround parts of the thigh and of the lower leg in the region of the knee;

wherein the fastening means comprise two fastening strips which, at two different heights, adjoin the cushion part, the two fastening strips extending approximately parallel to each other;

the two fastening strips are closable in ring shape with the cushion part around the thigh and lower leg respectively;

the cushion part has three middle cushions lying one below the other and abutting each other with horizontal abutment lines, an upper one of said middle cushions protecting the knee cap, and a lower one of said middle cushions protecting the shinbone, and each of said middle cushions having essentially a hexagonal shape;

the cushion part further comprises two lateral cushions, a first of said lateral cushions lying above a second of said lateral cushions, said two lateral cushions adjoining said three middle cushions in a honeycomb arrangement; and

a first imaginary point located on said upper middle cushion and a second imaginary point located on said first lateral cushion and a third imaginary point located on said second lateral cushion are vertices of an imaginary triangle, said knee pad including means for preventing geometry of the triangle from changing significantly with respect to the knee cap and the shinbone upon a bending of the knee.

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**5,500,956**

## BASKETBALL GLOVE

**William V. Schulkin, 56 Iselin Terr., Larchmont, N.Y. 10538, and Mark C. Mirken, 235 E. 40th St., New York, N.Y. 10016**

**Filed Jul. 15, 1994, Ser. No. 275,545**

**Int. Cl.[6] A41D *19/00*; A63B *71/00***

**U.S. Cl. 2—161.1** **2 Claims**

1. An ultra lightweight glove for handling a basketball comprising

(a) a palm panel layer having lateral edges and a spandex top panel layer having lateral edges; said layers sewn together at lateral edges thereof to provide a glove body construction;

(b) said palm panel layer having an outer surface and an inner surface said the outer surface of said palm panel layer being





completely covered by a plurality of protruding rubberized friction elements permanently adhered thereto;

(c) said palm panel layer and said top panel layer being comprised of a spandex material having interstices and being stretchable and comfortable closesly in a skin-tight manner to the anatomy of a hand of a wearer of the glove, said protruding friction elements being bonded in said interstices each of said protruding elements having a shape of a hemisphere extending above said outer surface of said glove, said protruding elements being spaced in a geometric pattern of a plurality of protruding elements and a plurality of valleys between adjacent sets of said plurality of protruding elements, wherein a valley of said plurality of valleys lies between adjacent protruding elements of said plurality of protruding elements, each of said protruding elements having a size and shape substantially equivalent to each of a plurality of hemispherical shaped beaded elements upon an outer surface of the basketball, wherein selected hemispherical beaded elements of the basketball contact selected valleys of said plurality of valleys and selected sets of said plurality of adjacent protruding elements.

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**5,500,957**

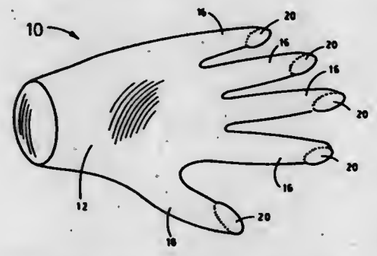
## SURGICAL GLOVE

**Daniel T. Stein, 2415 Buckeye St., Newport Beach, Calif. 92660**

**Continuation of Ser. No. 33,114,, Mar. 18, 1993, abandoned, which is a division of Ser. No. 823,261, Jan. 21, 1992, abandoned. This application Feb. 14, 1995, Ser. No. 388,910**

**Int. Cl.[6] A41D *19/04***

**U.S. Cl. 2—169** **3 Claims**




2. A method for forming an improved surgical glove from a liquid that yields a flexible material upon hardening, the method comprising the steps of:

providing a glove mold of five digits, the glove mold having a shallow liquid-retaining cavity formed on a volar side of a distal end of at least one digit of the mold;

dipping the mold into the liquid to coat the mold with a layer of the liquid;

filling the shallow cavity with the liquid;

removing the liquid coated mold from the liquid leaving a thicker coating of the liquid in regions over the shallow cavities;

hardening the liquid retained on the glove mold to form solid flexible material; and

removing the hardened flexible material from the mold forming a surgical glove having a reinforcing pad resulting from the greater thickness of liquid retained by the shallow cavity.

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**5,500,958**

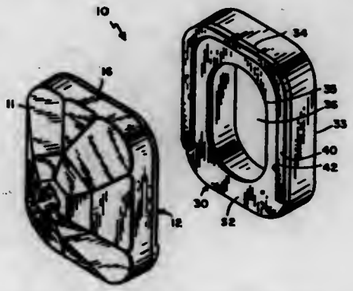
## SEAL PLATE ATTACHMENT FOR EARMUFFS

**Robert N. Falco, Indianapolis, Ind., assignor to Cabot Safety Corporation, Southbridge, Mass.**

**Filed Jan. 19, 1994, Ser. No. 183,559**

**Int. Cl.[6] A42B *1/06***

**U.S. Cl. 2—209** **22 Claims**




1. A seal plate attachment for earmuffs, comprising:

a first portion having a substantially flat surface, an outer perimeter and an inner perimeter defining a central opening,

said first portion including a first channel extending around a section of said outer perimeter; and

a second portion having a substantially flat surface, an outer perimeter and an inner perimeter defining a central opening,

said second portion including a rim projecting inwardly from and extending around a section of said outer perimeter,

said rim forming a second channel to oppose said first channel, such that said second portion is slidable relative to said first portion,

wherein a soft sealing element is attached to said second portion flat surface.

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**5,500,959**

## SUPPORT BELT WITH HIGH TENSION CINCHING SYSTEM

**Edward H. Yewer, Jr., 6259 N. Highway 83, Hartland, Wis. 53029**

**Filed Feb. 1, 1994, Ser. No. 189,858**

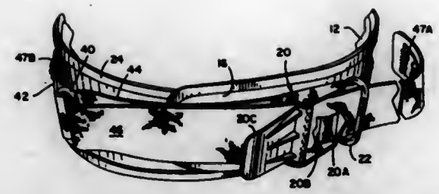
**Int. Cl.[6] A61F *5/00***

**U.S. Cl. 602—19** **13 Claims**

1. A support belt for cinching around a waist of a human user, comprising:

a strap for surrounding said waist, said strap having an interior surface facing said waist, an exterior surface facing away from said waist, a first end portion and a second end portion opposite from said first end portion, said second end portion having a free end;

a power ring secured to said first end portion, said power ring having an opening therein for receiving said free end therethrough and a bridging portion for contacting said free end on



said exterior surface of said strap around approximately 180° of said bridging portion; and

a second ring secured to said second end portion of said strap, said second ring having an opening therein for receiving said free end therethrough after said free end is inserted through said power ring and a bridging portion for contacting said free end on said interior surface of said strap around approximately 180° of said bridging portion; and

a fastener adapted to releasably secure said free end after said free end has been inserted through said second ring;

wherein said fastener is secured to said second end portion and is positioned between said power ring and said second ring when said belt is secured around said waist to secure said free end between said power ring and said second ring.

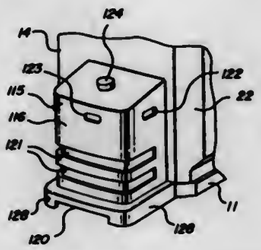
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**5,500,960**

**FLUSH SYSTEM FOR OUTDOOR PORTABLE TOILETS**

**Richard L. Tagg, Sandhutton, England, assignor to Poly-John Enterprises Corporation, Whiting, Ind.**

**Filed Jan. 30, 1995, Ser. No. 380,681**
**Int. Cl.[6] E03D *1/00***
**U.S. Cl. 4—318** **10 Claims**



1. A flush system for an outdoor portable toilet having a cabana formed of a base for supporting the cabana upon a ground-like surface and connected with side and rear walls and a front portion having a doorway with a door, and having a waste material holding tank arranged upon the base adjacent said walls, and with a toilet structure positioned on the tank and opening into the tank for depositing toilet waste therein, comprising;

an actuatable flushing mechanism for flowing flushing liquid through the toilet structure when actuated so that the liquid may move toilet waste from the toilet structure into the waste holding tank;

a separate, closed, fresh water tank positioned on the outside of the cabana, with the tank having a forward wall arranged in close proximity to a cabana wall, and with the tank having a bottom upon which supports are provided for supporting the tank upon the ground-like surface upon which the cabana is supported;

a fluid carrying pipe connected to the water tank and having a disconnectable coupling through which the pipe is connected to the flushing mechanism for providing flush liquid from the water tank to the flushing mechanism when said mechanism is actuated;

said water tank being refillable with fresh water, when desired, and having a water containing capacity which is less than the volume of the holding capacity of the waste material holding tank;

whereby the waste holding tank may be emptied and the water tank refilled at approximately the same time, so that transferring water from the water tank, through the flushing mechanism, into the holding tank will not overfill the holding tank.

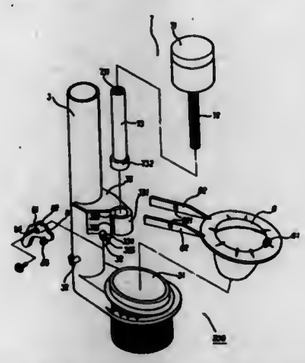
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**5,500,961**

**DOUBLE-TRIP HANDLE TYPE FLUSH CONTROL MECHANISM FOR BALLFLOAT TOILETS**

**Jin-Bo Tsai, No. 23, Lane 12, Chien Tung Street, Tainan City, Taiwan**

**Filed Feb. 28, 1995, Ser. No. 395,956**
**Int. Cl.[6] E03D *1/14***
**U.S. Cl. 4—325** **2 Claims**



1. A double-trip handle type flush control mechanism mountable in a water tank of a toilet and controlled to lift a tank ball of the water tank for letting water be drawn out of the water tank to flush the toilet, the water tank including an overflow tube, the mechanism comprising:

a barrel mountable in a trip handle mounting hole on the peripheral wall of the water tank of the ballfloat toilet, said barrel comprising a circular outside flange at one end positionable outside the water tank, an inside annular flange at an opposite end, a threaded portion around the periphery, a square block raised from said circular outside flange, a first locating block and a second locating block raised from said circular outside flange opposite to said square block and defining a first moving zone and a second moving zone;

a water sealing cushion mounted around said square block of said barrel and positionable between said circular outside flange of said barrel and the outside of said water tank;

a nut threaded onto said threaded portion of said barrel and engagable against the inside wall of the water tank to tightly fasten said barrel to said water tank;

a first trip handle mounted on said barrel for lifting said tank ball, said first trip handle comprising a cap-like circular shell at one end disposable outside the water tank and defining a curved slot, a tubular shaft inserted through said barrel, and a locating block raised from the circular shell of said first trip handle and inserted into said first moving zone, the tubular shaft of said first trip handle comprising a square coupling portion at the end remote from the circular shell of said first trip handle, an inside annular flange, an outside annular groove engaged with the inside annular flange of said barrel, and two retainer springs mounted on two opposite sides of the square coupling portion of said first trip handle;

a second trip handle mounted on said first trip handle for lifting said tank ball, said second trip handle comprising a cap-like circular shell at one end disposable outside the water tank, a stem inserted through said tubular shaft of said first trip handle, and a locating block disposed in parallel with said stem and inserted into said second moving zone, said stem comprising a square coupling portion at the end remote from the circular shell of said second trip handle, an outside annular groove engaged with the inside annular flange of the square coupling portion of said first trip handle, and two retainer springs raised from two opposite sides of the square coupling portion of said second trip handle;

a first link having one end mounted around the square coupling portion of said first trip handle and stopped in place by the retainer springs of said first trip handle and turned by said first trip handle, and an opposite end connectable to said tank ball for allowing said tank ball to be lifted by said first trip handle;

a second link having one end mounted around the square coupling portion of said second trip handle and stopped in place by the retainer springs of said second trip handle and turned by said second trip handle, and an opposite end connectable to said tank ball for allowing said tank ball to be lifted by said second trip handle;

a frame securely fixable to the overflow tube of the water tank, having a vertical axle housing and a side rod, said vertical axle housing having a longitudinal opening through a peripheral wall thereof and a step on the inside;

a float ball assembly mounted in said vertical axle housing above said tank ball, said float ball assembly comprising a locating tube inserted into said axle housing and having an inner thread around the inside wall, and a float ball having a bottom screw rod threaded into the inner thread of said locating tube; and

a swivel block pivoted about the side rod of said frame, having a weight and a hook at one end, and a raised portion at an opposite end, the hook of said swivel block being connected to said second link by a chain, the raised portion of said swivel block being positioned beneath said axle housing to stop said locating tube of said float ball assembly from falling downward when said tank ball is lifted from said valve seat by said first trip handle; and

wherein when said second trip handle is pressed down, the second link is driven to lift said tank ball and said swivel block, causing water to be drawn out of the water tank and said swivel block to move away from said float ball assembly for allowing said float ball assembly to fall and to force down said tank ball so that said tank ball is forced to close when a small volume of water is drawn away from the water tank.



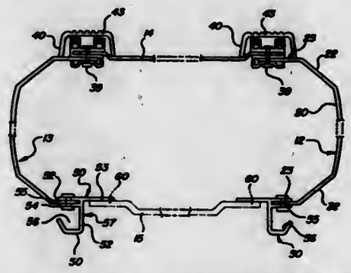
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**5,500,962**

**OUTDOOR TOILET CABANA**

**Richard L. Tagg, Sandhutton, England, assignor to Polyjohn Enterprises Corporation, Gasper, Ind.**

**Filed Jan. 30, 1995, Ser. No. 380,680**
**Int. Cl.[6] A47K *11/04***
**U.S. Cl. 4—476** **16 Claims**



1. An out-door toilet cabana comprising a pair of spaced apart, substantially vertical side walls and a substantially vertical rear wall connected to the side walls, a front doorway opening with a door, a roof and a base;

each of said side walls being formed of a large, generally planer panel having rear and front vertical edge portions that are bent at an obtuse angle towards the plane of the opposite side wall to form angled corner sections that are integral with the side wall panel, and with the free edges of the corner sections each being bent into a narrow, vertical edge flange which is directed towards and is arranged in approximately the plane of the corresponding flange formed on the opposite side wall corner section;

said rear wall being formed of a substantially flat panel having opposite, vertical side edge strip portions that extend towards end lie substantially in a plane parallel with the edge flanges formed on the rear edges of the side wall panels;

a pair of connector strips joining the adjacent rear wall strip portions and side wall flanges, with each connector strip being formed with a pair of sidewise opening channels which open in opposite directions, end with one channel of each connector strip receiving a rear wall strip portion and with the other channel each connector strip receiving a side wall flange for thereby connecting said strip portions to said flanges, end with each said channels being deeper than the strip portions of the rear panel and the side panel edge flanges respectively so as to accommodate variations in the dimeasions in the walls in assembling a pre-determined size.

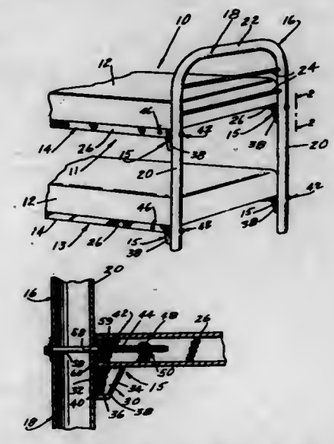
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**5,500,963**

**SECURING DEVICE FOR INTERLOCKING TUBULAR BED FRAME BUNK BEDS**

**John Yeh, 660 S. Aberdeen, Anaheim Hills, Calif. 92807**

**Filed May 9, 1994, Ser. No. 240,171**
**Int. Cl.[6] A47C *19/02***
**U.S. Cl. 5—9.1** **6 Claims**



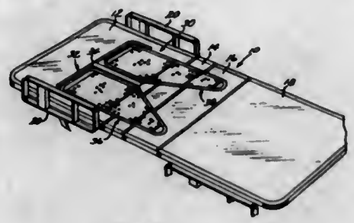
1. In combination a means for attaching and securing a horizontal, tubular, supporting frame member to a vertical post member, wherein the improvement comprises:

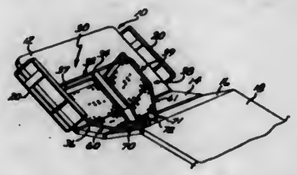
an attaching means defined by a depending tongue member fixedly secured adjacent one end of the tubular supporting frame member, and a mounting bracket fixedly attached to the post member and formed to receive said depending tongue member therein;

a securing means defined by an elongated screw mounted through the post member so as to extend within the horizontal tubular supporting frame member; and

a nut member transversely mounted in said tubular supporting frame member and positioned therein, whereby said screw is threadably received in said nut member so that said tongue member is secured in place within said mounting bracket of said post.

**5,500,964**
**PATIENT MANIPULATING KIT AND METHOD OF CONVERTING A HOSPITAL BED TO A PATIENT MANIPULATION APPARATUS**
Øivind Bergersen, Askim, Norway, assignor to National Health Equipment, Inc., Costa Mesa, Calif.
Filed Mar. 9, 1994, Ser. No. 209,114
Int. Cl.[6] A61G 7/06
U.S. Cl. 5—607 15 Claims





12. A lifting patient manipulating apparatus comprising:
a patient support device including an upwardly facing shoulder support panel and a buttocks support panel hingedly connected to said shoulder support panel for articulation along a first transverse hinge line;
a pair of right and left shoulder wing devices overlying the opposite sides of said shoulder support panel;
a longitudinal hinge device coupling said shoulder wing devices together at their laterally inner edges for rotation of the respective wing devices to respective elevated positions;
a pair of lower wing devices overlying said buttocks support panel and hingedly connected to the respective said shoulder wing devices for rotation relative thereto along respective hinge axes overlying said first hinge line; and
right and left operators coupled with the respective said right and left shoulder wing devices for rotating said shoulder wings to the respective said elevated positions carrying the respective lower wing devices therewith.

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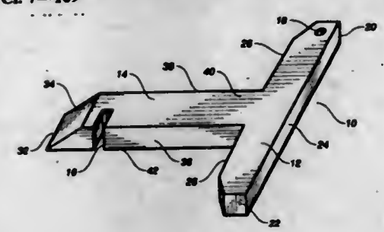
**5,500,965**
**CUSHION**
Angus P. D. Hannagan, Waterlooville, and Michael A. McGrath, Portsmouth, both of, England, assignors to Pegasus Airwave Limited, Waterlooville, England
PCT No. PCT/GB93/02024, § 371 Date Mar. 24, 1995, § 102(e) Date Mar. 24, 1995, PCT Pub. No. WO94/07396, PCT Pub. Date Apr. 14, 1994
PCT Filed Sep. 28, 1993, Ser. No. 403,775
Claims priority, application United Kingdom, Sep. 29, 1992, 9220498
Int. Cl.[6] A61G 7/04
U.S. Cl. 5—654 13 Claims

1. A cushion for the seat of a chair having at least two groups of cyclically inflatable tubes (4,6,8,10), each group comprising at least one tube, and control means (18) for inflating and deflating said groups sequentially, characterized in that said cushion further has a buffer chamber (12,14) which is maintained by said control means (18) in communication with the inflated group or groups of said cyclically inflatable tubes, said buffer chamber comprising at least one inflatable buffer tube which provides a part of the sitting surface of the chair.



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**5,500,966**
**ZIPPER ASSISTANCE TOOL**
Alan Wheat, 18809 Egret Bay #202, Houston, Tex. 77058
Filed Apr. 4, 1994, Ser. No. 222,532
Int. Cl.[6] B25F 1/00; B25B 33/00
U.S. Cl. 7—169 19 Claims



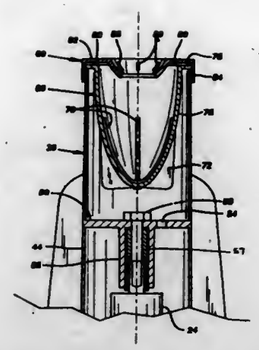
13. A tool comprising:
a handle;
an arm connected to and extending transversely to a longitudinal axis of said handle, said arm having a top surface and a bottom surface;
a slot formed in said arm adjacent an end of said arm opposite said handle, said slot extending parallel to said longitudinal axis of said handle, said slot extending from said top surface to said bottom surface; and
a tapered surface formed at an end of said arm opposite said handle.

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**5,500,967**
**LIQUID FABRIC SOFTENER DISPENSER FOR AUTOMATIC WASHING MACHINES**
Steven R. Wilson, Columbia, Mo.; James M. McGee, Webster City, Iowa; Loween Clayberg, Webster City, Iowa, and Curtis J. Conklin, Webster City, Iowa, assignors to White Consolidated Industries, Inc., Cleveland, Ohio
Filed Mar. 1, 1995, Ser. No. 396,682
Int. Cl.[6] D06F 39/02
U.S. Cl. 8—158 16 Claims

1. A treating liquid dispenser, comprising:
a dispenser cup having a body portion and a radially extending rim portion, said rim portion having a series of openings formed therein and an upper surface from which a plurality of bosses project; and,





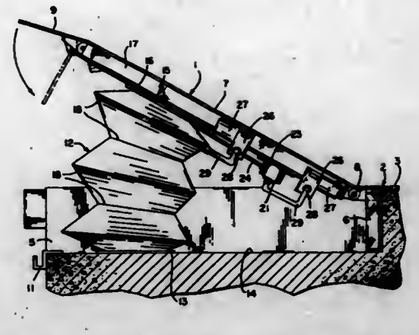
a cap member overlying said dispenser cup, said cap member having a main body portion and a downwardly projecting annular wall, said main body portion having an opening formed therein to permit the introduction of treating liquid into said dispenser cup, wherein an inner surface of said main body portion is spaced from said rim portion by said bosses and thereby allows treating liquid within said cup body portion to be dispensed therefrom through the openings in the rim portion.

16. A method for dispensing treating liquid into a washing machine, said washing machine having an agitator, a dispensing cup, and a cap member, said dispensing cup being supported upon an upper surface of said agitator and providing a body portion and a rim portion which radially extends from said body portion, said body portion being adapted to receive treating liquid and having an inner surface including a series of inwardly extending vanes, said rim portion having an upper surface from which projects a series of bosses and having a series of openings formed therein, said cap member overlying said dispensing cup and being resiliently pressed over an upper end of said agitator, a lower surface of said cap member being maintained a distance from said rim portion upper surface by said bosses, comprising the steps of:
operating said washing machine in a wash cycle whereby said agitator rotates back and forth in an alternating fashion;
mixing said treating liquid within said body portion of said dispensing cup during said wash cycle;
operating said washing machine in a spin cycle whereby said agitator rotates in one direction at a high rate of speed, centrifugal forces generated during said wash cycle causing said treating liquid to flow up the inner surface of said cup body portion and downwardly through said openings in said rim portion and into the hollow interior of said agitator;
retaining the treating liquid within a holding chamber formed within the agitator;
dispensing the treating liquid from the holding chamber when the rotational speed of the agitator slows to a predetermined rate at an end of the spin cycle;
directing the treating liquid down the interior of the agitator and into the outer wash tub wherein the treating liquid is mixed with wash water and subsequently distributed throughout the inner wash tub and the clothes therein.

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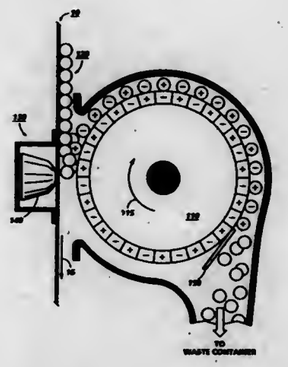
**5,500,968**
**DOCK LEVELER INCORPORATING AN INFLATABLE BAG**
Charles H. Hodges, Ruxton, Md., assignor to Kelley Company, Inc., Milwaukee, Wis.
Continuation of Ser. No. 814,002, Dec. 26, 1991, abandoned.
This application May 27, 1994, Ser. No. 250,650
Int. Cl.[6] E01D 1/00
U.S. Cl. 14—71.7 22 Claims

1. A dock leveler to be mounted on a loading dock, comprising a supporting structure, a ramp having a rear edge hinged to the supporting structure and movable between a horizontal position and an upwardly inclined position, a lip hinged to the forward edge of said ramp and movable between a downwardly hanging pendant position and an extended position where the lip forms an extension to the ramp, an inflatable bag interconnected between the ramp and the lip, inflating means connected to said bag for inflating said bag and pivoting said lip from the pendant position to the extended position, a first pressure member connected to said ramp, and a second pressure member connected to said lip, said bag being interposed between said pressure members.



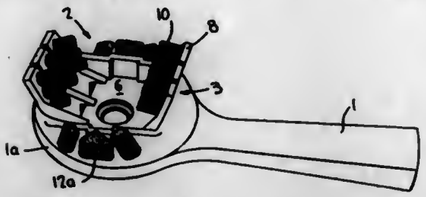
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**5,500,969**
**DUAL POLARITY COMMUTATED ROLL ELCTROSTATIC CLEANER WITH ACOUSTIC TRANSFER ASSIST**
John M. Bonislawski, Jr., Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Oct. 24, 1994, Ser. No. 327,933
Int. Cl.[6] G03G 21/00
U.S. Cl. 15—1.51 11 Claims



1. An apparatus for cleaning particles from a surface having a first surface and a second surface, the first surface being opposite the second surface, comprising:
a device, in communication with the first surface, for loosening the particles from the second surface; and
roll, positioned adjacent the second surface, for attracting, electrostatically, loosened particles thereto, said roll including a plurality of sebments forming a circumference of said roll with adjacent segments being opposite polarities for attracting having opposite polarities thereto.

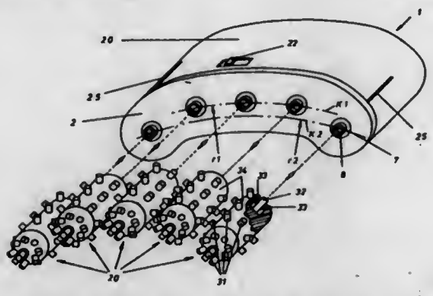
**5,500,970**
**AUTOMATIC TOOTHBRUSH**
**Wilhelm Maurer, Talacherring 15, CH-8103 Unterengstringen, and Andreas Maurer, Zurich, both of, Switzerland, assignors to Wilhelm Maurer, Switzerland**
**Filed Dec. 14, 1993, Ser. No. 162,144**
**Claims priority, application Switzerland, Apr. 15, 1992, 1261/92**
**Int. Cl.[6] A61C *17/34*; A46B *13/02***
**U.S. Cl. 15—22.1** **19 Claims**




1. An automatic toothbrush comprising a main head attached to a grip; a cleaning head mounted on said main head in a manner which allows reciprocating movement of the cleaning head in relation to the main head; a support means mounted on said cleaning head and having cleaning elements mounted on the support means in such a manner that the cleaning elements will contact opposed sides of a tooth and adapt to reciprocating and rotational movement in relation to the main head; and a drive means which is operationally linked to the cleaning head and the support means to provide said reciprocating movement of the cleaning head and provide said reciprocating and rotational movement of the support means and cleaning elements and thus initiate and provide at least two sequences of motions to the cleaning elements in relation to a tooth.

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**5,500,971**
**HAND-SCRUBBING BRUSH**
**Hartmut Springmann, Bichlerstrasse 7a, D-7530 Pforzheim, Germany**
**PCT No. PCT/EP93/00667, § 371 Date Sep. 9, 1994, § 102(e) Date Sep. 9, 1994, PCT Pub. No. WO93/19658, PCT Pub. Date Oct. 14, 1993**
**PCT Filed Mar. 19, 1993, Ser. No. 295,830**
**Claims priority, application Germany, Mar. 28, 1992, 42 10 301.0**
**Int. Cl.[6] A46B *13/02***
**U.S. Cl. 15—23** **15 Claims**




1. A hand-scrubbing brush, comprising drive means; a housing accommodating said drive means, said housing having a kidney-shaped profile with two opposite kidney-shaped sides; a plurality of rotational bodies equipped with bristles and rotatably mounted on one of said kidney-shaped sides of said housing along a line adapted to a kidney shape of said profile; and means for transmitting movement of said drive means to said rotational bodies so as to drive said rotational bodies in form-locking and force-locking manner.

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**5,500,972**
**ROTATING BACK SCRUBBER**
**David C. Foster, 1743 Creole St., La Place, La. 70068**
**Filed Nov. 7, 1994, Ser. No. 334,943**
**Int. Cl.[6] A46B *13/02***
**U.S. Cl. 15—28** **3 Claims**

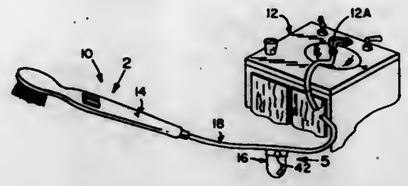



1. A rotating back scrubber comprising:
a plurality of cylindrical brushes each being symmetrically oriented about an individual axis extending through a center thereof, the brushes being equally and radially spaced from a common center axis, each of the cylindrical brushes comprising a brush gear having a plurality of bristles extending therefrom;
a rotating means for spinning each brush about the individual axis thereof and simultaneously rotating the brushes about the common center axis;
and,
an elongated handle coupled to the rotating means to permit manual manipulation of the back scrubber,
wherein the rotating means comprises a cylindrical main body coupled to an upper distal end of the elongated handle, a transverse plate extending across an end of the cylindrical main body; a fixed gear concentrically positioned within the cylindrical main body and projecting from an interior surface of the transverse plate; a rotating plate rotatably mounted about the fixed gear, the rotating plate including an annular rack extending about an outer perimeter thereof; a motor mounted within the elongated handle and including a motor shaft projecting into an interior of the cylindrical main body; a motor gear mounted to the motor shaft so as to rotate therewith, the motor gear being positioned in mesh with the annular rack of the rotating plate; a battery contained within the elongated handle; a switch electrically coupled to both the battery and the motor for selectively effecting energization of the motor; a plurality of rotating axles projecting from the rotating plate into a substantially parallel orientation relative to a common center axis directed through the fixed gear, the rotating axles being radially spaced from the common center axis an equal distance and receiving thereover an individual brush gear positioned in mesh with the fixed gear, whereby an energization of the motor will rotate the motor gear to cause a subsequent rotation of the rotating plate about the fixed gear, with a rotation of the rotating axles about the fixed gear effecting a concurrent rotation of the brush gears about the rotating axles.



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**5,500,973**
**HYDRO POWERED PLAQUE REMOVER**
**John J. Phelan, 109 Jeanette Ave., Inwood, N.Y. 11696**
**Filed May 8, 1995, Ser. No. 438,102**
**Int. Cl.[6] A61C *17/30*; A46B *11/06***
**U.S. Cl. 15—29** **11 Claims**

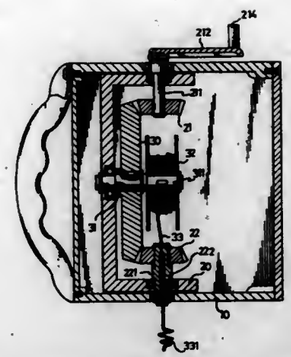



1. A plaque removing device adaptable to a water supply, comprising:
a) a flexible conduit containing a rinse conduit and at least one water conduit, said flexible conduit having a flexible conduit first end connectable to said water supply and a flexible conduit second end;
b) an interchangeable toothbrush having a interchangeable toothbrush head portion and containing a rinse passageway communicating with said rinse conduit and at least one water passageway communicating with said at least one water conduit, said toothbrush being disconnectingly attached to said flexible conduit second end so that said interchangeable toothbrush can be changed for user preference;
c) a plurality of bristles disposed on said toothbrush head portion and communicating with both said rinse passageway and said at least one water passageway;
e) a rinse reservoir disposed in said rinse conduit and containing a rinse so that water from said water supply passes through said water conduit and said water passageway and ultimately is deposited on said plurality of bristles and said rinse passes through said rinse conduit and said rinse passageway and ultimately is deposited on said plurality of bristles.

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**5,500,974**
**DEVICE FOR DREDGING WASTE CLOGGED IN A TOILET, DRAINPIPE, AND THE LIKE**
**Chung K. Wu, No. 248, Sec. 1, Nan Kuo Rd., Chung Hua City, Chang Hua Hsien, Taiwan**
**Continuation-in-part of Ser. No. 316,912, Oct. 3, 1994, abandoned. This application Aug. 9, 1995, Ser. No. 512,774**
**Int. Cl.[6] B08B *9/02***
**U.S. Cl. 15—104.33** **2 Claims**

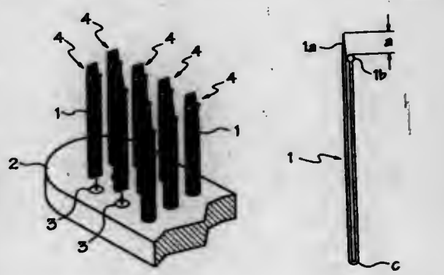
1. A device for dredging wastes comprising:
a casing (10) having an upper wall, a lower wall and two opposite vertical side walls, a stem portion (212) rotatably mounted on the upper wall of said casing (10);
a substantially U-shaped frame (20) mounted in said casing (10) and having an upper section pivotally engaged with the upper wall of said casing (10), a lower section pivotally engaged with the lower section of said casing (10), and a side section;
a first axle (211) having an upper end which extends through the upper section of said frame (20) and the upper wall of said casing (10) and securely attached to said stem portion (212) to rotate therewith, and having a lower end, a drive gear (21) fixedly mounted around the lower end of said first axle to rotate therewith;




a second-axle (221) having a center line aligning with that of said first axle (211) and having an upper end and a lower end which is rotatably mounted through the lower section of said frame (20) and the lower wall of said casing (10), a driven gear (22) fixedly mounted around the upper end of said second axle (221) to rotate therewith, a longitudinal passage (222) vertically defined in an inner wall of said second axle (221) and communicating with outside of the lower wall of said casing (10), a threaded groove (223) defined in an upper portion of the inner wall of said second axle (221) and communicating with said longitudinal passage (222); and
a third axle (31) having a first end rotatably mounted through a mediate portion of the side section of said frame (20) and a second end (311), a transmission gear (30) fixedly mounted around said third axle (31) to rotate therewith and meshing between said drive gear (21) and said driven gear (22), a reel (32) securely mounted on the second end (311) of said third axle (31) to rotate therewith, a length of stranded rope (33) wound around said reel (32) and having a free end extending through said threaded groove (223) and said longitudinal passage (222) in said second axle (221) to outside of the lower wall of said casing (10), an outer threaded portion (333) formed on said length of stranded rope (33) for threaded engagement in said threaded groove (223), a spiral portion (331) formed on the free end of said stranded rope (33).

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**5,500,975**
**TOOTHBRUSH**
**Kiyoshi Sano, Osaka, Japan, assignor to Taihei Kogyo Co., Ltd., Osaka, Japan**
**Filed Apr. 6, 1995, Ser. No. 418,594**
**Claims priority, application Japan, Apr. 15, 1994, 6-102260**
**Int. Cl.[6] A46B *3/16*; *9/04***
**U.S. Cl. 15—167.1** **3 Claims**




1. A toothbrush comprising:
a brush head; and

bundles of filaments, said bundles of filaments each being folded into a U-shaped bend and set in said brush head,

each of said filaments having a first end, and a second end shaped differently than said first end, said filaments being folded at a location intermediate said first and second ends;

wherein each said first end is tapered off and sized so that it is adapted to be inserted into a periodontal pocket, and each said second end is shaped into a ball, such that each said first end extends a distance from the respective second end.

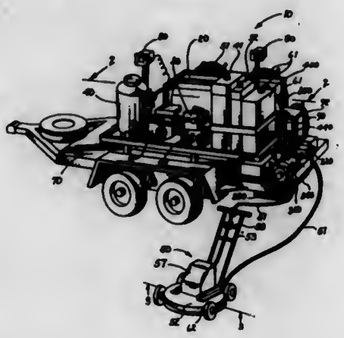
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**5,500,976**

## MOBILE CYCLONIC POWER WASH SYSTEM WITH WATER RECLAMATION AND ROTARY UNION

**Richard D. Rohrbecher, and Judith M. Jacobson, both of Phoenix, Ariz., assignors to Cyclone Surface Cleaning, Inc., Glendale, Ariz.**

**Filed Sep. 8, 1993, Ser. No. 118,139**
**Int. Cl.[6] B08B *5/04;3/02***
**U.S. Cl. 15—320** **6 Claims**



1. A system for cleaning substantially flat surfaces, of the type including a portable platform that can be transported from site to site and a mobile wash and reclamation unit that is connected to said portable platform by flexible conduits;

said portable platform having processing units including a water storage system for holding water to be used for cleaning, a water pumping system for pumping and pressurizing the water from the storage system, a vacuum system and a filter and reclamation unit mounted thereon wherein the improvement comprises:

said mobile wash and reclamation device including a base and has a top side and a bottom side, said bottom side of the mobile wash and reclamation device is supported by ground engaging wheels and has a spray bar having nozzles at each end extending therefrom;

a rotary union including a stationary portion and a rotating portion, said stationary portion being mounted on said base and is coupled to said water storage system by one of said flexible conduits;

said spray bar, being coupled to said rotating portion;

said stationary and rotating portions of said rotary union functioning as a seal and coupling for passing a given volume of high pressure water per minute from said water storage system to the nozzles of said spray bar.

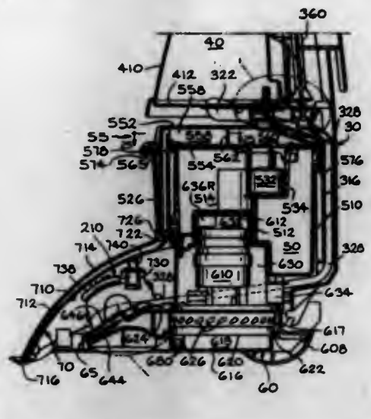
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**5,500,977**

## UPRIGHT CARPET EXTRACTOR

**Gregg A. McAllise, North Canton, and Jeffery A. Morgan, Cuyahoga Falls, both of Ohio, assignors to The Hoover Company, North Canton, Ohio**

**Filed Jan. 14, 1994, Ser. No. 182,760**
**Int. Cl.[6] A47L *11/34***
**U.S. Cl. 15—320** **31 Claims**



1. A carpet extractor comprising:

a) a base frame, said base frame including vacuum producing means, cleaning solution distribution means for applying cleaning solution upon the surface being cleaned, and vacuum nozzle means for removing at least a portion of said cleaning solution from the surface being cleaned;

b) a cleaning solution recovery tank removably supported upon said base frame, said recovery tank fluidly communicating with said vacuum nozzle means and said vacuum producing means whereby working air is caused to enter said vacuum nozzle, pass through said recovery tank and to the vacuum producing means said recovery tank surrounding at least a portion of said vacuum producing means;

c) fluid separation means, associated with said recovery tank whereby liquid carried by said working air is separated from said working air and collected in said recovery tank;

d) upright handle means pivotally connected to said base frame whereby the base frame may be manually manipulated in a forward and reverse direction, said handle means including a cleaning solution supply tank removably supported thereupon; and

e) cleaning solution supply means whereby cleaning solution is conveyed from said supply tank to said cleaning solution distribution means.

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**5,500,978**

## VACUUM CLEANER APPARATUS AND DISPOSABLE BAG FOR SAME

**Morris M. Levine, 109 Donnybrook Rd., Scarsdale, N.Y. 10583**

**Filed Oct. 8, 1993, Ser. No. 133,673**
**Int. Cl.[6] A47L *9/14***
**U.S. Cl. 15—347** **19 Claims**

1. A vacuum cleaner apparatus comprising:

a housing;

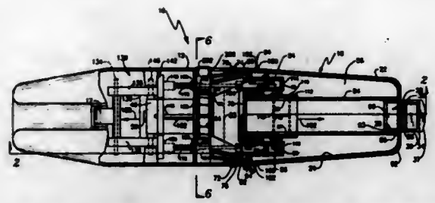
blower means disposed in said housing;

means defining a source of power for driving said blower means;

substance collection container means that are detachably engaged with said housing and include an inlet portion formed therein;

a suction section that extends generally between said blower means and said substance collection container means, said





suction section including first port means that are disposed in said container means;

an intake section that is engageable with said inlet portion of said container means and includes second port means that are disposed in said container means; and

actuator means for selectively connecting said blower means with said power source to operate said blower means and opening said first and second port means to create a vacuum in said container means such that air and accompanying substances are drawn through said intake section into said container, and for selectively disconnecting said blower means from said power source and closing said first and second port means to terminate airflow and restrict substance movement into and out of said container means.

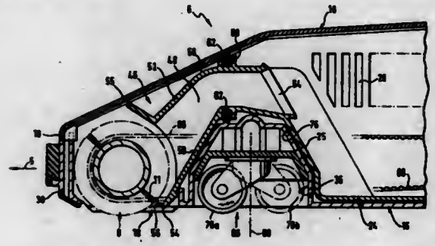
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**5,500,979**

## VACUUM CLEANER

**Peter Wörwag, Romanshorn, Switzerland, assignor to Firma Fedag, Romanshorn, Switzerland**

**Filed Apr. 3, 1995, Ser. No. 417,051**
**Claims priority, application Germany, Apr. 2, 1994, 44 11 526.1**
**Int. Cl.[6] A47L *5/32***
**U.S. Cl. 15—349** **18 Claims**



1. A vacuum cleaner comprising:

a housing having a bottom portion with wheels for rolling said vacuum cleaner across a floor;

a handle rod with a handle for guiding and pushing said vacuum cleaner across a floor, said handle rod connected to said housing;

a suction blower with a drive motor positioned in said housing;

said housing comprising a brush roller chamber;

a rotatably driven brush roller with brush elements positioned in said brush roller chamber;

said housing having a suction slot through which said brush elements of said brush roller extend;

said housing further comprising a receiving chamber positioned between said brush roller chamber and said suction blower;

a removable dirt collecting container received in said receiving chamber;

said dirt collecting container having sidewalls, wherein a first one of said sidewalls faces said brush roller chamber, wherein said first sidewall has an inlet slot extending substantially over the length of said brush roller chamber for allowing passage of a suction air stream entering said brush roller chamber through said suction slot into said dirt collecting container;

a suction channel connecting said brush roller chamber to said inlet slot for guiding the suction air stream from said brush roller chamber to said inlet slot, said suction channel tapering in a flow direction of the suction air stream;

said suction channel extending substantially over the length of said brush roller from a periphery of said brush roller upwardly to said inlet slot;

said suction channel comprising a guide wall located adjacent to said bottom portion and extending upwardly at a slant, said guide wall having a lower edge facing said brush roller chamber and delimiting said suction slot.

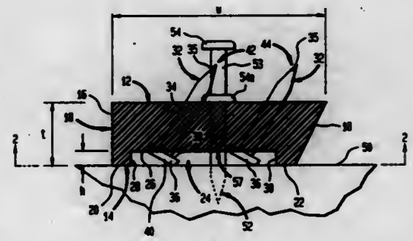
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**5,500,980**

## CARPET STRIPS AND METHODS OF MAKING CARPET STRIPS AND OTHER EXTRUDED ARTICLES

**Darrell R. Morrow, Sewell, and Leslie D. Morrow, Mullica Hill, both of N.J., assignors to Morrow Associated Enterprises, Mickleton, N.J.**

**Filed Nov. 16, 1993, Ser. No. 153,372**
**Int. Cl.[6] A47G *27/04***
**U.S. Cl. 16—16** **20 Claims**



1. A carpet securement comprising a polymeric body in the form of an elongated strip having top and bottom surfaces and lateral edges bounding said surfaces, said body further including a longitudinally-extending groove in said bottom surface, said bottom surface of said body having a pair of substantially coplanar lands extending longitudinally on opposite sides of said groove and adapted to bear on a floor when the securement is disposed on a floor, the securement further including bearing means for engaging a floor within said groove to thereby support said body when the carpet securement is disposed on a floor, the securement further comprising carpet engaging means for engaging a carpet overlying said top surface, said carpet-engaging means including a plurality of fasteners having shanks protruding above said top surface, said fasteners having drive elements positioned in said groove and being disposed so that they can engage a floor when the fastener is disposed on a floor, whereby said drive elements of said fasteners will serve to support said body between said lands, said bearing means including said drive elements of said fasteners.

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**5,500,981**

## LUGGAGE HANDLE ASSEMBLY

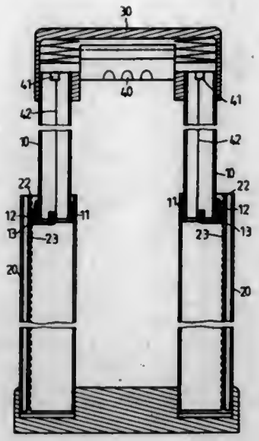
**Shu-Mou Ho, 58, Ma Yuan West St., Taichung, Taiwan**

**Filed Sep. 7, 1994, Ser. No. 301,650**
**Int. Cl.[6] B25G *1/04***
**U.S. Cl. 16—115** **1 Claim**

1. A handle assembly comprising:

a pair of conduits each including a plurality of depressions provided therein,

a pair of tubes each including a first end slidably engaged in said conduits respectively and a second end extended outward of said conduits,



a pair of resilient members secured to said first ends of said tubes respectively and each including a free end for engaging with said depressions for positioning said tubes relative to said conduits,

a handle body secured to said second ends of said tubes and including channel means formed therein,

a bar slidably engaged in said channel means and including a hand grip provided thereon,

means for biasing said bar toward said tubes, and

cable means coupling said bar to said free ends of said resilient members so as to disengage said free ends from said depressions and so as to allow adjustment of said tubes relative to said conduits.

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**5,500,982**

**HINGE MECHANISM FOR PORTABLE ELECTRONIC APPARATUS**

**Takashi Hosoi, Oume, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Continuation of Ser. No. 83,327, Jun. 29, 1993, abandoned, which is a continuation of Ser. No. 766,270, Sep. 27, 1991, abandoned, which is a division of Ser. No. 633,197, Dec. 31, 1990, Pat. No. 5,052,878, which is a continuation of Ser. No. 542,784, Jun. 26, 1990, abandoned, which is a continuation of Ser. No. 90,279, Aug. 28, 1987, abandoned. This application Dec. 13, 1994, Ser. No. 358,573**

**Claims priority, application Japan, Aug. 29, 1986, 61-131357**

**Int. Cl.[6] E05D *11/10***

**U.S. Cl. 16—297** **26 Claims**

1. A portable electronic apparatus comprising:

a base unit including a keyboard and a hinge mount portion;

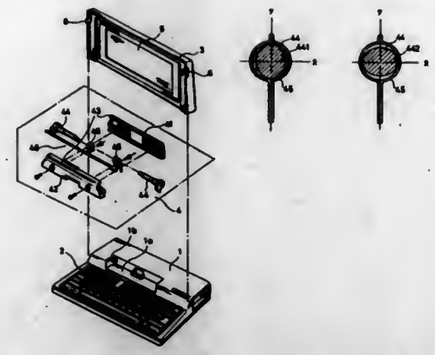
a hinge device mounted on the hinge mount portion;

a display unit rotatably connected to the base unit through the hinge device, and including an outer surface and an inner surface having a display screen, the display unit being rotatable between a first position for covering the keyboard, a second position for exposing the display screen in an upward direction for viewing from above, and an erect position between the first position and the second position;

the hinge device including:

(1) a rotatable shaft connected to the display unit; and

(2) a friction member contacting the rotatable shaft for generating an increasing friction force corresponding to the angle of rotation of the display unit as the display unit rotates from the erect position to the second position, the friction force temporarily keeping the display unit in a selected position between the erect position and the second position;



wherein the rotatable shaft has a cross section, said cross section having a first diameter larger than a second diameter; and

wherein the friction member is in contact with a portion on the second diameter of the rotatable shaft when the display unit is in the erect position.

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**5,500,983**

**CORNER CABINET HINGE**

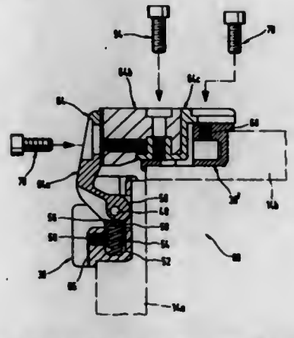
**Reinhard Lautenschläger, Reinheim, Germany, assignor to Mepla Werke Lautenschlager GmbH & Co. KG, Germany**

**Filed Apr. 28, 1994, Ser. No. 236,469**

**Claims priority, application Germany, May 7, 1993, 43 15 159.0**

**Int. Cl.[6] E05F *1/08***

**U.S. Cl. 16—304** **16 Claims**



1. A hinge (**30**) for hanging a free door panel (**14*b***) of a bipartite corner cabinet door, on a second door panel (**14*a***) that is hung to turn on a carcase supporting wall, comprising:

two mounting parts, each associated with one of the door panels, which provide for the door panels to be turned by about 90 degrees from a position where the door panels (**14*a*;14*b***) are held approximately at right angles to one another when the corner cabinet door is closed, to a position substantially in parallel alignment when the corner cabinet door (**14**) is open;

the first mounting part comprising a hinge cup (**38**) fixed in one of the door panels;

the second mounting part comprising a multi-angled hinge arm (**64**) journaled at one end on a pivot pin (**40**) provided in the hinge cup, and which is adjustably fastenable to the other door panel; said multi-angle hinge arm (**64**) comprising a bearing arm section (**64*a***), a connecting arm section (**64*b***) and a mounting arm section (**64*c***) releasably joined to one another and succeeding one another longitudinally, wherein the bearing arm section (**64*a***) is journaled in the hinge cup (**38**) and joined to the connecting arm section (**64*b***) for adjustment in a first coordinate direction, the connecting arm section (**64*b***) is attached non-rotatably to the other door panel for adjustment at right angles to the first coordinate direction, and the mounting arm section (**64*c***) in turn is attached to mounting means (**38'**) fastened to the associated door panel (**14*b***) for adjustment in a coordinate direction running substantially at right angles to the aforesaid coordinate directions; and

thrusting means, provided in the area where the multi-angled hinge arm is journaled in the hinge cup, which biases the free door panel (**14*b***) to an angle of slightly more than 90° relative to the second door panel (**14*a***) hinged on the carcase; and wherein

the thrusting means comprises a pusher (**52**), mounted for displacement in the hinge cup (**38**) and resiliently biased toward the pivot pin (**40**), and a cam surface (**56**), formed on a bearing sleeve (**58**) surrounding the pivot pin (**40**) wherein the cam surface is engaged by the pusher (**52**).

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**5,500,984**

**REFRIGERATOR DOOR OPENING/CLOSING APPARATUS**

**Hyun Sub Lee, Anyang, Rep. of Korea; assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea**

**Filed Nov. 17, 1994, Ser. No. 343,985**

**Claims priority, application Rep. of Korea, Nov. 30, 1993, 1993-25787 U**

**Int. Cl.[6] E05F *1/02***

**U.S. Cl. 16—309** **6 Claims**



1. A refrigerator, comprising:

a refrigerator housing forming a refrigerating compartment;

a refrigerator door hingedly mounted to said housing for rotation about a vertical axis, to open and close said compartment; and

a door opening/closing apparatus, including:

a follower slide member arranged coaxial with said axis and mounted for rotation with said door, and

a camming slide member arranged coaxial with said axis and disposed beneath said follower slide member such that said follower slide member is rotatable relative to said camming slide member;

said camming slide member including a slanted camming surface, and said follower slide member including a slanted follower surface arranged to slide upwardly along said slanted camming surface during opening of said door such that said door is slightly raised, and to slide downwardly along said slanted camming surface during closing of said door to assist such closing;

said slanted follower surface being spaced horizontally from said slanted camming surface when said door is in a closed state to enable said door to be partially opened before said slanted follower surface contacts said slanted camming surface.



**5,500,985**

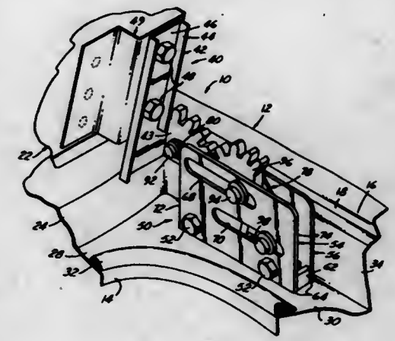
**VEHICLE HINGE ASSEMBLY WITH TRANSLATING PIVOT**

**Herbert D. Klueger, Farmington Hills, Mich., assignor to Chrysler Corporation, Highland Park, Mich.**

**Filed Mar. 20, 1995, Ser. No. 407,355**

**Int. Cl.[6] E05D *7/00;11/06***

**U.S. Cl. 16—354** **11 Claims**



1. A hinge assembly for mounting a closure panel with an edge on a vehicle body structure for movement between an upwardly extending panel open position and a panel closed position, said hinge assembly comprising:

a panel-half hinge member adapted to be secured to the panel adjacent a forward edge thereof, a longitudinally extending vertically disposed forward sector gear adapted to be fixedly connected to the panel-half hinge member;

a longitudinally extending body-half hinge member adapted to be secured to a body portion, said body-half hinge member defining laterally spaced inboard and outboard opposed wall surfaces with a predetermined distance therebetween supporting a longitudinally extending gear rack adjacent a lower portion said member;

said wall surfaces having an upper pair of elongated horizontal guide slots and a lower pair of elongated horizontal guide slots;

a pair of inboard and outboard links, said forward sector gear and an aft sector gear being in meshed relation and positioned between said links and with said aft sector gear in meshed relation with said gear rack;

each said link defined by a forward extending leg portion terminating in a forward pivot hole, a downwardly and rearwardly angled leg portion terminating in an aft pivot hole and an intermediate pivot hole at a juncture of said leg portions, a forward pivot pin extending thorough said forward link holes and a center of rotation hole of said forward sector gear;

an intermediate pivot pin extending through each upper slot, each link intermediate hole and a center of rotation hole of said aft sector gear, and an aft pivot pin extending through each lower guide slot and each said link aft hole; whereby

as the panel and forward sector gear are rotated counterclockwise about said forward pivot pin to the panel open position said aft sector gear rotates clockwise about said intermediate pivot pin while said aft sector gear conjointly travels rearward on said gear rack, causing said links to translate said forward pivot pin rearward thereby shifting the panel edge away from the body structure.

**5,500,986**

## METHOD AND APPARATUS FOR MOVING RECTANGULAR COILER CANS

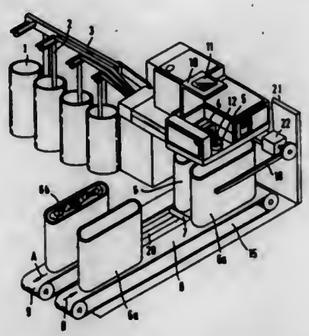
**Ferdinand Leifeld, Kempen; Stefan Schlichter, Viersen; Bernhard Windges, Mönchengladbach, and Siegfried Günkinger, Heiningen, all of, Germany, assignors to Trützschler GmbH & Co. KG, Mönchengladbach, Germany**

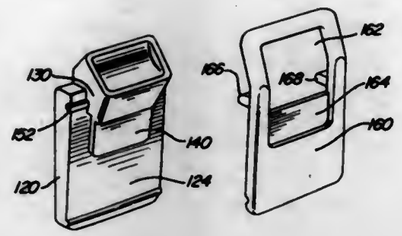
**Filed May 13, 1994, Ser. No. 242,639**

**Claims priority, application Germany, May 14, 1993, 43 16 158.8; Mar. 4, 1994, 44 07 110.8**

**Int. Cl.[6] D01H *9/18***

**U.S. Cl. 19—159 A** **22 Claims**





1. A method of handling flat coiler cans charged and to be charged with sliver in a sliver charging station of a sliver producing fiber processing machine; each can having, as viewed in an upright position thereof, two opposite, first vertical walls and two opposite, second vertical walls; said first walls being horizontally longer than said second walls; each said can having a horizontal length dimension measured parallel to said first walls and a horizontal width dimension measured perpendicularly to the length dimension; said length dimension being greater than said width dimension; comprising the following steps:

(a) advancing an empty can into a first standby station situated at said sliver charging station;

(b) advancing an empty can from said first standby station into said sliver charging station in a direction parallel to said width dimension;

(c) charging a can with sliver in said sliver charging station;

(d) advancing a full can, in a direction parallel to said width dimension, from said sliver charging station into a second standby station situated at said sliver charging station; and

(e) advancing a full can out of said second standby station.

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**5,500,987**

## PIN CLIP

**Howard J. Rosen, Huntington Beach, Calif., assignor to Flo-Tool International, Inc., Tustin, Calif.**

**Filed May 20, 1994, Ser. No. 246,514**

**Int. Cl.[6] A44B *21/00*; A45F *5/00***

**U.S. Cl. 24—351** **19 Claims**

1. A pin clip, comprising:

a tongue member having an opening therethrough;

a back member having a finger, a front member located adjacent the back member with the finger inserted through the opening of said tongue member and resiliently holding the tongue member against the back member, and

cooperative pivoting and locking means on the tongue and back members to hold the members in relative pivotal position.

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**5,500,988**

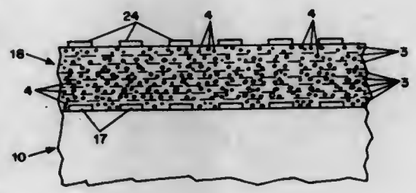
## METHOD OF MAKING A PEROVSKITE THIN-FILM INK JET TRANSDUCER

**Edward R. Moynihan, Plainfield, N.H.; Paul A. Hoisington, Norwich, Vt., and David W. Gallus, Merrimack, N.H., assignors to Spectra, Inc., Hanover, N.H.**

**Continuation-in-part of Ser. No. 89,310, Jul. 9, 1993, Pat. No. 5,446,484, which is a division of Ser. No. 615,893, Nov. 20, 1990, Pat. No. 5,265,315. This application Jun. 13, 1994, Ser. No. 258,709**

**Int. Cl.[6] H01L *41/22***

**U.S. Cl. 29—25.35** **21 Claims**



1. A method for making an ink jet transducer comprising providing a substrate, depositing at least one perovskite-seeded PZT layer on the substrate, and firing the PZT layer to form a piezoelectric, polycrystalline perovskite PZT film having a thickness between about 1 and about 25 microns, and forming at least one electrode pattern adjacent to a surface of the piezoelectric film to provide a transducer element.

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**5,500,989**

## SLIDING CHIP GUARD FOR A BRAKE LATHE

**James D. Ford, Franklin, Tenn., and Larry C. Tuck, Franklin, Ky., assignors to Hennessy Industries, Inc., Lavergne, Tenn.**

**Filed Apr. 3, 1995, Ser. No. 415,195**

**Int. Cl.[6] B23Q *11/08*; B23B *25/04***

**U.S. Cl. 29—27 R** **5 Claims**

1. A chip guard for an industrial machine producing or exposed to debris such as a brake lathe, said machine having a housing and internal working parts within said housing, a gap in such housing exposing the internal working parts to infiltration of debris, said gap having a perimeter, a working part extending from inside the housing protruding through the gap, said working part traversing the gap during operation of the machine, said chip guard including:

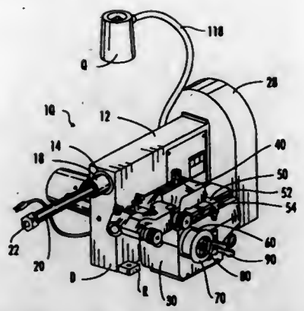
a. a clip having a body of a size and shape to cover the gap in the housing of the machine,

b. an elongated opening in the body of said clip,

c. said elongated opening being generally the shape of the path of movement of the moving part protruding through the gap of the machine,

d. legs depending from the body of the clip,





e. said legs shaped to mate with and snap onto the perimeter of the gap formed in the housing and hold the body of said clip in position to cover the opening in the housing of the machine formed by the gap;

f. a follower made of a flexible material and shaped and arranged to mate with and slide over the body of said clip,

g. said follower having an outer perimeter defining its shape,

h. said follower having an opening within its perimeter and a slit between said opening and said perimeter,

i. the opening in said follower shaped to mate with and fit about the portion of the moving part protruding through the gap of the machine, and

j. means on said machine guiding said follower to cause said follower to follow the path of movement of the moving part protruding through the gap of the machine whereby said follower covers said gap and said elongated opening in said clip during said movement to prevent debris from infiltrating internally of said housing.

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**5,500,990**

## RIVETING TOOL

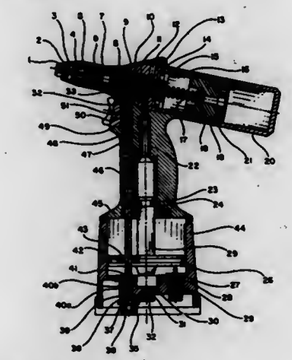
**Josef Wihan, 549 32, Velké Poříčí 451, Czechoslovakia**

**Filed Jun. 10, 1994, Ser. No. 258,580**

**Claims priority, application Czechoslovakia, Jun. 11, 1993, 1141-93**

**Int. Cl.[6] B21J *15/10***

**U.S. Cl. 29—243.525** **11 Claims**



1. A riveting tool comprising:

a rivet suction system for holding a rivet in the riveting tool;

a rivet shank clamping assembly;

means for receiving pressurized air from a source of pressurized air;

a control valve having a closed position, a first position and a second position, wherein when said control valve is in said first position, pressurized air from the means for receiving pressurized air is allowed to pass to the rivet suction system, and when said control valve is in said second position, pressurized air from the means for receiving pressurized air is allowed to pass to the rivet shank clamping assembly;

a trigger for moving the control valve from the first position to the second position; and

pressure responsive regulating means for moving the control valve from the closed position to the first position by lifting the tool from a substantially planer surface.

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**5,500,991**

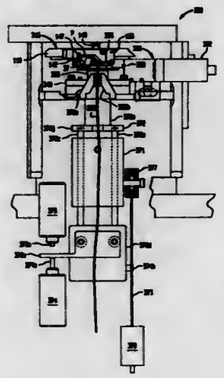
## NEEDLE AND SUTURE SWAGING AND PULL-TESTING METHOD

**David Demarest, Parsippany, and Michael G. Hodulik, Dunellen, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.**

**Division of Ser. No. 181,607, Jan. 13, 1994. This application Mar. 29, 1995, Ser. No. 412,751**

**Int. Cl.[6] B23Q *17/00***

**U.S. Cl. 29—407.08** **18 Claims**



1. A method of automatically swaging surgical needles to associated sutures, said method comprising:

(a) sequentially feeding a plurality of needles and a plurality of associated sutures between a pair of swaging dies, with a first of said pair being adjustably fixed;

(b) sequentially swaging each of said needles to an associated suture by driving the second of said pair of dies towards the adjustably fixed die to form a plurality of needle-suture assemblies;

(c) pull testing each nth needle-suture assembly to obtain an nth sample failure value;

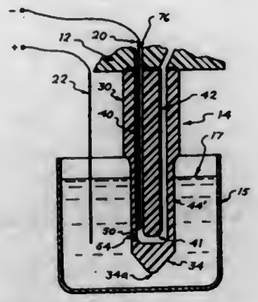
(d) comparing said nth sample failure value with a low failure threshold value and generating a first signal if said nth sample failure value is below said low failure threshold value; and

(e) incrementally adjusting the position of said adjustably fixed die in response to said first signal to move said adjustably fixed die an incremental distance towards the second die.

**5,500,992**
**METHOD OF MAKING STRESS RELIEVED COUNT PROBE**

Thomas L. Barnes, Sunrise; James W. Colburn, Margate; Catherine L. Daniel, Coconut Creek; William R. Jones, Jr., Hialeah, and Millard D. Longman, Coral Springs, all of Fla., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation of Ser. No. 173,524, Dec. 23, 1993, abandoned.
This application Mar. 20, 1995, Ser. No. 407,790
Int. Cl.[6] B23P *19/02*
U.S. Cl. 29—525 2 Claims



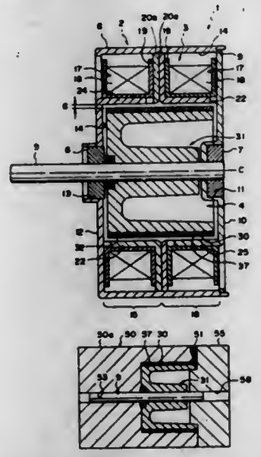
1. A method of making a count probe for counting particles, the method comprising the steps of:
(a) forming a count wafer;
(b) forming a core member having an opening for accepting the count wafer;
(c) applying the count wafer to the opening in the core member while the core member is at ambient temperature to form an interference fit between the count wafer and the core member; and
(d) annealing the core member after application of the count wafer to the opening in the core member to relieve substantially all stress in the core member but leaving sufficient stress such that the count wafer is retained with the core member by an interference fit, the annealing step comprising
(i) changing the core member from ambient temperature to a first temperature within a first time period;
(ii) maintaining the core member at the first temperature for a second time period;
(iii) changing the core member to a second temperature within a third time period;
(iv) maintaining the core member at the second temperature for a fourth time period;
(v) changing the core member to a third temperature within a fifth time period;
(vi) maintaining the core member at the third temperature for a sixth time period; and
(vii) changing the core member to ambient temperature within a seventh time period.

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**5,500,994**
**METHOD OF MANUFACTURING A ROTOR**

Hideki Itaya, Chiba, Japan, assignor to Mabuchi Motor Co., Ltd., Matsudo, Japan

Filed Sep. 19, 1994, Ser. No. 307,468
Claims priority, application Japan, Dec. 30, 1993, 5-353595
Int. Cl.[6] H02K *15/02*
U.S. Cl. 29—598 4 Claims



1. A method for producing a rotor for a miniature electric motor in which a stator is provided within a casing and the rotor is provided so as to face the stator, comprising the following steps of:
inserting a rotary shaft into a body of said rotor made of plastic;
subsequently incorporating the rotor body into a molding die and at the same time positioning said rotary shaft relative to said molding die; and
thereafter, injecting rare earth plastic magnet material, heated and molten at a temperature higher than a softening point t1 of said rotor body, into said molding die and forming a magnetic layer on an outer circumferential surface of said rotor body.

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**5,500,993**
**METHOD FOR MANUFACTURING ARMATURES**

John M. Beakes, Fairborn, and E. Wayne Zicht, Huber Heights, both of Ohio, assignors to Globe Products Inc., Huber Heights, Ohio

Continuation of Ser. No. 234,136, Apr. 28, 1994, abandoned.
This application Jun. 28, 1994, Ser. No. 267,285
Int. Cl.[6] H02K *15/00*
U.S. Cl. 29—597 6 Claims

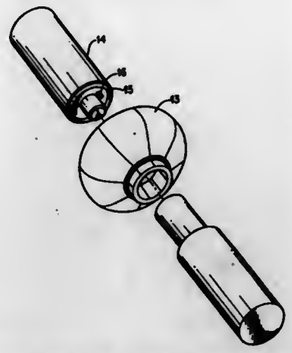
1. A method for positioning a stack of laminations for an electric motor in a predetermined rotary alignment, each of said laminations having a plurality of radially-extending teeth, at least one of said laminations lacking the radially outermost portion of at least one tooth thereby forming at least one gap in said at least one of said laminations, said method comprising:
placing said stack on a support member;
rotating said support member;
detecting the position of said at least one gap; and
upon said detection of the position of said at least one gap, interrupting the rotation of said support member.



**5,500,995**
**METHOD OF PRODUCING RADIOFREQUENCY RESONATING CAVITIES OF THE WELDLESS TYPE**

Vincenzo Palmieri; Renato Preciso; Vladimir L. Ruzinov; Sergei Y. Stark, and Il'Ya I. Kalik, all of Legnaro, Italy, assignors to Istituto Nazionale Di Fisica Nucleare, Frascati, Italy

Filed Nov. 5, 1993, Ser. No. 147,595
Claims priority, application European Pat. Off., Jun. 14, 1993, 93830260
Int. Cl.[5] H01L *39/24*
U.S. Cl. 29—599 7 Claims



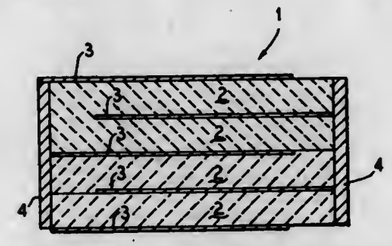
5. A method of producing a weldless radio-frequency resonating cavity, comprising the steps of: providing a cavity die which can be disassembled and which has the form of the resonating cavity; clamping said cavity die between two cylinders having the form of radio-frequency cut-off tubes, said cylinders being connected to said cavity die by conical coupling surfaces cooperating with a pin carried by one cylinder and introduced into a seat of the other cylinder; spinning a foil by using the cavity die together with the cylinders until a monolithic foil body consisting of a resonating cavity disposed between two cut-off tubes covers the cavity die and said cylinders; and disengaging said cavity die by disassembling the cavity die.

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**5,500,996**
**METHOD FOR MANUFACTURING A THERMISTOR HAVING A NEGATIVE TEMPERATURE COEFFICIENT IN MULTI-LAYER TECHNOLOGY**

Georg Fritsch, and Hans G. Schuster, both of Graz, Austria, assignors to Siemens Aktiengesellschaft, Munich, Germany

Division of Ser. No. 757,604, Sep. 11, 1991, abandoned. This application Feb. 22, 1993, Ser. No. 20,435
Claims priority, application Germany, Sep. 21, 1990, 40 29 988.0
Int. Cl.[6] H01C *7/04*
U.S. Cl. 29—612 6 Claims



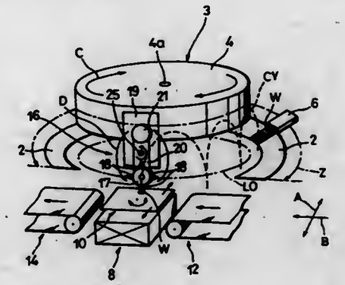
1. A method for manufacturing a multi-layer thermistor having a negative temperature coefficient, comprising the steps of:
producing a plurality of layers formed of fine-particle ceramic material by first producing a suspension with an initial material and organic bonding materials, solvents, and softening agents and then subsequently drawing out with a stripping technique to form an extremely thin film from which the individual fine-particle ceramic material layers are formed;
applying metal coats by a silk screening technique onto the fine-particle ceramic material layers, the metal coats containing at least one precious metal as a critical constituent and selected from the group consisting of Ag, Au, Pd, Pt, said metal coats extending from one side edge of each ceramic layer over the ceramic layer but stopping short of and being spaced from the opposite side edge;
stacking the ceramic layers with the respective coats on top of one another but with an alternating offset of the metal coats; and
pressing the stack, sintering the stack, and applying a solderable metallization at sides of the stack to connect to every other coat at the respective sides.

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**5,500,997**
**WORK MOUNTING APPARATUS**

Kazutaka Kobayashi; Kiseo Kojima; Takeshi Harada, all of Tokyo; Hiroshi Hohrai, and Ikuo Hayafuji, both of Kuwana, all of, Japan, assignors to Japan Tobacco Inc., Tokyo, and Kabushiki Kaisha Toshiba, Kawasaki, both of, Japan

Filed Mar. 22, 1994, Ser. No. 215,626
Claims priority, application Japan, Mar. 23, 1993, 5-063740
Int. Cl.[6] H05K *13/00*
U.S. Cl. 29—740 8 Claims



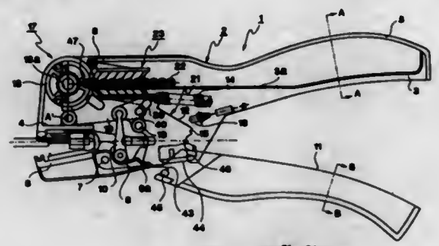
1. A work mounting apparatus comprising:
a work supply section having a supply position to which works are continuously supplied, the supply position being located on a predetermined travel path;
pickup means for picking up a work from the supply position, said pickup means including a carrier arranged above the travel path and movable along the travel path, a work head arranged at the carrier and having an attraction rod projecting toward the travel path, and drive means for causing the work head to make a cycloidal motion, while holding the work head in a fixed orientation with respect to the travel path during movement of the carrier;
a work mounting section arranged on the travel path at a distance from said supply section, said work mounting section including a table surface for receiving thereon a component on which a work is to be mounted;
control means for controlling the cycle of the cycloidal motion to allow the attraction rod of the work head to attract a work at the supply position and to position a release point for the attracted work on the travel path, at which the attracted work is to be released; and
actuating means for moving the table surface along a line intersecting the travel path such that said actuating means shifts a target point on the component, at which the work is to be mounted, to the release point on the travel path.

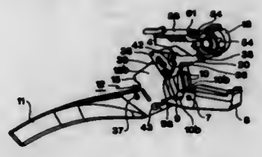
**5,500,998**

## TONGS FOR DRESSING CONDUCTOR ENDS

**Hartmut Schmode, Blomberg; Siegfried Storm, Schlangen; Helmut Thiele, Kamen; Ulrich Wiebe, Dörentrup; Bernd David; Detlev Hetland, both of Detmold; Hans-Joachim Kornfeld, Vlotho, and Johann-Georg Salten, Lage/Hagen, all of, Germany, assignors to Weidmüller Interface GmbH & Co., Detmold, Germany**

**Continuation of Ser. No. 971,081, Nov. 4, 1992, abandoned.**
**This application Aug. 15, 1994, Ser. No. 290,295**
**Claims priority, application Germany, Nov. 4, 1991, 41 36 302.7**
**Int. Cl.[6] H01R *43/045*; B21D *7/06*;*43/28***
**U.S. Cl. 29—751** **26 Claims**





1. Tongs for dressing conductor ends, comprising:
two handles which are movable relative to one another;
a first dressing station for dressing a conductor end;
a drive device for driving the first dressing station during operation of the handles, the handles and the first dressing station being operatively connected to the drive device;
a second dressing station which is selectively driven via the drive device, the second dressing station being a crimping station having a rotatable drum which rotates about a rotation axis, a core end sleeve being positionable in the rotatable drum and being crimped onto a conductor end during crimping; and
means for selectively coupling the crimping station to the drive device only when the crimping station is moved in an axial direction, the crimping station being moved in the axial direction by the conductor end to be dressed being inserted into the crimping station, the axial direction in which the crimping station is moved being generally parallel to the rotation axis such that movement of the crimping station in the axial direction couples the crimping station to the drive device.

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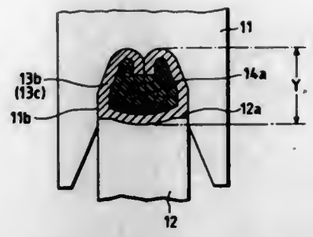
**5,500,999**

## TERMINAL CRIMPING DEVICE

**Sakai Yagi; Hitoshi Sakai, and Toshinori Yamamoto, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan**

**Continuation of Ser. No. 96,002, Jul. 23, 1993, abandoned.**
**This application Feb. 3, 1995, Ser. No. 384,598**
**Claims priority, application Japan, Jul. 24, 1992, 4-217432**
**Int. Cl.[6] H01R *43/04***
**U.S. Cl. 29—753** **2 Claims**

1. A terminal crimping device comprising:
a pressing toothed upper die having a recess, said recess being defined by opposing side walls each including a vertically extending linear guide wall of predetermined length, said



linear guide walls being spaced by a constant predetermined distance over said predetermined length and defining a space therebetween; and
a lower die engaged with said recess of said pressing toothed upper die to crimp an electrical terminal over an electrical wire so as to connect said electrical terminal to said electrical wire, the width of said lower die being substantially equal to said predetermined distance,
wherein said electrical terminal is crimped over said electrical wire while said lower die is in said space defined by said vertically extending linear guide walls, and wherein each of said side walls further includes a pair of inclined guide walls which are separated by said vertically extending linear guide walls.

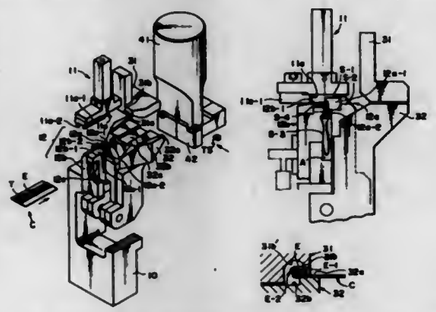
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**5,501,000**

## SLIDER INSERTING APPARATUS FOR CONCEALED SLIDE FASTENER AND CONCEALED SLIDE FASTENER FINISHING MACHINE

**Naoki Kondo, Toyama, Japan, assignor to Ykk Corporation, Tokyo, Japan**

**Filed Nov. 16, 1994, Ser. No. 341,136**
**Claims priority, application Japan, Nov. 18, 1993, 5-289398**
**Int. Cl.[6] A41H *37/06***
**U.S. Cl. 29—767** **5 Claims**



1. An apparatus for inserting a slider for a concealed slide fastener, comprising:
an upper slider holder having a contact surface contacting the back and the rear end of a flange portion of the slider, and a lower slider holder disposed directly below said upper slider holder and having a contact surface contacting, at least, the front surface and the fore-end of a guide post of the slider to support thereon the guide post, said lower slider holder being vertically movable when the slider is inserted into a fastener chain;
said lower slider holder including a first holder portion and a second holder portion respectively disposed forwardly and rearwardly of a pull chamber which is defined between said first and second holder portions for receiving therein a pull of the slider;



said first holder portion having a contact surface contacting the front surface and the fore-end of the guide post for supporting the guide post, and an unlocking surface contacting a locking pawl of the slider to release the locking pawl from interlocking engagement with coupling elements of the fastener chain when said contact surface of said first holder portion and the front surface and the fore-end of the guide post contact each other; and
said second holder portion having a contact surface contacting the front surface of the flange portion for supporting the flange portion, said second holder portion being made movable in a direction away from the slider when the slider is held between said upper and lower slider holders.

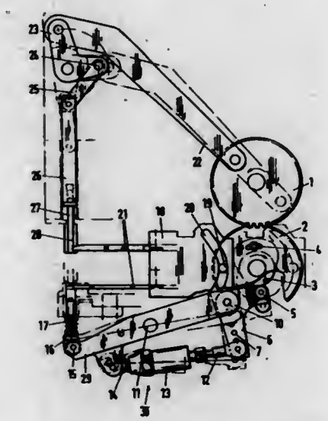
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**5,501,001**

## MACHINE FOR MOUNTING RIVETS, SNAPS AND THE LIKE

**Rolf Kamps, Wuppertal, Germany, assignor to Stocko Verschlusstechnik GmbH & Co., Wuppertal, Germany**

**Filed Mar. 15, 1995, Ser. No. 404,647**
**Claims priority, application Germany, Mar. 15, 1994, 44 08 691.1**
**Int. Cl.[6] B23P *19/04*; A41H *37/10***
**U.S. Cl. 29—788** **6 Claims**



1. A device for mounting parts; said device comprising:
an upper tool with an upper stamp;
a lower tool with a lower stamp;
a drive unit for driving said upper and said lower tools;
a feeding device for feeding said parts to said upper and lower tools;
a gear arrangement for connecting said upper and said lower tools to said drive unit such that said upper and said lower tools are moveable in a reciprocating manner toward one another; and
said gear arrangement comprising:
a) an eccentric disk;
b) a drive lever connected to said eccentric disk;
c) a rocker arm having a swivel axis about which said rocker arm swivels;
d) said rocker arm pivotably connected with a first end to said drive lever and with a second end to said lower tool; and
e) a control rod connected to said rocker arm and said drive lever, wherein a plurality of points of attachment are provided for said control rod.

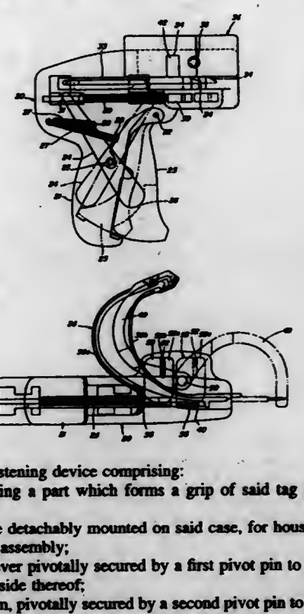
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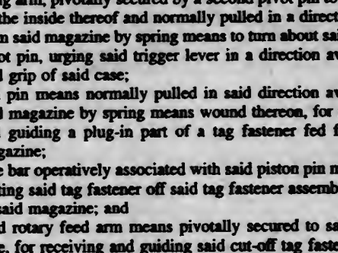
**5,501,002**

## TAG FASTENING DEVICE

**Syouichi Fukami, 2-3-8-825 Minamisuna Koutou-ku, Tokyo, Japan**

**Filed Jun. 20, 1994, Ser. No. 262,618**
**Int. Cl.[6] B25B *25/00***
**U.S. Cl. 29—811.2** **6 Claims**





1. A tag fastening device comprising:
a case having a part which forms a grip of said tag fastening device;
a magazine detachably mounted on said case, for housing a tag fastener assembly;
a trigger lever pivotally secured by a first pivot pin to said grip on an inside thereof;
a swing arm, pivotally secured by a second pivot pin to said grip on the inside thereof and normally pulled in a direction away from said magazine by spring means to turn about said second pivot pin, urging said trigger lever in a direction away from said grip of said case;
piston pin means normally pulled in said direction away from said magazine by spring means wound thereon, for receiving and guiding a plug-in part of a tag fastener fed from said magazine;
a slide bar operatively associated with said piston pin means, for cutting said tag fastener off said tag fastener assembly loaded in said magazine; and
curved rotary feed arm means pivotally secured to said magazine, for receiving and guiding said cut-off tag fastener, after passing it through a hole of a tag, to a position for attachment to an article.

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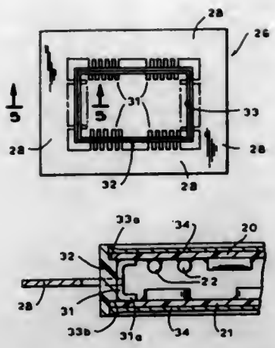
**5,501,003**

## METHOD OF ASSEMBLING ELECTRONIC PACKAGES FOR SURFACE MOUNT APPLICATIONS

**Elliot Bernstein, Glen Cove, N.Y., assignor to Bel Fuse Inc., Jersey City, N.J.**

**Filed Dec. 15, 1993, Ser. No. 167,420**
**Int. Cl.[6] H01R *43/00***
**U.S. Cl. 29—827** **10 Claims**

1. A method of assembling an electronic package of the type having first and second printed circuit boards, each of which has discrete components and conductive output areas on one side thereof for subsequent surface mounting of the electronic package, which method comprises:
(a) providing a conductive lead frame having a plurality of sides defining a first opening, the lead frame further having a plurality of leads extending into the first opening, each of the leads having first and second sides, one end of each lead being



attached to one of the sides of the lead frame and a second end of each lead extending into the first opening;

(b) forming a nonconductive frame within the first opening, the nonconductive frame being attached to each of the leads intermediate the first and second ends thereof and defining a second opening within the first opening, the first and second openings having peripheral dimensions greater than the peripheral dimensions of the electronic package, and the leads of the conductive lead frame extending into the second opening;

(c) positioning the electronic package within the second opening such that the first and second boards are supported on the nonconductive frame, the components of the first board are spaced from and face the components of the second board, the conductive output areas of the first board are in contact with the first sides of a first group of the leads and the conductive output areas of the second board are in contact with the second sides of a second group of the leads;

(d) conductively attaching the conductive output areas of the electronic assembly to different ones of the leads in the second opening;

(e) encapsulating the electronic package; and

(f) severing the sides of the conductive lead frame from the first ends of the leads.

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**5,501,004**

**OUTER-LEAD BONDING APPARATUS AND METHOD THEREFOR**

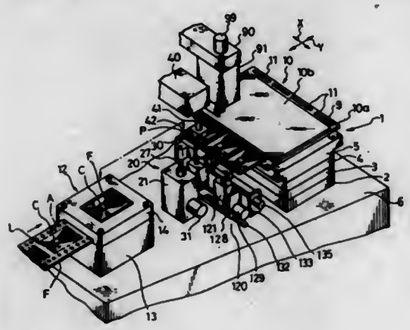
**Yasuto Onitsuka, Fukuoka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Sep. 1, 1994, Ser. No. 299,766**

**Claims priority, application Japan, Sep. 6, 1993, 5-221079**

**Int. Cl.[6] H01R** *43/06;* **B23P** *19/00*

**U.S. Cl. 29—827** **6 Claims**



1. An outer-lead bonding method comprising the steps of:

locating an outer lead of a tape carrier package above an electrode of a display panel;

lowering a pressing member and slightly pressing said outer lead on said electrode to temporarily remove any warp of said outer lead;

detecting a positional deviation between said outer lead and said electrode when said outer lead is being pressed onto said electrode by said pressing means;

relatively moving said tape carrier package from said electrode to correct said positional deviation; and

lowering a compression member and bonding said outer lead onto said electrode.

3. An outer-lead bonding apparatus comprising:

holding means for holding thereon a substrate on which an electrode is formed;

nozzle means for feeding a tape carrier package to a position where an outer lead of said tape carrier package is to be disposed on said electrode;

pressing means for pressing an outer lead of said tape carrier package onto said electrode on the holding means to remove any warp of said outer lead;

bonding means for bonding said outer lead to said electrode on the holding means; and

observation means for observing said electrode and said outer lead when said outer lead is being pressed onto said electrode by said pressing means, said observation means being disposed under a position where said outer lead is bonded to said electrode.

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**5,501,005**

**MOUNTING DEVICE OF ELECTRONIC COMPONENTS AND A MOUNTING METHOD**

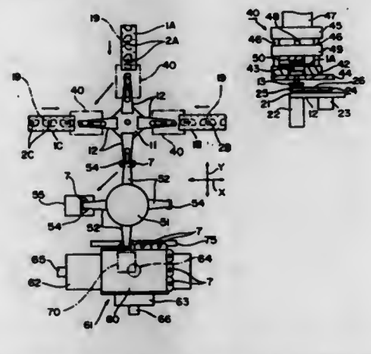
**Yasuto Onitsuka, Fukuoka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Sep. 29, 1994, Ser. No. 313,595**

**Claims priority, application Japan, Sep. 30, 1993, 5-244539**

**Int. Cl.[6] H05K** *3/30;3/34;* **B23P** *19/00;* **G07F** *11/66*

**U.S. Cl. 29—833** **12 Claims**



1. A mounting device for electronic components being punched out from a film carrier comprising:

a supplying means for supplying film carriers having electronic components on said film carriers,

a substrate holding means for holding substrates,

a punching means for punching out the electronic component on said film carrier having an upper die and a lower die having a through hole, wherein said upper die is for punching out the electronic component into said through hole,

a take out means for taking out the punched out electronic component through a bottom of said through hole and for transmitting said punched out electronic component to a transfer means;



a transfer means for transferring an electronic component from said take out means to a mounting position adjacent said substrate holding means, and

a pressure bonding means for pressure bonding leadwires of an electronic component and electrodes of the substrate.

11. A mounting method for mounting an electronic component punched out from a film carrier to a substrate comprising the steps of:

(a) adjusting a position of a film carrier having electronic components bonded thereon relative to a punching means,

(b) punching out an electronic component bonded on said film carrier,

(c) taking the punched out electronic component out through the bottom of said punching means,

(d) transferring the taken out electronic component to a mounting point on a substrate, and

(e) pressure bonding leadwires of the electronic component with electrodes of the substrate.

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**5,501,006**

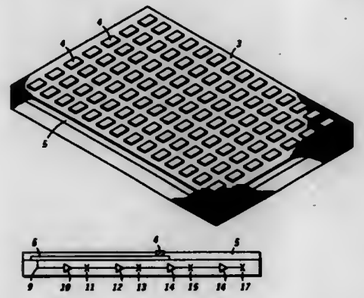
**METHOD FOR CONNECTION OF SIGNALS TO AN INTEGRATED CIRCUIT**

**John B. Gehman, Jr., and Richard P. O'Connell, both of Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.**

**Division of Ser. No. 124,786, Sep. 22, 1993, abandoned. This application May 9, 1994, Ser. No. 239,796**

**Int. Cl.[6] H05K** *3/34*

**U.S. Cl. 29—840** **6 Claims**



1. A method for connecting a clock signal to an integrated circuit comprising the steps of:

providing a substrate with at least one distribution bonding pad connected to a first set of bonding pads;

providing the clock signal on a distribution lead, said distribution lead being located within the substrate;

buffering within the substrate the clock signal;

providing the integrated circuit with a second set of bonding pads corresponding to the first set of bonding pads;

applying an insulation layer between the integrated circuit and the substrate except for the first and the second sets of bonding pads;

interconnecting the first and second sets of bonding pads; and

connecting the distribution lead to the at least one distribution bonding pad of the substrate for transmitting the clock signal to the second set of bonding pads on the integrated circuit.

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**5,501,007**

**METHOD OF PRODUCING SORBING SHEETS AND LAMINATES HAVING REACTIVATING AND INVIGORATING FUNCTIONS**

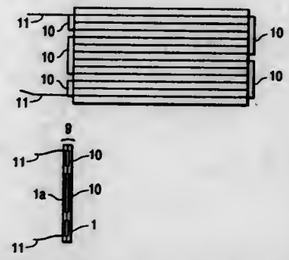
**Toshimi Kuma, Fukuoka, Japan, assignor to Kabushiki Kaisha Seibu Giken, Fukuoka, Japan**

**Filed May 28, 1993, Ser. No. 67,622**

**Claims priority, application Japan, Jun. 7, 1992, 4-189813**

**Int. Cl.[6] H05K** *3/02*

**U.S. Cl. 29—846** **16 Claims**



1. A method for manufacturing an adsorbing sheet providing reactivating and invigorating functions, comprising the steps of:

(a) chemically synthesizing and fixing an adsorbent on the surface of and within a sheet containing a resistor embedded in the sheet, and

(b) connecting terminals to both ends of the resistor to make reactivation and invigoration possible with the application of electric current.

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**5,501,008**

**METHOD OF PRODUCING AN ARRANGEMENT FOR ESTABLISHING CONTACT IN JOINTS**

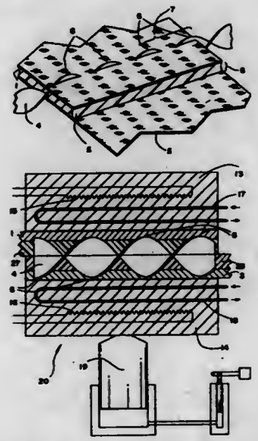
**Kari-Erik Leeb, Djurhamn, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden**

**Division of Ser. No. 216,828, Mar. 24, 1994, Pat. No. 5,435,746. This application May 17, 1995, Ser. No. 442,774**

**Claims priority, application Sweden, Mar. 24, 1993, 9300966**

**Int. Cl.[6] H01K** *3/00*

**U.S. Cl. 29—849** **1 Claim**



1. A method of producing an arrangement for establishing electrical contacts in a metal surface joint to achieve uniformly distributed electric conductivity along the joint, wherein the arrangement comprises:

a joint formed between two metal surfaces, wherein the joint is filled with a plastic material which adheres to the metal surfaces; and

an electric contact making device disposed between the metal surfaces, wherein the electric contact making device includes surface penetrating devices which at delimited parts cut through the metal surfaces so as to form electric contacts between the metal surfaces in a manner such that the electric contacts are distributed along the joint in a controlled manner, and the electric contacts are protected against oxidation by the plastic material; the method comprising the steps of:

subjecting the metal surfaces containing the plastic material and the electric contact making device placed therebetween to an overpressure which is directed at right angles to the plane of the metal surfaces while the plastic material is in a fluid state; and

bringing the plastic material to a solid state with a residual overpressure so that the surface penetrating devices of the electric contact making device obtain a mechanically biassed contact pressure which remains permanently in the arrangement.

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**5,501,009**

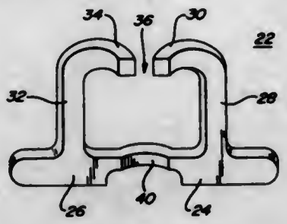
## CONNECTOR FOR HIGH DENSITY ELECTRONIC ASSEMBLIES

**Robert G. McClure, Lancaster, Pa., assignor to Berg Technology, Inc., Reno, Nev.**

**Division of Ser. No. 169,586, Dec. 17, 1993, Pat. No. 5,409,406. This application Oct. 20, 1994, Ser. No. 326,319**

**Int. Cl.[6] H01R *13/115***

**U.S. Cl. 29—882** **4 Claims**




1. A method of manufacturing a connector terminal, comprising:

providing a quantity of terminal material;

forming said quantity of terminal material into:

a first base portion having a first contact beam cantilevered therefrom, said first contact beam having a first distal end;

a second base portion having a second contact beam cantilevered therefrom, said second contact beam having a second distal end, wherein a gap is formed between said first and second distal ends, wherein said first and second base portions lie substantially in a common plane;

an intermediate portion disposed between and integral with said first and second base portions; and displacing an amount of said terminal material at said intermediate portion to adjust the size of said gap, wherein the terminal material displaced is bowed out of said plane.

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**5,501,010**

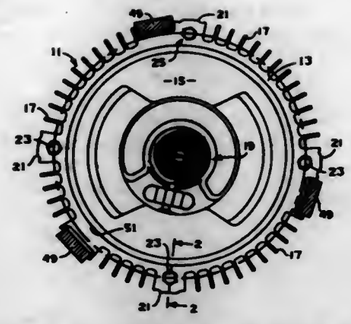
## METHOD OF ASSEMBLY FOR A FAN

**George E. Scott, Marshall, Mich., assignor to Eaton Corporation, Cleveland, Ohio**

**Filed Aug. 8, 1994, Ser. No. 287,388**

**Int. Cl.[6] B23P *15/00***

**U.S. Cl. 29—889.3** **9 Claims**




1. A method of assembling a fan and fan drive, the fan drive being of the type comprising an output assembly, an input member and means operable to transmit torque from said input member to said output assembly; the fan being of the type comprising a mounting portion, adapted to be bolted to said output assembly of said fan drive, and a plurality of fan blades; said output assembly of said fan drive defining a plurality N of bores, and a plurality N of threaded fasteners, each of said fasteners adapted to be in threaded engagement with one of said bores, and each of said fasteners including a threaded portion and a head portion; said mounting portion of said fan having an axial thickness (X) and defining a plurality N of fastener openings; said method comprising:

(a) inserting each of said threaded portions of said plurality N of threaded fasteners into one of said bores, to a position whereby said head portion is spaced from an adjacent surface of said output assembly by an axial dimension at least equal to said axial thickness (X);

(b) providing a fan wherein each of said fastener openings is generally keyhole shaped, and includes a first, larger portion which is larger than said head portion of said fastener, and a second, smaller portion, which is smaller than said head portion, but larger than said threaded portion;

(c) subsequent to steps (a) and (b), placing said mounting portion of said fan proximate said adjacent surface of said output assembly, ith said head portions of said threaded fasteners extending through said first, larger portions of said fastener openings;

(d) moving said fan relative to said fan drive to a position in which said second, smaller portions of said fastener openings are disposed about said threaded portions; and

(e) tightening said threaded fastener head portions against said mounting portion of said fan.

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**5,501,011**

## METHOD OF MANUFACTURE OF AN ENCLOSURE CONTAINING HOT GASES COOLED BY TRANSPORTATION, IN PARTICULAR THE THRUST CHAMBER OF A ROCKET ENGINE

**Marc Pellet, Vernon, France, assignor to Societe Europeenne de Propulsion, Suresnes, France**

**Continuation-in-part of Ser. No. 62,068, May 14, 1993, Pat. No. 5,363,645. This application Jul. 25, 1994, Ser. No. 279,973**

**Claims priority, application France, May 18, 1992, 92 06002**

**Int. Cl.[6] B23P *15/00***

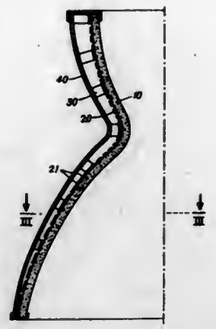
**U.S. Cl. 29—890.01** **9 Claims**

1. A method of manufacturing an enclosure containing hot gases cooled by transpiration comprising:

forming a rigid shaped shell comprised of a microperforated sheet metal hydraulic calibration sheath,

welding spacers to an outside face of the hydraulic calibration sheath;






welding an outer sealing envelope on an outside surface of the spacers; and

forming a porous wall by applying a deposit onto an inside face of the hydraulic calibration sheath.

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**5,501,012**

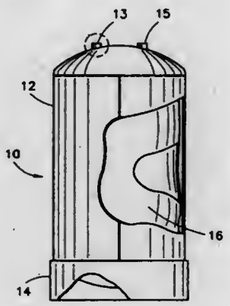
## TANK LINING METHOD

**Thomas G. Nogles, Broomall, Pa., assignor to Southcorp Water Heaters USA, Inc., Bala Cynwyd, Pa.**

**Continuation of Ser. No. 195,385, Feb. 14, 1994, abandoned. This application Jun. 28, 1995, Ser. No. 496,051**

**Int. Cl.[6] B21D *39/00***

**U.S. Cl. 29—890.051** **9 Claims**




1. In a method of making a lined metallic water tank for a water heater, the steps which comprise:

(a) making a metallic tank pre-form having an opening;

(b) inserting a collapsible container through said opening into said metallic tank pre-form;

(c) drawing a vacuum inside said collapsible container to displace said collapsible container away from said opening;

(d) joining a closure to said opening of said metallic tank pre-form to form a completed water tank having inside surfaces while continuing to draw said vacuum; and

(e) applying pressure within said collapsible container to expand said collapsible container against said inside surfaces of said completed water tank.

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**5,501,013**

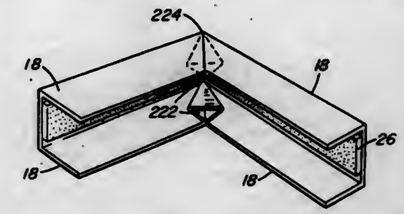
## SPACER AND SPACER FRAME FOR AN INSULATING GLAZING UNIT AND METHOD OF MAKING SAME

**Stephen C. Misera, Tarentum; Thomas P. Kerr, Pittsburgh, and William R. Sitkos, Delmont, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.**

**Division of Ser. No. 64,264, May 20, 1993, Pat. No. 5,351,451, which is a division of Ser. No. 906,645, Jun. 30, 1992, Pat. No. 5,255,481, which is a division of Ser. No. 578,697, Sep. 4, 1990, Pat. No. 5,177,916. This application Jun. 6, 1994, Ser. No. 254,222**

**Int. Cl.[6] B21D *1/00***

**U.S. Cl. 29—897.312** **44 Claims**




1. A method of making a spacer frame for spacing sheets of a multi sheet glazing unit, the spacer frame having at least one corner, comprising the steps of:

providing an elongated substrate of a bendable material, the substrate having a first edge and a second edge spaced from and opposite to the first edge, a first major surface and a second major surface opposite to the first major surface between the first and second edges;

imposing on a major surface of the substrate a first set of crease lines adjacent the first edge and spaced from centerline of the substrate and a second set of crease lines adjacent the second edge and spaced from the centerline with the first set of crease lines opposite the second set of crease lines, the first and second sets of crease lines each include at least two bend lines, the bend lines of the first set of crease lines angled toward one another to provide a generally "V" shape configuration with the open end of the "V" facing the first edge of the substrate and the bend lines of the second set of crease lines angled toward one another to provide a generally "V" shape configuration with the open end of the "V" formed by the second set of crease lines facing the second edge of the substrate;

forming the substrate to provide a spacer stock having a first upright leg and a second upright leg spaced from the first upright leg with the first and second upright legs connected by a base to provide the upright legs and the base with a generally U-shaped cross section configuration with the first major surface of the substrate defining inner surface of the spacer stock and with the "V" formed by the first set of crease lines in the first upright leg and the "V" formed by the second set of crease lines in the second upright leg;

bending the base of the spacer stock at a location between the first and second sets of crease lines while moving portions of the first and second upright legs between the "V" formed by the first and second set of crease lines toward each other over the base to provide the spacer frame having the at least one corner, and

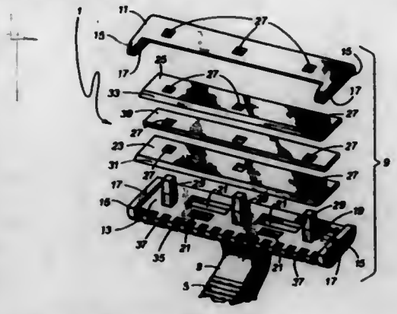
joining ends of the spacer frame, wherein the first upright leg of the spacer frame lies in a first plane, the second upright leg of the spacer frame lies in a second plane, the base of the spacer frame on one side of the at least one corner lies in a third plane, and the base of the spacer frame on the other side of the at least one corner lies in a fourth plane with the first and second planes parallel to one another, the third and fourth planes intersecting one another and the third and fourth planes intersecting the first and second planes, and the base of the spacer frame and portions of the upright legs of the spacer frame at the at least one corner being continuous.

**5,501,014**

## SAFETY RAZOR CARTRIDGE WITH PASS-THROUGH APERTURES AND PROCESS OF MAKING

**Kenneth J. Hegemann, 7301 E. Evans Rd., Scottsdale, Ariz. 85260**

**Filed Aug. 22, 1994, Ser. No. 293,552**
**Int. Cl.[6] B26B *21/18***
**U.S. Cl. 30—50** **13 Claims**



1. A shaving device comprising:
a) first and second razor blades in spaced-apart arrangement having elongated edges formed thereon for cutting and shaving whiskers and hair; and,
b) cartridge means for retaining said blades therein and presenting said cutting edges at an angle for shaving action against the skin, wherein said cartridge means includes a frontless and backlass hollow container defined by spaced-apart, elongated cap and base and spaced-apart, shorter side walls, said cap, said base and said walls joined together to form a rigid structure wherein said cap and base are further supported by at least one stub passing therebetween containing a monolithic spacer which is affixed to and is an integrally-formed part of said stub to provide additional support thereto and to said razor blades and to form a pass-through aperture between said blades allowing passage of shaved material away from said cutting edges to allow movement of said blade over the skin free of accumulations of cut material.

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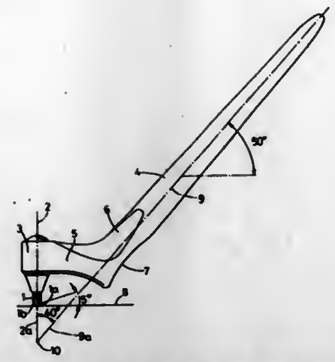
**5,501,015**

## HAND-HELD INSTRUMENT FOR CUTTING PAPER OR SIMILAR PLANAR SHEET MATERIAL

**Edward H. Harvey, 3 Church-End Cottages, Bletchingdon, Oxford, United Kingdom**

**Filed Apr. 17, 1995, Ser. No. 423,826**
**Claims priority, application United Kingdom, May 18, 1994, 94099363**
**Int. Cl.[6] B26B *3/08***
**U.S. Cl. 30—164.9** **15 Claims**

1. A hand-held instrument for cutting planar sheet material in a predetermined direction of cut, comprising:
(a) a cutter blade at least the cutting edge of which is formed from a hard wear resistant material,
(b) a head portion containing ball or roller bearing means in which said cutter blade is mounted so as to be freely rotatable about an axis,
(c) a neck portion integral with the head portion and extending substantially radially outwardly thereof,
(d) an elongate handle portion integral with the neck portion, the longitudinal axis of the handle portion extending at an angle of from 30 to 50 degrees with respect to the axis of rotation of the cutter blade,
(e) the instrument having a position of use in which the cutter blade is in contact with the upper surface of a horizontal planar sheet to be cut, the axis of rotation of the cutter blade is substantially vertical and the handle portion can be held in the manner of a pen,



(f) the axis of rotation of the cutter blade and the longitudinal axis of the handle portion, if said axes are extended, intersecting at a point below the lower surface of said horizontal planar sheet when the instrument is in said position of use,
(g) the cutter blade having a cutting edge which extends at an angle of from 10 to 20 degrees to said horizontal planar sheet when the instrument is in said position of use, and
(h) the cutting edge of the cutter blade terminating in a cutting tip which first contacts the planar sheet to be cut and which, when by manipulation of the handle portion the cutting blade is moved to cut the planer sheet, trails behind the rotational axis of the cutter blade by a distance of from 1 to 5 mm to properly align the cutter blade with the direction of cut.

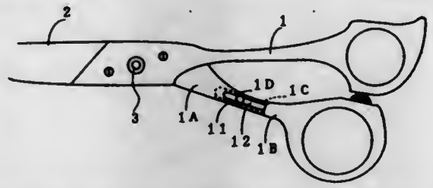
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**5,501,016**

## SCISSORS

**Takayoshi Kuribayashi, 5-9-14, Seijo, Setagaya-ku, Tokyo, Japan**

**Filed Nov. 2, 1994, Ser. No. 333,609**
**Int. Cl.[6] B26B *13/04***
**U.S. Cl. 30—260** **5 Claims**



1. A pair of blade replacement type scissors, comprising:
a first scissor part and a second scissor part, each scissor part having a grip portion connected to a separate blade portion, said grip portion having a shaft portion with an engaging groove with a cross section which is protrusion shaped, said blade portion having an insertion portion with a cross section which is protrusion shaped, said insertion portion being formed corresponding to said engaging groove, said insertion portion having a shaft hole in a center thereof, for mounting said first and second scissor parts on each other via a shaft, said insertion portion having bolt holes provided at opposite sides of said shaft hole for fastening said blade portion to said grip portion, said grip portion includes said shaft portion and a handle hole portion, adjustment means for changing a length of said grip portion including an arm end of said shaft portion, formed in a shape of a pipe, and an arm end of said handle hole portion formed with a small diameter portion for inserting said arm end of said handle hole portion into said pipe, a stopper screw provided on said small diameter portion, said stopper screw protruding through an elongated hole provided



extending through said shaft portion, said arm end of said handle hole portion being slidable within said pipe of said arm end of said shaft portion with said stopper screw extending through said elongated hole of said shaft portion for fixing said shaft portion to said handle hole portion.

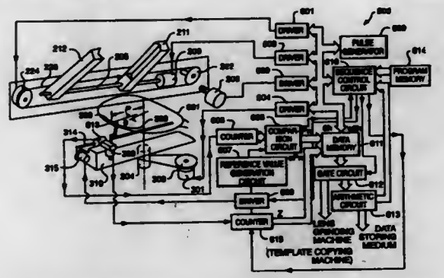
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**5,501,017**

## METHOD AND APPARATUS FOR MEASURING A FRAME CONFIGURATION

**Yasuo Suzuki, Tokyo, Japan, assignor to Kabushiki Kaisha Topcon, Tokyo, Japan**

**Filed Feb. 6, 1995, Ser. No. 384,006**
**Claims priority, application Japan, Feb. 7, 1994, 6-013748**
**Int. Cl.[6] G01B *7/28***
**U.S. Cl. 33—200** **4 Claims**



1. A method of measuring a frame configuration, comprising:
a first step of bringing a feeler as a measuring means into contact with a V-shaped groove of a lens frame of an eyeglass frame held by a frame holding means and moving said feeler along said V-shaped groove so as to obtain radius vector information ($_{o}\rho_{n}$, $_{o}\theta_{n}$) about said V-shaped groove in radial directions, obtain height data $Z_n$ in a direction of a Z-axis relative to said radius vector information ($_{o}\rho_{n}$, $_{o}\theta_{n}$), and obtain three-dimensional lens frame configuration information ($_{o}\rho_{n}$, $_{o}\theta_{n}$, $Z_n$);
a second step of calculating an angle θ of inclination of said lens frame from the maximum and minimum of said height data $Z_n$; and
a third step of, if said angle θ exceeds a given angle β, rotating and inclining said frame holding means so as to make said angle θ smaller than said given angle β and again obtaining height data $Z_n$ in said direction of the Z-axis relative to said radius vector information ($_{o}\rho_{n}$, $_{o}\theta_{n}$) and thereby obtaining new lens frame configuration information ($_{o}\rho_{n}'$, $_{o}\theta_{n}$, $Z_n$) in three dimensional directions.

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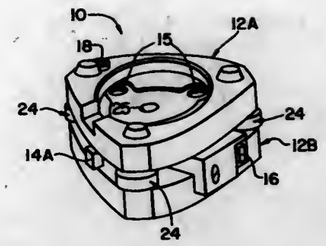
**5,501,018**

## TRIBRACH DEVICE

**Sonney J. Porter, 4604 E. 13th St., Cheyenne, Wyo. 82001**

**Filed Jul. 22, 1994, Ser. No. 279,742**
**Int. Cl.[6] G01C *5/00;15/00***
**U.S. Cl. 33—290** **7 Claims**

1. A tribrach device comprising:
(a) an upper body member including a plurality of apertures extending vertically therethrough; and wherein said upper body member also includes a light beam opening extending vertically therethrough;
(b) a lower body member attached to said upper body member; wherein said lower body member includes a light beam opening extending vertically therethrough;
(c) a locking ring disposed between said upper and lower body members; wherein said locking ring includes a plurality of outwardly-extending lugs corresponding to the number and position of said apertures; wherein said locking ring is pivotable in a manner such that said lugs move between a locking position and a retracted position; wherein when said locking ring moves toward said retracted position said lugs move away from said apertures, and when said locking ring moves toward said locking position said lugs move toward said apertures; and further including biasing means for biasing said locking ring toward said locking position; and



(d) a laser beam generator between said upper and lower body members for generating a visible light beam; and further including means for directing said light beam upwardly and downwardly along a vertical axis through said light beam openings in said upper body member and said lower body member.

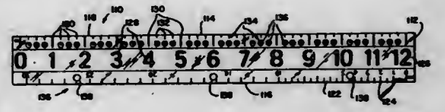
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**5,501,019**

## MEASURING AND DRAWING INSTRUMENT

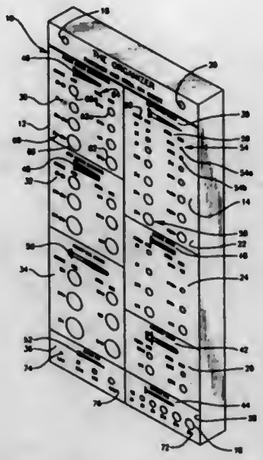
**Gabriel E. Concari, and Rhonda M. Westberg, both of Madison, Wis., assignors to Fiskars Inc., Wausau, Wis.**

**Division of Ser. No. 163,268, Dec. 6, 1993, Pat. No. 5,426,859.**
**This application Mar. 14, 1995, Ser. No. 403,395**
**Int. Cl.[6] G01B *3/04***
**U.S. Cl. 33—494** **11 Claims**



1. An instrument for measuring and for drawing straight lines, the instrument comprising an elongated plate having a first generally straight edge and a second generally straight edge opposite and parallel to the first edge, the instrument further comprising:
a first measurement region disposed along the first generally straight edge and including a first series of measurement marks separated by spaces along the first measurement region;
a second measurement region disposed along the second generally straight edge and including a second series of measurement marks different from the first series and separated by spaces along the second measurement region; and
a series of visual symbols disposed in linear arrangement along a single line in the first measurement region and cooperating with the first series of measurement marks to assist a user in measuring distances along the first edge, wherein the series of visual symbols comprises consecutive geometric shapes, each geometric shape having a portion appropriately shaded to visually signify its position along the first measurement region.

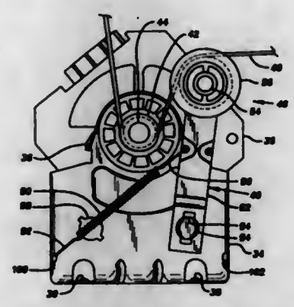
**5,501,020**
**FASTENER AND DRILL BIT GAUGE**
**Jack W. Welt, 9550 Mariner's Cove La., Fort Myers, Fla. 33919**
**Filed Mar. 8, 1995, Ser. No. 400,715**
**Int. Cl.[6] G01B 3/34**
**U.S. Cl. 33—555.2** **13 Claims**



1. A fastener and drill bit gauge comprising:
gauge element;
a first longitudinal series of holes with different respective diameters formed in said gauge element and arranged in order of progressively increasing diameter, each said hole in said first series having a diameter that corresponds to the diameter of a hole formed by a respective drill bit;
a second longitudinal series of holes with different respective diameters formed in said gauge element and arranged substantially parallel to said first series in a like order of progressively increasing diameter, each hole in said second series being transversely aligned with a corresponding hole in said first series and having a diameter that corresponds with the diameter of a respective self-tapping screw that is operably engagable with a drill bit hole having the diameter of said aligned hole in said first series, whereby one or more drill bit and self-tapping screws are engaged with at least some of said holes in said first and second series, respectively, to measure a selected sizes for one of self-tapping screw and a complementary drill bit and determine a corresponding size for the other of the self-tapping screw and the complementary drill bit;
a first series of indicia disposed on said gauge adjacent to each of said holes in said second series to indicate the diameter of the self-tapping screw that corresponds with each of said holes in said second series;
a third longitudinal series of holes with different respective diameters formed in said gauge element and arranged in order of progressively increasing diameter, each hole in said third series having a diameter that corresponds with the diameter of a respective anchor element that is operably engaged by a plurality of self-tapping screws with different respective diameters;
a second series of indicia disposed adjacent each said hole of said third series, which indicia designate the various respective diameters of the self-tapping screws that are operably engagable with each of said anchor elements;
a fourth longitudinal series of holes with different respective diameters formed in said gauge element and arranged substantially parallel to said third series in a like order of progressively increasing diameter, each hole in said fourth series being transversely aligned with a corresponding hole in said third series and having a diameter that corresponds with a diameter of a hole formed by a respective drill bit, whereby one or more anchor elements and drill bits are engaged with at least some of the holes in said third and fourth series, respectively, to measure a selected size for an anchor element and determine a corresponding size for a complementary drill bit.

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**5,501,021**
**COMMON IDLER STRAP FOR USE IN A CLOTHES DRYER**
**Kevin Torborg, Webster City, and Max Flachbach, Fort Dodge, both of Iowa, assignors to White Consolidated Industries, Inc., Cleveland, Ohio**
**Filed May 30, 1995, Ser. No. 453,231**
**Int. Cl.[6] F26B 17/00**
**U.S. Cl. 34—594** **20 Claims**



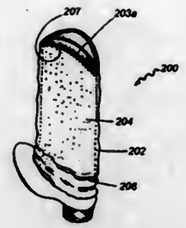
1. An idler device for maintaining tension on a belt driven by a rotating drive pulley of a motor, said idler device comprising:
a support bracket having a wall generally perpendicular to a rotational axis of said drive pulley and an opening in said wall;
an idler strap assembly including a strap having first and second end portions and a boss on said first end portion, said boss extending through said opening in said wall whereby said strap is rotatable about a central axis of said boss, and an idler pulley rotatingly mounted on said second end portion of said strap, said idler pulley having a rotational axis generally parallel with the rotational axis of the drive pulley; and
a spring element connected to said strap and biasing rotation of said strap in a direction toward the drive pulley with said idler pulley against the belt to tension the belt.

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**5,501,022**
**DECORATIVE BOOT**
**Dianne Cohn, 1315 SE. 1st St., Fort Lauderdale, Fla. 33301**
**Continuation of Ser. No. 733,865, Jul. 22, 1991, abandoned, which is a continuation-in-part of Ser. No. 437,095, Nov. 16, 1989, abandoned, which is a continuation-in-part of Ser. No. 308,538, Feb. 10, 1989, abandoned. This application Oct. 25, 1994, Ser. No. 328,510**
**Int. Cl.[6] A41D 17/00**
**U.S. Cl. 36—2.00 R** **3 Claims**

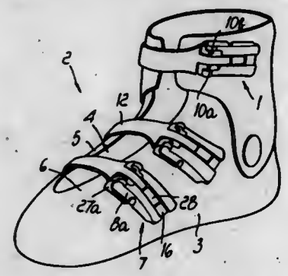
1. A readily removable integral flexible non-elastic decorative component having a fixed tubular shape and being essential non-stretchable transversely, adapted to surround and lie substantially smoothly on the surface of a dress boot; said component extending from the upper edge of the boot to the ankle portion of the boot, thus covering the leg portion but leaving the toe and heel portions exposed; said component comprising a leather exterior portion and an inner smooth lining attached thereto; said outer leather portion being longer than said lining and being stitched to the bottom edge of said lining so as to form a wrinkled portion adjacent the stitching.





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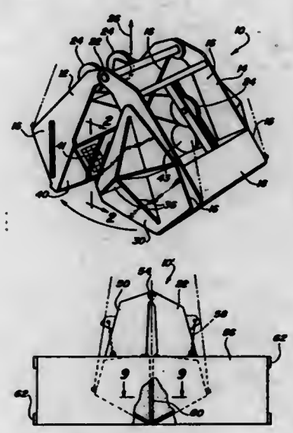
**5,501,023**
**SECURING DEVICE, PARTICULARLY FOR SPORTS SHOES**
**Onorio Miotto, Santo Stefano di Valdobbiadene, Italy, assignor to AM S.r.l., Monsigo di Moriago Della Battaglia, Italy**
**Filed Feb. 14, 1994, Ser. No. 195,105**
**Claims priority, application Italy, Apr. 15, 1993, TV93U0019**
**Int. Cl.[6] A43B 5/04**
**U.S. Cl. 36—50.5** **10 Claims**



1. A securing device for fastening sports shoe traction elements comprising;
a baseplate (17) having a longitudinal extension and connectable to a sports shoe;
a lever arm (7) connectable, at an intermediate portion thereof to a sports shoe traction element (12),
pivoting means (10*a*, 10*b*, 23*a*, 23*b*) at least temporarily pivotally connecting one end of said lever arm (7) to said baseplate (17);
safety connection means (14*a*, 14*b*, 15, 30*a*, 30*b*, 31) releasably connecting said lever arm (7) to said baseplate (17), at an opposite end of said lever arm (7) with respect to said pivoting means (10*a*, 10*b*, 23*a*, 23*b*), and;
means (8*a*, 8*b*, 28) for preventing lateral movement of said lever arm (7) with respect to said longitudinal extension of said baseplate (17), when said opposite end of said lever arm (7) is connected to said baseplate (17) by said safety connection means (14*a*, 14*b*, 30*a*, 30*b*),
wherein said pivoting means (10*a*, 10*b*, 23*a*, 23*b*) comprise pivots (10*a*, 10*b*) connected to said lever arm (7), and curved teeth (23*a*, 23*b*) connected to said baseplate (17), said curved teeth (23*a*, 23*b*) at least temporarily rotatably accommodating said pivots (10*a*, 10*b*).
wherein said lever arm (7) comprises a single substantially U-shaped body defining two wings (8*a*, 8*b*), wherein said pivots comprise two coaxially aligned substantially cylindrical pivots (10*a*, 10*b*), one of said cylindrical pivots being connected to each of said wings (8*a*, 8*b*),
wherein said curved teeth (23*a*, 23*b*) comprise a pair of curved teeth (23*a*, 23*b*) connected to said baseplate (17), said pair of curved teeth (23*a*, 23*b*) each defining a substantially S-shaped cross section, said securing device further comprising first inclined planes (24*a*, 24*b*) defined by said curved teeth (23*a*, 23*b*), and complementary shaped inclined planes (25*a*, 25*b*) defined on said lever arm (7) proximate to said two coaxially aligned substantially cylindrical pivots (10*a*, 10*b*), said first inclined planes (24*a*, 24*b*) being engagable in abutment engagement with said complementary shaped inclined planes (25*a*, 25*b*) when said opposite end of said lever arm (7) is connected to said baseplate (17) by said safety connection means (14*a*, 14*b*, 30*a*, 30*b* 31).

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**5,501,024**
**POWER BUCKET**
**Raymond C. Bergeron, 3452 W. Jefferson, Trenton, Mich. 48183**
**Filed May 17, 1994, Ser. No. 245,240**
**Int. Cl.[6] B66C 3/02**
**U.S. Cl. 37—184** **13 Claims**

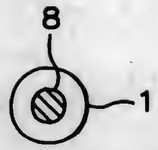


1. A bucket for a power shovel comprising:
a first bucket half and second bucket half, each bucket half having a pair of spaced sidewalls and an endwall exteading between said sidewalls which form a scoop,
means for pivotally securing said bucket halves together so that said scoops face each other, said bucket halves being moveable between an open position in which said scoops face each other and form a load carrying chamber,
a first swiper plate attached to one sidewall on each side of the bucket, a second swiper plate attached to the other sidewall on each side of the bucket, said first swiper plates being generally V-shaped and having an apex which extends toward said other sidewall, said second swiper plates being generally V-shaped and having an apex which extends toward said one sidewall, each said second swiper plate overlapping a portion of said first swiper plate and the other sidewall on its associated side of the bucket as said bucket halves pivot between a partially closed and a fully closed position.

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**5,501,025**
**RETAINING SLING SWIVELS**
**David A. Johnson, P.O. Box 12204, Salem, Oreg. 97309**
**Filed Nov. 1, 1994, Ser. No. 332,700**
**Int. Cl.[6] F41C 27/00**
**U.S. Cl. 42—85** **13 Claims**

1. An apparatus for engaging a sling swivel for a firearm comprising:
a) a closed narrow fabric loop;
b) an outer sliding piece with two holes through which opposite sides of said closed narrow fabric are held; and




c) an inner sliding piece with two holes through which opposite sides of said closed narrow fabric are held where said swivel is between said outer sliding piece and said inner sliding piece.

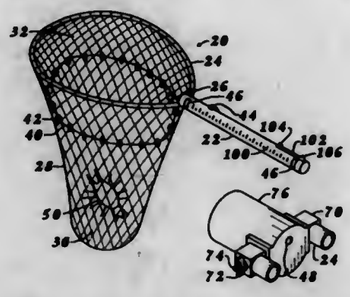
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**5,501,026**

## CLOSABLE NET FOR UNDERWATER OPERATION AND METHOD OF USE

Vincent C. Brynat, and Lauren S. Gregg, both of 3054 Oleander Dr., Lake Placid, Fla. 33852

Filed Jul. 22, 1994, Ser. No. 278,824
Int. Cl.[6] A01K 77/00
U.S. Cl. 43—12 18 Claims




1. A netting device suitable for hand-held operation underwater for trapping a crustacean, the netting device comprising;

a) a handle, the handle substantially hollow comprising a connection end, an entry point, an interior, an exterior, the entry point in close proximity to the connection end;

b) a hoop, the hoop having a hoop circumference, the hoop circumference defining an opening, the hoop attached to the connection end of the handle, the handle and the hoop having a point of connection;

c) a flexible net, the flexible net having a net circumference, a bunt, an open position, a closed position, the flexible net attached to the hoop and encircling the hoop circumference, the bunt defining a confinement area for the crustacean, the bunt extendable to one side of the opening of the hoop, the opening of the hoop being the only opening of the flexible net of sufficient size to permit passage of the crustacean between the confinement area and an outside area, the outside area being beyond the confinement area, the open position having the confinement area of the flexible net substantially open at the opening of the hoop, the closed position having the confinement area of the flexible net substantially closed at the opening of the hoop;

d) a draw apparatus, the draw apparatus secured to the flexible net and at least partially encircling the net circumference, the draw apparatus having a spacing, the spacing being the distance from, and relatively parallel to, the hoop, the spacing from the hoop sufficient to allow for collection of the draw apparatus to a central location, the central location relatively central within the opening of the hoop, the draw apparatus having an entry point, the entry point being in close proximity to the handle;

e) a draw line, the draw line having a first end, a second end, a retraction length, the first end inserted through the draw apparatus utilizing the entry point and extending through the draw apparatus at least partially around the net circumference, the second end inserted through the entry point in the handle, the draw line adaptable for retraction and expansion of the flexible net between the open position and the closed position, the retraction length being the amount of the draw line required to transfer the flexible net from the open position to the closed position;

f) retraction displacement means, the retraction displacement means to cause retraction of the retraction length of the draw line to within the handle to cause the draw apparatus, attached to the flexible net, to be collected to the central location within the opening of the hoop to cause the flexible net to be placed in the closed position;

g) locking means, the locking means to selectively restrict activation of the retraction displacement means;

h) a trigger mechanism, the trigger mechanism located at a predetermined position on the handle, the trigger mechanism to permit controlled release of the locking means to activate the retraction displacement means;

whereby the user would position the netting device to place the crustacean within the confinement area of the flexible net and operate the trigger mechanism to release the locking means to cause the retraction displacement means to cause the draw apparatus to place the flexible net in the closed position to trap the crustacean and prevent escape thereof.

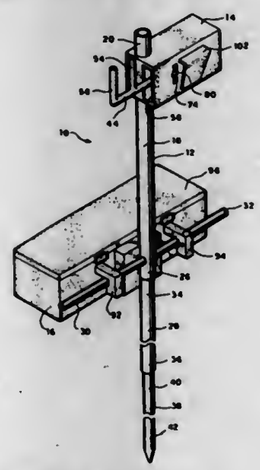
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**5,501,027**

## FISHING POLE ALERT DEVICE

Jody L. Acker, #8, 287 Hudson St., Cornwall On Hudson, N.Y. 12520

Filed Oct. 24, 1994, Ser. No. 330,816
Int. Cl.[6] A01K 85/01
U.S. Cl. 43—17 11 Claims




1. A fishing rod alert device comprising:

a stake for anchoring the fishing rod alert device to the ground, said stake having a top end and a bottom end;

an alert box fixed to said top end of said stake, said alert box having a top, a bottom, a front, a rear, a left side, and a right side;

a trip bar having an outside portion and an inside end portion, said trip bar being arranged to pivot about a shaft located within said alert box, said shaft passing through said trip bar between said outside portion and said inside end portion, and said outside portion being configured to support a fishing rod;

said shaft having a first end and a second end, said first end of said shaft slidably engaging a slot in said left side of said alert box, said second end of said shaft passing through a slot in said right side of said alert box, said slot in said right side of said alert box being aligned with said slot in said left side of said alert box, said second end of said shaft having threads that matingly engage internal threads provided in a knob, and said knob being frictionally engageable with the periphery of said slot in said right side of said alert box, whereby said shaft can be secured at a selected height above said bottom of said alert box; and

an alarm signal generator disposed within said alert box and being responsive to pivotal movement of said trip bar, whereby an alarm signal is generated when a fish striking a bait provided at the end of a line connected to a fishing rod supported by said trip bar, causes said trip bar to pivot about said shaft.



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**5,501,028**

## FISHING ROD HOLDER WITH BITE SIGNALING MEANS

Harold L. Hull, 401 Canyon Way #43, Sparks, Nev. 89434, and Daniel E. Webb, 1905 Citron St., Reno, Nev. 89512

Filed Feb. 17, 1995, Ser. No. 390,657
Int. Cl.[6] H01K 97/12
U.S. Cl. 43—17 4 Claims




1. A combination fishing rod holder and bite signaling means comprising; support means, said support means being substantially an elongated probe having a first and second end, said first end being capable of being forced into a supporting surface, a tubular cross member having a length longer than its girth, said tubular cross member being fixidly attached to said second end of said support means forming a T, a U-shaped member, said U-shaped member having substantially parallel legs, said legs having their distal ends spaced apart at a greater distance than said length of said cross member, said distal ends each having a bore substantially in alignment with said cross member, said bore being of a size substantially equal to an inside diameter of said cross member, a circular member substantially in the form of a flat washer having an outer circumference, said circular member having a bore of a size substantially equal to an inside diameter of said cross member, said circular member having multiple saw teeth on its said outer circumference, said circular member being fixidly attached to an outer surface of one of said parallel legs of said U-shaped member with its said bore in alignment with said bore of said U-shaped member, a mounting bolt, said mounting bolt being of a length to pivotably mount said U-shaped member with said circular member to said cross member, a substantially elongated rectangular support plate having a first and second end, said first end being fixidly attached to a common leg of said U-shaped member, said first end supporting an uprising fixidly attached to a fishing rod support mechanism, said mechanism comprising; two uprising fingers having first and second ends with said first ends being pivotably mounted to said first end of said support plate, a spring, said second ends being biased toward each other by said spring, said fingers having a first and second position, stop means to allow said fingers to assume said first position, said first position being closed to capture a rod portion of said fishing rod, said second position being open to allow said rod portion of said fishing rod to be released; a fishing rod handle support means, said support being fixidly attached to said second end of said support plate, said fishing rod handle support means releasably capturing a handle portion of said fishing rod, said support plate having an uprising portion on one of its elongated sides, said uprising portion having multiple recesses to accept a crank handle of said fishing rod, said probe supporting a ratcheting structure comprising; a horizontal support leg fixidly attached at one of its ends to said probe at a point below said circular member having saw teeth, said support leg supporting an L-shaped member having a short leg and a long leg pivotably mounted to the distal end of said support leg, said short leg being in communication with said saw teeth of said circular member, said long leg of said L-shaped member acting as a weight to keep said short leg of said L-shaped member in register with said saw teeth,

whereby;

when said fishing rod is placed in said fishing rod holder with the handle portion in said handle support means and said crank handle of said fishing rod is placed in one of said multiple recesses and said rod portion of said fishing rod is placed between said uprising fingers and said ratcheting structure is set into a position wherein said fishing rod is held in a plane more vertical than horizontal, and said probe is forced into said supporting surface in an upright position, when a fish bites and disturbs the fishing line of said fishing pole the tip of said fishing pole is pulled and said ratcheting structure ratchets one saw-tooth and said plane of said fishing rod assumes a more horizontal position to indicate a bite.

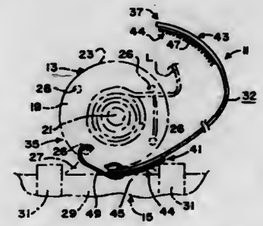
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**5,501,029**

## FISHING REEL COVER

Cecil G. McDaniel, Sr., Grenada, Miss., assignor to Tim McDaniel, and Robert D. Willis, both of Grenada, Miss.

Filed Apr. 25, 1994, Ser. No. 231,826
Int. Cl.[6] A01K 97/08
U.S. Cl. 43—26 11 Claims




5. In combination, a fishing rod, a fishing reel and a fishing reel cover;

said fishing reel including a first side member, a second side member, and a rotatable spool extending between said first and second side members;

each of said first and second side members having an outer perimeter wall;

said fishing reel cover including a flexible body member for extending around said outer perimeter walls of said first and second side members of said fishing reel and for covering said rotatable spool of said fishing reel;

said body member of said fishing reel cover including a first end portion for extending in one direction around said fishing reel, and includes a second end portion for extending in an opposite direction around said fishing reel;

said fishing reel cover including attachment means for removably attaching said first and second end portions to one another about said fishing reel;

said fishing reel including a mounting base shoe for securing to said fishing rod;

said first end portion of said body member of said fishing reel cover having a slot therein for receiving said mounting base shoe of said fishing reel when said body member extends around said fishing reel with said mounting base shoe of said fishing reel attached to said fishing rod;

said fishing reel including at least one cross bar member extending between said first and second side members thereof;

said fishing reel cover including at least one hook means attached to said first end portion of said body member of said fishing reel cover for attachment to said cross bar member of said fishing reel.

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**5,501,030**

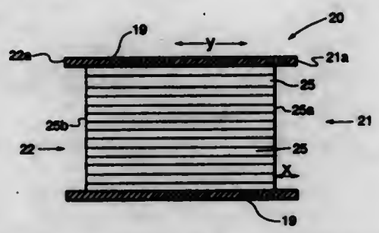
**FISHING HOOK HOLDER**

**Franklin C. Markle, Jr., 840 Birchrun Rd., Chester Springs, Pa. 19425**

**Filed Aug. 31, 1994, Ser. No. 299,155**

**Int. Cl.[6] A01K *97/06***

**U.S. Cl. 43—57.1** **3 Claims**




1. A holder device for snelled fish hooks, each fish hook having at least one point and a leader extending therefrom, said device comprising an outer, essentially tubular, structure having two outer open ends, each open end adaptable to receive one or more snelled fish hooks, said outer tubular structure having in its interior a plurality of essentially tubular, hollow inner members, each inner member having two open ends and each inner member being of a length less than the length of the outer tubular structure so that there is a cavity between each open end of each inner tubular member and the corresponding open end of the outer tubular structure, the depth of said cavity being the axial distance between the open end of each inner tubular member and the open end of the outer tubular structure to which it is in closest proximity, wherein the longitudinal axis of each of said inner tubular members extends substantially parallel to the longitudinal axis of the outer tubular structure, wherein each tubular member is sized to accommodate the leader of a snelled fish hook and each cavity is sufficiently sized to accommodate a snelled fish hook.

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**5,501,031**

**MOUSE TRAP**

**Joergen Hellesen, Tommerup, Denmark, assignor to Erik Molgaard, Svendborg, Denmark**

**PCT No. PCT/DK92/00294, § 371 Date Apr. 20, 1994, § 102(e) Date Apr. 20, 1994, PCT Pub. No. WO93/06722, PCT Pub. Date Apr. 15, 1993**

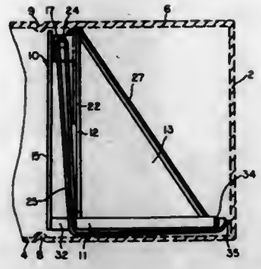
**PCT Filed Oct. 7, 1992, Ser. No. 211,582**

**Claims priority, application Denmark, Jan. 10, 1991, 1723/91**

**Int. Cl.[6] A01M *23/30***

**U.S. Cl. 43—78** **14 Claims**

1. A trap for animals such as mice and rodents comprising a frame, a spring-loaded, releasable displacement member supported by the frame, the frame having a frame opening for receiving a head of an animal, said frame having a front wall, in which the frame opening is placed and on the outside of which the displacement member is arranged so as to be displaceable transverse to the frame opening, said displacement member being spring-loaded by means of resilient bands fastened to the frame, cover parts protecting the resilient bands located on the front side of the front wall, the cover parts formed integral with the frame, a surrounding box within which the frame with the displacement member is placeable, the surrounding box having a closed rear wall, and a box opening, the frame opening facing the box opening, the displacement member (17) being connected to the frame (10) by means of a securing line (27) which is extended to be within reach of the animal in the frame (10) inside the frame opening (22).




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**5,501,032**

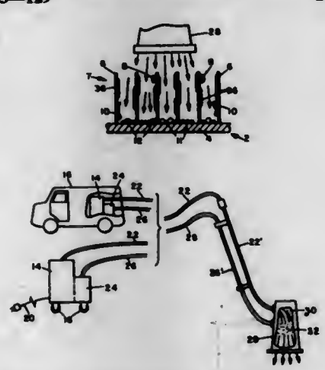
**EXTERMINATION OF PUPATING INSECTS**

**Judith L. Pitman, San Diego, Calif., assignor to FleaXperts, Inc., San Diego, Calif.**

**Filed May 31, 1994, Ser. No. 251,081**

**Int. Cl.[6] A01M *19/00***

**U.S. Cl. 43—129** **27 Claims**




21. Apparatus for extermination of pupating insects, including adult and emergent insects, larvae and eggs, which comprises:

a generator for providing hot water under pressure;

a mixer for mixing an insecticide combination comprising at least one adulticide and at least one larvacide into said hot water, said insecticide combination maintaining insecticidal properties during application and for a residual period of time thereafter;

an applicator for delivering said mixture of hot water and insecticide combination under pressure to an infestation location where said pupating insects, including pupal cocoons of said insects, are present;

a conduit for delivering said mixture of hot water and insecticide combination under pressure to said applicator; and

means for maintaining said delivery of said mixture of hot water and insecticide combination to said applicator and from applicator to said location for a period of time sufficient to deliver a quantity of said adulticide and said larvacide sufficient to kill those of said insects, eggs and larvae with which it comes in contact, both during said application and during said residual period of time; and create an environment around said cocoons of elevated ambient temperature, pressure and humidity, whereby pupation within said cocoons is induced to terminate, said cocoons are induced to open and metamorphosed insects are induced to emerge from said cocoons within a period of time less than said residual period of time, such that said emergent insects contact residual quantities of said adulticide and are killed.



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**5,501,033**

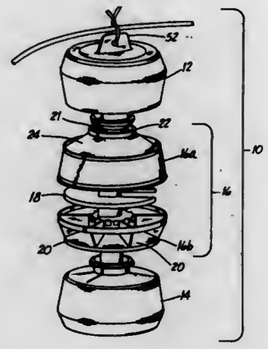
**TWO-STAGE LIQUID DELIVERY BAIT STATION**

**Mark E. Weller, Mt. Pleasant, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.**

**Filed May 2, 1994, Ser. No. 236,926**

**Int. Cl.[6] A01M *1/20***

**U.S. Cl. 43—131** **14 Claims**




1. A two-stage liquid bait-toxicant delivery station for the control of insects, the delivery station being capable of transforming from a preactivated configuration to an activated configuration and comprising:

a. a lower liquid reservoir for containing a first liquid;

b. an upper liquid reservoir for containing a second liquid;

c. an insect access and feeding portion located between the upper and lower liquid reservoirs, the insect access and feeding portion having an absorbent feeding pad located therein and insect access ports which allow insects to reach the absorbent feeding pad;

d. a fluid transfer system that does not communicate with the liquid reservoirs when the delivery station is in its preactivated configuration but that, when the delivery station is in its activated configuration, connects the upper liquid reservoir and the lower liquid reservoir with the insect access and feeding portion to allow liquid within the upper and the lower liquid reservoirs to reach the insect access and feeding portion upon activation of the delivery station; and

e. flow controlling means for controlling the flow into the fluid transfer system of the second liquid from the upper liquid reservoir so that initially the first liquid and subsequently the second liquid are delivered to the absorbent feeding pad, to sequentially expose the first and second liquids to insects feeding from the absorbent feeding pad.

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**5,501,034**

**DEVICE FOR DESTROYING INSECTS**

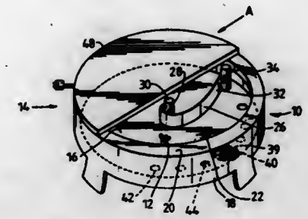
**Haim Hazan, 312/12 Zvi Borenstein Street, Yeruchaim, Israel**

**Filed Nov. 22, 1994, Ser. No. 345,762**

**Claims priority, application Israel, Nov. 23, 1993, 107721**

**Int. Cl.[6] A01M *1/20***

**U.S. Cl. 43—132.1** **13 Claims**




1. A device for destroying insects by mechanical impact, comprising:

a housing including a base member and a curved wall surrounding the base member and attached thereto, and a first segment of said base member being at least partially open and exposed to an area from which flies and other insects are to be attracted, and an aperture provided in said housing through which impacted insects are removed therefrom;

a lure for attracting insects associated with said first segment of said base member; a leaf spring having a first extremity which is attached near the centre of curvature of said curved wall, said spring being substantially straight at its second extremity, the second spring extremity being close to the inner surface of said curved wall; and

means for bend-loading said leaf spring and for suddenly releasing said second extremity, thereby causing said leaf spring to traverse said first segment at high velocity and to impact any insects present within said housing segment.

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**5,501,035**

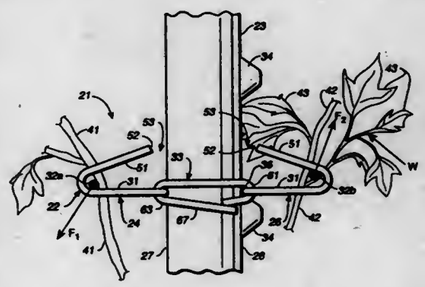
**TRELLIS WIRE SUPPORT ASSEMBLY**

**John S. Downer, Santa Rosa, and Paul A. Downer, Sebastopol, both of Calif., assignors to Vineyard Industry Products Co., Windsor, Calif.**

**Filed Dec. 8, 1993, Ser. No. 163,044**

**Int. Cl.[6] A01G *17/06;17/14***

**U.S. Cl. 47—47** **4 Claims**




1. In a trellis wire support assembly including a first wire member formed with a pair of arms dimensioned to extend outwardly of opposite outermost sides of a grape stake, said arms each including an outwardly-extending support arm portion for support of a trellis wire thereon and an inwardly-extending retention arm portion; and a second wire member formed for coupling to said

first wire member to secure said first wire member to said grape stake, the improvement in said trellis wire support assembly comprising:

said first wire member and said second wire member combining to encircle said grape stake, and said second wire member securing said first wire member to said grape stake with said arms in a substantially fixed angular position against rotation about a longitudinal axis of said grape stake and with substantially the entire length of each of said support arm portions and the entire length of each of said retention arm portions being located outwardly of said opposite outermost sides of said grape stake;

said retention arm portions each extending inwardly from said support arm portion toward said grape stake in a vertically-spaced relation with respect to said support arm portion over an inwardly-extending distance sufficient to retain said trellis wire between said support arm portion and said retention arm portion for both an upright and an inverted mounting orientation of said trellis wire support assembly on said grape stake; and

said retention arm portions each terminating in a distal end spaced outwardly from said opposite outermost sides of said grape stake to define a trellis wire-receiving opening with, and outwardly of, said opposite outermost sides of said grape stake.

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**5,501,036**

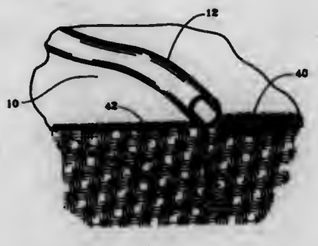
**EVEN-COIL EDGING FOR CARTONLESS PACKAGING**

**Clyde A. Torp, Jr., Naperville; Michael R. Hall, Aurora; Paul R. Miessler, Addison, and Michael R. Vogler, Aurora, all of Ill., assignors to Suncast Corporation, Batavia, Ill.**

**Filed Dec. 13, 1993, Ser. No. 165,949**

**Int. Cl.[6] A01G *1/00***

**U.S. Cl. 47—33** **10 Claims**




1. A grass edging device that is stored without external packaging and adapted for use adjacent borders of walks and plant beds comprising:

a length of flexible plastic material having a longitudinally extending upper body portion and a vertical barrier of nominal thickness depending therefrom, said vertical barrier having a blade extending perpendicular to a side surface of said barrier along a bottom portion thereof and a receptacle means disposed on an opposite side surface of said barrier for use when said device is placed into a coiled position whereby said grass edging device is stored without external packaging by securing said blade to said receptacle means, said blade and receptacle means available for anchoring said device to the earth in an uncoiled position.

**5,501,037**

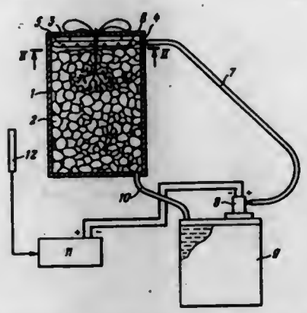
**HYDROPONICS PROCESS AND DEVICE**

**Anatoly S. Aldokimov; Ivan A. Aldokimov, and Vyacheslav A. Aldokimov, all of ulista Parkovaya, 95, kv. 209, Kramatorsk, Ukraine**

**Continuation of Ser. No. 85,161, Jul. 2, 1993, abandoned. This application Feb. 28, 1995, Ser. No. 400,261**

**Int. Cl.[6] A01G *31/00;31/02***

**U.S. Cl. 47—58** **4 Claims**




1. A process for hydroponic raising of plants in an enclosed vegetal vessel, comprising:

filling the said enclosed vegetal vessel with a substrate;

arrangement of seedling in said substrate within said enclosed vegetal vessel;

pressurized aerosol irrigation of the substrate surface with a nutrient solution from above said substrate surface; and

changing periodicity of said irrigation inversely with respect to ambient air temperature;

changing duration of said irrigation inversely with respect to ambient air temperature; and

wherein periodicity and duration of said irrigation are changed proportionstely with respect to one an other.

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**5,501,038**

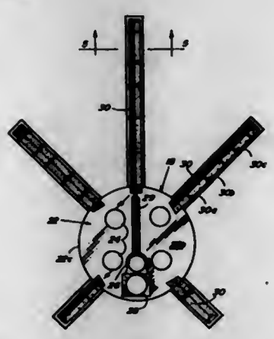
**PLANTED POT SELF-POSITIONING PLANT SUPPORT DEVICE**

**Antoine Gregoranto, 843, Thibaudeau, Ile Bizard (Québec), Canada**

**Filed Feb. 27, 1995, Ser. No. 395,236**

**Int. Cl.[6] A01G *9/12***

**U.S. Cl. 47—70** **10 Claims**




1. A self-positioning device for supporting in upstanding fashion inside a flower pot an elongated plant holder defining a lower end portion, said flower pot having a base wall, a side wall and a top mouth, said self-positioning device comprising:



(a) a generally flat base plate member defining a top face, adapted for spacedly laying next to said base wall of said flower pot, said base plate member being adapted to be embedded into a layer of earth;

(b) a first socket member integral with said base plate member, upwardly protruding from said top face and defining an open outer top free end, said first socket member adapted to receive said lower end portion of said elongated plant holder in said open outer top free end and to support said plant holder in upright position;

(c) a number of radial finger members, extending radially outwardly from said base plate member integrally thereof and substantially within the plane thereof, said finger members being cross-sectionally V-shaped, with the apices thereof being downwardly directed, for direct engagement against said flower pot base wall; and

(d) means for adjusting the length of each said finger member;

wherein said self-positioning device is adaptable to any one of flower pots of different sizes and shapes and wherein said self-positioning device enables selective positioning of said first socket member within said flower pot to accommodate any one of a variety of plant foliage configurations.

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**5,501,039**

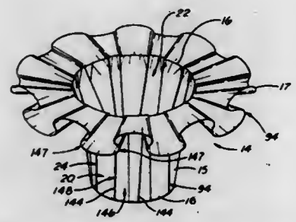
**METHOD OF FORMING A FLOWER POT OR FLOWER POT COVER WITH CONTROLLED PLEATS**

**Donald E. Weder; Joseph G. Straeter, both of Highland, Ill., and Frank J. Craig, Valley Park, Mo., assignors to Highland Supply Corporation, Highland, Ill.**

**Continuation of Ser. No. 54,929, Apr. 28, 1993, which is a division of Ser. No. 737,752, Jul. 30, 1991, Pat. No. 5,228,934, which is a division of Ser. No. 422,653, Oct. 17, 1989, Pat. No. 5,073,161, which is a continuation-in-part of Ser. No. 366,588, Jun. 15, 1989, Pat. No. 5,111,613, Ser. No. 397,114, Aug. 22, 1989, Pat. No. 5,029,412, Ser. No. 367,098, Jun. 15, 1989, Pat. No. Des. 318,030, and Ser. No. 219,083, Jul. 13, 1988, Pat. No. 4,897,031, which is a continuation of Ser. No. 4,275, Jan. 5, 1987, Pat. No. 4,773,182, which is a continuation of Ser. No. 613,080, May 22, 1984, abandoned. This application Jul. 26, 1994, Ser. No. 280,407**

**Int. Cl.[6] A01G *9/02***

**U.S. Cl. 47—72** **1 Claim**




1. An article for covering a flower pot, comprising:

a base formed into a predetermined shape having a closed lower end, an open upper end, and an object opening dimensioned to receive the flower pot, the base formed of a flexible sheet of material and having a plurality of pleats spaced circumferentially about the base formed by overlapping portions of the sheet of material, each of the pleats extending from the upper end to the lower end and each pleat having a predetermined shape which is reversely shaped relative to the adjacent pleats in the base such that the base is provided with alternating reversely shaped pleats, the sheet of material having an upper surface and a lower surface with at least one of the upper surface and the lower surface being a bondably connectable surface such that the overlapping portions of one of the upper surface and the lower surface are bondingly connected to retain the base in the predetermined shape; and

a skirt extending from the open upper end of the base, the skirt having a plurality of pleats spaced circumferentially about the skirt formed by overlapping portions of the skirt, each pleat having a predetermined shape which is reversely shaped relative to the adjacent pleats in the skirt such that the skirt is provided with alternating reversely shaped pleats, each of the pleats in the skirt are aligned with a corresponding one of the pleats in the base and the overlapping portions of the skirt are substantially unconnected to one another.

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**5,501,040**

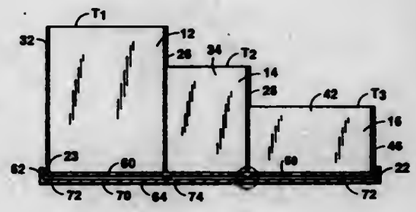
**TERRACED PLANTER**

**Kimberly L. White-Wexler, and Richard T. Wexler, both of 590 Berkley St., Berkley, Mass. 02779**

**Continuation of Ser. No. 107,514, Aug. 17, 1993, Pat. No. 5,449,940. This application Nov. 29, 1994, Ser. No. 345,995**

**Int. Cl.[6] A01G *25/00***

**U.S. Cl. 47—82** **11 Claims**




1. A portable and decorative planter for holding an arrangement of plants comprising:

a housing having a plurality of compartments defined by a plurality of partition walls intersecting a bottom wall, each said compartment being adapted to hold soil for growing one or more plants having similar soil and watering needs, said bottom wall having a descending rib extending about the perimeter of said bottom wall and a plurality of cross-ribs, each disposed beneath a respective partition wall;

a drip pan disposed under said housing for collecting water drained from the soil of each said compartment; and

drainage means associated with each said compartment for allowing the soil drainage water to exit each said compartment and enter said drip pan.

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**5,501,041**

**WINDOW GUARD FOR CATS**

**Kyra Fischbeck, and John P. Boyle, both of 446 E. 76 St. (4C), New York, N.Y. 10021**

**Filed Aug. 29, 1994, Ser. No. 297,036**

**Int. Cl.[6] E06B *7/00***

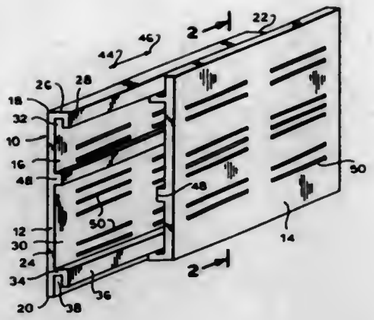
**U.S. Cl. 49—55** **5 Claims**

1. A window guard for cats comprising:

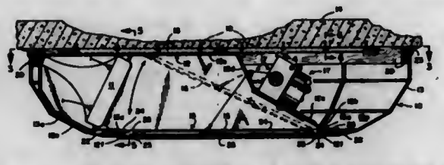
a first panel, and

an identical second panel, with said first panel and said second panel each having an upper edge and a lower edge,

first sliding connection means mounted proximate to said upper edges and second sliding connection means mounted proximate to said lower edge of said first and said second panels with said sliding connection means maintaining a sliding relationship between said first and said second panels, in which said sliding connection means each include identical horizontal flanges and identical vertical flanges and in which said first and said second panels each have a longitudinal dimension and a lateral dimension.



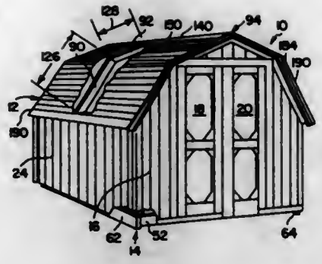
5,501,042
**BELOW-THE-CEILING MOUNTING FOR A TELEVISION RECEIVING SET OR A VIDEO PROJECTOR**
Keith I. Gustaveson, and Elsie E. Gustaveson, both of 1558 Palo Verde Way #22, Salt Lake City, Utah 84121
Filed Aug. 12, 1994, Ser. No. 289,705
Int. Cl.[6] A47B 81/06
U.S. Cl. 52—39 12 Claims



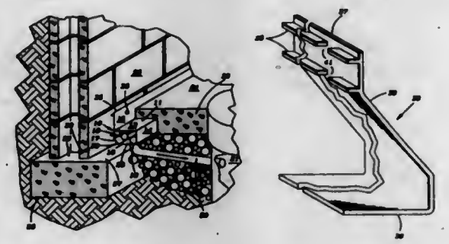
1. A below-the-ceiling mounting for a television receiving set or a video projector, comprising two shells of structural sheet material fastened together to cooperatively provide a visually unitary housing to fit against and suspend from the ceiling of a room or other viewing area in downwardly protruding orientation relative to said ceiling, one of said shells being within the other as an inner shell and having means for receiving, internally thereof, a television receiving set or a video projector in downwardly slanting orientation toward a viewing or projecting opening in the bottom of said housing; a door mounted to hinge in said housing for lifting and lowering to open and close, respectively, said opening; powered means within said housing for lifting and lowering said door under control from outside said housing; and the other of said shells covering said one shell and said powered means as an outer shell to provide visual compatibility between said housing protruding below the ceiling and the ceiling as a whole.

5,501,043
**YARD BARN WITH VINYL ROOF**
Owen H. Park, Carmel, Ind., assignor to Heartland Indusgries, Inc., Carmel, Ind.
Filed Sep. 14, 1993, Ser. No. 121,269
Int. Cl.[6] E04B 7/04;5/14
U.S. Cl. 52—92.1 20 Claims

1. A yard building having side walls comprising side paneling, studs and a top plate, and a longitudinal axis, the building comprising:
a floor structure coupled to the side walls,
a plurality of rafters coupled to the side walls and to each other to provide a roof structure,
a plurality of similarly shaped longitudinally extending vinyl sheets attached directly to the rafters of the roof structure, each sheet having an upper longitudinal edge and a lower longitudinal edge, each lower longitudinal edge including means for engaging the upper longitudinal edge of an adjacent sheet, the top plates attached to the rafters and means for attaching a lower longitudinal edge of a first vinyl sheet of the plurality of vinyl sheets to the roof structure, the attaching means being coupled to the top plate and overhanging at least a portion of the side wall and wherein the engaging means of the lower longitudinal edge of the first vinyl sheet encircles a portion of the attaching means.



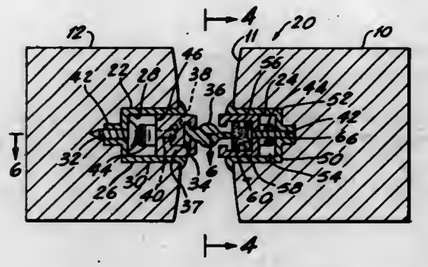
5,501,044
**SUB-FLOOR DRAIN CONDUIT FOR WATER-CONTROL SYSTEMS**
Lawrence M. Janesky, 11 Fawn Meadow La., Huntington, Conn. 06484
Filed Aug. 31, 1994, Ser. No. 298,937
Int. Cl.[6] E04B 1/70; E02D 19/00
U.S. Cl. 52—169.5 14 Claims



1. An elongate water-conveying drainage conduit element designed to be installed in a subterranean room having an outer peripheral wall having a base supported on a footing and having a floor with outer peripheral edges which extend to the base of said wall and cover said footing, said drainage conduit element being designed to be substantially covered by the peripheral edges of said floor of said room, to receive groundwater admitted at said base and through areas of said wall above said base and to convey said groundwater to a remote drain, said drainage conduit element comprising a vertical upper wall portion which is designed to extend above the surface of said floor, adjacent the wall of said room, said vertical upper wall portion having a rear surface comprising uniform spacer means for engagement with the wall of said room to space the rear surface of the vertical upper wall portion from the wall of said room and provide therebetween a narrow drainage space to admit water flowing down the wall of said room, said vertical wall portion extending downwardly and outwardly, away from the vertical, to a horizontal base wall portion designed to engage the wall footing and support the conduit element thereon, said vertical and horizontal wall portions enclosing an elongate conduit section which is open to the admission of groundwater to convey said water peripherally through said drainage conduit element to one or more remote drains.

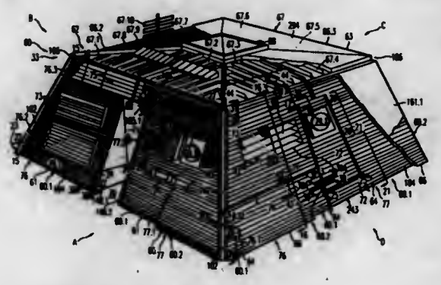


5,501,045
**INTUMESCENT DOOR SEAL**
Elias Wexler, Scarsdale, N.Y., assignor to Zero International Inc., Bronx, N.Y.
Filed Aug. 19, 1994, Ser. No. 292,197
Int. Cl.[6] E04C 2/00
U.S. Cl. 52—232 10 Claims



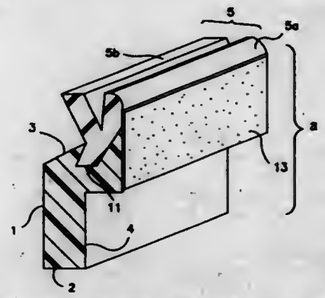
1. An intumescent seal comprising, a first housing having a first outwardly opening channel formed therein, a second housing adjustably and movably mounted in said first outwardly opening channel of the first housing, said second housing having an outwardly opening channel formed therein and said outwardly opening channel of the second housing being substantially filled with an intumescent material.

5,501,046
**BUILDING**
Lukas M. Hattingh, Transvaal, and Marthinus G. Kruger, Pretoria, both of, South Africa, assignors to ECO Innovations Ltd., Road Town, Virgin Islands (Br.)
Filed Jul. 7, 1993, Ser. No. 87,068
Claims priority, application South Africa, Jul. 8, 1992, 92/0101
Int. Cl.[6] E04B 1/343
U.S. Cl. 52—266 24 Claims



1. A building which includes:
a roof;
a first set of at least four trapezoidal shaped walls each wall in the form of a wall panel each wall panel comprising;
a left side edge;
a right side edge which is opposite the left side edge the left and right side edges extending between the ground and the roof;
a bottom edge at the ground and extending between the left and right side edges; and
a top edge at the roof the top edge opposite and generally parallel to the bottom edge and extending between the left side and right side edges, with the left side edge of one wall panel adjacent and attached to the right side edge of one other wall panel, all the wall panels arranged in this manner so that the wall panels lean towards one another and towards the inside of the building; and
an opening provided in any one of the wall panels which opening can give access to the inside of the building.

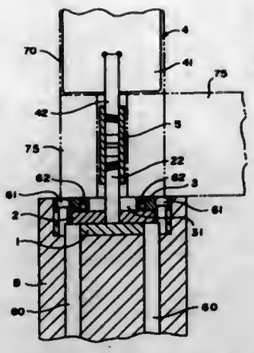
5,501,047
**SECUREMENT PROFILE FOR WALL COVERING WITH INVISIBLE MOUNTING**
Gerard Delaunay, Bergemoen, and Francois X. Isaia, Olette, both of, France, assignors to Profilix, Olette, France
PCT No. PCT/FR92/00284, § 371 Date Dec. 15, 1993, § 102(e) Date Dec. 15, 1993, PCT Pub. No. WO92/18722, PCT Pub. Date Oct. 29, 1992
PCT Filed Mar. 30, 1992, Ser. No. 133,161
Claims priority, application France, Apr. 15, 1991, 91 04572; Jan. 21, 1991, 91 12951
Int. Cl.[6] A47H 23/00
U.S. Cl. 52—273 4 Claims



1. A device for securement of a wall covering, the device comprising a profile having a rear bearing surface having an upper end terminating in a tapered edge, an opposite surface substantially parallel to the rear bearing surface, said tapered edge including a groove and terminating at an acute angle defining an upper edge of the opposite surface, and a flexible strip mounted within said groove and having two diverging spaced lips extending away from said tapered edge, said two diverging spaced lips having distal ends lying in a plane which is perpendicular to the rear bearing surface of the profile, the tapered edge and flexible strip forming a recess for receiving an edge of the covering.

5,501,048
**STRUCTURAL JOINT AND CONNECTOR**
Teruo Nakanishi, Kyoto, Japan, assignor to Nakanishi Construction Company, Japan
Filed Sep. 30, 1994, Ser. No. 312,966
Int. Cl.[6] E02D 27/00
U.S. Cl. 52—296 12 Claims

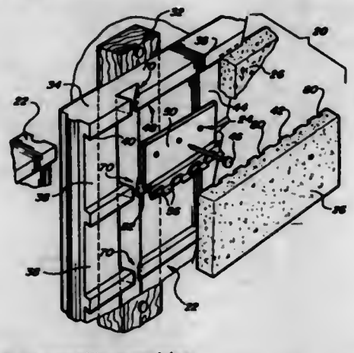
1. A structural joint connector for connecting a post to a foundation wall, said structural joint connector comprising:
a lower plate to be connected to the foundation wall;
a middle plate positioned above said lower plate, said middle plate including a plate portion and a threaded bolt portion extending upwardly from said plate portion;
an upper plate with a center opening for receiving and accommodating free lateral movement of said threaded bolt portion of said middle plate, said upper plate is connected to said lower plate when the structural joint is assembled providing a space that is sufficient to receive and accommodate free lateral movement of said middle plate between said upper plate and said lower plate;
a metal connector to be connected to the lower end of the post, said metal connector including a flat plate portion and a threaded bolt portion extending downwardly from said flat plate portion; and



a threaded connector for connecting said threaded bolt portion of said middle plate with said threaded bolt portion of said metal connector.

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**5,501,049**
**THIN BRICK PANEL ASSEMBLY**
**Steven R. Francis, 6824 Deerhill Dr., Clarkston, Mich. 48346; Gerald T. Francis, 5744 Covell, Brighton, Mich. 48116; Robert G. Francis, 20994 W. Farm Ln., Northville, Mich. 48167, and Gregory J. Francis, 19354 Wakenden, Redford, Mich. 48240**
**Continuation-in-part of Ser. No. 952,821, Sep. 28, 1992, Pat. No. 5,373,676. This application Feb. 22, 1994, Ser. No. 199,615**
**Int. Cl.[6] E04B *1/20***
**U.S. Cl. 52—367** **20 Claims**



1. A brick assembly comprising:

a plurality of generally rectangular-shaped, thin brick tiles having a width, length, and depth defining a top, bottom, and sides;

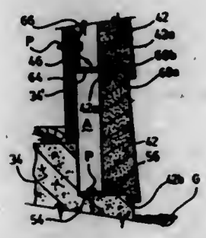
a backing member having a plurality of generally parallel longitudinally extending channels defined by a plurality of generally parallel longitudinally extending retaining bars, said retaining bars being laterally spaced from one another, with a lateral space between adjacent bars being less than the width of said thin brick tiles such that said retaining bars engage said sides of said thin brick tiles along the length of said thin brick tiles to retain a plurality of said thin brick tiles within said channels, said bars having a top and sides, said sides of said bars defining the walls of said channels and engaging said sides of said thin brick files;

a plurality of mortar locks formed in said bars, said mortar locks being defined by notches intermittently formed in said retaining bars, said notches having an inverted generally V-shape when viewed from either side of said retaining bars, said V-shape being defined by opposed lateral walls angled with respect to one another; and

a quantity of mortar adhered between adjacent tiles at least along said bars with said mortar engaging said lateral walls to interlock said mortar within said notches in a generally dovetail engagement.

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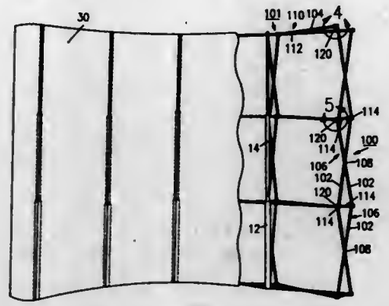
**5,501,050**
**SHINGLED TILE BLOCK SIDING FACADE FOR BUILDINGS**
**Raymond Ruel, 54, Mgr. Bourget, Lévis, Québec, Canada**
**Continuation-in-part of Ser. No. 136,943, Oct. 18, 1993, abandoned. This application Jul. 7, 1995, Ser. No. 499,463**
**Int. Cl.[6] E04B *2/32***
**U.S. Cl. 52—513** **1 Claim**



1. A building comprising a building wall, a footing protruding from said building wall and a facade consisting of several tile blocks arranged in vertically superposed horizontal courses at a predetermined distance from said building wall, the blocks of the lowermost course directly supported by said footing, the blocks of an underlying course directly supporting the blocks of an overlying course, each tile block made of solid material and having a flat top edge face, a bottom edge face parallel to said top edge face, a pair of flat parallel side edge faces normal to said top and bottom edge faces, a flat exterior face and a flat interior face, said interior face normal to said edge faces, said exterior face downwardly diverging relative to said interior face, a lip downwardly protruding from said bottom edge face and forming a lower extension of said exterior face, each tile block further having a peripheral, continuous groove formed in said top, bottom and side edge faces, said groove coplanar with said interior face and nearer said interior face than said exterior face, said bottom edge face defining an external, flat, bottom edge face portion extending from said lip to said groove and an internal, flat, bottom edge face portion extending from said groove to said interior face and recessed relative to said external bottom edge face portion, the lips of the tile blocks of an overlying course forming a shingle lap with the tile blocks of an underlying course, the tile blocks of the lowermost course resting directly on said footing by direct supporting engagement of their external bottom edge face portion with said footing and with their lip forming a shingle lap with said footing, the external bottom edge face portion of the tile blocks of said courses except said lowermost course resting directly on the top edge face of the tile blocks of an underlying course, the internal bottom edge face portions of the tile blocks of all said courses defining a clip passage with said footing and with the top edge face of the tile blocks of an underlying course, and clips to secure said facade in front of said building wall, each clip having a web normal to said building wall and freely extending through one of said passages and an inturned flange freely engaging said groove of said top and bottom edge faces and further including flat strips engaging said grooves at said side edge faces of two adjacent tile blocks of the same course, said clips and flat strips maintaining said facade at a set distance from said building wall without supporting the load of said blocks, said load being entirely supported by said footing.



**5,501,051**
**PORTABLE DISPLAY FRAME WITH TELESCOPING SUPPORT BARS**
**Jeffrey Harlan, Alta Loma, Calif., assignor to Professional Displays, Inc., Covina, Calif.**
**Filed Jun. 20, 1994, Ser. No. 262,996**
**Int. Cl.[6] E04H *12/18***
**U.S. Cl. 52—646** **20 Claims**



16. A display board combination comprising a support frame having a plurality of spaced-apart hubs disposed in two vertical rows, a pair of spaced-apart, vertically disposed support devices attached to the support frame and a display board attached to the support devices, wherein each support device comprises:

(a) an elongate first bar having a proximal end, a distal end, a forward wall with a flat outer surface and a thickness t, a pair of opposing sidewalls, and a lip disposed on the proximal end;

(b) an elongate second bar configured and dimensioned to be slidably disposed and retained within the first bar, the second bar having a proximal end, a distal end, a forward wall with a flat outer surface and a thickness u, a pair of opposing side walls and a lip disposed on the proximal end of the second bar;

(c) a first connection piece attached to the distal end of the second bar comprising:

(i) a forward moiety affixed to the distal end of the second bar and a rearward moiety displaceably attached to the rearward moiety, the forward moiety having a first forward surface section disposed flush with the outer surface of the forward wall of the second bar and a second forward surface section disposed distal to the first forward surface section and in a parallel plane with that of the first forward surface section but recessed therefrom by a distance substantially equal to t;

(ii) a spring disposed between the forward and rearward moieties and configured and dimensioned to urge the forward moiety away from the rearward moiety; and

(iii) a catch disposed on the second forward surface section, the catch being configured and dimensioned to (I) engage the lip on the proximal end of the first bar when the device is telescopically expanded, and (II) not engage the lip on the proximal end of the first bar when the device is telescopically contracted;

so that the second bar can be telescopically expanded out of the first bar in such a way that the outer surface of the forward wall in the first bar is flush with both the first forward surface section of the first connection piece and the forward wall in the outer surface of the second bar; and

so that the second bar can be telescopically contracted into the first bar by depressing the forward moiety of the first connection piece against the force exerted by the spring and then sliding the first connection piece and the second bar into the first bar;

(d) an elongate third bar configured and dimensioned to be slidably disposed and retained within the second bar, the third bar having a proximal end, a distal end, a forward wall with a flat outer surface, and a pair of opposing side walls;

(e) a second connection piece attached to the distal end of the third bar comprising:

(i) a forward moiety affixed to the distal end of the third bar and a rearward moiety displaceably attached to the rearward moiety of the second connection piece, the forward moiety of the second connection piece having a first forward surface section disposed flush with the outer surface of the forward wall of the third bar and a second forward surface section disposed distal to the first forward surface section of the second connection piece and in a parallel plane with that of the first forward surface section of the second connection piece but recessed therefrom by a distance substantially equal to u;

(ii) a spring disposed between the forward and rearward moieties of the second connection piece and configured and dimensioned to urge the forward moiety of the second connection piece away from the rearward moiety of the second connection piece; and

(iii) a catch disposed on the second forward surface section of the second connection piece and being configured and dimensioned to (I) engage the lip on the proximal end of the second bar when the device is telescopically expanded, and (II) not engage the lip on the proximal end of the second bar when the device is telescopically contracted;

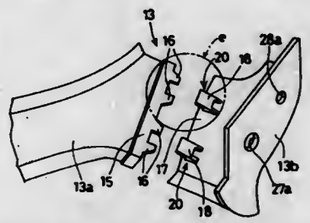
so that the third bar can be telescopically expanded out of the second bar in such a way that the outer surface of the forward wall in the second bar is flush with both the first forward surface section of the second connection piece and the outer surface of the forward wall in the third bar; and

so that the third bar can be telescopically contracted into the second bar by depressing the forward moiety of the second connection piece against the force exerted by the spring in the second connection piece and then sliding the second connection piece and the third bar into the second bar; and

(f) a plurality of frame attachment components affixed spaced apart along the support device, each of the frame attachment components being slidably engaged to a corresponding hub on the support frame.

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**5,501,052**
**TRIM MOUNTING STRUCTURE**
**Tomohide Saji, Hamamatsu, Japan, assignor to Suzuki Motor Corporation, Shizuoka, Japan**
**Filed Jun. 17, 1994, Ser. No. 261,736**
**Claims priority, application Japan, Sep. 30, 1993, 5-244135**
**Int. Cl.[6] B60R *13/02***
**U.S. Cl. 52—716.5** **5 Claims**

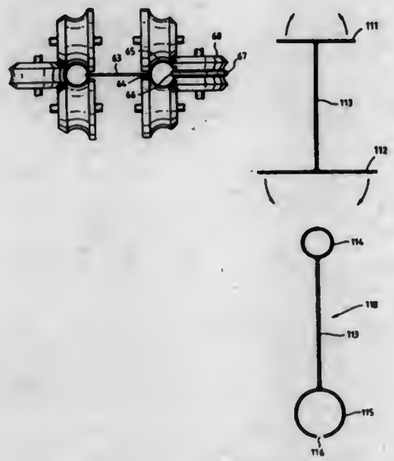


1. A T-bar roof trim mounting structure connecting first and second pillar trims of a T-bar roof on a vehicle body, one of said first and second trims covering a mounting of the T-bar roof on the vehicle body, said mounting structure comprising a claw-shaped protrusion installed at an edge of the first trim so that a forked portion is formed between the edge of said first trim and said claw-shaped protrusion, a plurality of protrusions are formed at an edge of the second trim, and these trims are installed to the vehicle body in a condition where relative positioning between said trims is performed by inserting the edge of the second trim into said forked portion of the first trim and abutting sides of said claw-shaped protrusion against said protrusions, said forked portion

being V-shaped in cross-section to facilitate easy engagement between said first and second trims.

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**5,501,053**
**INTERENGAGEABLE STRUCTURAL MEMBERS**
**Leslie D. Goleby, Acicia Ridge, Australia, assignor to Tube Technology Pty., Ltd., Australia**
**PCT No. PCT/AU91/00441, § 371 Date Mar. 26, 1993, § 102(e) Date Mar. 26, 1993, PCT Pub. No. WO92/05893, PCT Pub. Date Apr. 16, 1992**
**PCT Filed Sep. 25, 1991, Ser. No. 30,207**
**Claims priority, application Australia, Sep. 28, 1990, PK2530**
**Int. Cl.[6] E04C *3/32*; B23P *17/00***
**U.S. Cl. 52—729.5** **19 Claims**

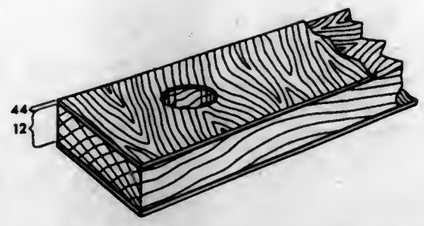


1. A method for the manufacture of structural members adapted for telescopic edge to edge engagement with a like structural member, said method comprising the steps of:
cold roll forming a structural member having an intermediate web member and opposed closed hollow side flanges extending along opposite sides of said web, said hollow side flanges being closed by welding the free edges thereof to respective junctions between the intermediate web and the hollow flanges; and
forming a slotted aperture in at least one of said hollow side flanges, said slotted aperture extending between opposed ends of said hollow side flange parallel to said intermediate web.

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**5,501,054**
**BOLTED WOOD CONNECTIONS**
**Lawrence A. Soltis, Mt. Horeb, and Robert J. Ross, Madison, both of Wis., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.**
**Filed Mar. 1, 1994, Ser. No. 204,114**
**Int. Cl.[6] E04C *3/42***
**U.S. Cl. 52—730.7** **11 Claims**

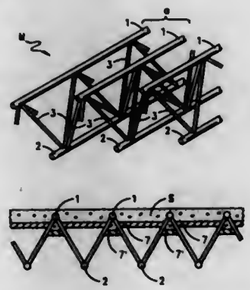
1. A structural member, comprising:
a. a wooden beam having grain directed along a length of said beam between ends, the beam having opposing faces generally parallel to the grain, at least one end having an aperture which extends between the opposing faces, the aperture suitable for receiving a connector; and



b. a ductile fiber reinforcing material bonded to at least one opposing face only adjacent to said aperture, a majority of fibers of the fiber reinforcing material directed across the grain.

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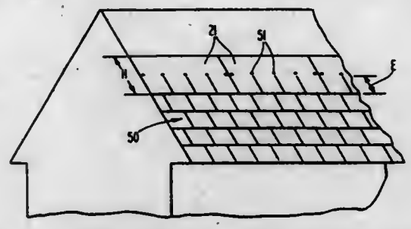
**5,501,055**
**METHOD FOR REINFORCED CONCRETE CONSTRUCTION**
**Herman Storch, Paraguay 2957-9E, 1425 Buenos Aires, Argentina, and Ernesto E. Storch, Granadilla 28-2C, 28220 Majahahonda, Madrid, Spain**
**Filed Dec. 6, 1993, Ser. No. 163,046**
**Claims priority, application Spain, Dec. 18, 1992, 9202572**
**Int. Cl.[6] E04C *1/00*; B32B *5/18***
**U.S. Cl. 52—741.1** **11 Claims**



1. A method of reinforced concrete construction, comprising the steps of:
providing a reticulated net including:
a first plurality of evenly spaced parallel coplanar rods forming an upper rim;
a second plurality of evenly spaced parallel coplanar rods forming a lower rim;
said rods in said upper rim laterally offset relative to said rods in said lower rim; and
a pair of connecting rods each having a triangular waveform configuration connecting each of said rods in said upper rim, excepting two laterally outermost rods of said upper rim, to an adjacent pair of said rods in said lower rim forming an integral reticulated net having a triangular waveform configuration and possessing alternately upwardly and downwardly opening V-shaped openings, said connecting rods disposed in planes obliquely intersecting planes of said upper and lower rims;
placing a first plurality of elongated individual rectangular permanent forms within said upwardly opening V-shaped openings between rods in said upper rim of said net;
placing a second plurality of elongated individual rectangular permanent forms within said downwardly opening V-shaped openings between rods in said lower rim of said net; and
pouring concrete at least partially over said net to form a reinforced concrete structure.



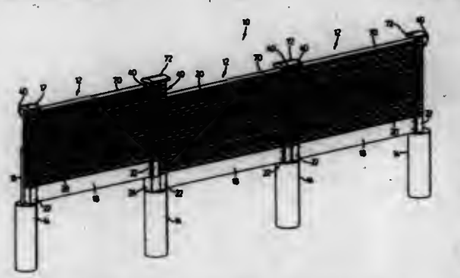
**5,501,056**
**PROCESS FOR ROOFING WITH AN 18 INCH SHINGLE**
**Marcia G. Hannah, Wayne; George W. Mehrer, Jenkintown; Michael J. Noone, Wayne; Kermit E. Stahl, North Wales, and Joseph Quaranta, Yardley, all of Pa., assignors to CertainTeed Corporation, Valley Forge, Pa.**
**Division of Ser. No. 94,243, Jul. 19, 1993, Pat. No. 5,375,491, which is a division of Ser. No. 682,611, Apr. 9, 1991, Pat. No. 5,287,669, which is a continuation-in-part of Ser. No. 515,601, Apr. 27, 1990, Pat. No. 5,181,361. This application Nov. 2, 1994, Ser. No. 333,278**
**Int. Cl.[6] E04D *1/22***
**U.S. Cl. 52—748.1** **1 Claim**



1. A process for roofing with shingles comprising applying successive courses of shingles over next previous courses of shingles by using shingles having overall heights of 18 inches, covering the upper 10 inches of the next previously laid course of shingles, and leaving exposed the lower 8 inches of the next previously laid course of shingles, whereby the material utilization efficiency is at least approximately 44.4 percent when the efficiency is defined as the ratio of shingle exposure height to overall shingle height.

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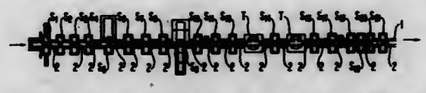
**5,501,057**
**UNIT MASONRY FENCE AND METHOD FOR ERECTING**
**John A. Dawson, Oakville, Canada, assignor to Canada Brick, Canada**
**Continuation of Ser. No. 2,363, Jan. 6, 1993, abandoned. This application Feb. 8, 1995, Ser. No. 385,705**
**Int. Cl.[6] E04H *17/14*; E04G *21/00*; E04C *2/40***
**U.S. Cl. 52—761** **20 Claims**



1. A partially prefabricated masonry fence comprising:
at least two footings spaced apart from one another;
structurally rigid support posts extending upwardly from said footings; and
at least one prefabricated fence panel unit mounted over said support posts and supported by said footings, said fence panel unit comprising a base support beam extending substantially throughout the length of said panel for supporting said panel, said base support beam having a receptacle near each end region thereof for receiving said support posts, wherein only said end regions contact said footings;
said fence panel unit further comprising a plurality of courses of masonry units laid on said support beam, wherein each masonry unit has a length less than the length of said base support beam.

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**5,501,058**
**COIL PACKING LINE EQUIPPED WITH INDEPENDENTLY RECIPROCATING CARRIAGES**
**Mitsuyoshi Sonoyama; Kentaro Suzuki; Masaki Aihara, all of Chiba; Hirokatsu Suzuki, Tokyo; Shoji Miyahara; Norio Kojima, both of Saitama, and Masatoshi Okada, Chiba, all of, Japan, assignors to Kawasaki Steel Corporation, Hyogo, and Tsubakimoto Chain Co., Osaka, both of, Japan**
**Filed Aug. 31, 1994, Ser. No. 297,912**
**Claims priority, application Japan, Aug. 31, 1993, 5-216728**
**Int. Cl.[6] B65B *35/10***
**U.S. Cl. 53—204** **5 Claims**

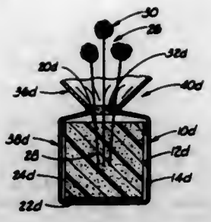


1. A coil packing line in which coils are packed by a plurality of operation processes, comprising:
a plurality of work stations, each operation process having a corresponding work station;
stationary skid means provided at each work station for supporting a coil at the work station;
carriage means provided between each work station for removing a coil from an upstream stationary skid means, supporting the coil and depositing the coil at a downstream stationary skid means; and
a plurality of reciprocating means for independently moving at least one carriage means back and forth between the upstream and downstream stationary skid means.

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**5,501,059**
**DECORATIVE ASSEMBLY FOR A FLORAL GROUPING**
**Donald E. Weder, Highland, and William F. Straeter, Breese, both of Ill., assignors to Highland Supply Corporation, Highland, Ill.**
**Continuation of Ser. No. 941,992, Sep. 8, 1992, Pat. No. 5,410,856, which is a continuation-in-part of Ser. No. 893,586, Jun. 2, 1992, Pat. No. 5,181,364, which is a continuation of Ser. No. 707,417, May 28, 1991, abandoned, which is a continuation of Ser. No. 502,358, Mar. 29, 1990, abandoned, which is a continuation-in-part of Ser. No. 249,761, Sep. 26, 1988, abandoned, said Ser. No. 941,992is a continuation-in-part of Ser. No. 934,832, Aug. 24, 1992, Pat. No. 5,426,914, which is a continuation-in-part of Ser. No. 819,311, Jan. 9, 1992, abandoned, which is a continuation of Ser. No. 765,416, Sep. 26, 1991, abandoned, which is a continuation of Ser. No. 530,491, May 29, 1990, abandoned, said Ser. No. 941,992is a continuation-in-part of Ser. No. 940,930, Sep. 4, 1992, Pat. No. 5,361,482, which is a continuation-in-part of Ser. No. 926,098, Aug. 5, 1992, which is a continuation-in-part of Ser. No. 803,318, Dec. 4, 1991, Pat. No. 5,344,016, which is a continuation-in-part of Ser. No. 707,417, May 28, 1991, abandoned. This application Apr. 24, 1995, Ser. No. 427,014**
**Int. Cl.[6] B65B *11/02*;*25/02***
**U.S. Cl. 53—397** **34 Claims**

1. A decorative assembly for a floral grouping, comprising:
a floral holding material having an upper end, a lower end and an outer peripheral surface, the floral holding material being constructed of a material capable of receiving a portion of the floral grouping and supporting the floral grouping without any pot means;
a sheet of material having an upper surface, a lower surface and an outer periphery, the upper surface of the sheet of material




being disposed adjacent a portion of the outer peripheral surface of the floral holding material and the sheet of material extending about a portion of the outer peripheral surface of the floral holding material; and

means for forming a crimped portion in a portion of the sheet of material with the crimped portion cooperating to hold the sheet of material in the position extended about the floral holding material to provide a decorative covering wherein the means for forming a crimped portion is used to form at least one overlapping fold in the sheet of material, which overlapping fold is substantially bonded via the means for forming the crimped portion and wherein the means for forming a crimped portion further comprises an adhesive or cohesive material.

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**5,501,060**

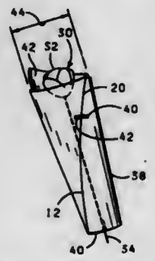
**METHOD FOR WRAPPING INDIVIDUAL FLORAL GROUPINGS WITH WRAPPING MATERIAL HAVING SIZING MARKS THEREON**

**Donald E. Weder, and John W. Bergstrand, both of Highland, Ill., assignors to Highland Supply Corporation, Highland, Ill.**

**Continuation-in-part of Ser. No. 10,899, Jan. 29, 1993, Pat. No. 5,381,642, which is a continuation-in-part of Ser. No. 968,798, Oct. 30, 1992, Pat. No. 5,369,934, and Ser. No. 965,585, Oct. 23, 1992, abandoned, which is a continuation of Ser. No. 893,586, Jun. 2, 1992, Pat. No. 5,181,364, which is a continuation of Ser. No. 707,417, May 28, 1991, abandoned, which is a continuation of Ser. No. 502,358, Mar. 29, 1990, abandoned, which is a continuation-in-part of Ser. No. 249,761, Sep. 26, 1988, abandoned, said Ser. No. 968,798is a continuation of Ser. No. 865,563, Apr. 9, 1992, Pat. No. 5,245,814, which is a continuation of Ser. No. 649,379, Jan. 31, 1991, Pat. No. 5,111,638, which is a continuation of Ser. No. 249,761, Sep. 26, 1988, abandoned. This application May 9, 1994, Ser. No. 239,483**

**Int. Cl.[6] B65B** *11/04;11/48;25/02*

**U.S. Cl. 53—399** **30 Claims**




1. A method for wrapping a floral grouping comprising:

providing a sheet of material having an upper surface, a lower surface and an outer periphery, a bonding material being disposed on the sheet of material, and a first sizing mark and a second sizing mark being disposed on the sheet of material;

providing the floral grouping having a flower end and a stem end;

disposing the floral grouping on the sheet of material; and

wrapping the sheet of material about the floral grouping to a position wherein the first sizing mark is substantially aligned with the second sizing mark and a portion of the sheet of material is brought into bonding contact with the bonding material on the sheet of material for bondingly connecting said portion of the sheet of material to another portion of the sheet of material to secure the sheet of material in a wrapped condition about the floral grouping so as to form a wrapper for the floral grouping having an upper end and a lower end, the floral grouping being disposed on the sheet of material and wrapped with the sheet of material whereby the flower end of the floral grouping is disposed near the upper end of the wrapper and the stem end of the floral grouping is disposed near the lower end of the wrapper, the first and second sizing marks being positioned on the sheet of material so that, when the sheet of material is wrapped about the floral grouping to the position wherein the first sizing mark is substantially aligned with the second sizing mark, the upper end of the wrapper has a perimeter length predetermined by alignment of the first and second sizing marks on the sheet of material.

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**5,501,061**

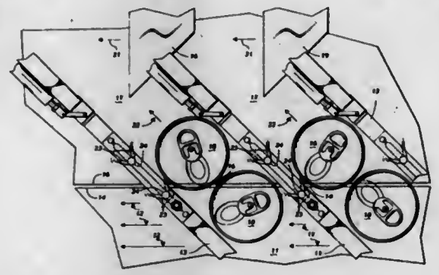
**METHOD AND APPARATUS FOR CLEARING EXCESS BEVERAGE CONTAINERS FROM A BEVERAGE CONTAINER PACKAGING MACHINE**

**William M. Easter, Roswell, Ga., assignor to Riverwood International Corporation, Atlanta, Ga.**

**Filed Jun. 16, 1994, Ser. No. 260,847**

**Int. Cl.[6] B65B** *21/06*

**U.S. Cl. 53—443** **20 Claims**



1. For implementation in a beverage container packaging machine wherein an array of spaced guide rails form lanes along which beverage containers are moved during the packaging process, a method of clearing excess trailing beverage containers from the machine at the end of a packaging operation, said method comprising the steps of:

(a) providing the guide rails with a set of compressed air nozzles coupled to a source of compressed air with the nozzles being positioned and oriented on the guide rails to direct a jet of compressed air along the lanes defined between the guide rails substantially in the direction of movement of beverage containers along the lanes;

(b) actuating the nozzles to direct a jet of compressed air along the lanes to clear excess trailing beverage containers from the lanes of the beverage packaging machine; and

(c) discontinuing the jet of compressed air when the excess trailing beverages have been cleared from the lanes by the force of the compressed air;

wherein said step of providing the guide rails with compressed air nozzles comprises the step of placing said compressed air nozzles in a transitional region of a moving conveyor and a stationary surface, said jet of compressed air forcing said beverage containers across said stationary surface away from said conveyor.



**5,501,062**

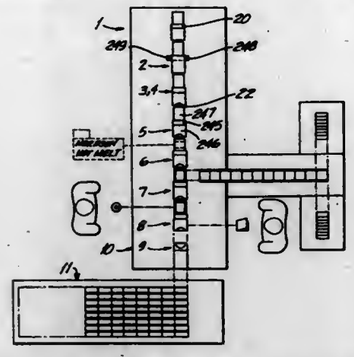
**PROCESS AND MACHINES FOR MANUFATUURING ONE-PIECE BOXES AND BOXES MADE THEREBY**

**G. Ambergen, Oldenzaal, and O. van Dijk, Enschede, both of, Netherlands, assignors to AGI Incorporated, Melrose Park, Ill.**

**Filed Jun. 3, 1993, Ser. No. 72,508**

**Int. Cl.[6] B65B** *3/02*

**U.S. Cl. 53—452** **47 Claims**




1. A method for manufacturing single piece boxes comprising:

a. wrapping a wrap around a board blank so that the said board blank and wrap are aligned;

b. cutting notches into the wrap and board blank to form a spine region; and

c. score setting the spine region of the wrapped board blank to form a seal between the wrap and the board blank.

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**5,501,063**

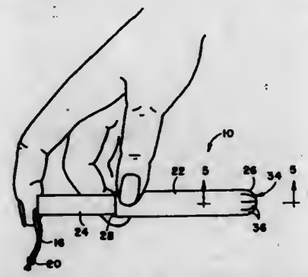
**APPARATUS AND METHOD OF REDUCING THE FORCE TO EXPEL A TAMPON FROM A TAMPON APPLICATOR AND THE APPLICATOR ITSELF**

**Richard R. Tews, Larsen; Jeffrey M. Weyenberg, Appleton, and Noel J. Rasmussen, Oshkosh, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.**

**Filed Sep. 6, 1994, Ser. No. 301,220**

**Int. Cl.[6] A61F** *13/30;15/00;* **B29C** *17/00*

**U.S. Cl. 53—452** **28 Claims**




20. A method of reducing the force required to expel a catamenial tampon from a tampon applicator, said applicator including a first member which is capable of housing a tampon, said first member having an inside diameter, first and second spaced apart ends, and an insertion tip formed adjacent to and at least partially closing said first end, said method comprising the steps of:

a) inserting a first punch into said second end of said first member;

b) sliding said first punch through said first member and expanding said insertion tip;

c) inserting a second punch into said opened insertion tip, said second punch having a forward end with an outside diameter which is sized larger than said inside diameter of said first member whereby at least a portion of said inside diameter of said first member is expanded;

d) reclosing said insertion tip; and

e) positioning a tampon in said first member, said tampon capable of being expelled through said insertion tip at an expulsion force which is less than that required to initially open said insertion tip.

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**5,501,064**

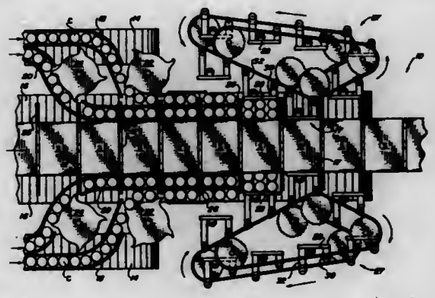
**APPARATUS AND METHOD FOR PUSHING ARTICLES INTO RECEPTACLE**

**Steve Ingram, Woodstock; Frank Moncrief, Acworth, both of Ga., and Charles McNamara, Tucson, Ariz., assignors to Riverwood International Corporation, Atlanta, Ga.**

**Filed Oct. 28, 1994, Ser. No. 330,496**

**Int. Cl.[6] B65B** *21/08;35/40;35/44;39/14*

**U.S. Cl. 53—473** **15 Claims**



1. A packaging machine for loading articles into a receptacle, comprising:

means for moving a group of a predetermined number of articles in a downstream direction;

means for moving a receptacle adjacent said group of articles in said downstream direction and at substantially the same speed;

an article pusher plate; and

means for moving the plate in a continuous closed path on the side of the article moving means remote from the receptacle moving means, the path including a diagonal run having a component of movement in said downstream direction and a component of movement at right angles thereto toward the receptacle moving means to enable the plate to contact and push the articles toward the moving receptacle;

the plate moving means including means for maintaining the plate substantially parallel to said downstream direction, said latter means comprising a first continuous chain connected to the plate at one location thereof and a second continuous chain connected to the plate at a different location, each chain traveling in a closed path.

**5,501,065**

## APPARATUS FOR PACKAGING INDIVIDUAL OBJECTS, ESPECIALLY FOODSTUFF PACKAGES

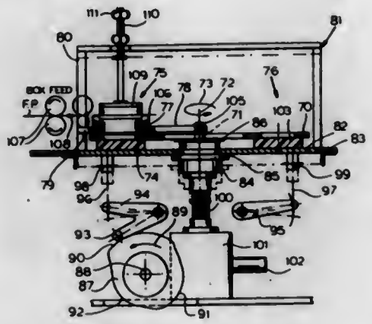
Georg Fischer, Velbert, and Edgar Glitzer, Duisburg, both of, Germany, assignors to Benz & Hilgers GmbH, Neuss, Germany

Continuation-in-part of Ser. No. 49,251, Apr. 16, 1993, Pat. No. 5,379,574. This application Oct. 13, 1994, Ser. No. 322,921

Claims priority, application Germany, Apr. 24, 1992, 42 13 555.9

Int. Cl.[6] B65B *7/26;11/06;35/50*

U.S. Cl. 53—535 19 Claims



1. An apparatus for packing grouped individual articles, said apparatus comprising:

a horizontal table plate;

a turntable spaced above said plate and rotatable about a substantially vertical axis and formed with a plurality of angularly equispaced upwardly open receptacle-receiving chambers;

drive means connected with said turntable for rotating said turntable to step said chambers to a receiving station and to a discharging station along a cyclical path of said chambers;

a feed and assembling device at said receiving station for feeding the individual articles to and grouping said individual articles at a location aligned with said receiving station;

a folding frame at said receiving station above said turntable registering with each of said chambers as each chamber is positioned at said receiving station;

feeding means for feeding a generally flat packing blank, erectable into a receptacle for said grouped individual articles, onto said folding frame and in alignment with a chamber of said turntable;

means for shifting said individual articles grouped at said location onto said blank;

a folding and hold-down device at said receiving station for engaging said blank and grouped individual articles thereon for displacing said blank and said grouped individual articles on said blank through said folding frame and into said chamber positioned at said receiving station, thereby erecting said receptacle from the blank around the grouped individual articles as the blank passes, through said folding frame;

means at said discharge station for receiving receptacles filled with the individual articles from respective chambers of said turntable positioned at said discharge station; and

means for stepwise adjustment of a beight of said table plate, said turntable, and said folding frame jointly to different receiving levels relative to said feed and assembling device to enable formation of layers of the grouped individual articles in said receptacles.

**5,501,066**

## STRETCHABLE FILM TRAY WRAPPING MACHINE

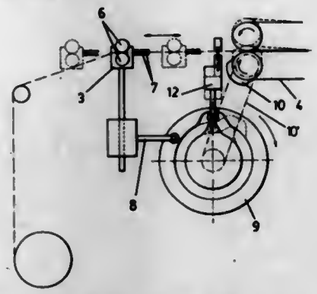
Iosu Errasti Iriarte, and Ignacio Aguirre Arregui, both of Orate, Spain, assignors to ULMA, S. Coop. Ltda., Onate, Spain

Filed Jun. 7, 1994, Ser. No. 255,853

Claims priority, application Spain, Jun. 11, 1993, 9301332; Apr. 29, 1994, 9400912; Apr. 29, 1994, 9400913

Int. Cl.[6] B65B *53/00*

U.S. Cl. 53—556 12 Claims



1. A stretchable film tray wrapping machine, comprising roll supporting means (2), film insertion and cutting means, drive belt means (4) for horizontally feeding the film, a wrapping station (5), feeding means (13) for trays to be wrapped with the film, and lifting means including a main swinging arm and a rod forming a jointed quadrilateral with the arm,

wherein the film insertion and cutting means comprises a horizontally moving carrier (3) having respective combs (7) to move forward and insert the film between the drive belt means (4) comprising top and bottom drive belts, which carrier (3) is joined to a cam (9) through tightening means (8) so that when the cam turns the carrier (3) is caused to move forwards and backwards, said cam having associated, on a different cam profile, a vertically moveable film cutting blade support (12), movement of the carrier being in synchrony with movement of a blade, in order that when the blade acts upon the film, the carrier is at a rearmost position and when the carrier moves forward, the blade is always at a lowermost position,

wherein the insertion combs (7) are inserted between said top and bottom drive belts of drive belt means (4) which has upper and lower shafts, said lower shaft is fitted with a pair of cams (11) which, act upon sheaves (11') on said upper shaft to cause the lower shaft to be lifted slightly and later to recover when the said cams stop acting.

**5,501,067**

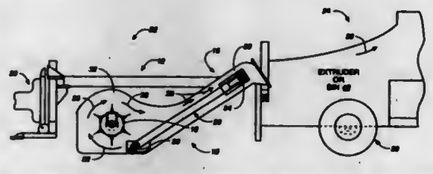
## SELECTIVE HARVESTING MACHINE

Claude E. Brown, 14281 Vintage Rd., Lodi, Calif. 95240

Filed Jul. 29, 1994, Ser. No. 282,751

Int. Cl.[6] A01D *45/00*

U.S. Cl. 56—121.4 13 Claims



1. A machine, useful in harvesting a selected portion of a plant, comprising:

a moveable frame;



a drum having a longitudinally extending axis and being rotatably mounted on the frame and wherein a shaft defines the rotation axis, the shaft and the drum axis together being parallel to but spaced from each other;

a plurality of longitudinally extending resilient mounts carried by the drum, the mounts being angularly spaced about a longitudinally extending axis of rotation parallel or congruent with respect to the drum axis; and,

a plurality of spaced apart picking fingers, the fingers outwardly projecting from the mounts, each finger being resiliently held in the mount so as to be capable of flexions over substantially 360 degrees in response to contact with plants during harvesting use of the machine.

**5,501,068**

## MULCHING ROTARY LAWN MOWER BLADE

William Martz, Holcomb, N.Y., assignor to Foley/PLP Co., Rochester, N.Y.

Filed Sep. 19, 1994, Ser. No. 308,785

Int. Cl.[6] A01D *34/73*

U.S. Cl. 56—255 14 Claims



1. A lawn mower blade adapted to be used in a rotary lawn mower, said blade having a longitudinal axis and leading and trailing edges wherein said leading edge is sharpened for cutting grass, comprising:

a) a mounting area which includes said longitudinal axis for mounting said blade on said rotary lawn mower; and

b) a plurality of cutting sections disposed along the length of said blade outward from said mounting area, wherein the leading edge of said each of said cutting sections is nearer to the ground than is the trailing edge of said each of said cutting sections.

**5,501,069**

## SELF-CLEANING RAKE

Bernard E. Lentz, 23 Wyandotte Dr., Cherokee Village, Ark. 72529

Filed Nov. 22, 1994, Ser. No. 343,367

Int. Cl.[6] A01D *7/10*

U.S. Cl. 56—400.100 14 Claims

1. A self-cleaning rake comprising:

an elongated, rigid handle;

a header coupled to said handle;

a plurality of elongated, flexible rake tines, each of said tines comprising a stem pivotally coupled to said header;

means for cleaning the rake comprising:

an arcuate spreader slidably penetrated by each of said tines for deploying or contracting said tines by radially deflecting them;

an elongated actuator for displacing the spreader, said actuator telescopingly coupled to said handle;

locking means for selectively yieldably locking said handle and said actuator together when said tines are radially deployed wherein said locking means comprises guide means associated with said handle for controlling displacements of said actuator and said actuator comprises detent means yieldably engaged by said guide means; and,

whereby said rake is cleaned as materials are removed from said tines by contact with said spreader.

**5,501,070**

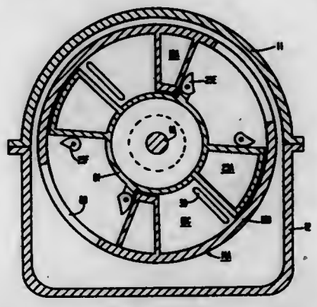
## DOUBLE-ROTOR ROTARY ENGINE AND TURBINE

Abraham S. Lin, 11637 Grand N.E., Albuquerque, N.M. 87123

Filed Jul. 6, 1992, Ser. No. 851,574

Int. Cl.[6] F02C *5/08*

U.S. Cl. 60—39.34 10 Claims



1. A double-rotor rotary engine and turbine comprising:

(a) a base;

(b) a housing rotatably mounted to the base, the housing having two hollow cases rigidly connected by a circle-cover and a rectangle-blade rigidly extended from the circle-cover for forming part of a combustion chamber;

(c) an output shaft rotatably mounted concentric with the housing, the shaft having a center-wheel rigidly extended therefrom for mounting a rectangle-blade extended within the housing for forming part of the combustion chamber;

(d) means for admitting a fuel-air mixture into the combustion chamber;

(e) means for compressing the fuel-air mixture within the combustion chamber following admission;

(f) means for expanding the combustion products within the combustion chamber following compression;

(g) means for releasing combustion products from the combustion chamber through an exhaust opening following expansion;

(h) turbine means operatively connected between the base and the housing, the turbine means providing a torque reaction against the housing in response to flow of the combustion products from the releasing means; and

(i) stop means on the housing and the shaft for limiting relative movement between the two rectangle-blades, between a first position wherein the two rectangle-blades move away from

each other to start the explosion stroke and a second position wherein the two rectangle-blades move toward each other to start the compression stroke.

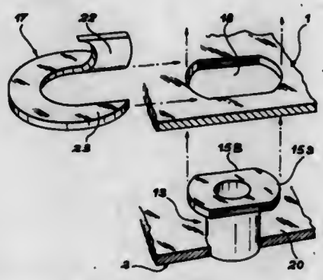
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**5,501,071**

## FIXING ARRANGEMENT FOR A THERMAL PROTECTION TILE IN A COMBUSTION CHAMBER

**Denis R. H. Ansart, Bois Le Roi; Didier Hernandez, Bretigny S/Sorge, and Rodolphe Martinez, Perigny S/Yerres, all of, France, assignors to Societe Nationale D'Etude Et De Construction De Moteurs D'Aviation "Snecma", Paris, France**

**Filed Dec. 22, 1994, Ser. No. 361,587**
**Claims priority, application France, Dec. 22, 1993, 93 15391**
**Int. Cl.[6] F02C *3/14;7/20***
**U.S. Cl. 60—39.32** **4 Claims**




1. An arrangement for removably fixing a thermal protection tile on the inside of a combustion chamber wall, said tile including a plate portion, the arrangement comprising:

at least one stud fixed to said plate portion, said stud having a shank by which said stud is fixed to said plate portion and a flat head spaced outwardly from said plate portion, said head having parts which project laterally further from said shank than other parts of said head;

means defining a hole in said combustion chamber wall having a shape corresponding to that of said head of said stud so that said head is able to pass through said hole, the distance between the under surface of said head and the outer surface of said plate portion facing said combustion chamber wall when said head is fully inserted through said hole being greater than the distance between the outer surface of said combustion chamber wall and said outer surface of said plate portion so as to define a clearance between said head and said outer surface of said wall; and

a split washer having a raised edge which allows said washer to be placed around said shank in said clearance between said head and said outer surface of said combustion chamber wall and which is turned down, after rotation of said washer, to retain said washer in place and thereby secure said head, and hence said tile, to said combustion chamber wall.

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**5,501,072**

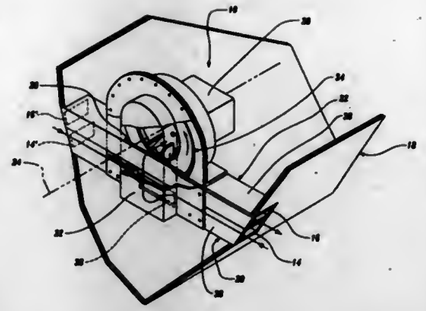
## COMBINED CENTRIFUGAL AND PADDLE-WHEEL SIDE THRUSTER FOR BOATS

**Mitchell A. Plancich, Marysville, and Merall L. Thompson, Lake Stevens, both of Wash., assignors to Pumpeller, Inc., Everett, Wash.**

**Filed Aug. 29, 1994, Ser. No. 298,027**
**Int. Cl.[6] B63H *11/00;25/46***
**U.S. Cl. 60—221** **19 Claims**

1. A method for producing thrust for maneuvering the hull of a water craft on a body of water, comprising:

supplying water from an inlet to the center of a paddle-wheel impeller rotatably mounted within the water craft;




discharging water from the paddle-wheel impeller into a discharge comprising tubular conduit that closely receives a circumferential paddle portion of the paddle-wheel impeller projecting into the tubular conduit through an aperture defined therein; and

rotating the paddle-wheel impeller to discharge a combined impeller and paddle-wheel driven stream of water from the conduit through the hull, where the direction of discharge is dependent on the direction of rotation of the impeller.

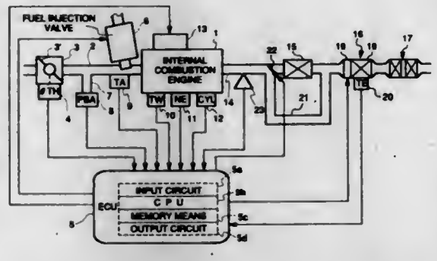
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**5,501,073**

## IGNITION TIMING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

**Yukio Miyashita; Yuichi Shimasaki; Toshikazu Oketani; Seiji Hatcho; Seiji Matsumoto; Takuya Aoki; Akihisa Saito; Takashi Komatsuda, and Hiroaki Kato, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Sep. 13, 1994, Ser. No. 305,278**
**Claims priority, application Japan, Sep. 13, 1993, 5-251099**
**Int. Cl.[6] F01N *3/28***
**U.S. Cl. 60—284** **14 Claims**




1. In an ignition timing control system for an internal combustion engine having an exhaust passage, an adsorber arranged in said exhaust passage for adsorbing unburnt components in exhaust gases, and an exhaust gas-purifying device arranged in said exhaust passage at a location downstream of said adsorber, said exhaust gas-purifying device having heater means,

the improvement comprising:

ignition timing-retarding means for retarding ignition timing of said engine when said engine is started in a cold state; and

ignition timing retardation-restraining means for restraining retardation of the ignition timing by said ignition timing-retarding means over a time period from the start of said engine to a time point said exhaust gas-purifying device is warmed up to a predetermined activated condition.

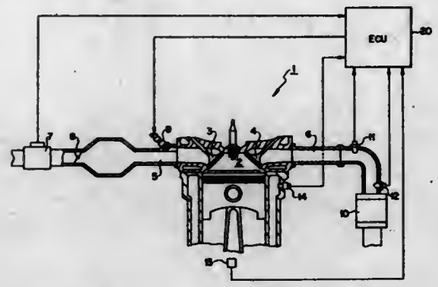


**5,501,074**

## EXHAUST GAS PURIFYING SYSTEM

**Hajime Suetsugu, Higashihiroshima; Tadataka Nakazumi, Kure; Akihide Takami, Hiroshima, and Takashi Takemoto, Higashihiroshima, all of, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan**

**Filed Mar. 22, 1994, Ser. No. 215,769**
**Claims priority, application Japan, Mar. 31, 1993, 5-096587**
**Int. Cl.[6] F01N *3/28***
**U.S. Cl. 60—285** **7 Claims**




1. An exhaust gas purifying system having a catalytic converter, which is disposed in an exhaust line so as to deoxidize or reduce and purify nitrogen oxides in exhaust gases, for an automobile engine, said exhaust gas purifying system comprising:

an air-fuel ratio sensor for detecting an air-fuel ratio of a fuel mixture based on an oxygen concentration in exhaust gas discharged from said automobile engine;

a temperature sensor disposed upstream from said catalytic converter in said exhaust line for detecting temperature of exhaust gas; and

control means for computing a target air-fuel ratio of a fuel mixture to be introduced into said automobile engine based on engine operating conditions, and compulsorily perturbing the air-fuel ratio of said fuel mixture based on said target air-fuel ratio only when said temperature sensor detects exhaust gas temperature greater than a specific temperature.

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**5,501,075**

## ELASTIC MOUNTING APPARATUS FOR MOUNTING A TURBOCHARGER HOUSING ON AN INTERNAL COMBUSTION ENGINE

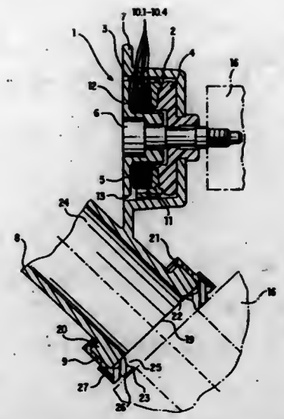
**Karl-Heinz Spies, Birkenau; Willi Schweikert, Heidelberg; Armin Barth, Gorxheimertal, and Hans-Gerhard Sander, Weinheim, all of, Germany, assignors to Firma Carl Freudenberg, Germany**

**Filed Mar. 16, 1995, Ser. No. 405,127**
**Claims priority, application Germany, Apr. 18, 1994, 44 13 392.8**
**Int. Cl.[6] F02B *37/00;* F02M *35/10;* F16L *17/073***
**U.S. Cl. 60—605.1** **8 Claims**

1. An apparatus for mounting a turbocharger housing including an intake pipe with an intake pipe flange on an internal combustion engine, comprising:

a clamping element comprising a first spring element and a second spring element, said spring elements being arranged in series, said clamping element joining said housing and said internal combustion engine so as to allow relative vibration between said housing and said internal combustion engine, said first spring element comprising an annular spring member made of an elastomeric material and said second spring element comprising at least one disk spring;

a clamping screw, said at least one disk spring being compressible by said clamping screw in such a way that its spring rate, after compression to an intended preload, is substantially zero; and




an annular sealing element made of an elastomeric material sealing said intake pipe against a cylinder head of said internal combustion engine.

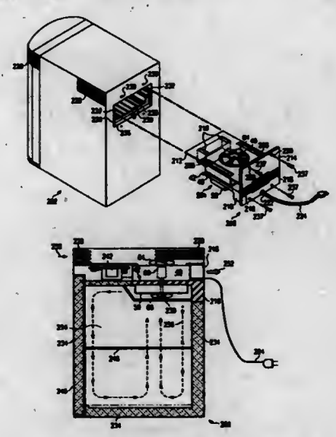
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**5,501,076**

## COMPACT THERMOELECTRIC REFRIGERATOR AND MODULE

**Charles A. Sharp, III; Michael J. Doke, both of Dallas; Richard A. Howarth, Allen, and Leonard J. Recine, Sr., Plano, all of Tex., assignors to Marlow Industries, Inc., Dallas, Tex.**

**Continuation-in-part of Ser. No. 146,712, Nov. 1, 1993, Pat. No. 5,367,879, which is a continuation-in-part of Ser. No. 47,695, Apr. 14, 1993, Pat. No. 5,315,830. This application Nov. 23, 1994, Ser. No. 334,340**
**Int. Cl.[6] F25B *21/02***
**U.S. Cl. 62—3.6** **22 Claims**



17. A method of making a module for controlling the temperature within an enclosed structure comprising:

forming a thermoelectric assembly having a thermoelectric device with a first heat sink disposed on one side of the device and a second heat sink disposed on the other side of the device, an electrical motor attached to one of the heat sinks with a rotating shaft extending longitudinally through the electrical motor and both heat sinks, a propeller attached to each end of the rotating shaft adjacent to the first heat sink and the second heat sink respectively;

fastening the thermoelectric assembly to a platform having a first opening therein, the first opening adjacent to one of the propellers of the fastened thermoelectric assembly;

attaching a panel to the platform; and

attaching the panel and the platform to the structure through a second opening in the structure, the second opening for receiving the thermoelectric assembly.

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**5,501,077**

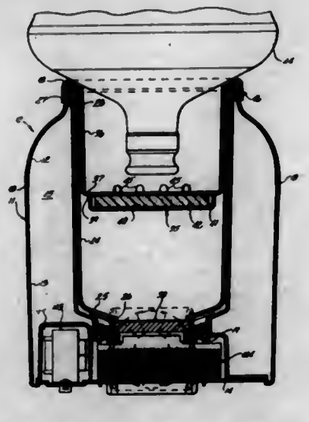
**THERMOELECTRIC WATER CHILLER**

**S. Spence Davis, Atlanta, Ga.; R. Clark Lucas, Santa Barbara, Calif.; Michael J. Nagy, Williamsburg, Mich.; Anthony E. Yeargin, Charlotte, and Gerald M. Zimbauer, Cornelius, both of N.C., assignors to Springwell Dispensers, Inc., Atlanta, Ga.**

**Filed May 27, 1994, Ser. No. 250,364**

**Int. Cl.[6] F25B *21/02***

**U.S. Cl. 62—364** **17 Claims**



1. A drinking-water chiller system, comprising:

a housing;

a tank supported on and extending within the housing;

a thermal insulating member suspended within the tank between upper and lower ends of the tank to define an upper zone for room-temperature water and a lower zone for chilled water;

an adjustable proportioning valve mounted on the housing and coupled to the upper and lower zones for dispensing variable proportions of room-temperature and chilled water; and

a cooling assembly in the housing, and having a cold-sink plate in contact with the tank, and a heat sink with a heat-dissipating means.

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**5,501,078**

**SYSTEM AND METHOD FOR OPERATING AN INTEGRATED GAS TURBINE AND CRYOGENIC AIR SEPARATION PLANT UNDER TURNDOWN CONDITIONS**

**Gerald A. Paolino, Lancaster, N.Y., assignor to Praxair Technology, Inc., Danbury, Conn.**

**Filed Apr. 24, 1995, Ser. No. 427,364**

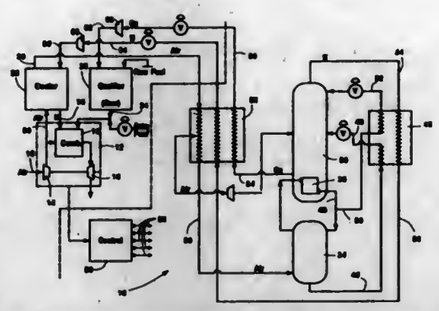
**Int. Cl.[6] F25J *3/00***

**U.S. Cl. 62—21** **7 Claims**

1. Apparatus operating at both a design point and a turndown point, said apparatus comprising:

gas turbine means for providing pressurized air;

gasifier means for producing and feeding fuel to said gas turbine means;



air separation means coupled to said gas turbine means for receiving said pressurized air via an air feed, for producing an oxygen-bearing fluid at a first purity and first pressure when said air feed is at a design point pressure, and for producing said oxygen-bearing fluid at a second purity and second pressure when said air feed is at a turndown pressure, said second purity and second pressure being lower than said first purity and first pressure, respectively;

compression means for compressing said oxygen-bearing fluid to about a design point pressure and for feeding said compressed oxygen-bearing fluid to said gasifier means; and

control means responsive to a turndown state for causing said gas turbine means to provide said pressurized air to said air separation means at said turndown pressure and for further causing said air separation means to respond thereto by producing and supplying said oxygen-bearing fluid at said second purity and second pressure to said compression means.

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**5,501,079**

**APPARATUS AND PROCESS FOR CRYOGENIC SEPARATION OF AIR AND LIQUID DISTRIBUTOR FOR A MASS TRANSFER COLUMN**

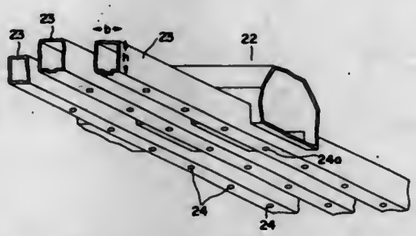
**Helmut Kreis, München; Anton Moll, Raisting, and Karl H. Stiegler, Neuötting, all of, Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Germany**

**Filed Jan. 24, 1994, Ser. No. 185,066**

**Claims priority, application Germany, Jan. 22, 1993, 43 01 712.6**

**Int. Cl.[6] F25J *3/00***

**U.S. Cl. 62—36** **30 Claims**



1. In an apparatus for cryogenic separation of air comprising at least one rectifying column, said column comprising at least one section equipped with packing materials and, positioned above said at least one section, a liquid distributor, said distributor comprising at least one main channel and a plurality of distributing channels connected to said main channel and in fluid communication therewith, said distributing channels having a plurality of openings therein to permit liquid discharge, the improvement wherein said main channel, said distributing channels, or both said main channel and said distributing channels, are closed over at least a portion of their top.



**5,501,080**

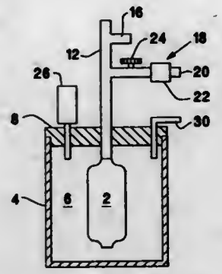
**SELF-CONTAINED CRYOGENIC GAS SAMPLING APPARATUS AND METHOD**

**Gary J. McManus; Billy G. Motes; Susan K. Bird, all of Idaho Falls, and Dale K. Kotter, Shelley, all of Id., assignors to Lockheed Idaho Technologies Company, Idaho Falls, Id.**

**Filed Dec. 14, 1994, Ser. No. 355,689**

**Int. Cl.[6] B01D *8/00***

**U.S. Cl. 62—55.5** **12 Claims**



1. Apparatus for obtaining a whole gas sample, comprising:

a sample vessel having an inlet for receiving a gas sample;

a controllable valve mounted in said inlet for controllably opening and closing said inlet;

valve control means coupled to said valve for opening and closing said valve at selected times;

a portable power source connected to said valve control means for supplying operating power to said valve control means;

a cryogenic coolant; and

means containing said coolant and placing said coolant in thermal communication with said vessel for cooling the interior of said vessel to cryogenic temperatures.

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**5,501,081**

**AUGER TYPE ICE MAKING MACHINE**

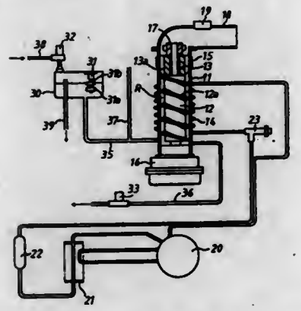
**Kazuhiro Mori, Toyoake; Naoya Uchida, and Susumu Tatematsu, both of Nagoya, all of, Japan, assignors to Hoshizaki Denki Kabushiki Kaisha, Toyoake, Japan**

**Filed Dec. 28, 1994, Ser. No. 365,456**

**Claims priority, application Japan, Dec. 28, 1993, 5-070493**

**Int. Cl.[6] F25C *1/14***

**U.S. Cl. 62—135** **9 Claims**



1. An auger type ice making machine having an upright evaporator housing the interior of which is formed with a cylindrical freezing surface, an auger mounted for rotary movement within the evaporator housing and drivingly connected at its lower end with an electric motor to scrape ice crystals off the freezing surface and to advance the scraped ice crystals toward an upper end of the evaporator housing, an extrusion head fixed in place within the upper end portion of the evaporator housing to compress the ice crystals advanced thereto by rotation of the auger and extrude the compressed ice crystals upwardly, a discharge pipe provided with an electrically operated drain valve and connected to a lower end portion of the evaporator housing to discharge supplied water from the evaporator housing when the drain valve is opened by its energization, an electric heater mounted on an outer periphery of the evaporator housing at a place corresponding with the extrusion head, detection means for issuing a halt signal of ice making operation of the machine when an ice storage bin of the machine is filled with the ice supplied with the evaporator housing, and control means for halting the electric motor when applied with the halt signal,

wherein said control means comprises means for energizing said electric heater when applied with the halt signal from said detection means and means for deenergizing said electric heater after lapse of a predetermined time and for energizing said drain valve after or before lapse of the predetermined time.

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**5,501,082**

**REFRIGERATION PURGE AND/OR RECOVERY APPARATUS**

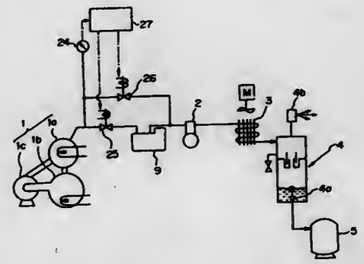
**Keiji Tachibana, Tokyo; Susumu Ishii, Tsuchiura; Michio Kumaki, Toda, and Takeo Genba, Ibaraki, all of, Japan, assignors to Hitachi Building Equipment Engineering Co., Ltd., Tokyo, Japan**

**Filed Jun. 15, 1993, Ser. No. 76,641**

**Claims priority, application Japan, Jun. 16, 1992, 4-156912; Jan. 23, 1992, 4-286043**

**Int. Cl.[6] F25B *45/00***

**U.S. Cl. 62—149** **7 Claims**



4. An apparatus for recovering low pressure refrigerant which is capable of controlling pressure in a refrigerator, comprising:

a gas pump for sucking a mixture of the refrigerant gas charged in the refrigerator and non-condensible gases having entered into the refrigerator, said gas pump including a vacuum pump and a compressor which are connected in series with each other, said compressor being positioned downstream of said vacuum pump;

a condenser positioned downstream of said compressor for cooling the gas mixture delivered from the gas pump;

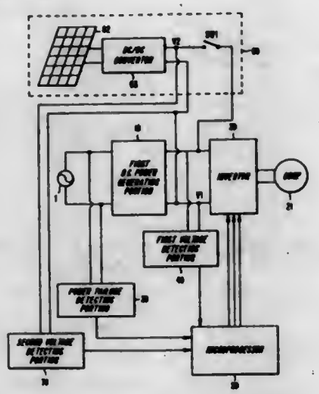
a liquid separator positioned downstream of said condenser for separating liquid refrigerant from gases;

a serial valve connected in series with said vacuum pump;

a bypass valve positioned in parallel with said serial valve and said vacuum pump along a bypass passage for directing refrigerant around said vacuum pump;

pressure sensing means for detecting and indicating a pressure in an up-stream line common to said serial and said bypass valves, wherein said serial valve and said bypass valve are capable of manual adjustment between respective open and closed positions in response to pressure indications by said pressure sensing means so as to control the pressure in the refrigerator.

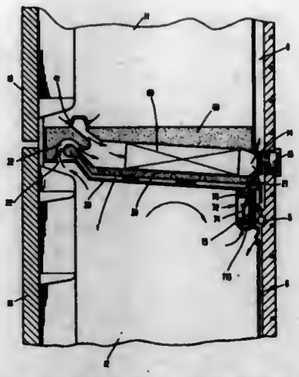
**5,501,083**
**CONTROL APPARATUS AND METHOD FOR AN AIR CONDITIONER COMPRESSOR**
**Tae D. Kim, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea**
**Filed Sep. 27, 1994, Ser. No. 313,582**
**Claims priority, application Rep. of Korea, Jan. 19, 1993, 1993-21704**
**Int. Cl.[6] F25B *27/00***
**U.S. Cl. 62—228.4** **7 Claims**



1. A control apparatus for a compressor of a refrigeration cycle, comprising:
a first power supply means for providing a first D.C. power by rectifying and then smoothing a commercial A.C. power source;
a second power supply means for providing a second D.C. power independently of said first means;
an invertor means for converting one of said first and second D.C. powers into A.C. power having a variable frequency and driving said compressor with said converted A.C. power;
a first detecting means for detecting a failure of said commercial A.C. power source;
a second detecting means for detecting an output voltage of said second D.C. power; and,
a control means connected to said first and second detecting means and said invertor means for connecting said second D.C. power to said invertor means to continuously drive said compressor when a magnitude of the output voltage of said second D.C. power is greater than a reference voltage during a failure of said commercial A.C. power source.

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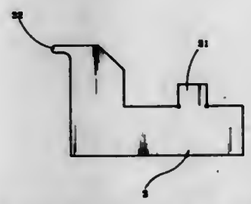
**5,501,084**
**AIR STERILIZER AND DEODORIZER FOR A REFRIGERATOR**
**Eui-Young Chang; Sung-Cheol Kang; Jin-Dong Jeong, and Tae K. Seok, all of Suwon, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea**
**Filed Oct. 28, 1994, Ser. No. 330,723**
**Claims priority, application Rep. of Korea, Nov. 24, 1993, 93-24833**
**Int. Cl.[6] F25D *27/00***
**U.S. Cl. 62—264** **8 Claims**



1. A refrigerator comprising:
a main body forming a freezing chamber and a refrigerating chamber;
a compartment disposed above said refrigerating chamber;
an evaporator disposed in said compartment for cooling air;
a first air inlet path leading from said refrigerating chamber to said evaporator;
a second air inlet path leading from said freezing chamber to said evaporator;
a first air outlet path leading from said evaporator to said refrigerating chamber;
a second air outlet path leading from said evaporator to said freezing chamber;
a fan disposed in said main body for circulating air to said evaporator from said refrigerating and freezing chambers, then through said first and second air inlet paths, and then back to said refrigerating and freezing chambers from said evaporator through said first and second air outlet paths, respectively; and
an air sterilizing and deodorizing mechanism disposed in said first air inlet path upstream of said evaporator for sterilizing floating bacteria and removing foul odor from air traveling from said refrigerating chamber toward said evaporator;
a contour plate underlying said compartment and forming a ceiling of said refrigerating chamber;
a thermal insulation member overlying said contour plate; and
a section of said first air inlet path being formed between said contour plate and said thermal insulation member.

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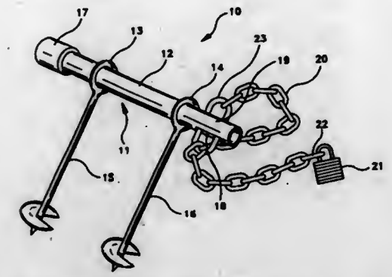
**5,501,085**
**FABRIC HOLDING-DOWN MECHANISM FOR DOUBLE KNIT MACHINES**
**Wan-Yih Chen, Taipei, Taiwan, assignor to Pai Lung Machinery Mill Co., Ltd., Taipei, Taiwan**
**Continuation-in-part of Ser. No. 141,509, Oct. 27, 1993, Pat. No. 5,386,711. This application Oct. 18, 1994, Ser. No. 324,670**
**Int. Cl.[6] D04B *15/06***
**U.S. Cl. 66—104** **2 Claims**



1. A presser sinker for a knitting machine having a fabric formation surface with a topmost edge, comprising:
a) a sinker body having a front edge; and
b) a projecting sinker head projecting outwardly beyond the front edge and located such that, when the front edge is adjacent to the fabric formation surface, the projecting sinker head is disposed above the topmost edge of the fabric formation surface.



**5,501,086**
**SECURITY DEVICE**
**Thomas M. Sherlock, 27260 Sherlock Rd., Los Altos Hills, Calif. 94022**
**Filed Jun. 8, 1994, Ser. No. 257,504**
**Int. Cl.[6] E05B *73/00***
**U.S. Cl. 70—58** **1 Claim**

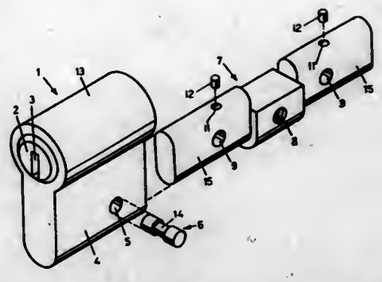


1. A device for securing an item to loose ground, such as sand at a beach, comprising:
two rods each with first and second ends, each of said rods having a length of about 30 inches, each of said rods having at least one substantially circular blade with a diameter of about 3 inches at said first end for threading into the ground by rotating;
said substantially circular blade having a portion cut to provide a cutting edge for said threading, and each of said rods having an opening at said second end;
a bar having a configuration to fit said opening at said second end in each of said rods, and having a predetermined length;
said bar having first and second ends, a elongated slot at said second end for attaching a first end of a flexible member, and means at said first end of said bar defining a configuration for preventing said first end of said bar from going through said opening at said second end in both of said rods;
said flexible member being in the form of a chain having first and second ends, said chain having links of a predetermined configuration with the link at said first end being elongated to fit through said elongated slot at said second end of said bar sufficiently to receive said second end of said chain and the other links readily therethrough; and
means for securing a second end of said chain to said item to be secured;
whereby said two rods are threaded into said ground spaced apart a distance less than said predetermined length of said bar so that with said bar installed between said two rods, neither of said two rods can be unthreaded from said ground.

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**5,501,087**
**ROTARY LOCKING CYLINDER FOR A SAFETY LOCK**
**Ernst Keller, Untere Schwandenstrasse 22, CH-8805 Richterswil, Switzerland**
**Filed Apr. 28, 1994, Ser. No. 230,104**
**Claims priority, application Switzerland, May 27, 1993, 1588/93**
**Int. Cl.[6] E05B *9/08***
**U.S. Cl. 70—370** **5 Claims**

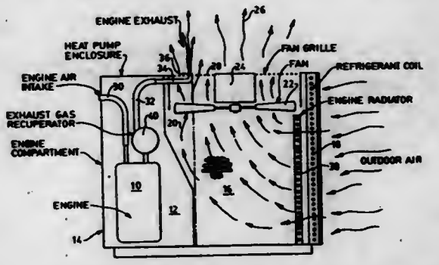
1. A rotary locking cylinder for a safety lock comprising:
a cylinder housing having a recess and a bore communicating with the recess, the cylinder housing being capable of occupying an upright position and an inverted position;
a cross piece having a first bore and a second bore, the second bore communicating with the first bore and the first bore of the cross piece communicating with the bore of the cylinder housing when the cross piece is inserted into the recess of the cylinder housing;



a locking element adapted to be slidably received in the second bore of the cross piece and being capable of occupying a locked position and an unlocked position;
a transverse pin adapted to be slidably inserted into the first bore of the cross piece and the bore of the cylinder housing when the cross piece is inserted into the recess of the cylinder housing;
the locking element engaging the transverse pin and preventing the removal of the transverse pin from the first bore of the cross piece when the locking element occupies the locked position.

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**5,501,088**
**EXHAUST GAS DISCHARGE SYSTEM FOR A GAS ENGINE HEAT PUMP**
**Jan B. Yates, 1081 Matterhorn Dr., Reynoldsburg, Ohio 43068**
**Filed Feb. 14, 1994, Ser. No. 195,518**
**Int. Cl.[6] F28F *19/00***
**U.S. Cl. 62—323.1** **6 Claims**




1. A heat pump assembly comprising an outdoor refrigerant evaporator coil, a heat pump housing having an engine compartment adapted to enclose an internal combustion engine and compressor, said compressor and said evaporator defining in part a refrigerant circuit, an outdoor air entry passageway in said housing, an air fan compartment separate from said engine compartment, an air discharge opening in said fan compartment, an air fan in said fan compartment adapted to move outdoor air across said coil, through said fan compartment and through said air discharge opening;
an engine exhaust duct in said engine compartment extending into said fan compartment on the downstream side of said fan whereby engine exhaust is mixed with outdoor airflow and carried by said outdoor air to the exterior of said heat pump housing whereby exhaust noise, combustion gas, odor and water vapor are dissipated.

**5,501,089**

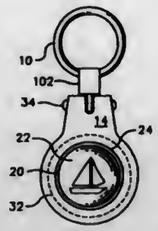
## KEY FOB AND ATTACHMENT

**Chang J. Song, 6740 Comstock Road, Richmond, British Columbia, Canada**

**Continuation-in-part of Ser. No. 49,046, Apr. 16, 1993. This application Feb. 14, 1994, Ser. No. 196,534**

**Int. Cl.[6] A44B *15/00***

**U.S. Cl. 70—456 R** **16 Claims**




1. A method for constructing a key fob for attachment to a key ring, the method comprising the steps of:

providing a dome having a display surface and a flange, said display surface having a first shape and a first area, said flange defining a second area greater than said first area and a second shape;

providing a fob having a top fold and a bottom fold, said top fold having an aperture formed therein, said aperture having substantially said first shape and said first area, said top and bottom folds forming a first edge having a second aperture formed therein;

placing a cross member along said first edge, said cross member having a neck portion extending through said second aperture, said neck portion having means for attachment to said key ring;

inserting, into said aperture, said display surface, wherein said flange prevents said dome from passing through said aperture;

securing said dome in said fob.

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**5,501,090**

## FLEXIBLE HOUSING FOR CONVENTIONAL KEYS OR FOR KEYS OF A SPECIAL KIND

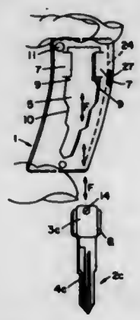
**Mario Mattiuzzo, Breda Di Piave, Italy, assignor to C.E.A. S.P.A., Lovadina Di Spresiano, Italy**

**PCT No. PCT/IT92/00087, § 371 Date Mar. 25, 1994, § 102(e) Date Mar. 25, 1994, PCT Pub. No. WO93/02587, PCT Pub. Date Feb. 18, 1993**

**PCT Filed Jul. 27, 1992, Ser. No. 190,080**

**Int. Cl.[6] A45C *11/32*; E05B *19/24***

**U.S. Cl. 70—458** **2 Claims**




1. A laminar housing and key combination in which one or more flat keys are retained in said housing in a removable way, said flat keys having heads (3, 3*a*, 3*b*, 3*c*, 3*d*) and stems (4, 4*a*, 4*c*, 4*d*) made of a metallic material and including thereon shaped teeth and longitudinal slots with one of a cylindrical, conical and tapered cross section, in order to realize a profile of a respective key (2, 2*a*, 2*b*'–2*b*", 2*c*, 2*d*); said housing (1, 20) comprising:

an elastically flexible plastic card having a substantially rectangular form;

said housing (1, 20) also being centrally provided with an opening or cavity (5, 21) with a peripheral edge (10, 22) that forms a closed profile and that encloses an area conforming to a shape of said key (2, 2*a*, 2*b*'–2*c*, 2*d*);

means (7, 7, 23) for seizing and holding the key in position, said seizing means being provided at said opening or cavity (5, 21), whereby engagement and disengagement of the respective key from the laminar housing (1, 20) is facilitated by a longitudinal bending involving no torsion of said elastically flexible plastic card by a user's hand;

wherein said seizing means (7—7) act on the lateral edges of the heads (3, 3*a*, 3*b*'–3*b*", 3*c*) of said flat keys, each of said heads being provided with fins (6—6, 6*b*'–6*b*', 6*b*"—6*b*"), having a reduced thickness, said fins being held by the seizing means (7) that extend beyond the peripheral edge (10) inside the opening or cavity (5) adjacent to the fins;

said housing (1) also having at least a nondecreasing thickness at the seizing means (7) in which slots (8) face each other and have lateral walls (9) that approach each other in order to compress from both sides said fins (6—6, 6*b*'—6*b*', 6*b*"—6*b*") on each head;

said housing (1) also including a strip means (24) for receiving a band means (27) for carrying coded data of the key, for reading by a sensor and transducer of a duplicating machine;

wherein one of said keys (2*a*) is provided with a through hole (17) for engagement of a pin (16) having ends which are enlarged and which have cambers (16', 16"), in order to hold the pin (16) in position on the head (3*a*) of the key (2*a*), thus preventing movement; and

said pin (16) having its longitudinal axis parallel to and offset with respect to a longitudinal symmetry plane (Y—Y) of the head (3*a*) of the key (2*a*)

said camber (16') of said pin (16) acting as a reference and recognition means for correct placement of the key (2*a*) inside the housing (1), said reference and recognition means being tactile means which project out of the head (3*a*) of the key (2*a*) for identification of a correct position of engagement of the key (2*a*) in a key-hole.

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**5,501,091**

## METHOD AND APPARATUS FOR ELONGATING METAL TUBES BY MEANS OF A MANDREL MILL

**Chihiro Hayashi, Takarazuka, Japan, assignor to Sumitomo Metal Industries, Ltd., Osaka, Japan**

**Filed Nov. 23, 1993, Ser. No. 155,844**

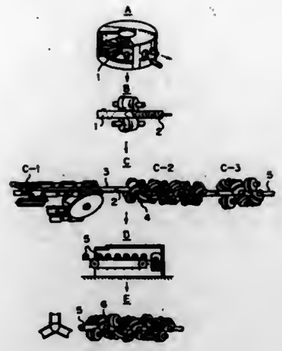
**Claims priority, application Japan, Dec. 11, 1992, 4-331820**

**Int. Cl.[6] B21B *17/02***

**U.S. Cl. 72—13.4** **18 Claims**

1. A method of elongating a metal tube by way of a mandrel mill having a series of rolling stands provided with rolls, including a final rolling stand having a delivery end, to produce a hollow shell, comprising inserting a tapered mandrel bar into a hollow piece, rolling the hollow piece through the rolling stands, and controlling a feeding speed of the mandrel bar to control a length by which the mandrel bar projects beyond the delivery end of the final rolling stand at a point in time when a leading end of the hollow piece is gripped by the rolls in the final rolling stand so that a wall thickness of the hollow piece is altered to permit the production of hollow shells of a plurality of sizes with different wall thicknesses using a single mandrel bar.






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**5,501,092**

## DIE-PUNCH MACHINE

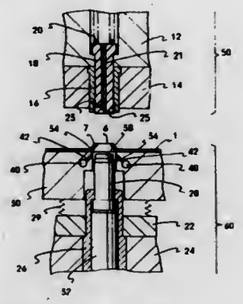
**Toshiki Miyazawa, and Masahide Sakaguchi, both of Tokyo, Japan, assignors to Hidaka Seiki Kabushiki Kaisha, Tokyo, Japan**

**Filed Jul. 12, 1994, Ser. No. 273,824**

**Claims priority, application Japan, Jul. 14, 1993, 5-173536; Jan. 18, 1993, 5-259740**

**Int. Cl.[6] B21D *37/18*; B21J *13/14***

**U.S. Cl. 72—43** **22 Claims**




22. A die-punch machine, comprising:

a punch;

a first member for holding said punch;

a second member being capable of relatively moving to and away from said first member;

a die being held by said second member, wherein a front end section of said punch is capable of inserting into said die;

an ejecting member for ejecting a workpiece, which is stuck on an inner face of said die, when the front end section of said punch comes off from said die, an outer circumferential face of said ejecting member being capable of sliding on the inner face of said die, said ejecting member being capable of contacting an end face of said punch in said die whereby said ejecting member is moved with the movement of said punch; and

an oil path for introducing a machine oil being formed in said ejecting member, one end of said oil path being opened on the outer circumferential face of said ejecting member, said one end of said oil path is opened in a groove, which is formed on an end face of said ejecting member, which is capable of contacting the end face of said punch.

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**5,501,093**

## PROCEDURE AND APPARATUS FOR FORMING A RECTANGULAR COLLAR AT THE END OF A PIPE

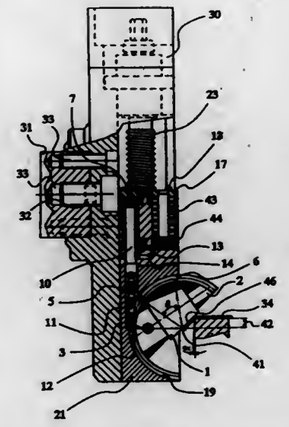
**Matti Paakkunainen, Hyvinkää , Finland, assignor to GS-Hydro Oy, Hämeenlinna, Finland**

**Filed May 23, 1994, Ser. No. 247,844**

**Claims priority, application Finland, May 28, 1993, 932439**

**Int. Cl.[6] B21D *19/02***

**U.S. Cl. 72—123** **18 Claims**




1. A method for forming a substantially rectangular collar at an end of a pipe, the pipe having a longitudinal axis and the method comprising the steps of:

placing a forming element of a turning unit against the pipe end;

moving the turning unit with the forming element in an axial direction of the pipe such that the turning unit and forming element are moved towards the pipe;

rotating the forming element along an interior surface of the pipe end about the longitudinal axis of the pipe;

moving the turning unit with the forming element in the axial direction of the pipe towards the pipe; and

automatically turning the turning unit with the forming element along a generally circular path from an initial position of substantially 45° with respect to the longitudinal axis to a final position in response to thrust produced during movement of the turning unit and forming element towards the pipe while simultaneously deforming the pipe end so as to produce a collar substantially rectangular with respect to the direction of the longitudinal axis of the pipe.

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**5,501,094**

## METHOD FOR BENDING A METAL THIN PLATE

**Akira Mizuta, and Toshikazu Yamamuro, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Dec. 28, 1993, Ser. No. 174,026**

**Claims priority, application Japan, Dec. 28, 1992, 4-358656; Apr. 13, 1993, 5-108736**

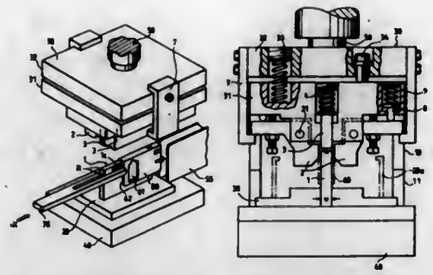
**Int. Cl.[6] B21D *5/01***

**U.S. Cl. 72—382** **11 Claims**

1. A method of bending a metal thin plate, comprising the steps of:

preparing a punch in which edge portions are one of chamfered as curved faces and formed into an obtuse angle of 90° or more, said punch having an unload channel which extends from one end of said punch to a position corresponding to a tab-bent portion of the metal thin plate;

sandwiching the metal thin plate between said punch and pressing means;



bending the metal thin plate, under a state where the metal thin plate is sandwiched, toward said punch by dies which are respectively located at both sides of said pressing means, thereby forming the metal thin plate into a shape having a U-shaped section with bent corners such that the edge portions of the punch are located at the bent corners of the metal thin plate;

pressing the metal thin plate toward the punch after the metal thin plate is bent along said punch to form the angle of the edge portions; and

unloading the bent metal thin plate in a direction along which the unload channel extends on said punch, the unload channel extending perpendicularly with respect to a direction of relative movement of the dies to the punch during bending of the metal thin plate.

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**5,501,095**

**BENDING PRESS**

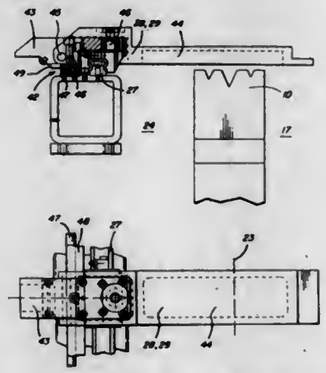
**Werner Diiger, Leonberg, and Friedrich Kilian, Göppingen, both of, Germany, assignors to Trumpf GmbH & Co., Ditzingen, Germany**

**Filed Oct. 7, 1994, Ser. No. 319,813**

**Claims priority, application Germany, Jan. 8, 1993, 9315209.4 U**

**Int. Cl.[6] B21D *11/22***

**U.S. Cl. 72—461** **16 Claims**



1. A bending press for bending workpieces along a bending line and providing a work area in front of the bending line and a stop area behind the bending line, said press comprising:

(a) a drive mechanism for effecting vertical movement of a bending tool in said bending line;

(b) an actuating device for said drive mechanism;

(c) a locking mechanism for said actuating device to disable its operation;

(d) a stop assembly in the stop area and including:

(i) a rail;

(ii) a rail drive mechanism to move said rail perpendicularly to the bending line;

(iii) at least two stops on said rail;

(iv) a releasable clamping mechanism to fix said stops in position on said rail, said stops being movable along said rail upon release of said clamping mechanism; and

(v) a clamp locking mechanism for locking said clamping mechanism in a clamp fixing position, said stop assembly being movable into a position in which the stops project over the bending line into the work area of the bending press when said locking mechanism for said actuating device is actuated, said clamp locking mechanism being actuatable to release said clamp locking mechanism when said locking mechanism for said actuating device is actuated to prevent operation of said drive mechanism, whereby said stops may be moved on said rail only when said stops project over said bending line and said locking mechanism is actuated to disable said actuating device and thereby said drive mechanism.

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**5,501,096**

**CALIBRATION METHOD FOR DETERMINING AND COMPENSATING DIFFERENCES OF MEASURING FORCES IN DIFFERENT COORDINATE DIRECTIONS IN A MULTI-COORDINATE SCANNING SYSTEM**

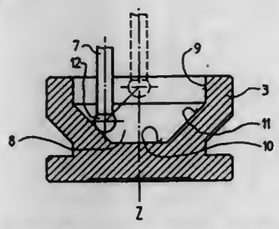
**Rudolf Stettner, Trostberg, and Kurt Feichtinger, Palling, both of, Germany, assignors to Dr. Johannes Heidenhain GmbH, Traunreut, Germany**

**Filed Aug. 5, 1994, Ser. No. 286,828**

**Claims priority, application Germany, Aug. 7, 1993, 43 26 551.0**

**Int. Cl.[6] G01B *5/03*; G01D *3/04*;*18/00*; G01L *5/18***

**U.S. Cl. 73—1 J** **5 Claims**



1. A calibration method of compensating differences of measuring forces in different coordinate directions in a measuring scanning system for use in a numerically controlled multi-coordinate measuring machine and including a tracer pin, said method comprising the steps of:

inputting parameters of the scanning system into a control unit of the multi-coordinate measuring machine;

providing a calibrating gauge and inputting parameters thereof into the control unit;

scanning calibrating surfaces of the calibrating gauge with the tracer pin, with a first scanning displacement being effected in a direction defined by two coordinate directions;

superimposing on the first scanning displacement a second scanning displacement in a direction which deviates from the direction of the first scanning displacement;

determining deviation displacement paths of the scanning system;

determining, on a basis of the deviation displacement paths, differences of the measuring forces in different coordinate directions and respective correction coefficients;

inputting the correction coefficients into the control unit;

automatically compensating measuring errors of the scanning system with the control unit; and

restoring the calibration process after accidental turning-off of the scanning system;

wherein the restoring step includes:



displacing the scanning system from a stop position thereof along at least one coordinate across a reference mark;

erasing an accidental measurement value in a reference mark position of the scanning system;

returning the scanning system to the stop position; and

determining a distance between the reference mark and the stop position and storing the distance in a storage of the control unit.

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**5,501,097**

**PORTABLE DEVICE FOR MEASURING A COEFFICIENT OF STATIC FRICTION**

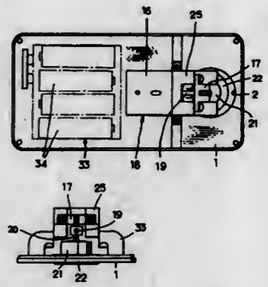
**Toshio Nomura, Tokyo, Japan, assignor to Shinto Scientific Co., Ltd., Tokyo, Japan**

**Filed Nov. 1, 1994, Ser. No. 332,079**

**Claims priority, application Japan, Nov. 30, 1993, 5-323303**

**Int. Cl.[6] G01N *19/02***

**U.S. Cl. 73—9** **20 Claims**



1. A portable device for measuring a coefficient of static friction comprising:

a voice coil motor;

a sensor means for detecting a movement of an output shaft of said voice coil motor;

a detector means for detecting an electric current supplied to said voice coil motor;

a converter means for converting an electric current value detected by said detector means into a coefficient of static friction;

wherein when an article to be measured is pushed and moved by an movement of said output shaft of said voice coil motor, and electric current is supplied to said voice coil to thereby obtain a coefficient of static friction.

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**5,501,098**

**ACOUSTIC ANALYSIS OF GAS MIXTURES**

**Gardy Cadet, Orange, and Jorge L. Valdes, Bedminster, both of N.J., assignors to AT&T Corp., Murray Hill, N.J.**

**Division of Ser. No. 175,828, Dec. 30, 1993, Pat. No. 5,392,635. This application Feb. 28, 1995, Ser. No. 395,262**

**Int. Cl.[6] G01N *29/02***

**U.S. Cl. 73—24.01** **1 Claim**



1. A method for determining the relative concentrator of components of a gas mixture comprising:

providing an acoustic cell comprising a hollow conduit for containing a gas mixture to be analyzed, said conduit having first and second ends;

a first transducer housing sealingly engaged with said first end of the conduit, said first transducer housing supporting a first transducer, and having an acoustic isolation material positioned at least partially between said first transducer and said first transducer housing to acoustically isolate said first transducer from said first transducer housing;

a second transducer housing sealingly engaged with said second end of the conduit, said second transducer housing supporting a second transducer and having an acoustic isolation material positioned at least partially between said second transducer and said second transducer housing to acoustically isolate said second transducer from said second transducer housing,

a first gas port coupled to said first end of the conduit; and

a second gas port coupled to said second end of the conduit;

wherein said acoustic isolation of said first transducer from said first transducer housing and said acoustic isolation of said second transducer from said second transducer housing produces a signal-to-noise ratio of at least 4 to 1,

flowing a gas mixture through the elongated hollow conduit;

transmitting ultrasonic sound waves through said first transducer and into said gas mixture;

detecting ultrasonic sound waves with said second transducer to determine the velocity of the ultrasonic sound waves in said gas mixture.

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**5,501,099**

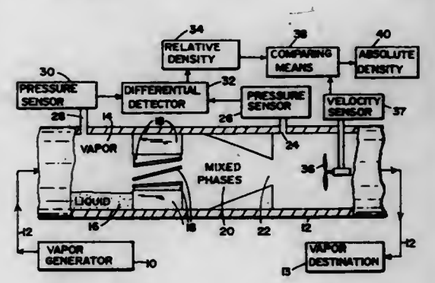
**VAPOR DENSITY MEASUREMENT SYSTEM**

**Fredrick M. Whorff, Bakersfield, Calif., assignor to ITT Corporation, New York, N.Y.**

**Filed Jun. 13, 1994, Ser. No. 258,650**

**Int. Cl.[6] G01F *1/74***

**U.S. Cl. 73—29.01** **17 Claims**




1. A system to measure the relative amounts of vapor and liquid flowing in a pipe comprising in combination:

means in said pipe to mix the vapor and liquid into a generally homogeneous mixture;

a venturi constriction in the pipe adapted to accelerate said mixture and thereby lower the pressure of said mixture;

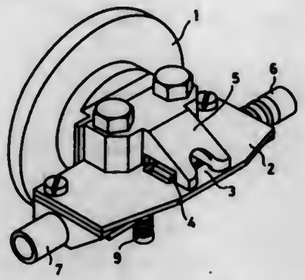
first pressure sensing means connected to measure the pressure in the pipe at a location before the vapor and liquid are mixed;

second pressure sensing means connected to measure the lower pressure produced by said venturi constriction;

pressure difference sensing means connected to said first and second pressure sensing means, and adapted to produce an output proportional to the difference in pressure between said first and second means as an indication of the density of said mixture and the relative amount of liquid mixed with the vapor; and

means in said pipe to measure the average velocity of said mixture at a location downstream of said constriction and where the mixture is still homogenous.

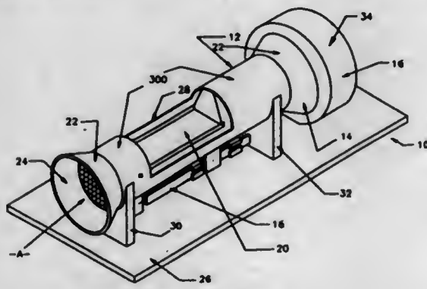
**5,501,100**
**DEVICE FOR MEASURING THE MASS OF FIBER SLIVERS**
**François Baechler, Wermatswil; Klaus Strehler, Zürich; Isidor Harzenmoser, Wallisellen, and Jürg Zehr, Uster, all of, Switzerland, assignors to Zellweger Luwa AG, Switzerland**
**Filed Jun. 23, 1994, Ser. No. 264,334**
**Claims priority, application Switzerland, Jun. 23, 1993, 01886/93**
**Int. Cl.[6] G01N *33/36*; G01B *121/04;21/12;13/00***
**U.S. Cl. 73—37.7** **14 Claims**



1. Device for measuring the mass of fiber slivers, comprising an entry part for the fiber sliver to be measured and a measuring part adjoining the entry part, said measuring part including two measuring members which operate under different measurement principles, one of the measuring members having means for measuring the pneumatic pressure generated by the fiber sliver at a contraction and the other measuring member having a measuring beam for mechanically sensing said fiber sliver.

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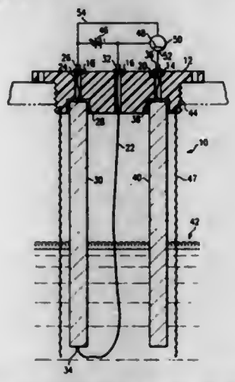
**5,501,101**
**DEMONSTRATION WIND TUNNEL**
**James R. Purcell, Rte. 6, Box 87D, Culpeper, Va. 22701**
**Filed Jan. 25, 1994, Ser. No. 187,405**
**Int. Cl.[6] G01M *9/00***
**U.S. Cl. 73—147** **8 Claims**



1. A portable wind tunnel, comprising:
a test section, said test section being a hollow member having a substantially constant cross-sectional area, a first end, a second end, and a length therebetween;
a window area, said window area being a cut-out section in said test section and providing a top view and a side view of platform means;
a window panel, said window panel being transparent, dimensioned to close said cut-out section and removably positioned in said cut-out section, providing visibility of the interior of said test section;
a platform, said platform being movably attached to said interior of said test section proximate said window area;
balance beam measuring means, said measuring means being disposed proximate said test section and operatively connected to said platform, said measuring means registering the drag force on a body generated by said air flow through said test section,
diffuser means, said diffuser having a diffuser inlet and a diffuser outlet, said diffuser inlet being attached to said first end of said test section and fitting proximate the periphery thereof, wherein said diffuser outlet has a greater cross-sectional flow area than said diffuser inlet;
a squirrel cage air flow generator, said air flow generator having an air inlet and an air outlet, wherein said air flow generator creates airflow in a direction through and parallel to said length of said test section;
flow straightening means, said flow straightening means being a honeycomb member positioned substantially normal to the direction of said flow and situated upstream from said air inlet; and
a constrictor, said constrictor having a constrictor inlet and a constrictor outlet, said constrictor outlet being attached to said second end of said test section and fitting proximate the periphery thereof, wherein said constrictor inlet has a greater cross-sectional area than said constrictor outlet.

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**5,501,102**
**FLOATLESS GAUGE WITH RESISTIVE/CONDUCTIVE POLYMER**
**Cecil M. Williamson, Carrollton, Tex., assignor to Rochester Gauges, Inc., Dallas, Tex.**
**Filed Nov. 24, 1993, Ser. No. 158,036**
**Int. Cl.[6] G01F *23/24***
**U.S. Cl. 73—304 R** **19 Claims**



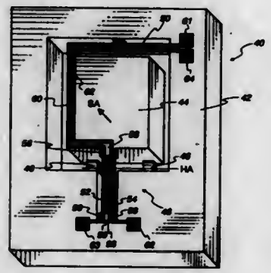
1. A floatless gauge assembly to be used in conjunction with a voltage source and voltage indicator for measuring the level of a fluid in a tank, comprising:
a first elongate electrically resistive/conductive polymeric member dimensioned to extend into the fluid, said first resistive/conductive member having a first end and a second end;
a first terminal electrically connected to said first end of said first elongate electrically resistive/conductive polymeric member, said first terminal providing a connection point for electrically connecting said first terminal to the positive terminal of a voltage source;
a second terminal electrically connected to said second end of said first elongate electrically resistive/conductive polymeric member, said second terminal providing a connection point for connecting said second terminal to the negative terminal of a voltage source;
a second elongate electrically resistive/conductive polymeric member dimensioned to extend into the fluid, said second resistive/conductive member having a first and second end; and



a third terminal electrically connected to said first end of said second elongate electrically resistive/conductive polymeric member, said third terminal providing a connection point for connecting to said third terminal one terminal of a voltage indicator.

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**5,501,103**
**TWO-PORT ELECTROMAGNETIC DRIVE FOR A DOUBLE-ENDED TUNING FORK**
**James R. Wondruff, Redmond, and Michael J. Robinson, Mukilteo, both of Wash., assignors to AlliedSignal Inc., Morristown, N.J.**
**Filed Feb. 15, 1994, Ser. No. 198,228**
**Int. Cl.[6] G01P *15/08***
**U.S. Cl. 73—514.29** **14 Claims**

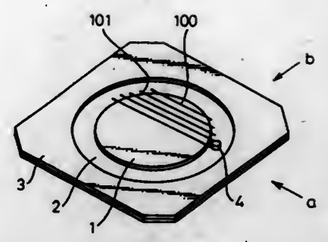


1. A vibrating beam accelerometer, comprising:
a proof mass;
a casing;
a plurality of flexures for connecting the proof mass to said casing defining a hinge axis HA; and
a plurality of vibrating beams defining opposing ends; said vibrating beams connected between said proof mass and said casing, two or more of said plurality of vibrating beams formed with separate and isolated electrical conducting paths, each one of said electrical conducting paths electrically connected to a pair of wire bond pads forming a port for enabling each one of said electrical conducting paths to be directly connected to a drive circuit and a pick off circuit.

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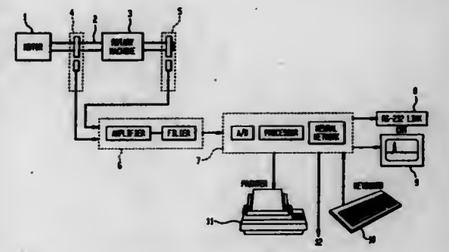
**5,501,104**
**METHOD OF MEASURING THE DEPTH OF FULL-CUT DICING GROOVES BY USING AN ULTRASONIC DETECTOR AND A DICING APPARATUS FOR CARRYING OUT THE SAME**
**Hotaka Ikeda, and Masaharu Nakamura, both of Mitaka, Japan, assignors to Tokyo Seimitsu Co., Ltd., Tokyo, Japan**
**Filed Feb. 16, 1994, Ser. No. 197,192**
**Claims priority, application Japan, Feb. 23, 1993, 5-033406**
**Int. Cl.[6] G01S *15/88***
**U.S. Cl. 73—629** **10 Claims**

1. A method of measuring a depth of a dicing groove cut in a workpiece, said method comprising the steps of:
providing a plate-shaped workpiece adhered to an adhesive sheet;
providing a dicing apparatus with a cutting blade rotating at a high speed thereupon;
providing an ultrasonic detector which emits ultrasonic waves;
cutting a groove in said plate-shaped workpiece with said cutting blade, said groove extending through a thickness of the workpiece;
emitting ultrasonic waves from said ultrasonic detector;
measuring at least one of the time interval between the emission of the ultrasonic waves and a return of an echo of the ultrasonic waves from the workpiece, and a phase difference between the emitted ultrasonic waves and the echo thereof;
wherein said cutting step includes cutting an extension groove in the adhesive sheet in an exposed area thereof not occupied by the plate-shaped workpiece, and wherein said measuring step includes measuring a depth of the extension groove.



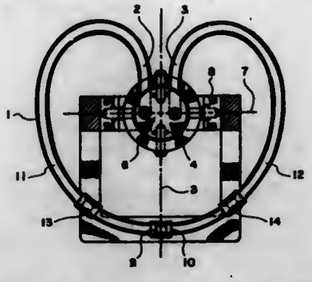
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**5,501,105**
**DIGITAL SIGNAL PROCESSING OF ENCODER SIGNALS TO DETECT RESONANCES IN ROTATING MACHINES**
**Walter Hernandez, Potomac, Md., and Richard Sutermeister, Fairfax, Va., assignors to Monitoring Technology Corp., Fairfax, Va.**
**Continuation-in-part of Ser. No. 769,821, Oct. 2, 1991, Pat. No. 5,365,787. This application Aug. 15, 1994, Ser. No. 290,375**
**Int. Cl.[6] G01H *1/00;11/00*; G08B *23/00*; G01N *29/00***
**U.S. Cl. 73—660** **19 Claims**



1. A method for analyzing the torsional and bending vibration of a rotary machine comprising the steps of:
a) acquiring at least one raw signal representative of the instantaneous rotational velocity of at least one shaft of said rotary machine;
b) conditioning said raw signal to produce conditioned signals;
c) digitizing said conditioned signals at an initial rate greater than required by the Nyquist criterion to produce initial digital signals and forming initial digital records therefrom each comprised of a portion of said initial digital signal;
d) processing said initial digital signal records to produce an enhanced signal wherein selected torsional vibration components are enhanced and other signal components are reduced;
e) averaging said enhanced signals so to remove selected random signal components; and
f) analyzing said averaged enhanced signals to determine the torsional and bending vibration parameters of said rotary machine.

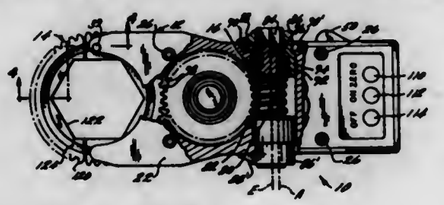
**5,501,106**
**INERTIA FORCE FLOWMETER WITH PIVOTALLY SUPPORTED VIBRATING CONDUIT**
**Hyok S. Lew; Yon S. Lew, and Yon K. Lew, all of 7890 Oak St., Arvada, Colo. 80005**
**Filed Nov. 16, 1993, Ser. No. 152,370**
**Int. Cl.[6] G01F 1/84**
**U.S. Cl. 73—861.038** **22 Claims**



1. An apparatus for measuring flow rate of media comprising in combination:
a) a substantially rigid structure disposed in a relationship allowing at least minimal amount of pivotal vibrations about a first axis and a second axis perpendicular to one another, and including at least one elongated flow passage disposed in a symmetric relationship about a plane including the first axis; wherein an inlet and outlet of the elongated flow passage are disposed adjacent to said plane;
b) at least one mechanical support means comprising at least one of a substantially freely pivoting joint and an elastically biased pivotable joint supporting the substantially rigid structure about at least one of the first and second axes in a relationship allowing an enhanced pivotal vibration of the substantially rigid structure about said one of the first and second axes;
c) means for exerting a vibratory force on the substantially rigid structure at said plane for generating a primary pivotal vibration of the substantially rigid structure about the second axis; and
d) means for measuring a level of a secondary pivotal vibration of the substantially rigid structure about the first axis as a measure of mass flow rate of media moving through the elongated flow passage.

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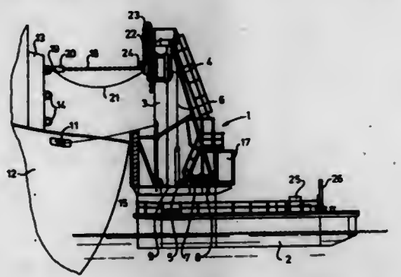
**5,501,107**
**TORQUE TOOL**
**Robert F. Snyder, 55 High La., Hamden, Conn. 06517, and Edward J. Poryday, 201 Marion Ave., Plantsville, Conn. 06479**
**Filed Feb. 23, 1993, Ser. No. 22,378**
**Int. Cl.[6] G01L 5/24**
**U.S. Cl. 73—862.23** **43 Claims**



1. A torque tool comprising:
main housing means;
gear train means mounted in said main housing means, said gear train means having at least one input means;
reaction means mounted to said main housing means; and
a hinged gear mounted to said main housing means and engaging said gear train means, said hinged gear having a hinge means wherein said hinged gear pivots about said hinge means into an open position, said hinged gear also having a locking means to maintain said hinged gear in a closed position, said hinged gear including an output means; and
a torque measuring means mounted to said main housing means, said torque measuring means including an electronic strain measuring device mounted to said main housing means in a position on said main housing means about which a moment occurs when a force is applied by said hinged gear;
an analog to digital converter adapted to receive an analog signal from said electronic strain measuring device and provide a corresponding digital signal; and
a digital display connected in circuit with said analog to digital converter.

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**5,501,108**
**TESTING DEVICE FOR WIPPER HOOKS**
**Hendrik Kuiken, Emmeloord, Netherlands, assignor to Kuiken N.V., Emmeloord, Netherlands**
**Filed Aug. 15, 1994, Ser. No. 290,500**
**Int. Cl.[6] G01L 1/00**
**U.S. Cl. 73—862.57** **6 Claims**



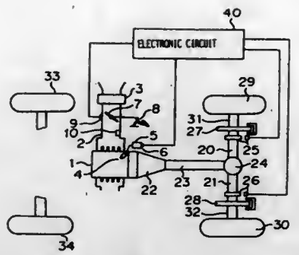
1. A device for testing a wipper hook mounted on a mast of a vessel, comprising: a pontoon having means for positioning said pontoon against the vessel, said pontoon including traction means connected to line means, and arranged to couple with the wipper hook to be tested and exert a traction force thereon, said traction means including height adjustable coupling means mounted on the pontoon for receiving said line means, and means for determining the traction force exerted on the wipper hook.

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**5,501,109**
**TORSION TORQUE DETECTING DEVICE, A SLIP DETECTING DEVICE, A ROAD FRICTION COEFFICIENT DETECTING DEVICE AND A TORSION TORQUE DETECTING METHOD**
**Yasuo Naito; Hideki Doi, and Chiaki Fujimoto, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**
**Filed Mar. 1, 1995, Ser. No. 396,524**
**Claims priority, application Japan, Nov. 30, 1994, 6-296694**
**Int. Cl.[6] G01B 3/02**
**U.S. Cl. 73—862.191** **14 Claims**

12. A torsion torque detecting method, comprising the steps of:
a) detecting a rotational velocity of a power unit for driving a vehicle;
b) calculating a rotational acceleration of the power unit from the detected rotational velocity thereof;
c) calculating an output torque of the power unit from operational parameters of the power unit; and

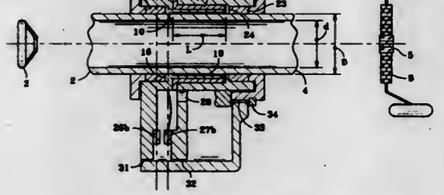





d) calculating torsion torques of wheel drive shafts for driving wheels from the rotational acceleration of the power unit and the output torque of the power unit.

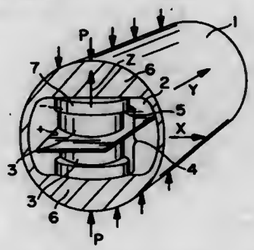
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**5,501,110**
**TORSION MEASURING DEVICE FOR A ROTATING SHAFT**
**Fernand Peilloud, Hery sur Alby, and Claire Blache, Echirolles, both of, France, assignors to The Torrington Company, Torrington, Conn.**
**Filed Mar. 31, 1993, Ser. No. 41,307**
**Claims priority, application France, Jun. 26, 1992, 92 07872**
**Int. Cl.[6] G01L 3/00**
**U.S. Cl. 73—862.321** **8 Claims**



1. A device for measuring torsion on a shaft comprising:
two magnetic field generators, immobilized with respect to a first portion of the shaft, located symmetrically with respect to each other in a first plane perpendicular to the shaft; and
two magnetic field detectors, immobilized with respect to a second portion of the shaft axially spaced from the first portion, the magnetic field detectors being located in a second plane perpendicular to the shaft, the magnetic field detectors providing separate signals that are combined to provide a signal proportional to torsional moment as a result of relative angular shift of the magnetic field generators with respect to the magnetic field detectors, wherein the signal proportional to torsional moment results from subtracting an output signal of one magnetic field detector from an output signal of the other magnetic field detector.

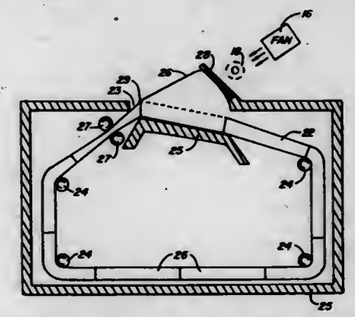
**5,501,111**
**FORCE SENSOR SYSTEMS ESPECIALLY FOR DETERMINING DYNAMICALLY THE AXLE LOAD, SPEED, WHEELBASE AND GROSS WEIGHT OF VEHICLES**
**Hans C. Sonderegger; Reto Calderara, and Claudio Cavalloni, all of Neftenbach, Switzerland, assignors to Kistler Instrumente AG, Winterthur, Switzerland**
**Continuation-in-part of Ser. No. 114,700, Aug. 31, 1993, abandoned, which is a continuation of Ser. No. 995,831, Dec. 23, 1992, Pat. No. 5,265,481, which is a continuation of Ser. No. 810,039, Dec. 19, 1991, abandoned. This application Jun. 22, 1994, Ser. No. 264,062**
**Claims priority, application Switzerland, Dec. 9, 1990, 04024/90**
**Int. Cl.[6] G01L 1/04**
**U.S. Cl. 73—862.642** **14 Claims**



12. A method for assembling and preloading a force sensor comprising:
distorting a cross-sectional area of a sleeve to enlarge one cross-sectional length of a longitudinal recess in the sleeve;
inserting into the recess a piezo assembly having a pair of piezo discs separated by a center post and between a pair of force-introducing parts;
relaxing the distortion whereby the piezo discs are preloaded elastically so that any air gaps between the force-introducing parts, piezo discs and center post are removed.

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**5,501,112**
**RETRODICTIVE MOLECULAR AND PARTICLE IN-SITU SNARES**
**Ralph Bernstein, Los Altos; Vasu H. Tahiliani, San Jose; Mario Rabinowitz, Redwood City, all of Calif., and Richard Grace, Pittsburgh, Pa., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.**
**Filed Jul. 2, 1993, Ser. No. 86,794**
**Int. Cl.[6] G01N 1/22**
**U.S. Cl. 73—864** **5 Claims**

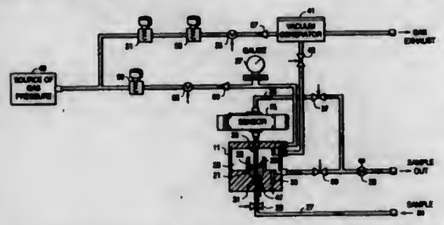



1. Apparatus for collecting gases and particles from a surrounding space before and during an accident occurring in the space to

permit the gases and particles to be later used to determine the cause of the accident, said apparatus comprising;
a hollow body having a wall provided with at least one opening, said body being in the space;
including a flexible belt movable through each opening,
permitting the belt to move into and out of the body,
there being means for moving the belt relative to the body,
said belt having a multitude of flexible collection chambers, the chambers are rejuvenatable by being squeezed to force out the collected gases and particles.

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**5,501,113**
**PARTICLE MEASURING SYSTEM WITH SONICALLY MEASURED FLOW RATE**
**Charles Harrison, Adelphi; Zhi X. Peng, Kensington; Gladys V. Range, Silver Spring, and Gary L. Morgan, Elkridge, all of Md., assignors to Pacific Scientific Company, Newport Beach, Calif.**
**Continuation of Ser. No. 148,616, Nov. 8, 1993, abandoned.**
**This application May 31, 1995, Ser. No. 455,400**
**Int. Cl.[6] G01N *15/02***
**U.S. Cl. 73—865.5** **11 Claims**

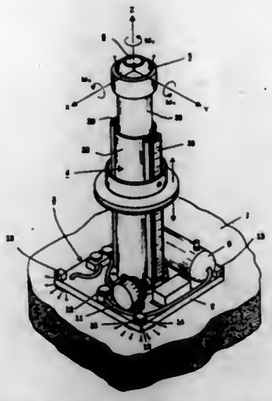


1. A particle measuring system comprising means having a flow cell and operating to measure the size of particles entrained in liquid flowing through said flow cell, means defining a chamber for containing a liquid, wherein the liquid in said chamber defines a liquid surface in said chamber, flow providing means to provide a flow path between said chamber and said flow cell to cause liquid to flow between said chamber and said flow cell and through said flow cell at a rate of flow corresponding to the rate of vertical displacement of the surface of the liquid in said chamber, and means to continuously monitor the rate of flow of liquid through said flow cell by measuring the rate of vertical displacement of the surface of the liquid in said chamber.

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**5,501,114**
**THREE-DIMENSIONAL FREE MOTION APPARATUS**
**Osamu Okamoto, Higashiyamato, and Teruomi Nakaya, Machida, both of, Japan, assignors to national Aerospace Laboratory of Science & Technology, Tokyo, Japan**
**Filed Feb. 3, 1994, Ser. No. 191,125**
**Claims priority, application Japan, Sep. 28, 1993, 5-263138**
**Int. Cl.[6] B64G *7/00***
**U.S. Cl. 73—865.6** **14 Claims**

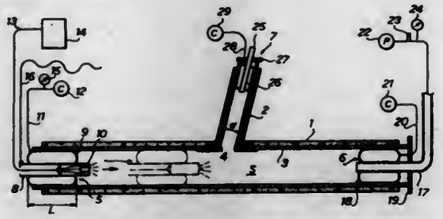
1. A three-dimensional free motion apparatus comprising: a plane sliding mechanism portion having a floating board mounted on a surface table through an extremely low friction plane sliding supporting means of a two-dimensional 3-freedom; a vertical shaft sliding mechanism portion supported on said floating board and a vertical sliding shaft tube supported so as to enable translation in a vertical direction on said vertical shaft sliding mechanism through an extremely low friction vertical shaft sliding and supporting means, and said vertical sliding shaft tube being connected to a balance belt for applying a balance weight; a 3-axis turning rotational mechanism portion formed above said vertical sliding shaft tube of said vertical shaft sliding mechanism portion and having a spherical shaft mounted thereon through a 3-axis extremely low



friction 3-freedom rotational and supporting means; and a specimen model loading portion supported on said spherical shaft.

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**5,501,115**
**METHOD OF INSPECTING A PIPE LINER BAG**
**Takao Kamiyama, Hiratsuka; Yasuhiro Yokoshima, Ibaraki, and Shigeru Endoh, Kasukabe, all of, Japan, assignors to Shonan Gosei-Jushi, Seisakusho K.K.; Yokoshima & Company, and Get Inc., all of, Japan**
**Filed Jul. 14, 1994, Ser. No. 275,104**
**Claims priority, application Japan, Jul. 28, 1993, 5-185788**
**Int. Cl.[6] G01M *3/12***
**U.S. Cl. 73—865.8** **15 Claims**



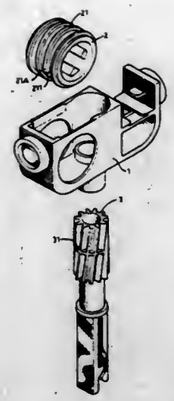
1. A method of inspecting a pipe liner bag for use in repairing a pipeline, comprising the steps of:
lining the inner wall of a pipeline with a hardened pipe liner bag;
air-tightly sealing all open ends of the pipe liner bag;
decreasing an inner pressure within the sealed pipe linear bag; and
inspecting a hardened condition by detecting distortion of said sealed pipe liner bag and an air-tight sealing effect provided by the pipe liner bag in a single procedure.

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**5,501,116**
**TRANSMISSION DEVICE FOR A VERTICAL BLIND**
**Ming L. Weng, P.O. Box 82-144, Taipei, Taiwan**
**Filed Mar. 2, 1994, Ser. No. 204,097**
**Int. Cl.[6] E06B *9/38*; F16H *1/16***
**U.S. Cl. 74—89.14** **1 Claim**

1. A transmission device for a vertical blind comprising:
a worm disposed within a housing and having an upper flange, a lower flange, a spiral tooth extending at least 720 degrees around the worm and having a given radial dimension, the tooth positioned between the said upper flange and said lower flange; and

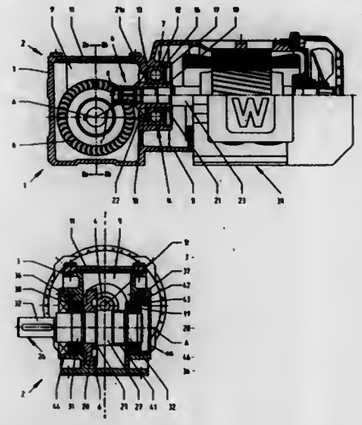




a worm gear disposed with said housing and meshed with said worm, said worm gear being formed with a partition across a number of teeth thereof, said worm gear being limited to rotate through a maximum angle of 180 degrees only;
characterized in that the spiral tooth has ends gradually extending radially outward beyond the said given radial dimension of the spiral tooth.

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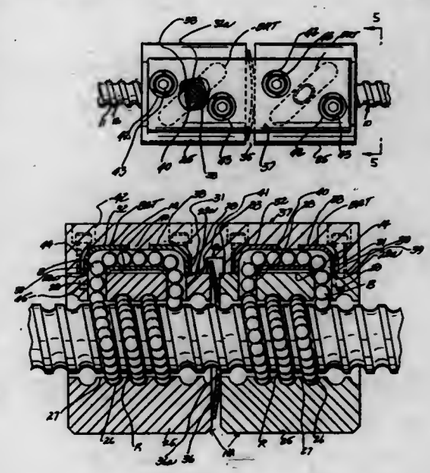
**5,501,117**
**MOTOR ASSEMBLY WITH GEAR HOUSING CONTAINING PINION GEAR SUPPORT BEARING**
**Norbert Mensing, Bruchsal, and Siegfried Kimmich, Kraichtal, both of, Germany, assignors to Sew-Eurodrive GmbH & Co., Bruchsal, Germany**
**Filed Mar. 24, 1994, Ser. No. 216,943**
**Claims priority, application Germany, Mar. 24, 1993, 43 09 559.3**
**Int. Cl.[6] F16H *1/12;57/02***
**U.S. Cl. 74—420** **19 Claims**



1. A motor assembly comprising:
a motor having a drive shaft which rotates during activation of the motor;
a gear housing attached to the motor;
a gear and a pinion meshing with the gear, the gear and the pinion being located within the gear housing with the gear driving a power takeoff; and
a bearing, mounted in the gear housing at a position displaced from the toothed gear, for rotatably supporting rotation of the pinion during activation of the motor; and wherein
the pinion has a hollow shaft with the hollow shaft engaging an outside surface of the drive shaft for directly driving the pinion.

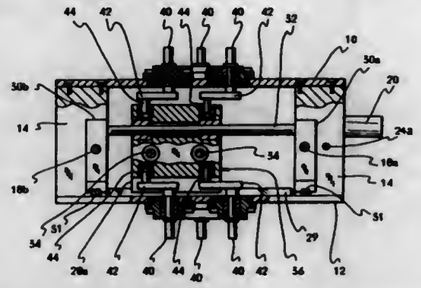
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**5,501,118**
**BALL NUT AND SCREW ASSEMBLY WITH PRELOAD RETAINING BALL RETURN TUBE CLAMP**
**Robert L. Benton, Bay City, Mich., assignor to Thomson Saginaw Ball Screw Co., Inc., Saginaw, Mich.**
**Filed Dec. 5, 1994, Ser. No. 350,271**
**Int. Cl.[6] F16H *25/22***
**U.S. Cl. 74—441** **9 Claims**



1. In a ball nut and screw assembly:
a) an exteriorly threaded, axially extending screw having exterior helical groove portions;
b) a nut assembly comprising a pair of nuts on said screw having interior helically complementally grooved portions, the respective groove portions of the screw and nut defining a pair of axially spaced helical raceways;
c) a train of load transfer bearing balls accommodated in each of said raceways;
d) at least one preloading member between said nuts for imposing a preload on said groove portions of the raceways;
e) external ball return tubes for each of said nuts having ends which communicate with opposite ends of each of said raceways for recirculating balls from one end of each raceway to the other;
f) an elongate unitary ball return tube clamp plate having opposed ends fastened respectively to a different one of said nuts extending across said preload creating member to clamp each of said ball return tubes to their respective nuts; and
g) fasteners extending between each of said nuts and the ends of said clamp plate for securing said return tubes in position and permitting said clamp plate to retain said nuts in preloaded condition.

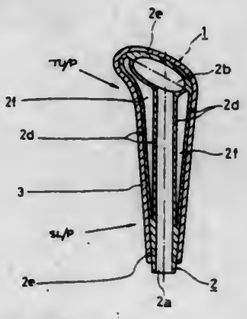
**5,501,119**
**ROTARY DRIVE SYSTEM**
**Ken Yanagisawa, Matsumoto, Japan, assignor to Yugen Kaisha Sozoan, Nagano, Japan**
**Filed Aug. 2, 1994, Ser. No. 284,132**
**Claims priority, application Japan, Aug. 9, 1993, 5-197113**
**Int. Cl.[6] G05G *11/00***
**U.S. Cl. 74—490.09** **17 Claims**



1. A rotary drive system, comprising:
a driving mechanism for moving a moving body around in a plane;
a plurality of output shafts being arranged perpendicular to said plane, said output shafts being capable of rotating on their axes at prescribed positions; and
a plurality of output levers wherein a first part of each output lever is rotatably connected to each output shaft and a second part thereof is rotatably connected to a face of said moving body, which is parallel to said plane, and wherein the distance between the first and second parts of each output lever is made equal.

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**5,501,120**
**SHIFT KNOB AND METHOD OF MAKING**
**Teishin Kikuchi; Hiroyuki Yamauchi; Seiichi Furuya, and Kenichi Kan, all of Tokyo, Japan, assignors to Niles Parts Co., Ltd., Tokyo, Japan**
**Filed Mar. 21, 1994, Ser. No. 216,027**
**Claims priority, application Japan, Apr. 14, 1993, 5-111071**
**Int. Cl.[6] F16H *59/04*; G05G *1/06***
**U.S. Cl. 74—543** **7 Claims**

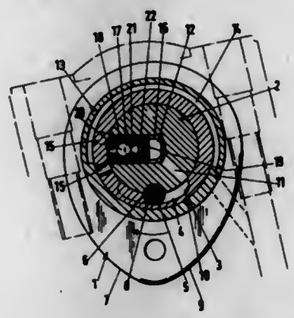


3. A shift knob comprising:
a one-piece body having a relatively thick upper end portion and a gradually tapering portion which extends from said relatively thick portion to a relatively slim lower portion;
wall means defining a first hollow portion which forms a button-receiving aperture in said relatively thick portion, a second hollow portion which forms a lever-receiving bore which extend from said button receiving aperture to an end of said gradually tapering portion, and a third hollow portion which is formed by gas injection molding, which surrounds said lever receiving bore and which extends from a location adjacent said button receiving aperture to a location proximate the end of said gradually tapering portion, said first, second and third hollow portions being so dimensioned and arranged as to be effective to cause said wall means to have an essentially uniform wall thickness; and
an outer covering layer formed over an external surface of said body, said outer covering layer having an essentially uniform thickness.

6. A method of molding a shift knob body comprising the steps of:
gas injection molding an elongate one-piece construction from a hard resin in a manner to form a relatively thick portion at one end of and a gradually tapering portion which becomes slim toward the other end, said relatively thick portion having a first hollow portion forming a button-receiving aperture, a second hollow portion which forms a lever-receiving bore which extends longitudinally from said button receiving aperture through the shift knob body and has an opening at a lower end thereof, and a third hollow portion which is formed by said gas injection, said third hollow portion extending about said lever-receiving bore and cooperating with said first and second hollow portions in a manner to form essentially uniform thickness walls throughout said shift knob body; and
coating the outer surface of said one-piece construction with a covering of soft material having an essentially uniform thickness.

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**5,501,121**
**CAMSHAFT ARRANGEMENT HAVING A CAM MOUNTED FOR LIMITED ANGULAR MOTION**
**Alfred Beier, Braunschweig; Dietrich Distler, Wolfsburg; Adamis Panagiotis, Wolfsburg, and Paul Gnegel, Wolfsburg, all of, Germany, assignors to Volkswagen AG, Wolfsburg, Germany**
**Filed Mar. 15, 1994, Ser. No. 213,128**
**Claims priority, application Germany, Mar. 15, 1993, 43 08 130.4**
**Int. Cl.[6] F16H *53/00***
**U.S. Cl. 74—568 R** **4 Claims**

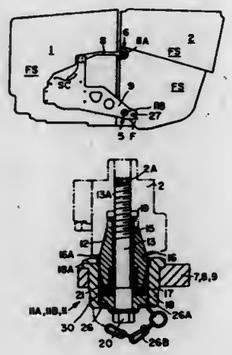


1. A camshaft arrangement for actuating a lift value provided with a closing spring comprising at least one cam supported for limited angular motion on camshaft and having a neck portion extending from one face of the cam parallel to the camshaft, the angular motion of the cam being limited by opposed stops which are fixed relative to the cam and the camshaft, respectively, and which form at least one interchamber adapted to be filled with a damping fluid, a sleeve bearing for the camshaft surrounding the neck portion and having an internal passage extending over a predetermined angle about the neck portion, the camshaft having longitudinal and transverse passages which are in flow communication with the internal passage in the neck portion and with the interchamber at a predetermined angular position of the cam with respect to the camshaft, the internal passage in the sleeve being arranged to supply damping fluid through the internal passage in the neck portion and the camshaft passages to the interchamber at the predetermined angular position.



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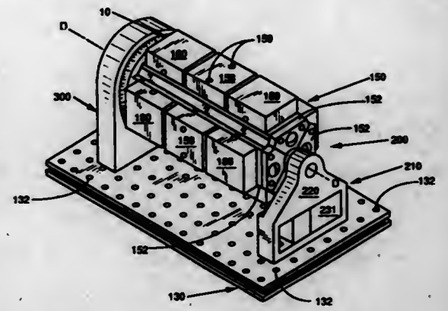
**5,501,122**
**COUPLING DEVICE FOR CONNECTING AN ENGINE BLOCK TO A GEAR CASE**
**Werner Leicht, Stetten; Dietrich Koch, Tettnang, and Juergen Gieseimann, Markdorf, all of, Germany, assignors to MTU Motoren- und Turbinen- Union Friedrichshafen GmbH, Friedrichshafen, Germany**
**Filed Jan. 24, 1994, Ser. No. 184,986**
**Claims priority, application Germany, Jan. 26, 1993, 43 02 007.0**
**Int. Cl.[6] F16H *57/02*; F16B *2/14***
**U.S. Cl. 74—606 R** **20 Claims**



1. A coupling device comprising two components (1, 2) to be coupled to each other, at least one flexible connecting link (7), a connector (SC) connecting one end of said at least one connecting link to one of said two components, a first screw connector (11) including a threaded bolt (13) with a threaded end and a head end (20), a centering member (16) having a central longitudinal bore through which said threaded bolt extends so that said centering member is slideably movable axially on said threaded bolt, said centering member (16) having a first outer conical surface facing toward said threaded end and a second outer conical surface facing toward said head end of said threaded bolt, a conical recess (12) and a threaded bore (2A) coaxial with said conical recess (12) in the other component of said two components so that tightening of said threaded bolt (13) pulls said first outer conical surface of said centering member (16) into said conical recess (12) for centering, a hole with walls in the other end of said at least one connecting link (7), a radially expandable clamping ring (17) positioned in said hole of said at least one connecting link, said radially expandable clamping ring (17) having an inner conical surface engaging said second outer conical surface of said centering member (16), said radially expandable clamping ring (17) having a radially outer surface for pressing said radially expandable clamping ring against said walls of said hole in said at least one connecting link (7) between said two components.

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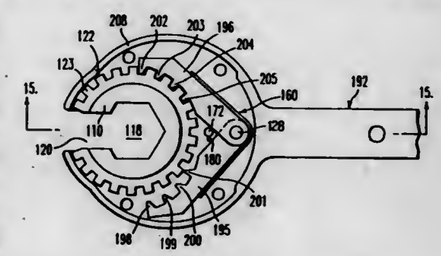
**5,501,123**
**INDEXING APPARATUS**
**George R. Swann, Gibsonia, and Eric R. Moore, Pittsburgh, both of Pa., assignors to Chick Machine Tool, Inc., Warrendale, Pa.**
**Filed Sep. 2, 1994, Ser. No. 300,606**
**Int. Cl.[6] B23Q *3/18*;*16/02***
**U.S. Cl. 74—822** **23 Claims**



1. Apparatus for selectively indexing an article about an axis, comprising:
a housing member; and
an indexing assembly attached to said housing member and said article, said indexing assembly having indexing means for selectively axially displacing said article along said axis to a disengaged position when a rotary force is initially applied thereto and permitting said article to thereafter be selectively rotated to a predetermined angular position about said axis upon the further application of said rotary force to said indexing assembly and selectively retaining said article in said predetermined angular position when said further application of rotary force is discontinued.

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**5,501,124**
**OPEN END RATCHET WRENCH**
**Earl T. Ashby, 3421 Saint Ann St., Owensboro, Ky. 42303**
**Division of Ser. No. 113,710, Aug. 31, 1993, Pat. No. 5,467,672, which is a continuation-in-part of Ser. No. 871,119, Apr. 20, 1992, abandoned. This application May 26, 1995, Ser. No. 451,499**
**Int. Cl.[6] B25B *13/46***
**U.S. Cl. 81—58.2** **18 Claims**



18. A reversible wrench, comprising:
a head having an aperture;
an operating jaw journaled for rotation in said head aperture, said jaw having a nut-engaging opening, and a ratchet having ratchet teeth formed in a peripheral surface of said jaw;
a pair of pivoted ratchet pawls, one for allowing rotation of said jaw in a clockwise direction and for blocking rotation in a counterclockwise direction and the other for allowing rotation of said jaw in a counterclockwise direction and for blocking

rotation in a clockwise direction, said ratchet pawls each having a plurality of projecting pawl teeth, one of said pawls being pivoted on a pivot pin on one side of the jaw and extending to and engagable with said ratchet on the other side of said jaw and said other pawl being pivoted on a pivot pin on the other side of the jaw and extending to and engagable with said ratchet on the one side of the jaw.

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**5,501,125**

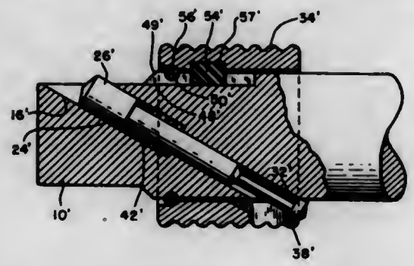
## QUICK RELEASE MECHANISM FOR TOOLS SUCH AS SOCKET WRENCHES

**Peter M. Roberts, Chattanooga, Tenn.; John B. Davidson, Chicago, and C. Robert Moon, Joliet, both of Ill., assignors to Roberts Tool International (USA), Inc., Chicago, Ill.**

**Continuation-in-part of Ser. No. 50,514, Apr. 20, 1993, abandoned, which is a continuation-in-part of Ser. No. 959,215, Oct. 9, 1992, Pat. No. 5,233,892. This application Aug. 2, 1994, Ser. No. 284,344**

**Int. Cl.[6] B25B *23/16***

**U.S. Cl. 81—177.85** **17 Claims**




1. In a tool comprising a drive stud for receiving and releasing a tool attachment; said drive stud having an opening therein and a locking element movably disposed in the opening; said drive stud defining a longitudinal axis and the opening oriented at a first non-zero angle with respect to the longitudinal axis; said opening defining upper and lower ends, the lower end of the opening being located at a portion of the drive stud constructed for insertion into the tool attachment; said lower end of the locking element being constructed to engage the tool attachment when the locking element is positioned in an engaging position and to release the tool attachment from the drive stud when the locking element is moved to a release position; the improvement comprising:

an actuating element retained on and slidably positioned on the drive stud to move along the longitudinal axis, said actuating element defining a slot;

said actuating element receiving the locking element in the slot and coupled to the locking element to move the locking element from the engaging position to the release position as the actuating element moves along the longitudinal axis, and rotation of said actuating element being effective to apply side loads to a portion of the locking element received in the slot;

an anti-rotation element coupled to one of the actuating element and the drive stud to slide along an out-of-round surface defined by the other of the actuating element and the drive stud, said out-of-round surface oriented to prevent rotation of the actuating element about the longitudinal axis and thereby to limit side loading of the locking element.

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**5,501,126**

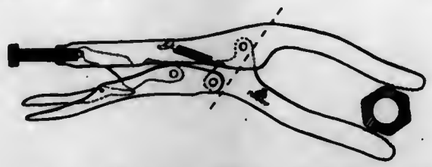
## CROSSING-JAW LOCKING PLIERS

**Brent P. Wright, 5233 S. State, Murray, Utah 84107**

**Filed Aug. 1, 1994, Ser. No. 283,585**

**Int. Cl.[6] B25B *7/02***

**U.S. Cl. 81—418** **1 Claim**



1. In a quick release pliers having a first and second jaw with the second jaw connected to the first at one pivot and to a quick release mechanism at a second pivot, the quick release mechanism engaging a threaded member to adjust the position of the release mechanism, the improvement comprising:

the first jaw being bifurcated and the second jaw being a single member adapted to fit between the bifurcated first jaw,

whereby upon movement of the threaded member, the position of the second pivot is moved forward with respect to the jaws, thus placing the second jaw between the bifurcated first jaw, to allow for internal engagement of a workpiece.

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**5,501,127**

## APPARATUS FOR TRIMMING FLAT MULTI-SHEET PRINTED PRODUCTS

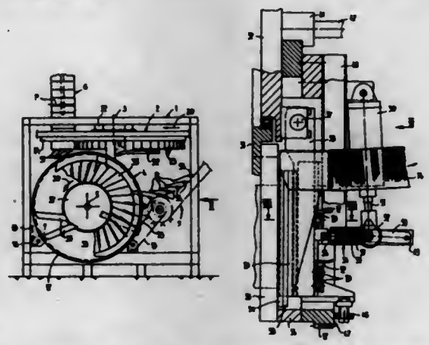
**Hans-Ulrich Stauber, Grüt, Switzerland, assignor to Ferag AG, Hinwil, Switzerland**

**Filed Dec. 17, 1993, Ser. No. 168,415**

**Claims priority, application Germany, Dec. 18, 1992, 42 43 060.7**

**Int. Cl.[6] B26D *1/03*; B65H *35/08***

**U.S. Cl. 83—100** **11 Claims**



1. An apparatus for trimming flat products, along at least one of two mutually opposite edges, comprising

a support stand (1),

a cellular wheel (4) comprising a plurality of generally radially extending spokes (33) which define cells (35) therebetween which are disposed about the circumference of the wheel,

bearing means mounting said cellular wheel to said support stand for rotation about a central axis (5),

said cellular wheel being divided along a plane (40) which is perpendicular to said central axis and so as to define two cellular wheel halves,

said bearing means comprising two bearing elements (32) rotatably mounting respective ones of said cellular wheel halves, and means fixedly mounting each of said bearing elements to said support frame while permitting selective movement with



respect to each other along a direction parallel to said central axis so as to permit adjustment of the lateral length of said cells,

a first blade member (36) mounted to each of said spokes (33) of at least one of said two cellular wheel halves, each first blade member (36) extending along one side edge of the associated spoke (33) so as to define a lateral side edge of the associated cell (35), and

at least one counter blade (39) associated with the first blade members (36) of said at least one cellular wheel half and being mounted to one of said bearing elements (32) so as to be non-rotatable with said at least one cellular wheel half and so as to operatively cooperate with the first blade members (36) upon rotation of said cellular wheel about said central axis (5).

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**5,501,128**

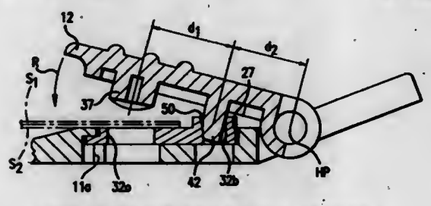
## FLOATING DIE PAPER PUNCH

**Michael D'Amore, Lake Villa, Ill., assignor to ACCO USA, Inc., Wheeling, Ill.**

**Filed Jan. 18, 1994, Ser. No. 188,162**

**Int. Cl.[6] B26F *1/32***

**U.S. Cl. 83—599** **10 Claims**




1. A punch for punching holes in a sheet comprising:

a) a base;

b) an arm pivotally movable with respect to the base;

c) pin punch elements mounted on the punch;

d) floating units including die holes mounted on the punch such holes for receiving the pin punch elements;

e) a first unit alignment guide element mounted on the arm and a second unit alignment guide element mounted on the unit, said guide elements engageable when the arm is pivoted,

whereby the engagement of the first and second guide elements causes the unit to float and align the pin punch elements with the die hole in the unit.

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**5,501,129**

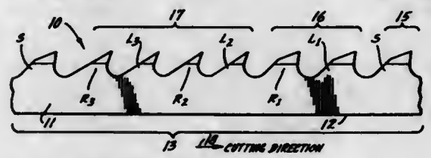
## ALL PURPOSE SAW BLADE

**Donald L. Armstrong, Wheaton, Ill.; Akiyoshi Yoneda, Akashi, and Kunihiko Okada, Himeji, both of, Japan, assignors to Armstrong-Blum Manufacturing Company, Mount Prospect, Ill., and Amada Company Limited, Kanagawa, Japan**

**Filed Sep. 27, 1994, Ser. No. 312,732**

**Int. Cl.[6] B27B *33/02***

**U.S. Cl. 83—848** **12 Claims**




1. A saw blade comprising:

a set of teeth, all of said teeth being of equal height,

the set of teeth comprising at least three different sub-sets of teeth, said sub-sets of teeth comprising

a first sub-set of teeth characterized by at least one straight tooth, the straight tooth having a first relief angle,

a second sub-set of teeth characterized by a plurality of primary cutting teeth having alternating leftward and rightward configurations, each of the primary cutting teeth of the second sub-set having a second relief angle,

a third sub-set of teeth characterized by a plurality of secondary cutting teeth having alternating leftward and rightward configurations, each of the secondary cutting teeth of the third sub-set having a third relief angle,

the third relief angle being greater than the first and second relief angles.

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**5,501,130**

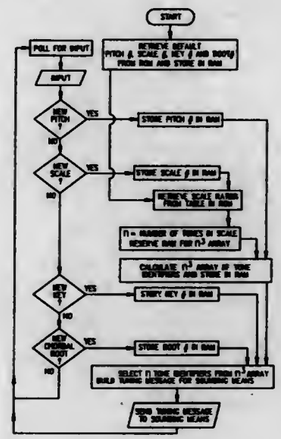
## JUST INTONATION TUNING

**J. William Gannon, Vancouver, and Rex A. Weyler, Manson's Landing, both of, Canada, assignors to Musig Tuning Corporation, Vancouver, Canada**

**Filed Feb. 10, 1994, Ser. No. 194,245**

**Int. Cl.[6] G10G *7/02***

**U.S. Cl. 84—454** **14 Claims**




5. Apparatus for adjusting the tuning of a musical device, having note selection receivers and a pitch provider, to provide a plurality of pitches with just intervals when note selections are provided to the note selection receivers, comprising:

selection receiving means for receiving a selected key and chordal root within the key;

means for determining the pitches to be provided when note selections are received based on a just interval from the tonic of the selected key to the tonic of the selected chordal root and just intervals from the tonic of the selected chordal root to each of the selected notes; and

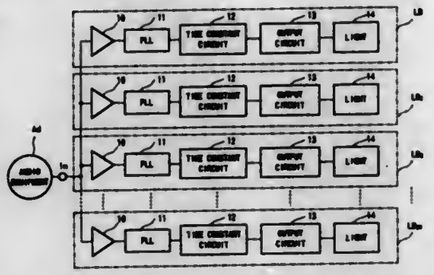
means for communicating the determined pitches to the musical device.

**5,501,131**

## DECORATIVE LIGHT BLINKING DEVICE USING PLL CIRCUITRY FOR BLINKING TO MUSIC

**Shuji Hata, Tokyo, Japan, assignor to Jalco Co., Ltd., Tokyo, Japan**

**Continuation-in-part of Ser. No. 871,670, Apr. 21, 1992, abandoned. This application May 16, 1994, Ser. No. 248,592**
**Claims priority, application Japan, Sep. 30, 1991, 3-278685**
**Int. Cl.[6] A63J** *17/00*
**U.S. Cl. 84—464 R** **11 Claims**



1. A decorative light blinking device flashing to music, comprising:

a plurality of channels, each including a buffer amplifier, a PLL circuit connected to said buffer amplifier and having a phase comparator, a loop filter and voltage control oscillator and lock state detecting circuit which generates a positive or negative logic digital output signal, a time constant circuit connected to said PLL circuit, an output circuit connected to said time constant circuit, and a decorative illuminant connected to said output circuit and turned on or off by an output from said output circuit; and

a signal input point into which input terminals of said buffer amplifiers of said channels are formed, and through which an electric music signal is input from audio equipment, free-running frequencies and capture ranges of said PLL circuits of said channels being arbitrarily set to within an audio frequency range so that the free-running frequencies and the capture ranges do not overlap with each other, said PLL circuits being set so as to be locked with respect to only frequencies corresponding to said capture ranges which are arbitrarily set in all frequency components constituting said music signal, whereby said time constant circuits integrate an output signal from said lock state detecting circuits in said PLL circuits so as to obtain a stable signal which operates said output circuits to convert said decorative illuminants from a state where said decorative illuminants are always turned off to a state where the same are turned on.

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**5,501,132**

## DRY PREPARATION OF PARTICULATE SOLID ENERGETIC MATERIAL

**Clark C. de Nevers, Salt Lake City; Jeffrey L. Nelson, Kearns; Steven T. Newsome, Magna; Patrick R. Oyler, Sandy, and Robert A. Patterson, West Jordan, all of Utah, assignors to Global Environmental Solutions, Inc., Hopkins, Minn., and Hercules Incorporated, Wilmington, Del.**

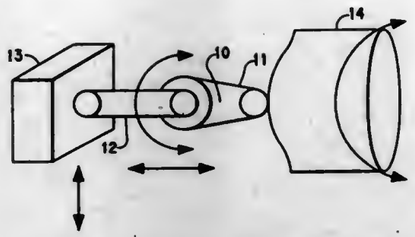
**Filed Aug. 31, 1994, Ser. No. 298,929**
**Int. Cl.[6] F42B** *33/00;* **B26D** *7/00;* **C06B** *21/00*
**U.S. Cl. 86—24** **15 Claims**

1. A process for preparation of particulate solid energetic material comprising:

(a) mounting a mass of solid energetic material in a casing for the application of a cutting tool having a rotating cutting surface;

(b) bringing the rotating cutting surface in contact with the energetic material by movement of at least one of the cutting tool and the energetic material, the position and motion of the cutting tool and the energetic material being such that a portion of the cutting surface is out of contact with the energetic material; and

(c) continuously removing the resulting particulate energetic material from the area of the cutting tool, the process being carried out in the substantial absence of liquid introduced as a coolant.



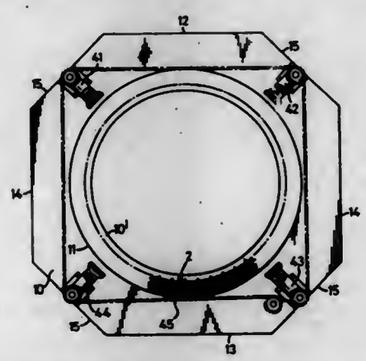
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**5,501,133**

## APPARATUS FOR MAKING A BRAID STRUCTURE

**David Brookstein, Wellesley; Donald Rose, Sharon; Robin Dent; John Dent, both of Foxboro, and John Skelton, Sharon, all of Mass., assignors to Albany International Corp., Albany, N.Y.**

**Continuation of Ser. No. 73,882, Jun. 9, 1993, abandoned, which is a continuation of Ser. No. 681,330, Apr. 5, 1991, abandoned, which is a division of Ser. No. 501,043, Mar. 29, 1990, abandoned. This application May 24, 1994, Ser. No. 248,577**
**Int. Cl.[6] D04C** *3/06*
**U.S. Cl. 87—33** **13 Claims**



1. A braiding machine for forming a multilayer braid, said machine comprising:

a braiding station;

supply means for supplying a plurality of strands of material to said braiding station to form a layer of braid at said station associated with each group of strands;

track means disposed at said braiding station defining at least a first and a second pair of serpentine paths, each pair of paths including a first and a second path, said first and second paths of each layer crossing over each other to define intralayer crossover points; and

braiding means disposed at said braiding station for braiding said strands into said layers and for passing one strand from each layer of braid into a next adjacent layer to form an interlock between said layers and including a plurality of package carriers, each package carrier being arranged for movement in one of said serpentine paths and receiving a strand from said supply means; each layer being formed by at least two package carriers, each carrier moving along a respective serpentine path of one of said pairs of serpentine paths; wherein one of said serpentine paths of one layer and one of said serpentine paths of an adjacent layer are provided at preselected positions with interlayer crossover points with one carrier crossing over to said first serpentine path of said adjacent layer at said interlayer crossover points; and with one carrier of said serpentine path of said adjacent layer crossing over to said one serpeatine path of said adjacent layer crossing over to said one serpentine path of said first layer at said interlayer crossover point;

wherein said first pair is axially spaced with respect to said second pair, and any two interlayer crossover points between two adjacent layers are separated by at least two intralayer crossover points.



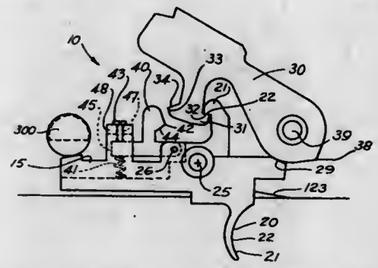
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**5,501,134**

## MULTI-STAGE MATCH TRIGGER ASSEMBLY FOR USE WITH SEMI-AUTOMATIC WEAPONS

**Charles R. Milazzo, N9178 Walnut St., East Troy, Wis. 53120, and John M. Krieger, Hartford, Wis., assignors to Charles R. Milazzo, East Troy, Wis.**

**Continuation of Ser. No. 37,791, Mar. 26, 1993, abandoned. This application Sep. 1, 1994, Ser. No. 299,854**
**Int. Cl.[6] F41A** *19/16*
**U.S. Cl. 89—139** **8 Claims**



1. A multi-stage trigger assembly for use by a shooter of a fire arm, the multi-stage trigger assembly comprising:

a trigger, a disconnector and a hammer;

the trigger being pivotally connected to the fire arm and to the disconnector;

the trigger further having a tensioning means for setting an initial trigger tension and holding the trigger in a normal position;

the hammer being pivotally connected to the fire arm;

the trigger having a pulling surface for the shooter to pull the trigger and the trigger and hammer each including a respective engagement means for engaging each other so that the hammer is held in a cocked position before the trigger is pulled;

the disconnector being pivotally connected to the trigger, the disconnector having a flat contact means and having a disconnector spring for holding the disconnector in a predetermined position until a sufficient force is applied to overcome the resistance of the disconnector spring;

the hammer further including a contact means for contacting the disconnector contact means so that when the trigger is first pulled the contact means contacts the disconnector and increases the pressure required to pull the trigger completely and disengage the engagement means of the hammer and the trigger;

the disconnector further including a disconnector adjustment arm and an adjustment screw;

the disconnector spring being located between the disconnector adjustment arm and the trigger.

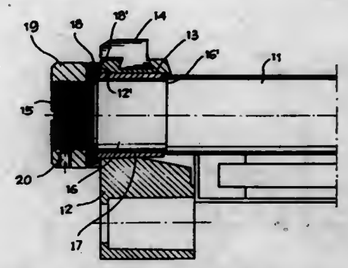
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**5,501,135**

## PRECISION MECHANISM FOR HANDGUNS

**Ugo G. Beretta, Brescia, Italy, assignor to Fabrica D'Armi P. Beretta S.p.A., Brescia, Italy**

**Filed Apr. 11, 1995, Ser. No. 422,144**
**Claims priority, application Italy, Jun. 23, 1994, BS94A0075**
**Int. Cl.[6] F41A** *21/48*
**U.S. Cl. 89—196** **5 Claims**



1. A semiautomatic handgun with precision mechanism comprising: a barrel-breechblock carriage assembly, the barrel being capable of axial movement with regard to the breechblock carriage, the breechblock carriage having a conical hole, said barrel extending into said conical hole, said conical hole decreasing in diameter from a front to a rear of the breechblock carriage; a threaded end section provided on an outside front part of said barrel; a cylindrical section following said threaded end section towards a rear of the handgun; an alignment bushing having an outer conical surface with a conicity substantially corresponding to a conicity of said conical hole, said cylindrical section being intended for joining together axially with said conical hole, said alignment bushing being mounted on said cylindrical section; an adjustment ring intended for resting against said alignment bushing and said breechblock carriage; and a threaded locking ring screwed onto said threaded section.

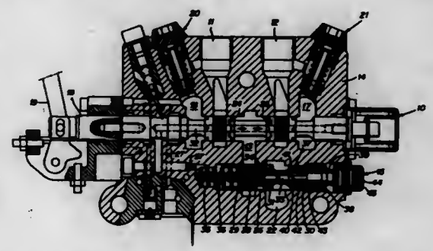
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**5,501,136**

## CONTROL SYSTEM FOR A HYDRAULIC MOTOR

**Orjan E. V. Wennerbo, Boras, Sweden, and Kyle G. Martyn, Huddersfield, Great Britain, assignors to Voac Hydraulics Boras AB, Boras, Sweden**

**Filed Jun. 24, 1994, Ser. No. 265,244**
**Claims priority, application Sweden, Jun. 24, 1993, 9302207**
**Int. Cl.[6] F15B** *11/08;13/04*
**U.S. Cl. 91—446** **3 Claims**



1. A control system for a hydraulic motor connected to an external load, the control system comprising:

a directional valve (10) having load pressure sensing means (24, 25) for sensing a load pressure, and said directional valve (10) being arranged to selectively feed hydraulic fluid to said motor from a pressure source; and

a load compensating valve (15) located upstream of said directional valve (10) and connected to said load pressure sensing

means (24, 25) and arranged to adjust a feed pressure of hydraulic fluid in relation to an actual load pressure;

said load compensating valve (15) including:

a valve spindle (28) having oppositely facing end surfaces (29,30), one (29) of said oppositely facing end surfaces being exposed to the actual load pressure for biassing said valve spindle (28) in an opening direction, and another of said oppositely facing end surfaces (30) being exposed to the hydraulic fluid feed pressure for biassing said valve spindle (28) in a closing direction;

a selectively activatable feed pressure reducing means comprising a spring element (43) applicable on said valve spindle (28) in the closing direction of the valve spindle; and

an actuating piston (38) selectively shiftable by fluid pressure from an inactive position in which said actuating piston (38) inhibits action of said spring element (43) to an active position in which said actuating piston (38) applies said spring element (43) onto said valve spindle (28) to thereby accomplish an increased bias force acting on said valve spindle (28) in the closing direction of said valve spindle (28).

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**5,501,137**

**HYDRAULIC MACHINE-TOOL ACTUATOR WITH POSITION DETECTORS**

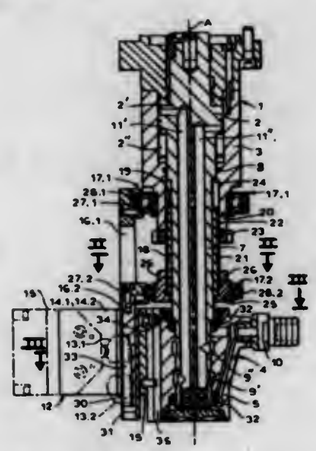
**Helmut Weichler, Bachhagel, Germany, assignor to Gunter Horst Rohm, Sontheim, Germany**

**Filed Jan. 17, 1995, Ser. No. 372,681**

**Claims priority, application Germany, Jan. 17, 1994, 44 01 1423**

**Int. Cl.[6] F01B *31/12***

**U.S. Cl. 92—5 R** **10 Claims**



1. An actuator comprising:

a cylinder centered on an axis;

a piston axially displaceable in the cylinder, defining therein axially opposite front and rear compartments, and having an axially rearwardly projecting stem;

a distributor axially fixed but rotatable about the axis on the stem offset from the cylinder, the piston and distributor being formed with passages for pressurizing and depressurizing the compartments;

at least one control element fixed on the distributor offset from the cylinder;

a sleeve coaxially surrounding the piston stem and forming a rear abutment against which the piston engages in a rearmost position of the piston;

adjustment means including formations on the cylinder and on the sleeve for axially displacing the sleeve on the cylinder and for fixing the sleeve on the cylinder at any of a multiplicity of axially offset positions thereon;

respective front and rear bearings on the cylinder and on the sleeve; and

respective front and rear control members extending axially rearward from the front and rear bearing and engageable with the control element to operate same.

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**5,501,138**

**AUTOMATIC ASSEMBLY FOR DELIVERING COFFEE INFUSIONS, WITH MEANS FOR EJECTING THE COFFEE DRY GROUNDS**

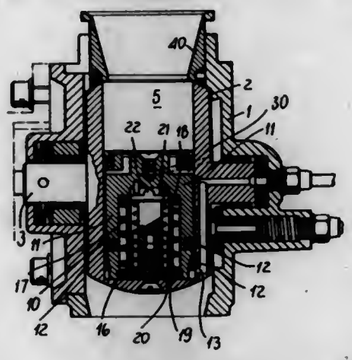
**Ermenegildo Fava, Via Po, 7, 20059 Vimercate (Milano), Italy**

**Filed May 17, 1994, Ser. No. 243,751**

**Claims priority, application Italy, Jun. 15, 1993, MI93A1279**

**Int. Cl.[6] A47J *31/34;31/36***

**U.S. Cl. 99—287** **6 Claims**



1. An automatic assembly for delivering infusions of coffee and ejecting dry coffee grounds, comprising a stator body, a rotor rotatably supported inside said stator body, said rotor defining a chamber housing therein a movable infusion piston comprising an outer telescopic element including a sealing gasket sealing a bottom portion of said chamber, which communicates with a duct for introducing water for pressing on and driving said piston, driving means being moreover provided for rotatively driving said rotor to bring successively said rotor to a coffee powder loading station, an infusion station and an unloading station, and driving means including rotary pins associated with said rotor and a reducing motor unit, said outer telescopic element having a bottom including an abutment engaging with an end of an outer spring another end of which abuts against a flange portion of an inner telescopic element provided with a flange inner portion thereon an inner spring operates which engages with a rim portion of a fixed lug connected to said bottom portion of said chamber.

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**5,501,139**

**POPCORN MAKER**

**Chiu Y. Lee, New Territories, Hong Kong, assignor to Chiaphua Industries Limited, New Territories, Hong Kong**

**Filed Nov. 21, 1994, Ser. No. 345,420**

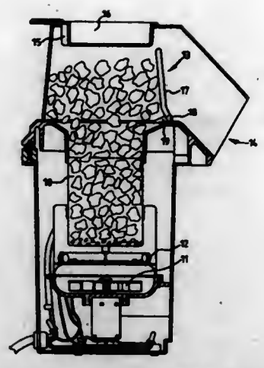
**Claims priority, application United Kingdom, Nov. 22, 1993, 9323984**

**Int. Cl.[6] A23L *1/18***

**U.S. Cl. 99—323.9** **8 Claims**

1. A popcorn maker comprising an open topped heating chamber, a passageway for popcorn extending from above the chamber to a discharge outlet, and a pivotably supported closable flap in the passageway which is balanced to close off the discharge outlet and direct corn back towards the chamber when pivoted to a first side of a prescribed position and which is balanced to remain open automatically upon pivoting from the first side to a second side of the prescribed position.





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**5,501,140**

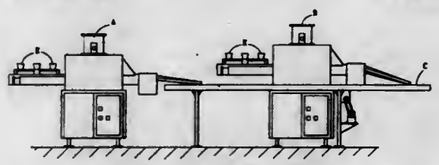
**DOUBLE-PRESS SYSTEMS FOR A PRODUCTION LINE FOR TORTILLAS AND THE LIKE**

**Silvestre G. Balleza, Atizapan de Zaragoza, and Vincente L. Perez, Ecatepec, both of, Mexico, assignors to Central Impulsora S.A. de C.V., Mexico**

**Continuation-in-part of Ser. No. 139,712, Oct. 22, 1993, abandoned. This application Mar. 17, 1995, Ser. No. 405,943**

**Int. Cl.[6] A21C *9/08;11/00;* A23P *1/00;* A47J *37/00***

**U.S. Cl. 99—349** **16 Claims**



1. A production line for tortillas prepared from flour comprising:

a first conveyor for receiving first units of dough;

a first press receiving the first units of dough from the first conveyor for pressing the first units of dough into tortillas;

a second conveyor for receiving second units of dough;

a second press connected in series with the first press for receiving the second units of dough from the second conveyor and for pressing the second units of dough into tortillas;

a third continuous conveyor positioned below said first conveyor and said second conveyor for sequentially receiving tortillas directly from said first conveyor and said second conveyor; and

means for synchronizing the first and second conveyors with the third conveyor providing a continuous array of pressed tortillas.

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**5,501,141**

**TORTILLA WARMING APPARATUS**

**Estuardo Mendez, 1345 Cabrillo Park Dr. #E-6, Santa Ana, Calif. 92701, and Jorge Uriarte, 13 Cornwallis, Irvine, Calif. 92720**

**Filed Jun. 28, 1994, Ser. No. 265,067**

**Int. Cl.[6] A47J *43/00;* A23P *1/00;* B65D *1/36***

**U.S. Cl. 99—426** **11 Claims**

1. An apparatus for warming one or more tortillas comprising:

a top and a bottom round pans formed of a rigid, high melting point material and of a diameter at least equal to the diameter of a tortilla, each of the pans having a flat, circular base portion defined by an interior and an exterior flat surface, the base portion being surrounded by an integral curved rim portion extending to one side of the base portion and terminating in an annular symmetrical lip, the base and the rim portions, together, defining a heating space therebetween, the pans being positionable with lips in mutual contact in a closed orientation to define an enclosed space for restricting the loss of moisture during heating of one or more tortillas in the enclosd space;

a hinge means having a first hinge arm attached to the top one of the pans and a second hinge arm attached to the bottom one of the pans so that the top one of the pans is rotatable from the closed orientation into a fully open orientation about a hinge pin supporting the first and second hinge arms;

the apparatus further including a first and second handle means positioned on a common diameter of the pans at opposing positions and extending radially therefrom, the second handle means having a rotatable grip portion for rotatably supporting the pans for inverting same.

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**5,501,142**

**STEAMER DEVICE FOR COOKING FOOD IN A GRILL**

**Richard D. Bailey, Dawson Springs, Ky., assignor to Bailey Steamer, Madisonville, Ky.**

**Filed Dec. 17, 1993, Ser. No. 169,349**

**Int. Cl.[6] A23B *4/044***

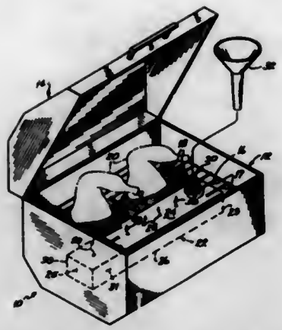
**U.S. Cl. 99—482** **12 Claims**

1. A refillable steamer device for placement in a grill having a grilling surface and a heating element to steam the food cooked within the grill, the steamer device comprising:

an elongated enclosed structure having side surfaces and top and bottom surfaces, the side and bottom surfaces being formed with a liquid-tight construction to create an enclosed interior volume to hold a steamer liquid, the enclosed structure configured to be placed proximate the grill heating element and entirely below said grilling surface with the top surface facing upwardly toward the grill surface;

a steamer liquid filling a portion of the enclosed interior volume and contacting a section of the bottom and side surfaces, the bottom and side surfaces of said enclosed structure operable to receive heat from the heating element and to evaporate the steamer liquid and create a steam environment within the enclosed interior volume;

a plurality of steam release openings formed in the top surface of the enclosed structure along the length thereof, the open-



ings extending into the steam environment of the interior volume and venting steam from the enclosed structure, the steam release openings directing the vented steam upwardly into the grill and toward the grilling surface from below the surface along the length thereof to flavor food being cooked on said surface;

a filling opening formed in the top surface of the enclosed structure and extending into the interior volume for filling and refilling the interior volume with steamer liquid, said filling opening being dimensioned larger than said steam release openings to facilitate easier filling and refilling of the enclosed structure;

whereby a preferred liquid may be used to steam the grilled food to impart the flavor of the steamer liquid to the food and to increase the cooking speed of the food and the steamer device may be refilled for proper steaming.

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**5,501,143**

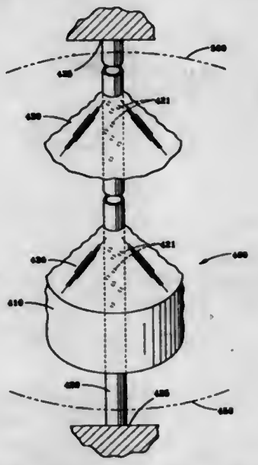
**IRREGULAR FLOW STEAM CONDITIONER**

**Kelsey C. Thom, Jr., Cedar Falls, Iowa, assignor to Rocksamp Champion, Waterloo, Iowa**

**Division of Ser. No. 259,108, Jun. 13, 1994, abandoned, which is a division of Ser. No. 61,891, May 14, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 468,945**

**Int. Cl.[6] A23N *17/00***

**U.S. Cl. 99—516** **17 Claims**



1. A steam injection device, for a vertical conditioning chamber for feed grain, comprising:

at least one hollow module having a substantially conical imperforate top and an open bottom;

means for supporting said at least one hollow module within said conditioning chamber the means for supporting said at least one hollow module comprising a single column extending from an anchored point below said conditioning chamber to an anchored point above said conditioning chamber along a vertical centerline thereof; and

means for supplying steam to said at least one hollow module.

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**5,501,144**

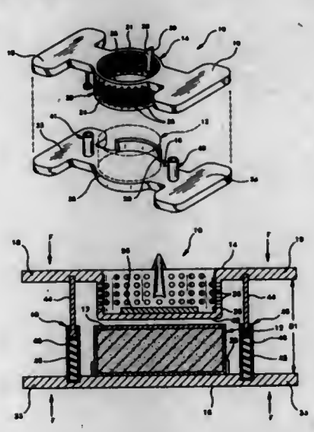
**PRESS FOR COMPRESSING THE CONTENTS OF A FOOD CAN**

**Keith Bryson, 3 Beachcrop Ct., Delran, N.J. 08075**

**Filed Oct. 6, 1994, Ser. No. 317,604**

**Int. Cl.[6] B30B *9/06***

**U.S. Cl. 100—116** **14 Claims**



1. A hand press device for pressing the lid of an open can against the contents of the can, comprising:

a first pressing element having a retaining means thereon for retaining the can in a fixed orientation;

a second pressing element positionable over the can, said second pressing element having a generally cylindrical structure extending therefrom, wherein said generally cylindrical structure is hollow having an interior, an exterior and perforations extending in between said interior and said exterior, said cylindrical structure terminating at an engagement surface that engages the lid of the open can when the can is interposed between said first pressing element and said second pressing element; and

handle members disposed on said first pressing element and said second pressing element for enabling said first pressing element and said second pressing element to be gripped in the hands of the user, wherein said first pressing element and said second pressing element can be physically biased toward one another thereby evenly pressing the lid against the contents of the open can.



**5,501,145**

**MULTI-PURPOSE CALENDAR**

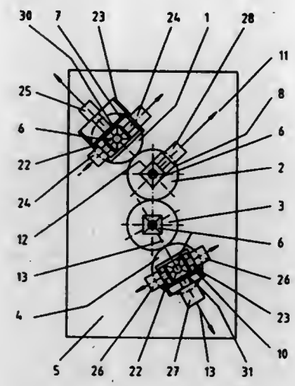
**Gerald Froum, Wedemark, Germany, assignor to Paul Troester Maschinenfabrik, Hanover, Germany**

**Filed Apr. 29, 1994, Ser. No. 235,288**

**Claims priority, application Germany, May 4, 1993, 43 14 653.8**

**Int. Cl.[6] D21G *1/00***

**U.S. Cl. 100—158 R** **10 Claims**



1. In a multi-purpose calender having a plurality of calender rolls mounted horizontally superposed extending in a common direction comprising four rotatably driven rolls consisting of two outer rolls and at least two coactive inner rolls intermediate the two outer rolls;

a first inner roll of said two inner rolls mounted rotatable about a horizontal axis of rotation fixed in a vertical and horizontal plane;

a shiftable second inner roll of said two inner rolls mounted rotatable about a horizontal axis of rotation and shiftable selectively to different positions constituting an end position in said vertical plane and other positions spaced away from said vertical plane in one direction and back to said end position for positioning said axis of rotation at said positions guided along a first inclined plane defining an acute angle relative to the horizontal and said vertical plane;

a crossable and shiftable first outer roll of said two outer rolls coactive with said second inner roll offset therewith mounted rotatable about a horizontal axis of rotation and crossable selectively along a second inclined plane parallel to said first inclined plane and the axis of rotation shiftable to different positions spaced along a third inclined plane defining an acute angle relative to said vertical plane and perpendicular to said second inclined plane;

a crossable and shiftable second outer roll of said two outer rolls coactive with said first inner roll offset therewith mounted rotatable about a horizontal axis crossable along a fourth inclined plane defining an acute angle relative to the horizontal and to said vertical plane and selectively shiftable to different positions along a fifth inclined plane defining an acute angle relative to said vertical plane and perpendicular to said fourth inclined plane; and

means for selectively crossing and shifting of said crossable and shiftable rolls to provide a plurality of calender operational positions of the rolls for effecting different roll gaps therebetween for calender operations, including production of sheets, webs, coating of sheets and fabrics on one or both sides, doubling of webs, and production of foils and strips.



**5,501,146**

**CYLINDRICAL DRUM ASSEMBLY INCLUDING A STENCIL SHEET FOR USE WITH A STENCIL PRINTING MACHINE**

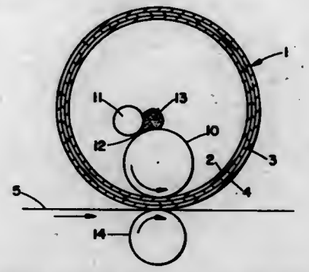
**Tetsu Yamanaka; Kengo Sugaya, and Syouichi Ikezima, all of Tokyo, Japan, assignors to Riso Kagaku Corporation, Tokyo, Japan**

**Filed Mar. 29, 1994, Ser. No. 219,145**

**Claims priority, application Japan, Apr. 1, 1993, 5-075772**

**Int. Cl.[6] B41N *1/24***

**U.S. Cl. 101—116** **10 Claims**



1. A cylindrical drum for stencil printing comprising:

a porous cylindrical body having a means for feeding an ink onto an inner surface thereof; and

a screen layer having an ink permeability provided on an outer surface of said porous cylindrical body;

said screen layer comprised of a fabric using side-by-side conjugated fibers consisting of a lower melting point component as one side component and a higher melting point component as an other side component, intersections of said fibers adhered with each other, at least one of the fibers which form the intersections having a softened lower melting point component.

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**5,501,147**

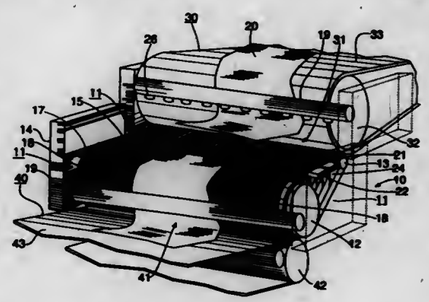
**AUTOMATIC DOFFING SYSTEM**

**David Jaffa, and Sandor Szarka, both of Franklin Lakes, N.J., assignors to Precision Screen Machines, Inc., Glen Ellyn, Ill.**

**Filed Oct. 5, 1993, Ser. No. 132,664**

**Int. Cl.[6] B41F *15/18*; B65G *47/52***

**U.S. Cl. 101—118** **25 Claims**



1. An apparatus for transferring an article from one conveyor to another, which comprises:

an array of endless conveyorized strips carried by a roller and a substantially rigid member;

moving means operatively associated with the roller for affecting rotation of the roller and driving the strips;

disks positioned longitudinally between the strips and coaxially with the roller at intervals across its widths;

the surface of the strips being characterized by a series of upwardly extending projections, each having a relatively small diameter in relation to its length; and

the disk diameters being sufficiently greater than that of the roller as to extend above the projections, lifting the article from the projections as it passes over the disks and carrying it to the other conveyor.

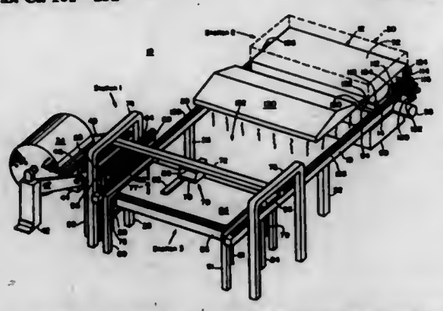
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**5,501,148**

## AUTOMATIC SHEET PRINTING AND ALIGNMENT SYSTEM

Stephen L. Bellio, Newton; Mark J. Condon, Brighton, and James F. Mueller, N. Reading, all of Mass., assignors to The Charles Stark Draper Laboratory Inc., Cambridge, Mass.

Filed Sep. 15, 1994, Ser. No. 306,652
Int. Cl.[6] B41F *13/24*
U.S. Cl. 101—232 11 Claims



1. An automatic sheet printing and aligament system, comprising:

a holding table for maintaining the position of a sheet on its surface;

a transport system for moving said table through a plurality of stations;

a first station for positioning a sheet on said table;

a second station for printing features on said sheet positioned on said table;

a third station for receiving said printed sheet from its position on said table to compile a stack of said sheets with their printed features in predetermined alignment; and

a control system for sequentially moving said table through said stations for repeatably printing and stacking each said sheet aligned with prior printed and stacked sheets received, transported and printed by the same said table.

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**5,501,149**

## DUAL SUBSTRATE, SINGLE-PASS PRINTING PROCESS

Robert J. Schleinz, Appleton, Wis.; Daniel J. Conrad, Murfreesboro, Tenn., and Joseph S. Kacherovsky, Philadelphia, Pa., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Dec. 2, 1994, Ser. No. 347,983
Int. Cl.[6] B41F *5/18;22/00*
U.S. Cl. 101—416.1 13 Claims

1. A dual substrate, single-pass printing process, comprising:

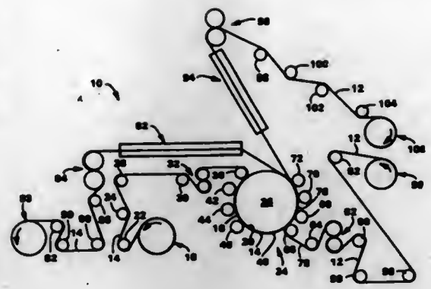
providing a continuously moving first substrate,

moving the first substrate to an ink printing station comprising at least two ink printing cylinders,

printing a pattern on the first substrate with one of the two ink printing cylinders,

then introducing a continuously moving second substrate between the first substrate and the other of the ink printing cylinders,

printing a pattern on the second substrate with the other of the ink printing cylinders, and collecting ink striking through the second substrate onto the first substrate.



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**5,501,150**

## PROCESS FOR THE PRODUCTION OF A PRINTING PLATE BY INKJET

Luc Leenders, Herentals; Leo Oolbrandt, Kruibeke; Jan Van den Bogaert, Schilde, and Guido Desie, Herent, all of, Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed May 18, 1995, Ser. No. 444,291
Claims priority, application European Pat. Off., Jul. 11, 1994, 94201994.4; Jan. 31, 1995, 95200227.7
Int. Cl.[6] B41M *5/00;* B41N *3/00;* B05D *3/04;3/10*
U.S. Cl. 101—466 20 Claims

1. Process for the manufacture of a lithographic printing plate comprising the steps of:

(1) information-wise projecting droplets of liquid onto a receiving material having a hydrophilic surface thus bringing into working relationship on said hydrophilic surface a reducible silver compound (A), a reducing agent (B) for said silver compound and physical development nuclei (C) that catalyze the reduction of said silver compound to silver metal, and

(2) hydrophobizing the silver image that has been obtained through said step (1).

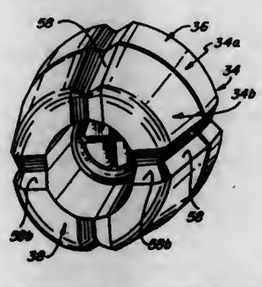
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**5,501,151**

## ALTERNATE SIGNAL PATH ISOLATION MEMBER AND NON-ELECTRIC DETONATOR CAP INCLUDING THE SAME

Gary R. Thuresson, Avon; Eric R. Davis, Torrington; Steven R. Pullen, Winsted; Alvaro Zappalorti, Avon, and Ernest L. Gladden, Granby, all of Conn., assignors to The Ensign-Bickford Company, Simsbury, Conn.

Filed Oct. 21, 1994, Ser. No. 327,284
Int. Cl.[6] C06C *5/04;7/00*
U.S. Cl. 102—275.7 15 Claims



1. An isolation member for positioning the signal emitting end of a non-electric signal transmission line with the shell of a detonator cap comprises:

a substantially cylindrical body dimensioned and configured to be received within the shell of the detonator cap and having



an exterior surface, an input end, an output end and an interior passageway extending through the body for transmission therethrough of an initiation signal from the input end to the output end of the body, the interior passageway defining a positioning region at the input end of the body and a discharge port at the output end of the body; and

an alternate flow path comprising one or more grooves extending along the exterior surface and connecting the positioning region of the body in initiation signal communication with the discharge port.

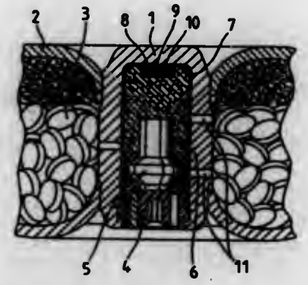
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**5,501,152**

## AIR BAG GAS GENERATOR WITH SPONTANEOUS IGNITION AGENT

Siegfried Zeuner, München; Hans-Peter Ruge, Vaterstetten, and Peter Neukirchinger, München, all of, Germany, assignors to Temic Bayern-Chemie Airgab GmbH, Munich, Germany

Filed Dec. 29, 1993, Ser. No. 175,300
Claims priority, application Germany, Jan. 23, 1993, 43 01 794.0
Int. Cl.[6] C06B *45/00*
U.S. Cl. 102—292 12 Claims



1. Air bag gas generator, comprising:

a propellant;

an ignitor with ignitor charge; and

a spontaneous ignition agent which ignites at a temperature that is markedly higher than a normal ambient temperature but substantially lower than an ignition temperature of said propellant, said spontaneous ignition agent comprising;

a mixture of nitrocellulose, an inorganic oxidizing agent, carbon as fuel for the inorganic oxidizing agent, wherein a percentage of nitrocellulose ranges from 20 to 70 wt. %, and a percentage of carbon is at least 3 wt. %.

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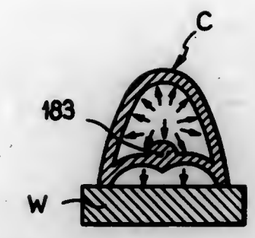
**5,501,153**

## PYROTECHNICAL HEAD HAVING IMPROVED DISPERSAL MEANS

Philippe Cassagne, Saint Lys, and Denis Dihlan, Auterive, both of, France, assignors to Etienne Lacroix Tous Artifices S.A., Muret, France

Filed Mar. 3, 1994, Ser. No. 205,873
Claims priority, application France, Mar. 5, 1993, 93 02597
Int. Cl.[6] F42B *1/02;4/26;4/06*
U.S. Cl. 102—307 15 Claims

1. A pyrotechnical head of the type comprising an elongate envelope including a cylindrical body that is circularly symmetrical about a longitudinal axis of symmetry, that is closed at its rear end by an end wall, a pyrotechnical composition contained in the envelope, and dispersal means for dispersing said pyrotechnical composition, wherein the dispersal means comprise an explosive slug at the front end of the envelope, longitudinal splitting means adapted to split the envelope longitudinally, said longitudinal splitting means comprising a metal sheath charged with an explosive, said sheath having a concave base outwardly directed to direct the explosive power towards the envelope and a transverse splitting means adapted to split the envelope transversely, said transverse splitting means comprising a metal sheath charged with an explosive, said sheath having a concave base outwardly directed to direct the explosive power towards the envelope, said transverse splitting means being placed at the periphery of the inside surface of the envelope in front of its end wall, wherein the transverse splitting means is adapted to cut off the rear end of the envelope transversely before the longitudinal splitting means have completely split the envelope in the longitudinal direction, such that under the effect of the longitudinal splitting means the envelope is split and opened in the form of segments that are hinged at the front, and wherein the pyrotechnical head further comprises pyrotechnical initiation means extending forwards from the rear of the envelope up to the explosive slug.



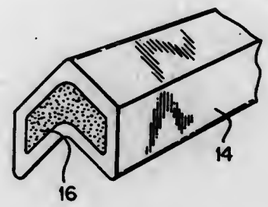
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**5,501,154**

## SUBSTANTIALLY LEAD-FREE TIN ALLOY SHEATH MATERIAL FOR EXPLOSIVE-PYROTECHNIC LINEAR PRODUCTS

Stanley Rodney, and Larry H. Barr, both of Hollister, Calif., assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 86,260, Jul. 6, 1993, Pat. No. 5,333,550. This application Jan. 14, 1994, Ser. No. 260,274
Int. Cl.[6] F42B *3/00*
U.S. Cl. 102—331 5 Claims



1. A substantially lead-free, tin alloy ignition cord comprising:

a) a tin alloy sheath having the following percentage weight proportions:

Tin approximately 96.5–98%

Antimony approximately 2 to 3%, and

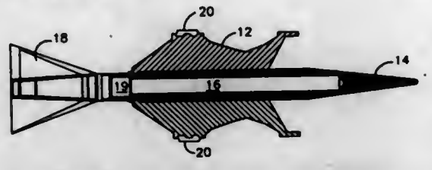
Lead approximately 0.09 to 1.42%;

b) a fuel/oxidizer pyrotechnic mix core load within said sheath.

## 5,501,155
## HOLLOW TRAINING ROUND

Michael S. L. Hollis, Abingdon; Fred J. Brandon, Aberdeen; Edward W. Kennedy, Baltimore, and Edward M. Schmidt, Forest Hill, all of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 24, 1994, Ser. No. 327,770
Int. Cl.[6] F42B 8/12
U.S. Cl. 102—529 2 Claims

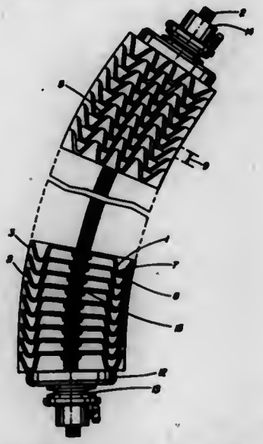



1. A fin stabilized kinetic tank training round comprising:
a one piece projectile having a closed nose end section,
fin stabilized means employed at an end of the projectile,
the projectile suitably contoured to be compatible with a sabot,
the projectile constructed of a low density material selected from the group consisting aluminum and magnesium having a continuous hollowed-out section starting immediately behind the closed nose section and running along the axis of the projectile to an end section thereof,
so that on the firing of the training round, the capability of the projectile to penetrate the target is significantly reduced.

## 5,501,156
## CURVED GUIDE RAIL

Hans Richter, Ortlerstrasse 77, Augsburg, Germany

PCT No. PCT/EP93/02253, § 371 Date May 4, 1994, § 102(e) Date May 4, 1994, PCT Pub. No. WO94/05860, PCT Pub. Date Mar. 17, 1994
PCT Filed Aug. 21, 1993, Ser. No. 232,195
Claims priority, application Germany, Sep. 5, 1992, 42 29 725.7
Int. Cl.[6] E01B 25/24;25/22
U.S. Cl. 104—89 20 Claims

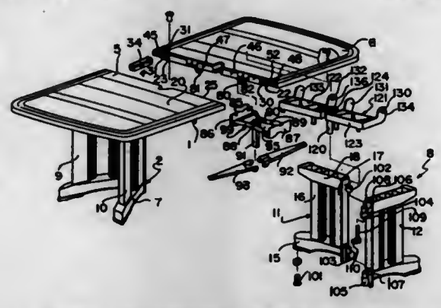


1. A multi-dimensionally bendable guide rail for passenger and material transportation system in which sheet-metal plates are stacked on a guy rope, said sheet-metal plates having a central bore for said guy rope, a slightly conically outward extending cylindrical part being centered on said central bore, a radially outward curved transition piece in the form of an arch adjoining said cylindrical part, said sheet-metal plates being stacked on said guy rope so that the cylindrical part of one sheet-metal plate partially protrudes into the cylindrical part of the adjacent plate, the guide rail being bendable in its flexible state when said sheet-metal plates are slightly pressed together and being fixed in its curved form when said sheet-metal plates are strongly pressed together.

## 5,501,157
## FOLDING TABLE

Josephus P. M. Westerburgen, Heythuysen, Netherlands, assignor to Lawn Comfort S.A., Alleur, Belgium

Filed Sep. 1, 1994, Ser. No. 299,438
Claims priority, application Netherlands, Sep. 2, 1993, 9301519
Int. Cl.[6] A47B 3/00
U.S. Cl. 108—115 18 Claims



1. A folding table comprising a tabletop and a support, said tabletop having two tabletop parts that are connected to one another in such a manner that enables them to pivotally move between a first position wherein respective top surfaces of the tabletop parts are disposed in a common plane and a second position wherein the tabletop parts are positioned such that respective bottom surfaces of said tabletop parts are disposed parallel to one another and facing one another, each tabletop part having an associated rim that is complementary with a rim of the other tabletop part, each tabletop part and its associated rim being connected to a bridge which enables the tabletop parts to be pivotable about respective axes of rotation which are parallel to one another, each tabletop part being provided with an associated toothed wheel segment at the bottom surface thereof adjacent the rim thereof, said toothed wheel segments of the respective tabletop parts having respective teeth members being in mesh with one another, and wherein the axis of rotation of each tabletop part coincides with the axis of rotation of its associated toothed wheel segment as said tabletop parts pivotally move between said first and second positions with said respective teeth members of said toothed wheels moving in mesh.

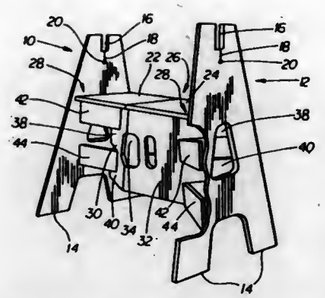
## 5,501,158
## PORTABLE WORK BENCH

Kirk S. Cheney, 236 Havelock Street, Toronto, Ontario, Canada

Filed Oct. 13, 1994, Ser. No. 322,158
Claims priority, application Canada, Jan. 14, 1993, 2108414
Int. Cl.[6] A47B 3/00
U.S. Cl. 108—165 7 Claims

1. A collapsible portable support apparatus of the type for supporting a work piece, or for providing an elevated working platform, and comprising:
right and left hand end members defining floor engaging means;
a pair of platform panel members having outer and inner ends and being hingedly connected to respective end members, at their outer ends, and hingedly connected together, at their inner ends, and adapted to swing between upwardly folded positions and generally horizontally extended work positions;
a first pair of right and left hand panel support members defining intermediate ends and outer ends and defining respective extensions, and notches between said extensions;
a second pair of right and left hand panel support members defining intermediate ends and outer ends and defining respective extensions, and notches between said extensions;
said first and second right and left hand panel support members being associated with respective extensions in interdigital relation with one another fitting within respective notches;
first intermediate hinge means connecting respective extensions of respective first right and left panel support members for folding action towards and away from one another, and second intermediate hinge means connecting respective extensions of said second right and left hand panel support members for folding action towards and away from one another, and,
end hinge means connecting respective right hand panel support members to said right hand end member, and further end hinge means connecting respective left hand panel support members to said left hand end member.

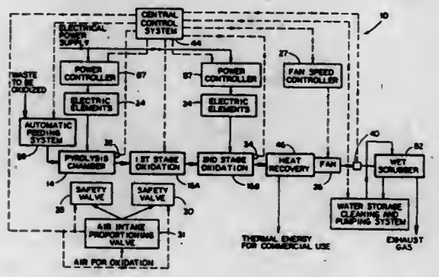




## 5,501,159
## METHOD OF CONTROLLING HYDROCARBON RELEASE RATE BY MAINTAINING TARGET OXYGEN CONCENTRATION IN DISCHARGE GASES

Paul H. Stevers, Kitchener, Canada, and Roger D. Eshleman, Waynesboro, Pa., assignors to Bio-Oxidation, Inc., Greencastle, Pa.

Continuation-in-part of Ser. No. 987,928, Dec. 9, 1992, Pat. No. 5,353,719. This application Jul. 29, 1994, Ser. No. 283,118
Int. Cl.[6] F23G 5/00; B09B 3/00
U.S. Cl. 110—188 22 Claims

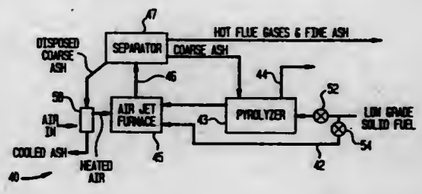



1. A method of controlling hydrocarbon release rate in thermal processing and converting of materials of widely varying energy content in a batch processing cycle, said hydrocarbon release rate controlling method comprising the steps of:
(a) providing a first chamber capable of receiving successive batches of feed materials for thermal processing and having widely varying energy content;
(b) producing heating in the first chamber to cause pyrolyzing of the feed materials into fluid materials;
(c) providing a second chamber communicating with the first chamber and capable of receiving the fluid materials from the first chamber and communicating the fluid materials to a discharge location;
(d) producing heating in the second chamber to cause oxidizing of the fluid materials into discharge gases reaching the discharge location;
(e) providing a jacketed vessel defining a channel surrounding the first and second chambers containing a flow of coolant fluid through the channel;
(f) producing separate variable flows of primary and secondary air respectively into and through the first and second chambers;
(g) sensing the temperatures in the first and second chambers;
(h) sensing the temperature of the coolant in the channel of the jacketed vessel;
(i) sensing the concentration of a preselected gas in the discharge gases; and
(j) in response to the temperatures sensed in the first and second chambers and in the jacketed vessel channel coolant and in response to the concentration of the preselected gas sensed in the discharge gases, controlling primary and secondary flows of air into the first and second chambers so as to proportion and to vary the respective amounts thereof and thereby maintain the concentration of the preselected gas in the discharge gases at a preset target level corresponding with the generation of substantially harmless discharge gases and production of substantially carbon-free residue ash.

## 5,501,160
## METHOD OF AND MEANS FOR GENERATING COMBUSTIBLE GASES FROM LOW GRADE FUEL

Daniel Goldman, Raanana, Israel; Boris Sinlakevith, Lwow, Ukraine; Benjamin Doron, Jerusalem, Israel; Lucien Y. Bronicki, Yavne, Israel, and Eli Yaffe, Savyon, Israel, assignors to Ormat Industries Ltd, Yavne, Israel

Continuation of Ser. No. 34,887, Mar. 19, 1993, abandoned. This application Jul. 13, 1994, Ser. No. 274,575
Claims priority, application Israel, Mar. 25, 1992, 101361; Mar. 30, 1992, 101424
Int. Cl.[6] F23G 5/12
U.S. Cl. 110—229 25 Claims

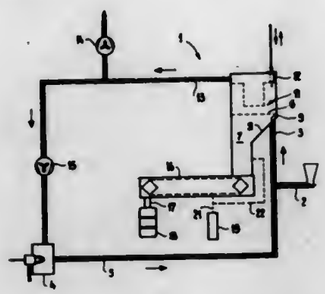



1. A method for producing combustible gases from solid fuel comprising the steps of:
a) pyrolyzing a portion of said fuel in a pyrolyzer to produce said combustible gases and carbonaceous material;
b) supplying said carbonaceous material from said pyrolyzer to a furnace and adding to said furnace a further portion of said solid fuel for combusting the carbonaceous material and said further portion of solid fuel to produce combustion products that include hot flue gases and ash particulate;
c) separating ash from said combustion products; and
d) directing separated ash into said pyrolyzer.

5,501,161
**PROCESS FOR THE THERMAL TREATMENT OF SOLIDS WHICH ARISE IN THE PURIFICATION OF FLUE GASES**

Harald Wanger, Brugg, and Hans Ruegg, Wohlen, both of, Switzerland, assignors to Von Roll-AG, Gerlafingen, Switzerland

Filed Jun. 10, 1994, Ser. No. 258,172
Claims priority, application Switzerland, Jun. 17, 1993, 01804/93
Int. Cl.[6] F23J 3/00
U.S. Cl. 110—344 21 Claims



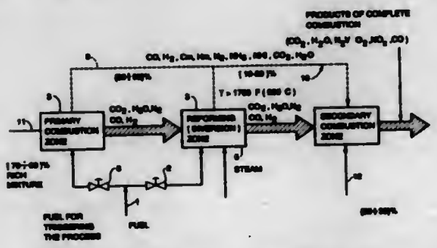
1. A process for thermal treatment of dustlike solids which are separated in a purification of flue gases, the process comprising the steps of:
feeding dustlike solids along a predetermined transport path to a filter device by means of a gas stream having at least a thermal treatment temperature, thereby decomposing chlorinated hydrocarbons or ammonium salts or chlorinated hydrocarbons and ammonium salts and, after filtration;
discharging the dustlike solids.

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5,501,162
**METHOD OF FUEL COMBUSTION**

Alexander Kravets, #613 B Cranbury Cross Rd., North Brunswick, N.J. 08902

Filed Jul. 19, 1993, Ser. No. 92,818
Int. Cl.[6] F23D 1/00
U.S. Cl. 110—347 5 Claims

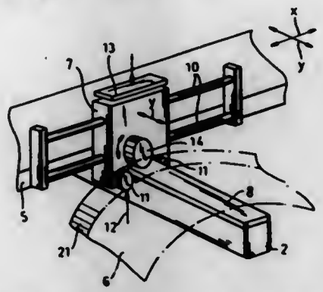



1. A method of fuel combustion, comprising the steps of
subjecting a hydrocarbon fuel to a reforming by mixing the fuel with a substance selected from the group consisting of combustion products, water steam and a mixture of combustion products and water steam at high temperature; and
supplying the thusly reformed fuel to at least one combustion zone which in a combustion of the reformed fuel with air is performed,
said subjecting including using the temperature of at least 1,700° F.

5,501,163
**SYSTEM FOR HOLDING A TUBULAR WORKPIECE IN AN EMBROIDERY MACHINE**

Karl-Peter Melder, Geisbach; Wolfgang Teetz, Kerken, and Rolf Zieschang, Duisburg, all of, Germany, assignors to ZKS-Stickmaschinen Gesellschaft mit beschrankter Haftung, Krefeld, Germany

Continuation-in-part of Ser. No. 935,048, Aug. 25, 1992, abandoned. This application Apr. 17, 1995, Ser. No. 422,979
Claims priority, application Germany, Nov. 21, 1991, 9114488 U
Int. Cl.[6] D05B 21/00; D05C 3/02
U.S. Cl. 112—102 14 Claims



1. In combination with an embroidery machine having a stationary stitching free arm defining a station, a pattern transfer element movable in longitudinal and transverse directions, and a frame having an edge and adapted to hold a workpiece to be embroidered, a holding system comprising:
a support connected to the transfer element and movable in the longitudinal direction relative to the station;
link means coupling the support to the transfer element for joint codirectional longitudinal movement;
a pair of outer wheels on the support, flanking the station and rotatable about respective axes generally parallel to the longitudinal direction;
a center wheel on the support vertically offset from and generally between the outer wheels and rotatable about a respective axis generally parallel to the longitudinal direction the center and outer wheels cooperating to hold the frame therebetween; and
drive means for rotating one of the wheels at a peripheral speed corresponding to transverse movement of the element and thereby displacing the workpiece and frame held by the wheels in direction transverse to the longitudinal direction.

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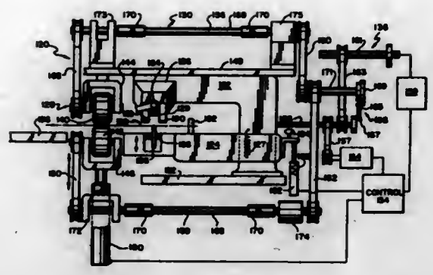
5,501,164
**APPARATUS FOR ASSEMBLY OF PILLOW-TOP MATTRESS COVERS**

Michael R. Porter, Topsfield; Charles E. Mulcahey, Beverly, and John J. Kirby, Hamilton, all of Mass., assignors to Porter Sewing Machines, Inc., Beverly, Mass.

Continuation of Ser. No. 101,941, Aug. 4, 1993, abandoned. This application Apr. 14, 1995, Ser. No. 422,151
Int. Cl.[6] D05B 1/24;27/10
U.S. Cl. 112—176 6 Claims

1. Apparatus for sewing together two thick materials using a blind stitch, said apparatus comprising:
a frame;
sewing apparatus disposed on said frame for sewing together two materials with a blind stitch;
means for feeding the thick materials to and through said sewing apparatus in a single direction of movement, said feeding means comprising:
two opposed rollers, said rollers being transversely spaced from and generally aligned with said sewing apparatus in a direction generally normal to said direction of movement





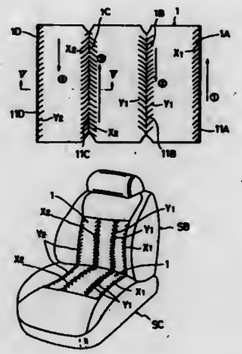
first means for continuously and positively driving a first one of said rollers in a first direction;
second means for continously and positively driving a second one of said rollers in a second direction opposite of said first direction; and
a feed dog transversely spaced from and generally aligned with said rollers in a direction generally normal to said direction of movement.

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5,501,165
**METHOD FOR FORMING DECORATIVE CREASES IN A TRIM COVER ASSEMBLY**

Hideo Nagashima, Akishima, Japan, assignor to Tachi-s Co., Ltd., Japan

Filed Mar. 11, 1994, Ser. No. 209,784
Int. Cl.[6] D05B 15/00;35/08; A47C 7/24
U.S. Cl. 112—475.06 19 Claims

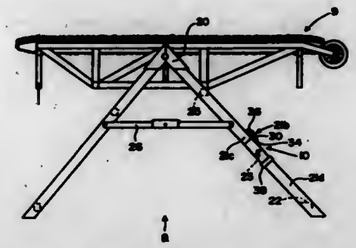


1. A method for forming a decorative crease in a trim cover assembly for an automotive seat, comprising the steps of:
providing one unitary sheet of base trim cover assembly;
gathering and sewing said one unitary sheet of base trim cover assembly in a sewing direction from one side thereof to another side thereof, such that at least one row of plural gathered parts is created along the sewing direction, thus creating a seam which extends generally centrally of and through said plural gathered parts;
whereby each of the thus-sewn gathered parts produces a pair of decorative creases from and in relation to said seam, wherein said pair of decorative creases are formed in a symmetrical pattern relative to said direction of said gather sewing and also such that said decorative creases are formed in a rearwardly slanting direction in reference to said seam.

5,501,166
**PERSONAL WATER CRAFT MOORING APPARATUS**

James R. Zieber, 6N006 Riverside Dr., St. Charles, Ill. 60174

Continuation-in-part of Ser. No. 288,730, Aug. 15, 1994, Pat. No. 5,425,322. This application Jan. 10, 1995, Ser. No. 370,850
Int. Cl.[6] B63B 21/00
U.S. Cl. 114—230 3 Claims



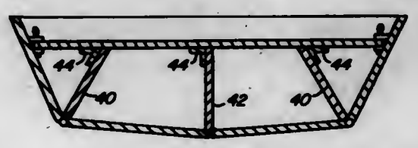
1. An improved portable personal water craft off shore mooring apparatus comprising a base consisting of two legs configured into an inverted V, with the legs being parallel and spaced apart, spacing between the legs being maintained by a plurality of cross members extending therebetween;
said cradle comprising a framework sized and configured to mount pivotably to the base, between the legs, the framework being centered upon the base, and;
said framework having two pads mounted thereon, the pads being parallel and spaced apart with a slight angulation toward one another to receive a bottom surface of a water craft thereon and therebetween, the improvement comprising the provision of legs which are adjustable in length at least at one end thereof, each comprising two converging sections which create an inverted V shaped leg, wherein two parallel leg sections each comprise at least two portions, the two leg portions being movable relative to each other to lengthen or shorten the leg section, as desired, and wherein one leg portion has a nub thereon and wherein a coacting leg portion has a linear array of slots therein, each of which engages over the nub, as desired length is set.

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5,501,167
**SEAT FOR COLLAPSIBLE BOAT**

Alex R. Kaye, 88 Shearer Dr., Atherton, Calif. 94027

Filed Mar. 24, 1995, Ser. No. 410,460
Int. Cl.[6] B63B 17/00
U.S. Cl. 114—363 14 Claims




1. In a collapsible boat having a pair of pivotally coupled bottom panels at a first junction and a pair of side panels pivotally coupled at second junctions, the side panels being pivotally coupled to the outer edges of respective bottom panels, a seat board assembly comprising:
a seat board for placement between said side panels;
a center wing secured to the seat board near the center part thereof, said center wing adapted to extend downwardly from the seat board and adapted to frictionally engage said first junction;
a pair of side wings extending downwardly and away from the seat board with the side wings being inclined, the lower ends

of the side wings being adapted to frictionally engage the second junctions; and

means for coupling the ends of the board to the side panels.

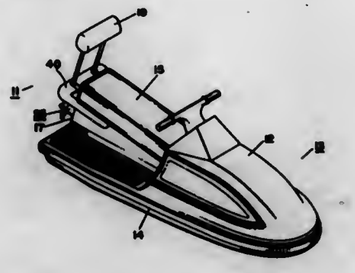
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5,501,168

**ADJUSTABLE SISSY BAR DEVICE FOR A JET SKI**

Timothy W. Zachary, 5612 Boca Raton Blvd., #163, Fort Worth, Tex. 76112

Filed Jun. 10, 1994, Ser. No. 258,545
Int. Cl.[6] B63B *17/00*
U.S. Cl. 114—363 11 Claims



1. A watercraft, comprising:

a) a yoke coupled to said watercraft, said yoke being located extending across a stem of said watercraft beneath a seat portion of said watercraft;

b) a slide bar mount coupled to said yoke extending transverse to said yoke, said slide bar mount being structured and arranged to slidably receive a slide bar;

c) a slide bar comprising an upper portion and first and second slide bar legs, said upper portion extending between and coupling parallel first and second slide bar legs, and said upper portion being adjustably located behind said seat portion of said watercraft, said first and second slide bar legs being located extending downward from said upper portion transverse to said yoke with said slide bar legs being slidably located extending through said slide bar mount;

d) said slide bar mount is structured and arranged to adjustably retain and support said slide bar in a plurality of vertical positions behind said seat portion of said watercraft.

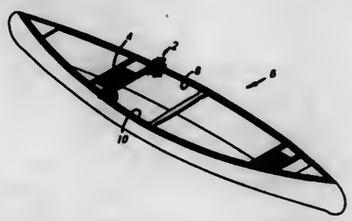
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5,501,169

**UNIVERSAL CANOE ACCESSORY MOUNTING BRACKET**

James M. Denker, 711 First Parish Rd., Scituate, Mass. 02066

Filed May 26, 1995, Ser. No. 452,327
Int. Cl.[6] B63B *43/14*
U.S. Cl. 114—364 11 Claims



1. An accessory mounting bracket assembly for mounting on the gunwales of a canoe, said bracket comprising:

a. a tubular beam of a length sufficient to span transversely across both gunwales of the canoe and project outwardly from the opposite outer sides of the gunwales;

b. a pair of gunwale clamp assemblies slidably mounted on said beam, each of said gunwale clamp assemblies having (i) a clamp removable but rigidly clamped on said tubular beam, (ii) a pair of clamp blocks spaced fore and aft with respect to each other with one block of each pair being positioned on each side of the tubular beam and with each of said blocks being arranged to engage the top surface of one of said gunwales, and a clamp jaw associated with each of said clamp blocks and arranged to engage the lower surface of one of said gunwales at a point below that at which the associated clamp block engages the top of the respective gunwale; and,

c. a mounting pad defined by each of said clamp assemblies, each of said mounting pads including (i) the portion of said tubular beam projecting outwardly beyond said clamp of said clamp assembly, a first mounting surface positioned generally perpendicular to the axis of said tubular beam and defined by an outer surface of one of said clamps, and a second mounting surface positioned in a plane generally parallel to the axis of said tubular beam.

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5,501,170

**GRADING STAKE WITH INDICATOR FLAG**

Sylvia Walsh, 1497 Via Manzanas, San Lorenzo, Calif. 94580

Filed Jun. 17, 1994, Ser. No. 261,997
Int. Cl.[6] G09F *17/00*; G01D *21/00*
U.S. Cl. 116—209 4 Claims



1. A grading stake having an indicator flag comprising:

a) a stake member having a pointed end, and an opposite top end with a side and a top;

b) a filament bundle having an attachment end, wherein the attachment end is attached to the side of the top end of the stake member, wherein the stake member has a perimeter and the filament bundle is attached to only a portion of the perimeter wherein the top of the stake member is not obscured from measurement taking by the filament bundle;

c) attachment means for attaching the filament bundle to the stake member wherein the attachment means comprises a tape wrap wound at least once around the top end of the stake member and the attachment end of the filament bundle wherein filament bundle comprises a plurality of polymer monofilaments having projecting ends and a middle that is looped and retained with a band forming said attachment end, wherein the banded filament bundle is attached along the side of the stake member with the tape wrap wound around both the banded attachment end of the filament bundle and the side of the top end of the stake member with the projecting ends of the monofilaments projecting from the top of the stake member and with the tape wrap being displaced a short distance from the top of the stake member for measurement taking.



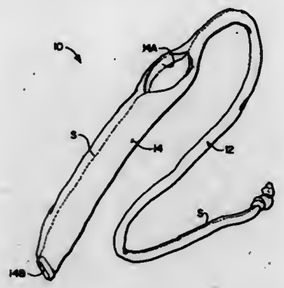
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5,501,171

**FLEXIBLE BOOKMARK WITH HOLDER FOR WRITING INSTRUMENT**

Linda S. Leake, 4407 Sunscape La., Raleigh, N.C. 27613

Filed Nov. 23, 1994, Ser. No. 344,370
Int. Cl.[6] B42D *9/00*; A45C *11/00*
U.S. Cl. 116—234 5 Claims



1. A combination bookmark and holder for a writing instrument comprising:

an elongated, elastic bookmark strip having an upper and a lower portion;

said upper portion being of sufficient length so as to fit between pages of an average book in a direction parallel to the spine of said book and said lower portion defining an elongated, flexible pouch therein for releasably holding the writing instrument therein; and

wherein said elastic strip comprises a length of elastic sheet-like material having a first width along the length of said upper portion and a second, relatively wider width along the length of said lower portion, and wherein opposing longitudinally extending edges of said sheet-like material are rolled over and stitched together so as to form a tube having a first diameter along the length of said upper portion and having a second, relatively larger diameter along the length of said lower portion, said pouch being the tube at the lower portion of said elongated bookmark strip, and an opening to said pouch being defined at the juncture between said upper and lower portions of said elongated bookmark strip.

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5,501,172

**METHOD OF GROWING SILICON SINGLE CRYSTALS**

Toshinari Mural; Eiichi Iino; Hideo Arai, all of Gunma; Izumi Fusegawa, Fukushima, and Hirotoshi Yamagishi, Gunma, all of, Japan, assignors to Shin-Etsu Handotai Co., Ltd., Japan

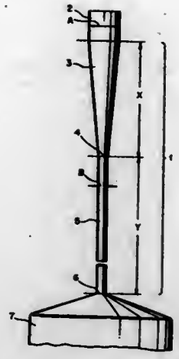
Filed Feb. 28, 1995, Ser. No. 395,837
Claims priority, application Japan, Mar. 11, 1994, 6-041360
Int. Cl.[6] C30B *15/20*
U.S. Cl. 117—15 7 Claims

1. A method of growing silicon single crystals, comprising the steps of:

a single crystal being so grown from a seed crystal that the diameter of said single crystal gets gradually narrower until the length of a seed taper reaches 2.5 to 15 times the sectional size of the seed crystal;

the diameter of a long near-cylindrical neck following the seed taper being so regulated that said diameter may be 0.09 to 0.9 times the sectional size of the seed crystal 2 and 2.5 mm as the smallest in diameter;

the spread of the diameter fluctuation of the neck being so restricted as to be less than 1 mm; and



the length of the neck being so controlled as to be kept within the range of 200 mm to 600 mm.

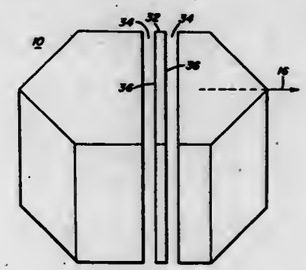
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5,501,173

**METHOD FOR EPITAXIALLY GROWING α-SILICON CARBIDE ON A-AXIS α-SILICON CARBIDE SUBSTRATES**

Albert A. Burk, Jr., Murrysville; Donovan L. Barrett, Penn Hills Township, Allegheny County; Hudson M. Hobgood, Murrysville; Rowland C. Clarke, Bell Township, Westmoreland County; Graeme W. Eldridge, Murrysville, and Charles D. Brandt, Mt. Lebanon, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 18, 1993, Ser. No. 138,564
Int. Cl.[6] C30B *25/20*; H01L *21/205*
U.S. Cl. 117—84 5 Claims



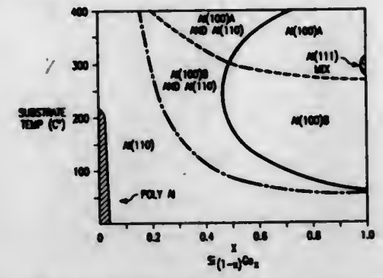
1. A method for epitaxially growing SiC on a substrate comprising the steps of:

a. providing an α-SiC crystal substrate;

b. forming a section from said crystal substrate by making a pair of cuts in said crystal substrate parallel to the c-axis of said crystal substrate, said section having opposing a-face surfaces parallel to the c-axis of said crystal;

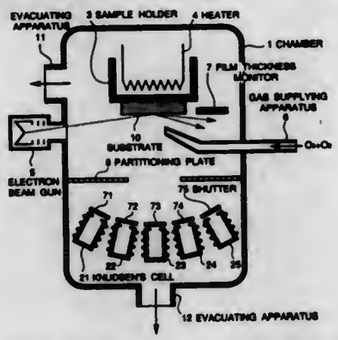
c. passing a gas mixture comprised of a hydrocarbon and a silane-based compound free of any halogen over one of said opposing a-face surfaces of said section, said hydrocarbon and said silane reacting to form an epitaxial layer of SiC.

5,501,174
**ALUMINUM METALLIZATION FOR SIGE DEVICES**
Chih-Chen Cho, and Hung-Yu Liu, both of Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Apr. 7, 1994, Ser. No. 224,355
Int. Cl.[6] C30B *23/08*
U.S. Cl. 117—106 4 Claims



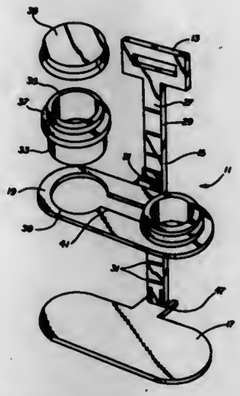

1. A method of depositing single crystal aluminum on $Si_{1-x}Ge_x$ of lattice orientation (100), X greater than 0 and less than 1, said method comprising:
selecting a substrate temperature corresponding to X such that the combination of X and said substrate temperature is represented in a graph region of FIG. 1 selected from the group of regions consisting of Al(110), Al(100) A and Al(100) B;
maintaining said $Si_{1-x}Ge_x$ at a pressure below approximately $2\times10^{-9}$ millibar;
maintaining said $Si_{1-x}Ge_x$ approximately at said substrate temperature; and
directing an aluminum flux at said $Si_{1-x}Ge_x$.

5,501,175
**PROCESS FOR PREPARING HIGH CRYSTALLINITY OXIDE THIN FILM**
So Tanaka, and Michitomo Iiyama, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan
Filed Jul. 1, 1994, Ser. No. 269,777
Claims priority, application Japan, Jul. 2, 1993, 5-190854; Jul. 19, 1993, 5-200016
Int. Cl.[6] C30B *23/08*; C23C *14/08*; C04B *35/00*
U.S. Cl. 117—106 16 Claims



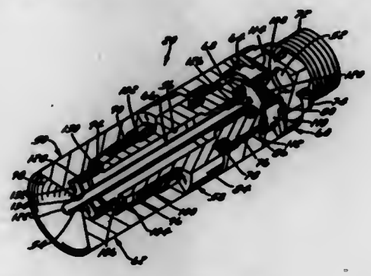

1. A process for preparing a film formed of $SrTiO_3$ oxide material on a substrate by using an apparatus comprising a vacuum chamber in which an oxidizing gas of $O_2$ including $O_3$ can be supplied near the substrate so that pressure around the substrate can be increased while maintaining high vacuum around an evaporation source and cell evaporation sources arranged in the vacuum chamber wherein the substrate is heated, molecular beam of constituent atoms of the oxide excluding oxygen are supplied from the K cell evaporation sources and an oxidizing gas is locally supplied to the vicinity of the substrate.

5,501,176
**PET FEEDING APPARATUS**
Tara S. Tully, 920 Meadow Creek Dr., Apt. 2118, Irving, Tex. 75038
Filed Sep. 16, 1994, Ser. No. 307,512
Int. Cl.[6] A01K *5/01*; *7/00*
U.S. Cl. 119—61 10 Claims



1. A pet feeding apparatus, comprising:
a vertical bracket having a plurality of horizontal slots spaced at intervals along the vertical length of the bracket;
a tray containing an opening configured to hold a bowl; and
a tray hinge having a first leaf and a second leaf, the first leaf being attached to the tray and the second leaf being removably attached to any one of the slots, the tray hinge allowing the tray to be pivoted between an upper position and a lower position.

5,501,177
**ANIMAL WATERING VALVE**
William E. Edstrom, Sr., Waterford, and George J. Grkavac, Milwaukee, both of Wis., assignors to Edstrom Industries, Inc., Waterford, Wis.
Filed Aug. 23, 1994, Ser. No. 294,738
Int. Cl.[6] A01K *7/06*
U.S. Cl. 119—72.5 23 Claims

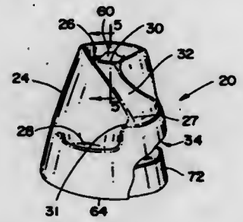


1. An animal watering valve comprising:



A. a housing having a longitudinal bore formed therein and having an upstream inlet and a downstream outlet, said housing including a valve cap and a valve seat disposed in axial alignment with one another;
B. an elastomeric diaphragm which includes
(1) a perforated web portion having apertures formed therethrough, and
(2) a cylindrical peripheral portion having a first end extending axially downstream from said web portion and being clamped between said valve seat and said valve cap, said peripheral portion defining a support from which said web portion can stretch; and
C. a valve stem located in said bore and extending from said diaphragm toward said outlet, said valve stem being laterally deflectable against said web portion of said diaphragm to permit fluid flow through said apertures of said diaphragm and out of said valve.

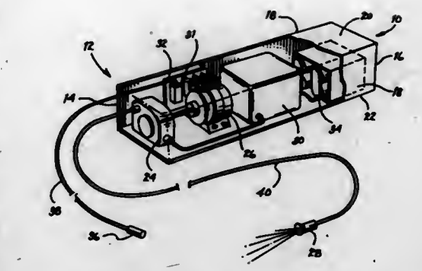
5,501,178
**PET WATERING APPARATUS WITH FLOWING WATER TO SIMULATE A MOUNTAIN CREEK**
Kay G. Kemp, 1504 Carolyn Dr., Orange, Tex. 77632
Filed Jul. 19, 1995, Ser. No. 504,275
Int. Cl.[6] A01K *7/00*
U.S. Cl. 119—74 13 Claims




1. Pet watering apparatus, comprising:
a container for holding water;
a simulated rock formation representing a mountain creek and defining a series of descending depressions and ledges to create descending pools and waterfalls connected by a flowing stream when water is supplied to said formation;
said formation defining a hollow interior of predetermined size and configuration for receiving said container within said hollow interior;
a pump positioned within said container for receiving water from said container;
a hollow conduit connecting said pump to a predetermined upper one of said depressions for elevating water from said pump to said upper depression;
a predetermined lower one of said depressions defining a drain opening therein in liquid communication with said container; and
means in operative relationship with said conduit and with said upper depression for controlling flow of water from said pump to said upper depression and thereby to said descending pools and waterfalls and to said stream.

5,501,179
**INDOOR HOUSEHOLD ANIMAL DETERRENT DEVICE**
George J. Cory, 230 W. Arroya Ave., Ajo, Ariz. 85321
Filed May 2, 1994, Ser. No. 236,546
Int. Cl.[6] A01K *15/00*
U.S. Cl. 119—712 20 Claims

1. An indoor animal deterrent device comprising:
a housing member;
a motor enclosed within said housing member;




a pump enclosed within said housing member, in electrical communication with said motor;
a means for delivering a spray mist of fluid, in fluid flow communication with said pump;
at least one fluid reservoir in fluid flow communication with said pump and said means for delivering said mist of water;
a means for sensing an approach of an animal, in electrical communication with said motor, thereby capable of relaying an electrical signal to said motor; and
a battery source for supplying an electrical current to said deterrent device.

5,501,180
**ELASTIC AND FLEXIBLE ANIMAL COLLAR**
Richard F. Beere, Waterford, Wis., assignor to Beere Tool Company, Inc., Racine, Wis.
Filed Feb. 8, 1995, Ser. No. 385,566
Int. Cl.[6] A01K *27/00*
U.S. Cl. 119—858 17 Claims

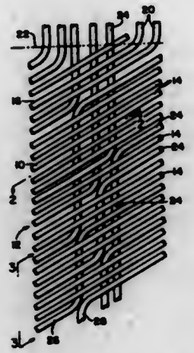


1. An animal collar having both elastic and flexible extendable and contractible characteristics, comprising an elongated piece of elastic and flexible material for conforming to the shape of a circle for positioning around the neck of an animal, said piece being elastic to be capable of extending and contracting in its circular shape around an animal's neck when fitted thereon and thereby be arranged to be snug on the animal's neck when fitted thereon and thereby be arranged to be snug on the animal's neck and in self-adjusting expansion and contraction thereon, said piece being of serpentine shape along its length when in its free-body condition and also being flexible and thereby arranged to alter said serpentine shape and thereby expand and contract the size of said circle, said piece being composed of segments with an interconnector connected between each two adjacent segments, and said segments each consisting of two side-by-side rows of three end-to-end connected and side-by-side disposed upright and inverted U-shapes in each of said rows and arranged in mirror image along said rows.

## 5,501,181
## SPIRAL FURNACE SUPPORT TUBE STRAP

Calvin E. Phelps, Sr., Akron, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Sep. 8, 1994, Ser. No. 302,563
Int. Cl.[6] F22B 37/00
U.S. Cl. 122—6 A 8 Claims



1. A method of supporting the spiral boiler tubing that surrounds a portion of the furnace or combustion area of a steam generator comprising the steps of:

(a) securing a plurality of elongated support members parallel to and co-planer with a series of upwardly spiraling elongated tubular members, said upwardly spiraling elongated members formed or configured to surround a portion of the furnace or combustion area of the steam generator, the combination of said support members and said tubular members defining a spiral tubular furnace enclosure;

(b) removing a first said support member from within said spiral tubular furnace enclosure at a first location and re-positioning said first support member to a second location within said spiral tubular furnace enclosure;

(c) inserting a second said support member within said spiral tubular furnace enclosure at said first location where said first support member was removed from said spiral tubular furnace enclosure; and,

(d) securing said support members to an upper region of the steam generator.

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## 5,501,182
## PERISTALTIC VANE DEVICE FOR ENGINES AND PUMPS

Leo Kull, and Raivo L. Kull, both of 58 Westover Ave., W. Caldwell, N.J. 07006

Filed Jul. 17, 1995, Ser. No. 502,964
Int. Cl.[6] F02B 53/00
U.S. Cl. 123—18 R 26 Claims

1. A peristaltic vane controlling device for a central-axis rotary variable volume pressure chamber supported by a base member (30), comprising:

an operating shaft OS), including an operating crank arm;

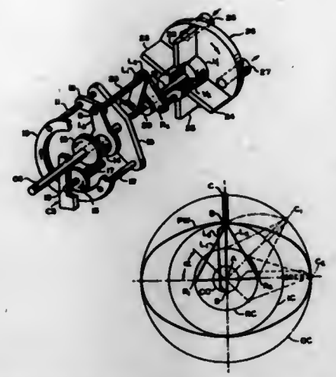
a first rotor with a crank arm ($R_1$), including first vanes on a first vane carrier ($V_1$) and first power transmission linkup means;

a second rotor with a crank arm ($R_2$), including second vanes on a second vane carrier ($V_2$) and second power transmission linkup means;

a control stator (CS) with a reference line effecting a revolving radial oscillating control motion by means of a control point (B) following a peristaltic control wave (PW);

a distributing stator (DS) including a pattern of inlet and outlet ports related to a reference line;

a cylindrical main pressure chamber divided to revolving variable volume subchambers between said first and second vanes



whereby said subchambers being in a communicating contact with a surface on said distributing stator;

a differential power transmission linkup means providing a limited angle differential connection between said operating shaft and said first and second rotors whereby said peristaltic wave is effecting a peristaltic motion with a number of peristaltic volume changes in a form of alternate accelerating and decelerating rotation of said first and second vanes to occur more than once during a revolution of said operating shaft; and

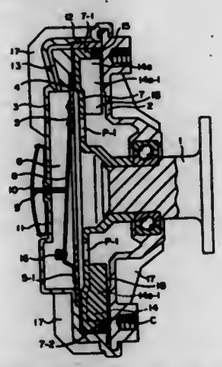
a registry between said reference lines on said control stator and on said distributing stator providing a synchronized communicating relationship between said revolving subchambers and said distributing stator for effecting a peristaltic flow of fluids through said inlet and outlet ports for any useful purpose.

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## 5,501,183
## TEMPERATURE SENSITIVE FLUID FAN COUPLING

Kenichi Takayama, Mishima, Japan, assignor to Usui Kokusai Sangyo Kaisha Ltd., Japan

Filed Nov. 16, 1994, Ser. No. 338,881
Claims priority, application Japan, Nov. 17, 1993, 5-311222; Jan. 27, 1994, 6-024794
Int. Cl.[6] F01P 7/02
U.S. Cl. 123—41.12 18 Claims



1. In a temperature-sensitive fluid fan coupling which comprises a rotary shaft, a casing supported by a bearing on said shaft and adapted for mounting a cooling fan on its outer periphery, a cover closing said casing so that said casing and cover may define a closed housing, a driving disc secured about said shaft at one end thereof within said casing, a partition having an oil flow control



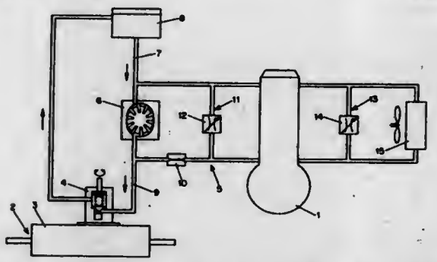
hole and dividing the interior of said housing into an oil reservoir and a torque transfer chamber in which said disc is disposed, said housing defining at least one dam facing the outer periphery of said disc where oil is centrifugally collected, and an oil circulating passage connected to said dam and extending from said torque transfer chamber to said oil reservoir, a temperature sensor provided on the outside of said cover for detecting the ambient temperature prevailing around the coupling, and a valve member situated in said oil reservoir, operationally connected to said sensor, and having one end positioned to close said oil flow control hole, said valve member being deformable to open said hole if said temperature detected by said sensor exceeds a predetermined level, so that a torque transfer gap defined between the mutually facing surfaces of said disc and said housing may have a differently sized area of effective contact with oil to control the transfer of torque from said shaft to said housing to be thereby driven, the improvement wherein said disc has a cylindrical wall projecting in at least one axial direction at its outer periphery, and said disc, said projecting wall and said housing define at least one oil storage chamber said disc having a plurality of radially extending partitions which divide said oil storage chamber into a plurality of portions.

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## 5,501,184
## MOTOR VEHICLE HAVING A COMMON LIQUID SUPPLY FOR A LIQUID-COOLED DRIVE ENGINE AND HYDRAULIC POWER STEERING

Helmut Engelen, and Horst Niki, both of Wolfsburg, Germany, assignors to Volkswagen AG, Wolfsburg, Germany

Filed Dec. 8, 1994, Ser. No. 351,677
Claims priority, application Germany, Dec. 16, 1993, 43 42 983.1
Int. Cl.[6] F01P 3/00
U.S. Cl. 123—41.29 3 Claims



1. A motor vehicle comprising a drive engine, a liquid-cooling circuit for the engine arranged to circulate coolant at a first pressure level, a hydraulic power steering arrangement having a pressure line to receive liquid supplied at a second pressure level higher than the first pressure level, pressure control means for establishing a pressure difference between the first and second pressure levels, a liquid reservoir for holding coolant to be supplied both to the liquid-cooling circuit for the engine and to the pressure line at the second pressure level, and a pump for circulating coolant to both the liquid-cooling circuit for the engine and to the pressure line.

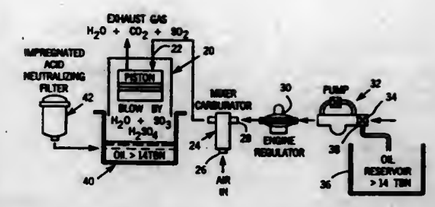
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## 5,501,185
## BIOGAS-DRIVEN GENERATOR SET

James L. King, Sheboygan, and Timothy J. Mintner, Elkhart Lake, both of Wis., assignors to Kohler Co., Kohler, Wis.

Filed Jan. 6, 1995, Ser. No. 369,623
Int. Cl.[6] F02B 43/04;75/12; F02M 21/04
U.S. Cl. 123—73 AD 7 Claims

1. A biogas fuel supply system for providing fuel to the intake of an internal combustion engine, which comprises:




a carburetor having an air intake and a biogas intake, the carburetor being operable to mix air with a stream of biogas supplied to the carburetor biogas intake and deliver the mixture to said engine intake;

a reservoir for storing acid-neutralizing oil; and

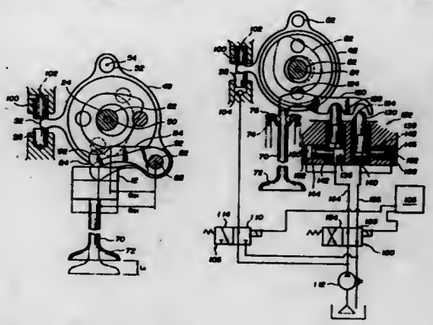
an injector coupled to the reservoir for receiving acid-neutralizing oil and injecting it into the stream of biogas supplied to the carburetor.

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## 5,501,186
## ENGINE VALVE CONTROL MECHANISM

Seinosuke Hara; Akira Hidaka, and Yoshihiko Yamada, all of Atsugi, Japan, assignors to Unisia Jecs Corporation, Atsugi, Japan

Filed Jul. 27, 1994, Ser. No. 280,874
Claims priority, application Japan, Jul. 27, 1993, 5-185018
Int. Cl.[6] F01L 13/00
U.S. Cl. 123—90.16 7 Claims



1. An engine valve control mechanism, comprising:

a cylinder valve;

a driving shaft rotatable about a shaft axis;

a cam rotatable relative to said driving shaft to actuate said cylinder valve;

a support;

an intermediate member supported in said support for rotation about an axis;

a first coupling between said driving shaft and said intermediate member at a first position spaced from said shaft axis;

a second coupling between said intermediate member and said cam at a second position angularly spaced from said first position with respect to said shaft axis,

said first and second couplings being so spaced from said shaft axis that they are at varying distances from said axis of said intermediate member during operation, each of said first and second couplings having a movable connection to permit the variation in its distance from said axis of said intermediate member;

means for varying an eccentricity of said intermediate member which is the relative position of said axis of said intermediate member to said shaft axis; and

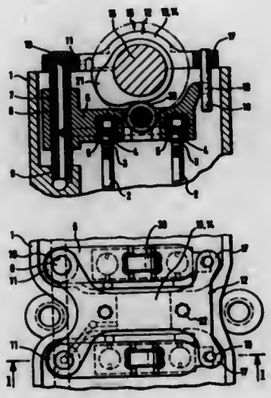
means responsive to the varying eccentricity of said intermediate member for varying a valve lift of said cylinder valve.

5,501,187

## CONNECTION OF A GUIDE RAIL OF A VALVE ACTUATION DEVICE WITH A CAMSHAFT BEARING

Walter Speil, Ingolstadt; Arndt Ihlemann, and Johann Kecker, both of Herzogenaurach, all of, Germany, assignors to Ina Walzlager Schaeffler KG, Germany

Filed Mar. 20, 1995, Ser. No. 406,664
Claims priority, application Germany, Mar. 24, 1994, 44 10 122.8
Int. Cl.[6] F01L 1/44;1/12;1/24
U.S. Cl. 123—90.22 5 Claims





1. A device for the simultaneous actuation of two gas exchange valves (2) of an internal combustion engine comprising a bridge (6) guided movably along a guide rail (8) which, with the interposition of hydraulic valve clearance compensation elements (4), is connected with valve shaft ends (3) of the gas exchange valves (2), a camshaft (16) rotatably supported in the cylinder head (1) by at least one camshaft bearing (15), comprising a bearing block (23) and a bearing cap piece (14) detachably connected thereto, and an engine element (12) supporting the guide rail (8) at an upper end thereof, characterized in that the engine element (12) is implemented in one piece with the bearing block (23) or the bearing cap piece (14), wherein the bridge (6) comprises a guide bore (7) for the guide rail (8), characterized in that between the bridge (6) and the engine element (12) a form-fit connection (18,19,25,26) is provided to prevent rotation of the bridge (6) about the guide rail (8).

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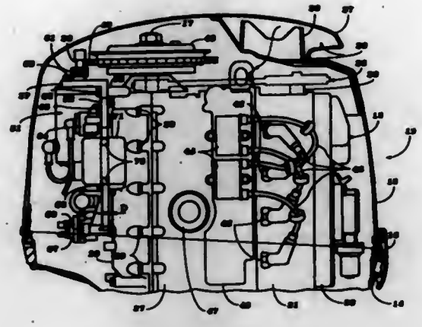
5,501,188

## ENGINE STARTER MOUNTING ARRANGEMENT

Yoshihito Fukuoka, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Sep. 6, 1994, Ser. No. 301,327
Claims priority, application Japan, Sep. 3, 1993, 5-269398
Int. Cl.[6] F02N 11/00
U.S. Cl. 123—179.25 15 Claims

1. An internal combustion engine having a cylinder block, a crankcase member affixed to one end of said cylinder block, an output shaft rotatably journaled by said engine and having a starter gear affixed thereto in exposed relationship at one side of said engine, a mounting plate mounted in spaced relationship to said crankcase member and on the side thereof opposite to said cylinder block for defining a cooling air gap therebetween, and a starter motor mounted on said mounting plate on the side of said mounting plate facing away from said crankcase member and operably engaged with said engine output shaft starter gear for effecting electrical starting of said engine.



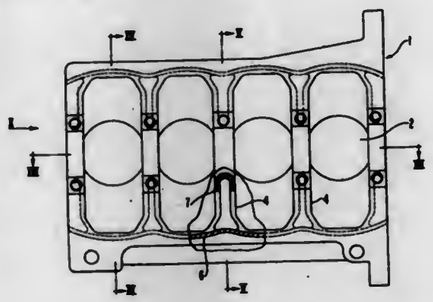
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5,501,189

## CYLINDER BLOCK FOR AN INTERNAL COMBUSTION ENGINE

Nico J. van Bezelj, Stiphout/Helmond, Netherlands, assignor to Eisenwerk Bruchl GmbH, Bruchl, Germany

PCT No. PCT/EP93/01613, § 371 Date May 16, 1994, § 102(e) Date May 16, 1994, PCT Pub. No. WO94/07017, PCT Pub. Date Mar. 31, 1994
PCT Filed Jun. 24, 1993, Ser. No. 244,032
Claims priority, application Germany, Sep. 18, 1992, 42 31 284.1
Int. Cl.[6] F02F 1/36
U.S. Cl. 123—193.1 8 Claims



1. A cast iron cylinder block for an internal combustion engine having a crankcase which defines a region for crankshaft bearings comprising:

at least two contiguous cylinders having a dividing plane therebetween;

a support web interposed between the cylinders and the crankcase for supporting the cylinders on an upper part of the crankcase, the support web including a bore for fastening screws of a seating for a crankshaft bearing; and

a cooling jacket surrounding the at least two contiguous cylinders and including on each side of the two contiguous cylinders, in the dividing plane, at least one reinforcing rib having upper and lower ends and a U-shaped cross-section which defines an inner U-profile extending, at the upper end of the reinforcing rib, into an extension defining a bore for a cylinder head stud screw and extending, at the lower end of the reinforcing rib, into an extension of the bore in the support web.

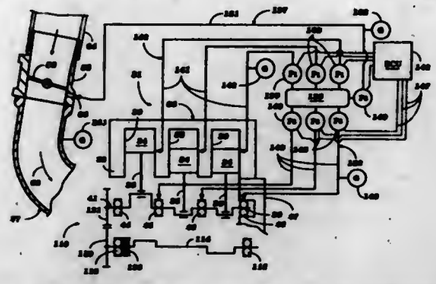


5,501,190

## LUBRICATING SYSTEM FOR ENGINE

Akihiko Okubo, and Takeshi Ito, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Aug. 9, 1994, Ser. No. 287,660
Claims priority, application Japan, Aug. 9, 1993, 5-217996
Int. Cl.[6] F01M 1/02
U.S. Cl. 123—196 M 15 Claims



1. A lubricating system for a two-cycle crankcase compression internal combustion engine comprised of a cylinder, at least one cylinder bore formed by said cylinder, a piston supported for reciprocation within said cylinder bore, a crankshaft rotatably journalled in a crankshaft chamber formed at one end of said cylinder bore and driven by said piston, a cylinder head affixed to said cylinder at the other end of said cylinder bore forming with said piston and said cylinder bore a combustion chamber the volume of which varies upon reciprocation of said piston, an induction system for supplying a charge to said crankcase chamber, a reed type check valve in said induction system for permitting air to flow into said crankcase chamber from said induction system means and precluding reverse flow from said induction system means and precluding reverse flow from said crankcase chamber into said air intake means, a first lubricating system for delivering lubricant directly to said cylinder bore for lubricating the sliding surfaces of said piston and said cylinder bore, and a second lubricating system for delivering lubricant directly to said crankshaft for the lubrication.

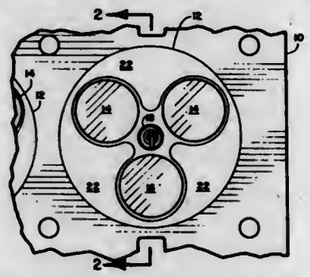
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5,501,191

## COMBUSTION CHAMBER SYSTEM HAVING AN IMPROVED VALVE ARRANGEMENT

James J. Feuling, 2521 Palma, Ventura, Calif. 93003

Continuation-in-part of Ser. No. 995,785, Dec. 23, 1992, Pat. No. 5,313,921. This application May 19, 1994, Ser. No. 246,788
Int. Cl.[6] F02P 15/02
U.S. Cl. 123—310 38 Claims



1. An improved combustion chamber system for use with internal combustion engine having at least one piston and a cooperating cylinder head forming a combustion chamber therebetween, which comprises:

three valves in the head at the combustion chamber, said valves being arranged around an axis of the cylinder;

two of the valves having substantially equal areas and adapted to act as intake valves;

the third of said valves having an area equal to, or slightly greater than, the area of one of the intake valves, the third valve being adapted to act as an exhaust valve;

said two intake valves being spaced a greater distance from each other than from said exhaust valve;

said piston having a generally planar surface adjacent to said head forming one wall of the combustion chamber; and

at least one ignition means for igniting an air/fuel mixture in the combustion chamber, said ignition means located entirely within said head without extending below the plane of said piston's generally planar surface at any point during engine operation.

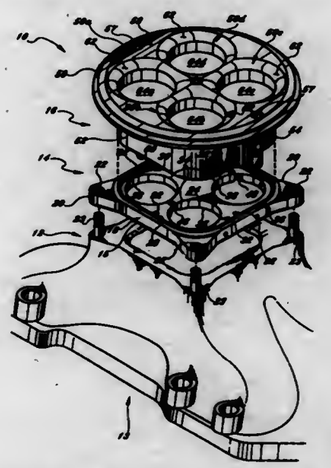
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5,501,192

## AIR VALVE FOR THE INTAKE MANIFOLD OF AN INTERNAL COMBUSTION ENGINE

David K. Cutler, Plantation, Fla., assignor to Cutler Induction Systems, Inc., North Miami Beach, Fla.

Filed Oct. 6, 1994, Ser. No. 319,060
Int. Cl.[6] F02M 23/02
U.S. Cl. 123—336 31 Claims



21. An apparatus including the combination of an air valve and an intake manifold for an internal combusion engine, comprising:

a manifold body including a plenum having an inlet defined by a plenum wall;

a valve base formed with a seat and at least one discharge bore having an inlet end and an outlet end, said outlet end of said at least one discharge bore being formed with a radius which intersects a mounting surface of said valve base, said valve base being mounted to said plenum of said manifold body so that said plenum wall is located at or radially outwardly from said point of intersection between said radius and said mounting surface of said valve base;

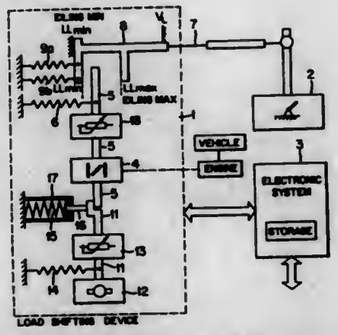
a valve body sealingly engageable with said seat in said valve base, said valve body being formed with at least one inlet bore alignable with said at least one discharge bore;

a throttle blade rotatably mounted within said at least one inlet bore, said throttle blade being pivotal between an open position in which a flow of air is permitted to pass through said inlet bore to said discharge bore in said valve base, and a closed position in which the air flow through said at least one inlet bore is substantially blocked.

## 5,501,193
## METHOD FOR THE RECOGNITION OF IDLING IN CONNECTION WITH A LOAD-SHIFTING DEVICE OF AN INTERNAL COMBUSTION ENGINE CONTROLLED BY THROTTLE VALVE

**Erwin Schneider, Liederbach, and Frank Göhring, Frankfurt, both of, Germany, assignors to VDO Adolf Schindling AG, Frankfurt, Germany**

**Filed Oct. 14, 1994, Ser. No. 324,248**
**Claims priority, application Germany, Nov. 26, 1993, 43 40 372.7**
**Int. Cl.[6] F02D *9/02;41/08***
**U.S. Cl. 123—339.14** **7 Claims**




1. A method for recognition of idling in connection with a load-shifting device of an internal combustion engine, wherein the engine is controlled by a throttle valve in response to a pedal and an electronic control system, the load-shifting device includes a first setting element on the throttle-valve side connected to the pedal and a first potentiometer, and a second potentiometer with a second setting element on the setting-drive side of an electromotive setting drive, the position of the setting element on the throttle-valve side is monitored by the first potentiometer, and the position of the setting element on the setting-drive side is monitored by the second potentiometer; the method comprising steps of:

providing for the first and the second potentiometers linear characteristic curves;

establishing a fixed predetermined ratio between the characteristic curves;

detecting an actual ratio of the characteristic curves resulting from operating of the engine; and

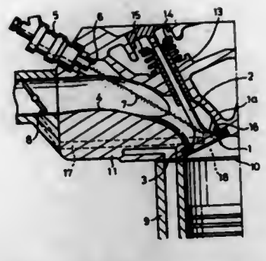
comparing the actual characteristic curve-ratio with the predetermined characteristic curve ratio for agreement, and, in the event of agreement between the actual ratio and the predetermined ratio of the characteristic curves, producing an idling signal and, in case an idling signal is already present, allowing the electromotive setting drive to be controlled by the electronic system.

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## 5,501,194
## FUEL INJECTION APPARATUS

**Kenji Kanehara, Toyohashi; Toshihiko Igashira, Toyokawa; Ikuo Watanabe, Okazaki; Masanori Okada, and Jun-ichi Matsudaira, both of Toyota, all of, Japan, assignors to Nippon Soken Inc., Nishio, and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan**

**Filed Sep. 7, 1994, Ser. No. 300,553**
**Claims priority, application Japan, Sep. 9, 1993, 5-224537**
**Int. Cl.[6] F02M *69/04***
**U.S. Cl. 123—470** **8 Claims**



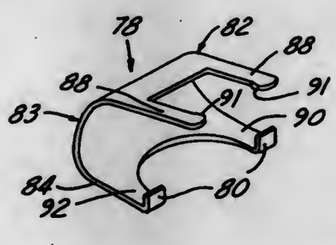
1. A fuel injection apparatus including a fuel injector provided in an intake port of an internal combustion engine upstream of an intake valve, said fuel injector injecting a fuel spray inside the intake port, wherein a spray target position, constituting the point where a center line of the fuel spray injected from an injection port of the fuel injector and the intake valve intersect, is set in a region between a first tangent passing through the center of the injection port and contacting one side of the outer circumference of the stem of the intake valve at a first contact point when seen from the stem side and a second tangent passing through the center of the injection port and contacting the inner circumference of the valve face of the intake valve at a second contact point at one side of the outer circumference of the stem, and wherein an ejection port for air is made to open in a tangential direction with respect to the valve seat clearance formed between the valve face and a valve seat face and an air passage connected to the ejection port is branched from the intake port at a position at the upstream side of a throttle valve so as to eject air from the ejection port in the same direction as a swirl of the fuel spray caused in the valve seat clearance.

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## 5,501,195
## RETAINER ARRANGEMENT FOR A BOTTOM FEED FUEL INJECTOR

**Bryan C. Hall, Newport News, Va., assignor to Siemens Automotive Corporation, Auburn Hills, Mich.**

**Filed Sep. 16, 1994, Ser. No. 308,031**
**Int. Cl.[6] F02M *55/02***
**U.S. Cl. 123—470** **8 Claims**




1. A retainer arrangement for a bottom feed fuel injector in which an elongated fuel injector body is received in an injector seat cavity formed in a portion of a fuel rail to receive fuel flow from an internal passage in said fuel rail through a port extending laterally into said fuel injector at a point intermediate the length of said fuel injector body, said retainer arrangement comprising:

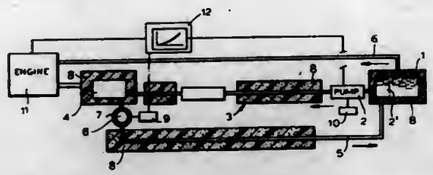
a retainer clip having a pair of spaced apart elongated legs joined at one end by a bridging connector portion, the other end of each of said legs having an opening for engaging a respective protrusion on said fuel rail, said bridging connector portion shaped with a space to be received into a recess on one side of said fuel injector body, said clip is formed from strip material.



## 5,501,196
## FUEL-INJECTION SYSTEM FOR MOTOR-VEHICLE ENGINE

**Erwin Brunnhofer, Fuldabrück, Germany, assignor to Techno-flow Tube-Systems GmbH, Fuldabruck, Germany**

**Filed Dec. 16, 1994, Ser. No. 357,500**
**Claims priority, application Germany, Dec. 28, 1993, 43 44 775.9**
**Int. Cl.[6] F02M *37/04***
**U.S. Cl. 123—497** **6 Claims**




1. A motor-vehicle engine system comprising:

an internal-combustion four-cycle engine having a fuel-supply manifold and operable at variable speed with a fuel requirement dependent on speed;

a substantially closed but vented fuel tank holding a supply of gasoline;

a fuel pump of an efficiency of at least 80% and having an input connected to the tank and an output;

a fuel-feed line connected between the fuel-pump output and the fuel-supply manifold;

control means connected to the engine and to the pump for operating the fuel pump at a throughput rate equal to between 5% and 40% more than the instantaneous fuel requirements of the engine;

a return line connected to the fuel tank;

an overpressure valve connected between the return line and the fuel-supply manifold; and

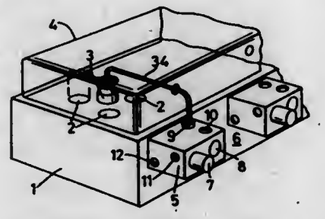
means connected to the overpressure valve for opening same and returning to the tank fuel in the manifold that is in excess of the engine's instantaneous requirements and for maintaining a predetermined pressure in the fuel-supply manifold.

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## 5,501,197
## FUEL INJECTION APPARATUS

**Paul J. Smith, Peterborough, Great Britain, assignor to Perkins Limited, Cambridgeshire, Great Britain**

**Filed Jun. 15, 1994, Ser. No. 260,069**
**Claims priority, application United Kingdom, Jun. 15, 1993, 9312288**
**Int. Cl.[6] F02M *37/04***
**U.S. Cl. 123—509** **22 Claims**



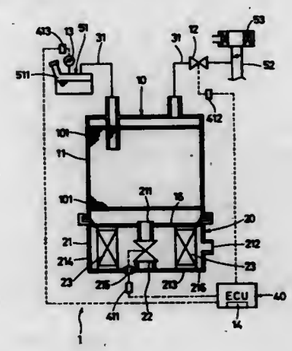
1. A fuel injection system comprising an injector assembly adapted to be inserted into a cylinder head of an internal combustion engine; an intensifier assembly adapted to be one of (a) inserted into the cylinder head, (b) attached to the cylinder head, or (c) attached to an engine valve cover remote from said injector assembly; a first port for the supply of fuel to the intensifier assembly; a second port for the supply of intensifier fluid to the intensifier assembly; a third port for the supply of pressure intensified fuel to said injector assembly through a conduit, whereby fuel supplied through said first port is intensified by fluid supplied through said second port and is delivered at intensified pressure to said injector assembly; and a solenoid operated valve incorporated in said intensifier assembly for the purpose of regulating the timing of fuel intensification.

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## 5,501,198
## FUEL VAPOR CONTROL APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

**Nobuhiko Koyama, Nagoya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan**

**Filed Feb. 1, 1995, Ser. No. 384,487**
**Claims priority, application Japan, Feb. 2, 1994, 6-031857**
**Int. Cl.[6] F02M *37/04***
**U.S. Cl. 123—520** **10 Claims**




1. A fuel vapor control apparatus for an internal combustion engine comprising:

a fuel vapor purging passage connecting a fuel tank and a suction pipe of said engine;

a canister, having a case and disposed in said purging passage, for adsorbing fuel vapor produced in said fuel tank,

a fuel vapor purge control valve, disposed in said purging passage between said canister and said suction pipe;

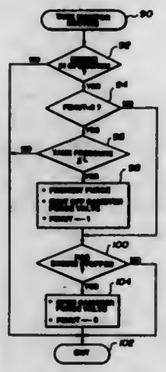
first means, having a housing secured close to said case of said canister, an air filter and an air switching valve, for controlling introduction of dust-free air flowing into said canister, said housing having an air intake port thereon open to the atmosphere and a through port open to said canister and forming a air flow passage of the air flow coming from said intake port and flowing through said air filter and said air switching valve; and

second means, having a pressure sensor disposed in said fuel tank and a computer unit which controls said fuel vapor purge control valve and said air switching valve to change the pressure of said purging passage in a predetermined manner, for detecting failure according to an output signal of said pressure sensor;

wherein said filter of said first means has a ring-shaped filter element secured air-tightly to said housing so as to surround said air switching valve to introduce thereto dust-free air.

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**5,501,199**
**MONITORING OF EVAPORATIVE PURGE SYSTEM**
**Shuichi Yoneyama, Kanagawa, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan**
**Filed Sep. 27, 1994, Ser. No. 312,750**
**Claims priority, application Japan, Sep. 28, 1993, 5-241863**
**Int. Cl.[6] F02M 33/02**
**U.S. Cl. 123—520** **8 Claims**

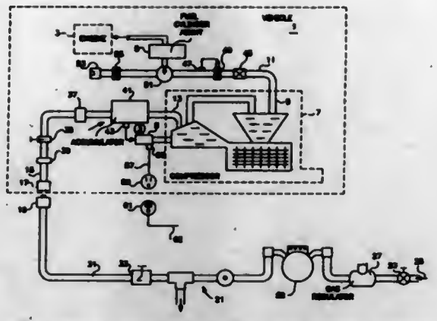


1. An evaporative purge system for an internal combustion engine having an air induction passage, comprising:
a canister having a canister vent valve;
a fuel tank coupled to said canister;
a purge line connected to said canister;
a canister purge valve fluidly connected between said purge line and the air induction passage;
means for monitoring a tank pressure within said fuel tank when the internal combustion engine operates and generating an output when said tank pressure drops below a predetermined vacuum;
means responsive to said output for closing said canister purge valve to shut off fluid flow communication between the fuel tank and the air induction passage; and
means for opening said canister purge valve when subsequently the engine ceases to operate.

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**5,501,200**
**COMPRESSED GAS FUELING SYSTEM**
**Stuart P. Bogartz, 16904 Citronia St., Sepulveda, Calif. 93001**
**Filed Jun. 28, 1994, Ser. No. 267,864**
**Int. Cl.[6] F02M 21/04**
**U.S. Cl. 123—527** **14 Claims**

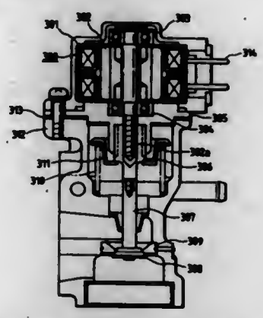
1. A fueling system for a vehicle equipped with an engine fueled by a compressible gas and gas storage means for providing the compressed gas to the engine and for storing the gas under pressure, comprising:
compressor means mounted in and transportable on board the vehicle for receiving gas at a first pressure through an inlet and outputting the gas through an outlet at a second pressure higher than the first pressure;
an electric motor for powering the compressor means, including electric input means for selectively coupling the electric motor to a source of electric power outside the vehicle;
inlet connector means for removably connecting the inlet to a source of low-pressure gas located outside the vehicle; and,



outlet connector means for providing a high-pressure connection between the outlet and the gas storage means;
wherein the inlet connector means includes an accumulator and first pressure switch means responsive to pressure within the accumulator for permitting operation of the compressor when the pressure in the accumulator is at least about a predetermined minimum pressure and for prohibiting operation of the compressor when the pressure within the accumulator is less than about the minimum pressure.

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**5,501,201**
**FLOW QUANTITY VALVE CONTROLLER AND MANUFACTURING METHOD FOR FLOW QUANTITY VALVE**
**Setuo Miyaai; Hidetoshi Okada; Hajime Kako; Hirofumi Obuchi; Satoshi Kawamura, and Toshihiko Miyake, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**
**Filed Mar. 21, 1995, Ser. No. 407,705**
**Claims priority, application Japan, Jun. 3, 1994, 6-122582**
**Int. Cl.[6] F02M 25/07; F16K 31/04**
**U.S. Cl. 123—571** **28 Claims**



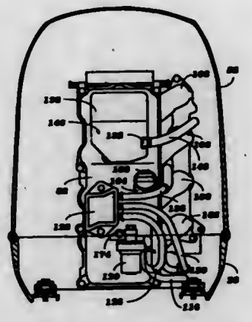
1. A flow quantity valve controller comprising:
a flow quantity valve of a stepper motor type for controlling a flow quantity of a fluid flowing through a flow path disposed in an internal combustion engine;
means for detecting a run condition of the internal combustion engine;
means for calculating a target position of said flow quantity valve based on a detection output of said run condition detection means;
means for calculating an assumed position of said flow quantity valve; and flow quantity valve control means for generating a drive signal to control said flow quantity valve to the target position based on calculation results of said target position calculation means; and
said assumed position calculation means;



wherein said flow quantity valve control means includes specific target position detection means for detecting the target position being a predetermined specific target position and performing initialization when said specific target position detection means detects a specific target position.

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**5,501,202**
**ENGINE COMPONENT LAYOUT FOR OUTBOARD MOTOR**
**Takahide Watanabe, Hamamatsu, Japan, assignor to Sanshin Industries Co., Ltd., Hamamatsu, Japan**
**Filed Sep. 6, 1994, Ser. No. 301,122**
**Claims priority, application Japan, Jun. 9, 1993, 5-221275; Jun. 9, 1993, 5-221276**
**Int. Cl.[6] F02B 25/06**
**U.S. Cl. 123—572** **20 Claims**

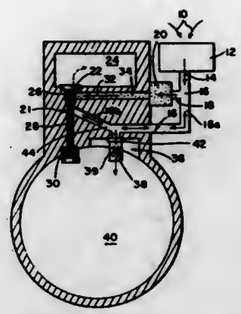


1. An engine for an outboard drive having a cylinder block interposed between a cylinder head and a crankcase, said engine further comprising a cam cover attached to said cylinder head to enclose a cam chamber within said cylinder head containing a valve operating mechanism, and a lubricant/vapor separator located on said cam cover outside of said cam chamber, said separator including an upper opening through which crankcase ventilation gases flow into said vapor chamber of said separator from said cam chamber, an intermediate opening through which the ventilation gases are vented for recirculation through the engine, and a lower opening through which lubricant, separated from the ventilation gases by said baffle, flows from said vapor chamber into said cam chamber.

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**5,501,203**
**DYNAMIC GAS SEAL FOR INTERNAL COMBUSTION ENGINES**
**John Santi, West Allis, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.**
**Filed Jan. 6, 1995, Ser. No. 369,706**
**Int. Cl.[6] F02B 33/00; F02M 25/06**
**U.S. Cl. 123—572** **8 Claims**

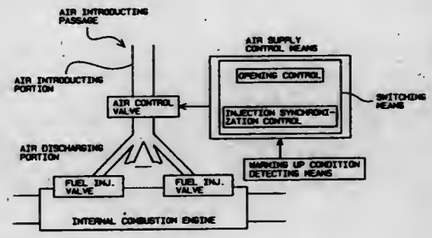
1. An internal combustion engine, comprising:
a crankcase;
a breather chamber, having an entrance in fluid flow communication with said crankcase that receives gases from said crankcase, said breather chamber also having an exit;
an intake valve system that controls the flow of air and fuel into a combustion chamber of said engine;
intake means for providing air at substantially atmospheric pressure;
an air/fuel mixing device having an intake that receives air from said intake means, and having an outlet in fluid flow communication with said intake valve system that provides an air/fuel mixture to said intake valve system;



a first passageway, interconnected between said intake means and said intake valve system, that provides a fluid flow communication with said intake valve system that provides an air/fuel mixture to said intake valve system;
a first passageway, interconnected between said intake means and said intake valve system, that provides a fluid flow communication from said intake means to said intake valve system which bypasses said air/fuel mixing device; and
a second passageway, interconnected between said breather exit and said first passageway such that gases from said breather exit may flow into said second passageway, into said first passageway, into said intake valve system, and then into said combustion chamber.

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**5,501,204**
**ASSIST AIR CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINE**
**Yukihiro Yamashita, Kariya; Hisashi Iida, Anjo, and Keiji Houjoh, Anjoh, all of, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan**
**Filed Jul. 6, 1994, Ser. No. 269,897**
**Claims priority, application Japan, Jul. 6, 1993, 5-166873**
**Int. Cl.[6] F02M 23/12**
**U.S. Cl. 123—588** **13 Claims**

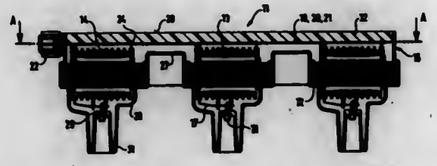



1. An assist air control apparatus for an internal combustion engine comprising:
a fuel injection valve for injecting fuel from an injection port into said internal combustion engine,
air introducing passage means defining an air introducing portion for introducing from outside air which pressure is higher than that around said fuel injection port and a plurality of air discharging portions for guiding introduced air from said air introducing portion to an opening formed near said fuel injection port for each cylinder,

an air control valve disposed in said air introducing passage for opening and closing said air introducing portion,
air supply control means for controlling air flow quantity which is supplied from said opening by controlling opening and closing of said air control valve,
warming-up detecting means for detecting warming-up condition of said internal combustion engine, and
switching means for switching over, in accordance with said warming-up condition detected by said warming-up detecting means, opening control for continuously controlling opening degree of said air control valve when said engine is cold and injection synchronization control for controlling said air control valve to open and close so as to supply air in synchronization with fuel injection of said fuel injection valve after said engine has been warming-up.

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**5,501,205**
**IGNITION COIL SET FOR A MULTICYLINDER INTERNAL COMBUSTION ENGINE**
**Dieter Betz, Vaihingen; Reinhold Herrmann, Stuttgart, and Uwe Hammer, Schwieberdingen, all of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany**
**Filed Mar. 16, 1995, Ser. No. 405,537**
**Claims priority, application Germany, Jun. 10, 1994, 44 20 271.7**
**Int. Cl.[6] F02P *3/02*; H01T *13/04***
**U.S. Cl. 123—635** **7 Claims**

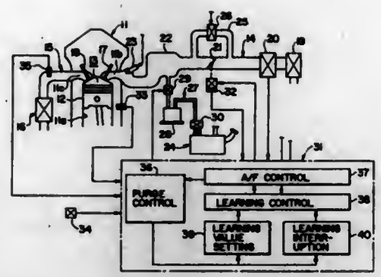


1. An ignition coil set for a multicylinder internal combustion engine, comprising a housing; a plurality of substantially identical ignition modules each having a primary coil and a secondary coil and accommodated in said housing; and a common connecting element formed so as to provide positioning of said primary coils and said secondary coils and to provide electrical contacting of terminals of said primary coils and low voltage side of said secondary coils when said coils are single spark coils or distribution of high voltage when said coils are formed as double spark coils, and also to provide positioning of said housing which accommodates said ignition modules.

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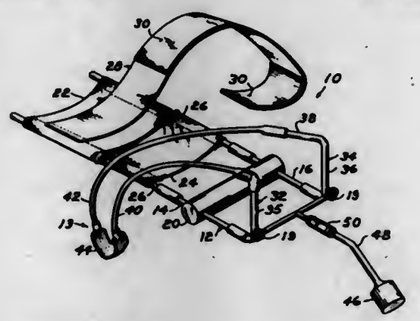
**5,501,206**
**AIR-FUEL RATIO CONTROL SYSTEM FOR ENGINE**
**Hiroyuki Takebayashi, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan**
**Filed Mar. 29, 1994, Ser. No. 219,793**
**Claims priority, application Japan, Mar. 31, 1993, 5-072713**
**Int. Cl.[6] F02D *41/00***
**U.S. Cl. 123—674** **15 Claims**

1. An air-fuel ratio control system comprising:
an internal combustion engine;
a sensor for detecting a parameter from an exhaust gas discharged from the engine;
a fuel injector for injecting fuel from a fuel tank into the engine;
vaporized fuel supplying means for supplying vaporized fuel from the fuel tank to the engine; and
control means for (1) feedback controlling an air-fuel ratio of a mixture to be supplied into the engine, based on the parameter detected from the exhaust gas discharged from the engine, so as to set said air-fuel ratio to a target air-fuel ratio, (2) gradually increasing an amount of vaporized fuel supplied to a necessary level during an initial interval of supplying said vaporized fuel, (3) learning and updating a control value used in feedback controlling said air-fuel ratio of the mixture based on a deviation of said air-fuel ratio from said target air-fuel ratio while supplying said vaporized fuel, (4) gradually changing said control value, upon a resumption of supplying said vaporized fuel, from zero (0) to a learned control value obtained during a preceding period of supplying vaporized fuel according to a gradually increasing amount of vaporized fuel supplied over an interval in which an amount of vaporized fuel supplied is gradually increased, and (5) operating said fuel injector to supply a specific amount of injected fuel from the fuel tank to the engine based on said control value.




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**5,501,207**
**ARM BRACED SLINGSHOT**
**Sidney L. Black, 1823 Sherry La., Edmond, Okla. 73003**
**Filed Dec. 23, 1994, Ser. No. 363,084**
**Int. Cl.[6] F41B *3/02***
**U.S. Cl. 124—20.1** **10 Claims**

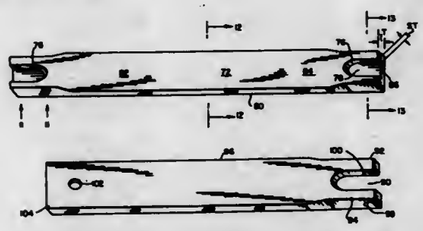


1. A slingshot, comprising;
a U-shaped frame having forward and rearward end portions and having a pair of leg members adapted to respectively extend along opposite sides of a forearm of a user and having a bight portion normally disposed forwardly of a hand of a user;
a saddle strap extending between and secured at its respective end portions to the respective leg of said pair of leg members opposite the bight portion for overlying an intermediate portion of a forearm and supporting said leg members adjacent opposite sides of the forearm;
a hand grip extending between and secured at its respective end portions to the respective leg of said pair of leg members adjacent the bight portion for grasping by the hand of a forearm with the wrist thereof level with the forearm and supporting the forward end portions of said pair of leg members substantially parallel with the forearm and wrist;
a pair of inverted L-shaped posts each having a standard portion respectively surmounted on the respective leg of said pair of leg members adjacent respective ends of the bight portion, each standard of said pair of posts having a foot portion of unequal length with respect to the length of the other foot portion,
said foot portions projecting generally rearwardly in parallel relation, and in acute angular relation with respect to the longitudinal axis of the respective leg of said leg members; and,
a sling including a missile pocket and equal length resilient tubular members respectively secured, at one end portion, with the end portion of respective foot portion opposite the standard of said pair of posts.



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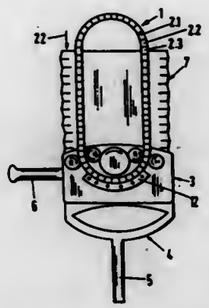
**5,501,208**
**MOLDED ARCHERY BOW LIMB**
**Gary L. Simonds, Gainesville, Fla., assignor to Bear Archery Inc., Gainesville, Fla.**
**Continuation of Ser. No. 867,369, Apr. 13, 1992, abandoned, which is a division of Ser. No. 648,693, Jan. 31, 1991, Pat. No. 5,141,689. This application Jan. 23, 1995, Ser. No. 376,294**
**Int. Cl.[6] F41B *5/00***
**U.S. Cl. 124—86** **6 Claims**



1. In an archery bow limb formed of longitudinally oriented fiber elements embedded in a resin matrix, said bow limb having a body with a tension surface normally under tension in use, a compression surface normally under compression in use, and a limb tip slot defined between a pair of limb tip forks at one end of the body, the improvement wherein:
at the interface between the body and limb tip forks, certain fiber elements of the body extend generally continuously to form the limb tip slot without being cut or severed within the slot.
6. A method of making an archery bow limb, comprising the steps of:
molding a limb paddle formed of longitudinally oriented fiber elements embedded in a resin matrix, said limb paddle having an upper surface, a lower surface, and two sides;
at at least one end of the limb paddle, and before the resin is cured, molding a depression in said upper surface, which depression extends between the two sides, but does not extend completely to the lower surface, the depression defining a partial limb tip slot between two partial limb tip forks;
arranging certain of the fiber elements of the limb paddle to be disposed closer to the lower surface in the area of the partial limb tip slot and to extend continuously to the partial limb tip slot, thus obtaining an unobstructed partial limb tip slot without the need to cut or sever any fibers which extend thereinto;
curing the resin;
and removing the portion of the limb paddle between the lower surface of the depression and the lower surface of the limb paddle, thus obtaining an archery bow limb with a limb tip slot defined between two limb tip forks.

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**5,501,209**
**MULTIPURPOSE TOOL**
**Ernst Wenger, Gwatt, Switzerland, assignor to Reserwa AG., Gwatt, Switzerland, and Vitesse Etablissement, Vaduz, Liechtenstein**
**Division of Ser. No. 66,041, Jun. 15, 1993, Pat. No. 5,365,914. This application Sep. 6, 1994, Ser. No. 301,047**
**Claims priority, application Switzerland, Jan. 25, 1991, 313/91**
**Int. Cl.[6] B28D *1/08***
**U.S. Cl. 125—21** **11 Claims**



1. Drive mechanism wherein at least one annular element is movably supported on a round, dimensionally stable guide rail in such a way that it can move along the guide rail only with execution of a helical movement, and wherein the guide rail is fashioned, along the lines of an electric linear motor, as a stator and the at least one annular element is fashioned as a rotor.

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**5,501,210**
**PORTABLE PROPANE COOKING TRAILER**
**Andrew P. Van Hoogmoed, 1216 Persimmon Way, Merced, Calif. 95340**
**Filed May 22, 1995, Ser. No. 445,514**
**Int. Cl.[6] F24C *1/16***
**U.S. Cl. 126—276** **16 Claims**



1. A portable cooking apparatus comprising:
a frame including ground-engaging wheels and a hitch;
at least one cooking element mounted on said frame, said at least one cooking element being a fuel-burning element;
a gurney including ground engaging wheels;
a fuel cylinder mounted on said gurney;
a conduit providing fluid communication between each said at least one cooking element and said fuel cylinder; and
mounting means for demountably fixing said gurney to said frame.

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**5,501,211**

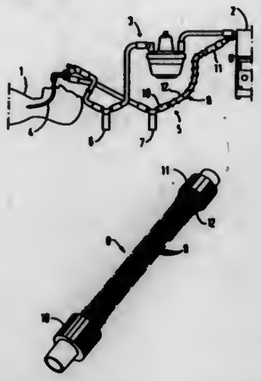
**Patent Not Issued For This Number**

5,501,212

## IN-LINE DEHUMIDIFYING DEVICE EXPOSED TO THE AMBIENT ENVIRONMENT

Georgios Psaros, Tullinge, Sweden, assignor to Siemens Aktiengesellschaft, Munich, Germany

Continuation of Ser. No. 944,266, Sep. 14, 1992, abandoned.
This application Sep. 26, 1994, Ser. No. 311,900
Claims priority, application Sweden, Sep. 25, 1991, 9102777
Int. Cl.[6] A62B 7/10;23/02;19/00; A61M 16/00
U.S. Cl. 128—205.12 13 Claims



1. A ventilator comprising:

an expiratory line and an expiratory flow meter, said expiratory line disposed before said expiratory flow meter, and said expiratory line carrying moisture-containing expired gases having a relative humidity from a patient;

and a dehumidifying device consisting of a plurality of tubes including an outer layer of tubes, means for permitting connection of said tubes in said expiratory line where said tube form a continuous in-line section of said expiratory line and the entirety of expired gases flow through said tubes, and with at least a portion, including said outer layer, of said plurality of tubes exposed directly and openly to ambient atmosphere without an airflow-impeding barrier;

and each of said tubes having a moisture-permeable tube wall for exchanging moisture between the expired gases therein and ambient atmosphere, said tubes forming, in combination, means for reducing the relative humidity of said expired gases to a relative humidity of less than 80%.

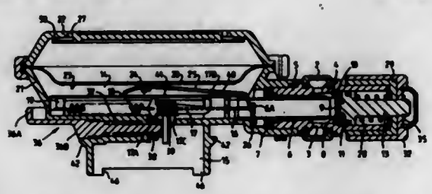
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5,501,213

## GAS FLOW CONTROL VALVES

Peter J. Jackson, Findon, England, assignor to Racal Health & Safety Limited, England

Filed Sep. 20, 1994, Ser. No. 309,992
Claims priority, application United Kingdom, Sep. 22, 1993, 9319580
Int. Cl.[6] A62B 9/02
U.S. Cl. 128—205.24 15 Claims



1. A gas flow control valve comprising: an inlet chamber and an outlet chamber; a main valve member for controlling the flow of a pressurised gas from the inlet chamber to the outlet chamber; and a flexible pressure-responsive member sensitive to the gas pressure within the outlet chamber for controlling the movement of the valve member; the valve member being an axially-slidable tube opening coaxially at its opposite ends, one said end of which extends into the inlet chamber, the other said end of which leads to the outlet chamber, and the interior of which defines a flow path to lead gas from the inlet chamber to the outlet chamber; a valve seat facing the valve member in the inlet chamber such that the spacing of the valve member from said seat controls the rate of gas flow through the valve member from the inlet chamber to the outlet chamber and contact of the valve member with said seat shuts off such flow; spring means acting upon the valve member to bias the same away from said seat; the pressure-responsive member being arranged to flex in one sense in response to reduction of gas pressure in said outlet chamber and to flex in the opposite sense in response to increase of gas pressure in said outlet chamber, the axis of flexure of the pressure-responsive member being inclined to the axis of the valve member; and mechanical linkage means being provided to link the pressure-responsive member to the valve member, the pressure-responsive member being connected to transmit movement to said linkage means in said opposite sense of its flexure and the linkage means being connected to transmit movement to the valve member in the closing direction thereof; whereby reduction of gas pressure within the outlet chamber permits the valve member to move away from said seat under the bias of said spring means while increase of gas pressure within the outlet chamber causes the pressure-responsive member to move the mechanical linkage means to move the valve member towards said seat against the bias of said spring means.

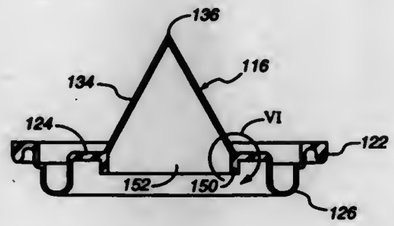
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5,501,214

## NON-REBREATHING VALVE AND VALVE ELEMENT THEREFOR

Kristine K. Sabo, New Kensington, Pa., assignor to Respironics, Inc., Murrysville, Pa.

Filed Sep. 26, 1994, Ser. No. 312,468
Int. Cl.[6] A61M 16/00; A62B 9/02
U.S. Cl. 128—205.24 5 Claims




1. A valve element formed of flexible, resilient material, said valve element comprising:

a peripheral portion;

a sealing portion contiguous with and extending radially inwardly of said peripheral portion; and

a hollow, wedge-shaped formation contiguous with and projecting from said sealing portion, said wedge-shaped formation having a base defining an opening in said sealing portion and a distal end terminating in a slot;



wherein said sealing portion includes means for preventing inversion of said wedge-shaped formation under pressure applied against said wedge-shaped formation, said means for preventing inversion of said wedge-shaped formation comprising a substantially semi-toroidal region projecting from said sealing portion in a direction generally opposite to said wedge-shaped formation.

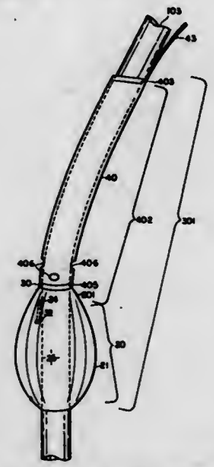
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5,501,215

## VENTILATION TUBE WITH EVACUATION SHEATH

Christine M. Huerta, 775 28th Ave., North, St. Petersburg, Fla. 33704

Filed May 16, 1995, Ser. No. 442,484
Int. Cl.[6] A61M 16/00
U.S. Cl. 128—207.15 20 Claims



1. A breathing augmentation apparatus for insertion from a point outside a patient's body through the patient's tracheal region to a patient's lung cavity, the apparatus comprising;

a ventilation tube, said ventilation tube being of a flexible material and of diameter adequate to pass sufficient air or oxygen at a pressure safe to a person's lung but small enough to fit through said tracheal region without trauma or damage to the epiglottis or interior throat surfaces and of sufficient length to reach from a point outside a patient's body, through said tracheal region and to the lung cavity opening;

a balloon cuff having a membrane, said balloon cuff being positioned radially about a ventilation tube at a point between said patient's epiglottis and lung opening, said balloon cuff further being adapted to alternatively be inflated to permit its expansion radially about said ventilation tube to fill the space between said ventilation tube and a patient's throat wall and then be deflated to permit its collapse upon said ventilation tube, said balloon cuff further being adapted, at its point along said ventilation tube most proximal to the exit of said ventilation tube from a patient, with a common joining band, said common joining band being further adapted to radially surround from said ventilation tube and hold said balloon cuff in place and to permit the insertion of a fluid pressure lumen for inflating and deflating said balloon cuff from a pressure source outside a patient's body;

an evacuation sheath having proximal and distal ends, said evacuation sheath further comprising a concentric sheath about said ventilation tube and extending from said common joining band proximally to a sealed connection about said ventilation tube through which a pressure source from outside a patient's body may be delivered to the space defined between said ventilation tube and said evacuation sheath, said evacuation sheath being adapted with one or more ports about its circumference near said common joining band.

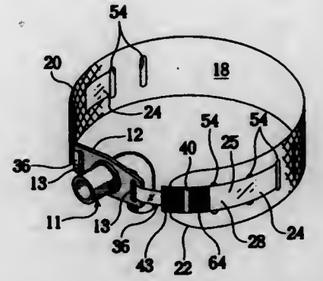
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5,501,216

## TRACHEOSTOMY TUBE HOLDER AND ASSOCIATED TUBE HOLDING METHOD

Timothy N. Byrd, 1267 Old Cades Cove Rd., Townsend, Tenn. 37882

Filed Nov. 23, 1994, Ser. No. 344,147
Int. Cl.[6] A61M 16/00
U.S. Cl. 128—207.17 14 Claims



1. A tracheostomy tube holder for maintaining the position of a tracheostomy tube having a flange with first and second openings, said tube holder comprising:

a first tube engaging assembly for engaging the tracheostomy tube, said first tube engaging assembly including a first foundation strap having a distal end portion and a proximal end portion and defining a first bonding surface, said first tube engaging assembly also including a first tube engaging strap for being received through said first opening in the tracheostomy tube flange and having a distal end portion for being positioned on said first bonding surface, said first tube engaging assembly further including a first locking strap having a proximal end secured to said first foundation strap and defining an inner adhesive surface for releasably engaging said distal end portion of said first tube engaging strap and said first bonding surface, whereby said distal end portion of said first tube engaging strap is releasably secured between said first foundation strap and said first locking strap, thereby securing said first tube engaging assembly to said tracheostomy tube; and

a second tube engaging assembly for engaging the tracheostomy tube, said second tube engaging assembly including a second foundation strap having a distal end portion and a proximal end portion and defining a second bonding surface, said second tube engaging assembly also including a second tube engaging strap for being received through said second opening in the tracheostomy flange tube and having a distal end portion for being positioned on said second bonding surface, said second tube engaging assembly further including a second locking strap having a proximal end secured to said second foundation strap and defining an inner adhesive surface for releasably engaging said distal end portion of said second tube engaging strap and said second bonding surface, whereby said distal end portion of said second tube engaging strap is releasably secured between said second foundation strap and said second locking strap, thereby securing said second tube engaging assembly to said tracheostomy tube.

5,501,217

## CONTACT LENS FOR INTRAOCULAR OBSERVATION

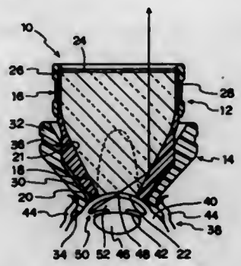
Shinji Ishiguro, Aichi, and Toshiharu Morino, Nagoya, both of, Japan, assignors to Tomey Corporation, Nagoya, Japan

PCT No. PCT/JP92/01734, § 371 Date Jun. 9, 1994, § 102(e) Date Jun. 9, 1994, PCT Pub. No. WO94/14369, PCT Pub. Date Jul. 7, 1994

PCT Filed Dec. 28, 1992, Ser. No. 244,382

Int. Cl.[6] A61B 3/16

U.S. Cl. 128—645 8 Claims




1. A contact lens for intraocular observation comprising a lens body having a contact face for contact with a cornea of an eyeball of a patient, and a lens support having a contact portion to be settled on a sclera of the eyeball of the patient, the lens body and the lens support being assembled on a slide mechanism means so as to be movable relative to each other in an axial direction of the lens, wherein the lens body is adapted to be pressed on the cornea of the eyeball of the patient by movement of the lens in an axial direction of the lens relative to the lens support settled on the sclera of the eyeball of the patient.

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5,501,218

## METHOD OF SCANNING IN MRI

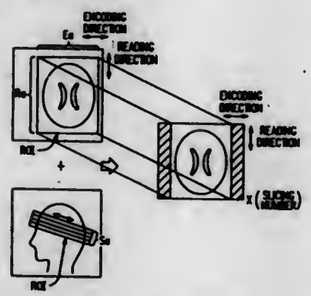
Yoshiyuki Usui, Kuroiso, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Continuation of Ser. No. 968,848, Oct. 30, 1992, abandoned. This application Feb. 2, 1995, Ser. No. 384,206

Claims priority, application Japan, Jan. 30, 1991, 3-284911; Jan. 27, 1992, 4-288953

Int. Cl.[6] A61B 5/055

U.S. Cl. 128—653.2 15 Claims




1. A method of magnetic resonance imaging of a desired diagnostic portion of an object carried out in accordance with three different scanning parameters for defining a scanning range in slicing, phase-encoding and reading directions within the diagnostic portion, the method comprising the steps of:

specifying two different slicing planes according to the desired diagnostic portion, said two slicing planes intersecting one another at an angle;

performing a one-time pilot scan of the two different slicing planes of the diagnostic portion to acquire magnetic resonance signals yielded therefrom, the pilot scan including at least a multislice imaging procedure;

obtaining two pilot images from the magnetic resonance signals acquired during the one-time pilot scan of the specified two different slicing planes;

displaying one of the two pilot images;

designating a part of the scanning parameters on the one pilot image displayed;

displaying the other of the two pilot images;

designating a remaining part of the scanning parameters on the other of the two pilot images displayed; and

performing the magnetic resonance imaging in accordance with the scanning parameters designated based upon the two pilot images displayed.

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5,501,219

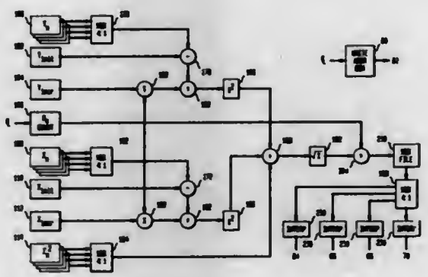
## REAL-TIME DYNAMIC TIME-OF-FLIGHT CALCULATOR

Robert N. Phelps, Livermore, Calif., and Lin X. Yao, Bellevue, Wash., assignors to Siemens Medical Systems, Inc., Iselin, N.J.

Continuation of Ser. No. 130,042, Sep. 30, 1993, abandoned. This application Nov. 14, 1994, Ser. No. 340,061

Int. Cl.[6] A61B 8/00

U.S. Cl. 128—660.07 14 Claims



14. An apparatus, comprising:

an ultrasound probe for receiving, at a plurality of locations in a three-dimensional space, ultrasound energy effectively radiated from a first point in the three-dimensional space and reflected from a second point in the multi-dimensional space, and generating an output for each of the plurality of locations;

a memory, responsive to the means for receiving and to a means for accessing, for storing the outputs and for retrieving the outputs; and

an address generator for the memory, the generator including:

means for transmitting write addresses to the memory, which write addresses are used to store the outputs;

a further memory for providing each of the plurality of locations in the multi-dimensional space;

register means for providing a location of the first point in the multi-dimensional space and a location of the second point in the multi-dimensional space; and

means, responsive to the plurality of locations and the locations of the first and second points, in real time, after at least some of the write addresses have been transmitted, for calculating a time-of-flight from the second point to each of the plurality of locations, and responsive to the time-of-flights for transmitting retrieval addresses to the memory, which retrieval addresses are used to retrieve the outputs from the memory.



5,501,220

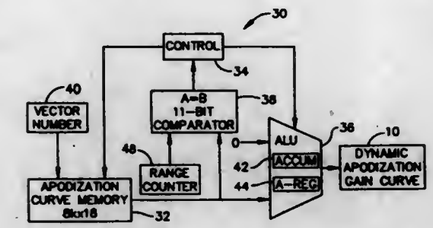
## DIGITAL GENERATION OF A DYNAMIC APODIZATION CORRECTION

Steven G. Foster, Greenfield, Wis., assignor to General Electric Company, Milwaukee, Wis.

Filed Nov. 22, 1994, Ser. No. 343,319

Int. Cl.[6] A61B 8/00

U.S. Cl. 128—661.01 4 Claims




1. A dynamic apodization gain correction apparatus for use with ultrasound imaging systems comprising:

an apodization curve generator;

a means for driving the curve generator to provide digital generation of the apodization gain correction curve, including an initial gain comprised of an initial plurality of active elements, and data represented by a series of pairs comprising a slope and an associated break point which represent incremental increases in the curve, wherein the initial plurality of active elements comprises a memory means, an arithmetic logic unit including an accumulator and a register, a control means for providing information to the memory means and instructions to the arithmetic logic unit, and a comparator means used by the control means to monitor time coincidence with the time-dependent break-points.

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5,501,221

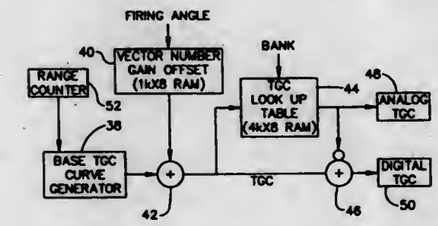
## TIME GAIN COMPENSATION IMPLEMENTATION

Steven G. Foster, Greenfield, and Mark H. Wheeler, Pewaukee, both of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Nov. 22, 1994, Ser. No. 343,161

Int. Cl.[6] A61B 8/00

U.S. Cl. 128—660.06 5 Claims




1. A time gain compensation apparatus for use with ultrasound imaging systems comprising:

a TGC curve generator;

a means for driving the TGC curve generator to generate a base curve, the base curve defined by an initial gain and data represented by a series of slopes and associated time-dependent break-points, the TGC curve generator further having an associated vector number gain offset for providing an offset value to be added to the base curve, to provide digital generation of the time gain compensation curve.

5,501,222

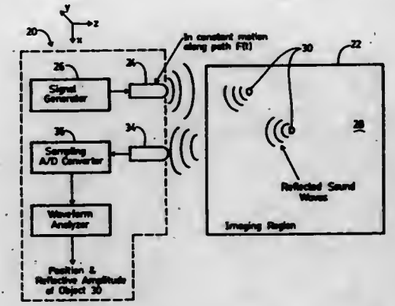
## SYSTEM FOR IMAGING A REGION

Keith A. Briggs, 430 Navaro Pl. #107, San Jose, Calif. 95134

Filed May 13, 1994, Ser. No. 242,536

Int. Cl.[6] A61B 8/00

U.S. Cl. 128—661.07 56 Claims




1. An acoustic system for imaging a region, comprising:

a transmitter transmitting an acoustic signal towards the region, said region reflecting said acoustic signal to generate a modified acoustic signal;

a receiver providing an output signal in response to said modified acoustic signal;

a device moving the transmitter or the receiver substantially continuously relative to the body to cause a Doppler phase shift of the receiver output signal relative to the transmitted signal, said transmitted signal being continuous for at least a time period during which said device is moving the transmitter or receiver; and

means for determining, from the Doppler phase shift between the transmitted signal during said at least one time period and the receiver output signal, the amplitudes of signals reflected from different portions of the region in order to provide an image of the region.

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5,501,223

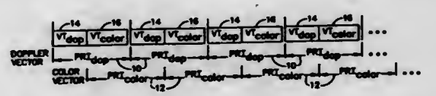
## DYNAMIC FIRING SEQUENCE FOR ULTRASOUND IMAGING APPARATUS

Michael J. Washburn, New Berlin, and Rowland F. Saunders, Hartland, both of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Nov. 23, 1994, Ser. No. 344,045

Int. Cl.[6] A61B 8/00

U.S. Cl. 128—661.09 8 Claims




1. A method for achieving a dynamic firing sequence for ultrasound imaging apparatus comprising the steps of:

providing operator selected parameters;

storing predetermined system constants;

calculating PRI using the operator selected parameters and the predetermined system constants;

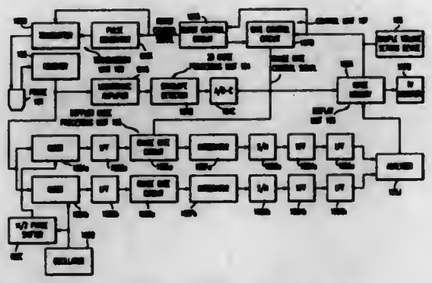
calculating a minimum vector time using the operator selected parameters and the predetermined system constants;

maximizing frame rate using the PRI calculation and the minimum vector time calculation;

interleaving color firings with Doppler firings; and

maximizing number of color positions that can be interleaved.

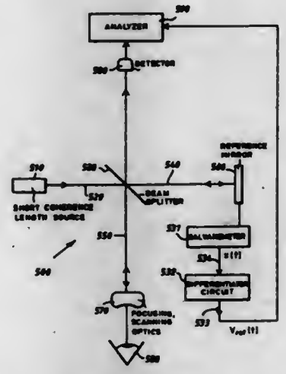
5,501,224
**ULTRASONIC DIAGNOSTIC APPARATUS**
Eiichi Shiki, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Feb. 28, 1995, Ser. No. 395,929
Claims priority, application Japan, Feb. 28, 1994, 6-029197
Int. Cl.[6] A61B 8/00
U.S. Cl. 128—661.10 29 Claims



1. An ultrasonic diagnostic apparatus comprising:
ultrasonic transmission and reception means for transmitting ultrasonic pulses into a moving target in the body, and receiving echo signals reflected from the moving target;
driving means for generating ultrasonic pulses to be transmitted by said ultrasonic transmission and reception means;
processing means for detecting Doppler signals by detecting phase of the echo signals;
sample volume setting means for designating an observation region in the moving target by means of a range gate having a gate width;
a sampling means for sampling the Doppler signals in the range gate; and
a control means for controlling said sampling means so that the gate width is smaller than the width of the observation region according to the designation of said sample volume setting means.

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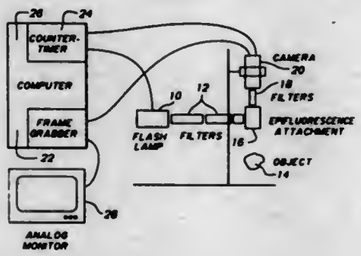
5,501,226
**SHORT COHERENCE LENGTH, DOPPLER VELOCIMETRY SYSTEM**
Christopher L. Petersen, and Thomas Hellmuth, both of Danville, Calif., assignors to Carl Zeiss, Inc., Thornwood, N.Y.
Filed Oct. 19, 1994, Ser. No. 325,675
Int. Cl.[6] A61B 5/02
U.S. Cl. 128—691 19 Claims




1. Apparatus for measuring a profile of speed of blood, wherein the speed is parallel or antiparallel to the direction of a sample beam, the profile being across a blood vessel in a biological sample, in particular, in a retinal blood vessel, which apparatus comprises:
a source of a beam of radiation having a principal wavelength, which beam of radiation is substantially spatially coherent and has a temporal coherence length which is less than 1 picosecond;
means for splitting the beam into the sample beam and a reference beam;
means for reflecting the reference beam;
means for altering an optical path length of the reference beam from the splitting means to a detector means at an alteration velocity;
means for directing the sample beam within the biological sample to pass through the blood vessel;
wherein the detector means comprises means: (a) for detecting interferences between reflections of the sample beam from matter in the sample including matter situated across the blood vessel and reflections of the reference beam from the reflecting means and (b) for generating an interference signal;
analyzer means for analyzing the interference signal to determine the profile of the speed of the blood from an analysis of frequency spectra of time segments of the interference signal, the alteration velocity in the time segments, and the principal wavelength.

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5,501,225
**IMAGING OF TISSUE OXYGEN USING NEEDLE PHOSPHORIMETER**
David F. Wilson, 207 St. Marks Sq., Philadelphia, Pa. 19104
Continuation-in-part of Ser. No. 763,184, Sep. 20, 1991, Pat. No. 5,279,297. This application Feb. 25, 1993, Ser. No. 22,190
Int. Cl.[6] G01N 21/64
U.S. Cl. 128—665 10 Claims



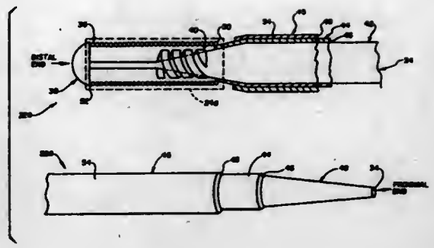

1. A method for producing a phosphorescent emission within a body portion which may be detected externally to the body portion comprising the following steps:
inserting a phosphorescent probe material into the body portion;
inserting a needle into said body portion, said needle encasing a light guide propagating a light signal having a first wavelength through said light guide and into said body portion, said light signal exciting said phosphorescent probe material within said body portion, and producing an emission of phosphorescent light having a radius of visibility which can be detected at a surface of said body; and
collecting said emitted phosphorescent light at the surface of said body.



5,501,227
**ANGIOPLASTY APPARATUS FACILITATING RAPID EXCHANGE AND METHOD**
Paul G. Yock, 2200 Redington Rd., Hillsborough, Calif. 94010
Continuation of Ser. No. 937,977, Nov. 2, 1992, Pat. No. 5,350,395, which is a continuation of Ser. No. 774,479, Oct. 10, 1991, abandoned, which is a continuation of Ser. No. 548,200, Jul. 5, 1990, Pat. No. 5,061,273, which is a continuation of Ser. No. 361,676, Jun. 1, 1989, abandoned, which is a continuation of Ser. No. 117,357, Oct. 27, 1987, abandoned, which is a continuation of Ser. No. 852,197, Apr. 15, 1986, abandoned. This application Sep. 17, 1993, Ser. No. 123,370
Int. Cl.[6] A61M 25/10
U.S. Cl. 128—662.06 4 Claims



1. An elongated ultrasound imaging catheter which is adapted to be inserted over a guidewire through a patient's blood vessel to perform diagnostic procedures therein, comprising:
a) an elongated catheter body having an inner lumen extending therethrough, a proximal portion which is adapted to extend out of the patient, and a distal portion which is adapted to be disposed entirely within the patient's vascular system during diagnostic procedures and which has a transition region with a proximal port therein opening to the exterior of the catheter and located at least 10 centimeters proximally from a distal port in the distal tip of the catheter body and a substantial distance distally from the proximal portion of the catheter body which extends out of the patient;
b) an ultrasound imaging device at the distal portion of the catheter body which is distal to the proximal port; and
c) an open ended tubular member fixed with respect to the catheter body and having an inner lumen which is substantially shorter than the catheter body, which is disposed substantially in its entirety within the distal portion of the catheter body and which extends proximally within the catheter body from the distal port at the distal tip of the catheter body to the proximal port in the transition region, said inner lumen of the tubular member adapted to slidably receive a guidewire therein so that a distal portion of the guidewire extends distally out of the distal port and a proximal portion thereof extends proximally out of the proximal port to the exterior of the catheter body and generally parallel and exteriorly to the catheter body over most of the length of the guidewire and out of the patient.



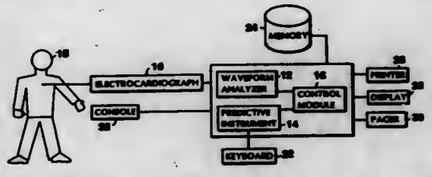
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5,501,228
**VIBRATION SENSING GUIDE WIRE**
Daniel M. Lafontaine, Plymouth; Roger Hastings, Burnsville, and Daniel O. Adams, Orono, all of Minn., assignors to SCIMED Life Systems, Inc., Maple Grove, Minn.
Continuation of Ser. No. 969,743, Oct. 30, 1992. This application Jul. 21, 1994, Ser. No. 278,552
Int. Cl.[6] A61B 5/00
U.S. Cl. 128—692 19 Claims

1. A percutaneous transluminal device comprising:
an elongate shaft having a distal end portion; and
a spring tip transducer coupled to said distal end portion of said shaft, said spring tip transducer comprising a system which converts mechanical vibrations less than or equal to 70 kilohertz to electrical signals wherein said spring tip transducer senses said mechanical vibrations.

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5,501,229
**CONTINUOUS MONITORING USING A PREDICTIVE INSTRUMENT**
Harry P. Selker, Wellesley, and John L. Griffith, Natick, both of Mass., assignors to New England Medical Center Hospital, Boston, Mass.
Filed Aug. 1, 1994, Ser. No. 283,951
Int. Cl.[6] A61B 5/04
U.S. Cl. 128—696 10 Claims

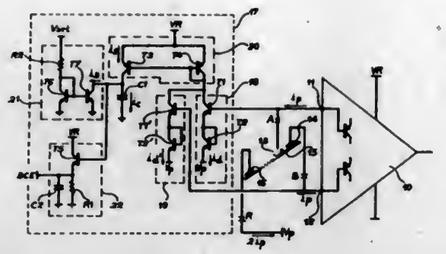



1. An instrument for continuously monitoring the condition of a patient who has a cardiovascular disease, said instrument comprising:
an electrocardiograph which during use is connected to the patient;
a waveform analyzer which analyzes a current segment of an ECG waveform for the patient from the electrocardiograph;
a computer receiving output from the waveform analyzer, said computer programmed to complete a monitoring cycle in which the computer uses the output from the waveform analyzer to compute a probability of a life threatening cardiac condition based upon the current segment of the patient's ECG waveform; and
a control module causing said computer to periodically repeat the monitoring cycle and for each repetition of said monitoring cycle to compute a change-of-condition measure, wherein said change-of-condition measure is calculated by subtracting a computed probability for a previous monitoring cycle from the computed probability for the current monitoring cycle,
said computer further programmed to compare during each monitoring cycle the computed change-of-condition measure for that monitoring cycle to a threshold value and if in excess of said threshold value to generate an alarm notification.

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5,501,230
**DEVICE FOR PROCESSING BIOLOGICAL SIGNALS SAMPLED BY ELECTRODES ON THE SKIN OF A PATIENT**
Laurent Lariviere, Montigny, France, assignor to Commissariat a l'Energie Atomique, Paris, France
Filed Feb. 7, 1994, Ser. No. 192,738
Claims priority, application France, Feb. 10, 1993, 93 01462
Int. Cl.[6] A61B 5/0402
U.S. Cl. 128—696 8 Claims

1. Device for processing biological signals sampled by electrodes (13, 14, 16) placed on the skin (15) of a patient having at



least two signal measuring electrodes (13, 14) and a reference electrode (16), and at least one input differential amplifier (10), whose inputs (11, 12) are connected to said measuring electrodes (13, 14), characterized in that the device comprises a circuit (17) for detecting the absence of a polymerization current of said input differential amplifier (10), and for supplying an alarm signal (DCE) in the case of a disconnection or detachment of at least one measuring electrode.

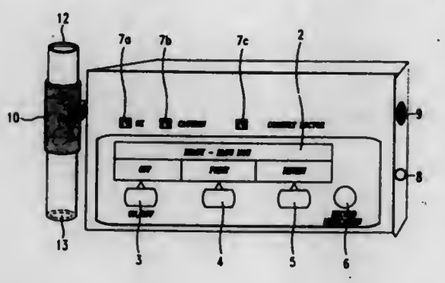
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**5,501,231**

**PATIENT OPERATED SYSTEM FOR TESTING AND RECORDING A BIOLOGICAL CONDITION OF THE PATIENT**

**Norman Kaish, 7-24 166th St., Whitestone, N.Y. 11357**

**Filed Jun. 2, 1993, Ser. No. 71,164**
**Int. Cl.[6] A61B *5/087***
**U.S. Cl. 128—725** **55 Claims**




1. A patient-operated device for testing and recording the respiratory status of a patient, said device comprising;

a) a portable housing;

b) prompter means in the housing for prompting the patient to operate the device;

c) sensor means affixed to the housing for sensing an expiratory flow rate of air of the patient and for generating a first signal representative of said flow rate of air;

d) processor means in the housing for processing said first signal to generate biological data representative of at least one of the values in the group consisting of peak expiratory flow rate (PEFR), forced expiratory volume in the first second (FEV. 1) and force vital capacity (FVC) of the patient;

e) time-generating means in the housing for generating time data representative of a time when said flow rate of air was sensed;

f) storage means in the housing for storing the biological data produced by said processor means and the time data produced by said time-generating means; and

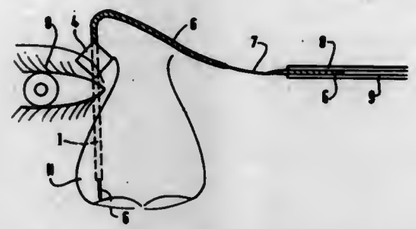
g) retrieval means in the housing for retrieving from said storage means the biological data together with the time data.

**5,501,232**

**METHOD AND APPARATUS FOR PLACING TEAR DUCT DRAIN TUBES**

**Pierre Ritleng, Nice, France, assignor to F.C.I. (France Chirurgie Instrumentation), France**

**Filed May 2, 1994, Ser. No. 236,270**
**Claims priority, application France, May 4, 1993, 93 05277**
**Int. Cl.[6] A61B *19/00***
**U.S. Cl. 128—898** **9 Claims**




1. A method of inserting a two-duct intubation device into place, the intubation device having a silicone tube with two opposite ends for coupling between a patient's tear ducts and nose, using an intubing cannula with a front end and a rear end, the cannula comprising a hollow cylindrical body closed at the from end, the cannula having an outside diameter that is less than an outside diameter of the silicone tube and having a lateral opening adjacent the front end of the cylindrical body and a longitudinal slot extending from the lateral opening to the rear end of the cannula, the method comprising the steps of:

providing each end of the silicone tube with a guide thread having a diameter that is smaller than an inside diameter of the hollow cylindrical body and smaller than a width of the lateral opening in the hollow cylindrical body, such that each guide thread can be advanced through the cylindrical body and the lateral opening;

providing a narrowed length along at least a zone of each guide thread, at which each guide thread can be passed laterally through the longitudinal slot;

inserting the cannula in a meatus and positioning a first one of the guide threads in the cannula up to the lateral opening;

causing the first guide thread to advance through the cannula and through the lateral opening, along the tear duct until the first guide thread becomes apparent inside the nose; and

disengaging the cannula from the meatus and from the guide thread by passing the first guide thread laterally through the longitudinal slot and pulling the tube into the tear duct via the first guide thread.

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**5,501,233**

**APPARATUS FOR VARYING TOBACCO ROD DENSITY**

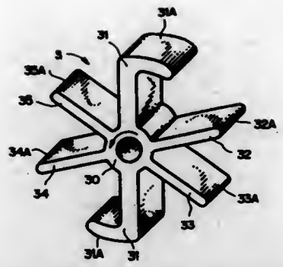
**Jacques Babey, Pully; Brian Salmon, St-Legier; Eric De Borst, Belmont, and Bernard Tallier, Cortaillod, all of, Switzerland, assignors to Philip Morris Incorporated, New York, N.Y.**

**Filed Jun. 14, 1994, Ser. No. 259,718**
**Claims priority, application European Pat. Off., Jun. 16, 1993, 93810432.0**
**Int. Cl.[6] A24C *5/18***
**U.S. Cl. 131—84.1** **35 Claims**

1. An apparatus for periodically compressing a rod of tobacco material, comprising:

a cam rotatable about an axis which is perpendicular to a longitudinal axis of the rod of tobacco material, the cam comprising a central core, at least one end blade extending from said central core, said end blade having a support surface to periodically compress an end region of successive segments of the rod of tobacco material as said cam rotates, and at least one interposed blade extending from said central core, said interposed blade having a support surface to periodically compress an intermediate region of successive rod segments between end regions of successive rod segments as said cam rotates, wherein said at least one interposed blade is shorter than said at least one end blade, wherein the intermediate region of the rod is less dense than the end region.





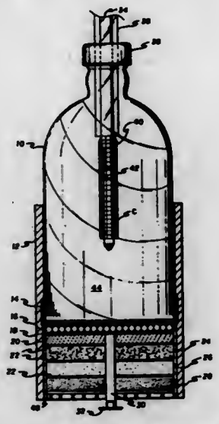

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**5,501,234**

**APPARATUS FOR FILTERING AND PURIFYING SIDE-STREAM AND SECOND-HAND TOBACCO SMOKE**

**Jon J. Hyre, P.O. Box 30, Fort Worth, Tex. 76101**

**Filed Dec. 23, 1994, Ser. No. 362,972**
**Int. Cl.[6] A24F *13/06***
**U.S. Cl. 131—187** **20 Claims**



1. An apparatus for filtering and purifying side-stream and second-hand smoke comprising:

an enclosure having first and second open ends, said first open end frictionally and releasably engaged to a base, said enclosure and base enclosing an inner volume, and said base having a perforated bottom surface;

a plurality of filtering elements positioned within said base and defining an air-permeable filtering passageway from said inner volume to space outside said inner volume, each of said plurality of filtering elements having a central opening therethrough, said central openings, in registration, defining an open central bore through said plurality of filtering elements;

a closure releasably engageable within said open central bore;

a cap having a central aperture therethrough, said cap releasably engageable with said second open end of said enclosure;

a first tube located within said central aperture of said cap and defining a first smoke conduit, said first tube having a first end located within said inner volume, and a second end located outside said inner volume;

a second tube located concentrically within said first tube and defining a second smoke conduit, said second tube having a first end located within said inner volume, and a second end located outside said inner volume;

a support connected to said first end of said second tube, said support dimensioned and configured to frictionally and releaseable engage a smoking product; and

a heat-activated catalytic converter adapted and positioned for surrounding the smoking product.

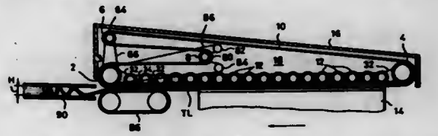
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**5,501,235**

**TOBACCO BAND APPARATUS FOR A CIGARETTE MANUFACTURING MACHINE**

**Tomoichi Watanabe, Tokyo, Japan, assignor to Japan Tobacco Inc., Tokyo, Japan**

**Filed Mar. 23, 1995, Ser. No. 408,864**
**Claims priority, application Japan, Mar. 28, 1994, 6-057709**
**Int. Cl.[6] A24C *5/18***
**U.S. Cl. 131—84.1** **8 Claims**



1. A tobacco band apparatus for a cigarette manufacturing machine, comprising:

a rotatable head pulley;

a tail pulley rotatably arranged at a distance from said head pulley;

an endless tobacco band passed round said head pulley and said tail pulley and including a straight portion extending straight between said head pulley and said tail pulley, the straight portion of said tobacco band having a lower surface serving as a suction surface to which shredded tobacco is attracted in a layer, and an upper surface facing inward of said tobacco band;

a plurality of guide rollers rotatably arranged between said head pulley and said tail pulley and disposed in contact with the upper surface of the straight portion of said tobacco band;

tension means for applying a predetermined teasile force to said tobacco band; and

drive means for rotating said head pulley, said tail pulley and said guide rollers synchronously with each other in an identical direction at an identical peripheral speed.

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**5,501,236**

**NICOTINE-IMPERMEABLE CONTAINER AND METHOD OF FABRICATING THE SAME**

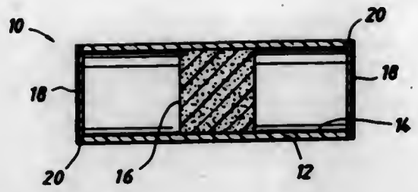
**Ira Hill, Locust, N.J.; Bengt E. Malmberg, Helsingborg, Sweden; Ronald G. Oldham, San Antonio, Tex.; James E. Turner, Atascosa, Tex.; Michael P. Ellis, San Antonio, Tex., and Sven-Börje Andersson, Ödåkra, Sweden, assignors to Pharmacia AB, Sweden**

**Continuation of Ser. No. 982,240, Nov. 25, 1992, Pat. No. 5,408,808, which is a continuation of Ser. No. 535,967, Jun. 8, 1990, Pat. No. 5,167,242. This application Mar. 8, 1995, Ser. No. 400,595**
**Int. Cl.[6] A24F *47/00***
**U.S. Cl. 131—270** **7 Claims**

1. A nicotine delivery system with an extended shelf life, containing a measured amount of nicotine which can selectively be made accessible to a user, comprising:

(a) a nicotine reservoir for holding and dispersing a measured amount of nicotine;

(b) a self-sealed, nicotine impermeable barrier enclosing the nicotine reservoir, said barrier including at least one nicotine barrier layer formed essentially of a copolymer of acrylonitrile and methyl acrylate;




(c) the barrier layer including at least two adjacent surfaces heat sealed to form a continuous nicotine impermeable barrier so that the nicotine can be prevented from migration outside the barrier.

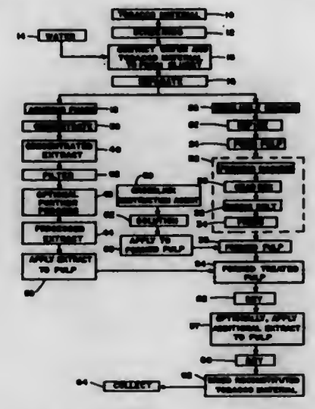
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**5,501,237**

**TOBACCO RECONSTITUTION PROCESS**

Harvey J. Young, Advance, and Edward J. S. Sohn, Lewisville, both of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Sep. 30, 1991, Ser. No. 769,914
Int. Cl.[6] A24B 15/24
U.S. Cl. 131—297 38 Claims




1. A process for providing a reconstituted plant material, the process comprising the steps of:

(a) extracting components from plant material having pectins using a solvent having an aqueous character thereby providing (i) a solvent having plant extract components therein, and (ii) a plant portion insoluble in the solvent; (b) separating at least a portion of the solvent and extract components therein from the insoluble plant portion;

(c) forming the insoluble plant portion provided in step (b) into a predetermined shape;

(d) contacting the plant portion provided in step (c) with a pectin release agent under conditions sufficient to release pectins within the plant portion;

(e) providing the portion of solvent and extract components provided in step (b) in a form capable of being applied to the plant portion of step (d); and

(f) contacting the plant portion of step (d) with the solvent and extract components of step (e) so as to crosslink the released pectins and to provide a reconstituted plant material.

**5,501,238**

**CIGARETTE FILTER CONTAINING A HUMECTANT**

Reid W. Von Borstel, 10301 S. Glen Rd., Potomac, Md. 20854, and Craig Lesser, 10724 Wilshire Blvd. #810, Los Angeles, Calif. 90024

Continuation of Ser. No. 2,951, Jan. 11, 1993, abandoned.
This application Dec. 23, 1994, Ser. No. 363,975
Int. Cl.[6] A24D 3/00
U.S. Cl. 131—331 10 Claims

1. A method of making a filter for a smokable device, comprising the steps of:

(a) providing a porous substrate;

(b) dispersing a humectant therein; and

(c) drying the substrate containing dispersed humectant to remove water leaving a residue of dry humectant;

wherein the humectant is sodium pyroglutamate.

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**5,501,239**

**HAIR PIECE USING DECORATIVE CLIP**

Lindsey J. Walker, London, Great Britain, assignor to Revlon Consumer Products Corporation, New York, N.Y.

Filed Dec. 27, 1993, Ser. No. 172,992
Claims priority, application United Kingdom, Jan. 7, 1993, 9320638
Int. Cl.[6] A45D 8/12; A41G 3/00
U.S. Cl. 132—275 14 Claims




1. A hair piece comprising a switch of hair attached at one end thereof to a clip; said clip comprising a pair of jaws having a mutual pivotal connection, each of said jaws having an edge portion spaced from said pivotal connection, said edge portions being curved in a concave sense in a direction away from said pivotal connection, said edge portion being formed with mutually engageable gripping means; said clip further comprising spring means which urges said edge portions of said jaws together and said gripping means into mutual engagement;

said clip further comprising a pair of ears disposed on the side of said spring means remote from said jaw, whereby, when said ears are pressed together, said jaws are opened against a force exerted by said spring means.

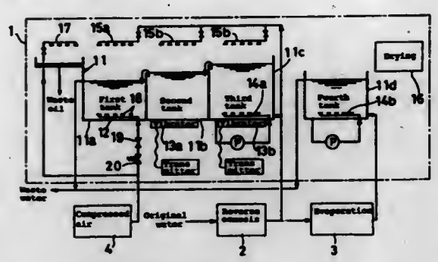


**5,501,240**

**CLEANING METHOD AND CLEANING APPARATUS**

Takeshi Dohku, Osaka; Kazuo Yoshida, Higashi-Osaka; Kazunori Kobe, Kawachinagano, and Kazuyuki Miyake, Ibaraki, all of, Japan, assignors to Hitachi Zosen Corporation, Osaka, Japan

Filed Oct. 3, 1994, Ser. No. 316,441
Claims priority, application Japan, Jan. 6, 1993, 5-258537; Feb. 25, 1994, 6-028099
Int. Cl.[6] B08B 3/10
U.S. Cl. 134—61 2 Claims




1. A cleaning apparatus comprising:

a first tank having a bubbling device disposed in the bottom, and a spray nozzle located above,

a second tank having an ultrasonic wave generating device disposed in the bottom or on the side, and a spray nozzle located above,

a third tank having an ultrasonic wave generating device disposed in the bottom or on the side, a water jet generating device in the bottom, and a spray nozzle located above, and

a fourth tank having a water jet generating device disposed in the bottom.

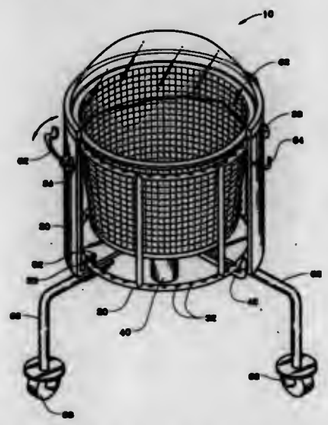
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**5,501,241**

**VEGETABLE AERATING DEVICE**

Glenn R. Jacobson, 1950 N. Andrews Ave., Apartment 203D, Ft.Lauderdale, Fla. 33311

Filed Oct. 27, 1994, Ser. No. 330,320
Int. Cl.[6] B08B 3/02; F26B 9/06
U.S. Cl. 134—95.2 9 Claims




1. An apparatus for drying items by aeration including:

a container having a floor and a vertically extending wall terminating in a container rim;

tubing housed within said container, said tubing having a plurality of apertures;

a mesh basket for holding items for drying, said basket sized for insertion within said container such that said basket is demountably supported by said container and elevated above said container floor;

a container lid, said lid sized for mounting on said container rim;

means for compressing ambient air, said compressing means in fluid communication with said tubing such that ambient air flows through said tubing and exits said tubing apertures thereby generating airflow within said container for drying items contained therein; and

a valve for selectively allowing water to flow through said tubing whereby said water exits said tubing through said tubing apertures thereby creating a cleansing spray for washing items contained within said container.

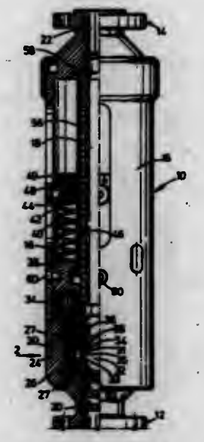
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**5,501,242**

**PRESSURE RELIEF VALVE**

Graeme F. Coutts, and Jeffrey C. Edwards, both of Aberdeen, Scotland, assignors to Expro North Sea Limited, Scotland

PCT No. PCT/GB93/01110, § 371 Date Mar. 13, 1995, § 102(e) Date Mar. 13, 1995, PCT Pub. No. WO94/08709, PCT Pub. Date Jan. 6, 1994
PCT Filed May 27, 1993, Ser. No. 360,750
Claims priority, application United Kingdom, Jun. 24, 1992, 9213371
Int. Cl.[6] F16K 15/04
U.S. Cl. 137—1 10 Claims



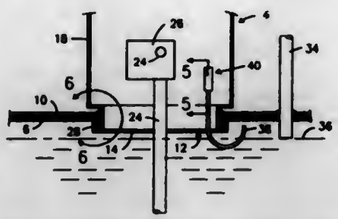

10. A method of relieving pressure above a predetermined value in fluid flow lines comprising the steps of,

applying a spring force to force a ball valve element against a valve seat in the absence of pressure in said fluid flow lines above said predetermined value,

and, when pressure in said fluid flow lines exceeds said predetermined value, urging said ball valve axially from said valve seat against said spring force,

rotating said ball valve element such that fluid flows through said ball valve element to relieve said excessive pressure, and when said pressure falls beneath said predetermined value, said spring force provides a restoring force to return the ball valve element into sealing engagement with said valve seat.

**5,501,243**
**LIQUID STORAGE TANK SUMP**
David T. Palazzo, P.O. Box 290676, Tampa, Fla. 33687
Filed Sep. 30, 1994, Ser. No. 315,422
Int. Cl.[6] B67D 5/00
U.S. Cl. 137—15 10 Claims



1. A method of installing a sump assembly into a liquid storage tank having an exterior portion and a tank wall with an aperture having a periphery extending through a portion of said tank wall, said method comprising the steps of

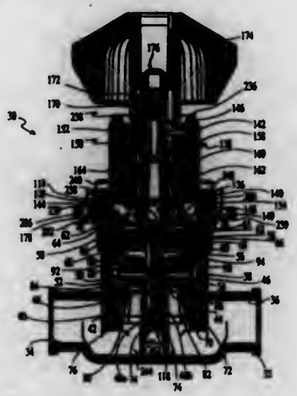
sealingly attaching within said aperture a generally cylindrical sump collar comprising a peripheral wall engaging the periphery of said aperture, said collar peripheral wall having an open outer extremity and having an inner extremity closed by a base member attached to said inner extremity of said peripheral wall;

fitting a generally cylindrical sump housing into said collar; and

sealingly attaching said sump housing to said sump collar, whereby said sump housing and said sump collar form a liquid containment chamber.

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**5,501,244**
**VALVE ASSEMBLY**
Niakan Shahriar, Sherman Oaks, Calif., assignor to Emhart Inc., Newark, Del.
Filed Nov. 14, 1994, Ser. No. 338,869
Int. Cl.[6] G05D 11/03
U.S. Cl. 137—98 24 Claims



1. A valve assembly having a pressure balancer, which comprises:

a housing formed with a chamber;

a poppet unit composed of a rigid material and mounted for movement within the chamber;

a diaphragm mounted on the poppet unit and separating the chamber into a first compartment and a second compartment which define a first fluid flow path and a second fluid flow path, respectively;

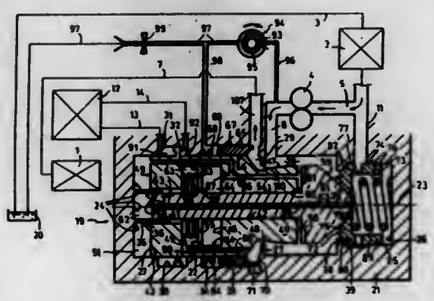
at least a portion of the poppet unit being located in the first compartment of the chamber;

a closure surface located in the first compartment adjacent the first fluid flow path; and

a compliant element mounted on and confined compliantly to the portion of the poppet unit for incremental movement therewith, the compliant element being aligned with and normally spaced from the closure surface and moved with the poppet unit to compliantly engage the closure surface and thereby seal the first fluid flow path upon movement of the diaphragm in a prescribed direction.

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**5,501,245**
**COAXIAL PRESSURIZED FLUID FLOW REGULATOR**
Michel Lechevalier, Mermont, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation (S.N.E.C.M.A.), Paris, France
Filed Oct. 17, 1994, Ser. No. 323,932
Claims priority, application France, Jan. 20, 1993, 93 12485
Int. Cl.[6] G05D 7/01
U.S. Cl. 137—117 9 Claims



1. A pressurized fluid flow regulator for controlling fluid in a fluid circuit having a source of pressurized fluid with an inlet and an outlet, the assembly comprising:

a) a valve body defining a high pressure feed chamber in fluid communication with the outlet of the source of pressurized fluid, an exhaust chamber having an inlet in fluid communication with the high pressure feed chamber and a fluid outlet, and a bypass chamber having an inlet in fluid communication with the high pressure feed chamber and an outlet in fluid communication with the inlet of the source of pressurized fluid;

(b) first valve means to meter the flow of fluid between the high pressure feed chamber and the exhaust chamber wherein the first valve means comprises a first valve member slidably located in the valve body so as to slide along an axis of movement;

(c) second valve means to open and close the fluid outlet of the exhaust chamber; and

(d) third valve means to control the opening and closing of the bypass chamber inlet such that the bypass chamber inlet is opened when the fluid pressure in the high pressure feed chamber exceeds a threshold value, wherein the third valve means comprises:

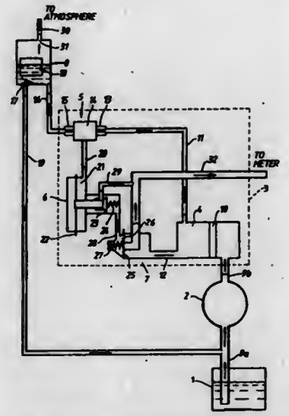
i) a first valve seat defined by the valve body adjacent to the bypass chamber inlet;

ii) a slide block slidably located in the bypass chamber, the slide block having a central passage in fluid communication with the bypass chamber; and,

ii) a second valve member slidably located in the valve body, the second valve member having a second valve surface with a generally conical configuration so as to seal the central passage when the second valve member contacts the slide block.



**5,501,246**
**AIR/VAPOUR SEPARATION DEVICE**
David R. Burns, and Victor C. Turner, both of Sydney, Australia, assignors to Gilbarco Limited, Basildon, United Kingdom
PCT No. PCT/GB92/00750, § 371 Date Oct. 19, 1993, § 102(e) Date Oct. 19, 1993, PCT Pub. No. WO92/19531, PCT Pub. Date Nov. 12, 1992
PCT Filed Apr. 23, 1992, Ser. No. 137,046
Claims priority, application Australia, Apr. 26, 1991, PK5838
Int. Cl.[6] B67D 5/58
U.S. Cl. 137—179 10 Claims



1. A device for separating gas entrained in a flow of liquid, the device comprising a main housing having a liquid inlet and a liquid outlet; a separation chamber disposed within the housing between the inlet and the outlet, the gas entrained in the flow of liquid being separated from the flow of liquid when the flow of liquid passes from the inlet to the outlet within the separation chamber; a vent passage extending from the separation chamber; a main valve within the housing for controlling the flow of liquid between the inlet and the outlet; means for detecting a presence of a gas in the vent passage comprising a dual orifice arrangement disposed in the vent passage; a pilot valve coupled to the means for detecting and to the main valve for controlling the main valve as a function of the presence of gas in the vent passage; and a first control passage within the housing for coupling the pilot valve to the dual orifice arrangement.

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**5,501,247**
**PRESSURE REGULATOR WITH MEANS TO BLOCK RELATIVE ROTATION OF PARTS DURING ASSEMBLY**
Robert F. Miller, Arcadia, Calif., assignor to Vemco Corporation, San Dimas, Calif.
Filed Feb. 17, 1995, Ser. No. 390,671
Int. Cl.[6] G05D 16/06
U.S. Cl. 137—316 21 Claims

1. In a fluid pressure regulator, the combination comprising:

a) a body forming a cavity and a cap on the body extending over the cavity, the cap and body carrying interengaging threads allowing rotary make-up of the cap on the body,

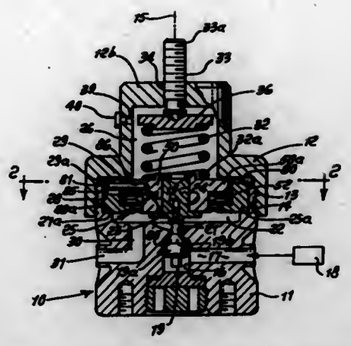
b) a diaphragm in the cavity and seated on a ledge formed by the body, thereby to form a seal,

c) a pressure transmitting element in the cavity to transmit cap pressure to said seal,

d) the body having flow porting and there being a poppet in the body and movable to control fluid flow via said porting,

e) a spring in the cap,

f) structure in the cavity and axially movable to transmit spring pressure to the diaphragm,

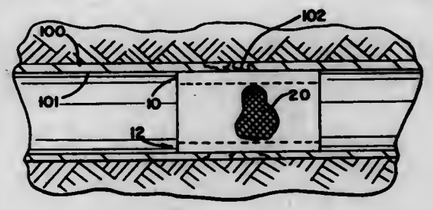


g) the poppet carried for axial movement with said structure,

h) and blocking means to block relative rotary movement between the pressure transmitting element and at least one of the body and said structure, said blocking means extending generally radially relative to said pressure transmitting element and said one of the body and said structure.

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**5,501,248**
**EXPANDABLE PIPE LINER AND METHOD OF INSTALLING SAME**
Larry W. Kiest, Jr., Ottawa, Ill., assignor to LMK Enterprises, Inc., Ottawa, Ill.
Filed Jun. 23, 1994, Ser. No. 264,583
Int. Cl.[6] F16L 55/162
U.S. Cl. 138—98 26 Claims



1. A method of lining the interior of a pipeline, comprising: providing a liner having a preselected length and a preselected original diameter, the liner being formed from a first tubular, seamless knitted fabric sleeve which is circularly knit and including stitches defining both a ground and terry loop pile extending from the ground for a preselected length, said ground and terry loop pile stitches permitting said fabric sleeve to expand radially outwardly to a final diameter which is greater than said liner original diameter when pressure is applied to an interior surface of said liner; impregnating said liner with a synthetic resin to form a resin-impregnated sleeve assembly; introducing said resin-impregnated sleeve assembly into the pipeline and extending said resin-impregnated sleeve assembly through a preselected length of said pipeline; expanding said resin-impregnated sleeve assembly radially outwardly along said liner preselected length until an outer circumferential surface of said resin-impregnated sleeve assembly contacts the interior surface of said pipeline; and, allowing said resin to cure, whereby said resin-impregnated sleeve assembly forms a new interior lining within said pipeline.

17. A liner for use in a pipe comprising: a first seamless, knitted fabric sleeve having an original diameter, the first fabric sleeve formed by circularly knitting multi-filament yarn to define stitches forming a ground and stitches forming a terry loop pile extending away from the ground, the ground stitches further defining open areas therebetween said ground and terry loop pile stitches permit-

ting said knitted fabric sleeve to expand radially outwardly when pressure is applied to an interior surface of said liner; a second seamless, braided fabric sleeve surrounding and in contact with said first sleeve for a length of said liner, said first and second sleeves having similar radial expansion characteristics, whereby said liner may be expanded up to an installation diameter which is greater than the original diameter of said first fabric sleeve; and said first and second fabric sleeves being impregnated with a resin, which when cured in place within a pipeline, forms a permanent new lining for the pipeline.

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**5,501,249**

**Patent Not Issued For This Number**

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**5,501,250**

**METHOD FOR DELETING AND REINTRODUCING YARNS TO A TEXTILE PROCESS**

**Donald W. Edwards; Peter Popper; David P. Rule, and William C. Walker, all of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Nov. 22, 1994, Ser. No. 345,724**

**Int. Cl.[6] D03D *47/34***

**U.S. Cl. 139—450** **10 Claims**



1. A method for deleting any individual yarn and reintroducing any individual yarn of a plurality of individual yarns being fed under tension from a plurality of individual sources to a textile process without disrupting the textile process or the other individual yarns, to thereby feed any number and combination of the plurality of yarns to the process, said method comprising:

deleting an individual yarn from the textile process according to the following steps:

cutting an individual yarn, that is being forwarded to the process, rapidly to prevent producing a disruptive tension change in the process or in other yarns being forwarded to the process to produce an upstream cut end of an individual yarn;

holding the upstream cut end of said individual yarn in an elongated condition at a ready position for reintroducing to the process; and

reintroducing said yarn at said ready position to the textile process according to the following steps;

metering said individual yarn from said source at a controlled rate;

passing said cut end of yarn with a first individual yarn forwarding jet for forwarding said cut end from said ready position and maintaining said cut end of yarn in an elongated condition during said metering;

directing said elongated, cut end of yarn in a path past an individual yarn cutter;

passing said elongated, cut end of yarn through a guide and a jet means for forwarding said elongated cut end of yarn from said cutter and along an individual yarn path, and maintaining said cut end of yarn in an elongated condition during said passing; and

converging said elongated, cut end of yarn with a plurality of individual yarn paths for said plurality of yarns for forwarding said yarn to said textile process.

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**5,501,251**

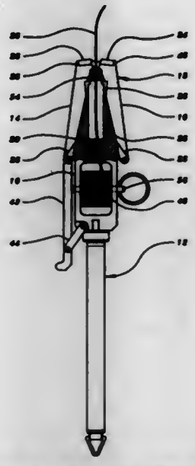
**WIRE TWISTING AND CUTTING TOOL**

**Robert L. Vader, and Michael C. Vader, both of P.O. Box 606, San Clemente, Calif. 92674**

**Filed Dec. 20, 1994, Ser. No. 360,980**

**Int. Cl.[6] B21F *15/04***

**U.S. Cl. 140—53** **5 Claims**



1. A wire twisting and cutting tool comprising a frame having two opposite ends and two opposite sides, a cylinder bored into the first end; a piston having two ends, the first inserted in said cylinder, means to provide a force to bias said piston out of said cylinder; the second end of said piston attached to the pivot pin of a shears consisting of two short and two long arms; said shears configured such that motion of said long arms away from each other results in said short arms moving towards each other; opposing clamping and shearing jaws attached to the ends of said short arms of said shears; toggle links connecting the end of one said long arm of said shears to the first side of said frame, toggle links connecting the end of the second said long arm of said shears to the second side of said frame, said toggle links tending to keep said jaws of said shears closed with a clamping force through said biasing action on said piston forcing said pivot of said shears away from said frame; a wire supply coil constrained in a cutout near the center of said frame; means to open said jaws to insert said wire; means attached to second end of said frame to provide rotation of said frame and said shears about an axis coaxial with said piston; means to apply a linear force to said frame along said rotational axis away from said shears thereby forcing said ends of said long arms of said shears further away from said sides of said frame through the action of said toggle links resulting in a cutting force on said jaws.

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**5,501,252**

**FASTENER**

**Gerd Bartzick, Gevelsberg, and Gerd Böhne, Schwelm, both of, Germany, assignors to Fried. Krupp AG Hoesch-Krupp, Essen, Germany**

**Filed Apr. 22, 1994, Ser. No. 231,130**

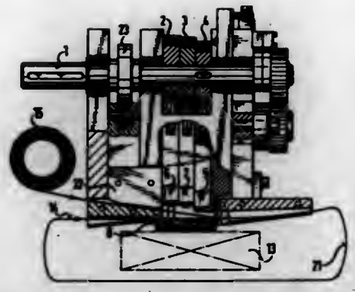
**Claims priority, application Germany, Apr. 26, 1993, 43 13 641.9**

**Int. Cl.[6] B21F *9/02***

**U.S. Cl. 140—152** **13 Claims**

1. A fastener for fastening together ends of a length of a steel strap wrapped around a package in a package strapping arrangement, comprising: a track section where said ends are fastened together; said fastener having a top above said track section, said fastener having a bottom below said track section; a pivot parallel





with said track section; a housing for holding said top and pivoting on said pivot; said top comprising strap-shaping punches, a strap clamp, and a strap cutter; said bottom comprising a strap-shaping die mounted on a base and facing said punches, said punches and said die having a nip therebetween, said pivot comprising simultaneously a single rotating shaft with driving elements for driving said fastener, said driving elements on said rotating shaft displacing said punches, said clamp, and said cutter and retaining said nip between said punches and said die.

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**5,501,253**

**APPARATUS FOR FILLING VESSELS WITH LIQUID**

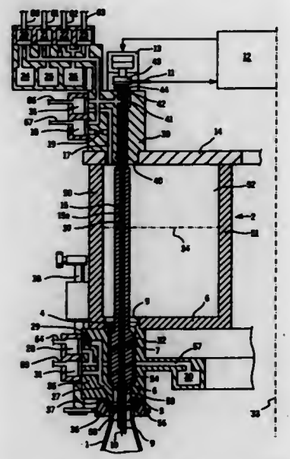
**Wilhelm N. Weiss, Lappersdorf, Germany, assignor to Krones AG Hermann Kronseder Maschinenfabrik, Neutraubling, Germany**

**Filed Jul. 28, 1994, Ser. No. 282,533**

**Claims priority, application Germany, Jul. 31, 1993, 93 11 427.3**

**Int. Cl.[6] B65B *31/00***

**U.S. Cl. 141—40** **9 Claims**



1. Apparatus for filling bottles with liquid, comprising:

a tank (2) for storing liquid and pressurized gas, the tank including a top (14) and a bottom (6), the bottom having an opening (5),

a member (35) at the bottom of the tank and having a vertical bore (4) communicating at the upper end thereof with the opening (5) in the bottom of the tank, the bore having a valve seat (8) and a liquid outflow hole (56) coaxial with the bore,

a generally cylindrical valve body (7) having upper and lower ends and an axial gas conducting bore (15*a*), the valve body arranged for being moved downwardly in the vertical bore (4) to engage the valve seat for preventing liquid from flowing to the hole and for being moved upwardly to permit liquid to flow through the hole,

a gas conducting tube (9) extending from said lower end of the valve body (7) coaxially with said axial bore (15*a*) for entering the mouth of the bottle, and a tubular extension stem (15) extending from said upper end of the valve body and having a gas conducting bore (15*a*) coaxial with the bore of the valve body, the tubular stem (15) passing through the interior of tank (2) and sealingly upwardly above the tank top (14),

a body (39) mounted to said top (14) of said tank through which body said tubular extension stem extends, said body having a passageway (17) and a pneumatic control valve (16) interposed in said passageway, the control valve having an inlet for pressurized gas coupled by way of said passageway to said tank and an outlet coupled by way of said passageway and by an opening in said tubular extension stem (15) to said gas conducting bore (15*a*), and said tubular extension stem passing through said body (39),

a pneumatic cylinder stationarily mounted proximate to said body and having a piston coupled to said tubular extension stem, and

a spring exerting a force on said tubular extension stem that tends to unseat said valve body (7) from said valve seat in opposition to the force of pressure in said pneumatic cylinder,

evacuation of said pneumatic cylinder allowing the spring to lift said tubular extension stem for said valve body to unseat and allow liquid to flow from said tank to a bottle, and

an electrical fill level probe (10) in said gas conducting tube 9 and a signal conductor extending from within said gas conducting tube (9) throughout the coaxial bore (15*a*) of the tubular extension stem (15) and out of the bore (15*a*) above the top (14) of the tank.

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**5,501,254**

**APPARATUS FOR FILLING A SACK WITH A FLOWABLE MATERIAL**

**Jan-Peter Björklund, Pargas, Finland, assignor to Optirec Oy Ab, Helsinki, Finland**

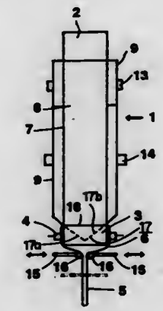
**PCT No. PCT/FI92/00267, § 371 Date Aug. 8, 1994, § 102(e) Date Aug. 8, 1994, PCT Pub. No. WO93/07056, PCT Pub. Date Apr. 15, 1993**

**PCT Filed Oct. 2, 1992, Ser. No. 211,370**

**Claims priority, application Finland, Jan. 4, 1991, 914687**

**Int. Cl.[6] B65B *31/04***

**U.S. Cl. 141—65** **7 Claims**



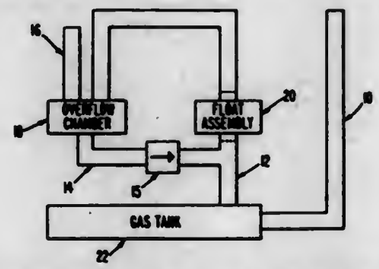
1. An apparatus for filling a sack with a flowable material, comprising a container having an inlet and an outlet and a sack holder to fasten the sack to be filled to the outlet of the container, the container having a wall for enclosing the flowable material, said wall being constituted from a material permeable to air, means for aspirating air out of the flowable material through the container wall,

the wall of the container defining a transverse cross-sectional area corresponding to the transverse cross-sectional area of the sack in a filled condition of said sack with flowable material,

means adjacent said sack holder below the outlet of the container for maintaining a portion of the sack closed to the flow of air during the aspiration of air from said container, with the exception of the mouth of the sack which is sealed to the outlet of the container, and for opening of the sack to receive the flowable material in a single charge after completed aspiration of air.

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**5,501,255**
**FUEL RECOVERY SYSTEM**
**Matthew P. Torta, P.O. Box 1008, Delran, N.J. 08075, and Jay Ross, Pennington, N.J., assignors to Matthew P. Torta, Deerfield Beach, Fla.**
**Filed Oct. 28, 1994, Ser. No. 330,985**
**Int. Cl.[6] B65B *1/30;31/00;* B67C *3/02***
**U.S. Cl. 141—95** **5 Claims**




1. A fuel recovery system for preventing spillage of fuel from a fuel tank attached to a fuel fill line and an overflow line, comprising:

(a) a float assembly adapted to be coupled to said overflow line;

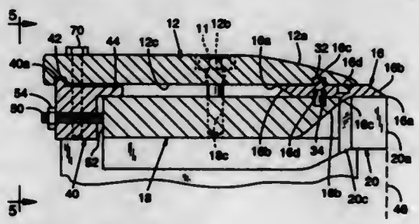
(b) an overflow chamber coupled to said float assembly;

(c) a return line coupled to said overflow chamber and adapted to be coupled to said fuel tank for delivering overfilled fuel from said overflow chamber to said fuel tank; and

(d) warning means for providing an alarm signal indicating the rise of fuel in said float assembly to a predetermined level, whereby a user is warned of an impending overflow of fuel into said.

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**5,501,256**
**CHIPPER KNIFE**
**Daniel R. Dyer, Portland, and James R. Sparks, Yamhill, both of Oreg., assignors to U.S. Natural Resources, Inc., Vancouver, Wash.**
**Filed Jul. 18, 1994, Ser. No. 276,697**
**Int. Cl.[6] B27G *13/04***
**U.S. Cl. 144—241** **17 Claims**




1. A chipper knife comprising:

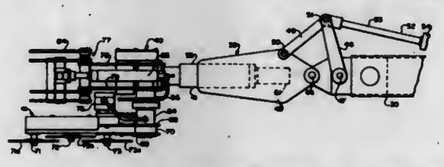
a generally planar body defining first and second opposing face surfaces, each face surface including a clamping portion for mounting of said knife and an exposed portion;

a cutting surface terminating in a cutting edge; and

a nose formation integral to said planar body at said first face surface and defining a border between said clamping portion and said exposed portion of said first face surface, said nose formation including an inclined chip breaking surface directed toward said first face surface in a direction from said clamping portion to said exposed portion of said first face surface.

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**5,501,257**
**TREE TRIMMING APPARATUS**
**Lewis L. Hickman, 1921 Still Oaks Dr., Montgomery, Ala. 36117-2435**
**Filed Mar. 6, 1995, Ser. No. 398,804**
**Int. Cl.[6] A01G *23/00;* B27L *1/00***
**U.S. Cl. 144—2 Z** **29 Claims**



1. A tree trimming apparatus connectable to an operating arm comprising:

a first housing connectable to said operating arm;

a first shaft journaled in said first housing and rotatable about a first axis;

means mounted on said first housing and operatively connected to said first shaft for rotating said first shaft about said first axis;

a second housing mounted on said first shaft;

a second shaft journaled in said second housing and rotatable about a second axis disposed at an angle relative to said first axis;

means mounted on said second housing and operatively connected to said second shaft for rotating said second shaft about said second axis;

a third housing mounted on said second shaft;

at least a third shaft journaled in said third housing and rotatable about a third axis disposed substantially parallel to said second axis, said shaft having severing means disposed thereon and rotatable therewith; and

means mounted on said third housing and operatively connected to said third shaft for rotating said third shaft about said third axis.

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**5,501,258**
**TIRE TREAD HAVING A CIRCUMFERENTIAL GROOVE DEEPER THAN TREAD ELEMENT HEIGHT**
**David J. Sulkowski, Guilford, Conn., assignor to Pirelli Armstrong Tire Corporation, New Haven, Conn.**
**Filed Jun. 27, 1994, Ser. No. 267,034**
**Int. Cl.[6] B60C *11/117;11/03***
**U.S. Cl. 152—209 R** **11 Claims**

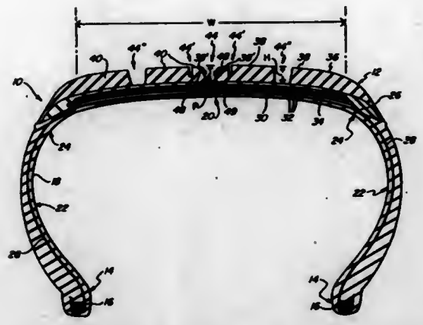
1. A nondirectional pneumatic tire having a carcass including a carcass ply arcing between two beads and a tread circumferentially extending around the carcass midway between the beads, the tire comprising:

a subtread formed of subtread rubber located in the carcass between the carcass ply and the tread;

a belt package located within said subtread and reinforcing the tread;

a plurality of road-contacting tread elements formed of tread rubber extending a height from the subtread;



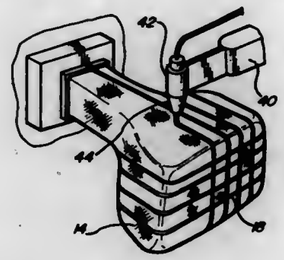



a first circumferential groove located at a mid-circumferential centerplane of the tire, the central circumferential groove having a substantially constant width in a direction around the circumference of the tire; said width being between 10% and 5% of overall contact width under normal operating conditions, and having a depth D greater than the tread element height H throughout tread element wear down to said subtread, depth D initially being between 2% and 9% greater than initial tread element height H, and said circumferential groove extending into said subtread of the tire to maintain wet traction throughout tread element wear down to said subtread; and

two continuous circumferential tread rubber ribs, one on either side of said central circumferential groove, the ribs having an outer diameter substantially equal to an outer diameter of the tread, the ribs radially reinforcing the tread and aiding to provide a substantially uniform road engaging surface to the tire.

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**5,501,259**
**INFLATABLE RESTRAINT DEVICE AND METHOD OF MANUFACTURING SAME**
**Edward B. Palm, 1710 Shore Club Dr., St. Clair Shores, Mich. 48080**
**Filed May 2, 1994, Ser. No. 236,964**
**Int. Cl.[6] B60R *21/16;* B29C *41/02***
**U.S. Cl. 156—156** **13 Claims**




1. A method of manufacturing an air bag having a mouth, said method comprising the steps of:

inflating a mold to a pre-specified configuration;

locating a first sheet over said mold so as to form a cavity having a single opening at said mouth of said air bag;

applying a plurality of fibers on said first sheet according to a pre-specified pattern;

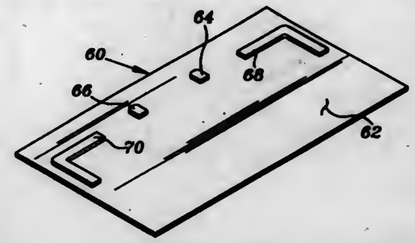
locating a second sheet over said mold so as to form said cavity having said single opening at said mouth of said air bag;

laminating said first and second sheets together; and

separating said air bag from said mold.

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**5,501,260**
**METHOD USING A JIG FOR AFFIXING AN ADAPTOR TO THE BOTTOM OF A BUSINESS CARD**
**Edward R. Young, 3030 Oak Ridge Pl., Grand Prairie, Tex. 75051**
**Filed Sep. 28, 1993, Ser. No. 128,378**
**Int. Cl.[6] B32B *31/14***
**U.S. Cl. 156—247** **5 Claims**




1. The method of combining a business card with an adaptor in such a way that the adaptor can be used to subsequently hold the business card in a holder having two parallel rails, said adaptor already having been provided with two side-by-side notches that are sized, shaped and located to mate with the two parallel rails of a holder, comprising the steps of:

a) placing an adaptor on top of a generally planar member where the adaptor will be supported with a controlled orientation at a first location, and the generally planar member having a pair of outwardly extending protuberances that are sized, shaped and located to mate with the pair of notches in the adaptor, and the adaptor being thin and generally planar and having upper and lower regions, and the adaptor having right and left sides and a central axis that lies in the plane of the adaptor and extends vertically between the two side-by-side notches, and the adaptor having a horizontal axis that lies in the plane of the adaptor and extends from one side of the adaptor to the other side, and said first location of the adaptor on the generally planar member being established by engagement of the adaptor's notches with the outwardly extending protuberances, and said first location also being controlled vertically in both up and down directions as well as horizontally to the right and to the left;

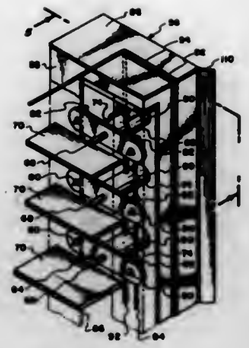
b) placing a business card on top of the generally planar member where the business card will be supported at a second location whose position with respect to the adaptor is controlled by a pair of spaced-apart elements that are permanently fixed with respect to the generally planar member, and the placement of the business card being such as to cause it to partially overlap and contact an upper region of the adaptor, and the business card's controlled position being one in which the card is centered with respect to the adaptor as well as being held at a finite distance above the adaptor's notches; and

c) using an adhesive to secure the adaptor to the business card while the two are still in contact and being supported in a controlled position by the generally planar member, said adhesive having been provided in a region where the business card partially overlaps an upper region of the adaptor.

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**5,501,261**
**WINDOW TREATMENT OPERATING MECHANISM**
**Robert G. Peale, 3137 Collingswood Dr., Cameron Park, Calif. 95682**
**Filed Oct. 17, 1994, Ser. No. 323,827**
**Int. Cl.[6] E06B *9/30***
**U.S. Cl. 160—168.1** **7 Claims**

1. An operating mechanism for a window treatment, said window treatment having a plurality of sheet material louvers, said louvers located in juxtaposition, said louvers being movable relative to each other from a spaced apart position to an abutting



position, said louvers also being simultaneously pivotally movable between an alignment position where said louvers combine to form a structure similar to a solid panel and a parallel position forming large spaces between said louvers forming a structure similar to an open window, said operating mechanism comprising:

an elongated guide track;

a support device connected to each said louver with there being a separate said support device for each said louver forming a series of said support devices, with each said support device being mounted on said guide track, each said support device having a longitudinal sleeve from which extends a transverse arm, each said louver having a connecting stud, said connecting stud of each said louver to connect with its respective said support device;

a connecting cord assembly extending between and attached to said series of said support devices, said connecting cord assembly being movable to produce said pivotal movement of said louvers; and

a pull cord assembly connected between each said support device, said pull cord assembly being operable exteriorly of said elongated guide track to move said louvers from said spaced apart position to said abutting position; and

an end cap being mounted at one end of said elongated guide track, said elongated guide track being mounted in a substantially vertical direction with said louvers extending substantially horizontally, said end cap includes a retaining bracket, one of said support devices is longitudinally fixed in position by said retaining bracket.

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**5,501,262**

**CORD LOCKING ASSEMBLY FOR USE WITH VENETIAN BLIND**

**Tadashi Inaba; Toshiyuki Mori; Masahiro Nagashima, and Kosuke Kawada, all of Tokyo, Japan, assignors to Toso Co., Ltd., Tokyo, Japan**

**Filed Oct. 28, 1994, Ser. No. 330,730**

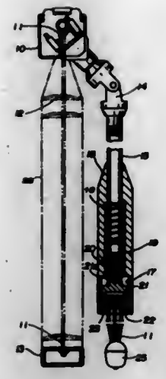
**Claims priority, application Japan, May 7, 1993, 5-107852; Feb. 7, 1994, 6-013291**

**Int. Cl.[6] E06B *9/324***

**U.S. Cl. 160—178.2** **9 Claims**

1. A cord locking assembly for use with a Venetian blind of the type having a head box, a hollow pole suspended from the head box, a hand grip axially movably fitted on the bottom portion of the hollow pole,

said assembly comprising a plug hole sleeve coaxially fixed to the bottom of the hollow pole, a plug disposed within the hand grip for fitting engagement with the plug hole sleeve from underside, an auxiliary compression spring interposed between the grip and the pole to upwardly bias the grip, and lift cords entering the grip through the plug hole sleeve and leaving the grip through the bottom thereof,



the plug being axially movably mounted within the hand grip and upwardly biassed by a lock compression spring interposed between the plug and the hand grip,

whereby the lift cords are fixedly locked between the plug and the plug hole sleeve when the hand grip is not operated,

whereby the lift cords are gradually movably locked between the plug and the plug hole sleeve when the hand grip is operated to a certain extent that the lock compression spring loosens while the plug remains unmoved, and

whereby the lift cords are released from the locking between the plug and the plug hole sleeve when the hand grip is operated to the full extent that the plug moves away from the plug hole sleeve.

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**5,501,263**

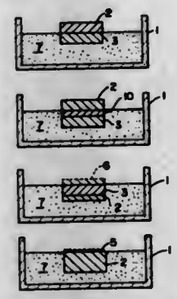
**MACROCOMPOSITE BODIES AND PRODUCTION METHODS**

**Ratnesh K. Dwivedi, Wilmington; Kurt J. Becker, Newark, both of Del.; Danny R. White, Elkton, Md.; Steven D. Keck, Hockessin, Del., and Mark G. Mortenson, North East, Md., assignors to Lanxide Technology Company, LP, Newark, Del.**

**Continuation-in-part of Ser. No. 520,924, May 9, 1990, abandoned. This application Jan. 8, 1993, Ser. No. 976,989**

**Int. Cl.[6] B22D *19/14***

**U.S. Cl. 164—97** **19 Claims**



1. A method for forming a macrocomposite body, comprising:

providing a permeable mass comprising a filler or a preform;

infiltrating at least a portion of the permeable mass with molten matrix metal to form a metal matrix composite body; and

causing the formation of oxidation reaction product from at least a portion of at least one surface of the formed metal matrix composite body, said oxidation reaction product being chemically distinct from aluminum nitride.



**5,501,264**

**PROCESS FOR PRODUCING A COMPOSITE USING POTASSIUM HEXATITANATE WHISKERS HAVING A TUNNEL STRUCTURE**

**Hidefumi Harada; Yasuo Inoue, and Eiji Sadanaga, all of Yamaguchi, Japan, assignors to Titan Kogyo Kabushiki Kaisha, Ube, Japan**

**Division of Ser. No. 901,232, Jun. 19, 1992, Pat. No. 5,366,816. This application Aug. 12, 1994, Ser. No. 289,437**

**Claims priority, application Japan, Jun. 20, 1991, 3-148836; Feb. 6, 1992, 4-21281**

**Int. Cl.[6] B22D *19/14***

**U.S. Cl. 164—97** **6 Claims**

1. A process for producing an alloy-base composite material comprising a light alloy matrix and potassium hexatitanate whiskers having a tunnel structure, said whiskers containing aluminum and niobium impurities in such amounts that the $Al_2O_3/Nb_2O_5$ molar ratio is at least 0.6, which comprises:

(1) preparing a sintered preform of potassium hexatitanate whiskers having a tunnel structure by blending potassium hexatitanate fibers with an organic binder and heating the resulting blend of fibers and binder at a temperature of 800°–1100° C. until the fibers are sintered, thereby yielding a consolidated preform,

(2) placing the melt casting preform in a mold, and

(3) pouring molten alloy into the preform in the mold, applying an elevated pressure to the mold and then rapidly cooling the mold to obtain the alloy-base composite material as a product of the process.

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**5,501,265**

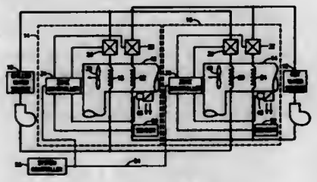
**FLUID FLOW CONTROL FOR HVAC SYSTEM WITH VALVE POSITION READJUSTMENT TO EQUALIZE CONDITIONING RATES IN MULTIPLE ZONES**

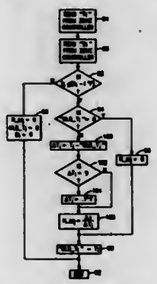
**Walter E. Bujak, Jr., Suffield, Conn., assignor to Carrier Corporation, Syracuse, N.Y.**

**Filed May 31, 1994, Ser. No. 250,880**

**Int. Cl.[6] F25B *29/00***

**U.S. Cl. 165—22** **14 Claims**





9. A process for defining the valve positions of flow control valves that govern the flow of a heat exchange medium to individual temperature controlled zones, said process comprising the steps of:

periodically reading the current temperatures of each zone;

computing zone temperature change representations indicating how the read temperatures from each zone are changing relative to an elapsed period of time occurring between successive periodic readings of temperatures from the zone;

computing an average of the zone temperature change representations for all zone controllers in a particular mode of operation;

computing a valve position offset for a flow control valve associated with a zone in the particular mode of operation, each valve position offset being a function of how the zone temperature change representation compares with the average of all zone temperature changes for all zones in the particular mode of operation; and

adjusting the valve position of a flow control valve in each zone in the particular mode of operation by the valve position offset for that zone.

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**5,501,266**

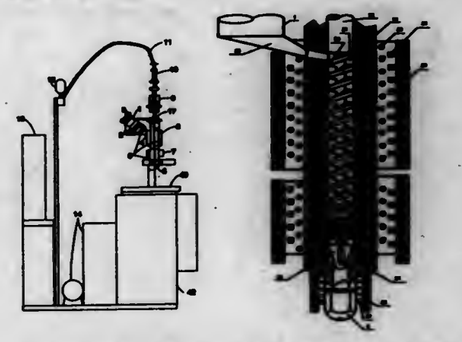
**METHOD AND APPARATUS FOR INJECTION MOLDING OF SEMI-SOLID METALS**

**Kuo K. Wang; Hsuan Peng; Nan Wang, and Shou-Poh Wang, all of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.**

**Filed Jun. 14, 1994, Ser. No. 259,625**

**Int. Cl.[6] B22D *17/00;23/00;27/08***

**U.S. Cl. 164—113** **19 Claims**



1. An injection molding machine for casting metals in semi-solid form, comprising:

a) a hopper for liquid metal, having means for maintaining the metal at a temperature above the liquidus temperature and a fluid outlet for liquid metal at the lower end thereof,

b) a vertical shearing/cooling section comprising

i) a solid tubular barrel having lower and upper ends, an axial cavity in the center, and a fluid input near the upper end thereof for inlet of liquid metal connected to the fluid outlet of the hopper,

ii) a screw located in the axial cavity of the barrel, having a shaft extending out of the upper end of the barrel, having a length less than the length of the barrel, and fitting in the axial cavity with only a small gap between the screw flights and the walls of the axial cavity, capable of rotational motion and axial motion from a first position in which the lower end of the screw is near the lower end of the barrel, to a second position in which the upper end of the screw is near the upper end of the barrel,

iii) a nozzle for mating with a mold, sealably located in the lower end of the axial cavity, having a fluid passage from the axial cavity to the lower end of the nozzle which mates with the mold,

iv) seal means for preventing liquid metal flow while permitting the screw shaft to rotate and move up and down, located around the screw shaft on the upper end of the axial cavity,

v) temperature control means for maintaining the barrel at a temperature below the liquidus temperature of the metal,

c) means for rotating the screw, connected to the screw shaft,

d) means for moving the screw lengthwise from its first position to its second position, connected to the screw shaft,

the machine operating such that the liquid metal is fed into the shearing/cooling section while the screw is in its first, lower position and is sheared by the rotating screw while being cooled below its liquidus temperature under the control of the temperature control means and forming a semi-solid material; the rotating screw is moved to its second, upper position; and the screw is quickly moved to its first, lower position, ejecting the semi-solid material through the nozzle into the mold.

18. The method of injection molding semi-solid metals, comprising the steps of:

a) starting with metal above its liquidus temperature,

b) shearing the metal with a rotating, vertical, non-compression screw agitator,

c) cooling the metal while it is being sheared, to a semi-solid state below its liquidus temperature,

d) raising the screw agitator, causing the semi-solid metal to accumulate below the screw agitator,

e) quickly lowering the screw agitator to inject the accumulated semi-solid metal into a mold.

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**5,501,267**

**AIR CONDITIONING APPARATUS FOR AN ELECTRIC VEHICLE USING LEAST POWER CONSUMPTION BETWEEN COMPRESSOR AND ELECTRIC HEATER**

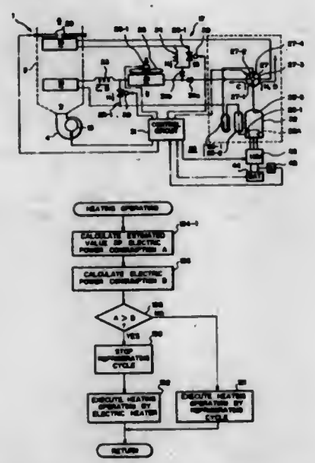
**Kunio Iritani, Anjo, and Akira Iseji, Nishio, both of, Japan, assignors to Nippondenso Co., Ltd., Japan**

**Filed Dec. 28, 1992, Ser. No. 997,365**

**Claims priority, application Japan, Dec. 27, 1991, 3-346691; Dec. 1, 1992, 4-322010**

**Int. Cl.[6] F25B *29/00***

**U.S. Cl. 165—29** **6 Claims**



1. An air conditioning apparatus for controlling a temperature of a cabin, comprising:

(a) a duct defining therein an air passageway to said cabin;

(b) a fan device for creating a forced air flow in said passageway toward the cabin;

(c) a refrigerating cycle comprising a compressor for obtaining a high pressure gaseous refrigerant, and an inner heat exchanger that receives the gaseous refrigerant from the compressor, said inner heat exchanger being arranged in the duct so that a heat exchange between the air in the duct and the refrigerant in the inner heat exchanger takes place to heat the air directed to the cabin;

(d) an electric motor for imparting a rotational movement to the compressor to recirculate the refrigerant along the refrigerating cycle;

(e) an electric heater arranged in the duct for generating electric heat for directly heating the air flow directed to the cabin;

(f) means for determining electrical power consumption of the refrigerating cycle and for determining electrical power consumption of the electric heater; and

(g) control means for selecting the one of the refrigerating cycle and the electric heater that consumes less electric power when obtaining a desired heating capacity at the cabin.

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**5,501,268**

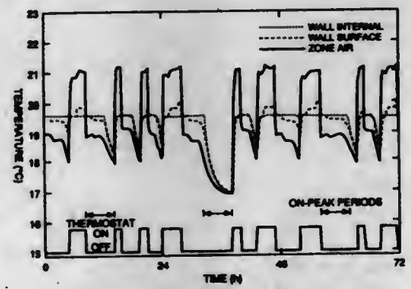
**METHOD OF ENERGY LOAD MANAGEMENT USING PCM FOR HEATING AND COOLING OF BUILDINGS**

**Therese K. Stovall, and John J. Tomlinson, both of Knoxville, Tenn., assignors to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.**

**Filed Jun. 28, 1993, Ser. No. 83,678**

**Int. Cl.[6] F25B *29/00*; F24J *3/02***

**U.S. Cl. 165—1** **14 Claims**




1. A method of energy load management for avoiding energy source use during selected time periods during selected heating and cooling of a building in which air motion conveys air within a selected temperature range for comfort of occupants of said building, said method comprising:

providing a first wallboard material on interior portions of said building removed from effects of temperature exterior to said building, said first wall board material containing therein a first phase change material having a melting point temperature substantially in a center of said selected temperature range for comfort;

providing a second wallboard material on interior surfaces of portions of said building subject to effects of temperature exterior to said building, said second wallboard material containing therein a second phase change material having a melting point temperature less than, but within about four degrees C. of said melting temperature of said first phase change material;

providing a thermostat within said building for setting and determining temperature within said building, said thermostat controlling de-activating said energy source at a beginning of said selected time period and activating said energy source at a conclusion of said selected time period;

conditioning air in an interior of said building with said energy source at a temperature to achieve an initial charged state of said first and second phase change materials at said beginning of said selected time period;

de-activating said energy source at said beginning of said selected time period whereby said first and second phase change materials change phase from said initial charged state to provide said selected heating and cooling of said building; and

activating said energy source at said conclusion of said selected time period whereby said first and second phase change materials change phase to return to said initial charged states.



**5,501,269**

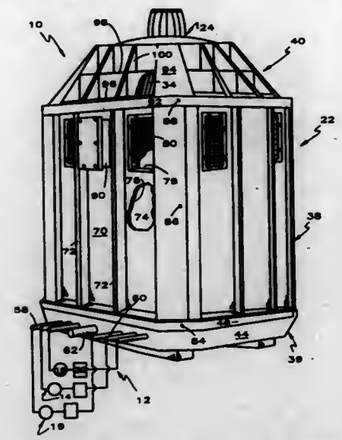
**CONDENSER UNIT**

**Robert E. Jenkins, 2903 Hillview Rd., Austin, Tex. 78703**

**Filed Aug. 25, 1993, Ser. No. 111,570**

**Int. Cl.[6] F28B *1/00***

**U.S. Cl. 165—110** **22 Claims**



1. A condensing unit comprising a housing having therein a fan creating an upward path of air movement through the housing; a heat exchange coil having an inlet and an outlet for connection to a source of hot refrigerant in a refrigeration loop; a sump, below the coil, for collecting a coolant; and means in communication with the sump for spraying the coolant on the coil,

the housing comprising

a base having a bottom wall and an upturned rim, a plurality of upright walls supported by the base, means connecting the walls together and a top,

the inlet and outlet extending laterally through the rim and then upwardly to the coil to allow the walls and top to be removed without affecting the coil; and

a frame, in the housing, supported by the base bottom wall and being unconnected thereto and being movable relative thereto and having the heat exchange coil suspended therefrom, the frame being constrained against substantial lateral movement by the walls.

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**5,501,270**

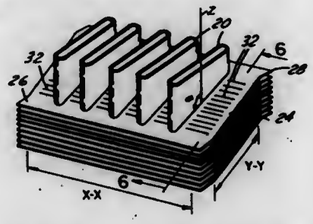
**PLATE FIN HEAT EXCHANGER**

**Darryl L. Young, Belleville, and Barry W. Blunsel, Livonia, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.**

**Filed Mar. 9, 1995, Ser. No. 401,579**

**Int. Cl.[6] F28F *1/32***

**U.S. Cl. 165—151** **14 Claims**




1. A fin assembly for use in a heat exchanger, the fin assembly comprising:

at least one tube for transporting a heat exchange fluid therein, the at least one tube extending longitudinally from a fluid manifold and being disposed between a pair of endsheets, the at least one tube defining a longitudinal axis parallel to the flow of fluid therethrough;

a generally planar base having a base longitudinal axis extending between the pair of endsheets, the base longitudinal axis being generally perpendicular to the tube longitudinal axis and a transverse axis generally perpendicular to the base longitudinal axis but being canted at an obtuse angle relative to the tube longitudinal axis, said base longitudinal and transverse axes defining a main plane, and wherein substantially the entire main plane of said base is disposed at said obtuse angle relative to the tube longitudinal axis;

a plurality of apertures for receiving the tubes therethrough; and

a plurality of louvres disposed on said base and extending generally parallel to the longitudinal axis of said base.

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**5,501,271**

**HEAT-EXCHANGER TANK**

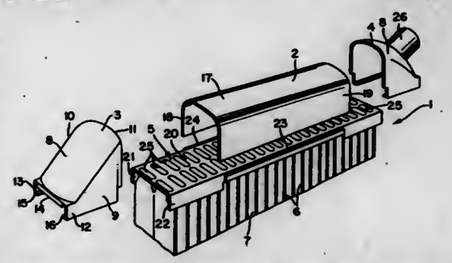
**Björn Wijkstrom, Asarum, Sweden, assignor to Valeo Engine Cooling AB, Solvesborg, Sweden**

**Filed Apr. 11, 1995, Ser. No. 420,360**

**Claims priority, application Sweden, Apr. 11, 1994, 9401212**

**Int. Cl.[6] F28F *9/02***

**U.S. Cl. 165—173** **11 Claims**



1. A heat-exchanger tank consisting of a cover, the cover having an opening and a plate, the plate being fixed at the opening of the cover, the plate being elongate and U-shaped, and having a web portion and two flanges, the cover consisting of a U-shaped middle piece and two separately manufactured cup-shaped end pieces, said middle piece having flanges, the flanges being secured to the plate flanges, said end pieces defining mouths, said mouths being U-shaped for connection to a respective end of the middle piece, each end piece further having two guide flanges, said guide flanges being connectable to the flanges of the plate and being adapted to guide the end pieces into correct alignment with the middle piece when the heat-exchanger tank is being assembled, wherein each end piece further having a fixing tongue at an end opposite to said mouth and being bent around an end edge of the plate.

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**5,501,272**

**MULTI-SENSOR RELIEF VALVE WELL TEST SYSTEM**

**Graeme F. Coutts, and Jeffrey C. Edwards, both of Scotland, United Kingdom, assignors to Expro North Sea Limited, Scotland**

**PCT No. PCT/GB92/01353, § 371 Date Mar. 25, 1994, § 102(e) Date Mar. 25, 1994, PCT Pub. No. WO93/05273, PCT Pub. Date Mar. 18, 1993**

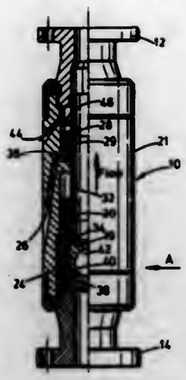
**PCT Filed Jul. 23, 1992, Ser. No. 199,242**

**Claims priority, application United Kingdom, Aug. 31, 1991, 9118692**

**Int. Cl.[6] E21B *49/00***

**U.S. Cl. 106—250.01** **10 Claims**

1. A well testing system comprising a ball valve having a plurality of fluid lines coupled thereto, said ball valve being



located between a process fluid flow line and a vent line, each fluid line being coupled to a respective piece of equipment rated at a certain pressure value, pressure relief means located in each fluid line between the piece of equipment and said ball valve, each pressure relief means being operable when an in-line fluid pressure exceeds a predetermined value to pass said fluid to said ball valve, said ball valve being actuatable in response to any one of said pressure relief means having fluid passed therethrough whereby the ball valve is actuated to an open position and remains in the open position once actuated, so that the well reservoir fluid/gas mixture from said fluid flow line passes through the ball valve to said vent line.

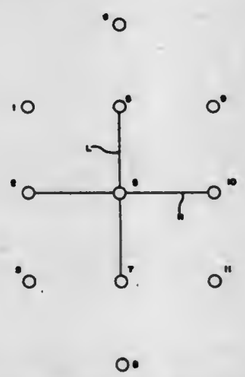
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**5,501,273**

## METHOD FOR DETERMINING THE RESERVOIR PROPERTIES OF A SOLID CARBONACEOUS SUBTERRANEAN FORMATION

**Rajen Puri, Aurora, Colo., assignor to Amoco Corporation, Chicago, Ill.**

**Filed Oct. 4, 1994, Ser. No. 317,742**
**Int. Cl.[6] E21B *43/16;43/30;47/06***
**U.S. Cl. 166—252.5** **34 Claims**



1. A method for determining the enhanced methane recovery characteristics of a solid carbonaceous subterranean formation, the method comprising:

a) injecting a gaseous desorbing fluid into the formation through a wellbore while obtaining injection rate data;

b) flowing-back the wellbore to produce a fluid comprising injected desorbing gaseous fluid and methane;

c) obtaining production rate data and chemical composition data for the fluid produced during step b); and

d) determining at least one of the following enhanced methane recovery characteristics for the formation surrounding the wellbore using the data obtained in steps a) and c), wherein the enhanced methane recovery characteristic is selected from the group consisting of:

effective permeability relationship, characteristic diffusion time for nitrogen, characteristic diffusion time for methane, characteristic diffusion time for the injected gaseous desorbing fluid, stress dependent permeability relationship, relative permeability relationship, reservoir flow capacity, whether the first wellbore is in fluid communication with non-carbonaceous subterranean formations, and combinations thereof.

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**5,501,274**

## CONTROL OF PARTICULATE FLOWBACK IN SUBTERRANEAN WELLS

**Philip D. Nguyen; Jim D. Weaver, both of Duncan, and David L. Brown, Temple, all of Okla., assignors to Halliburton Company, Duncan, Okla.**

**Filed Mar. 29, 1995, Ser. No. 412,668**
**Int. Cl.[6] E21B *43/04;43/267***
**U.S. Cl. 166—276** **20 Claims**

1. Method of treating a subterranean formation penetrated by a wellbore comprising the steps of providing a fluid suspension including a mixture of a particulate material and a thermoplastic material wherein said thermoplastic material is in the form of flakes having a thickness of from about 2.5 to about 250 microns and an average surface area of from about 2 to about 325 square millimeters; pumping the fluid suspension including the mixture into the subterranean formation through the wellbore; depositing the mixture of particulate and thermoplastic material in the subterranean formation whereby the material interacts with at least a portion of the particulate to retard movement within said formation of said particulate.

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**5,501,275**

## CONTROL OF PARTICULATE FLOWBACK IN SUBTERRANEAN WELLS

**Roger J. Card; Paul R. Howard; Jean-Pierre Feraud, all of Tulsa, and Vernon G. Constien, Sperry, all of Okla., assignors to Dowell, a division of Schlumberger Technology Corporation, Houston, Tex.**

**Continuation-in-part of Ser. No. 207,976, Mar. 8, 1994, Pat. No. 5,439,055, which is a continuation-in-part of Ser. No. 42,978, Apr. 5, 1993, Pat. No. 5,330,005. This application Mar. 2, 1995, Ser. No. 397,529**
**Int. Cl.[6] E21B *43/267***
**U.S. Cl. 166—280** **14 Claims**

1. A method of treating an underground formation penetrated by a wellbore using a fluid suspension, comprising the steps of:

(a) providing a fluid suspension, said suspension comprised of a fluid, a particulate material, and a solid material, the solid material being selected from the group of solid materials consisting of metal, polymers, ceramics and glass;

(b) pumping the fluid suspension downhole through a wellbore;

(c) depositing the fluid suspension in the formation;

(d) flowing back fluid from the formation, thereby forming a matrix of solid material and particulate material; and

(e) reducing migration of particulate material from the matrix into the wellbore.

5. A method of reducing the production of proppant from a well after fracturing a subterranean formation penetrated by the well, comprising:

(a) pumping a fluid from the surface of the ground through a wellbore and into a subterranean formation, the fluid comprising a viscous liquid, proppant, and shavings or discs of polymer material,



(b) forming a matrix within the subterranean formation, the matrix comprising the proppant and polymer material in close association with each other, and

(c) reducing production of the proppant from the well.

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**5,501,276**

## DRILLING FLUID AND FILTER CAKE REMOVAL METHODS AND COMPOSITIONS

**Jim Weaver; Krishna M. Ravi, both of Duncan, Okla.; Larry S. Eoff, Katy, Tex.; Rick Gdanski, and J. Michael Wilson, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.**

**Filed Sep. 15, 1994, Ser. No. 306,689**
**Int. Cl.[6] E21B *33/16;37/00***
**U.S. Cl. 166—291** **16 Claims**

1. A method of removing gelled and dehydrated drilling fluid and filter cake from the walls of a wellbore comprising:

contacting said drilling fluid and filter cake with a removal composition for a period of time sufficient to cause the disintegration of said drilling fluid and filter cake, said composition being comprised of an aqueous solution of sugar selected from the group consisting of monosaccharide sugars, disaccharide sugars, trisaccharide sugars and mixtures thereof; and

displacing said removal composition and disintegrated drilling fluid and filter cake from said wellbore.

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**5,501,277**

## COMBATING LOST CIRCULATION DURING THE DRILLING OF WELLS

**David D. Onan, Lawton, and Bobby G. Brake, Duncan, both of Okla., assignors to Halliburton Company, Duncan, Okla.**

**Filed Mar. 6, 1995, Ser. No. 399,266**
**Int. Cl.[6] E21B *33/138***
**U.S. Cl. 166—293** **20 Claims**

1. An improved method of combating lost drilling fluid circulation into a subterranean thief zone penetrated by a well bore comprising the steps of:

forming a quick set cementitious composition comprised of an amorphous silica material, water present in an amount sufficient to form a slurry and an alkali present in an amount sufficient to react with said amorphous silica material in the presence of said water to form a cementitious composition which subsequently sets into a hard substantially impermeable mass;

introducing said cementitious composition into said thief zone by way of said well bore;

allowing said cementitious composition to set into a cementitious plug in said thief zone and in said well bore; and then

continuing the drilling of said well bore through and below said cementitious plug.

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**5,501,278**

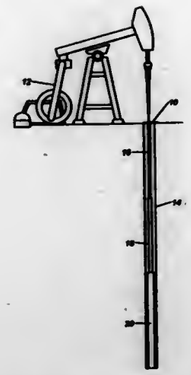
## METHOD OF ACHIEVING HIGH PRODUCTION RATES IN WELLS WITH SMALL DIAMETER TUBULARS

**Kenneth D. Garrett, Lubbock, and Norman D. Rogers, Sundown, both of Tex., assignors to Texaco Inc., White Plains, N.Y.**

**Filed Dec. 16, 1994, Ser. No. 357,470**
**Int. Cl.[6] E21B *17/00;43/00***
**U.S. Cl. 166—369** **2 Claims**

1. A method for improving the production rate from a producing oil well comprising the steps of:

providing the well with a rod string comprised of a plurality of rod sections, each said section being formed by metallic rods having a different diameter and tensile strength with the smallest diameter metallic rod section having the highest tensile strength;



arranging said metallic rod sections in the well with the largest diameter, lowest tensile strength metallic rods toward the bottom of the rod string and the smallest diameter, highest tensile strength metallic rods towards the top of said rod string at the top of the well.

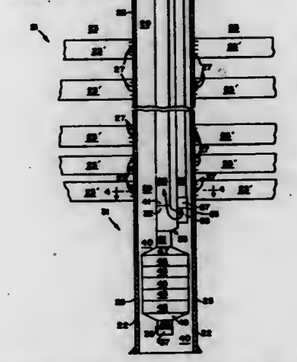
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**5,501,279**

## APPARATUS AND METHOD FOR REMOVING PRODUCTION-INHIBITING LIQUID FROM A WELLBORE

**Arvind K. Garg, Englewood, and Jack McAnear, Littleton, both of Colo., assignors to Amoco Corporation, Chicago, Ill.**

**Filed Jan. 12, 1995, Ser. No. 372,161**
**Int. Cl.[6] E21B *43/00***
**U.S. Cl. 166—372** **27 Claims**



1. A method for removing water from a wellbore which penetrates at least one carbonaceous seam and has perforations which allow methane and water to flow from the at least one carbonaceous seam into the wellbore, the method comprising the steps of:

a) installing a gas-lift apparatus in the wellbore, the gas-lift apparatus comprising:

a chamber for collecting water;

a valve receiving means coupled to the chamber; and

a linear access means for transferring a wireline into and at least partially through the chamber;

b) operating the gas-lift apparatus in a continuous water removal mode;
c) switching the gas-lift apparatus from the continuous water removal mode to an intermittent water removal mode using a wireline retrievable tool; and
d) operating the gas-lift apparatus in the intermittent water removal mode.

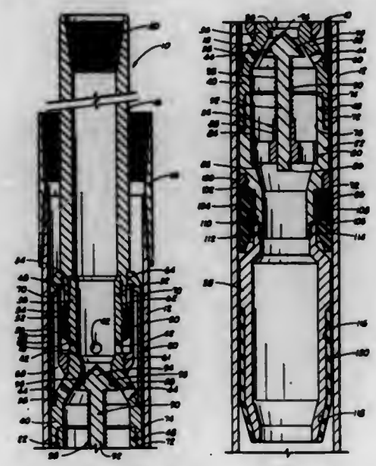
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**5,501,280**

## CASING FILLING AND CIRCULATING APPARATUS AND METHOD

David P. Brisco, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Oct. 27, 1994, Ser. No. 330,392
Int. Cl.[6] E21B *34/06*
U.S. Cl. 166—373 20 Claims



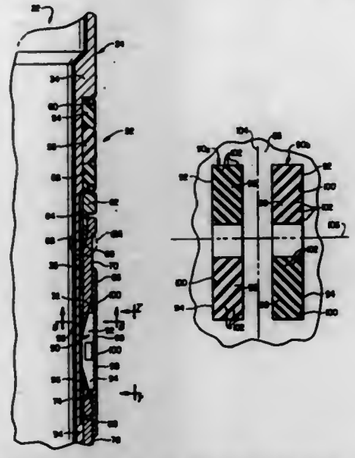
1. An improved casing filling and circulating apparatus for running a casing string into a well bore comprising:
a tubular connector;
a tubular pressure relief seal body member connected to an end of said connector;
pressure relief seal means connected to said pressure relief seal body member for relieving pressure from said casing by back-flow through said connector when the pressure in said casing is higher than the pressure in said connector;
a tubular casing seal body member connected to said pressure relief seal body member;
check valve means connected to the interior of said casing seal body member for preventing spillage and for preventing fluid back-flow through said casing filling and circulating apparatus except when said pressure relief seal means permits such back flow;
casing seal means connected to the exterior of said casing seal body member for sealingly engaging the interior of said casing string when inserted thereinto; and
a tubular guide nose member connected to said casing seal body member.

**5,501,281**

## TORQUE-RESISTANT, SEAL SETTING FORCE-LIMITED, HYDRAULICALLY SETTABLE WELL PACKER STRUCTURE AND ASSOCIATED METHODS

Pat M. White, and John C. Gano, both of Carrollton, Tex., assignors to Halliburton Company, Houston, Tex.

Continuation-in-part of Ser. No. 296,941, Aug. 26, 1994. This application Jan. 30, 1995, Ser. No. 380,901
Int. Cl.[6] E21B *33/128*
U.S. Cl. 166—387 37 Claims



1. Torque-resistant well packer apparatus comprising:
a tubular body coaxially positionable within a subterranean well flow conductor and having an axial centerline;
a circumferentially spaced plurality of slip anchors supported on said tubular body for radial movement relative thereto between inwardly retracted release positions and outwardly extended setting positions,
each of said slip anchors having an outer side surface portion with a spaced series of parallel gripping teeth formed thereon, said teeth being generally helically disposed relative to said centerline, said teeth further having lengths that are sloped relative to said centerline and relative to a plane perpendicular to said centerline; and
setting means carded on said tubular body and being selectively operable to forcibly drive said slip anchors from said release positions thereof to said setting positions thereof.

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**5,501,282**

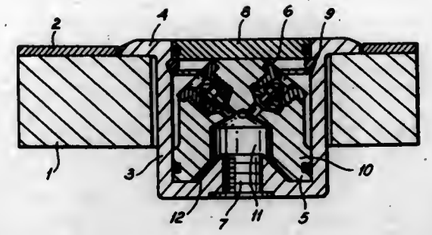
## FIRE-FIGHTING EQUIPMENT

Göran Sundholm, Ilmari Kiannon kuja 3, FIN-04310 Tuusula, Finland

PCT No. PCT/FI92/00213, § 371 Date Jun. 1, 1994, § 102(e) Date Jun. 1, 1994, PCT Pub. No. WO93/00962, PCT Pub. Date Jan. 21, 1993
PCT Filed Jul. 10, 1992, Ser. No. 175,392
Claims priority, application Finland, Jul. 12, 1991, 913394; Jan. 11, 1991, 914823
Int. Cl.[6] A62C *37/08*
U.S. Cl. 169—37 12 Claims

1. Fire-fighting equipment having a number of spray heads for spraying extinguishing liquid, at least a part of said spray heads being, in inactive state, covered by a shield, whereby said spray heads are of the type capable of operating with a high drive pressure, preferably producing concentrated fog sprays with strong penetration power, the respective shield being arranged, upon activation of the respective spray head, to be removed by the action of the extinguishing liquid, and at least one of said spray heads





provided with a shield being movably mounted in a holder fastened in a floor in such a manner that said at least one spray head upon activation is lifed up by the extinguishing liquid thus removing the shield provided in front of said at least one spray head.

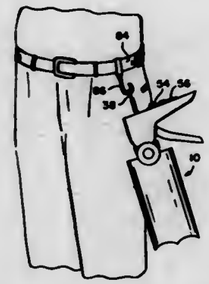
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**5,501,283**

## HOLE CUTTING DEVICE FOR RECOVERING TARGETS LOCATED WITH A METAL DETECTOR

H. Dean Nordquist, 57 Knight St., Glens Falls, N.Y. 12801

Filed Jul. 25, 1994, Ser. No. 280,154
Int. Cl.[6] A01B *1/24;* E21B *25/00*
U.S. Cl. 172—22 6 Claims



1. A hole cutting device for recovering a metal target discovered with a metal detector, said metal target being buried at a depth X in a layer of soil, said metal detector providing an operator of said hole cutting device with an indication of said depth X, comprising:
a cutting tube having a cutting edge and an opposing, upper rim;
a handle member, mounted proximate the upper rim of said cutting tube, for rotatably driving the cutting edge of said cutting tube into said soil toward said metal target, with the cutting edge of said cutting tube positioned above said metal target;
a piston member having a piston rod and a piston head mounted to a first end of said piston rod, said piston member extending longitudinally within said cutting tube and mounted concentrically therewith, wherein said piston head is longitudinally displaced toward the upper rim of said cutting tube by said soil as the cutting edge of said cutting tube is driven into said soil, the longitudinal displacement of said piston head propelling a second, opposing end of said piston rod outwardly beyond the upper rim of said cutting tube, the second, opposing end of said piston rod including a first connecting element for removably securing said hole cutting device to a second, complementary connecting element disposed on an operator of said hole cutting device, said soil forming a plug within said cutting tube, said cutting tube forming a hole in said soil upon removal of said cutting tube; and
a depth indicator, formed integrally with the second end of said piston rod, for providing an instantaneous depth measurement of the cutting edge of said cutting tube as said cutting edge is driven into the soil, said depth indicator being propelled by said piston rod outwardly beyond the upper rim of said cutting tube;
wherein said metal target is located proximate the cutting edge of said cutting tube when said depth indicator indicates said depth X.

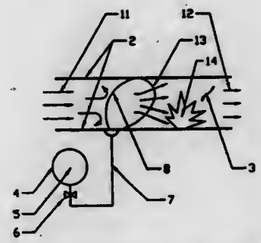
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**5,501,284**

## INFLATABLE BAG FIRE EXTINGUISHING SYSTEM

Robert G. Clodfelter, 7813 Port Clr., Centerville, Ohio 45459-4106, and Benito Botteri, 2398 Red Apple Dr., Dayton, Ohio 45431

Filed Apr. 22, 1994, Ser. No. 232,515
Int. Cl.[6] A62C *3/08*
U.S. Cl. 169—54 12 Claims



1. An apparatus for extinguishing fire in a confined compartment having a normal flow of ventilating air therethrough, said apparatus comprising:
an inflatable bag mounted in a collapsed condition adjacent the compartment, said bag being configured to be compatible with volume and space geometry of the compartment and having means for dispersing a gaseous or vaporizable liquid fire extinguishing agent;
a normally deactivated source of said gaseous or vaporizable liquid fire extinguishing agent connected to said bag;
and means operatively connected to said source to activate release of said gaseous or vaporizable liquid fire extinguishing agent for inflating the bag resulting in blockage of the normal flow of the ventilating air, displacement of at least a portion of residual air, and dispersal of said agent through the bag into the compartment to effect fire extinguishment.

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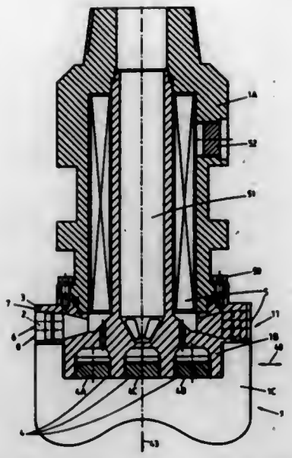
**5,501,285**

## METHOD FOR CONTROLLING THE HEAD OF A DRILLING OR CORE-DRILLING DEVICE AND APPARATUS FOR CARRYING OUT THIS METHOD

Etienne Lamine, 74, Avenue du Ponte de Luttre, B-1190 Brussels, Belgium, and Kees Langeveld, Volmerlaan 6, 2288 GB Rijswijk ZH, Netherlands

Filed Jul. 18, 1994, Ser. No. 276,137
Claims priority, application Belgium, Jul. 20, 1993, 09300768
Int. Cl.[6] E21B *47/00*
U.S. Cl. 175—27 35 Claims

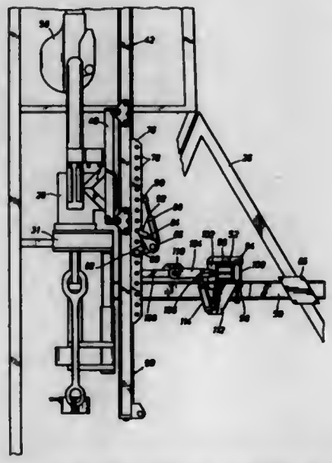
1. A measuring system for a drill bit for measuring a parameter related to movement of at least a portion said drill bit, said drill bit being secured to the end of a drill string and being operable for drilling a borehole through a formation, said drill string and said borehole forming a fluid flow path for circulating fluid through said drill string and said borehole, said apparatus comprising:
a bit body for said drill bit, said bit body having a fluid bore extending therethrough such that said fluid flow path extends through said fluid bore, said bit body having a sensor mount disposed therein;
at least one cutter edge mounted to said bit body for cutting into said formation to



a tubular shank portion extending from said bit body and having a top connector for connecting to said drill string;
a movement sensor affixed to said sensor mount in said bit body, said movement sensor being responsive to a parameter related to movement of said drill bit for producing an electrical signal;
an electrical conductor for electrically conducting said electrical sensor signal; and
a data collection system operable for receiving said electrical sensor signal.

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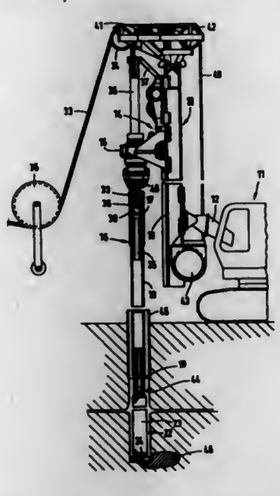
**5,501,286**
**METHOD AND APPARATUS FOR DISPLACING A TOP DRIVE TORQUE TRACK**
Joe R. Berry, The Woodlands, Tex., assignor to Bowen Tools, Inc., Houston, Tex.
Filed Sep. 30, 1994, Ser. No. 316,085
Int. Cl.[6] E21B *19/00*
U.S. Cl. 175—52 14 Claims



13. In a derrick having a connection proximate the top of the derrick to suspend a torque track therefrom which guides a top drive drill unit used to rotate a drill string to drill a well, a method for displacing one end of the torque track proximate the well, said method comprising the steps of:
disengaging the drill string from the top drive drill unit;
suspending the top drive drill unit from the one end of the torque track proximate the well;
displacing the one end of the torque track proximate the well in a first direction about the connection of said torque track to said derrick; and
displacing the one end of the torque track proximate the well in a second direction about the connection of said torque track to said derrick.

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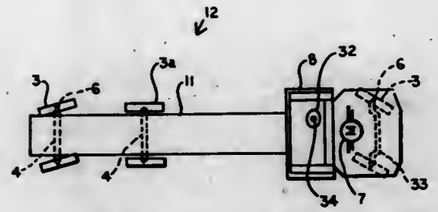
**5,501,287**
**DRILLING DEVICE WITH TELESCOPIC KELLYBAR**
Gottfried Lesser, Olpe-Rhode, Germany, assignor to Ing. G. Klemm Bohrtechnik GmbH, Germany
Filed Sep. 8, 1994, Ser. No. 302,316
Claims priority, application Germany, Sep. 29, 1993, 43 33 114.9
Int. Cl.[6] E21B *4/02*
U.S. Cl. 175—173 10 Claims



1. A drilling device comprising a telescopic Kellybar (16) including an outer tube (17) and at least one inner telescopic tube (18) guided and lockable in said outer tube (17), a tool (22) being mountable to a front end of the inner telescopic tube (18), a drilling mast (10) on which a carriage (14) is displaceable, said carriage (14) including a drive head (15) for rotating the outer tube (17) of the Kellybar (16), a rotating head (30) being provided in the Kellybar (16), said rotating head (30) including a stator (31) connected to at least one pressure line (33) and a rotor (32) connected to the front end of the inner telescopic tube (18), and a rotation protecting means (36) projecting into the outer tube (17) extending to the stator (31) for preventing rotation of the stator (31) with the Kellybar (16).

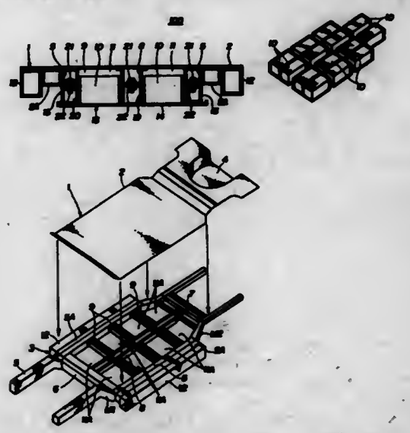


**5,501,288**
**REMOTE STEERING OF ON-HIGHWAY MOTOR VEHICLES**
Edgar A, Ducote, P.O. Box 45654, Baton Rouge, La. 70895
Continuation-in-part of Ser. No. 130,470, Oct. 1, 1993, Pat. No. 5,392,872, which is a continuation-in-part of Ser. No. 807,199, Dec. 16, 1991, Pat. No. 5,305,844, which is a division of Ser. No. 594,716, Oct. 9, 1990, Pat. No. 5,135,064, which is a continuation-in-part of Ser. No. 337,192, Apr. 13, 1989, Pat. No. 5,026,085. This application Jan. 11, 1995, Ser. No. 371,383
Int. Cl.[6] B62D *61/10*
U.S. Cl. 180—24.01 8 Claims



1. An extended motor vehicle having front and rear ends, the vehicle comprising:
(a) an elongated, integral chassis including a frame;
(b) a body including a motor, mounted on the frame;
(c) a first pair of steerable wheels rotatably mounted on spindles attached to opposite ends of a first fixed axle at the front end of the vehicle;
(d) a second pair of steerable wheels rotatably mounted on spindles attached to opposite ends of a second fixed axle at the rear end of the vehicle;
(e) a pair of fixed wheels rotatably mounted on opposite ends of a third fixed axle disposed between and spaced apart from the first and second axles, at least one of the second and third axles being a driving axle;
(f) a steering wheel for directing the motion of the motor vehicle; and
(g) means for forcibly steering the second pair of steerable wheels in accordance with the orientation of the steering wheel and the geometry of the motor vehicle, said geometry being inclusive of the disposition and spacing of the axles and of the dimensions of the motor vehicle, said means for forcibly steering the second pair of steerable wheels including
($g_1$) a steering column connected to the steering wheel;
($g_2$) a steering shaft having first and second ends;
($g_3$) a universal joint connecting the steering column to the first end of the steering shaft;
($g_4$) a steering-gear box connected to the second end of the steering shaft;
($g_5$) a pitman arm connected to and responsive to the gear box;
($g_6$) an electrical sensor responsive to the position of the pitman arm and rigidly fastened to the frame of the vehicle;
($g_7$) a microprocessor electrically connected to the pitman arm, the microprocessor being programmed to receive from the sensor an electrical signal that is indicative of the position of the pitman arm, and to transmit an electrical signal indicative of the position of the pitman arm; and
($g_8$) a servomechanism constructed and arranged to receive the electrical signal from the microprocessor, and to forcibly steer the second pair of steerable wheels in accordance with said signal.

**5,501,289**
**FLOOR STRUCTURE OF ELECTRIC VEHICLE**
Masaharu Nishikawa, Hadano; Kouji Chiba, Yokohama; Tatsuo Matsuzaki, Nishinomagi, and Atsushi Hanyu, Yokosuka, all of, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Jan. 24, 1994, Ser. No. 185,355
Claims priority, application Japan, Jan. 22, 1993, 5-008863; Mar. 10, 1993, 5-048685; Mar. 12, 1993, 5-051168
Int. Cl.[6] B60R *16/04*; B62D *21/12*
U.S. Cl. 180—68.5 16 Claims

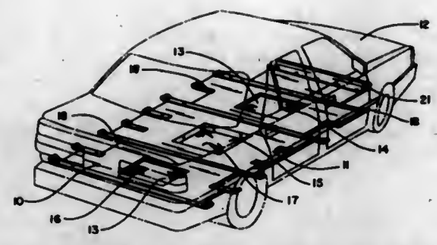


1. A floor structure of an electric motor vehicle powered by batteries mounted thereon, comprising:
an upper unit including a first panel and a first base structure, said first panel being a floor panel of said vehicle, said first base structure being mounted on a lower surface of said first panel and including laterally extending front and rear cross members and two longitudinally extending side members by which members a first given space facing downward is defined;
a lower unit including a second panel and a second base structure, said second base structure being mounted on an upper surface of said second panel to define a second given space which faces upward, said first base structure of the upper unit being mounted on said second base structure of the lower unit such that said first and second given spaces face each other and are merged with each other;
partition means for dividing the second given space of said lower unit into a plurality of container spaces, each container space being sized to contain therein at least one of said batteries; and
connecting means for detachably connecting the first base structure of said upper unit with the second base structure of said lower unit thereby to merge said first and second given spaces.

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**5,501,290**
**VEHICLE DRIP SHIELD**
Arnold Volz, 12223 Scott Ave., Yuma, Ariz. 85367, and Leann M. Herman, 11289 Joshua La., Yuma, Ariz. 85365
Filed Nov. 3, 1994, Ser. No. 333,719
Int. Cl.[6] B62D *25/20*
U.S. Cl. 180—69.1 3 Claims

1. A new and improved vehicle drip shield having a top middle portion which comprises: a flexible, semi-rigid tough film member configured to fit the underside of a vehicle frame; at least one pocket member formed in said film member under a drip point on said vehicle; a plurality of strap means securing said film member to said vehicle frame; at least one strap means extending across the



top middle portion of the shield; a disposable absorbent liner member inserted in said pocket member; and a continuous securing flap projecting from a forward end of the film member for wrapping and securing about a component of the vehicle frame, the securing flap having spaced and parallel longitudinal edges and defining a transverse width extending between the longitudinal edges, with one of the longitudinal edges being coupled to the forward end of the film member, wherein a longitudinal length of the securing flap is substantially greater than the transverse width thereof.

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**5,501,291**

**SKIRT FOR AN AIR CUSHION VEHICLE AND FILAMENT MEMBER THERETO**

**Leif Qvist, Vaniase, Denmark, assignor to Dan/Hover c/o Leif Qvist, Vaniase, Denmark**

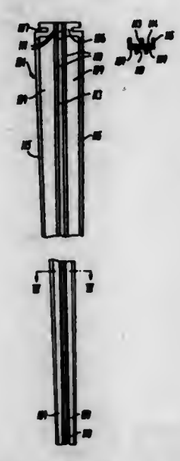
**PCT No. PCT/DK92/00371, § 371 Date Jun. 9, 1994, § 102(e) Date Jun. 9, 1994, PCT Pub. No. WO93/11985, PCT Pub. Date Jun. 24, 1993**

**PCT Filed Dec. 8, 1992, Ser. No. 244,791**

**Claims priority, application Denmark, Dec. 9, 1991, 1908/91; Jun. 25, 1992, 0840/92**

**Int. Cl.[6] B60V *1/16***

**U.S. Cl. 180—127** **5 Claims**



1. A skirt for an air cushion vehicle having a number of air cushion chambers which are horizontally, outwardly delimited by the skirt in its transverse direction, which skirt extends in a longitudinal direction, said skirt comprising: elongated filament members extending downwardly, each filament member having an upper base portion with engagement means for attaching the filament member to a retainer adjacent another filament member in said longitudinal direction of the skirt, said filament member including at least three elongated filaments extending from the base portion and having a taper in cross-sectional area towards a free end of said filament, said at least three filaments being juxtaposed in said transverse direction of the skirt to include an inner filament and an outer filament and a central filament, said inner and outer filaments having a substantially larger dimension in said transverse direction of the skirt than said central filament, and at least one of said juxtaposed elongated filaments having at least one web that protrudes in said longitudinal direction of the skirt and projects over a portion of the adjacent filament member.

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**5,501,292**

**ELECTRICALLY OPERATED VEHICLE**

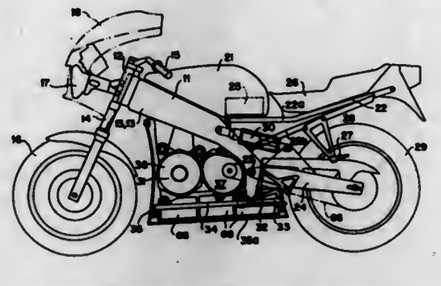
**Yoshinori Kawashima, Saitama; Atsuo Hojo, and Masayoshi Ryu, both of Tokyo, all of, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 739,839, Aug. 2, 1991, abandoned. This application Jan. 10, 1994, Ser. No. 180,768**

**Claims priority, application Japan, Aug. 2, 1990, 2-205593; Jan. 11, 1990, 2-272940; Jan. 11, 1990, 2-272941; Mar. 3, 1991, 3-043877**

**Int. Cl.[6] B62K *11/00***

**U.S. Cl. 180—220** **26 Claims**



1. An electrically operated saddle vehicle comprising:

a twin-tube vehicle frame;

at least one front wheel supported on a front wheel supporting member mounted adjacent to a front portion of said vehicle frame;

at least one rear wheel supported on a rear wheel supporting member mounted adjacent to a rear portion of said vehicle frame;

an electric motor supported on said vehicle frame between said front wheel and said rear wheel and including a front portion positioned adjacent to said front wheel;

transmission means operatively connected to said electric motor and at least one of said front and rear wheels for providing propulsion for said vehicle, the electric motor and transmission means being in linear alignment in the longitudinal direction of the vehicle with the electric motor being in front of the transmission means, the transmission means being mounted to the vehicle frame;

wherein air is directed to contact said electric motor while said vehicle is in motion for cooling said electric motor during use; and

at least one battery connected to said electric motor and being disposed in a frame mounted beneath said electric motor for lowering the center of gravity of said vehicle.



**5,501,293**

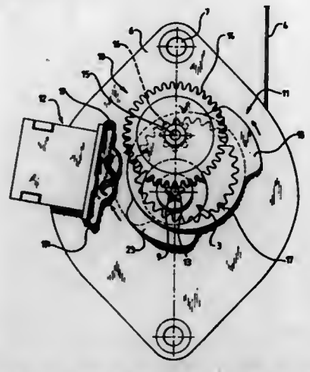
**SAFETY BELT RETRACTOR**

**Bengt Börjesson, West Bloomfield, and James T. Hoskyns, Lake Orion, both of Mich., assignors to Autoliv Development AB, Vargarda, Sweden**

**Filed Jan. 23, 1995, Ser. No. 376,349**

**Int. Cl.[6] B60R *21/00***

**U.S. Cl. 180—268** **22 Claims**



1. A retractor for a vehicle safety belt, the retractor comprising a housing, a spindle rotatably mounted within the housing and a safety belt, one end of which is attached to the spindle, the spindle being spring-biassed for retracting the safety belt so that the safety belt is wound around the spindle; a sensor adapted to provide a signal indicative of whether the safety belt is wound upon the spindle and not in use or is withdrawn from the housing suggesting that the safety belt is in use; means for activating the sensor; and gear means for transmitting rotational movement of the spindle to the means for activating the sensor; the gear means being coupled to the spindle and causing the means for activating the sensor to adopt a unique position upon withdrawal of any one particular length of safety belt from the spindle and causing activation of the sensor in dependence upon the length of safety belt withdrawn.

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**5,501,294**

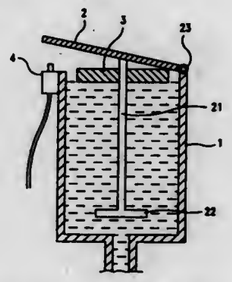
**BRAKE OIL LEVEL SAFETY DEVICE FOR MOTOR VEHICLES**

**Lo Chih-Chun, 15-13F, No. 4, Hsi Ning South Road, Taipei, Taiwan**

**Filed Dec. 27, 1994, Ser. No. 364,813**

**Int. Cl.[6] B60K *28/10*; B60T *17/18***

**U.S. Cl. 180—271** **2 Claims**



1. A brake oil level safety device for motor vehicles having switch means connected in series between an ignition system and a battery power supply of a motor vehicle, and control means disposed in a brake oil cup of an oil brake system of a motor vehicle and moved by brake oil in said brake oil cup to switch on said switch means when the level of said brake oil in said brake oil cup surpasses a predetermined range, and to switch off said switch means when the level of said brake oil in said brake oil cup drops below said predetermined range and characterized in said control means comprising a cover board pivoted to said brake oil cup, a downward guide rod extended from said cover board and suspended in said brake oil cup and terminating in a disk, and a float mounted around said guide rod and moved between said cover board and said disk.

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**5,501,295**

**CABLELESS ELEVATOR SYSTEM**

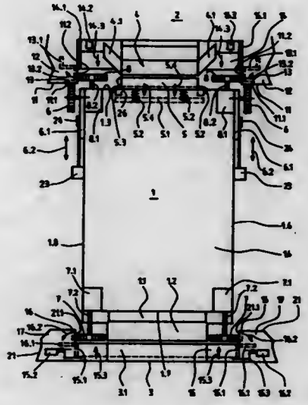
**Wolfgang Müller, Meggen, and Viktor Wunderlin, Kriens, both of, Switzerland, assignors to Inventio AG, Hergiswil, Switzerland**

**Filed Feb. 17, 1993, Ser. No. 18,787**

**Claims priority, application Switzerland, Feb. 17, 1992, 00463/92**

**Int. Cl.[6] B66B *9/00***

**U.S. Cl. 187—406** **19 Claims**



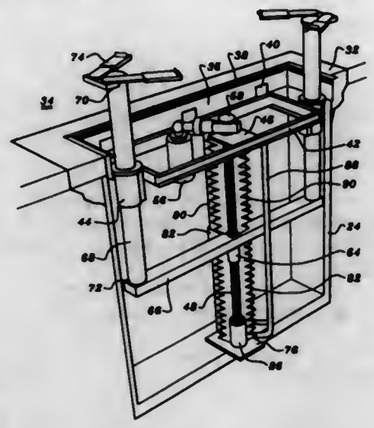
1. A cableless elevator system for high buildings having elevator cars moving in and between at least two vertically extending elevator shafts comprising:

an elevator car having a friction drive means attached thereto for moving along a vertical travel path in an elevator shaft and along an horizontal travel path extending from the elevator shaft;

a linear drive having a first portion mounted on said elevator car and a second portion mounted in the elevator shaft for moving said elevator car along the vertical travel path; and

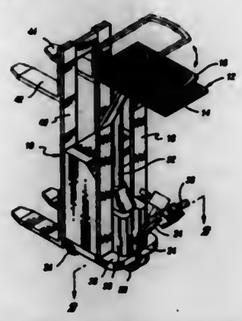
horizontal guide means extending from the elevator shaft and forming the horizontal travel path for said elevator car, said horizontal guide means including pivotable intermediate pieces for selectively closing and opening gaps in the elevator shaft at the horizontal travel path along the vertical travel path for said elevator car.

**5,501,296**
**DUAL POST SINGLE SCREW AUTOMOTIVE SCREW LIFT SYSTEM**
Robert H. Fletcher, San Diego, Calif., assignor to Advantage Lift Systems, Inc., San Diego, Calif.
Continuation-in-part of Ser. No. 194,858, Feb. 9, 1994, Pat. No. 5,404,968. This application Dec. 16, 1994, Ser. No. 357,853
Int. Cl.[6] B66F 7/10
U.S. Cl. 187—210 20 Claims



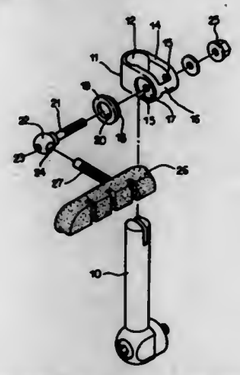
1. An automotive screw lift system, comprising:
(a) an environment-defining enclosure having an upwardly directed mouth, said mouth positioned substantially at a work level of the system, said enclosure defining both a longitudinal and a transverse axis;
(b) means for anchoring of said enclosure relative to reactive forces generated by vehicles during lifting thereof by said system, said anchoring means disposed substantially at said work level and peripherally about and to said mouth of said enclosure;
(c) a rigid support structure secured tip on inner surfaces of said anchoring means, thereby defining a rigid horizontal plane substantially across said mouth of said enclosure and co-parallel therewith;
(d) vertically directed guide means secured to longitudinally opposite ends of said support frame;
(e) a vertically-oriented elongated screw drive having an upper end and a lower end, said upper end including an annular thrust bearing positioned at about the level of said support frame and said lower end thereof including a screw drive support bearing;
(f) power means for imparting selectable rotation to said screw drive, an output of said power means in mechanical linkage to said thrust bearing of said screw drive;
(g) a load nut screw-threadably mounted upon said screw drive, said nut comprising means for facilitating upward and downward travel upon said screw drive;
(h) a load nut mounting tube, secured radially outwardly of said screw drive, said tube having a interior portion thereof rigidly mounted upon said load nut, thereby preventing the rotation thereof;
(i) a pair of vertically-disposed plungers, each having an upper end and a lower end, each lower end thereof secured upon a cross-beam, each plunger passing vertically upwardly through a respective one of said collars; and
(j) automotive superstructure support means secured to each of said upper ends of said cylindrical plungers.

**5,501,297**
**SAFETY GUARD ASSEMBLY FOR FORK LIFT TRUCKS**
Harold Josephs, 25311 Ronald Ct., Oak Park, Mich. 48237, assignor to Harold Josephs, Oak Park, Mich.
Filed Nov. 8, 1994, Ser. No. 335,639
Int. Cl.[6] B66F 9/06
U.S. Cl. 187—222 18 Claims



1. An overhead guard assembly for a pedestrian-operated industrial lift truck maneuvered by an arcuately shifting handle and a vertically elongated mast supporting an article lifting implement, said guard assembly comprising:
an elongated shaft having a vertical axis, said shaft being rotatable about said vertical axis, said shaft being operatively connected to said handle for rotating said shaft as said handle is arcuately shifted;
a fixed horizontally disposed structural member mounted adjacent the upper end of said mast; and
a pivotable horizontally disposed structural member mounted adjacent the upper end of said mast, said pivotable member being operatively connected to said elongated shaft and arcuately movable in a horizontal plane intersecting said vertical axis whereby said pivotable member rotates in tandem with said handle to provide an overhead barrier above said handle.

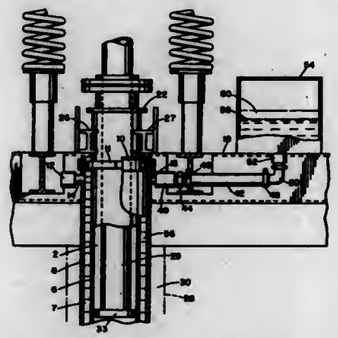
**5,501,298**
**BRAKE MECHANISM**
Chen Zen-Ming, P.O. Box 53-8, Taichung, Taiwan
Filed May 22, 1995, Ser. No. 445,707
Int. Cl.[6] B62L 1/06
U.S. Cl. 188—24.19 2 Claims



1. A brake mechanism for a bicycle comprising:
an actuating arm for securing to the bicycle,
a clamper including a pair of walls, said walls including a gap formed therebetween and including a first end portion having an opening formed therein for engaging with said actuating arm and including a second end portion having a bar bridging said gap,
a bolt including a first end engaged through said walls and threadedly engaged with a nut, and including a second end having a head formed thereon, said head including a puncture laterally formed therein, and
a brake shoe including a rod engaged within said puncture of said head,
said rod being forced to engage with said clamper when said nut is threaded to said bolt, and said rod being adjustable relative to said head before said nut is threaded to said bolt.



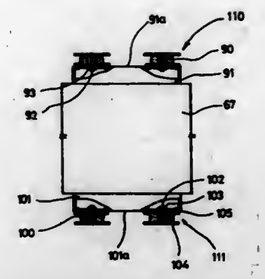
**5,501,299**
**PROCESS AND APPARATUS FOR PREVENTING CORROSION OF A HYDRAULIC ELEVATOR CYLINDER**
William K. Holmes, San Diego, Calif., assignor to U.S. Elevator, El Cajon, Calif.
Filed Jan. 5, 1994, Ser. No. 177,424
Int. Cl.[6] B66B 9/04
U.S. Cl. 187—272 34 Claims



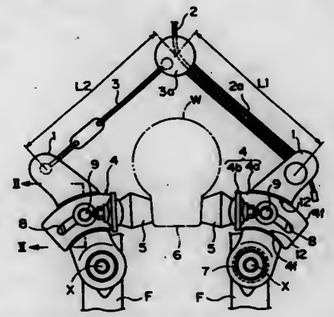
1. A process for protecting a hydraulic cylinder having a surface exposed to an underground environment against biogenic and aqueous corrosion, comprising the steps of:
a. enclosing said cylinder surface exposed to said environment within a casing with a space between said cylinder surface and said casing;
b. substantially filling said space with a fluid;
c. providing a fluid conduit between said space and a reservoir for said fluid;
d. filling said space and that portion of said reservoir below a predetermined level with said fluid; and
e. detecting the presence of water in said space by observation of said fluid reaching a level in said reservoir above said predetermined level.

**5,501,300**
**MOVER VIBRATION ABSORBING DEVICE FOR LINEAR MOTOR ELEVATOR**
Kil H. Cho, Changwon, Rep. of Korea, assignor to LG Industrial Systems Co., Ltd., Seoul, Rep. of Korea
Filed Oct. 26, 1994, Ser. No. 329,473
Claims priority, application Rep. of Korea, Nov. 5, 1993, 23119/1993
Int. Cl.[6] B66B 1/28
U.S. Cl. 187—289 6 Claims

1. In a mover vibration absorbing device for a linear motor elevator, said elevator comprising a counter support unit vertically reciprocated by a linear motor in the opposite direction of an elevator car, a rod type stator vertically penetrating the counter support unit and fixed at its top and bottom ends to a top support frame and to a bottom support frame, and a hollow cylindrical mover placed in the center of the counter support unit and slidably receiving at its center the stator and vertically reciprocated along the stator, the improvement comprising:
top and bottom frames provided on top and bottom of said counter support unit respectively;
top steel plates coupled to flanges of the top and bottom frames respectively;
top and bottom support members provided on top and bottom surfaces of the hollow cylindrical mover respectively;
bottom steel plates coupled to flanges of said top and bottom support members respectively;
top and bottom vibration absorbing rubbers, each of said rubbers being interposed between an associated top steel plate and an associated bottom steel plate; and
fixing means for fixing the top steel plates to the flanges of the top and bottom frames and for fixing the bottom steel plates to the flanges of the top and bottom support members.



**5,501,301**
**BICYCLE BRAKE ARM HAVING A BRAKE SHOE CLEARANCE ADJUSTING MECHANISM**
Yasushi Nishimura, Izumi, Japan, assignor to Shimano Inc., Osaka, Japan
Filed Jul. 21, 1994, Ser. No. 277,269
Claims priority, application Japan, Jul. 26, 1993, 5-040631
Int. Cl.[6] B62L 1/08;1/14
U.S. Cl. 188—24.19 15 Claims



1. A bicycle brake apparatus comprising:
a brake arm pivotally mounted to a bicycle frame adjacent to a bicycle tire rim for providing selective engagement and disengagement of a brake shoe mounted on said arm against the rim by pivotal movement of the brake arm about a pivot axis on said frame;
a support member adjustably mounted to said brake arm via a first adjusting mechanism for positional changes with respect to said brake arm, said brake shoe adjustably mounted to said support member via a second adjusting mechanism for posi-

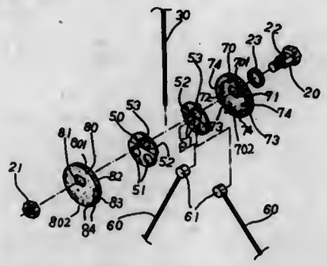
tion changes relative to said support member, said support member confined to arcuate movement about said pivot axis relative to said brake arm.

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**5,501,302**
**HANGING APPARATUS FOR BRAKE CORD OF A BICYCLE**

**Yuh-Jou Hung, No.16, Wei Hsin chuang, Shih Pai Li, Changhua City, Taiwan**

**Filed Jul. 24, 1995, Ser. No. 506,212**
**Int. Cl.[6] B62L 3/00**
**U.S. Cl. 188—24.21** **1 Claim**



1. A hanging apparatus for a brake cord of a bicycle, an end of the brake cord being securely connected with said hanging apparatus and two hanging cords being connected between said hanging apparatus and two brake blocks, said brake cord being able to pull Said hanging apparatus to synchronously pull the hanging cords so as to drive the brake blocks to move toward each other for frictionally contacting with a rim of a wheel to brake the bicycle, said hanging apparatus comprising:.

two circular metal plates each having a middle bent sections a lower section formed with two circular holes. and an upper section formed with an elliptic hole the upper section of the metal plate being formed with a semicircular channel above the elliptic hole, whereby when the two metal plates are attached to each other the channels together form a circular socket having a diameter slightly smaller than that of a brake cord, two hanging heads of the hanging cords capable of being positioned in the circular holes of the metal plates, whereby when the metal plates are attached to each other, the hanging cords are adapted to be clamped therebetween;

a seat member receiving the metal plates and formed with an elliptic hole and a peripheral flange disposed with upper and lower notches and left and right notches, a diameter of each notch being slightly larger than that of either of the hanging cords, whereby the hanging cords could be capable of passing through the left and right notches Of the flange of the seat member; and

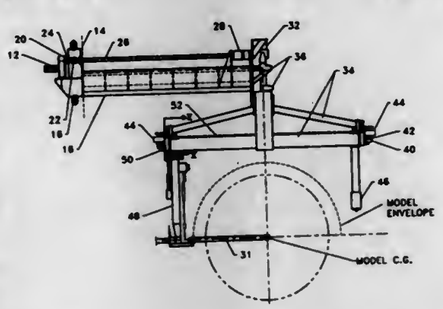
a cover member overlaid on the seat member, the cover member being formed with an elliptic hole and a peripheral flange formed with upper and lower notches and left and right notches, several engaging posts being disposed on the flange of the seat member and several engaging orifices being formed on the flange of the cover member, whereby the engaging posts can be inserted into the engaging orifices so as to engage the cover member with the seat member and clamp the metal plates and the hanging heads therebetween with the hanging cords passing through the notches of the seat member and cover member, a stepped bolt having an elliptic large diameter section and a threaded small diameter section being passed through a rubber washer, the elliptic holes of the seat member, metal plates and cover member, the threaded section of the bolt being tightened by a nut, a through bole being formed on the large diameter section of the bolt in allignment with the circular socket of the metal plates, whereby the brake cord can pass through the upper notches of the seat member and cover member, the circular socket of the metal plates, the through hole of the bolt and a clearance between the lower sections of the metal plates and the lower notches of the seat member and cover member, the bolt being tightened by the nut and adapted to be able to pull the brake cord, the seat member and cover member being engaged with each other to compress the circular socket of the metal plates and adapter to bind the brake cord therein without loosening therefrom, the hanging cords adapted to be sufficiently swingable within the left and right notches of the seat member and cover member without being tensioned during braking operation.

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**5,501,303**
**SINGLE ACTING TRANSLATIONAL/ROTATIONAL BRAKE**

**Johnny W. Allred, Newport News, and Vincent J. Fleck, Jr., Yorktown, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.**

**Continuation of Ser. No. 64,324, May 12, 1993, abandoned. This application Jul. 21, 1995, Ser. No. 505,054**
**Int. Cl.[6] F16D 63/00; F16F 9/00**
**U.S. Cl. 188—67** **6 Claims**




1. A single action brake apparatus for simultaneously braking translational movement of a translatable housing and rotational movement of a rotatable shaft secured to the housing, the housing being mounted on and translatable along a track, the rotatable shaft having an axis of rotation perpendicular to the track, the brake apparatus comprising:

at least one flat surface brake for braking the translational movement along the track of the translatable housing;

a cone friction brake for braking the rotational movement of the rotatable shaft; and

means for applying a force to the cone friction brake in a direction parallel to the axis of rotation of the rotatable shaft, the force causing the cone friction brake to engage and creating a reaction force that causes the flat surface brake to engage.

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**5,501,304**
**BAND BRAKE HOLDER/LEVER**

**Anthony W. Fini, Jr., 4273 Mundy St., Blasdell, N.Y. 14219**

**Division of Ser. No. 252,890, Jun. 2, 1994, abandoned. This application May 1, 1995, Ser. No. 434,581**
**Int. Cl.[6] F16D 51/02**
**U.S. Cl. 188—77 W** **5 Claims**

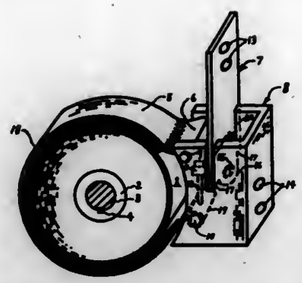
1. A band brake assembly comprising:

a brake drum, mounted to a shaft and rotatable with said shaft;

a bracket mounted adjacent said brake drum having generally; parallel spaced legs interconnected by a base and opposed slots in said legs;

a brake band arranged around said brake drum and means for mounting one end of said brake band;





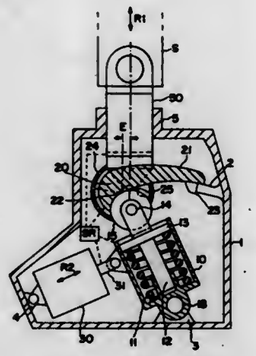
a lever member sized for said opposed slot and mounted in said opposed slots, means for connecting the opposite end of said brake band to said lever member between said generally parallel spaced legs, and means for preventing movement of said lever member on the bottom of one of said slots when said lever member is pivotally moved so that when force is applied to said lever member said lever member pivots on the bottom of said one of said slots and pulls said brake band around said brake drum whereby the rotation of said brake drum is opposed.

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**5,501,305**
**DEVICE FOR GENERATING A REVERSIBLE WORKING STROKE**

**Joseph Stalmeir, and Erich Fuderer, both of Munich, Germany, assignors to Knorr-Bremse AG, Munich, Germany**

**Filed Jun. 24, 1994, Ser. No. 265,213**
**Claims priority, application Germany, Sep. 8, 1993, 43 30 440.0**
**Int. Cl.[6] F16D 65/16;65/32**
**U.S. Cl. 188—167** **31 Claims**



1. A force generating system for generating a reversible working stroke with a variable force acting upon a force take-up system which, because of varying elastic deformation, develops a counter-force which changes as a function of the stroke, comprising:

a lever mechanism including a pivot point fixed with respect to a force take-up system and including a lever arm for interacting with said force take-up system at a force application point of a given lever arm length;

an energy-storing force generating device which acts upon the lever mechanism at a changeable position of its lever arm for supplying a portion of the energy stored in it when the lever arm length is increased and, for at least partially taking up again the energy taken up by the force take-up system when the lever arm length is decreased;

an adjusting arrangement for the controllable changing of the position in which the force generating device acts upon the lever arm of the lever mechanism; and

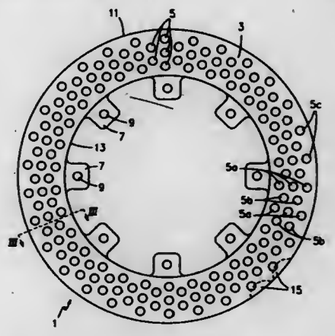
a sensor for detecting the position in which the force generating device acts upon the lever arm of the lever mechanism.

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**5,501,306**
**BRAKE ROTOR WITH A HEAT-RESISTANT CERAMIC COATING**

**Gerald Martino, P.O. Box 202, New Stanton, Pa. 15672**

**Filed Jun. 10, 1994, Ser. No. 257,873**
**Int. Cl.[6] F16D 65/10**
**U.S. Cl. 188—218 XL** **20 Claims**



1. A racing car brake rotor comprising:

a solid brake ring;

said brake ring comprising means for connecting to a racing car braking system;

said means for connecting having at least one connection portion, each of said at least one connection portion having at least one physical dimension configured for connection with a hub of a braking system;

said brake ring having first and second opposing braking surfaces, said first and second braking surfaces being oriented generally parallel to one another;

said first and second braking surfaces having means for being contacted by friction pads of a braking system;

said brake ring defining a central rotational axis being generally perpendicular to said first and second braking surfaces;

said brake ring having:

an inner peripheral surface, disposed towards said central rotational axis and generally connecting said first and second braking surfaces; and

an outer peripheral surface, disposed away from said central rotational axis and generally connecting said first and second braking surfaces;

a plurality of apertures being disposed through said brake ring, said plurality of apertures extending through said brake ring between said first and second braking surfaces;

said plurality of apertures being configured for dissipating heat during a braking operation of said rotor;

a ceramic coating disposed at least on said first and second braking surfaces, said ceramic coating being configured for providing thermal insulation for said brake rotor

said plurality of apertures comprise:

a set of smaller apertures and a set of larger apertures;

each of said set of smaller apertures being disposed radially closer to said outer peripheral surface than are said larger apertures;

a plurality of sets of two apertures, wherein each set of said plurality of sets of two apertures comprises two of said larger apertures; and

a plurality of sets of three apertures, wherein each set of said plurality of sets of three apertures comprises at least one of said larger apertures and at least one of said smaller apertures.

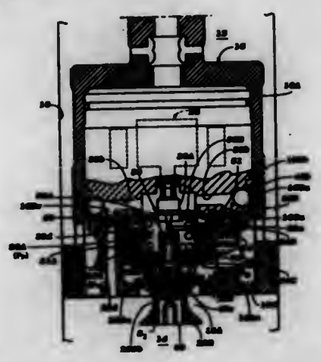
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**5,501,307**

## SHOCK ABSORBER

Sonstenod Lars, Upplands Vasby, Sweden, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

PCT No. PCT/JP92/01383, § 371 Date Apr. 22, 1994, § 102(e) Date Apr. 22, 1994, PCT Pub. No. WO93/08416, PCT Pub. Date Apr. 29, 1993
PCT Filed Oct. 23, 1992, Ser. No. 211,872
Claims priority, application Japan, Jan. 24, 1991, 3-383880
Int. Cl.[6] F16F 5/00
U.S. Cl. 188—319 31 Claims



1. A shock absorber comprising a cylinder, a piston in said cylinder for defining two main oil chambers in said cylinder, a main oil channel for communicating said two main oil chambers, a main valve for opening and closing said main oil channel, a main chamber facing to one end of the main valve so as to transmit the hydraulic pressure in the high pressure side main oil chamber for biasing said main valve toward the direction for opening said main oil channel, a pilot chamber facing to the other end of said main valve, a pilot valve for releasing the pressure in said pilot chamber to the low pressure side main oil chamber, a linear solenoid for biasing said pilot valve in a closing direction, a variable orifice having an opening area varied solely by the relative positions of said pilot and main valves, and a pilot flow channel extending from said main chamber through the variable orifice and through said pilot valve to the low pressure side main oil chamber.

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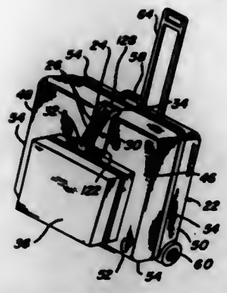
**5,501,308**

## RETRACTABLE INCREMENTALLY ADJUSTING AUXILIARY LUGGAGE ATTACHMENT MECHANISM AND METHOD

William L. King, Denver, Colo., assignor to Samsonite Corporation, Denver, Colo.

Filed Jan. 18, 1994, Ser. No. 182,495
Int. Cl.[6] A45C 5/14;13/30;13/38
U.S. Cl. 190—102 20 Claims

1. An attachment mechanism adapted to attach an auxiliary luggage case to a main luggage case, comprising:
- a cassette attached to the main luggage case, the cassette defining an elongated receptacle and a retention edge adjacent to the receptacle;
- an elongated flexible belt;
- an auxiliary luggage case attachment device connected to an outer end of the elongated belt;



- a plurality of link members connected to the belt, one of the link members being a stop link member connected to an inner end of the elongated belt, the other ones of the link members being intermediate link members positioned in substantially abutting relationship with one another along the length of the belt between the attachment device and the stop link member;
- the elongated receptacle having a length adapted to receive the belt and the link members connected to the belt;
- means for retaining the stop link member within the receptacle to prevent removal of the stop link member from the receptacle and to allow movement of the stop link member along the length of the receptacle;
- the belt and the intermediate link members being selectively extendable and retractable between a fully extended position outside the receptacle and a fully retracted position within the receptacle;
- adjacent intermediate link members being separated by a distance sufficient to allow a portion of the flexible belt between the adjacent intermediate link members to contact the retention edge while one of the adjacent intermediate link members extends outside of the receptacle and the other one of the adjacent intermediate link members is retracted within the receptacle;
- the cassette including a restraint structure adjacent to the receptacle and the retention edge to restrain the other one of the adjacent intermediate link members within the receptacle and establish a partially extended position of the belt and the intermediate link members outside the receptacle once the portion of the belt contacts the retention edge; and
- the restraint structure and the retention edge supporting the weight of the auxiliary luggage case once the auxiliary luggage case is attached to the attachment device at the outer end of the belt.

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**5,501,309**

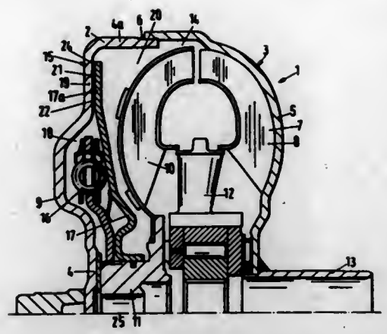
## HYDROKINETIC TORQUE CONVERTER WITH LOCKUP CLUTCH

Ernst Walth, Heilbronn, and Georg Weidner, Bühl, both of, Germany, assignors to LuK Getriebe-Systeme GmbH, Bühl, Germany

Filed Jul. 27, 1994, Ser. No. 281,409
Claims priority, application Germany, Jul. 30, 1993, 43 25 685.8
Int. Cl.[6] F16H 45/02; F16D 13/72
U.S. Cl. 192—3.29 23 Claims

1. A hydrokinetic torque converter comprising:
- a housing having a fluid-containing chamber and being rotatable about a predetermined axis;
- a pump, a turbine and a stator in said chamber; and
- an engageable and disengageable lockup clutch interposed between said housing and said turbine and comprising a piston movable in said chamber in the direction of said axis and dividing said chamber into a first compartment disposed at a first radial distance from said axis and a second compartment wherein the pressure of fluid varies when the converter is in use, at least one first friction surface carried by said





piston and at least one second friction surface carried by a component rotatable with said housing, said friction surfaces confronting and being in engagement with each other in the engaged condition of said clutch and being disposed at a greater second radial distance from said axis, at least one of said piston and said component having at least one passage for the flow of fluid from said second compartment into said first compartment along said friction surfaces in the engaged condition of said clutch, at least one of said piston and said component being elastically deformable at said at least one passage and said at least one passage being configurated to permit variations of the rate of fluid flow therein as a function of variable fluid pressure in said second compartment and the elastic deformability of said at least one of said piston and said component.

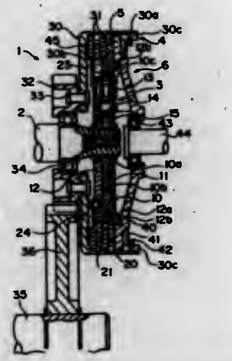
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**5,501,310**

## MOTORCYCLE CLUTCH DEVICE

Koji Kajitani, Kyoto; Hiroshi Mizukami, Neyagawa, and Norihisa Uesohara, Ibaraki, all of, Japan, assignors to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Aug. 11, 1994, Ser. No. 289,361
Claims priority, application Japan, Aug. 20, 1993, 5-206640; Aug. 20, 1993, 5-206641
Int. Cl.[6] F16D 13/22
U.S. Cl. 192—48.3 17 Claims



1. A clutch device for transmitting and disconnecting power between the crankshaft of a motorcycle engine and the input shaft of a manual transmission, comprising:
- an hub assembly;
- a first friction disk member coupled to said hub assembly for rotation therewith in both a first and a second rotational direction;
- a second friction disk member coupled to said hub assembly for rotation therewith in only one of said directions;
- an annular plate fixed to said hub extending radially beyond an outer circumference of said hub, limiting movement of said first and second friction disk members in a first axial direction;
- a clutch case at least partially enclosing said hub assembly and said friction disk members;
- at least one third friction disk member coupled to said clutch case for rotation therewith and extending between said first and second friction disks;
- a pressure plate supported on said clutch case biased for pressing said friction disks into contact with each other within said clutch case.

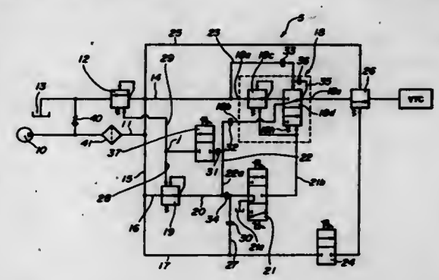
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**5,501,311**

## FLUID PRESSURE CONTROL DEVICE FOR VARIABLE TORQUE TRANSFER OF FOUR WHEEL DRIVE VEHICLE

Tatsuo Wakahara, Kawasaki, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 6, 1994, Ser. No. 319,047
Claims priority, application Japan, Nov. 24, 1993, 5-293658
Int. Cl.[6] F16D 48/02
U.S. Cl. 192—85 R 15 Claims



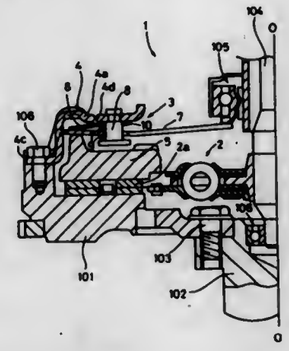
1. In a four wheel drive system having a variable torque transfer through which the driving force distribution between front and rear wheels of a vehicle is varied in accordance with the magnitude of fluid pressure supplied to the transfer,
- a fluid pressure control device for producing the fluid pressure supplied to said transfer, which comprises:
- a first hydraulic circuit which is arranged to have a first operation mode wherein the first hydraulic circuit outputs, for the transfer, a fluid pressure which is varied continuously;
- a second hydraulic circuit which is arranged to have a second operation mode wherein the second hydraulic circuit outputs, for the transfer, a fluid pressure which is varied stepwisely;
- piping means for connecting said first and second hydraulic circuits to constitute a united hydraulic circuit; and
- shutters arranged in given portions of said piping means to selectively open and close the given portions for allowing said united hydraulic circuit to have said first and second operation modes selectively.

5,501,312

## CLUTCH ASSEMBLY CONE SPRING HAVING WEAR PROTECTION MEANS

Hiroshi Mizukami, Neyagawa; Koji Kajitani, Tsuzuki; Keisuke Fujimoto, Hirakata, and Norihisa Uenohara, Ibaraki, all of, Japan, assignors to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Aug. 16, 1994, Ser. No. 291,650
Claims priority, application Japan, Aug. 25, 1993, 5-046236 U; Aug. 25, 1993, 5-046237 U; Aug. 25, 1993, 5-046238 U
Int. Cl.[6] F16D *13/48*
U.S. Cl. 192—89.23 11 Claims



1. A clutch cover assembly comprising:
- a clutch cover attachable to a flywheel, said clutch cover provided with hardened support portions;
- a pressure plate concentrically disposed within said cover;
- a diaphragm spring having a lever portion and a pressing portion, said diaphragm spring coupled for pivotal movement to said cover, said pressing portion engaging said pressure plate, said pressing portion formed proximate an outer radial edge of said diaphragm spring;
- a cone spring disposed within said cover between said diaphragm spring and an inner surface of said clutch cover, an inner radial edge of said cone spring engaging said hardened support portions and an outer radial edge of said cone spring engagable with said pressing portion for urging said pressure plate toward the flywheel.

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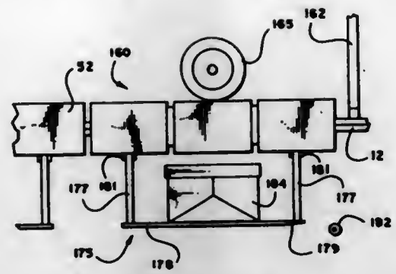
5,501,313

## SUSPENDED TILTING TRAY PACKAGE SORTING APPARATUS

Henri Bonnet, Atlanta, Ga., assignor to United Parcel Service of America, Inc., Atlanta, Ga.

Division of Ser. No. 154,207, Nov. 17, 1993, Pat. No. 5,433,311. This application Mar. 6, 1995, Ser. No. 398,544
Int. Cl.[6] B65G *47/46*
U.S. Cl. 198—370.09 13 Claims

1. An apparatus for transporting objects, comprising:
- a track;
- a plurality of carriages mounted for movement along said track;
- a drive mechanism operable to move a line of said carriages along said track; and
- an object-holding platform suspended from two carriages and below at least two of said carriages and movable with said line of carriages.



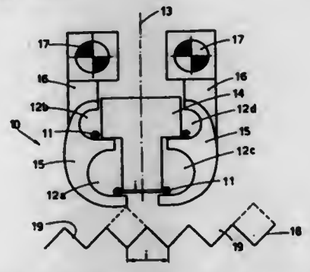
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5,501,314

## METHOD FOR THE MULTIPLE RECEIPT AND DISCHARGE OF ROLLED SECTIONS ONTO A COOLING PLATE AND DEVICE PERFORMING SUCH METHOD

Ferruccio Tomat, Udine, and Giuseppe Bordignon, Bicinicco, both of, Italy, assignors to Danieli & C. Officine Meccaniche SpA, Buttrio, Italy

Filed Jul. 20, 1994, Ser. No. 278,001
Claims priority, application Italy, Jul. 30, 1993, UD93A0149
Int. Cl.[6] B65G *47/30*
U.S. Cl. 198—418.1 14 Claims



1. Method for the multiple receipt and discharge of rolled sections onto a cooling plate having a plurality of acceptance seatings for accepting sections, the seatings having a pitch "i", comprising delivering a first group of two or more rolled sections simultaneously from an intake channel to at least one multigroove equipped channel, the at least one multigroove channel comprising a supporting bar and panels moveable with respect to and provided adjacent opposite sidewalls of the supporting bar, the sidewalls having an upper portion extending further toward the panels than a lower portion of the sidewalls, each of the panels cooperating with one of the sidewalls of the supporting bar to define therebetween a first guide groove adjacent the lower portion of the sidewall and a second guide groove above the first guide groove and adjacent the upper portion of the sidewall, the panels and sidewalls being conformed to ensure that a first displacement of each panel away from the supporting bar frees a section in the first guide groove while a further displacement frees a section in the second guide groove, discharging the first group while another group of sections arrives in separate distinct grooves in the at least one multigroove equipped channel, such discharge taking place in cooperation with specific acceptance seatings on the cooling plate, advancing the cooling plate in each forward movement cycle by a number of acceptance seatings equal to "n" times the pitch ("i") of the cooling plate, the number "n" being a function of the number of rolled sections arriving at the same time, wherein adjacent lower grooves of said at least one multigroove equipped channel are separated by a distance approximately equal to the pitch "i" of the cooling plate, whereby discharge of sections from the adjacent lower grooves allows the sections to fall directly into adjacent acceptance seatings in the cooling plate.



5,501,315

## UNSCRAMBLING CONVEYOR

Weston R. Loomer, Walton, Ky., assignor to Western Atlas Inc., Hebron, Ky.

Division of Ser. No. 135,598, Oct. 13, 1993, Pat. No. 5,400,896. This application Jan. 20, 1995, Ser. No. 376,197
Int. Cl.[6] B65G *47/12*
U.S. Cl. 198—445 13 Claims



1. A combined flow splitter and unscrambling conveyor having one input and two outputs, the conveyor comprising:
- a first and second set of rollers forming a herringbone pattern and having a first output conveyor coupled to the downstream end;
- a third and fourth set of rollers forming a herringbone pattern and having a second output conveyor coupled to the downstream end;
- an input conveyor coupled to the second and third set of rollers at the upstream end;
- means for applying diverging lateral forces to articles delivered at the upstream end of the second and third set of rollers;
- means for applying converging lateral forces to articles on the first and second sets of rollers and on the third and fourth sets of rollers; whereby articles enter the conveyor in a scrambled mass at the upstream end of the second and third sets of rollers and exit the conveyor in two lines at the downstream end of the first end second sets of rollers and the third and fourth sets of rollers.

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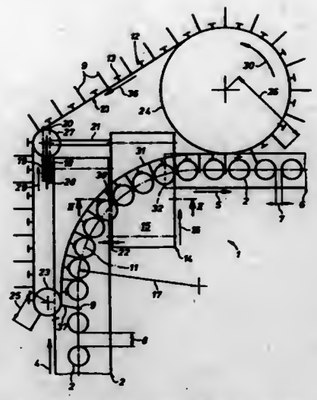
5,501,316

## ROUTING APPARATUS FOR A TRAIN OF CONTAINERS OF GLASS OR THE LIKE

Heinz Hermening, Porta Westfalica; Siegfried Schwarzer, Stöckse, and Hans-Georg Seidel, Rinteln, all of, Germany, assignors to The firm Hermann Heye, Obernkirchen, Germany

PCT No. PCT/EP93/02434, § 371 Date Jun. 17, 1994, § 102(e) Date Jun. 17, 1994, PCT Pub. No. WO94/08879, PCT Pub. Date Apr. 28, 1994
PCT Filed Sep. 9, 1993, Ser. No. 256,008
Claims priority, application Germany, Jan. 20, 1992, 42 35 369.6
Int. Cl.[6] B65G *47/26*
U.S. Cl. 198—457 33 Claims

1. Apparatus for the routing of containers of glass, glass-like material or plastics material arriving on a first conveyor belt in a row at a comparatively high, first speed to a second conveyor belt running at a lower, second speed and at an angle to the first conveyor belt, wherein the second conveyor belt carries the containers away in a row, said apparatus comprising:
- transportation fingers for routing each container;
- a common drive member on which said transportation fingers are arranged for moving said fingers;
- wherein said transportation fingers are guided on a continuously curved path during the routing of the containers from the first to the second conveyor belt, said curved path being concave relative to the containers;
- support means for maintaining each container on said continuously curved path;
- at least one intermediate belt arranged in said continuously curved path between the first conveyor belt and the second conveyor belt for taking control of each container along part of said continuously curved path; and
- wherein each said intermediate belt, said first conveyor belt and said second conveyor belt each have an upper run, said upper run of each said intermediate belt being approximately co-planar with the upper runs of the first and second conveyor belts and drivable in a direction so as to impart to the containers a driving component in a direction toward said drive member.



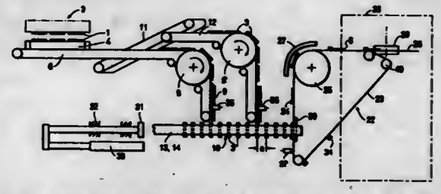
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5,501,317

## APPARATUS FOR RECEIVING AND ADVANCING CONTAINER LIDS OF FERROMAGNETIC MATERIAL

Walter Sommer; Wilhelm Lange, both of Essen, and Klaus-Peter Dirks, Moers, all of, Germany, assignors to Krupp Maschinentechnik Gesellschaft mit beschränkter Haftung, Essen, Germany

Filed May 9, 1994, Ser. No. 240,105
Claims priority, application Germany, May 7, 1993, 43 15 307.0
Int. Cl.[6] B65G *35/00*
U.S. Cl. 198—464.2 13 Claims



1. An apparatus for receiving ferromagnetic container lids from a first processing unit and for advancing the lids to a second processing unit, comprising
- (a) a storage track having a length dimension and opposite first and second ends; said storage track including
  - (1) first and second magnet assemblies extending parallel to said length dimension in a substantially horizontal orientation; said first and second magnet assemblies having a clearance corresponding to an expected outer diameter of the lids for accommodating the lids in said clearance in an orientation in which said outer diameter of the lids is perpendicular to said length dimension; said lids being adapted to be suspended in said clearance by magnetic forces generated by said first and second magnet assemblies and acting on the lids;
  - (2) a first abutment situated in said clearance at said first end of said storage track for abutting an outermost lid of a lid series suspended in said clearance; and

(3) a second abutment situated in said clearance at said second end of said storage track for abutting an outermost lid of the lid series;

(b) a supply conveyor extending to said storage track for advancing the lids to said storage track and introducing the lids in a vertical direction into said storage track; and

(c) a removal conveyor extending from said storage track for removing a lid therefrom; the lids in suspension in said clearance assume a spaced relationship relative to one another by mutual repulsion.

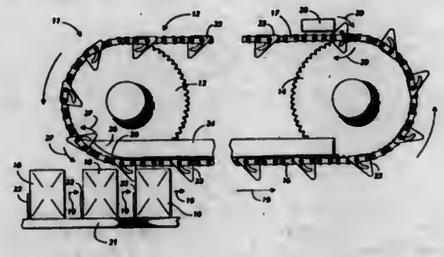
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**5,501,318**

**OVERHEAD PUSHER LUG ASSEMBLY FOR PACKAGING MACHINES**

**Jeff A. Diarud, Marietta, Ga., assignor to Riverwood International Corporation, Atlanta, Ga.**

**Filed Jul. 6, 1994, Ser. No. 271,297**
**Int. Cl.[6] B65G 19/26**
**U.S. Cl. 198—732** **12 Claims**



1. An overhead pusher lug assembly for use in article packaging machines wherein cartons to be packed are conveyed sequentially along a path with a predetermined space being provided between each carton and its immediately trailing carton, said overhead pusher lug assembly being generally disposed above the carton path and comprising:

an endless flexible lug conveyor having an upper flight and a lower flight with said lower flight of said lug conveyor being positioned to overlie cartons on said path and being oriented substantially along the direction of carton movement;

said lug conveyor having an upstream end and a downstream end and being driven to move said lower flight of said conveyor from said upstream end to said downstream end at a rate synchronized with the rate at which cartons are conveyed along the path;

an array of pusher lugs rotatably mounted at spaced intervals along said lug conveyor;

each of said pusher lugs being rotatable on said conveyor between a first position wherein said lug projects generally upwardly from said lower flight of said conveyor in a direction away from the carton path and a second position wherein said lug projects generally downwardly from said lower flight of said conveyor in a direction toward the carton path;

said pusher lugs, when in their second positions, projecting into the spaces between cartons on the carton path with each downwardly projecting lug engaging the trailing edge of a carton on the path to stabilize the carton as it is conveyed along the path;

first means at the upstream end of said pusher lug assembly for rotating said pusher lugs from their first positions to their second positions as the lugs move onto said lower flight of said lug conveyor to insert the lugs into the spaces between leading and trailing cartons on the path and to avoid impact between the lugs and trailing cartons on the path; and

second means on said pusher lug assembly for rotating said pusher lugs from their second positions back to their first positions after said pusher lugs have traversed said lower flight of said lug conveyor.

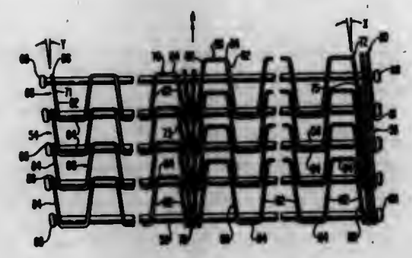
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**5,501,319**

**CONVEYOR BELT WITH ASYMMETRIC EDGE LINKS**

**John Larson, Northfield, Minn., and Jack R. Raum, Winchester, Va., assignors to Ashworth Bros., Inc., Fall River, Mass., and Northfield Freezing Systems, Inc., Northfield, Minn.**

**Filed Jun. 21, 1994, Ser. No. 263,071**
**Int. Cl.[6] B65G 21/18**
**U.S. Cl. 198—778** **27 Claims**



1. A flat wire conveyor belt having a direction of travel, for use in a conveyor system including an edge drive means for driving the belt in the direction of travel and a stationary support framework which supports the belt, said belt comprising:

a plurality of transversely disposed links of flat wire each integrally including a plurality of laterally spaced substantially longitudinally disposed first members and a plurality of transversely disposed connecting members each connecting adjacent ones of said first members, adjacent ones of said connecting members extending between opposite ends of said first members so that the first and connecting members of each flat wire link form a plurality of alternating oppositely opening nestable segments, each of said first members having a pair of longitudinally spaced first openings extending laterally therethrough;

a plurality of pivotal transverse rods extending laterally across the belt and having inner and outer ends along inner and outer edges of the belt, said rods extending through said first openings to interconnect said flat wire links in transverse rows;

wherein said plurality of flat wire links includes edge links positioned at the innermost and outermost edges of the belt, said innermost edge link having an edge longitudinally disposed first member with a leading terminal end relative to the direction of travel of the belt, and said outermost edge link having an edge longitudinally disposed first member with a trailing terminal end relative to the direction of travel of the belt such that said edge links of said belt are asymmetrically orientated;

wherein said innermost edge link is immediately adjacent the drive means and said innermost edge link having a leading terminal end relative to the direction of travel of the belt reduces damage to said innermost edge link caused by contact of said terminal end with the drive means; and

wherein said outermost edge link is immediately adjacent the stationary support framework and said outermost edge link having a trailing terminal end relative to the direction of travel of the belt reduces damage to the outermost edge link caused by contact of said terminal end with the stationary support framework.

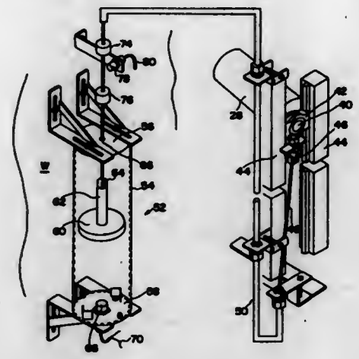


**5,501,320**

**TENSIONING ASSEMBLY FOR AN ENDLESS BELT CONVEYOR SYSTEM**

**Frank D. Chipcase, 116 Worcester Dr., Wayne, N.J. 07470, assignor to Frank D. Chipcase, Wayne, and Joseph Lupo, Nutley, both of N.J.**

**Filed Jan. 23, 1995, Ser. No. 376,828**
**Int. Cl.[6] B65G 23/44**
**U.S. Cl. 198—810.04** **11 Claims**



1. A conveyor assembly, which comprises:

a frame member;

an endless chain member;

drive means for circulating said endless chain member about said frame member;

an endless belt member spirally coiled about said frame member;

a roller assembly including a belt drive roller and a dancer roller;

tension drive means for driving said belt drive roller for tensioning said endless belt member from said frame member to cause said endless belt member to come into driving contact with said endless chain member thereby to circulate said endless belt member about said frame member, distance between said dancer roller and said belt drive roller defining tensioning relationship between said endless belt member and said endless chain member;

means for sensing said tensioning relationship and providing a signal representative of a variance of said tensioning relationship from a predetermined equilibrium position of driving contact; and

means for adjusting speed of said tension drive means in response to said signal.

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**5,501,321**

**EYEGLASSES CASE**

**Chin-Fen Liu, P.O. Box 82-144, Taipei, Taiwan**

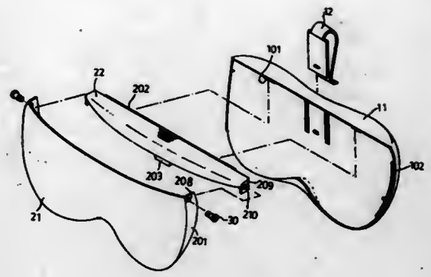
**Filed Mar. 14, 1995, Ser. No. 403,939**
**Int. Cl.[6] A45C 11/04**
**U.S. Cl. 206—5** **2 Claims**

1. An eyeglasses case comprising:

a cover made of transparent colored material and having two lugs each at one side thereof;

a movable frame having two ears each at one end thereof and being rotatably connected between the two lugs of said cover, said movable frame having a bottom formed with a recess with two opposite side walls and having a top formed with two slits; and

a container having two side edges adapted to engage with the lugs of said cover and two upper edges adapted to engage with the slits of said movable frame.



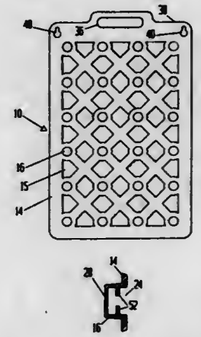
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**5,501,322**

**RECYCLABLE BOTTLE CARRIER**

**Tina Drebushenko, 5341 Overland Dr., Huntington Beach, Calif. 92649**

**Filed Sep. 2, 1994, Ser. No. 300,125**
**Int. Cl.[6] B65D 71/00**
**U.S. Cl. 206—151** **9 Claims**



1. The combination of a hand-held holder and at least one empty, uncapped bottle having, at its upper extremity, a cylindrical neck of an axial length no greater than the height of its bottlecap and a reduced diameter from that of its body and bearing an external groove for retention of a bottlecap, which comprises:

a. a one-piece holder having a planar body formed of a single, rigid, flat sheet extending the width and length of said body;

b. a plurality of apertures disposed about an apertured area entirely within the periphery of said flat sheet at spacings substantially equal to the diameters of said bottles;

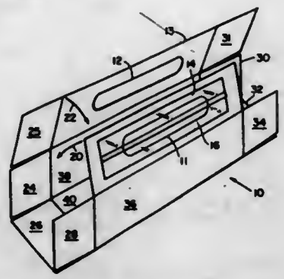
c. a plurality of integral bottleneck receptacles, one each with each of said apertures, each of said receptacles having a diameter of said bottle neck, with a substantially cylindrical side wall having an axial length no greater than the axial length of said cylindrical neck and a bottom wall, thereby forming a generally cup-shaped receptacle closed about its bottom wall and open at said aperture; and

d. at least one rib projecting from the interior of said sidewall of each of said receptacles to engage said groove on said bottle necks, whereby said bottles can be secured in orthoganol positions to said planar body;

e. a carrier support located outside of said apertured area, and adjacent the upper edge of said flat sheet, whereby said body is disposed in a vertical plane; and

d. at least one empty and cap-less bottle with its cylindrical neck received within one of said receptacles and secured therein by said rib and projecting orthogonally to the vertical plane of said body.

5,501,323
SEALED DISPENSER SYSTEM
Gary L. Deneaha, deceased, late of Hampden; Donald B. Kostanski, Hampden; Frank L. Carter, Wilbraham, and Jeffrey G. Shimmers, West Springfield, all of Mass., assignors to Pioneer Packaging, Inc., Chicopee, Mass.
Filed May 26, 1994, Ser. No. 249,634
Int. Cl.[6] B65D 85/18
U.S. Cl. 206—278 6 Claims



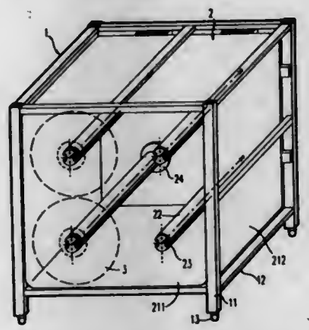
1. A sealed dispenser comprising:
a cover having a first dispensing hole therein;
a base having a second dispensing hole aligned with said first dispensing hole such that said first and second dispensing holes are congruent; and
first and second flexible overlapping flaps mounted between said cover and base and covering said holes forming a sealed barrier when said flaps are closed and permitting extraction of dispensable material when said flaps are opened.

5,501,324
SOFT-SIDED LUGGAGE CASE WITH INTERFITTING AND FOLDABLY SEPARATE PACKING COMPARTMENTS
Dana Franklin, and Bonnie M. Earl, both of Denver, Colo., assignors to Samsonite Corporation, Denver, Colo.
Filed Jan. 18, 1994, Ser. No. 182,408
Int. Cl.[6] B65D 85/18
U.S. Cl. 206—279 45 Claims



29. A soft-sided luggage case comprising:
a substantially rectangular outer peripheral frame structure;
flexible material attached to the outer peripheral frame structure to define opposing top and bottom panels, opposing end panels and a bottom face panel, said panels defining a substantially rectangular internal cavity which is open opposite the bottom face panel;
a substantially rectangular first interior frame structure;
flexible material attached to the first interior frame structure to define opposing side panels, opposing edge panels and a top face panel, said panels defining a substantially rectangular first packing compartment adapted to receive clothing and personal items;
a flexible cover;
means for selectively attaching the flexible cover to the opposing side and edge panels of the first packing compartment to selectively open and close the first packing compartment;
a substantially rectangular second interior frame structure fixed to the outer peripheral frame structure and defining a second packing compartment within the internal cavity adapted to receive clothing and personal items;
a first edge panel of the first packing compartment pivotably connected to the bottom panel to allow the first packing compartment to selectively pivot into and out of the internal cavity so that the top face panel is opposite the bottom face panel when the first packing compartment is within the internal cavity, said first and second packing compartments being adapted to receive clothing and personal items substantially only when the first packing compartment is pivoted out of the internal cavity; and
a zipper extending along a periphery of the top face panel of the first packing compartment, said zipper operable to secure the first packing compartment to the flexible material attached to the outer peripheral frame structure when the first packing compartment is pivoted within the internal cavity to maintain the first packing compartment in a closed position within the internal cavity.

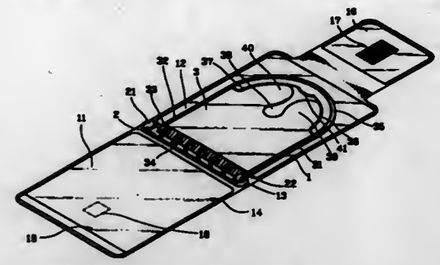
5,501,325
PACKING-CONTAINER SYSTEM FOR COILS OF MAGNETIC TAPE
Michael Mehltretter, Munich, Germany, assignor to IBSM Mehltretter GmbH, Munich, Germany
PCT No. PCT/EP92/00487, § 371 Date May 4, 1994, § 102(e) Date May 4, 1994, PCT Pub. No. WO92/18979, PCT Pub. Date Oct. 29, 1992
PCT Filed Mar. 4, 1992, Ser. No. 137,059
Claims priority, application Germany, Apr. 22, 1991, 9104918 U
Int. Cl.[6] B65D 85/671
U.S. Cl. 206—303 19 Claims



1. Packaging device for magnetic tape reels, which comprises:
an outer support frame and an inner collecting tank which is mounted within the support frame, said collecting tank being attached to the support frame so as to overhang freely and having freely overhanging side members located so as to be distanced from the support frame; and
at least one mandrel which protrudes freely from a side of the tank and is attached to the support frame in order to mount the magnetic tape reels.

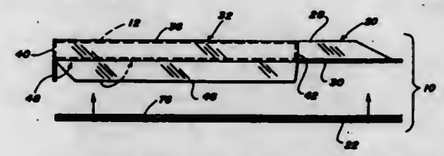


5,501,326
LASER RECORD PROTECTION FOLDER
Wu C. Shuhsiang, No.40-1, Lane 47, Sec.1, Shui-Yuan St., Tan-Shui Town, Taipei Hsien, Taiwan
Filed Jun. 26, 1995, Ser. No. 494,961
Int. Cl.[6] B65D 85/57
U.S. Cl. 206—307.1 6 Claims



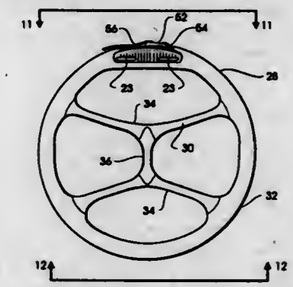
1. A laser record protection folder comprising:
an outer cover including a front cover, a rear cover, and a connection portion for connecting said two covers together; outer ends of said front cover and said rear cover extended with a fastening flap provided with fastening elements;
a loose-leaf fastener including two lock lugs on both ends thereof, and a plurality of binding rings;
several bag elements, of which each including two pieces; outer edge of said two pieces being sealed together; inner end of said bag element furnished with a plurality of binding holes so as to be attached with said loose-leaf fastener; outer end of said bag element formed into a semi-circular shape; outer end of one said piece of said bag element being an opening piece by means of dividing lines and a slot so as to facilitate a laser record to insert therein; outer end of said bag element having a center flap for retaining a laser record therein;
aforesaid loose-leaf fastener being fixedly attached to said connection portion inside said outer cover;
said bag element being attached to said binding rings by means of said binding holes; said bag element being used for receiving a laser record.

5,501,327
COMPACT DICS HOLDER
D. Sherman Cox, 4 Chipper Rd., St. Louis, Mo. 63131
Continuation-in-part of Ser. No. 71,258, Jun. 4, 1993, Pat. No. 5,351,824. This application Oct. 3, 1994, Ser. No. 317,123
Int. Cl.[6] B65D 85/30
U.S. Cl. 206—308.1 8 Claims



1. A compact disc holder for holding a jewel box containing a compact disc comprising a unitary body and a closure plate,
said body having a longitudinal axis and a top surface and a bottom surface, a generally square chamber for a jewel box formed in said body having a substantially planar top wall joined at its edges by side and end walls, said chamber side and end walls opening on the bottom surface of the body, a substantially planar tab formed in said body attached to one of the end walls, said tab having at least one ridge with first and second ends and a top wall coplanar with the top wall of the chamber, said ridge generally parallel to the longitudinal axis of the body and running substantially the length of the tab, said ridge merging with the top wall of the chamber at its first end and rising out of the plane of the tab and sloped towards the top wall of the chamber at its second end;
said closure plate closing the chamber at the bottom surface of the body
whereby the compact disc holder is resistant to folding perpendicular to its longitudinal axis such that the compact disc is less susceptible to theft and the ridge furthers proper placement of the compact disc holder in a display box.

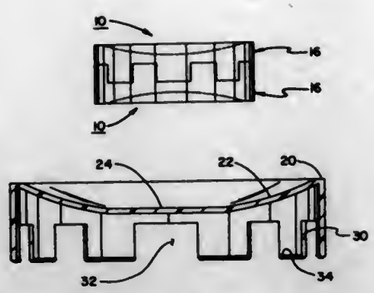
5,501,328
COVER FOR GOLF BAG THROAT STRUCTURE
Gary E. Keller, Mesa; Gregory M. Sugg, Phoenix; John A. Solheim, Phoenix, and Nip T. Lim, Phoenix, all of Ariz., assignors to Karsten Manufacturing Corporation, Phoenix, Ariz.
Filed Jan. 20, 1995, Ser. No. 375,937
Int. Cl.[6] A63B 55/00
U.S. Cl. 206—315.6 9 Claims



1. A cover for use with a golf bag wherein the golf bag has a body with a top end which is open and a bottom end which is closed, said top end of said body being defined by a throat structure that includes a peripheral ring and at least one cross bar connected at its ends to said peripheral ring, said cover being attachable to said throat structure and comprising:
an outer portion for covering said peripheral ring on said throat structure, said outer portion having opposed ends;
connection means on said outer portion for joining said opposed ends of said outer portion together;
an inner portion for covering said cross bar on said throat structure; and
fastener means on said inner portion for removably attaching said inner portion to said throat structure cross bar.

5,501,329
TELEPHONE HANDSET COVER
Daniel J. Provence, 160 Mohawk Dr., Cranford, N.J. 07016
Filed Apr. 5, 1995, Ser. No. 417,196
Int. Cl.[6] B65D 85/00
U.S. Cl. 206—320 2 Claims

1. A telephone handset cover comprising;
a cover means for positioning over a communication portion of a telephone handset, said cover means comprising an outer annular wall; a truncated conical wall extending radially outward from the outer annular wall and terminating in an enlarged center aperture; a center wall extending across the center aperture of the conical wall, the center wall being shaped so as to define a plurality of apertures directed therethrough;
an engaging means extending from the cover means for engaging a handset groove of the handset to secure the cover means relative thereto, said engaging means having a depending cylindrical side wall coupled to and extending from said outer




annular wall so as to be circumferentially extendable about a communicating portion of said handset; a plurality of arcuate tabs projecting from the depending cylindrical side wall, the arcuate tabs projecting substantially colinearly from said side wall and each terminating in a lower distal end whereat an arcuate radial projection is mounted along an interior surface, the arcuate radial projection extending radially inwards towards a center of said depending side wall and being adapted to engage a handset groove extending about a communication portion of a handset, said arcuate tabs being each defined by a plurality of cut-outs directed into said cylindrical side wall, said tabs being each of an arcuate length substantially equal to an arcuate length of the cut-outs so that the engaging means of a pair of the telephone handset covers can be cooperatively engaged to couple the pair of the telephone handset covers together such that contaminated interior portions thereof are substantially encapsulated, said arcuate tabs each further including an arcuate axial projection extending from a lower distal end thereof; and further wherein the depending cylindrical side wall within each of the cut-outs is shaped so as to define an arcuate axial groove shaped for cooperative reception of an arcuate axial projection of one of the arcuate tabs when a pair of the telephone handset covers is coupled together.

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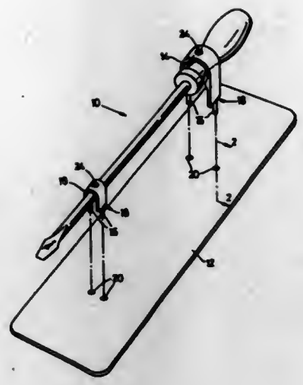
**5,501,330**

## PACKAGING OF HAND TOOLS

**Geoffrey Betts, "Sunfield", High Street, Whitwell, near Worksop, England**

**Continuation of Ser. No. 146,991, Nov. 2, 1993, abandoned.**
**This application Apr. 7, 1995, Ser. No. 418,846**
**Claims priority, application United Kingdom, Nov. 4, 1992, 9223112**
**Int. Cl.[6] B65D *85/20***
**U.S. Cl. 206—349** **17 Claims**

1. A packaged point-of-sale item comprising a hand tool and a sheet of card to which it is secured by at least one bifurcated resilient clip having a pair of legs and a hole through a part of said clip joining said legs, said the resilient clip surrounding a neck portion of the hand tool and the legs of the clip being secured at respective extremities thereof to the sheet of card in a manner requiring damage of the card to detach it from the card, so that when forming part of the packaged point-of-sale item the tool cannot be removed from the card by sliding it through the clip and so that, when subsequently detached from the card and from the tool, the clip is securable to a wall by securing means extending from the wall through the clip hole whereby said legs project from the wall to act as a resilient clip for releasably holding the hand tool thereon.



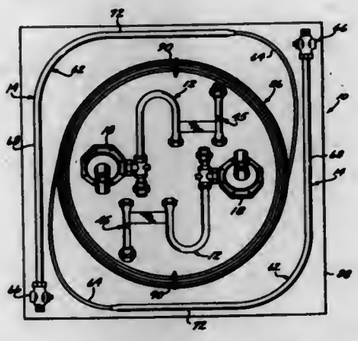

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**5,501,331**

## GAS SERVICE LINE COMPLETION KIT AND METHOD OF FABRICATION AND INSTALLATION

**Robert W. Lyall, Huntington Beach; Jeffrey W. Lyall, Orange, and Mark E. Huetinck, Brea, all of Calif., assignors to R. W. Lyall & Company, Inc., Corona, Calif.**

**Filed Oct. 20, 1994, Ser. No. 325,135**
**Int. Cl.[6] F16L *41/08*; B65D *85/00***
**U.S. Cl. 206—223** **27 Claims**




1. A method of mass producing gas service field installation kits at a factory for providing service line connections through respective gas meters having respective meter inlets and outlets arranged in respective predetermined orientations between a gas distribution main line and respective gas service inlet pipe fittings, each spaced a predetermined distance away from said distribution main, the method comprising the steps of:

determining said predetermined orientation and said predetermined distance;

forming an integral gas meter mounting assembly by selecting first and second metallic pipes of respective predetermined lengths, bending said first and second pipes to form in said first pipe a turn-back U fitting having first inlet and outlet ends, and in said second pipe an elbow having second inlet and outlet ends, selecting a bracket and affixing said turn-back U fitting and said elbow thereto to orient said outlet end of said turn-back U fitting and said inlet end of said elbow in a complementary orientation relative to said predetermined orientation for connection to the respective said meter inlets and outlets, selecting a pressure regulator having regulator inlet and outlet fittings, and coupling said outlet fitting of said pressure regulator to said first inlet end of said turn-back U fitting;



forming an integral riser assembly by selecting a metallic L-shaped riser pipe of a selected length to define a vertical riser length having an upper end and a horizontal riser length having a bottom end, selecting plastic tubing of a length greater than said selected length, telescoping said bottom end of said riser pipe over a free end of said plastic tubing so that an excess length of said plastic tubing projects from said bottom end to terminate in an excess end, coupling said free end of said plastic tubing to said upper end of said riser pipe to form a gas impermeable seal, selecting a shut-off valve of the type having valve inlet and outlet fittings, and coupling said inlet fitting of said valve to said upper end of said riser pipe;

packaging said riser assembly and said gas meter mounting assembly together to form said kit; and

storing said kit for subsequent installation.

12. A set of factory fabricated gas service installation kits to provide a service line connection through a set of gas meters having respective meter inlets and meter outlets arranged in predetermined spacings and orientations to connect between a gas distribution main line and respective gas service inlet pipe fittings spaced a predetermined distance away from said gas distribution main, each kit of said set comprising:

a gas meter mounting assembly including first and second metallic pipes of respective predetermined lengths, said first pipe formed with a turned back U fitting having first inlet and outlet ends, said second pipe formed with an elbow having second inlet and outlet ends, a bracket affixing said turned back U fitting and said elbow together to orient said first outlet end of said turned back U fitting and said second inlet end of said elbow spaced apart at said predetermined spacing and configured for connection to the respective said meter inlets and outlets, and a pressure regulator having regulator inlet and outlet fittings, said regulator outlet fitting coupled to said first inlet end of said turned back U fitting;

a riser assembly including a metallic L-shaped riser pipe of a selected length to define a vertical riser length having an upper end and a horizontal riser length having a bottom end, an integral plastic tubing of a length greater than said selected length having one end telescoped into said bottom end of said riser sufficiently far to leave an excess length of said plastic tubing projecting from said bottom end to terminate in an excess end, said one end of said tubing being coupled to said upper end of said riser pipe to form a gas impermeable seal therebetween, and a shut-off valve of the type having valve inlet and outlet fittings, said valve inlet fitting coupled to said upper end of said riser pipe;

a mounting board of a predetermined width and height; and

means mounting said riser assembly and said gas meter mounting assembly on said board to form a package.

23. A method of mass producing a set of gas service field installation kits at a factory for providing service line connections through respective gas meters having respective meter inlets and outlets arranged in respective predetermined orientations between a gas distribution main line and respective gas service inlet pipe fittings, each spaced a predetermined distance away from said distribution main, the method comprising the steps of fabricating each kit by:

determining said predetermined distance;

forming a gas meter mounting assembly by selecting first and second metallic pipes of the respective predetermined lengths, bending said first and second pipes to form in said first pipe a turn-back U fitting having first inlet and outlet ends, and in said second pipe an elbow having second inlet and outlet ends, said first outlet end and said second inlet end configured for connection to the respective said meter inlets and outlets, selecting a pressure regulator having regulator inlet and outlet fittings, and coupling said outlet fitting of said pressure regulator to said first inlet end of said turn-back U fitting;

forming an integral riser assembly by selecting a metallic L-shaped riser pipe of a selected length to define a vertical riser length having an upper end and a horizontal riser length having a bottom end, selecting plastic tubing of a length greater than said predetermined distance, telescoping said bottom end of said riser pipe over a free end of said plastic tubing so that an excess length of said plastic tubing projects from said bottom end to terminate in an excess end, coupling said free end of said plastic tubing to said upper end of said riser pipe to form a gas impermeable seal, selecting a shut-off valve of the type having valve inlet and outlet fittings, and coupling said inlet fitting of said valve to said upper end of said riser pipe;

packaging said riser assembly and said gas meter mounting assembly together to form said kit; and

storing said kits for subsequent installation.

24. A set of factory fabricated gas service installation kits to provide a service line connection through a set of gas meters having respective meter inlets and outlets arranged in predetermined spacings and orientations to connect between a gas distribution main line and respective gas service inlet pipe fittings spaced a predetermined distance away from said gas distribution main, each kit of said set comprising:

a gas meter mounting assembly including first and second metallic pipes of respective predetermined lengths, said first pipe formed with a turn-back U fitting having first inlet and outlet ends, said second pipe formed with an elbow having second inlet and outlet ends, said first outlet end of said turn-back U fitting and said second inlet end of said elbow configured for connection to the respective said meter inlets and outlets, and a pressure regulator having regulator inlet and outlet fittings, said regulator outlet fitting coupled to said first inlet end of said turn-back U fitting;

a riser assembly including a metallic L-shaped riser pipe of a selected length to define a vertical riser length having an upper end and a horizontal riser length having a bottom end, an integral plastic tubing of a length greater than said selected length having one end telescoped into said bottom end of said riser sufficiently far to leave an excess length of said plastic tubing projecting from said bottom end to terminate in an excess end, said one end of said tubing being coupled to said upper end of said riser pipe to form a gas impermeable seal therebetween, and a shut-off valve of the type having valve inlet and outlet fittings, said valve inlet fitting coupled to said upper end of said riser pipe;

a mounting board of a predetermined width and height; and

means mounting said riser assembly and said gas meter mounting assembly on said board to form a package.

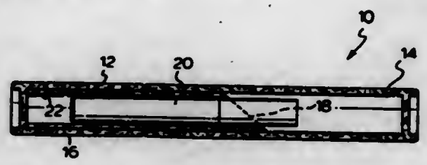
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**5,501,332**

## CIGARETTE EXTINGUISHING STORAGE DEVICE

**George E. Ayres, Campbellville; Gary D. Black, Brampton; Larry Bowen, Orangeville, all of, Canada; Warren A. Brackmann, Collins, Mo.; Benedict Keaveney, Rexdale, and John D. Kilpatrick, Aurora, both of, Canada, assignors to Rothmans, Benson & Hedges, Inc., North York, Canada**

**Continuation of Ser. No. 8,347, Jan. 22, 1993, Pat. No. 5,377,826. This application Jul. 27, 1994, Ser. No. 281,279**
**Int. Cl.[6] A24F *13/18***
**U.S. Cl. 206—246** **14 Claims**




1. A tubular cigarette extinguishing and storage device, comprising:

a first individual tubular element comprising a tubular wall closed at one end and open at another end and having an outer surface and an inner surface and having a diameter defining a single cigarette-receiving tubular cavity,

a second individual tubular element comprising a tubular wall closed at one end and open at another end and having an outer

surface and an inner surface and having a diameter defining a single cigarette-receiving tubular cavity,

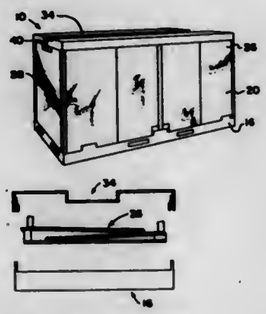
said first and second individual tubular elements being constructed to permit an overlapping sliding fit relationship between portions of said first and second tubular elements adjacent, their open ends to define an enclosure for extinguishing a single cigarette and for storing an extinguished single cigarette,

said first and second individual tubular elements being dimensioned to receive a single cigarette in sliding fit relationship with an internal surface of overlapping portions of said first and second individual tubular elements and

deodorant means located in said enclosure for minimizing the adverse effects of cigarette smoke condensates in said enclosure, said deodorant means being provided by particulate material provided in the form of a layer formed at the inner surface of at least the one of said individual tubular elements into which a single lit cigarette is intended to be received for extinguishing the same.

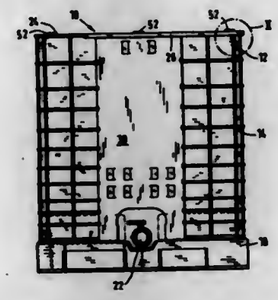
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**5,501,333**
**COLLAPSIBLE CONTAINER**
William E. Swan, Glen Riddle, Pa., assignor to Container Research Corporation, Glenn Riddle, Pa.
Continuation-in-part of Ser. No. 996,822, Dec. 23, 1992, abandoned. This application Apr. 11, 1994, Ser. No. 225,526
Int. Cl.[6] B65D *19/00*
U.S. Cl. 206—386 8 Claims



1. A collapsible container comprising
a base,
side wall, and
a cap;
said base including a horizontally disposed member that defines a perimeter, said horizontally disposed member comprising means for supporting an article to be carried, means on said base for engaging and supporting said side wall, said last named means being located on said perimeter of said base;
said side wall being comprised of two sets of sections with each of said sets including three sections that are interconnected by hinges and two spaced posts that are rectangular in cross section;
at least one of said posts in each of said sets of being fixed to said center section along the edge of said center section adjacent a second section of said sets so that said post moves with said center section, said post being hingedly connected to said second section of said set; the other of said posts being hingedly connected to said center section along the edge of said center section adjacent said third section of said set, said other post being fixed to said third section of said set for movement with said third section; each of said sections being dimensioned so that said sections can lie on said base and be within the area defined by said perimeter; and
said cap comprises a generally horizontal member that includes a depending apron, said apron including means for selectively engaging said side wall or said base.

**5,501,334**
**PALLET CONTAINER WITH COVER PLATE**
Dietmar Praytalla, Kerpen, and Mirten Burgdorf, Swistal, both of, Germany, assignors to Mauser-Werke GmbH, Brühl, Germany
PCT No. PCT/EP94/01245, § 371 Date Oct. 18, 1994, § 102(e) Date Oct. 18, 1994, PCT Pub. No. WO94/25367, PCT Pub. Date Nov. 10, 1994
PCT Filed Apr. 21, 1994, Ser. No. 325,247
Claims priority, application Germany, Apr. 23, 1993, 9306177 U
Int. Cl.[6] B65D *19/00;90/20*
U.S. Cl. 206—386 24 Claims



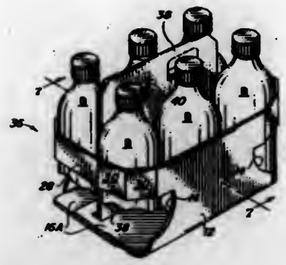
1. Pallet container (10) for storage and transport of liquid contents, comprising a thin-walled inner container (12) made of thermoplastic material and having a top plate (18) formed with a charging opening (20) and a discharge valve (22) near a lower end thereof; a support jacket (14) of bars which tightly enclose the inner container (12); and a bottom pallet (16) suitable for application with a forklift and fixedly secured to the support jacket (14),
wherein the top plate (18) of the inner container (12) is covered from above by a cover plate (26) of thermoplastic material which includes a central opening (28) for access to the charging opening (20) and is fixedly secured about its perimeter with an upper rim of the support jacket (14), said support jacket (14) having an upper edge formed by the uppermost circumferential bar (24) which is covered from above in horizontal direction by the cover plate (26) and covered from outside in vertical direction by a subsequently arranged flange rim (34) which projects downwardly substantially at a right angle from the cover plate (26), wherein on each side of the support jacket (14) at least one vertical bar (40) of the support jacket (14) is upwardly extended beyond the uppermost horizontal circumferential bar (24), passed through a respective bore (38) in the cover plate (26) and secured from above to the cover plate (26).

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**5,501,335**
**BANDED BASKET-STYLE CARRIER**
Randall L. Harris, Powder Springs, Ga., assignor to Riverwood International Corporation, Atlanta, Ga.
Filed Sep. 21, 1994, Ser. No. 310,123
Int. Cl.[6] B65D *75/00*
U.S. Cl. 206—427 15 Claims

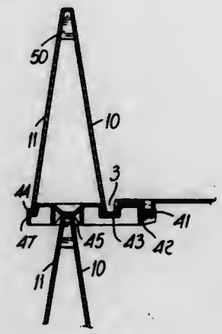
1. A basket-style carrier for packaging two adjacent rows of articles, comprising:
a bottom panel connected by fold lines to opposite side panels;
each side panel having an upper portion, a relatively wide lower portion and a relatively narrow intermediate portion between the upper and lower portions; and
flexible bands connected to and extending between opposite ends of the upper side panel portions for snugly engaging articles packaged adjacent the flexible bands;
the carrier having open end portions between the flexible bands, the bottom panel and opposite intermediate side panel portions, whereby lower portions of articles packaged adjacent the flexible bands are exposed; and
a handle connected to the carrier for lifting the carrier.





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**5,501,336**
**GENERIC GOODS-CONTAINING CRATE**
Giuseppe De Maria, Caronno Varesino, Italy, assignor to Proge Plast Engineering S.r.l., Gallarate, Italy
Filed Nov. 16, 1994, Ser. No. 341,983
Claims priority, application Italy, Nov. 29, 1993, MI93A2511
Int. Cl.[6] B65D *21/06*
U.S. Cl. 206—505 14 Claims

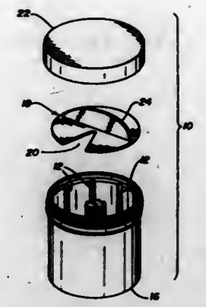


1. Generic goods-containing crate that can be stacked during use and can be partially interlocked to form a pack during storage, wherein it comprises a central tray-like body which has a bottom that is delimited, along its perimeter, by inner side walls which are tilted outwards from the bottom towards the upper edge, at least portions of outer side walls extending from said upper edge, said outer side walls surrounding said inner side walls and being inclined outwards from said upper edge towards the free edge, stacking and reinforcement blocks being furthermore provided which can be arranged in an active position, in which they join the lower ends of said inner side walls and of said at least portions of outer side walls, and in a packing position, in which they arrange themselves below said bottom.

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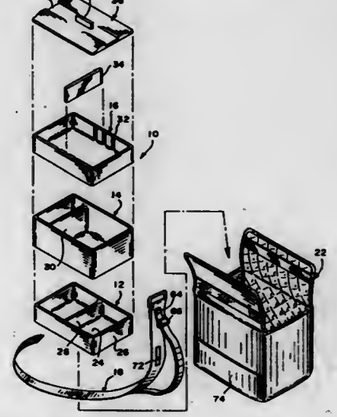
**5,501,337**
**ANALGESIC TABLET CONTAINER**
Harry S. Sowden, Southampton, Pa., assignor to McNeil-PPC, Inc., Milltown, N.J.
Filed Sep. 16, 1994, Ser. No. 308,012
Int. Cl.[6] B65D *83/04;85/42*
U.S. Cl. 206—528.0 9 Claims

1. A container for tablets comprising:
a plurality of slots arranged in a radial fashion about a center, each of said slots configured to accept at least one tablet, said slots formed as a pair of parallel grooves, wherein one of said grooves is located at the center of said container and the second of said grooves is located at a circumferential location about the center of said instrument;
at least one tablet held in a said slot, said tablet contained within said slot to move solely within said slot; and
a bottom and a lid, said bottom and lid forming constraining ends of said slots, and wherein said lid contains an opening therein, said opening forming a passage therethrough to access a predetermined number of slots at any time.



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**5,501,338**
**FOOD CARRIER SYSTEM**
Paul E. Preston, 4359 Ward Dr. NE., Salem, Oreg. 97305
Filed Feb. 18, 1994, Ser. No. 198,877
Int. Cl.[6] A45C *11/20*; B65D *21/02*; A45F *5/00*
U.S. Cl. 206—545 2 Claims



1. A food carrier, comprising:
a) a plurality of stacked, interchangeable rigid food tray assemblies, at least one of said tray assemblies having a plurality of compartments formed therein;
b) strap means for securing the stacked food tray assemblies to each other, said strap means comprising a handle for carrying said food carrier, said strap means further comprising a main strap, comprising:
a first end portion;
a second, opposite, end portion comprising a terminal end including a strip of fabric of the type that has either loops

or hooks that fasten to a complimentary strip of fabric having either hooks or loops, so that the strips can be fastened or unfastened by pressing them together or pulling them apart and an intermediate part having a complementary strip of said fabric; and,

a loop secured to said first end portion, said main strap being sufficiently long to extend around said stacked food tray assemblies, so that said terminal end may be introduced through said loop and against said complementary strip of said fabric so as to secure said tray assemblies;

c) a thermally insulative cover for the outside of said food tray assemblies for stabilizing the temperature of any food contained therein; and

d) a lid engageable upon the uppermost tray assembly, said lid having a projection for convenient handling,

said main strap further comprises a cutout therein to receive said projection and thereby stabilize said main strap relative to said tray assemblies.

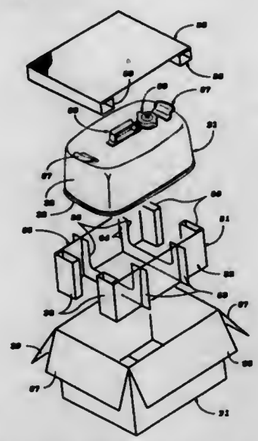
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**5,501,339**

## PACKING BOX WITH CRADLE SHAPED PORTION

**Shintaro Suzuki, and Toru Matsushita, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan**

**Division of Ser. No. 69,986, May 28, 1993, Pat. No. 5,372,259.**
**This application Aug. 1, 1994, Ser. No. 283,605**
**Claims priority, application Japan, Jun. 9, 1992, 4-174894; Jun. 9, 1992, 4-174895**
**Int. Cl.[6] B65D *81/10***
**U.S. Cl. 206—586** **7 Claims**



1. A packing box for shipping an article, said packing box being formed from corrugated paper and comprising a first part formed into a substantially cubical box configuration comprised of four sides scored and folded at their junctures and upper and lower end flaps scored and folded from the sides for forming top and bottom closures and for receiving and containing a shipped article, the interior of said packing box defining a volume receiving a second part forming at least a lower cradle shaped portion defining a recess to receive and nest the shipped article within said box and space the shipped article inwardly from the inner surface of said box for shipping protection, said cradle shaped portion being formed solely from corrugated paper and comprised of a plurality of first sections spaced from each other and of a width equal to the width of the interior of said packing box the first sections having slots receiving a plurality of second sections extending perpendicular to said first sections to space said first sections from each other and space said second sections from each other, said cradle shaped portion being foldable from said cradle shaped portion to a generally flat configuration, said second sections each having a length at least equal to the length of the interior of said packing box.

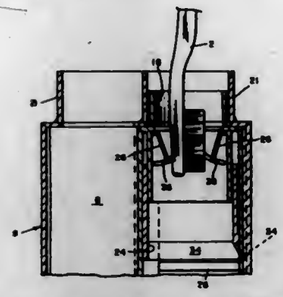
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**5,501,340**

## NON-SPILL LIQUID TOOTHPASTE DISPENSER

**Bryan W. Stafford, 914 Knob Hill, Redondo Beach, Calif. 90277**

**Filed Jun. 13, 1995, Ser. No. 489,787**
**Int. Cl.[6] B65D *77/04***
**U.S. Cl. 206—361** **5 Claims**



1. A liquid toothpaste dispenser device comprising in combination:

an elongated case made of rigid plastic, having a rectangular shape cross-section with two long sides being approximately twice the width of the two short sides, and fully open at one end of its length, designated the case bottom, and having a stepped flange projecting from the distal end of said case, said distal end designated the case top, said stepped flange being rectangular in plan shape, conforming to the surface shape of said case top and having a divider across the center of said flange, producing two approximately square openings that provide access to the interior portion of said case;

a cartridge made of molded, rigid plastic, having a rectangular cross-section shape and a length sized to fit snugly inside said case, said cartridge having a wide channel formed in approximately one half of the cartridge thickness and extending for the cartridge length, the two vertical wider sides of said cartridge extend as arms toward its rear, forming said channel, said channel opening being made wide enough to accommodate the width of a toothbrush;

said cartridge including a cavity formed inside its length for filling with liquid toothpaste and a projecting circular flange at the top of said cartridge, said circular flange having a circular opening communicating with said cavity;

said cartridge including means for a door access valve installed inside the top of said cartridge to prevent leakage of said liquid toothpaste from said cartridge, while permitting access by a toothbrush head to said liquid toothpaste when required;

means for keying and guiding said cartridge into said case;

a case stand, said stand made of rigid plastic and being a shallow open top rectangular box having four projecting pieces attached to the underside of said box around its periphery forming legs, the sides of said box being sized to fit snugly into the bottom opening of said case, thereby bolding said cartridge in place inside said case and providing a vertical stand; and

a dispenser cap made of rigid plastic, said cap being shaped to fit closely over the outside surface of said stepped flange on top of said case, said cap having a square, plastic-hinged flap located in its top surface to permit insertion of a toothbrush through said flap and into said case for storage; said cap including a plastic plug mounted inside and sized and located to fully engage the inside surface of said circular flange at the top of said cartridge when said cap is placed in position on top of said case; said cap, through said plug, providing an additional safety prevention of fluid leakage from said cartridge.



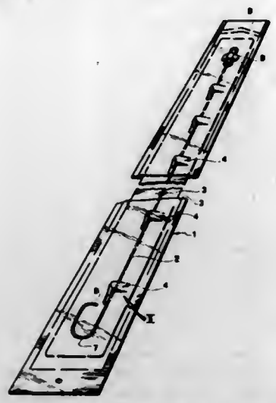
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**5,501,341**

## CATHETER PACKAGING

**Bert Van Es, Roden, Netherlands, assignor to Cordis Corporation, Miami Lakes, Fla.**

**Filed Feb. 7, 1995, Ser. No. 384,844**
**Claims priority, application Netherlands, Feb. 10, 1994, 9400214**
**Int. Cl.[6] B65D *85/20***
**U.S. Cl. 206—364** **4 Claims**



1. Packaging for a catheter comprising: a card received in an envelope, which is provided with a row of retaining elements with lips formed by cuts which can be bent out of the surface of the card around a bending line defined by the ends of the cut, each retaining element comprising at least one push down lip, which can extend across the catheter and an opposing enclosing lip, a lateral edge of the enclosing lip that is directed towards the push down lip extending mainly parallel to the row.

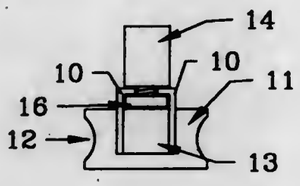
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**5,501,342**

## MAGNETIC SOCKET TRACK

**Ronald J. Geibel, 1521 Sandburg Dr., Schaumburg, Ill. 60173**

**Filed Jun. 26, 1995, Ser. No. 494,727**
**Int. Cl.[6] B65D *85/20***
**U.S. Cl. 206—378** **4 Claims**




1. A magnetic socket track comprising an elongated non-ferrous base with a channel through its length, two ferrous metal strips extending the length of the outside walls of the channel, said ferrous metal strips each having a ninety degree bend with the protrusions of the bends facing each other, a magnetic strip within the channel between the ferrous metal strips at the base of the channel, the magnetic strip having the north pole contacting one metal strip and the south pole contacting the other, the length of the ferrous metal strips being such as to provide a small channel between the magnetic material and the protrusions of the ninety degree bends in the ferrous metal strips, non-ferrous threaded studs and socket receptacles, the small channel being sized to receive the square or hexagonal heads of said non-ferrous threaded studs on which said non-ferrous socket receptacles are threaded, whereby said magnetic strip and said ferrous metal strips produce a strong magnetic force on the outside faces of the ninety degree metal protrusions and this magnetic force holds the sockets firmly on the track when they are placed over the socket receptacles.

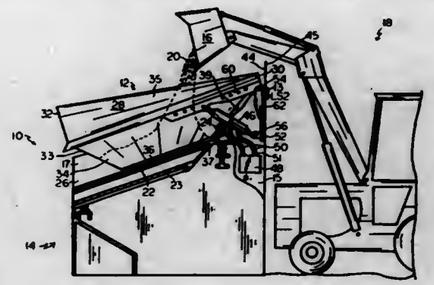
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**5,501,343**

## SOIL FEEDING APPARATUS WITH INTERRUPTOR AND METHOD

**Robert J. Hadden, Middleboro, Mass., assignor to The Read Corporation, Middleboro, Mass.**

**Filed Aug. 19, 1994, Ser. No. 293,515**
**Int. Cl.[6] B07B *1/00***
**U.S. Cl. 209—240** **27 Claims**



1. A material feeder of the type for use above an associated material separating apparatus and adapted to feed, over a time period, material onto the associated material separating apparatus, said material feeder assembly having:

a) a hopper body having a first end and a second end, said hopper body being pivotably mounted at said first end on the associated material separating apparatus and pivotable from a first material loading position, wherein the material may be loaded into said hopper body, to a second material discharging position, wherein said hopper body is angled with respect to the material separating apparatus and the associated material is discharged from said hopper body onto the associated material separating apparatus; and

b) tilting means to tilt said hopper body from said first position to said second position at a controlled rate of tilting, which tilt means includes:

i) hydraulic cylinder means operated by hydraulic fluid to effect movement of said hopper body between said first and second position;

ii) hydraulic fluid reservoir to provide hydraulic fluid to said hydraulic cylinder means;

iii) hydraulic fluid pump to direct hydraulic fluid from said hydraulic fluid reservoir into said hydraulic cylinder means to effect movement of said hopper body from said first to said second position;

iv) control module means to direct said hydraulic fluid on receipt of a signal to move said hopper body from said first to said second position, and to return said hopper body from said second position rapidly to said first position, thereby providing for the controlled feeding of said material onto the associated material separating apparatus, the improvement which comprises:

an interruption means to interrupt temporarily and abruptly a plurality of times the rate of tilting of said hopper body during the time that said hopper body is moving from said first position to said second position, said interruption means to provide for the gradual incremental discharge of the material from said hopper body onto the associated material separating apparatus on each interruption by an abrupt change in inertial forces on the material during said interruption of the rate of tilting of said hopper body, which interruption means comprises:

a first timer means to interrupt said flow of hydraulic fluid to said hydraulic cylinder means and to divert said hydraulic fluid back to said hydraulic fluid reservoir to cause a brief selected, timed cessation of hydraulic fluid flow to said hydraulic cylinder means and a change in inertial forces on said hopper body and the material thereon; and second timer means to control the frequency of said interruption periods of said first timer means to secure the gradual incremental discharge of material from said hopper body with each frequency of interruption.

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**5,501,344**

**PROCESS FOR THE IDENTIFICATION OF RANDOMLY SHAPED AND/OR PLANE MATERIALS BY DETERMINATION OF THE STRUCTURE OF THE MATERIALS THROUGH APPLICATION OF ELECTROMAGNETIC AND/OR ACOUSTIC WAVES**

**Dieter Kaiser, Dortmund, and Franz Wintrich, Essen, both of, Germany, assignors to RWE Entsorgung, Germany**

**Continuation of Ser. No. 139,925, Oct. 20, 1993, abandoned. This application Apr. 14, 1995, Ser. No. 422,761**

**Claims priority, application Germany, Jan. 23, 1992, 42 35 956.2**

**Int. Cl.[6] B07C *5/00***

**U.S. Cl. 209—578** **12 Claims**

1. A process for identifying and sorting randomly-shaped or plane material or mixtures thereof, comprising:

irradiating the surface structure of randomly-shaped or plane or mixed randomly-shaped/plane material with electromagnetic waves in the UV- or visible portion of the electromagnetic spectrum, resulting in image producing waves emitted from said surface structure,

recording the image producing waves arriving from the thus-irradiated material in a receiver-sensor device equipped with a data logger, said data logger having stored therein data relating to a sufficient number of surface characteristics of randomly-shaped or plane material to identify such material,

comparing the image recorded in accordance with surface fine-structure in said material, from the waves arriving from the thus-irradiated material to said data stored in said data logger to identify the thus-irradiated material, and generating a signal, with said receiver-sensor, for controlling a sorting device, and

sorting said thus-irradiated material by means of a sorting device controlled by a said signal received from said receiver-sensor device.

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**5,501,345**

**GARMENT HOLDER ASSEMBLY**

**Frank J. Hilstolsky, Dallas; Westcoat Beakley, Carverton; Raymond A. Longo, Wilkes-Barre, and William H. Scott, Mountaintop, all of Pa., assignors to Metro Industries, Inc., Reno, Nev.**

**Filed Nov. 15, 1993, Ser. No. 151,805**

**Int. Cl.[6] A47F *5/00***

**U.S. Cl. 211—113** **18 Claims**

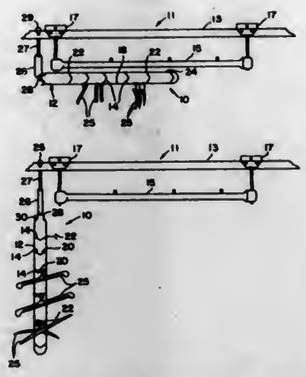
1. A garment holder assembly, comprising:

a support structure;

first supporting means for supporting said support structure in a first attitude in a substantially horizontal orientation; and

second supporting means, independent from said first supporting means, for supporting said support structure in a second attitude different from the first attitude and in a substantially vertical orientation, wherein

said support structure includes first garment support means for supporting garments when said support structure is oriented in the first attitude, and second garment support means for supporting garments when said support structure is oriented in the second attitude, and wherein



said support structure has an elongated side and wherein said first supporting means comprises at least one book secured to said elongated side.

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**5,501,346**

**MULTISTAGE TTELESCOPE BOOM**

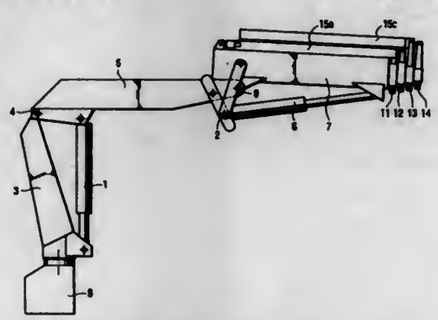
**Eckhard Wimmer, Hallein, Austria, assignor to Palfinger Aktiengesellschaft, Bergheim/Salzburg, Austria**

**Continuation of Ser. No. 81,293, Jun. 28, 1993, abandoned. This application Jan. 9, 1995, Ser. No. 370,458**

**Claims priority, application Austria, Nov. 11, 1991, 2224/91**

**Int. Cl.[6] B66C *23/04***

**U.S. Cl. 212—349** **20 Claims**



1. A multistage telescopic boom comprising:

a plurality of arms including a non-telescoping longitudinally innermost arm and plural, successively longitudinally outer arms each telescopingly nested within a respective precedingly inner arm and successively movable longitudinally thereof;

plural hydraulic units connecting respective pairs of adjacent said arms, each said hydraulic unit achieving telescopic movement of an outer said arm of the respective pair of arms relative to an inner said arm thereof;

each said hydraulic unit comprising a cylinder rigidly mounted on said inner arm of the respective said pair of arms, a piston slidable within an interior of said cylinder and dividing said interior into extension and retraction chambers receiving hydraulic fluid, and a piston rod fixed to said piston and fixed to said outer arm of said respective pair of arms, such that said piston rod and said outer arm are movable with said piston relative to said cylinder and said inner arm;

said piston and piston rod of at least an innermost said hydraulic unit being hollow and having an inner chamber, and said cylinder of said at least said innermost hydraulic unit having



mounted on a bottom wall thereof a pipe extending into said extension chamber thereof, said pipe sealingly fitting within said inner chamber and preventing communication between said extension chamber and said inner chamber when said piston and piston rod are only partially extended relative to said cylinder, and said extension chamber and said inner chamber being in communication when said piston and piston rod are fully extended relative to said cylinder, thereby enabling hydraulic fluid to pass from said extension chamber to said inner chamber; and

a fluid line connecting said inner chamber of said piston and piston rod of said at least said innermost hydraulic unit to said extension chamber of said cylinder of the next outer said hydraulic unit;

whereby hydraulic fluid can be passed to said extension chamber of said next outer hydraulic unit only after said piston and piston rod of said innermost hydraulic unit have fully extended the next outer said arm relative to said innermost arm.

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**5,501,347**

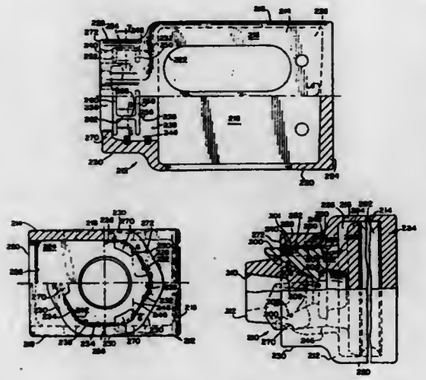
**VARIABLE ANGLE FRICTION CLUTCH MECHANISM FOR A DRAFT GEAR ASSEMBLY**

**Walter H. Merker, Jr., Downersgrove, and Howard R. Sommerfeld, Oak Forest, both of Ill., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.**

**Division of Ser. No. 183,838, Jan. 21, 1994, Pat. No. 5,443,170, which is a division of Ser. No. 3,109, Jan. 11, 1993, abandoned. This application Apr. 5, 1995, Ser. No. 393,418**

**Int. Cl.[6] B61G *7/00***

**U.S. Cl. 213—32 C** **7 Claims**



1. A railroad car coupler system variable angle draft gear assembly, said variable angle draft gear assembly comprising:

(a) a housing member having a hollow cast body divided into an inner section and an outer friction bore section,

(b) elastomeric means carried in said inner section of said housing member for absorbing a first portion of energy generated during closure of said variable angle draft gear assembly;

(c) an intermediate follower engaging said elastomeric means and having an outer end extending into said friction bore section of said housing member;

(d) a top and a pair of side friction shoe seats each defined by pairs of inner surfaces of sidewalls of said friction bore section of said housing member and radiused inside corners formed at a joiner of said pairs of said sidewall inner surfaces;

(e) a grooved recess formed as part of each said friction shoe seat, said grooved recess having an inner and outer groove portion positioned substantially perpendicular to a longitudinal axis of said housing member and a connecting groove portion joining said inner and outer groove portions and positioned in proximate alignment with said seat corner

(f) an insert having a rigid body of a bronze material defined by a pair of elongated segments joined by a connecting segment with said insert disposed in said friction seat grooved recess;

(g) a set of friction shoes carried one in each said friction shoe seat, said friction shoes having wear surfaces spaced apart by a radiused end with said shoe wear surfaces in contact respectively with said insert elongated segments and said shoe radiused ends positioned to engage said insert connecting segments;

(h) a wedge member positioned between said friction shoes with said wedge member having sloped wedging surfaces engaging with inside walls of said friction shoes, so that an impacting force on said wedge may move said wedge inward toward an end wall of said housing to force said shoes radially outward and move said shoes inward under frictional restraint, said restraint being regulated in part by material of said insert acting as a lubricant to control a coefficient of friction between said shoes and said friction shoe seats, said inward shoe movement on occasions being sufficient to uncover said friction shoe seat grooved recess outer groove portions with said insert body maintaining said insert elongated segment in said outer groove portion to insure continued control of said frictional restraint; and

(i) at least one resilient member having a portion received in at least one groove formed on at least one layer surface of said housing member at said outer friction bore section, said groove having substantially the shape of said portion, and said at least one resilient member, engaged with said set of friction shoes for exerting a predetermined lateral force on at least one of said friction shoes which is at least sufficient to maintain frictional engagement between said wedge member and said set of friction shoes.

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**5,501,348**

**CAP WITH A HINGED TOP LID**

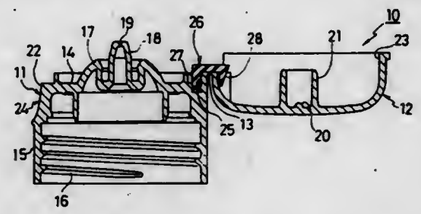
**Kiyoshi Takeuchi, Funabashi, Japan, assignor to Kao Corporation, Tokyo, Japan**

**Filed Jun. 14, 1994, Ser. No. 260,270**

**Claims priority, application Japan, Jun. 16, 1993, 5-168356; Mar. 28, 1994, 6-079307**

**Int. Cl.[6] B65D *43/24***

**U.S. Cl. 215—235** **6 Claims**



1. A cap comprising:

a cap body having a top lid hinged thereto by a hinge, said top lid being held in a closed position by a lock mechanism formed on the cap body and on the top lid; and

an elastic rubber member having a first end fitted on said cap body and a second end positioned at the top lid, said elastic rubber member being positioned near said hinge;

wherein said elastic rubber member is deformed between said cap body and said top lid by compression and bending when said top lid is closed, and when said lock mechanism is released, an elastic restoring force of said elastic rubber member forces said top lid open, said elastic restoring force of said elastic rubber member restoring said elastic rubber member to an initial form of the elastic rubber member prior to deformation, said elastic rubber member contacting both said

cap body and said top lid and maintaining said contact during the opening of the top lid to fully open the top lid; and

said second end of said elastic rubber member has a tapered wedge shape, said tapered wedge shaped second end being capable of compressive and bending deformations when pushed by said top lid.

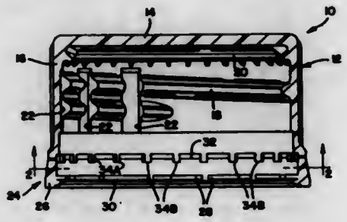
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**5,501,349**

**TAMPER-INDICATING PLASTIC CLOSURE WITH SELECTIVELY STRENGTHENED PILFER BAND**

**Thomas J. McCandless, Crawfordsville, Ind., assignor to H-C Industries, Inc., Crawfordsville, Ind.**

**Filed Oct. 27, 1994, Ser. No. 329,866**
**Int. Cl.[6] B65D *41/34***
**U.S. Cl. 215—252** **12 Claims**



1. A tamper-indicating closure for a container, comprising:

a plastic closure cap having a top wall portion, and a depending annular skirt portion;

a tamper-indicating pilfer band positioned beneath said skirt portion, said pilfer band including means for engaging said container for tamper-indication; and

selectively strengthened frangible means at least partially detachably connecting said pilfer band to said skirt portion, said frangible means comprising first frangible bridge means detachably connecting a minor portion of the circumference of said pilfer band to said skirt portion, and second frangible bridge means at least partially detachably connecting a major portion of the circumference of said pilfer band to said skirt portion, said second bridge means exhibiting higher resistance to fracture than said first bridge means so that during removal from the container, said first bridge means fracture for tamper-indication prior to fracture of said second bridge means,

said first bridge means comprises a series of circumferentially spaced apart first frangible bridges respectively having substantially uniform first fracturable cross-sectional areas, and said second frangible means comprises a series of circumferentially spaced apart second frangible bridges respectively having substantially uniform second fracturable cross-sectional areas, said second cross-sectional area being greater than said first cross-sectional area so that after fracture of said first bridges, said second frangible bridges fracture sequentially, starting with at least one of said second bridges positioned circumferentially adjacent to one of said first bridges,

said first bridge means detachably connecting between 90° and 180° of the circumference of said pilfer band to said skirt portion.

**5,501,350**

**PROCESS FOR PRODUCING PRINTED WIRING BOARD**

**Risaburo Yoshida; Kiyotomo Nakamura; Akitsu Ota, and Mitsuaki Taguchi, all of Tokyo, Japan, assignors to Toppan Printing Co., Ltd., Tokyo, Japan**

**Filed Jan. 5, 1995, Ser. No. 369,087**
**Claims priority, application Japan, Jan. 6, 1994, 6-000239; Sep. 13, 1994, 6-244744; Nov. 28, 1994, 6-292544**
**Int. Cl.[6] H01B *13/00*; B44C *1/22*; C23F *1/00***
**U.S. Cl. 216—20** **11 Claims**




1. A process for producing a printed wiring board, comprising the steps of forming a photosensitive resist layer on a copper layer provided on an insulating substrate, patterning the photosensitive resist layer, and etching the copper layer made bare from the photosensitive resist layer to form a copper wiring layer, wherein;

the surface of said copper layer is subjected to pretreatment comprising the steps of black-oxide treating the surface by the use of an alkaline oxidizing solution and subsequently finely surface-roughening the black-oxide treated surface by the use of an acidic treating solution comprised of phosphoric acid or an organic acid, followed by drying in the presence of oxygen, and thereafter said photosensitive resist layer is formed thereon.

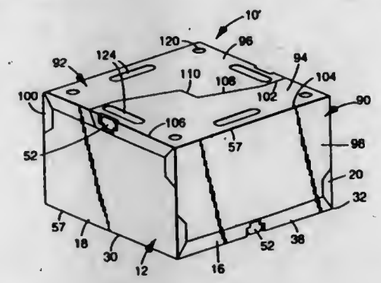
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**5,501,351**

**REUSABLE, MULTIPLE-PIECE STORAGE CONTAINER**

**Gerald J. Niles, and Davis W. Chamberlin, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Continuation-in-part of Ser. No. 915,126, Jul. 17, 1992, Pat. No. 5,303,823. This application Apr. 22, 1993, Ser. No. 52,121**
**Int. Cl.[6] B65D *6/16;85/02***
**U.S. Cl. 220—4.21** **11 Claims**



1. A parallelepipedal storage container comprising at least first, second, and third sections, wherein the second and third sections are substantially identical and has a weakened portion to enable the section to fold to separate each second and third section into a half central base wall and one side wall which can be oriented at right angles to each other, wherein each side wall of the second and third sections has a free end opposite the end adjacent the base wall, wherein each half central base wall has a free edge, an opposing edge adjacent to the side wall, and two free side edges, wherein the opposing edge of the half base portions comprises lips that are complementary to each other, and wherein the second and third sections can be positioned with the half central base walls coplanar and with the respective free edges of the half central base walls abutting each other, wherein the storage container is formed by folding each of the second and third sections into an L shape, and mating the sections so that the side edges of the side walls of each section are disposed adjacent the side edges of the side walls of each adjacent section to form edges of the storage container; wherein after the container is formed, when the half central base walls of the second and third sections are coplanar the container is closed and when the half central base walls of the second and third sections are not coplanar the container is open; and means, formed integrally as one piece with the sections, for securing the sections together to form the container and for guiding the second section with respect to the third section during assembly of these sections.

6. A storage container comprising four substantially identical sections, wherein the sections complementarily and matingly engage each other to form a completely closed container, wherein each section includes two wall portions and each section has a weakened portion to enable the section to fold between a configuration with the two wall portions substantially planar with each other and a configuration with the two wall portions substantially perpendicular to each other.



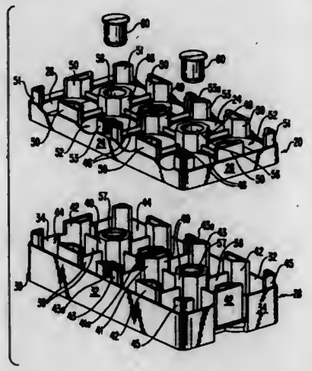
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**5,501,352**

**HEIGHT EXTENSION FOR CRATES AND THE LIKE**

**William P. Apps, Anaheim, Calif., assignor to Rehrig Pacific Company, Inc., Los Angeles, Calif.**

**Filed Jun. 1, 1993, Ser. No. 69,779**
**Int. Cl.[6] B65D *27/00***
**U.S. Cl. 220—4.26** **6 Claims**



4. An extension device adapted for use on top of a crate for retaining and transporting containers, the crate being nestable with other crates when empty of containers and stackable with other crates when holding containers, said extension comprising:

a wall structure configured to mate with the crate so as to extend the height of the crate to more stably retain containers within the crate; and

locking means for securing said extension to the crate, said locking means having an aperture and a locking pin inserted into said aperture such that said locking pin locks onto a portion of the crate to securely join said extension to the crate, said locking pin comprising a cylindrical shank and an integral top cover forming an annular top rim and an annular bottom flange having a tapered side surface and a bearing surface such that when said pin is inserted into said aperture, said tapered side surface slides past an abutment of the crate and said bearing surface abuts against the abutment of the crate to thereby lock said extension to the crate;

wherein said extension being nestable with other crates when empty of containers and stackable with other crates when holding containers.

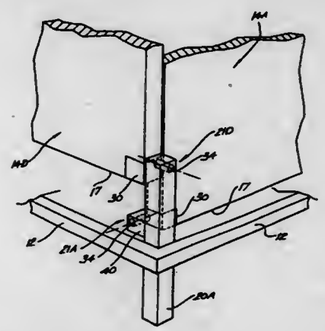
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**5,501,353**

**COLLAPSIBLE CONTAINER**

**Gary F. Warren, Booyal, Australia, assignor to Bush House Pty Ltd, Australia**

**PCT No. PCT/AU92/00482, § 371 Date Mar. 11, 1994, § 102(e) Date Mar. 11, 1994, PCT Pub. No. WO93/04952, PCT Pub. Date Mar. 18, 1993**
**PCT Filed Sep. 10, 1992, Ser. No. 204,364**
**Claims priority, application Australia, Sep. 11, 1991, PK8319**
**Int. Cl.[6] B65D *19/12;19/16***
**U.S. Cl. 220—6** **46 Claims**



1. A collapsible container comprising:

a container base;

a plurality of post members extending generally upwardly from the container base;

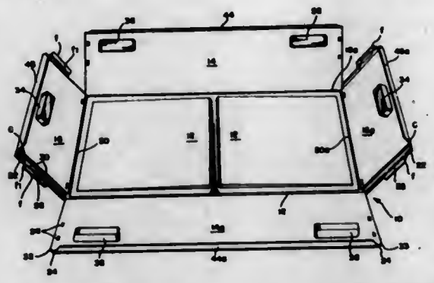
a plurality of wall members, each mounted between a respective pair of post members via hinge means and moveable between an erected position wherein the wall member extends generally away from the container base and a collapsed position wherein the wall member generally overlays the container base, each wall member having top, bottom and side edges extending between inner and outer faces, the inner face lying closer to the container base than the outer face in the collapsed position,

the hinge means comprising a pair of hinge pins each extending between a side edge of a wall member and a respective post member, each hinge pin being rotatably supported at one or both of the wall member and post member and located on the side edge closer to the inner face than the outer face and closer to the bottom edge than the top edge;

each post member being adapted to support a hinge pin of one of the wall members and additionally comprising receiving means extending laterally from the post member, the receiving means being adapted for supporting a hinge pin of an adjacent wall member;

such that when each wall member is in the erected position, the arrangement of the receiving means enables sealing engagement between said one of the wall members and said adjacent wall member to sealingly define the container outer wall; and each wall member has cladding mounted to its outer face, the outer face cladding extending beyond the bottom edge of the wall member so that in the erected position it is parallel to and adjacent a respective panel or post member and assists in sealingly defining the container outer wall.

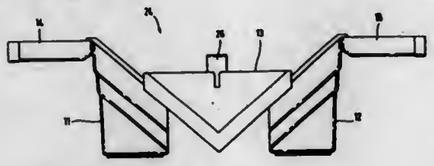
5,501,354
**COLLAPSIBLE CONTAINER**
Per S. Stromberg, Wessels vei 11, Lillestrom, Norway
PCT No. PCT/US93/04862, § 371 Date Apr. 18, 1994, § 102(e) Date Apr. 18, 1994, PCT Pub. No. WO93/24378, PCT Pub. Date Dec. 9, 1993
PCT Filed May 24, 1993, Ser. No. 211,830
Claims priority, application United Kingdom, May 26, 1992, 9211112
Int. Cl.[6] B65D 5/40
U.S. Cl. 220—7 4 Claims



1. A collapsible shipping container for use in the shipping, handling and/or storing of goods, formed from a single molding of plastics material comprising
a bottom wall having opposed side- and end edges disposed adjacent each other,
side wall panels hinged to said side edges of said bottom wall and end wall panels hinged to said end edges of said bottom wall so that said side- and end wall panels can be erected from a collapsed position to an upright position, and
means for locking said side- and end wall panels together in said upright position,
said locking means including channel means extending along end edges of said end wall panels and arranged to receive adjacent end portions of said side wall panels, and flap means hinged to and extending from said end wall panels and folded into overlapping relationship with adjacent end portions of said side wall panels and having means for engaging said end portions of said side wall panels within said channel means whereby said side- and end wall panels are mutually supported and maintained in erected position, and
wherein said end portions of said side wall panels include at least one outwardly extending rib which is received in said channel means, and said flap means includes a locking rib arranged to engage said outwardly extending rib formed along said adjacent end portion of said side wall panel when said side- and end walls are erected.

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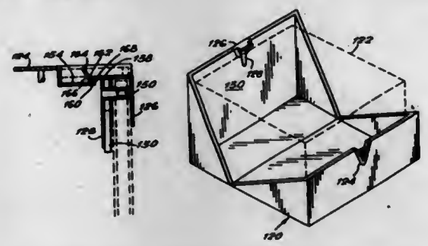
5,501,355
**WORK-BOX**
Manfred Elzenbeck, Klosterstr. 39-41, D-71711 Steinheim, and Klaus Haar, Landhausstr. 3, D-71384 Weinstadt, both of, Germany
Filed Jun. 24, 1993, Ser. No. 82,229
Int. Cl.[6] A47G 19/00
U.S. Cl. 220—23.2 17 Claims



1. A work-box comprising
a) a central box unit and two lateral box units, each of said box units having a bottom wall, a front end wall, a rear end wall, two opposing lateral side walls, and adjacent surfaces of complementary shape so that the work-box in a closed state forms an essentially solid block, and
b) guide means arranged between said central box unit and said lateral box units, respectively, wherein
c) said bottom wall of said central box unit comprises downwardly inclined, slanted wall portions, thus providing a contour of said central box unit that essentially corresponds to a triangular prism, said central box unit being open in upward direction and a lower edge defined by said slanted wall portions of its bottom wall facing in a downward direction, and
d) upper edges of said front end, said rear end, and said side walls of said lateral box units defining a plane being parallel to said slanted wall portions of said central box unit.

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5,501,356
**FILE BOX CLOSURE CATCH**
Paul R. Billingham, 22 Heathfield Terrace, Chiswick, London W4 4JE, England
PCT No. PCT/GB92/00510, § 371 Date Sep. 27, 1993, § 102(e) Date Sep. 27, 1993, PCT Pub. No. WO92/17672, PCT Pub. Date Oct. 15, 1992
PCT Filed Mar. 20, 1992, Ser. No. 122,404
Claims priority, application United Kingdom, Mar. 28, 1991, 9106666
Int. Cl.[6] B65D 45/16
U.S. Cl. 220—324 14 Claims



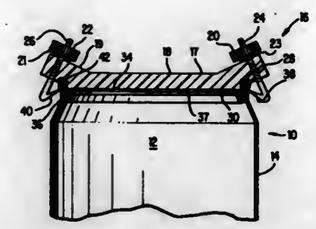
1. A closure catch adapted to releasably bold together two cooperating parts of a box having a side wall and a lid or cover, comprising a first catch member (124) which fits onto an edge of one of the side wall and lid, and which includes an outwardly facing projection (160) of one piece therewith, and a second catch member (126) which fits over a cooperating edge of the other of the lid and side wall and includes an inwardly facing projection (162) of one piece therewith, said projection being adapted to snap over the outwardly facing projection of the first catch member; wherein said first catch member (24) is formed with a recess (154) on its outer surface and the outwardly facing projection (160) is located in said recess, the projection (162) of the second catch member being arranged to fit into said recess so that the catch is flush with an exterior of the box when it is in a closed condition, wherein one of the catch members is U-shaped to grip the corresponding edge of the box.

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5,501,357
**SEALING DEVICE FOR METALLIC CONTAINERS**
Joe Fullin, 21 Knob Hill Rd., Norwalk, Conn. 06851
Filed Mar. 14, 1994, Ser. No. 209,728
Int. Cl.[6] B65D 45/16;45/24
U.S. Cl. 220—325 5 Claims

1. A device for sealing the contents of a previously opened container from the environment, the container provided with a top

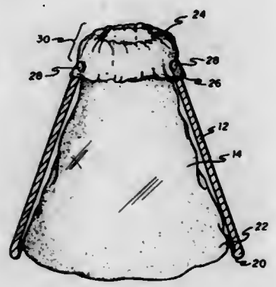




surface, having at least a portion removed therefrom, the top surface of the container surrounded by a rim, comprising:
a cover;
a sealing device attached to the underside of said cover, said sealing device contoured to the profile of the top surface of the container and adapted to overlie the rim and any remaining portion of the top surface; said cover configured to overlay the top surface of said container, said cover further including a middle portion, and a peripheral portion, said middle portion being flat and said peripheral portion being slanted from said middle portion; and
locking means for tightly securing said sealing device to the rim and any remaining portion of the top surface, to isolate the contents of the container to the outside environment, whereby said peripheral portion covers the outer surface area of said previously opened or the non-removed portion of the container top or said rim.

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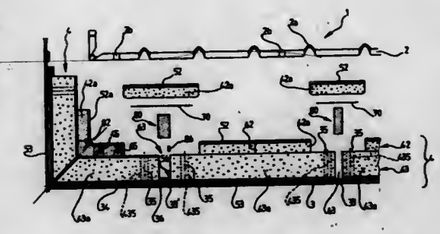
5,501,358
**BOTTOMLESS RECEPTACLE AND BI-FRUSTOCONICAL LINER SYSTEM**
Robert Hobday, 373 Flour Ct., Westerville, Ohio 43082-1011
Filed Feb. 2, 1995, Ser. No. 382,796
Int. Cl.[6] B65F 1/06
U.S. Cl. 220—404 6 Claims



1. A receptacle for waste, laundry, or other articles comprising:
a flexible liner having a top partial-cone member with a wide, open, top end and a narrow connecting end, and a bottom partial-cone member with a wide, closed, bottom end and a narrow connecting end, said narrow connecting ends joined at a mid-liner intersection which is adapted to accommodate a closure element;
an integral partial-cone-shaped supporting holder with an open top and an open bottom end;
said bottom partial-cone member of said liner being sized to fit within said holder;
said top end of said holder has multiple snap receiving members disposed around said top end of said holder; and,
said top partial-cone member of said liner has a corresponding number of multiple projecting snaps, each of said projecting snaps being capable of releasable insertion into each of said snap receiving members of said holder.

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5,501,359
**PREFABRICATED STRUCTURE FOR FORMING FLUID-TIGHT AND THERMO-INSULATED WALLS FOR VERY LOW TEMPERATURE FLUID CONFINEMENT CONTAINER**
Jean-Michel Chauvin, Plaisir, and Jean M. Claude, Rambouillet, both of, France, assignors to Societe Nouvelle Technigaz, Montigny-le-Bretonneux, France
PCT No. PCT/FR93/00492, § 371 Date Mar. 10, 1994, § 102(e) Date Mar. 10, 1994, PCT Pub. No. WO93/23699, PCT Pub. Date Nov. 25, 1993
PCT Filed May 19, 1993, Ser. No. 185,820
Claims priority, application France, May 20, 1992, 92 06136
Int. Cl.[6] B63B 3/00
U.S. Cl. 220—452 11 Claims



1. In a prefabricated structure for forming fluid-tight and thermally insulating walls of a container for a very low temperature fluid, comprising,
a substantially flexible fluid-tight internal primary barrier having an inner face in contact with said fluid and an outer face;
an internal distribution panel layer secured to said outer face of said primary barrier;
a rigid external partition having an outer face and an inner face;
an external distribution panel layer secured to said inner face of said external partition;
two intermediate thermal insulation panel layers, said layers held in sandwich-like fashion between said internal and external distribution panel layers and comprising an external and an internal layer, each of said thermal insulation layers being constituted by jutaposed insulating plates made from a fluid-tight material;
wherein each of said insulating plates of each thermal insulating panel layer forms a joint with an adjacent insulating plate of that thermal insulating panel layer, said plates being located in a way that the joints in one layer are situated in front of a plate of the other layer; and
a cover strip situated between and adhering to said two insulation layers in a way to cover each said joint, and a connector made from a fluid-tight insulating material being provided for obturating each said joint;
said external insulation layer containing a plurality of holes at a predetermined distance from said joints in said external insulation layer and said external distribution panel being fastened to said external partition by fastening members located at an outer end of said holes formed in said external insulation layer; and
fluid-tight connectors made from insulating material provided for filling up and hermetically adhering to a respective one of said holes whereby said external insulating layer is continuous and fluid-tight over its entire surface.

**5,501,360**

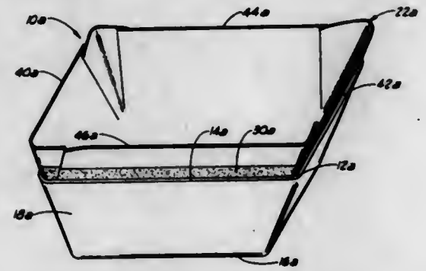
## BASKET LINING MATERIAL HAVING A COHESIVE THEREON AND METHOD

**Donald E. Weder, Highland, Ill., assignor to Highland Supply Corporation, Highland, Ill.**

**Continuation of Ser. No. 413,142, Mar. 29, 1995, which is a continuation of Ser. No. 121,967, Sep. 14, 1993, Pat. No. 5,411,167, which is a continuation of Ser. No. 781,040, Oct. 21, 1991, abandoned, which is a continuation-in-part of Ser. No. 649,379, Jan. 31, 1991, Pat. No. 5,111,638, said Ser. No. 781,040is a continuation-in-part of Ser. No. 502,358, Mar. 29, 1990, abandoned. This application May 30, 1995, Ser. No. 453,722**

**Int. Cl.[6] B65D *5/00***

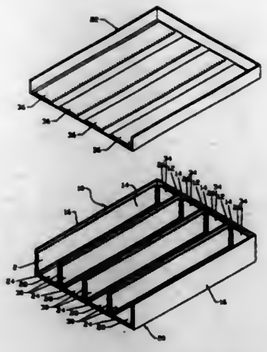
**U.S. Cl. 220—460** **12 Claims**



1. A basket lining material, comprising:

a basket having an upper end, a lower end, and an outer surface, a basket opening being formed in the basket with a portion of the basket opening intersecting the upper end of the basket forming an inner surface having contours, the basket opening being sized and shaped for receiving items and the items being retained in the basket opening by the basket, a cohesive on the inner surface of the basket; and

an unpreformed sheet of material having an upper surface, a lower surface and an outer periphery, the sheet of material having a cohesive on at least one surface thereof, the sheet of material being disposed in the basket opening without first being preformed to conform to the inner surface of the basket, the cohesive on the sheet of material being disposed adjacent at least a portion of the cohesive on the inner surface of the basket and the sheet of material being crushed and flattened against the inner surface of the basket thereby forming a liner, the liner cohesively contacting and connecting to the inner surface of the basket, the liner thereby substantially conforming to the shape of the inner surface of the basket, the cohesive bonding to the cohesive on the inner surface of the basket and holding the liner in place against the inner surface of the basket, wherein items placed in the basket are received upon the liner, and wherein the liner remains firmly and unmovingly connected to the inner surface of the basket when items are both disposed and retained on the liner.



is located in a void and is spaced apart from said protruding mid-portions and said inside surface.

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**5,501,362**

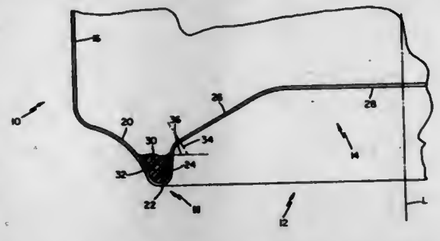
## CAN BOTTOM WITH INSIDE OR OUTSIDE SURFACES SECURED TOGETHER BY CIRCULAR WELD OR BOND

**Daniel F. Cudzik, Chesterfield County, Va., assignor to Reynolds Metals Company, Richmond, Va.**

**Filed Mar. 7, 1994, Ser. No. 206,590**

**Int. Cl.[6] B65D *6/02***

**U.S. Cl. 220—612** **20 Claims**



1. A metal beverage container, comprising a bottom wall and a drawn and ironed (D&I) side wall extending substantially axially from the bottom wall to define an open end of the container, said bottom wall and said side wall being of one piece construction, said bottom wall including an annular rest radius having an outer connecting web portion leading into the side wall and an inner connecting web portion leading into a central panel of the bottom wall, said rest radius defining an annular support surface for the container located below the inner and outer connecting web portions, said inner and outer connecting web portions being permanently joined to each other at least at intermediate portions thereof.

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**5,501,361**

## DOCUMENT PRESERVATION SYSTEM

**Jeff P. DeMordaunt, 2502 Park St., Rolling Meadows, Ill. 60008**

**Continuation of Ser. No. 52,156, Apr. 22, 1993, abandoned. This application Jun. 27, 1994, Ser. No. 266,167**

**Int. Cl.[6] B65D *85/00***

**U.S. Cl. 220—529** **10 Claims**

1. A document container, comprising:

a plurality of walls defining a chamber, each of said walls having an inside surface; and

protruding mid-portions associated with a plurality of said inside surfaces wherein adjacent protruding mid-portions are spaced apart from one another thereby forming a plurality of voids such that every corner of a document stored in said chamber

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**5,501,363**

## COMBINATION DRINKING CUP AND MEGAPHONE

**Robert E. Muller, 227 Key Palm Rd., Boca Raton, Fla. 33432; Robert Tinari, 150 NW. 7th Ct., Boca Raton, Fla. 33486, and David J. Canestrale, Jr., 82 Vista Del Rio, Boynton Beach, Fla. 33426**

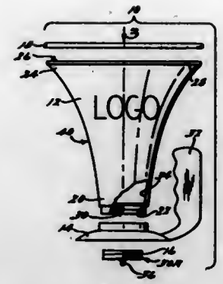
**Filed Jun. 16, 1994, Ser. No. 260,528**

**Int. Cl.[6] B65D *25/24***

**U.S. Cl. 220—630** **16 Claims**

1. An apparatus useful as a multipurpose container under at least one adaptation and as a megaphone under another adaptation, the apparatus comprising:





a hollow body portion having a narrow first end, an enlarged second end and an integral substantially hollow coaster portion disposed along said first end for selectively maintaining the apparatus in an upright position, said first end including a port hole and said second end including an enlarged opening defined by a pouring lip;

a resealable, selectively detachable plug insertible through said coaster means for connection to said body portion along the first end to seal the port hole; and

a selectively attachable cap which is press fit over said pouring lip to close off the enlarged opening occurring at said second end;

whereby upon detaching the plug and the selectively attachable cap from the body portion the apparatus can be converted from a multipurpose container to a megaphone.

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**5,501,364**

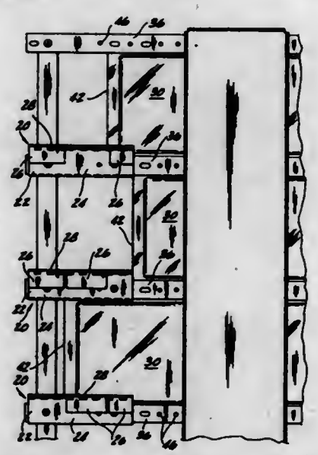
## DOORSTOPS FOR MULTIPLE-PRODUCT MERCHANDISING MACHINE

**Alan Cooper, Lancashire, England, assignor to Unidynamics Corporation, Stamford, Conn.**

**Filed Sep. 23, 1994, Ser. No. 311,595**

**Int. Cl.[6] G07F *11/54***

**U.S. Cl. 221—12** **16 Claims**



1. A variable doorstop for selectively determining the opening distance of an access door of a merchandising machine, said access door being mounted in channels of the merchandising machine to be slidable along a path between an open position wherein the access door permits access to a compartment aligned therewith and a closed position wherein access to the compartment is restricted, the doorstop comprising a hinge assembly including at least one hinge, each hinge having a backing plate for mounting the hinge on the merchandising machine and at least one abutment plate rotatable about a pin of the hinge to selectively pivot the abutment plate from a non-engagement position in which the abutment plate is positioned away from the path of the access door to an engagement position in which the abutment plate is in the path of the access door thereby establishing the open position by restricting the access door from sliding further along the channels past the abutment plate in the engagement position as the access door is slid from the closed position to the open position.

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**5,501,365**

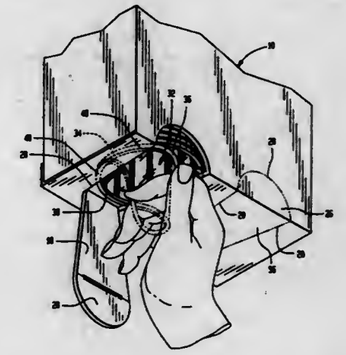
## PACKAGE AND SYSTEM FOR DISPENSING PREFORMED NURSER SACS

**David B. Richiger, Danbury, Conn., and Salvatore J. Leone, Dover, Del., assignors to Playtex Products, Inc., Westport, Conn.**

**Filed Mar. 25, 1994, Ser. No. 218,314**

**Int. Cl.[6] B65H *1/00***

**U.S. Cl. 221—63** **18 Claims**



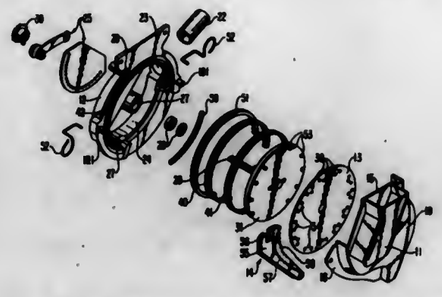
1. A system for dispensing a plurality of nurser liners one at a time, comprising:

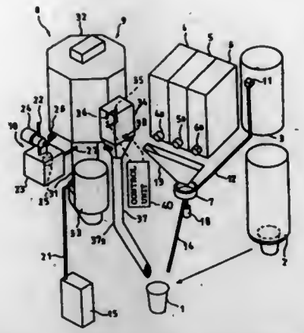
a dispenser having a bottom wall with an edge that defines a flap, wherein the flap is adapted to move from a first position to a second position in which the flap exposes an aperture in the bottom wall;

a plurality of nurser liners stacked in a nesting arrangement, each one of the plurality of nurser liners having a single open end, each open end having a flexible rim with a diameter greater than that of the aperture, the plurality of nurser liners being positioned so that the rims are adjacent the aperture with a lowermost one of the plurality of nurser liners abutting the edge;

wherein the edge of the bottom wall of the dispenser acts as a guide for deflecting the rim inward of the lowermost nurser liner as the rim passes through the aperture, and restricts the remainder of the plurality of nurser liners from moving with the lowermost nurser liner out of the dispenser to overcome friction forces caused by the nesting arrangement.

**5,501,366**
**SINGLE-SEED DISPENSER OF A PNEUMATIC PRECISION SOWER**
**Antonino F. Florido, Pordenone, Italy, assignor to Matermacc S.r.l., Pordenone, Italy**
**Filed Jul. 22, 1994, Ser. No. 277,314**
**Claims priority, application Italy, Jul. 29, 1993, PN93A0057**
**Int. Cl.[6] B23Q 7/04**
**U.S. Cl. 221—211** **20 Claims**





1. A single-seed dispenser of a pneumatic precision sower, comprising:
a seed supply container;
a housing defining a suction chamber therein, said housing being joined to said seed supply container;
a dispenser disc interposed between said seed supply container and said housing and rotatably supported in the dispenser, one surface of said dispenser disc facing said seed supply container and the other surface of said dispenser disc facing said vacuum chamber, and said dispenser disc having a series of perforations extending therethrough at the other outer circumference thereof;
a stripper having an edge overlying said perforations at said one surface of the disc, said edge being configured to strip excess seeds from adhering to the disc at each one of said perforations; and
at least one partition member mounted in said housing and covering only portions of said perforations at said other surface of the disc over at least a circumferential extent of the dispenser disc over which suction in the suction chamber acts through said perforations to draw seeds to said one surface of the disc, to thereby limit the effective size of openings constituted by said perforations and through which seeds of a given size can pass.

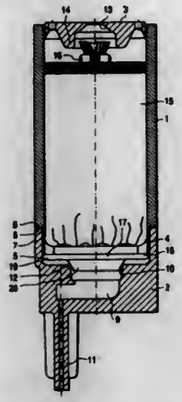
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**5,501,367**
**ICE FEEDER**
**Noboru Chigira, Saitama, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan**
**Filed Jun. 9, 1994, Ser. No. 257,337**
**Claims priority, application Japan, Jun. 15, 1993, 5-168465**
**Int. Cl.[6] B67D 5/62**
**U.S. Cl. 222—55** **16 Claims**

1. An ice feeder comprising:
ice storing means for storing ice;
an ice gate provided in said ice storing means for controlling delivery of said ice from said ice storing means;
a supply passage extending from said ice gate for supplying said ice therethrough;
sensor means arranged in said supply passage for detecting passage of said ice delivered from said ice storing means and for generating a detection signal indicative of said passage of said ice;
supply amount measuring means for measuring an amount of said ice delivered, based on said detection signal from said sensor means; and
control means for generating a no-ice-stock signal indicative of an insufficient stock of ice held in said ice storing means when a time period required for said amount of said ice delivered which is measured by said supply amount measuring means to reach a first predetermined value exceeds a first predetermined time period.

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**5,501,368**
**DEVICE FOR EMPTYING A FILM TUBE**
**Gerd Brandhorst, Landsberg; Wolf-Dietrich Herold, Seefeld, and Ralf Heiduczek, Gröbenzell, all of, Germany, assignors to Thera Patent GmbH & Co. KG Gesellschaft Fur Industrielle Schutzrechte, Seefeld, Germany**
**Filed Jan. 11, 1995, Ser. No. 371,219**
**Claims priority, application Germany, Jan. 13, 1994, 9400524 U**
**Int. Cl.[6] B65D 35/28**
**U.S. Cl. 222—95** **3 Claims**

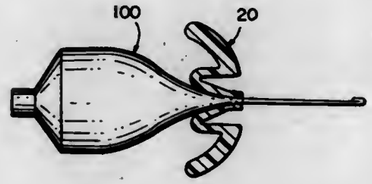


1. A device for emptying a film tube which contains a flowable substance and has a dispensing end provided with a ring, the device comprising a cylindrical housing with a displaceable piston and a cap and being adapted to receive the tube between said piston and said cap, said housing including an end portion having an inner wall and a ring supporting surface, the cap having a dispensing opening, an annular engaging portion surrounding the dispensing opening and cooperating with said ring for sealing the dispensing end of the tube, and a cylindrical end portion having an inner wall and being adapted to engage the end portion of the housing, the peripheral portion of the ring being centered by the inner wall of the outer one of said end portions of said housing and said cap, and the ring having a peripheral portion which exceeds the inner diameter of the housing for engaging said supporting surface, and wherein
a gap remains between mutually facing surfaces of said end portions of the housing and the cap when said housing, cap and tube are assembled with said ring abutting said engaging portion of the cap and the peripheral portion of said ring abutting said supporting surface of said housing.



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**5,501,369**
**DEVICE FOR SQUEEZING THE CONTENTS OF FLEXIBLE TUBES**
**Zeev Tal, 15 Ha'assif Street, Haifa 34637, Israel**
**Filed Mar. 2, 1995, Ser. No. 397,580**
**Int. Cl.[6] B65D 35/28**
**U.S. Cl. 222—103** **17 Claims**

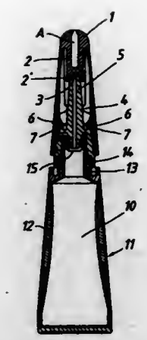



1. A device for squeezing out a desired quantity of past contents of a flexible or collapsible tube having sealed end, said device comprising an integral structure having two elongated members connected by a frame, each of said elongated members having a free elongate side to which a resilient tongue is integrally attached, said resilient tongue being a U-shaped leaf spring having one side integrally attached to said free elongate side of a respective elongated member and another being free, said resilient tongues defining an opening which narrows gradually from a relatively wide entrance, the width of which entrance being correlated to the thickness of the rear end of the tube, through which the sealed end of the tube is inserted, to a narrow slot whose width is correlated to the double wall thickness of the tube, said resilient tongues exerting a pressure on the walls of the tube and flattening the same whilst sliding thereon and also exerting a constant force on the pressed together flattened walls of the tube holding the walls of that part of the tube engaged by said slot firmly closed, thus separating between a front of the tube which is full and a rear part of the tube which is emptied and preventing escape of the contents of the tube backwards and also preventing unwanted sliding of the device along the tube, said resilient tongues pressing the walls of the tube together, whereby a desired quantity of the contents of the tube is squeezed out of the tube by pressing the walls of said front full part of the tube together or by pushing the device toward the front full part of the tube.

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**5,501,370**
**CONTAINER WITH NOZZLE CAP**
**Naomi Okamura, Kuki; Takao Hino, Yokohama; Akio Nimura, Kawaguchi; Masayuki Fukai, Chofu; Keizi Shimizu, Osaka; Harumi Teramae, Takarazuka, and Chiaki Hata, Ibaraki, all of, Japan, assignors to Taoka Chemical Company, Limited, Tokyo, Japan**
**Filed Jul. 20, 1994, Ser. No. 277,110**
**Claims priority, application Japan, Jul. 23, 1993, 5-202811**
**Int. Cl.[6] B67D 3/00**
**U.S. Cl. 222—111** **20 Claims**

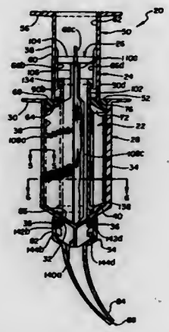
1. A container combined with a nozzle cap comprising
a nozzle connected to a body of said container, said nozzle including a tip end and a base end with a discharge port formed within the tip end of said nozzle; and



said nozzle cap being made of a resin cap and including a resilient column element projecting into an interior of said cap, said resilient column element having a head end and a base end, the head end of said column element including a concave hole formed therein into which the tip end of said nozzle is removably fitted thereby closing the discharge port of said nozzle, the base end of said resilient column element including a cavity portion longitudinally formed therein for increasing a flexibility of said column element.

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**5,501,371**
**MIXING SYRINGE**
**Jean Schwartz-Feldman, Rte. 1, Box 55, New Ulm, Minn. 56073**
**Filed Jul. 7, 1994, Ser. No. 271,796**
**Int. Cl.[6] B01F 15/02; B67D 5/56**
**U.S. Cl. 222—136** **11 Claims**

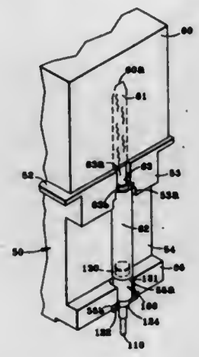


1. A mixing syringe for providing a mixture from a plurality of compounds, comprising:
a storage area for selectively, separately storing a plurality of compounds;
mixing means operably carried within the storage area for substantially mixing the plurality of compounds into a mixture, where said mixing means is retractable from a storage position to a mixing position by the mixing motion such that in the mixing position the areas of separate storage become in flow communication with each other; and

applicator means for selectively directionally extruding the mixture through an aperture.

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**5,501,372**
**PUMP TIP FOR FLUID DISPENSER**
Warren S. Deansen, P.O. Box 614, Nashua, N.H. 03061
Continuation-in-part of Ser. No. 23,628, May 27, 1994. This application Dec. 16, 1994, Ser. No. 357,392
Int. Cl.[6] B67D *5/06*; G01F *11/02*
U.S. Cl. 222—207 3 Claims



1. An improved pump tip for use with a fluid vessel and pump tube in a fluid dispenser wherein said pump tube is connected to lower end of said fluid vessel such that fluid contained therein flows freely from said vessel into said pump tube,

said pump tip comprising a body, a nozzle projecting downward from lower end of said body, and a tube coupling projecting upward from upper end of said body and attachable to lower end of said pump tube,

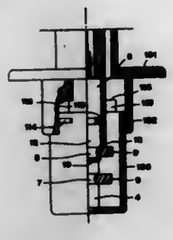
said body containing an interior chamber, said chamber communicating with an output opening at lower end of said nozzle and further communicating with an input opening at upper end of said tube coupling whereby a continuous passage is formed through said pump tip,

said body having at least one longitudinally-extending external mating surface, said mating surface directly engagable and closely fitting within a lower tube locator recess of said fluid dispenser, thereby providing a rigid interface and lateral support means to said pump tip and extending said tube coupling above said tube locator recess whereby said pump tip is not susceptible to lateral displacement during operation of said dispenser and said pump tube does not extend downward into said tube locator recess when attached to said tube coupling,

said body further comprising keyed surfaces corresponding to mating surfaces in said tube locator recess, said keyed surfaces and said mating surfaces cooperating to provide resistance to twisting and upward movement of said pump tip when said pump tip is engaged with said tube locator recess,

said external mating surface having a generally cylindrical shape, said keyed surfaces comprising at least one tab extending outward from said body corresponding to at least one mating slot in said tube locator recess and further comprising at least one step surface on said body corresponding to at least one mating step surface in said tube locator recess.

**5,501,373**
**ATOMIZING DISPENSER FOR ENDONASAL DRUG SPRAY ADMINISTRATION**
Rosaria Galli, Genoa, Italy, assignor to R.G.s.a.s.di Rosaria Galli & C, Italy
PCT No. PCT/IT92/00090, § 371 Date Jun. 17, 1994, § 102(e) Date Jun. 17, 1994, PCT Pub. No. WO93/02804, PCT Pub. Date Feb. 18, 1993
PCT Filed Jul. 30, 1992, Ser. No. 190,112
Claims priority, application Italy, Aug. 2, 1991, 91A000102
Int. Cl.[6] G01F *11/00*
U.S. Cl. 222—386 7 Claims



1. An atomizing dispenser for dispensing a solution as an endonasal spray, said dispenser comprising:

a tubular pump chamber, having first and second ends, said pump chamber being affixed to radial extensions for gripping and pressing the dispenser, said tubular chamber having an opening at the first end of the chamber and being in fluid connection with an atomizing nozzle at the second end of the chamber;

a piston slidable in an axial direction in said pump chamber, said piston including a control button at a lower end; and

a detent adapted to resist axial sliding of the piston relative to the chamber past a given point, wherein said detent is a ring adapted to be seated in a groove on one of the piston or chamber, and wherein said ring has an opening therein, said detent cooperating with said chamber and said piston to prevent movement of the chamber relative to the piston until sufficient compressive force is applied to the piston, relative to the chamber, to cause the piston and chamber to snap past the detent, whereby adequate force for dispensing the solution is provided.

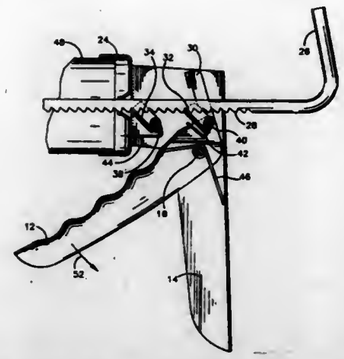
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**5,501,374**
**DEVICE FOR EXTRUDING HIGH VISCOSITY FLUID HAVING MULTIPLE MODES OF OPERATION**
William C. Laufer, Cleveland; Richard C. Weiner, North Olmsted, and Stipe Vranic, Middleburg Heights, all of Ohio, assignors to Vital Products, Co., Cleveland, Ohio
Filed Jun. 17, 1994, Ser. No. 261,479
Int. Cl.[6] B67D *5/42*
U.S. Cl. 222—391 8 Claims

1. A multiple operational pressure relief mechanism for use with a high viscosity fluid delivery device having a drive rod with teeth along one longitudinal side of said rod, said rod attached to a piston for extruding said fluid, a handle including an operating lever pivotally attached at a point proximate to the upper ends of the handle and the operating lever, biasing means for maintaining the lower end of the operating lever and the handle away from one another, and a first dog means pivotally attached to the operating lever proximate to the upper end of the operating lever and biased to continuously engage the teeth of the drive rod to effect the forward movement of the drive rod and piston as the lower end of the operating handle is moved toward the handle, the pressure relief mechanism comprising:

a second dog means for engaging the teeth of the drive rod to prevent the rearward movement of the drive rod, the second dog means pivotally attached in the upper handle section and



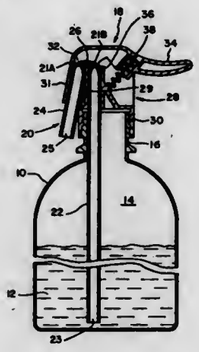


aligned with the pivotal attachment of the first dog means such that both the first and second dog means simultaneously engage the teeth of the drive rod when the lower end of the operating lever is at the farthest position from the handle; and

a release arm fixedly attached to the operating lever and having sufficient length to contact the second dog means upon movement of the operating lever to the nearest position to the handle to cause the second dog means to disengage the teeth of the drive rod.

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**5,501,375**
**DISPENSER VALVE FOR DISPENSING A PRESSURIZED LIQUID**
Billy Nilson, Mjolby, Sweden, assignor to Cenova Innovations & Produktions AB, Mjolby, Sweden
Filed May 12, 1994, Ser. No. 242,543
Int. Cl.[6] B65D *83/20*
U.S. Cl. 222—402.13 5 Claims

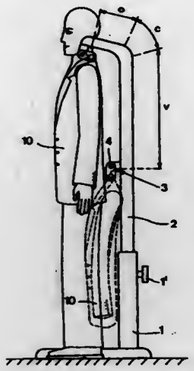


1. A dispenser valve for dispensing a liquid from a container wherein the container contains a liquid to be dispensed and a pressurized gas, said dispensing valve comprising:

a length of flexible tubing, said tubing divided into three segments by two folds along two substantially parallel lines arranged perpendicularly to the axis of said tubing, said folds separated by a section of said tubing, a first said segment movable relative to a second said segment, one end of said tubing adapted to be immersed in said liquid;

a straightener for selectively retaining said length of tubing in a folded condition to block passage of fluid therethrough and for selectively moving said first segment relative to said second segment to permit fluid to pass therethrough, whereby liquid is selectively dispensed from a said container.

**5,501,376**
**DEVICE FOR PROVIDING ASSISTANCE IN DONNING GARMENTS EQUIPPED WITH SLEEVES**
Emilio Roda-Balzarini, Via al Ruscello 6, 6962 Viganello, Switzerland
Filed Aug. 23, 1994, Ser. No. 294,303
Claims priority, application Switzerland, Jul. 19, 1994, 02283/94
Int. Cl.[6] A47G *25/80;25/90;* A41H *5/00*
U.S. Cl. 223—111 7 Claims



1. Device for providing assistance to a user in donning a garment (**10**) equipped with sleeves, wherein said device comprises:

a) two matching tubular element (**2**), including a vertical element essentially shaped like an L at an upper end segment;

b) movable parts (**3**), each of which is connected to one of said elements (**2**) and is free to slide along an essentially L-shaped path in the tubular elements (**2**);

c) pincers (**4**) which are firmly attached, respectively, to said movable parts (**3**), and which grasp a part of the garment (**10**) to be donned without creasing while traveling along the L-shaped path, said pincers (**4**) further being equipped to open at the end of said L-shaped path;

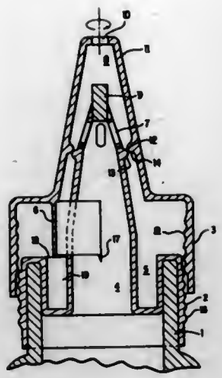
d) an electric motor (**6**) which is attached to the movable parts (**3**) and which is equipped with one or more pedal switches (**7**) to ensure drive in both directions of motion, as well as to ensure stoppage; and

e) a base (**1**) which supports the device.

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**5,501,377**
**CENTRAL SEALING PIN CAP**
Werner F. Dubach, Maur, Switzerland, assignor to Createchnic AG, Switzerland
PCT No. PCT/CH93/00099, § 371 Date Jan. 4, 1994, § 102(e) Date Jan. 4, 1994, PCT Pub. No. WO93/22212, PCT Pub. Date Nov. 11, 1993
PCT Filed Apr. 16, 1993, Ser. No. 170,342
Claims priority, application Switzerland, May 4, 1992, 01422/92
Int. Cl.[6] B67D *3/00*
U.S. Cl. 222—521 10 Claims

1. In a rotatable central sealing pin cap for a container (**1**), having a stationary part (**2**) fixed with respect to the container (**1**), a detachable pouring screw cap (**3**) threadedly adjustable with respect to the stationary part (**2**) for adjustment between an open and a closed position of the rotatable central sealing pin cap with respect to a sealing pin (**9**) oriented toward an opening (**10**) of the detachable pouring screw cap (**3**), the improvement comprising: a radial wall (**19**) attached to the stationary part (**2**), an annular wall (**6**) attached to the detachable pouring screw cap (**3**), a positioning tip (**17**) extending from a bottom edge of said annular wall (**6**), a



first annular shoulder (13) positioned on the stationary part (2), a second annular shoulder (14) positioned on the detachable pouring screw cap (3); at a position of contact between an upper portion of the first annular shoulder (13) add a lower portion of the second annular shoulder (14) internal threads (15) on an internal wall of the detachable pouring screw cap (3) being disengaged from external threads (16) on an external wall of the stationary part (2), said positioning tip (17) extending below an upper edge of said radial wall (19) and interfering with said radial wall (19) to limit rotation of said detachable pouring screw cap (3) with respect to said stationary part (2).

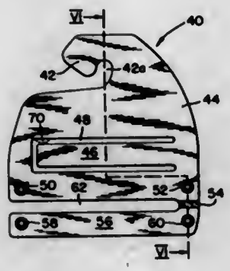
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**5,501,378**

## GARMENT HANGER

Chester Kolton, Westfield, and Stuart S. Spater, Livingston, both of N.J., assignors to B&G Plastics, Inc., Newark, N.J.

Filed Jul. 22, 1994, Ser. No. 279,280
Int. Cl.[6] A47G 25/28
U.S. Cl. 223—87 11 Claims



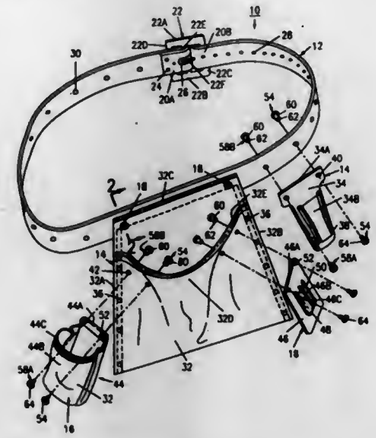
1. A garment hanger comprised of a one-piece body having a hook portion for the receipt of a display rod, a central portion depending from said hook portion, said body defining in said central portion an opening therethrough and a garment support member disposed in said opening and movable relative to said body and a lower portion defining a fold line segment depending from said central portion and a flap segment depending from said fold line segment, said central portion, said fold line segment and said flap segment jointly defining a slot in said body which extends through said fold line segment and opens into a margin of said body.

**5,501,379**

## MODULAR UTILITY BELT

Jose C. Muñoz, Pico Rivera, Calif., assignor to McGuire-Nicholas Company, Inc., City of Commerce, Calif.

Filed Apr. 22, 1994, Ser. No. 232,824
Int. Cl.[6] A45F 5/00
U.S. Cl. 224—240 3 Claims



1. A utility belt comprising:

(a) a belt adapted to be worn about the waist of a user, the belt having at least five equally spaced belt fastener receivers positioned around the belt and extending therethrough, the distance between adjacent belt fastener receivers being equal to X;

(b) a belt attachment comprising a rear wall having a pair of belt fasteners spaced apart a distance substantially equal to X multiplied by an integer which is at least two, wherein said pair of belt fasteners correspond with and mate with a first pair of said belt fastener receivers to selectively attach the belt attachment to the belt with at least one belt fastener receiver between said first pair of belt fasteners without a belt fastener engaged thereto and a front wall attached to said rear wall having a pair of outer fastener receivers wherein the distance between the pair of outer fastener receivers is substantially equal to an integer multiple of X; and

(c) an outer attachment comprising a rear wall having a pair of outer fasteners spaced apart a distance substantially equal to an integer multiple of X, said pair of outer fasteners corresponding with and mating with one of a second pair of said belt fastener receivers, respectively, and said pair of outer fastener receivers, respectively, for selectively attaching the outer attachment to one of said belt and said front wall of said belt attachment.

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**5,501,380**

## SAFETY HOLSTER FOR HANDGUN

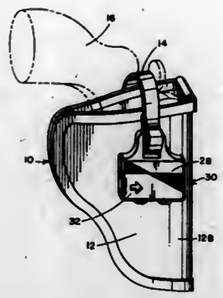
Kuang-Li Wu, 4669 W. Highway 192, Kissimmee, Fla. 34746

Filed Dec. 12, 1994, Ser. No. 353,685
Int. Cl.[6] F41C 33/02
U.S. Cl. 224—243 10 Claims

1. A safety holster for a handgun comprising:

a holster adapted for receiving a barrel and receiver portion of a handgun with a handgrip and hammer portion of the handgun extending outward of the holster, said holster having an outer surface and a reverse surface with a belt loop means attached to said reverse surface of said holster for enabling said holster to be carried on a person's belt;





a flexible strap having one end attached to said reverse surface of said holster and having a second end extendable over at least the hammer portion of the handgun to said outer surface of said holster;

a two-member locking device having a first, fixed member attached to said outer surface of said holster and having a second, releasable member attached to said second end of said strap; and

said locking device comprising a combination lock requiring setting of a unique combination for releasing said second member from said first member.

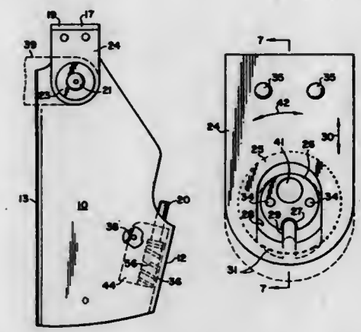
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**5,501,381**

## HANDGUN HOLSTER

William H. Rogers, and Norman E. Clifton, Jr., both of Jacksonville, Fla., assignors to Safariland Ltd., Inc., Ontario, Calif.

Filed Jan. 5, 1994, Ser. No. 176,766
Int. Cl.[6] F41C 33/00
U.S. Cl. 224—243 21 Claims



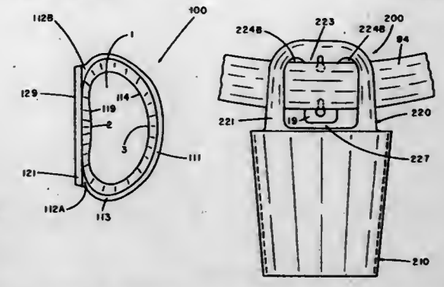
1. A handgun holster comprising a quick release withdrawal restraint, an inner and outer sidewall joined together along lower front and back portions to define an inner cavity having an open top shaped to fit a handgun holstered therein, an elongated restraining strap having opposite ends and a medial portion bridging said sidewalls across said open top, means for pivotal attachment of said opposite ends of said strap to respective said sidewalls to permit movement of said strap from a position across said open top to restrict handgun withdrawal to a position generally forwardly of said holster to permit handgun withdrawal, said means for pivotal attachment including a detent means releasably engaged with said means for pivotal attachment for preventing forward pivotal movement of said restraining strap until said strap is moved at said means for pivotal attachment in a predetermined direction.

**5,501,382**

## UNIVERSAL HAND TOOL HOLDER

Edward H. Webb, 17003 County Rd. 181, Paynesville, Minn. 56362

Continuation-in-part of Ser. No. 191,776, Feb. 2, 1994, abandoned. This application Feb. 15, 1995, Ser. No. 389,208
Int. Cl.[6] A45F 5/00
U.S. Cl. 224—253 4 Claims



1. I claim a tool holder of a type that holds a hand held tool so as to be readily accessible, comprising:

(a) a slightly resilient holster having an upper end and a lower end, the upper end of the tool holster defining a first surface area and the lower end of the tool holster defining a second surface area, the second surface area being at least eighty percent as large as the first surface area;

(b) an epitrochoidal cavity, the epitrochoidal cavity residing between the upper end and the lower end of the holster;

(c) a belt mounting means for securing the holster to a belt of a type worn about a person's waist, the belt mounting means including a rigid panel extending outwardly from the epitrochoidal cavity, the rigid panel being perforated by a pair of laterally spaced slots of sufficient size to receive a belt;

(d) a wall mounting means for securing the holster to a wall surface, the wall mounting means being formed by a perforation of the rigid panel, the perforation including at least one hole formed through a section of the rigid panel disposed between the laterally spaced slots; and

(e) a chuck key retaining means formed as an integral part of the holster proximate the upper end of the holster.

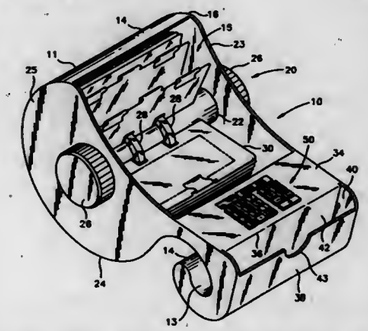
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**5,501,383**

## COUPON HOLDER AND DISPENSING APPARATUS

Paul A. Wilson, 12234 Betsworth Rd., Valley Center, Calif. 92082

Filed Dec. 14, 1993, Ser. No. 167,575
Int. Cl.[6] B62B 5/00
U.S. Cl. 224—411 27 Claims



1. A store coupon storage and dispensing apparatus comprising:

an elongated frame comprising opposing spaced side walls interconnected by a contoured sheet of stiff material, a downwardly opening notch being formed in one end of said frame and being shaped and configured to engage a handle of a shopping cart;

a drum providing a curved path for coupon file cards, said drum being disposed in said frame extending between said side walls; and

means for removably, engageably retaining coupon file cards on said drum and adapted to permit the file cards to be slidable along said curved path.

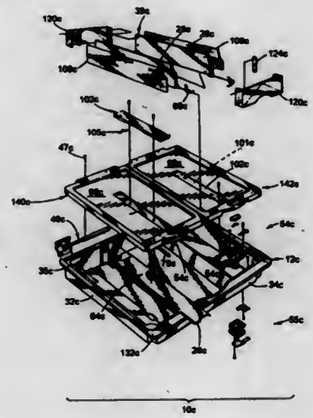
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**5,501,384**

## STORAGE SYSTEM

**Chester R. Wisniewski, Grand Haven, Mich., assignor to Prince Corporation, Holland, Mich.**

**Filed Jul. 11, 1994, Ser. No. 273,236**
**Int. Cl.[6] B60R *11/00***
**U.S. Cl. 224—539** **20 Claims**



1. An apparatus for subdividing a storage area in a vehicle, comprising:

a storage bin defining a compartment and including sidewalls and a bottom;

a first cover configured to cover said storage bin, said first cover being pivotally movable between an open position for accessing said compartment and a closed position, said first cover including marginal material defining an access opening in said first cover; and

a second cover configured to cover said access opening, said second cover being pivotally movable between an open position for accessing said compartment through said access opening and a closed position, whereby said compartment can be accessed by selectively opening one of said first and second covers;

a plurality of dividers pivotally connected to a support surface of at least one of said storage bin and said first cover for movement between a raised position wherein said plurality of dividers subdivide the support surface and a lowered position wherein said plurality of dividers form a relatively flat surface for supporting items thereon; and

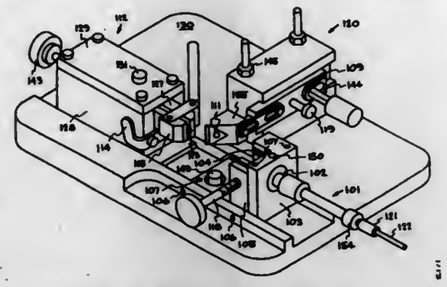
foldable carpet sections positioned on said plurality of dividers and said at least one of said storage bin and said first cover.

**5,501,385**

## LARGE CORE FIBER OPTIC CLEAVER

**John M. Halpin, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Dec. 8, 1994, Ser. No. 351,915**
**Int. Cl.[6] C03B *37/16***
**U.S. Cl. 225—96** **2 Claims**



1. A device for cleaving optical fibers comprising:

a scribing means for scribing an optical fiber, said scribing means comprising a scribe tension means for adjusting the tension of the scribing means against the fiber;

a chuck assembly comprising:

a chuck block wherein said chuck block further comprises a linear slot;

a chuck positioned within said slot for movement along said slot from a loaded to an unloaded position, said chuck comprising a first holding means for holding an optical fiber within the chuck during scribing and cleaving;

a biassing means for moving said chuck along said slot from the loaded position to the unloaded position; and

a latch for holding the chuck in the loaded position; and

a fiber connector block for holding the optical fiber during scribing and cleaving, said fiber connector block further comprising spacial adjustment means for aligning the fiber with the scribing means and the chuck assembly in the x, y and phi directions.

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**5,501,386**

## TAPE GUIDE ROLLER WITH FLANGE AND TAPERED SURFACE FOR USE IN VIDEO TAPE RECORDER

**Hiroshi Kobayashi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Continuation of Ser. No. 247,510, May 23, 1994, abandoned, which is a continuation of Ser. No. 29,921, Mar. 11, 1993, abandoned, which is a continuation of Ser. No. 802,307, Dec. 4, 1991, abandoned. This application Jun. 5, 1995, Ser. No. 462,569**
**Claims priority, application Japan, Dec. 27, 1990, 2-414951**
**Int. Cl.[6] G11B *15/60***
**U.S. Cl. 226—190** **1 Claim**

1. A tape guide roller comprising:

a roller shaft affixed at a first end to a tape guide portion adjacent a magnetic head drum of a video tape recorder;

a rotatable cylindrical roller having a uniform right cylindrical surface supported for rotation on said roller shaft so as to come in continuous rotatable contact with a tape wrapped around the magnetic head drum, said rotatable cylindrical roller having a height substantially less than the width of said tape;

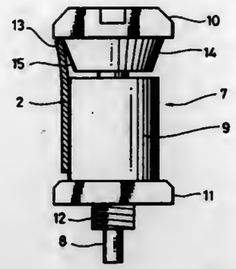
a circular flange attached to a second end of said shaft and having an outer diameter greater than an outer diameter of said rotatable cylindrical roller and having a lower surface opposing an upper edge of said tape;

a non-rotatable tape transport portion unitarily formed on the lower surface of said circular flange, said tape transport portion having a conical shape tapering toward an upper end of said cylindrical roller; and

a gap formed between said tape transport portion and the upper end of said cylindrical roller,

wherein said conical shape of said tape transport portion has a maximum diameter larger than the outer diameter of said cylindrical roller and smaller than the outer diameter of said circular flange and said conical shape has a minimum diameter smaller than the outer diameter of said cylindrical roller, and wherein the height of said tape transport portion plus said height of said cylindrical roller less a width of said gap is substantially equal to the width of the tape, said cylindrical roller being rotatable and said transport portion being non-rotatable such that the tape is in continuous rotatable contact with said cylindrical roller and is in continuous slidable contact with said tape transport portion, and a tape height regulating force acting on said tape is generated by both said lower surface of said flange and said conical shape of said tape transport portion, the force on said tape generated by said flange and the force on said tape generated by said tape transport portion acting substantially in the same direction.





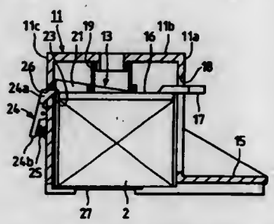
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**5,501,387**

## STAPLE CARTRIDGE AND STAPLE SHEET PACK

**Toru Yoshie, Tokyo, Japan, assignor to Max Co., Ltd., Tokyo, Japan**

**Filed Jan. 14, 1994, Ser. No. 181,032**
**Claims priority, application Japan, Jan. 18, 1993, 5-006234; Jan. 19, 1993, 5-007002; Jan. 21, 1993, 5-008633**
**Int. Cl.[6] B27F *7/17;7/38***
**U.S. Cl. 227—120** **13 Claims**



1. A staple cartridge for a motor driven stapler comprising:

a receiving means for receiving a plurality of staple sheets having a laminated structure bundled by a band member, each staple sheet including a plurality of straight staples successively connected to each other in a side-by-side relationship, said receiving means comprising:

a base member; and

a staple holder means movable relative to said base member for holding said staple sheets;

a spring means for biasing said staple sheets inserted into said receiving means, said staple sheets being biased in a downward direction with respect to said cartridge; and

a first locking means for locking said staple sheets, biased by said spring means, at a predetermined position in said staple cartridge,

wherein said staple cartridge is detached from said motor driven stapler when said staple sheets are inserted into said receiving means; and

wherein said staple holder means has at least one engagement hole for receiving said first locking means.

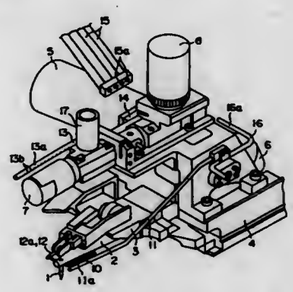
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**5,501,388**

## WIRE BONDING APPARATUS

**Takashi Takeuchi, Higashiyamato, Japan, assignor to Kabushiki Kaisha Shinkawa, Tokyo, Japan**

**Filed Nov. 19, 1994, Ser. No. 343,256**
**Claims priority, application Japan, Nov. 25, 1993, 5-319049**
**Int. Cl.[6] H01L *21/607***
**U.S. Cl. 228—1.1** **4 Claims**



1. A wire bonding apparatus comprising a bonding horn which holds a capillary at one end and a detection camera which detects a workpiece so that pads of semiconductor pellets on a workpiece are connected to leads of lead frames via wires which pass through said capillary; and said apparatus further comprising:

an adiabatic plate installed beneath said bonding horn so as to block radiant heat of said heating block which heats said workpiece, and

a cooling air supply means which blows cooling air to said bonding horn and to a mirror tube of said detection camera or a camera supporting arm which supports said detection camera.

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**5,501,389**

## TITANIUM TUBE SEAL WELDING HEAD ENCLOSURE

**Dorel Muth, Kitchener, and Dennis McGuinness, Cambridge, both of, Canada, assignors to The Babcock & Wilcox Company, New Orleans, La.**

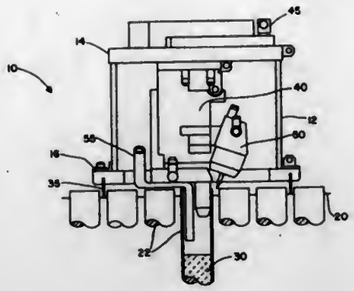
**Filed Feb. 14, 1994, Ser. No. 194,953**
**Int. Cl.[6] B23K *9/00***
**U.S. Cl. 228—29** **9 Claims**

1. An arrangement for providing a weld on a material, comprising:

an enclosure having a closed top and an open bottom opposite the top, the enclosure being positioned on the material at the bottom, said bottom of said enclosure having means for sealing said enclosure to the material and for preventing oxidation of the material, said enclosure being made of a transparent thermoplastic material;

a rotating welding head including an electrode and gas supply means within the enclosure for performing a welding operation on the material; and

inert gas means for providing an inert gas atmosphere within the enclosure.

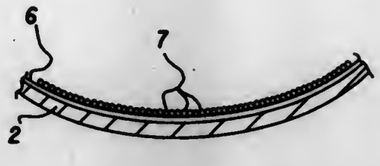


5,501,390
METHOD FOR BONDING THERMALLY-MISMATCHED ELEMENTS OF A TRAVELING WAVE TUBE
Curtis G. Allen, Hayward; David H. Perrone, Redwood City, and David M. Rossi, San Francisco, all of Calif., assignors to Litton Systems, Inc., Woodland Hills, Calif.
Division of Ser. No. 968,416, Oct. 29, 1992. This application Aug. 8, 1994, Ser. No. 287,545
Int. Cl.[6] B23K 1/19
U.S. Cl. 228—124.1 1 Claim



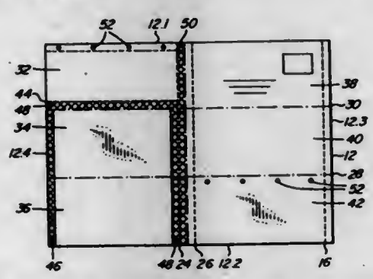
1. Apparatus for bonding a first element to a second element, each of said elements including a metallic component, wherein said elements are characterized by differing coefficients of thermal expansion comprising, in combination:
a) a copper plate including a first surface having a plurality of indentations and a second, opposed surface comprising a corresponding plurality of cones;
b) said plate being located in the region of the interface between said elements so that pluralities of points of tangency are formed between said plate and said first and second elements;
c) said first element including metallization layers of predetermined composition including a surface metallization layer of silver and characterized in that the major portion thereof is ceramic; and
d) bonds comprising an alloying braze compound being formed between said elements and said plate at said points of tangency whereby said elements are bonded to one another.

5,501,391
METHOD FOR APPLYING BRAZING MATERIAL TO A METAL STRUCTURE, PARTICULARLY SUBREGIONS OF A HONEYCOMB BODY
Ludwig Wieres, Overath, Germany, assignor to Emitec Gesellschaft fuer Emissionstechnologie mbH, Lohmar, Germany
Filed Feb. 24, 1995, Ser. No. 393,856
Claims priority, application Germany, Sep. 18, 1992, 42 31 338.4
Int. Cl.[6] B23K 31/02;1/00;101/02
U.S. Cl. 228—248.1 25 Claims



1. A method for applying brazing material to a metal structure, which comprises:
applying a sticky material maintaining adhesiveness up to temperatures of at least 180° C., to at least a subregion of a metal structure,
subsequently applying brazing powder and permanently adhering the brazing powder to the sticky material, and
heat treating the structure after the application of the brazing powder but prior to brazing, without the brazing powder falling out during the heat treating step and during ensuing handling steps.

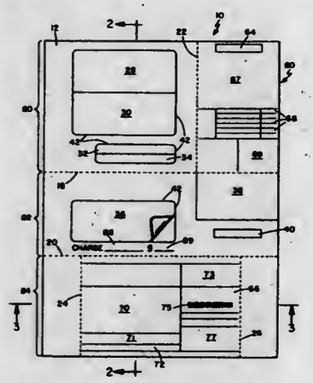
5,501,392
FOLDED SINGLE SHEET MAILER
Manfred G. Kraus, North Vancouver, Canada, assignor to 478336 B.C. Ltd., Richmond, Canada
Filed Oct. 25, 1993, Ser. No. 140,458
Int. Cl.[6] B65D 27/04;27/34
U.S. Cl. 229—92.3 7 Claims



1. A folded single sheet mailer comprising a rectangular sheet having a first pair of opposed ends, a second pair of opposed ends, an outer face and an inner face, said sheet being folded on itself transverse to said first pair of ends along a line offset from the middle of said sheet to provide one fold ply extending beyond the other fold ply, a first line of perforation in said one ply in the portion extending beyond the other fold ply, said first line of perforation extending transverse to said first pair of ends, a first glue line on said inner face on the portion extending beyond the other ply, a second glue line extending transversely of said first glue line adjacent one of said first pair of opposed ends, a second line of perforation extending along said second glue line from said transverse fold to one of said second pair of opposed ends, a pair of superimposed lines of perforation, respectively, in said one ply and in said other fold ply adjacent said transverse fold line and a third glue line on said outer face between said superimposed lines of perforation and said transverse fold line, said sheet further being folded on itself along a plurality of spaced apart secondary fold lines transversely of said transverse fold line to provide an outgoing envelope which is sealed along one pair of its opposite ends and which is openable by tearing along said superimposed lines of perforation and said first line of perforation.

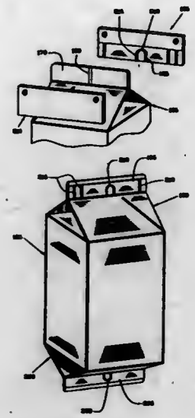


5,501,393
MAILING FORM
Gerard F. Walz, Fallbrook, Calif., assignor to Walz Postal Solutions, Inc., Fallbrook, Calif.
Filed Apr. 14, 1994, Ser. No. 227,513
Int. Cl.[6] B65D 27/06
U.S. Cl. 229—92.8 14 Claims



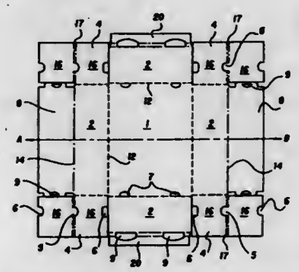
1. A mailing form, comprising:
first and second superimposed sheets, each sheet having an inner face facing the other sheet and an outer face;
the first sheet having a plurality of detachable label areas which are detachable from the remainder of the first sheet, each detachable label area having an adhesive backing facing said second sheet;
the first and second sheets being permanently secured together over predetermined, adhered areas of said form;
the second sheet having predetermined, non-adhered areas on its inner face which are aligned with the detachable label areas of the first sheet, the non-adhered areas being covered with a non-adhesive coating on the inner face facing said first sheet;
one of said adhered areas being detachable from the remainder of the form to provide a predetermined mailing form part, each of the sheets having predetermined printed indicia on its outer face in said one adhered area;
the inner face of the first sheet being coated with a layer of adhesive material for securing the first sheet to the second sheet, the adhesive layer in said label areas comprising said adhesive backing; and
the form having a first, transverse tear line for detaching a portion of the form from the remainder of the form, said portion comprising said predetermined mailing form part, said portion including a pair of second tear lines extending perpendicular to said transverse tear line for detaching a part of said mailing form part from the remainder of said portion, and side strips on opposite sides of said portion outside said tear lines, the inner face of said second sheet being coated with non-adhesive material in said side strips.

5,501,394
GABLE TOP CARTON HAVING A U-SHAPED STAKE SEAL AND METHOD AND APPARATUS FOR FORMING
Kenneth M. Eno, 1816 Slater La., Burnsville, Minn. 55337
Filed Dec. 22, 1993, Ser. No. 172,397
Int. Cl.[6] B65D 5/08
U.S. Cl. 229—137 25 Claims



1. A gable top carton comprising:
a) a gable top;
b) a fin extending from the gable top;
c) an inverted U-shaped stake seal for sealing a channel of the fin.

5,501,395
STACKABLE BOX WITH REINFORCED WALLS
Peter M. McElroy, Auckland, New Zealand, assignor to Kiwi Packaging Limited, Auckland, New Zealand
Continuation of Ser. No. 971,606, Nov. 6, 1992, abandoned. This application Sep. 7, 1994, Ser. No. 301,726
Claims priority, application New Zealand, Nov. 7, 1991, 240500; Apr. 10, 1992, 242313
Int. Cl.[6] B65D 5/20
U.S. Cl. 229—148 19 Claims



1. A blank for a carton or package, said package comprising:
a rectangular base portion limited by fold lines and said base portion having openings formed therein; and
four separate peripheral portions including
(i) an opposed pair of the peripheral portions being foldable to create first opposed side walls and subsequent to assembly being further folded to provide at least part of a top of the package, portions of the peripheral portions to form said first opposed side walls being extended at one end in a direction parallel to the fold line connection to the base portion to

define a flap which can be folded at right angles from the side wall to assume a position as part of the structure of an end wall normal to each first opposed side wall with at least one projection formed by part of said flap directed upwardly and said flap further containing a single fold line defining two equal sized support panels, said two equal sized support panels folded onto each other at said fold line to provide an entire area of said flap with a double thickness of material and wherein said single fold line extending only across an entire width of said two support panels and a cut-out along said single fold line defining said at least one projection of said flap; and

(ii) a second opposed pair of peripheral portions each being foldable to create a remaining part of the structure of said end wall normal to said first opposed side walls;

wherein parallel flutes of corrugated board run across the blank to be a) vertically extending in each side wall and b) vertically extending in at least that part of each said flap having said at least one projection when the blank is assembled and wherein said openings formed in the base portion allow nestings therein of projections of a similar package positioned therebeneath to provide a nesting capability.

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**5,501,396**

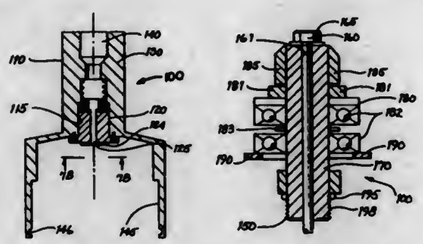
**MOBILE CYCLONIC POWER WASH SYSTEM WITH WATER RECLAMATION AND ROTARY**

**Richard D. Rohrbacher, and Judith M. Jacobson, both of Phoenix, Ariz., assignors to Cyclone Surface Cleaning, Inc., Glendale, Ariz.**

**Division of Ser. No. 118,139, Sep. 8, 1993. This application Nov. 22, 1994, Ser. No. 343,650**

**Int. Cl.[6] B05B *3/06***

**U.S. Cl. 239—7** **19 Claims**



1. A method of sealingly directing high pressure water through a rotary union in a water cyclone sprayer comprising the steps of:

providing a first subassembly of non-rotatable downwardly biased components slideably mounted in a housing fixedly mounted to the sprayer including a first downwardly directed silicon carbide seal surface;

providing a second subassembly of rotatable components retainingly mounted within the housing including a second silicon carbide seal surface; and

rotatably forcing the second silicon carbide seal surface against the first silicon carbide seal surface to form a seal therebetween thereby preventing the water directed through the rotary union from leaking through or around the seal.

**5,501,397**

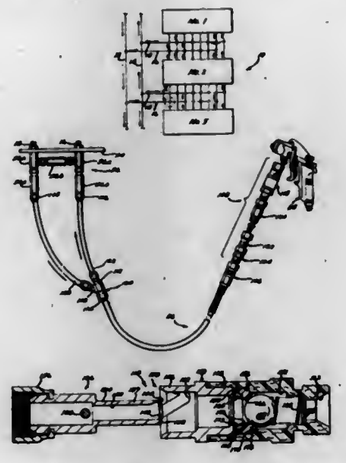
**RECIRCULATING PAINT SYSTEM HAVING A VALVED QUICK DISCONNECT FLUID COUPLING ASSEMBLY**

**Earl R. Holt, Rochester, Mich., assignor to Hose Specialties/ Capri, Inc., Highland Park, Mich.**

**Filed Dec. 2, 1993, Ser. No. 161,825**

**Int. Cl.[6] F16L *37/28*; B05B *9/00***

**U.S. Cl. 239—124** **14 Claims**



1. In a recirculating paint supply system including a pressurized conduit having a first end and second end for receiving and supplying, respectively, a liquid coating composition to a spray nozzle in an amount in excess of that required and for returning the excess liquid coating composition to a supply tank, the improvement comprising:

flow preventing means, including a valve body fitted to the second end of said conduit, for preventing fluid flow from said conduit;

flow enabling means, extending from said spray nozzle and insertable in said valve body, for enabling the liquid coating composition to communicate to said nozzle, said flow enabling means including a stem; and

connecting means for connecting said valve body to said spray nozzle,

said flow preventing means being normally operable to prevent fluid from passing from said conduit to said spray nozzle when said valve body is disconnected from said spray nozzle and comprising a fluid seal means mounted in said valve body for assisting in sealing said valve body, said fluid seal means having a first end face opposite a second end face and a central passage extending between said end faces, said second end face forming a skirt which tapers inwardly, and a closure member normally forced into sealing engagement with the first end face of said fluid seal means and the central passage for preventing flow through said valve body, and

said stem being operable to cause said skirt to expand outwardly to first establish sealing engagement with the second end face during axial insertion to inhibit flashback of the liquid coating composition before said stem engages and moves said closure member from engagement with said first end face of said fluid seal means, fluid flow being enabled substantially simultaneously with said closure member being forced from engagement with said first end face of said fluid seal means by said stem.



**5,501,398**

**DEVICE FOR LIQUID AND SOLID DELIVERY FROM CROP SPRAYING AIRCRAFT**

**Maxwell W. Davidson, Edinburgh, Great Britain, assignor to Maxwell Davidson Ltd., Edinburgh, United Kingdom, and Custom Farm Service of Arizona, Stanfield, Ariz.**

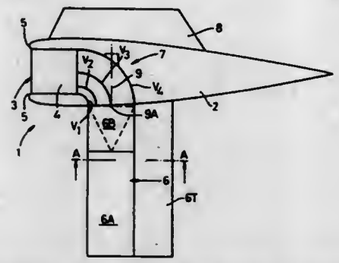
**PCT No. PCT/GB93/00302, § 371 Date Sep. 7, 1994, § 102(e) Date Sep. 7, 1994, PCT Pub. No. WO93/15954, PCT Pub. Date Aug. 19, 1993**

**PCT Filed Feb. 12, 1993, Ser. No. 290,708**

**Claims priority, application United Kingdom, Feb. 12, 1992, 9202872**

**Int. Cl.[6] B64D *1/18***

**U.S. Cl. 239—171** **10 Claims**



1. A discharge device for use in discharging a treatment substance onto a crop or a ground surface from a crop spraying aircraft, the device including means for mounting the device on an aircraft, a treatment substance supply means, a conduit member providing an air passage, said air passage including an inlet portion to receive air due to forward movement of the aircraft, an outlet portion with an outlet discharge and an elbow portion to connect the inlet portion to the outlet portion, said treatment supply means is located and arranged with respect to the air passage such that treatment substance is delivered substantially only in the outlet portion of the air passage, said outlet portion faces in downwardly direction to discharge said air and the treatment substance together in a direction having a major component vertically downward.

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**5,501,399**

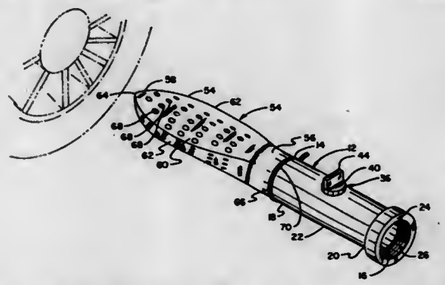
**AUTOMOBILE WHEEL CLEANING DEVICE**

**Joseph P. Clenkus, 9121 Doubloon Rd., Indianapolis, Ind. 46268**

**Filed Jun. 6, 1994, Ser. No. 254,554**

**Int. Cl.[6] B05B *7/04***

**U.S. Cl. 239—310** **1 Claim**



1. A new and improved automobile wheel cleaning device comprising, in combination:

a regulator shaft comprised of reinforced rubber and formed in a hollow generally cylindrical configuration with a first open end and a second open end, the shaft including an inboard region adjacent to the first open end, an outboard region adjacent to the second open end and a central region therebetween, the inboard region being smaller than the outboard region, a hollow generally cylindrical collar being affixed to the second open end, the collar having an inner surface, an outer surface and two open ends, the collar having a larger circumference than the outboard region and including a plurality of internal screw threads, a washer shaped in a ring configuration being positioned inside the collar, the collar adapted to be coupled with a standard garden hose in an operative orientation, the outboard region of the regulator shaft adapted to receive a soap pellet encased in an envelope, when utilizing the apparatus, the soap pellet gradually dissolving and flowing out the inboard region of the regulator shaft, the central region being enlarged to form a generally spherical chamber and including a circular hole extending therethrough;

a restrictor dial, the dial including a plate formed in a generally planar cylindrical configuration with an upper surface and a lower surface, the upper surface including a generally planar rectangular finger grip extending perpendicularly therefrom, the finger grip positioned diametrically across the upper surface of the plate, a valve formed in a generally planar circular configuration being positioned within the chamber of the regulator shaft, the valve including a small generally cylindrical rod extending from it and rotatably affixed within the surface of the shaft, an axle formed in a generally cylindrical configuration being positioned through the chamber, a first end of the axle being affixed to the center point of the lower surface of the plate with a second end being affixed to the valve located diametrically opposite from the rod, the regulator dial adapted to allow a user to regulate water therethrough by turning the dial to a plurality of open positions;

a cleaning head comprised of micro cell polyurethane foam and formed in a hollow generally cylindrical configuration with an inner section, an outer section, a central section and two opposing side edges, the side edges forming a V-shaped configuration and positioned diametrically opposite from each other, the central section having a large width and positioned between the inner and outer sections, the outer section including an outermost extent having a point, the outer section having a gradually decreasing width between its point and the central section, the inner section including an innermost extent having an open end, the inner section having a gradually decreasing width between its open end and the central section, the open end of the inner section adapted to be positioned around the open end of the inboard section of the regulator shaft, the cleaning head also including a plurality of apertures adapted to permit the free flow of water therethrough in an operative orientation; and

a clip shaped in a ring configuration and releasably coupling the cleaning head upon the shaft, the clip being positioned around the open end of the cleaning head.

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**5,501,400**

**WATER SPRAY GUN**

**Awdu Kuo, No. 10, Fang Tsung Road, Wen Chien Tsun, Fang Yuan Hsiang, Changhua Hsien, Taiwan**

**Filed Aug. 9, 1994, Ser. No. 287,885**

**Int. Cl.[6] B05B *1/12;1/16***

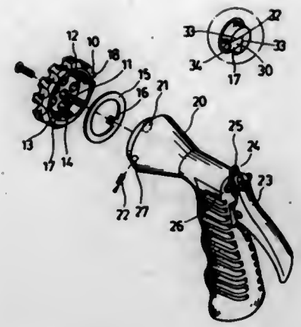
**U.S. Cl. 239—394** **4 Claims**

1. A water spray gun comprising:

a) a housing including a front water outlet and a control lever for controlling the flow of water through the water outlet;

b) a spray pattern dial rotatably mounted over the water outlet, the dial including a plurality of nozzles for selective alignment with the water outlet upon rotation of the dial, and an annular recess including a bottom wall extending around the nozzles, a plurality of holes extending around and through the bottom wall, and a radial opening disposed inwardly of the recessed wall;

c) a packing ring mounted within the annular recess, the ring including an inwardly extending projection fitted into the



radial opening, the projection having a through hole for providing communication between the water outlet and the plurality of holes in the bottom wall of the annular recess through the radial opening when the projection is aligned with the water outlet;

d) at least one nozzle having a flow hole with a cross-sectional configuration in the form of a sector defined by an angle formed by a pair of radii and a peripheral arc, whereby when the at least one nozzle is aligned with the water outlet and the spray gun is maintained in a horizontal position of use, the angle is disposed above the peripheral arc in vertical alignment;

e) a plurality of locating grooves spaced around the annular recess and a locating means alternatively engageable with the locating grooves for selectively maintaining a nozzle or the projection in alignment with the water outlet; and

f) locking means for maintaining the control lever in an open position for permitting continuous water flow through the water outlet.

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**5,501,401**

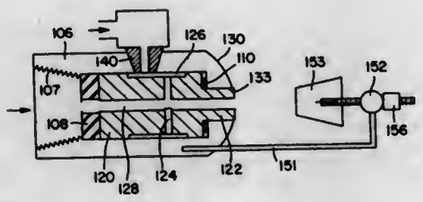
**ULTRASONIC FOGGING DEVICE WITH AGITATION CHAMBER**

**Michael Munk, 130 Gun Club Rd., Stamford, Conn. 06903**

**Filed Mar. 29, 1994, Ser. No. 218,932**

**Int. Cl.[6] B05B** *7/04;1/26*

**U.S. Cl. 239—431** **18 Claims**



1. An ultrasonic fogger, comprising:

a generally cylindrical body having an axial bore therethrough with an inlet at a rear face of said body and an outlet at a front face of said body;

means for coupling a gas supply to the inlet end of the bore;

an agitation chamber in said body in communication with said bore;

means for coupling a liquid supply to said chamber; and

a resonator spaced from and opposing the outlet end of said bore.

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**5,501,402**

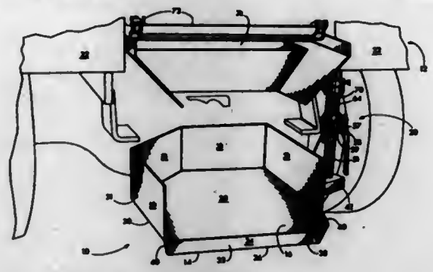
**PATCHING PAN DEVICE**

**Daniel K. Jones, 5337 Reiner Rd., Madison, Wis. 53704**

**Filed Dec. 9, 1993, Ser. No. 164,367**

**Int. Cl.[6] A01C** *15/00*

**U.S. Cl. 239—650** **13 Claims**



1. A patching pan device comprising:

a. a vehicle having a material containment bed with a material distribution opening;

b. a material distribution pan including a substantially horizontal base sheet with an upper surface adapted to receive and support material thereupon, an opposing lower surface, and an edge therebetween, the edge having a continuous substantially vertical wall arising therefrom about at least a major portion of the edge; and

c. a collar joined to the pan, the collar being pivotally and detachably connected to a vertically disposed shaft attached to the vehicle, whereby the pan may be positioned in an operating position wherein the upper surface may receive material from the distribution opening, and a stored position wherein the pan is located generally away from the distribution opening.

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**5,501,403**

**SPREADING APPARATUS AND A DISTRIBUTION CHAMBER THEREFOR**

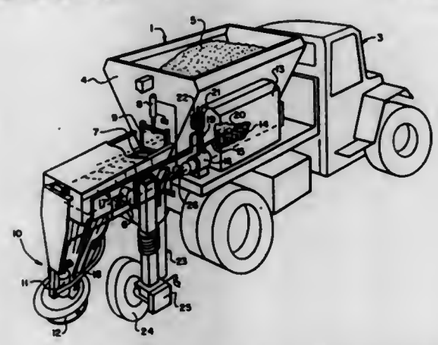
**Cornelis B. van Vooren, Almelo, Netherlands, assignor to Schmidt Holding Europe GmbH, Netherlands**

**Filed Jun. 2, 1994, Ser. No. 252,956**

**Claims priority, application Netherlands, Jun. 3, 1993, 9300955**

**Int. Cl.[6] A01C** *23/00*

**U.S. Cl. 239—662** **8 Claims**



1. A spreading apparatus comprising a controllable metering valve; a spreader member; a container for spreadable granular material, wherein the container is provided with an outlet which is closable with the controllable metering valve and which connects to the spreader member; a feed conduit for wetting agent; and a reservoir for liquid wetting agent, the reservoir including an outlet provided with a pump connected to the feed conduit for wetting agent, wherein the feed conduit includes a siphon which extends above a filling level of the reservoir for liquid wetting agent and is provided with venting means and wherein the feed conduit connects via an open feed conduit end to the spreader member.



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**5,501,404**

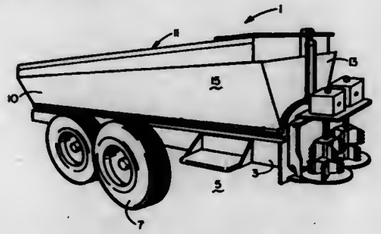
**MANURE SPREADER WITH VERTICAL EXPELLERS**

**Donald A. Meyer, and Larry Meyer, both of Dorchester, Wis., assignors to Meyer Manufacturing Corporation, Dorchester, Wis.**

**Continuation-in-part of Ser. No. 888,191, May 26, 1992, Pat. No. 5,368,236. This application Jul. 8, 1994, Ser. No. 272,051**

**Int. Cl.[6] A01C** *23/00*

**U.S. Cl. 239—676** **3 Claims**



1. An improved manure spreader comprising:

a. a box having front and back ends with side walls, a back wall, and a floor, the back wall having a discharge opening with a predetermined height therethrough, the floor being formed with a pair of generally semi-circular channels partially defined by a generally vertical central web;

b. frame means for supporting the box to be rolled along the ground;

c. a pair of auger means lying horizontally within the respective channels in the box floor and terminating adjacent the back wall discharge opening;

d. gate means for selectively opening and closing the discharge opening; and

e. a pair of expeller means mounted to the box back wall for rotating entirely outside the box about respective vertical axes, said expeller means being located proximate and in general horizontal alignment with the back wall discharge opening and having respective axial lengths that are at least one-half of the height of the discharge opening,

so that said auger means can propel materials stored in the box through the discharge opening to the expeller means and the expeller means can fling the material over the ground.

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**5,501,405**

**DISPENSER APPARATUS FOR SPREADING PARTICULATE MATERIAL**

**James R. Doornek, Mequon, Wis., assignor to Douglas Dynamics, Inc., Milwaukee, Wis.**

**Filed Jul. 5, 1994, Ser. No. 270,453**

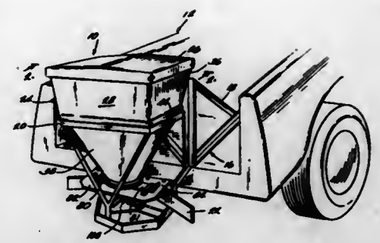
**Int. Cl.[6] A01C** *17/00*

**U.S. Cl. 239—683** **17 Claims**

1. A dispenser apparatus for particulate material, said dispenser apparatus comprising:

a hopper defining an enclosed chute for the particulate material, said hopper including a plurality of vertically successive stages including an uppermost stage, a lowermost stage, and at least one intermediate stage between said uppermost and lowermost stages, each of said stages defining a chute section having a downwardly narrowing portion, and each of said stages including an upper portion defining an inlet opening, and lower portion defining an outlet opening, the outlet opening of each of said uppermost and intermediate stages being coextensive with said inlet opening of a succeeding one of said stages, and said outlet opening of each of said stages defining a horizontal cross-sectional area, the horizontal cross-sectional area defined by said outlet opening of each of said lowermost and intermediate stages being smaller than the horizontal cross-sectional area defined by said outlet opening of each preceding one of said stages, and said chute section defined by said lowermost stage including a top portion immediately below said outlet opening of an immediately preceding one of said stages, said top portion defining a cross-sectional area in a horizontal plane that is greater than said cross-sectional area defined by said outlet opening of said immediately preceding one of said stages so that the top portion of the lowermost chute section is expanded relative to said outlet opening of said immediately preceding one of said stages before narrowing to the outlet opening thereof, and

means in said hopper for agitating the particulate material.



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**5,501,406**

**PLASTIC BOBBIN CARRIER**

**Walter Henning, Hermann-Löns-Strasse 1, D-5110 Alsdorf-Hoengen, Germany**

**PCT No. PCT/DE92/00310, § 371 Date Dec. 22, 1993, § 102(e) Date Dec. 22, 1993, PCT Pub. No. WO92/18408, PCT Pub. Date Oct. 29, 1992**

**PCT Filed Apr. 15, 1992, Ser. No. 133,134**

**Claims priority, application Germany, Apr. 20, 1991, 41 12 954.7**

**Int. Cl.[6] B65H** *75/20;75/12;* **D06F** *17/00*

**U.S. Cl. 242—118.11** **16 Claims**



1. A one-piece plastic bobbin carrier for taking up threads and yarns, said plastic bobbin carrier being in the form of a substantially cylindrical shell having radial openings therein and first and second ends, said shell comprising:

first and second end rings at said first and second ends of said shell, said first and second end rings having radially inwardmost surfaces;

an outer winding surface;

a substantially cylindrical inner surface;

a plurality of shell segments spaced apart from one another, said shell segments having inner and outer surfaces, said outer surfaces defining said outer winding surface of said shell, and said inner surfaces defining said inner surface of said shell;

a plurality of supporting webs joining said shell segments together, said supporting webs being continuous and extending from said first end ring to said second end ring, said supporting webs having a cross section which is constant over their entire length, said supporting webs resting on said inner surface of said shell segments and being formed in one piece with said shell segments, and said supporting webs protruding radially over said radially inwardmost surface of at least one of said first and second end rings.

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**5,501,407**

## PHOTO FILM CASSETTE HAVING LIGHT TRAPPING RIBBONS IN WHICH PILE THREADS ARE SECURELY HELD IN PLACE AND METHOD OF MANUFACTURING THE RIBBONS

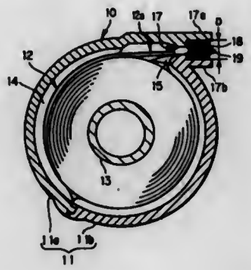
**Hidetoshi Kawasaki, Minami-Ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Apr. 12, 1994, Ser. No. 225,968**

**Claims priority, application Japan, Apr. 12, 1993, 5-084911**

**Int. Cl.[6] G03B** *17/26*

**U.S. Cl. 242—348.4** **19 Claims**




1. A photo film cassette having a spool on which photo film is wound, a cassette shell for containing said spool in a rotatable fashion, said photo film cassette comprising:

a pair of light-trapping ribbons, respectively mounted on walls of a passage port formed in said cassette shell, for preventing ambient light from entering said cassette shell through said passage port, said ribbons constituted of warp pile woven fabric woven in a needle loom from warp threads, weft threads, and warp pile threads;

a first one of said weft threads being passed under a first one of said warp threads, then passed over a first one of said warp pile threads, and subsequently passed under a second one of said warp threads; and

said pile fabric woven so as to render said first and second warp threads symmetric with one another relative to said first warp pile thread.

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**5,501,408**

## JOG DEVICE FOR MAGNETIC RECORDING AND REPRODUCING APPARATUS

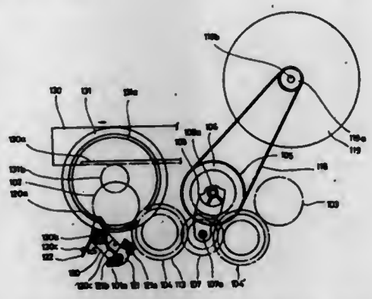
**Seong-Sik Kang; Sung-Heon Choi, both of Kyungki; Myung-Cheol Baek, Seoul; Sung-Pyo Hong, Kyungki; Ji Y. Lee; Lee H. Ryu, both of Seoul; Soo-Beom Lee, Kyungki; Hee Y. Park, Kyungki, and Yoon-Sig Lee, Kyungki, all of, Rep. of Korea, assignors to Goldstar Co., Ltd., Seoul, Rep. of Korea**

**Filed Sep. 19, 1994, Ser. No. 308,300**

**Claims priority, application Rep. of Korea, Sep. 20, 1993, 1993-19072**

**Int. Cl.[6] G11B** *15/44*

**U.S. Cl. 242—356.5** **6 Claims**



1. A jog device for a magnetic recording and reproducing apparatus, comprising:

tape supply and tape take-up reel assemblies for winding a magnetic tape;

a rotating gear portion selectively engaged with said tape supply and tape take-up reel assemblies, respectively, having a clutch mechanism including respective clutch gears for transmitting a driving force of a capstan motor to said reel assemblies directly or by a clutch force by a slip; and

rotating means for rotating said clutch mechanism of said rotating gear portion by a clutch force, due to slip from an additional driving source, thereby rotating said reel assemblies by a clutch force due to slip upon mode conversion, said rotating means including a clutch gear rotating unit, said unit being temporarily rotated during mode conversion so as to rotate said respective clutch gear of said tape supply reel clutch, said clutch gear rotating unit including a jog lever; a gear lever cooperating with said jog lever for selectively rotating said clutch gear of said tape supply reel clutch; a drive member for driving said clutch gear rotating unit during said mode conversion; and a returning unit for returning said clutch gear rotating unit during said mode conversion to a normal-direction reproducing mode state of said clutch gear rotating unit.

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**5,501,409**

## METHOD OF AND APPARATUS FOR WINDING ALL-THREAD BOBBINS

**Bruno Grabher, and Heinrich Strasser, both of Lustenau, Austria, assignors to Casati Carlo AG, Au, Switzerland**

**Filed Dec. 2, 1993, Ser. No. 161,237**

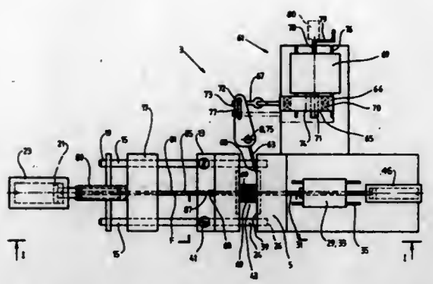
**Claims priority, application Switzerland, Dec. 3, 1992, 03716/92**

**Int. Cl.[6] B21C** *47/24;* **B65H** *63/00*

**U.S. Cl. 242—362.2** **25 Claims**

1. A method of making an all-thread bobbin on a rotary spindle between first and second end walls at least one of which is adjustable axially of the spindle to define with the other end wall a winding chamber of selected length, comprising the steps of establishing a source of thread having a portion extending into the chamber; moving the spindle axially across the chamber between the end walls and into an opening in the first end wall; rotating the





spindle to wind the portion of and thereupon additional thread around the spindle in the chamber with attendant formation of a growing bobbin; shifting the thread back and forth between the first and second end walls intermediate the source and the growing bobbin so that the growing bobbin extends across the chamber between the end walls; arresting the spindle when the bobbin in the chamber is fully grown by containing a predetermined quantity of thread; extracting the spindle from the opening and from the chamber; moving the at least one end wall away from the other end wall to permit evacuation of the grown bobbin from the chamber; grasping a second portion of the thread between the evacuated bobbin and the source; withdrawing the thus grasped second portion of the thread into the opening of the first end wall; and thereupon moving the spindle across the chamber and back into the opening to engage the withdrawn second portion preparatory to renewed rotation of the spindle for the winding of thread therearound.

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**5,501,410**

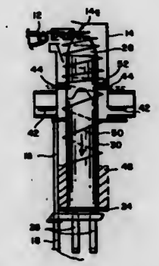
## COIL REFORMING CHAMBER WITH AUXILIARY COIL PLATE

**Raymond R. Starvaski, Worcester, Mass., assignor to Morgan Construction Company, Worcester, Mass.**

**Filed Jan. 27, 1995, Ser. No. 379,943**

**Int. Cl.[6] B21C** *47/10;47/24*

**U.S. Cl. 242—363** **10 Claims**



1. Apparatus for gathering a descending helical formation of rings into an upstanding annular coil, said apparatus comprising:

a vertically disposed enclosure having an upper end through which said rings are received to accumulate in coil form within said enclosure, and a lower end through which an accumulated coil may be withdrawn;

an elevator platform underlying said enclosure;

first operating means for vertically adjusting the position of said elevator platform between an upper position adjacent to but spaced beneath the lower end of said enclosure, and a lower position spaced beneath said upper position; a coil plate carried by said elevator platform;

second operating means for vertically adjusting the position of said coil plate relative to said elevator platform between an upper level protruding upwardly into said enclosure when said elevator platform is at said upper position, and a lower discharge level spaced beneath said upper level when said elevator platform is at said lower position;

whereupon a coil being formed within said enclosure may be received on said coil plate at said upper level and removed from said coil plate at said discharge level.

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**5,501,411**

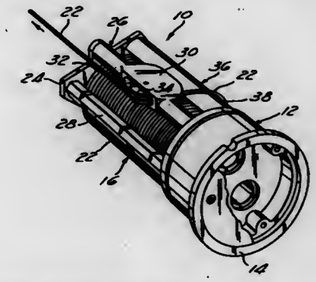
## TOWED VEHICLE DEPLOYMENT APPARATUS HAVING GUIDE TO REDUCE LINE PULL-OFF ANGLE

**Roger D. Brum, and David T. Currier, both of Irvine, Calif., assignors to Southwest Aerospace Corporation, Tustin, Calif.**

**Filed Mar. 14, 1994, Ser. No. 213,907**

**Int. Cl.[6] B65H** *27/00*

**U.S. Cl. 242—397** **13 Claims**



1. A reeling apparatus comprising:

a spool;

a housing, said spool being rotatably connected to said housing;

a tow line dispensably stored in windings about said spool;

a line guide attached to said housing, said tow line being extended from said spool over said line guide; and

at least one standoff bar attached to said housing in generally parallel relation to said spool, said tow line being extended over said standoff bar prior to being extended over said line guide to reduce the pull-off angle of the tow line from the spool.

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**5,501,412**

## APPARATUS AND METHOD FOR CONTROLLING TENSION IN A WEB

**Michael E. McAleavey, 559 Gettysburg Dr., San Jose, Calif. 95123**

**Filed Jul. 21, 1994, Ser. No. 278,349**

**Int. Cl.[6] B65H** *23/24*

**U.S. Cl. 242—417.1** **16 Claims**

1. An apparatus for controlling tension in a web supported at opposite ends of the web, the apparatus comprising;

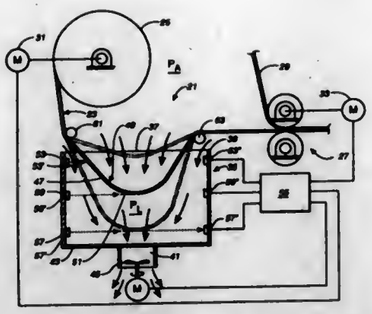
means, between the opposite ends of the web, for forming a pressure region adjacent a first side of the web, the pressure region being at a lower pressure than ambient pressure, such that at least a portion of the web is urged in a direction of the pressure region;

the web supported at its opposite ends being placed in tension in an amount corresponding to the pressure of the pressure region;

means for adjusting a pressure of the pressure region;

sensor means for determining a position of the portion of the web and for generating a signal corresponding to the position of the portion of the web; and

a control apparatus, the control apparatus receiving the signal from the sensor means and generating a signal, received by the pressure adjusting means, in response to the signal from the sensor means, the pressure adjusting means adjusting the



pressure of the pressure region in response to the signal from the control apparatus.

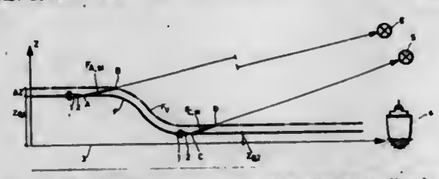
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**5,501,413**

## METHOD AND DEVICE FOR RECOGNIZING DECOYS SERVING TO DISGUISE A TARGET WITH THE AID OF AN ACTIVE SEARCH HEAD

**Fridbert Kilger, and Lothar Höwer, both of Munich, Germany, assignors to Daimler-Benz Aerospace AG, Munich, Germany**

**Filed Jan. 16, 1973, Ser. No. 329,229**
**Int. Cl.[6] F41G 9/00**
**U.S. Cl. 244—3.15** **12 Claims**



1. A method of recognizing decoy targets serving to disguise a selected target and located at positions separated laterally and vertically from the selected target, using an active search head on a roll-stabilized missile homing on an acquired one of the targets along a flight path at a predetermined altitude, comprising producing a simulated elevation signal ahead of the missile in the elevation plane of the missile toward the acquired target; deriving from the predetermined altitude as increased by a constant value, an altitude signal, comparing the simulated elevation signal with the derived altitude signal; and, responsive to the simulated elevation signal exceeding the derived altitude signal, interrupting the homing guidance of the missile toward the hitherto acquired target, in the azimuth plane.

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**5,501,414**

## STRUCTURE HAVING AN AERODYNAMIC SURFACE FOR AN AIRCRAFT

**Richard Bauer, Hamburg, Germany, assignor to Deutsche Aerospace Airbus GmbH, Hamburg, Germany**

**Filed May 11, 1994, Ser. No. 240,827**
**Claims priority, application Germany, May 11, 1993, 43 15 600.2**
**Int. Cl.[6] B64C 1/06;3/18;3/26**
**U.S. Cl. 244—124** **7 Claims**

1. A structure having an aerodynamic surface for an aircraft, comprising at least two structural components including at least two spars, a plurality of ribs including rib elements, and two shells, whereby the ribs extend in the direction of a profile depth of the structure, and wherein said shells and said ribs are divided in the direction of said profile depth with an approximately equal division into a plurality of shell elements and rib elements, wherein said structural components are so nested one in the other that a following structural component is partly inserted into a preceding structural component; wherein each structural component comprises one spar, two shell elements and several rib elements; wherein the length of the spars and of the shells corresponds approximately to a span width of the structure; wherein each of the rib elements comprises two rib halves connected to each other; and the shell elements are constructed as integral structural parts.

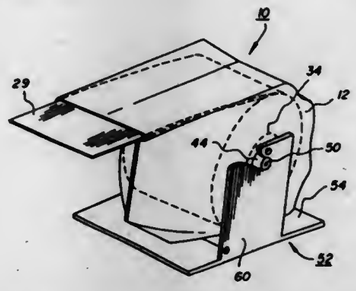
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**5,501,415**

## METHOD AND APPARATUS FOR STORING AND DISPENSING A ROLL OF PHOTOGRAPHIC WEB

**Clark E. Harris, Fairport, and John A. Kappler, Macedon, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Feb. 28, 1995, Ser. No. 395,959**
**Int. Cl.[6] B65H 16/06**
**U.S. Cl. 242—596.7** **11 Claims**



1. A flexible enclosure for storing and dispensing a roll of photosensitive web material for use in cooperating apparatus, said enclosure comprising:

a) a flexible opaque bag configured to enclose the roll, said bag including first and second opposite sidewalls extending between opposing rearward and forward portions and between opposing upper and lower portions, at least one of said sidewalls having a centrally disposed aperture therein, said rearward portion defining a closable opening through which the roll can pass into said bag, said bag further including a shallow neck portion projecting forwardly from said forward portion to a distal end thereof defining an exit slot through which the strip of web material can pass;



b) a cylindrical core within said bag, said core having flush axial ends;

c) a mounting pin disposed coaxially in an end of said core, said pin having a shaft extending outward of said core through said central aperture in said sidewall and having a flange on said shaft, said flange being outside said bag and cooperating with said core to light-tightly capture a portion of said sidewall therebetween, said pin having further a shouldered portion of said shaft adapted to mate with means for storing and dispensing said web from said enclosure.

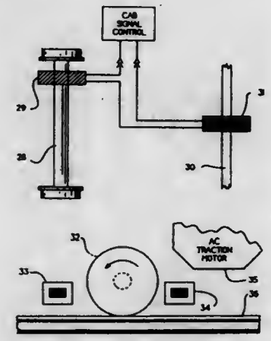
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**5,501,416**

## METHOD AND APPARATUS FOR INDUCTIVELY RECEIVING CAB SIGNALING ON BOARD A RAILWAY VEHICLE

**Ronald R. Capan, Pittsburgh, Pa., assignor to Union Switch & Signal Inc., Pittsburgh, Pa.**

**Filed Jul. 15, 1994, Ser. No. 275,991**
**Int. Cl.[6] B61L 1/00**
**U.S. Cl. 246—63 R** **27 Claims**




1. A cab signal receiving apparatus mounted on board a railway vehicle propelled on rail tracks by an electric drive motor and having a lead wheel/axle assembly, such receiving apparatus comprising:

signal receiving means mounted on such railway vehicle for sensing track current and providing a sensed signal;

said sensed signal having a cab signal component and an interference component;

sampling means for providing a sampled signal having the characteristic of electromagnetic interference subjected to said signal receiving means by the magnetic field of such electric motor; and

means for subtracting said sampled signal from said sensed signal such that said interference component is reduced.

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**5,501,417**

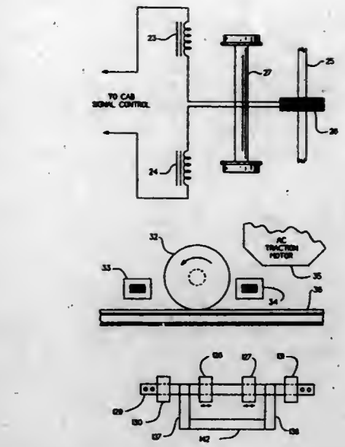
## NOISE CANCELLATION IN RAILWAY CAB SIGNAL

**Ronald R. Capan, Pittsburgh, Pa., assignor to Union Switch & Signal Inc., Pittsburgh, Pa.**

**Continuation-in-part of Ser. No. 275,991, Jul. 15, 1994. This application Feb. 21, 1995, Ser. No. 393,115**
**Int. Cl.[6] B61L 1/00**
**U.S. Cl. 246—63 R** **20 Claims**

1. A cab signal receiving apparatus mounted on board a railway vehicle propelled on rail tracks by an electric drive motor and having a lead wheel/axle assembly, such receiving apparatus comprising:

signal receiving means mounted on such railway vehicle for sensing track current and providing a sensed signal;




said sensed signal having a cab signal component and an interference component;

sampling means for providing a sampled signal having the characteristic of electromagnetic interference subjected to said signal receiving means by the magnetic field of such electric motor;

means for subtracting said sampled signal from said sensed signal such that said interference component is reduced;

said receiving means including at least one receiver coil arranged to inductively couple to such track current;

said sampling means including at least one sampling coil arranged to pick-up electromagnetic interference characteristic of the electromagnetic interference subjected to said at least one receiver coil;

said at least on receiving coil including a plurality of receiving coils, and said at least one sampling coil including a sampling coil for each of said receiving coils, arranged with a respective one of said receiving coils to pick-up electromagnetic interference characteristic of said respective one of said receiving coils; and

said sampling coils and said receiving coils are mounted on a single core.

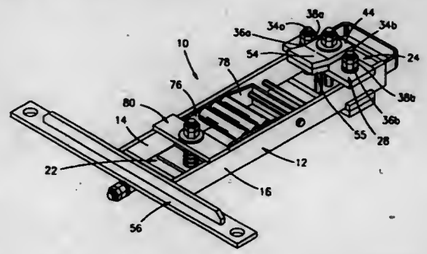
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**5,501,418**

## SWITCH POINT ROLLER ASSIST APPARATUS

**John Humphrey, R.R. 1, Box 131, Walnut, Iowa 51577, and Dean Wieser, 4416 S. 34th St., Omaha, Nebr. 68107**

**Filed Oct. 3, 1994, Ser. No. 316,844**
**Int. Cl.[6] E01B 7/00**
**U.S. Cl. 246—453** **13 Claims**



1. A switch point roller assist apparatus for attachment to a railroad rail at a switching location comprising;

an elongated main support structure having a center longitudinal axis and inner and outer ends;
rail securement means mounted on said main support structure adjacent said outer end for releasably connecting said main support structure to a railroad rail;
an elongated tie bar adjustably mounted on said main support structure adjacent said inner end generally perpendicular to said center longitudinal axis of said main support structure;
roller support means adjustably mounted on said main support structure;
at least one roller means having a center rotational axis, said roller means rotatably mounted on said roller support means such that said center rotational axis is generally perpendicular to said center longitudinal axis of said main support structure;
said tie bar adjustably mounted on said main support structure such that the position of said tie bar is vertically adjustable relative to said main support structure; and
said roller support means adjustably mounted on said main support structure such that the position of said at least one roller means is vertically adjustable relative to said main support structure such that said roller may be fixed in multiple operative positions.

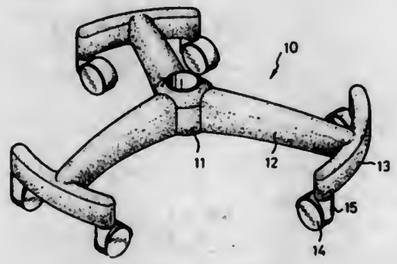
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**5,501,419**

## CHAIR LEG ASSEMBLY WITH THREE LEGS

**Ching-Feng Huang, No. 42-4, Mintsu Rd., Hsinying City, Tainan Hsien, Taiwan**

**Filed Dec. 8, 1994, Ser. No. 354,821**
**Int. Cl.[6] A47B *91/00*; F16M *11/20***
**U.S. Cl. 248—188.7** **5 Claims**



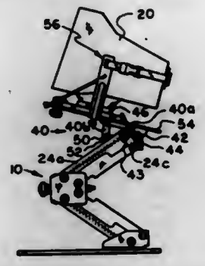

1. A chair leg assembly for cooperating with a chair which comprises a seat portion and a seat post fixedly mounted on an underside of said seat portion, said chair leg assembly comprising;
a tubular sleeve member rotatably mounted around a lower end of said seat post of said chair;
three extension legs each having a first end fixedly mounted to said tubular sleeve member and a second end;
three horizontally disposed support members each fixedly mounted on the second end of a corresponding one of said extension legs, each of said support members extending transversely to said respective extension legs, and each of said support members having two distal ends;
six pivot members each rotatably mounted on an underside of a corresponding one of said distal ends of each of said support members; and
six wheels rotatably mounted on an underside of a corresponding one of said pivot members.

**5,501,420**

## COUNTERBALANCE MECHANISM

**Richard L. Watt; Donald R. Pangborn, and Peter J. Kerl, all of Jamestown, N.Y., assignors to Weber-Knapp Company, Jamestown, N.Y.**

**Filed Jun. 17, 1994, Ser. No. 261,444**
**Int. Cl.[6] E04G *3/00***
**U.S. Cl. 248—280.11** **17 Claims**




1. A counterbalance mechanism for positioning a load relative to a support, said mechanism comprising:
a base for connecting said mechanism to said support;
a lower parallelogram linkage including a common connecting link, a lower end link connected to said base, and a pair of side links having opposite ends connected to said lower end link and said common connecting link by pivot pins;
an upper parallelogram linkage including said common connecting link, an upper end link, and a pair of side links having opposite ends connected to said upper end link and said common connecting link by pivot pins;
a pair of counterbalance spring means connected one to each of said lower and upper linkages; and
an auxiliary linkage operatively connected to said upper linkage for carrying said load and automatically tilting said load relative to said upper linkage and said support incident to movement of said load relative to said support, whereby said load has a continuous variation in tilt relative to said base as said load moves vertically relative to said base.

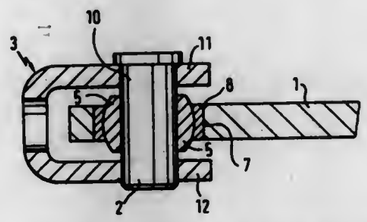
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**5,501,421**

## STAY BAR SUPPORT FOR VEHICLE DOOR STOP

**Bernd-Alfred Klüting, Radevormwald, Germany, assignor to ED. Scharwächter GmbH & Co., KG, Remscheid, Germany**

**Continuation of Ser. No. 53,023, Apr. 23, 1993, abandoned.**
**This application Mar. 13, 1995, Ser. No. 403,114**
**Claims priority, application Germany, Apr. 23, 1992, 42 13 298.3**
**Int. Cl.[6] A47F *5/00***
**U.S. Cl. 248—288.3** **14 Claims**




1. A stay bar support for a door stop of a vehicle door assembly including a door and a door post, said stay bar support comprising:
a plate-like stay bar for connection to one of the door and the door post and having a bore;
a support bracket for connection to another one of the door and the door post;
a gudgeon supported in said support bracket and extending into said bore of said stay bar for pivotally supporting said stay bar; and
spherical bearing means for pivotally supporting said stay bar on said gudgeon, said bearing means including a raceway formed as a washer and fixedly secured in said bore of said stay bar with an interference fit, said raceway having a height which is substantially equal to a thickness of said stay bar.

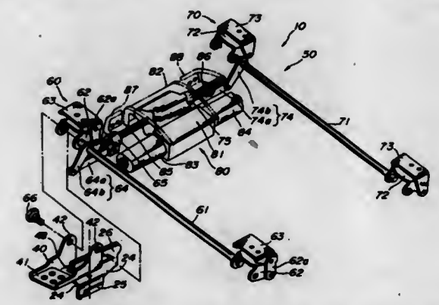
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**5,501,422**

## VEHICULAR SEAT ADJUSTER

**Isamu Chinomi, Ayase, Japan, assignor to Ikeda Bussan Co., Ltd., Ayase, Japan**

**Filed Mar. 25, 1994, Ser. No. 217,848**
**Claims priority, application Japan, Mar. 29, 1993, 5-069686**
**Int. Cl.[6] B60N *2/00***
**U.S. Cl. 248—419** **8 Claims**




1. A seat adjuster for a vehicular seat, said seat adjuster comprising:
a rail unit for adjustably sliding the vehicular seat in the fore-and-aft direction including,
a floor rail adapted to being fixed on a floor of a vehicle body,
a seat rail being engaged with said floor rail so as to be slidable in the fore-and-aft direction of the vehicle; and
a seat lifting mechanism fixed on said seat rail, said seat lifting mechanism including,
a lifting drive unit being operated according to a request of a seat occupant,
a front lifting unit adapted to being disposed under a front portion of the seat for vertically moving the seat front portion according to the operation of said lifting drive unit, said front lifting unit including,
a front shaft adapted to being laterally located under the seat front portion and being axially rotated according to the operation of said lifting drive unit,
a front supporting link vertically swinging according to the rotation of said front shaft,
a front transmission link connecting said lifting drive unit and said front shaft,
a rear lifting unit adapted to being disposed under a rear portion of the seat for vertically moving the seat rear portion according to the operation of said lifting drive unit, said rear lifting unit including,
a rear shaft being of a same shape as said front shaft and adapted to being laterally located under the seat rear portion, said rear shaft being axially rotated according to the operation of said lifting drive unit,
a rear supporting link being of a same shape as said front supporting link and vertically swinging according to the rotation of said rear shaft,
a rear transmission link being of a same shape as said front transmission link and connecting said lifting drive unit and said rear shaft.

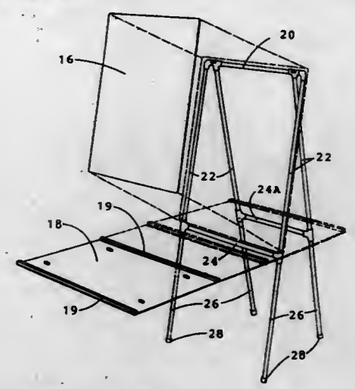


**5,501,423**

## PORTABLE EASEL WITH TABLE

**William L. Roberts, 794 Mockingbird La., San Bernardino, Calif. 92404-2435**

**Filed Oct. 6, 1994, Ser. No. 319,314**
**Int. Cl.[6] A47B *97/04***
**U.S. Cl. 248—441.1** **2 Claims**




1. A portable easel comprising:
a horizontal top crosspiece;
two rearwardly inclined front legs, each connected at an upper end thereof to opposite ends of said top crosspiece;
at least one forwardly inclined rear leg connected at an upper end thereof to said top crosspiece between said two front legs;
a horizontal lower front crosspiece connected at each end to said two front legs;
two pegs extending generally horizontally from the front of said top crosspiece;
an easel board with holes near an upper end thereof for placement upon said pegs, said board being adapted to hang from said pegs with the back of said board resting against said front legs; and
a horizontal tray table with holes therethrough whereby said table rests upon said lower front crosspiece, said front and rear legs extending through said tray table holes for holding said tray table in place.

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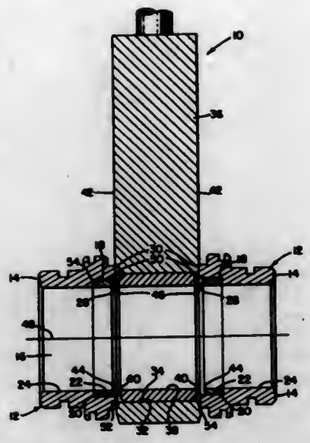
**5,501,424**

## WIRE CUTTING INSERT FOR GATE VALVE

**Michael R. Williams, and Matthew W. Long, both of Houston, Tex., assignors to FMC Corp, Chicago, Ill.**

**Filed Feb. 9, 1994, Ser. No. 194,085**
**Int. Cl.[6] E21B *33/06***
**U.S. Cl. 251—1.3** **39 Claims**

1. A valve seat and gate assembly for use in a gate valve, said assembly comprising a valve body having a valve chamber therein;
a valve inlet and a valve outlet in communication with said valve chamber;
a valve gate housed in said valve chamber and arranged to move reciprocally therein in a generally vertical direction between a flow position and a stop flow position, said valve gate having a central opening;
a generally horizontal flow path defined by said valve inlet, said valve outlet, and said central opening when said valve gate is in said flow position;
a pair of generally ring-shaped valve seats each received in a seat pocket in said valve body on one side of said valve gate and each positioned concentrically around said valve inlet and said valve outlet, respectively, forming part of said flow path, each said valve seat adapted to sealingly engage said valve gate; at least one generally ring-shaped wire-cutting seat insert for cutting Wireline or tubing run through said valve in



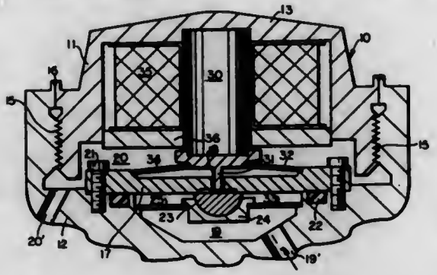
said flow path, said seat insert being received in an insert pocket in one of said valve seats and positioned concentrically around either said valve inlet or said valve outlet, said seat insert having a central opening forming a wire-cutting surface along inner circumferential edge of said central opening located at an end of said insert located adjacent to said valve gate, whereby when said valve gate is moved from said flow position to said stop-flow position, said wireline is sheared between the wire-cutting surface of said seat insert and paid inner circumferential edge of said central opening:

each said valve seat has a seat outer end in contact with said valve body and a seat inner end forming a generally vertical first plane adapted to sealingly engage said valve gate;

said seat insert has an axial length less than an axial length of said insert pocket such that when said insert is received in said insert pocket, said wire-cutting surface does not contact said valve gate.

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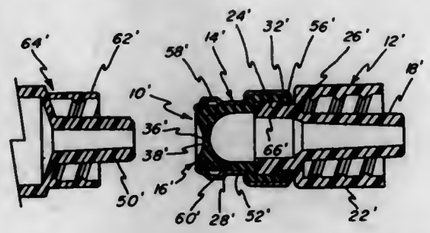
**5,501,425**
**MAGNETOSTRICTIVELY ACTUATED VALVE**
**Robert H. Reinicke, Mission Viejo, Calif., and Derek T. Schappell, Morristown, N.J., assignors to Marotta Scientific Controls, Inc., Montville, N.J.**
**Filed Sep. 21, 1994, Ser. No. 309,776**
**Int. Cl.[6] F16K *31/06***
**U.S. Cl. 251—129.15** **34 Claims**



1. A valve comprising upper and lower valve-housing body parts which are generally cup-shaped with closed ends and with telescopically fitted mutually engaged skirt portions defining a cavity between the closed end of the upper valve-housing body part and the closed end of the lower valve-housing body part, the lower valve-housing body part having a seat member with a central opening and defining an inlet chamber on one side of said seat member and part of an outlet chamber on the other side of said seat member, a poppet-valve member supported by said lower body part in a first compliantly preloaded relation of seated closure of said central opening within said inlet chamber, a poppet pin extending with radial clearance through said central opening for actuated poppet engagement to open said valve, a magnetostrictive rod carried by said upper cup-shaped valve-housing body part on an axis of alignment with said poppet pin, and axially prestressed compliant means reacting between said seat member and said magnetostrictive rod in a second compliantly preloaded relation of rod abutment with the closed end of said upper body part, said magnetostrictive rod forming the core of a magnetic circuit wherein an excitation winding is inductively coupled to said core.

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**5,501,426**
**MEDICAL COUPLING SITE VALVE BODY**
**Gordon E. Atkinson, Cedarville, Ohio, and Dennis A. Boehmer, Beavercreek, both of Ohio, assignors to Vernay Laboratories, Inc., Yellow Springs, Ohio**
**Continuation of Ser. No. 153,998, Nov. 18, 1993, abandoned, which is a continuation-in-part of Ser. No. 44,830, Apr. 12, 1993, Pat. No. 5,295,657, which is a division of Ser. No. 893,813, Jun. 4, 1992, Pat. No. 5,251,873. This application May 10, 1994, Ser. No. 241,123**
**Int. Cl.[6] A61M *25/00*; F16L *37/28***
**U.S. Cl. 251—149.1** **15 Claims**



1. A medical coupling site for cooperation with a medical fitting having a tubular cannula surrounded by an internally threaded collar, said medical coupling site comprising:

a support base defining a longitudinal axis;

a retainer supported by said support base and extending substantially parallel to said longitudinal axis;

an elastomeric valve member including a tubular body portion extending substantially parallel to said longitudinal axis, said valve member having first and second ends and a relatively thin diaphragm extending across said first end of said valve member;

wherein a thickness of said body portion, measured in a direction perpendicular to said longitudinal axis, is greater than a thickness of said retainer near said first end of said valve member.

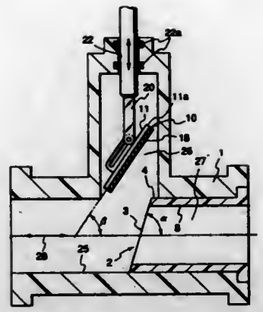
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**5,501,427**
**PLATE VALVE**
**Masayuki Ando, Funabashi, Japan, assignor to Taimei Kinzoku Kogyo Co., Ltd., Tokyo, Japan**
**Filed Dec. 7, 1994, Ser. No. 350,660**
**Claims priority, application Japan, Apr. 28, 1994, 6-090860**
**Int. Cl.[6] F16K *1/18;31/44***
**U.S. Cl. 251—228** **16 Claims**

1. A plate valve comprising:

a valve casing defining a flow passage, and further defining a valve element recess, and further defining an opening between said flow passage and said valve element recess;





a valve seat disposed in said flow passage of said valve casing at a first angle with respect to a line of flow through said flow passage, and having a portion extending into said opening between said flow passage and said valve element recess;

a valve element having a back portion, and having a base portion for engaging said valve seat to prevent flow through said flow passage;

a control rod disposed in said valve element recess and passing through an aperture in said valve casing, said control rod being moveable in an axial direction;

support means pivotally joining said control rod to said valve element at said back portion, said valve element being freely suspended by said control rod at said back portion, said base portion being engageable with said valve seat through axial movement of said control rod toward said flow passage;

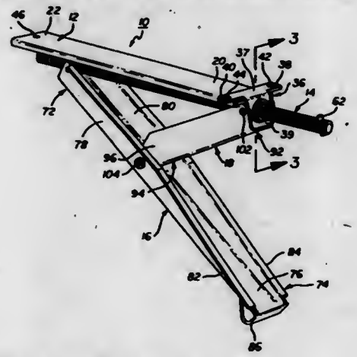
said valve element being suspended by said control rod at a second angle with respect to the line of flow through said flow passage when said valve element is positioned at least partially within said valve element recess and is not in contact with said valve seat, said second angle being less than said first angle;

whereby axial movement of said control rod toward said flow passage causes said valve element to contact and pivot about said portion of said valve seat which extends into said opening when said valve element is positioned substantially within said flow passage.

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**5,501,428**
**STABILIZER JACK**
**Bernard F. Garceau, Granger, Ind., assignor to Norco Industries, Inc., Compton, Calif.**
**Filed Dec. 14, 1994, Ser. No. 355,697**
**Int. Cl.[6] B66F *7/24***
**U.S. Cl. 254—424** **17 Claims**

1. An improved stabilizer jack for securement to he underside of



a recreational vehicle, comprising:

a channel frame formed with a top wall having inner and outer ends and opposite side walls projecting downwardly and turned inwardly to form track flanges cooperating with said top wall to form a track and terminating in parallel retaining edges spaced a predetermined distance apart;

an elongated screw rotatably mounted from said frame and restrained against longitudinal movement;

a trunnion plate carried in said track including a threaded bore for engaging said screw and formed with a reinforcing annular rim surrounding said threaded bore and having an inner diameter substantially the same diameter as said bore;

a support leg having proximal and distal ends, said proximal end pivotally carried from said trunnion plate, said distal end projecting downwardly and outwardly from said track;

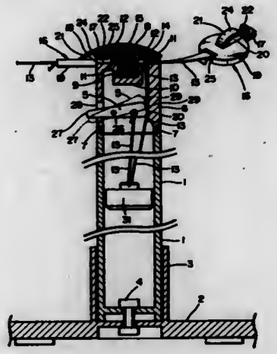
a strut having upper and lower ends, said upper end formed with upwardly turned retainer flanges spaced laterally apart and received in closed spaced relation between the respective said retaining edges;

a first pivot pin pivotally connecting said upper end of said strut to said frame to hold said upwardly turned retainer flanges interposed between said inwardly turned flanges of said frame; and

a second pivot pin pivotally connecting said lower end of said strut to said leg whereby said frame may be mounted to the underside of said recreational vehicle and said screw rotated to drive said trunnion plate along said track to pivot said strut about said first and second pivot pins to lower said distal end of said leg while said first pivot pin holds said retainer flanges constrained between the respective said retaining edges of said track.

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**5,501,429**
**PARTITION POLE SYSTEM**
**Shusuke Sakuma, Tokyo, Japan, assignor to Kabushiki Kaisha Shukoh, Tokyo, Japan**
**Filed Jun. 1, 1994, Ser. No. 251,957**
**Int. Cl.[6] E04H *17/00***
**U.S. Cl. 256—1** **8 Claims**



1. A partition pole system comprising:

a plurality of spaced partition poles each composed of a base and a hollow pole mounted on said base, said hollow pole having a withdrawal hole defined in an upper end portion thereof and a coupling disposed in said upper end portion;

a plurality of partition cords housed in said poles, respectively, for withdrawal therefrom through the respective withdrawal holes thereof;

a connector mounted on a distal end of each of said partition cords for connection to the coupling of another pole;

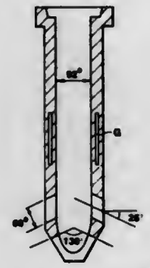
drawing means for pulling each of said partition cords into each of said poles, respectively; and

a releasable stopper for keeping each of said partition cords withdrawn out of each of said poles, respectively, and wherein

said stopper comprises an engaging bar pivotally supported in each of said poles below said withdrawal hole and having an inner end engageable with an abutment defined on an inner wall surface of the pole when said inner end is lowered and releasable from said abutment when said inner end is lifted.

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5,501,430
**IMMERSION NOZZLE FOR CONTINUOUS CASTING**
Yuichi Yamaoka; Katsuhiko Murakami, both of Kawasaki, and Mikio Suzuki, Sendai, all of, Japan, assignors to NKK Corporation, Tokyo, Japan
Filed Oct. 11, 1994, Ser. No. 320,862
Claims priority, application Japan, Jan. 13, 1993, 5-278879; Feb. 22, 1994, 6-046543
Int. Cl.[6] B22D *35/00*
U.S. Cl. 266—236 15 Claims

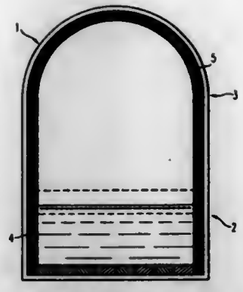


1. An immersion nozzle for continuous casting comprising:
(a) an immersion nozzle body leading molten metal from a tundish into a mold for continuous casting;
(b) said immersion nozzle body having an opening hole at a top end of said immersion nozzle body, said opening hole receiving the molten metal from the tundish;
(c) said immersion nozzle body having a vertical bore which has a center axis;
(d) said immersion nozzle body having at least one pair of exit ports, said at least one pair of exit ports introducing the molten metal from said vertical bore into the mold, said exit ports being located symmetrically with regard to a cross sectional plane passing through a center axis of said vertical bore;
(e) said immersion nozzle body having a slit opening for introducing the molten metal downwardly into said mold, the slit opening being located at a level lower than said exit ports and with the slit opening not being connected with the exit ports, a direction of the slit opening being substantially the same as a direction of a line connecting respective centers of the two exit ports of the at least one .pair of exit ports; and
(f) a bottom of said vertical bore having a downwardly convex surface below said exit ports.

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5,501,431
**MELTING FURNACE FOR RESIDUES FROM WASTE INCINERATION PLANTS**
Markus Pfister, Döttingen, and Christian Wieckert, Seon, both of, Switzerland, assignors to ABB K.K., Tokyo, Japan
Filed May 24, 1995, Ser. No. 449,843
Claims priority, application Germany, May 28, 1994, 44 18 734.3
Int. Cl.[6] C21B *7/04*
U.S. Cl. 266—242 9 Claims

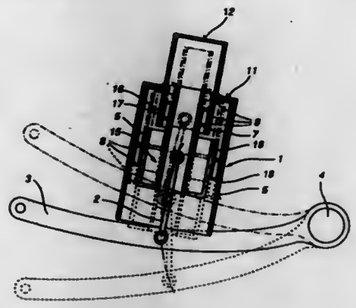
1. A melting furnace, comprising:
a furnace vessel having a substructure portion for contacting and holding a melt and a superstructure portion in contact with a gas atmosphere above said melt,



wherein said substructure portion is lined internally with a refractory material comprising 10–70 wt. % $Cr_2O_3$, 10–60 wt. % $Al_2O_3$ and 5–14 wt. % $ZrO_2$, and said superstructure portion is lined with a refractory material comprising 80–100 wt. % MgO and 20–0 wt. % $Al_2O_3$, $ZrO_2$ or mixture thereof.

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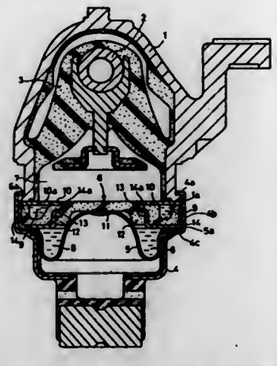
5,501,432
**MOTOR VEHICLE AIR SPRING**
Peter Tattermusch, and Thomas Huch, both of Esslingen, Germany, assignors to Mercedes-Benz AG, Germany
Filed Mar. 8, 1995, Ser. No. 400,253
Claims priority, application Germany, Mar. 8, 1994, 44 07 740.8
Int. Cl.[6] F16F *5/00*
U.S. Cl. 267—64.24 4 Claims



1. An air spring for a motor vehicle, comprising a housing, a piston surrounded by the housing, and U-shaped bellows, the housing and the piston being configured to form guide surfaces for the U-shaped bellows operatively arranged therebetween and acting in opposite directions, each of the U-shaped bellows is arranged between a radially outer circumferential wall of the piston and a radially inner circumferential wall of the housing, wherein the housing and the piston comprise axially engaging double ring bodies having a connected inner ring and an outer ring located opposite each other in mirror image and arranged in a region of the U-shaped bellows such that the outer rings and the inner rings define an annular space to receive the U-shaped bellows.



5,501,433
**LIQUID SEALING AND VIBRATION ISOLATOR**
Kazutoshi Satori, Saitama, Japan, assignor to Yamashita Rubber Kabushiki Kaisha, Saitama, Japan
Filed Jul. 6, 1994, Ser. No. 267,924
Claims priority, application Japan, Jul. 6, 1993, 5-192807; May 10, 1994, 6-120500
Int. Cl.[6] F16F *5/00*
U.S. Cl. 267—140.13 40 Claims

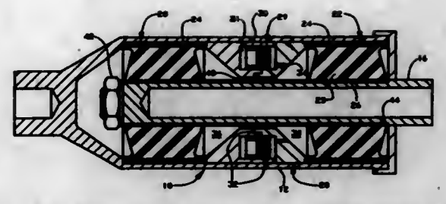


1. A liquid sealing and vibration isolating apparatus comprising:
a first connecting member attached to at least one of a body and a vibrating member;
a second connecting member attached to at least one of the other of the body and the vibrating member;
an elastic body provided between the first and second connecting members;
a liquid chamber provided between the elastic body and a wall portion formed by either of the first and second connecting member;
a partition wall for dividing the liquid chamber into two chambers; and
an orifice for communicating between the two liquid chambers divided by the partition wall;
wherein the partition wall is provided with a membrane portion allowing elastic deformation corresponding to an input vibration and with a stopper portion integrally formed with the membrane portion and adapted to abut against an immovable portion when the membrane portion is elastically deformed, said stopper portion being formed at a periphery of the membrane portion and projecting continuously in a circumferential direction thereof and further including an immovable portion positioned adjacent to said stopper portion and being disposed to be substantially perpendicular to the projecting direction of said stopper portion.

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5,501,434
**HYBRID FLUID AND ELASTOMER DAMPER**
Dennis P. McGuire, Erie, Pa., assignor to Lord Corporation, Erie, Pa.
Filed May 10, 1994, Ser. No. 241,224
Int. Cl.[6] F16F *9/04*
U.S. Cl. 267—140.11 18 Claims

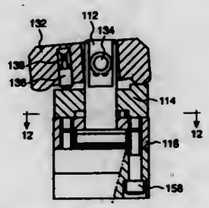
15. A damper for interconnection between a pair of components, said damper comprising:
a) a slender primary generally cylindrical element;
b) a secondary generally cylindrical element received within said primary cylindrical element;
c) first and second annular elastomeric members interconnecting said primary and secondary cylindrical elements at axially spaced locations, each of said annular elastomeric members having an appreciable thickness relative to their respective diameters;



d) a first fluid-containing chamber at least partially defined by said primary and secondary cylindrical elements and said first elastomeric member;
e) a second fluid-containing chamber at least partially defined by said primary and secondary cylindrical elements and said second elastomeric member;
f) a narrow annular passageway interconnecting said first and second fluid-containing chambers, said annular passageway having a length which is several times its width;
g) a first connecting means for operatively connecting said primary cylindrical element to one of said pair of components;
h) a second connecting means for operatively connecting said secondary cylindrical element to the other of said pair of components;
i) a trapezoidally shaped annular protrusion formed upon and extending from a first one of said primary and secondary generally cylindrical elements toward and proximate the second one of said primary and secondary cylindrical elements to partially define said annular passageway;
whereby relative axial motion between said pair of components causes deformation of said elastomeric members causing significant hysteresis damping in said elastomeric members as well as fluid flow between said first and second fluid-containing chambers through said narrow annular passageway resulting in throttling and shearing of said fluid such that said relative motion is damped by a combined force generated by said elastomer and said fluid.

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5,501,435
**MECHANICAL CAM CLAMP**
Luciano T. S. Monteiro, c/o Rua Visconde de Inhaumaa, 476, 09670 Sao Caetano do Sul, Sao Paulo, Brazil
Division of Ser. No. 29,663, Mar. 11, 1993, abandoned. This application Dec. 27, 1994, Ser. No. 363,995
Int. Cl.[6] B23Q *3/08*
U.S. Cl. 269—24 18 Claims



1. A cam clamp comprising:
(a) a base;
(b) a central shaft having a longitudinal axis and a flange at one axial end, said flange being rotatably engaged within said base, and said shaft being rotatable about said longitudinal axis;
(c) a clamp member pivotably mounted on said central shaft at an axial end opposite said axial end having said flange;
(d) a locking ring rotatably disposed about and in frictional contact with said central shaft, on top of said base and adjacent to said clamp member;
(e) means for manually rotating said locking ring; and

said stopper comprises an engaging bar pivotally supported in each of said poles below said withdrawal hole and having an inner end engageable with an abutment defined on an inner wall surface of the pole when said inner end is lowered and releasable from said abutment when said inner end is lifted.

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**5,501,430**

## IMMERSION NOZZLE FOR CONTINUOUS CASTING

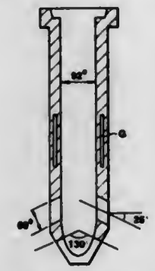
**Yuichi Yamaoka; Katsuhiko Murakami, both of Kawasaki, and Mikio Suzuki, Sendai, all of, Japan, assignors to NKK Corporation, Tokyo, Japan**

**Filed Oct. 11, 1994, Ser. No. 320,862**

**Claims priority, application Japan, Jan. 13, 1993, 5-278879; Feb. 22, 1994, 6-046543**

**Int. Cl.[6] B22D *35/00***

**U.S. Cl. 266—236** **15 Claims**



1. An immersion nozzle for continuous casting comprising:

(a) an immersion nozzle body leading molten metal from a tundish into a mold for continuous casting;

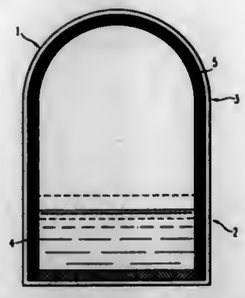
(b) said immersion nozzle body having an opening hole at a top end of said immersion nozzle body, said opening hole receiving the molten metal from the tundish;

(c) said immersion nozzle body having a vertical bore which has a center axis;

(d) said immersion nozzle body having at least one pair of exit ports, said at least one pair of exit ports introducing the molten metal from said vertical bore into the mold, said exit ports being located symmetrically with regard to a cross sectional plane passing through a center axis of said vertical bore;

(e) said immersion nozzle body having a slit opening for introducing the molten metal downwardly into said mold, the slit opening being located at a level lower than said exit ports and with the slit opening not being connected with the exit ports, a direction of the slit opening being substantially the same as a direction of a line connecting respective centers of the two exit ports of the at least one pair of exit ports; and

(f) a bottom of said vertical bore having a downwardly convex surface below said exit ports.



wherein said substructure portion is lined internally with a refractory material comprising 10–70 wt. % $Cr_2O_3$, 10–60 wt. % $Al_2O_3$ and 5–14 wt. % $ZrO_2$, and said superstructure portion is lined with a refractory material comprising 80–100 wt. % MgO and 20–0 wt. % $Al_2O_3$, $ZrO_2$ or mixture thereof.

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**5,501,431**

## MELTING FURNACE FOR RESIDUES FROM WASTE INCINERATION PLANTS

**Markus Pfister, Döttingen, and Christian Wieckert, Seon, both of, Switzerland, assignors to ABB K.K., Tokyo, Japan**

**Filed May 24, 1995, Ser. No. 449,843**

**Claims priority, application Germany, May 28, 1994, 44 18 734.3**

**Int. Cl.[6] C21B *7/04***

**U.S. Cl. 266—242** **9 Claims**

1. A melting furnace, comprising:

a furnace vessel having a substructure portion for contacting and holding a melt and a superstructure portion in contact with a gas atmosphere above said melt,

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**5,501,432**

## MOTOR VEHICLE AIR SPRING

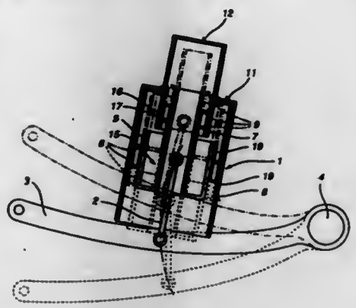
**Peter Tattermusch, and Thomas Huch, both of Esslingen, Germany, assignors to Mercedes-Benz AG, Germany**

**Filed Mar. 8, 1995, Ser. No. 400,253**

**Claims priority, application Germany, Mar. 8, 1994, 44 07 740.8**

**Int. Cl.[6] F16F *5/00***

**U.S. Cl. 267—64.24** **4 Claims**



1. An air spring for a motor vehicle, comprising a housing, a piston surrounded by the housing, and U-shaped bellows, the housing and the piston being configured to form guide surfaces for the U-shaped bellows operatively arranged therebetween and acting in opposite directions, each of the U-shaped bellows is arranged between a radially outer circumferential wall of the piston and a radially inner circumferential wall of the housing, wherein the housing and the piston comprise axially engaging double ring bodies having a connected inner ring and an outer ring located opposite each other in mirror image and arranged in a region of the U-shaped bellows such that the outer rings and the inner rings define an annular space to receive the U-shaped bellows.



**5,501,433**

## LIQUID SEALING AND VIBRATION ISOLATOR

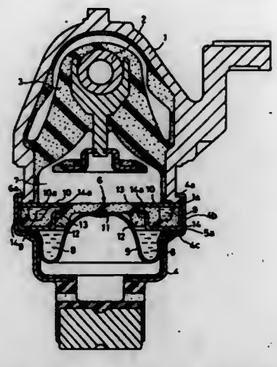
**Kazutoshi Satori, Saitama, Japan, assignor to Yamashita Rubber Kabushiki Kaisha, Saitama, Japan**

**Filed Jul. 6, 1994, Ser. No. 267,924**

**Claims priority, application Japan, Jul. 6, 1993, 5-192807; May 10, 1994, 6-120500**

**Int. Cl.[6] F16F *5/00***

**U.S. Cl. 267—140.13** **40 Claims**



1. A liquid sealing and vibration isolating apparatus comprising:

a first connecting member attached to at least one of a body and a vibrating member;

a second connecting member attached to at least one of the other of the body and the vibrating member;

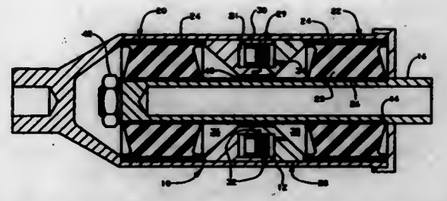
an elastic body provided between the first and second connecting members;

a liquid chamber provided between the elastic body and a wall portion formed by either of the first and second connecting member;

a partition wall for dividing the liquid chamber into two chambers; and

an orifice for communicating between the two liquid chambers divided by the partition wall;

wherein the partition wall is provided with a membrane portion allowing elastic deformation corresponding to an input vibration and with a stopper portion integrally formed with the membrane portion and adapted to abut against an immovable portion when the membrane portion is elastically deformed, said stopper portion being formed at a periphery of the membrane portion and projecting continuously in a circumferential direction thereof and further including an immovable portion positioned adjacent to said stopper portion and being disposed to be substantially perpendicular to the projecting direction of said stopper portion.



d) a first fluid-containing chamber at least partially defined by said primary and secondary cylindrical elements and said first elastomeric member;

e) a second fluid-containing chamber at least partially defined by said primary and secondary cylindrical elements and said second elastomeric member;

f) a narrow annular passageway interconnecting said first and second fluid-containing chambers, said annular passageway having a length which is several times its width;

g) a first connecting means for operatively connecting said primary cylindrical element to one of said pair of components;

h) a second connecting means for operatively connecting said secondary cylindrical element to the other of said pair of components;

i) a trapezoidally shaped annular protrusion formed upon and extending from a first one of said primary and secondary generally cylindrical elements toward and proximate the second one of said primary and secondary cylindrical elements to partially define said annular passageway;

whereby relative axial motion between said pair of components causes deformation of said elastomeric members causing significant hysteresis damping in said elastomeric members as well as fluid flow between said first and second fluid-containing chambers through said narrow annular passageway resulting in throttling and shearing of said fluid such that said relative motion is damped by a combined force generated by said elastomer and said fluid.

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**5,501,434**

## HYBRID FLUID AND ELASTOMER DAMPER

**Dennis P. McGuire, Erie, Pa., assignor to Lord Corporation, Erie, Pa.**

**Filed May 10, 1994, Ser. No. 241,224**

**Int. Cl.[6] F16F *9/04***

**U.S. Cl. 267—140.11** **18 Claims**

15. A damper for interconnection between a pair of components, said damper comprising:

a) a slender primary generally cylindrical element;

b) a secondary generally cylindrical element received within said primary cylindrical element;

c) first and second annular elastomeric members interconnecting said primary and secondary cylindrical elements at axially spaced locations, each of said annular elastomeric members having an appreciable thickness relative to their respective diameters;

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**5,501,435**

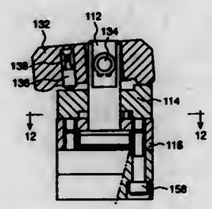
## MECHANICAL CAM CLAMP

**Luciano T. S. Monteiro, c/o Rua Visconde de Inhauma, 476, 09670 Sao Caetano do Sul, Sao Paulo, Brazil**

**Division of Ser. No. 29,663, Mar. 11, 1993, abandoned. This application Dec. 27, 1994, Ser. No. 363,995**

**Int. Cl.[6] B23Q *3/08***

**U.S. Cl. 269—24** **18 Claims**



1. A cam clamp comprising:

(a) a base;

(b) a central shaft having a longitudinal axis and a flange at one axial end, said flange being rotatably engaged within said base, and said shaft being rotatable about said longitudinal axis;

(c) a clamp member pivotably mounted on said central shaft at an axial end opposite said axial end having said flange;

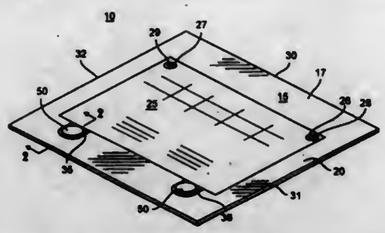
(d) a locking ring rotatably disposed about and in frictional contact with said central shaft, on top of said base and adjacent to said clamp member;

(e) means for manually rotating said locking ring; and

(f) stop means for preventing the rotation of said central shaft beyond a certain arclength of travel.

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**5,501,436**
**SUBSTRATE RETENTION FIXTURE**
Dennis K. Miller, 1517 W. Knowles Clr., Mesa, Ariz. 85202
Filed Mar. 30, 1994, Ser. No. 220,210
Int. Cl.[6] B23Q *1/00*
U.S. Cl. 269—47 14 Claims

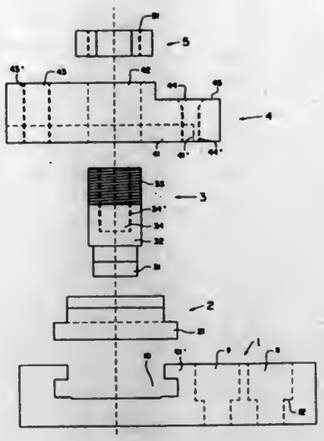


1. A substrate retention fixture comprising:
a base having a substrate receiving cavity therein with a plurality of openings adjacent the cavity and in communication therewith;
a plurality of spools, one each positioned in each opening of the plurality of openings, with each spool being slideably mounted within the opening for movement between a first position in which the spool is disengaged from a substrate positioned in the cavity and a second position in which at least an edge of the spool is frictionally engaged with a substrate positioned in the cavity;
a plurality of springs, one each positioned in each opening of the plurality of openings, the spring in each opening engaged with the spool in the opening and biasing the spool into the second position; and
an alignment pin mounted on the base within the area for engaging and aligning a substrate received in the area.

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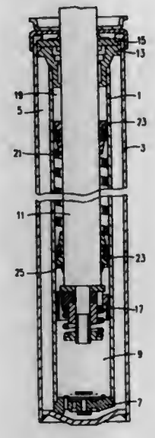
**5,501,437**
**ADAPTER FOR USE WITH CLAMPING DEVICES ON MULTI-HOLE-MACHINE-TOOL WORKPIECE TABLES**
Heinz Kisslig, Hauptstrasse 83, CH-8552 Felben-Wellhausen, Switzerland
PCT No. PCT/CH93/00172, § 371 Date Mar. 4, 1994, § 102(e) Date Mar. 4, 1994, PCT Pub. No. WO94/01242, PCT Pub. Date Jan. 20, 1994
PCT Filed Jul. 5, 1993, Ser. No. 199,256
Claims priority, application Switzerland, Jul. 6, 1992, 2114/92
Int. Cl.[6] B23Q *3/06*
U.S. Cl. 269—99 14 Claims

1. In an adapter for use with clamping devices for clamping workpieces on at least one of a perforated screen plate and a perforated screen block, the improvement comprising: a plurality of building block-like elements, comprising a base plate (1) with at least two bores (11) separated by a first distance equal to a second distance between screen holes of the perforated screen plate for fastening the base plate (1) to the perforated screen plate, the base plate (1) forming a first T-groove (10) at a lateral distance from the two bores (11) for receiving a transverse sliding element (2), the transverse sliding element (2) forming a second T-groove (20) perpendicular to the first T-groove (10) for receiving a base 31 of a longitudinal sliding element (3) with the base (31) having a shape of a T-nut, a building block element (4) resting on the base plate (1), and arresting means for securing the building block-like elements with respect to each other by interlocking the building block-like elements and clamping the building block-like elements together.



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**5,501,438**
**MOTOR VEHICLE VIBRATION DAMPER**
Günther Handke, Euerbach, Germany; Edward W. Silye, Macomb, Mich.; Toivo Raabis, Dearborn Heights, Mich.; Thomas Achard, Troy, Mich., and Matthias Raulf, Rochester Hills, Mich., assignors to Fichtel & Sachs AG, Schweinfurt, Germany
Filed Aug. 12, 1994, Ser. No. 289,626
Claims priority, application Germany, Aug. 14, 1993, 43 27 439.0; Mar. 12, 1994, 44 08 405.6
Int. Cl.[6] B60G *15/10*
U.S. Cl. 267—226 16 Claims



1. A vibration damper for motor vehicles, said vibration damper having a longitudinal dimension, and said vibration damper comprising:
tubular member means, said tubular member means having a first end and a second end, and said tubular member means comprising means for attaching said tubular member means to one of:
a wheel suspension of the motor vehicle and a support structure of the motor vehicle;
said tubular member means defining a chamber therewithin, said chamber containing damping fluid therewithin;



piston means disposed within said chamber and dividing said chamber into first and second chamber portions;
said piston means comprising means for controlling flow of damping fluid between said first and second chamber portions;
piston rod means projecting through said first end of said tubular member means, said piston rod means being movable axially within said tubular member means in a direction along the longitudinal dimension of the vibration damper;
said piston rod means having a first end connected to said piston means for movement of said piston means along with said piston rod means;
said piston rod means having a second end disposed opposite said first end, said second end of said piston rod means comprising means for attaching said piston rod means to the other of:
the wheel suspension of the motor vehicle and the support structure of the motor vehicle;
said first end of said tubular member means comprising guide means for guiding movement of said piston rod means during said axial movement of said piston rod means;
said guide means comprising means for at least partially closing said first end of said first and second tubular members;
said piston rod means and said tubular member means defining an annular space therebetween;
resilient member means disposed within said annular space for at least damping movement of said first end of said piston rod means in a direction towards said guide means;
said resilient member means having a first end disposed towards said guide means and a second end disposed towards said piston means;
each of said first and second ends of said resilient member means comprising bearing members for respectively contacting said guide means and said piston means and bearing against said guide means and said piston means during compression of said resilient member means between said guide means and said piston means;
each of said bearing members being mounted to said first and second ends of said resilient member means in a selectively detachable manner;
each said bearing member comprising an annular-shaped member disposed about said piston rod means;
each said bearing member comprising a surface disposed towards and encircling said piston rod means;
said surface of each said bearing member comprising a guide surface for guiding relative movement between said bearing members and said piston rod means;
said resilient member means comprising a cylindrical spring;
said cylindrical spring defining an interior dimension and an exterior dimension;
said cylindrical spring having a first end and a second end; each said bearing member comprising:
an annular sleeve portion for being disposed about said piston rod means and disposed within said interior dimension of said cylindrical spring; and
an annular flange portion for being disposed about said piston rod means and disposed axially adjacent said first and second ends of said cylindrical spring, said annular flange portion having a diameter greater than the interior dimension of said cylindrical spring.

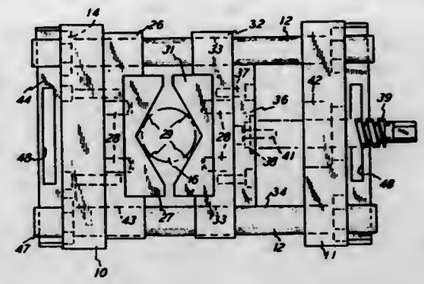
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**5,501,439**

**Patent Not Issued For This Number**

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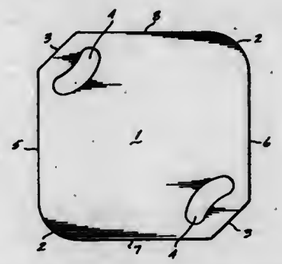
**5,501,440**
**VISE**
Bernard G. Bilse, 3524-11th Ave., Racine, Wis. 53403
Filed Jul. 8, 1994, Ser. No. 272,023
Int. Cl.[6] B25B *1/10*
U.S. Cl. 269—253 20 Claims



1. A vise comprising two spaced-apart end plates rectangular in shape in the projection toward each other, a plurality of four tie rods, each of said corners of said end plates has an opening therein, said tie rods extend in respective ends through said openings, each of said ends of said tie rods has a groove therein, restrainer disposed in each of said grooves for establishing a fixed spaced-apart relationship of said end plates, a pair of jaws supported on said assembly and with one of said jaws being supported directly on some of said tie rods and being movable toward the other of said jaws for clamping a workpiece between said jaws and along a line within the confines defined by the positions of said rods, and a compressive force applicator connected with said one jaw and being arranged and located to have its compressive force action applied only centrally along said line.

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**5,501,441**
**CUTTING BOARD IMPROVEMENT**
Bill A. Kegley, P.O. Box 6636, Lynnwood, Wash. 98036
Filed Nov. 14, 1994, Ser. No. 339,873
Int. Cl.[6] B23Q *3/00*
U.S. Cl. 269—289 R 6 Claims



1. A cutting board comprising a substantially square, flat, flexible sheet having a first pair of diagonally opposite corners, a second pair of diagonally opposite corners, opposite side edges extending between corners of the first and second pairs, opposite end edges extending between corners of the first and second pairs, and four corner portions adjacent, respectively, to the corners of the first and second pairs of diagonally opposite corners, the sheet having a hand hole in the corner portion adjacent to each of the corners of the second pair of diagonally opposite corners, and the sheet being foldable along a diagonal intersecting the corners of the first pair of diagonally opposite corners to place the hand holes in registration and form a chute with adjacent end and side edges

of the sheet inclined from the first pair of diagonally opposite corners to the second pair of diagonally opposite corners.

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**5,501,442**

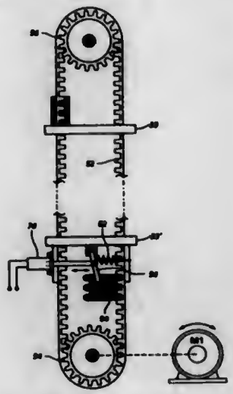
## DUAL MODE TAMPER/OFFSETTER

**Barry P. Mandel, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

**Continuation-in-part of Ser. No. 148,454, Nov. 8, 1993, Pat. No. 5,377,965. This application Jul. 5, 1994, Ser. No. 270,350**

**Int. Cl.[6] B65H *31/34***

**U.S. Cl. 270—58** **1 Claim**



1. In a sheet stacking and job separating system for the printed sheet output of print jobs of a reproduction apparatus, in which, repeatedly, plural said printed sheets are compiled as a print job set by being tamped into a squared stack in a compiler with a tamper system, and said compiled print job set stack is ejected from said compiler onto an output stacking tray holding plural said print job set stacks in a common stack, and wherein respective said print job set stacks are stacked offset from one another in said output stacking tray: the improvement comprising a dual mode print job set stack tamper and job sets offsetting system, wherein in a first mode, said tamper system tamps said print job set into a squared stack in said compiler while retaining said print job set in a defined stacking position; and wherein in a second mode said tamper system shifts a selected said print job set out of said defined stacking position into an offset position to provide said offset position of said print job set in said output stacking tray;

wherein said tamper system includes a spaced pair of upstanding sheet tampers between which said printed sheets are compiled, and a dual mode tamper drive system, and wherein in said first mode at least one of said tampers is driven towards the other said tamper to tamp said print job set into a squared stack in said defined stacking position by said dual mode tamper drive system, and wherein in said second mode said dual mode tamper drive system causes said tampers to move cooperatively to shift said print job set out of said defined stacking position into said print job set offset position;

wherein in said second mode said dual mode tamper drive system is connected to both said tampers to move both said tampers in the same direction by a selected print job set offsetting distance;

wherein said dual mode tamper drive system has a single drive motor which is differently connected to said tampers in said first mode than said second mode;

wherein said dual mode tamper drive system comprises a clutching system and a belt drive system directly driven by said single drive motor and connecting with both said tampers by said clutching system, which belt drive system in said first mode is connected by said clutching system to both said tampers at portions of said belt drive system which are moving in opposing directions, and which belt drive system said second mode is connected by said clutching system to both said tampers at respective portions of said belt drive system which are moving in the same direction.

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**5,501,443**

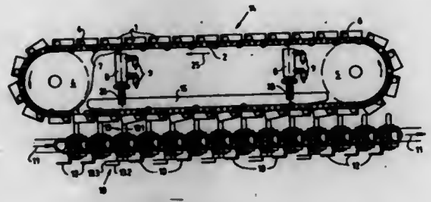
## DEVICE FOR THE RELEASE OF FOLDED PRODUCTS

**Kevin L. Cote, Durham, N.H., and Richard D. Curley, Haverhill, Mass., assignors to Heidelberger Druckemaschinen AG, Heidelberg, Germany**

**Filed Dec. 2, 1994, Ser. No. 349,110**

**Int. Cl.[6] B65G *37/00;47/10***

**U.S. Cl. 270—058** **17 Claims**



1. A device for the release of products transported on a conveyer, comprising:

a release module including rotating members to which a plurality of swivelable blocks are attached, each of said swivelable blocks having one or more tabs;

a conveyor which transports a plurality of identical product holders past said release module, each of said identical product holders being associated with one of said swivelable blocks as said conveyor transports said product holders past said release module;

a plurality of selectively actuable ramps associated with said release module, each of said selectively actuable ramps operably disposed relative to selected ones of the tabs, actuation of each selectively actuable ramps thereby causing said ramp to contact its selected tabs, and causing said blocks passing by said actuated ramps and having said tabs corresponding to said actuated ramps to swivel, the swiveling of the blocks causing said associated product holders to release products.

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**5,501,444**

## SHEET SUPPLY APPARATUS

**Hiroshi Yukimachi; Teruo Komatsu, both of Yokohama; Takahiro Azeta; Tsuyoshi Waragai, both of Kawasaki; Tomoyuki Araki, Tokyo, and Osamu Hoshii, Kawasaki, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Aug. 9, 1994, Ser. No. 287,416**

**Claims priority, application Japan, Jan. 18, 1993, 6-003622; Aug. 19, 1993, 5-205225; Aug. 31, 1993, 5-216047; Nov. 19, 1993, 5-290743; Nov. 19, 1993, 5-290747; Nov. 19, 1993, 5-290748**

**Int. Cl.[6] B65H *1/08***

**U.S. Cl. 271—127** **22 Claims**

1. A sheet supply apparatus comprising:

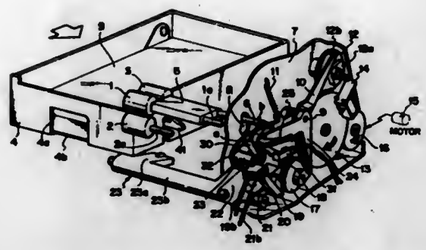
a lifter means for maintaining a height of an upper surface of a sheet stack supported by a sheet supporting means substantially constant by lifting or lowering said sheet supporting means; and

a supply means for feeding out an uppermost sheet from the sheet stack maintained in a constant height position by said lifter means;

wherein said lifter means comprises:

a clutch means for transmitting a predetermined amount of rotation from a drive gear;





a rock means for rocking a ratchet pawl by the rotation transmitted by said clutch means;

a ratchet gear engageable by said ratchet pawl and rotated by a rocking movement of said ratchet pawl;

a lifter member connected to said ratchet gear to lift said sheet supporting member by rotation of said ratchet gear; and

an actuation means shifted in accordance with the height of the upper surface of the sheet stack rested on said sheet supporting means to actuate said clutch means when the height of the upper surface of the sheet stack is below a predetermined height.

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**5,501,445**

## AUTOMATIC DOCUMENT HANDLER TRAY COVER SYSTEM

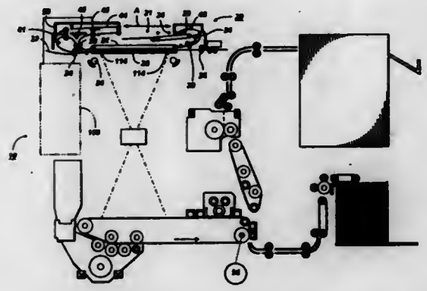
**Michael J. Lowman, Hemel Hampstead, and Dennis M. Bendall, Leighton Buzzard, both of, United Kingdom, assignors to Xerox Corporation, Stamford, Conn.**

**Filed Jan. 12, 1995, Ser. No. 371,912**

**Claims priority, application United Kingdom, Jan. 18, 1994, 9400845**

**Int. Cl.[6] B65H *1/00***

**U.S. Cl. 271—145** **9 Claims**



1. A document sheet feeding apparatus including a document input tray for receiving document sheets to be fed from said input tray to be copied, a cover arranged to be guided between a first position, in which said input tray is uncovered to allow document sheets to be unobstructedly loaded into said input tray, and a second position in which said cover covers said input tray; characterized by a cover drive system for automatically driving said cover from said first position to said second position, and a control system for controlling said drive system so that said cover is automatically driven into said second position starting prior to said document sheets feeding from said tray.

**5,501,446**

## PAPER STRIP TRANSPORTING APPARATUS

**Takatoshi Takemoto; Keichi Tsubota, both of Tokyo; Hideyuki Kadomatsu, Odawara, and Etsuro Sasaki, Kawasaki, all of, Japan, assignors to Kabushiki Kaisha Ace Denken, Tokyo, Japan**

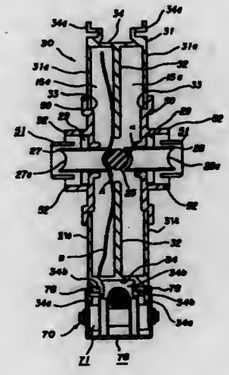
**PCT No. PCT/JP92/01449, § 371 Date May 9, 1994, § 102(e) Date May 9, 1994, PCT Pub. No. WO93/09047, PCT Pub. Date May 13, 1993**

**PCT Filed Nov. 9, 1992, Ser. No. 240,709**

**Claims priority, application Japan, Nov. 8, 1991, 3-293279; Nov. 8, 1991, 3-293280**

**Int. Cl.[6] B65H *29/70***

**U.S. Cl. 271—188** **11 Claims**



1. A paper strip transporting apparatus, comprising:

a drive pulley and a driven pulley, separated from each other;

a belt which is disposed between and around said drive and driven pulleys;

a plurality of transporting rollers, disposed along the belt between the drive and driven pulleys; and

a drive unit for driving the drive pulley;

either one of the transporting rollers and the belt having a convex portion and the other having a concave portion at corresponding facing areas thereof, the transporting rollers being disposed with respect to the belt so that the convex portion is positioned within the concave portion in a non-contacting relationship and such that the convex portion is spaced apart from the concave portion by a distance selected to be in the range of a single thickness of a paper strip passing therebetween to three times the thickness of the paper strip.

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**5,501,447**

## DEVICE FOR ADJUSTING THE POSITIONS OF SUCTION-TYPE GRIPPERS ON A SHEET-TRANSFER DRUM

**Rudi Haupenthal, Epfenbach, Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Germany**

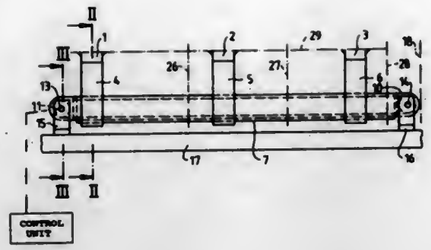
**Filed May 10, 1994, Ser. No. 240,923**

**Claims priority, application Germany, May 10, 1993, 43 15 547.2**

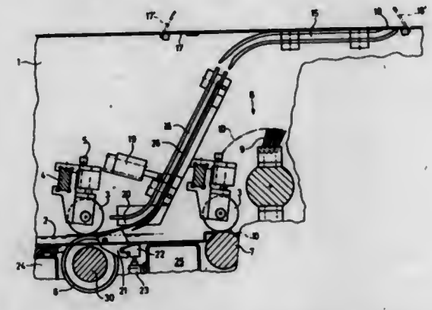
**Int. Cl.[6] B65H *5/12***

**U.S. Cl. 271—276** **6 Claims**

1. Device for adjusting the position of suction-type grippers on a sheet-transfer drum, wherein the suction-type grippers are disposed basically along at least one generating line, are displaceable and fixable perpendicularly to a sheet-transport direction, comprising a plurality of endless belts, the suction-type grippers being disposed on the endless belts.



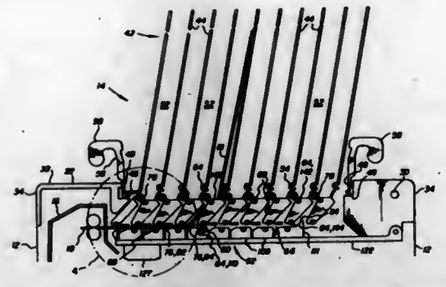
5,501,448
**DEVICE FOR REMOVING INSPECTION COPIES AT ROTARY CROSS CUTTERS**
Richard B. Mack, Brühl, and Rainer Klenk, St. Leon-Rot, both of, Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Germany
Filed May 17, 1994, Ser. No. 243,852
Claims priority, application Germany, May 17, 1993, 43 16 413.7
Int. Cl.[6] B65H 29/00
U.S. Cl. 271—280 14 Claims



1. Device for removing inspection or specimen copies at rotary cross cutters or deliveries in sheet-fed presses which, at a cutting station, cut a continuously supplied web of material into individual copies subsequently conveyable substantially free of contact and partly mutually overlapping in a given conveying direction in a copy-transport plane to a decelerating station disposed downline from the cutting station, comprising a swivellably mounted copy guide, said copy guide being swivellable into a position adjacent the copy-transport plane, and at least one swivel cam assigned to the copy-transport plane, said swivel cam being activatable for penetrating the copy-transport plane so as to change the conveying direction of the copies into said swivellably mounted copy guide.

5,501,449
**SORTING APPARATUS AND SORTING AND PROCESSING APPARATUS**
Anthony M. Olexy, Honeoye Falls; Michael P. Urbon, Churchville, and Paul D. Westlake, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Continuation of Ser. No. 221,435, Mar. 31, 1994, Pat. No. 5,449,168. This application Mar. 16, 1995, Ser. No. 405,113
Int. Cl.[6] B65H 39/10
U.S. Cl. 271—292 5 Claims

1. A sorting apparatus for use with a processor for media sheets, said processor having a top discharge and a service opening adjoining said discharge, said sorting apparatus comprising:

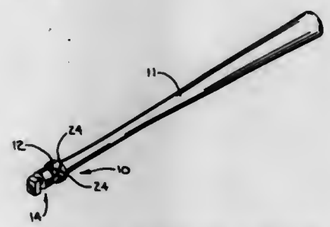


a body mounted on said processing apparatus, said body being pivotable about an axis of rotation, between a closed position and an open position, said body in said closed position blocking access to said service opening, said body in said open position being displaced from said service opening, said body having an upper surface substantially radial to said axis of rotation;

a partition member mounted on said body, said partition member comprising a unitary array of parallel partitions extending outward from said body, said partitions defining a first plurality of bins for said media sheets, said partition member being movable, independent of said body, between an operative position, wherein said partitions define a zone of obstruction extending outward from said upper surface of said body, and a displaced position, wherein said partitions are at least substantially removed from said zone; and

a sorter mechanism disposed substantially within said body, said sorter mechanism having a plurality of sheet guides, said sheet guides defining a primary passage and a plurality of secondary passages, said primary passage having an entrance aligned with said discharge, said secondary passages each branching individually from said primary passage, said secondary passages each having an exit adjoining a respective said bin, said sorter mechanism having a transport system for propelling said media sheets along said primary passage to selected said bins.

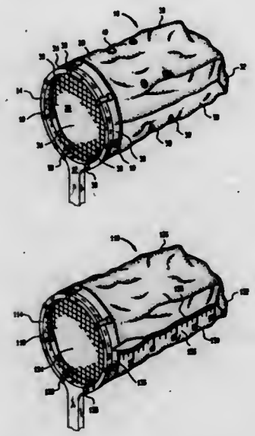
5,501,450
**WEIGHT FOR BASEBALL BAT AND METHOD OF MANUFACTURE**
Timothy J. Nolan, 332 Joren Trail, Antioch, Ill. 60002
Filed Aug. 26, 1994, Ser. No. 296,719
Int. Cl.[6] A63B 69/40
U.S. Cl. 273—26 R 35 Claims



1. In combination, a baseball bat with a knob at one end, and a baseball baring training device comprising a weight sized for positioning in co-axial alignment with the knob of the baseball bat, the weight having an internally threaded nut secured in fixed assembly with said weight, a bolt bore extended through the weight co-axially aligned with a threaded bore defined by the internally threaded nut, a bolt with external threads threadingly engaged through said threaded bore of the internally threaded nut, and a pair of annular members attached in integral assembly with said weight, the annular members extending away from the weight in a crossed pattern with each other and being positioned in engagement with axially facing surface areas of said knob of the baseball bat, the bolt when rotated exerting a pulling force against the pair of annular members engaged against the axially facing surface areas of said knob to hold the baseball batting training device in fixed engagement with the knob of said baseball bat.



5,501,451
**WARMUP DEVICE FOR RACKET SPORTS**
Robert Slusarczyk, 153 Belleville Ave., Bloomfield, N.J. 07003
Filed May 27, 1994, Ser. No. 249,345
Int. Cl.[6] A63B 69/38
U.S. Cl. 273—29 A 19 Claims



1. A racket-sport training device for use on a sporting racket having a handle and a planar annular frame with strings supported thereby, said training device capable of use during warmup and service training comprising:

a pocket formed from a flexible, wind-resistant material capable of entrapping air therewithin, dimensioned so as, when used for service training, to provide audible confirmation of proper execution of service, said pocket, in turn, further comprising;

a wall; and,

wind-resistance adjustment means for adjusting, during exercises prior to play, the aerodynamic drag thereof, said wind-resistance adjustment means mounted in said wall altering the retention capacity of the pocket;

an aperture at one end of said pocket having a perimeter dimensioned to be substantially equal to the perimeter of said annular frame;

a plurality of attachment means for removably attaching said pocket to and from said annular frame without interfering with the strings thereof; and,

said training device when used in combination with the racket is capable for use in functional exercises prior to play through adding stress to practice strokes by increasing the aerodynamic drag of the racket head and when used for said service training, providing audible confirmation thereof.

5,501,452
**PUTTING TRAINING DEVICE USING MUSCLE MEMORY**
Glen A. Halvorson, 10101 N. Arabian Trails #1031, Scottsdale, Ariz. 85258
Filed Jun. 24, 1994, Ser. No. 265,652
Int. Cl.[6] A63B 69/36
U.S. Cl. 273—35 R 6 Claims



1. A portable putting training device comprising:

a rigid guide rail having a first end and a second end;

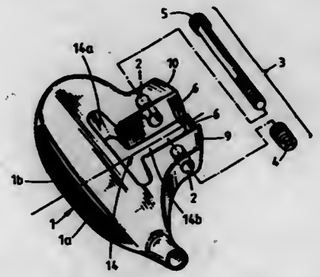
a lengthwise slot within the guide rail;

the guide rail resting on a putting surface, positioned parallel to a trajectory of a golf ball;

a plate extending perpendicularly above the guide rail, the plate slidably mounted to the guide rail such that the plate travels within the lengthwise slot starting from an original longitudinal position; and

a tensioning means attached to the plate, wherein the tensioning means provides pressure opposing a putting stroke and returns the plate to the original longitudinal position along the guide rail.

5,501,453
**PRETENSIONED GOLF CLUB HEAD**
Douglas Hurst, Montreal, Canada, assignor to Stokes & Co., Inc., Kingwood, Tex.
Filed Jan. 27, 1995, Ser. No. 379,750
Int. Cl.[6] A63B 53/04
U.S. Cl. 273—78 12 Claims



12. A golf club head having an adjustable pre-tension condition at the impact face area of the club head which comprises:

a golf club head having a planer face with an impact face area and linear axis extending perpendicularly through the planar face;

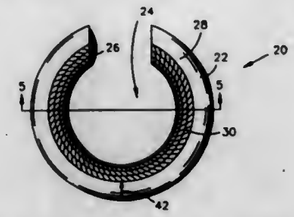
at least two substantially parallel rear projections projecting rearwardly from the planer face, each rear projection being drilled with holes on a common axis to receive a tensioning assembly;

a tensioning assembly comprising a bolt, threaded to receive a nut, extending through the holes in the rear projections in a direction perpendicular to the linear axis whereby the adjustment of the pre-tension condition at the impact face area of the club tensioning assembly causes the rearwardly protruding toward compress the rear projections to each other thereby changing the pre-tension condition at the impact face area of the club head;

a lug mounted upon and extending from one of said rear projections toward the other of said rear projections to limit the adjustment of the tensioning assembly;
an internal re-enforcement sleeve to mate with and to secure a golf club shaft to the golf club head;
an aperture within the golf club head for housing an internal weight;
a cavity which has the approximate shape defined by a first cavity section in the head oriented behind and substantially parallel to the planar face and perpendicular to the linear axis and a second cavity section which joins and extends from the first cavity section to a back end of the adjustable club head between the rear protrusions;
a resilient elastomeric filler to fill the first and second cavity sections; and
an elastomeric cap which is mounted on and covers the back of the adjustable golf club head.

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**5,501,454**
**FOOTBALL KICKING TEE**
**Matthew H. Frantz, Cincinnati, Ohio, assignor to Frantz, Inc., Cincinnati, Ohio**
**Filed Aug. 19, 1994, Ser. No. 293,495**
**Int. Cl.[6] A63B *67/00***
**U.S. Cl. 273—55 B** **15 Claims**

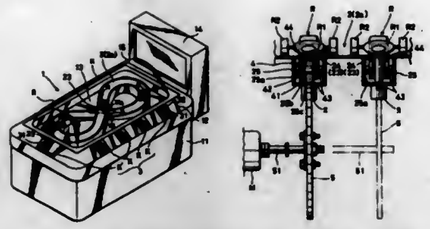



1. A football kicking tee for supporting a football in a substantially upright or angled position on a substrate, comprising:
a support member having upper and lower surfaces with the lower surface being adapted to interface with a substrate, said surfaces confined between two spaced parallel planes, said support member further comprising inner and outer surfaces extending between the upper and lower surfaces;
at least a portion of said inner surface having a curved cross-sectional configuration and defining an opening extending between the first and second surfaces, the opening extending through the support member and being of sufficient size to allow the passage of an end portion of a football, but of insufficient size to allow passage of the entire football; said curved cross-sectional configuration of said inner surface providing a range of contact points for a football having an end portion extending into the opening, the elevation of the range of contact points on said curved cross-sectional configuration being variable depending on the angle at which the football is positioned.

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**5,501,455**
**RACING GAME MACHINE WITH VARYING TRACK LEVELS**
**Takashi Hirata, Higashikurume, and Kazuhito Matsuura, Tokyo, both of JP, Japan, assignors to Konami Co., Ltd., Hyogo, Japan**
**Filed Nov. 28, 1994, Ser. No. 345,676**
**Claims priority, application Japan, Nov. 26, 1993, 5-296440; Nov. 26, 1993, 5-296441**
**Int. Cl.[6] A63F *9/14***
**U.S. Cl. 273—86 B** **11 Claims**

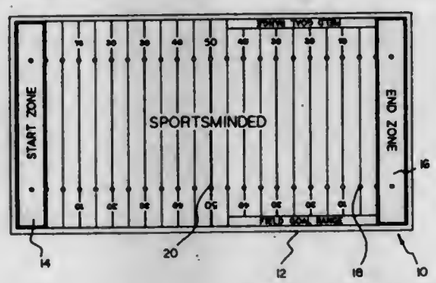
1. A racing game machine comprising:



an endless plate member formed with a plurality of running lanes on a top surface thereof, the endless plate member having a grade-separated intersection portion;
a plurality of endless transporting chains provided below the endless plate member, each endless transporting chain having a magnetic portion at a specified portion;
a plurality of guide members provided below the endless plate member, each guide member being operable to hold one of the plurality of endless transporting chains within respective courses corresponding to the plurality of running lanes formed on the top surface of the endless plate member;
a moving mechanism operable to move the plurality of endless transporting chains independently of one another along the respective guide members;
a plurality of running objects each having a magnetic portion, each running object being magnetically bound to each endless transporting chain by magnetic attraction between the magnetic portion of the running object and the magnetic portion of the endless transporting chain and moved together with the movement of the endless transporting chain; and
a controller operable to control the moving mechanism in accordance with a predetermined game program.

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**5,501,456**
**CHILDREN'S SPORTS TRIVIA GAME**
**Alex C. Collins, and Margaret M. Collins, both of 3925 W. 31st St., St. Louis Park, Minn.**
**Filed Feb. 21, 1995, Ser. No. 391,780**
**Int. Cl.[6] A63F *7/06***
**U.S. Cl. 273—94** **6 Claims**

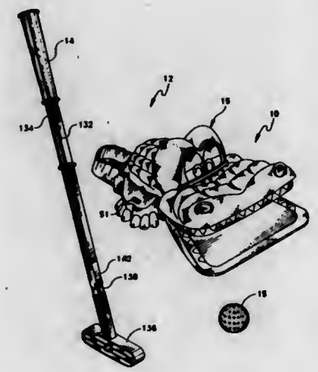



1. A children's sports trivia game for providing challenging play action through the use of a question and answer format comprising, in combination:
a game board having a width and a length with a starting end and a finishing end, with yard lines, each of five yards, the game board having 23 peg holes extending in each of two rows from within the starting end to within the finishing end, the game board having indicia thereon replicating a football field including yard lines, the peg holes spaced along the yard lines with one of the holes positioned within the starting end and one of the holes positioned within the finishing end, the rows of peg holes being spaced across the width of the board with between about 60 to 65 percent of the width of the board between the rows of peg holes and with between about 18 to 20 percent of the width of the board between each row of peg holes and the adjacent edge, the game board having four rubber foot pads secured to a lower surface thereof;
a field goal range marked by indicia extending from adjacent to the finishing end and a location prior to the midpoint of the length of the board;
two playing pieces, each of the playing pieces replicating a football player, each of the two playing pieces having a pegged lower end, each pegged lower end adapted to be received within the plurality of peg holes of the game board;
a plurality of sports trivia cards and answer cards; and
a rule book, whereby said sports trivia cards and said answer cards are used in combination with said rule book to determine the movement of said playing pieces in said pegged holes along said game board.



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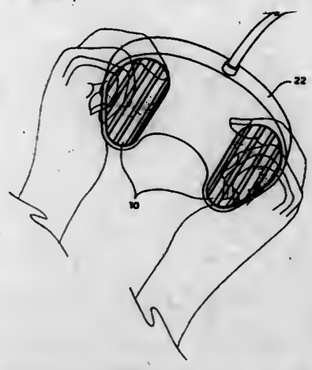
**5,501,457**
**GAME APPARATUS**
**Nobuaki Ogihara, Kawaguchi, Japan, assignor to Hasbro, Inc., Pawtucket, R.I.**
**Filed Jan. 23, 1995, Ser. No. 377,543**
**Int. Cl.[6] A63B *71/02***
**U.S. Cl. 273—127 C** **8 Claims**




1. A game apparatus comprising:
a game element adapted to be propelled along a supporting surface;
a housing including a character figure head portion having upper and lower jaw portions which cooperate to form a mouth, at least one of said upper and lower jaw portions being pivotable for moving said mouth between open and closed positions, said housing being receivable on a supporting surface so that said lower jaw portion rests thereon, said lower jaw portion forming a ramp for receiving said game element in said housing, said ramp leading from the supporting surface to an area behind said mouth when said mouth is in the open position and said character figure is received on the supporting surface so that said lower jaw portion rests thereon; and
ejecting means for receiving said game element from said ramp and for automatically ejecting said game element therefrom by tossing it through the air over said head portion.

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**5,501,458**
**ELECTRONIC GAME CONTROLLER COVERS**
**Kevin C. Mallory, 3344 Highway 11 South, Riceville, Tenn. 37370**
**Filed Jan. 19, 1995, Ser. No. 374,874**
**Int. Cl.[6] A63B *71/04*; A63F *9/22***
**U.S. Cl. 273—148 B** **10 Claims**

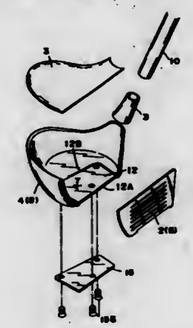



1. A combination of an electronic game controller case and a cover comprising:
an electronic game controller case containing means for controlling an electronic game;
a shaped, absorbent and textured covering material, whereby a game controller case can be partially covered; and,
affixing means for attaching said shaped, absorbent and textured covering material to a game controller case;
whereby an electronic game controller case is partially covered to prevent the deleterious deposit of a user's perspiration and to improve the user's enjoyment of an electronic game being controlled.

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**5,501,459**
**HOLLOW CLUB HEAD WITH WEIGHTED SOLE PLATE**
**Eimatsu Endo, Tsubame, Japan, assignor to Kabushiki Kaisha Endo Seisakusho, Japan**
**Division of Ser. No. 245,874, May 19, 1994. This application Dec. 16, 1994, Ser. No. 357,108**
**Claims priority, application Japan, May 31, 1993, 5-129620; May 19, 1993, 5-117328; Dec. 28, 1993, 5-334330; Feb. 18, 1994, 6-21399; Feb. 22, 1994, 6-24319; Feb. 28, 1994, 6-30240; Mar. 7, 1994, 6-35844; Apr. 5, 1994, 6-67365; Apr. 6, 1994, 6-68786**
**Int. Cl.[6] A63B *53/04***
**U.S. Cl. 273—167 H** **6 Claims**

1. A golf club head having a metallic and hollow head body



having an interior and exterior, said head body having a face for striking a golf ball and a sole portion extending rearwardly from said face along a bottom of the head body, comprising:

a sole portion of the head body formed with a concave portion expanding toward the interior of the head body;

a balance weight being provided in the concave portion, which is disposed on approximately the same plane with the sole portion, the balance weight being formed of material having a larger specific gravity than that of the head body,

wherein a front end of said concave portion is located toward said face, while a back end of said concave portion is located rearwardly relative to a center portion of said sole portion, said back end extending farther at its toe side than at its heel side.

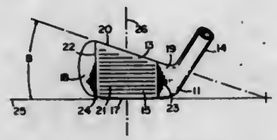
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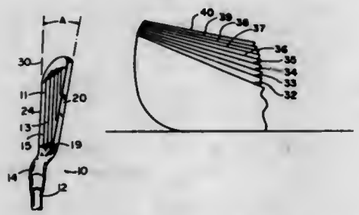
**5,501,460**

**GOLF CLUB SET WITH CONSTANT PROJECTED TOPLINE ANGLE**

**Carl E. Scheie, Libertyville, Ill., assignor to Wilson Sporting Goods Co., Chicago, Ill.**

**Filed Sep. 23, 1994, Ser. No. 310,876**
**Int. Cl.[6] A63B 53/04**
**U.S. Cl. 273—167 R** **5 Claims**





1. A set of a plurality of golf clubs, each of the clubs including a clubhead and a shaft having a longitudinal centerline, each of the clubheads including a blade portion having a generally planar striking face and a hosel portion which is attached to the shaft, the blade portion including a sole having a bottom surface and a leading edge, the blade portion also having a topline, each clubhead having:

a loft angle which is defined by an angle between a plane of the striking face and a plane which extends through the centerline of the shaft and parallel to the leading edge of the sole,

a topline angle which is defined by an angle between the topline of the blade portion and a ground plane which is tangent to the bottom surface of the sole,

a projected topline angle which is defined by an angle between the topline and a plane which is tangent to the leading edge of the sole and parallel to said plane extending through the centerline of the shaft when viewed by a golfer who is addressing the club and who is generally aligned with said plane extending through the centerline of the shaft, the loft angle of each of the clubheads being different,

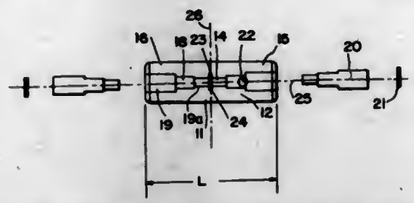
the projected topline angle of each of the clubheads being greater than 0° and being substantially the same and the topline angle of each of the clubheads being different.

**5,501,461**

**GOLF PUTTER HEAD**

**Matt Donofrio, Apt-G-Bamt Greenbrier CT, Clifton, N.J. 07012**

**Filed Nov. 7, 1994, Ser. No. 335,041**
**Int. Cl.[6] A63B 53/04**
**U.S. Cl. 273—171** **16 Claims**



8. A golf putter head having an elongated cylinder configuration with a longitudinal central axis therethrough, wherein the weight distribution of the golf club head, at substantially all axial cross sectional positions thereof, is substantially concentrically evenly distributed around said axis, wherein said head is comprised of an outer elongated cylindrical shell having metal weights contained therein, with said weights being configured and positioned to provide the weighted ends and the central balancing along the longitudinal axis and radial axis, wherein said shell contains two metal weights of substantially equal weight, with each weight being of tiered cylindrical configuration of varying diameters, wherein said weights are aligned with the longitudinal axis and positioned such that the diameter tier of each weight is closes to the respective end of the golf putter head.

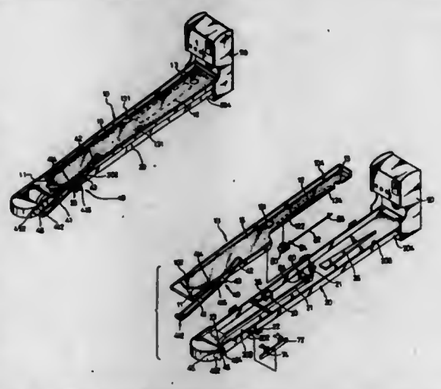
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**5,501,462**

**GOLF PRACTICE DEVICE FOR PLAYING**

**Wu-tung Shih, No. 16, Hoping Rd., Chaochou Chen, Pingtung Hsien, Taiwan**

**Filed Aug. 3, 1995, Ser. No. 510,864**
**Int. Cl.[6] A63B 67/02**
**U.S. Cl. 273—176 FA** **3 Claims**



1. A golf practice device comprising:

an inclined elongated base (**20**) having a plurality of golf balls (**100**) contained therein and including first and second end portions (**202**) and (**204**) each having a first side and a second side, said first end portion (**202**) being at a level lower than that of said second end portion (**204**), a passage (**206**) defined in said base (**20**) for said plurality of golf balls (**100**) to pass therethrough, an inlet hole (**23**) laterally defined in the first side of said first end portion (**202**) of said base (**20**) and communicating with said passage (**206**), a guiding plate (**21**) mounted in said passage (**206**) for guiding said plurality of golf balls (**100**) into said inlet hole (**23**);

a gate operating mechanism (**30**) mounted in said passage (**206**) of said base (**20**) and operating between a first module in which said plurality of golf balls (**100**) are stopped by said gate operating mechanism (**30**) and a second module in which said plurality of golf balls (**100**) are able to pass therethrough;

a control panel (**50**) mounted on the second end portion (**204**) of said base (**20**) for operating said gate operating mechanism (**30**);

an elongated plate (**10**) mounted on said base (**20**) and including first and second end portions (**102**) and (**104**) each having a first side and a second side, said first end portion (**102**) being at a level lower than that of said second end portion (**104**), an artificial sod (**15**) covered on said elongated plate (**10**), a substantially V-shaped flange (**11**) formed on the first end portion (**102**) of said elongated plate (**10**) and protruding upwardly therefrom, a first socket (**13**) defined through said artificial sod (**15**) and the second end portion (**104**) of said elongated plate (**10**) and communicating with said passage (**206**), at least one second socket (**131**) defined through said artificial sod (**15**) and a mediate portion of said elongated plate (**10**) and communicating with said passage (**206**); and

a pivot member (**40**) pivotally mounted on said elongated plate (**10**) and including a pivot axle (**43**) fixedly mounted on the first side of the first end portion (**102**) of said elongated plate (**10**), a first lever (**41**) having a first end which has a supporting bracket (**412**) fixedly mounted thereon and a second end which is pivotally mounted on said pivot axle (**43**) and has a recess (**414**) defined therein, and a second lever (**42**) fixedly attached to the second end of said first lever (**41**) to pivot therewith about said pivot axle (**43**), said pivot member (**40**) being pivoted between a first position where the first end of said first lever (**41**) is at a lowermost level thereof such that one of said plurality of golf balls (**100**) is able to move through said inlet hole (**23**) to be retained on said supporting bracket (**412**), and a second position where said first lever (**41**) is disposed at a substantially horizontal state such that said golf ball (**100**) is able to move from said supporting bracket (**412**) into said recess (**414**) and into said artificial sod (**15**).



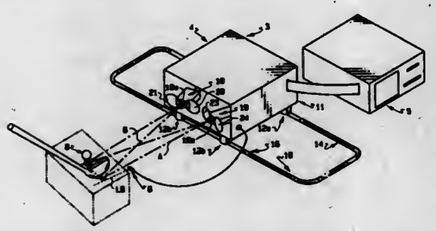
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**5,501,463**

**METHOD AND APPARATUS TO DETERMINE OBJECT STRIKING INSTRUMENT MOVEMENT CONDITIONS**

**William Gobush, North Dartmouth; Diane Pelletier, Fairhaven, and Charles Days, South Dartmouth, all of Mass., assignors to Acushnet Company, New Bedford, Mass.**

**Continuation of Ser. No. 979,712, Nov. 20, 1992, abandoned.**
**This application Feb. 24, 1994, Ser. No. 209,169**
**Int. Cl.[6] A63B 69/36**
**U.S. Cl. 273—184 R** **7 Claims**



1. A system for monitoring the initial movement of a striking instrument just prior to and at contact with an object comprising:

(a) a support means for the object in a field of view;

(b) a portable housing adjacent the object including at least two cameras in fixed relationship in said housing;

(c) a first camera unit in said housing having a light sensitive panel, said first camera unit being focused on the field of view through which the instrument passes prior to striking the object;

(d) a second camera unit in said housing having a light sensitive panel focused on the field of view;

(e) means for sbuttering or gating the camera units at least two times as the instrument and object pass through the field of view;

(f) three or more contrasting areas on the striking instrument and three or more contrasting areas on the object said areas positioned so that light emitting therefrom reaches said light sensitive panels to form light patterns thereon and create analog image signals when the camera shutters are open; and

(g) image digitizing means for receiving said analog signals and discriminating between instrument contrasting and object contrasting areas to determine the conditions of the path and orientation of the instrument through the field.

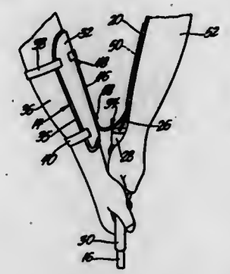
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**5,501,464**

**GOLF SWING FOREARM/WRIST POSITIONER**

**Leo Dalbo, Sebastopol, Calif., assignor to Dalmo, Inc., Bloomfield Hills, Mich.**

**Filed Mar. 30, 1995, Ser. No. 413,612**
**Int. Cl.[6] A63B 69/36**
**U.S. Cl. 273—187.2** **9 Claims**



1. A forearm/wrist positioner which maintains a predetermined triangular relationship between the forearms of a leading arm and a trailing arm of a trainee as the trainee swings a golf club from the address position to the backswing, downswing, and follow-through positions, said forearm/wrist positioner comprising a cuff member adapted to be mounted on one of said forearms of said trainee, a spacer member having one end thereof fastened to said cuff member and adapted to have the other end thereof extend towards and be pressed by said one of said forearms against said other of said forearms of the trainee for maintaining said predetermined triangular relationship between said forearms while allowing relative movement between said other end and said one of said forearms as the trainee swings the golf club from said address position through said follow-through position, said spacer member being made of a malleable material as a single unitary member which allows the size of the included angle between the forearms of the trainee to be adjusted by manually forcibly moving one end of said spacer member relative to said other end, and means for maintaining said cuff member on said one of said forearms in a substantially fixed position while allowing said relative movement between said other end of said spacer member and said other forearm as said golf club is swung from said address position through said follow-through position.

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**5,501,465**

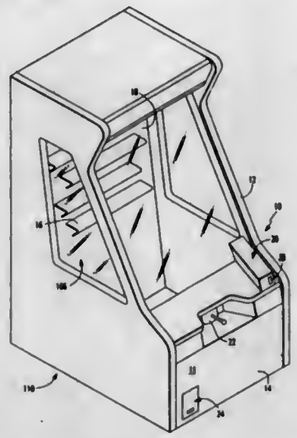
**Patent Not Issued For This Number**

**5,501,466**

## COIN PROJECTING GAME APPARATUS

**Wallace W. Welch, Downers Grove; Python V. Anghelo, Chicago; William F. Triplett, Elgin, all of Ill., and Katherine A. Adams, Chesterton, Ind., assignors to Capcom Coin-op, Inc., Arlington Heights, Ill.**

**Filed Feb. 10, 1995, Ser. No. 387,021**
**Int. Cl.[6] A63F *9/02***
**U.S. Cl. 273—355** **18 Claims**



1. A game apparatus, comprising:
a cabinet defining a playing area including a plurality of shelves mounted therein each having disposed thereon a plurality of game pieces;
a receiving mechanism attached to said cabinet for accepting a playing piece; and
a spring activated catapult mechanism linked to said receiving mechanism for launching said playing piece towards said shelves for the purpose of dislodging said game pieces.

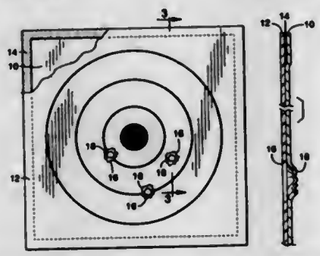
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**5,501,467**

## HIGHLY VISIBLE, POINT OF IMPACT, FIREARM TARGET-SHATTERABLE FACE SHEET EMBODIMENT

**Walter Kandel, 4159 N. Overlook Ter., Portland, Oreg. 97217**

**Continuation of Ser. No. 171,336, Dec. 14, 1993, abandoned, which is a continuation-in-part of Ser. No. 55,555, May 3, 1993, abandoned. This application Dec. 2, 1994, Ser. No. 349,007**
**Int. Cl.[6] F41J *5/18***
**U.S. Cl. 273—378** **19 Claims**



1. A firearm target having a target area and comprising:
a) a backing sheet of target material,
b) a superimposed, target-marked discrete face sheet comprising an impact-shatterable material which in the immediate area of bullet impact shatters selectively to form a bullet hole which is substantially larger than the bullet hole through the backing sheet, thereby exposing a substantial area of the face surface of the backing sheet,
c) the backing sheet and face sheet having face surfaces of contrasting colors, and
d) marginal holding means holding the face sheet to the backing sheet, selectively in the superimposed marginal areas thereof and arranged for maintaining the sheets substantially completely separate and discrete from each other in the target area.

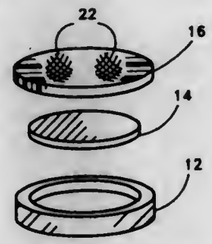
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**5,501,468**

## SLAMMER FOR USE IN PLAYING MILK CAP TYPE GAMES

**Bruce Browne, Bonita, Calif., assignor to B and P Plastics, National City, Calif.**

**Division of Ser. No. 394,891, Feb. 27, 1995, Pat. No. 5,443,106, which is a continuation-in-part of Ser. No. 305,437, Sep. 13, 1994, Pat. No. 5,421,588. This application May 15, 1995, Ser. No. 441,070**
**Int. Cl.[6] A63B *65/10***
**U.S. Cl. 273—424** **7 Claims**



1. A slammer for playing Milk Caps type games, which comprises:
at least one continuous, unapertured, metal disk;
a first synthetic resin housing portion surrounding a first face of said disk assembly and at least some of the outer edges of said disk assembly; and
a second synthetic resin housing portion covering the second face of said disk assembly and bonded to said first synthetic resin housing portion, said second housing portion being a softer resin than the resin forming said first housing portion.

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**5,501,469**

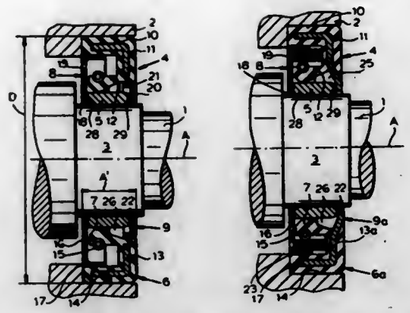
## AXIALLY COMPACT UNITIZED LIP SEAL

**Jean Ducugnon, Calutre, and Eugene Faure, Lyon, both of, France, assignors to P.I.V. S.A., Villeurbanne, France**

**Filed Jun. 13, 1994, Ser. No. 258,855**
**Claims priority, application France, Jun. 14, 1993, 93 07347**
**Int. Cl.[6] F16J *15/32***
**U.S. Cl. 277—37** **19 Claims**

1. A seal for use between a shaft rotatable about and extending along an axis and having an outer surface and a housing through which the shaft passes axially, the seal comprising:
a rub ring fixed on the shaft outer surface and having an outer surface centered on the axis;
a one-piece flexible seal ring having a pair of outer axially oppositely directed end faces lying in and defining a pair of axially spaced end planes and unitarily formed with
an outer portion fixed in and directly engaging the housing,
an inner lip engaging radially inward against the outer rub-ring surface,
an intermediate portion extending radially inward from the outer portion, and





a relatively thin and flexible annular web connecting the lip to the intermediate portion;
a rigid inner protector ring lying axially wholly between the planes and radially wholly within the seal ring, fixed in the seal ring, and having a radially inwardly projecting inner flange juxtaposed with the rub ring and having a close radial clearance with one of the outer surfaces; and
a rigid outer protector ring lying axially wholly between the planes and radially wholly within the seal ring, fixed in the seal ring, and having a radially inwardly projecting inner flange juxtaposed with the rub ring and having a close radial clearance with one of the outer surfaces.

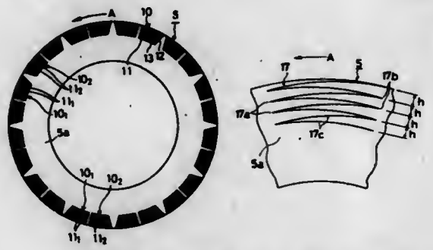
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**5,501,470**

## NON-CONTACTING SHAFT SEALING DEVICE WITH GROOVED FACE PATTERN

**Toshihiko Fuse, and Eiji Okumachi, both of Sanda, Japan, assignors to Nippon Pillar Packing Co., Ltd., Osaka, Japan**

**Filed Dec. 2, 1993, Ser. No. 160,195**
**Claims priority, application Japan, Dec. 11, 1992, 4-331828; Jul. 22, 1993, 5-181059**
**Int. Cl.[6] F16J *15/34***
**U.S. Cl. 277—96.1** **17 Claims**



1. A non-contacting shaft sealing device wherein a sealing end face of a case seal and a sealing end face of a rotary shaft seal rotate relatively in a non-contacting state with a film of fluid from a high pressure region being sealed interposed therebetween, and sealing end face having an even number of dynamic pressure generating groove groups disposed in the peripheral direction relative to each other said on said one sealing end face, each dynamic pressure generating groove group having plural independent and approximately L-shaped linear dynamic pressure generating grooves each composed of a fluid lead-in part extending in a radial direction on said one sealing end face to a peripheral edge of said one sealing end face so as to communicate with said high pressure region, and a dynamic pressure generating part extending in the peripheral direction of said one sealing end face from an end portion of a respective fluid lead-in part, said dynamic pressure generating grooves not crossing each other and, within each group, being disposed adjacent one another in the radial direction of said one sealing end face, any two adjacent dynamic pressure generating groove groups being symmetrically disposed in the peripheral direction about a diametral center line of said one sealing end face extending between said any two adjacent dynamic pressure generating groove groups, said dynamic pressure generating grooves having a width between 0.001 and 2.0 mm, and said one sealing end face having a groove ratio of 0.1 to 0.9 where the groove ratio is defined as the ratio of the radial width of a dynamic pressure generating groove group to the radial width of an annular face where said sealing end faces overlap.

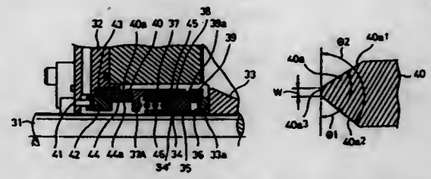
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**5,501,471**

## MECHANICAL SEAL WITH BLADE-LIKE SEALING END

**Kanji Ohba, Kobe; Takeo Nakajima, Sanda, and Yuichi Tamura, Kobe, all of, Japan, assignors to Nippon Pillar Packing Co., Ltd., Osaka, Japan**

**Continuation of Ser. No. 853,749, Jun. 11, 1992, abandoned. This application May 20, 1994, Ser. No. 247,120**
**Int. Cl.[6] F16J *15/34***
**U.S. Cl. 277—96.1** **9 Claims**



1. A mechanical seal for a shaft and associated with a fluid space, comprising: a rotary seal ring and a stationary seal ring which slide on and come in contact with each other for sealing a fluid; spring means for biasing one of said seal rings toward the other seal ring so that said one seal ring is resiliently pressed against said other seal ring, one of said seal rings having a flat sealing end surface and the other seal ring having inner and outer peripheral surfaces and an edge surface defining a blade-like sealing end portion which slides on and comes in contact with said flat sealing end surface; an O-ring; and means for receiving the O-ring,
said means for receiving said O-ring defining a groove and an O-ring engaging surface in said groove, the diameter of which, in the radial direction of the rotary seal ring, is substantially equal to the outer diameter defined by said edge surface,
said blade-like sealing end portion being arranged such that the angles formed by the inner and outer peripheral surfaces thereof with respect to the edge surface thereof are set in the range of 105° to 150°, and
the width of the edge surface of said blade-like sealing end portion is set in the range of 0.1 mm to 0.3 mm, wherein the balance ratio determined by the ratio of the contact area of both sealing rings to the pressure receiving area of the flat sealing end surface is set substantially to zero.

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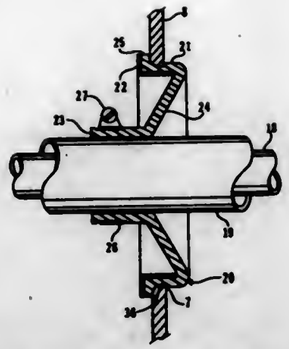
**5,501,472**

## DUAL COMPRESSION SEAL FOR CONDUITS WITH COMPLIANCE TO BOTH AXIAL AND ANGULAR MOVEMENT

**rodney E. Brancher, P.O. Box 12344, Wilmington, Del. 19850, and Anthony C. Paladinetti, Jr., 742 Taunton Rd., Wilmington, Del. 19803**

**Continuation-in-part of Ser. No. 945,501, Sep. 16, 1992, abandoned. This application Apr. 8, 1994, Ser. No. 224,904**
**Int. Cl.[6] F16J *9/04***
**U.S. Cl. 277—178** **11 Claims**

1. A compression seal for a conduit that passes through a feed-through aperture in a watertight wall, wherein said feed-through aperture has an irregular rim and wherein said seal fixedly



conforms to the irregular aperture rim and allows longitudinal movement of said conduit along the centerline of said aperture as well as wide angular movements with respect thereto, said compression seal comprising:

aperture rim sealing means, having a flange portion which compressively engages a face of the watertight wall and an annular portion connected to said flange portion and compressively engaging the rim of said aperture in said wall, for fixedly sealing said rim of said wall aperture;

locking ring means, having a substantially right-angle cross-section, for compressing said flange portion and said annular portion of said aperture sealing rim means to follow the contours of said wall and said irregular aperture rim to compressively secure said aperture rim sealing means in said wall aperture;

conduit sealing means, having an annual portion compressed about said conduit, for fixedly sealing the periphery of said conduit; and

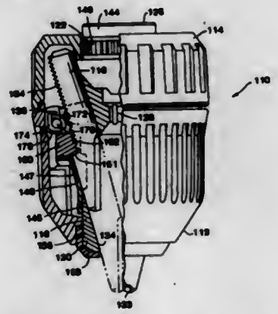
conical web means of flexible material for sealingly connecting said aperture rim sealing means and said conduit sealing means and allowing longitudinal and angular movements of said conduit with respect to the centerline of said aperture.

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**5,501,473**
**CHUCK**

**Christopher B. Bartou, and Stephen W. Steadings, both of Seneca, S.C., assignors to Power Tool Holders Incorporated, Wilmington, Del.**

**Continuation-in-part of Ser. No. 106,063, Aug. 13, 1993, Pat. No. 5,348,317. This application Aug. 12, 1994, Ser. No. 289,922**
**Int. Cl.[6] B23B *13/12***
**U.S. Cl. 279—62** **17 Claims**



1. A chuck for use with a manual or powered driver having a rotatable drive shaft, said chuck comprising:

a) a generally cylindrical body member having a nose section and a tail section, said tail section adapted to mate with said drive shaft of said driver and said nose section having an axial bore formed therein and a plurality of angularly disposed passageways formed therethrough and intersecting said axial bore;

b) a plurality of jaws slidably positioned in said angularly disposed passageways, each of said jaws having a jaw face formed on one side thereof;

c) a nut rotatably mounted on said body member and in engagement with said threads on said jaws;

d) a nut retainer member axially fixed on said body for maintaining said nut on said body, said nut retainer member including a frusto-conical portion; and

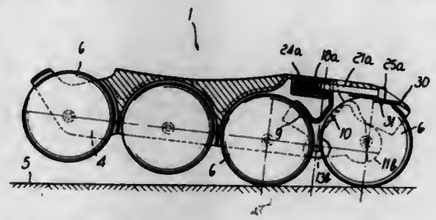
e) a generally cylindrical front sleeve member in driving engagement with said nut and overlying said nose section of said body member whereby when said front sleeve member is rotated with respect to said body member, said jaws will be moved thereby.

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**5,501,474**
**BRAKING DEVICE FOR IN-LINE SKATES**

**Gino Conte, Caerano San Marco, Italy, assignor to Roces S.R.L., Montebelluna, Italy**

**Filed Nov. 3, 1994, Ser. No. 333,712**
**Claims priority, application Italy, Apr. 12, 1994, MI94A0674**
**Int. Cl.[6] A63C *17/14***
**U.S. Cl. 280—11.2** **19 Claims**



1. An in-line skate comprising:

a frame;

at least two in-line wheels associated with said frame;

a body pivotably mounted to said frame in a region between the two wheels, one of said wheels being rotatably mounted to said body, another of said wheels being rotatably mounted directly to said frame;

biasing means mounted to said frame for resiliently biasing said body towards a cruising configuration relative to said frame; and

braking means including at least two braking surfaces each disposed on one of said frame and said body for frictionally interacting simultaneously with both of said wheels in a tilted braking configuration of said body relative to said frame.

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**5,501,475**
**UNIVERSAL STAINLESS STEEL TRUCK STEP AND ADJUSTABLE SUPPORT ROD**

**Don Bundy, Sapulpa, Okla., assignor to Mid-America Automotive, Inc., Sapulpa, Okla.**

**Filed Jul. 29, 1994, Ser. No. 282,977**
**Int. Cl.[6] B60R *3/00***
**U.S. Cl. 280—166** **8 Claims**

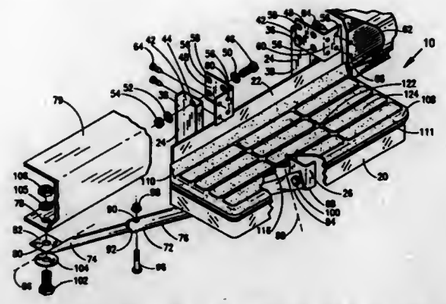
1. A universal step for a vehicle comprising:

a horizontal plate,

a perimeter lip being secured to and extending downward from a front and side edges of said plate,

a backplate being secured to and extending upward from a back edge of said plate,





a cap being secured over said plate such that said plate is concealed by said cap,

at least one L-shaped brace,

one leg of each brace being secured to a bottom surface of said plate, a second leg of each L-shaped brace being secured to a proximal end of a universal bracket, a distal end of said universal bracket being provided with means for securing said universal bracket to said vehicle,

an adjustable support rod,

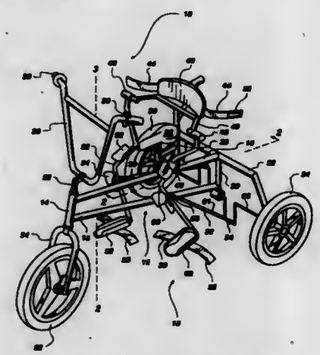
said support rod being comprised of a smaller rod and a larger rod, a proximal end of said larger rod receiving a proximal end of said smaller rod in telescoping manner, means for securing said smaller rod within said larger rod, a first end of said support rod being provided with means for securing said first end to said vehicle, a second end of said support rod being provided with means for securing said second end to said plate.

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**5,501,476**
**MUSCLE POWERED THERAPEUTIC VEHICLE**

**Glade Howell, Salt Lake City; Jeff W. Bean, Kaysville; Judith L. Gooch, Salt Lake City; Donald Bioswick, Salt Lake City, and Don R. Brown, Salt Lake City, all of Utah, assignors to University of Utah Research Foundation, Salt Lake City, Utah**

**Continuation of Ser. No. 888,724, May 16, 1992, abandoned. This application Jan. 19, 1995, Ser. No. 376,128**
**Int. Cl.[6] B62M *1/04***
**U.S. Cl. 280—230** **18 Claims**



1. A wheeled vehicle capable of being propelled by a user which is carried thereon, including users with less than normal muscular control and strength, the vehicle comprising:

a frame;

at least one steerable wheel connected to the frame;

user support means for supporting the user on the frame;

steering means for allowing the user to steer the steerable wheel;

means for receiving at least a portion of the user's thigh at a position on the user's leg between the user's knee and the user's hip, the means for receiving at least a portion of the user's thigh comprising means for receiving the back of the user's thigh such that contact with the back of the user's thigh is made and the means for receiving the back of the user's thigh is moved by the hip extension motion of the user;

means for pivotally connecting the means for receiving at least a portion of the user's thigh to the frame at a point in substantial alignment with the user's hip;

driving wheel means connected to the frame, the driving wheel means comprising a wheel and means for transmitting any extension motion of the user's hip into the rotational movement of the driving wheel means, the driving wheel means comprising an axle connected to a driving wheel, the axle having an eccentric portion thereof and the means for receiving at least a portion of the user's thigh comprising means for connecting the back of the user's thigh to the eccentric portion of the axle; and

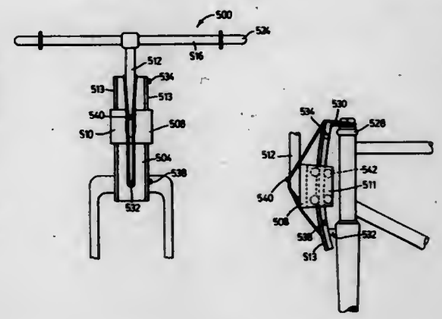
means for transmitting the extension motion of the user's hip into the rotational movement of the driving wheel means such that the vehicle can be propelled by the hip extension motion of the user.

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**5,501,477**
**BICYCLE**

**Gregory J. Moreau, 88 Old Penetang Road, Wyebridge, Ontario, Canada**

**Filed Aug. 5, 1994, Ser. No. 286,818**
**Int. Cl.[6] B62K *21/14***
**U.S. Cl. 280—281.1** **6 Claims**



1. An improved bicycle including a handlebar assembly comprising:

a handlebar;

a control means operatively connected to a steerable wheel of said bicycle for permitting limited movement of said handlebar relative to a frame of said bicycle about an imaginary arc centered at a rear wheel axle of said bicycle, said control means including a substantially arcoidal portion, having a pair of extremities and which is generally coincident with said imaginary arc;

a slider means engaging said control means to allow movement of said slider means along said arcoidal portion, engagement between said slider means and said control means also allowing movement of said slider means in a direction normal to said arcoidal portion; and

said handlebar being connected to said slider means, whereby said handlebar is moveable with said slider means along said arcoidal portion and, to a relatively lesser extent, in said normal direction.

5,501,478
**OCCUPANT PROPELLED THREE WHEELED VEHICLE**
David G. Doan, Reynoldsville, Pa., assignor to Robert L. Doan, Relyidsville, Pa.
Filed Jun. 7, 1995, Ser. No. 483,708
Int. Cl.[6] B62K *5/02;5/08;* B62M *1/00*
U.S. Cl. 280—282 20 Claims

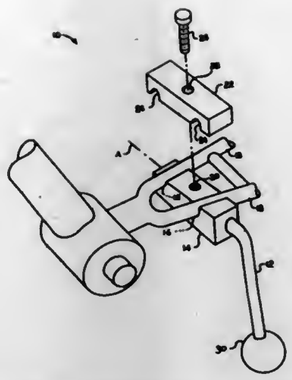


1. An occupant-propelled tricycle comprising:
an elongated frame, said frame including a forward portion and a rearward portion;
a ground engaging front drive wheel, said front drive wheel mounted for rotation about a transverse horizontal axis at the forward portion of the frame;
right and left ground engaging rear wheels, said rear wheels each mounted for rotation about a transverse horizontal axis at the rearward portion of the frame, each said rear wheel further being rotatably attached to said frame for pivotal movement about a respective vertical steering axis;
a pedal assembly at least partially rearwardly displaced from said front drive wheel axis, said pedal assembly including a pair of pedals mounted for rotation about a transverse horizontal pedalling axis;
power coupling means coupled to the pedal assembly and the front drive wheel for transmitting rotational power therebetween;
a seat mounted to the frame longitudinally between the transverse horizontal axis of rotation of the rear wheels and the pedalling axis for supporting a user for upright pedalling of the tricycle;
a steering assembly, said steering assembly includes a rotatable steering shaft and a steering member attached thereto, said rotatable steering shaft coupled to both said rear wheels for angularly displacing each said rear wheel with respect to its respective vertical steering axis; and
a braking mechanism for applying a braking force to at least one of said wheels.

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5,501,479
**KICKSTAND BUMPER**
Donald E. Fehrenbach, 4200 M Rd., Escanaba, Mich. 49829, and Allan J. Waeghe, 7710 Summit 19.55 Dr., Gladstone, Mich. 49837
Filed Nov. 8, 1994, Ser. No. 337,490
Int. Cl.[6] B62H *1/00*
U.S. Cl. 280—293 4 Claims

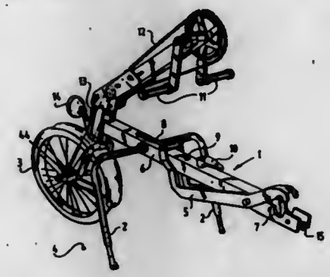
1. A kickstand comprising:
a single downwardly projectable leg including,
a proximal end, and
a distal end;
means for anchoring said proximal end of said leg to a two wheeled vehicle;
a spherical member surrounding said distal end of said leg, said spherical member having a bore penetrating partially thereinto, said distal end of said leg fitting into said bore; and



an adhesive disposed within said bore, for adhering said leg to said spherical member.

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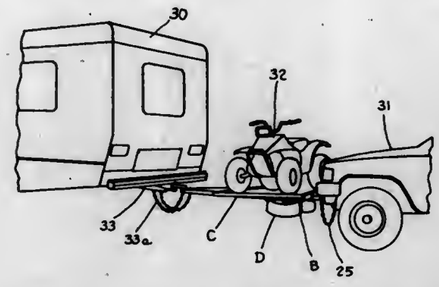
5,501,480
**AUXILIARY FRAME FOR A WHEELCHAIR AND WHEELCHAIR FOR USE WITH AN AUXILIARY FRAME**
Hendrik J. Ordelman, Boutraat 33, NL-7161 XX Neede; Gerhard Temmink, Wiedenbroeksingel 32, NL-7481 BT Haaksbergen; Herman W. H. Stokkers, Vonkenkaamp 3, NL-7482 GB Haaksbergen, and Harm Braam, Spoelsterstraat 6, NL-7481 KG Haaksbergen, all of, Netherlands
Filed Jun. 3, 1994, Ser. No. 253,730
Claims priority, application European Pat. Off., Jun. 4, 1993, 93201604.1; Netherlands, Jul. 28, 1993, 9301322
Int. Cl.[6] B62M *1/14*
U.S. Cl. 280—304.1 18 Claims



1. An auxiliary frame for a wheelchair, comprising: coupling means for coupling the auxiliary frame to the wheelchair, at least one steerable wheel and drive means, wherein the coupling means are formed by a central elongate body provided with a bearing for co-action with a frame of the wheelchair and a clamping bracket pivotally connected to the elongate body and co-acting with the bearing, wherein the coupling means also includes a stationary hook-like member connected to the elongate body, and wherein the coupling means also includes locking means, which locking means are formed by a member pivotally connected to the clamping bracket and a stop connected to the elongate body.



5,501,481
**MOTOR HOME TOWING AND CARRYING APPARATUS AND METHOD**
William M. Chumley, 3303 Green Pond Rd., and Kenneth D. Chumley, 835 Lightwood Knot Rd., both of Woodruff, S.C. 29388
Filed Oct. 31, 1994, Ser. No. 331,995
Int. Cl.[6] B60D *1/14;* B62D *53/00*
U.S. Cl. 280—476.1 14 Claims

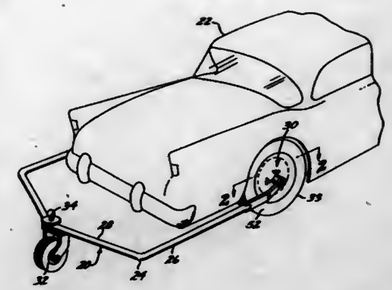


1. Apparatus for securement of an automobile to a motor home and for carrying articles between the motor home and the automobile for towing behind the motor home comprising:
a tow bar having an attachment device on one end for making a steering connection to said motor home pivoted about an upright axis permitting movement of the tow bar in a substantially horizontal plane about said axis;
a connecting frame fastened against horizontal movement adjacent a forward end thereof to a rear portion of said tow bar;
a carrier platform member including a flat support surface carried by said connecting frame in superposed relation thereto so that said tow bar positions a forward end of said carrier platform member adjacent a rear end of said motor home;
a transversely spaced pair of wheels for supporting said carrier platform member for bookup of the apparatus for towing and supporting said carrier platform members for acting as a trailer;
a retracting device facilitating raising of the wheels and locking the wheels during towing in raised out-of-the-way position during towing;
a towing connection for said automobile carried by said connecting frame adjacent a rear end of said carrier platform member; and
said towing connection including
a substantially horizontal transverse pivotal connection for securement to said automobile substantially fixing said automobile against horizontal movement in respect to said connecting frame but permitting pivotal movement in a vertical plane during towing;
whereby said carrier platform member is positioned between said tow bar and said towing connection providing a carrier accessible for use avoiding storage of articles in the motor home and for stabilizing the motor home and automobile during towing.

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5,501,482
**WHEEL COUPLING FOR ATTACHING A VEHICULAR DEVICE TO A WHEEL OF AN AUTOMOTIVE VEHICLE**
William J. McClive, 619 Elysian, Big Bear City, Calif. 92314
Filed Sep. 28, 1993, Ser. No. 127,763
Int. Cl.[6] B60D *1/00*
U.S. Cl. 280—503 28 Claims

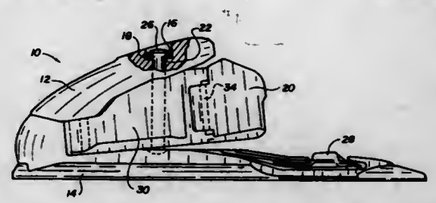
1. A wheel coupling for attaching a vehicular device to a vehicle including a rotary wheel support hub having a hub rotation axis and lug bolts spaced circumferentially about said axis, and a wheel



coaxially mounted on said hub having a central hub portion containing openings receiving said lug bolts, respectively, said wheel coupling comprising:
a coupling part having a coupling axis and including coupling means for attachment to said vehicular device,
mounting brackets spaced circumferentially about said coupling part including means for connecting said brackets to vehicle lug bolts,
mounting means mounting said brackets on said coupling part in a manner which permits at least one of the following bracket adjustments: (a) adjustment of said brackets about said coupling axis, (b) adjustment of said brackets toward and away from said coupling axis.

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5,501,483
**AUTOMATIC RELEASE SKI BINDING**
Premek Stepanek, Garmisch-Partenkirchen; Gerd Klubitschko, Oberammergau, and Werner Messerschmidt, Garmisch-Partenkirchen, all of, Germany, assignors to Marker Deutschland GmbH, Germany
Filed Nov. 15, 1993, Ser. No. 152,576
Claims priority, application Germany, Nov. 16, 1992, 42 38 657.8
Int. Cl.[6] A63C *9/085*
U.S. Cl. 280—625 16 Claims



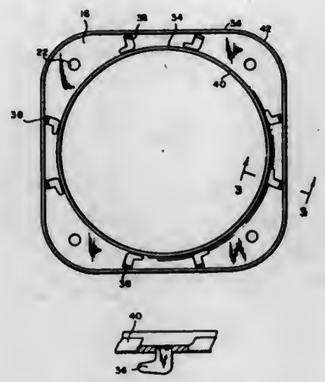
1. A ski binding for securing a ski boot to a ski, said ski binding comprising:
a base member fixable to said ski, said base member having a longitudinal axis;
an upper housing portion rotatable at one end about an axis transverse to the longitudinal axis of the base member;
sole holder means connected to said upper housing portion at an opposite end and including a pair of jaws for laterally holding the sole of the ski boot, said sole holder means rotatable about said transverse axis with said upper housing portion;
generally vertical connecting means for connecting said upper housing portion with said base member, said upper housing portion movable along said vertical connecting means when rotating about said transverse axis; and
resilient means operatively engageable with said connecting means, for absorbing a rotational force applied to said upper housing portion when said upper housing portion rotates about said transverse axis and for biasing said upper housing portion towards said base member.

**5,501,484**

## RIVETLESS CUSHION RETAINING RING WITH TABS WHICH LOCK THE RING IN PLACE AFTER ROTATION

Davin G. Saderholm, Salt Lake City; Kirk Rasmussen, West Point, and Brian M. Shaklik, Bountiful, all of Utah, assignors to Morton International, Inc., Chicago, Ill.

Filed Mar. 20, 1995, Ser. No. 379,412
Int. Cl.[6] B60R 21/20
U.S. Cl. 280—728.2 6 Claims



1. An annular retainer ring for holding an air bag cushion onto an air bag inflator housing consisting of:

an annular ring having an inner boundary, a body with a top and bottom, an outer boundary, a plurality of holes passing through the body of the ring and a plurality of axial descending members integral to and projecting away from the bottom of said ring, at least some of said axial descending members consisting of a first leg portion extending perpendicular to the radii of the annular ring and terminating in a second leg portion bent over at an angle with respect to said first leg portion said second leg portion extending circumferentially to the axis of said ring.

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**5,501,485**

## SNAP-ON AIR BAG COVER

Thomas L. Eckhout, Waterford, Mich., assignor to Larry J. Winget, Leonard, Mich.

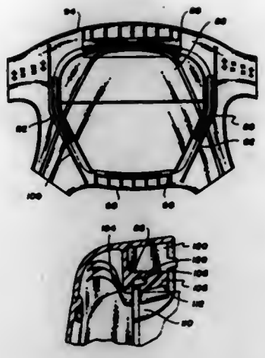
Continuation of Ser. No. 140,669, Oct. 21, 1993, abandoned, which is a continuation-in-part of Ser. No. 984,326, Dec. 2, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 479,250
Int. Cl.[6] B60R 21/20
U.S. Cl. 280—728.3 20 Claims

1. A plastic molded, snap-on air bag cover moutable onto an air bag container including a retaining member, said snap-on air bag cover comprising:

a front cover adapted to overlie an uninflated air bag container;

first and second side panels connected to opposite sides of said front cover;

a resilient clip member extending from each of said side panels, each said clip member having an extending snap-on groove defined therein adapted to cooperate with said retaining member for affixing said air bag cover to said air bag container, each clip member characterized in cross section as having an engagement section for contacting the retaining member during mounting onto the container and a biasing groove formed therein to facilitate resilient displacement of the engagement section and wherein at least one clip member is attached to its respective side panel in a live hinge-like fashion to assist in a snap-on mounting of the cover onto the container.



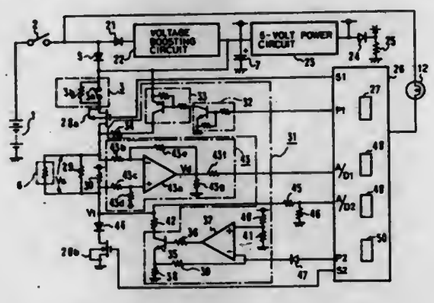
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**5,501,486**

## FAULT DETECTION METHOD AND APPARATUS FOR AIR BAG ACTIVATION DEVICE

Osamu Fujita, and Katsuhiko Ohmae, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 21, 1994, Ser. No. 326,923
Claims priority, application Japan, Jun. 20, 1994, 6-137307
Int. Cl.[6] B60R 21/32
U.S. Cl. 280—735 12 Claims




1. A fault detection circuit for an air bag activation device having collision sensing means for sensing a collision of a vehicle on which said device is installed, air bag activating means for inflating an air bag in response to a triggering current, and control means for feeding the triggering current to said air bag activating means in response to a signal indicative of the detection of a collision of the vehicle from said collision sensing means, said fault detection circuit comprising:

a) current supply means for non-continuously supplying a small, constant magnitude current, of insufficient strength to trigger the air bag activating means, to said air bag activating means to detect a fault thereof, even if a triggering current supply voltage source varies;

b) voltage amplifying means for amplifying a voltage appearing across said air bag activating means; and

c) fault detection means for detecting a fault of said air bag activating means based on an output of the voltage amplifying means when said small, constant magnitude current is supplied to said air bag activating means.

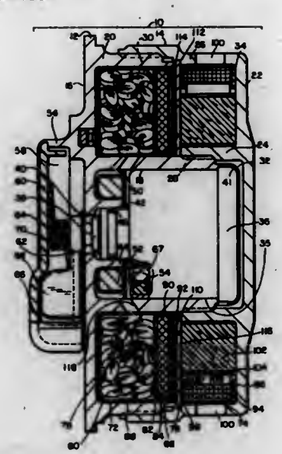


**5,501,487**

## DRIVER SIDE ALL MECHANICAL INFLATOR FOR AIRBAG SYSTEMS

Dennis A. Trevillyan, Plant City, Fla., and Jeffrey L. Parrish, Troy, Mich., assignors to Breed Automotive Technology, Inc., Lakeland, Fla.

Filed Feb. 1, 1995, Ser. No. 382,282
Int. Cl.[6] B60R 21/26
U.S. Cl. 280—736 8 Claims



1. An inflator comprising:

a first and a second housing member cooperating when attached to form a housing having a central tubular chamber and an outer annular chamber disposed around said tubular chamber;

a choke plate captured by and supported between said first and second housing members to divide said outer chamber into a first portion and a second portion;

one of said first and second members including an inner cylindrical and an outer cylindrical wall with said choke plate extending between said inner and outer cylindrical walls;

a gas generating material disposed in said first portion;

filtering means disposed in said second portion for filtering gases from said material, said filtering means including a tubular filter member; and

a baffle disposed adjacent to said filter member, said baffle being tubular and extending in an axial direction between said first member and said choke plate.

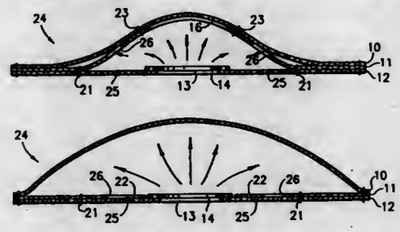
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**5,501,488**

## AIRBAG WITH ALTERNATE DEPLOYMENT MODES

Davin G. Saderholm, Salt Lake City; Brian M. Shaklik, Bountiful, and Kirk H. Rasmussen, West Point, all of Utah, assignors to Morton International, Inc., Chicago, Ill.

Filed Apr. 28, 1995, Ser. No. 430,352
Int. Cl.[6] B60R 21/28;21/16
U.S. Cl. 280—739 17 Claims



1. An airbag for a vehicle occupant restraint system, said airbag comprising:

a front panel, a rear panel and an inner panel interposed between said front and rear panels, each said panel having an outer peripheral edge, all of said panels being of fabric joined together along a non-rupturable outer seam at their outer peripheral edges to define an airbag with said front and rear panels being the outer walls of the airbag and with said inner panel inside the airbag;

a generally central opening in the rear panel providing a mouth of the airbag for receiving inflation gas, a generally central opening in the inner panel at least as large as said opening in the rear panel;

said inner panel additionally being joined to the front panel along an inner seam around the central opening on the inner panel and joined to the rear panel by a non-rupturable middle seam located between said inner seam and said outer seam on the inner panel;

a flap comprising an area on the inner panel between said inner seam and said middle seam, said flap having an inner edge comprising said inner seam and an outer edge comprising said middle seam;

gas exhaust means on said rear panel between said middle seam and the mouth of the airbag;

flap release means for separating said flap from the front panel at or adjacent the inner edge of said flap during inflation of the airbag in the normal inflation mode, said separated flap covering at least a portion of the gas exhaust means on the rear panel after separation of the flap from the front panel to prevent escape of inflation gas through said covered portion gas exhaust means.

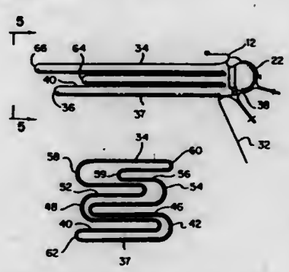
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**5,501,489**

## FULLY EXTENDED PLEAT FOR PASSENGER AIR BAG FOLD

Marc D. Folsom, Tokyo, Japan, and Donald J. Paxton, Brigham City, Utah, assignors to Morton International, Inc., Chicago, Ill.

Filed Mar. 30, 1995, Ser. No. 413,743
Int. Cl.[6] B60R 21/16
U.S. Cl. 280—743.1 6 Claims



5. An inflatable folded and rolled air bag cushion attached to a rigid housing adapted to be mounted in a vehicle for restraining a vehicle passenger, the air bag being made of a flexible fabric and having a generally rectangular mouth with one pair of sides defining the width of the mouth, said mouth width being substantially equal to the length of an opening in said housing,

the folded air bag cushion including:

at least two longitudinal pleats defined by first fold lines extending parallel to and for the extent of the width of the bag mouth and second fold lines spaced from and parallel to the first fold lines, the longitudinal pleats having a length extending perpendicular to both the first and second fold lines;

the at least two longitudinal pleats further including a plurality of transverse pleats defined by third and fourth fold lines perpendicular to the first and second fold lines, the third and fourth fold lines corresponding to the length of the housing

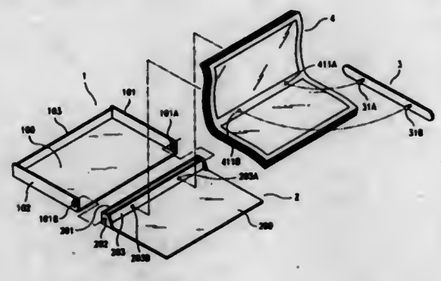
opening, the transverse pleats each extending generally the length of the housing opening and for the length of the longitudinal pleats;

a roll formed in the transverse pleats having an axis parallel to the width of the mouth, said roll being formed of only part of the length of the longitudinal pleats and being tightly positioned against the air bag cushion fabric at one side of the mouth of the air bag to provide an exposed portion of the roll which does not extend into the housing opening; and

the remainder of the length of the longitudinal pleats being formed into a loop of unrolled fabric having an end that extends a predetermined distance from an edge of the housing opening, said loop end being folded inwardly toward the roll axis to contact only part of the exposed roll portion.

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**5,501,490**
**ALBUM**
**Yung-Hung Lo, 3F, No. 11, Lane 14, Chung San St., Hsi Chih Town, Taipei Hsien, Taiwan**
**Filed Jun. 7, 1995, Ser. No. 476,352**
**Int. Cl.[6] B42D 1/00**
**U.S. Cl. 281—21.1** **3 Claims**



1. An album comprising:

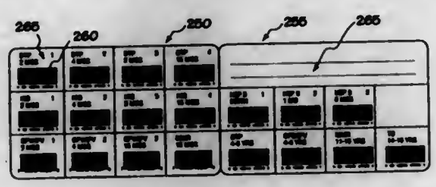
a bottom shell made of rectangular shape, said bottom shell comprising a flat rectangular base, a first upright side wall and a second upright side wall respectively raised from two opposite short sides of said flat rectangular base of said bottom shell, a third upright side wall raised from one long side of said flat rectangular base of said bottom shell and connected between said first upright side wall and said second upright side wall, a first slot on said first upright side wall at one end remote from said third upright side wall, and a second slot on said second upright side wall at one end remote from said third upright side wall;

a cover shell covered on said bottom shell, said cover shell comprising a flat rectangular base, an outer upright wall and an inner upright wall raised along one long side of said rectangular base of said cover shell, two outward pivot pins disposed at two opposite ends of said inner and outer upright walls and respectively inserted into said first slot and said second slot of said bottom shell for permitting said cover shell to be pivotably connected to said bottom shell, and a plurality of binding holes longitudinally spaced on said inner upright wall;

a stack of pocket-designed blank pages received inside said bottom shell and said cover shell for holding pictures, said stack of pocket-designed blank pages having a plurality of binding holes longitudinally aligned in the middle; and

an elongated binding plate fastened to said inner upright wall of said cover shell to hold said stack of pocket-designed blank pages in place, said binding plate having a plurality of upright retainer rods spaced at one side and respectively inserted through said binding holes on said stack of pocket-designed blank pages and then fitted into the binding holes on said inner upright wall of said cover shell to hold down said stack of pocket-designed blank pages in place.

**5,501,491**
**PEEL OFF COUPON REDEMPTION CARD AND TRACKING SYSTEM**
**Kenneth Thompson, 2368 Eastman Ave., Ste. 3, Ventura, Calif. 93003, assignor to Kenneth Thompson, and Debra Tak Thompson, Ventura, Calif.**
**Continuation-in-part of Ser. No. 884,962, May 15, 1992, Pat. No. 5,308,120, and a continuation-in-part of Ser. No. 17,762, Feb. 15, 1991. This application May 2, 1994, Ser. No. 237,503**
**The portion of the term of this patent subsequent to May 3, 2011, has been disclaimed.**
**Int. Cl.[6] B42D 15/00**
**U.S. Cl. 283—70** **40 Claims**



1. A method of redeeming a coupon secured to a redemption card which comprises:

presenting to a redemption center a redemption card having a bar code thereon and containing at least one peel-off coupon;

peeling off at least one said peel-off coupon from said redemption card;

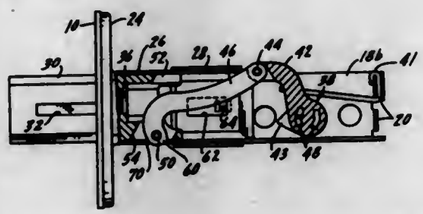
transferring said peel-off coupon to a tracking means;

crediting the value of said peel-off coupon to the redeemer by reading said bar code on said redemption card with a bar code reader; and

returning said redemption card to the redeemer.

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**5,501,492**
**DEADBOLT WITH INFINITELY ADJUSTABLE BACKSET**
**Pete Kajuch, Brookfield, Wis., assignor to Master Lock Company, Milwaukee, Wis.**
**Filed Apr. 11, 1994, Ser. No. 225,744**
**Int. Cl.[6] E05C 19/00**
**U.S. Cl. 292—1.5** **22 Claims**

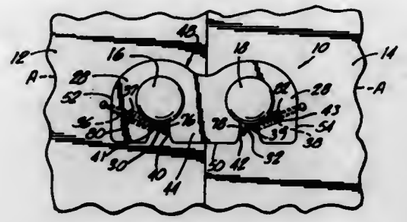


1. An adjustable backset door latch having a case, a bolt movable within said case between an extended position in which the bolt extends forwardly of said case and a retracted position in which said bolt is within said case, a swivel mounted in Said case for turning movement, means connecting said swivel and said bolt whereby turning of said swivel moves said bolt between said extended and retracted positions, said swivel being movable relative to a forward end of said casing for adjusting backset between defined backset adjustment limits and at all of infinite positions therebetween,

and means for holding said bolt in a fully extended position, resisting inward movement thereof except by turning of said swivel, at either limit of backset adjustment and at all backset adjustment positions therebetween.



**5,501,493**
**SECURITY DEVICE FOR DUAL DOORS**
**Robert H. Arthur, 1665 Via strella, Pomona, Calif. 91768**
**Filed Sep. 22, 1994, Ser. No. 310,588**
**Int. Cl.[6] E05C 19/18**
**U.S. Cl. 292—258** **11 Claims**



1. A security device for securing first and second adjacent doors having first and second door knobs, respectively, each door knob having a neck portion and a head portion, the security device comprising:

(a) a rigid plate disposed substantially between two parallel planes, the rigid plate having a bottom wall, a first side wall and a second side wall;

(b) first and second openings spaced apart from one another in the bottom wall of the plate, the first and second openings having first and second inside walls and first and second outside walls, respectively, contiguous with the bottom wall, the first and second openings being wider than the neck portions and narrower than the head portions of the first and second door knobs, respectively, so that the neck portions fit within the openings and the plate is held in place by the head portions when the plate is installed on the doors;

(c) first and second holes in the first and second side walls, respectively, the first and second holes extending substantially parallel to and between the two planes through the plate and through the first and second outside walls, respectively;

(d) first and second locking pins slidably disposed within the first and second holes, respectively, the pins being sufficiently long so that, in locked positions of the pins, the first and second pins are capable of extending:

(i) through the first and second holes, respectively;

(ii) into the first and second openings, respectively; and

(iii) below the first and second neck portions, respectively, when the plate is installed,

so that, in their locked positions, the pins prevent the plate from being removed from the doors when the plate is installed on the doors, the first and second pins further having protruding portions extending out of the holes for gripping by a user of the security device; and

(e) first and second springs attached to the first and second locking pins for biasing the first and second locking pins to their locked positions.

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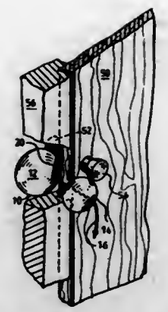
**5,501,494**
**PORTABLE DOOR LOCK SUITABLE FOR USE BY PEOPLE OF ALL AGES**
**Thomas Willetts, 8 Camelot La., St. James, N.Y. 11780**
**Filed Sep. 12, 1994, Ser. No. 304,395**
**Int. Cl.[6] C05C 17/04**
**U.S. Cl. 292—262** **11 Claims**

1. A removable door lock in combination with a door comprising:

a) an exterior member;

b) a cord having a first end and a second end, said first end being coupled to said exterior member;

c) an interior member slidably arranged on said cord so that it is movable along said cord toward and away from said exterior member;



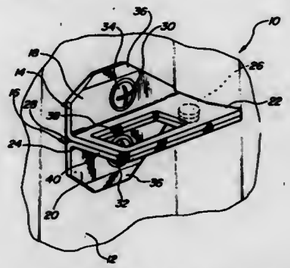
said cord containing stopping means for stopping movement of said interior member in a direction away from said exterior member, said stopping means being located at a point on said cord between said first and second ends; and

said interior member having means for selectively engaging said stopping member so that said interior member may be stopped by and released from said stopping member, wherein

said exterior member is located on an exterior side of the door and said interior member is located on an interior side of the door, and after the door is closed, said interior member is slid along said cord toward the door and said means for selectively engaging said stopping member is brought into engagement with said stopping member.

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**5,501,495**
**AUTOMOBILE DOOR STRIKER ASSEMBLY**
**Burrell S. Claucherty, Jackson, Mich., assignor to Manchester Stamping Corporation, Manchester, Mich.**
**Filed Feb. 15, 1994, Ser. No. 196,467**
**Int. Cl.[6] E05B 15/02**
**U.S. Cl. 292—340** **8 Claims**



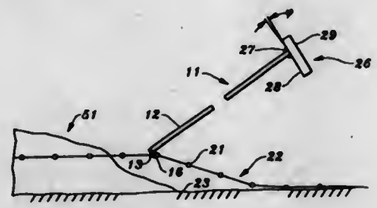
1. A striker assembly for an automobile door locking mechanism, said striker assembly comprising:

a body defined by a pair of individually formed rigid members fixedly secured to one another to form said body, said rigid members each being unitary structures including a mounting flange adapted to mount said striker assembly to an automobile door, said rigid members each also including a substantially planar striker plate having an interior face and an exterior face, said mounting flanges being angularly oriented with respect to said striker plates, said interior faces of said striker plates being in surface-to-surface contact with one another and said interior face of one of said striker plates being fixedly secured to said interior face of the other of said striker plates, each of said striker plates having portions defining an aperture commonly extending through both of said striker plates, said aperture being defined in said striker plates so as to be generally offset to one side of said striker plates, said striker plates being secured to each other by a spot

weld at an enlarged area resulting from the offset location of said aperture, said aperture further defining an integral striker bar in said striker plates which extends along two sides of said striker plates in opposition to said enlarged area, said striker bar and said aperture being configured to receive a latch of the automobile door locking mechanism thereby retaining the automobile door in its closed position.

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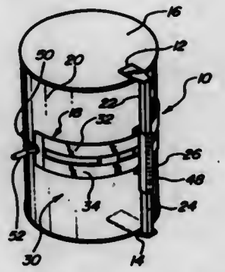
**5,501,496**
**WIRE MESH PULLER**
Robert S. Ramos, P.O. Box 651, Keys, Calif. 95326
Filed Jul. 20, 1990, Ser. No. 555,234
Int. Cl.[6] B65G 7/12
U.S. Cl. 294—26 4 Claims




1. A wire mesh puller comprising
an elongated rigid shank having an upper and a lower side,
a substantially straight tooth depending laterally from the lower side of said shank at an outer end thereof, and
a handle attached to an inner end of said shank in substantially perpendicular relation thereto and substantially parallel relation to said tooth and having a major portion depending from the lower side of said shank and a minor portion extending above the upper side of said shank sufficient to accommodate gripping by the index finger of a hand having the remaining fingers thereof disposed about said handle below said shank.

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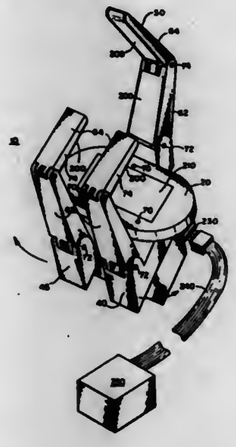
**5,501,497**
**ADJUSTABLE DRUM HANDLING CARRIER**
Bradley Holloway, Angola, Ind., assignor to Vestil Manufacturing Company, Angola, Ind.
Filed Mar. 16, 1994, Ser. No. 214,842
Int. Cl.[6] B66C 1/10
U.S. Cl. 294—86.4 4 Claims




1. An adjustable drum handling carrier comprising:
an arcuate cradle for peripherally engaging said drum;
an upright assembly tube extending parallel to an axis of said drum and removably attached to a midpoint of said cradle by a strap and bolts received in spaced threaded bosses on said assembly tube; and
a top and a bottom bracket tube each having an end adjustably telescoped within said assembly tube and each having a drum engaging bracket at a free end.

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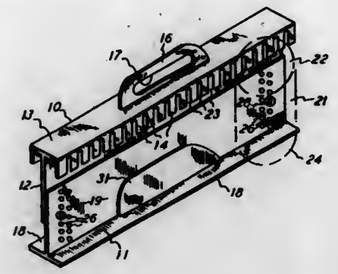
**5,501,498**
**METHODS AND APPARATUS FOR MECHANICALLY INTELLIGENT GRASPING**
Nathan T. Ulrich, Philadelphia, Pa., assignor to The Trustees of the University of Pennsylvania, Philadelphia, Pa.
Continuation of Ser. No. 63,125, May 13, 1993, abandoned, which is a continuation of Ser. No. 798,015, Nov. 20, 1991, abandoned, which is a continuation of Ser. No. 596,572, Oct. 11, 1990, abandoned, which is a continuation of Ser. No. 520,714, May 8, 1990, abandoned, which is a division of Ser. No. 239,187, Aug. 31, 1988, Pat. No. 4,957,320. This application Jun. 7, 1994, Ser. No. 255,123
Int. Cl.[6] B25J 15/10
U.S. Cl. 294—106 17 Claims



1. Apparatus for grasping an object, comprising:
(a) a palmar surface comprising a grasping surface and a perimeter;
(b) a first articulated member comprising a grasping surface, the member attached to said palmar surface by a grip drive having an axis of rotation, wherein the grasping surface of the member is displaced from the axis of rotation and the axis of rotation is attached to the palmar surface at a point inward from the perimeter of the palmar surface, and wherein the articulated member further comprises at least a first and a second rotatable joint, wherein both of the rotatable joints are disposed above the grasping surface of the palmar surface at all times, and the axis of rotation of the first articulated member is fixed at a first position and placed to allow a range of motion of at least 90°, and wherein said articulated member is moveable relative to the perimeter;
(c) means for actuating said articulated member in coordination with said palmar surface by rotating the first and second rotatable joints and by moving the grip drive about the axis of rotation; and
(d) a non-rotatable stationary member affixed to the palmar surface, and comprising a grasping surface,
whereby the articulated member and the stationary member can selectively cooperate to grasp an object between them and can selectively be positioned so that a respective grasping surface of each of them is coplanar and can be used to execute a grasp.



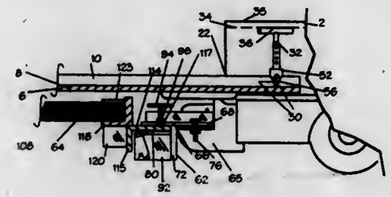
**5,501,499**
**TOPLESS CONTAINER CARRIER**
Frank L. Zitka, 3600 Buckley Rd., Racine, Wis. 53404
Filed Jun. 20, 1994, Ser. No. 262,676
Int. Cl.[6] B65D 71/00
U.S. Cl. 294—159 18 Claims




1. A topless container carrier comprising two elongated pieces forming a T-shape and with each having an upright stem and an elongated portion disposed transverse to said stem, said stems having openings therein disposed to align with selected ones of each other when said stems are in adjacent and overlapping positions relative to each other, releasable fasteners disposed in selected ones of said openings for releasably receiving said pieces together to have said portions spaced apart at selected distances, fingers attached to one of said portions and pointed toward the other of said portions and being arranged to extend into an open top of a container positioned between said portions, whereby said other of said portions upwardly supports the container and said fingers hold the open top end of the container.

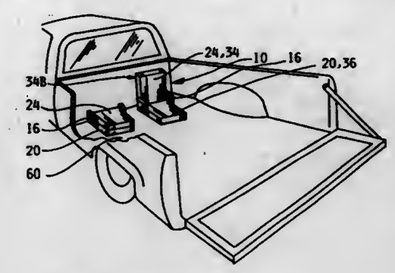
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**5,501,500**
**TRUCK BED EXTENSION APPARATUS**
Paul W. Cannon, 505 Daniel La., Brandon, Miss. 39042
Filed Nov. 18, 1994, Ser. No. 342,252
Int. Cl.[6] B60R 9/06
U.S. Cl. 296—26 15 Claims




1. An extension for a pick up truck bed comprising:
an elongate plate sized to fit from within a pick up truck bed to a position beyond the rear of the pick up truck;
a first and a second extensible telescoping brace, each extending from a forward side position on said plate up to an overhanging truck bed lip on the pick up truck, including means for extending said braces to hold said plate forward end down against said pick up truck bed;
a tongue receiving box affixed to a rear bumper of said truck;
a undercarriage affixed at a rear end to said plate, having a forward extending tongue, said tongue received and held within said box; and
means for affixing said tongue into said box.

**5,501,501**
**TRUCK-BED DETACHABLE SEAT ASSEMBLY**
Robert M. White, P.O. Box 337, Arroyo Grande, Calif. 93421, and Jeffrey P. Zee, 3965 Sourdough Rd., Acton, Calif. 93510
Filed Apr. 4, 1994, Ser. No. 222,014
Int. Cl.[6] B60N 2/24
U.S. Cl. 296—64 20 Claims




1. A seat assembly that detachably attaches to a truck bed, said seat assembly comprising:
a) a first and second side plate, with each plate having an upper edge, a lower edge, a front edge and a back edge, said side plate further having normal to its side:
(1) at least two seat attachment bores therethrough, located near the lower edge,
(2) a backrest hinge pin bore therethrough, located near the back edge,
(3) a backrest locking bore therethrough, located near the corner of the upper edge and the back edge,
(4) at least two seat-belt attachment bores therethrough, located near the upper edge of said second side plate, and,
(5) a seat-belt receptor bore therethrough, located near the upper edge of said first side plate and centrally aligned between said at least two seat belt attachment bores,
b) a seat having a lower surface, an upper surface, a first side surface and a second side surface, with the first and second side surfaces each having at least two side-plate attachment bores therethrough in alignment with the respective at least two seat attachment bores on said first and second side plates, where through the attachment bores is inserted an attachment means that secures said first and second side plates to said seat,
c) means for attaching said seat to the truck bed,
d) a backrest comprising:
(1) an upper frame member having a first end and a second end,
(2) a first vertical member extending downward from the first end of the upper frame member and having near its bottom edge, normal to the first vertical member, a hinge pin bore therethrough and having above the hinge pin bore, also normal to the first vertical member, a locking bore therethrough,
(3) a second vertical member extending downward from the second end of the upper frame member and having near its bottom edge, normal to the second vertical member, a hinge pin bore therethrough and having above the hinge pin bore, also normal to the second vertical member, a locking bore therethrough,
e) a pivot pin inserted through each of the hinge pin bores on said backrest and through the backrest hinge pin bores on said side plates, where said pivot pins have means for being retained therein and allow, said backrest to be lowered against the upper surface of said seat,
f) a locking pin inserted through each of the locking bores on said backrest and through the backrest locking bores on said first and second side plate, where when said locking pins are inserted, said backrest is secured in its upright, normal sitting position and when said locking pins are not inserted, said backrest pivots downward about said pivot pin to allow said

backrest to be lowered against the upper surface of said seat when said assembly is not being occupied,

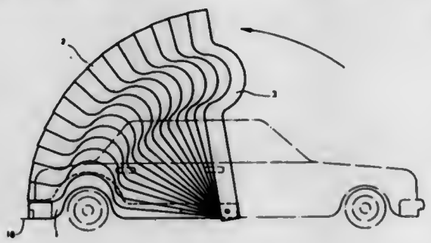
g) a seat belt assembly comprising:

(1) a seat belt buckle receptor that includes a bottom section having a bore therethrough that is in alignment with said seat-belt receptor bore on said first side plate, where through said bores is inserted and retained a receptor pin to swivelly attach said receptor to said first side plate, and

2) a seat belt having an attachment section on one end and a buckle-insert on the other end, with the attachment section attached to and near the upper edge of said second side plate by a pair of bolt and nut combinations, where when said buckle insert is lockably inserted into said seat-belt receptor, a person sitting on said assembly is safely restrained thereto.

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**5,501,502**
**FOLDABLE VEHICLE COVER**
**Sheng-Feng Wang, 58, Ma Yuan West St., Taichung, Taiwan**
**Filed Jan. 3, 1995, Ser. No. 390,302**
**Int. Cl.[6] B60J *11/00***
**U.S. Cl. 296—136** **3 Claims**



1. A foldable vehicle cover comprising:

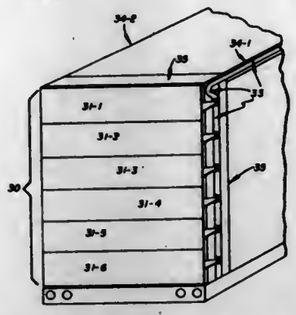
a frame securing a vehicle, said frame including a substantially U-shaped configuration having two free ends and an upper portion which has a first engaging means provided thereon;

a plurality of substantially U-shaped panels including two free ends pivotally coupled to said free ends of said frame, said panels including an innermost panel located beside said frame and including an outermost panel, each of said panels including a lower portion having a second engaging means provided thereon, said second engaging means of said innermost panel being engaged with said first engaging means for limiting rotational movement of said innermost panel, each of said panels including an upper portion having a third engaging means for engaging with said second engaging means to limit rotational movement of said panels;

a cap engaged beside said outermost panel and including two free ends pivotally coupled to said free ends of said panels, said cap including a lower portion having a fourth engaging means for engaging with said third engaging means of said outermost panel and for rotating said panels to form a nested group of arch shaped configuration for covering and for protecting said vehicle; and

each of said frame, said panels and said cap comprising two legs including a middle portion having an arched portion formed thereon for aligning with wheels of said vehicle.

**5,501,503**
**VEHICULAR DOOR**
**Henry Thayer, 1 Mass Ave., Worcester, Mass. 01609**
**Filed Mar. 24, 1994, Ser. No. 216,947**
**Int. Cl.[6] B60J *5/12***
**U.S. Cl. 296—146.8** **17 Claims**



1. An exterior door for providing access to the interior of a vehicle comprising a roll door and means for mounting said roll door on the outside of said vehicle;

wherein said door tracks have open sides which face outwardly and are mounted inwardly from the rear edge of said vehicle along said header, and before reaching the top corner of the vehicle, said tracks curve towards outer edges, and then curve back to form said top rails substantially flush with the roof of said vehicle;

thereby to allow said door to seal said vehicle when in a down closed-position, while allowing said door to clear the corner of said vehicle during opening, and then allowing the opened door to sit above the roof when in the up, fully-open position.

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**5,501,504**
**MOTOR HOME CONSTRUCTION**
**James R. Kunz, Riverside, Calif., assignor to Fleetwood Enterprises Inc., Riverside, Calif.**
**Filed Jul. 1, 1994, Ser. No. 270,141**
**Int. Cl.[6] B60P *3/32***
**U.S. Cl. 296—164** **23 Claims**



1. In a motor home including a chassis frame, the chassis frame having front and rear ends, sides extending between the ends and including a pair of spaced longitudinal chassis frame rails, extending generally between the ends and supported by a rear axle with wheels, the structural improvement comprising:

a pair of longitudinally-extending beam members forming a set of longitudinal platform rail members, the longitudinal platform rail members positioned substantially above and generally parallel to and rigidly interconnected with the chassis frame rails and extending from substantially in advance of the axle to the end of the chassis frame rails;

a plurality of transversely-extending cross-beam members, the cross-beam members connected to each of the longitudinal platform rail members and lying above the chassis frame rails;

a plurality of lower outrigger supports cantilevered and secured to the chassis frame rails and extending generally parallel to one another from the chassis frame rails;

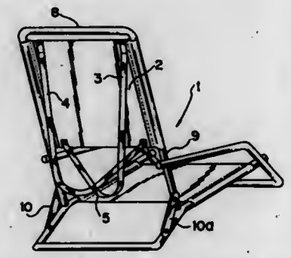


a plurality of upper outrigger supports cantilevered and secured to at least one of the longitudinal platform rail members and extending from the rail member generally parallel to the other upper outrigger supports, the upper outrigger supports being secured such that an upper surface of each upper outrigger support is substantially coplanar with an upper surface of the adjacent longitudinal platform rail; and

at least one storage bin positioned between adjacent extending outrigger supports, the bin being generally box-shaped and having at least one open side, the bin being secured to the adjacent outrigger supports to form a storage compartment.

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**5,501,505**
**SHOULDER STRAPS FOR BEACH CHAIR**
**David Jablonski, 14A Birchview Dr., Piscataway, N.J. 08854**
**Filed Sep. 7, 1994, Ser. No. 301,597**
**Int. Cl.[6] A47C *1/00***
**U.S. Cl. 297—4** **5 Claims**



1. Straps for attachment to a chair to enable a person to carry said chair on their shoulders in combination with a chair,

said chair having a frame, a backrest attached to said frame, said backrest having at least a top portion and a bottom portion, a seat area attached to said frame allowing a person to sit on said chair, and legs also attached to said frame allowing said chair to be supported on a surface,

said straps comprising, at least a pair of straps,

each of said straps having a first end attached adjacent to said top portion of said backrest, and a second end attached adjacent to said bottom portion of said backrest,

one of said straps crossing said other strap at a point between said first end and said second end, so that the length of said straps on one side of said crossing point is shorter than the length of said straps on the other side of said crossing point,

said length of said straps on one side of said crossing point that is shorter being closer to said legs than to said top portion of said backrest,

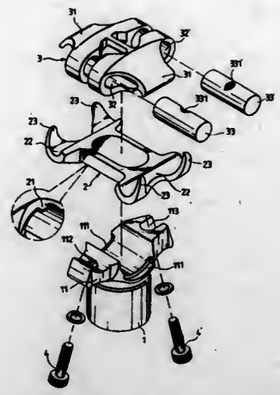
said straps are joined together at said crossing point and said crossing point being closer to said legs than to said top portion of said backrest.

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**5,501,506**
**BICYCLE SADDLE ADJUSTMENT STRUCTURE**
**Yu-Ju Kao, 2, Alley 1, Lane 29, Sec. 2, Pei-Shin Rd., Shin-Tien City, Taipei Hsien, Taiwan**
**Filed May 9, 1994, Ser. No. 239,976**
**Claims priority, application Taiwan, May 11, 1993, 82216181**
**Int. Cl.[6] B62J *1/00***
**U.S. Cl. 297—215.15** **1 Claim**

1. A bicycle saddle adjustment structure comprising:

a) a seat post including a top portion, a base on the top portion, the base including a central curved slot having a pair of opposed sides, a curved recess extending outwardly from each side, a front protruding side provided with a hole therethrough, and a rear protruding side provided with an open slot therein;



b) an H-shaped lower clamp having a central curved bottom engagable with the curved slot of the base, a pair of opposed sides, an upwardly curved slotted flange on each side, and a pair of inwardly directed opposed keys at the curved bottom for engagement with the curved recesses of the base;

c) an H-shaped upper clamp including a central curved top surface, a pair of opposed sides, a downwardly curved slotted flange at each side, a front portion including an open slot and an axle hole, a rear portion including an open slot and an axle hole, a pair of axles receivable within the axle holes, and each axle having a threaded bole formed therein; and

d) a pair of threaded bolts engageable through the hole and open slot of the base and threadedly engageable with the threaded holes of the axles for securing the upper and lower clamps to the base and the rails of a saddle between the upwardly curved slotted flanges of the lower clamp and the downwardly curved slotted flanges of the upper clamp.

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**5,501,507**
**SEAT WITH SPRING-LOADED LUMBAR SUPPORT**
**Karl Hummitzsch, 27-225 Benjamin Rd., Waterloo, Ontario, Canada**
**Filed Sep. 12, 1994, Ser. No. 305,945**
**Int. Cl.[6] A47C *7/14***
**U.S. Cl. 297—284.4** **4 Claims**



1. A chair comprising:

a base;

a seat assembly supported above the base;

an upper seat back secured to at least one of said base and said seat assembly, said seat back being generally fixed in position relative to the seat assembly at any given point in time, and which is positioned so as to contact the upper back area of a person when sitting in the chair;

a lumbar support secured to at least one of said base and said seat assembly independently of said upper seat back, said lumbar support being positioned so as to contact the lumbar area of a person when sitting in the chair; and

biasing means for continuously urging said lumbar support forwardly from a position of general alignment with said upper seat back such that said lumbar support is automatically maintained against and in general alignment with the lumbar area of the person when the person leans forward in the chair.

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**5,501,508**

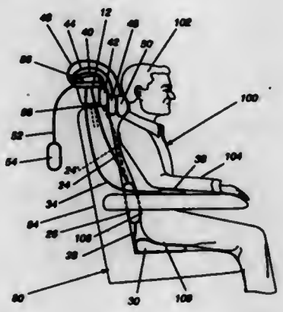
**DEVICE FOR SUPPORTING THE USER OF A CHAIR**

**Anthony S. Llewellyn, 19355 Wells Rd., Athens, Ala. 35611**

**Filed Aug. 26, 1994, Ser. No. 296,502**

**Int. Cl.[6] A47C 7/36**

**U.S. Cl. 297—397** **5 Claims**



1. A device for use in connection with a seat having a base, a back, and a headrest, said device comprising:

a. an attachment member having means for releasible attaching said device to said headrest;

b. a first upper support member attached to said attachment member by a first elongated strap extending between said attachment member and said first upper support member;

c. at least one additional upper support member attached to said attachment member by at least one additional strap, at least one strap for each additional upper support member, with each succeeding additional strap being longer than the preceding strap said at least one additional strap and respective additional support member being separate from and unattached to any other preceding support member; and

d. a lumbar support member attached to said first attachment member by a lumbar strap said lumber support member adapted to extend to a lumber point on said back.

**5,501,509**

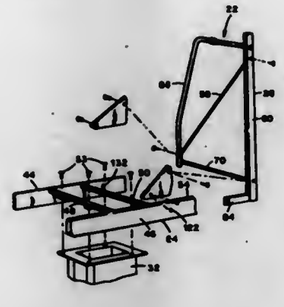
**FRAME ASSEMBLY FOR A VEHICLE SEAT**

**Alvaro E. Urrutia, Knoxville, Tenn., assignor to National Seating Company, Vonore, Tenn.**

**Filed Apr. 29, 1994, Ser. No. 235,429**

**Int. Cl.[6] A47C 7/20**

**U.S. Cl. 297—452.18** **20 Claims**



1. A frame assembly for a vehicle seat having a front, a back a lower back corner and two opposite sides including one side of the seat and the other side of the seat, the assembly comprising:

a seat-supporting section including two elongated side members including one side member and the other side member and arranged so as to extend between the front and the back of the seat and so that each side member is provided with a back end, the one side member being disposed adjacent the one side of the seat and the other side member being disposed adjacent the other side of the seat and each of the two side members having a longitudinal axis;

a back-supporting section including an elongated beam having a longitudinal axis wherein the elongated beam is disposed adjacent the back and the one side of the seat so that the longitudinal axis of the one side member and the longitudinal axis of the beam are coplanar, the beam being arranged in an angular relationship with the one elongated side member so as to extend generally upwardly therefrom and so that the beam is provided with an upper end portion, a lower end and a lower end portion, the back-supporting section also including bracing means which extend between the upper end portion and a predetermined location disposed adjacent the back and the other side of the seat; and

gusset means for joining the lower end portion of the beam to the one elongated side member and for joining the bracing means to the other elongated side member wherein the gusset means includes a first corner-strengthening gusset disposed adjacent the one side of the seat for spanning the lower back corner thereof and is attached to the lower end portion of the beam at a first location therealong which is spaced from the lower end thereof and to the one side member at a second location therealong which is spaced from the back end thereof so that the first gusset maintains a preselected and nonadjustable spacing between the first and second locations, and the gusset means further includes a second corner-strengthening gusset disposed adjacent the other side of the seat for spanning the lower back corner thereof and is attached to the bracing means at the predetermined location and to the other side member at another location therealong which is spaced from the back end thereof so that the second gusset maintains a preselected and nonadjustable spacing between the predetermined location and the another location.



**5,501,510**

**STRUCTURE FOR CONNECTING FLEXIBLE ANNULAR MOLDING TO WHEEL CAP BODY**

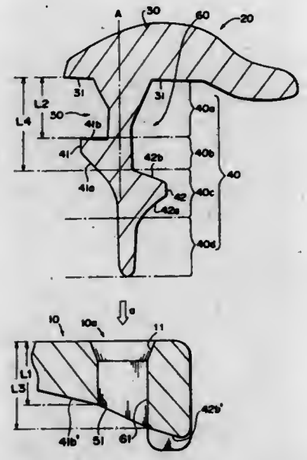
**Takashi Ichikawa, and Isao Sumi, both of Aichi, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan**

**Filed Jun. 6, 1995, Ser. No. 467,293**

**Claims priority, application Japan, Jul. 28, 1994, 6-176536**

**Int. Cl.[6] B60B 7/04**

**U.S. Cl. 301—37.23** **10 Claims**



1. A wheel cap for an automobile comprising:

a wheel cap body which is formed approximately in a disk shape and which has a periphery thereof in which a plurality of through-holes are made with adjacent through-holes separating from each other with a predetermined space, and

a flexible annular molding which is fitted around the periphery of the wheel cap body and which has a molding body and a plurality of engaging legs, corresponding to the through-holes, which extend from the molding body in a projecting direction in which each of the engaging leg is inserted into the through-hole of the wheel cap body,

each engaging leg of the flexible annular molding having a proximal part, a first engaging part, a second engaging part, and a distal part, which are fixed one after another in this order from a side of the molding body, wherein the proximal part, which has an outer diameter generally equal to an inner diameter of the through-hole of the wheel cap body, engages the through-hole of the wheel cap body, wherein the first and second engaging parts have an outer diameter larger than the inner diameter of the through-hole, respectively, wherein the distal part has an outer diameter generally equal to or smaller than the inner diameter of the through-hole,

the first engaging part having a first projecting part while the second engaging part having a second projecting part, wherein each of the first and second projecting parts extends in a direction perpendicular to the projecting direction of the engaging leg and extends in a direction different from each other with respect to the projecting direction, so that the first projecting part is provided at a location different from a location in which the second projecting part is provided with respect to a distance from the molding body, so that the flexible annular molding has a first concave part between the molding body and the first projecting part while the flexible annular molding has a second concave part between the molding body and the second projecting part,

a length in the projecting direction of the through-hole which corresponds to the first concave part corresponding to a length in the projecting direction of the first concave part while a length in the projecting direction of the through-hole which corresponds to the second concave part corresponding to a length in the projecting direction of the second concave part.

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**5,501,511**

**TWO WHEELED VEHICLE WITH A PRESSURE ACTUATED COUPLER BETWEEN EACH ACTUATOR AND WHEEL BRAKE**

**Arnold Wagner, Winterthur, Switzerland, assignor to Peraves Ltd., Winterthur, Switzerland**

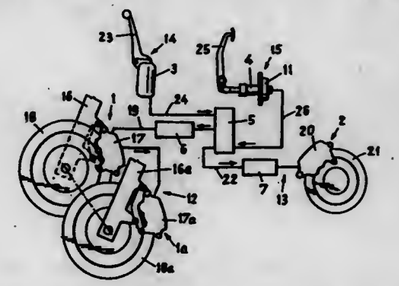
**PCT No. PCT/CH93/00261, § 371 Date Jul. 25, 1994, § 102(e) Date Jul. 25, 1994, PCT Pub. No. WO94/12374, PCT Pub. Date Jun. 9, 1994**

**PCT Filed Nov. 16, 1993, Ser. No. 256,815**

**Claims priority, application Switzerland, Nov. 28, 1992, 03655/92**

**Int. Cl.[6] B60T 7/02; B62L 3/00**

**U.S. Cl. 303—9.64** **10 Claims**



1. A fluid interlinked brake device for a single-track vehicle having first and second brake systems, one associated with a front wheel and one associated with a rear wheel of the vehicle, each brake system comprising at least one brake unit and an independent actuator operatively coupled with the brake unit, a coupler operatively connecting the first and second brake systems and including first and second pressure medium ducts which are fluidly isolated from one another and which are each adapted to be fluidly connected to the actuator of the respective brake systems, and a movable connecting part actuatable by pressurized medium in the ducts for coupling the first and second brake systems to permit actuation of the corresponding brake units by one of the actuators in response to a movement of the connecting part induced by the pressurized medium in one of the ducts.

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**5,501,512**

**SYSTEM AND METHOD FOR AUTOMATICALLY CALIBRATING TRANSDUCERS IN ELECTRO-PNEUMATIC FREIGHT BRAKE CONTROL SYSTEMS**

**James E. Hart, Trafford, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.**

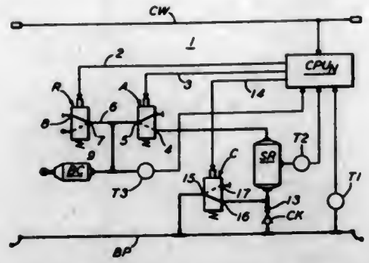
**Filed Jun. 27, 1995, Ser. No. 495,278**

**Int. Cl.[6] B60T 13/68**

**U.S. Cl. 303—15** **26 Claims**

1. A system for calibrating pressure transducers in an electro-pneumatic brake control system for a train of railroad cars having pneumatic and electric communication means between the train locomotive and respective cars, each car having in addition to said pneumatic communication means, a supply reservoir connected to said pneumatic communication means and a brake cylinder device connected to said supply reservoir, said calibration system comprising:

a. pressure transducer means for providing a feedback signal according to the pressure of at least one of said pneumatic communication means, said supply reservoir and said brake cylinder device at each said car;




b. means for calculating a mathematical best fit curve that closely approximates the actual natural gradient of train pressure for said at least one of said pneumatic communication means, said supply reservoir and said brake cylinder device in accordance with corresponding ones of said transducer feedback signals being connected to said microprocessor means;

c. means for deriving from said best fit curve a theoretical reference pressure value for each said car depending on its location in said train; and

d. means for determining a difference between said theoretical reference value and said transducer feedback signal corresponding thereto for each said car to use as a transducer error correction factor.

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**5,501,513**

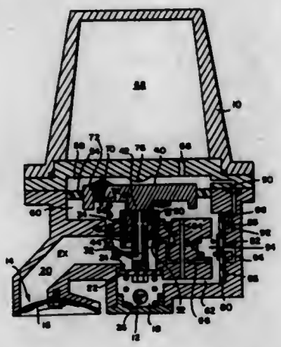
**EMERGENCY VENT VALVE**

**Robert Gayfer, Watertown, N.Y., assignor to New York Air Brake Corporation, Watertown, N.Y.**

**Filed Nov. 15, 1994, Ser. No. 340,856**

**Int. Cl.[6] B60T *15/18***

**U.S. Cl. 303—73** **13 Claims**



1. An emergency vent valve for a vehicle air brake system in which brakes are applied and released in response to decreases and increases in pressure in a brake pipe, said emergency vent valve comprising:

control volume;

piston means subject to control volume pressure on one side and brake pipe pressure on an opposite side;

exhaust valve means responsive to a differential pressure between brake pipe and control volume for connecting said control volume to atmosphere when said control volume pressure exceeds brake pipe pressure by a given amount;

first choke means for releasing fluid from said control volume at a first rate when said exhaust valve means is open;

vent valve means for connecting said brake pipe to atmosphere when opened by said piston means when brake pipe pressure reduction exceeds said first rate; and

second choke means for limiting the releasing fluid from said control volume to atmosphere at a second rate less than said first rate when said vent valve means and said exhaust valve means are both open.

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**5,501,514**

**HYDRAULIC BRAKE DEVICE HAVING AN ANTI-SKID SYSTEM**

**Reinhard Resch, Stuttgart; Anton van Zanten, Ditzingen-Schlickingen; Rainer Lauer, deceased, late of Münchingen; Regina Schroff-Lauer, heir; Joscha Lauer, heir, both of Weissach; Rainer Altmann, Erligheim; Jürgen Binder, Schwieberdingen, and Michael-Raymond Meyer, Ludwigsburg, all of, Germany, assignors to Robert Bosch GmbH, Germany, and Mercedes Benz AG, both of Stuttgart**

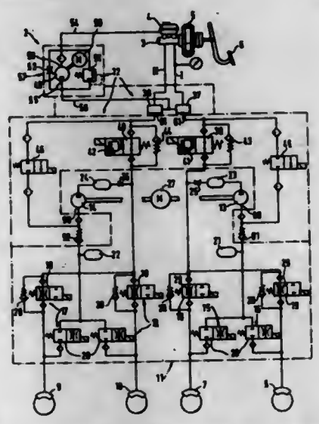
**PCT No. PCT/DE93/00882, § 371 Date Aug. 19, 1994, § 102(e) Date Aug. 19, 1994, PCT Pub. No. WO94/07720, PCT Pub. Date Apr. 14, 1994**

**PCT Filed Sep. 4, 1993, Ser. No. 244,495**

**Claims priority, application Germany, Sep. 26, 1992, 42 32 311.8**

**Int. Cl.[6] B60T *8/48;8/24;7/12***

**U.S. Cl. 303—115.4** **20 Claims**



1. A vehicle hydraulic brake system having a two-brake circuit main brake cylinder, comprising a reservoir for the main brake cylinder, two brake circuits for wheel brakes of a motor vehicle, associated with the wheel brakes, an anti-lock protection device which has brake pressure modulation valve arrangements and, per brake circuit, a feed-back pump and an additional device for automatic braking in association with the anti-lock protection device, this additional device having, between a combination of the main brake cylinder and the reservoir, on the one hand, and the anti-lock protection device for this combination, on the other, a cylinder in each brake circuit connected to the anti-lock protection device, each said cylinder including a separating piston, which separates a secondary space from a primary space, a 2/2-way valve, and a separating piston return spring, and a common auxiliary pump with valve means for both brake circuits, the common auxiliary pump supplying pressure into the primary space in automatic braking operation to displace the separating piston and to close said 2/2-way valve of each brake circuit, and having a control unit for controlling the anti-lock protection device in order to avoid a danger of wheel lock and to control the additional device for automatic braking and to improve the driving behavior of the vehicle and for drive-slip control at drivable wheels, the auxiliary pump (49) supplies a pressure to said primary space of said cylinder which is substantially below a full braking pressure which is generated by means of the main brake cylinder (3), the secondary space (69, 105) is connected to an inlet (89, 90) of the feed-back pump (13, 14) by means of an electrically controllable 2/2-way valve (45, 46) of said anti-lock protection device, and in that a combination of a switch-over valve (39, 40) and a pressure limiting valve (41, 42) open towards the secondary space, (69, 105) is arranged between an outlet of said feed-back pump (13, 14) and the secondary space (69, 105).



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**5,501,515**

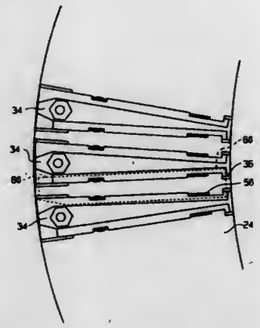
**DATA CARTRIDGE CAROUSEL**

**Warren L. Dalziel, Monte Sereno, Calif., assignor to Storage Technology Corporation, Louisville, Colo.**

**Continuation of Ser. No. 984,294, Nov. 30, 1992, abandoned. This application Jul. 19, 1994, Ser. No. 277,533**

**Int. Cl.[6] A47B *81/06*; G11B *15/68*; B65G *1/00***

**U.S. Cl. 312—9.31** **9 Claims**



1. A carousel for use in an automated library system, adapted to carry a plurality of data cartridges, each data cartridge having preformed depressions on two opposite faces, comprising:

a top member having a substantially circular periphery;

a lower member having a substantially circular peripbery;

spacing means, for holding the lower member at a fixed distance from the upper member and with the centers of the top member and of the lower member on a common central axis;

a plurality of cartridge guides affixed to the top member;

a plurality of cartridge guides affixed to the lower member, adjacent pairs of the cartridge guides on the lower member being disposed to retain between each pair one of the data cartridges in a radial orientation with respect to the central axis; and

a plurality of spring means, attached to selected ones of the cartridge guides, for engaging depressions on the data cartridges faces to provide a retaining force against inadvertent displacement of a cartridge from the carousel, each spring means including a wire spring, attached to one of the cartridge guides and preloaded to exert a force in a direction parallel to the central axis.

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**5,501,516**

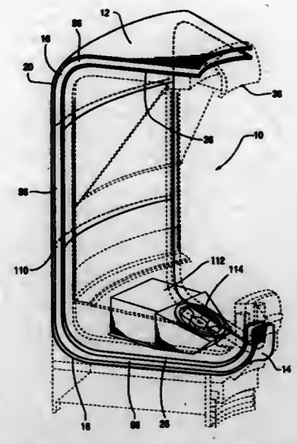
**UNIVERSAL MODULAR APPARATUS FOR SELECTIVELY FORMING CURVED CONCAVE AND CONVEX SECTIONS OF A REFRIGERATED DISPLAY CASE**

**Joseph A. Federico, Langhorne, Pa., assignor to Delaware Capital Formation Inc., Wilmington, Del.**

**Filed Nov. 17, 1994, Ser. No. 340,933**

**Int. Cl.[6] A47F *3/04***

**U.S. Cl. 312—116** **26 Claims**



1. A universal modular apparatus for selectively forming curved sections of a refrigerated display case with an upper canopy section and a lower tank section having a thermally insulated concave housing including an outer concave tank liner, an outer concave canopy liner, an inner concave tank liner and an inner concave canopy liner and a thermally insulated convex housing including an outer convex tank liner, an outer convex canopy liner, an inner convex tank liner and an inner convex canopy liner each formed from an inner modular liner member or outer modular liner member usable to form both concave and convex curved sections within the tank and canopy thereof, said apparatus comprising:

A. a plurality of outer modular members each being capable of selectively forming an outer concave tank liner, an outer concave canopy liner, an outer convex tank liner and an outer convex canopy liner for a thermally insulated housing for a curved refrigerated display case, each said outer modular member comprising:

(1) an outer horizontal panel being generally planar and arc shaped and including:

(a) a first outer longitudinal end;

(b) a second outer longitudinal end being spatially disposed from said first outer longitudinal edge and oriented approximately perpendicularly with respect thereto;

(c) an outer narrow arcuate end extending between said first outer longitudinal end and said second outer longitudinal end; and

(d) an outer wide arcuate end extending between said first outer longitudinal end and said second outer longitudinal end, said outer wide arcuate end being longer than said outer narrow arcuate end;

(2) an outer narrow vertical panel extending upwardly from said outer narrow arcuate end generally perpendicularly with respect to said outer horizontal panel;

(3) an outer narrow corner member extending between said outer narrow arcuate end and said outer narrow vertical panel, said outer narrow corner member being arcuate and extending through an angle of approximately ninety degrees;

(4) an outer wide vertical panel extending upwardly from said outer wide arcuate end generally perpendicularly with respect to said outer horizontal panel;

(5) an outer wide corner member extending between said outer wide arcuate end and said outer wide vertical panel, said outer wide corner member being arcuate and extending through an angle of approximately ninety degrees;

B. a plurality of inner modular members each being capable of selectively forming an inner concave tank liner, an inner concave canopy liner, an inner convex tank liner and an inner convex canopy liner for a thermally insulated housing for a curved refrigerated display case, each said inner modular member comprising:

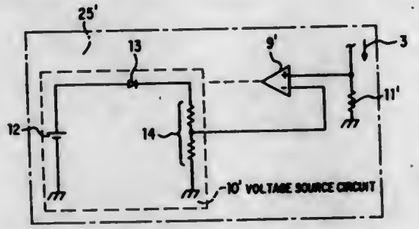
(1) an inner horizontal panel being generally planar and arc-shaped and including:

(a) a first inner longitudinal end;

(b) a second inner longitudinal end being spatially disposed from said first inner longitudinal edge and oriented approximately perpendicularly with respect thereto;
(c) an inner narrow arcuate end extending between said first inner longitudinal end and said second inner longitudinal end; and
(d) an inner wide arcuate end extending between said first inner longitudinal edge and said inner second horizontal straight edge, said inner wide arcuate end being longer than said inner narrow arcuate end;
(2) an inner narrow vertical panel extending upwardly from said inner narrow arcuate end generally perpendicularly with respect to said inner horizontal panel;
(3) an inner narrow corner member extending between said inner narrow arcuate end and said inner narrow vertical panel, said inner narrow corner member being arcuate and extending through an angle of approximately ninety degrees, said inner narrow corner member having a radius of curvature less than that of said outer narrow corner member;
(4) an inner wide vertical panel extending upwardly from said inner wide arcuate end generally perpendicularly with respect to said inner horizontal panel; and
(5) an inner wide corner member extending between said inner wide arcuate end and said inner wide vertical panel, said inner wide corner member being arcuate and extending through an angle of approximately ninety degrees, said inner wide corner member having a radius of curvature less than that of said outer narrow corner member.

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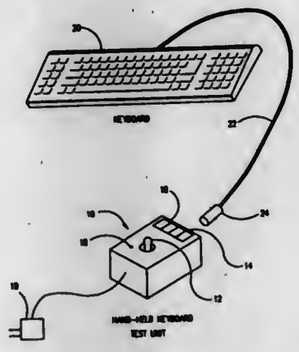
**5,501,517**
**CURRENT DETECTING DEVICE WITH TEMPERATURE COMPENSATING DEVICE**
**Shin Kiuchi, Matsumoto, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan**
**Filed Dec. 16, 1993, Ser. No. 166,995**
**Claims priority, application Japan, Dec. 17, 1992, 4-336464**
**Int. Cl.[6] H02H 3/08**
**U.S. Cl. 361—101** **8 Claims**




1. A device for detecting a current flowing through a circuit, comprising:
current detecting means connected to the circuit and providing a detection voltage corresponding to the current flowing through the circuit;
comparison means connected to the current detecting means for receiving the detection voltage; and
voltage source means connected to the comparison means for providing to the comparison means a reference voltage changeable corresponding to temperature so that the comparison means compares the reference voltage with the detection voltage, said voltage source means including a reference voltage source for generating a constant voltage, voltage control means and voltage dividing means with a dividing point, which are connected together in series, output voltage of said voltage source means being extracted at the dividing point in the voltage dividing means, temperature dependency rate of the voltage control means being inversely proportional to temperature dependency rate of said current detecting means to thereby prevent change of a predetermined overcurrent value due to temperature change.

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**5,501,518**
**HAND-HELD KEYBOARD TESTER**
**James S. Woodward, Austin, Tex., assignor to Dell USA, L.P., Austin, Tex.**
**Filed Jan. 31, 1994, Ser. No. 189,225**
**Int. Cl.[6] G06F 11/22**
**U.S. Cl. 364—551.01** **13 Claims**




1. A hand-held keyboard testing unit, comprising:
an enclosure;
a keyboard connector jack attached to said enclosure, said jack arranged to receive a keyboard connector on a cable extending from the keyboard;
a controller within said enclosure, said controller being programmed solely to test the functional capability of the keyboard; and
wherein said enclosure has a volume of no more than sixty cubic inches and a weight of no more than one pound to permit the keyboard testing unit to be hand-held.

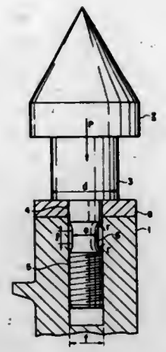
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**5,501,519**
**SCREW HEAD FOR INJECTION MOLDING MACHINE**
**Mikiyoshi Miyauchi, Susono, and Hiroyuki Kakishima, Shizuoka, both of, Japan, assignors to Toshiba Machine Co., Ltd., Tokyo, Japan**
**Filed Feb. 24, 1995, Ser. No. 394,301**
**Claims priority, application Japan, Feb. 24, 1994, 6-026528**
**Int. Cl.[6] B29C 45/17**
**U.S. Cl. 366—78** **3 Claims**

1. A screw head for a screw of an injection molding machine, mounted to a distal end portion of the screw, said screw head comprising:
a tip portion at a first end of the screw head;
a trunk portion extending axially away from the tip portion;
a screw portion at a second end of said screw head opposite said tip portion, said screw portion having a nominal diameter f; and
an undercut portion formed between said trunk portion and said screw portion, said undercut portion having a shaft portion of diameter e and curved portions, each having a radius of curvature r at opposite ends of the shaft portion, wherein a relationship between the shaft diameter e of said undercut portion and the nominal diameter f of said screw portion is defined as:

$0.74f \leq e$



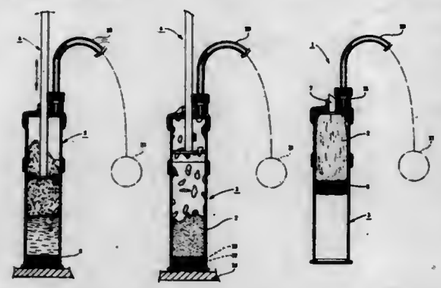


and, a relationship between the nominal diameter f of said screw portion and the radius of curvature r of said undercut portion is defined as:

$0.5f \leq r$.

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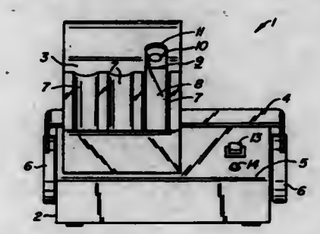
**5,501,520**
**DEVICE FOR PRODUCING REDUCED POROSITY BONE CEMENT**
**Lars Å A. Lidgren, and Lars G. Dahl, both of Lund, Sweden, assignors to MIT AB, Sjobo, Sweden**
**Division of Ser. No. 13,074, Feb. 3, 1993, Pat. No. 5,328,262.**
**This application Apr. 26, 1994, Ser. No. 233,697**
**Claims priority, application Sweden, Feb. 7, 1992, 9200360-7**
**Int. Cl.[6] B01F 13/06**
**U.S. Cl. 366—139** **9 Claims**



1. A mixing device for producing reduced porosity bone cement, comprising:
a mixing cylinder (3) having a mixing space, the mixing space having wall surfaces to which clumps of bone cement adhere during mixing of components of the bone cement;
means (4) for mixing the components in the mixing space,
a front member (5) provided at a front end of the mixing cylinder, the front member (5) having a discharge opening (13) for discharging bone cement from the mixing space,
a movable piston (6) fixably mounted at a rear end of the mixing cylinder, the movable piston being releasable from the rear end of the mixing cylinder and movable in the mixing space toward the discharge opening (13) for collecting the clumps of bone cement adjacent the discharge opening, and for discharging bone cement (2) through the discharge opening (13); and
a vacuum source (21) connected to the mixing device, generating a vacuum in the mixing space during mixing of the components;
wherein, when the movable piston (6) is released from the rear end of the mixing cylinder and moved in the mixing space for collecting the clumps of bone cement adjacent to the discharge opening (13) such that the vacuum generated in the mixing space by the vacuum source generates a vacuum in pores formed in the bone cement (2) during the collecting of the clumps of bone cement, whereby the size of the pores is reduced when the bone cement (2), after collecting, is exposed to atmospheric pressure; and
wherein the vacuum source (21) is connected to the front member (5).

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**5,501,521**
**MIXING APPARATUS FOR TEST TUBES**
**Hilda B. Hjalmarson, Beckasjudarvägen 31, III, Nacka 131 36, Sweden**
**PCT No. PCT/SE92/00646, § 371 Date Mar. 17, 1994, § 102(e) Date Mar. 17, 1994, PCT Pub. No. WO93/05874, PCT Pub. Date Apr. 1, 1992**
**PCT Filed Sep. 18, 1992, Ser. No. 211,248**
**Claims priority, application Sweden, Sep. 20, 1991, 9102736**
**Int. Cl.[6] B01F 9/00**
**U.S. Cl. 366—208** **5 Claims**

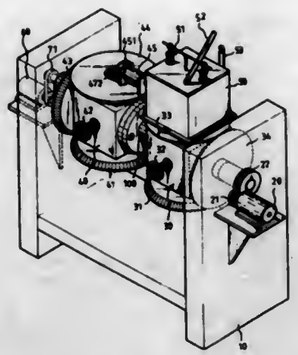


1. A mixing device for test tubes, comprising a base with an intermittent rocking drive unit arranged therein and a mixing tray, for receiving test tubes, movably mounted to said base, said intermittent rocking drive unit comprising intermittent drive control circuitry, a motor coupled to and controlled by the control circuitry, the motor drivingly coupled to the mixing tray, said mixing tray being driven by said intermittent rocking drive unit which subjects said mixing tray to an intermittent rocking movement, wherein said intermittent rocking drive unit is constructed and arranged to perform said intermittent rocking movement with a prescribed frequency and a prescribed number of oscillations when started, with a resting period at each end position of said intermittent rocking movement so that each test tube is subjected to a prescribed mixing process.

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**5,501,522**
**MULTIPLE ROTATION MATERIALS PROCESSOR**
**Lin C. Tung, Suite 1, 11 F. No. 95-8 Chang Ping Rd. Sec. 1, Taichung, Taiwan**
**Filed Aug. 8, 1994, Ser. No. 286,139**
**Int. Cl.[6] B01F 9/00**
**U.S. Cl. 366—219** **2 Claims**

1. A processor for triturating or mixing materials comprises:
a mount;
a first and a second differential gear assembly, each said assembly including a housing fixedly coupled together by a first axle journal therebetween, a first external bevel gear disposed outside each said housing, a second and a third external bevel gear disposed outside each said housing perpendicularly engaged with a respective one of said first external bevel gears, a first internal bevel gear disposed inside each said housing co-axial and coupled with a respective one of said external bevel gears, a second and a third internal bevel gear disposed inside each said housing perpendicularly engaged with a respective one of said first internal bevel gears, with



said first internal bevel gear of each said housing having a common shaft therebetween, a fourth internal bevel gear in said housing of said second differential gear assembly perpendicularly engaged with said second and third internal bevel gears thereof;

a first motor fixed to said mount rotatingly coupled to said first and second differential gear assemblies and effecting rotation of said housing of each said differential gear assembly about a first axis;

a second motor fixed to said mount and to said fourth internal bevel gear of said second differential gear assembly effecting rotation of said first, second and third internal bevel gears of said first and second differential gear assemblies about a second axis perpendicular to said first axis;

a cylinder container rotatably fixed to said second external bevel gear on said second differential gear assembly rotatingly coupled to said second internal gear via a pair of less diameter bevel gears thereof;

an outer container coupled to said second external bevel gear of said first differential gear assembly so as to rotate about said first axis;

an inner container having a chamber therein resiliently held in said outer container to rotate therewith, materials to be triturated or mixed being stored in the chamber thereof.

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**5,501,523**

**IMPELLER SYSTEM FOR MIXING AND ENHANCED-FLOW PUMPING OF LIQUIDS**

**Ronald J. Weetman, Rochester; Richard A. Howk, and Thomas A. Post, both of Pittsford, all of N.Y., assignors to General Signal Corporation, Stamford, Conn.**

**Continuation-in-part of Ser. No. 369,622, Jan. 6, 1995. This application Apr. 26, 1995, Ser. No. 429,410**

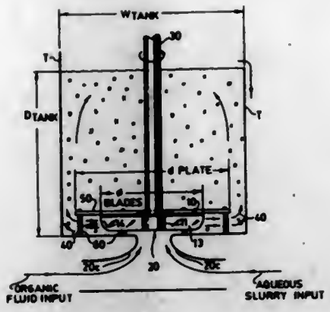
**Int. Cl.[6] B01F *7/10***

**U.S. Cl. 366—263** **17 Claims**

1. An enhanced-flow and efficient impeller system for forming a uniform dispersion of droplets of at least one fluid in at least one other immiscible fluid in a mixer tank of a the system comprising:

a radial flow impeller rotatably driven by a drive shaft and having a plurality of radial flow inducing blades having blade tips terminating along a blade terminating circle radially outwardly of said drive shaft and having means for providing controlled shear stress on the fluids so as to create said dispersion of droplets, one face of said radial flow impeller disposed proximate a contoured fluid inlet port at the bottom of said mixer tank and concentric with said drive shaft; and

a radial flow extension plate disposed adjacent another opposing face of said radial flow impeller and extending radially outwardly there along by a radial distance at least to said blade terminating circle.




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**5,501,524**

**METHOD FOR MIXING GRANULATES, POWDERS AND LIQUIDS AND A DEVICE THEREFOR**

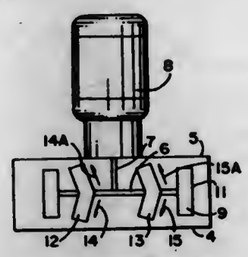
**Hette Zuidema, Roomweg 268, 7523 BW Enschede, Netherlands**

**Filed Mar. 16, 1994, Ser. No. 214,344**

**Claims priority, application European Pat. Off., Dec. 14, 1993, 93203515**

**Int. Cl.[6] B01F *7/18***

**U.S. Cl. 366—306** **20 Claims**




1. A method for mixing at least two, first and second materials in a continuous process in a housing for producing a mixture with a homogeneous distribution of said materials, where at least the first material is in granular or powder form and where said materials are introduced into said housing and mixed therein with the aid of a rotor which rotates about an axis, the mixture subsequently being expelled from said housing, the method comprising the steps of moving said materials in the housing in an approximately radial direction alternately toward and from said rotor axis at least one cycle during each rotation of said rotor.

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**5,501,525**

**BONE-GUARD BAG**

**Stanley J. Cox, and Kevin M. Byers, both of Newnan, Ga., assignors to Winpak Films, Inc., Senoia, Ga.**

**Filed Feb. 24, 1994, Ser. No. 201,368**

**Int. Cl.[6] B65D *30/08;33/01***

**U.S. Cl. 383—103** **13 Claims**

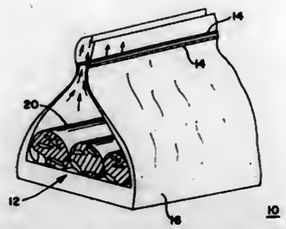
1. A packaging container for protecting foods from oxygen and moisture contact for preservation during storage or shipment, comprising:

(a) an outer bag made from an oxygen and moisture-impermeable material;

(b) an inner bag made from a puncture-resistant material for containing the food products, said inner bag having an open end with a periphery and having a closed end which can be positioned within the interior of said outer bag, means for securing the periphery of the open end of said inner bag to the interior surface of said outer bag such that the closed end of said inner bag may move within said outer bag; and

(c) vent means allowing communication between said inner and outer bags so that air can be evacuated in a single step from both said inner bag and said outer bag such that once said outer and inner bags are sealed simultaneously to prevent reentry of air, the food product contained within said inner bag is protected from oxygen and moisture contact, while the puncture resistance of said inner bag prevents bones or other sharp surfaces of the food from penetrating said inner and outer bags to compromise the oxygen and moisture-resistant integrity of said container.






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**5,501,526**

**SLIDING BEARING**

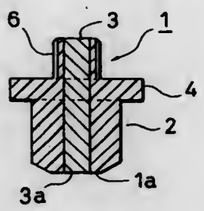
**Hiromitsu Asai, Kanagawa, and Takahiko Uchiyama, Fujisawa, both of, Japan, assignors to NSK Ltd., Tokyo, Japan**

**Filed Jun. 15, 1994, Ser. No. 259,872**

**Claims priority, application Japan, Jun. 15, 1993, 5-143868; Jan. 28, 1994, 6-008902**

**Int. Cl.[6] F16C *29/02***

**U.S. Cl. 384—13** **30 Claims**




1. A sliding bearing having a sliding surface adapted to move with reference to a sliding guide surface with the sliding surface of the bearing facing the sliding guide surface, the bearing comprising a sliding bearing member made of synthetic resin to substantially define the sliding surface of the bearing, and a lubricating composition member made of synthetic resin that contains lubricating oil therein and assembled with the sliding bearing member so that the lubricating composition member is opposed to the sliding guide surface.

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**5,501,527**

**LINEAR MOVEMENT BALL GUIDEWAY**

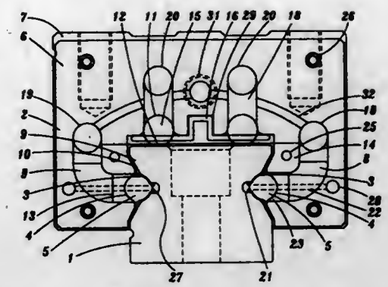
**Jeff C. H. Chang, No. 46, 37th Rd., Taichung Industrial Park, Taichung, Taiwan**

**Filed Dec. 30, 1993, Ser. No. 175,953**

**Int. Cl.[6] F16C *31/06***

**U.S. Cl. 384—45** **6 Claims**

1. A linear movement ball guideway comprising a slide block and a guide rail, wherein said slide block is composed of a slide block main body and two end caps and said guide rail is formed with two lateral concave surfaces while said slide block is formed with a corresponding convex surface and said concave surface and convex surface are formed with Gothic type ball member grooves defining lateral ball member passages within which multiple loaded and unloaded ball members roll, said slide block comprising an upper portion including two lateral sides in proximity to which are formed semicircular surfaces defining upper ball member passages, a top point of said loaded ball members contacting with said semicircular surface, while a bottom point of said loaded ball members contacting an upper surface of said guide rail, said ball member having limited between said end caps of said slide block by a retainer member to linearly move therewithin, said ball members turning through said end caps in a three-ball pushing turning manner with an optimal short distance, two groups of said ball members being disposed on said upper side of said guide rail to bear upper load and torque and adjust the pre-load and installation accuracy of two lateral groups of said ball members.




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**5,501,528**

**TRACK RAIL FIXING STRUCTURE FOR LINEAR MOTION UNITS**

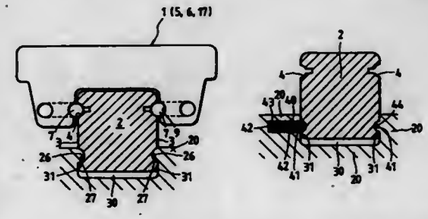
**Norimasa Agari, Seki, and Hideki Kuwahara, Gifu, both of, Japan, assignors to Nippon Thompson Company, Ltd., Tokyo, Japan**

**Filed Dec. 2, 1994, Ser. No. 352,048**

**Claims priority, application Japan, Dec. 24, 1993, 5-346027**

**Int. Cl.[6] F16C *29/06***

**U.S. Cl. 384—45** **7 Claims**

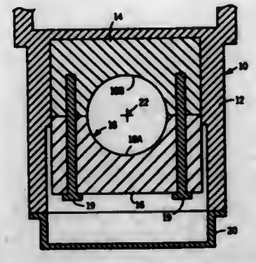



1. A track rail fixing structure for linear motion units, which comprises:

a track rail provided with raceway grooves in both of longitudinal side wall surfaces thereof, a casing provided with raceway grooves opposed to said raceway grooves in said track rail, rolling elements adapted to roll between said raceway grooves, a slider saddling on said track rail and moving relatively thereto, and a mounting base on which said track rail is fixed,

said track rail fixing structure being constituted of a longitudinally extending dovetail groove formed in a lower surface of said track rail, and a dovetail formed on an upper surface of said mounting base and fitted in said dovetail groove to fix said track rail on said mounting base.

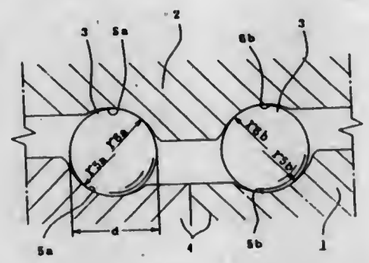
5,501,529
**BEARING SUPPORT INSERT**
Terry M. Cadle, Wauwatosa; Carl J. Landgraf, Waukesha, and Georgia M. Mayer, Hartford, all of Wis., assignors to Zenith Sintered Products, Inc., Germantown, Wis.
Filed May 17, 1994, Ser. No. 245,175
Int. Cl.[6] F16C 35/00; F02F 7/00
U.S. Cl. 384—432 10 Claims



1. A bearing support of an internal combustion engine block, said engine block comprising an aluminum alloy engine block body and a bearing insert, said insert being made of a metal composite matrix including a skeleton made from a ferrous powder metal material and the material of said body permeating interconnected voids of said skeleton.

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5,501,530
**DOUBLE-ROW BALL BEARING OF ANGULAR TYPE FOR WHEEL**
Kenichi Nagai; Hiroya Miyazaki, and Naoki Mitsue, all of Fujisawa, Japan, assignors to NSK Ltd., Tokyo, Japan
Filed Dec. 14, 1994, Ser. No. 356,078
Claims priority, application Japan, Dec. 15, 1993, 5-315301
Int. Cl.[6] F16C 33/58
U.S. Cl. 384—516 1 Claim



1. A double-row ball bearing of angular-type for a wheel in a vehicle comprising an inner ring having an outside surface around which first and second inner-ring raceways are formed in rows, an outer ring having an inside surface around which first and second outer-ring raceways are formed in rows, and a plurality of balls located rotatably between the first and second inner-ring raceways and the first and second outer-ring raceways, the balls having the same outer diameter, either of the inner and outer rings adapted to be supported by a suspension apparatus, and the other of the inner and outer rings adapted to support the wheel,

(A) when installing the double-row ball bearing to the suspension apparatus, the first inner-ring raceway and the first outer-ring raceway are located on the widthwise outside of the vehicle, and the second inner-ring raceway and the second outer-ring raceway are located on the widthwise inside of the vehicle, then at least one of the following conditions, (a) and (b), must be satisfied,

(a) the first inner-ring raceway has a first groove radius and the second inner-ring raceway has a second groove radius, such that the first groove radius of the first inner-ring raceway is larger than the second groove radius of the second inner-ring raceway,

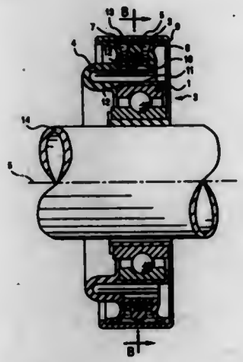
(b) the first outer-ring raceway has a third groove radius and the second outer-ring raceway has a fourth groove radius such that the third groove radius of the first outer-ring raceway is larger than the fourth groove radius of the second outer-ring raceway,

(B) provided that the outside diameter of the balls is taken to be d, then the second groove radius of the second inner-ring raceway is 0.51d to 0.53d, the first groove radius of the first inner-ring raceway is 0.51d to 0.56d, the fourth groove radius of the second outer-ring raceway is 0.515d to 0.545d, and the third groove radius of the first outer-ring raceway is 0.53d to 0.565d,

(C) the first groove radius of the first inner-ring raceway is not less than the second groove radius of the second inner-ring raceway, and the third groove radius of the first outer-ring raceway is not less than the fourth groove radius of the second outer-ring raceway.

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5,501,531
**CARDAN SHAFT BEARING**
Arno Hamaekers, Gorxheimertal-Unterfl, Germany, assignor to Firma Carl Freudenberg, Weinheim, Germany
Filed May 11, 1994, Ser. No. 241,380
Claims priority, application Germany, May 21, 1993, 43 17 062.5
Int. Cl.[6] F16C 27/06
U.S. Cl. 384—536 24 Claims



1. A shaft bearing for a rotating shaft comprising:

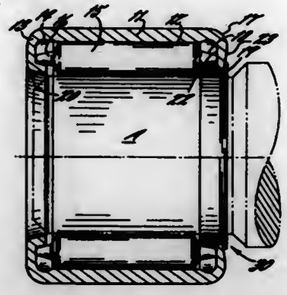
an antifriction bearing comprising an inner and an outer ring, said inner ring comprising rubberizing on a radial surface faring said shaft;

a retainer ring;

a rubber ring connecting said outer ring and said retainer ring, said rubber ring comprising a U-shaped profile which is open in a direction parallel to an axis of said shaft bearing, said rubber ring being fixed at least partially on axial ends of said outer ring and said retainer ring.



5,501,532
**TRUNNION ROLLER BEARING RETAINER**
Arnold M. Terrill, Thomaston, Conn., assignor to The Torrington Company, Torrington, Conn.
Filed Nov. 23, 1994, Ser. No. 344,192
Int. Cl.[6] F16C 33/46
U.S. Cl. 384—572 15 Claims



1. A roller bearing comprising:

an annular sleeve defining an outer roller race, and including an integral radially inwardly directed lip at each end thereof, with each of said lips having an outer surface and an oppositely directed inner surface;

a complement of trunnion rollers arranged on said race between said lips so that said inner surfaces act as axial thrust surfaces for the ends of the trunnion rollers;

a retainer ring mounted on at least one of said lips for retaining the adjacent ends of the trunnion bearings on said race, said retainer ring comprising:

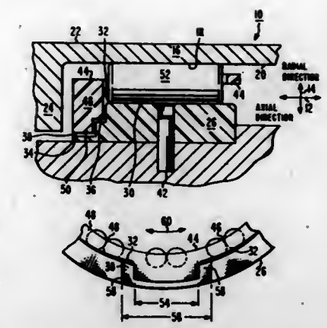
(a) a cylindrical medial portion disposed concentrically inside said one lip;

(b) an outer flange extending radially outwardly from one side edge of said medial portion and overlying a portion of the outer surface of said one lip; and

(c) an inner flange extending from the other side edge of said medial portion and extending in an outwardly inclined direction and into abutting relation with said inner surface of said one lip.

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5,501,533
**ROLLER BEARING ASSEMBLY HAVING IMPROVED AXIAL RETENTION AND ANGULAR CLOCKING**
Richard R. Williams, Pohatcong Township, N.J.; Peter C. Preston, Oshkosh, Wis., and Willard C. Macfarland, Jr., Goshen, Conn., assignors to Roller Bearing Company of America, Newtown, Pa.
Filed Jun. 3, 1995, Ser. No. 497,735
Int. Cl.[6] F16C 33/46;33/58;43/04
U.S. Cl. 384—572 16 Claims



1. A roller bearing assembly having improved axial retention and angular clocking comprising:

A. an inner race member defining a inner race bearing surface thereon, said inner race member including an inner race shoulder member positioned adjacent said inner race bearing surface and extending outwardly therefrom;

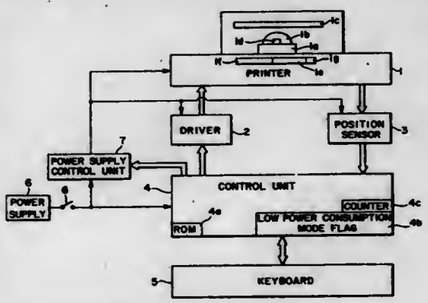
B. an outer race member extending around said inner race member and being spatially disposed therefrom, said outer race member defining an outer race bearing surface spatially disposed from and facing said inner race bearing surface, said outer race member defining a peripheral groove means extending therearound, said inner race shoulder member extending outwardly from said inner race bearing surface beyond said outer race bearing surface to facilitate axial retention of said inner race member with respect to said outer race member;

C. a bearing cage member positioned between said inner race bearing surface of said inner race member and said outer race bearing surface of said outer race member, said bearing cage member defining a plurality of bearing containment chambers therein, said bearing cage member including a peripheral rim means adapted to be positioned extending into said peripheral groove means to facilitate axial retention of said bearing cage member with respect to said outer race member; and

D. a plurality of roller bearing members positioned retained within said bearing containment chambers defined within said bearing cage member, said roller bearing members being rotatable moveable with respect to said bearing cage member, said roller bearing members being in abutment with respect to said inner race bearing surface of said inner race member and in abutment with said outer race bearing surface of said outer race member to facilitate relative movement between said inner race member and said outer race member by rotation of said roller bearing members positioned within said bearing cage member therebetween.

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5,501,534
**ELECTRONIC APPARATUS WHICH IS AUTOMATICALLY INITIALIZED WHEN NORMAL OPERATION IS RESUMED AFTER THE APPARATUS HAS BEEN IN A LOW POWER CONSUMPTION MODE**
Shigeru Mizoguchi, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 13,178, Jan. 29, 1993, abandoned, which is a continuation of Ser. No. 585,029, Sep. 19, 1990, abandoned, which is a continuation of Ser. No. 290,804, Dec. 23, 1988, abandoned, which is a continuation of Ser. No. 854,438, Apr. 21, 1986, abandoned. This application Oct. 6, 1994, Ser. No. 320,425
Claims priority, application Japan, Apr. 26, 1985, 6-088991
Int. Cl.[6] B41J 29/38
U.S. Cl. 400—54 14 Claims

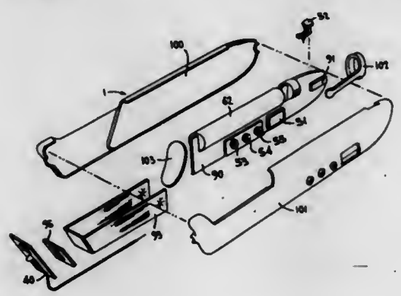



1. An electronic apparatus comprising:

input means including a keyboard having a plurality of character keys for entering respective characters;
processing means for processing a character entered by said input means;
a printer for outputting the character processed by said processing means;
mode selection means for selecting, in response to entry of a character by said input means, one of a low power consumption mode in which said printer achieves low power consumption and a normal operation mode in which said printer achieves normal power consumption;
power control means for selectively supplying said printer with power in response to the selection of a mode by said selection means; and
control means for, in response to operation of a character key in the low power consumption mode, changing the low power consumption mode to the normal operation mode without printing a character corresponding to the operated character key.

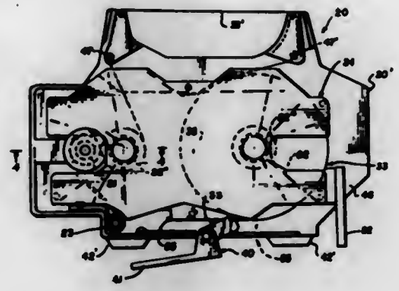
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**5,501,535**
**ELECTRONIC MARKING INSTRUMENT**
**Nicholas J. Hastings; Peter J. Taylor, and Graham S. Gutsell, all of Cambridge, United Kingdom, assignors to The Technology Partnership Ltd., Hertfordshire, United Kingdom**
**PCT No. PCT/GB93/00440, § 371 Date Dec. 27, 1994, § 102(e) Date Dec. 27, 1994, PCT Pub. No. WO93/17872, PCT Pub. Date Aug. 16, 1993**
**PCT Filed Mar. 3, 1993, Ser. No. 295,834**
**Claims priority, application United Kingdom, Mar. 3, 1992, 9204589; Mar. 3, 1992, 9204592**
**Int. Cl.[6] B41J *3/39***
**U.S. Cl. 400—88** **11 Claims**



1. A hand-held writing device comprising:
an elongate casing having an elongate axis;
an electrically actuated writing head for making marks on a writing surface;
a sensor for detecting movement of the writing head in any direction in a plane parallel to the surface without rotation of the device about its longitudinal axis; and
means for causing the writing head to be actuated to cause writing when the sensor detects said movement of the writing head relative to the surface.

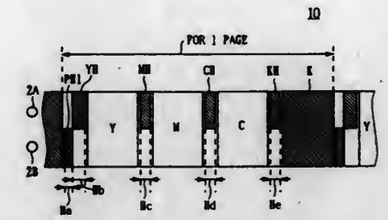
**5,501,536**
**TYPEWRITER CARTRIDGE APPARATUS HAVING AN OUTER HOUSING WITH INNER LOOP ATTACHED RIBBON CARTRIDGE**
**Robert E. Kleve, 1103 24th Ave. S., Grand Forks, N. Dak. 58201**
**Continuation-in-part of Ser. No. 602,734, Oct. 24, 1990, abandoned, which is a continuation-in-part of Ser. No. 269,972, Nov. 10, 1988, abandoned. This application Mar. 18, 1993, Ser. No. 33,896**
**Int. Cl.[6] B41J *32/00***
**U.S. Cl. 400—208** **5 Claims**



5. A ribbon cartridge including a a loop attaching unitary cartridge and outer housing, said loop attaching unitary cartridge being inserted into said outer housing, said outer housing being insertable into a ribbon driving device for the operation thereof, and wherein said outer housing has a peripheral drive adapted to be driven by said ribbon driving device and has a horizontal base with a front edge and vertical sloe walls and a plurality of spaced ribbon guide means along the front edge of the base and spaced from one another along the front edge with an opening along the front edge between the guide means;
said loop attaching unitary cartridge comprising a pair of elongated panels spaced laterally from one another, a pair of bearing supports fixed to said panels at intervals between the panels, a pair of reels rotatably mounted on said bearing supports between said pair of panels, an elongated ribbon having a pair of ends with one of said ends wound onto one of said reels and the other end permanently affixed to the other of said reels, said ends being inside the confines of said panels, said ribbon having an intermediate portion outside the confines of said panels, said pair of elongated panels having a lateral portion between the panels along a front edge of said panels and supporting in spaced relation said intermediate portion In front of and outside the confines or said panels, so that said unitary cartridge may be detachably mounted onto said outer housing as a single unitary structure and the intermediate portion of said ribbon will be accessable along the front edge of said unitary cartridge and outside the cartridge from said opening in front of said outer housing, so that it can be grasped, drawn, and looped about said spaced ribbon guide means on the front of said outer housing with the ends of said ribbon remaining inside the confines of said panels of said cartridge, means for moving said unitary cartridge into engagement with said peripheral drive, said one reel of said cartridge being adapted to to receive said peripheral drive of said outer housing in response to said movement of said unitary cartridge for said peripheral drive to drive said ribbon onto said one reel from said other reel of said cartridge.



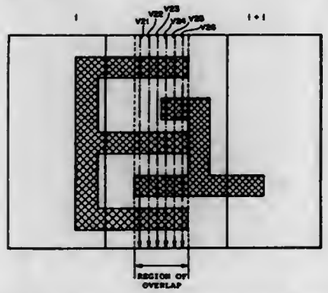
**5,501,537**
**INK RIBBON**
**Nobuo Kohno, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan**
**Filed Jul. 25, 1994, Ser. No. 279,872**
**Claims priority, application Japan, Jul. 30, 1993, 5-208483**
**Int. Cl.[6] B41J *31/00***
**U.S. Cl. 400—240.4** **17 Claims**



1. An ink ribbon, one end of which is wound around a supply reel and the other end of which is wound around a take-up reel, comprising:
a belt type base;
a plurality of sets of color ink areas formed repeatedly in a longitudinal direction along said base, each color ink area in each set of said color ink areas having a different color, respectively;
a unit header mark adapted to be detected by a first sensor formed between each set of color ink areas for indicating a beginning portion of each set of the color ink areas; and
a plurality of color header marks adapted to be detected by a second sensor, each of said color header marks being formed between each said color ink areas for indicating a beginning portion of each said color ink areas, said color header marks being formed with respect to said unit head mark so that overlap in the width direction of said base is absent;
one of said plurality of color header marks being a diameter mark whose length in the longitudinal direction is varied so as to indicate the diameter of the ink ribbon wound around one of said supply reel and said take-up reel.

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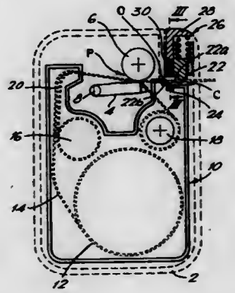
**5,501,538**
**APPARATUS AND METHOD FOR ADJUSTING CHARACTER SPACING**
**Akira Sawada, Nagaokakyo; Hiroshi Kumamoto, Osaka, and Takashi Suzuki, Nagoya, all of, Japan, assignors to Omron Corporation, Kyoto, Japan**
**Filed Jun. 21, 1994, Ser. No. 263,148**
**Claims priority, application Japan, Jun. 25, 1993, 5-155905**
**Int. Cl.[6] B41J *19/32***
**U.S. Cl. 400—304** **26 Claims**




1. An apparatus for adjusting the spacing of characters placed on a readable medium, comprising:
character dot-data generating means for developing character dot data, which represents characters constructing a designated character string, in a memory, wherein each character has a character face;
first characteristic-quantity generating means for generating, character by character, character density data representing broadness of the character face of the character in the character dot data developed in said memory;
second characteristic-quantity generating means for generating, character by character, character face overlap area data representing degree of overlap between both characters in a state in which the character and a character adjacent thereto are closest together in the character dot data developed in said memory;
third characteristic-quantity generating means for generating, character by character, blank-space area data representing broadness of blank space produced between both characters in a state in which the character and the character adjacent thereto are closest together in the character dot data developed in said memory;
character spacing inferring means for inferring an appropriate character spacing character by character by applying the character density data, the character face overlap area data and the blank-space data generated by said first, second and third characteristic-quantity generating means, respectively, to already given knowledge relating to character spacing adjustment; and
means for using said appropriate character spacing when placing characters on a readable medium.

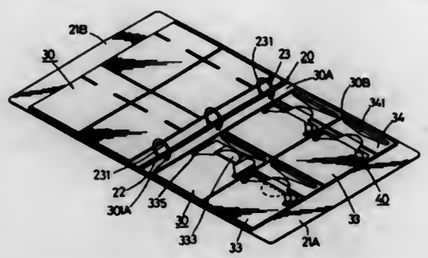
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**5,501,539**
**TAPE CUTTING APPARATUS**
**Robert C. L. Day, Cambridge, United Kingdom, assignor to Esselte Dymo N.V., St. Niklaas, Belgium**
**Filed Jun. 27, 1994, Ser. No. 266,822**
**Claims priority, application United Kingdom, Jul. 12, 1993, 9314388**
**Int. Cl.[6] B41J *15/00;35/28***
**U.S. Cl. 400—621** **18 Claims**



1. A printing device in combination with a cassette, wherein said cassette is removably received in a cassette receiving bay of the printing device, said cassette holding a supply of tape and the printing device further comprising a cutting blade for cutting said tape after printing, and a blade protection device comprising a blade protection member mounted for movement relative to the cutting blade so as to prevent movement of the blade in a first position and to allow movement of the blade in a second position, the blade protection member being movable between the first and second positions by insertion of said cassette into the cassette receiving bay.

**5,501,540**
**BINDER ASSEMBLY WITH A LOOSE-LEAF SHEET HAVING A POUCH FOR RECEIVING A COMPUTER DISK THEREIN**
**Chin-Lien Ho, No. 36, Le-Yang Rd., Hsi-Tun Dist., Taichung City, Taiwan**
**Filed Jun. 1, 1995, Ser. No. 457,561**
**Int. Cl.[6] B42F *13/00***
**U.S. Cl. 402—73** **12 Claims**

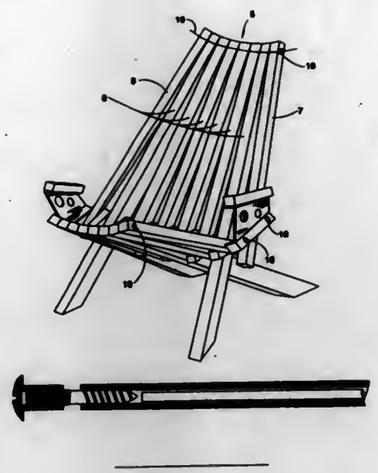


1. A binder assembly for receiving computer disks therein, said binder assembly comprising:
a cover unit including rigid back and front covers, a spine portion interconnecting said back and front covers, and a retaining set provided on an inner side of said spine portion; and
at least one loose-leaf sheet, each said loose-leaf sheet including a punching unit adapted to engage removably said retaining set on said spine portion, and a pouch unit which is connected to said punching unit at one side and which has at least one pouch, each said pouch including
a plastic first backing sheet portion,
a plastic first front sheet portion having top and bottom ends and opposite side edges, said first front sheet portion being connected sealingly to said first backing sheet portion at said side edges and at said bottom end, said first front sheet portion cooperating with said first backing sheet portion to define a disk receiving space that is adapted to receive a computer disk therein, and
a foldable retaining flap that extends integrally from an intermediate section of said top end of said first front sheet portion and that is adapted to extend between the computer disk in said disk receiving space and said first backing sheet portion to prevent untimely removal of the computer disk from said disk receiving space.

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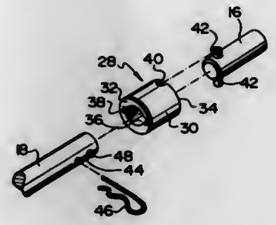
**5,501,541**
**FLEXIBLE COUPLING DEVICE**
**Daniel Gomes, 12 Railroad Ave., P.O. Box 117, Worcester, N.Y. 12197-0111**
**Filed Aug. 9, 1993, Ser. No. 105,328**
**Int. Cl.[6] A47C *4/10*; F16B *7/20*;*12/12***
**U.S. Cl. 403—41** **12 Claims**

1. A flexible coupling device for coupling a plurality of pieces each including an aligned bore, wherein said flexible coupling device comprises:
a) a flexible tube that is a hollow solid wall cylinder;
b) a flexible metal rod or wire placed inside said flexible tube such that said flexible metal rod is not in axial tension; and
c) means for removably securing said flexible tube through said aligned bores of said pieces, and in axial tension between, thereby holding each of said pieces in a fixed longitudinal relationship, while permitting relative rotation between each of said pieces and allows said flexible metal rod to remain within said flexible tube without being in axial tension when said tube is in axial tension.



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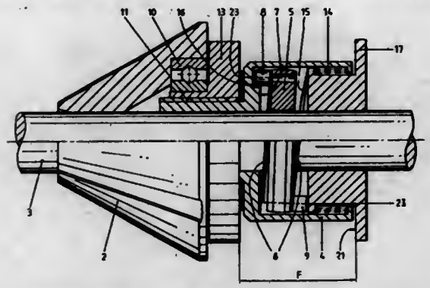
**5,501,542**
**RAPID COUPLING FOR A SUPPORTED, DRIVEN SHAFT**
**William M. Hall, Sr., Bluffton, Ind., assignor to Farmatic Research, Inc., Komoka, Canada**
**Filed Sep. 23, 1994, Ser. No. 311,165**
**Int. Cl.[6] F16D *1/10***
**U.S. Cl. 403—306** **15 Claims**



1. A rapid coupling for coupling a drive shaft to a driven shaft, comprising:
a coupling sleeve having a drive end with an end face, a driven end with an end face and an axial bore that extends from the drive end to the driven end and is sized to accommodate the drive shaft and the driven shaft and be axially slidable over the shafts, the driven end including slots for receiving driven pin ends affixed to the driven shaft;
key means for connecting the coupling sleeve to the drive shaft for rotation therewith, the key means permitting axial movement of the coupling sleeve while inhibiting rotational movement of the coupling sleeve on the drive shaft, at least one key way cooperating with the key means to permit axial movement of the coupling sleeve, the key way extending from the end face of the drive end to the end face of the driven end of the coupling sleeve; and
locking means associated with the drive shaft for locking the coupling sleeve in a coupled position wherein the coupling sleeve receives an end of the driven shaft, the driven pin ends are received in the slots and the driven shaft is axially rotated with the drive shaft.



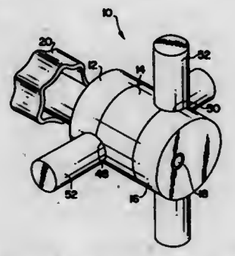
**5,501,543**
**QUICK LOCKING DEVICE FOR AXIAL LOCKING**
**Jürgen-Ulrich Schlüter-Wohlfeil, Bökland, Germany, assignor to Joachim Uhing KG GmbH & Co., Mielkendorf, Germany**
**Filed Jun. 7, 1994, Ser. No. 254,949**
**Claims priority, application Germany, Jun. 21, 1993, 43 20 480.5**
**Int. Cl.[6] F16B *21/00***
**U.S. Cl. 403—321** **9 Claims**



1. A quick locking device for producing axial locking forces on a smooth shaft, comprising a locking unit; a holding unit movable relative to said locking unit and having a housing with a ring-shaped chamber limited by chamber surfaces; a freely supported clamping ring adapted to surround a shaft and located inside the housing with pretensioning by a spring force in said ring-shaped chamber changeable in an axial direction; diametrically opposite pins provided on said clamping ring and contacting said chamber surfaces in contact points, said locking unit and said holding unit being provided with a locking thread and arranged so that axial locking forces are transmitted through said locking unit and said locking thread to said holding unit and through one of said pins for locking connection between said clamping ring and the shaft to provide self-locking; and a spring providing tensioning of said clamping ring and vectorially supporting a clamping action through another of said pins.

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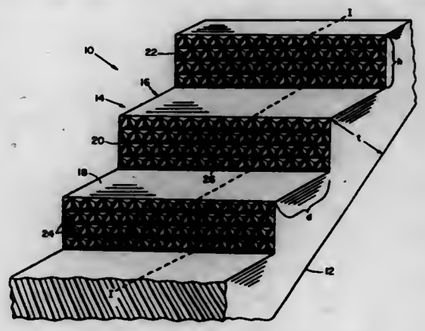
**5,501,544**
**THREE-PIECE CLAMPING ASSEMBLY**
**James W. Cairns, West Chester, Pa., assignor to Nolu Plastics, Inc., Aston, Pa.**
**Filed Nov. 10, 1994, Ser. No. 339,277**
**Int. Cl.[6] F16B *7/04***
**U.S. Cl. 403—400** **10 Claims**



1. A clamping assembly comprising:
a generally cylindrical first end member having first and second end surfaces and a recess defined in said first end surface, said first end member having a bore defined therethrough,
a generally cylindrical intermediate member having a first and second end surfaces and a recess in each of said end surfaces thereof, said intermediate member having a bore defined therethrough,
a generally cylindrical second end member having first and second end surfaces and a recess defined in one of said end surfaces thereof, a bore extending at least part-way from said first end surface toward said second end surface, at least part of said bore defining screw threads,
said intermediate member being disposed between said first and second end members such that said bore of said intermediate member and said bore of said first end member align with said bore of said second end member to define an axially extending bore, and one of said recesses of said intermediate member cooperating with said recess of said first end member to define a first pin bore that extends through the clamping assembly, generally transverse to said axially extending bore, the other recess of said intermediate member cooperating with said recess of said second end member to define a second pin bore through the clamping assembly, generally transverse to said axially extending bore and generally transverse to said first pin bore, said first and second pin bores being constructed and arranged to receive associated pins therein,
a rod having first and second ends and having screw threads defined along at least a portion of a length thereof, said rod being disposed through said bore of said intermediate member and said bore of said first end member, said threads being engaged with said screw threads of said bore of said second end member at said second end thereof, and
a control knob provided on said first end of said rod, said control knob including a stop surface which is constructed and arranged to engage said second end surface of said first end member,
wherein, once said control knob is moved such that the rod further engages the screw threads of the bore of said second end member and said stop surface engages said second end surface of said first end member, surfaces defining said first and second pin bores are constructed and arranged to frictionally engage and clamp said associated pins therein with the pins free from direct locking engagement with the rod, and said first end member, said intermediate member and said second end member cooperate to define a smoothly contoured, generally continuous outer peripheral surface.

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**5,501,545**
**RETROREFLECTIVE STRUCTURE AND ROAD MARKER EMPLOYING SAME**
**Helmut Walter, Pittsfield, N.Y., assignor to Reflexite Corporation, Avon, Conn.**
**Filed Nov. 9, 1994, Ser. No. 336,467**
**Int. Cl.[6] E01F *9/06*; G02B *5/124***
**U.S. Cl. 404—14** **19 Claims**



1. A retroreflective structure to retroreflect light incident along an optical axis comprising:
a) a planar window side which faces the incident light and which surface is adapted to be disposed on a road marker at an angle $\alpha$ to a road surface; and

b) a facet side opposite the window side comprising a tiered structure having a plurality of steps with tread surfaces and riser surfaces intersecting at an angle and wherein said riser surfaces comprise an array of retroreflective prism elements formed in the riser surfaces and disposed therein such that light incident at said angle α to the plane of the window side is retroreflected by said prism elements, and wherein α is less than 90° and greater than 0°.

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**5,501,546**

**APPARATUS FOR DISSIPATING WAVE ENERGY**

**Donald E. Derrell, Blackrock, Rarotonga 01, Cook Islands**

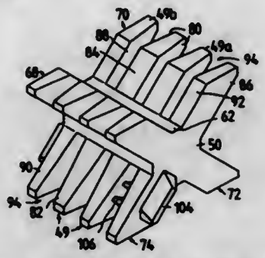
**PCT No. PCT/NZ93/00008, § 371 Date Jul. 27, 1994, § 102(e) Date Jul. 27, 1994, PCT Pub. No. WO93/17189, PCT Pub. Date Sep. 2, 1993**

**PCT Filed Feb. 24, 1993, Ser. No. 256,944**

**Claims priority, application New Zealand, Feb. 26, 1992, 241750**

**Int. Cl.[6] E02B *3/04***

**U.S. Cl. 405—25** **8 Claims**




1. A structure for dissipating the energy of waves impinging on a shore, the structure comprising a number of similarly shaped, spaced apart, upwardly disposed vanes positioned in at least one row on the floor of a body of water adjacent the shore so that passages for the waves are defined between at least some pairs of adjacent vanes, CHARACTERISED IN THAT each passage has
an entrance facing away from the shore and an exit facing the shore;
sidewalls defined by the vanes which sidewalls converge from the entrance to the exit;
and a lower cross wall, at least a portion of which slopes upwardly from the entrance to the exit.

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**5,501,547**

**MODULAR CHANNEL SECTION ASSEMBLY FOR PROVIDING A DRAINAGE SYSTEM**

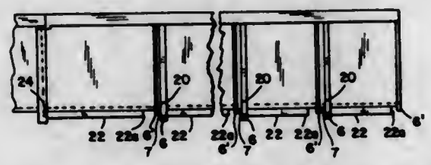
**Giulio Mantelli, Altare, Italy, assignor to First Plast S.R.L., Altare, Italy**

**Continuation of Ser. No. 974,281, Nov. 10, 1992, abandoned. This application Jul. 8, 1994, Ser. No. 272,869**

**Claims priority, application Italy, Nov. 11, 1991, RM91U0216**

**Int. Cl.[6] E03F *1/00***

**U.S. Cl. 405—121** **21 Claims**




1. A modular channel section assembly for a drainage system for water or other liquids, comprising a plurality of channel sections (2) having ends connected to each other, each said channel section having a plurality of pairs of ribs, each pair having a first rib (6) and a second rib (6'), both ribs of each pair extending in planes perpendicular to the channel section at an outer surface (4) of said channel section, each said channel section defining an internal groove (24) on one end thereof and a second rib 6' on the other end, pairs of first and second ribs being provided along the length of each channel section at regularly spaced intervals which are submultiples of the length of each channel section (2), said first rib (6) of each pair being shaped so as to facilitate engagement of said channel sections to a cement support on which said channel section is adapted to be laid, said second rib (6') of each pair being spaced from said first rib (6) and being formed with a male profile, an end second rib (6') of a first channel section coupled with a groove (24) provided at one end of an adjacent second channel section (2), said second rib (6') of each pair on each channel section being nearer to said groove (24) on one end thereof than said first rib (6) so that when a channel section is cut between first and second ribs of a rib pair at a second rib (6') to reduce the length of said channel section, said section of reduced length has a groove (24) adapted to couple with an end second rib (6') of an adjacent channel section to form a channel extension of a length multiple of the distance between said groove (24) and said second rib (6') of said reduced length channel section.

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**5,501,548**

**METHOD FOR CONTROLLING THE DIRECTION OF A SHIELD TUNNELING MACHINE AND AN APPARATUS THEREFOR**

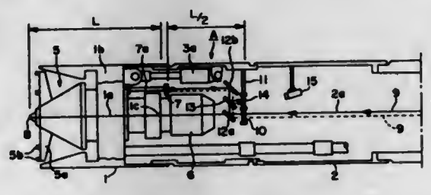
**Mitsutoshi Hayashi, Okuniya; Akitaka Fujita, Tokyo; Shingo Nagashima, Tokyo, and Isao Fujimori, Higashimurayama, all of, Japan, assignors to Tokyo Gas Co., Ltd., and Kabushiki Kaisha Iseki Kaihatsu Koki, both of Tokyo, Japan**

**Filed Feb. 24, 1994, Ser. No. 201,332**

**Claims priority, application Japan, Mar. 22, 1993, 5-085111**

**Int. Cl.[6] E21D *9/00;9/06***

**U.S. Cl. 405—143** **2 Claims**




1. A directional control apparatus comprising:
a cutter head provided with a cutter for excavating the ground and with a reflector for reflecting a laser beam;
a tail shield articulated through a directional control means with the cutter head, and provided with a target on which the laser beam reflected by the reflector provided on the cutter is projected, and with a television camera for taking an image of a target and a screen;
an image processor for separating only the same color signal of said laser beam from the image taken by a television camera by which the position of the spot on a target and a screen is detected;
a memory in which the position of the original spots of a laser beam projected on a target and a screen, respectively, measured at the beginning of a propelling shield tunneling machine is stored;
a comparator in which a position of the present spot of a laser beam projected on a screen during the propulsion of the shield tunneling machine is compared with the position of an original spot of a laser beam projected on a screen, and when it is detected that the present spot of a laser beam projected on a screen is displaced from the original spot to another place of a laser beam, a signal corresponding to the displacement of the present spot from the original spot to another place is generated; and
an actuator for actuating the directional control means by which the directional control means is operated so that the present spot of a laser beam projected on a screen is made to coincide with the original spot.



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**5,501,549**

**PULLING AND CONNECTING TOOL FOR SUBSEA CONDUITS**

**Jøren Breda, Asker; Jens Bakke, and Sverre Caspersen, both of Oslo, all of, Norway, assignors to Kvaerner Energy a.s, Oslo, Norway**

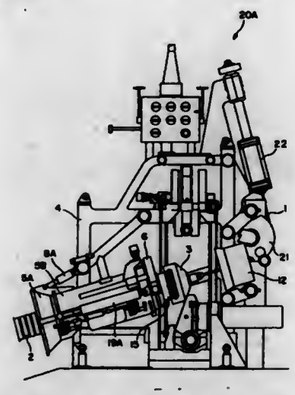
**PCT No. PCT/NO93/00024, § 371 Date Jul. 26, 1994, § 102(e) Date Jul. 26, 1994, PCT Pub. No. WO93/16267, PCT Pub. Date Aug. 19, 1993**

**PCT Filed Feb. 10, 1993, Ser. No. 256,845**

**Claims priority, application Norway, Feb. 10, 1992, 920518**

**Int. Cl.[6] F16L *1/12***

**U.S. Cl. 405—169** **7 Claims**




1. A tool for the remote-controlled pulling, aligning and connecting of a subsea conduit to a subsea installation, said tool comprising a framework (4), a pulling wire (1) with a pulling head (3) which can be releasably attached to the end (15) of the subsea conduit and aligning means which bring the ends (15,16) of the conduit which are to be connected in line with one another, characterized by a frame (5,5B) pivotably mounted on the framework (4) around a substantially horizontal axis oriented substantially at right angle to the axis of the conduit (2) and at almost the same height as the height at which the conduit (2) will finally lie, said frame (5) comprising a grip elevator (6) which can grip and hold the pulled conduit (2) and manipulate the end (15) of the conduit (2) between a slanting pulling position and a final, substantially horizontal connecting position.

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**5,501,550**

**PILE ASSEMBLY AND METHOD EMPLOYING EXTERNAL MANDREL**

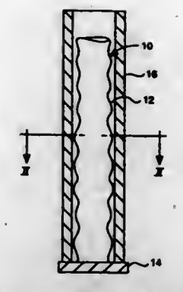
**Salvatore J. Calabrese, 5917 Oakland Park Dr., Burke, Va. 22015**

**Filed Jul. 11, 1994, Ser. No. 272,561**

**Int. Cl.[6] E02D *5/34***

**U.S. Cl. 405—232** **10 Claims**

1. A piling assembly comprising a casing unit comprising an upright hollow casing having a bottom and an outer periphery and a drive boot secured to the bottom of the casing and extending laterally beyond the outer periphery of the casing; and an external mandrel adapted to be supported on said drive boot in surrounding relation with said casing, said mandrel being of a height greater than that of said casing and having an opening therein along the height thereof of a size greater than the greatest width of the casing so as to enable the mandrel to be placed around the casing through relative lateral movement between the mandrel and casing.




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**5,501,551**

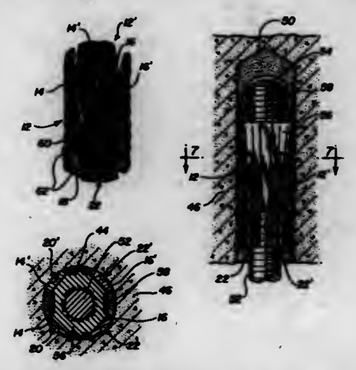
**MINE ROOF EXPANSION ANCHOR, EXPANSIBLE SHELL ELEMENT USED THEREIN AND METHOD OF INSTALLATION**

**Raymond L. Wright, Syracuse, N.Y., assignor to The Eastern Company, Naugatuck, Conn.**

**Filed Mar. 24, 1995, Ser. No. 409,407**

**Int. Cl.[6] E21D *20/02***

**U.S. Cl. 405—259.4** **21 Claims**




1. An expansion anchor shell element for engagement with the wall of a bore hole to anchor therein an elongated rod, said shell element comprising:
a) a plurality of leaves, each elongated between upper and lower ends and each having opposite side edges;
b) means for maintaining said leaves in assembled relation, substantially symmetrically arranged about a central axis with inner surfaces facing toward and outer surfaces facing away from said central axis;
c) means defining a passageway extending into said outer surface, continuously between said upper and lower ends, of at least one of said leaves, whereby the spaces within said bore hole above and below said one leaf communicate through said passageway when said outer surface of said one leaf is engaged with said bore hole wall.

20. The method of anchoring the distal, threaded end of a mine roof bolt in a blind drill hole of predetermined diameter, said method comprising:
a) supporting a radially expansible shell with a plurality of elongated leaves, each having an inner and an outer surface and an upper and a lower end, in substantially symmetrical,

surrounding relation to said bolt end with said inner surfaces in spaced relation thereto and the outermost portions of said outer surfaces lying on a circle of not greater than said predetermined diameter;

b) threadedly engaging a tapered plug with said bolt end, said plug having a small end extending from said leaf upper ends into the space between said bolt and said leaf inner surfaces, a large end having a cross-dimension sufficient when moved into said space to move said leaf outer surfaces outwardly into tightly gripping engagement with the wall of said drill bole;

c) providing at least one, continuous flow passage extending into said outer surface of at least one of said leaves for passage of a flowable material from said upper to said lower end of said one leaf when the latter is in said tightly gripping engagement with the wall of said drill bole;

d) inserting into said drill bole a rupturable cartridge having separate compartments containing respective components of a hardenable resin grouting mix initially in a flowable state;

e) advancing said distal end of said bolt, with said plug and said shell thereon, into said drill bole behind said cartridge to rupture said cartridge against the blind end of said drill bole and release said components and causing flow of at least a portion thereof through said flow passage; and

f) rotating said bolt to move said plug axially thereon and move said leaf outer surfaces outwardly into tightly gripping engagement with said bore bole wall.

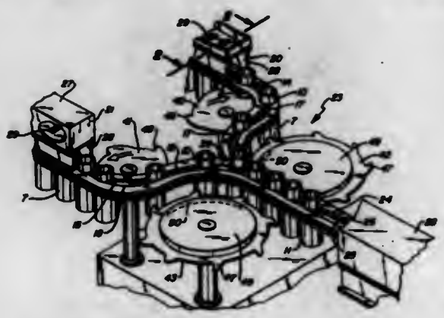
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**5,501,552**

## CONVEYING SYSTEM FOR UNSTABLE ARTICLES HAVING A NECK RING

**Donald J. Simkowski, Loveland, Colo., assignor to Goldco Industries, Inc., Loveland, Colo.**

**Filed Apr. 29, 1994, Ser. No. 235,354**
**Int. Cl.[6] B65G *51/03***
**U.S. Cl. 406—52** **18 Claims**



1. An article conveying system for conveying articles having neck portions, said system comprising:

input conveying means having a portion engaging the neck portions of the articles for conveying the articles along plural paths in single file;

output means having a portion engaging the neck portions of the articles; and

combining means positioned to receive the articles in single file from each of said plural paths of said input conveying means, said combining means including guide means engagable with the neck portions of the articles received from said input conveying means and guiding the articles in a downstream direction through said combining means with the articles being discharged in single file from said combining means to said output means, and said combining means also including actuating means having a portion movable in said downstream direction for engaging the neck portions of the articles and thereafter, while continuing said engagement of the neck portions of the articles by said actuating means, urging the articles through at least a portion of said combining means in said downstream direction.

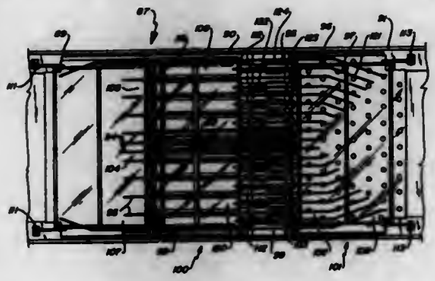
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**5,501,553**

## DEVICE UTILIZING FLUID FOR EFFECTING NESTED ALIGNMENT OF ARTICLES AND PARTICULARLY UNDECORATED CANS

**Donald J. Simkowski, Loveland, Colo., assignor to Goldco Industries, Inc., Loveland, Colo.**

**Continuation-in-part of Ser. No. 999,464, Dec. 29, 1992, Pat. No. 5,320,457, which is a continuation of Ser. No. 733,667, Jul. 22, 1991, abandoned. This application Jun. 9, 1994, Ser. No. 257,199**
**Int. Cl.[6] B65G *51/03***
**U.S. Cl. 406—88** **26 Claims**



1. A device for effecting nested alignment of articles having a generally circular cross-section, said device comprising:

conveying means for receiving articles having a generally circular cross-section and providing said articles at a discharge end;

aligning means adjacent to said discharge end of said conveying means for receiving articles discharged from said conveying means, said aligning means having guide means in first and second areas with said guide means establishing a plurality of guideways in each of said first and second areas and with a portion of preselected ones of said guide means extending at an angle with respect to the remainder of said guide means to effect converging of articles discharged from said guideways, said first area being located longitudinally adjacent said second area in a downstream direction of said device, said guideways in said first area having a width sufficient to enable articles to move through said guideways in single file and said guideways in said second area including a first group of said guideways having a width sufficient to enable articles to move through said first group of guideways in single file and a second group of said guideways having a width sufficient to enable articles to move through said second group of guideways in multiple file, said second group of guideways being located laterally adjacent said first group of guideways in a direction normal to said downstream direction;

staging means for receiving articles discharged from said aligning means; and

article urging means for urging articles in said downstream direction through said guideways and into said staging means with the articles discharged from said guideways providing a plurality of separate adjacent rows of articles at said staging means and with the articles of said adjacent rows being offset from one another such that the articles are in nested relationship with each article contacting adjacent articles in the same and adjacent rows.

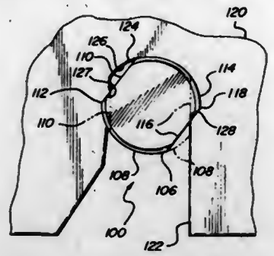


**5,501,554**

## DEBURRING TOOL

**William A. Robinson, Canton, Mich., and William R. Robinson, Juno Beach, Fla., assignors to E-Z Burr Tool Company, Plymouth, Mich.**

**Continuation-in-part of Ser. No. 164,745, Dec. 9, 1993, Pat. No. 5,358,363. This application Nov. 1, 1994, Ser. No. 333,038**
**Int. Cl.[6] B23B *51/00***
**U.S. Cl. 408—153** **6 Claims**



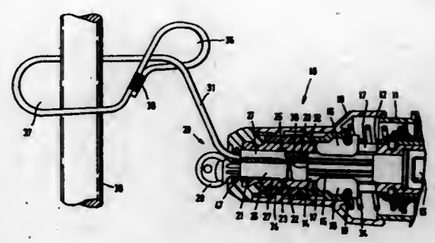
1. A deburring tool comprising:

an arbor formed with an elongated recess extending longitudinally therein, a flat resilient cutting blade received in recess;

a pivotal blade retention and release member mounted in said arbor and extending transversely with respect to the longitudinal axis thereof, said retention and release member having a head portion mounted for turning movement in said arbor and having a shank portion extending from said head portion through said recess, said shank portion having a periphery with at least one arcuate surface flanked by at least two non-arcuate surfaces defining opposite sides of said shank portion;

said cutting blade having an open-ended slot for receiving said shank portion therein, said open-ended slot being defined by an internal edge in said blade having one arcuate surface complementary to the arcuate surface of said shank portion and flanked by at least two non-arcuate slot surfaces complementary to said non-arcuate surfaces of said shank portion; and

said retention and release member being selectively rotatable in said arbor and with respect to said blade between a blade retention position in which said non-arcuate surfaces of said shank portion engage said complementary non-arcuate slot surfaces of said open-ended slot to prevent separation of said blade from said retention and release member and to condition said tool for deburring operation, and a blade release position in which non-arcuate surfaces of said shank portion move from engagement with said non-arcuate surfaces of said slot to a point whereby said shank portion can pass through said open-end of said slot to permit separation of said blade and from said blade retention and release member and from said arbor for blade repair and replacement.



said tool holder and provided with a key unlockable blocking body which secures said blocking device from undesired withdrawal, so that when said blocking body is connected with said tool holder it blocks said tool holder from insertion of a tool.

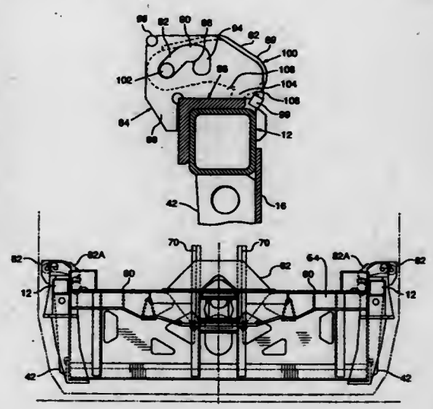
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**5,501,556**

## RETRACTABLE GUIDE ASSEMBLY FOR CHANGING THE EFFECTIVE WIDTH OF A RAILROAD FREIGHT CAR CONTAINER WELL

**Ronald S. Butcher, 607 Geneva Park Drive, Burlington, Ontario, and James W. Forbes, 485 Red River Drive, Waterloo, Ont., both of, Canada**

**Division of Ser. No. 225,383, Apr. 8, 1994. This application Mar. 31, 1995, Ser. No. 414,085**
**Int. Cl.[6] B60P *1/00*; B61D *45/00***
**U.S. Cl. 410—94** **8 Claims**



1. A retractable guide assembly for changing the effective width of a container well of a railroad freight car, said guide assembly comprising,

a housing having a pair of spaced apart walls, said walls each having an inverted U-shaped slot,

a guide slidably mounted between said walls for translational movement relative to said housing, said guide slidable between a retracted position and an extended position in which a portion of said guide projects beyond said housing, said guide having a bar for extending through each slot of said walls for travelling therealong in a camming relationship as said guide slides between the retracted position and extended position.

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**5,501,555**

## BLOCKING DEVICE FOR TOOL HOLDER OF HAND POWER TOOL AND HAND POWER TOOL PROVIDED THEREWITH

**Ulrich Mnetschele, and Harald Schindler, both of Stuttgart, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany**

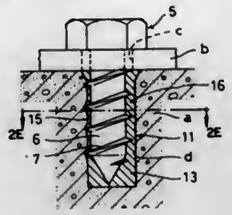
**Filed Feb. 15, 1995, Ser. No. 388,747**
**Claims priority, application Germany, Feb. 26, 1994, 44 06 394.6**
**Int. Cl.[6] B23B *45/00*; E05B *73/00***
**U.S. Cl. 408—241 R** **22 Claims**

1. A combination of a tool holder and a blocking device for a hand power tool, comprising a tool holder; and a blocking device for said tool holder, said blocking device being connectable with

## 5,501,557
## SCREW FASTENER

**Takao Wakai, Higashiosaka, Japan, assignor to Wakai & Co., Ltd., Osaka, Japan**

**Filed Apr. 29, 1994, Ser. No. 235,660**
**Claims priority, application Japan, Apr. 30, 1993, 5-103921; Aug. 17, 1993, 5-203294**
**Int. Cl.[6] F16B *13/06***
**U.S. Cl. 411—55** **13 Claims**




1. A fastener assembly comprising: a screw fastener including a trunk having a cylindrical outer surface and a bore extending into said trunk from one end thereof, said bore having an axial center offset in the radial direction of the trunk from the center of the cylindrical outer surface of the trunk such that said bore is eccentric with respect to said outer surface, and such that said trunk has a first portion of a thickness, as measured in the radial direction of the bore that is greater than the thickness of a second portion of the trunk located diametrically across said bore from said first portion, and a head extending radially outwardly of said trunk at said one end thereof; and a screw for insertion into the bore of the trunk of said screw fastener; and the fastener assembly satisfying the following conditions:

$$d+\tfrac{1}{2}(D-d)>r+t_2$$

and

$$d+\tfrac{1}{2}(D-d)<r+t_1$$

wherein D is the major diameter of the thread of said screw, d is the minor diameter of the thread of said screw, r is the radius of said bore of the trunk of the screw fastener as measured in a cross-sectional plane of the trunk passing through said first and second portions of the trunk, $t_1$ is said thickness of the first portion of the trunk, and $t_2$ is said thickness of the second portion of the trunk, whereby when said screw fastener is fitted in a starting hole in a wall and said screw is screwed into said screw fastener, a first portion of the thread of said screw penetrates said second portion of the trunk of the screw fastener so as to bite into the wall whereas a second portion of the thread of said screw embeds in said first portion of the trunk of the screw fastener.

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## 5,501,558
## ANTI-FRICTION TEE-NUT WITH DEFLECTED EDGES

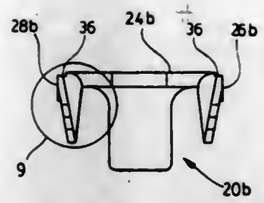
**Siegfried Figge, Holland Landing, and Martin K. Leistner, Toronto, both of, Canada, assignors to Sigma Tool & Machine, Scarborough, Canada**

**Filed Aug. 25, 1994, Ser. No. 295,389**
**Int. Cl.[6] F16B *37/00***
**U.S. Cl. 411—176** **1 Claim**

1. An anti-friction Tee-nut for use in Tee-nut setting machines having a Tee-nut feed mechanism and comprising;

a threaded sleeve portion;

a flat planar flange portion extending substantially normal to said threaded sleeve portion around one end thereof, said flange portion defining upper and lower surfaces in respective upper and lower planes, said threaded sleeve portion extending downwardly from said lower surface of said flange portion and said flange portion having side portion on either side which are planar and are adapted to be received in said feed mechanism of a setting machine, and,



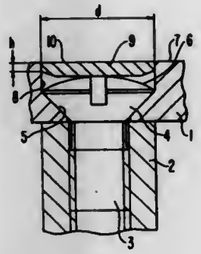

leading and trailing end flange edge portions, and said upper surfaces of said leading and trailing end flange edge portions being deflected downwardly out of said upper plane of said upper surface of said flange portion and deflection extending transversely from side to side of said leading and trailing end edge portions of said flange portion and wherein said deflected flange edge portions comprise depressions formed transversely along said leading and trailing end edges from side to side of said flange portions.

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## 5,501,559
## SCREW CONNECTION FOR JOINING TWO COMPONENTS

**Harald Lenherr, Beringen, Switzerland, and Franz Strohner, Büsingen, Germany, assignors to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland**

**Filed Sep. 23, 1994, Ser. No. 311,673**
**Claims priority, application Switzerland, Jan. 1, 1993, 2958/93**
**Int. Cl.[6] F16B *19/00;33/00***
**U.S. Cl. 411—373** **14 Claims**




1. A screw connection comprising

(a) a first component having

(1) an outer surface; and

(2) a countersunk bore extending from said surface and having a cylindrical portion adjoining said outer surface;

(b) a second component adjoining said first component;

(c) a screw passing through said countersunk bore and extending into said second component for joining together said first and second components; said screw including a screw head having an end face being recessed relative to said outer surface; said end face having a tool-receiving part; and

(d) a disk press-fitted into said cylindrical portion; said disk having a surface oriented toward said end face; said surface of said disk further having a center part being in one of a direct and indirect contact with said end face and a circumferential marginal part being at a clearance from said end face; said clearance being of sufficient dimensions for allowing an angular displacement of said disk about said contact, whereby an externally applied pressing force on said disk at a disk location spaced from said center part causes a rocking motion of said disk.

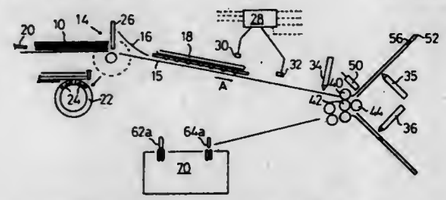


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## 5,501,560
## MAILABLE DOCUMENTS, APPARATUS AND METHOD

**Robert H. Blume, The Old Forge, 41 Park Road, Hartwell, Northamptonshire, England**

**PCT No. PCT/GB93/00283, § 371 Date Oct. 8, 1993, § 102(e) Date Oct. 8, 1993, PCT Pub. No. WO93/15990, PCT Pub. Date Aug. 19, 1993**
**PCT Filed Dec. 9, 1993, Ser. No. 129,202**
**Claims priority, application United Kingdom, Feb. 12, 1992, 9202958**
**Int. Cl.[6] B42C *9/00***
**U.S. Cl. 412—37** **10 Claims**



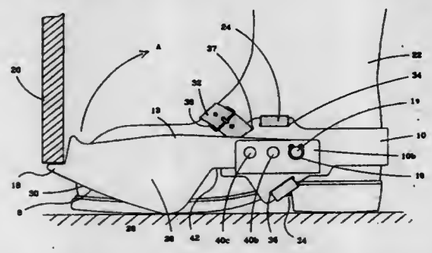

1. Mailing apparatus for a pre-printed sheet (10) characterised by transport means (15,18) to move the sheet past first adhesive applicators (34) spaced transversely across the direction of sheet feed (A), first gripping means (40,42) to direct the sheet leading edge towards a first buckle chute (52) whereby to form a first sheet bulge (1), second gripping means (42,44) to engage the first sheet bulge to withdraw a portion of the sheet past second adhesive applicators (35) spaced transversely across the direction of sheet withdrawal from the first buckle chute, the second gripping means directing the first bulge towards a second buckle chute whereby to form a second bulge (2), third gripping means (42,46) to engage the second bulge and withdraw a different portion of the sheet from the second buckle chute past third adhesive applicators spaced transversely across the direction of sheet withdrawal from the second buckle chute.

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## 5,501,561
## FOOT MOUNTABLE DRYWALL POSITIONING DEVICE

**Lawrence H. Wulff, Site 18, Comp. 7, R.R. #4, Vernon, British Columbia, Canada**

**Filed Jan. 23, 1995, Ser. No. 377,286**
**Claims priority, application Canada, Jan. 21, 1994, 2113949**
**Int. Cl.[6] E04G *21/16***
**U.S. Cl. 414—11** **4 Claims**




1. A foot mountable drywall positioning device comprising a drywall positioning lever pivotally mounted to means for releasably securing said lever to a boot, said lever rotatable between a lowered drywall engaging position and a raised position, said lever rotatable about pivot means on said means for releasably securing said lever to a boot,

said drywall lever comprising a first "U"-shaped bracket having an apex end, opposed ends opposite said apex end, and a fulcrum between said apex end and said opposed ends,

said apex end having means for releasably engaging a sheet of drywall,

said opposed ends pivotally connected to said pivot means on said means for releasably securing said lever to a boot,

said fulcrum comprising opposed elongated rocker surfaces depending downwardly from said first "U"-shaped bracket rearwardly of said apex end so as to be engagable with a floor surface when said lever is in said lowered drywall engaging position,

and said pivot means disposed on either side of a boot, in proximity to a heel on said boot, when said foot mountable drywall positioning device is mounted on said boot,

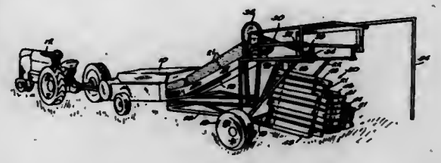
whereby when said fulcrum is engaged with said floor surface said lever may be rotated about said opposed elongated rocker surfaces by lowering said means for releasably securing said lever to a boot to thereby raise said apex end and said drywall sheet releasably engaged thereon.

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## 5,501,562
## HAY BALE STACKER

**Lawrence Zimmerman, 1156 180th Ave., New Richmond, Wis. 54017**

**Filed Mar. 20, 1995, Ser. No. 405,743**
**Int. Cl.[6] B65G *57/32***
**U.S. Cl. 414—111** **5 Claims**



1. In a machine for stacking rectangular hay bales emerging from a hay baler in pyramidal stacks of six bales, said machine being adapted to being towed behind a baler and including a chute for receiving a row of bales from a baler discharge chute,

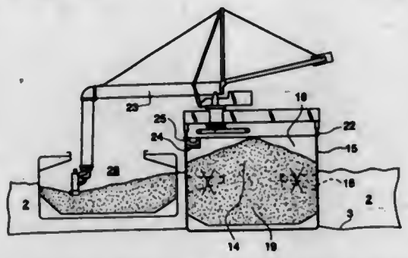
said machine further comprising a pivoting drop table to serially drop and rotate said bales 90° about an axis extending centrally along the longest dimensions of said bales, said table having a horizontal position for successively receiving each of said bales and being pivotable about a pivot axis along one side thereof to a dropped position for discharge of said bales,

a supporting bed for receiving said bales into three rows from said pivoting table, said bed being provided with a side panel and a pair of separator panels for separating rows of bales in said stack, said separator panels being tiltable for orienting said bales into a pyramidal stack,

said machine being mounted for towing on an axle having a wheel at each end, and said bed being pivotable from a substantially level position wherein said bales are collected, to a rearwardly dropped position for discharge of said bales onto a field in a pyramidal stack, the improvement comprising;

said separator panels being oriented at an oblique angle relative to the line of travel of said machine whereby slippage of said bales from between said panels is facilitated.

**5,501,563**
**BULK MATERIAL LOADING AND UNLOADING FACILITY FOR SEA-GOING SHIPS**
**Hartmut Grathoff, Wendelstein, Germany, assignor to Man Gutehoffnungshutte, Oberhausen, Germany**
**Filed Jan. 27, 1994, Ser. No. 187,615**
**Claims priority, application Germany, Feb. 6, 1993, 43 03 481.0**
**Int. Cl.[6] B63B 27/22**
**U.S. Cl. 414—137.1** **13 Claims**

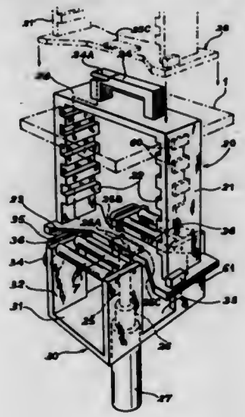


7. A method for creating a bulk material loading and unloading facility for seagoing ships transporting bulk material, the method comprising the steps of:
providing a scrapped cargo ship;
adding a raised wall structure to said scrapped cargo ship, said raised wall structure extending above a waterline when said scrapped cargo ship is sunk;
sinking said scrapped cargo ship onto a bottom of a body of water;
attaching rails to said scrapped cargo ship;
providing a bulk material loading and unloading device traveling on said rails.

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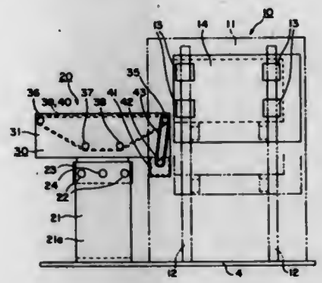
**5,501,564**
**SYSTEM FOR THE STORAGE AND TRANSPORTATION OF FLAT OBJECTS SUCH AS EXTRA-FLAT BOXES AND ITS PORTABLE RACK**
**Claude Doche, Claix, France, assignor to Commissariat a l'Energie Atomique, France**
**Filed Oct. 1, 1993, Ser. No. 131,211**
**Claims priority, application France, Jan. 16, 1992, 92 12424**
**Int. Cl.[6] B65G 1/04**
**U.S. Cl. 414—331** **8 Claims**

1. A system for storage and transportation of flat objects (1) for supplying at least one location (6) with objects (1), said objects being individually transported, said system comprising means for groupwise storage of flat objects (1), means for individual transportation of the flat objects (1) stored in the storage means and constituting a bidirectional conveyor having two tracks moving in two opposite directions, means for distribution of the flat objects (1) transported by the transporting means and wherein, the transporting means include displacement modules (4) having an elementary portion of each track, the distribution means include distribution modules (5), the means for the groupwise storage of the flat objects (1) are constituted by modules for storing the objects (1) each incorporating a portable rack (20) having a frame structure (21) comprising a base (2), a narrow central part (28), an upper part (29), and having shelves (22) located within the structure (21) for receiving the flat objects (1), and a handle (24), a fixed structure (27), a chassis (30) constituted by two parallel, U-shaped uprights (32) at the top of which are provided at least two rollers (7) issuing to the outside of the uprights (32) by a driving wheel (36) itself receiving a belt (35) driven by a motor (34), said chassis (30) being vertically mobile in the fixed structure (27) and a piston (25) mobile and sliding in a hollow piston (26) integral with the chassis (30) for receiving the portable rack (20), all of the said modules (2, 4, 4A, 5) being juxtaposed in order to constitute the two tracks.



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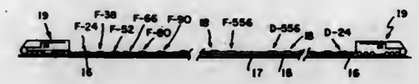
**5,501,565**
**DEVICE FOR STORING THIN PLATE-FORM PARTS**
**Noboru Fujino, and Hisashi Ueda, both of Tokyo, Japan, assignors to Kabushiki Kaisha Shinkawa, Tokyo, Japan**
**Continuation of Ser. No. 105,513, Aug. 11, 1993, abandoned. This application Jan. 4, 1995, Ser. No. 368,715**
**Claims priority, application Japan, Aug. 12, 1992, 4-236383**
**Int. Cl.[6] B65G 39/10**
**U.S. Cl. 414—331** **2 Claims**



1. A device for storing thin plate-form parts comprising: (a) an elevator which is raised and lowered and also carries and positions a storing magazine that receives thin plate-form parts; and (b) a loading conveyor which conveys thin plate-form parts, that have been conveyed from a transporting conveyor, toward said storing magazine; and wherein a loading conveyor driving means is installed so that said driving means moves said loading conveyor in a horizontal direction and perpendicular to a conveying direction of said thin plate-form parts; and further comprising:
a control means including a memory means into which parameter data indicative of a width of said plate-form parts and a thickness of a side plate of said storing magazine and offset data indicative of a position of said loading conveyor and a position of an inner surface of said side plate of said storing magazine are loaded, said control means for controlling said loading conveyor driving means in response to values of said parameter data and offset data.



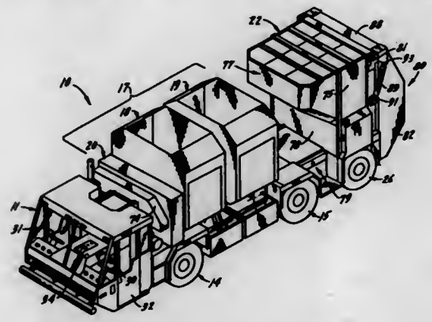
**5,501,566**
**SYSTEM FOR POSITIONING AND SUPPORTING TRAILERS ON RAILCARS**
**Thomas H. Engle, R.D. 2, Cape Vincent, N.Y. 13618**
**Continuation of Ser. No. 178,801, Jan. 7, 1994, Pat. No. 5,452,982, which is a continuation-in-part of Ser. No. 581,328, Sep. 12, 1990, Pat. No. 5,112,172. This application Apr. 21, 1995, Ser. No. 403,955**
**Int. Cl.[6] B65G 63/00**
**U.S. Cl. 414—333** **9 Claims**



1. A system for positioning and supporting trailers on a train having a plurality of railroad cars using a tractor, comprising:
a plurality of stanchion means spaced along said train for receiving and securing a trailer to said train;
a plurality of unique position indicating indicia each indicating a linear distance of one of a plurality of stanchion positions from a common reference point on said train to allow selection of one of said indicia and positioning of a trailer on a stanchion means at said selected indicia: and
means for determining the indicium of a second stanchion means' position as a function of the indicium of a first stanchion means' position to which a first trailer is secured and the length of a second trailer to be secured to said second stanchion.

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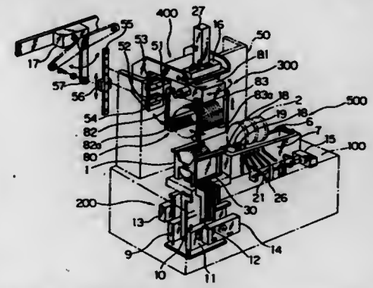
**5,501,567**
**REFUSE VEHICLES**
**Daniel J. Lanzdorf, Pickett; Thomas H. Betters, Appleton; Eric E. Braun, Oshkosh; Chad O. Konop, Oshkosh, and James L. Steiner, Oshkosh, all of Wis., assignors to Oshkosh Truck Corporation, Oshkosh, Wis.**
**Continuation-in-part of Ser. No. 879,761, May 6, 1992, abandoned. This application Mar. 10, 1993, Ser. No. 29,115**
**Int. Cl.[6] B60P 1/28**
**U.S. Cl. 414—408** **11 Claims**



1. In combination in a refuse/recycler vehicle,
an integrated chassis vehicle, including, firstly,
a main chassis having front wheel means and rear wheel means including a rear drive axle,
at least one recycling bin having enclosing walls and a floor on the main chassis for recyclable materials,
means for curbside loading of the recyclable materials to the recycling bin,
means for unloading the recycling bin, and
secondly, a tag axle chassis (having wheel means, said wheel means including a tax axle,)
said tag axle chassis being rigidly secured to the main chassis to form (an) a rigid integrated chassis,
said tag axle chassis having wheel means continuously in contact with the ground, said wheel means including a tag axle, said tag axle chassis wheel means being located generally rearwardly of the rear wheel means of the main chassis and being effective to assume load as the integrated chassis moves downwardly as the load on the vehicle increases,
a refuse body mounted on the tag axle chassis, said refuse body having at least a floor, containment wall means extending upwardly from the floor and discharge means, and
motive means mounted on the main chassis for propelling the vehicle and providing power to unload the recycling bin and the refuse body.

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**5,501,568**
**WAFER ALIGNING APPARATUS**
**Tosio Ono, Nishigoshi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**
**Filed Jun. 28, 1994, Ser. No. 266,748**
**Claims priority, application Japan, Jul. 1, 1993, 5-163656**
**Int. Cl.[6] B65G 65/02**
**U.S. Cl. 414—417** **20 Claims**

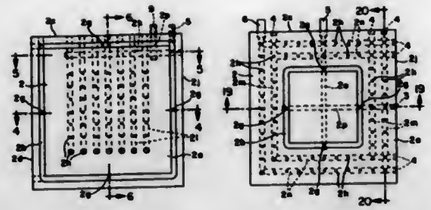


1. A wafer aligning apparatus comprising:
a plurality of wafer retaining plates, each retaining plate having a plurality of distinct retaining portions for retaining a plurality of wafers spaced from each other in a noncontacting relationship;
guide means for guiding said wafer retaining plates; and
retaining plate transferring means for transferring said plurality of wafer retaining plates along said guide means wherein, when said plurality of wafer retaining plates are at a first end of said guide means, said plates are aligned at a first pitch, and, when said plurality of wafer retaining plates are at a second end of said guide means, said plates are aligned at a second pitch different from the first pitch.

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**5,501,569**
**NON-CONTACT TYPE MOVING TABLE**
**Nobuto Yamazaki; Minoru Torihata, and Shinji Maki, all of Tokyo, Japan, assignors to Kabushiki Kaisha Shinkawa, Tokyo, Japan**
**Division of Ser. No. 101,847, Aug. 4, 1993, Pat. No. 5,439,341. This application Jan. 13, 1995, Ser. No. 372,880**
**Claims priority, application Japan, Aug. 4, 1992, 4-227975**
**Int. Cl.[6] F16C 32/06**
**U.S. Cl. 414—676** **1 Claim**

1. A non-contact type XY moving table for a semiconductor processing machine comprising:
a guide table having a guide surface which is a plane, top surface thereof; and
a moving table provided on said guide table, said moving table having a moving surface which faces said guide surface of said guide table; and wherein



a plurality of vacuum suction holes are provided circumferentially on said moving surface;

a source of vacuum is coupled to said plurality of vacuum suction holes such that vacuum suction is executed from said moving surface;

an air supply groove and a plurality of air supply holes are provided on an inner area of said moving surface surrounded circumferentially by said plurality of said vacuum suction holes;

a source of compressed air is coupled to said plurality of air supply holes and air supply groove so that compressed air is supplied from said moving surface to said guide surface; and

so that a single-plane, non-contact rigid bearing is provided between said guide surface of said guide table and said moving surface of said moving table.

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**5,501,570**

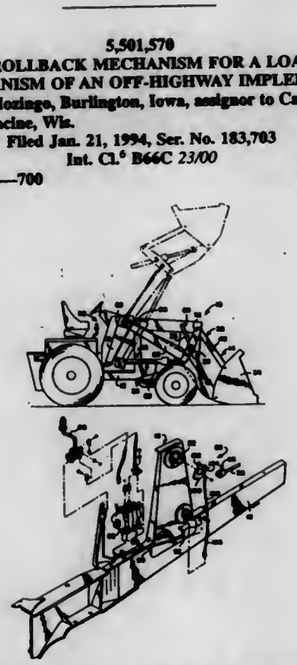
**ANTI-ROLLBACK MECHANISM FOR A LOADER MECHANISM OF AN OFF-HIGHWAY IMPLEMENT**

**Robert E. Mozingo, Burlington, Iowa, assignor to Case Corporation, Racine, Wis.**

**Filed Jan. 21, 1994, Ser. No. 183,703**

**Int. Cl.[6] B66C *23/00***

**U.S. Cl. 414—700** **14 Claims**



1. An off-highway implement having a fore-and-aft extending frame, a loader mechanism connected to the frame for generally vertical movements relative to the frame, said loader mechanism including a pair of loader arms pivotally attached to the frame toward one end thereof and having a bucket pivotally attached between and toward a second end of the arms, a powered mechanism operatively associated with said loader mechanism to effect movement thereof, said powered mechanism including a first linear actuator interconnecting said loader arms and said frame to effect said generally vertical movements of the loader arms and a second linear actuator interconnecting said loader arms and said bucket for controlling pivotal movements of the bucket relative to the loader arms, and a control mechanism operatively associated with said powered mechanism for controlling the linear actuators, said control mechanism comprising a controller connected to the frame to allow movement of an elongated handle about first and second pivot axes in both longitudinal and transverse directions, respectively, a valve body including a first valve interposed between said first actuator and a power source and connected through a first linkage to said controller for operating said first actuator in response to longitudinal movements of said handle about said first axis, and a second valve interposed between said second actuator and said power source and connected through a second linkage to said controller for operating said second actuator in response to transverse movements of said handle about said second axis, and an anti-rollback mechanism responsive to elevational movements of said loader arms for automatically positioning said second valve and thereby effecting operation of said second actuator to maintain said bucket in a generally level disposition as the loader arms are raised through a predetermined angle relative to the frame, and wherein said anti-rollback mechanism includes an anti-rollback shaft mounted on the frame of the implement and having a longitudinal axis about which said shaft rocks for transferring motion over a fore-and-aft extended distance, with a first end of said anti-rollback shaft being coanected to a control member which rocks said anti-rollback shaft about said axis as the loader arms are raised through said predetermined angle relative to said frame, and with a second end of said anti-rollback shaft being adapted to move said second linkage thereby effecting operation of said second actuator to maintain said bucket at a generally level disposition as the loader arms are raised through said predetermined angle relative to said frame.

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**5,501,571**

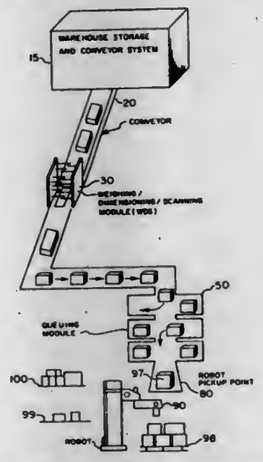
**AUTOMATED PALLETIZING SYSTEM**

**William Van Durrett; Gerald W. Hieronymus; Marguerite A. Pond; Todd D. Price; Margaret L. S. Scurry, all of Charlotte, and William C. Steene, Gastonia, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jan. 21, 1993, Ser. No. 7,646**

**Int. Cl.[6] B65G *57/26***

**U.S. Cl. 414—786** **12 Claims**




8. A method for automatically palletizing cartons on a pallet without a priori knowledge of the cartons to be palletized, using a robot to pick cartons from a conveyor carrying the cartons to the robot, said method comprising the steps of:

detecting each carton as said carton moves onto the conveyor;

weighing each carton as said carton moves onto the conveyor to produce weight data;

measuring the dimensions of each carton as said carton moves onto the conveyor to obtain dimensional data;

building a computer file of weight data and dimensional data of each carton on the conveyor;

utilizing an expert system to continuously map the best loading sequence and optimal location of the cartons on a pallet;

reordering up to a predetermined number of the cartons on the conveyor to permit the sequence of loading mapped by said expert system; and

loading the cartons onto a pallet with the robot in the sequence and locations mapped by the expert system.



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**5,501,572**

**INLET HOUSING FOR CENTRIFUGAL PUMPS**

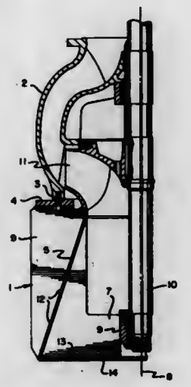
**Gérard Lefebvre, Annecy Cedex, France, assignor to KSB Aktiengesellschaft, Frankenthal, Germany**

**Filed May 3, 1994, Ser. No. 237,030**

**Claims priority, application Germany, May 3, 1993, 43 14 478.0**

**Int. Cl.[6] F04D *29/70***

**U.S. Cl. 415—121.2** **11 Claims**



1. A centrifugal pump comprising:

a pump housing having a flange connected thereto;

an inlet housing having an inlet opening, said inlet housing being connected to said flange remote from said inlet opening, said inlet housing including an inlet funnel, said inlet funnel defining said inlet opening which is disposed about a central axis of said pump, said inlet funnel having a perforated sidewall, said inlet funnel extending from adjacent to said flange to adjacent to said inlet opening.

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**5,501,573**

**SEGMENTED SEAL ASSEMBLY AND METHOD FOR RETROFITTING THE SAME TO TURBINES AND THE LIKE**

**William P. Sanders, Aurora, Canada, assignor to Steam Specialties, Inc., Burnt Hills, N.Y.**

**Continuation of Ser. No. 11,190, Jan. 29, 1993. This application Oct. 19, 1994, Ser. No. 326,068**

**Int. Cl.[6] F01D *5/20;11/08***

**U.S. Cl. 415—173.5** **9 Claims**

1. A segmented seal assembly for retrofitting existing turbine units, the assembly comprising:

a plurality of semicircular arcuate seal ring segments disposed between a turbine casing and moving blades of a turbine shaft, each segment being configured for cooperation with an inner surface of the unit, the inner surface being a portion of the casing;

at least one threaded fastener for mounting each segment to the inner surface, whereupon assembly of the segments into a seal ring, fluid flow over the moving blades is limited:

a first cover band mounted to an outer surface of the moving blades so as to limit fluid flow over the blades and protect the blades and seal from damage due to contact between them; and

a second cover band mounted to the first cover band, the first and second cover bands being secured to the blades, the first cover band having a projection oriented so as to confine the fluid flow to a selected flow path along the moving blades, each cover band being one piece and circumferentially continuous.

5. A method for retrofitting existing turbine units with a segmented arcuate seal ring assembly, which comprises the steps of:

a. disposing a segment of the assembly between a turbine casing and moving blades of a turbine shaft, each segment being configured for cooperation with an inner surface of the unit, the inner surface being a portion of the nozzle block of the turbine unit;

b. mounting the segment to the inner surface using at least one threaded fastener so as to limit fluid flow over the moving blades;

c. mounting a first cover band to an outer surface of the moving blades so as to limit fluid flow over the blades and protect the blades and seal from damage due to contact between them; and

d. mounting a second cover band to the first cover band so as to further limit fluid flow over the blades and protect the blades and seal from damage due to contact between them, the first cover band having a projection oriented so as to confine the fluid flow to a selected flow path along the moving blades, each cover band being one piece and circumferentially continuous.

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**5,501,574**

**BLOOD PUMP**

**Donald A. Raible, Santa Ana, Calif., assignor to Baxter International Inc., Deerfield, Ill.**

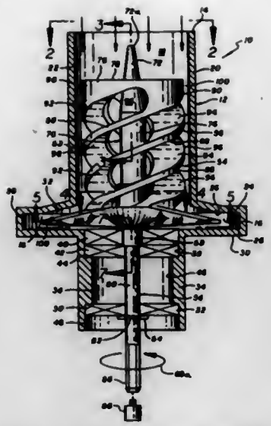
**Continuation of Ser. No. 83,405, Jun. 28, 1993, Pat. No. 5,368,438. This application Nov. 10, 1994, Ser. No. 336,964**

**The portion of the term of this patent subsequent to Nov. 29, 2011, has been disclaimed.**

**Int. Cl.[6] F04D *1/08***

**U.S. Cl. 415—74** **10 Claims**

1. A liquid pump comprising:



a housing defining an inlet, an outlet, and a flow path extending between the inlet and outlet for communicating a flow of liquid through said housing;

a rotor member journaled in said flow path, said rotor member impelling said flow of liquid in response to rotation of said rotor member, said rotor member including:

(a) plural helical fluid transport flutes defining an entrance recess and each helical flute extending axially from said entrance recess, said helical flutes cooperatively defining a like plurality of helical pumping channels opening radially outwardly and helically from said entrance recess;

(b) an axially extending bore defined by said helical flutes within said rotor member, said bore having a central axis;

(c) a core member rotating with said rotor member being received into and extending through said bore of said rotor member along the central axis of said bore, said core member being separate from said helical flutes; and

(d) wherein the liquid flows from said entrance recess axially down said helical flutes to said outlet.

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**5,501,575**

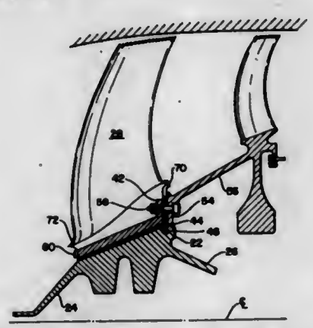
**FAN BLADE ATTACHMENT FOR GAS TURBINE ENGINE**

**David A. Eldredge, Port St. Lucie, Fla., and Robert A. Ress, Jr., Carmel, Ind., assignors to United Technologies Corporation, Hartford, Conn.**

**Filed Mar. 1, 1995, Ser. No. 396,842**

**Int. Cl.[6] F01D** *5/32*

**U.S. Cl. 416—144** **19 Claims**



1. Attachment means for a rotor having a disk and a plurality of circumferentially spaced blades, said disk having, a fore end, and aft end, and a rim area including a plurality of cicumferentially spaced axially sloped slots formed in said rim area, a flange radially extending from said rim area adjacent one end of each of said plurality of sloped slots, an annular retainer plate having a fore face and aft face, a portion at the inner diameter of said annular retainer plate fitted into an annular groove formed in said disk, a portion of said fore face extending radially beyond said annular groove bearing against said flange, an axially disposed support structure bearing against a portion of said aft face, and means for attaching said annular retainer plate to said flange and said support structure whereby the axial loads produced by said blades during rotation of said disk are reacted by said annular retainer plate so that said blade can be configured to have a low bub to tip ratio for high speed rotation.

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**5,501,576**

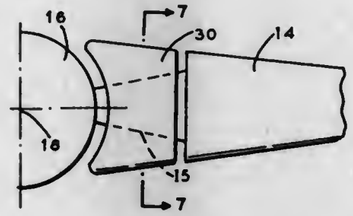
**STATIC EFFICIENCY ENHANCER FOR AXIAL FANS**

**Robert C. Monroe, Houston, Tex., assignor to Hudson Products Corporation, Houston, Tex.**

**Continuation of Ser. No. 243,359, May 16, 1994, abandoned, which is a division of Ser. No. 109,888, Aug. 23, 1993, Pat. No. 5,328,335. This application May 18, 1995, Ser. No. 443,606**

**Int. Cl.[6] F01D** *5/12*

**U.S. Cl. 416—239** **8 Claims**



1. A static efficiency enhancer for an axial fan having a hub and a plurality of blades extending radially outwardly from the hub, the enhancer comprising:

each blade having a neck connected to the hub;

a plurality of airfoils extending outwardly from the hub to provide additional air velocity at the periphery of the hub, each airfoil having a concave surface and an opposite convex surface;

each airfoil encircling the neck of a respective blade; and

the hub being a flat disc-shape and the airfoils enlarging an area of work done with enhanced static efficiency toward the hub.

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**5,501,577**

**GAS OPERATED PUMP LEAK PREVENTER**

**Gary L. Cornell, 23623 Narcissus Cir., Moreno Valley, Calif. 92557, and Donald G. Vise, 4737 E. Mineral Rd., Phoenix, Ariz. 85044**

**Filed Dec. 19, 1994, Ser. No. 359,059**

**Int. Cl.[6] F04B** *49/10;* **F01B** *1/00*

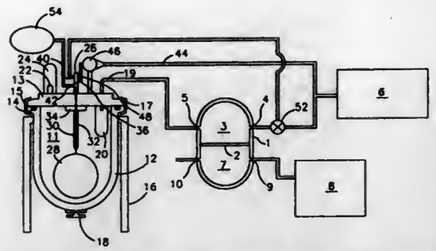
**U.S. Cl. 417—9** **19 Claims**

1. A method for detecting and containing a liquid leak in a compressed gas-operated, liquid pumping diaphragm pump, and for stopping the operation of the pump when such leak is detected, the pump having a gas inlet, a gas exhaust port through which gas escapes from the pump, a liquid inlet and a liquid outlet, the method comprising the steps of:

connecting a source of regulated compressed gas to the gas inlet of the pump;

connecting the exhaust port to a vessel such that liquid entrained in the exhaust gas collects in the bottom of the vessel;





connecting the source of regulated compressed gas to a shutoff valve controlling the flow of gas to the pump inlet;

sensing the level of the liquid that accumulates in the bottom of the vessel; and

disconnecting the gas source from the shutoff valve when the sensed level reaches a predetermined value causing the shut-off valve to stop the flow of gas to the pump gas inlet resulting in the shut-down of the pump.

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**5,501,578**

**HYDROSTATIC AXIAL PISTON PUMP WITH THREE BEARING ARRANGEMENT**

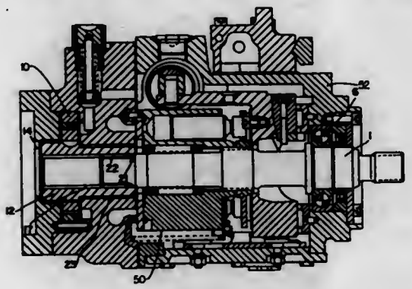
**Eckhard Skirde, Aukrug-Boken, Germany, assignor to Sauer Inc., Ames, Iowa**

**Continuation of Ser. No. 104,887, Aug. 10, 1993, abandoned. This application Feb. 3, 1995, Ser. No. 383,296**

**Claims priority, application Germany, Aug. 14, 1992, 42 27 037.5**

**Int. Cl.[6] F04B** *23/10*

**U.S. Cl. 417—199.1** **8 Claims**



1. In an axial piston pump for a closed circuit hydrostatic transmission having a housing, a shaft assembly in the housing drivingly connected to an axial piston rotating kit and to a charge pump, the shaft assembly including a main shaft having opposite ends and a charge pump shaft having opposite ends, one of the charge pump shaft ends being coaxially coupled to an end of the main shaft, the main shaft being drivingly connected to the axial piston rotating kit and the charge pump shaft being drivingly connected to the charge pump, the improvement comprising:

a bearing arrangement having only three bearings operatively mounted on the housing for completely rotatably supporting the shaft assembly;

said bearing arrangement including of a first bearing mounted in the housing and located at an end of the main shaft remote from the charge pump shaft for supporting the shaft assembly for rotation in the housing, a second bearing operatively mounted on the housing and located at the end of the charge pump shaft remote from the main shaft for supporting the charge pump shaft for rotation, and a third bearing operatively mounted on the housing and aligned with the coaxially coupled ends of the charge pump shaft and main shaft such that the charge pump shaft and main shaft are simultaneously supported for rotation.

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**5,501,579**

**AXIAL MULTI-PISTON COMPRESSOR HAVING ROTARY VALVE FOR ALLOWING RESIDUAL PART OF COMPRESSED FLUID TO ESCAPE**

**Kazuya Kimura; Chuichi Kawamura; Masafumi Ito, and Yoshihiro Makino, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan**

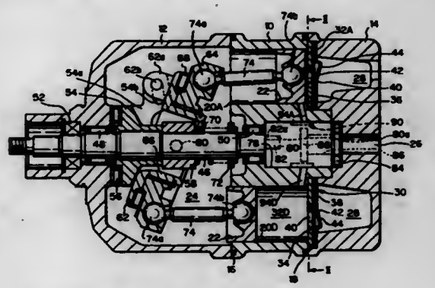
**Filed Oct. 5, 1993, Ser. No. 132,116**

**Claims priority, application Japan, Jan. 5, 1992, 4-266190**

**The portion of the term of this patent subsequent to Jan. 31, 2012, has been disclaimed.**

**Int. Cl.[6] F04B** *1/12*

**U.S. Cl. 417—269** **5 Claims**



1. An axial multi-piston compressor comprising:

a drive shaft;

a cylinder block having cylinder bores formed therein and surrounding said drive shaft;

a plurality of pistons slidably received in the respective cylinder bores;

a conversion means for converting a rotational movement of said shaft into a reciprocation of each piston in the corresponding cylinder bore such that a suction stroke and a discharge stroke are alternately executed therein, a fluid being introduced into said cylinder bore during the suction stroke, and during the compression stroke, the introduced fluid being compressed and discharged from said cylinder bore so that a residual part of the compressed fluid remains in said cylinder bore when the compression stroke is finished; and

a valve means for allowing the residual fluid to escape from said cylinder bore a predetermined time after the suction stroke is initiated in the cylinder bore into a second cylinder bore, and wherein said valve means comprises a rotary valve joined to said drive shaft to be rotated together therewith and having a groove in the form of a closed loop formed in a peripheral surface thereof, and during the rotation of said rotary valve, a communication between the cylinder bores is established by said groove.

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**5,501,580**

**PROGRESSIVE CAVITY PUMP WITH FLEXIBLE COUPLING**

**Donald J. Barrus, Los Alamitos, and Steven K. Tetzlaff, Riverside, both of Calif., assignors to Baker Hughes Incorporated, Houston, Tex.**

**Filed May 8, 1995, Ser. No. 437,205**

**Int. Cl.[6] F04B** *17/00;* **F01C** *1/10*

**U.S. Cl. 417—410.3** **6 Claims**

1. In a pump assembly having a progressive cavity pump with a stator and a rotor, a motor which rotates a drive shaft for rotating



the rotor in orbiting motion, an improved coupling between the motor and the pump, comprising:

a connector shaft having a splined rotor end and a splined drive shaft end;

a rotor coupling connected to the rotor for orbiting movement therewith and having an internal splined receptacle which slides over the rotor end of the connector shaft to cause the rotor end of the connector shaft to orbit in unison with the rotor;

a drive shaft coupling connected to the drive shaft and having an internal splined receptacle which slides over the drive shaft end of the connector shaft; and

a guide means for restraining the drive shaft from orbiting motion, the connector shaft having sufficient flexibility to accommodate the orbiting movement of its rotor end.

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**5,501,581**

**MAGNETIC FLUID PUMP AND A METHOD FOR TRANSPORTING FLUID USING THE SAME**

**Woo-sung Han, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea**

**Continuation of Ser. No. 121,376, Sep. 15, 1993, abandoned. This application Feb. 24, 1995, Ser. No. 394,218**

**Claims priority, application Rep. of Korea, Dec. 15, 1992, 92-24364**

**Int. Cl.[6] F04B** *17/00;35/04*

**U.S. Cl. 417—415** **11 Claims**

1. A pump comprising:

a pipe;

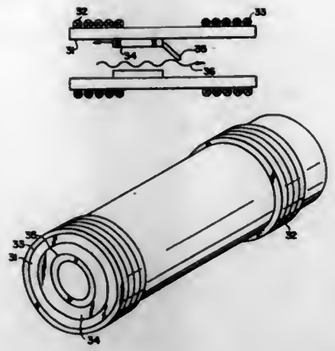
a first coil formed on a first outer surface of a first predetermined section of said pipe;

a second coil formed on a second outer surface of a second predetermined section of said pipe apart from said first predetermined section of said pipe;

a single reciprocatable hollow cylinder having an outer cylindrical surface, said single reciprocatable hollow cylinder including:

an entire outer cylindrical surface of said single reciprocatable hollow cylinder being in close tolerance contact with an inner cylindrical surface of said pipe to prevent at least one of particle generation and particle accumulation between said inner cylindrical surface of said pipe and said outer cylindrical surface of said single reciprocatable hollow cylinder, and

a single valve which opens and closes a fluid path at an outlet of said single reciprocatable hollow cylinder; and said single reciprocatable hollow cylinder being reciprocated in said pipe by an application of a first electrical current to said first coil and said second coil, followed by an application of a second electrical current opposite said first electrical current, to said first coil and said second coil.



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**5,501,582**

**MAGNETICALLY DRIVEN CENTRIFUGAL PUMP**

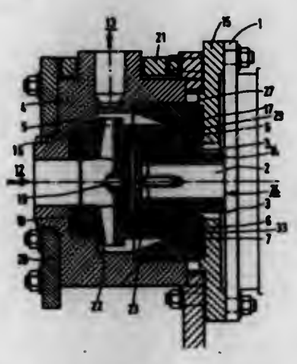
**Pascal Gautier, Grenoble; Gilles Braussen, Longeville les Metz; Bernard Gouthier, Thiaucourt; Ghislaine Deswert, Pagny-sur-Moselle, and Ernest Totino, Sainte Ruffine, all of, France, assignors to Le Carbone Lorraine, Courbevoie, France**

**Filed Jan. 24, 1995, Ser. No. 377,435**

**Claims priority, application France, Jan. 26, 1994, 94 01104**

**Int. Cl.[6] F04B** *17/00*

**U.S. Cl. 417—420** **15 Claims**



1. Magnetically driven centerifugal pump comprising:

a) a fixed assembly comprising a pump barrel made of a carbonaceous material and having an inlet port and an outlet port therein for flow of fluid therethrough, rigid annular bearings and a non-magnetic, non-electrically conductive sealing shell; and

b) a rotating assembly comprising an impeller made of a carbonaceous material, a cylindrical rotor made of a carbonaceous material and having sealed therein permanent tracking magnets which are thereby isolated from transported fluid, said rotor being fixed directly to the impeller to form an impeller-rotor assembly which rests on said annular bearings located at axial extremities of said impeller-rotor assembly, and a driver centerally located with respect to said impeller-rotor assembly and comprising magnets disposed for interacting with said permanent tracking magnets for rotating said impeller-rotor assembly, said sealing shell isolating said driver from said impeller-rotor assembly;

said impeller-rotor assembly comprising a secondary circuit for circulation of transported fluid including a space defined between said impeller-rotor assembly and said sealing shell.



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**5,501,584**

**SCROLL TYPE COMPRESSOR HAVING A PASSAGE FROM THE SUCTION CHAMBER TO A COMPRESSION POCKET**

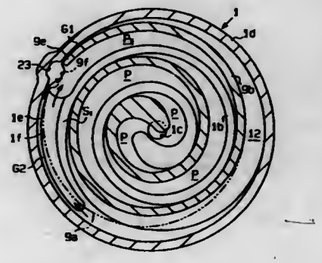
**Shinya Yamamoto; Kiyohiro Yamada; Tetsuhiko Fukanuma; Yasushi Watanabe; Shigeru Hisanaga, all of Kariya; Eiichi Nagasaku, Aichi, and Shigeki Iwanami, Okazaki, all of, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, and Nippondenso Co., Ltd., both of Kariya, Japan**

**Filed Oct. 14, 1994, Ser. No. 323,537**

**Claims priority, application Japan, Jan. 15, 1993, 5-258692**

**Int. Cl.[6] F04C** *18/04*

**U.S. Cl. 418—15** **10 Claims**



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**5,501,583**

**TURBO VACUUM PUMP**

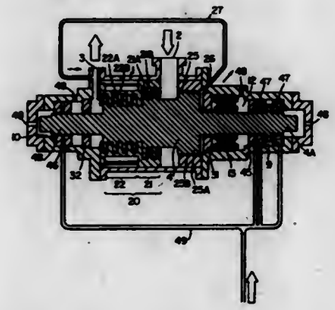
**Takashi Nagaoka, Tsukuba; Shinjiro Ueda, Abiko; Seiji Sakagami; Akira Nishiuchi, both of Ibaraki, and Hirofumi Sakurai, Hitachi, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Continuation-in-part of Ser. No. 103,806, Aug. 10, 1993, Pat. No. 5,380,171. This application Nov. 21, 1994, Ser. No. 345,440**

**Claims priority, application Japan, Aug. 19, 1992, 4-219992**

**Int. Cl.[6] F01D** *1/36*

**U.S. Cl. 417—423.4** **8 Claims**



1. A turbo vacuum pump comprising:

a housing provided with a suction port and a discharge port;

an evacuation pump housed in said housing and carried by a rotor for compressing a gas suctioned through said suction port and for discharging the compressed gas through said discharge port;

a motor including a rotor carried by said rotor of said evacuation pump for driving said evacuation pump;

bearing means for supporting opposite axial end portions of said rotor of said evacuation pump in said housing, wherein said bearing means includes a first part for supporting one axial end of said rotor and a second part for supporting the other axial end of said rotor, said first part of said bearing means including a radial gas bearing and a thrust gas bearing, said second part of said bearing means including a radial gas bearing; and

spiral grooved dynamic seal means provided in a vicinity of said suction port at an opposite side of said suction port to said evacuation pump.

1. A scroll type compressor including a fixed scroll provided in a housing having an inner wall, a connecting section connecting said fixed scroll to said housing, and a movable scroll eccentrically connected to a rotary shaft in the housing for performing an orbital movement without rotating about an axis thereof and opposed to said fixed scroll to define a plurality of pockets therebetween, the volume of each of said pockets being reduced in accordance with the orbital movement of said moveable scroll to compress refrigerant gas led into one of said pockets:

a suction chamber defined between said moveable scroll and said housing;

said fixed scroll having a fixed end plate and a fixed spiral element, said fixed spiral element having an inner end located substantially at a center of said housing and an outer end located adjacent to said inner wall of said housing;

said moveable scroll having a moveable end plate and a moveable spiral element;

said connecting section extending towards said inner wall of the housing from said outer end of said fixed spiral element and having an initial end which is thicker than said outer end of said fixed spiral element and a terminal end which is thinner than said outer end of said fixed spiral element, said connecting section having gradually decreasing thickness along the inner wall of the housing; and

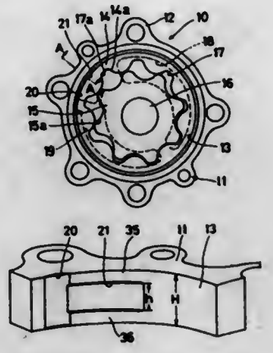
a passage provided in at least one of said housing, said connecting section and said moveable scroll, said passage guiding the refrigerant gas from said suction chamber to said one pocket for reducing any pressure difference between said suction chamber and the pocket when the refrigerant gas is introduced into the pocket, said passage including a first recess formed in the connecting section, said first recess having a depth decreasing substantially in proportion to the thickness of the connecting section for ensuring the strength of the connecting section.

5,501,585

## OIL PUMP HAVING A SEALING MECHANISM FOR A PUMPING CHAMBER

Tetsuyuki Ogawa, Handa, and Hideki Nakayoshi, Kariya, both of, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Nov. 28, 1994, Ser. No. 348,239
Claims priority, application Japan, Nov. 26, 1993, 5-297107
Int. Cl.[6] F01C 1/10
U.S. Cl. 418—171 4 Claims



1. An oil pump comprising:
a pump housing having a cylindrical portion;
an inner rotor rotatably disposed in the cylindrical portion;
an outer rotor rotatably disposed in the cylindrical portion, the outer rotor having lobes meshing with lobes of the inner rotor to form pumping chambers therebetween;
a suction port formed in the pump housing, the suction port communicating with at least one of the pumping chambers;
a discharge port provided in the pump housing, the discharge port communicating with at least one of the pumping chambers, wherein one of said pumping chambers is fluidically separated from both of said suction and discharge ports;
a first groove formed in a radially inner surface of the cylindrical portion and communicating with the discharge port;
a second groove formed in the radially inner surface of the cylindrical portion and directly communicating continuously with the first groove, the second groove being positioned at the circumferential location of said one of said pumping chambers which is fluidically separated from both of said suction and discharge ports; and
sealing surfaces formed at opposite axial sides of said second groove to prevent oil leakage from the second groove;
wherein said discharge port is facing the side surface of the inner rotor and the outer rotor, an outer edge of the discharge port positioning inside of the outer edge of the outer rotor has a portion against the first groove, and the first groove is directly connecting with the portion of the discharge port.

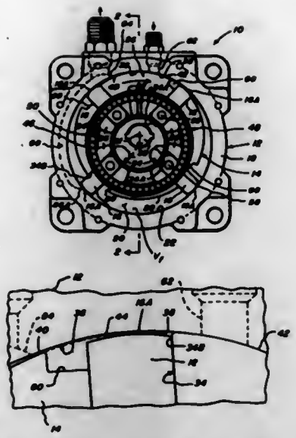
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5,501,586

## NON-CONTACT ROTARY VANE GAS EXPANDING APPARATUS

Thomas C. Edwards, 1426 Gleneagles Way, Rockledge, Fla. 32955

Filed Jun. 20, 1994, Ser. No. 262,408
Int. Cl.[6] F01C 1/00
U.S. Cl. 418—264 14 Claims



1. A non-contact rotary vane gas expanding apparatus for converting controlled expansion of gas to rotary motive power, said apparatus comprising:
(a) a stator housing including a primary bore having a primary surface curved concentrically around a stator axis and a secondary bore having a secondary surface curved concentrically about a rotor axis extending parallel to and spaced a preselected distance from said stator axis, said secondary surface intersecting said primary surface to form angularly spaced edge junctions on said stator housing being respectively leading and trailing with respect to one another and with reference to a predetermined direction of rotation within said stator housing;
(b) a rotor supported in said primary bore of said stator housing and having an outer surface curved concentrically around said rotor axis, said rotor axis being offset from said stator axis toward said secondary surface such that said outer surface of said rotor undergoes rotation about said rotor axis in eccentric relation to said primary surface and in concentric relation to said secondary surface, said rotor having a rotor radius and said secondary bore having a radius equal to said rotor radius plus a preselected gap clearance selected to be relatively small so as to provide a gas sealing function preventing respective gas flow adjacent to said rotor outer surface and stator secondary surface between said angularly spaced leading and trailing edge junctions thereof;
(c) means defining at least one slot defined in said rotor extending radially relative to said rotor axis and terminating at said outer surface of said rotor;
(d) means defining a gas receiving pocket in said rotor adjacent to each said radially extending slot at a trailing side thereof relative to the direction of rotation of said rotor;
(e) at least one vane, said vane being disposed in said slot of said rotor and being movable radially within said slot relative to said rotor and said rotor axis thereof, said vane having an outer tip surface spaced from said primary and secondary surfaces of said stator housing by a preselected clearance so as to provide a gas seal therewith preventing gas flow past said outer tip surface of said vane between said vane and said primary and secondary surfaces of said stator housing;
(f) means defining a gas inlet port in said stator housing open only into said secondary bore between said leading and trailing edge junctions on said stator housing; and
(g) means defining a gas outlet port in said stator housing open only into said primary bore and disposed at a preselected angular distance upstream from said leading edge junction on said stator housing such that said gas expanding apparatus can function as a motor and said rotor can function as a part of a rotary drive shaft when an initial volume of a gas under pressure is transferred through said secondary bore to said gas receiving pocket disposed adjacent to said trailing side of said vane via said gas inlet port when said vane is disposed proximate to said secondary bore, said initial volume of pressurized gas expanding thereafter and causing rotation of said rotor by the effect of said pressurized gas being applied on said trailing side of said rotor vane adjacent to said gas receiving pocket.

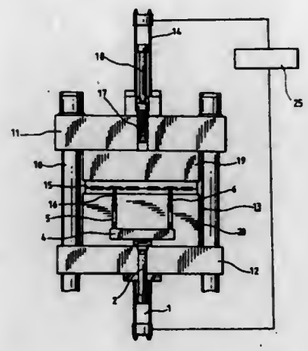


5,501,587

## MOLDING MACHINE FOR SEMICONDUCTOR PACKAGE

Nho K. Kwak, Incheon, Rep. of Korea, assignor to Han-Mi Mold & Tool, Co., Ltd., Incheon, Rep. of Korea

Filed Sep. 1, 1994, Ser. No. 299,901
Claims priority, application Rep. of Korea, Sep. 4, 1993, 93-17572
Int. Cl.[6] B29C 45/02;45/14
U.S. Cl. 425—116 2 Claims



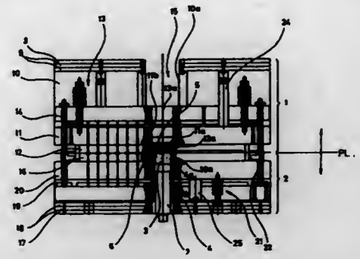
2. A molding machine for packaging a semiconductor said molding machine being adapted to interchangeably and selectively work with a first mold having an upper port for receiving a first molding resin and a first molding cavity communicating with said upper port and a second mold having a lower port for receiving a second molding resin and a second molding cavity communicating with said lower port comprising:
a fixed top plate member arranged in a substantially horizontal direction;
guiding rod means having at least one end thereof attached to said top plate member and being substantially perpendicular thereto;
a movable plate member movably mounted on said guiding rod means and being movable in an upward and downward direction towards and away from said fixed top plate member in a path controlled by said guiding rod means;
a first transfer rod arranged in said top plate member and having a flanger tip adapted to compress resin into said first molding cavity;
a first hydraulic cylinder adapted to move said first transfer rod to compress said resin into said first molding cavity when said transfer rod is moved downward;
a second transfer rod arranged in said movable plate member and having a flanger tip adapted to compress resin into said second molding cavity when said transfer rod is moved upwardly;
a second hydraulic cylinder arranged below said movable plate for selectively moving said movable plate and said second transfer rod upwardly and downwardly; and
a controller for selectively controlling the movement of said first and second hydraulic cylinders whereby when said first mold is arranged between said fixed and movable plates, resin is compressed into said first loading cavity by said first transfer rod moving downwardly and when said second mold is arranged between said fixed and movable plates, said resin is compressed into said second molding cavity by said transfer rod moving upwardly.

5,501,588

## MOLD FOR A SEMICONDUCTOR PACKAGE

Nho K. Kwak, Incheon, Rep. of Korea, assignor to Han-Mi Mold & Tool Co., Ltd, Rep. of Korea

Filed Apr. 17, 1995, Ser. No. 423,165
Claims priority, application Rep. of Korea, Apr. 22, 1994, 94-8542
Int. Cl.[6] B29C 45/02;45/14
U.S. Cl. 425—116 3 Claims



1. A mold for a semiconductor package comprising:
an upper mold mounted in an upper portion of a mold press, said upper mold forming an upper recess;
a lower mold mounted in a lower portion of the mold press, said lower mold forming a lower recess, said upper and lower molds forming at least one mold cavity therebetween;
a flange tip mounted to move in a port in one of the upper and lower molds;
a port fixing block configured to mount interchangeably in both the upper and lower recesses, said port fixing block mounted in the recess of said one of the molds in which the flange tip is mounted; and
a center block having a runner as a feeding passage for resin and for preventing a counter current of resin, said center block configured to mount interchangeably in both the upper and lower recesses, said center block mounted in the recess of the other of the molds.

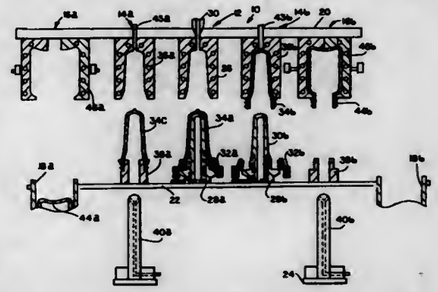
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5,501,589

## INJECTION BLOW MOLDING APPARATUS

Paul Marcus, 6 Bayberry Dr., Saddle River, N.J. 07458

Continuation-in-part of Ser. No. 224,042, Apr. 7, 1994, abandoned, and a continuation-in-part of Ser. No. 282,530, Jul. 28, 1994. This application Sep. 20, 1994, Ser. No. 309,103
Int. Cl.[6] B29C 49/64
U.S. Cl. 425—526 35 Claims



19. An injection blow molding apparatus having shortened injection molding cycles with extended cooling for increased production of selected oriented finished bottles, comprising:
a parison injection molding station having a parison injection mold and a first core rod assembly and a first neck mold

defining with the injection mold a cavity for forming the parison, means for introducing into the cavity molten resin under pressure to form the parison;

at least one cooling station having a cooling mold;

indexing means including the first core rod assembly and the first neck mold for moving the parison to the cooling station at which the parison is placed in the cooling mold for cooling the parison; the indexing means having means to thereafter remove the first core rod assembly and the first neck mold from the parison and leave the parison in the cooling mold for further cooling and move the first core rod assembly and the first neck mold back to the injection molding station;

an orient-stretch blow molding station for stretching and blowing the parison into an oriented finished bottle;

the indexing means including a transfer bushing to remove the parison from the cooling station and transfer it to the orient-stretch blow molding station when the first core rod is moved to the cooling station;

an ejection station for ejecting the blown finished bottle.

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**5,501,590**

## APPARATUS FOR MANUFACTURING BIAXIALLY ORIENTED, THERMALLY STABLE BLOWN CONTAINERS

**Hiroyuki Orimoto; Saburo Suzuki, both of Ueda, and Fumiya Amari, Komoro, all of, Japan, assignors to Nissei ASB Machine Co., Ltd., Japan**

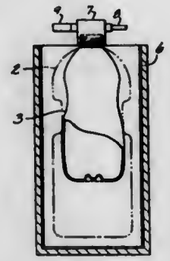
**Continuation of Ser. No. 229,647, Apr. 19, 1994, which is a continuation-in-part of Ser. No. 942,323, Sep. 9, 1992, abandoned, which is a continuation of Ser. No. 600,202, Oct. 18, 1990, abandoned. This application Mar. 16, 1995, Ser. No. 406,098**

**Claims priority, application Japan, Jan. 23, 1989, 1-275565; Feb. 9, 1990, 2-30495**

**The portion of the term of this patent subsequent to Dec. 14, 2012, has been disclaimed.**

**Int. Cl.[6] B29C *49/64***

**U.S. Cl. 425—526** **20 Claims**



1. An apparatus for manufacturing a hot-fillable plastic container comprising:

a first blow mold for blow-molding a preform into a primary molded article having a capacity larger than that of the plastic container and having an open mouth;

means for heating the primary molded article so that the primary molded article shrinks and for continuing to heat the article as it shrinks to produce a shrunken primary article;

means for sealing the mouth of the primary molded article while in the means for heating to enable pressure within the primary molded article to increase as the article shrinks to provide resistance against shrinkage; and

a final blow mold for blow-molding the shrunken primary molded article into the plastic container having a capacity less than that of the primary molded article.

**5,501,591**

## BLOW-MOULDING MACHINE WITH CALIBRATION STATIONS

**Alfred Effenberger, Filderstadt, Germany, assignor to R. Stahl Blasformtechnik GmbH, Leinfelden-Echterdingen, Germany**

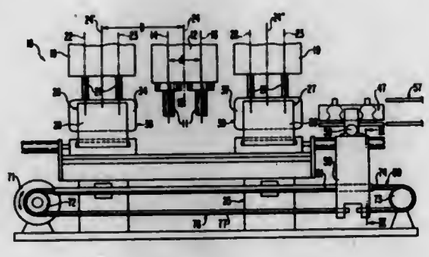
**PCT No. PCT/EP92/00124, § 371 Date Sep. 29, 1993, § 102(e) Date Sep. 29, 1993, PCT Pub. No. WO92/13703, PCT Pub. Date Aug. 20, 1992**

**PCT Filed Jan. 22, 1992, Ser. No. 98,261**

**Claims priority, application Germany, Feb. 5, 1991, 41 03 416.3**

**Int. Cl.[6] B29C *49/06***

**U.S. Cl. 425—529** **13 Claims**



1. A blow molding machine comprising two calibration stations, an extruder arranged between said two calibration stations and producing hose-shaped parisons adapted to be blown into hollow bodies by mold forms in alternating sequence and in periodical sequence at the respective calibration stations, said calibration stations and extruder being arranged along a vertically extending longitudinal center plane of the blow molding machine along which the mold forms are displaceable back and forth between associated calibration stations and the extruder, a transport device adapted to transport the respective hollow bodies blown at the calibration stations to at least one post processing station in sequence as timed by blow cycles by the blowing molding machine, wherein the transport device is fashioned as a transport mask displaceable back and forth along a transport path, said transport path is disposed a lateral distance from the longitudinal center plane of the blow molding machine and parallel thereto, said transport mask is transported alternatingly between the respective calibration stations into an acceptance position opposite the respective calibration stations, wherein starting from the acceptance position at the respective calibration stations, the transport mask is transported to the at least one post processing station which, when viewed in a direction of transportation of the transport mask, said at least one post processing station is arranged following one of the calibration stations, wherein said transport mask is constructed as a blow mold half mask having at least one acceptance aperture opening in a direction of an associated calibration station for enabling an introduction of a hollow molded body from the calibration station, for vertically supporting and for securing the hollow body to the transport mask to prevent the hollow molded body from falling out of the transport mask during transport by fully formed engagement of a contour of the at least one acceptance aperture with one of protrusions and form reductions of the respective hollow molded bodies, and wherein each of said calibration stations include blow mandrels for blowing the hollow bodies in the mold forms, said calibration stations are constructed to be moveable in a direction at a right angle with respect to the longitudinal center plane of the blow molding machine.



**5,501,592**

## MOLD HAVING OPPOSED OFFSET COOLING CHANNELS

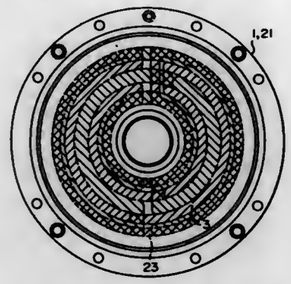
**Takehiko Kitamura, Chiba, Japan, assignor to Sumitomo Heavy Industries, Ltd., Tokyo, Japan**

**Filed Jul. 28, 1994, Ser. No. 281,658**

**Claims priority, application Japan, Dec. 22, 1993, 5-345638**

**Int. Cl.[6] B29C *45/73***

**U.S. Cl. 425—547** **3 Claims**



1. An injection mold having a cavity formed between opposing faces of a fixed mold and a movable mold for defining a shape of a product, and cooling channels formed in said fixed mold and said movable mold, respectively, for cooling resins injected into said cavity,

wherein cooling channels of said movable mold are formed in said movable mold at positions at least opposite to those where cooling channels of said fixed mold are not formed.

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**5,501,593**

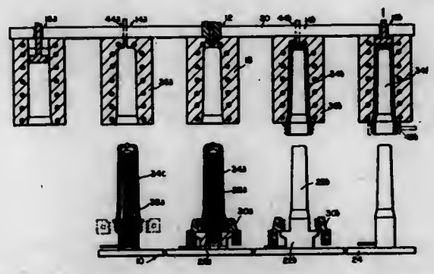
## PARISON MOLDING APPARATUS

**Paul Marcus, 6 Bayberry Dr., Saddle River, N.J. 07458**

**Continuation-in-part of Ser. No. 224,042, Apr. 7, 1994, abandoned. This application Jul. 28, 1994, Ser. No. 282,530**

**Int. Cl.[6] B29C *45/73***

**U.S. Cl. 425—547** **29 Claims**



23. A parison injection molding apparatus having shortened injection molding cycles with extended cooling for increased parison production, comprising:

a parison injection molding station having a parison injection mold and a first core rod assembly defining with the injection mold a cavity for forming the parison, means for introducing into the cavity molten resin under pressure to form the parison, the injection mold and core rod assembly having cooling means for cooling the parison;

at least one cooling station having a cooling mold;

indexing means for moving the parison on the core rod assembly to the cooling station at which the parison is placed in the cooling mold by the core rod assembly for cooling the parison; the indexing means having means to thereafter remove the core rod assembly from the parison and leave the parison in the cooling mold for further cooling and move the core rod assembly back to the injection molding station;

an ejection station having a cooling mold for further cooling the parison and having means for ejecting the cooled parison;

another core rod assembly having cooling means; the indexing means having means to move said another core rod assembly to the cooling station when the first core rod assembly is returned to the injection molding station for further cooling of the parison and to remove the parison from the cooling station and transfer it to the ejection station when the first core rod is moved to the cooling station.

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**5,501,594**

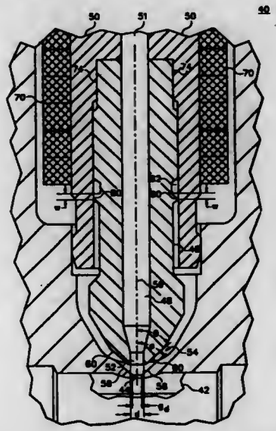
## APPARATUS FOR FORMING A THERMOPLASTIC BODY

**Gary R. Glozer, Spencerport; Edgar G. Earnhart, Hilton; Brett J. Le Beau, Sr., Rochester; Andrea E. Marek, Livonia; Rudy Trick, Rochester, and James E. Vinaco, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Feb. 16, 1994, Ser. No. 197,896**

**Int. Cl.[6] B29C *45/20***

**U.S. Cl. 425—549** **4 Claims**



1. An apparatus for forming a thermoplastic body, comprising:

a mold including a bore having side walls and a mold cavity having a gate portion, said gate portion including a first end for receiving molten material and a second end for delivering molten material to the mold cavity to form the thermoplastic body therein;

a hot tip mounted within said bore and including an elongated body member, a channel, and a necked down portion, said channel exteading axially through said body for passing molten material therethrough, the channel having two ends and an inlet located at one end for receiving molten material and an outlet located at the other end for delivering molten material to the first end of the gate portion, said necked down portion of the body member surrounding the outlet and spaced from said side walls, said body member comprising a threaded portion at the inlet end for removably attaching to said mold, said threaded portion being capable of cooperating with an oppositely threaded portion in said mold, said body member including means for precisely aligning both said threaded portion with said oppositely threaded portion in said mold, and said outlet end with said gate portion of said mold cavity; and

means for mounting said body to fixedly position said outlet relative to said first end of said gate portion, and for maintaining the fixedly position between said outlet and said first end when molten material is passing through said channel and when molten material is not passing through said channel,

said necked down portion being configured such that said outlet is spaced from said first end of said gate portion by up to 0.015 inches to define an open annulus between said necked down portion and said side walls so as to allow molten material to pass through the channel into the first end of said gate portion of the mold cavity when molten material is flowing through said channel.

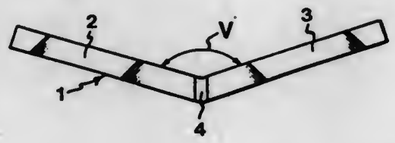
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**5,501,595**

## MATRIX BAND AND MATRIX RETAINER FOR A FRONT-TOOTH MATRIX

**Lars Brorson, Drottninggatan 62, SE-252 21 Helsingborg, Sweden**

**Filed May 2, 1994, Ser. No. 236,952**
**Claims priority, application Sweden, Mar. 3, 1994, 9400744**
**Int. Cl.[6] A61C** *5/12*
**U.S. Cl. 433—39** **14 Claims**




1. A front tooth matrix band for fillings in proximally and buccally opening cavities, comprising:

a bendable plastic single-layer band having a central transition area for overlying the middle of the palatal side of a front tooth, the transition area being extensible and extending entirely across the band in a width-wise direction, and two substantially inextensible parts joined by the transition area for overlying the proximal and the buccal sides of the front tooth, the inextensible parts forming, when the band lies flat in a plane, an obtuse angle in the plane, the matrix band being substantially completely conformable to the contour of a front tooth by tightening the matrix band as a loop around the tooth with said transition area engaging the middle of the palatal side of the front tooth while portions of said inextensible parts on each side of said transition area engage the proximal and buccal sides of the tooth.

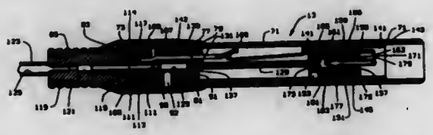
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**5,501,596**

## AUTOCLAVABLE DENTAL SCALER HANDPIECE

**Ronald L. Bailey, Harvester, Mo., assignor to Young Dental Manufacturing Company, Inc., Earth City, Mo.**

**Filed Jul. 27, 1994, Ser. No. 281,452**
**Int. Cl.[6] A61C** *1/07;1/08*
**U.S. Cl. 433—86** **17 Claims**



1. A dental scaler including a control unit, a hand piece assembly, and a conduit carrying fluid and electrical power to the handpiece assembly; the handpiece assembly including a conduit connector secured to an end of said conduit remote from the control unit and an autoclavable handpiece removably connectable to the connector;

said conduit connector including a connector housing containing an electrical terminal, a fluid flow path having an inlet and an outlet, and a valve in said fluid flow path; said valve having a valve body housing a valve seat and a valve member movable between an open position and a closed position, said valve being biased closed;

said autoclavable handpiece including

a transducer body defining a fluid flow path;

a scaler tip secured to an end of said transducer body in fluid communication with said transducer body fluid flow path;

a piezoelectric crystal mounted on said transducer body in operative contact with said tip to vibrate said tip when activated;

an external sleeve extending rearwardly from said transducer body;

a handpiece connector body housed in said external sleeve spaced rearwardly of said transducer body; said handpiece connector body defining a fluid flow path in communication with said transducer body fluid flow path, and having a fluid connector in said handpiece fluid flow path connectable to said conduit connector valve, and an electrical terminal connectable to said conduit connector electrical terminal;

a wire electrically connecting said piezoelectric crystal to said handpiece connector body electrical terminal.

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**5,501,597**

## DENTAL INSTRUMENT WITH GRIPPING HANDLE AND METHOD FOR MANUFACTURING SAME

**Roselyn Wilson, Lakeville, Minn., assignor to Minnesota Prophy Power, Inc., Lakeville, Minn.**

**Filed Apr. 29, 1994, Ser. No. 236,494**
**Int. Cl.[6] A61C** *3/00*
**U.S. Cl. 433—141** **12 Claims**



1. A dental instrument comprising:

(a) an elongate shaft having an end portion and a collar;

(b) a dental workpiece extending from the collar of the shaft, the workpiece comprising a shank and work-tip; and

(c) a gripping handle extending from the end portion of the shaft to the shank of the workpiece, the gripping handle surrounding and adhering to the end portion of the shaft, to the collar, and to the workpiece at the shank.

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**5,501,598**

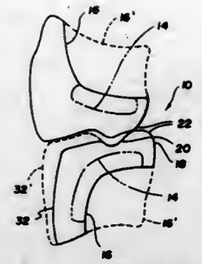
## DENTAL TOOTH SYSTEM

**Carl E. Misch, 410 Claremount, Dearborn, Mich. 48124**

**Filed Jul. 28, 1993, Ser. No. 98,524**
**Int. Cl.[6] A61C** *13/08;13/10*
**U.S. Cl. 433—197** **20 Claims**

1. A dental tooth system for a partially or completely edentulous patient, comprising:





a block of denture teeth in which individual teeth are interconnected for stability and secured to a rigid base, each tooth including

enlarged undercut surfaces disposed buccal and lingual on the medial and lateral aspects thereof to permit greater mechanical retention to the rigid base to which the block is secured, and

a reduced gingival contour to accommodate implanted attachments or bars, thereby allowing the block of denture teeth to be positioned medially;

denture teeth opposing the block, each of the opposing teeth including an enlarged central fossa,

the block being positioned and configured so that only a lingual cusp of a given tooth of said block occludes with the central fossa of an opposing tooth in centric occlusion, wherein

occlusal surfaces of the denture teeth opposing the block of teeth and teeth in the block are configured so that they lie on imaginary spheres, thereby allowing a balanced occlusion while forming a medial positioned lingual occlusion.

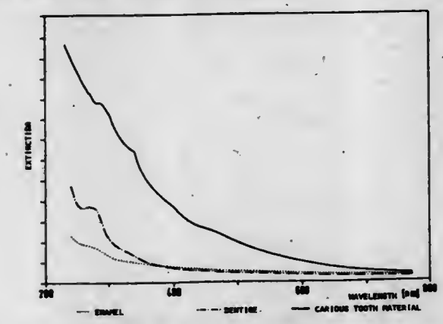
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**5,501,599**

## DEVICE FOR REMOVING CARIOUS TOOTH MATERIAL BY LASER LIGHT AND USE OF A LASER LIGHT SOURCE

**Peter Rechmann, Dellestrasse 79, Duesseldorf-Unterbach, Germany**

**Continuation of Ser. No. 946,352, Oct. 27, 1992, abandoned.**
**This application Aug. 19, 1994, Ser. No. 292,173**
**Claims priority, application Germany, May 4, 1990, 40 14 303.1**
**Int. Cl.[6] A61C** *5/00*
**U.S. Cl. 433—215** **14 Claims**




1. A method of selectively removing only carious tooth material from a tooth comprising the steps of creating a laser light beam from pulsed laser light in the form of a light spot, conducting the pulsed laser light through a flexible light guide to thereby create a light spot upon a tooth, manipulating the flexible light guide to direct a light spot on carious tooth material of the tooth, maintaining the wavelength of the laser light beam in the range of substantially 320 to 520 nm, and maintaining the energy density per pulse of the light spot substantially in the range of 0.30 to about 7.0 J/cm$^2$ whereby healthy dentine and enamel are unaffected.

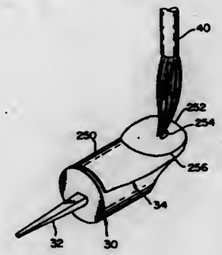
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**5,501,600**

## METHOD OF LAMINATING A PORCELAIN VENEER TO A TOOTH

**Paul W. Johnson, 5103 46th NE., Seattle, Wash. 98105**

**Filed Sep. 22, 1994, Ser. No. 310,636**
**Int. Cl.[6] A61C** *13/00*
**U.S. Cl. 433—227** **23 Claims**



1. A method of making a porcelain veneer to be cemented to a dental patient's front tooth, to become a porcelain laminate thereof, aesthetically covering the front surface of this tooth, comprising the following steps:

preparing an impression of a patient's teeth;

preparing a model of the patient's teeth by pouring die stone material into the impression for the subsequent hardening thereof;

preparing a Pindex model portion of the hardened die stone model by cutting free at least one tooth die and securing a pin to this tooth die, and also forming a hole in the model to receive an end portion of this secured pin, whereby the cut away pinned tooth die is then replaced on the hardened die stone model until it is subsequently needed as this method progresses;

preparing a portion of a noble metal foil by cutting a portion which is large enough to extend over the front surface of the tooth die and beyond to form an apron serving as a tweezer gripping handling portion of the noble metal foil;

preparing a thin plastic cover to receive, to keep clean, to position and to hold together the noble metal foil and the pinned front tooth die, inclusive of winding dental floss about the thin plastic cover and the pin, which is covered by the plastic;

conforming the noble metal foil to the front surface of the tooth die by creating an orbital and isostatic force which squeezes together the noble metal foil and the patient's tooth die, so the noble metal foil accurately conforms to the front surface of the patient's tooth die, with the force being created by the operation of dies, each die having a rubber or rubber-like material insert with a receiving space, whereby the plastic covered noble metal foil and the patient's tooth die are positioned to be in these receiving spaces, and compressed air, at a selected pressure, is utilized to move a piston within a cylinder causing the dies to contact one another, insuring the rubber inserts are fully compressed entirely about both noble metal foil and the patient's tooth die, which are positioned together within the then plastic cover, and thereby accomplish the accurate forming of the noble metal foil in a few seconds of time;

inspecting the conforming of the noble metal foil to the front surface of the tooth die, upon the removal of the dental floss windings and the thin plastic cover;

separating the perfect fitting noble metal foil, then considered as the noble metal foil matrix, from the patient's tooth die;

creating a porcelain slurry of a selected shade;

brushing porcelain slurry on part of part of the front surface of the noble metal foil matrix, leaving a central bald area;
firing the noble metal foil matrix, so covered by the brushing on of the porcelain slurry, at a baking temperature;
roughening the surface of this first fired then cooled porcelain;
brushing a porcelain slurry on the central bald area of the front surface of the noble metal foil matrix, and on the roughened surface of the first fired then cooled porcelain;
firing the noble metal foil matrix so covered, at a baking temperature to obtain a glazed surface of the porcelain;
separating the noble metal foil matrix from the porcelain, creating the porcelain veneer also called the porcelain laminate;
covering the front surface of the porcelain laminate with wax to protect the gloss of the glazed surface of the porcelain;
roughening the inside surface of the porcelain laminate;
removing the wax from the front surface of the porcelain laminate;
thereby completing this porcelain laminate for the subsequent lamination thereof to a patient's front tooth, using a selected adhesive, to secure the porcelain veneer on the patient's front tooth.

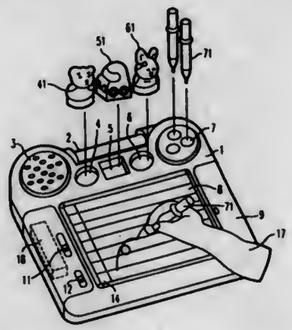
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**5,501,601**

## EDUCATIONAL DRAWING TOY WITH SOUND-GENERATING FUNCTION

**Masatoshi Todokoro, Matsudo, and Masami Shiraishi, Tiba, both of, Japan, assignors to Stuff Co., Ltd., and Works Co., Ltd., both of Tokyo, Japan**

**Filed Jun. 14, 1994, Ser. No. 260,385**
**Claims priority, application Japan, Jun. 15, 1993, 5-039909 U**
**Int. Cl.[6] G09B 5/00**
**U.S. Cl. 434—169** **7 Claims**



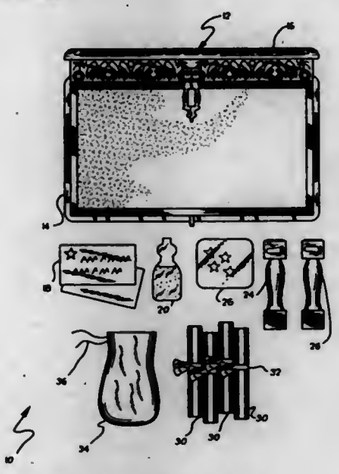

1. An educational drawing toy with sound-generating function, comprising a resilient whiteboard, plural sets of contacts arranged in the form of a matrix underneath the resilient whiteboard, and a sound-generating circuit electrically connected to the plural sets of contacts, wherein under the action of pressure from a pen applied upon drawing a picture on the whiteboard, the plural sets of contacts are selectively and successively brought into contact with each other to actuate the sound-generating circuit so that at least one of a scale and a melody is played as the pen traverses the matrix and in dependence on which sets of contacts in the matrix are brought into contact.

**5,501,602**

## DENTAL CARE EDUCATIONAL AND TOOTH FAIRY VISIT KIT WITH MAGIC DUST

**Karen L. Anderson, and Keith E. Anderson, both of 247 Center Church Rd., McMurray, Pa. 15317**

**Continuation-in-part of Ser. No. 25,497, Jul. 5, 1994, which is a continuation of Ser. No. 10,138, Jul. 1, 1993, abandoned. This application Oct. 21, 1994, Ser. No. 325,978**
**Int. Cl.[6] G09B 23/28**
**U.S. Cl. 434—263** **9 Claims**




1. A dental care educational kit comprising:
a storage chest;
an envelope for receiving a deciduous tooth;
a coin bag;
a magical fairy dust container; and magical fairy dust positioned within said container for dispensing therefrom, said magical fairy dust comprising a metallic flake powder which exhibits reflective properties in the presence of light to enhance viewing of said magical fairy dust.

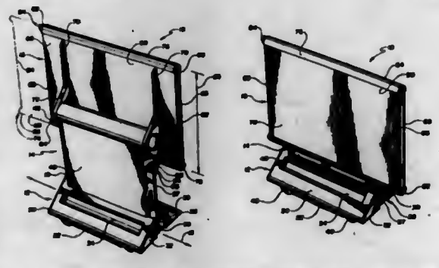
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**5,501,603**

## MODULARIZED VISUAL TRAINING AID FOR CLASSROOM INSTRUCTION

**Eric J. Mueller, Minneapolis; Gary M. Benting; Leslie R. Abraham, both of Owatonna, and Phillip C. Dretzka, Minneapolis, all of Minn., assignors to Wenger Corporation, Owatonna, Minn.**

**Filed Aug. 12, 1994, Ser. No. 289,398**
**Int. Cl.[6] B43L 1/00**
**U.S. Cl. 434—419** **15 Claims**



1. A visual training aid for classroom instruction, comprising:
a base adapted to rest on a generally planar surface;



an upright support operably coupled to, and extending generally vertically upward from said base;
a display housing; and
a pivot mechanism presenting a generally horizontal pivot axis operably, pivotably coupling said display housing to said upright support, said display housing presenting at least one display surface, said display housing being pivotably shiftable about said horizontal pivot axis between a generally vertical elevated position and a generally vertical lowered position, said pivot mechanism including a display housing mounting bracket orienting said display housing in a spaced apart relationship with said pivot axis such that said display housing is positioned on one side of said pivot axis in said elevated position and on the opposite side of said pivot axis in said lowered position thereby stabilizing the display housing in both said elevated and said lowered positions.

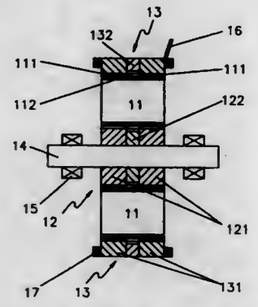
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**5,501,604**

## FLEXIBLE BAND-GEARS FOR CONDUCTING POWER/SIGNAL ACROSS ROTARY JOINT

**Roopnarine, New York, N.Y.; Thomas Myrick, New Providence, N.J., and Kin Y. Kong, Baldwin, N.Y., assignors to Honeybee Robotics, Inc., New York, N.Y.**

**Filed Feb. 23, 1994, Ser. No. 200,753**
**Int. Cl.[6] H01R 39/08**
**U.S. Cl. 439—19** **20 Claims**




1. A flexible band-gear system for transferring electrical power or an electrical signal across a rotary joint comprising:
a ring gear assembly including an annular ring gear centered on a main axis having gear teeth disposed on an inner annular surface facing toward the main axis, and at least one band centered on the main axis in proximate relation to said annular ring gear having an electrically conducting layer disposed on an inner annular surface thereof facing toward the main axis;
a plurality of planet gear assemblies disposed in spaced relation from each other inwardly of said ring gear assembly and spaced at equal radial distances from the main axis, wherein said planet gear assemblies each have a respective planet gear rotatable about an individual planet gear axis with gear teeth on an annular surface thereof in geared engagement with said ring gear of said annular ring gear assembly, and at least one band centered on the individual planet axis in proximate relation to said planet gear having an electrically conducting layer disposed on an outer annular surface thereof in rolling electrical contact with the band of said annular ring gear assembly; and
a sun gear assembly disposed inwardly of said planet gear assemblies and centered on the main axis, said sun gear assembly including a sun gear provided with gear teeth facing outwardly in geared engagement with the planet gears of said planet gear assemblies, at least one band centered on the main axis in proximate relation to said sun gear member having an electrically conducting layer facing outwardly in rolling electrical contact with the bands of said planet gear assemblies, a rotary member aligned on the main axis mounting said sun gear and band, and conducting means in electrical contact with said band of said sun gear assembly for transferring electrical power or an electrical signal to or from an external device,
whereby electrical power or an electrical signal can be transferred to or from the external device through said bands of said ring, planet, and sun gear assemblies in rolling electrical contact with each other across a rotary joint represented by said rotary member centered on the main axis within the flexible band-gear system.

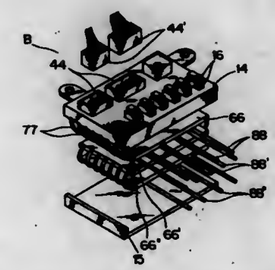
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**5,501,605**

## WIRING HARNESS ASSEMBLY FOR VEHICLES

**Keiichi Ozaki, Kosai; Sanae Kato, Gotenba, and Yoshimi Masuda, Shizuoka, all of, Japan, assignors to Yazaki Corporation, Tokyo, Japan**

**Filed May 26, 1994, Ser. No. 249,198**
**Claims priority, application Japan, Jun. 7, 1993, 5-135658; Jun. 7, 1993, 5-135659**
**Int. Cl.[6] H01R 9/09**
**U.S. Cl. 439—34** **6 Claims**




1. A wiring harness assembly which includes a plurality of interconnected wiring harnesses, said wiring harness assembly comprising:
a primary wire bundle formed by a plurality of primary wires, said primary wire bundle being foldable such that a first portion of said primary wire bundle overlies a second portion of said primary wire bundle;
insulating means adjacent to and generally coextensive with said first portion of said primary wire bundle, said insulating means having a plurality of openings therethrough for communication with said plurality of primary wires;
a plurality of branch wires which respectively branch from ones of said plurality of primary wires, each of said plurality of branch wires extending through respective ones of said plurality of openings in said insulating means, and said branch wires being gathered at a distance from said insulating means to form a sub-wiring harness;
connecting means for interconnecting respective ones of said plurality of wires in said primary wire bundle with respective ones of said plurality of branch wires;
said insulating means being interposed between said first portion of said primary wire bundle and said second portion of said primary wire bundle in the folded construction, and said insulating means covering said connecting means, wherein said primary wire bundle, said insulating means, and said plurality of branch wires can be housed in one casing through folding of said primary wire bundle.

**5,501,606**

## ELECTRICAL CONNECTOR HAVING CONTACT GUIDE MEMBER

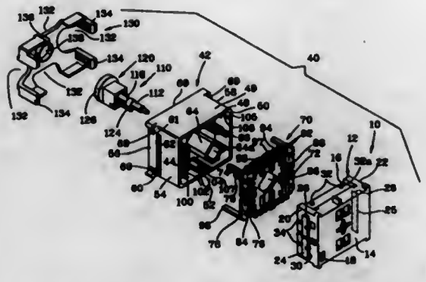
**Kenzo Oda, Hadano; Akira Nagamine, Kawasaki, and Shinji Amemiya, Yokohama, all of, Japan, assignors to The Whitaker Corporation, Wilmington, Del.**

**Filed Mar. 29, 1994, Ser. No. 219,597**

**Claims priority, application Japan, Apr. 1, 1993, 5-016151 U; Feb. 3, 1994, 6-031912**

**Int. Cl.[6] H01R *13/44***

**U.S. Cl. 439—140** **14 Claims**



1. A connector having contact guide member comprising a first connector including a first housing and male contacts disposed in said housing to extend in a mating direction of said first connector, a second connector including a second housing to mate with said first housing, and a guide member in said first housing having through holes through which contact sections of said male contacts pass, said guide member being movable toward rear ends of said contact sections by being pushed by said second connector as said first and second connectors are mated together, characterized in that:

said first housing has projections formed on an inner wall thereof at a more forward position than front ends of said contact sections;

said guide member has legs formed with resilient spring members extending in the mating direction and hook members engaging said projections to prevent the movement of said guide member toward the rear ends of said contact sections; and

said second housing having pushing projections unlatching the engagement between said legs and said projections by pushing said hook members during mating between said first and second housings.

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**5,501,607**

## WATERPROOF STRUCTURE FOR CHARGING CONNECTOR

**Nobuaki Yoshioka, and Toshiaki Hasegawa, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan**

**Filed May 13, 1994, Ser. No. 242,623**

**Claims priority, application Japan, May 13, 1993, 5-159925**

**Int. Cl.[6] H01R *13/44***

**U.S. Cl. 439—142** **8 Claims**

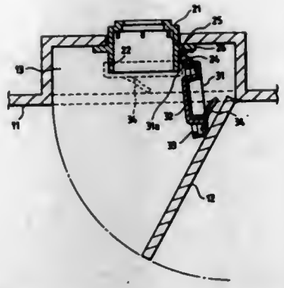
1. A waterproof structure for an electrical charging connector, comprising:

a body cover for opening and closing an opening of a recessed portion formed in a vehicle body;

a waterproof cap for covering a charging connector provided in the recessed portion; and

moving means for alternately urging said cap in its opening and closing directions depending on the angular position of said waterproof cap,

wherein said waterproof cap is journalled openably and closably in close proximity to a connecting opening of said charging connector, and, when said body cover is moved in its closing direction, said waterproof cap is automatically pushed by said body cover in a closing direction thereby closing said connecting opening of said charging connector.



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**5,501,608**

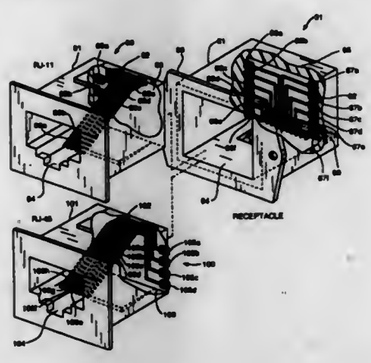
## COMPUTER SYSTEM WITH AN INTERCONNECTION RECEPTACLE SUITABLE FOR DIFFERENT EXTERNAL CONNECTORS

**David C. Scheer, Pollock Pines, and Homer T. Gee, Roseville, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.**

**Filed Dec. 20, 1993, Ser. No. 170,098**

**Int. Cl.[6] H01R *27/00***

**U.S. Cl. 439—218** **16 Claims**




1. An interconnecting receptacle for a computer system, comprising:

(A) a case mounted on a housing of the computer system for receiving an external connector, wherein the case is not detachable from the housing and is fixed on the housing;

(B) a plurality of metallic contacts located inside the case for electrically connecting circuitry of the computer system inside the housing to the external connector, wherein the external connector can be one of (1) a first type of connector that includes a first number of electrical connectors and (2) a second type of connector that includes a second number of electrical connectors, wherein when the external connector is the first type of connector and is inserted inside the case, a first set of the plurality of metallic contacts are used to connect to the first number of electrical connectors of the external connector, wherein when the external connector is the second type of connector and is inserted inside the case, a second set of the plurality of metallic contacts are used to connect to the second number of electrical connectors of the external connector such that the interconnecting receptacle can be connected to both the first and second types of connectors.



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**5,501,609**

## CONNECTOR HAVING A SOFT CUSHION MEMBER

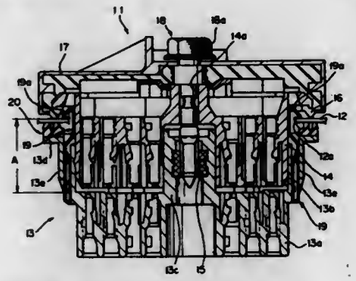
**Kaoru Watanabe, Yokkaichi, Japan, assignor to Sumitomo Wiring Systems, Ltd., Japan**

**Filed Nov. 18, 1994, Ser. No. 342,339**

**Claims priority, application Japan, Nov. 26, 1993, 5-068072 U**

**Int. Cl.[6] A01R *13/52***

**U.S. Cl. 439—277** **3 Claims**



1. A connector comprising:

a stationary connector housing adapted to be secured to a rear side of a panel having an opening so that a connecting end portion of said housing is opposed to said opening;

a detachable connector housing adapted to be removably attached to a front side of said panel and fitted through said opening in said panel to said stationary connector housing;

a waterproofing seal member provided on said detachable connector housing for closely contacting with a front side periphery around said opening in said panel upon fitting of said connector housings;

a flange provided on said stationary connector housing and adapted to be opposed to a rear side periphery around said opening in said panel; and

a cushion member, softer than said seal member, disposed between said flange and said rear side periphery around said opening in said panel.

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**5,501,610**

## FLEXIBLE CABLE CONNECTOR

**Shinichi Ikemoto, Tokyo, Japan, assignor to Kel Corporation, Tokyo, Japan**

**Filed Sep. 6, 1994, Ser. No. 301,527**

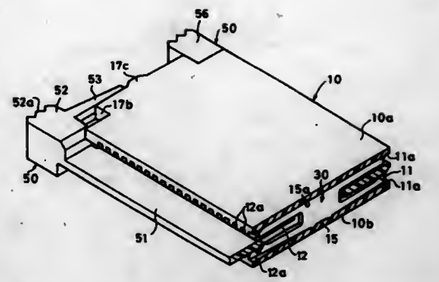
**Claims priority, application Japan, Sep. 7, 1993, 5-053379 U**

**Int. Cl.[6] H01R *9/07***

**U.S. Cl. 439—498** **6 Claims**

1. A flexible cable connector for effecting electrical connection to respective conductive paths on respective end portions of first and second flexible cables comprising:

an elongate insulating housing having first and second, oppositely directed, cable receiving faces and formed with first and second, elongate cable receiving cavities with respective cable receiving mouths opening to the respective cable receiving faces and aligned with each other in substantially coplanar relation, and with a row of contact receiving sockets extending along the housing between the cable receiving cavities so that each socket communicates with both cable receiving cavities;



a plurality of electrical contacts each having a mounting portion and first and second pairs of arms extending from respective opposite sides thereof, the arms of each pair extending in side by side relation, spaced a predetermined distance apart to provide between them a cable receiving gap, cable receiving gaps provided by first pairs of arms being aligned in substantially coplanar relation with cable receiving gaps provided by respective corresponding second pairs of arms and at least one arm of each pair of arms being formed adjacent a free end thereof with a protuberance protruding towards a respective other arm portion of that pair, the contacts being mounted in the housing a row by receipt of respective mounting portions in respective contact receiving sockets and respective arms of the first and second pairs extending adjacent respective opposite sides of the first and second cable receiving cavities, respectively, and with respective cable receiving gaps opening in a cable insertion direction towards respective cable receiving mouths and with at least the protuberances of each contact protruding into the respective cavities adjacent the respective mouths;

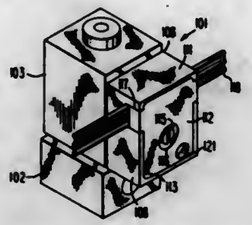
first and second, elongate cable clamping sliders each having a central pressing portion, actuating portions, at respective opposite ends of the pressing portion and locking arms extending from respective actuating portions thereof in the insertion direction and having latching means at free ends thereof;

means provided on opposite longitudinal ends of the housing for mounting the first and second cable clamping sliders on the housing with the respective locking arms extending across each longitudinal end of the housing towards opposite faces and respective pressing portions extending along the first and second cable receiving faces aligned in substantially coplanar relation with each other and in alignment with respective cable receiving gaps for reciprocal sliding movement in the insertion direction between open, cable admitting positions, in which the respective pressing portions are adjacent the respective cable admitting mouths and withdrawn from respective cable receiving gaps to permit end portions of respective flexible cables to be inserted through respective cable admitting mouths past the respective pressing portions into the respective cavities and into respective gaps between the first and second pairs of contact arms, respectively, and closed, cable clamping positions in which the pressing portions are advanced into respective first and second cavities and into the gaps pressing respective conductive paths of inserted cable end portions into engagement with respective protuberances to effect electrical connection therewith, at each end of the connector the locking arms extending from the first face being offset from locking arms extending from the second face so that they are located at different levels and their latching means can be moved past each other with their respective locking arms in overlapping relation to latch the respective cable clamping sliders in the cable clamping position by movement of the cable clamping sliders from the cable admitting position to the cable clamping position.

### 5,501,611
### ACTUATING DEVICE

Bruno Staiger, Erligheim; Helmut Rivinius, and Jochen Welz, both of Bissingheim, all of, Germany, assignors to Steuerungstechnik Staiger GmbH & Co. Produktions-Vertrieb GmbH KG, Erligheim, Germany

Continuation of Ser. No. 201,363, Feb. 24, 1994, Pat. No. 5,453,022. This application Jul. 15, 1994, Ser. No. 275,498
Claims priority, application Germany, Feb. 24, 1993, 43 05 544.3; Jan. 11, 1994, 44 00 476.1; Jan. 18, 1994, 44 01 202.0
Int. Cl.[6] H01R 4/24
U.S. Cl. 439—404 8 Claims



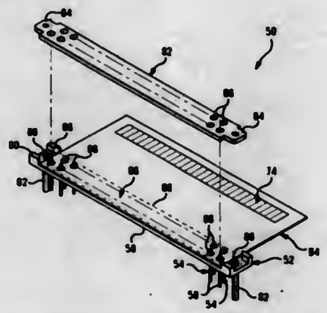
1. An actuating device, comprising an actuator; at least one control conductor connected with said actuator; at least one through connection useable without a tool and associated with said electrical actuator, said control conductor uninterruptedly contacting with said through connection; a magnetic valve provided for said actuator; and a mounting rail accommodating said control conductor and supporting said magnetic valve and said actuator, said through connection with said control conductor contacting in the region of said mounting rail.

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### 5,501,612
### LOW PROFILE BOARD-TO-BOARD ELECTRICAL CONNECTOR

Eric T. Green, Hummelstown, Pa., assignor to The Whitaker Corporation, Wilmington, Del.

Filed Jun. 17, 1994, Ser. No. 261,599
Int. Cl.[6] H01R 9/07
U.S. Cl. 439—499 5 Claims



1. An electrical connector for interconnecting circuits of a daughter card to a mother board and being of the type including a housing and an array of contacts retained to the housing, with contact sections exposed along a board-remote surface for interconnection with respective traces of a flexible film circuit element at a first interconnection region thereof, with the traces extending to at least one second interconnection region of the flexible film circuit element for connection to corresponding traces of a daughter card, the improvement comprising:

said housing includes embossments rising from the board-remote surface at corners thereof in spaced apart pairs adjacent each end of the first interconnection region; and

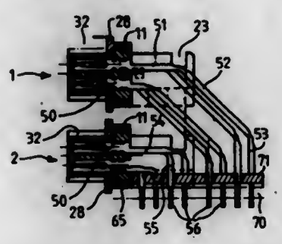
a plate disposed across said first interconnection region atop the board-remote face of the housing and adjacent an outwardly exposed surface of the flexible circuit element with a flange at each end of said plate disposed between a said pair of embossments of said housing, said plate including an array of apertures therethrough associated with the terminations of the traces of the flexible circuit element with the contact sections and adapted for ends of the contact sections and the joints with the traces to be disposed within the apertures, and potting compound cured within the apertures embedding and sealing the terminations.

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### 5,501,613
### CONNECTOR ASSEMBLY INCORPORATING SUPERPOSED CONNECTION ELEMENTS

Michel Lenoir, Montfort le Gesnois, France, assignor to Framatome Connectors International, Courbevoie, France

Filed Jun. 2, 1994, Ser. No. 253,028
Claims priority, application France, Jun. 4, 1993, 93 06700
Int. Cl.[6] H01R 13/60
U.S. Cl. 439—540.1 5 Claims



1. A stacked electrical connector assembly comprising:

(a) upper and lower electrical connection elements each having a housing incorporating a front part in which front part is placed an insulating body receiving contacts, said housing having longitudinal ends provided with areas comprising a vertical innermost wall, a horizontal wall and a front wall;

(b) stacking brackets comprising an upper end part engaging a lower part of said upper connection element and a lower end part engaging an upper part of said lower electrical connection element;

(c) said upper end part of said stacking brackets comprising a vertically protruding lug to be force-fitted into an opening of said horizontal wall of said upper connection element, said upper end part further comprising a rear extension to be force-fitted in a rear slot of said horizontal wall;

(d) said lower end part of said stacking brackets comprising at least one downwardly protruding lug to be force-fitted in an opening of said horizontal wall of said lower connection element; and

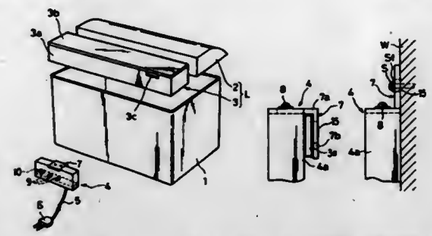
(e) said lower end part further comprising a rear extension to be force-fitted in a rear slot of said horizontal wall.



### 5,501,614
### DEVICE FOR RAISING AQUARIUM FISH AND ITS RECEPTABLE ASSEMBLY

Toshihiro Tsuchiya, Kashiwa, Japan, assignor to Nisso Industry Co., Ltd., Tokyo, Japan

Filed Mar. 18, 1994, Ser. No. 210,282
Claims priority, application Japan, Mar. 19, 1993, 5-018156 U
Int. Cl.[6] H01R 13/73
U.S. Cl. 439—574 8 Claims



1. A receptacle assembly for a device for raising aquarium fish, comprising:

an assembly body having an open side facing downward, accommodating a plurality of electric plug receiving receptacles therein and having a receptacle cover disposed inside the assembly body at a position spaced a predetermined distance from the open side of the assembly body for positioning and fixing the plurality of electric plug receiving receptacles; and

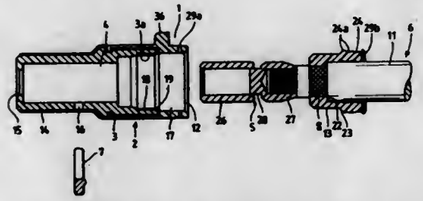
an assembly holder having a lateral wall portion attached to said assembly body and a vertical wall portion extending from said lateral wall portion and extending parallel to the direction faced by the open side of said assembly body and at a distance from said assembly body.

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### 5,501,615
### ELECTRO-MAGNETICALLY SHIELDED CONNECTOR

Shigemitsu Inaba; Shigemi Hashizawa, and Hidehiko Kuboshima, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Division of Ser. No. 249,199, May 26, 1994, Pat. No. 5,460,544. This application May 12, 1995, Ser. No. 439,788
Claims priority, application Japan, May 26, 1993, 5-145407; May 26, 1993, 5-145408; Aug. 31, 1993, 5-216039
Int. Cl.[6] H01R 17/04
U.S. Cl. 439—578 1 Claim



1. An electromagnetically shielded connector comprising:

a housing made of an electrically insulating material, said housing being substantially cylindrical and defining a chamber therein;

a shield member made of an electrically conductive material, said shield member being disposed inside of said housing and being integrally formed with said housing;

an electrical terminal unit received in said chamber and adapted to be connected to a shielded electrical cable;

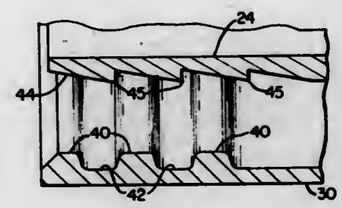
a water-proof plug made of an electrically conductive material and coupled to an end of said shielded electrical cable and being adapted to receive a portion of the shielded electrical cable, said water-proof plug being disposed in an opening of said chamber to seal said opening, said water-proof plug being coupled to a shield of the shielded electrical cable and to said shield member.

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### 5,501,616
### END CONNECTOR FOR COAXIAL CABLE

Randall A. Holliday, 11047 Tennyson Pl., Westminster, Colo. 80030

Filed Mar. 21, 1994, Ser. No. 210,480
Int. Cl.[6] H01R 17/04
U.S. Cl. 439—585 14 Claims



1. An end connector for connecting an end of a coaxial cable to a terminal wherein said cable has radially inner and outer, generally cylindrical conductors separated by an annular dielectric, an outer tubular jacket of rubber or rubber-like material encasing said outer conductor and a portion of said outer conductor being exposed at the end of said cable, said connector comprising:

(a) radially inner and outer spaced coaxial sleeves, said inner sleeve being sized to insertion of said inner conductor and said annular dielectric therein, said outer sleeve being sized for insertion of said outer conductor and said jacket through one end of said connector between said inner and outer sleeves;

(b) at least one endless circular rib extending circumferentially around an inner wall surface portion of said outer sleeve adjacent to the one end of said outer sleeve, said rib having an inner rounded surface engaging an external surface of said jacket only when said cable is fully inserted into said connector and said outer sleeve is deformed radially inwardly until said jacket occupies a circumferentially extending space adjacent to said rib; and

(c) means for connecting said connector to said terminal.

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### 5,501,617
### INSULATION DISPLACEMENT CONNECTOR INSERTION CAP

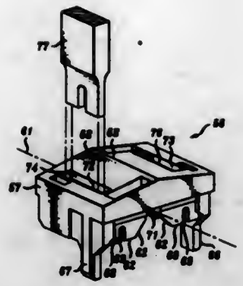
Jaime R. Arnett, Fishers, Ind., assignor to AT&T Corp., Murray Hill, N.J.

Filed Oct. 31, 1994, Ser. No. 329,671
Int. Cl.[6] H01R 23/02
U.S. Cl. 439—676 10 Claims

1. An insertion cap for use with a modular type insulation displacement connector having a centerline and a plurality of wire receiving slots arranged in spaced linear rows on either side of the centerline which contain bifurcated fingers for making connection to the wires when inserted in the slots, said insertion cap comprising:

a body having a centerline and having a top portion with a top surface and first and second depending side walls spaced a distance apart;

a plurality of rib members extending at least a portion of the distance between said side walls and spaced from each other longitudinally of the cap;



each of said ribs having a bottom edge for engaging the wires to be connected, and a slot therein for allowing the ribs to be inserted into the connector past the bifurcated fingers; and

means on said cap for receiving and centering a tool bit to drive the bottom edge of said ribs past at least a portion of the bifurcated fingers, said means having a longitudinal centerline lying in a vertical plane that lies between the spaced linear rows of receiving slots.

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**5,501,618**

**L-SHAPED BULB SOCKET**

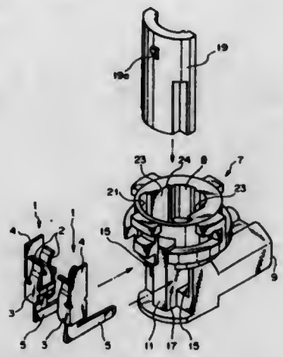
**Junji Muta, and Yoshiaki Furuta, both of Yokkaichi, Japan, assignors to Sumitomo Wiring Systems, Ltd., Japan**

**Filed Nov. 23, 1994, Ser. No. 344,455**

**Claims priority, application Japan, Nov. 25, 1993, 5-320946**

**Int. Cl.[6] H01R** *13/436*

**U.S. Cl. 439—699.2** **4 Claims**



1. An L-shaped bulb socket comprising:

a housing having a bulb inlet port, a connector inlet port, a pair of terminal accommodating chambers, and a terminal insertion opening formed in a wall opposite to said connector inlet port, said bulb inlet port being arranged to be perpendicular to said connector inlet port in said housing;

a pair of metal terminals disposed in said respective terminal accommodating chambers, each metal terminals having a pair of clamp portions adapted to hold a respective terminal of a bulb and a terminal portion adapted to be connected to each terminal of a connector, said terminal portion extending perpendicularly to said clamp portions; and

a lid member mounted on said terminal insertion opening slidably in a bulb inserting direction to cover said opening and retain said metal terminals in said housing.

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**5,501,619**

**CONNECTOR**

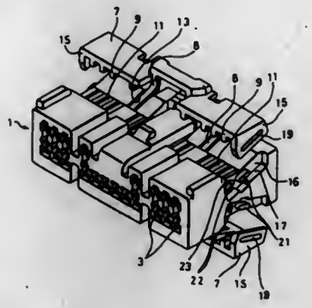
**Atsushi Sakatani; Osamu Sasai, and Masaji Suzuki, all of Yokkaichi, Japan, assignors to Sumitomo Wiring Systems, Ltd., Japan**

**Filed Apr. 21, 1994, Ser. No. 230,822**

**Claims priority, application Japan, May 7, 1993, 5-029267 U**

**Int. Cl.[6] H01R** *13/514*

**U.S. Cl. 439—752** **12 Claims**



5. A connector having a plurality of terminal insert holes for receiving a plurality of terminal pieces, the connector comprising:

a retainer having a first portion fixed to said connector via at least one flexible member and a second portion engageable with said connector between a provisionally engaged position and a normally engaged position;

a recessed portion for receiving said second portion of said retainer, said recessed portion comprising means for attaching said retainer to said connector in said provisionally engaged position and said normally engaged position such that said plurality of terminal pieces are insertable into said plurality of terminal insert holes in said provisionally engaged position; and

an inclined guide surface in said recessed portion, said guide surface guiding said retainer between said provisionally engaged position and said normally engaged position.

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**5,501,620**

**ELECTRICAL CONNECTOR**

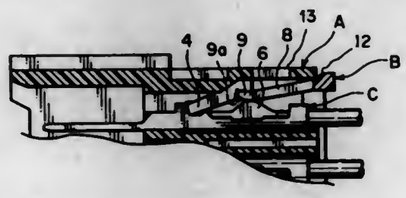
**Takashi Ishii; Tamio Watanabe, and Toru Nagano, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan**

**Continuation of Ser. No. 207,681, Mar. 9, 1994, abandoned. This application Jun. 30, 1995, Ser. No. 497,453**

**Claims priority, application Japan, Mar. 10, 1993, 5-010133 U**

**Int. Cl.[6] H01R** *13/436*

**U.S. Cl. 439—752** **5 Claims**



1. An electrical connector comprising:

a plurality of terminals;

a housing;

terminal accommodating cavities in the housing;



an outer wall on said housing enclosing said terminal accommodating cavities;

a terminal locking member including a frame slidably attachable to the housing in a preliminary locked state and a fully locked state;

resilient terminal locking pieces formed on inner surfaces of said outer wall defining the respective terminal accommodating cavities of said housing for locking the terminals;

resilient terminal supporting pieces attached to said terminal locking member and having terminal locking portions for locking the terminals;

lifting projections in the terminal accommodating cavities for engaging said terminal locking portions to lift said resilient terminal supporting pieces at the preliminary locked state of the terminal locking member to permit the terminals to enter the terminal accommodating cavities and to be engaged with the resilient terminal locking pieces; and

guide projections formed on said housing outer wall and disposed at spaced locations on the inner surfaces of the terminal accommodating cavities adjacent said terminals locking pieces, said guide projections having slant faces formed thereon for guiding each of the terminal locking portions of said terminal supporting pieces inwardly to a locking position with respect to the terminals while the terminal locking member is moved from the preliminary locked state to the fully locked state and for pressing the terminal supporting pieces inwardly to force the terminal locking portions against the terminals for doubly locking the terminals in combination with said terminal locking pieces at the fully locked state of the terminal locking member.

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**5,501,621**

**OUTBOARD ENGINE STRUCTURE**

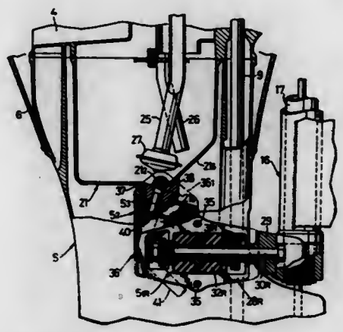
**Hideo Shigedomi; Kaoru Ichihashi, and Hiroyuki Yoshida, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Jul. 19, 1994, Ser. No. 277,065**

**Claims priority, application Japan, Jul. 20, 1993, 5-039473 U**

**Int. Cl.[6] B63H** *21/38*

**U.S. Cl. 440—52** **26 Claims**



1. An outboard engine structure comprising an engine, a case for carrying said engine on an upper portion thereof, an oil pan which is accommodated inside an extension case forming at least a part of said case and stores oil for lubricating said engine, a drain passage for draining the oil from said oil pan, a drain passage opening and closing means for opening and closing said drain passage, and a pair of left and right mounts for carrying said extension case on a swivel case against vibration, wherein a mount receiving recess for receiving at least a part of one of said left and right mounts and an oil drain recess to which said drain passage opening and closing means is exposed are formed adjacent to each other and opened in the same direction on a side surface on one of left and right sides of said extension case, and wherein said oil drain recess and said mount receiving recess for said one of the left and right mounts are disposed adjacently to each other in a vertical direction with a common partition wall interposed therebetween.

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**5,501,622**

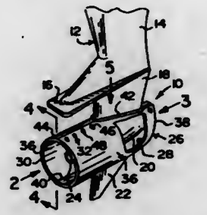
**MARINE MAMMAL GUARD**

**John J. Phelan, 109 Jeanette Ave., Inwood, N.Y. 11696**

**Filed May 8, 1995, Ser. No. 438,029**

**Int. Cl.[6] B63H** *5/16*

**U.S. Cl. 440—71** **4 Claims**



1. A marine mammal guard for an outboard motor having a drive shaft housing, an anticavitation plate, a lower support unit, a gear casing, a skeg and a propeller hub with a plurality of propeller blades radially thereabout, said guard comprising:

a) a protective housing having a pair of forward intake ports and a rearward exit port; and

b) means for securing said protective housing to the lower support unit, so that said protective housing will extend about the gear casing, the propeller hub and propeller blades below and parallel to the anticavitation plate and above the skeg, so as to protect marine animals from the propeller blades; and

c) at least two fitted foam blocks mounted between said protective housing and the gear casing, so that said protective housing will fit snugly thereto, thereby reducing vibration and inhibiting movement of said protective housing with respect to said outboard motor, wherein said protective housing includes:

i) a pair of generally semi-circular cylindrical components., each having a tapered forward end with one said forward intake port and half of said rearward exit port; and

ii) a hinge running lengthwise along lower edges between said components from said rearward exit port up to an opening provided for the skeg, wherein said securing means includes:

I) a gasket to fit about the lower support unit at the junction of a portion of upper mating edges of said components;

II) said upper mating edges of said components having a plurality of aligned spaced apart transverse bores therethrough; and

III) a plurality of bolts to thread into said bores, to keep said upper mating edges of said components abutted together closed.

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**5,501,623**

**PROPELLER DRIVE**

**Perry G. Bowen, III, 250 Adelina Rd., Prince Frederick, Md. 20678**

**Filed Oct. 14, 1994, Ser. No. 323,089**

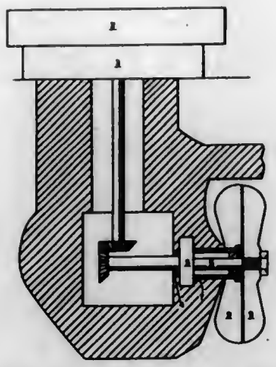
**Int. Cl.[6] B63H** *5/10*

**U.S. Cl. 440—75** **22 Claims**

1. A propeller drive for a marine vessel, comprising:

a diesel engine, said diesel engine having a transmission and an output shaft;

a clutch assembly, said clutch assembly connected to said output shaft of said diesel engine;



an outer propeller shaft and an inner propeller shaft connected to said clutch assembly and extending coaxially away from said clutch assembly;

an inner propeller, said inner propeller connected to said outer propeller shaft, said inner propeller rotatably operated through said clutch assembly by said output shaft;

an outer propeller, said outer propeller connected to said inner propeller shaft, said inner propeller rotatably operated through said clutch assembly by said output shaft, said inner propeller and said outer propeller both selectably operable for rotation in the same direction so that said inner propeller may be driven without driving said outer propeller or so that said outer propeller may be driven without driving said inner propeller.

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**5,501,624**

**OUTBOARD MOTOR COOLING ARRANGEMENT**

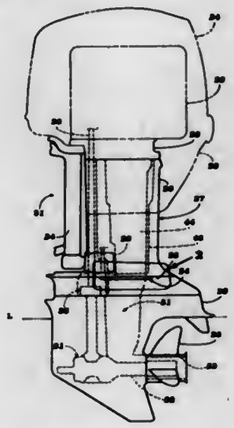
**Masahiro Matsumoto, and Kazunobu Nozue, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan**

**Filed Jul. 21, 1995, Ser. No. 505,808**

**Claims priority, application Japan, Jul. 25, 1994, 6-172434**

**Int. Cl.[6] B63H *5/12***

**U.S. Cl. 440—88** **24 Claims**



1. An exhaust arrangement for the lower unit of a marine propulsion device having a lower casing forming at least in part an underwater exhaust gas discharge for discharge of exhaust gases from a propelling internal combustion engine, said lower casing defining an exhaust cavity, an exhaust conduit extending within said lower casing and terminating in said exhaust cavity at a point above the level of water under at least some running conditions of said marine propulsion device, and means for delivering a flushing stream of cooling water to the outer surface of at least the portion of said lower casing which encloses said exhaust cavity from above the level of water.

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**5,501,625**

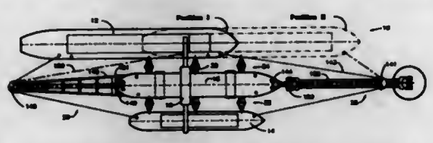
**FLOATING TERMINAL**

**Sidney I. Belinsky, 40 Waterside Plz. Apt. 14A, New York, N.Y. 10010**

**Continuation-in-part of Ser. No. 233,231, Apr. 25, 1994, abandoned, which is a continuation-in-part of Ser. No. 934,707, Aug. 24, 1992, abandoned. This application Dec. 27, 1994, Ser. No. 364,285**

**Int. Cl.[6] B63B *22/02***

**U.S. Cl. 441—3** **6 Claims**



1. A floating terminal for transferring cargo from a large ship to a small shuttle ship or vice versa, said floating terminal having a single point anchoring arrangement having a central hub, around which said floating terminal can rotate, to which cargo ships can berth at both port and starboard sides, comprising:

a fendering system permanently attached to at least one of said port and starboard sides and comprising at least two parallel gravity type floating breasting dolphins;

a mooring system which includes:

a bow mooring buoy with two guiding sheaves, said mooring buoy being chained to said hub of said single point anchoring arrangement;

a stern mooring floating dolphin comprising a floating pontoon, a truss type structure connecting said floating pontoon with the stern of said ship through a pair of bearings having a common axis, and two guiding sheaves located on the upper deck of floating pontoon; and

at least two quick actuating arresting arrangements on each of said port and starboard side of said floating terminal for preventing lateral movements of said floating terminal upon impact with the berthed ships.

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**5,501,626**

**POLYGONAL ELEMENT FOR CONSTRUCTING POLYHEDRAL STRUCTURES IN THE FORM OF A FLEXIBLE PERIPHERAL FRAME**

**Edward H. Harvey, 3 Church End Cottages, Bletchingdon, Oxford, United Kingdom**

**Filed Apr. 17, 1995, Ser. No. 423,027**

**Claims priority, application United Kingdom, Jan. 20, 1994, 9421165**

**Int. Cl.[6] A63H *33/08***

**U.S. Cl. 446—104** **12 Claims**

1. A polygonal element for forming polyhederal structures by hingedly connecting together a plurality of such elements in edge-to-edge relationship, wherein each side margin of the polygonal element comprises:

(a) an inner edge and an outer edge,

(b) first and second projections extending outwardly of the outer edge and defining therebetween a recess,

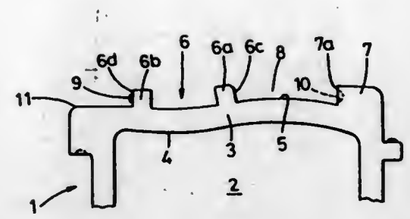
(c) said first projection consisting of a pair of spaced limbs extending outwardly of the outer edge and unconnected at their ends, said limbs each having an outer side face, the outer side faces of said limbs being spaced apart a distance which is substantially the same as the length of said recess,

(d) the outer face of that limb adjacent said second projection defining a first side face of said recess and forming an abutment face,

(e) a second side face of said recess opposite said abutment face formed on said second projection and having a hinge socket formed therein, and an outer side face of the distal of said limbs being provided with a projecting hinge pip,

whereby when the polygonal element is hingedly connected edge-to-edge with another such element by inserting said first projection of a side margin of each element in the recess of the side margin of the other element so that the abutment faces thereof abut, pressure will be exerted on the outer side faces of the limbs of the first projection of each element to produce sufficient bowing of the side margin of each element to enable the hinge pip of each side margin to be sprung into the hinge socket of the other side margin of the other element.





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**5,501,627**

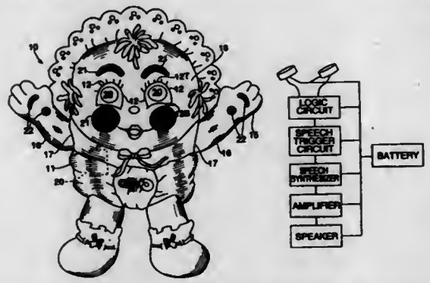
**CHILDREN'S TOY WITH PEEK-A-BOO ACTIVATION**

**Penny Ekstein, 155 E. 55th St., New York, N.Y. 10022**

**Filed Nov. 8, 1994, Ser. No. 345,562**

**Int. Cl.[6] A63H *3/28***

**U.S. Cl. 446—175** **11 Claims**




1. A doll having a body, a first eye located on a head portion of said body, a first hand and a first flexible arm connecting said first hand to said body,

said body containing a speech synthesizer for producing a speech signal, a speech trigger circuit for activating said speech synthesizer and a speaker for producing an audible output in response to a speech signal produced by said speech synthesizer,

said first eye containing a first switch responsive to covering and uncovering said first eye, said first switch providing an indication to said speech trigger circuit that said first eye is either covered or uncovered, and

a fastening means for releasably fastening said first hand over said first eye said doll further comprising a second eye, a second hand and a second flexible arm, and wherein said second eye contains a second switch responsive to covering and uncovering said second eye, said second switch providing an indication to said speech trigger circuit that said second eye is either covered or uncovered, and

said speech trigger circuit providing a speech activation signal to said speech synthesizer in response to receipt of an indication that both of said first and second eyes have initially become covered, and then within a predetermined time period thereafter, that said first and second eyes have both become uncovered.

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**5,501,628**

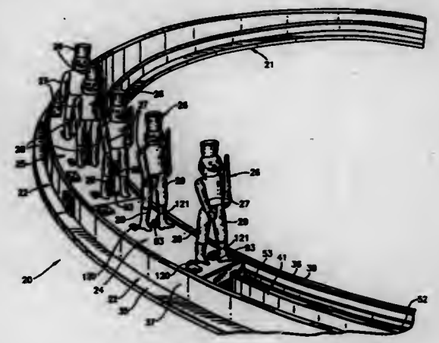
**CAM-OPERATED, SYNCHRONIZED MARCHING SOLDIER TRACKWAY**

**Thomas L. Simmel, Milford, and Deborah J. McDarren, Ridgefield, both of Conn., assignors to Link Group International, Ridgefield, Conn.**

**Filed Feb. 14, 1994, Ser. No. 195,864**

**Int. Cl.[6] A63H *11/18***

**U.S. Cl. 446—332** **21 Claims**



1. An entertainment system providing a plurality of automatic movable objects constructed for following a defined path and performing at least one repeatable activity, said system comprising:

A. an elongated path defining member;

B. a carrier cooperatively associated with the path defining member for movement thereon

C. a plurality of objects

a. mounted to the carrier for movement along the path member;

b. each of said objects performing a first activity in synchronization with each other,

c. each of the objects being pivotally mounted to the carrier for enabling each object to pivot about a pivot axis relative to the carrier from a first position to a second position,

D. movement control means cooperatively associated with the object for advancing the object along the path defining member;

E. first control means mounted to the object for causing the object to repeatedly perform a first desired activity or movement on a repeatable basis, while the object advances along the path defining member; and

F. second control means

a. cooperatively associated with the object for causing the object to perform a second desired activity or movement each time the object traverses at least one particular location on the path defining member,

b. constructed for controllably moving each object from its first position to its second position each time said object traverses a first zone on the path defining member and controllably returning each object from its second position to its first position each time the object traverses a second zone on the path defining member, whereby each object is capable of providing a second, unique activity or movement every time each object traverses a first zone and

automatically returns to its original position every time the object traverses the second zone, and comprising

c. first means for maintaining each object in its first position, comprising

1. a plate member mounted to the elongated path defining member and comprising a terminating edge spaced away from a surface of the path defining member a fixed distance which extends substantially the entire length thereof, and

2. a follower arm mounted to the pivotable object and positioned for cooperative association with the plate member for controlling the pivoting action of the object and preventing arcuate movement of the object about the pivot axis when said follower arm is in contact with the terminating edge of the plate,

d. second means for enabling each object to arcuately pivot from its first position into its second position, and

e. third means for causing each object to arcuately pivot from its second position to its first position,

whereby an entertainment system is attained which is capable of providing simultaneous movement of an object about a path while also having the object perform a first desired activity on a continuing and repeatable basis, and also performing a second separate and distinct activity at specifically designated locations.

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**5,501,629**

**BUFFING APPARATUS SUITABLE TO BUFF THIN PLATE WORK AND CONTROLLING METHOD FOR THE APPARATUS**

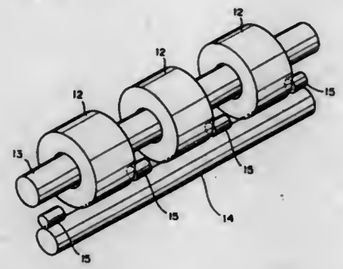
**Eishirou Kawana; Hitoshi Ogawa; Koichi Ishida, and Kazuo Aoki, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Filed Sep. 8, 1993, Ser. No. 117,928**

**Claims priority, application Japan, Sep. 10, 1992, 4-241658; Jan. 16, 1992, 4-278661**

**Int. Cl.[6] B24B *1/00***

**U.S. Cl. 451—28** **10 Claims**




1. A buffing apparatus, comprising:

a plurality of buffing rolls removably secured in a predetermined spaced relationship from each other to a shaft which is driven to rotate;

a backup roll disposed in parallel to said buffing rolls and extending over an overall length of all of said buffing rolls; and

a holding roll disposed at least between each adjacent ones of said buffing rolls, said holding roll being positioned such that an axis thereof is positioned on a straight line interconnecting a center of a transverse section of one of said buffing rolls and a center of a transverse section of said backup roll and an outer periphery thereof substantially contacts with a contacting plane of said buffing rolls.

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**5,501,630**

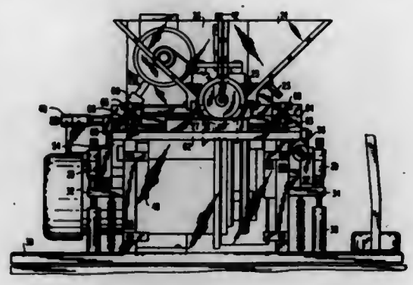
**METHOD FOR GRINDING NEEDLE POINTS ON SURGICAL GRADE NEEDLE BLANKS**

**W. Scott Samuel, Bristol, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.**

**Division of Ser. No. 959,054, Oct. 9, 1992, Pat. No. 5,388,374. This application Jun. 28, 1994, Ser. No. 266,743**

**Int. Cl.[6] B24B *1/00***

**U.S. Cl. 451—49** **17 Claims**



1. Method for grinding needle points on surgical grade needle blanks comprising the steps of:

(a) providing a surgical needle grinding apparatus having

a transport wheel;

a support saddle having first and second ends and defining a curvature corresponding to a curvature of the transport wheel, the support saddle adjustably positioned adjacent the transport wheel to frictionally hold elongated surgical grade needle blanks therebetween, wherein a feed point is defined by the juxtaposition of the first end of the support saddle and the transport wheel;

a grinding wheel having an asymmetrically concave grinding surface disposed adjacent the transport wheel and the support saddle;

(b) rotating the transport wheel;

(c) rotating the grinding wheel; and

(d) feeding at least one elongated surgical grade needle blank to the feed point such that each at least one workpiece is advanced along the asymmetrically concave grinding surface.

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**5,501,631**

**COIN HANDLING DEVICE WITH AN IMPROVED LUBRICATION SYSTEM**

**Douglas U. Mennie, Barrington; George A. Rokos, Naperville, and Joseph J. Gelb, Mt. Prospect, all of Ill., assignors to Cummins-Allison Corp., Mt. Prospect, Ill.**

**Continuation-in-part of Ser. No. 325,778, Oct. 17, 1994, which is a continuation-in-part of Ser. No. 177,908, Jan. 19, 1994, Pat. No. 5,370,575. This application Mar. 9, 1995, Ser. No. 401,414**

**Int. Cl.[6] G07D *3/00***

**U.S. Cl. 453—3** **24 Claims**

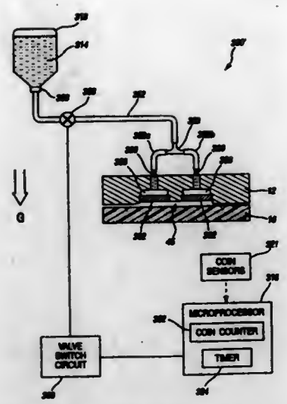
1. A coin handling system, comprising:

a coin-driving member having a resilient surface;

a stationary coin-guiding member having a coin-guiding surface opposing the resilient surface of the coin-driving member, the coin-guiding surface being positioned generally parallel to the resilient surface and spaced slightly therefrom, the resilient surface of the coin-driving member moving coins along the coin-guiding surface of the coin-guiding member;

a cavity formed in the coin-guiding surface of the coin-guiding member;






a reservoir storing a lubrication fluid;

a supply tubing for conveying the lubrication fluid from the reservoir to the cavity; and

a control system regulating the flow of the lubrication fluid from the reservoir to the cavity via the supply tubing.

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**5,501,632**

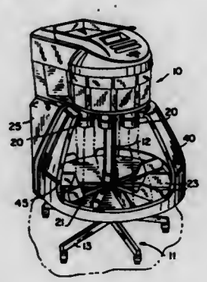
**COIN SORTER SECURITY COMPARTMENT**

**Thomas P. Adams, Oconomowoc; Kerry Karpathian, Waukesha; Roger Klemp, Watertown, and Thomas S. Murphy, Lake Mills, all of Wis., assignors to Brandt, Inc., Watertown, Wis.**

**Filed Apr. 17, 1995, Ser. No. 422,970**

**Int. Cl.[6] G07D *3/00***

**U.S. Cl. 453—3** **15 Claims**



1. A security compartment for a coin handling apparatus having a plurality of coin containers arrayed in a circle around a centerline, said compartment comprising:

a stationary enclosure connected to the coin handling apparatus on one side of the circle; and

a shroud mounted for rotation about the centerline and having an opening that may be hidden by the enclosure or exposed to provide access to the coin containers when the shroud is rotated.

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**5,501,633**

**COIN MECHANISM HAVING COIN LEVEL SENSOR**

**Keith J. Watkins, Wokingham, and Nigel A. Winstanley, Reading, both of, United Kingdom, assignors to Mars Incorporated, McLean, Va.**

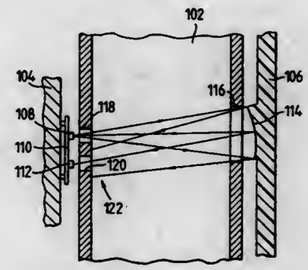
**PCT No. PCT/GB92/01735, § 371 Date Apr. 12, 1994, § 102(e) Date Apr. 12, 1994, PCT Pub. No. WO93/08544, PCT Pub. Date Apr. 29, 1993**

**PCT Filed Sep. 21, 1992, Ser. No. 211,675**

**Claims priority, application United Kingdom, Jan. 16, 1991, 9121958**

**Int. Cl.[6] G07F *9/02***

**U.S. Cl. 453—17** **11 Claims**




1. A coin mechanism having a coin storage tube and an optical sensor for sensing the level of coins in the tube, the sensor comprising a light source arranged to direct a light beam across the tube, means for returning the beam across the tube and a light detector for detecting the returned beam, wherein the means for returning the beam is a concave mirror having a curvature such as to give the beam a projected area at the detector, substantially greater than the effective area of the detector.

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**5,501,634**

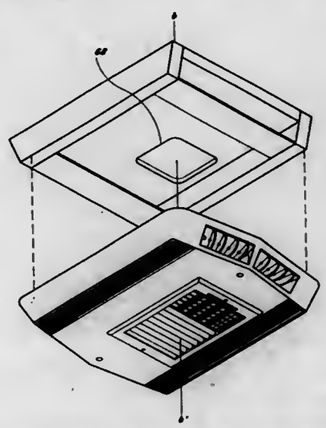
**AIR CONDITIONER COVER ASSEMBLY**

**Timothy S. Wilder, 5237 SW. 120th Ave., Cooper City, Fla. 33330**

**Filed Oct. 31, 1994, Ser. No. 332,339**

**Int. Cl.[6] B60H *1/32***

**U.S. Cl. 454—136** **8 Claims**



1. A cover assembly for a mounted air conditioning unit, said air conditioning unit having an output blower, said cover assembly comprising:

a cover member having a face portion and a sidewall extending around its periphery, said cover member attached to a base area of the mounted air conditioning unit;

register means for passing a volume of undiverted air from said mounted air conditioner unit through said cover member, said register means providing a first outlet means for air received from said output blower, said register means disposed within the face portion of said cover member and being substantially aligned with the output blower of said air conditioning unit when said cover member is attached to a portion of the air conditioning unit, said register means having a plurality of volume control louvers for allowing an amount of undiverted air to pass through said cover member, said volume control louvers being positioned anywhere from a fully closed position to a fully open position; and

at least one side diffuser disposed within said sidewall of said cover member, said side diffuser providing a second outlet means for air received from said output blower;

wherein when said volume control louvers are in a fully closed position a volume of air received from said output blower is deflected by said register means along said cover means through said side diffuser.

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**5,501,635**

**COMBINE WITH STRAIN CHOPPER**

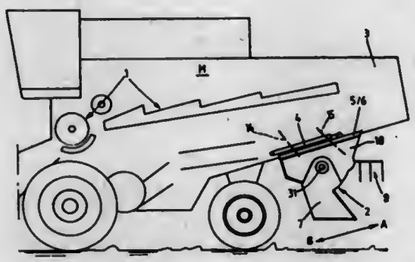
**Martin Niermann, Harsewinkel, Germany, assignor to Class oHG beschränkt haftende offene, Handelsgesellschaft, Germany**

**Filed Dec. 6, 1994, Ser. No. 354,074**

**Claims priority, application Germany, Dec. 8, 1993, 43 41 764.7**

**Int. Cl.[6] A01F** *12/40*

**U.S. Cl. 460—112** **12 Claims**




1. A combine comprising a straw chopper, to a rear of a threshing and separator apparatus, the straw chopper being shiftable in a displacement motion on a straw hood into a work position (A) and a nonworking position (B), via a fluid pressure cylinder (4),

wherein the straw chopper (2) is displaceably supported on guides (5,6) of the straw hood (3) and is movable into the work position (A) and nonworking position (B) by means of the fluid pressure cylinder (4), a discharge hopper (7) of the straw chopper (2) and a straw guide rake (8) disposed on the straw chopper (2) being pivoted into a working position (A) and a nonworking position (B) as a function of the displacement motion of the straw chopper (2) via coupling members (9–13).

**5,501,636**

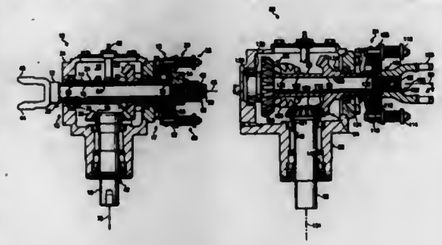
**ROTARY MACHINE SYSTEM HAVING HOLLOW TUBE SHAFT AND PLURAL OUTPUT SHAFTS**

**Jeffrey S. Janke, and Ronald L. Parkins, both of Oregon, Ill., assignors to Woods Equipment Corporation, Oregon, Ill.**

**Filed Jan. 10, 1994, Ser. No. 179,164**

**Int. Cl.[6] F16D** *7/02;* **F16H** *37/06*

**U.S. Cl. 464—48** **25 Claims**



1. A rotary machinery system comprising:

a tubular shaft rotatable about a first axis and having a hollow core, said tubular shaft having a first end and a second end;

a second shaft coaxial with said tubular shaft and rotatable in a first direction in response to an input torque about said first axis, at least a portion of said second shaft being located in said hollow core, said second shaft having an input end configured to receive said input torque and a transfer end;

a clutch assembly coupling said first end of said tubular shaft to said transfer end of said second shaft for rotating said tubular shaft in said first direction responsive to rotation of said second shaft;

an output shaft rotatable about a second axis; and

coupling means for rotatably coupling said output shaft to said tubular shaft.

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**5,501,637**

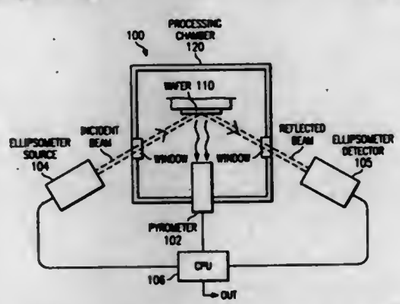
**TEMPERATURE SENSOR AND METHOD**

**Walter M. Duncan; Francis G. Celii, both of Dallas; Steven A. Henck; Ajit P. Paranjpe, both of Plano; Douglas L. Mahlum, Allen, and Larry A. Taylor, N. Richland Hills, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Continuation of Ser. No. 104,963, Aug. 10, 1993, abandoned. This application Sep. 20, 1994, Ser. No. 309,347**

**Int. Cl.[6] G01J** *5/10;5/58;4/04;* **G02F** *1/01*

**U.S. Cl. 374—126** **15 Claims**




1. A temperature sensor for a layered structure, comprising:

a pyrometer; and

an absorptance detector coupled to said pyrometer, said detector determining emissivity of a layered structure based on layer thickness measurements;

wherein said absorptance detector provides an emissivity correction for said layered structure to said pyrometer.



14. A method of temperature sensing of a non-metal layered structure, comprising the steps off:

determining the absorptance of a non-metal layered structure by ellipsometry based on layer thickness measurements with said non-metal layered structure including at a surface at least one layer of known materials;

determining an emissive power at said surface of said non-metal layered structure by pyrometry; and

computing the temperature from said emissive power and said absorptance.

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**5,501,638**

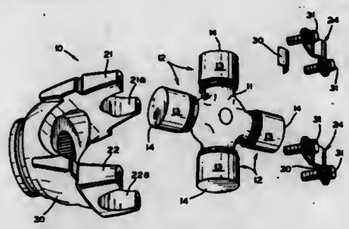
**BEARING CUP RETAINER STRAP FOR UNIVERSAL JOINT**

**James A. Duggan, Temperance, Mich., assignor to Dana Corporation, Toledo, Ohio**

**Filed Mar. 29, 1994, Ser. No. 219,385**

**Int. Cl.[6] F16D** *3/40*

**U.S. Cl. 464—130** **20 Claims**



1. A retainer strap for securing a bearing cup within a recess formed in an arm of a yoke of a universal joint assembly comprising:

a body portion including a surface adapted to extend about and engage a portion of the bearing cup to retain the bearing cup in engagement with the recess in the arm of the yoke;

means for securing said body portion to the arm of the yoke; and

a friction material secured to said surface of said body portion, said friction material defining a coefficient of friction which is greater than a coefficient of friction defined by said surface of said body portion, said friction material adapted to frictionally engage the bearing cup when said body portion is secured to the yoke so as to prevent relative rotation therebetween.

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**5,501,639**

**CONSTANT VELOCITY UNIVERSAL BALL JOINT**

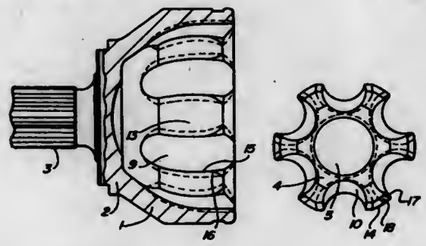
**Werner Krude, Neunkirchen-Wolperath, Germany, assignor to GKN Automotive AG, Lohmar, Germany**

**Filed Jan. 13, 1993, Ser. No. 3,630**

**Claims priority, application Germany, Jan. 15, 1992, 42 00 848.4**

**Int. Cl.[6] F16D** *3/223*

**U.S. Cl. 464—145** **10 Claims**




1. A constant velocity joint comprising:

an outer joint part and an inner joint part, each part including a plurality of ball tracks extending substantially in a longitudinal direction and a plurality of faces, each respective face being disposed between adjacent ball tracks;

balls for torque transmission are guided in the opposed tracks in the outer joint part and in the inner joint part;

a cage with cage windows holding each ball in a plane positioned substantially perpendicular relative to a longitudinal axis;

means for guiding the cage with the balls onto an angle-bisecting plane if the axes of the outer joint part and the inner joint part deviate from one another; and

at the outer joint part and/or at the inner joint part, each track face of the ball tracks subjected to loads by contact of the balls, as well as a portion of each face adjoining ball tracks, are subjected to a hardening operation and each face including unhardened zones positioned between the face portions.

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**5,501,640**

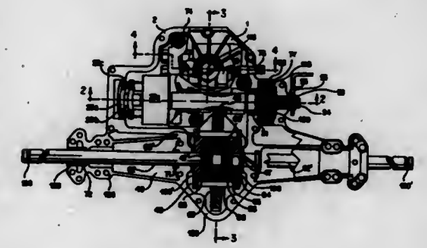
**TRANSAXLE HAVING HYDROSTATIC TRANSMISSION WITH HYDRAULIC REDUCTION**

**Ray M. Hauser, Decatur, Ill., and Alan W. Johnson, Ames, Iowa, assignors to Hydro-Gear Limited Partnership**

**Continuation of Ser. No. 25,272, Mar. 2, 1993, Pat. No. 5,330,394, which is a division of Ser. No. 917,858, Jul. 22, 1992, Pat. No. 5,314,387, which is a continuation-in-part of Ser. No. 727,463, Jul. 9, 1991, Pat. No. 5,201,692. This application Jun. 16, 1994, Ser. No. 260,807**

**Int. Cl.[6] F16H** *47/04*

**U.S. Cl. 475—83** **8 Claims**



1. A transaxle having a hydrostatic transmission for use in a vehicle to convert rotational power from the vehicle engine to output axle means of said vehicle, comprising

a) a housing for said transaxle comprising an upper section and a lower section, said sections meeting at a parting plane which is generally parallel to said output axle means;

b) a hydraulic displacement pump located in said housing and having a rotatable cylinder block containing a plurality of chambers for holding reciprocal pistons, and receiving a rotatable input shaft;

c) at least one hydraulic displacement motor located in said housing and having a rotatable cylinder block containing a plurality of chambers for holding reciprocal pistons;

d) means for driving a rotatable output drive mechanism;

e) mounting means for rotatably mounting said hydraulic displacement pump and said hydraulic displacement motor wherein said mounting means is separate from said housing and is mounted therein;

f) porting means integrally formed with said mounting means for hydraulically connecting said hydraulic displacement pump to said hydraulic displacement motor;

g) hydraulic transfer means comprising said piston chambers of said hydraulic displacement pump, said piston chambers of said hydraulic displacement motor and said porting means wherein the displacement of said piston chambers of said

hydraulic displacement motor is larger than the displacement of said piston chambers of said hydraulic displacement pump; and

h) means for reducing the rotational speed of said output axle means relative to the rotational speed of said input shaft, wherein at least a portion of the speed reduction is accomplished through said hydraulic transfer means and a portion of said reduction is taken through at least one set of mechanical gears.

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**5,501,641**

**MOTOR VEHICLE GEAR WHEEL CHANGE TRANSMISSION WITH A RETARDER BRAKE**

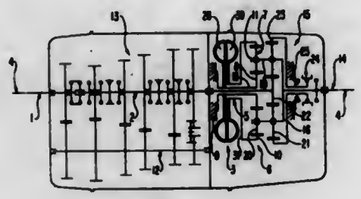
**Albrecht Koellermeyer, Althuette, and Detlef Schnitzer, Denkendorf, both of, Germany, assignors to Mercedes-Benz AG, Germany**

**Filed Jul. 21, 1994, Ser. No. 277,280**

**Claims priority, application Germany, Jul. 21, 1993, 43 24 460.2**

**Int. Cl.[6] F16H *3/56;37/04;47/08;* F16D *57/00***

**U.S. Cl. 475—107** **2 Claims**



1. A motor vehicle gear wheel change transmission of the countershaft construction, comprising an input shaft, a main shaft coaxial to the input shaft and a retarder brake with a drive shaft situated centrically to a braking rotation axis in a driving connection with the main shaft via a power take-off with a planetary gearset, and with one central wheel of the planetary gearset of the power take-off connected with a non-rotating housing and another central wheel connected with the drive shaft of the retarder brake, and the planet carrier in a driving connection with the main shaft,

wherein the braking rotation axis is coaxial with respect to a rotation axis of the main shaft, and the retarder brake and the planetary gearset of the power take-off are operatively arranged between a basic transmission comprising the input shaft as a transmission input, at least one countershaft and the main shaft as a transmission output on one side and an auxiliary transmission of planet wheel construction situated on the other side, said auxiliary transmission being in a transmission power flux in series between a main shaft and a coaxially arranged output shaft, and a non-rotatable driving connection is provided between the planet carrier of the planetary gearset of the power take-off and the planet carrier of the auxiliary transmission, and a hollow shaft through which the main shaft passes constitutes a connection between a central wheel of the planetary gearset of the power take-off and the retarder brake and further wherein the hollow shaft is fixedly connected with a stator of the retarder brake and with a central wheel of the planetary gearset of the power take-off, the other central wheel of the planetary gearset of the power take-off being non-rotatably connected with a rotor of the retarder brake, and planet wheels of the planetary gearset being rotatably arranged relative to planet wheels of the auxiliary transmission.

**5,501,642**

**SHIFT CONTROL SYSTEM FOR VEHICULAR AUTOMATIC TRANSMISSION**

**Takeshi Inuzuka; Masashi Hattori, both of Anjo; Masato Kaigawa, Toyota; Yasuo Hojo, Nagoya; Atsushi Tabata, Okazaki, and Kenji Shirai, Mishima, all of, Japan, assignors to Aisin Aw Co., Ltd., Japan**

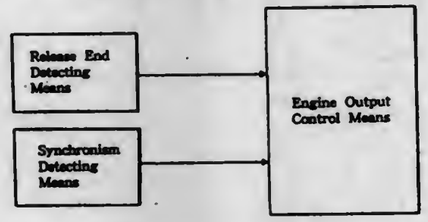
**PCT No. PCT/JP94/00383, § 371 Date Feb. 21, 1995, § 102(e) Date Feb. 21, 1995, PCT Pub. No. WO94/21484, PCT Pub. Date Sep. 29, 1994**

**PCT Filed Mar. 9, 1994, Ser. No. 335,846**

**Claims priority, application Japan, Mar. 15, 1993, 5-081513**

**Int. Cl.[6] B60K *41/04***

**U.S. Cl. 477—107** **6 Claims**




1. A shift control system for a vehicular automatic transmission, comprising:

release end detecting means for detecting the release end of a frictional engagement element for a higher gear stage, at a shifting time from higher to lower gear stages;

synchronism detecting means for detecting the synchronism between an engine R.P.M. and a rotating element in the automatic transmission at the lower gear stage; and

engine output control means for controlling the output of the engine,

wherein said engine output control means starts the rise control of the engine output, when the release end of the Frictional engagement element for the higher gear stage is detected by said release end detecting means, and ends the rise control of said engine output when the synchronism between the engine R.P.M. and the rotating element in the automatic transmission at the lower gear stage is detected by said synchronism detecting means.

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**5,501,643**

**POWER TRANSMISSION BELT**

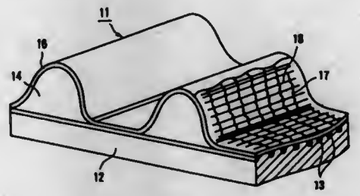
**Shigehiro Isshiki; Masami Sato; Yasuyuki Tatsumi, and Yutaka Yoshimi, all of Yamatokoriyama, Japan, assignors to Unitta Company, Osaka, Japan**

**Filed Nov. 16, 1994, Ser. No. 341,156**

**Claims priority, application Japan, Nov. 19, 1993, 5-314284; Jan. 21, 1994, 6-282652**

**Int. Cl.[6] F16G *1/08***

**U.S. Cl. 474—268** **23 Claims**




1. A power transmission belt provided with a belt body formed using as a rubber stock a hydrogenated nitrile rubber having a



Mooney viscosity at 100° C. of at least 90 and cords embedded in the belt body extending in the longitudinal direction of the belt body and having at their outermost layer a layer of phenol resin modified by a phenol having side chains with unsaturated bonds and a component including a phenyl carboxylic acid and a predetermined compound.

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**5,501,644**

**METHOD AND ARRANGEMENT FOR ACTUATING AN AUTOMATIC TRANSMISSION**

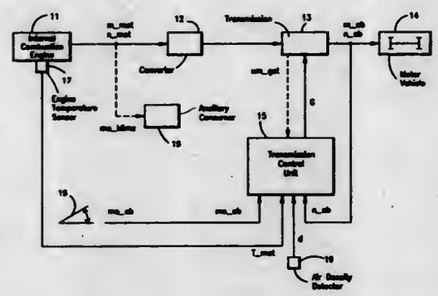
**Hong Zhang, Schwieberdingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany**

**Filed Sep. 1, 1994, Ser. No. 299,446**

**Claims priority, application Germany, Sep. 4, 1993, 43 29 978.4**

**Int. Cl.[6] B60K *41/04***

**U.S. Cl. 477—97** **11 Claims**



1. A method of actuating an automatic transmission of a motor vehicle equipped with a drive unit consuming fuel, the method comprising the steps of:

providing a first signal (n_ab) representing the transmission output rpm and/or the motor rpm and/or the transmission input rpm;

providing a second signal (mo_ab) representing a desired value for the torque outputted by said transmission;

providing a threshold value (mo_ab_stst) which is at least dependent upon parameters (mo_verl, Pa, Tans, mo_klima) which influence the maximum torque (mo_kup_max) outputted by said drive unit to said transmission; and,

adjusting the transmission ratio in dependence upon a comparison of at least one of said first signal (n_ab) and said second signal (mo_ab) to said threshold value (mo_ab_stst) thereby causing said drive unit to operate in an operating range which is optimal as to the consumption of fuel.

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**5,501,645**

**CONTROL SYSTEM FOR VEHICULAR AUTOMATIC TRANSMISSIONS WITH A QUICK-SHIFT HYDRAULIC SYSTEM FOR MANUAL SHIFTING**

**Takao Taniguchi, Okazaki; Kazumasa Tsukamoto, Toyota; Masahiro Hayabuchi, Anjo, and Masahiko Ando, Okazaki, all of, Japan, assignors to Aisin Aw Co., Ltd., Japan**

**Continuation of Ser. No. 964,625, Oct. 23, 1992, abandoned.**

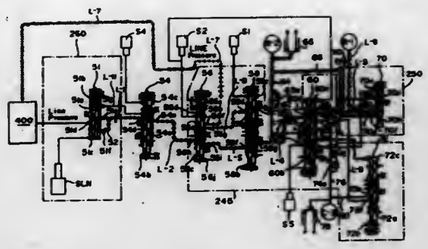
**This application Apr. 15, 1994, Ser. No. 228,186**

**Claims priority, application Japan, Jan. 24, 1991, 3-277549**

**Int. Cl.[6] F16H *61/24;* B60K *41/06***

**U.S. Cl. 477—130** **10 Claims**

1. A control system for a vehicular automatic transmission including a planetary gear unit and a plurality of hydraulically operated friction elements for connecting components of the planetary gear unit selectively either to rotary members or to stationary members, said control system comprising:



an electronic control unit for outputting at least one signal indicating a detected running condition of the vehicle;

a hydraulic control unit for selectively switching and controlling oil pressures to be fed to the friction elements, said hydraulic control unit comprising:

hydraulic servo means for achieving a first gear stage, said hydraulic servo means comprising a first hydraulic servo for engagement to provide engine braking;

a second hydraulic servo for achieving a second gear stage;

oil pressure generating means for generating a first oil pressure;

pressure regulating means for regulating said first oil pressure to produce a second oil pressure in accordance with the detected running condition of the vehicle;

shift switch means, disposed between said oil pressure generating means and both of (1) said hydraulic servo means and (2) said second hydraulic servo, for switching and controlling feed of said first oil pressure to either said hydraulic servo means or said second hydraulic servo in accordance with the detected running condition of the vehicle;

first oil passage means for feeding said first oil pressure from said oil pressure generating means to said hydraulic servo means, through said shift switch means;

flow control means disposed in said first oil passage means, between said hydraulic servo means and said shift switch means;

first switch means disposed between said pressure regulating means and said hydraulic servo means, for selectively feeding said second oil pressure to said first hydraulic servo in accordance with the detected running condition of the vehicle;

second switch means, disposed between said pressure regulating means and said first switch means, for selectively feeding said second oil pressure to said shift switch means in accordance with the detected running condition of the vehicle; and

second oil passage means for feeding said second oil pressure from said pressure regulating means to said hydraulic servo means through said second switch means and said first switch means.

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**5,501,646**

**JAW, FACE AND NECK MUSCLE EXERCISE APPARATUS**

**Warren G. Miller, Linthicum, Md., assignor to W. G. Miller Associates, Linthicum, Md.**

**Filed Aug. 26, 1994, Ser. No. 296,477**

**Int. Cl.[6] A63B *23/025;23/03***

**U.S. Cl. 482—11** **7 Claims**

1. A portable jaw and neck muscle exercise apparatus, comprising:

a piston;

a cylinder positioned substantially coaxially with said piston, one end of said piston extending into one end of said cylinder;

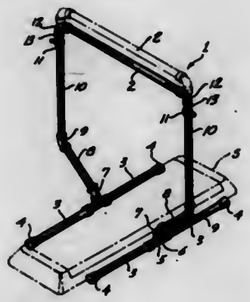
spring means within said cylinder for providing resistance against the movement of said piston into said cylinder;

a chin cup connected to one end of said piston and cylinder combination; and

anchor means for holding said piston and cylinder combination in place between the chin and chest of the user when in use.



5,501,647
**FREESTANDING HAND BAR**
Marnie Snyder, 10877 Bill Point Clr., Bainbridge Island, Wash. 98110
Filed Sep. 8, 1994, Ser. No. 303,059
Int. Cl.[6] A63B 1/00
U.S. Cl. 482—38 6 Claims

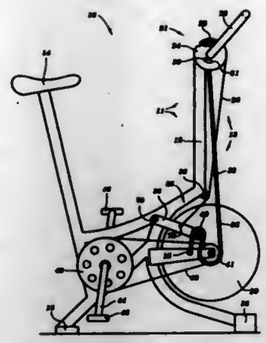


1. Exercise apparatus comprising:
a freestanding hand bar for resting on a supporting surface including an upper elongated horizontal member, and a stand connected to said horizontal member for supporting said horizontal member spaced above the supporting surface, said stand including two elongated feet disposed in substantially parallel relationship and spaced apart laterally for resting on the supporting surface and two upright legs connected to said feet, respectively, and extending upward therefrom, each of said legs having an elongated portion angled upward and outward from the corresponding foot to which such leg is connected, said upper horizontal member normally extending transversely of said feet and being of a length substantially greater than the distance between said feet; and
a portable step aerobics exercise step having opposite sides positioned between and closely adjacent to said feet.

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5,501,648
**FRONT WHEEL DRIVE BICYCLE EXERCISE DEVICE**
Nikita Grigoriev, East James St., Richfield Springs, N.Y. 13439
Filed Jul. 15, 1994, Ser. No. 276,481
Int. Cl.[6] A63B 21/00; A61H 1/02
U.S. Cl. 482—57 5 Claims

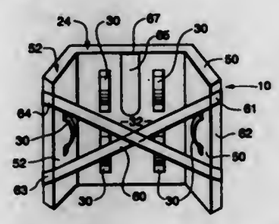
1. Apparatus comprising:
a front wheel and a reciprocating handlebar assembly attached to a frame;
a first clutch and a second clutch mounted for driving said front wheel;



a drive pulley mounted to said handlebar assembly, wherein said drive pulley includes a slot for limiting rotation of said drive pulley;
a first elongate member, connecting said first clutch to said drive pulley, whereby said reciprocating handlebar assembly, in conjunction with said drive pulley, is adapted for driving said first clutch; and
a second elongate member, connecting said second clutch to a pedal crank assembly, whereby the pedal crank assembly is adapted for driving said second clutch.

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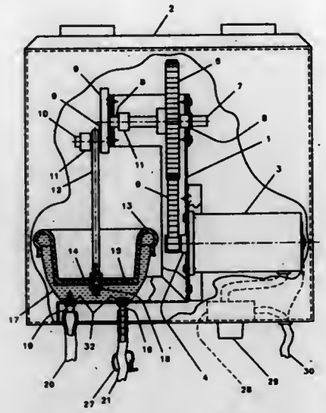
5,501,649
**MARTIAL ARTS TRAINING PAD AND BLOCKING SHIELD**
Timothy J. Queppet, 117 Railroad Ave., Unit A1, West Grove, Pa. 19390
Filed Oct. 27, 1994, Ser. No. 329,415
Int. Cl.[6] A63B 69/26
U.S. Cl. 482—88 9 Claims



1. A portable combination training pad and blocking shield for use by athletes in practicing martial arts kicking and punching techniques which a partner may hold in front of his body for protection and to provide strike surfaces for an athlete to strike while practicing kicking and punching, comprising:
a resilient strike board having an outside surface against which said kicking and punching is directed, and inside surfaces opposite said outside surface having shield holding handles, wherein the improvement comprises:
the resilient board having,
a generally planar front strike surface, bound by an upper edge, a lower edge, a left edge and a right edge;
a left lateral side extending rearwardly relative to said planar front surface toward said partner from said left edge of said front surface, and having a left lateral strike surface; and,
a right lateral side extending rearwardly relative to said planar front surface toward said partner from said right edge of said front surface and having a right lateral strike surface, wherein the left lateral side and the right lateral side form an angle with said front strike surface and an interior space.



5,501,650
**AUTOMATED MASTURBATORY DEVICE**
Reinhard R. Gellert, 2821 N. Elm La., Arlington Heights, Ill. 60004
Filed Sep. 8, 1993, Ser. No. 118,154
Int. Cl.[6] A61F 5/00
U.S. Cl. 600—38 6 Claims

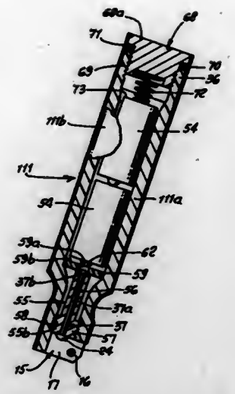


1. An automated masturbatory device comprising:
(a) means for providing reciprocating motion;
(b) a sealed transducer having fluid therein and a fitting thereon for fluid communication;
(c) a connecting rod;
(d) a fluid communication conduit;
(e) a generally hollow cylindrical receiver including:
(1) a pliable elongated annular bladder positioned therein;
(2) the annular bladder having a fitting thereon for connection to said fluid communication conduit;
(3) a removable cap;
(f) said means for providing reciprocating motion being connected to said sealed transducer with said connecting rod; said sealed transducer provides repeated fluid pulses to the receiver via said fluid communication conduit; said repeated fluid pulses acting on the receiver with said removable cap installed cause masturbatory motion when said receiver is placed over a male penis.

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5,501,651
**FLUID SUBMERSIBLE LARYNGOSCOPE PREVENTING ELECTROLYTIC CURRENT FLOW**
Jack Bauman, 2210 Wilshire Blvd., Ste. 705, Santa Monica, Calif. 90403
Filed Jun. 13, 1994, Ser. No. 258,729
Int. Cl.[6] A61B 1/26
U.S. Cl. 600—198 13 Claims

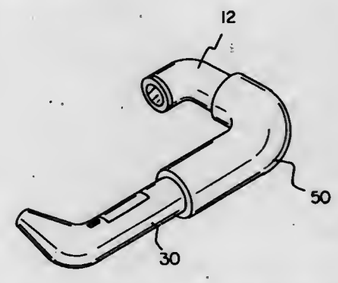
1. In a fluid submersible laryngoscope including a hollow handle to contain power supply means, a blade to be inserted into a patient's mouth, and means to removably attach the blade to an end portion of the handle in a substantially L shaped configuration, the improvement comprising:
a) a terminal pin carried by the handle at said end portion of the handle,
b) first fluid sealing means between the terminal pin and handle to block access of external fluid into the hollow handle, whether or not the blade is attached to the handle, and when the handle is submerged in fluid, said fluid sealing means comprising a tubular elastomeric body carrying said terminal pin and having an end, and



c) means for preventing deflection of the terminal pin into electrical current transmitting relation with the power supply means until the blade is attached to the handle,
wherein said means for preventing deflection comprises an insulation disc located between said power supply means and said end of the elastomeric body, said insulation disc defining a bore through which said terminal pin at least partially extends, whereby attachment of the blade to the handle causes said terminal pin to move through said bore into current transmitting relation with the power supply means.

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5,501,652
**SELF-EXAMINATION OTOSCOPE**
William A. Woods, 3009 Kings La., Nashville, Tenn. 37218
Filed Sep. 15, 1994, Ser. No. 306,420
Int. Cl.[6] A61B 1/227
U.S. Cl. 600—200 4 Claims



1. A self-examination otoscope for allowing a user to examine an eardrum and external canal of one of his own ears comprising, in combination:
an eyepiece component further comprising:
a hollow rigid elbow having a circular cross-section, an open eyepiece end, an open base end, and a perpendicular bend therebetween;
an adjustable magnifying lens coupled to the eyepiece end; and
a mirror disposed therein and secured at the bend at a position for directing light entering the base end towards the eyepiece end;
a speculum component further comprising:
a hollow rigid elbow wish an interior and exterior portion and further having a circular cross-section, a conical open

speculum end, an open base end having a diameter greater than the speculum end, and a perpendicular bend therebetween;

a removable door formed thereon between the bend and base end;

a mirror disposed within the elbow and secured at the bend in a position for directing light entering the speculum end towards the base end;

a lamp disposed within the elbow and secured thereto at a location between the speculum end and bend for directing light through the speculum end when electrically energized;

a battery disposed within the elbow and secured thereto at a location adjacent to the door for supplying electrical energy; and

a power switch coupled between the lamp and battery and extended through the elbow to the exterior thereof with the power switch having an enabled orientation for allowing the lamp to be electrically energized and a disabled orientation for preventing the lamp from being electrically energized; and

a central component further comprising:

a hollow rigid elbow having a circular cross-section, an open first end removably and telescopically mated with the base end of the speculum component, an open second end removably and telescopically mated with the base end of the eyepiece component, and a perpendicular bend therebetween; and

a mirror disposed within the elbow and secured at the bend in a position for directing light entering the first end towards the second end;

whereby when the speculum end is disposed within a user's ear, the eyepiece end is positioned near a user's eye for viewing, and the power switch is placed in the enabled orientation, light transmitted from the lamp is reflected from an ear drum and external canal of the user's ear and transmitted through the elbows and through the magnifying lens, thus allowing the user to perform a self-examination of his own ear.

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**5,501,653**

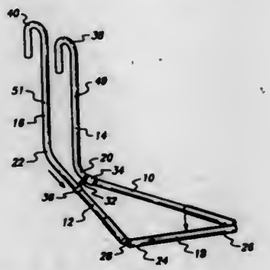
**ABDOMINAL WALL LIFTING RETRACTOR WITH HINGED CROSS-MEMBER**

**Albert K. Chin, Palo Alto, Calif., assignor to Origin Medsystems, Inc., Menlo Park, Calif.**

**Continuation-in-part of Ser. No. 890,033, May 28, 1992, abandoned, Ser. No. 62,707, May 18, 1993, and Ser. No. 128,477, Sep. 28, 1993, abandoned, which is a continuation-in-part of Ser. No. 890,033, Sep. 28, 0, and Ser. No. 62,707, Sep. 28, 0, which is a continuation of Ser. No. 706,781, May 29, 1991, abandoned, said Ser. No. 890,033is a continuation-in-part of Ser. No. 706,781, May 29, 0. This application Dec. 6, 1993, Ser. No. 163,275**

**Int. Cl.[6] A61B *17/02***

**U.S. Cl. 600—204** **9 Claims**



1. An apparatus for laparoscopically lifting an abdominal wall, the apparatus comprising:

first and second lifting members, each having a longitudinal axis;

first and second lifting rods each extending angularly from a corresponding one of the first and second lifting members, each lifting rod having a proximal end and a distal end;

a cross-member having two ends, one end hinged to the distal end of the first lifting rod and the other end hinged to the distal end of the second lifting rod;

connecting means for connecting the lifting rods such that the lifting rods are movable between a streamlined condition, in which the lifting members are spaced by a first distance and in which the lifting rods and cross-member are configured for insertion through a small laparoscopic incision in an abdominal wall, and a lifting position in which the lifting members are spaced by a second distance smaller than the first distance and in which the lifting rods and the cross-member form a substantially triangular lifting area for interior engagement of the abdominal wall and in which the lifting rods and cross-member occupy a lifting plane which extends transversely across the longitudinal axes of the lifting members; and

lifting means for delivering a lifting force to the lifting rods.

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**5,501,654**

**ENDOSCOPIC INSTRUMENT HAVING ARTICULATING ELEMENT**

**Stephen J. Failla, Cincinnati; Michael J. Stokes, Gates Mills; Daniel W. Price, Loveland; Charles M. Rarey, Akron, and Beanie Thompson, Cincinnati, all of Ohio, assignors to Ethicon, Inc., Cincinnati, Ohio**

**Continuation of Ser. No. 92,326, Jul. 15, 1993, abandoned. This application Aug. 16, 1994, Ser. No. 291,352**

**Int. Cl.[6] A61B *17/02;17/28;17/32***

**U.S. Cl. 600—204** **46 Claims**



7. An endoscopic surgical instrument for insertion by a user through a trocar cannula, comprising:

a housing, said housing having a proximal end proximal the user of said instrument and an opposite distal end; and at least one elongated element extending at least partially within said housing and being longitudinally movable between a retracted position and an extended position; and said element having a working section which is elastically bendable from a curved configuration and which includes at least two relatively thin flat strips which are positioned adjacent each other; each of said strips having a distal end located in said working section and a proximal end located proximally of said working section; said element being simultaneously bendable and longitudinally movable; said distal end of said housing engaging said working section wherein said element is substantially straightened from said curved configuration as said element moves longitudinally from said extended position to said retracted position; said strips being generally parallel to each other when said working section is in said curved configuration; said strips being affixed to each other at said proximal ends so as to be non-slidable relative to each other at said proximal ends and longitudinally slidable relative to each other at said distal ends and being individually constructed with said curved configuration in said working section.



**5,501,655**

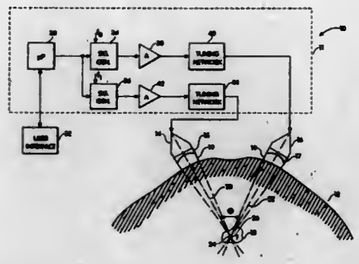
**APPARATUS AND METHOD FOR ACOUSTIC HEAT GENERATION AND HYPERTHERMIA**

**Kenneth D. Rolt, Medford, and Padmakar P. Lele, Westford, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.**

**Continuation of Ser. No. 861,187, Mar. 31, 1992, abandoned. This application Jul. 15, 1994, Ser. No. 275,809**

**Int. Cl.[6] A61N *7/02***

**U.S. Cl. 601—3** **44 Claims**



1. An ultrasound hyperthermia applicator for heating a tissue mass target within a human body, comprising

first ultrasound hyperthermia source means for producing ultrasound energy having a frequency $f_0$ between about 50 Khz and 5 Mhz;

first focusing means for focusing the energy from the first ultrasound hyperthermia source means and for producing a first focused ultrasound beam for heating the target;

second ultrasound hyperthermia source means for producing ultrasound energy having a frequency $f_1$ between about 50 Khz and 5 Mhz;

second focusing means for focusing the energy from the second ultrasound hyperthermia source means and for producing a second focused ultrasound beam for heating the target;

aiming means for directing the first and second focused ultrasound beams at the target to be heated so that the first and second ultrasound beams cross each other at the target, and the focus of the first and the second ultrasound beams are substantially coincident where the beams cross; and

control means for activating the first and second ultrasound hyperthermia source means to provide simultaneous irradiation of the target by each of the first and second focused ultrasound beams to heat the target;

wherein the first and second ultrasound hyperthermia source means provide ultrasound energy sufficient for producing intermodulation products at the target where the first and second focused ultrasound beams cross, and wherein the intermodulation products including integral multiples of sum-frequencies $f_0+f_1$ which are absorbed by the target to provide additional heat to the target and the intermodulation products are absorbed by the tissue mass target at a substantially greater rate than ultrasound energy having a frequency of either $f_0$ or $f_1$ or a linear superposition of $f_0$ and $f_1$.

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**5,501,656**

**ARM MOTION SUPPORT APPARATUS**

**Keiko Homma, and Tatsuo Arai, both of Tsukuba, Japan, assignors to Agency of Industrial Science & Technology, and Ministry of International Trade & Industry, both of Tokyo, Japan**

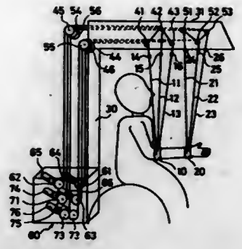
**Filed Aug. 26, 1994, Ser. No. 296,470**

**Claims priority, application Japan, Aug. 26, 1993, 5-234131**

**Int. Cl.[6] A61H *1/00***

**U.S. Cl. 601—33** **6 Claims**

1. An arm passive motion apparatus comprising:



a first orthesis having a sufficient length to surround the arm of the user approximately about the elbow region and a first securing means to fasten the first orthesis about the arm;

a second orthesis having a sufficient length to surround the arm of the user approximately about the wrist region and a second securing means to fasten the second orthesis about the arm;

a first group of lines connected at their first end to the first orthesis wherein each line of the first group is connected in a spaced relationship about the circumference of the orthesis and the arm in order to provide multiple directional positioning of the arm;

a second group of lines connected at their first end to the second orthesis wherein each line of the second group is connected in a spaced relationship about the circumference of the orthesis and the arm in order to provide multiple directional positioning of the arm;

a support member fixed to a supporting means for locating the support member about the user and his arms, said support member including a plurality of guide members wherein each line is supported by at least one of the guide members such that all the lines are kept separated; and

winder means for individually controlling the length of each of the lines, said winder means being directly connected to the second ends of each of the first and second groups of lines and the winder means controlling the position of the arm in multiple degrees of freedom by selectively lengthening and shortening each line to achieve the desired position.

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**5,501,657**

**METHOD OF ALLEVIATING CARPAL TUNNEL SYNDROME**

**Andrew A. Feero, 3069 W. 11th Ave. Cir., Broomfield, Colo. 80020**

**Filed Jan. 30, 1995, Ser. No. 380,104**

**Int. Cl.[6] A61H *7/00***

**U.S. Cl. 601—40** **6 Claims**



1. A neuromuscular manipulative method for alleviating carpal tunnel syndrome, comprising: subjecting a forearm, elbow, wrist and hand of a human evidencing said syndrome to flexion and extension movement sufficient to stretch at least one of the flexor digitorum profundus, flexor digitorum superficialis, flexor carpi radialis, brachioradialis, palmaris longus and flexor retinaculum muscles; manipulating and massaging the palmaris longus by

applying moderate digital pressure progressively along the direction of muscle fibers, intermittently with applying digital pressure progressively across the direction of muscle fibers in an amount sufficient to reduce inflammation and increase blood circulation therein; manipulating deep tissue forearm musculature extending from the vicinity of the elbow to the wrist and appended to tendons traversing the flexor cavity, by applying strong digital pressure progressively longitudinally along the musculature of the forearm in a direction from the elbow toward the wrist in a manner sufficient to promote taunt band release of said musculature; manipulating said forearm musculature with progressive digital pressure manipulation sufficient to promote increased blood circulation in said musculature; applying deep tissue trigger point digital pressure manipulation to said palmaris longus, starting at the medial epicondyle and progressing downwardly along the flexor cavity of the forearm toward the wrist sufficient to reduce facia congestion and inflammation thereof; and manipulating said palmaris longus with progressive digital pressure manipulation sufficient to promote increased blood circulation and to encourage adhesion separation.

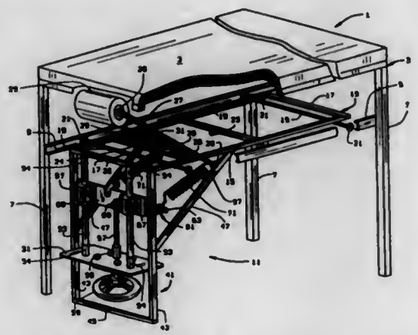
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**5,501,658**

## MASSAGE TABLE ROLLER MECHANISM

**Paul E. Frye, Rte. 3, Doniphan, Mo. 63935**

**Filed Jun. 6, 1994, Ser. No. 254,370**
**Int. Cl.[6] A61H *15/00***
**U.S. Cl. 601—99** **10 Claims**



1. A massage table including a table frame and a roller assembly;
said table frame having legs, a cushion supported on said table frame, and two generally straight and horizontal slides secured to said table frame beneath said cushion, said slides extending between a front of said table and a back of said table;
said roller assembly including:
a carriage frame; said carriage frame including a generally horizontal portion and a generally vertical portion; said generally horizontal portion having a front end member, a back end member, side members, a mounting plate extending between said side members; said generally vertical portion having generally vertically extending elongate members depending from said generally horizontal portion; a second mounting plate secured between said vertically extending elongate members; and at least one linear bearing mounted at one end to said second mounting plate and extending generally vertically from said second mounting plate;
wheels rotatably supported on said carriage frame and received in said table frame slides to slidably mount said roller assembly to said table;
a roller mounted to said carriage frame to exert pressure to a bottom surface of said cushion, said roller being movable vertically relative to carriage, and so that said roller can follow curvatures placed in said cushion by a patient lying on said table;
said roller being mounted on a roller frame pivotally mounted to said mounting plate, said roller frame including elongate, spaced-apart side members joined at one end by an axle; a hinge mounting plate secured to said roller frame elongate members intermediate the ends of said elongate frame members; said hinge mounting plate being hingedly connected to said roller assembly mounting plate to pivotally secure said roller frame to said carriage frame; said roller being journaled on said axle; and
a tensioning mechanism operable to alter the effective pressure exerted by said roller on said cushion; said tensioning mechanism including a bracket mounted to said at least one linear bearing to be movable vertically relative to said linear bearing and a moving means for raising and lowering said bracket, said tensioning member being secured at a second end to said bracket;
said carriage further including a stop to prevent the roller from being raised above a desired maximum height, said stop being vertically and horizontally spaced from said hinge mounting plate.

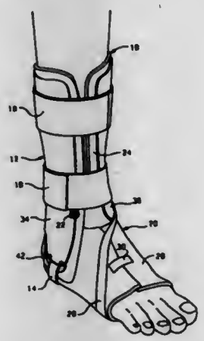
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**5,501,659**

## ANKLE BRACE

**James C. Morris, and Joe G. Stetman, both of Rancho Santa Fe, Calif., assignors to Smith & Nephew DonJoy, Inc., Carlsbad, Calif.**

**Continuation-in-part of Ser. No. 14,649, Feb. 8, 1993, abandoned. This application Apr. 11, 1994, Ser. No. 226,290**
**Int. Cl.[6] A61F *5/00***
**U.S. Cl. 602—27** **19 Claims**



1. In a stirrup style ankle brace adapted to be inserted into a shoe and to be fitted about the lower leg and ankle of a wearer for inhibiting inversion and eversion of the ankle while accommodating plantar flexion and dorsiflexion of the foot, the improvement comprising:
a rigidifying shell having upper and lower ends, said shell consisting of a unitary member made of a substantially rigid material and including at its upper end a leg encircling portion adapted to at least substantially encircle a portion of the lower leg of the wearer above the wearer's ankle and achilles tendon and a pair of spaced apart ankle stays extending substantially vertically downward from opposite sides of said leg encircling portion over the ankle and down to the heel of the wearer on both the medial and lateral sides of the leg,
said leg encircling portion accommodating flexing the sides of said portion about a vertical axis intermediate said ankle stays for accommodating movement of the sides of said portion and said ankle stays horizontally into firm supporting engagement with the medial and lateral sides of the wearer's leg and ankle,
said shell having no contact with the posterior surface of the heel of the wearer and accommodating insertion of the lower ends of said ankle stays into the wearer's shoe,
said unitary shell mitigating vertical movement of said ankle stays relative to one another.



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**5,501,660**

**Patent Not Issued For This Number**

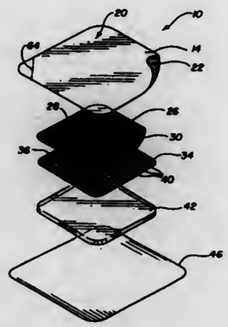
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**5,501,661**

## METHOD OF MAKING A WOUND DRESSING PRODUCT CONTAINING A POROUS LAYER

**James V. Cartmell, Xenia; Wayne R. Sturtevant, Centerville; William E. Bausmith, III, Batavia, and Michael L. Wolf, West Milton, all of Ohio, assignors to New Dimensions in Medicine, Inc., Dayton, Ohio**

**Division of Ser. No. 372,851, Jan. 13, 1995, which is a continuation of Ser. No. 130,698, Oct. 4, 1993, abandoned, which is a continuation-in-part of Ser. No. 68,633, May 27, 1993, Pat. No. 5,423,737. This application May 5, 1995, Ser. No. 435,307**
**Int. Cl.[6] A61F *13/00***
**U.S. Cl. 602—58** **8 Claims**



1. A method of manufacturing a wound dressing product for a wound, comprising the steps of:
providing a thin-film layer having a first side and a second side and further having a perimeter portion and a center portion;
coating said second side of said thin-film layer with an adhesive layer;
providing a porous backing layer having first and second opposing sides;
providing a support layer having a first side and a second side, said support layer comprising a permeable fabric having a plurality of interstices therewith;
applying a hydrogel material directly to said second side of said support layer, wherein said hydrogel material penetrates said interstices to said first side of said support layer such that said hydrogel material resides on both said first side and said second side of said support layer;
laminating said first side of said support layer to said second side of said backing layer, wherein said hydrogel material located on said first side of said support layer adheres to said second side of said backing layer, such that said backing layer, said support layer and said hydrogel material collectively form a reinforced hydrogel patch;
laminating said hydrogel patch to said center portion of said thin-film layer, wherein said first side of said backing layer adheres to said second side of said thin-film layer by means of said adhesive layer;
providing a release liner having a first side and a second side;
laminating said first side of said release liner to said perimeter portion of said second side of said thin-film layer, whereby said adhesive layer is positioned between said thin-film layer and said release liner.

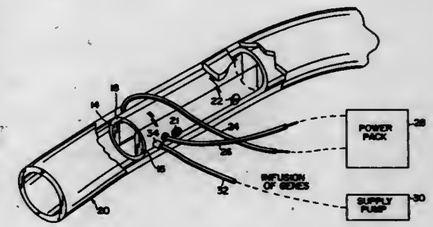
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**5,501,662**

## IMPLANTABLE ELECTROPORATION METHOD AND APPARATUS FOR DRUG AND GENE DELIVERY

**Gunter A. Hofmann, San Diego, Calif., assignor to Genetronics, Inc., San Diego, Calif.**

**Continuation-in-part of Ser. No. 887,315, May 22, 1992, abandoned. This application Sep. 12, 1994, Ser. No. 304,584**
**Int. Cl.[6] A61N *1/30***
**U.S. Cl. 604—20** **20 Claims**




1. A method of introducing molecules into living blood cells of a patient for therapeutic purposes, comprising the steps of:
providing an implantable electric field generating device;
implanting said device into a body of the patient at a preselected location within close proximity of a selected blood stream and disposed at least partially around a center of a selected blood vessel through which the selected blood stream flows for generating electric fields at a preselected location within said selected blood vessel;
infusing preselected of said molecules into the selected blood vessel upstream of the preselected location within said selected blood vessel; and
applying an electric signal to the implanted device to cause it to generate electric fields of a predetermined amplitude and duration to repeatedly subject a quantity of blood flowing past the preselected location within the selected blood vessel to said electric fields of a predetermined amplitude and duration in order to make the walls of preselected cells in the blood transiently permeable to permit the molecules to enter said preselected cells without killing said cells.

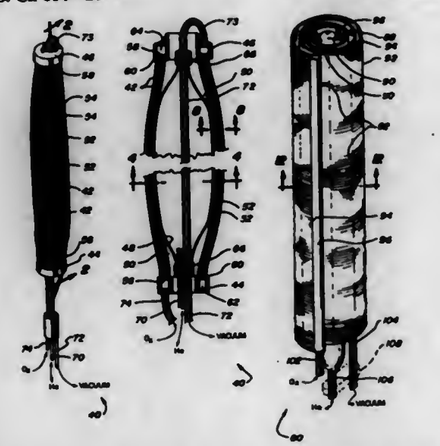
11. An apparatus for introducing molecules in vivo into living blood cells of a patient, comprising:
an implantable electric field generating device sized and shaped to be implanted in the patient at a preselected location in close proximity of a selected blood stream and disposed at least partially around a center of a selected blood vessel through which the selected blood stream flows for generating electric fields at a preselected location within the selected blood vessel of the patient;
means for injecting a predetermined quantity of a fluid medium carrying preselected of said molecules into the selected blood vessel upstream of the preselected location within the selected blood vessel; and
means for applying an electric signal to the implantable device for causing it to repeatedly generate electric fields of a predetermined amplitude and duration in order to make the walls of preselected cells in blood flowing past the preselected location within the selected blood vessel to be transiently permeable to permit the molecules to enter said preselected cells without killing said cells.

5,501,663

## INFLATABLE PERCUTANEOUS OXYGENATOR WITH TRANSVERSE HOLLOW FIBERS

Brack G. Hattler; Harvey S. Borovetz, both of Pittsburgh, Pa.; Gary D. Reeder, Morrison, Colo.; Patricia J. Sawzik, and Frank R. Walters, both of Pittsburgh, Pa., assignors to Medtronic Electromedics, Inc., Parker, Colo.

Filed Jul. 2, 1993, Ser. No. 87,487
Int. Cl.[6] A61M 37/00
U.S. Cl. 604—26 19 Claims



1. An elongated intravenous percutaneous oxygenator having a longitudinal axis comprising in combination:

a balloon extending along the length of the oxygenator and a first lumen for delivering gas to said balloon and exhausting gas from said balloon, and

a plurality of hollow gas permeable and liquid impermeable fibers surrounding said balloon, said fibers having an input end and an output end, a input lumen connected in fluid communication with the input end of said fibers, a output lumen connected in fluid communication with the output end of said fibers, gas moving means for delivering oxygen to said input lumen and removing gas from said output lumen, and gas inflation means in communication with said first lumen for inflating and deflating said balloon, at least some of said fibers extending to some degree transversely to said longitudinal axis said fibers being grouped in mats, there being a plurality of overlying layers of said mats.

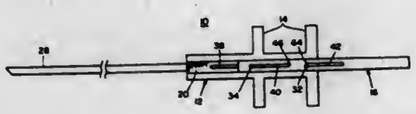
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5,501,664

## SUBCUTANEOUS DRUG DELIVERY DEVICE

Antoine Kaldany, Chestnut Hill, Mass., assignor to InterMED, Inc., Chestnut Hill, Mass.

Continuation of Ser. No. 965,638, Oct. 23, 1992, Pat. No. 5,358,474, which is a continuation-in-part of Ser. No. 908,353, Jul. 6, 1992, abandoned, which is a continuation-in-part of Ser. No. 724,706, Jul. 2, 1991, Pat. No. 5,127,419. This application Jul. 6, 1994, Ser. No. 271,027
Int. Cl.[6] A61M 31/00
U.S. Cl. 604—57 5 Claims



1. A surgical instrument comprising:

a) a housing with a bore extending along a longitudinal axis of the housing and a track extending parallel to the bore, said track having an elongate proximal housing slot and an elongate distal housing slot extending along the longitudinal axis;

b) a piston having a distal tip end and a cannula mounted coaxially thereto and within the bore extending along the longitudinal axis thereof;

c) a driving member slideably engaged in said track for longitudinal movement therein, the driving member having a proximal elongate slot with a notch formed therein and a distal elongate slot with a notch formed therein, said slots extending along the longitudinal axis;

d) a piston drive pin for engaging the piston with the driving member, the piston drive pin extending from the piston in a direction perpendicular to the longitudinal axis through the proximal housing slot and the proximal driving member slot, the piston drive pin engaging the piston with the driving member by movement of the driving member distally long the track toward the piston tip end, the piston capable of being extended until the piston drive pin reaches the distal end of the proximal housing slot; and

e) a cannula drive pin for engaging the cannula with the driving member, the cannula drive pin extending from the cannula in a direction perpendicular to the longitudinal axis through the distal housing slot and the distal driving member slot, the piston drive pin engaging the cannula with the driving member when the piston drive pin is at the distal end of the proximal housing slot, the cannula capable of being extended by movement of the driving member further along the track toward the piston tip end until the cannula drive pin reaches the distal end of the distal housing slot.

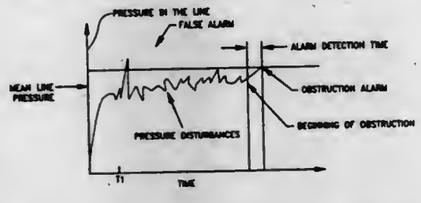
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5,501,665

## PROCESS AND DEVICE FOR DETECTION OF OBSTRUCTIONS IN A PERFUSION LINE

Abdel-Nasser Jhuboo, St. Etienne de St. Geoirs, and Pierre Rebours, Voiron, both of, France, assignors to Becton Dickinson and Company, Franklin Lakes, N.J.

Filed Jul. 18, 1994, Ser. No. 276,300
Claims priority, application France, Sep. 30, 1993, 93 11654
Int. Cl.[6] A61M 31/00
U.S. Cl. 604—65 22 Claims




1. Process for the detection of obstructions in a perfusion line, the process being characterized by the fact that it comprises the steps consisting of:

choosing a gradient constant;

measuring a first pressure in the perfusion line;

measuring a second pressure in the perfusion line after a time interval;

subtracting the first pressure from the second pressure to obtain a first pressure difference;

comparing the first pressure difference to the gradient constant; and

generating a signal if the first pressure difference exceeds or is equal to the gradient constant.



5,501,666

## NEEDLELESS INJECTOR

Jerry Spielberg, Willingboro, N.J., assignor to Mycone Dental Supply Co., Cherry Hill, N.J.

Filed May 24, 1995, Ser. No. 453,133
Int. Cl.[6] A61M 5/30
U.S. Cl. 604—68 15 Claims



1. A piston actuated needleless injector comprising:

an elongated main body member having a first section and a second section, the first section including a longitudinal cavity for receiving an ampule, the ampule having a first end and a second end and containing a liquid to be discharged from the injector, the main body member having a first longitudinal passageway extending between the cavity and the second section, a second longitudinal passageway extending between the first section and the second section, the second passageway including a discharge chamber, and a conduit extending between the cavity and the discharge chamber;

a holder for removably retaining the ampule within the cavity;

a plunger located within the first passageway shiftable into the cavity and into the ampule second end for pressurizing the liquid therein;

a needle for piercing the ampule first end and providing a means for the liquid to exit from the ampule to the discharge chamber by way of the conduit;

a piston member axially movable within the second passageway for pressurizing the liquid within the discharge chamber, the piston member defining a movable boundary for increasing and decreasing the volume of the discharge chamber;

a discharge mechanism in fluid communication with the discharge chamber located at a free end of the first section for discharging the liquid from the injector; and

a check valve assembly located in the conduit between the ampule and the discharge chamber, the check valve assembly preventing backflow of liquid from the discharge chamber to the ampule, wherein the check valve assembly comprises:

a hollow main body having a first end and a second end;

a head piece having a narrow axial bore therein, a first section and a second section, the first section having a smaller cross-section than the second section, the first section being secured within the second end of the check valve main body, the bore receiving the needle and allowing liquid to flow from the ampule into the check valve assembly;

a retainer having an axial bore therein and a rim along an outer edge, the retainer being secured within the first end of the check valve main body such that the rim abuts an outer edge of the check valve main body;

a generally cylindrical valve member disposed within the check valve main body between the head piece and the retainer for preventing liquid backflow;

an O-ring disposed within the check valve main body between the valve member and the head piece for providing a seal between the head piece and the valve member; and

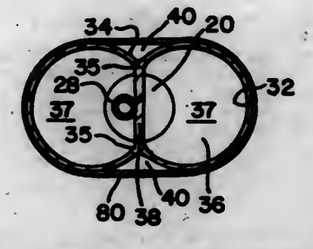
a spring disposed within the check valve main body between the valve member and the retainer for biasing the valve member against the O-ring.

5,501,667

## PERFUSION BALLOON AND METHOD OF USE AND MANUFACTURE

Kenneth L. Verdun, Jr., Coral Springs, Fla., assignor to Cordis Corporation, Miami Lakes, Fla.

Filed Mar. 15, 1994, Ser. No. 213,150
Int. Cl.[6] A61M 29/02
U.S. Cl. 604—96 23 Claims




1. A dilation catheter for use in medical procedures comprising:

an elongated flexible tubular member;

a unitary multichamber balloon having an exterior surface and being disposed on said tubular member, said unitary multichamber balloon having a collapsed condition of a size allowing said balloon to be transported through a body vessel, and said balloon having an expanded condition of a size allowing said balloon to engage a body vessel wall;

a longitudinally extending septum formed integrally with said balloon and coaxial therewith, said septum being generally substantially thicker in width than said exterior surface of said balloon, said septum further including radially extending portions spaced inwardly of said exterior surface and cooperating with said balloon to define a plurality of chambers within said balloon, said septum further cooperating with said balloon to define a longitudinally extending channel exteriorly of and between adjacent chambers of said balloon when said balloon is in its expanded condition; and

means for passing fluid between said balloon chambers and said flexible tubular member to evenly vary said balloon between its collapsed and expanded conditions.

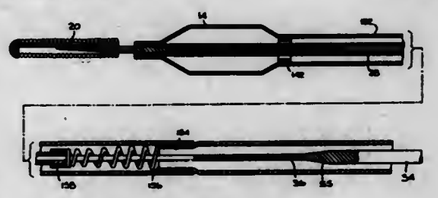
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5,501,668

## ANGIOPLASTY BALLOON CATHETER AND ADAPTOR

Stavros B. Kontos, Woodcliff Lake, N.J., assignor to Boston Scientific Corporation, Natick, Mass.

Continuation of Ser. No. 743,189, Aug. 9, 1991, Pat. No. 5,318,529. This application Apr. 19, 1994, Ser. No. 229,696
Int. Cl.[6] A61H 29/00
U.S. Cl. 604—96 27 Claims



1. A balloon catheter assembly comprising:

a catheter tube having a main body portion and a distal portion terminating respectively in proximal and distal ends and having an inflation lumen therein,

a balloon membrane having proximal and distal ends, wherein its proximal end is attached to the distal portion of said catheter tube,

a guide tube having proximal and distal portions terminating respectively in proximal and distal ends and a lumen therein, wherein the distal end of said membrane is attached to said guide tube,

a balloon chamber defined by said membrane and its attachment at one end to said catheter tube and at its other end to said guide tube wherein said chamber is in communication with the lumen of said catheter tube and wherein, when not inflated, said balloon chamber extends distally of the distal end of said catheter tube,

a captive guidewire having an axially elongated proximal portion disposed within the inflation lumen of said catheter tube and having an axially elongated distal portion disposed through the lumen of said guide tube and extending distally thereof, and

a resilient spring member coupled between said catheter tube and said guide tube for transmitting axial force from said catheter tube to said guide tube, while permitting fluid communication between the inflation lumen of said catheter tube and said balloon membrane.

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**5,501,669**

**URINARY CATHETER WITH RESERVOIR SHROUD**

**Anthony J. Conway; Philip J. Conway, both of Chatfield, and Richard D. Fryar, Jr., Rochester, all of Minn., assignors to Rochester Medical Corporation, Stewartville, Minn.**

**Division of Ser. No. 285,026, Aug. 2, 1994, which is a continuation-in-part of Ser. No. 827,936, Jan. 29, 1992, Pat. No. 5,360,402, which is a continuation-in-part of Ser. No. 809,281, Dec. 13, 1991, Pat. No. 5,261,896, which is a continuation-in-part of Ser. No. 489,462, Mar. 6, 1990, abandoned, which is a continuation-in-part of Ser. No. 487,422, Mar. 1, 1990, Pat. No. 5,098,379, which is a continuation-in-part of Ser. No. 462,832, Jan. 10, 1990, Pat. No. 5,137,671.**

**This application Mar. 30, 1995, Ser. No. 413,499**

**Int. Cl.[6] A61M *29/00*; A61F *5/44*;*2/02***

**U.S. Cl. 604—97** **9 Claims**



1. A hand-actuated retention catheter, comprising:

a tube having a proximal end and a distal end, the tube having outer and inner surfaces, the inner surface defining an inner lumen, an overcoat layer encircling the tube, the overcoat layer having interior and exterior surfaces, a cavity interposed between the tube and the overcoat layer, said cavity encircling the tube and being defined by portions of the outer surface of the tube in cooperation with portions of the interior surface of the overcoat layer, a fluid within the cavity, a restriction means and a means for limiting the lateral ballooning of the reservoir section; wherein the overcoat layer includes an expandable, resilient balloon section proximate a distal end, the fluid reservoir section proximal thereto, and a catheter sleeve section interconnecting said balloon section and said reservoir section, each of the sections corresponds to a corresponding section of the catheter; the cavity including a balloon portion, a fluid reservoir portion, and a catheter sleeve portion thereof interconnecting said balloon portion and said reservoir portion; the catheter sleeve section of the overcoat layer defines a narrowing in the cavity through which fluid passing from the fluid reservoir portion and the balloon portion thereof must pass; the restriction means encircling the sleeve section to restrict the flow of fluid from the balloon portion to the fluid reservoir portion of the cavity, and the means for limiting lateral ballooning encircling the reservoir section to limit the lateral ballooning thereof, said means for limiting lateral ballooning not substantially restricting the flow of fluid from the balloon portion to the fluid reservoir portion of the cavity.

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**5,501,670**

**SYRINGE SYSTEM PROVIDING RETRACTION OF NEEDLE CANNULA INTO DISPOSABLE CARTRIDGE**

**Robert F. Sak, 9674 Colorado Ct., Boca Raton, Fla. 33498**

**Filed Mar. 31, 1995, Ser. No. 414,498**

**Int. Cl.[6] A61M *5/00***

**U.S. Cl. 604—110** **17 Claims**



1. A needle retracting piston for use in a disposable medicant cartridge for a syringe, comprising:

an elastomeric piston body axially slidable within a tubular cartridge body; and

a needle retraction unit mounted within said elastomeric piston body, said unit including a tensile strength member arranged for making engagement with a plunger hook to allow proximal retraction of said plunger body through said tubular cartridge body, and a needle receiving structure for interlocking, at the end of an injection stroke, with a proximal end of a needle cannula protruding into said cartridge body, whereby a used needle cannula can be retracted with said piston body into said cartridge.



**5,501,671**

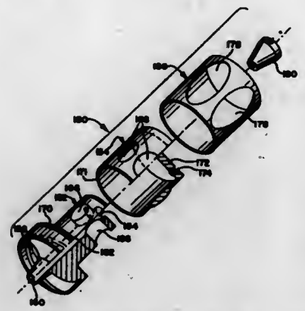
**VASCULAR BLOOD CONTAINMENT DEVICE**

**Jonathan J. Rosen, Alpharetta; Richard A. Hillstead, Duluth; Thomas D. Weldon, Gainesville; Charles E. Larsen, Cumming, all of Ga., and David O. Williams, Barrington, R.I., assignors to Novoste Corporation, Norcross, Ga.**

**Filed Nov. 2, 1993, Ser. No. 146,555**

**Int. Cl.[6] A61M *5/178***

**U.S. Cl. 604—168** **29 Claims**



1. A blood containment device for use with a vascular entry needle, comprising:

a main body portion including a distal opening and a proximal opening and a guideway extending therebetween, said distal opening being adapted to communicatively connect to a vascular entry needle, and said proximal opening being adapted to receive an elongated medical instrument for passage through said guideway and said vascular entry needle;

a barrier disposed in said guideway between said proximal and distal openings which prevents passage of blood through said guideway but allows passage therethrough of an elongated medical instrument; and

said main body portion including a touch accessible compliant member in fluid communication with said distal opening of the device such that blood pressure at said distal opening is transmitted to said compliant or flexible member, thereby causing said compliant member to move responsively to changes in blood pressure at said distal opening.

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**5,501,672**

**DISPOSABLE SELF-SHIELDING HYPODERMIC SYRINGE**

**John R. Firth, Charbonneau, Okla.; Anthony R. Perez, Alhambra, and Ronald A. Meyer, San Dimas, both of Calif., assignors to Safety Syringes, Inc., Arcadia, Calif.**

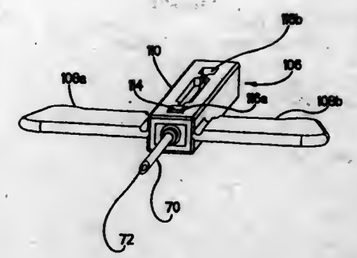
**Division of Ser. No. 783,825, Oct. 29, 1991, Pat. No. 5,279,581, which is a continuation-in-part of Ser. No. 581,734, Sep. 12, 1990, Pat. No. 5,108,378, which is a continuation-in-part of Ser. No. 521,243, May 9, 1990, abandoned. This application Jan. 18, 1994, Ser. No. 183,951**

**Int. Cl.[6] A61M *5/00***

**U.S. Cl. 604—177** **6 Claims**

1. A butterfly wing IV catheter comprising a body member having laterally extending tabs to help hold the catheter in place for an extended period of time, the body member having an opening therethrough and a slot in a wall of the body member having first and second spaced pockets, and

a slide member configured to fit and slide within the opening in the body member and comprising a needle and a hollow fitting to which flexible tubing can be attached, the slider member including a boss adapted to fit into the first and second pockets of the body member to define respective extended and retracted positions of the needle, and wherein when the needle is retracted the hollow fitting extends outwardly from the opening in the body member and wherein when the needle is extended the hollow fitting is adapted to pull flexible tubing into an end of the opening of the body member.



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**5,501,673**

**INJECTION CARTRIDGE**

**Birger Hjertman, Vällingby; Gustav Levander, Bromma, and Olle Ljunquist, Täby, all of, Sweden, assignors to Pharmacia AB, Stockholm, Sweden**

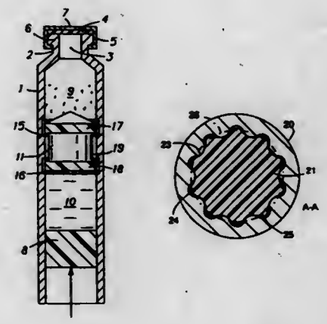
**PCT No. PCT/SE93/00337, § 371 Date Dec. 8, 1994, § 102(e) Date Dec. 8, 1994, PCT Pub. No. WO93/20868, PCT Pub. Date Oct. 28, 1993**

**PCT Filed Apr. 16, 1993, Ser. No. 325,289**

**Claims priority, application Sweden, Apr. 21, 1992, 9201248**

**Int. Cl.[6] A61M *5/00***

**U.S. Cl. 604—191** **20 Claims**



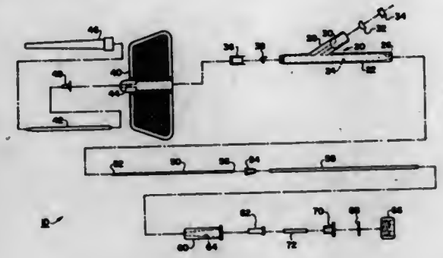
1. An injection cartridge of the dual-chamber type, comprising a tubular barrel which at its front end is sealed by a closure which may be penetrated by an outlet conduit for a liquid preparation from the cartridge, and at its rear end is closed by a piston which may be moved forward, and a movable transversal wall inside said barrel, said movable wall dividing the cartridge into two separate chambers, and a bypass connection between the two chambers, said bypass connection being openable by the displacement of said movable wall to permit a bypass flow of liquid between the two chambers, and characterized in that said connection between the two chambers is arranged as a modification of the surface of the interior wall of the barrel, said modification extending completely around the circumference of the interior wall and comprising a plurality of lands and grooves in said interior wall surface, said lands extending inward from the nominal interior circumference of the barrel and said grooves extending outward from said nominal interior circumference, such that a liquid flow may be arranged around the whole circumference of the movable wall.

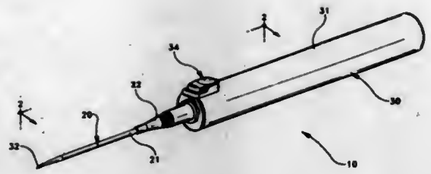
**5,501,674**

## INTRAVENOUS CATHETER WITH NEEDLE COVER AND BLOOD COLLECTION TUBE

**Frederick W. Trombley, III, New Kensington, and Mark Trocki, Cheswick, both of Pa., assignors to Medrad, Inc., Pittsburgh, Pa.**

**Filed Mar. 7, 1994, Ser. No. 206,696**
**Int. Cl.[6] A61M** *39/24;39/00*
**U.S. Cl. 604—247** **13 Claims**





1. A catheter introducer apparatus comprising:
a needle housing defining an elongated passage having a distal end in fluid communication with said catheter;
a needle slidably disposed within said catheter having a sharpened distal end adapted to protrude from said catheter;
filter means in fluid communication with said needle to allow air to escape therethrough while permitting blood flowback through said needle; and
sealing means cooperating with said filter means to prohibit bloodflow through the catheter upon removal of the needle therefrom; wherein
said filter means includes a filter valve associated with a proximal end of said needle, said filter valve having;
a valve housing in fluid communication with said needle;
a valve positioned within said housing; and
a filter cap mateable with said valve housing and having valve opening
means associated therewith mateable with said valve, so that attachment of said
filter cap to said valve housing opens said valve, and removal of said cap closes
said valve.

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**5,501,675**

## SAFETY CATHETER ASSEMBLY HAVING SAFETY STOP PUSH BUTTON

**Timothy J. Erskine, Sandy, Utah, assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.**

**Filed Dec. 27, 1994, Ser. No. 364,635**
**Int. Cl.[6] A61M** *5/00*
**U.S. Cl. 604—263** **14 Claims**

1. A catheter and safety introducer needle assembly, comprising:
a catheter having a catheter hub with an inside and an outside;
a generally hollow barrel having a proximal end and a distal end;
a needle having a sharp distal tip and a proximal end;
a needle hub affixed adjacent to the proximal end of the needle and movably disposed in the barrel;
a spring disposed about the needle and extending between the needle hub and the distal end of the barrel;
an activation latch having a top and a bottom and movably mounted adjacent to the distal end of the barrel and adapted for selective engagement with the needle hub to hold the needle hub adjacent to the distal end of the barrel against the bias of the spring such that the needle extends beyond the distal end of the barrel and through the catheter with the catheter hub adjacent to the distal end of the barrel; and
a projection extending from the activation latch for engagement with the catheter hub to prevent movement of the activation latch when the catheter hub is adjacent to the distal end of the barrel.

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**5,501,676**

## COUPLING SYSTEM FOR SAFETY CANNULA

**John J. Niedospial, Princeton Junction, N.J.; Linn C. Hoover, Webster, N.Y.; Michael T. Mallon, New Fairfield, Conn., and James E. Hoyes, Somerset, N.J., assignors to Sanofi Winthrop, Inc., Malvern, Pa.**

**Filed Jan. 13, 1995, Ser. No. 372,271**
**Int. Cl.[6] A61M** *5/00*
**U.S. Cl. 604—283** **19 Claims**



1. A coupling system for transferring a medicament from a cartridge to a pre-slit injection site wherein said pre-slit injection site comprises:
a cylindrical housing baving a first end and a second end;
internal male luer threads located in said cylindrical housing adjacent to said second end to receive and engage a catheter having female luer threads thereon;
a hollow cylindrical fluid flow member providing a sterile fluid flow coupling when said catheter is engaged with said pre-slit injection site; and
a resealable septum located at the first end of said housing to seal said pre-slit injection site when said pre-slit injection site is not engaged by said catheter;
wherein said coupling system comprises:
a hub having a proximal and distal end and a flow channel located centrally therein, said flow channel comprising:
a needle cannula having a sharp end at the proximal end of the hub; and
a blunt cannula at the distal end of the hub;
said bub comprising:
a first sleeve located on the proximal end of the hub and designed to engage a closure on a cartridge;
a second sleeve located on the distal end of the hub having internal threads thereon to engage said catheter connected to said pre-slit injection site; and
a middle portion integral with and connecting the sleeves on the proximal and distal ends of the hub;
said first sleeve covering in a spaced relationship and extending beyond the sharp end of said needle cannula.



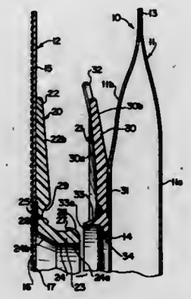
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**5,501,677**

## TWO-PIECE OSTOMY APPLIANCE AND LOW-PROFILE COUPLING RING ASSEMBLY

**Ole R. Jensen, 646 Orangeburgh Rd., River Vale, N.J. 07675**

**Filed Jun. 20, 1994, Ser. No. 262,599**
**Claims priority, application Denmark, Jun. 25, 1993, 759/93**
**Int. Cl.[6] A61F** *5/44*
**U.S. Cl. 604—338** **17 Claims**



9. A two-piece ostomy appliance for peristomal attachment to a patient's body, comprising a pouch component and an adhesive faceplate component provided with alignable stoma-receiving openings and including a pair of flexible, thermoplastic, faceplate and pouch coupling rings for detachably and sealingly coupling said components together; said faceplate coupling ring having a flat annular flange with generally planar pouchside and bodyside surfaces and having an integral collar extending away from said flange in a pouchside direction immediately about the stoma-receiving opening of said faceplate; said collar having an external annular latching shoulder at its pouchside end and having an annular external sealing surface sloping radially outwardly from said shoulder to the pouchside surface of said flange; said pouch coupling ring also having a flat annular flange with generally planar pouchside and bodyside surfaces and having an integral, flexible, annular sealing lip extending about the stoma-receiving opening of said pouch in a bodyside direction towards said faceplate and into forceful sealing engagement with said sealing surface when said rings are coupled together; said pouch coupling ring also having a radially inwardly extending annular latching rib engagable with said shoulder for holding said rings in latched condition.

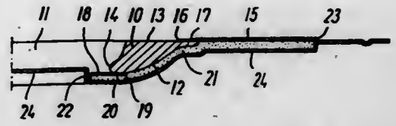
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**5,501,678**

## ADAPTER FOR USE IN CONNECTION WITH OSTOMY EQUIPMENT

**Hans Olsen, Hørsholm, Denmark, assignor to Coloplast A/S, Denmark**

**PCT No. PCT/DK92/00258, § 371 Date Feb. 28, 1994, § 102(e) Date Feb. 28, 1994, PCT Pub. No. WO93/04646, PCT Pub. Date Mar. 18, 1993**
**PCT Filed Aug. 31, 1992, Ser. No. 199,266**
**Claims priority, application Denmark, Aug. 30, 1991, 1529/91**
**Int. Cl.[6] A61F** *5/44*
**U.S. Cl. 604—344** **13 Claims**



1. An adapter for use together with ostomy equipment and comprising a ring-shaped member (10, 15, 18) with a radial extent between an inner periphery (22) and an outer periphery (23) and having a proximal side and a distal surface, said proximal surface having a convex face (12) and on its proximal side a layer of adhesive (21) by means of which the adapter can be adhered to a user's skin, the ring-shaped member (10, 15, 18) comprising a central, relatively rigid ring (10) with the convex face (12) and a peripheral part (15) which is an integrated part of the relatively rigid ring (10), characterized in that the peripheral part (15) is relatively flexible and extends radially considerably further than the relatively rigid ring (10), the peripheral part (15) consisting of a proximal side and a distal side, the proximal side being in contact with the layer (21) of adhesive, and at least as far as the layer of adhesive, the distal side being flat and non-adhesive and being adapted for direct connection with the ostomy equipment.

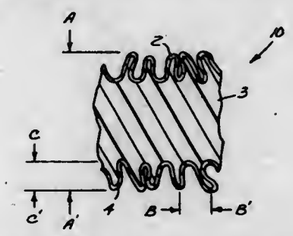
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**5,501,679**

## ELASTOMERIC LAMINATES WITH MICROTEXTURED SKIN LAYERS

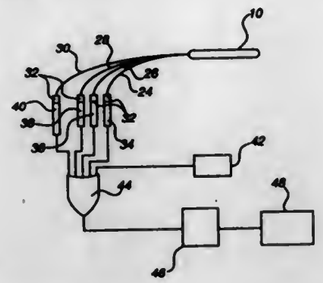
**Dennis L. Krueger; Joseph T. Bartusiak; Thomas P. Hanschen, and Karen M. Caplk, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturinf Company, St. Paul, Minn.**

**Continuation-in-part of Ser. No. 438,593, Nov. 17, 1989, abandoned. This application Mar. 30, 1990, Ser. No. 503,716**
**Int. Cl.[6] A61F** *13/66;* **C09J** *7/02*
**U.S. Cl. 604—393** **9 Claims**



1. A garment comprising a body engaging area said body engaging area comprising an elastomeric laminate comprising at least one discrete elastomeric layer and at least two discrete continuous skin layers at least one of which is a microtextured permanently deformed polymeric layer wherein the materials forming the elastomeric layer and the materials forming the polymeric layer are selected such that said at least one elastomeric layer and said at least one microtextured skin layer are in continuous contact.

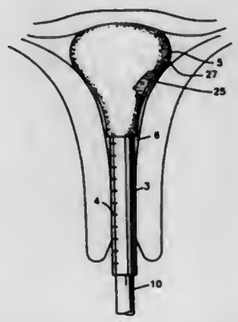
**5,501,680**
**BOUNDARY AND PROXIMITY SENSOR APPARATUS FOR A LASER**
**John L. Kurtz, Indiana; Marc D. Liang, and Krishna Narayanan, both of Pittsburgh, all of Pa., assignors to The University of Pittsburgh, Pittsburgh, Pa.**
**Filed Jan. 15, 1992, Ser. No. 821,404**
**Int. Cl.[6] A61B 17/36**
**U.S. Cl. 606—9** **36 Claims**



1. A laser system comprising:
a laser which is operable to emit laser radiation and adapted to be grasped by a user and freely passed over a treatment area;
control means operatively connected to said laser for activating and deactivating said laser; and
means for sensing a boundary of said treatment area, said means for sensing a boundary being operable to transmit a signal to said control means to deactivate said laser upon passage of laser radiation emitted by said laser beyond a boundary of said treatment area and to transmit a signal to said control means to activate said laser upon passage of laser radiation emitted by said laser within said boundary.

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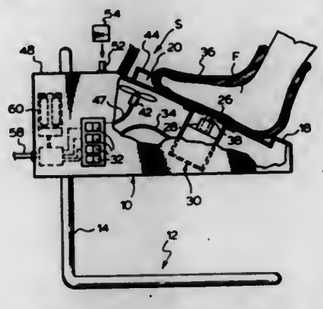
**5,501,681**
**INTRAUTERINE CRYOABLATION CAUTERIZING APPARATUS AND METHOD**
**Robert S. Neuwirth, 400 Gloucester St., Englewood, N.J. 07631, and Lee R. Bolduc, 6416 Gainsborough Dr., Raleigh, N.C. 27612**
**Filed Nov. 12, 1993, Ser. No. 151,709**
**Int. Cl.[6] A61B 17/00**
**U.S. Cl. 606—21** **23 Claims**



1. An apparatus for effecting necrosis of an uterine endometrium comprising:
an applicator comprising a catheter for insertion into the uterus, said catheter having a proximal end and a distal end, and a distendable bladder attached to said distal end;
inflating means connected to said proximal end for distending said distendable bladder;
cooling means disposed within said distal end of said catheter and connected to said proximal end for cooling a non-circulating fluid within said distendable bladder; and
control means communicating with said inflating means and said cooling means for regulating the distending and cooling of said non-circulating fluid within said distendable bladder.

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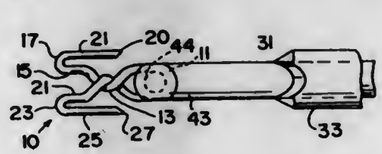
**5,501,682**
**MULTI PURPOSE VIBRATING FOOT STOOL**
**Sophia Edwards-Colle, 17 Desert Sand Dr., Brampton, Ontario, Canada**
**Filed Jun. 10, 1993, Ser. No. 74,466**
**Int. Cl.[6] A61H 1/08**
**U.S. Cl. 601—61** **10 Claims**



1. A foot stool comprising a body means, vibrator means mounted in said body means for massaging a user's foot, said body means comprising foot support means onto which the user's foot can be positioned, shoe means being provided, said shoe means being adapted to receive the user's foot, said vibrator means and said shoe means comprising cooDerating disconnectable coupling means for coupling said shoe means to said vibrator means, said coupling means extending through an opening in said support means, said shoe means being adapted to be removably connected to said vibrator means by way of said coupling means, whereby when said shoe means and said vibrator means are connected by said coupling means, vibrations produced by said vibrator means are transmitted to said shoe means and thus to the user's foot.

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**5,501,683**
**SUTURE ANCHOR FOR SOFT TISSUE FIXATION**
**Arthur F. Trott, Largo, Fla., assignor to Linvatec Corporation, Largo, Fla.**
**Division of Ser. No. 78,907, Jun. 18, 1993, Pat. No. 5,372,604. This application Sep. 29, 1994, Ser. No. 314,988**
**Int. Cl.[6] A61B 17/56**
**U.S. Cl. 606—72** **7 Claims**



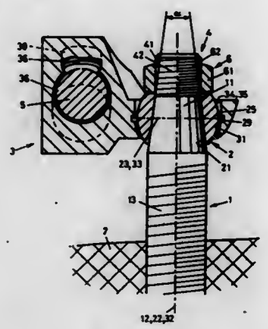
1. In combination:
a bone anchor for securing suture in a bone tunnel by engaging the bone tunnel wall, said anchor comprising:



a body section;
at least first and second bendably deformable wire legs having no significant resilience, each leg having a first end secured to said body section and an opposite end suitable for penetrating bone tissue;
an engageable element projecting from said body section to permit the anchor to be grasped and positioned in the bone tunnel;
wherein said anchor has a pre-deployment position in which said deformable wire legs are retracted in a dimension transversely of the bone tunnel axis to permit the anchor to be unimpededly inserted into and removed from the bone tunnel; and
wherein said anchor, while in the bone tunnel, is capable of being deformably bent to a permanent deployment position in which said wire legs extend generally toward an opening of the bone tunnel at an acute angle to the bone tunnel wall to permit the pointed ends of the wire legs to penetrate the bone tunnel wall as the anchor is moved in a direction toward the tunnel opening;
and an insertion tool comprising:
an elongated rod having a distal end and a proximal end;
selectively openable and closeable jaws disposed at said distal end of said rod, said jaws being configured to firmly engage said engageable element when closed;
an actuator disposed at the proximal end of said rod for permitting manually actuated opening and closing of said jaws; and
a member mounted on said tool to be selectively movable longitudinally relative to said rod, said member having a distalmost position relative to said rod wherein said member causes said wire legs to deformably bend outwardly to said permanent deployment position.

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**5,501,684**
**OSTEOSYNTHETIC FIXATION DEVICE**
**Johannes F. Schlapfer, Glarus, and Martin Hess, Holstein, both of, Switzerland, assignors to Synthes (U.S.A.), Paoli, Pa.**
**PCT No. PCT/CH92/00125, § 371 Date Jul. 26, 1994, § 102(e) Date Jul. 26, 1994, PCT Pub. No. WO/9400066, PCT Pub. Date Jan. 6, 1994**
**PCT Filed Jun. 25, 1992, Ser. No. 199,130**
**Int. Cl.[6] A61B 19/84**
**U.S. Cl. 606—73** **25 Claims**



1. An osteosynthetic fixation device comprising:
a fixation element having a longitudinal axis, a head section at least in part of conical shape and an anchoring element abutting said head section, for attachment to bone,
a separate clamping element having the shape of a layer of a sphere and extending on both sides of a great circle of said sphere, said clamping element having a longitudinal axis, a conical bore hole and a plurality of slots extending transverse to said great circle and,
a separate tensioning element extending from the head section for drawing and wedging the head section of said fixation element into the conical bore hole of said fixation element independent of the fixation element's attachment to the bone.

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**5,501,685**
**METHOD FOR SECURING A CRANIAL PIECE IN POSITION**
**Robert F. Spetzler, 6107 N. Palo Cristi, Paradise Valley, Ariz. 85253**
**Filed Apr. 26, 1994, Ser. No. 233,851**
**Int. Cl.[6] A61B 17/88**
**U.S. Cl. 606—75** **3 Claims**

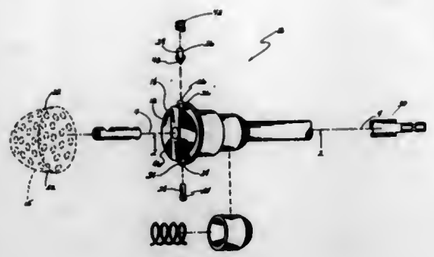


1. A method for replacing and securing a cranial plate in position in a cranial opening to prevent the cranial piece from shifting from adjacent cranium bone edges, the method comprising the steps of:
(a) positioning over a medullar portion of the cranial plate a surgical pin comprising distal and proximal shanks having ends tapering to a relatively sharp point, said shanks being arranged about a central collar having a dimension transverse to the longitudinal axis of the shanks greater than the diameters of the shanks so that the collar forms distal and proximal opposing shoulders for limiting the insertion depth of the pin;
(b) inserting the distal tapered shank of the pin into the medullar portion of the cranial plate so that the distal collar shoulder rests against the medullar portion of the cranial plate; and
(c) inserting the proximal tapered shank of the pin into a medullar portion of the adjacent cranium bone edge so that the proximal collar shoulder rests against the medullar portion of the cranium bone edge.

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**5,501,686**
**TOOL DRIVER**
**Brian D. Salyer, Warsaw, Ind., assignor to Othy, Inc., Warsaw, Ind.**
**Division of Ser. No. 858,935, Mar. 27, 1992, Pat. No. 5,282,804, which is a continuation-in-part of Ser. No. 696,951, May 8, 1991, Pat. No. 5,171,313. This application Jun. 25, 1993, Ser. No. 83,094**
**Int. Cl.[6] A61B 17/00**
**U.S. Cl. 606—79** **21 Claims**

1. A patella cutter comprising a shaft with an axis of rotation having a tool end and a collet end, a boss secured to said tool end, said boss having a debris cavity extending axially therein, a cutting lid with cutting edges and debris passages, said cutting lid being detachably secured to said boss to close said debris cavity, whereby said shaft and said cutting lid can be rotatably driven as a unit and bone debris removed from the patella can be retained in said debris cavity.



5,501,687

## BODY FOR DISTRIBUTING BONE CEMENT FOR THE ANCHORING OF IMPLANTS

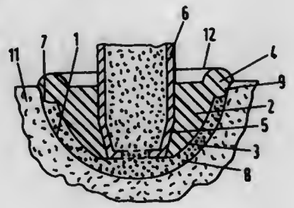
Hans-Georg Willert, Götingen, Germany, and Kurt Bider, Winterthur, Switzerland, assignors to Sulzer Medizinaltechnik AG, Winterthur, Switzerland

Filed Nov. 4, 1993, Ser. No. 148,767

Claims priority, application European Pat. Off., Nov. 20, 1992, 92810905

Int. Cl.[6] A61B *17/88;* A61F *2/34*

U.S. Cl. 606—94 6 Claims



1. A removable mold for distributing bone cement from a hand-held bone cement syringe and into a hip joint cavity prepared in a bone, the hip joint cavity for receiving and anchoring a hip joint implant, the mold for distributing the bone cement in the hip joint cavity so that the bone cement corresponds in shape with an outer geometry of the implant, the mold comprising:

a solid rubber-like body having a molding surface that is fashioned to correspond in shape to the outer geometry of the hip joint implant, and wherein the body defines a central channel, the channel being sized to receive and position the bone cement syringe near the molding surface to allow the hope cement to be delivered through the channel with minimal travel and with minimal loss of pressure so that the cement may be evenly distributed between the bone and the molding surface upon hand operation of the syringe; and

wherein the mold further includes an elastic collar integrally formed about the periphery of the body, the collar being sized to rest against the bone and to hold the molding surface spaced-apart from the bone, and wherein the elasticity of the mold allows the mold to be removed from the hip joint cavity without substantial removal of the cement when the cement reaches a desired viscosity and the hip joint implant placed therein.

5,501,688

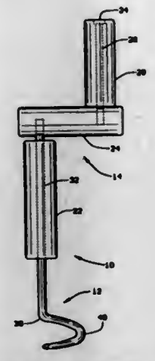
## SURGICAL DEVICE FOR MANIPULATING WIRE

Leo A. Whiteside, Chesterfield, and Stephen E. White, Ballwin, both of Mo., assignors to Surgical Accessories, Inc., Bridgeton, Mo.

Filed Feb. 17, 1994, Ser. No. 198,105

Int. Cl.[6] A61B *17/88;17/56*

U.S. Cl. 606—103 14 Claims



9. A surgical instrument for fastening a bone with a wire by circumscribing the bone with the wire and twisting ends of the wire together, said instrument comprising:

a hook configured to surround at least a portion of the bone for circumscribing the wire around the bone; and

a crank for tightly twisting the wire ends together, the crank being joined with the hook.

5,501,689

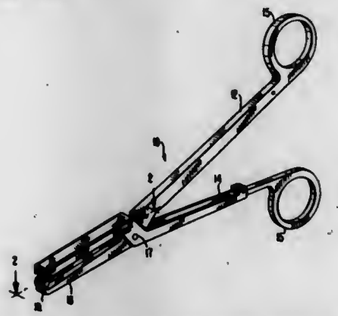
## PLAQUE STAPLER

David T. Green, Westport; Henry Bolanos, Norwalk; Daniel E. Alesi, Sherman, all of Conn., and Kenneth E. Toso, Portchester, N.Y., assignors to United States Surgical Corporation, Norwalk, Conn.

Filed Feb. 3, 1994, Ser. No. 191,230

Int. Cl.[6] A61B *17/04*

U.S. Cl. 606—139 7 Claims



1. A method for joining first and second plaque-lined blood vessel segments to one another, comprising the steps of:

a) detaching a portion of plaque lining from adjacent end portions of the first and second blood vessel segments to be joined;

b) providing a surgical stapling device including an anvil for placement adjacent an interior surface of the first and second vessel segments and a cartridge assembly containing a plurality of staples for placement adjacent an exterior surface of the first and second vessel segments and structure for driving the staples from the cartridge through the plaque lining the walls of the blood vessels to be formed against the anvil;

c) stapling the remaining portion of the plaque lining in each blood vessel segment to a wall thereof; and

d) joining the end portions of the blood vessel segments to one another in the area from which the plaque lining has been removed.



5,501,690

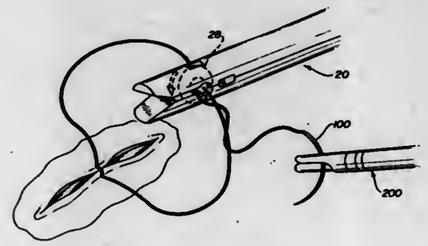
## SUTURING DEVICE

John P. Measamer, Cincinnati; Robert F. Welch, Maineville, and Brett Swensgard, Massillon, all of Ohio, assignors to Ethicon Endo-Surgery, Cincinnati, Ohio

Filed Sep. 2, 1994, Ser. No. 300,295

Int. Cl.[6] A61B *17/04*

U.S. Cl. 606—146 18 Claims



1. A surgical suture device comprising:

a shaft;

a rod extending through the shaft and movable therein;

a cartridge connected to said shaft;

a suture fixedly held on a rotatable suture wheel placed on said cartridge said suture wheel having a mechanism for mating with said rod and said cartridge having a proximal end attached to said shaft; and

an actuating mechanism connected proximally to said shaft, said actuating mechanism operable to cause said rod to rotate said suture wheel.

5,501,691

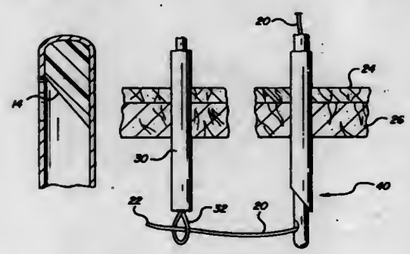
## VERRES NEEDLE SUTURING DEVICE

Milton H. Goldrath, 31074 Oakleaf, Franklin, Mich. 48025

Continuation of Ser. No. 36,074, Mar. 23, 1993, abandoned. This application May 2, 1994, Ser. No. 237,402

Int. Cl.[6] A61B *11/00*

U.S. Cl. 606—148 9 Claims



1. In a needle assembly of the type including:

a hollow, cylindrical sheath terminating in a sharp cutting edge for piercing external body tissue of a patient;

and a spring loaded, hollow, gas introducing probe disposed inside said sheath and having a cylindrical outer surface, a blunt free end, a longitudinal channel formed in said probe, and an opening formed in said surface proximate said blunt free end and spaced apart therefrom, said opening being in communication with said channel so as to permit the passage of gas through said channel, said probe being operative to move between a first, extended position wherein said blunt tip projects from said sheath to prevent said cutting edge from cutting internal body tissue of said patient to a second retracted position wherein said blunt tip is substantially disposed inside said sheath so as to permit said cutting edge to penetrate said tissue, said probe being biased into said first position and operative to move from said first to said second position as the needle assembly penetrates into a body cavity of said patient, the improvement comprising:

an angled guide connecting said channel and said opening, said guide tapering in a direction toward said opening and including an oblique guide surface operative to guide an end of a piece of suture material which is threaded through said channel out of said opening for subsequent capture by a suture snare.

5,501,692

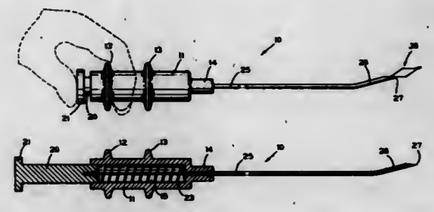
## LAPAROSCOPIC SUTURE SNARE

Erol D. Riza, 550 Riverside Dr., Rossford, Ohio 43460

Filed Jan. 28, 1994, Ser. No. 188,439

Int. Cl.[6] A61B *17/00*

U.S. Cl. 606—148 54 Claims



1. A suture snare instrument comprising:

a hollow housing defining an internal cavity;

an introducer needle having a first end secured to said hollow housing and a second end, said second end terminating in a sharp point to permit the insertion thereof through body tissue;

a plunger extending within said hollow housing and supported for sliding movement relative thereto between first and second positions;

a spring engaged with said plunger to urge said plunger toward said first position and

a wire disposed within said introducer needle and connected to said plunger for movement therewith, said wire having a looped end which is retracted within said second end of said introducer needle when said plunger is in said first position and which extends outwardly from said second end of said introducer needle when said plunger is in said second position.

5,501,693

## SURGICAL HEMOSTATIC CLIP

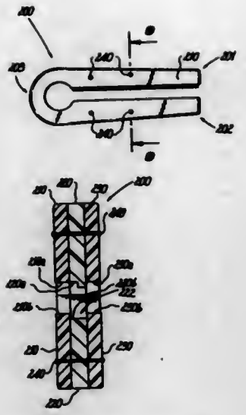
Roy D. Gravener, Fairfield, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Filed Jul. 6, 1994, Ser. No. 272,380

Int. Cl.[6] A61B *17/04*

U.S. Cl. 606—157 12 Claims

1. A hemostatic clip for application to body tissue comprising:



a clip body defining first and second opposed leg portions and a connecting bail portion, each of the first and second opposed leg portions having an elongated tissue contacting surface defined thereon, the tissue contacting surface on the first leg portion having a longitudinally extending tongue formed thereon including first and second opposed lateral facets, the tissue contacting surface on the second leg portion having a longitudinally extending groove formed therein including first and second opposed lateral walls, the tongue and groove being oriented such that, upon approximation of the first and second leg portions, a greater gap distance exists between the first lateral facet of the tongue and the first lateral wall of the groove than exists between the second lateral facet of the tongue and the second lateral wall of the groove.

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**5,501,694**

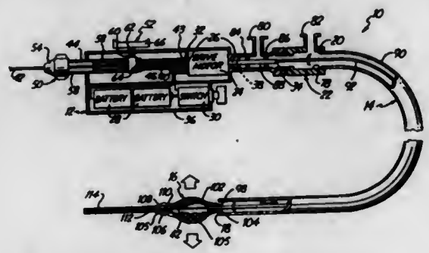
**EXPANDABLE INTRAVASCULAR OCCLUSION MATERIAL REMOVAL DEVICES AND METHODS OF USE**

**Thomas V. Ressemann, St. Cloud; Anthony C. Vrba, and Steven S. Hackett, both of Maple Grove, all of Minn., assignors to SciMed Life Systems, Inc., Maple Grove, Minn.**

**Continuation-in-part of Ser. No. 55,995, Apr. 29, 1993, which is a continuation-in-part of Ser. No. 976,199, Nov. 13, 1992, abandoned. This application Mar. 3, 1994, Ser. No. 206,053**

**Int. Cl.[6] A61B *17/00*; A61M *25/00***

**U.S. Cl. 606—159** **14 Claims**



1. An intravascular device for removing vascular occlusion material within a vascular lumen in a patient, the intravascular device comprising:

an expandable removal element having a proximal and a distal end;

an inner drive shaft comprising a helix extending through the removal element and operatively connected to the distal end of the removal element for energizing the removal element intravascularly; and

an outer drive shaft comprising a helix operatively coupled to the proximal end of the removal element for energizing the removal element intravascularly wherein the inner drive shaft extends coaxially through the outer drive shaft and wherein the inner drive shaft and the outer drive shaft are shiftable with respect to one another.

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**5,501,695**

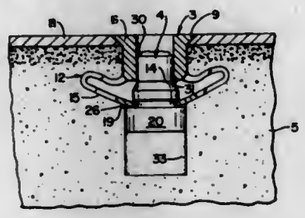
**FASTENER FOR ATTACHING OBJECTS TO BONES**

**William E. Anspach, Jr., Palm Beach Gardens, Fla.; William S. Reid, Knoxville, Tenn.; Eddy H. Del Rio, Royal Palm Beach, and William E. Anspach, III, Palm Beach Gardens, both of Fla., assignors to The Anspach Effort, Inc.**

**Continuation-in-part of Ser. No. 889,477, May 27, 1992, Pat. No. 5,326,205. This application Mar. 21, 1994, Ser. No. 215,279**

**Int. Cl.[6] A61B *17/04***

**U.S. Cl. 606—232** **29 Claims**



1. A rivet for expanding into a hole in a material, said rivet comprising a tubular body having an exterior surface for fitting into the hole and having a projection extending radially from a first end of the body for controlling an extent to which said rivet can extend into the hole, the body having an aperture extending therethrough from the first end to a second end wherein the aperture has a first diameter in a first portion of the body adjacent to the first end and a second diameter in a second portion of the body adjacent to the second end of the body wherein the first diameter is smaller than the second diameter to thereby form an annular step in the aperture, the exterior surface at the second portion tapers inward toward the second end which has an end surface that is beveled toward the aperture, said body further includes a plurality of elongated slots extending along the exterior surface spaced from both the first end and the second end and communicating with the aperture and said elongated slots defining longitudinal ribs in the body between the slots, wherein the ribs expand radially into the material upon compression of the body.

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**5,501,696**

**UNITARY ANCHOR FOR SOFT TISSUE FIXATION**

**Arthur F. Trott, Largo, Fla., assignor to Linvatec Corporation, Largo, Fla.**

**Continuation of Ser. No. 111,319, Aug. 25, 1993, Pat. No. 5,411,522. This application Dec. 28, 1994, Ser. No. 365,385**

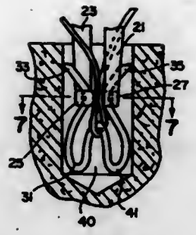
**Int. Cl.[6] A61B *17/04***

**U.S. Cl. 606—232** **11 Claims**

1. An anchor for attaching suture in a bone tunnel having a predetermined longitudinal depth and predetermined diameter, said anchor comprising:

a continuous wire-like member including means for receiving and retaining suture, said means including a bend in said wire-like member forming a generally helical segment of at least one complete suture-retaining loop and first and second





diverging coplanar legs extending from said helical segment, said helical segment having a diameter smaller than said predetermined diameter, said first and second legs having pointed ends normally spaced by a distance greater than the predetermined diameter of said bone tunnel, said legs being resiliently compressible toward one another sufficiently to permit selective reduction of the transverse spacing between said pointed ends to at most equal said predetermined diameter, said anchor being adapted for insertion distally into said bone tunnel with said helical segment preceding said legs and said legs compressed, and wherein the overall length of said anchor from the distal end of said helical segment to said pointed ends is less than said predetermined longitudinal depth of said bone tunnel.

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**5,501,697**

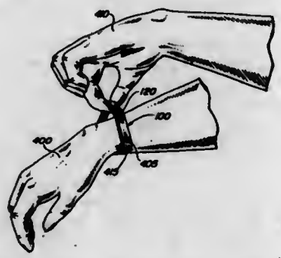
**TREATMENT DEVICE TO AID IN LONG-TERM CESSATION OF SMOKING**

**Gary R. Fisher, 2251 Federal Ave., Los Angeles, Calif. 90064**

**Filed Jun. 23, 1992, Ser. No. 902,970**

**Int. Cl.[6] A61B *17/00***

**U.S. Cl. 606—204** **26 Claims**



1. A device for use by an individual to overcome cigarette smoking addiction, comprising:

a wrist band having an elastic segment with a maximum elongation not in excess of 100% when the elastic segment is stretched without exceeding its elastic limit, The tensile force required to attain said elongation being not in excess of five pounds;

a non-elastic hook fastener segment with a plurality of hooks attached to the top side of said hook fastener segment;

a non-elastic loop fastener segment with a plurality of loops attached to the top side of said loop fastener segment;

an acupressure stimulator comprising a generally curved surface and a generally flat attachment surface for contacting the surface of the human body in the proximal region of the wrist;

means for attaching the bottom side of said hook fastener segment to said wrist band adjacent a proximal end of said elastic segment;

means for attaching the bottom side of said loop fastener segment to said wrist band adjacent the distal end of said elastic segment; and

means for attaching said acupressure stimulator to one side of said wrist band at a selected one of said non-elastic segments.

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**5,501,698**

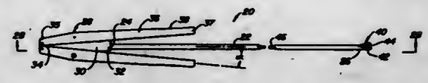
**ENDOSCOPIC MICROSURGICAL INSTRUMENTS AND METHODS**

**Alex T. Roth, Redwood City, and Scott H. Miller, Sunnyvale, both of Calif., assignors to Heartport, Inc., Redwood City, Calif.**

**Filed Feb. 14, 1994, Ser. No. 194,946**

**Int. Cl.[6] A61B *17/00***

**U.S. Cl. 606—205** **51 Claims**



1. A microsurgical instrument comprising: an outer shaft having a proximal end, a distal end, and an axial lumen therebetween;

an inner shaft slidably disposed in the axial lumen and having a proximal end and a distal end;

an end effector coupled to the distal end of the inner shaft and movable relative to the outer shaft; and

an actuator at the proximal end of the outer shaft, the actuator comprising:

an actuator body attached to a first shaft selected from the outer shaft and the inner shaft;

a first arm having a proximal end and a distal end, the proximal end being pivotally coupled to the actuator body by a pin means, and the distal end extending distally and outwardly from the actuator body on a first lateral side of the outer shaft to form an acute angle therewith;

a second arm having a proximal end and a distal end, the proximal end being pivotally coupled to the actuator body by a pin means, and the distal end extending distally and outwardly from the actuator body on a second lateral side of the outer shaft opposite the first lateral side to form an acute angle therewith;

a first link having an outer end and an inner end, the outer end being coupled to the first arm at a first pivot point distal to the proximal end of the first arm, and the inner end being coupled to a second shaft selected from the outer shaft and the inner shaft; and

a second link having an outer end and an inner end, the outer end being coupled to the second arm at a second pivot point distal to the proximal end of the second arm, and the inner end being coupled to the second shaft;

wherein the first and second arms are symmetrically pivotable to translate the inner shaft relative to the outer shaft, thereby actuating the end-effector.

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**5,501,699**

**Patent Not Issued For This Number**

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**5,501,700**

**EARDRUM PERFORATION PATCH AND EARDRUM UNDERSURFACE SCRAPER**

**Keisuke Hirata, 1920-1, Noginomori-cho 4-chome, Ogaki-shi Gifu-ken 503, Japan**

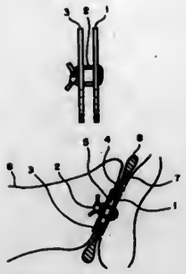
**Filed Jan. 5, 1994, Ser. No. 177,403**

**Claims priority, application Japan, Jan. 8, 1993, 5-032387**

**Int. Cl.[6] A61B *17/04***

**U.S. Cl. 606—215** **17 Claims**

1. An eardrum perforation patch made of absorbable material with biological affinity for closing a tympanic perforation comprising:



a closure piece placeable inside the perforation for closing the perforation;

at least one coupler connected to said closure piece for holding the closure piece against the perforation; and

a supporting piece placeable outside the perforation for supporting said closure piece, the at least one coupler connecting the closure piece to the supporting piece,

the at least one coupler being thread which extends between the closure piece and the supporting piece, the thread being the only connection between the closure piece and the supporting piece.

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**5,501,701**

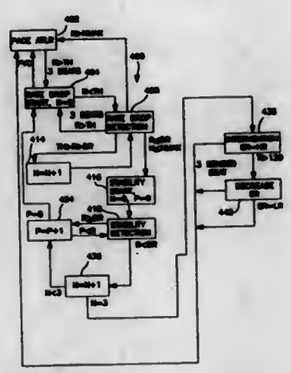
**PACEMAKER WITH VASOVAGAL SYNCOPE DETECTION AND THERAPY**

**H. Toby Markowitz, Roseville, and Michael F. Hess, Minneapolis, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.**

**Continuation-in-part of Ser. No. 235,433, Apr. 29, 1994, abandoned. This application Sep. 20, 1994, Ser. No. 309,285**

**Int. Cl.[6] A61N *1/36***

**U.S. Cl. 607—9** **24 Claims**



1. A cardiac pacer comprising:

means for detecting depolarizations of a heart and generating signals therefrom;

means for determining an intrinsic heart rate connected to receive said signals from such detected depolarization;

pulse generating means for delivering cardiac pacing pulses at a first pacing rate;

means for defining first and second threshold heart rates;

drop detecting means for detecting a rapid drop in spontaneous heart depolarization rate from a rate above said first threshold heart rate to a rate below said second threshold heart rate.

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**5,501,702**

**TIME SHARING MULTIPOLAR RHEOGRAPHY APPARATUS AND METHOD**

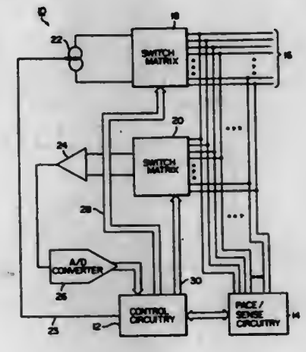
**Gianni Plicchi, Bologna, and Massimo Ceccarelli, Cesena, both of, Italy, assignors to Medtronic, Inc., Minneapolis, Minn.**

**Filed Jul. 19, 1994, Ser. No. 277,051**

**Claims priority, application Italy, Jun. 6, 1994, RM94A0356**

**Int. Cl.[6] A61N *1/36***

**U.S. Cl. 607—20** **7 Claims**




1. A pulse generator system comprising:

a plurality of electrodes, each adapted to be disposed at a separate site in a patient's body;

a plurality of conductive leads, each coupled at a distal end to one of said plurality of electrodes;

first and second switching circuits coupled to a proximal end of each of said plurality of leads;

a rheography pulse generating circuit coupled to said first switching circuit, said rheogmphy pulse generating circuit adapted to generate a constant current rheography pulse in response to a rheography pulse control signal;

an impedance detection circuit having first and second terminals coupled to said second switching circuit, said impedance detection circuit adapted to produce an output voltage corresponding to an impedance present between said first and second impedance detection circuit terminals;

control circuitry coupled to said first and second switching circuits and to said rheography pulse generating circuit. said control circuitry adapted to generate a source control signal identifying two of said plurality of leads, and to generate a recording control signal identifying two of said plurality of leads, and to generate said rheography pulse control signal;

wherein said first switching circuit is responsive to said source control signal to couple said two leads identified by said source control signal to said rheography pulse generating circuit, and wherein said second switching circuit is responsive to said recording control signal to couple said two leads identified by said recording control signal to said first and second impedance detection circuit terminals, respectively;

such that said rheography current pulse is conducted on said leads identified by said source control signal and such that said impedance detection circuit output voltage corresponds to impedance between said leads identified by said recording control signal.



**5,501,703**

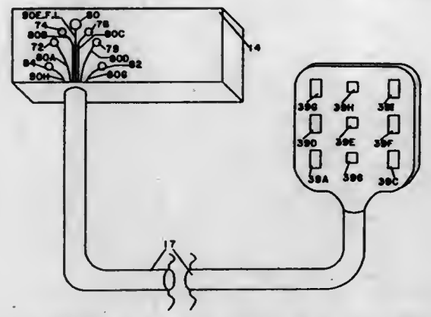
**MULTICHANNEL APPARATUS FOR EPIDURAL SPINAL CORD STIMULATOR**

**Jan Holsheimer, Oldenzaal, and Johannes J. Struijk, Rijssen, both of, Netherlands, assignors to Medtronic, Inc., Minneapolis, Minn.**

**Filed Jan. 24, 1994, Ser. No. 185,616**

**Int. Cl.[6] A61N *1/04***

**U.S. Cl. 407—46** **70 Claims**



1. An apparatus for stimulating neural tissue in a spinal column comprising:

a) a source of electrical pulses having a plurality of channels through which electrical pulses produced by the source of electrical pulses are passed, the source of electrical pulses producing output pulses in each of the channels, the source of electrical pulses having means for independently changing parameters of the output pulses in each channel;

b) a lead adapted to be implanted near the spinal column, the lead connected to the source of electrical pulses, the lead having a proximal and a distal end and a first axis extending parallel to the spinal column when the lead is implanted near the spinal column, the lead having at least a first, a second and a third electrode located substantially in line near the distal end of the lead, the first, second and third electrodes located generally along a second axis that is generally perpendicular to the first axis of the lead, the lead having at least the first and third electrodes each connected to a different channel of the source of electrical pulses and the second electrode being generally centered with respect to the first and third electrodes so that cathode/anode pairs are formed between each of the first and second electrodes and the second and third electrodes, respectively, the source of electrical pulses producing pulses delivered through the channels to at least the respective first and third electrodes, the pulses through the channels to the respective first and third electrodes overlapping in time during at least a portion of each pulse.

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**5,501,704**

**METHOD FOR APPLYING LOW ENERGY EMISSION THERAPY**

**Rea-Woun Chang, Singapore, Singapore; Niels Kuster, Zurich, Switzerland; Boris Pasche, New York, N.Y.; Jean-Pierre Lebet, Montreux, Switzerland; Alexandre Barbault, Colmar, France, and Henry Kunz, Zurich, Switzerland, assignors to Symtonic, S.A., Switzerland**

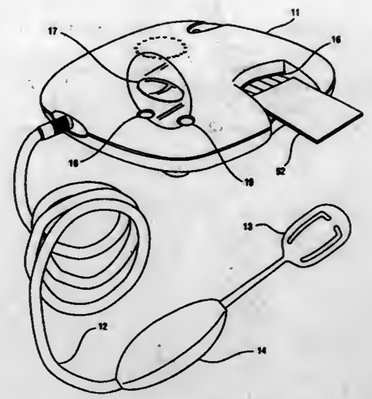
**Division of Ser. No. 951,963, Sep. 25, 1992, Pat. No. 5,441,528. This application Jun. 2, 1995, Ser. No. 458,975**

**Int. Cl.[6] A61N *1/32***

**U.S. Cl. 607—69** **2 Claims**

1. A method of treating a patient suffering from generalized anxiety disorders including panic attacks, comprising:

applying to the patient electromagnetic energy having a radio frequency carrier of less than 1 GHz, modulated with a plurality of discrete modulation signals having frequencies of from 0.1 Hz to 10 kHz, the application of the electromagnetic energy being performed over a period of time sufficient to cause a therapeutically effective amount of the electromagnetic energy to affect said disorders to be applied to the patient.



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**5,501,705**

**METHOD FOR THE TREATMENT OF PSORIASIS WITH ELECTRIC CURRENT**

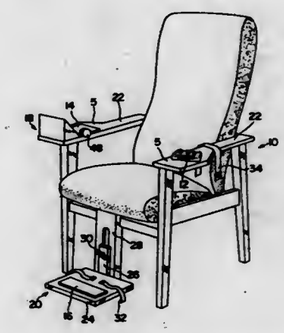
**Omar Fakhri, 115 Broadley Street, London NW8, United Kingdom**

**Continuation of Ser. No. 679,000, Jun. 13, 1991, abandoned. This application Dec. 9, 1992, Ser. No. 989,815**

**Claims priority, application United Kingdom, Jan. 31, 1988, 8825464; Dec. 29, 1988, 8830318**

**Int. Cl.[6] A61N *1/20***

**U.S. Cl. 607—75** **3 Claims**



1. A method of treatment of psoriasis in humans, comprising passing D.C. electric current through the body of a patient suffering from psoriasis, from the fingertips to the toes, and gradually increasing the electric current to a predetermined level.

**5,501,706**

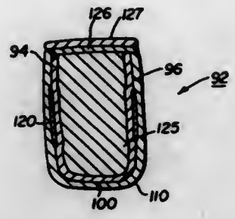
## MEDICAL IMPLANT STRUCTURE AND METHOD FOR USING THE SAME

**Irving K. Arenberg, Englewood, Colo., assignor to Wildflower Communications, Inc., Englewood, Colo.**

**Filed Nov. 29, 1994, Ser. No. 346,012**

**Int. Cl.[6] A61F 2/28**

**U.S. Cl. 623—16** **23 Claims**




1. A medical implant structure comprising:

a containment member comprising an open top portion, a closed bottom portion, a side wall, and an internal cavity therein surrounded by said side wall, said containment member being comprised of collagen;

a supply of a granular implant composition positioned within said internal cavity of said containment member, said implant composition being comprised of a plurality of individual granules; and

a supply of an activator material positioned within said internal cavity of said containment member in combination with said implant composition, said activator material adhering said individual granules of said implant composition together to form a temporarily pliable mixture which ultimately solidifies to produce a solid mass sufficiently rigid for use within said implant structure.

17. A method for structurally reinforcing a tissue region within a living subject comprising the steps of:

providing a medical implant structure comprising:

a containment member comprising an open top portion, a closed bottom portion, a side wall, and an internal cavity therein surrounded by said side wall, said containment member being comprised of collagen;

a supply of a granular implant composition positioned within said internal cavity of said containment member, said implant composition being comprised of a plurality of individual granules; and

a supply of an activator material positioned within said internal cavity of said containment member in combination with said implant composition, said activator material adhering said individual granules of said implant composition together to form a temporarily pliable mixture which ultimately solidifies to produce a solid mass sufficiently rigid for use within said implant structure;

inserting said implant structure within said living subject prior to solidification of said mixture;

positioning said implant structure adjacent to and against said tissue region to be reinforced; and

physically manipulating and shaping said implant structure prior to solidification of said mixture so that said implant structure dimensionally conforms with said tissue region.



**5,501,707**

## AQUEOUS DISPERSIONS OF NEW AMPHIPHILIC CO-OLIGOMERS FOR THE WASHING- AND CLEANING-RESISTANT OILING OF LEATHER AND SKINS AND THEIR USE

**Ludwig Schieferstein, Ratingen; Rudolf Zauns-Huber; Joachim Conradi, both of Duesseldorf, and Emil Ruscheinsky, Leverkusen, all of, Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany**

**PCT No. PCT/EP92/01938, § 371 Date May 3, 1994, § 102(e) Date Mar. 3, 1994, PCT Pub. No. WO93/05188, PCT Pub. Date Mar. 18, 1993**

**PCT Filed Aug. 24, 1992, Ser. No. 204,168**

**Claims priority, application Germany, Sep. 3, 1991, 41 29 244.8**

**Int. Cl.[6] C14C 9/00**

**U.S. Cl. 8—94.23** **20 Claims**

1. A process for the washing and dry-cleaning resistant oiling of mineral tanned leather and skins which comprises: introducing co-oligomers into the leather by contacting the leather with an aqueous dispersion of the co-oligomers formed by the radical-initiated aqueous emulsion copolymerization at a mildly acidic to neutral pH of a composition comprising:

(a) semiesters of maleic acid with at least one alcohol selected from the group consisting of oleophilic alcohols and alkylene oxide adducts of oleophilic alcohols;

(b) at least one of acrylic acid and methacrylic acid; and

(c) from 0 to 45% by weight of the co-oligomer of at least one monomer selected from the group consisting of hydrophilic and oleophilic monomers which are not (a) or (b).

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**5,501,708**

## PROCESS FOR TANNING HIDES AND COMPOUNDS FOR USE THEREIN

**Peter Pojer, North Caulfield; Kenneth C. Montgomery, North Warrandyte; Chi P. Huynh, Hawthorn, and Brian Milligan, North Balwyn, all of, Australia, assignors to Commonwealth Scientific and Industrial Research Organisation, Campbell, Australia**

**PCT No. PCT/AU92/00154, § 371 Date Oct. 7, 1993, § 102(e) Date Jan. 18, 1994, PCT Pub. No. WO92/18456, PCT Pub. Date Oct. 29, 1992**

**PCT Filed Apr. 9, 1992, Ser. No. 129,181**

**Claims priority, application Australia, Apr. 9, 1991, PK5510; Feb. 18, 1992, PL0950**

**Int. Cl.[6] C14C 3/06;3/08**

**U.S. Cl. 8—94.26** **11 Claims**

1. A method of tanning skin or hide, which method includes:

providing

a skin or hide;

an amount of metallic salt, sufficient to have a tanning effect on the skin or hide, wherein the metal is selected from chromium, aluminium, titanium or zirconium; and

at least one organic polyol ester of gallic acid, trimellitic acid, pyromellitic acid or 3,3',4,4' benzophenone tetracarboxylic acid;

applying the organic polyol ester to the skin or hide; and

contacting the skin or hide after it has had the organic polyol ester applied thereto, with the metallic salt in solution for a period sufficient to complex therewith.

**5,501,709**

## ECONOMY AND PLUMPING CHROME TANNING

**Karlheinz Fuchs, Huenfelden, Germany, assignor to Hoechst AG, Germany**

**Filed Aug. 12, 1993, Ser. No. 105,380**

**Claims priority, application Germany, Aug. 14, 1992, 42 26 983.0**

**Int. Cl.[6] C14C 1/08;3/04**

**U.S. Cl. 8—94.27** **20 Claims**

1. A process for treatment of delimed and bated pelts which comprises:

contacting the delimed and bated pelts with an anionic, colloidal silicate in a pickle bath, and

subsequent to said contacting, while said delimed and bated pelts are in the pickle bath, adding to the pickle bath an acid comprising an aldehyde- or keto-carboxylic acid or a combination of aldehyde- and keto-carboxylic acids.

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**5,501,710**

## COPPER PHTHALOCYANINE DYESTUFFS AND THEIR USE

**Klaus Wunderlich, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany**

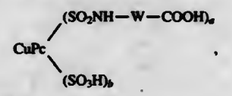
**Filed Oct. 14, 1994, Ser. No. 323,213**

**Claims priority, application Germany, Jan. 21, 1993, 43 35 958.2**

**Int. Cl.[6] C09B 47/20;47/24;11/02; D06P 3/62**

**U.S. Cl. 8—402** **10 Claims**

1. Copper phthalocyanine dyestuffs which, in the form of the free acid, have the formula




(I)

in which

CuPc represents a copper phthalocyanine radical,

W represents branched or straight-chain $C_{9-16}$-alkylene,

a represents 2 to 4,

b represents 0 to 2, and

the sum of a and b is 3 to 4.

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**5,501,711**

## METHOD FOR TREATMENT OF CELLULOSE FABRICS TO IMPROVE THEIR DYEABILITY WITH REACTIVE DYES

**Marek Weltrowski, Brossard, Canada, and Merle S. Masri, Emeryville, Calif., assignors to Water & Oil Technologies, Inc., Montgomery, Ill.**

**Filed Oct. 26, 1994, Ser. No. 329,215**

**Int. Cl.[6] D06P 3/66;1/46**

**U.S. Cl. 8—543** **11 Claims**

1. A method of improving the dyeability of cellulose fabric by reactive dyes, said method comprising the following steps:

(a) pretreating the cellulose fabric with an oxidizing agent;

(b) applying chitosan oligomers to the cellulose fabric;

(c) stabilizing the product of step (b) by treating with a solution of a reducing agent; and

(d) dyeing the resultant product of the steps with a reactive dye.

5,501,712

## METHOD FOR CRYSTALLIZATION OF α-L-ASPARTYL-L-PHENYLALANINE METHYL ESTER

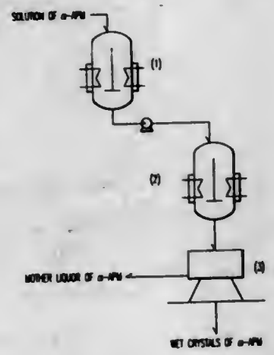
Sou Abe, and Shinichi Kishimoto, both of Kawasaki, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Continuation of Ser. No. 203,472, Feb. 28, 1994, Pat. No. 5,425,787, which is a continuation of Ser. No. 967,234, Oct. 27, 1992, abandoned. This application Oct. 21, 1994, Ser. No. 326,953

Claims priority, application Japan, Jan. 30, 1991, 3-284590; Apr. 22, 1992, 4-102918

Int. Cl.[6] C07C *229/00*; B01D *9/02*

U.S. Cl. 23—295 R 6 Claims




1. A method for crystallization of α-L-aspartyl-L-phenylalanine methyl ester, comprising forming a cold solution of α-APM from a saturated solution by indirect heat exchange with a coolant, said cold solution of α-APM having a temperature not greater than 20° C. higher than the temperature of the coolant; and stirring said cold solution while continuously feeding an aqueous feed solution of α-APM to said cold solution of α-APM.

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5,501,713

## ENGINE FUELS

Joe S. Wilkins, Jr., 1706 E. Southmore, Pasadena, Tex. 77502

Filed May 4, 1994, Ser. No. 238,266

Int. Cl.[6] C10L *1/18*

U.S. Cl. 44—307 14 Claims

1. A fuel for igniting an engine comprising:

at least one terpene;

at least one alcohol having from about one to about six carbon atoms; and

at least one lubricating oil;

such that the combination of said at least one terpene, said at least one alcohol, and said at least one lubricating oil act as an engine fuel for igniting an engine.

5,501,714

## OPERATION OF DIESEL ENGINES WITH REDUCED PARTICULATE EMISSION BY UTILIZATION OF PLATINUM GROUP METAL FUEL ADDITIVE AND PASS-THROUGH CATALYTIC OXIDIZER

James M. Valentine, Fairfield, Conn., and Jeremy D. Peter-Hoblyn, Bodwin, England, assignors to Platinum Plus, Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 372,188, Jan. 13, 1995, which is a continuation-in-part of Ser. No. 251,520, May 31, 1994, which is a continuation-in-part of Ser. No. 918,679, Jul. 22, 1992, abandoned, and a continuation-in-part of Ser. No. 251,520, May 31, 1994, abandoned, which is a continuation-in-part of Ser. No. 918,679, Jul. 22, 1992, abandoned, and a continuation-in-part of Ser. No. 3,245, Jan. 11, 1993, abandoned, which is a continuation-in-part of Ser. No. 808,435, Dec. 16, 1991, abandoned, which is a continuation-in-part of Ser. No. 794,329, Nov. 12, 1991, abandoned, which is a continuation of Ser. No. 291,245, Dec. 28, 1988, abandoned. This application Mar. 14, 1995, Ser. No. 403,365

Int. Cl.[6] C10L *1/30*

U.S. Cl. 44—358 14 Claims

1. A method for improving the operation of a diesel engine, by enabling the operation of a pass-through oxidation catalyst over long periods of time with continued catalytic activity and without the undesirable conversion of $SO_2$ to $SO_3$, comprising:

providing a diesel engine including a combustion chamber, for combusting a diesel fuel and thereby produce combustion gases including particulates, and an exhaust system, for removing combustion gases from the combustion chamber, said exhaust system including a pass-through catalyst support having sufficient surface to support an active oxidation catalyst for oxidizing at least a portion of the particulates discharged from the engine upon operation of the engine;

introducing a fuel comprising a platinum group metal composition into a combustion chamber of a diesel engine, said platinum group metal composition being stable in the fuel composition prior to combustion and consumable during combustion to release platinum metal catalyst in active form; and

combusting the fuel within said combustion chamber to release from the fuel upon combustion an active form of catalyst;

discharging the exhaust from the combustion chamber and passing it through the pass-through catalyst support to deposit the active form of the catalyst within the pass-through catalyst support to thereby catalyze the support for selective catalytic activity.

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5,501,715

## TERNARY ELEMENT COMPOUNDS IN THE A1-B-P SYSTEM, PROCESSES FOR THEIR PRODUCTION AND THEIR USE

Nils Perchenek, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jun. 24, 1994, Ser. No. 264,967

Claims priority, application Germany, Jul. 7, 1993, 43 22 579.9

Int. Cl.[6] C01B *35/10*; C22C *21/00*; C09K *3/14*

U.S. Cl. 51—307 12 Claims

1. Ternary element compounds of aluminum, boron and phosphorus, wherein each of said elements is present in a quantity of 1 to 90 mol-%.

8. A process for producing ternary element compounds of aluminum, boron and phosphorus, comprising reacting mixtures of aluminum phosphide and boron, or aluminum phosphide and boron phosphide, or aluminum phosphide and boron and boron phosphide, in liquid aluminum.



5,501,716

## DEVICE FOR CLEANING SURROUNDING AIR FED TO PASSENGER COMPARTMENT OF MOTOR VEHICLE

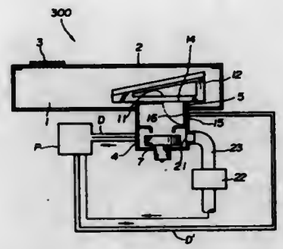
Takatoshi Chiba, and Shigeru Kobayashi, both of Omiya, Japan, assignors to Kansei Corporation, Omiya, Japan

Division of Ser. No. 113,639, Aug. 31, 1993, Pat. No. 5,368,620. This application Oct. 19, 1994, Ser. No. 325,511

Claims priority, application Japan, Sep. 1, 1992, 4-233557; Sep. 1, 1992, 4-233558; Jan. 23, 1992, 4-286339; Jan. 26, 1992, 4-287805; Dec. 28, 1992, 4-347524; Dec. 28, 1992, 4-347631

Int. Cl.[6] B01D *35/147*

U.S. Cl. 55—215 10 Claims




1. An air cleaning system for use in a motor vehicle having a cowl top and a passenger compartment, comprising:

a first structure secured to said cowl top to provide an air box;

a second structure secured to said first structure to provide an air intake case;

first means for defining in said cowl top a first opening through which the interior of said air box and the surrounding air are communicated;

second means for defining a second opening through which the interior of said air box and that of said air intake case are communicated;

third means for fluidly communicating the interior of said air intake case with said passenger compartment;

an air filter unit located in said air box upstream of said second opening so that air in the air box is filtered by said air filter unit upon flowing from the air box to the air intake case through said second opening; said air filter unit including an air filter bolder and an air filter element held by said bolder;

an electric air blower positioned in said air intake case for, which upon energization thereof, generates an air flow from said first opening to said passenger compartment through the interior of said air box, said air filter unit; said second opening, the interior of said air intake case and said third means;

bypass means for producing a bypass passage between the interior of said air box and that of said air intake case bypassing said air filter element when said air filter element is blocked with arrested dusts by a certain degree, said bypass means including means defining, in said air filter holder, at a portion downstream of said air filter element, a third opening through which the interior of said air box and that of said air intake case are freely communicated, a damper door pivotally connected to an inner wall of said air filter holder in a manner to selectively open and close said third opening from the back side, and biasing means for biasing said damper door in a direction to close said third opening, said biasing means comprising a spring which permits said damper door to open said third opening when the pressure in the air filter holder downstream of said air filter element is reduced to a certain level;

means for defining in said air intake case a fourth opening;

passage means for communicating said fourth opening and said passenger compartment; and

a switch door pivotally connected to said air intake case to selectively open and close said fourth opening and said second opening.

5,501,717

## METHOD AND FURNACE APPARATUS FOR BENDING AND TEMPERING A GLASS SHEET SUPPORTED ON A RING MOULD

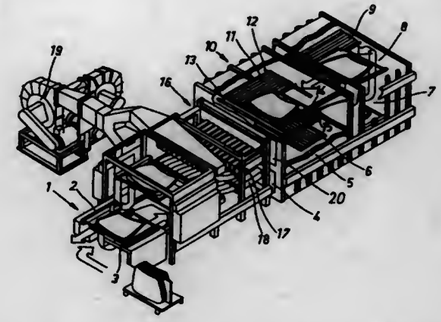
Jukka Vehmas, and Juha Paavola, both of Tampere, Finland, assignors to Tamglass Engineering Oy, Tampere, Finland

Filed Apr. 5, 1994, Ser. No. 223,023

Claims priority, application Finland, Apr. 23, 1993, 931828

Int. Cl.[6] C03B *23/023*; *27/04*

U.S. Cl. 65—104 16 Claims




1. A method for bending and tempering glass sheets supported on a ring mould, comprising:

placing a glass sheet on a ring mould,

conveying the ring mould with the glass sheet through at least one preheating section to preheat the glass sheet,

conveying the ring mould and preheated glass sheet into a bending furnace between upper and lower resistance fields,

further heating the preheated glass sheet in the bending furnace to a bending and tempering temperature and allowing the glass sheet to bend, and

conveying the glass sheet from the bending furnace into a tempering section where a tempering step is performed by blowing chilling air to opposite surfaces of the glass sheet,

wherein the step of conveying the glass sheet in the bending furnace into the tempering section includes measuring at least one of a temperature of the glass sheet and a degree of bending of the glass sheet, and accelerating the glass sheet toward the tempering section when at least one of the temperature and degree of bending of the glass sheet reaches a predetermined amount, wherein a leading edge of the glass sheet travels a distance through the bending furnace to a discharge opening of the bending furnace at least equal to a dimension of the glass sheet aligned in a conveying direction of the glass sheet in the bending furnace, wherein the glass sheet reaches a final shape in the bending furnace at the discharge opening.

9. A furnace apparatus for bending and tempering glass sheets, said apparatus comprising:

a loading and unloading station,

a plurality of outline moulds including carrier wagons,

at least one preheating section,

a separate bending furnace

a separate tempering section provided with nozzles for blasting chilling air to opposite surfaces of a bent glass sheet, and

means for conveying a glass sheet on one of said outline moulds through the furnace apparatus,

wherein the bending furnace includes a resistance field having a length in a traveling direction of the glass sheet through the bending furnace of at least 1.5 times a dimension of the at least one preheating section in the traveling direction and wherein the bending furnace and tempering section are located on a single horizontal level, wherein the glass sheet on said outline mould is movable on the horizontal level within boundaries of the resistance field toward the tempering section.

5,501,718

## METHOD TO PRODUCE SUBSTITUTE FOR PEAT MOSS

William E. Bandurski, 1084 - 24th St., Des Moines, Iowa 50311

Continuation of Ser. No. 223,537, Apr. 5, 1994, abandoned, which is a continuation-in-part of Ser. No. 43,535, Apr. 6, 1993, abandoned. This application Feb. 13, 1995, Ser. No. 387,618

Int. Cl.[6] C05F 11/08; C05C 9/00

U.S. Cl. 71—9 18 Claims

1. A method to produce a substitute for peat moss comprising:

mixing adsorptive cellulosic carrier material with an inoculum containing lignin cellulose degrading microorganisms in a fermenter in an effective amount sufficient to allow for rapid growth throughout the fermenter and a liquid feedstock consisting essentially of a manure, or municipal waste or a blend of these to form a mixture having a moisture content of up to 25% by weight and wherein liquid and dissolved nutrients are absorbed into the carrier material and solids are concentrated and bacteria grows on a surface of the carrier material,

transferring said mixture to a chamber to isolate the mixture from atmospheric oxygen, prevent loss of moisture, and maintain the mixture at even temperature throughout,

increasing the temperature of said mixture in said chamber to a temperature of 135° to 175° F. and forming a moist atmosphere containing ammonia and maintaining the mixture at this temperature until said cellulosic material changes from a natural color to a dark brown color, then

aerating said mixture to reduce the temperature and to remove water vapor, ammonia and other gases found in the mixture in an exhaust gas and continuing aeration until the mixture is dried to less than 25% by weight moisture and causes microorganisms or bacterial community that has developed to become dormant and then removing said mixture from said chamber containing carrier material having substantially same physical shade and size as initially mixed for use as a substitute for peat moss.

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5,501,719

## GROUND STRENGTHENING/SOIL-IMPROVING MATERIAL

Yukimori Shida, deceased, late of Kanagawa; by Chieko Shida, executor; by Yoshitaka Shida, executor, both of Yokohama; by Mutsuho Shida, executor, Shizuoka; by Yukie Takarazawa, executor, and by Emiko Shida, executor, both of Yokohama, all of, Japan, assignors to Tokiwa Kogyo Co., Ltd., Japan

Continuation-in-part of Ser. No. 809,823, Dec. 16, 1991, abandoned, which is a continuation of Ser. No. 332,004, Mar. 3, 1989, abandoned. This application Jul. 14, 1994, Ser. No. 274,824

Claims priority, application Japan, Mar. 17, 1989, 1-63777

Int. Cl.[6] C05F 5/00; C05G 3/04

U.S. Cl. 72—25 11 Claims

1. A ground-strengthening/soil-improving material comprising a base material produced by calcining, at a temperature of 1200°–1600° C., clay minerals selected from the group consisting of pyrophyllite, montmorillonite, selinite, kaolinite, tuff clay and kanto-loam admixed, prior to calcining, with materials selected from the group consisting of:

(a) 50–55 wt. % of sludge cakes discharged from a crude sugar refining stage in a sugar refinery;

(b) 10–14 wt. % of ash discharged from an incinerator in a papermaking plant;

(c) 1 wt. % of iron rust discharged from an iron factory or steel slags;

(d) 10 wt. % of rolling slags occurring in an aluminum manufacturing process,

said materials containing CaO, $Al_2O_3$, $SiO_2$ and $Fe_2O_3$ as major components and wherein 10–20 wt. % of gypsum is admixed with said base material after calcining.

5,501,720

## SPRAY-DRIED UREA-FORMALDEHYDE AND LIGNOSULFONATE COMPOSITIONS

Richard F. Buchholz, Shelton, Wash., assignor to Georgia-Pacific Corporation, Atlanta, Ga.

Filed Jun. 13, 1994, Ser. No. 258,821

Int. Cl.[6] C05C 9/02

U.S. Cl. 71—28 6 Claims

1. A fertilizer composition consisting essentially of a water insoluble mixture of an urea-formaldehyde resin and a lignosulfonate wherein said composition has a weight ratio of urea-formaldehyde resin solids to lignosulfonate solids between about 1:1 and 15:1 and is prepared by mixing an aqueous urea-formaldehyde resin with a lignosulfonate to form an aqueous mixture and spray-drying the aqueous mixture to form a freely-flowing insoluble powder.

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5,501,721

## PROCESS FOR PRODUCING PIG IRON AND CEMENT CLINKER

Alfred Edlinger, Baden, Switzerland, assignor to Holderbank Financiere Glarus AG, Glarus, Switzerland

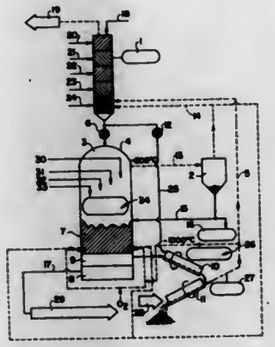
PCT No. PCT/AT94/00007, § 371 Date Sep. 20, 1994, § 102(e) Date Sep. 20, 1994, PCT Pub. No. WO94/17214, PCT Pub. Date Aug. 4, 1994

PCT Filed Jan. 26, 1994, Ser. No. 307,615

Claims priority, application Austria, Jan. 26, 1993, 125/93

Int. Cl.[6] C21B 11/00

U.S. Cl. 75—434 15 Claims



1. Process for the preparation of pig iron and cement clinker in a fusion gasifier comprising the steps of:

preheating a charge. Comprising lime, and optionally iron ore, in a preheater;

optionally deacidifying the charge;

optionally subjecting the charge to preliminary reduction;

calcining the charge to produce a preheated calcination product;

optionally sintering the calcination product;

introducing the calcination product into the fusion generator;

blowing coal into a coal fluidized bed of the fusion generator;

reducing and melting the calcination product in the coal fluidized bed of the fusion generator to produce slag having an enhanced CaO content;

tapping off pig iron and the slag in liquid form from the fusion generator; and

cooling the slag to for the cement clinker.



5,501,722

## NATURAL GAS TREATMENT PROCESS USING PTMSP MEMBRANE

Lora G. Toy, San Francisco, and Ingo Pinnau, Palo Alto, both of Calif., assignors to Membrane Technology and Research, Inc., Menlo Park, Calif.

Continuation of Ser. No. 153,272, Nov. 16, 1993, abandoned, which is a continuation of Ser. No. 970,699, Nov. 4, 1992, abandoned. This application Feb. 15, 1995, Ser. No. 389,730

Int. Cl.[6] B01D 53/22

U.S. Cl. 95—50 11 Claims

1. A process for separating a $C_3$+ hydrocarbon from a gas stream comprising methane and said $C_3$+ hydrocarbon, said process comprising the steps of:

(a) providing an incoming gas stream comprising methane and said $C_3$+ hydrocarbon;

(b) providing a gas-separation membrane comprising poly(trimethylsilylpropyne), said membrane having a feed side and a permeate side and being more permeable to said $C_3$+ hydrocarbon than to methane;

(c) contacting said feed side with said gas stream;

(d) withdrawing from said permeate side a permeate stream enriched in said $C_3$+ hydrocarbon compared with said incoming gas stream;

said membrane being characterized in that it exhibits a selectivity for butane over methane, when tested with gas mixtures containing butane and methane at a feed pressure no greater than about 950 psig, of at least about 10.

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5,501,723

## ACTIVATED CARBON FILTER FOR VENTING A FUEL TANK

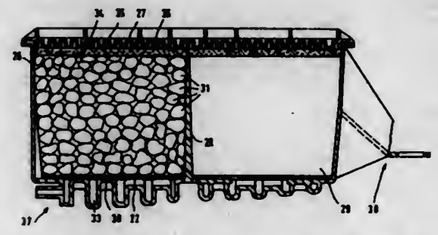
Heinz Andress, Erdmannhausen; Karl-Ernst Hummel, Bietigheim-Bissingen; Arthur Klotz, Remseck, and Thomas Schermuly, Flein, all of, Germany, assignors to Filterwerk Mann & Hummel GmbH, Ludwigsburg, Germany

Filed Jun. 15, 1994, Ser. No. 260,309

Claims priority, application Germany, Jun. 19, 1993, 43 20 384.1

Int. Cl.[6] B01D 53/04

U.S. Cl. 96—131 11 Claims



1. An activated carbon filter for venting a fuel tank for an internal combustion engine having an intake pipe, comprising:

a housing having a floor and a cover for holding activated carbon;

a first connection for coupling said housing with the fuel tank;

a second connection for coupling said housing with the intake pipe;

a third connection for coupling said housing with the atmosphere;

a first partition arranged in said housing and extending between said first and third connections so as to form two chambers;

at least one chamber being filled with activated carbon;

and wherein at least one of said cover and said floor is configured with a plurality of elongated parallel grooves therein which form individual guiding ducts extending from one chamber to the other through which fuel vapors flow from the one chamber to the other chamber.

5,501,724

## COATING COMPOSITION FOR ATTENUATING REFLECTION OF ELECTROMAGNETIC RADIATION

Howard Loff, 21888 Westchester Rd., Shaker Heights, Ohio 44122

Filed Jun. 16, 1994, Ser. No. 260,880

Int. Cl.[6] C09D 5/32; C09G 1/16

U.S. Cl. 106—10 34 Claims

1. A coating composition for attenuating reflection of electromagnetic radiation having a wavelength greater than 800 nm from a surface, said composition comprising a chromophore capable of absorbing about 95% of said electromagnetic radiation and a polymer binder wherein said polymer binder is selected from the group consisting of reaction products of unsaturated anhydrides with polyols; oligomers, polymers, and copolymers of acrylic and methacrylic acids coupled with alkanols of 1 to 8 carbon atoms; polyurethanes, polyesters, polyamides, and combinations thereof and wherein said coating composition is a polish composition.

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5,501,725

## METHOD FOR INCREASING THE STABILITY OF NON-IONIC SURFACTANT-CONTAINING INK COMPOSITIONS

Hiang Lauw, Corvallis; Garold Radke, Lebanon, and Cheryl A. Macleod, Corvallis, all of Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 3, 1995, Ser. No. 398,631

Int. Cl.[6] C09D 11/02

U.S. Cl. 106—20 A 19 Claims

1. A method for increasing the cloud point and stability of an ink composition comprising the steps of:

providing an ink composition comprising at least one solvent, at least one coloring agent, and at least one ethoxylated non-ionic surfactant therein, said ink composition having a first cloud point;

placing said ink composition in contact with a portion of multicellular polymeric foam which will react with said ethoxylated non-ionic surfactant in said ink composition to produce a treated ink product having a second cloud point which is greater than said first cloud point, said ink composition being absorbed into said foam and converted into said treated ink product therein; and

extracting said treated ink product from said multicellular polymeric foam, said second cloud point of said treated ink product being greater than said first cloud point.

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5,501,726

## INK FOR THERMAL INK JET RECORDING AND THERMAL INK JET RECORDING METHOD USING THE SAME

Toshitake Yui; Yoshiro Yamashita; Eisuke Hiraoka; Yasuharu Endo, and Ken Hashimoto, all of Minami-ashigara, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Feb. 21, 1995, Ser. No. 391,182

Claims priority, application Japan, Feb. 25, 1994, 6-051010

Int. Cl.[6] C09D 11/02

U.S. Cl. 106—20 R 11 Claims

1. An ink for thermal ink jet recording comprising water, a coloring material, (a) 2,2'-thiodiethanol, and (b) $C_nH_{2n+1}O(CH_2CH_2O)_mH$, wherein n represents an integer of 3 to 6 and m represents an integer of 1 to 3; and the content of the component (a) is 3 to 20% by weight based on said ink and the content of the component (b) is from 1 to 20% by weight based on said ink.

5,501,727
**COLOR STABILITY OF DENTAL COMPOSITIONS CONTAINING METAL COMPLEXED ASCORBIC ACID**
**Bing Wang, Maplewood, and Sumita B. Mitra, West St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**
**Filed Feb. 28, 1994, Ser. No. 202,931**
**Int. Cl.[6] A61K** *6/00*
**U.S. Cl. 106—35** **21 Claims**

1. A curable dental composition, comprising:
a) a compound having an ethylenically unsaturated moiety,
b) an oxidizing agent, and
c) metal complexed ascorbic acid, wherein the ascorbic acid is complexed with a metal selected from the group consisting of transition metals and metals of group IIIB.

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5,501,728
**FRICTION MATERIAL**
**Christopher C. Shepley, and David R. Carter, both of Cartersville, Ga., assignors to Brake Pro, Inc., Cartersville, Ga.**
**Filed Jul. 22, 1994, Ser. No. 278,748**
**Int. Cl.[6] C09K** *3/14*
**U.S. Cl. 106—36** **15 Claims**

1. A friction material useful for enhancing the wear resistance between contacting surfaces, comprising:
a base friction material including fibrous material, carbonaceous material, iron powder, inert fillers and binders; and
a metal sulfide-iron powder alloy.

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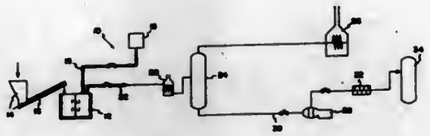
5,501,729
**PITCH BASED IMPREGNANT FOR CARBON AND GRAPHITE AND METHOD**
**Irwin C. Lewis, Strongsville, and Terrence A. Pirro, Cleveland, both of Ohio, assignors to UCAR Carbon Technology Corporation, Danbury, Conn.**
**Continuation of Ser. No. 230,429, Apr. 19, 1994, abandoned, which is a continuation of Ser. No. 858,502, Mar. 27, 1992, abandoned. This application Jul. 19, 1995, Ser. No. 504,187**
**Int. Cl.[6] C09D** *195/00*
**U.S. Cl. 106—274** **5 Claims**

1. A pitch based impregnant for a carbon or graphite body in the form of a liquid solution of at least 40% by weight of a coal tar pitch or a petroleum pitch in which the solids insoluble in quinoline are present in an amount of less than 1%, said pitch being dissolved in furfural, said solution having a viscosity at room temperature of less than 150 cps and containing at least 5 wt % of an acid catalyst.

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5,501,730
**ASPHALT COMPOSITION AND PROCESS FOR OBTAINING SAME**
**Quoc Dinh Duong, and Rhéal Boisvert, both of Montreal, Canada, assignors to Bitumar R. & D., Montreal, Canada**
**PCT No. PCT/CA93/00074, § 371 Date Dec. 30, 1993, § 102(e) Date Dec. 30, 1993, PCT Pub. No. WO93/17076, PCT Pub. Date Sep. 2, 1993**
**Continuation-in-part of Ser. No. 940,462, Sep. 4, 1992, Pat. No. 5,270,361, which is a continuation-in-part of Ser. No. 840,848, Feb. 25, 1992, abandoned. This PCT application Feb. 23, 1993, Ser. No. 170,274**
**Int. Cl.[6] C09D** *195/00*
**U.S. Cl. 106—281.1** **17 Claims**

1. A process for obtaining a homogeneous asphalt composition comprising the steps of:
a) mixing asphalt with synthetic of natural rubber particles at a temperature of from 160° to 200° C. in order to have the paxtides in suspension in the asphalt;



b) raising the temperature to about 220° to 260° C.;
c) injecting air under high pressure;
d) homogenizing the mixture;
e) incorporating a vulcanizing agent and agitating; and
f) recovering the homogeneous asphalt composition.
12. An asphalt composition comprising:
from 60 to 99% by weight of asphalt;
from 1 to 40% by weight of synthetic or natural rubber dissolved in the asphalt; and
from 0.01 to 3% by weight of a vulcanizing agent.

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5,501,731
**CARBON-CONTAINING LUSTER PIGMENTS**
**Raimund Schmid, Neustadt; Norbert Mronga, Dossenheim; Werner Ostertag, Gruenstadt, and Helmut Schmidt, Osthofen, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany**
**Filed Jun. 27, 1994, Ser. No. 266,384**
**Claims priority, application Germany, Jul. 15, 1993, 43 23 744.4**
**Int. Cl.[6] C04B** *14/20*
**U.S. Cl. 106—417** **3 Claims**

1. A process for producing luster pigments which comprises applying one or more carbon-containing compounds selected from the group consisting of the metals aluminum, chromium, cerium, zirconium and mixtures thereof, wherein the carbon-containing compounds are selected from the group consisting of acetylacetonates, formates, acetates and lactates, with or without one or more further carbon-containing compounds selected from the group consisting of low and high molecular weight sugars and polyoxymethylene, to platelet-shaped silicatic substrate particles and then thermally decomposing the carbon-containing compounds on the surface of the substrate particles under oxygen-excluding conditions at a temperature which substantially prevents reduction of the oxides of said metals.

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5,501,732
**PROCESS FOR PREPARING SILANIZED $TiO_2$ PIGMENTS USING A MEDIA MILL**
**Philipp M. Niedenzu, New Johnsonville; Scott M. Herkimer, Dickson, and Ronald L. Chaney, McEwen, all of Tenn., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.**
**Continuation-in-part of Ser. No. 203,144, Feb. 28, 1994, abandoned. This application Feb. 23, 1995, Ser. No. 392,706**
**Int. Cl.[6] C09C** *1/36*
**U.S. Cl. 106—447** **8 Claims**

1. A process for preparing a high solids $TiO_2$ pigment comprising the steps of:
(a) reducing the viscosity of a high solids $TiO_2$ pigment slurry by adjusting the pH in the range of about 7.5 to about 11;
(b) media milling the slurry;
(c) contacting the slurry with an organosilicon reagent; and
(d) drying the slurry to less than 1 wt. % water.

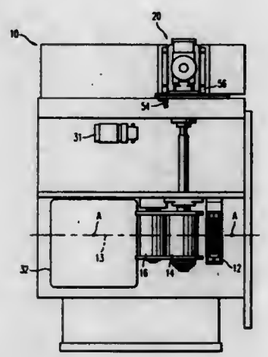


5,501,733
**RARE EARTH METAL SULFIDE PIGMENTS COMPRISING FLUORINE VALUES**
**Pierre Macaudiere, Asnieres/Seine; Jorge Morros, Turckheim; Jean-Michel Tourre, Croissy S/Seine, and Alain Tressaud, Pessac, all of, France, assignors to Rhone-Poulenc Chimie, Courbevoie Cedex, France**
**Filed Jun. 9, 1994, Ser. No. 257,823**
**Claims priority, application France, Jun. 9, 1993, 93 06899**
**Int. Cl.[6] C01F** *1/00;17/00;* **C04B** *35/50*
**U.S. Cl. 106—461** **49 Claims**

1. Fluoridated particulates of a rare earth metal sesquisulfide pigment/colorant.

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5,501,734
**YARN COATING ASSEMBLY AND APPLICATOR**
**Larry J. Oliphant, Swisher, Iowa, assignor to Gillette Canada, Inc., Kirkland, Canada**
**Continuation-in-part of Ser. No. 151,707, Nov. 12, 1993, abandoned, which is a continuation-in-part of Ser. No. 832,151, Feb. 6, 1992, Pat. No. 5,353,820. This application May 26, 1994, Ser. No. 249,516**
**Int. Cl.[6] B05C** *3/12*
**U.S. Cl. 118—234** **15 Claims**

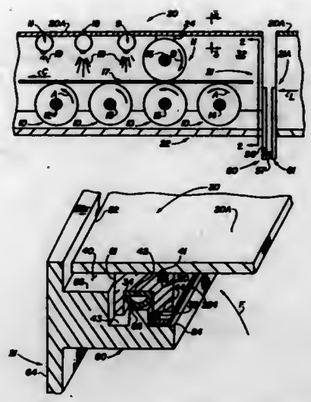


1. A coating applicator for applying a coating material to yarn comprising a container wherein the container has at least one open-ended slot, said at least one slot having a base and an open end for receiving a section of yarn, and said at least one slot being defined by a pair of spaced apart, substantially parallel sides, extending from the base and spaced sufficiently closely to each other to support a predetermined amount of a coating material by capillary action, wherein the container has an upstream and a downstream face, at least the upstream face of the container being inclined inwardly towards the open end.

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5,501,735
**APPARATUS FOR PROCESSING PRINTED CIRCUIT BOARD SUBSTRATES**
**Don P. Pender, 1121 E. Wesleyan Dr., Tempe, Ariz. 85282**
**Division of Ser. No. 20,211, Feb. 19, 1993, Pat. No. 5,288,323. This application Feb. 22, 1994, Ser. No. 200,190**
**Int. Cl.[6] B05B** *7/00;* **B05C** *15/00;11/00*
**U.S. Cl. 118—300** **3 Claims**

1. Apparatus for contacting with a fluid a substrate traveling through said apparatus, said apparatus including
(a) a conveyor table for transporting said substrate;
(b) means for contacting said substrate with a fluid;



(c) a housing enclosing said conveyor table and said means for contacting said substrate with a fluid, said housing including a pair of side walls and a removable top panel spaced from said side walls for accessing said conveyor table;
(d) a sealing system connected to said removable top panel and at least one of said side walls to prevent said fluid from leaking out from within said housing, said sealing system including
(i) a first elongate horizontally disposed member attached to said one of said side walls and having an upstanding lip having an elongate upper contact surface, a well to one side of said lip, and a subcontact surface positioned below said upper contact surface, and
(ii) a second elongate horizontally disposed member attached to said removable top panel and having
an elongate primary contact surface spaced apart from and opposing said elongate upper contact surface, and
an elongate secondary contact surface spaced apart from and opposing said subcontact surface;
(f) a first elongate elastic sealing member interposed between said primary contact surface and said elongate upper contact surface; and,
(g) a second elongate elastic sealing member interposed between said elongate secondary contact surface and said subcontact surface.

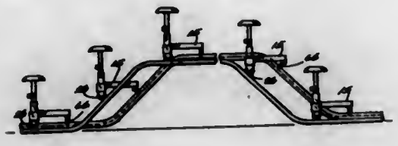
2. Apparatus for contacting with a fluid a substrate traveling through said apparatus, said substrate having an outer peripheral edge and first and second opposed generally planar surfaces co-terminating at said edge, said apparatus including
(a) a first conveyor table for transporting said substrate;
(b) first means for contacting said substrate with a fluid;
(c) a first housing enclosing said conveyor table and said first means for contacting said substrate with a fluid, said first housing including an end wall having an edge;
(d) a second conveyor table for transporting said substrate;
(e) second means for contacting said substrate with a fluid;
(f) a second housing enclosing said second conveyor table and said second means for contacting said substrate with a fluid, said second housing including an end wall having an edge, said edge of said end wall of said first housing being adjacent said edge of said end wall of said second housing;
(g) a groove formed in one of said end walls;
(h) O-ring means in said groove between said end walls and sealingly contacting each of said end walls; and,
(i) a resilient U-shaped member slipped over said edges of said end walls of said first and second housing to compress said edges against one another.

5,501,736

## CONVEYOR FOR TRANSPORTING PARTS IN A PAINT BOOTH AND DRYING AND CURING APPARATUS

Charles Statz, and Thomas Strandberg, both of Wausau, Wis., assignors to Harley-Davidson Motor Company, Milwaukee, Wis.

Filed Sep. 14, 1994, Ser. No. 306,030
Int. Cl.[6] B05C 13/00
U.S. Cl. 118—500 6 Claims



1. A conveyer for transporting a part to be painted through a paint booth and drying and curing apparatus, the conveyer comprising a transporter having an upwardly extending elongate member, selectively operable lifting means longitudinally movable on the elongate member between a first angular position and a second angular position, support means on said elongate member for supporting said lifting means in each of its angular positions, part support means mounted on said elongate member for rotation and engaging said lifting means and being rotatable on said elongate member when said lifting means is in its first angular position on said elongate member and being locked against rotation when said lifting means is in its second angular position on said elongate member.

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5,501,737

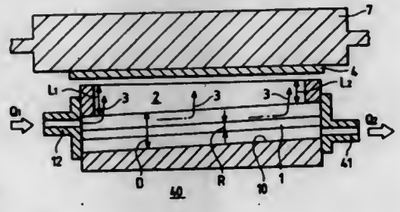
## COATING METHOD AND APPARATUS HAVING AN EXCHANGEABLE RESISTING BODY INSERTABLE IN THE RESERVOIR

Shinsuke Takahashi, and Norio Shibata, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 981,302, Nov. 25, 1992, abandoned. This application Jun. 8, 1994, Ser. No. 257,586
Claims priority, application Japan, Nov. 26, 1991, 3-335576
Int. Cl.[6] B05C 3/18
U.S. Cl. 118—410 6 Claims

1. In a coating apparatus in which a part of a coating composition supplied to a reservoir is continuously discharged from one end of said reservoir and said coating composition is also discharged from a top end portion of a slit disposed in opposition to a surface of a continuously moving flexible belt support to thereby coat said surface of said continuously moving flexible belt support with a thin film of said coating composition the improvement wherein an exchangeable resisting body is inserted into said reservoir to adjust flow resistance in said reservoir, wherein said exchangeable resisting body adjusts flow resistance under a condition to satisfy the following expression

$$\frac{\frac{12\eta_s}{d^2w}q(L_1-L_2)-f(p)\eta_s wQ}{\left[\frac{12\eta_s}{d^2w}q(L_1+L_2)+f(p)\eta_s wQ\right]\times 0.5}\leq 0.05$$



in which d represents the gap quantity of said slit, $L_1$ represents the slit depth from a coating composition supply side end of said reservoir to said top end portion of said slit, $L_2$ represents the slit depth from the coating composition discharge side end of said reservoir to said top end portion of said slit, w represents the ejection width of said slit, $\eta_s$ represents the viscosity of the coating composition in said reservoir, $\eta_s$ represents the viscosity of the coating composition in said slit, Q represents the average flow rate in said reservoir, q represents the flow rate of the coating composition ejected from said slit, and f(p) represents the pressure loss coefficient of the coating composition in said reservoir, and

wherein said apparatus further satisfies the following expression

$$\frac{\frac{12\eta_s}{d^2w}q(L_1-L_2)-\frac{128}{\pi D^4}\left((1-k^4)\frac{(1-k^2)^2}{\ln(1/k)}\right)^{-1}\eta_s wQ}{\left[\frac{12\eta_s}{d^2w}q(L_1+L_2)+\frac{128}{\pi D^4}\left((1-k^4)\frac{(1-k^2)^2}{\ln(1/k)}\right)^{-1}\eta_s wQ\right]\times 0.5}\leq 0.05$$

in which D represents the inner diameter of said reservoir, R represents the diameter of said resisting body, and k represents the inner diameter ratio (R/D) of said reservoir.

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5,501,738

**Patent Not Issued For This Number**

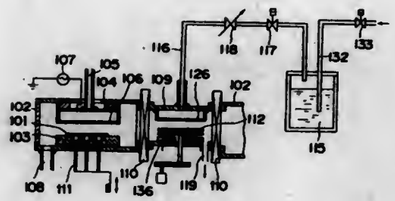


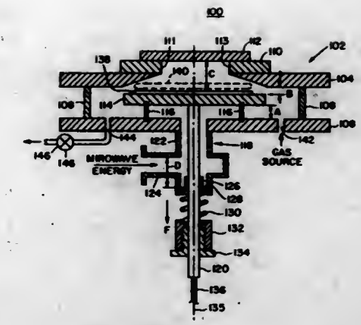
5,501,739

## APPARATUS AND METHOD FOR FORMING THIN FILM

Yuichiro Yamada, Saita; Naoki Suzaki, Neyagawa; Ryuzo Houchin, Hiraksta; Noboru Nomura, Kyoto; Kousaku Yano, Katano, and Yuka Terai, Osaka, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 29, 1993, Ser. No. 158,305
Claims priority, application Japan, Nov. 27, 1992, 4-318824
Int. Cl.[6] C23C 16/00
U.S. Cl. 118—729 9 Claims





1. An apparatus comprising:

a vacuum chamber for forming a thin film on a substrate, said vacuum chamber having a gas blow-out plate therein for blowing gas into said vacuum chamber;

an organic molecular layer forming chamber located adjacent to said vacuum chamber for forming an organic layer on the substrate, said forming chamber comprising a substrate carrying device therein, said substrate carrying device comprising a transfer arm movable between one position in said vacuum chamber and another position in said forming chamber for transferring the substrate between said vacuum chamber and said forming chamber, and an organic material gas blow-out plate; and

a feeding device connected with said organic material gas blow-out plate for feeding material to said forming chamber for forming an organic molecular layer that includes one of silicon and germanium on the surface of the substrate;

wherein said gas blow-out plate of said vacuum chamber has a plurality of blow-holes therein for blowing gas located opposite to said transfer arm when said transfer arm is in said one position in said vacuum chamber and said organic material gas blow-out plate has a plurality of blow-holes therein for blowing gas located opposite to said transfer arm when said transfer arm in said another position in said forming chamber.

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5,501,740

## MICROWAVE PLASMA REACTOR

Matthew M. Besen, Tewksbury; Evelio Sevillano, Lexington, and Donald K. Smith, Arlington, all of Mass., assignors to Applied Science and Technology, Inc., Woburn, Mass.

Continuation-in-part of Ser. No. 72,272, Jun. 4, 1993. This application Mar. 29, 1994, Ser. No. 219,208
Int. Cl.[6] C23C 16/00
U.S. Cl. 118—723 MP 41 Claims

1. A microwave plasma reactor, comprising:

a chamber for containing a gas to be energized into a plasma with microwave energy;

a cavity for containing a microwave field to create the gas plasma;

an electrode having two surfaces and located in said cavity for radiating microwave energy from one of its surfaces to form the plasma proximate said electrode radiating surface; and

means for introducing microwave energy onto the other of the two electrode surfaces, said microwave energy passing around the other of the two electrode surfaces and proximate said electrode radiating surface for creating a microwave discharge to form the plasma.

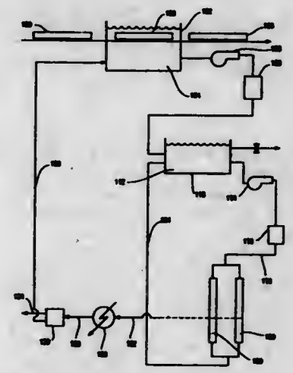
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5,501,741

## PROCESS FOR PURIFYING AQUEOUS RINSE SOLUTIONS USED IN METAL FORMING OPERATIONS

Kelly R. McMahon, Antioch, Calif., assignor to USS-POSCO, Pittsburg, Calif.

Filed Jan. 11, 1994, Ser. No. 179,740
Int. Cl.[6] B08B 7/04
U.S. Cl. 134—13 10 Claims



1. In a metal forming process in which tallow is used as a lubricant and alkaline water is used to rinse the tallow from formed metal surfaces, with used rinse water containing tallow and a minor amount of fatty acids, said rinse water being recycled using a purifying procedure comprising the steps of:

separating said used rinse water into a tallow stream and a fatty acid containing aqueous stream;

cooling said fatty acid containing aqueous stream to produce a fatty acid phase; and,

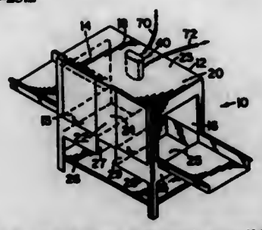
separating said fatty acid phase from said aqueous stream.

5,501,742

## METHOD FOR DISPENSING SOLID RINSE AIDS

Peter J. Fernholz, Burnsville, Minn., assignor to Ecolab Inc., St. Paul, Minn.

Division of Ser. No. 19,785, Feb. 19, 1993, Pat. No. 5,320,118.
This application Feb. 24, 1994, Ser. No. 201,175
Int. Cl.[6] A47L *15/44*; B08B *3/00*
U.S. Cl. 134—25.2 17 Claims



1. A method for dissolving and dispensing a solid block of rinse aid in a form of a concentrated solution, comprising the steps of:
(a) placing a solid block of rinse aid into a dispenser, said dispenser comprising a housing for containing the solid block of rinse aid and a spray means for directing a dissolving spray of an aqueous liquid at an exposed surface of the solid block of rinse aid;
(b) spraying an aqueous liquid from said spray means onto an exposed surface of said solid block of rinse aid, thereby forming a concentrated rinse aid solution;
(c) directing said concentrated rinse aid solution to a reservoir disposed within a warewash machine;
(d) pumping the concentrated rinse aid solution from said reservoir to an injection point where it is combined with an aqueous liquid to form an end use solution; and
(e) directing said end use solution to a utilization point in said warewash machine;
wherein said rinse aid solution is stored in said reservoir for a period of time effective to preserve said rinse aid solution from biological contamination, whereby said rinse aid solution is preserved by an elevated temperature present in said warewash machine during operation thereof, and said reservoir is made from a heat resistant material.

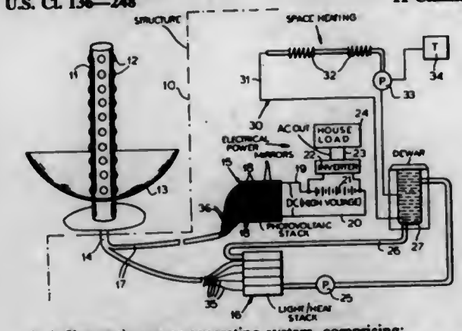
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5,501,743

## FIBER OPTIC POWER-GENERATING SYSTEM

Matthew Cherney, One Park La., Mount Vernon, N.Y. 10552

Filed Aug. 11, 1994, Ser. No. 289,285
Int. Cl.[6] H01L *31/052;31/058*; F24J *2/00*
U.S. Cl. 136—248 11 Claims




1. A fiber-optic power generating system, comprising:
an elongated tower positioned apart from a structure to be supplied with power;
a multiplicity of circularly shaped solar-light collectors on said tower spaced apart over the height of the tower and around the periphery thereof;
respective optical fibers assigned to said collectors and transmitting light therefrom, said optical fibers being formed into an optical fiber trunk extending from said tower into said structure; and
within said structure a stack of energy transducing plates each receiving at least one optical fiber from said trunk and provided with means for distributing light delivered by an optical fiber over the respective plate for producing energy utilized at least in part within said structure, said stack being a stack of photovoltaic plates generating electrical energy, at least some of said plates being electrically connected in series, and an optically conductive plate juxtaposed with each photovoltaic plate and having a light diffusion surface facing the respective photovoltaic plate, said optical fibers terminating at an edge of each of said optically conductive plates.

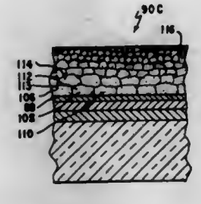
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5,501,744

## PHOTOVOLTAIC CELL HAVING A P-TYPE POLYCRYSTALLINE LAYER WITH LARGE CRYSTALS

Scot P. Albright, Lakewood, Colo., and Rhodes R. Chamberlin, El Paso, Tex., assignors to Photon Energy, Inc., Golden, Colo.

Continuation of Ser. No. 95,599, Jul. 21, 1993, abandoned, which is a continuation-in-part of Ser. No. 819,882, Jan. 13, 1992, Pat. No. 5,279,678. This application Jul. 12, 1994, Ser. No. 274,574
Int. Cl.[6] H01L *31/072;31/0368;31/0392*
U.S. Cl. 136—258 15 Claims



1. A photovoltaic cell comprising:
an n-type polycrystalline layer;
a p-type polycrystalline layer adjoining the n-type polycrystalline layer and forming a photovoltaic junction therewith, the p-type polycrystalline layer including at least a planar layer portion consisting essentially of relatively large crystals adjoining the n-type polycrystalline layer, wherein the relatively large crystals have a mean diameter of from about 1.5 microns to about 3.0 microns;
the planar layer portion including oxidized impurities to obtain p-type electrical properties for the planar layer portion; and
each of the relatively large crystals having a planar surface in substantially planar engagement with an interface surface of the n-type polycrystalline layer.

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5,501,745

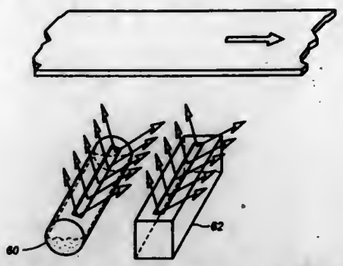
## LOW TEMPERATURE METHOD FOR MAKING A PHOTOVOLTAIC MATERIAL

Geoffrey Dearnaley, San Antonio, Tex., assignor to Southwest Research Institute, San Antonio, Tex.

Filed May 31, 1994, Ser. No. 251,760
Int. Cl.[6] H01L *31/20*
U.S. Cl. 136—258 25 Claims

1. A method for making a photovoltaic material, comprising the steps of:
(a) coating a substrate with a transparent conducting film;
(b) directing a vapor stream of carbonaceous precursor in a vacuum toward the conducting film;





(c) exposing the conducting film and precursor to a flux of atoms of a species suitable to produce a p-type conducting layer in the film in a vacuum;
(d) simultaneously with the exposing of step (c), bombarding the conducting film and precursor with an ion beam having energies in the range of about 1–20 KeV for a sufficient period of time to rupture a sufficient number of C-H bonds in the precursor and to form an amorphous p-type carbonaceous residue;
(e) directing a vapor stream of siloxane precursor toward the p-type conductor layer in a vacuum;
(f) simultaneously with the directing of step (e), bombarding the p-type conductor layer and siloxane precursor with a beam of hydrogen ions having energies in the range of about 0.5–2.0 KeV for a sufficient period of time to produce a siloxane film;
(g) directing a vapor stream of carbonaceous precursor at the siloxane film in a vacuum;
(h) exposing the carbonaceous precursor and siloxane film to a flux of atoms of a species suitable to produce an n-type conducting layer above the siloxane film in a vacuum;
(i) simultaneously with the exposing of step (h), bombarding the carbonaceous precursor with a beam of argon or nitrogen ions for a sufficient amount of time to produce an n-type conductor layer with a low-hydrogen content; and
(j) depositing an evaporated stream of metal atoms onto the n-type conductor layer in at least two defined strips.
18. The product produced by the method of claim 1.

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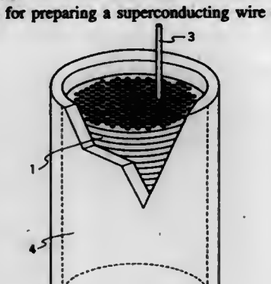
5,501,746

## PROCESS FOR PREPARING SUPERCONDUCTING WIRE

Kunihiko Egawa; Yoshio Kubo; Takayuki Nagai; Fusaoki Uchikawa; Shoji Miyashita, and Hiroko Higuma, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabusuhiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 167,061, Dec. 16, 1993. This application Jan. 30, 1995, Ser. No. 380,723
Int. Cl.[6] C22F *1/16*
U.S. Cl. 148—98 20 Claims

1. A process for preparing a superconducting wire which comprises the steps of making a plurality of holes in each of Cu base metal plates, placing said plates in a supporting container in a stacked fashion so that the holes in said plates are aligned with each other to form through-holes in the resulting stacked body, stuffing a material convertible into a superconductor by a heat treatment into said through-holes of the stacked body, evacuating and sealing said supporting container to form a composite billet, processing said composite billet to reduce its sectional area to a wire, and heat-treating said wire to convert said convertible material into a superconductor.



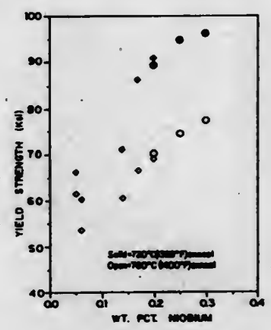
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5,501,747

## HIGH STRENGTH IRON-COBALT-VANADIUM ALLOY ARTICLE

Millard S. Masteller, Fleetwood, and Douglas W. Dietrich, Wernersville, both of Pa., assignors to CRS Holdings, Inc., Wilmington, Del.

Filed May 12, 1995, Ser. No. 440,532
Int. Cl.[6] C22C *38/10;19/07*
U.S. Cl. 148—311 19 Claims




1. A magnetic article formed of an alloy consisting essentially of, in weight percent, about

| | |
|---|---|
| C | 0.003–0.02 |
| Mn | 0.10 max. |
| Si | 0.10 max. |
| P | 0.01 max. |
| S | 0.003 max. |
| Cr | 0.1 max. |
| Ni | 0.2 max. |
| Mo | 0.1 max. |
| Co | 48–50 |
| V | 1.8–2.2 |
| Nb | 0.15–0.5 |
| N | 0.004 max. |
| O | 0.006 max. |

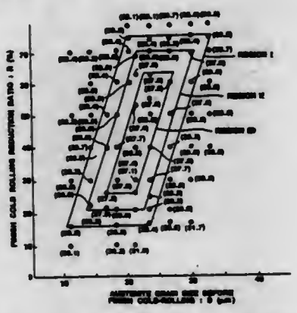
and the balance essentially iron, said article having been annealed at a temperature of not more than 740° C. (1364° F.) for not more than about 4 hours, and said article having a room temperature yield strength of at least about 620 MPa (90 ksi).

5,501,748
**PROCEDURE FOR THE PRODUCTION OF THIXOTROPIC MAGNESIUM ALLOYS**
Haavard Gjestland, and HÅkon Westengen, both of Porsgrunn, Norway, assignors to Norsk Hydro A.S., Oslo, Norway
Filed Jun. 10, 1993, Ser. No. 74,659
Claims priority, application Norway, Jun. 10, 1992, 922266
Int. Cl.[6] C22F *1/06*
U.S. Cl. 148—538 9 Claims

1. A method for production of a thixotropic magnesium alloy, which consists essentially of adding a grain refiner to a molten magnesium alloy, rapidly cooling the alloy to solid state, and subsequently heating the alloy to its two-phase region.

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5,501,749
**METHOD FOR PRODUCING A THIN FE-NI ALLOY FOR SHADOW MASK THEREOF**
Tadashi Inoue; Kiyoshi Tsuru; Tomoyoshi Okita, and Michihito Hiasa, all of Kawasaki, Japan, assignors to NKK Corporation, Tokyo, Japan
Division of Ser. No. 7,755, Jan. 22, 1993, Pat. No. 5,456,771.
This application Nov. 18, 1994, Ser. No. 342,238
Claims priority, application Japan, Jan. 24, 1992, 4-032941; Feb. 28, 1992, 4-078506; Sep. 24, 1992, 4-279542
Int. Cl.[6] C21D *8/02*
U.S. Cl. 148—621 10 Claims



1. A method for producing a thin Fe—Ni alloy sheet for a shadow mask comprising:
(a) hot-rolling a slab consisting of Ni of 34 to 38 wt. %, Si of 0.05 wt. % or less, B of 0.0005 wt. % or less, O of 0.002 wt. % or less and N of 0.0005 wt. % or less; optionally at least one of C, Mn or Cr, the balance being Fe and inevitable impurities, into a hot-rolled strip;
(b) annealing the hot-rolled strip from step (a) at a temperature of 810° to 890° C.;
(c) carrying out a first cold-rolling of the annealed hot-rolled strip from step (b) at a reduction ratio of 40 to 55% into a cold-rolled strip;
(d) carrying out a first recrystallization annealing of the first cold-rolled strip from step (c);
(e) carrying out a second cold-rolling of the first recrystallization annealed strip from step (d) at a reduction ratio of 81 to 94% into a cold-rolled strip;
(f) carrying out a second recrystallization annealing of the second cold-rolled strip from step (e);
(g) finish cold rolling the second recrystallization annealed strip from step (f) at a finish cold reduction ratio of from 16 to 29%;
(h) strain relief annealing the finish cold-rolled strip from step (g);
(i) annealing the strain relief annealed strip from step (h) at a temperature of 740° to 900° C., a time of 2 to 40 minutes and at conditions satisfying the following relationship: $T \geqq -123 \log t + 937$, where T is the temperature (°C.) of the annealing of the strain relief annealed strip and t is the duration of the annealing of the strain relief annealed strip in minutes; and
(j) press-forming the strip from step (i).

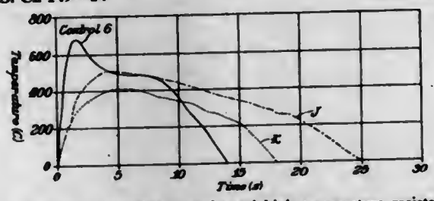
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5,501,750
**WICK COMPOSITIONS FOR INCENDIARY DEVICES**
Richard E. Smith, 4649 Lilac, Glenview, Ill. 60025, and C. James Dahn, 400 N. Wheeling Rd., Prospect Heights, Ill. 60070
Filed Jan. 10, 1995, Ser. No. 370,702
Int. Cl.[6] C06B *45/00*
U.S. Cl. 149—2 10 Claims

1. A wick composition for incendiary devices having a controlled burn rate comprising:
(a) about 25 to about 75 weight percent of a nitrate compound selected from the group consisting of cellulose nitrate, cellulose trinitrate, polyvinyl nitrate, and ammonium nitrate;
(b) a nitrate stabilizer; and
(c) a wick or string material.

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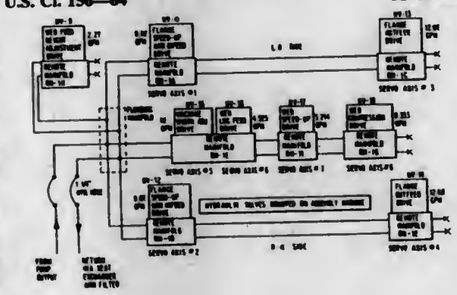
5,501,751
**PYROPHOIC MATERIAL AND METHOD FOR MAKING THE SAME**
Alfonso L. Baldi, Sea Isle City, N.J., and Frank J. Clark, Glasgow, Del., assignors to Alloy Surfaces Co. Inc., Wilmington, Del.
Filed Dec. 8, 1994, Ser. No. 351,672
Int. Cl.[6] C06B *45/14*
U.S. Cl. 149—14 19 Claims




1. A body comprising a perforated high temperature resistant membrane encapsulating a pyrophoric element.

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5,501,752
**WOODEN I-BEAM ASSEMBLY MACHINE AND CONTROL SYSTEM THEREFOR**
William M. Owens, Tacoma, and Victor Croston, Gig Harbor, both of Wash., assignors to Globe Machine Manufacturing Company, Tacoma, Wash.
Filed Nov. 5, 1993, Ser. No. 147,526
Int. Cl.[6] B32B *31/00*
U.S. Cl. 156—64 31 Claims

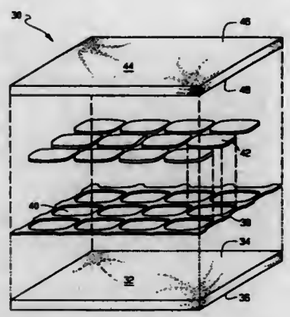




31. A method of manufacturing a wooden I-beam from a pair of elongated wooden flange members each having a longitudinal groove formed in one of the faces of the flange, and planar wooden web members having opposite longitudinal edges, comprising the steps of conveying an opposing pair of said flanges along left and right hand flange chutes within the machine utilizing a plurality of infeed flange drive rolls; conveying a plurality of web members between said flange chutes in end-to-end relationship with a plurality of top and bottom web drive rolls; said left and right hand flanges being gradually converged to enable the web edges to be respectively inserted into the flange grooves in joined relationship to form the beam; conveying the joined beam towards a discharge end of said machine with a plurality of flange outfeed drive rolls, and controlling the speed of operation of said flange infeed drive rolls and said web drive rolls so that a substantially constant output speed is achieved with said flange outfeed drive rolls.

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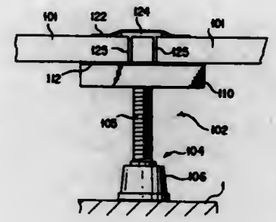
5,501,753
**STABILIZED FLUID BARRIER MEMBER AND METHOD FOR MAKING AND USING SAME**
Timothy D. Stark, Urbana, Ill., assignor to Geosynthetics, Inc., Miami, Fla.
Filed Sep. 1, 1994, Ser. No. 299,778
Int. Cl.[6] B32B *3/12;31/14;* E02D *17/00;17/20*
U.S. Cl. 156—70 10 Claims




1. A method for forming a stabilized fluid barrier member, which method comprises: providing a first outer sheet member formed from a material selected from the group consisting of geotextiles and geomembranes, said sheet member having a top surface and a bottom surface; positioning, upon the top surface of said first sheet member a stabilizer element having a plurality of interstitial apertures formed therein, said apertures adapted to contain a selectively fluid-impervient barrier material and to substantially prevent displacement of said barrier material within said barrier member, notwithstanding the angular inclination at which said fluid barrier member is oriented, said stabilizer element abutting at least a portion of said first outer sheet member top surface;
at least partially filling the interstitial apertures in said stabilizer element with at least one selectively fluid-impervient barrier material;
positioning a second outer sheet member on top of the stabilizer element, said second sheet member having a top surface and a bottom surface and formed from a material selected from the group consisting of geotextiles and geomembranes, wherein said second sheet member is positioned atop said stabilizer element such that at least a portion of said second sheet member bottom surface abuts an upper surface of said stabilizer element; and
bonding together said first sheet member, said stabilized element and said second sheet member along at least a portion of their abutting surfaces to form a laminate wherein the stabilizer element is in contact with and bonded to at least a portion of both said first and said second outer sheet members.

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5,501,754
**METHOD OF ASSEMBLING RAISED DRY-FLOOR**
Hiroaki Hiraguri, Kumagaya, Japan, assignor to Taisei Electronic Industries Co., Ltd., Japan
Continuation of Ser. No. 934,245, Aug. 25, 1992, abandoned.
This application Nov. 14, 1994, Ser. No. 340,436
Claims priority, application Japan, Sep. 11, 1991, 3-258794; Jun. 10, 1992, 4-175018
Int. Cl.[6] E04B *5/00;* E04F *15/024*
U.S. Cl. 156—71 8 Claims




1. A method of assembling a raised dry-floor having floor panels supported by a group of unit supporting legs, the method comprising the steps of:
providing a plurality of floor panels having a generally rectangular configuration and marginal portions extending along a periphery thereof;
providing a plurality of unit supporting legs each comprised of a rod-shaped leg member having a groove in an upper end face thereof and a supporting plate mounted on the upper end of the rod-shaped leg member in such a manner that it can be moved up and down to adjust the level thereof;
providing a gap covering member comprised of two or more elongated leg portions extending in a parallel relationship and a flat upper portion formed integrally with the leg portions, the flat upper portion connecting upper ends of the leg portions and having longitudinal marginal portions which project outwardly from the leg portions on opposite sides;
providing a plurality of double faced adhesive tapes having a width larger than that of said flat upper portion of said gap covering member;
disposing said unit supporting legs on a surface of a foundation floor at prescribed pitches corresponding to the configuration of said floor panels;
disposing said floor panels on said unit supporting legs leaving prescribed gaps substantially equal to the diameter of the upper end of said rod-shaped leg member between adjacent floor panels in such a manner that said floor panels are supported along their marginal portions by said unit supporting legs;
adjusting levels of the floor panels by fitting a leading end of a turning tool in the groove formed on the upper end face of the rod-shaped leg member through said gap and turning the rod-shaped leg member;
disposing said gap covering member in each of said prescribed gaps between adjacent floor panels, said step of disposing said gap covering member comprising inserting said leg portions of said covering member in said gaps between adjacent floor panels so that said longitudinal marginal portions of the flat upper portion rest on the marginal portions of said floor panels;
fixing said double-faced adhesive tape on each of said flat upper portions of said gap covering members and said marginal portions of said adjacent floor panels, so that said gap covering member is fixedly secured to the marginal portions of said adjacent floor panels; and
laying a floor covering material on the assembled floor panels thereby fixedly securing said floor covering material thereonto by means of said double-faced adhesive tape.

**5,501,755**

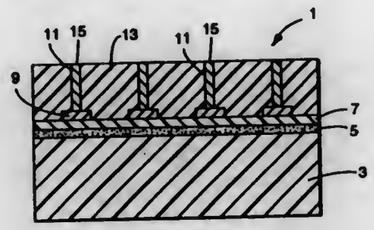
## LARGE AREA MULTI-ELECTRODE RADIATION DETECTOR SUBSTRATE

**John C. Dahlquist, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Filed Feb. 18, 1994, Ser. No. 198,614**

**Int. Cl.[6] B32B *31/00***

**U.S. Cl. 156—153** **20 Claims**




1. A process for making an electrical interconnect comprising the steps of adhering a flexible electrical circuit to the surface of a substrate, building conductive posts on said flexible electrical circuit, putting a curable dielectric composition around said posts, and curing said composition.

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**5,501,756**

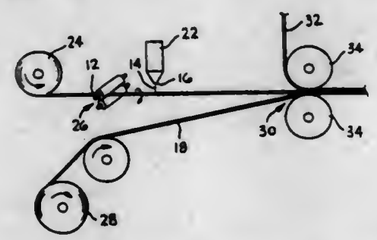
## ELONGATED ELEMENT COMPRISING HELICALLY PATTERNED ADHESIVE

**Neal A. Rollins, Menasha, and John A. Rooyakkers, Little Chute, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.**

**Continuation of Ser. No. 14,052, Feb. 5, 1993, Pat. No. 5,340,648, which is a continuation of Ser. No. 689,230, Apr. 22, 1991, abandoned. This application Mar. 11, 1994, Ser. No. 209,849**

**Int. Cl.[6] B32B *7/12;15/04;* D02G *3/00;* B65H *81/00***

**U.S. Cl. 156—167** **11 Claims**




1. A method for joining an elongated element to a substrate with an adhesive, the steps of the method comprising:

providing a substantially continuous filament of adhesive;

contacting the elongated element with the adhesive such that the adhesive wraps around the elongated element in a substantially continuous helical pattern; and

bringing the adhesive-wrapped elongated element into contact with a substrate.

**5,501,757**

## PROCESS FOR PRODUCTION OF A BAG HAVING LINEAR RIBS

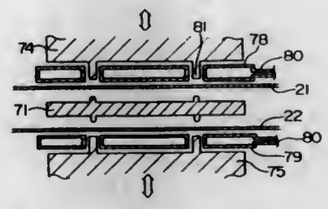
**Tadao Takagaki, Tokyo, Japan, assignor to Sumitomo Bakelite Co., Ltd., Tokyo, Japan**

**Filed Jul. 1, 1994, Ser. No. 269,579**

**Claims priority, application Japan, Jul. 6, 1993, 5-191937**

**Int. Cl.[6] B32B *31/18;31/20***

**U.S. Cl. 156—196** **16 Claims**




1. A process for production of a bag having linear ribs comprising:

(a) providing first and second material sheets, said first and second material sheets being formed from a multi-layer resin film having a surface layer of a heat adhesive resin with a low melting point;

forming linear ribs on said first and second material sheets by providing a plate shaped mold having an upper face and a lower face, the upper face and the lower face of the plate shaped mold each having linear protrusions, and introducing the first of the material sheets into a space between the upper face of the plate shaped mold and an upper female mold disposed at the upper face of the plate shaped mold and introducing the second of the material sheets into a space between the lower face of the plate shaped mold and a lower female mold disposed at the lower face of the plate shaped mold, the layers of the heat adhesive resin having a low melting point which face the plate shaped mold; the upper female mold and the lower female mold have penetrated linear cavities at positions corresponding to the linear protrusions on the upper and lower faces of the plate shaped mold, said cavities exposing portions of the material sheets, and the upper female mold and the lower female mold being capable of opening or closing, an upper heating panel being disposed at an upper side of the upper female mold and a lower heating panel being disposed at a lower side of the lower female mold, the heating panels providing heat to the linear cavities and to said exposed portions of the material sheets; the heating panels being capable of opening and closing;

pushing the material sheets at the exposed portions over or below the linear protrusions on both faces of the plate shaped mold into the linear cavities of the female molds by pressing the upper female mold and the lower female mold toward the plate shaped mold with a driving mechanism of the female molds or by moving the upper heating panel and the lower heating panel toward the plate shaped mold from outside of the female molds with a driving mechanism of the heating panels, the heating panels being heated to a temperature of or above the softening point of the heat adhesive resin, thereby forming linear ribs on the sheets;

(b) heat sealing the material sheets of the multi-layer resin film having linear ribs at portions thereof corresponding to peripheral parts of the bag to be produced including a bottom and side edges; and

(c) cutting off and separating the heat sealed parts from the material sheets to produce the bag.



**5,501,758**

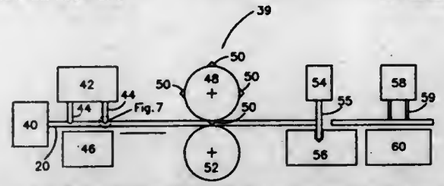
## METHOD OF MAKING A COLLAPSIBLE PLASTIC CONTAINER

**Larry E. Nitardy, Easton, Pa., assignor to North America Packaging Corporation, Bala-Cynwyd, Pa.**

**Filed Dec. 20, 1993, Ser. No. 170,382**

**Int. Cl.[6] B29C *53/06;* B32B *31/20;* B65D *6/10;6/18***

**U.S. Cl. 156—198** **10 Claims**




1. A method for producing a collapsible container having panels interconnected by hinges, said method comprising the steps of:

(a) providing a hollow plastic sheet having substantially parallel opposing walls separated by a plurality of longitudinally extending webs communicating between said walls;

(b) forming transversely arranged hinges in said hollow plastic sheet by hot compressing at least one of the walls of said hollow plastic sheet along a line crossing at least a portion of said longitudinally extending webs;

(c) forming longitudinally extending hinges in said hollow plastic sheet by cold compressing at least one of the walls of said hollow plastic sheet along a line substantially parallel to said longitudinally extending webs;

(d) removing a container blank from said hollow plastic sheet corresponding to said transversely arranged hinges and said longitudinally extending hinges; and

(e) finishing said container blank to form said container.

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**5,501,759**

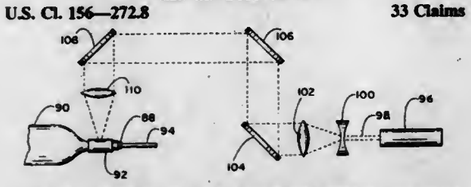
## LASER BONDING OF ANGIOPLASTY BALLOON CATHETERS

**Michael R. Forman, St. Paul, Minn., assignor to Schneider (USA) Inc., Plymouth, Minn.**

**Continuation of Ser. No. 113,181, Aug. 30, 1993, abandoned, which is a division of Ser. No. 800,201, Nov. 29, 1991, Pat. No. 5,267,959. This application Sep. 12, 1994, Ser. No. 304,413**

**Int. Cl.[6] B32B *31/00***

**U.S. Cl. 156—272.8** **33 Claims**




1. A process for forming a fluid tight seal between a polymeric body and a polymeric dilatation member surrounding the body, comprising the steps of:

positioning a dilatation member of polymeric material along and in surrounding relation to a body of polymeric material, with the dilatation member and body aligned to place a first surface portion of the dilatation member and a second surface portion of the body in a contiguous and confronting relation, wherein the polymeric materials forming the body and the dilatation member have non-uniform energy absorption spectra that include high absorptivity wavelength bands, and wherein at least one of the high absorptivity wavelength bands of the polymeric material forming the body and at least one of the high absorptivity wavelength bands of the polymeric material forming the dilatation member overlap one another in at least one range of overlapping wavelengths;

selecting a monochromatic energy wavelength that is contained within at least one of the overlapping wavelength ranges;

generating substantially monochromatic energy at said selected monochromatic energy wavelength;

controllably directing the monochromatic energy onto the body and the dilatation member to concentrate the monochromatic energy in a narrow bond site circumscribing the body and running along the interface of the first and second surface portions, thus to melt the polymeric materials along said bond site and the immediate region thereof; and

allowing the previously melted polymeric material to cool and solidify to form a fusion bond between the body and dilatation member.

20. A process for forming a fluid tight seal between a polymeric length of catheter tubing and a polymeric dilatation balloon surrounding the catheter tubing, comprising the steps of:

selecting a length of catheter tubing formed of a first polymeric material and a dilatation balloon formed of a second polymeric material, wherein the first and second polymeric materials have respective first and second non-uniform energy absorption spectra with respective first and second high absorptivity wavelength bands, and wherein at least one of the first wavelength bands overlaps at least one of the second wavelength bands to define at least one region of overlap in which both of the first and second energy absorption spectra exhibit high absorptivity;

positioning the polymeric dilatation balloon along and in surrounding relation to the length of polymeric catheter tubing, to align the dilatation balloon and the catheter tubing to place a first surface portion of the dilatation balloon and a second surface portion of the catheter tubing in a contiguous and confronting relation;

selecting a monochromatic energy wavelength that is contained within said at least one region of overlap;

generating substantially monochromatic energy at said selected monochromatic energy wavelength;

controllably directing the monochromatic energy onto the catheter tubing and the dilatation balloon to concentrate the monochromatic energy in a narrow bond site circumscribing the catheter tubing and running along the interface of the first and second surface portions, to melt the polymeric materials only along the bond site and the immediate region thereof; and

allowing the previously melted polymeric materials to cool and solidify to form a fusion bond between the catheter tubing and the dilatation balloon.

32. A process for forming a fluid tight seal between a polymeric body and a polymeric dilatation member surrounding the body, comprising the steps of:

positioning a dilatation member of polymeric material along and in surrounding relation to a body of polymeric material, with the dilatation member and body aligned to place a first surface portion of the dilatation member and a second surface portion of the body in a contiguous and confronting relation, wherein the polymeric materials forming the body and the dilatation member have non-uniform energy absorption spectra that include high absorptivity wavelength bands, and wherein at least one of the high absorptivity wavelength bands of the polymeric material forming the body and at least one of the high absorptivity wavelength bands of the polymeric material forming the dilatation member overlap one another in at least one range of overlapping wavelengths;

selecting a monochromatic energy wavelength that is contained within the at least one range of overlapping wavelengths;

generating substantially monochromatic energy at said selected monochromatic energy wavelength and at a laser power of less than about 10 watts;

controllably directing the monochromatic energy onto the body and the dilatation member to concentrate the monochromatic energy in a narrow bond site circumscribing the body and running along the interface of the first and second surface portions, thus to melt the polymeric materials along said bond site and the immediate region thereof; and

allowing the previously melted polymeric material to cool and solidify to form a fusion bond between the body and dilatation member.

**5,501,760**

## DISC TABLE FOR DISC RECORDING/REPRODUCING APPARATUS AND METHOD FOR PRODUCING SAME

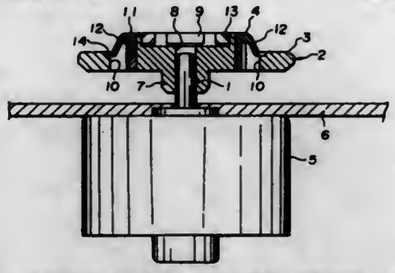
**Hiroshi Mukawa, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Division of Ser. No. 5,159, Jan. 15, 1993, abandoned. This application Mar. 16, 1994, Ser. No. 213,539**

**Claims priority, application Japan, Jan. 24, 1992, 4-032932; May 26, 1992, 4-157308; Sep. 30, 1992, 4-285218**

**Int. Cl.[6] C09J *5/00***

**U.S. Cl. 156—305** **8 Claims**




1. A method for producing a disc table comprising a fitting member fitted at its distal end into a circular center aperture formed in a disc;

a table section integrated to said fitting member at the proximal side of said fitting member and having a setting surface for setting a perimetral section of the center aperture of said disc;

thrusting and supporting means for thrusting and supporting said disc with respect to said table section; and

centering means in the form of plural centering members provided at a proximal side of said fitting member for thrusting the inner rim of the center aperture of said disc for aligning the center of the disc with the center of said fitting member, said method comprising:

positioning said fitting member by fitting a reference shaft of a positioning jig in a central aperture of said fitting member;

placing said centering means so that said centering members are positioned at the peripheral side of said fitting member;

abutting each of said centering members with a substantially equal thrusting force on an abutment inner wall section of a positioning hole formed in said positioning jig with said reference shaft as a center, for positioning said centering means with respect to said fitting member; and

adhesively bonding said centering means to said fitting member.

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**5,501,761**

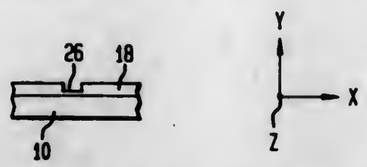
## METHOD FOR STRIPPING CONFORMAL COATINGS FROM CIRCUIT BOARDS

**Jeffrey J. Evans, Milltown, N.J.; Leslie A. Guth, Newtown, Pa., and Urmi Ray, Plainsboro, N.J., assignors to AT&T Corp., Murray Hill, N.J.**

**Filed Oct. 18, 1994, Ser. No. 324,550**

**Int. Cl.[6] B32B *35/00***

**U.S. Cl. 156—344** **13 Claims**




1. A method for removing a conformal coating from a circuit board, said method comprising the steps of

locally thinning said coating,

and then subjecting said coated circuit board in a processing chamber to supercritical carbon dioxide.

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**5,501,762**

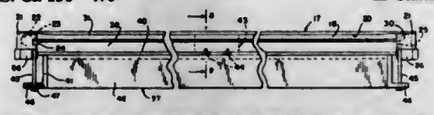
## HOT PLATE FOR CORRUGATED PAPERBOARD DOUBLE FACER

**Carl R. Marschke, Phillips, and Larry M. Krznarich, Park Falls, both of Wis., assignors to Marquip, Inc., Phillips, Wis.**

**Filed Jun. 7, 1994, Ser. No. 255,159**

**Int. Cl.[6] B31F *1/20*; B32B *31/26***

**U.S. Cl. 156—470** **11 Claims**



1. A hot plate for supporting and heating a traveling web of corrugated paperboard in a double facer comprising:

a web supporting top plate made of a non-ferrous metal having a high thermal conductivity;

a series of spaced generally parallel open-ended non-ferrous metal tubes extending transverse to the direction of web travel, positioned in a planar array beneath and in operative heat conducting contact with the underside of said top plate;

a pair of manifolds attached to the top plate, each manifold connecting the open ends of the tubes along one lateral edge of the top plate;

a source of a heated fluid operatively connected to said manifolds;

means for transferring the heated fluid through said tubes between the manifolds;

a lower steel supporting frame including a bottom plate adapted to underlie said top plate in parallel vertical spaced relation thereto;

anchoring means rigidly interconnecting the top plate and said bottom plate midway between said manifolds; and,

vertical holddown means connecting the manifolds to the lateral outer edges of the supporting frame for preventing upward bowing of the top plate caused by thermally induced vertical. movement of the lateral edges of the top plate and for allowing horizontal lateral movement thereof caused by thermal expansion of the top plate in opposite directions from said anchoring means.

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**5,501,763**

## TAPE JOINING APPARATUS

**Michio Ueda, Tokushima; Akio Suzuki, Tokyo; Yoshiro Suenaga, Tokyo, and Takayuki Ishikawa, Tokyo, all of, Japan, assignors to Shikoku Kakoki Co., Ltd., Tokushima, Japan**

**Filed Oct. 18, 1994, Ser. No. 324,620**

**Claims priority, application Japan, Jan. 19, 1993, 5-56393 ]U**

**Int. Cl.[6] B65H *21/00***

**U.S. Cl. 156—504** **8 Claims**

1. A tape joining apparatus for joining the rear end of a preceding tape to the leading end of a subsequent tape, the apparatus comprising:

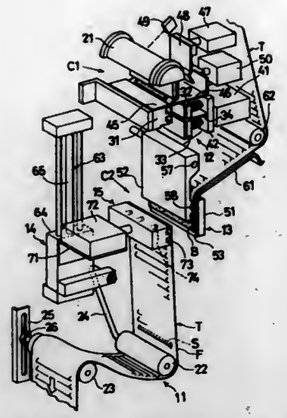
transport means for transporting the preceding tape via a joining station,

a fixed holder disposed on one side of a path of transport of the tape at the joining station for releasably holding the leading end of the subsequent tape with an adhesive applied to the leading end so as to oppose the leading end to the preceding tape,

a movable body disposed on the other side of the tape transport path and positionable at the joining station as a lower limit of stroke thereof,

a movable holder supported by the movable body and movable in a direction orthogonal to the tape transport path for holding





the rear end of the preceding tape at an upper limit of stroke of the movable body and releasing the preceding tape at the lower limit of stroke of the movable body, and

means for pressing the movable holder against the fixed holder at the joining station,

the transport means having a movable guide roller attached to the movable body for the preceding tape to be passed therearound.

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**5,501,764**

## APPARATUS FOR BONDING TEXTILE SHEET-LIKE STRUCTURES

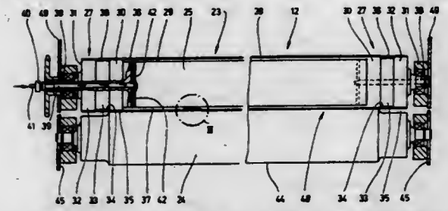
**Jürgen Inselmann, Löhne, Germany, assignor to Herbert Kenegiesser GmbH & Co., Vlotho, Germany**

**Continuation of Ser. No. 885,826, May 20, 1992, abandoned. This application Apr. 28, 1994, Ser. No. 235,148**

**Claims priority, application Germany, May 25, 1991, 41 17 170.5**

**Int. Cl.[6] B23K *37/00***

**U.S. Cl. 156—580** **12 Claims**



1. In an apparatus for bonding textile sheet-like structures and having a heating station, at least one pressure device which follows the heating station, and at least one transport conveyor, the improvement wherein:

the transport conveyor has two adjacent covering means (19, 20; 57, 58) between which the sheet-like structures are transportable through the heating station and into the pressure device;

the pressure device comprises a pressure roller (23, 61) having an outside adjacent one of said covering means, and a contact means (24, 51) having an outside adjacent the other of said covering means;

the pressure roller comprises a resiliently deformable sleeve which is subjectable to pressure from inside the sleeve by means of a fluid to maintain a constant and uniform pressure on each sheet-like structure passing between said pressure roller and said contact means;

the sleeve is cylindrical, the pressure roller (23) has a solid roller core (25) which is at least partially surrounded by the cylindrical sleeve (26), and the cavity (37) is formed between the sleeve (26) and the roller core (25) by a circular necking in the roller core (25);

the sleeve (26) is releasably connected with its opposed edge portions (35) to the roller core (25) in a sealing manner; and

the sleeve (26) is connected to opposed end portions (27) of the roller core (25) which delimit the central necking of the roller core (25) on both sides and have a greater diameter than the necking.

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**5,501,765**

## HEAT-SEALING APPARATUS

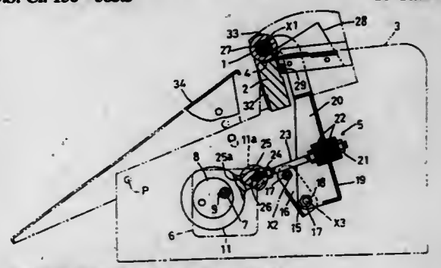
**Yasuo Hashimoto, Toyonaka, Japan, assignor to Fuji Impulse Co., Ltd., Japan**

**Filed Oct. 4, 1994, Ser. No. 317,322**

**Claims priority, application Japan, Dec. 28, 1993, 5-334636**

**Int. Cl.[6] B30B *5/02*; *15/34***

**U.S. Cl. 156—583.3** **10 Claims**



1. A heat-sealing apparatus comprising:

a casing;

a pair of lower and upper binding members for vertically binding a portion of a heat-fusible wrapper therebetween;

heater means attached to a binding face of said lower binding member which is in turn fixed to said casing, said binding face defining a first plane and said heater means being operable to heat-fuse said portion of the wrapper; and

a switching mechanism for switching over said upper binding member between a binding position where said upper binding member is pressed against said binding face of said lower binding member and a releasing position where said upper binding member is retracted in an upper-rear direction away from said binding face of said lower binding member;

wherein said upper binding member comprises a heat-resistant elastic pressing roller rotatable about an axis extending along a length of said heater means wherein in said binding position a second plane is defined which is perpendicular to said first plane and which includes said axis of said pressing roller and wherein in said releasing position said axis of said pressing roller is out of said second plane retracted in said upper-rear direction.

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**5,501,766**

## MINIMIZING OVERETCH DURING A CHEMICAL ETCHING PROCESS

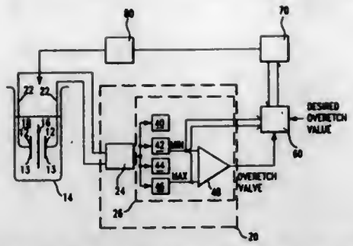
**Steven G. Barbee, Dover Plains; Tony F. Heinz, Chappaqua, both of N.Y.; Yiping Hsiao, San Jose, Calif.; Leping Li, Poughkeepsie; Eugene H. Ratzlaff, Hopewell Junction, both of N.Y., and Justin W. Wong, South Burlington, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jun. 30, 1994, Ser. No. 269,864**

**Int. Cl.[6] G01N *27/46*; H01L *21/00***

**U.S. Cl. 156—627.1** **15 Claims**

1. A method for contactless, real-time, in-situ monitoring of a chemical etching process during etching of at least one wafer in a wet chemical etchant bath, said method comprising the steps of:




a) providing two conductive electrodes in the wet chemical bath, wherein said two electrodes are proximate to but not in contact with the at least one wafer;
b) monitoring an electrical characteristic between the two electrodes as a function of time in the etchant bath of the at least one wafer, wherein a change in the electrical characteristic is indicative of a state of the etching process;
c) detecting a minimum value of said electrical characteristic during etching;
d) determining a time of the minimum value of said electrical characteristic;
e) detecting a maximum value of said electrical characteristic during etching;
f) determining a time of the maximum value of said electrical characteristic; and
g) comparing the time of said minimum value and the time of said maximum value and determining an overetch value therefrom.

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**5,501,767**

**METHOD FOR GETTERING NOBLE METALS FROM MINERAL ACID SOLUTION**

**Troy Sorensen, and Eric Grieger, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.**

**Filed Nov. 13, 1992, Ser. No. 975,789**
**Int. Cl.[6] H01L *21/00***
**U.S. Cl. 156—662.1** **4 Claims**

4. A method of manufacturing an electronic semiconductor integrated circuit, comprising the steps of,
providing a phosphoric acid solution containing Polonium-210;
heating said phosphoric acid solution to a temperature suitable for removal of silicon nitride from a silicon wafer;
inserting a getter into said phosphoric acid solution;
heating said getter to said temperature;
removing said getter from the phosphoric acid thereby removing at least a portion of Polonium-210 from said phosphoric acid solution; and
etching silicon nitride from a semiconductor wafer using said phosphoric acid solution subsequent to said step of removing.

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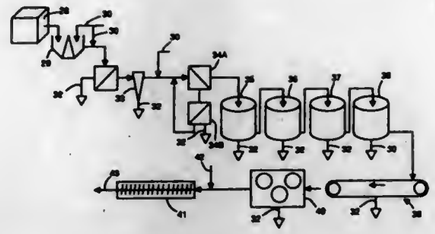
**5,501,768**

**METHOD OF TREATING PAPERMAKING FIBERS FOR MAKING TISSUE**

**Michael A. Hermans; Robert J. Makoila, both of Neenah; Kristin A. Goerg-Wood, and Fung-jou Chen, both of Appleton, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.**

**Continuation-in-part of Ser. No. 993,190, Dec. 18, 1992, Pat. No. 5,348,620, which is a continuation-in-part of Ser. No. 870,648, Apr. 17, 1992, abandoned. This application Apr. 29, 1994, Ser. No. 235,760**
**Int. Cl.[6] D21C *9/00***
**U.S. Cl. 162—9** **40 Claims**

1. A method for making tissue comprising (a) forming an aqueous suspension of papermaking fibers comprising at least 25 weight percent secondary fibers and having a consistency of about 20 or greater; (b) passing the aqueous suspension through a shaft disperser having a volume-to-working surface area ratio of about 1 centimeter or greater at a temperature of 150° F. or greater with a power input of about 1 horsepower-day per ton of dry fiber or greater, wherein the TD Index of the fibers is increased about 25 percent or greater; (c) feeding the fibers through a tissue making headbox to form a wet web; and (d) drying the web to form a dried tissue.




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**5,501,769**

**PULPING WOOD USING FATTY ACID ESTERS OF POLYOXYALKALENE GLYCOLS TO ENHANCE PULPING UNIFORMITY AND PULP YIELD**

**Michael M. Blackstone, Ridgeland, and Hugh E. Nuckolls, Mauldin, both of S.C., assignors to Chemstone, Inc., Greenville, S.C.**

**Continuation-in-part of Ser. No. 896,060, Jun. 9, 1992, Pat. No. 5,298,120. This application Mar. 28, 1994, Ser. No. 218,330**
**Int. Cl.[6] D21C *3/04***
**U.S. Cl. 162—76** **12 Claims**

1. A process for cooking wood in a cooking liquor medium comprising the steps of:
a) providing wood to a treatment vessel;
b) contacting said wood with a composition comprising a fatty acid ester of a polyoxyalkene glycol, said glycol having a molecular weight of from about 300 to about 20,000; and
c) cooking said wood that has ben contacted with said composition in an alkaline liquor to produce a pulp, wherein said process provides a simultaneous reduction in pulp rejects and an increase in pulp yield.

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**5,501,770**

**ENZYMES IN COMBINATION WITH POLYELECTROLYTES FOR ENHANCING THE FREENESS OF CLARIFIED SLUDGE IN PAPERMAKING**

**Jawed M. Sarkar, Naperville, and Hanuman P. Didwania, Lisle, both of Ill., assignors to Nalco Chemical Company, Naperville, Ill.**

**Filed Aug. 12, 1994, Ser. No. 289,451**
**Int. Cl.[6] D21H *21/10***
**U.S. Cl. 162—100** **8 Claims**

5. A process for enhancing the freeness of recycled newsprint pulp which comprises the sequential steps of:
a) adding to the pulp at least 0.05% based on the dry weight of the pulp of a cellulolytic enzyme;
b) allowing the pulp to contact the cellulolytic enzyme for about 30 minutes to about 60 minutes at a temperature of at least 40° C.;
c) adding at least 0.011% based on the dry weight of the pulp of a water-soluble cationic polymer as a retention aid; and
d) adding at least 0.007% based on the dry weight of the pulp of a water soluble anionic copolymer of acrylamide/acrylic acid.



**5,501,771**

**PAPERMAKING PROCESS AND PAPER PRODUCED THEREFROM**

**Lucien Bourson, Colombes, France, assignor to Elf Atochem S.A., Puteaux, France**

**Continuation of Ser. No. 912,730, Jul. 13, 1992. This application Apr. 28, 1994, Ser. No. 234,632**
**Claims priority, application France, Jul. 12, 1991, 91 08819**
**Int. Cl.[6] D21H *17/00***
**U.S. Cl. 162—158** **4 Claims**

1. An aqueous suspension of a papermaking composition comprising cellulosic papermaking fibers and based on total weight of said composition:
(a) from 5 to 30% of $CaCO_3$ filler;
(b) from 0.01 to 2% of alkyl ketene dimer as a paper sizing agent;
(c)(1) from 0.2 to 1.7% of a cationic starch having a molecular weight ranging from $3\times10^4$ to $12\times10^4$ and a degree of substitution ranging from 0.01 to 0.1;
(c)(2) from 0.01 to 0.3% of a polyaluminum chloride, expressed as $Al_2O_3$, said polyaluminum chloride comprising a salt having the formula:

$$Al_nOH_m(SO_4)_kCl_{3n-m-2k}$$

in which the basicity (m/3n) ranges from about 0.4 to 0.65 and which has an Al equivalent/Cl equivalent ratio ranging from 2.8 to 5, an apparent molecular weight MA measured by conventional light diffusion and apparent hydrodynamic diameters ØZ and ØW measured by quasi-elastic light diffusion as follows:

MA=7,000–35,000

ØZ(Å)=350–2,500

ØW(Å)=200–1,200; and

(c)(3) 0.01 to 0.3% of an anionic silica sol, expressed as $SiO_2$.

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**5,501,772**

**CELLULOSIC MODIFIED LIGNIN AND CATIONIC POLYMER COMPOSITION AND PROCESS FOR MAKING IMPROVED PAPER OR PAPERBOARD**

**David L. Elliott, Imperial; Ronald J. Falcione, Canonsburg, and Wood E. Hunter, Pittsburgh, all of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.**

**Continuation of Ser. No. 69,252, May 28, 1993, abandoned. This application Jun. 7, 1996, Ser. No. 479,486**
**Int. Cl.[6] D21H *21/10***
**U.S. Cl. 162—163** **11 Claims**

1. An improved paper furnish composition comprising:
(a) an aqueous cellulosic furnish;
(b) a high molecular weight cationic polymer having a weight average molecular weight greater than about 1 million wherein said cationic polymer is a copolymer derived from a cationic monomer that is a acryloyloxyethyl trimethyl ammonium chloride and a nonionic monomer that is acrylamide wherein the weight ratio of said cationic monomer: said nonionic monomer is from about 99:1 to 1:99; and
(c) a modified lignin which is a sulfonated lignin having a weight average molecular weight greater than about 10,000, wherein the ratio of said cationic polymer: said modified lignin is from about 10:1 to 1:10, on an active basis, wherein said cationic polymer and modified lignin are each present in an amount of at least about 0.1 pounds per ton, based on the dry weight of solids of the aqueous cellulosic furnish, and said improved paper furnish exhibits improved drainage, retention and formation with respect to said aqueous cellulosic furnish.

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**5,501,773**

**CELLULOSIC, MODIFIED LIGNIN AND CATIONIC POLYMER COMPOSITION AND PROCESS FOR MAKING IMPROVED PAPER OR PAPERBOARD**

**David L. Elliott, Imperial; Ronald J. Falcione, Canonsburg, and Wood E. Hunter, Pittsburgh, all of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.**

**Continuation of Ser. No. 69,258, May 28, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 483,645**
**Int. Cl.[6] D21H *21/10***
**U.S. Cl. 162—163** **12 Claims**

1. A process in which paper or paperboard is made by forming an aqueous cellulosic paper furnish having improved properties in the areas of drainage, retention, and formation which comprises adding to said furnish at least about 0.1 pounds per ton, based on the dry weight of the solids of said furnish, of (A) a high molecular weight cationic polymer having a weight average molecular weight greater than about 1 million wherein said cationic polymer is a copolymer derived from a cationic monomer that is a acryloyloxyethyl trimethyl ammonium chloride and a nonionic monomer that is acrylamide wherein the weight ratio of said cationic monomer said nonionic monomer is from about 99:1 to 1:99 and at least about 0.1 pounds per ton, based on the dry weight of the solids of said furnish, of (B) a modified lignin which is a sulfonated lignin having a weight average molecular weight greater than about 10,000, draining the furnish to form a sheet, and drying said sheet, wherein the weight ratio of said cationic polymer (A): said modified lignin (B) is from about 10:1 to 1:10, on an active basis.

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**5,501,774**

**PRODUCTION OF FILLED PAPER**

**Anthony J. Burke, North Yorkshire, England, assignor to Allied Colloids Limited, West Yorkshire, England**

**Filed Jan. 21, 1994, Ser. No. 188,388**
**Claims priority, application United Kingdom, Jan. 26, 1993, 9301451**
**Int. Cl.[6] D21H *21/10***
**U.S. Cl. 162—164.1** **12 Claims**

1. A process for making filled paper comprising providing an aqueous feed suspension containing 2.5 to 20% by weight of filler and cellulosic fiber in a dry weight ratio of 10:1 to 1:50
coagulating the filler with the fiber in the feed suspension by adding cationic coagulant agent to the feed suspension, the cationic coagulant agent being added to the feed suspension in an amount of at least 0.005% dry weight based upon the dry weight of the suspension and the cationic coagulant agent being selected from the group consisting of inorganic coagulating agents, cationic naturally occurring polymers and synthetic cationic polymers having intrinsic viscosity below 3 dl/g,
making an aqueous thinstock suspension by diluting with water an aqueous thickstock suspension consisting of or formed from the feed suspension,
adding anionic particulate material to the thinstock or to the thickstock from which the thinstock is formed, the anionic particulate material being added to the thinstock or to the thickstock from which the thinstock is formed in an amount of 0.02 to 2% dry weight based upon dry weight of suspension and the anionic particulate material being selected from the group consisting of swelling clays and particulate material having a size below 0.1 μm and being selected from the group consisting of particulate polysilicic acid compounds, zeolite and anionic polymeric emulsions,
subsequently adding polymeric retention aid in an amount of 100 to 1500 grams per ton dry weight to the thinstock, the polymeric retention aid having an IV of above 4 dl/g and the retention aid being selected from the group consisting of polyethylene oxide and acrylamide polymers, said acrylamide polymers being selected from the group consisting of polyacrylamide homopolymers and copolymers of acrylamide

with up to 50 weight percent cationic monomer or up to 50 weight percent anionic monomer,
draining the thinstock to form a sheet, and
drying the sheet.

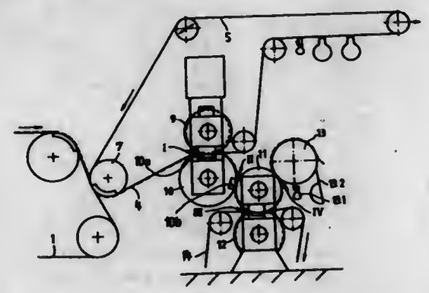
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5,501,775

## WET PRESS FOR A PAPER MAKING MACHINE

Gerhard Kotitschke, Steinheim, and Christian Schiel, Heidenheim, both of, Germany, assignors to J. M. Voith GmbH, Germany

Filed Jan. 21, 1994, Ser. No. 184,592
Claims priority, application Germany, Jan. 23, 1993, 43 01 750.9; Jun. 26, 1993, 43 21 405.3
Int. Cl.[6] D21F 3/02
U.S. Cl. 162—360.3 5 Claims



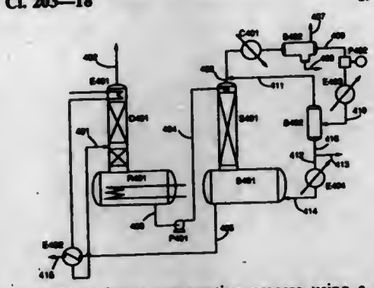
1. A wet press for a paper making machine for pressing moisture from a moist paper web, the press comprising:
a plurality of press rolls, each press roll having an outer surface;
the press rolls being arranged so that the rolls define pairs which form respective press nips between the rolls of each pair of rolls, the plurality of press rolls being of such number and being so structured and arranged that there are at least four successive press nips in the wet press along the web path;
the press rolls being so placed as to guide the web so that the web passing through the wet press is continuously supported by the outer surfaces of successive press rolls on the web path from the first of the press nips formed between one pair of the rolls to the last of the press nips formed by another pair of the rolls;
the second and fourth press nip in succession on the web path being free of a felt passing through the respective press nip; each of the press rolls defining the second and fourth press nip having a closed outer surface;
the first press nip including a shoe press roll as one of the press rolls, the shoe press roll having a concave press shoe which forms the first press nip along the web path in cooperation with another one of the press rolls;
the shoe press roll having a ledge which forms the second press nip in cooperation with another press roll having a smooth closed outer surface;
a felt passing through each of the first and the third of the press nips along the web path;
one of the press rolls defining the third press nips including a shoe press; and
means supporting the web for bringing it to the first of the press nips along the web path and further means supporting the web and bringing it away from the last of the press nips along the web path.

5,501,776

## PROCESS FOR THE REGENERATION OF A DESICCANT

Christophe Lermite, Paris; Jean-Claude Amande, Villepreux; Bernard Chambon, Acheres, and Joseph Larue, Chambourcy, all of, France, assignors to Institut Francais Du Petrole, and Nouvelles Applications Technologiques (Nat.), both of Rueil Malmaison, France

Filed Nov. 19, 1993, Ser. No. 154,406
Claims priority, application France, Nov. 19, 1992, 92 14020
Int. Cl.[6] B01D 3/34
U.S. Cl. 203—18 19 Claims



1. A liquid desiccant regeneration process using a stripping agent, wherein the stripping agent is liquid at ambient temperature and pressure, and forms a heteroazeotrope with water; and the process comprises:
(a) distilling a water laden liquid desiccant in a distillation zone comprising at least one rectification stage to produce an overhead vapor and a partially regenerated liquid desiccant;
(b) reboiling in a reboil zone said partially regenerated liquid desiccant to provide a vapor phase and residual partially regenerated liquid desiccant;
(c) stripping in a stripping zone the residual partially regenerated liquid desiccant from step (b), using vaporized stripping agent, to provide regenerated liquid desiccant;
(d) condensing the overhead vapor exiting distillation step (a), the condensation producing two liquid phases, a water-rich liquid phase and a stripping agent-rich liquid phase;
(e) heating the stripping agent-rich liquid phase from step (d) to generate a vapor phase richer in water than said liquid phase and a water-depleted liquid stripping agent phase; and
(f) vaporizing at least a portion of resultant water-depleted liquid stripping agent phase from step (e) said portion being substantially sufficient to maintain a constant flow rate of vaporized stripping agent in step (c);
(g) utilizing resultant vaporized water-depleted stripping agent from step (f) in step (c); and
(h) collecting the regenerated liquid desiccant from step (c) in a reservoir.

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5,501,777

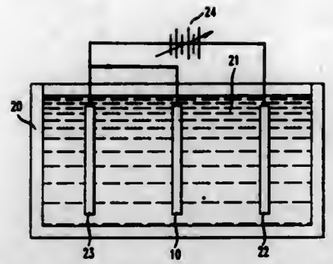
## METHOD FOR TESTING SOLDER MASK MATERIAL

Donald Dinella, Berkeley Heights; Sudarshan Lal, Glen Rock, both of N.J.; Kim L. Morton, Richmond, Va., and David A. Nicol, Trenton, N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Dec. 30, 1994, Ser. No. 366,539
Int. Cl.[6] G01N 27/26; B05D 3/10
U.S. Cl. 205—791 7 Claims

1. A method for testing the adhesion of a mask material to an underlying substrate during an electroless plating process employing a particular bath comprising the steps of:
determining the electrical potential at a surface of the substrate at which equal oxidation and reduction reactions occur in the bath;
depositing the mask material on a surface of a test substrate, which surface includes conductive material;
immersing the test substrate in an electrolyte along with a pair of electrodes;





applying to the electrodes a dc potential at least equal to the determined electrical potential such that the test substrate is a cathode; and
examining the test substrate to determine if any loss of adhesion occurs between the mask and the substrate.

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5,501,778

## ORGANIC SUPERCONDUCTOR AND PROCESS FOR PRODUCING THE SAME

Harald Müller, and Yoshinobu Ueba, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed May 14, 1993, Ser. No. 61,027
Claims priority, application Japan, May 19, 1992, 4-126350
Int. Cl.[6] C07B 37/00
U.S. Cl. 204—157.62 9 Claims

7. A process for producing an organic superconductor comprising the steps of: dissolving or dispersing an electron donor, wherein said electron donor is tetrathiafulvalene, and an electron acceptor, wherein said electron acceptor is selected from the group consisting of $I_3^-$, $Cu(NSC)_2^-$, and $Cu[N(CN)_2]X^-$, wherein X represents a halogen atom in a solvent in a substantially oxygen-free reaction vessel; and then performing a treatment with ultrasonic waves to react said electron donor with said electron acceptor.

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5,501,779

## AQUEOUS ELECTROCOATING BATHS CONTAINING SYNTHETIC RESINS CAPABLE OF DEPOSITION ON THE CATHODE, AND A PROCESS FOR COATING ELECTRICALLY CONDUCTING SUBSTRATES

Michael Geist, Ludwigshafen; Udo Strauss; Helmut Fobbe, both of Munster; Klaus Arit, Senden; Walter Jouck, Munster, all of, Germany, and Klaus Cibura, Southfield, Mich., assignors to BASF Lacke & Farben Aktiengesellschaft, Munster, Germany

Division of Ser. No. 168,969, Dec. 16, 1993, Pat. No. 5,427,661, which is a continuation of Ser. No. 27,938, Mar. 8, 1993, abandoned, which is a continuation of Ser. No. 918,153, Jul. 17, 1992, abandoned, which is a continuation of Ser. No. 458,702, Jan. 19, 1990, abandoned. This application Mar. 24, 1995, Ser. No. 410,193
Claims priority, application European Pat. Off., Jul. 29, 1987, 87110956; Germany, Nov. 16, 1987, 37 38 827.4
Int. Cl.[6] C25D 13/10
U.S. Cl. 904—501 12 Claims

2. A method for reducing surface defects in electrodeposited films on electrically conducting substrates comprising
a. immersing the substrate in an aqueous electrocoating bath containing at least one synthetic resin to be deposited on a cathode, and surface defect forming contaminants, as well as an amount of a copolymer of an alkyl vinyl ether of the general formula $CH_2$=CH—O—R, wherein R represents an alkyl radical of 2 to 4 carbons, effective to reduce defect formation by the contaminants,
b. connecting the substrate as the cathode,
c. depositing a film on the substrate by means of direct current,
d. removing the substrate from the electrocoating bath, and
e. baking the deposited paint film, to provide a coating substantially free of surface defects caused by contaminants.

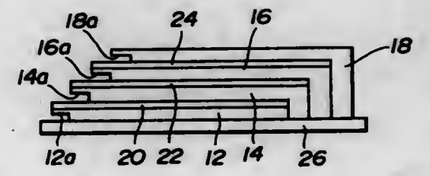
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5,501,780

## HEAT INSULATING GLASS WITH MULTILAYER COATING

Yasunobu Iida; Satoru Honda, both of Matsuzaka; Sachio Asai, Taki; Isao Nakamura, Fujisato; Hidenori Noguchi, Matsusaka, and Takao Tomioka, Kawa, all of, Japan, assignors to Central Glass Company, Limited, Ube City, Japan

Filed Aug. 13, 1993, Ser. No. 105,581
Claims priority, application Japan, Aug. 13, 1992, 4-215989
Int. Cl.[6] C23C 14/00
U.S. Cl. 204—192.15 18 Claims



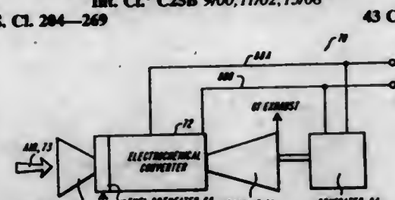
1. A method for forming thin film bands on first and second transparent glass plates by means of first and second jigs, each of the first and second jigs being corrosion resistant, heat resistant and formed with a projection portion, the method comprising the steps of:
(a) placing the first glass plate on a base member such that a first major surface of the first glass plate is exposed, the first major surface having a first end portion and a first adjacent portion which bounds on the first end portion;
(b) placing the first jig on the first glass plate so as to precisely position the first jig relative to the first glass plate such that a major portion of the first major surface is masked by the first jig, such that the first end portion of the first glass plate remains exposed and such that the projection portion of the first jig is positioned spaced from and above the first adjacent portion;
(c) placing the second glass on the first jig so as to precisely position the second glass plate relative to the first jig such that a second major surface of the second glass plate is exposed, the second major surface having a second end portion and a second adjacent portion which bounds on the second end portion, and such that the first end portion of the first glass plate still remains exposed,
(d) placing the second jig on the second glass plate so as to precisely position the second jig relative to the second glass plate and to form a structure having the first and second glass plates and the first and second jigs such that a major portion of the second major surface is masked by the second jig, such that the first and second end portions remain exposed and such that the projection portion of the second jig is positioned spaced from and above the second adjacent portion;
(e) placing the structure in a physical vapor deposition device such that the first and second end portions are exposed to a target of the device; and
(f) actuating the device such that a first thin film portion deposits on each of the first and second end portions and a second thin film portion deposits on each of the first and second adjacent portions, the first and second thin film portions being merged with each other so as to form the thin film band, the first thin film portion being uniform in thickness and color, the second thin film portion being wedge shaped and thus gradated in color.

**5,501,781**

## ELECTROCHEMICAL CONVERTER HAVING INTERNAL THERMAL INTEGRATION

**Michael S. Hsu, Lincoln, and Ethan D. Hoag, East Boston, both of Mass., assignors to Ztek Corporation, Waltham, Mass.**

**Filed Aug. 8, 1994, Ser. No. 287,093**
**Int. Cl.[6] C25B 9/00;11/02;15/08**
**U.S. Cl. 204—269** **43 Claims**




1. An electrochemical converter assembly, comprising
a stack of converter plate elements including
a plurality of electrolyte plates having an oxidizer electrode material on one side and a fuel electrode material on the opposing side;
a plurality of interconnector plates for providing electrical contact with said electrolyte plates, wherein said stack of converter elements is assembled by alternately stacking interconnector plates with said electrolyte plates; and
a plurality of manifolds axially formed within said stack and adapted to receive reactants, said converter assembly operating at a selected operating temperature; and
internal reactant heating means disposed within said manifolds for heating at least a portion of one of said reactants to said operating temperature of said converter assembly while passing through said manifolds.

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**5,501,782**

## ELECTROCHEMICAL CONVERTER HAVING OPTIMAL PRESSURE DISTRIBUTION

**Michael S. Hsu, Lincoln, Mass., assignor to Ztek Corporation, Waltham, Mass.**

**Continuation-in-part of Ser. No. 215,466, Mar. 21, 1994, abandoned. This application Aug. 8, 1994, Ser. No. 287,092**
**Int. Cl.[6] C25B 9/00;9/04;11/02;15/08**
**U.S. Cl. 204—270** **49 Claims**



1. An electrochemical converter assembly, comprising
a stack of converter plate elements having unsealed peripheral edgea including
a plurality of electrolyte plates having an oxidizer electrode material on one side and a the electrode material on the opposing side, and
a plurality of interconnector plates for providing electrical contact with said electrolyte plates, wherein said stack of converter elements is assembled by alternately stacking interconnector plates with said electrolyte plates, and
low pressure drop reactant flow means for producing a substantially uniform flow of reactants through said stack of converter elements, and for producing a substantially low differential pressure condition within said converter assembly, such that spent fuel and oxidizer reactants are discharged from said converter assembly along at least a substantial portion of said peripheral edges of said converter element.

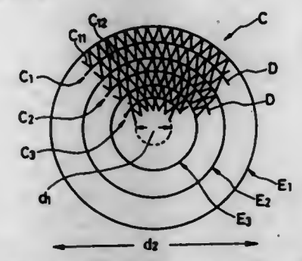
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**5,501,783**

## CYLINDRICAL ELECTROSTATIC OIL CLEANER

**Mariko Kawasaki, Tokyo, Japan, assignor to Kleentek Industrial Co., Ltd., Tokyo, Japan**

**Filed Sep. 19, 1994, Ser. No. 306,443**
**Claims priority, application Japan, Sep. 28, 1993, 5-263083**
**Int. Cl.[6] B01D 35/06**
**U.S. Cl. 204—665** **8 Claims**




1. A cylindrical electrostatic oil cleaner for removing dust from an insulating liquid, comprising:
a cylindrical receptacle;
a plurality of cylindrical positive and negative electrode plates coaxially arranged in an opposing relationship within said receptacle, thereby defining an innermost compartment surrounded by the innermost electrode plate and outer compartments defined between the respective electrode plates; and
a plurality of coaxially arranged insulating dust collectors, one insulating dust collector arranged in the innermost compartment and in each of the outer compartments, respectively, each of said insulating dust collectors comprising a plurality of cylindrical collector elements, each cylindrical collector element forming a corrugated zigzag peripheral wall in said innermost compartment and each said outer compartment, said cylindrical collector elements being in lateral side-by-side relationship in said innermost compartment and each of said outer compartments.

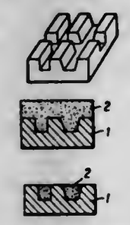
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**5,501,784**

## PROCESS FOR PRODUCING MICROSTRUCTURE METALLIC ELEMENTS

**Christoph Leumöllmann, Gernsbach; Joachim Eicher, Karlsruhe, and Holger Reinecke, Dortmund, all of, Germany, assignors to Microparts GmbH, Dortmund, Germany**

**Filed Mar. 10, 1994, Ser. No. 208,296**
**Claims priority, application Germany, Mar. 12, 1993, 43 07 869.9**
**Int. Cl.[6] C25D 1/00**
**U.S. Cl. 205—67** **11 Claims**




1. A process for the production of a metallic element, comprising the steps of:



(a) forming a mold having an open cavity on one surface thereof from a solid body by mechanical machining, additive structuring or subtractive structuring,
(b) filling the cavity and covering the mold with a flowable electrically non-conductive material,
(c) solidifying the flowable electrically non-conductive material to form a solid layer in contact with the surface of said mold and filling said cavity,
(d) removing a portion of said solid layer to expose the surface of said mold and said cavity filled with solidified flowable material,
(e) applying a layer of conductive material to and covering the exposed surface of said mold and filled cavity,
(f) separating the conductive layer and solidified flowable material in the cavity from the mold to provide a structure having a shape complementary to the mold,
(g) electrodepositing a metal layer on the complementary structure, and
(h) separating the metal layer from the complementary structure to provide a metallic element.

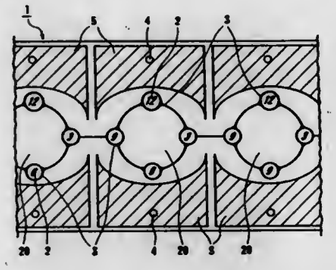
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**5,501,785**

## PROCESS FOR MANUFACTURING ELECTROFORMED PATTERNS

**Hiroo Nakayama, Yokosuka, Japan, assignor to Tefco International Co., Ltd., Japan**

**Filed Jan. 17, 1995, Ser. No. 373,555**
**Claims priority, application Japan, Jul. 13, 1994, 6-161597; Jan. 13, 1994, 6-248192**
**Int. Cl.[6] C25D 1/00**
**U.S. Cl. 205—67** **6 Claims**



1. A process for manufacturing electroformed patterns, comprising:
forming electroformed patterns and an electroformed line surrounding said patterns on a surface of a conductive substrate,
peeling the electroformed patterns and the electroformed line from the conductive substrate to transfer them onto a pressure-sensitive first adhesive layer provided on a support,
forming a firmly bonding second adhesive layer on a whole surface of a side of the electroformed patterns and the electroformed line opposite the first adhesive layer,
removing the electroformed line, and
adhering the electroformed patterns to a surface of an adherend through the firmly bonding second adhesive layer, simultaneously with separating the electroformed patterns from the support.

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**5,501,786**

## METHOD OF MAKING THE COMPOUND $CuInSe_2$

**François Gremion, Meinier, Switzerland; Jean-Paul Issartel, Cranves-Sales, France, and Klaus Mueller, Grand-Lancy, Switzerland, assignors to Yazaki Corp., Tokyo, Japan**

**PCT No. PCT/IB94/00147, § 371 Date Feb. 3, 1995, § 102(e) Date Feb. 3, 1995, PCT Pub. No. WO94/29904, PCT Pub. Date Dec. 22, 1994**
**PCT Filed Jun. 7, 1994, Ser. No. 382,008**
**Claims priority, application Switzerland, Jun. 8, 1993, 722/93**
**Int. Cl.[6] C25D 15/00**
**U.S. Cl. 205—109** **18 Claims**

1. A method of making a $CuInSe_2$ compound comprising the steps of:
a) providing an electrically conductive substrate the total surface of which is substantially chemically resistant to Se in the vapor phase;
b) depositing on said substrate a first layer comprising between 50 atomic % and 100 atomic % of In or Cu, the remainder of said layer being at least in part Cu or In respectively;
c) depositing on said substrate a second layer having a composition between 50 atomic % and 100 atomic % of Cu or In so that the overall atomic ratio In/Cu of the two layers together is between 45/55 and 55/45;
d) incorporating, when depositing at least one of said layers, Se in the form of particles such that Se is present in an amount between 3 and 100 atomic % of the combined atomic % of In and Cu in the two layers; and
e) forming the $CuInSe_2$ compound by thermal reaction, where the atomic % of Se is lower than the combined atomic % of In and Cu of both layers, raising the proportion of Se to be equal to the combined atomic % of In and Cu of both layers by at least one of (i) depositing Se onto said second layer or (ii) carrying out said thermal reaction in a neutral atmosphere at the vapor pressure of Se.

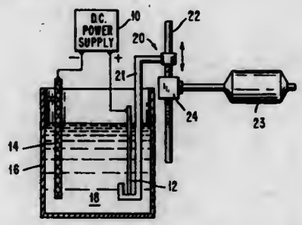
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**5,501,787**

## IMMERSION SCANNING SYSTEM FOR FABRICATING POROUS SILICON FILMS

**Ernest Bassous, Bronx; Jean-Marc Halbout, Larchmont; Subramanian S. Iyer, Yorktown Heights, all of N.Y., and Vijay P. Kesan, Ridgefield, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Division of Ser. No. 266,444, Jun. 27, 1994, Pat. No. 5,458,756, which is a continuation of Ser. No. 862,939, Apr. 3, 1992, abandoned. This application Feb. 27, 1995, Ser. No. 395,936**
**Int. Cl.[6] C25D 7/12;11/32**
**U.S. Cl. 205—124** **14 Claims**




1. A method for producing porous silicon on the surface of a substrate to fabricate a light-emitting Si device, comprising the steps of:
providing an anode having a surface formed on a substrate composed at least substantially of silicon, for receiving porous silicon to be produced by anodization on said surface;
providing an electrochemical cell containing an electrolyte and having an unsealed opening therein for receiving said anode into said electrolyte for said anodization;

providing a cathode having a surface disposed opposite said surface of said anode in said electrolyte, for cooperating with said anode in said anodization;
moving said anode and said electrolyte with respect to each other to immerse said anode in said electrolyte for said anodization and remove said anode from said electrolyte after anodization; and
producing a current between said anode and said cathode when they are immersed in said electrolyte to perform said anodization,
wherein said electrolyte comprises an aqueous solution of 10–25% hydrofluoric acid (HF) and 5–25% acetic acid.

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**5,501,788**
**SELF-STABILIZING PITCH FOR CARBON FIBER MANUFACTURE**
**H. Ernest Romine; Edward J. Nanni; Mark W. Carel, and W. Mark Southard, all of Ponca, Okla., assignors to Conoco Inc., Ponca City, Okla.**
**Filed Jun. 27, 1994, Ser. No. 266,286**
**Int. Cl.[6] C10C *1/18;3/02***
**U.S. Cl. 208—45** **27 Claims**

1. A process for preparing solvated isotropic pitch comprising:
a) mixing an isotropic pitch and a solvent to form a mixture;
b) separating said mixture into a liquid solvent phase and a solvated pitch phase;
c) recovering said solvated pitch phase.

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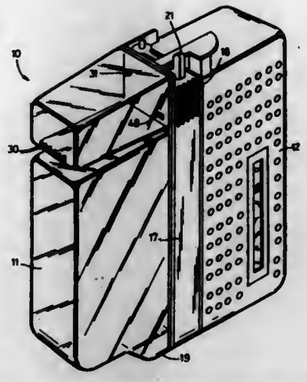
**5,501,789**
**PROCESS FOR IMPROVED CONTACTING OF HYDROCARBON FEEDSTOCK AND PARTICULATE SOLIDS**
**David B. Bartholic, Watchung, N.J., assignor to Bar-Co Processes Joint Venture, Houston, Tex.**
**Filed May 24, 1994, Ser. No. 248,184**
**Int. Cl.[6] C10G *11/18;9/32***
**U.S. Cl. 208—146** **21 Claims**

1. In a process wherein a fluidized particulate solid is contacted with a hydrocarbon feedstock in a vertically extending contacting zone, the improvement which comprises introducing a stream of the particulate solid into the contacting zone, and introducing a plurality of streams of liquid hydrocarbon feedstock into the contacting zone to intimately contact the particulate solid therein, said plurality of streams each being introduced into the contacting zone from one of a plurality of nozzles spaced apart in the contacting zone, and having a flow path extending into the contacting zone and a flow pattern formed of spaced ligaments of the liquid hydrocarbon feedstock and having a thickness which is substantially constant and a width which diverges from the point of introduction into the contacting zone.

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**5,501,790**
**AQUARIUM FILTER**
**Robert L. J. Wiedemann, Shepperton, United Kingdom, assignor to Pet Mate Limited, Surrey, United Kingdom**
**Filed Dec. 13, 1994, Ser. No. 357,201**
**Claims priority, application United Kingdom, Dec. 16, 1993, 9325881**
**Int. Cl.[6] C02F *3/02*; A01K *63/04***
**U.S. Cl. 210—86** **18 Claims**

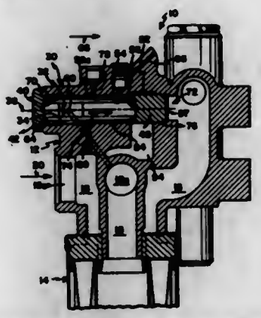
1. A biological filter for an aquarium comprising a closed top biological filter chamber containing a biological filter medium, means for disposing the chamber in or alongside an aquarium tank so that the chamber is substantially below the water level of the tank, means for connecting the bottom region of the chamber to water in the tank, means for introducing air under pressure into the chamber, an outlet connection in the upper region of the chamber




and U-tube means comprising two upright branches joined at their bottom ends at or above the level of the bottom of the chamber, one said branch communicating at its upper end with said outlet connection of the chamber and the upper end of the other branch being level with or above said outlet connection, the arrangement being such that in use of the filter air admitted to the chamber displaces water therein until the water level in the chamber reaches the bottom ends of the branches, whereupon residual water in the other branch is expelled to permit evacuation of air from the chamber through the U-tube means with consequent refilling of the chamber and of the branches of the U-tube means with water from the aquarium tank to recommence the cycle.

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**5,501,791**
**PRESSURE ISOLATION VALVE AND BYPASS VALVE; AND FILTER HEAD ASSEMBLY INCORPORATING SAME**
**Jeffrey J. Theisen, Prior Lake, and John F. Connelly, Chanhassen, both of Minn., assignors to Donaldson Company, Inc., Minneapolis, Minn.**
**Continuation of Ser. No. 128,045, Sep. 28, 1993, abandoned, which is a continuation of Ser. No. 848,271, Mar. 9, 1992, abandoned. This application Oct. 24, 1994, Ser. No. 327,888**
**Int. Cl.[6] B01D *35/143;35/147***
**U.S. Cl. 210—90** **2 Claims**



1. A filter head for receiving a filter and mounting to an end of a spin-on type filter having a central fluid outlet and fluid inlet extending circumferentially around the central fluid outlet, the filter head including a pressure isolation valve for emitting a pressure signal when the pressure differential across the filter head reaches a predetermined value, comprising:
a filter head;
means for mounting the spin-on type filter to the filter head housing;

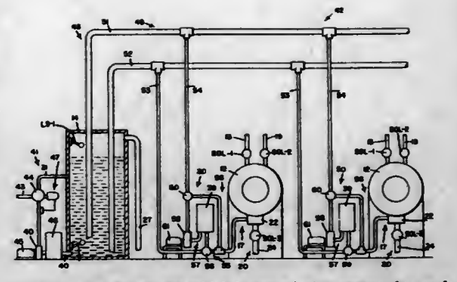


an upstream fluid passageway connecting the filter head housing with the filter circumferential fluid inlet and communicating to a source of unfiltered fluid;
a downstream fluid passageway connecting the filter head with the filter central fluid outlet and communicating with an outlet for filtered fluid;
means for sensing the difference in pressure between the fluid in the upstream and downstream fluid passageways, wherein the sensing means includes a cylindrical piston slidably mounted in a cylindrical chamber formed in the filter head, said chamber having a first fluid inlet formed therein at one end thereof fluidly open to the upstream passageway and a second fluid inlet formed in a sidewall thereof fluidly communicating to the downstream passageway, the piston having first and second faces fluidly communicating with the upstream and downstream passageways through the first and second fluid inlets, respectively, wherein the piston includes a cylindrical Wall, Said piston having a recessed portion formed in the cylindrical wall extending annularly around the piston and defining an annular chamber with said chamber, and biasing means for exerting a force of a predetermined value on the piston and biasing the piston against fluid pressure in the upstream passageway;
a signal channel opening to a first signal aperture formed in the sidewall of said chamber axially between said first and second fluid inlets for fluidly connecting the upstream fluid passageway with the chamber;
a signal outlet port opening to a second signal aperture formed in the sidewall of said chamber axially between said first and second fluid inlets for fluidly connecting the chamber to a pressure switch;
wherein the cylindrical wall of said piston includes a cylindrical un-recessed portion that is configured and arranged to sealably cover said first and second signal apertures to substantially prevent flow through said first and second apertures when said piston is in a closed position;
wherein said recess is configured and arranged to be adjacent said first and second signal apertures to permit flow from said first signal aperture to said second signal aperture via said recess when said piston is in an open position;
wherein the biasing means moves the piston to said closed position when the sensing means senses a difference between the pressures in the upstream and downstream passageways that is less than the predetermined value; and,
wherein fluid pressure from the upstream passageway moves the piston to said open position wherein when the sensing means senses a difference between the pressures in the upstream and downstream passageways that equals or exceeds the predetermined value.

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**5,501,792**
**ENERGY AND WATER SAVING LAUNDRY SYSTEM**
**John D. Carroll, Jr., Charlton, Mass., assignor to Hydrokinetics, Inc., Auburn, Mass.**
**Filed Mar. 23, 1994, Ser. No. 216,818**
**Int. Cl.[6] D06F *33/02***
**U.S. Cl. 210—141** **9 Claims**

4. An energy and water conservation laundry mechanism comprising:
(a) a plurality of automatic washing machines, each of said machines having independent time control means for executing at least one wash cycle and at least one rinse cycle, each of said at least one wash cycle and said at least one rinse cycle including introduction of water to the respective machine and discharge of water from the respective machine, each of said washing machines having a fresh water supply inlet mechanism for selectively connecting the washing machine to a source of fresh water;
(b) rinse water storage means which includes a water storage tank and first conduit means which is operatively connected to said water storage tank;



(c) second conduit means which is operatively connected to each of said washing machines;
(d) pump means including means for operatively connecting said rinse water storage means to said second conduit means for selectively pumping rinse water from each of said washing machines to said rinse water storage means and for pumping rinse water from said rinse water storage means to each of said washing machines, said pump means comprising a pump and valve assembly for each of said washing machines, each of said pump and valve assemblies comprising:
(1) a first pipe means which is connected to said rinse water storage means and to said second conduit means;
(2) a second pipe means which is connected to said rinse water storage means and said second conduit means;
(3) a third pipe means which is connected to said first pipe means and to said second pipe means;
(4) a pump which is operatively connected to said third pipe means for pumping rinse water from said second pipe means to said first pipe means;
(5) a first valve which is operatively connected to said first and third pipe means, said first valve having a first position wherein rinse water flows from said third pipe means toward the respective washing machine, said first valve having a second position wherein rinse water flows from said third pipe means toward said rinse water storage means; and
(6) a second valve which is operatively connected to said second and third pipe means, said second valve having a first position wherein rinse water flows from said rinse water storage means toward said third pipe means, said second valve having a second position wherein rinse water flows from the respective washing machine toward said third pipe means, whereby when both of said first and second valves are in their first positions, water is pumped from said rinse water storage means to the respective washing machine and when both of said first and second valves are in their second positions, rinse water is pumped from the respective washing machine to said rinse water storage means;
(e) discharge means which is operatively connected to each of said washing machines for selectively discharging water from the at least one rinse cycle of each of said washing machines into said second conduit means and for selectively discharging water from the at least one wash cycle of each of said washing machines into a waste water system; and
(f) control means for coordinating the at least one wash and at least one rinse cycle of each of said washing machines with said pump means, said discharge means and said fresh water supply inlet mechanism so that for each of said washing machines, rinse water is pumped into the washing machine from said rinse water storage means for the at least one wash cycle, water from the at least one wash cycle is discharged into a waste water system, fresh water from the fresh water supply inlet mechanism is introduced into the washing machine for the at least one rinse cycle, and water is discharged from the washing machine at the end of the at least one rinse cycle and pumped to said rinse water storage means.

6. An energy and water conservation laundry system as recited in claim 4, further comprising, for each of said washing machines, a filter which is operatively connected to said third pipe means so

that rinse water which is pumped toward and away from the washing machine flows through said filter.

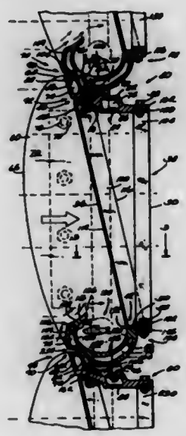
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5,501,793

## TRAVELING WATER SCREEN INCLUDING IMPROVED BASKET

Robert R. Cheesman, Waukesha; James A. Ehleiter, Franklin; Don N. Gass, Brown Deer; Gary B. Tatsak, Glendale, all of Wis., and R. Ian Fletcher, Damariscotta, Me., assignors to Envirex Inc., Waukesha, Wis.

Filed Mar. 31, 1994, Ser. No. 221,368
Int. Cl.[6] B01D *33/333*
U.S. Cl. 210—160 35 Claims



1. A basket for a traveling water screen, the traveling water screen being operable for screening water flowing through the traveling water screen in a downstream direction, the basket comprising

an upper lip beam,

a pair of spaced apart end members at opposite ends of the upper lip beam and joined to the upper lip beam,

a water screen extending between the end members and having an upper edge portion supported by the upper lip beam, a lower edge portion opposite the upper edge portion, and opposite edges supported by the spaced apart end members, and

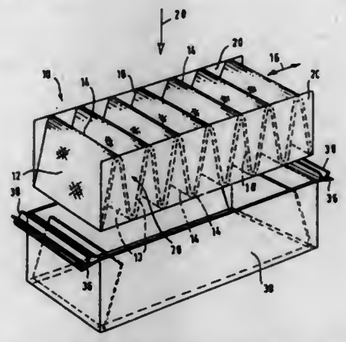
a lower lip beam extending between the spaced apart end members and supporting the lower edge portion of the water screen, the lower lip beam including an elongated upwardly opening channel upstream of the water screen, the lower lip beam including an upstream wall having a lower portion and an upper portion, the lower portion of the upstream wall including a lower forward surface facing in the upstream direction, at least a portion of the lower forward surface being convex, the upper portion of the upstream wall being inclined upwardly and in the downstream direction from the lower portion of the upstream wall, the upper portion of the upstream wall including an upper forward surface facing in the upstream direction, and at least a portion of the upper forward surface being nonplanar for deflecting water upwardly and over the upwardly opening channel.

5,501,794

## WAVE FILTER WITH FLEXIBLE TENSIONING MEMBERS

Peter Van de Graaf, St. Josephstraat, and Anton J. J. Horsten, Statenlaan, both of, Netherlands, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

PCT No. PCT/US92/09311, § 371 Date May 16, 1994, § 102(e) Date May 16, 1994, PCT Pub. No. WO93/12858, PCT Pub. Date Jul. 8, 1993
PCT Filed Oct. 30, 1992, Ser. No. 244,014
Claims priority, application Germany, Dec. 31, 1991, 41 43 245.2
Int. Cl.[6] B01D *27/06*
U.S. Cl. 210—493.3 10 Claims



1. A filter for filtering fluids comprising a filter element (10) having longitudinal side edges and folded in a wave-shaped manner said filter element having bending lines (14) extending in a first transverse direction and substantially planar filter element folding portions (12) arranged therebetween where the successive folding portions (12) and bending lines define a wave-shape extending in a second longitudinal direction, the filter element (10) is able to be stretched and compressed in the second longitudinal direction, two flexible tensioning members are connected to the two side edges of the filter element extending in the second longitudinal direction which flexible tensioning members allow the filter element to be compressed, which flexible tensioning members when elongated under tension have a modulus sufficient to limit the stretching of the filter element (10) in the second longitudinal direction fixing said filter element folding portions (12) in the wave-shape, said flexible tensioning members comprising flexible tensioning bands (20) with their width being at least equal to the horizontal distance between two adjacent bending lines (14) with the flexible tensioning bands and said filter element formed of thermoplastic materials.

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5,501,795

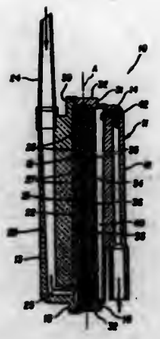
## DEVICE FOR DEPLETION OF THE LEUCOCYTE CONTENT OF BLOOD AND BLOOD COMPONENTS

David B. Pall, Roslyn Estates, and Thomas C. Goell, Glen Cove, both of N.Y., assignors to Pall Corporation, East Hills, N.Y.

Continuation of Ser. No. 71,990, Jun. 7, 1993, Pat. No. 5,344,561, which is a continuation of Ser. No. 719,506, Jun. 24, 1991, Pat. No. 5,229,012, which is a continuation-in-part of Ser. No. 527,717, May 22, 1990, abandoned, which is a continuation-in-part of Ser. No. 349,439, May 9, 1989, abandoned. This application Jul. 18, 1994, Ser. No. 277,426
The portion of the term of this patent subsequent to Sep. 6, 2011, has been disclaimed.
Int. Cl.[6] B01D *27/02;39/02*
U.S. Cl. 210—508 31 Claims

1. A device for the depletion of the leukocyte content of a blood product comprising a fibrous leukocyte adsorption/filtration filter





having a pore diameter of from about 0.5 to about 2 μm, a negative zeta potential, and a CWST of from about 60 to about 70 dynes/cm.

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5,501,796

## METHOD FOR SEPARATING MATERIALS

William G. Kozak, Hatfield; Dharmesh Chovatia, Bensalem, and George A. Smith, Newtown, all of Pa., assignors to Henkel Corporation, Plymouth Meeting

Filed Aug. 8, 1994, Ser. No. 287,014
Int. Cl.[6] B01D *11/04*
U.S. Cl. 210—638 20 Claims

20. A process for the separation of naphthalenesulfonate-based carbonyl condensates from water, said process comprising:

contacting a mixture comprised of water and a naphthalenesulfonate-based carbonyl condensate selected from the group consisting of formaldehyde condensates of naphthalenesulfonic acids, formaldehyde condensates of lower-alkyl substituted naphthalenesulfonic acids, and mixtures of two or more of such members, said condensate having a number average molecular weight of from about 2,000 to about 4,000 and a weight average molecular weight of from about 7,000 to about 13,000, wherein said naphthalene-based condensate comprises 10 parts per million to about 5% by weight of said mixture thereof with water, with a liquid organic phase comprised of a cationic lipophilic amine selected from the group of tri-alkyl tertiary amines or tetra-alkyl quaternary amines wherein the total number of carbon atoms in the alkyl groups is at least 22 and each of at least three of the alkyl groups has at least four carbon atoms, wherein the ratio of cationic amine equivalents of said cationic lipophilic amine to sulfonate equivalents of said naphthalenesulfonate-based carbonyl condensate is from about 0.3:1 to about 30:1, to form an aqueous phase depleted with respect to said mixture of naphthalenesulfonate-based carbonyl condensate and a liquid organic phase enriched in naphthalenesulfonate-based carbonyl condensate, and

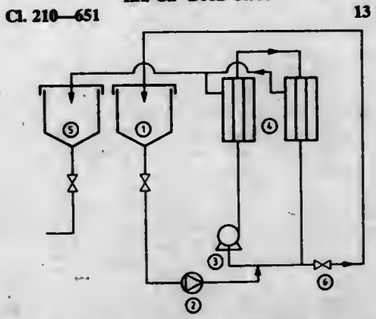
separating said aqueous phase depleted with respect to said mixture of naphthalenesulfonate-based carbonyl condensate and said liquid organic phase enriched with respect to naphthalenesulfonate-based carbonyl condensate, wherein said contacting and separating are effective in reducing the concentration of said naphthalenesulfonate-based carbonyl condensate in said mixture to less than about 0.01% by weight.

5,501,797

## PROCESS FOR RECOVERY OF RAW MATERIALS IN THE ASPARTAME PREPARATION PROCESS

Geert W. Meindersma, Stein, and Franciscus H. P. Vergossen, Echt, both of, Netherlands, assignors to Holland Sweetener Company V.o.F., Netherlands

Filed Aug. 30, 1994, Ser. No. 298,708
Int. Cl.[6] B01D *61/00*
U.S. Cl. 210—651 13 Claims



1. A process for recovering raw materials from an aqueous process stream from the production of aspartame, wherein said aqueous process stream contains dissolved salt and raw materials, which process comprises subjecting to nanofiltration said aqueous process stream having a salt content of at least 1% by weight, with the aid of a composite nanofiltration membrane having a retention between about 50 and about 100% for components having a molecular weight greater than about 100 Daltons and a retention between about +20 and about −40% for monovalent salts, wherein a retentate containing the raw materials is formed, and recovering the raw materials contained in the retentate or recycling the retentate.

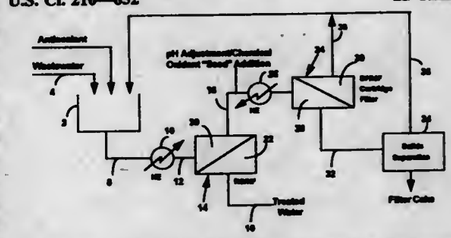
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5,501,798

## MICROFILTRATION ENHANCED REVERSE OSMOSIS FOR WATER TREATMENT

Riad A. Al-Samadi, Burlington, and Andrew Benedek, Toronto, both of, Canada, assignors to Zenon Environmental, Inc., Burlington, Canada

Filed Apr. 6, 1994, Ser. No. 225,454
Int. Cl.[6] B01D *61/00*
U.S. Cl. 210—652 22 Claims



1. An improved method of extending the useful life of a reverse osmosis (RO) membrane having a high pressure side and a low pressure side, the membrane used for separating sparingly soluble inorganic materials from an aqueous liquid, the method capable of 90% to 99% recovery of purified liquid, comprising:

(a) introducing and aqueous liquid containing sparingly soluble inorganic materials to which have been added antiscalant to the high pressure side of a RO membrane;

(b) pressurizing said aqueous liquid on said high pressure side to produce purified liquid on the low pressure side substantially free of said inorganic materials;

(c) removing liquid containing concentrate sparingly soluble inorganic materials from the high pressure side of said RO

membrane, the liquid being removed before precipitation of said concentrated sparingly soluble inorganic material on the RO membrane;
(d) recovering purified liquid as treated water on the low pressure side of said RO membrane at a rate of at least 70% the rate of introducing said aqueous liquid containing sparingly soluble inorganic materials to the high pressure side of said RO;
(e) precipitating said sparingly soluble inorganic materials removed from the high pressure side of the RO membrane to provide liquid containing inorganic precipitate;
(f) passing said liquid containing inorganic precipitate to a high pressure side of a microfiltration (MF) membrane;
(g) passing liquid form the high pressure side of said MF membrane to a low pressure side of said MF membrane thereby providing substantially precipitate-free liquid and concentrating said particles of said inorganic materials on the high pressure side of said MF membrane;
(h) removing particles of said inorganic materials from the high pressure side of said MF membrane; and
(i) recirculating precipitate-free liquid from the low pressure side of said MF membrane and introducing to the high pressure side of the RO membrane thereby providing for high levels of recovery of said purified liquid and extending the life of said RO membrane.

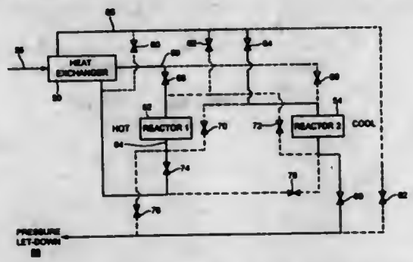
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**5,501,799**

**METHOD TO REMOVE INORGANIC SCALE FROM A SUPERCRITICAL WATER OXIDATION REACTOR**

**Luke D. Bond, Etobicoke; Charles C. Mills, Mississauga; Philip Whiting, Milton, all of, Canada; Stanley L. Koutz, San Diego, Calif.; David A. Hazlebeck, El Cajon, Calif., and Kevin W. Downey, San Diego, Calif., assignors to AbitibiPrice, Inc., Mississauga, Canada, and General Atomics, San Diego, Calif.**

**Filed Jun. 7, 1994, Ser. No. 255,070**
**Int. Cl.[6] C02F 1/74**
**U.S. Cl. 210—721** **9 Claims**




1. A method of oxidizing a feed stream comprising organic compounds, inorganic compounds and water in two or more supercritical water oxidation reactors connected to permit the feed stream to be directed for oxidation in any one of said reactors and the effluent stream from any one of said reactors to be directed to flow through any one or more of the remaining reactors as a flushing stream, the method comprising the steps of:
a) directing said feed stream to one of said supercritical water oxidation reactors and supercritically oxidizing said feed stream whereby said organic compounds are oxidized and at least some of said inorganic compounds precipitate;
b) cooling the effluent stream from said reactor in which supercritical oxidation is occurring to a temperature and pressure at which inorganic scale formed under supercritical conditions is soluble in said effluent stream and directing said effluent stream as a flushing stream to flush one or more of said remaining connected supercritical water oxidation reactors to remove inorganic precipitate from said one or more of said remaining connected reactors;
c) repeating steps (a) and (b) with one of said remaining connected supercritical water oxidation reactors.

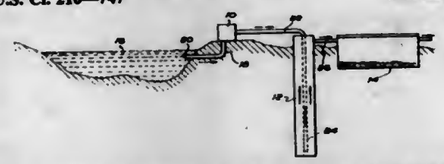
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**5,501,800**

**TREATMENT OF WATER TO REMOVE GAS VACUOLATE CYANOBACTERIA**

**Keith B. Clarke, Decoy House, Browston, Great Yarmouth, Norfolk NR31 9DP, and Anthony E. Walsby, 27 Old Saeed Park, Stoke Bishop, Bristol BS9 1RG, both of, England**

**Division of Ser. No. 735,615, Jul. 25, 1991, Pat. No. 5,422,002, which is a continuation of Ser. No. 435,706, Nov. 13, 1989, abandoned, which is a continuation of Ser. No. 101,658, Sep. 28, 1987, abandoned. This application Mar. 7, 1995, Ser. No. 399,824**
**Int. Cl.[6] C02F 1/00**
**U.S. Cl. 210—747** **3 Claims**



1. A method of treatment of water to remove gas vacuolate cyanobacteria which includes the steps of: hydrostatically subjecting the water removed from a body of water to a predetermined pressure in order to collapse the gas vesicles inside the cells of the cyanobacteria; and separating the thus treated cyanobacteria by allowing them to sink to the bottom of settlement means along with any other sediment in the water.

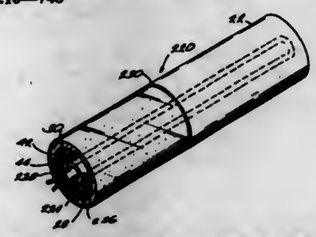
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**5,501,801**

**METHOD AND APPARATUS FOR DESTROYING ORGANIC COMPOUNDS IN FLUID**

**Yin Zhang; John C. Crittenden; David W. Hand, all of Houghton, and David L. Perram, Allouez, all of Mich., assignors to Board of Control of Michigan Technology University, Houghton, Mich.**

**Filed Nov. 30, 1993, Ser. No. 160,102**
**Int. Cl.[6] C02F 1/48**
**U.S. Cl. 210—748** **23 Claims**



1. A method for photocatalytic oxidation of organic contaminants in a fluid, said method comprising the steps of:
(a) providing a reactor including a treatment zone containing a $TiO_2$ photocatalyst affixed to an adsorbent support material, the $TiO_2$ photocatalyst being formed on the adsorbent support material by hydrolysis of a coating of titanium isopropoxide;
(b) introducing the fluid into said treatment zone for contact with said $TiO_2$ photocatalyst and said adsorbent support material and exposing the fluid and said $TiO_2$ photocatalyst and support material to UV radiation while the fluid is in said treatment zone, for a first period sufficient to destroy a desired amount of the organic contaminants in the fluid and to regenerate the support material;
(c) continuing to introduce the fluid into said treatment zone for contact with said $TiO_2$ photocatalyst and said adsorbent support material in the absence of UV radiation for a second period when the adsorbent support material is capable of removing organic contaminants from the fluid; and
(d) optionally repeating steps (b) and (c).



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**5,501,802**

**METHOD FOR TREATING WATER USING AN ORGANIC SANITIZER AND A PERSULFATE**

**Dean S. Thorp, Levittown, Pa.; Frank E. Caropreso, Skillman, N.J.; Robert H. Tieckelmann, Trenton, N.J., and Donald Lapham, III, Plainsboro, N.J., assignors to FMC Corporation, Philadelphia, Pa.**

**Continuation of Ser. No. 51,488, Apr. 22, 1993, abandoned. This application Sep. 23, 1994, Ser. No. 311,834**
**Int. Cl.[6] C02F 1/50**
**U.S. Cl. 210—758** **8 Claims**

1. A method of treating water, comprising
introducing a chelating agent to the water for the purpose of chelating metal cations present in the water;
providing an antichlor;
adding an effective amount of biguanide sanitizer;
applying an effective amount of a salt containing $S_2O_8$ oxidizer.

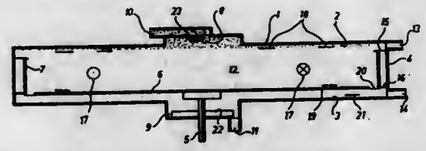
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**5,501,803**

**METHOD AND APPARATUS FOR SEPARATING PARTICLES FROM A BASE LIQUID**

**Gösta Walin, Nitaregatan, Sweden, assignor to Gosta Wahlin Havsteknik AB, Vastra Frolunda, Sweden**

**PCT No. PCT/SE92/00188, § 371 Date Jan. 17, 1994, § 102(e) Date Jan. 17, 1994, PCT Pub. No. WO92/16279, PCT Pub. Date Oct. 1, 1992**
**PCT Filed Mar. 24, 1992, Ser. No. 122,455**
**Claims priority, application Sweden, Mar. 25, 1991, 910 0887**
**Int. Cl.[6] B01D 21/20**
**U.S. Cl. 210—787** **13 Claims**



13. A method for separation from a base liquid of particles and other substances contained therein, the particles and other substances having a density deviating from a density of the base liquid, the method comprising steps of:
providing a housing with a floor, a ceiling, a connecting peripheral wall, a central portion, and an interior space;
further providing a rotatable element for reception within said housing interior, said housing further including a first collection pocket in said ceiling and a second collection pocket in said floor, and an inlet channel and a first outlet channel in said peripheral wall, said first collection pocket coupled to a second outlet channel and said second collection pocket coupled to said third outlet channel;
providing a rotatable element within the interior of said housing, said rotatable element comprising a first plurality of mutually spaced elements and a second plurality of mutually spaced elements, the second plurality of mutually spaced elements interweaved between the first plurality of elements such that the first and second plurality of mutually spaced elements have respective surfaces which are substantially parallel to one another and form spaces therebetween;
introducing the base liquid and the particles and other substances contained therein into the inlet channel at the periphery of the housing and into the space between the first and second surfaces of the rotatable element;
rotating the first and second elements relative to one another in the same direction and moving the first and second elements towards and away from one another based on rotational rates;
separating particles and other substances having a density deviating from the density of the base liquid;
collecting any particles and other substances lighter than the base liquid in the first collection pocket and then removing the lighter particles and substances through the second outlet channel;
collecting any particles and other substances heavier than the base liquid in the second collection pocket and then removing the heavier particles and substances through the third outlet channel, the second and third outlet channels being disposed on opposing sides of the rotatable element at the central portion of the ceiling and floor, respectively;
removing the base liquid from the housing through the first outlet channel.

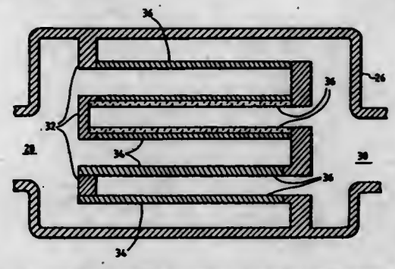
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**5,501,804**

**APPARATUS AND PROCESS FOR BLENDING ELASTOMER PARTICLES AND SOLUTION INTO A UNIFORM MIXTURE**

**Richard A. Hall; Michael G. O'Connell, both of Naperville, and Evelyn A. Taylor, Edwardsville, all of Ill., assignors to Amoco Corporation, Chicago, Ill.**

**Filed Jul. 14, 1994, Ser. No. 275,293**
**Int. Cl.[6] B01D 17/12;36/00**
**U.S. Cl. 210—805** **14 Claims**



6. A process for blending elastomer particles and solution into uniform mixtures, which comprises the steps of
(A) providing a mechanical apparatus which comprises;
a mechanical cell containing a solid core having an entrance surface, an exit surface spaced apart from and substantially parallel to the entrance surface, and a plurality of minute core passageways therebetween for flow of an elastomer-containing hydrocarbon solution from the entrance surface to the exit surface, wherein the passageways have a characteristic dimension of predetermined size to reduce globules of elastomer to small particles distributed evenly in liquid hydrocarbon solution without plugging the passageways, the cell further comprising an entrance manifold means in flow communication with the plurality of core passageways at the entrance surface and an exit manifold means in flow communication with the same passageways at the exit surface, thereby in flow communication with the entrance manifold means,
a pump means having an inlet port and an outlet port, which outlet port is in flow communication with the entrance manifold means, and
a flow apportioning means having an inlet port in flow communication with the exit manifold means and at least a first and a second outlet ports, at least one of which outlet ports is in flow communication with the inlet port of the pump means,
(B) controlling temperatures within the mechanical apparatus to temperatures in a range from about 90° F. to about 180° F.,
(C) introducing an elastomer-containing liquid stream into the inlet port of the pump means, transferring elastomer-

containing liquid from the outlet port of the pump means at a pressure in a range upward from about a pressure at the entrance surface in a range upward from about 5 psi, and expelling an elastomer-containing liquid stream, and

(D) apportioning the elastomer-containing liquid stream into at least a first portion and product portion with the flow apportioning means, transferring the first portion from an outlet port of the flow apportioning means to the inlet port of the pump means, and expelling a uniform elastomer-containing liquid product portion from another outlet port of the flow apportioning means;

wherein a recirculation factor, expressed as a ratio of the first portion to the product portion, is a number in a range from about 0.01 to about 10.

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**5,501,805**

**FRAGRANCE COMPOSITIONS AND THEIR USE IN DETERGENT PRODUCTS**

**John M. Behan, Ashford, and Christopher F. Clements, Folkestone, both of, England, assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.**

**Continuation of Ser. No. 89,154, Jul. 8, 1993, abandoned, which is a division of Ser. No. 697,918, May 1, 1991, abandoned, which is a continuation-in-part of Ser. No. 539,636, Jun. 18, 1990, abandoned. This application Apr. 25, 1995, Ser. No. 428,398**

**Claims priority, application United Kingdom, Jun. 19, 1989, 8914055**

**Int. Cl.[6] C11D *3/50;* C11B *9/00;* D06M *13/00***

**U.S. Cl. 252—8.6** **11 Claims**

1. In a fabric meaning liquid or solid composition include, from 0.1% to 5% of a perfume composition of fragrance materials, the improvement wherein the content of fragrance materials in the perfume composition comprises (a) about 20% to 60% of at least one musk, based on the weight of the perfume composition, (b) at least 10% of at least one salicylate, based on the weight of the perfume composition on, and (c) at least about 20% of other fragrance materials which are neither musk nor salicylate, based on the weight of the perfume composition, and wherein the fragrance materials (a), (b) and (c) together have an odour intensity not greater than that of a 10% solution of benzyl acetate in dipropylene glycol.

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**5,501,806**

**CONCENTRATED LIQUID FABRIC SOFTENING COMPOSITION**

**Amjad Farooq, Somerset, N.J.; Regis Cesar, Villers-le-Bouillet, and Francoise Deville, Liege, both of, Belgium, assignors to Colgate-Palmolive Co., New York, N.Y.**

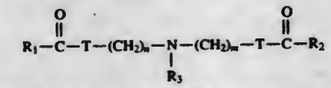
**Continuation-in-part of Ser. No. 92,186, Jul. 15, 1993, abandoned. This application Mar. 14, 1994, Ser. No. 213,308**

**Int. Cl.[6] D06M *13/10;13/325***

**U.S. Cl. 252—8.8** **14 Claims**

1. A stable, pourable and water dispersible fabric softener composition comprising an aqueous dispersion containing particles from about 0.01 μm to about 25 μm of about 28 to about 50 weight percent of the total formulation of components (A) and (B) combined, with the proviso that at least 20% of hydrocarbon groups in components (A) and (B) contain unsaturated carbon to carbon bonds, wherein:

(A) a is an inorganic or organic acid salt of a fabric softening compound of formula (I):



(I)

wherein $R_1$ and $R_2$, independently, represent $C_{12}$ to $C_{30}$ aliphatic hydrocarbon groups,

$R_3$ represents $(CH_2CH_2O)_pH$, $CH_3$ or H,

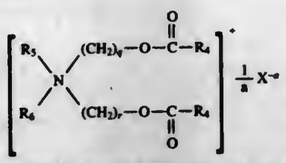
T represents NH,

n=1to 5,

m=1 to 5, and

p=1 to 10;

(B) is a biodegradable fatty ester quaternary ammonium compound of formula (11):



(II)

wherein each $R_4$ independently represents an aphatic hydrocarbon group having from to 8 to 22 carbon atoms,

$R_5$ represents $(CH_2)_sR_7$ (where $R_7$ represents an alkoxy carbonyl group containing from 8 to 22 carbon atoms, benzyl, phenyl, ($C_1$–$C_4$)-alkyl substituted phenyl, OH or H); $R_6$ represents $(CH_2)_tR_8$ (where $R_8$ represents benzyl, phenyl ($C_1$–$C_4$) alkyl substituted phenyl, OH or H); q, r, s and t, each independently, represent a number of 1 to 3; and x is an anton of valence a; and

(C) an aqueous solvent including an anti-gelling effective amount of electrolyte;

(D) the weight ratio of formula (I) to formula (II) is from about 5:1 to about 1:5; and

(E) wherein the composition has a viscosity of less than 2,000centipoise at 20° C.

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**5,501,807**

**OVERBASED CARBOXYLATES**

**Rainer Benda, Avenue Salome 18, 1150-Brussels, Belgium; Edouard M. Mathieu, 10 Rue de la Mare Saint Aignan, 76130 Mont-Saint-Aignan, and Olivier Letailleur, BB 32 Les Pommiers, 76170 Lillibone, both of, France**

**Filed Jul. 12, 1994, Ser. No. 211,777**

**Claims priority, application United Kingdom, Jan. 14, 1991, 9121736.4**

**Int. Cl.[6] C10M *159/20***

**U.S. Cl. 252—18** **6 Claims**

1. A process for the production of basic calcium carboxylic acid salts comprising

i) Neutralising a C7 to C15 aliphatic carboxylic acid in the presence of a volatile solvent

ii) Adding excess calcium in which the molar ratio of calcium to the organic carboxylic acid is between 2 and 4

iii) Carbonating the mixture at a temperature of from 15° C. to 60° C.

iv) Removal of the volatile solvent and water of reaction and adding a diluent,

wherein the carboxylic acid comprises saturated C8, C9 and C10 oxo acids in which the oxo acids contains less than or equal to 10% by weight of linear acid, less than or equal to 10% by weight of acids which are branched on carbon 2, and greater than 80% by weight of acids which are mono- or polysubstituted on carbon 3 or carbons of higher rank, or C7 to C15 acids comprising acids mono- or polysubstituted in the 3-position or carbons of higher rank with less than 40% by weight of linear acids and less than 20% by weight of acids substituted on carbon 2.



**5,501,808**

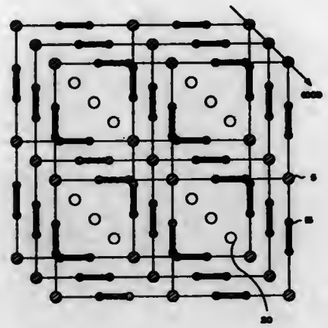
**CRYSTALLINE-LIKE TRANSITION METAL MATERIAL**

**Philip Patalano, 521 Lauiki St. #6, Honolulu, Hi. 96826**

**Filed Apr. 18, 1994, Ser. No. 228,782**

**Int. Cl.[6] C01G *49/00;53/00;55/00***

**U.S. Cl. 556—28** **42 Claims**




6. A solid planar compound comprising a transition metal selected from the group consisting of Ni(II), Pd(II), Pt(II), Au(III), Ir(I), and Rh(I) and acetylide ligands having a unit cell with two axes, a and b, independently having dimensions of a value of from 4.9N Å to 5.1N Å, wherein N is a multiplier less than 100.

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**5,501,809**

**ELECTRORHEOLOGICAL FLUIDS CONTAINING PARTICLES OF A POLAR SOLID MATERIAL AND AN INACTIVE POLYMERIC MATERIAL**

**Barton J. Schober; Carlos A. Piedrahita, both of Mentor, and Joseph W. Plalet, Euclid, all of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio**

**Filed Aug. 19, 1994, Ser. No. 293,536**

**Int. Cl.[6] C10M *107/36;101/02;149/00***

**U.S. Cl. 252—73** **29 Claims**

1. An electrorheological fluid of a particulate phase and a continuous phase, comprising:

(a) a hydrophobic liquid medium; and

(b) a dispersed particulate phase comprising

(i) a polar solid material consisting of a cellulosic material which is capable of exhibiting electrorheological activity in the presence of a low molecular weight polar material and which exhibits a room-temperature conductivity of less than about $10^{-4}$ S/cm; and

(ii) a non-cellulosic polymeric material consisting of polymers derived from polymerization of monomeric units of alkyloxazolines which has a solubility parameter of about 15 to about 50 $(MPa)^{1/2}$ and which exhibits substantially no electrorheological activity in the absence of a low molecular weight polar material.

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**5,501,810**

**PROCESS FOR INCREASING THE APPARENT DENSITY OF SPRAY-DRIED DETERGENTS**

**Hans Eugster, Prattein, Switzerland; Herbert Reuter, Haan, Germany, and Beat Buser, Mochlin, Switzerland, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany**

**PCT No. PCT/EP93/00775, § 371 Date Dec. 9, 1994, § 102(e) Date Dec. 9, 1994, PCT Pub. No. WO93/21300, PCT Pub. Date Oct. 28, 1993**

**PCT Filed Mar. 31, 1993, Ser. No. 318,696**

**Claims priority, application Germany, Apr. 8, 1992, 42 11 699.6**

**Int. Cl.[6] C11D *11/00;17/06***

**U.S. Cl. 252—89.1** **12 Claims**

1. A process for increasing the apparent density of a spray-dried detergent composition, comprising spraying said detergent composition with a liquid nonionic surfactant and an aqueous solution of an alkali metal silicate and mixing the mixture in a mixing unit.

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**5,501,811**

**AZEOTROPES OF OCTAMETHYLTRISILOXANE AND ALIPHATIC OR ALICYCLIC ALCOHOLS**

**Ora L. Flaningam, and Dwight E. Williams, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.**

**Filed Apr. 24, 1995, Ser. No. 427,316**

**Int. Cl.[6] C11D *7/26;7/50;* C09K *3/18;* H05K *3/26***

**U.S. Cl. 252—174.15** **8 Claims**

1. A composition consisting essentially of:

(a) about 91–98% by weight octamethyltrisiloxane and about 2–9% by weight 1-heptanol, wherein the composition is homogenous and azeotropic at a temperature within the range of about 135°–162.4° C. inclusive, wherein the composition has a vapor pressure of about 360.2 Torr at 135° C. when the composition consists essentially of 98% by weight octamethyltrisiloxane and 2% by weight 1-heptanol, and wherein the composition has a vapor pressure of about 1,000 Torr at 162.4° C. when the composition consists essentially of 91% by weight octamethyltrisiloxane and 9% by weight 1-heptanol; or

(b) about 74–98% by weight octamethyltrisiloxane and about 2–26% by weight cyclohexanol, wherein the composition is homogenous and azeotropic at a temperature within the range of about 75°–156.6° C. inclusive, wherein the composition has a vapor pressure of about 54.9 Torr at 75° C. when the composition consists essentially of 98% by weight octamethyltrisiloxane and 2% by weight cyclohexanol, and wherein the composition has a vapor pressure of about 1,000 Torr at 156.6° C. when the composition consists essentially of 74% by weight octamethyltrisiloxane and 26% by weight cyclohexanol; or

(c) about 88–99% by weight octamethyltrisiloxane and about 1–12% by weight 4-methylcyclohexanol, wherein the composition is homogenous and azeotropic at a temperature within the range of about 125–161.9° C. inclusive, wherein the composition has a vapor pressure of about 345.8 Torr at 125° C. when the composition consists essentially of 99% by weight octamethyltrisiloxane and 1% by weight 4-methylcyclohexanol, and wherein the composition has a vapor pressure of about 1,000 Torr at 161.9° C. when the composition consists essentially of 88% by weight octamethyltrisiloxane and 12% by weight 4-methylcyclohexanol.

2. A composition consisting essentially of:

(a) about 78–99% by weight octamethyltrisiloxane and about 1–22% by weight 1-heptanol, wherein the composition is homogeneous and azeotrope-like at a temperature within one degree of 152.1° C. at 760 Torr; or

(b) about 54–89% by weight octamethyltrisiloxane and about 11–46% by weight cyclohexanol, wherein the composition is homogeneous and azeotrope-like at a temperature within one degree of 147° C. at 760 Torr; or

(c) about 74–99% by weight octamethyltrisiloxane and about 1–26% by weight 4-methylcyclohexanol, wherein the composition is homogeneous and azeotrope-like at a temperature within one degree of 151.9° C. at 760 Torr.

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**5,501,812**

**TOILET BAR COMPOSITIONS CONTAINING GLYCOLIPID SURFACTANTS AND A PROCESS FOR MANUFACTURING SUCH SURFACTANTS**

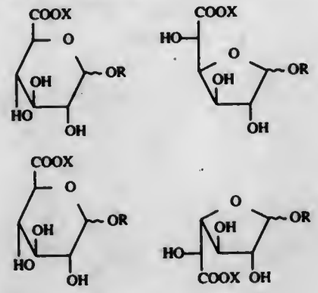
**Robert Vermeer, Nutley; Bijan Harichian, South Orange, both of N.J.; John Gormley, Chestnut Ridge, N.Y.; Michael Massaro, Ridgefield Park, and George Grudev, Hewitt, both of N.J., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.**

**Continuation-in-part of Ser. No. 816,421, Dec. 31, 1991, abandoned. This application Oct. 12, 1993, Ser. No. 135,237**

**Int. Cl.[6] C11D *1/18;1/38;3/26;7/32***

**U.S. Cl. 252—174.17** **17 Claims**

1. A toilet bar soap composition comprising about 1 to about 45% by weight of an alkali metal (alkyl glycoside) uronate selected from the group consisting of:



wherein:

R is a substituted or unsubstituted, saturated or unsaturated alkyl group having 8 to 24 carbons; and

X is an alkali metal.

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**5,501,813**

**THICKENER FOR AQUEOUS COMPOSITIONS**

**Stephen A. Fischer, Yardley; Kartar S. Arora, Chalfont; Reuben Grinstein, Blue Bell; Patrick M. McCurry, Jr., Lansdale, and Judith C. Giordan, Villanova, all of Pa., assignors to Henkel Corporation, Plymouth Meeting, Pa.**

**Filed Nov. 2, 1993, Ser. No. 146,549**

**Int. Cl.[6] C11D *1/72;3/22;3/20;1/74***

**U.S. Cl. 252—174.17** **4 Claims**

1. A thickener composition comprising: (a) from about 1.0% to about 25% by weight of 1,2-propanediol; (b) from about 5% to about 25% by weight of water; (c) from about 20% to about 60% by weight of a nonionic surfactant having an HLB of less than about 14 selected from the group consisting of nonylphenol EO-9, decyl alcohol EO-6, an alkyl polyglycoside of the formula I

$$R_1O(Z)_a \qquad (I)$$

wherein $R_1$ is a monovalent organic radical having from about 6 to about 30 carbon atoms; Z is saccharide residue having 5 or 6 carbon atoms; a is a number having a value from 1 to about 6, and combinations thereof; (d) from about 25% to about 60% by weight of an ester of an ethoxylated polyol selected from the group consisting of pentaerythritol PEG-120 tetra C12–C18 ester, pentaerythritol PEG-90 tetra isostearate, pentaerythritol PEG-130 tetra isostearate, pentaerythritol PEG-120 tetra isostearate and combinations thereof.

**5,501,814**

**DETERGENTS AND CLEANING PREPARATIONS CONTAINING SELECTED BUILDER SYSTEMS**

**Konrad Engelskirchen, Meerbusch; Herbert Fischer; Beatrix Kottwitz, both of Duesseldorf; Horst Upadek, Ratingen, and Christian Nitsch, Duesseldorf, all of, Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany**

**PCT No. PCT/EP92/02368, § 371 Date Apr. 22, 1994, § 102(e) Date Apr. 22, 1994, PCT Pub. No. WO93/08251, PCT Pub. Date Apr. 29, 1993**

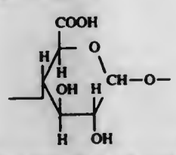
**PCT Filed Oct. 14, 1992, Ser. No. 211,884**

**Claims priority, application Germany, Jan. 23, 1991, 41 34 914.8**

**Int. Cl.[6] C11D *9/20;2/26***

**U.S. Cl. 252—174.17** **21 Claims**

1. A surfactant-containing detergent composition comprising finely-divided, water-insoluble builder components and from 0.5% to 15% by weight, based on the weight of said composition, of an at least partly water-soluble co-builder, said co-builder comprising the oxidation products of polyglucosans wherein, on average, at least 15 mole percent thereof consists of oxidized anhydroglucose units corresponding to formula I



(I)

and which have an average molecular weight of up to 15,000.

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**5,501,815**

**PLASTICWARE-COMPATIBLE RINSE AID**

**Victor F. Man, Minneapolis, Minn., assignor to Ecolab Inc., St. Paul, Minn.**

**Filed Sep. 26, 1994, Ser. No. 312,460**

**Int. Cl.[6] C11D *1/66;3/00;7/26;7/00***

**U.S. Cl. 252—174.17** **20 Claims**

1. An aqueous rinse aid, comprising:

(a) about 5–10 wt-% of an alkyl polyglycoside; and

(b) about 5–40 wt-% of a nonionic, reverse, polyoxyethylene-containing polyoxyalkylene block copolymer having an ethylene oxide content of less than about 50 wt-% of the copolymer comprising $-(EO)_x-(PO)_y$, wherein EO is ethylene oxide, PO is propylene oxide, x if from 1 to 1000, and y is from 1 to 500, wherein the rinse aid upon dilution with water results in an aqueous rinse solution having desired sheeting, low-foaming characteristics and compatibility with plasticware.

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**5,501,816**

**AQUEOUS BASED SOLVENT FREE DEGREASER COMPOSITION**

**John J. Burke, Sparta, N.J.; Joanne P. Gorczyca, Livonia, and Gregory W. Drewno, Riverview, both of Mich., assignors to BASF Corporation, Mount Olive, N.J.**

**Filed Jul. 12, 1994, Ser. No. 273,690**

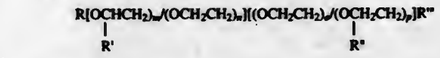
**Int. Cl.[6] C11D *1/70***

**U.S. Cl. 252—174.21** **1 Claim**

1. An aqueous based, solvent free degreaser composition, comprising on a weight basis:

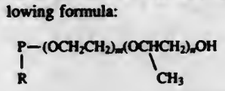


a) about 2.5–5.0% of one alcohol alkoxylate with a fatty alcohol moiety selected from the group of compounds having the formula:



wherein R is a $C_{12}$ to $C_{15}$ branched or straight chain alkyl group, m is 1.5, n is 1, o is 9, p is 3.5 and R' is $CH_3$; $—CH_2CH_3$, and mixtures thereof, R" is $—CH_3$, $—CH_2CH_3$, and mixtures thereof, and R"' is —OH, $—CH_3$, $—O—C_3$-$C_{18}$ hydroxyalkyl group and mixtures thereof;

b) about 2.5–5.0% of one alkyl phenol alkoxylates of the following formula:



wherein R is a $C_8$ branched or straight chain alkyl group, m is 10 and n is 0 and P represents a phenyl group;

c) about 2.5–5.0% of one alkyl oxyethylate of the following formula:



wherein R is a $C_{12}$ to $C_{13}$ branched or straight chain alkyl group and x is within the range of about 6 to 8; and

d) water;

wherein further, the ratio of (a) to (b) to (c) is 1:1:1.

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**5,501,817**

**PROCESS FOR STABILIZING AQUEOUS ZEOLITE SUSPENSIONS USING A LINEAR FATTY ALCOHOL POLYGLYCOL ETHER HAVING A SPECIFIC DEGREE OF ETHOXYLATION**

**Ditmar Kischkel, Monheim; Karl Schmid, Mettmann; Andreas Syldath, and Thomas Krohnen, both of Duesseldorf, all of, Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany**

**PCT No. PCT/EP93/00227, § 371 Date Aug. 10, 1994, § 102(e) Date Aug. 10, 1994, PCT Pub. No. WO93/16159, PCT Pub. Date Aug. 19, 1993**

**PCT Filed Feb. 1, 1993, Ser. No. 284,594**

**Claims priority, application Germany, Feb. 10, 1992, 42 03 789.1**

**Int. Cl.[6] C11D *3/12;1/72***

**U.S. Cl. 252—174.25** **4 Claims**

1. A process for stabilizing an aqueous zeolite suspension, which comprises: adding to the suspension comprising from 20% to 60% by weight of zeolite, from 0.1 to 5% by weight of the suspension of a suspending agent consisting essentially of at least one fatty alcohol polyethylene glycol ether of the formula: $R^1O—(CH_2CH_2O)_n$ wherein $R^1$ consists essentially of a linear aliphatic alkyl group containing 12–14 carbon atoms and n is an average number of 4.2 to 4.8 for the total amount of fatty alcohol polyethylene glycol ether suspending agent.

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**5,501,818**

**FERROELECTRIC CHIRAL SMECTIC LIQUID CRYSTAL COMPOSITION AND LIQUID CRYSTAL DEVICE USING SAME**

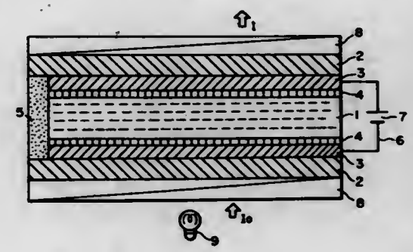
**Kenji Shinjo, Atsugi; Takao Takiguchi, Tokyo; Hiroyuki Kitayama, Sagamihara; Kazuharu Katagiri, Tama; Masataka Yamashita, Hiratsuka; Masahiro Terada, Atsugi; Takeshi Togano, and Masanobu Asaoka, both of Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 232,396, Apr. 25, 1994, abandoned, which is a continuation of Ser. No. 57,021, May 5, 1993, abandoned, which is a continuation of Ser. No. 370,712, Jun. 23, 1989, abandoned. This application Oct. 26, 1994, Ser. No. 329,619**

**Claims priority, application Japan, Jun. 24, 1988, 63-157675; Jul. 29, 1988, 63-188109; Jun. 9, 1989, 1-147989**

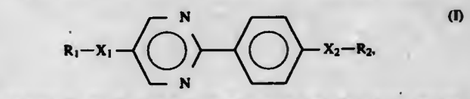
**Int. Cl.[6] C09K *19/34;19/30;19/12;19/20***

**U.S. Cl. 252—299.61** **21 Claims**



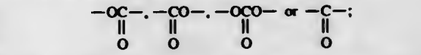
1. A ferroelectric chiral smectic liquid crystal composition, comprising:

at least one compound represented by the following formula (I):

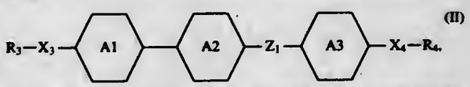


(I)

wherein $R_1$ and $R_2$ denote a linear or branched alkyl group having 1–18 carbon atoms $X_1$ and $X_2$ denote a single bond, —O—,

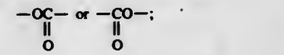


at least one compound represented by the following formula (II):

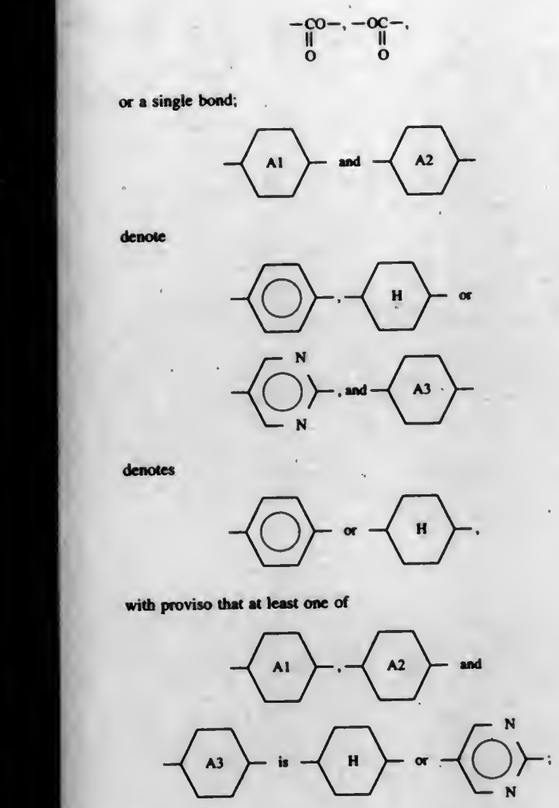


(II)

wherein $R_3$ and $R_4$ denote a linear or branched alkyl group having 1–18 carbon atoms $X_3$ and $X_4$ denote a single bond,



$Z_1$ denotes




**5,501,819**

## CEMENTITIOUS COMPOSITION

**Luc B. J. Westhof, Arendonk, Belgium; Ibrahim Turhan, Levittown; George G. Tessler, Holland, both of Pa., and Frans L. J. De Peuter, Mol, Belgium, assignors to ICI Americas Inc., Wilmington, Del.**

**Division of Ser. No. 123,164, Sep. 20, 1993, Pat. No. 5,366,600, which is a division of Ser. No. 836,662, Feb. 14, 1992, abandoned. This application Oct. 7, 1994, Ser. No. 319,579**

**Claims priority, application United Kingdom, Feb. 12, 1991, 9102891**

**Int. Cl.[6] H01B *1/02***

**U.S. Cl. 252—503** **6 Claims**

1. A conductive cementitious composition containing a cement and nickel-coated carbon fibres in an amount sufficient to increase the conductivity of the composition.

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**5,501,820**

## AQUEOUS ENZYMATIC DETERGENT COMPOSITIONS

**Carlo J. van den Bergh, Rotterdam, Netherlands; Howard B. Kaiserman, Guttenberg, N.J., and Marja Ouwendijk, Hellevoetsluis, Netherlands, assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.**

**Continuation of Ser. No. 964,534, Oct. 14, 1992. This application Mar. 17, 1994, Ser. No. 210,264**

**Claims priority, application European Pat. Off., Jan. 16, 1991, 91202692**

**Int. Cl.[6] C11D *3/386;1/04;1/12***

**U.S. Cl. 252—549** **7 Claims**

1. An aqueous enzymatic detergent composition having improved storage stability comprising:

(a) from about 5 to about 65% by weight of a surfactant system wherein said surfactant system comprises a mixture of:

(i) anionic surfactants selected from the group consisting of the salts of $C_9$–$C_{20}$ alkylarylsulfonates; $C_8$–$C_{22}$ primary or secondary sulphonates: $C_8$ to $C_{24}$ olephinsulfonates; sulfonated carboxylic acids; $C_8$–$C_{22}$ alkylslphates; $C_8$–$C_{24}$ alkylpolyglycolether sulphates, carboxylates and phosphates; and mixture thereof; and

(ii) a non-anionic surfactant selected from the group consisting of nonionic surfactant, cationic surfactant, amphoteric surfactant, zwitterionic surfactant and mixtures thereof;

the ratio of anionic to non-anionic being grater than 1:1,

(b) a mutant subtilisin enzyme in which the amino acid sequence has been changed at least at positions 195 and 222 by substitution with another amino acid, said enzyme being added in sufficient quantity to have an activity level of 0.01 to 200,000 GU/g;

(c) lipase enzyme having an activity of 10 to 30:000 LU/g; and

(d) optionally additionally comprising an enzyme selected from the group consisting of amylases and cellulase,

said composition being essentially free from bleaching agents.

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**5,501,821**

## OPTICAL ARTICLE EXHIBITING A LARGE FIRST HYPERPOLARIZABILITY

**Craig S. Willand, Pittsford; Douglas R. Robello, Webster; Edward J. Urankar, Ithaca, and Abraham Ulman, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

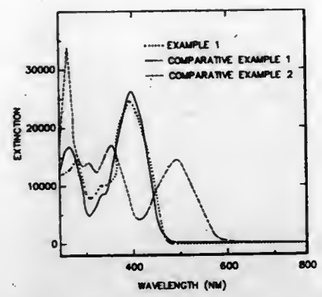
**Continuation-in-part of Ser. No. 976,832, Nov. 16, 1992, abandoned. This application Feb. 19, 1993, Ser. No. 19,815**

**Int. Cl.[6] F21V *9/00***

**U.S. Cl. 252—582** **26 Claims**

1. An optical article, for the transmission of electromagnetic radiation, said optical article including: a medium exhibiting a second-order electric susceptibility greater than $10^{-9}$ electrostatic units, said medium including polar aligned dipole subunits, each said dipole subunit having a plurality of noncentrosymmetric






molecular dipoles and a connector system, each said molecular dipole having an electron donor moiety, an electron acceptor moiety, and a linking moiety, said linking moiety having a pair of covalent bonds to said connector system, each said molecular dipole having a conjugated $\pi$ bonding system extending from said electron donor moiety along said linking moiety to said electron acceptor moiety to permit oscillation of said molecular dipole between a ground state and an excited state, said states differing in polarity, said connector system joining said linking moieties to complete a solitary ring or a system of fused rings retaining said molecular dipoles in substantially parallel relative vector relation.

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**5,501,822**

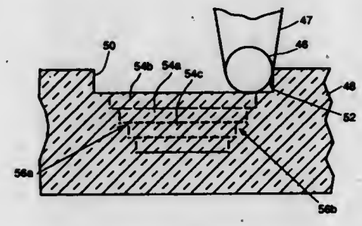
## FABRICATION METHOD FOR A 3-D OPTO-ELECTRONIC SYSTEM WITH LASER INTER-SUBSTRATE COMMUNICATION

**Randy L. Kubena, Agoura; Frederic P. Stratton, El Segundo; Gary M. Atkinson, Santa Monica; Hugh McNulty, Jr., Santa Monica, and James W. Ward, Canoga Park, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.**

**Division of Ser. No. 971,383, Nov. 4, 1992, Pat. No. 5,335,243. This application May 5, 1994, Ser. No. 238,131**

**Int. Cl.[6] B29D *11/00***

**U.S. Cl. 264—1.37** **9 Claims**




1. A method of forming a 3-dimensional mirror having a desired curvature, in an x-direction and a y-direction, for use in an opto-electronic system in-line with a laser on a substrate to redirect and restrict the expansion of a beam from said laser, comprising the steps of:

forming a substantially flat-walled mirror in the substrate in-line with the laser, and

raster scanning said flat-walled mirror with a focused ion beam (FIB) to obtain said desired curvature in both x- and y-directions so that said mirror both deflects and focuses said beam from said laser away from said substrate.

**5,501,823**

## PREPARATION OF ANHYDROUS TETRAZOLE GAS GENERANT COMPOSITIONS

**Gary K. Lund, Ogden, and Reed J. Blau, Richmond, both of Utah, assignors to Thiokol Corporation, Ogden, Utah**

**Continuation-in-part of Ser. No. 101,396, Aug. 2, 1993. This application Dec. 3, 1993, Ser. No. 162,596**

**The portion of the term of this patent subsequent to Jan. 7, 2014, has been disclaimed.**

**Int. Cl.[6] C06B *21/00***

**U.S. Cl. 264—3.1** **22 Claims**

1. A method for preparing a gas generating composition comprising the steps of:

a) pressing a quantity of gas generating material into pellets, said gas generating material comprising an oxidizer and a hydrated fuel, said fuel selected from the group consisting of tetrazoles; and

b) drying said pellets until the hydrated fuel is converted to anhydrous form.

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**5,501,824**

## THERMAL STEREOLITHOGRAPHY

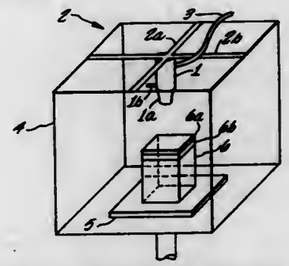
**Thomas A. Almquist, San Gabriel, and Dennis R. Smalley, Baldwin Park, both of Calif., assignors to 3D Systems, Inc., Valencia, Calif.**

**Continuation of Ser. No. 900,801, Jun. 17, 1992, abandoned, which is a continuation of Ser. No. 592,559, Oct. 4, 1990, Pat. No. 5,141,680, which is a continuation-in-part of Ser. No. 182,801, Apr. 18, 1988, Pat. No. 4,999,143. This application Nov. 8, 1993, Ser. No. 148,544**

**The portion of the term of this patent subsequent to Aug. 25, 2009, has been disclaimed.**

**Int. Cl.[6] B29C *35/08;41/02;41/36***

**U.S. Cl. 264—401** **30 Claims**




1. An apparatus for forming a three-dimensional object, comprising:

a building chamber within which the three-dimensional object is formed, for containing one of a building material and a support material which is capable of physical transformation upon exposure to synergistic stimulation, the building chamber being maintained at a temperature below a flowable temperature;

a container for containing the other one of the building material and support material comprising material which is normally solid but flowable when maintained at or above the flowable temperature;

a heater for maintaining the normally solid material at or above the flowable temperature thereby forming flowable material;

a nozzle coupled to the container for selectively dispensing a flow of the flowable material into the building chamber;

a computer coupled to the apparatus and programmed to transmit control signals;

a flow controller coupled to the nozzle and responsive to control signals, for controlling the flow of the flowable material into the building chamber;

a positioner responsive to control signals, for relatively positioning the nozzle and the three-dimensional object being formed;

an exposer positioned in proximity to the building chamber and responsive to control signals, for exposing the material contained in the building chamber;

wherein control signals are sent to the flow controller and the positioner to selectively dispense the flow of the flowable material according to a prescribed pattern, the pattern specifying at least one region where building material is to be located and at least one region where support material is to be located; and

wherein control signals are sent to the exposer to expose the material contained within the building chamber.

4. A method for forming a three-dimensional object, comprising the steps of:

maintaining a building chamber within which the three-dimensional object is formed, at a temperature below a flowable temperature;

containing one of a building material and a support material which is capable of physical transformation upon exposure to synergistic stimulation in the building chamber;

containing the other one of the building material and support material comprising material which is normally solid but flowable when maintained at or above the flowable temperature in a container;

maintaining the normally solid material in the container at or above the flowable temperature thereby forming flowable material;

relatively positioning the nozzle and the three-dimensional object being formed;

selectively dispensing a flow of the flowable material into the building chamber according to a prescribed pattern, the pattern specifying at least one region where building material is to be located and at least one region where support material is to be located;

exposing the material contained in the building chamber; and

repeating the positioning, dispensing and exposing steps to form the object.

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**5,501,825**

**PROCESS FOR THE MANUFACTURE OF A SHAPED SKI**

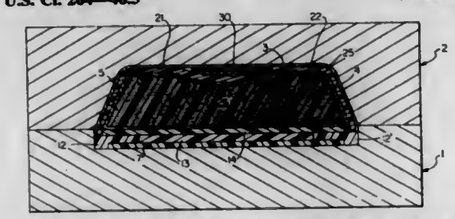
**François Jodelet, Voiron, France, assignor to Skis Rossignol SAS, France**

**Filed Sep. 2, 1994, Ser. No. 300,720**

**Claims priority, application France, Sep. 7, 1993, 93 10831**

**Int. Cl.[6] B29C *44/06;44/12***

**U.S. Cl. 264—46.5** **9 Claims**




1. A process for the manufacture of a shaped ski in a single step which includes simultaneously forming and molding, said process comprises:

positioning a mold containing a bottom part and a cover part, said parts having contoured wall surfaces defining the shape of the bottom, sides and top of the ski;

laying down a lower assembly in the bottom part of the mold, said lower assembly having a sliding surface, edges and at least one lower reinforcing element;

positioning an upper fibrous supple rainforcing layer on said lower assembly thereby forming a cavity between the lower assembly and the upper fibrous reinforcing layer;

placing a protective and decorative layer on said upper fibrous supple reinforcing layer, said protective and decorative layer forming at least part of narrow side faces and a top face of the ski;

positioning locally at least one rigid additional element between the upper fibrous supple reinforcement layer and the protective and decorative layer whereby the placement of said rigid additional element controls the relative position of said upper fibrous supple reinforcing layer with respect to the faces of the ski, said rigid additional element having the general shape of a half moon having a curvature side, the curvature side of said rigid additional element being directed towards the lower assembly;

closing the cover pan of the mold onto the bottom part of the mold;

injecting into said cavity constituents of a foam, said constituents expanding and thereby press, the upper fibrous supple reinforcement layer, the rigid additional element, the protective and decorative layer and the lower assembly against the contoured wall surfaces of the mold parts, whereby the orientation of the curvature side of the half moon shape of the rigid additional element prevents the abrupt deformation of the upper fibrous supple reinforcing layer;

cooling and opening the mold in order to remove the shaped ski.

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**5,501,826**

**PROCESS FOR MANUFACTURING LIGHTWEIGHT INORGANIC PARTICLES**

**Raymond T. Ertle, and Raymond J. Ertle, both of Pompton Plains, N.J., assignors to Cylatec Corp., Pompton Plains, N.J.**

**Continuation-in-part of Ser. No. 783,898, Oct. 29, 1991, Pat. No. 5,246,654. This application Sep. 17, 1993, Ser. No. 123,431**

**The portion of the term of this patent subsequent to Sep. 21, 2010, has been disclaimed.**

**Int. Cl.[6] B29B *9/02***

**U.S. Cl. 264—118** **8 Claims**

1. A method for producing dense, free-flowing and non-caking alkali metal silicate-based particles which are heat expandable into lightweight particles of a spumiform character, comprising the steps of:

providing a dilatant aqueous gel comprising an alkali metal silicate as the majority non-aqueous component, said silicate being present in said gel in a dissolved state; and the non-aqueous content of said gel being in the range of about 38 to 65% (w/w);

imposing upon said gel shearing forces exceeding the flow response characteristics of the gel, whereby the viscosity of the gel under said shearing forces becomes sufficiently high to cause a discontinuity in the gel, resulting in disruption into discrete particles;

surface conditioning said discrete particles while maintaining said particles as separate entities, to form a skin on the particles so that they will not agglomerate or coalesce with one another; and

drying the conditioned particles to form particles having about a 5 to 40% (w/w) moisture level.

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**5,501,827**

**LASER MARKABLE POLYTETRAFLUOROETHYLENE RESIN MATERIAL AND METHOD OF MAKING**

**Patricia J. Deeney, Lawrenceville, N.J.; David S. Garrison, Yardley, Pa., and David E. Newman, Huntington Station, N.Y., assignors to Garlock Inc., New York, N.Y.**

**Continuation of Ser. No. 107,850, Aug. 17, 1993, abandoned, which is a continuation-in-part of Ser. No. 10,979, Jan. 29, 1993, abandoned. This application Feb. 8, 1995, Ser. No. 385,724**

**Int. Cl.[6] B29C *47/00;35/02*; C08K *3/22*; C08L *27/12***

**U.S. Cl. 264—460** **18 Claims**

1. A process for producing a laser markable material particularly useful for electrical cables and insulated conductors, wherein



stable markings of substantially uniform, high contrast can be encoded throughout the extent of the material, said process including the steps of:

(a) selecting a particulate photosensitive material having a mean particle size greater than 3 microns;

(b) mixing the photosensitive material particles with a fine powder paste extrudable polytetrafluoroethylene resin;

(c) air milling the mixture produced in step (b) to produce a uniform dispersion of said photosensitive material particles and said fine powder polytetrafluoroethylene resin;

(d) blending the uniform dispersion produced in step (c) with an extrusion aid comprising a hydrocarbon solvent to produce a blend having a composition by weight of 2 to 9% photosensitive material particles, 8 to 23% extrusion aid and the balance polytetrafluoroethylene resin;

(e) forming the blend of step (d) into a preform suitable for paste extrusion; and

(f) paste extruding said preform to produce a uniformly photosensitive material-filled polytetrafluoroethylene resin material having a selected configuration to produce said laser markable material.

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**5,501,828**

**METHOD FOR PRODUCING A WEAR-DETECTION PROBE FOR A BRAKE LINING MATERIAL**

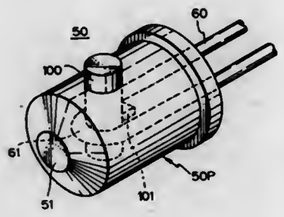
**Fumiyoshi Tanigawa, Mie, Japan, assignor to Sumitomo Wiring Systems, Ltd., Mie, Japan**

**Continuation of Ser. No. 45,228, Apr. 13, 1993, abandoned. This application Dec. 5, 1994, Ser. No. 353,359**

**Claims priority, application Japan, Jul. 8, 1992, 4-206033**

**Int. Cl.[6] B29C *53/02;70/72***

**U.S. Cl. 264—138** **3 Claims**




1. A method of making a wear-detection probe for a brake lining, comprising the steps of:

a) preparing a metal mold including a set of metal mold members and a positioning pin including a stopper extending from a side portion thereof;

b) removably disposing said positioning pin in a mating bore in a given one of said metal mold members of said metal mold so that said positioning pin stands upright on said given one of said metal mold members by means of said stopper;

c) bending a linear conductor around said positioning pin until a U-turned portion of the conductor is formed about said positioning pin;

d) enclosing said positioning pin and said U-turned portion by the other metal mold members of said metal mold to form a given interior space;

e) pouring a molten resin material into said given interior space to form a resin molded housing about the U-turned portion of the conductor and at least a portion of the positioning pin which includes the stopper; and

f) removing said resin molded housing from said metal mold while leaving said positioning pin inside said resin molded housing so as to form a permanent insert in the probe.

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**5,501,829**

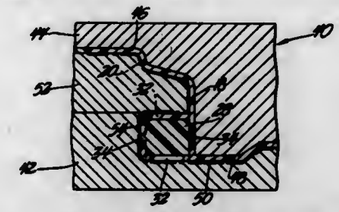
**METHOD OF MANUFACTURING A TRIM PANEL USING CORE BLOCK SPACER MEANS**

**Lawrence R. Nichols, Dover, N.H., assignor to Davidson Textron Inc., Dover, N.H.**

**Filed Aug. 12, 1994, Ser. No. 289,526**

**Int. Cl.[6] B29C *33/30*; B28B *7/20***

**U.S. Cl. 264—261** **8 Claims**




1. A method of molding a trim panel component that has a nominal thickness and that includes a die locked pocket that has a wall that is substantially thicker than the nominal thickness of the trim panel component, comprising the steps of:

providing a preformed core block comprising a body that has a plurality of stand offs,

providing a mold apparatus having a retractable slide or lifter that forms an undercut cavity for forming a die locked pocket in the molded trim panel component,

loading the preformed core block into the undercut cavity so that the body is spaced from surfaces of the undercut cavity by the stand offs,

and introducing uncured plastic material into the mold apparatus to mold the trim panel component so that the preformed core block is embedded in a relatively thick wall of the molded trim panel component.

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**5,501,830**

**LAMINATING RESINS HAVING LOW ORGANIC EMISSIONS (I)**

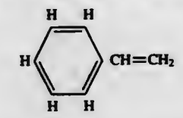
**Thomas W. Smeal, Murrysville Boro, Westmoreland County, and George L. Brownell, Mount Lebanon Township, Allegheny County, both of Pa., assignors to Aristech Chemical Corporation, Pittsburgh, Pa.**

**Continuation-in-part of Ser. No. 24,022, Mar. 1, 1993, abandoned. This application Mar. 3, 1994, Ser. No. 205,222**

**Int. Cl.[6] B28B *1/14;1/32***

**U.S. Cl. 264—308** **6 Claims**

1. Method of laminating a solid formed body comprising (a) providing a forming surface having a desired positive or negative shape, (b) providing a liquid mixture comprising (1) about two parts by weight unsaturated polyester resin, (2) about one part to about four parts by weight alkoxylated bisphenol-A diacrylate or dimethacrylate, (3) about 20% to about 60%, based on the total weight of (1) and (2), of a monomer of the formula




where one H connected to the ring is substituted by $CH_3$, and (4) an effective amount of a polymerization catalyst, (c) applying said mixture to said forming surface at ambient temperatures in layers while permitting said layers incrementally to polymerize, thereby building said shaped article, and wherein no more than 20.0 g/m$^2$ of volatile emissions as measured by Section 1162 of the Regulations of the South Coast (California) Air Quality District are created, and (d) removing the finished solid formed body from said surface.

**5,501,831**

## METHOD FOR PREPARING INTERPENETRATED POLYMER FILMS

**Robert Kovar, Wrentham, and Roland R. Wallis, Jr., Allston, both of Mass., assignors to Foster-Miller, Inc., Waltham, Mass.**

**Continuation of Ser. No. 878,906, May 6, 1992, abandoned, which is a division of Ser. No. 365,847, Jun. 14, 1989, Pat. No. 5,168,011, which is a division of Ser. No. 64,746, Jun. 22, 1987, Pat. No. 4,845,150, which is a continuation-in-part of Ser. No. 780,648, Sep. 26, 1985, abandoned. This application Aug. 19, 1994, Ser. No. 292,747**

**Int. Cl.[6] B29C *55/26***

**U.S. Cl. 264—503** **8 Claims**




1. The method of preparing a film comprising a polymer having a microscale structure orientation therein, comprising providing a dope containing an ordered polymer having microscale structure orientation therein, solidifying said microscale structure by coagulation in an aqueous medium, causing a binder precursor to penetrate the microstructure of the solidified polymer, and converting said precursor to said binder.

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**5,501,832**

## METHOD AND APPARATUS FOR FORMING A MOULDED ARTICLE INCORPORATING A REINFORCING STRUCTURE

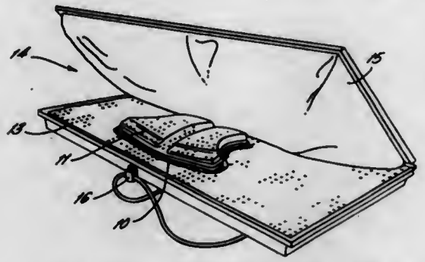
**Alfred A. Adams, Norwich, United Kingdom, assignor to Group Lotus Limited, Norfolk, England**

**Continuation of Ser. No. 820,876, Feb. 28, 1992, abandoned. This application May 4, 1994, Ser. No. 238,207**

**Claims priority, application United Kingdom, Jul. 27, 1989, 8917142**

**Int. Cl.[6] B29C *70/44***

**U.S. Cl. 264—510** **18 Claims**




1. A method of moulding a reinforcing structure for use in a subsequent moulding operation to form a moulded article, comprising the steps of:

providing a mould tool having first and second mould parts, said first mould part defining a first mould surface and said second mould part defining a second mould surface;

disposing a fibrous mat between said first and second mould parts, said fibrous mat being formed of fibres with a thermoformable binder disposed therebetween;

partially closing said mould tool around said fibrous mat such that said first and second mould surfaces are in face-to-face relationship with said fibrous mat disposed therebetween;

heating said fibrous mat while between said first and second mould parts so as to render said fibrous mat pliable;

placing said mould tool on a vacuum forming table, said vacuum forming table comprising a perforated table and a lid pivotally attached to said table, said lid comprising a frame and a flexible membrane spanning the area within said frame;

bringing the lid and table into contact;

evacuating the volume enclosed between said lid and said perforated table such that pressure is applied to close said first and second mould parts to shape said fibrous mat;

allowing said mould tool and said shaped fibrous mat to cool thereby forming said reinforcing structure;

opening said mould tool and removing the moulded reinforcing structure thus formed from said mould tool.

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**5,501,833**

## METHOD OF MAKING SINTERED CONTACT COMPONENT

**Katsuyoshi Kondoh, Itami, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan**

**Division of Ser. No. 284,986, Aug. 4, 1994, Pat. No. 5,460,639. This application Jun. 5, 1995, Ser. No. 461,016**

**Claims priority, application Japan, Aug. 9, 1993, 5-218130**

**Int. Cl.[6] B22F *1/00***

**U.S. Cl. 419—33** **6 Claims**

1. A method of making sintered contact component having high strength, good frictional contact characteristic under dry conditions and wet conditions, and high fusion resistance which comprises subjecting a material powder mixture to the process of mechanical alloying, mechanical grinding or pelletizing, the material powder mixture including a Cu-Sn alloy powder containing 3 to 20 wt % of Sn with the balance being made up substantially of Cu and an unavoidable impurity, 15 to 25 wt % of an iron-based intermetallic compound, and 0.5 to 3 wt % of a solid lubricant, thereby preparing an alloy powder having the iron-based intermetallic compound pulverized in a particle size range of up to 15 μm maximum, with an average particle size of not more than 5 μm, in which the iron-based intermetallic compound, together with the solid lubricant, is uniformly dispersed in the Cu matrix, and molding and sintering the alloy powder into a sintered product having 1 to 30 vol % of vacancies uniformly dispersed therein, the vacancies each being sized not more than 30 μm.

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**5,501,834**

## NONMAGNETIC FERROUS ALLOY WITH EXCELLENT CORROSION RESISTANCE AND WORKABILITY

**Kazuyuki Nakasuji, Nishinomiya, and Masaki Takashima, Urawa, both of, Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, and Sanyo Special Alloys, Ltd., Shimotuka, both of, Japan**

**Filed Sep. 1, 1994, Ser. No. 299,348**

**Claims priority, application Japan, Sep. 3, 1993, 5-219735**

**Int. Cl.[6] C22C *38/30;30/00***

**U.S. Cl. 420—36** **12 Claims**

1. A nonmagnetic nickel-free alloy with excellent corrosion resistance and workability to be used for products in constant contact with the human body, said alloy consisting essentially of, by weight, 9 to 25% Cr, up to 2.0% Si, 3 to 35% Mn, 10 to 40% Co, the sum of Mn and 0.6 Co satisfying the formula $22\% \leqq Mn+0.6\,Co \leqq 36\%$, and the balance Fe and incidental impurities.



**5,501,835**

## HEAT-RESISTANT, AUSTENITIC CAST STEEL AND EXHAUST EQUIPMENT MEMBER MADE THEREOF

**Rikizou Watanabe, Mooka; Norio Takahashi, Ohmiya; Hirofumi Kimura, Mooka, and Toshio Fujita, Tokyo, all of, Japan, assignors to Hitachi Metals, Ltd., Japan**

**Filed Nov. 29, 1994, Ser. No. 350,145**

**Claims priority, application Japan, Feb. 16, 1994, 6-019420; Feb. 16, 1994, 6-019421**

**Int. Cl.[6] C22C *38/48***

**U.S. Cl. 420—54** **10 Claims**

1. A heat-resistant, austenitic cast steel with excellent castability and machinability, said austenitic cast steel having a composition consisting essentially, by weight of:

C: 0.2–0.6%
C—Nb/8: 0.07–0.3%
Si: 0.3–1.5%
Mn: 0.3–1.5%
Ni: 8–15%
Cr: 17–25%
Nb: 1–4%
W: 2.66–4%,
N: 0.03–0.2%, and
Fe and inevitable impurities: balance.

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**5,501,836**

## ENTRAPPED NON-ENZYMATIC MACROMOLECULES FOR CHEMICAL SENSING

**Joel Myerson, Berkely, Calif., assignor to Hewlett Packard Company, Palo Alto, Calif.**

**Filed Jul. 11, 1994, Ser. No. 273,384**

**Int. Cl.[6] G01N *21/17***

**U.S. Cl. 422—57** **4 Claims**

1. A sensor element useful in making optical measurement wherein the sensor element comprises:

a sol-gel glass;

an immobilized macromolecule integrated within the sol-gel glass wherein the immobilized macromolecule is non-covalently bonded to the sol-gel and wherein it includes a chemically sensitive indicator material; and

wherein the resulting sensor element performs at temperatures up to approximately 121 degrees C.

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**5,501,837**

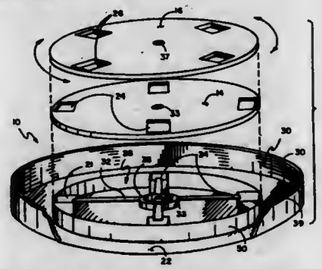
## ONE-STEP TEST DEVICE

**Philip W. Sayles, 172 Sycamore St., Watertown, Mass. 02172**

**Continuation-in-part of Ser. No. 275,256, Jul. 15, 1994, Pat. No. 5,429,804. This application Jun. 30, 1995, Ser. No. 497,539**

**Int. Cl.[6] G01N *21/01***

**U.S. Cl. 422—58** **7 Claims**




1. An improved test device having a testing mode, said device for receipt of a fluid specimen to be tested, said test device having a cup with a cover lid, said cover lid able to be attached to said cup in fluid-tight relationship, further comprising:

at least one window defined in said cover lid, said cover lid having a central portion with a central portion aperture defined therein, a top, a bottom surface of said cover lid and a cover lid side wall;

a strip chamber having a central portion, a bottom wall having a bottom wall aperture defined therein, and a strip chamber side wall, said strip chamber side wall disposed in contact with said bottom surface of said cover lid disposed interior to and spaced away from said cover lid side wall defining a space therebetween, said space between said strip chamber and said cover lid side wall defining a space for receipt of said cup;

at least one test chamber having an interior, a bottom, a test chamber side wall and a test chamber aperture defined in said bottom of said test chamber, said test chamber positioned within said strip chamber and having a reagent strip receipt notch defined in said test chamber side wall;

means to open and close said test chamber aperture; and

at least one reagent strip having a length, a first end portion and a second end portion, said reagent strip having a color change testing area disposed along its length, said reagent strip being substantially disposed in said strip chamber, said second end portion extending through said reagent strip receipt notch in said test chamber and into said interior of said test chamber, said device in its testing mode with a fluid specimen contained within said cup and said cover lid attached thereto, to be inverted, causing said fluid to flow into said interior of said test chamber, when said test chamber aperture is open, and to come in contact with said second end portion of said reagent strip, said fluid being carried along said reagent strip to said color change testing area to create a test result which test result can be viewed through said window in said cover lid.

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**5,501,838**

## AUTOMATED IMMUNOCHEMICAL ANALYZER

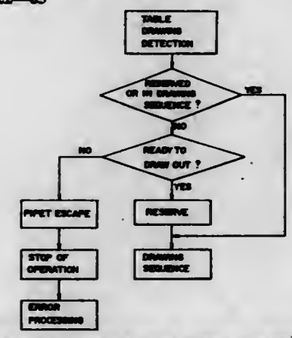
**Toshihiro Ootani, and Takayoshi Izumi, both of Kobe, Japan, assignors to Toa Medical Electronics Co., Ltd., Kobe, Japan**

**Continuation of Ser. No. 35,620, Mar. 23, 1993, abandoned. This application Jan. 3, 1995, Ser. No. 367,824**

**Claims priority, application Japan, Apr. 3, 1992, 4-112150**

**Int. Cl.[6] G01N *35/02***

**U.S. Cl. 422—65** **6 Claims**




1. An automated immunochemical analyzer, comprising:

at least one reaction plate;

a table for mounting said at least one reaction plate;

at least one specimen rack;

a table for mounting said at least one specimen rack, wherein the table for mounting said at least one reaction plate and the table for mounting said at least one specimen rack can be individually drawn out;

means for holding said at least one reaction plate;

means for aspirating and discharging sample liquid, having an elevatable pipet for aspirating and discharging sample liquid;

means for moving the means for holding said at least one reaction plate and the means for aspirating and discharging sample liquid simultaneously;

means for judging whether it is possible or impossible to draw out the table for mounting said at least one reaction plate, on the basis of an access status of the means for holding said at least one reaction plate to the table for mounting said at least one reaction plate;

means for displaying whether it is possible or impossible to draw out the table for mounting said at least one reaction plate on the basis of the judgment thereof;

means for judging whether it is possible or impossible to draw out the table for mounting said at least one specimen rack, on the basis of an access status of the means for aspirating and discharging sample liquid to the table for mounting said at least one specimen rack;

means for displaying whether it is possible or impossible to draw out the table for mounting said at least one specimen rack on the basis of the judgment thereof; and

means for reservation, for changing a sequence from not allowing a drawing out state to allowing a drawing out state for preventing one of said means for holding said at least one reaction plate and said means for aspirating and discharging sample liquid from access to said table for mounting said at least one reaction plate and said table for mounting said at least one specimen rack, respectively, so that said tables can be drawn out, wherein a reservation is automatically set to maintain a state allowing drawing out when said tables are drawn out even if a reservation is not set.

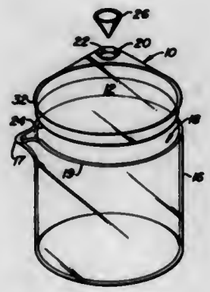
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**5,501,839**

**BEAKER COVER**

**Elia R. Tarantino, Reno, Nev., assignor to ID Technology, Reno, Nev.**

**Filed Apr. 7, 1995, Ser. No. 418,739**
**Int. Cl.[6] B01L *3/00***
**U.S. Cl. 422—99** **13 Claims**




1. A beaker cover for covering and enclosing a containment volume of a beaker having an upper periphery defining an opening to the containment volume, comprising:

a top structure configured with an interior surface formed to overlie the containment volume of the beaker, and having an opening therethrough to permit access to the containment volume;

an annular skirt formed to depend from the top structure and to be accepted into the beaker;

wherein the top structure includes a bottom periphery that forms with the annular skirt a shoulder to rest upon the upper periphery of the beaker; and

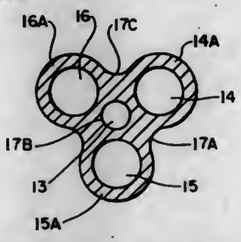
a stopper configured to be accepted in the opening of the top structure, closing the opening, the stopper comprising a cavity containing a coolant wherein said stopper provides a structure for reflux activity.

**5,501,840**

**MULTILUMEN TUBING FOR CENTRIFUGAL BLOOD SEPARATOR**

**Marco Mantovani, Poggio Rusco; Stephano Sarti, Budrio, and Ivo Panzani, Mirandola, all of, Italy, assignors to Dideco S.r.l., Mirandola, Italy**

**Continuation of Ser. No. 924,839, Aug. 4, 1992, abandoned. This application Mar. 7, 1994, Ser. No. 207,238**
**Claims priority, application Italy, Aug. 5, 1991, MI91A2203**
**Int. Cl.[6] B04B *5/04*; A61M *1/34***
**U.S. Cl. 422—101** **7 Claims**




1. A centrifugal blood separator comprising:

a rotating plate having an axis of rotation about which the plate rotates;

a blood container removably coupled to the rotating plate;

a first connector connected to the rotating plate;

a plurality of lines connected between the blood container and the first connector for conveying blood components;

a second stationary connector spaced apart from the first connector along the axis of rotation of the rotating plate; and

a tube connected between the first and second connectors, the tube being monolithic along its entire length between the first and second connectors and having a central axis and a plurality of lobes spaced peripherally about the central axis forming a multilobate outer wall in a transverse cross-section, each lobe having a duct for conveying a blood component, each duct having an axis parallel to the central axis.

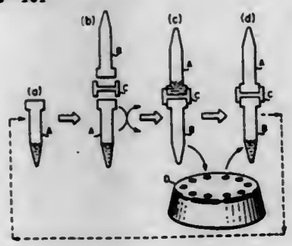
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**5,501,841**

**CONNECTION-TYPE TREATMENT SYSTEM FOR MICRO SOLUTION AND METHOD OF TREATMENT**

**Yuan C. Lee, Timonium, Md.; Shinji Inoue, Los Altos, Calif.; Akinori Tsujimoto, Palo Alto, Calif., and Akimasa Miwa, Mountain View, Calif., assignors to Artchem, Inc., Palo Alto, Calif.**

**Continuation-in-part of Ser. No. 94,659, Jul. 20, 1993, abandoned, Ser. No. 136,711, Oct. 12, 1993, abandoned, and Ser. No. 6,783, Jan. 21, 1993, abandoned, which is a continuation-in-part of Ser. No. 930,017, Aug. 13, 1992, abandoned, which is a continuation-in-part of Ser. No. 791,837, Nov. 14, 1991, abandoned, said Ser. No. 94,659is a continuation-in-part of Ser. No. 930,017, Nov. 14, 0, said Ser. No. 136,711is a continuation of Ser. No. 930,017, Nov. 14, 0. This application Jul. 27, 1994, Ser. No. 282,097**
**Int. Cl.[6] B01L *3/14***
**U.S. Cl. 422—101** **40 Claims**






1. A dual invertible microtube and connector assembly for transfer and treatment of micro solutions and centrifugation comprising in operative combination:

a) a first source microtube having a first open end and terminating in a second, tapered, permanently closed end, said first microtube adapted to contain a micro solution sample therein for treatment by inversion;

b) a second target microtube having substantially the same shape as said first microtube and having a first open end and terminating in a second, tapered, permanently closed end;

c) each of said microtubes includes adjacent to its open end:

i) threads disposed along a first peripheral wall surface; and

ii) a smooth, cylindrical second peripheral wall surface;

d) a connector assembly for connecting the open end of said first microtube to the open end of said second microtube, said connector assembly having a first generally cylindrical connector end having a smooth inner peripheral wall surface for slip fit connection about an outer peripheral wall of the open end of either of said first or second microtubes, and a second threaded connector end for threaded engagement with the threaded open end of the other one of said first or second microtubes;

e) a generally tubular membrane support having an outer peripheral wall, an inner peripheral wall and a generally flat foraminous membrane support surface disposed within said inner peripheral wall, said inner peripheral wall and said membrane foraminous support defining a central cavity for insertion within the open end of the microtube having said first connector end slip-fitted thereover;

f) a single means for securing a membrane to said foraminous surface of said membrane support in a manner to provide a liquid tight seal between the periphery of said membrane support and said membrane;

g) said membrane support in combination with said securing means retaining said membrane at a recessed distance within the open end of either of said first or second microtubes for filtering and applying a predetermined treatment to said sample solution while passing said sample solution from said first source microtube into said second target microtube by inversion of said first source microtube containing said sample solution to be filtered over said second target microtube; and

h) said dual invertible microtube and connector assembly are adapted for inversion for unvented treatment of said sample solution, and for direct centrifugation of treated samples retained in said microtubes.

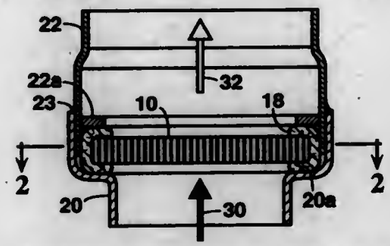
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**5,501,842**

**AXIALLY ASSEMBLED ENCLOSURE FOR ELECTRICAL FLUID HEATER AND METHOD**

**Lawrence S. Rajnik, Corning, and Paul S. Schmitt, Big Flats, both of N.Y., assignors to Corning Incorporated, Corning, N.Y.**

**Filed Aug. 30, 1994, Ser. No. 298,337**
**Int. Cl.[6] F01N *3/28*; B01D *53/36***
**U.S. Cl. 422—174** **3 Claims**




1. A fluid treating assembly comprising a metal honeycomb of open cellular structure resiliently mounted in an open-ended metal enclosure, said enclosure comprising:

a first tubular metal element having a first bore defining a fluid input end and a first honeycomb mounting end, the first bore including within the first honeycomb mounting end a first interior support for supporting the honeycomb within the first bore, at least a portion of the first mounting end extending past the first interior support to form a first honeycomb retaining lip;

a second tubular metal element having a second bore defining a second honeycomb mounting end and a fluid output end, the second bore defining the second honeycomb mounting end including a second interior support for supporting the honeycomb within the second bore, at least a portion of the second mounting end extending past the second interior support to form a second honeycomb retaining lip;

the metal honeycomb of cellular structure being disposed between the first and second interior supports and aligned to permit the passage through the structure of a fluid to be treated; and

a resilient mounting material positioned between the metal honeycomb and each of the interior supports; wherein

(i) the first and second honeycomb retaining lips are telescoped together to form said enclosure such that one lip overlaps the other to form an overlapping lip and an underlying lip;

(ii) the underlying lip is clear of contact with the support extending from the overlapping lip;

(iii) each of the first and second honeycomb retaining lips is provided with at least one recess; the first and second interior supports being spaced to apply equal and opposite mounting pressure to the resilient mounting material and the metal honeycomb;

(iv) the tubular metal elements are fastened together to maintain the spacing of the first and second interior supports;

(v) the metal honeycomb is provided with at least one electrode; and

(vi) the recess in the overlapping lip is aligned with the recess in the underlying lip to form an opening in the enclosure from which the electrode extends.

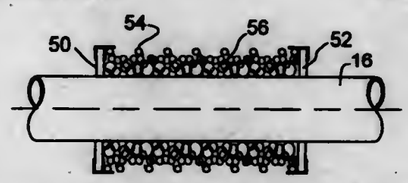
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**5,501,843**

**WIPER CARTRIDGE**

**Ronald L. Peterson, Tucon, Ariz., assignor to Vulcan Peroxidation Systems, Inc., Tucson, Ariz.**

**Filed Oct. 14, 1994, Ser. No. 323,116**
**Int. Cl.[6] B01J *19/08*; *19/12***
**U.S. Cl. 422—186.3** **1 Claim**




1. An improved shuttling scraper for cleaning the outside surface of a tube mounted coaxially in a cylindrical reaction chamber in which a liquid flows in the annular space between the tube and the wall of the cylindrical reaction chamber, said improved shuttling scraper comprising:

a first wiper assembly having an annular form and lying in a first plane perpendicular to the axis of the cylindrical reaction chamber;

a second wiper assembly having an annular form and lying in a second plane perpendicular to the axis of the cylindrical reaction chamber and spaced from the first plane;

a helical spring connecting said first wiper assembly and said second wiper assembly and resiliently maintaining a space between them; and,

a wiper cartridge of annular form lying in a plane intermediate the first plane and the second plane, surrounding the tube and

engaging the tube in a tight sliding grip, and having an outside diameter less than the inside diameter of the helical spring, whereby said wiper cartridge is captive between said first wiper assembly and said second wiper assembly and does not come in contact with said helical spring, whereby movement of said wiper cartridge relative to said tube is delayed until said shuttling scraper has established a piston relationship with the cylindrical reaction chamber, thereby permitting said shuttling scraper to operate at lower flow rates than would be possible if said wiper cartridge were not present.

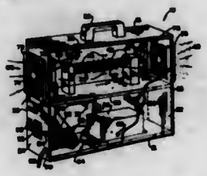
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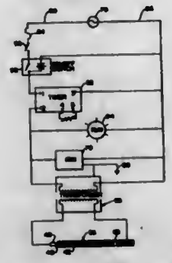
**5,501,844**

**AIR TREATING APPARATUS AND METHOD THEREFOR**

**John R. Kasting, Jr., Waxhaw, and Ronald G. Potter, Monroe, both of N.C., assignors to OxiDyn, Incorporated, Monroe, N.C.**

**Filed Jun. 1, 1994, Ser. No. 251,466**
**Int. Cl.[6] B01J *19/12***
**U.S. Cl. 422—186.15** **10 Claims**





1. Apparatus for treating air with ozone comprising:
a) a housing having an air inlet and an air outlet and defining therebetween a passageway for the passage of air through said apparatus;
b) means for drawing surrounding air through said passageway from said inlet to said outlet and discharging the air through said outlet into the surrounding air; and
c) means for continually introducing ozone into the air in said passageway for discharge with the air through said outlet at a predetermined first concentration of ozone in the air, wherein said ozone introducing means comprises a corona generator located in said passageway, a transformer electrically connected to said corona generator and having a predetermined constant output voltage of from about 8,000 to 12,000 volts, and means for controlling the interval of time over which said ozone generator generates ozone for introduction into the air.

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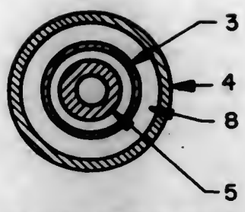
**5,501,845**

**CHILLED OXYGEN FOR AN IONIZATION DEVICE**

**Fernando C. Duarte, 275 Orange Ave., #127A, Chula Vista, Calif. 91911**

**Continuation of Ser. No. 239,986, May 9, 1994, abandoned. This application Mar. 10, 1995, Ser. No. 474,467**
**Int. Cl.[6] B01J *19/18***
**U.S. Cl. 422—186.19** **2 Claims**

1. An ozonizer comprising an inner tubular electrode positioned concentrically within an outer tubular electrode, and a dielectric tube concentrically located between the inner and outer electrodes forming an annular passage between one or both of the electrodes and the dielectric tube, an electric power source connected to the inner and outer electrodes, a means to supply substantially pure oxygen to the annular passage, said oxygen being pre-conditioned to a temperature of 10° F. or less before entering the ozonizer.



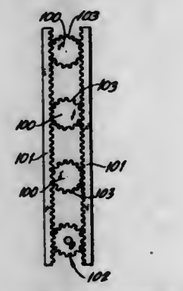

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**5,501,846**

**APPARATUS FOR INCREASING CATALYTIC EFFICIENCY**

**Richard Pavelle, 23 Berkshire Dr.; Paul Burstein, 19 Glengarry, both of Winchester, Mass. 01890; Leon Ferber, 2310 Stearns Hill Rd., Waltham, Mass. 02154, and Ronald M. Latanision, 28 Nassau Dr., Winchester, Mass. 01890**

**Continuation of Ser. No. 37,478, Mar. 26, 1993, abandoned, which is a continuation of Ser. No. 598,477, Oct. 16, 1990, abandoned, which is a continuation-in-part of Ser. No. 369,370, Jun. 21, 1989, Pat. No. 4,968,395. This application Aug. 8, 1994, Ser. No. 287,344**
**Int. Cl.[6] F01N *3/10***
**U.S. Cl. 422—211** **15 Claims**




1. An apparatus for a non-electrolytic catalytic process, comprising: at least one catalyst configured as of formed and shaped solid disconnected from a source of electrical energy and means for mechanically manipulating and deforming the at least one catalyst to control its operating efficiency.

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**5,501,847**

**PROCESS FOR PURIFYING IMPURE SULPHURIC ACID**

**Jean-François Joly, Paris; Eric Benazzi, Montesson; Frédéric Chaigne, Valence; Jean-Yves Bernhard, Mennecy, and Jean-Charles Viltard, Valence, all of, France, assignors to Institut Francais Du Petrole, Rueil Malmaison, France**

**Filed Jan. 6, 1995, Ser. No. 369,482**
**Claims priority, application France, Jan. 6, 1994, 94 00145**
**Int. Cl.[6] C01B *17/90;17/74***
**U.S. Cl. 423—531** **9 Claims**

1. A process for purifying an impure sulfuric acid solution by eliminating the hydrocarbon substances contained therein, said solution containing 50% to about 99.9% by weight of sulfuric acid and hydrocarbons substances in their free or combined forms, said process being characterized in that:
a) the impure sulfuric acid is sorbed into a porous inorganic silica;
b) said silica containing said sulfuric acid is then calcined at a temperature of between 100° C. and 400° C. in oxygen containing gas flow at to desorb off the sulfuric acid values while retaining hydrocarbons in the silica.



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**5,501,848**

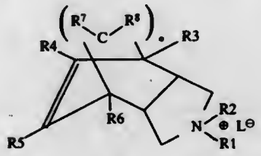
**METHOD FOR PREPARING CRYSTALLINE ALUMINOPHOSPHATE MATERIALS USING AZAPOLYCYCLIC TEMPLATING AGENTS**

**Yumi Nakagawa, Oakland, Calif., assignor to Chevron U.S.A. Inc., San Francisco, Calif.**

**Continuation-in-part of Ser. No. 193,352, Feb. 8, 1994, abandoned. This application Jul. 5, 1994, Ser. No. 270,695**
**Int. Cl.[6] C01B *37/04;37/06;37/08***
**U.S. Cl. 423—706** **58 Claims**

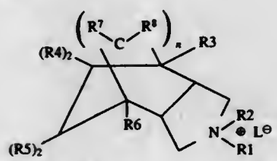
1. A method for preparing a crystalline molecular sieve comprising oxides of one or more trivalent element(s) and oxides of one or more pentavalent element(s), said method comprising contacting under crystallization conditions one or more active sources of said oxides with a templating agent having a molecular structure of the form:

(I)



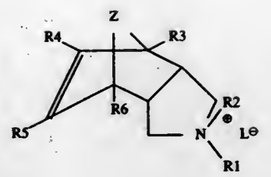
or

(IA)



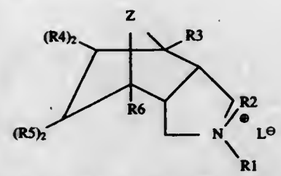
wherein:
R1 and R2 are at each independent occurrence selected from the group consisting of hydrogen, a lower alkyl group, and when taken together, a spirocyclic group having from 3 to 6 carbon atoms;
R3, R4, R5 and R6 are at each independent occurrence selected from the group consisting of hydrogen, halogen, and a lower alkyl group;
n has at each independent occurrence a value of 1, 2, 3, or 4;
R7 and R8 are at each independent occurrence selected from the group consisting of hydrogen, and a lower alkyl group, and when n is one (1), R7 and R8 can be taken together to form a spirocyclic group having from 3 to 6 carbon atoms; and when n is two (2) or greater, one of R7 and R8 on one carbon atom can be taken together with one of R7 and R8 on an adjacent carbon atom to form a ring having from 3 to 6 carbon atoms; and
L is an anion which is not detrimental to the formation of the molecular sieve;
or a molecular structure of the form:

(II)



or

(IIA)



wherein Z is at each independent occurrence selected from the group consisting of oxygen, nitrogen, sulfur, and a hydrocarbyl radical; and
R1, R2, R3, R4, R5, R6, and L are as defined above.

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**5,501,849**

**EMOLLIENT COMPOSITION**

**William H. Lee, Romford, United Kingdom, assignor to Biogian Ireland (R&D) Limited, Ireland**

**PCT No. PCT/GB92/00556, § 371 Date Sep. 24, 1993, § 102(e) Date Sep. 24, 1993, PCT Pub. No. WO92/17208, PCT Pub. Date Oct. 15, 1992**
**PCT Filed Mar. 26, 1992, Ser. No. 119,240**
**Claims priority, application United Kingdom, Mar. 26, 1991, 9106365**
**Int. Cl.[6] A61K *7/42***
**U.S. Cl. 424—59** **22 Claims**

1. An emollient composition for use in a psoriasis treatment in which abnormal skin is exposed to incident therapeutic radiation, comprising a lipophilic emollient and an active agent, wherein said active agent is trimethylpsoralen, 8-methoxypsoralen or urocanic acid, said lipophilic emollient spread in a 5 μm thick layer absorbs 20% or less of the incident therapeutic radiation, the composition is a non-viscous liquid which, on application to skin, spreads to provide a substantially uniform coating of the lipophilic emollient and active agent, and the coating does not absorb a significant amount of the incident therapeutic radiation and is sufficiently non-volatile to persist for a period of sufficient length, for a therapeutically effective dose of incident radiation to be administered.

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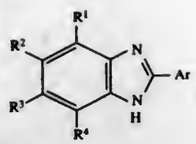
**5,501,850**

**USE OF BENZIMIDAZOLE DERIVATIVES AS LIGHT PROTECTION FILTERS**

**Ingeborg Stein, Erzhausen; Ulrich Heywang, Darmstadt; Alexander Putz, Michelstadt, and Roland Martin, Weinheim, all of, Germany, assignors to Merck Patent Gesellschaft Mit Beschrankter Haftung, Darmstadt, Germany**

**PCT No. PCT/EP93/00233, § 371 Date Oct. 13, 1993, § 102(e) Date Oct. 13, 1993, PCT Pub. No. WO93/15712, PCT Pub. Date Aug. 19, 1993**
**PCT Filed Feb. 2, 1993, Ser. No. 133,071**
**Claims priority, application Germany, Feb. 13, 1992, 42 04 257.7**
**Int. Cl.[6] A61K *31/415;7/42;* C07D *235/18***
**U.S. Cl. 424—59** **11 Claims**

1. A cosmetic composition comprising, as light protection filters, at least one benzimidazole of the formula



in which

$R^1$, $R^2$, $R^3$ and $R^4$ in each case independently of one another are H, alkyl or alkoxy having 1 to 10 C atoms and

Ar is phenyl which is unsubstituted or substituted by 1–5 aminoalkyl, alkyl, alkoxy, cycloalkoxy, hydroxyl or hydroxyalkoxy groups having 1 to 10 C atoms or benzimidazole-2-yl-phenyl which is monosubstituted with 1 to 2 alkyl groups having 1 to 10 C atoms,

wherein at least one of the radicals $R^1$ to $R^4$ or an alkoxy substituent on the group Ar is a 2-ethylhexyloxy group.

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**5,501,851**

**EMULSION POLYMERS FOR USE IN HAIR FIXATIVES**

**Paul R. Mudge, Belle Mead; John C. Leighton, Flanders; Sirisoma Wanigatunga, Bridgewater, and Natalie Morawsky, Highland Park, all of N.J., assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.**

**Continuation of Ser. No. 915,488, Jul. 16, 1992, abandoned. This application Sep. 12, 1994, Ser. No. 304,618**

**Int. Cl.[6] A61K** *7/11;9/10;* **C08J** *3/05;* **C08F** *6/24*

**U.S. Cl. 424—70.16** **14 Claims**

1. A particulate dispersion of a polymer in water suitable for use as a hair fixative characterized in that the polymer

(i) is present in an amount from 2% to 15% by weight,

(ii) has a particle size from 32 nm to 280 nm,

(iii) is prepared from

(a) one or more ethylenically unsaturated acidic monomers, each containing one or more available carboxyl groups, present in an amount of 5%– 35% by weight of the polymer and

(b) one or more water insoluble comonomers present in an amount of 65%–95% by weight of the polymer, and

(iv) is neutralized with one or more cosmetically acceptable organic or inorganic bases in an amount effective to make the polymer later removable with shampoo, but without destabilizing the particles.

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**5,501,852**

**BIOLOGICAL CONTROL OF LEPIDOPTERONS PESTS USING BACILLUS THURINGIENSIS**

**Martin-Paul Meadows, Brighton; Deborah J. Ellis, Bognor Regis, and Paul Jarrett, Littlehampton, all of, United Kingdom, assignors to Agricultural Genetics Company Limited, Cambridge, England**

**Continuation of Ser. No. 883,330, May 14, 1992, abandoned. This application Dec. 28, 1994, Ser. No. 365,188**

**Claims priority, application United Kingdom, May 14, 1991, 9110391**

**Int. Cl.[6] A01N** *63/00;* **C12N** *1/20*

**U.S. Cl. 424—93.461** **8 Claims**

1. A biologically pure culture of a strain of *Bacillus thuringiensis* having all of the identifying characteristics of *Bacillus thuringiensis* NCIMB 40385.

**5,501,853**

**PEPTIDE PLASMINOGEN ACTIVATORS**

**Nancy L. Haigwood, Oakland, Calif.; Ernest-Guenter Afting, Marburg, Germany; Guy Mullenbach, Oakland, Calif., and Eric P. Paques, Marburg, Germany, assignors to Chiron Corporation, Emeryville, Calif., and Behringwerke AG, Marburg, Germany**

**Continuation-in-part of Ser. No. 812,879, Dec. 3, 1985, abandoned. This application Dec. 22, 1986, Ser. No. 944,117**

**Int. Cl.[6] C12N** *15/00;9/64;* **A61K** *38/49*

**U.S. Cl. 424—94.64** **15 Claims**

1. A human tissue plasminogen activator capable of dissolving clots and having at least one improved property selected from the group consisting of improved plasminogenolytic specific activity, increased fibrin dependence, and decreased plasminogen inhibitor susceptibility, said human tissue plasminogen activator having the lysine at amino acid position 277 substituted with arginine and having from 3 to 25 amino acids deleted from the C-terminus.

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**5,501,854**

**HYBRID REAGENTS CAPABLE OF SELECTIVELY RELEASING MOLECULES INTO CELLS**

**Victor A. Raso, Brookline, Mass., assignor to Boston Biomedical Research Institute, Boston, Mass.**

**Continuation of Ser. No. 482,001, Feb. 16, 1990, abandoned. This application Dec. 28, 1992, Ser. No. 298,754**

**Int. Cl.[6] A61K** *39/395;39/40;* **C12P** *21/08;* **C07K** *16/46*

**U.S. Cl. 424—136.1** **6 Claims**

1. A hybrid reagent for delivering diphtheria toxin or a cytotoxic mutant or fragment thereof to a cellular target within cells of a host, comprising:

a) a first portion which, upon in vivo administration to the host at a first pH, delivers and binds said hybrid reagent to the surface of said cells with the subsequent pinching off of the surface of said cells to form endosomes having a second and lower pH and containing said hybrid reagent whereby the hybrid reagent is transported to the interior of said cells by endocytosis, said first portion comprising anti-transferrin receptor monoclonal antibody or an antigen binding fragment thereof; and

b) a second portion comprising an antibody or antigen binding fragment which binds said diphtheria toxin or a cytotoxic mutant or fragment thereof at said first pH and releases it at a second and lower pH within the endosomes, said antibody or antigen binding fragment comprising monoclonal antibody specific towards diphtheria toxin or a fragment thereof;

whereby said hybrid reagent, upon in vivo administration to said host with the antibody or antibody fragment bound to the diphtheria toxin or a cytotoxic mutant or fragment thereof will bind to the surface of said cells, will be endocytosed into said cells and will release the diphtheria toxin or a cytotoxic mutant or fragment thereof to the cellular target within said cells.

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**5,501,855**

**NEEM OIL AS A MALE CONTRACEPTIVE**

**Gursaran P. Talwar; Shakti N. Upadhyay, and Suman Dhawan, all of J.N.U. Complex, Shahid Jeet Singh Marg, New Delhi 110 067, Ind.**

**Filed Sep. 2, 1993, Ser. No. 115,867**

**Int. Cl.[6] A61K** *35/78;31/335;31/34;31/12*

**U.S. Cl. 424—195.1** **7 Claims**

1. A method of blocking the fertility in a male mammal which comprises administering neem oil into the vas deferens of the male in an amount sufficient to block the fertility of said male.



**5,501,856**

**CONTROLLED-RELEASE PHARMACEUTICAL PREPARATION FOR INTRA-OCULAR IMPLANT**

**Akira Ohtori, Iizuka; Masako Andoh, Amagasaki, and Yasushi Morita, Toyonaka, all of, Japan, assignors to Senju Pharmaceutical Co., Ltd., Osaka, Japan**

**Filed Nov. 27, 1991, Ser. No. 799,249**

**Claims priority, application Japan, Nov. 30, 1990, 2-338853**

**Int. Cl.[6] A61F** *2/14;* **A61K** *47/32*

**U.S. Cl. 424—428** **6 Claims**

1. A method for the prevention of the recurrence of proliferative vitreoretinopathy or of glaucoma after a surgical operation for the treatment thereof comprising placing in the interior of the operated eye a controlled-release pharmaceutical preparation in the shape of a stick, needle or film adapted for introduction into the vitreous cavity as an intraocular implant and produced by (a) homogeneously dispersing as an active agent therein at least one anti-inflammatory steroid or one cell proliferation antagonist in a polylactic acid with a number-average molecular weight of about 2,000 to about 4,000 or with a number-average molecular weight of about 5,000 to about 7,000, or a mixture thereof, and (b) forming the dispersion of anti-inflammatory steroid or one cell proliferation antagonist in the polylactic acid into the shape of a stick, needle or film adapted for introduction into the vitreous cavity as an intraocular implant.

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**5,501,857**

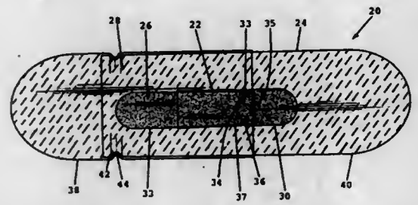
**ORAL NUTRITIONAL AND DIETARY COMPOSITION**

**William A. Zimmer, Hollandale, Wis., assignor to Midwestern Bio-Ag Products & Services, Inc., Blue Mounds, Wis.**

**Continuation-in-part of Ser. No. 920,104, Jul. 24, 1992, Pat. No. 5,310,555. This application May 9, 1994, Ser. No. 239,701**

**Int. Cl.[6] A23K** *1/18*

**U.S. Cl. 424—438** **32 Claims**



1. A dietary adjunct composition comprising:

a double capsule, said double capsule including an inner capsule and an outer capsule spaced apart and enclosing said inner capsule,

a) said inner capsule including a dissolvable gelatin shell and a first substance therein,

b) said outer capsule including a dissolvable gelatin shell and a second substance therein; wherein, one of said substances is viable gastrointestinal microorganisms and the other said substance is a nutritional supplement having the property of diminishing viability of said microorganisms; wherein said microorganisms are selected from the group consisting of gastrointestinal bacteria, live cell yeasts, fungi and a combination thereof; wherein said bacteria are one or more of the genus Lactobacillus, Streptococcus, Pediococcus, Bifidobacterium, or Propionibacterium; wherein said live cell yeast is the genus Saccharomyces; wherein said fungus is the genus Aspergillus; and wherein said nutritional supplement is selected from the group consisting of vitamins, minerals, and a combination thereof; said vitamins including one or more of vitamin A, vitamin D, vitamin E, vitamin $B_{12}$, riboflavin, niacin, pantothenic acid, thiamine, choline, folic acid, biotin, vitamin K, and vitamin C; and said minerals including one or more of cobalt, copper, iron, manganese, zinc, and selenium.

**5,501,858**

**RAPIDLY DISPERSABLE COMPOSITIONS CONTAINING POLYDEXTROSE**

**Richard C. Fuisz, Great Falls, Va., assignor to Fuisz Technologies Ltd., Chantilly, Va.**

**Continuation of Ser. No. 881,612, May 12, 1992, abandoned. This application Sep. 10, 1993, Ser. No. 120,171**

**Int. Cl.[6] A61K** *7/00;47/00*

**U.S. Cl. 424—439** **35 Claims**

1. A pharmaceutical composition comprising a solid polydextrose-based matrix including a medicament, said matrix being readily dispersible in liquids to form a colloidal suspension, said composition formed by flash flow processing a medicament and a solid carrier comprising polydextrose, said carrier being resistive to dispersing prior to said flash flow processing.

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**5,501,859**

**ABSORBABLE MAGNESIUM COMPOSITION AND METHOD OF USING SAME**

**Walter T. Woods, Jr., R.R. 1, Box 13, Chatham, Ill. 62629, and Charles S. Lichtman, Birmingham, Ala., assignors to Walter T. Woods, Jr., Springfield, Ill.**

**Filed Mar. 22, 1994, Ser. No. 215,910**

**Int. Cl.[6] A61K** *9/127*

**U.S. Cl. 424—450** **15 Claims**

13. A method for treating hypomagnesemia comprising the step of enterally administering to a patient suffering from same a liposomal composition comprising a therapeutically effective amount of a magnesium salt, and liposome forming lipids in an amount sufficient to encapsulate the magnesium salt.

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**5,501,860**

**HEMICELLULOSE BINDER AND PRODUCT USING THE SAME**

**Hirokazu Maeda; Hitoshi Furuta; Taro Takahashi, all of Ibaraki, and Hiroshi Shimizu, Suita, all of, Japan, assignors to Fuji Oil Co., Ltd., Osaka, Japan**

**PCT No. PCT/JP93/01112, § 371 Date Mar. 31, 1994, § 102(e) Date Mar. 31, 1994, PCT Pub. No. WO94/03071, PCT Pub. Date Feb. 17, 1994**

**PCT Filed Aug. 6, 1993, Ser. No. 211,510**

**Claims priority, application Japan, Aug. 7, 1992, 4-232996; Jan. 29, 1993, 5-012996; May 17, 1993, 5-114310**

**Int. Cl.[6] A61K** *9/16;9/20*

**U.S. Cl. 424—464** **8 Claims**

1. A sugar coating composition consisting of an aqueous solution of sugar and a binder as an active ingredient, the binder comprising water-soluble hemicellulose derived from soybeans, the water-soluble hemicellulose having an average molecular weight in the range of 50,000 to one million and being added to the sugar coating composition in the range of 1 to 30% by weight.

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**5,501,861**

**FAST DISSOLVING TABLET AND ITS PRODUCTION**

**Tadashi Makino, Ibaraki; Masayuki Yamada, Kawanishi, and Jun-ichi Kikuta, Suita, all of, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan**

**Continuation of Ser. No. 10,398, Jan. 28, 1993, abandoned. This application Sep. 6, 1994, Ser. No. 301,036**

**Claims priority, application Japan, Jan. 29, 1992, 4-013511**

**Int. Cl.[6] A61K** *9/20*

**U.S. Cl. 424—464** **13 Claims**

1. A fast dissolving tablet which contains an effective amount of an active ingredient and a water-soluble carbohydrate, and having

(1) a porosity of 30 to 70%,

(2) a hardness of 3 to 20 kg, and

(3) a falling impact strength of 0 to 70%, which tablet is produced from a composition to be compression-molded com-

prising said active ingredient, 30 to 80% by weight of said water-soluble carbohydrate having a mean particle size of 20 to 70 μm, and 1 to 3% by weight of water, said weights based on the composition to be compression-molded, by a process comprising the steps of adhering particles of said carbohydrate to each other by moistening the surfaces of said particles with said water in the composition, molding the composition at a pressure of 5 to 130 Kg/cm$^2$, and removing said water.

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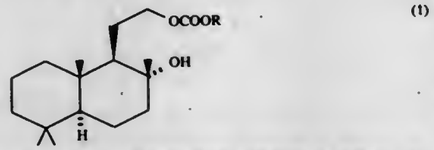
**5,501,862**

**ALKYL CARBONATE DERIVATIVES OF SCLAREOL DIOL**

**Philip A. Christenson, Midland Park, N.J., assignor to Givaudan-Roure Corporation, Clifton, N.J.**

**Filed Dec. 22, 1993, Ser. No. 173,309**
**Int. Cl.$^6$ A23L *1/22***
**U.S. Cl. 426—538** **11 Claims**

1. A compound represented by formula (1):




(1)

wherein R is selected from the group consisting of branched and unbranched lower-alkyl and lower-cycloalkyl groups having from 1 to 10 carbon atoms.

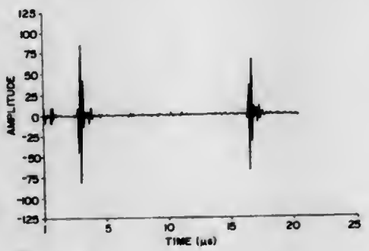
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**5,501,863**

**CONTRAST MEDIA SYNTHESIZED FROM POLYALDEHYDES**

**Georg Rössling; Celal Albayrak; Matthias Rothe, and Joachim Siegert, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany**

**Continuation of Ser. No. 95,500, Jul. 26, 1993, abandoned, which is a continuation of Ser. No. 653,792, Feb. 11, 1991, abandoned. This application Jan. 17, 1995, Ser. No. 373,467**
**Claims priority, application Germany, Feb. 9, 1990, 40 04 430.0**
**Int. Cl.$^6$ A61K *9/50;49/00***
**U.S. Cl. 424—489** **25 Claims**




1. Microparticles consisting essentially of (a) a biodegradable polymer having a molecular weight of 1–30 Kd, obtainable by polymerizing a polymerizable aldehyde, and (b) 0.01–2 wt % of a gas and/or liquid with a boiling point below 60° C. relative to the amount of polymer, said microparticles having a diameter of 0.1 to 40 μm and said aldehyde having been polymerized in the presence of said gas and/or liquid.

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**5,501,864**

**METHOD OF MAKING SUGAR-CONTAINING CHEWING GUM WITH PROLONGED SWEETNESS INTENSITY**

**Joo H. Song, Northbrook, and Kevin B. Broderick, Berwyn, both of Ill., assignors to Wm. Wrigley Jr. Company, Chicago, Ill.**

**Continuation-in-part of Ser. No. 226,667, Apr. 12, 1994, Pat. No. 5,415,880. This application May 13, 1994, Ser. No. 242,301**
**Int. Cl.$^6$ A23G *3/30***
**U.S. Cl. 426—3** **26 Claims**

1. A method of making a sugar-containing chewing gum having enhanced long-term sweetness provided by the sugar, comprising the steps of:

providing about 10–95% by weight of a chewing gum base including a mildly hydrophilic polymer attractor in sufficient quantity to constitute at least about 7% by weight of the chewing gum;

providing about 10–90% by weight sugar which is at least about 60% as sweet as sucrose;

providing one or more humectants in the chewing gum;

adding the ingredients to a mixer;

mixing some of the sugar with water to form a water/sugar mixture;

temporarily attaching at least some of the water/sugar mixture to the mildly hydrophilic polymer attractor; and

blending the ingredients together to form chewing gum;

whereby the temporary attachment of the water/sugar mixture to the polymer attractor causes enhanced long-term sweetness during chewing.

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**5,501,865**

**MILK CHOCOLATE AND METHOD OF MAKING SAME**

**Albert Zumbe, Neuchatel, Switzerland, and Anne-Marie Bade, Waldenburch, Germany, assignors to Jacobs Suchard AG, Waldenburch, Germany**

**PCT No. PCT/GB92/00657, § 371 Date Oct. 29, 1993, § 102(e) Date Oct. 29, 1993, PCT Pub. No. WO92/19112, PCT Pub. Date Nov. 12, 1992**
**PCT Filed Apr. 10, 1992, Ser. No. 140,055**
**Claims priority, application United Kingdom, Apr. 30, 1991, 9109251; Sep. 25, 1991, 9120449**
**Int. Cl.$^6$ A23G *1/00***
**U.S. Cl. 426—548** **20 Claims**

1. A milk chocolate composition made from an admixture of a cocoa component, a milk component and a sweetener component, wherein the cocoa component comprises cocoa butter and cocoa powder, the milk component comprises low fat milk powder and butterfat, and the sweetener component comprises a sugar alcohol, wherein a total fat content of the composition is less than about 30% by weight, of which at least 75% by weight is made up of an aggregate of cocoa butter and butterfat.

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**5,501,866**

**PRODUCT AND METHOD FOR INHIBITING CAFFEINE STIMULATION WITH THEANINE**

**Takami Kakuda; Takanobu Matsuura; Yuko Sagesaka, and Toshio Kawasaki, all of Tokyo, Japan, assignors to Ito En, Ltd., Tokyo, Japan**

**Division of Ser. No. 117,814, Sep. 8, 1993, abandoned. This application Mar. 21, 1995, Ser. No. 408,170**
**Claims priority, application Japan, Dec. 2, 1990, 2-414871**
**Int. Cl.$^6$ A23F *3/00;5/00***
**U.S. Cl. 426—594** **11 Claims**

1. A method for inhibiting caffeine stimulation, comprising the step of adding a caffeine stimulation inhibitor containing theanine to foods and beverages, such that said theanine is present in an amount between 10 and 500 times greater than an amount of caffeine present in said foods and beverages.



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**5,501,867**

**COMPOSITION FOR SEASONING AND PREPARING FOOD ITEMS FOR GRILLING AND METHOD OF MAKING THE SAME**

**Timothy F. Creehan, P.O. Box 1504, Destin, Fla. 32540, and Richard L. Creel, Jr., 734 Legon Dr. #17, Destin, Fla. 32541**

**Filed Nov. 4, 1994, Ser. No. 334,048**
**Int. Cl.$^6$ A23D *9/00;* A23L *1/39***
**U.S. Cl. 426—601** **9 Claims**

1. A composition suitable for use as a seasoning and non-stick base for preparing food items for cooking on a grill, comprising:

(a) approximately 67% by volume of an egg-based composition comprising: egg yolk, distilled vinegar and soybean oil, whereby said items are prevented from sticking to said grill during cooking;

(b) approximately 6% by volume of a lemon juice comprising: water, lemon juice concentrate, lemon oil and preservatives;

(c) approximately 5% by weight of a tomato paste comprising: tomatoes, salt and citric acid;

(d) approximately 5% by weight of a salt-based composition comprising: salt, yellow dye and imitation butter flavoring;

(e) approximately 3% by volume of white vinegar;

(f) approximately 3% by volume of water;

(g) flavorings comprising:

i. approximately 2% by weight of black pepper;

ii. approximately 0.5% by weight of cayenne pepper;

iii. approximately 1% by weight of granulated garlic; and,

iv. approximately 0.5% by weight of basil;

(h) approximately 3% by weight of a mustard-based composition comprising: black mustard seeds, vinegar, white wine, salt and spices;

(i) approximately 2% by weight of paprika; and,

(j) approximately 1% by weight of sugar.

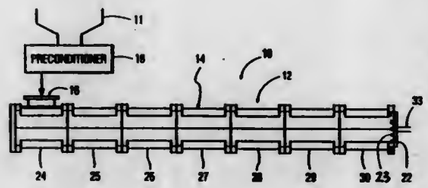
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**5,501,868**

**EXTRUDED DOG TREAT FOOD PRODUCT HAVING IMPROVED RESISTANCE TO BREAKAGE**

**George F. Collings, Auburn; Neil P. Stout, Topeka; Christopher S. Cowell, Topeka, and Stephen J. Pias, Topeka, all of Kans., assignors to Colgate Palmolive Company, Piscataway, N.J.**

**Filed Sep. 21, 1993, Ser. No. 124,911**
**Int. Cl.$^6$ A23K *1/18***
**U.S. Cl. 426—623** **7 Claims**




1. A method of preparing a dog treat food product which exhibits reduced physical breakage during shipping and handling which comprises working a food mixture containing about 20 to about 70% by weight carbohydrate, about 12 to about 30% by weight protein, about 3 to about 20% by weight fat and about 0.5 to about 5% by weight nutritional balancing agent ingredients, under mechanical pressure and heat sufficient to convert the mixture to a flowable mass, passing the mass through a die to obtain an expanded extrudate product, segmenting the extrudate into pieces and then drying the pieces to a final moisture content of about 6.0 to about 10.0% by weight in an atmosphere of about 5 to about 25% relative humidity, a dry bulb temperature of about 150° to about 250° F., and a wet bulb temperature of about 105° to about 150° F., the pieces being exposed to these drying conditions for a period of about 20 to about 120 minutes.

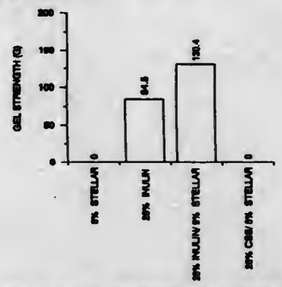
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**5,501,869**

**FAT-FREE TABLESPREAD AND METHOD OF MAKING**

**Gregory S. Buliga, Mount Prospect; Mark S. Miller, Arlington Heights, both of Ill.; William F. Powell, Liverpool, England; Daniel G. Lis, Wheeling, Ill.; R. G. Krishnamurthy, Glenview, Ill.; Vernon C. Witte, Naperville, Ill., and Sharon Tomski, Mundelein, Ill., assignors to Kraft Foods, Inc., Northfield, Ill.**

**Continuation-in-part of Ser. No. 138,734, Oct. 18, 1993, abandoned, which is a continuation-in-part of Ser. No. 997,689, Dec. 28, 1992, abandoned. This application Jun. 8, 1994, Ser. No. 255,454**
**Int. Cl.$^6$ A23D *7/015***
**U.S. Cl. 426—658** **32 Claims**




1. A non-fat or low-fat spreadable or squeezable margarine consisting essentially of:

(a) a fat mimetic selected from the group consisting of gelling type maltodextrins, starch modified by acid hydrolysis to remove amorphous regions therefrom and waxy maize starch,

(b) from 1 to 5% of a bulking agent selected from the group consisting of non-gelling maltodextrins, polydextrose and corn syrup solids,

(c) sufficient inulin to achieve the desired properties of a spreadable or squeezable margarine, and

(d) water.

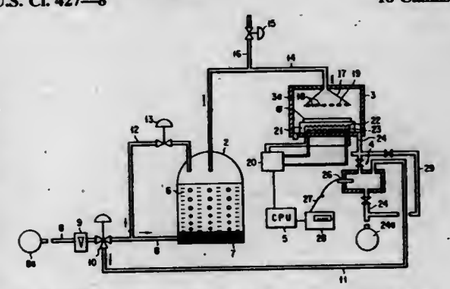
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**5,501,870**

**METHOD AND APPARATUS FOR HYDROPHOBIC TREATMENT**

**Masatoshi Shiraishi, Kikuchi, and Tomoko Hamada, Kumamoto, both of, Japan, assignors to Tokyo Electron Limited, Tokyo, and Tokyo Electron Kyushu Limited, Tosu, both of, Japan**

**Division of Ser. No. 136,373, Oct. 15, 1993, Pat. No. 5,401,316. This application Jan. 23, 1995, Ser. No. 376,393**
**Claims priority, application Japan, Jan. 15, 1992, 4-302998**
**Int. Cl.$^6$ B05D *3/02;* C23C *16/00***
**U.S. Cl. 427—8** **18 Claims**




1. A method of treating a surface of a semiconductor substrate to make said surface hydrophobic, said treatment being carried out within a process chamber having a gas supply pipe and a discharge pipe which communicate therewith and having a temperature

adjusting means for adjusting a treating temperature of said substrate, comprising the steps of:

putting said substrate in said process chamber, followed by closing said process chamber;

supplying a mixed gas consisting of a vaporized treating agent and a carrier gas into said process chamber through said gas supply pipe while discharging a waste gas from said process chamber through said discharge pipe;

measuring the concentration of said treating agent within said waste gas flowing within said discharge pipe;

providing a predetermined reference value of the concentration of said treating agent, based on a relationship between the concentration of said treating agent and the treating temperature or treating time, relative to hydrophobic conditions, which is determined by the contact angle of a water droplet on the substrate surface;

comparing the measured value of said concentration of said treating agent with said predetermined reference value; and

changing the degree of hydrophobicity on the substrate surface by changing either the treating temperature or the treating time.

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**5,501,871**

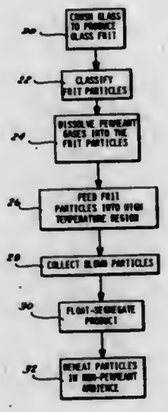
**THERMAL INSULATING MATERIAL AND METHOD OF MANUFACTURING SAME**

**Timothy M. Henderson, Ann Arbor, Mich., assignor to Innovation Associates, Inc., Ann Arbor, Mich.**

**Division of Ser. No. 969,492, Oct. 30, 1992. This application May 16, 1994, Ser. No. 243,451**

**Int. Cl.[6] B05B *5/00***

**U.S. Cl. 427—160** **12 Claims**




1. A method of producing an evacuated microsphere comprising the steps of:

forming particles;

dissolving permeant gases into the particles;

heating the gas permeated particles to blow each particle into a shell containing only the permeant gases in a hollow interior of the shell while excluding gases from outside the shell which cannot be readily out permeated from the hollow interior of each shell at a low temperature; and

out-permeating the permeant gases from the hollow interior of the shells in a gas atmosphere composed of gases having permeabilities much lower than that of the permeant gases within the shell to evacuate the interior of the shells to a pressure of $\leq 10^{-4}$ Torr and to thereby remove substantially all of the gases from the interior of the shell at any temperature.

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**5,501,872**

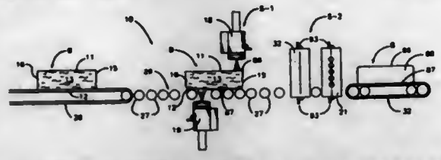
**METHOD AND APPARATUS FOR COATING A SIX-SIDED FIBROUS BATTING**

**Martin A. Allen, and John T. Fetcko, both of Dawsonville, Ga., assignors to Exxon Chemical Patents, Inc., Wilmington, Del.**

**Filed Apr. 19, 1995, Ser. No. 425,973**

**Int. Cl.[6] B05D *1/12***

**U.S. Cl. 427—180** **12 Claims**



1. A method of coating a six-sided fibrous batt having four side surfaces and two end surfaces, which comprise the steps of:

(a) passing the batt between a first pair of meltblowing dies wherein two of the side surfaces are coated with meltblown thermoplastic fibers;

(b) passing the batt through a second pair of meltblowing dies positioned in confronting relation with the other two side surfaces of the four side surfaces wherein the other two side surfaces of the batt are coated with meltblown thermoplastic fibers;

(c) moving the batt so that the end surfaces pass in confronting relationship between a third pair of meltblowing dies wherein the two end surfaces are coated with meltblown thermoplastic fibers.

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**5,501,873**

**IMPACT SPRAY CLADDING OF INNERDUCT LINER**

**Michael W. Ferrarill, Fairview, Pa., assignor to Technology Licensing Company, Pittsburgh, Pa.**

**Filed Jan. 27, 1995, Ser. No. 379,947**

**Int. Cl.[6] B05D *3/02;7/22***

**U.S. Cl. 427—195** **6 Claims**

1. A method of cladding the inner surface of an innerduct or conduit made from a thermoplastic polymer, said comprising the steps of:

a. heating said innerduct or conduit to be clad to a temperature less than melting point of said innerduct or conduit, and

b. spraying a polymeric material onto the heated inner surface of said innerduct or conduit at a velocity sufficient to impact said inner software to provide a coating thereover.

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**5,501,874**

**METHOD OF COATING GRANULAR MATERIAL AND APPARATUS THEREFOR**

**Takaharu Yamamoto, Kitakyushu; Teruji Tahara, Odawara, and Kouji Eguchi, Kitakyushu, all of, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan**

**Filed May 13, 1994, Ser. No. 243,600**

**Claims priority, application Japan, May 18, 1993, 5-139376; Jun. 29, 1993, 5-185612; Dec. 14, 1993, 5-342527**

**Int. Cl.[6] B05D *7/00***

**U.S. Cl. 427—212** **19 Claims**

1. A method of coating a granular material comprising steps of:

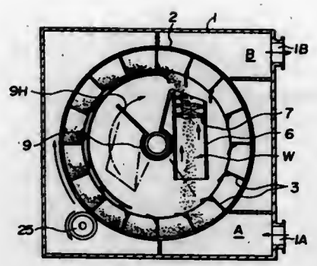
dropping a granular material from an upper portion in a duct disposed in a coating apparatus;

spraying the granular material during falling with a coating solution containing a film-forming material dissolved in a solvent in the duct;

drying the granular material sprayed with the coating solution by a drying gas flowing upwardly from a lower portion to an upper portion in the duct; and

carrying the dropped granular material to an upper portion in the coating apparatus.






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**5,501,875**

**METAL COATED SILICA PRECURSOR POWDERS**

**Mark J. Loboda, and Udo C. Pernisz, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.**

**Filed Dec. 27, 1994, Ser. No. 364,147**

**Int. Cl.[6] B05D *7/00***

**U.S. Cl. 427—222** **17 Claims**

1. A method of coating a powder comprising a silica precursor with a metal comprising:

placing a powder comprising a silica precursor into a vacuum chamber;

evacuating the vacuum chamber;

introducing a vaporized metal into the vacuum chamber; and

facilitating deposition of the metal vapor onto the surface of the powder.

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**5,501,876**

**PROCESS FOR THE MANUFACTURE OF PZT FILMS**

**Hans-Jürgen Gesemann, Chemnitz; Lutz Seffner, Dresden, and Karin Völker, Weinböhla, all of, Germany, assignors to MAN Roland Druckmaschinen AG, Offenbach am Main, Germany**

**Filed Jul. 27, 1994, Ser. No. 281,580**

**Claims priority, application Germany, Jul. 27, 1993, 43 25 167.6**

**Int. Cl.[6] B05D *3/02***

**U.S. Cl. 427—226** **6 Claims**

1. A process for producing a lead zirconate titanate (PZT) film on a substrate by thick-film technique in which the PZT films contain at least one of modified PZT and unmodified PZT, comprising the steps of: providing a substrate; applying a PZT precursor with a Zr content X of $X \geqq X_p+0.02 < X_p+0.10$ onto the substrate, where $X_p$ is the Zr content of the base composition at a morphotropic phase boundary determined by a maximum coupling $K_r$; and firing the PZT precursor to convert the precursor into said PZT film.

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**5,501,877**

**PATTERNED DEPOSITION OF THIN FILMS**

**James H. Adair; Rajiv K. Singh; William R. Eisenstadt, all of Gainesville, Fla., and Sherry S. Staehle, Ballwin, Mo., assignors to University of Florida, Gainesville, Fla.**

**Filed Sep. 19, 1994, Ser. No. 308,156**

**Int. Cl.[6] C23C *16/00***

**U.S. Cl. 427—249** **24 Claims**

1. A method for the formation of a patterned film composed of a high surface energy material on a substrate comprising the steps of:

(A) creating a photomask pattern on a substrate using photolithography, whereby certain areas of the substrate are exposed while the remaining areas are covered by the photomask pattern;

(B) providing the substrate and photomask pattern with a surface charge opposite to the surface charge of particles of a high surface energy material;



(C) removing said photomask pattern from said substrate;

(D) adsorbing said particles onto said substrate by exposing said substrate to an aqueous colloidal suspension of said particles of said high surface energy material;

(E) removing said substrate from said aqueous colloidal suspension; and

(F) depositing a film of said high surface energy material onto said substrate and said adsorbed particles by chemical vapor deposition.

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**5,501,878**

**PROCESS FOR REDUCING THE CARBONIZATION OF HEAT EXCHANGE SURFACES**

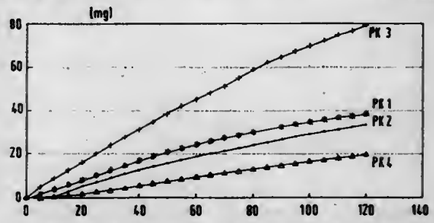
**Simon Barendregt, VR Rhoon, Netherlands; Gerhard Zimmermann, and Grete Bach, both of Leipzig, Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Germany, and KTI Group B.V., Zoetermeer, Netherlands**

**Filed Oct. 11, 1994, Ser. No. 320,875**

**Claims priority, application Germany, Jan. 8, 1993, 43 34 827.0**

**Int. Cl.[6] B05D *3/02;3/04***

**U.S. Cl. 427—377** **9 Claims**




1. A process for reducing carbonization of heat exchange surfaces in a tubular heat exchanger for a rapid cooling of cracking products leaving a cracking furnace, comprising the steps of: cleaning the tubular heat exchanger; and, treating heat exchange surfaces which come into contact with the cracking products under conditions which reduce $Fe_2O_3$ on the surfaces to $Fe_3O_4$ to a greatest possible extent, without forming submicron Fe powder.

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**5,501,879**

**ABRASION-RESISTANT COATED FIBER STRUCTURE**

**Sadamitsu Murayama, Takatsuki, Japan, assignor to Teijin Limited, Osaka, Japan**

**Division of Ser. No. 50,876, Apr. 21, 1993, abandoned, which is a continuation of Ser. No. 475,691, Feb. 6, 1990, abandoned. This application May 18, 1994, Ser. No. 243,996**

**Claims priority, application Japan, Feb. 10, 1989, 1-30005**

**Int. Cl.[6] B05D *3/02***

**U.S. Cl. 427—381** **6 Claims**

1. A process for producing an abrasion resistant coated fiber structure, comprising the steps of:

preparing and treating liquid containing polytetrafluoroethylene as a polymeric material by:



a) emulsifying fine particles of a solution of the polymeric material in a solvent by using an emulsifying agent, in a liquid medium, or

b) dispersing fine solid particles of the polymeric material in a liquid medium;

applying the treating liquid to a fiber structure comprising a number of individual fibers having a thermal decomposition temperature of 230° C. or more, to provide layers of the treating liquid in a total dry amount of 0.5 to 80% by weight based on the total amount of the individual fibers;

drying the treating liquid layers on the individual fibers at a temperature of 80° C. or more; and

heat-treating the resultant dried fluorine-containing polymeric layers on the individual fibers at a temperature of from 280° C. up to but not including 370° C., to provide coating layers covering and fixed to the surfaces of the individual fibers at an average surface-covering percentage of 35% or more, the coating layers having a number of individual polymeric material particles fixed with the appearance of herring roe to the individual fiber surfaces.

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**5,501,880**

**PROCESS TO PRODUCE REINFORCED TIRE CORDS WITH PLASMA TREATED FIBERS INCORPORATED INTO A RUBBER/BLOCKED ISOCYANATE COMPOSITION**

**Dane K. Parker, Massillon, and Derek Shuttleworth, Munroe Falls, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio**

**Continuation-in-part of Ser. No. 956,221, Oct. 5, 1992, abandoned. This application Oct. 21, 1994, Ser. No. 327,333**

**Int. Cl.[6] B05D *3/02*; H05H *1/00***

**U.S. Cl. 427—389.9** **20 Claims**

1. A process for preparing a rubber article containing a polymeric reinforcement which consists essentially of the steps of: (1) plasma treating the polymeric reinforcement in a manner whereby reactive groups containing Zerewitinoff active hydrogen atoms are bonded to the surface thereof; (2) incorporating the polymeric reinforcement having Zerewitinoff active hydrogen atoms bonded to the surface thereof into an uncured rubber composition, wherein said rubber composition has pendant blocked isocyanate groups bound thereto; and (3) curing the uncured rubber with sulfur into a desired shape for the rubber article at an elevated temperature sufficient to deblock the isocyanate groups bonded to the uncured rubber allowing for the isocyanate groups to react with the Zerewitinoff active hydrogen atoms bonded to the surface of the polymeric reinforcement, wherein said elevated temperature is a temperature which is within the range of about 140° C. to about 250° C.

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**5,501,881**

**COATED FUSER MEMBER PROCESSES**

**Timothy J. Fuller, Pittsford; Joseph Mammino, Penfield; Paul J. Brach, Rochester; Robert Blaszak, Penfield; Robert N. Finsterwalder, Webster, and Santokh S. Badesha, Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Dec. 1, 1994, Ser. No. 347,667**

**Int. Cl.[6] B05D *1/02***

**U.S. Cl. 427—421** **19 Claims**

1. A process for the preparation of a fuser member consisting essentially of applying to a fuser supporting substrate a coating mixture of a fluoropolymer, and an aliphatic alcohol, selected in an amount of from about 1 to about 20 weight percent.

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**5,501,882**

**METHOD OF MAKING HEAT-RESISTANT COATED ELECTRICALLY CONDUCTIVE WIRE**

**Satoshi Shukushima, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan**

**Division of Ser. No. 280,672, Jul. 27, 1994, Pat. No. 5,492,761, which is a continuation of Ser. No. 942,334, Sep. 9, 1992, abandoned, which is a continuation of Ser. No. 520,139, May 8, 1990, abandoned, which is a continuation-in-part of Ser. No. 435,835, Nov. 14, 1989, abandoned. This application Apr. 4, 1995, Ser. No. 415,993**

**Claims priority, application Japan, Jan. 27, 1989, 1-18600**

**Int. Cl.[6] B05D *3/00*; C08J *7/18***

**U.S. Cl. 427—496** **1 Claim**

1. A method of making a heat-resistant coated electrically conductive wire, which comprises the steps of:

forming an insulating coating of one thermoplastic resin or a plurality of thermoplastic resins containing aromatic rings or complex rings, which resin or resins are not cross-linkable alone by electron beams, on an electrically conductive wire, and

subjecting the insulating coating to irradiation with an accelerated ion beam, wherein the thermoplastic resin or resins are cross-linked to obtain a heat-resistant coated electrically conductive wire,

wherein the energy of the accelerated ion beam is in a range of 0.1 MeV to 50 MeV, wherein the dose of said accelerated ion beam is in a range of $1\times10^{11}$ ions/cm$^2$ to $1\times10^{15}$ ions/cm$^2$, and wherein the thermoplastic resin or plurality of resins is selected from the group consisting of polyetheretherketone, polyamide, polyetherimide, polyallylate, polycarbonate and polysulfone.

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**5,501,883**

**MATERIAL FOR USE AS A TRANSPARENT CONDUCTIVE FILM AND METHOD FOR MAKING A TRANSPARENT CONDUCTIVE FILM USING THE MATERIAL**

**Takao Ishikawa; Tomoji Oishi, and Sachiko Maekawa, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Jul. 27, 1994, Ser. No. 281,029**

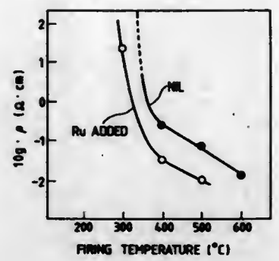
**Claims priority, application Japan, Sep. 7, 1993, 5-221874**

**Int. Cl.[6] C09K *19/00***

**U.S. Cl. 428—1** **1 Claim**

1. A low resistance, transparent conductive film comprising tin oxide to which antimony is added to form a film, and not more than about 2 wt. % of fine particles of at least one oxide of a Group VIII metal except for Fe, Co and Ni on the tin oxide-antimony film, the fine particles having a particle size of not greater than 5 nm.






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**5,501,884**

**DIAMINO COMPOUNDS AND THEIR PRODUCTION METHOD AND LIQUID CRYSTAL ALIGNMENT LAYERS USING THE COMPOUNDS**

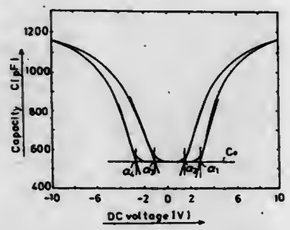
**Minoru Nakayama, Kumamoto; Toshiya Sawai, Chiba; Masaharu Hayakawa, Chiba; Shizuo Murata, Chiba, and Yukino Abe, Chiba, all of, Japan, assignors to Chisso Corporation, Tokyo, Japan**

**Division of Ser. No. 162,318, Dec. 7, 1993, Pat. No. 5,382,688. This application Aug. 25, 1994, Ser. No. 295,457**

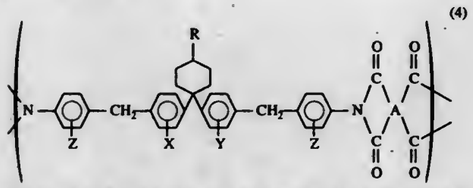
**Claims priority, application Japan, Dec. 7, 1992, 4-351340; Dec. 7, 1992, 4-351341**

**Int. Cl.[6] G02F *1/1337*; C08G *69/26*; C07C *211/54***

**U.S. Cl. 428—1** **7 Claims**




1. A liquid crystal alignment layer containing as a principal constituent a polyimide having a structure unit represented by the general formula (4):



(4)

wherein R indicates hydrogen or an alkyl group having 1 to 8 carbon atoms, further, X, Y and Z indicate hydrogen, an alkyl group having 1 to 3 carbon atoms or fluorine, respectively, and a part or all of them may be the same or different, and the positions of these substitutive groups may be ortho positions or meta positions, and A is an aromatic group of four valences, an aliphatic group of four valences or a complex group having aromatic and aliphatic properties of four valences.

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**5,501,885**

**FOLDABLE DECORATION**

**Elane Yeh, P.O. Box 82-144, Taipei, Taiwan**

**Filed Nov. 18, 1994, Ser. No. 342,170**

**Int. Cl.[6] B44C *3/06***

**U.S. Cl. 428—9** **1 Claim**




1. A foldable decoration comprising:

a decorative body;

a plurality of sector members having a first side, a second side and an arc between the first and second sides, each of said sector members being formed with a radial slot and two holes one at each end of the arc, said sector members being assembled so that the first side of one of said sector members is laid upon on the second side of an adjacent one of said sector members and pivotally connected thereto, the radial slot of said sector members extending beyond a line joining centers of the two holes at the upper ends of said arc;

a pin extending through the radial slot of said sector members; and

a cap engaged with said pin.

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**5,501,886**

**CELLULOSE HYDRATE-BASED FLAT OR TUBULAR FILM**

**Klaus-Dieter Hammer, Mainz; Manfred Siebrecht, Wiesbaden; Leo Mans, Saulheim; Theo Kranz, and Hermann Winter, both of Wiesbaden, all of, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany**

**Filed Jul. 19, 1994, Ser. No. 277,838**

**Claims priority, application Germany, Jul. 19, 1993, 43 24 169.7; Jan. 11, 1993, 43 34 561.1**

**Int. Cl.[6] F16L *11/08***

**U.S. Cl. 428—34.8** **18 Claims**

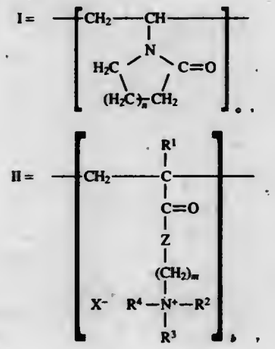
1. A cellulose hydrate film, comprising

cellulose hydrate and a polymer selected from the group consisting of

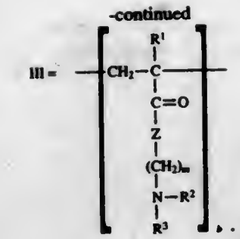
a homopolymer of repeating units of the formula I,

a copolymer of repeating units of the formulae I and II, and

a copolymer of repeating units of the formulae I and III, and a mixture thereof, wherein



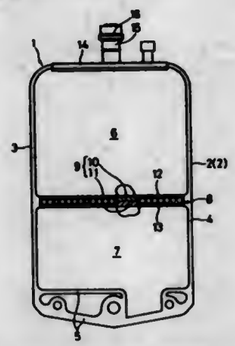
-continued

III = 

in which
n=1, 2 or 3,
m=2, 3, 4, 5 or 6,
a=about 20 to 100 mol %,
b=about 80 to 20 mol % and
a+b=100 mol %,
$R^1$ is H or a ($C_1$–$C_6$)-alkyl radical,
$R^2$ to $R^4$ are identical or different and are ($C_1$–$C_6$)alkyl radicals,
Z=O or N-$R^5$, in which $R^5$=H or ($C_1$–$C_6$)-alkyl radicals and
X=$Cl^-$, $Br^-$, $I^-$, $F^-$, $1/2SO_4^{2-}$, $HSO_4^-$, ($C_1$– $C_6$)-alkyl-O-$SO_2$-$O^-$, ($C_1$–$C_6$)-alkyl-$SO_2$-$O^-$.

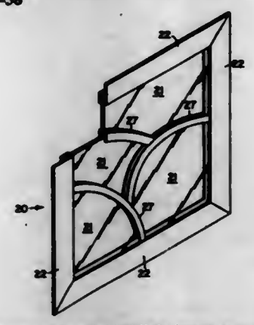
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**5,501,887**
**RESIN LAMINATE**
**Hiroshi Tanaka; Keso Morishige, both of Ichihara; Katsushi Watanabe, Matsushige, and Shigetoshi Kashiyama, Naruto, all of, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, and Otsuka Pharmaceutical Factory, Inc., Tokushima, both of, Japan**
Filed Dec. 28, 1993, Ser. No. 174,332
Claims priority, application Japan, Dec. 28, 1992, 4-348928; Nov. 15, 1993, 5-284904
Int. Cl.[6] B29D *22/00*
U.S. Cl. 428—35.2 9 Claims



1. A container formed from a resin laminate comprising:
an outer layer comprising a linear polyethylene having a density of not less than 0.910 g/cm$^3$ and less than 0.950 g/cm$^3$,
an inner layer comprising a linear polyethylene having a density of not more than 0.940 g/cm$^3$, and
an intermediate layer or layers provided between the outer layer and the inner layer, wherein at least one intermediate layer comprises a linear polyethylene having a density of not more than 0.920 g/cm$^3$, said density being different from the densities of the linear polyethylenes for forming the outer layer and the inner layer; and
at least one of said outer layer, said inner layer and said intermediate layer or layers is formed from a linear polyethylene composition comprising each linear polyethylene and a high-density polyethylene having a density of not less than 0.950 g/cm$^3$ in an amount of 5% to 55% by weight.

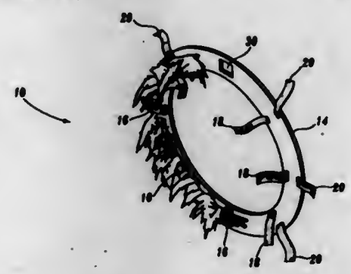
**5,501,888**
**DIVIDED LIGHT INSERT AND KIT FOR MOUNTING**
**Craig Hanson, Oakdale, Minn.; John Gallagher, Amery, Wis., and Kirk Schneider, Eden Prairie, Minn., assignors to Anderson Corporation, Bayport, Minn.**
Continuation of Ser. No. 16,982, Feb. 12, 1993, abandoned. This application Jan. 27, 1996, Ser. No. 379,838
Int. Cl.[6] B44C *5/08;1/16;* B32B *17/00;* E06B *3/54*
U.S. Cl. 428—38 29 Claims



1. A kit for mounting a divided light insert on a window, said kit comprising:
a) a divided light insert sized to fit proximate a primary glazing panel of said window, said divided light insert further comprising:
1) a plurality of lights;
2) interior caming disposed between said lights, said interior caming being substantially lead free, said interior caming having two channels, each of said channels being sized to receive an edge of one of said plurality of lights; and
3) edge caming disposed about a perimeter of said insert, said edge caming comprising a channel receiving edges of said plurality of lights which are proximate said perimeter of said insert and a flange extending away from a center of said insert said edge caming being substantially lead free;
b) retaining means attached to a frame of said window for retaining said divided light insert proximate said window; and
c) ventilating means for providing ventilation between said divided light insert and said primary glazing panel.

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**5,501,889**
**SUPPORT STRUCTURE FOR FORMING WREATHS**
**Dora I. Church, 23829 101st Pl. West, Edmonds, Wash. 98020**
Filed Oct. 13, 1994, Ser. No. 322,439
Int. Cl.[6] A47G *7/02*
U.S. Cl. 428—66.5 8 Claims



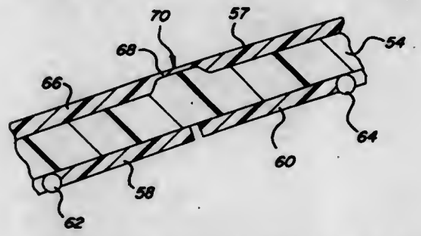
1. A support structure for forming a wreath, comprising:
(a) an annular backing ring;
(b) a plurality of straps connected to the backing ring, each strap being spaced from one another along the circumference of the backing ring, each strap including:



(i) a first portion having a first engaging material for releasably engaging with a second engaging material; and
(ii) a second portion having a second engaging material for releasably engaging the first engaging material; and
(c) a plurality of first openings defined in the backing ring at spaced apart locations along the circumference of the backing ring, wherein a strap is inserted in at least some of the first openings.

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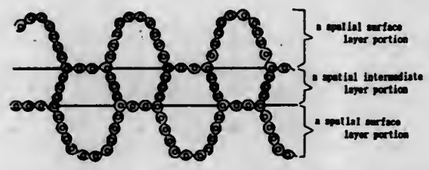
**5,501,890**
**INVISIBLE TEAR SEAM FOR AN AIR BAG DEPLOYMENT OPENING COVER**
**Daniel H. Mills, Durham, N.H., assignor to Davidson Textron Inc., Dover, N.H.**
Division of Ser. No. 985,916, Dec. 4, 1992, Pat. No. 5,443,777. This application Jan. 17, 1995, Ser. No. 373,450
Int. Cl.[6] B32B *1/04*
U.S. Cl. 428—68 2 Claims



1. A thermoformed plastics cover construction for an airbag deployment door subassembly, comprising:
a main portion having a wall thickness of about 0.04 inches and a predetermined strength; and
a relatively weaker tear seam portion having a predetermined geometric pattern and surrounded by said main portion, said seam portion having an as-formed seam width of about 0.5 to 1.0 inches and an as-formed material thickness of about 0.02 to 0.03 inches.

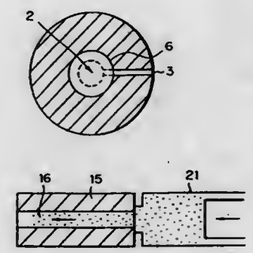
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**5,501,891**
**CUSHIONING STRUCTURE**
**Isamu Saika, Osaka, and Kenji Inagaki, Ibaraki, both of, Japan, assignors to Teijin Limited, Osaka, Japan**
Filed Feb. 17, 1995, Ser. No. 390,585
Claims priority, application Japan, Apr. 28, 1994, 6-091888
Int. Cl.[6] A47C *27/12;27/16;* A61G *7/02;* B32B *1/06*
U.S. Cl. 428—71 14 Claims




1. A cushioning structure which is a three-dimensional multiple woven texture constituted by a spatial surface layer portion and a spatial intermediate layer portion, characterized in that (i) protuberances are formed on one side or both sides of the surface layer portion at least unidirectionally and have an average height of 2 to 15 mm, an average width of one side of the protuberance being 2 to 30 mm; and that (ii) said intermediate layer portion is formed of one or more layers, each layer having a plurality of communicating hollow portions which are arranged in parallel unidirectionally.

**5,501,892**
**CERAMIC PARTS HAVING SMALL HOLE(S) AND METHOD OF MANUFACTURING THE SAME**
**Shinji Ohtsubo, Nagoya, Japan, assignor to NGK Insulators, Ltd., Japan**
Continuation of Ser. No. 269,626, Jul. 1, 1994, which is a continuation of Ser. No. 35,803, Mar. 23, 1993, abandoned. This application Dec. 15, 1994, Ser. No. 356,545
Claims priority, application Japan, Mar. 25, 1992, 4-67649; Mar. 30, 1992, 4-73853
Int. Cl.[6] C04B *38/00*
U.S. Cl. 428—131 7 Claims



1. A ceramic body comprising:
at least one material selected from the group consisting of silicon nitride, silicon carbide, and partially stabilized zirconia; and
at least one hole formed in said ceramic body, said hole having a diameter of not more than 3 mm, with the surface roughness $R_{max}$ of the inner surface of said hole being 2 μm≦$R_{max}$≦7 μm, whereby said body has a measured four-point flexural strength of at least about 80% of that of a similar body having the same diameter hole with an inner surface roughness of $R_{max}$ 0.8 μm.

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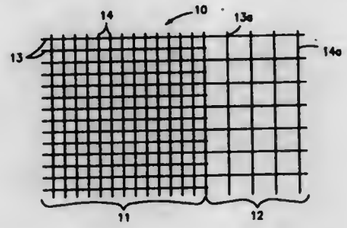
**5,501,893**
**METHOD OF ANISOTROPICALLY ETCHING SILICON**
**Franz Laermer, Stuttgart, and Andrea Schilp, Schwäbisch Gmünd, both of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany**
PCT No. PCT/DE93/01129, § 371 Date Aug. 5, 1994, § 102(e) Date Aug. 5, 1994, PCT Pub. No. WO94/14187, PCT Pub. Date Jun. 23, 1994
PCT Filed Nov. 27, 1993, Ser. No. 284,490
Claims priority, application Germany, Dec. 5, 1992, 42 41 045.2
Int. Cl.[6] C25F *3/12;* B44C *1/22*
U.S. Cl. 428—161 26 Claims

1. A method of anisotropic plasma etching of silicon to provide laterally defined recess structures therein through an etching mask employing a plasma, the method comprising:
a. anisotropic plasma etching in an etching step a surface of the silicon by contact with a reactive etching gas to removed material from the surface of the silicon and provide exposed surfaces;
b. polymerizing in a polymerizing step at least one polymer former contained in the plasma onto the surface of the silicon during which the surfaces that were exposed in a preceding etching step are covered by a polymer layer thereby forming a temporary etching stop; and
c. alternatingly repeating the etching step and the polymerizing step.

### 5,501,894
## FABRIC FOR STRENGTHENING AND/OR REINFORCING FLAT-SHAPED ARTICLES

Bernd Lagemann, Tiengen, and Friedrich Mathias, Erzingen, both of, Germany, assignors to Synteen Gewebe Technik GmbH, Klettgau-Erzingen, Germany

Filed Apr. 11, 1994, Ser. No. 225,568
Claims priority, application Germany, May 19, 1993, 9307658 U
Int. Cl.[6] B32B 7/00
U.S. Cl. 428—57 10 Claims



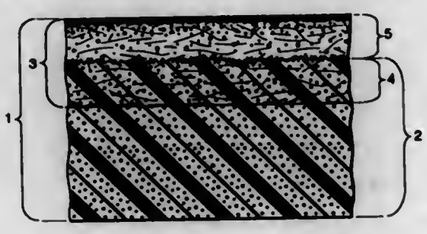

1. A fabric for strengthening and/or reinforcing flat-shaped articles, in particular of plastered structures (1) or the like, consisting of ward threads (14) and woof threads (13), which form a basic fabric (11) and a connected edge area (12), characterized by the fact, that the edge area (12) is thinned in relation to the basic fabric (11).

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### 5,501,895
## FLOOR COVERING UNDERLAYMENT

Brenda L. Finley, 1018 Donegal Springs Rd., Mount Joy, Pa. 17552, and Ralph W. Wright, Jr., 303 Donna Ave., Lancaster, Pa. 17603

Filed Jul. 23, 1992, Ser. No. 917,845
Int. Cl.[6] B32B 23/02;3/06;5/14
U.S. Cl. 428—194 11 Claims



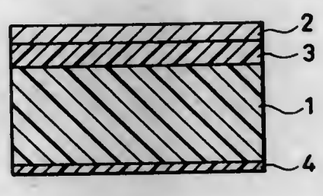

1. A floor covering system comprising an underlayment, an adhesive and a resilient flooring sheet, the underlayment being adhered to the flooring sheet by the adhesive, the underlayment comprising a fiber layer of at least about 10 mils in thickness and a foamed polymeric layer, the fiber layer having at least a 5 pound per lineal inch hot tensile strength, a portion of the foamed polymeric layer interpenetrating a portion of the fiber layer adjacent the foamed polymeric layer.

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### 5,501,896
## MAGNETIC RECORDING MEDIUM

Yasuhiro Ueyama, Kadoma; Keiichi Ochiai, Hiroshima; Tetsuo Satake, Osaka; Hideaki Komoda, Hirakata, and Hideo Hatanaka, Neyagawa, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 756,221, Sep. 9, 1991, abandoned.
This application Sep. 20, 1994, Ser. No. 308,967
Claims priority, application Japan, Sep. 10, 1990, 2-240823; Nov. 30, 1990, 2-337992
Int. Cl.[6] B32B 5/16; G11B 5/66
U.S. Cl. 428—323 9 Claims




1. A magnetic recording medium comprising:
a non-magnetic substrate;
a magnetic film formed adjacent to a first surface of said non-magnetic substrate;
a back-coat film formed adjacent to a second surface of said non-magnetic substrate, said back-coat film having a first flake powder of $\alpha$—$Fe_2O_3$ and a binder, said first flake powder having a shape defined by an aspect ratio ranging from 5:1 to 150:1, said aspect ratio being a ratio of an average particle diameter of said first flake powder to an average thickness of said first flake powder, said average particle diameter of said first flake powder ranging from 0.05 μm to 1.5 μm;
a first under-coat film formed between said non-magnetic substrate and said magnetic film, said first under-coat film having a second flake powder of $\alpha$—$Fe_2O_3$ and a binder, said second flake powder having a shape defined by an aspect ratio ranging from 5:1 to 150:1, said aspect ratio being a ratio of an average particle diameter of said second flake powder to an average thickness of said second flake powder, and said average particle diameter of said second flake powder ranging from 0.05 μm to 1.5 μm; and
a second under-coat film formed between said non-magnetic substrate and said back-coat film, said second under-coat film having a third flake powder of $\alpha$—$Fe_2O_3$ and a binder, said third flake powder having a shape defined by an aspect ratio ranging from 5:1 to 150:1, said aspect ratio being a ratio of an average particle diameter of said third flake powder to an average thickness of said third flake powder, and said average particle diameter of said third flake powder ranging from 0.5 μm to 3.0 μm.

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### 5,501,897
## TRACKING RESISTANT PRESSURE-SENSITIVE ADHESIVE TAPE

Hiroki Ichikawa; Kaoru Aizawa, and Toshimitsu Okuno, all of Osaka, Japan, assignors to Nitto Denko Corporation, Osaka, Japan

Continuation of Ser. No. 27,847, Mar. 8, 1993, abandoned.
This application Oct. 31, 1994, Ser. No. 332,440
Int. Cl.[6] C09J 7/02
U.S. Cl. 428—261 3 Claims




1. A tracking resistant pressure-sensitive adhesive tape comprising an electrically insulating film wherein said electrically insulating film is a composite film of a surface layer and a support film, wherein said surface layer comprises a polyolefin series resin, butyl rubber, or polymethyl methacrylate, and wherein said electrically insulating film has a comparative tracking index by an tracking resistant test of the IEC method of at least 400 V, a modulus of elasticity of from 20 to 1,200 kg/mm$^2$, and a thickness of from 5 to 150 μm, and having formed on one side thereof a pressure-sensitive adhesive layer.



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### 5,501,898
## INTERIOR EQUIPMENT PART FOR VEHICLES

Walter Föttinger; Hansjörg Grimm, both of Weinheim, and Gerhard Schaut, Hemsbach, all of, Germany, assignors to Firma Carl Freudenberg, Weinheim, Germany

Filed Aug. 25, 1993, Ser. No. 112,822
Claims priority, application Germany, Aug. 26, 1992, 42 28 304.3
Int. Cl.[6] B32B 27/36
U.S. Cl. 428—287 3 Claims

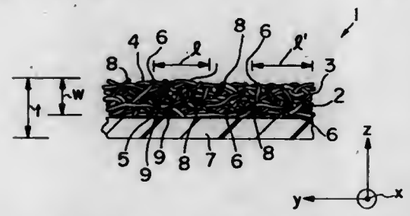
1. An interior equipment part for a vehicle comprising a heat and pressure compacted laminate of a first outer layer of polyester fibers for exposure to heat, a second outer layer of polyester fibers for exposure to heat, and an inner layer of polyester fibers sandwiched between said first and second outer layers, each of the first and second outer layers and the inner layer consisting essentially of polyester fibers having a titer of 1.5–30 dtex, where from 25% to 100% by weight of each of the first and second outer layers consists of polybutylene terephthalate fibers and where each of the first and second outer layers contains from 0% to 75% by weight of homogeneously distributed polyester endless fibers having a melting point greater than 228° C., wherein the inner layer has a density which is 8–40% of a density of the outer layers, and the heat and pressure compacted laminate having a thickness of from 1 mm to 6 mm.

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### 5,501,899
## STATIC ELIMINATOR AND METHOD

William J. Larkin, 27 Parsons Dr., Swampscott, Mass. 01907

Filed May 20, 1994, Ser. No. 247,051
Int. Cl.[6] H02H 1/00; D04H 1/58
U.S. Cl. 428—288 6 Claims



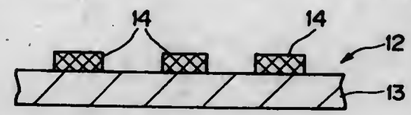

1. A low profile ionizing surface for use in an apparatus through which insulative material flows or is propelled, said low profile ionizing surface comprising:
a low profile fibrous network having an exposed and an adhered surface and comprising a multiplicity of electrically conductive microfibers crossing one another at intervals to be in electrically conductive communication with one another across said network, the lengths of said microfibers being selected to provide a multiplicity of microfiber ionizing points disposed across said network at or near said exposed surface, the thickness of said network being less than the average length of said microfibers; and
an adhesive means comprising an adhesive layer to bond said adhered surface to a surface of said apparatus such that, when said network is electrically grounded or electrically charged, air between said ionizing points and said material passing said exposed surface is sufficiently ionized to remove static charge from said material or to attract or repel said material to or from said apparatus surface.

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### 5,501,900
## BLACK MATRIX SUBSTRATE, AND COLOR FILTER AND LIQUID CRYSTAL DISPLAY DEVICE USING THE SAME

Ryutaro Harada, and Satoshi Mitamura, both of Shinjuku, Japan, assignors to DAI Nippon Printing Co., Ltd., Japan

Filed Mar. 1, 1994, Ser. No. 203,569
Claims priority, application Japan, Mar. 3, 1993, 5-042663; Mar. 8, 1993, 5-075178
Int. Cl.[6] B32B 5/16
U.S. Cl. 428—323 10 Claims




1. A black matrix substrate comprising:
a substrate; and
a black pattern formed on said substrate, said black pattern comprising a hydrophilic resin and metal particles precipitated therein;
wherein (i) said metal particles have such a particle diameter distribution that particles having particle diameter in a range of 10 nm to 20 nm are not less than 40% of the total particles, in a range of 10 nm to 30 nm are not less than 80% of the total particles and in a range of 5 nm to 50 nm are not less than 90% of the total particles, (ii) a projected area density at a conversion of 600 Å thickness of said metal particles in said black pattern is not less than 60%, and (iii) an optical density of said black matrix substrate is not less than 1.5;
said black pattern being formed by depositing said hydrophilic resin on said substrate in the form of said black pattern, and subjecting the resin pattern to an electroless plating process to precipitate said metal particles in said black pattern.

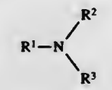
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### 5,501,901
## BIAXIALLY ORIENTATED POLYPROPYLENE MULTILAYER FILM, PROCESS FOR ITS PRODUCTION, AND ITS USE

Detlef E. Schulhmann, Kiedrich; Thomas Dries, Schwabenheim; Adolf Wilhelm, Wiesbaden; Dieter Scheidecker, Eltville; Harald Lohmann, Neunkirchen; Ursula Murschall, Nierstein; Herbert Peiffer, Mainz, and Gunter Schloegl, Kelkheim, all of, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Jan. 25, 1994, Ser. No. 186,144
Claims priority, application Germany, Jan. 25, 1993, 43 01 897.1; Jan. 25, 1993, 43 01 896.3
Int. Cl.[6] B32B 27/00
U.S. Cl. 428—323 20 Claims

1. A sealable, coextruded, biaxially orientated opaque film comprising a base layer which comprises a propylene polymer and filler, and at least one sealable top layer, wherein the top layer comprises inorganic and/or organic particles and tertiary aliphatic amine of the formula I



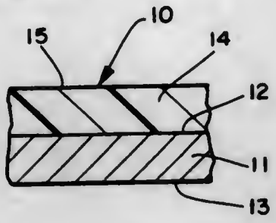
(I)

in which
$R^1$ is an unsaturated alkyl radical having at least 18 carbon atoms and

$R^2$ and $R^3$ are identical or different and are $R^4$—$CH_2OH$, in which $R^4$ is an essentially saturated $C_1$–$C_6$-alkylene radical.

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**5,501,902**
**PRINTABLE MATERIAL**
**Francis J. Kronzer, Marietta, Ga., assignor to Kimberly Clark Corporation, Neenah, Wis.**
**Filed Jun. 28, 1994, Ser. No. 268,089**
**Int. Cl.[6] B32B 5/16**
**U.S. Cl. 428—323** **46 Claims**

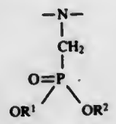



1. A printable material having first and second surfaces, the printable material comprising:
a first layer defining the first surface; and
a second layer defining the second surface, which layer comprises
particles of a thermoplastic polymer having largest dimensions of less than about 50 micrometers;
from about 10 to about 50 weight percent of a film-forming binder, based on the weight of the thermoplastic polymer; and
from about 0.2 to about 10 weight percent of an ink viscosity modifier, based on the weight of the thermoplastic polymer.

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**5,501,903**
**MAGNETIC RECORDING MEDIUM HAVING A BINDER SYSTEM INCLUDING A NON HALOGENATED VINYL POLYMER AND A POLYURETHANE POLYMER EACH WITH SPECIFIED PENDANT GROUPS**
**Ruth M. Erikkila, Lilydale; James G. Carlson, Lake Elmo, both of Minn.; Christopher M. Evans, Essex, United Kingdom; James A. Greczyna, Vadnais Heights; Ramesh C. Kumar, Maplewood, both of Minn.; Colin F. Norman, Essex, United Kingdom, and Nelson T. Rotto, North St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**
**Filed Jul. 29, 1994, Ser. No. 282,958**
**Int. Cl.[6] G11B 5/00**
**U.S. Cl. 428—328** **11 Claims**

1. A magnetic recording medium comprising a magnetic layer provided on a nonmagnetizable substrate, said magnetic layer comprising:
(a) a polymeric binder system comprising (i) a first resin component comprising a nonhalogenated vinyl copolymer comprising a plurality of pendant nitrile groups, a plurality of pendant hydroxyl groups, and at least one pendant quaternary ammonium group, and (ii) a second resin component comprising a polyurethane polymer comprising a plurality of units of the formula:

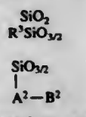



in which:
the nitrogen atom forms part of the backbone chain of the polymer, and $R^1$ and $R^2$ independently represent an alkyl group, cycloalkyl group, an aryl group or together comprise the necessary carbon atoms to complete a ring, and
(b) a magnetic pigment dispersed in the polymeric binder system.

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**5,501,904**
**COATING AGENTS**
**Ippei Noda, and Masami Ishikawa, both of Aichi, Japan, assignors to Takemoto Yushi Kabushiki Kaisha, Japan**
**Division of Ser. No. 218,878, Mar. 28, 1994, Pat. No. 5,405,691, which is a continuation of Ser. No. 970,574, Nov. 3, 1992, abandoned. This application Dec. 22, 1994, Ser. No. 362,088**
**Claims priority, application Japan, Nov. 7, 1991, 3-321316**
**Int. Cl.[6] B32B 5/16**
**U.S. Cl. 428—331** **14 Claims**

1. A coating agent comprising an aqueous emulsion of polysilane-polyvinyl graft copolymer consisting essentially of siloxanep unit including at least one kind selected from the group consisting of units of first kind given by Formula (1), units of second kind given by Formula (2) and units of third kind given by Formula (3); said units of third kind which are included being equal to or greater than 0.5 molar % of the total of said units that are included; said Formulas (1) through (3) being given by:



Formula (1)



Formula (2)



Formula (3)

where $R^3$ is substituted or non-substituted hydrocarbon group having a carbon atom directly connected to a silicon atom, not having radical polymerization property and having substituting group for said substituted hydrocarbon group, said substituting group being selected from the group consisting of halogen group, epoxy group, cyano group and ureido group; $A^2$ is a divalent organic group having a carbon atom directly connected to a silicon atom and being connected to $B^2$; and $B^2$ is a vinyl polymer block.

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**5,501,905**
**MATT BIAXIALLY STRETCHED POLYPROPYLENE FILM AND A PROCESS FOR PRODUCING THE SAME**
**Anton Krallmann, Fallingbostel; Thomas Blum, Schwarmstedt, and Ingo Schinkel, Walsrode, all of, Germany, assignors to Wolff Walsrode Aktiengesellschaft, Walsrode, Germany**
**Filed Mar. 17, 1994, Ser. No. 210,845**
**Claims priority, application Germany, Mar. 24, 1993, 43 09 555.0**
**Int. Cl.[6] B32B 7/12**
**U.S. Cl. 428—339** **7 Claims**

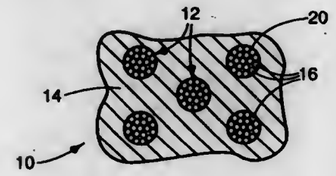
1. Matt two-layered or multilayered, biaxially stretched polypropylene films comprising an outer matt layer M, a core layer K and optionally additional layers S which are adjacent to the core layer on the side opposite to the matt layer, and polymer mixtures from which the matt layer can be produced, wherein the matt layer M has a layer thickness of from 0.5 to 5.0 μm and is composed of
25–75% of one or more polypropylene/polyethylene block copolymers,
5–15% of an ethylene based co- or terpolymer modified with polar groups,
15–40% of a random co- and/ or terpolymer produced from propylene/ethylene/butylene with propylene as main component,
5–20% of a high density polyethylene and
0–5 % of a natural or synthetic silica,
the above-mentioned components being used in the state delivered from the supplier or in the form of batches thereof,



the core layer K
consists of a thermoplastic polymer or copolymer of propylene which may be equipped with conventional slip agents, antistatic agents or anti-blocking agents,
the layers S
which are adjacent to the core layer on the side opposite the matt layer consist either of a thermoplastic polypropylene which may be equipped with conventional slip agents, antistatic agents or anti-blocking agents,
or of a thermoplastic random copolymer
of the polypropylene having one or more α-olefins containing 2 to 6 carbon atoms, which may be equipped with conventional slip agents, antistatic agents or anti-blocking agents,
or of a layer which can be heat laminated,
composed of mixtures of ethylene-based copolymers,
or of a layer combination of the above-mentioned layer S.

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**5,501,906**
**CERAMIC FIBER TOW REINFORCED METAL MATRIX COMPOSITE**
**Herve E. Deve, Minneapolis, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**
**Filed Aug. 22, 1994, Ser. No. 293,812**
**Int. Cl.[6] B32B 9/00**
**U.S. Cl. 428—366** **12 Claims**




1. A fiber-reinforced composite comprising at least one tow in a metal matrix, said tow comprising a plurality of continuous ceramic fibers held together by a carbonaceous matrix wherein said continuous ceramic fibers have an average diameter of about 1 to about 50 micrometers.

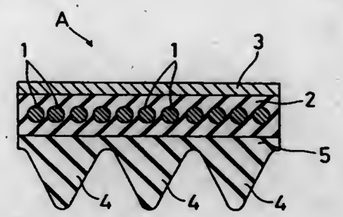
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**5,501,907**
**FIBROUS ELECTRICALLY CONDUCTIVE FILLER**
**Takao Hayashi, Yamaguchi; Nobuyoshi Kasahara, Saitama; Norihiro Sato, and Kouichi Kawaratani, both of Yamaguchi, all of, Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan**
**Filed Sep. 29, 1993, Ser. No. 128,233**
**Claims priority, application Japan, Sep. 29, 1992, 4-283709**
**Int. Cl.[6] B05D 3/02; B32B 9/00**
**U.S. Cl. 428—389** **4 Claims**

1. A fibrous electrically-conductive filler comprising fibrous aluminum borate as a core material and a layer of a tin oxide coated on said fibrous aluminum borate, said tin oxide being free of antimony.

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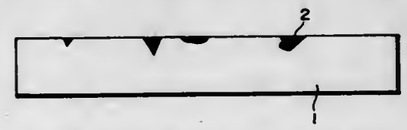
**5,501,908**
**RUBBER COMPOSITION AND TRANSMISSION BELT USING THE SAME**
**Tsutomu Shioyama; Naoki Hamano, and Masaaki Ogino, all of Kobe, Japan, assignors to Bando Chemical Industries, Ltd., Kobe, Japan**
**Continuation-in-part of Ser. No. 37,430, Mar. 26, 1993, abandoned. This application Mar. 7, 1994, Ser. No. 206,835**
**Int. Cl.[6] F16G 1/08; 1/04; 5/06; B32B 25/02**
**U.S. Cl. 428—395** **12 Claims**




1. A rubber composition comprising:
a rubber forming a continuous phase of 100 weight parts;
a nylon fiber having a diameter of about 0.3 μm and a length of about 300 μm of 1 to 15 weight parts, the nylon fiber being grafted with a rubber capable of co-cross-linking to the rubber forming the continuous phase; and
a nylon fiber having a diameter of between about 10 and 50 μm and a length of between about 0.3 and 6.0 mm of 1 to 30 weight parts.

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**5,501,909**
**POLYCRYSTALLINE DIAMOND SUBSTRATE AND PROCESS FOR PRODUCING THE SAME**
**Kenjiro Higaki; Hideaki Nakahata; Akihiro Hachigo, and Shinichi Shikata, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Japan**
**Filed Feb. 15, 1994, Ser. No. 196,609**
**Claims priority, application Japan, Feb. 16, 1993, 5-026506**
**Int. Cl.[6] C30B 25/04**
**U.S. Cl. 428—408** **11 Claims**

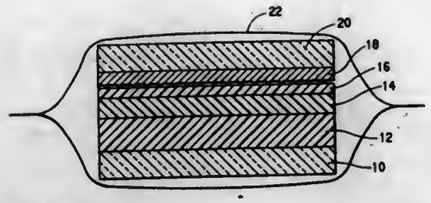



1. A diamond substrate having a polished smooth surface, comprising:
a polycrystalline diamond film having a surface with a pit, and
an insulating material other than diamond having a resistivity of $10^6$ Ω.cm or higher, which occupies the pit, at least a portion of the surface of the polycrystalline diamond film being exposed from the insulating material.

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**5,501,910**
**EMBOSSED GLASS/PLASTIC LAMINATE**
**Charles A. Smith, Vienna, W. Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**
**Division of Ser. No. 155,349, Nov. 19, 1993, Pat. No. 5,393,365. This application Sep. 1, 1994, Ser. No. 299,380**
**Int. Cl.[6] B32B 9/04**
**U.S. Cl. 428—447** **5 Claims**

1. A glass/plastic laminate having a decorative relief pattern thereon comprised of



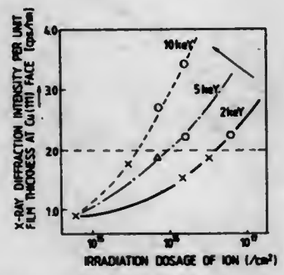

a) a glass sheet,
b) an adhesive layer,
c) a plastic film one side of which is adhered by said adhesive layer to said glass sheet, and
d) a cured layer of a polysiloxane antiabrasion material covering the entire surface of the other side of said plastic film,
e) said laminate having a relief pattern in the cured layer of antiabrasion material.

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**5,501,911**
**COPPER CRYSTAL FILM COATED ORGANIC SUBSTRATE**

**Akinori Ebe; Kiyoshi Ogata; Satoshi Nishiyama; Naoto Kuratani, and Taizo Okazaki, all of Kyoto, Japan, assignors to Nissin Electric Co., Ltd., Kyoto, Japan**

**Division of Ser. No. 892,378, Jun. 4, 1992, Pat. No. 5,316,802. This application May 25, 1993, Ser. No. 65,913**
**Claims priority, application Japan, Feb. 20, 1992, 4-70389; Mar. 24, 1992, 4-66239; Apr. 7, 1992, 4-84299**
**Int. Cl.[6] B32B** *15/08;15/20;* **B05D** *3/06*
**U.S. Cl. 428—457** **2 Claims**




1. A copper film coated substrate, comprising:
an organic substrate having a surface which has been irradiated with inert gas ions; and
a copper crystal film formed on said surface of (111) orientation predominate and said copper film has an X-ray diffraction intensity of 2.0 cps/nm or more per unit film thickness at a crystal orientation (111) face of said copper film.

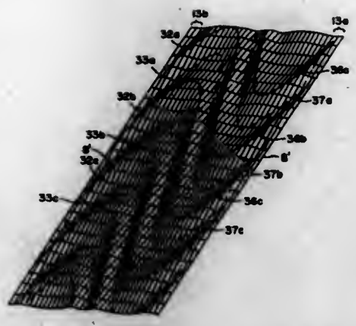
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**5,501,912**
**STRIP MATERIAL**

**Jan G. Sergenius, Bergsundsgatan 15, S-117 37 Stockholm, Sweden**

**PCT No. PCT/SE92/00640, § 371 Date Mar. 14, 1994, § 102(e) Date Mar. 14, 1994, PCT Pub. No. WO93/05901, PCT Pub. Date Apr. 1, 1993**
**PCT Filed Sep. 18, 1992, Ser. No. 204,315**
**Claims priority, application Sweden, Sep. 20, 1991, 9102729**
**Int. Cl.[6] B21D** *13/10;* **E04C** *2/32;* **B32B** *3/28*
**U.S. Cl. 428—604** **13 Claims**

1. A metal strip having increased longitudinal and transverse stiffness, high bendability without permanent deformation, and spring characteristics, comprising:




at least one corrugated zone along a length of the strip and corrugations of the corrugated zones having ridges with valleys therebetween with an isohypsis of said ridges and valleys forming arcs when projected on an X-Y plane of a three dimensional X-, Y-, Z-direction system in which the X-direction coincides with a width of the corrugation zone, the Y-direction coincides with a length of the corrugation zone and the Z-direction is perpendicular to the X-Y plane and longitudinal sections through the corrugated zone form waves in the Y-Z plane, propagating in the Y-direction and alternating in the Z-direction, said waves having a wave lengths and being in a continuously curved configuration; and wherein
(a) a depths of the corrugations were $0.5T<A<2T$, where T is a thickness of the strip, A is a corrugation depth defined as the amplitude of the wave pattern from a center line of the strip in a symmetry plane of the corrugation zone coinciding with a tip of the arc of the ridges projected on the X-Y plane; and
(b) the height of the arcs was at least as large as the wave length of said waves alternating in the Z-direction.

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**5,501,913**
**GARNET POLYCRYSTALLINE FILM FOR MAGNETO-OPTICAL RECORDING MEDIUM**

**Kenji Shimokawa, Kawasakaki, and Norikazu Kawamura, Tokyo, both of, Japan, assignors to Nippon Steel Corporation, and Nippon Hoso Kyokai, both of, Japan**

**Filed Nov. 13, 1991, Ser. No. 791,653**
**Int. Cl.[6] G11B** *5/66;* **C04B** *35/00*
**U.S. Cl. 428—694 ML** **14 Claims**



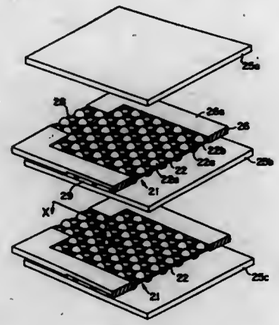

1. A garnet polycrystalline film for a magneto-optical recording medium comprising:
two layers of polycrystalline garnet represented by $Bi_xR_{3-x}M_yFe_{5-y}O_{12}$ where $0 \leq X \leq 3$, $0 \leq Y \leq 5$, R represents one or more rare earth elements including yttrium, and M represents Ga, Al or In); wherein:
said two layers being adjacent to each other and having crystal lattice constants different by ±0.3% or more, and an average crystal grain diameter of one of the layers being smaller than that of the other layer and 1 μm or less.



**5,501,914**
**SOLID OXIDE ELECTROLYTE FUEL CELL**

**Tokuki Satake; Fusayuki Naaje; Kiyoshi Watanabe, and Shigeaki Yamamuro, all of Kobe, Japan, assignors to Mitsubishi Jukogyo Kaboshiki Kaisha, Tokyo, Japan**

**Filed Aug. 26, 1994, Ser. No. 296,134**
**Claims priority, application Japan, Sep. 1, 1993, 5-217613**
**Int. Cl.[6] H01M** *2/08;8/10*
**U.S. Cl. 429—36** **7 Claims**




1. A solid oxide electrolyte fuel cell comprising:
a power generation film having opposing sides and a periphery, said power generation film comprising a solid oxide electrolyte film, an oxygen electrode formed on one side of said solid oxide electrolyte film, and a fuel electrode formed on the other side of said solid solid oxide electrolyte film, and said power generation film having a plurality of dimples projecting from each of said opposing sides;
two interconnectors, one provided on each of said opposing sides of said power generation film; and
a sealing section located at and integrally formed with said periphery of said power generation film, said sealing section defining openings therein and having opposing faces effective to join said power generation film to said two interconnectors at said opposing faces of said sealing section and said dimples projecting from said opposing sides;
wherein said dimples of said power generation film are dome-shaped.

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**5,501,915**
**POROUS ELECTRODE FOR ELECTRODE ASSEMBLIES IN A FUEL CELL**

**Graham A. Hards, Wallingford, and Thomas R. Ralph, Reading, both of, United Kingdom, assignors to Johnson Matthey Public Limited Company, United Kingdom**

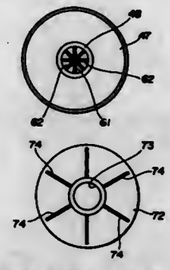
**Continuation of Ser. No. 79,461, Jun. 18, 1993, abandoned. This application Apr. 26, 1995, Ser. No. 429,460**
**Claims priority, application United Kingdom, Jun. 20, 1992, 9213124**
**Int. Cl.[6] H01M** *4/92;4/86*
**U.S. Cl. 429—42** **8 Claims**

1. A porous electrode suitable for use in a membrane electrode assembly for solid polymer fuel cells, said electrode comprising a first component comprising a highly dispersed precious metal catalyst on particulate carbon impregnated with proton conducting polymer, said highly dispersed precious metal catalyst being present at a precious metal loading of 0.01– 1.0 mg/cm² of geometric electrode area, and a second component comprising hydrophobic polymer and a dispersion of particulate carbon, characterized in that said second component is fired at a temperature of at least 280° C. and subsequently said first and second components, are combined to form an electrode active layer, said first and second components having a uniform concentration throughout said electrode active layer.

**5,501,916**
**BATTERY HAVING A THROUGH-HOLE AND HEAT DISSIPATING MEANS**

**Kazunori Teramoto, and Naoyuki Sugeno, both of Fukushima, Japan, assignors to Sony Corporation, Tokyo, Japan**

**Filed Apr. 15, 1994, Ser. No. 228,260**
**Claims priority, application Japan, Apr. 15, 1993, 5-087709; Jul. 27, 1993, 5-203778**
**Int. Cl.[6] H01M** *6/10;10/50*
**U.S. Cl. 429—94** **7 Claims**



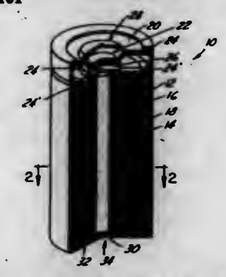

1. A battery comprising a battery vessel having a central opening with an inner surface, a battery lid with an opening, a cylindrical part with an axially extending opening with an inner surface, and a spiral-shaped electrode made up of a strip-shaped positive electrode and a strip-shaped negative electrode wound about the cylindrical part a number of times with a separator therebetween, said spiral-shaped electrode being mounted in said battery vessel so that the axially extending opening of the cylindrical part is substantially coincident with the central opening of the vessel, said battery vessel being sealed after charging a liquid electrolyte therein by said battery lid with the axially extending opening of said lid being coincident with the opening of the lid, and cooling means comprising at least one heat-dissipating member being arranged on one of the inner surface of the axially extending opening and a surface of the lid.

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**5,501,917**
**HYDROGEN STORAGE MATERIAL AND NICKEL HYDRIDE BATTERIES USING SAME**

**Kuochih Hong, 1790 Rolling Woods, Troy, Mich. 48098**

**Filed Jan. 28, 1994, Ser. No. 189,080**
**Int. Cl.[6] H01M** *4/02*
**U.S. Cl. 429—101** **22 Claims**




1. A material for forming a hydride, for hydrogen storage and for forming a hydride electrode, said material comprising:
a material selected from the group having composition formula $A_aB_bNi_cD_dM_eR_z$, wherein A is at least one element selected from the group consisting of Ti, Zr, Hf, Y, V, Nb, Pd, Mg, Be and Ca; B is at least one element selected from the group consisting of Mg, Al, V, Nb, Ta, Cr, Mn, Si, C, B, and Mo; D is at least one element selected from the group consisting of W, Fe, Co, Cu, Zn, Ag, Sb and Sn; M is at least one element selected from the group consisting of Li, Na, K, Rb, Cs, P, S, Sr and Ba; R is at least one element selected from the group

consisting of Sc, Y, La, Ce, Pr and Yb; and where the atomic mole ratios a, b, c, x, y and z are defined by: $0.10 \leq a \leq 0.85$, $0.02 \leq b \leq 0.85$, $0.02 \leq c \leq 0.85$, $0.01 \leq x \leq 0.30$, $0 \leq y \leq 0.30$, $0 \leq z \leq 0.12$, and $a+b+c+x+y+z=1.00$.

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**5,501,918**

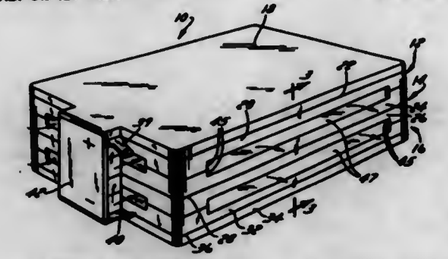
**THERMAL MANAGEMENT OF RECHARGEABLE BATTERIES**

**Robert G. Gruenstern, Muskego; Ronald J. Bast, Greendale, both of Wis.; Julie A. Aldecoa, Santa Cruz, and Lawrence F. Miller, Santa Clara, both of Calif., assignors to Globe-Union Inc., Milwaukee, Wis.**

**Continuation of Ser. No. 14,804, Feb. 8, 1993, Pat. No. 5,338,624. This application Aug. 11, 1994, Ser. No. 289,804**

**Int. Cl.[6] H01M 2/02**

**U.S. Cl. 429—120** **18 Claims**



1. A battery stack, comprising:

a plurality of stacked, sealed cells, each cell containing a pair of positive and negative electrodes, a separator interposed between the electrodes, an electrolyte permeating the separator, a plastic casing enclosing each cell, and electrical connections for connecting the electrodes of each cell to associated terminals;

wherein at least one casing is spaced from the casing of an adjacent cell in the stack by plastic projections integrally molded on the at least one casing that leave an air space for heat dissipation between adjacent cells, the air space being open along an edge of the stacked cells, and the plastic projections are bonded to the adjacent cell casing such that the stack of cells forms an integral unit.

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**5,501,919**

**SOLID ION CONDUCTING MATERIAL, OBTAINED FROM A POLYMER AND AN ALKALINE CATION SALT, WITH APPLICATION AS AN ELECTROLYTE**

**Jean-Luc Paul, Bordeaux, and Jean-Claude Lassegues, Pessac, both of, France, assignors to Saint-Gobain Vitrage International, Courbevoie, France**

**Continuation of Ser. No. 898,534, Jun. 15, 1992, abandoned. This application Feb. 15, 1994, Ser. No. 196,793**

**Claims priority, application France, Jun. 14, 1991, 91 07283**

**Int. Cl.[6] H01M 6/18**

**U.S. Cl. 429—192** **15 Claims**

1. A solid ion conductor material, comprising:

a branched polyethylene imine polymer containing repeating ethylene imine monomer units, a polyethylene glycol plasticizer for said polymer containing repeating oxygen-containing monomer units, and a lithium salt, wherein the ratio $N/Li^+$ of the number of nitrogen atoms N contained in said polymer to the number of lithium cations $Li^+$ originating from said salt is from 6 to 10, the ratio of the number of oxygen-containing monomer units of said plasticizer to the number of said oxygen-containing monomer units plus said ethylene imine monomer units is 20 to 60%, and said solid ion conductor material has a conductivity of at least $10^{-5}$ ohm$^{-1}$ cm$^{-1}$ at 25° C.

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**5,501,920**

**SOLID POLYMERIC ELECTROLYTE INCLUDING A CROSS-LINKED POLYETHER ENCOMPASSING AN ION COMPOUND AND A LIQUID PLASTICIZER**

**Maria Andrei, Bergeto; Arnaldo Roggero, San Donato Milanese; Massimo Soprani, Borgoessia, and Alberto Gandini, Milan, all of, Italy, assignors to Enitricerche S.p.A., Milan, Italy**

**Filed Jun. 29, 1994, Ser. No. 267,521**

**Claims priority, application Italy, Jul. 9, 1993, MI93A1488**

**Int. Cl.[6] H01M 6/18**

**U.S. Cl. 429—192** **11 Claims**

1. Polymeric electrolyte structure, in the form of a membrane, consisting of a solution of an ion compound in a cross-linked polyether comprising a liquid plasticizer, characterized in that said polymeric electrolyte structure is obtained by the following steps:

a) copolymerizing a vinyl ether having the formula:

$$R-(O-CH_{2-CH2}-)_n-O-CH=CH_2 \quad (I)$$

wherein: R indicate the methyl or ethyl radical; n is an integer ranging from 1 to 16; with an allyl vinyl ether having the formula:

$$CH_2=CH-CH_2-(O-CH_2-CH_2-)_m-O-CH=CH_2 \quad (II)$$

wherein: m is an integer varying from 1 to 10, with a molar ratio between (I) and (II) of between 70/30 and 95/5, to obtain a copolymer having allyl unsaturations; b) hydrosilating the double allyl bond of the copolymer obtained in step (a) by reaction with an alkoxy silane, said silane being trimethoxy or triethoxy silane, to obtain a hydroxylated copolymer;

c) cross-linking the hydrosilated copolymer obtained in step (b) by means of a diprotic cross-linking agent in solution in a plasticizer, said plasticizer being an oligomer or a dipolar aprotic solvent in a quantity of 20 to 80% by weight, in the presence of an ion compound; and evaporating any low-boiling compounds formed in the cross-linking reaction to obtain a membrane capable of containing the liquid plasticizer.

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**5,501,921**

**FABRICATION OF ALKANE POLYMER ELECTROLYTE**

**Ib I. Olsen, 700 S. Saratoga Ave., #W301, San Jose, Calif. 95129**

**Filed Apr. 25, 1994, Ser. No. 232,908**

**Int. Cl.[6] H01M 10/40**

**U.S. Cl. 429—192** **15 Claims**

1. A polymeric electrolyte comprising:

(a) a polymeric matrix formed by polymerizing alkane monomers each having 2 to 100 carbon atoms which has been functionalized with a compound which (1) is reactive with said alkane monomers and (2) which will enable said alkane monomers to undergo cross-linking to form a polymeric network, the number of functional groups being selected such that said polymeric electrolyte does not react with an alkali metal anode;

(b) one or more non-aqueous solvents;

(c) one or more inorganic salts which render said polymeric electrolyte conductive; and

(d) 0.5–5% by volume poly(ethylene oxide).



**5,501,922**

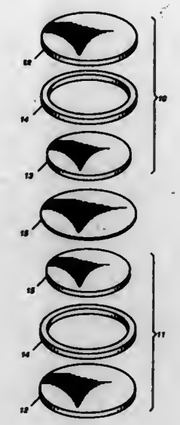
**POLYOXOMETALATE CARBON ELECTRODES AND ENERGY STORAGE DEVICE MADE THEREOF**

**Changming Li; Lijun Bai, both of Vernon Hills, and Keryn Ke Lian, Northbrook, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Apr. 7, 1995, Ser. No. 418,354**

**Int. Cl.[6] H01M 4/58; H01G 9/00; C25B 11/12**

**U.S. Cl. 429—218** **17 Claims**



1. An electrode for an energy storage device, comprising a carbon support having adsorbed thereon a protonated polymer, the polymer having absorbed therein a polyoxometalate.

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**5,501,923**

**Patent Not Issued For This Number**

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**5,501,924**

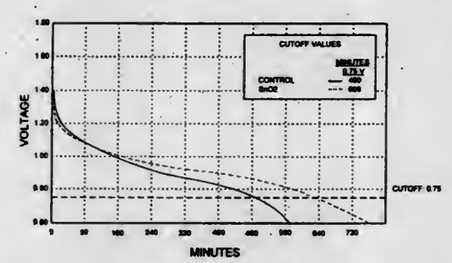
**ALKALINE CELL HAVING A CATHODE INCLUDING A TIN DIOXIDE ADDITIVE**

**Wendi M. Swierbut, Westlake, and John C. Nardi, Brunswick, both of Ohio, assignors to Eveready Battery Company, Inc., Mo.**

**Filed Jun. 7, 1995, Ser. No. 479,590**

**Int. Cl.[6] H01M 4/50**

**U.S. Cl. 429—224** **5 Claims**




1. An electrochemical cell having an anode, a cathode, and an electrolyte, said cathode comprising a manganese dioxide active material and an additive comprising $SnO_2$.

**5,501,925**

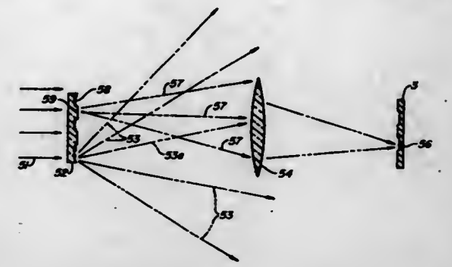
**HIGH POWER MASKS AND METHODS FOR MANUFACTURING SAME**

**Adlai H. Smith, San Diego; Robert O. Hunter, Jr., Rancho Santa Fe, and Bruce B. McArthur, San Diego, all of Calif., assignors to Litel Instruments, San Diego, Calif.**

**Filed May 27, 1994, Ser. No. 250,694**

**Int. Cl.[6] G03F 9/00**

**U.S. Cl. 430—5** **11 Claims**



1. A mask for use with a lens imaging system for projecting light from said mask for processing a workpiece, said mask for transmitting light to be imaged on said workpiece to the receiving aperture of an imaging system for projection on said workpiece, said mask comprising:

a transparent plate;

first patterned areas on said transparent plate for producing light images on said workpiece with sufficient intensity to process said workpiece, said first patterned areas having transmission of light within the receiving aperture of said imaging system;

second patterned areas on said transparent plate for producing light images on said workpiece with insufficient intensity to process said workpiece, said second patterned areas scattering a first substantial fraction of light outside of the receiving aperture of said imaging system and a second remaining fraction of light within the receiving aperture of said imaging system whereby said second areas produce images of reduced intensity on said workpiece through the receiving aperture of said imaging system with insufficient intensity to process said workpiece.

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**5,501,926**

**DICHROMATIC PHOTOMASK AND A METHOD FOR ITS FABRICATION**

**John C. Cheng, San Jose; Timothy M. Reith, Morgan Hill, and James S. Wong, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Continuation of Ser. No. 897,627, Jun. 12, 1992, abandoned. This application Jan. 31, 1995, Ser. No. 383,553**

**Int. Cl.[6] G11B 7/26; G03F 9/00**

**U.S. Cl. 430—5** **13 Claims**

1. A process of manufacturing a photomask comprising the steps of:

overlaying an electromagnetic radiation transmissive substrate with an electromagnetic radiation filter layer, the filter layer being comprised of a material which passes electromagnetic radiation of a wavelength which causes acceleration dissolution and which blocks electromagnetic radiation which causes deceleration dissolution in a dual tone photoresist process;

overlaying the filter layer with an electromagnetic radiation blocking layer such that the filter layer is located between the substrate and the blocking layer, the radiation blocking layer comprised of a material which blocks both electromagnetic radiation of a wavelength which causes acceleration dissolution and electromagnetic radiation which causes deceleration dissolution in said dual tone photoresist process;

overlaying the blocking layer with a dual tone photoresist layer, said photoresist layer having at least one dissolution accelerating additive and at least one dissolution decelerating additive;

using a mastering tool to generate electromagnetic radiation of a first wavelength and radiation of a second wavelength and exposing first areas of the photoresist layer to radiation of the first wavelength, second areas of said photoresist layer to radiation of the second wavelength, while leaving third areas of the photoresist layer unexposed to any radiation, the radiation of the first wavelength activating the dissolution decelerating additive of the photoresist layer and the radiation of the second wavelength activating the dissolution accelerating additive of the photoresist layer; and

removing the photoresist, blocking and filter layers from the second areas, removing the photoresist layer from the first areas, and removing the photoresist and blocking layers from the third areas.

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**5,501,927**

## ELECTROPHOTOGRAPHIC PHOTORECEPTORS

**Akira Imai; Toru Ishii; Akihiko Tokida, and Yutaka Akasaki, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan**

**Continuation of Ser. No. 692,297, Apr. 26, 1991, abandoned. This application Jun. 23, 1993, Ser. No. 80,132**

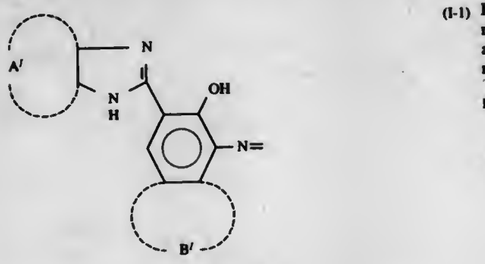
**Claims priority, application Japan, Apr. 27, 1990, 2-110203; Apr. 27, 1990, 2-110204; Apr. 27, 1990, 2-110205; Apr. 27, 1990, 2-110206; Apr. 27, 1990, 2-110207; Apr. 27, 1990, 2-110208**

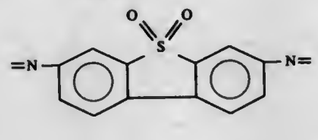
**Int. Cl.[6] G03G 5/06**

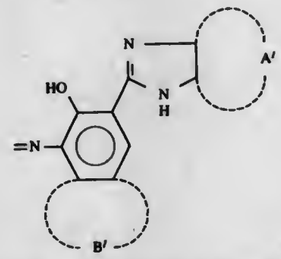
**U.S. Cl. 430—78** **17 Claims**

1. An electrophotographic photoreceptor comprising a light-sensitive layer containing a bisazo or trisazo compound represented by formula (I-1), (II-1), (III-2), (III-3), (III-4), (IV-1), (V-1) or (VI-1)

(I-1)

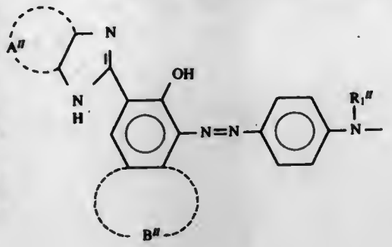


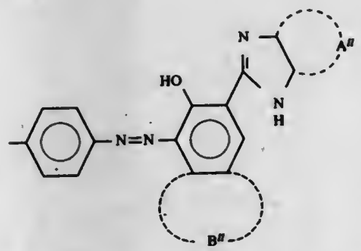




wherein $A'$ represents the atomic group necessary to form an aromatic ring which may be substituted; and $B'$ represents the atomic group necessary to form a naphthalene ring or a carbazole ring with the two carbon atoms of the hydroxy phenyl group of formula I-1, of which the carbazole ring may be substituted with one or more substituents selected from the group consisting of a halogen atom, an alkyl group, an alkoxy group and a nitro group;

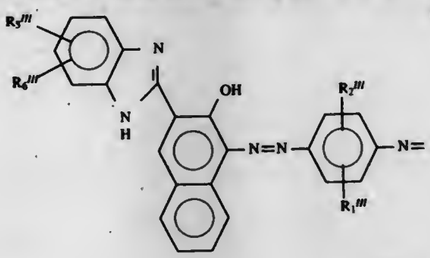
(II-1)

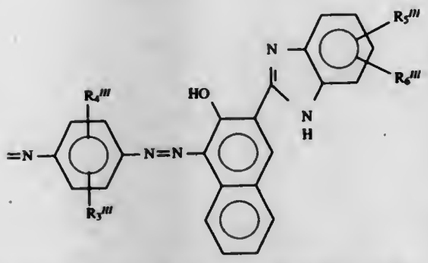




wherein $A''$ represents the atomic group necessary to form an aromatic ring which may be substituted; $B''$ represents the atomic group necessary to form a naphthalene ring or a carbazole ring with the two carbon atoms of the hydroxy phenyl group of formula II-1, of which the carbazole ring may be substituted with one or more substituents selected from the group consisting of a halogen atom, an alkyl group, an alkoxy group and a nitro group; and $R_1''$ represents a hydrogen atom, an alkyl group or an aryl group;

(III-2)

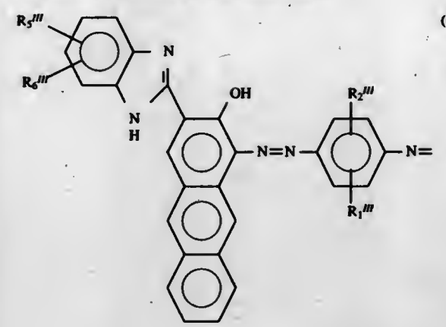


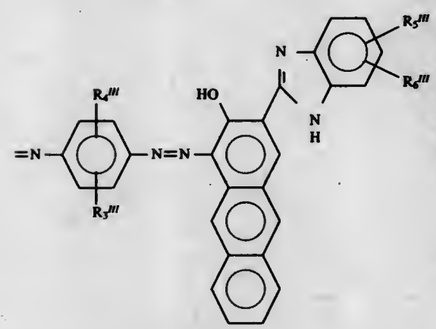


wherein $R_1'''$, $R_2'''$, $R_3'''$, and $R_4'''$, each represents a hydrogen atom, a halogen atom, an alkyl group, an alkoxy group or an alkenyl group, or $R_1'''$ and $R_2'''$ and $R_3'''$ and $R_4'''$ respectively represent the atomic groups necessary to form, in combination with each other, a naphthalene ting taken together with the benzene ring; $R_5'''$ and $R_6'''$ each represents a hydrogen atom, a halogen atom, an alkyl group, a nitro group, a cyano group or a β-dicyano-α-phenylvinyl group, or $R_5'''$ and $R_6'''$ respectively represent the atomic groups necessary to form, in combination with each other, a monocyclic or polycyclic hydrocarbon ring;



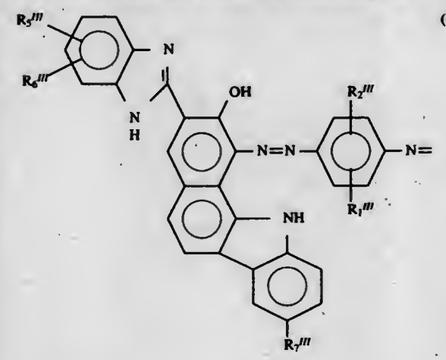
(III-3)



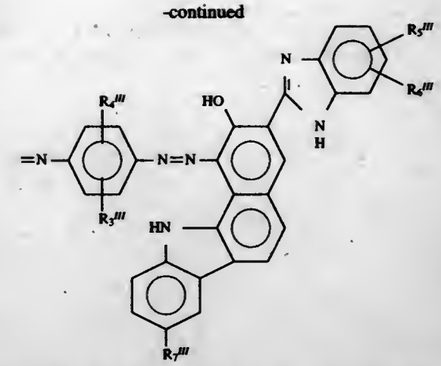


wherein $R_1'''$, $R_2'''$, $R_3'''$ and $R_4'''$ each represents a hydrogen atom, a halogen atom, an alkyl group, an alkoxy group or an alkenyl group, or $R_1'''$ and $R_2'''$ or $R_3'''$ and $R_4'''$ respectively represent the atomic groups necessary to form, in combination with each other, a naphthalene ring taken together with the benzene ring; $R_5'''$ and $R_6'''$ each represents a hydrogen atom, a halogen atom, an alkyl group, an alkenyl group, an aryl group or a β-dicyano-α-phenylvinyl group, or $R_5'''$ and $R_6'''$ respectively represent the atomic groups necessary to form, in combination with each other, a monocyclic or polycyclic hydrocarbon ring;

(III-4)

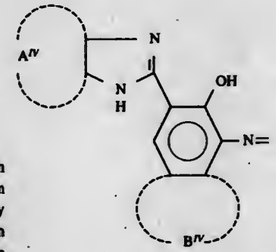


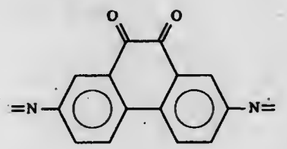
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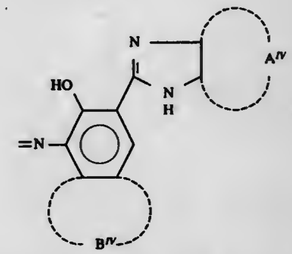


wherein $R_1'''$, $R_2'''$, $R_3'''$ and $R_4'''$ each represents a hydrogen atom, a halogen atom, an alkyl group, an alkoxy group or an alkenyl group, or $R_1'''$ and $R_2'''$ or $R_3'''$ and $R_4'''$ respectively represent the atomic groups necessary to form, in combination with each other, a naphthalene ring taken together with the benzene ring; $R_5'''$ and $R_6'''$ each represents a hydrogen atom, a halogen atom, an alkyl group, an alkenyl group, an aryl group, an alkoxy group, an acyl group, a nitro group, a cyano group or a β-dicyano-α-phenylvinyl group, or $R_5'''$ and $R_6'''$ respectively represent the atomic groups necessary to form, in combination with each other, a monocyclic or polycyclic hydrocarbon ring; and $R_7'''$ represents a hydrogen atom, a halogen atom, an alkyl group, an alkoxy group or a nitro group;

(IV-1)



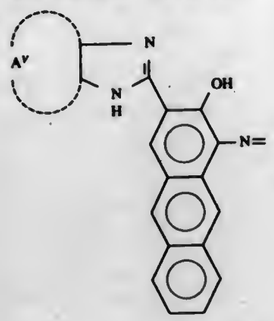


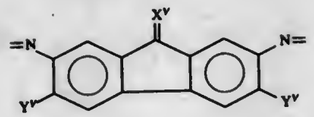


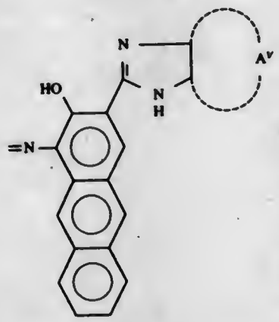
wherein $A'^{V}$ represents the atomic group necessary to form an aromatic ring or a hetero ring, of which the aromatic ring may be substituted; and $B'^{V}$ represents the atomic group necessary to form a naphthalene ring or a carbazole ring with the two carbon atoms

of the hydroxy phenyl group of formula IV-1, of which the carbazole ring may be substituted with one or more substituents selected from the group consisting of a halogen atom, an alkyl group, an alkoxy group and a nitro group;

(V-1)





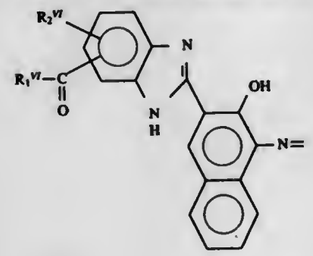


wherein $X^V$ represents an oxygen atom or a group

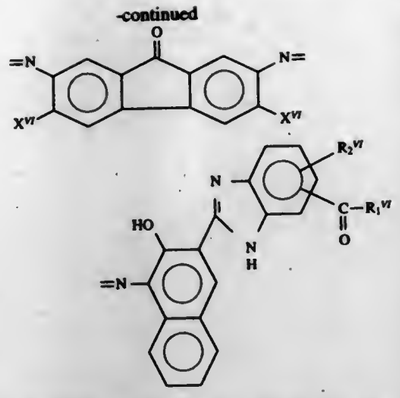


$Y^V$ represents a hydrogen atom or a halogen atom; and $A^V$ represents the atomic group necessary to form an aromatic ring or a hetero ring, of which the aromatic ring may be substituted;

(VI-1)



-continued



wherein $X^{VI}$ represents a hydrogen atom or a halogen atom; $R_1^{VI}$ represents an alkyl group or aryl group; $R_2^{VI}$ represents a hydrogen atom, a halogen atom, an alkyl group, an aryl group, an alkoxy group, an acyl group or a nitro group, or $R_1^{VI}$ and $R_2^{VI}$ may combine with each other to form a monocyclic or polycyclic hydrocarbon ring.

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**5,501,928**

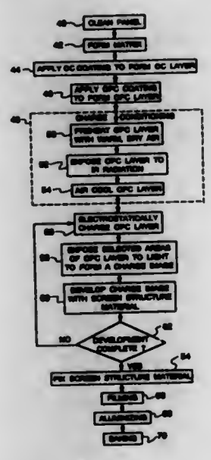
## METHOD OF MANUFACTURING A LUMINESCENT SCREEN FOR A CRT BY CONDITIONING A SCREEN-STRUCTURE LAYER

**Pabitra Datta, Cranbury; Eugene S. Poliniak, Willingboro, both of N.J.; Peter M. Ritt, East Petersburg, Pa.; Brian T. Collins, Lancaster, Pa., and Harry R. Stork, Adamstown, Pa., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.**

**Filed Dec. 14, 1994, Ser. No. 355,563**

**Int. Cl.[6] G03C *5/00*; H01J *9/38*; B65D *3/02;5/06***

**U.S. Cl. 430—23** **11 Claims**



1. In a method of electrophotographically manufacturing a luminescent screen assembly on an interior surface of a faceplate panel for a color CRT, comprising:

forming a photoreceptor on said interior surface of said panel by the steps of



coating said interior surface thereof with a volatilizable, organic conductive solution to form an organic conductive (OC) layer; and

overcoating said first OC layer with a volatilizable, organic photoconductive solution to form a volatilizable organic photoconductive (OPC) layer; the improvement comprising:

conditioning said OPC layer by directing a stream of warm dry gas onto said OPC OPC layer to warm said layer to a preheat temperature, while maintaining said panel at a panel temperature less than said preheat temperature;

exposing said OPC layer to IR radiation to rapidly increase the temperature of said OPC layer to a curing temperature, greater than said preheat temperature, to remove some of the volatilizable constituents from said OPC layer, without substantially increasing the temperature of said panel; and

cooling said OPC layer by directing at least one stream of cool gas onto the surface thereof to lower the temperature of said OPC layer to a subsequent processing temperature.

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**5,501,929**

## METHOD FOR PREPARATION OF PRINTING PLATE BY ELECTROPHOTOGRAPHIC PROCESS

**Eiichi Kato, and Sadao Osawa, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed May 13, 1994, Ser. No. 242,667**

**Claims priority, application Japan, May 14, 1993, 5-135058**

**Int. Cl.[6] G03G *13/28***

**U.S. Cl. 430—49** **24 Claims**

1. A method for preparation of a printing plate by an electrophotographic process comprising forming a toner image on a transfer layer capable of being removed upon a chemical reaction treatment provided on the surface of an electrophotographic light-sensitive element by an electrophotographic process, heat-transferring the toner image together with the transfer layer onto a receiving material a surface of which is capable of providing a hydrophilic surface suitable for lithographic printing at the time of printing, and removing the transfer layer on the receiving material upon the chemical reaction treatment,

wherein the transfer layer mainly contains a thermoplastic resin (AH) having a glass transition point of from 10° C. to 140° C. or a softening point of from 35° C. to 180° C. and a thermoplastic resin (AL) having a glass transition point of from −50° C. to 45° C. or a softening point of from 0° C. to 60° C. in which the glass transition point or softening point of the resin (AH) is at least 2° C. higher than that of the resin (AL), and the surface of the electrophotographic light-sensitive element being in contact with the transfer layer has an adhesive strength of not more than 200 gram.force, which is measured according to JIS Z 0237-1980 "Testing methods of pressure sensitive adhesive tape and sheets".

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**5,501,930**

## ELECTROPHOTOGRAPHIC PHOTORECEPTOR CONTAINING ENAMINE DERIVATIVE

**Akihiro Kondo, Nara; Kiyofumi Morimoto, Tenri, and Kazuhiro Emoto, Nagaokakyo, all of, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Aug. 10, 1994, Ser. No. 288,549**

**Claims priority, application Japan, Aug. 26, 1993, 5-211497; Mar. 23, 1994, 6-052184; May 20, 1994, 6-106632**

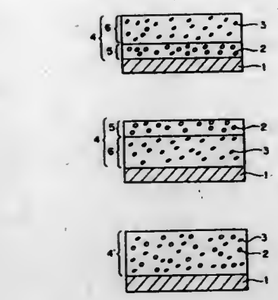
**Int. Cl.[6] G03G *5/06***

**U.S. Cl. 430—59** **6 Claims**

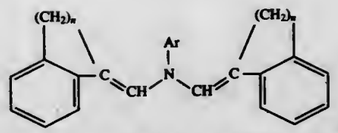
1. An electrophotographic photoreceptor comprising:

a conductive support; and

a photosensitive layer formed on the conductive support, the photosensitive layer containing an enamine derivative as a carrier transport material represented by the formula (I)



(I)



wherein Ar is an aryl group or substituted aryl group selected from the group consisting of phenyl, tolyl, methoxyphenyl, ethoxyphenyl, isopropylphenyl, fluorophenyl, trifluoromethylphenyl, dimethylaminophenyl, naphthyl, methylnaphthyl, biphenyl, methylbiphenyl, methoxybiphenyl, anthryl, tetralinyl and indanyl group; a heterocyclic group or substituted heterocyclic group selected from the group consisting of pyridyl, pyrimidyl, benzothiofuranyl, fluoroenonyl, acridinyl, 2,1,3-benzothiadiazolyl, 2-benzothiadiazolyl, 6-methoxy-2-benzothiadiazolyl, 2-benzoxazplyl, 2-methyl-5-benzoxazolyl, 4-phenyl-2-thiazolyl, 5-ethyl-2-1,3,4-thiadiazolyl and 5methyl-3-isoxazolyl; an aralkyl group or substituted aralkyl group selected from the group consisting of benzyl, methoxybenzyl and methylbenzyl; or a heterocyclic substituted alkyl group; and n is 2, 3 or 4.

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**5,501,931**

## TONER FOR FLASH FIXATION

**Kazuhiro Hirama, and Mikio Uno, both of Kanagawa, Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan**

**Filed Aug. 18, 1994, Ser. No. 291,510**

**Claims priority, application Japan, Aug. 18, 1993, 5-204232; Aug. 18, 1993, 5-204233; Mar. 28, 1994, 6-057256**

**Int. Cl.[6] G03G *13/20;9/08***

**U.S. Cl. 430—109** **20 Claims**

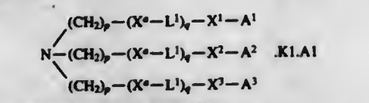
1. A toner for flash fixation which comprises: (i) a resin containing (a) a low molecular weight compound having a peak in molecular weight distribution at 3,000 to 60,000 measured by gel permeation chromatography and (b) a high molecular weight compound having a peak or shoulder in molecular weight distribution at 80,000 to 1,000,000 measured by gel permeation chromatography, wherein the low molecular weight compound and the high molecular weight compound are the same kind of resin and are selected from the group consisting of a styrene resin, a polyester resin and an epoxy resin, with the weight ratio of said low molecular weight to said high molecular weight compound being in the range of 97 to 60/3 to 40; and (ii) a coloring material.

## 5,501,932
## CHARGE CONTROL AGENT AND TONER FOR DEVELOPING ELECTROSTATIC IMAGES

**Shuji Sugawara, Neyagawa; Kazuaki Sukata, Yawata, and Shun-ichiro Yamanaka, Hirakata, all of, Japan, assignors to Orient Chemical Industries, Ltd., Osaka, Japan**

**Filed Mar. 29, 1994, Ser. No. 219,613**
**Claims priority, application Japan, Mar. 31, 1993, 5-098523**
**Int. Cl.[6] G03G 9/097**
**U.S. Cl. 430—110** **12 Claims**

1. Positively chargeable toner for developing electrostatic images which comprises a toner resin, a coloring agent and a charge control agent whose active ingredient is a complex salt compound selected from the group consisting of a compound of formula [1], a compound of formula [2] and a compound of formula [3]:



[1]

.K1.A1

wherein with respect to formula [1]:

$X^a$, $X^1$, $X^2$ and $X^3$ independently represent —O— or —S—,

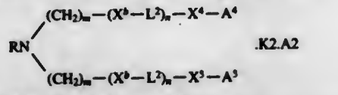
$L^1$ represents a divalent group selected from the group consisting of an alkylene group having 1 to 4 carbon atoms which is branched or not branched, a cycloalkylene group and a monocyclic or polycyclic arylene group which is optionally substituted with a substituent selected from the group consisting of tert-butyl, chloro and nitro,

$A^1$, $A^2$ and $A^3$ independently represent hydrogen, an alkyl group, a cycloalkyl group, an aralkyl group, a monocyclic aryl group which is optionally substituted with a substituent selected from the group consisting of methyl, tert-butyl, octyl, chloro, nitro, hydroxyl and thiol, a polycyclic aryl group which is optionally substituted with a substituent selected from the group consisting of alkyl, halogen, nitro and hydroxyl, or a residue of a nitrogen-containing heterocyclic compound having an —OH or —SH group,

p represents an integer from 1 to 4,

q represents an integer from 0 to 20, and

1·A1 represents an organic or inorganic salt capable of forming a complex with an amine compound, in which K1 is a cation selected from the group consisting of alkali metal ions, alkaline earth metal ions, ammonium ions and pyridinium ions, and A1 is an anion of an organic or inorganic acid;



[2]

.K2.A2

wherein with respect to formula [2]:

R represents an alkyl group having 1 to 20 carbon atoms or an aralkyl group having 7 to 12 carbon atoms, each of which is optionally substituted with a substituent selected from the group consisting of alkyl, halogen, cyano and hydroxyl,

$X^b$, $X^4$ and $X^5$ independently represent —O— or —S—,

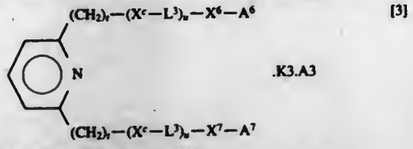
$L^2$ represents a divalent group selected from the group consisting of an alkylene group having 1 to 4 carbon atoms which is branched or not branched, a cycloalkylene group and a monocyclic or polycyclic arylene group which is optionally substituted with a substituent selected from the group consisting of tert-butyl, chloro and nitro,

$A^4$ and $A^5$ independently represent hydrogen, an alkyl group, a cycloalkyl group, an aralkyl group, a monocyclic aryl group which is optionally substituted with a substituent selected from the group consisting of methyl, tert-butyl, octyl, chloro, nitro, hydroxyl and thiol, a polycyclic aryl group which is optionally substituted with a substituent selected from the group consisting of alkyl, halogen, nitro and hydroxyl, or a residue of a nitrogen-containing heterocyclic compound having an —OH or —SH group,

m represents an integer from 1 to 4,

n represents an integer from 0 to 20, and

K2·A2 represents an organic or inorganic salt capable of forming a complex with an amine compound, in which K2 is a cation selected from the group consisting of alkali metal ions, alkaline earth metal ions, ammonium ions and pyridinium ions, and A2 is an anion of an organic or inorganic acid; and



[3]

.K3.A3

wherein with respect to formula [3]:

$X^c$, $X^6$ and $X^7$ independently represent —O— or —S—,

$L^3$ represents a divalent group selected from the group consisting of an alkylene group having 1 to 4 carbon atoms which is branched or not branched, a cycloalkylene group and a monocyclic or polycyclic arylene group which is optionally substituted with a substituent selected from the group consisting of tert-butyl, chloro and nitro,

$A^6$ and $A^7$ independently represent hydrogen, an alkyl group, a cycloalkyl group, an aralkyl group, a monocyclic aryl group which is optionally substituted with a substituent selected from the group consisting of methyl, tert-butyl, octyl, chloro, nitro, hydroxyl and thiol, a polycyclic aryl group which is optionally substituted with a substituent selected from the group consisting of alkyl, halogen, nitro and hydroxyl, or a residue of a nitrogen-containing heterocyclic compound having an —OH or —SH group,

t represents an integer from 1 to 4,

u represents an integer from 0 to 20, and

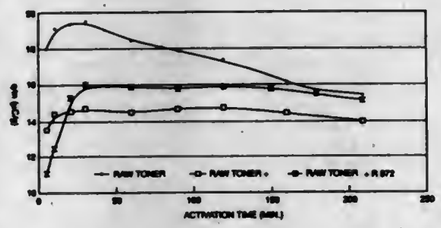
K3·A3 represents an organic or inorganic salt capable of forming a complex with a pyridine compound, in which K3 is a cation selected from the group consisting of alkali metal ions, alkaline earth metal ions, ammonium ions and pyridinium ions, and A3 is an anion of an organic or inorganic acid.

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## 5,501,933
## TONER CONTAINING PIGMENT AND SURFACE MODIFIED PYROGENICALLY PRODUCED ALUMINUM OXIDE

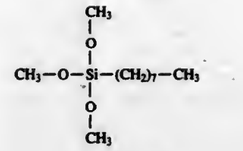
**Hans Deusser, Karlstein; Dieter Kerner, Hanau; Jürgen Meyer, Stockstadt; Günther Michael, Karlstein, and Andreas Stubbe, Rodenbach, all of, Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Germany**

**Division of Ser. No. 141,083, Oct. 27, 1993, Pat. No. 5,419,928, which is a division of Ser. No. 12,163, Jan. 28, 1993, Pat. No. 5,384,194. This application May 19, 1994, Ser. No. 245,620**
**Claims priority, application Germany, Jan. 31, 1992, 42 02 694.6**
**Int. Cl.[6] G03G 9/08**
**U.S. Cl. 430—110** **4 Claims**

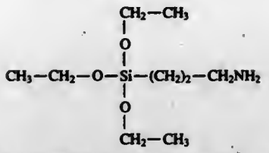



1. An electrophotographic toner comprising a resin, a pigment and a surface-modified pyrogenically produced aluminum oxide which has been surface modified with a mixture of silane A and silane B corresponding to the formulas:





Silane A



Silane B

said surface-modified pyrogenically produced aluminum oxide having the following physico-chemical properties:

| | | |
|---|---|---|
| Surface | ($m^2$/g) | 50 to 100 |
| Stamping density | (g/l) | 50 to 90 |
| Drying loss | (%) | ≤5 |
| Annealing loss | (%) | 5.0 to 15 |
| C content | (%) | 0.5 to 12 |
| pH | | 4 to 8. |

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## 5,501,934
## CHARGEABLE RESIN POWDER

**Kazuaki Sukata, Yawata; Shun-ichiro Yamanaka, Hirakata, and Shuji Sugawara, Neyagawa, all of, Japan, assignors to Orient Chemical Industries, Ltd., Osaka, Japan**

**Filed Aug. 22, 1994, Ser. No. 293,848**
**Claims priority, application Japan, Aug. 23, 1993, 5-231016**
**Int. Cl.[6] G03G 9/097**
**U.S. Cl. 430—110** **17 Claims**

1. A chargeable resin powder comprising at least a thermosetting resin or a thermoplastic resin, and a charge control agent or a charge enhancer, wherein a host-guest compound formed from a combination of a chargeable host compound and a guest compound of substantially no chargeability is contained as a charge control agent or charge enhancer which controls or enhances resin powder charging.

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## 5,501,935
## TONER AGGREGATION PROCESSES

**Raj D. Patel, Oakville; Michael A. Hopper, Toronto; Paul J. Gerroir, Oakville, and Grazyna E. Kmiecik-Lawrynowicz, Burlington, all of, Canada, assignors to Xerox Corporation, Stamford, Conn.**

**Filed Jan. 17, 1995, Ser. No. 373,806**
**Int. Cl.[6] G03G 9/087;9/08**
**U.S. Cl. 430—137** **35 Claims**

1. A process for the preparation of toner compositions consisting essentially of

(i) preparing a pigment dispersion, which dispersion is comprised of a pigment, an ionic surfactant, ad optionally a charge control agent;

(ii) shearing said pigment dispersion with a latex or emulsion blend comprised of resin, a counterionic surfactant with a charge polarity of opposite sign to that of said ionic surfactant, and a nonionic surfactant;

(iii) heating the above sheared blend below about the glass transition temperature (Tg) of the resin to form electrostatically bound toner size aggregates with a narrow particle size distribution;

(iv) subsequently adding further anionic or nonionic surfactant solution to minimize further growth in the coalescence (v); and

(v) heating said bound aggregates above about the Tg of the resin and wherein said heating is from a temperature of about 103° to about 120° C., and wherein said toner compositions are spherical in shape.

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## 5,501,936
## POSITIVE-WORKING QUINONEDIAZIDE PHOTORESIST COMPOSITION CONTAINING A CYCLOHEXYL-SUBSTITUTED TRIPHENYLMETHANE COMPOUND

**Hiroshi Hosoda; Reni Numata; Kousuke Doi; Nobuo Tokutake; Hidekatsu Kohara, and Toshimasa Nakayama, all of Kanagawa, Japan, assignors to Tokyo Ohka Kogyo Co., Ltd., Japan**

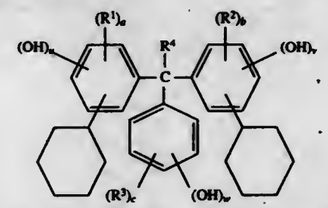
**Filed Dec. 23, 1994, Ser. No. 362,857**
**Claims priority, application Japan, Dec. 28, 1993, 5-333936**
**Int. Cl.[6] G03F 7/023**
**U.S. Cl. 430—191** **11 Claims**

1. A positive-working photoresist composition which comprises, as a uniform mixture:

(a) an alkali-soluble resin;

(b) a quinonediazide group-containing compound; and

(c) a cyclohexyl-substituted triphenylmethane compound represented by the formula



in which $R^1$, $R^2$ and $R^3$ are each a hydrogen atom, alkyl group having 1 to 3 carbon atoms or alkoxy group having 1 to 3 carbon atoms, $R^4$ is a hydrogen atom or alkyl group having 1 to 3 carbon atoms and the subscripts a, b, c, u, v and w are each 1, 2 or 3 with the provisos that a+u and b+v each do not exceed 4 and c+w does not exceed 5, in an amount in the range from 5% to 50% by weight based on the amount of component (a) in the composition and the amount of component (b) is in the range of from 5 to 100% by weight based on the total amount of components (a) and (c).

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## 5,501,937
## HEAT MODE THERMAL TRANSFER RECORDING MATERIAL

**Shinji Matsumoto; Atsushi Nakajima; Katsumi Maejima; Seta Kawakami, and Koichi Nakatani, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan**

**Continuation of Ser. No. 41,444, Apr. 1, 1993, abandoned. This application Nov. 4, 1994, Ser. No. 334,802**
**Claims priority, application Japan, Apr. 14, 1992, 4-094422; Jan. 9, 1992, 4-271830**
**Int. Cl.[6] B41M 5/26**
**U.S. Cl. 430—200** **12 Claims**

1. A heat mode thermal transfer recording material comprising

a) a support;

b) a light-heat converting layer comprising

1) a water-soluble near infrared-absorptive dye having a sulfo group; and

2) a water soluble binder;

c) an ink layer containing a colorant and a binder which can be softened or melted upon heating, and transferred; and

d) a cushioning layer;

wherein said water-soluble near infrared-absorptive dye has an absorption peak at wavelengths longer than 700 nm and the water solubility of said dye is not less than 0.1% by weight of water, and said light-heat converting layer is disposed between said support and said ink layer.

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**5,501,938**

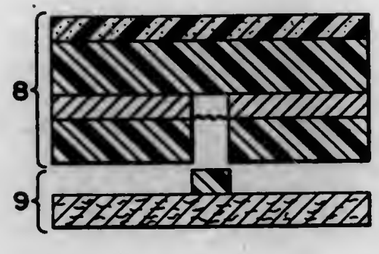
**ABLATION-TRANSFER IMAGING/RECORDING**

**Ernest W. Ellis, Leverett; Diane M. Foley, and Dana R. Arnold, both of Northampton, all of Mass., assignors to Rexham Graphics Inc., South Hadley, Mass.**

**Continuation of Ser. No. 61,037, May 14, 1993, abandoned, which is a continuation of Ser. No. 841,489, Feb. 26, 1992, Pat. No. 5,256,506, which is a division of Ser. No. 707,039, May 29, 1991, Pat. No. 5,171,650, which is a continuation-in-part of Ser. No. 592,790, Oct. 4, 1990, abandoned, which is a continuation-in-part of Ser. No. 497,648, Mar. 23, 1990, abandoned, which is a continuation-in-part of Ser. No. 330,497, Mar. 30, 1989, abandoned. This application Jan. 13, 1994, Ser. No. 181,191**

**Int. Cl.[6] G03C *8/02;8/10;5/16***

**U.S. Cl. 430—201** **33 Claims**




1. A method for transferring a contrasting pattern of intelligence from a composite ablation-transfer imaging medium to a receptor element in contiguous registration therewith, said composite ablation-transfer imaging medium comprising a support substrate (i), at least one intermediate dynamic release layer (ii) essentially coextensive therewith and an imaging radiation-ablative carrier topcoat (iii) also essentially coextensive therewith, said imaging radiation-ablative carrier topcoat (iii) including an imaging amount of a contrast imaging material contained therein and comprising at least one imaging radiation-ablative binder and at least one imaging radiation absorber/sensitizer, and said at least one dynamic release layer (ii) absorbing such imaging radiation at a rate sufficient to effect the imagewise ablation mass transfer of at least said carrier topcoat (iii), which method comprises imagewise irradiating said composite ablation-transfer imaging medium according to such pattern of intelligence with an intensity sufficient to effect the imagewise ablation mass transfer of the volume of the imagewise-exposed area of at least the radiation-ablative carrier topcoat (iii) of said imaging medium securedly onto said receptor element and whereby said transferred contrast imaging material delineates said pattern of intelligence thereon.

**5,501,939**

**SPECTRALLY SENSITIZED PREFOGGED DIRECT-POSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIAL**

**Ludo Van Rompuy, Destelbergen, and Paul Coppens, Turnhout, both of, Belgium, assignors to AGFA-Gevaert, N.V., Mortsel, Belgium**

**Filed Jun. 13, 1995, Ser. No. 487,246**

**Claims priority, application European Pat. Off., Jul. 1, 1994, 94201899**

**Int. Cl.[6] G03C *1/485;8/06;* G03F *7/07***

**U.S. Cl. 430—204** **12 Claims**

1. A photographic material with a pH at 25° C. of at most 7, containing on a support at least one layer, comprising a prefogged direct-positive silver halide emulsion spectrally sensitized with one or more electron-accepting sensitizing dyes in a total amount of at least 0.15 mmole/mole silver halide, the silver halide crystals of said prefogged direct-positive silver halide emulsion containing silver chloride for at least 60 mole %, silver bromide in a range from 0.5 mole % to 39.98 mole % and silver iodide in a range from 0.02 mole % to 2 mole %, characterized in that said silver halide cristals contain silver iodide for at least 0.20 mmole/mole AgX in the outer 10% by weight of said cristals and said layer contains a gelatin species containing $Ca^{2+}$ in an amount ranging from 0.2 % to 1 % by weight.

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**5,501,940**

**PROCESS FOR PROTECTING A BINARY IMAGE WITH A SILOXANE DURABLE LAYER THAT IS NOT REMOVABLE BY HEXANE, ISOPROPANOL OR WATER**

**Iris B. K. Bloom, Waltham; Agota F. Fehervari, Lexington, both of Mass.; Russell A. Gaudiana, Merrimack, N.H.; Richard A. Minns, Arlington, and Howard G. Schild, Brighton, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.**

**Filed May 20, 1993, Ser. No. 65,345**

**Int. Cl.[6] G03F *7/34***

**U.S. Cl. 430—253** **22 Claims**

22. A process for forming a protected image, the process comprising:

providing a layer of a porous or particulate image-forming substance on a heat-activatable image-forming surface of a first sheet-like element, the layer of the image-forming substance having a cohesive strength greater than the adhesive strength between the layer and the first element;

providing a second sheet-like element on the opposed side of the layer of image-forming substance from the first element, the image-forming substance having an adhesion to the second element greater than its adhesion to the first element,

thereby providing a thermal imaging medium,

said thermal imaging medium being capable of absorbing radiation at or near the interface of said heat-activatable image-forming surface with said layer of porous or particulate image-forming substance, converting the absorbed radiation into heat sufficient in intensity to activate said heat-activatable image-forming surface, such that upon cooling exposed portions of said layer of porous or particulate image-forming substance are more firmly attached to said heat-activatable image-forming surface and to said first sheet;

imagewise subjecting portions of the thermal imaging medium to exposure to brief and intense radiation, thereby causing absorption of said radiation at or near the interface of said heat-activatable image-forming surface with said layer of porous or particulate image-forming substance, conversion of the absorbed radiation into heat, activation of said heat-activatable image-forming surface, and firm attachment of exposed portions of the image-forming substance to the first element;

separating the first and second elements, thereby leaving those portions of the image-forming substance not exposed to the radiation attached to the second element and those portions of the image-forming substance exposed to the radiation attached to the first element, and thereby forming a pair of images on the first and second elements, each of the images comprising a plurality of first areas, at which the image-forming substance is adhered to the first or second dement, and a plurality of second areas, at which the first or second element is free from the image-forming substance;

providing a laminating sheet comprising a durable layer and a support layer, the durable layer being substantially transparent and comprising a polymeric organic material having incorporated therein a siloxane, the siloxane being incorporated into the polymeric material in such a manner that it is not removed therefrom by hexane, isopropanol or water;

laminating the laminating sheet to the binary image so that the durable layer adheres to both the first and second areas of the image; and

separating the support layer from the image such that the durable layer remains attached to the image,

thereby covering the image with a durable layer such that exposure of the durable layer to hexane, isopropanol or water does not remove the siloxane from the durable layer.



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**5,501,941**

**PHOTOIMAGEABLE POLYIMIDE COATING**

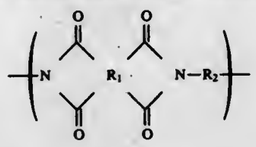
**David D. Ngo, Naperville, Ill., assignor to Amoco Corporation, Chicago, Ill.**

**Continuation of Ser. No. 865,069, Apr. 8, 1992, abandoned, which is a continuation of Ser. No. 522,363, May 8, 1990, abandoned. This application Jul. 1, 1994, Ser. No. 269,698**

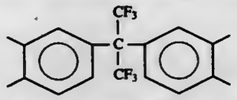
**Int. Cl.[6] G03C *1/492***

**U.S. Cl. 430—270.15** **33 Claims**

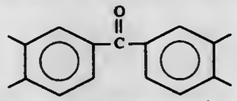
1. A photoimageable polyimide comprising recurring units of



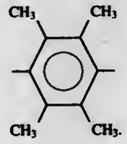
wherein $R_1$ comprises from about 70 to about 10 mole percent



and from about 30 to about 90 mole percent



and wherein $R_2$ consists essentially of



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**5,501,942**

**PHOTOSENSITIVE COMPOSITION CONTAINING WATER AS SOLVENT OR DISPERSANT**

**Roger P. Salvin, Weil am Rhein, Germany, and Adrian Schultheiss, Tentlingen, Switzerland, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.**

**Continuation of Ser. No. 990,827, Dec. 14, 1992, abandoned, which is a continuation of Ser. No. 808,385, Dec. 16, 1991, abandoned. This application Sep. 12, 1994, Ser. No. 304,643**

**Claims priority, application Switzerland, Dec. 18, 1990, 4010/90**

**Int. Cl.[6] C08F *2/50;* G03C *1/73;* G03F *7/033***

**U.S. Cl. 430—280.1** **14 Claims**

1. A photosensitive solder resist composition which contains at least 30% by weight of water as solvent and/or dispersing medium for the components thereof and which comprises at least the following components in the indicated amounts:

10–50% by weight of water-soluble solid, crosslinkable film-forming polymers as binder selected from the group consisting of acrylic acid and methacrylic acid polymers and copolymers, and carboxyl group-containing acrylate and methacrylate polymers and copolymers, the carboxyl groups of which composition are reacted with ammonia and/or amines in an amount sufficient to ensure the water-solubility of said polymers and copolymers, the amines being chosen such that, at least at the temperatures suitable for the thermal cure of the polymers in the composition, they will substantially volatilise from a film which forms or has formed from said composition,

4–50% by weight of water-soluble and/or water-dispersible photopolymerisable acrylate and/or methacrylate monomers and/or corresponding oligomers,

0.1 to 10% by weight of water-soluble and/or water-dispersible photoinitiator compounds for the photopolymerisable acrylate and/or methacrylate monomers and/or corresponding oligomers, and,

with the proviso that when the binder contains non-selfcrosslinking polymers, then the composition further comprises

2.5–40% by weight of a thermal hardener for the polymeric binder which hardener is a water-soluble and/or water-dispersible crosslinking agent for the polymeric binder, selected from the group consisting of epoxy resins, melamine resins, blocked polyisocyanates and mixtures thereof.

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**5,501,943**

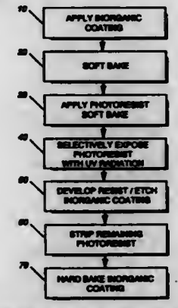
**METHOD OF PATTERNING AN INORGANIC OVERCOAT FOR A LIQUID CRYSTAL DISPLAY ELECTRODE**

**Thomas J. Swirbel, Davie, Fla., assignor to Motorola, Inc., Schaumburg, Ill.**

**Filed Feb. 21, 1995, Ser. No. 391,816**

**Int. Cl.[6] B44C *1/22***

**U.S. Cl. 430—313** **10 Claims**




1. A method of photodefining a hardcoat material, comprising: providing a substrate having a major surface;

coating the major surface with a thin film of an uncured hardcoat material;

applying a photoresist layer over the uncured hardcoat material;

providing a pattern in the photoresist layer to selectively reveal portions of the uncured hardcoat material;

providing a pattern in the uncured hardcoat material by etching the revealed portions with an alkaline solution, said pattern corresponding to the pattern in the photoresist layer;

removing the photoresist layer; and

heating the substrate to cure the uncured hardcoat material.

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**5,501,944**

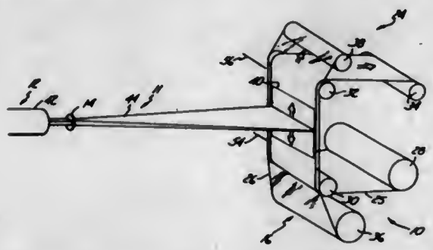
## ABLATIVE IMAGING BY PROXIMITY LITHOGRAPHY

**Jeffrey B. Hill, Stillwater; Andrew J. Ouderkirk, Woodbury; Daniel P. Stubbs, May Township, County of Washington; Robert S. Jackson, Little Canada, and Douglas S. Dunn, Maplewood, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Continuation of Ser. No. 169,504, Dec. 17, 1993, abandoned. This application Jan. 31, 1995, Ser. No. 381,022**

**Int. Cl.[6] G03F *7/22;5/00***

**U.S. Cl. 430—321** **20 Claims**



1. A method of prolonging the useful life of a mask by preventing debris from workpieces from dispersing away from the workpieces, the debris created by a high energy source of ultraviolet radiation used to ablate a shaped image in each of the workpieces, the method comprising:

(a) providing a first workpiece;

(b) placing a first portion of a debris-blocking layer in contact with the first workpiece, the layer being substantially transparent to ultraviolet radiation such that the high energy source is capable of ablating the shaped image in the workpiece;

(c) providing a mask;

(d) placing the mask in contact with the debris-blocking layer such that the layer is disposed between the mask and the workpiece;

(e) directing radiation from the high energy source through the mask, through the debris-blocking layer, and toward the workpiece;

(f) ablating the workpiece with the radiation, thereby forming the shaped image;

(g) providing a second workpiece;

(h) placing a second portion of the debris-blocking layer in contact with the second workpiece;

(i) repeating steps (d)–(f); and

(j) separating said portions of the debris-blocking layer from the workpieces, whereby the shaped image may be formed in a plurality of workpieces while minimizing degradation of the mask, thereby minimizing the need to clean the mask and prolonging the useful life of the mask.

**5,501,945**

## METHOD OF USING MULTICHROMIC POLYMERS IN PACKAGING

**Sebastian V. Kanakkanatt, Akron, Ohio, assignor to The University of Akron, Akron, Ohio**

**Filed Aug. 30, 1994, Ser. No. 298,465**

**Int. Cl.[6] B65B *55/00*; G03C *1/73*; A23L *3/00*; A61L *2/00***

**U.S. Cl. 430—338** **2 Claims**

1. A method of using packaging material to indicate exposure of an article packaged therein to irradiation, comprising:

a) affixing to or incorporating into the packaging material one or more photochromic dyes;

b) preparing a package with said packaging material and said article;

c) after a) and b) exposing the dye to one or more radiation frequencies such that the dye absorbs said one or more radiation frequencies, indicating exposure or lack of exposure of said article to irradiation; and,

wherein said photochromic dye is one or more of fulgides, triaryl methane leuco-cyanides, triaryl methane leucohydroxides or triaryl methane leucobisulfites.

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**5,501,946**

## PRE-FOGGED DIRECT REVERSAL SILVER HALIDE PHOTOGRAPHIC MATERIAL

**Yoshihiro Takagi, and Yoshio Inagaki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

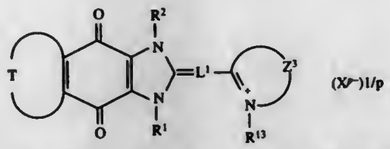
**Continuation of Ser. No. 98,728, Jul. 29, 1993, abandoned. This application Jul. 27, 1994, Ser. No. 281,139**

**Claims priority, application Japan, Jul. 29, 1992, 4-220906; Jul. 30, 1992, 4-203929; Jul. 31, 1992, 4-205737; Aug. 10, 1992, 4-212670; Aug. 10, 1992, 4-212671; Aug. 10, 1992, 4-232696; Aug. 11, 1992, 4-214110**

**Int. Cl.[6] G03C *1/12;1/485***

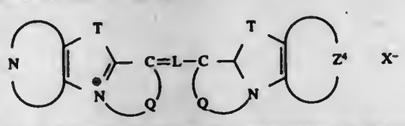
**U.S. Cl. 430—573** **5 Claims**

1. A pre-fogged direct reversal silver halide photographic material comprising on a support at least an emulsion layer comprising a previously fogged silver halide emulsion for forming a direct positive image, wherein said emulsion layer comprises at least one compound represented by one of the following general formula (II), (V) or (VIII):



(II)

wherein T represents an atomic group necessary for the formation of a benzene ring; $R^1$, $R^2$ and $R^3$ each represents an alkyl, aralkyl, phenyl or allyl group; $L^1$ represents a trivalent connecting group in which 1, 3, 5 or 7 methine groups are connected to form conjugated double bonds; $Z^3$ represents an atomic group necessary for the formation of a 5- or 6-membered ring; X represents an anion; and p represents an integer 1 or 2;

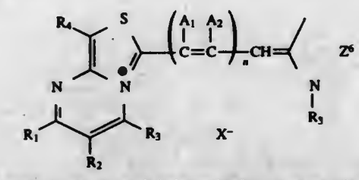


(V)

wherein $Z^4$ represents an atomic group necessary for the formation of a benzene ring, naphthalene ring or heterocyclic aromatic ring; T represents O, S, Se, N—$R^1$, $CR^2R^3$ or —$CR^4$=$CR^5$—; $R^1$, $R^2$ and $R^3$ each independently represents an alkyl group, alkenyl group or aryl group; $R^4$ and $R^5$ each independently represents a hydrogen atom, halogen atom, alkyl group, aryl group, alkoxy group, aryloxy group, carboxyl group, acyl group, acylamino



group, carbamoyl group, sulfamoyl group or sulfonamido group; Q is an ethylene group, propylene group, butylene group, or group formed by replacing one or more hydrogen atoms in these groups by a fluorine atom, a chlorine atom or a $C_{1-4}$ alkyl group; L represents a trivalent group in which 5 or 7 methine groups are connected to form conjugated double bonds; and X- represents an anion;



(VIII)

wherein $A_1$ and $A_2$ each independently represents a hydrogen atom a halogen atom, an alkoxy group, an aryloxy group, a cyano group, an alkyl group, an aryl group, or an aralkyl group; $Z^6$ represents an atomic group necessary for the formation of a 5-membered heterocyclic group; $R_1$ to $R_2$ each independently represents a hydrogen atom a $C_{1-20}$ alkyl group, a $C_{6-20}$ phenyl group or a $C_{7-20}$ benzyl group; $R_5$ represents a $C_{1-20}$ alkyl group, a $C_{6-20}$ phenyl group, a $C_{7-20}$ aralkyl group or may form a 6-membered heterocyclic group with $Z^6$; n represents an integer 0, 1 or 2; and $X^-$ represents an anion.

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**5,501,947**

## PCR DIAGNOSIS OF HUMAN PAPILLOMA VIRUS TYPE 16

**Vincent C. Emery, Hampstead; Peggy J. Bavin, London, and Patrick Walker, Hampstead, all of, England, assignors to Royal Free Hospital School of Medicine, London, England**

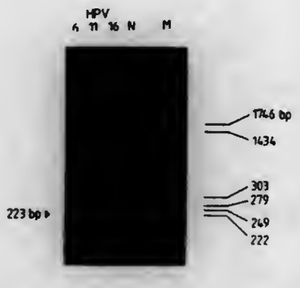
**PCT No. PCT/GB91/01212, § 371 Date Mar. 12, 1993, § 102(e) Date Mar. 12, 1993, PCT Pub. No. WO92/01815, PCT Pub. Date Feb. 6, 1992**

**PCT Filed Jul. 19, 1991, Ser. No. 965,274**

**Claims priority, application United Kingdom, Jul. 19, 1990, 9015845**

**Int. Cl.[6] C07H *21/00*; C12Q *1/68;1/70*; C12P *19/34***

**U.S. Cl. 435—5** **19 Claims**




1. A method for detecting the presence of HPV 16 DNA in a DNA sample which comprises bringing the sample into contact with PCR primer oligonucleotide A:

5' GGGGTCGGTGGACCGGTCGATGTA 3' (SEQ ID NO:1) or a fragment of at least 15 contiguous nucleotides thereof, and PCR primer oligonucleotide B:

5' GGGCTCTGTCCGGTTCTGCTTGTC 3' (SEQ ID NO:2) or a fragment of at least 15 contiguous nucleotides thereof, treating the sample to denature the DNA, conducting a polymerase chain reaction, thereby amplifying the HPV 16 DNA, and detecting the amplified HPV 16 DNA.

**5,501,948**

## STABILIZED HEPATITIS B E ANTIGEN SUITABLE FOR IMMUNOASSAYS

**Daniel J. Hicklin, Jersey City, N.J.; Charles T. Tackney, Brooklyn, N.Y., and Harlan W. Waksal, Upper Montclair, N.J., assignors to ImClone Systems Incorporated, New York, N.Y.**

**Continuation of Ser. No. 35,560, Mar. 22, 1993, abandoned, which is a continuation of Ser. No. 808,842, Dec. 16, 1991, abandoned, which is a continuation-in-part of Ser. No. 476,747, Feb. 7, 1990, abandoned, which is a continuation-in-part of Ser. No. 307,900, Feb. 6, 1989, abandoned. This application Jun. 6, 1994, Ser. No. 254,475**

**Int. Cl.[6] C12Q *1/70***

**U.S. Cl. 435—5** **12 Claims**

1. A method of stabilizing the antigenicity of hepatitis Be antigen, HBeAg, over time, comprising the steps of:

a. adsorbing anti-HBeAg antibodies to a solid support to form a coated solid support;

b. diluting previously denatured HBeAg into a non-denaturing solution;

c. capturing the HBeAg on said anti-HBeAg antibody coated support to form a second coating;

d. insolubilizing said captured HBeAg; and

e. storing the captured and insolubilized HBeAg at temperatures up to 37° C. in low humidity conditions.

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**5,501,949**

## PARTICLE BOUND BINDING COMPONENT IMMUNOASSAY

**David L. Marshall, Norcross, Ga., assignor to Murex Diagnostics Corporation, Anguilla, Anguilla**

**Continuation of Ser. No. 877,862, May 4, 1992, abandoned, which is a continuation of Ser. No. 630,365, Dec. 18, 1990, Pat. No. 5,236,826, which is a continuation of Ser. No. 220,882, Jun. 22, 1988, abandoned, which is a continuation of Ser. No. 96,207, Sep. 8, 1987, abandoned, which is a continuation of Ser. No. 807,157, Dec. 10, 1985, abandoned. This application Aug. 15, 1994, Ser. No. 290,487**

**Int. Cl.[6] C12Q *1/70***

**U.S. Cl. 435—5** **26 Claims**

1. A method for detection or quantitation of an analyte in a solution comprising the steps of:

(a) contacting the solution with insoluble particles having attached thereto a binding component specific for the analyte, so as to form a suspension comprising a first complex wherein the first complex comprises the analyte, the binding component and the insoluble particle;

(b) applying the suspension to at least a portion of a semi-permeable membrane having interstices of dimensions relative to the insoluble particles and having a thickness such that the insoluble particles are retained throughout the thickness of the semi-permeable membrane, the portion of the semi-permeable membrane retaining the insoluble particles defining an assay zone;

(c) contacting the semi-permeable membrane containing the assay zone with a labeling component capable of specifically binding to the first complex so as to form a second complex wherein the second complex comprises the first complex and the labeling component, the semi-permeable membrane permitting the labeling component which is not bound to the first complex to pass out of the assay zone; and

(d) measuring the signal produced by the labeling component of the second complex as an indicator of the presence or amount of the analyte present in the solution.

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**5,501,950**

**Patent Not Issued For This Number**

5,501,951

**NUCLEIC ACID PROBES TO COCCIDIOIDES IMMITIS**

Curt L. Millman, St. Louis, Mo., assignor to Gen-Probe Incorporated, San Diego, Calif.

Continuation of Ser. No. 811,052, Dec. 18, 1991, Pat. No. 5,284,747. This application Jan. 6, 1994, Ser. No. 178,014

Int. Cl.[6] C07H *21/04;* C12Q *1/68*

U.S. Cl. 435—6 16 Claims

1. A hybridization assay probe targeted to *Coccidioides immitis* 28S rRNA or rDNA encoding said 28S rRNA, comprising an oligonucleotide able to distinguish *Coccidioides immitis* from *Blastomyces dermatitidis, Candida albicans, Candida tropicalis, Saccharomyces cerevisiae, Saccharomyces carlsbergensis, Histoplasma capsulatum,* and *Cryptococcus neoformans.*

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5,501,952

**ANALOGUES OF REPORTER GROUPS AS BACKGROUND REDUCERS IN HYBRIDIZATION ASSAYS**

Michael L. Cubbage, Houston; Joel Bresser, Bellaire; Mark Blick, Houston, and Shyh C. Ju, Flowermound, all of Tex., assignors to Aprogenex, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 916,183, Jul. 17, 1992, abandoned. This application Jan. 14, 1994, Ser. No. 182,808

Claims priority, application China, Jul. 17, 1993, 93116558.X; Israel, Jul. 18, 1993, 106381

Int. Cl.[6] C13Q *1/68;* G01N *33/53*

U.S. Cl. 435—6 34 Claims

1. A detection process, which process comprises the steps of:

(1) contacting a biological entity with a solution comprising a probe that binds to a target molecule in or on said biological entity, said contacting performed in a manner such that the probe binds to said target molecule so as to make that probe a target-molecule-bound probe, said probe being associated with a reporter group,

(2) contacting the biological entity with a solution comprising a competitive analogue of said reporter group, said competitive analogue being a substance that binds nonspecifically with said biological entity in competitive equilibrium with said reporter group and is not bound to a probe for said target molecule nor bound to a probe for any other target molecule in or on said biological entity,

(3) performing one or more steps that will detect the reporter group on the probe bound to the biological entity but that will not detect the competitive analogue bound to the biological entity,

wherein step (1) takes place before step (2), after step (2), or during step (2),

wherein said biological entity is a cell or a virus, and

wherein said competitive analogue is a substance other than aurintricarboxylic acid.

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5,501,953

**PROCESS FOR QUANTITATIVELY LYSING LIPOSOMES AND A PROCESS FOR DETERMINING THE AMOUNT OF AN ANALYTE USING SAME**

Minoru Fujita, and Masaaki Kida, both of Amagasaki, Japan, assignors to Wako Pure Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 914,136, Jul. 17, 1992, abandoned. This application Feb. 28, 1994, Ser. No. 203,488

Claims priority, application Japan, Jul. 23, 1991, 3-206571

Int. Cl.[6] C12Q *1/68;* G01N *33/53;33/542;33/544*

U.S. Cl. 435—6 23 Claims

1. A process for quantitatively lysing liposomes, which comprises contacting liposomes having biotin fixed on membrane surfaces thereof with a lytic agent comprising a surfactant and avidin to bring about an avidin-biotin binding reaction, the presence of both said surfactant and said avidin thereby causing lysis of the membranes of said liposomes the amount of said lysis corresponding to the amount of avidin bound to biotin on the surface of said liposomes, said surfactant being used in a concentration of 0.001 to 1.0% v/v in said solution containing said liposomes.

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5,501,954

**METHOD OF DETECTING CELLULAR MATERIAL**

Anna M. Mahr, Natick; Ann E. Bowe, Needham; Alyson L. Ruff-Roberts, Holliston, and Katherine W. Klinger, Sudbury, all of Mass., assignors to Genzyme Corporation, Cambridge, Mass.

Filed Jun. 13, 1994, Ser. No. 259,224

Int. Cl.[6] C12Q *1/68;1/70;* G01N *33/53;* C07H *21/04*

U.S. Cl. 435—6 24 Claims

1. A method for detecting a target DNA in a morphologically identifiable cell in situ, comprising:

a. depositing a cell onto a polymeric membrane filter wherein the cell is retained on the polymeric membrane filter and the DNA is available for in situ hybridization with a labeled nucleic acid probe specific for the target DNA;

b. incubating the polymeric membrane filter with a non-isotopically labeled nucleic acid probe for a period of time sufficient for hybridization of the nucleic acid probe to the target DNA; and

c. detecting the nucleic acid probe in situ wherein detection of the nucleic acid probe is indicative of the presence of the target DNA.

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5,501,955

**IMMUNOLOGICAL TEST FOR THE PRESENCE OF ANTIBODIES IN BIOLOGICAL FLUIDS**

Andreas Bergmann, Berlin, Germany, assignor to B.R.A.H.M.S. Diagnostica GmbH, Berlin, Germany

PCT No. PCT/EP92/01348, § 371 Date Apr. 20, 1993, § 102(e) Date Apr. 20, 1993, PCT Pub. No. WO93/00587, PCT Pub. Date Jan. 7, 1993

PCT Filed Jun. 15, 1992, Ser. No. 971,822

Claims priority, application Germany, Jun. 20, 1991, 41 20 412.3

Int. Cl.[6] G01N *33/564;33/543*

U.S. Cl. 435—7.93 12 Claims




1. An immunological assay method for the determination of autoantibodies in a biological fluid obtained from a subject suspected of suffering from an autoimmune disease, the presence of such autoantibodies being indicative of the autoimmune disease, the method comprising the steps of:

incubating said biological fluid for a predetermined time period under conditions favoring specific binding of antibodies to antigens with

a predetermined amount of an antigen in the form of a crude extract from a human or animal organ wherein said antigen has at least a first binding site and a second binding site,

a solid phase or microsolid phase bearing a predetermined amount of a first immobilized antibody which specifically binds to said first binding site of said antigen, and



a predetermined amount of a further antibody which bears a detectable label and specifically binds to said second binding site of said antigen;

wherein autoantibodies present in said biological fluid

prevent, by competitive inhibition, specific binding of said first immobilized antibody to said first binding site, and specific binding of said further antibody to said second binding site;

separating said solid phase or microsolid phase bearing said first immobilized antibody from non-immobilized material; and

determining the presence of or amount of said detectable label in said solid phase or microsolid phase bearing said first immobilized antibody; and

inversely correlating the presence of or amount of detectable label in said solid phase or microsolid phase with the presence of or amount of the autoantibodies to be detected in the biological fluid.

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5,501,956

**POLYREDOX COUPLES IN ANALYTE DETERMINATIONS**

Henry G. Wada, Atherton; Harden M. McConnell, Stanford, and Dean G. Hafeman, Hillsborough, all of Calif., assignors to Molecular Devices Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 952,465, Sep. 28, 1992, abandoned, which is a continuation of Ser. No. 497,988, Mar. 23, 1990, abandoned. This application Jan. 24, 1994, Ser. No. 185,730

The portion of the term of this patent subsequent to Jul. 17, 2007, has been disclaimed.

Int. Cl.[6] C12Q *1/60;* G01N *27/26*

U.S. Cl. 435—11 17 Claims

1. In a method for determining the presence of an oxidase in an assay medium by employing a metal electrode for detection of a redox reaction, the improvement which comprises:

(a) a tetramethylbenzidine and hydrogen peroxide; with

(b) an iron or ruthenium containing ionic redox couple in the assay medium.

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5,501,957

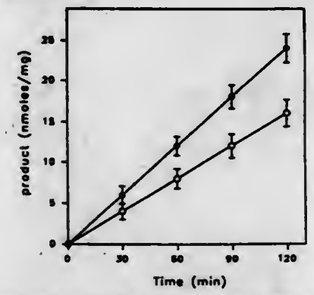
**METHOD FOR MEASURING GLYCOSYLTRANSFERASE ACTIVITY**

James W. Dennis, Etobicoke; Katherine A. Siminovitch, Toronto, both of, Canada, and Alessandro Datti, Terni, Italy, assignors to Mount Sinai Hospital Corporation, Toronto, Canada

Continuation of Ser. No. 968,865, Oct. 30, 1992, abandoned. This application Aug. 22, 1994, Ser. No. 293,940

Int. Cl.[6] C12Q *1/48;1/00;* G01N *33/00;* A01N *43/04*

U.S. Cl. 435—15 28 Claims




1. A method of assaying for a glycosyltransferase in a sample, which comprises the steps of:

(a) reacting the sample with a first sugar donor and an acceptor substrate which in the presence of a glycosyltransferase in the sample produces a transferase product, the first sugar donor and acceptor substrate being selected such that the sugar from the first sugar donor is capable of being transferred to the acceptor substrate in the presence of the glycosyltransferase to be assayed;

(b) reacting the transferase product with a second sugar donor having a sugar which is labelled with a labelling agent and a transferase enzyme which is capable of transferring the sugar from the second sugar donor to the transferase product to produce a labelled transferase product and which has a higher affinity for the transferase product compared to the affinity of the glycosyltransferase for the acceptor substrate, and assaying for the labelling agent activity of the labelled transferase product or unreacted second sugar donor.

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5,501,958

**DETERMINATION OF POTASSIUM IONS IN FLUIDS**

Michael N. Berry, Eden Hills, Australia; Michael-Harold Town, Oberhausen, Germany; Georg-Burkhard Kresse, Penzberg, Germany, and Uwe Herrmann, Bernried, Germany, assignors to Boehringer Mannheim GmbH, and The Flinder University of South Australia, Australia

Continuation of Ser. No. 958,534, Oct. 8, 1992, abandoned, which is a continuation of Ser. No. 804,820, Nov. 27, 1991, abandoned, which is a division of Ser. No. 696,326, Apr. 30, 1991, abandoned, which is a continuation of Ser. No. 302,799, Jan. 19, 1989, abandoned. This application Sep. 19, 1994, Ser. No. 308,823

Claims priority, application Australia, Apr. 10, 1987, PI1365; Jun. 5, 1987, PI2311

Int. Cl.[6] C12Q *1/00;1/34;* G01N *33/20;33/566*

U.S. Cl. 435—18 77 Claims

1. Process for the determination of the concentration of potassium ions in a fluid sample, comprising measuring the activity of an enzyme whose activity is stimulated by potassium ions and is selected from the group consisting of a transferase or an oxidoreductase in the presence of a competitive inhibitor ion which is present in an amount sufficient to increase the ratio of the activity of the enzyme to the concentration of free potassium ions in the fluid sample to within an optimal range for measurement of the concentration of potassium ions in the fluid sample, wherein the measured activity of said enzyme is proportional to the concentration of said potassium ions in the fluid sample.

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5,501,959

**ANTIBIOTIC AND CYTOTOXIC DRUG SUSCEPTIBILITY ASSAYS USING RESAZURIN AND POISING AGENTS**

Michael V. Lancaster, and Rebecca D. Fields, both of Woodland, Calif., assignors to Alamar Biosciences Laboratory, Inc., Chicago, Ill.

Continuation of Ser. No. 312,485, Sep. 26, 1994, abandoned, which is a continuation of Ser. No. 150,564, Nov. 10, 1993, abandoned, which is a continuation of Ser. No. 856,109, Mar. 23, 1992, abandoned, which is a continuation-in-part of Ser. No. 298,599, Jan. 17, 1989, abandoned. This application Feb. 28, 1995, Ser. No. 396,362

Int. Cl.[6] C12Q *1/18;1/02;* C12N *5/02;1/02*

U.S. Cl. 435—32 23 Claims

1. A method for determining susceptibility of cultured cells to growth inhibitory substances, said method comprising:

culturing the cells in a growth medium in the presence of the growth inhibitory substance;

exposing the cultured cells to resazurin in the presence of a poising agent in an amount selected to inhibit reduction of the resazurin to resorfurin in the growth medium in the absence of cellular growth, wherein the poising agent comprises a salt selected to maintain the redox potential of the growth medium in the range from about +0.3 volts to +0.45 volts in the absence of cellular growth; and

observing the reduction of resazurin to resorfurin as an indicator of cellular viability.

**5,501,960**

## METHOD FOR IMPROVING QUANTITATIVE RECOVERY OF MICROORGANISMS FROM SPECIMENS CONTAINING BLOOD COMPONENTS

Gordon L. Dorn, 6647 Lakewood Blvd., Dallas, Tex. 75214

Continuation of Ser. No. 162,664, Dec. 3, 1993, abandoned.
This application Feb. 27, 1995, Ser. No. 396,262
Int. Cl.[6] C12Q *1/04;* C12N *1/00*
U.S. Cl. 435—34 27 Claims

1. In a method for testing a sample containing at least one blood component for the presence of microorganisms, wherein (a) said sample is mixed with sodium polyanethol sulfonate in a sufficient quantity to block humoral components present in said sample from exerting a tidal effect on microorganisms which may be present in said sample, to form a sodium polyanethol sulfonate-treated mixture; (b) an aliquot of said sodium polyanethol sulfonate-treated mixture is distributed onto a culture plate containing a nutritional agar media to form an inoculated culture plate in an aliquot to media ratio to provide sufficient dilution of said sodium polyanethol sulfonate-treated mixture to allow said microorganisms to replicate; (c) said inoculated culture plate is incubated for a sufficient period of time to allow colony forming units of said microorganisms present in said sample to form; and (d) said colony forming units are counted to quantitate said microorganisms,

the improvement comprising adding a sufficient concentration of sodium polyanethol sulfonate at the time of forming said sodium polyanethol sulfonate-treated mixture such that sodium polyanethol sulfonate is maintained at a concentration from about 0.1% to about 1.0% up to the time of counting said colony forming units to quantitate said microorganisms.

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**5,501,961**

## METHOD FOR DETECTION OF A PHYSIOLOGICAL ABNORMALITY

Edward J. McMurchie, Flagstaff Hill, Australia, assignor to Commonwealth Scientific and Industrial Research Organisation, Campbell, Australia

Filed Feb. 26, 1993, Ser. No. 977,431
Claims priority, application Australia, Aug. 28, 1990, PK2017/90
Int. Cl.[6] C12Q *1/06;* G01N *33/48*
U.S. Cl. 435—39 39 Claims

1. A method for determining the presence of hypertension or a pre-disposition towards hypertension in a human subject, which method comprises:

determining the sodium ion ($Na^+$) uptake under an imposed proton ($H^+$) concentration gradient across the membrane of isolated single cheek epithelial (buccal mucosal) cells taken from said subject, wherein the rate of proton dependent sodium ion uptake by said cells indicates the presence of hypertension or a predisposition towards hypertension in said subject.

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**5,501,962**

## INTERLEUKEN-3 (IL-3) HUMAN/MURINE HYBRID POLYPEPTIDES AND RECOMBINANT PRODUCTION OF THE SAME

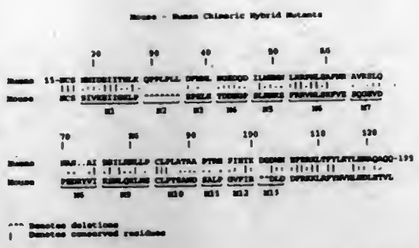
Sarah R. Braford-Goldberg, St. Louis; Alan M. Easton, Maryland Heights; Barbara K. Klein, St. Louis; John P. McKearn, Pacific, and Peter O. Olins, Glencoe, all of Mo., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Jun. 21, 1993, Ser. No. 81,539
Int. Cl.[6] C12N *15/24;15/27;* C07K *14/54;* A61K *38/20*
U.S. Cl. 435—69.52 17 Claims

7. A vector consisting a DNA sequence selected from the group consisting of:

a DNA having a nucleotide sequence corresponding to SEQ ID NO: 78;

a DNA having a nucleotide sequence corresponding to SEQ ID NO: 81;




a DNA having a nucleotide sequence corresponding to SEQ ID NO: 82;

a DNA having a nucleotide sequence corresponding to SEQ ID NO: 83; and

a DNA having a nucleotide sequence corresponding to SEQ ID NO: 91.

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**5,501,963**

## AMPLIFICATION AND DETECTION OF NUCLEIC ACIDS IN BLOOD SAMPLES

Jean Burckhardt, Magden, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Sep. 8, 1993, Ser. No. 118,534
Claims priority, application Switzerland, Sep. 11, 1992, 2875/92
Int. Cl.[6] C12P *19/34;* C12Q *1/00;1/48;1/68*
U.S. Cl. 435—91.2 16 Claims

1. A method for enzymatic amplification of target nucleic acid sequences in a blood sample treated with an anticoagulant, carried out in an amplification reaction mixture, said blood sample comprising at least five volume per cent of said reaction mixture, said method comprising:

(a) determining the concentration of monovalent ions and bivalent ions in said anticoagulant-treated blood sample;

(b) adjusting the monovalent ion concentration in said reaction mixture to a range of 10–200 mM;

(c) if bivalent ions are present in said anticoagulant-treated blood sample, adjusting the bivalent ion concentration in the reaction mixture to a range of 1.4–40 mM; and

(d) amplifying the target nucleic acid sequences in said blood sample.

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**5,501,964**

## METHODS FOR PRODUCING PROBES CAPABLE OF DISTINGUISHING DNA FROM RELATED SOURCES

Michael Wigler, Lloyd Harbor, and Nikolai Lisitsyn, Cold Spring Harbor, both of N.Y., assignors to Cold Spring Harbor Laboratory, Cold Spring Harbor, N.Y.

Continuation-in-part of Ser. No. 974,447, Nov. 12, 1992. This application Nov. 9, 1993, Ser. No. 149,199
The portion of the term of this patent subsequent to Jul. 25, 2012, has been disclaimed.
Int. Cl.[6] C12P *19/34;* C12Q *1/68*
U.S. Cl. 435—91.2 14 Claims

1. A method for producing probes capable of distinguishing at least one sequence difference between DNA from two different eukaryotic sources, said method comprising:

completely digesting separately the DNA from said two different sources with a restriction endonuclease to provide digested fragments, wherein one of said sources is driver DNA, and the other source is tester DNA, wherein said tester DNA comprises target DNA, wherein said target DNA comprises sequence differences between the DNA of said two sources;

ligating a first set of adaptors to said digested fragments and amplifying said fragments using primers to one of the strands



of said first set adaptors to provide amplified amounts of fragments of said digested fragments of less than about 2 kbp as amplicons;

carrying out a first round of the following steps for enrichment of target DNA:

removing said first set of adaptors from said amplicons and ligating a second set of adaptors to the 5' ends of the amplicons of tester DNA;

combining under melting and annealing conditions said tester amplicons with a large excess of at least about 5-fold of driver amplicons, whereby a portion of the resulting dsDNA comprises self-annealed tester DNA including target DNA;

filling in the 3' ends of annealed DNA;

amplifying said portion of said dsDNA with primers complementary to one of said strands of said second set of adaptors to enrich for target DNA;

optionally repeating said first round of steps as a second round or successive round, to provide DNA sequences which serve to identify differences in DNA sequences between said tester source and said driver source.

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**5,501,965**

## PROCESS FOR PRODUCING FRUCTOSE 2,6-BISPHOSPHATE AND PURIFICATION PROCESS THEREOF

Ken Iwata; Tatsuo Katayama, and Hiroshi Nakajima, all of Kyoto, Japan, assignors to Unitika Ltd., Hyogo, Japan

Filed Mar. 16, 1994, Ser. No. 213,738
Claims priority, application Japan, Mar. 17, 1993, 5-084102; Mar. 17, 1993, 5-084103
Int. Cl.[6] C12P *19/24;19/02*
U.S. Cl. 435—94 20 Claims

1. A process for producing fructose 2,6-bisphosphate comprising the steps of:

admixing fructose 6-phosphate, adenosine 5'-triphosphate, a phosphate donor, and the following enzymes (a) and (b):

(a) fructose 6-phosphate 2-kinase, and

(b) an enzyme which converts adenosine 5'-diphosphate into adenosine 5'-triphosphate, in a reaction buffer,

allowing enzymatic reaction to occur so as to form fructose 2,6-bisphosphate, and

isolating said fructose 2,6-bisphosphate from the resulting reaction buffer.

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**5,501,966**

## *PSEUDOMONAS AERUGINOSA* AND ITS USE IN A PROCESS FOR THE BIOTECHNOLOGICAL PREPARATION OF L-RHAMNOSE

Carlo Giani, Frankfurt am Main; Dieter Wullbrandt, Hofheim/Taunus; Reinhardt Rothert, Niedernhausen, and Johannes Meiwes, Idstein, all of, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 80,257, Jun. 23, 1993, abandoned.
This application Jan. 19, 1995, Ser. No. 375,230
Claims priority, application Germany, Jun. 25, 1992, 42 20 437.2; Jul. 31, 1992, 42 25 283.0
Int. Cl.[6] C12P *19/02;19/44;* C12N *1/20*
U.S. Cl. 435—105 8 Claims

1. A process for the preparation of L-rhamnose, which comprises synthesizing rhamnolipids in a concentration of 70–120 g/l of culture solution by fermentation of *Pseudomonas aeruginosa*, wherein said *Pseudomonas aeruginosa* is selected from the group consisting of

*Pseudomonas aeruginosa* DSM 7107,

*Pseudomonas aeruginosa* DSM 7108,

a mutant of *Pseudomonas aeruginosa* DSM 7107 capable of producing rhamnolipids in a concentration of 70–120 g/l of culture solution, and

a mutant of *Pseudomonas aeruginosa* DSM 7108 capable of producing rhamnolipids in a concentration of 70–120 g/l of culture solution;

hydrolyzing the rhamnolipids to L-rhamnose without isolation of the rhamnolipids prior to hydrolysis; and recovering the L-rhamnose.

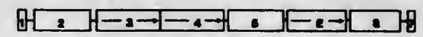
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**5,501,967**

## PROCESS FOR THE SITE-DIRECTED INTEGRATION OF DNA INTO THE GENOME OF PLANTS

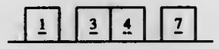
Remko Offringa, Leiden; Marcellus J. A. De Groot, Utrecht; Paul J. J. Hooykaas, Oegstgeest, and Petrus J. M. Van Den Elzen, Voorhout, all of, Netherlands, assignors to Mogen International, n.v./Rijksuniversiteit te Leiden, Leiden, Netherlands

Continuation of Ser. No. 659,288, May 21, 1991, abandoned.
This application Jul. 6, 1993, Ser. No. 87,928
Claims priority, application Netherlands, Jul. 26, 1989, 8901931
Int. Cl.[6] C12N *15/82;15/84;15/29*
U.S. Cl. 435—172.3 19 Claims




1. A process for introducing a defined DNA sequence in a selected target locus of a nuclear plant cell genome by integrating at least a part of a recombinant DNA into said genome through homologous recombination at the target locus, comprising the steps of:

a) coincubating plant protoplasts or plant cells under transforming conditions, with a strain of the genus Agrobacterium capable of T-region transfer and containing a plant transformation vector which comprises recombinant DNA of the formula:




wherein boxes 1 and 7 are T-DNA border sequences, and wherein one of box 1 or 7 may be absent; and

wherein box 3 comprises a DNA sequence sufficiently homologous to a DNA sequence inside the target locus and sufficiently long to promote homologous recombination; and

wherein box 4 comprises a DNA sequence not homologous to sequences occurring in the target locus; and

wherein the lines connecting the boxes shown may comprise any number of nucleotides or basepairs, and

b) identifying protoplasts or cells that have obtained the said defined DNA sequence in their genomes at said target locus.

5,501,968

## THERMOSTABLE CYCLODEXTRIN GLYCOSYL TRANSFERASE AND PROCESSES USING IT

Robert L. Starnes, Sacramento, Calif.; Philip C. Trackman, Needham, Mass., and Dennis M. Katkocin, New Fairfield, Conn., assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

Continuation-in-part of Ser. No. 25,529, Mar. 3, 1993, abandoned, and a continuation-in-part of Ser. No. 4,178, Jan. 13, 1993, and a continuation-in-part of Ser. No. 455,188, Dec. 22, 1989, said Ser. No. 25,529is a continuation-in-part of Ser. No. 337,794, Apr. 13, 1989, and a continuation-in-part of Ser. No. 4,178, Apr. 13, 0, said Ser. No. 337,794is a continuation-in-part of Ser. No. 108,469, Oct. 15, 1987, abandoned, said Ser. No. 4,178is a continuation of Ser. No. 337,795, Apr. 13, 1989, abandoned, which is a continuation-in-part of Ser. No. 108,688, Oct. 15, 1987, abandoned. This application May 24, 1993, Ser. No. 66,813

Int. Cl.[6] C12N *9/10;* C12P *19/18*

U.S. Cl. 435—193 5 Claims

1. An isolated thermostable cyclodextrin glycosyl transferase derived from Thermoanaerobacter or Thermoanaerobium having the following properties:

(a) a temperature optimum of about 95° C. measured at pH 5;

(b) a pH optimum of about 5.0; and

(c) a residual activity of about 95% after 40 minutes incubation at 80° C. and pH 5.0 in the absence of starch and $Ca^{++}$.

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5,501,969

## HUMAN OSTEOCLAST-DERIVED CATHEPSIN

Gregg A. Hastings, Rockville; Mark D. Adams, Potomac; Claire M. Fraser, Queenstown; Norman H. Lee, Woodstock, all of Md.; Ewen F. Kirkness, Washington, D.C.; Judith A. Blake, Laurel; Lisa M. Fitzgerald, Germantown, both of Md.; Fred H. Drake, Glenmoore, and Maxine Gowan, Valley Forge, both of Pa., assignors to Human Genome Sciences, Inc., Rockville, Md.

Filed Mar. 8, 1994, Ser. No. 208,007

Int. Cl.[6] C12N *15/57;15/63;1/21;5/10*

U.S. Cl. 435—240.2 39 Claims

18. An isolated polynucleotide comprising a member selected from the group consisting of:

(a) a polynucleotide encoding a mature polypeptide encoded by the cathepsin polynucleotide contained in ATCC Deposit No, 75671; and

(b) a polynucleotide which hybridizes to and which is at least 95% complementary to the polynueleotide of (a).

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5,501,970

## NUCLEOTIDE SEQUENCES CODING FOR RIBOSOME INACTIVATING PROTEINS

Giuseppe Legname; Gianni Gromo; Daniela Modena, and Diego Brocchetti, all of Milan, Italy, assignors to ITALFARMACO S.p.A., Milan, Italy

PCT No. PCT/EP92/01711, § 371 Date May 13, 1994, § 102(e) Date May 13, 1994, PCT Pub. No. WO93/03153, PCT Pub. Date Feb. 18, 1993

PCT Filed Jul. 29, 1992, Ser. No. 182,114

Claims priority, application Italy, Jul. 31, 1991, MI91A02136; Jun. 17, 1992, MI92A01476

Int. Cl.[6] C12N *15/29;15/56;1/21;5/10;15/63*

U.S. Cl. 435—240.1 8 Claims

1. A DNA sequence coding for a ribosome inactivating protein from *Dianthus caryophyllus* as shown in SEQUENCE ID NO: 1.

5,501,971

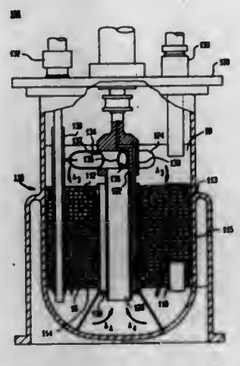
## METHOD AND APPARATUS FOR ANCHORAGE AND SUSPENSION CELL CULTURE

David Freedman; Guozheng Wang, both of Highland Park, N.J., and Avinoam Kadouri, Petach-Tiqua, Israel, assignors to New Brunswick Scientific Co., Inc., New Brunswick, N.J.

Continuation of Ser. No. 11,350, Jan. 29, 1993, abandoned. This application Nov. 30, 1994, Ser. No. 346,830

Int. Cl.[6] C12N *5/00;* C12M *3/00*

U.S. Cl. 435—240.23 12 Claims



1. An apparatus for use in the cultivation of cells comprising:

a vessel having an upper portion, a closed bottom portion and side walls extending from said closed bottom portion;

a hollow tube positioned in said vessel having a lower open end;

a basket including a top and a bottom portion with holes therethrough, said basket extending around said hollow tube to the side walls of said vessel;

means for introducing gas bubbles in said vessel; and

agitator means for fluid flow affixed to said hollow tube, said agitator means including tubulation means having an input opening coupled to said hollow tube and an exit opening, said fluid being circulated by said agitator means for providing substantially bubble-free fluid to said basket,

wherein said gas bubbles rise towards said upper portion of said vessel and said substantially bubble free fluid flows from said bottom portion of said vessel through said hollow tube to the top of said vessel and returns to said bottom portion of said vessel through said basket.

6. A method for the cultivation of cells comprising the steps of:

placing a carrier within a basket, said basket positioned within a vessel;

adding cells to said basket, said cells being immobilized on said carrier;

introducing gas bubbles directly in said vessel to said basket, said vessel having a bottom and top portion; and

circulating substantially bubble-free medium through the basket, said gas bubbles rise towards said top portion of said vessel and said bubble-free medium flows to the bottom of said vessel through said basket for providing bubble-free flow said circulating step being carried out with an agitator means, said basket including a hollow tube, said agitator means including tubulation means, said tubulation means having an inlet attached to said hollow tube and an outlet,

wherein fluid flows from the bottom of said vessel through said hollow tube to said inlet and through said outlet of said tubulation means to the top of said vessel and returns to the bottom of said vessel through said basket.



5,501,972

## METHOD OF PRODUCING EMBRYOGENIC CALLUS OF NORWAY SPRUCE (*PICEA ABIES* AND REGENERATING PLANTLETS THEREFROM

Roger J. Westcott, Wellingborough, United Kingdom, assignor to Unilever Patent Holdings B.V., Vlaardingen, Netherlands

Continuation of Ser. No. 898,903, Jun. 10, 1992, abandoned. This application Jan. 27, 1994, Ser. No. 187,818

Int. Cl.[6] C12N *5/04;5/02;5/00*

U.S. Cl. 435—240.49 3 Claims

1. A method of producing embryogenic Norway spruce callus, comprising culturing needle or bud explants from Norway spruce trees approximately 26 years old or younger so as to form non-embryogenic callus and culturing said non-embryogenic callus in the presence of Norway spruce nurse cells so as to produce embryogenic callus, wherein said non-embryogenic callus and said nurse cells are located in close proximity on opposed sides of a filter membrane.

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5,501,973

## TREATMENT FOR CONTAMINATED MATERIAL

Thomas B. Mayfield, 15417 Chichester, Houston, Tex. 77040

Continuation-in-part of Ser. No. 927,147, Aug. 7, 1992, abandoned. This application May 20, 1994, Ser. No. 247,002

Int. Cl.[6] C12N *1/00;1/38;* B09B *3/00;* C05F *11/08*

U.S. Cl. 435—244 8 Claims

1. A treatment composition for treating contaminated material, the treatment composition comprising

water,

powderized soft coal,

an alkali metal carbonate, and

algin extract solution,

the ratio by weight of water to coal to alkali metal carbonate about 18:6:1.

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5,501,974

## DISRUPTING A HYDROPHOBIC LAYER FORMED DURING FERMENTATION WITH NITROGEN DIOXIDE

David Griffin, 1 Paddington Cir., Broxville, N.Y. 10708

Continuation of Ser. No. 186,060, Jan. 24, 1994, abandoned, which is a continuation of Ser. No. 896,419, Jun. 10, 1992, abandoned. This application Apr. 4, 1995, Ser. No. 416,925

Int. Cl.[6] C12N *1/38;1/14;* C12P *1/04;* C02F *3/02*

U.S. Cl. 435—244 5 Claims

1. An industrial microbiological process utilizing aerobic microorganisms said process comprising employing an air or oxygen stream to aerate a microorganism-rich aqueous culture medium in a process vessel with the production of air bubbles in said culture medium, said culture medium comprising an aqueous phase and a microorganism phase, wherein said process forms a hydrophobic third phase in said culture medium, said hydrophobic third phase being of reduced gas permeability and impeding access of oxygen to said aerobic microorganisms which process further comprises forming dilute nitric acid in situ to facilitate dispersion of said hydrophobic third phase by entraining nitrogen dioxide gas in said air or oxygen stream in quantities sufficient to break down its binding properties and permit agglomeration and dispersal of said hydrophobic third phase materials, said quantities being controlled to prevent toxicity to said microorganisms due to said nitric acid being introduced to said culture medium.

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5,501,975

## DNA MOLECULES ENCODING AN ER-LOCATED ENDOPROTEASE

Bhabatosh Chaudhuri, Münchenstein, Switzerland; Christine Stephan, Kingersheim, France; Peter Seeboth, Inzlingen, Germany, and Howard Riezman, Biel-Benken, Switzerland, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

Continuation of Ser. No. 989,260, Dec. 11, 1992, abandoned. This application Oct. 24, 1994, Ser. No. 328,961

Claims priority, application European Pat. Off., Dec. 16, 1991, 91810984

Int. Cl.[6] C12N *15/62;15/63;15/57*

U.S. Cl. 435—252.3 8 Claims

1. A recombinant DNA molecule encoding an expression cassette for an ER-located "dibasic processing endoprotease" wherein the "dibasic processing endoprotease" consists of a "dibasic processing endoprotease" selected from the group consisting of YAP3 and KEX2p and an ER-retention signal selected from the group consisting of HDEL, KDEL and RDEL.

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5,501,976

## METHODS AND COMPOSITIONS FOR THE CONTROL OF THE FLESH FLY

Dov Borovsky, Vero Beach, Fla.; Arnold De Loof, Leuven, and Dany Bylemans, Leopoldsburg, both of, Belgium, assignors to The University of Florida, Gainesville, Fla.

Division of Ser. No. 192,243, Feb. 7, 1994, Pat. No. 5,459,130. This application May 23, 1995, Ser. No. 448,059

Int. Cl.[6] C12N *1/20;* A61K *38/04;* C07K *5/00;* C07H *19/00*

U.S. Cl. 435—252.3 6 Claims

1. An isolated DNA molecule encoding a peptide consisting of the amino acid sequence shown in SEQ ID NO. 1.

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5,501,977

## BIOFILTER COMPRISING LEONARDITE, CLAY AND LIME

John A. Cruze, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 72,025, Jun. 7, 1993, Pat. No. 5,378,280. This application Jul. 7, 1994, Ser. No. 271,601

Int. Cl.[6] B01D *53/54;53/72;53/84*

U.S. Cl. 435—266 32 Claims

1. A process for decontaminating a contaminated air stream with

a biofilter comprising contacting an air stream, contaminated with at least one volatile compound, with a biofilter composition wherein said biofilter composition comprises leonardite, clay, lime, and an inorganic salt mixture, each of which is present in an amount sufficient to support the growth of at least one microorganism suitable to degrade said at least one volatile compound, and said contacting occurring for a time and under conditions sufficient for said at least one microorganism to decade said at least one volatile compound.

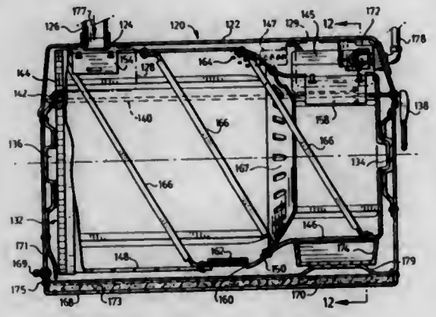
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**5,501,978**

## AERATION DRUM FOR COMPOSTING TOILET

**Henric Sundberg, Burlington, Canada**

**Continuation-in-part of Ser. No. 37,756, Mar. 26, 1993, Pat. No. 5,345,620. This application Jun. 1, 1994, Ser. No. 252,467**
**Int. Cl.[6] C12M *1/10;1/06***
**U.S. Cl. 435—290.3** **9 Claims**



1. In a composting unit comprising a housing and an aeration drum rotatably mounted for rotation about a longitudinal axis thereof oriented horizontally inside the housing, the aeration drum and the housing having cooperating access means for receiving human waste matter from a toilet remote from the unit and discharging said waste into the drum, solid waste discharge means for discharging decomposed solid waste matter, liquid waste discharge means in the aeration drum in fluid communication with the housing, and respective gas outlet means for ventilation and aeration of the aeration drum, the improvement in which the aeration drum has a narrow first end and a wide second end extending radially outwardly from said narrow first end, the liquid waste discharge means being disposed in said wide second end and the solid waste discharge means being disposed in said narrow first end for discharge of decomposed solid waste matter in a radial direction into the housing beneath said narrow first end of the drum where the decomposed solid waste matter is accommodated until periodically removed through withdrawal means provided in the housing, the configuration of said aeration drum being adapted to favour the separation of dried decomposed solid waste matter while maintaining a moist environment required for decomposition.

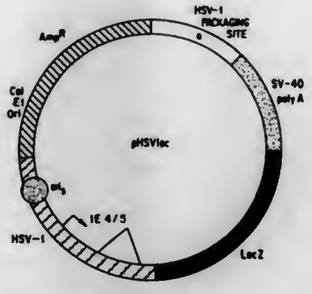
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**5,501,979**

## HERPES SIMPLEX VIRUS TYPE I EXPRESSION VECTOR

**Alfred I. Geller, Jamaica Plains, and Xandra O. Breakefield, Newton, both of Mass., assignors to The General Hospital Corporation, Charlestown, Mass.**

**Continuation of Ser. No. 913,977, Jul. 16, 1992, abandoned, which is a continuation of Ser. No. 304,619, Feb. 1, 1989, abandoned. This application Nov. 30, 1993, Ser. No. 159,110**
**Int. Cl.[6] C12N *15/86;15/63***
**U.S. Cl. 435—320.1** **13 Claims**




1. The recombinant HSV-1 vector pHSVlac.

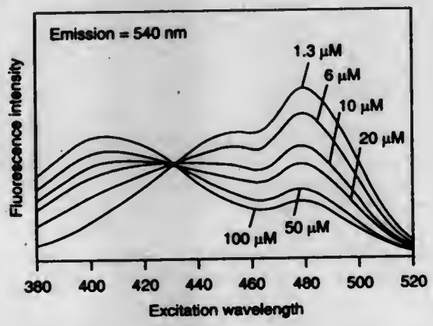
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**5,501,980**

## BENZAZOLYLCOUMARIN-BASED ION INDICATORS

**Haralambos E. Katerinopoulos, Crete; Helene Iatridou, Salonica; Evangelia Foukaraki, Crete, all of, Greece; Mohammad N. Malekzadeh, Eugene; Michael A. Kuhn, Eugene, and Richard P. Haugland, Eugene, all of Oreg., assignors to Molecular Probes, Inc., Eugene, Oreg.**

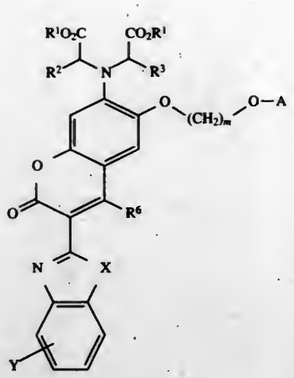
**Filed May 20, 1994, Ser. No. 247,013**
**Int. Cl.[6] G01N *33/20***
**U.S. Cl. 436—74** **21 Claims**




16. A method of measuring the concentration of a polycationic metal ion in a sample, comprising:

a) adding to said sample, in an amount sufficient to generate a detectable fluorescent response to said metal ion, a compound according to the formula

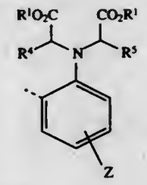




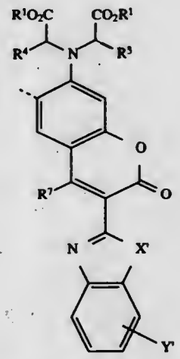
wherein

m is either 2 or 3;

A is either of the formula



or A is of the formula



wherein

$R^1$ is H, an alkyl group having 1–5 carbons, a benzyl, an alpha-acyloxyalkyl or a pharmaceutically acceptable esterifying group, a t-butyldimethylsilyl ester, or a pharmaceutically acceptable salt;

$R^2$, $R^3$, $R^4$ and $R^5$ are independently H or methyl;

$R^6$ and $R^7$ are independently H, CN, $CH_3$, $CF_3$ or $CONH_2$;

X and X' are independently O, S, or $C(CH_3)_2$;

Y and Y' are independently H, an alkyl having 1–18 carbons, $—NO_2$, $—NH_2$, $—NH(C═O)(CH_2)_nCH_3$, $—CF_3$, F, Cl, Br, I, $—OR^8$, $—CO_2R^9$, or $—OCH_2CO_2R^9$, where n=0–16; $R^9$ is H, an alkyl group having 1–18 carbons, a benzyl ($C_6H_5CH_2—$), an alpha-acyloxyalkyl, acetate, or a t-butyldimethylsilyl ether; and $R^9$ is H, an alkyl group having 1–17 carbons, a benzyl ($C_6H_5CH_2—$) an alpha-acyloxyalkyl or other pharmaceutically acceptable esterifying group, a t-butyldimethylsilyl ester, or a pharmaceutically acceptable salt; or one of Y and Y' is a covalently attached conjugant; and

Z is one of H, an alkyl having 1–18 carbons, $—NH_2$, $—NH(C═O)(CH_2)_nCH_3$, $—CF_3$, F, Cl, Br, I, $—OR^8$, $—CO_2R^9$, or $—OCH_2CO_2R^9$; or Z is a covalently attached conjugant;

b) illuminating said sample to generate an absorbance or fluorescence response; and

c) observing said absorbance or fluorescence response.

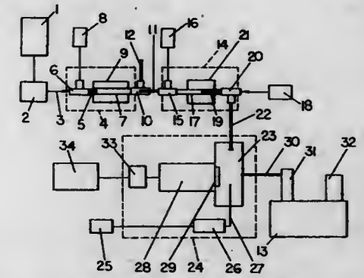
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**5,501,981**

## METHOD AND APPARATUS FOR CHEMILUMINESCENT DETECTION OF SULFUR

**John D. Ray, and Nell Johansen, both of Boulder, Colo., assignors to Sievers Instruments, Inc., Boulder, Colo.**

**Continuation-in-part of Ser. No. 754,889, Sep. 6, 1991, Pat. No. 5,310,683, which is a division of Ser. No. 444,636, Dec. 1, 1989, abandoned, which is a continuation-in-part of Ser. No. 275,980, Nov. 25, 1988, abandoned. This application Mar. 5, 1993, Ser. No. 27,145**
**Int. Cl.[6] G01N *21/76***
**U.S. Cl. 436—123** **20 Claims**



11. A method of detecting sulphur in a sample containing sulphur and hydrocarbon, comprising: oxidizing the hydrocarbons in a first combustion step in a first burner, converting the sulphur to sulphur monoxide in a second combustion step in a second burner, reacting ozone with the carbon monoxide to produce excited sulphur dioxide, and measuring the chemiluminescence of the excited sulphur dioxide to detect sulphur in the sample.

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**5,501,982**

## METHOD OF USING A DISPOSABLE REAGENT PACK

**Louis Saldivar, Jr., Kenosha, Wis., and Sangvorn Rutnarak, Long Grove, Ill., assignors to Abbott Laboratories, Abbott Park, Ill.**

**Continuation of Ser. No. 298,446, Aug. 29, 1994, abandoned, which is a division of Ser. No. 169,886, Dec. 20, 1993, abandoned. This application Jun. 2, 1995, Ser. No. 459,377**
**Int. Cl.[6] G01N *1/00***
**U.S. Cl. 436—150** **2 Claims**

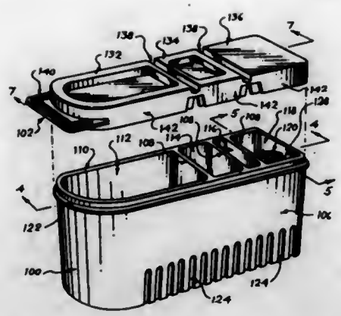
1. A method of using a disposable reagent pack with a blood analytical instrument having a red blood cell probe to analyze a red blood cell sample and a white blood cell probe to analyze a white blood cell sample, the method comprising the steps of:

(a) providing a disposable reagent pack comprising a red blood cell sample well and a white blood cell sample well disposed substantially within a lysing solution well such that a blood sample in the white blood cell sample well and a lysing solution in the lysing solution well may be selectively transferred between the white blood cell sample well and the lysing solution well;

(b) placing a cover on the disposable reagent pack;

(c) inverting the disposable reagent pack to selectively transfer and to mix the blood sample in the white blood cell sample well and the lysing solution;

(d) removing the cover from the disposable reagent pack;



(e) placing the disposable reagent pack on the blood analytical instrument;
(f) simultaneously inserting the white blood cell probe into the lysing solution well and the red blood cell probe into the red blood cell sample well;
(g) simultaneously analyzing the red blood cell sample with the red blood cell probe and the white blood cell sample with the white blood cell probe; and
(h) removing the disposable reagent pack from the analytical instrument.

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**5,501,983**

## ASSAY OF FREE AND COMPLEXED PROSTATE-SPECIFIC ANTIGEN

**Hans Lilja, Holländarevägen 28, S-23600 Höllviken, Sweden, and Ulf-Håkan Stenman, Helkelsvägen 10, SF-02700 Grankulla, Finland**

**PCT No. PCT/FI91/00223, § 371 Date Mar. 19, 1993, § 102(e) Date Mar. 19, 1993, PCT Pub. No. WO92/01936, PCT Pub. Date Jan. 2, 1992**
**PCT Filed Jul. 22, 1991, Ser. No. 956,509**
**Claims priority, application Sweden, Jul. 23, 1990, 9002480**
**Int. Cl.[5] G01N *33/543;33/558;33/566***
**U.S. Cl. 436—518** **20 Claims**

1. An immunoassay of prostate-specific antigen (PSA) characterized in that
the fraction of prostate-specific antigen in complex with $\alpha_1$-antichymotrypsin is measured using one or more antibodies.

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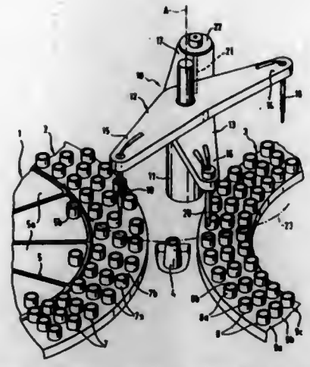
**5,501,984**

## ANALYSER UNIT FOR HETEROGENEOUS IMMUNOLOGICAL TESTS

**Meinrad Hofstetter, Feisberg; Klaus Leckebusch, Massin, and Armin Panzer, Tria, all of, Switzerland, assignors to Boehringer Mannheim GmbH, Mannheim, Germany**

**Division of Ser. No. 874,996, Apr. 24, 1992, abandoned, which is a continuation of Ser. No. 551,827, Jul. 12, 1990, abandoned. This application Jun. 17, 1993, Ser. No. 77,500**
**Claims priority, application Germany, Jul. 19, 1989, 39 23 833.4**
**Int. Cl.[6] G01N *33/543***
**U.S. Cl. 436—518** **18 Claims**

1. A method of selectively performing a plurality of heterogeneous immunological tests in one run in a sample-selective operation in which for each sample contained in a particular sample vessel an arbitrary selection of analyses required for said sample for detection of an analyte is possible and wherein said tests comprise highly specific binding reactions of immunological binding partners, at least some of the binding reactions requiring substantially different incubation times, using an automatic analyzer that comprises:



a plurality of reagent vessels containing liquid reagents and having openings therein;
reagent rotor means having a reagent rotor axis for rotatably providing seats for the reagent vessels, with the reagent vessel openings arranged on at least one circle about the reagent rotor axis;
the reagent vessels located on the reagent vessel seats on the reagent rotor means;
a plurality of sample vessels containing liquid samples and having openings therein;
sample rotor means having a sample rotor axis for rotatably providing seats for the sample vessels, with the sample vessel openings arranged on at least one circle about the sample rotor axis;
the sample vessels located on the sample vessel seats on the sample rotor means;
a plurality of reaction vessels containing a carrier bound reagent which is specific for either the analyte or another specific binding reagent, and having openings therein;
reaction rotor means having a reaction rotor axis for rotatably providing seats for the reaction vessels, with the reaction vessel openings arranged on a plurality of concentric circles about the reaction rotor axis;
the reaction vessels located on the reaction vessel seats on the reaction rotor means;
wherein at least two of the sample, reagent and reaction rotor means are arranged concentric to one another;
liquid handling means for transferring reagents and samples between the plurality of reagent, sample and reaction vessels, the liquid handling means including a transfer needle means movable along a movement path which crosses each of said circles of openings of said reagent vessels, sample vessels and reaction vessels for transferring liquid from one vessel to another;
a washing means including a washing needle for individually washing single reaction vessels on said rotor by introducing liquid thereinto and suctioning liquid therefrom; and
a detection means at the periphery of said reaction rotor means including a liquid sampling suction needle
said method comprising the steps of:
(a) rotating the sample vessel rotor means into a liquid handling position in which said movement path of said transfer needle means crosses said circle of sample vessels, and transferring a liquid sample from a sample vessel to the liquid handling means;
(b) rotating the reaction vessel rotor means into a liquid handling position in which said movement path of said transfer needle means crosses said circle of reaction vessels, and transferring the liquid sample from the liquid handling means to one of the reaction vessels of the reaction vessel rotor means;
(c) rotating the reagent vessel rotor means into a liquid handling position in which said movement path of said transfer needle means crosses said circle of reagent vessels, and transferring a liquid reagent from the reagent vessel to the liquid handling means, the liquid reagent including a conjugate of an immunological binding partner specific for said analyte or another specific binding reagent in said reaction vessel and a label;
(d) transferring the liquid reagent from the liquid handling means to the reaction vessel having the liquid sample therein while the reaction vessel rotor means is in said liquid handling position in which said transfer needle means crosses said circle of reaction vessels;
(e) mixing the liquid sample and the liquid reagent in said reaction vessel;
(f) incubating the reaction vessel contents while on the reaction vessel rotor while maintaining the reaction vessel at a preselected temperature for a preselected period of time;
g) rotating said reaction rotor means and plural circles of reaction vessels thereon into a washing position, lowering said washing needle of said washing means into a single reaction vessel, and washing the contents of that reaction vessel by introducing a wash liquid therein and suctioning liquid therefrom to effect separation of a carrier bound and a free reaction component of the reaction in the reaction vessel;
(h) adding a detection reagent to the reaction vessel so as to produce an observable change by a reaction of the label with the detection reagent; and
(i) rotating said reaction rotor means into a detection position and lowering the liquid sampling suction needle of said detection means into said reaction vessel and suctioning liquid therefrom; and
(j) detecting an observable change of said liquid caused by said reaction of said detection reagent with said label by sampling of liquid from an individual reaction vessel on the reaction rotor, evaluating the sampled liquid, and correlating the observable change to the presence of analyte in the liquid sample; wherein said steps (a) to (e) are performed consecutively in a series of analyses of different samples with respect to the same heterogeneous immunological test and wherein, during performing said step (f) with respect to a first heterogeneous immunological test of at least one sample, steps (a) to (e) are performed with respect to a second heterogeneous immunological test of at least one sample which second immunological test is different from the first heterogeneous immunological test.



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**5,501,985**

## ANALYTE-SUBSTITUTE REAGENT FOR USE IN SPECIFIC BINDING ASSAY METHODS, DEVICES AND KITS

**Bennett W. Baugher, Waukegan; Aurora J. Chamberlain, Buffalo Grove; Sharon M. Devereaux, Gurnee, and Frank S. Ungemach, Lake Villa, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.**

**Continuation of Ser. No. 67,254, May 25, 1993, Pat. No. 5,340,748, which is a continuation of Ser. No. 554,304, Jul. 18, 1990, abandoned. This application Apr. 21, 1994, Ser. No. 230,995**
**Int. Cl.[6] G01N *33/543***
**U.S. Cl. 436—518** **4 Claims**

1. A device for determining the presence or amount of at least one analyte of interest in a test sample, comprising:
(a) a first reaction site having
(i) at least one reversibly incorporated analyte-substitute reagent comprising an analyte-component conjugated to a ligand-component,
wherein said analyte-component has at least one epitope in common with said at least one analyte of interest, and said analyte-component specifically binds to a single analyte-specific binding member, and
wherein said ligand-component specifically binds to a ligand-specific binding member but does not specifically bind to an analyte-specific binding member, and
(ii) at least one immobilized first analyte-specific binding member which specifically binds an epitope present on both said at least one analyte of interest and said analyte-component of said analyte-substitute reagent,
wherein in the presence of said at least one analyte of interest, a mixture of analyte/first analyte-specific binding member complex, analyte-substitute reagent/first analyte-specific binding member complex, and unbound analyte-substitute reagent is formed and the amount of unbound analyte-substitute reagent increases as the amount of said at least one analyte of interest increases;
(b) a second reaction site distinct from said first reaction site having
at least one reversibly incorporated indicator reagent each comprising a label capable of producing a detectable signal, wherein said label is conjugated to a second specific binding member which directly or indirectly specifically binds said unbound analyte-substitute reagent; and
(c) a third reaction site distinct from said first and second reaction sites having
at least one directly or indirectly immobilized capture reagent comprising a third specific binding member which specifically binds said analyte-substitute reagent,
wherein said at least one capture reagent and said at least one indicator reagent form a directly or indirectly bound detectable complex with said unbound analyte-substitute reagent which indicates the presence or amount of said at least one analyte, and
wherein when said capture reagent specifically binds said analyte-component then said indicator reagent specifically binds said ligand-component, and when said capture reagent specifically binds said ligand-component then said indicator reagent specifically binds said analyte-component.

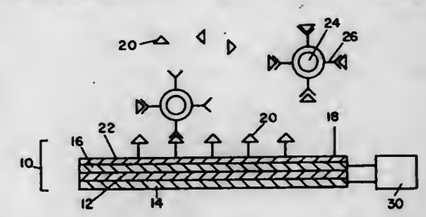
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**5,501,986**

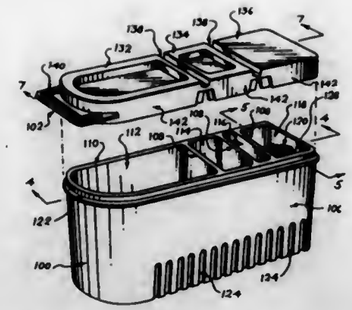
## PIEZOELECTRIC SPECIFIC BINDING ASSAY WITH MASS AMPLIFIED REAGENTS

**Michael D. Ward, Newark, and Richard C. Ebersole, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Continuation of Ser. No. 908,585, Jun. 30, 1992, abandoned, which is a continuation of Ser. No. 409,886, Sep. 20, 1989, abandoned, which is a continuation-in-part of Ser. No. 178,367, Apr. 6, 1988, abandoned. This application Jul. 28, 1994, Ser. No. 283,475**
**Int. Cl.[6] G01N *33/531***
**U.S. Cl. 436—525** **4 Claims**



1. A method for detecting an analyte suspected of being present in a sample, comprising the steps of:
(1) forming a reaction system comprising:
(i) a QCM capable of a change in resonant frequency having a first member of a specific binding pair attached to the surface thereof;
(ii) a gold sol particle attached to a second member of the specific binding pair, the gold sol particle
a) having a diameter between about 5 to 100 nm,
b) and wherein the second member of the specific binding pair attached to the gold sol particle is capable of binding to the first member of the specific binding pair which is attached to the QCM surface;



(e) placing the disposable reagent pack on the blood analytical instrument;
(f) simultaneously inserting the white blood cell probe into the lysing solution well and the red blood cell probe into the red blood cell sample well;
(g) simultaneously analyzing the red blood cell sample with the red blood cell probe and the white blood cell sample with the white blood cell probe; and
(h) removing the disposable reagent pack from the analytical instrument.

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**5,501,983**

**ASSAY OF FREE AND COMPLEXED PROSTATE-SPECIFIC ANTIGEN**

**Hans Lilja, Hollåndarevägen 28, S-23600 Höllviken, Sweden, and Ulf-Håkan Stenman, Helkelsvägen 10, SF-02700 Grankulla, Finland**

**PCT No. PCT/FI91/00223, § 371 Date Mar. 19, 1993, § 102(e) Date Mar. 19, 1993, PCT Pub. No. WO92/01936, PCT Pub. Date Jan. 2, 1992**
**PCT Filed Jul. 22, 1991, Ser. No. 956,509**
**Claims priority, application Sweden, Jul. 23, 1990, 9002480**
**Int. Cl.[6] G01N** *33/543;33/558;33/566*
**U.S. Cl. 436—518** **20 Claims**

1. An immunoassay of prostate-specific antigen (PSA) characterized in that
the fraction of prostate-specific antigen in complex with $\alpha_1$-antichymotrypsin is measured using one or more antibodies.

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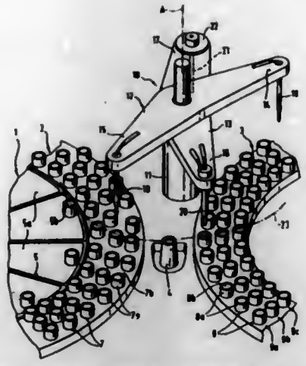
**5,501,984**

**ANALYSER UNIT FOR HETEROGENEOUS IMMUNOLOGICAL TESTS**

**Meinrad Hofstetter, Feisberg; Klaus Leckebusch, Maesin, and Armin Panzer, Trin, all of, Switzerland, assignors to Boehringer Mannheim GmbH, Mannheim, Germany**

**Division of Ser. No. 874,996, Apr. 24, 1992, abandoned, which is a continuation of Ser. No. 551,827, Jul. 12, 1990, abandoned. This application Jun. 17, 1993, Ser. No. 77,500**
**Claims priority, application Germany, Jul. 19, 1989, 39 23 833.4**
**Int. Cl.[6] G01N** *33/543*
**U.S. Cl. 436—518** **18 Claims**

1. A method of selectively performing a plurality of heterogeneous immunological tests in one run in a sample-selective operation in which for each sample contained in a particular sample vessel an arbitrary selection of analyses required for said sample for detection of an analyte is possible and wherein said tests comprise highly specific binding reactions of immunological binding partners, at least some of the binding reactions requiring substantially different incubation times, using an automatic analyzer that comprises:



a plurality of reagent vessels containing liquid reagents and having openings therein;
reagent rotor means having a reagent rotor axis for rotatably providing seats for the reagent vessels, with the reagent vessel openings arranged on at least one circle about the reagent rotor axis;
the reagent vessels located on the reagent vessel seats on the reagent rotor means;
a plurality of sample vessels containing liquid samples and having openings therein;
sample rotor means having a sample rotor axis for rotatably providing seats for the sample vessels, with the sample vessel openings arranged on at least one circle about the sample rotor axis;
the sample vessels located on the sample vessel seats on the sample rotor means;
a plurality of reaction vessels containing a carrier bound reagent which is specific for either the analyte or another specific binding reagent, and having openings therein;
reaction rotor means having a reaction rotor axis for rotatably providing seats for the reaction vessels, with the reaction vessel openings arranged on a plurality of concentric circles about the reaction rotor axis;
the reaction vessels located on the reaction vessel seats on the reaction rotor means;
wherein at least two of the sample, reagent and reaction rotor means are arranged concentric to one another;
liquid handling means for transferring reagents and samples between the plurality of reagent, sample and reaction vessels, the liquid handling means including a transfer needle means movable along a movement path which crosses each of said circles of openings of said reagent vessels, sample vessels and reaction vessels for transferring liquid from one vessel to another;
a washing means including a washing needle for individually washing single reaction vessels on said rotor by introducing liquid thereinto and suctioning liquid therefrom; and
a detection means at the periphery of said reaction rotor means including a liquid sampling suction needle
said method comprising the steps of:
(a) rotating the sample vessel rotor means into a liquid handling position in which said movement path of said transfer needle means crosses said circle of sample vessels, and transferring a liquid sample from a sample vessel to the liquid handling means;
(b) rotating the reaction vessel rotor means into a liquid handling position in which said movement path of said transfer needle means crosses said circle of reaction vessels, and transferring the liquid sample from the liquid handling means to one of the reaction vessels of the reaction vessel rotor means;
(c) rotating the reagent vessel rotor means into a liquid handling position in which said movement path of said transfer needle means crosses said circle of reagent vessels, and transferring a liquid reagent from the reagent vessel to the liquid handling means, the liquid reagent including a conjugate of an immunological binding partner specific for said analyte or another specific binding reagent in said reaction vessel and a label;
(d) transferring the liquid reagent from the liquid handling means to the reaction vessel having the liquid sample therein while the reaction vessel rotor means is in said liquid handling position in which said transfer needle means crosses said circle of reaction vessels;
(e) mixing the liquid sample and the liquid reagent in said reaction vessel;
(f) incubating the reaction vessel contents while on the reaction vessel rotor while maintaining the reaction vessel at a preselected temperature for a preselected period of time;
g) rotating said reaction rotor means and plural circles of reaction vessels thereon into a washing position, lowering said washing needle of said washing means into a single reaction vessel, and washing the contents of that reaction vessel by introducing a wash liquid therein and suctioning liquid therefrom to effect separation of a carrier bound and a free reaction component of the reaction in the reaction vessel;
(h) adding a detection reagent to the reaction vessel so as to produce an observable change by a reaction of the label with the detection reagent; and
(i) rotating said reaction rotor means into a detection position and lowering the liquid sampling suction needle of said detection means into said reaction vessel and suctioning liquid therefrom; and
(j) detecting an observable change of said liquid caused by said reaction of said detection reagent with said label by sampling of liquid from an individual reaction vessel on the reaction rotor, evaluating the sampled liquid, and correlating the observable change to the presence of analyte in the liquid sample; wherein said steps (a) to (e) are performed consecutively in a series of analyses of different samples with respect to the same heterogeneous immunological test and wherein, during performing said step (f) with respect to a first heterogeneous immunological test of at least one sample, steps (a) to (e) are performed with respect to a second heterogeneous immunological test of at least one sample which second immunological test is different from the first heterogeneous immunological test.



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**5,501,985**

**ANALYTE-SUBSTITUTE REAGENT FOR USE IN SPECIFIC BINDING ASSAY METHODS, DEVICES AND KITS**

**Bennett W. Baugher, Waukegan; Aurora J. Chamberlain, Buffalo Grove; Sharon M. Devereaux, Gurnee, and Frank S. Ungemach, Lake Villa, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.**

**Continuation of Ser. No. 67,254, May 25, 1993, Pat. No. 5,340,748, which is a continuation of Ser. No. 554,304, Jul. 18, 1990, abandoned. This application Apr. 21, 1994, Ser. No. 230,995**
**Int. Cl.[6] G01N** *33/543*
**U.S. Cl. 436—518** **4 Claims**

1. A device for determining the presence or amount of at least one analyte of interest in a test sample, comprising:
(a) a first reaction site having
(i) at least one reversibly incorporated analyte-substitute reagent comprising an analyte-component conjugated to a ligand-component,
wherein said analyte-component has at least one epitope in common with said at least one analyte of interest, and said analyte-component specifically binds to a single analyte-specific binding member, and
wherein said ligand-component specifically binds to a ligand-specific binding member but does not specifically bind to an analyte-specific binding member, and
(ii) at least one immobilized first analyte-specific binding member which specifically binds an epitope present on both said at least one analyte of interest and said analyte-component of said analyte-substitute reagent,
wherein in the presence of said at least one analyte of interest, a mixture of analyte/first analyte-specific binding member complex, analyte-substitute reagent/first analyte-specific binding member complex, and unbound analyte-substitute reagent is formed and the amount of unbound analyte-substitute reagent increases as the amount of said at least one analyte of interest increases;
(b) a second reaction site distinct from said first reaction site having
at least one reversibly incorporated indicator reagent each comprising a label capable of producing a detectable signal, wherein said label is conjugated to a second specific binding member which directly or indirectly specifically binds said unbound analyte-substitute reagent; and
(c) a third reaction site distinct from said first and second reaction sites having
at least one directly or indirectly immobilized capture reagent comprising a third specific binding member which specifically binds said analyte-substitute reagent,
wherein said at least one capture reagent and said at least one indicator reagent form a directly or indirectly bound detectable complex with said unbound analyte-substitute reagent which indicates the presence or amount of said at least one analyte, and
wherein when said capture reagent specifically binds said analyte-component then said indicator reagent specifically binds said ligand-component, and when said capture reagent specifically binds said ligand-component then said indicator reagent specifically binds said analyte-component.

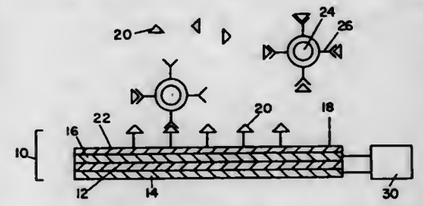
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**5,501,986**

**PIEZOELECTRIC SPECIFIC BINDING ASSAY WITH MASS AMPLIFIED REAGENTS**

**Michael D. Ward, Newark, and Richard C. Ebersole, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Continuation of Ser. No. 908,505, Jun. 30, 1992, abandoned, which is a continuation of Ser. No. 409,886, Sep. 20, 1989, abandoned, which is a continuation-in-part of Ser. No. 178,367, Apr. 6, 1988, abandoned. This application Jul. 28, 1994, Ser. No. 283,475**
**Int. Cl.[6] G01N** *33/531*
**U.S. Cl. 436—525** **4 Claims**



1. A method for detecting an analyte suspected of being present in a sample, comprising the steps of:
(1) forming a reaction system comprising:
(i) a QCM capable of a change in resonant frequency having a first member of a specific binding pair attached to the surface thereof;
(ii) a gold sol particle attached to a second member of the specific binding pair, the gold sol particle
a) having a diameter between about 5 to 100 nm,
b) and wherein the second member of the specific binding pair attached to the gold sol particle is capable of binding to the first member of the specific binding pair which is attached to the QCM surface;

c) wherein the areal density of the gold sol particle exceeds the areal density of the member of binding pair to which the sol particle is attached; and

(iii) an analyte receptor site residing on either the first member of the specific binding pair or on the second member of the specific binding pair;

(2) adding to the reaction system a sample suspected of containing an analyte, whereby the analyte specifically reacts with either the first or second member of the specific binding pair, thereby preventing the binding of the first member to the second member whereby such prevention of binding inhibits the attachment of the gold sol particle to the QCM and thereby effects a change in said resonant frequency of said QCM;

(3) measuring the change in resonant frequency; and

(4) correlating the change in resonant frequency obtained in step (3) with the amount of the analyte suspected of being present in the sample.

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**5,501,987**

## DUAL ANALYTE IMMUNOASSAY FOR METHAMPHETAMINE AND AMPHETAMINE

**Kathy P. Ordonez, Hoboken, and Salvatore J. Salamone, Stockton, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.**

**Continuation of Ser. No. 899,196, Jun. 16, 1992, abandoned. This application Jun. 10, 1994, Ser. No. 258,125**

**Int. Cl.[6] G01N** *33/546;33/577*

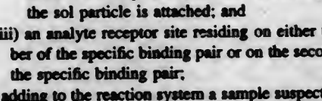
**U.S. Cl. 436—534** **5 Claims**

1. In a dual analyte immunoassay for the detection of amphetamine and methamphetamine in a sample, wherein to the sample is added an antibody selective for amphetamine and an antibody selective for methamphetamine, and whereby the presence of amphetamine and/or methamphetamine is determined by measuring the amount of a labelled reagent which remains bound or unbound to such antibodies as a result of competitive displacement by an analyte which may be present in such sample, the improvement comprising utilizing as the labelled reagent an amphetamine of the formula:

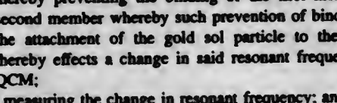


wherein L is a detectable labelling moiety, A is a linkage group capable of physically or chemically binding to L, X is H2, O, S or NH, and n=1–6;

the antibody selective for amphetamine is generated by an immunogen of the formula:



and the antibody selective for methamphetamine is generated from an immunogen of the formula:



where m and m' are ±1 or the same as n independently for the methamphetamine and amphetamine immunogens, and P is a poly (amino acid) having reactive amine groups.

**5,501,988**

## ANTI HCG-β CORE MONOCLONAL ANTIBODY, ITS PRODUCTION AND USE

**Kiyoshi Kobayashi; Makoto Katsuno, and Takahisa Kobayashi, all of Nagano, Japan, assignors to Wako Pure Chemical Industries, Ltd., Osaka, Japan**

**Continuation of Ser. No. 581,111, Sep. 12, 1990, abandoned. This application Apr. 12, 1993, Ser. No. 48,963**

**Claims priority, application Japan, Jan. 4, 1989, 1-259293**

**Int. Cl.[6] G01N** *33/53;* **C12N** *5/20;* **C07K** *16/26*

**U.S. Cl. 436—548** **15 Claims**

10. An immunological determination method, which comprises

(a) reacting a specimen solution containing an unknown amount of hCG-β core region and hCG-β subunit, a predetermined amount of a monoclonal antibody which is immobilized on a carrier, wherein the monoclonal antibody has the following properties:

(1) specifically binds to hCG-β core region in urine or serum of a human patient with a cancer selected from the group consisting of ovarian cancer, cervical cancer, corpus uteri-cancer, stomach cancer, kidney cancer and chorial diseases;

(2) specifically binds to hCG-β subunit in urine or serum of a human patient with a cancer selected from the group consisting of ovarian cancer, cervical cancer, corpus utericancer, stomach cancer, kidney cancer and chorial diseases;

(3) same degree of specific binding to hCG-β core region and hCG-β subunit;

(4) substantially less degree of specific binding to hCG than to the hCG-β core region or the hCG-β subunit; and

(5) even less degree of specific binding to hLH than to hCG, and another antibody which recognizes a different epitope of hCG-β core region and hCG-β subunit from an epitope which is recognized by the monoclonal antibody and is labeled with a labeling agent,

(b) determining the amount of the labeling agent which is either bound or not bound to the carrier, and

(c) determining the unknown amount of hCG-β core region and hCG-β subunit on the basis of the amount of the labeling agent obtained in (b).

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**5,501,989**

## METHOD OF MAKING SEMICONDUCTOR DEVICE/ CIRCUIT HAVING AT LEAST PARTIALLY CRYSTALLIZED SEMICONDUCTOR LAYER

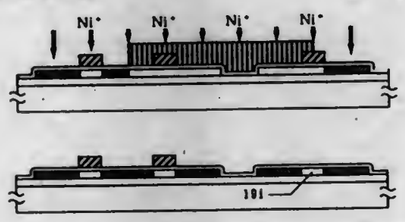
**Toru Takayama, and Yasuhiko Takemura, both of Kanagawa, Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan**

**Filed Mar. 21, 1994, Ser. No. 216,107**

**Claims priority, application Japan, Mar. 22, 1993, 5-086744; Mar. 22, 1993, 5-086745; Mar. 22, 1993, 5-086746; Mar. 22, 1993, 5-086747**

**Int. Cl.[6] H01L** *21/335;21/84*

**U.S. Cl. 437—21** **15 Claims**




10. A method of manufacturing a semiconductor circuit comprising:

a first step of forming a semiconductor film substantially in an amorphous state on a substrate,

a second step of introducing a catalyst element for promoting crystallization to said semiconductor film at a concentration of $1\times10^{17}$ to $2\times10^{20}$ atoms/cm$^3$,



a third step of forming an insulation film, a gate electrode of a thin film transistor and a mask material for a thin film diode on said semiconductor film,

a fourth step of adding a doping impurity to the semiconductor film using said gate electrode and said mask material as a mask and

a fifth step of activating the introduced impurity by applying heat annealing to said semiconductor film.

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**5,501,990**

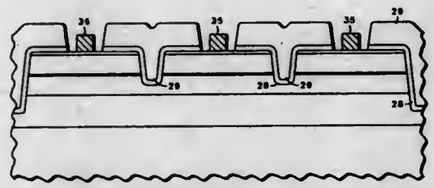
## HIGH DENSITY LED ARRAYS WITH SEMICONDUCTOR INTERCONNECTS

**Paige Holm, Phoenix, and Benjamin W. Gable, Chandler, both of Ariz., assignors to Motorola, Schaumburg, Ill.**

**Division of Ser. No. 239,672, May 9, 1994. This application Apr. 3, 1995, Ser. No. 415,796**

**Int. Cl.[6] H01L** *21/20*

**U.S. Cl. 437—23** **15 Claims**




1. A method of fabricating a high density light emitting diode array with semiconductor interconnects comprising the steps of:

providing a substrate of non-conductive material with a major surface, a conductive layer of material on the major surface of the substrate, a first carrier confinement layer on the conductive layer, an active layer on the first carrier confinement layer and a second carrier confinement layer on the active layer;

separating portions of the second carrier confinement layer, the active layer and the first carrier confinement layer into a plurality of light emitting diodes positioned in rows and columns and separating the conductive layer into a plurality of columns connecting a first contact of each light emitting diode in a column to a first contact of each other light emitting diode in the column;

forming column contacts connected to the conductive layer at an end of each column; and

forming a second contact on the cap layer of each light emitting diode and connecting second contacts for each light emitting diode in a row to the second contacts of all other light emitting diodes in the row.

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**5,501,991**

## PROCESS FOR MAKING A BIPOLAR JUNCTION TRANSISTOR WITH A SELF-ALIGNED BASE CONTACT

**Wen-Yueh Jang, Hsin-chu, Taiwan, assignor to Winbond Electronics Corporation, Hsin Chu, Taiwan**

**Filed Jul. 13, 1994, Ser. No. 274,540**

**Int. Cl.[6] H01L** *21/265*

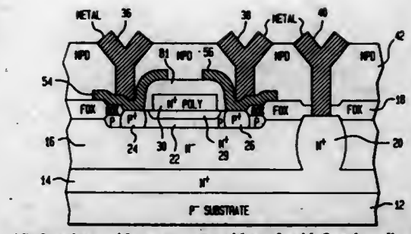
**U.S. Cl. 437—31** **1 Claim**

1. A method for forming a bipolar junction transistor comprising the sequence of steps of:

(a) forming a lightly doped base region on a substrate between field oxide regions, wherein said substrate already includes a collector region.

(b) forming a first heavily doped emitter layer on said lightly doped base region,

(c) forming a heavily doped emitter region below said first heavily doped emitter layer in said base region by thermally out-diffusing impurities from said first heavily doped emitter layer,




(d) forming oxide spacers on sides of said first heavily doped emitter layer,

(e) forming nitride spacers on said oxide spacers so that portions of said base region between said nitride spacers and said field oxide regions remain exposed,

(f) forming a base oxide layer by thermal growth over said exposed portions of said base region, said thermal growth being a final thermal cycle wherein heat is used,

(g) forming openings between said oxide spacers and said field oxide layer by removing said nitride spacers,

(h) forming heavily doped base contact regions in said openings by implanting ions into said base region below said openings, and

(i) forming an interconnect layer on said base contact regions, on said field oxide regions and on said oxide spacers.

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**5,501,992**

## METHOD OF MANUFACTURING BIPOLAR TRANSISTOR HAVING RING-SHAPED EMITTER AND BASE

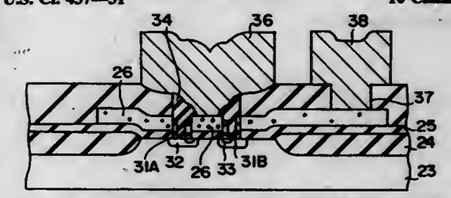
**Shunji Nakamura, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan**

**Division of Ser. No. 74,680, Jun. 10, 1993, abandoned. This application Sep. 27, 1994, Ser. No. 313,571**

**Claims priority, application Japan, Jun. 11, 1992, 4-151861**

**Int. Cl.[6] H01L** *21/265*

**U.S. Cl. 437—31** **10 Claims**




1. A method of manufacturing a bipolar transistor comprising:

a process of forming a first lamination structure composed of a first insulating layer laminated on a semiconductor layer of a first conduction type which becomes a collector region, a first conductor layer laminated on said first insulating layer and a second insulating layer laminated on said first conductor layer, a first opening formed in said first lamination structure for exposing the surface of said semiconductor layer of the first conduction type, a second lamination structure composed of a third insulating layer formed on said semiconductor layer of the first conduction type at the bottom of said first opening while being isolated from the inner wall of said first opening and a second conductor layer laminated on said third insulating layer and containing impurities of the first conduction type, and a second opening for exposing the surface of said semiconductor layer of the first conduction type between the inner periphery of said first opening and the outer periphery of said second lamination structure;

a process of forming a base region by introducing impurities of a second conduction type which is reverse to said first conduction type into said semiconductor layer of the first conduction type exposed through said second opening or forming a base region by growing an epitaxial layer of the second

conduction type on said semiconductor layer of the first conduction type exposed in said second opening;

a process of forming a side wall composed of a third conductor layer lower than at least the upper edge of said second insulating layer, the upper end portion of said third conductor layer being in contact with said first conductor layer and second conductor layer exposed on the side wall in said second opening and the lower end being in contact with said semiconductor layer of the first conduction type, along the side wall surface of said second opening;

a process of diffusing impurities of the first conduction type in said second conductor layer through said side wall being in contact with said second conductor layer so as to form a first emitter region, wherein the side wall composed of the third conductor layer in contact with said second conductor layer is useful as an emitter pull-out electrode;

a process of performing anisotropic etching after forming a fourth insulating layer on the whole surface so as to have said fourth insulating layer remain on the side wall of said first opening and forming a third opening exposing the surface of said second conductor layer at the same time, and also of covering the surface of the base pull-out electrode composed of said side wall in contact with said first conductor layer and the surface of said base region with said fourth insulating layer so as to insulate them from said second conductor layer; and

a process of forming an emitter electrode connecting electrically to said second conductor layer exposed through said third opening, a base electrode connecting electrically to said first conductor layer through a fourth opening provided in said second insulating layer and a collector electrode connecting to said semiconductor layer of the first conduction type.

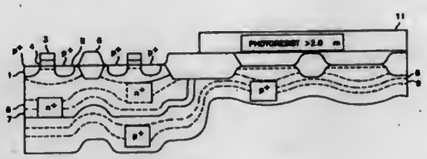
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**5,501,993**

**METHOD OF CONSTRUCTING CMOS VERTICALLY MODULATED WELLS (VMW) BY CLUSTERED MEV BILLI (BURIED IMPLANTED LAYER FOR LATERAL ISOLATION) IMPLANTATION**

**John O. Borland, South Hamilton, Mass., assignor to Genus, Inc., Sunnyvale, Calif.**

Filed Nov. 22, 1994, Ser. No. 343,116
Int. Cl.[6] H01L *21/8238*
U.S. Cl. 437—34 21 Claims



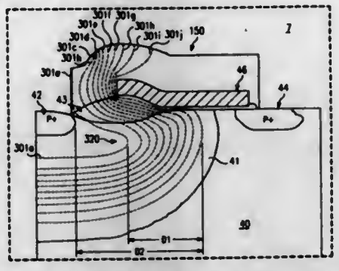
1. That method of manufacturing a semiconductor device comprising the following steps:
applying a first mask
forming isolation or active areas
removing the first mask and applying a second mask
placing the wafer in a treatment chamber
performing a clustered series of irradiation steps while the wafer remains in said treatment chamber and before said wafer is removed therefrom each of which comprises irradiating said wafer through said second mask with ions of a conductivity type and an energy, wherein the energy of the ions in any one irradiation step differs from that in the other irradiation steps, and wherein the energy of the ions in one of the irradiation steps is higher than that in the other irradiation steps.

**5,501,994**

**EXTENDED DRAIN RESURF LATERAL DMOS DEVICES**

**Chia-Cu P. Mei, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.**

Continuation of Ser. No. 224,948, Apr. 8, 1994. This application Jun. 7, 1995, Ser. No. 487,763
Int. Cl.[6] H01L *21/265*
U.S. Cl. 437—40 5 Claims



1. A method for making a high voltage transistor comprising:
forming a well in a semiconductive substrate, said well having a first impurity concentration level;
forming a drift region in said well, said drift region having a second impurity concentration level which is opposite to said first impurity concentration level, said second impurity concentration level having a value which will result in the formation of a depletion region when an operating voltage is applied which is not substantially larger than needed to withstand a breakdown voltage that said high voltage transistor is designed to withstand;
forming a drain in said drift region such that an extended drain will be formed in said drift region between said drain and said depletion region when said operating voltage is applied to said drain whereby $R_{ds(on)}$ is minimized.

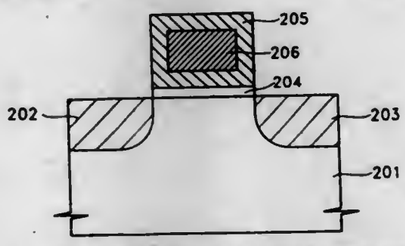
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**5,501,995**

**METHOD FOR MANUFACTURING A GATE ELECTRODE OF A MOS TRANSISTOR**

**Hyun-koock Shin, Seoul; Kyu-charn Park, Kyungki-do; Jong Moon, Kyungki-do, and Tae-earn Shim, Kyungki-do, all of, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea**

Filed Dec. 19, 1994, Ser. No. 358,904
Claims priority, application Rep. of Korea, Dec. 17, 1993, 93-28223
Int. Cl.[6] H01L *21/265*
U.S. Cl. 437—41 12 Claims



1. A method for manufacturing an electrode, comprising the steps of:
forming a first diffusion preventing layer on an underlying layer;
forming a mask pattern having an opening on said first diffusion preventing layer, said opening exposing a portion of said first diffusion preventing layer;
forming a metal layer on said exposed portion of said first diffusion preventing layer;



forming a second diffusion preventing layer on exposed portions of said metal layer and said mask pattern;
etching back said second diffusion preventing layer in such a manner as to expose a first major surface of said mask pattern, and to leave a remaining portion of said second diffusion preventing layer on said metal layer;
removing said mask pattern; and,
forming a third diffusion preventing layer on exposed portions of said remaining portion of said second diffusion preventing layer, exposed sidewalls of said metal layer, and exposed portions of said first diffusion preventing layer.

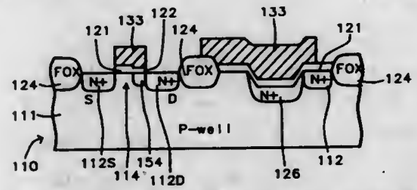
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**5,501,996**

**METHOD OF MANUFACTURE OF HIGH COUPLING RATIO SINGLE POLYSILICON FLOATING GATE EPROM OR EEPROM CELL**

**Sheng-Hsing Yang, Hsinchu, and Jyh-Kuang Lin, I-Lan, both of, Taiwan, assignors to United Microelectronics Corporation, Hsinchu, Taiwan**

Filed Dec. 14, 1994, Ser. No. 355,670
Int. Cl.[6] H01L *21/8247*
U.S. Cl. 437—43 30 Claims



1. A method of manufacturing an erasable programmable ROM device on a lightly doped semiconductor substrate having a surface, said method comprising the sequence of steps as follows:
forming a mask upon said substrate with openings therein,
forming regions of silicon dioxide in said semiconductor substrate through said openings in said mask, said regions of silicon dioxide extending down into sunken regions in said substrate,
removing said silicon dioxide from said substrate forming at least one opening in a sunken region in said substrate,
introduction of ions into said substrate below said sunken region to form a buried control gate conductor region in said substrate,
forming a gate oxide layer over said buried control gate conductor region in said substrate, and
forming a gate structure over said gate oxide layer to form said erasable programmable ROM device.

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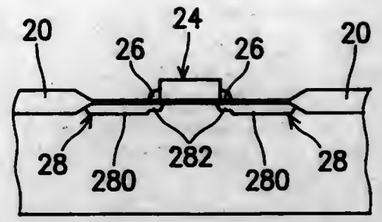
**5,501,997**

**PROCESS OF FABRICATING SEMICONDUCTOR DEVICES HAVING LIGHTLY-DOPED DRAIN**

**Jyh-Kuang Lin, I-Lan, and Tn-Chi Kuo, Hsinchu, both of, Taiwan, assignors to United Microelectronics Corp., Hsinchu City, Taiwan**

Continuation of Ser. No. 237,064, May 3, 1994, abandoned. This application Apr. 19, 1995, Ser. No. 425,695
Int. Cl.[6] H01L *21/265*
U.S. Cl. 437—43 9 Claims

1. A process for fabricating a semiconductor device having an active region and having a gate structure formed on a substrate, said gate structure having a gate thickness, said process comprising the steps of:
forming a sidewall spacer on at least one sidewall of said gate structure by depositing a single insulating layer over the substrate and the gate structure and etching back the insulating layer to form the sidewall spacer, said sidewall spacer having a sidewall spacer thickness measured in a depth direction of said substrate such that an impurity implantation applied to said sidewall spacer is only obstructed but not blocked by said sidewall spacer thickness, said sidewall spacer thickness being less than said gate thickness; and
implanting impurities to form at least one lightly-doped region underneath said sidewall spacer while at the same time forming at least one heavily-doped region in the area not obstructed by said sidewall spacer, said at least one lightly-doped region being adjacent to said at least one heavily-doped region and defining with the adjacent heavily-doped region said active region of said semiconductor device.



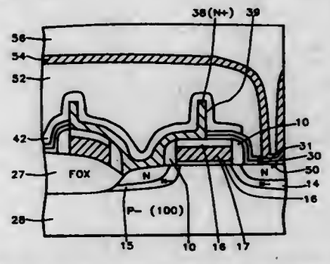
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**5,501,998**

**METHOD FOR FABRICATING DYNAMIC RANDOM ACCESS MEMORY CELLS HAVING VERTICAL SIDEWALL STACKED STORAGE CAPACITORS**

**Chung-Zen Chen, Taipei, Taiwan, assignor to Industrial Technology Research Institution, Hsinchu, Taiwan**

Filed Apr. 26, 1994, Ser. No. 233,768
Int. Cl.[6] H01L *21/70;27/00*
U.S. Cl. 437—52 25 Claims



1. A method for fabricating a capacitor on a semiconductor substrate having a device region formed therein comprising the steps of:
depositing a first insulating layer on said substrate;
depositing a second insulating layer on said first insulating layer forming a diffusion barrier and etch stop layer on said substrate; and
depositing a third insulating layer composed of borophosphosilicate glass on said second insulating layer and planarizing said third insulating layer;
forming openings through said third, second and first insulating layers to said device region in said substrate;
depositing a first polysilicon layer over said substrate and said openings to thereby form a bottom capacitor electrode and making electrical contact to the said device region therein;
depositing and planarizing a fourth insulating layer over said first polysilicon layer and planarizing said fourth insulating layer by thermal anneal; and
etching back said fourth insulating layer until said first polysilicon layer is exposed in areas external to said openings;
etching back said first polysilicon layer in areas external to said openings to complete and isolate said bottom capacitor electrodes over and aligned to said openings;

etching completely said third and fourth insulating layers to expose top and sides of said bottom capacitor electrodes and exposing said second insulation layer elsewhere outside the bottom capacitor electrode on said substrate;

forming a dielectric layer on surfaces of said isolated bottom capacitor electrodes; and

depositing a second polysilicon layer on said dielectric layer, and on said second insulating layer elsewhere on said substrate forming a top capacitor electrode.

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**5,501,999**

## PROCESS FOR FORMATION OF CAPACITOR FOR DRAM CELL

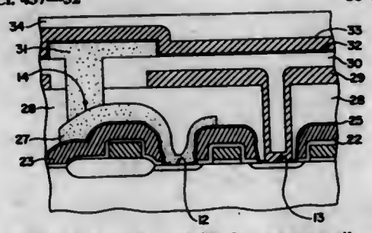
**Gum-Jin Park, Buk-ku, Rep. of Korea, assignor to LG Semicon, Co. Ltd., Cheongju, Rep. of Korea**

**Filed Apr. 12, 1995, Ser. No. 420,546**

**Claims priority, application Rep. of Korea, Apr. 12, 1994, 94-7590**

**Int. Cl.[6] H01L** *21/8242*

**U.S. Cl. 437—52** **16 Claims**




1. A process for forming a capacitor for a memory cell, comprising the steps of:

(a) forming a transistor having a gate electrode and a source and drain on a semiconductor substrate, forming a first inter-layer insulating layer on the substrate and transistor, depositing a first conductive layer on the first inter-layer insulating layer, and etching the first conductive layer and the first inter-layer insulating layer to form a lower plate electrode;

(b) forming a capacitor dielectric layer on the lower plate electrode and the substrate;

(c) etching the capacitor dielectric layer to form a contact to the source of the transistor, depositing a second conductive layer on the capacitor dielectric layer and the substrate, and patterning the second conductive layer to form a lower node electrode;

(d) forming a second inter-layer insulating layer on the lower node electrode and the dielectric layer, forming a via hole to the lower node electrode, forming a third conductive layer, and patterning the third conductive layer to form an upper node electrode; and

(e) forming a dielectric layer on the upper node electrode, forming a fourth conductive layer on the dielectric layer, and patterning the fourth conductive layer to form an upper plate electrode.

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**5,502,000**

## METHOD OF FORMING A ANTIFUSE STRUCTURE WITH INCREASED BREAKDOWN AT EDGES

**Kevin T. Look, Fremont, and Evert A. Wolsheimer, Sunnyvale, both of Calif., assignors to Xilinx, Inc., San Jose, Calif.**

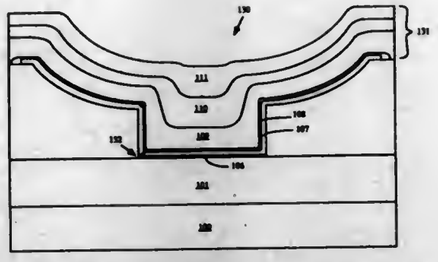
**Division of Ser. No. 132,071, Oct. 4, 1993, Pat. No. 5,475,253, which is a continuation-in-part of Ser. No. 933,428, Aug. 21, 1992, abandoned. This application May 8, 1995, Ser. No. 436,995**

**Int. Cl.[6] H01L** *21/70;27/00*

**U.S. Cl. 437—60** **24 Claims**

1. A method of forming an antifuse comprising the steps of:

(a) forming a first conductive layer on a substrate;




(b) forming a first oxide layer on said first conductive layer;

(c) forming a via in said first oxide layer which extends to said first conductive layer, wherein said via includes a lower portion forming a profile perpendicular to said first conductive layer, and an upper portion forming a concave profile;

(d) forming an antifuse layer on said first conductive layer, wherein the top surface of said antifuse layer follows the contours of said lower and upper portions of said via; and

(e) forming a second conductive layer on said antifuse layer.

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**5,502,001**

## METHOD OF FORMING LIGHT BEAM AND METHOD OF FABRICATING SEMICONDUCTOR INTEGRATED CIRCUITS

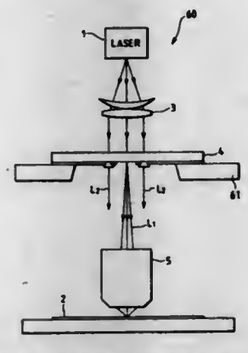
**Yoshihiko Okamoto, Ohme, Japan, assignor to Hitachi, Ltd., Tokyo, Japan**

**Continuation of Ser. No. 810,374, Dec. 19, 1991, abandoned. This application Mar. 28, 1994, Ser. No. 218,233**

**Claims priority, application Japan, Dec. 19, 1990, 2-403662; Mar. 11, 1991, 3-044712; Apr. 18, 1991, 3-086461; Apr. 18, 1991, 3-086462; Jan. 24, 1991, 3-276011**

**Int. Cl.[6] H01L** *21/26*

**U.S. Cl. 437—173** **11 Claims**




1. A method of fabricating a semiconductor integrated circuit device wherein in cutting a programming element of a redundant circuit formed on a semiconductor substrate by irradiating the programming element with a laser beam so as to remedy a defect in the semiconductor integrated circuit device, use is made of a light flux that is obtained by forming a light beam by focusing the light emitted from a source of light through an objective lens, the light emitted from said source of light being divided into two light fluxes, the phase of one of the light fluxes is inverted, and then said two light fluxes are focused through said objective lens to form a focused light beam on the programming element in which destructive interference occurs between the two light fluxes, thereby reducing a size of the focused light beam on the programming element relative to a size the focused light beam would have on the programming element if the destructive interference did not occur.



**5,502,002**

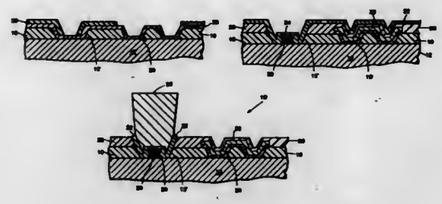
## POLYIMIDE PASSIVATION OF GAAS MICROWAVE MONOLITHIC INTEGRATED CIRCUIT FLIP-CHIP

**Wah-Sang Wong, Montebello, and William D. Gray, Redondo Beach, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.**

**Continuation of Ser. No. 886,567, May 21, 1992, abandoned. This application Oct. 4, 1994, Ser. No. 317,983**

**Int. Cl.[6] H01L** *21/283;21/56*

**U.S. Cl. 437—182** **5 Claims**



1. A process for forming three terminal, GaAs microwave monolithic integrated circuit flip chips suitable for mounting to a metallized ceramic substrate, comprising the steps of:

(a) providing said chips with completed devices thereon, including a patterned top metallization layer on a major surface of said chips;

(b) forming a first polyimide layer on said major surface and patterning said first polyimide layer to expose bump-post sites and bridge post sites on said major surface, wherein said first polyimide layer has a thickness of about 3 to 4 μm;

(c) forming a first membrane layer of gold-titanium on said first polyimide layer and in said bump-post sites and said bridge post sites, wherein in said first membrane layer of gold-titanium, gold ranges from about 1,000 to 2,000 Å in thickness and titanium ranges from about 200 to 500 Å in thickness;

(d) forming gold posts having a height of at least 75 μm and gold bridges in said bump-post sites and said bridge post sites, respectively;

(e) removing any portions of said first gold-titanium membrane not covered by said gold posts and said gold bridges;

(f) forming a second polyimide layer on said major surface and patterning said second polyimide layer to expose said gold posts, wherein said second polyimide layer has a thickness of about 4 to 6 μm;

(g) forming a second membrane layer of silver-titanium on said second polyimide layer and on said gold posts, wherein in said second membrane layer of silver-titanium, said silver ranges from about 1,000 to 2,000 Å in thickness and said titanium ranges from about 200 to 500 Å in thickness;

(h) patterning bump photoresist over said second polyimide layer to expose said gold posts;

(i) plating silver bumps on said gold posts; and

(j) removing said bump photoresist and any portions of said second silver-titanium membrane layer not covered by said silver bumps,

thereby providing final passivated flip chips wherein said first polyimide layer is formed such that it passivates said major surface, said second polyimide layer is formed such that it passivates said gold bridges, and said second membrane layer is formed such that it prevents scavenging of gold from said gold posts.

**5,502,003**

## SILICON CARBIDE ELECTRONIC DEVICE MANUFACTURING METHOD

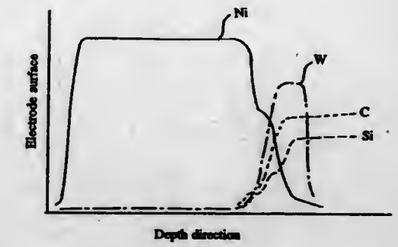
**Shinji Ogino; Tatsuo Urushidani, and Hiroshi Kanemaru, all of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Japan**

**Filed Mar. 1, 1995, Ser. No. 396,147**

**Claims priority, application Japan, Mar. 4, 1994, 6-033983**

**Int. Cl.[6] H01L** *21/28*

**U.S. Cl. 437—189** **6 Claims**




1. A method of manufacturing a silicon carbide electronic device, said method comprising:

forming a tungsten layer on top of an n-type silicon carbide substrate;

forming a conductive metal layer on the tungsten layer, wherein the conductive metal layer includes a nickel layer formed in contact with the tungsten layer; and

applying a heat treatment after the conductive metal layer has been formed on the tungsten layer.

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**5,502,004**

## METHOD FOR MANUFACTURING A SEMICONDUCTOR DEVICE WITH HEAT TREATED DIFFUSION LAYERS

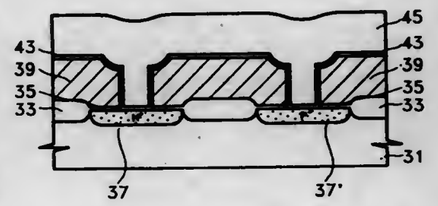
**Chang-soo Park, Suwon, Japan, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea**

**Filed Sep. 7, 1993, Ser. No. 117,580**

**Claims priority, application Rep. of Korea, Jan. 5, 1992, 92-18178**

**Int. Cl.[6] H01L** *21/44*

**U.S. Cl. 437—190** **5 Claims**




1. A method for manufacturing a semiconductor device, comprising the steps of:

forming an insulating layer on a semiconductor substrate having an impurity-doped region therein, the insulating layer having a contact hole exposing the impurity-doped region;

forming a first diffusion barrier layer on the inner surface of the contact hole and on the surface of the semiconductor substrate which is exposed by the contact hole;

after said step of forming the first diffusion barrier layer is completed, heat-treating the first diffusion barrier layer at a pressure no greater than about 4 mTorr;

forming a metal layer on the second diffusion barrier layer; and

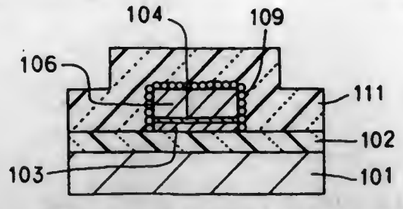
patterning the metal layer and the first and second diffusion barrier layers, thereby providing a metal wiring layer.

**5,502,005**

## PRODUCTION METHOD OF SEMICONDUCTOR DEVICE HAVING A WIRING LAYER CONTAINING GOLD

**Kaoru Mikagi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Nov. 29, 1993, Ser. No. 160,351**
**Claims priority, application Japan, Nov. 27, 1992, 4-341419**
**Int. Cl.[6] H01L *21/44***
**U.S. Cl. 437—195** **19 Claims**




1. A production method of a semiconductor device, comprising:
a first step of forming a first insulator film on a semiconductor substrate;
a second step of forming a patterned wiring film containing gold on said first insulator film;
a third step of contacting said wiring film and an uncovered area of said first insulator film with a halogenide gas of a metal so that said halogenide gas is absorbed onto said patterned wiring film without using a reduction gas for said halogenide, thereby forming a metal layer from said absorbed halogenide, said metal layer covering top and side surfaces of said patterned wiring film; and
a fourth step of forming a second insulator film on said metal layer to cover its surface.

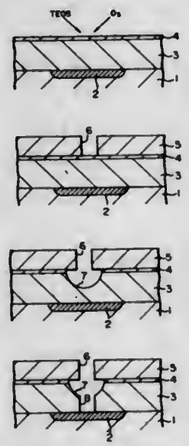
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**5,502,006**

## METHOD FOR FORMING ELECTRICAL CONTACTS IN A SEMICONDUCTOR DEVICE

**Yasuo Kasagi, Tokyo, Japan, assignor to Nippon Steel Corporation, Tokyo, Japan**

**Filed Nov. 2, 1994, Ser. No. 334,334**
**Claims priority, application Japan, Nov. 2, 1993, 5-297259**
**Int. Cl.[6] H01L *21/44***
**U.S. Cl. 437—195** **5 Claims**




3. A method of making a semiconductor device, comprising the steps of:
providing a first insulating film in which a contact hole is formed;
forming a second insulating film on the first insulating film, the second insulating film having a hydrophobic surface;
forming and patterning a photoresist film on the second insulating film, the photoresist film having an opening directly above the contact hole to be formed;
performing wet etching on at least a part of the second insulating film with the photoresist film used as a mask; and
performing anisotropic etching on the first insulating film with the photoresist film used as a mask, wherein:
the second insulating film is made from a mixed gas of tetraethyl orthosilicate TEOS and ozone $O_3$ in a low pressure CVD process; and
a ratio of the flow of TEOS to the flow of $O_3$ is adjusted in a range of between 1:1 and 1:10 when the second insulating film is formed.

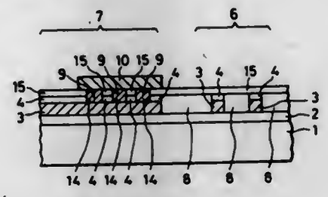
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**5,502,007**

## METHOD OF FORMING FLAT SURFACE OF INSULATOR FILM OF SEMICONDUCTOR DEVICE

**Hiroshi Murase, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Jul. 28, 1994, Ser. No. 283,295**
**Claims priority, application Japan, Jul. 29, 1993, 5-207218**
**Int. Cl.[6] H01L *21/302;21/463***
**U.S. Cl. 437—225** **8 Claims**




1. A method of forming a flat surface of an insulator film of a semiconductor device, comprising the steps of:
forming a first wiring film on a semiconductor substrate;
forming a first insulator film on said first wiring film;
forming a patterned resist film on said first insulator film;
patterning said first insulator film to a pattern using said patterned resist film as a mask;
patterning said first wiring film using said patterned first insulator film as a mask;
removing said patterned resist film to produce said patterned first wiring film formed on said substrate and said patterned first insulator film formed over said patterned first wiring film, said patterned first wiring film and said patterned first insulator film having spaces formed therein;
forming a second insulator film on said patterned first insulator film to fill said spaces with said second insulator film, said first insulator film being relatively lower in polishing rate than said second insulator film, said second insulator film having a surface being uneven due to said patterned first wiring film and said patterned first insulator film; and
polishing said uneven surface of said second insulator film under pressure until said first insulator film is exposed to flatten said uneven surface of said second insulator film, said spaces remaining filled with said second insulator film;
wherein said patterned first wiring film has a first wiring region and a second wiring region, said first wiring region being relatively lower in polishing rate than said second wiring region; and
wherein said patterned first insulator film acts as a polishing stopper in said second wiring region to compensate for a difference in polishing rate between said first wiring region and said second wiring region during polishing.

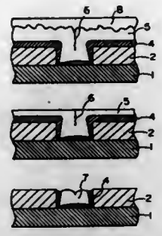


**5,502,008**

## METHOD FOR FORMING METAL PLUG AND/OR WIRING METAL LAYER

**Hideaki Hayakawa; Tetsuo Gocho, both of Kanagawa, and Junichi Sato, Tokyo, all of, Japan, assignors to Sony Corporation, Tokyo, Japan**

**Continuation of Ser. No. 120,636, Sep. 13, 1993, abandoned, which is a continuation of Ser. No. 889,851, May 28, 1992, abandoned. This application Nov. 21, 1994, Ser. No. 347,192**
**Claims priority, application Japan, May 29, 1991, 3-153958**
**Int. Cl.[6] H01L *21/465***
**U.S. Cl. 437—225** **2 Claims**



1. A method of forming a metal plug in a contact hole provided in an insulation layer on a substrate, comprising the steps of:
forming a non-flat metal layer in the contact hole to fill the contact hole and extend above the contact hole and laterally above a surface of the insulation layer,
polishing a surface of the metal layer to planarize the metal layer surface;
etching back the planarized metal layer to expose a surface of the insulation layer; and
forming a coating film on the metal layer prior to the polishing step, wherein the polishing step is performed by polishing the coating film and the metal layer surface.

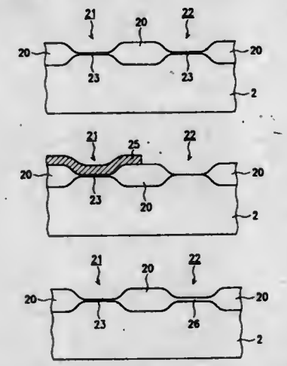
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**5,502,009**

## METHOD FOR FABRICATING GATE OXIDE LAYERS OF DIFFERENT THICKNESSES

**Jengping Lin, Taoyuan Hsien, Taiwan, assignor to United Microelectronics Corp., Hsinchu, Taiwan**

**Filed Feb. 16, 1995, Ser. No. 389,247**
**Int. Cl.[6] H01L *21/02***
**U.S. Cl. 437—239** **15 Claims**




1. A method for fabricating gate oxide layers of different thicknesses on a silicon substrate comprising the steps of:
(a) forming a field oxide layer on said substrate to define a plurality of first active regions and second active regions therebetween;
(b) forming a first gate oxide layer over said plurality of first active regions and said second active regions;
(c) forming a silicon nitride layer onto an overall surface;
(d) patterning and etching said silicon nitride layer to remove a portion of said silicon nitride layer within said second active regions;
(e) removing a portion of said first gate oxide layer within said second active regions; and
(f) forming a second gate oxide layer over said second active regions.

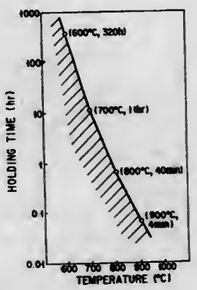
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**5,502,010**

## METHOD FOR HEAT TREATING A SEMICONDUCTOR SUBSTRATE TO REDUCE DEFECTS

**Souichi Nadahara, Poughkeepsie, N.Y.; Kikuo Yamabe; Hideyuki Kobayashi, both of Yokohama, Japan; Kunihiro Terasaka, Tokyo, Japan; Akihito Yamamoto, Kanagawa, Japan, and Naohiko Yasuhisa, Ooita, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Jul. 15, 1993, Ser. No. 91,266**
**Claims priority, application Japan, Jul. 17, 1992, 4-191118; Dec. 28, 1992, 4-349538**
**Int. Cl.[6] H01L *21/324;21/477***
**U.S. Cl. 437—247** **5 Claims**



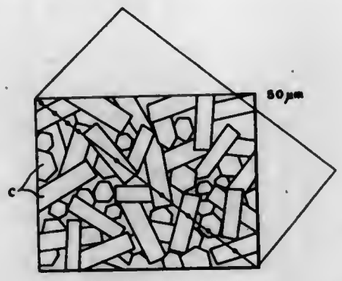

1. A method of processing a semiconductor substrate comprising the steps of:
heating said semiconductor substrate for a time and a temperature defined by a line connecting for points in a graph, in which the heat treating temperature is plotted in the abscissa and heat treating time is plotted on the ordinate of the graph, or for a shorter time, or at a lower temperature, wherein said four points are:
900° C., 4 minutes,
800° C., 40 minutes,
700° C., 11 hours, and
600° C., 320 hours; and then
heating said semiconductor substrate at a temperature of not less than 1100° C. under a non-oxidizing atmosphere with a surface of said semiconductor substrate substantially exposed,
wherein after said processing said semiconductor substrate has a BMD density of less than $10^9$ BMDs/cm$^3$ in a surface region having a depth not larger than 20 μm as measured from the surface.

5,502,011

## SILICON NITRIDE SINTERED BODY

Takehisa Yamamoto; Takao Nishioka; Kenji Matsunuma, and Akira Yamakawa, all of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Japan

Continuation of Ser. No. 969,238, Jan. 13, 1993, abandoned. This application Sep. 9, 1994, Ser. No. 303,591
Claims priority, application Japan, Jan. 21, 1991, 3-272635
Int. Cl.[6] C04B 35/587;35/599
U.S. Cl. 501—97 2 Claims




1. A silicon nitride sintered body consisting essentially of a sintering aid and crystal grains having a linear density of 60 to 120 per 50 μm length, as measured in an arbitrary two-dimensional section of the sintered body, said crystal grains consisting essentially of α-silicon nitride and β'-sialon represented by the formula $Si_{6-Z}Al_ZO_ZN_{8-Z}$, wherein $0<Z<1.0$, said α-silicon nitride being present in an amount not exceeding 30% and an amount of β'-sialon being 70% to less than 100%, in terms of peak intensity ratio, as determined by X-ray diffractometry.

5,502,012

## FUSED CERAMIC BEADS

Christophe Bert, Caumont Sur Durance, and Daniel Urffer, Morieres-Les-Avignon, both of, France, assignors to Societe Europeenne Des Produits Refractaires, Courbevoie, France

Filed Jan. 9, 1995, Ser. No. 370,258
Claims priority, application France, Jan. 11, 1994, 94 00209
Int. Cl.[6] C04B 35/48
U.S. Cl. 501—103 24 Claims

1. Fused ceramic beads comprising intermixed zirconia crystals bonded with a glassy silicate phase, and having the following chemical composition in % by weight on the basis of the oxides:
40 to 95% $ZrO_2$ and $HfO_2$;
0.1 to 10% $Y_2O_3$; and
10 to 45% $SiO_2$.

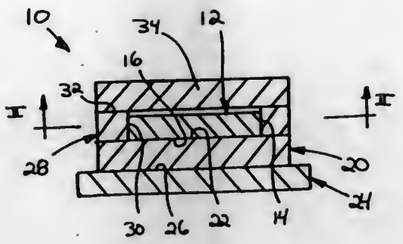
5,502,013

## METHOD FOR MAKING A SMOOTH-SURFACE CERAMIC

Gilbert James, P.O. Box 1546, Wakefield, Mass. 01880

Continuation of Ser. No. 696,570, May 8, 1991, Pat. No. 5,316,989. This application May 27, 1994, Ser. No. 250,562
Int. Cl.[6] C04B 35/08;35/10
U.S. Cl. 501—153 1 Claim

1. A thin, flat poured or slip-cast as fired substrate comprising at least 99% of densely packed inorganic grains of ceramic forming powder of alumina or berrylia and the balance comprising equal amounts of ball clay and talc, the ceramic being characterized by zero water absorption and CLA surface smoothness of less than 1 microinch on at least one major surface of the ceramic, and a flatness of less than 0.00 inch per inch camber.

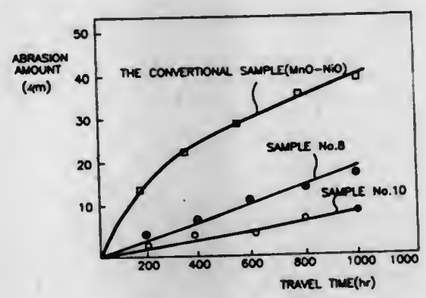



5,502,014

## NON-MAGNETIC CERAMIC SUBSTRATE MATERIAL

Won H. Lee, Seongnam-si, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Nov. 22, 1994, Ser. No. 343,774
Claims priority, application Rep. of Korea, Dec. 3, 1993, 26355/1993
Int. Cl.[6] C04B 35/46
U.S. Cl. 501—135 2 Claims




1. Non-magnetic ceramic substrate material for magnetic head comprising a basic composition of 10–35 mol % of CaO, 10–40 mol % of $TiO_2$, 10–60 mol % of NiO and 10–50 mol % of CoO, wherein 0.1–5.0 wt % of at least two compounds selected from the group consisting of $ZrO_2$, $Al_2O_3$, $SiO_2$, $Cr_2O_3$, and $V_2O_5$ are added to the basic composition.

5,502,015

## INFRARED TRANSMITTING BARIUM FLUORIDE SINTERED BODY

Kenichiro Shibata; Akihito Fujii, and Toshihiro Sakamoto, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 84,616, Jul. 1, 1993, abandoned. This application Feb. 16, 1995, Ser. No. 389,420
Claims priority, application Japan, Jul. 1, 1992, 4-197835
Int. Cl.[6] C04B 35/553
U.S. Cl. 501—151 1 Claim

1. An infrared transmitting polycrystalline powdered barium fluoride sintered body with does not contain an additive component, said sintered body having an average crystal grain size of not more than 100 μm and which gives 55–93% in-line transmissions to the infrared region of 8–11 μm wave lengths in the form of a 3 mm test piece, said transmitting barium fluoride sintered body having a bending strength, according to JIS R-1061, of not less than 30 MPa.



5,502,016

## METHOD TO TREAT AN ION-EXCHANGER CATALYST FOR THE PROCESS OF BISPHENOL-A SYNTHESIS

Maciej Kiedik; Andrzej Krueger; Józef Kojt; Antoni Korek; Wojciech Balcerowiak; Jacek Hetper; Maria Majchrzak, all of Kędzierzyn-Kozle; Jan Niedzicia, Kobylice; Ryszard Kościuk, Kędzierzyn-Kozle; Anna Rzodeczko, Kędzierzyn-Kozle; Jerzy Mróz, Kędzierzyn-Kozle, and Zbigniew Swiderski, Kędzierzyn-Kozle, all of, Poland, assignors to Instytut Ciezkiej Syntezy Organicznej Blachownia, and Zaklady Chemiczne Blachownia, both of Kedzierzyn-Kozle, Poland

Filed May 23, 1994, Ser. No. 248,317
Claims priority, application Poland, Jun. 22, 1993, 299459
Int. Cl.[6] B01S 37/30
U.S. Cl. 502—11 1 Claim

1. A method for the treatment of an ion exchange catalyst for the process of bisphenol-A synthesis, wherein the catalyst forms an acid ion exchange bed of a sulphonated styrene-divinylbenzene copolymer containing 2–50% divinylbenzene, in hydrogen form, and having a moisture content of up to 85% by weight, comprising the steps or sequence of:
(1) passing phenol containing 0.01–2% by weight water through the cation exchange bed at a temperature in the range 50°–90° C. to provide a resultant first effluent containing 40–99.5% by weight phenol and 0.5–60% by weight water,
(2) running said resultant first effluent through a basic anion exchange resin to obtain a resultant second effluent,
(3) removing water from the second effluent by distillation to obtain a dewatered phenol,
(4) recycling said dewatered phenol through the cation exchange bed and its resultant first effluent throughout anion exchange resin until the water content of said cation exchanger is at or below 15%,
(5) washing the catalyst bed at a temperature of 60°– 100° C. with a mixture consisting of 35–80% by weight phenol, 0.5–5% by weight of acetone, 5–30% by weight of bisphenol-A, 0.5–30% by weight of the phenol-acetone condensation reaction by-products and 0.1–3% by weight of water,
(6) contacting the effluent with the basic ion exchange resin,
(7) recycling said contacted effluent through said cation exchange bed and basic ion exchange resin until the cation exchanger has a moisture content of not more than 5% by weight.

5,502,017

## METALLOCENE CATALYST CONTAINING BULKY ORGANIC GROUP

Tobin J. Marks, Evanston; Li Ja, Chicago, and Xinmin Yang, Evanston, all of Ill., assignors to Northwestern University, Evanston, Ill.

Filed Mar. 10, 1994, Ser. No. 209,669
Int. Cl.[6] B01J 31/14
U.S. Cl. 502—103 9 Claims

1. An ionic metallocene catalyst for olefin polymerization which comprises: (1) a cyclopentadienyl ligand, a Group IVB transition metal, and alkyl, aryl, or hydride substituents, as a cation, and (2) a weakly coordinating anion comprising boron substituted with four halogenated aryl substituents each containing a bulky organic substituent to improve the solubility and thermal stability of the catalyst as compared to a catalyst containing tetrakis (pentafluorophenyl) boron as the anion.

5,502,018

## NICKEL-CONTAINING COMPOSITION FOR CATALYSIS AND OLEFIN DIMERISATION AND OLIGOMERISATION PROCESS

Yves Chauvin, Rueil Malmaison, France; Sandra Einloft, Rio Grande Do Sul, Brazil, and Helene Olivier, Rueil Malmaison, France, assignors to Institut Francais du Petrole, Rueil Malmaison, France

Filed Sep. 21, 1994, Ser. No. 309,703
Claims priority, application France, Sep. 22, 1993, 93 11382
Int. Cl.[6] B01J 27/185
U.S. Cl. 502—213 17 Claims

1. A catalytic composition comprising a mixture of at least one alkylaluminum halide, at least one bivalent nickel complex which contains two molecules of tertiary phosphine and at least one bivalent nickel compound or complex compound containing neither water nor phosphine.

5,502,019

## CONVERSION OF CARBON MONOXIDE USING COBALT-BASED METAL OXIDE CATALYSTS

Robert L. Augustine, Livingston, N.J.; Jay A. Fournier, Richmond, Va.; John B. Paine, III, Midlothian, Va.; Kenneth H. Shafer, Midlothian, Va., and Setrak K. Tanielyan, South Orange, N.J., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Jul. 15, 1994, Ser. No. 275,245
Int. Cl.[6] B01J 23/72;23/80
U.S. Cl. 502—314 44 Claims

1. A mixed-metal oxide catalyst composition comprising an amorphous intimate mixture of an oxide of cobalt in a principal amount and lesser amounts of one or more oxides of metals selected from the group consisting of manganese, aluminum, bismuth, cerium, chromium, copper, iron, lanthanum, magnesium, titanium, zinc, and zirconium, the amorphous intimate mixture catalyst composition being obtained by calcining in an oxygen-containing atmosphere at a temperature of about 150° C. to about 290° C.

5,502,020

## CATALYST FOR PRODUCTION OF ETHYLENE OXIDE AND PROCESS FOR PRODUCING THE CATALYST

Tomoatsu Iwakura, and Yukako Kawakatsu, both of Ibaraki, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Apr. 4, 1994, Ser. No. 222,592
Claims priority, application Japan, Apr. 14, 1993, 5-087580
Int. Cl.[6] B01J 23/04;23/30
U.S. Cl. 502—317 20 Claims

1. A catalyst for the production of ethylene oxide from ethylene, said catalyst comprising a porous carrier and at least silver, tungsten and cesium deposited on said carrier, wherein:
(A) loadings of silver, tungsten and cesium are from 5 to 50% by weight, from 5 to 700 ppm, and from 250 to 2000 ppm, respectively;
(B) the silver is deposited on the outside surface or said carrier and on the inner surfaces of the pores of said carrier;
(C) silver grains deposited on said carrier have an average diameter in the range of from 0.01 to 0.4 micron;
(D) the loading ($S_A$) of silver on the outside surface layer of said catalyst and the loading ($I_A$) of silver on the innermost layer of said catalyst satisfy the following formula;

$$I_A \geq 0.65 S_A$$

(E) the tungsten is deposited on the outside surface of said carrier and on the inner surfaces of the pores of said carrier, and the loading ($S_W$) of tungsten on the outside surface layer of said catalyst and the loading ($I_W$) of tungsten on the innermost layer of said catalyst satisfy the following formula;

$I_W \geq 0.5S_W$

and

(F) the cesium is deposited on the outside surface of said carrier and on the inner surfaces of the pores of said carrier, and the loading ($S_C$) of cesium on the outside surface layer of said catalyst and the loading ($I_C$) of tungsten on the innermost layer of said catalyst satisfy the following formula:

$I_C \geq 0.7S_C$

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**5,502,021**

**HIGHLY REACTIVE REAGENTS AND COMPOSITIONS FOR PURIFYING EXHAUST GASES AND WASTEWATER, PRODUCTION AND USE THEREOF**

**Georg Schuster, Tegernheim, Germany, assignor to Walhalla-Kalk Entwicklungs-Und Vertriebegesellschaft, Regensburg, Germany**

**Continuation of Ser. No. 146,436, Oct. 29, 1993, which is a continuation of Ser. No. 784,238, Oct. 29, 1991. This application Jun. 7, 1995, Ser. No. 480,029**

**Claims priority, application Germany, Jan. 29, 1990, 40 34 417.7**

**Int. Cl.[6] B01J** *20/00*

**U.S. Cl. 502—400** **17 Claims**

1. Highly reactive reagents for purifying exhaust gases and flue gases, especially from combustion processes, and wastewater with the same or similar pollutants as in the exhaust gases based on mixtures of calcium hydroxide with additives, characterized by:

a mixture of

(a) dry slaked lime with porous ground clay as additive; or

(b) dry foamed slaked lime with ground clay as additive;

wherein the mixture contains about 60 to 99 wt. percent of slaked lime, based on dry weight.

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**5,502,022**

**CHROMATOGRAPHY ADSORBENTS UTILIZING MERCAPTO HETEROCYCLIC LIGANDS**

**Alexander Schwarz, Brookline, Mass., and Meir Wilchek, Rehovot, Israel, assignors to BioSepra, Inc., Marlborough, Mass.**

**Filed May 16, 1994, Ser. No. 243,861**

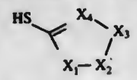
**Int. Cl.[6] B01J** *20/22*

**U.S. Cl. 502—401** **26 Claims**

1. A pseudobioaffinity chromatography adsorbent for use in selectively adsorbing immunoglobulins, said pseudobioaffinity chromatography adsorbent comprising:

(a) a solid support material; and

(b) a ligand immobilized on the surface of the solid support material, said ligand being a compound of the formula




wherein each of $X_1$, $X_2$ and $X_3$ is selected from the group consisting of S, $SCH_3^+$, O, NH, $NCH_3$, $CH_2$ and $CR_1R_2$ wherein at least one of $R_1$ and $R_2$ is not hydrogen; wherein $X_4$ is selected from the group consisting of N, $NCH_3^+$, CH and CR wherein R is not hydrogen; and wherein at least two of $X_1$, $X_2$, $X_3$ and $X_4$ are neither $CH_2$, CH, CR nor $CR_1R_2$.

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**5,502,023**

**APPARATUS FOR CATALYTICALLY DECONTAMINATING EXHAUST GASES AND METHOD FOR PRODUCING THE APPARATUS**

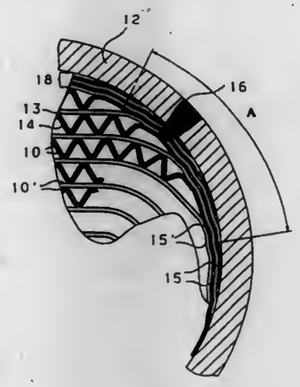
**Bohumil Humpolik, Ludwigsburg, and Jürgen Bayer, Esslingen, both of, Germany, assignors to Emitec Gesellschaft fuer Emissionstechnologie mbH, Lohmar, Germany**

**Division of Ser. No. 138,342, Oct. 18, 1993, Pat. No. 5,366,700. This application Nov. 14, 1994, Ser. No. 338,963**

**Claims priority, application Germany, Apr. 16, 1991, 41 12 354.9**

**Int. Cl.[6] B23K** *31/02*

**U.S. Cl. 29—890** **9 Claims**




1. A method for producing an apparatus for catalytically decontaminating exhaust gases, which comprises:

a) providing individual at least partly corrugated sheet metal layers of a metal carrier body coated with a wash coat and having end segments;

b) intertwining the sheet metal layers, overlapping end segments of the sheet metal layers, and inserting the intertwined sheet metal layers into a jacket encompassing the metal carrier body; and

c) simultaneously connecting the overlapping end segments of the sheet metal layers to the jacket in uncoated regions of the end segments with a joining technique.

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**5,502,024**

**HEAT TRANSFER IMAGE-RECEIVING SHEET**

**Ryohei Takiguchi; Hitoshi Saito; Masanori Torii; Jun Hasegawa; Hideo Fujimura, and Yoshinori Nakamura, all of Tokyo, Japan, assignors to Dai Nippon Printing Co., Ltd., Japan**

**Division of Ser. No. 855,965, Mar. 23, 1992, Pat. No. 5,312,797. This application Feb. 25, 1994, Ser. No. 202,091**

**Claims priority, application Japan, Mar. 28, 1991, 3-87421; Mar. 28, 1991, 3-87422; Nov. 8, 1991, 3-319665**

**Int. Cl.[6] B41M** *5/035;5/38*

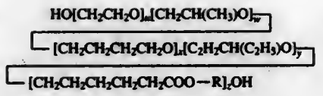
**U.S. Cl. 503—227** **1 Claim**

1. A heat transfer image-receiving sheet comprising:

a substrate sheet; and

a dye-receiving layer provided on at least one surface of the substrate sheet, said dye-receiving layer comprising a urethane-modified polyester resin obtained by adding to a polyester resin a diol component and polyisocyanate, said diol component comprising a compound having the following formula and having a molecular weight of 200 to 1,000:






wherein

u, w, x, y and z respectively represent an integer of 0 to 10, provided that at least one of u, w, x, y and z is not 0, and R is an alkylene group, a phenylene group or an alkylene oxide group.

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**5,502,025**

**SAFENING HERBICIDAL PYRAZOLYLSULFONYLUREAS**

**Brett H. Bussler, St. Louis Park, Minn., assignor to Monsanto Company, St. Louis, Mo.**

**Continuation of Ser. No. 926,510, Aug. 14, 1992, abandoned, which is a continuation-in-part of Ser. No. 748,582, Aug. 22, 1991, abandoned, which is a continuation-in-part of Ser. No. 459,228, Dec. 29, 1989, Pat. No. 5,256,630, which is a continuation-in-part of Ser. No. 212,621, Jul. 1, 1988, Pat. No. 5,225,570, which is a continuation-in-part of Ser. No. 84,786, Aug. 13, 1987, abandoned. This application Apr. 25, 1995, Ser. No. 427,762**

**Int. Cl.[6] A01N** *25/32*

**U.S. Cl. 504—107** **8 Claims**

1. Composition comprising a herbicidally-effective amount of NC-319 and an antidotally-effective amount of oxazolidine, 3-(dichloroacetyl)-2,2-dimethyl-5-(2-furanyl).

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**5,502,026**

**HERBICIDAL MIXTURES COMPRISING BROMOXYNIL AND A SUBSTITUTED 3-PHENYLPYRAZOLE**

**Alan Gamblin, Ongar Essex, England, and Jacques Rognon, Lyons, France, assignors to Rhone-Poulenc Agrochimie, Lyon Cedex, France**

**Filed May 19, 1994, Ser. No. 246,287**

**Claims priority, application France, May 19, 1993, 93 06271**

**Int. Cl.[6] A01N** *43/56;37/34*

**U.S. Cl. 504—139** **21 Claims**

1. A herbicidal mixture comprising a synergistic herbicidally effective amount of 1-methyl-3-[2-fluoro-4-chloro-5-(ethoxycarbonylmethoxy)phenyl] -4-chloro-5 -difluoromethoxypyrazole (I) and bromoxynil (II).

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**5,502,027**

**HERBICIDAL GLUTARIMIDES**

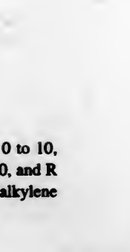
**Barry C. Lange; John W. Ashmore; Jane Wissinger-Cornille, all of Lansdale, and Colin M. Tice, Elkins Park, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.**

**Division of Ser. No. 129,483, Sep. 30, 1993, Pat. No. 5,393,735, which is a continuation of Ser. No. 563,780, Aug. 9, 1990, abandoned, which is a continuation-in-part of Ser. No. 401,329, Aug. 31, 1989, abandoned. This application Oct. 14, 1994, Ser. No. 323,292**

**Int. Cl.[6] A01N** *43/72;* **C07D** *265/36*

**U.S. Cl. 504—225** **20 Claims**

1. A herbicidal compound of the formula




I

wherein

A is carbonyl, thiocarbonyl or methylene;

$A^1$ is carbonyl or methylene;

Q is $(CH_2)_n$, where n is 0 or 1, or oxygen;

R is $(C_1$–$C_4)$alkyl, $(C_1$–$C_4)$haloalkyl containing from one to nine halo atoms, or phenyl;

$R^1$is hydrogen or $(C_1$–$C_2)$alkyl;

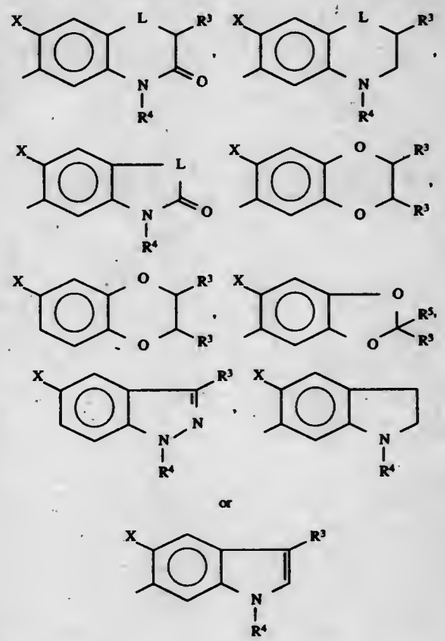
$R^2$ is hydrogen; or

R, $R^1$ and $R^2$ taken together form a fused phenyl ring;

X is hydrogen, cyano or halogen;

T is hydrogen or fluorine; and

Z and Y together form a 6-membered heterocyclic ring fused to the phenyl ring structure to form a bicyclic moiety having the structure




wherein

L is oxygen

$R^3$ is hydrogen or alkyl;

$R^4$ is hydrogen; alkyl; alkenyl; alkynyl; alkoxyalkyl; alkenyloxyalkyl; alkynyloxyalkyl; alkoxycarbonylalkyl; cycloalkyl; cycloalkylalkyl; alkylaminoalkyl; alkylaminocarbonylalkyl; heterocyclyl or heterocyclyl$(C_1$–$C_6)$alkyl wherein the heterocyclyl group is a three to six membered heterocyclic ring containing one, two or three hetero atoms selected from the group consisting of oxygen, nitrogen and sulfur: alkoxycarbo-

nylalkyl, phenylalkyl; alkylthioalkyl; alkenylthioalkyl; alkynylthioalkyl; alkoxycarbonyl; or alkanoyl;
and the agronomically acceptable salts thereof.

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**5,502,028**

## HERBICIDAL PYRIMIDINYL OR TRIAZINYL HALOACETIC ACID DERIVATIVES

**Christoph Harde; Gerhard Johann; Gabriele Krüger; Richard Rees; Gerhard Tarara, all of Berlin, Germany, and Peter S. Gates, Cambridge, England, assignors to Schering Agrochemicals Limited, England**

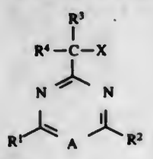
**Continuation of Ser. No. 119,048, Sep. 10, 1993. This application Dec. 16, 1994, Ser. No. 357,526**

**Claims priority, application United Kingdom, Mar. 13, 1991, 9105297**

**Int. Cl.[6] A01N** *43/54;43/66;* **C07D** *239/52;251/20*

**U.S. Cl. 504—227** **25 Claims**

1. The haloacetic acid derivatives of the formula:



(I)

and salts thereof, where:
A is —N═ or —CH═;
X is halo;
$R^1$ and $R^2$, which may be the same or different, each represent alkyl, alkoxy, haloalkyl, haloalkoxy, halo, alkylamino or dialkylamino;
$R^3$ is —CN, —$COOR^5$, —$CONR^6R^7$, —$CSNH_2$, —CHO, —CH═Z, —CH(OAlkyl)$_2$, —$CH_2OH$, —$CH_2OR^9$, or a substituted or unsubstituted 5- or 6-membered heterocyclic group linked via a ring carbon atom which is between two ring heteroatoms;
$R^4$ is H, or a substituted or unsubstituted alkyl, alkenyl, alkynyl, cycloalkyl, aryl or aralkyl group;
$R^5$ is H, —N═$CR^{6a}R^{6b}$, or a substituted or unsubstituted alkyl, alkenyl, alkynyl, cycloalkyl or aralkyl group;
$R^6$ is H, or a substituted or unsubstituted alkyl, alkenyl, alkynyl, cycloalkyl, aryl, aralkyl or heteroaryl group;
$R^7$ is a group as defined for $R^6$ or is —SO $R_2R^8$, —OH, —CN, —$OR^{10}$, —$NH_2$, or —$NHR^{10}$; or $R^6$ and $R^7$ together form a ring;
$R^8$ is —$NR^{6a}R^{6b}$ or a substituted or unsubstituted alkyl, alkenyl, alkynyl, cycloalkyl, aralkyl, aryl or heteroaryl group;
$R^9$ is a substituted or unsubstituted alkyl, alkenyl, alkynyl, cycloalkyl, aralkyl or acyl group;
$R^{10}$ is a group as defined for $R^9$ or is a substituted or unsubstituted aryl or heteroaryl group;
Z is ═N—$NR^6R^{12}$ or ═$NOR^6$;
$R^{12}$ is a group as defined for $R^6$, or is a substituted or unsubstituted acyl group; and
$R^{6a}$ and $R^{6b}$, which may be the same or different, are each a group as defined for $R^6$;
with the proviso that, when $R^4$ is ortho-substituted phenyl or naphthyl, any ortho-substituent thereon is halogen, —$NO_2$, —OH, —$OR^{10}$, —SH, —$SR^8$, —$SOR^8$, —$SO_2R^8$, —$NH_2$, —$NR^6R^{10}$, aryl or heteroaryl.

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**5,502,029**

## LAMINATED SUPER CONDUCTOR OXIDE WITH STRONTIUM, CALCIUM, COPPER AND AT LEAST ONE OF THALLIUM, LEAD, AND BISMUTH

**Toshiya Doi, Hitachi; Atsuko Soeta, Mito; Seizi Takeuchi, Hitachiota; Tomoichi Kamo, Ibaraki, and Shinpei Matsuda, Tokyo, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Jan. 26, 1994, Ser. No. 186,545**

**Claims priority, application Japan, Jan. 27, 1993, 5-011730**

**Int. Cl.[6] H01B** *12/02;* **H01L** *39/12;* **C04B** *35/453;* **C01F** *11/04*

**U.S. Cl. 505—234** **7 Claims**

1. A superconductor comprising a laminated structure with alternating layers of first and second superconducting materials, said layers having thicknesses of no less than 5 nm and no more than 5 μm, said first superconducting material having the chemical composition:

$$(Tl_{1-z1-z2}Pb_{z1}Bi_{z2})X(Sr_{1-z3}Ba_{z3})_2Ca_{n-1}Cu_nO_{2n+3+z4}$$

where
n=2, 3, 4, 5, or 6,
$0 \leq X1 \leq 0.8$
$0 \leq X2 \leq 0.5$
$0 \leq X1+X2 \leq 1$,
$0 \leq X3 \leq 1$,
$-0.5 \leq X4 \leq 0.5$,
and the second superconducting material having the chemical composition:

$$(Bi_{1-z5}Pb_{z5})_2(Sr_{1-z6}Ba_{z6})_2Ca_{n-1}Cu_nO_{2n+4+z7}$$

where
n=1, 2, or 3,
$0 \leq X5 \leq 0.8$
$0 \leq X6 \leq 0.2$
$-0.5 \leq X7 \leq 0.5$.

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**5,502,030**

## LIQUID ADDITIVE COMPRISING A SULFONATED ASPHALT AND PROCESSES THEREFOR AND THEREWITH

**Bharat B. Patel, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed Oct. 18, 1993, Ser. No. 137,533**

**Int. Cl.[6] C09K** *7/02*

**U.S. Cl. 507—126** **50 Claims**

27. A process for contacting a subterranean formation with a well fluid in an oil field operation wherein said well fluid comprises a clay and a composition which comprises water, a viscosifier, a polypropylene glycol polymer, and at least one sulfonated asphalt.

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**5,502,031**

## METHYL SUBSTITUTED PROPYL-SUBSTITUTED PENTAMETHYL INDANE DERIVATIVES PROCESSES FOR PRODUCING SAME AND PERFUMERY USES THEREOF

**Mark A. Sprecker, Sea Bright, and Olivier J. Gillotin, Denville, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.**

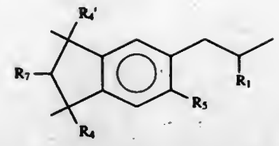
**Continuation-in-part of Ser. No. 214,229, Mar. 17, 1994, Pat. No. 5,376,630. This application Sep. 22, 1994, Ser. No. 309,505**

**Int. Cl.[6] A61K** *7/46*

**U.S. Cl. 512—13** **19 Claims**

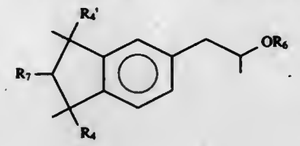
1. At least one methyl, substituted propyl-substituted pentamethyl indane derivative defined according to the structure:





wherein $R_1$ is chloro, hydroxyl or $OR_6$ and $R_5$ is methyl or hydrogen with the proviso that $R_1$ is chloro when $R_5$ is hydrogen; wherein $R_6$ is methyl, ethyl, n-propyl or i-propyl and wherein the structure represents a mixture wherein, in the mixture in one of the compounds $R_4$ and $R_4$' are both methyl and $R_7$ is methyl; and in the other compounds one of $R_4$ or $R_4$' is methyl and the other is ethyl and $R_7$ is hydrogen.

5. A substance of claim 1 defined according to the structure:



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**5,502,032**

## PEPTIDES, THE PREPARATION AND USE THEREOF

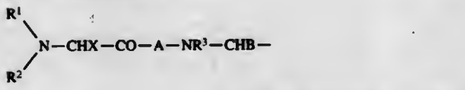
**Andreas Haupt; Bernd Janssen, both of Ludwigshafen; Kurt Ritter; Dagmar Klinge, both of Heidelberg; Gerhard Kellhauer, Dannstadt-Schauernheim, all of, Germany; Cynthia Romerdahl, Wayland, Mass.; Teresa Barlozzari, Brookline, Mass., and Xiao-dong Qian, Wellesley, Mass., assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany**

**Continuation-in-part of Ser. No. 991,309, Dec. 16, 1992, abandoned. This application Jan. 5, 1994, Ser. No. 178,529**

**Int. Cl.[6] A61K** *38/07;38/06*

**U.S. Cl. 514—17** **13 Claims**

1. A peptide of the formula I



where
$R^1$ is methyl, ethyl, isopropyl, cyclopropyl or fluoroethyl;
$R^2$ is hydrogen, methyl, ethyl, isopropyl or cyclopropyl, or
$R^1$—N—$R^2$ together are



which may be unsubstituted or substituted by one or more methyl groups,
X is hydrogen, $C_1$–$C_5$-alkyl, cyclopropyl, cyclopentyl, cyclohexyl, —$CH_2$-cyclohexyl or benzyl;
A is valyl, isoleucyl, leucyl, allo-isoleucyl, 3-tert-butylalanyl, 2-tert-butylglycyl, 2-ethylglycyl or 2-cyclohexylglycyl;
$R^3$ is hydrogen, methyl or ethyl;
B is hydrogen, $C_1$–$C_5$-alkyl, cycloalkyl, —$CH_2$-cyclohexyl or benzyl;
D is hydrogen, hydroxy, acetoxy, or $C_1$–$C_4$-alkoxy;
E is hydrogen or $C_1$–$C_4$-alkyl;
$R^7$ is $NR^4$—CHG—CHK—CHL—CO—;
$R^4$ is hydrogen or methyl;
G is hydrogen, $C_1$–$C_5$-alkyl, cyclohexyl, —$CH_2$-cyclohexyl, or benzyl;
K is hydrogen, hydroxy, acetoxy, or $C_1$–$C_4$-alkoxy;
L is hydrogen, or $C_1$–$C_5$-alkyl, or
$R^4$ and G together are —$(CH_2)_4$—, —$(CH_2)_3$—, or —$CH_2$—CH(OH)—$CH_2$—;
M is valyl, 2-tert-butylglycyl, prolyl, hydroxyprolyl, isoleucyl, leucyl, 3-cyclohexylalanyl, phenylalanyl, tetrahydroisoquinolyl-2-carbonyl, 3-thiazolylalanyl, 3-thienylalanyl, histidyl, tyrosyl, 3-pyridylalanyl, 3-tert-butylalanyl, 2-cyclohexylglycyl, or 3-naphthylalanyl;
b and d are independently 0 or 1;
Q is hydroxy, $C_1$–$C_5$-alkoxy, phenoxy, benzyloxy or a substituted or unsubstituted amino group;
and the salts thereof with physiologically tolerated acids.

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**5,502,033**

## NEW ANTIMICROBIAL POLYPEPTIDE COMPOUND A PHARMACEUTICAL COMPOSITION COMPRISING THE SAME, AND A METHOD FOR TREATING INFECTIOUS DISEASES

**Toshiro Iwamoto, Tsukuba; Akihiko Fujie; Kumiko Nitta, both of Tsuchiura; Yasuhisa Tsurumi; Nobuharu Shigematsu, both of Tsukuba; Chiyoshi Kasahara, Ikeda; Motohiro Hino, Tsuchiura, and Masakuni Okuhara, Tsukuba, all of, Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan**

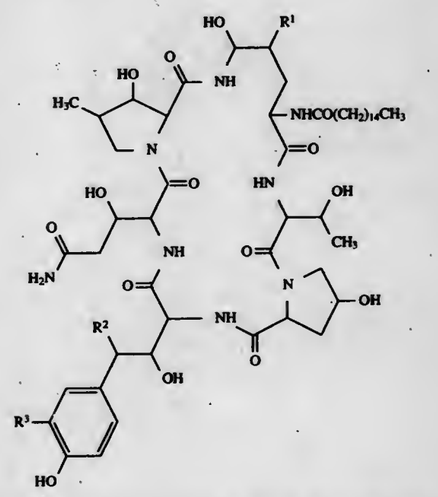
**Continuation of Ser. No. 610,759, Nov. 8, 1990, abandoned. This application Mar. 28, 1994, Ser. No. 218,883**

**Claims priority, application United Kingdom, Nov. 13, 1989, 8925593**

**Int. Cl.[6] A61K** *38/00;* **C07K** *5/12;7/06;7/00*

**U.S. Cl. 514—11** **3 Claims**

1. A compound of the following general formula (SEQ ID NO: 1):



wherein $R^1$ is hydrogen or hydroxy, $R^2$ is hydrogen or hydroxy, $R^3$ is hydroxy or hydroxysulfonyloxy, with proviso that when $R^1$ is hydrogen, $R^2$ is hydrogen, or a pharmaceutically acceptable salt thereof.

**5,502,034**

## METHODS FOR PRODUCING THROMBIN

**Richard D. Holly, and Donald C. Foster, both of Seattle, Wash., assignors to Zymogenetics, Inc., Seattle, Wash.**

**Division of Ser. No. 998,972, Dec. 30, 1992, which is a continuation-in-part of Ser. No. 860,701, Mar. 31, 1992, abandoned, which is a continuation-in-part of Ser. No. 816,281, Dec. 31, 1991, abandoned. This application Jun. 5, 1995, Ser. No. 463,953**

**Int. Cl.[6] A61K** *38/00;38/46;* **C12N** *9/74;* **C12P** *21/06*

**U.S. Cl. 514—12** **11 Claims**

1. A method for treating a patient for a bleeding disorder or wound, which comprises administering to the patient a therapeutically effective amount of a pharmaceutical composition which comprises a recombinant gla-domainless prothrombin that can be cleaved to form an active thrombin molecule, and a physiologically acceptable carrier.

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**5,502,035**

## N-TERMINUS MODIFIED ANALOGS OF LHRH

**Fortuna Haviv, Deerfield, Ill.; Timothy D. Fitzpatrick, Boulder, Colo.; Rolf E. Swenson, Grayslake, Ill.; Charles J. Nichols, Greendale, Wis., and Nicholas A. Mort, Waukegan, Ill., assignors to Tap Holdings Inc., Abbott Park, Ill.**

**Continuation-in-part of Ser. No. 103,474, Aug. 6, 1993, abandoned. This application Jul. 27, 1994, Ser. No. 279,677**

**Int. Cl.[6] C07K** *14/59*

**U.S. Cl. 514—15** **8 Claims**

1. A peptide having structure I or pharmaceutically acceptable salt thereof

X—A—B—C—D—E—F—G—H—I—J—K
0 1 2 3 4 5 6 7 8 9 10 11 I

wherein

X is an acyl group selected from the group consisting of

(a) dihydroshikimyl,
(b) 2-furoyl,
(c) 3-furoyl,
(d) tetrahyrofuro-2-yl,
(e) tetrahydrofuro-3-yl,
(f) (thien-2-yl)carbonyl,
(g) (thien-3-yl)carbonyl,
(h) (tetrahydrothien-2-yl)carbonyl,
(i) (tetrahydrothien-3-yl)carbonyl,
(j) pyrrol-2-yl)carbonyl,
(k) (pyrrol-3-yl)carbonyl,
(l) prolyl,
(m) N-acetyl-prolyl,
(n) 3-(indolin-3-yl)propionyl,
(o) (indolin-3-yl)acetyl,
(p) (indolin-2-yl)carbonyl,
(q) (indolin-3-yl)carbonyl,
(r) benzo[b]fur-2-yl)carbonyl,
(s) (dihydrobenzo[b]fur-2-yl)carbonyl,
(t) (tetrahydropyran-2-yl)carbonyl,
(u) (tetrahydropyran-3-yl)carbonyl,
(v) (piperidin-3-yl)carbonyl,
(w) (N-acetylpiperidin-3-yl)carbonyl,
(x) nicotinyl, optionally substituted with alkyl of from one to six carbon atoms, alkoxy of from one to six carbon atoms, halogen, or hydroxy,
(y) isonicotinyl, optionally substituted with alkyl of from one to six carbon atoms, alkoxy of from one to six carbon atoms, halogen, or hydroxy,
(z) picolinoyl,
(aa) 2-, 3- or 4-quinolinecarbonyl, optionally substituted with alkyl of from one to six carbon atoms, alkoxy of from one to six carbon atoms, halogen, or hydroxy;
(bb) salicyl,
(cc) shikimyl, and
(dd) p-toluenesulfonyl;

A is absent or is an aminoacyl residue selected from the group consisting of

D-alanyl,
3-aminopropionyl,
4-aminobutyryl,
5-aminovaleryl,
6-amino-hexanoyl,
7-aminoheptanoyl,
8-aminooctanoyl,
11-aminoundecanoyl,
azaglycyl,
glycyl,
sarcosyl, and
D-seryl;

B is an aminoacyl residue selected from the group consisting of

D-phenylalanyl,
D-3-(4-chlorophenyl)alanyl,
D-3-(4-fluorophenyl)alanyl,
D-3-(quinolin-3-yl)alanyl,
sarcosyl,
glycyl,
azaglycyl,
D-3,3-diphenylalanyl,
$N^{\alpha}$-methyl-D-3-(naphth-2-yl)alanyl, and
D-3-(naphth-2-yl)alanyl;

C is an aminoacyl residue selected from the group consisting of

D-3-(4-chlorophenyl)alanyl,
D-3,3-diphenylalanyl,
D-3-(4-fluorophenyl)alanyl,
D-3-(naphth-2-yl)alanyl,
D-phenylalanyl, and
D-3-(quinolin-3-yl)alanyl;

D is an aminoacyl residue selected from the group consisting of

D-alanyl,
D-3-(benzo[b]thien-2-yl)alanyl,
glycyl,
D-3-(naphth-1-yl)alanyl,
D-3-(pyrid-3-yl)alanyl,
D-3-(quinolin-3-yl)alanyl, and
D-3-(thiazol-2-yl)alanyl;

E is an aminoacyl residue selected from the group consisting of

glycyl,
L-seryl,
L-homoseryl,
L-seryl(O-benzyl), and
$N^{\alpha}$(R1)-L seryl where R1 is alkyl of from one to four carbon atoms;

F is an aminoacyl residue selected from the group consisting of

$N^{\alpha}$(R1)-alanyl,
$N^{\alpha}$(R1)-(3-(4-(3-amino-1,2,4-triazol-5-yl)amino)phenyl)alanyl,
$N^{\alpha}$(R1)-(3-(4-((3-amino-1,2,4-triazol-5-amino) methyl)phenyl)alanyl,
$N^{\alpha}$(R1)-(3-(4-(3-amino-1,2,4-triazol-5-yl)amino)cyclohexyl)alanyl,
$N^{\alpha}$(R1)-(3-(4-(nicotinyl)amino)cyclohexyll)alanyl,
$N^{\alpha}$(R1)-(N-e-nicotinyl)lysyl,
$N^{\alpha}$(R1)-(N-e-(3-amino-1,2,4-triazol-5-yl)lysyl,
$N^{\alpha}$(R1)-3-(4-nitrophenyl)alanyl,
$N^{\alpha}$(R1)-3-(4-aminophenyl)alanyl,
$N^{\alpha}$(R1)-3-(4-aminocyclohexyl)alanyl,
$N^{\alpha}$(R1)-tyrosyl,
$N^{\alpha}$(R1)-tyrosyl(O-methyl),
$N^{\alpha}$(R1)-phenylalanyl,
$N^{\alpha}$(R1)-cyclohexylalanyl,
$N^{\alpha}$(R1)-glycyl,
$N^{\alpha}$(R1)-arginyl,
$N^{\alpha}$(R1)-histidyl, and
$N^{\alpha}$(R1)-homoarginyl; where R1 is hydrogen or alkyl of from one to four carbon atoms;

G is an aminoacyl residue selected from the group consisting of

glycyl,



D-citrullyl,
D-homocitrullyl,
β-alanyl,
D-lysyl(N-epsilon glycyl nicotinyl),
D-lysyl(N-epsilon azaglycyl nicotinyl),
D-lysyl(N-epsilon shikimyl),
D-lysyl(N-epsilon glycyl shikimyl),
D-lysyl(N-epsilon azaglycyl shikimyl),
D-lysyl(N-epsilon dihydroshikimyl),
D-lysyl(N-epsilon glycyl dihydroshikimyl),
D-lysyl(N-epsilon azaglycyl dihydroshikimyl),
D-lysyl(N-epsilon fur-2-oyl),
D-lysyl(N-epsilon glycyl fur-2-oyl),
D-lysyl(N-epsilon azaglycyl fur-2-oyl),
D-lysyl(N-epsilon tetrahydrofur-2-oyl),
D-lysyl(N-epsilon glycyl tetrahydrofur-2-oyl),
D-lysyl(N-epsilon azaglycyl tetrahydrofur-2-oyl),
D-lysyl(N-epsilon-(3-amino-1,2,4-triazol-5-yl)amino), and
D-3-(4-(3-amino-1,2,4-triazol-5-yl)amino)phenylalanyl;

H is an aminoacyl residue selected from the group consisting of

L-leucyl;
$N^{\alpha}(R^1)$-L-leucyl;
glycyl;
sarcosyl;
prolyl;
L-valyl;
L-cyclohexylalanyl; and
$N^{\alpha}(R^1)$-L-cyclohexylalanyl;

where $R^1$ is hydrogen or alkyl of from one to six carbon atoms;

I is an aminoacyl residue selected from the group consisting of

L-citrullyl;
L-homocitrullyl;
L-histidyl;
L-(N-ε-isopropyl)lysyl;
L-arginyl;
$N^{\alpha}(R^1)$-L-arginyl;
L-homoarginyl;
L-2-amino-6-$N^{g}$-ethylguanidinohexanoyl; and
L-2-amino-6-$N^{g}$,$N^{g}$-diethylguanidinohexanoyl;

J is an aminoacyl residue selected from the group consisting of

L-prolyl;
4-hydroxy-L-prolyl;
L-pipecolyl;
L-azetidinyl;
L-2,8-tetrahydroisoquinoline-2-carbonyl,
$N^{\alpha}(R^1)$-L-leucyl;
sarcosyl; glycyl; and
N(R1)-L-alanyl;

where $R^1$ is hydrogen or alkyl of from one to six carbon atoms; and

K is —NH(CH2CH3) or is an aminoacyl residue selected from the group consisting of

D-alanylamide,
D-alanyl(OH),
D-glutamyl(OH),
L-glutamyl(OH),
$N^{\alpha}(R^1)$-L-alanylamide,
$N^{\alpha}(R^1)$ )-D-alanylamide,
sarcosamide,
D-serylamide,
azaglycylamide, and
glycylamide,

where $R^1$ is as defined above and with the proviso that when K is —$NH(CH_2CH_3)$ then J is L-prolyl.

**5,502,036**

## ANTIHERPES PENTAPEPTIDE DERIVATIVES HAVING A SUBSTITUTED ASPARTIC ACID SIDE CHAIN

**Julian Adams, Ridgefield, Conn.; Pierre L. Beaulieu, Montreal, Canada; Robert Déziel, Ville Mont-Royal, Canada; John DiMaio, Montreal, Canada; Louis Grenier, Laval, Canada; Pierre Lavallée, Rosemere, Canada, and Neil Moss, Laval, Canada, assignors to BioMega Boehringer Ingelheim Research Inc., Laval, Canada**

**Continuation of Ser. No. 927,694, Aug. 7, 1992, abandoned, which is a continuation of Ser. No. 547,670, Jul. 3, 1990, abandoned. This application Mar. 9, 1994, Ser. No. 208,168**

**Claims priority, application Canada, Jul. 7, 1989, 605091**

**Int. Cl.[6] C07K** *7/02*

**U.S. Cl. 514—17** **7 Claims**

1. A peptide of formula I

X-$NR^1$-CH($R^2$)-C($W^1$)-NH-$CR^3$($R^4$)-C($W^2$)-$NR^5$-CH[$CH^2$C(O)-Y]-C($W^3$)-NH-$CR^6$-[$CR^7CR^8$)-COOH]-C($W^4$)-NH-$CR^9$($R^{10}$)-Z I

wherein X is 4-methylpentanoyl, phenylpropionyl, (4-hydroxyphenyl)propionyl or (3,4-dihydroxyphenyl)propionyl; $R^1$ is methyl; $R^2$ is 1-methylethyl; $R^3$ is hydrogen; $R^4$ is lower alkyl; $R^5$ is hydrogen; $R^6$ is hydrogen; $R^7$ and $R^8$ each independently are hydrogen or $R^7$ and $R^8$ together with the carbon atom to which they are attached form a lower cycloalkyl; $R^9$ is hydrogen or methyl; $R^{10}$ is 2-methylpropyl, 3-methylbutyl; 2,2-dimethylpropyl or 2-cyclohexylethyl; $W^1$, $W^2$ and $W^3$ are oxo; $W^4$ is oxo or thioxo; Y is 1-methylheptyloxy, dodecyloxy, N(Me)OMe, N,N-diethylamino, N,N-diisopropylamino, N-methyl-N-octylamino, pyrrolidino or morpholino; and Z is hydrogen, COOH, $CH_2OH$, $CONR^{14}R^{15}$ wherein $R^{14}$ and $R^{15}$ each independently are hydrogen; or a therapeutically acceptable salt.

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**5,502,037**

## PRO-CYTOTOXIC DRUG CONJUGATES FOR ANTICANCER THERAPY

**Alexi Kondratyev, Silver Spring, Md., assignor to Neuromed Technologies, Inc., Silver Spring, Md.**

**Filed Jul. 9, 1993, Ser. No. 88,646**

**Int. Cl.[6] A61K** *38/18;* **C07K** *17/02;14/48*

**U.S. Cl. 514—21** **8 Claims**

1. A drug conjugate composition comprising:

a) a first moiety polypeptide or protein tumor cell homing agent consisting of NGF;

b) a second moiety spacer molecule covalently linked to said homing agent; and,

c) a third moiety pro-cytotoxic drug covalently linked to said spacer molecule, wherein said pro-cytotoxic drug is a cyclophosphamide or cycloisophosphamide capable of being metabolized intracellularly by at least one endogenous enzyme normally present within said tumor cells to a cytotoxic metabolic product,

wherein said conjugate binds to and is internalized by said tumor cell.

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**5,502,038**

## CHOLESTEROL SEQUESTRANT GLYCOSIDES THAT INHIBIT INTESTINAL CHOLESTEROL ABSORPTION

**M. Rene Malinow, Portland, Oreg., assignor to Medical Research Foundation of Oregon, Beaverton, Oreg.**

**Filed Jun. 21, 1993, Ser. No. 80,282**

**Int. Cl.[6] A61K** *31/705;31/715;* **A01N** *45/00;43/04*

**U.S. Cl. 514—26** **4 Claims**

1. A method of reducing cholesterol absorption in a digestive system of a mammal, comprising administering to the mammal a therapeutically effective amount of the compound neotigogenin trisaccharide.

**5,502,039**

## O-DERIVATIZED ALGINIC ACID ANTIGENS

**Gerald Pier, Brookline, Mass., assignor to Brigham and Women's Hospital, Inc., Boston, Mass.**

**Continuation-in-part of Ser. No. 962,480, Oct. 16, 1992, abandoned. This application Jul. 11, 1994, Ser. No. 273,237**

**Int. Cl.[6] A61K** *39/104;* **C08B** *37/00*

**U.S. Cl. 514—23** **29 Claims**

1. An O-derivatized alginic acid antigen comprising

a backbone of a uronic acid polymer including D-mannuronic acid, wherein said uronic acid polymer is derivatized with a noacetyl short chain carboxylic acid.

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**5,502,040**

## ANTICOCCIDIAL METHOD

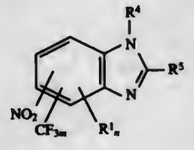
**George O. P. O'Doherty, Greenfield, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.**

**Division of Ser. No. 37,800, Mar. 26, 1993, Pat. No. 5,331,003. This application Apr. 21, 1994, Ser. No. 230,959**

**Int. Cl.[6] A61K** *31/70;31/415*

**U.S. Cl. 514—27** **10 Claims**

1. A method of preventing or treating coccidiosis in a fowl which comprises administering to the fowl both a first substance and a second substance, said first substance being a polyether antibiotic and said second substance selected from compounds of the formula



wherein

$R^1$ represents bromo or chloro,

m represents an integer of 0 or 1 and n represents an integer of from 0 to 3, with the sum of m and n being an integer of from 1 to 3;

$R^4$ represents H, OH, $OCH_3$, or a group hydrolyzable to a foregoing $R^4$ moiety; and

$R^5$ represents difluoromethyl, chlorodifluoromethyl, 1, 1, 2,2-tetrafluoroethyl, or a perfluoroalkyl of $C_1$–$C_3$;

and the physiologically acceptable salts thereof; said first and second substance being administered in amounts which, together, are effective to prevent or treat coccidiosis in the fowl.

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**5,502,041**

## POTENT INHIBITOR OF HIV REVERSE TRANSCRIPTASE

**Laura K. Moen, Norfolk, and Gary F. Clark, Chesapeake, both of Va., assignors to The Center for Innovative Technology, Herndon, Va.**

**Filed Dec. 11, 1992, Ser. No. 989,114**

**Int. Cl.[6] A61K** *31/715;* **C08B** *31/00*

**U.S. Cl. 514—54** **3 Claims**

1. An isolated, substantially pure compound isolated from fucoidan having the following properties:

(a) being brown pigmented;

(b) being insoluble in organic solvents;

(c) lacking hexose, hexosamine, uronic acid or sulfate groups;

(d) lacking polysaccharide structure;

(e) being inhibitory to HIV RT activity in vitro;

(f) being non-competitive with dTTP;

(g) having an ultraviolet absorption spectrum as shown in FIG. 4;

(h) having an apparent molecular weight of about 12 kD, as determined by gel chromotography;

(i) having an infrared spectrum as shown in FIG. 7;

(j) having an NMR spectrum as shown in FIG. 8;

(k) being composed of at least the following elements in % weight: C: 20.52 (±0.5%); H: 4.64 (±0.4%); N: 20.38 (±0.6%) and O: 36.19 (±1%); and

(l) being soluble in aqueous medium.

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**5,502,042**

## METHODS AND COMPOSITIONS FOR TREATING WOUNDS

**Elliott A. Gruskin, Killingworth, and Ying Jiang, North Haven, both of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.**

**Filed Jul. 22, 1994, Ser. No. 278,778**

**Int. Cl.[6] A01N** *43/04;* **C07H** *5/04*

**U.S. Cl. 514—59** **20 Claims**

1. A composition comprising:

a hydrolyzable wound treatment including an oxidized polysaccharide,

wherein said polysaccharide is a cross-linked bead; and

wherein said cross linked polysaccharide bead has a chemically induced charge thereon.

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**5,502,043**

## USE OF HYDROXYETHYL STARCH FOR IMPROVEMENT OF MICROCIRCULATION

**Burghard Weidler; Klaus Sommermeyer, both of Rosbach; Klaus Henning, Usingen, and Frank Bepperling, Rosbach, all of, Germany, assignors to Fresenius AG, Bad Homburg, Germany**

**Filed Mar. 30, 1994, Ser. No. 220,150**

**Claims priority, application Germany, Apr. 3, 1993, 43 10 974.8**

**Int. Cl.[6] A61K** *31/72;31/70;* **C08B** *31/10*

**U.S. Cl. 514—60** **4 Claims**

1. A method for improving microcirculation in a patient, comprising:

administering to the patient an effective amount of a hydroxyethyl starch having a molecular weight of about 110,000 to about 150,000, a substitution level MS of about 0.38 to about 0.5, a substitution level DS of about 0.32 to about 0.45, and a $C_2/C_6$ ratio from 8 to 20.

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**5,502,044**

## FLUORINATED 4-AMINOANDROSTADIENONE DERIVATIVES AND PROCESS FOR THEIR PREPARATION

**Franco Buzzetti, Monza; Antonio Longo, and Enrico Di Salle, both of Milan, all of, Italy, assignors to Farmitalia Carlo Erba S.r.l., Milan, Italy**

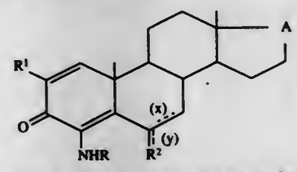
**Filed Feb. 14, 1994, Ser. No. 195,205**

**Claims priority, application United Kingdom, Feb. 18, 1993, 9303306; Jan. 29, 1993, 9322378**

**Int. Cl.[6] C07J** *41/00;* **A61K** *31/56*

**U.S. Cl. 514—177** **6 Claims**

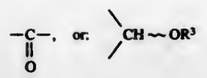
1. A compound of the formula (I):



(I)

wherein (x) and (y) are each single or double bonds; A is





each of R and $R^3$ is independently hydrogen or acyl; $R^1$ is hydrogen or fluorine; and wherein when (y) is a single bond, $R^2$ is hydrogen, fluorine, methyl or trifluoromethyl; and when (y) is a double bond, $R^2$ is methylene;

provided that when one of (x) and (y) is a double bond, the other is a single bond, and that at least one of $R^1$ and $R^2$ is fluorine or $R^2$ is trifluoromethyl; or a pharmaceutically acceptable salt thereof.

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**5,502,045**

## USE OF A STANOL FATTY ACID ESTER FOR REDUCING SERUM CHOLESTEROL LEVEL

**Tatu Miettinen; Hannu Vanhanen, both of Helsinki, and Ingmar Wester, Raisio, all of, Finland, assignors to Raision Tehtaat Oy AB, Raisio, Finland**

**PCT No. PCT/FI91/00139, § 371 Date Nov. 22, 1993, § 102(e) Date Nov. 22, 1993, PCT Pub. No. WO92/19640, PCT Pub. Date Nov. 12, 1992**

**PCT Filed May 3, 1991, Ser. No. 140,085**

**Int. Cl.[6] A61K** *31/56*

**U.S. Cl. 514—182** **8 Claims**

1. The method of reducing the absorption of cholesterol into the bloodstream comprising orally introducing into the body an effective amount of a substance containing a β-sitostanol fatty acid ester prepared by the interesterification of β-sitostanol with a fatty acid ester containing between 2 and 22 carbon atoms in the presence of an interesterification catalyst.

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**5,502,046**

## 11β-SUBSTITUTED 14,17-ETHANOESTRATRIENES, PROCESS FOR THEIR PRODUCTION AND THEIR USE AS PHARMACEUTICAL AGENTS

**Rolf Bohlmann; Hermann Kunzer; Hans-Peter Muhn-Seipoldy; Yukishige Nishino, and Martin Schneider, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany**

**PCT No. PCT/EP92/02210, § 371 Date Jun. 24, 1994, § 102(e) Date Jun. 24, 1994, PCT Pub. No. WO93/06124, PCT Pub. Date Apr. 1, 1993**

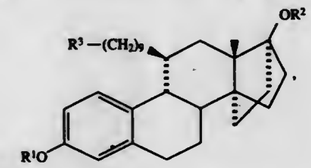
**PCT Filed Sep. 24, 1992, Ser. No. 211,173**

**Claims priority, application Germany, Sep. 24, 1991, 41 32 182.0**

**Int. Cl.[6] A61K** *31/565;* **C07J** *1/00*

**U.S. Cl. 514—182** **17 Claims**

1. An 11β-substituted 14,17-ethanoestratriene compound of formula I



(I)

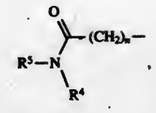
wherein

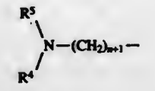
$R^1$ is hydrogen, $C_1$–$C_{12}$ alkanoyl, benzoyl, straight-chain or branched-chain $C_1$–$C_{12}$ alkyl, $C_3$–$C_7$ cycloalkyl, or $C_4$–$C_8$ alkylcycloalky,

$R^2$ is hydrogen a $C_1$–$C_{12}$ alkanoyl,

$R^3$ is







or $R^4$—SO—,

n is 0, 1 or 2, and

$R^4$ and $R^5$ are each, independently of one another, hydrogen, straight-chain or branched $C_1$–$C_8$ alkyl or partially fluorinated straight-chain or branched $C_1$–$C_8$ alkyl.

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**5,502,047**

## TREATMENT FOR INSOMNIA

**Neil B. Kavey, 26 W. Orchard Rd., Chappagua, N.Y. 10514**

**Filed Mar. 22, 1993, Ser. No. 34,252**

**Int. Cl.[6] A61K** *31/33;31/335;31/35*

**U.S. Cl. 514—183** **10 Claims**

1. A method for the treatment of a patient suffering from chronic insomnia comprising administering to said patient a compound selected from the group consisting of doxepin and pharmaceutically acceptable salts thereof in a daily dosage ranging from about 0.5 to about 20 milligrams.

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**5,502,048**

## SUBSTITUTED NITROGEN HETEROCYCLES

**Marc J. Chapdelaine, Wilmington; Timothy W. Davenport, New Castle; Laura E. Garcia-Davenport, New Castle, all of Del.; Paul F. Jackson, Chadds Ford, Pa.; Jeffrey A. McKinney, West Chester, Pa., and Charles D. McLaren, Landenberg, Pa., assignors to Zeneca Limited, London, England**

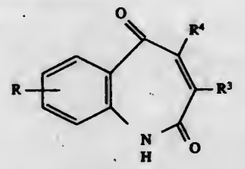
**Filed Jun. 9, 1994, Ser. No. 255,613**

**Claims priority, application United Kingdom, Jun. 10, 1993, 9311948**

**Int. Cl.[6] A61K** *31/55;* **C07D** *223/16*

**U.S. Cl. 514—213** **18 Claims**

1. A compound of formula I



(I)

wherein

R denotes 0–3 substituents on the benz-ring selected independently from halo, trifluoromethyl and cyano;

$R^3$ is hydroxy, (1–6C)alkyloxy (which may bear a carboxy or (1–3C)alkoxycarbonyl substituent) or $NR^aR^b$ in which

$R^a$ and $R^b$ are independently selected from hydrogen, (1–6C)alkyl, (2–6C)alkenyl, (3–7C)cycloalkyl, (3–7C)cycloalkyl(1–6C)alkyl, aryl, aryl(1–6C)alkyl, heteroaryl, heteroaryl(1–6C)alkyl and $CH_2Y$ in which Y is $(CHOH)_nCH_2OH$ or $(CH_2)_nR^c$ (wherein n is an integer from 1 to 5) and in which $R^a$ and $R_b$ (except when $CH_2Y$) independently may bear a $COR^c$ substituent; or

$NR^aR^b$ forms a pyrrolyl, pyrrolinyl, pyrrolidinyl, piperidino, piperazinyl, morpholino, thiomorpholino (or S-oxide) or perhydroazepinyl ring which may further bear one or more

(1–6C)alkyl, phenyl, phenyl(1–4C)alkyl, phenoxy or phenyl(1–4C)alkyl substituents;

$R^4$ is (2–6C)alkenyl, (2–6C)alkynyl, aryl or heteroaryl and $R^4$ independently may bear $COR^c$; —OH or —O(1–4C)alkyl; (1–4C)alkyl, -(1–4C)alkylcarboxy(1–4C)alkyl, aryl or —Si— and wherein

$R^c$ is hydroxy, (1–4C)alkoxy, or $NR^dR^e$ in which $R^d$ and $R^e$ are independently selected from hydrogen,(1–3C)alkyl, benzyl or phenyl wherein the aryl portion may be unsubstituted or substituted with halogen, (1–4C)alkyl or (1–5C)O—; or $NR^dR^e$ forms a pyrrolyl, pyrrolinyl, pyrrolidinyl, piperidino, piperazinyl (which may bear a (1–3C)alkyl or benzyl substituent at the 4-position), morpholino, thiomorpholino (or S-oxide) or perhydroazepinyl ring;

and wherein each aryl moiety is selected from a phenyl radical or an ortho-fused bicyclic carbocyclic radical having nine to ten ring atoms in which at least one ring is aromatic; and each heteroaryl moiety is a radical attached via a ring carbon of a monocyclic aromatic ring containing five ring atoms consisting of carbon and one to four heteroatoms selected from oxygen, sulfur and nitrogen, or containing six ring atoms consisting of carbon and one or two nitrogens;

and in which an aryl or heteroaryl portion of $R^3$ or $R^4$ may bear one or more halo, trifluoromethyl, (1–6C)alkyl, (2–6C)alkenyl, phenyl, phenyl(1–4C)alkyl, hydroxy, (1–6C)alkoxy, phenoxy, phenyl(1–4C)alkoxy, nitro, amino, trifluoroacetylamino, carboxy, (1–3C)alkoxy-carbonyl or a phenyl carbonyl group; a 1,3 dioxolo group; a -(1–4C)alkylNRR' wherein R or R' is H or (1–4C)alkyl; a -(1–4C)alkylCN or cyano substituents;

or a pharmaceutically acceptable salt thereof.

7. A pharmaceutical composition for treating stroke, hypoglycemia, ischemic attack or anoxia comprising an effective amount of a compound according to claim 1 and a pharmaceutically acceptable excipient.

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**5,502,049**

**USE OF PHENOTHIAZINE DERIVATIVES IN THE TREATMENT OF ISCHAEMIA AND/OR HYPOXIA**

**Claude Garret, Fontenay sous Bois; Jean Ratsud, Eaubonne, and Jean-Marie Stutzmann, Villecresnes, all of, France, assignors to Rhone-Poulenc Rorer S.A., Antony, France**

**PCT No. PCT/FR93/00312, § 371 Date Sep. 7, 1994, § 102(e) Date Sep. 7, 1994, PCT Pub. No. WO93/19757, PCT Pub. Date Oct. 14, 1993**

**PCT Filed Mar. 29, 1993, Ser. No. 295,667**

**Claims priority, application France, Mar. 30, 1992, 92 03793**

**Int. Cl.[6] A61K** *31/54*

**U.S. Cl. 514—224.8** **2 Claims**

1. Method for treatment of ischaemia and/or hypoxia comprising treating a patient with an effective amount of N-n-propyl-10-(1-(1-pyrrolidinyl)-2-propyl)-2-phenothiazinecarboxamide (L series) or their pharmaceutically acceptable salts.

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**5,502,050**

**BLOCKING UTILIZATION OF TETRAHYDROBIOPTERIN TO BLOCK INDUCTION OF NITRIC OXIDE SYNTHESIS**

**Steven S. Gross, New York, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.**

**Filed Nov. 29, 1993, Ser. No. 158,829**

**Int. Cl.[6] A61K** *31/54;31/495;31/525;31/44*

**U.S. Cl. 514—241** **6 Claims**

1. A method of prophylaxis or treatment of a subject for systemic hypotension caused by pathological overproduction of nitric oxide from arginine in vascular cells in said subject induced by therapy with a cytokine or exposure to a bacterial endotoxin, said method comprising administering to a subject possibly developing or having such systemic hypotension a therapeutically effective amount of at least one inhibitor of the use of tetrahydrobiopterin as a cofactor for nitric oxide synthase functional to block the induction of nitric oxide synthesis by cytokines and bacterial endotoxins, wherein said inhibitor is a dihydroxy substituted 4-phenyl(hydro)pyridine or a corresponding quinone or hydroquinone.

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**5,502,051**

**3-AMINOPYRROLES, METHODS FOR THEIR SYNTHESIS AND FOR THEIR PHARMACEUTICAL USE**

**Peter Scharfenberg, Wuppertal; Jürgen Liebscher, Berlin; Alexander Knoll, Berlin; Aleksej Uschmajew, Berlin; Andreas Rolfs, Berlin; Dieter Lohman, Radebeul; Gottfried Faust, and Eveline Morgenstern, both of Berlin, all of, Germany, assignors to Arzneimittelwerk Dresden GmbH, Radebeul, Germany**

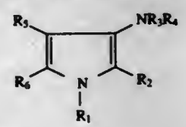
**Filed Nov. 16, 1990, Ser. No. 614,459**

**Claims priority, application Germany, Nov. 17, 1989, WPCO7D334670.8**

**Int. Cl.[6] A61K** *31/40;31/445;31/535*

**U.S. Cl. 514—235.5** **5 Claims**

1. A process for treating a CNS condition, which comprises administering to a patient in need therefor a pharmaceutically effective dose of a 3-aminopyrrole of Formula Ia



(Ia)

wherein

$R_1$ is H, $C_{1-20}$ alkyl, cycloalkyl, aralkyl, carboxylic acyl, alkoxycarbonyl, or ethoxycarbonylmethyl;

$R_2$ is H, carbocyclic acyl, —COOH, alkoxycarbonyl, carbocyclic oxycarbonyl, $NH_2CO$—, phenylaminocarbonyl, benzyloxycarbonyl, or carbocyclic aryl;

$R_3$ is $C_{1-10}$ alkyl, or cycloalkyl;

$R_4$ is $C_{1-10}$ alkyl, cycloalkyl, or $—NR_3$ and $R_4$ is dialkylamino, or $R_3$ and $R_4$ taken together with the nitrogen form morpholino, pyrrolidino, or piperidino;

$R_5$ is biphenyl, monocarboxylic aryl, or monocarbocyclic aryl substituted with alkyl, alkoxy, or halo; and

$R_6$ IS H, or $C_{1-4}$ alkyl, or $R_5$ and $R_6$ taken together are a divalent $C_{1-10}$ alkyl bridge; or

a pharmaceutically acceptable salt thereof.

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**5,502,052**

**USE OF A COMBINATION OF APRACLONIDINE AND TIMOLOL TO CONTROL INTRAOCULAR PRESSURE**

**Louis M. DeSantis, Fort Worth, Tex., assignor to Alcon Laboratories, Inc., Fort Worth, Tex.**

**Continuation of Ser. No. 812,889, Dec. 20, 1991, abandoned, which is a continuation of Ser. No. 472,686, Jan. 31, 1990, abandoned, which is a continuation of Ser. No. 186,504, Apr. 26, 1988, abandoned. This application Dec. 22, 1994, Ser. No. 364,831**

**Int. Cl.[6] A61K** *31/535;31/415*

**U.S. Cl. 514—236.2** **1 Claim**

1. A method of controlling intraocular pressure which comprises applying topically to the affected eye a therapeutically effective amount of a composition comprising: 0.02 to 2.0 wt. % of para-amino clonidine or a pharmaceutically acceptable salt thereof, 0.01 to 3.0 wt. % of timolol or a pharmaceutically acceptable sale thereof, and a pharmaceutically acceptable vehicle therefor.



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**5,502,053**

**HIV PROTEASE INHIBITOR COMPOUNDS**

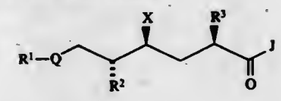
**Bruce D. Dorsey, Harleysville; Joel R. Huff, Gwynedd Valley, and Susan F. Britcher, Norristown, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.**

**Continuation of Ser. No. 944,568, Sep. 14, 1992, abandoned. This application Aug. 23, 1994, Ser. No. 294,772**

**Int. Cl.[6] A61K** *31/395;* **C07D** *265/28*

**U.S. Cl. 514—239.2** **7 Claims**

1. A compound of the formula

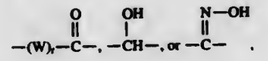


I-a

wherein

X is —OH,

Q is



wherein

W is —O— or —NH—, and t is zero or 1;

$R^1$ is $—C_{1-6}$ alkyl unsubstituted or substituted with tetrahydrofuryl or $—C_{5-7}$ cycloalkyl;

$R^2$ is $—CH_2—C_{5-10}$ cycloalkyl or $—CH_2$-phenyl,

$R^3$ is $—CH_2$-phenyl, unsubstituted or substituted with one or more of

1) hydroxy,

2) $C_{1-3}$ alkoxy unsubstituted or substituted with one or more of

i) —OH,

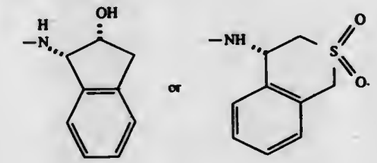
ii) $C_{1-3}$ alkoxy, or

iii) phenyl,

3) $—O(CH_2)_2$-morpholinyl, or

4) $—O—((CH_2)_mO)_p—R$ wherein m is 2–5, p is 1–4 and R is hydrogen or $C_{1-4}$ alkyl;

and J is



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**5,502,054**

**6-SUBSTITUTED-3,5-DIAMINO-1,2,4-TRIAZINES AS INSECTICIDES**

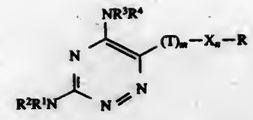
**Clinton J. Peake, Trenton, and Thomas G. Cullen, Milltown, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.**

**Continuation-in-part of Ser. No. 338,288, Nov. 10, 1994, abandoned, which is a continuation of Ser. No. 289,000, Aug. 11, 1994, abandoned. This application Apr. 18, 1995, Ser. No. 424,144**

**Int. Cl.[6] C07D** *253/075;* **A01N** *43/707*

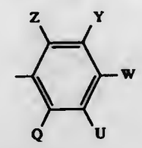
**U.S. Cl. 514—242** **15 Claims**

1. An insecticidal composition comprising, in admixture with an agriculturally acceptable carrier, an insecticidally effective amount of a 1,2,4-triazine compound of the formula



wherein

m is 1 to 12; n is 0 or 1; T is $CH_2$, CH═CH, or C≡C; X is $Si(CH_3)_2$, $C(CH_3)_2$, $CH(CH_3)$, or O; and R is methyl, vinyl, cyclopentyl, phenyl, naphthyl, or a substituted phenyl of the formula:



wherein

Q is hydrogen or chloro; U is hydrogen, chloro, trifluoromethyl, phenyl, or 4-fluorophenyl; W is hydrogen, ethyl, chloro, trifluoromethyl, or propylsulfonyl; Y is hydrogen, chloro, bromo or trifluoromethyl; and Z is hydrogen;

$R^1$, $R^2$, $R^3$, and $R^4$ are independently selected from the group consisting of hydrogen, $—CH_3$, $—C_2H_5$, or $—C(=O)R^5$, where $R^5$ is straight or branched chain lower alkyl of one to three carbon atoms, $—CH_2OCH_2CH_3$, $—CH_2OCH_2CH_2CH_3$, $—CH_2CH_2OCH_3$, or $—CH_2CH_2OCH_2CH_3$;

with the proviso that when T is alkylene or acetylene, m must be 1;

and agriculturally acceptable salts thereof.

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**5,502,055**

**TREATMENT OF ENDOTOXIC SHOCK WITH PUTRESCINE**

**Soo-Ray Wang, Taipei, Taiwan, assignor to National Science Council, Taipei, Taiwan**

**Filed Aug. 2, 1995, Ser. No. 510,582**

**Int. Cl.[6] A61K** *31/495*

**U.S. Cl. 514—250** **6 Claims**

1. A method for protecting a living subject from endotoxic shock, comprising administering to said subject a pharmaceutical composition which comprises an effective amount of putrescine and a pharmaceutically acceptable carrier.

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**5,502,056**

**CAFFEINE CONTAINING COMPOSITION**

**Richard Breitbarth, 10 Old Bloomfield Ave. P.O. Box 682, Pinebrook, N.J. 07058**

**Filed May 27, 1994, Ser. No. 249,365**

**Int. Cl.[6] A61K** *31/52;7/00;33/44*

**U.S. Cl. 514—263** **26 Claims**

1. A composition having stimulant and antisoporific properties comprising caffeine solubilized with para-aminobenzoic acid affixed to non-metallic ionically charged microparticulate carrier particles in the form of a microdispersion in a pharmaceutically acceptable vehicle wherein said caffeine is present in an amount of 12–17%, said solubilizing agent is present in an amount of 12–17% and said non-metallic ionically charged microparticulate carrier particles are present in an amount of 4–4.5%.

## 5,502,057

## POLYSUBSTITUTED PYRIDINES USEFUL FOR TREATING LIPOPROTEINANAEMIA AND ARTERIOSCLEROSIS

**Rolf Angerbauer; Peter Fey; Walter Hübsch, all of Wuppertal; Thomas Philippa, Cologne; Hilmar Bischoff, Wuppertal; Dieter Petzinna, Düsseldorf; Delf Schmidt, Wuppertal, all of, Germany, and Günter Thomas, Arese, Italy, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany**

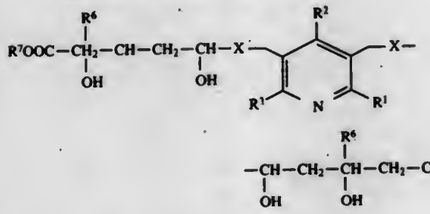
**Continuation of Ser. No. 587,700, Sep. 25, 1990, abandoned, which is a continuation-in-part of Ser. No. 298,453, Jan. 17, 1989, Pat. No. 4,968,689. This application Jul. 14, 1993, Ser. No. 92,655**

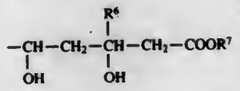
**Claims priority, application Germany, Jan. 20, 1988, 38 01 440.8; Italy, Jul. 29, 1988, 21587/A 88**

**Int. Cl.[6] C07D** *213/55;213/57;213/30;* **A61K** *31/44*

**U.S. Cl. 514—277** **5 Claims**

1. A disubstituted pyridine of the formula





in which

$R^1$ is phenyl or naphthyl optionally substituted by a member selected from the group consisting of lower alkyl, lower alkoxy, lower alkylthio, lower alkylsulphonyl, phenyl, phenyloxy, fluorine, chlorine, bromine, cyano, trifluoromethyl, trifluoromethoxy, trifluoromethylthio or lower alkoxycarbonyl, or by a group of the formula $—NR^4R^5$,

where

$R^4$ and $R^5$ each independently is lower alkyl, phenyl or benzyl,

$R^2$ is cyclopropyl, cyclopentyl, cyclohexyl, or is lower alkyl,

$R^3$ is hydrogen, cyclopropyl, cyclopentyl, or lower alkyl,

X each independently is —CH=CH— or $—CH_2—CH_2—$ and

$R^6$ each independently is hydrogen or lower alkyl, and

$R^7$ each independently is lower alkyl, phenyl, benzyl, or a physiologically tolerable cation.

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## 5,502,058

## METHOD FOR THE TREATMENT OF PAIN

**David J. Mayer; Donald D. Price; Jianren Mao, all of Richmond, Va., and John W. Lyle, Belmar, N.J., assignors to Virginia Commonwealth University, Richmond, Va.**

**Continuation of Ser. No. 95,107, Jul. 21, 1993, which is a continuation-in-part of Ser. No. 27,177, Mar. 5, 1993, Pat. No. 5,352,683. This application May 19, 1994, Ser. No. 246,184**

**Int. Cl.[6] A61K** *31/485*

**U.S. Cl. 514—289** **5 Claims**

1. A method of alleviating pain which comprises administering to a mammal that is either exhibiting pain or is about to be subjected to a pain-causing event a pain-alleviating amount of (a) at least one member selected from the group consisting of dextromethorphan, dextrorphan, their mixtures and their pharmaceutically acceptable salts and (b) lidocaine or pharmaceutically acceptable salt thereof with (a) being administered prior to, with or following the administration of (b).

## 5,502,059

## SUBSTITUTED 1-NAPHTHYL-3-PYRAZOLECARBOXAMIDES WHICH ARE ACTIVE ON NEUROTENSIN, THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

**Bernard Labeeuw, Montpellier; Danielle Gully, Saubens; Francis Jeanjean, Vaillaunes; Jean-Charles Molimard, St. Gely Du Fesc, and Robert Boigegrain, Asnas, all of, France, assignors to Sanofi, Paris, France**

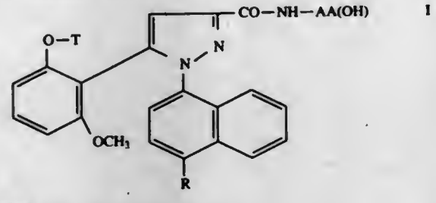
**Filed Oct. 11, 1994, Ser. No. 320,270**

**Claims priority, application France, Jan. 12, 1993, 93 12136**

**Int. Cl.[6] C07D** *231/10;471/16;413/00;403/00;* **A61K** *31/415;31/44;31/535*

**U.S. Cl. 514—296** **8 Claims**

1. A compound of formula:



in which:

R represents a group chosen from:

—CN, $—C(NH_2)=N—OH$, $—C(NR_4R_5)=NR_6$,

$—CONR_1R_2$, $—CON(R_7)(CH_2)_pNR_1R_2$,

$—CON(R_7)(CH_2)_qCN$, $—CON(R_7)(CH_2)_qC(NR_{14}R_{15})=N—R_{16}$,

$—CH_2CN$, $—CH_2CONR_1R_2$, $—CH_2CON(R_7)(CH_2)_pNR_1R_2$,

$—CH_2CON(R_7)(CH_2)_qCN$, $—CH_2COOR_7$,

$—O(CH_2)_nNR_1R_2$, $—O(CH_2)_nCONR_1R_2$,

$—O(CH_2)_nCOOR_7$, $—O(CH_2)_nSO_2NR_1R_2$,

$—N(R_7)COR_3$, $—N(R_7)CO(CH_2)_nNR_1R_2$,

$—N(R_7)CO(CH_2)_nNHCOR_3$, $—N(R_7)SO_2R_8$,

$—N(R_7)CONR_9R_{10}$, $—CH_2N(R_7)COR_3$,

$—CH_2N(R_7)SO_2R_8$, $—CH_2CH_2NR_{11}R_{12}$,

$—CH_2CH_2N(R_7)COR_3$, $—CH_2CH_2N(R_7)SO_2R_8$,

$—SO_2NR_1R_2$, $—SO_2N(R_7)(CH_2)_nNR_1R_2$,

$—CH_2CON(R_7)(CH_2)_qC(NR_{14}R_{15})=NR_{16}$

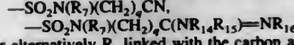
$—N(R_7)CO(CH_2)_qCN$,

$—N(R_7)CO(CH_2)_qC(NR_{14}R_{15})=NR_{16}$,

$—SO_2N(R_7)(CH_2)_qCN$,

$—SO_2N(R_7)(CH_2)_qC(NR_{14}R_{15})=NR_{16}$;

or alternatively R, linked with the carbon atom at position 5 of the naphthyl radical, forms a group:



p=2 to 6;

n=1 to 6;

q=1 to 5;

$R_1$ and $R_2$ each independently represent a hydrogen or a $(C_1–C_4)$ alkyl; or $R_1$ and $R_2$, together with the nitrogen atom to which they are attached, represent a heterocycle chosen from: pyrrolidine, piperidine, piperazine substituted at position 4 with $R_7$, morpholine or thiomorpholine;

$R_3$ represents hydrogen; a $(C_1–C_8)$ alkyl; a $(C_3–C_6)$ cycloalkyl; a phenyl; a piperidyl;

$R_4$ and $R_5$ each independently represent a hydrogen or a $(C_1–C_4)$ alkyl;

$R_6$ represents a $(C_1–C_4)$ alkyl;

$R_7$ represents a hydrogen or a $(C_1–C_4)$ alkyl;

$R_8$ represents a $(C_1–C_4)$ alkyl;

$R_9$ and $R_{10}$ each independently represent a hydrogen or a $(C_1–C_4)$ alkyl; $R_{10}$ can, furthermore, represent a group $—(CH_2)_nNR_1R_2$;

or $R_9$ and $R_{10}$, together with the nitrogen atom to which they are attached, represent a heterocycle chosen from: pyrrolidine, piperidine, piperazine substituted at position 4 with $R_7$, morpholine or thiomorpholine;



$R_{11}$ and $R_{12}$ each independently represent a hydrogen or a $(C_1–C_4)$ alkyl; or $R_{11}$ and $R_{12}$, together with the nitrogen atom to which they are attached, represent pyrrolidine or piperidine;

$R_{13}$ represents a hydrogen; a group $—(CH_2)_nNR_1R_2$; a group $—NHCOR_3$;

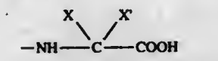
$R_{14}$ and $R_{15}$ each independently represent a hydrogen or a $(C_1–C_4)$ alkyl;

$R_{16}$ represents a hydrogen; $R_{16}$ can, furthermore, represent a $(C_1–C_4)$ alkyl when $R_{14}$ represents a hydrogen and $R_{15}$ represents a $(C_1–C_4)$ alkyl;

or $R_{14}$ and $R_{16}$ together represent an ethylene group or a trimethylene group and $R_{15}$ represents a hydrogen or a $(C_1–C_4)$ alkyl;

T represents hydrogen; a $(C_1–C_4)$ alkyl; an allyl; a $(C_3–C_8)$ cycloalkyl; a $(C_3–C_8)$ cycloalkylmethyl; a methoxyethyl;

the group —NH—AA(OH) represents the residue of an amino acid:



where X is hydrogen and X' is hydrogen, a $(C_1–C_5)$ alkyl or a non-aromatic $C_3–C_{15}$ carbocyclic radical; or alternatively X and X', together with the carbon atom to which they are attached, form a non-aromatic $C_3–C_{15}$ carbocycle; and its salts.

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## 5,502,060

## HIV PROTEASE INHIBITORS

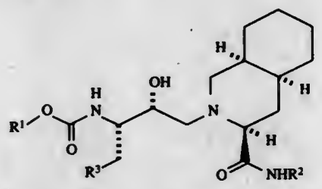
**Wayne J. Thompson; Arun K. Ghosh, both of Lansdale; Joel R. Huff, Gwynedd Valley, and Hee Y. Lee, Hatfield, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.**

**Continuation of Ser. No. 144,894, Oct. 27, 1993, abandoned, which is a continuation of Ser. No. 929,991, Aug. 21, 1992, abandoned, which is a continuation-in-part of Ser. No. 781,470, Oct. 23, 1991, abandoned. This application Oct. 25, 1994, Ser. No. 328,936**

**Int. Cl.[6] C07D** *217/02;* **A61K** *31/47*

**U.S. Cl. 514—307** **13 Claims**

1. A compound



wherein:

$R^1$ is a) 5- to 7- membered carbocylic ring which is either saturated, partially saturated or unsaturated, the carbocylic ring being unsubstituted or substituted with one or more of $C_{1-4}$ alkyl, $C_{2-4}$ alkenyl, $C_{1-3}$ alkoxy, halo-$C_{1-3}$ alkyl, aryl-$C_{1-3}$ alkyl, or $C_{3-5}$ cycloalkyl; or

b) 5- to 7-membered heterocyle having one heteroatom selected from O or S, any of which heterocycle is unsubstituted or substituted with one or more of $C_{1-4}$ alkyl, $C_{2-4}$ alkenyl, oxo, $C_{3-5}$ cycloalkyl, or $C_{1-3}$ alkoxy;

$R^2$ is a) $C_{1-5}$ alkyl, unsubstituted or substituted with one or more of —OH or $C_{1-3}$ alkoxy; or

5- to 7-membered carbocyclic ring which is either saturated, partially saturated or unsaturated, the carbocyclic ring being unsubstituted or substituted with one or more of $C_{1-4}$ alkyl, $C_{2-4}$ alkenyl, $C_{1-3}$ alkoxy, or hydroxy;

$R^3$ is a) Phenyl unsubstituted or substituted with one or more of —OH or $C_{1-3}$ alkoxy; or

$C_{3-7}$ cycloalkyl unsubstituted or substituted with one or more of —OH or $C_{1-3}$ alkoxy,

or pharmaceutically acceptable salt or hydrate thereof.

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## 5,502,061

## PEPTIDYL SUBSTITUTED BENZAMIDES AND NAPHTHAMIES

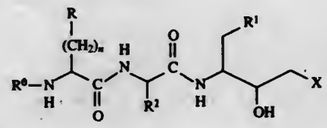
**Kwan Y. Hui, Carmel; Charles D. Jones, Indianapolis; Louis N. Jungheim, Indianapolis, and Pamela A. Pennington, Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.**

**Continuation of Ser. No. 995,282, Dec. 22, 1992, abandoned. This application Sep. 26, 1994, Ser. No. 312,491**

**Int. Cl.[6] A61K** *37/02;* **C07D** *213/40;295/26;303/36;* **C07C** *49/11;31/125;251/38;275/18*

**U.S. Cl. 514—311** **32 Claims**

1. A compound of formula I



wherein:

$R^0$ is hydrogen, $C_1–C_6$ alkoxycarbonyl, or $C_2–C_6$ alkanoyl;

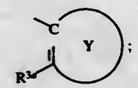
n is 0, 1 or 2;

R is phenyl, naphthyl or indolyl;

$R^1$ is phenyl, naphthyl or $—S-R^{1a}$, where $R^{1a}$ is phenyl or naphthyl;

$R^2$ is $—CH(CH_3)_2$, $—CH_2C(O)NH_2$, $CH_2$-imidazolyl, cyano $(C_1–C_4)$-alkyl, $—CH_2SCH_3$ or $—CH_2C(O)-R^{2a}$, where $R^{2a}$ is $C_1–C_4$ alkylamino;

X is a group having the structure:



Y is phenyl or naphthyl;

$R^{3a}$ is a group having the structure:

$—C(O)-NR^4R^4$;

$R^4$ at each occurrence is independently hydrogen, $C_1–C_6$ alkyl or hydroxy $(C_1–C_4)$ alkyl;

or a pharmaceutically acceptable salt thereof.

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## 5,502,062

## 2-AMINO-4-QUINOLYL-DIHYDROPYRIDINES, PROCESSES FOR THEIR PREPARATION, AND THEIR USE

**Jürgen Stoltefuss, Haan; Siegfried Goldmann, Wuppertal; Alexander Straub, Wuppertal; Martin Bechem, Wuppertal; Rainer Gross, Wuppertal; Siegbert Hebisch, Bottrop; Joachim Hütter, and Howard-Paul Rounding, both of Wuppertal, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany**

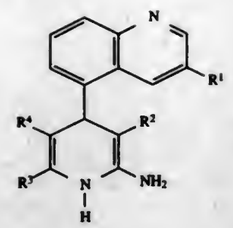
**Filed Apr. 20, 1994, Ser. No. 230,187**

**Claims priority, application Germany, Apr. 27, 1993, 43 13 693.1**

**Int. Cl.[6] C07D** *401/04;401/14;* **A61K** *31/47;31/44*

**U.S. Cl. 514—314** **6 Claims**

1. A 2-amino-4-quinolyl-1,4-dihydropyridine of the



(I)

in which

$R^1$ represents phenyl which is optionally substituted up to 2 times by identical or different substituents selected from the group consisting of fluorine, chlorine, nitro, trifluoromethyl, methyl, ethyl, methoxy, ethoxy, dimethylamino or hydroxyl, or represents thienyl or pyridyl,

$R^2$ represents a group of the formula —CO—$NR^5R^6$ or —CO—A—$R^7$,

in which

$R^5$ and $R^6$ are identical or different and denote hydrogen or a straight-chain, branched, cyclic, saturated or unsaturated hydrocarbon radical having up to 5 carbon atoms which is optionally substituted by, fluorine or chlorine or by phenyl which is optionally substituted by fluorine chlorine, methyl, methoxy, methylthio, trifluoromethyl or trifluoromethoxy, or denote phenyl which is optionally substituted by fluorine or chlorine or by methyl, methoxy, trifluoromethyl or trifluoromethoxy,

A denotes a direct bond or an oxygen atom,

$R^7$ denotes hydrogen or phenyl, or denotes a, straight-chain or branched, saturated or unstaturated hydrocarbon radical having up to 8 carbon atoms which is optionally interrupted by oxygen or by —CO—, —CO—NH—, —O—CO—, —CO—O—, —NH—CO—, —$SO_2$—NH—, —NH—$SO_2$—, —S(O)$_b$— or —$NR^9$,

in which

b denotes a number 0, 1 or 2,

$R^9$ denotes hydrogen or phenyl, or denotes a cyclic, saturated or unsaturated, straight-chain or branched hydrocarbon radical having up to 4 carbon atoms which is optionally substituted by fluorine, chlorine or bromine or by phenyl,

or the hydrocarbon radical is interrupted up to 2 times by identical or different interruptions selected from the group consisting of phenylidene, and where the hydrocarbon radical is optionally substituted up to 2 times by identical or different substituents wherein said substituents are cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, fluorine, chlorine, nitro, cyano, hydroxyl, —O—$NO_2$ or straight-chain or branched alkylthio, alkoxy or acyloxy having in each case up to 2 carbon atoms, trifluoromethyl or trifluoromethoxy, or is substituted by a group of the formula —$CO_2$—$R^{10}$, —$CONR^{11}R^{12}$ or —$NR^{13}R^{14}$,

in which

$R^{10}$ has the meaning of $R_9$ given above, and is identical or different to the latter,

and

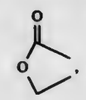
$R^{11}$, $R^{12}$, $R^{13}$ and $R^{14}$ have the meaning of $R^5$ and $R^6$ given above, and are identical or different to the latter,

$R^3$ represents hydrogen, methyl or ethyl,

$R^4$ represents nitro or formyl,

or

$R^3$ and $R^4$ together form a lactone ring of the formula



or salt thereof.

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**5,502,063**

**1-HALOPYRIDIN-4-AMINO-4-ALKYLPIPERIDINES**

**Marco Baroni, Vanzago; Tiziano Croci, Milan; Marco Landi, Bussero; Umberto Guzzi, Milan, all of, Italy, and Dino Nisato, Saint Georges d'Orques, France, assignors to Sanofi, Paris, France**

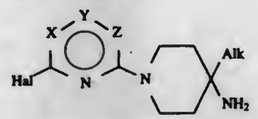
**Filed Oct. 7, 1994, Ser. No. 319,595**

**Claims priority, application European Pat. Off., Jan. 11, 1993, 93402498**

**Int. Cl.[6] A61K *31/44;31/445;* C07D *401/04***

**U.S. Cl. 514—318** **9 Claims**

1. A compound of formula (I):



(I)

in which Hal is a halogen atom, Alk is a ($C_1$–$C_4$)alkyl group and X, Y and Z are each —CH=, and its pharmaceutically acceptable or unacceptable salts.

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**5,502,064**

**4-HETEROCYCLYL-SUBSTITUTED DIHYDROPYRIDINES**

**Bodo Junge; Wolfgang Hartwig; Heinrich Meier; Rudolf Schohe-Loop, all of Wuppertal, Germany; Zhan Gao, Beijing, China; Bernard Schmidt, Lindlar, Germany; Maarten de Jonge, Overath, Germany, and Teunis Schuurman, Lohmar, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany**

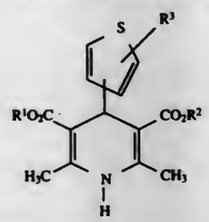
**Filed Oct. 22, 1993, Ser. No. 141,846**

**Claims priority, application Germany, Jan. 30, 1992, 42 36 707.7**

**Int. Cl.[6] C07D *409/04;* A61K *31/44***

**U.S. Cl. 514—336** **2 Claims**

1. A 4-heterocyclyl-substituted dihydropyridine of the formula



(I)

in which

$R^1$ is cyclopropyl, cyclopentyl, cyclohexyl or cycloheptyl, or is straight-chain or branched alkyl having up to 6 carbon atoms, which is optionally substituted by straight-chain or branched alkoxy having up to 4 carbon atoms, cyano, cyclopropyl, cyclopentyl, cyclohexyl, cycloheptyl or phenoxy, which is optionally substituted up to 3 times by identical or different fluorine or cyano substituents or by straight-chain or branched alkyl or alkoxy each having up to 4 carbon atoms,



$R^2$ is a methoxylethyl moiety

and

$R^3$ is trifluoromethyl or cyano,

or a salt thereof.

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**5,502,065**

**INDOLE DERIVATIVES AS 5-$HT_1$-LIKE AGONISTS**

**Alan D. Brown; Roger P. Dickinson, and Martin J. Wythes, all of Sandwich, United Kingdom, assignors to Pfizer Inc., New York, N.Y.**

**PCT No. PCT/EP93/00867, § 371 Date Sep. 21, 1994, § 102(e) Date Sep. 21, 1994, PCT Pub. No. WO93/21178, PCT Pub. Date Oct. 28, 1993**

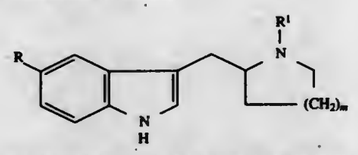
**PCT Filed Apr. 8, 1993, Ser. No. 307,566**

**Claims priority, application United Kingdom, Apr. 14, 1992, 9208161**

**Int. Cl.[6] A61K *31/44;* C07D *209/04;213/04***

**U.S. Cl. 514—339** **11 Claims**

1. A compound of formula (I):



(I)

or a pharmaceutically acceptable salt thereof, wherein

R is phenyl, pyridinyl, pyridazinyl, pyrimidinyl, pyrazinyl, furyl or thienyl, all of which may be optionally substituted by halo, $C_1$–$C_4$ alkyl, $C_1$–$C_4$ alkoxy or a group of the formula:

—X—$R^2$;

$R^1$ is H, $C_1$–$C_6$ alkyl, $C_3$–$C_7$ cycloalkyl, $C_5$–$C_7$ cycloalkenyl, $C_3$–$C_6$ alkenyl or $C_3$–$C_6$ alkynyl, said alkyl group being optionally substituted by $C_3$–$C_7$ cycloalkyl, $C_3$–$C_7$ cycloalkyloxy, OH, $C_1$–$C_6$ alkoxy, $CONR^3R^4$, $SO_2NR^3R^4$, $COR^5$, $SOR^5$, $SO_2R^5$, $CO_2R^6$, aryl, aryloxy, aryl($C_1$–$C_6$)alkoxy or heteroaryl, said alkenyl group being optionally substituted by aryl and said cycloalkyl group being optionally substituted by OH; the cycloalkyl and cycloalkenyl groups of the foregoing groups being optionally linked to the N-atom by a $C_1$–$C_2$ alkylene moiety;

$R^2$ is $COR^7$, $CO_2R^7$, $SOR^7$, $SO_2R^7$, $CONR^3R^4$, $SO_2NR^3R^4$, $NHCOR^7$, $NHCONR^3R^4$, $NHSO_2R^7$, $NHSO_2NR^3R^4$, OH or CN,

$R^3$ and $R^4$ are either each independently selected from H, $C_3$–$C_7$ cycloalkyl and $C_1$–$C_6$ alkyl, said alkyl group being optionally substituted by $C_3$–$C_7$ cycloalkyl or aryl, or $R^3$ and $R^4$ taken together represent $C_3$–$C_6$ alkylene optionally interrupted by 0, S(O)$_n$, NH or N($C_1$–$C_6$ alkyl);

$R^5$ is $C_1$–$C_6$ alkyl, $C_3$–$C_7$ cycloalkyl, $C_3$–$C_7$ cycloalkyl($C_1$–$C_6$)alkylene, aryl($C_1$–$C_6$)alkylene or aryl; $R^6$ is $C_1$–$C_6$ alkyl, $C_3$–$C_7$ cycloalkyl or aryl($C_1$–$C_6$)alkylene;

$R^7$ is $C_1$–$C_6$ alkyl;

X is a direct link or $C_1$–$C_7$ alkylene;

m is 1 or 2;

n is 0, 1 or 2; "aryl", when used in the definitions of $R^1$, $R^3$, $R^4$, $R^5$ and $R^6$, means phenyl optionally substituted by $C_1$–$C_6$ alkyl, $C_1$–$C_6$ alkoxy or halo; and "heteroaryl", used in the definition of $R^1$, means pyridinyl, pyrimidinyl, pyrazinyl, furyl, thienyl, pyrrolyl, thiazolyl or oxazolyl.

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**5,502,066**

**1,2,4-DITHIAZOLIUM SALTS AS CHEMOTHERAPEUTICS**

**Ulrich Heinemann, Leichlingen; Ralf Tiemann, Leverkusen, and Klaus Stünkel, Wuppertal, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany**

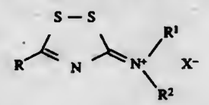
**Filed Jun. 10, 1994, Ser. No. 258,118**

**Claims priority, application Germany, Jun. 18, 1993, 43 20 157.1**

**Int. Cl.[6] A61K *31/41;* C07D *285/01***

**U.S. Cl. 514—360** **6 Claims**

1. A method of inhibiting TNF-α in a patient in need thereof which comprises administering to such patient an amount effective therefor of a 1,2,4-dithiazolium salt of the formula



(I)

in which

R represents a radical of the formula —S—$R^3$ or —$NR^4R^5$,

$R^1$ represents straight-chain or branched alkyl having 1 to 8 carbon atoms, or represents aryl having 6 to 10 carbon atoms which is optionally substituted once or several times by identical or different substituents, wherein the substituents are:

halogen, cyano, nitro, in each case straight-chain or branched alkyl, alkoxy, alkylthio, alkylsulphinyl or alkylsulphonyl having in each case 1 to 4 carbon atoms, in each case straight-chain or branched halogenoalkyl, halogenoalkoxy, halogenoalkylthio, halogenoalkylsulphinyl or halogenoalkylsulphonyl having in each case 1 to 4 carbon atoms and 1 to 9 identical or different halogen atoms, in each case straight-chain or branched alkoxycarbonyl or alkoximinoalkyl having in each case 1 to 4 carbon atoms in the individual alkyl parts and phenyl which is optionally substituted once or several times by identical or different substituents wherein the substituents are halogen and/or straight-chain or branched alkyl and/or straight-chain or branched alkoxy and/or straight-chain or branched halogenoalkyl and/or straight-chain or branched halogenoalkoxy having in each case 1 to 4 carbon atoms and, optionally, 1 to 9 identical or different halogen atoms, and

$R^2$ represents straight-chain or branched alkyl having 1 to 8 carbon atoms, or

$R^1$ and $R^2$, together with the nitrogen atom to which they are bonded, represent a saturated five- to seven-membered heterocyclic radical which is optionally substituted once or several times by identical or different substituents and optionally contains further heteroatoms wherein the heteroatoms are selected from the group consisting of nitrogen, oxygen and sulphur and the substituents are:

halogen, in each case straight-chain or branched alkyl or alkoxy having in each case 1 to 4 carbon atoms or in each case straight-chain or branched halogenoalkyl or halogeno alkoxy having in each case 1 to 4 carbon atoms and 1 to 9 identical or different halogen atoms, and

X represents the anion of an inorganic acid, and wherein

$R^3$ represents straight-chain or branched alkyl having 1 to 8 carbon atoms, or represents arylalkyl having 6 to 10 carbon atoms in the aryl part and 1 to 4 carbon atoms in the straight-chain or branched alkyl part or heteroarylalkyl having 2 to 9 carbon atoms and 1 to 3 identical or different heteroatoms wherein the heteroatoms are nitrogen, oxygen and sulphur in the heteroaryl part and 1 to 4 carbon atoms in the straight-chain or branched alkyl part, in each case optionally substituted in the aryl or heteraryl part once or several times by identical or different substituents, wherein the substituents are:

halogen, cyano, nitro, carbamoyl, in each case straight-chain or branched alkyl, alkoxy or alkoxycarbonyl having in each case 1 to 4 carbon atoms or in each case straight-chain or

branched halogenoalkyl or halogenoalkoxy having in each case 1 to 4 carbon atoms and 1 to 9 identical different halogen atoms,

$R^4$ represents in each case straight-chain or branched alkyl, alkenyl or alkynyl having each case up to 8 carbon atoms, or represents straight-chain or branched halogenoalkyl having 1 to 8 carbon atoms and 1 to 17 identical or different halogen atoms, or represents in each case straight-chain or branched cyanoalkyl, dioxolanylalkyl, alkoxyalkyl or dialkylaminoalkyl having in each case 1 to 8 carbon atoms in the individual alkyl parts, or represents cycloalkylalkyl having from 3 to 8 carbon atoms in the cycloalkyl part and 1 to 8 carbon atoms in the straight-chain or branched alkyl part, or represents aryl having 6 to 10 carbon atoms, arylalkyl having 6 to 10 carbon atoms in the aryl part and 1 to 4 carbon atoms in the straight-chain or branched alkyl part or heteroarylalkyl having 2 to 9 carbon atoms and 1 to 3 identical or different heteroatoms wherein the heteroatoms are nitrogen, oxygen and sulphur in the heteroaryl part and 1 to 4 carbon atoms in the straight-chain or branched alkyl part, in each case optionally substituted in the aryl or heteroaryl part once or several times by identical or different substituents, wherein the substituents are:

halogen, in each case straight-chain or branched alkyl or alkoxy having in each case 1 to 4 carbon atoms or in each case straight-chain or branched halogenoalkyl or halogenoalkoxy having in each case 1 to 4 carbon atoms and 1 to 9 identical or different halogen atoms, and

$R^5$ represents in each case straight-chain or branched alkyl or alkenyl having in each case up to 8 carbon atoms, or represents arylalkyl having 6 to 10 carbon atoms in the aryl part and 1 to 4 carbon atoms in the straight-chain or branched alkyl part, which is optionally substituted in the aryl part once or several times by identical or different substituents, wherein the substituents are:

halogen, in each case straight-chain or branched alkyl or alkoxy having in each case 1 to 4 carbon atoms or in each case straight-chain or branched halogenoalkyl or halogenoalkoxy having in each case 1 to 4 carbon atoms and 1 to 9 identical or different halogen atoms, or

$R^4$ and $R^5$, together with the nitrogen atom to which they are bonded, represent a saturated five-to seven-membered heterocyclic radical which can optionally contain further heteroatoms wherein said heteroatoms are nitrogen, oxygen and/or sulphur and which is optionally substituted once or several times by identical or different substituents, wherein the substituents are:

halogen, in each case straight-chain or branched alkyl or alkoxy having in each case 1 to 4 carbon atoms or in each case straight-chain or branched halogenoalkyl or halogenoalkoxy having in each case 1 to 4 carbon atoms and 1 to 9 identical or different halogen atoms.

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**5,502,067**

## TREATING APNEAHYPOPNEA/SNORING IN HUMANS

**Julia A. Morgan, 8398 Harvest St., Richland, Mich. 49083**

**Continuation-in-part of Ser. No. 191,786, Feb. 4, 1994, Pat. No. 5,407,953. This application Jan. 9, 1995, Ser. No. 370,202**

**Int. Cl.[6] A61K** *31/415*

**U.S. Cl. 514—397** **7 Claims**

1. A method for treating sleep apnea and hypopnea and snoring in a human patient suffering from such conditions which comprises administering to said patient a compound resulting in the release of pilocarpine in an amount effective to reduce or eliminate such apnea and hypopnea and/or snoring conditions in such patient during the treatment interval.

**5,502,068**

## CYCLOPROPYLPYRROLOINDOLE-OLIGOPEPTIDE ANTICANCER AGENTS

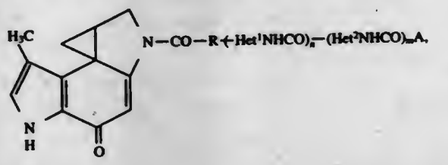
**J. William Lown; Yuqiang Wang, and Weide Luo, all of Edmonton, Canada, assignors to Symphar Laboratories, Inc., Alberta, Canada**

**Filed Jan. 31, 1995, Ser. No. 381,355**

**Int. Cl.[6] A61K** *31/40;* **C07D** *487/04*

**U.S. Cl. 514—397** **20 Claims**

**20.** A method of treating solid and blood-borne cancers selected from the group consisting of nasopharyngeal tumors and lymphocytic leukemia comprising administering to a patient in need of such treatment, an amount of a compound of the formula:



wherein,

$Het^1$ and $Het^2$ are individually selected from the group consisting of pyrrole, imidazole, N-alkylimidazole, N-alkoxymethylimidazole, triazole, thiophene, furan, thiazole, oxazole, N-alkylpyrrole, N-alkoxymethylpyrrole and pyrazole,

R is selected from the group consisting of a valence bond; a divalent $C_1$–$C_6$ alkyl; a divalent $C_2$–$C_6$ alkenyl; a divalent $C_2$–$C_6$ alkynyl; a divalent cycloalkane of formula $C_pH_{2p-2}$ wherein p is 3 to 7; and an ortho, meta or para linked aromatic group,

A is selected from the group consisting of a $C_1$–$C_6$ alkyl group; an amidine or derivative thereof; a guanidine; a secondary, tertiary or quaternary ammonium salt; and a sulfonium salt,

n is 0 to 3, and

m is 0 to 3,

wherein when n=0, m is 1–3,

effective to treat said solid and blood-borne cancers.

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**5,502,069**

## 1-THIOCARBAMOYL-5-HYDROXY-PYRAZOLES AS MICROBICIDES

**Klaus Sasse, Bergisch Gladbach; Peter Wachtler, Cologne; Georg-Wilhelm Ludwig, and Wilfried Paulus, both of Krefeld, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany**

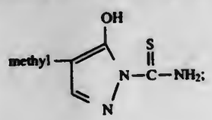
**Continuation of Ser. No. 84,781, Jun. 29, 1993, abandoned, which is a continuation of Ser. No. 884,679, May 18, 1992, abandoned. This application Sep. 7, 1994, Ser. No. 302,076**

**Claims priority, application Germany, May 28, 1991, 41 17 385.6**

**Int. Cl.[6] A01N** *43/56*

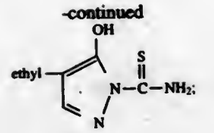
**U.S. Cl. 514—404** **2 Claims**

1. A process for the preservation of an industrial material which comprises applying to said material a microbicidally effective amount of a compound selected from the group consisting of:

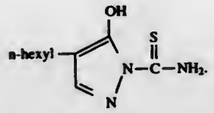




-continued



and



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**5,502,070**

## SUBSTITUTED 3,4-HETARYL-PYRAZOLINES

**Rainer Fuchs, Wuppertal; Reiner Fischer, Monheim; Christoph Erdelen, Leichlingen, and Wilhelm Stendel, Wuppertal, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany**

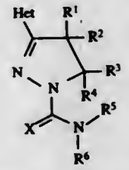
**Filed Sep. 30, 1993, Ser. No. 129,923**

**Claims priority, application Germany, Jan. 7, 1992, 42 33 717.8**

**Int. Cl.[6] C07D** *403/14;* **A01N** *47/38*

**U.S. Cl. 514—406** **6 Claims**

1. A substituted 3,4-hetaryl-pyrazoline of the formula

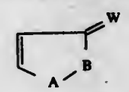


(I)

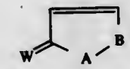
in which

$R^1$ represents an optionally substituted pyrrolyl, pyrazolyl, imidazolyl, 1,2,3-triazolyl, tetrazolyl, pyridonyl, 1,2,4-triazolyl or triazinyl radical, or

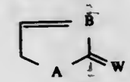
$R^1$ furthermore represents an azolinone, azolinethione or azolinimino radical, which is unsubstituted or mono- or disubstituted by identical or different substituents and bonded via nitrogen, selected from the group consisting of



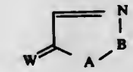
($R^1$-a)



($R^1$-b)

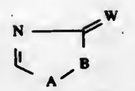


($R^1$-c)

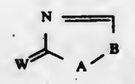


($R^1$-d)

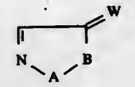
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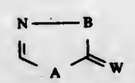
($R^1$-e)



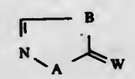
($R^1$-f)



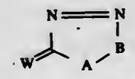
($R^1$-g)



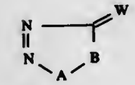
($R^1$-h)



($R^1$-i)

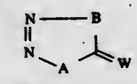


($R^1$-k)



($R^1$-l)

and



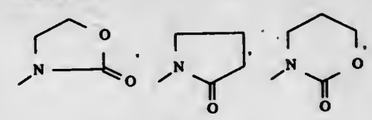
($R^1$-m)

wherein

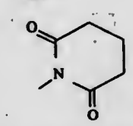
one of the groups A or B represents nitrogen and in each case the other (A or B) represents oxygen or sulphur, or represents the group —N-alkyl($C_1$–$C_4$—), or represents a methylene grouping —$CH_2$— or a CH group,

W represents oxygen or sulphur, or represents the group —N-alkyl ($C_1$–$C_4$), or

$R^1$ furthermore represents a heterocyclic ring, which is unsubstituted or mono- to trisubstituted, selected from the group consisting of



and



wherein said substituents on the heterocyclic rings identified above are selected from the group consisting of fluorine, chlorine, bromine, iodine, cyano, nitro, hydroxyl, amino,

alkyl($C_1$–$C_4$), alkoxy($C_1$–$C_4$), alkyl($C_1$–$C_4$)thio, halogenoalkyl($C_1$–$C_2$), halogenoalkoxy($C_1$–$C_2$), halogenoalkyl($C_1$–$C_2$)thio, alkyl($C_1$–$C_3$)amino, dialkyl($C_1$–$C_3$)amino, dihalogenoalkyl ($C_1$–$C_2$)amino, alkoxy($C_1$–$C_4$)carbonyl and phenyl which is optionally substituted by fluorine, chlorine, bromine, methyl, ethyl, methoxy, ethoxy, halogenoalkyl($C_1$–$C_2$), halogenoalkoxy($C_1$–$C_2$) or halogenoalkyl($C_1$–$C_2$)thio,

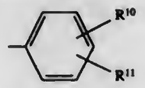
$R^2$ represents hydrogen, alkyl($C_1$–$C_4$), cycloalkyl($C_3$–$C_6$) which is optionally substituted by fluorine, chlorine, bromine or halogenoalkyl($C_1$–$C_3$); halogenoalkyl($C_1$–$C_3$)thio or alkoxy($C_1$–$C_4$)carbonyl,

$R^3$ represents hydrogen or alkyl($C_1$–$C_4$),

$R^4$ represents hydrogen or alkyl($C_1$–$C_4$),

$R^5$ represents hydrogen, alkyl($C_1$–$C_4$), phenyl or alkyl($C_1$–$C_3$)thio,

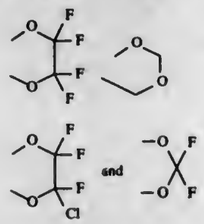
$R^6$ represents alkyl($C_1$–$C_4$) which is optionally substituted by fluorine, chlorine, bromine, halogenoalkyl($C_1$–$C_3$) or halogenoalkoxy($C_1$–$C_3$), or represents cycloalkyl($C_3$–$C_6$) which is optionally substituted by fluorine, chlorine, bromine, halogenoalkyl($C_1$–$C_3$) or halogenoalkoxy($C_1$–$C_3$), or represents the radical



wherein

$R^{10}$ and $R^{11}$ can be identical or different and represent hydrogen, fluorine, chlorine, bromine, iodine, alkyl($C_1$–$C_4$), nitro, cyano, halogenoalkyl($C_1$–$C_3$), alkoxy($C_1C_4$), halogenoalkoxy($C_1C_3$), alkyl($C_1$–$C_3$)thio, halogenoalkyl($C_1$–$C_3$)thio, phenoxy which is optionally substituted by fluorine, chlorine, bromine, halogenoalkyl($C_1$–$C_3$), alkoxy($C_1$–$C_3$) or alkyl($C_1C_3$), mono- or dialkylamino having in each case 1 to 4 carbon atoms in the alkyl radical and optionally substituted by fluorine, chlorine, bromine, alkoxy($C_1C_3$) or halogenoalkyl($C_1$–$C_3$), or cyanoalkyl($C_3$–$C_6$) which is optionally substituted by alkyl($C_1$–$C_3$), alkoxy($C_1$–$C_3$), fluorine, chlorine, bromine or alkyl($C_1$–$C_3$)thio, or wherein

$R^{10}$ and $R^{11}$ together represent a divalent radical selected from the group consisting of



and



X represents oxygen or sulphur and

Het represents a thienyl radical which is unsubstituted or mono- to trisubstituted by identical or different substituents selected from the group consisting of methyl, ethyl, n-propyl, i-propyl, tert-butyl, fluorine, chlorine, bromine, iodine, halogenoalkyl($C_1$–$C_3$), methoxy, ethoxy, n-propyloxy, i-propyloxy, alkyl($C_1$–$C_3$)thio, halogenoalkoxy($C_1$–$C_3$), halogenoalkyl($C_1$–$C_3$)thio, alkoxy($C_1$–$C_3$)carbonyl, phenoxy or phenylthio which is optionally substituted by fluorine, chlorine, bromine, methyl, ethyl, methoxy, ethoxy or halogenoalkyl($C_1$–$C_3$), alkenyl($C_3$–$C_4$)oxy, alkinyl($C_2$–$C_4$), alkyl($C_1$–$C_3$)thionyl, alkyl($C_1$–$C_3$)sulphonyl, halogenoalkyl($C_1C_3$)thionyl, halogenoalkyl ($C_1$–$C_3$)sulphonyl, nitro and cyano, or wherein two adjacent positions are bonded to one another by a 3,4-methylenedioxy or 3,4-ethylenedioxy radical which is substituted by fluorine and/or chlorine.

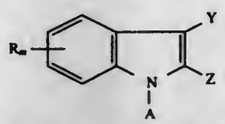
**5,502,071**

## INDOLES AS INSECTICIDES AND ACARICIDES

David M. Gange, Mercer, N.J., assignor to American Cyanamid Company, Wayne, N.J.

Filed Aug. 19, 1994, Ser. No. 293,152
Int. Cl.[6] A01N *43/38*
U.S. Cl. 514—415 4 Claims

1. A method for the control of insect or acarid pests which comprises contacting said pests of their food supply, habitat or breeding grounds with a pesticidally effective amount of a compound formula I



(I)

wherein Y and Z are each independently CN or $C_1$ haloalkyl; R is halogen, m is 2 and A is hydrogen.

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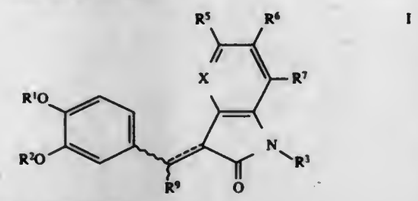
**5,502,072**

## SUBSTITUTED OXINDOLES

Hiroko Masamune, Noank, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Nov. 26, 1993, Ser. No. 164,973
Int. Cl.[6] A61K *31/40*; C07D *209/12*
U.S. Cl. 514—418 9 Claims

1. A compound of the formula:



I

wherein X is N or $CR^4$;

$R^1$ is ($C_1$–$C_4$)alkyl or phenyl-($C_1$–$C_6$)alkyl;

$R^2$ is ($C_1$–$C_{10}$)alkyl, phenyl-($C_1$–$C_6$)alkyl, ($C_3$–$C_7$) cycloalkyl, or ($C_6$–$C_{12}$) polycycloalkyl;

or $R^1$ and $R^2$, taken together with the oxygens to which they are attached, represent a methylene or ethylene bridge which forms a 5 or 6 membered ring;

$R^3$ is hydrogen, ($C_1$–$C_6$)alkyl, ($C_1$–$C_6$)alkyloxycarbonyl, ($C_1$–$C_6$)alkyloxy, ($C_1$–$C_6$) alkoxycarbonyl-($C_1$–$C_6$)alkyl, —$CONR^{10}R^{11}$; or -($C_1$–$C_6$)alkyl-$CONR^{10}R^{11}$;

$R^{10}$ and $R^{11}$ are independently selected from hydrogen and ($C_1$–$C_6$)alkyl, or $R^{10}$ and $R^{11}$, taken together with the nitrogen to which they are attached, form a pyrrolidine or piperidine ring;

$R^4$, $R^5$, $R^6$ and $R^7$ are independently selected from hydrogen, halogen, ($C_1$–$C_6$) alkoxy, ($C_3$–$C_7$) cycloalkyloxy, hydroxy, ($C_2$–$C_6$) acyloxy, nitro, $NR^8R^{12}$, $SO_2NR^8R^{12}$, ($C_1$–$C_6$)alkyl, ($C_1$–$C_6$) alkylcarbonyl, phenyl-($C_1$–$C_6$)alkoxy, and ($C_6$–$C_{12}$) polycycloalkoxy or any combination of $R^4$ and $R^5$, $R^5$ and $R^6$, or $R^6$ and $R^7$ which together form —$OCH_2O$— or —$OCH_2CH_2O$—, such that, when taken together with the carbons to which they are attached, they form, respectively, a 5- or 6-membered ring;

$R^8$ and $R^{12}$ are independently selected from hydrogen and ($C_1$–$C_6$)alkyl, or $R^8$ and $R^{12}$, taken together with the nitrogen to which they are attached, form a pyrrolidine or piperidine ring;

$R^9$ is hydrogen or ($C_1$–$C_6$)alkyl;

the broken line represents an optional double bond; and

the wavy lines indicate that the compounds exist as (E) and/or (Z) stereoisomers when the broken line is a double bond;



with the proviso that (a) if $R^1$ and $R^2$ are both methyl, X is CH, $R^9$ is hydrogen, and the broken line is a double bond, then (i) at least one of $R^3$, $R^5$, $R^6$, and $R^7$ is other than hydrogen; (ii) at least one of $R^5$, $R^6$ and $R^7$ is other than hydrogen or $R^3$ is other than methyl; and (iii) at least one of $R^3$ and $R^7$ is other than hydrogen or at least one of $R^5$ and $R^6$ is other than O—$CH_3$; (b) if $R^3$ is hydrogen, $R^9$ is hydrogen, X is CH, the broken line is a double bond, and $R^1$ and $R^2$ together represent a methylene bridge, then at least one of $R^3$, $R^6$ and $R^7$ is other than hydrogen; and (c) if $R^1$ and $R^2$ are both methyl, X is CH, $R^9$ is hydrogen, and the broken line is a single bond, then at least one of $R^5$ and $R^6$ is other than O—$CH_3$, or $R^7$ is other than hydrogen, or $R^3$ is other than $COCH_3$;

or a pharmaceutically acceptable salt thereof.

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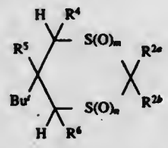
**5,502,073**

## HETEROCYCLIC PESTICIDAL COMPOUNDS

John E. Casida, Berkeley, Calif.; Michael Elliott, Hertfordshire, United Kingdom, and David A. Pulman, Hertfordshire, England, assignors to The Wellcome Foundation, London, England, and The Regents of the University of California, Oakland, Calif.

Continuation of Ser. No. 74,157, Jun. 9, 1993, abandoned, which is a continuation of Ser. No. 807,631, Dec. 13, 1991, abandoned, which is a continuation of Ser. No. 641,635, Jan. 17, 1991, abandoned, which is a continuation of Ser. No. 201,796, Jun. 1, 1988, abandoned, which is a continuation-in-part of Ser. No. 171,357, Mar. 21, 1988, abandoned. This application Feb. 23, 1994, Ser. No. 200,364
Claims priority, application United Kingdom, Jun. 5, 1987, 8713222; Sep. 5, 1987, 8720928
Int. Cl.[6] A01N *43/32*; C07D *339/08*
U.S. Cl. 514—436 10 Claims

1. A compound of the formula (I)



which contains between 10 and 27 carbon atoms, and wherein

m and n are independently selected from 0, 1 and 2;

$R^{2a}$ is hydrogen, methyl, or ethyl;

$R^{2b}$ is acetylene or is a group $R^7$, wherein $R^7$ is a $C_{1\text{-}13}$ non-aromatic hydrocarbyl group, or a $C_{1\text{-}13}$ non-aromatic hydrocarbyl group substituted by a cyano, a $C_{1\text{-}4}$ alkoxycarbonyl group, one or two hydroxy groups, one to five halo atoms which are the same or different, or by one to three groups $R^8$ which are the same or different, and each contains one to four heteroatoms, which are the same or different, and are chosen from oxygen, sulfur, nitrogen and silicon, wherein $R^8$ is chosen from alkoxy, alkenyloxy, alkynyloxy, alkoxyalkoxy, acyloxy, alkylthio, alkenylthio, alkynylthio, alkynylsulphonyl, alkynylsulphinyl, alkynyloximino, trialkylsilyl, haloalkylthio, haloalkoxy, haloalkenyloxy, haloalkynyloxy, sulphonyl, sulphinyl, alkyloximino, carbalkoxy and mono or di-substituted alkylamino groups and wherein $R^8$ is linked via an oxygen, sulfur, nitrogen or silicon atom to $R^7$;

$R^4$ and $R^6$ are the same or different and are chosen from hydrogen, methyl, trifluoromethyl or cyano;

$R^5$ is hydrogen or methyl and

$Bu^t$ is tertiary butyl,

provided that $R^{2b}$ is not propyl or butyl.

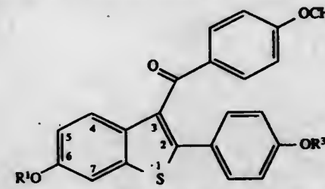
**5,502,074**

## BENZOTHIOPHENES FOR BONE HEALING AND FRACTURE REPAIR

George J. Cullinan, Trafalgar, and Masahiko Sato, Carmel, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

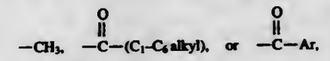
Filed Aug. 22, 1994, Ser. No. 294,130
Int. Cl.[6] A61K *31/38*
U.S. Cl. 514—443 3 Claims

1. A method of facilitating bone healing or fracture repair comprising administering to a human in need thereof an effective amount of a compound having the formula



(I)

wherein $R^1$ and $R^3$ are independently hydrogen,



wherein Ar is optionally substituted pheayl;

$R^2$ is selected from the group consisting of pyrrolidine, hexamethylenemino, and piperidino; or a pharmaceutically acceptable salt of solvate thereof.

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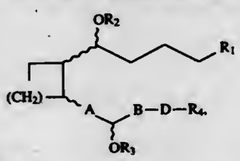
**5,502,075**

## LEUKOTRIENE-$B_4$ DERIVATIVES, PROCESS FOR THEIR PRODUCTION AND THEIRUSE AS PHARMACEUTICAL AGENTS

Werner Skuballa; Bernd Buchmann; Josef Heindl; Wolfgang Fröhlich; Roland Ekerdt, and Claudia Giesen, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

PCT No. PCT/EP92/02653, § 371 Date May 27, 1994, § 102(e) Date May 27, 1994, PCT Pub. No. WO93/11105, PCT Pub. Date Jun. 10, 1993
PCT Filed Nov. 19, 1992, Ser. No. 244,500
Claims priority, application Germany, Nov. 29, 1991, 41 39 868.8; Nov. 29, 1991, 41 39 869.6
Int. Cl.[6] A61K *31/34*;*31/19*
U.S. Cl. 514—461 20 Claims

1. A leukotriene-$B_4$ compound of formula I



(I)

in which

$R^1$ means $CH_2OH$, $CH_3$, $CF_3$, $COOR^5$, $CONR^6R^7$, or

$R^1$ together with $R^2$ means a carbonyl group,

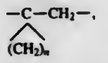
$R^2$ and $R^3$ are the same or different and represent H or an organic acid radical with 1–15 C atoms,

$R^4$ symbolizes H, ($C_1$–$C_{10}$) alkyl optionally substituted once or several times by chlorine or bromine, $C_3$–$C_{10}$ cycloalkyl, $C_6$–$C_{10}$ aryl radical optionally substituted, independent from one another, once or several times by chlorine, bromine, phenyl, $C_1$–$C_4$ alkyl, $C_1$–$C_4$ alkoxy, fluoromethyl, chloromethyl, trifluoromethyl, carboxy or hydroxy, or a 5- or 6-membered aromatic heterocyclic ring with at least 1 heteroatom,

$R^5$ means hydrogen, $C_1$–$C_{10}$ alkyl, $C_3$–$C_{10}$ cycloalkyl, $C_6$–$C_{10}$ aryl radical optionally substituted by 1–3 chlorine, bromine, phenyl, $C_1$–$C_4$ alkyl, $C_1$–$C_4$ alkoxy, fluoromethyl, chloromethyl, trifluoromethyl, carboxy or hydroxy, $CH_2$—CO—($C_6$–$C_{10}$) aryl or a 5- or 6-membered ring with at least 1 heteroatom,

A symbolizes a trans, trans-CH═CH—CH═CH, a —$CH_2CH_2$—CH═CH— or a tetramethylene group,

B symbolizes a $C_1$–$C_{10}$ straight-chain or branched-chain alkylene group, which optionally can be substituted by fluorine or the group



D can mean a direct bond, oxygen, sulfur, —C≡C—, —CH═$CR^8$ or together with

B can also mean a direct bond,

$R^6$ and $R^7$ are the same or different and represent H or $C_1$–$C_4$ alkyl or $R^7$ represents H and $R^6$ represents $C_1$–$C_{10}$ alkanoyl or $C_1$–$C_{10}$ alkanesulfonyl,

$R^8$ means H, $C_1$–$C_{15}$ alkyl, chlorine, bromine, and

n is 3–5 as well as, if $R^5$ means hydrogen, their salts with physiologically compatible bases and their cyclodextrin clathrates.

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**5,502,076**

**DISPERSING AGENTS FOR USE WITH HYDROFLUOROALKANE PROPELLANTS**

**Suresh C. Dixit, Neshamic Station; David Goldman, Hillsdale, both of N.J.; John J. Hu, Huntington, Conn., and Krish Sethachutkul, Scarsdale, N.Y., assignors to Hoffmann-La Roche Inc., Nutley, N.J.**

**Filed Mar. 8, 1994, Ser. No. 208,164**

**Int. Cl.[6] A61K *31/21***

**U.S. Cl. 514—510** **14 Claims**

1. A composition which comprises a hydrofluoroalkane, a leukotrine antagonist present at about 0.01% by weight to about 2.0% by weight of the composition, and a dispersing agent present at from about 0.01% by weight to about 1.0% by weight of the composition, the dispersing agent being selected from the group consisting of $C_3$-1inked triesters, vitamin E acetate, glycerin, t-butanol, and transesterified oil/polyethylene glycol.

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**5,502,077**

**FATTY ACID COMPOSITION**

**Harald Breivik, Skjelsvik; Bernt Borretzen, Porsgrunn; Knut H. Dahl, Ulefoss; Hans E. Krokan, Sjetnemarka, and Kaare H. Bonaa, Tromso, all of, Norway, assignors to Norsk Hydro A.S., Oslo, Norway**

**Continuation of Ser. No. 389,902, Aug. 4, 1989, abandoned. This application Jun. 23, 1992, Ser. No. 902,500**

**Claims priority, application United Kingdom, Aug. 11, 1988, 8819110**

**Int. Cl.[6] A61K *31/23;31/19***

**U.S. Cl. 514—560** **12 Claims**

1. A method for the treatment or prophylaxis of hypertriglyceridemia in a human patient, which comprises orally administering to the patient a pharmaceutical composition in which the active ingredients consist essentially of a mixture of fatty acids of which at least 80% by weight is comprised of a combination of (all-Z omega-3)-5,8,11,14,17-eicosapentaenoic acid (EPA) and (all-Z omega-3)-4,7,10,13,16,19-docosahexaenoic acid (DHA) in a weight ratio of EPA:DHA of from 1:2 to 2:1, said composition being administered in amounts providing a daily dosage of 1 to 10 grams of said mixture of fatty acids.

**5,502,078**

**CHEMICAL COMPOUNDS**

**Brian R. Holloway, Congleton; Ralph Howe, Macclesfield, and Balbir S. Rao, Chapel, all of, England, assignors to Zeneca Limited, London, England**

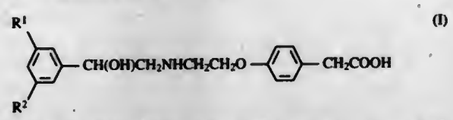
**Continuation-in-part of Ser. No. 889,186, May 28, 1992, abandoned. This application May 7, 1993, Ser. No. 57,763**

**Claims priority, application United Kingdom, May 28, 1991, 9111425**

**Int. Cl.[6] A61K *31/195***

**U.S. Cl. 514—567** **9 Claims**

1. A compound of the formula (I):



(I)

wherein $R^1$ is chloro, fluoro, bromo, trifluoromethyl or methyl; $R^2$ is hydrogen or fluoro; or a bioprecursor or a pharmaceutically acceptable salt thereof.

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**5,502,079**

**N-PHENYLALKYL SUBSTITUTED α-AMINO CARBOXAMIDE DERIVATIVES AND PROCESS FOR THEIR PREPARATION**

**Philippe Dostert, Paris, France; Paolo Pevarello, Pavia; Franco Heidempergher, Parabiago; Mario Varasi, Milan; Alberto Bonsignori, Milan, and Romeo Roncucci, Milan, all of, Italy, assignors to Farmitalia Carlo Erba S.r.l., Milan, Italy**

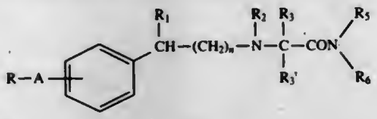
**Division of Ser. No. 65,888, May 25, 1993, Pat. No. 5,391,577, which is a division of Ser. No. 646,596, Jan. 25, 1991, Pat. No. 5,236,957. This application Nov. 17, 1994, Ser. No. 343,853**

**Claims priority, application United Kingdom, May 25, 1989, 8912071; Apr. 4, 1990, 9007567**

**Int. Cl.[6] A61K *31/165***

**U.S. Cl. 514—620** **5 Claims**

1. A method of treating a patient with Parkinson's disease, depression, involuntary spasm, brain ischemia or inducing hypnosis, which method comprises administering to the patient a therapeutically effective amount of a compound of formula (I)



(I)

wherein

R is selected from the group consisting of $C_1$–$C_8$ alkyl, $C_3$–$C_8$ cycloalkyl, furyl, thienyl, pyridyl and phenyl, the phenyl ring being unsubstituted or substituted by 1 to 4 substituents independently chosen from the group consisting of halogen, $C_1$–$C_6$ alkyl, $C_1$–$C_6$ alkoxy and trifluoromethyl;

A is —$(CH_2)_m$— or —$(CH_2)_p$—X—$(CH_2)_q$—, wherein m is an integer of 1 to 4, one of p and q is zero and the other is zero or an integer of 1 to 4, and X is selected from the group consisting of —O—, —S— and —$NR_4$— in which $R_4$ is hydrogen or $C_1$–$C_4$ alkyl;

n is zero or 1;

each of $R_1$ and $R_2$, independently, is hydrogen or $C_1$–$C_4$ alkyl;

$R_3$ is selected from the group consisting of hydrogen and $C_1$–$C_4$ alkyl which is unsubstituted or substituted by hydroxy or by a phenyl ring optionally substituted by 1 to 4 substituents independently chosen from the group consisting of halogen, $C_1$–$C_6$ alkyl, $C_1$–$C_6$ alkoxy and trifluoromethyl;

$R'_3$ is hydrogen; or $R_3$ and $R'_3$ taken together with the adjacent carbon atom form a $C_3$–$C_6$ cycloalkyl ring;

each of $R_5$ and $R_6$, independently, is hydrogen or $C_1$–$C_6$ alkyl; and wherein when R is $C_1$–$C_8$ alkyl, then A is a —$(CH_2)_p$—X—$(CH_2)_q$— group in which p and q are both zero and X is as defined above; or a pharmaceutically acceptable salt thereof.



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**5,502,080**

**COMBINED USE OF DOPAMINE AND SEROTONIN AGONISTS IN THE TREATMENT OF ALLERGIC DISORDERS**

**Pietr Hitzig, 1319 Blue Mount Rd., Monkton, Md. 21111**

**Filed Nov. 1, 1994, Ser. No. 333,294**

**Int. Cl.[6] A61K *31/135***

**U.S. Cl. 514—654** **23 Claims**

1. A method of treating a disorder to the immune system comprising administering to a patient in need of same an effective amount of at least one serotonin agonist and at least one dopamine agonist wherein the combination of the serotonin agonist and the dopamine agonist are present in an amount effective to treat the patient's condition.

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**5,502,081**

**WATER-INSOLUBLE DERIVATIVES OF HYALURONIC ACID AND THEIR METHODS OF PREPARATION AND USE**

**Jing-Wen Kuo, Stoneham; David A. Swann, Lexington, both of Mass., and Glenn D. Prestwich, Harbor, N.Y., assignors to Research Foundation of State University of New York, Stony Brook, N.Y., and Anika Research, Incorporated, Woburn, Mass.**

**Division of Ser. No. 920,698, Jul. 28, 1992, Pat. No. 5,356,883, which is a continuation-in-part of Ser. No. 809,399, Dec. 18, 1991, abandoned, which is a division of Ser. No. 388,578, Aug. 1, 1989, abandoned. This application Aug. 18, 1994, Ser. No. 292,478**

**Int. Cl.[6] A61K *47/36;9/70;* A01N *25/10;* A61L *15/28***

**U.S. Cl. 514—777** **20 Claims**

1. A composition, comprising:

a water-insoluble biocompatible material comprising a modified hyaluronic acid in which at least about 5% of carboxyl functionalities have been derivatized, and wherein essentially all of the derivatized functionalities are O-acyl or N-acyl ureas; and

a substance having pharmaceutical activity covalently bonded to said modified hyaluronic acid and releasable therefrom by hydrolysis.

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**5,502,082**

**LOW DENSITY MATERIALS HAVING GOOD COMPRESSION STRENGTH AND ARTICLES FORMED THEREFROM**

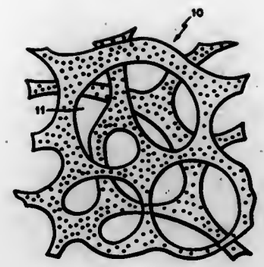
**Peter D. Unger, Convent Station, and Ronald P. Rohrbach, Flemington, both of N.J., assignors to AlliedSignal Inc., Morris Township, N.J.**

**Continuation-in-part of Ser. No. 27,975, Mar. 8, 1993, which is a continuation-in-part of Ser. No. 811,757, Dec. 20, 1991, abandoned. This application Nov. 4, 1993, Ser. No. 148,110**

**Int. Cl.[6] C08F *16/06***

**U.S. Cl. 521—141** **11 Claims**

1. A covalently crosslinked, highly porous body derived from a water-soluble, hydrogel polymer, said porous body being characterized in that it has an open-celled 3-dimensional lattice structure, a density of less than about 1.0 g/cm$^3$, a surface area of equal to or greater than about 30 m$^2$/g, and a compression strength of equal to or less than about 10% yield at 10 psi, and an average pore diameter of from about 50 Angstroms to about 500 Angstroms wherein said hydrogel polymer is selected from the group consisting of alginates, gums, starch, dextrins, agar, gelatins, casein, collagen, polyvinyl alcohol, polyethylenimine, acrylate polymers, starch/acrylate copolymers, and mixtures and copolymers thereof.




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**5,502,083**

**ONIUM SALT, PHOTOPOLYMERIZATION INITIATOR, ENERGY RAY-CURING COMPOSITION CONTAINING THE INITIATOR, AND CURED PRODUCT**

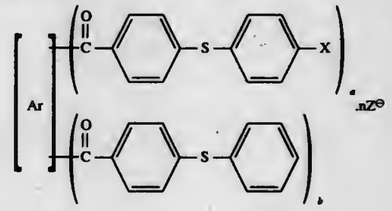
**Tetsuya Abe; Kazuhiko Ishii, both of Yono, and Minoru Yokoshima, Toride, all of, Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan**

**Filed Jun. 8, 1994, Ser. No. 255,469**

**Int. Cl.[6] C08F *2/50;16/32;16/22;* C08G *59/18***

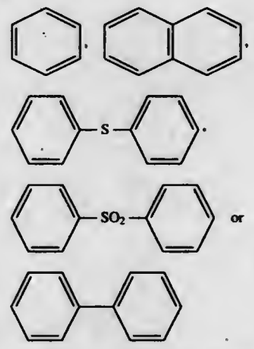
**U.S. Cl. 522—31** **13 Claims**

1. An energy ray-curable composition which contains a cation polymerizable substance and an onium salt represented by the following formula (1):

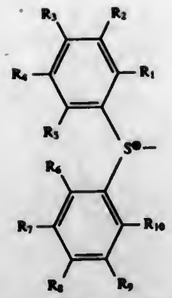


(1)

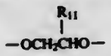
wherein Ar is



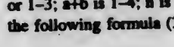
which may have at least one substituent selected from ($C_1$–$C_5$) alkyl group, ($C_1$–$C_5$) alkyloxycarbonyl group, ($C_1$–$C_5$) alkylcarbonyloxy group, benzoyl group, cyano group, ($C_1$–$C_5$) alkylthio group and halogen atom; X is a bisphenyl-sulfonio group represented by the following formula (2):



wherein $R_1$–$R_{10}$ each is a hydrogen atom, a halogen atom, a nitro group, an alkoxy group, an alkyl group, a phenyl group which may have a substituent of $C_6$–$C_{18}$, a phenoxy group, a phenylcarbonyl group, an alkylthio group, a phenylthio group, a benzyloxy group, a $C_1$–$C_{25}$ aliphatic group containing at least one hydroxyl group or a $C_3$–$C_{25}$ aliphatic group containing a group represented by the following formula:



where $R_{11}$ is a hydrogen atom or an alkyl group; a is 1–4; b is 0 or 1–3; a+b is 1–4; n is 1–4; and Z is a halide represented by the following formula (3):



(3)

where M is a boron atom, a phosphorus atom, an arsenic atom or an antimony atom, Q is a halogen atom, m is 3–6, l is 0 or 1, and m+l is 4–6.

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**5,502,084**

**ORGANOPOLYSILOXANE COMPOSITION CONTAINING A CYCLOPENTENYL RADICAL AND CROSSLINKABLE IN A THIN LAYER UNDER ULTRAVIOLET**

Jacques Cavezzan, and Jean-Marc Frances, both of Villeurbanne, both of, France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Nov. 21, 1990, Ser. No. 616,942
Claims priority, application France, Nov. 21, 1989, 89 15529
Int. Cl.[6] C08G 77/12;77/20; C08F 2/50
U.S. Cl. 522—99 8 Claims

1. An organopolysiloxane composition comprising a cyclopentenyl radical comprising:

(a) a diorganopolysiloxane polymer comprising (i) at least 3 cyclopentenyl radicals per molecule, each of these groups being directly linked, by an SiC bond, to a different silicon atom; and (ii) at least one silicon atom to which a hydrogen atom is directly linked; and

(b) an effective amount of at least one photoinitiator.

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**5,502,085**

**PRESSURE-SENSITIVE ADHESIVE HAVING EXCELLENT HEAT-RESISTANCE, ADHESIVE SHEETS THEREOF, AND METHODS FOR PRODUCING THEM**

Masahiro Ohura; Takao Yoshikawa; Yasuyuki Tokunaga; Takaaki Moriyama, and Tetsuo Inoue, all of Osaka, Japan, assignors to Nitto Denko Corporation, Osaka, Japan

Continuation of Ser. No. 37,397, Mar. 26, 1993, abandoned.
This application Aug. 1, 1994, Ser. No. 283,676
Claims priority, application Japan, Mar. 27, 1992, 4-101808; Mar. 27, 1992, 4-101809
Int. Cl.[6] C08F 2/46
U.S. Cl. 522—106 10 Claims

1. A pressure-sensitive adhesive having excellent heat resistance comprising a photopolymerization product of a composition comprising:

a) 100 parts by weight of monomers comprising from 70 to 100% by weight of a (meth)acrylic acid alkyl ester having from 2 to 14 carbon atoms in the alkyl moiety, and from 30 to 0% by weight of a monoethylenically unsaturated monomer copolymerizable with the (meth)acrylic acid alkyl ester,

b) from 0.02 to 20 parts by weight of a radical chain inhibitor,

c) up to 5 parts by weight of a polyfunctional (meth)acrylate as a crosslinking agent, and

d) from 0.01 to 5 parts by weight of a photopolymerizable initiator,

wherein said photopolymerization product is a dried photopolymerization product, and the amount of any residual unreacted monomer in said dried photopolymerization product is less than 10,000 ppm.

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**5,502,086**

**WATER-ABSORPTIVE CONTACT LENS AND PROCESS FOR ITS PRODUCTION**

Haruyuki Hiratani, and Keiji Sugimoto, both of Nagoya, Japan, assignors to Menicon Co., Ltd., Nagoya, Japan

Filed Jun. 20, 1994, Ser. No. 262,457
Claims priority, application Japan, Aug. 4, 1993, 5-193527
Int. Cl.[6] C08L 29/00
U.S. Cl. 523—108 11 Claims

1. A water-absorptive contact lens obtained by saponification of a copolymer, consisting essentially of:

(A) from 1 to 30% by weight of a (meth)acrylate polymer having at least one polymerizable group per molecule on average, which is obtained by copolymerizing (a) an alkyl (meth)acrylate and (b) a monomer having at least two polymerizable groups per molecule, as the main components;

(B) from 45 to 95% by weight of a vinyl ester;

(C) from 0.02 to 10% by weight of a crosslinking agent which is not decomposable by saponification; and

(D) from 0.1 to 20% by weight of a crosslinking agent which is decomposable by saponification.

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**5,502,087**

**DENTAL COMPOSITION, PROSTHESIS, AND METHOD FOR MAKING DENTAL PROSTHESIS**

Louis H. Tateosian, York; Scott E. Shaffer, Jacobus, and Mark A. Latta, York, all of Pa., assignors to Dentsply Research & Development Corp., Milford, Del.

Continuation-in-part of Ser. No. 81,940, Jun. 23, 1993, abandoned. This application May 16, 1994, Ser. No. 240,857
Int. Cl.[6] A61C 13/08;13/00; C08F 120/18;120/20
U.S. Cl. 523—115 46 Claims

1. A dental prosthesis comprising polymeric material formed by heat curing a one-component polymerizable composition for from about 0.25 hour to about 24 hour at from about 115° F. to about 240° F. in a chamber of a dental prosthesis mold having an inner wall with a dental prosthesis shape, said composition comprising less than 10 percent by weight of polymerizable acrylic compounds having a gram molecular weight of less than 200, and at least one polymerizable acrylic compound having a gram molecular weight of at least 1,000, said polymeric material having at least about 20,000 flexes to failure using the Flexural Fatigue of Denture Bases Test and an unnotched Izod impact strength of at least 2.5 ft.lb/in as measured by Modified ASTM D256.



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**5,502,088**

**WOOD SUBSTITUTE BASED ON LIGNOCELLULOSIC AND INORGANIC MATERIALS, METHOD FOR OBTAINING THE SAME AND USE**

Andrei Hododi, Calea Serban Voda No. 270, bloc 14, sc.B, et 6, sector 4, R-75207 Bucharest, Romania

PCT No. PCT/RO92/00008, § 371 Date Jun. 6, 1994, § 102(e) Date Jun. 6, 1994, PCT Pub. No. WO93/12179, PCT Pub. Date Jun. 24, 1993
PCT Filed Dec. 8, 1992, Ser. No. 244,692
Claims priority, application Romania, Dec. 18, 1991, 148968
Int. Cl.[6] C08J 3/00; C08K 3/34; C08L 95/00; C08H 5/04
U.S. Cl. 524—34 8 Claims

1. A wood-substitute composition which consists essentially of:

(a) 35 to 60 parts by weight of lignocellulosic particles;

(b) 5 to 35 parts by weight of limestone;

(c) 5 to 30 parts by weight of a synthetic binder resin selected from the group consisting of polyvinylacetate, polyoxymethylene, melâmine-formaldehyde, and polystyrene; and

(d) 5 to 15 parts by weight of each of the following: a bitumen foam as a fireproofing agent, blast furnace cinders as a thermoinsulator, and thermopower station ash as an anti-phonal agent.

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**5,502,089**

**POLYMER EMULSION AGENT FOR CROSS-LINKING A POLYMER EMULSION AND METHOD FOR MAKING A POLYMER FILM**

Mark C. Bricker, Gilbertsville, and Paul R. Van Rheenen, Warminster, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 110,523, Aug. 20, 1993, abandoned.
This application Sep. 7, 1994, Ser. No. 303,274
Int. Cl.[6] C08L 1/26
U.S. Cl. 524—44 18 Claims

1. A crosslinkable polymeric emulsion comprising particles of a copolymer derived from an ethylenically unsaturated carboxylic acid monomer and an ethylenically unsaturated comonomer dispersed in an aqueous medium; colloidal particles of an insoluble ferric salt dispersed in the aqueous medium; and an amount of a stabilizer selected from the group consisting of nonionic surfactants and protective colloids effective to sterically stabilize the emulsion; said emulsion having a pH of from about 1.5 to about 8.5.

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**5,502,090**

**HIGH TENACITY AND HIGH TOUGHNESS ACRYLIC SULFIDE FIBERS, A PROCESS FOR PRODUCTION THEREOF, AND COMPOSITE MATERIALS PREPARED BY USING IT**

Takeo Matsunase, and Takashi Takada, both of Shiga, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 134,075, Dec. 14, 1987, abandoned.
This application Sep. 25, 1989, Ser. No. 412,563
Claims priority, application Japan, Apr. 14, 1986, 61-84334; Apr. 14, 1986, 61-84335; Jun. 30, 1986, 61-151680
Int. Cl.[6] C08J 7/12;5/14
U.S. Cl. 524—3 16 Claims

1. Composite materials being reinforced with non-carbonized organic acrylic sulfide fibers.

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**5,502,091**

**ENHANCEMENT OF PAPER DRY STRENGTH BY ANIONIC AND CATIONIC GUAR COMBINATION**

Sunil P. Dasgupta, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 929,554, Aug. 14, 1992, Pat. No. 5,318,669, which is a continuation-in-part of Ser. No. 812,534, Dec. 23, 1991, abandoned. This application Feb. 28, 1994, Ser. No. 202,417
Int. Cl.[6] C08L 89/00; D21H 11/00;13/00;15/00
U.S. Cl. 524—55 9 Claims

1. A composition for modifying a paper pulp slurry to enhance the dry strength of the paper produced without substantially reducing its softness consisting essentially of (1) an anionic polymeric component selected from the group of polymers consisting of carboxymethyl guar, carboxymethyl bean gum, carboxymethyl hydroxyethyl guar, and a carboxymethyl hydroxypropyl guar, and (2) a cationic polymeric component selected from the group of polymers consisting of a cationic guar, a cationic acrylamide copolymer, a cationic bean gum, a cationic wet strength resin, and both a cationic wet strength resin and at least one of the other of said cationic polymers, the wet strength resin being a polymeric amine-epichlorohydrin resin selected from the group consisting of a polyamide-epichlorohydrin (PAE)resin, a polyalkylenepolyamine-epichlorohydrin (PAPAE) resin, and an amine polymer-epichlorohydrin (APE) resin, in which amine groups have been alkylated with epichlorohydrin to produce a polyamine-epichlorohydrin resin that has azetidinium or epoxide functionality.

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**5,502,092**

**BIOCOMPATIBLE POROUS MATRIX OF BIOABSORBABLE MATERIAL**

Thomas H. Barrows, Cottage Grove; Myhanh T. Truong, Blaine, and Paul R. Suszko, Cottage Grove, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 18, 1994, Ser. No. 198,906
Int. Cl.[6] C08J 9/28
U.S. Cl. 521—64 31 Claims




1. A process for producing a biocompatible porous matrix of bioabsorbable polymer, said process comprising:

a) providing a bioabsorbable polymer;

b) dissolving said bioabsorbable polymer in a volumetric orientation aid to yield a molten solution;

c) solidifying said molten solution to yield an orientation matrix comprising first and second phases, said first phase being said bioabsorbable polymer and said second phase being said volumetric orientation aid; and

d) then alter said solidifying removing said volumetric orientation aid from said solid orientation matrix;

to yield a biocompatible matrix of bioabsorbable polymer.

5,502,093

## POLYACETAL RESIN COMPOSITION

Toru Katsumata, and Nobuyuki Matsunaga, both of Shizuoka, Japan, assignors to Polyplastics Co., Ltd., Japan

Filed Nov. 21, 1994, Ser. No. 345,697
Claims priority, application Japan, Nov. 30, 1993, 5-299936
Int. Cl.[6] C08K 5/34;5/07
U.S. Cl. 524—91 8 Claims

1. A polyacetal resin composition which comprises:
(A) 100 parts by weight of a polyacetal resin,
(B) 0.1 to 30 parts by weight of a homopolymer or copolymer of methyl methacrylate,
(C) 0.1 to 10 parts by weight of an oxyalkylene polymer having chains of 2 to 8 consecutive carbon atoms,
(D) 0.01 to 2.0 parts by weight of a UV absorber, and
(E) a hindered amine additive package comprising a mixture of
(E1) 0.01 to 1 part by weight of a low molecular weight hindered amine compound having a molecular weight of less than 700, and
(E2) 0.01 to 4 parts by weight of a high molecular weight hindered amine compound having a molecular weight of 700 or more.

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5,502,094

## PHYSIOLOGICALLY ACCEPTABLE EMULSIONS CONTAINING PERFLUOROCARBON ETHER HYDRIDES AND METHODS FOR USE

George G. I. Moore, Afton; Richard M. Flynn, Mahtomedi, and Miguel A. Guerra, Woodbury, all of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation-in-part of Ser. No. 246,962, May 20, 1994. This application May 17, 1995, Ser. No. 437,299
Int. Cl.[6] C08K 5/52
U.S. Cl. 524—145 19 Claims

1. A physiologically acceptable aqueous emulsion comprising
a saturated $C_8$ to $C_{12}$ perfluorocarbon ether hydride selected from the group consisting of a hydroperfluoroaliphatic ether, a hydroperfluoroaliphatic ether substituted with a perfluoroalicyclic group, and a hydroperfluorocycloaliphatic ether and mixtures thereof, wherein said aliphatic ether has a straight-chain or a branched-chain of carbon atoms,
water and a surfactant, wherein the components are contained in the emulsion in amounts for acceptable physiological administration.

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5,502,095

## THERMOPLASTIC ELASTOMER COMPOSITION

Toshifumi Ueshima; Ko Hasegawa; Toshio Teramoto, all of Yokkaichi; Tatsuo Nakajima, Iwata, and Takeyoshi Konomoto, Kakegawa, all of, Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, and NTN Corporation, Osaka, both of, Japan

Filed Nov. 4, 1993, Ser. No. 145,615
Claims priority, application Japan, Nov. 6, 1992, 4-297062
Int. Cl.[6] C08K 5/54
U.S. Cl. 524—269 15 Claims

1. A thermoplastic elastomer composition comprising
(A) 50–98% by weight of a thermoplastic polyester elastomer which is a polyester block copolymer composed of
(A-1) a high melting crystalline segment consisting of an aromatic polyester unit and (A-2) a low melting polymer segment consisting of an aliphatic polyether unit and/or an aliphatic polyester unit,
(B) 50–2% by weight of a rubber which is at least one member selected from the group consisting of acrylonitrile-butadiene copolymer rubber, hydrogenated acrylonitrile-butadiene copolymer rubber, hydrogenated acrylic acid ester-butadiene copolymer rubber, acrylic rubber, ethylene-acrylic acid ester copolymer rubber and ethylene-propylene copolymer rubber, and
(C) a polyorganosiloxane in an amount of 0.01–10 parts by weight per 100 parts by weight of the total of the components (A) and (B).

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5,502,096

## ROOM TEMPERATURE QUICK CURABLE ORGANOPOLYSILOXANE COMPOSITION

Tsuneo Kimura, and Masatoshi Arai, both of Matsuida, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Oct. 19, 1994, Ser. No. 328,525
Claims priority, application Japan, Jan. 25, 1993, 5-288673
Int. Cl.[6] C08K 5/07
U.S. Cl. 524—356 11 Claims

1. A room temperature quick curable composition, comprising
(A) a diorganopolysiloxane or a polyoxyalkylene polymer wherein both ends of the molecular chain are blocked with a hydrolyzable silyl group and that has a viscosity of 25 to 1000,000 centistokes at 25° C.,
(B) a carbonyl compound having at least one carbonyl group in the molecule and no unsaturated bond between the alpha carbon and the beta carbon,
(C) an organic compound having at least one $NH_2$ group in the molecule, and
(D) an organic compound having at least one α,β-unsaturated carbonyl group in the molecule, with said components (B) and (C) being selected such that the carbonyl group and the $NH_2$ group are reactive with each other.

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5,502,097

## FLUORORESIN POWDER LIQUID DISPERSION CAPABLE OF FORMING THICK COATINGS

Takumi Saito, Shizuoka, Japan, assignor to DuPont-Mitsui Fluorochemicals Co., Ltd., Tokyo, Japan

Filed May 26, 1994, Ser. No. 249,585
Claims priority, application Japan, Jun. 3, 1993, 5-156378
Int. Cl.[6] C08J 3/05; C08K 5/05; C08L 27/12
U.S. Cl. 524—389 11 Claims

1. A fluororesin powder liquid dispersion comprising 5–50% by volume based on the liquid dispersion of heat-flowable fluororesin powder having an average particle size of 5–300 μm, a porosity of not higher than 0.74 and a total surface area of not greater than 10 $m^2/cm^3$ and liquid dispersion medium having a surface tension of not more than 45 dyne/cm, further comprising 10–40% by weight based on the heat flowable fluororesin powder of an organic liquid with a boiling point of 150° C.–340° C., the heat flowability of said fluororesin powder being characterized by flow at temperatures beyond the melting point of the fluororesin of said powder.

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5,502,098

## POLYMER COMPOSITION FOR ELECTRICAL PART MATERIAL

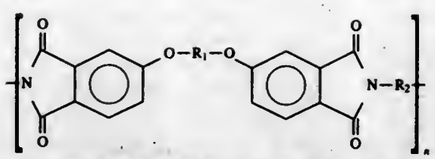
Fumie Watanabe; Takashi Mizoguchi, and Masatoshi Iwafune, all of Satte, Japan, assignors to Cosmo Research Institute, and Cosmo Oil Co., Ltd., both of Tokyo, Japan

Filed Jun. 27, 1994, Ser. No. 266,382
Claims priority, application Japan, Jun. 28, 1993, 5-185616; Jun. 28, 1993, 5-185617
Int. Cl.[6] C08L 67/02;71/12;79/08
U.S. Cl. 524—404 6 Claims

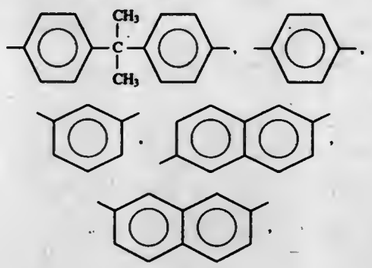
1. A polymer composition for electrical part material which comprises,
(I) a polymer blend which comprises,
(A) (a) a polyether imide represented by the following formula (1),



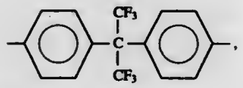
(1)



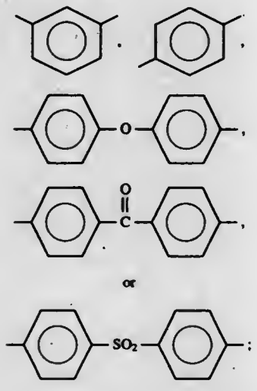
wherein n indicates an integer of 1–10,000, $R_1$ represents a



or



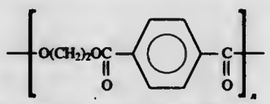
and $R_2$ represents a group



and

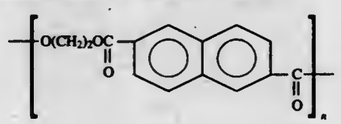
(b) a polyester represented by the following formulas (2-1) to (2-11),

(2-1)



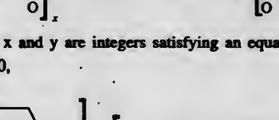
wherein n indicates an integer of 1–10,000,

(2-2)



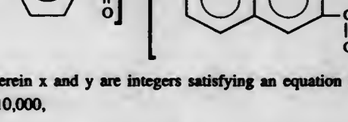
wherein n indicates an integer of 1–10,000,

(2-3)



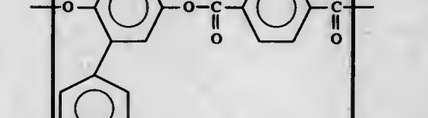
wherein n indicates an integer of 1–10,000,

(2-4)



wherein n indicates an integer of 1–10,000,

(2-5)



wherein n indicates an integer of 1–10,000,

(2-6)



wherein n indicates an integer of 1–10,000,

(2-7)



wherein x and y are integers satisfying an equation x+y =2 to 10,000,

(2-8)



wherein x and y are integers satisfying an equation x+y =2 to 10,000,

(2-9)

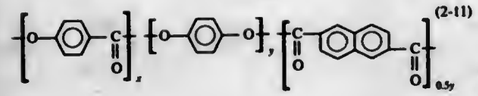


wherein x and y are integers satisfying an equation x+y =2 to 10,000,

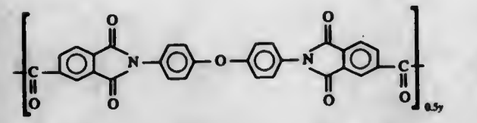
(2-10)



wherein n indicates an integer of 1–10,000, or

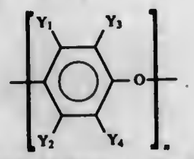


(2-11)



wherein x and y are integers satisfying an equation x+y =2 to 10,000, and

(B) polyphenylene ethers represented by the following formula (3),



(3)

wherein n indicates an integer of 1–1000, $Y_1$, $Y_2$, $Y_3$, and $Y_4$ individually represent hydrogen or methyl group,

(II) a copolymer of maleic anhydride and a vinyl compound, wherein the amount of component (II) is 0.1 to 50 parts by weight for 100 parts by weight of said polymer blend (I).

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**5,502,099**

**MOLDING COMPOSITIONS**

**Lawrence R. Wallace, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.**

**Continuation of Ser. No. 640,021, Jan. 10, 1991, abandoned, which is a continuation of Ser. No. 424,543, Oct. 20, 1989, abandoned. This application Jun. 2, 1993, Ser. No. 71,201**

**Int. Cl.[6] C08K *3/10***

**U.S. Cl. 524—413** **5 Claims**

1. A molding composition which consists essentially of:

(a) from 30–75% by total weight of composition of barium sulfate;

(b) from 25–65% by total weight of composition of polyetherimide ester resin; and

(c) from 0.01 to 5% by total weight of composition of an antioxidant.

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**5,502,100**

**COATED GOLF BALL**

**Kiyoto Maruoka, and Kuniyasu Horiuchi, both of Kobe, Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo, Japan**

**Filed Jun. 29, 1994, Ser. No. 267,514**

**Claims priority, application Japan, Jun. 29, 1993, 5-158639**

**Int. Cl.[6] C08K *3/22*; A63B *37/12***

**U.S. Cl. 524—430** **11 Claims**

1. A coated golf ball in which the body thereof is coated with a white paint containing titanium oxide as a main pigment, said white paint comprising 45 to 60% by weight of titanium oxide, 0.005 to 0.20% by weight of a blue pigment and 0.001 to 0.06% by weight of a red pigment, based on 100% by weight of the solid content of the coating, and the weight ratio of the blue pigment to the red pigment being 0.9 to 5.

**5,502,101**

**PROCESS FOR THE PRODUCTION OF A MULTICOAT FINISH AND AQUEOUS BASECOATS SUITABLE FOR THIS PROCESS**

**Stephan Schwarte, Emedetten; Arnold Dobbelstein, deceased, late of Münster; Jürgen Niemann, Münster; Walter Lassmann, Münster; Susanne Pientek, Münster; Ulrich Poth, Münster, and Klaus Elkelmann, Münster, all of, Germany, assignors to BASF Lacke + Farben, AG, Muenster-Hiltrup, Germany**

**PCT No. PCT/EP91/00448, § 371 Date Nov. 30, 1992, § 102(e) Date Nov. 30, 1992, PCT Pub. No. WO91/14515, PCT Pub. Date Oct. 3, 1991**

**PCT Filed Mar. 9, 1991, Ser. No. 927,309**

**Claims priority, application Germany, Mar. 28, 1990, 40 09 857.5**

**Int. Cl.[6] C08K *3/20***

**U.S. Cl. 524—460** **14 Claims**

1. A process for the production of a multicoat protective and/or decorative finish in which

(1) an aqueous pigmented basecoat is applied to the substrate surface as basecoat,

(2) a polymer film is formed from the coating applied in stage (1),

(3) a transparent topcoat is applied to the basecoat obtained in this way and subsequently

(4) the basecoat is baked together with the topcoat, wherein the basecoat comprises a water-dispersible polyacrylate resin which is obtained by (I) solution polymerization of components (a) and (b), in an organic solvent or solvent mixture., in the presence of at least one polymerization initiator, wherein components (a) and (b) are polymerized sequentially

and wherein component (a) includes

(a1) 2.5 to 15, preferably 3 to 7% by weight of an ethylenically unsaturated monomer which contains at least one carboxyl group per molecule and is copolymerizable with (b1), (b2), (b3) and (a2), or a mixture of such monomers, together with

(a2) 0 to 60, preferably 0 to 28% by weight of an ethylenically unsaturated monomer which is free from carboxyl groups and is copolymerizable with (b1), (b2), (b3) and (a1), or a mixture of such monomers, and

component (b), includes

(b1) 40 to 90, preferably 40 to 80% by weight of a (meth)acrylic acid ester which is copolymerizable with (b2), (b3), (a1) and (a2) and is essentially free from carboxyl groups, or a mixture of such (meth)acrylic acid esters and

(b2) 0 to 45, preferably 4 to 34% by weight of an ethylenically unsaturated monomer which is copolymerizable with (b1), (b3), (a1) and (a2), contains at least one hydroxyl group per molecule and is essentially free from carboxyl groups, or a mixture of such monomers, and

(b3) 0 to 40, preferably 10 to 30% by weight of an ethylenically unsaturated monomer which is copolymerizable with (b1), (b2), (a1) and (a2), is essentially free from carboxyl groups and is different from (b1) and (b2), or a mixture of such monomers, and

(II) at the end of the polymerization neutralizing the resultant polyacrylate resin at least partially and dispersing it in water, the sum of the proportions by weight of (a1), (a2), (b1), (b2) and (b3) always being 100% by weight, and the type and amount of (b1), (b2), (b3), (a1) and (a2) being chosen so that the polyacrylate resin has a hydroxyl value of 0 to 200, preferably of 20 to 120, an acid value of 20 to 100, preferably of 25 to 50, and a glass transition temperature ($T_G$) of −40° C. to +60° C., preferably of −20° C. to +40° C.



**5,502,102**

**EPOXY MODIFIED BLENDS OF POLY(ARYLENESULFIDE) AND POLYETHERIMIDE RESINS**

**Darryl Nazareth, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.**

**Filed Aug. 9, 1994, Ser. No. 287,974**

**Int. Cl.[6] C08F *8/39;283/04***

**U.S. Cl. 524—494** **11 Claims**

1. A composition consisting essentially of:

a) a polyetherimide resin present at a level of from about 5% to about 35% by weight based on the total weight of the composition;

(b) a poly(p-phenylene sulfide) resin present at a level of from about 40% to about 55% by weight based on the total weight of the composition; and

(c) an epoxy compound present at a level of from about 1% to about 12% by weight based on the total weight of the composition, wherein the epoxy compound is an epoxy cresol novolak resin; wherein the weight ratio of poly(arylene sulfide) resin to polyetherimide is between 8:1 and 2:1.

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**5,502,103**

**MULTI-ARM BLOCK COPOLYMER, AND PRESSURE SENSITIVE ADHESIVE AND TAPE EMPLOYING A MULTI-ARM ELASTOMERIC BLOCK COPOLYMER**

**Jingjing Ma, and Mark K. Nestegard, both of Woodbury, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Division of Ser. No. 66,860, May 25, 1993, Pat. No. 5,412,031. This application Jan. 26, 1995, Ser. No. 378,491**

**Int. Cl.[6] C08F *293/00;297/00***

**U.S. Cl. 524—534** **7 Claims**

1. A pressure sensitive adhesive, comprising:

(a) 100 parts by weight of a multi-arm elastomeric block copolymer having the structure $(A\text{-}B)_m Y(C\text{-}D)_n$ wherein A, B, C and D are polymer segments; Y is a residue of a multifunctional coupling agent; m and n are the number of arms where both m and n are greater than o, and the sum of m plus n being at least 3; A comprises a random copolymer of a monoalkenylarene and a conjugated diene; B and C individually are selected from the group consisting of a homopolymer of a conjugated diene and a polymer of two or more conjugated dienes; D is selected from the group consisting of a homopolymer of a monoalkenylarene and a copolymer of a monoalkenylarene and a conjugated diene wherein the Tg of D is greater than the Tg of A; and the weight percent of monoalkenylarene in the block copolymer is 40% or less;

(b) about 20 to about 300 parts by weight of a tackifying resin;

(c) 0 to about 50 parts by weight of a crosslinking agent; and

(d) 0 to about 200 parts of a plasticizer.

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**5,502,104**

**USE OF A COPOLYMER FOR THE PREPARATION OF AQUEOUS EMULSIONS**

**Gerd Hohner, Gersthofen; Franz-Leo Heinrichs, Gablingen, and Jürgen Kainz, Neusäss, all of, Germany, assignors to Hoechst Aktiengesellschaft, Germany**

**Filed Feb. 14, 1994, Ser. No. 195,780**

**Claims priority, application Germany, Feb. 12, 1993, 43 04 314.3**

**Int. Cl.[6] C08L *39/00***

**U.S. Cl. 524—556** **2 Claims**

1. An aqueous emulsion comprising

I) 1 to 35% by weight of a copolymer comprising

a) at least 20% by weight of units which are derived from at least one $C_{12}$–$C_{60}$-α-olefin,

b) 1 to 30% by weight of units which are derived from at least one carboxylic acid of the formula $CH_2{=}CR^1{-}COOH$,

c) 18.2 to 60% by weight of units which are derived from at least one carboxylic acid ester of the formula $CH_2{=}CR^1{-}COOR^2$,

in which $R^1$ is a hydrogen atom or a methyl group, and $R^2$ is a straight chain or branched alkyl radical having 1 to 22 carbon atoms, and

d) 0 to 30% by weight of units which are derived from styrene, 3-methylstyrene, 4-methylstyrene, or α-methylstyrene,

II) 1 to 30% by weight of an emulsifier, and

III) 50 to 98% by weight of water.

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**5,502,105**

**METHOD OF EMULSION POLYMERIZATION**

**Anthony Revis, Freeland, Mich., assignor to Dow Corning Corporation, Midland, Mich.**

**Filed Aug. 25, 1994, Ser. No. 296,200**

**Int. Cl.[6] C08L *83/00***

**U.S. Cl. 524—837** **20 Claims**

1. A method of making a silicone emulsion comprising dispersing a siloxane in water by forming a mixture of water, a cyclic siloxane, and an ethoxylated alcohol nonionic surfactant; adding to the mixture a polymerization initiator which is an organosilanolate; heating the mixture of water, cyclic siloxane, ethoxylated alcohol, and organosilanolate; agitating the heated mixture; and allowing the cyclic siloxane to polymerize until an emulsion is formed.

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**5,502,106**

**POLYMERIC BLENDS**

**Edward E. LaFleur, Warminster; William J. Work, Huntingdon Valley, both of Pa.; Robert M. Amici, Berlin, Mass.; Newman M. Bortnick, Orcland, and Norman L. Holy, Penns Park, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.**

**Continuation-in-part of Ser. No. 83,957, Jun. 25, 1993, which is a continuation-in-part of Ser. No. 929,878, Aug. 12, 1992, abandoned. This application Oct. 31, 1994, Ser. No. 332,288**

**Int. Cl.[6] C08L *29/02;25/12;27/06;33/12***

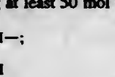
**U.S. Cl. 525—57** **5 Claims**

1. A polymeric blend comprising:

(a) from about 80 to about 95 parts of at least one polar polymer selected from the group consisting of poly(vinyl chloride), a polycarbonate, a polyglutarimide, a polymer of methyl methacrylate, a polyamide, a polyester, or a polymer containing units derived from styrene and acrylonitrile, wherein the at least one polar polymer is not of natural origin;

(b) from about 5 to about 20 parts of a polymeric composite of:

i) from about 60 to about 95 parts by weight of a first polymer containing at least 50 mol % of units of the structure



ii) from about 5 to about 40 parts by weight of a second polymer containing at least about 70 parts of units derived from at least one of a lower alkyl methacrylate or acrylate, and at least one of either up to about 25 parts of units derived from a vinyl or vinylidene monomer containing an amide group or up to about 25 parts of units derived from an unsaturated carboxylic acid or anhydride, the composite containing the second polymer dispersed in a continuous phase of the first polymer.

**5,502,107**

## POLYSTYRENE MODIFIED WITH A TELECHELIC POLYORGANOSILOXANE

**Donald T. Liles, Midland; Kenneth M. Lee, Bay City, and David L. Murray, Midland, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.**

**Filed Jun. 30, 1994, Ser. No. 269,239**

**Int. Cl.[6] C08F 283/12**

**U.S. Cl. 525—63** **34 Claims**

1. A composition comprising a blend of:

(A) a polystyrene polymer; and

(B) a silicone crumb rubber powder uniformly dispersed in said polystyrene polymer, said silicone crumb rubber prepared by the steps comprising:

(I) reacting a preformed aqueous polydiorganosiloxane emulsion comprising water, a surfactant, and a plurality of silanol-terminated polydiorganosiloxane molecules, with a grafting silane in the presence of an organotin catalyst to form a non-crosslinked telechelic emulsion polymer, wherein said grafting silane has the formula:

$$RQSi(X)_2$$

where

X is a hydrolyzable group,

Q is an unsaturated organic functional group,

R is Q, or a saturated monovalent hydrocarbon group of from one to six carbon atoms, and

(II) thereafter co-polymerizing an unsaturated monomer with said non-crosslinked telechelic emulsion polymer formed in step (I) to form particles therefrom; and

(III) recovering the particles resulting from step (II), said composition containing from 5 to 50 parts by weight of said polydiorganosiloxane for each 100 parts by weight of said polystyrene polymer.

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**5,502,108**

## PRESSURE-SENSITIVE ADHESIVE COMPRISING SOLID TACKY MICROSPHERES AND MACROMONOMER-CONTAINING BINDER COPOLYMER

**Spencer F. Silver; Roger W. Leinen, and Joaquin Delgado, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.**

**Continuation of Ser. No. 68,503, May 27, 1993, abandoned, which is a division of Ser. No. 884,633, May 15, 1992, Pat. No. 5,215,818, which is a division of Ser. No. 512,774, Apr. 20, 1990, Pat. No. 5,118,750. This application Oct. 20, 1994, Ser. No. 326,736**

**The portion of the term of this patent subsequent to Feb. 19, 2008, has been disclaimed.**

**Int. Cl.[6] C08L 51/00;33/00**

**U.S. Cl. 525—77** **9 Claims**

1. A repositionable pressure-sensitive adhesive comprising:

a) from about 70 weight % to about 99 weight % solid, polymeric, acrylate tacky, infusible, solvent-insoluble, solvent-dispersible elastomeric microspheres comprising

i) at least one alkyl acrylate or alkyl methacrylate ester; and

ii) at least one polar monomer, and

b) correspondingly from about 1 weight % to about 30 weight % of a binder copolymer comprising an elastomeric polymeric backbone having pendant therefrom polymeric moieties, said backbone containing repeating A and C monomers and from about 1 weight % to about 20 weight % B monomers, wherein

A is a monomeric acrylic or methacrylic acid ester of a non-tertiary alcohol, said alcohol having from 1 to 14 carbon atoms, with the average number of carbon atoms being about 4–12, said A monomer comprising from about 50 weight % to about 98 weight % of said monomers;

B is a polar monomer copolymerizable with said monomeric acrylic acid ester;

C is monomer having the general formula $X—(Y)_n—Z$, wherein Z is a vinyl group copolymerizable with said A and B monomers, Y is a divalent linking group, where n is zero or 1, and Z is a monovalent polymeric moiety having a $T_g$ greater than 20° C., and a weight average molecular weight in the range of about 2,000 to about 30,000 and being unreactive under free radical polymerization conditions, C comprising from about 1 weight % to about 30 weight % of said monomers,

wherein said binder copolymer has a shear storage of at least about $1\times10^5$ Pascals at 3 Hz and 22° C.

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**5,502,109**

## PROCESS FOR THE PRODUCTION OF HEAT-STABLE MOLDINGS USEFUL AS A FRICTION LINING FOR GRINDING TOOLS

**Siegfried Wallenwein, Buettelborn, and Richard Sattelmeyer, Wiesbaden, both of, Germany, assignors to Hoechst Aktiengesellschaft, Germany**

**Filed Dec. 21, 1994, Ser. No. 360,393**

**Claims priority, application Germany, Dec. 23, 1993, 43 44 133.5**

**Int. Cl.[6] C08L 9/06**

**U.S. Cl. 525—141** **8 Claims**

1. A process for the production of heat-stable moldings by molding and vulcanizing a mixture containing a natural or synthetic rubber in the presence of a sulfur-free vulcanizer/activator system comprising 5 to 59 parts by weight of p-($C_4$–$C_{10}$)-alkylphenol resols, per 100 parts by weight of rubber, as vulcanizer which contain at least 90 mol % of p-($C_4$–$C_{10}$)-phenols, based on the total amount of phenols, and a mixture of 1 to 20 parts by weight of halogen-containing polymers and 1 to 15 parts by weight of zinc oxide, per 100 parts by weight of rubber, as the activator at a temperature of 120° to 250° C.

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**5,502,110**

## RESIN COMPOSITION FOR ELECTROPHOTOGRAPHIC TONER

**Katsuru Matsumoto, Kanagawa; Nobuhiro Hirayama, Hiratsuka; Kenji Uchiyama, Odawara; Shoji Kawasaki, Yokohama; Tamami Fukui, Yokohama, and Katsuo Uramoto, Yokohama, all of, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan**

**Filed Apr. 27, 1993, Ser. No. 52,831**

**Claims priority, application Japan, Apr. 28, 1992, 4-110338; Jun. 11, 1992, 4-152176; Jun. 15, 1992, 4-154848; Jun. 25, 1992, 4-167351; Sep. 4, 1992, 4-237295**

**Int. Cl.[6] C08L 33/04;33/24;25/04;25/14**

**U.S. Cl. 525—221** **9 Claims**

1. A resin composition for an electrophotographic toner comprising an ethylene series high polymer (Y) which is a homopolymer or copolymer of at least one bifunctional ethylene series unsaturated monomer which is a monomer having and polymerizable through a single carbon to carbon double bond or is a copolymer thereof with at least one polyfunctional monomer which is a monomer having and polymerizable through at least two carbon to carbon double bonds, the carbon to carbon double bonds not being conjugated with each other, the weight average molecular weight $M_w$ of said polymer (Y) being at least 100,000 and the $M_w/M_n$ of said polymer (Y) being at least 3, where $M_n$ is the number average molecular weight, and an ethylene series polymer (X) prepared by polymerizing 100 parts of a bifunctional ethylene series unsaturated monomer as defined above in the presence of 0.01–10 parts by weight of a substance having three or more peroxide groups in the molecule and/or in the presence of a substance having one or more unsaturated functional groups which are carbon to carbon double bonds and one or more peroxide groups in the molecule, the $M_w/M_b$ (where $M_w$ is the weight-average molecular weight, and $M_b$ is the weight-average molecular weight between crosslinking points) of said polymer (X) being from 2 to 99, the $M_w$ of said polymer (X) being 50,000 or less, the ratio of said polymer (X) to said polymer (Y) being from 15:85 to 85:15 (by weight).



**5,502,111**

## PROCESS FOR MAKING POLYVINYL CHLORIDE COMPOSITIONS HAVING HIGH HEAT DISTORTION TEMPERATURES

**Gia Huynh-Ba, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Continuation-in-part of Ser. No. 941,692, Sep. 8, 1992, abandoned, which is a continuation-in-part of Ser. No. 665,642, Mar. 6, 1991. This application Apr. 12, 1994, Ser. No. 226,427**

**Int. Cl.[6] C08L 27/06;27/08**

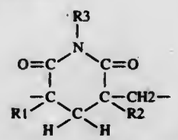
**U.S. Cl. 525—239** **5 Claims**

1. A process for the manufacture of a polyvinyl chloride composition having an improved heat distortion temperature, said process comprising blending at a temperature set within a range of about 150°–220° C.

(A) 50–95 parts by weight of polyvinyl chloride with

(B) a complementary amount, the total adding to 100 parts by weight, of a polymer blend, comprising a matrix and a dispersed phase, consisting essentially of about

(i) 30–85 weight percent of a dispersed phase of an imidized acrylic resin having a glass transition temperature above 150° C., as determined according to ASTM standard D3418, taking the midpoint value, and a flexural modulus of at least 690 kPa wherein at least 20% of ester groups originally present in the resin are imidized to units of the following formula (1):



(1)

wherein each one of R1, R2, and R3 independently is hydrogen or a $C_1$–$C_{20}$ alkyl, cycloalkyl, or aryl group, said imidized acrylic resin further containing 0–50 weight percent of a copolymerized ethylenically tinsaturated additional monomer and being substantially free of functional groups capable causing degradation of polyvinyl chloride within the temperature range of about 150°–220° C.; said resin being melt-processable at a temperature within the range of about 200° to 300° C.;

(ii) 15–70 weight percent of a matrix of a third polymer, which is melt

processable throughout the temperature range of about 150° to 300° C. and is substantially free of functional groups capable of causing degradation of imidized acrylic resin within the temperature range of about 200°–300° C. and of polyvinyl chloride within the temperature range of about 150°–220° C.; said polymer blend (B) of imidized acrylic resin (i) with third polymer (ii) being melt-processable below about 220° C.;

blending of polyvinyl chloride with polymer blend (B) being conducted under such temperature and shear conditions that blend (B) becomes dispersed in polyvinyl chloride; and substantially all of the imidized acrylic resin (i) forms compatible, single-phase composition with polyvinyl chloride.

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**5,502,112**

## THERMOPLASTIC OLEFINS

**Andrew J. Peacock, Houston, Tex., assignor to Exxon Chemical Patents Inc., Wilmington, Del.**

**Continuation-in-part of Ser. No. 210,101, Mar. 18, 1994, abandoned, which is a continuation of Ser. No. 922,216, Jul. 30, 1992, abandoned. This application Dec. 1, 1994, Ser. No. 348,016**

**The portion of the term of this patent subsequent to Feb. 22, 2094, has been disclaimed.**

**Int. Cl.[6] C08L 23/06;23/16**

**U.S. Cl. 525—240** **17 Claims**

1. A blend comprising:

a. from 25 wt. % to 45 wt. % of a random propylene copolymer containing from 0.1 to 10 mole percent of an α-olefin comonomer;

b. from 20 wt. % to 40 wt. % of a non-crystalline or substantially non-crystalline ethylene/α-olefin elastomer, said elastomer optionally comprising a diene termonomer; and

c. from greater than 30 wt. % to 45 wt. % of a polyethylene having a density of at least 0.94 g/cm$^3$;

wherein each wt. % is based upon the total weight of said blend.

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**5,502,113**

## STABLE AQUEOUS METALLIC FLAKE DISPERSION USING PHOSPHATED ACRYLIC POLYMER DISPERSANT

**Joseph A. Antonelli, Riverton, N.J.; Lee A. E. Becton, Media; Brian P. Devlin, Broomall, both of Pa., and Christopher Scopazzi, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Aug. 22, 1994, Ser. No. 294,002**

**Int. Cl.[6] C08L 33/08;33/12;63/10;33/14**

**U.S. Cl. 525—287** **8 Claims**

1. A pigment dispersion useful for forming aqueous coating compositions comprising metallic flake pigment, an aqueous carrier and a phosphated graft copolymer dispersant (binder);

wherein the graft copolymer has a weight average molecular weight of about 5,000– 100,000 and comprises about 20–80% by weight of a polymeric backbone and about 80–20% by weight of macromonomer side chains attached to the backbone wherein

(1) the polymeric backbone being hydrophilic in comparison to the side chains and consists essentially of polymerized ethylenically unsaturated monomers and

(2) the side chains being hydrophobic in comparison to the backbone and consist of macromonomers that are attached to the backbone at a single terminal point and consist essentially of polymerized ethylenically unsaturated monomers that are polymerized in the presence of a cobalt chain transfer agent and have a weight average molecular weight of about 1,000–30,000;

wherein the graft copolymer contains about 2 to 70% by weight, based on the weight of the graft copolymer, of polymerized glycidyl (meth)acrylate monomers in the backbone and the glycidyl groups being reacted with phosphoric acid or phosphorous pentoxide and the polymer being neutralized with an inorganic base or an amine; and the metallic flake pigment is present in a binder to pigment weight ratio of least 10/100.

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**5,502,114**

## TERMINAL-MODIFIED POLYOLEFINS

**Naomi Murakami; Miyuki Usui; Hiroyuki Furuhashi, and Satoshi Ueki, all of Saitama, Japan, assignors to Tonen Corporation, Tokyo, Japan**

**PCT No. PCT/JP93/00154, § 371 Date Mar. 16, 1994, § 102(e) Date Mar. 16, 1994, PCT Pub. No. WO93/16115, PCT Pub. Date Aug. 19, 1993**

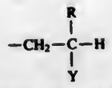
**PCT Filed Feb. 5, 1993, Ser. No. 137,075**

**Claims priority, application Japan, Feb. 10, 1992, 4-023808; Feb. 10, 1992, 4-023809; Feb. 10, 1992, 4-023810**

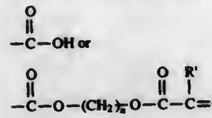
**Int. Cl.[6] C08L 23/10;23/16;23/26**

**U.S. Cl. 525—301** **3 Claims**

1. A process for the production of a terminal-modified linear chain polyolefin in which the polyolefin is polypropylene or ethylene-propylene random copolymer, one of the terminals of the polyolefin has a substituent represented by the following General Formula I,

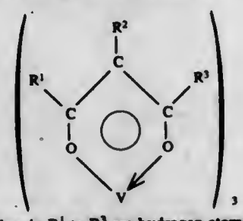


in which R is a hydrogen atom or methyl group, Y is



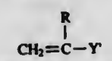
R' is a hydrogen atom or methyl group, and n is an integer of 2 to 4, which process comprises polymerizing propylene or random-copolymerizing ethylene and propylene in the presence of a catalyst consisting essentially of an organoaluminum compound and a vanadium compound represented by the following General Formula III,

III

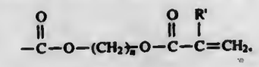


wherein $R^1$ to $R^3$ are hydrogen atoms or hydrocarbon groups of 1 to 8 carbon atoms and at least one of $R^1$ to $R^3$ must be a hydrogen atom, but all of $R^1$ to $R^3$ must not be hydrogen atoms, thus obtaining respectively living linear polypropylene or living linear ethylene-propylene random-copolymer, and then reacting the living polypropylene or ethylene-propylene random-copolymer with a methacrylic acid derivative or acrylic acid derivative represented by the following General Formula IV,

IV



wherein R has the same meaning as described above, Y' is



and R' and n have the same meanings as described above.

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**5,502,115**

**FLUOROELASTOMER COMPOSITIONS CONTAINING BROMINE AND IODINE IN THE POLYMERIC CHAIN WITH A REDUCED EMISSION OF TOXIC ALKYLHALO COMPOUNDS DURING CURING WITH THE PEROXIDE**

**Graziella Chiodini, Saronno Varese, and Anna Minutillo, Milan, both of, Italy, assignors to Ausimont S.r.l., Milan, Italy**

**Division of Ser. No. 296,939, Aug. 29, 1994, Pat. No. 5,399,633, which is a continuation of Ser. No. 26,165, Mar. 1, 1993, abandoned, which is a continuation of Ser. No. 798,176, Nov. 26, 1991, abandoned, which is a continuation of Ser. No. 450,466, Dec. 14, 1989, abandoned. This application Dec. 30, 1994, Ser. No. 366,775**

**Claims priority, application Italy, Dec. 16, 1988, 22995 A/88**

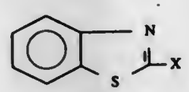
**Int. Cl.[6] C08F *8/00***

**U.S. Cl. 525—326.3** **3 Claims**

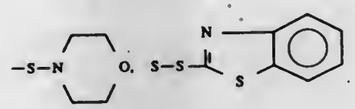
1. Fluoroelastomeric compositions containing bromine and/or iodine in the polymeric chain as peroxide cure sites, comprising organic peroxides of the aliphatic, cycloaliphatic or alkylaromatic type, either saturated or unsaturated, and an additive in an amount equal to 0.1–3 parts by weight for 100 parts by weight of fluoroelastomer, comprising at least one compound selected from the group consisting of:

I

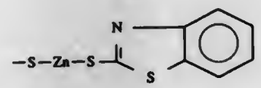
a) benzothiazole and derivatives thereof of general formula:



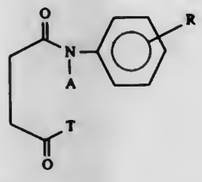
wherein: X represents H, —SH,



and



b) maleamide derivatives of the formula:

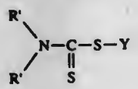


wherein

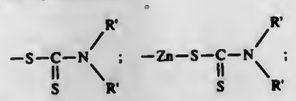
A=H, and T represents —OH

R represents H, alkyl with 1 to 6 carbon atoms, halogen, $—NO_2$

c) thiuram derivatives of the formula:

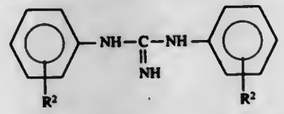


wherein Y represents



wherein R' represents alkyl with 1 to 4 carbon atoms,

d) diphenylguanidine derivatives of formula:



wherein $R^2$ represents H, alkyl with 1 to 6 carbon atoms and

e) maleic anhydride, diaryl-formamide and derivatives of diazo and triazo-dicyclodecenes.



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**5,502,116**

**BIODEGRADABLE COPOLYMERS AND PLASTIC ARTICLES COMPRISING BIODEGRADABLE COPOLYMERS OF 3-HYDROXYHEXANOATE**

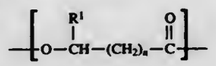
**Isao Noda, Fairfield, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio**

**Continuation of Ser. No. 422,011, Apr. 13, 1995, abandoned, which is a continuation of Ser. No. 371,940, Jan. 12, 1995, abandoned, which is a continuation of Ser. No. 189,029, Jan. 28, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 472,353**

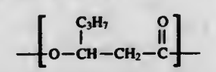
**Int. Cl.[6] C08L *67/04***

**U.S. Cl. 525—415** **21 Claims**

1. A plastic article comprising a biodegradable copolymer, wherein the biodegradable copolymer comprises at least two randomly repeating monomer units wherein the first randomly repeating monomer unit has the structure



wherein $R^1$ is H or $C_2$ alkyl, and n is 1 or 2; the second randomly repeating monomer unit has the structure



and wherein at lust 50% of the randomly repeating monomer units have the structure of the first randomly repeating monomer unit.

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**5,502,117**

**COPOLYMERS OF POLYASPARTIC ACID**

**Louis L. Wood, Rockville, Md., assignor to Srchem, Inc., Elkridge, Md.**

**Division of Ser. No. 373,088, Jan. 17, 1995, Pat. No. 5,466,760, , , , This application May 17, 1995, Ser. No. 442,824**

**Int. Cl.[6] C08G *69/48***

**U.S. Cl. 525—435** **3 Claims**

1. A process for the preparation of copolymers of polyaspartic acid comprising reacting maleic acid, ammonia and a polyamine at a temperature of 120° C. to 350° C. and converting the resultant polymer into a salt by adding a hydroxide.

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**5,502,118**

**POLYESTER SALTS AND THEIR USE AS CHARGE CONTROL AGENTS**

**Hans-Tobias Macholdt, Darmstadt; Rüdiger Bauer, Eppstein, and Joachim Zöller, Mainz, all of, Germany, assignors to Hoechst Aktiengesellschaft, Germany**

**Filed Sep. 21, 1994, Ser. No. 310,147**

**Claims priority, application Germany, Sep. 22, 1993, 43 32 170.4**

**Int. Cl.[6] C08F *20/00***

**U.S. Cl. 525—437** **19 Claims**

1. A polymer salt whose anionic component is a polyester which comprises the product of reaction of the individual components comprising a), b) and c) and optionally d) and optionally e), where

a) is a dicarboxylic acid or a reactive derivative of a dicarboxylic acid, being free from sulfo groups,

b) is a difunctional aromatic, aliphatic or cycloaliphatic sulfo compound whose functional groups are hydroxyl or carboxyl, or hydroxyl and carboxyl,

c) is an aliphatic, cycloaliphatic or aromatic diol, a polyetherdiol or a polycarbonatediol,

d) is a polyfunctional compound of functionality>2 whose functional groups are hydroxyl or carboxyl, or hydroxyl and carboxyl, and

e) is a monocarboxylic acid

and whose cationic component comprises metal cations, ammonium ions, immonium cations, guanidinium cations, phosphonium, arsonium or stibonium cations or a mixture of the abovementioned cations.

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**5,502,119**

**STABILIZED POLYESTER-POLYCARBONATE COMPOSITIONS**

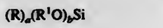
**Douglas G. Hamilton, Mt. Vernon, Ind., assignor to General Electric Company, Pittsfield, Mass.**

**Continuation of Ser. No. 984,766, Dec. 3, 1992, abandoned. This application Feb. 28, 1995, Ser. No. 396,353**

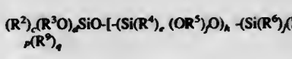
**Int. Cl.[6] C08F *20/00***

**U.S. Cl. 525—439** **20 Claims**

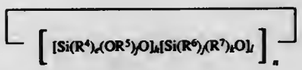
1. A polyester-polycarbonate composition comprising (A) at least one polyester prepared by the reaction of at least one alkanediol with at least one dicarboxylic acid or dialkyl ester thereof in the presence of a metallic catalyst, (B) at least one polycarbonate, and (C) at least one organosilicate having the general formula



or



or



wherein $0 \leq a \leq 3$; $1 \leq b \leq 4$; $a+b=4$; $0 \leq c \leq 3$; $c+d=3$; $0 \leq e \leq 2$; $0 \leq f \leq 2$; $e+f=2$; $0 \leq h \leq 20$; $0 \leq j \leq 2$; $0 \leq k \leq 2$; $j+k=2$; $0 \leq l \leq 20$; $0 \leq n \leq 100$; $0 \leq p \leq 3$; $0 \leq q \leq 3$; $d+f+p>0$; $p+=3$; R, $R^1$, $R^2$, $R^3$, $R^4$, $R^5$, $R^6$, $R^7$, $R^8$, and $R^9$ are each independently H, an alkyl radical having 1–20 carbon atoms, an aryl radical having 6–20 carbon atoms, an alkylaryl radical having 1–20 carbon atoms, an alkenyl radical having 1–20 carbon atoms, or halogenated derivatives of the foregoing; wherein the organosilicate is present in an amount sufficient to substantially inhibit ester-carbonate interchange in the composition.

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**5,502,120**

**MELT-EXTRUDED MONOFILAMENT COMPRISED OF A BLEND OF POLYETHYLENE TEREPHTHALATE AND A THERMOPLASTIC POLYURETHANE**

**Girish M. Bhatt, S. Burlington, Vt., and Dale B. Johnson, Ottawa, Canada, assignors to JWI Ltd., Kanata, Canada**

**Continuation-in-part of Ser. No. 34,287, Mar. 19, 1993, abandoned, which is a continuation of Ser. No. 701,752, May 17, 1991, abandoned, which is a continuation of Ser. No. 324,614, Mar. 17, 1989, abandoned, which is a continuation-in-part of Ser. No. 228,447, Aug. 5, 1988, abandoned. This application Aug. 4, 1994, Ser. No. 285,740**

**Int. Cl.[6] D01F *6/92***

**U.S. Cl. 525—440** **27 Claims**

1. A melt extruded monofilament having improved abrasion resistance, wet-to-dry dimensional stability, and improved crimpability, consisting essentially of a blend of:

i) from more than 60 to about 75 percent by weight of an essentially anhydrous polyethylene terephthalate having an intrinsic viscosity ranging from 0.50 to 1.20 when measured in a solvent comprising a 60:40 parts by weight mixture of phenol and 1,1,2,2-tetrachloroethane at 30° C.,

ii) from about 25 to less than 40 percent by weight of an essentially anhydrous thermoplastic ether- or ester-based

polyurethane having a Durometer Type A hardness less than 95, or a Durometer Type D hardness less than 75, and

iii) from 0 to about 5 percent by weight of a hydrolyric stabilizer,

wherein the Relative Abrasion Resistance of the melt extruded monofilament as measured by the ratio of weight loss of monofilaments comprised of the unblended essentially anhydrous polyethylene terephthalate as defined in i) to the weight loss of monofilaments comprised of the blend is from about 1.19 to about 2.67 when wound in a single layer around one end of a polyethylene rod and abraded by rotation while immersed in a slurry of 57% by weight of No. 24 grit sand in water.

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**5,502,121**

## BLENDS OF POLYARYLATES WITH ALIPHATIC POLYESTERS

**Christopher E. Scott, Watertown, Mass.; James D. Small, Jr., Blountville; Hsinjin Yang, Johnson City, both of Tenn.; Paul D. Yacobucci, Rochester, N.Y., and Gary M. Stack, Kingsport, Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.**

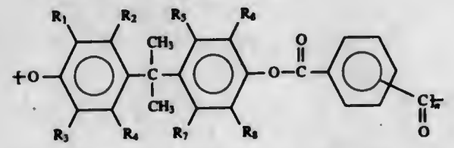
**Filed Sep. 30, 1994, Ser. No. 316,000**

**Int. Cl.[6] C08L** *67/03*

**U.S. Cl. 525—444** **13 Claims**

1. A blend comprising:

(A) about 1 to 99 weight % of a polyarylate based on alkylbisphenol-A having the structure:



wherein $R_1$, $R_2$, $R_3$, $R_4$, $R_5$, $R_6$, $R_7$, $R_8$ are selected from the group consisting of —H, $—CH_3$, $—CH_2CH_3$, with the proviso that at least one of $R_1$, $R_2$, $R_3$, $R_4$, $R_5$, $R_6$, $R_7$, and $R_8$ are either $—CH_3$ or $—CH_2CH_3$, and wherein n is an integer of 5 or greater, and

(B) about 99 to 1 weight % of an aliphatic polyester comprising linear acids or cycloaliphatic acids having rings comprising six or more carbons and linear glycols or cycloaliphatic glycols having rings comprising six or more carbon atoms;

wherein an article prepared from said blend is visually clear having a diffuse transmittance value of 40% or greater as determined by ASTM Method 1003.

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**5,502,122**

## BLENDS BASED ON POLYARYLENE ETHERS AND POLYARYLENE SULFIDES

**Martin Weber, Neustadt, and Wolfgang Eberle, Mainz, both of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany**

**Filed Mar. 24, 1995, Ser. No. 410,301**

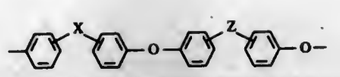
**Claims priority, application Germany, Mar. 26, 1994, 44 10 661.0; Jun. 14, 1994, 44 20 643.7**

**Int. Cl.[6] C08L** *81/04;81/06*

**U.S. Cl. 525—534** **6 Claims**

1. A molding material comprising

A) from 1 to 20% by weight of polyarylene ethers in which at least 0.03% by weight, based on the number average molecular weight $M_n$ of the polyarylene ethers, comprises terminal hydroxyl groups and which contain repeating units of the formula I



(I)

or corresponding units substituted in the nucleus by $C_1$–$C_6$-alkyl, $C_1$–$C_6$-alkoxy, aryl, chlorine or fluorine, where

X may be $—SO_2—$, —SO—, —O—, CO, —N=N—, $—RC=CR^c—$, $—CR^bR^c—$ or a chemical bond and

Z is selected from the group consisting of $—SO_2—$, —SO—, CO,

—N=N— and $—RC=CR^c—$,

R and $R^c$ are each hydrogen or $C_1$–$C_6$-alkyl and

$R^b$ and $R^c$ may each be hydrogen or $C_1$–$C_6$-alkyl, $C_4$–$C_{10}$-cycloalkyl, $C_1$–$C_6$-alkoxy, $C_4$–$C_{10}$-cycloalkyl, $C_1$–$C_6$-alkoxy or aryl or a fluorine or chlorine derivate of each of these,

B) from 5 to 95% by weight of polyarylene ethers in which less than 0.03% by weight, based on the number average molecular weight $M_n$ of the polyarylene ethers, comprises hydroxyl groups, whereby the average molecular weights and relative viscosities of the polyarylene ethers B are in the same range as those of the polyarylene ethers A,

C) from 4 to 94% by weight of polyarylene sulfides,

D) from 0 to 60% by weight of fibrous or particulate fillers,

E) from 0 to 45% by weight of rubber impact modifiers, and

F) from 0 to 40% by weight of additives or processing assistants.

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**5,502,123**

## PROCESS FOR PREPARING VINYL CHLORIDE POLYMER

**Tadayoshi Hiyama, Ibaraki; Toru Yokota, Chiba, and Tadashi Amano, Ibaraki, all of, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan**

**Filed Aug. 10, 1994, Ser. No. 288,590**

**Claims priority, application Japan, Dec. 21, 1993, 5-345209**

**Int. Cl.[6] C08F** *2/20*

**U.S. Cl. 526—88** **12 Claims**

1. A process for preparing a vinyl chloride polymer by suspension polymerization of a monomeric charge containing vinyl chloride dispersed and suspended in an aqueous medium while agitating the suspension in a reactor, characterized in that

(1) a partially saponified polyvinyl alcohol having an average degree of polymerization of 150 to 600 and a degree of saponification of 20 to 55 mol % is added to the monomeric charge as a dispersant in an amount of 0.01 to 5 parts by weight per 100 parts by weight of the monomeric charge before polymerization is started,

(2) a suspending agent selected from the group consisting of (A) a water-soluble partially saponified polyvinyl alcohol having an average degree of polymerization of 700 to 3,000 and a degree of saponification of 70 to 85 mol %, (B) a hydroxypropylmethyl cellulose having a degree of methoxy substitution of 26 to 30% by weight, a degree of hydroxypropoxy substitution of 4 to 15% by weight, and a viscosity of 5 to 4,000 centipoise as measured in a 2% by weight aqueous solution at 20° C., and mixtures thereof is used in an amount of 0.03 to 2 parts by weight per 100 parts by weight of the monomeric charge and added continuously from the start of polymerization and entirely while the polymerization rate is in the range of 5% to 50%, and

(3) the agitating power applied to the aqueous suspension in the reactor is 80 to 100 kg·m/s·ton while said suspending agent is being added, and increased above 110 kg·m/s·ton after the completion of addition.



**5,502,124**

## TRANSITION METAL OLEFIN POLYMERIZATION PROCESSES

**Donna J. Crowther, Baytown; Richard A. Fisher, League City; Jo Ann M. Canich, Webster; Gregory G. Hlatky, and Howard W. Turner, both of Houston, all of Tex., assignors to Exxon Chemical Patents Inc., Wilmington, Del.**

**Division of Ser. No. 86,772, Jul. 1, 1993, which is a continuation-in-part of Ser. No. 907,998, Jul. 1, 1992, abandoned. This application May 19, 1995, Ser. No. 445,062**

**Int. Cl.[6] C08F** *4/69;4/68*

**U.S. Cl. 526—127** **21 Claims**

1. A process to produce polyolefins comprising contacting one or more olefins containing from 2 to 20 carbon atoms under polymerization conditions with a composition comprising a coordinatively unsaturated cationic transition metal complex having at least one reactive metal-ligand sigma bond, said cation stabilized by a low coordination number polyanionic ancillary ligand system and charge balanced with at least one compatible non-coordinating anion(s).

16. A process to produce polyolefins comprising contacting one or more olefins containing from 2 to 20 carbon atoms under polymerization conditions with a composition according to the formula:

$$\{(L_3)A(L_4)\}^{-c}M_nX_2$$

wherein:

M is group 5 or 6 transition metal in its highest oxidation state;

n is the group number of the metal;

$L_3$ and $L_4$ are the same or different substituted or unsubstituted anionic ancillary ligands covalently bonded to the metal;

X is a uninegative ligand selected from hydride radicals, hydrocarbyl radicals, halogen-substituted hydrocarbyl radicals, halocarbyl radicals, hydrocarbyl-substituted organometalloid radicals, halocarbyl-substituted organometalloid radicals, halides, alkoxides, amides or phosphides;

A is an optional bridging group bridging $L_3$ and $L_4$;

c is an integer representing the charge on the ancillary ligand system $\{(L_3)A(L_4)\}$;

and alumoxane.

19. The process of claim 16 selected from the group tris(pyrazolyl)borato vanadium oxide dichloride, cyclopentadienylvanadium(p-tolyimido)dichloride, $Cp^*(C_2B_9H_{11})TaMe_2$, wherein $Cp^*$ is $C_5Me_5$, $(C_2B_9H_{11})W{=}NAr^1(Me)(Cl)$, wherein $Ar^1$ is 2,6-dimethylbenzene, $W(=NAr^2)_2(CH_2SiMe_3)_2$, wherein $Ar^2$ is 2,6-diisopropylbenzene, or, $CpNb{=}N(2,6\text{-diisopropylbenzene})Me_2$.

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**5,502,125**

## PROCESS FOR PREPARING ETHYLENE COPOLYMERS

**Radu Bordeianu, Marl, and Christoph Theis, Niederkassel, both of, Germany, assignors to Huels Aktiengesellschaft, Marl, Germany**

**Filed Mar. 10, 1995, Ser. No. 401,975**

**Claims priority, application Germany, May 5, 1994, 44 15 872.6**

**Int. Cl.[6] C08F** *210/18;4/685*

**U.S. Cl. 526—140** **7 Claims**

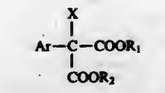
1. A process for preparing olefin copolymers, comprising:

copolymerizing ethylene, an α-olefin and, optionally a diene having non-conjugated double bonds by solution polymerization in the presence of:

(a) an organoaluminum compound,

(b) a vanadium compound in the oxidation state from +3 to +5, and

(c) an activator in a molar ratio of from 0.5 to 100 relative to vanadium of said vanadium compound, said activator being a 2-halomalonic ester substituted by an aromatic group and having the formula



wherein X=F, Cl, Br or I, Ar is an aromatic radical which is unsubstituted, monosubstituted or polysubstituted by alkyl or alkoxy groups and which is bound to the central carbon atom either directly or by an intervening carbonyl group; and $R_1$ and $R_2$ are hydrocarbon radicals having from 1 to 20 carbon atoms.

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**5,502,126**

## PROCESS FOR THE SYNTHESIS OF ISOPRENE BUTADIENE RUBBER

**Anthony J. Bell, Stow; Barry A. Matrana, Akron, and Adel F. Halasa, Bath, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio**

**Division of Ser. No. 77,633, Jun. 17, 1993, Pat. No. 5,405,815. This application Oct. 28, 1994, Ser. No. 330,468**

**Int. Cl.[6] C08F** *4/52;236/08*

**U.S. Cl. 526—142** **24 Claims**

1. A process for the synthesis of isoprene-butadiene rubbers which comprises copolymerizing isoprene monomer and 1,3-butadiene monomer in an organic solvent in the presence of a catalyst system which is made by the sequential steps of (1) mixing (a) an organoaluminum hydride, (b) an aliphatic alcohol containing from 1 to 12 carbon atoms, and (c) optionally, 1,3-butadiene in an organic solvent to produce a modified organoaluminum catalyst component; (2) adding an organometallic compound which contains a metal from Group III-B of the Periodic System to the modified organoaluminum catalyst component to produce a Group III-B metal containing catalyst component; and (3) adding a compound which contains at least one labile halogen atom to the Group III-B metal containing catalyst component.

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**5,502,127**

## PROCESS FOR PRODUCTION OF HOMOGENEOUS POLYETHYLENE

**Xinlai Bai, Piscataway, N.J., assignor to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.**

**Filed Mar. 31, 1994, Ser. No. 221,683**

**The portion of the term of this patent subsequent to Feb. 20, 2013, has been disclaimed.**

**Int. Cl.[6] C08F** *4/68;236/20*

**U.S. Cl. 526—143** **7 Claims**

1. A process for the production of a homogeneous polyethylene having a polydispersity in the range of about 2 to about 3.5 and an essentially uniform comonomer distribution comprising contacting a mixture comprising ethylene, one or more alpha-olefins, each having 4 to 8 carbon atoms, and one or more unconjugated dienes, under polymerization conditions, with a catalyst system comprising:

(a) a catalyst precursor, in independent or prepolymer form, consisting of vanadium $(acetylacetonate)_3$;

(b) optionally, a support for said precursor;

(c) a cocatalyst consisting of an alkylaluminum halide having the formula $AlR_{(3-a)}X_a$ wherein each R is independently alkyl having 1 to 14 carbon atoms: each X is independently chlorine, bromine, or iodine; and a is 1 or 2; and

(d) a promoter, which is a chlorinated ester having at least 2 chlorine atoms,

with the proviso that sufficient unconjugated diene is present in the mixture to provide, in the homogeneous polyethylene, about 0.01 to about 0.8 percent by weight diene based on the weight of the homogeneous polyethylene.

## 5,502,128

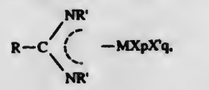
### GROUP 4 METAL AMIDINATE CATALYSTS AND ADDITION POLYMERIZATION PROCESS USING SAME

Juan C. Flores, and Marvin D. Rausch, both of Amherst, Mass., assignors to University of Massachusetts, Amherst, Mass.

Filed Dec. 12, 1994, Ser. No. 354,341
Int. Cl.[6] C08F 4/42;112/08; B01J 31/38
U.S. Cl. 526—160 9 Claims

1. A process for preparing polymers of addition polymerizable monomers comprising contacting an addition polymerizable monomer under addition polymerization conditions with a catalyst composition comprising:

1) a Group 4 metal complex corresponding to the formula:



MXpX'q, or a dimer thereof, wherein:

M is titanium, zirconium or hafnium in the +2, +3 or +4 formal oxidation state;

R is an inert ligand group of up to 20 nonhydrogen atoms; and

R' independently each occurrence is a group selected from hydrocarbyl, sily, halohydrocarbyl and mixtures thereof, said R' having up to 10 nonhydrogen atoms;

X is an anionic ligand group having up to 40 atoms exclusive of the class of ligands that are cyclic, delocalized, n-bound ligand groups;

X' independently each occurrence is a neutral Lewis base ligating compound, having up to 20 atoms;

p is 1, 2 or 3, and is one less than the formal oxidation state of M; and

q is 0, 1 or 2, and

2) an activating cocatalyst;

the molar ratio of 1) to 2) being from 1:10,000 to 100:1; or

B) the reaction product formed by converting 1) to an active catalyst by use of an activating technique.

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## 5,502,129

### TRIORGANOTIN LITHIUM, PROCESS TO PREPARE SAME AND ANIONIC POLYMERIZATION INITIATED THEREWITH

William L. Hergenrother, Akron, Ohio; W. Novis Smith, Philadelphia, Pa.; Anthony J. Muratore, III, Elverson, Pa.; Jay C. Sigle, Downingtown, Pa., and Mark T. Nemeth, Exton, Pa., assignors to Bridgestone Corporation, Tokyo, Japan, and Cyprus Foote Mineral Co., Malver, Pa.

Filed May 13, 1994, Ser. No. 242,648
Int. Cl.[6] C08F 4/58; C07F 7/22
U.S. Cl. 526—176 17 Claims

1. A triorgano substituted-tin lithium initiator, comprising;

the reaction product of a solution of hexaorgano substituted-ditin with lithium metal in the presence of one or more solubilizing solvents which form the triorgano substituted-tin lithium, said reaction product having less than 3000 parts of a halide based on one million parts of said triorgano substituted-tin lithium initiator and said reaction product having at least 90 percent by weight of said triorgano substituted-tin lithium based on all of the tin containing species in said reaction product, wherein the mole ratio of said solubilizing solvents to said triorgano substituted-tin lithium is above 3:1, and wherein said organo groups are independently an alkyl or a cyclo-alkyl having from 1 to 12 carbon atoms or an aryl or an alkyl substituted aryl having from 6 to 15 carbon atoms.

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## 5,502,130

### ANIONIC POLYMERIZATION INITIATORS CONTAINING ADDUCTS OF CYCLIC SECONDARY AMINES AND CONJUGATED DIENES, AND PRODUCTS THEREFROM

David F. Lawson, Uniontown; Thomas A. Antkowiak, Wadsworth; James E. Hall, Mogadore, and Mark L. Stayer, Jr., Suffield, all of Ohio, assignors to Bridgestone Corporation, Tokyo, Japan

Division of Ser. No. 175,294, Dec. 29, 1993. This application Jun. 6, 1995, Ser. No. 469,131
Int. Cl.[6] C08F 4/46
U.S. Cl. 526—180 5 Claims

1. A method of preparing a polymer comprising the steps of:

forming a solution of one or more anionically polymerizable monomers in a hydrocarbon solvent; and,

polymerizing said monomer with an anionic polymerization initiator comprising a carbon-lithio salt of the adduct of a cyclic secondary amine with a conjugated diene.

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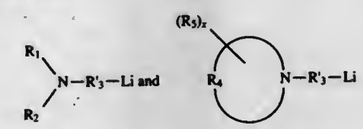
## 5,502,131

### METHOD OF PREPARING POLYMER USING ALLYL- AND XYLYL-AMINE CONTAINING INITIATORS

Thomas A. Antkowiak, Rittman; James E. Hall, Mogadore; David F. Lawson, Uniontown; John R. Schreffler, Clinton, and Mark L. Stayer, Jr., Suffield, all of Ohio, assignors to Bridgestone Corporation, Tokyo, Japan

Division of Ser. No. 363,111, Dec. 23, 1994. This application Jun. 6, 1995, Ser. No. 469,150
Int. Cl.[6] C08F 4/48;36/02;36/22
U.S. Cl. 526—180 3 Claims

1. A method of preparing a polymer comprising: polymerizing at least one monomer selected from diolefin monomers having from about 4 to about 12 carbon atoms, monovinyl aromatic monomers having from about 8 to about 20 carbon atoms, and trienes, in the presence of a polymerization initiator having a general formula selected from



wherein $R_1$ and $R_2$ are the same or different and are selected from alkyls, cycloalkyls and aralkyls having from 1 to about 12 carbon atoms; $R'_3$ is a group selected from allyl, 2-methallyl and xylyl, with one hydrogen atom removed; $R_4$ is a carbocyclic group of from about 3 to about 20 methylene groups; each $R_5$ is an alkyl substituent on a methylene group having from 1 to about 20 carbon atoms; and, x is an integer of from 0 to about 10.

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## 5,502,132

### PROCESS FOR PRODUCING A PERFLUORO COPOLYMER

Norihide Sugiyama; Hidenobu Murohushi, and Masaru Nakamura, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Division of Ser. No. 919,646, Jul. 27, 1992, abandoned. This application Feb. 9, 1994, Ser. No. 194,124
Int. Cl.[6] C08F 16/24
U.S. Cl. 526—247 5 Claims

1. A perfluoro copolymer comprising the radical polymerization product of:

1–99% by weight of $CF_2$=CFOCF$_2$CF=$CF_2$; and

1–99% by weight of perfluoro-2-2-dimethyl-1,3-dioxol.



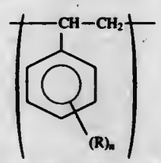
## 5,502,133

### SYNDIOTACTIC STYRENE POLYMERS

Nobuhide Ishihara, Sodegaura; Masahiko Kuramoto, and Michitake Uoi, both of Ichihara, all of, Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Division of Ser. No. 693,375, Apr. 30, 1991, Pat. No. 5,252,693, which is a continuation-in-part of Ser. No. 416,914, Oct. 4, 1989, abandoned, which is a continuation-in-part of Ser. No. 175,581, Mar. 28, 1988, abandoned, which is a continuation of Ser. No. 888,153, Jul. 18, 1986, abandoned, said Ser. No. 416,914is a continuation-in-part of Ser. No. 138,914, Dec. 28, 1987, abandoned. This application Apr. 15, 1993, Ser. No. 46,752
Claims priority, application Japan, Jul. 29, 1985, 60-165881; May 6, 1986, 61-101926; Jan. 28, 1987, 62-17973
The portion of the term of this patent subsequent to Oct. 12, 2010, has been disclaimed.
Int. Cl.[6] C08F 12/34;12/14;12/08
U.S. Cl. 526—347 60 Claims

1. A syndiotactic styrene polymer having repeating units of the formula (I):



(I)

wherein R for each repeating unit is selected from the group consisting of hydrogen, halogen, and a substituent containing carbon, oxygen, nitrogen, sulfur, phosphorus, or silicon and wherein n represents an integer of 1 to 3, a degree of polymerization of not less than 5, and a stereoregularity which has syndiotacticity in terms of the racemic pentad of not less than 30% and wherein when n is 2 or 3, the R's can be the same or different.

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## 5,502,134

### RESIN COMPOSITION CONTAINING A POLYCARBONATE-POLYDIMETHYLSILOXANE

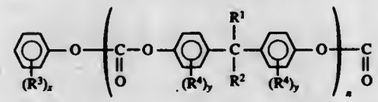
Masaya Okamoto, and Takashi Kanezaki, both of Ichihara, Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 9,384, Jan. 27, 1993, abandoned, which is a continuation of Ser. No. 640,416, Jan. 15, 1991, abandoned. This application Jul. 28, 1994, Ser. No. 282,157
Claims priority, application Japan, Jul. 7, 1989, 1-174046
Int. Cl.[6] C08L 69/00
U.S. Cl. 524—537 12 Claims

1. A resin composition comprising

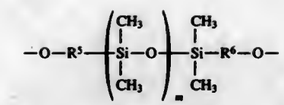
(i) 40 to 90 weight % of a polycarbonate-polydimethylsiloxane copolymer, said copolymer comprising

(a) a polycarbonate block represented by the formula



wherein $R^1$ and $R^2$ independently represents hydrogen or an alkyl group having 1–4 carbon atoms, $R^3$ and $R^4$ independently represent halogen, an alkyl group having 1–20 carbon atoms or an aryl group, x denotes an integer of 0–5, y denotes an integer of 0–4 and n denotes an integer of 1–100, and

(b) a polydimethylsiloxane block represented by the formula



wherein $R^5$ and $R^6$ independently represent an organic residue having an aromatic nucleus, and m denotes an integer greater than or equal to 100,

said copolymer having a content of the polydimethylsiloxane block of 0.5–10% by weight, an n-hexane soluble matter content in an amount of 1.0% by weight or less and a viscosity average molecular weight of 10,000–50,000, and

(ii) 60 to 10% by weight of an inorganic filler.

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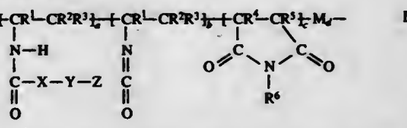
## 5,502,135

### COPOLYMERS BASED ON DICARBOXIMIDES, ALKENYL ISOCYANATES AND/OR ALKENYLURETHANES

Stefan Beckmann, Bad Dürkheim; Rudolf Zentel, Nierstein; Michael Doerr, Wiesbaden, and Manfred Eich, Mühltal, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Mar. 9, 1995, Ser. No. 401,612
Claims priority, application Germany, Mar. 11, 1994, 44 08 199.5
Int. Cl.[6] C08F 222/40;226/02
U.S. Cl. 526—262 5 Claims

1. A copolymer based on monomers selected from the group consisting of dicarboximides, alkenyl isocyanates and alkenylurethanes of the formula I



I

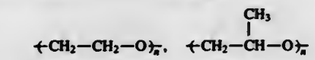
where

$R^1$, $R^2$, $R^3$, $R^4$ and $R^5$, independently of one another are each selected from the group consisting of hydrogen, $C_1$–$C_{20}$-alkyl, $C_1$–$C_{20}$-alkyl which contains hetero atoms and substituted $C_1$–$C_{20}$ -alkyl;

$R^6$ is hydrogen or $C_1$–$C_{10}$-alkyl which is unsubstituted or substituted by phenyl or hydroxyl, or is $C_3$–$C_8$-cycloalkyl, or is phenyl or benzyl, each of which is unsubstituted or substituted by 1 to 4 $C_1$–$C_6$-alkyl or $C_1$–$C_6$-alkoxy groups, or is phenethyl, diphenylmethyl, naphthyl, carbazoyl, isobornyl, adamantyl or 9-fluorenyl;

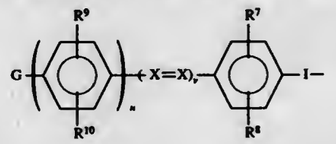
X is O or NH;

Y is methylene, ethylene, propylene, isopropylene, straight-chain or branched $C_1$–$C_{20}$-alkylene,



where n is from 1 to 15,

Z is hydrogen or a radical of formula V



V

where

$R^7$ to $R^{10}$ are identical or different and are each H, straight-chain or branched $C_1$–$C_{10}$-alkyl, $C_1$–$C_{10}$-alkoxy or $C_3$–$C_7$-cycloalkyl,

l is O or $NR^{11}$,

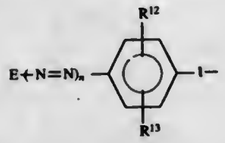
$R^{11}$ is H, $C_1$–$C_{10}$-alkyl, $C_3$–$C_7$-cycloalkyl, phenyl, benzyl or phenethyl,

u and v are each 0 or 1,

X is CH or N and

G is CN, $NO_2$, dicyanovinyl, tricyanovinyl, CHO or $CH{=}C(CO_2R^{11})$, or a radical of the formula VI:

where



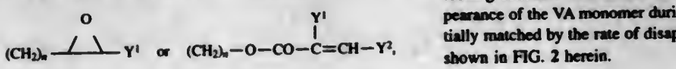
VI

n is 0 or 1,

$R^{12}$ and $R^{13}$, independently of one another, are each hydrogen, straight-chain or branched $C_1$–$C_{10}$ -alkyl, $C_1$–$C_{10}$-alkoxy or $C_3$–$C_7$-cycloalkyl.

l is O or $NR^{14}$ wherein

$R^{14}$ is hydrogen $C_1$–$C_{10}$-alkyl, $C_3$–$C_7$-cycloalkyl,



where n is 0 or 1,

$Y^1$ is hydrogen or methyl and $Y^2$ is hydrogen or phenyl, and

E is a radical of a diazo component which is derived from a five-membered aromatic heterocyclic amine which has from one to three hetero atoms selected from the group consisting of nitrogen, oxygen and sulfur in the heterocyclic ring and may be fused with a benzene, thiophene, pyridine or pyrimidine ring;

M is any copolymerizable monomer and a+b+c+d=1, where

a and c each range from 0.3 to 0.7 and

b and d each range from 0 to 0.3.

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**5,502,136**

**PROCESS FOR MAKING SUBSTANTIALLY HOMOGENEOUS COPOLYMERS OF VINYL PYRROLIDONE AND VINYL ACETATE WHICH FORM CLEAR AQUEOUS SOLUTIONS**

**Yuanzhen Zhong, Wayne; Philip F. Wolf, Bridgewater, and Yakir Reuven, West Orange, all of N.J., assignors to ISP Investments Inc., Wilmington, Del.**

**Filed Dec. 28, 1994, Ser. No. 365,526**

**Int. Cl.[6] C08F *226/10;218/08***

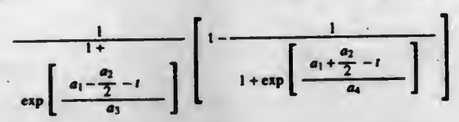
**U.S. Cl. 526—264** **5 Claims**

1. A process for making substantially homogeneous copolymers of 50–90% vinyl pyrrolidone (VP) and 10–50% vinyl acetate (VA) monomers, by weight, which form clear aqueous solutions at room temperature, by polymerization of the monomers in a water miscible organic solvent, or mixtures of the solvent with water, in the presence of a radical initiator, which comprises:

(a) precharging a reactor with a predetermined initial amount of the VA monomer in accordance with a selected weight ratio of said monomers, and about 15–40% by weight of said selected amount of VP, and the solvent and initiator, at a polymerization temperature, and

(b) introducing vinyl pyrrolidone into said reactor at a specific feeding schedule determined from the following Equations:

$A_t =$ EQUATION 1



where $A_t$ has four adjustable parameters, $a_1$, $a_2$, $a_3$ and $a_4$;

$a_1$ is a parameter which determines the center of the distribution;

$a_2$ is a parameter which affects the width of the distribution;

$a_3$ is a parameter which determines the ascending portion of the distribution; and

$a_4$ is a parameter which determines the descending portion of the distribution; and

t=time (in minutes) from the beginning of the copolymerization;

EQUATION 2

$$\%\ VP \text{ to be fed at time } t = \frac{A_t}{\sum_{t=0}^{N} A_t} \times 100$$

where N=time when the polymerization is completed; wherein a set of determined values for $a_1$, $a_2$, $a_3$ and $a_4$ provides said specific feeding schedule and assures that the curve of the rate of disappearance of the VA monomer during the polymerization is substantially matched by the rate of disappearance of the VP monomer, as shown in FIG. 2 herein.

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**5,502,137**

**POLYETHER GLYCOLS AND ALCOHOLS DERIVED FROM 3,4-EPOXY-1-BUTENE, TETRAHYDROFURAN AND AN INITIATOR**

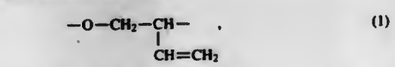
**James C. Matayabas, Jr.; Peter B. MacKenzie, and John A. Hyatt, all of Kingsport, Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.**

**Filed Nov. 25, 1994, Ser. No. 344,905**

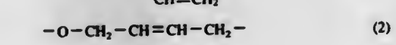
**Int. Cl.[6] C08G *65/14;65/08***

**U.S. Cl. 528—393** **5 Claims**

1. A polyether polymer comprising m units of residue (1), n units of residue (2), and p units of residue (3) wherein (i) residues (1), (2) and (3) have the structures:



(1)



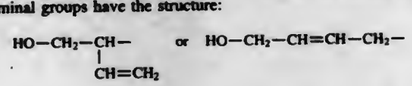
(2)

and



(3)

(ii) the total value of m+n+p is 5 to 70, (iii) the value of n/(m+n+p) is in the range of 0.2 to 0.4, and (iv) at least 98 percent of the terminal groups have the structure:



or 



**5,502,138**

**TEXTILE COATING AND METHOD OF USING THE SAME**

**Venkataram Krishnan, Cary, and Winfeld S. Rutherford, Durham, both of N.C., assignors to Reichhold Chemicals, Inc., Durham, N.C.**

**Division of Ser. No. 410,047, Mar. 24, 1995, which is a continuation-in-part of Ser. No. 113,830, Aug. 27, 1993, Pat. No. 5,403,640. This application May 30, 1995, Ser. No. 454,576**

**Int. Cl.[6] C08F *24/00***

**U.S. Cl. 526—273** **9 Claims**

1. A styrene-free polymeric textile coating composition comprising:

(a) about 10 to 90 percent by weight non-aromatic unsaturated mono- or dicarboxylic ester monomer;

(b) about 10 to 90 percent by weight aliphatic conjugated diene monomer; and

(c) about 0.3 to 5 percent by weight of an unsaturated mono- or dicarboxylic acid monomer or a monomer based on a half ester of the unsaturated dicarboxylic acid.

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**5,502,139**

**CROSS-LINKABLE POLYMERIC COMPOSITION**

**Huan K. Toh, Fullerton, and Choong M. Kok, Flagstaff Hill, both of, Australia, assignors to Sola International Holdings Ltd., South Australia, Australia**

**Continuation of Ser. No. 151,820, Nov. 15, 1993. This application Apr. 20, 1995, Ser. No. 426,480**

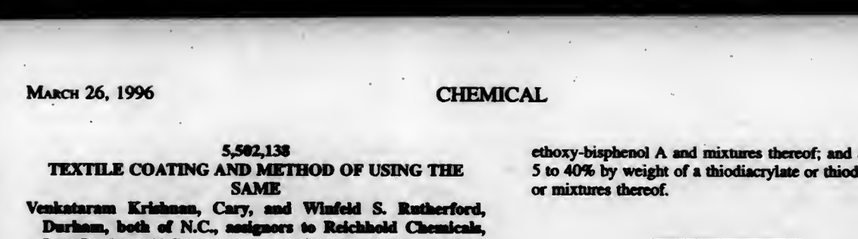
**Claims priority, application Australia, Nov. 16, 1992, PL5864**

**Int. Cl.[6] C08F *236/22***

**U.S. Cl. 526—284** **12 Claims**

1. A cross-linkable polymeric casting composition suitable for use in the formation of a transparent optical article having a high refractive index in the range of 1.55 to 1.60 comprising:

approximately 5% to 30% by weight based on the total weight of the casting composition of a fluorene diacrylate or dimethacrylate monomer selected from monomers of the general formula



wherein

$R_1$=H or alkyl,

$R_2$=H or alkyl,

X=H or OH, and

m and n are integers provided that the sum of m and n is from 0 to 4; approximately

5% to 60% by weight of a polyoxyalkylene glycol diacrylate or dimethacrylate; and

at least one comonomer selected from the group consisting of approximately 2.5% to 25% by weight of a urethane monomer having 2 to 6 terminal acrylic and/or methacrylic groups; approximately 5 to 45% by weight of a polyfunctional unsaturated cross-linking agent selected from the group consisting of tri- and tetra-functional vinyls, and acrylic and methacrylic monomers; approximately 10 to 60% by weight of a bisphenol monomer selected from the group consisting of dimethacrylate and diacrylate esters of bisphenol A, dimethacrylate and diacrylate esters of 4,4'bishydroxy-ethoxy-bisphenol A and mixtures thereof; and approximately 5 to 40% by weight of a thiodiacrylate or thiodimethacrylate; or mixtures thereof.

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**5,502,140**

**THERMALLY POLYMERIZED DICYCLOPENTADIENE/VINYL AROMATIC RESINS**

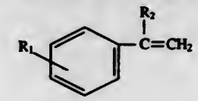
**Norman E. Daugherbough, Turtle Creek; Dane G. Goodfellow, Pittsburgh, and Deborah A. Riedl, Library, all of Pa., assignors to Hercules Incorporated, Wilmington, Del.**

**Filed Oct. 19, 1994, Ser. No. 325,763**

**Int. Cl.[6] C08F *232/08***

**U.S. Cl. 526—283** **16 Claims**

1. A hydrocarbon resin consisting essentially of a thermally polymerized copolymer made from (1) about 40% to 90% by weight based on total monomers of a cyclic diolefin component comprising at least about 50% by weight dicyclopentadiene, and (2) about 60% to 10% by weight based on total monomers of at least one vinyl aromatic component having the formula



where $R_1$ is H or a 1–10 carbon linear or branched chain alkyl group at the meta- or para-position and $R_2$ is a 1–10 carbon linear or branched chain alkyl group or a 2-methyl-2-phenylpropyl group, the resin having a Ring and Ball softening point of about 70° to about 150° C., having a Mz with a maximum value of about 4000, having a Mw with a maximum value of about 2500, and having a Pd with a maximum value of about 3.0.

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**5,502,141**

**METHOD OF MAKING THIOL METHACRYLATE OR ACRYLATE AND A LENS MADE THEREFROM**

**Yuichiro Iguchi; Michio Kimura, both of Otsu, and Koichiro Oka, Ibaraki, all of, Japan, assignors to Toray Industries, Inc., Japan**

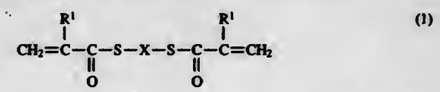
**Division of Ser. No. 169,683, Dec. 17, 1993, Pat. No. 5,399,735, which is a division of Ser. No. 1,875, Jan. 6, 1993, Pat. No. 5,294,690, which is a continuation of Ser. No. 844,477, Mar. 2, 1992, Pat. No. 5,247,041, which is a continuation of Ser. No. 482,285, Feb. 20, 1990, abandoned. This application Dec. 8, 1994, Ser. No. 351,687**

**Claims priority, application Japan, Feb. 22, 1989, 1-42822; Apr. 18, 1989, 2-09372**

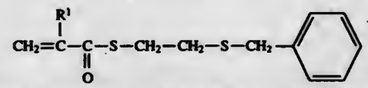
**Int. Cl.[6] C08F *28/02***

**U.S. Cl. 526—286** **1 Claim**

1. A high-refractive-index plastic lens composed of a thiol methacrylate or acrylate resin obtained by polymerizing a thiol methacrylate or acrylate monomer represented by the following formula (1) or (2), or a monomer mixture comprising at least 10% by weight of the thiol methacrylate or acrylate monomer of the formula (1) or (2):

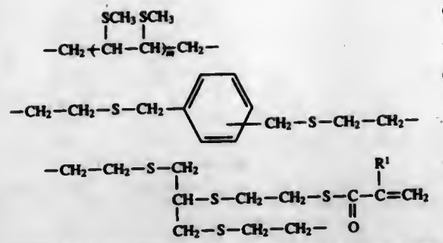


(1)



(2)

wherein $R^1$ represents a hydrogen atom or a methyl group and X represents a divalent group selected from the group consisting of:



wherein $R^1$ is the same as defined above and m is an integer of from 1 to 4.

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**5,502,142**

## DIRECT THERMAL SYNTHESIS AND CERAMIC APPLICATIONS OF POLY(BORAZYLENES)

**Larry G. Sneddon, Havertown, Pa.; Jeffrey S. Beck, Princeton, and Paul J. Fazen, Wenonah, both of N.J., assignors to The Trustees of the University of Pennsylvania, Philadelphia, Pa.**

**Continuation of Ser. No. 821,344, Jan. 13, 1992, abandoned, which is a continuation of Ser. No. 491,293, Mar. 9, 1990, abandoned. This application Oct. 26, 1993, Ser. No. 143,524**

**Int. Cl.[6] C08G 79/08**

**U.S. Cl. 528—7** **3 Claims**

1. Poly(borazylene) consisting essentially of repeating units of the formula $(B_3N_3M_4)$ which poly(borazylene) is free of measureable traces of metal catalyst and has, according to size exclusion chromatography/low angle laser light scatter (SEC/LALLS) analysis, a $M_w$ of at least about 2,100 and a $M_n$ of at least about 980, and which is soluble in a polar solvent selected from the group consisting of tetrahydrofuran and glyme to an extent of at least about 50 wt. %.

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**5,502,143**

## PROCESS FOR PREPARING POLYIMIDE RESINS

**Yoshihiro Oie, Tokyo, and Hiroshi Itstani, Chiba, both of, Japan, assignors to PI Material Research Laboratory, Kanagawa, Japan**

**Continuation-in-part of Ser. No. 166,916, Dec. 15, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 466,729**

**Claims priority, application Japan, Dec. 25, 1992, 4-358909; Dec. 2, 1993, 5-339549**

**Int. Cl.[6] C08G 77/08**

**U.S. Cl. 528—12** **16 Claims**

1. In the process for preparing polyimide resins comprising:

(A) reacting one mole of a first diamine with about 2–10 moles of an acid dianhydride in an organic polar solvent at a temperature of from 140°–220° C. in the presence of a binary catalyst to form imide oligomers containing more than 80% by weight of an imide monomeric unit;

wherein the acid dianhydride is selected from the group consisting of biphenyltetracarboxylic dianhydride; benzophenonetetracarboxylic dianhydride; 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis(1,2-benzenedicarboxylic dianhydride); bis(dicarboxylphenyl)ether dianhydride and bicyclo(2,2,2)oct-7-ene-2,3,5,6-tetracarboxylic dianhydride, and

the organic polar solvent is selected from the group consisting of N-methyl-2-pyrrolidone, N,N-dimethyl formamide N,N-dimethylacetamide, N-acetyl morpholine and tetramethyl urea;

(B) reacting the imide oligomers with a second diamine so that the total amount of the first diamine and the second diamine is almost equivalent in moles to the acid dianhydride in the reaction solution at a temperature of 140°–220° C. to form a polyimide block polymer solution;

wherein the first diamine is different from the s[illegible]d diamine, and the first and second diamines are selected from the group consisting of 1,4-benzenediamine; [illegible]hyl-1,3-benzenediamine; 4,4'-diamino-3,3'-dimethyl[illegible]phenyl; 4,4'-diamino- 3,3'-dimethoxy-1,1-biphenyl; [illegible]thylene bis(benzeneamine); 4,4'-oxybis(benzeneamine); 3,4'-oxybis(benzeneamine); 4,4'-thiobis(benzeneamine); 4,4'-sulfonyl(benzeneamine); 3,3'-sulfonyl(benzeneamine); 1-trifluoromethyl-2,2,2-trifluoroethylidene-4,4'-bis(benzeneamine); 2,2-bis[4-(4-aminophenoxy)phenyl]propane; bis[4-(3-aminophenoxy)phenyl]sulfone; 1,3-bis[1-(4-aminophenyl)-1-methylethylidene]benzene; 1,4-bis(4-aminophenoxy)benzene; 1,3-bis(4-aminophenoxy)benzene; 9,9-bis(4-aminophenyl)fluorene and diaminosiloxane;

(C) preparing directly polyimide resins from the polyimide block polymer solution by heat evaporation, thereby removing both the solvent and the binary catalyst;

the improvement wherein the binary catalyst comprises a first component which is a compound selected from the group consisting of γ-valerolactone and crotonic acid and a second component which is a compound selected from the group consisting of pyridine and N-methyl morpholine, said first component being about 0.01–0.2 mole per mole of the acid dianhydride and said second component being about 1–2 moles per mole of the first component.

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**5,502,144**

## COMPOSITION AND METHOD FOR PREPARING SILICONE ELASTOMERS

**Chung-Mien Kuo, Midland, Mich., and Stephen J. Clarson, Loveland, Ohio, assignors to University of Cincinnati, Cincinnati, Ohio, and Three Bond Co., Ltd., Tokyo, Japan**

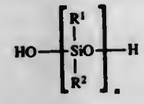
**Filed Jul. 15, 1994, Ser. No. 275,977**

**Int. Cl.[6] C08G 77/08**

**U.S. Cl. 528—18** **22 Claims**

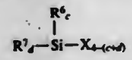
1. A composition used in the polycondensation of silicone polymers to prepare silicone elastomers comprising:

(a) a hydroxy-terminated polyorganosiloxane having the formula



wherein $R^1$ and $R^2$ are each $C_1$–$C_{13}$ monovalent substituted or unsubstituted hydrocarbon groups, and n is an integer of from about 1 to about 10,000;

(b) a cross-linking agent having the formula:



wherein $R^6$ and $R^7$ are each substituted or unsubstituted monovalent radicals selected from hydrogen, $C_1$–$C_{13}$ alkyl, alkenyl, alkoxy, haloalkyl, cyanoalkyl, aryl, aryloxy, or mixtures thereof, c and d are each 0 or 1, and X is a hydrolyzable radical; the amount of said cross-linking agent being from about 0.1 to about 30 parts by weight based on 100 parts by weight of component (a);

(c) an effective amount of a condensation curing catalyst which exhibits a catalytic action in the condensation reaction of the hydroxy groups in component (a) with the hydrolyzable groups in component (b); the amount of component (c) being from about 0.001 to about 10 parts by weight based on 100 parts by weight of component (a); and

(d) an effective amount of a cure accelerator selected from the group consisting of formamide, N-methylformamide, and mixtures thereof.



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**5,502,145**

## COATING SYSTEM FOR GLASS STRENGTH RETENTION

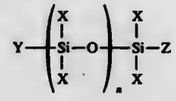
**David M. Szum, Elmhurst, Ill., assignor to DSM Desotech. Inc., Elgin, Ill.**

**Filed Mar. 2, 1994, Ser. No. 204,993**

**Int. Cl.[6] C08G 77/04; C08L 75/16;83/06**

**U.S. Cl. 528—28** **6 Claims**

1. A curable coating composition for a glass substrate, said composition comprising: an oligomer that is the reaction product of a hydroxy functional monomer containing ethylenic unsaturation, a polyisocyanate and a hydroxyfunctional polyether; and a poly(siloxane) having the formula:



wherein Y and Z are independently selected from the group consisting of halogen, alkyl and alkoxy; n is one or more; and each X is independently a hydrolyzable group or a siloxane group.

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**5,502,146**

## METHOD OF PRODUCING SILICONE RUBBER COMPOSITIONS

**Yoshio Inoue; Masaharu Takahashi; Minoru Igarashi, and Susumu Sekiguchi, all of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan**

**Filed Aug. 31, 1994, Ser. No. 298,860**

**Claims priority, application Japan, Aug. 31, 1993, 5-239096**

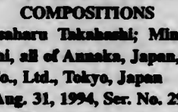
**Int. Cl.[6] C08G 77/04**

**U.S. Cl. 528—34** **9 Claims**

1. A method of producing a silicone rubber composition, comprising the steps of:

mixing

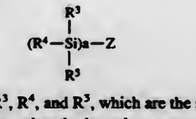
(A) an organopolysiloxane having a silanol group at both the ends of the molecular chain represented by the following general formula (1):



(1)

wherein $R^1$ and $R^2$, which are the same or different, each represent a substituted or unsubstituted monovalent hydrocarbon group and n is an integer of 2 to 3,000,

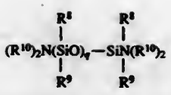
(B) an organosilicon compound represented by the following general formula (2):



(2)

wherein a is 1 or 2, $R^3$, $R^4$, and $R^5$, which are the same or different, each represent a monovalent hydrocarbon group which is unsubstituted or substituted by halogen or cyano, when a is 1, Z represents a hydroxyl group, a halogen atom, or —$NR^6R^7$, and when a is 2, Z represents >NX in which $R^6$ and $R^7$, which are the same or different, each represent a substituted or unsubstituted monovalent hydrocarbon group, and X represents a hydrogen atom or a substituted or unsubstituted monovalent hydrocarbon group,

(C) a compound represented by the following general formula:



wherein $R^8$ and $R^9$ which are the same or different, each represent a substituted or unsubstituted monovalent hydrocarbon group, $R^{10}$ represents an alkyl group, and q is an integer of 0 to 1,000, and

(D) a reinforcing filler, and

heating the resulting mixture thereby lengthening the chain of the organopolysiloxane (A).

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**5,502,147**

## ALIPHATIC RIM ELASTOMERS

**Neil H. Nodelman, Pittsburgh; David D. Steppan, Gibsonia; Albert Magnotta, Monaca; Robert M. Loring, Library; Richard E. Keegan, McMurray, all of Pa., and William E. Slack, Moundsville, W. Va., assignors to Bayer Corporation, Pittsburgh, Pa.**

**Filed Dec. 21, 1993, Ser. No. 171,282**

**Int. Cl.[6] C08G 18/14**

**U.S. Cl. 528—49** **23 Claims**

1. A process for the production of polyurethane moldings from a reaction mixture by a reaction injection molding process, wherein said reaction mixture comprises the following components:

A) an aliphatic polyisocyanate having a viscosity of less than about 20,000 mPa·s at 25° C. and having a NCO functionality of 2.3 to 4.0, said polyisocyanate being selected from the group consisting of

a1) a polyisocyanate containing isocyanurate groups,

a2) a polyisocyanate containing biuret groups,

a3) a uretdione diisocyanate,

a4) a polyisocyanate containing urethane groups,

a5) a polyisocyanate containing allophanate groups,

a6) a polyisocyanate containing isocyanurate and allophanate groups,

a7) a polyisocyanate containing carbodiimide groups and/or uretone imine groups,

a8) a polyisocyanate containing oxadiazinetrione groups, and

a9) blends thereof;

with

B) an isocyanate-reactive component comprising

b1) from about 30 to 94.9% by weight, based on the weight of component B), of at least one compound containing at least one of the groups selected from the group consisting of hydroxy-groups and amine-groups, and having an average functionality of from 1 to 4 and a molecular weight of from about 500 to 10,000, and

b2) from about 5 to 60% by weight, based on the weight of component B) and component C), of an organic chain extender having a molecular weight of from 61 to 500 and being selected from the group consisting of diols, triols, primary amines, secondary amines, amino alcohols and mixtures thereof, wherein the OH:NH equivalent ratio of said chain extender is from 1:1 to 25:1,

in the presence of

C) from 0. 1 to 10% by weight, based on the weight of component B) and component C), of at least one catalyst,

wherein the amount of component B) and component C) totals 100%, and said components are processed via the one-shot process at an isocyanate index of 80 to 130, with the proviso that said aliphatic polyisocyanate contains less than 10% by weight of isophorone diisocyanate.

5,502,148

## TWO-COMPONENT POLYURETHANE COATING COMPOSITIONS AND THEIR USE FOR COATING OR SEALING FLOORS

Karl-Heinz Hentschel, Bergisch Gladbach; Ulrich Walter, Langenfeld, and Bernd Riberi, Odenthal, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 18, 1994, Ser. No. 182,871
Claims priority, application Germany, Jan. 28, 1993, 43 02 266.9
Int. Cl.[6] C08G 18/42;18/48;18/73;18/74
U.S. Cl. 528—60 6 Claims

1. A two-component polyurethane coating composition which consists essentially of

A) a polyisocyanate component containing A1) 50 to 95 wt. % of one or more (cyclo)aliphatic polyisocyanates based on

A1.1) 50 to 100 wt. % of one or more polyisocyanates prepared from hexane 1,6-diisocyanate, containing isocyanurate and uretdione groups and having a viscosity at 23° C. of 100 to 300 mPa·s, a content of isocyanate groups of 20 to 24 wt. % and a content of urethane groups of 0 to 5 wt. % and

A1.2) 0 to 50 wt. % of one or more polyisocyanates having (cyclo)aliphatically bound isocyanate groups other than the polyisocyanates of A 1.1) and

A2) 5 to 50 wt. % of one or more aromatic polyisocyanates based on

A2.1) 50 to 100 NCO equivalent % of one or more urethane group-containing polyisocyanates prepared from toluene 2,4-, and optionally 2,6- diisocyanate and having an NCO content of 12 to 20 wt. % and a urethane group content (calculated as $CHNO_2$) of 12 to 29 wt. % and

A2.2) 0 to 50 NCO equivalent % of one or more polyisocyanates having aromatically bound isocyanate groups other than the polyisocyanates of A2.1),

B) a polyol component containing

B1) 50 to 100 wt. % of one or more organic polyhydroxyl compounds having an average hydroxyl content of 6 to 23 wt. % and an average hydroxyl functionality of 2 to 4, selected from (i) polycaprolactone polyols, (ii) polyether polyols wherein the alkylene oxide units are derived from 80 to 100 wt. % of propylene oxide units and 0 to 20 wt. % of ethylene oxide units, or (iii) mixtures of (i) and (ii) and

B2) 0 to 50 wt. % of one or more organic polyhydroxyl compounds other than B1) and

C) optionally known additives from coating technology, wherein components A) and B) are present in quantities corresponding to an NCO/OH equivalent ratio of 0.9:1 to 1.3:1.

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5,502,149

## POLYISOCYANATE CURING AGENT AND PAINT AND ADHESIVE COMPOSITIONS CONTAINING THE SAME

Mitsuhiro Yoshida, Hiratsuka; Susumu Sato, and Hisashi Nanno, both of Yokohama, all of, Japan, assignors to Nippon Polyurethane Industry Co., Ltd., Tokyo, Japan

Filed Apr. 28, 1994, Ser. No. 234,262
Claims priority, application Japan, Sep. 29, 1993, 5-264042
Int. Cl.[6] C08G 18/30
U.S. Cl. 528—60 18 Claims

1. A polyisocyanate curing agent which comprises a polyisocyanate compound obtained from hexamethylene diisocyanate and containing not more than 0.5% by weight of hexamethylene diisocyanate monomer, 21 to 60% by weight of uretidine dione dimer and 11 to 40% by weight of isocyanurate cyclic trimer, the uretidine dione dimer and the isocyanurate cyclic timer being prepared form a product obtained by urethane modification of 0.5 to 15% of total isocyanate groups of hexamethylene diisocyanate before or during dimer and trimer formation by an alcohol having at least two hydroxyl groups and a branched hydrocarbon group consisting of two side chains, wherein the branched hydrocarbon group has a total of 4 to 35 carbon atoms, 2 to 33 of which carbons are present in the two side chains.

5,502,150

## LINEAR HDI URETHANE PREPOLYMERS FOR RIM APPLICATION

David D. Steppan, Gibsonia; Ronald A. Cageao, Beaver; Neil H. Nodelman, Pittsburgh, all of Pa.; William E. Slack, Moundsville, W. Va., and Frank Sanns, Jr., Pittsburgh, Pa., assignors to Bayer Corporation, Pittsburgh, Pa.

Filed Jun. 29, 1994, Ser. No. 267,732
Int. Cl.[6] C08G 18/10
U.S. Cl. 528—60 14 Claims

1. A process for the production of polyurethane moldings from a reaction mixture by the reaction injection molding process, wherein said reaction mixture comprises the following components:

A) a hexamethylene diisocyanate prepolymer having a functionality of less than 2.3, an NCO content of 5 to 25%, and a monomer content of less than 2% by weight;

with

B) an isocyanate-reactive component comprising:

b1) from about 20 to 94% by weight, based on the weight of component B) and component C), of at least one organic compound having a molecular weight of from 500 to 10,000, and containing at least about two isocyanate-reactive hydroxyl groups,

b2) from about 5 to 50% by weight, based on the weight of component B) and component C), of at least one organic compound having a molecular weight of from about 61 to 500, and being selected from the group consisting of diols, aminoalcohols, and mixtures thereof,

and

b3) from about 1 to 20% by weight, based on the weight of component B) and component C), of at least one hydroxyl-based crosslinking compound having a functionality greater than 2, a molecular weight of from about 92 to 500, and containing no more than 1 aliphatic amine hydrogen atom capable of reacting with isocyanate groups;

in the presence of

C) from 0.1 to 10% by weight, based on the weight of component B) and component C), of at least one catalyst comprising

c1) from 0.1 to 10% by weight, based on the weight of component B) and component C), of at least one catalyst selected from the group consisting of metal carboxylates, metal halides, ammonium carboxylates, and mixtures thereof,

c2) from 0.0 to 10% by weight, based on the weight of component B) and component C), of at least one tin-sulfur catalyst, and

c3) from 0.0 to 10% by weight based on the weight of component B) and component C), of at least one tertiary amine catalyst, and the amount of components c1), c2) and c3) present totals 0.1 to 10% by weight, based on the weight of component B) and component C);

wherein the amount of component B) and component C) totals 100%, and said components are processed via the one-shot process at an isocyanate index of 70 to 130.

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5,502,151

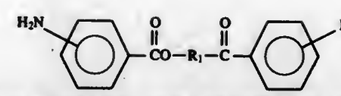
## PROCESS FOR PREPARING POLYUREA AND POLYURETHANE-UREA RESIN

Haruo Watanabe, Tokyo, Japan, assignor to Hodogaya Chemical Co., Ltd., Tokyo, Japan

Filed Mar. 15, 1994, Ser. No. 212,940
Claims priority, application Japan, Mar. 17, 1993, 5-081116
Int. Cl.[6] C08G 18/32;18/60
U.S. Cl. 528—68 10 Claims

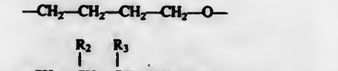
1. A process for preparing a polyurea resin, which comprises reacting an amino compound represented by formula (I) with a polyisocyanate compound:



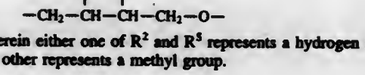


(I)

wherein $R^1$ represents a polyalkylene ether group a number average molecular weight of 500 to 5,000 which is composed of, as constituent groups, alkylene ether groups represented by formulas (II) and (III) wherein the groups of formulas (II) and (III) are randomly arranged:



(II)



(III)

wherein either one of $R^2$ and $R^5$ represents a hydrogen atom, and the other represents a methyl group.

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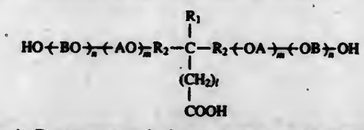
5,502,152

## CARBOXYL GROUP-CONTAINING POLYOXYALKYLENE DERIVATIVE

Shigeru Shimada, Kawasaki; Susumu Jinbo, and Hideyuki Ishi, both of Kanagawa, all of, Japan, assignors to Hodogaya Chemical Co., Ltd., Kawasaki, Japan

Filed Jan. 13, 1995, Ser. No. 372,250
Claims priority, application Japan, Jan. 14, 1994, 6-014917
Int. Cl.[6] C08G 18/48
U.S. Cl. 528—71 5 Claims

1. A polyoxyalkylene containing compound having a carboxyl group and hydroxy groups represented by formula (I):



(I)

wherein $R_1$ represents a hydrogen atom or an alkyl group having from 1 to 3 carbon atoms; $R_2$ represents an alkylene group having from 1 to 6 carbon atoms or an arylene group having from 6 to 8 carbon atoms; A represents an alkylene group having from 4 to 7 carbon atoms; B represents an alkylene group having from 2 to 6 carbon atoms; l represents from 0 to 2; m represents from 0.1 to 35; n represents from 0.1 to 50; and $0.5<(m+n)<50$.

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5,502,153

## METHOD FOR PREPARING OPTICAL-GRADE POLYCARBONATE COMPOSITIONS

Takeshi Sakashita; Tomoaki Shimoda, both of Iwakuni; Kimiyoshi Miura, Ohno; Kenichi Tominari, Narashino, and Akio Kanezawa, Sodegaura, all of, Japan, assignors to GE Plastics Japan Ltd., Japan

Division of Ser. No. 22,710, Mar. 1, 1993, Pat. No. 5,364,926. This application Oct. 24, 1994, Ser. No. 330,141
Int. Cl.[6] C08G 64/00
U.S. Cl. 528—198 13 Claims

1. An improved method for preparing optical-grade polycarbonate compositions by melt-polycondensing an aromatic dihydroxy compound and a diester carbonate in the presence of a catalyst selected from the group consisting of

(a) an alkali metal compound and a nitrogen-containing basic compound,

(b) an alkaline earth metal compound and a nitrogen-containing basic compound,

(c) an alkali metal compound, a nitrogen-containing basic compound and boric acid,

(d) an alkaline earth metal compound, a nitrogen-containing basic compound and boric acid,

(e) an alkali metal compound, a nitrogen-containing basic compound and a boric acid ester and

(f) an alkaline earth metal compound, a nitrogen-containing basic compound and a boric acid ester to give a molten reaction product

and adding to the reaction product an additive selected from the group consisting of

(i) a sulfur-containing acidic compound having a pKa value no greater than 3,

(ii) a phosphorus compound,

(iii) an epoxy compound,

(iv) a phenolic stabilizer and

(v) a sulfur-containing acidic compound derivative having a pKa value no greater than 3

wherein the improvement comprises adding one or more of the additives to the molten reaction product and mixing the additive or additives with the reaction product before the temperature of the reaction product is reduced whereby heat degradation of the polycarbonate due to the generation of shearing heat is suppressed and the level of inclusions is reduced.

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5,502,154

## APPARATUS FOR PROCESSING MATERIALS

John M. Iwasyk, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 346,959, Nov. 30, 1994. This application Jun. 6, 1995, Ser. No. 467,258
Int. Cl.[6] C08G 69/26;69/28
U.S. Cl. 528—310 2 Claims

1. A polyamide made by the continuous process for preparing polyhexamethylene adipamide by the melt polymerization of an aqueous solution of a polyamide-forming salt of an aliphatic diamine and a dicarboxylic acid, wherein the polyamide is processed in an apparatus comprising a transfer screw disposed adjacent an outlet of an agitator section, a spiral ribbon extending upwardly from the transfer screw, a ring disposed vertically above the spiral ribbon and at least one baffle disposed vertically above the spiral ribbon and connected to the ring to thereby mix, finish and de-volatize the polymer.

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5,502,155

## MANUFACTURE OF PARTIALLY AROMATIC POLYAMIDES

Howard C. Ng, Kingston, Canada, assignor to Du Pont Canada Inc., Mississauga, Canada

Filed Mar. 3, 1994, Ser. No. 205,228
Int. Cl.[6] C08G 69/28
U.S. Cl. 528—349 29 Claims

1. A process for the manufacture of a partially aromatic polyamide comprising the polymerization stages of, in sequence:

(a) feeding to a reactor an admixture in the form of a slurry in aqueous solution, said admixture being formed from at least one aromatic dicarboxylic acid and at least one aliphatic diamine;

(b) with the incremental addition of water and in the presence of 0.05 to 2% by weight of a monocarboxylic acid selected from the group consisting of formic acid and acetic acid, heating the slurry to a temperature of at least 270° C. while maintaining a pressure of at least 1.2 MPa;

(c) while maintaining said temperature at at least 270° C. and the pressure at at least 1.2 MPa, venting water and other volatile matter from the reactor;

(d) maintaining said temperature for a further period of time, and then while continuing to maintain the temperature at at least 270° C., reducing the pressure in the reactor to atmospheric pressure; and

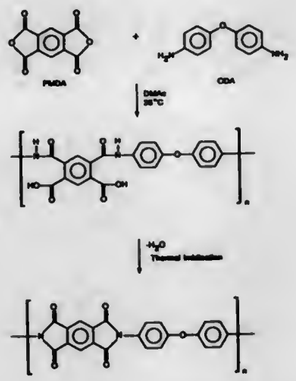
(e) discharging the polyamide so obtained from the reactor.

5,502,156

## ELECTRICALLY CONDUCTING POLYIMIDE FILM CONTAINING TIN COMPLEXES

Anne K. St. Clair, Poquoson, Va.; Stephen A. Ezzell, Woodbury, Minn.; Larry T. Taylor, Blacksburg, and Harold G. Boston, Newport News, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 28, 1994, Ser. No. 282,849
Int. Cl.[6] C08G 73/10; B05D 5/06; B32B 27/00
U.S. Cl. 528—353 8 Claims



1. A process for preparing a thermally-stable $SnO_2$-surfaced polyimide film wherein the electrical conductivity of the $SnO_2$ surface is within the range of about $3.0\times10^{-3}$ to about $1\times10^{-2}$ ohms$^{-1}$, which process comprises:

preparing a polyamic acid solution by reacting a diamine and a dianhydride in a polar aprotic solvent;

adding $SnCl_4$ $(DMSO)_2$ to the polyamic acid solution to produce a homogeneous admixture;

spreading the homogeneous admixture as a film on a rigid substrate; and

thermally treating the film of the homogeneous admixture to imidize the polyamic acid to a polyimide and at the same time induce migration of the $SnCl_4$ $(DMSO)_2$ to the surface of the film of the homogeneous admixture, where the $SnCl_4$ $(DMSO)_2$ is converted to $SnO_2$.

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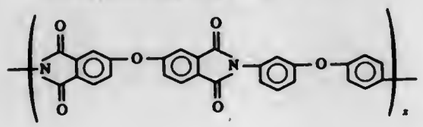
5,502,157

## COPOLYIMIDES PREPARED FROM ODPA, BTDA AND 3,4'-ODA

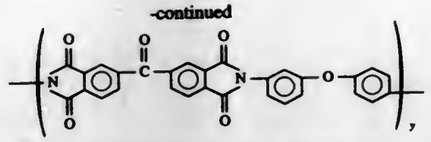
Alice C. Chang, Yorktown, and Terry L. St. Clair, Poquoson, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 31, 1994, Ser. No. 299,172
Int. Cl.[6] C08G 73/10;69/26
U.S. Cl. 528—353 16 Claims

1. A copolyimide comprising the repeat units:



-continued



wherein x is 67 to 80 mole percent of the copolyimide and y is 20 to 33 mole percent of the copolyimide.

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5,502,158

## DEGRADABLE POLYMER COMPOSITION

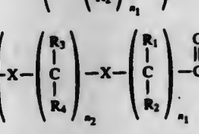
Richard G. Sinclair, Columbus, and Edward S. Lipinsky, Worthington, both of Ohio, assignors to Ecopol, LLC, Golden, Colo.

Continuation-in-part of Ser. No. 579,080, Sep. 6, 1990, Pat. No. 5,216,050, and Ser. No. 579,085, Sep. 6, 1990, Pat. No. 5,180,765, and Ser. No. 579,460, Sep. 6, 1990, Pat. No. 5,252,642, and Ser. No. 579,465, Sep. 6, 1990, abandoned, each , Sep. 6, 0which is a continuation-in-part of Ser. No. 387,676, Jul. 31, 1989, abandoned, and Ser. No. 387,678, Jul. 31, 1989, abandoned, and Ser. No. 386,844, Jul. 31, 1989, abandoned, and Ser. No. 387,670, Jul. 31, 1989, abandoned, each , Jul. 31, 0which is a continuation-in-part of Ser. No. 229,894, Aug. 8, 1988, abandoned, and Ser. No. 229,896, Aug. 8, 1988, abandoned, and Ser. No. 317,391, Mar. 1, 1989, abandoned, and Ser. No. 229,939, Aug. 8, 1988, abandoned. This application Sep. 22, 1992, Ser. No. 950,854
Int. Cl.[6] C08G 63/08
U.S. Cl. 528—354 73 Claims

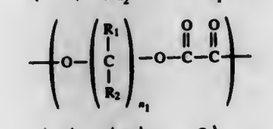
1. A degradable film material comprising:

a) a nontoxic hydrolytically degradable polymer comprising repeating monomer or comonomer units selected from the group consisting of:

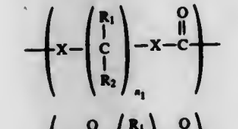
i)



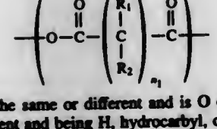
ii)



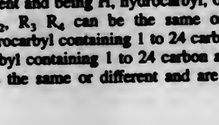
iii)



iv)



v)



wherein X is the same or different and is O or NR' R' being the same, or different and being H, hydrocarbyl, or substituted hydrocarbyl; $R_1$, $R_2$, $R_3$ $R_4$ can be the same or different and are hydrogen, hydrocarbyl containing 1 to 24 carbon atoms, or substituted hydrocarbyl containing 1 to 24 carbon atoms, and where $n_1$ and $n_2$ can be the same or different and are an integer of from 1–12;



b) a nontoxic modifier, wherein said modifier is compatible with said polymer such that the film material has a uniform appearance and said modifier is nonvolatile and nonfugitive; and

c) wherein said film material has a tensile strength of less than about 20,000 psi.

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5,502,159

## ABSORBABLE COMPOSITION

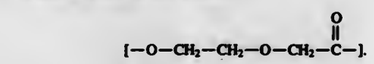
Cheng-Kung Liu, Norwalk; Steven L. Bennett, New Haven; John Kennedy, Stratford; Donald S. Kaplan, Weston, and Ross R. Muth, Brookfield, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Continuation of Ser. No. 248,309, May 23, 1994, abandoned, which is a continuation-in-part of Ser. No. 58,515, May 3, 1993, Pat. No. 5,314,989, which is a continuation-in-part of Ser. No. 686,815, Apr. 17, 1991, Pat. No. 5,225,520. This application May 1, 1995, Ser. No. 431,529
Int. Cl.[6] C08G 63/08
U.S. Cl. 528—354 19 Claims

1. A block copolymer which comprises a proportion of units of one or more hard phase forming monomers as one of said blocks, and another of said blocks comprising a proportion of units having the formula:



randomly combined with a proportion of units of one or more hard phase forming monomers, said hard phase forming monomer is comprising from about 1 to about 10 mole percent of the block containing units of the formula:



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5,502,160

## POLYOLEFIN-POLYARYLATE ALLOY FIBERS AND THEIR USE IN HOT-MIX COMPOSITIONS FOR MAKING AND REPAIRING GEOWAYS

James P. Modrak, Conyers, Ga., assignor to Hercules Incorporated, Wilmington, Del.

Filed Aug. 3, 1994, Ser. No. 285,559
Int. Cl.[6] D02G 3/00
U.S. Cl. 428—359 20 Claims

1. A melt-spun staple fiber, comprising: an alloy of (I) 98–73 wt. % of a polyolefin comprising polyethylene, polypropylene, or a copolymer thereof and (ii) 2–27 wt. % of a polyarylate, wherein the polyarylate is present in an amount effective to increase the softening temperature of the fiber.

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5,502,161

## METHOD FOR THE PRODUCTION OF FREE-FLOWING TETRAFLUOROETHYLENE POLYMER MOLDING POWDERS

Leonard W. Harvey, Downingtown, Pa., and Eric N. Martin, Greenville, Del., assignors to ICI Americas Inc., Wilmington, Del.

Filed Dec. 21, 1994, Ser. No. 362,378
Int. Cl.[6] C08K 5/06;5/053; B29C 67/00
U.S. Cl. 528—494 12 Claims

1. A process for preparing an agglomerated tetrafluoroethylene polymer, said process comprising:

(A) wetting a tetrafluoroethylene polymer with an aqueous solution containing a wetting agent selected from the group consisting of (a) ethylene glycol ethers, having the following general formula

$$C_nH_{2n}O\,(C_2H_4O)_xH$$

wherein
n is an integer equal to from 3 to 8,
a is an integer equal to 2n+1, 2n–1 or 2n–3, and
x is an integer equal to from 1 to 3 provided that
when n equals 3, a is either 2n+1 or 2n–1, and
when n equals 7 or 8, x is 2 or 3

(b) propylene glycol ethers having the following general formula

$$C_nH_{2n}O\,(C_2H_4O)_xH$$

wherein
n is an integer equal to 3 or 4
a is an integer equal to 2n+1, 2n–1 or 2n–3, and
x is an integer equal to 1 or 2 provided that
when n equals 3, a is either 2n+1 or 2n–1 and

(c) diols or triols having the following general formula

$$R\text{—}(OH)_x$$

wherein
R is a linear or branched chain, saturated or unsaturated hydrocarbon radical containing from 6 to 12 carbon atoms, and
X is an integer equal to 2 or 3.

(B) mechanically agitating the wetted composition to form it into agglomerates and

(C) drying the agglomerates.

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5,502,162

## METHOD OF TREATING STRUCTURES INCLUDING SILICONE MATERIALS

Ching-Ping Wong, Lawrenceville, N.J., assignor to AT&T Corp., Murray Hill, N.J.

Filed May 23, 1994, Ser. No. 247,826
Int. Cl.[6] C08G 77/00; H01H 3/12
U.S. Cl. 528—496 15 Claims

1. A method for making structures containing a silicone elastomer comprising the steps of:

(a) forming a structure comprising a silicone elastomer;

(b) immersing the structure in a low molecular weight liquid hydrocarbon that has the property of swelling the silicone and dissolving silicone oils, said immersing occurring for a period of time sufficient to cause visible swelling of the silicone material;

(c) separating the silicone material from the hydrocarbon liquid; and

(d) drying the silicone material to return the material to its original state before swelling.

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5,502,163

## CONTROL OF SECRETION OF MILK

Caroline V. P. Addey, Ayr; Malcolm Peaker, and Colin J. Wilde, both of Alloway, all of, Scotland, assignors to British Technology Group Limited, London, England

Continuation of Ser. No. 856,206, Jul. 13, 1992, abandoned. This application Feb. 28, 1995, Ser. No. 395,535
Claims priority, application United Kingdom, Nov. 13, 1989, 8925595
Int. Cl.[6] C07K 16/18;14/47
U.S. Cl. 530—300 2 Claims

1. An isolated protein in glycosylated or unglycosylated form which inhibits milk secretion by lactating cows and which is present in the second significant peak ("2A") when a fraction of the whey proteins of the milk, obtained from said lactating cows

separated by ultrafiltration using filters of cut-off values 10 KDa and 30 KDa, is resolved on an anion exchange column of particles of monodisperse hydrophilic polymers having pendant $—CH_2N(CH_3)_3^+$ groups, the particle diameter being 10±0.5 μm, using 10 mM imidazole buffer, pH 7.0 and a 0 to 1.0M sodium chloride elution gradient and further which is present in the second significant peak obtained when peak 2A is further resolved on a chromatofocussing column containing particles of monodisperse hydrophilic polymers having pendant tertiary $—N^+HR_2$ and quaternary $—N^+R_3$ amine groups where R represents an organic group, the particle diameter being 10±0.5 μm, using 10 mM imidazole, pH 6.5 and amphoteric buffer of pH 4.0 to create a pH gradient of 6.5 and said protein having a molecular weight as determined by gel filtration chromatography, of about 7 KDa and an isoelectric point, as determined by isoelectric focussing of material from said peak 2A in a tube of polyacrylamide gel within the range 4.8 to 5.0.

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**5,502,164**

**PEPTIDE COMPOUNDS HAVING THERAPEUTIC ACTIVITY**

**James D. Rosamond, Honeoye, and Myles E. Pierson, Pittsford, both of N.Y., assignors to Fisons Corporation, Rochester, N.Y.**

**Continuation of Ser. No. 994,542, Dec. 21, 1992, abandoned, which is a continuation-in-part of Ser. No. 810,985, Dec. 20, 1991, abandoned, which is a continuation-in-part of Ser. No. 441,275, Nov. 27, 1989, abandoned. This application Aug. 22, 1994, Ser. No. 294,283**

**Claims priority, application United Kingdom, Sep. 29, 1992, 9220543; Jan. 2, 1992, 9220761**

**Int. Cl.[6] A61K** *38/00;* **C07K** *7/00;7/06*

**U.S. Cl. 530—329** **1 Claim**

1. A compound having the formula Hpa($SO_3$H)-Ahx-Gly-Trp-Ahx-MeAsp-Phe-$NH_2$ (SEQ ID NO 17) or a pharmaceutically acceptable derivative thereof.

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**5,502,165**

**PROCESS FOR PEPTIDE SEGMENT CONDENSATION**

**Guo-Jie Ho, Rahway; David A. Mathre, Skillman; Zhiguo Song, Edison, and Khateeta Emerson, Iselin, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.**

**Filed Apr. 4, 1994, Ser. No. 222,767**

**Int. Cl.[6] C07C** *231/02;* **C07K** *1/08*

**U.S. Cl. 530—341** **9 Claims**

1. A process for forming an amide product comprising reacting a carboxylic acid and an amine, in the presence of a coupling reagent selected from EDC, DCC or diisopropylcarbodiimide and an additive, in a bi-phasic mixture of water and an organic solvent selected from isopropyl acetate, methyl t-butyl ether or toluene.

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**5,502,166**

**NMDH RECEPTOR PROTEINS AND GENES ENCODING THE SAME**

**Masayoshi Mishina, Niigata, Japan, assignor to Mitsubishi Chemical Corporation, Tokyo, Japan**

**Filed Feb. 26, 1993, Ser. No. 26,138**

**Claims priority, application Japan, Feb. 26, 1992, 4-039563; Jun. 30, 1992, 4-173155; Aug. 12, 1992, 4-215017; Nov. 13, 1992, 4-303878**

**Int. Cl.[6] C07K** *14/705;* **C12N** *15/12*

**U.S. Cl. 530—350** **9 Claims**

1. An isolated glutamate receptor represented by an amino acid sequence selected from the group consisting of Sequence ID No. 1, No. 2, No. 3 and No. 4.

**5,502,167**

**CDR GRAFTED HUMANISED CHIMERIC T-CELL ANTIBODIES**

**Herman Waldmann, University of Cambridge, Department of Pathology, Immunology Div., Tennis Court Road; Louise Walsh, The University of Cambridge, Department of Pathology, Tennis Court Road, both of Cambridge, CB2 1QP; James S. Crowe, and Alan P. Lewis, both of the Wellcome Foundation Limited, Langley Court, South Eden Park Road, Beckenham, Kent, BR3 3BS, all of, Great Britain**

**PCT No. PCT/GB92/02251, § 371 Date Jun. 3, 1994, § 102(e) Date Jun. 3, 1994, PCT Pub. No. WO93/11237, PCT Pub. Date Jun. 10, 1993**

**PCT Filed Dec. 4, 1992, Ser. No. 244,626**

**Claims priority, application United Kingdom, Dec. 6, 1991, 9125979**

**Int. Cl.[6] A61K** *35/16;39/00;39/395;* **C07K** *16/00*

**U.S. Cl. 530—387.3** **6 Claims**

1. A humanised antibody that specifically binds resting and activated T-cells, inhibits T-Cell proliferation and lyses T-cells from mice transgenic for human CD2, the heavy and light chain variable domains of said antibody are composed of framework and complementary determining regions, wherein light chain complementary determining region 1 has the amino acid sequence set forth in SEQ ID NOs. 3 or 4, light chain complementary determining region 2 has the amino acid sequence set forth in SEQ ID NOs. 5 or 6, light chain complementary determining region 3 has the amino acid sequence set forth in SEQ ID NOs. 7 or 8, heavy chain complementary determining region 1 has the amino acid sequence set forth in SEQ ID NOs. 11 or 12, heavy chain complementary determining region 2 has the amino acid sequence set forth in SEQ ID NOs. 13 or 14, and heavy chain complementary determining region 3 has the amino acid sequence set forth in SEQ ID NOs. 15 or 16.

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**5,502,168**

**MONOCLONAL ANTIBODIES TO A CONTINUOUS AND CROSS-REACTIVE EPITOPE AND AN ISOLATED PROTEIN OF A SEXUAL STAGE OF *P. FALCIPARUM***

**Nirbhay Kumar, Bethesda, Md., assignor to The Johns Hopkins University, Baltimore, Md.**

**Continuation of Ser. No. 779,494, Oct. 24, 1991, abandoned. This application Sep. 14, 1993, Ser. No. 120,225**

**Int. Cl.[6] A61K** *35/16;* **C07K** *16/00*

**U.S. Cl. 530—388.4** **3 Claims**

1. Monoclonal antibodies 6B6, 16C3, 19F1, or 11G12, represented by ATCC deposit numbers HB11155, HB11158, HB11157, and HB11154 respectively, which recognize a continuous epitope in the gametocyte stage of *P. falciparum* having the amino acid sequence set forth in SEQ ID NO:1, which is a shared continuous epitope among the 230, 48/45 and 27 kDa gamete surface proteins.

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**5,502,169**

**DEACTIVATION OF THE INNER SURFACES OF CAPILLARIES**

**Gerhard Schomburg, and Martin Gilges, both of Mülheim an der Ruhr, Germany, assignors to Studiengesellschaft Kohle mBH, Mulheim an der Ruhr, Germany**

**Continuation of Ser. No. 118,911, Sep. 9, 1993, abandoned. This application Nov. 23, 1994, Ser. No. 344,200**

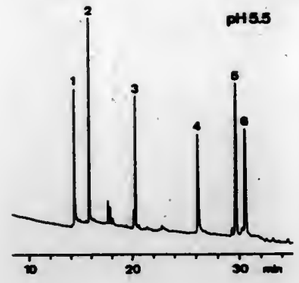
**Claims priority, application Germany, Sep. 11, 1992, 42 30 403.2**

**Int. Cl.[6] C07K** *1/14;1/26;* **C25D** *13/06;* **C07H** *21/00*

**U.S. Cl. 204—454** **12 Claims**

1. A process for producing capillaries for capillary zone electrophoresis which consists of applying directly to the inner surface of a capillary an aqueous solution consisting essentially of a polar polymer, and treating the polymer to render it water-insoluble to fix it directly to the inner surface of the capillary by heat treatment.






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**5,502,170**

**AZO DYES WITH AN ACETALIZED DIAZO COMPONENT OF THE THIOPHENE OR THIAZOLE SERIES**

**Sabine Gruettner-Mertes, Mutterstadt; Helmut Reichelt, Neustadt; Arno Lange, Bad Durkheim, and Helmut Degen, Frankenthal, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany**

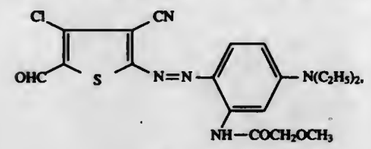
**Division of Ser. No. 307,794, Sep. 30, 1994, Pat. No. 5,466,790. This application May 17, 1995, Ser. No. 443,165**

**Claims priority, application Germany, May 12, 1992, 42 15 495.2**

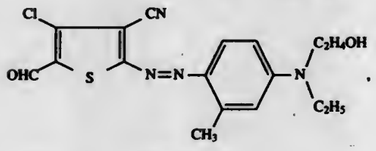
**Int. Cl.[6] C09B** *67/48;29/033;29/09;* **D06P** *1/18*

**U.S. Cl. 534—575** **1 Claim**

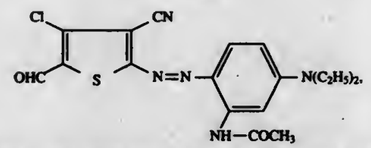
1. A crystal form for each of the dyes of the formulae




(IIIa)




(IIIb)




(IIIc)

which crystal forms have the following X-ray diffraction diagrams (Cu—$K_\alpha$ radiation):

IIIa)

lines of high intensity at diffraction angles Θ [°] of 8.497 and 9.175;

lines of medium intensity at diffraction angles Θ [°] of 7.018, 11.836 and 9.721;

lines of low intensity at diffraction angles Θ [°] of 25.164, 5.920, 25.934, 24.425, 23.442, 26.335, 13.119, 17.906, 15.674, 13.963, 15.153, 27.471, 14.630, 17.028, 18.833, 20.982, 28.275, 21.247, 19.490, 29.898, 30.726 and 34.570;

IIIb)

lines of high intensity at diffraction angles Θ [°] of 24.971 and 12.551;

lines of medium intensity at diffraction angles Θ [°] of 22.850 and 11.093;

lines of low intensity at diffraction angles Θ [°] of 11.548, 9.100, 27.564, 29.233, 17.967, 7.424, 22.255, 30.296, 28.175, 13.645, 14.406, 17.368, 26.458, 16.018, 16.809, 19.206, 20.006, 32.464, 34.775, 33.479 and 33.833;

IIIc)

lines of high intensity at diffraction angles Θ [°] of 7.441;

lines of medium intensity at diffraction angles Θ [°] of 11.090;

lines of low intensity at diffraction angles Θ [°] of 8.662, 10.063, 26.181, 17.373, 19.540, 22.901, 14.950, 12.888, 14.C97, 15.961, 28.237, 27.752, 29.035, 32.108, 34.326, 33.239 and 33.543.

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**5,502,171**

**PROCESS FOR THE PREPARATION OF DYESTUFFS**

**Roderich Raue, Leverkusen; Alfred Brack, Odenthal, and Karl-Heinrich Lange, Leverkusen, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany**

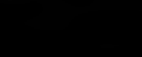
**Division of Ser. No. 311,831, Sep. 23, 1994, which is a continuation of Ser. No. 48,024, Apr. 15, 1993, abandoned, which is a continuation-in-part of Ser. No. 874,674, Apr. 27, 1992, abandoned, which is a continuation-in-part of Ser. No. 665,632, Mar. 6, 1991, abandoned. This application May 16, 1995, Ser. No. 442,049**

**Claims priority, application Germany, Mar. 15, 1990, 40 08 263.6**

**Int. Cl.[6] C09B** *41/00*

**U.S. Cl. 534—579** **12 Claims**

1. A process for the preparation of dyestuffs of the general formula

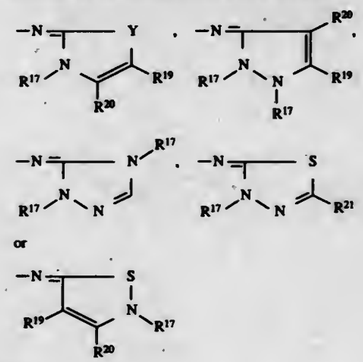



(IIIa)

in which

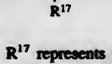
D is the radical of a heterocyclic diazo component selected from the group consisting of substituted and unsubstituted, benzo-fused and non-benzo-fused thiazols, isothiazols, thiadiazols, oxazols, imidazols and triazols and

Z is the radical of a substituted or unsubstituted $C_6$–$C_{10}$-arylamino group or is the radical of the formula




in which

Y represents —S—, —O— or




$R^{17}$ represents hydrogen, unsubstituted $C_1$–$C_8$-alkyl or $C_1$–$C_8$-alkyl which is substituted by hydroxy, halogen, cyano, $C_1$–$C_4$-alkoxy, carboxyl, $C_1$–$C_4$-(di)alkylaminocarbonyl, $C_1$–$C_4$-alkoxycarbonyl or $C_1$–$C_4$-alkylsulphonyl or represents $C_2$–$C_4$-alkylen, unsubstituted phenylmethyl, unsubstituted

phenylethyl or phenylmethyl or phenylethyl which in each case is substituted by halogen, cyano, $C_1$–$C_4$-alkyl or $C_1$–$C_4$-alkoxy,

$R^{19}$ and $R^{20}$ either represent hydrogen or together represent the remaining members of a fused benzene ring and

$R^{21}$ represents $C_1$–$C_4$-(di)alkylamino, $C_6$–$C_{10}$-(di)arylamino, $C_1$–$C_4$-alkyl-$C_6$–$C_{10}$-arylamino, morpholino, piperidino, piperazino, pyrrolidino, $C_1$–$C_4$-alkylmercapto or $C_6$–$C_{10}$-arylmercapto,

in which a diazo component of the formula

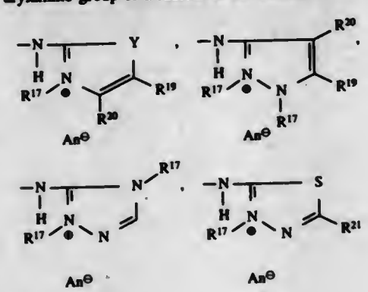
$$D—NH_2$$

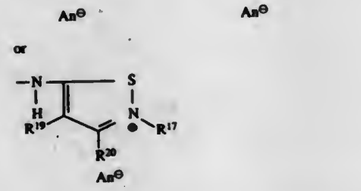
and a component of the formula

$$H—Z_1$$

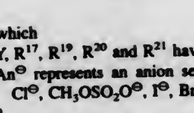
wherein

$Z_1$ is a radical of a substituted or unsubstituted $C_6$–$C_{10}$-arylamino group or a radical of the formulae





or



in which

Y, $R^{17}$, $R^{19}$, $R^{20}$ and $R^{21}$ have the above given meaning and

$An^{\ominus}$ represents an anion selected from the series comprising $Cl^{\ominus}$, $CH_3OSO_2O^{\ominus}$, $I^{\ominus}$, $Br^{\ominus}$, $CH_3COO^{\ominus}$,

and

the substitutents for the substituted aromatic diazo component, the substituted heterocyclic diazo component, the aryl part of the substituted $C_6$–$C_{10}$-arylamino groups in the definition of Z and $Z_1$, the heterocyclyl part of the heterocyclylimino group, the hetaryl part of the hetarylamino group, or the substituted carbocyclic rings are concerned, being selected from the group consisting of $C_1$–$C_4$-alkyl, $C_6$–$C_{10}$-aryl, $C_1$–$C_4$-alkoxy, $C_1$–$C_4$-alkoxycarbonyl, $C_1$–$C_4$-alkylcarbonyloxy, cyano, $C_1$–$C_4$-(di)alkylamino, $C_1$–$C_4$-(di)alkylaminocarbonyl, $C_1$–$C_4$-alkylcarbonylamino, hydroxy, halogen, $C_1$–$C_4$-alkylcarbonyl, $C_1$–$C_4$-alkylsulphonyl, $C_1$–$C_4$-(di)alkylaminosulphonyl, $C_1$–$C_4$-alkylsulphonylamino, $C_1$–$C_4$-alkoxysulphonyl, $C_1$–$C_4$-alkylsulphonyloxy, nitro, $C_6$–$C_{10}$-(di)arylamino, $C_1$–$C_4$-alkyl-$C_6$–$C_{10}$-arylamino, phenylsulphonyl, phenylazo, benzothiazolyl, 1,2,4-oxadiazolyl, morpholino, piperidino, piperazino, pyrrolidino, $C_1$–$C_4$-alkylmercapto and $C_6$–$C_{10}$-arylmercapto and as far as the amino part of the substituted $C_6$–$C_{10}$-arylamino group in the definition of Z and $Z_1$ is concerned, it is unsubstituted or substituted by substituted or unsubstituted $C_1$–$C_8$-alkyl, $C_2$–$C_4$-alkylen or substituted or unsubstituted $C_1$–$C_4$-alkyl-$C_6$–$C_{10}$-aryl,

are reacted in an aqueous medium with a nitrite selected from the group consisting of alkali nitrite, $C_1$–$C_5$-alkyl nitrite, glycol nitrite or polyol nitrite in the presence of $CO_2$ at a pressure of 5–100 bar at a temperature of 0°–125° C.

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**5,502,172**

**PROCESS FOR THE PREPARATION OF PYRAZOLE AZO DYESTUFFS**

**Kerstin Pape, and Horst Berneth, both of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany**

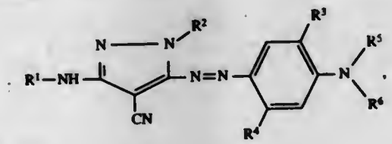
**Division of Ser. No. 355,365, Dec. 13, 1994, Pat. No. 5,446,136. This application Apr. 6, 1995, Ser. No. 416,387**

**Claims priority, application Germany, Dec. 20, 1993, 43 43 454.1**

**Int. Cl.[6] C09B** *43/00;43/12;29/036*

**U.S. Cl. 534—591** **2 Claims**

1. A process for the preparation of a pyrazole azo dyestuff of the formula



(I)

in which

$R^1$ denotes hydrogen or an acyl radical,

$R^2$ denotes hydrogen, alkyl, alkenyl, cycloalkyl, aralkyl, aryl or a heterocyclic radical which is optionally bonded via alkylene,

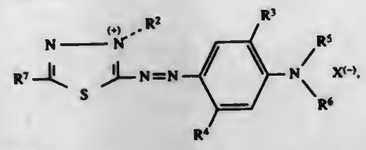
$R^3$ denotes hydrogen, halogen, alkyl or alkoxy,

$R^4$ denotes hydrogen, halogen, hydroxyl, amino, nitro, cyano, alkyl, alkoxy, acylamino, acyloxy or alkoxycarbonyl,

$R^5$ and $R^6$ independently of one another in each case denote hydrogen, alkyl, aralkyl or aryl or

$NR^5R^6$ together denotes a hydrogenated heterocyclic radical which is bonded via the nitrogen and optionally contains further hetero atoms

which comprises reacting a cationic 1,3,4-thiadiazole dyestuff of the formula



(II)

in which

$R^2$, $R^3$, $R^4$, $R^5$ and $R^6$ have the meanings given above

$R^7$ denotes hydrogen, alkyl, cycloalkyl, aralkyl, aryl a heterocyclic radical which is optionally bonded via alkylene, $OR^8$, $SR^8$ or $NR^8R^9$,

$R^8$ and $R^9$ independently of one another denote hydrogen, alkyl, alkenyl, acyl, cycloalkyl, aralkyl, aryl or a heterocyclic radical which is optionally bonded via alkylene or

$NR^8R^9$ denotes a completely hydrogenated heterocyclic radical which is bonded via the nitrogen and optionally contains further heteroatoms

and

$X^-$ denotes an anion with malononitrile.



**5,502,173**

**PROCESS FOR THE PREPARATION OF A SUBSTITUTED 2-AMINO-1-SULPHONAPHTHALENE**

**Horst Jäger, Leverkusen; Siegbert Arnold, Bonn, and Richard Sommer, Odenthal-Gloebusch, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany**

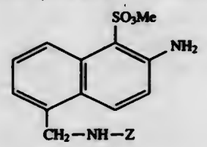
**Continuation of Ser. No. 32,880, Mar. 18, 1993, abandoned, which is a continuation of Ser. No. 815,110, Dec. 30, 1991, abandoned. This application Sep. 27, 1994, Ser. No. 312,578**

**Claims priority, application Germany, Jan. 10, 1991, 41 00 513.9**

**Int. Cl.[6] C09B** *62/085;62/09;19/00;* **C07D** *251/50*

**U.S. Cl. 534—598** **11 Claims**

1. Process for the preparation of a compound of the formula



(1)

in which

Z=a radical of a fiber-reactive pyrimidine or aminotriazine radical component which contains at least one reactive fluorine atom, and

Me=Li, Na, K or H characterised in that a fluorine-containing reactive component of the formula

Z=F (2) (F=fluorine)

and an aqueous solution of an alkali metal salt, of 2-amino-5-amino-methyl-naphthalene-1-sulphonic acid (3) is metered into a reactor, the reactive component (2) and the sulphonic acid (3) being metered simultaneously into the reactor with reaction wherein the pH is 8 to 11 at the beginning and during the reaction.

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**5,502,174**

**REACTIVE DYESTUFFS BASED ON A SUBSTITUTED BARBITURIC ACID**

**Stefan Ehrenberg, Cologne; Aloysius Engel, Leverkusen, and Hermann Henk, Cologne, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany**

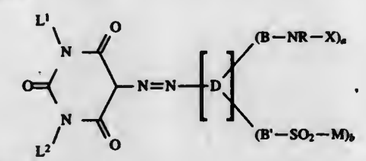
**Filed Aug. 25, 1994, Ser. No. 296,308**

**Claims priority, application Germany, Sep. 1, 1993, 43 29 421.9**

**Int. Cl.[6] C09B** *62/006;62/08;62/507;* **D06P** *1/38*

**U.S. Cl. 534—635** **9 Claims**

1. Fibre-reactive azo dyestuff of the formula (1) or a tautomers thereof



(1)

wherein

a=0, 1 or 2,

b=0, 1 or 2,

a+b=1 or 2,

D=the radical of an aromatic or heterocyclic diazo component,

B and B'=independently of one another a direct bond or bridge member,

X=a fibre-reactive heterocyclic radical,

R=H or unsubstituted or substituted $C_1$–$C_4$-alkyl,

M=$CH_2$—$CH_2$—OH, CH=$CH_2$ or $CH_2$—$CH_2$—V, wherein V=a radical which can be eliminated under alkaline conditions, and

$L^1$ and $L^2$=as identical or different radicals, H or an aliphatic or aromatic group, wherein at least one of the substituents $L^1$ and $L^2$ is substituted by at least one polar radical or represents hydroxyl.

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**5,502,175**

**FATTY ACID ESTERS OF METHYLGLUCOSIDE DERIVATIVES**

**Natvarlel Desai, Dinslaken, and Klaus Wiestzki, Kamp-Lintfort, both of, Germany, assignors to Th. Goldschmidt AG, Germany**

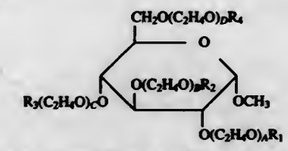
**Filed Apr. 21, 1994, Ser. No. 230,928**

**Claims priority, application Germany, Apr. 22, 1993, 43 13 117.4**

**Int. Cl.[6] C07H** *15/04;15/06;15/08*

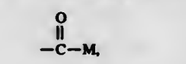
**U.S. Cl. 536—18.3** **8 Claims**

1. A mixture of fatty acid esters of methylglucoside derivatives of formula I



(I)

wherein A, B, C, D=21 to 75, $R_1$, $R_2$, $R_3$, $R_4$=H or



with $R_1$–$R_4$ not simultaneously being H, and M= $C_{11}$–$C_{18}$ alkenyl or alkyl.

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**5,502,176**

**MYELOID CELL SPECIFIC PROMOTER**

**Daniel G. Tenen, Boston; Heike L. Pahl, Cambridge, and Timothy C. Burn, Bedford, all of Mass., assignors to Beth Israel Hospital, Boston Association, Boston, Mass.**

**Continuation-in-part of Ser. No. 20,465, Feb. 19, 1993, which is a continuation of Ser. No. 837,776, Feb. 13, 1992, abandoned. This application Apr. 14, 1993, Ser. No. 49,283**

**Int. Cl.[6] C07H** *21/04;* **C12N** *5/16;15/85*

**U.S. Cl. 536—24.1** **6 Claims**

1. A promoter of the CD11b gene comprising all or a functional portion of isolated or recombinant SEQ ID NO: 1 which directs the expression of a gene preferentially in myeloid cells.

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**5,502,177**

**PYRIMIDINE DERIVATIVES FOR LABELED BINDING PARTNERS**

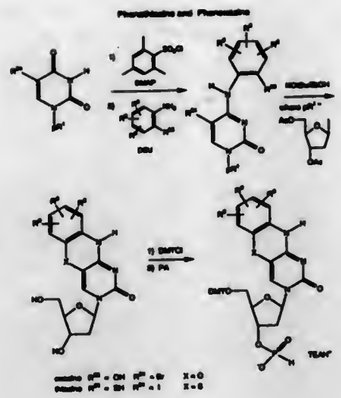
**Mark D. Matteucci, Burlingame; Robert J. Jones, Millbrae, and Kuei-Ying Lin, Fremont, all of Calif., assignors to Gilead Sciences, Inc., Foster City, Calif.**

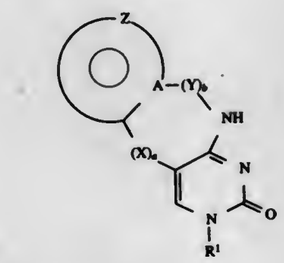
**Filed Sep. 17, 1993, Ser. No. 123,505**

**Int. Cl.[6] C07H** *21/04*

**U.S. Cl. 536—26.6** **12 Claims**

1. A compound having the structure:





wherein

$R^1$ is an oligonucleotide;

a is 1 and b is 0;

A is C or CH;

X is S, O, NH or $NCH_2R^6$;

Z is taken together with A to form an aryl ring structure comprising 6 ring atoms wherein the aryl ring carbon atoms are unsubstituted with other than H or at least 1 nonbridging ring carbon atom is substituted with $R^6$ or =O;

$R^6$ is independently H, $C_1$–$C_6$ alkyl, $C_2$–$C_6$ alkenyl, $C_2$–$C_6$ alkynyl, $NO_2$, $N(R^3)_2$, C≡N or halo, or an $R^6$ is taken together with an adjacent Z group $R^6$ to complete a phenyl ring; and

$R^3$ is a protecting group or H; and tautomers, solvates and salts thereof.

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**5,502,178**

**METHODS FOR PRODUCING AMIDATED OR AMINATED WATER SOLUBLE CELLULOSE ACETATES**

**Balarum Gupta, North Plainfield, N.J., assignor to Hoechst Celanese Corp., Somerville, N.J.**

**Division of Ser. No. 742,983, Aug. 9, 1991, abandoned. This application Aug. 20, 1993, Ser. No. 110,072**

**Int. Cl.[6] C08B *15/00***

**U.S. Cl. 536—32** **11 Claims**

1. A method of producing an amidated water soluble cellulose acetate comprising amidating a water soluble cellulose acetate substrate with acetonitrile in dimethylsulfoxide and in the presence of concentrated sulfuric acid.

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**5,502,179**

**CARRAGEENAN PRODUCT AND A METHOD OF PRODUCING SAME**

**Peter F. Larsen, Hejbjerg, Denmark, assignor to Grinsted Products A/S (Danisco A/S, Copenhagen, Denmark**

**PCT No. PCT/DK94/00131, § 371 Date Jul. 12, 1994, § 102(e) Date Jul. 12, 1994, PCT Pub. No. WO92/19192, PCT Pub. Date Nov. 12, 1992**

**PCT Filed Mar. 28, 1994, Ser. No. 211,927**

**Int. Cl.[6] C07G *17/00*; C07H *1/06***

**U.S. Cl. 536—114** **34 Claims**

1. A method of producing a carrageenan product which contains at least 70% by weight of carrageenan, comprising subjecting a carrageenan-containing seaweed material in which 6-sulphated galactose units in the carrageenan have been converted into 3,6-anhydro galactose units by treating said material with a base and which has a dry matter content of at least 25% by weight and at the most 75% by weight to an extrusion or shear mixer treatment to obtain a carrageenan product, which product

(i) shows a maximum swelling at a temperature which is at the most 85° C., when measuring a 3% by weight suspension of the product having a dry matter content of at least 85% by weight and an average particle size of less than 0.18 mm, in a 0.7% by weight aqueous solution of KCl by means of a Brabender Viscograph operated at 60 rpm and at a heating rate of 1.5° C./min from an initial temperature of 35° C., and which product

(ii) exhibits a light transmission of at least 5% when measured in the form of a water gel containing 0.126% dry matter of the product by means of a spectrophotometer at a wavelength of 420 nm in a cuvette with a light path of 1 cm.

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**5,502,180**

**INULIN DERIVATIVES, PROCESS FOR THEIR PREPARATION AND THEIR USE**

**Markwart Kunz, Worms, and Alireza H. Begli, Ramsen, both of, Germany, assignors to Südzucker AG Mannheim/ Ochsenfurt, Germany**

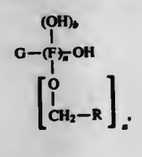
**Filed Aug. 10, 1994, Ser. No. 288,072**

**Claims priority, application Germany, Aug. 10, 1993, 43 26 782.3**

**Int. Cl.[6] A61K *31/715*; C08B *37/18*; C07H *1/00*; C07G *17/00***

**U.S. Cl. 536—123** **6 Claims**

1. An inulin compound of the formula



(I)

in which

G is a glucopyranose group;

F is a fructofuranose group;

R represents a $—CH_2OH$ or $—CHOH—(CH_2)_m—CH_3$ group;

m is an integer from 0 to 10;

n is on average a number from 10 to 50; and

a and b are each a number from 0 to 3, where a+b=3.



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**5,502,181**

**LOW GEL STRENGTH AGAR-AGAR**

**Masaaki Kojima; Kazuhiro Tabata; Yuji Uzuhashi, and Yoshiki Ito, all of Nagano, Japan, assignors to INA Food Industry Co., Ltd., Nagano, Japan**

**Division of Ser. No. 6,277, Jan. 19, 1993, abandoned. This application Oct. 18, 1994, Ser. No. 324,545**

**Claims priority, application Japan, May 15, 1992, 4-148855; Jul. 23, 1992, 4-217250; Aug. 3, 1992, 4-226398**

**Int. Cl.[6] C08B *37/12***

**U.S. Cl. 536—123.1** **10 Claims**

3. A process for producing a food material exhibiting unique desirable properties not otherwise present in said food material, comprising:

extracting agar components from seaweeds serving as the raw materials of agar to manufacture normal agar;

treating the so-extracted normal agar with acid to reduce the molecular weight of the normal agar components to produce low gel strength agar;

neutralizing the acid to terminate its effect, thereby adjusting the molecular weight of the low gel strength agar to a degree such that when the agar is present in water at a concentration of 1.5%, the agar has a gel strength in the range between 10 to 250 g/cm$^2$; and

combining the resulting low gel strength agar with a food material.

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**5,502,182**

**PROCESS FOR THE PREPARATION OF HYDROCORTISONE**

**Francis Brion, Gagny; Jean Buendia, Le Perreux sur Marne; Christian Dielez, Palaiseau, and Michel Vivat, Ingny sur Marne, all of, France, assignors to Roussel Uclaf, France**

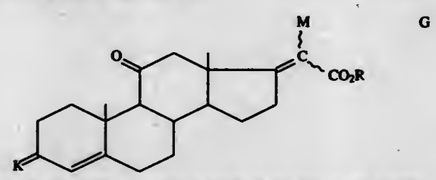
**Division of Ser. No. 105,742, Aug. 12, 1993, Pat. No. 5,401,840, which is a division of Ser. No. 935,535, Aug. 25, 1992, Pat. No. 5,260,463. This application Dec. 22, 1994, Ser. No. 362,120**

**Claims priority, application France, Sep. 6, 1991, 91 11052**

**Int. Cl.[6] C07J *21/00***

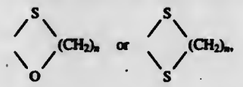
**U.S. Cl. 540—30** **2 Claims**

1. A compound of the formula

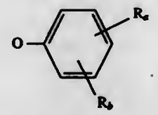


(G)

wherein K represents a protective group of the oxo of the formula



wherein n is 2 or 3; M is chlorine, bromine, or



wherein $R_a$ and $R_b$ are individually selected from the group consisting of hydrogen, —OH, and alkyl and alkoxy of 1 to 4 carbon atoms and R is selected from the group consisting of alkyl of 1 to 6 carbon atoms, aralkyl of 7 to 15 carbon atoms, trialkyl silyl triphenyl silyl and diphenyl tert-butylsilyl.

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**5,502,183**

**STEROID INTERMEDIATES AND PROCESSES FOR THEIR PREPARATION**

**David R. Andrews, Maplewood, and Anantha R. Sudhakar, East Brunswick, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.**

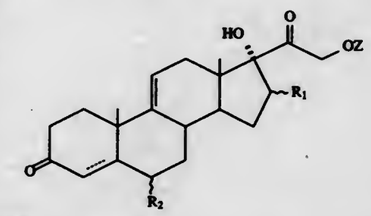
**PCT No. PCT/US93/00211, § 371 Date Jul. 25, 1994, § 102(e) Date Jul. 25, 1994, PCT Pub. No. WO93/15103, PCT Pub. Date Aug. 5, 1993**

**Continuation-in-part of Ser. No. 826,695, Jan. 28, 1992, abandoned. This PCT application Jan. 26, 1993, Ser. No. 256,812**

**Int. Cl.[6] C07J *21/00***

**U.S. Cl. 540—46** **35 Claims**

1. A process for the preparation of steroid intermediates of the formula



(I)

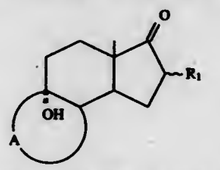
wherein

Z is an acyl group;

$R_1$ is a hydrogen, α- or β-methyl, hydroxy, or a lower alkoxy group;

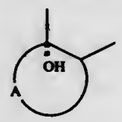
$R_2$ is hydrogen, fluoro, chloro or lower alkyl; and the dotted line represents an optional double bond; which comprises:

a. optionally contacting a 9α-hydroxy steroid of the formula



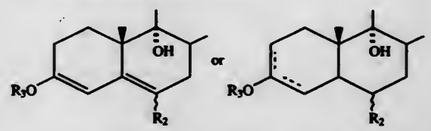
(III)

wherein $R_1$ is as hereinbefore defined and



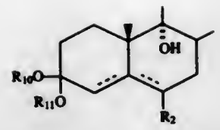
represents

i) an enol ether of the formula:



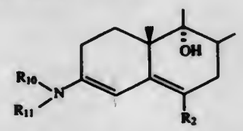
wherein $R_3$ is a lower alkyl or a trisubstituted silyl group wherein the silyl substituents are independently lower alkyl, phenyl or phenylalkyl; the dashed line represents a double bond present in one or the other position; and $R_2$ is as hereinbefore defined;

ii) a ketal of the formula:



wherein $R_{10}$ and $R_{11}$ independently are lower alkyl groups, optionally connected together to form a five or six membered ring; the dashed lines represent an optional bond present in either the A or B ring; and $R_2$ is as hereinbefore defined; or

iii) an enamine of the formula



wherein $R_2$, $R_{10}$ and $R_{11}$ are as hereinbefore defined with the proviso that the optional six membered ring may optionally contain an oxygen or nitrogen atom;

with either

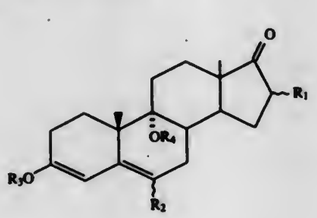
1) excess base and a trisubstituted silylchloride;
2) a lower alkyl, vinyl or phenyl haloformate; and
3) a lower alkanol;

or

1) excess base;
2) a lower alkyl, vinyl or phenyl haloformate; and
3) an alkoxide

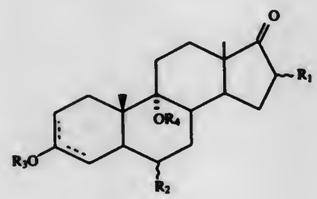
to afford the C-9 carbonate of the formula

a)



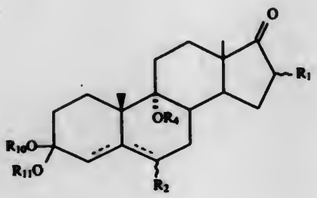
(IVa)

b)



(IVb)

c)

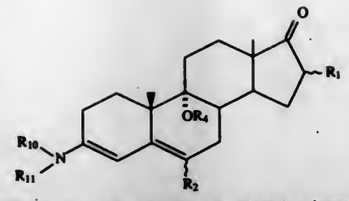


(IVc)

-continued

or

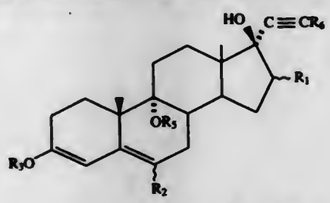
d)



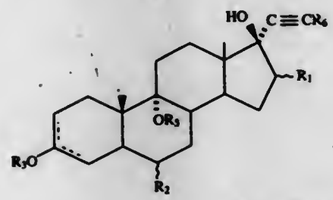
(IVd)

wherein $R_4$ is a lower alkyl, vinyl or phenyl carbonate group, and $R_1$, $R_2$, $R_3$, $R_{10}$ and $R_{11}$ are as hereinbefore defined;

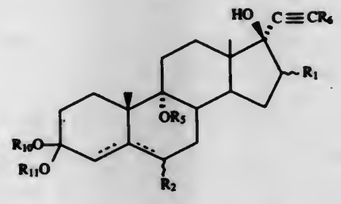
b. contacting the resultant C-9 carbonate of step a or the 9α-hydroxy starting material of formula III with lithium acetylide or lithium trimethylsilyl acetylide optionally in the presence of LiX wherein X is a chloro, bromo or perchlorate ion, to afford the C-17 ethynyl compound of the formula



(Va)

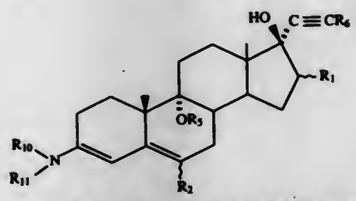


(Vb)



(Vc)

or



(Vd)

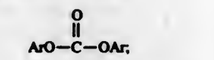
wherein $R_5$ is hydrogen, a lower alkyl carbonate, a vinyl carbonate or a phenyl carbonate group, $R_6$ is hydrogen or a trimethylsilyl group; $R_1$, $R_2$, $R_3$, $R_{10}$, $R_{11}$ and the dashed and dotted lines are as hereinbefore defined;

c. esterifying the resulting C-17 hydroxyl compound of step b with

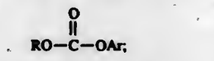
1) catalytic phenoxide formed in in situ with a metal hydride and a phenol; and



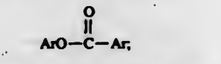
2) a diarylcarbonate of the formula



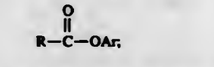
or an alkylaryl carbonate of the formula



or a diarylcarboxylate of the formula



or an arylalkylcarboxylate of the formula

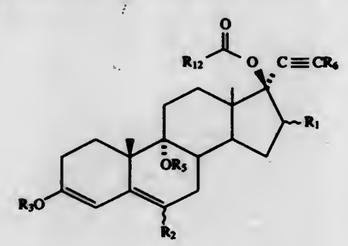


wherein R is a lower alkyl group and Ar is an aryl group; and

3) a metal hydride; in an aprotic solvent;

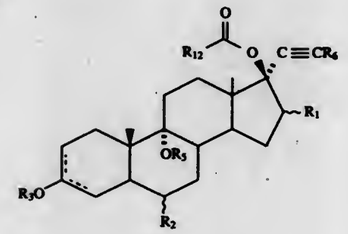
to afford the C-17 ester of the formula

a)



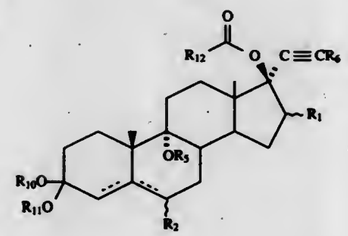
(VIa)

b)



(VIb)

c)

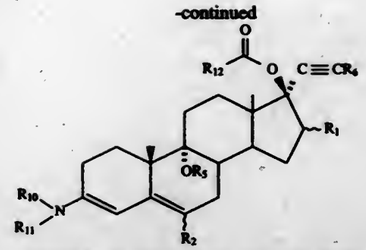


(VIc)

or

d)

-continued



(VId)

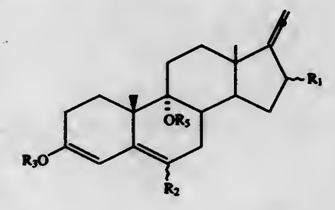
wherein $R_{12}$ is a lower alkyl, aryl, lower alkoxy or aryloxy group and $R_1$, $R_2$, $R_3$, $R_5$, $R_{10}$, $R_{11}$ and the dashed and dotted lines are as hereinbefore defined; and in the case wherein $R_6$ is a trisubstituted silyl group, removal of that group by a conventional desilylation method;

d. contacting the resulting C-17 ester of step c with one of the following reducing agents:

1. formic acid or its salts;
2. a samarium (II) salt;
3. a transition metal;

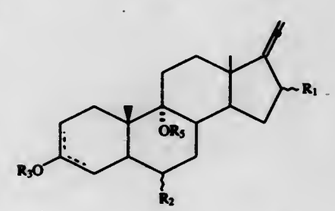
and a palladium catalyst containing a phosphine or phosphite ligand, to afford the 17-allene of the formula

a)



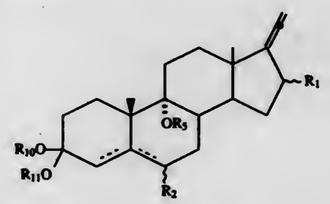
(VIIa)

b)



(VIIb)

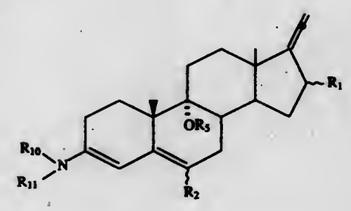
c)



(VIIc)

or

d)

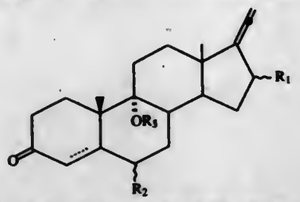


(VIId)

wherein $R_1$, $R_2$, $R_3$, $R_5$, $R_{10}$, $R_{11}$ and the dashed and dotted lines are as hereinbefore defined;

e. treatment of the resulting 17-allene of step d with an aqueous strong acid to afford the 3-one of the formula

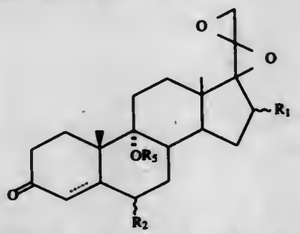
(VIII)



wherein $R_1$, $R_2$, $R_5$ and the dotted line are as hereinbefore defined;

f. oxidizing the resulting 3-one of step e with a dialkyl dioxirane to afford the compound of the formula

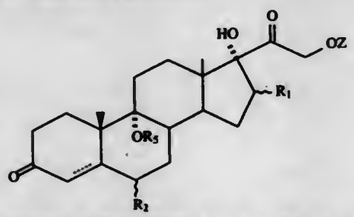
(IX)



wherein $R_1$, $R_2$, $R_5$ and the dotted line are as hereinabove defined;

g. treatment of the compound of step f with an alkali metal salt of a carboxylic acid under phase-transfer conditions to afford the compound of the formula

(X)



wherein Z is an acyl group, $R_1$, $R_2$, $R_5$, and the dotted line are as hereinbefore defined; and

h. treatment of the compound of step g with a strong acid to afford the Δ9,11 steroid of formula I.

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**5,502,184**

**PROCESS FOR PRODUCING ε-CAPROLACTAM**

**Hiroshi Kajikuri, Ibaraki; Hideto Tojima, Kyoto; Tomokazu Nakamura, Toyonaka, and Masaru Kitamura, Takatsuki, all of, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan**

**Filed Aug. 19, 1994, Ser. No. 293,169**

**Claims priority, application Japan, Aug. 20, 1993, 5-206527**

**Int. Cl.[6] C07D 201/04**

**U.S. Cl. 540—536** **13 Claims**

1. A process for producing ε-caprolactam which consists essentially of allowing crude ε-caprolactam obtained by gas phase Beckmann rearrangement of cyclohexanone oxime to contact hydrogen at 100°–200° C. in the presence of a hydrogenation catalyst.

**5,502,185**

**PREPARATION OF LACTAMS**

**Eberhard Fuchs, Frankenthal, and Tom Witzel, Ludwigshafen, both of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany**

**Filed Dec. 19, 1994, Ser. No. 358,413**

**Claims priority, application Germany, Jun. 28, 1994, 44 22 610.1**

**Int. Cl.[6] C07D 201/08**

**U.S. Cl. 540—538** **5 Claims**

1. A process for the preparation of a cyclic lactam by reacting an aminocarboxylic acid compound of the formula I

$$H_2N-(CH_2)_m-COR^1 \qquad I$$

where $R^1$ is —OH, —o—$C_1$–$C_{12}$-alkyl or —$NR^2R^3$ and $R^2$ and $R^3$, independently of one another, are each hydrogen, $C_1$–$C_{12}$-alkyl or $C_5$–$C_8$-cycloalkyl and m is an integer from 3 to 12,

with water, wherein the reaction is carried out in the liquid phase using a heterogeneous catalyst.

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**5,502,186**

**PROCESS FOR PREPARING INTERMEDIATES FOR THE SYNTHESIS OF D1 ANTAGONISTS**

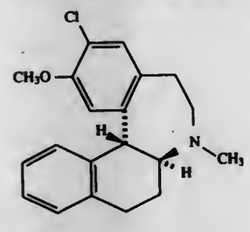
**Donald Hou, Verona; Richard W. Draper, North Caldwell; Gary M. Lee, Murray Hill, and Janet L. Mas, Scotch Plains, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.**

**Division of Ser. No. 127,667, Sep. 27, 1993, Pat. No. 5,461,147. This application May 23, 1995, Ser. No. 447,467**

**Int. Cl.[6] C07D 223/14**

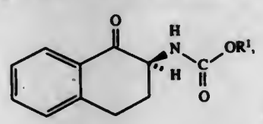
**U.S. Cl. 540—576** **3 Claims**

1. A process for preparing a compound of the formula



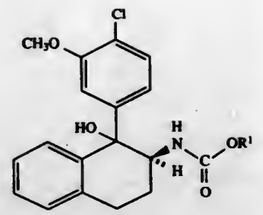
comprising the steps:

(C1) reacting a ketocarbamate of the formula



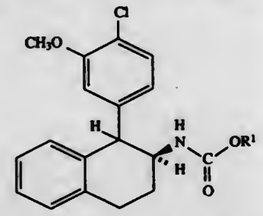
wherein $R^1$ $C_1$–$C_6$ alkyl or —$CH_2C_6H_5$ with the lithium reagent prepared from 5-bromo-2-chloroanisole and t-butyllithium, to form a compound of the formula





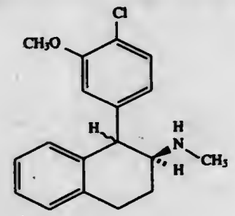
wherein $R^1$ is as defined above;

(C22) reacting the product of step (C1) with a trialkylsilane and $CF_3CO_2H$ to form a compound of the formula



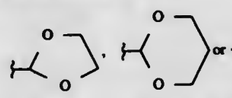
wherein $R^1$ is as defined above, as a mixture of cis and trans isomers;

(C3) reducing the product of step (C2) by treating with a hydride reducing agent to form a compound of the formula

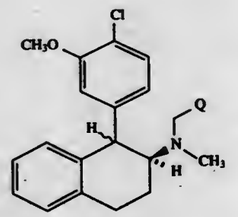


as a mixture of cis and trans isomers;

(C4) reacting the product of Step (C3) with a compound of the formula J—$CH_2$—Q, wherein J is a leaving group, and Q is a group of the formula

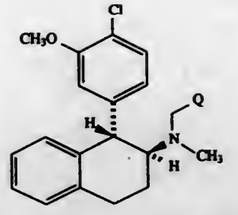


wherein $R^2$ is $C_1$–$C_6$ alkyl, to form a compound of the formula



as a mixture of cis and trans isomers;

(C5) treating the product of step (C4) with an alkoxide base to form a compound of the formula



(C6) cyclizing the product of step (C5) to form the compound of formula I.

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**5,502,187**

**PHARMACEUTICALLY ACTIVE BICYCLIC-HETEROCYCLIC AMINES**

**Donald E. Ayer, Kalamazoo; Gordon L. Bundy, Portage, and Eric J. Jacobsen, Plainwell, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.**

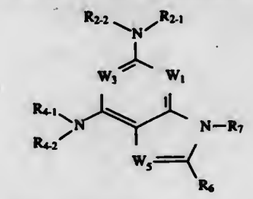
**Continuation-in-part of Ser. No. 863,646, Apr. 3, 1992, abandoned, and a continuation of Ser. No. 222,995, Apr. 5, 1994, abandoned, which is a continuation of Ser. No. 128,957, Sep. 29, 1993, abandoned. This application Oct. 3, 1994, Ser. No. 317,934**

**Int. Cl.[6] C07D 265/04**

**U.S. Cl. 544—117** **25 Claims**

1. A bicyclic heterocyclic amines of the formula (XXX)

(XXX)



where

$W_1$ is —N= or —CH=;

$W_3$ is —N= or —CH=;

$W_5$ is —N= or —$CR_5$— with the proviso that $W_5$ is —$CR_5$— when both $W_1$ and $W_3$ are —N=;

where

$R_5$ is

($C_5$-1)

(A) —H,

($C_5$-2)

(B) $C_1$–$C_8$ alkyl optionally substituted with 1 thru 4 $R_{5\text{-}1}$ where $R_{5\text{-}1}$ is

(1) —F, —Cl, —Br,

(2) $C_1$–$C_4$ alkyl,

(3) —$CF_3$,

(4) =O,

(5) —$OR_{5\text{-}2}$ where $R_{5\text{-}2}$ is

(a) —H,

(b) $C_1$–$C_4$ alkyl,

(c) phosphate,

(d) sulfate,

(e) —CO—$R_{5\text{-}8}$ where $R_{5\text{-}8}$ is $C_1$–$C_4$ alkyl or $C_6$–$C_9$ aralkyl,

(f) —CO—$NR_{5\text{-}10}R_{5\text{-}11}$ where $R_{5\text{-}10}$ and $R_{5\text{-}11}$ are the same or different and are —H or $C_1$–$C_3$ alkyl,

(g) sulfamate,

(h) glucosyl,

(i) galactosyl,

(j) glucuronic acid,

(k) maltosyl,

(l) arabinosyl,

(m) xylosyl,
(n) —CO—CH($NH_2$)—H,
(o) —CO—CH($NH_2$)—$CH_3$,
(p) —CO—CH($NH_2$)—$CH(CH_3)_2$,
(q) —CO—CH($NH_2$)—$CH_2$—$CH(CH_3)_2$,
(r) —CO—CH($NH_2$)—$CH(CH_3)$—$CH_2$—$CH_3$,
(s) —CO—CH($NH_2$)—$CH_2$—OH
(t) —CO—CH($NH_2$)—CH(OH)—$CH_3$,
(u) —CO—CH($NH_2$)—$CH_2$-⬟,
(v) —CO—CH($NH_2$)—$CH_2$-[p-pheayl]—OH,
(w) —CO—CH($NH_2$)—$CH_2$-[2-indolyl]
(x) —CO—CH($NH_2$)—$CH_2$—SH,
(y) —CO—CH($NH_2$)—$CH_2$—$CH_2$—S—$CH_3$,
(z) —CO—C*H—NH—$CH_2$—$CH_2$—C*$H_2$ where the carbon atoms marked with an "*" are bonded together to form a heterocyclic ring,
(aa) —CO—C*H—NH—$CH_2$—CH(OH)—C*$H_2$ where the carbon atoms marked with an "*" are bonded together to form a heterocyclic ring,
(bb) —CO—CH($NH_2$)—$CH_2$—COOH,
(cc) —CO—CH($NH_2$)—$CH_2$—$CONH_2$,
(dd) —CO—CH($NH_2$)—$CH_2$—$CH_2$—COOH,
(ee) —CO—CH($NH_2$)—$CH_2$—$CH_2$—$CONH_2$,
(ff) —CO—CH($NH_2$)—$CH_2$—C*—NH—CH=N—C*H= where the carbon atoms marked with an "*" are bonded together to form a heterocyclic ring,
(gg) —CO—CH($NH_2$)—$CH_2$—$CH_2$—$CH_2$—NH—C(=NH)—$NH_2$,
(hh) —CO—CH($NH_2$)—$CH_2$—$CH_2$—$CH_2$—$CH_2$—$NH_2$,
(ii) —CO—CH($NH_2$)—$CH_2$—$CH_2$—CH(OH)—$CH_2$—$NH_2$,
(jj) —CO—$CH_2$—$CH_2$—$NH_2$,
(kk) —CO—$CH_2$—$CH_2$—$CH_2$—$NH_2$,
(ll) —CO—CH($NH_2$)—$CH_2$—$CH_2$—$CH_2$—$NH_2$,
(mm) —CO—CH($NH_2$)—$CH_2$—$CH_2$—$CH_2$—NH—CO—$NH_2$,
(nn) —CO—CH($NH_2$)—$CH_2$—$CH_2$—OH,
(6) —$SR_{5-2}$ where $R_{5-2}$ is defined above,
(7) —$NHR_{5-3}$ where $R_{5-3}$ is —H or $C_1$–$C_4$ alkyl,
(8) —$NR_{5-4}R_{5-5}$ where $R_{5-4}$ and $R_{5-5}$ are the same or different and are $C_1$–$C_4$ alkyl or may taken together with the attached nitrogen atom to form the heterocyclic ring —N*—$(CH_2)_{n1}$—$R_{5-6}$—$(CH_2)_{n2}$ * where the atoms marked with an asterisk (*) are bonded together resulting in the formation of a ring, where $n_1$ is 1 thru 5, $n_2$ is 0 thru 3 and $R_{5-6}$ is
(a) —$CH_2$—,
(b) —O—,
(c) —S—,
(d) —$NR_{5-9}$ where $R_{5-9}$ is
(i) $C_1$–$C_6$ alkyl optionally substituted with 1 thru 3 —OH or —$OCH_3$,
(ii) $C_1$–$C_6$ alkylcarbonyl,
(iii) $C_1$–$C_6$ alkoxycarbonyl,
(iv) $C_6$–$C_{12}$ arylalkyl,
(v) -⬟,
(vi)—$SO_2$—$C_1$–$C_8$ alkyl,
(vii) $CH_3$—C*—O—CO—O—C*—$CH_2$— where the carbon atoms designated by * are attached by a double bond to form a five member ring,
(9) —$(CH_2)_{n3}CO_2R_{5-2}$, where $n_3$ is 0 thru 6 and $R_{5-2}$ is as defined above,
(10) —$(CH_2)_{n3}CON(R_{5-3})_2$ where $n_3$ is as defined as above and where $R_{5-3}$ may be the same or different and is defined above,
(11) —$(CH_2)_{n3}CONR_{5-4}R_{5-5}$ where $n_3$, $R_{5-4}$, $R_{5-5}$ are as defined above,
(12) —$(CH_2)_{n1}OR_{5-2}$ where $R_{5-2}$ and $n_1$ are as defined above,
(13) —$(CH_2)_{n1}OCOR_{5-3}$ where $R_{5-3}$ and $n_1$ are as defined above,
(14) —$(CH_2)_{n1}SR_{5-2}$ where $R_{5-2}$ and $n_1$ are as defined above,
(15) —$(CH_2)_{n1}NHR_{5-3}$ where $R_{5-3}$ and $n_1$ are as defined above,
(16) —$(CH_2)_{n1}NR_{5-4}R_{5-5}$ where $R_{5-4}$, $R_{5-5}$, and $n_1$ are as defined above,

($C_5$-3)
(C) —$(CH_2)_{n3}$-⬟ optionally substituted with 1 thru 4 $R_{5-1}$ where $R_{5-1}$ and $n_3$ are as defined as above,
(D) —$(CH_2)_{n3}$-pyridin-2-, 3- or 4-yl optionally substituted with 1 thru 4 $R_{5-1}$ where $n_3$ and $R_{5-1}$ are as defined above,
(E) —$(CH_2)_{n3}$-naphthalin-1-, 2-yl optionally substituted with 1 thru 4 $R_{5-1}$ where $n_3$ and $R_{5-1}$ are as defined above,
($C_5$-5)
(F) —$(CH_2)_{n3}CO_2R_{5-2}$ where $n_3$ and $R_{5-2}$ are as defined above,
($C_5$-6)
(G) —$(CH_2)_{n3}CON(R_{5-3})_2$ where $n_3$ is as defined as above and where $R_{5-3}$ may be the same or different and is as defined above,
($C_5$-7)
(H) —$(CH_2)_{n3}CONR_{5-4}R_{5-5}$ where $n_3$, $R_{5-4}$, $R_{5-5}$ are as defined above,
($C_5$-8)
(I) —$(CH_2)_{n3}SO_3R_{5-2}$ where $n_3$ and $R_{5-2}$ are as defined above,
($C_5$-9)
(J) —$C_3$–$C_7$ cycloalkyl;

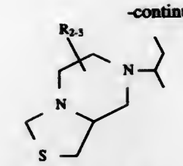
where
$R_{2-1}$ is
(A) —H,
(B) $C_1$–$C_8$ alkyl optionally substituted with 1 thru 4
(1) —F,
(2) —Cl,
(3) —$OR_{5-2}$ where $R_{5-2}$ is as defined above,
(4) —$N(R_{5-9})_2$ where $R_{5-9}$ may be the same or different and is as defined above;

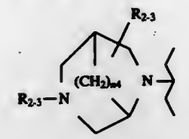
where
$R_{2-2}$ is
(A) —H,
(B) $C_1$–$C_8$ alkyl optionally substituted with 1 thru 4
(1) —F,
(2) —Cl,
(3) —$OR_{5-2}$ where $R_{5-2}$ is as defined above,
(4) —$N(R_{5-9})_2$ where $R_{5-9}$ may be the same or different and is as defined above, or $R_{2-1}$ and $R_{2-2}$ are taken together with the attached nitrogen atom to form a heterocyclic ring selected from the group consisting of
(A) 1-pyrrolidinyl optionally substituted on carbon with 1 thru 3 $R_{2-3}$ where $R_{2-3}$ is selected from the group of
(1) $C_1$–$C_6$ alkyl optionally substituted with 1 thru 3 —OH or —$OCH_3$,
(2) $C_1$–$C_6$ alkenyl optionally substituted with 1 thru 3 —OH or —$OCH_3$,
(3) $C_1$–$C_6$ alkylcarbonyl,
(4) $C_1$–$C_6$ alkoxycarbonyl,
(5) $C_6$–$C_{12}$ arylalkyl,
(6) =O,
(7) —OH,
(8) —C≡N,
(9) —$CO_2R_{2-4}$ where $R_{2-4}$ is
(a) —H,
(b) $C_1$–$C_4$ alkyl,
(c) $C_6$–$C_{12}$ aryl,
(d) $C_6$–$C_{12}$ aralkyl,
(10) —$NH_2$,
(11) —Cl,
(12) —F,
(13) —Br,
(14) -⬟ optionally substituted with 1 thru 3 —F, —Cl, —Br, —OH, —$OCH_3$, —$OCH_2$-⬟, —$NO_2$, $C_1$–$C_3$ alkyl, —$NH_2$, —$NHCH_3$, $N(CH_3)_2$, —$CO_2R_{2-4}$ where $R_{2-4}$ is as defined above,
(15) —$(CH_2)_{n4}NR_{2-6}R_{2-7}$ where $R_{2-6}$ and $R_{2-7}$ are the same or different and are $C_1$–$C_4$ alkyl or may taken together with the attached nitrogen atom to form the heterocyclic ring —N*—$(CH_2)_{n5}$—$R_{2-5}$—$(CH_2)_{n6}$ * where the atoms marked with an asterisk (*) are bonded together resulting in the formation of a ring, where $n_4$ is 0 thru 3, $n_5$ is 1 thru 5, $n_6$ is 0 thru 3 and $R_{21}$is
(a) —$CH_2$—,
(b) —O—,
(c) —S—,

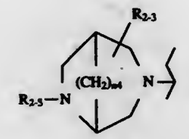


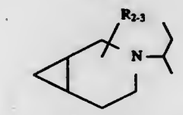
(d) —$NR_{2-4}$ where $R_{2-4}$ is as defined above,
(B) 1-piperdinyl optionally substituted on carbon with 1 thru 3 $R_{2-3}$ where $R_{2-3}$ is as defined above,
(C) 1-morpholinyl optionally substituted on carbon with 1 thru 3 $R_{2-3}$ where $R_{2-3}$ is as defined above,
(D) 1-piperazinyl optionally substituted on carbon with 1 thru 3 $R_{2-3}$ where $R_{2-3}$ is as defined above and optionally substituted in the 4-position with $R_{2-9}$ where $R_{2-9}$ is
(1) $C_1$–$C_6$ alkyl optionally substituted with 1 thru 3 —OH or —$OCH_3$,
(2) $C_1$–$C_6$ alkylcarbonyl,
(3) $C_1$–$C_6$ alkoxycarbonyl,
(4) $C_6$–$C_{12}$ arylalkyl,
(5) -⬟,
(6)—$SO_2$-$C_1$–$C_8$ alkyl,
(7) $CH_3$—C*—O—CO—O—C*—$CH_2$— where the carbon atoms designated by * are attached by a double bond to form a five member ring,
(E) 1-aziridinyl optionally substituted on carbon with 1 thru 2 $R_{2-3}$ where $R_{2-3}$ is as defined above,
(F) 1-azetidinyl optionally substituted on carbon with 1 thru 3 $R_{2-3}$ where $R_{2-3}$ is as defined above,
(G) 1-hexamethyleneimino optionally substituted on carbon with 1 thru 3 $R_{2-3}$ where $R_{2-3}$ is as defined above,
(H) 1-pyrrolyl optionally substituted on carbon with 1 thru 3 $R_{2-3}$ where $R_{2-3}$ is as defined above,
(I) 1-imidazolyl optionally substituted on carbon with 1 thru 3 $R_{2-3}$ where $R_{2-3}$ is as defined above,
(J) 1-pyrazoyl optionally substituted on carbon with 1 thru 3 $R_{2-3}$ where $R_{2-3}$ is as defined above,
(K) 1-pyrazolidinyl optionally substituted on carbon with 1 thru 3 $R_{2-3}$ where $R_{2-3}$ is as defined above,
(L) 1,2,3-triazolyl optionally substituted on carbon with 1 thru 3 $R_{2-3}$ where $R_{2-3}$ is as defined above,
(M) 1,2,4-triazolyl optionally substituted on carbon with 1 thru 3 $R_{2-3}$ where $R_{2-3}$ is as defined above,
(N) 1-tetrazolyl optionally substituted on carbon with 1 thru 3 $R_{2-3}$ where $R_{2-3}$ is as defined above,
(O) 1-thiomorpholinyl optionally substituted on carbon with 1 thru 3 $R_{2-3}$ where $R_{2-3}$ is as defined above,
(P) 1-thiazolidinyl, optionally substituted on carbon with 1 thru 3 $R_{2-3}$ where $R_{2-3}$ is as defined above,

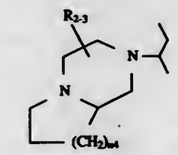
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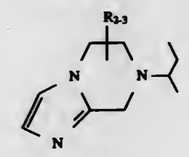

(U)($R_{2-1}$/$R_{2-2}$-5)

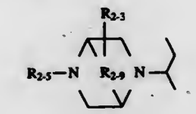

(V)($R_{2-1}$/$R_{2-2}$-6)

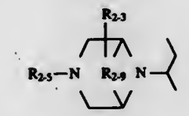

(W)($R_{2-1}$/$R_{2-2}$-7)

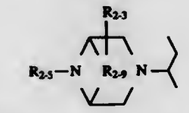

(X)($R_{2-1}$/$R_{2-2}$-8)

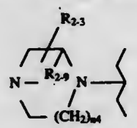

(Y)($R_{2-1}$/$R_{2-2}$-9)

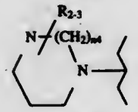

(Z)($R_{2-1}$/$R_{2-2}$-10)

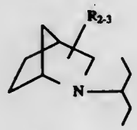

(AA)($R_{2-1}$/$R_{2-2}$-11)

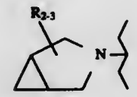

(BB)($R_{2-1}$/$R_{2-2}$-12)


(CC)($R_{2-1}$/$R_{2-2}$-13)


(Q)($R_{2-1}$/$R_{2-2}$-1)


(R)($R_{2-1}$/$R_{2-2}$-2)


(S)($R_{2-1}$/$R_{2-2}$-3)


(T)($R_{2-1}$/$R_{2-2}$-4)

where
$R_{2-3}$and $R_{2-5}$ are as defined above,
where
$R_{2-9}$ is
(A) —$(CH_2)_{n4}$where $n_4$ is 1 thru 3,
(B) —$CH_2OCH_2$,
(C) —$CH_2SCH_2$,
(D) —$CH_2SO_2CH_2$,
(E) —$CH_2S$,

(F) —$CH_2SO_2$,

(G) —$CH_2N(R_{2-5})CH_2$ where $R_{2-5}$ is as defined above, with the proviso that $R_{2-1}$ and $R_{2-2}$ can not both be —H;

where $R_{4-1}$ is defined the same as $R_{2-1}$, but may be the same or different than $R_{2-1}$,

where $R_{4-2}$ is defined the same as $R_{2-2}$, but may be the same or different than $R_{2-2}$, with the proviso that $R_{4-1}$ and $R_{4-2}$ can not both be —H;

where ($R_6$-1) $R_6$ is defined the same as $R_5$, but may be the same or different than $R_5$, with the proviso that;

(I) one of $R_5$, $R_6$ or $R_7$ must be selected from the group consisting of

($C_5$-3)

(C) —$(CH_2)_{n3}$-ϕ optionally substituted with 1 thru 4 $R_{5-1}$ where $R_{5-1}$ and $n_3$ as defined as above,

(D) —$(CH_2)_{n3}$-pyridin-2-, 3- or 4-yl optionally substituted with 1 thru 4 $R_{5-1}$where $n_3$ and $R_{5-1}$ are as defined above,

(E) —$(CH_2)_{n3}$-naphthalin-1-, 2-yl optionally substituted with 1 thru 4 $R_{5-1}$ where $n_3$ and $R_{5-1}$ are as defined above, and

(II) for at least one of these three aromatic substituents, $n_3$ must be 0;

where $R_7$ is defined the same as $R_5$, but may be the same or different than $R_5$; with the proviso that $W_1$ and $W_3$ can not both be —CH=, and pharmaceutically acceptable salts thereof.

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**5,502,188**

**PRODUCTION OF ALMOST COLORLESS SOLUTIONS OF N-METHYLMORPHOLINE OXIDE**

**Klemens Massonne, Westheim; Gerd Kenrad, Limburgerhof, both of, Germany; Mark D. Sandison, Dearborn, Mich.; Gregory E. Moffitt; Lawrence E. James, both of Grosse Ile, Mich., and John Banger, High Bridge, N.J., assignors to BASF Corporation, Mount Olive, N.J.**

**Filed Jun. 7, 1995, Ser. No. 482,391**

**Int. Cl.[6] C07D 295/24**

**U.S. Cl. 544—173** **7 Claims**

1. A process for producing aqueous solutions of N-methylmorpholine N-oxide having APHA numbers below 200, based on an N-methylmorpholine N-oxide content of 50% by weight, comprising the steps of:

A. Obtaining an aqueous N-methylmorpholine solution whose water content is at least 35% by weight;

B. Oxidizing the aqueous N-methylmorpholine solution with hydrogen peroxide at a temperature range from 50°–80° C.;

C. Adjusting the concentration of the aqueous N-methylmorpholine N-oxide solution prepared in (B) by distilling off residual N-methylmorpholine and water.

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**5,502,189**

**COMPOUNDS FORMED FROM O-HYDROXYPHENYL-1,3,5-TRIAZINES AND STERICALLY HINDERED AMINES**

**Mario Sloaga, Tafers; Jean-Luc Birbaum, Fribourg; Jean Rody, Richen, all of, Switzerland, and Andreas Valet, Eimeldingen, Germany, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.**

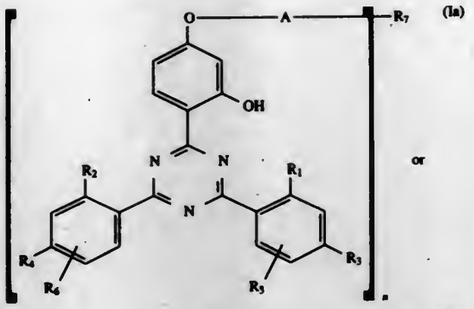
**Division of Ser. No. 29,213, Mar. 10, 1993, Pat. No. 5,376,710, which is a division of Ser. No. 685,367, Apr. 15, 1991, Pat. No. 5,229,512. This application Oct. 6, 1994, Ser. No. 319,835**

**Claims priority, application Switzerland, Apr. 20, 1990, 1338/90**

**Int. Cl.[6] C07D 251/24**

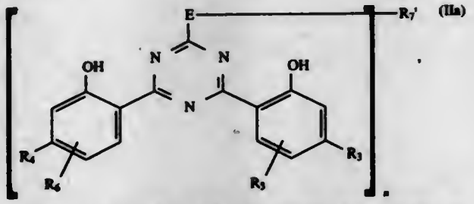
**U.S. Cl. 544—216** **6 Claims**

1. A compound of the formula Ia or IIa



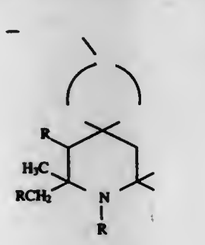
(Ia)

or

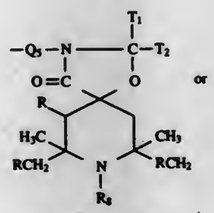


(IIa)

in which n is 1 or 2, $R_1$ and $R_2$ independently of one another are hydrogen, —OH, $C_1$–$C_{12}$alkyl or halogen, $R_3$ and $R_4$ independently of one another are hydrogen, —OH, $C_1$–$C_{12}$alkyl, $C_1$–$C_{18}$alkoxy, halogen or a radical —O—A—$R_7$, $R_5$ and $R_6$ independently of one another are hydrogen, $C_1$–$C_{12}$alkyl, halogen or a radical —O—A—$R_7$, A is a direct bond, —$(CH_2)_m$CO— where m=zero or 1 to 4, —$CH_2CH(R')O$— or —$CH_2CH(OH)CH_2$—, E is a direct bond, —$(CH_2)_r$CO— where r= 1 to 4 or —$(CH_2)_r$— where r=1 or 2, R' is hydrogen, methyl or phenyl, and $R_7$ and $R_7$' are a radical of the formulas IX, Xa or Xb when n=1,

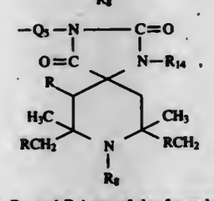


(IX)



(Xa)

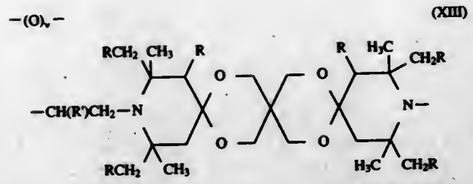
or



(Xb)

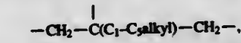
and when n=2, $R_7$ and $R_7$' are of the formula (XIII):





(XIII)

in which R is methyl or hydrogen, $R_8$ is hydrogen, oxy, $C_1$–$C_{12}$alkyl, $C_1$–$C_{12}$alkoxy, $C_3$–$C_8$alkenyl, $C_3$–$C_8$alkenyloxy, $C_3$–$C_8$alkynyl, $C_5$–$C_6$cycloalkyl, $C_5$–$C_6$cycloalkyloxy, phenyl-$C_1$–$C_4$alkyl, $C_1$–$C_8$alkanoyl, $C_3$–$C_5$alkenoyl, —$CH_2CH(OH)R'$ or phenoxy, R' is hydrogen, methyl or phenyl, $Q_4$ is $C_2$–$C_8$alkylene or



v is the number 1 if A or E have the meaning indicated, but A is not equal to a direct bond or —$CH_2CH(R')O$—, or v in compounds of the formula Ia is zero if A is a direct bond or —$CH_2CH(R')O$—, $Q_5$ is —$OCH_2CH_2$— or —$OCH_2CH(OH)CH_2$— if A or E has the meaning indicated, but A is unequal to a direct bond or —$CH_2CH(R')O$—, or in compounds of the formula Ia $Q_5$ is —$CO(CH_2)_2$— or —$CO(CH_2)_3$— if A is a direct bond or —$CH_2CH(R')O$—, $Q_5$ is a direct bond if A is —$CH_2CH(OH)CH_2$—, or $Q_5$ is —$OCO(CH_2)_s$— where s=1–4 if A in formula Ia is —$CH_2CH(OH)CH_2$— or E in formula IIa is —$(CH_2)_r$—, $T_1$ and $T_2$ independently of one another are hydrogen, $C_1$–$C_{18}$alkyl, phenyl-$C_1$–$C_4$alkyl or phenyl or naphthyl which are unsubstituted or substituted by halogen or $C_1$–$C_4$alkyl, $T_1$ and $T_2$, together with the C atom bonding them, form a $C_5$–$C_{12}$cycloalkane ring, and $R_{14}$ is hydrogen, $C_1$–$C_{12}$alkyl, allyl, benzyl or $C_2$–$C_6$alkoxyalkyl.

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**5,502,190**

**PROCESS FOR THE PRODUCTION OF DIALKYL PYRIMIDYLPHOSPHATES**

**Daniel M. Wasleski, Raytown; David T. Erdman, Kansas City, both of Mo., and Peter E. Newallis, Leawood, Kans., assignors to Bayer Corporation, Pittsburgh, Pa.**

**Filed Nov. 12, 1993, Ser. No. 151,322**

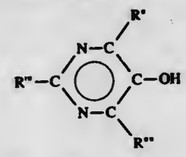
**Int. Cl.[6] C07F 9/6512**

**U.S. Cl. 544—243** **15 Claims**

1. A process for the production of an O,O-dialkyl pyrimidylphosphate comprising reacting components consisting essentially of:

a) an O,O-dialkyl phosphorohalothioate with

b) a 5-hydroxypyrimidine which is of the formula



in which

$R^*$ represents hydrogen, methyl or an alkylthio group having from 1 to 2 carbon atoms;

$R^{**}$ represents hydrogen, an alkyl group having from 1 to 8 carbon atoms, an alkylthiomethyl group, an alkylsulfinylmethyl group or an alkylsulfonylmethyl group with alkyl meaning from 1 to 4 carbon atoms, a phenyl group, a phenylthio group, an alkylthio group having from 1 to 4 carbon atoms, an alkylsulfinyl group having from 1 to 4 carbon atoms, an alkylsulfonyl group having from 1 to 4 carbon atoms, or an alkylthioethylthio group having from 1 to 2 carbon atoms in the alkyl group; and

$R^{***}$ represents hydrogen or a methyl group in the presence of

c) a phase transfer catalyst consisting essentially of an imidazole,

d) an aromatic solvent, and

e) an alkali metal hydroxide

at a pH of from about 8 to about 12 and a temperature of up to about 70° C.

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**5,502,191**

**METHOD OF SYNTHESIZING STERICALLY HINDERED 5-SUBSTITUTED-1H-TETRAZOLES FROM NITRILES USING A LEWIS ACID AND AN AZIDE**

**Rocco J. Galante, Somerville, N.J., assignor to American Cyanamid Company, Madison, N.J.**

**Continuation of Ser. No. 87,626, Jul. 1, 1993, abandoned. This application Feb. 17, 1995, Ser. No. 391,317**

**Int. Cl.[6] C07D 239/90**

**U.S. Cl. 544—284** **2 Claims**

1. A process for making 5-substituted tetrazoles of formula I:



I

wherein

R is selected from moieties of the formulae:



;

wherein

$R^1$ is selected from hydrogen, halogen, ($C_1$–$C_6$)alkyl, ($C_1$–$C_6$)alkoxy, hydroxyl, phenyl and substituted phenyl wherein the substitution is selected from ($C_1$–$C_3$)alkyl, and —O($C_1$–$C_3$)-alkyl;

$R^3$ is selected from



$R^4$ is ($C_3$–$C_4$)alkyl; which comprises:

reacting a compound of formula: R—CN wherein R is as defined hereinabove; with a zinc azide bispyridine preformed metal azide complex, in a polar solvent at reflux temperature for from 4 to 72 hours; acidifying and recovering the 5-substituted tetrazole I so produced.

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**5,502,192**

## PROCESS FOR THE PREPARATION OF QUINACRIDONES FROM DIHYDROQUINACRIDONES IN AN AQUEOUS MEDIUM

**James B. Ganci, Wilmington, Del., assignor to Ciba-Geigy Corporation, Tarrytown, N.Y.**

**Filed Aug. 8, 1994, Ser. No. 287,348**
**Int. Cl.[6] C09B 48/00**
**U.S. Cl. 546—49** **27 Claims**

1. A process for preparing an unsubstituted or substituted quinacridone, which process comprises an oxidation step wherein a 6,13-dihydroquinacridone is converted to the corresponding quinacfidone in a basic, aqueous reaction medium utilizing a quinone compound and molecular oxygen as oxidizing agent, which reaction medium consists essentially of 100 parts by weight of an aqueous base, from 6 to 12 parts by weight of the 6,13-dihydroquinacridone, from 0.5 to 3 parts by weight of a nonionic, polar organic material which forms a second liquid phase in the basic reaction medium and which is an aliphatic monoalcohol, a cycloaliphatic monoalcohol, an araliphatic monoalcohol, a $C_4$–$C_8$diol, $C_6$–$C_8$glycol, polyglycol or a mono-$C_1$–$C_6$alkyl ether derivative of a $C_4$–$C_8$diol, $C_6$–$C_8$glycol or a polyglycol, and an effective oxidizing amount of the quinone compound and molecular oxygen.

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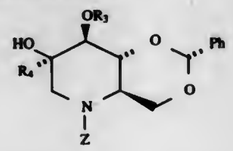
**5,502,193**

## 2-SUBSTITUTED TERTIARY CARBINOL DERIVATIVES OF 1,5-IMINOSUGARS

**Ish K. Khanna, Vernon Hills; Richard A. Mueller, Glencoe, and Richard M. Weier, Lake Bluff, all of Ill., assignors to G. D. Searle & Co., Skokie, Ill.**

**Continuation of Ser. No. 272,723, Jul. 8, 1994, which is a division of Ser. No. 89,534, Jul. 12, 1993, abandoned, which is a division of Ser. No. 861,858, Apr. 1, 1992, Pat. No. 5,258,518. This application Jan. 19, 1994, Ser. No. 375,024**
**Int. Cl.[6] C07D 491/056;491/06**
**U.S. Cl. 546—116** **5 Claims**

1. A compound of the formula



wherein Z is $COOCH_2Ph$,
$R_3$ is (1,1-dimethylethyl)dimethylsilyl, 2-(methoxy)ethoxymethyl, 2-(trimethylsilyl)ethoxymethyl, or methyl and
$R_4$ is methyl.

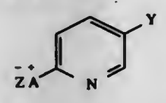
**5,502,194**

## PROCESS FOR THE PREPARATION OF 2-HALOGENO-PYRIDINE DERIVATIVES

**Eric Rivadeneira, Leverkusen, and Klaus Jelich, Wuppertal, both of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany**

**Continuation-in-part of Ser. No. 205,121, Feb. 28, 1994, which is a continuation-in-part of Ser. No. 15,715, Feb. 9, 1993, abandoned. This application Mar. 31, 1994, Ser. No. 220,620**
**Claims priority, application Germany, Feb. 19, 1992, 42 04 920.2; Apr. 15, 1992, 42 12 595.2; Apr. 6, 1993, 43 11 247.1**
**Int. Cl.[6] C07D 213/22;213/56;213/73;213/80**
**U.S. Cl. 546—257** **4 Claims**

1. A compound of the formula



in which
A represents the cationic radical of an organic nitrogen base,
Z represents an anion formed on an electrophilic compound and
Y represents halogen, alkyl or halogenoalkyl.

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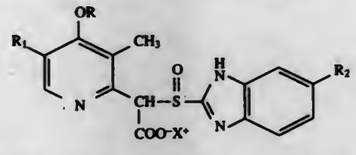
**5,502,195**

## SULFOXIDE-CARBOXYLATE INTERMEDIATES OF OMEPRAZOLE AND LANSOPRAZOLE

**Clarke Siemsen, 156 Upper Canada Drive, North York, Ontario, Canada, and Bob Macel, 208 Simonston Boulevard, Thornhillintario, Canada**

**Continuation-in-part of Ser. No. 276,378, Jul. 18, 1994, which is a division of Ser. No. 145,572, Nov. 4, 1993, Pat. No. 5,374,730. This application Nov. 22, 1994, Ser. No. 345,725**
**Int. Cl.[6] C07D 401/12**
**U.S. Cl. 546—271** **2 Claims**

1. A sulfoxide-carboxylate compound of the formula



wherein either (a) R and $R_1$ are each methyl and $R_2$ is methoxy; or (b) R is 1,1,1-trifluoroethyl and $R_1$ and $R_2$ are both hydrogen; and X represents an organic-ammonium ion selected from the group consisting of tetramethylammonium, tetraethylammonium and benzyltrimethylammonium.

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**5,502,196**

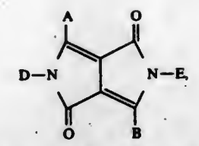
## PYRROLO[3,4-C]PYRROLES CONTAINING AMINE OXIDE GROUPS

**Zhimin Hao, Marly; Abul Iqbal, Arconciel, and Rudolf Kirchmayr, Marly, all of, Switzerland, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.**

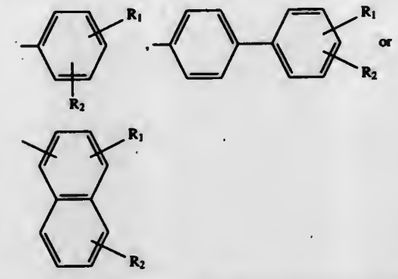
**Filed Mar. 14, 1995, Ser. No. 404,012**
**Claims priority, application Switzerland, Mar. 21, 1994, 843/94**
**Int. Cl.[6] C07D 211/10**
**U.S. Cl. 546—271** **4 Claims**

1. A pyrrolo[3,4-c]pyrrole of formula

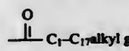




wherein A and B are each independently of the other a group of formula



or Q, wherein Q is a 5- or 6-membered heterocyclic aromatic amine oxide radical which is unsubstituted or substituted by one, two or three $C_1$–$C_{18}$alkyl, $C_1$–$C_{18}$alkoxy or



and which may contain one or two fused benzene rings, $R_1$ and $R_2$ are each independently of the other hydrogen, halogen, $C_1$–$C_{18}$alkyl, $C_1$–$C_{18}$alkoxy, $C_1$–$C_{18}$alkylmercapto, —CN, —$NO_2$ or trifluoromethyl, D and E are each independently of the other hydrogen, $C_1$–$C_{18}$alkyl, $C_2$–$C_4$alkenyl, $C_7$–$C_{10}$aralkyl, unsubstituted phenyl or phenyl which is substituted by chloro, bromo, $C_1$–$C_6$alkyl, $C_1$–$C_4$alkoxy, trifluoromethyl or nitro, with the proviso that at least one of the substituents A and B is an amine oxide radical Q.

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**5,502,197**

## DERIVATIZED PYRIDINOLINE REAGENT

**Yuri Daniloff, Mountain View, Calif.; Simon P. Robins, Aberdeen, Scotland; Brian J. Evans, Santa Clara, Calif.; David A. Pratt, Aberdeen, Scotland, and Robert Lungard, Portola Valley, Calif., assignors to Metra Biosystems, Inc., Palo Alto, Calif.**

**Division of Ser. No. 954,790, Sep. 30, 1992, Pat. No. 5,350,855. This application Apr. 28, 1994, Ser. No. 234,068**
**Int. Cl.[6] C07D 401/12;213/55;213/71**
**U.S. Cl. 546—281** **8 Claims**

1. A method of derivatizing the aliphatic hydroxyl group of pyridinoline comprising:
reacting a dried sample of pyridinoline with an acylating agent in anhydrous trifluoroacetic acid for a time sufficient to selectively derivatize the aliphatic hydroxyl group of the pyridinoline.

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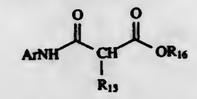
**5,502,198**

## (I) α-ARYL OR HETEROARYL-SUBSTITUTED AMIDE ESTER ACAT INHIBITORS

**Joseph A. Picard, and Drago R. Sliskovic, both of Ypsilanti, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.**

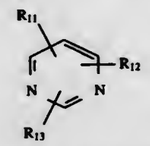
**Division of Ser. No. 156,225, Nov. 22, 1993, Pat. No. 5,420,339. This application Mar. 6, 1995, Ser. No. 398,704**
**Int. Cl.[6] C07D 213/55**
**U.S. Cl. 546—335** **11 Claims**

1. A compound having the formula



I

wherein Ar is
(a) phenyl substituted with from 2 to 3 substituents selected from phenyl,
alkyl having from 1 to 6 carbon atoms and which is straight or branched,
alkoxy having from 1 to 6 carbon atoms and which is straight or branched,
phenoxy,
hydroxy,
fluorine,
chlorine,
bromine,
nitro,
trifluoromethyl,
—COOH,
—COOalkyl wherein the alkyl moiety has from 1 to 4 carbon atoms and is straight or branched, or
$-(CH_2)_yNR_{17}R_{18}$ wherein y is 0 or 1 and each of $R_{17}$ and $R_{18}$ is independently selected from hydrogen or an alkyl group having from 1 to 4 carbon atoms;
(b) 1- or 2-naphthyl which is substituted with from 2 to 3 substituents selected from
phenyl,
alkyl having from 1 to 6 carbon atoms and which is straight or branched,
alkoxy having from 1 to 6 carbon atoms and which is straight or branched,
hydroxy,
fluorine,
chlorine,
bromine,
nitro,
trifluoromethyl,
—COOH,
—COOalkyl wherein alkyl has from 1 to 4 carbon atoms and which is straight or branched,
$-(CH_2)_yNR_{17}R_{18}$ wherein y, $R_{17}$, and $R_{18}$ have the meanings defined above; or;
(c)



wherein $R_{11}$, $R_{12}$, and $R_{13}$ are each independently
(a) hydrogen,
(b) alkyl of from 1 to 4 carbon atoms and which is straight or branched;
(c) alkoxy of from 1 to 3 carbon atoms and which is straight or branched;
(d) alkylthio of from 1 to 3 carbon atoms and which is straight or branched;
(e) fluorine;

(f) chlorine;
(g) bromine;
wherein $R_{15}$ is a 5- or 6-membered monocyclic or fused bicyclic heterocycle containing at least 1 to 4 nitrogen, oxygen, or sulfur atoms in at least 1 ring member;
wherein $R_{16}$ is
(a) a straight or branched hydrocarbon chain having from 10 to 20 carbon atoms and which is saturated or contains from 1 to 3 double bonds;
N-oxides thereof, or a pharmaceutically acceptable salt thereof.

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**5,502,199**

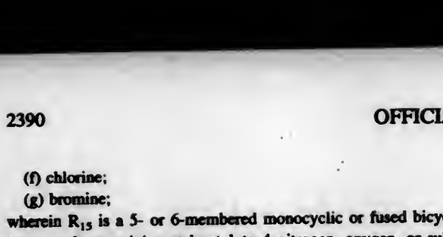
## PROCESS FOR PREPARING SODIUM 3R,5S-(+)-ERYTHRO-(E)-7-[4-(4-FLUOROPHENYL)-2,6-DIISOPROPYL-5-METHOXYMETHYL-PYRID-3-YL]-3,5-DIHYDROXY-HEPT-6-ENOATE

**Rolf Angerbauer, Wuppertal; Rolf Grosser, Leverkusen, both of, Germany; Werner Hinsken, Clayton, N.C., and Joachim Rehse, Wuppertal, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany**

**Filed Mar. 17, 1994, Ser. No. 214,894**
**Claims priority, application Germany, Mar. 24, 1993, 43 09 553.4**
**Int. Cl.[6] C07D *213/30***
**U.S. Cl. 546—342** **8 Claims**

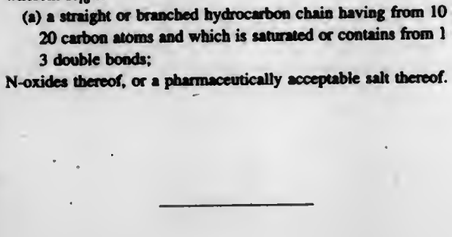
1. A process for preparing sodium 3R,5S-(+)-erythro-(E)-7-[4-(4-fluorophenyl)-2,6-diisopropyl-5-methoxymethyl-pyrid-3-yl]-3,5-dihydroxy-hept-6-enoate of the formula

(Ia)



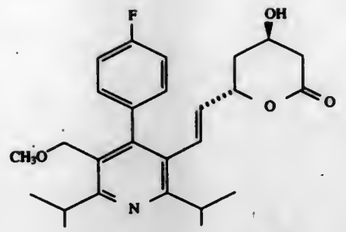
which is an enantiomerically pure form which comprises initially converting racemic esters of the formula (II)

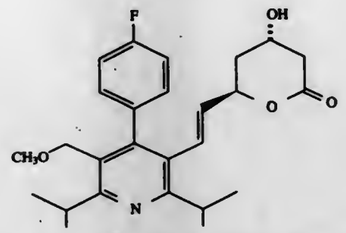
(II)



(rac)

in which
R represents $C_1$–$C_4$-alkyl, into the racemic mixture of lactones of the formulae





separating this racemate into the individual enantiomeric lactones by chromatography on a chiral phase and converting the enantiomeric lactones, in each case by hydrolysis, into the desired enantiomerically pure end product.

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**5,502,200**

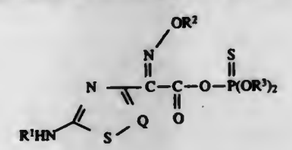
## REACTIVE THIOPHOSPHATE DERIVATIVES OF THIA(DIA)ZOLE ACETIC ACID AND PROCESS FOR PREPARING THE SAME

**Sung Kyum Kim; Jong C. Lim; The S. Kwon; Bong J. Park, all of Youseong, and Woo H. Kim, Seo, all of, Rep. of Korea, assignors to Lucky, Ltd., Rep. of Korea**

**Filed Apr. 6, 1994, Ser. No. 223,756**
**Claims priority, application Rep. of Korea, Apr. 10, 1993, 93/6008**
**Int. Cl.[6] C07F *9/02***
**U.S. Cl. 548—119** **4 Claims**

1. A reactive thiophosphate derivative of thia(dia)zole acetic acid represented by the following general formula (I):

(I)



in which
$R^1$ represents hydrogen or an amino-protecting group;
$R^2$ represents hydrogen $C_1$–$C_4$ alkyl, or $—C(R^a)(R^b)CO_2R^c$, wherein $R^a$ and $R^b$ are identical or different from each other and represent hydrogen or $C_1$–$C_4$ alkyl, or $R^a$ and $R^b$ together with a carbon atom to which they are bound form a $C_3$–$C_7$ cycloalkyl group, and $R^c$ is hydrogen or a carboxy-protecting group;



$R^3$ represents $C_1$–$C_4$ alkyl or phenyl, or $R^3$ together with the oxygen atom and the phosphorus atom to which it is bound forms a 5- or 6-membered heterocyclic ring; and
Q represents N or CH.

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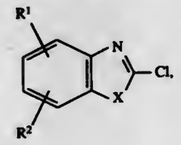
**5,502,201**

## PROCESS FOR PREPARING 2-CHLORO-BENZOTHIAZOLES OR 2-CHLORO-BENZOXAZOLES

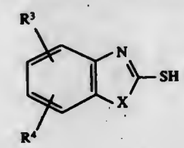
**Volker Käss, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany**

**Filed Apr. 20, 1994, Ser. No. 230,177**
**Claims priority, application Germany, Apr. 27, 1993, 43 13 748.2; Apr. 27, 1993, 43 13 750.4**
**Int. Cl.[6] C07D *277/68;263/54***
**U.S. Cl. 548—152** **9 Claims**

1. A process for preparing 2-chloro-benzothiazoles or 2-chloro-benzoxazoles of the formula



in which
$R^1$ and $R^2$, independently of one another, represent hydrogen, straight-chain or branched $C_1$-$C_4$-alkyl, straight-chain or branched $C_1$-$C_4$-alkoxy, nitro, fluorine, chlorine, bromine, $SO_2Cl$, cyano or $SO_2$-$C_1$-$C_4$-alkyl, and
X represents sulphur or oxygen,
which comprises chlorinating with thionyl chloride 2-mercapto-benzothiazoles or 2-mercapto-benzoxazoles of the formula



in which
$R^3$ and $R^4$, independently of one another, have the same meanings given for $R^1$ and $R^2$ or independently of one another denote $SO_3H$
wherein said chlorination is carried out at a temperature range of 30° to 140° C. and in the presence of 50–1000% by weight based on the 2-mercapto compound of a solvent or diluent and comprises
0.8–3- mol of $SOCl_2$ per mole of the 2-mercapto compound; and
0.001–5 mol %, based on the 2-mercapto compound, of a phosphorous acid compound of the formula

$YP(OR^5)_2$,

in which
$R^5$ represents hydrogen, straight-chain or branched $C_1$-$C_{12}$-alkyl which is unsubstituted or mono- or disubstituted by halogen and/or $C_1$-$C_4$-alkoxy, phenyl which is optionally mono- or disubstituted by halogen and/or $C_1$-$C_4$-alkyl and/or $C_1$-$C_4$-alkoxy, or $C_7$-$C_{10}$-aralkyl wherein its aromatic part is optionally mono- or disubstituted by identical or different substituents wherein the substituents are halogen and/or $C_1$-$C_4$-alkyl and/or $C_1$-$C_4$-alkoxy and
Y represents hydrogen or $OR^5$.

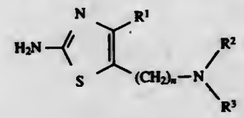
**5,502,202**

## AMINOALKYLTHIAZOLE DERIVATIVE

**Atsuro Nakazato; Yoshinori Sekiguchi, both of Saitama; Yutaka Kawashima, Gunma, and Katsuo Hatayama, Saitama, all of, Japan, assignors to Taisho Pharmaceutical Co., Ltd., Japan**

**PCT No. PCT/JP92/00702, § 371 Date Nov. 29, 1993, § 102(e) Date Nov. 29, 1993, PCT Pub. No. WO92/21667, PCT Pub. Date Dec. 10, 1992**
**PCT Filed May 29, 1992, Ser. No. 142,471**
**Claims priority, application Japan, May 30, 1991, 3-228144**
**Int. Cl.[6] C07D *277/40***
**U.S. Cl. 548—198** **2 Claims**

1. An aminoalkylthiazole derivative represented by formula:



(wherein $R^1$ is 4-bromophenyl; $R^2$ and $R^3$ are either the same or different and each represents an alkyl group having 4 to 10 carbon atoms; and n is 2 or 3) and a salt thereof.

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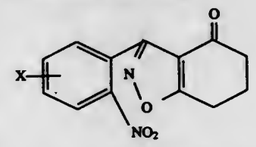
**5,502,203**

## CERTAIN 6,7-DIHYDRO-3(2-NITROPHENYL)-1,2-BENZISOXAZOL-4(5H)-ONES AS INTERMEDIATES

**Gregory M. Shutske, Flemington; Kevin J. Kapples, Little York, both of N.J., and John D. Toner, Perkasie, Pa., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.**

**Division of Ser. No. 322,634, Oct. 13, 1994, abandoned, which is a division of Ser. No. 24,037, Mar. 1, 1993, Pat. No. 5,382,594, which is a division of Ser. No. 654,691, Feb. 13, 1991, Pat. No. 5,210,087. This application May 31, 1995, Ser. No. 451,327**
**Int. Cl.[6] C07D *261/20;219/10***
**U.S. Cl. 548—241** **2 Claims**

1. A compound of the formula



wherein X is hydrogen, loweralkyl, halogen, loweralkoxy, hydroxy, or trifluoromethyl.

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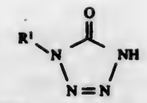
**5,502,204**

## PROCESS FOR THE PREPARATION OF 1-SUBSTITUTED-5(4H)-TETRAZOLINONES

**Akihiko Yanagi, Tochigi; Yukiyoshi Watanabe, Saitama, and Shin-ichi Narabu, Ibaraki, all of, Japan, assignors to Nihon Bayer Agrochem K.K., Tokyo, Japan**

**Filed Sep. 7, 1994, Ser. No. 301,589**
**Claims priority, application Japan, Sep. 14, 1993, 5-250907**
**Int. Cl.[6] C07D *257/02;403/04;413/04;417/04***
**U.S. Cl. 548—251** **4 Claims**

1. A process for the preparation of a 1-substituted-5(4H)-tetrazolinone of the formula

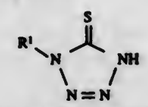


(I)

wherein

$R^1$ represents 7-fluoro-4-ethoxy-2H, 1,4-benzoxazine 3(4H)-one- 5(4H)-yl,

which comprises reacting a 1-substituted-5(4H)-tetrazolinethione of the formula



(II)

with an ethylene oxide of the formula



(III)

wherein

$R^2$ represents methyl, and said 1-substituted-5(4H) -tetrazoline is 1-[7-fluoro-4-ethoxy-2H-1,4-benzoxazine-3(4H)-one-6-yl]-5-(4H)-one-6-yl] -5(4H) -tetrazolinone

in the presence of a base and in the presence of water, an alcohol or a mixture thereof at a temperature of −30° C. to +50° C., for a time of 1 to 12 hours and wherein the compound of formula (III) is present in an amount of from 1.0 to 1.3 mols per tool of the compound of formula (II), and the base is present in an amount of 1.0 to 1.2 mols per mol of the compound of formula (II), said base being a member of the group consisting of the hydroxides, carbonates and bicarbonates of alkali metals or alkaline earth metals.

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5,502,205

**DYES FOR USE IN DIVERSE APPLICATIONS**

Eric Kiekens, Kessel-Lo, and Paul Callant, Edegem, both of, Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

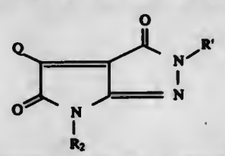
Division of Ser. No. 345,739, Nov. 21, 1994. This application May 31, 1995, Ser. No. 454,692

Claims priority, application European Pat. Off., Dec. 2, 1993, 93203382; Feb. 28, 1994, 94200500

Int. Cl.[6] C07D 487/04

U.S. Cl. 548—360.5 4 Claims

1. A dye corresponding to the following general formula (I):



(I)

wherein Q represents a substituted or unsubstituted aromatic or heterocyclic aromatic ring and wherein

$R^1$ and $R^2$ each independently represent hydrogen, substituted or unsubstituted alkyl; substituted or unsubstituted aryl; substituted or unsubstituted heterocyclyl; substituted or unsubstituted vinyl or one of the following substituents being $C(=N—R^5)$ —$R^4$; $CH=(N+)(—R^5)_2$; $CR^3=(N+)(—R^4)_2$; $C=N^+—O^-$; CO—H; CO—NH—$R^5$; CO—NH—$SO_2$—$R^5$ and the corresponding salts: CO—O—$R^5$; CO—$R^5$; CO—S—$R^5$; CS—H; CS—NH—$R^5$; CS—O—$R^5$; CS—$R^5$; CS—S—$R^5$; F, Cl, Br, I, CN; N=C=N—$R^5$; N=C=O; N=C=S; N=N(O)—$R^5$; N=N—$R^5$; NH—CO—NH—$R^5$; NH—CO—$R^5$; NH—CS—NH—$R^5$; NH—CS—$R^5$; NH—$R^5$; NH—$SO_2$—$R^5$; $NO_2$; $NR^5$—CO—$R^4$; $NR^1CS—R^2$; $NR_2^5$; O—CN; O—CO—$R^5$; O—$R^5$; O—$SO_2$—$R^5$; $P(OR^5)_2$; PO—$(OR^5)_2$; S—CN; S—CO—$R^5$; S—CS—$R^5$; S—$R^5$; S—$R^5$; SO—$R^5$; $SO_2$—NHR[5] and the salts derived therefrom; $SO_2$—$R^5$; $SO_3H$ and the salts derived therefrom and wherein each of $R^3$, $R^4$ and $R^5$ represent substituted or unsubstituted alkyl; substituted or unsubstituted aryl; substituted or unsubstituted heterocyclyl; substituted or unsubstituted vinyl.

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5,502,206

**LIQUID-CRYSTALLINE ORGANOSILOXANES CONTAINING CHIRAL TARTARIMIDES**

Ingo P. Zaha, München; Franz-Heinrich Kreuzer, Marthartied, and Hans-Peter Weitzel, Raischach, all of, Germany, assignors to Consortium für elektrochemische Industrie GmbH, Munich, Germany

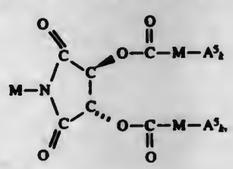
Filed May 9, 1994, Ser. No. 239,780

Claims priority, application Germany, May 27, 1993, 43 17 704.2

Int. Cl.[6] C07D 207/416; C07F 7/21

U.S. Cl. 548—406 7 Claims

1. A liquid-crystalline organosiloxane containing, per molecule, at least one Si—C-boaded, chiral tartarimide radical of the formula



(1)

in which

M is a radical of the formula

$$R^1—(X^1_a—A^1_b—A^2_c)_d—Z_e—(X^2_f—A^3_g—A^4_h—)_i \quad (2),$$

where, in the above formulas 1 and 2,

$R^1$ is a radical of the formula $C_nH_m$, in which

n is an integer having a value of from 0 to 20,

m has the value 2n or, if n is at least 2, can also have the value (2n–2), and one or more methylene units in $R^1$ can be replaced by oxygen atoms, which can be bonded to carbon and/or silicon atoms,

$X^1$ and $X^2$ are identical or different divalent radicals from the group consisting of—O—, —COO—, —CONH—, —CO—, —S—, —C≡C—, —CH=CH—, —CH=N—, —$CH_2$—, —N=N— and —N=N(O)—,

$A^1$, $A^2$, $A^3$ and $A^4$ are identical or different divalent radicals, selected from the group, consisting of 1,4-phenylene, 1,4-cyclohexylene, substituted arylenes having 6 to 10 carbon atoms, and substituted cycloalkylene, having 6 to 10 carbon atoms, where the substituents are selected from the group consisting of halogen atoms, $C_1$- to $C_6$-alkoxy radicals, nitro and cyano groups, $C_1$- to $C_6$-alkyl radicals, carboxy($C_1$- to $C_4$-alkyl) radicals and tri($C_1$- to $C_4$-alkyl)siloxy radicals,

Z are identical or different divalent to tetravalent benzene, cyclohexane or cyclopentane radicals,

$A^5$ are identical or different, saturated or olefinically unsaturated alkyl, alkoxy or cycloalkyl radicals, each having 1 to 16 carbon atoms, cholestane radicals, cholesteryl radicals, halogen atoms, hydrogen atoms, hydroxyl, nitrile, acryloxy, (meth)-acryloxy, (meth)acryloxyethyleneoxy, (meth)acryloxydi-(ethyleneoxy), (meth)acryloxytri(ethyleneoxy), R- or S-tetrahydrofurancarboxylate and trialkylsiloxy groups whose alkyl radicals each have 1 to 8 carbon atoms,

a, b, c, d, f, g, h, i and k are each identical or different integers having a value of from 0 to 3, where the sum a+b+c+d+e+f+g+h+i+k is at least 2 and the sum of d and i is at most 4, and

e is a number having a value of 0 to 1.



5,502,207

**ALKENYL-SUBSTITUTED BISNADIMIDES, PROCESS FOR MANUFACTURING THE SAME, PROCESS FOR CURING THE SAME, AND ADHESIVES AND COATING MATERIALS UTILIZING THE SAME**

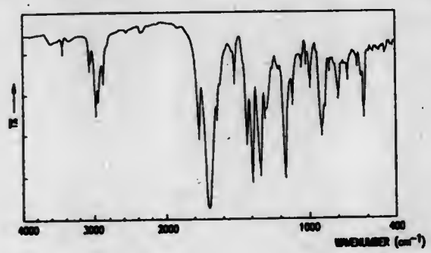
Norio Futaesaku; Hideo Fukuda, both of Ichihara; Yoshiharu Itou, Sodegaura; Hiromitsu Baba, and Isao Maruyama, both of Ichihara, all of, Japan, assignors to Maruzen Petrochemical Co., Ltd., Japan

Filed Aug. 10, 1994, Ser. No. 288,592

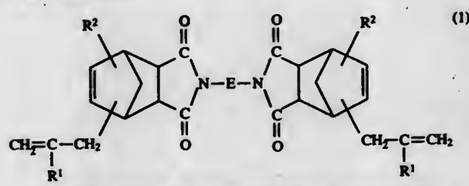
Claims priority, application Japan, Aug. 13, 1993, 5-222258; Apr. 18, 1994, 6-104821

Int. Cl.[6] C07D 209/76; C08F 222/40

U.S. Cl. 548—435 5 Claims

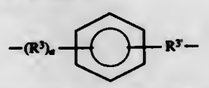


1. An alkenyl-substituted bisnadimide represented by the following formula (1):



(1)

wherein $R^1$ and $R^2$ individually represent a hydrogen atom or a methyl group, and E is an alkylene.phenylene group or an alkylene.phenylene.alkylene group represented by the following formula (2):



[2]

(wherein a is an integer of 0 or 1, and $R^3$ and $R^3$'individually represent a $C_1$–$C_4$ alkylene group or a $C_5$–$C_8$ cycloalkylene group).

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5,502,208

**FINELY PARTICULATE CYANO-SUBSTITUTED DIKETOPYRROLOPYRROLE PIGMENTS AND THE PREPARATION THEREOF**

Olof Wallquist, Marly, Switzerland, assignor to Ciba-Geigy Corporation, Tarrytown, N.Y.

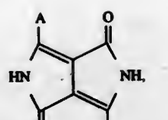
Filed Jul. 21, 1994, Ser. No. 278,595

Claims priority, application Switzerland, Jul. 29, 1993, 2298/93; May 18, 1994, 1543/94

Int. Cl.[6] C07D 403/14;487/04; C09B 57/00; C08K 5/34

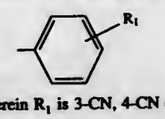
U.S. Cl. 548—453 12 Claims

1. A finely particulate 1,4-diketopyrrolo[3,4-c]pyrrole of formula



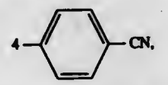
(I)

wherein A is a radical of formula



(II)

wherein $R_1$ is 3-CN, 4-CN or



in which at least 84% of the pigment particles have a Stokes equivalent diameter of ≦0.40 μm.

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5,502,209

**BENZOPYRANCARBOXAMIDE DERIVATIVES, SALTS THEREOF, PROCESS FOR THE PREPARATION OF SAME AND USE THEREOF**

Yutaka Baba; Toshinao Usui; Takuji Kakigami; Yoshiro Ozeki; Katsura Tsukamoto; Nobuyuki Aoneda, and Nobuyuki Itoh, all of Nagoya, Japan, assignors to Sanwa Kagaku Kenkyusho Co., Ltd., Nagoya, Japan

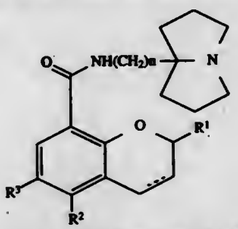
Filed Jun. 13, 1995, Ser. No. 489,770

Claims priority, application Japan, Jul. 5, 1994, 6-153456; Jan. 25, 1995, 7-009596

Int. Cl.[6] C07D 471/06; A61K 31/40

U.S. Cl. 548—454 6 Claims

1. A benzopyrancarboxamide derivative of the formula



(I)

wherein $R^1$ is hydrogen atom or a lower alkyl group; $R^2$ is hydrogen atom, a lower alkyl group, halogen atom, an amino radical or an acylamino group; $R^3$ is hydrogen atom, a lower alkyl group, a lower alkoxy group or halogen atom; dotted line is a possible double bond; and n is an integer of 1–5, or a pharmacologically acceptable salt of the compound.

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5,502,210

**1H-ISOIN DOLE-1,3-DIONE COMPOUNDS**

Hans Hilpert, Reinach, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

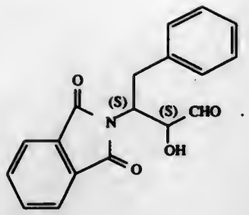
Filed Jul. 11, 1994, Ser. No. 273,088

Claims priority, application Switzerland, Jul. 15, 1993, 2132/93; Aug. 4, 1993, 2330/93

Int. Cl.[6] C07D 401/06

U.S. Cl. 548—465 8 Claims

1. (2S,3S)-3-(1,3-Dioxo-2,3-dihydro-1H-isoindol-2-yl)-2-hydroxy-4-phenylbutyraldehyde of the formula



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5,502,211

## SUBSTITUTED DIPYRROMETHANES AND THEIR PREPARATION

Tilak Wijesekera, Glen Mills, Pa., assignor to Sun Company, Inc. (R&M), Philadelphia, Pa.

Filed Oct. 26, 1993, Ser. No. 143,261
Int. Cl.[6] C07D 207/32
U.S. Cl. 548—518 5 Claims

1. Bis (pyrrol-2-yl) perhalocarbylmethane compounds.

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5,502,212

## PROCESS FOR THE MANUFACTURE OF 5-CYANO-4-LOWER ALKYL-OXAZOLES

Werner Bourath, Freiburg; Reinhard Karge, Staufen, both of, Germany, and Horst Pauling, Bottmingen, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Feb. 16, 1994, Ser. No. 197,426
Claims priority, application Switzerland, Feb. 25, 1993, 578/93
Int. Cl.[6] C07D 263/30
U.S. Cl. 548—236 6 Claims

1. A process for the manufacture of a 5-cyano-4-lower alkyl-oxazole, which comprises reacting, in a polar, aprotic organic solvent selected from the group consisting of methyl tertiary butyl ether, ethyl tertiary butyl ether and tertiary amyl methyl ether, a 5-carbamoyl-4-lower alkyl-oxazole with an N,N-disubstituted formamide and cyanuric chloride to dehydrate said 5 -carbamoyl-4-lower alkyl-oxazole and thereby produce said 5-cyano-4-lower alkyl-oxazole, wherein the ratio of the total weight of the 5-cyano-4-lower alkyl-oxazole and the cyanuric chloride, in grams, to the volume of the solvent, in milliliters, is from about 1:2 to about 1:25.

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5,502,213

## PURIFICATION OF CRUDE PYRROLES

Peter Pfab, Limburgerhof; Peter Wahl, Ladenburg, and Dieter Franz, Ludwigshafen, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Jan. 21, 1994, Ser. No. 184,689
Claims priority, application Germany, Jan. 23, 1993, 43 01 776.2
Int. Cl.[6] C07D 207/32
U.S. Cl. 548—564 11 Claims

1. A process for purifying crude pyrroles containing pyrrolidine impurities as obtained in the preparation of pyrroles of the general formula I



where R is hydrogen or a $C_1$–$C_6$-alkyl radical, which comprises treating the crude pyrrole with an acid or an activated carboxylic acid derivative and removing the pyrrole from the resulting mixture by distillation at reduced pressure and a bottom temperature of up to 160° C.

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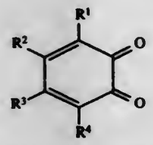
5,502,214

## 1,2-BENZOQUINONES AND METHODS FOR MAKING AND USING SAME

Beverly A. Teicher, Needham, Mass., and Zhen-Dong Huang, Shanghai, China, assignors to Dana Farber Cancer Institute, Boston, Mass.

Filed Jul. 19, 1993, Ser. No. 93,763
Int. Cl.[6] C07D 205/00;229/00; C07C 50/02
U.S. Cl. 548—950 34 Claims

1. A method for preparation of a 1,2-benzoquinone comprising: contacting a catechol, an oxidant, a nucleophilic reagent, and a compound comprising a metal selected from the group consisting of Fe, Co, Ni, Cu, Zn, Ga, Ru, Rh and Pd in the presence of a basic catalyst for a time and temperature sufficient to form a 1,2-benzoquinone having the following formula:



wherein $R^1$ and $R^4$ are each independently hydrogen, halogen, cyano, substituted or unsubstituted alkyl, substituted or unsubstituted alkenyl, substituted or unsubstituted alkoxy, substituted or unsubstituted aminoalkyl, or substituted or unsubstituted thioalkyl;

$R^2$ and $R^3$ are each independently hydrogen, halogen, cyano, substituted or unsubstituted alkyl, substituted or unsubstituted alkenyl, substituted or unsubstituted aminoalkyl, or substituted or unsubstituted thioalkyl, substituted or unsubstituted alkylsulfoxide, substituted or unsubstituted sulfonoalkyl, substituted or unsubstituted alkanoyl, substituted or unsubstituted alkylcarboxyamino, or a substituted or unsubstituted heteroaromatic group having 1 to 3 rings, 3 to 8 ring members in each ring and 1 to 3 N or S atoms, with at least one of $R^2$ and $R^3$ being other than hydrogen.

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5,502,215

## METHOD FOR PURIFICATION OF LACTIDE

Yoshiaki Yamaguchi, Tokyo, and Tomohiro Arimura, Kanagawa, both of, Japan, assignors to Musashino Chemical Laboratory, Ltd., Tokyo, Japan

Filed Dec. 2, 1994, Ser. No. 348,305
Claims priority, application Japan, Dec. 8, 1993, 5-308346
Int. Cl.[6] C07D 319/12
U.S. Cl. 549—274 6 Claims

1. A method for the purification of lactide characterized by removing meso-lactide from a mixture containing at least one lactide selected from the group consisting of L-lactide and D-lactide together with meso-lactide by causing said mixture to contact with water and separating the non-meso-lactide crystals.



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5,502,216

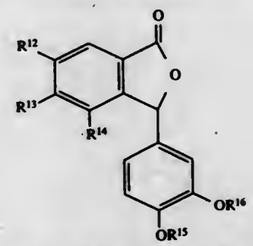
## LIGNAN ANALOGUES, METHODS OF PREPARATION THEREOF AND ANTI-HYPERLIPEMIC AGENTS

Sachio Mori, Ashiya; Shozo Takechi, Higashiosaka; Shiro Kida, Osaka; Takuji Mizui, Takarazuka, and Teruhisa Ichihashi, Kobe, all of, Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Division of Ser. No. 301,996, Sep. 7, 1994, Pat. No. 5,449,814, which is a division of Ser. No. 78,205, Jun. 17, 1993, Pat. No. 5,420,333. This application May 22, 1995, Ser. No. 445,506
Claims priority, application Japan, Jan. 17, 1991, 3-298119
Int. Cl.[6] C07D 307/83
U.S. Cl. 549—310 2 Claims

1. A compound of the formula (VI'):

(VI)



in which each of $R^{12}$ and $R^{13}$ is lower alkoxy or $R^{12}$ and $R^{13}$ are combined together to form an alkylenedioxy;

$R^{14}$ is lower alkoxy or hydrogen; and

each of $R^{15}$ and $R^{16}$ is lower alkyl.

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5,502,217

## PROCESS FOR PREPARING LACTONES

Takamasa Fuchikami; Noriko Wakasa; De-Hua He, all of Sagamihara; Takanori Miyake, Yokkaichi; Takashi Okada, Yokkaichi; Atsushi Fujimura, Yokkaichi; Hiroyuki Sasakibara, Yokkaichi; Yoshiaki Kanou, Yokkaichi, and Toshihiro Saito, Machida, all of, Japan, assignors to Tosoh Corporation, Yamaguchi, and Sagami Chemical Research Center, Tokyo, both of, Japan

Continuation of Ser. No. 975,326, Nov. 16, 1992, abandoned. This application Oct. 25, 1994, Ser. No. 328,607
Claims priority, application Japan, Nov. 18, 1991, 3-328381; Jun. 23, 1992, 4-187465
Int. Cl.[6] C07D 307/33
U.S. Cl. 549—325 27 Claims

1. A process for the preparation of a γ-lactone which comprises catalytically hydrogenating at least one compound selected from the group consisting of dicarboxylic acids having a maleic acid core structure or a succinic acid core structure and having 4 to 10 carbon atoms, or functional derivatives thereof, in the presence of a catalyst comprising at least one metal selected from the group consisting of ruthenium, rhodium, palladium, iridium and platinum or a combination of said metals with at least one element selected from the group consisting of the elements of Group IVa, VIb and VIIb of the periodic table, and there is also added to the reaction mixture, in addition to and apart from the catalyst, at least one compound selected from the group consisting of alkali metal salts and alkali metal hydroxides.

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5,502,218

## PROCESS FOR THE PRODUCTION OF KETENE DIMERS

John F. Nicholas, Portishead, England, and Piotr Zettlmger, Huddinge, Sweden, assignors to Eka Nobel AB, Sweden

PCT No. PCT/SE94/00118, § 371 Date Sep. 15, 1994, § 102(e) Date Sep. 15, 1994, PCT Pub. No. WO94/19386, PCT Pub. Date Sep. 1, 1994
PCT Filed Feb. 14, 1994, Ser. No. 382,801
Claims priority, application Sweden, Feb. 22, 1993, 9300584
Int. Cl.[6] C07D 305/12
U.S. Cl. 549—329 18 Claims

1. A process for the production of ketene dimers which comprises reacting fatty acid halides with tertiary amines, wherein the process is operated batchwise and the reaction is started in the presence of an initial reaction mixture containing ketene dimer and pre-prepared crystals of tertiary amine hydrogen halide and said process is carried out in the substantial absence of additional solvents.

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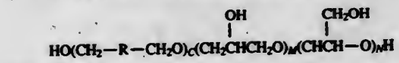
5,502,219

## LOW CALORIE SUBSTITUTE FOR AN EDIBLE OIL

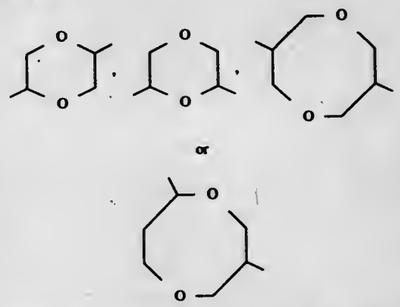
Eugene G. Harris, West Chester, Ohio, assignor to Henkel Corporation, Plymouth Meeting, Pa.

Division of Ser. No. 79,117, Jun. 17, 1993, Pat. No. 5,399,371. This application Dec. 8, 1994, Ser. No. 352,339
Int. Cl.[6] C07D 319/12;371/04
U.S. Cl. 549—347 3 Claims

1. A polyglycerol composition having the structure of formula I



wherein R is



or



C comprises up to about 3 percent of all N+M units, and N+M is a number from about 3 to about 15, said polyglycerol being essentially free of low molecular weight glycerides selected from the group consisting of glycerine, diglycerine and triglycerine.

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5,502,220

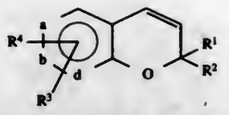
## PROCESS FOR THE PREPARATION OF INTERMEDIATES USEFUL IN THE PREPARATION OF PYRANYL CYANOGUANIDINE DERIVATIVES

Jeffrey T. North, Trenton, N.J., assignor to Bristol-Myers Squibb Company, Princeton, N.J.

Continuation of Ser. No. 80,046, Jun. 18, 1993, abandoned. This application Dec. 23, 1994, Ser. No. 362,711
Int. Cl.[6] C07D 311/60;491/052
U.S. Cl. 549—396 5 Claims

1. A process for the preparation of compounds of the formula

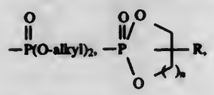
I



where a, b, and d are all carbon atoms or one of a, b and c is a nitrogen atom or -NO- and the others are carbon atoms;

$R^1$ and $R^2$ are independently hydrogen, alkyl or arylalkyl, or $R^1$ and $R^2$ taken together with the carbon atom to which they are attached form a 5- to 7-membered carbocyclic ring;

$R^3$ is hydrogen, alkyl, haloalkyl, alkenyl, alkynyl, cycloalkyl, arylalkyl, cycloalkylalkyl, -CN, $-NO_2$, -COR, -COOR, -CONHR, -CONRR', $-CF_3$, S-alkyl, -SOalkyl, $-SO_2$alkyl,

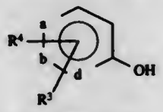


halogen, amino, substituted amino, -OH, -O-alkyl, $-OCF_3$, $-OCH_2CF_3$, -OCOalkyl, -OCONRalkyl, -NRCOalkyl, -NRCOOalkyl or -NRCONRR' wherein R and R' in the above groups is independently hydrogen, alkyl, haloalkyl, aryl, arylalkyl, cycloalkyl, or (cycloalkyl)alkyl;

$R^4$ is hydrogen, alkyl, -OH, -O-alkyl, amino, substituted amino, -NHCOR, -CN or $-NO_2$; and

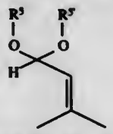
n is an integer of 1 to 3; consisting essentially of the step of condensation of a phenol of formula

II



with an acetal of formula

III



where $R^5$ and $R^{5'}$ are the same alkyl group or can together form a dioxolane ring in the presence of a catalytic amount of a tertiary amine selected from quinoline, N-methylmorpholine, 4-dimethylaminopyridine, 1,4-diazabicyclo[2.2.2]octane, 1,8-diazabicyclo[ 5.4.0]undec-7-ene, tributylamine, picoline, lutidine or pyridine in an inert organic solvent selected from toluene or xylene to form compounds of formula I.

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**5,502,221**

**PROCESS FOR PRODUCING CYCLOHEXYLBUTYRIC ACID DERIVATIVE**

**Noboru Sayo; Noboru Sano, and Hidenori Kumobayashi, all of Kanagawa, Japan, assignors to Takasago International Corporation, Tokyo, Japan**

**Division of Ser. No. 175,505, Dec. 30, 1993, Pat. No. 5,442,105, which is a continuation-in-part of Ser. No. 900,444, Jun. 18, 1992, abandoned. This application May 5, 1995, Ser. No. 437,874**

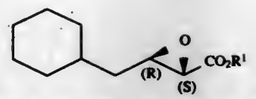
**Claims priority, application Japan, Jun. 21, 1991, 3-150224**

**Int. Cl.[6] C07D 303/38**

**U.S. Cl. 549—549** **1 Claim**

1. A 4-cyclohexyl-(2S,3R)-epoxybutyric acid ester represented by formula (3):

(3)



wherein $R^1$ represents a lower alkyl group.

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**5,502,222**

**PROCESS FOR PREPARING DELTA 9,11 AND 21-CHLORO CORTICOSTEROIDS**

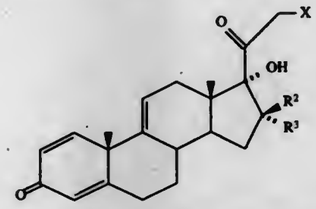
**Xiaoyong Fu; Tiruvettiparam K. Thiruvengadam, both of Edison; Chou-Hong Tsao, Elizabeth; Junning Lee, Gillette, and Cesar Colon, Rahway, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.**

**Filed Jun. 1, 1994, Ser. No. 252,302**

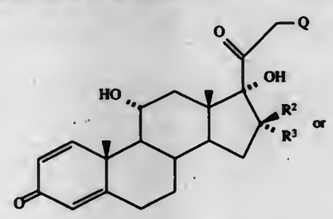
**Int. Cl.[6] C07J 5/00;7/00;75/00**

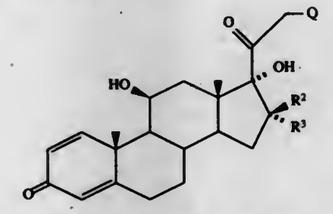
**U.S. Cl. 552—595** **5 Claims**

1. A regioselective process for preparing $\Delta^{9,11}$ steroids of the formula



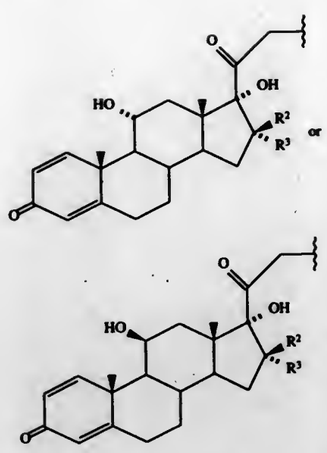
wherein one of $R^2$ or $R^3$ is $CH_3$ and the other is H; and X is H, halogeno or —OR, wherein R is H or —C(O)$R^1$, and $R^1$ is $CF_3$, $C_1$–$C_6$ alkyl or $C_1$–$C_6$ alkoxy, comprising treating an 11-α- or 11-β-hydroxy steroid of the formula





respectively, wherein Q is $-OSO_2C_6H_4CH_3$, $-OSO_2CH_3$, —O—C(O)O—B or X, wherein B is a group of the formula





and wherein X, $R^2$ and $R^3$ are as defined above, with $PCl_5$, $PCl_3$, $POCl_3$ or either $SO_2Cl_2$ and imidazole, or triphenylphosphine and $CCl_4$.

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**5,502,223**

**PROCESS FOR PREPARATION OF $\Delta^{4,9(11),16}$ PREGNATRIENE-3,20-DIONES**

**Francis Brion, Gagny; Jean Bucsadia, Le Perreux Sur Marne; Christian Diolez, Palaiseau, and Michel Vivat, Lagny Sur Marne, all of, France, assignors to Roussel Uclaf, France**

**Division of Ser. No. 145,890, Oct. 29, 1993, Pat. No. 5,401,864, which is a division of Ser. No. 971,189, Nov. 4, 1992, Pat. No. 5,294,704, which is a division of Ser. No. 885,150, May 18, 1992, Pat. No. 5,187,273. This application Feb. 21, 1995, Ser. No. 343,050**

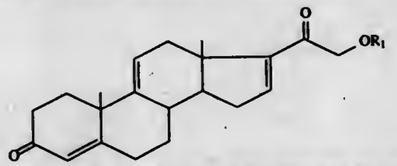
**Claims priority, application France, May 23, 1991, 91 06202**

**Int. Cl.[6] C07J 21/00;33/00**

**U.S. Cl. 552—602** **2 Claims**

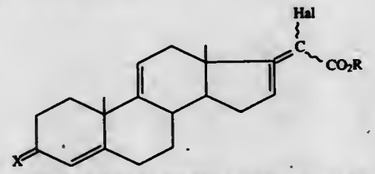
1. A process for the preparation of a compound of the formula

A

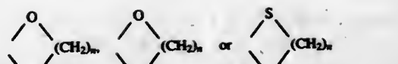


wherein $R_1$ is acyl of 1 to 8 carbon atoms comprising reacting a compound of the formula

I



wherein Hal is chlorine or bromine, R is selected from the group consisting of alkyl of 1 to 6 carbon atoms, aralkyl of 7 to 15 carbon atoms and a silylated group, K is a protective group selected from the group consisting of

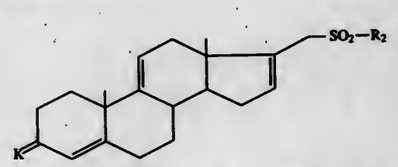


n is 2 or 3 and the wavy lines mean the groups may have either isomer form or are mixtures thereof in an alkaline medium with an alkaline sulfinate of the formula

$R_2$—$SO_2$—Q

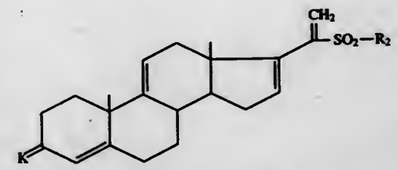
wherein $R_2$ is selected from the group consisting of methyl, phenyl, tolyl or xylyl and Q is an alkali metal in the presence of a base to obtain after saponification and decarboxylation a compound of the formula

IX



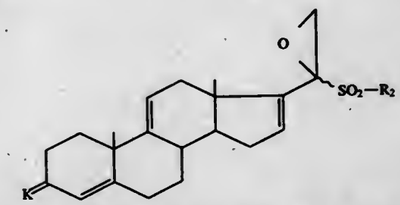
wherein K and $R_2$ are defined as above, subjecting the latter to the action of formaldehyde in the presence of a base to obtain a compound of the formula

X



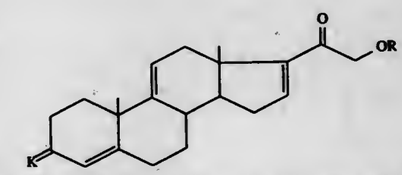
subjecting the latter to the action of an epoxidation agent in an alkaline medium to obtain a compound of the formula

XI



opening the epoxide function of the compound of formula XI in a basic medium and in the presence of $R_1O^{-7}$ ions, in which $R_1$ is defined as above to obtain a compound of the formula

XII



the protected 3-oxo function of which is deprotected to obtain the compound of formula A.

**5,502,224**

**BIOTENSIDE ESTERS AND PHOSPHATIDES WITH VITAMIN-D AND VITAMIN-E COMPOUNDS**

**Carl Eugster, Richen; Conrad H. Eugster, Wallisellen; Walter Haldemann, Binningen, all of, Switzerland, and Giorgio Rivara, Torino, Italy, assignors to Marigen, S.A., Richen, Switzerland**

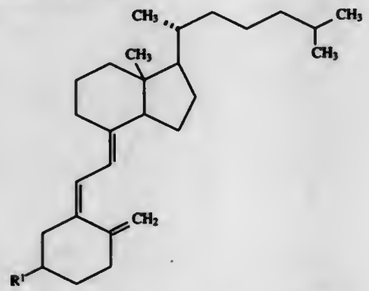
**Continuation of Ser. No. 42,251, Apr. 2, 1993, abandoned. This application Sep. 30, 1994, Ser. No. 312,980**

**Claims priority, application Switzerland, Jun. 4, 1991, 01662/91**

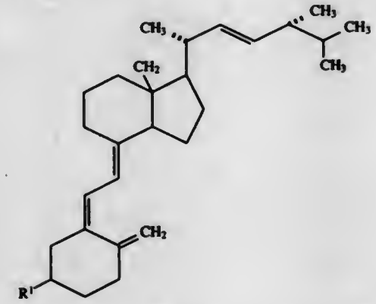
**Int. Cl.[6] C07C *401/00***

**U.S. Cl. 552—653** **4 Claims**

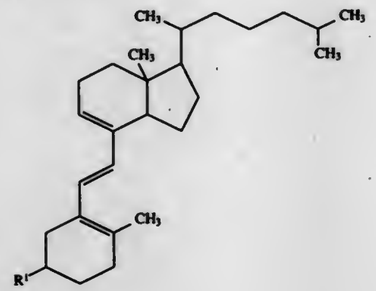
1. A purified ester of a vitamin-D compound according to one of formulae (I) to (IV):



(I)

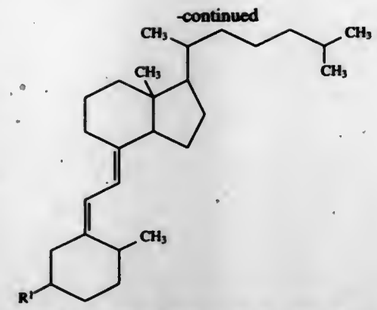


(II)



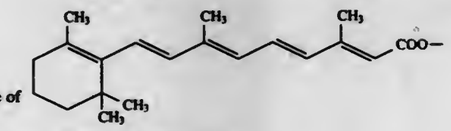
(III)

-continued



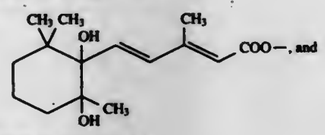
(IV)

wherein $R^1$ is selected from the group consisting of a group of formula (VII):



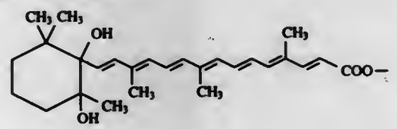
(VII)

a group of formula (VIII):



(VIII)

a group of formula (IX):



(IX)

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**5,502,225**

**PERFLUOROALKYL TERMINATED URETHANE LUBRICANTS**

**Eduard K. Kleiner, Pound Ridge, and Athanasios Karydas, New York, both of N.Y., assignors to Dynax Corporation, Elmsford, N.Y.**

**Filed Nov. 9, 1992, Ser. No. 972,825**

**Int. Cl.[6] C07C *231/00;261/00***

**U.S. Cl. 554—42** **20 Claims**

1. A compound of the formula:

$$[R_f-CH_2CH_2-X-CONH]_m A+NHCO-X-R_1]_n$$

in which

$R_f$ is a straight or branched perfluoroalkyl group of from 6 to 20 carbon atoms;

X is —O— or —S—;

$R_1$ is alkyl of from 8 to 36 carbon atoms;

m has a value of 1, 2, or 3;

n has a value of 0, 1, or 2;

the sum of m and n being 1, 2, or 3; and

A is $R_1$ if the sum of m and n is 1, and otherwise an aliphatic, cycloaliphatic, or aromatic group of up to 36 carbon atoms and having a valence equal to the sum of m and n.



**5,502,226**

**PROCESS OF PREPARING ω-HYDROXY ACIDS**

**Suk H. Cho, Bogota, and Victor DeFlorio, Belleville, both of N.J., assignors to Elizabeth Arden Co., Division of Conopco, Inc., New York, N.Y.**

**Filed Nov. 14, 1994, Ser. No. 338,300**

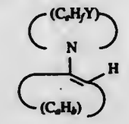
**Int. Cl.[6] C07C *51/00***

**U.S. Cl. 554—154** **17 Claims**

1. A process of preparing an ω-hydroxy acid, the process comprising the steps of:

(i) preparing an anhydrous mixture comprising:

(a) an enamine having Formula I:



(I)

wherein

a is an integer from 1 to 20,

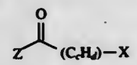
b is an integer from 2 to 40,

e is an integer from 4 to 12,

f is an integer from 4 to 24, and

Y is oxygen, nitrogen, or $—CH_2$,

(b) a compound having Formula II:



(II)

wherein

c is an integer from 1 to 30;

d is an integer from 2 to 60;

X selected from the group consisting of —OH, a halogen atom, OTs, and OMs; and

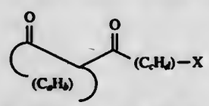
Z is a halogen atom; and

(c) a base catalyst;

wherein the molar ratio of the enamine to the compound having Formula II is in the range of from about 1:1 to about 1:2;

(ii) reacting the anhydrous mixture obtained in step (i) at a temperature in the range of from about 20° C. to about 150° C., to obtain a first reaction solution;

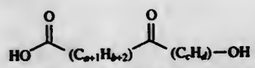
(iii) quenching the first reaction solution obtained in step (ii) with an aqueous acid and refluxing to obtain a second reaction solution containing a diketone having Formula III:



(III)

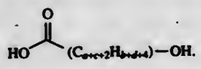
(iv) mixing the diketone having Formula III with a hydroxy-containing inorganic base in a solvent to obtain a third reaction solution;

(v) refluxing the third reaction solution obtained in step (iv) to obtain a fourth reaction solution containing a ketoacid having Formula IV:



(IV)

(vi) carrying out a reduction of the diketone having Formula (IV) to obtain the ω-hydroxy acid having Formula V



(V)

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**5,502,227**

**LIQUID INDIUM SOURCE**

**Ravindra K. Kanjolia, North Andover, and Benjamin C. Hui, Peabody, both of Mass., assignors to CVD, Incorporated, Woburn, Mass.**

**Filed Jul. 27, 1993, Ser. No. 97,821**

**Int. Cl.[6] C07F *5/00***

**U.S. Cl. 556—1** **3 Claims**

1. A method of providing vapor phase trimethylindium comprising dissolving trimethylindium in a $C_3$–$C_5$ trialkylindium solvent to produce a solution and entraining trimethylindium from said solution with a carrier gas.

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**5,502,228**

**THERMALLY ACTIVATED OLEFIN METATHESIS CATALYST PRECURSOR**

**Andrew Bell, West Grove, Pa., and Tim J. Coffy, Houston, Tex., assignors to Metton America, Inc., Abingdon, Va.**

**Filed Dec. 29, 1993, Ser. No. 175,328**

**Int. Cl.[6] C07F *11/00*; B01J *31/00***

**U.S. Cl. 556—57** **13 Claims**

1. An olefin metathesis catalyst precursor having the formula:

$$M(Y)(OR^2)_x(R^3)_yL_s$$

wherein M is molybdenum or tungsten; Y is oxygen or $NR^1$; $R^1$ and $R^2$ are the same or different and are selected from the group consisting of $C_6H_3$-2,6-i-$Pr_2$, $CMe_3$, $C(CF_3)_3$, $CMe(CF_3)_2$, and $CH_2CMe_3$; $R^3$ is selected from the group consisting of $CH_2CMe_2Ph$ and $CH_2CMe_3$, where Me is a methyl group, Ph is a phenyl group, and i-Pr is an isopropyl group; except when $R^2$ is $CMe_3$, then $R^3$ cannot simultaneously be $CH_2CMe_3$; L is a Lewis base; s is 0 or 1; and x+y=4.

4. An olefin metathesis catalyst precursor having the formula:

$$M(Y)(OR^2)_x(R^3)_y(X)_zL_s$$

wherein M is molybdenum or tungsten; Y is oxygen or $NR^1$; $R^1$, $R^2$, and $R^3$ are the same or different and are selected from the group consisting of alkyl, cycloalkyl, cycloalkenyl, polycycloalkyl, polycycloalkenyl, haloalkyl, haloaralkyl, substituted or unsubstituted aralkyl and aryl groups, and silicon-containing analogs thereof; X is halogen; L is a Lewis base; s is 0 or 1; x+y+z=4; y>1; x is 2 or more1 and two $OR^2$ groups are replaced by a chelating ligand $(OR^2)_2$,

wherein the chelating ligands are selected from the group consisting of 3,5-di-tert-butylcatechol; 2,2'-methylenebis(4-chlorophenol); catechol; binaphtholate; pinacol; perfluoropinacol; benzopinacol; 2,2'-methylenebis(4-methyl-6-butylphenol); 2,2'-methylenebis(4-ethyl-6-butylphenol); 4,4'-methylenebis(2,6-tert-butylphenol); 2,2'-ethylenebis( 4,6-di-tert-butylphenol); 2,2'-methylenebis(4-ethyl- 6-(1-methylcyclohexyl)phenol; 4,4'-butylidenebis(6-tert-butyl-2-methylphenol); 4,4'-thiobis (6-tert-butyl-3-methylphenol; 4,4'-methylenebis (2,6-dimethylphenol); 1,1'-thiobis(2-naphthol); 2,2'-isobutylindenebis (4,6-tert-butylphenol); 2,2'-isobutylindenebis(4,6-dimethylphenol), and 2,2'-methylenebis(4-methyl-6-cyclohexyl)phenol.

5,502,229

## DIPHENYLSILOXANE OLIGOMERS FUNCTIONALIZED AT BOTH TERMINAL AND METHOD FOR THE PREPARATION THEREOF

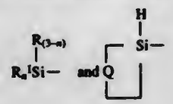
Brian R. Harkness; Mamoru Tachikawa, and Kazumi Takeuchi, all of Kanagawa, Japan, assignors to Dow Corning Asia, Ltd., Tokyo, Japan

Filed Mar. 14, 1995, Ser. No. 403,991
Claims priority, application Japan, Mar. 23, 1994, 6-052009
Int. Cl.[6] C07F 7/08
U.S. Cl. 556—406 11 Claims

1. A diphenylsiloxane oligomer functionalized at both terminals, said oligomer having the following general formula

$$G—(OSi(Ph)_2)_m—O—G$$

wherein Ph denotes a phenyl radical, m is 3 to 50 and G has a formula independently selected from the group consisting of



in which $R^1$ is independently selected from the group consisting of hydrogen and a monovalent hydrocarbon group having 2 to 8 carbon atoms excluding phenyl, tolyl, xylyl, and ethylphenyl radicals, R is independently selected from the group consisting of $R^1$, methyl radical and phenyl radical, Q is a divalent hydrocarbon group and n is an integer having a value of 1 to 3.

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5,502,230

## PROCESS FOR PREPARING HYDROGEN-CONTAINING METHYLCHLOROSILANES

Konrad Mautner, Kastl; Ulrich Goetze, Burghausen; Anton Schinabeck, Burghausen, and Wilfried Kalchauer, Burghausen, all of, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed Aug. 14, 1995, Ser. No. 514,529
Claims priority, application Germany, Sep. 8, 1994, 44 31 995.9
Int. Cl.[6] C07F 7/08
U.S. Cl. 556—468 9 Claims

1. A process for preparing hydrogen-containing methylchlorosilanes of the formula

$$R_xCl_{3-x}SiH, \quad (I)$$

which comprises reacting disilanes of the formula

$$R_xCl_{3-x}Si—SiR_xCl_{3-x}, \quad (II)$$

where, in the formulae I and II,
R is a hydrogen atom, a methyl, phenyl or ethyl radical and
x is 0, 1, 2 or 3,
with hydrogen chloride in the presence of a catalyst comprising
(A) palladium(O) or platinum(O) and
(B) an organic compound selected from among tertiary amines, carboxamides, alkylureas, tertiary phosphines, phosphor amides, quaternary ammonium halides, quaternary phosphonium halides or mixtures thereof.

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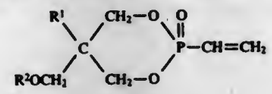
5,502,231

## PROCESS FOR THE PREPARATION OF CYCLIC VINYLPHOSPHONIC ESTERS

Fritz Engelhardt; Ulrich Riegel, both of Frankfurt am Main, and Hans-Jerg Kleiner, Kronberg, all of, Germany, assignors to Cassella Aktiengesellschaft, Germany

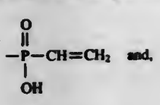
Filed Feb. 21, 1995, Ser. No. 391,528
Claims priority, application Germany, Mar. 4, 1994, 44 07 272.4
Int. Cl.[6] C07F 9/6564
U.S. Cl. 558—110 13 Claims

1. Process for the preparation of compounds of the formula I



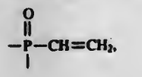
(I)

in which
$R^1$ is ($C_1$–$C_4$)-alkyl or —$CH_2OR^3$;
$R^2$, if $R^1$ is ($C_1$–$C_4$)-alkyl, is hydrogen or



and,

if $R^1$ is —$CH_2OR^3$, $R^2$ forms together with $R^3$ a group



comprising the reaction of a 1,1,1-tris(hydroxymethyl)-($C_2$–$C_5$)-alkane or 2,2-bis(hydroxymethyl)- 1,3-propanediol with vinylphosphonic anhydride.

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5,502,232

## PROCESS FOR PREPARING DIARYL CARBONATES

Hans-Josef Buysch, Krefeld; Joachim Dohm, Köln; Carsten Hesse, Krefeld; Johann Rechner, Krefeld, and Dieter Kaufmann, Goslar, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 15, 1994, Ser. No. 339,613
Claims priority, application Germany, Nov. 22, 1993, 43 39 697.6; Dec. 9, 1993, 43 41 990.9
Int. Cl.[6] C07C 69/96
U.S. Cl. 558—270 20 Claims

1. A process for preparing an organic carbonate of the formula (I)

$$R—O—CO—O—R \quad (I),$$

in which
R is a substituted or not substituted $C_6$–$C_{12}$-aryl, by reaction of an aromatic hydroxy compound of the formula (II),

$$R—O—H \quad (II),$$

where
R is as defined above, with carbon monoxide and oxygen at 30°–200° C. and at a pressure of 1–80 bar in the presence of a base, a quaternary salt, a desiccant, a compound of a noble metal of the group VIIIB as catalyst and a cocatalyst selected from the group consisting of the metal compounds of the groups IIIA, IVA, VA, IB, IIB, VIB and VIIB of the Periodic Table of the Elements, wherein the noble metal catalyst is, prior to the reaction, activated by treatment with carbon monoxide in a liquid phase at a temperature of 15°–200° C. and a pressure of 1–300 bar in the presence of the quaternary salt and in the presence or in the absence of the cocatalyst,



with the noble metal catalyst being present in the activation mixture in an amount of 0.0001–30% by weight, based on the total reaction mixture.

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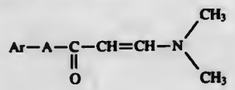
5,502,233

## ENAMINE INTERMEDIATES FOR THE PREPARATION OF SUBSTITUTED PYRIDYLPYRIMIDINES

Ulrich Heinemann, Leichlingen; Heinz-Wilhelm Dehne, Monheim; Stefan Dutzmann, Hilden, and Christoph Erdelen, Leichlingen, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

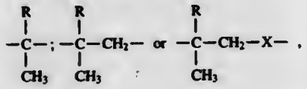
Division of Ser. No. 107,670, Aug. 16, 1993, Pat. No. 5,416,088. This application Jan. 23, 1995, Ser. No. 376,583
Claims priority, application Germany, Feb. 23, 1991, 41 05 751.1
Int. Cl.[6] C07C 211/28;229/30;327/22
U.S. Cl. 558—256 2 Claims

1. An enamine of the formula



(III)

in which
A represents a radical of the formula



where
R in each case is alkyl
X represents oxygen or sulphur and
Ar represents phenyl which is optionally monosubstituted to pentasubstituted by identical or different substituents, wherein the substituents are halogen, cyano, nitro, straight-chain or branched alkyl, straight-chain or branched alkoxy or straight-chain or branched alkyl thio, each having 1 to 4 carbon atoms in the alkyl moieties, straight-chain or branched halogenoalkyl, straight-chain or branched halogenoalkoxy or straight-chain or branched halogenoalkylthio, each having 1 to 4 carbon atoms in the alkyl moiety and 1 to 9 identical or different halogen atoms, straight-chain or branched alkoxycarbonyl or alkoxyiminoalkyl, each having 1 to 4 carbon atoms in the individual alkyl moieties, or phenyl which is optionally monosubstituted to pentasubstituted by identical or different substituents from the group consisting of halogen and straight-chain or branched alkyl having 1 to 4 carbon atoms.

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5,502,234

## PROCESS FOR THE PREPARATION AND SEPARATION OF CYCLOPROPANECARBONITRILE

Shaowo Liang, Kingsport, Tenn., assignor to Eastman Chemical Company, Kingsport, Tenn.

Filed Jul. 17, 1995, Ser. No. 503,345
Int. Cl.[6] C07C 253/00
U.S. Cl. 558—314 8 Claims

1. Process for the preparation and separation of cyclopropanecarbonitrile (CPCN) by the steps comprising:
(1) reacting cyclopropanecarboxaldehyde (CPCA) with hydroxylamine base in the presence of water to obtain CPCA oxime, wherein the mole ratio of CPCA:hydroxylamine is about 1:0.5 to 1:5;
(2) contacting the CPCA oxime of step (1) with formic acid to obtain CPCN, wherein the mole ratio of formic acid:CPCA oxime is about 0.5:1 to 5:1; and
(3) contacting the mixture comprising CPCN formed in step (2) with a base to obtain a mixture comprising an organic phase containing CPCN and an aqueous phase, wherein the equivalents of base per mole of formic acid used in step (2) is in the range of about 0.5:1 to 2:1.

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5,502,235

## SOLVENTLESS PROCESS FOR MAKING 2,6 DIFLUOROBENZONITRILE

Mark W. Zettler; Richard E. Tobey, and Ronald B. Leng, all of Midland, Mich., assignors to DowElanco, Indianapolis, Ind.

Filed Dec. 28, 1994, Ser. No. 365,726
Int. Cl.[6] C07C 253/30
U.S. Cl. 558—425 25 Claims

1. A process for making 2,6-difluorobenzonitrile, comprising:
a) reacting 2,6-dichlorobenzonitrile with a substantially anhydrous alkali metal fluoride in a reactor at a temperature between about 160° C. and about 300° C. and in the presence of a phase transfer catalyst but in the absence of a solvent, to produce a first mixture comprising 2-chloro-6-fluorobenzonitrile, 2,6-difluorobenzonitrile, unreacted 2,6-dichlorobenzonitrile, the catalyst and tars resulting from the reaction;
b) separating 2,6-difluorobenzonitrile from the first mixture to produce a second mixture comprising 2-chloro-6-fluorobenzonitrile, 2,6-dichlorobenzonitrile, the tars, and the catalyst; and
c) separating 2,6-dichlorobenzonitrile and 2-chloro-6-fluorobenzonitrile from the second mixture to produce a third mixture comprising the tars and the catalyst and recycling the separated 2,6-dichlorobenzonitrile and 2-chloro-6-fluorobenzonitrile into the reactor.

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5,502,236

## METHOD FOR THE PRODUCTION OF (3-ALKOXYCARBONYL-2-BUTENYL)TRIPHENYLPHOSPHONIUM SALTS

Bruno Burdet, Baldersheim, France; August Rüttimann, Arlesheim, Switzerland; Jean-Marie Santer, St. Louis, France, and Theodor Siegfried, Riehen, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Mar. 17, 1995, Ser. No. 405,682
Claims priority, application Switzerland, Mar. 23, 1994, 868/94
Int. Cl.[6] C07C 253/30
U.S. Cl. 558—460 9 Claims

1. A process for producing 2-chloro-2-methyl-3-butenenitrile which process comprises α-chlorinating 2-methyl-3-butenenitrile by reacting said nitrile with an aqueous solution of an alkali metal or alkaline earth metal hypochlorite to produce said α-chlorinated nitrile.

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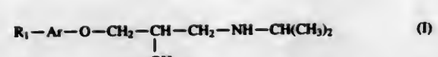
5,502,237

## 1-ARYLOXY-3-ALKYLAMINO-2-PROPANOL-NITRATE ESTERS, THE USE THEREOF AND CORRESPONDING PHARMACEUTICAL COMPOSITION

María Prat Quiñ, Barcelona; Joan Pi Sallent, La Llagosta, and Dagmar V. Veit, Saint Joan Despi, all of, Spain, assignors to Prodesfarma, S. A., Barcelona, Spain

Filed Jun. 27, 1994, Ser. No. 265,960
Claims priority, application Spain, Jul. 30, 1993, 9301721
Int. Cl.[6] C07C 205/01
U.S. Cl. 560—21 3 Claims

1. 1-aryloxy-3-alkylamino-2-propanol nitrate esters of general formula I

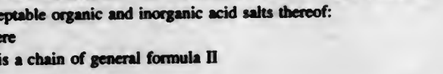


(I)

and the enantiomers and diastereoisomers and therapeutically acceptable organic and inorganic acid salts thereof:

where

$R_1$ is a chain of general formula II



(II)

where m is 1 or 2; Z is a —C(O)NH-amide; and $R_2$ is a $C_{2-3}$ straight or branched chain alkyl having at least one-$ONO_2$ group as a substituent; and Ar is a naphthalene ring.

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**5,502,238**

**PROCESS FOR THE CRYSTALLIZATION OF ASPARTAME**

**Marinus P. W. M. Rijkers, Stein, and Alexander P. M. Vrijzen, Meerssen, both of, Netherlands, assignors to Holland Sweetener Company V.o.F., Netherlands**

**Continuation of Ser. No. 102,217, Aug. 5, 1993, abandoned. This application Mar. 1, 1995, Ser. No. 396,861**

**Claims priority, application Netherlands, Aug. 5, 1992, 9201408**

**Int. Cl.[6] C07C *229/02***

**U.S. Cl. 560—41** **30 Claims**

1. A process for the crystallization of aspartame comprising the following steps:

neutralizing with a base an acidic solution of aspartame in water having a pH less than about 3 to obtain a neutralized solution having a pH greater than about 3, wherein said neutralization is rapidly effected;

mixing said acidic solution during said neutralization to obtain a substantially homogeneous solution, wherein said mixing is rapidly effected; and

stopping said mixing at least one second before crystallization becomes visually perceptible; and

thereafter crystallizing aspartame from the mixed solution obtained in the previous step at a substantially constant temperature,

wherein the temperatures of said acidic and neutralized solutions during said neutralization and crystallization steps are not more than about 5° C. different.

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**5,502,239**

**PROCESS FOR RECOVERING DIMETHYL TEREPHTHALATE**

**Brad L. Smith, and Gary E. Wilkins, both of Wilmington, N.C., assignors to Hoechst Celanese Corporation, Somerville, N.J.**

**Filed Aug. 7, 1995, Ser. No. 512,244**

**Int. Cl.[6] C07C *67/48***

**U.S. Cl. 560—78** **6 Claims**

1. A process for recovering dimethyl terephthalate comprising the steps of:

a) providing a dimethyl terephthalate stream including dimethyl terephthalate, glycols, and coordination compounds;

b) acidifying the coordination compounds to disassociate ligands from metal ions;

c) separating the ligands from metal ions;

d) separating the dimethyl terephthalate from the glycols; and

e) recovering the dimethyl terephthalate.

**5,502,240**

**ESTERIFICATION PROCESS USING A TITAMIUM ZEOLITE CATALYST**

**Joseph Pugach, Monroeville Borough; Thomas W. Smeal, Municipality of Murrysville, and Howard S. Karp, Monroeville Borough, all of Pa., assignors to Aristech Chemical Corporation, Pittsburgh, Pa.**

**Filed Jun. 9, 1995, Ser. No. 488,561**

**Int. Cl.[6] C07C *64/08***

**U.S. Cl. 560—99** **10 Claims**

1. A process of preparing an ester, comprising the steps of:

(a) making a reaction mixture comprising, an alcohol, a carboxylic acid, and a heterogeneous titanium zeolite catalyst;

(b) heating said reaction mixture; and

(c) allowing said reaction mixture to react, wherein water is removed to drive the formation of said ester.

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**5,502,241**

**PROCESS FOR THE PREPARATION OF ALKYL CARBAMATES**

**Raghunath V. Chaudhari; Sunil P. Gupte; Ashutosh A. Kelkar, all of Maharashtra, and Devidas S. Kolhe, late of Pune, all of, Ind., assignors to Council of Scientific & Industrial Research, New Delhi, Ind.**

**Continuation of Ser. No. 812,753, Dec. 23, 1991, abandoned, which is a continuation-in-part of Ser. No. 475,747, Feb. 6, 1990, abandoned. This application Sep. 16, 1994, Ser. No. 307,393**

**Int. Cl.[6] C07C *269/04***

**U.S. Cl. 560—157** **12 Claims**

1. A process for the preparation of methyl methyl carbamate comprising reacting at least one compound selected from the group consisting of methyl amine and N,N'dimethyl urea with carbon monoxide, an oxidizing agent comprising oxygen and a monoalcohol in a reactor at suitable temperature and pressure conditions to optimize the formation of the methyl methyl carbamate, said temperature and pressure conditions comprising a carbon monoxide partial pressure of between about 100 and 1,500 psig, an oxygen partial pressure of between about 10 and 300 psig, and a temperature between about 140° and 350° C., said reaction being conducted in the presence of a catalyst system consisting essentially of (i) a precursor containing a platinum group metal, and (ii) at least one halogen containing promoter effective to promote said reaction, said at least one compound being charged to the reactor at a volume concentration of from about $3.2\times10^{-4}$ to about $1.6\times10^{-3}$ mol/cm$^3$, whereby to minimize a reverse reaction wherein the methyl, methyl carbamate reacts with $CH_3NH_2$ to form N,N'-dimethyl urea and $CH_3OH$ and thereby to optimize a yield of and selectivity for the methyl methyl carbamate, said monoalcohol and said carbon monoxide each being present in an amount of at least one mol per amine group of the methyl amine or per urea group of the N,N'-dimethyl urea, said oxidizing agent being present such that the oxygen is present in the reactor at a CO/$O_2$ ratio in the range of about 1:1 to 50:1 and said catalyst being employed in an amount of one mol of catalyst per 5 to 8000 mols of methylamine or dimethyl urea compound.

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**5,502,242**

**PROPIOLATE ESTER COMPOUND AN ACARICIDE CONTAINING THE SAME AS AN ACTIVE INGREDIENT AND AN ACARICIDAL METHOD**

**Akira Shuto, Ashiya; Hiroi Kishda, Takarazuka; Yoji Takada, Toyonaka, and Takao Ishiwatari, Minoo, all of, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan**

**Filed Aug. 5, 1994, Ser. No. 286,463**

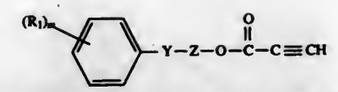
**Claims priority, application Japan, Aug. 6, 1993, 5-196043**

**Int. Cl.[6] C07C *69/52***

**U.S. Cl. 560—221** **12 Claims**

1. A propiolate ester compound represented by the formula I:





I

wherein $R_1$ represents a hydrogen atom, a halogen atom, a $C_1$–$C_4$ alkyl group or a $C_1$–$C_4$ alkoxy group;

m is an integer of 1 to 5;

Y represents —$CH_2CH_2CH_2$—, —$OCH_2$—, or —$CH_2O$—;

Z represents a $C_2$–$C_6$ alkylene group which may be substituted with a $C_1$–$C_4$ alkyl group; and

$R_1$ may be the same or different, when m is an integer of larger than 1.

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**5,502,243**

**HYDROCARBONYLATION OF DIMETHYL ETHER**

**Francis J. Waller, Allentown, and David W. Studer, Wescosville, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.**

**Continuation-in-part of Ser. No. 963,771, Oct. 20, 1992, abandoned, which is a continuation-in-part of Ser. No. 870,126, Apr. 15, 1992. This application Sep. 16, 1994, Ser. No. 308,018**

**Int. Cl.[6] C07C *67/36***

**U.S. Cl. 560—232** **19 Claims**

1. A process for the synthesis of ethylidene diacetate which comprises reacting a feed containing dimethyl ether, methanol, and synthesis gas which contains hydrogen, carbon monoxide, and carbon dioxide in a liquid phase reactor containing at least acetic acid and a catalyst system consisting essentially of a Group VIII metal, methyl iodide, lithium iodide, and lithium acetate at conditions sufficient to react the components in said feed with acetic acid to produce said ethylidene diacetate and one or more additional oxygenated acetyl compounds, wherein the molar ratio of carbon dioxide to methanol in said feed is between 5 and 12.

9. A process for the synthesis of ethylidene diacetate which comprises:

(a) reacting synthesis gas comprising hydrogen, carbon monoxide, and carbon dioxide in a first liquid phase reactor in the presence of a methanol synthesis catalyst and a methanol dehydration catalyst suspended in an inert liquid at conditions sufficient to produce dimethyl ether and methanol;

(b) withdrawing from said first reactor an intermediate stream comprising dimethyl ether, methanol, and unreacted synthesis gas;

(c) passing said intermediate stream into a second liquid phase reactor containing at least acetic acid and reacting said dimethyl ether, methanol, and unreacted synthesis gas which contains hydrogen, carbon monoxide, and carbon dioxide with acetic acid in the presence of a catalyst system consisting essentially of a Group VIII metal, methyl iodide, lithium iodide, and lithium acetate at conditions sufficient to produce said ethylidene diacetate and one or more additional oxygenated acetyl compounds, wherein the molar ratio of carbon dioxide to methanol in said intermediate stream is between 5 and 12; and

(d) withdrawing from said second liquid phase reactor a liquid stream which contains said ethylidene diacetate and one or more additional oxygenated acetyl compounds and a vapor stream which contains unreacted synthesis gas.

16. In a process for synthesizing one or more oxygenated acetyl compounds selected from the group consisting of ethylidene diacetate, acetaldehyde, acetic acid, acetic anhydride, and methylacetate from a feed containing dimethyl ether, hydrogen, and carbon monoxide in a liquid phase reactor in the presence of a catalyst system consisting essentially of a Group VIII metal, methyl iodide, and lithium iodide, the improvement which comprises increasing the yield of said oxygenated acetyl compounds by adding carbon dioxide to said feed such that the molar ratio of carbon dioxide to dimethyl ether is between 0.3 and 1.3, wherein said liquid phase reactor contains at least acetic acid.

**5,502,244**

**PROCESS FOR PRODUCING ISOCYANATES**

**Takashi Okawa; Toshinari Aoki; Hiroshi Matsunaga, and Hideo Igarashi, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan**

**Filed Mar. 16, 1995, Ser. No. 405,014**

**Claims priority, application Japan, Mar. 18, 1994, 6-048690**

**Int. Cl.[6] C07C *263/00***

**U.S. Cl. 560—345** **4 Claims**

1. A process for producing an isocyanate from a carbamic acid ester which comprises thermally decomposing the carbamic acid ester at a temperature of 150° to 350° C. in the presence of a catalyst consisting of an organic sulfonic acid to form the isocyanate and an alcohol.

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**5,502,245**

**METHODS OF MAKING INTERMEDIATE OXIDATION PRODUCTS BY CONTROLLING TRANSIENT CONVERSION IN AN ATOMIZED LIQUID**

**Mark W. Dassel, Indianola, Wash., and Eustathios Vassiliou, Newark, Del., assignors to Twenty-First Century Research Corporation, Newark, Del.**

**Filed Jun. 7, 1995, Ser. No. 477,234**

**Int. Cl.[6] C07C *51/16***

**U.S. Cl. 562—413** **33 Claims**

1. A method of preparing an intermediate oxidation product from a first liquid containing a first reactant and a gas containing an oxidant, the method comprising the steps of:

atomizing the first liquid to form a plurality of droplets in the gas at an atomization temperature and at an atomization distance from a mass of a second liquid;

causing a substantially non-destructive oxidation at an oxidation pressure between the first reactant and the oxidant to form the intermediate oxidation product;

coalescing the droplets into the mass of the second liquid;

controlling transient conversion of the first reactant and the oxidant to intermediate oxidation product in the droplets to be within a predetermined pre-coalescing transient conversion range, before said droplets coalesce into the second liquid; and

separating the intermediate oxidation product from the second liquid.

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**5,502,246**

**SOLID-PHASE SYNTHESIS UTILIZING PHOTOCHEMICAL CARBON-SULFUR BOND CLEAVAGE OF THIOETHERS**

**Irving Sucholeiki, Watertown, Mass., assignor to Eli Lilly and Company, Indianapolis, Ind.**

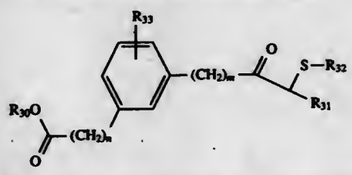
**Filed Mar. 22, 1994, Ser. No. 215,607**

**Int. Cl.[6] C07C *323/07***

**U.S. Cl. 562—426** **4 Claims**

1. A compound having the following formula:

Formula I

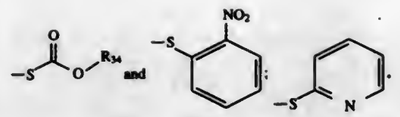


wherein:

$R_{30}$ is selected from the group consisting of H and $C_{1-4}$ alkyl;

$R_{31}$ and $R_{34}$ are selected from the group consisting of $C_{1-4}$ alkyl;

$R_{32}$ is selected from the group consisting of H, t-butyl,



$R_{33}$ is selected from the group consisting of H and up to three $C_{1-4}$ alkoxy substitutents;
n is 1 to 10; and
m is 0 to 10.

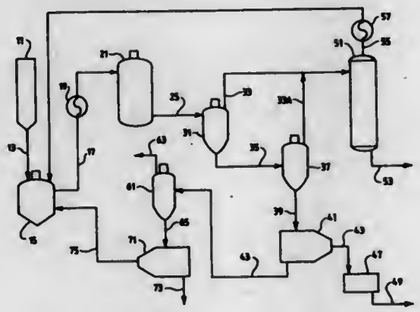
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**5,502,247**

**PROCESS FOR RECOVERY OF AROMATIC ACID OR ESTER AND POLYOL FROM WASTE POLYESTER RESINS**

**Thomas M. Bartos, Naperville; Bruce I. Rosen, Morton Grove, and Jeffrey I. Rosenfeld, Schaumburg, all of Ill., assignors to Amoco Corporation, Chicago, Ill.**

**Filed Nov. 17, 1994, Ser. No. 341,012**
**Int. Cl.[6] C07C 51/43;51/493**
**U.S. Cl. 562—486** **20 Claims**



1. A process for recovering dibasic aromatic acid or an ester thereof from polyester resin comprising repeating units of dibasic aromatic acid residue and repeating units of dihydric alcohol residue linked by ester bonds which process comprises:

depolymerizing polyester resin in a liquid solvent under conditions of elevated temperature and pressure suitable for opening of ester bonds to form a mixture comprising a solution of dibasic aromatic acid or an ester thereof, dihydric alcohol, organic impurities, and other components of the resin;

crystallizing substantially all of the dibasic aromatic acid or ester from the solution by flash crystallization down to pressure of about one atmosphere to form a vapor containing a major mount of the dihydric alcohol and solvent, and a slurry of dibasic aromatic acid or ester crystals in mother liquor;

separating from the mother liquor a product of crude dibasic aromatic acid or ester substantially free of dihydric alcohol, but containing some organic impurities;

crystallizing retained organic impurities from the mother liquor solution by flash crystallization to a pressure in a range downward from about one atmosphere to form a slurry of mother liquor solids;

recovering mother liquor solids from the slurry; and

recycling the recovered solids to the depolymerization mixture.

**5,502,248**

**PROCESS FOR CONCURRENT HYDROLYSIS OF ESTERS AND SEPARATION OF PRODUCTS USING A SIMULATED MOVING BED**

**Gregory A. Funk, Carol Stream; Hemant W. Dandekar, and Simon H. Hobbs, both of Chicago, all of Ill., assignors to UOP, Des Plaines, Ill.**

**Filed Feb. 27, 1995, Ser. No. 395,240**
**Int. Cl.[6] C07B 53/00**
**U.S. Cl. 562—606** **30 Claims**

1. A liquid phase process for the continuous hydrolysis of esters containing from about 2 to about 16 carbon atoms with concurrent separation of hydrolysis products comprising:

a. continuously introducing a desorbent and a feed, which collectively comprise at least one ester and water, to a simulated moving bed of a solid or a mixture of solids effective to catalyze hydrolysis and to separate hydrolysis products by selective adsorption of at least one product;

b. hydrolyzing the ester(s) to form the hydrolysis products consisting of at least one alcohol and at least one carboxylic acid;

c. separating the alcohol(s) from the carboxylic acid(s) by selectively adsorbing at least one class of product on the solid or mixture of solids;

d. desorbing the selectively adsorbed class of product from the solid or mixture of solids using the desorbent; and

e. collecting and recovering the separated alcohol(s) and carboxylic acid(s).

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**5,502,249**

**PROCESS FOR THE REMOVAL OF IODINE FROM ACETYL COMPOUNDS**

**Carl F. Fillers, Greeneville; Jerry A. Barron, Gray, and Eric D. Middlemas, Johnson City, all of Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.**

**Filed May 31, 1994, Ser. No. 251,228**
**Int. Cl.[6] C07C 51/42;51/573**
**U.S. Cl. 562—608** **8 Claims**

5. Process for the reduction in the iodine content of an acetyl product stream comprising (i) acetic acid and (ii) about 500 parts per billion to 10 parts per million iodine in the form of iodine, one or more iodine-containing compounds or a mixture thereof, which comprises the steps of:

(1) feeding the acetyl product stream to the middle or lower section of a distillation column containing a packing material constructed of a nickel-copper alloy comprising 50 to 80 weight percent nickel and 50 to 20 weight percent copper and maintained at a temperature of about 110° to 130° C.; and

(2) removing from the distillation column (i) a minor amount of acetic acid vapor from the top of the column; (ii) a minor amount of acetic acid liquid from the base of the column; and (iii) a major amount of purified acetic acid from the upper section of the distillation column; wherein (a) the purified acetic acid contains less than about 100 ppb iodine; (b) the amount of purified acetic acid removed from the distillation column constitutes about 80 or more weight percent of the amount of the acetyl product stream fed to the distillation column; (c) most of the iodine contained in the acetyl product stream fed to the distillation column is removed in the liquid which is removed from the base of the column; and (d) the liquid hourly space velocity of the acetyl product stream fed to the distillation column is about 200 to 300, in which liquid hourly space velocity is the unit volume of acetyl product stream feed per unit volume of packing material defined in step (1).



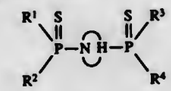
**5,502,250**

**BIS(DIALKYLTHIOPHOSPHORYL)AMINES AS METAL EXTRACTANTS**

**John Campbell, Rochdale; Raymond F. Dalton, Cheadle Hulme, and Peter M. Quan, Rochdale, all of, United Kingdom, assignors to Zeneca Limited, London, England**

**Division of Ser. No. 70,951, Jun. 4, 1993, Pat. No. 5,393,431. This application Nov. 29, 1994, Ser. No. 348,997**
**Claims priority, application United Kingdom, Jun. 5, 1992, 9211986; Feb. 5, 1993, 9302332**
**Int. Cl.[6] C07F 9/36**
**U.S. Cl. 564—12** **5 Claims**

1. A compound of the formula:



wherein each of $R^1$, $R^2$, $R^3$ and $R^4$ is a branched alkyl group containing from 3 to 20 carbon atoms.

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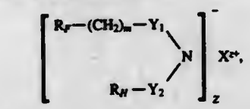
**5,502,251**

**IMIDES AND THEIR SALTS, AS WELL AS THEIR USE**

**Klaus Pohmer, Cologne; Rainer Weber, Odenthal; Cornelia Dörzbach-Lange, Kuerten-Becheu; Karlheinz Stachulla; Hans-Heinrich Moretto, both of Leverkusen, and Manfred Wienand, Bergisch Gladbach, all of, Germany, assignors to Bayer AG, Leverkusen, Germany**

**Continuation of Ser. No. 60,995, May 14, 1993, abandoned. This application Feb. 1, 1995, Ser. No. 383,702**
**Claims priority, application Germany, May 26, 1992, 42 17 366.3**
**Int. Cl.[6] C07C 311/15;311/09;311/03;233/31**
**U.S. Cl. 564—82** **9 Claims**

1. Fluoroalkyl- and fluoroaryl-group-containing imides and their salts of general formula (I)



(I)

wherein

$R_F$ is a perfluoroalkyl group with 3 to 10 carbon atoms or a perfluoroaryl group with 6 to 12 carbon atoms,

$R_H$ is an alkyl group with 1 to 30 carbon atoms, an aryl group with 6 to 12 carbon atoms or a mixed alkylaryl group with 7 to 30 carbon atoms,

$Y_1$ and $Y_2$ each represent a



group,

X is a hydrogen cation or a uni- or multivalent cation,

m is a whole number from 0 to 6, and

z is a whole number from 1 to 7 corresponding to the charge of the cation X.

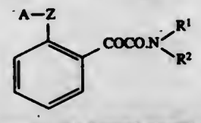
**5,502,252**

**PROCESS OF PRODUCING INTERMEDIATES FOR USE IN PRODUCTION OF ALKOXYIMINOACETAMIDES AND INTERMEDIATES TO BE USED THEREIN**

**Akira Takase, Otsu; Hiroyuki Kai, Yamatokoriyama; Kuniyoshi Nishida, Kaka, and Moriyasu Masui, Yokkaichi, all of, Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan**

**Division of Ser. No. 953,884, Sep. 30, 1992, Pat. No. 5,387,714. This application Nov. 10, 1994, Ser. No. 339,254**
**Claims priority, application Japan, Jan. 4, 1991, 3-257513**
**Int. Cl.[6] C07C 233/05;231/02**
**U.S. Cl. 564—169** **1 Claim**

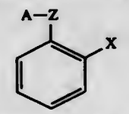
1. A process of producing an α-ketamide of the formula:



(V)

wherein A is alkyl, unsubstituted phenyl or phenyl substituted by at least one substituent selected from the group consisting of alkyl, alkenyl, alkynyl, alkoxy, halogenated alkyl, halogenated alkenyl, halogenated alkynyl, cycloalkyl, cycloalkenyl and unsubstituted phenyl groups; Z is $—CH_2—$, —O—, —S—, —CH(OH)—, —CO—, —NR— (wherein R is hydrogen or alkyl), $—CH_2CH_2—$, —CH=CH—, $—CH_2O—$, $—CH_2S—$, $—CH_2S(O)—$, $—OCH_2—$, $—SCH_2—$, $—S(O)CH_2—$ or epoxy; and $R^1$ and $R^2$ are identically or differeatly hydrogen, alkyl or cycloalkyl, the process comprising the steps of:

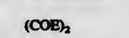
reacting a halide of the formula:



(I)

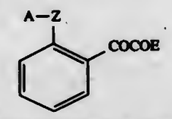
wherein A and Z are the same as described above and X is halogen, with magnesium;

reacting the resultant reaction product with an oxalyl compound of the formula:



(II)

wherein E is the same as described above, to form an α-keto acid halide of the formula:



(III)

wherein A and Z are the same as described above and E is halogen; and

reacting the α-keto acid halide with an amine of the formula: wherein $R^1$ and $R^2$ are the same as described above.

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**5,502,253**

**CYCLOHEX-2-ENYL ACETAMIDES**

**Gary A. Flynn, Cincinnati, Ohio, assignor to Merrell Pharmaceuticals Inc.**

**Continuation of Ser. No. 155,972, Nov. 19, 1993, abandoned. This application Mar. 30, 1995, Ser. No. 415,028**
**Int. Cl.[6] C07C 233/14**
**U.S. Cl. 564—210** **2 Claims**

1. The compound (S)-2,2,2-trichloro-N-(2-chloro-cyclohex-2-enyl)-acetamide.

5,502,254

## METHOD FOR THE PREPARATION OF 2-HYDROXYARYLALDOXIMES

Daniel Levin, Manchester, United Kingdom, assignor to Zeneca Limited, London, England

Continuation of Ser. No. 108,424, Aug. 19, 1993, Pat. No. 5,399,761. This application Mar. 15, 1995, Ser. No. 404,468

Claims priority, application United Kingdom, Aug. 20, 1992, 9217724

Int. Cl.[6] C07C 249/08

U.S. Cl. 564—259 13 Claims

1. A method for the preparation of a 2-hydroxyarylaldoxime which comprises reacting hydroxylamine with a 2-hydroxyarylaldehyde, said reaction being performed in the presence of a compound of a metal of Group II, of the Periodic Table and/or under such conditions that the 2-hydroxyarylaldehyde is at least partially in the form of a salt and/or complex of a metal of Group II, of the Periodic Table.

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5,502,255

## SUBSTITUTED GUANIDINES HAVING HIGH BINDING TO THE SIGMA RECEPTOR AND THE USE THEREOF

John Keana, Eugene, and Eckard Weber, Portland, both of Oreg., assignors to State of Oregon, acting by and through the Oregon State Board of Higher Education, acting for and on behalf of the Oregon Health Sciences University and the University of Oregon, Portland, Oreg.

Division of Ser. No. 528,216, May 25, 1990, abandoned, which is a continuation-in-part of Ser. No. 346,494, May 2, 1989, abandoned, which is a continuation-in-part of Ser. No. 254,868, Oct. 6, 1988, abandoned, which is a continuation-in-part of Ser. No. 884,150, Jul. 10, 1986, Pat. No. 4,709,094. This application Feb. 23, 1993, Ser. No. 21,051

Int. Cl.[6] C07C 279/04;279/18

U.S. Cl. 564—230 6 Claims

1. A compound selected from the group consisting of N-(2-methyl-4-azidophenyl)-N'-(2-methylphenyl)guanidine, N,N'-di(o-methylbenzyl)guanidine, N,N-di(o-methylbenzyl)guanidine and N,N'-dibenzylguanidine.

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5,502,256

## PROCESS FOR PREPARING 2,2'DINITRODIPHENYL DISULPHIDE

Ferdinand Hagedorn; Helmut Fiege; Robert Sölner, all of Leverkusen, and Rudolf Heim, Bergisch Gladbach, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 7, 1994, Ser. No. 350,552

Claims priority, application Germany, Dec. 14, 1993, 43 42 619.0

Int. Cl.[6] C07C 323/09

U.S. Cl. 568—25 11 Claims

1. A process for preparing 2,2'-dinitrodiphenyl disulphide which comprises reacting 2-chloronitrobenzene with aqueous alkali metal disulphide solution in the presence of 0.001 to 0.2 molar equivalents based on the amount of 2-chloronitrobenzene of a phase transfer catalyst and an organic solvent wherein the molar ratio of 2-chloronitrobenzene to alkali metal disulphide is from 1.7 to 3:1 and the organic solvent is selected from the group consisting of an alcohol, a water-miscible ketone, or a dipolar, aprotic solvent.

5,502,257

## PROCESS FOR THE PRODUCTION OF CYCLOPROPANECARBOXALDEHYDE

Shaowo Liang, Kingsport; Timothy W. Price, Church Hill; Timothy R. Nolen; Daniel B. Compton, both of Kingsport, and David C. Attride, Gray, all of Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.

Filed Feb. 21, 1995, Ser. No. 391,793

Int. Cl.[6] C07C 47/293;47/28

U.S. Cl. 568—433 5 Claims

1. Process for the preparation of cyclopropanecarboxaldehyde which comprises heating 2,3-dihydrofuran at a temperature of about 300° to 600° C. and a pressure of about 3 to 345 bars absolute.

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5,502,258

**Patent Not Issued For This Number**

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5,502,259

## METHOD FOR PURIFICATION OF PHENOL

Vladimir M. Zakoshansky; Irina I. Vasilieva, and Andrei K. Griaznov, all of St. Petersburg, Russian Federation, assignors to General Electric Company, and Ilia International, U.S.S.R.

Filed Aug. 15, 1994, Ser. No. 290,258

Claims priority, application Russian Federation, Dec. 1, 1993, 93-053966/04

Int. Cl.[6] C07C 37/68;37/70

U.S. Cl. 568—754 19 Claims

1. A method for purification of phenol from carbonyl compounds and unsaturated compounds to increase activity, to increase catalyst life and to permit regeneration, comprising contacting the phenol with a zeolite catalyst with pores of more than 4 Å in diameter under atmospheric pressure or a pressure which matches the pressure of the liquid phenol and at a temperature of between about 120° to 250° C.

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5,502,260

## PROCESS FOR PREPARING MULTIPLY FLUORINATED NITROBENZENES

Thomas Schach, Gernsheim, and Theodor Papenfuhs, Frankfurt am Main, both of, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

Filed Jul. 19, 1994, Ser. No. 276,951

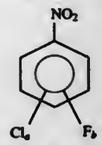
Claims priority, application Germany, Jul. 21, 1993, 43 24 365.7

The portion of the term of this patent subsequent to Dec. 19, 2012, has been disclaimed.

Int. Cl.[6] C07C 201/2

U.S. Cl. 568—938 10 Claims

1. A process for preparing multiply fluorinated nitrobenzenes comprising the step of reacting a compound of the formula (4)

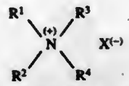


(4)

in which a is a number from 2 to 4 and b is a number from 0 to 2; with an alkali metal fluoride, in the presence of a catalyst, wherein the catalyst consists essentially of:

a component a) which consists essentially of one quaternary ammonium compound corresponding to formula 1 or a plurality of quaternary ammonium compounds corresponding to formula (1)





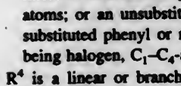
(1)

in which $R^1$, $R^2$ and $R^3$ are identical or different and are a linear or branched alkoxypolyoxyalkyl radical of the formula $(C_mH_{2m}O)_pR^5$, in which $R^5$ is hydrogen or a linear or branched alkyl radical having from 1 to 16 carbon atoms, m is an integer from 1 to 10 and p is a number from 1 to 15; or a linear or branched alkyl radical having from 1 to 30 carbon atoms; or an unsubstituted phenyl or naphthyl radical; or a substituted phenyl or naphthyl radical, with the substituents being halogen, $C_1$–$C_4$-alkyl, $C_1$–$C_4$-alkoxy, nitro or cyano;

$R^4$ is a linear or branched alkoxypolyoxyalkyl radical of the formula $—(C_mH_{2m}O)_pR^5$ in which m, p, and $R^5$ are as defined above; and

$X^{(-)}$ is an inorganic anion; or

the catalyst consists essentially of a mixture of component a) and a component b) which consists essentially of one or more quaternary ammonium salt(s) or phosphonium salt(s) of the formula (2)



(2)

in which $R^6$, $R^7$, $R^8$ and $R^9$ are identical or different and are a linear or branched alkyl radical having from 1 to 22 carbon atoms; or an unsubstituted or substituted aryl radical or a $C_1$–$C_4$-alkylaryl radical, with aryl being phenyl or naphthyl and said substituents being halogen, $C_1$–$C_4$-alkyl, $C_1$–$C_4$-alkoxy, nitro or cyano; and

Y is N or P; or

the catalyst consists essentially of a mixture of component a) and a component c) which consists essentially of one or more polyether(s) of the formula (3)



(3)

in which $R^{10}$ and $R^{11}$ are identical or different and are hydrogen or a linear or branched alkyl radical having from 1 to 16 carbon atoms,

x is an integer from 2 to 6 and

r is a number from 0 to 20; or

component c consists essentially of a crown ether; or

the catalyst consists essentially of a mixture of components a), b) and c).

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5,502,261

## PROCESS FOR PREPARING 2,2'-BIS(HALOMETHYL)-1,1'-BINAPHTHYL

Hans-Jerg Kleiner, Kronberg; Dieter Regnat, Eppstein, and Horst Röschert, Ober-Hilbersheim, all of, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt

Filed Mar. 21, 1995, Ser. No. 408,057

Claims priority, application Germany, Mar. 23, 1994, 44 09 974.6; Sep. 19, 1994, 44 33 296.3

Int. Cl.[6] C07C 17/14;22/04

U.S. Cl. 570—196 26 Claims

1. A process for preparing 2,2-bis(halomethyl)-1,1'-binaphthyl, which comprises the step of reacting 2,2'-dimethyl-1,1'-binaphthyl in the presence of a solvent with a halogenating agent under the action of light having a wavelength of from $10^{-5}$ to $10^{-6}$ m at from −10° to 120° C.

5,502,262

## PROCESS FOR THE CONVERSION OF VULCANIZED RUBBERS INTO OILS BY USE OF SUPERCRITICAL AQUEOUS FLUIDS

Nakamichi Yamasaki, Kochi; Kenji Tsuda, Hiroshima; Hiroyuki Okuda, Hiroshima, and Toshinori Tenno, Hiroshima, all of, Japan, assignors to Nakamichi Yamasaki, Kochi, and Nishikawa Rubber Co., Ltd., Hiroshima, both of, Japan

Filed Mar. 29, 1994, Ser. No. 219,104

Claims priority, application Japan, Apr. 1, 1993, 5-100403; Apr. 1, 1993, 5-100404; Apr. 1, 1993, 5-100405

Int. Cl.[6] C07C 7/00;1/32

U.S. Cl. 585—241 11 Claims

1. A process for the conversion of vulcanized rubber products into an oil mixture composed mainly of hydrocarbons which comprises providing a rubber product vulcanized with sulfur or a peroxide, adding an aqueous medium to the rubber product, subjecting the resultant mixture to decomposition under supercritical conditions of a temperature of from 374° to 500° C. and a pressure not lower than 225 kg/cm$^2$ thereby obtaining an oily substance mainly composed of mixed hydrocarbons.

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5,502,263

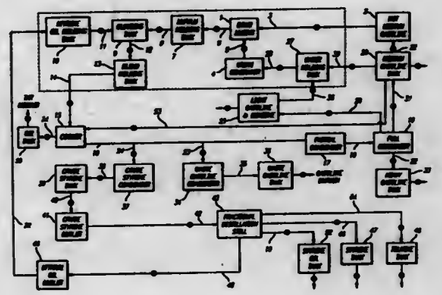
## METHOD OF RECLAIMING STYRENE AND OTHER PRODUCTS FROM POLYSTYRENE BASED PRODUCTS

Thomas E. Pomford, and Henry T. Pomford, both of 14112 Durbullen Dr., Poway, Calif. 92064

Continuation of Ser. No. 10,350, Jan. 28, 1993, Pat. No. 5,406,010. This application Jan. 10, 1995, Ser. No. 370,682

Int. Cl.[6] C07C 4/04

U.S. Cl. 585—241 6 Claims



1. A method for reclamation of styrene from polystyrene in polystyrene based products, comprising the steps of:

mixing the polystyrene based product with a solvent to form a polystyrene solution having a sufficiently low viscosity to allow free boiling of said polystyrene solution, said solvent being selected from the group consisting of vinylbenzene, and styrene oil resulting from the partial depolymerization of polystyrene, said styrene oil having a pour point below −20° C. and a boiling point between about 300° C. and 320° C.;

heating the polystyrene solution to a temperature of from approximately 300° C. to 400° C. to depolymerize the polystyrene and to produce a vinylbenzene fraction and a heavier containing said styrene oil as a result of the partial depolymerization of polystyrene;

separating the vinylbenzene fraction from the heavier fraction; and

recycling at least a portion of said styrene oil to provide at least a portion of said solvent in the step of mixing said polystyrene with said solvent to form a polystyrene solution prior to said step of heating the polystyrene solution.

**5,502,264**

## METHOD OF PREPARING UNSATURATED DIMERS OF α-METHYLSTYRENES

**Hiroshi Nishizawa; Takayuki Saitoh; Tatsuo Itoh, and Kiyotaka Mashita, all of Ichihara, Japan, assignors to Goi Chemical Company, Ltd., Chiba, Japan**

**Filed May 18, 1994, Ser. No. 245,670**
**Claims priority, application Japan, Sep. 6, 1993, 5-243536**
**Int. Cl.[6] C07C *2/04***
**U.S. Cl. 585—406** **18 Claims**

1. A method of preparing an unsaturated dimer of an α-methylstyrene comprising dimerizing the α-methylstyrene by stirring 50 to 95 parts by weight of the α-methylstyrene at a temperature of 20° to 90° C. for 0.5 to 24 hours in the presence of 50 to 5 parts by weight of an aqueous solution of a sulfonic acid; the aqueous solution of the sulfonic acid having a concentration of sulfonic acid of 30 to 80% by weight.

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**5,502,265**

## CHROMIUM RIBBON-LIKE SILICATE CLAY α-OLEFIN CATALYSTS

**Joseph S. Shveima, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.**

**Division of Ser. No. 59,228, May 6, 1993, Pat. No. 5,376,611, which is a continuation-in-part of Ser. No. 883,857, Dec. 9, 1991, abandoned. This application Sep. 29, 1994, Ser. No. 314,998**
**Int. Cl.[6] C07C *2/08***
**U.S. Cl. 585—530** **10 Claims**

1. A process for polymerizing at least one olefin having 2 to 8 carbon atoms per molecule which comprises contacting said olefin under polymerization conditions with a catalyst system which was produced by the process comprising:

(a) contacting a ribbon-like clay selected from the group consisting of sepiolites having a surface area in the range of about 125 to about 215$M^2/g$ and a pore volume in the range of about 0.35 to about 0.70 $cm^3/g$ and palygorskites having a surface area in the range of about 110 to about 140$M^2/g$ and a pore volume in the range of about 0.50 to about 0.70 $cm^3/g$, with a chromium solution having a chromium content in the range of about 0.001 g/ml to about 0.01 g/ml and a pH in the range of about 1.5 to about 2.5 thereby preparing a first product;

(b) heating said first product at a temperature in the range of about 150° C. to about 550° C. and for a time period in the range of about 30 minutes to about 10 hours in an inert atmosphere;

(c) thereafter continuing heating said first product at a temperature in the range of about 500° C. to about 900° C. and for a time period in the range of about 1 hour to about 50 hours in an oxidizing atmosphere.

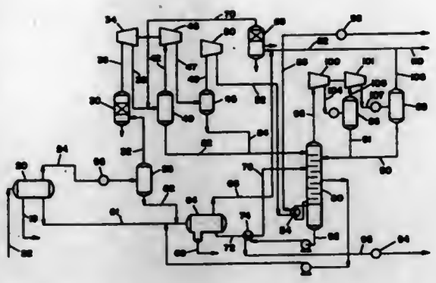
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**5,502,266**

## METHOD OF SEPARATING WELL FLUIDS PRODUCED FROM A GAS CONDENSATE RESERVOIR

**John E. Hodson, Reading, England, assignor to Chevron Research and Technology Company, a Division of Chevron U.S.A. Inc., San Francisco, Calif.**

**Filed Oct. 19, 1992, Ser. No. 963,143**
**Int. Cl.[6] C07C *7/00;7/09***
**U.S. Cl. 585—802** **4 Claims**



1. A method of separating well fluids produced from a gas condensate reservoir into a liquid phase and a gas phase for export from an offshore platform comprising:

flowing gas condensate produced fluids from a reservoir to a first stage separator;

maintaining the first stage separator at a pressure of between about 600 psi and 1500 psi and a temperature of between approximately the hydrate formation temperature of the produced fluids and 240° F.;

separating said gas condensate into a first gas phase and a first liquid phase, and cooling said first gas phase to below about 80° F.;

removing a residual liquid component from said first gas phase, and dehydrating said first gas phase to remove residual water from said first gas phase;

expanding and cooling said first gas phase to a pressure and a temperature needed to achieve a hydrocarbon dew point pressure that permits a substantially single phase flow;

compressing said first gas phase and flowing said first gas phase to an export system;

combining said first liquid phase with the residual liquid removed from said first gas phase, and flowing the combined liquid phase to a second stage separator maintained at a pressure of between about 400 psig to 600 psig and a temperature of about 80° F. to 200° F.;

separating said combined liquid into a second gas phase and a second liquid phase, dehydrating said second gas phase, and flowing said second gas phase to an export system;

flowing said second liquid phase to a stabilizer column maintained at a pressure of about 15 psig to 50 psig and a temperature between about 50° F. at the top of said column to 240° F. at the bottom of said column;

removing a liquid component from said stabilizer column to an export system and removing a gas component from said stabilizer; and

compressing and dehydrating said gas component for recycle into said first gas phase.

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**5,502,267**

## ORGANIC AND METALLIC WASTE DISPOSAL IN BENTONITE-WATER MIXTURES

**Winton G. Aubert, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.**

**Filed Jun. 30, 1994, Ser. No. 269,455**
**Int. Cl.[6] B09B *1/00;3/00***
**U.S. Cl. 588—250** **13 Claims**

1. A method of disposing of waste material selected from a group consisting of refinery sludges and tank bottom sludges and paint, solvent and wax manufacturing wastes, active metals, metal oxides and hydrocarbon waste comprising the steps of:

preparing a slurry of said waste material, bentonite and water such that said waste material is attached to said bentonite by at least one of adsorption and ion exchange; and

injecting said slurry into a subterranean earth formation through a disposal well.

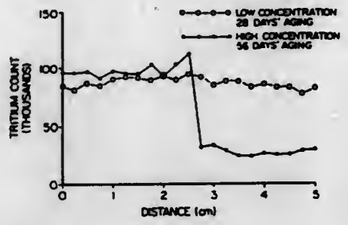


**5,502,268**

## METHOD FOR SEALING OF A MASS OF WASTE

**Pierre L. Côté, Hamilton, Canada, and Hans A. Van der Sloot, Callantsoog, Netherlands, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of the Environment, Canada**

**PCT No. PCT/NL91/00209, § 371 Date Apr. 22, 1993, § 102(e) Date Apr. 22, 1993, PCT Pub. No. WO92/06801, PCT Pub. Date Apr. 30, 1992**
**PCT Filed Oct. 22, 1991, Ser. No. 50,010**
**Claims priority, application Canada, Jan. 22, 1990, 2028251**
**Int. Cl.[6] A62D *3/00; B09B 3/00***
**U.S. Cl. 588—259** **22 Claims**




1. A method for sealing off a mass of waste or stabilized waste which comprises:

surrounding the mass of waste, stabilized waste, or its emplacement site with a substantially continuous layer of porous material containing a first reagent, the layer defining one portion of a substantially continuous, waste-encompassing interface;

providing a second reagent, capable of forming a precipitate on reaction with said first reagent, in porous material defining an adjacent portion of said interface;

and causing solvent for the reagents to permeate the porous materials so that the reagents in said adjacent portions diffuse or migrate towards each other to form a precipitate in the pores of said porous material substantially along said interface;

the amount of each reagent being at least such that the pores of said porous material along said interface are filled forming a waste-encompassing layer of reduced permeability at least 100×lower than that of the porous material before sealing or with a diffusivity of a solute through water-filled pores of the material of at least 10×lower than that before sealing.

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**5,502,269**

## PROCESS FOR THE ISOMERIZATION OF EXTERNAL OLEFINS TO INTERNAL OLEFINS CONCOMITANTLY WITH DIOLEFIN HYDROGENATION

**Patrick Sarrazin, Rueil Malmaison; Charles Cameron, Paris; Jean-Paul Boitiaux, Poissy, and Pierre Dufresne, Rueil Malmaison, all of, France, assignors to Institut Francais du Petrole, Rueil Malmaison, France**

**Filed Jul. 29, 1994, Ser. No. 282,474**
**Claims priority, application France, Jul. 3, 1993, 93/09529**
**Int. Cl.[6] C07C *5/23***
**U.S. Cl. 585—668** **17 Claims**

1. In a process for the isomerization of external olefins contained in a feedstock to internal olefins, said liquid feedstock containing diolefins, in the presence of a palladium based catalyst and in the presence of hydrogen, the isomerization conditions of the process corresponding to a temperature of between 20° C. and 200° C., a pressure of between 1 and 50 bars, a VVH of between 0.5 and 10 $h^{1-}$and an H2/diolefin molar ratio of between 0.5 and 5, the improvement wherein the catalyst is treated, before being loaded into the isomerization reactor, with at least one sulphur-containing organic compound dissolved in a solvent; the resultant catalyst containing 0.05% to 10% by weight of sulphur, is loaded into the reactor and activated in a neutral or reducing atmosphere at a temperature of between 20° C. and 300° C., a pressure of between 1 and 50 bars and a VVH of between 50 and 600 $h^{-1}$; and the feedstock is brought into contact with said activated catalyst under said isomerization conditions.

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**5,502,270**

## STARCH AND GRAIN WITH A NOVEL GENOTYPE

**Richard W. Pearlstein, and James F. Ulrich, both of Newark, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Mar. 30, 1993, Ser. No. 40,333**
**Int. Cl.[6] A01H *5/00;5/10;1/00***
**U.S. Cl. 800—200** **3 Claims**

1. Grain produced by maize in which the genotype of said grain comprises a genome which is homozygous recessive for the waxy gene and the amylose extender gene, and heterozygous for the dull gene.

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**5,502,271**

## MAIZE RESISTANT TO ARYLOXYPHENOXYALKANECARBOXYLIC ACID HERBICIDES

**Günter Donn, Hofheim am Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany**

**Continuation of Ser. No. 245,864, May 17, 1994, abandoned, which is a continuation of Ser. No. 70,430, Jun. 8, 1993, abandoned. This application Jun. 5, 1995, Ser. No. 464,295**
**Claims priority, application European Pat. Off., Mar. 12, 1991, 91103765**
**Int. Cl.[6] A01H *1/04;1/06;* C12N *5/04;15/01***
**U.S. Cl. 800—200** **15 Claims**

2. A maize plant regenerated from auxin-autotrophic maize cells, maize protoplasts, maize cell cultures and maize calli as well as progeny thereof which is resistant to conventional application concentrations of aryloxyphenoxyalkanecarboxylic acid herbicides, and the progeny of such a maize plant.

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**5,502,272**

## HYBRID CORN PLANT AND SEED (3563)

**Loren J. Hoffbeck, Tipton, Ind., assignor to Pioneer Hi-Bred International, Inc., Des Moines, Iowa**

**Continuation of Ser. No. 649,791, Feb. 1, 1991, abandoned. This application May 10, 1995, Ser. No. 438,678**
**Int. Cl.[6] A01H *5/00;4/00;* C12H *5/04***
**U.S. Cl. 800—200** **4 Claims**

1. A hybrid corn plant designated as 3563 and its parts, produced from seed having ATCC accession no. 97344.

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**5,502,273**

## PRODUCTION OF POLYHYDROXY ALKANOATE IN PLANTS

**Simon W. J. Bright, Marlow, Bucks; David Byrom, Cleveland, and Philip A. Fentem, Berkshire, all of, England, assignors to Zeneca Limited, London, United Kingdom**

**Continuation of Ser. No. 181,370, Jan. 14, 1994, abandoned, which is a continuation of Ser. No. 873,429, Apr. 24, 1992, abandoned. This application Sep. 28, 1994, Ser. No. 314,439**
**Claims priority, application United Kingdom, Apr. 24, 1991, 9108756**
**Int. Cl.[6] A01H *5/00;* C12N *5/14;15/00;15/52;* C12P *7/62***
**U.S. Cl. 800—205** **6 Claims**

1. A *Brassica napus* plant adapted for the production of polyhydroxyalkanoate comprising a recombinant genome of a *Brassica*

*napus* plant, which genome contains genes encoding β-ketothiolase, acetoacetyl-Coenzyme A reductase and polyhydroxyalkanoate synthase for catalysing the production of polyhydroxyalkanoate together with gene regulatory sequences, including seed specific gene regulatory sequences directing expression of the said genes to the seed of said *Brassica napus* plant.



**5,502,274**

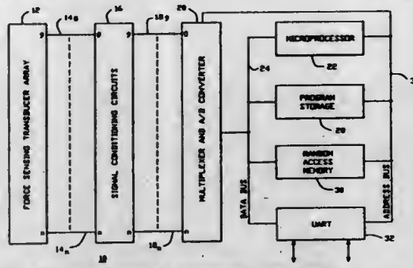
## ELECTRONIC MUSICAL INSTRUMENT FOR PLAYING ALONG WITH PRERECORDED MUSIC AND METHOD OF OPERATION

**Jimmy C. Hotz, Thousand Oaks, Calif., assignor to The Hotz Corporation, Thousand Oaks, Calif.**

**Division of Ser. No. 84,745, Jun. 29, 1993, abandoned, which is a continuation of Ser. No. 820,761, Jan. 13, 1992, abandoned, which is a division of Ser. No. 447,381, Dec. 7, 1989, Pat. No. 5,099,738, which is a continuation of Ser. No. 292,966, Jan. 3, 1989, abandoned. This application Jun. 6, 1994, Ser. No. 254,447**

**Int. Cl.[6] G10H *1/38***

**U.S. Cl. 84—613** **28 Claims**




1. An electronic musical instrument comprising:
a plurality of manual input devices adapted to generate manual input device signals in response to being played;
a first memory adapted to store a plurality of different translation tables, said translation tables adapted to translate said manual input device signals into corresponding control signals;
a device for automatically playing a sound recording having at least a sound recording track and an information track recorded thereon, said information track containing translation table selection signals synchronized with events in said sound recording track, said device adapted to output said translation table selection signals;
a translator responsive to said manual input device signals, said translation tables and said translation table selection signals, and adapted to generate said control signals; and
an electronic signal generator responsive to said control signals.

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**5,502,275**

## AUTOMATIC ACCOMPANIMENT APPARATUS IMPLEMENTING SMOOTH TRANSITION TO FILL-IN PERFORMANCE

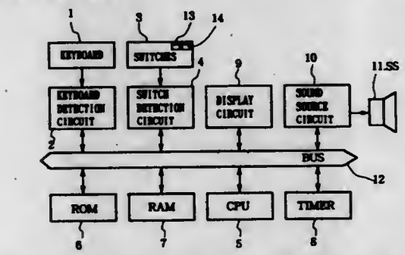
**Masao Kondo; Shinichi Ito, and Hiroki Nakazono, all of Hamamatsu, Japan, assignors to Yamaha Corporation, Japan**

**Filed Apr. 15, 1994, Ser. No. 228,135**

**Claims priority, application Japan, May 31, 1993, 5-152930**

**Int. Cl.[6] G10H *1/38;1/40***

**U.S. Cl. 84—635** **17 Claims**




9. An automatic accompaniment apparatus comprising:
automatic accompaniment means for selectively performing a plurality of predetermined musical patterns including a first rhythm pattern, a second rhythm pattern, a first other pattern, and a second other pattern;
a selector for instructing a change of automatic accompaniment from one group of predetermined musical patterns to another group; and
a controller responsive to said selector and coupled to said accompaniment means, separately controlling switching of said first rhythm pattern to said second rhythm pattern and switching of said first other pattern to said second other pattern depending on a timing of the selecting of the musical patterns relative to a bar of said musical patterns being currently performed.

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**5,502,276**

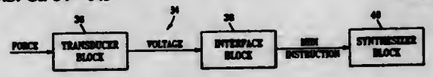
## ELECTRONIC MUSICAL KEYBOARD INSTRUMENTS COMPRISING AN IMMOVABLE POINTING STICK

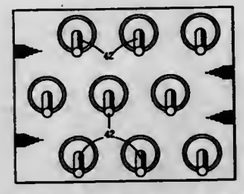
**David H. Jameson, Chappaqua, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Continuation-in-part of Ser. No. 215,345, Mar. 21, 1994. This application May 2, 1995, Ser. No. 432,656**

**Int. Cl.[6] G10H *7/00***

**U.S. Cl. 84—645** **6 Claims**



1. A process for retrofitting an electronic musical instrument for supporting multiple parameter control, the process comprising the steps of:
(1) equipping the electronic musical instrument with at least one pointing stick, the or each pointing stick dedicated to a preselected information parameter and being adapted for sensing a force indicative of a desired control parameter; wherein the or each pointing stick is substantially immovable with respect to the instrument but can respond to finger-tip inputs; and
(2) connecting the or each immovable pointing stick to a musical instrument digital interface (MIDI) generator means for translating a force into a corresponding musical instrument digital interface instruction.

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**5,502,277**

## FILTER DEVICE AND ELECTRONIC MUSICAL INSTRUMENT USING THE FILTER DEVICE

**Goro Sakata, Mitaka, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan**

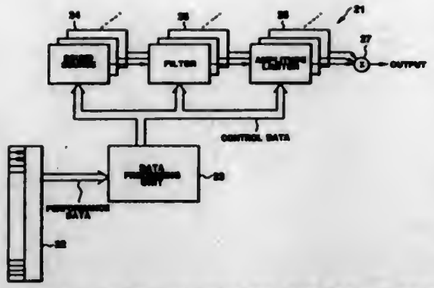
**Division of Ser. No. 82,059, Jun. 23, 1993, which is a continuation of Ser. No. 727,654, Jul. 9, 1991, Pat. No. 5,270,954. This application May 2, 1995, Ser. No. 432,672**

**Claims priority, application Japan, Jul. 18, 1990, 2-189786**

**Int. Cl.[6] G10H *1/12;5/00***

**U.S. Cl. 84—661** **48 Claims**

1. An electronic musical instrument comprising:
performance operating means for inputting performance data;
musical-tone signal generating means for generating musical tone signal data on the basis of the performance data input from said performance operating means;
frequency setting means for setting a desired frequency from which a transmission characteristic of filtering begins to vary




on the basis of the performance data input from said performance operating means;

gain setting means for setting a gain at a half frequency of sampling frequency on the basis of the performance data input from said performance operating means;

coefficient calculating means for calculating coefficients based on the desired frequency set by said frequency setting means and the gain set by the gain setting means; and

digital filtering means for performing a filtering operation on musical tone signal data generated by said musical tone signal generating means on the basis of a transmission function defined by the coefficient output from said coefficient outputting means.

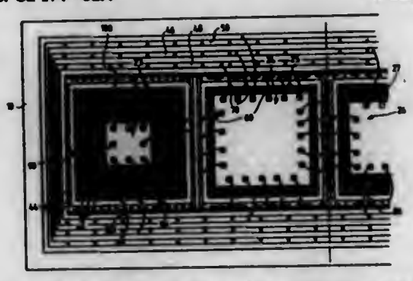
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**5,502,278**

**ENCASED ELECTRONIC CIRCUIT WITH CHIP ON A GRID ZONE OF CONDUCTIVE CONTACTS**

**Henri Mabboux, Saint Martin le Vinoux, and Michel Mermet-Guyennet, Saint Egreve, both of, France, assignors to Thomson Components Militaires et Spatiaux, Courbevoie, France**

**Continuation of Ser. No. 640,387, Jan. 23, 1991, abandoned.**
**This application Oct. 6, 1993, Ser. No. 132,701**
**Claims priority, application France, May 30, 1989, 89 07091**
**Int. Cl.[6] H01L *23/02*; H01R *9/00***
**U.S. Cl. 174—52.4** **8 Claims**



1. A chip-carrier for wire-bonded chips comprising a substrate having a support face including:

at least one supporting area for receiving a rear face of a wire bondable chip, which chip has on an opposite face a majority of its input and output contacts,

conductive regions surrounding said supporting area and intended to be connected to external connection pins,

conductive contacts located between said conductive regions and said supporting area so as to permit to link by at least two conductive wires from one input or output contact of said chip to at least one conductive region when the dimensions of the chip are too small to authorize a reliable link with only one wire between said input an output contact and said conductive region,

wherein said supporting area is covered with continuous conductive layer.

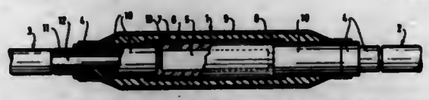
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**5,502,279**

**JOINT FOR ELECTRICAL CABLES**

**Pierre Mirebeau, Villebon Sur Yvette; Stanislas Galaj, Arcueil, and Madeleine Prigent, Marcoussis, all of, France, assignors to Euromold, Brussels, Belgium**

**Filed Dec. 22, 1994, Ser. No. 362,663**
**Claims priority, application France, Dec. 23, 1993, 93 15557**
**Int. Cl.[6] H02G *15/103***
**U.S. Cl. 174—73.1** **8 Claims**



1. A joint for a medium or high tension electrical cable comprising, coaxially from the cable core, at least a first layer which is externally surrounded by a second layer that is elastomeric and electrically insulative, characterized in that said first layer is constituted by a mixture of a polymeric matrix and a filler constituted by a polymer comprising functions in its monomer units which can distribute the electric field homogeneously, said filler being selected from a polymer containing polar pendant groups with a relative dielectric constant greater than or equal to 10, the proportion being selected so that the dielectric constant of said mixture is greater than or equal to 6, said first and second layers being intimately associated with an adhesion greater than or equal to 5 $N.cm^{-1}$.

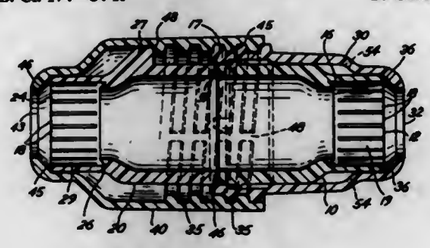
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**5,502,280**

**CABLE SPLICE PROTECTOR**

**Joseph Rocci, Burr Ridge, and David W. Kirby, Lemont, both of Ill., assignors to Etcon Corporation, Burr Ridge, Ill.**

**Continuation of Ser. No. 100,672, Jul. 30, 1993, abandoned.**
**This application Nov. 7, 1994, Ser. No. 335,111**
**Int. Cl.[6] H01R *4/00*; *13/52***
**U.S. Cl. 174—84 R** **26 Claims**



1. A cable splice protector comprising:

(a) a first inner shell having a first open end an opposing second open end having a smaller cross-sectional area than the first open end and consisting of a compressible wall;

(b) an apertured gronmet located inside the compressible wall of the first inner shell;

(c) a second inner shell having a first open end complementary to the first open end of the first inner shell, an opposing second open end having a smaller cross-sectional area than the first open end and consisting of a compressible wall;

(d) an apertured grommet located inside the compressible wall of the second inner shell;

(e) a first outer shell having a cavity large enough to contain the first inner shell and having a first open end and an opposing second open end having an inwardly tapered shoulder;

(f) a second outer shell having a cavity large enough to contain the second inner shell, the second outer shell including a first open end, and an opposing second open end having an inwardly tapered shoulder;

(g) a connector for compressively uniting the first outer shell with the second outer shell; and



(h) a seal located between the first open end of the first inner shell and the first open end of the second inner shell.

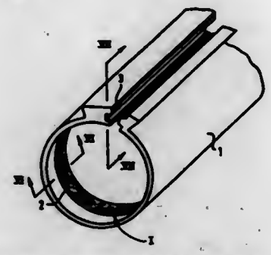
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**5,502,281**

**CABLE SLEEVE OF PLASTIC COMPOSED OF A SLOTTED SOCKET PIPE AND SEAL MEMBERS AT THE FACE END**

**Rainer Schoelling, Herdecke; Detlef Graefe; Hermann Klostermeyer, both of Hagen, and Martin Greisinger, Iserlohn, all of, Germany, assignors to RXS Schrumpftechnik-Garnituren GmbH, Hagen, Germany**

**Filed May 10, 1994, Ser. No. 240,136**
**Claims priority, application Germany, May 27, 1993, 43 17 724.7**
**Int. Cl.[6] H02G *15/113***
**U.S. Cl. 174—92** **21 Claims**



1. In a cable sleeve having a region having a pipe section with a circumferential surface adapted to mate with a seal member, and a longitudinal seam having mating seam edges, said circumferential surface and said seam edges respectively having sealing regions, the improvement comprising:

a sealing insert firmly joined to said pipe section and arranged in said sealing regions of said circumferential surface and said seam edges; and

wherein the sealing insert is vulcanized to the pipe section.

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**5,502,282**

**SLEEVE HEAD FOR A CABLE SLEEVE HAVING A SEAL INSERT COMPOSED OF ELASTIC MATERIAL**

**Dieter Kunze, Neuried, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany**

**Filed Jun. 7, 1994, Ser. No. 257,097**
**Claims priority, application Germany, Aug. 11, 1993, 43 26 972.9**
**Int. Cl.[6] H02G *15/04***
**U.S. Cl. 174—93** **23 Claims**

1. In a sleeve head for a cable sleeve having a seal insert of elastic material and having pressure-producing elements for pressing the seal insert, the improvement comprising:

the cable sleeve being conically expanded toward the end in the introduction region;

a conical seal insert, two pressure plates, and at least one pressure-producing element arranged between the two pressure plates, the insert being matched to the introduction region, arranged between the two pressure plates;

the seal insert comprising conically converging cable introduction openings;

the seal insert compressed and shaped by the pressure plates using the pressure-producing elements, such that a sealing pressing against the introduced cables ensues due to the deformation of the seal insert in the cable introduction openings.

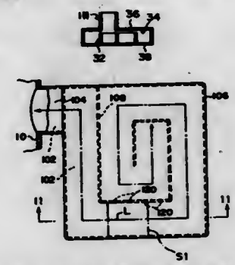
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**5,502,283**

**MUFFLER**

**Hidehito Ukai; Kazuo Kometani; Kazuyuki Horie, and Toshiaki Nakayama, all of Aichi, Japan, assignors to Toyoda Boshoku Kabushiki Kaisha, and Nippondenso Co., Ltd., both of, Japan**

**Continuation of Ser. No. 958,251, Sep. 24, 1992, abandoned.**
**This application Mar. 3, 1995, Ser. No. 400,200**
**Claims priority, application Japan, Sep. 25, 1991, 3-245970; Jul. 31, 1992, 4-205459**
**Int. Cl.[6] F01N *7/08*; *1/02*; *1/08***
**U.S. Cl. 181—228** **20 Claims**



1. A muffler for connection to an intermediate portion of a ventilation conduit comprising:

means for defining an offshoot path including:

an offshoot path member having a first opening and a second opening, said first opening designed to be connected to said intermediate portion of said ventilation conduit; and

an enclosed chamber connected to and in communication with said offshoot path member at said second opening, said enclosed chamber containing at least one partition positioned therein such that said offshoot path undergoes at least one bend in direction within said chamber, and at least one small opening in said at least one partition, said at least one small opening positioned transversely to said offshoot path.

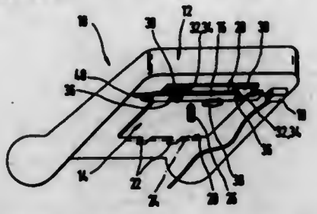
19. A muffler for connection to a ventilation conduit comprising:

an offshoot path member having a first opening and a second opening, said first opening designed to be connected to said ventilation conduit;

an enclosed chamber including top and bottom walls and first and second side walls, said enclosed chamber connected to and in communication with said offshoot path member at said second opening, said enclosed chamber including at least one interior partition extending from one of said first and second side walls toward the other of said first and second side walls but not contacting the other of said first and second side walls, said at least one interior partition also extending from one of said top and bottom walls toward but not contacting the other of said top and bottom walls to form an open end of said at least one interior partition, and a continuous gap between said open end of said at least one interior partition and the other of said top and bottom walls; and

said offshoot path member, said enclosed chamber, and said at least one interior partition defining an offshoot path, and said continuous gap providing an escape path for sound waves in said offshoot path.

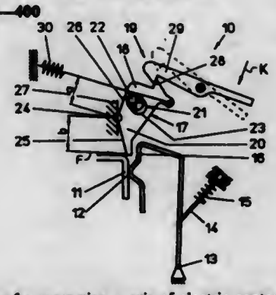
5,502,284
**SEAT PLATE ASSEMBLY**
Hermann Meiller, Amberg; Richard Ott, Kümmersbruck, and Walter Mertel, Sulzbach-Rosenberg, all of, Germany, assignors to Grammer AG, Amberg, Germany
Filed Mar. 6, 1995, Ser. No. 398,927
Claims priority, application Germany, Mar. 14, 1994, 44 08 481.1
Int. Cl.[6] H01H *3/14*; B60K *28/00*
U.S. Cl. 200—85 A 5 Claims



1. A seat plate assembly for a vehicle, comprising a base portion, a seat cushion means on the base portion, an at least substantially flat operating element resiliently movably disposed between the base portion and the seat cushion means, a switching means actuable by movement of the operating element for switching a functional device of the vehicle into a first condition upon a given minimum weight loading on the assembly and for switching the functional device into a second condition when the assembly is relieved of load, at least one drive portion at the underside of the operating element and having at least one actuating wedge surface, an elongate actuating member for operating the switching means and having at least one opening co-operable with said actuating surface of said drive portion, whereby upon downward movement of said operating element and therewith said drive portion under a weight loading on said assembly said actuating surface presses against an edge of the associated opening in the elongate actuating member and displaces the elongate actuating member in the longitudinal direction thereof for actuation of the switching means, and a spring means connected to the elongate actuating member and adapted to be mechanically stressed when the elongate actuating member is displaced for actuation of the switching means.

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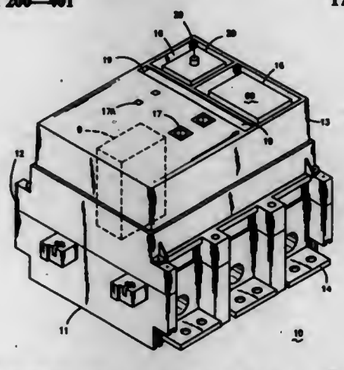
5,502,285
**CONTACT-SEPARATING DEVICE FOR CIRCUIT BREAKERS**
Peter Flohr, Main, Germany, assignor to Heinrich Kopp AG, Kahl/Main, Germany
Filed Jul. 25, 1994, Ser. No. 280,100
Claims priority, application Germany, Aug. 3, 1993, 43 26 067.5
Int. Cl.[6] H01H *5/00*
U.S. Cl. 200—400 10 Claims



1. A device for separating a pair of electric contacts in a circuit breaker which tend to weld and consist of a stationary contact and a movable contact which is movable away from the stationary contact:
comprising a tripping lever for actuating said movable contact, said tripping lever being biased in a contact-separating direction and movable about a tripping lever fulcrum from a stand-by position to a displaced position and
means for holding the tripping lever in the stand-by position and for tripping the tripping lever from the stand-by position,
the movement of the tripping lever from its stand-by position after a tripping involving a displacement of the fulcrum for exerting a biased separating force on said movable contact.

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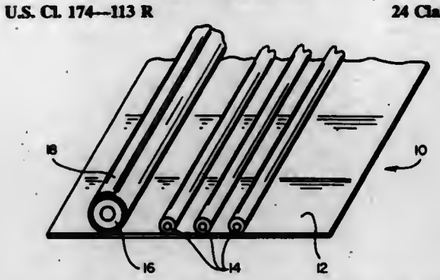
5,502,286
**BELL ALARM AND LOCK-OUT FOR HIGH AMPERE-RATED CIRCUIT BREAKERS**
John A. Pellman, Seymour; Raymond K. Seymour, Plainville; Paul H. Singer, West Hartford, and Paul T. Rajotte, Plainville, all of Conn., assignors to General Electric Company, New York, N.Y.
Filed May 25, 1994, Ser. No. 248,910
Int. Cl.[6] H01H *23/00*
U.S. Cl. 200—401 17 Claims



1. An industrial-rated circuit breaker for high level overcurrent protection comprising:
an insulative base and an insulative cover;
an operating mechanism in said base controlled by an electronic trip unit arranged within a trip unit recess in said cover; and
a bell alarm and lock-out accessory unit arranged within an accessory recess 16 in said cover, said accessory unit including a reset button extending from a top of said accessory unit to provide indication as to the condition of said operating mechanism and to allow manual reset function to said accessory unit, said accessory unit further includes a flux shifter having a plunger extending from said accessory unit at a bottom thereof;
a plate connecting between said reset button and said plunger, said plate being slidably arranged within said accessory unit between a latched and an unlatched position;
a switch interacting with said plate to thereby turn said switch on and off by contact with said plate between said latched and unlatched positions; and
a printed circuit board connecting with said switch and said flux shifter, said printed circuit board including means for removably connecting with said circuit breaker trip unit.



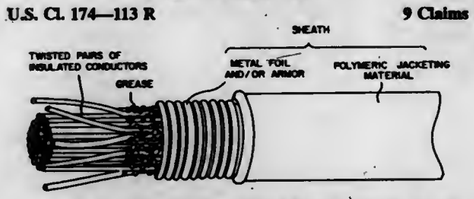
5,502,287
**MULTI-COMPONENT CABLE ASSEMBLY**
Phu D. Nguyen, San Jose, Calif., assignor to Raychem Corporation, Menlo Park, Calif.
Filed Mar. 10, 1993, Ser. No. 28,710
Int. Cl.[6] H01B *7/00*
U.S. Cl. 174—113 R 24 Claims



1. A cable assembly which can be bent or twisted and which comprises
(1) a support substrate;
(2) a first cable component which comprises at least one conductor; and
(3) a first affixment means which
(a) is wrapped spirally around the first cable component so that the first cable component is slidable relative to the first affixment means, and
(b) is secured to the support substrate.

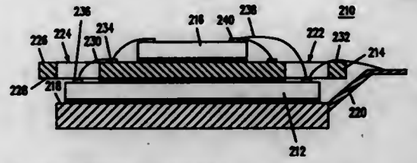
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5,502,288
**TELEPHONE CABLES**
Jeffrey M. Cogen, Flemington; Michael J. Keogh, and Geoffrey D. Brown, both of Bridgewater, all of N.J., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.
Filed Mar. 30, 1994, Ser. No. 219,995
Int. Cl.[6] H01B *7/28*
U.S. Cl. 174—113 R 9 Claims




1. An article of manufacture comprising (I) a plurality of electrical conductors having interstices therebetween, each electrical conductor being surrounded by one or more layers comprising a mixture of (i) one or more polyolefins; (ii) a first antioxidant selected from the group consisting of poly(2,2,4-trimethyl-1,2-dihydroquinoline); the reaction product of diphenylamine and acetone; the reaction product of diphenylamine, acetone, and formaldehyde; and mixtures thereof; and (iii) a second antioxidant selected from the group consisting of 2,2'-oxalyldiamido-bis[ethyl-3-( 3,5-di-tert-butyl-4-hydroxyphenyl)propionate]; 1,2-bis(3,5-di-tert-butyl-4-hydroxyhydrocinnamoyl)hydrazine; and mixtures thereof; and (II) hydrocarbon cable filler grease within the interstices.

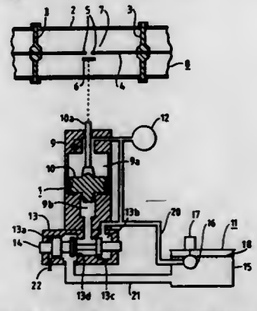
5,502,289
**STACKED MULTI-CHIP MODULES AND METHOD OF MANUFACTURING**
Hem P. Takiar, Fremont, and Peng-Cheng Lin, Cupertino, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.
Division of Ser. No. 887,774, May 22, 1992, Pat. No. 5,422,435. This application Mar. 16, 1995, Ser. No. 403,861
Int. Cl.[6] H05K *1/00*
U.S. Cl. 174—266 4 Claims



1. A circuit assembly, comprising:
a first semiconductor die having substantially parallel opposing first and second surfaces and at least one electrical contact disposed at the first semiconductor die first surface;
a second semiconductor die having substantially parallel opposing first and second surfaces and at least one electrical contact disposed at the second semiconductor die first surface, the second semiconductor die being mounted on and at least partially supported at its second surface by the first semiconductor die first surface, the second semiconductor die having a hole extending therethrough from the second semiconductor die first surface to the second semiconductor die second surface to expose the first semiconductor die electrical contact; and
a fine wire conductor having first and second ends, the first end extending through the hole in the second semiconductor die and being connected to the first semiconductor die electrical contact.

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5,502,290
**SWITCH MECHANISM**
Osamu Koyanagi; Kunio Hirasawa; Masanori Tsukushi; Yukio Kurosawa, all of Hitachi; Tadashi Sato, Mito, and Yoichi Ohshita, Katsuta, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Continuation of Ser. No. 125,838, Sep. 24, 1993, abandoned, which is a continuation of Ser. No. 761,304, Sep. 17, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 483,878
Claims priority, application Japan, Sep. 17, 1990, 2-243734; Feb. 13, 1991, 3-019743
Int. Cl.[6] H01H *33/34*
U.S. Cl. 218—78 12 Claims



1. A hydraulically-operated switch mechanism for an electric switching device, comprising a movable member movable to cause movement of an electrical contact of the switching device for opening and closing of an electrical circuit of the switching device, and a hydraulic operating system for moving said movable mem-

ber, said hydraulic operating system having a hydraulic operating device connected to said movable member for moving said movable member, hydraulic fluid for use as a working fluid for operating the hydraulic operating device, and means for supplying the working fluid to the operating device for operating the device, wherein said working fluid has a flammability temperature above 300° C., and wherein said working fluid is incombustible.

6. A hydraulically-operated switch mechanism for an electric switching device, comprising a movable member movable to cause movement of an electrical contact of the switching device for opening and closing of an electrical circuit of the switching device, a hydraulic operating system for moving said movable member and thereby said electrical contact for opening and closing an electrical circuit of the switching device, said hydraulic operating system having: a hydraulic operating device connected to said movable member for moving said movable member, hydraulic fluid for use as a working fluid for operating the hydraulic operating device, and means for supplying the working fluid to the operating device for operating the device; and said hydraulically-operated switch mechanism further comprising a hollow, gas-tightly sealed casing enclosing at least said hydraulic operating system in its entirety, said hollow, gas-tightly sealed casing being filled with a gas which does not support combustion therein.

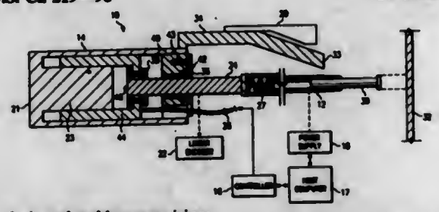
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5,502,291

## STUD WELDER

Gerald F. Cummings, Vancouver, Canada, assignor to Emhart Inc., Newark, Del.

Filed Nov. 7, 1994, Ser. No. 335,551
Int. Cl.[6] B23K 9/20
U.S. Cl. 219—98 10 Claims



1. A stud welder comprising:
(a) a welding head having a stud receiving and retaining mechanism for holding an end of a stud towards a workpiece;
(b) a linear actuator having a fixed permanent magnet, a movable coil coupled to an acutator shaft and said actuator shaft coupled to said welding head; and
(c) a controller coupled to said actuator coil and to said welding head and operative to move said actuator coil and welding head from a retracted to an extended position and back again and to cause welding current to flow into said welding head.

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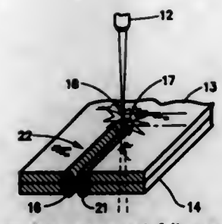
5,502,292

## METHOD FOR LASER WELDING ULTRA- THIN METAL FOILS

John C. Peruzzka, Fort Collins; David K. Benson, and C. Edwin Tracy, both of Golden, all of Colo., assignors to Midwest Research Institute, Kansas City, Mo.

Filed Aug. 4, 1994, Ser. No. 285,819
Int. Cl.[6] B23K 26/00
U.S. Cl. 219—121.64 19 Claims

1. A method of lap or side by side lap welding ultra-thin metal foils having a thickness of less than 0.002 inches comprising:
a) providing a first ultra-thin foil having a thickness of less than 0.002 inches,
b) providing a second ultra-thin foil having a thickness of less than 0.002 inches,
c) placing one of the ultra-thin foils on top of the other ultra-thin foil so that the foils are arranged in a stacked configuration,



d) clamping the first and second foils together in a stacked configuration,
e) providing a laser having a focused beam,
f) directing the beam of the laser onto the stacked foils to cut portions of the stacked foils to form a channel outlined by the cut portions of the stacked foils, and to melt the cut portions of the stacked foils to form weld beads.

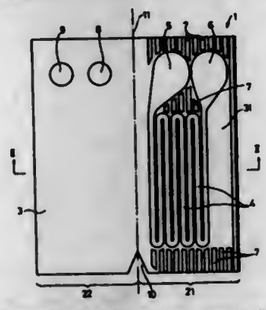
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5,502,293

## HEATER ELEMENT FOR A TUBE CONNECTING DEVICE

Shoichi Ohnishi, Fuji, and Atsushi Suzuki, Yamanashi, both of, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed May 25, 1993, Ser. No. 66,430
Claims priority, application Japan, May 26, 1992, 4-158500
Int. Cl.[6] B29C 65/30; H05B 3/10;3/16;3/20
U.S. Cl. 219—543 18 Claims



1. A heater element, to which a predetermined voltage is applied, suitable for use in a tube connecting device, comprising:
a metal plate;
an insulating layer formed on one surface of said metal plate;
a resistor formed on said insulating layer, for electrically generating heat, said resistor comprising a screen printed conductive paste applied in a winding pattern on said insulating layer, said resistor having first and second end portions;
a pair of terminals connected to said first and second end portions, respectively, of said resistor; and
means for applying a voltage across said pair of terminals to cause an electrical current to flow through said winding pattern of screen printed conductive paste for causing said resistor to generate heat;
wherein said winding pattern of screen printed conductive paste is hardened on said insulating layer, and wherein said metal plate is separated into two halves along a fold-line, said resistor and said pair of terminals being formed on one side of said fold line, and two holes being formed in said metal plate on another side of said fold line, said holes being aligned with said terminals such that when said heater element is folded in half along said fold line, said holes are disposed respectively over said pair of terminals.

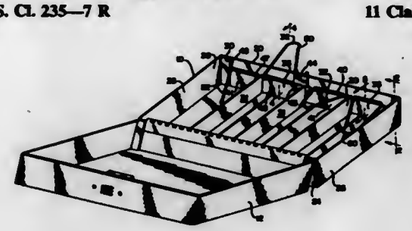


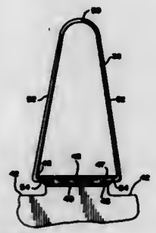
5,502,294

## CASH BOX WITH BILL WEIGHTS

John S. Yang, Northbrook, Ill., assignor to Block and Company, Inc., Wheeling, Ill.

Continuation of Ser. No. 364,417, Dec. 27, 1994, abandoned, which is a continuation of Ser. No. 111,991, Aug. 25, 1993, abandoned. This application Aug. 17, 1995, Ser. No. 516,520
Int. Cl.[6] G07G 1/00
U.S. Cl. 235—7 R 11 Claims





1. A cash box comprising:
a box having a base and side walls extending upwardly from the base;
a tube disposed above and substantially parallel to the base, the tube being supported along one of the side walls of the box and having an open inner diameter and mitered ends so that the tube has a longest and a shortest axial dimension, the shortest axial dimension of the tube being nearest the base of the box; and
a bill weight comprising an integral length of resilient wire having a center section, two arms diverging from the center section and a pair of end segments, each of the end segments secured at a first end thereof to a corresponding one of the arms and having a second end thereof extending from the corresponding arm to be inserted into the tube, each of the end segments being rotatable within the mitered ends of the tube, the two arms being inwardly biased toward one another when the end segments are placed within the mitered ends of the tube, and each of the two end segments being formed at an angle with respect to its corresponding arm to bias the second ends of the end segments toward the center section of the bill weight to provide a further retaining force when the arms converge along the mitered ends of the tubes.

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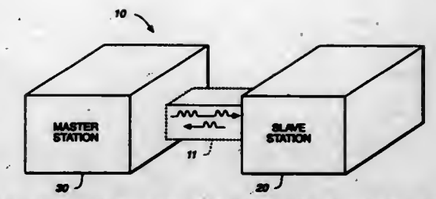
5,502,295

## WIRELESS POWERING AND COMMUNICATION SYSTEM FOR COMMUNICATING DATA BETWEEN A HOST SYSTEM AND A STAND-ALONE DEVICE

William H. Owen, Los Altos Hills, and James M. Jaffe, Santa Clara, both of Calif., assignors to Xicor, Inc., Milpitas, Calif.

Division of Ser. No. 974,131, Nov. 10, 1992, Pat. No. 5,434,396. This application Apr. 11, 1995, Ser. No. 420,347
Int. Cl.[6] G06K 5/00
U.S. Cl. 235—380 8 Claims

1. A system for data transmission between a master station and a slave station in which an electromagnetic coupling medium is formed between the master station and the slave station, the electromagnetic coupling medium being capable of communicating




data bi-directionally between the master station and the slave station in the form of electromagnetic energy transitions, said system comprising:
means in said master station for transmitting a first digital value to said slave station, including means for causing a first predetermined number of energy transitions to be coupled to said medium followed by a first resting duration in which substantially no energy transitions are coupled to said medium by said master station, said energy transitions being coupled through said medium in the form of energy pulses, each said energy pulse having a first energy level, a second energy level, and energy transitions between said first and second energy levels;
means in said master station for transmitting a second digital value to said slave station, including means for causing a second predetermined number of energy transitions to be coupled to said medium followed by a second resting duration in which substantially no energy transitions are coupled to said medium by said master station;
means in said slave station for detecting from said medium said first predetermined number of energy transitions followed by said first resting duration and for outputting a signal representative of said first digital value in response thereto, and for detecting said second predetermined number of energy transitions followed by said second resting duration and for outputting a signal representative of said second digital value in response thereto; and
means in said slave station for powering said slave station from the energy pulses coupled to it by said master station through said electromagnetic coupling medium.

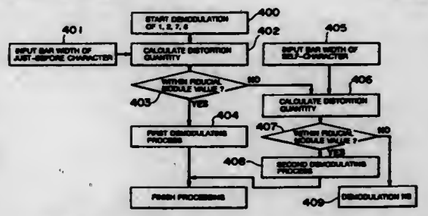
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5,502,296

## METHOD OF AND APPARATUS FOR DEMODULATING BAR CODE

Hiroaki Kawai; Mitsuo Watanabe; Shinichi Sato; Ichiro Shinoda, and Motohiko Itoh, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 21, 1994, Ser. No. 310,045
Claims priority, application Japan, Dec. 20, 1993, 5-320145; Aug. 5, 1994, 6-184972
Int. Cl.[6] G06K 7/10
U.S. Cl. 235—462 25 Claims




1. A method of demodulating bar codes, comprising:
a distortion quantity calculating step of calculating a distortion quantity of a bar width of a character to be demodulated by use of bar code data generated by reading the bar codes in which characters are expressed by bar widths;

a distortion quantity determining step of determining whether or not a bar width distortion quantity calculated in said distortion quantity calculating step falls within a range of predetermined values;

a first demodulating step of, when determining that the distortion quantity of the bar width falls within the range of the predetermined values in said distortion quantity determining step ,demodulating the character from the bar code data by effecting a first correcting process on the bar width distortion quantity; and

a second demodulating step of, when determining that the distortion quantity of the bar width does not fall within the range of the predetermined values in said distortion quantity determining step,demodulating the character from the bar code data by effecting a second correcting process on the distortion quantity of the bar width.

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**5,502,297**

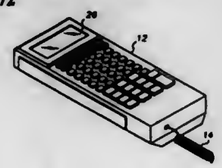
## METHOD AND APPARATUS FOR DETECTING THE PRESENCE OF A SURFACE BEARING A BAR CODE SYMBOL

**David M. Sherman, Everett, Wash., assignor to Intermec Corporation, Everett, Wash.**

**Continuation of Ser. No. 964,918, Oct. 22, 1992, abandoned. This application Dec. 12, 1994, Ser. No. 354,274**

**Int. Cl.[6] G06K 7/10**

**U.S. Cl. 235—472** **5 Claims**





1. In a device for convening machine readable symbols on a surface to information signals, a low power apparatus for detecting the presence of the surface, the apparatus comprising:

a light source that is pulsed at a carrier frequency, the light source producing a pulsed light beam;

a light detector that receives portions of the pulsed light beam that are reflected off of the surface, the light detector producing a reflection signal having amplitude variations that are proportional to reflective characteristics of the surface;

a synchronous demodulator having a first input that is coupled to receive the reflection signal having amplitude variations that are proportional to the reflective characteristics of the surface, the synchronous demodulator having a second input that is coupled to a signal having a frequency that approximates, and is in phase with the carrier frequency so that the synchronous demodulator produces a demodulated signal that isolates the amplitude variations in the reflection signal that are proportional to the reflective characteristics of the surface;

a comparator having a first input coupled to the first input of the synchronous demodulator to receive the reflection signal and a second input coupled to a reference potential, an output of the comparator producing a surface detection signal as a function of the reference potential relative to a value of the first input of the comparator, the surface detection signal having a first state indicating that the surface is present and a second state indicating that the surface is not present; and

a synchronizer that monitors the output of the comparator at the frequency that approximates, and is in phase with, the carrier frequency to produce a detect signal indicating the detection of the surface in response to the surface detection signal occurring at the carrier frequency.

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**5,502,298**

## APPARATUS AND METHOD FOR CONTROLLING AN EXTINCTION RATIO OF A LASER DIODE OVER TEMPERATURE

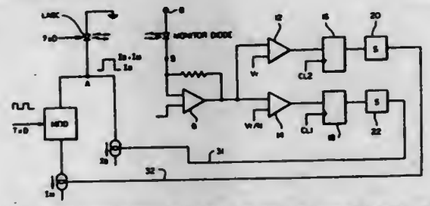
**William L. Geller, Foster City, Calif., assignor to Ericsson Raynet, Menlo Park, Calif.**

**PCT No. PCT/US92/11157, § 371 Date Aug. 22, 1994, § 102(e) Date Aug. 22, 1994, PCT Pub. No. WO93/13577, PCT Pub. Date Jul. 8, 1993**

**PCT Filed Dec. 21, 1992, Ser. No. 244,983**

**Int. Cl.[6] H04B 10/04**

**U.S. Cl. 250—205** **15 Claims**



1. An optical transmission system including a laser light source, comprising:

means for detecting a first voltage magnitude representative of an intensity of optical radiation emitted by the laser light source while transmitting at a first output power level, the first output power level corresponding to the transmission of a logical 1;

means for adjusting the first output power level of the laser light source to maintain the first voltage magnitude in close proximity to a first preset voltage value;

means for detecting a second voltage magnitude representative of an intensity of optical radiation emitted by the laser light source while transmitting at a second output power level, the second output power level corresponding to the transmission of a logical 0; and

means for adjusting the second output power level of the laser light source to maintain the second voltage magnitude in close proximity to a second preset voltage value.

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**5,502,299**

## CURRENT RATIO CIRCUIT FOR MULTI-COLOR IMAGING

**David L. Standley, Westlake Village, Calif., assignor to Rockwell International Corporation, Seal Beach, Calif.**

**Filed Dec. 12, 1994, Ser. No. 354,348**

**Int. Cl.[6] G01J 3/50**

**U.S. Cl. 250—208.2** **17 Claims**

1. An electronic circuit, comprising:

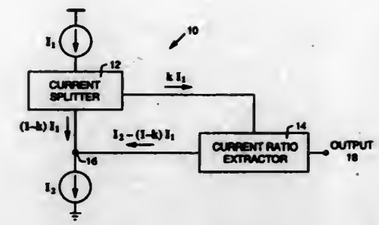
a first current source providing a source current;

a second current source providing a sinking current;

a current splitter connected to said first and second current sources; and

means connected to said current splitter and said second current source for providing an output comprising a function of said source current and said sinking current.





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**5,502,300**

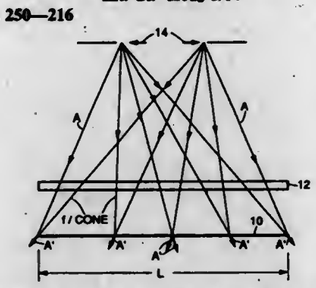
## COMPOUND OPTICALLY TIPPED DETECTORS

**William O. McKeag, Santa Barbara, and Russell D. Granneman, Goleta, both of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.**

**Filed Mar. 31, 1993, Ser. No. 44,437**

**Int. Cl.[6] H01J 3/14**

**U.S. Cl. 250—216** **26 Claims**



1. A method of reducing an optical signature from a array having at least one radiation detector, comprising the steps:

providing the array, the array having first and second axes;

tilting the array, with respect to an incident beam of radiation, along a first one of the axes; and

tilting the array, with respect to the incident beam of radiation, along a second one of the axes such that a spatial extent of intersections of features of the array, with wavefronts of the radiation, are minimized, thereby reducing reflections of the radiation from the features.

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**5,502,301**

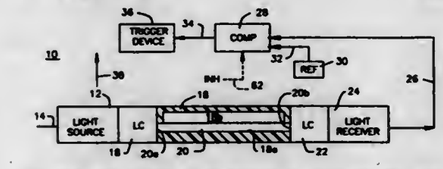
## FIBER OPTIC SENSORS AND CONTROL SYSTEMS FOR AUTOMOBILE OCCUPANT PROTECTION APPARATUS

**Randal B. Lord, Inman, S.C., assignor to Thomas & Betts Corporation**

**Filed May 23, 1994, Ser. No. 247,748**

**Int. Cl.[6] H01J 5/16**

**U.S. Cl. 250—227.14** **23 Claims**



1. A fiber optic sensor for the sensing of forces imposed thereon in a predetermined direction, said sensor comprising a housing and an optical fiber of a type which is self-deformable in response to forces imposed on said sensor, said housing retentively engaging first and second opposed ends of said fiber and placing said fiber in tangential contiguity with an interior surface of said housing, said housing defining a cavity aside said fiber, permitting movement of said fiber therein distal from said tangential contiguity of said fiber with said housing interior surface, said cavity and said fiber being successive to said housing interior surface and the cavity being successive to the fiber in said predetermined force imposition direction.

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**5,502,302**

## SCRATCH-SUPPRESSING SCANNING APPARATUS WITH ASPHERICAL LENS

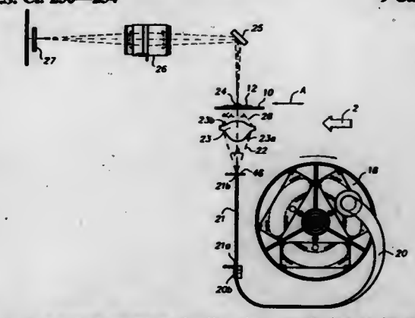
**Jacques Leonard, Mortsel, Belgium, assignor to AGFA-GEVAERT, N.V., Mortsel, Belgium**

**Filed Sep. 12, 1994, Ser. No. 304,556**

**Claims priority, application European Pat. Off., Sep. 17, 1993, 93202697; Dec. 24, 1993, 93203698**

**Int. Cl.[6] H01J 3/14**

**U.S. Cl. 250—234** **9 Claims**



1. A scanning apparatus for linewise reproducing an image on one face of a transparent image carrier onto light-sensitive means, which comprises:

support means defining a support surface for the image carrier,

an elongated light source,

a rod-like aspherical lens disposed between said light source and said support means for focusing said elongated light source onto the image carrier located on said support means, the characteristics of said lens and its position with respect to said support means being such that the illuminating angle ($\alpha$) of the image carrier on said support means is at least 20 angular degrees and that light intensity variations over said angle are smaller than 15%, and

an imaging lens for forming an image of a scanned line on said carrier onto said light-sensitive means.

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**5,502,303**

## ELECTRONIC PHANTOM SOURCE FOR GAMMA-RAY CAMERAS

**Carlos Gonzalez-Lepera, Wallingford, Pa., assignor to Trustees of the University of Pennsylvania, Philadelphia, Pa.**

**Filed Jul. 28, 1994, Ser. No. 282,524**

**Int. Cl.[6] G01T 1/164; H01J 37/06**

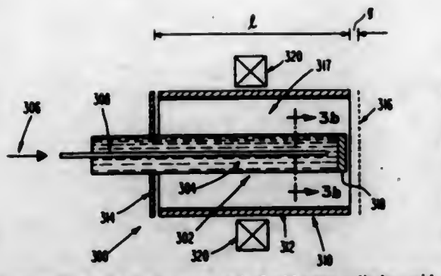
**U.S. Cl. 250—252.1** **24 Claims**

1. A positron source comprising:

an inner cylinder adapted to contain a liquid radioisotope as a source of positrons;

an outer cylinder disposed coaxially with said inner cylinder so as to form an annular cavity therebetween, an inner surface of said outer cylinder being coated with a high atomic number material sufficient to stop positrons emitted from said inner cylinder while also providing a desired fraction of backscattered positrons;

a pusher disk at a first end of said outer cylinder, said pusher disk being positively biased with respect to said inner cylinder to push low energy positrons emitted from said inner cylinder toward a second end of said outer cylinder; and




an extraction grid at said second end of said outer cylinder, said extraction grid being negatively biased with respect to said inner cylinder so as to extract low energy positrons from said annular cavity.

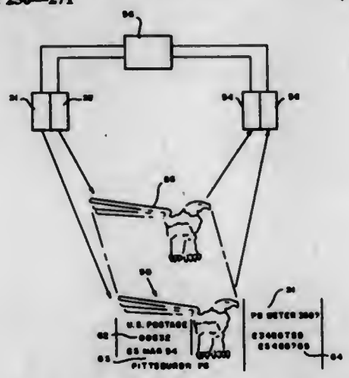
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**5,502,304**

**BAR CODE SCANNER FOR READING A VISIBLE INK AND A LUMINESCENT INVISIBLE INK**

**William Berson, Weston, and Judith D. Auslander, Westport, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.**

**Filed Dec. 1, 1994, Ser. No. 347,631**
**Int. Cl.[6] G06K 7/12;7/14**
**U.S. Cl. 250—271** **7 Claims**




1. A system for sequentially reading indicia, said system comprises:

means for reading a first indicia that is printed on an object with a ink that is visible to the human eye by reflected light; and

means for reading a second indicia that is placed on top of the first indicia, said second indicia is similar in appearance to said first indicia but differs from said first indicia and said second indicia is made of a luminescent ink that is invisible to the human eye; and

means for switching from said first reading means to said second reading means so that said first and second indicia or a portion of said first and second indicia appear to a human observer viewing said first and second indicia to move.

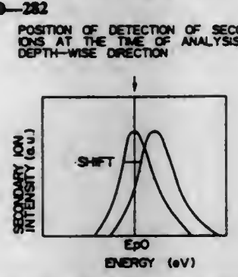
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**5,502,305**

**MEASUREMENT OF TRACE ELEMENT CONCENTRATION DISTRIBUTION, AND EVALUATION OF CARRIERS, IN SEMICONDUCTORS, AND PREPARATION OF STANDARD SAMPLES**

**Yuji Katsuoka, Kawasaki, Japan, assignor to Fujitsu, Ltd., Kawasaki, Japan**

**Division of Ser. No. 137,766, Oct. 19, 1993, Pat. No. 5,442,174. This application May 19, 1995, Ser. No. 444,875**
**Claims priority, application Japan, Jan. 23, 1992, 4-285783; Aug. 24, 1993, 5-209658**
**Int. Cl.[6] G01N 23/225**
**U.S. Cl. 250—282** **6 Claims**




1. An evaluation method of a carrier inside a semiconductor, comprising:

irradiating primary ions to the surface of a first semiconductor into which an electrically conductive impurity is introduced, under a condition such that electrical charge up occurs on the surface of said semiconductor;

sequentially measuring the intensity of secondary ions emitted from said semiconductor surface and having a specific level of energy with the passage of the irradiation time of said primary ions; and

obtaining a carrier concentration distribution in said first semiconductor in a depth-wise direction from a carrier concentration corresponding to the intensity of said secondary ions and an etching quantity of said first semiconductor corresponding to the irradiation time of said primary ions.

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**5,502,306**

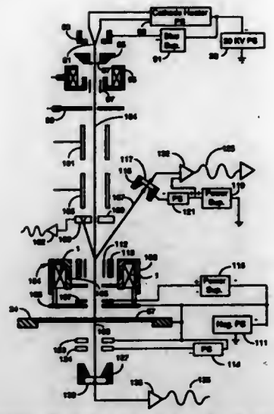
**ELECTRON BEAM INSPECTION SYSTEM AND METHOD**

**Dan Meisburger, San Jose; Alan D. Brodie, Palo Alto; Curt Chadwick, Los Gatos; Anil Desai, San Jose; Hans Dohse, Pleasanton; Dennis Enge, San Jose; John Greene, Los Altos; Ralph Johnson, Los Gatos; Ming-Yie Ling, Sunnyvale; John McMurtry, Menlo Park; Barry Becker, San Jose; Ray Paul, Palo Alto; Mike Robinson, San Jose; Richard Simmons, Los Altos; David E. A. Smith, San Mateo; John Taylor, San Jose; Lee Veneklasen, Castro Valley, all of Calif.; Dean Walters, Naperville, Ill.; Paul Wieczorek, San Jose, Calif.; Sam Wong, San Jose, Calif.; April Dutta, Milpitas, Calif.; Surendra Lele, Santa Clara, Calif.; Kirkwood Rough, San Jose, Calif.; Henry Pearce-Percy, Los Gatos, Calif.; Jack Y. Jau, Fremont, Calif.; Chun C. Lin, Cupertino, Calif.; Hoi T. Nguyen, Milpitas, Calif.; Yen-Jen Oyang, Cupertino, Calif.; Timothy L. Hutcheson, Los Gatos, Calif.; David J. Clark, Atherton, Calif.; Chung-Shih Pan, Palo Alto, Calif.; Chetana Bhaskar, San Jose, Calif.; Chris Kirk, Beconsfield Bucks, England; Eric Munro, London, England; John Gibilisco, Boulder, Colo., and Paul Sandland, Springfield, Oreg., assignors to KLA Instruments Corporation, San Jose, Calif.**

**Continuation of Ser. No. 710,351, May 30, 1991, abandoned. This application Mar. 17, 1994, Ser. No. 214,377**
**Int. Cl.[6] H01J 37/26**
**U.S. Cl. 250—310** **35 Claims**

1. An automatic system for the automatic inspection of a substrate comprising:





a field emission electron source to provide an electron beam;

a charged particle beam column to deliver and scan an electron beam from said field emission electron source on the surface of said substrate;

at least one charged particle detector to detect at least one of the three types of charged particles emanating from the top or bottom surfaces of said substrate, namely, secondary charged particles, back-scattered charged particles and transmitted charged particles; and

a continuously moving x-y stage disposed to receive said substrate and to provide at least one degree of motion to said substrate while the substrate is being scanned by the charged particle beam.

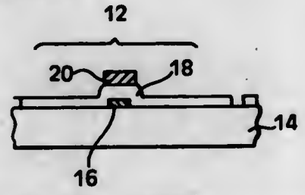
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**5,502,307**

**SPUN CAST IR DETECTOR ARRAYS AND METHOD OF MAKING THE SAME**

**Shankar B. Baliga, Bethage; George Rullman, Dix Hills, and Alan P. Doctor, Sea Cliff, all of N.Y., assignors to Servo Corporation of America, Hicksville, N.Y.**

**Filed Apr. 18, 1994, Ser. No. 228,960**
**Int. Cl.[6] G01J 5/10**
**U.S. Cl. 250—338.3** **10 Claims**




1. A temperature detector comprising:

a first electrode and second electrode disposed in parallel;

a spuncast pyroelectric polymer film integral with a substrate, said film including portions disposed between said first and second electrodes to form a capacitive device, said first and second electrodes being disposed on a respective top and bottom of said film, said film having a polarization which changes in response to IR radiation impinging on said film.

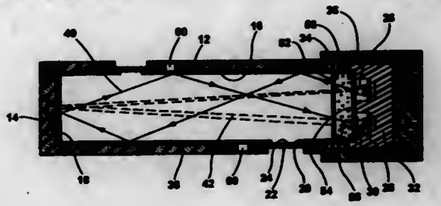
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**5,502,308**

**DIFFUSION-TYPE GAS SAMPLE CHAMBER**

**Jacob Y. Wong, Santa Barbara, Calif., assignor to Gaztech International Corporation, Goleta, Calif.**

**Continuation-in-part of Ser. No. 915,983, Jul. 16, 1992, Pat. No. 5,340,986. This application Jul. 25, 1994, Ser. No. 279,915**
**Int. Cl.[6] G01N 21/61**
**U.S. Cl. 250—338.5** **9 Claims**




1. An improved diffusion-type gas sample chamber for transmitting radiation through gases present in the chamber by ambient pressure diffusion, the gases including an analyte gas having an absorption band and including an interfering gas having an absorption band that partially overlaps the absorption band of the analyte gas, said improved diffusion-type gas sample chamber comprising in combination:

a) an elongated hollow tube having an inner wall and having a closed end and an open end, composed of a gastight material and having a specularly-reflective surface on the inner wall and on the inwardly-facing side of the closed end;

b) said tube including a plurality of filtering apertures arrayed along said tube for improving the diffusion into and out of the space within said tube;

c) a sheet of a semipermeable membrane covering each of said plurality of filtering apertures, said semipermeable membrane permitting gases to diffuse through it under ambient pressure into and out of the space within said tube and preventing airborne particles larger than a predetermined size from entering said space;

d) a source of radiation;

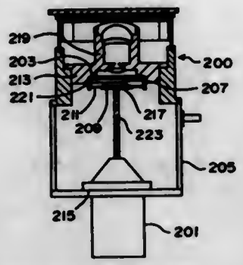
e) a detector of radiation;

f) means for mounting both said source of radiation and said detector of radiation proximate said open end and facing said closed end, whereby some of the radiation emitted in various directions from said source of radiation is conducted by at least one reflection from the specularly-reflective surface on the inner wall to the specularly-reflective surface on the inwardly-facing side of the closed end and from the latter by at least one reflection from the specularly-reflective surface on the inner wall to said detector of radiation;

g) a gas filter cell located between said closed end of said tube and said detector so that radiation traveling from said source to said detector must pass twice through said gas filter cell; and,

h) said gas filter cell enclosing a quantity of the interfering gas which substantially absorbs that part of the radiation generated by said source which lies in the absorption band of the interfering gas, whereby said detector receives substantially no radiation at wavelengths where the absorption band of the interfering gas overlaps the absorption band of the analyte gas, thereby rendering said improved diffusion-type gas sample chamber substantially immune to the presence of the interfering gas.

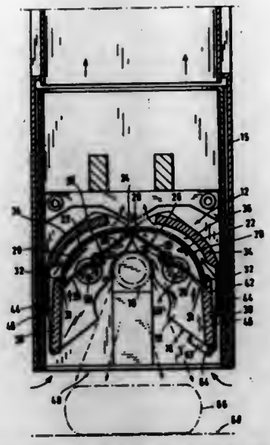
5,502,309
STARING SENSOR
John E. Davis, Claremont, Calif., assignor to Rockwell International Corporation, Seal Beach, Calif.
Filed Sep. 6, 1994, Ser. No. 300,763
Int. Cl.[6] G02B 13/06;17/00
U.S. Cl. 250—353 5 Claims




1. A staring sensor apparatus, comprising:
an optics assembly comprising:
a convex mirror for receiving light from a panoramic field of view in which the field of view in one direction is considerably larger than the field of view in the direction perpendicular thereto; and
a plurality of transmissive elements for receiving light substantially solely from said convex mirror, said convex minor and said transmissive elements each providing substantially a 360° azimuthal field of regard; and,
a two-dimensional focal plane assembly (FPA) for collecting and convening an incoming optical signal from said optics assembly to an electrical waveform which depicts the energy falling on each pixel of said FPA in a discrete unit of time, pixel outputs thereof thus representing the energy emitted from specific calibratable regions around said optics assembly.

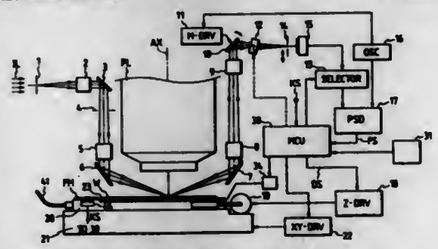
5,502,310
UV-RADIATING APPARATUS FOR IRRADIATING PRINTING INK ON ITEMS AND METHODS OF DRYING ITEMS WITH PRINTING INK THEREON
Hans-Dieter Nisstrath, Hiddenhausen, and Michael Voigt, Kirchlengern, both of, Germany, assignors to Werner Kammann Maschinenfabrik GmbH, Germany
Filed Jun. 3, 1994, Ser. No. 253,521
Claims priority, application Germany, Jun. 5, 1993, 43 18 735.8
Int. Cl.[6] G01J 1/00
U.S. Cl. 250—492.1 15 Claims

1. An UV-radiating apparatus for irradiating printing ink on items which in operation are transported along a transportation path past the apparatus, comprising a housing, within the housing a radiation source, a reflector housing surrounding the radiation source over a part of its periphery and adapted to absorb IR-radiation at least over a portion of its surfaces which are towards the radiation source, the reflector housing being divided into first and second parts in a direction at least substantially parallel to the longitudinal axis of the radiation source, cold-light mirror means between the radiation source and at least a part of the IR-radiation-absorbing surfaces of the reflector housing, wherein the first part and second part of said reflector housing are provided with first and second holders at respective ends thereof, fixing means on the first and second holders for mounting at least one cold-light mirror which is disposed in each said reflector housing part towards the radiation source and spaced from said reflector housing part, and means mounting said first and second parts of the reflector housing within said housing pivotably about respective axes extending at least substantially parallel to the longitudinal axis of the radiation source between a first limit position in which



the reflector housing is open at its side towards the transportation path and a second limit position in which said parts of the reflector housing with their regions towards the transportation path form between the radiation source and the transportation path a shielding means by which at least a portion of the transportation path and an item possibly disposed thereon is shielded relative to the radiation source, the reflector housing then being opened at the side of the radiation source which is remote from the transportation path.

5,502,311
METHOD OF AND APPARATUS FOR DETECTING PLANE POSITION
Yuji Imai, Ohmiya; Yasuaki Tanaka, Chigasaki, and Shinji Wakamoto, Tokyo, all of, Japan, assignors to Nikon Corporation, Tokyo, Japan
Continuation of Ser. No. 113,815, Aug. 31, 1993, which is a continuation-in-part of Ser. No. 3,451, Jan. 12, 1993, abandoned. This application Apr. 13, 1995, Ser. No. 421,826
Claims priority, application Japan, Jan. 17, 1992, 4-006407; Mar. 2, 1992, 4-044723; Mar. 25, 1992, 4-067345; Sep. 2, 1992, 4-233987; Sep. 4, 1992, 4-237163
Int. Cl.[6] G01N 2/86
U.S. Cl. 250—548 29 Claims

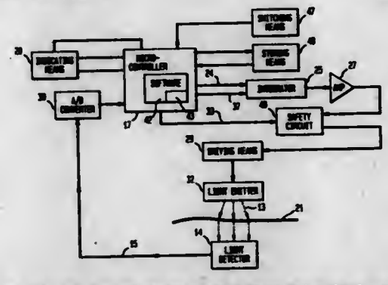



1. A plane positioning apparatus comprising:
a projection system for projecting a beam to a given portion on a substrate surface;
a light receiving system for receiving a reflective beam from said substrate surface to output a photoelectric signal corresponding to variation of the light receiving position;
a calculating circuit to output a deviation signal corresponding to a deviation amount of said substrate surface from a predetermined fiducial plane in accordance with said photoelectric signal;



a substrate shifting system for shifting and setting said substrate to a given position in a direction perpendicular to said fiducial plane in accordance with said deviation signal;
a detecting device for detecting level variation of said deviation signal generated at a time of displacing said substrate surface and said fiducial plane interrelatedly within a range having substantially a linear relationship with said deviation amount;
a calculating device for calculating a value of inclination of level variation characteristics at a point where said substrate surface and said fiducial plane are substantially matched in accordance with said level variation characteristics; and
a correcting device for correcting an allowable range set for said level variation characteristics in accordance with said calculated value of inclination in order to control said substrate shifting system.

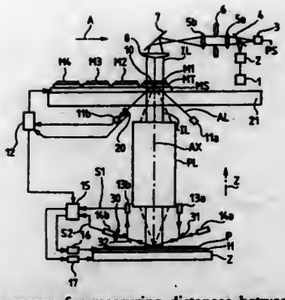
5,502,312
DOUBLE DOCUMENT DETECTION SYSTEM HAVING DECTECTOR CALIBRATION
John L. Lorenzo, Southbury, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.
Filed Apr. 5, 1994, Ser. No. 223,185
Int. Cl.[6] G01N 21/32; G01J 1/32
U.S. Cl. 250—559.1 32 Claims



1. In a double document detection system, wherein documents are successively advanced along a document feed path located between a light emitter and a corresponding light detector for generating an output signal, and wherein means are provided responsive to the output signal to detect the double document condition, the improved method of calibrating the system comprising the steps of providing a calibration document in the document feed path, generating a series of increasingly wider pulses, generating a series of drive pulses corresponding to the increasingly wider pulses for driving the light emitter at a required energy level, monitoring the output signal of the light detector until the output signal reaches a predetermined value, and fixing the width of one of the pulses in the series of increasingly wider pulses corresponding to the output signal of the predetermined value.

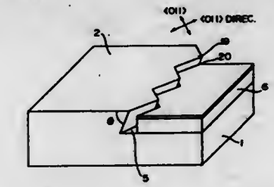
5,502,313
EXPOSURE APPARATUS AND METHOD HAVING A MEASURING UNIT FOR MEASURING DISTANCES BETWEEN A MASK SURFACE AND A PROJECTION OPTICAL SYSTEM
Osamu Nakamura, Urawa; Masamitsu Yanagihara, Yokohama, and Hideji Goto, Kawasaki, all of, Japan, assignors to Nikon Corporation, Tokyo, Japan
Filed Sep. 12, 1994, Ser. No. 302,479
Claims priority, application Japan, Sep. 14, 1993, 5-252528
Int. Cl.[6] G01N 21/86
U.S. Cl. 250—559.26 10 Claims

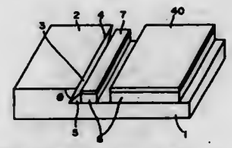
1. An exposure apparatus comprising:
a projection optical system for projecting a pattern formed on a mask onto a photosensitive substrate;



measuring means for measuring distances between said mask and said projection optical system at a plurality of positions within a surface of said mask; and
driving means for changing a position of said photosensitive substrate with respect to said projection optical system on the basis of a plurality of the distances measured by said measuring means.

5,502,314
FIELD-EMISSION ELEMENT HAVING A CATHODE WITH A SMALL RADIUS
Yoshikazu Hori, Kobe, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jul. 1, 1994, Ser. No. 269,676
Claims priority, application Japan, Jul. 5, 1993, 5-165310; Apr. 28, 1994, 6-091398
Int. Cl.[6] H01L 29/06;29/12;29/04; H01J 1/46
U.S. Cl. 257—10 16 Claims



1. A field-emission element comprising:
a substrate selected from a group consisting of a conductive substrate and a semiconductor substrate;
an elevated surface disposed on said substrate;
a step intersecting with said elevated surface making an acute angle;
a cathode formed at the intersection between said step and said elevated surface;
a base surface disposed on said substrate intersecting with a lower edge of said step;
an insulation layer disposed on said base surface; and
a gate electrode insulated from said base surface, disposed on said insulation layer at a position close to said cathode due to the thickness of said insulation layer;
wherein electrons are emitted from said cathode when an electric field is applied between said gate electrode and said cathode.

5,502,315

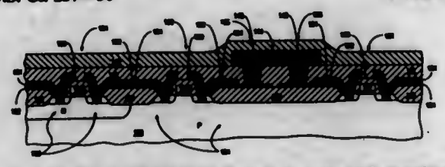
## ELECTRICALLY PROGRAMMABLE INTERCONNECT STRUCTURE HAVING A PECVD AMORPHOUS SILICON ELEMENT

Hua-Thye Chua, Los Altos; Andrew K. Chan, Palo Alto; John M. Birkner, Portola Valley; Whitten Ralph G., San Jose; Richard L. Bechtel, Sunnyvale, and Mammen Thomas, San Jose, all of Calif., assignors to QuickLogic Corporation, Santa Clara, Calif.

Continuation of Ser. No. 812,613, Dec. 23, 1991, abandoned, which is a division of Ser. No. 447,969, Dec. 8, 1989, which is a continuation-in-part of Ser. No. 404,996, Sep. 7, 1989, abandoned. This application Dec. 2, 1993, Ser. No. 161,504

Int. Cl.[6] H02L 27/02

U.S. Cl. 257—50 5 Claims



1. An antifuse having upper and lower electrodes and amorphous silicon material disposed between generally parallel opposing portions of the upper electrode and the lower electrode, the amorphous silicon material comprising in an unprogrammed state the type of silicon material that results from a plasma enhanced chemical vapor deposition of silicon without subsequent exposure to temperatures in excess of 500 degrees Centigrade, and the opposing portions of the upper and lower electrodes contacting said amorphous silicon material being of a low silicon-diffusible material and being spaced apart a particular distance and having a particular area for limiting, in conjunction with the amorphous silicon material, current through the amorphous silicon to about 10 nanoamperes or less at 5.5 volts in the unprogrammed state, wherein the opposing portions of the upper and lower electrodes are spaced apart the particular distance for attaining a resistance through the amorphous silicon material in a programmed state under 200 ohms.

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5,502,316

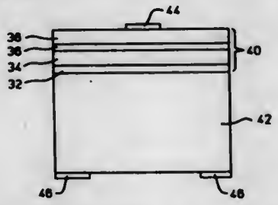
## WAFER BONDING OF LIGHT EMITTING DIODE LAYERS

Fred A. Kish; Frank M. Steranka, both San Jose; Dennis C. DeFevere, Palo Alto; Virginia M. Robbins, Los Gatos, and John Uebbing, Palo Alto, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 298,691, Aug. 31, 1994, abandoned, which is a division of Ser. No. 36,532, Mar. 19, 1993, Pat. No. 5,376,580. This application Oct. 12, 1995, Ser. No. 542,210

Int. Cl.[6] H01L 33/00

U.S. Cl. 257—94 16 Claims



1. A light emitting semiconductor device comprising:
an arrangement of semiconductor layers for generating light in response to a conduction of current;
an optically transparent wafer-bond layer coupled to said semiconductor layers, an interface of said wafer-bond layer with the semiconductor layers exhibiting properties characteristic of layers that have undergone wafer bonding, including a conductive ohmic bond to said semiconductor layers and being mechanically robust; and
electrode means for applying a current to said arrangement of semiconductor layers.

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5,502,317

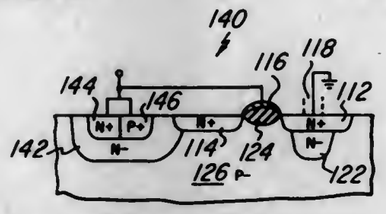
## SILICON CONTROLLED RECTIFIER AND METHOD FOR FORMING THE SAME

Charvaka Duvvury, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 91,544, Jul. 14, 1993, Pat. No. 5,369,041. This application Oct. 25, 1994, Ser. No. 328,211

Int. Cl.[6] H01L 29/74

U.S. Cl. 257—107 12 Claims



1. A semiconductor structure comprising:
a semiconductor layer of a first conductivity type;
a first doped region disposed within said semiconductor layer and of a second conductivity type different than said first conductivity type and having a first doping concentration;
a contact structure overlying and in contact with said first doped region;
a first well region of said second conductivity type formed in said semiconductor layer beneath said contact region extending through said first doped region and into said layer, said first well region having a doping concentration less than said first doping concentration;
a second well region of said second conductivity type formed in said layer and spaced from said first doped region;
a second doped region of said second conductivity type formed in said second well region;
a third doped region of said first conductivity type formed in said second well region; and
a fourth doped region of said second conductivity type formed in said semiconductor layer and spaced from said first doped region, said fourth doped region partially overlapping said second well region.

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5,502,318

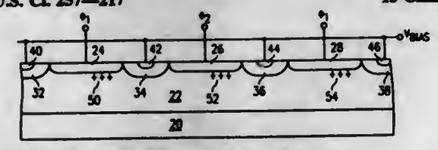
## BIPOLAR GATE CHARGE COUPLED DEVICE WITH CLOCKED VIRTUAL PHASE

Jaroslav Hynecek, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 196,845, Feb. 14, 1994, abandoned. This application Mar. 9, 1995, Ser. No. 401,321

Int. Cl.[6] H01L 29/765;27/148; G11C 19/28

U.S. Cl. 257—217 15 Claims



1. A charge coupled device cell comprising:
a semiconductor layer of a first conductivity type;
a buried channel of a second conductivity type on the semiconductor layer;



a first virtual gate of the first conductivity type in the buried channel, the first virtual gate is a continuous region, the first virtual gate is switched between at least two potential levels;
a first virtual barrier in the buried channel beneath the first virtual gate;
a first virtual well in the buried channel beneath the first virtual gate and adjoining the first virtual barrier; and
a first bipolar gate of the second conductivity type adjacent the first virtual gate.

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5,502,319

## SOLID STATE IMAGE SENSOR WITH NON-PARALLEL CONDUCTORS

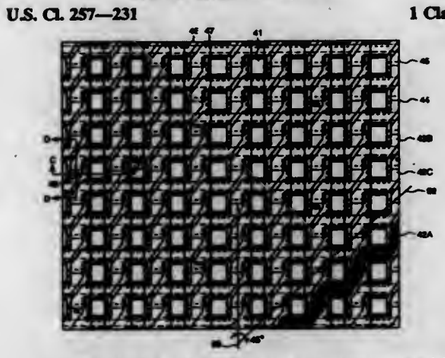
Bum-Sik Kim, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Continuation of Ser. No. 63,786, May 20, 1993, abandoned. This application Oct. 12, 1994, Ser. No. 322,395

Claims priority, application Rep. of Korea, May 20, 1992, 92-8497

Int. Cl.[6] H01L 27/148;29/768

U.S. Cl. 257—231 1 Claim



1. A charge coupled solid state image sensor device comprising:
a plurality of photodiodes arranged in a matrix on a semiconductor substrate;
a plurality of charge coupled devices, disposed in said semiconductor substrate, each charge coupled device adjacent at least one of said plurality of photodiodes, said plurality of charge coupled devices thereby being arranged in a plurality of substantially straight lines;
a plurality of transfer gates, each transfer gate connecting one of said plurality of photodiodes to a respective one of said plurality of charge coupled devices;
a first insulating layer disposed over said photodiodes and said charge coupled devices;
a plurality of overlapping gates arranged over said first insulating layer;
a second insulating layer disposed between overlapping portions of said plurality of overlapping gates;
a third insulating layer disposed over said plurality of overlapping gates and over said second insulating layer;
a plurality of conductors formed of a conductive material and disposed over said third insulating layer and arranged at a non-parallel angle with respect to said plurality of charge coupled devices arranged in said plurality of substantially straight lines, each of said plurality of conductors being directly in contact with at least one of said plurality of overlapping gates through said second insulating layer and said third insulating layer; and
a photo-blocking layer formed on said plurality of conductors.

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5,502,320

## DYNAMIC RANDOM ACCESS MEMORY (DRAM) SEMICONDUCTOR DEVICE

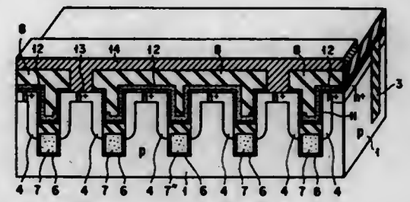
Takashi Yamada, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 15, 1994, Ser. No. 212,796

Claims priority, application Japan, Mar. 15, 1993, 5-080116

Int. Cl.[6] H01L 27/108;29/76;29/94;31/062

U.S. Cl. 257—302 6 Claims



1. A semiconductor device, comprising:
a semiconductor substrate of a first conductivity type;
a trench type element isolation region formed in a preset depth from the semiconductor substrate surface;
an element region of the first conductivity type surrounded by the element isolation region;
a gate trench for forming a gate electrode, the gate trench being formed in the semiconductor substrate with a smaller depth than the element isolation region and extending through the element region and the element isolation region;
a gate electrode buried in the bottom portion of the gate trench via a gate insulation film;
source and drain regions of a second conductivity type formed in the element region and separated from each other by the gate trench; and
a plate electrode which is buried in said gate trench and formed on said gate electrode via a capacitor insulation film, wherein at least one of said source and drain regions is used as a storage node of a capacitor;
wherein the top surface of the gate electrode lies higher than the bottom levels of the source and drain regions and lower than a contact surface of the source and drain regions.

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5,502,321

## FLASH MEMORY HAVING INCLINED CHANNEL

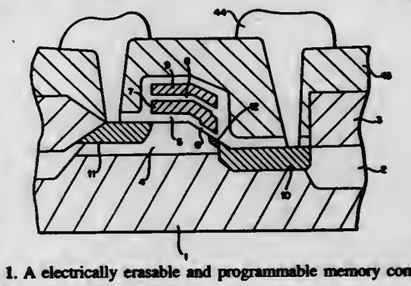
Tadashi Matsushita, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Japan

Filed Oct. 24, 1994, Ser. No. 327,910

Claims priority, application Japan, Nov. 8, 1993, 5-278209

Int. Cl.[6] H01L 29/788

U.S. Cl. 257—316 17 Claims

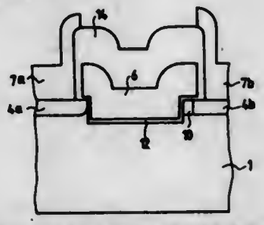


1. A electrically erasable and programmable memory comprising:
a semiconductor substrate;
a source region and a drain region formed spaced apart from each other by a definite distance on a main surface of said semiconductor substrate;

a channel region provided between the source region and the drain region;
a gate insulating film provided on the channel region;
a floating gate electrode provided on the gate insulating film; and
a control gate electrode provided with an interlayer insulating film sandwiched therebetween so that the control gate electrode at least partially laminates the floating gate electrode;
the main surface having an inclined portion, and the channel region being formed in a region comprising at least a point of change in an inclination angle of the inclined portion, and the source region being vertically offset with respect to the drain region.

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**5,502,322**
**TRANSISTOR HAVING A NONUNIFORM DOPING CHANNEL**
**Dae S. Jung; Bong K. Joo; Sang Y Kim, and Han S. Yoon, all of Ichonkun, Rep. of Korea, assignors to Hyundai Electronic Industries Co., Ltd., Rep. of Korea**
**Division of Ser. No. 160,684, Dec. 2, 1993, Pat. No. 5,376,570. This application Sep. 21, 1994, Ser. No. 310,264**
**Claims priority, application Rep. of Korea, Dec. 2, 1992, 1992-23083**
**Int. Cl.[6] H01L** *29/76;31/062*
**U.S. Cl. 257—330** **1 Claim**

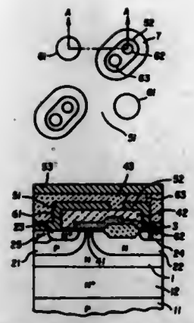


1. A transistor having a nonuniform doping channel comprising:
a gate oxide film formed on a semiconductor substrate provided with a trench, said trench having a center and an axis at the center, said substrate having a surface;
a gate electrode formed on said gate oxide film atop the trench and surroundings, said gate electrode having a longer portion and a shorter portion and thus, being asymmetrical with regard to the axis passing the center of the trench;
a source region formed neighboring the shorter portion of said gate electrode;
a high density channel region formed by doping impurities of same type as said semiconductor substrate below the longer portion of said gate electrode, said high density channel region extending a first depth from the surface of said substrate, said trench extending a second depth with said second depth being greater than said first depth; and
a drain region formed neighboring said high density channel region.

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**5,502,323**
**LATERAL TYPE FIELD EFFECT TRANSISTOR**
**Akio Kitamura, and Naoto Fujishima, both of Nagano, Japan, assignors to Fuji Electric Co., Ltd., Japan**
**Filed Sep. 23, 1994, Ser. No. 311,490**
**Claims priority, application Japan, Sep. 29, 1993, 5-242267; Feb. 22, 1994, 6-022930**
**Int. Cl.[6] H01L** *29/76;29/94;31/062*
**U.S. Cl. 257—335** **13 Claims**

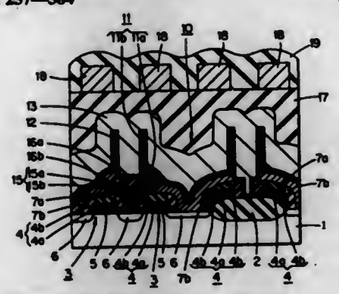
1. A lateral type field effect transistor, comprising:
a source region and a drain region formed in a surface layer of a semiconductor substrate;



source region under layer wiring connected to said source region through a source region contact hole formed through an insulative film;
drain region under layer wiring connected to said drain region through a drain region contact hole formed through said insulative film; and
upper layer wiring connected to at least one of said source region under layer wiring and said drain region under layer wiring through a through hole formed through an inter-layer insulation film formed on said source region under layer wiring and said drain region under layer wiring;
wherein a first direction connecting said through hole with at least one of said source region contact hole and said drain region contact hole crosses a second direction connecting said source region contact hole with said drain region contact hole at an angle.

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**5,502,324**
**COMPOSITE WIRING LAYER**
**Atsushi Hachisuka, and Yoshinori Okumura, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**
**Continuation of Ser. No. 228,587, Mar. 31, 1994, abandoned, which is a continuation of Ser. No. 75,909, Jun. 14, 1993, abandoned, which is a continuation of Ser. No. 814,274, Jan. 2, 1992, abandoned. This application Dec. 23, 1994, Ser. No. 363,548**
**Claims priority, application Japan, Jan. 8, 1991, 3-000719**
**Int. Cl.[6] H01L** *29/417;29/423;29/43;29/49*
**U.S. Cl. 257—384** **9 Claims**



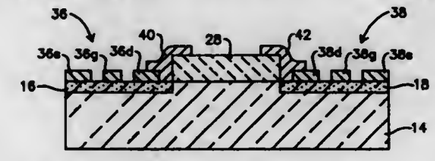
1. A semiconductor memory device comprising:
a semiconductor substrate having a main surface;
an insulating layer on the main surface of said semiconductor substrate; and
a bit line in contact with said substrate, said bit line comprising:
a first conductive layer of polycrystalline silicon formed on said insulating layer, said first conductive layer having an upper surface, a lower surface, and a pair of side surfaces between said upper and lower surfaces; and



a pair of second conductive layers of a refractory metal silicide formed on said insulating layer contacting said first conductive layer only at said side surfaces.

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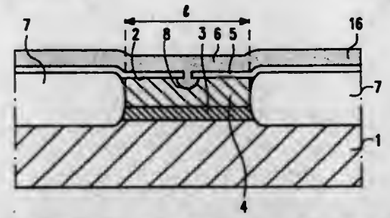
**5,502,325**
**INTEGRATED MAGNETORESISTIVE SENSOR**
**Marko Sokolich, Los Angeles; Hiroyuki Yamasaki, Palos Verdes Estates, and Huai-Tung Yang, Torrance, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.**
**Division of Ser. No. 161,021, Dec. 3, 1993. This application May 30, 1995, Ser. No. 453,940**
**Int. Cl.[6] H01L** *29/82;43/00*
**U.S. Cl. 257—421** **4 Claims**



1. An integrated magnetoresistive sensor, comprising:
a semiconductor substrate,
a doped layer in said substrate,
a magnetoresistor integrated on said substrate, said magnetoresistor having a thickness substantially greater than the thickness of said doped layer, and
electrical contacts to said doped layer establishing at least one active electrical device therein, and interconnecting said device with said magnetoresistor.

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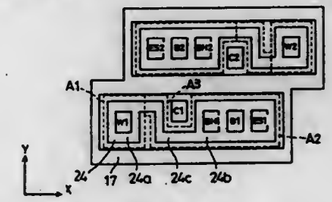
**5,502,326**
**SEMICONDUCTOR DEVICE PROVIDED HAVING A PROGRAMMABLE ELEMENT WITH A HIGH-CONDUCTIVITY BURIED CONTACT REGION**
**Jan W. Slotboom; Pierre H. Woerlee, and Reinout Woltjer, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**
**Continuation of Ser. No. 154,683, Nov. 18, 1993, abandoned. This application Jan. 25, 1995, Ser. No. 381,002**
**Claims priority, application European Pat. Off., Nov. 20, 1992, 92203576**
**Int. Cl.[6] H01L** *29/00;27/095;27/10*
**U.S. Cl. 257—530** **12 Claims**



1. A semiconductor device with a semiconductor body and a programmable memory element comprising a doped semiconductor region and a conductor region which are everywhere separated from one another in the unprogrammed state by at least a portion of an insulating layer, the conductor region comprising a material which is suitable for forming a rectifying junction with the material of the doped semiconductor region, said rectifying junction being formed in the programmed state, the programmable memory element comprising a contact region which contacts the doped semiconductor region and the semiconductor body, and said contact region has a comparatively low electrical resistivity compared to that of said doped semiconductor region, characterized in that the contact region is provided at a side of the doped semiconductor region remote from the insulating layer and is separated from the insulating layer by the doped semiconductor region, in that the doped semiconductor region and the contact region form a narrow vertical stack, and in that both the doped semiconductor region and the contact region are laterally bounded by a narrow dielectric isolation region at mutually opposing sides, said narrow dielectric isolation region extending to a greater depth in said semiconductor body than that of said contact region.

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**5,502,327**
**SEMICONDUCTOR DEVICE**
**Motohisa Ikeda, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan**
**Filed Aug. 10, 1994, Ser. No. 288,035**
**Claims priority, application Japan, Sep. 2, 1993, 5-218700**
**Int. Cl.[6] H01L** *27/02;29/02*
**U.S. Cl. 257—539** **22 Claims**

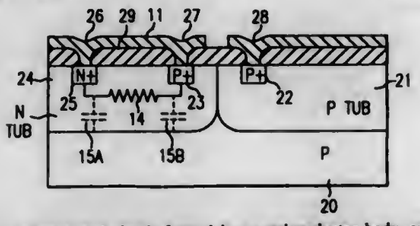


1. A semiconductor device comprising:
a first layer made of a first type semiconductor;
a second layer provided on said first layer and made of a second type semiconductor, said second layer including low resistance diffusion parts and high resistance diffusion parts, said first and second type semiconductors being one and the other of n-type and p-type semiconductors;
a third layer provided on the low resistance diffusion parts of said second layer and made of the first semiconductor type, thereby forming a pair of transistors which form a flip-flop and use the high resistance diffusion parts as balanced load resistors; and
first and second isolation regions respectively provided with respect to said pair of transistors, and with a predetermined interval between the first and second isolation regions such that the pair of transistors are accommodated within an area between said first and second isolation regions, said first and second isolation regions respectively having a stepped surface;
each of said high resistance diffusion parts of said second layer comprising:
a first linear part separated by a predetermined distance from said first isolation region, wherein said first linear part includes a first end and a second end, wherein one of said first and second ends form a terminal thereof, said first linear part being located closer to said first isolation region than a central portion of the high resistance diffusion part;
a second linear part separated by said predetermined distance from said second isolation region and having a width identical to that of the first linear part, wherein said second linear part includes a first end and a second end, wherein one of said first and second ends forms a terminal thereof, said second linear part being located closer to the second isolation region than a central portion of the high resistance diffusion part; and
a third linear part connecting the first and second linear parts.

**5,502,328**
**BIPOLAR ESD PROTECTION FOR INTEGRATED CIRCUITS**

Che-Tsung Chen, Allentown; Thaddeus J. Gabara, North Whitehall Township, Lehigh County; Bernard L. Morris, Allentown, and Yehuda Smooha, South Whitehall Township, Lehigh County, all of Pa., assignors to AT&T Corp., Murray Hill, N.J.

Continuation of Ser. No. 847,438, Mar. 6, 1992, Pat. No. 5,304,839, which is a continuation of Ser. No. 623,876, Dec. 4, 1990, abandoned. This application Apr. 18, 1994, Ser. No. 228,834
Int. Cl.[6] H01L 29/00
U.S. Cl. 257—546 3 Claims




1. An integrated circuit formed in a semiconductor body, and having a conductive bondpad that is coupled to circuitry, wherein an electrostatic discharge (ESD) device is connected to said bondpad for conducting an electric charge from said bondpad to a negative ($V_{SS}$) power supply conductor on said integrated circuit when the positive voltage on said bondpad exceeds a given limit, characterized in that said electrostatic discharge protection device is a pnp bipolar transistor having:
an n-type base region located in an n-type tub region that is located in a p-type substrate;
a heavily doped p-type emitter region formed directly in said n-type tub and connected to said bondpad through a conductor formed in a window in an overlying dielectric;
and a p-type collector region that is connected to said negative power supply conductor;
wherein said pnp bipolar transistor has its collector formed in a p-type region located adjacent to said n-type tub region in said semiconductor body;
wherein said base is connected to said bondpad by means comprising a heavily doped n-type contact region formed in said n-type tub region and spaced apart from said heavily doped p-type emitter region;
whereby said bipolar transistor becomes highly conducting during a positive voltage ESD event, and becomes significantly less conducting when normal operating voltages are applied to said bondpad.

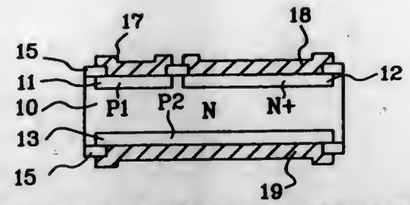
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**5,502,329**
**PROTECTION COMPONENT FOR AUTOMOBILE CIRCUIT**

Robert Pezzani, Vonvray, France, assignor to SGS-Thomson Microelectronics S.A., Saint-Genis, France

Continuation of Ser. No. 10,269, Jan. 28, 1993, abandoned. This application Sep. 1, 1994, Ser. No. 300,172
Claims priority, application France, Jan. 31, 1992, 92 01311
Int. Cl.[6] H01L 29/00
U.S. Cl. 257—546 22 Claims

18. A monolithic semiconductor protection component comprising:
an input terminal, an output terminal, and a reference terminal;
a first surface and a second surface;
means, coupled between the input and output terminals, for allowing current to flow from the input terminal to the output terminal when a forward biased voltage is applied to the input terminal and allowing current to flow from the output terminal to the input terminal when a reverse biased voltage, essentially within the range of 20 to 40 volts, is applied to the input terminal, the means for allowing including a first P/N junction diode; and



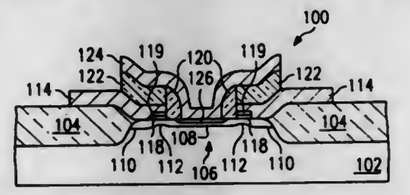

means for protecting against voltage surges, coupled between the output terminal and the reference terminal;
wherein the means for allowing is disposed on the first surface of the component and the means for protecting is disposed between the first and second surfaces of the component.

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**5,502,330**
**STACKED BARRIER-DIFFUSION SOURCE AND ETCH STOP FOR DOUBLE POLYSILICON BJT WITH PATTERNED BASE LINK**

F. Scott Johnson, and Kelly Taylor, both of Plano, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 392,597, Feb. 23, 1995. This application Jun. 7, 1995, Ser. No. 473,865
Int. Cl.[6] H01L 27/01;27/12
U.S. Cl. 257—588 6 Claims




1. A bipolar transistor comprising:
a collector region;
an intrinsic base region within said collector region;
an extrinsic base region within said collector region;
a base link-up region within said collector region between said intrinsic base region and said extrinsic base region;
a base-link diffusion source layer above said base link-up region;
a barrier layer over said base-link diffusion source layer;
a base electrode overlying said barrier layer and said extrinsic base layer; and
an emitter region within said intrinsic base region.

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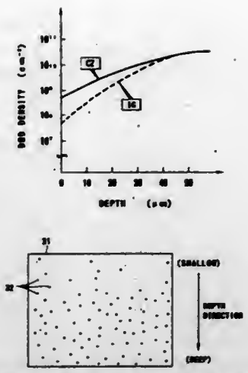
**5,502,331**
**SEMICONDUCTOR SUBSTRATE CONTAINING BULK MICRO-DEFECT**

Yoko Inoue, and Shuichi Samata, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 199,936, Feb. 22, 1994, abandoned. This application May 19, 1995, Ser. No. 444,892
Claims priority, application Japan, Feb. 23, 1993, 5-033574
Int. Cl.[6] H01L 29/30;29/167
U.S. Cl. 257—617 1 Claim

1. A semiconductor substrate containing bulk micro-defects





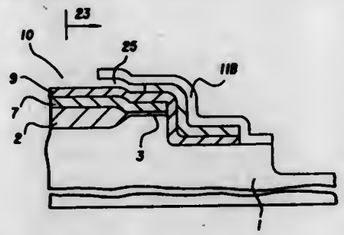

under the condition that the average density of bulk micro-defects of the substrate is within the range of $5\times10^2$ to $5\times10^6$ pieces per $cm^3$ from a surface of the substrate to a depth of 10 μm and a density of bulk micro-defects is above $5\times10^7$ pieces per $cm^3$ in the interior 20 μm or deeper from the surface.

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**5,502,332**
**SEMICONDUCTOR DEVICE HAVING A BELT COVER FILM**

Shinichirou Ikemasu; Yoshiki Hasegawa, and Yasuhiko Konno, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Continuation of Ser. No. 948,033, Sep. 21, 1992, abandoned. This application Aug. 19, 1994, Ser. No. 293,209
Claims priority, application Japan, Sep. 19, 1991, 3-239364
Int. Cl.[6] H01L 23/544
U.S. Cl. 257—620 15 Claims

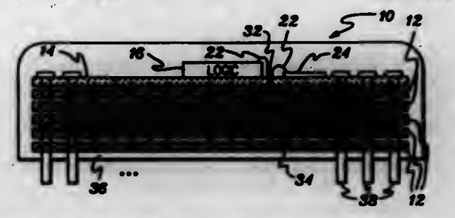



1. A semiconductor device comprising:
an insulating film;
a conductive material film formed on the insulating film by an isotropical etching for providing a pattern, a backside of the conductive material film being exposed by isotropically etching the insulating film; and
a dispersion preventing means for preventing etching residue from dispersing during isotropical etching, wherein said dispersion preventing means is a part of said conductive material film, formed in a scribe area and provided as surrounding a chip.

**5,502,333**
**SEMICONDUCTOR STACK STRUCTURES AND FABRICATION/SPARING METHODS UTILIZING PROGRAMMABLE SPARE CIRCUIT**

Claude L. Bertin, South Burlington; Erik L. Hedberg, Essex Junction, and Wayne J. Howell, South Burlington, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 30, 1994, Ser. No. 220,086
Int. Cl.[6] H01L 23/02
U.S. Cl. 257—685 25 Claims



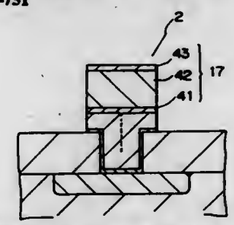

1. An electronic semiconductor structure comprising:
a plurality of semiconductor chips electrically coupled together in a system, at least one semiconductor chip of the plurality of semiconductor chips having a memory with m memory cells, wherein m is an integer;
a control circuit for coupling said plurality of semiconductor chips to external circuitry, said control circuit including selection means for facilitating access to a selected semiconductor chip, said selected semiconductor chip comprising one semiconductor chip of the at least one semiconductor chip having a memory, said selected semiconductor chip corresponding to an address received from the external circuitry., said control circuit including a plurality of circuit paths;
a spare memory circuit functionally integrated with said plurality of circuit paths of said control circuit, and having n memory cells, wherein n is an integer and $n \leq m$, said spare memory circuit being electrically connected to said at least one semiconductor chip having said memory and being programmable such that a single memory cell of the n memory cells of the spare memory circuit can functionally replace a single failed memory cell of said m memory cells of the at least one semiconductor chip having said memory.

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**5,502,334**
**METAL WIRING**

Keiji Shinohara, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 10, 1993, Ser. No. 149,946
Claims priority, application Japan, Nov. 10, 1992, 4-326128
Int. Cl.[6] H01L 23/48
U.S. Cl. 257—751 16 Claims




1. A semiconductor device having a metal wiring, comprising:
an adhesive wiring layer formed conformally on a dielectric film having a
contact hole with an underlying substrate, and inside said contact
hole; a first metal wiring layer formed on said adhesive wiring layer, at least filling

said contact hole and extending above and over a top surface of said
dielectric film; and a second metal wiring layer formed on said first metal wiring layer; wherein the second metal wiring layer is a laminated film of layers having a
center layer selected from the group consisting of Al and Al alloy
layers, and Ti layers on opposite sides thereof.

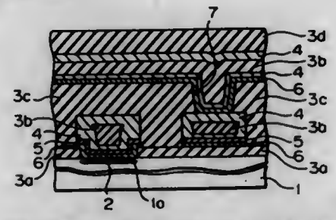
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**5,502,335**

## SEMICONDUCTOR DEVICE WITH WIRING LAYER

**Noriaki Oda, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Continuation of Ser. No. 962,414, Oct. 16, 1992, abandoned. This application Jun. 15, 1994, Ser. No. 260,608**
**Claims priority, application Japan, Jan. 18, 1991, 3-269810**
**Int. Cl.[6] H01L** *23/532;29/43*
**U.S. Cl. 257—751** **7 Claims**




3. A semiconductor device comprising a semiconductor substrate, an insulating layer covering said semiconductor substrate, a conductive region formed on said insulating layer, a contact hole selectively formed in said insulating layer, and a wiring layer formed in contact with said conductive region and extending along said contact hole, said wiring layer including a first conductive film which is in contact with said conductive region, an isolation film formed on said first conductive film, and a second conductive film formed to cover said isolation film, said first and second conductive films having portions connected to each other so as to completely envelope said isolation film,
wherein said first and second conductive films and said portions thereof are made of gold.

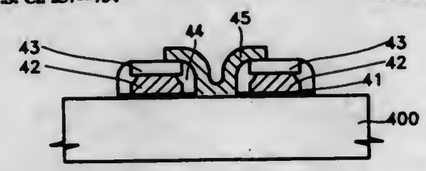
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**5,502,336**

## SEMICONDUCTOR DEVICE AND MANUFACTURING METHOD THEREOF

**Won-mo Park, Seoul; Jung-hyun Shin, and Young-bun Park, both of Suwon, all of, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea**

**Filed Mar. 14, 1994, Ser. No. 209,475**
**Claims priority, application Rep. of Korea, Mar. 13, 1993, 93-3842**
**Int. Cl.[6] H01L** *21/90*
**U.S. Cl. 257—754** **10 Claims**




1. A semiconductor device, comprising:
a semiconductor substrate;
a first insulating film pattern on said semiconductor substrate;
a first conductive film pattern formed on said first insulating film pattern and having an upper edge, the upper edge having a chamfered upper edge and a lower edge substantially perpendicular to an upper surface of said semiconductor substrate;
a second insulating film pattern formed on said first conductive film pattern;
a spacer formed on said upper edge and said lower edge of said first conductive film pattern, said spacer forming a contact hole exposing said semiconductor substrate; and
a second conductive film pattern in contact with said semiconductor substrate in said contact hole;
wherein said chamfered upper edge of said first conductive film pattern provides an enlarged thickness in said spacer so as to protect said first conductive film pattern from exposure in said contact hole.

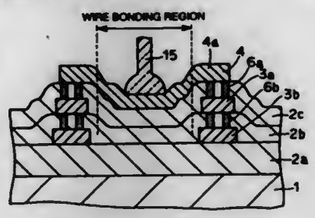
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**5,502,337**

## SEMICONDUCTOR DEVICE STRUCTURE INCLUDING MULTIPLE INTERCONNECTION LAYERS WITH INTERLAYER INSULATING FILMS

**Masahiko Nozaki, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Nov. 18, 1994, Ser. No. 344,572**
**Claims priority, application Japan, Jul. 4, 1994, 6-152086**
**Int. Cl.[6] H01L** *23/48*
**U.S. Cl. 257—773** **6 Claims**




4. A semiconductor device, comprising:
a semiconductor substrate;
an annular lower interconnection layer provided on said semiconductor substrate with a space at the center;
an interlayer insulating film provided on said semiconductor substrate to fill said space and to cover said lower interconnection layer;
an uppermost interconnection layer provided on said interlayer insulating film to cover said space and to cover said lower interconnection layer;
a via hole provided in said interlayer insulating film for connecting said annular lower interconnection layer and said uppermost interconnection layer; and
a conductive material filled in said via hole for electrically connecting said lower interconnection layer and said uppermost interconnection layer; wherein
a portion of said uppermost interconnection layer positioned above said space is used as a bonding pad.

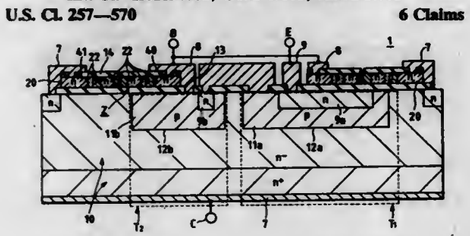


**5,502,338**

## POWER TRANSISTOR DEVICE HAVING COLLECTOR VOLTAGE CLAMPED TO STABLE LEVEL OVER WIDE TEMPERATURE RANGE

**Minoru Suda, Takasaki; Masatoshi Nakasu, Shibukawa, and Tetsuo Iijima, Maebachi, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Continuation-in-part of Ser. No. 52,836, Apr. 27, 1993, Pat. No. 5,397,914. This application Nov. 18, 1994, Ser. No. 341,130**
**Claims priority, application Japan, Apr. 30, 1992, 4-138034; Mar. 19, 1993, 5-85429; Nov. 24, 1993, 5-318987**
**Int. Cl.[6] H02H** *9/02;* **G05F** *1/613;* **H01L** *27/02*
**U.S. Cl. 257—570** **6 Claims**




1. A power transistor device on a semiconductor substrate comprising:
a first terminal;
a second terminal;
a third terminal;
a first bipolar transistor which is formed at the semiconductor substrate and which has a base coupled to the first terminal, a collector coupled to the second terminal, and an emitter;
a second bipolar transistor which is formed at the semiconductor substrate and which has a base coupled to the emitter of the first bipolar transistor, a collector coupled to the second terminal and an emitter coupled to the third terminal; and
a plurality of Zener diodes and forward diodes coupled in series between the first terminal and the second terminal,
wherein the plurality of Zener diodes and forward diodes are formed of pn junctions in a polycrystalline silicon film which has a predetermined width and which is arranged along a circumference of the semiconductor substrate so as to have a ring like shape, and
wherein the pn junctions in the polycrystalline silicon film are arranged along the circumference of the semiconductor substrate in rings, respectively.

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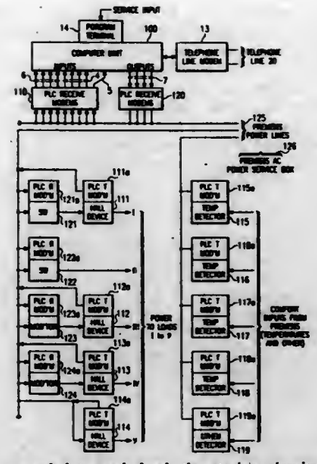
**5,502,339**

## SUBSCRIBER ELECTRIC POWER LOAD CONTROL SYSTEM

**Kent Hartig, Lancaster, Mass., assignor to The Trustees of Boston University, Boston, Mass.**

**Continuation of Ser. No. 985,794, Nov. 30, 1992, abandoned, which is a continuation of Ser. No. 404,194, Sep. 7, 1989, Pat. No. 5,168,170. This application May 26, 1994, Ser. No. 250,333**
**Int. Cl.[6] H02J** *1/00*
**U.S. Cl. 307—31** **16 Claims**

1. A system for controlling electric power usage by a plurality of loads at an electric power company subscriber's premises, comprising:
circuitry operable to store data representative of a plurality of distinct real time intervals during which the electric power usage is to be controlled;
said storing circuitry further operable to store data representative of distinct load limits for each real time interval, for each load;
circuitry coupled to each load and operable to detect the power usage of the load;




circuitry coupled to each load, the storing circuitry, and the detecting circuitry and operable to generate control signals; and
circuitry coupled to each individual load and responsive to said generating circuitry and operable to individually limit power usage of each load such that the power usage of each load does not exceed the limit stored in the storing circuitry during an associated predetermined real time interval.

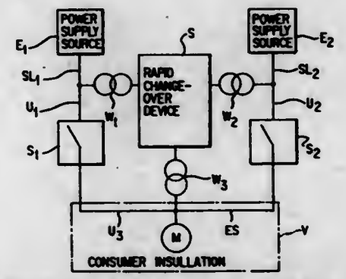
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**5,502,340**

## MEASURING PROCESS FOR OBTAINING A SWITCHING COMMAND IN A RAPID CHANGEOVER DEVICE

**Norbert Schuster, Forchheim, Germany, assignor to Siemens Aktiengesellschaft, München, Germany**

**PCT No. PCT/DE92/00821, § 371 Date Mar. 21, 1994, § 102(e) Date Mar. 21, 1994, PCT Pub. No. WO93/06644, PCT Pub. Date Apr. 1, 1993**
**PCT Filed Sep. 21, 1992, Ser. No. 211,113**
**Claims priority, application Germany, Sep. 20, 1991, 41 31 815.3**
**Int. Cl.[6] H02J** *3/00*
**U.S. Cl. 307—87** **2 Claims**




1. A process for issuing a switching command in a rapid changeover device for switching a consumer installation from a power supply source to a second power supply source by means of a power switch having an inherent response time $t_s$, the process comprising steps of:
a) disconnecting the consumer installation from the power supply source;
b) when disconnecting the consumer installation from the power supply source,
(i) measuring a peak value $U_{3max}$ and a frequency $f_3$ of the voltage $U_3$ at the consumer installation, a peak value $U_{2max}$

and a frequency $f_2$ of the voltage $U_2$ at the second power supply source, and a relation between a phase angle $\Gamma_3$ of the voltage at the consumer installation and a phase angle $\Gamma_2$ of the voltage at the second power supply source;

(ii) storing the peak value $U_{3max}$ and the frequency $f_3$ of the voltage $U_3$ at the consumer installation, the peak value $U_{2max}$ and the frequency $f_2$ of the voltage $U_2$ at the second power supply source, and the relation between a phase angle $\Gamma_3$ of the voltage at the consumer installation and a phase angle $\Gamma_2$ of the voltage at the second power supply source;

(iii) measuring and storing an abrupt change $cU_{3max}$ in the voltage $U_3$ at the consumer installation;

c) after the consumer installation is disconnected from the power supply source, measuring a change (a) in frequency $f_3$ and a change (b) in voltage $U_3$ at the consumer installation as a function of time;

d) subsequently forming a differential voltage signal $\Delta U$ from the voltage of the second power supply source $U_2$ and from the voltage at the consumer installation $U_3$, the differential voltage $\Delta U$ being defined by the expression:

$$|U_{2max}-(1-c)\cdot(1-b\cdot t_2)U_{3max}\cdot\exp(j(\omega_2-\omega_3)t_2-0.5\ at_2^2+\Gamma_2-\Gamma_1)|$$

where,

$\omega_2=2\cdot\Pi f_2$ and

$\omega_3=2\Pi f_3$;

e) issuing a switch command to effect a switchover such that, in view of the inherent response time $t_s$ of the power switch, the switchover will occur when the differential voltage $\Delta U$ formed in step (f) is below a permissible maximum value.

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**5,502,341**

**ELECTRIC MOTOR AND METHOD OF PRODUCING THE SAME**

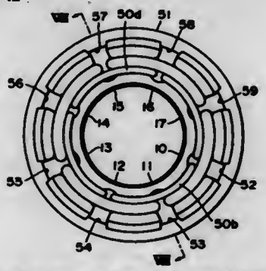
**Hironobu Sato, Ota, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan**

**Division of Ser. No. 885,865, May 20, 1992, abandoned. This application Apr. 25, 1994, Ser. No. 232,303**

**Claims priority, application Japan, May 20, 1991, 3-114838**

**Int. Cl.[6] H02K** *15/02;15/10;1/04;1/16*

**U.S. Cl. 310—42** **4 Claims**




1. A method of producing a stator for an electric motor comprising the steps of:

forming a stator core having a plurality of teeth at a constant circumferential interval having an outer periphery that is annularly connected, a bore defined by the teeth, and slots between adjoining teeth such that the slots communicate with the bore through a plurality of openings separating the adjoining teeth;

molding the stator core integrally with synthetic resin such that the synthetic resin overlies upper faces and lower faces of the stator core and inner surfaces of the slots, the synthetic resin forming a non-magnetic mold member that closes the plurality of openings and has the bore inside thereof;

forming notches in said outer periphery of said stator core molded with the synthetic resin so that the slots are radially outwardly open;

winding stator wires in the slots through the notches from the outer circumference of the stator core molded with the synthetic resin; and

forcibly fitting an annular yoke over the outer periphery of the stator core so that the annular yoke closes the notches after the stator wires are wound in the slots, thereby forming a magnetic path between the adjoining teeth;

wherein said step of forming notches comprises removing portions of the outer periphery of the stator core and the non-magnetic mold member that are radially outward of the slots.

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**5,502,342**

**MACHINE HAVING DEVICES TO REDUCE TRANSMISSIONS OF STRUCTURE-BORNE NOISE**

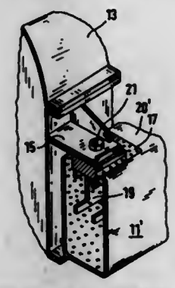
**Bernward Feldkamp, Winkeling, and Bernd Schlieperskötter, Neunkirchen-Seelscheid, both of, Germany, assignors to Klöckner-Humboldt-Deutz AG, Cologne, Germany**

**Filed Feb. 28, 1994, Ser. No. 202,780**

**Claims priority, application Germany, May 11, 1993, 43 15 694.0**

**Int. Cl.[6] F16M** *1/04;* **H02K** *5/24*

**U.S. Cl. 310—51** **7 Claims**




1. A machine comprising, in combination:

a machine rotor,

a housing for said rotor,

a base frame formed from section beams (11, 11', 25).

fastening means (14, 15) detachably connecting said machine to said beams and

separating joints (16, 17, 27, 27', 28) between said fastening means (14, 15) and said section beams (11, 11', 25), said separating joints and said section beams in the region of said fastening means being filled with material strong in compression and capable of deadening structure-borne noise,

said fastening means being at least partially embedded in said structure-borne noise deadening material.

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**5,502,343**

**MINIATURE MOTOR**

**Kazutoshi Yoshimura; Kenji Hagiwara, and Isao Shibuya, all of Chiba, Japan, assignors to Mabuchi Motor Co., Ltd., Chiba, Japan**

**Filed Jun. 16, 1994, Ser. No. 260,532**

**Claims priority, application Japan, Jul. 23, 1993, 5-182609**

**Int. Cl.[6] H02K** *13/06*

**U.S. Cl. 310—220** **6 Claims**

1. A miniature motor, comprising:

a case made of metallic material, formed into a bottomed hollow tubular shape and having a permanent magnet fixedly fitted to the inner circumferential surface thereof;

a rotor having an armature facing said permanent magnet;

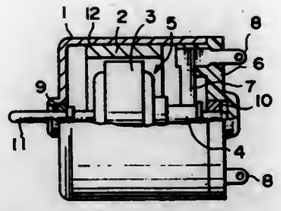
a commutator;

a case cap fitted to an open end of said case;

brushes for making sliding contact with said commutator;

input terminals electrically connected to said brushes, said input terminals being connected to said case cap;






bearings provided on said bottom part of said case and provided on said case cap, said rotor beam rotatably supported by said bearings;

an internal space defined by said case and said case cap being filled with an atmosphere of a polymer having a weight-average molecular weight of 250–5000, said polymer being polyoxyalkylene glycol diester, or polyoxyalkylene glycol monoester.

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**5,502,344**

**PACKAGED PIEZOELECTRIC OSCILLATOR INCORPORATING CAPACITORS AND METHOD OF MAKING THE SAME**

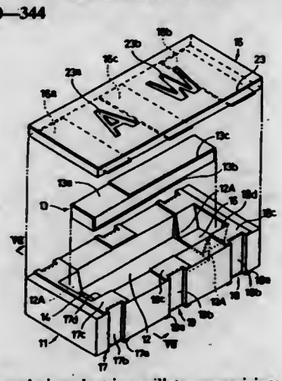
**Hisaya Yoshimoto; Shigeru Kambara, and Ikuo Matsumoto, all of Kyoto, Japan, assignors to Rohm Co., Ltd., Kyoto, Japan**

**Filed Aug. 22, 1994, Ser. No. 293,926**

**Claims priority, application Japan, Aug. 23, 1993, 5-208075; Mar. 29, 1994, 6-059202; Mar. 29, 1994, 6-059203; Mar. 29, 1994, 6-059204; Mar. 29, 1994, 6-059205; Mar. 29, 1994, 6-059206; Mar. 30, 1994, 6-060587; Mar. 31, 1994, 6-062536**

**Int. Cl.[6] H01L** *41/08*

**U.S. Cl. 310—344** **14 Claims**




1. A packaged piezoelectric oscillator comprising:

an insulating package body having a bottom mounting face and an upwardly open housing groove which has a bottom surface formed with oscillator electrodes at both ends of the housing groove, the package body being externally formed with first to third lead electrodes spaced from each other, the first and second lead electrodes extending into the housing groove for electrical connection to the respective oscillator electrodes, the third lead electrode being located between the first and second lead electrodes;

a piezoelectric element fixedly received in the housing groove of the insulating package body and held in electrically conduction with the respective oscillator electrodes; and

a lid member upwardly spaced from the bottom mounting surface of the package body and attached to the package body to close the housing groove, the lid member having a lower inside surface formed with first to third capacitor electrodes in electrical conduction with the first to third lead electrodes, respectively, none of the first to third capacitor electrodes extending onto an upper outside surface of the lid member.

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**5,502,345**

**UNITARY TRANSDUCER WITH VARIABLE RESISTIVITY**

**Manfred Kahn, Alexandria, Va.; Carl C. Wu, Potomac, Md., and Saadi Zain, New York, N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Aug. 29, 1994, Ser. No. 296,881**

**Int. Cl.[6] H01L** *41/08*

**U.S. Cl. 310—358** **18 Claims**

1. An actuator comprising an actuator element containing regions of a ceramic material, at least one of said regions containing an additive of a different resistivity than a region devoid of said additive or the same additive in a different amount than in another region, wherein amount of said additive in one of said regions is about 0.02–5% based on total weight of said region and wherein said additive is selected from the group consisting of metal oxide compounds that are capable of reducing the resistivity of said ceramic material when mixed therewith, said element capable of deflecting in response to an applied electric field and having a continuous and an uninterrupted structure devoid of a seam between at least two of said regions.

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**5,502,346**

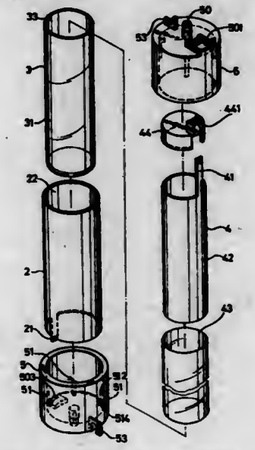
**APPARATUS TO GENERATE CORONA DISCHARGES**

**Ting-Shin Hsieh, Taipei, Taiwan, assignor to Xetin Co., Ltd., Taipei, Taiwan**

**Filed Aug. 9, 1994, Ser. No. 287,747**

**Int. Cl.[6] H01J** *1/88;* **H01T** *19/00*

**U.S. Cl. 313—247** **8 Claims**




1. An apparatus to generate corona discharges comprising:

(a) a ground electrode tube, a first end of which includes a protruding connector,

(b) a single-opening insulating tube, said single-opening insulating tube is inserted into said ground electrode tube such that a gap is formed between an outer wall of said single-opening insulating tube and an inner wall of said ground electrode tube,

(c) a high-voltage electrode tube which is inserted into said single-opening insulating tube, said high-voltage electrode tube includes a connector at a first end and is secured in an interior of said single-opening insulating tube by means of an

insulating plug such that said connector of said high-voltage electrode tube protrudes from said single-opening insulating tube, and

(d) two insulating caps; wherein

said insulating caps encloses both ends of said ground electrode tube such that said ground electrode tube, said single-opening insulating tube, and said high-voltage electrode tube form a single unit,

an outer surface of each of said insulating caps includes an air hole to allow the flow of air therethrough,

said outer surfaces of said insulating caps also each include a hole that receives respectively said connector of said ground electrode tube and said connector of said high-voltage electrode tube,

an inner surface of each of said insulating caps includes a plurality of dual-function projecting pieces so as to form an air space between said ground electrode tube and said single-opening insulating tube, and to form air spaces between said inner surfaces of said insulating caps and said ground electrode tube and said single-opening insulating tube respectively.

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**5,502,347**

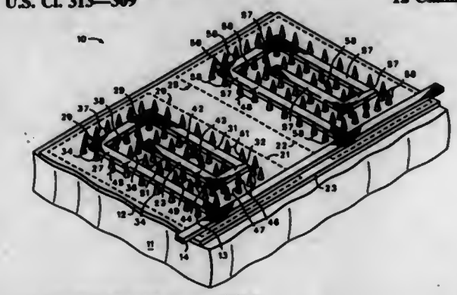
**ELECTRON SOURCE**

**Lawrence N. Dworsky, and James E. Jaskie, both of Scottsdale, Ariz., assignors to Motorola, Schaumburg, Ill.**

**Filed Oct. 6, 1994, Ser. No. 319,403**

**Int. Cl.[6] H01J 1/02**

**U.S. Cl. 313—309** **12 Claims**



1. An electron source comprising:

a substrate;

a resistive layer on the substrate wherein a portion of the resistive layer forms a first pixel area;

a conductor strip on the resistive layer, the conductor strip positioned adjacent a first long side of the resistive layer;

a first meander conductor on the resistive layer and within the first pixel area wherein the first meander conductor projects from the conductor strip; and

a first plurality of emitters on the resistive layer wherein each emitter is substantially equidistant from the first meander conductor.

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**5,502,348**

**BALLISTIC CHARGE TRANSPORT DEVICE WITH INTEGRAL ACTIVE CONTAMINANT ABSORPTION MEANS**

**Curtis D. Moyer, Phoenix; Lawrence N. Dworsky, and Robert C. Kane, both of Scottsdale, all of Ariz., assignors to Motorola, Schaumburg, Ill.**

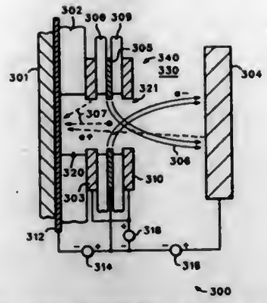
**Filed Dec. 20, 1993, Ser. No. 169,232**

**Int. Cl.[6] H01J 1/46;17/24; H01L 29/06;23/58**

**U.S. Cl. 313—310** **18 Claims**

1. A ballistic charge transport device comprising:

a supporting substrate having a major surface;



an integrally formed contaminant absorption layer having an affinity to absorb charged and uncharged atomic and molecular contaminants disposed on the major surface;

a first insulating layer disposed on the contaminant absorption layer and having a first insulator aperture defined therethrough so as to expose a portion of the contaminant absorption layer;

an active device assembly comprised of a plurality of layers disposed on the first insulating layer and including:

a charged particle source layer having first and second surfaces and designed to emanate desired particles;

second and third insulator layers in operable communication one on each of the first and second charged particle source layer surfaces;

first and second electric field particle extraction layers one each disposed on one of the second and third insulator layers, and

an assembly aperture defined therethrough and substantially in registration with the first insulator aperture; and

a receiving terminal, for receiving desired charged particles emanating from the source, distally disposed with respect to the active device assembly and defining a transport region therebetween, such that desired charged particles emanating from the source are received at the receiving terminal and contaminant particles emanating from the receiving terminal and desorbed from other device surfaces are preferentially absorbed at the contaminant absorption layer.

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**5,502,349**

**ELASTIC MEMBER FOR SUPPORTING SHADOW MASK OF COLOR PICTURE TUBE**

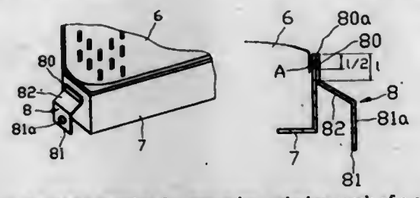
**Ho S. Seo, Taegu, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea**

**Filed Jul. 5, 1994, Ser. No. 267,769**

**Claims priority, application Rep. of Korea, Jul. 5, 1993, 1993-12554**

**Int. Cl.[6] H01J 29/07**

**U.S. Cl. 313—404** **6 Claims**



1. An elastic member for supporting a shadow mask of a color picture tube having a panel, comprising:

a fixing portion including a welding point which is located at less than a half of said fixing portion's length from a top end thereof and an extended portion movably extending from said welding point to a bottom end of the fixing portion,

said extended portion having a length which is more than a half of said fixing portion's length,



said fixing portion being fixed to a mask frame of the color picture tube at said welding point;

a connecting portion having a connecting hole through which said elastic member is attached to a panel pin formed on the inner side of the panel; and

a sliding portion which connects said fixing portion and said connecting portion, so as to form a one-piece elastic member;

wherein said extended portion of the fixing portion reduces permanent deformation of the elastic member.

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**5,502,350**

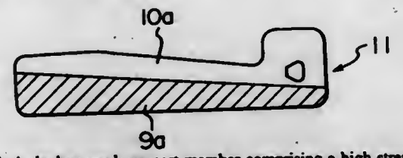
**SHADOW MASK SUPPORT MEMBER HAVING HIGH STRENGTH AND THERMAL DEFORMATION RESISTANT LOW-EXPANSION ALLOY PLATE AND HIGH EXPANSION ALLOY PLATE AND METHOD OF PRODUCING THE SAME**

**Toshihiro Uehara, Yasugi, Japan; Koji Sato, Berkeley, Calif., and Shuichi Nakamura, Yasugi, Japan, assignors to Hitachi Metals Ltd., Tokyo, Japan**

**Filed Aug. 18, 1994, Ser. No. 291,904**

**Int. Cl.[6] H01J 29/07**

**U.S. Cl. 313—404** **11 Claims**



1. A shadow mask support member comprising a high-strength, low-expansion alloy plate, and a high-expansion alloy plate which are bonded together on their marginal surfaces, said low-expansion alloy plate having an excellent resistance to thermal deformation, said low-expansion alloy plate consisting essentially, by weight, of 0.1–0.5% C, 1.0% or less Si, 2.0% or less Mn, 30–40% Ni, 1.0–5.0% Mo and the balance Fe and incidental impurities, said low-expansion alloy plate having an average thermal expansion coefficient of $6\times10^{-6}$/° C. or less at 30°–100° C. and a tensile strength of 100 kgf/mm$^2$ or greater at a room temperature, and said high-expansion alloy plate having an average thermal expansion coefficient of $14\times10^{-6}$/° C. or greater at 30°–100° C. and a tensile strength of 110 kgf/mm$^2$ or greater at a room temperature.

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**5,502,351**

**SPARK PLUG HAVING HORIZONTAL DISCHARGE GAP**

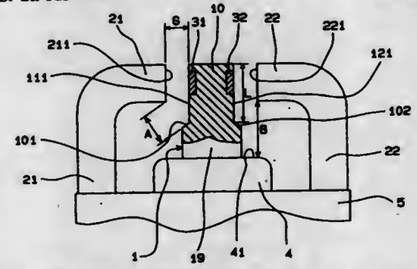
**Akio Katoh, Nishio, and Nobuo Abe, Yokkaichi, both of, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan**

**Filed Apr. 8, 1994, Ser. No. 224,975**

**Claims priority, application Japan, Apr. 28, 1993, 5-125553**

**Int. Cl.[6] H01T 13/20**

**U.S. Cl. 313—141** **10 Claims**



1. A spark plug for igniting compressed air-fuel mixture of an internal combustion engine comprising:

an insulator;

a first electrode protruding from an end of said insulator, and having a free end face, said first electrode having a flat face defined on a surface thereof and extending toward said free end face in an axial direction of said first electrode, a base having an outer circumferential surface and a connecting portion for connecting said outer circumferential surface of said base and said flat face;

a housing secured in surrounding relation to said insulator;

a second electrode attached to said housing such that a tip face of said second electrode is opposed to said flat face of said first electrode;

a noble metal piece secured to said flat face of said first electrode so as to form a spark discharge gap between itself and said tip face of said second electrode;

wherein if said spark discharge gap is defined as G, and a minimum gap between said tip face of said second electrode and said connecting portion of said first electrode is defined as A, and a minimum gap between said tip face of said second electrode and said end of said insulator is defined as B, a distance of said gaps A, B and G satisfy the following relations:

the distance of A≧1.2×the distance of G; and

the distance of B≧the distance of G.

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**5,502,352**

**SPARK PLUG HAVING HORIZONTAL DISCHARGE**

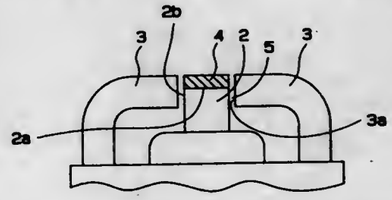
**Akio Katoh, Nishio, and Kozo Takamura, Nagoya, both of, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan**

**Filed Aug. 16, 1994, Ser. No. 291,544**

**Claims priority, application Japan, Aug. 19, 1993, 5-205108**

**Int. Cl.[6] H01T 13/20**

**U.S. Cl. 313—141** **12 Claims**



1. A spark plug for an internal combustion engine comprising:

a center electrode having an outer peripheral surface and an end face;

a ground electrode having a discharge portion opposed to said outer peripheral surface so as to form a spark gap therebetween; and

a tip electrode composed of a material having a superior consumable resistance as compared to said center electrode, having a cross-sectional shape substantially identical to that of said end face, and disposed on said end face so as to form a spark gap with said discharge portion;

wherein a thickness along an axial direction of said center electrode of said discharge portion of said ground electrode where spark discharge occurs is substantially larger than a thickness along said axial direction of said tip electrode where spark discharge occurs.

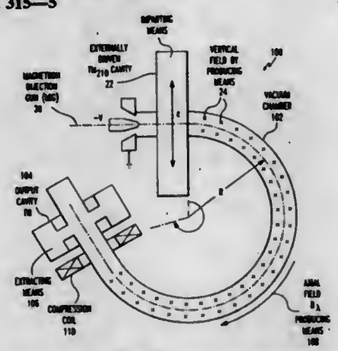
## 5,502,353
## APPARATUS FOR BUNCHING RELATIVISTIC ELECTRONS

Frederick M. Mako, 6308 Youngs Branch Dr., Fairfax Station, Va. 22039, and Terry F. Godlove, 9713 Manteo Ct., Fort Washington, Md. 20744, assignors to Frederick M. Mako, Fairfax Station, Va.; Terry F. Godlove, Fort Washington, Md., and Ansel M. Schwartz, Pittsburgh, Pa.

Continuation of Ser. No. 828,413, Jan. 31, 1992, abandoned. This application Aug. 22, 1994, Ser. No. 293,580

Int. Cl.[6] H01J 23/10;25/02

U.S. Cl. 315—5 2 Claims




2. An apparatus for bunching relativistic electrons comprising:

an electron injection gun for producing a pin beam of electrons;

a vacuum chamber, at least a portion of which is toroidally shaped, said vacuum chamber having a central axis defining an axial direction, said vacuum chamber comprised of an input cavity at a first end of the vacuum chamber having means for imparting a predetermined drift displacement by periodic transverse magnetic field modulation to each electron of said electron beam passing therethrough such that electrons are caused to bunch together at a predetermined location in the vacuum chamber at a second end thereof, said input cavity disposed adjacent to said gun to receive electrons therefrom, and an output cavity disposed at essentially the second end of the toroidal portion having means for generating RF energy from the electrons passing therethrough;

means for producing an axial magnetic field in the axial direction in at least the toroidal portion of the vacuum chamber to maintain the electrons in the chamber, said axial field producing means disposed adjacent to the vacuum chamber;

means for producing a vertical magnetic field in a vertical direction perpendicular to the axial direction in the vacuum chamber to maintain the electrons in the chamber, said vertical field producing means disposed adjacent to the vacuum chamber; and

a compression coil, said compression coil disposed adjacent to the output cavity to compress the electrons together.

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## 5,502,354
## DIRECT CURRENT ENERGIZED PULSE GENERATOR UTILIZING AUTOGENOUS CYCLICAL PULSED ABNORMAL GLOW DISCHARGES

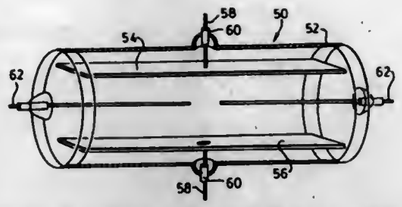
Paulo N. Correa, and Alexandra N. Correa, both of 42 Rockview Gardens, both of Concord, Ontario, Canada

Continuation-in-part of Ser. No. 922,863, Jul. 31, 1992, abandoned. This application Apr. 19, 1994, Ser. No. 229,931

Int. Cl.[6] H01J 7/24

U.S. Cl. 315—111.01 18 Claims

1. A pulse generator comprising a cold cathode vacuum discharge tube having an anode and a cathode enclosed within an evacuated housing, wherein the cathode has an extended surface facing the anode and the cathode is capable of auto-electronic emissions under abnormal glow discharge conditions, which emissions have an extinction potential substantially higher than the sustaining potential of a vacuum arc discharge in the same tube, said discharge tube being connected in an external circuit comprising a continuous direct current source connected between the anode and the cathode, the external circuit being capable of delivering a potential sufficient to initiate auto-electronic emissions, and sufficient current at sufficient potential to drive said tube into a negative resistance region of abnormal glow discharge, the external circuit having an impedance sufficient that, as the tube is driven into said negative resistance region, potential between the anode and the cathode collapses below said extinction potential before a vacuum arc is established, whereby an endogenous cyclical pulsed abnormal glow discharge (PAGD) will occur, the cathode being of sufficiently robust construction to enable it to withstand sustained PAGD and erosion resulting therefrom without disruption or substantial thermionic emission, the surface of the cathode facing the anode being of a metal and having an area which promotes auto-electronic emission at much lower currents than predicted by the Fowler-Nordheim field emission theory, and the minimum separation of the cathode from the anode being at least about 2 cm.




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## 5,502,355
## PLASMA PROCESSING APPARATUS FOR PRODUCING HIGH DENSITY PLASMA

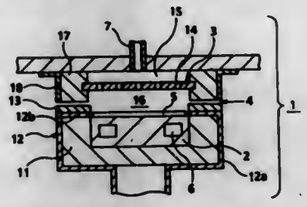
Supica Mashiro, Tokyo, Japan, assignor to Anelva Corporation, Tokyo, Japan

Filed Nov. 21, 1994, Ser. No. 345,458

Claims priority, application Japan, Nov. 30, 1993, 5-299929

Int. Cl.[6] H01J 7/24

U.S. Cl. 315—111.21 7 Claims




1. A plasma processing apparatus for processing a surface of a substrate by a reactive gas plasma, comprising:

a vacuum processing chamber for maintaining a vacuum therein;

first and second electrodes in said vacuum processing chamber in parallel and opposite each other, said first electrode being applied with a high frequency power while said second electrode being grounded so that a reactive gas plasma is produced at a space between said first and second electrodes, said substrate is supported by either one of said first and second electrodes;

a narrow gap portion formed along peripheries of said first and second electrodes, whose distance is narrower than a distance between central portions of said first and second electrodes;

a ground shield made of conductive material provided around said first electrode to which high frequency power is applied so that said ground shield surrounds an outside surface of said first electrode; and



an annular extension ground shield portion which extends into said narrow gap portion, said annular extension ground shield portion being continuous with said ground shield and being made of a conductive metal.

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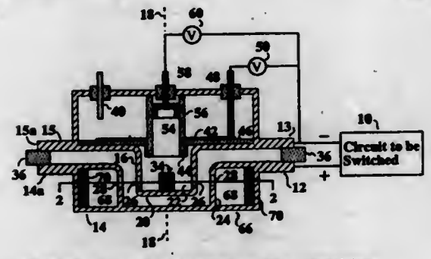
## 5,502,356
## STABILIZED RADIAL PSEUDOSPARK SWITCH

Malcolm W. McGeoch, Brookline, Mass., assignor to Plex Corporation, Brookline, Mass.

Filed May 2, 1994, Ser. No. 237,010

Int. Cl.[6] H01J 7/24

U.S. Cl. 315—111.91 17 Claims




1. A stabilized radial pseudospark switch comprising:

a hollow cathode having an axis of symmetry;

a hollow anode coaxial with and surrounding said cathode, said cathode and said anode including a plurality of aligned pairs of holes which define an array of pseudospark channels, said pseudospark channels having longitudinal axes which intersect at a point on said axis of symmetry;

a stabilizing electrode element for controlling spontaneous anode-cathode current and for accelerating switch commutation, said stabilizing electrode element being located on said axis of symmetry in alignment with said pseudospark channels and being maintained at the electrical potential of said cathode;

an auxiliary electrode for supplying electrons for causing switch commutation;

an auxiliary voltage source for applying a positive potential between the auxiliary electrode and the cathode for maintaining the switch open circuit and for applying a negative potential between the auxiliary electrode and the cathode for causing switch commutation by the formation of discharges in said pseudospark channels; and

a vacuum-tight enclosure for maintaining a gas at prescribed pressure in a region between said cathode and said anode.

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## 5,502,357
## LOW COST INVERTER FOR EL LAMP

Robert A. Kimball, Scottsdale, Ariz., assignor to Durel Corporation, Chandler, Ariz.

Filed Oct. 3, 1994, Ser. No. 317,198

Int. Cl.[6] H05B 37/02

U.S. Cl. 315—209 R 10 Claims

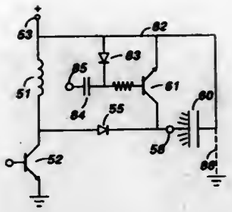
1. A low cost inverter for powering an electroluminescent lamp from a low voltage DC source, said inverter comprising:

a supply terminal and a ground terminal for connection to said DC source;

an output terminal for connection to a first electrode of said electroluminescent lamp;

means connected to said supply terminal, said ground terminal and said output terminal for providing pulses to said lamp; and

a discharge path for discharging said lamp, said discharge path including a first transistor connected between said output terminal and said supply terminal for eliminating waste current in said discharge path.




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## 5,502,358
## METHOD AND APPARATUS FOR CONTROLLING THE TENSION OF A POWER CORD OF A SELF-PROPELLED ROBOT

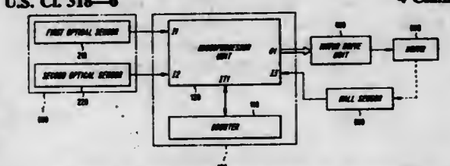
Jae-Bong Lee, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Aug. 31, 1994, Ser. No. 297,931

Claims priority, application Rep. of Korea, Sep. 1, 1993, 93-17425

Int. Cl.[6] B65H 59/38

U.S. Cl. 318—6 4 Claims




1. A method for controlling the tension on an electric power supply cord of a self-propelled robot, the cord being wound on a rotary spool carried by said self-propelled robot for undergoing unwinding and winding-up motions, and a motor for applying a rotary force to the spool, said method comprising the steps of:

A) causing said robot to propel itself to produce an unwinding of said cord, while applying a selected tension on said cord as it is being unwound;

B) sensing an unwinding speed of said cord as it is being unwound;

B1) maintaining at least said selected tension on said cord when said cord unwinding speed is sensed as being less than a predetermined speed, and

B2) applying a rotary force from said motor to said spool in a cord-unwinding direction for reducing the tension on said cord to a value below said selected tension when said cord unwinding speed is sensed as being at or above said predetermined speed.

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## 5,502,359
## SMALL MOTOR WITH PERMANENT-MAGNET ROTOR

Hugo Schemmann, Schnesberg, Netherlands, and Theo Hüsgen, Aachen, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

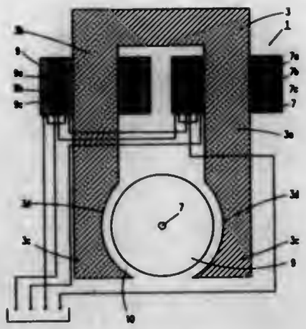
Filed Aug. 24, 1994, Ser. No. 295,443

Claims priority, application Germany, Aug. 28, 1993, 43 29 046.9

Int. Cl.[6] H02K 7/00;1/00;3/14

U.S. Cl. 310—40 MM 8 Claims

1. A small motor comprising: a permanent-magnet rotor and a laminated stator having first and second limbs with end portions that form magnetic poles for the rotor, said limbs carrying exciter coils, wherein said exciter coils on both limbs in two winding groups, of which an outer winding layer and an inner winding layer of the first limb and the second limb, respectively, and a central winding layer of the second limb and the first limb, respectively, are connected in series with one another.

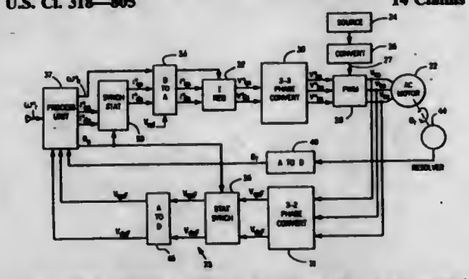


5,502,360

## STATOR RESISTANCE DETECTOR FOR USE IN ELECTRIC MOTOR CONTROLLERS

Russel J. Kerkman, Milwaukee; Brian J. Seibel, Grafton, and Doyle Busse, Muskego, all of Wis., assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Mar. 10, 1995, Ser. No. 401,522
Int. Cl.[6] H02P 7/00; 5/40
U.S. Cl. 318—805 14 Claims



1. A stator resistance estimator for use with a motor control system, the control system altering motor operation in response to a current command vector in a dq frame of reference, and in which d and q-axis stator feedback voltages are used for motor control purposes, each feedback voltage including a voltage drop component attributable to a stator resistance and a counter EMF component attributable to a rotor field, the estimator comprising:

(a) a calculator determining a phase angle of the current command vector in the dq frame of reference;

(b) a voltage converter operating on said d and q-axis feedback voltages to generate d' and q'-axis voltages in a new coordinate frame of reference where the q'-axis is defined by the phase angle, the d'-axis is in quadrature with the q'-axis, and the d'-axis voltage does not include a voltage drop component;

(c) a corrector to force the d'-axis voltage to be equal to a d'-axis command EMF component;

(d) an EMF identifier for determining the value of a q'-axis command EMF component;

(e) a summer for mathematically combining the q'-axis voltage and the q'-axis command EMF producing a q'-axis voltage error signal; and

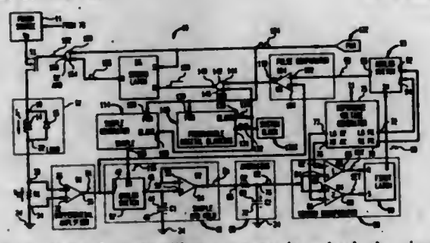
(f) a divider for mathematically combining the q'-axis voltage error signal and command current vector producing the stator resistance estimate.

5,502,361

## LOAD CURRENT LIMITING CIRCUIT FOR PWM CONTROLLED BRUSHLESS MOTOR

Sungwon R. Moh, Wilton; Scott T. Potter, Southport; Frank D. Ramirez, Stamford, and Edilberto I. Salazar, Brookfield, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 18,597, Feb. 17, 1993, Pat. No. 5,382,890. This application Aug. 31, 1994, Ser. No. 298,863
Int. Cl.[6] H02P 5/06
U.S. Cl. 318—254 10 Claims



1. A circuit for controlling a current in a load, the circuit comprising:

a. means for connecting the circuit to a source of power, the power source connecting means including a power switch having off and on operating modes;

b. means for connecting the circuit to a supply of a pulse width modulated (PWM) control signal, the PWM supply connecting means including an AND gate having first and second input means and an output means, one of the first and second input means connected for receiving the PWM control signal, and the AND gate output means connected to the power switch for operating the switch;

c. means for monitoring the current in the load, the monitoring means including a differential amplifier, the differential amplifier having an instantaneous output voltage signal proportional to the load current when the power switch is in the on operating mode;

d. means for comparing a value derived from the instantaneous signal to a high reference voltage signal and a low reference voltage signal and providing a first comparison signal;

e. means for providing a peak reference voltage signal in response to the first comparison signal;

f. means for comparing the peak reference voltage signal and instantaneous output voltage signal and providing a second comparison signal; and

g. means for providing a signal corresponding to the second comparison signal to the other of the first and second input means of the AND gate for operating the power switch in consideration of the comparison between the peak reference voltage signal and instantaneous output voltage signal.

5,502,362

## ASYNCHRONOUS MACHINE WITH A SHORT-CIRCUIT ROTOR

Jürgen Brandes, Bad Neustadt, Germany, assignor to Siemens Aktiengesellschaft, München, Germany

Filed Mar. 28, 1994, Ser. No. 218,779
Claims priority, application Germany, Mar. 30, 1993, 43 10 320.0
Int. Cl.[6] G05B 5/00
U.S. Cl. 318—471 30 Claims

1. An asynchronous machine comprising:

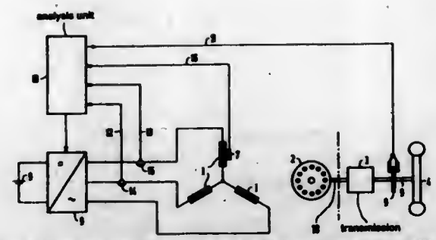
a) at least two bearings;

b) a stator winding;

c) a short-circuit rotor being rotatably supported by means of said beatings and having a locking device for locking said rotor; and

d) an analysis unit having a connecting line coupled to the locking device:





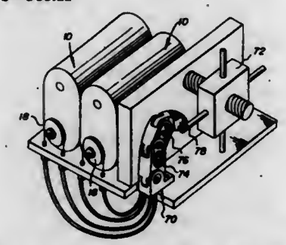
e) at least one temperature sensor which measures a prevailing temperature at a predetermined machine part anal transmits measured temperature values to the analysis unit, which analysis unit, in dependence upon the measured temperature values, switches on and off a voltage to the stator winding and emits control signals via the connecting line to the locking device to lock and release the rotor, the switching on and off of the voltage, as well as the locking and release of the rotor being carried out in each case at temperature values preset for the analysis unit, by means of which analysis unit, moreover, a level of the voltage switched on to the stator winding is preset in such a way that a current flows in the stator winding which corresponds to several times a rated current of the machine.

5,502,363

## APPARATUS FOR CONTROLLING ANGULAR POSITIONING AND STIFFNESS MODULATIONS OF JOINT OF ROBOTIC MANIPULATOR

Uri Tasch, Pikesville, and Arie Kalkstein, Baltimore, both of Md., assignors to Unitversity of Maryland-Baltimore County, Baltimore, Md.

Filed Jan. 4, 1994, Ser. No. 177,123
Int. Cl.[6] B25J 17/00
U.S. Cl. 318—568.11 21 Claims



1. An apparatus for controlling the angular positioning and stiffness modulation of a joint of a robotic manipulator comprising:

a housing;

means positioned within said housing for controlling said stiffness modulations of said joint of said robotic manipulator;

means positioned within said housing for controlling said angular positioning of said joint of said robotic manipulator;

a threaded shaft connected to said means for controlling said stiffness modulations;

a shaft connected to said means for controlling said angular positioning; and

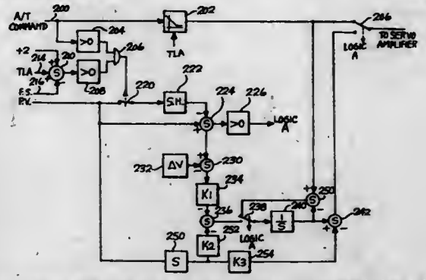
a shaft support means having an aperture and a threaded aperture therethrough for receiving said shaft and said threaded shaft, respectively, in order for said shaft support means to translate back and forth on said shaft due to the positioning of said shaft support means on said threaded shaft.

5,502,364

## AIRCRAFT AUTOMATIC THROTTLE FORWARD STOP SERVO SYSTEM AND METHOD

Frederick C. Blechen, Redmond; Michael W. Kelley, Renton, and David K. Lyndon, Issaquah, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jul. 26, 1993, Ser. No. 98,163
Int. Cl.[6] G05B 9/03; G05D 1/08
U.S. Cl. 318—618 31 Claims



1. A servo amplifier system responsive to a command signal for driving a servoed device against a stop position of said device, said system comprising:

position feedback means for producing a feedback signal representative of the position of said device;

summing means for summing said command signal with said feedback signal to produce an error signal;

amplifier means for receiving said error signal and producing an output signal adapted to drive said servoed device; and

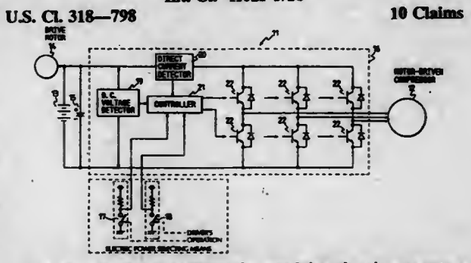
processing means for monitoring said amplifier means output signal and, in response to detecting a predetermined condition of said output signal representative of said device being in said stop position, applying a predetermined control signal to said summing means such that said servoed device is biased against said stop position with a controlled force, said processing means further comprising retraction detection means for determining the condition of said servoed device being retracted from said stop position and inhibiting said control signal responsive thereto such that said device may be retracted from said stop position without opposition from said servo system.

5,502,365

## DRIVING CONTROL APPARATUS OF MOTOR-DRIVEN COMPRESSOR UTILIZED FOR AUTOMOBILE

Yasuo Nanbu, Oono, and Makoto Yoshida, Kusatsu, both of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Aug. 30, 1993, Ser. No. 113,470
Claims priority, application Japan, Aug. 31, 1992, 4-230945
Int. Cl.[6] H02P 5/28
U.S. Cl. 318—798 10 Claims



1. A driving control apparatus for supplying electric power to a motor-driven compressor mounted on an automobile, comprising:

electric source means for storing an electric energy to be supplied to the motor-driven compressor;

direct current detecting means for detecting a direct current supplied from the electric source means to the motor-driven compressor;

direct current voltage detecting means for detecting a d.c. voltage of the direct current supplied from the electric source means, the d.c. voltage being applied to the motor-driven compressor; and

control means for calculating an electric power obtained by multiplying the direct current detected by the direct current detecting means and the d.c. voltage detected by the direct current voltage detecting means together, for comparing the electric power to an upper limit of the electric power, and for controlling the motor-driven compressor to reduce the electric power consumed by the motor-driven compressor to an electric power value lower than the upper limit in cases where the electric power is larger than the upper limit;

wherein the direct current detecting means comprises:

a peak direct current detecting circuit for detecting a peak value of the direct current, wherein the control means stops operation of the motor-driven compressor, which is under control of the control means, in cases where the peak value of the direct current is determined by the control means to be higher than an allowable peak limit of the peak value; and

an average direct current detecting circuit for detecting an average value of the direct current, wherein the electric power is calculated by the control means by multiplying the average value and the d.c. voltage detected by the direct current voltage detecting means together.

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**5,502,366**

**BATTERY PACK COUPLER FOR CAMCORDER WITH SLIDING LEVER**

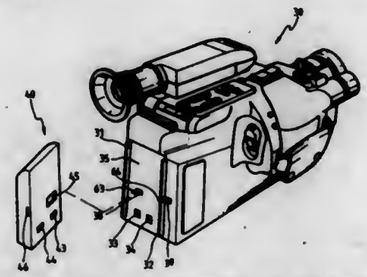
**Chang H. Lee, Yongin, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki, Rep. of Korea**

**Filed May 16, 1994, Ser. No. 242,849**

**Claims priority, application Rep. of Korea, Jul. 27, 1993, 93-14066**

**Int. Cl.[6] H01M *10/46***

**U.S. Cl. 320—2** **12 Claims**



1. A battery pack coupler for detachably uniting a battery pack to battery-attaching plate of a camcorder housing, said battery pack having openings formed on the bottom and one flank thereof, said coupler comprising:

a plurality of guide holes formed in said battery-attaching plate;

guide ribs formed on said battery-attaching plate at positions spaced apart an amount substantially equal the width of said battery pack, one of said guide ribs having an aperture formed therein;

an operating lever having hooking pieces thereon, said operating lever being positioned relative to said plate so that said hooking pieces pass through said plurality of guide holes, respectively to project outside said housing, said operating lever being slidable to a hooked position; and

elastically biasing means for elastically biasing said operating lever in one direction to said booked position wherein said hooking pieces are engaged with said openings,

wherein one of said hooking pieces passes through said aperture when said operating lever is moved to said hooked position.

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**5,502,367**

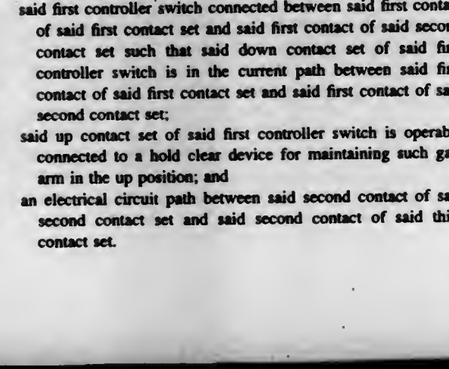
**HIGHWAY CROSSING CONTROL**

**Richard S. Jones, Swansea, S.C., assignor to Union Switch & Signal Inc., Pittsburgh, Pa.**

**Filed Aug. 19, 1994, Ser. No. 292,580**

**Int. Cl.[6] H02P *7/06*; B61L *1/08***

**U.S. Cl. 318—281** **10 Claims**



1. A highway crossing gate control for driving a gate arm between an up position and a down position in response to an up signal comprising:

a permanent magnetic DC motor mechanically connected to drive such gate arm up when rotated in a direction and to drive such gate arm down when rotated in a direction opposite to said direction;

a motor control relay connected to said up signal to be energized in response to such up signal;

said motor control relay having a first contact set having a connection between a side of the armature of said motor and a first contact upon energization of said motor control relay, and having a connection between said armature and a second contact only when said motor control relay is de-energized;

said motor control relay having a second contact set having a connection between a power supply and a first contact upon energization of said motor control relay, and having a connection between said power supply and a second contact when said motor control relay is de-energized;

said motor control relay having a third contact set having a connection between the opposite side of said armature and a first contact when said motor control relay is energized and having a connection between said opposite side of said armature and a second contact when said motor control relay is de-energized;

a first controller switch having an up contact set made only when such gate arm is in such up position and a down contact set made only when such gate arm is in a position other than such up position;

said first controller switch connected between said first contact of said first contact set and said first contact of said second contact set such that said down contact set of said first controller switch is in the current path between said first contact of said first contact set and said first contact of said second contact set;

said up contact set of said first controller switch is operably connected to a hold clear device for maintaining such gate arm in the up position; and

an electrical circuit path between said second contact of said second contact set and said second contact of said third contact set.



**5,502,368**

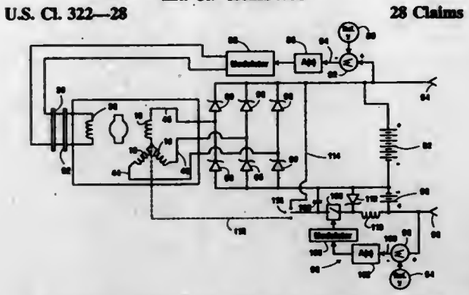
**HYBRID ALTERNATOR WITH VOLTAGE REGULATOR**

**Charles D. Syverson, North Mankato, Minn., and William P. Curtiss, Chelsea, Mass., assignors to Ecoair Corp., New Haven, Conn.**

**Filed Jun. 6, 1994, Ser. No. 251,530**

**Int. Cl.[6] H02H *7/06***

**U.S. Cl. 322—28** **28 Claims**



1. A voltage regulator for controlling bidirectional current flow through a winding of an alternator to control an output voltage of the alternator, the voltage regulator comprising:

a voltage monitoring circuit connected to monitor the output voltage of the alternator, the voltage monitoring circuit producing an error signal indicating that the output voltage of the alternator should be increased or decreased;

a switching circuit connected to the winding and arranged to connect the winding in multiple modes, including:

a forward polarity mode in which a forward polarity voltage is applied to the winding,

a reverse polarity mode in which a reverse polarity voltage is applied to the winding, and

a decay mode in which current induced in the winding when connected in the forward or reverse polarity mode is permitted to decay without inducing damaging voltages in the voltage regulator; and

a control circuit connected to the switching circuit, responsive to the error signal of the monitoring circuit, the control circuit controlling the switching circuit to enter the forward polarity mode to increase the output voltage of the alternator, to enter the reverse polarity mode to decrease the output voltage of the alternator and to enter the decay mode whenever switching away from the forward or reverse polarity mode.

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**5,502,369**

**STABILIZED DIRECT CURRENT POWER SUPPLY**

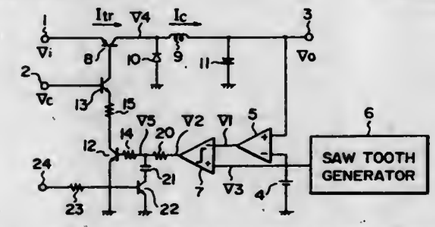
**Masaki Niwayama, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Continuation-in-part of Ser. No. 955,068, Oct. 1, 1992, abandoned. This application Jun. 6, 1995, Ser. No. 468,915**

**Claims priority, application Japan, Jan. 1, 1991, 3-253753**

**Int. Cl.[6] G05F *1/56***

**U.S. Cl. 323—273** **23 Claims**




1. A stabilized direct current power supply for supplying power to an electronic device capable of loading and ejecting an information recording medium, comprising:

a series transistor inserted in series between a power supply input terminal receiving a direct current power supply and an output terminal for supplying power to the electronic device; and

selection means, responsive to an operation mode signal of the electronic device, for selecting a state in which direct current stabilization of a chopper type is performed in conjunction with said series transistor in response to the operation mode signal not indicating a desired loading or ejecting operation and for selecting a state in which direct current stabilization of a linear control type is performed by operating said series transistor as a linear amplifier in response to the operation mode signal indicating a desired loading or ejecting operation.

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**5,502,370**

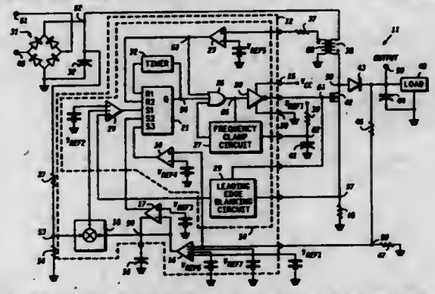
**POWER FACTOR CONTROL CIRCUIT HAVING A BOOST CURRENT FOR INCREASING A SPEED OF A VOLTAGE CONTROL LOOP AND METHOD THEREFOR**

**Jeff W. Hall; Steven M. Barrow, both of Phoenix; Jade H. Alberkrack, Tempe, and Eric W. Tisinger, Chandler, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Sep. 6, 1994, Ser. No. 300,545**

**Int. Cl.[6] G05F *1/40*; H02M *3/335***

**U.S. Cl. 323—284** **11 Claims**



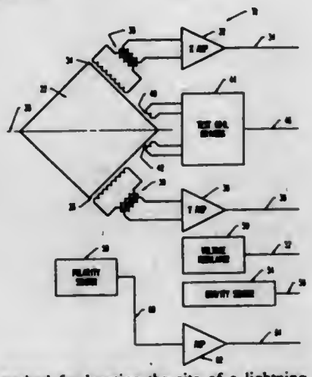
1. An integrated power factor control circuit for making an average AC line current sinusoidal and in phase with an AC line voltage signal, the integrated power factor control circuit enabling and disabling a transistor for generating a DC output voltage from a full-wave rectified AC line voltage signal, the integrated power factor control circuit comprising:

a transconductance amplifier responsive to the DC output voltage for providing an error signal, said transconductance amplifier having a linear voltage to current response within a predetermined voltage range around the DC output voltage and providing a boosted error signal when the DC output voltage is outside said predetermined voltage range for rapidly changing the DC output voltage in a direction towards the predetermined voltage range;

a multiplier having a first input for receiving a voltage proportional to the full-wave rectified AC line voltage signal, a second input for receiving said error signal of said transconductance amplifier, and an output, said multiplier mixes said voltage proportional to the full-wave rectified AC line voltage signal and said error signal of said transconductance amplifier for generating said control signal for making the average AC line current to be sinusoidal and in phase with the AC line voltage signal; and

control means responsive to said control signal of said multiplier, a voltage control loop for regulating the DC output voltage being formed by said multiplier, transconductance amplifier, and control means wherein said boosted current of said transconductance amplifier increases a speed in which said voltage control loop responds to changes in the DC output voltage.

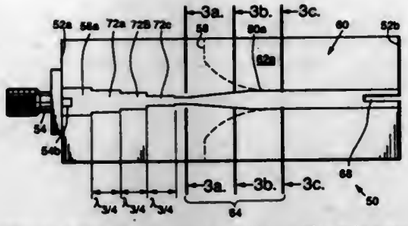
**5,502,371**
**STORM MONITOR**
**John S. Youngquist, 899 Niagara Blvd., Ft. Erie, Ontario, Canada**
**Division of Ser. No. 115,183, Aug. 31, 1993, Pat. No. 5,408,175, which is a division of Ser. No. 708,487, May 31, 1991, Pat. No. 5,245,274. This application Mar. 15, 1995, Ser. No. 404,750**
**Int. Cl.[6] G01W *1/16***
**U.S. Cl. 324—72** **1 Claim**



1. The method for locating the site of a lightning occurrence with respect to a heading axis, said lightning occurrence evoking an electromagnetic field including an H-field component and an E-field component, comprising the steps of:
providing a first H-field antenna including a first coil structure having a first array of windings oriented at a select angle with respect to said heading axis and deriving a first response to said H-field component;
providing a second H-field antenna including a second coil structure having a second array of windings orthogonally disposed with respect to said first array and deriving a second response to said H-field component;
acquiring the bearing of said heading axis as the positional response of a compass gyroscope controlled stepper motor; and
deriving lightning occurrence bearing and range information from said first and second responses and said positional response; and
publishing said bearing and range information as a visually perceptible readout.

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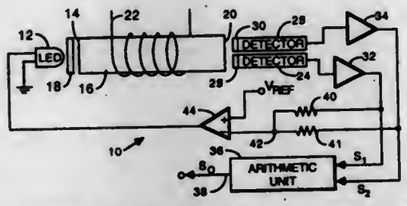
**5,502,372**
**MICROSTRIP DIAGNOSTIC PROBE FOR THICK METAL FLARED NOTCH AND RIDGED WAVEGUIDE RADIATORS**
**Clifton Quan, Arcadia, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.**
**Filed Oct. 7, 1994, Ser. No. 320,030**
**Int. Cl.[6] G01R *31/02;19/28***
**U.S. Cl. 324—72.5** **17 Claims**




7. A test probe for testing individual radiating elements and associated feed circuitry in an array of radiating elements without disassembling said array and in the absence of mutual coupling effects involving radiating elements other than the radiating element under test, each radiating element including a radiating portion with a gap of a predetermined dimension between radiator conductor elements, the probe comprising:
a dielectric board with a thickness and having first and second opposed surfaces;
first and second conductor strips formed respectively on said opposing first and second surfaces of said dielectric board at an insertion end of said probe, said conductor strips defining a broadside coupled strip transmission line;
connector means for connection to said broadside strip transmission line;
said probe having a width dimension across said thickness of said dielectric board and said first and second conductor strips which is equal to said gap dimension so that upon insertion of said insertion end into said radiating portion said first and second strip conductors make contact with said radiator conductor elements and bypass said radiator element.

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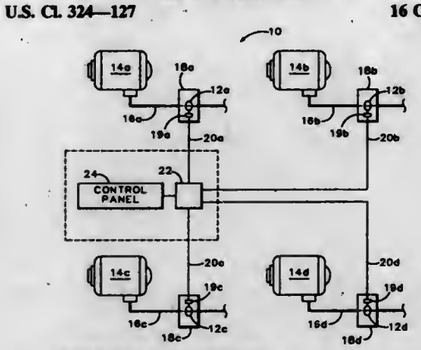
**5,502,373**
**MAGNETO-OPTICAL CURRENT MEASUREMENT APPARATUS**
**Lawrence J. Ryczek, Oconomowoc, and Ruth E. Hubbell, Milwaukee, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio**
**Filed Jun. 15, 1994, Ser. No. 260,138**
**Int. Cl.[6] G01R *31/00***
**U.S. Cl. 324—96** **15 Claims**




1. A magneto-optical electric current measuring system (**10** or **50**) comprising:
a conductor (**22** or **77**) for carrying electric current to be measured;
a magneto-optical element (**16** or **52**) adjacent to said conductor, and acting as a Faraday rotator which rotates a plane of polarization of polarized light passing through said magneto-optical element as a function of the electric current carried by said conductor;
a light emitter (**12** or **54**) for generating a light beam that is directed through said magneto-optical element;
an input optical polarizer (**18** or **58**) located between said light emitter (**12** or **54**) and said magneto-optical element (**16** or **52**) to polarize the light beam;
first and second light detectors (**24** and **26**, or **70** and **72**) located within a single beam of light emerging from said magneto-optical element;
a first output optical polarizer (**28** or **74**) located between said magneto-optical element (**16** or **52**) and said first light detector (**24** or **70**), and having a polarization axis that is oriented at −45 degrees to a plane of polarization of the light beam emerging from said magneto-optical element when electric current is not passing through said conductor; and
a second output optical polarizer (**30** or **76**) located between said magneto-optical element (**16** or **52**) and said second light detector (**26** or **72**), and having a polarization axis that is oriented at +45 degrees to a plane of polarization of the light beam emerging from said magneto-optical element when electric current is not passing through said conductor.



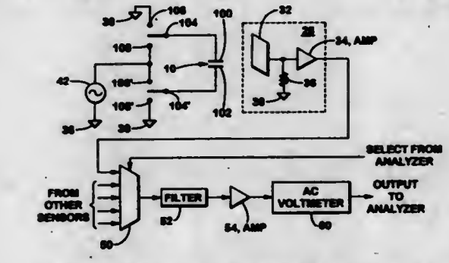
**5,502,374**
**CURRENT SENSORS**
**Roger S. Cota, Vancouver, Wash., assignor to Veris Industries, Inc., Portland, Oreg.**
**Filed Sep. 2, 1994, Ser. No. 300,732**
**Int. Cl.[6] G01R *19/22***
**U.S. Cl. 324—127** **16 Claims**




1. A measuring system comprising:
(a) a transformer magnetically linked with a power cable to produce a voltage signal in response to the presence of a changing current within the power cable;
(b) an input circuit electrically connected to said transformer for receiving said voltage signal and including means for producing a full-wave rectified analog current signal representative of said changing current within said power cable in response to receiving said voltage signal;
(c) a transmission line having a first end and a second end, said first end being electrically interconnected with said input circuit so as to receive said analog current signal; and
(d) an output circuit spaced apart from said first end, said second end being electrically interconnected with said output circuit and said output circuit receiving said analog current signal therefrom, said output circuit including an integrator circuit for integrating said analog current signal and means for producing a resultant signal in response to receiving said analog current signal.

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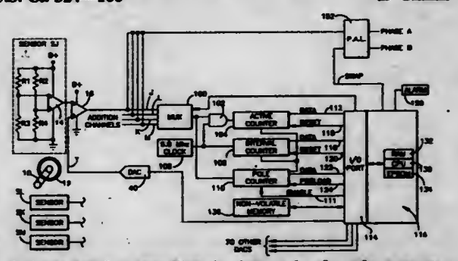
**5,502,375**
**METHOD AND APPARATUS FOR DETERMINING ORIENTATION OF POLARIZED CAPACITORS**
**James E. Marek, Cypress, Tex., assignor to Compaq Computer Corporation, Houston, Tex.**
**Filed Aug. 4, 1994, Ser. No. 285,905**
**Int. Cl.[6] G01R *29/12***
**U.S. Cl. 324—133** **20 Claims**




1. Circuitry for in-circuit determination of the orientation of a capacitor having first and second conducting plates, comprising:
means for applying first and second signals to the first and second conducting plates of the capacitor such that the capacitor generates a first external electric field responsive to said applied signals;
means for sensing the first electric field proximate to the capacitor and measuring the magnitude of the first electric field;
means for reversing said first and second signals applied to the first and second conducting plates of the capacitor such that the capacitor generates a second external electric field responsive to said reversed signals;
means for sensing the second electric field proximate to the capacitor and measuring the magnitude of the second electric field;
means for determining the ratio of the magnitude of the first electric field to the magnitude of the second electric field; and
means for determining the orientation of the capacitor based upon said ratio.

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**5,502,376**
**APPARATUS FOR CONTROLLING THE DUTY CYCLE OF A PULSE GENERATOR**
**Frederick J. Busch, Cleveland Heights, Ohio, assignor to Avtron Manufacturing, Inc., Independence, Ohio**
**Filed May 24, 1994, Ser. No. 248,302**
**Int. Cl.[6] G01P *3/48;3/54***
**U.S. Cl. 324—166** **19 Claims**

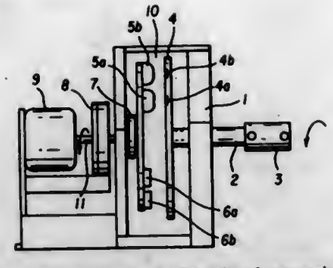



1. Apparatus for controlling the duty cycle of a pulse generator which provides a periodic input signal having a frequency proportional to the rate of movement of an input member and having means for comparing said input signal with a threshold signal and providing, for each cycle of said periodic signal, an ON signal so long as the magnitude of said input signal exceeds that of said threshold signal, and wherein said duty cycle corresponds with the ratio of the time duration of said ON signal to the duration of said cycle, said apparatus comprising:
means for providing clock pulses having a fixed frequency rate;
first counting means for counting the total number of said clock pulses occurring during an interval corresponding with a number N of said ON pulses to provide a total count of B;
second counting means for counting the total number of said clock pulses occurring during each of said N ON pulses during said interval and providing a total count of A;
threshold signal calculating means for calculating the ratio of A to B and providing a ratio R; and
means for calculating a new value for said threshold signal wherein said new value varies as a function of the value of said ratio R.

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**5,502,377**
**METHOD AND APPARATUS FOR MEASURING ROTARY MOVEMENT OF A SHAFT**
**Michael N. Freund, Schorndorf, Germany, assignor to Eastman Kodak Company, Rochester, N.Y.**
**Filed Dec. 7, 1994, Ser. No. 350,595**
**Claims priority, application Germany, Dec. 24, 1993, 43 44 494.6**
**Int. Cl.[6] G01P *3/36;3/48***
**U.S. Cl. 324—175** **5 Claims**

1. A programmable apparatus for measuring a rotary movement of a shaft, said apparatus comprising:




a magnetic disk provided with a plurality of concentric magnetic tracks upon which has been provided an inductively scanable magnetic pattern;

a plurality of magnetic read heads, each read head being positioned to scan the magnetic patterns on a respective magnetic track at a fixed distance, such that voltage pulses generated by the magnetic read heads are characteristic of the rotational speed of the shaft to be measured;

a clutch connecting the disk to the shaft to be measured;

a motor drivingly connected to a common shaft;

means drivingly coupling the read heads to the common shaft; and

an encoder on the common shaft and adapted to determine the rotational speed of the common shaft.

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**5,502,378**

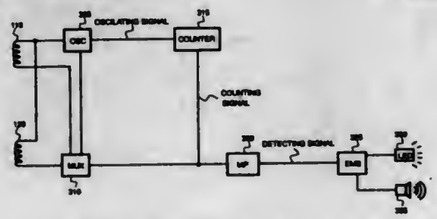
**FLUID PARTICLE SENSOR INCLUDING A CONTAINER, A FIRST COIL AND A SECOND COIL DISPOSED ABOUT A MAGNET LOCATED ADJACENT THE CONTAINER FOR ATTRACTING THE PARTICLES**

**Lonnie D. Atteberry, Peoria Hts.; Timothy A. Boston, Tremont; John W. Crayton, Washington; Jeffrey J. Riebschlager, Toluca, and Noel J. Rytter, Peoria, all of Ill., assignors to Caterpillar, Peoria, Ill.**

**Continuation-in-part of Ser. No. 95,559, Jul. 26, 1993, abandoned. This application Nov. 14, 1994, Ser. No. 338,724**

**Int. Cl.[6] G01N *27/74*; G08B *17/12***

**U.S. Cl. 324—204** **21 Claims**




1. An apparatus for detecting particles within a fluid, comprising:

a housing defining a cavity having a bottom surface;

a magnet disposed adjacent the bottom surface of the cavity and adapted to attract and contain particles within the cavity;

a first coil wound in a belix about the outer surface of the cavity, wherein the induction of the first coil is responsive to the particle accumulation within the cavity; and

a second coil wound in a helix about the magnet, wherein the induction of the second coil is responsive to the temperature of the fluid and independent to the particle accumulation within the cavity.

**5,502,379**

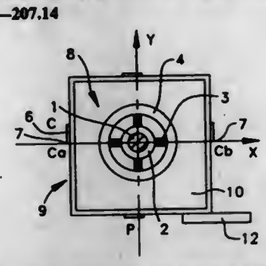
**SENSOR FOR MEASURING THE SWING OF A CABLE INCLUDING A CROWN WITH PERMANENT MAGNETS SECURED TO THE CABLE**

**Jozef Hansel; Jerzy Kwasniewski; Andrej Tytko, and Leslaw Lankosz, all of Krakow, Poland, assignors to Reichert Technology S.A., Pagny Sur Moselle, France**

**Filed Jun. 29, 1994, Ser. No. 268,036**

**Int. Cl.[6] G01B *7/14;7/30*; G01P *13/00***

**U.S. Cl. 324—207.14** **9 Claims**




1. A stable magnetic field sensor for measuring swing of a cable, comprising:

a crown for attachment to the cable, wherein the crown includes a plurality of permanent magnets disposed radially between an inner magnetic ring and an outer magnetic ring; and

a support for attachment to a fixed structure, wherein the support includes a plurality of measuring elements affixed thereto, and wherein the support surrounds the crown and is spaced at a predetermined distance from the crown so that movement of the magnets of the crown within and relative to the measuring elements of the support provides a measurement of the swing of the cable.

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**5,502,380**

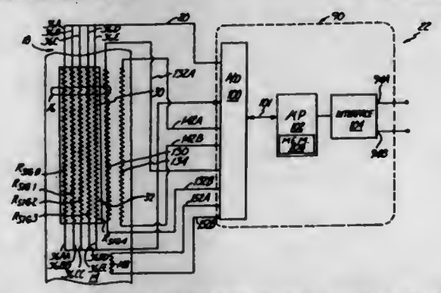
**ANALOG WEIGHTED BINARY ABSOLUTE POSITION ENCODER INCLUDING AN ARRAY OF SENSE RESISTORS EACH HAVING MATERIAL RESPONSIVE TO FWX AND NONRESPONSIVE TO FLUX**

**Fred C. Sittler, Victoria, and Kathryn M. Howard, Chanhassen, both of Minn., assignors to Rosemount Inc., Eden Prairie, Minn.**

**Filed Apr. 28, 1994, Ser. No. 234,182**

**Int. Cl.[6] G01B *7/14*; G01R *33/06*; H03M *1/22*; G01D *5/34***

**U.S. Cl. 324—207.21** **35 Claims**



1. A position sensor for providing an output representative of a position of a moving member, a source of flux disposed on the moving member, the position sensor comprising:



an array of sense resistors disposed on a stationary member and subject to the flux, each resistor including two types of material, one type responsive and the other type non-responsive to the flux;

a reference circuit for providing a first signal representative of a resistance of the sense resistors in the absence of flux and a second signal representative of a resistance in the sense resistors caused by the flux; and

an analyzer for sensing the resistance of each of the sense resistors for forming a corresponding sensed resistance and for providing a referenced additive resistance for each of the sense resistors, the referenced additive resistance determined by differencing each of the sensed resistances and the first signal, ratioing each difference to the second signal, weighting each ratio by a weighting factor and summing the referenced additive resistance for each of the sense resistors to provide the position sensor output.

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**5,502,381**

**STRESS SENSOR USING MAGNETOSTRICTION THIN FILM**

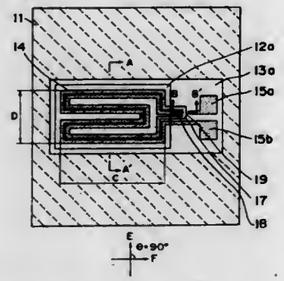
**Shinji Saitou, Suita, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan**

**Filed Mar. 30, 1994, Ser. No. 220,293**

**Claims priority, application Japan, Mar. 31, 1993, 5-073199**

**Int. Cl.[6] G01B *7/24*; G01R *33/18***

**U.S. Cl. 324—209** **7 Claims**




1. A mechanical sensor comprising:

a substrate;

an electrically conducting coil formed on the substrate, which coil being connected to two terminals; and

a first magnetic layer which can be magnetized by the coil, at least a part of the first magnetic layer having magnetostriction, the first magnetic layer having been subjected to heat treatment of an as-grown first magnetic layer, whereby a stress generated in the first magnetic layer being detected as a change in impedance by using the coil;

wherein a thermal expansion coefficient $\alpha_s$ of the substrate and a thermal expansion coefficient $\alpha_f$ of the first magnetic layer hold a relation that $\sigma>\sigma_b$ if $\sigma>0$ and $\sigma<\sigma_b$ if $\sigma<0$, wherein $\sigma$ denotes an internal stress in the as-grown first magnetic layer, $\sigma_b$ denotes an internal stress generated in the magnetic layer due to the heat treatment, which $\sigma_b$ being proportional to $\Delta T\times(\alpha_f-\alpha_s)$, wherein $\Delta T$ denotes a difference between ambient temperature and heat treatment temperature.

**5,502,382**

**APPARATUS FOR MAGNETIC INSPECTION USING MAGNETIC SHIELD, WITH SPECIFIC RELATION OF DISTANCE E BETWEEN MAGNETIC SENSORS AND DISTANCE L BETWEEN EACH MAGNETIC SENSOR AND THE OBJECT TO BE INSPECTED, TO OBTAIN OPTIMUM S/N**

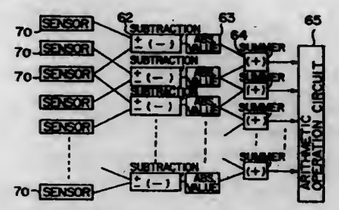
**Seigo Ando, and Yasuhiro Matsufuji, both of Tokyo, Japan, assignors to NKK Corporation, Kawasaki, Japan**

**Continuation of Ser. No. 927,498, Sep. 29, 1992, Pat. No. 5,357,198. This application Jul. 15, 1994, Ser. No. 276,517**

**Claims priority, application Japan, Feb. 4, 1991, 3-13568; Feb. 18, 1991, 3-23306; Feb. 18, 1991, 3-23307**

**Int. Cl.[6] G01N *27/83*; G01R *33/12***

**U.S. Cl. 324—242** **1 Claim**




1. A magnetic inspection apparatus comprising:

a magnetizer for generating a magnetic field in an object to be inspected, said object running in a predetermined direction, said magnetizer including a pair of magnetic poles provided in facing relation to said object, said pair of magnetic poles being arranged in said predetermined direction;

a plurality of magnetic sensors arranged at small intervals in a widthwise direction of said object perpendicular to said predetermined direction, for detecting a leakage magnetic flux due to a defect of said object at locations in said widthwise direction, each of said magnetic sensor having sides which face said magnetic poles;

a plurality of subtraction circuits each for calculating a difference signal between output signals from those ones of said magnetic sensors which are separated by a predetermined distance;

a plurality of absolute value circuits each for calculating an absolute value of each difference signal output from each subtraction circuit; and

an arithmetic operation circuit for evaluating the defect of the object on the basis of the absolute value signal output from each absolute value circuit,

wherein the relationship between a distance E (unit=mm) between the magnetic sensors associated with the output signals subjected to subtraction in each subtraction circuit and a distance L (unit=mm) between each magnetic sensor and the object is defined by $17<EL<78$.

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**5,502,383**

**CONTROLLER FOR HALL EFFECT SENSOR USING CYCLICALLY VARYING POWER**

**Yasuo Funami; Manabu Nishi; Yoshimi Watanabe, and Shunya Senda, all of Gyoda, Japan, assignors to Showa Corporation, Japan**

**Filed Jun. 7, 1994, Ser. No. 255,168**

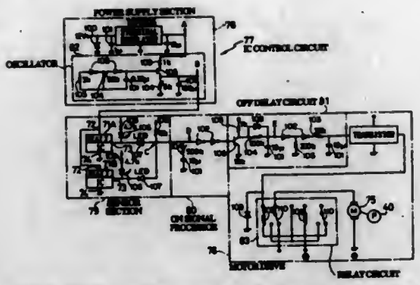
**Claims priority, application Japan, Jun. 10, 1993, 5-163842**

**Int. Cl.[6] G01R *33/07*; G01B *7/14*; F15B *15/28*; B63H *25/00***

**U.S. Cl. 324—251** **5 Claims**

1. A controller for a Hall effect sensor comprising:

a sensor section including a Hall effect sensor which detects a magnetic flux density and converts a change of magnetic flux density to a change of an output voltage to produce an output electric signal, said Hall effect sensor having a hysteresis which is set as an output characteristic of the output voltage corresponding to the magnetic flux density;



a power supply section connected to said sensor section to supply a power source to the Hall effect sensor;

a signal processing section connected to said sensor section to process the output electric signal produced by said sensor section; and

said power supply section supplies to the Hall effect sensor power which cyclically changes in a range of specified value in a positive or negative area and gradually increases in a first half of each cycle such that said Hall effect sensor outputs an "off" signal when the magnetic flux density which acts on the Hall effect sensor remains in a width of the hysteresis and an "on" signal when the magnetic flux density remains above an upper limit of the width of the hysteresis.

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**5,502,384**

**IMAGE RECONSTRUCTION METHOD IN NUCLEAR MAGNETIC RESONANCE IMAGING APPARATUS**

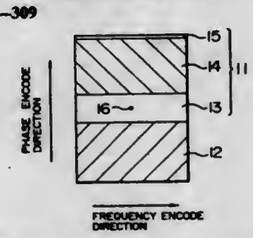
**Chitose Nakaya, Tokyo; Yoshitaka Bito, Kokubunji; Etsuji Yamamoto, Akishima; Hiroshi Nishimura; Hiroyuki Takeuchi, both of Kashiwa; Shigeru Watanabe, Ibaraki; Akihiro Miyajima, and Hitoshi Arai, both of Kashiwa, all of, Japan, assignors to Hitachi, Ltd., and Hitachi Medical Corporation, both of Tokyo, Japan**

**Filed May 17, 1994, Ser. No. 243,907**

**Claims priority, application Japan, May 24, 1993, 5-121120**

**Int. Cl.[6] G01R *33/20***

**U.S. Cl. 324—309** **12 Claims**




1. An image reconstruction method in a nuclear magnetic resonance imaging apparatus for reconstructing an intended image of an object under inspection by effecting measurement of nuclear magnetic resonance signals, so as to obtain detected data of a detected region, for at least about a half of a region inclusive of an origin of an acquired data space, at which both of a phase encode and a frequency encode are zero, of said region of either one of a phase encode axis and a frequency encode axis of said acquired data space in which the nuclear magnetic resonance signals from said object are expressed by said phase encode axis and said frequency encode axis, estimating data of the nuclear magnetic resonance signals of undetected regions from said detected data on the basis of complex conjugate symmetry of said detected data, and reconstructing the intended image of said object, said method comprising:

a first step to get, from said detected data, a first region comprising the whole region of said detected region and a second region as a part of said detected region having a positional relationship of complex conjugate symmetry with data of said undetected region, and symmetric with a line passing through an origin on one of said axes of said acquired data space, at which encode is zero, and parallel to the other of said axes;

a second step to get Fourier transforms F1 and F2 of the detected data of said first and second regions, respectively;

a third step to get a complex conjugate value F3 of said Fourier transform F2; and

a fourth step to sum said Fourier transform F1 and the product obtained by multiplying said complex conjugate value F3 by the quotient obtained by dividing the difference between said Fourier transform F1 and said Fourier transform F2 by the complex conjugate value of the difference between said Fourier transform F1 and said Fourier transform F2; for thereby obtaining the image of said object.

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**5,502,385**

**METHOD OF FORMING A SERIES OF MR IMAGES, AND DEVICE FOR CARRYING OUT THE METHOD**

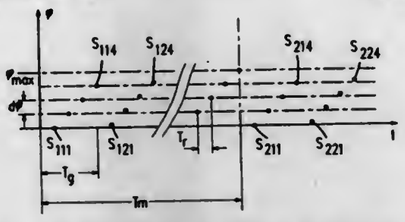
**Michael H. Kuhn; Volker Rasche, and Roland Proksa, all of Hamburg, Germany, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Jun. 8, 1994, Ser. No. 255,510**

**Claims priority, application Germany, Jun. 12, 1993, 43 19 539.3**

**Int. Cl.[6] G01V *03/14***

**U.S. Cl. 324—309** **6 Claims**




6. A magnetic resonance (MR) imaging method, comprising causing sequences to act on an examination zone in the presence of a steady magnetic field to generate respective MR signals, each sequence comprising at least one RF pulse and a magnetic gradient field active during generation of a respective MR signal, and reconstructing each MR image of a series of MR images from a same first number of successively generated subsets of the MR signals thus generated, each subset consisting of a same second number of MR signals, wherein the gradient magnetic field active during generation of a respective MR signal is such as to cause a scan through k-space along a path which includes the origin of k-space, which path is rotated about the origin from one sequence to another so that the paths of the MR signals of each first number of successively generated subsets are different from each other and, for each subset, all points on the paths of the MR signals of the subset at a same radial distance from the origin are uniformly spaced apart.



**5,502,386**

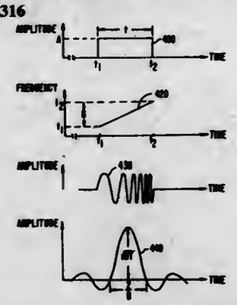
**PULSED LOW FREQUENCY EPR SPECTROMETER AND IMAGER**

**John Bourg, Bethesda; James Mitchell, Damascus; Mark Mirotznik, Silver Spring; Bradley Roth, Kensington, all of Md.; Sankaran Subramanian, Madras, Ind.; Murali Cherukuri, Rockville, Md.; Paul G. Zablocky, Alexandria, Va.; Thomas J. Pohida, Monrovia, Md.; Paul D. Smith, Annapolis, Md.; Walter S. Friauf, Bethesda, Md., and Rolf G. Tschudin, Kensington, Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.**

**Continuation of Ser. No. 97,811, Jul. 26, 1993, Pat. No. 5,387,867. This application Nov. 15, 1994, Ser. No. 340,100**

**Int. Cl.[6] G01R *33/20***

**U.S. Cl. 324—316** **12 Claims**




1. An improved excitation system for an electron paramagnetic resonance system having a resonator for receiving excitation signals and containing an aqueous sample that includes electrons which resonate at a selected RF resonant frequency that is not highly absorbed by the aqueous sample, said system including:

means for supplying a radio frequency (RF) carrier signal having a frequency about equal to said selected RF resonant frequency;

pulse forming means, having an input coupled to receive said RF carrier signal, for forming an RF carrier signal pulse;

frequency modulating means, coupled to receive said RF carrier signal pulse, for frequency modulating said RF carrier frequency pulse to form a frequency-modulated pulse having a predetermined bandwidth;

pulse compression means, coupled to receive said frequency-modulated pulse, for compressing said frequency-modulated pulse to form a compressed frequency-modulated pulse having a shorter time duration and substantially the same bandwidth as said frequency-modulated pulse;

means for coupling said compressed frequency-modulated pulse to said resonator so that said aqueous sample is excited by said compressed frequency-modulated pulse.

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**5,502,387**

**VARIABLE GEOMETRY MRI COIL**

**Robert E. McGill, Dix Hills, N.Y., assignor to Northrop Grumman Corporation, Los Angeles, Calif.**

**Filed Aug. 23, 1994, Ser. No. 294,507**

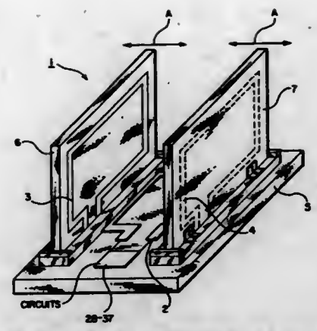
**Int. Cl.[6] G01R *33/28***

**U.S. Cl. 324—318** **4 Claims**

1. A magnetic resonance imaging coil set apparatus, comprising:

antenna means for receiving signals representative of nuclear magnetic resonances induced by a radio frequency excitation magnet apparatus, said antenna means comprising at least two antenna coils arranged on first and second parallel plates to be movable relative to each other, and a fixed coil arranged on a fixed plate transverse to the parallel plates;

tuning/impedance matching means mounted on the fixed plate for matching an impedance of said fixed and movable coils




with an impedance of a transmission line for transferring radio frequency energy from said antenna means to an MRI receiver;

a multi-mode signal matrixing circuit mounted on the fixed plate, said multi-mode signal matrixing circuit including means for connecting either of the vertical coils separately to a signal output, for connecting said fixed coil separately to said signal output, and for connecting said fixed and movable coils in quadrature to said signal output; and

impedance loading means for lowering a Q factor of said tuning/impedence matching means, and a preamplifier mounted on the fixed plate for increasing the signal level to compensate for the signal reduction due to the lower Q factor.

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**5,502,388**

**METHOD OF MEASURING THE PH VALUE OF A TEST SOLUTION WITH GLASS-ELECTRODE MEASURING CELLS AND OF SIMULTANEOUSLY CALIBRATING THE MEASURING CELLS**

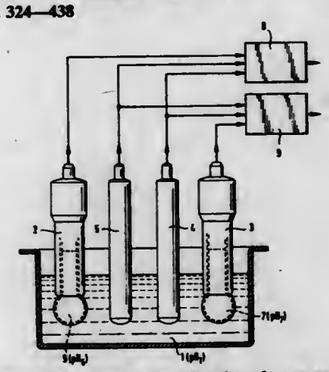
**Werner Melzer, Liederbach, Germany, assignor to Hoechst Aktiengesellschaft, Germany**

**Filed Feb. 2, 1994, Ser. No. 190,600**

**Claims priority, application Germany, Feb. 4, 1993, 43 03 187.0; Aug. 10, 1993, 43 26 764.5**

**Int. Cl.[6] G01N *27/416***

**U.S. Cl. 324—438** **5 Claims**




1. A method of measuring the pH value of a test solution with glass-electrode measuring cells, in which method the potentials occurring between the glass-electrodes and a reference electrode are processed in pH meters with temperature compensation and measuring-cell slope deviation,

wherein the potential between a first glass electrode and the reference electrode and the potential between a second glass electrode and the reference electrode, both glass electrodes having different internal reference solutions, are processed in a first pH meter and a second pH meter, wherein the measur-

ing cell slope in said first pH meter and said second pH meter is derived from the processed potentials by dividing the difference in the processed potentials by the difference in the pH values of said internal reference solutions of said first glass electrode and said second glass electrode, and

wherein the pH value of the test solution is derived from one of the processed potentials, the corresponding pH values of the internal reference solution and the derived measuring cell slope.

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**5,502,389**

## APPARATUS FOR POLYELECTROLYTE MEASUREMENT WITH AN ULTRASONICALLY DRIVEN LINER

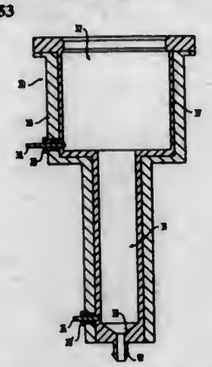
**Hermann Hochgraeber, Seefeld, and Lutz Pickelmann, Munich, both of, Germany, assignors to Mntek Analytic GmbH, Herrsching, Germany**

**Filed Jun. 1, 1994, Ser. No. 251,916**

**Claims priority, application European Pat. Off., May 3, 1994, 94106918**

**Int. Cl.[6] G01N 27/60**

**U.S. Cl. 324—453** **12 Claims**



1. An apparatus for automated polyelectrolyte measurement of a substance, comprising:

a sample vessel with an outer wall defining within said wall a cylindrical cavity;

a liner disposed within the cylindrical cavity and made of an electrically insulating material, the liner being attached to the outer wall in such a way to resist and transmit tensile and shear forces during ultrasonic oscillations;

a reservoir of larger diameter than said cylindrical cavity and located above and in communication with said cavity;

electrodes extending from outside said outer wall into said cylindrical cavity, said electrodes located one at each end of said cylindrical cavity, respectively;

a means for measuring a charge displacement between said electrodes;

an ultrasound generator; and

an ultrasonic oscillator which is coupled mechanically to the outer wall of said sample vessel so as to transmit ultrasonic oscillations to the sample vessel and which, during a rinsing procedure, is actuated by the ultrasound generator in such a way as to induce ultrasonic oscillations in a rinsing liquid within said cylindrical cavity, the output frequency of the ultrasound generator being adjustable depending on a sample to be measured.

**5,502,390**

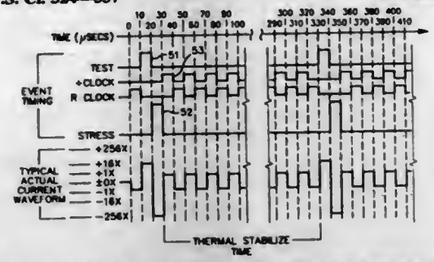
## ADIABATIC CONDUCTOR ANALYZER METHOD AND SYSTEM

**Floyd W. Olsen, Athens, Pa., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Mar. 15, 1994, Ser. No. 213,352**

**Int. Cl.[6] G01R 31/12**

**U.S. Cl. 324—537** **28 Claims**




1. A method for locating constrictions in electrical conductors of predetermined normal cross-sections, the method comprising the steps of:

isolating a unitary length of conductive material;

applying a test current pulse to the isolated conductive material, the current level of the test pulse being sufficient to enable a resistance measurement to be made and being below the level necessary to heat the isolated conductive material;

measuring the electrical resistance of the isolated conductive material under unstressed condition;

storing the unstressed resistance value;

applying a stress current pulse to the isolated conductive material, the current level of the stress current pulse being much greater than the current level of the test current pulse, thereby causing heating of any constriction therein; thereafter

adiabatically measuring the electrical resistance of the stressed isolated conductive material; and

subtracting the unstressed resistance measurement from the resistance measurement under stressed conditions to determine a difference value.

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**5,502,391**

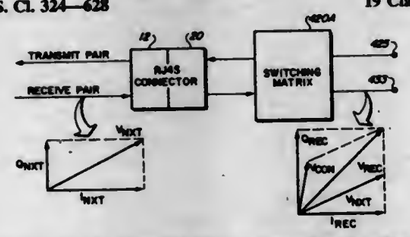
## APPARATUS FOR MEASURING THE CROSSTALK IN A CABLE

**James R. Sciacero, Scottsdale, and John P. Hittel, Phoenix, both of Ariz., assignors to MicroTest, Inc., Phoenix, Ariz.**

**Filed Sep. 11, 1992, Ser. No. 943,724**

**Int. Cl.[6] G01R 27/26**

**U.S. Cl. 324—628** **19 Claims**




1. Apparatus for measuring near end crosstalk between first and second pairs of conductors in a multiconductor cable terminated in a connector at said near end, said apparatus comprising:

first means for selectively transmitting a signal having a predetermined characteristic on said first pair of conductors;

second means for receiving signals having said predetermined characteristic present on said second pair of conductors, compensating for crosstalk in said near end connector, and generating indicia of near end crosstalk between said pairs of conductors.



**5,502,392**

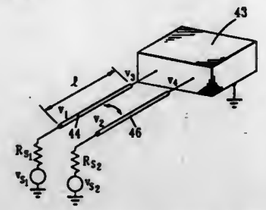
## METHODS FOR THE MEASUREMENT OF THE FREQUENCY DEPENDENT COMPLEX PROPAGATION MATRIX, IMPEDANCE MATRIX AND ADMITTANCE MATRIX OF COUPLED TRANSMISSION LINES

**Gnanalingam Arjavalingam, Yorktown Heights; Alina Deutsch, Chappaqua; Gerard V. Kopcsay, Yorktown Heights, and James K. Tam, Shrub Oak, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Continuation of Ser. No. 876,956, Apr. 30, 1992, abandoned. This application Nov. 12, 1993, Ser. No. 151,595**

**Int. Cl.[6] G01R 27/04**

**U.S. Cl. 324—638** **29 Claims**




1. A method for determining the complex frequency dependent propagation matrix, Γ(f), of a transmission line of predetermined cross section comprising:

providing a first transmission line set of a first length $l_1$, having said predetermined cross section;

providing a second transmission line set of a second length $l_2$ having said predetermined cross section, wherein $l_1 \neq l_2$;

providing a first input pulse to said first transmission line set;

monitoring a plurality of outputs from said first transmission line set;

providing a second input pulse to said second transmission line set;

monitoring a second plurality of outputs from said second transmission line set; and

comparing said first outputs to said second outputs to determine said complex frequency dependent propagation matrix.

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**5,502,393**

## DENSITOMETER USING A MICROWAVE

**Seiji Yamaguchi, Sagamihara; Takeshi Yamaura, Narashino; Takatsugu Ogata, Sayama; Tsutomu Suzuki, and Ikuo Arai, both of Tokyo, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, and Tokyo Metropolitan, Tokyo, both of, Japan**

**Filed Mar. 30, 1994, Ser. No. 220,056**

**Claims priority, application Japan, Mar. 30, 1993, 5-071664**

**Int. Cl.[6] G01R 27/32; G01N 22/00**

**U.S. Cl. 324—639** **19 Claims**

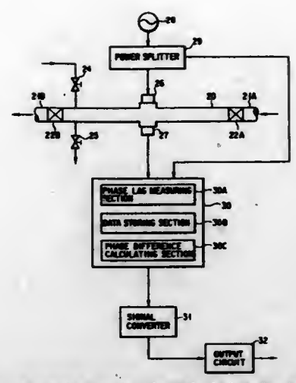
1. A densitometer using a microwave, comprising:

a microwave detection section for producing a first microwave receiving signal by transmitting and receiving a microwave of a frequency band of 1.4 GHz to 1.75 GHz to and from a reference fluid, and a second microwave receiving signal by transmitting and receiving a microwave of a frequency band of 1.4 GHz to 1.75 GHz to and from a measuring fluid;

a phase detection section for obtaining a phase difference between said first microwave receiving signal and said second microwave receiving signal, said phase detection section comprising,

phase lag detection means for detecting a first phase lag of the first microwave receiving signal and a second phase lag of the second microwave receiving signal, and

phase difference detection means for obtaining a phase difference between the first and second microwave receiving signals based on the first and second phase lags detected by said phase lag detection means; and




a density calculation section for calculating the density of the measuring fluid based on said phase difference obtained by said phase detection section.

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**5,502,394**

## COMPACT, PORTABLE DEVICE FOR MEASURING THE REFLECTION COEFFICIENT OF A STRUCTURE EXPOSED TO MICROWAVE RADIATION

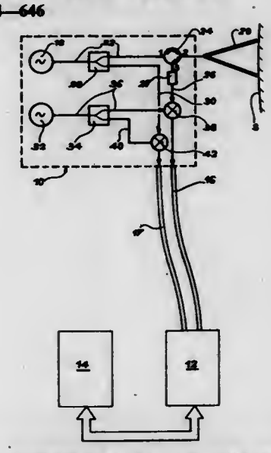
**Gérard P. Piau, Puteaux, France, assignor to Aerospatiale Société Nationale Industrielle, France**

**Filed Oct. 20, 1994, Ser. No. 326,530**

**Claims priority, application France, Jan. 25, 1993, 93 12685**

**Int. Cl.[6] G01R 27/04**

**U.S. Cl. 324—646** **7 Claims**




1. Device for measuring the reflection coefficient of a structure exposed to microwave radiation comprising:

a first microwave radiation generator emitting a microwave radiation signal at a first given frequency,

at least one combined microwave applicator-receiver which can be plated to the structure,

a rigid microwave transmission line connecting the first generator to the applicator-receiver,

means for measuring the amplitude and phase of the reflection coefficient,

branching means placed in the transmission line and connecting the transmission line to the measuring means for transmission of a signal received at the branching means from the applicator-receiver,

a second microwave radiation generator emitting a microwave radiation signal at a second given frequency, which second given frequency differs from the first given frequency by a given low frequency,
first mixer means for establishing a reference signal at said low frequency, said reference signal being equal to the difference of the signals from the first and second generators,
second mixer means for establishing a measuring signal at said low frequency, said measuring signals being equal to the difference of the signals from the branching means and the second generator,
and wherein the first and second generators, the microwave applicator-receiver, the first and second mixer means, the branching means and the microwave transmission line form a portable device connected to the measuring means by flexible, low frequency cable.

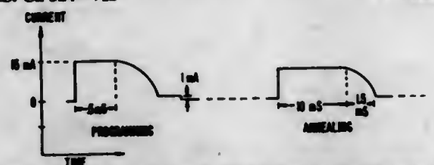
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**5,502,395**

## METHOD FOR PROGRAMMING ANTIFUSES FOR RELIABLE PROGRAMMED LINKS

**William J. Allen, 10120 Lockwood Dr., Cupertino, Calif. 95014-2614**

**Filed May 25, 1994, Ser. No. 249,001**
**Int. Cl.[6] G01R *27/08;31/02;* H01H *37/76***
**U.S. Cl. 324—713** **9 Claims**




1. A method of programming selected antifuses in a plurality of antifuses in an integrated circuit, said method comprising
driving a programming pulse of current through a selected previously unprogrammed antifuse;
measuring a resistance through said antifuse after said programming pulse;
comparing said measured resistance with a predetermined resistance value;
repeating said driving, measuring and comparing steps until said measured resistance is less than a predetermined resistance value; and
driving a current at a predetermined voltage through said antifuse for a first predetermined amount of time and ramping down said current in a predetermined manner in a second predetermined amount of time;
whereby said selected antifuses have low and stable programmed resistances.

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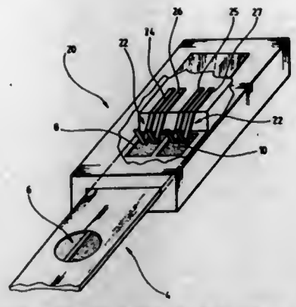
**5,502,396**

## MEASURING DEVICE WITH CONNECTION FOR A REMOVABLE SENSOR

**Pierre Desarzens, Bienne, and Rudolf Dinger, St-Aubin, both of, Switzerland, assignors to Asulab S.A., Bienne, Switzerland**

**Filed Sep. 21, 1994, Ser. No. 309,778**
**Claims priority, application France, Sep. 21, 1993, 93 11318**
**Int. Cl.[6] G01N *27/26***
**U.S. Cl. 324—713** **13 Claims**

1. A measuring device for use with a removable sensor, said sensor having at least an active zone for sensing a physical or chemical parameter, and having at least two electrical contact surfaces electrically connected to said active zone, said measuring device having a normal mode and a test mode, and comprising:
an electric measuring circuit for measuring, in said normal mode, said physical or chemical parameter based on said sensing of said active zone;




a connection comprising at least two first contacts, each of said first contacts establishing a respective electric connection between said two electrical contact surfaces of said removable sensor and said electric measuring circuit;
a testing unit for testing said electric connection between said two electrical contact surfaces of said removable sensor and said electric measuring circuit; and
said connection also comprising at least two second contacts, each of said second contacts:
a) establishing a respective electric connection between said two electrical contact surfaces of said removable sensor and said testing unit, and
b) enabling an electric test current to flow, in said test mode, between any one of said two first contacts and a respective one of said second contacts which is associated with an identical one of said two electrical contact surfaces.

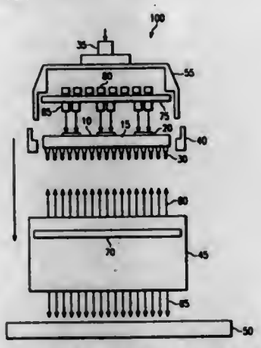
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**5,502,397**

## INTEGRATED CIRCUIT TESTING APPARATUS AND METHOD

**James M. Buchanan, Austin, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.**

**Filed Nov. 12, 1992, Ser. No. 975,475**
**Int. Cl.[6] G01R *31/02***
**U.S. Cl. 324—754** **7 Claims**




1. An automatic handler test station for testing an integrated circuit packaged in a housing having a plurality of leads projecting from said housing and a plurality of contact elements disposed along at least one surface of the housing, said handler test station comprising:
a test circuit board;
a contactor electrically connected to said test circuit board;
a plurality of electronic circuit components located externally of said integrated circuit and said housing;
a movable platform having a portion thereof disposed adjacent the housing of said integrated circuit and adapted to move the leads of said integrated circuit into temporary electrical contact with said contactor and the contact elements disposed on said housing of the integrated circuit into temporary electrical contact with said electronic circuit components located externally of said integrated circuit and said housing;
a printed circuit board disposed between said movable platform and said housing and having said electronic circuit components mounted thereon; and,
a plurality of pogo pins mounted to said printed circuit board and electrically connected to said electronic circuit components mounted on the printed circuit board, said pogo pins being configured for conductive engagement with said contact elements disposed along at least one surface of the housing of said integrated circuit when said leads are moved into electrical contact with said contactor during the testing of said integrated circuit at said handler test station.



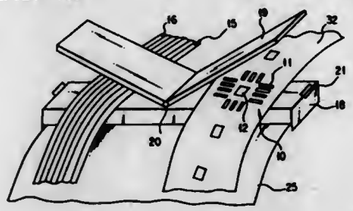
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**5,502,398**

## SEMICONDUCTOR DEVICE BURN-IN APPARATUS

**Shinobu Wada, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Sep. 15, 1994, Ser. No. 306,311**
**Claims priority, application Japan, Sep. 17, 1993, 5-231224**
**Int. Cl.[6] G01R *31/02***
**U.S. Cl. 324—760** **3 Claims**




1. A semiconductor device burn-in apparatus comprising:
sockets for detachably clamping a film on which a plurality of TAB products, each having a semiconductor device thereon, are arranged in succession and a flexible tape-like wiring board which is situated in the same plane as, and in parallel to, said film and on which electrically conductive wiring patterns are formed, in units of one of said TAB products, and for electrically connecting said film and said tape-like wiring board; and
storage means for storing said film, said tape-like wiring board and said socket as a combined structure having an elongated shape, and subjecting said combined structure to a burn-in process.

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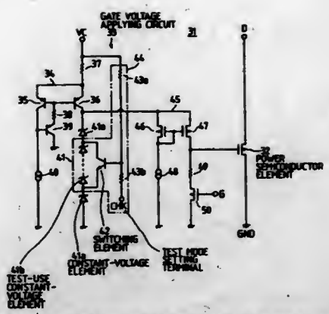
**5,502,399**

## POWER SEMICONDUCTOR DEVICE WITH A GATE WITHSTAND-VOLTAGE TEST TERMINAL

**Hiroshi Imai, Kariya, Japan, assignor to Nippondenso Co., Ltd., Aichi-Pref, Japan**

**Filed Jun. 22, 1994, Ser. No. 264,046**
**Claims priority, application Japan, Jun. 23, 1993, 5-151953**
**Int. Cl.[6] G01R *31/28***
**U.S. Cl. 324—765** **3 Claims**

2. A power semiconductor device comprising:
a power semiconductor element having a gate oxide film formed on a semiconductor substrate;
a gate voltage applying circuit integrally formed on said semiconductor substrate, said gate voltage applying circuit including constant-voltage means, said gate voltage applying circuit converting a power source voltage into a constant gate driving voltage and applying said constant gate driving voltage to a gate of said power semiconductor element in response to a gate trigger signal;




a test mode setting terminal for setting a test mode by which a test voltage is applied to said gate of said power semiconductor element in a gate withstand voltage test, said test voltage being higher than said gate driving voltage;
test-use constant-voltage means provided in said gate voltage applying circuit and connected in series with said constant-voltage means;
a switching element connected in parallel with said test-use constant-voltage means, said switching element short-circuiting said test-use constant-voltage means in response to a signal produced by said test mode setting terminal under normal operating condition, said short-circuiting condition of said test-use constant-voltage means being released during said gate withstand voltage test condition so that said test voltage is applied to said gate of said power semiconductor element during said gate withstand voltage test.

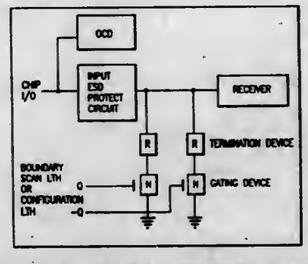
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**5,502,400**

## LOGICALLY CONFIGURABLE IMPEDANCE MATCHING INPUT TERMINATORS FOR VLSI

**Robert R. Livolsi, Shokan; Robert J. Lynch, Saugerties; George A. Williams, II, Lake Katrine, and Roy A. Wood, Saugerties, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Feb. 15, 1994, Ser. No. 196,675**
**Int. Cl.[6] H03H *11/28***
**U.S. Cl. 326—30** **7 Claims**

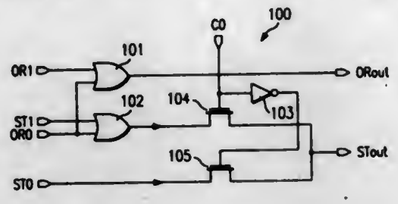



1. A VLSI circuit component, comprising: a carrier substrate component, a plurality of VLSI chips disposed on said carrier substrate component and having a plurality of chip elements made of integrated circuits formed thereon, each VLSI chip having as part of said integrated circuits I/O receiver and driver elements, a net of connections between chip elements of said VLSI chips disposed on the carrier substrate component to provide a configuration at the inputs to the VLSI chips, and a termination unit including two transistors, each of said two transistors receiving a different signal, for altering the line terminating configuration at the inputs to each of said VLSI chips after they have been imbedded into multichip packages, and wherein said termination unit for altering the line termination configuration permits alteration of the VLSI chip inputs without full knowledge of the final I/O interconnections at the time of the chip and substrate designs.

## 5,502,401
## CONTROLLABLE WIDTH OR GATE

**Richard Simpson, Carlton, Great Britain, and Erick Oakland, Zavalla, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Apr. 26, 1995, Ser. No. 428,978**
**Int. Cl.[6] H03K *19/173***
**U.S. Cl. 326—38** **3 Claims**

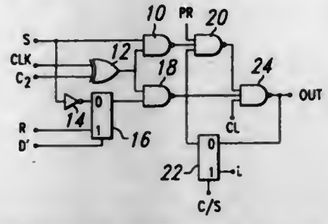



1. An N bit wide controllable width OR gate comprising:
an N bit wide data input port;
a control word input port receiving a control word of M bits, where M equals $\log_2 N$ rounded up to the nearest integer number of bits;
N-1 controllable OR gate cells, each controllable OR gate cell having an OR0 input, a ST0 input, an OR1 input, a ST1 input, a control bit input, an ORout output and a STout output, each controllable OR gate cell having
a first OR gate having a first input connected to said OR0 input, a second input connected to said OR1 input and an output connected to said ORout output,
a second OR gate having a first input connected to said OR0 input, a second input connected to said ST1 input and an output,
a first pass gate having an input connected to said output of said second OR gate, an output connected to said STout output, and a control gate connected to said control bit input,
an invertor having a input connected to said control bit input and an output, and
a second pass gate having an input connected to said ST0 input, an output connected to said STout output, and
a control gate connected to said output of said invertor;
a first layer of said controllable OR gate cells having said OR0 and ST0 inputs connected a corresponding bit of said data port and said OR1 and ST1 input connected to a next higher bit of said data input port, said control bit input of each controllable OR gate cell of said first layer connected to a least significant bit of said control word input port;
subsequent layers of said controllable OR gate cells having said OR0 input connected to said ORout output of a first controllable OR gate cell of a prior layer, said ST0 input connected to said STout output of said first controllable OR gate cell of said prior layer, said OR1 input connected to said ORout output of a second controllable OR gate cell of said prior layer, said ST1 input connected to said STout output of said second controllable OR gate cell of said prior layer, said control bit inputs of each controllable OR gate cell of each layer connected to a corresponding bit of said control word input port; and
said STout of a single controllable OR gate cell of a final layer forming said controllable width OR gate output.

## 5,502,402
## FPGA ARCHITECTURE BASED ON A SINGLE CONFIGURABLE LOGIC MODULE

**Mahesh M. Mehendale, Bangalore, Ind., assignor to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Jan. 5, 1995, Ser. No. 369,208**
**Int. Cl.[6] H03K *19/177***
**U.S. Cl. 326—40** **4 Claims**

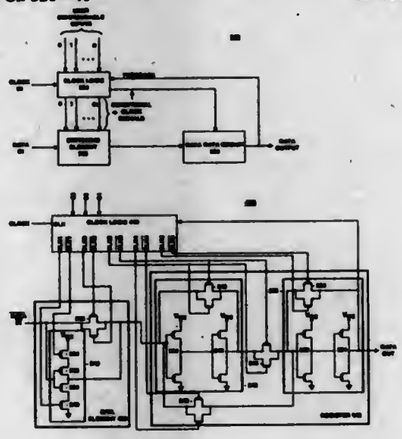



1. A configurable logic module, which can be configured as combinational or sequential, comprises:
a combinational logic block;
a sequential logic block;
a plurality of inputs are coupled to the combinational logic block and outputs from the combinational logic block are coupled to the sequential logic block;
said sequential logic block comprises cross-coupled NAND gates acting as a flip-flop, and a multiplexer in the feedback path from the output of one cross-coupled NAND gate to the input of the other cross-coupled NAND gate, thus by choosing an appropriate select signal for the multiplexer, the feedback can be connected wherein the cross-coupled NAND gates form a flip-flop for performing sequential logic or if the feedback is disconnected wherein the logic module implements a combinational function.

## 5,502,403
## HIGH SPEED CONFIFURATION INDEPENDENT PROGRAMMABLE MACROCELL

**Lin-Shih Liu, Fremont; Syed B. Raza, Sunnyvale; Hagop Nazarian, San Jose, all of Calif.; George M. Ansel, Starkville, Miss.; Stephen M. Douglass, Saratoga, Calif., and Jeffery S. Hunt, Ackerman, Miss., assignors to Cypress Semiconductor Corp., San Jose, Calif.**

**Filed Dec. 20, 1994, Ser. No. 360,469**
**Int. Cl.[6] H03K *19/173;19/0948***
**U.S. Cl. 326—46** **19 Claims**



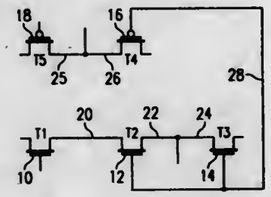


1. A circuit comprising:
a plurality of user configurable inputs for configuring said circuit;
clock logic coupled to said user configurable inputs and coupled to receive a clock input, said clock logic for generating conditional clock signals to implement a logic function for said circuit based on said clock input and said user configurable inputs;
a switching element including at least one pass gate coupled to said clock logic to receive some of said conditional clock signals and coupled to receive an input signal for said circuit, said switching element for generating a logic output, in accordance with said conditional clock signals, to implement said logic function by controlling propagation of said input signal through said pass gate; and
a data path circuit coupled to receive said logic output and others of said conditional clock signals for providing additional functionality, wherein propagation delay through said switching element to said data path circuit is independent of said user configurable inputs.

## 5,502,404
## GATE ARRAY CELL WITH PREDEFINED CONNECTION PATTERNS

**Robert J. Landers, Plano; Shivaling S. Mahant-Shetti, Dallas, both of Tex.; R. Krishman, and C. Mutukrishnan, both of Ganganagar, Ind., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Apr. 28, 1995, Ser. No. 431,233**
**Int. Cl.[6] H01L *25/00;* H03K *19/173***
**U.S. Cl. 326—50** **10 Claims**



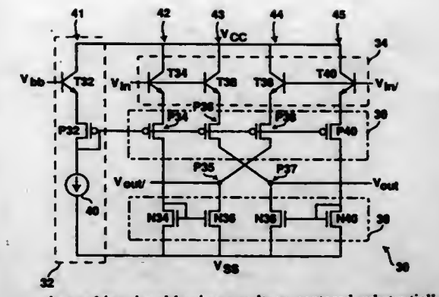

1. A CMOS base cell including a plurality of partially wired transistors for use in a gate array comprising, in combination:
a first plurality of N-channel transistors consisting of three series connected N-channel transistors, a first node being formed between the first and the second N-channel transistor and a second node being formed between the second and third N-channel transistor;
a first plurality of P-channel transistors consisting of two series connected P-channel transistors a third node being formed between the first and second P-channel transistor; and
first connection means for connecting the gate of one said series connected P-channel transistor to the gate of said second and third N-channel transistor.

## 5,502,405
## METHOD AND APPARATUS FOR CML/EC TO CMOS/ TTL TRANSLATORS

**Bertrand J. Williams, Campbell, Calif., assignor to Cypress Semiconductor Corporation, San Jose, Calif.**

**Filed Nov. 8, 1994, Ser. No. 335,908**
**Int. Cl.[6] H03K *19/0175***
**U.S. Cl. 326—66** **17 Claims**

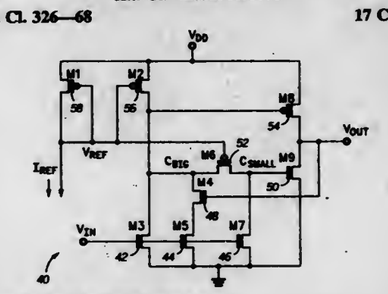
1. A translating circuit for translating at least a first input signal having a first input voltage level to a first output signal having a first output voltage level, said translating circuit comprising:
a bias reference generator having a first transistor, a second transistor and a current source, wherein said first transistor receives a bias signal having a voltage centered substantially at the mid-point of the logic swing of said first input signal and said bias reference generator generating a bias voltage;
an input circuit receiving said first input signal;
a cascode circuit having a plurality of transistors each having its input node coupled to each other, wherein said cascode circuit is coupled to said input circuit and to said bias reference generator, said cascode circuit receiving said bias voltage, having a controlled current and outputting said first output signal; and
a current-mirror circuit coupled to said cascode circuit.




## 5,502,406
## LOW POWER LEVEL SHIFT CIRCUIT AND METHOD THEREFOR

**Kevin M. Traynor, and Hengwei Hsu, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Mar. 6, 1995, Ser. No. 399,004**
**Int. Cl.[6] H03R *19/0175***
**U.S. Cl. 326—68** **17 Claims**



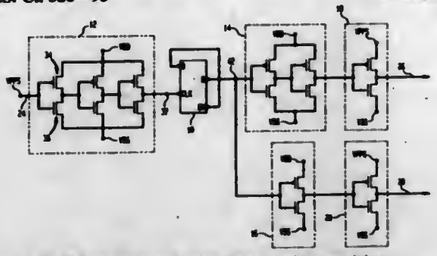

1. A level shift circuit, comprising:
means for generating a constant voltage reference value;
a first inverter having a constant current source load, the first inverter having an input for receiving an input signal and an output;
means for generating a control signal in response to the constant voltage reference value; and
a second inverter having a first input coupled to the means for generating the control signal and a second input coupled to the first inverter for receiving the output of the first inverter, the second inverter providing a voltage output signal at a first logic level when the output of the first inverter is in a first logic state and the control signal is in a second logic state, the second inverter providing the voltage output signal at a second logic level when the output of the first inverter is in a third logic state and the control signal is in a fourth logic state.

**5,502,407**

## LOW-POWER-DISSIPATION CMOS CIRCUITS

**Wilhelm C. Fischer, Westfield, and Thaddeus J. Gabara, Murray Hill, both of N.J., assignors to AT&T Corp., Murray Hill, N.J.**

**Filed Dec. 2, 1994, Ser. No. 348,388**
**Int. Cl.[6] H03K *19/0948***
**U.S. Cl. 326—95** **5 Claims**



1. A CMOS clock signal generating circuit comprising

an input terminal adapted to be connected to a pulsed power supply that is characterized by a waveform that repetitively cycles at a specified repetition rate in a ramped fashion between a voltage designated VDD and a point of reference potential designated VSS,

means connected to said input terminal and responsive to said ramped waveform being applied to said input terminal for generating complementary rectangular signals each of whose repetition rates is one-half that of the specified repetition rate of said ramped waveform,

first and second inverters each including a p-channel device having gate, source and drain electrodes and an n-channel device having gate, source and drain electrodes,

means in each inverter directly connecting the drain electrode of said p-channel device to the drain electrode of said n-channel device,

power supply leads adapted to be connected to said pulsed power supply and to VSS,

means connecting the source electrodes of the n-channel and p-channel devices in said inverters to said power supply leads,

means directly connecting together the gate electrodes of the n-channel and p-channel devices in each of said first and second inverters,

and means for applying said complementary rectangular signals to the respective connected-together gate electrodes in said inverters to provide at the respective connected-together drain electrodes of said inverters complementary clock output signals that each correspond to portions of said ramped waveform and that are synchronous with said ramped waveform.

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**5,502,408**

## CIRCUIT FOR DECODING 2T ENCODED BINARY SIGNALS

**Werner Scholz, Gehrden, Germany, assignor to Deutsche Thomson-Brandt GmbH, Villingen-Schwenningen, Germany**

**Filed Dec. 14, 1994, Ser. No. 356,076**
**Claims priority, application Germany, Dec. 17, 1993, 43 43 252.2**
**Int. Cl.[6] G11C *8/00***
**U.S. Cl. 326—105** **14 Claims**

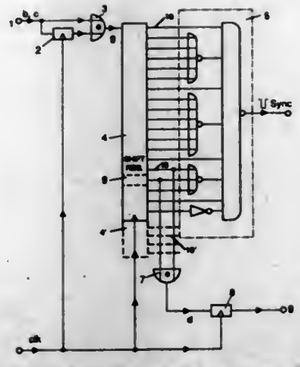
1. A decoding circuit for encoded binary signals, comprising:

a data input terminal;

a first D-type flip flop having an input coupled to said input terminal;

a first exclusive OR gate having one input coupled to said input terminal and another input coupled to an output of said first D-type flip flop;

a shift register having an input coupled to an output of said exclusive OR gate;



a second D-type flip flop having an input coupled to said shift register; and,

a second exclusive OR gate having one input coupled to an output of said second D-type flip flop and another input coupled to a tap of said shift register, said second exclusive OR gate having an output at which decoded input signals are reconstituted.

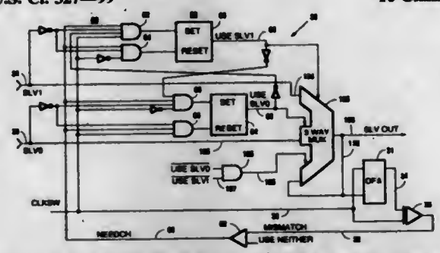
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**5,502,409**

## CLOCK SWITCHER CIRCUIT

**Paul G. Schnizlein, and David E. Norris, both of Austin, Tex., assignors to Advanced Micro Devices, Sunnyvale, Calif.**

**Continuation of Ser. No. 26,493, Mar. 4, 1993, abandoned.**
**This application Dec. 27, 1994, Ser. No. 364,436**
**Int. Cl.[6] H03K *5/13***
**U.S. Cl. 327—99** **10 Claims**



1. A clock switcher circuit for providing at least one set of clock signals selected from a plurality of clock sources, said clock switcher circuit preventing shorter than a normal pulse length of an old clock source, said normal pulse length having a leading edge and a trailing edge, upon switch to a new clock source comprising:

a flip-flop for holding a state indicating which of said plurality of clock sources is then being used to provide said at least one set of clock signals, comparing said state to a selector signal indicating which of said plurality of clock sources should be used, and generating a mismatch signal if said state differs from said selector signal;

a gate for selectively outputting at least one response signal in response to said mismatch signal from said flip-flop said gate having inputs of said selector signal, said mismatch signal, and said at least one set of clock signals;

an SR latch for generating at least one set/reset output signal, said SR latch having inputs of said at least one response signal, said at least one set/reset output signal being looped to set said gate; and

a MUX for generating said at least one set clock signals, said MUX having inputs of said plurality of clock sources, and said at least one set/reset output signal, said at least one set of clock signals dictating said state of said flip-flop; wherein said switch to said new clock source is not triggered by said leading edge or said trailing edge.



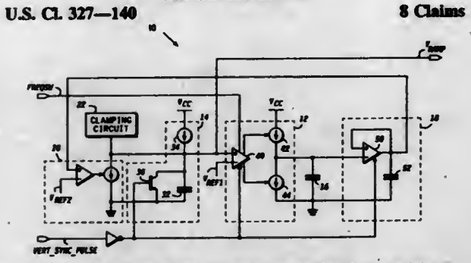
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**5,502,410**

## CIRCUIT FOR PROVIDING A VOLTAGE RAMP SIGNAL

**Pak-Kong Dunn, Kwun Tong; Kwok-Ban Nip, KLN, and Chi-Man Lin, Kowloon, all of, Hong Kong, assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Mar. 14, 1994, Ser. No. 212,750**
**Int. Cl.[6] H03K *4/06***
**U.S. Cl. 327—140** **8 Claims**



1. A circuit for providing a voltage ramp signal, comprising:

a ramp generator having an input and an output, said input of said ramp generator being coupled to receive a pulse signal, said output of said ramp generator coupled for providing the voltage ramp signal;

a comparator circuit responsive to said pulse signal and having an input and an output, said input of said comparator circuit coupled to said output of said ramp generator;

a first capacitor having first and second terminals, said first terminal of said first capacitor coupled to said output of said comparator circuit, said second terminal of said first capacitor coupled to a first supply voltage terminal;

a sample and hold circuit responsive to said pulse signal and having an input and an output, said input of said sample and hold circuit coupled to said first terminal of said first capacitor; and

a transconductance amplifier having an input and an output, said input of said transconductance amplifier coupled to said output of said sample and hold circuit, said output of said transconductance amplifier coupled to said output of said ramp generator.

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**5,502,411**

## FREQUENCY SYNTHESIZER

**Toru Matsuki, Tokyo, and Atsushi Inahashi, Saitama, both of, Japan, assignors to NEC Corporation, Tokyo, Japan**

**Filed Sep. 6, 1994, Ser. No. 300,528**
**Claims priority, application Japan, Sep. 6, 1993, 5-220758**
**Int. Cl.[6] H03B *19/00*; H03K *5/00***
**U.S. Cl. 327—156** **7 Claims**

1. A frequency synthesizer comprising:

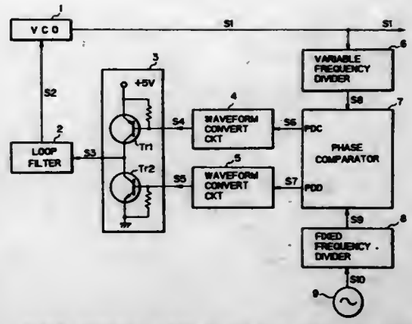
a reference signal source for generating a reference signal having a reference frequency;

a loop filter having a low-pass characteristic provided with a cut-off frequency lower than said reference frequency, said loop filter outputting a control voltage signal corresponding to a charge/discharge control signal;

a VCO for outputting a signal having a radio frequency corresponding to said control voltage signal;

a variable frequency divider for dividing the frequency of said signal from said VCO;

a digital signal output type phase comparator responsive to an output of said variable frequency divider and said reference signal for producing a first comparison output and a second comparison output, said first comparison output appearing over a period of time during which said output of said variable frequency divider is delayed in phase relative to said reference signal, said second comparison output appearing over a period of time during which said output of said variable frequency divider is advanced relative to said reference signal;



a charge pump responsive to said first and second comparison outputs for outputting said charge/discharge control signal;

a first waveform converting circuit for dividing said first comparison output into a plurality of output periods within a repetition period of said reference signal and for feeding said divided first comparison output to said charge pump; and

a second waveform converting circuit for dividing said second comparison output into a plurality of output periods within a repetition period of said reference signal and for feeding said divided second comparison output to said charge pump;

said first and second waveform converting circuits converting said first and second comparison outputs to signals whose frequency is higher than said reference frequency, thereby to cause spurious components in said VCO output signal apart from a center frequency reduced in intensity.

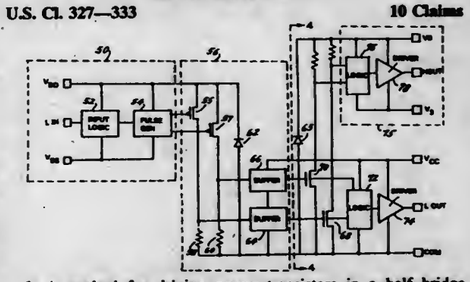
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**5,502,412**

## METHOD AND CIRCUIT FOR DRIVING POWER TRANSISTORS IN A HALF BRIDGE CONFIGURATION FROM CONTROL SIGNALS REFERENCED TO ANY POTENTIAL BETWEEN THE LINE VOLTAGE AND THE LINE VOLTAGE RETURN AND INTEGRATED CIRCUIT INCORPORATING THE CIRCUIT

**Chongwook C. Choi, and David C. Tam, both of Redondo Beach, Calif., assignors to International Rectifier Corporation, El Segundo, Calif.**

**Filed May 4, 1995, Ser. No. 433,841**
**Int. Cl.[6] H03K *19/0175***
**U.S. Cl. 327—333** **10 Claims**



1. A method for driving power transistors in a half bridge configuration from a control signal referenced to any potential between the line voltage for the power transistors and the line voltage return, comprising:

providing a control signal referenced to any potential between the line voltage and the line voltage return to an input circuit;

providing said input circuit with two voltage levels floating with respect to a common voltage level;

providing an output of said input circuit to a first level shifting circuit which shifts the level of the output of the input circuit so that it is referenced to the common voltage level;

providing said output referenced to the common voltage level to a low side driver circuit for the power transistor in said half bridge configuration which functions as a low side power transistor;

providing said output referenced to said common voltage level also to a second level shifting circuit which shifts the level of said output from said first level shifting circuit to produce a signal referenced to a second higher voltage level than said common level; and

providing the signal referenced to said second higher voltage level to a high side driver circuit for driving the power transistor comprising the high side power transistor in said half bridge configuration.

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**5,502,413**

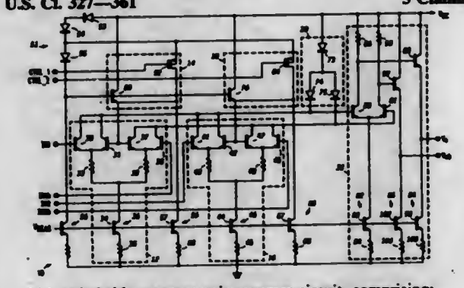
**SWITCHABLE CONSTANT GAIN SUMMING CIRCUIT**

**Gary L. Stuhlmiller, Chandler, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.**

**Filed Jan. 31, 1994, Ser. No. 188,984**

**Int. Cl.[6] G06G *7/42***

**U.S. Cl. 327—361** **5 Claims**



1. A switchable constant gain summer circuit, comprising:

a plurality of amplifier circuits respectively responsive to a plurality of input signals, each one of said plurality of amplifier circuits having a control input and common first and second outputs for respectively providing first and second output signals, and wherein each one of said plurality of amplifier circuits includes:

first and second emitter coupled transistors, a collector of said first transistor coupled to a collector of said second transistor both of which are coupled to said common first output, a base of said first transistor coupled to receive a first input signal, a base of said second transistor coupled to one of a plurality of control means which alternately provide first and second voltages thereat;

third and fourth emitter coupled transistors, a collector of said third transistor coupled to a collector of said fourth transistor both of which are coupled to said common second output, a base of said third transistor coupled to said base of said second transistor, a base of said fourth transistor coupled for receiving an inversion of said first input signal; and

a current source coupled between said emitters of said first, second, third and fourth transistors and a first supply voltage terminal;

said plurality of control means responsive to a plurality of control signals for alternately providing said first and second voltages at corresponding said control inputs of said plurality of amplifier circuits;

a load circuit coupled to said common first and second outputs of said plurality of amplifier circuits wherein a DC current through said load circuit is substantially constant and independent of whether said first or second voltage is applied to said control inputs of said plurality of amplifier circuits; and

an output stage having first and second inputs and first and second outputs, said first and second inputs of said output stage respectively coupled to said common first and second outputs of said plurality of amplifier circuits, said first and second outputs of said output stage for respectively providing first and second summed voltages.

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**5,502,414**

**CIRCUIT FOR DELAYING DATA LATCHING FROM A PRECHARGED BUS AND METHOD**

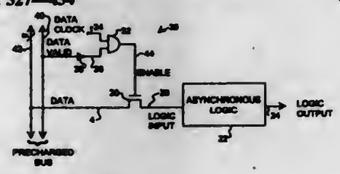
**Thang Tran; Gopi Ganapathy; Michael D. Goddard, and Robert Thaden, all of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.**

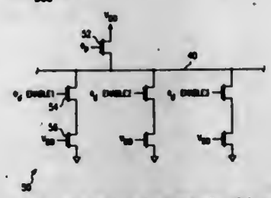
**Continuation of Ser. No. 6,731, Jan. 21, 1993, abandoned.**

**This application Apr. 13, 1995, Ser. No. 422,617**

**Int. Cl.[6] H03K *17/687***

**U.S. Cl. 327—434** **3 Claims**



1. In a system in which data may be driven on a bus during a data-drive phase, a circuit for passing data from the bus to a receiving circuit, the circuit comprising:

an input line for receiving data from the bus;

a transistor having an input and an output, the input connected to the input line, and the output connected to the receiving circuit;

an enabling means coupled to said bus and said transistor for detecting valid data of a predetermined level and for turning on the transistor when valid data is present on the bus during said data-drive phase, said enabling means comprising:

a delay means, comprising at least one inverter having an input connected to a data-valid signal, for receiving and delaying said data-valid signal; and

a control means, having a first input connected to an output of said inverter and a second input connected to said data-clock signal, for receiving said data-clock signal and said delayed data-valid signal and for producing a enable signal which is connected to a gate of said transistor.

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**5,502,415**

**BOOSTER POWER GENERATING CIRCUIT**

**Katsuaki Matsui; Sampei Miyamoto, and Hidekazu Kikuchi, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan**

**PCT No. PCT/JP93/01683, § 371 Date Jun. 29, 1994, § 102(e) Date Jun. 29, 1994, PCT Pub. No. WO94/11943, PCT Pub. Date May 26, 1994**

**PCT Filed Nov. 17, 1993, Ser. No. 256,228**

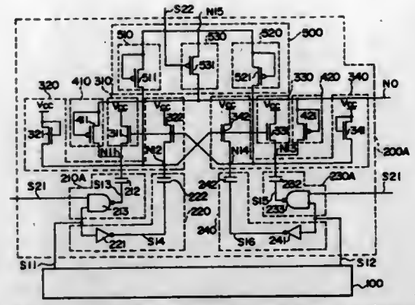
**Claims priority, application Japan, Nov. 18, 1992, 4-308555; Mar. 16, 1993, 5-055498**

**Int. Cl.[6] G05F *1/10***

**U.S. Cl. 327—536** **5 Claims**

1. A booster power generating circuit comprising:






a first booster circuit for supplying a first booster potential to a first node in response to a first pulse signal;

a second booster circuit for supplying a second booster potential to a second node in response to a second pulse signal;

a third booster circuit for supplying a third booster potential to a third node in response to a third pulse signal;

a fourth booster circuit for supplying a fourth booster potential to a fourth node in response to a fourth pulse signal;

a first precharge circuit for precharging said first node upon reception of said fourth booster potential from said fourth node;

a second precharge circuit for precharging said third node upon reception of said second booster potential from said second node;

a first output circuit for outputting said second and fourth booster potentials of said second and fourth nodes; and

a second output circuit for outputting said first and third booster potentials of said first and third nodes.

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**5,502,416**

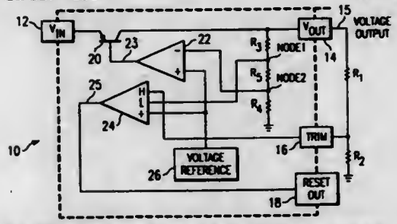
**ADJUSTABLE RESET THRESHOLD FOR AN INTEGRATED REGULATOR**

**Giovanni Pietrobon, Novi, Mich., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.**

**Filed Mar. 31, 1995, Ser. No. 414,779**

**Int. Cl.[6] H03K *5/08***

**U.S. Cl. 327—538** **20 Claims**




1. An integrated regulator having an externally adjustable reset threshold, comprising:

a transistor contained within an integrated circuit device which is supplied with a voltage input signal from an external power supply;

a voltage reference block contained within the integrated circuit device which produces a voltage reference signal;

a first resistive network contained within the integrated circuit device;

an operational amplifier contained within the integrated circuit device having a first voltage reference input signal equal to the voltage reference signal, a second input signal controlled by the first resistive network, and an output signal; wherein the operational amplifier regulates a voltage output signal of the integrated regulator by regulating the current of the transistor in order to maintain the voltage output signal within an acceptable range of a desired value of the voltage output;

a comparator contained within the integrated circuit device having at least a first voltage reference input signal equal to the voltage reference signal, a second input signal, and a reset output signal, wherein the comparator senses if the operational amplifier is regulating the voltage output signal of the integrated regulator within the acceptable range of the desired value of the voltage output signal, and the reset output signal is equal to an inactive state when the operational amplifier is regulating the voltage output signal within the acceptable range of the desired value of the voltage output signal and the reset output signal is equal to an active state when the operational amplifier is not regulating the voltage output signal within the acceptable range of the desired value of the voltage output signal; and

a second resistive network, contained outside the integrated circuit device and connected in series with the voltage output signal of the integrated regulator, which may be adjusted in order to change a value of a reset threshold of the integrated regulator wherein the reset threshold is defined as a trip point at which a given value of the voltage output signal will cause the reset output signal of the comparator to change from the inactive state to the active state or from the active state to the inactive state.

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**5,502,417**

**INPUT AMPLIFIER CIRCUIT**

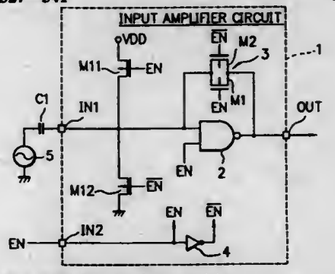
**Susumo Uriya, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Dec. 14, 1993, Ser. No. 165,931**

**Claims priority, application Japan, Dec. 28, 1992, 4-359826**

**Int. Cl.[6] H03F *1/30***

**U.S. Cl. 327—541** **7 Claims**




1. An input amplifier circuit, comprising:

an amplifying gate circuit provided with a first input terminal for receiving an input signal to be amplified, a second input terminal for receiving an enable signal capable of assuming one of an OFF and an ON state, and an output terminal for providing an amplified signal, the amplifying gate circuit being selectively responsive to the enable signal to switch between an operative state and an inoperative state of said amplifying gate circuit;

a switching feedback circuit interconnected between the first input terminal and the output terminal of the amplifying gate circuit, said switching feedback circuit being controlled by the enable signal; and

a combination of a first MOS transistor having a resistance value in a conductive state interconnected between a direct current power source supplying a direct current voltage and the first input terminal of the amplifying gate circuit and controlled by the enable signal, and a second MOS transistor also having said resistance value in said conductive state interconnected between the first input terminal of the amplifying gate circuit and a grounded terminal and controlled by an inverted enable signal, said enable signal, in the OFF state, enabling said first and second MOS transistors to be conductive, whereby, when the enable signal assumes the OFF state for rendering said amplifying gate circuit inoperative, the direct current voltage applied through the now On first and second transistors is

divided and applied as a bias voltage to the first input terminal of the amplifying gate circuit.

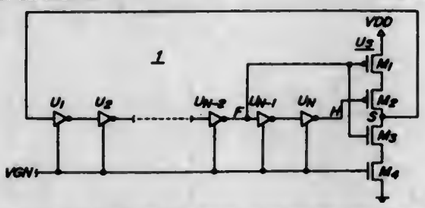
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**5,502,418**

## VOLTAGE-CONTROLLED OSCILLATING CIRCUIT

**Yasuo Arai, Tsukuba, Japan, assignor to National Laboratory for High Energy Physics, Tsukuba, Japan**

**Filed Jan. 30, 1995, Ser. No. 380,580**
**Claims priority, application Japan, Apr. 7, 1994, 6-069507**
**Int. Cl.[6] H03B 5/24; H03K 3/353; H03L 7/099**
**U.S. Cl. 331—57** **2 Claims**




1. A voltage-controlled oscillating circuit comprising a multi-staged phase inversion circuit composed of N stages of phase inversion devices connected in series, where N is an even-numbered integer equal to at least 4, wherein a phase inversion delay time is controlled by means of an applied voltage, in each of said phase inversion devices, and a switch circuit having a delay time characteristic similar to that of said inversion circuit; wherein a switch output is at high logic level when outputs of phase inversion devices in the last stage and in the second stage from the last stage of said multi-staged phase inversion circuit are both at low logic level, while said switch output is at low logic level when said output of the phase inversion device in the second stage from the last stage is at high logic level; where said output of said switch circuit is fed back to the input of said multi-staged phase inversion circuit so as to form an oscillating circuit; wherein a timing signal having a time interval of one-Nth of the oscillation period of said oscillating circuit is taken out from respective phase inversion devices in respective stages of said multi-staged phase inversion circuit and said switch circuit.

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**5,502,419**

## PULSE WIDTH MODULATION SIGNAL GENERATION AND TRIANGULAR WAVE SIGNAL GENERATOR FOR THE SAME

**Somei Kawasaki, Urawa; Masami Iseki, Yokohama, and Hirokari Ebata, Yamato, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Jan. 3, 1993, Ser. No. 70,876**
**Claims priority, application Japan, Jun. 5, 1992, 4-145693; Jun. 5, 1992, 4-145694; Jan. 13, 1992, 4-274319; Jan. 13, 1992, 4-274320; May 28, 1993, 5-127503; May 28, 1993, 5-127504**
**Int. Cl.[6] H03K 4/06**
**U.S. Cl. 332—109** **44 Claims**

1. A triangular wave generator circuit comprising:
a triangular wave generator unit for generating a triangular wave signal;
a first comparator for comparing said generated triangular wave signal with a predetermined level; and
a second comparator for comparing the triangular wave signal generated by said triangular wave generator unit with a second predetermined level different than said predetermined level,
wherein said triangular wave generator unit generates the triangular wave signal in accordance with a comparison result by said first and said second comparators for maintaining a desired offset level and peak level.

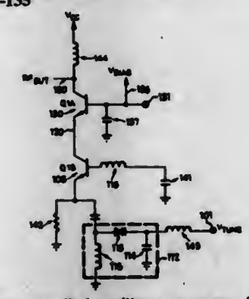
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**5,502,420**

## CASCODE VCO FREQUENCY MODULATOR

**Michael J. Barclay, Thirsk, United Kingdom, assignor to VTech Communications, Ltd., Hong Kong**

**Filed Jun. 1, 1994, Ser. No. 252,409**
**Claims priority, application United Kingdom, Jun. 2, 1993, 9311339**
**Int. Cl.[6] H03B 5/12; H03C 3/16;3/22**
**U.S. Cl. 332—135** **16 Claims**



1. A voltage controlled oscillator apparatus for generating a modulated signal at a desired center frequency, the desired center frequency being set by a tuning voltage, said voltage controlled oscillator apparatus comprising:
an oscillator transistor having a base, a collector and an emitter, the junction between said oscillator transistor base and said oscillator transistor collector having an inherent junction capacitance,
said oscillator transistor collector-base junction capacitance serving to provide voltage variable capacitance resulting in the generation of the modulated signal having received a modulating signal;
tank circuit means for determining the desired center frequency, said tank circuit means being electrically connected to the tuning voltage and said oscillator transistor emitter;
said oscillator transistor base being RF live so as to destabilize said oscillator transistor such that it oscillates due to its interaction with said tank circuit means; and
a second transistor having a base, a collector and an emitter, said second transistor emitter connected to said oscillator transistor collector such that said second transistor and said oscillator transistor are in cascode configuration,
said second transistor base being RF grounded and accepting as an input said modulating signal, which is output onto said second transistor emitter toward modulating said oscillator transistor,
said second transistor further serving to amplify the modulated signal generated by said oscillator transistor collector-base junction capacitance in response to said modulating signal onto a signal output,
whereby the need for a varactor external to said tank circuit means is alleviated and the interconnection between said oscillator transistor and said second transistor effectively isolates the modulating signal from said oscillator transistor and said tank circuit means.



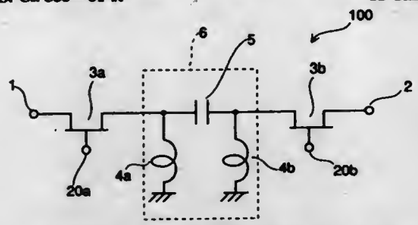
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**5,502,421**

## VARIABLE ATTENUATION MICROWAVE ATTENUATOR

**Kazuhiko Nakahara, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Mar. 23, 1995, Ser. No. 409,043**
**Claims priority, application Japan, Jul. 27, 1994, 6-175243**
**Int. Cl.[6] H03H 7/24**
**U.S. Cl. 333—81 R** **11 Claims**




1. A variable attenuation microwave attenuator comprising:
an input terminal to which input signals are applied;
an output terminal from which output signals are output;
a high-pass filter having an electrical length of 90° and input and output ends, the high-pass filter transmitting signals with frequencies higher than a cut-off frequency;
a first variable resistor connecting the input terminal to the input end of the high-pass filter; and
a second variable resistor connecting the output end of the high-pass filter to the output terminal, wherein input signals are attenuated by the first and second variable resistors and are output from the output terminal.

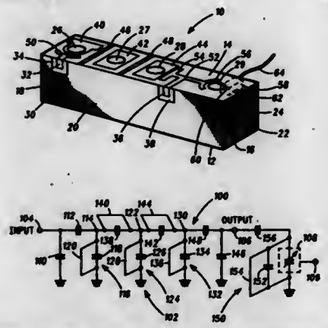
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**5,502,422**

## FILTER WITH AN ADJUSTABLE SHUNT ZERO

**Michael Newell, Placitas; Raymond Sokola, and David Heine, both of Albuquerque, all of N.M., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Aug. 12, 1994, Ser. No. 289,816**
**Int. Cl.[6] H01P 1/205**
**U.S. Cl. 333—207** **16 Claims**



1. A filter with an adjustable shunt zero, comprising:
(a) a filter having a predetermined passband defined by tuned resonators located between an input and an output, and stopband;
(b) a variable reactance element for adjusting the stopband frequency of local maximum attenuation in proximity to the passband, defined as a shunt zero, coupled to at least one of the input and output of the filter and to a parallel resonant circuit other than one of the tuned resonators, whereby the shunt zero is adjustable over a range of frequencies; and
the variable reactance element includes a variable voltage capacitor and the parallel resonant circuit including an inductive element and a capacitive element, the variable voltage capacitor is connected to the input or the output of the filter and the parallel resonant circuit is coupled between the variable capacitor and ground.

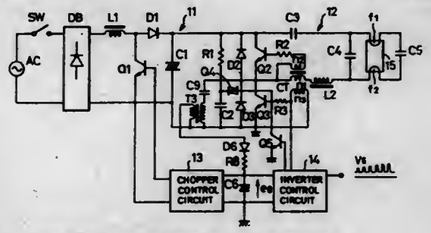
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**5,502,423**

## DISCHARGE LAMP LIGHTING DEVICE

**Akio Okude; Tokushi Yamauchi; Kei Mitsuyasu; Yoshifumi Kuroki; Naoki Ohnishi, and Katsuyuki Kiyozumi, all of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan**

**Filed Apr. 22, 1994, Ser. No. 231,148**
**Claims priority, application Japan, Apr. 23, 1993, 5-098200; Aug. 11, 1993, 5-199814**
**Int. Cl.[6] H05E 37/02**
**U.S. Cl. 315—291** **21 Claims**




1. A discharge lamp lighting device comprising:
a discharge lamp;
an alternating current (AC) power source generating an AC signal;
means for converting the AC signal into a direct current (DC) signal;
means for converting the DC signal into a high frequency AC signal having a first frequency, for applying the high frequency AC signal to the discharge lamp, for controlling the high frequency AC signal to have first, second, third, and fourth amplitudes during respective first (t1), second (t2), third (t3) and fourth (t4) periods, for warming the discharge lamp during the first period t1, for controlling the third amplitude to be greater than the fourth amplitude, for controlling the fourth period t4 to be substantially longer than the third period t3 (i.e., t4>>t3), for alternately applying the third voltage for the third period and then the fourth voltage for the fourth period to intermittently apply a pulse-shaped voltage to the discharge lamp at a second frequency less than the first frequency, for varying at least one of the third and fourth amplitudes to dim the discharge lamp, and for gradually increasing the third amplitude until the discharge lamp is started while avoiding a flash.

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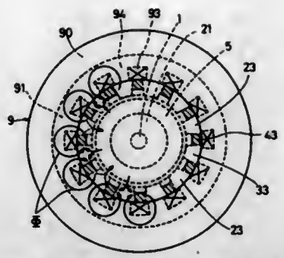
**5,502,424**

## METHOD OF MAGNETIZING ROTARY MACHINE FIELD CORE UNIT

**Yoshihiro Kato, Kariya; Toshiaki Hotta, Chiryu, and Masaki Shimizu, Nagoya, all of, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan**

**Filed Mar. 7, 1995, Ser. No. 399,886**
**Int. Cl.[6] H01F 13/00**
**U.S. Cl. 335—284** **13 Claims**

11. A method of magnetizing a rotary machine field core unit having a cylindrical boss portion made of low carbon solid iron, a pair of disk members disposed at opposite sides of said field core unit, a pair of claw poles extending axially from a corresponding



one of said pair of disk members, an unmagnetized magnet member disposed between said pair of claw poles, a field coil wound around said cylindrical boss portion and a pair of slip rings electrically connected to coil ends of said field coil comprising the steps of:

inserting said field core into a yoke having magnetizing poles and magnetizing coils surrounding the magnetizing poles so that each said claw pole faces a corresponding one of said magnetizing pole; and

supplying said magnetizing coils with magnetizing current so that a first of said pair of claw poles are polarized to be N poles and a second of said pair of claw poles are polarized to be S poles.

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**5,502,425**

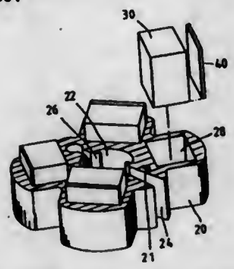
**MAGNETIC ENERGY REINFORCING DEVICE**

**Tsung C. Tsai, No. 3, Hsing Hwa Lane, Hsing Hwa Li, Lu Kang Chen, Taiwan**

**Filed Jun. 1, 1995, Ser. No. 457,492**

**Int. Cl.[6] H01F *7/02*; B01D *35/06*; B03C *1/02***

**U.S. Cl. 335—304** **7 Claims**



1. A magnetic energy reinforcing device of the type comprising a base having an axial through hole, and a plurality of chambers symmetrically spaced around said through hole, and a plurality of magnets respectively mounted in each chamber on said base, wherein a plurality of antimagnetic plates are mounted on said base and respectively disposed adjacent to said magnets at an outer side to concentrate the magnetic energy of said magnets into said axial through bole.

**5,502,426**

**PROTECTION SWITCH DEVICE**

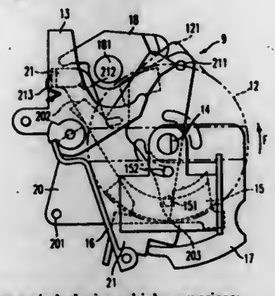
**Christian Blanchard, Rueil Malmaison; Michel Lauraire, Saint Maur Des Fosses, and Didier Vigouroux, Jouy-Le-Moutier, all of, France, assignors to Schneider Electric SA, Boulogne-Billancourt, France**

**Filed Jun. 6, 1994, Ser. No. 254,896**

**Claims priority, application France, Jun. 7, 1993, 93 06968**

**Int. Cl.[6] H01H *67/02***

**U.S. Cl. 335—132** **9 Claims**



1. Protection switch device which comprises:

power poles having mobile contacts carried by a contact-holder,

a magnetically and/or thermally tripped protection system detecting overloads or overcurrents on each pole current path and an actuator mechanism operated manually by an actuator button, said actuator mechanism including a permanent magnet lever cooperating with a magnetizable contact operating arm and a magnetizable tripping arm, movement of which is controlled by said protection system, wherein said actuation mechanism includes a manual actuator directly opening power contacts of a overload relay or, after turning the manual actuator button, opening an auxiliary contact to interrupt current in a coil of a solenoid actuating a contactor/overload relay; and

a swing arm coupled to said contact holder wherein said actuator mechanism actuates said swing-arm.

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**5,502,427**

**FUSE ASSEMBLY WITH LOW EXHAUST AND REPLACEABLE CARTRIDGE**

**Henry W. Scherer, Gurnee; Bruce A. Biller, Chicago; Hiram S. Jackson, Morton Grove; Roy T. Swanson, La Grange Park, and David W. Zabel, Evanston, all of Ill., assignors to S&C Electric Company, Chicago, Ill.**

**Filed Apr. 7, 1994, Ser. No. 227,202**

**Int. Cl.[6] H01H *71/10*; *85/04***

**U.S. Cl. 337—176** **33 Claims**

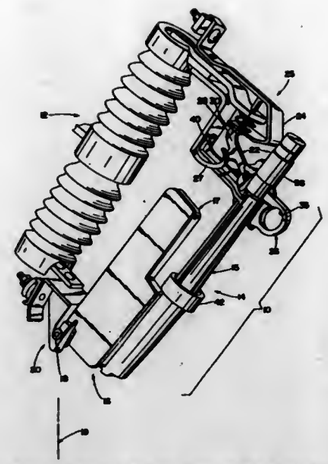
1. A fuse for use in an electrical mounting having spaced apart upper and lower terminals and mounting arrangements, the fuse comprising:

a housing comprising a first housing portion and a second housing portion, at least a substantial part of said second housing portion being arranged alongside said first housing portion;

fusible element means for defining predetermined current limiting and current interruption characteristics, said fusible element means comprising a first fusible element disposed within said first housing portion and a second fusible element disposed within said second housing portion, said first and second fusible elements being connected in an electrical series-circuit relation, said first fusible element operating in response to overcurrents above a first predetermined level in accordance with predetermined time-current characteristics and said second fusible element providing predetermined current-limiting characteristics in a current-limiting mode to limit overcurrents only when the overcurrence level exceeds a second predetermined level higher than said first predetermined level; and

means carried by said housing for supporting said housing within and for providing electrical connection of said series-circuit relation of said connected first and second fusible elements to the spaced apart upper and lower terminals and mounting arrangements of the electrical mounting.





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**5,502,428**

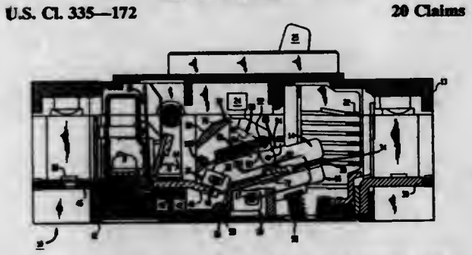
**CIRCUIT BREAKER WITH ONE-PIECE CROSSBAR INCLUDING AN INTEGRALLY MOLDED OPERATING ARM**

**Rex J. McColloch, Snellville; Stephen D. Cella, Stone Mountain, and Bernard DiMarco, Lilburn, all of Ga., assignors to Siemens Energy & Automation Inc., Alpharetta, Ga.**

**Filed Mar. 30, 1995, Ser. No. 413,655**

**Int. Cl.[6] H01H *9/00***

**U.S. Cl. 335—172** **20 Claims**



1. In a multi-phase circuit breaker of the type including a base, a contact arm associated with each phase and pivotally attached to the base to pivot between open and closed positions to conduct current in the closed position, and an operating mechanism for supplying energy to move the contact arms, a one-piece crossbar comprising:

a first plastic contact arm saddle;

a second plastic contact arm saddle;

a first plastic torque carrying member joined between the saddles and formed integrally with the saddles, the crossbar being pivotably supportable by the base to pivot about a first axis between open and closed positions; and

a plastic operating arm including a linking end and joined to the crossbar between the saddles, the plastic operating arm being formed integrally with the saddles and the torque carrying member, and the linking end being offset from the first axis and connectable with the operating mechanism to pivot the crossbar to its open position while the saddles engage the contact arms to thereby move the contact arms to their open positions.

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**5,502,429**

**INDUCTIVE DEVICE COMPRISING CONNECTION MEMBERS**

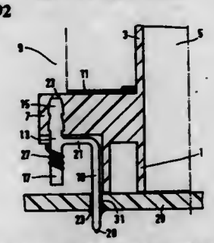
**Erik A. A. De Jong, and Jan H. M. Hopmans, both of Tilburg, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Feb. 9, 1995, Ser. No. 386,236**

**Claims priority, application European Pat. Off., Feb. 15, 1994, 94200393**

**Int. Cl.[6] H01F *15/10***

**U.S. Cl. 336—192** **7 Claims**



1. An inductive device, comprising a coil former made of an electrically insulating material, and at least one winding of an electrically conductive wire arranged on the coil former, said coil former, comprising connection members made of an electrically conductive material and each of which comprises a fixing portion anchored in the coil former, a comparatively rigid attachment pin to which one end of the wire is attached, and a comparatively flexible contact pin which projects from the coil former, wherein the attachment pin and the contact pin extend substantially in parallel and are interconnected by a connection portion which extends approximately transversely of their longitudinal direction the fixing portion extends substantially in the prolongation of the attachment pin at the side of the connection portion which is remote from the attachment pin and the contact pin, and the cross-section of the attachment pin is greater than that of the contact pin whereas its length is shorter than that of the contact pin.

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**5,502,430**

**FLAT TRANSFORMER AND POWER SUPPLY UNIT HAVING FLAT TRANSFORMER**

**Tadashi Takahashi; Kenichi Onda, both of Hitachi; Akihiko Kanouda, Katsuta; Hideaki Horie, Hitachi; Syuya Hagiwara, Mito; Noriyuki Uchiyama, and Sadamu Saito, both of Hitachi, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Oct. 27, 1993, Ser. No. 141,628**

**Claims priority, application Japan, Jan. 29, 1992, 4-291124**

**Int. Cl.[6] H01F *27/28***

**U.S. Cl. 336—232** **35 Claims**

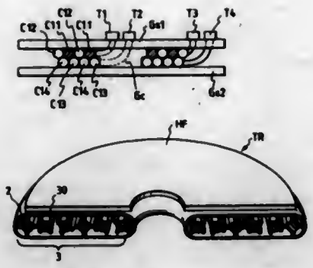
1. A flat transformer, comprising a coil body formed by plural conductors, wherein:

each of said plural conductors is coated by an insulating material;

said coil body is formed as a spiral winding of plural conductors;

a part of said plural conductors form a primary winding of the flat transformer, and the remainder of said plural conductors form a secondary winding of the flat transformer; and

each of said plural conductors of said secondary winding contacts at least one of said plural conductors of said primary winding.

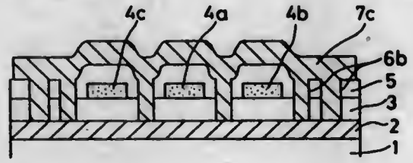


5,502,431

## INTEGRATED CIRCUIT DEVICE

Shinichi Usui, Tokyo, Japan, assignor to Nippon Precision Circuits Inc., Tokyo, Japan

Filed Feb. 7, 1994, Ser. No. 192,468
Claims priority, application Japan, Mar. 4, 1993, 5-043747
Int. Cl.[6] H01C 1/012
U.S. Cl. 338—308 3 Claims



1. An integrated circuit device comprising;

a thin-film resistor;

conductive layer means for electromagnetically shielding said thin-film resistor, said conductive layer means being provided above and below said thin-film resistor;

said conductive layer means including a first insulation layer, a first conductive layer formed on said first insulation layer, and a second insulation layer formed on said first conductive layer;

said thin-film resistor being disposed on a portion of said second insulation layer;

said conductive layer means further including a third insulation layer covering said thin-film resistor and areas of said second insulation layer free from contact with said thin-film resistor;

said third insulation layer defining first contact holes providing access to said thin-film resistor through said third insulation layer;

said second and third insulation layers defining second contact holes providing access to said first conductive layers through said second and third insulation layers;

said conductive layer means further including first wiring layers formed in-part on said third insulation layer and in-part contacting said thin-film resistor through said first contact holes and a second wiring layer formed in-part on said third insulation layer and in-part contacting said first conductive layer through said second contact holes; and

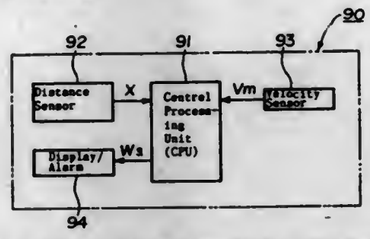
said second wiring layer including a portion thereof on said third insulation layer and over said thin-film resistor to provide electromagnetic shielding for said thin-film resistor.

5,502,432

## APPARATUS AND METHOD OF WARNING REAR-END COLLISION

Yukio Ohmamyuda, Sagamihara; Shigeru Kimura, Yokohama; Toru Tanabe, Machida; Kazuhisa Iwasaki, Yokohama; Takao Seto, Yokohama; Hideki Kitamura, Yokohama, and Yasushi Senoo, Yokohama, all of, Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan

Filed Dec. 10, 1992, Ser. No. 988,675
Claims priority, application Japan, Dec. 16, 1991, 3-351815
Int. Cl.[6] B60Q 1/00
U.S. Cl. 340—436 10 Claims




1. A warning apparatus for warning of a possible rear-end collision of a given vehicle having the warning apparatus with another vehicle preceding the given vehicle, comprising:

a computer;

a distance means for determining a vehicle-to-vehicle distance between the given vehicle and the another vehicle and for sending a distance signal to said computer;

a velocity means for determining a velocity of the given vehicle and for sending a velocity signal to said computer;

alarm means for receiving a warning signal provided by said computer;

said computer computing an anticipated rear-end collision time $T_a$ of the given vehicle with the another vehicle with an equation:

$$T_a = \frac{X - T_t \times V_m}{\frac{T_a \times G}{2} + V_r}.$$

where $T_a$ is an anticipated rear-end collision time as measured in seconds, X is a vehicle-to-vehicle distance between the given vehicle and the another vehicle measured in meters, $T_t$ is a buffer time measured in seconds, $V_m$ is a velocity of the given vehicle measured in m/s (meters per second), $V_r$ is a relative velocity measured in m/s (meters per second), and G is an acceleration on relative velocity $V_r$;

said computer sending said warning signal to said alarm means; and

said alarm means providing a warning in response to the computed anticipated rear-end collision time $T_a$.

5,502,433

## METHOD AND DEVICE FOR DETECTING HYDROPLANING CONDITIONS FOR VEHICLE TIRES

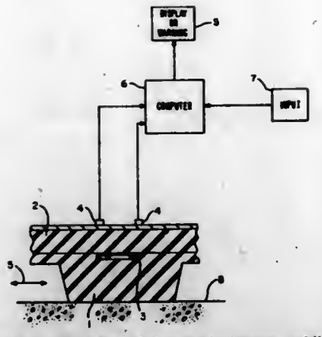
Bert Breuer, Seeheim-Jugenheim; Jörg Stöcker, Mühltal-Traunheim, and Jürgen Roth, Sailauf, all of, Germany, assignors to Continental Aktiengesellschaft, Hanover, Germany

Filed Dec. 17, 1993, Ser. No. 169,114
Claims priority, application Germany, Dec. 17, 1992, 42 42 726.6; Jan. 21, 1993, 43 35 938.8
Int. Cl.[6] B60Q 1/00
U.S. Cl. 340—438 13 Claims

1. A method for detecting a hydroplaning risk for vehicle tires, said method comprising the steps of:

measuring continuously sequential deformations of tread elements of the vehicle tire in a circumferential direction over a






circumferential length of the tread elements while passing through a contact zone of the vehicle tire and generating a sequence of corresponding signals, wherein said sequence of corresponding signals has a section, referred to as a positive impulse, wherein the deformations of the tread elements near a leading edge of the contact zone are counter to the direction of rotation;

differentiating the sequence of corresponding signals over the circumferential length to determine a slope near a center of the positive impulse;

comparing the slope to predetermined evaluation standards; and

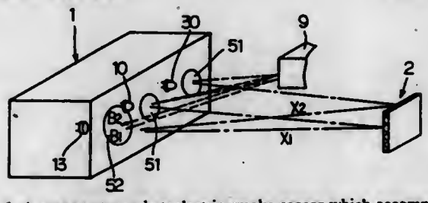
as a function of said predetermined evaluation standards, determining the danger of hydroplaning when said slope is below a preset value whereby a warning signal is generated.

5,502,434

## SMOKE SENSOR

Osami Minowa, Machida; Junichi Narumiya, Fujisawa; Tetsuya Nagashima, Sagamihara; Yoshihito Hirai, Odawara, and Mariko Ishida, Yokohama, all of, Japan, assignors to Hochiki Kabushiki Kaisha, Tokyo, Japan

Filed May 21, 1993, Ser. No. 66,909
Claims priority, application Japan, May 29, 1992, 4-161726; May 29, 1992, 4-161727; May 29, 1992, 4-161728; May 29, 1992, 4-161729; Jun. 8, 1992, 4-173758
Int. Cl.[6] G08B 17/10
U.S. Cl. 340—630 17 Claims




1. A separate type photoelectric smoke sensor which accommodates the presence of obstructive shielding objects, comprising;

light emitting means for emitting a light beam along a predetermined path; a reflecting plate arranged along said predetermined path and disposed at a certain distance from said light emitting means for reflecting said light beam;

light receiving means for receiving reflected light from said reflecting plate; and

judgement means for outputting a sense signal if light received from said light receiving means is smaller than a predetermined threshold value,

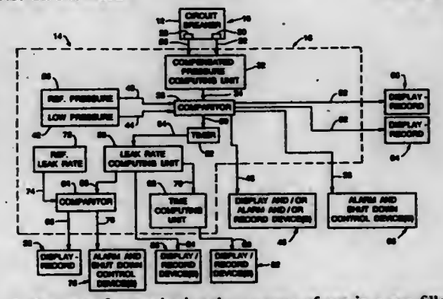
the quantity of reflected light from a shielding object interposed between said light emitting means and said reflecting plate is obtained from the difference between the quantity of received light measured during lighting of said light emitting means in a situation where there is no shielding object and the quantity of received light measured during lighting of said light emitting means in a situation where there is a shielding object, and the difference between the quantity of reflected light and the quantity of received light measured during lighting of said light emitting means is compared with said predetermined threshold value within said judgement to determine if there is a fire.

5,502,435

## METHOD AND SYSTEM FOR MONITORING CIRCUIT BREAKER GAS PRESSURE

Douglas E. Ralston, 6055 Deer Run Rd., Chagrin Falls, Ohio 44022

Filed Apr. 6, 1994, Ser. No. 223,759
Int. Cl.[6] G08B 21/00
U.S. Cl. 340—632 35 Claims



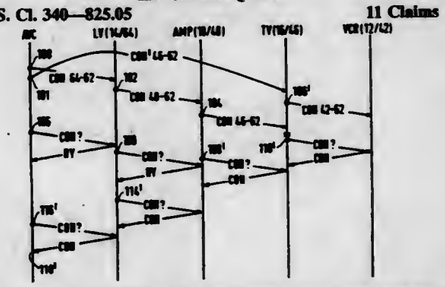

1. A system for monitoring the pressure of gas in a gas filled circuit breaker container in which said gas has a pressure and a temperature comprising, means for producing a first signal representative of a temperature compensated gas pressure in said container, means for providing a second signal representative of a reference gas pressure in said container, comparator means including means for comparing said first and second signals and providing a third signal in response to said first signal being less than said second signal, thus indicating a drop in pressure in said container from said reference pressure, and means responsive to said third signal including means for indicating said pressure drop.

5,502,436

## METHOD OF IDENTIFYING A SIGNAL PATH AND SIGNAL PROCESSING APPARATUS

Bernard van Steenbrugge, Redhill, England, assignor to D2B Systems Company Limited, Redhill, England

Continuation of Ser. No. 932,168, Aug. 19, 1992, abandoned.
This application Oct. 11, 1994, Ser. No. 321,074
Claims priority, application United Kingdom, Aug. 21, 1991, 9118040
Int. Cl.[6] H04Q 1/00
U.S. Cl. 340—825.05 11 Claims




1. In a system having at least three apparatuses, each apparatus having at least one user information signal path connection to

adjacent apparatuses, each apparatus additionally coupled to a serial data bus having distributed control for the transmission of data bus messages, a method of identifying, by use of serial data bus messages, a desired path for transmitting a user information signal between a first one of said apparatuses and a second one of said apparatuses, the method comprising the steps of:

(a) initiating a first autonomous process whereby a succession of said user interface signal path connections are identified through a succession of apparatuses of the system from the first apparatus to the second apparatus;

(b) initiating, concurrently with first autonomous process, a second autonomous process whereby a succession of said user interface signal path connections are identified, starting with a third apparatus, through a succession of apparatuses of the system until the second apparatus is reached;

(c) in the event that the third apparatus is reached during the first process, terminating the first process and appending the path identified so far by the second process to the path identified so far by the first process between the first apparatus and the third apparatus.

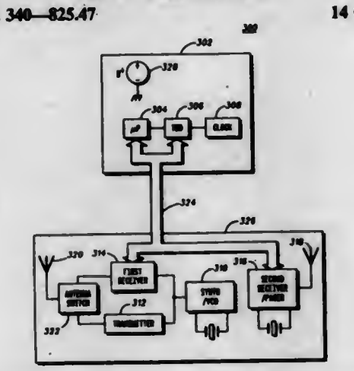
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**5,502,437**

## RECEIVER ISOLATION SCHEME

**Paul D. Marko, Ft. Lauderdale, and Kenneth D. Alton, Coral Springs, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Apr. 25, 1994, Ser. No. 233,016**
**Int. Cl.[6] G08B** *5/22;23/02*
**U.S. Cl. 340—825.47** **14 Claims**



1. A method for coordinating the synchronization of first and second receivers within a communication device, the method comprising the steps of:

scanning for a first incoming signal at the first receiver for a predetermined time frame using a first communication protocol;

scanning for a second incoming signal at the second receiver for a predetermined time frame using a second communication protocol; and

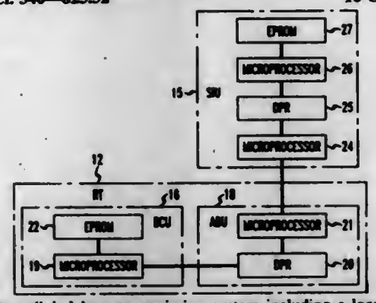
altering the predetermined time frame of the second communication protocol in response to the predetermined time frame of the first communication protocol.

**5,502,438**

## ADDRESS MANAGEMENT FOR REMOTE TERMINALS IN DIGITAL LOOP TRANSMISSION SYSTEMS

**John H. Blevin, Scotrun, Pa.; Robert W. DeMarco, Hanover Township, Morris County, N.J.; Peter A. A. Dempsey, Morris Plains, N.J.; Raphael Jimenez, Randolph Township, Morris County, N.J., and Roger H. Levy, Berkeley Heights Township, Union County, N.J., assignors to AT&T Corp., Murray Hill, N.J.**

**Continuation of Ser. No. 636,962, Jan. 2, 1991, abandoned. This application Apr. 20, 1993, Ser. No. 49,957**
**Int. Cl.[6] H04Q** *1/00*
**U.S. Cl. 340—825.52** **16 Claims**




1. In a digital loop transmission system including a local area network comprising a plurality of remote terminals, each having a preset unique multi-byte serial number, and at least one master circuit in one of said terminals, a method for assigning addresses to said terminals comprising the steps of:

generating a search address by each of said terminals which search address has a lesser number of bytes than the serial number;

performing a binary search by the master circuit to determine the search address of each terminal wherein the master circuit sends a range of search addresses to remote terminals, each remote terminal with a search address within that range responds to the master circuit, and the master circuit divides the search range until it receives a single response from a remote terminal with a search address within the transmitted range; and

assigning to each remote terminal by the master circuit an active address which is different from the search address and also has a lesser number of bytes than the serial number.

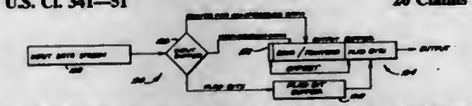
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**5,502,439**

## METHOD FOR COMPRESSION OF BINARY DATA

**Gary J. Berlin, Beech Island, S.C., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed May 16, 1994, Ser. No. 243,164**
**Int. Cl.[6] H03M** *7/30*
**U.S. Cl. 341—51** **20 Claims**



18. A method for managing an input data stream received from an input buffer, said method for use with a storage buffer and an output buffer, said input data stream composed of a series of data bytes including at least one string of repeated data bytes, said at least one string of repeated data bytes repeating a previous data byte string in said series of data bytes, and said method comprising the steps of:

reading each data byte in said series of data bytes;

determining whether said each data byte is part of a repeated data byte string;



replacing said repeated data byte string by a pointer that indicates the location and run length of said previous data byte string, said series of data bytes then containing pointers and remaining data bytes;

establishing a first flag bit for said repeated data byte string and a second flag bit for each remaining data byte;

storing temporarily in a flag bit buffer said first and said second flag bits in the order in which they were established;

writing said remaining data bytes and said pointers to said storage buffer as an output series of data bytes;

writing said flag bit from said temporary flag bit buffer to said storage buffer at the end of said output series;

reading said output series with said flag bits;

identifying each pointer in said output series using said flag bits;

locating each previous data byte string from each pointer;

replacing each pointer with said previous data byte string to form, in sequence with said data bytes, a restored series of data bytes equivalent to said series of data bytes; and

writing said restored series of data bytes to said output buffer.

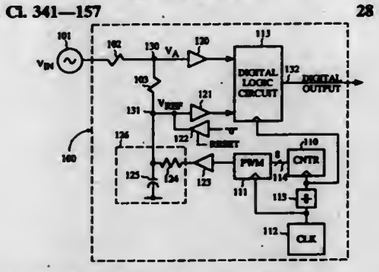
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**5,502,440**

## STRUCTURE AND METHOD FOR PERFORMING ANALOG TO DIGITAL CONVERSION

**Bernard J. New, 142 Stacia St., Los Gatos, Calif. 95032**

**Filed Sep. 2, 1994, Ser. No. 300,280**
**Int. Cl.[6] H03M** *1/60*
**U.S. Cl. 341—157** **28 Claims**




1. An analog-to-digital converter comprising:

a clock signal generator having an output terminal;

a voltage generator having an input terminal coupled to the output terminal of said clock signal generator and an output terminal;

a voltage divider circuit having a first input terminal for receiving an analog input signal, a second input terminal coupled to the output terminal of said voltage generator, and an output terminal;

a first digital buffer having an input terminal coupled to the output terminal of said voltage divider circuit and an output terminal;

a second digital buffer having an input terminal coupled to the output terminal of said voltage generator and an output; and

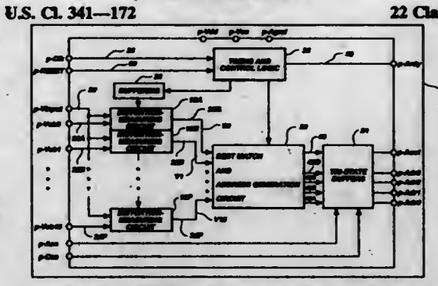
a digital logic circuit having a first input terminal coupled to the output terminal of said first digital buffer, a second input terminal coupled to the output terminal of said second digital buffer, a third input terminal coupled to the output terminal of said clock signal generator, and an output terminal for receiving a digital output signal.

**5,502,441**

## ANALOG SWITCHED-CAPACITOR VECTOR QUANTIZER

**Jody A. Swenson, Logan, Utah, assignor to Utah State University Foundation, North Logan, Utah**

**Filed Nov. 24, 1993, Ser. No. 157,977**
**Int. Cl.[6] H03M** *1/12*
**U.S. Cl. 341—172** **22 Claims**



1. An analog vector quantizer system for determining which of a plurality of codevectors most closely matches an input signal, the system comprising:

input means for receiving the input signal and the codevectors;

capacitor-based distortion measuring means receiving the input signal and the codevectors for determining distortions between the input signal and respective ones of the codevectors and providing respective distortion signals representative of the distortions; [and]

best match means receiving the respective distortion signals and determining which of the distortions signals represents a lowest distortion; and

an identification generation circuit that produces an identification signal indicative of which codevector its associated with the lowest distortion.

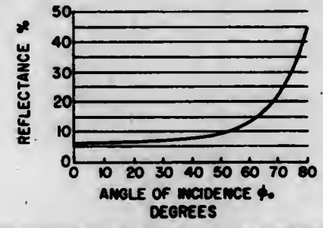
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**5,502,442**

## METHOD OF FORMING A DURABLE WIDEBAND ANTI-REFLECTION COATING FOR INFRARED WINDOWS

**Frank C. Sulzbach, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.**

**Division of Ser. No. 400,606, Aug. 30, 1989. This application Jun. 7, 1995, Ser. No. 474,809**
**Int. Cl.[6] H01Q** *17/00;* **B05D** *1/36*
**U.S. Cl. 342—2** **2 Claims**




1. A method for forming an ultra hard, dual band anti-reflection coating for a window comprising:

forming a first silicon layer of predetermined thickness;

forming a first diamond like carbon layer less than 0.5 micron thick on said first silicon layer;

forming a second silicon layer less than 0.5 micron thick on said first diamond like carbon layer; and

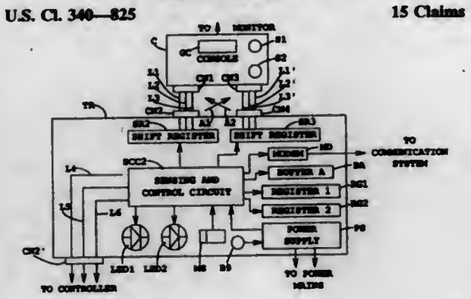
forming a second DLC layer less than 1 micron thick on said second silicon layer to produce a coating which passes radiation in both the approximate 2–5 and 7–12 micron range.

## 5,502,443

### TRANSPONDER FOR INTERACTIVE DATA EXCHANGE BETWEEN INDIVIDUALLY USER-CONTROLLED COMPUTER-STEERED SYSTEMS

Robert S. Newberry, 3209 Beverly Dr., Huntsville, Ala. 35801

Filed Jun. 27, 1994, Ser. No. 265,738
Int. Cl.[6] H04Q *1/00*
U.S. Cl. 340—825 15 Claims




1. A transponder comprising:

first and second transponder output port means for outputting binary data words to an associated system;

transponder input port means for receiving binary data words supplied thereto;

communication port means adapted for connection to a two-way communication system for transmitting and receiving binary command words; and

a transponder control system including:

first memory storage means for storing the last data word received at said transponder input port means,

command word generating means for forming command words having a status portion containing a replica of the contents of said first memory storage means and a control portion including an error detection code and a confirmation code having a first configuration indicative of error-free reception of a command word at said communication port means and a second configuration indicative of transmission error in said received command word, said generating means including first output means for outputting via said communication port means a command word so formed responsively to receipt of a command word at said communication port means,

second memory storage means for storing a replica of the status portion of the last word outputted via said communication port means,

third memory storage means for storing a replica of the status portion of a command word received in reply to said outputted command word,

transfer means for providing said replicas to said second and third memory storage means,

second and third output means for outputting via said first and second transponder output port means replicas of the contents of said second and third memory storage means respectively responsively to receipt of demand signal conditions at said first and second transponder output port means respectively, and

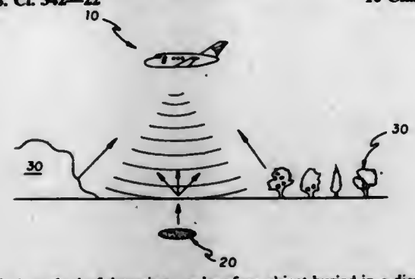
disabling means for disabling said transfer means responsively to receipt of either one of an error-indicating condition and a confirmation code having said second configuration in said command word received in reply.

## 5,502,444

### METHOD AND APPARATUS FOR IMPROVING THE SIGNAL-TO-CLUTTER RATIO OF AN AIRBORNE EARTH PENETRATING RADAR

Ira Kohlberg, Alexandria, Va., assignor to Mandex, Inc., Springfield, Va.

Filed Sep. 23, 1994, Ser. No. 311,674
Int. Cl.[6] G01S *13/00*
U.S. Cl. 342—22 10 Claims




1. A method of detecting a subsurface object buried in a dispersive environment comprising the steps of:

transmitting a radiant signal;

receiving a returned reflection of the radiant signal, the returned reflection including a clutter response and a buried object response;

dividing the returned reflection into time intervals;

performing a correlation operation for the returned reflection to obtain a sequence of correlation voltages;

determining the existence of correlation values in the sequence beyond the time interval containing the clutter response;

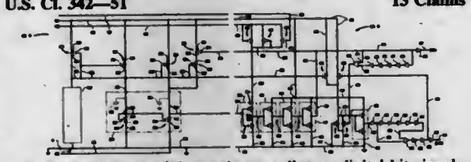
indicating the presence of the buried object based on the existence of correlation values beyond the time interval containing the clutter response.

## 5,502,445

### SYSTEM AND METHOD FOR REMOTE IDENTIFICATION OF CODED ARTICLES AND THE LIKE

Andrew G. F. Dingwall, Princeton, and Jonathan L. Schepps, Mercer, both of N.J., assignors to David Sarnoff Research Center, Inc., Princeton, N.J.

Continuation of Ser. No. 348,095, Nov. 25, 1994, which is a division of Ser. No. 998,164, Dec. 29, 1992. This application May 22, 1995, Ser. No. 445,641
Int. Cl.[6] G01S *13/08*
U.S. Cl. 342—51 13 Claims



1. A circuit for receiving and responding to digital bit signals, the circuit comprising:

an input stage comprising first and second MOS detector transistors each having a gate, a source and a drain with their gates connected in common to the drain of the first transistor, the sources of the transistors being connected respectively to a first rail and to an input terminal for receiving the digital bit signals;

first and second MOS transistors connected as controlled current sources respectively to the drains of the first and second detector transistors,

a first small capacitor connected between the drain of the first detector transistor and the first rail,

a second capacitor connected between the drain of the second detector transistor and the first rail, the voltage across the second capacitor in the absence of an incoming signal being substantially different from the voltage across the first capacitor; and

at least one amplifier stage of a p-channel field effect transistor (FET) and an n-channel FET series connected with common gate input and common drain output, the common gate input of the stage being connected in parallel with the second small capacitor, the output of the amplifier stage switching between the first rail and a second rail potential when the voltage across the second capacitor changes sufficiently in response to the microwave signal such that the output of the amplifier stage produces binary "0" and "1" bits in accordance with the signals.

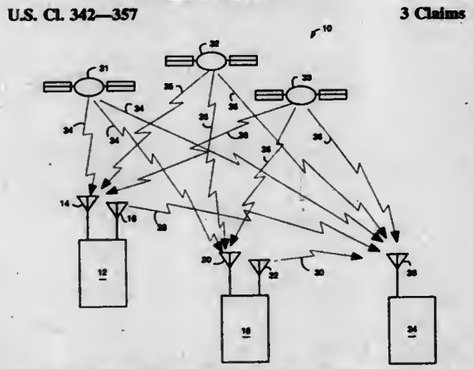


## 5,502,446

### GPS-BASED AUTOMATIC TARGET REPORTING AND FINDING NETWORK AND COMPONENTS

Valentine L. Denninger, Sunnyvale, Calif., assignor to Trimble Navigation Limited, Sunnyvale, Calif.

Filed May 2, 1994, Ser. No. 236,638
Int. Cl.[6] G01S *5/02*
U.S. Cl. 342—357 3 Claims



1. An automatic target reporting and finding network (10), comprising:

a constellation of orbiting navigation satellites (31–33) for transmitting from each two spread spectrum, L-band microwave carrier signals "L1" and "L2" (34–36) in a code division multiple access (CDMA) configuration that shares the same L1 and L2 frequencies, wherein said L1 signal from each satellite is binary phase shift key (BPSK) modulated by two pseudo-random noise (PRN) spreading codes in phase quadrature and carries a coarse grained acquisition code (C/A-code) and/or a precision, fine-grained code (P-code), and wherein said L2 signal from each satellite is BPSK modulated by only said P-code and provides for a fifty baud navigation channel;

a first mobile unit (12) including a radio frequency (RF) amplifier (100) for low-noise amplification of L1 signals (34–36), a navigation computer (102) including a microcomputer (CPU) (104) and a digital signal processor (DSP) (112), all interconnected to compute a first set of positions and velocities of the first mobile unit (12) from ranging and timing information included in said L1 signals (34–36);

a first L2-frequency transmitter (120) connected to receive said first set of positions and velocities of the first mobile unit (12) and to transmit such data by CDMA access on said L2 carrier frequency (28) with a first PRN spreading code different from any used by said satellites (31–33);

a second mobile unit (24) including a radio frequency (RF) amplifier (80) for low-noise amplification of L1 and L2 signals (28 and 34–36), a navigation computer (82) including a microcomputer (CPU) (84) and a digital signal processor (DSP) (92) all interconnected to compute a second set of positions and velocities of the second mobile unit (24) from ranging and timing information included in said L1 signals (34–36); and

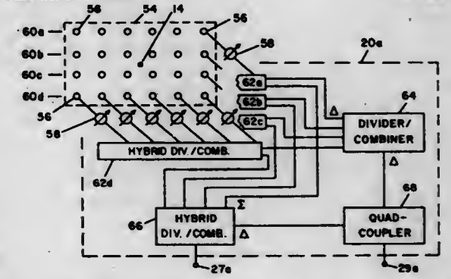
vector means (40, 60, 88, 94, 96) connected to receive said first set of positions and velocities of the first mobile unit (12) communicated by said L2 carrier frequency (28) to said RF amplifier (80), and connected to receive said second set of positions and velocities of the second mobile unit (24), and providing for an indication of said first position relative to said second position.

## 5,502,447

### BEAM SHARPENED PENCIL BEAM ANTENNA SYSTEMS

Richard J. Kumpfbeck, Lloyd Harbor, and Peter W. Hannan, Smithtown, both of N.Y., assignors to Hazeltine Corporation, Greenlawn, N.Y.

Filed Oct. 28, 1993, Ser. No. 144,910
Int. Cl.[6] H01Q *3/22*
U.S. Cl. 342—373 19 Claims




5. A dual mode antenna system, having a sum mode and a ring mode, comprising:

an array of radiating elements positioned around a central axis in rows and columns, including at least one column or a plurality of rows of said radiating elements spaced from said central axis at each of zero, 90, 180 and 270 degree positions around said central axis, each said radiating element arranged to provide an antenna pattern nominally in the direction of said central axis;

intercoupling means, intercoupling said radiating elements, for providing a sum mode signal by combining signals from a plurality of said radiating elements and for providing a ring mode signal, representing an antenna pattern having a zero to 360 degree progressive phase characteristic around said central axis, by combining in an out of phase relationship signals from selected ones of said radiating elements positioned on opposite sides of said central axis to form two difference signals and combining said two difference signals in a quadrature phase relationship to form said ring mode signal;

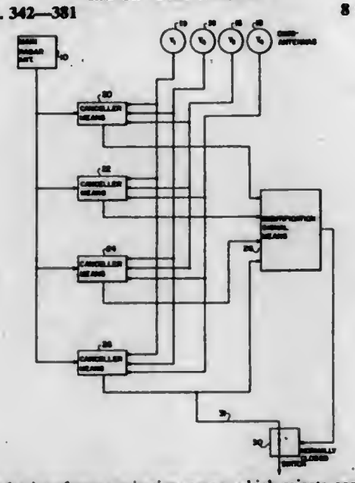
phase shift means, coupled to the feed paths of a plurality of said radiating elements, for adjusting the relative phase of signals coupled to said radiating elements; and

processing means, coupled to said intercoupling means, for processing said sum mode and ring mode signals in a predetermined manner.

## 5,502,448
## METHOD AND MEANS FOR SHORT PULSE INTERFERENCE REJECTION

**Ben H. Cantrell, and Bernard L. Lewis, both of Oxon Hill, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Aug. 30, 1977, Ser. No. 329,695**
**Int. Cl.[6] G01S *3/16;3/28***
**U.S. Cl. 342—381** **8 Claims**



1. Radar interference rejection means which rejects continuous noise as well as short-pulse interference signals for use with a radar set having a main directional antenna comprising, in combination:

a plurality of omni-directional receiving antennas (Omnis) arranged around the main antenna;

a plurality of canceller means equal in number to the number of Omnis, the main antenna being coupled to all said canceller means, and the Omnis being coupled to said canceller means in different sets consisting of one less than the total number of Omnis; and

identification signal means for subtracting the outputs of said canceller means from each other in sets of two, all said sets being different, determining whether any of the subtracted outputs are substantially different from the other, and providing an identification signal signifying that this condition exists.

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## 5,502,449
## GROUND UNIT FOR THE DETECTION, IDENTIFICATION, AND DIRECTION DETERMINATION OF A MARKER BEACON

**Frederick F. Hiltz, Newport, R.I., and Charles E. Wilson, Clarksville, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

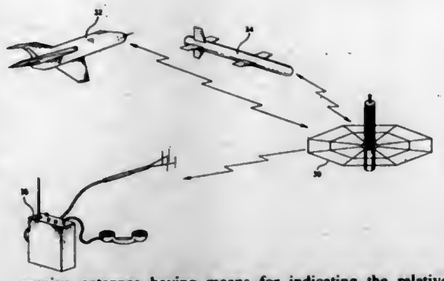
**Filed Mar. 23, 1994, Ser. No. 216,560**
**Int. Cl.[6] G01S *5/02***
**U.S. Cl. 342—417** **1 Claim**

1. A ground unit for use in conjunction with a marker beacon comprising:

detection and identification means for detecting and identifying a marker beacon upon receipt of predetermined radio signals;

direction determination means for determining the direction of said marker beacon; and

said detection and identification means further comprising a code selector having code selection means for selecting an identification code, a pair of hand-held receiver antennas for receiving identification code group signals, said hand-held



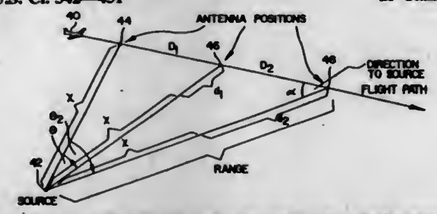
receive antennas having means for indicating the relative strength of signals received at each hand-beld antenna with respect to the other hand-beld antenna, a receiver having a receiver network and a switch for connecting one at a time each of said pair of receive antennas to said receiver network, a pulse width discriminator connected to receiver network and having a pulse width discriminating means for checking the pulse width of the received signals, a one-shot multivibrator connected to said pulse width discriminator, said one-shot multivibrator having signalling means for providing an output signal when the pulse width of the signals at the pulse width discriminator meet predetermined criteria, a correlator connected to said code selector for receiving said selected identification code and to receive said output from said multivibrator, said correlator having identification code means for determining if said received signal meets said identification code criteria and for providing an output signal if such criteria is met, and information means connected to receive said correlator output signal for providing information of the detection and identification of said marker beacon and said information means further comprising one of a handset and a pair of headphones providing an audio signal.

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## 5,502,450
## SINGLE ANTENNA DIRECTION-FINDING SYSTEM

**Joseph H. Zablotney, Oakton, and Steven F. Gorman, Falls Church, both of Va., assignors to E-Systems, Inc., Dallas, Tex.**

**Filed Jul. 19, 1994, Ser. No. 276,992**
**Int. Cl.[6] G01S *3/02***
**U.S. Cl. 342—451** **25 Claims**




1. A method of determining the direction from a single antenna movable along a path to a source of a continuous signal having a stable symbol rate comprising the steps of:

a) detecting the occurrence of a first symbol in said signal at a first position along path of antenna movement;

b) determining a first difference in terms of an unknown distance between the signal source and the first antenna position, between (i) an expected occurrence of a second symbol at the first antenna position and (ii) an actual occurrence of the second symbol at a second antenna position a first known distance from the first antenna position, and determining a second difference in terms of the unknown distance, between (i) an expected occurrence of a third symbol at the first antenna position and (iii) an actual occurrence of the third symbol at a third antenna position a second known distance from the first antenna position; and



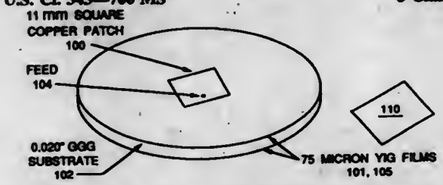
c) determining the direction to the source relative to the path of antenna movement from one of the antenna positions by the simultaneous solution of equations for at least two triangles in the form $a^2=b^2+c^2-2bc(\cos\alpha)$, where $\alpha$ is the angle between the path of antenna movement and the direction to the source to be determined.

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## 5,502,451
## PATCH ANTENNA WITH MAGNETICALLY CONTROLLABLE RADIATION POLARIZATION

**Peter J. Rainville, Stow, Mass., and Frances J. Harackiewicz, Carbondale, Ill., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.**

**Filed Jul. 29, 1994, Ser. No. 284,884**
**Int. Cl.[6] H01Q *1/38***
**U.S. Cl. 343—700 MS** **3 Claims**




1. A microstrip patch antenna which radiates an electromagnetic signal which has a variable polarization, said microstrip patch antenna comprising:

a substrate;

a ferrite film on top of said substrate;

a microstrip patch placed on top of said ferrite substrate;

a feed which is placed on the edge of said microstrip patch to conduct said electromagnetic signal thereto and cause said microstrip patch to radiate said electromagnetic signal thereby; and

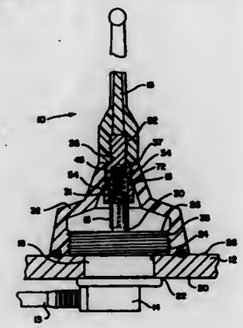
a means for applying a magnetic field to said microstrip patch to vary thereby the variable polarization of the electromagnetic signal, wherein said applying means comprises an external electromagnet which is fixed in proximity with said microstrip patch to emit a d.c. magnetic field thereon, said d.c. magnetic field having a strength of up to 500 gauss.

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## 5,502,452
## UNIVERSAL MOUNTING SYSTEM FOR MOBILE TELECOMMUNICATIONS ANTENNAS

**Francisco X. Gomez, Oak Park, Ill., assignor to The Antenna Company, Itasca, Ill.**

**Filed Jul. 13, 1994, Ser. No. 274,494**
**Int. Cl.[6] H01Q *1/32;1/50***
**U.S. Cl. 343—715** **22 Claims**



1. In an external antenna mounting assembly for a mobile telecommunication unit of a vehicle, the antenna mounting assembly including an antenna radiating element, an antenna base element which extends through an opening of the vehicle, the antenna base element having an electrical contact pin extending therefrom to provide a point of operative electrical connection to the telecommunication unit of said vehicle, the improvement comprising:

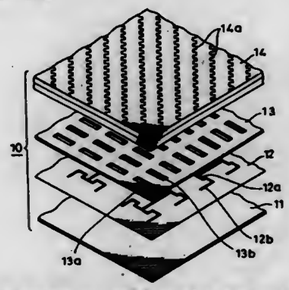
an integrated assembly for covering the antenna base element and establishing an operative connection between said antenna base element contact pin and the radiating element, the assembly including a base cap element and a contact pin extension cartridge, the base cap element having means for engaging said antenna base element contact pin, said base cap element having a first passage extending therethrough in alignment with said antenna base element contact pin and a second passage in communication with the first passage, the second passage being larger than said first passage, said contact pin extension cartridge including an elongated body which partially extends within the base cap first passage and firmly engages said base cap element such that said cartridge body and base cap element act as a single component during installation thereof on said antenna base element, said cartridge body including an axial cavity and a hollow contact sleeve disposed in the cavity, said cartridge body further including a spring means disposed in said cavity and in contact with, at opposite ends of the spring means, said contact sleeve and said cartridge body, said contact sleeve rotatably receiving said contact pin in engagement therewith such that a portion of said antenna base element contact pin extends into said contact sleeve when said integrated assembly is installed upon said antenna base element, said contact sleeve extending into said base cap element second passage, said contact sleeve further including a plurality of longitudinal slots which divide said contact sleeve into distinct arcuate segments to thereby facilitate engagement between said antenna base element contact pin and said contact sleeve by permitting said contact sleeve segments to flex outwardly into said base cap element second passage without interference with said base cap element during engagement with said antenna base element contact pin.

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## 5,502,453
## PLANAR ANTENNA HAVING POLARIZER FOR CONVERTING LINEAR POLARIZED WAVES INTO CIRCULAR POLARIZED WAVES

**Katsuya Tsukamoto, Hirakata, and Takshi Saito, Shijonawate, both of, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan**

**Continuation of Ser. No. 978,792, Nov. 19, 1992, abandoned.**
**This application Feb. 17, 1995, Ser. No. 390,419**
**Claims priority, application Japan, Dec. 13, 1991, 3-329237**
**Int. Cl.[6] H01Q *19/00;1/38***
**U.S. Cl. 343—756** **1 Claim**




1. A planar antenna in a multilayered structure comprising:

a grounding conductor plate,

a power supplying circuit plate,

a radiating circuit plate which are mutually separated with a dielectric layer interposed between them,

said radiating circuit plate being formed with a metal plate having a plurality of pairs of apertures made through the metal plate in the absence of any patch element and acting as radiating elements in a slot shape for generating linear polarized waves by an electromagnetic coupling of respective said pairs of apertures to respective power supply probes formed in said power supplying circuit plate in physically non-contacting relationship, and

a polarizer disposed in front of said radiating plate for converting said linear polarized waves into circular polarized waves,

wherein said pairs of apertures of said radiating circuit plate are arranged in a propagating direction of leakage electric waves generated in a parallel plate mode between said radiating circuit plate and said grounding conductor plate by said electromagnetic coupling of the respective pairs of apertures of the radiating circuit plate to said respective power supply probes of said power supplying circuit plate, for rendering said leakage electric waves to have a phase substantially of one wavelength or an integral multiple thereof between central axes of adjacent pairs of the apertures and to be radiated again through the apertures at position adjacent to those where the leakage electric waves are generated.

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**5,502,454**

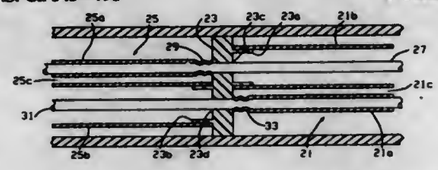
**ELECTRICAL CONDUCTING SHEEL STRUCTURE FOR COAXIAL COLLINEAR ARRAY ANTENNA**

**Thomas J. Psinakis, East Meadow; John E. Arthur, III, Island Park, and Anthony M. Bucceri, Larchmont, all of N.Y., assignors to Unisys Corporation, Blue Bell, Pa.**

**Filed Nov. 9, 1994, Ser. No. 337,334**

**Int. Cl.[6] H01Q 9/04**

**U.S. Cl. 343—791** **6 Claims**




1. An antenna of the type having coaxial transmission line elements coupled in a manner which connects the inner conductor of a coaxial transmission line element to the outer conductor of an adjacent coaxial transmission element comprising:

an electrical conducting integral structure having first and second circular sections and a web;

said second circular section having an inner surface with an inner diameter and positioned such that said inner surface serves as an outer conductor for one coaxial transmission line element of said antenna,

said first circular section being electrically connected to an inner conductor of a coaxial transmission line element adjacent to said one coaxial transmission line element, thereby electrically connecting said outer conductor of said one coaxial transmission line element to said inner conductor of said adjacent coaxial transmission line element.

**5,502,455**

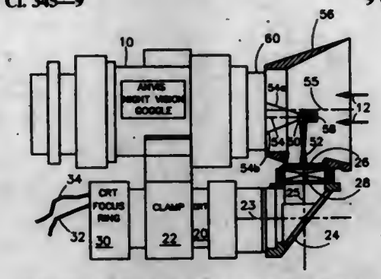
**METHOD AND APPARTUS FOR PRODUCING A SYMBOLOGY DISPLAY INTO A NIGHT VISION SYSTEM**

**Frank J. Ferrin, Plymouth, and Paul N. Turner, Columbia Heights, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.**

**Filed Jul. 21, 1994, Ser. No. 278,466**

**Int. Cl.[6] G09G 5/00**

**U.S. Cl. 345—9** **9 Claims**




1. Apparatus for providing superimposed symbology from a CRT into a scene being viewed through a night vision viewer having a first end portion to receive light from the scene and a second end portion to view the scene comprising:

an optical system positioned to conduct symbology from the CRT to the viewer, said optical system including a reflecting member positioned on a narrow beam member extending in air across the first end portion of the viewer in the path from the scene and being sized so as to reduce obstruction of the light from the scene, to reduce the amount of light from the CRT to a level compatible with the light from the scene and to reduce the aperture of the optical system in order to provide a large depth of focus.

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**5,502,456**

**DISPLAY APPARATUS FOR VEHICLES**

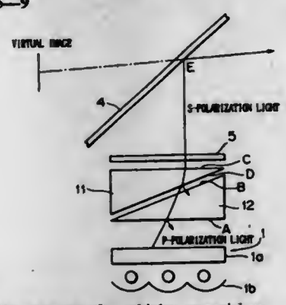
**Hidenobu Koreaga; Makoto Takashima, and Tadashi Iino, all of Susono, Japan, assignors to Yazaki Corporation, Tokyo, Japan**

**Continuation of Ser. No. 230,246, Apr. 20, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 486,263**

**Claims priority, application Japan, Apr. 21, 1993, 5-094204**

**Int. Cl.[6] G09G 5/00**

**U.S. Cl. 345—9** **6 Claims**




1. A display apparatus for vehicles comprising:

a display device;

first and second prisms stacked together with the prism apex angles being directed in opposite directions to each other, the first and second prisms being disposed in close relation to the display surface of the display device;

a reflecting member to reflect the display light that has passed through the prisms toward the viewing point of a driver of the vehicle;



means for emitting the display light from the display device as a P-polarization light through said stacked prisms and toward the reflecting surface of the reflecting member; and

polarized direction rotating means disposed between the prisms and the reflecting member to rotate by 90 degrees to change the direction of light polarization from P-polarization light to S-polarization light the polarized direction of the display light which has passed the prisms wherein the light caused to impinge on the reflecting member is S-polarization light.

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**5,502,457**

**FIBER OPTIC FACE PLATE FOR A SEAMLESS MODULAR DISPLAY**

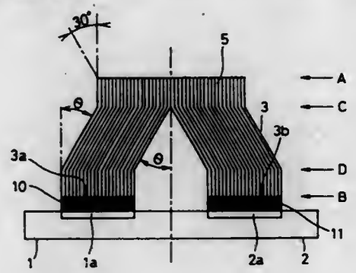
**Keiji Sakai, Nara; Hiroyuki Yamamoto, and Yukio Kurata, both of Tenri, all of, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Apr. 28, 1994, Ser. No. 234,666**

**Claims priority, application Japan, Apr. 28, 1993, 5-103311**

**Int. Cl.[6] G09G 3/36; G02F 1/1335; G02B 6/06**

**U.S. Cl. 345—87** **7 Claims**




1. A display apparatus comprising:

at least one display element having a display screen; and

image transition means for transiting an image from an input end face thereof to an output end face thereof, the input end face being connected to the display screen;

wherein the image transition means includes a first optical block having first and second end faces and a second optical block having first and Second end faces, which each have a plurality of optical fibers combined together, the first end face of the first optical block constitutes the input end face of the image transition means, and the first end face of the second optical block constitutes the output end face of the image transition means;

wherein a numerical aperture of the optical fiber of the first optical block is smaller than a numerical aperture of the optical fiber of the second optical block, and a diameter of the optical fiber of the first optical block is smaller than a diameter of the optical fiber of the second optical block; and

wherein a total number of the optical fibers of the first optical block per a unit area is larger than a total number of the optical fibers of the second optical block per the unit area.

**5,502,458**

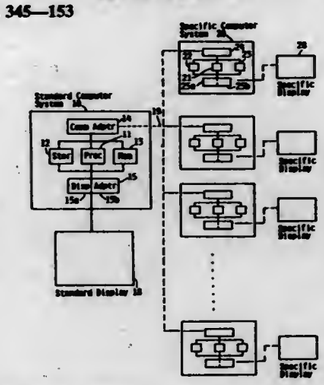
**METHOD AND APPARATUS FOR CREATING AND DISPLAYING FAITHFULL COLOR IMAGES ON A COMPUTER DISPLAY**

**Gordon W. Braudaway, Yorktown Heights, N.Y., and Helen R. Delp, Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Nov. 10, 1992, Ser. No. 974,862**

**Int. Cl.[6] G09G 5/04**

**U.S. Cl. 345—153** **2 Claims**




1. A method in a standard computer system for creating information used to display a faithful color image on a specific computer display connected to a specific computer system comprising the steps of:

generating a palette calibration table and a display independent normalized palette table from information about a standard display, said generating step comprising the substeps of,

obtaining a standard pale from said standard computer system;

determining CIE XYZ* values flora said standard display, said CIE XYZ* values being standard tristimulus values; and

generating said palette calibration table from said CIE XYZ* values and said standard palette;

creating a display independent image from said display independent normalized palette table and from an original image;

transmitting said palette calibration table to said specific computer display via a communications path; and

transmitting said display independent image to said specific computer display via a communications path.

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**5,502,459**

**OPTICAL AUXILIARY INPUT ARRANGEMENT AND METHOD OF USING SAME**

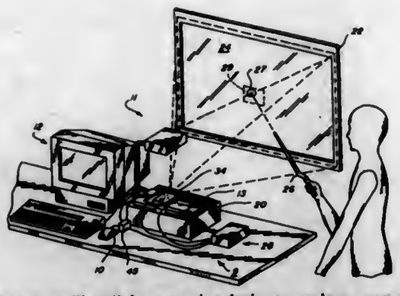
**Roger N. Marshall, Solana Beach; Richard M. Lizon, Escondido, and Lane T. Hauck, San Diego, all of Calif., assignors to Proxima Corporation, San Diego, Calif.**

**Continuation of Ser. No. 829,916, Feb. 3, 1992, abandoned, which is a continuation-in-part of Ser. No. 829,880, Feb. 3, 1992, abandoned, and a continuation-in-part of Ser. No. 656,803, Feb. 14, 1991, abandoned, which is a continuation-in-part of Ser. No. 611,416, Nov. 9, 1999, Pat. No. 5,181,015, which is a continuation-in-part of Ser. No. 433,029, Nov. 7, 1989, abandoned. This application Apr. 19, 1994, Ser. No. 233,741**

**Int. Cl.[6] G09G 5/08**

**U.S. Cl. 345—158** **21 Claims**

1. A method for optically emulating a computer mouse input device to change a primary video image reflecting from a viewing surface, the primary image being defined by a plurality of pixel images arranged in a matrix array, where each pixel image is disposed at a specific x, y coordinate location within the array, comprising:



using an auxiliary light generating device to produce a sequence of auxiliary light information, said sequence of auxiliary light information being indicative of a mouse double click command in the form of sequenced spots of auxiliary control light reflecting from the viewing surface;

detecting a spot of auxiliary control light reflecting from the viewing surface;

determining initially whether the detected spot of auxiliary control light is tentatively an initial sequenced spot in said mouse double click command;

storing X, Y camera coordinate values of the detected spot of auxiliary control light if it is an initial sequenced spot in said mouse double click command, said X, Y camera coordinate values corresponding to at least one x, y computer coordinate location of one of the pixel images in the matrix array;

converting the stored X, Y camera coordinate values of the detected spot of auxiliary control light to the corresponding x, y coordinate values so they can be transmitted as part of said mouse double click command;

setting an on timer when the spot of auxiliary control light is detected within the matrix array of pixel images defining the primary image, said on timer being set to a predetermined period of time T in order to help facilitate optically emulating the double click command of the computer mouse input device;

determining whether the detected spot of light has been extinguished before said predetermined period of time T has elapsed;

setting an off timer when the detected spot of light has been extinguished, said off timer being set to a predetermined period of time t;

detecting another spot of auxiliary control light reflecting from the viewing surface;

determining whether the detected another spot of auxiliary control light is disposed within at least m coordinate locations of the stored X coordinate location and within at least n coordinate locations of the stored Y coordinate location;

setting said on timer again when the another spot of auxiliary control light is detected, said on timer being set to a predetermined period of time T in order to help facilitate optically emulating the double click command of the computer mouse input device;

determining whether the detected another spot of auxiliary control light has been extinguished before said predetermined period of time T has elapsed;

storing X, Y camera coordinate values of the another detected spot of auxiliary control light if it is the next sequenced spot in said mouse double click command, said X, Y camera coordinate value being determined to be within m coordinate locations of the previously stored X coordinate location and within n coordinate locations of the previously stored Y coordinate location;

converting the presently stored X, Y camera coordinate values of the another detected spot of auxiliary control light to the corresponding x, y coordinate values so they can be transmitted as part of said mouse double click command if the detected another spot of auxiliary control light was extinguished before the predetermined period of time T elapsed and if the another spot of light was disposed within at least m coordinate locations of the stored X coordinate location and within at least n coordinate locations of the stored Y coordinate location;

whereby when a sequence of auxiliary light spots are detected indicative of a double click command to cause said mouse double click command is transmitted.

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**5,502,460**

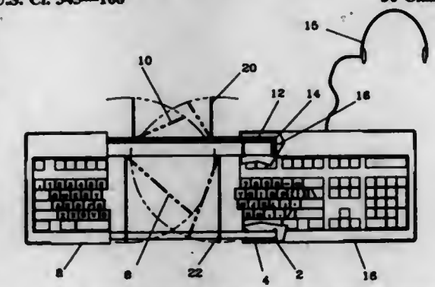
## ERGONOMIC KEYBOARD

**James H. Bowen, 12190 Richland Dr., Catharpin, Va. 22018**

**Continuation-in-part of Ser. No. 67,015, May 26, 1993, abandoned. This application Aug. 2, 1994, Ser. No. 284,108**

**Int. Cl.[6] G09G *5/00***

**U.S. Cl. 345—168** **50 Claims**



1. A stand alone keyboard where the keys are split and separable so a first plurality of alpha characters can be entered with a left hand separated from a second plurality of alpha characters entered with a right hand, said keyboard comprising in combination:

a left hand set of alpha keys for entering said first plurality of alpha characters, said left hand set being housed in a left housing;

a right hand set of alpha keys for entering said second plurality of alpha characters, said right hand set being housed in a right housing;

a flat planar surface forming a top surface of a structure separating said left hand set of alpha keys and said right hand set of alpha keys, said structure spanning substantially from front to rear of said keyboard, said left and right housing forming left and right keyboard, respectively, said structure connecting said left and right housings to maintain alignment between said left and right housings; and

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**5,502,461**

## HAND WRITTEN CHARACTER INPUT SYSTEM/ ALLOWING CHANGE OF SIZE OF CHARACTER WRITING FRAMES

**Masayoshi Okamoto; Takatoshi Yoshikawa; Kazuhiro Ieda, and Hiroshi Horii, all of Gifu, Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan**

**Filed Apr. 8, 1994, Ser. No. 224,867**

**Claims priority, application Japan, May 11, 1993, 5-109437**

**Int. Cl.[6] G09G *5/00***

**U.S. Cl. 345—173** **5 Claims**

1. A hand written character input system, comprising:

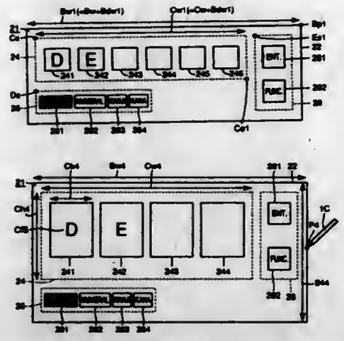
input means for inputting handwritten characters;

display means for displaying in said input means, one or more character writing frames each defining an area in which at least one of said handwritten characters can be input, and a data input frame including said one or more character writing frames;

first changing means for changing size of said data input frame;

second changing a means for changing number of said character writing frames in response to the size of said data input frame changed by said first changing means;





third changing means for changing size of said character writing frames in response to the size of said data input frame changed by said first changing means; and

mode selecting means for selecting change of the number of said character writing frames by said second changing means, or change of the size of said character writing frames by said third changing means.

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**5,502,462**

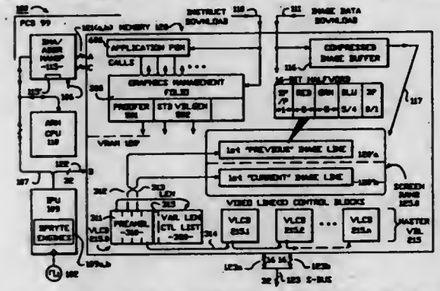
## DISPLAY LIST MANAGEMENT MECHANISM FOR REAL-TIME CONTROL OF BY-THE-LINE MODIFIABLE VIDEO DISPLAY SYSTEM

**Robert J. Mical, Redwood City; David L. Needle, Alameda; Stephen H. Landrum, San Leandro, and Teju Khubchandani, Mountain View, all of Calif., assignors to The 3DO Company, Redwood City, Calif.**

**Filed Nov. 1, 1993, Ser. No. 146,505**

**Int. Cl.[6] G09G *5/00***

**U.S. Cl. 345—185** **10 Claims**



1. A method for preparing a list of configuration control words for download from system memory to a programmably re-configurable image-enhancing and display subsystem, wherein the image-enhancing and display subsystem is configured by the downloaded configuration control words and accordingly processes and outputs display signals representing image lines, said preparation method comprising the steps of:

(a) defining in a first region of the system memory, a first control word having a ListLen field, where the first control word is to be processed before all optional control words, if any, of the first region and where the ListLen field indicates a number of optional additional control words that are to be included if at all in the first region and that are to be downloaded after the first control word, said first control word and optional additional control words of the first region being used upon download for configuring the image-enhancing and display subsystem before the processing and output by the image-enhancing and display subsystem of display signals representing a corresponding first set of one or more image lines;

(b) defining in said first memory region, a second control word, where the second control word includes a pointer to a first portion of a memory buffer containing first image data corresponding to the first set of one or more image lines;

(c) defining in said first memory region, a third control word; and

(d) defining in said first memory region, a fourth control word, where the fourth control word includes a pointer to a next memory region having next control words to be optionally next downloaded for re-configuring the image-enhancing and display subsystem.

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**5,502,463**

## MESSAGE CARD

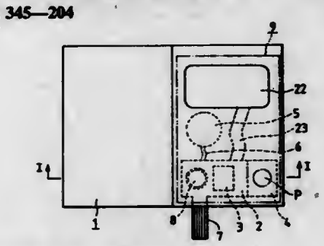
**Naotaka Sasaki, and Shunichi Kawamata, both of Kiryu, Japan, assignors to Japan Servo Co., Ltd., Tokyo, Japan**

**Filed Jun. 14, 1993, Ser. No. 76,148**

**Claims priority, application Japan, Jul. 7, 1992, 4-201774**

**Int. Cl.[6] G09G *3/00***

**U.S. Cl. 345—204** **2 Claims**



1. A greeting card comprising:

a folded sheet card,

means for supplying electric energy,

means for displaying visual image data,

means for producing audio messages,

a control circuit mounted on a flexible substrate for recording, storing and reproducing both visual images and audio messages,

connecting means for electrically connecting the control circuit on the flexible substrate with the visual image display means,

connecting means for electrically connecting the control circuit on the substrate with the audio message producing means,

writing terminals for writing desired visual images data and audio messages data on the control circuit from an external source and being connected electrically to the control circuit on the flexible substrate, and

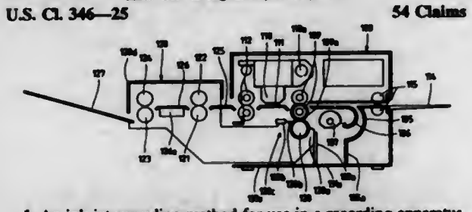
switch means including, a first electrode on a first portion of the flexible substrate, a contact electrode on a second portion of the flexible substrate and a third portion of the flexible substrate which includes a window and acts as a spacer located between the first and second portions overlying the first portion for activating and reproducing the visual images data and the audio messages data so that, when the switch means is activated by pressing a predetermined location on an exterior surface of the folded sheet card, the recorded and stored visual images data and audio messages data are reproduced such that the visual images are displayed and audio messages are generated.

**5,502,464**

## FIXATER AND RECORDING APPARATUS USING THE SAME

**Kazuyoshi Takahashi; Naoji Otsuka; Tokihide Ebata, all of Kawasaki; Hiromitsu Hirabayashi, Yokohama; Hiroshi Tajika, Yokohama; Noribumi Koitabashi, Yokohama; Atsushi Arai; Kenji Aono, both of Kawasaki, and Hitoshi Sugimoto, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 766,063, Sep. 26, 1991, abandoned.**
**This application Dec. 19, 1994, Ser. No. 358,993**
**Claims priority, application Japan, Sep. 27, 1990, 2-258326; Sep. 27, 1990, 2-258327; Sep. 28, 1990, 2-259161; Sep. 28, 1990, 2-260232**
**Int. Cl.[6] B41J** *2/01;29/00;2/17*
**U.S. Cl. 346—25** **54 Claims**



1. An ink jet recording method for use in a recording apparatus, said apparatus for recording on a recording medium using an ink jet recording head and a detachably mounted fixater device for promoting fixation of an image recorded on the recording medium, said method comprising the steps of:

detecting whether the fixater device is mounted on a mounting section of the recording apparatus;

discriminating whether the recording medium to be recorded is formed of a second material having fixation properties different from fixation properties of a first material; and

controlling the recording apparatus so that the image is recorded on the recording medium upon detection that the fixater device is mounted on the mounting section and upon discrimination that the recording medium is formed of the second material and so that the image is not recorded on the recording medium upon detection that the fixater device is mounted on the mounting section and discrimination that the recording medium is not formed of the second material.

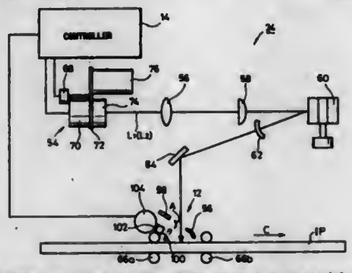
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**5,502,465**

## IMAGE READING AND RECORDING APPARATUS USING A STIMULABLE PHOSPHOR SHEET AND A THERMOSENSITIVE RECORDING MEDIUM

**Toshitaka Agano, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Feb. 25, 1993, Ser. No. 22,276**
**Claims priority, application Japan, Feb. 27, 1992, 4-041706**
**Int. Cl.[6] B41M** *5/26;* **H01J** *37/21*
**U.S. Cl. 347—264** **12 Claims**



1. An image reading and recording apparatus comprising:

image reading and recording means for reading and recording image information;

first feed means for feeding an image-bearing sheet with image information recorded thereon to said image reading and recording means;

second feed means for feeding a thermosensitive recording sheet having a support coated with a coloring agent, a color developer and light-absorbing dyes, said recording sheet being capable of producing a color having different densities depending on an amount of thermal energy irradiated on said recording sheet;

an optical laser beam scanning system for scanning said image-bearing sheet and said thermosensitive recording sheet with at least one laser beam of a predetermined wavelength in a main scanning direction while said image-bearing sheet and said thermosensitive recording sheet are fed in an auxiliary scanning direction in said image reading and recording means, to read optical information based on the image information from said image-bearing sheet and to record the image information from said image-bearing sheet on said thermosensitive recording sheet; and

photoelectric converting means for converting the optical information read from said image-bearing sheet into an electric signal.

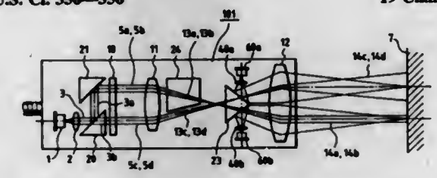
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**5,502,466**

## DOPPLER VELOCIMETER AND POSITION INFORMATION DETECTION APPARATUS FOR USE WITH OBJECTS HAVING VARIATIONS IN SURFACE DEPTH

**Shigeki Kato, Tokyo; Hidejiro Kadowaki, Yokohama; Yasuhiko Ishida; Makoto Takamiya, both of Tokyo; Jun Ashiwa, and Shinji Ueda, both of Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Jun. 28, 1994, Ser. No. 266,740**
**Claims priority, application Japan, Jun. 29, 1993, 5-184426; May 31, 1994, 6-118548**
**Int. Cl.[6] G01B** *9/02*
**U.S. Cl. 356—356** **19 Claims**



1. A position information detection apparatus comprising:

a first detection system for radiating two collimated light beams onto an object to be measured at a crossing angle to form interference fringes at a predetermined interval, said first detection system detecting scattered light emanating from the object to be measured by the interference fringes at the predetermined interval;

a second detection system for radiating two light beams onto the object to be measured at a crossing angle to form interference fringes having a gradient with each other in an opposing direction to the object to be measured, said second detection system detecting scattered light emanating from the object to be measured by the interference fringes having the gradient; and

detection means for comparing output signals from said first and second detection systems, and detecting relative position information of the object to be measured, along an opposing direction of said first and second detection systems to the object to be measured.

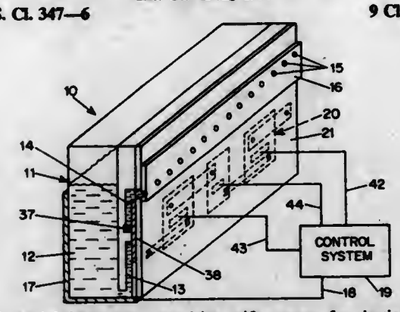


**5,502,467**

## INK JET PRINTHEAD WITH INK VISCOSITY CONTROL

**Paul A. Hoisington, Norwich, Vt., and Michael A. Cockett, Lenham, England, assignors to Spectra, Inc., Hanover, N.H.**

**Filed Mar. 7, 1994, Ser. No. 206,765**
**Int. Cl.[6] B41J** *2/01*
**U.S. Cl. 347—6** **9 Claims**




1. An ink jet system comprising orifice means for ejecting ink drops toward a substrate, pressure chamber means communicating with the orifice means for applying ink under pressure to the orifice means to eject drops of ink therefrom, ink supply means for supplying ink to the pressure chamber means, heater means for heating the ink supplied to the pressure chamber means and viscosity-detecting means including at least two components having different fluid resistance and inertance characteristics for detecting the viscosity of the ink supplied to the pressure chamber means.

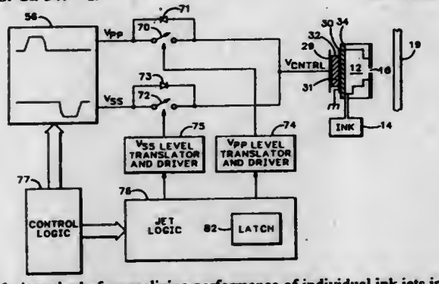
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**5,502,468**

## INK JET PRINT HEAD DRIVE WITH NORMALIZATION

**David L. Knierim, Wilsonville, Oreg., assignor to Tektronix, Inc., Wilsonville, Oreg.**

**Filed Dec. 28, 1992, Ser. No. 997,003**
**Int. Cl.[6] B41J** *2/01*
**U.S. Cl. 347—19** **38 Claims**




1. A method of normalizing performance of individual ink jets in an ink jet printing apparatus that comprises a print head having a plurality of ink jets each having an operating parameter, wherein a quantifiable performance characteristic of each of said ink jets depends on a value of the parameter, and the operating parameter of each of said ink jets is adjustable independently of the operating parameter of another ink jet, said method comprising the steps of:

(a) selecting a first ink jet;

(b) operating the selected ink jet with the operating parameter of the ink jet set to a first test value and quantifying a first corresponding value of said performance characteristic of the selected ink jet;

(c) operating the selected ink jet with the operating parameter of the ink jet set to a second test value and quantifying a second corresponding value of said performance characteristic of the selected ink jet;

(d) calculating a value of the operating parameter for the selected ink jet based on a desired value of said performance characteristic of the selected ink jet, said first test value and said second test value of the operating parameter of the selected ink jet, and said first corresponding value and said second corresponding value of the performance characteristic of the first ink jet;

(e) adjusting the operating parameter of the selected ink jet to said calculated value;

(f) selecting a second ink jet; and

(g) repeating steps (b)–(e).

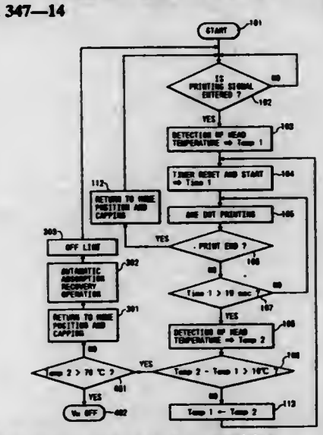
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**5,502,469**

## INK JET RECORDING APPARATUS WITH DETECTION OF RATE OF TEMPERATURE

**Kenjiro Watanabe, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 987,246, Dec. 7, 1992, abandoned, which is a continuation of Ser. No. 653,299, Feb. 11, 1991, abandoned. This application Aug. 22, 1994, Ser. No. 293,417**
**Claims priority, application Japan, Feb. 13, 1990, 2-31730**
**Int. Cl.[6] B41S** *29/38;2/365*
**U.S. Cl. 347—14** **8 Claims**




1. An ink jet recording apparatus comprising:

recording means for recording information, said recording means having a plurality of ink orifices and a plurality of energy generation elements, each of said energy generation elements generating energy for ejecting an ink droplet in accordance with image data and which said energy generation element is associated with a corresponding ink orifice;

detection means for detecting a temperature of said recording means at a beginning and an end of a predetermined time interval during a recording operation to output detection values related to the temperature of the recording means at the beginning and the end of the predetermined time interval during the recording operation;

power providing means for providing electric power to said recording means;

control means receiving the detection values for controlling said power providing means in accordance with both a temperature variation during the predetermined time interval and the temperature detected at the end of the predetermined time interval, the temperature variation being related to the temperature at the beginning and the end of the predetermined time interval,

wherein when the temperature variation exceeds a reference value, and in addition, when the temperature detected at the end of the predetermined time interval exceeds a predetermined temperature associated with an abnormal temperature rise of said recording means, said predetermined temperature being greater than said temperature variation, said control means controls said power providing means so as to stop the

providing of electric power to said recording means, while when the temperature variation does not exceed the reference value and when the temperature detected at the end of the predetermined time interval does not exceed the predetermined temperature, regardless of the temperature variation, said control means controls said power providing means so as not to stop the providing of electric power to said recording means.

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**5,502,470**

## INK JET RECORDING HEAD AND PROCESS FOR PRODUCING THE SAME

**Satoru Miyashita; Mitsuro Atobe; Yasushi Karasawa; Kiyohiko Takemoto, and Yasuhiro Ouki, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan**

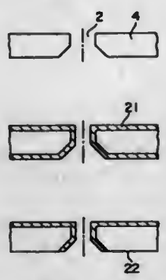
**PCT No. PCT/JP92/00109, § 371 Date Sep. 23, 1992, § 102(e) Date Sep. 23, 1992, PCT Pub. No. WO92/13720, PCT Pub. Date Aug. 20, 1992**

**PCT Filed Feb. 4, 1992, Ser. No. 927,386**

**Claims priority, application Japan, Feb. 4, 1991, 3-13273; Mar. 22, 1991, 3-59127; Mar. 22, 1991, 3-59128; Apr. 16, 1991, 3-83751; May 21, 1991, 3-116059; May 21, 1991, 3-116061; Jun. 18, 1991, 3-145957; Sep. 9, 1991, 3-227872**

**Int. Cl.[6] B41J *2/135***

**U.S. Cl. 347—45** **12 Claims**




1. A process for producing an ink jet recording head for use in an ink jet recording device, comprising subjecting a surface of a nozzle for jetting an ink of the ink jet recording head to a treatment for rendering the surface of the nozzle water-repellent, the process comprising the steps of:

preparing a polymer solution of polydiperfluoroakyl fumarate dissolved in a solvent;

coating through dipping said polymer solution on an entire surface of a nozzle plate provided with an ink jet hole to form a water-repellent layer comprising a fluoropolymer on the entire surface of the nozzle plate; and

removing through grinding the water-repellent layer on a surface of the nozzle plate on a side opposite from which an ink is jetted.

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**5,502,471**

## SYSTEM FOR AN ELECTROTHERMAL INK JET PRINT HEAD

**Ernst Obermeier, Berlin; Joachim Heinzl, München; Peter Krause, Frankfurt an der Oder; Bernhard Hochwind, München, and Alfred Zollner, Eitting, all of, Germany, assignors to Eastman Kodak Company, Rochester, N.Y.**

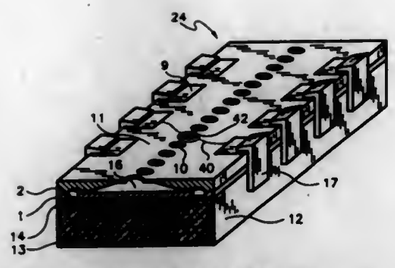
**Filed Apr. 28, 1993, Ser. No. 54,537**

**Claims priority, application Germany, Apr. 28, 1992, 42 14 555.4**

**Int. Cl.[6] B41J *2/05***

**U.S. Cl. 347—65** **11 Claims**

1. A system for an electrothermal ink jet print head comprising a chip including




a plurality of ink channels disposed on the chip,

a plurality of flow throttle structures of a defined cross-section, with each one of the plurality of flow throttle structures having a first end and having a second end, wherein the first end of each flow throttle structure of the plurality of flow throttle structures is connected to a respective one of the plurality of ink channels, and wherein a throughput of the flow throttle structure is determined by the number and size of passage openings of the flow throttle structure,

a plurality of heating elements disposed in the chip for transferring heat to an ink liquid for forming electrothermally generated vapor bubbles in the ink liquid,

a plurality of electrical feed lines disposed on the chip and each one of the plurality of electrical feed lines connected to a corresponding one of the plurality of heating elements,

a plurality of contact terminal locations disposed on the chip and each one of the plurality of contact terminal locations connected to a corresponding one of the plurality of electrical feed lines,

a plurality of ink-ejection openings disposed on the chip, wherein each one of the plurality of ink-ejection openings is connected to a corresponding one of the plurality of ink channels and wherein each electrothermally generated vapor bubble formed by a thermal transfer from a respective one of the plurality of heating elements expands in a direction opposite to an ink-ejection direction,

an ink-storage container detachably connected to the chip, where a top side of the ink-storage container is disposed toward the chip, and including

a supply channel formed in the surface of the ink-storage container, wherein the supply channel is connected to the second end of each flow throttle structure of the plurality of flow throttle structures,

a material layer disposed between the chip and the ink-storage container, and wherein each one of the plurality of the flow throttle structures is formed as a longitudinally extended channel on each side of said ink channel furnished in the chip and covered by the material layer, thereby forming a layer construction for the electrothermal ink jet print head.

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**5,502,472**

## DROPLET JET APPARATUS

**Masahiko Suzuki, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan**

**Filed Nov. 17, 1993, Ser. No. 154,108**

**Claims priority, application Japan, Feb. 16, 1993, 5-026855**

**Int. Cl.[6] B41J *2/045***

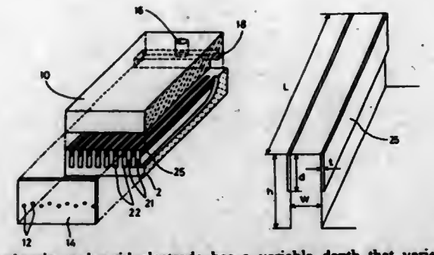
**U.S. Cl. 347—69** **15 Claims**

1. An ink jet apparatus comprising:

a first plate comprising a piezoelectric actuator plate having a plurality of grooves formed by spaced upstanding sidewalls having opposed sides, said sidewalls each having an electrode formed on both sides thereof; and

a second plate coupled to said first plate, said grooves of said first plate and said second plate defining ink channels delineated at least by said sidewalls that act as pressure chambers deformable upon selective application of voltage to each said electrode,






wherein each said electrode has a variable depth that varies within a range between at most ±30% of a set electrode depth value, said variable depth extending in a direction parallel to said upstanding sidewall.

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**5,502,473**

## INK JET HEAD WITH INK CAVITY RESONANCE

**Amanda H. East, and Richard W. Janse Van Rensburg, both of Cambridge, England, assignors to Videojet Systems Limited, Wood Dale, Ill.**

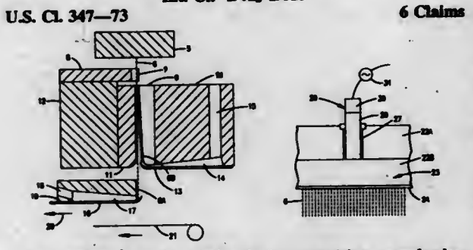
**PCT No. PCT/GB89/01520, § 371 Date Aug. 12, 1991, § 102(e) Date Aug. 12, 1991, PCT Pub. No. WO90/06850, PCT Pub. Date Jun. 28, 1990**

**PCT Filed Dec. 20, 1989, Ser. No. 688,565**

**Claims priority, application United Kingdom, Dec. 20, 1988, 8829625**

**Int. Cl.[6] B41J *2/025***

**U.S. Cl. 347—73** **6 Claims**




1. A continuous ink jet printing device comprising a nozzle plate (24) provided with a substantially linear array of nozzles and forming one wall of an ink cavity (23); and an acoustic generator in the form of an elongate body (26) projecting, in a direction parallel to the direction in which the jets leave the nozzles, towards the nozzle plate in contract with ink in the cavity to transmit acoustic vibrations, in use, into the ink to cause uniform break up into droplets of ink jets (6) leaving the nozzles, the body being shaped and tuned to vibrate substantially only in the longitudinal mode and at a resonant frequency which is within 10% of a frequency to excite natural resonant vibrations in the ink in the cavity between the end of the body and the nozzle plate, the width of the body being less than the length of the nozzle array, or of that part of the array associated with that body.

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**5,502,474**

## PRINT PULSE PHASE CONTROL

**James A. Katerberg, Kettering, and Randy L. Fagerquist, Dayton, both of Ohio, assignors to Scitex Digital Printing, Inc., Dayton, Ohio**

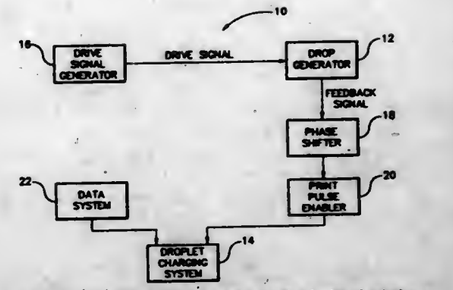
**Filed Mar. 27, 1992, Ser. No. 858,796**

**Int. Cl.[6] B41J *2/02***

**U.S. Cl. 347—75** **20 Claims**

1. A print pulse phase control system of a continuous ink jet printer comprising:

a drop generator capable of receiving a drive signal and having a means for generating a feedback signal;




a means for comparing a phase of the feedback signal relative to the drive signal and producing a comparator signal in response thereto;

output means for using the comparator signal to output a control signal for controlling a frequency of the drive signal; and

means for producing print pulses at a fixed phase relative to the feedback signal.

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**5,502,475**

## INK JET RECORDING APPARATUS PROVIDED WITH FIXATING MEANS

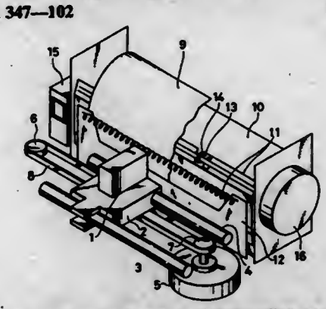
**Yoshiaki Kaburagi, Tokyo; Shoichiro Shoda, Yokohama; Tetsuo Kimura, Sagamihara; Yoji Ara, Yokohama; Takanori Mukai, Naka; Masaaki Nakamura, Toyonaka, and Katsuyuki Yokoi, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 186,504, Jan. 26, 1994, abandoned, which is a continuation of Ser. No. 106,197, Aug. 13, 1993, abandoned, which is a continuation of Ser. No. 829,594, Feb. 3, 1992, abandoned, which is a continuation of Ser. No. 559,979, Jul. 30, 1990, abandoned, which is a continuation of Ser. No. 441,210, Nov. 30, 1989, abandoned, which is a continuation of Ser. No. 324,819, Mar. 17, 1989, abandoned. This application Aug. 12, 1994, Ser. No. 288,810**

**Claims priority, application Japan, Mar. 18, 1988, 63-65090; May 19, 1988, 63-120678; Jul. 19, 1988, 63-179828**

**Int. Cl.[6] B41J *2/01;29/00***

**U.S. Cl. 347—102** **25 Claims**




1. An ink jet recording apparatus for recording on a recording medium having two sides and being characterized by a parameter that affects deformation of the recording medium, said apparatus comprising:

a mounting section for mounting an ink jet recording head having a discharge port, the recording head depositing ink droplets in an adjacent ink recording area on one side of the recording medium, Wherein a gap is maintained between the discharge port and the recording medium;

a recording medium guide member;

conveying means for conveying the recording medium;

a mechanism for heating said recording medium guide member to heat the ink recording area for promoting the fixation of the ink to the recording medium; and

means communicating with at least said conveying means for changing the rate of heat imparted to a unit length of the recording medium with respect to the direction of conveyance thereof by said heating mechanism in conformity with the parameter that affects deformation of the recording medium for preventing the recording medium from coming into contact with the discharge port, wherein deformation of the recording medium is controlled by said changing means, and wherein said changing means includes a member for manually changing a set temperature of said heating mechanism when said apparatus is in an off-line state with respect to a host.

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**5,502,476**

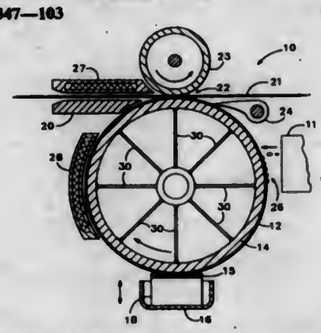
**METHOD AND APPARATUS FOR CONTROLLING PHASE-CHANGE INK TEMPERATURE DURING A TRANSFER PRINTING PROCESS**

**Meade M. Neal, Muline; Clark W. Crawford, Wilsonville; Barry D. Reeves, and James D. Rise, both of Lake Oswego, all of Oreg., assignors to Tektronix, Inc., Wilsonville, Oreg.**

**Continuation-in-part of Ser. No. 981,646, Nov. 25, 1992, Pat. No. 5,389,958. This application Apr. 4, 1994, Ser. No. 223,265**

**Int. Cl.[6] B41J *2/01***

**U.S. Cl. 347—103** **18 Claims**




1. A method of transferring and fusing an image to a print medium in image, transfer printing from intermediate transfer surface to a final receiving substrate utilizing a process window defined by an interrelated set of parameters relating to transfer pressure, preheater temperature, intermediate transfer surface temperature, ink, and transfer speed, comprising:

providing a supporting surface;

controlling the supporting surface to maintain a predetermined surface temperature;

applying an intermediate transfer surface on the supporting surface;

depositing phase change ink in a phase-change ink image on the intermediate transfer surface, the image being maintained at a desired temperature of between about 20° C. and about 80° C.

heating a print medium with a media preheater set to a predetermined temperature of about 60° C. to about 150° C. to facilitate fusing the phase-change ink image to the print medium;

placing the heated print medium in contact with the phase-change ink image in a pressure nip and passing it through the pressure nip; and

transferring the phase-change ink image to the print medium in the pressure nip by pressing the ink image into the ink image into the fibers of the final receiving substrate without cohesive failure.

**5,502,477**

**THERMAL TRANSFER TYPE COLOR PRINTER**

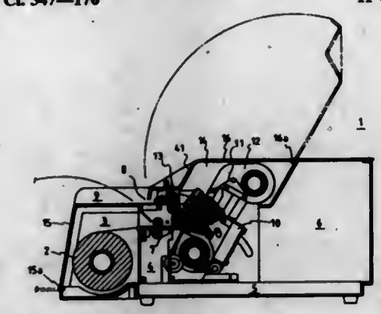
**Naomi Osada, Yokohama; Toshiro Kohno, and Satoshi Kanbe, both of Yokosuka, all of, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan**

**Filed May 27, 1993, Ser. No. 67,833**

**Claims priority, application Japan, May 29, 1992, 4-163575; Jun. 30, 1992, 4-195959; Apr. 22, 1993, 5-118961**

**Int. Cl.[6] B41J *2/325***

**U.S. Cl. 347—176** **11 Claims**




1. A color printer, comprising:

a platen roller;

a recording head means to be brought into contact with said platen roller to record an image having at least two colors on a recording sheet interposed between said recording head means and said platen roller, said two colors being successively printed on a surface of said recording sheet with said recording sheet being operated to reciprocate with respect to a recording position on said platen roller;

clamping means provided at a downstream side of said recording head means in a sheet travelling path from a supply section of said recording sheet to a discharging section of said recording sheet for holding said recording sheet when recording said image, said clamping means being fixed with respect to said recording position so that a distance between a holding position of said recording sheet taken by said clamping means and said recording position on said platen roller is always constant during the image recording.

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**5,502,478**

**LED ELECTROPHOTOGRAPHIC PRINTER HAVING LED ARRAY AND COORDINATED PARALLEL DRIVE OF LED SUBARRAYS**

**Takeo Mimura, Tachikawa, Japan, assignor to Sunx Limited, Tachikawa, Japan**

**Continuation of Ser. No. 22,906, Feb. 26, 1993, abandoned. This application Sep. 16, 1994, Ser. No. 307,275**

**Int. Cl.[6] B41J *2/45***

**U.S. Cl. 347—237** **3 Claims**

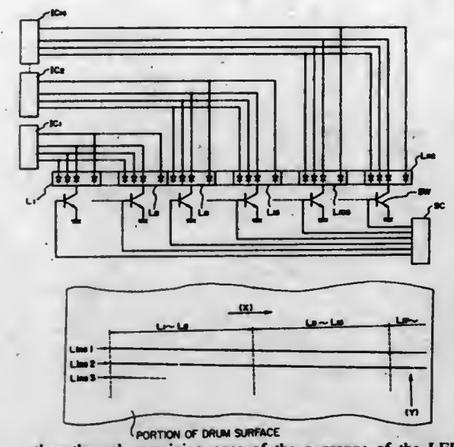
1. A printer for electrophotographic image formation, comprising

an LED array having m×n LED subarrays positioned in alignment, each LED subarray of the LED subarrays having a plurality of LED elements, the LED array having a first end and a second end and being partitioned into n groups of the LED subarrays, each group of said n groups of the LED subarrays having m LED subarrays of the LED subarrays;

a driver circuit having n drive sections, each one of the n drive sections being connected to a respective one of the n groups of the LED subarrays for providing drive signals for scanning of the m LED subarrays within that respective group;

control means for scanning the LED array in sequence, starting a first scan with a first LED subarray of the m LED subarrays of a first group of the n groups of the LED subarrays at the first end of the LED array, continuing through the m subarrays of the first group of the n groups of the LED subarrays and






then through remaining ones of the n groups of the LED subarrays, and ending at the second end of the LED array, and starting a second scan with said first LED subarray at said first end when the first scan of the first group of the n groups of the LED subarrays is completed while previously started scanning continues to the second end, and starting subsequent scans each time a current scan of the first group of the n groups of LED subarrays is completed while previous scans continue to the second end, each of said subsequent scans starting with said first LED subarray and continuing to the Second end, said control means providing no other scans of said array other than said first scan, said second scan, and said subsequent scans; and

means responsive to the drive signals from each of the n drive sections of the driver circuit for activating the m LED subarrays in a respective group of the n groups of LED subarrays in accordance with the scanning by the control means.

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**5,502,479**

**INK JET CARTRIDGE AND INK JET APPARATUS HAVING SAME**

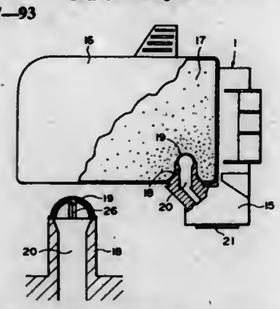
**Hiroyuki Ishinaga, Tokyo; Masami Ikeda, Yokohama; Tsutomu Abe, Isehara; Seiichiro Karita, Yokohama, and Teruo Arashima, Kawasaki, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Jun. 16, 1993, Ser. No. 76,979**

**Claims priority, application Japan, Jun. 16, 1992, 4-181798**

**Int. Cl.[6] B41J *2/175***

**U.S. Cl. 347—93** **10 Claims**




1. An ink jet cartridge comprising:

a head portion for emitting ink supplied from an ink container provided with ink absorbing material;

ink passage means defining an ink passage for supplying ink from the ink container to said head portion;

a filter disposed adjacent to one end of the ink passage and press-contacted against the absorbing material in the ink container, said filter shaped to have an arcuate surface of a constant curvature; and

a reinforcing member provided along an inner side of said filter.

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**5,502,480**

**THREE-DIMENSIONAL VISION CAMERA**

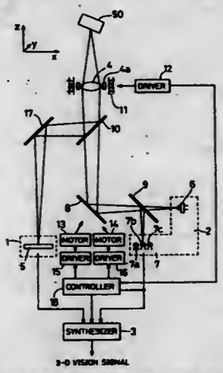
**Kaeko Kuga, and Takuzo Uemura, both of Kyoto, Japan, assignors to Rohm Co., Ltd., Kyoto, Japan**

**Filed Jan. 24, 1995, Ser. No. 377,589**

**Claims priority, application Japan, Jan. 24, 1994, 6-005622; Mar. 31, 1994, 6-062305**

**Int. Cl.[6] H04N *13/02***

**U.S. Cl. 348—46** **4 Claims**




1. A three-dimensional vision camera comprising:

a taking lens movable along its optical axis;

taking lens driving means for moving the taking lens;

a photographic light receiving device including photoelectric conversion elements arranged in a matrix form, said photographic light receiving device receiving a light beam transmitted by the taking lens to be incident on the photographic light receiving device so that each photoelectric conversion element outputs a video signal;

a light emitting device which emits a light beam irradiated to a photographic object;

a distance measuring light receiving device including photoelectric conversion elements arranged in an array form, said distance measuring light receiving device receiving a light beam emitted by the light emitting device and reflected by the photographic object so that each photoelectric conversion element outputs an electric signal;

a first optical device rotatable about an axis vertical to the optical axis of the taking lens, said first optical device being arranged behind the taking lens on the optical axis of the taking lens and reflecting the light beam emitted by the light emitting device toward the taking lens;

optical device rotating means for rotating the first optical device;

a second optical device arranged between the light emitting device and the first optical device, said second optical device transmitting a light beam advancing from the light emitting device to the first optical device and reflecting a light beam advancing from the first optical device to the light emitting device toward the distance measuring light receiving device;

controlling means for controlling the taking lens driving means so that the taking lens is stopped at a plurality of predetermined positions, said controlling means controlling the optical device rotating means to rotate the first optical device every time the taking lens is stopped at the plurality of predetermined positions so that a direction in which the light beam is reflected by the first optical device is varied, said controlling means outputting a taking lens drive amount and an optical device rotation amount; and

three-dimensional vision signal outputting means supplied with the video signal outputted from the photographic light receiving device, the electric signal outputted from the distance measuring light receiving device and the taking lens drive amount and the optical device rotation amount outputted from the controlling means, said three-dimensional vision signal outputting means producing a distance signal representative of a distance to a photographed portion of the photographic object to which the light beam is irradiated by the light emitting device based on the taking lens drive amount and synthesizing the video signal and the distance signal into a three-dimensional vision signal when the electric signal is supplied from a predetermined photoelectric conversion element of the distance measuring light receiving device, said video signal being outputted from the photoelectric conversion element of the photographic light receiving device receiving the light beam from the photographed portion of the photographic object, said three-dimensional vision signal outputting means outputting the three-dimensional vision signal.

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**5,502,481**

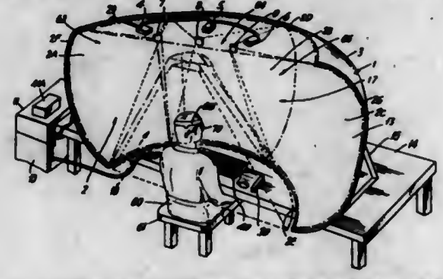
## DESKTOP-BASED PROJECTION DISPLAY SYSTEM FOR STEREOSCOPIC VIEWING OF DISPLAYED IMAGERY OVER A WIDE FIELD OF VIEW

**Aaron M. Deutinger, Briarcliff Manor; David C. Swift, Ossining, and Sadeg M. Faris, Pleasantville, all of N.Y., assignors to Reveo, Inc., Hawthorne, N.Y.**

**Continuation-in-part of Ser. No. 126,077, Sep. 23, 1993, and a continuation-in-part of Ser. No. 269,202, Jun. 30, 1994, and a continuation-in-part of Ser. No. 976,518, Nov. 16, 1992. This application Nov. 14, 1994, Ser. No. 339,986**

**Int. Cl.[6] H04N *13/04***

**U.S. Cl. 348—51** **18 Claims**



1. An image display system for simultaneously displaying a plurality of optical images of a three-dimensional object taken from a plurality of viewing directions defined relative to said three-dimensional object, said image display system comprising:

a three-dimensional display surface of generally concave geometry and electrically-passive construction, said three-dimensional display surface having

at least first and second display surface regions in spatially contiguous relation to each other,

an upper edge surface bordering at least a portion of said first display surface region,

a lower edge surface bordering at least a portion of said second display surface region,

a first side edge surface bordering at least said first display surface region, and

a second side edge display surface bordering at least said second display surface region,

wherein

said upper edge surface defines an upper volume-boundary surface,

said lower edge surface defines a lower volume-boundary surface,

said first and second edge surfaces define a front volume-boundary surface, and

said upper and lower volume-boundary surfaces, said front volume-boundary surface and said three-dimensional display surface collectively circumscribe a three-dimensional display volume disposed in the direction of the concavity of said three-dimensional display surface;

first image signal generation means for generating a first electrical signal representative of a first optical image of said three-dimensional object viewed along a first viewing direction;

second image signal generation means for generating a second electrical signal representative of a second optical image of said three-dimensional object viewed along a second viewing direction;

first optical image producing means, fixedly disposed adjacent said upper volume-boundary surface and responsive to said first electrical signal, for generating said first optical image and projecting said first optical image onto said first display surface region of said three-dimensional display surface such that the light rays emanating from said first optical image producing means towards said first display surface region are generally confined within a first image projection volume substantially spatially encompassed within and stationarily fixed relative to said three-dimensional display volume; and

second optical image producing means, fixedly disposed adjacent said upper volume-boundary surface and being responsive to said second electrical signal, for generating said second optical image and projecting said second optical image onto said second display surface region of said three-dimensional display surface such that light rays emanating from said second optical image producing means towards said second display surface region are generally confined within a second image projection volume substantially spatially encompassed within and stationarily fixed relative to said three-dimensional display volume,

whereby a viewer supported in the direction of the concavity of said three-dimensional display surface is free to view said first and second projected optical images from anywhere within a three-dimensional viewing zone being spatially encompassed within and stationarily fixed relative to said three-dimensional display volume, and substantially free of projected light rays emanating from said first and second image projection means towards said first and second display surface regions, respectively.

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**5,502,482**

## DERIVATION OF STUDIO CAMERA POSITION AND MOTION FROM THE CAMERA IMAGE

**Alexander T. Graham, Broad Oak Heathfield, United Kingdom, assignor to British Broadcasting Corporation, London, United Kingdom**

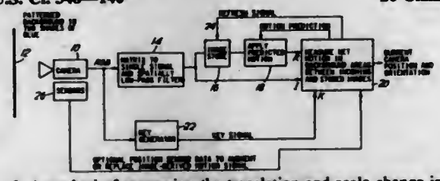
**PCT No. PCT/GB93/01715, § 371 Date Apr. 15, 1994, § 102(e) Date Apr. 15, 1994, PCT Pub. No. WO94/05118, PCT Pub. Date Mar. 3, 1994**

**PCT Filed Aug. 12, 1993, Ser. No. 211,779**

**Claims priority, application United Kingdom, Aug. 12, 1992, 9217098**

**Int. Cl.[6] H04N *7/18***

**U.S. Cl. 348—140** **26 Claims**



1. A method of measuring the translation and scale change in a sequence of video images, the method comprising:

storing a first image in said sequence to form a stored image;

forming a prediction of the translation and scale change from said stored image to a further image in said sequence;



transforming said stored image by said prediction of the translation and scale change to form a transformed first image;

comparing a further image in said sequence with said transformed first image;

deriving measurements of translation and scale change between said stored image and said further image from said comparison and said prediction; and

replacing said first image with a new incoming image when the image area common to both said first image and incoming image falls below a given proportion of the whole image area of said incoming image.

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**5,502,483**

## VIDEO CAMERA APPARATUS

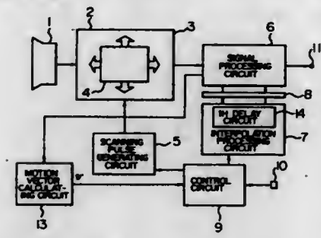
**Satoshi Takase, Takasaki; Takuya Imaide, Fujisawa; Toshiro Kinugasa, Hiratsuka, and Hiroyuki Komatsu, Yokohama, all of, Japan, assignors to Hitachi, Ltd., Japan**

**Filed Dec. 21, 1993, Ser. No. 171,005**

**Claims priority, application Japan, Dec. 24, 1992, 4-344369**

**Int. Cl.[6] H04N *5/228;7/01***

**U.S. Cl. 348—208** **7 Claims**



1. A video camera apparatus comprising:

an imager for scanning a part of a photo-sensitive pixel area in which a focused objective image is photo-electrically converted;

a scanning pulse generating means for generating a scanning pulse that drives said imager;

interpolation processing means for obtaining signals of two adjacent scanning lines from an output signal of said imager and adding said two adjacent scanning lines after multiplying each respectively by an interpolation coefficient $\alpha$ and $(1-\alpha)$;

signal processing means for processing an output signal of said interpolation processing means;

vibration detecting means for detecting a vibration of said video camera caused by external forces; and

control circuit means for setting said interpolation coefficient $\alpha$ (where $0 \leq \alpha \leq 1$) of said interpolation processing means in response to a detected output from said vibration detecting means, for controlling said scanning pulse generating means, wherein a limited value X of said interpolation coefficient $\alpha$ is selected to be a value smaller than ½, and for controlling said interpolation processing means wherein a combination of two scanning lines that are to be processed by said interpolation processing means are made different by making a scanning state of said imager different when $0 \leq \alpha \leq X$ or $(1-X) < \alpha \leq 1$ and $X \leq \alpha \leq (1-X)$ if X is limited value of said interpolation coefficient $\alpha$ smaller than ½.

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**5,502,484**

## VIDEO CAMERA AND VIDEO SIGNAL REPRODUCING APPARATUS WITH SHAKE DETECTION AND CORRECTION OPERATION

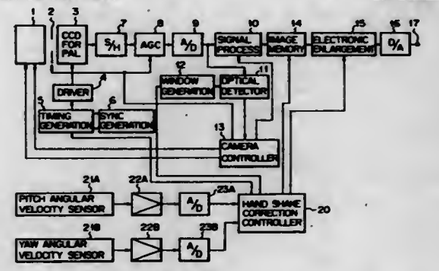
**Miyuki Okada, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Continuation of Ser. No. 187,058, Jan. 27, 1994, abandoned. This application Jul. 14, 1995, Ser. No. 502,584**

**Claims priority, application Japan, Feb. 12, 1993, 5-047434; Feb. 16, 1993, 5-050029**

**Int. Cl.[6] H04N *5/232***

**U.S. Cl. 348—208** **29 Claims**



1. A video camera comprising:

lens means for collecting light from an object to be photographed;

an image pickup device for converting the light collected by said lens means into an electric signal;

an analog to digital converting circuit for converting the electric signal from said image pickup device into a digital signal;

a memory circuit for storing the digital signal produced by said analog to digital converting circuit;

shake detecting means for detecting a shake of the video camera;

calculating means for obtaining a correction amount from an output signal of said shake detecting means and for generating an optical control signal and an electronic control signal;

optical correcting means responsive to said optical control signal for correcting a shake of an image caused by the shake of the video camera up to a predetermined limit;

optical zoom means included in said lens means for enlarging or reducing the object to be photographed; and

electronic zoom means for enlarging or reducing the object to be photographed represented by said digital signal from said analog to digital converting circuit and for correcting a portion of the shake that exceeds the predetermined limit in response to said electronic control signal.

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**5,502,485**

## CAMERA WHICH COMPRESSES DIGITAL IMAGE DATA IN CORRESPONDENCE WITH THE FOCUS CONTROL OR THE STOP VALUE OF THE CAMERA

**Masahiro Suzuki, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan**

**Filed Jun. 23, 1994, Ser. No. 264,471**

**Claims priority, application Japan, Jun. 23, 1993, 5-174653**

**Int. Cl.[6] H04N *5/76***

**U.S. Cl. 348—231** **29 Claims**

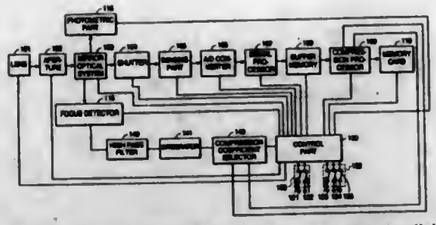
1. A camera comprising:

an imaging and digitizing device;

a photographic optical system which forms a subject image on the imaging and digitizing device, the imaging and digitizing device converting the subject image into digital signals;

a focus detection device, coupled to the photographic optical system, which focuses the photographic optical system and provides a corresponding focus output signal; and

a compression unit which receives the digital signals from the imaging and digitizing device and the focus output signal



from the focus detection device and compresses the digital signals at a compressibility corresponding to the focus output signal.

14. A method of forming compressed subject image data, the method comprising:

forming a subject image;

focusing the subject image and providing a corresponding focus signal;

converting the subject image into digital signals; and

compressing the digital signals at a compressibility corresponding to the focus signal, wherein the subject image contains high frequency components and the focus signal contains high frequency components which indicate the quantity of high frequency components in the subject image, the method further comprising

filtering the focus signal to provide a high pass output signal passing the high frequency components contained in the focus signal,

integrating the high pass output signal,

selecting a compression coefficient in response in the integrated high pass output signal, and

the step of compressing includes compressing the digital signal in correspondence with the selected compression coefficient so that the compressibility indirectly corresponds to the focus signal.

25. A camera comprising:

a release switch having a half push state and a full push state;

an imaging and digitizing device;

an optical system which forms a subject image on the imaging and digitizing device, the imaging and digitizing device converting the subject image into digital signals;

a detection device which, when the release switch is in the half push state, detects information for use in forming the subject image and provides a corresponding output signal, the output signal being a separate signal from, and not derived from, the digital signals; and

a compression unit which receives the digital signals from the imaging and digitizing device and the output signal from the detection device and, when the release switch is in the full push state, compresses the digital signals at a compressibility corresponding to the output signal of the detection device.

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**5,502,486**

## IMAGE SENSING APPARATUS WHICH CAN DETECT OPTICAL CHARACTERISTICS OF AN IMAGE TO CONTROL TITLE INSERTION

**Osamu Ueda, and Koji Takahashi, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 869,466, Apr. 15, 1992, abandoned. This application Feb. 28, 1994, Ser. No. 203,695**

**Claims priority, application Japan, Apr. 25, 1991, 3-095553; Jan. 23, 1991, 3-275516**

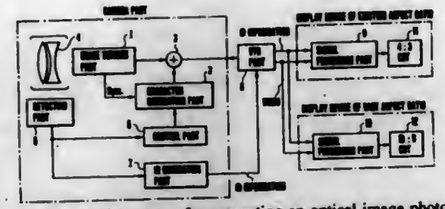
**Int. Cl.[6] H04N** *5/278*

**U.S. Cl. 348—239** **37 Claims**

1. An image sensing apparatus comprising:

a) an optical system capable of varying an aspect ratio of a photographed image;

b) detecting means for detecting a conversion ratio of said optical system;



c) image sensing means for converting an optical image photographed by said optical system into an electrical signal;

d) combining means for combining character information with image information outputted from said image sensing means; and

e) controlling means for controlling a combining operation of said combining means in accordance with an output from said detecting means.

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**5,502,487**

## CHARACTER SIGNAL DISPLAY FOR A CAMCORDER USING EXISTENT SYNCHRONIZATION SIGNALS FOR CHARACTER DISPLAY

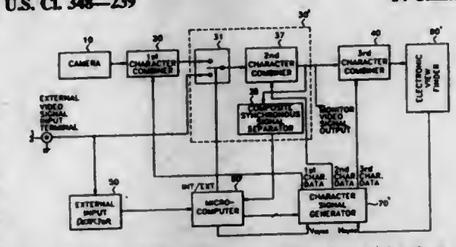
**Sung-gyu Choi, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea**

**Filed Aug. 1, 1994, Ser. No. 283,805**

**Claims priority, application Rep. of Korea, Jul. 31, 1993, 1993-14810; Jul. 19, 1994, 94-17905**

**Int. Cl.[6] H04N** *5/262*

**U.S. Cl. 348—239** **14 Claims**



1. A character signal display for a camcorder which selects an input camera video signal or an external video signal in response to a mode control signal so as to use a synchronous signal loaded onto a selected signal for character display, said character signal display comprising:

a camera for converting optical information corresponding to a photographed object into an electrical signal and for combining said electrical signal with an input synchronous signal generated by a synchronous signal generator associated with said camera to provide the camera video signal;

a viewfinder for displaying a character signal by employing a composite synchronous signal separated from said camera video signal or from said external video signal applied via an external input terminal;

external input detecting means for sensing whether said external video signal is input to said external input terminal;

selection control means for selectively controlling output of said camera video signal or said external video signal in accordance with the mode control signal, while selecting said camera video signal when said external video signal is not input to thereby output said selected signal; and

character signal generating means for generating said character signal for display at a predetermined location on said viewfinder by employing the composite synchronous signal loaded onto said selected signal and another composite synchronous signal separated by said viewfinder.



**5,502,488**

## SOLID-STATE IMAGING DEVICE HAVING A LOW IMPEDANCE STRUCTURE

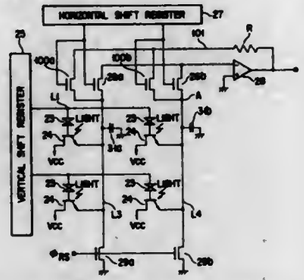
**Tatsuo Nagasaki, Yokohama; Takeshi Mori, Tokyo, and Hideo Adachi, Iruma, all of, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan**

**Continuation-in-part of Ser. No. 878,855, May 5, 1992, Pat. No. 5,307,169. This application Dec. 1, 1993, Ser. No. 160,926**

**Claims priority, application Japan, May 7, 1991, 3-101579; Jan. 25, 1991, 3-279661**

**Int. Cl.[6] H04N** *5/335*

**U.S. Cl. 348—300** **15 Claims**



1. A solid-state imaging device which comprises:

a semiconductor substrate;

a plurality of pixels formed on said semiconductor substrate and generating pixel signals;

output amplifier means for converting a pixel signal generated in each of said pixels to an imaging signal, and for outputting said imaging signal;

said pixels each including a photoelectric converting portion for generating a charge in accordance with an amount of received light, a capacitor for storing the charge generated from said photoelectric converting portion, and a switching portion for reading out the charge stored in said capacitor as said pixel signal;

said plurality of pixels being arranged in a matrix in first and second directions, said matrix including a plurality of lines in both of said first and second directions;

a plurality of horizontal selecting lines connected to pixels which form a plurality of said lines of said matrix in said first direction;

a plurality of vertical selecting lines connected to pixels which form a plurality of said lines of said matrix in said second direction;

a pixel address circuit for addressing the pixels by applying a read-out signal to said horizontal and vertical selecting lines, and for reading out said pixel signal from the addressed pixel;

said output amplifier means including an output amplifier for converting the pixel signals input from said pixels via said vertical selecting lines, to the imaging signal; and

load resistance reducing means, coupled to said vertical selecting lines, for reducing a load resistance of the switching portion in said pixels and for improving a S/N ratio of the imaging signal.

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**5,502,489**

## METHOD FOR THE MOTION ADAPTIVE SPATIAL FILTERING OF VIDEO SIGNALS IN AN IMAGE CODING APPARATUS

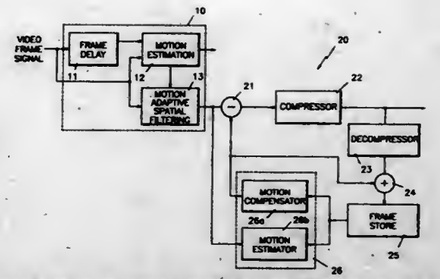
**Jong-Hun Kim, Seoul, and Seong-Dae Kim, Daejeon, both of, Rep. of Korea, assignors to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea**

**Filed Jan. 3, 1994, Ser. No. 176,794**

**Int. Cl.[6] H04N** *7/18;7/12*

**U.S. Cl. 348—607** **5 Claims**

1. A method for filtering a video frame signal with a predetermined temporal cutoff frequency to achieve a temporal band limitation in an image coding apparatus having a filter and an encoder for eliminating redundancy in the filtered video frame signal in order to compress the video frame signal to a manageable size for the transmission thereof, wherein the video frame signal has one or more object moving in a high velocity, which comprises the steps of:



(a) determining a motion vector which represents the movement of the moving object between a current video frame signal and its previous video frame signal; and

(b) performing a filtering operation of the video frame signal in the spatial domain with a spatial cutoff frequency which changes adaptively with the determined motion vector in order to achieve the temporal band limitation, wherein the motion vector includes a velocity component and a direction component, and the spatial cutoff frequency $f_s$ is represented as follows:

$$f_s = \frac{1}{|V|} \cdot f_t$$

wherein ft is the predetermined temporal cutoff frequency; and V is the velocity component.

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**5,502,490**

## DISPLAY UNIT HAVING A LIGHT-TO-LIGHT CONVERSION ELEMENT

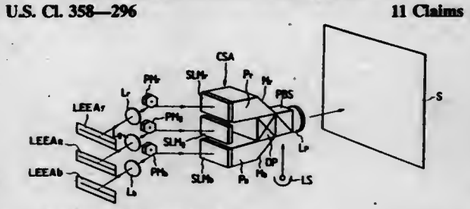
**Itsuo Takanashi, Kamakura; Shintaro Nakagaki, Miura; Ichiro Negishi, Yokosuka; Tetsuji Suzuki, Yokosuka; Fujiko Tatsumi, Yokohama; Ryusaku Takahashi, Yokosuka, and Keiichi Maeno, Yokosuka, all of, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan**

**Division of Ser. No. 216,232, Mar. 16, 1994, Pat. No. 5,463,468, which is a continuation of Ser. No. 702,817, May 21, 1991, abandoned. This application Jun. 2, 1995, Ser. No. 459,240**

**Claims priority, application Japan, May 21, 1990, 2-130498; May 23, 1990, 2-134928; Jul. 20, 1990, 2-192358**

**Int. Cl.[6] H04N** *1/23;3/02;8/07;* **G02F** *1/1335*

**U.S. Cl. 358—296** **11 Claims**



1. A display unit, comprising:

(a) three parallel spaced light-emitting element arrays provided for three primary colors, each array being composed of a plurality of linearly arranged light-emitting elements corresponding to a same number of picture elements;

(b) means for driving said light-emitting elements of each of said light-emitting element arrays to emit beams of light simultaneously for a predetermined period of time in accor-

dance with a corresponding one of three different rows of pieces of picture element information;

(c) a first deflecting means for deflecting the light beams emitted from a first one of said light-emitting element arrays, simultaneously in a direction perpendicular to a longitudinal direction of said light-emitting element arrays;

(d) a second deflecting means for deflecting the light beams emitted from a second one of said light-emitting element arrays, simultaneously in a direction perpendicular to a longitudinal direction of said light-emitting element arrays;

(e) a third deflecting means for detecting the light beams emitted from a third one of said light-emitting element arrays, simultaneously in a direction perpendicular to a longitudinal direction of said light-emitting element arrays;

(f) a first light-to-light conversion element including two electrodes of opposite polarities and a photoconductive layer and a photo-modulation layer disposed between said electrodes, wherein said photoconductive layer forms an image when scanned with the deflected light beams from said first light-emitting element array;

(g) a second light-to-light conversion element including two electrodes of opposite polarities and a photo-conductive layer and a photo-modulation layer disposed between said electrodes, wherein said photoconductive layer forms an image when scanned with the deflected light beams from said second light-emitting element array;

(h) a third light-to-light conversion element including two electrodes of opposite polarities and a photo-conductive layer and a photo-modulation layer disposed between said electrodes, wherein said photoconductive layer forms an image when scanned with the deflected light beams from said third light-emitting element array;

(i) a first lens for imaging the light beams from said first light-emitting element array via said first deflecting means onto said photoconductive layer of said first light-to-light conversion element;

(j) a second lens for imaging the light beams from said second light-emitting element array via said second deflective means onto said photoconductive layer of said second light-to-light conversion element;

(k) a third lens for imaging the light beams from said third light-emitting element array via said third deflecting means onto said photoconductive layer of said third light-to-light conversion element; and

(l) a three color separation and composition optical system associated with said first, second and third light-to-light conversion elements for combining colors of the respective images formed in said first, second and third light-to-light conversion elements and reproducing them as a composite color image.

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**5,502,491**

## ORTHOGONAL TRANSFORM CODING APPARATUS AND DECODING APPARATUS

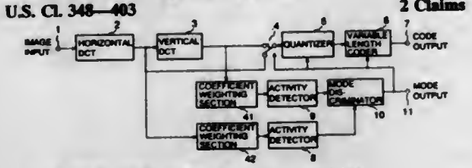
**Kenji Sugiyama, and Hiroya Nakamura, both of Yokosuka, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan**

**Division of Ser. No. 113,676, Aug. 31, 1993, Pat. No. 5,424,778. This application Mar. 2, 1995, Ser. No. 397,752**

**Claims priority, application Japan, Aug. 31, 1992, 4-255870; Mar. 26, 1993, 5-92285**

**Int. Cl.[6] H04N 7/30**

**U.S. Cl. 348—403** **2 Claims**




1. An image signal coding apparatus comprising:

means for orthogonal-transforming image signals to be coded by two-dimensional transformation and horizontal one-dimensional transformation to obtain first transform coefficients and second transform coefficients, respectively;

means for detecting a status of the image signals on the basis of the first and second transform coefficients to output a status signal;

means responsive to the status signal for selecting between the first and the second transform coefficients to provide selected transform coefficients;

means for quantizing the selected transform coefficients to produce quantized transform coefficients; and

means for coding the quantized transform coefficients to output coded signals;

wherein said means for detecting a status comprises means for detecting a first activity and a second activity of the first and second transform coefficients, respectively, and means for comparing the first and second activities mutually, and

wherein said means for comparing the first and second activities mutually further comprises means for applying a weight to each transform coefficient according to frequency for each dimension, and said means for detecting a first activity and a second activity detects the first and second activities of the image signals on the basis of weighted transform coefficients obtained by applying said weight to each transform coefficient.

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**5,502,492**

## MOTION VECTOR DETECTION APPARATUS

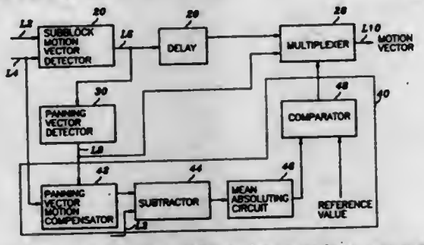
**Hae-Mook Jung, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea**

**Filed Apr. 8, 1994, Ser. No. 225,223**

**Claims priority, application Rep. of Korea, Apr. 9, 1993, 93-5969**

**Int. Cl.[6] H04N 7/36**

**U.S. Cl. 348—413** **3 Claims**




1. An apparatus for detecting a motion vector between a current frame and a previous frame of digital video signals, wherein the current frame is divided into a multiplicity of generally large panning blocks, each of the panning blocks having a plurality of subblocks, which comprises:

a subblock motion vector detector for detecting a subblock motion vector for each of the subblocks included in a panning block within the current frame;

a panning vector detector for detecting a panning vector for the panning block, wherein said panning vector detector includes:

means, in response to each of the subblock motion vectors applied thereto from the subblock motion vector detector, for counting the number of the subblock motion vectors with an identical displacement with respect to the panning block so as to determine a maximum counted number of the subblock motion vectors with the identical displacement;

means for storing the subblock motion vector at the time of the determined maximum counted number;

means for comparing the maximum counted number of the subblock motion vectors with a predetermined threshold number; and

means for assigning as the panning vector the subblock motion vector in said storing means when it is determined that the maximum counted number is greater than the predetermined threshold number;

a motion vector determination circuit for determining whether the mean absolute value of the difference signals obtained by subtracting the panning block from a motion-compensated previous frame block generated from the previous frame by using the panning vector is greater or smaller than a predetermined reference value to produce a control signal; and

means, in response to the control signal, for selecting the subblock motion vector from the subblock motion vector detector or the panning vector from the panning vector detector as an output of the apparatus for determining motion vectors.



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**5,502,493**

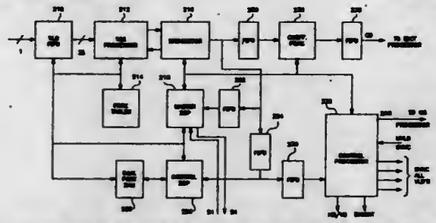
## VARIABLE LENGTH DATA DECODER FOR USE WITH MPEG ENCODED VIDEO DATA

**Edwin R. Meyer, Bensalem, Pa., assignor to Matsushita Electric Corporation of America, Secaucus, N.J.**

**Filed May 19, 1994, Ser. No. 246,272**

**Int. Cl.[6] H04N 7/12**

**U.S. Cl. 348—426** **14 Claims**



1. Apparatus for decoding a data stream including a plurality of variable length encoded data values, wherein the data stream conforms to a predetermined syntax including a portion representing control information, the apparatus comprising:

decoding means, coupled to receive the variable length encoded data stream and responsive to a first control signal, for converting each variable length encoded value in the data stream into a corresponding decoded value;

master processing means, coupled to receive decoded values provided by the decoding means, for generating, from the received values, the first control signal for the decoding means and a second control signal, different than the first control signal; and

control processing means, responsive to said second control signal, coupled to receive decoded values provided by the decoding means representing the control information of the data stream and for processing the received values to divide the received control information into first and second data types, concurrently with the processing performed by the decoding means and the master processing means.

3. Apparatus for decoding a data stream including a plurality of variable length encoded data values, wherein the data stream conforms to a predetermined syntax including a portion representing control information, the apparatus comprising:

decoding means, coupled to receive the variable length encoded data stream and responsive to a control signal, for converting each variable length encoded value in the data stream into a corresponding decoded value, wherein the decoding means includes sequencing means for executing preprogrammed routines responsive to the control signal;

master processing means, coupled to receive decoded values provided by the decoding means, for generating, from the received values, the control signal for the decoding means; and

control processing means, coupled to receive decoded values provided by the decoding means representing the control information of the data stream and for processing the received values, concurrently with the processing performed by the decoding means and the master processing means.

13. Apparatus for decoding a data stream including a plurality of variable length encoded data values, wherein the data stream conforms to a predetermined syntax including a portion representing control information, the apparatus comprising:

means for dividing the data stream into N segments, where N is an integer;

N decoding means, each coupled to receive a respectively different one of the N segments of the variable length encoded data stream and responsive to a control signal, for converting each variable length encoded value in the segment into a corresponding decoded value;

N master processing means, each coupled to receive decoded values provided by a respectively different one of the decoding means, for generating, from the received values, the control signal for the decoding means; and

N control processing means, each coupled to receive decoded values provided by a respectively different one of the decoding means representing the control information of the data stream and for processing the received values, concurrently with the processing performed by the decoding means and the master processing means.

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**5,502,494**

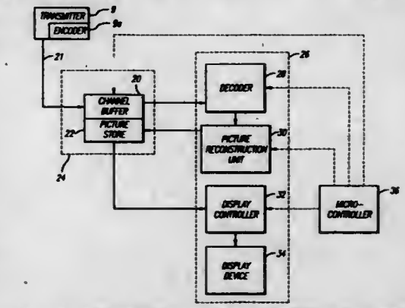
## MANAGEMENT OF CHANNEL BUFFER IN VIDEO DECODERS

**David R. Auld, San Jose, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.**

**Continuation of Ser. No. 143,198, Oct. 25, 1993, Pat. No. 5,398,072. This application Mar. 13, 1995, Ser. No. 402,708**

**Int. Cl.[6] H04N 7/50**

**U.S. Cl. 348—426** **14 Claims**




1. A Motion Picture Experts Group (MPEG) video data transmission system, comprising:

a transmitter including an encoder for encoding video data in accordance with an MPEG standard to produce an encoded video bitstream including motion compensated pictures and Discrete Cosine Transform (DCT) encoded pictures;

a communications channel for transmitting said video bitstream from the transmitter; and

a receiver for receiving said video bitstream from the communications channel, the receiver including:

a buffer for temporarily storing said video bitstream;

a processor for processing said video bitstream and determining therefrom a number of bits in a picture being stored in the buffer;

a reconstruction unit for reconstructing said motion compensated pictures and said DCT encoded pictures; and

a controller for causing said picture being stored in the buffer to be transferred from the buffer to the reconstruction unit when said number of bits of said video bitstream has been stored in the buffer.

8. A Motion Picture Experts Group (MPEG) video data receiver for receiving a video bitstream which is encoded in accordance with an MPEG standard and includes motion compensated pictures and Discrete Cosine Transform (DCT) encoded pictures, the receiver comprising;

a buffer for temporarily storing said video bitstream;
a processor for processing said video bitstream and determining therefrom a number of bits in a picture being stored in the buffer;
a reconstruction unit for reconstructing said motion compensated pictures and said DCT encoded pictures; and
a controller for causing said picture being stored in the buffer to be transferred from the buffer to the reconstruction unit when said number of bits of said video bitstream has been stored in the buffer.

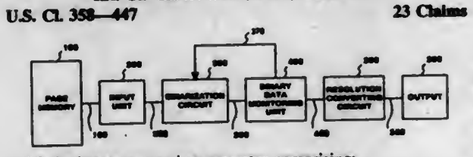
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**5,502,495**

## IMAGE PROCESSING CAPABLE OF PROVIDING HIGHER RESOLUTION IN LOW-DENSITY REGIONS

**Yuichi Bannai, Koganei; Toshihiko Sato, Inagi, and Kunihiro Yamamoto, Machida, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 821,775, Jan. 16, 1992, abandoned. This application Jul. 7, 1994, Ser. No. 272,506**
**Claims priority, application Japan, Jan. 25, 1991, 3-007814; Jan. 25, 1991, 3-007815**
**Int. Cl.[6] H04N *1/405;1/409;* G06T *5/00***
**U.S. Cl. 358—447** **23 Claims**



16. An image processing apparatus comprising:
input means for inputting binary image data;
resolution converting means for converting the resolution of the binary image data inputted by said input means in a manner such that the binary image data for one pixel becomes data for a plurality of pixels; and
detecting means for detecting a pixel, which is an isolated point, in the binary image data inputted at said input means,
wherein said detecting means further comprises:
search means for searching for binary image data peripheral to the pixel, with regard to each pixel of the inputted binary image data, in order to detect the isolated point; and
feeding means for feeding the result of the search performed by said search means to said resolution converting means.

20. An image processing apparatus comprising:
input means for inputting binary image data;
resolution converting means for converting the resolution of the binary image data inputted by said input means in a manner such that the binary image data for one pixel becomes data for a plurality of pixels;
detecting means for detecting a pixel, which is an isolated point, in the binary image data inputted by said input means; and
output means for outputting a light-and-dark image based upon an output obtained by said resolution converting means,
wherein said resolution converting means diffuses the binary image data for the isolated pixel, detected by said detecting means, into a broader area than an area required for the plurality of pixels obtained at said resolution converting means, upon the resolution conversion.

22. An image processing apparatus comprising:
input means for inputting binary image data;
resolution converting means for converting the resolution of the binary image data input by said input means in a manner such that the binary image data for one pixel becomes data for a plurality of pixels;
detecting means for detecting a pixel, which is an isolated point, in the binary image data input by said input means, on the basis of the binary image data peripheral to the pixel; and
effecting means for effecting the resolution converting by said resolution converting means, based on the result of the detection performed by said detecting means.

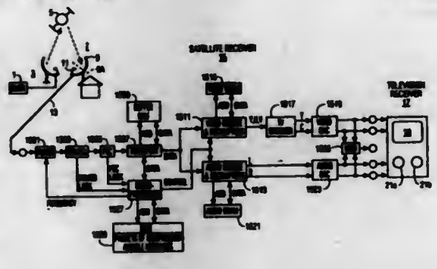
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**5,502,496**

## APPARATUS FOR PROVIDING AUDIBLE INSTRUCTIONS OR STATUS INFORMATION FOR USE IN A DIGITAL TELEVISION SYSTEM

**James E. Hailey, Sr., and David E. Virag, both of Indianapolis, Ind., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.**

**Filed Jun. 9, 1994, Ser. No. 257,320**
**Int. Cl.[6] H04N *7/12***
**U.S. Cl. 348—462** **8 Claims**



1. In a television system for processing received digital signals representing video and audio information which has been compressed for transmission, said digital signals being organized in a stream of multiplexed packets, each of said packets including payload data representing a particular type of information, header data for identifying the particular type of information represented by the payload data and error correction data, apparatus comprising:
means responsive to said received stream of digital signals for correcting errors occurring in said packets according to the respective error correction data to produce an error corrected stream of multiplexed data packets;
a buffer memory including a memory location for storing payload data representing transmitted video information and a memory location for storing payload data representing transmitted audio information;
a transport responsive to said error corrected stream of packets for routing payload data of said packets to ones of said memory locations of said memory section according to the respective header data contained in said packets;
a decoder for decompressing payload data representing video information to produce a digital signal representing decompressed video information;
means for coupling a signal responsive to said digital signal representing said decompressed video information to an image reproducing device;
a decoder for decompressing payload data representing audio information to produce a digital signal representing decompressed audio information;
means for coupling a signal responsive to said digital signal representing said decompressed audio information to a sound reproducing device;
a data bus for coupling payload data stored in said memory locations of said buffer memory to respective decoders;
a control memory for storing data representing audible message information which has been compressed in the same manner as the transmitted audio information; and
a controller for selectively routing said audible message data from said control memory to said memory location of said buffer memory for temporarily storing said payload data representing transmitted audio information so that said audible message data is thereafter routed to said audio decoder.



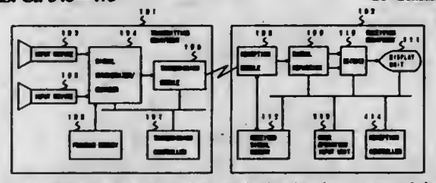
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**5,502,497**

## TELEVISION BROADCASTING METHOD AND SYSTEM ENABLING PICTURE BROADCASTING FROM THE TRANSMITTING EQUIPMENT TO THE RECEIVING EQUIPMENT USING ALTERNATIVE BROADCASTING SYSTEM STANDARDS

**Kimiya Yamaashi, Hitachi; Masayuki Tani, Katsuta; Koichiro Tanikoshi, Hitachi; Masayasu Futakawa, Hitachi; Shinya Tanifuji, Hitachi; Atsushi Kawabata, Hitachi; Norito Watanabe, Hitachi, and Kazunari Maeda, Tondabayashi, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Continuation of Ser. No. 936,779, Aug. 28, 1992, abandoned. This application Jun. 6, 1995, Ser. No. 470,449**
**Claims priority, application Japan, Aug. 28, 1991, 3-217508**
**Int. Cl.[6] H04N *7/08***
**U.S. Cl. 348—473** **18 Claims**



1. A television broadcasting method wherein a transmitting equipment broadcasts a broadcast program picture, while a receiving equipment receives and displays a broadcasted broadcast program picture from said transmitting equipment, said method comprising the steps of:
broadcasting control information by means of said transmitting equipment, said control information including broadcast system standard information specifying a broadcast system standard for receiving and displaying said broadcast program picture at said receiving equipment;
broadcasting said broadcast program picture in accordance with said broadcast system standard by means of said transmitting equipment;
receiving said control information by means of said receiving equipment; and
displaying said broadcast program picture broadcasted from said transmitting equipment, on a basis of said broadcast system standard specified by said broadcast system standard information included in a received said control information by means of said receiving equipment.

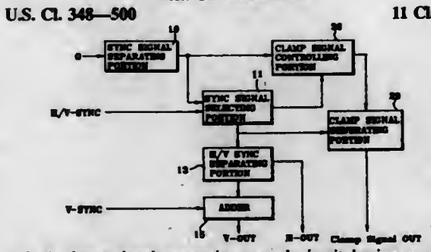
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**5,502,498**

## CLAMP SIGNAL GENERATION-CONTROL CIRCUIT AND A METHOD THEREFOR

**Tae J. Park, Anyang; Ho D. Hwang, Seoul, and Joong Y. Kwon, Suwon, all of, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea**

**Filed Mar. 7, 1994, Ser. No. 207,406**
**Claims priority, application Rep. of Korea, Mar. 10, 1993, 93-3476; Apr. 23, 1993, 93-6852; May 14, 1993, 93-8339; May 19, 1993, 93-8546; May 19, 1993, 93-8547**
**Int. Cl.[6] H04N *5/18***
**U.S. Cl. 348—500** **11 Claims**



1. A clamp signal generation-control circuit having a clamp signal controlling circuit including a sync signal separating portion for separating and outputting a sync signal mixed with a green signal in a video signal, a sync signal selecting portion receiving said sync signal mixed with the green signal from said sync signal separating portion and also separately receiving horizontal and vertical sync signals from an input thereof for selectively outputting said sync signal from said sync signal separating portion and said horizontal and vertical sync signals in accordance with a previously-set priority, a horizontal/vertical sync signal separating portion for separating and outputting horizontal and vertical sync signals received from said sync signal selecting portion, and a clamp signal generating portion connected to said sync signal selecting portion for triggering a clamp signal at a predetermined edge of the sync signal supplied from said sync signal selecting portion, said clamp signal generation-control circuit comprising:
clamp signal controlling means connected to said sync signal separating portion and said sync signal selecting portion for discriminating the mixing of said sync signal with said green signal and the input of horizontal and vertical sync signals, said clamp signal controlling means also being connected to the clamp signal generating portion for controlling the output of said clamp signal generating portion.

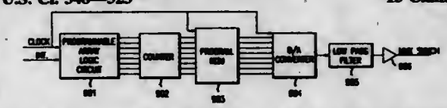
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**5,502,499**

## SYNCHRONIZING WAVEFORM GENERATOR

**Christopher H. Birch, Toronto; Christian V. van Staden, Scarborough; Walter R. Brooks, Georgetown; Paul D. Nicholas, Scarborough, and Steven S. Lawrence, Toronto, all of, Canada, assignors to Scientific-Atlanta, Inc., Norcross, Ga.**

**Division of Ser. No. 161,160, Dec. 3, 1993. This application Jun. 7, 1995, Ser. No. 478,830**
**Int. Cl.[6] H04N *5/06***
**U.S. Cl. 348—523** **15 Claims**



1. A waveform generator for generating a synchronizing waveform comprising
a continuous periodic waveform generator means for generating a continuous periodic waveform having a frequency within the television bandwidth,
interrupting means for interrupting the generation of the continuous periodic waveform,
frame marking signal generator means, responsive to the interrupting means, for generating a frame marking signal, the frame marking signal comprising one cycle of a periodic waveform having a greater amplitude and a lower frequency than that of the continuous periodic waveform.

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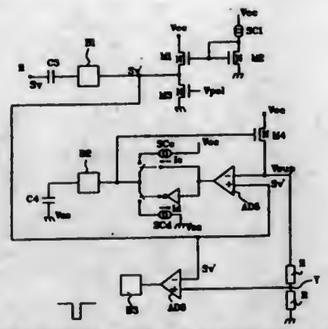
**5,502,500**

## CIRCUIT FOR EXTRACTING A SYNCHRONIZATION SIGNAL FROM A COMPOSITE VIDEO SIGNAL, IN MOS TECHNOLOGY

**Jacques Meyer, Corenc, France, assignor to SGS-Thomson Microelectronics S.A., Pouilly, France**

**Filed Apr. 29, 1993, Ser. No. 54,592**
**Claims priority, application France, Apr. 30, 1992, 92 05753**
**Int. Cl.[6] H04N *5/08***
**U.S. Cl. 348—525** **25 Claims**

1. An MOS circuit for extracting a synchronization signal from a composite video signal, coupled between a supply voltage and a ground voltage, comprising:
an alignment circuit aligning the composite signal with a reference voltage to produce an aligned composite signal;
an output comparator comparing the aligned composite signal with a level that is intermediate between a low level of a synchronization interval of the composite video signal and a signal suppression level of the composite video signal;



a first stage aligning the low level with the ground voltage;

a second stage detecting the suppression level of the aligned composite signal including a first capacitor, a second comparator having a first input operable to receive the aligned composite signal and a second input operable to receive a second signal, the second comparator controlling charging or discharging of the first capacitor depending on a polarity of a voltage difference across the first and second inputs, and a negative feedback transistor having a gate connected to the first capacitor and a source connected to the second input of the second comparator to vary the voltage at the second input when charging of the first capacitor varies, in a direction correlated with the variation direction of the charging; and

a voltage divider connected between the second input of said second comparator and the ground voltage, the output comparator having a first input connected to a medium tap of the divider and a second input receiving the aligned composite signal.

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**5,502,501**

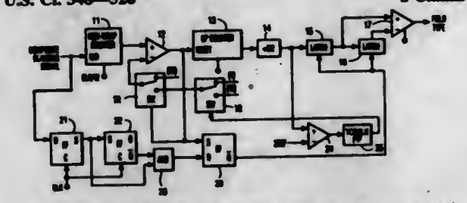
**FIELD TYPE DETECTOR FOR VIDEO SIGNAL**

**Mark F. Rumreich, and Barth A. Canfield, both of Indianapolis, Ind., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.**

**Filed Mar. 31, 1994, Ser. No. 220,566**

**Int. Cl.[6] H04N *5/08***

**U.S. Cl. 348—526** **2 Claims**



1. A field type detector for identifying first and second field types of a video signal, comprising:

a source of composite blanking signals derived from said video signal and composed of randomly time spaced horizontal blanking and vertical blanking signal components, wherein a difference in the time spacing of said horizontal and vertical blanking components of two consecutive fields is indicative of the field type of a current field of said video signal;

a source of clock pulses;

counter means responsive to said composite blanking signal and to said clock pulses for providing a count signal related to said time spacing for said current field;

means responsive to said current field count signal and to a stored count signal related to said time spacing for the field preceding said current field for providing a field type indication;

comparator means, responsive to said current field count signal and to a reference signal for providing a switching signal when said current field count signal exceeds said reference signal; and

means responsive to said switching signal, for altering the operating mode of said counter means so as to modify the relationship between said count signal and said time spacing.

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**5,502,502**

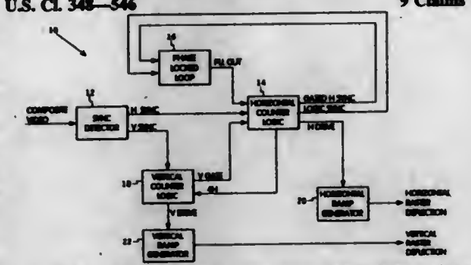
**PLL-BASED METHOD AND APPARATUS FOR GENERATING VIDEO DRIVE SIGNALS FROM VARIOUS SYNC FORMATS**

**Gretchen T. Gaskill, Albuquerque, N.M., and Robert J. Vitello, Duluth, Ga., assignors to Honeywell Inc., Minneapolis, Minn.**

**Filed Mar. 6, 1995, Ser. No. 398,708**

**Int. Cl.[6] H04N *5/12***

**U.S. Cl. 348—546** **9 Claims**



1. Apparatus for generating video drive signals from various video formats, comprising:

a detector for detecting a composite video drive signal and extracting therefrom horizontal sync pulses occurring during a horizontal sync portion of the video signal and vertical sync pulses occurring during a vertical sync portion of the video signal;

a phase locked loop for generating pulses at a frequency determined by a difference in time between first and second signals;

horizontal counter logic coupled to the detector and phase locked loop for counting pulses from the phase locked loop and generating a horizontal drive signal at a predetermined count and for generating the first and second signals to control the pulse frequency of the phase locked loop, the first signal generated at the predetermined count and the second signal generated during the horizonal sync portion of the video signal by a horizontal sync pulse and generated during the vertical sync portion of the video signal by a delayed version of the first signal; and

vertical counter logic responsive to a signal from the horizontal counter logic for generating a vertical gating pulse during the vertical sync portion of the video signal, the vertical gating pulse applied to the horizontal counter logic to select between the horizontal sync pulse and the delayed version of the first signal as the second signal to the phase locked loop.

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**5,502,503**

**DIGITAL COLOR TV FOR PERSONAL COMPUTERS**

**Mark C. Koz, 731 Stanford Ave., Palo Alto, Calif. 94306**

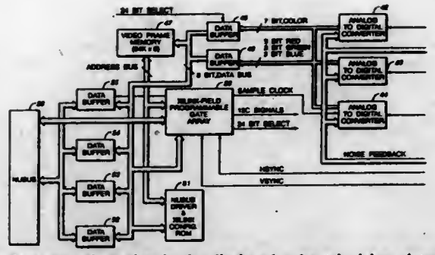
**Division of Ser. No. 121,718, Sep. 14, 1993, Pat. No. 5,341,175, which is a division of Ser. No. 683,593, Apr. 9, 1991, Pat. No. 5,249,164, which is a continuation-in-part of Ser. No. 545,352, Jun. 27, 1990, abandoned. This application Aug. 19, 1994, Ser. No. 292,831**

**Int. Cl.[6] H04N *9/00***

**U.S. Cl. 348—552** **28 Claims**

1. An apparatus for displaying on a monitor screen of a computer a color television picture at a frame repetition rate sufficient





to show smooth motion in the displayed color television picture while the computer processes other computer programs, said apparatus comprising:

a connector for receiving an analog video signal;

video signal processing means adapted for separating the analog video signal into color component signals;

analog-to-digital conversion means for continuously converting the color component signals into digital color component signals;

digital buffer means to assemble digital video words from the digital color component signals, each digital video word representing one color pixel;

video frame memory of capacity sufficient to store a television picture frame made up of said digital video words;

video data transfer means adapted for transferring a plurality of said digital video words from said video frame memory to a processing bus included in the computer through a plurality of data buffers adapted to substantially simultaneously transfer in parallel the plurality of said digital video words to the processing bus of the computer; and

control means for data transfer adapted to communicate to the computer when a television picture frame is ready for transfer to the processing bus included in the computer, to control transfer of digital video words from said video frame memory to the data buffers of said video data transfer means responsive to a signal from the computer, loading each data buffer with a digital video word, then directing substantially simultaneous transfer of all digital video words in parallel from said data buffers to the processing bus of the computer as one computer word.

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**5,502,504**

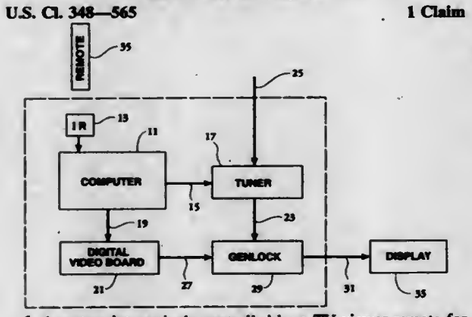
**VIDEO MIX PROGRAM GUIDE**

**Connie T. Marshall, Muskogee; Thomas R. Lemmons, Coweta, and Donald W. Allison, Tulsa, all of Okla., assignors to Prevue Networks, Inc., Tulsa, Okla.**

**Filed Apr. 28, 1994, Ser. No. 234,060**

**Int. Cl.[6] H04N *7/00;9/74***

**U.S. Cl. 348—565** **1 Claim**



1. A system interactively controlled by a TV viewer remote for superimposing portions of a scroll program guide over a basic programming signal for display on the viewer's display screen comprising:

a tuner having an input for receiving TV signals in a plurality of cable channels and an output for passing a signal of any selected one of said channels;

a computer having input means for receiving any of a plurality of control signals from the TV viewer remote, output means for controlling said tuner to pass said signal of said any selected one of said channels in response to one of said plurality of control signals from said TV viewer remote and means for receiving and storing a scroll input picture image signal containing local program guide data and for generating a scroll output picture image signal consisting of at least a portion of said scroll input picture image signal; and

means for superimposing said output picture image signal over said passed signal to provide a display signal for input to the viewer's display screen,

said computer being responsive to control signals from said remote to cause said superimposing means to change the percentage of transparency of said output picture image signal in relation to said passed signal.

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**5,502,505**

**SPECIAL EFFECT VIDEO APPARATUS FOR ACHIEVING EXTENDED DIMMING AND FADING EFFECTS**

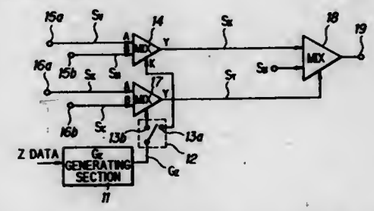
**Tetsuro Nakata, and Motomu Ueta, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan**

**Filed Mar. 29, 1994, Ser. No. 219,709**

**Claims priority, application Japan, Mar. 30, 1993, 5-093858**

**Int. Cl.[6] H04N *5/265;5/275;* G06F *15/00***

**U.S. Cl. 348—595** **4 Claims**



1. A video special effect apparatus for processing a special effect on an image corresponding to an input video signal, comprising:

mix control signal generating means for generating a mix control signal based on depth data determined according to the video signal;

first mixing means for receiving the video signal and a matte signal showing a predetermined color and for changing a mixing rate of the video signal and the matte signal according to the mix control signal and outputting an output signal corresponding to the image subjected to an extended dim effect, the output signal representing the predetermined color when the video signal is identical to the matte signal; and

second mixing means for receiving a background signal showing a background and the output signal of the first mixing means and for changing a mixing rate of the background signal and the output signal of the first mixing means according to a key signal.

## 5,502,506
## APPARATUS FOR EQUALIZING TELEVISION SIGNALS WITH FAST CONVERGENCE

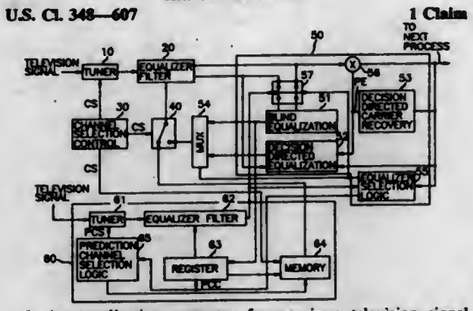
**Young-Bae Choi, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea**

**Filed Nov. 4, 1994, Ser. No. 334,295**

**Claims priority, application Rep. of Korea, Nov. 4, 1993, 93-23325**

**Int. Cl.[6] H04N 5/21**

**U.S. Cl. 348—607** **1 Claim**




1. An equalization apparatus for use in a television signal receiving system having a tuner for receiving a television signal from a selected channel, which comprises:

first equalizer filter means for receiving the television signal from the tuner and for equalizing the television signal by using a plurality of equalizer coefficients in order to generate a equalized television signal;

first coefficient update means for receiving the equalized television signal and fir generating first updated coefficients, including:

a blind equalization means responsive to the equalized television signal for generating first coarsely updated coefficients and responsive to a equalized prediction television signal for generating second coarsely updated coefficients;

a decision directed equalization means responsive to the equalized television signal for generating finely updated coefficients; and

first control means responsive to the equalized television signal for evaluating a mean square error thereof and, when the mean square error is identical to or smaller than a predetermined error value, for generating the finely updated coefficients as the first updated coefficients;

second coefficient update means for generating second updated coefficients, including:

prediction channel selection means responsive to a first control signal for generating a prediction television signal of a selected prediction channel;

second equalizer filter means for receiving the prediction television signal and for equalizing the prediction television signal by using the plurality of equalizer coefficients in order to generate a equalized prediction television signal wherein the plurality of equalizer coefficients are replaced by the second coarsely updated coefficients;

second control means responsive to the equalized prediction television signal for evaluating a mean square error thereof and, when the mean square error is identical to or smaller than a predetermined error value, for generating the first control signal; and

means responsive to the first control signal for storing the second coarsely updated coefficients corresponding to the selected prediction channel and, a channel change operation of the television signal receiving system, for producing the second coarsely updated coefficients corresponding to a changed channel as the second updated coefficients; and

coupling means for providing the first updated coefficients to the first equalizer filter means and, at the channel change operation, for coupling the second updated coefficients to the first equalizer filter means.

## 5,502,507
## EQUALIZATION APPARATUS WITH FAST COEFFICIENT UPDATING OPERATION

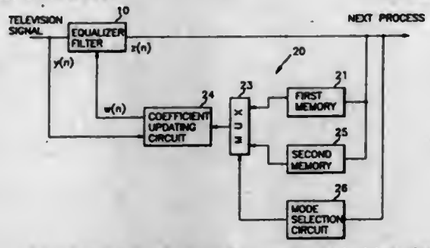
**Young-Sang Kim, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea**

**Filed Jan. 17, 1995, Ser. No. 373,153**

**Claims priority, application Rep. of Korea, Jan. 18, 1994, 94-756**

**Int. Cl.[6] H04N 5/21**

**U.S. Cl. 348—607** **2 Claims**




1. An equalization apparatus for use in a television signal receiving system, which comprises:

an equalizer filter having a set of filter coefficients for equalizing a received television signal distorted from an original signal having a plurality of original data samples in a transmission channel to produce a filtered signal, wherein the received television signal includes a plurality of data 10 samples and the filtered signal includes a corresponding plurality of filtered data samples;

first memory means for storing a set of coarse error values, each of the coarse error values representing the difference between a predicted filtered data sample and a predetermined value, and for generating, in response to a filtered data sample corresponding to said predicted filtered data sample, a first error signal representative of the corresponding coarse error value;

second memory means for storing a set of fine error values, each of the fine error values representing the difference between a predicted filtered data sample and a corresponding original data sample, and for generating, in response to a filtered data sample corresponding to said predicted filtered data sample and a control signal, a second error signal representative of the corresponding fine error value;

updating means for generating, in response to the received television signal and the first error signal, a set of coarsely updated filter coefficients as the set of filter coefficients for the equalizer filter, and for generating, in response to the received television signal and the second error signal, a set of finely updated filter coefficients as the set of filter coefficients for the equalizer filter; and

control means for generating the control signal when the mean square error of the filtered signal is identical to or smaller than a predetermined threshold value, to thereby couple the second error signal to the updating means.

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## 5,502,508
## GRADATION COMPENSATING APPARATUS FOR A VIDEO SIGNAL

**Minoru Kawabata, Sakai, and Atsuhisa Kageyama, Ibaraki, both of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Jun. 30, 1994, Ser. No. 268,302**

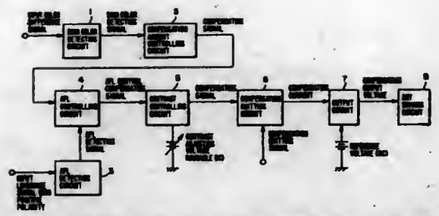
**Claims priority, application Japan, Jul. 28, 1993, 5-186051**

**Int. Cl.[6] H04N 9/64; 5/20**

**U.S. Cl. 348—652** **8 Claims**

1. A gradation compensating apparatus for a video signal comprising:





skin color detecting means for receiving an input color difference signal, for detecting a skin color portion of said input color difference signal and for outputting a skin color detecting signal;

compensation amount controlling means, responsive to said skin color detecting signal, for generating a first compensating signal for controlling compensation to said skin color;

APL detecting means for receiving an input luminance signal, for detecting an average picture level from said input luminance signal and for outputting an APL detecting signal;

APL controlling means for controlling the level of said first compensating signal responsive to said APL detecting signal and for outputting a second compensating signal;

output means for controlling said second compensating signal responsive to an inputted dc voltage and for outputting a compensating output voltage, and

CRT driving means for controlling brightness in a picture corresponding to said video signal by using said second compensating output voltage as a cutoff reference voltage, and wherein;

brightness of the skin color portion in said picture corresponding to said video signal is selectively increased.

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## 5,502,509
## CHROMINANCE-LUMINANCE SEPARATION METHOD AND FILTER PERFORMING SELECTIVE SPATIAL FILTER BASED ON DETECTED SPATIAL CORRELATION

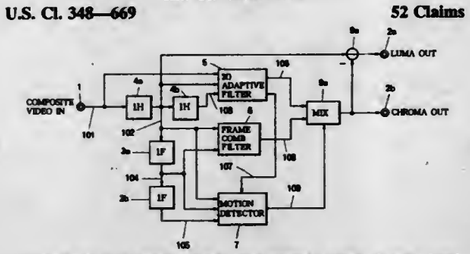
**Takuji Kurashita; Noriyuki Yamaguchi; Mitsuru Ishizuka; Junko Kijima; Hitoshi Hasegawa, and Masaharu Yao, all of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Jun. 21, 1994, Ser. No. 263,198**

**Claims priority, application Japan, Jun. 21, 1993, 5-174970; Jul. 6, 1993, 5-192879; Mar. 22, 1994, 6-076606**

**Int. Cl.[6] H04N 9/78**

**U.S. Cl. 348—669** **52 Claims**




1. A method of separating a chrominance signal from a luminance signal in a composite video signal in which said chrominance signal is superimposed on a high-frequency region of said luminance signal, comprising the steps of:

(a) detecting spatial correlation of said composite video signal along at least one axis;

(b) bandpass-filtering said composite video signal on one of only a horizontal axis and at least a vertical axis selected according to said spatial correlation to obtain a first chrominance signal;

(c) comb-filtering said composite video signal on a time axis to obtain a second chrominance signal;

(d) detecting a degree of motion in said composite video signal; and

(e) mixing said first chrominance signal and said second chrominance signal in proportion to the degree of motion detected in said step (d) to obtain an output chrominance signal.

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## 5,502,510
## METHOD FOR TEMPORAL FILTERING OF VIDEO SIGNALS USING A MOTION ADAPTIVE SPATIAL FILTER

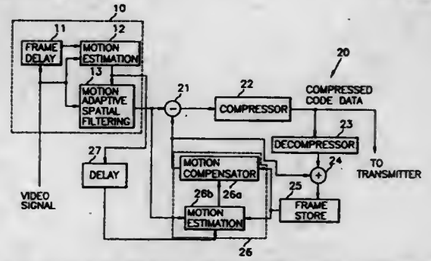
**Joog-Hoon Kim, Seoul, and Seong-Dae Kim, Daejeon, both of, Rep. of Korea, assignors to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea**

**Filed Sep. 19, 1994, Ser. No. 308,238**

**Claims priority, application Rep. of Korea, Sep. 17, 1993, 93-18870**

**Int. Cl.[6] H04N 7/13**

**U.S. Cl. 348—701** **2 Claims**




1. A method for filtering a video signal having a plurality of pixels with a predetermined temporal cutoff frequency to achieve a temporal band-limitation thereof, comprising the steps of:

(b1) calculating a plurality of spatial filter impulse responses in the frequency domain based on a plurality of predetermined candidate motion vectors and the temporal cutoff frequency;

(b2) determining a plurality of impulse responses in the spatial domain based on the spatial filter impulse responses in the frequency domain;

(b3) determining one of said candidate motion vectors as a motion vector which represents the motion for a current pixel;

(b4) selecting one of said impulse responses based on the determined motion vector, thereby performing a filtering operation for the current pixel in the video signal; and

(b5) repeating said steps (b3) to (b4) until all of the pixels in the video signal are processed.

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## 5,502,511
## METHOD AND APPARATUS FOR CONTROLLING EXPANDED SWEEPS

**Scott Nagel, Sioux Falls, S. Dak., assignor to Sencore, Inc., Sioux Falls, S. Dak.**

**Filed Dec. 5, 1994, Ser. No. 349,187**

**Int. Cl.[6] H04N 3/223**

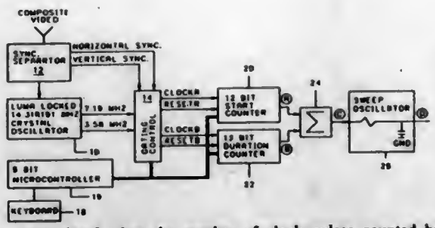
**U.S. Cl. 348—704** **7 Claims**

1. Apparatus for generating control signals for expanded sweeps in a television waveform monitor, said monitor being used to display portions of a standard television signal including horizontal and vertical sync pulses, comprising in combination

clock pulse generating means for producing a train of clock pulses at a predetermined rate,

means for synchronizing the occurrence of said clock pulses with the horizontal sync pulses of the waveform being monitored,

a preloaded start counter means for counting clock pulses applied thereto between a first reset signal and a first pulse count preloaded therein, and for producing a duration counter




start signal when the number of clock pulses counted has reached said first preloaded pulse count,

said preloaded start counter means producing said duration counter start signal having a first output level which occurs between said first reset signal and a different second output level,

a preloaded duration counter for counting clock pulses applied thereto between the beginning of said second output level of said duration start signal and the time when the number of clock pulses counted thereby has reached a second pulse count preloaded therein,

means for applying said duration counter start signal to said duration counter to initiate the counting of said clock pulses by said duration counter,

said duration counter producing an output signal having said first output level between the occurrence of said duration counter start signal and the time said preloaded second count in said duration counter is reached,

an exclusive or circuit having an output when only one or the other of a pair of predetermined input signal levels is applied to a pair of inputs thereof, for applying the outputs from said start and duration counter means to said exclusive or circuit to produce a sweep control signal starting at the occurrence of the duration start signal and ending at the time the duration counter has counted the number of clock pulses preloaded therein.

7. A method of producing control signals for an expanded sweep in a cathode ray tube type of a television video waveform monitor, comprising the steps of

generating a train of clock pulses at a frequency which is a multiple of the horizontal sweep frequency of a television waveform to be monitored,

selecting a portion of the television waveform to be displayed,

preloading into a first pulse counter the number of clock pulses which occur between a sync pulse of said waveform and the left edge of the selected portion to be displayed,

preloading into a second pulse counter the number of clock pulses which occur between the left and right edges of said selected portion of said television waveform,

producing a first control signal when the number of clock pulses counted by said first counter reaches said number preloaded into said first counter,

initiating counting by said second pulse counter when said first control is produced, and

producing a second control signal when the number of clock pulses counted by said second counter reaches said number preloaded into said second counter,

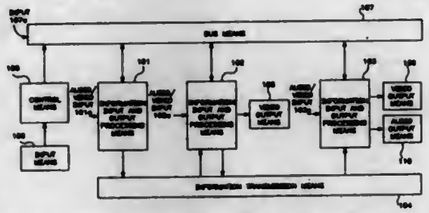
whereby, said first and second control signals occur respectively at the left and right edges of the selected portion of said television waveform.

## 5,502,512

## APPARATUS AND METHOD FOR DIGITAL VIDEO AND AUDIO PROCESSING A PLURALITY OF PICTURES AND SOUNDS

Toshihiro Toyoda, Moriguchi; Yoshihiro Mori, Hirakata, and Hidemasa Kitagawa, Toyonaka, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Mar. 28, 1994, Ser. No. 218,760
Claims priority, application Japan, Mar. 29, 1993, 5-069620
Int. Cl.[6] H04N 5/268
U.S. Cl. 348—706 11 Claims




1. An apparatus for digital video and audio processing comprising:

a plurality of information input and output (I/O) processors, each for receiving, providing, and processing at least one of video information and audio information,

information transmission means, coupled to each one of the plurality of information I/O processors, for transmitting the video information and the audio information between adjacent information I/O processors in only one direction from a preceding information I/O processor to subsequent information I/O processors,

control means for controlling each one of the plurality of information I/O processors,

bus means, coupled to the plurality of information I/O processors and to the control means, for transferring at least one of video information, audio information, and control information between the control means and the plurality of information I/O processors and between the plurality of information I/O processors, and

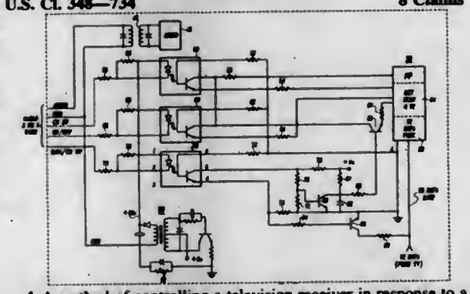
output means, coupled to respective ones of the plurality of information I/O processors, for providing one of (a) a video output and (b) an audio output from a respective one of the plurality of information I/O processors.

## 5,502,513

## THREE WIRE TELEVISION REMOTE CONTROL OPERABLE WITH KEY CLOSURES OR DATA PULSES

Robert E. Mudra, 2157 Walnut Ct., Glenview, Ill. 60025

Filed Dec. 27, 1994, Ser. No. 364,649
Int. Cl.[6] A04N 5/44
U.S. Cl. 348—734 8 Claims



4. A method of controlling a television receiver in response to a key closure or data pulses received from a remote location over a pair of wires, said key closure having a substantially longer duration than said data pulses comprising:



receiving said key closure and said data pulses;

decoding said data pulses with a microprocessor programmed to ignore said key closure;

detecting said key closure with a timing circuit including a charging capacitor that charges during voltage conditions on said wires that correspond to said key closure and said data pulses;

discharging said capacitor in the absence of said key closure and said data pulses by operating a transistor in the absence of said voltage conditions; and

operating key closure identification circuitry in response to said timing circuit.

8. In combination with a television receiver operable in response to data pulses or a key closure communicated over a pair of wires comprising:

means for receiving said key closure and said data pulses, said key closure being of longer duration than said data pulses;

microprocessor means for decoding said data pulses and for ignoring said key closure;

timing means including a capacitor that is charged in the presence of voltage conditions on said wires corresponding to the presence of said key closure or said data pulses and discharged in the absence thereof for detecting said key closure;

a transistor having its output coupled across said capacitor, said transistor being normally conductive in the absence of said voltage conditions on said wires; and

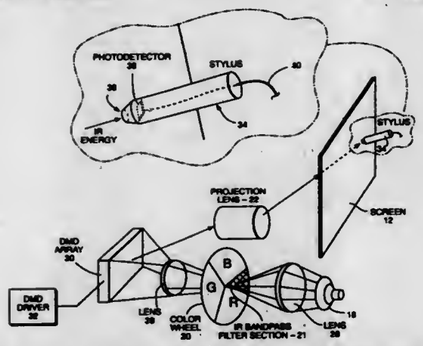
key closure identification means operated in response to said timing means.

## 5,502,514

## STYLUS POSITION SENSING AND DIGITAL CAMERA WITH A DIGITAL MICROMIRROR DEVICE

James H. Vogeley; Arthur W. Vogeley, both of Yorktown, and Giles K. Davis, Newport News, all of Va., assignors to nView Corporation, Newport News, Va.

Filed Jun. 7, 1995, Ser. No. 475,996
Int. Cl.[6] H04N 5/74
U.S. Cl. 348—771 24 Claims




1. An apparatus for sensing position of a stylus relative to a projected image where a digital micromirror device (DMD) array is used for projecting said image upon a surface, said DMD array including a plurality of controllable pixel mirrors, said image created by directing light from a first light source onto said DMD array which controllably reflects said directed light through an optical system onto said surface, said image comprised of a plurality of sequentially projected frame images where there is a finite time duration between successive projected frame images, said apparatus comprising:

a second light source and a means for illuminating said surface with light from said second light source;

said stylus including a reflector for reflecting said second light source light from said surface back towards said surface;

energizing means for scanning by selectively energizing said plurality of controllable pixel mirrors during said finite duration between successive projected frame images;

a detecting means for detecting the presence of said reflected second source light on said surface when reflected by at least one of said controllable pixel mirrors; and

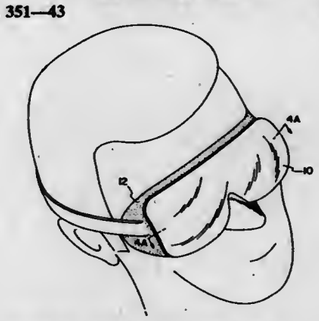
address means, responsive to said detecting means and said energizing means, for providing a stylus position output when said detecting means detects said reflected second source light from said surface during said finite duration.

## 5,502,515

## DIVING MASK

Salvatore N. Sansalone, 12 Paradise Gardens, Bramalea, Ontario, Canada

Continuation-in-part of Ser. No. 606,457, Oct. 31, 1990, Pat. No. 5,204,700, which is a continuation-in-part of Ser. No. 276,470, Nov. 25, 1988, abandoned. This application Apr. 15, 1993, Ser. No. 47,131
The portion of the term of this patent subsequent to Jul. 20, 2010, has been disclaimed.
Int. Cl.[6] G02C 1/00
U.S. Cl. 351—43 20 Claims




1. An underwater vision device, comprising:

a) a supporting member arranged for sealing engagement with the face of a user;

b) a lens means mounted in said supporting member, said lens means having an optical surface;

c) said lens means being generally curved so that multiple radii of curvature are incorporated on said optical surface such that the radius of curvature changes progressively with increasing distance away from one or more points on said optical surface; and

d) the radius of curvature increasing progressively with increasing distance away from one or more predetermined central points on said optical surface in order to reduce overall lens distortion.

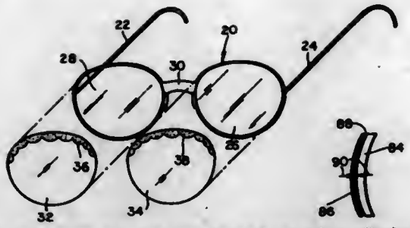
## 5,502,516

## DISPOSABLE/REUSABLE SUN FILTER

Warren B. Elterman, 200 Middle Neck Rd., Sands Point, N.Y. 11050

Filed Mar. 11, 1994, Ser. No. 212,196
Int. Cl.[6] G02C 9/00
U.S. Cl. 351—47 26 Claims

1. A light shield adapted for being mounted on a two-sided ocular lens, said shield comprising a relatively thin but rigid body of light permeable material, and means interposed between said body and one side of the lens to mount the shield on said lens in light intercepting relationship relative to the eye of a user of said




lens, said means including opposite surfaces and an adhesive on each of said surfaces, said adhesives being of different adhesive strengths, one of said adhesives beings adapted to stick to said shield in relatively permanent manner.

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**5,502,517**

**SOFT CONTACT LENS WITH A BACK SURFACE WHOSE CENTRAL AND INTERMEDIATE PORTIONS ARE FORMED BY DIFFERENT ELLIPSOIDAL SURFACES CONTINUOUSLY CONTIGUOUS TO EACH OTHER**

**Naoki Anan, Inuyama; Bungo Takagi, Niwa, and Kazuya Miyamura, Nagoya, all of, Japan, assignors to Menicon Co., Ltd., Japan**

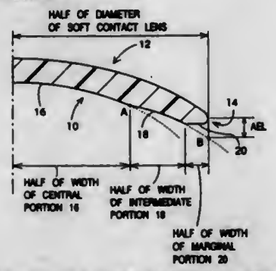
**PCT No. PCT/JP93/01546, § 371 Date Apr. 26, 1994, § 102(e) Date Apr. 26, 1994, PCT Pub. No. WO94/10599, PCT Pub. Date May 11, 1994**

**PCT Filed Oct. 26, 1993, Ser. No. 232,035**

**Claims priority, application Japan, Jan. 27, 1992, 4-312969; Jan. 25, 1993, 5-266438**

**Int. Cl.[6] G02C *7/04***

**U.S. Cl. 351—160 H** **10 Claims**




1. A soft contact lens having a back surface which is to face a cornea, a front surface which cooperates with said back surface so as to provide a desired degree of dioptric power of the lens, and a connecting surface for continuously connecting said back and front surfaces of said lens to each other, said soft contact lens being characterized in that:

said back surface is constituted by: a central portion which is to contact said cornea and serves as an optical lens portion, said central portion being formed by an ellipsoidal surface with an eccentricity in the range of 0.2–0.7, and a vertex radius of curvature in the range of 5.00–10.00 mm; an intermediate portion which is to contact said cornea and is located at the periphery of said central portion so as to surround said central portion, said intermediate portion being formed by another ellipsoidal surface with an eccentricity in the range of 0.2–0.7, at least one of the eccentricity and a vertex radius of curvature of said ellipsoidal surface of said intermediate portion being different from that of said ellipsoidal surface of said central portion; and a marginal portion which is located around the periphery of said intermediate portion and formed so that said marginal portion is spaced away from said cornea such that an axial clearance between said cornea and said back surface of said contact lens increases with an increase in a distance of said marginal portion from said intermediate portion in a radially outward direction, said central, intermediate and marginal portions being continuously contiguous to each other to provide said back surface of said lens.

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**5,502,518**

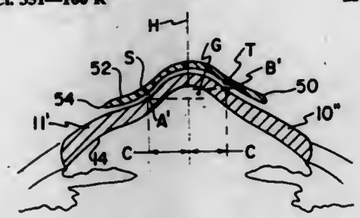
**ASYMMETRIC ASPHERIC CONTACT LENS**

**David M. Lieberman, 300 E. 51st. St., New York, N.Y. 10022**

**Filed Sep. 9, 1993, Ser. No. 119,351**

**Int. Cl.[6] G02C *7/04***

**U.S. Cl. 351—160 R** **23 Claims**




1. A contact lens for use on a patient's eye with an asymmetric aspheric cornea, said lens having: an anterior surface, a posterior surface and a base, said posterior surface comprising a peripheral portion, which is asymmetric and aspherical and at least coextensive with the base of said lens;

said peripheral portion asymmetrically and aspherically matching a corresponding peripheral portion of the cornea which lies under said peripheral portion of the lens when the lens is worn in the patient's eye; and

said contact lens is not substantially greater in diameter than said cornea.

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**5,502,519**

**OPTOMETRIC APPARATUS**

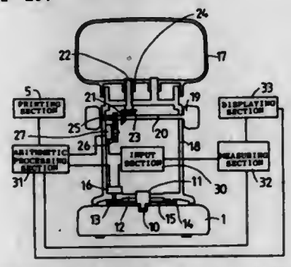
**Yoshinobu Hosoi, Gamagori, Japan, assignor to Nidek Co., Ltd., Japan**

**Filed Dec. 20, 1993, Ser. No. 168,998**

**Claims priority, application Japan, Jan. 12, 1993, 5-020483**

**Int. Cl.[6] A61B *3/10***

**U.S. Cl. 351—204** **13 Claims**




1. An optometric apparatus for measuring optical characteristics of an eye to be examined comprising:

moving means for moving measuring section to adjust alignment with an eye to be examined;

first deviation amount detecting means for detecting deviation amount of the measuring section in a lateral direction relatively to the eye at the time of measuring each of a left eye and a right eye to be examined;

second deviation amount detecting means for detecting deviation amount of the measuring section in a vertical direction relatively to the eye to be examined at the time of measuring each of a left eye and a right eye to be examined; and

correcting means for correcting data about an angle of astigmatic axis of the eye measured by the measuring section, based on the result detected by the first deviation detecting means and the second deviation detecting means.



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**5,502,520**

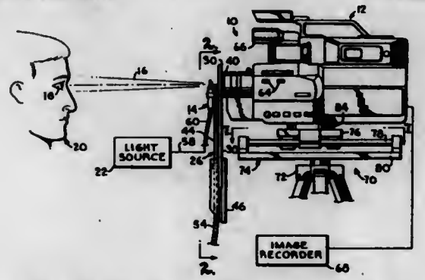
**METHOD AND APPARATUS FOR DETECTING EYE DISORDERS**

**Gerhard W. Cibis, 1268 W. 57th St., Kansas City, Mo. 64113, and Thomas P. Luke, 3721 SW. Harbor Clr., Lee's Summit, Mo. 64082**

**Filed Dec. 3, 1993, Ser. No. 162,865**

**Int. Cl.[6] A61B *3/14;3/00***

**U.S. Cl. 351—206** **12 Claims**




1. A medical device for recording images of a light beam reflected off of the eyes of a patient, the device comprising:

a video image recorder for recording real time video of the eyes of the patient and including a lens for focusing a video image onto a recording medium;

a light emitting device coupled with the video image recorder for directing a beam of light into the eyes of the patient; and

means for movably mounting the light device on the video image recorder to allow the beam of light to be directed from variable positions within a field of the lens so that light reflected from the patient's eyes and recorded onto the recording medium travels along a path generally coincident with that of the beam of light.

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**5,502,521**

**OPHTHALMOMETRIC APPARATUS**

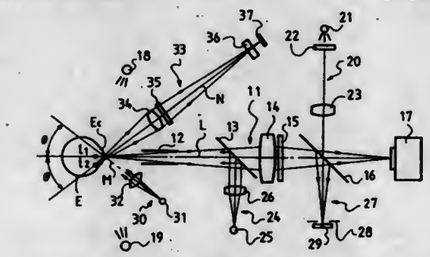
**Kouki Katou, Anjo, Japan, assignor to Nidek Co., Ltd., Japan**

**Filed Apr. 26, 1994, Ser. No. 223,298**

**Claims priority, application Japan, Apr. 30, 1993, 5-128356; May 31, 1993, 5-154419**

**Int. Cl.[6] A61B *3/10;3/14***

**U.S. Cl. 351—221** **17 Claims**




1. An ophthalmometric apparatus comprising an eyeball observing means for observing the front part of the eyeball, a measuring means, and a measuring means moving means for moving the measuring means relative to the eyeball;

the improvement comprising:

a first optical index forming system that projects a light beam along the optical axis of the eyeball observing means to form a first alignment index in the eyeball;

a first optical index detecting system that detects the position of the first alignment index on the basis of the light that travels along the optical axis of the eyeball observing means;

a second optical index forming system that projects a light beam on the eyeball along an optical axis inclined at an angle to the optical axis of the eyeball observing means to form a second alignment index in the eyeball;

a second optical index detecting system that detects the position of the second alignment index and has an optical axis in a substantially mirror image relation with the optical axis of the second optical index forming system with respect to the optical axis of the eyeball observing means;

a correction calculating means that calculates distance information about the distance between the eyeball and the eyeball observing means represented by the output of the second optical index detecting system, on the basis of the output of the first optical index detecting system; and

a display means that displays distance information provided by the correction calculating means and representing the distance between the eyeball and the eyeball observing means in the observation field of the eyeball observing means.

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**5,502,522**

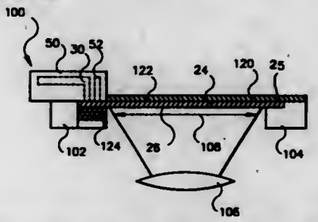
**COMPACT MAGNETIC HEAD FOR A PHOTOGRAPHIC CAMERA**

**Dennis F. Cullum, Leucadia, Calif., and Fernando G. Silva, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed May 12, 1994, Ser. No. 241,535**

**Int. Cl.[6] G03B *17/24***

**U.S. Cl. 354—106** **2 Claims**




1. A magnetic head for a camera for use with a moving filmstrip having a magnetic-memory region, wherein said head comprises a first track-forming portion for at least reading information from the magnetic-memory region of said filmstrip, a second track-forming portion for writing information onto the magnetic-memory region of said filmstrip, and a core having a major dimension including spaced areas for allowing wire coils to be wound thereon, is characterized in that:

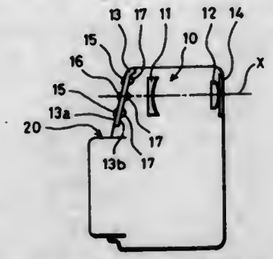
the major dimension of the core extends in a direction perpendicular to the direction of travel of the moving filmstrip and is parallel to the plane of the filmstrip, wherein the first track-forming portion is positioned farther from a photographic image area of the filmstrip than the second track-forming portion.

5,502,523

## INVERTED GALILEAN FINDER FOR CAMERA

Kazunori Ohno, and Yasuhiko Tanaka, both of Saitama, Japan, assignors to Fuji Photo Optical Co., Ltd., Saitama, Japan

Filed Sep. 8, 1994, Ser. No. 303,154
Claims priority, application Japan, Sep. 9, 1993, 5-248743
Int. Cl.[6] G03B 13/02
U.S. Cl. 354—219 10 Claims




1. An inverted Galilean finder incorporated in a camera comprising:

an optical system including a objective lens and an eyepiece; and

a transparent cover plate disposed in front of said objective lens, said transparent cover plate having a front surface on an object side on which a framing marking indicative of an exposure area in the field of view is formed and a back surface on which a lens for diopter adjustment is formed correspondingly in position to said framing marking.

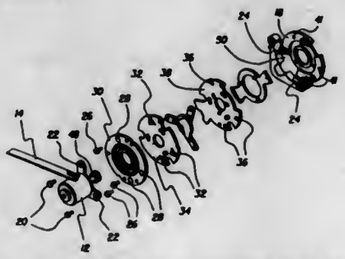
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5,502,524

## APERTURE/SHUTTER MECHANISM WITH DAMPING MEMBER

Robert A. Bovenzi, Rochester; Jean F. Depatie, Albion, and Michael D. Dunn, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 27, 1993, Ser. No. 144,171
Int. Cl.[6] G03B 9/08;9/58
U.S. Cl. 354—230 4 Claims



1. An aperture/shutter mechanism comprising one or more shutter blades moveable between an open position and a closed position, is characterized by:

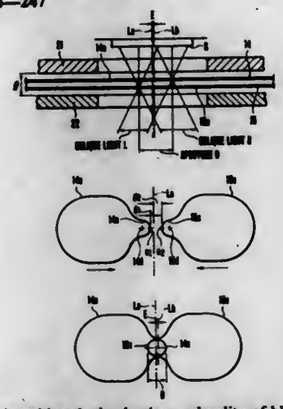
at least one damping member having a damping surface in continuous frictional contact with at least a portion of a surface of said one or more shutter blades to reduce oscillation of said one or more shutter blades during movement between said open and closed positions, wherein said one or more shutter blades define an aperture when moved to said open position, and said damping member has an aperture aligned with said aperture defined by said one or more shutter blades.

5,502,525

## SHUTTER BLADES FOR INCREASING UNIFORMITY OF OBLIQUE INCIDENT LIGHT

Yoshiyuki Minogechi, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 855,420, Mar. 23, 1992, abandoned.
This application Apr. 18, 1994, Ser. No. 229,395
Claims priority, application Japan, Mar. 27, 1991, 3-062903; Mar. 27, 1991, 3-062904
Int. Cl.[6] G03B 9/40
U.S. Cl. 354—247 4 Claims



1. A photographing device having a plurality of blades disposed one after another in an overlapping manner in the direction of an optical axis of a photo-taking lens, with an exposing aperture part for high luminance included in an exposing aperture hole formed in each of said blades, and performing exposure control for an exposure surface by driving and moving said blades relative to each other in the direction of traversing the optical axis, characterized in that:

fore end positions, relative to the optical axis, of said exposing aperture parts for high luminance included in said exposing aperture holes formed respectively in said blades are arranged to be located farther away from the optical axis accordingly as said blades are located farther away from the exposure surface, and wherein the exposing aperture holes are arranged to adjust an amount of light incident through said photo-taking lens.

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5,502,526

## CAMERA

Yuji Katano, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 219,854, Mar. 30, 1994, abandoned, which is a continuation of Ser. No. 973,750, Nov. 9, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 483,967
Claims priority, application Japan, Nov. 20, 1991, 3-305043
Int. Cl.[6] G03B 17/02
U.S. Cl. 354—288 8 Claims

1. A camera comprising:

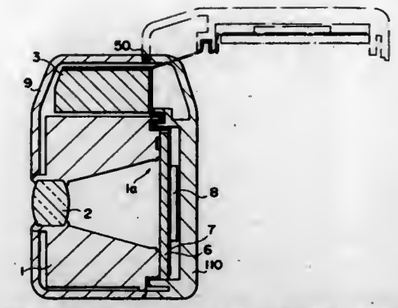
a camera body having a film exposure portion, a cartridge chamber provided apart from said film exposure portion, and an opening at a rearward portion of said camera body, wherein film is adapted to be forwarded in the body in a film forwarding direction,

a light blocking member, separate from said camera body that closes said opening, said light blocking member having an edge portion extending in a direction parallel to said film forwarding direction,

a first electrical circuit being supported on said light blocking member,

a second electrical circuit, separate from said first electrical circuit, being housed within said camera body, and,






a resilient wiring member electrically connecting together said first electrical circuit and said second electrical circuit,

wherein said wiring member is wired through said edge portion of said light blocking member, and said light blocking member being rotatable between a closed position, in which said opening is closed, and an open position, in which said opening is opened, deforming said wiring member.

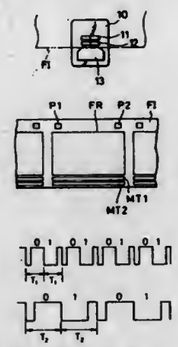
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5,502,527

## CAMERA CAPABLE OF MAGNETIC RECORDING

Kazuyuki Kazami, Tokyo; Hideo Hibino, Kawasaki; Norikazu Yokonuma, Yokohama; Youichi Yamazaki, Kawasaki, and Junichi Yanai, Chigasaki, all of, Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 214,632, Mar. 18, 1994, abandoned.
This application Dec. 23, 1994, Ser. No. 364,395
Claims priority, application Japan, Mar. 19, 1993, 5-060418
Int. Cl.[6] G03B 17/24
U.S. Cl. 354—106 20 Claims




17. A recorder capable of magnetically recording information on a first magnetic recording region and a second magnetic recording region provided on a film, comprising:

a signal generating circuit which generates a first recording signal having a first frequency for information including at least data and clock information which is to be recorded on said first magnetic recording region, and which generates a second recording signal having a second frequency which is lower than said first frequency for information including at least data and clock information which is to be recorded on said second magnetic recording region; and

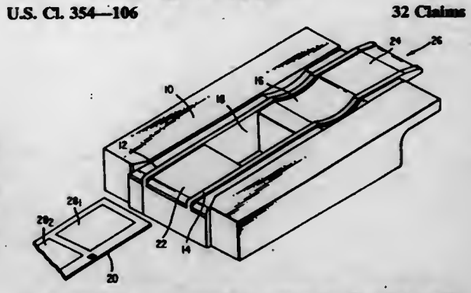
a recording device which, in synchronization with the feeding of the film, records information using said first recording signal on said first magnetic recording region, and records information using said second recording signal on said second magnetic recording region.

5,502,528

## MAGNETICS-ON-FILM IMAGE AREA RECORDING HEAD AND INTERFACE

Wlodzimierz S. Czarnecki, Santa Fe; George W. Brock, La Jolla; Kent R. Gandola, Carlsbad; Joseph de Lellis, Escondido, and Christopher P. Mencher, Encinitas, all of Calif., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 2, 1994, Ser. No. 333,532
Int. Cl.[6] G03B 17/24
U.S. Cl. 354—106 32 Claims




1. A magnetic record/reproduce system for recording and/or reproducing information in relation to image frames of a photographic filmstrip in a substantially transparent magnetic layer on a surface of the photographic filmstrip, the filmtrip having a cross-curvature in the cross film direction across the width of said filmstrip, comprising:

means for defining an elongated filmstrip transport path tending to straighten and flatten said filmstrip to conform with a film plane and having a record/reproduce cavity therein;

means for advancing the filmstrip in a film transport direction in said film plane from a filmstrip supply to a filmstrip takeup and through said record/reproduce cavity, whereby said filmstrip extending across said cavity exhibits cross-curvature in said film plane;

a magnetic head for contacting the magnetic layer for recording or reproducing information, said magnetic head having a contoured profile in said cross film direction conforming with said filmstrip cross-curvature for ensuring elastic compliance of the cross-curvature of said filmstrip with said elongated magnetic head; and means for positioning said magnetic head with respect to said filmstrip transport path and said record/reproduce cavity to penetrate said film plane and divert said filmstrip, whereby said filmstrip is diverted in said record/reproduce cavity and wraps around said magnetic head in compliance with said head in the film transport and cross film directions.

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5,502,529

## METHOD OF RECYCLING SINGLE-USE CAMERA

Dennis R. Zander, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

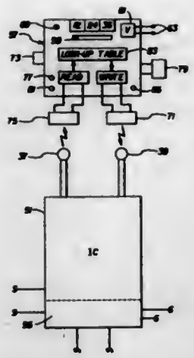
Filed Feb. 14, 1995, Ser. No. 388,645
Int. Cl.[6] G03B 15/05;17/18;29/00
U.S. Cl. 354—127.1 13 Claims

1. A method of recycling a single-use camera after a function of the camera has been purposefully disabled to prevent unauthorized reuse of the camera, comprising inputting a reset code to the camera to re-enable the function that has been disabled to permit authorized reuse of the camera, is characterized further by:

inputting a start code to the camera before the reset code is to be inputted to the camera to condition the camera for testing;

testing the camera to determine whether the camera is reusable; and

preventing the reset code from being inputted to the camera when testing the camera indicates the camera is not reusable.



5,502,530

**CAMERA USING SINGLE MOTOR TO DRIVE A FLASH ILLUMINATION-ANGLE VARYING MECHANISM AND OTHER CAMERA OPERATIONS**

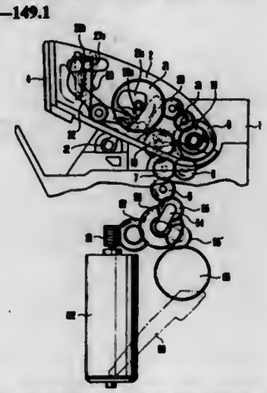
**Shoji Kaihara, and Hidehiko Fukahori, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Division of Ser. No. 798,641, Nov. 26, 1991, Pat. No. 5,384,612. This application Oct. 31, 1994, Ser. No. 331,820**

**Claims priority, application Japan, Nov. 29, 1990, 2-332682; Nov. 29, 1990, 2-332683; Nov. 29, 1990, 2-332685**

**Int. Cl.[6] G03B *15/05***

**U.S. Cl. 354—149.1** **6 Claims**



1. A camera including a flash unit, said camera comprising:

(a) an illumination-angle varying mechanism for varying a flash illumination angle by moving an optical element in a predetermined direction within said flash unit;

(b) a motor, disposed in a camera body, rotatable in a first direction and in a second direction;

(c) a clutch for switching a drive transmission in accordance with a switching of a direction of rotation of said motor;

(d) a first transmission system for transmitting a rotation of said motor to said illumination-angle varying mechanism in accordance with a switching of said clutch caused by a rotation of said motor in the first direction; and

(e) a second transmission system for transmitting a rotation of said motor to a camera-operating mechanism other than a flash unit operating mechanism in accordance with a switching of said clutch caused by a rotation of said motor in the second direction.

5,502,531

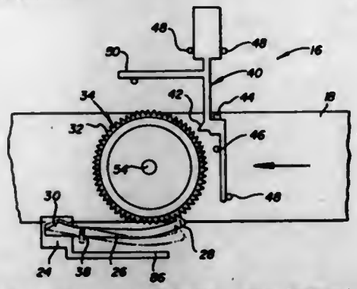
**CAMERA WITH EXPOSURE COUNTING MECHANISM**

**Stanley W. Stephenson, III, Spencerport, and Tom Seamans, Corfu, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Feb. 15, 1995, Ser. No. 388,932**

**Int. Cl.[6] G03B *17/36***

**U.S. Cl. 354—217** **10 Claims**



1. A photographic camera including a camera body and a shutter button moveable relative to the camera body for actuating film exposure, and being of the type wherein a frame counter is adapted to provide respective visible indications corresponding to successive frames of exposed filmstrip as each one of the frames is exposed in a film passageway that leads from a film supply spool to a film take-up spool, the camera characterized by:

a counter wheel having a plurality of ratchet teeth about its periphery; said ratchet teeth corresponding to the advance of said filmstrip;

a holding lever including a pawl for engaging said ratchet teeth when film is present in the camera and for disengaging said ratchet teeth when film is not present in the camera; and

an advancing lever in communication with said shutter button for incrementally rotating said counter wheel in response to shutter button actuation.

5,502,532

**METHOD AND SYSTEM FOR PROCESSING FILM BY SPEED AND ACTIVATING AGENT CONCENTRATION TEMPERATURE CONTROL**

**Mark G. Biesinger, 2481 Hartford St., Salt Lake City, Utah 84106, and Matthew M. Biesinger, 1016 E. 900 South, Apt. #4, Salt Lake City, Utah 84105**

**Filed May 23, 1994, Ser. No. 248,141**

**Int. Cl.[6] G03D *13/00***

**U.S. Cl. 354—298** **18 Claims**

1. A method for developing a heat processed type photographic emulsions film having a base side opposite an emulsions side, and a leading end opposite a trailing end, the method comprising the steps of:

sensing a signal output from a temperature sensing means for sensing the temperature within a development compartment, the signal being proportional to the temperature of the development compartment;

converting the signal output from the means for sensing the temperature of the development compartment into a series of corresponding digital signals for the temperature of the development compartment;

comparing the series of corresponding digital signals for the temperature of the development compartment with a predetermined development compartment temperature range;

deriving a controller output signal for the development compartment as a function of time, the predetermined development compartment temperature range, and the series of corresponding digital signals for the temperature of the development compartment using the PID equation;

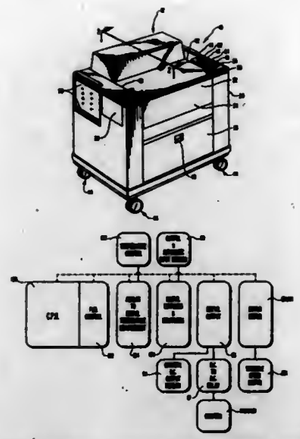
applying power to a means for heating the development compartment proportional to the derived controller output signal for the development compartment while the temperature of the development compartment is below the predetermined development compartment temperature range, and removing power applied to the means for heating the development compartment proportional to the derived controller output signal for the development compartment while the temperature of the development compartment is above the predetermined development compartment temperature range;

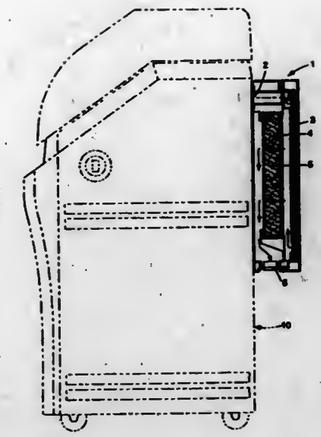
moving the film at a predetermined decreasing rate sequence from an initial film moving rate into and through the development compartment, the portion of the film within the development compartment being free from contact within the development compartment;

moving the film into a cooling compartment at an entrance of the cooling compartment immediately after the development compartment; and

cooling the portion of the film in the cooling compartment to a temperature substantially below the predetermined development compartment temperature range.







5,502,534

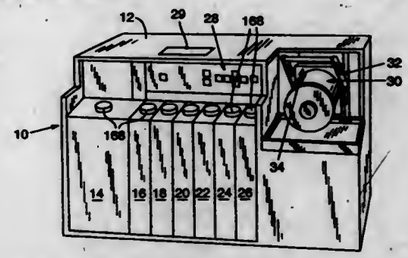
**AUTOMATED PHOTO DEVELOPING MACHINE**

**Marine D. Lynch, Beaverton; James W. Bernklau, Tigard; Corey L. Davis, Beaverton; Raymond J. Easton, Portland; Robert E. Lach, and Richard D. Paulson, both of Beaverton, all of Oreg., assignors to Wing-Lynch, Inc., Beaverton, Oreg.**

**Filed Sep. 16, 1994, Ser. No. 307,268**

**Int. Cl.[6] G03D *3/02***

**U.S. Cl. 354—323** **22 Claims**



1. An apparatus for developing sensitized photographic material in selected chemical processing solutions taken from solution storage tanks, comprising:

a light-tight canister having a mounting surface and defining a cavity for holding the material to be developed, the mounting surface including at least one opening to admit chemicals therein;

the canister further including a light-tight shutter assembly in the mounting surface, which may be opened when the canister abuts an injection surface, thereby exposing the canister cavity to injection nozzles;

a central shaft extending substantially along an axial length of the canister;

a manifold injection structure, including a plurality of injection nozzles through which chemical processing solutions are injected into the canister cavity, having an injection surface against which the canister mounting surface is selectively mounted in a light- and fluid-tight fit;

a valving structure for controlling delivery under pressure of selected chemical processing solutions to the manifold injection structure; and

a drain assembly located adjacent the manifold injection structure for draining spent chemicals out of the canister.

5,502,533

**FILTER FOR PHOTOTHERMOGRAPHIC DEVELOPER**

**Robert M. Biegler, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Continuation of Ser. No. 322,977, Oct. 13, 1994. This application Jun. 6, 1995, Ser. No. 468,526**

**Int. Cl.[6] G03D *7/00***

**U.S. Cl. 354—300** **4 Claims**

1. A thermal developing unit for the thermal development of photothermographic media which comprises a means for thermally developing photothermographic media by placing said media in contact with a heated element within a case, and a filter system comprising

a) an inlet through which hot processing gases are directed to,

b) a heat conducting, condensate accumulator,

c) a particulate filter located at or after the exit of the heat conducting, condensate accumulator and upstream from,

d) an absorbent block, and

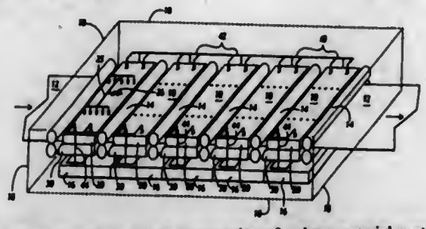
e) an exit through which the filtered air leaves the filtering system.

5,502,535

## METHOD AND APPARATUS FOR PROCESSING PHOTOSENSITIVE SHEET MATERIAL

Basavaraj R. Desai, Knoxville, Tenn., assignor to Picture Productions, Knoxville, Tenn.

Filed Aug. 18, 1994, Ser. No. 292,515
Int. Cl.[6] G03D 3/02
U.S. Cl. 354—324 32 Claims



1. Apparatus for use in the processing of a sheet material coated on at least one side thereof with a photosensitive emulsion, the apparatus comprising:

top and bottom plates relatively aligned to provide a sheet processing chamber between a roof structure respective to said top plate and a floor structure respective to said bottom plate, a sheet material traveling plane passing through said processing chamber along a traveling direction, said processing chamber including a plurality of process fluid flow channels disposed across said processing chamber in an alternating manner between a plurality of ridge lines substantially parallel with said traveling plane and substantially transverse of said traveling direction, each of said top and bottom plates defining a process fluid supplier and a process fluid receiver, each of said process fluid suppliers being disposed along side said processing chamber and along one edge of said sheet material traveling plane, each of said process fluid receivers being disposed along side said processing chamber and along an opposite edge of said sheet material traveling plane; and,

a process fluid circulation means for withdrawing process fluid from each of said process fluid receivers and delivering said fluid to each of said process fluid suppliers.

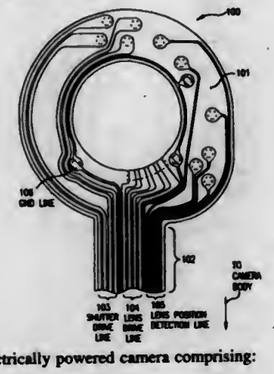
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5,502,536

## ELECTRICALLY POWERED CAMERA

Tatsuo Arasuma, Saitama; Nobuhiko Terui; Hidenori Miyamoto, both of Chiba, and Junichi Omi, Kanagawa, all of, Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Jan. 20, 1995, Ser. No. 375,722
Claims priority, application Japan, Jan. 20, 1994, 6-004889
Int. Cl.[6] G03B 3/10;5/00;7/00
U.S. Cl. 354—400 20 Claims




1. An electrically powered camera comprising:

a detection device that outputs detection signals on a detection signal line;

an electrically powered camera mechanism;

a control device that generates control signals on a control signal line based on the detection signals provided from said detection device, said control device coupled to said detection device by said detection signal line;

a driving device that generates driving signals on a drive signal line based on said control signals provided from said control device, said driving device coupled to said control device by said control signal line and coupled to said camera mechanism by said drive signal line; and

a low impedance line located between the drive signal line and at least one of said detection signal line and said control signal line.

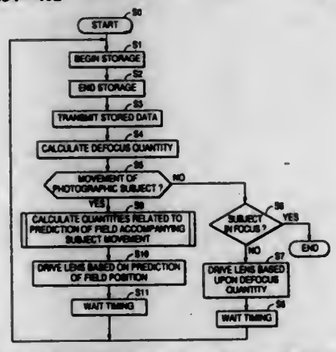
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5,502,537

## FOCUS ADJUSTMENT DEVICE HAVING PREDICTIVE FUNCTION

Ken Utagawa, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Oct. 19, 1993, Ser. No. 138,007
Claims priority, application Japan, Jan. 19, 1992, 4-279951
Int. Cl.[6] G03B 13/36
U.S. Cl. 354—402 19 Claims




1. A focus adjustment device having a predictive function, comprising:

(a) a photographic lens;

(b) an imaging surface on which an image of a photographic subject is formed;

(c) a focus detection surface;

(d) a defocus detection device to detect a relative displacement of the imaging surface from the focus detection surface and to intermittently output a defocus quantity indicating an amount of the relative displacement;

(e) a lens drive unit to drive the photographic lens to a focused state based upon the defocus quantity output by the defocus detection device;

(f) a first calculation unit to determine a first quantity related to movement speed of the photographic subject based upon defocus quantities output by the defocus detection device during a time period which is greater than a predetermined time period $T_{m}$;

(g) a second calculation unit to determine a second quantity related to movement speed of the photographic subject based upon defocus quantities output by the defocus detection device during a time period which is shorter than the predetermined time period $T_{m}$;

(h) a parameter calculating unit to generate a parameter to determine the appropriateness of the first and second quantities with respect to predicting a photographic field position; and

(i) a control unit to control the lens drive unit, based on the parameter generated by the parameter calculation unit, to drive the lens to correct the photographic field position accompanying movement of the photographic subject according to one of the first quantity, the second quantity, and a combination of the first and second quantity.



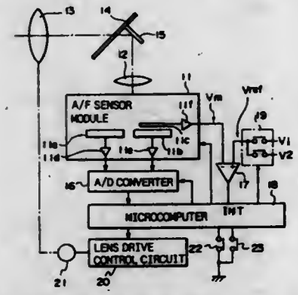
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5,502,538

## FOCUS DETECTION DEVICE

Akira Ogasawara, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 197,562, Feb. 17, 1994, abandoned, which is a continuation of Ser. No. 76,956, Jun. 16, 1993, abandoned. This application Jun. 2, 1995, Ser. No. 458,460
Claims priority, application Japan, Jun. 19, 1992, 4-161069
Int. Cl.[6] G03B 13/36; H04N 3/14
U.S. Cl. 354—402 12 Claims




1. A focus detection device, comprising:

(a) a photoelectric conversion circuit, which comprises a plurality of auto focus sensors each of which comprises a plurality of electric charge accumulation type photoelectric conversion devices and accumulates electric charge corresponding to the light intensity of an image of an object to be photographed which is cast on its said electric charge accumulation type photoelectric conversion devices, said photoelectric conversion circuit repeatedly outputting an electrical signal for focus detection corresponding to the distribution of light intensity of said image of said object to be photographed;

(b) a monitor photoelectric conversion circuit which receives light from said image of said object to be photographed and outputs a monitor electrical signal correlated to the average amount of electric charge accumulation of said electric charge accumulation type photoelectric conversion devices;

(c) a focus detection optical system which leads a luminous flux from said object to be photographed which has passed through a photographic optical system onto said auto focus sensors of said photoelectric conversion circuit and onto said monitor photoelectric conversion circuit, and which focuses said luminous flux into said images thereon of said object to be photographed;

(d) an analog to digital conversion circuit which converts the electrical signal for focus detection output from said photoelectric conversion circuit into a digital signal;

(e) an electric charge accumulation time period calculation circuit which, in order to keep the maximum level of the digital signal for focus detection output from said analog to digital conversion circuit less than or equal to a previously determined target level, calculates the time period for the next episode of electric charge accumulation based upon the time period for the current episode of electric charge accumulation;

(f) a comparison circuit which compares the level of the monitor electrical signal which is output from said monitor photoelectric conversion circuit with a standard level, and which outputs an electric charge accumulation termination signal for terminating electric charge accumulation by said photoelectric conversion circuit, when said monitor electrical signal exceeds said standard level;

(g) an electric charge accumulation control circuit which controls said photoelectric conversion circuit to perform the accumulation of electric charge according to the electric charge accumulation time period calculated by said electric charge accumulation time period calculation circuit, and which further controls said photoelectric conversion circuit to terminate the accumulation of electric charge, when during this electric charge accumulation time period said electric charge accumulation termination signal is output from said comparison circuit;

(h) a focus detection calculation circuit which calculates the focus adjustment state for said photographic optical system based upon the digital signal for focus detection output from said analog to digital conversion circuit;

(i) a detection circuit which detects the fact that the electrical signal for focus detection output by said photoelectric conversion circuit exceeds the maximum input level for said analog to digital conversion circuit; and

(j) a standard level switchover circuit which, when it is detected by said detection circuit that said electrical signal for focus detection output by said photoelectric conversion circuit has exceeded the maximum input level for said analog to digital conversion circuit, reduces said standard level of said comparison circuit, so as quickly to terminate the next episode of electric charge accumulation by said photoelectric conversion circuit.

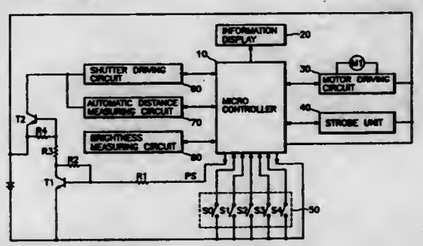
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5,502,539

## CAMERA CAPABLE OF CONTROLLING A SUPPLY OF POWER AND RELATED CONTROL METHOD

Tae-kyeong Yeon; Seong-tae Kim, and Bon-jeong Goo, all of Changwon-si, Rep. of Korea, assignors to Samsung Aerospace Industries, Ltd., Kyeongsangnam, Rep. of Korea

Filed Mar. 23, 1994, Ser. No. 216,322
Claims priority, application Rep. of Korea, Mar. 25, 1993, 934740
Int. Cl.[6] G03B 7/26
U.S. Cl. 354—484 8 Claims




1. A camera comprising:

means for supplying power to an internal circuitry of the camera;

a power switch connected to the power supplying means and the internal circuitry, the power switch having one each of ON and OFF states;

means for determining one or more photographic conditions associated with an object; and

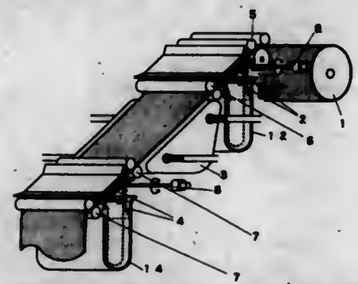
means for concurrently activating the power supplying means and the determining means to initiate a photograph taking operation while the power switch is in the OFF state.

5,502,540

## PRINTING/DEVELOPING APPARATUS

Hiroshi Miyawaki; Takayuki Oka, both of Wakayama, and Masaaki Tsuji, Hanaan, all of, Japan, assignors to Noritsu Koki Co., Ltd., Wakayama, Japan

PCT No. PCT/JP93/01319, § 371 Date May 17, 1994, § 102(e) Date May 17, 1994, PCT Pub. No. WO94/07182, PCT Pub. Date Mar. 31, 1994
PCT Filed Sep. 16, 1993, Ser. No. 240,659
Claims priority, application Japan, Sep. 17, 1992, 4-273789
Int. Cl.[6] G03B 27/32;35/14;35/24
U.S. Cl. 355—22 1 Claim



1. A printing/developing apparatus for 3D stereoscopic photographs comprising a movable arrangement of either an exposure stage or a lens unit and an exposure stage, the exposure stage being for 3D stereoscopic photographs and being arranged such that the stage moves rolled photographic printing paper while holding the printing paper thereon in a direction parallel to a surface of the printing paper in a minute movement, during which movement the printing paper is exposed a plurality of times, wherein said apparatus is equipped with loop spaces in a transporting path of a photographic printing paper at positions in the front and rear of the exposure stage for enabling the apparatus to process the rolled photographic printing paper.

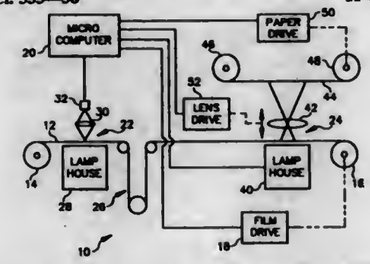
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5,502,541

## PHOTOGRAPHIC PRINTER AND METHOD FOR AUTOMATICALLY DETECTING PANORAMIC FORMAT IMAGE FRAMES

Richard Oliver, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 10, 1994, Ser. No. 240,189
Int. Cl.[6] G03B 27/52
U.S. Cl. 355—38 11 Claims




1. A method of discriminating between full size and panoramic images interspersed on a strip of film, a panoramic frame area being nested within a full size frame area leaving a non-panoramic frame area which is within the full size frame area but outside the panoramic frame area, the method comprising the steps of:

(a) determining from a film density datum value of at least one pixel in the non-panoramic frame area if the image is a full size image and, if not,

(b) then performing a longitudinal edge detection operation to determine from film density data values of pixels in both the panoramic and non-panoramic frame areas if an edge exists between the two areas and, if so, the existence of a panoramic image is determined and, if not, a full size image is determined.

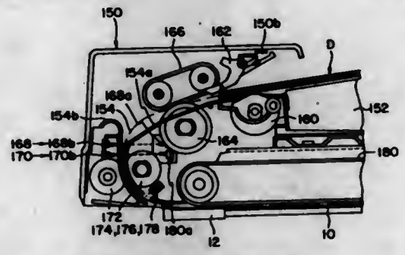
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5,502,542

## IMAGE-FORMING APPARATUS WITH AN EXPOSURE-LIGHT INTENSITY ADJUSTING FUNCTION FOR A TWO-SIDED ORIGINAL

Shouji Takano, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 3, 1994, Ser. No. 317,584
Claims priority, application Japan, Dec. 29, 1993, 5-351000
Int. Cl.[6] G03G 27/72;21/00
U.S. Cl. 355—69 2 Claims



1. An image forming apparatus, comprising:

a platen on which an original is placed so that a first surface of the original is positioned at an exposure area;

first detecting means for detecting that a second surface of the original which is opposite to the first surface, has an image;

second detecting means for detecting a transmittance of the original;

exposure means for exposing the first surface positioned at the exposure area by emitting a light to make a light image;

means for adjusting an intensity of the light emitted by the exposure means corresponding to the transmittance when the first detecting means detects that the second surface has the image; and

means for forming a copying image on the basis of the light image, wherein the first detecting means includes means for outputting predetermined signals corresponding to a high density area of the second surface of the original, means for counting the number of the predetermined signals, and means for determining that the second surface has the image when the counted number is more than a predetermined number.

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5,502,543

## SYSTEM FOR COLLECTING STATISTICAL DATA ON REMOTELY MONITORED MACHINES

Jodi F. Aboujaoude, West Henrietta, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 28, 1994, Ser. No. 267,685
Int. Cl.[6] G03G 15/00
U.S. Cl. 355—202 19 Claims

1. A system for remote monitoring of a printing machine comprising:

interface means for acquiring status data representative of a status of an associated printing machine;

a central processor unit;

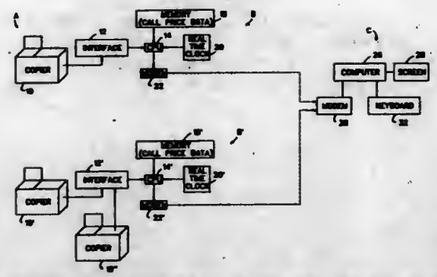
a memory unit addressable by the central processor unit;

means for communicating the status data to the memory unit;

a real time clock for generating real time data;

means for communicating the real time data to the central processor unit;






call price data, representative of call rates, disposed in the memory unit;

the central processor unit including comparison means for comparing the call price data, the status data and the real time data; and

signal means for selectively initiating a remote data connection as a result of a comparison of the call price data, the status data and the real time data.

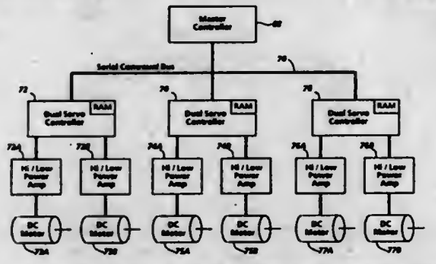
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5,502,544

## PARAMETER BASED DIGITAL SERVO CONTROLLER

Kevin M. Carolan, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 15, 1994, Ser. No. 306,295
Int. Cl.[6] G03G 21/00
U.S. Cl. 355—204 23 Claims




1. A reproduction machine having components including a control, a photosensitive member, a transfer station, a copy sheet transport system, and a fuser for producing images on copy sheets, the control including a main controller and a plurality of servo systems interconnected over a serial command bus, the servo systems being electrically connected to said components, each of the servo systems being provided with a control profile for at least one of the components, the improvement comprising logic in the main controller for monitoring the operation of a given servo system and automatically changing the control profile for said given servo system in response to detected conditions.

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5,502,545

## JAM PROCESSING DEVICE SUITABLE FOR USE IN AN IMAGE FORMING APPARATUS

Ryoichi Tsuruoka, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Apr. 5, 1995, Ser. No. 417,038
Claims priority, application Japan, May 16, 1994, 6-125720
Int. Cl.[6] G03G 15/00
U.S. Cl. 355—207 3 Claims

1. A jam processing device suitable for use in an image forming apparatus, said image forming apparatus comprising: at least one image carrier disposed adjacent to means for electrostatically carrying the recording paper; said recording paper carrying means forming part of a paper conveying path; means for acting on said at least one image carrier, said recording paper and said recording paper carrying means; said image carrier acting means comprising a charging device and a developer, said jam processing device comprising:

detecting means for detecting paper jams at a plurality of locations along said paper conveying path;

control means for forcedly ejecting any recording paper existing in said paper conveying path in accordance with information about a paper jam detected by said detecting means; and

means for selectively controlling actuation of said means acting on said at least one image carrier based on the information about the paper jam detected by said detecting means when the recording paper is forcedly ejected from said paper conveying path, wherein when said at least one image carrier means is deactuated, said charging device is in an operating state and said developer is in a non-operating state.

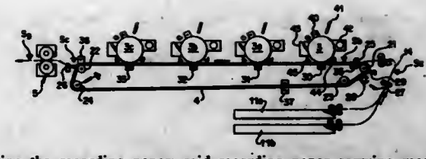
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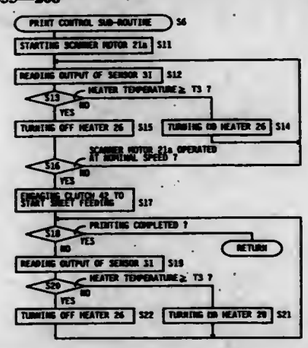
5,502,546

## IMAGE FIXING HEATER HAVING STANDBY TEMPERATURE CONTROL

Kiyoshi Muto, Yokkaichi, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Oct. 18, 1994, Ser. No. 323,725
Claims priority, application Japan, Jan. 20, 1993, 5-262111
Int. Cl.[6] G03G 13/20;15/20
U.S. Cl. 355—208 10 Claims






1. A method of forming an image by an electrophotographic image forming apparatus, comprising the steps of:

generating a visible image on a recording medium in response to a print start command;

applying heat to said recording medium to fix said visible image on said recording medium;

detecting a temperature adjacent to a heating device for generating said heat;

measuring a predetermined time which has passed after a last image forming operation which includes said steps of generating a visible image and apply heat to said recording medium; and

controlling said heating device such that said temperature is held at an image fixing level when said visible image is generated and fixed by the heat generated by said heating device, at a high stand-by level lower than said image fixing level when the apparatus is in a first stand-by state without said print start

command being received within said predetermined time, and at a low stand-by level lower than said high stand-by level when the apparatus is in a second stand-by state without said print start command being received even after said predetermined time has passed,

said step of controlling said heating device comprising storing in a memory a main control routine for controlling an operation of the apparatus, said main control routine being formulated to control said heating device so as to hold said temperature at said low stand-by level immediately after the apparatus is turned on and before a first print start command is received, and when the apparatus is in said second stand-by state without the print start command being received even after said predetermined time has passed after said image forming operation.

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5,502,547

## SEALING DEVICE, PROCESS CARTRIDGE, IMAGE FORMING APPARATUS AND ASSEMBLING METHOD OF THE PROCESS CARTRIDGE

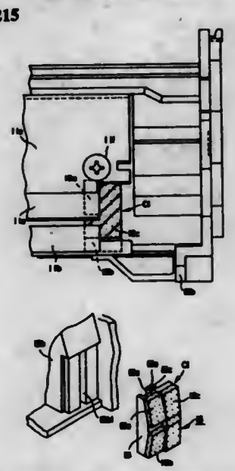
Masanari Shirai, Chigasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 20, 1994, Ser. No. 277,571

Claims priority, application Japan, Jul. 20, 1993, 5-178683; Jul. 13, 1994, 6-161461

Int. Cl.[6] G03G *21/00*

U.S. Cl. 355—215 40 Claims



1. A sealing device for use with a process cartridge including a cartridge frame, an image bearing member mounted in said cartridge frame, and process means, mounted in the cartridge frame, operative on the image bearing member to prevent toner from leaking out of the cartridge frame, said sealing device comprising:

a holder having an attachment portion for detachably attaching the holder to the cartridge frame;

a first sealing member, attached to said holder, capable of contacting a first position on the cartridge frame to prevent the toner from leaking out of the cartridge frame; and

a second member, separate from said first sealing member, attached to said holder and capable of contacting a second said cartridge frame position on the cartridge frame, wherein said first position and said second position are different.

5,502,548

## CONTACT-TYPE CHARGING MEMBER WHICH INCLUDES AN INSULATING METAL OXIDE IN A SURFACE LAYER THEREOF

Yasuyuki Suzuki, Saitama, and Takashi Yamashita, Toride, both of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

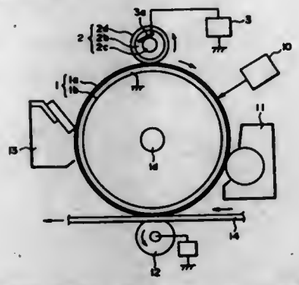
Continuation of Ser. No. 145,133, Nov. 3, 1993, abandoned.

This application Mar. 15, 1995, Ser. No. 405,407

Claims priority, application Japan, Nov. 4, 1992, 4-295136

Int. Cl.[6] G03G *15/02*

U.S. Cl. 355—219 19 Claims



1. A charging member for use in a contact charging device which charges a charge-receiving member by applying a voltage to the charging member and disposing the charging member in contact with the charge-receiving member, comprising:

at least an elastic layer and a surface layer disposed thereon contacting the charge-receiving member, the surface layer comprising at least a semiconductive resin and an insulating metal oxide contained in the semiconductive resin, and the surface layer having a maximum height of surface roughness (Rmax) of 10 μm to 100 μm.

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5,502,549

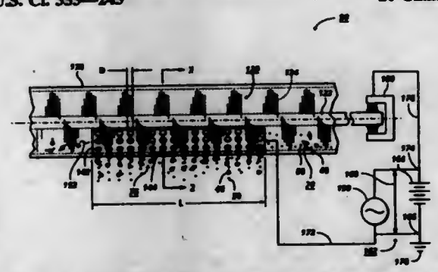
## ELECTRICALLY BIASED TONER FILTRATION

Steven C. Hart; Cyril G. Edmunds, and Gerald M. Kryk, all of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 11, 1994, Ser. No. 321,633

Int. Cl.[6] G03G *15/06*

U.S. Cl. 355—245 20 Claims



1. An apparatus for filtering contaminants from marking particles within a conduit, comprising:

means for moving the marking particles in the conduit;

a screen positioned adjacent the conduit so that the marking particles pass therethrough; and

means for applying an electrical bias between said moving means and said screen to facilitate the passage of marking particles therethrough.



5,502,550

## IMAGE FORMING APPARATUS AND METHOD

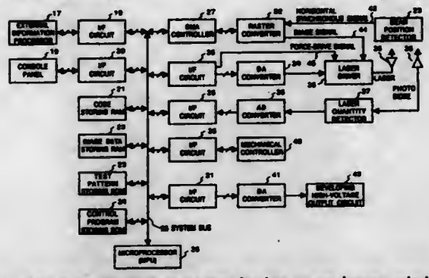
Kenjiro Hori, Tokorozawa; Satoshi Akiyama, Yokohama; Hideki Suzuki, Yokohama, and Takefumi Takubo, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 238,352, May 5, 1994, abandoned, which is a continuation of Ser. No. 934,261, Aug. 25, 1992, abandoned. This application Dec. 30, 1994, Ser. No. 366,440

Claims priority, application Japan, Aug. 27, 1991, 3-215396; Sep. 11, 1991, 3-231511

Int. Cl.[6] G03G *21/00*

U.S. Cl. 355—246 44 Claims



1. An image forming apparatus having a test image printing function and a printing density adjustment function, said apparatus comprising:

image forming means for forming an image;

density setting means for setting a printing density of the image to be formed by said image forming means;

generating means for generating a test pattern signal corresponding to a test pattern image; and

control means for controlling said density setting means so as to form the test pattern image at a plurality of different printing densities, when said image forming means forms the test pattern image on the basis of the test pattern signal generated by said generating means.

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5,502,551

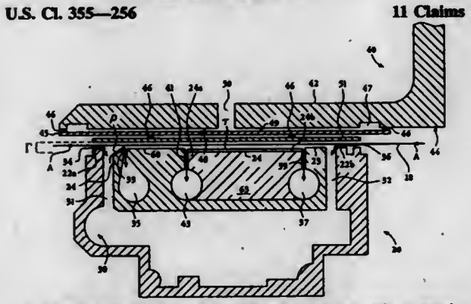
## TONING SHOE EMPLOYING A BIFURCATED RETURN PORT

Richard J. Bonino, Menlo Park, and Gene F. Day, Hillsborough, both of Calif., assignors to Phoenix Precision Graphics, Inc., Sunnyvale, Calif.

Filed May 30, 1995, Ser. No. 453,388

Int. Cl.[6] G03G *15/10*

U.S. Cl. 355—256 11 Claims



1. A toning shoe for an electrostatic recorder or copier comprising:

a toning member having a toning surface positioned to face a recording medium having a first major surface bearing a latent image and an opposed second major surface, said toning member having a first side and a second side, spaced apart from and parallel to said first side,

an adjacent member, proximate to and spaced apart from said first side, defining a fluid applicator port therebetween;

a knife edge, positioned proximate to said second side, and spaced apart from said toning member, to remove excess toner from said first major surface of said recording medium;

a first peripheral member disposed on a side of said knife edge opposite to said toning member, said first peripheral member being spaced apart from said knife edge, defining a first major fluid channel therebetween;

a second peripheral member spaced apart from said adjacent member, defining a second major fluid channel therebetween; and

a bifurcation means, disposed between said knife edge and said toning member, for separating a fluid flow, said knife edge and said bifurcation means defining a first fluid return channel therebetween with said toning member and said bifurcation means defining a second fluid return channel therebetween.

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5,502,552

## DEVELOPING DEVICE FOR AN IMAGE FORMING APPARATUS

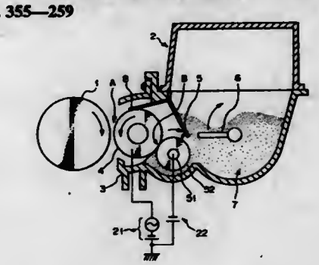
Naoki Iwata; Takeshi Saito, both of Tokyo; Hidetoshi Yano; Hiromitsu Takagaki, both of Yokohama; Kazuhiro Nishido, Tokyo; Ichiro Komuro; Shigeki Sawa, both of Yokohama, and Nobuhiro Shima, Gotenba, all of, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

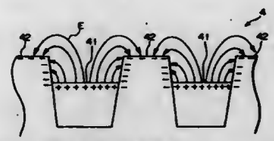
Filed Jun. 17, 1994, Ser. No. 261,976

Claims priority, application Japan, Jun. 19, 1993, 5-172449

Int. Cl.[6] G03G *15/06*

U.S. Cl. 355—259 14 Claims





1. A developing device comprising:

a developer carrier for carrying a developer thereon to develop a latent image formed on an image carrier, the developer carrier including a surface having a plurality of raised portions and a plurality of recessed portions distributed thereon, said raised portions and said recessed portions having a difference in height which is greater than one-half of a mean particle size of said developer, and wherein one of said plurality of recessed portions and said plurality of raised portions includes dielectric surfaces and the other of said plurality of recessed portions and said plurality of raised portions includes conductive surfaces;

a developer supply roller for supplying developer to said developer carrier, said developer supply roller having a conductive elastic outer surface in contact with said developer carrier;

wherein fine closed electric fields are formed on said developer carrier causing developer to deposit on said surface of said developer carrier in multiple layers; and

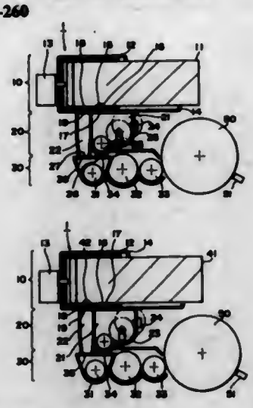
wherein 40%–70% of said surface of said developer carrier constitutes said dielectric surfaces and a remainder of said surface of said developer carrier constitutes said conductive surfaces.

5,502,553

## DEVELOPING DEVICE

Toshiki Masuda, Okazaki, and Akio Kimura, Toyokawa, both of, Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Feb. 22, 1995, Ser. No. 394,168
Claims priority, application Japan, Feb. 24, 1994, 6-026562
Int. Cl.[6] G03G *15/06*
U.S. Cl. 355—260 15 Claims



15. A developing device comprising:
a developing section which develops an electrostatic latent image formed on a photosensitive member;
a holder into which is detachably installable a developer cartridge and has a first replenishment aperture and a second replenishment aperture;
a first path which connects the first replenishment aperture and the developing device for supplying toner therethrough; and
a second path which connects the second replenishment aperture and the developing device for supplying toner therethrough.

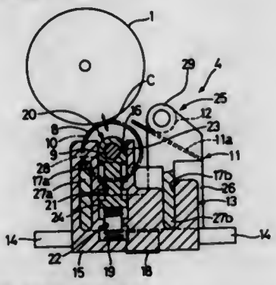
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5,502,554

## IMAGE TRANSFERRING UNIT OF NON-CONTACT TYPE ROLLER METHOD

Shigeki Hayashi; Hiroyuki Ueda; Tadakazu Ogiri; Shinichi Kotera; Hiroki Morishita; Yasuhiko Moriuchi; Kohichi Yasuda, and Naoyuki Ishida, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Japan

Filed Oct. 17, 1994, Ser. No. 323,934
Claims priority, application Japan, Nov. 16, 1993, 5-286346
Int. Cl.[6] G03G *15/16*
U.S. Cl. 355—271 4 Claims



1. A transfer unit comprising:
a transfer roller arranged below a photoreceptor drum,
a gap maintaining roller having a diameter greater than a diameter of the transfer roller provided in a vicinity of each end of the transfer roller, the gap maintaining rollers being in contact with a surface of the photoreceptor drum to form a predetermined gap between a peripheral surface of the transfer roller and the surface of the photoreceptor drum,
a pre-transfer guide for guiding a sheet to the photoreceptor drum arranged in a vicinity of an upstream side of the transfer roller,
a bearing member for admitting therein an end portion of a roller shaft of the transfer roller, said bearing member being independently arranged in a vicinity of each end of the roller shaft,
being arranged to be slidable upward and downward, and being elastically pushed up, such that said gap maintaining rollers are brought in contact with the surface of the photoreceptor drum, and
a guide attaching member for attaching the end portion of the pre-transfer guide, the guide attaching member being arranged to be slidable upward and downward, being elastically pushed up, and being independently arranged in a vicinity of each end of the pre-transfer guide,
the bearing member and the guide attaching member being engaged with each other so that a vertical position variation of the transfer roller and a vertical position variation of the end portion of the pre-transfer guide accord with each other.

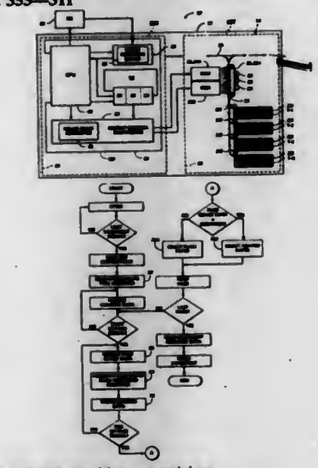
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5,502,555

## PRINTING SYSTEM HAVING AN IMAGE CHARACTERISTICS AUTOMATIC METHOD AND APPARATUS FOR COPY SHEET RESELECTION

Andras I. Lakatos, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 11, 1994, Ser. No. 273,386
Int. Cl.[6] G03G *21/00*
U.S. Cl. 355—311 23 Claims



15. A printing machine comprising:
(a) an image receiving member;
(b) a raster image output unit for outputting an image of an original in segments onto said image receiving member;
(c) means for effecting a controllable aspect of the printing machine, said controllable aspect having at least first and second states; and
(d) an electronic control subsystem for controlling the printing machine, the control subsystem comprising:
(i) a unit for receiving imaging data items including image data items and segment control data items for processing;
(ii) a unit for reading a prestored identifier for a type of image data items to be used as a basis for selecting between said at least first and second states of said controllable aspect;
(iii) a comparing unit for obtaining a result from comparing with said prestored identifier, types of image data items received and processed between a start-of a segment control data item and an end-of said segment control data item; and
(iv) a unit for automatically selecting one of said first and said second states of said controllable aspect of the machine depending on the result of the comparing unit.



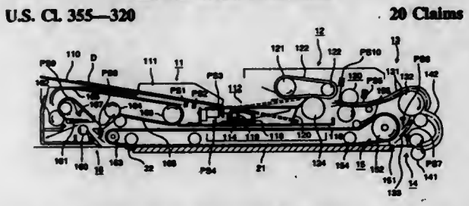
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5,502,556

## AUTOMATIC DOCUMENT FEEDING APPARATUS FOR FEEDING TWO-SIDED DOCUMENTS

Yasushi Yamada, Hachioji, Japan, assignor to Konica Corporation, Tokyo, Japan

Filed Jul. 6, 1993, Ser. No. 87,184
Claims priority, application Japan, Jul. 14, 1992, 4-187143; Jul. 14, 1992, 4-187159
Int. Cl.[6] G03G *21/00;15/00*
U.S. Cl. 355—320 20 Claims



1. An automatic document feeding apparatus for conveying a plurality of documents to an image reading section, said apparatus comprising:
a first conveyor for separately conveying each of a plurality of documents from a document stack section to said image reading section at which an image on each of said plurality of documents is read;
a second conveyor for conveying each of said plurality of documents from said image reading section to a document reversing section;
said document reversing section including means for turning over each of said plurality of documents;
a third conveyor for conveying each of said plurality of documents from said document reversing section to said image reading section; and
a document discharging section including means for discharging each of said plurality of documents from said image reading section to a document receiving section of said apparatus;
wherein said first conveyor comprises a fourth conveyor for conveying each of said plurality of documents from said document stack section to a waiting position; and, while a first one of said plurality of documents is conveyed to said image reading section by said third conveyor, a second one of said plurality of documents is conveyed by said first conveyor to a waiting position following a trailing end of said first one of said plurality of documents, before said first one of said plurality of documents is discharged to said document receiving section;
and wherein said first one and said second one of said plurality of documents are conveyed in parallel when said first one of said plurality of documents is discharged from said image reading section.

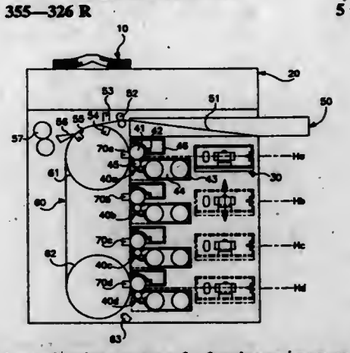
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5,502,557

## IMAGE FORMING APPARATUS

Min-ho Choi, and In-yong Song, both of Suwon, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki, Rep. of Korea

Filed Oct. 7, 1994, Ser. No. 328,286
Claims priority, application Rep. of Korea, Apr. 12, 1994, 94-7656; Apr. 12, 1994, 94-7657
Int. Cl.[6] G03G *15/01*
U.S. Cl. 355—326 R 5 Claims



1. An image forming apparatus for forming an image on a sheet of paper according to image information, said apparatus comprising:
a plurality of image forming units each having a photoconductive drum for forming a latent image by means of exposing, and a developing device for containing a predeterminedcolor developer and developing said latent image, for providing different-colored developed images;
an exposing device installed to move to the position of a selected image forming unit of said plurality of image forming units and for exposing said photoconductive drum according to said image information;
an endless transfer belt for conveying said sheet of paper along the outer surface thereof so that said sheet of paper passes said photoconductive drums of said plurality of image forming units;
a plurality of transfer chargers installed to correspond to said respective photoconductive drums on said endless transfer belt so that the image developed by said photoconductive drum is transferred onto said sheet of paper; and
paper feeding/ejecting means for feeding said sheet of paper to said endless transfer belt and ejecting said sheet of paper therefrom.

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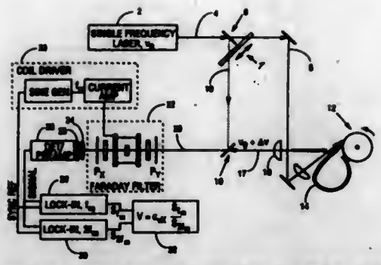
5,502,558

## LASER DOPPLER VELOCIMETER

James H. Menders, 943 Oliver Ave., San Diego, Calif. 92109, and Brett Spivey, 131 Seeman Dr., Encinitas, Calif. 92024

Filed Oct. 3, 1994, Ser. No. 316,939
Int. Cl.[6] G01S *17/58*
U.S. Cl. 356—28.5 12 Claims

1. A laser Doppler velocimeter for measuring the velocity of a target, comprising:
a) a laser producing a laser beam,
b) a beam splitting means for splitting said laser beam into a probe beam and a reference beam said probe beam being directed at said target,
c) a collection-forming means for collecting light of said probe beam reflected from said target and forming at least a portion of said reflected light into a reflected beam,
d) a directing means for directing both said reference beam and said reflected beam into at least one atomic line filter said atomic fine filter comprising:
1) a vapor cell,



2) a first magnet means for providing a constant magnetic field at said vapor cell,

3) a second magnet means for providing an alternating magnetic field at said vapor cell, said alternating magnetic field defining a first frequency,

4) crossed polarizers,

e) a detection means for detecting light of said reference beam and said reflected beam passing through said at least one atomic line filter, said reflected light detected by said detection means containing light oscillating at said first frequency and oscillating at a second frequency equal to twice said first frequency and said reference beam containing light modulated at a frequency equal to twice said first frequency, said first and said second frequencies each defining amplitudes,

f) a frequency measuring means for measuring the relative amplitudes of said first and said second frequencies in the light detected by said detection means, the velocity of said target being determinable from said amplitude measurements.

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**5,502,559**

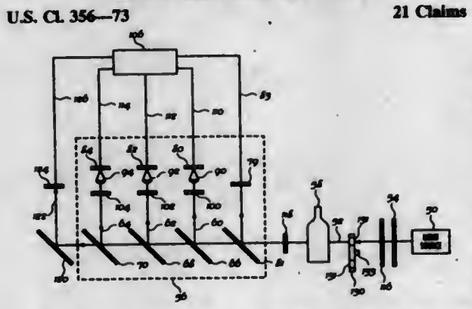
**APPARATUS AND METHOD FOR DETECTION OF MATERIAL USED IN CONSTRUCTION OF CONTAINERS AND COLOR OF SAME**

**Ken R. Powell, Centreville, and Rusty Driscoll, Leesburg, both of Va., assignors to Environmental Products Corporation, Fairfax, Va.**

**Continuation of Ser. No. 144,030, Nov. 1, 1993, abandoned. This application Dec. 7, 1994, Ser. No. 350,739**

**Int. Cl.[6] G01N *21/00*; B07C *5/00***

**U.S. Cl. 356—73** **21 Claims**



1. An apparatus for analyzing a character of a translucent container, comprising:

a light source having multiple wavelengths emitted simultaneously for directing a beam of light along a single optical axis through the container, said multiple wavelengths contained in said beam of light being simultaneously directed along said optical axis through the container;

a first optical analyzer for analyzing a color of light passing through the container, including

one or more detectors for generating signals in response to light incident thereon;

first directing means for directing one or more portions of said beam of light passing through the container toward said one or more detectors; and

means for determining a color of the container depending upon relative magnitudes of said signal from said one or more detectors.

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**5,502,560**

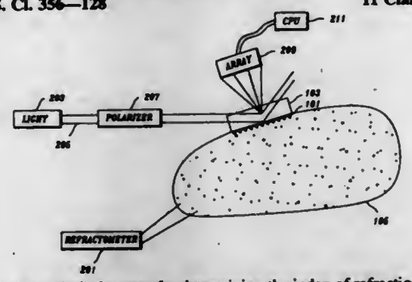
**ANALYTICAL SENSOR USING GRATING LIGHT REFLECTION SPECTROSCOPY**

**Brian Anderson, Renton; Anatol Brodsky, and Lloyd Burgess, both of Seattle, all of Wash., assignors to University of Washington, Seattle, Wash.**

**Filed Jul. 22, 1994, Ser. No. 279,473**

**Int. Cl.[6] G01N *21/41*; G01J *3/42***

**U.S. Cl. 356—128** **11 Claims**



1. An analytical sensor for determining the index of refraction of a liquid or gas, said sensor comprising:

a diffraction grating having a grating period formed on a dielectric and disposed in contact with said liquid or gas;

a light source providing light incident on said diffraction grating at an angle of incidence and wherein such incident light does not traverse said liquid or gas;

a photodiode array for capturing a reflection spectrum from said diffraction grating when said light is incident on said diffraction grating; and

computing means for determining said refractive index based upon at least said angle of incidence, said grating period, and said reflection spectrum.

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**5,502,561**

**CHARACTERIZATION OF PARTICLES BY MODULATED DYNAMIC LIGHT SCATTERING**

**Darrell K. Hutchins, Conway, Ark., and Barton E. Dahneke, Palmyra, N.Y., assignors to Board of Trustees of the University of Arkansas, Little Rock, Ark.**

**Division of Ser. No. 244,965, Sep. 15, 1988. This application Aug. 20, 1990, Ser. No. 569,800**

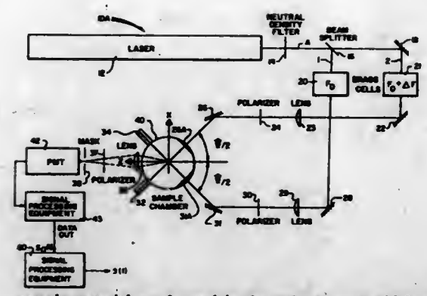
**Int. Cl.[6] C01N *15/02***

**U.S. Cl. 356—336** **17 Claims**

1. A method for measuring the radiation scattered or emitted from one or more particles or other sample material at zero or small angle from the forward illumination direction for determining properties of said particles or sample material comprising the steps of:

illuminating said particles or sample material by incident radiation in two crossed beams such that said particles or other





sample material are located in the volume over which the beams intersect and a component of the incident radiation has forward direction separated from the axis of either of the two beams of incident radiation;

modulating at least one of said beams so that said component of the incident radiation varies periodically in its intensity with displacement t in time and x in space such that the illumination intensity due to said component is proportional to $\sin(2\pi\Delta Ft-Kx)$ where the modulation frequency $\Delta F$ is the difference in frequency of said two radiation beams and $K=(4\pi/\lambda)\sin(\Psi/2)$ and $\lambda$ the wavelength of the illuminating radiation and $\Psi$ the intersection angle of the two crossed beams;

detecting the scattered or emitted radiation at one or more selected values of scattering angle $\phi$ where $\phi$ is the angle between the forward direction and the axis along which the scattered radiation is detected;

isolating the ac component of the scattered or emitted radiation signal(s) at or near the modulation frequency $\Delta F$; and

taking the time-averaged value(s) of the scattered or emitted radiation signal(s) that result from the modulated illumination at said scattering angle(s) to obtain said scattered or emitted radiation signal(s) substantially free of both interference from incident radiation and from uncertainty in illumination radiation intensity due to stationary or slowly varying the spatial variations in space in illumination intensity caused by constructive and destructive interference of the radiation in the intersection volume of the two beams in non-modulated illumination fields or caused by time-averaging of signals over too short a measuring time in non-modulated and slowly modulated illumination fields.

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**5,502,562**

**METHOD AND APPARATUS FOR ABSOLUTE INTERFEROMETRY USING A MEASUREMENT BEAM AND A REFERENCE BEAM HAVING PARALLEL WAVE FRONTS AND SHARING A SINGLE BEAM PATH**

**Peter Werle, Farchant, Germany, assignor to Fraunhofer-Gesellschaft Zur Forderung Der Angewandten Forschung E.V., Germany**

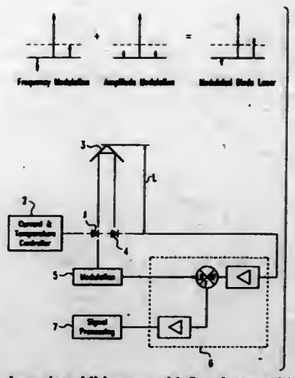
**Filed Sep. 27, 1994, Ser. No. 313,734**

**Claims priority, application Germany, Sep. 30, 1993, 43 33 423.7**

**Int. Cl.[6] G01B *9/02***

**U.S. Cl. 356—349** **9 Claims**

1. A method of absolute interometry for determining the length of a measurement distance wherein a first beam is generated by a diode laser, and the measurement distance is the distance between the diode laser and a reflector as determined by means of a detector, and comprising the steps of high-frequency modulating the first beam v1 of the diode laser in such a way that in the frequency range separated from a carrier frequency by an amount corresponding to a modulation frequency vm at least one resulting side band vs is produced with vs=v1+ vm, so that



the diode laser in addition to said first beam with the carrier frequency simultaneously generates a second beam with side band frequency but parallel wave fronts,

said first and second beams each pass along the same optical path within a single optical beam, and

the interference of said first and second beam with one another is measured at the detector as a corresponding detector signal; and

measuring the phase shift $\Delta\phi$, comprising the phase difference between said detector signal and modulation reference signal, as a measure of the change in the length comprising the measurement distance.

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**5,502,563**

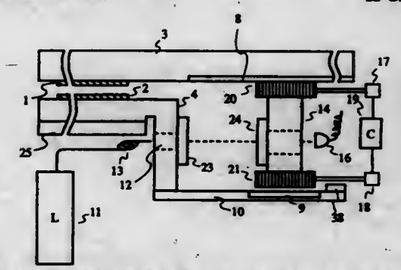
**TRANSPORTER FOR OPTICAL SPECTRUM ANALYZER IN ALIGNMENT SYSTEM**

**Thomas J. Dunn, Mohegan Lake, and Kanti Jain, Briarcliff Manor, both of N.Y., assignors to Anvik Corporation, Elmsford, N.Y.**

**Filed Oct. 21, 1994, Ser. No. 327,259**

**Int. Cl.[6] G01B *9/02***

**U.S. Cl. 356—352** **11 Claims**



1. A transporter, for an alignment system for first and second objects, identified as mask (1) and wafer (2), featuring first and second cavity mirrors (23,24) forming an optical cavity referenced to a frequency stabilized light source (11), comprising:

a) a mask base plate (3) which holds said mask (1) and has an appropriate mask stage clamping surface (8);

b) a wafer base plate assembly (4); having means to hold said wafer (2) in an orientation which is substantially parallel to said mask (1); having means to hold said first cavity mirror (23); having an extension plate (10) with a wafer stage clamping surface (9) and having means to hold said extension plate (10) with said wafer stage clamping surface (9), substantially parallel to said mask stage clamping surface (8);

c) a dual-clamping mirror support 914), for said second cavity mirror (24), capable of clamping to either said mask base plate (3), to said extension plate (10), or both;

d) a mask stage clamp (20), capable of establishing a rigid connection between said mask base plate (3) and said dual-clamping mirror support (14); and

e) a wafer stage clamp (21), capable of establishing a rigid connection between said extension plate (10) and said dual-clamping mirror support (14).

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**5,502,564**

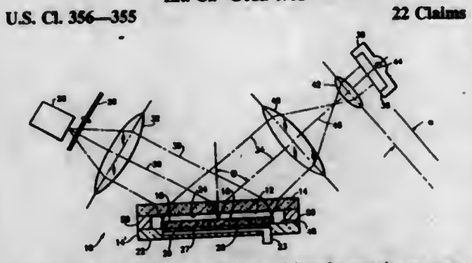
## SUBSTRATE THICKNESS MEASUREMENT USING OBLIQUE INCIDENCE MULTISPECTRAL INTERFEROMETRY

**Anthony Ledger, Newfairfield, Conn., assignor to Hughes Aircraft Company, Los Angeles, Calif.**

**Filed Sep. 13, 1994, Ser. No. 304,982**

**Int. Cl.[6] G01B 9/02**

**U.S. Cl. 356—355** **22 Claims**



1. An oblique incidence multispectral interferometric apparatus for measuring gross surface height errors or for measuring the total thickness of a substrate comprising:

first multispectral light source;

a support associated with said source arranged to hold said substrate so that the light from said source strikes a first surface of said substrate at an oblique incidence;

a first reference flat arranged between said light source and said substrate so as to define an air space between said first surface of said substrate and a first optically flat surface of said first reference flat which faces said first surface of said substrate; and

a camera for imaging the fringes formed by the reflected light from said air space.

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**5,502,565**

## METHOD AND APPARATUS FOR MEASURING THE FLYING HEIGHT OF A MAGNETIC HEAD ABOVE A DISK SURFACE AT THREE WAVELENGTHS

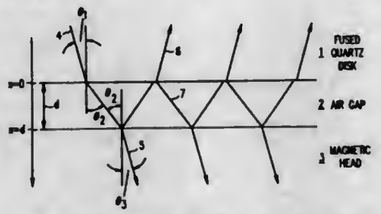
**Tadashi Fukuzawa, Tokyo; Teiji Hisano; Tetsuji Morita, both of Fujisawa, and Koichi Ikarugi, Chigasaki, all of, Japan, assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Aug. 19, 1994, Ser. No. 293,010**

**Claims priority, application Japan, Aug. 19, 1993, 5-205308**

**Int. Cl.[6] G01B 9/02**

**U.S. Cl. 356—357** **6 Claims**




1. A method for measuring the flying height of a magnetic device above a disk surface, comprising the steps of:

illuminating a gap, the width of the gap corresponding to said flying height, between said magnetic device and said disk surface, with a source of light;

measuring, at three wavelength, the actual intensity of interference light caused by reflections across said gap from said magnetic device and said disk surface;

calculating a theoretical intensity of interference light, said theoretical intensity of interference light being dependent upon the width of said gap;

calculating the error between said actual intensity and said theoretical intensity; and,

recalculating the theoretical intensity so as to minimize said error, whereby the width of said gap is determined.

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**5,502,566**

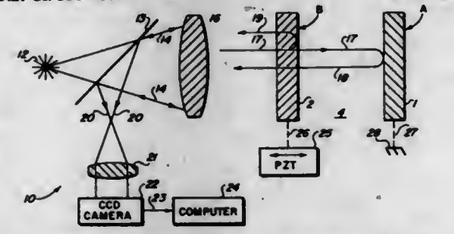
## METHOD AND APPARATUS FOR ABSOLUTE OPTICAL MEASUREMENT OF ENTIRE SURFACES OF FLATS

**Chiayu Ai; James C. Wyant; Lian-Zhen Shao, and Robert E. Parks, all of Tucson, Ariz., assignors to Wyko Corporation, Tucson, Ariz.**

**Continuation of Ser. No. 97,168, Jul. 23, 1993, abandoned. This application Feb. 13, 1995, Ser. No. 387,635**

**Int. Cl.[6] G01B 9/02**

**U.S. Cl. 356—359** **8 Claims**




1. A method of measuring absolute topographies of the entire surfaces of a plurality of flats using an interferometer system including an interferometer adapted to support two flats, a detection system, and a computer adapted to compute the OPD (optical path difference) between surfaces of the two flats, the interferometer including a detector array, each element of which corresponds to a pixel of an image of the flat within a field of view of the interferometer, the method comprising the steps of:

(a) supporting a first flat having a first surface and a second flat having a second surface in the interferometer with the second surface facing the first surface;

(b) operating the interferometer system to measure and store the OPDs between the first surface and the second surface for each pixel;

(c) rotating the first flat by a predetermined angle relative to its initial orientation in step (a) and then repeating step (b);

(d) repeating step (c) a number of times for an equal number of other angles, respectively:

(e) substituting a third flat having a third surface for the second flat, and operating the interferometer system to measure and store the OPDs between the first and third surfaces for each pixel,;

(f) replacing the first flat by the second flat oriented with the second surface facing the third surface and operating the interferometer system to measure and store the OPDs between the second and third surfaces for each pixel; and

(g) operating the computer to solve first, second, and third equations for the absolute topographies of the entire first, second, and third surfaces of the first, second, and third flats, respectively, the first, second and third equations expressing the topographies of the corresponding first, second, and third surfaces of the first, second, and third flats, respectively, as a sum of even—even, odd–even, even–odd, and odd—odd parts in order to use the stored OPDs to compute the absolute topography of the entire first, second, and third surfaces,



wherein the even—even parts have left–right symmetry and top–bottom symmetry, the odd–even parts have left–right anti-symmetry and top–bottom symmetry, the even–odd parts have left–right symmetry and top–bottom anti-symmetry, and the odd—odd parts have left–right anti-symmetry and top–bottom anti-symmetry.

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**5,502,567**

## MICROPOLARIMETER, MICROSENSOR SYSTEM AND METHOD OF CHARACTERIZING THIN FILMS

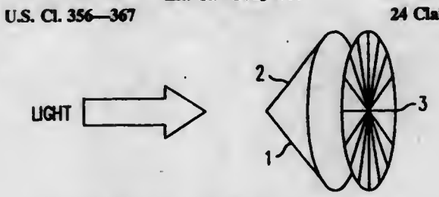
**Peter Pokrowsky, Mainz; Eckehard Kiefer, Grafenau; Michael Abraham, Mainz; Bernd Stenkamp, Mainz; Wolfgang Ehrfeld, Mainz, and Thomas Zetterer, Schwabenheim, all of, Germany, assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jun. 28, 1994, Ser. No. 268,149**

**Claims priority, application European Pat. Off., Jun. 28, 1993, 93110277**

**Int. Cl.[6] G01J 4/00**

**U.S. Cl. 356—367** **24 Claims**




1. A micropolarimeter, comprising:

a non-rotating detector having a circular configuration of N sectors; and

a non-rotating analyzer for assigning polarization value to each of the sectors of said detector, said analyzer having an optical axis and further comprising a transparent cone having a convex surface and a base, with said non-rotating detector in direct contact with the base of said non-rotating analyzer.

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**5,502,568**

## OPTICAL POSITION DETECTING UNIT, OPTICAL COORDINATE INPUT UNIT AND OPTICAL POSITION DETECTING METHOD EMPLOYING A PATTERN HAVING A SEQUENCE OF 1'S AND 0'S

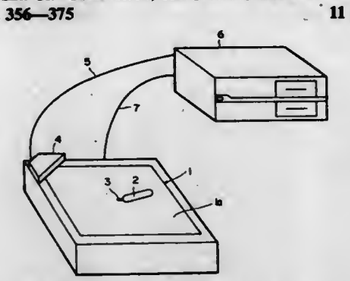
**Yasuji Ogawa, and Hideo Yoichi, both of Saitama, Japan, assignors to Wacom Co., Ltd., Saitama, Japan**

**Continuation-in-part of Ser. No. 215,761, Mar. 22, 1994. This application Jul. 28, 1994, Ser. No. 281,129**

**Claims priority, application Japan, Mar. 23, 1993, 5-87940; Dec. 29, 1993, 5-354442**

**Int. Cl.[6] G01B 11/14; H01J 40/14; G03B 19/10**

**U.S. Cl. 356—375** **11 Claims**



1. An optical position detecting apparatus comprising:

an input unit including a two-dimensional coordinate position detecting plane;

a position pointer having a point-like light emitting section for pointing at arbitrary positions on the two-dimensional coordinate position detecting plane;

a linear image pickup sensor including plural pixels arranged in a substantially straight line to define an image pickup surface for receiving light from the point-like light-emitting section;

a pattern disposed in front of the linear image pickup sensor at a position having a known distance, L, from the image pickup surface in a path of light emitted from the point-like light-emitting section, the pattern having a specific pattern including equi-spaced "1" and "0" code elements, parts of the specific pattern respectively corresponding to light emitting positions of the position pointer, one of the parts being projected onto the linear image pickup surface by light emitted from the point-like light-emitting section, the code elements extending in a direction parallel to a direction in which the pixels extend; and

a signal processing means for processing signals detected by the linear image pickup sensor, the detected signals being derived from the pixels in response to the pixels sensing an image of the part of a specific pattern projected onto the image pickup surface so positions of the code elements included in the image are obtained from the detected signals, the detected signals being combined in the signal processing means so: (a) a distance in the image is determined by the obtained positions of the code elements, (b) an enlargement image ratio, m, is determined as a ratio of an interval between the code elements in the specific pattern and the determined distance, and (c) a distance from the point-like light-emitting section to the linear image pickup sensor along a line normal to the image pickup surface is determined in accordance with $\{m/(m-1)\}xL$.

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**5,502,569**

## APPARATUS AND METHOD FOR RECORDING DIGITAL VIDEO SIGNALS

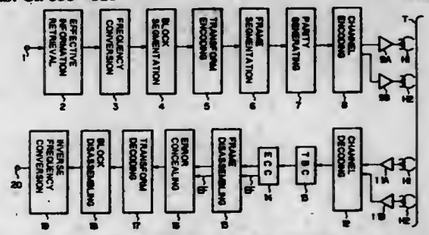
**Keiji Kanota, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Filed Jul. 10, 1992, Ser. No. 911,488**

**Claims priority, application Japan, Jul. 19, 1991, 3-203484**

**Int. Cl.[6] H04N 9/79; G11B 5/00**

**U.S. Cl. 358—310** **17 Claims**




1. A method of recording digital video signals in slant tracks on a magnetic tape by means of a plurality of magnetic heads disposed on a rotating drum about which said tape is wrapped, said heads each forming a respective one of said tracks during each rotation of said drum, the method comprising the steps of:

forming said digital video signals into n×n blocks of picture data elements, n being an integer greater than 1, each said block of picture data elements being formed of a contiguous n×(n/2) area of a first field and a corresponding contiguous n×(n/2) area of an immediately following field of said digital video signals;

compression-coding each said block of picture data elements to form a block of coefficient data that includes a plurality of elements, the compression-coding including an orthogonal transformation of said block of picture data elements; and

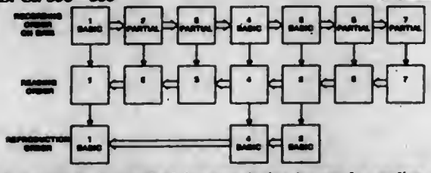
recording all elements of said block of coefficient data in a single one of said slant tracks.

## 5,502,570

### IMAGES REPRODUCING METHOD CAPABLE OF SKIPPING REPRODUCTION OF COLLATERAL INFORMAITON DURING REPRODUCTION IN A SPECIAL MODE

Akihiro Shikakura, Kawasaki; Motokazu Kashida, Musashino, and Ikuo Watanabe, Kawasaki, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 12, 1991, Ser. No. 653,897
Claims priority, application Japan, Feb. 13, 1990, 2-31722; Feb. 13, 1990, 2-31732
Int. Cl.[6] H04N 5/76;5/781
U.S. Cl. 358—335 8 Claims



1. A reproducing method for reproducing images by reading an image signal recorded on a recording medium, the image signal including (i) a plurality of basic blocks each including basic image data capable of independently representing an image and (ii) a plurality of collateral blocks each including collateral image data capable of representing the image when supplemented with basic image data, each of the basic blocks and collateral blocks including additional data capable of identifying a block as a basic block or as a collateral block, said reproducing method comprising the steps of:

reading the image signal from the recording medium in a reverse sequence which is reverse from a recording sequence;

discriminating whether a block included in the reverse read image signal is a basic block or a collateral block in accordance with the additional data included in the block; and

reproducing, in accordance with the results of said discriminating step, only the basic image data from the reverse-read image signal.

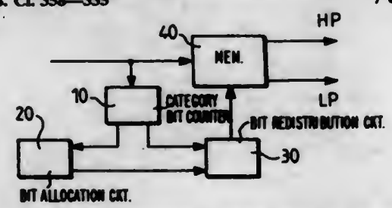
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## 5,502,571

### DEVICE FOR PROCESSING DIGITAL SIGNALS FIRST CODED BY MEANS OF VARIABLE LENGTH CODING AND DEVICE FOR INVERSELY PROCESSING SIGNALS THUS PROCESSED

Philippe Decotignie, Paris, and Sabine Jourdan, Savigny-Sur-Orge, both of, France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 4, 1993, Ser. No. 148,109
Claims priority, application France, Nov. 18, 1992, 92 13855; Jun. 9, 1993, 93 06923
Int. Cl.[6] H04N 5/76;7/12
U.S. Cl. 358—335 7 Claims




1. A device for processing a digital signal for transmission and/or storage, which signal consists of a stream of data bits representing a sequence of video images and which is coded, at least in part, in accordance with a variable length coding algorithm; each image having a plurality of image sections, each image section being represented in said signal by a sub-assembly of blocks of data bits preceded by a synchronizing signal, the data bits in each block representing one or more of a predetermined number M ($\mu \geq 2$) of types of data having relative priorities in accordance with a predetermined hierarchy; said device comprising:

(a) an addressable memory for receiving and storing the data bits of said signal;

(b) a counting circuit for also receiving the data bits of said signal and determining therefrom for each image section the numbers of data bits for each of said types of data;

(c) a bit allocation circuit coupled to said counting circuit for assigning to each image section for each type of data channel bit allocations for transmission and/or storage of data bits via a plurality N ($N \geq 2$) of channels of different priorities, the channel bit allocations being proportioned with reference to a group of said video images;

(d) a bit redistribution circuit coupled to said memory, to said counting circuit and to said bit allocation circuit, for controlling redistribution of the data bits applicable to each image section among said channels in accordance with the following criteria:

(i) as a function of the channel bit allocations assigned to said image section for the channel of highest priority (HP), assigning to said HP channel in descending hierarchal order all data bits applicable to said image section which can be entirely included in said HP allocations;

(ii) as a function of the channel bit allocations assigned to said image section for the channel of lowest priority (LP), assigning to said LP channel in ascending hierarchal order all data bits applicable to said image section which can be entirely included in said LP allocations;

(iii) for the data bits so assigned, and the sub-assembly of data blocks applicable to said image section, calculating in numbers of bits an average length per block which defines a specific unit length of a transmission packet for each of said types of data;

(iv) for a type of data which cannot be exclusively assigned to either of the HP and LP channels, assigning to the HP channel those bits of such data relating to said image section which can be included in the HP channel according to an equal distribution of such data bits for all image sections, followed by a subsequent complementary assignment of any leftover bits of such data in data blocks in the LP channel;

(v) for the type of data in (iv), calculating in numbers of bits an average length per block which defines a specific unit length of a transmission packet for such data; supplying said unit length and the assignment information in (iv) to said addressable memory for read-out of such data; and for each channel and each transmission packet of such data having said specific unit length, locating at least the first bits relating to the relevant hierarchal data type in each packet and any leftover bits of other data blocks in complementary locations.

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## 5,502,572

### VARIABLE SPEED VIDEO SIGNAL REPRODUCING APPARATUS

Kazuo Kuroda, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 988,249, Dec. 9, 1992, abandoned.
This application Mar. 31, 1994, Ser. No. 221,267
Claims priority, application Japan, Dec. 18, 1991, 3-335253
Int. Cl.[6] H04N 5/76
U.S. Cl. 358—335 11 Claims

1. A video signal reproducing apparatus for reproducing field image signals recorded on a first field of video signals and a second field of video signals on a recording medium comprising:

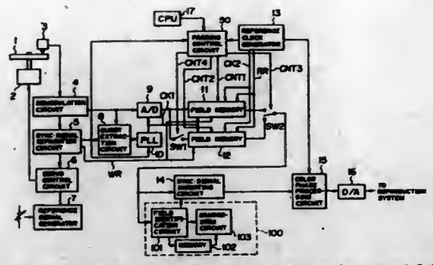
means for receiving from the recording medium the field video signals recorded on said first and second fields;

means for detecting successive receipt of the field image signals recorded on a same field; and

means for normally alternately scanning the field image signals recorded on the first field at scanning positions of the first field and the field image signals recorded on the second field at scanning positions of the second field,

wherein rather than alternating between said first field and said second field, said scanning means successively scans the field image signals of the same field at a same scanning position when the detecting means detects a successive receipt of a field image signal of the same field.





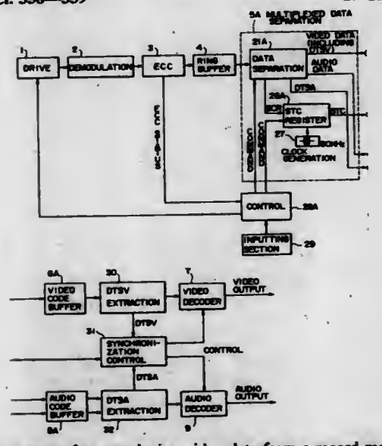
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## 5,502,573

### APPARATUS FOR REPRODUCING AND DECODING MULTIPLEXED DATA FROM A RECORD MEDIUM WITH MEANS FOR CONTROLLING DATA DECODING AS A FUNCTION OF SYNCHRONIZATION ERRORS

Yasushi Fujinami, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 14, 1993, Ser. No. 165,885
Claims priority, application Japan, Dec. 18, 1992, 4-355557; Jan. 29, 1993, 5-034557
Int. Cl.[6] H04N 5/95;5/78
U.S. Cl. 358—339 17 Claims



1. Apparatus for reproducing video data from a record medium on which is recorded in multiplexed form the video data, reference time data representing a reference time and video time data representing the time at which decoding of said video data reproduced from the record medium should begin, said apparatus comprising:

reference time data separating means for separating said reference time data from the reproduced multiplexed data and for generating timing data based thereon;

a video buffer for temporarily storing the video data and video time data which are reproduced from said record medium;

a video time data extractor coupled to said video buffer for extracting the video time data from said video buffer;

a video decoder for decoding the video data temporarily stored in said video buffer, said video buffer being connected to said video time data extractor and to said video decoder; and

synchronizing control means coupled to receive and compare said generated timing data and said extracted video time data and for controlling said video decoder as a function of the comparison.

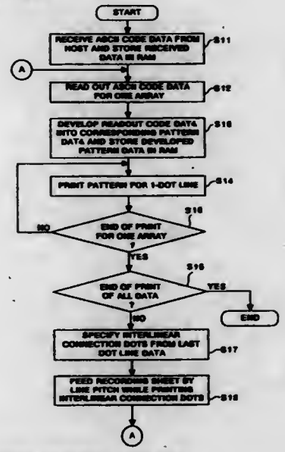
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## 5,502,574

### FACSIMILE APPARATUS WHICH CAN AVOID UNWANTED INTERLINE BREAKS IN OUTPUT

Toshifumi Nakajima, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 113,314, Aug. 30, 1993, abandoned, which is a continuation of Ser. No. 820,023, Jan. 13, 1992, abandoned, which is a continuation of Ser. No. 430,175, Nov. 1, 1989, abandoned. This application Dec. 27, 1994, Ser. No. 364,511
Claims priority, application Japan, Nov. 4, 1988, 63-277481; Dec. 1, 1988, 63-304670
Int. Cl.[6] H04N 1/00;1/40
U.S. Cl. 358—400 6 Claims




1. A facsimile apparatus comprising:

receiving means for receiving characters and symbol coded data;

a font memory for storing bit image patterns of characters and symbols;

converting means to convert the character and symbol coded data received by said receiving means into image data by reading the bit image patterns stored in said font memory in accordance with the character and symbol coded data;

inserting means to generate and insert supplemental data lines between character and symbol image lines converted by said converting means;

selecting means to select positions where upper and lower symbols on adjacent character and symbol lines are the same and where such symbols are predefined to indicate joining vertical lines;

adding means to add dots into supplemental data lines in positions where there are vertical lines in the symbols selected by said selecting means, in a case where the symbol coded data is determined as specific coded data which indicates lines;

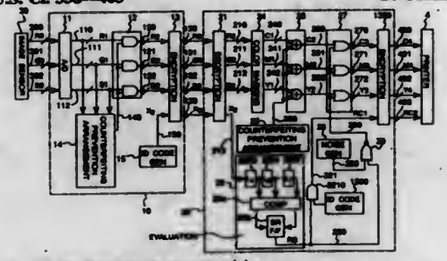
storage means to store the image data generated by said converting means and the image data generated by said adding means; and

outputting means to output the image data and supplemental data stored in said storage means.

## 5,502,575
## IMAGING APPARATUS HAVING A COUNTERFEITING PREVENTION FUNCTION

Tsutomu Kai, Hirakata; Kazuyuki Murata, Tsuzuki; Yasuhiro Kuwahara, Osaka; Hitoshi Ono, Hirakata; Tsutomu Mikami, Hirakata; Tomoko Suetake, Hirakata, and Akio Kojima, Neyagawa, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 29, 1993, Ser. No. 99,717
Claims priority, application Japan, Aug. 6, 1992, 4-209360
Int. Cl.[6] H04N 1/00; G06K 9/00; H04L 9/00
U.S. Cl. 358—405 14 Claims



1. An imaging apparatus comprising:
color image sensor means for reading an original document;
analog-to-digital converter means for converting an analog color signal read by said color image sensor means to a digital color signal;
color masking means for compensating the color data of said digital color signal and for generating image formation data for forming an image;
image forming means for forming an image on a copy sheet based on said image formation data;
encryption means for encrypting said digital color signal and for producing an encrypted signal;
decryption means for decrypting said encrypted signal;
a first single chip for holding at least said analog-to-digital converter means and said encryption means; and
a second single chip for holding at least said color masking means and said decryption means where the imaging apparatus only operates when said first single chip and said second single chip are combined.

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## 5,502,576
## METHOD AND APPARATUS FOR THE TRANSMISSION, STORAGE, AND RETRIEVAL OF DOCUMENTS IN AN ELECTRONIC DOMAIN

Thomas E. Ramsay, Minneapolis, and James C. Elkins, Golden Valley, both of Minn., assignors to Ramsay International Corporation, Minneapolis, Minn.

Filed Aug. 24, 1992, Ser. No. 933,623
Int. Cl.[6] H04N 1/40;1/00
U.S. Cl. 358—444 51 Claims

1. A method for the storage and retrieval of a two-dimensional electronic image expressible as a digital array or bitmap for the purpose of interactive document processing, said method being utilized in association with a storage device having a storage medium, said method comprising the steps of:
writing at least a portion of the digital array or bitmap corresponding to the two-dimensional electronic image to an output memory;
reading said digital content from said output memory;
converting said digital content to a first analog signal as said digital content is read from said output memory;
adding a plurality of image control signals to said first analog signal to define a format, said format defining a frame;
selectively transmitting said first analog signal over the transmission pathway to the remote location or storing said first analog signal as at least one said frame on the storage device, the storage device being capable of receiving and storing said first analog signal on the storage medium along with a multiplicity of like frames, the storage device further being capable of randomly accessing and selectively retrieving and outputting a separate analog signal corresponding to said first analog signal stored as at least one said frame from among said multiplicity of lie frames, said separate analog signal including said plurality of image control signals;
retrieving said separate analog signal including said plurality of image control signals from the storage device;
stripping said plurality of image control signals from said separate analog signal retrieved from the storage device;
converting said separate analog signal retrieved from the storage device to a digital signal;
writing said digital signal to an input memory such that the digital array or bitmap corresponding to the two-dimensional electronic image is reconstituted in said input memory,
whereby the electronic image may subsequently be utilized in one or more document processing operations including the transformation, presentation, representation, transmission, or storage and retrieval of the electronic image,
wherein the plurality of image control signals includes a plurality of raster synchronization pulses and corresponding blanking intervals, at least one pilot signal, and at least one set of calibration pulses.

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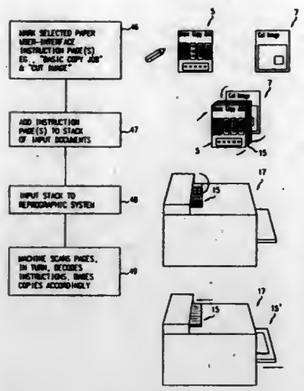
## 5,502,577
## PAPER USER INTERFACE FOR IMAGE MANIPULATIONS SUCH AS CUT AND PASTE

Jock D. Mackinlay, Palo Alto, and Walter A. L. Johnson, Santa Clara, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 950,564, Sep. 25, 1992, Pat. No. 5,438,430. This application Apr. 25, 1995, Ser. No. 428,759
The portion of the term of this patent subsequent to Aug. 1, 2012, has been disclaimed.
Int. Cl.[6] H04N 1/387
U.S. Cl. 358—468 20 Claims

1. A method for producing an output document having at least one desired output image from an input document having at least one input image, comprising the steps of:
attaching a self-stick removable instruction sheet to an input document;
scanning the self-stick removable instruction sheet with a scanner;
scanning at least one input image from the input document with the scanner;
decoding an image processing command contained on the self-stick removable instruction sheet; and
producing an output document having at least one output image from the scanned at least one input image in accordance with the decoded image processing command.



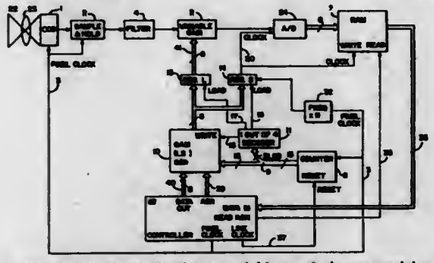


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## 5,502,578
## OPTICAL SCANNER HAVING A VARIABLE RESOLUTION

Asbjørn Smitt, Aalsgarde, Denmark, assignor to Contex A/S, Denmark

Filed Mar. 16, 1994, Ser. No. 213,990
Int. Cl.[6] H04N 1/40;1/04;3/14; H01L 27/00
U.S. Cl. 358—474 47 Claims

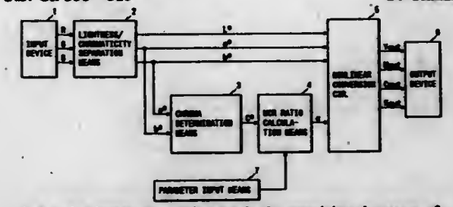


1. An optical scanner having a variable resolution comprising:
an optical detecting unit which, controlled by a controller generated pixel clock signal, applies a discrete signal representing pixels in a scanned region;
a filter for filtration of the discrete signal;
a sample clock generator comprising a counter, a store, and a first register;
a clock-controlled analog-to-digital converter connected to receive the discrete signal from the filter, said converter converts the discrete signal to a digital signal having a preselected resolution, said resolution being controlled by the sample clock generator;
said counter receiving the pixel clock signal and generating a multibit signal;
said store containing binary data words, said multibit signal from the counter serving as an address signal for the store, an addressed, binary data word generated and read by the store;
said first register receiving the read, binary data word from the store and being coupled to a second periodic clock generator which controls reading from the register so as to provide a clock signal having clock pulses when individual bits of the data word assume a first binary state, and having no clock pulses when the individual bits of the data word assume a second binary state, said clock signal being passed to the analog-to-digital converter as a sample clock signal.

## 5,502,579
## COLOR IMAGE PROCESSING METHOD AND APPARATUS CAPABLE OF ADJUSTING THE UCR RATIO

Shinji Kita; Hitoshi Ogatsu, and Kazumasa Murai, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Oct. 20, 1993, Ser. No. 138,430
Claims priority, application Japan, Sep. 10, 1993, 5-248475
Int. Cl.[6] H04N 1/56;1/60
U.S. Cl. 358—518 14 Claims



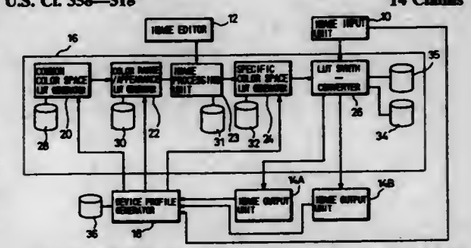
1. A color image processing method comprising the steps of:
receiving three input color signals produced by a color image input device by reading a document;
converting the three input color signals to three uniform color signals on a uniform color space;
determining a chroma signal from the three uniform color signals;
determining an under color removal ratio in accordance with a function of the chroma signal; and
determining color output signals of four colors including black based on the three uniform color signals and the under color removal ratio.

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## 5,502,580
## COLOR REPRODUCTION SYSTEM

Akira Yoda; Yoshinori Usami, and Shuichi Ohtsuka, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 30, 1994, Ser. No. 315,625
Claims priority, application Japan, Jan. 6, 1993, 5-250528
Int. Cl.[6] H04N 1/52;1/56;1/60;1/393
U.S. Cl. 358—518 14 Claims



1. A color reproduction system for processing color image data supplied from an image input unit according to a color reproduction process depending on input conditions of the image input unit and output conditions of an image output unit, and reproducing a color image based on the processed color image data with the image output unit, comprising:
conversion formula setting means for setting the color reproduction process as at least one image data conversion formula;
variable setting means for setting a selectable variable conversion formula and parameters depending on the input and output conditions with respect to variables of said image data conversion formula; and
selecting means for selecting said image data conversion formula, said variable conversion formula, and said parameters depending on the input and output conditions;

the arrangement being such that the color image data are reproduced using said image data conversion formula, said variable conversion formula, and said parameters which are selected by said selecting means.

13. A color reproduction system for processing color image data supplied from an image input unit according to a color reproduction process depending on input conditions of the image input unit and output conditions of an image output unit, and reproducing a color image based on the processed color image data with the image output unit, comprising:

a common color space converter for converting the color image data into color image data in a common color space based on the color reproduction process;

a color range converter for converting the color image data in the common color space into color image data in a reproducible color range of the image output unit which is established depending on the input and output conditions; and

a specific color space converter for converting the color image data in a reproducible color range into color image data in a specific color space of the image output unit which is established depending on the input and output conditions;

the arrangement being such that a color image is reproduced based on the color image data produced by said specific color space converter.

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**5,502,581**

## HOLOGRAM MANUFACTURING METHOD AND APPARATUS

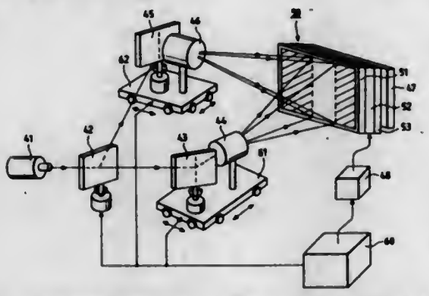
**Toshiyuki Sudo, Atsugi; Naosato Taniguchi, Machida, and Hideki Morishima, Atsugi, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 980,967, Nov. 24, 1992, abandoned. This application Nov. 18, 1994, Ser. No. 345,357**

**Claims priority, application Japan, Nov. 26, 1991, 3-310893**

**Int. Cl.[6] G03H *1/04;1/30***

**U.S. Cl. 359—10** **9 Claims**



1. A hologram manufacturing apparatus for manufacturing a hologram optical element by a step and repeat exposure method, comprising:

light shield means for controlling transmission of a reference light beam and an object light beam, which each have a wavefront, to a photosensitive material, said light shield means including a spatial light modulator, having a light transmission area and a light non-transmission area thereof, which is controlled in accordance with an input signal;

drive means for driving said spatial light modulator by supplying the input signal to the spatial light modulators, wherein said drive means moves a position of the light transmission area and changes a shape of the light transmission area; and

moving means for moving the essential point light source position of the reference light beam and the object light beam, which are incident on the light transmission area, in accordance with the light beam transmission control by said light shield means.

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**5,502,582**

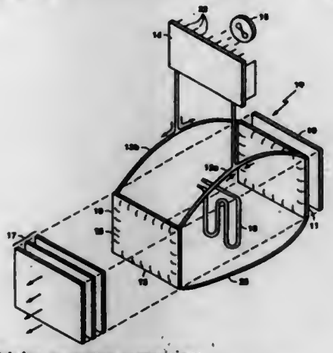
## LIGHT SOURCE COOLER FOR LCD MONITOR

**Ralph I. Larson, Bolton, Mass.; Richard J. Phillips, Alachua, Fla.; Lawrence Guzowski, Tolland, Conn., and Victor M. Samarov, Carlisle, Mass., assignors to Anvid Laboratories, Inc., South Lancaster, Mass.**

**Filed Sep. 2, 1994, Ser. No. 300,373**

**Int. Cl.[6] G02F *1/1335;* F28D *15/00***

**U.S. Cl. 359—49** **50 Claims**



1. A lighting apparatus comprising:

a light source which generates light and heat;

a translucent container having a surface proximate to a surface of the light source and being positioned between the light source and a destination to be illuminated by the light from the light source such that light passes through a portion of the container prior to reaching said destination;

a coolant liquid contained within the container, a portion of which coolant vaporizes from absorption of the heat from the light source; and

a condenser in fluid communication with the container, the condenser receiving vaporized coolant from the container and drawing thermal energy from the vaporized coolant to return the vaporized coolant to a liquid state.

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**5,502,583**

## LIQUID CRYSTAL DISPLAY DEVICE CAPABLE OF COMPENSATING FOR A POSITIONING ERROR BETWEEN A DRAIN LINE AND A DISPLAY ELECTRODE

**Osamu Sukegawa, and Hirobumi Ihara, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan**

**Filed May 13, 1994, Ser. No. 242,645**

**Claims priority, application Japan, May 15, 1993, 5-136774**

**Int. Cl.[6] G02F *1/1343***

**U.S. Cl. 359—59** **4 Claims**

2. An active matrix liquid crystal display device comprising a liquid crystal panel comprising:

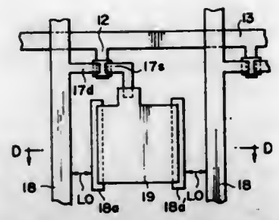
an insulating film;

a plurality of thin-film transistors formed on said insulating film, each of said thin-film transistors having a drain electrode and a source electrode;

drain lines, each being of a first conductive material, said drain lines being formed on said insulating film and connected to the drain electrodes of said thin-film transistors, respectively;

first compensating lines, each being of said first conductive material, said first compensating lines being formed on said insulating film simultaneously with said drain lines with a predetermined distance left between the drain line and the first compensating line for each of said thin-film transistors;





second compensating lines, each being of said first conductive material, said second compensating lines being formed on said insulating film simultaneously with said drain lines and said first compensating lines with the second compensating line for each of the thin-film transistors located farther from the drain line for each of the thin-film transistors than the first compensating line for each of said thin-film transistors and with said predetermined distance left between the second compensating line for one of the thin-film transistors and the drain line for an adjacent one of said thin-film transistors, said adjacent one of the thin-film transistors being nearer to the second compensating line for said one of the thin-film transistors rather than the drain line for said one of the thin-film transistors; and

display electrodes, each being of a second conductive material which is different from said first conductive material, said display electrodes being formed on said insulating film and connected to the source electrode of said thin-film transistors, respectively, the display electrode for each of said thin-film transistors being formed on said insulating film so that the display electrode for each of said thin-film transistors is positioned between the first and the second compensating lines for each of said thin-film transistors, the display electrode for each of said thin-film transistors being furthermore formed on the first and the second compensating lines for each of said thin-film transistors so that both peripheral parts of the display electrode for each of said thin-film transistors are overlaid on inner peripheral parts of the first and the second compensating lines for each of said thin-film transistors;

said first and said second compensating lines compensating for non-uniformity of capacitances between the drain line and the display electrode for each of said thin film transistors and between the display electrode for said one of the thin-film transistors and the drain line for said adjacent one of the thin-film transistors.

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**5,502,584**

## PROCESS FOR PRODUCING FERROELECTRIC LIQUID CRYSTAL DEVICE

**Sunao Mori, Atsugi; Tadashi Mihara, Isehara, and Yasuto Kodera, Fujisawa, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Mar. 16, 1994, Ser. No. 213,527**

**Claims priority, application Japan, Mar. 16, 1993, 5-082717; May 28, 1993, 5-151251**

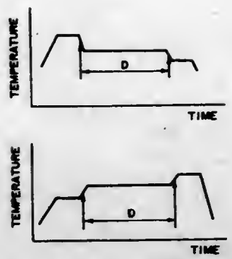
**Int. Cl.[6] G02F *1/1341;1/141***

**U.S. Cl. 359—90** **6 Claims**

1. A process for producing a liquid crystal device including a chiral smectic liquid crystal disposed between a pair of opposite substrates, comprising:

selecting a chiral smectic liquid crystal which successively assumes isotropic phase, smectic A phase and chiral smectic phase upon temperature decrease; and

injecting the chiral smectic liquid crystal in a temperature range where two higher temperature phases of the liquid crystal are co-present, wherein the two higher temperature phases are the isotropic phase and the smectic A phase.



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**5,502,585**

## OPTICAL TRANSISTOR

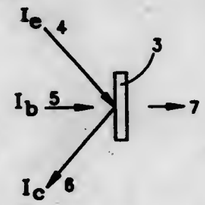
**Qian Dingrong, Livermore, Calif., assignor to Shanghai Institute of Technical Physics, Academia Sinica, Shanghai, China**

**Filed Feb. 25, 1993, Ser. No. 22,635**

**Claims priority, application China, Feb. 25, 1992, 92108337.8**

**Int. Cl.[6] G02F *3/00***

**U.S. Cl. 359—108** **22 Claims**



1. An optical transistor comprising:

a sample of semiconductor material for receiving an incident light beam having a frequency in an infrared wave band, said semiconductor material having a concentration of carriers sufficient to output said incident light beam as an output beam;

a light source for producing a bias beam to irradiate a spot on the sample and thereby excite said carriers to move and maintain a plasma oscillation reflection edge of the sample at a desired frequency position, wherein said bias beam comprises incoherent light with a continuous spectrum; and

another light source for producing a laser beam as a working beam which irradiates the sample within the spot produced by the bias beam, the plasma oscillation reflection edge of the sample having a frequency characteristic such that an intensity variation of the bias beam produces an intensity modulation of said output beam.

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**5,502,586**

## OPTICAL NETWORK INCLUDING BRANCH POINTS FEATURING THREE INTERCONNECTED BIDIRECTIONAL OPTICAL WAVEGUIDES HAVING FREE ENDS WITH REFLECTIONLESS TERMINATIONS

**Horst Ohnsorge, Freiberg, Germany, assignor to Alcatel SEL Aktiengesellschaft, Stuttgart, Germany**

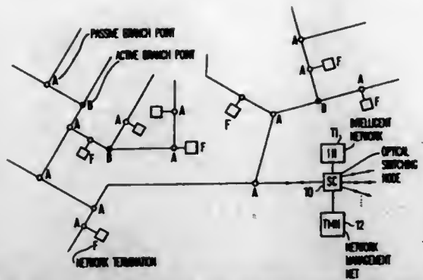
**Filed Jun. 3, 1994, Ser. No. 253,769**

**Claims priority, application Germany, Jun. 5, 1993, 43 18 732.3**

**Int. Cl.[6] H04J *14/00;* H04B *10/20***

**U.S. Cl. 359—117** **9 Claims**

1. A network for transmitting messages between subscribers using light as a carrier, wherein the subscribers are connected to




connecting points, and wherein optical signals transmitted into the network by any of the subscribers can be received at every subscriber connecting point, characterized in

that the network has branch points (A,B), each branch point having three interconnected optical waveguides,

that the three optical waveguides interconnected at a branch point are interconnected by a coupler which is bidirectional in each of three transmission paths,

that the subscriber connecting points are arbitrary points along the individual optical waveguides of the network,

that a coupler which is bidirectional in three transmission paths is provided at each of the connecting points, and

that the free ends of the optical waveguides of the network are terminated by reflectionless terminations.

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**5,502,587**

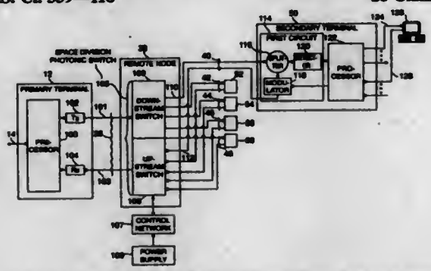
**NETWORK COMPRISING A SPACE DIVISION PHOTONIC SWITCH AND A TERMINAL WHICH FORMS AN OUTPUT SIGNAL FROM AN INPUT SIGNAL**

**Nicholas J. Frigo, Atlantic Highlands, N.J., assignor to AT&T Corp., Murray Hill, N.J.**

**Filed Jun. 30, 1994, Ser. No. 268,427**

**Int. Cl.[6] H04B *10/20;10/00;* H04J *14/00***

**U.S. Cl. 359—118** **28 Claims**




1. An apparatus for providing communications between terminals in a telecommunications network comprising:

at least one primary terminal comprising at least one waveguide loop;

a remote node comprising a space division photonic switch, the space division photonic switch being responsive to control signals from a control network:

a plurality of secondary terminals, each comprised of at least one waveguide loop and a first circuit comprised of a detector and a modulator, the first circuit responsive to signals from a processor;

wherein the space division photonic switch connects a waveguide loop of a primary terminal with a waveguide loop of a secondary terminal in response to a control signal from the control network; and

wherein the first circuit of the secondary terminal receives an information bearing input signal from the primary terminal via the connected waveguide loops, separates said information bearing input signal into a first portion and a second portion, receives data from the processor, impresses the processor data on the second portion of the information bearing input signal to form an output data signal, and sends the output data signal to any other terminal.

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**5,502,588**

**OPTICAL TRANSMISSION PROCESS AND SYSTEM FOR SENDING SOLITONS OVER VERY LONG DISTANCES**

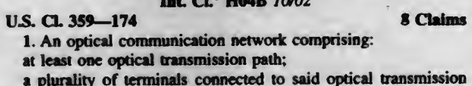
**Izo Abram, Saint Cloud, France, assignor to France Telecom, France**

**Filed Jun. 23, 1993, Ser. No. 81,798**

**Claims priority, application France, Jun. 24, 1992, 92 07722**

**Int. Cl.[6] H04B *10/00***

**U.S. Cl. 359—154** **24 Claims**




9. An optical transmission system for transmitting at least one stream of solitons said system comprising:

means for generating at least one stream of light pulses, wherein each light pulse is sent inside a time-window, window wherein consecutive time windows are contiguous and of the same duration, wherein each light pulse has the same shape and the same amplitude, the amplitude being greater than a predetermined threshold required to obtain soliton pulses when the stream propagates in a monomode optical fiber;

means coupled to the generating means for coding the light pulses of said stream with data to be transmitted;

means coupled to the coding means for stabilizing each soliton in its time window and thereby stabilizing said stream of solitons by introducing a repulsive interaction between each soliton and an immediately preceding soliton and between each soliton and an immediately following soliton,

means coupled to the coding means for injecting said stream of coded pulses into said monomode optical fiber;

means coupled to the injecting means for propagating the light pulses in the form of soliton pulses, said propagation means including said monomode optical fiber, wherein the optical fiber has a non-linear refractive index and an anomalous group velocity dispersion at the optical wavelength of the pulses;

optical amplification means for amplifying the soliton pulses as they propagate in the fiber; and

means coupled to the optical fiber for receiving and decoding the stream of soliton pulses.

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**5,502,589**

**OPTICAL COMMUNICATION SYSTEMS AND OPTICAL NODES FOR USE THEREIN**

**Noboru Yamamoto, Fujisawa; Kenji Nakamura, Hadano, and Masao Majima, Atsugi, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 159,108, Nov. 30, 1993, abandoned, which is a continuation of Ser. No. 759,923, Sep. 13, 1991, abandoned. This application Jun. 5, 1995, Ser. No. 465,575**

**Claims priority, application Japan, Sep. 17, 1990, 2-246657**

**Int. Cl.[6] H04B *10/02***

**U.S. Cl. 359—174** **8 Claims**

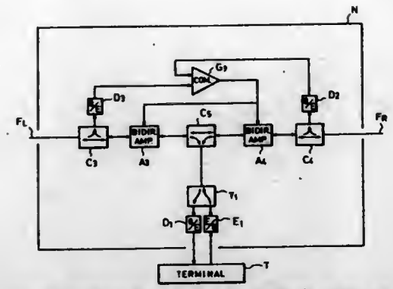
1. An optical communication network comprising:

at least one optical transmission path;

a plurality of terminals connected to said optical transmission path; and

a plurality of optical nodes provided along said optical transmission path, said optical nodes each comprising optical branching means for outputting a first part of an optical signal input from said optical transmission path to one of said terminals and outputting a second part of the optical signal to said






optical transmission path, optical combining means for combining a light beam transmitted from one of said terminals with the second part of the optical signal output to said optical transmission path, an optical amplifying device for amplifying the second part of the optical signal output to said optical transmission path as it is without converting it to an electric signal, and controlling means for controlling a gain of said optical amplifying device so as to equalize an intensity of an optical signal input to each said optical node with an intensity of an optical signal output from each said optical node, wherein

said controlling means includes a comparator, and when said one terminal is in a non-transmission state said optical amplifying device is controlled by said comparator.

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**5,502,590**

**HARMONIC WAVE GENERATING ELEMENT FOR COHERENT LIGHT HAVING SHORT WAVELENGTH**

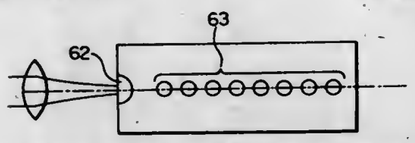
**Kazuo Suzuki, Tokyo, and Yukihiro Yamamoto, Kawasaki, both of, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan**

**Filed Jun. 6, 1994, Ser. No. 254,581**

**Claims priority, application Japan, Jun. 8, 1993, 5-164017; Mar. 28, 1994, 6-081006**

**Int. Cl.[6] G02F *1/37***

**U.S. Cl. 359—332** **9 Claims**




7. A harmonic wave generating element for converting coherent incident light into an n-th harmonic wave which has a wavelength equal to or shorter than one half of the wavelength of the incident light, comprising:

a non-linear optical material having an end surface to which the incident light is applied and an upper surface perpendicular to the end surface;

a plurality of polarization-inverted portions formed periodically along a propagation direction of the incident light in the non-linear optical material except for the vicinity of the end surface of the non-linear optical material so that any upper surface of the polarization-inverted portion is exposed on the upper surface of the non-linear optical material;

a plurality of polarization-non-inverted portions arranged between the adjacent polarization-inverted portions, each of the polarization-non-inverted portions having a refractive index different from a refractive index of the polarization-inverted portion; and

a lens-like light focusing mechanism formed at the end surface of the non-linear optical material with an upper surface of the lens-like light focusing mechanism being exposed on the upper surface of the non-linear optical material, and having a refractive index different from a refractive index of the non-linear optical material;

said polarization-inverted portions and said polarization-non-inverted portions forming a discrete optical waveguide; wherein

any boundary line on the upper surface of the non-linear optical material between the polarization-inverted portion and the polarization-non-inverted portion is curved; and

a boundary line on the upper surface of the non-linear optical material between the lens-like light focusing mechanism and the non-linear optical material is curved so as to optically couple the incident light to the discrete optical waveguide.

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**5,502,591**

**OPTICAL AMPLIFIER WITH A DOPED FLUORIDE GLASS OF OPTICAL FIBRE AND PROCESS FOR PRODUCING SAID AMPLIFIER**

**Mathilde Semenkoff, Perros Guirec; Daniel Ronarc 'H, and Marcel Guibert, both of Lannion, all of, France, assignors to France Telecom Etablissement Autonome de Droit Public, Paris, France**

**Filed Jan. 24, 1995, Ser. No. 377,472**

**Claims priority, application France, Jan. 26, 1994, 94 00837**

**Int. Cl.[6] H01S *3/00***

**U.S. Cl. 359—341** **13 Claims**



1. A fibre optical amplifier comprising:

a central erbium doped, fluoride glass, monomode optical fibre; and

first and second silica monomode optical fibres; said central, first, and second fibres having substantially similar optical mode diameters, said central fibre located between said first and second fibres and being optically coupled to said first and second fibres, wherein at least one of said first or second fibres is doped with erbium.

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**5,502,592**

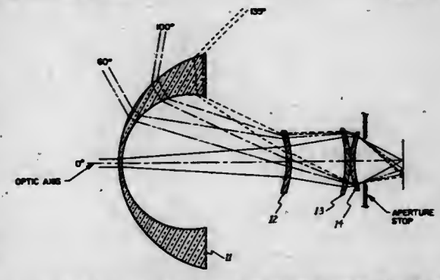
**WIDE-APERTURE INFRARED LENSES WITH HYPER-HEMISPHERICAL FIELDS OF VIEW**

**Thomas H. Jamieson, Sunnyvale, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.**

**Filed Nov. 22, 1993, Ser. No. 155,254**

**Int. Cl.[6] G02B *13/14;13/06;9/62***

**U.S. Cl. 359—355** **6 Claims**




2. An optical system for forming an infrared image of a distant scene on a focal surface, said distant scene subtending a solid angle greater than $2\pi$ steradians about an optic axis normal to said focal surface, said optical system comprising a plurality of lens elements disposed coaxially along said optic axis, said lens elements coact-

ing with each other to achieve substantial correction of said optical system for geometrical aberrations, comprising lens elements that are configured and positioned with respect to each other along said optic axis substantially according to a design form specified as follows:

| Surface No. | Radius (mm) | Thickness (mm) | Material |
|---|---|---|---|
| 1 | 42.78 | 1.31 | Germanium |
| 2 | 25.97 | 63.51 | |
| 3 | −34.17 | 1.57 | Geranium |
| | Conic constant: 3.326 | | |
| 4 | −41.21 | 21.08 | |
| 5 | −48.14 | 1.83 | Geranium |
| 6 | −36.45 | 0.05 | |
| 7 | 24.53 | 1.83 | Germanium |
| 8 | 35.39 | 3.65 | |
| Aperture stop | ∞ | 15.25 | |
| Image plane | ∞ | | |

where the surfaces of the lens elements are numbered consecutively from left to right along the optic axis.

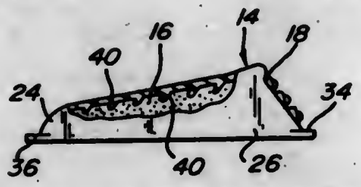
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**5,502,593**

**COMPACT PAVEMENT MARKER**

**Peter Hedgewick, Windsor, Canada, assignor to Pac-Tec, Inc., Newark, Ohio**

**Filed Aug. 3, 1992, Ser. No. 924,679**
**Int. Cl.[6] G02B 5/136**
**U.S. Cl. 359—547** **14 Claims**




1. A pavement marker for reflecting light from the headlight of a vehicle, said pavement marker being adapted for mounting to a road surface, said pavement marker comprising:
a shell having a front face, a rear portion, and a generally planar top surface extending between said front face and said rear portion, said front face having a predetermined height which is greater than a predetermined height of said rear portion, said top surface extending above said road surface along a first plane which slopes downwardly between said front face and said rear portion; and
means for reflecting light mounted to said front face of said shell.

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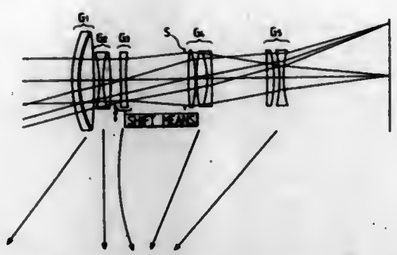
**5,502,594**

**ZOOM LENS INCORPORATING VIBRATION-PROOFING FUNCTION**

**Kenzaburo Suzuki, Tokyo, and Masahiro Nakatsuji, Machida, both of, Japan, assignors to Nikon Corporation, Tokyo, Japan**

**Filed Oct. 7, 1993, Ser. No. 132,909**
**Claims priority, application Japan, Jan. 14, 1992, 4-275621; Jan. 14, 1992, 4-275626**
**Int. Cl.[6] G02B 27/64**
**U.S. Cl. 359—557** **20 Claims**

1. A zoom lens incorporating a vibration-proofing function, comprising, sequentially from an object side:
a first lens group having a positive refracting power;
a second lens group having a negative refracting power;




a third lens group having a negative refracting power;
a fourth lens group having a positive refracting power;
a fifth lens group having a negative refracting power, said lens groups moving so that when varying a magnifying power from a wide-angle end to a telephoto end, a spacing between said first and second lens groups increases; a spacing between said second and third lens groups changes linearly or non-linearly; and a spacing between said fourth and fifth lens groups is reduced and
a shift means for preventing image vibrations by moving one of said third and fourth lens groups in a direction transverse to the optical axis.

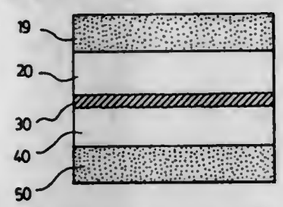
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**5,502,595**

**COLOR FILTERS AND THEIR PREPARATION**

**Lee-Ching Kuo; Fang-Chuan Ho, both of Hsinchu; William Lee, Taichung, and Yean-Kuen Fang, Tainan, all of, Taiwan, assignors to Industrial Technology Research Institute, Taiwan**

**Filed Jun. 3, 1994, Ser. No. 253,907**
**Int. Cl.[6] G02B 5/28;1/10;5/22**
**U.S. Cl. 359—589** **21 Claims**




1. A color filter comprising a transparent substrate and two or more multilayer films of amorphous silicon materials deposited on said substrate, each film being different, each layer of said two or more multi-layer films having a thickness less than the wavelength of the visible light, and at least three layers of said two or more multilayer films of amorphous silicon materials in an alternate arrangement wherein the amorphous silicon materials are selected from a-SiOx and a-SiNx.

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**5,502,596**

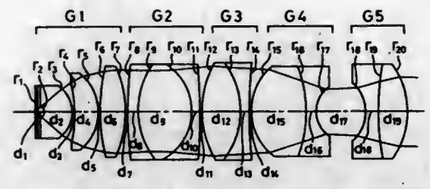
**IMMERSION MICROSCOPE OBJECTIVE**

**Toshinobu Suzuki, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan**

**Filed Nov. 19, 1993, Ser. No. 154,556**
**Claims priority, application Japan, Nov. 20, 1992, 4-311702**
**Int. Cl.[6] G02B 21/02**
**U.S. Cl. 359—657** **3 Claims**

1. A microscope objective having an object side, comprising, in order from the object side:






a first lens unit of positive refractive power including a cemented lens comprising a plano-convex lens and a meniscus lens including a concave surface directed toward the object side;
a second lens unit including a cemented lens comprising three lens elements a negative lens element, a positive lens element, and a negative lens element;
a third lens unit including a cemented lens;
a fourth lens unit including a cemented meniscus lens comprising a concave surface directed toward an image side of said microscope objective; and
a fifth lens unit including a cemented meniscus lens comprising a negative lens and a positive lens and comprising a concave surface directed toward the object side;
wherein said microscope objective satisfies the following conditions:

$$n_2-n_1>0.1 \quad (1)$$

$$n_{13}-n_{12}>0.15 \quad (2)$$

$$|f/f_1|>0.65 \quad (3)$$

$$|f/f_4|<0.2 \quad (4)$$

$$-0.8<F_B/D<-0.3 \quad (5)$$

wherein $n_1$ and $n_2$ are the respective refractive indices of the plano-convex lens and the meniscus lens having a concave surface directed toward the object side in said first lens unit;
wherein $n_{12}$ and $n_{13}$ are the respective refractive indices of the negative and positive lenses in said fifth lens unit;
wherein $f_1$, $f_4$ and f are the respective focal lengths of said first lens unit, said fourth lens unit and the microscope objective;
wherein $F_B$ is back focus of the microscope objective; and
wherein D is distance from a first lens surface of the microscope objective to a final lens surface of the microscope objective.

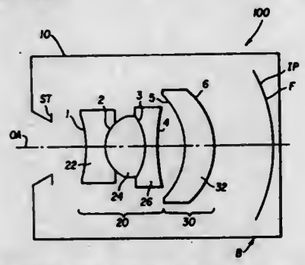
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**5,502,597**

**WIDE-ANGLE PHOTOGRAPHIC LENS SYSTEM AND A PHOTOGRAPHIC CAMERA**

**Lee R. Estelle, and Joel S. Lawther, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Feb. 2, 1994, Ser. No. 191,223**
**Int. Cl.[6] G02B 9/04;9/06;13/18; G03B 37/00**
**U.S. Cl. 359—793** **32 Claims**




1. A lens system comprising in order from an object side:
an aperture stop;
a front lens unit located behind said aperture stop, said front lens unit including a triplet, said triplet consisting of two negative power lens elements and a positive power lens element located between said negative power lens elements; and
a rear lens unit located behind said front lens unit.

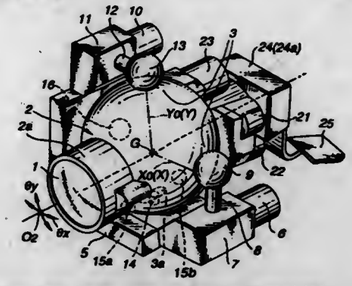
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**5,502,598**

**LENS FRAME SUPPORTING MECHANISM**

**Akiteru Kimura; Miki Matsuzaki, both of Hachioji; Atsuhiko Tanaka, Hino, and Masatoshi Inoue, Hachioji, all of, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan**

**Filed Nov. 12, 1993, Ser. No. 151,557**
**Claims priority, application Japan, Nov. 12, 1992, 4-302667; Aug. 2, 1993, 5-191352; Sep. 6, 1993, 5-221263; Sep. 6, 1993, 5-221264**
**Int. Cl.[6] G02B 7/02**
**U.S. Cl. 359—814** **27 Claims**




1. A lens frame supporting mechanism, comprising:
a spherical surface that is a specified region of an outer surface of a lens frame, and includes spherical areas covering at least movable zones of said lens frame, and is a driven and supported member;
supporting driving members being substantially in point contact with said spherical areas of said spherical surface, and supporting said associated spherical areas, and at least one of which drives its associated spherical area by rotating in contact with said associated spherical area in order to rotate and displace said associated spherical area in a given direction; and
a movement restrainer that restrains said lens frame from rotating about an optical axis, and permits movement in all other directions except the given rotation direction, and stays between said lens frame and a support member.

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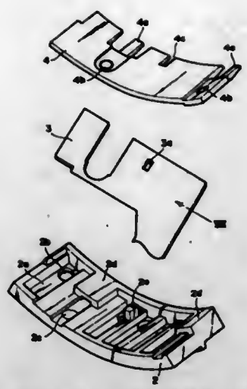
**5,502,599**

**CONDUCTIVE CONNECTOR FOR CAMERA SYSTEM COMPONENTS**

**Hideo Kanno, Chiba, and Nobuyoshi Nasu, Yokohama, both of, Japan, assignors to Nikon Corporation, Tokyo, Japan**

**Filed May 20, 1994, Ser. No. 247,876**
**Claims priority, application Japan, Jul. 27, 1993, 5-204635; Jul. 27, 1993, 5-204636**
**Int. Cl.[6] G03B 17/00; G02B 7/02**
**U.S. Cl. 359—827** **9 Claims**

1. A connector comprising:
a first connector cover with a first engaging portion;
a second connector cover with a second engaging portion being engageable with said first engaging portion to establish a connection between said first and second connector covers, said second connector cover being mountable on said first connector cover in a superposed manner therewith when said first engaging portion is engaged with said second engaging portion;
plural contact members positioned between said first and second connector covers and provided with movable contact pins



biased in a direction as to protrude from an external face of said first connector cover; and

a conductive pattern bearing member positioned partly between said first and second connector covers and having conductive patterns formed on a face thereof, said conductive patterns contacting said movable contact pins;

wherein said first connector cover has a third engaging portion, and

said conductive pattern bearing member has a fourth engaging portion for positioning said conductive pattern bearing member with respect to said first connector cover by engagement with said third engaging portion, and for preventing a deviation of said second connector cover upon attachment of said second connector cover to said first connector cover.

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**5,502,600**

**ELECTRONIC DEVICE FOR FAST DUPLICATION OF MAGNETIC TAPES**

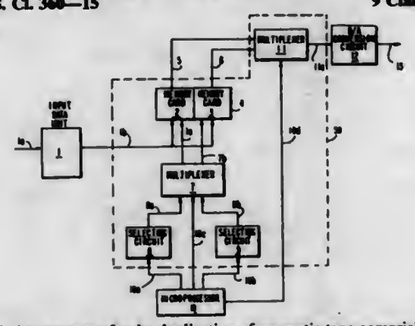
**Bernardino Bernardini, Via Bartolozzi 11, Milan, Italy**

**Continuation of Ser. No. 753,329, Aug. 30, 1991, abandoned. This application Mar. 7, 1994, Ser. No. 207,115**

**Claims priority, application Italy, Aug. 31, 1991, 21357A90**

**Int. Cl.[6] G11B *5/86;3/64***

**U.S. Cl. 360—15** **9 Claims**



1. An apparatus for the duplication of magnetic tape comprising:

means for providing data input;

parallelly arranged memory means, connected to said data input means, for enabling the simultaneous reading of the data of at least one previously stored program and the writing of the data of at least one other program;

address control means, connected to said memory means for designating storage locations for said input data in said memory means, wherein said address means comprises at least one selecting means, responsive to output signals received from a microprocessor, for providing a plurality of output signals, wherein said selecting means comprises a plurality of three-state buffer type gate circuits providing a plurality of output signals, in parallel, wherein said signals activate and select the desired subdivision of said cells of said static memory cards;

at least one address switching circuit, connected to said selecting means and said microprocessor, wherein said address switching circuit provides input signals to said memory means; and

digital-to-analog conversion means, receiving digital output signals from said memory means and converting said digital signals to analog output signals; and

means for recording said analog signals output from said digital-to-analog conversion means.

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**5,502,601**

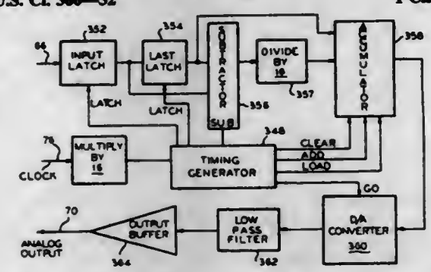
**HIGH SPEED RECORDED INFORMATION DUPLICATING EQUIPMENT**

**Robert G. Scheffler, Wheaton, Ill., assignor to Magic Music Cassette Company, Wheeling, Ill.**

**Continuation of Ser. No. 709,714, Jun. 3, 1991, Pat. No. 5,365,381, which is a continuation-in-part of Ser. No. 253,067, Oct. 4, 1988, Pat. No. 5,021,893, which is a continuation-in-part of Ser. No. 133,936, Dec. 17, 1987, Pat. No. 5,041,921, which is a continuation-in-part of Ser. No. 874, Jan. 6, 1987, abandoned. This application Nov. 14, 1994, Ser. No. 338,899**

**Int. Cl.[6] G11B *3/64;5/86;7/28;20/00***

**U.S. Cl. 360—32** **1 Claim**




1. An information duplicating recording machine comprising:

means for providing source signals in digital form;

means for electronically buffer storing said digital source signals;

means responsive to said buffer stored digital signals for making duplicate recordings of analog signals whereby said source signals are isolated from said recorded signals;

a digital-to-analog converter means interposed between said buffer storage means and said duplicate recording means;

said digital-to-analog converter including means for calculating a substantially smooth curve envelope for said digital signals; and

said digital-to-analog converter includes means for dividing a difference between successive digital samples into N-steps, and means for adding one of said steps to each of N-samples between said successive digital samples.



**5,502,602**

**RECORDING AND/REPRODUCING APPARATUS HAVING NO CAPSTAN AND NO PINCH ROLLER AND METHOD OF CONTROLLING THE SAME**

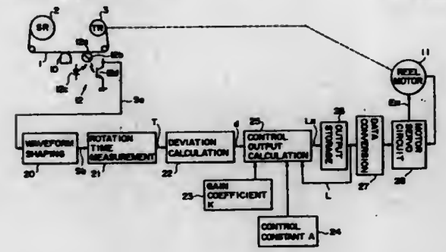
**Kunio Shimizu, Chiba, and Yoshitomo Nakano, Tokyo, both of, Japan, assignors to Sony Corporation, Tokyo, Japan**

**Filed Jul. 19, 1993, Ser. No. 92,864**

**Claims priority, application Japan, Jul. 21, 1992, 4-214727; Jul. 21, 1992, 4-214728; Jul. 21, 1992, 4-214729; Jul. 21, 1992, 4-214730; Jul. 21, 1992, 4-214731**

**Int. Cl.[6] G11B *15/52***

**U.S. Cl. 360—73.14** **13 Claims**




1. A recording and/or reproducing apparatus of a type which has no capstan and no pinch roller, comprising:

reel driving means including a motor for driving a reel to rotate to perform a feeding operation of a recording medium in the form of a tape;

tape feeding speed detection means including a roller for contacting the recording medium so as to be rotated by the recording medium when the recording medium is fed;

a stationary recording and/or reproducing head arranged adjacent said tape for recording and/or reproducing a signal from said tape;

rotation period measurement means for measuring a period of rotation of said roller of said tape feeding speed detection means;

deviation calculation means for calculating a deviation from a predetermined speed of the recording medium using a measured value from said rotation period measurement means;

constant value generation means for generating a non-varying constant value which is dependent upon a relationship between a servo control output range and a rotational speed range of said motor of said reel driving means;

servo control value calculation means for calculating a servo control value for a current control cycle, which varies in proportion to the rotational speed range of said motor of said reel driving means, the deviation calculated by said deviation calculation means, the constant value generated by said constant value generation means, and a servo control value calculated in an immediately preceding control cycle by said servo control value calculation means;

storage means for storing the servo control value output from said servo control value calculation means for said current control cycle and supplying the stored servo control value as a servo control value for the immediately preceding control cycle to said servo control value calculation means; and

servo means for controlling a rotational speed of said motor of said reel driving means in response to the servo control value calculated by said servo control value calculation means for said current control cycle so that a feeding speed of the recording medium is made substantially equal to the predetermined speed.

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**5,502,603**

**ROTATING HEAD TYPE RECORDING/REPRODUCING APPARATUS WHICH USES WIDE RECORDING HEADS TO RECORD A SINGLE PILOT SIGNAL OVER THREE TRACKS AND PREVENTING OVERWRITING OF THE PILOT SIGNAL BY THE NEXT HEAD SCAN**

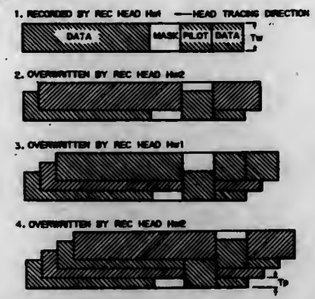
**Takanobu Kohno, Tokyo, and Tadashi Ozue, Kanagawa, both of, Japan, assignors to Sony Corporation, Tokyo, Japan**

**Filed Oct. 4, 1994, Ser. No. 317,484**

**Claims priority, application Japan, Jan. 8, 1993, 5-277842**

**Int. Cl.[6] G11B *5/02***

**U.S. Cl. 360—77.14** **11 Claims**




1. A rotating head type recording and reproducing apparatus for recording and reproducing an information signal as a slant track onto and from a tape shaped recording medium, comprising:

(1) a first recording rotating head with a width equal to or wider than three track pitches;

(2) a second recording rotating head with the same head width as said first recording rotating head and with a different azimuth from that of said first recording rotating head;

(3) pilot signal generating means for generating a pilot signal with a predetermined frequency;

(4) separating means for separating the information signal into a first information signal for said first recording rotating head and a second information signal for said second recording rotating head;

(5) record control means

(a) for causing said first recording rotating head and said second recording rotating head to overwrite a track that was recorded by the other recording rotating head for a predetermined width with a new track so as to successively form tracks,

(b) for causing said first recording rotating head to form a pilot signal recording region, an information signal recording region, and a mask region during each scan to the tape shaped recording medium, the pilot signal being recorded in the pilot signal recording region, the first information signal being recorded in the information signal recording region, and no signal being recorded in the mask region that corresponds to a pilot signal recording region recorded at the last scanning of said first recording rotating head, and

(c) for causing said second recording rotating head to form an information recording region and a mask region during each scan to said tape shaped recording medium, the second information signal being recorded in the information signal recording region, the mask region corresponding to a pilot signal recording region recorded at the last scanning of said first recording rotating head;

(6) a first reproducing rotating head with a width that is equal to or larger than one track pitch and equal to or less than two track pitches and with the same azimuth as said first recording rotating head;

(7) a second reproducing rotating head with a width that is equal to or larger than one track pitch and equal to or less than two track pitches and with the same azimuth as said second recording rotating head;

(8) tracking error signal generating means for generating a tracking error signal that varies according to the relation of

signal levels of two pilot signals reproduced from the two pilot signal regions on the same track by said fist reproducing rotating head; and

(9) compensating means for compensating a tracking error in accordance with the tracking signal.

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**5,502,604**

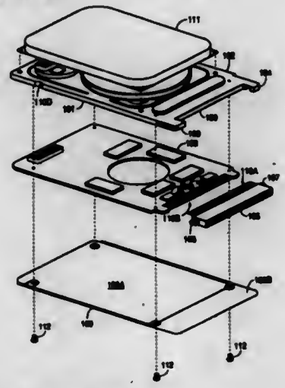
**DISK DRIVE WITH RAIL MOUNTING ARRANGEMENT**

**David M. Furay, Boulder, Colo., assignor to Intégral Peripherals, Inc., Boulder, Colo.**

**Continuation of Ser. No. 958,858, Oct. 8, 1992, abandoned. This application Aug. 16, 1994, Ser. No. 291,249**

**Int. Cl.[6] G11B *5/012*; H05K *7/02***

**U.S. Cl. 360—97.01** **21 Claims**



1. A disk drive comprising:

a base housing member, said base housing member comprising a generally planar body on which a spin motor assembly and an actuator are mounted and extending from a first side of said disk drive to a second side of said disk drive, said base housing member terminating in a pair of side rails, said side rails being oriented parallel to each other and extending laterally outward from opposite sides of said disk drive;

a cover attached to said base housing member, said cover and said base housing member together forming a cavity which encloses one or more recording disks; and

an electrical connector rigidly fixed to respective ends of said side rails, said electrical connector being oriented so as to mate with a corresponding electrical connector when said disk drive is moved in a direction parallel to said side rails;

wherein said pair of side rails are configured for sliding into a pair of channel guides included in a memory card slot in a computer or other instrument.

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**5,502,605**

**SPINDLE MOTOR OF DISK APPARATUS INCLUDING AN IMPROVED SPINDLE HUB**

**Kenichi Myokan, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan**

**Filed Oct. 3, 1994, Ser. No. 317,120**

**Claims priority, application Japan, Dec. 28, 1993, 5-349714**

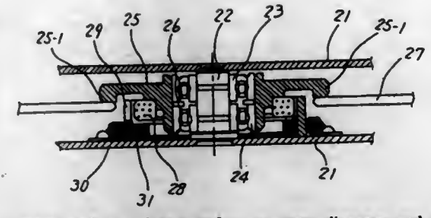
**Int. Cl.[6] G11B *17/02*;*5/016***

**U.S. Cl. 360—99.08** **14 Claims**

1. A spindle motor for rotating a disk within a disk apparatus comprising:

a spindle shaft adapted to be secured to a housing said spindle shaft extending between an upper end portion and a lower end portion;

a spindle hub rotatably attached to said spindle shaft, said spindle hub including a flange, said flange being defined by an



upper surface, a lower surface, an outer diameter, and an internal space located radially inwardly of said outer diameter adjacent said lower surface;

a disk defined by a minor diameter and a major diameter, wherein said minor diameter is less than both said major diameter and said outer diameter of said flange, and said disk being attached to said lower surface of said flange;

a ring-like permanent magnet attached to said lower surface of said flange within said internal space;

a plurality of stators attached within said internal space of said flange in concentric positions in face-to-face relationship with said ring-like permanent magnet; and

a plurality of armature coils wound on each of said stators.

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**5,502,606**

**ROTARY MAGNETIC HEAD DEVICE HAVING PLURAL MAGNETIC HEADS WHICH ARE INDEPENDENTLY MOVABLE**

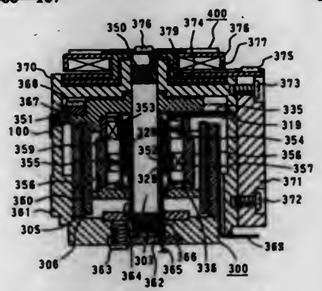
**Kazuo Mori; Tetsuya Shigeeda; Kazuyuki Kokubo; Norihiro Yonezawa, and Kimihide Nakatsu, all of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Jul. 16, 1993, Ser. No. 92,691**

**Claims priority, application Japan, Jul. 17, 1992, 4-190881; Jul. 17, 1992, 4-190882; Dec. 25, 1992, 4-359166; Jan. 20, 1993, 5-007286; Apr. 21, 1993, 5-094356; May 20, 1993, 5-118470; Jun. 14, 1993, 5-142030; Jun. 14, 1993, 5-142031; Jul. 15, 1993, 5-175366**

**Int. Cl.[6] G11B *5/588***

**U.S. Cl. 360—107** **24 Claims**



1. A rotary magnetic head device comprising:

a stationary cylinder having a guide face for guiding a magnetic tape, said guide face being formed on an outer periphery of said stationary cylinder;

a shaft for supporting said stationary cylinder;

a rotary cylinder which is supported by said shaft, and which is rotatable;

a primary rotary transformer which is fixed to said stationary cylinder;

a secondary rotary transformer which is disposed on said rotary cylinder and which opposes said primary rotary transformer;

first and second plate springs;

a yoke for fixedly attaching said first and second plate springs to said rotary cylinder;



a holder which consists of a plurality of holder members which are supported by said first and second plate springs so as to be respectively independently movable in an axial direction;

a bobbin mounted on said stationary cylinder to oppose said holder in a radial direction

a plurality of coils wound on said bobbin;

a plurality of magnets which are fixed to said holder, which are magnetized in the radial direction, and which oppose said bobbin in the radial direction; and

a plurality of magnetic heads for recording and reproducing signals on said magnetic tape, said plurality of magnetic heads being respectively mounted on a plurality of front ends of said first plate spring or said second plate spring so that when a current is selectively supplied to one or more of said plurality of coils, a respective one or more of said magnetic heads move independently in the axial direction.

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**5,502,607**

**RECORDING OR REPRODUCING APPARATUS**

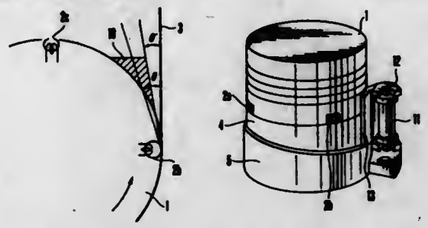
**Tatsuzo Ushiro, Saitama, and Kitahiro Kaneda, Kanagawa, both of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 927,547, Aug. 6, 1992, abandoned, which is a continuation of Ser. No. 262,610, Oct. 26, 1988, abandoned. This application Feb. 24, 1994, Ser. No. 201,048**

**Claims priority, application Japan, Nov. 2, 1987, 62-275869; Nov. 2, 1987, 62-275870**

**Int. Cl.[6] G11B *15/60***

**U.S. Cl. 360—130.24** **4 Claims**



1. A recording or reproducing apparatus including a rotary drum with heads mounted on the periphery thereof in such a manner that they protrude, and a stationary drum which is disposed adjacent to said rotary drum, said rotary drum being rotated to record a signal on or to reproduce a signal from a tape-like recording medium wrapped around predetermined portions of said drums and travelling at a predetermined speed, and movable tape guide means

an improvement being characterized by the inclusion of a tape supporting member for restricting the movement of predetermined portions of said tape-like recording medium toward said drums, said tape supporting member being arranged to stabilize air in a space formed between said medium and said drums, said stationary drum being formed, on its outer peripheral surface, with lead means having a lead surface for guiding the tape-like recording medium, said lead means having a stopper at an end of said lead surface for affixing said tape supporting member in said apparatus, said movable tape guide means being positioned at the end of said lead surface by contact with said stopper.

**5,502,608**

**TAPE CASSETTE**

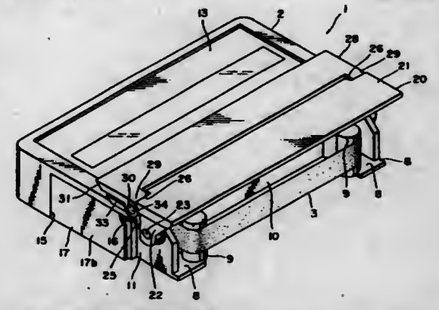
**Yoichirou Senshu; Shuichi Ota, both of Kanagawa; Hiroshi Fujii; Akihiro Uetake, both of Tokyo; Takashi Sawada, Kanagawa; Shinichi Hasegawa, Chiba; Kazuyoshi Suzuki, Tokyo, and Tetsuro Morii, Chiba, all of, Japan, assignors to Sony Corporation, Tokyo, Japan**

**Continuation of Ser. No. 19,841, Feb. 19, 1993, abandoned. This application Sep. 28, 1994, Ser. No. 314,368**

**Claims priority, application Japan, Feb. 27, 1992, 4-075693**

**Int. Cl.[6] G11B *23/02***

**U.S. Cl. 360—132** **9 Claims**



1. A tape cassette comprising:

a case including top and bottom walls and side walls extending therebetween, said case having a mouth in a front portion of said case with said mouth having openings at the front, top and bottom of said front portion of the case;

tape reels rotatable in said case;

a recording tape wound on said reels and including a tape run between said reels which extends across said mouth;

a front lid pivoted on said side walls of the case for movements in an arcuate path relative to said case between a closed position of said front lid in which said front lid covers said opening at the front of said front portion of the case for protecting said tape run extending across said mouth when the tape cassette is not in use, and an opened position of the front lid displaced upwardly and rearwardly from said closed position of the front lid for uncovering said opening at the front of said front portion of the case and thereby providing access to said tape therethrough when the tape cassette is in use;

a slide shutter slidably supported on said side walls of the case for rectilinear sliding movement relative to said case between a closed position of said slide shutter at which said shutter covers said opening at the bottom of said front portion of the case when said front lid is in said closed position of the front lid, and an opened position of said slide shutter displaced rearwardly from said closed position of the slide shutter and in which said slide shutter uncovers said opening at the bottom of said front portion of the case when the front lid is in said opened position of the front lid;

an upper lid having a front edge portion pivotally joined to said front lid at an edge portion of the front lid which is at the top thereof in said closed position of said front lid;

guiding means for said upper lid moving the latter to a closed position of the upper lid in which said upper lid is flush with said top wall of the case and in which a back edge of said upper lid is contiguous with a front edge of said top wall so as to cover said opening at the top of said front portion of the case when said front lid is moved to said closed position of the front lid, said guiding means moving said upper lid to an opened position of the upper lid in which said upper lid overlies said top wall of the case for uncovering said opening at the top of said front portion of the case in response to movement of said front lid to said opened position of the front lid; and

cooperative means on said upper lid and said slide shutter for locking said upper lid in said closed position of the upper lid in response to forward movement of said slide shutter from

said opened position of the slide shutter to said closed position of the slide shutter.

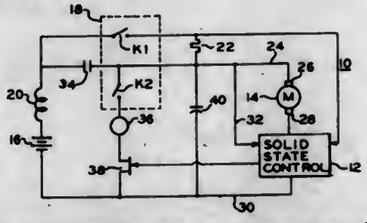
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**5,502,609**

## ELECTRIC CIRCUITRY FOR PREVENTING CONTACTOR TIP CONTAMINATION IN DRY SWITCHING APPLICATIONS

**Sherrill G. Thomas, Sutherlin, Va., and Larry G. Ball, Snow Camp, N.C., assignors to General Electric Company, Fort Wayne, Ind.**

**Filed Dec. 8, 1994, Ser. No. 352,417**
**Int. Cl.[6] H01H 1/6**
**U.S. Cl. 361—6** **5 Claims**




1. A contactor control system for a DC electric motor power system for reducing contactor tip contamination from dry-switching, the power system including a DC power source coupled to a motor through a normally open line contactor, an electronic motor controller coupled in circuit with the motor and a line filter capacitor coupled in parallel circuit arrangement with the motor and controller, the control system including:

a first switch connected in circuit between the power source and the controller for enabling the controller upon closure of said first switch;

resistance means connected between said first switch and the capacitor whereby charging current is supplied to the capacitor upon closure of said first switch;

an electromagnetic actuator for the line contactor;

a solid-state switch connected in series circuit with said electromagnetic actuator, the series combination of said actuator and solid-state switch being connected in parallel circuit with the capacitor; and

means in the controller for gating said solid state switch into conduction when voltage on the capacitor exceeds a preselected voltage whereby discharge current from the capacitor is effective to energize said actuator for closing the line contactor such that voltage on the capacitor is less than the source voltage at contactor closure to affect a current through the contactor at closure.

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**5,502,610**

## SWITCHING REGULATOR HAVING HIGH CURRENT PREVENTION FEATURES

**Steve I. Chaney, Pleasanton, Calif., assignor to Micrel, Inc., San Jose, Calif.**

**Filed Sep. 2, 1993, Ser. No. 116,427**
**Int. Cl.[6] H02M 3/335**
**U.S. Cl. 361—18** **12 Claims**

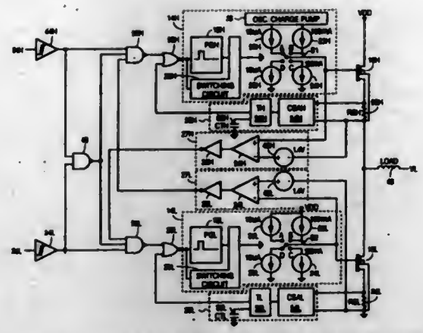
1. A switching circuit comprising:

a first transistor having a first terminal for conducting load current to a load circuit, and a second terminal coupled to receive a first voltage; and

a current regulating circuit, said current regulating circuit having an output terminal coupled to a control terminal of said first transistor, said current regulating circuit having an input terminal for receiving an input signal,

said current regulating circuit comprising:

a first current source for generating a first constant current;




a second current source for generating a second constant current;

one or more switches connected to said first current source, said second current source, and said control terminal of said first transistor; and

a timer connected to said one or more switches for controlling said one or more switches to couple said first constant current to said control terminal of said first transistor for a first predetermined period of time in response to said input signal to switch said first transistor to a first state, and, after said first predetermined period of time, controlling said one or more switches to only couple said second constant current to said control terminal of said first transistor to maintain said first transistor in said first state, said second constant current being substantially less than said first constant current.

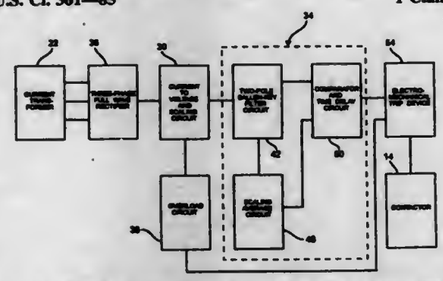
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**5,502,611**

## CIRCUIT FOR PROVIDING PHASE LOSS AND PHASE IMBALANCE PROTECTION

**Barry Rodgers, Raleigh, N.C., assignor to Square D Company, Palatine, Ill.**

**Filed Oct. 14, 1994, Ser. No. 323,407**
**Int. Cl.[6] H02H 3/46**
**U.S. Cl. 361—85** **1 Claim**



1. A circuit for detecting phase imbalance in a three phase electrical system, said circuit comprising;

a plurality of current transformers, each monitoring a current flowing in one phase of the three phase system and providing an induced current proportional to said monitored current;

a full wave bridge rectifier for rectifying said induced current produced by said current transformers;

a current to voltage converter for producing a voltage signal proportional to said induced current;

a two pole filter for receiving said signal from said current to voltage converter and selectively passing a desired signal having a particular frequency range or selectively blocking an undesired signal having a particular frequency range;



a scaling circuit for receiving a portion of said desired signal and producing therefrom a scaled average signal having a preselected magnitude lower than said desired signal;

a comparator/timer for receiving a portion of said desired signal and said scaled average signal and producing an output signal based on a comparison of said desired signal and said scaled average signal; and

an electromechanical trip device for receiving said output signal and selectively initiating a trip signal to an electrical contactor for the purpose of interrupting said three phase system.

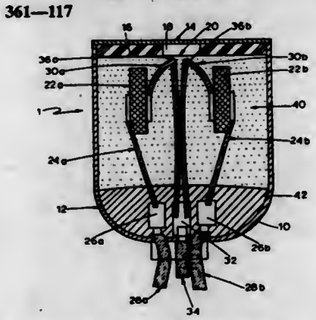
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**5,502,612**

## SECONDARY SURGE ARRESTER WITH ISOLATING AND INDICATING FEATURES

**Joseph C. Osterhout, Lockport; Steven P. Hensley, Geneva; Alex Demetzensky, Berwyn, and Howard E. Swanson, Chicago, all of Ill., assignors to Joslyn Manufacturing Company, Franklin Park, Ill.**

**Continuation-in-part of Ser. No. 911,669, Jul. 8, 1992, abandoned. This application Feb. 7, 1994, Ser. No. 193,227**
**Int. Cl.[6] H02H 7/04**
**U.S. Cl. 361—117** **22 Claims**




10. A secondary surge arrester comprising:

first and second electrical conductors;

a fault current limiting fuse and an arrester element connected to the first and second electrical conductors such that the arrester element conducts surge currents from one of the first and second electrical conductors to the other of the first and second electrical conductors in response to electrical surges, wherein the fault current limiting fuse comprises a fusible material surrounded by an energy absorbing material;

a ventless casing which includes a transparent area and which encloses the arrester element and the fault current limiting fuse; and

a heat sensitive element made of paper and disposed within the ventless casing between the energy absorbing material and the transparent area which responds to heat generated by the fault current limiting fuse during a failure of the arrester element to indicate the operability of the arrester element.

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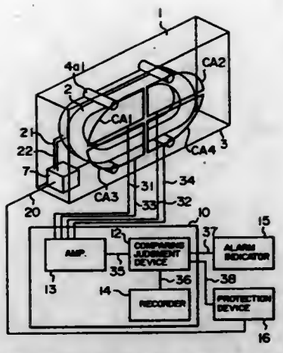
**5,502,613**

## SUPERCONDUCTING MAGNET ABNORMALITY DETECTION AND PROTECTION APPARATUS

**Toshio Saitoh; Teruhiro Takizawa, both of Hitachi; Naoki Maki, Ibaraki; Takashi Kobayashi, Hitachiota; Masayuki Shibata, Hitachi; Ken Yoshioka, Hitachiota; Tadasi Sonobe, Iwaki, and Fumio Suzuki, Hitachi, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Jul. 8, 1993, Ser. No. 87,417**
**Claims priority, application Japan, Jul. 15, 1992, 4-188352**
**Int. Cl.[6] H02H 7/00**
**U.S. Cl. 361—19** **18 Claims**

1. A superconducting magnet abnormality detection and protection apparatus comprising:




magnetic flux detecting devices disposed inside of an outer vessel of at least one superconducting magnet, the at least one superconducting magnet including at least a superconducting coil, a load support for supporting the superconducting coil and the outer vessel, the outer vessel housing the superconducting coil, the load support and the magnetic flux detecting devices therein;

decision means for determining whether there is an abnormality in output voltage of the magnetic flux devices; and

means selected at least one of alarm means for informing of an abnormal state on the basis of an output signal of the decision means, and protection means for protecting the superconducting magnet on the basis of the output signal.

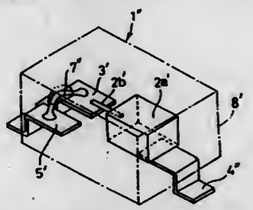
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**5,502,614**

## SOLID ELECTROLYTIC CAPACITOR

**Chojiro Kuriyama, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan**

**Continuation of Ser. No. 164,802, Dec. 10, 1993, abandoned, which is a division of Ser. No. 41,972, Apr. 2, 1993, Pat. No. 5,329,421. This application Nov. 8, 1994, Ser. No. 335,593**
**Claims priority, application Japan, Apr. 7, 1992, 4-85354**
**Int. Cl.[6] H01G 9/15**
**U.S. Cl. 361—534** **2 Claims**




1. A solid electrolytic capacitor comprising:

a capacitor element including a chip body and an anode wire projecting from the chip body;

an anode lead electrically connected to the anode wire;

a cathode lead paired with the anode lead and electrically connected to the chip body;

an auxiliary lead separate from the anode and cathode leads;

a resin package enclosing the capacitor element, part of the anode lead, part of the cathode lead, and part of the auxiliary lead; and

a solder fuse wire for electrically connecting the auxiliary lead to one of the chip body and the anode lead within the resin package;

wherein each of the anode, cathode and auxiliary leads has an inner end located in the resin package, and an outer end projecting from the resin package; and

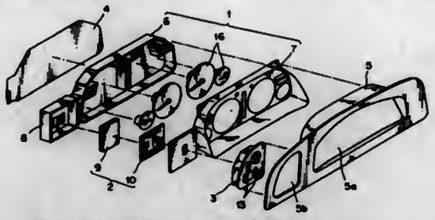
wherein one end of the solder fuse wire is in the form of a nail head.

5,502,615

## METER MODULE ASSEMBLY

Minoru Kubota; Keizo Nishitani, and Yoshiaki Nakayama, all of Susono, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed May 10, 1995, Ser. No. 438,915
Claims priority, application Japan, May 19, 1994, 6-105247
Int. Cl.[6] H02B *1/10*
U.S. Cl. 361—647 8 Claims



1. A meter module assembly comprising:
a combination meter panel implemented with meters/indicating lamps and a drive circuit thereof;
an electric junction box integrating functional circuits to distribute and control power sources and input/output signals for vehicle-mounted electric equipment including said meters/indicating lamps;
a switch unit integrating switches for vehicle-mounted electric equipment; and wherein said combination meter panel, said electric junction box, and said switch unit are integrally united,
said electric junction box integrally combined with said switch unit at the rear surface of said unit being arranged side by side with said combination meter panel, and said electric junction box being electrically connected with said combination meter panel by a flexible circuit board.

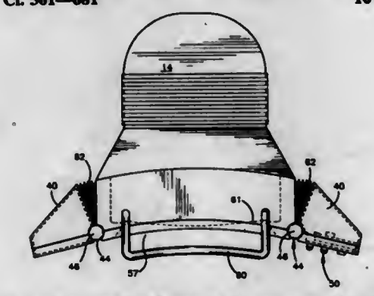
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5,502,616

## WING STATION FOR DISPLAYING DATA TO A COMPUTER MONITOR OPERATOR

Justin M. Maguire, Jr., Barrington, R.I., assignor to Elsag International N.V., Zuidoost, Netherlands

Division of Ser. No. 123,624, Sep. 17, 1993, Pat. No. 5,416,666.
This application Feb. 28, 1995, Ser. No. 395,803
Int. Cl.[6] H05K *7/16*; G06F *1/16*
U.S. Cl. 361—681 10 Claims



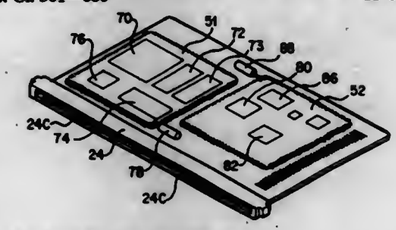
1. An auxiliary unit for displaying data to an operator viewing a computer monitor so as to allow the operator to simultaneously view both the monitor and the unit comprising:
a computer;
a computer monitor used to display data from said computer;
a wing station containing a display; and
mounting means for positioning said wing station with respect to said monitor to allow the operator to view both simultaneously.

5,502,617

## ELECTRONIC DEVICE HAVING A FLAT, CARD-LIKE CASING ENCLOSING COMPONENTS FOR A COMPLETE COMPUTER SYSTEM

Katsumi Tsukada; Norio Nakamura; Minoru Nimura; Hiroyuki Suemori; Tomio Kamihata, and Mutsuaki Yamazaki, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Continuation of Ser. No. 151,214, Nov. 12, 1993. This application May 19, 1995, Ser. No. 444,997
Claims priority, application Japan, Nov. 13, 1992, 4-304060; Nov. 13, 1992, 4-304062; Nov. 13, 1992, 4-304063; Feb. 19, 1993, 5-054843; Jun. 15, 1993, 5-169695; Nov. 8, 1993, 5-278643; Nov. 13, 1993, 4-304064
Int. Cl.[6] G06F *1/16*; H05K *7/10*; H01R *13/64*
U.S. Cl. 361—686 12 Claims



1. An electronic device, comprising:
a flat, card-like casing encasing computer system component elements being fixedly attached to a double-sided printed wiring board having a front and a back, the front including a CPU, an IO subsystem chip and memories, the back including an image control circuit, memories and peripheral equipment control ICs, a control bus electrically coupled to said CPU and including at least part of an address bus and a data bus over which said CPU transmits information, and an IO bus electrically coupled to said peripheral equipment control ICs and over which said peripheral equipment control ICs transfer signals to and from external peripheral equipment; and
a connector formed on one side of said casing, said connector being electrically coupled to said control bus and to said IO bus.

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5,502,618

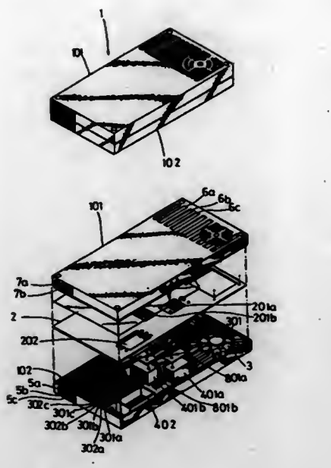
## DISSIPATION CASE FOR A POWER SUPPLIER OF DIRECT CURRENT

Ming D. Chiou, 3F., No. 4, Alley 11, Lane 327, Sec. 2, Chung Shan Rd., Chung Ho City, Taipei, Taiwan

Filed Nov. 29, 1994, Ser. No. 346,046
Int. Cl.[6] H05K *7/20*
U.S. Cl. 361—695 4 Claims

1. A dissipation case for a power supplier of direct current comprising:
an upper cover,
a base cover which is made of cast aluminum alloy with an open surface closed by said upper cover to form an inner space,
a printed circuit board which comprises a plurality of power transistors, a transformer and related wirings and is located in said inner space to convert alternating current into direct current along with a voltage drop; wherein
a plurality of heat sinks integral to said base cover are in communication with said power transistors and a receiving chamber with thermal silicon rubber therein is provided on said base cover to receive said transformer.





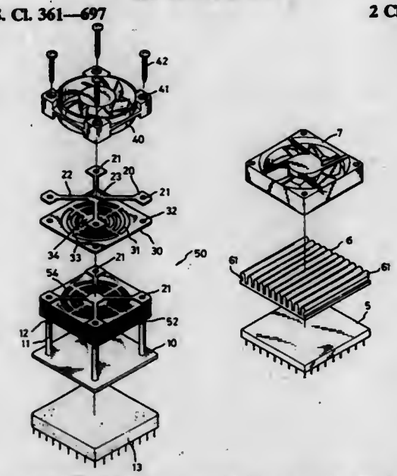
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5,502,619

## HEAT SINK ASSEMBLY FOR COMPUTER CHIPS

Michael Wang, Taipei Hsien, Taiwan, assignor to Tenmax Trading Corp., Taiwan

Filed Dec. 12, 1994, Ser. No. 354,438
Int. Cl.[6] H05K *7/20*
U.S. Cl. 361—697 2 Claims



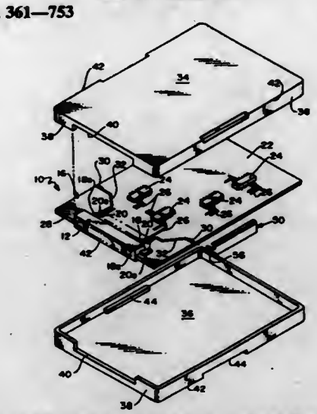
1. A heat sink assembly for computer chips, comprising:
a base plate having a lower surface to be secured to a computer chip and an upper surface having protrusions projecting upwardly therefrom;
a combinative heat dissipation unit mounted on said base plate, said unit including a plurality of alternately stacked sheets and X-shaped washers defining a plurality of transverse gaps between adjacent sheets, said gaps being open to ambient, each of said sheets having a plurality of slots formed therethrough such that a plurality of openings are formed from a top surface of said unit to a bottom surface thereof; and
a fan mounted on said heat dissipation unit and secured to said protrusions of said base plate, whereby a blowing operation of said fan dissipates heat generated by the computer chip and conducted to said base plate and to said heat dissipation unit, through said plurality of transverse gaps to ambient.

5,502,620

## GROUNDED IC CARD

Gordon W. Funck, Naperville, and Harold K. Lang, Fox River Grove, both of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Mar. 11, 1994, Ser. No. 212,458
Int. Cl.[6] H05K *5/00*
U.S. Cl. 361—753 10 Claims



1. In an IC card which includes a circuit board having a generally planar substrate with at least one electrical component mounted thereon, a receptacle including terminals mounted at an edge of the circuit board, and a pair of generally planar cover panels sandwiching the circuit board therebetween and leaving at least a mating face of the receptacle exposed for connection to an appropriate mating electrical apparatus,
wherein the improvement comprises
at least one elongated, channel-Shaped conductive grounding clip embracing adjacent side edge portions of the cover panels and including means for holding the cover panels in assembled condition,
the cover panels including recessed areas at said edge portions for receiving leg portions of the grounding clip to maintain the leg portions generally flush with the planes of the cover panels,
a ground circuit means on the circuit board for engaging the grounding clip, and
at least a portion of the grounding clip being exposed exteriorly of the IC card for engaging an appropriate ground means on the mating electrical apparatus.

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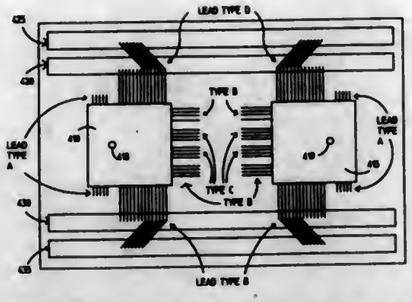
5,502,621

## MIRRORED PIN ASSIGNMENT FOR TWO SIDED MULTI-CHIP LAYOUT

Daniel L. Schumacher, Tewksbury, Mass., and John Wood, Rochester, N.H., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 31, 1994, Ser. No. 221,144
Int. Cl.[6] H05K *7/02*
U.S. Cl. 361—760 13 Claims

1. An integrated circuit package for mounting to a circuit board having a top side and a bottom side, comprising:
a plurality of pin assignments, arranged as a mirror image around the periphery of said package and positioned as a mirror image of each other along an arbitrary axis drawn through the center of said IC package;
a plurality of non-mirror image pin assignments, wherein, said integrated circuit package provides for enhanced lead routing on said circuit board when mounting a first integrated circuit package on the top side and said second integrated circuit package is mounted on said bottom side, and wherein said integrated circuit packages are rotated 180 degrees with




respect to each other such that said mirror pin assignments are directly opposite each other on opposite sides of said circuit board.

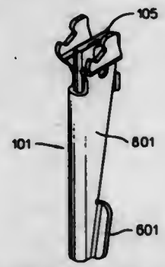
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**5,502,622**

**RETENTION CLIP TO MOUNT A HANDLE TO A CIRCUIT BOARD**

**S. Daniel Cromwell, Roseville, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed Sep. 30, 1994, Ser. No. 315,995**
**Int. Cl.[6] H05K *7/14***
**U.S. Cl. 361—801** **10 Claims**




1. A retaining clip apparatus, for retaining an insertion/extraction handle constructed with a channel in the middle thereof and two opposing pivot projections internal to the channel to a circuit board having a plurality of reliefs in the surface thereof, comprising:

a "U" shaped generally flat retaining clip having a first and a second side;

each side of the retention clip includes a handle pivot aperture operative to receive a handle pivot projection such that when the retaining clip is inserted into the channel of the handle, the handle pivot projections cooperate with the handle pivot apertures to thereby enable the handle to pivot relative to the clip; and

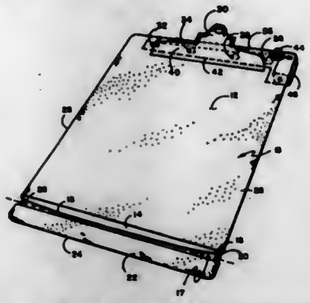
a first circuit board retention tab associated with the first side and a second circuit board retention tab associated with the second side of the retaining clip where both circuit board retention tabs project inwardly from the associated sides toward the middle of the "U" shape such that when the clip is slid over the surface of the circuit board, the retention tabs cooperate with the reliefs in the surface of the circuit board to thereby retain the clip and the handle on the circuit board.

**5,502,623**

**ILLUMINATED CLIPBOARD**

**Gregory R. Brotz, P.O. Box 1322, Sheboygan, Wis. 53081**

**Filed Jun. 5, 1995, Ser. No. 463,764**
**Int. Cl.[6] F21V *33/00***
**U.S. Cl. 362—99** **2 Claims**



1. An improved clipboard comprising:

a transparent body having an upper surface and a bottom surface, said upper surface having a plurality of sides and said bottom surface having a plurality of curved sides, said upper surface being light-emitting and light-diffusing, said curved sides of said bottom surface rising upwards to meet said sides of said upper surface;

means for said bottom surface to act as a reflector; and

a light source having an "on" and an "off" mode, said light source embedded within said transparent body, said light source in its "on" mode directing its light within said transparent body of said clipboard to be reflected off said reflective bottom surface and out said light-emitting and light-diffusing upper surface.

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**5,502,624**

**UMBRELLA WITH ALARMING AND LIGHTING FUNCTIONS**

**Yue-Feng Tu, No. 23, Alley 6, Lane 87, Fu-Der Street, Yang-Mei, Taoyuan Hsien, Taiwan**

**Filed Jan. 18, 1995, Ser. No. 374,304**
**Int. Cl.[6] A45B *3/02***
**U.S. Cl. 362—102** **12 Claims**



1. An umbrella with alarming and lighting functions comprising a plurality of ribs pivotally connected near the top end of a shaft by means of a nest, a water resistant cap placed on the top side of the nest, and pieces of fabric laid over the top side of the ribs, characterized in that:

said shaft is provided on the top end with a bulb socket for installing a bulb, male threads being formed around the top end for a transparent lamp shade to be screwed thereto, the shaft being provided on the lower end with a handle within which a space is defined for receiving battery cells and the lower end having a bottom cap, a switch being provided on the handle whereby electrical energy required for the bulb on the top of the shaft is supplied directly by the cells by means of wires via the switch;



said ribs comprise rods having electrical leads embedded therein one end thereof being provided with a socket for installing a bulb or LED and the other end thereof being formed with a pivotal connection, the end of the pivotal connection being formed into a ball shaped contact and a rod shaped contact being formed slightly spaced therefrom along said rib and separated by an insulating layer wherein the leads are connected to the pivotal connection and the bulb socket;

said nest comprises a nest seat, an inner conductive ring, a nest cap and an outer conductive ring, the nest seat having formed therein an annular groove which mates with the ball shaped contact of the pivotal connection on the ends of the ribs, the annular groove being formed around the periphery with a plurality of notches which fit around a neck of the pivotal connection, the inner conductive ring being mounted within the annular groove and formed with notches mating with said notches of the nest seat, the nest cap being installed over the top side of the nest seat and comprising a disk body provided on the bottom side with said outer conductive ring, whereby the ball shaped contact is in constant contact with the inner conductive ring such that in use by stretching the ribs open, the rod shaped contact is brought into contact with the outer conductive ring such that electrical energy is delivered to the bulbs on the tips of the ribs and whereby the switch on the handle is used to control illumination of both the bulb on the top end of the shaft and the bulbs on the tips of the ribs and to solely control the bulb on the top end of the shaft for use as a flashlight after the umbrella is folded whereby the rod shaped contact and the outer conductive ring are disconnected.

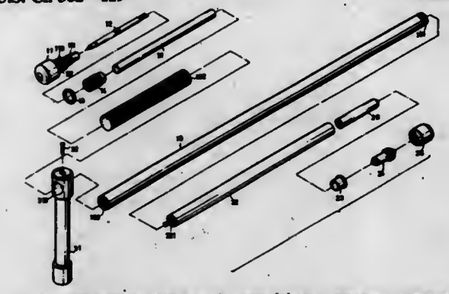
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**5,502,625**

**MULTIPURPOSE HAND TOOL**

**Ming-Yi Peng, No. 9, Lane 28, Chang Shou Street, Su Lin Chen, Taipei Hsien, Taiwan**

**Filed Aug. 17, 1995, Ser. No. 516,070**
**Int. Cl.[6] B25B *23/18***
**U.S. Cl. 362—119** **2 Claims**



1. A multipurpose hand tool comprising a spanner, a screwdriver, and an illuminator, wherein:

said spanner comprises a box-end vertical rod having a box end at one end and a transverse coupling hole at an opposite end, and a transverse tube covered with a rubber covering and fastened to the transverse coupling hole of said box-end vertical rod by a tightening up screw, said transverse tube having an outer thread at one end and an inner thread at an opposite end;

said screwdriver comprises a head, a blade, a rubber ring, and a chuck sleeve, said head comprising an annular groove around the periphery, a threaded coupling portion, which receives said blade, and an outer thread between said threaded coupling portion and said annular groove for threading into the inner thread of said transverse tube, said rubber ring being mounted around the annular groove of said head, said chuck sleeve being fastened to said threaded coupling portion to hold down said blade, said blade having a keystone tip at one end and a Phillips head tip at an opposite end;

said illuminator comprises a stop rod inserted into said transverse tube and stopped against the blade of said screwdriver, a cylindrical battery case inserted into said transverse tube and having a press-button switch at one end stopped against said stop rod, a set of battery cells mounted in said cylindrical battery case, a socket fastened to said cylindrical battery case at one end remote from said press-button switch, a lamp bulb fastened to said socket and connected said battery cells, and a lamp cover threaded onto the outer thread of said transverse tube to hold said lamp bulb on the inside and turned relative to said transverse tube to turn on/off said lamp bulb.

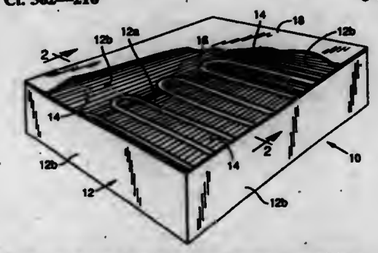
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**5,502,626**

**HIGH EFFICIENCY FLUORESCENT LAMP DEVICE**

**James B. Armstrong, Albuquerque, N.M., and J. Michael Lengyel, Ramona, Calif., assignors to Honeywell Inc., Minneapolis, Minn.**

**Filed Jun. 17, 1994, Ser. No. 261,590**
**Int. Cl.[6] F21S *5/00*; F21V *5/02;9/16***
**U.S. Cl. 362—216** **5 Claims**



1. A backlight for a liquid crystal display comprising:

an enclosure having an interior facing floor surface connected to interior facing side wall surfaces, and an open top;

a serpentine tube providing UV light located within said enclosure;

a plurality of grooves disposed in said interior facing side walls and said interior facing floor surface wherein a phosphor coating is disposed over said grooves in said interior facing side wall surfaces and said interior facing floor surface and the grooves are positioned relative to the serpentine tube to provide visible light in a uniform fashion when the UV light reacts with the phosphor coating;

an exit window positioned at said open top of said enclosure which allows passage of visible light therethrough, said exit window defining an interior ceiling surface for said enclosure wherein additional grooves with a phosphor coating are disposed on said interior ceiling surface.

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**5,502,627**

**STAGE LIGHTING LAMP UNIT AND STAGE LIGHTING SYSTEM INCLUDING SUCH UNIT**

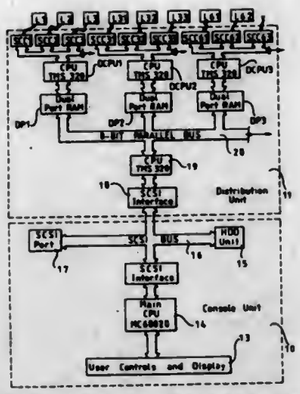
**Mark A. Hunt, Derby; Keith J. Owen, Moseley, and Michael D. Hughes, Wolverhampton, all of, United Kingdom, assignors to Light & Sound Design Limited, Edinburgh, United Kingdom**

**Filed Jun. 18, 1993, Ser. No. 77,877**
**Claims priority, application United Kingdom, Sep. 25, 1992, 9220303; Sep. 25, 1992, 9220309; Apr. 20, 1993, 9308071**
**Int. Cl.[6] F21V *21/00***
**U.S. Cl. 362—286** **9 Claims**

1. A communication system for communicating between a controlling unit and at least one lamp unit controlled by the controlling unit over a serial link, the communication system comprising:

a) a central controller unit, having:

a line driver, connected to the serial link, for producing output signals when enabled and driven by an input signal;




a controlling processor, monitoring status indicative of messages to be sent to at least one lamp unit, producing said input signal for said line driver indicative of said messages, and controlling said line driver to selectively enable and disable said line driver, said processor including an associated timer, which causes a time delay of a first predetermined time between enabling said line driver and producing said input signal; and

b) a lamp unit having:

a line receiver, connected to said serial link to receive serial communication information therefrom;

a buffer for holding information from said line receiver; and

a processor which inspects contents of said buffer, said processor including a timer which produces interrupts which are synchronized with initial receipt of information and at a second predetermined time thereafter, the second predetermined time being shorter than the first predetermined time so that any initial spurious information sent on enable of said line driver always causes a time-out of said processor in said lamp.

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**5,502,628**

**AC-DC CONVERTER**

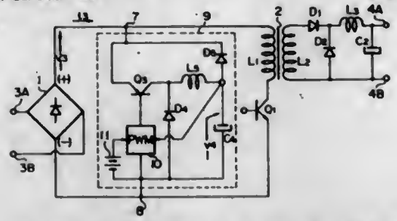
**Koji Arakawa, Tsurugashima, Japan, assignor to Toko, Inc., Japan**

**Continuation of Ser. No. 994,926, Dec. 22, 1992, abandoned. This application Apr. 14, 1994, Ser. No. 227,891**

**Claims priority, application Japan, Dec. 27, 1991, 3-360275; May 22, 1992, 4-155650**

**Int. Cl.[6] H02M *3/335***

**U.S. Cl. 363—20** **6 Claims**




1. An improved AC-DC converter wherein a primary winding of a converter transformer, and a switching transistor are connected in series with each other between output terminals of a rectifier connected to a commercial power supply line; and by controlling "on" time of said switching transistor, a stabilized DC output is derived through a rectifying-smoothing circuit connected to a secondary winding of said converter transformer, the improvement comprising: a step-down type DC-DC converter including at the output side thereof a filter circuit, said step-down type DC-DC converter being connected between a first connection point between the positive side output terminal of said rectifier and said primary winding and a second connection point between the negative side output terminal of said rectifier and the negative side of said switching transistor; an output capacitor forming said filter circuit and at the output side of said filter circuit; and a reverse current preventing element connected between the output side of said DC-DC converter and said first connection point, said reverse current preventing element forming a current path along which energy stored at said output capacitor is returned to said first connection point, whereby said output capacitor is charged only with a current flowing through said step-down DC-DC converter through operation of said step-down type DC-DC converter; voltage appearing across said output capacitor as a result of said output capacitor being charged is controlled by said step-down DC-DC converter so as to be always lower than a peak value of output voltage of said rectifier; the energy stored at said output capacitor is returned to said first connection point through said reverse-current preventing element irrespective of operation of the switching element of said DC-DC converter.

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**5,502,629**

**DC-DC CONVERTER**

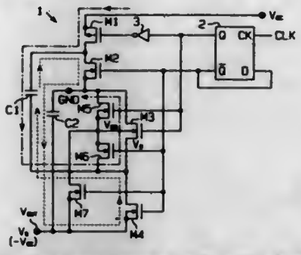
**Hidenobu Ito, and Hiroko Mizuno, both of Kasugai, Japan, assignors to Fujitsu Limited, Japan**

**Filed Mar. 28, 1995, Ser. No. 412,112**

**Claims priority, application Japan, Mar. 31, 1994, 6-087573**

**Int. Cl.[6] H02M *3/18***

**U.S. Cl. 363—60** **15 Claims**




1. A DC-DC converter, supplied with power from first and second DC power supplies having different supply voltages, said DC-DC converter comprising:

a first capacitor;

a second capacitor having a lead serving as an output terminal of the DC-DC converter;

first and second MOS transistors for selectively connecting said first capacitor to said first and second DC power supplies so as to charge said first capacitor;

third and fourth MOS transistors for selectively connecting said first capacitor to said second capacitor so as to charge said second capacitor by electric charges stored in said first capacitor,

wherein a predetermined output voltage is produced at said output terminal, based on the charge/discharge operations of said first and second capacitors by alternately turning on the first and second MOS transistors' pair and the third and fourth MOS transistors' pair, and

wherein a variable voltage is applied to a back gate of one MOS transistor selected from said first to fourth MOS transistors, and constant voltages are applied to back gates of the other three MOS transistors;

a first control transistor for forming a connection between a source and a back gate of said selected MOS transistor; and

a second control transistor for applying one of said predetermined output voltage and the supply voltages of said first and second DC power supplies to the back gate of said selected MOS transistor.



**5,502,630**

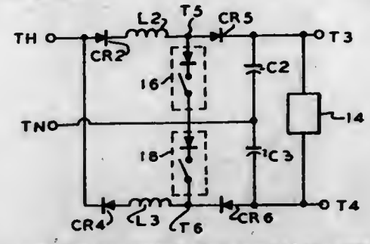
**POWER FACTOR CORRECTED RECTIFICATION**

**Alexander Rokhvarg, Cliffside Park, N.J., assignor to Transistor Devices, Inc., Cedar Knolls, N.J.**

**Filed Jul. 19, 1994, Ser. No. 277,500**

**Int. Cl.[6] H02M *7/21***

**U.S. Cl. 363—84** **47 Claims**




1. A power supply adapted to be connected to a power main providing alternating current, for delivering power to a load, comprising:

energy output means for conveying electrical energy to said load;

inductive means adapted to be coupled to said power main for inductively storing and discharging energy;

a unidirectional means having a pair of unidirectional conducting paths coupled between said inductive means and said energy output means for steering bidirectional current from said inductive means to provide a unipolar potential at said energy output means;

switching means coupled to said inductive means (a) for branching away from said pair of unidirectional conducting paths, and (b) for switching a flow of bidirectional current through said inductive means to alternately (i) store energy from said power main in said inductive means, and (ii) convey energy from said inductive means and said power main to said energy output means; and

control means coupled to said switching means for operating it at a repetition rate exceeding that of half cycles of said power main, said switching means having a duty cycle that is varied by said control means in a direction tending to keep current from said power main in phase with voltage on said power main.

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**5,502,631**

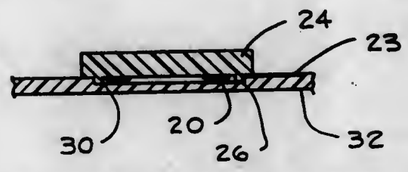
**CIRCUIT ELEMENTS THAT ARE ULTRASONICALLY WELDED TOGETHER**

**Yoshio Adachi, Kodaira, Japan, assignor to AUE Institute, Ltd., Kodaira, Japan**

**Continuation of Ser. No. 691,342, Apr. 25, 1991, abandoned. This application Oct. 7, 1994, Ser. No. 320,110**

**Int. Cl.[6] H05K *7/02*; H01L *23/544***

**U.S. Cl. 361—760** **10 Claims**




1. An ultrasonically welded electronic circuit comprising:

a circuit board formed of ultrasonically weldable material;

a conductive circuit pattern formed on the circuit board; and

at least one electronic element comprising

an ultrasonically weldable exterior region,

at least one terminal unit on a contact surface of the element for electrically coupling the element to a conductive circuit pattern of a circuit board, and

alignment means for aligning the electronic element to the circuit board so as to ensure correct positioning of the electronic element and reliable electrical coupling,

wherein the ultrasonically weldable exterior region is ultrasonically welded to the circuit board.

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**5,502,632**

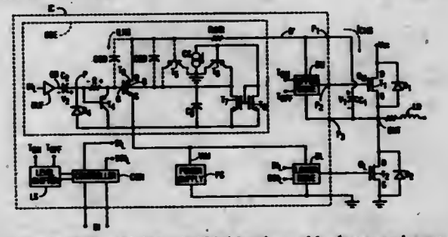
**HIGH VOLTAGE INTEGRATED CIRCUIT DRIVER FOR HALF-BRIDGE CIRCUIT EMPLOYING A BOOTSTRAP DIODE EMULATOR**

**Leo F. P. Warmerdam, Nijmegen, Netherlands, and Anand Jaiswamy, Sunnyvale, Calif., assignors to Philips Electronics North America Corporation, New York, N.Y.**

**Continuation-in-part of Ser. No. 155,053, Nov. 19, 1993, Pat. No. 5,373,435, which is a continuation of Ser. No. 160,176, May 7, 1993, abandoned. This application Jul. 15, 1994, Ser. No. 275,569**

**Int. Cl.[6] H02M *3/24*; *3/335***

**U.S. Cl. 363—98** **10 Claims**



1. A circuit for driving a half-bridge formed by lower and upper power transistors connected between an output terminal and respective lower and upper rails of a high voltage DC supply, and for charging a bootstrap capacitor having first and second ends, the first end being connected to said output terminal, said circuit comprising:

means for generating lower and upper drive command signals for commanding driving said respective lower and upper power transistors to non-contemporaneous conducting states;

power supply means for generating at a power supply output a relatively low control voltage with respect to said lower rail;

a lower drive module connected to the power supply output for being powered by said relatively low control voltage and comprising means for applying a lower drive control signal between a control electrode of the lower power transistor and the lower rail in response to said lower drive command signal;

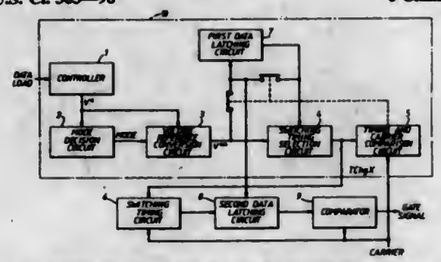
an upper drive module adapted to be connected to the first end of the bootstrap capacitor for being powered by a bootstrap voltage across said bootstrap capacitor and comprising means for applying an upper transistor control signal between a control electrode of the upper power transistor and the output terminal in response to said upper drive input control signal; and

bootstrap diode emulator means for charging said bootstrap capacitor to said bootstrap voltage, said bootstrap diode emulator means comprising a Lateral Diffused Metal Oxide Semiconductor (LDMOS) transistor having a source electrode connected to said power supply output, a drain electrode adapted to be connected to the second end of the bootstrap capacitor, a gate electrode coupled to a further control signal derived from said lower drive command signal for driving said LDMOS transistor to a conducting state when the lower power transistor is driven to a conducting state, and a backgate electrode, there being a parasitic transistor connected to said backgate electrode, and biasing and limiting means coupled to the backgate electrode for biasing the backgate electrode while limiting the current that said parasitic transistor can shunt away from said bootstrap capacitor.

## 5,502,633
## METHOD AND APPARATUS FOR CONTROLLING AN INVERTER

Satoshi Miyazaki, Kanagawa; Lazhar Ben-Brahim, and Ryoichi Kurosawa, both of Tokyo, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 4,899, Jan. 21, 1993, Pat. No. 5,361,197.
This application Sep. 15, 1994, Ser. No. 306,579
Claims priority, application Japan, Jan. 24, 1992, 4-011110; Jun. 2, 1992, 4-141233; Sep. 14, 1992, 4-244428
Int. Cl.[6] H02M 3/24;5/42
U.S. Cl. 363—98 6 Claims




1. A method of controlling an inverter generating a plurality of phase voltages and a corresponding plurality of line voltages defined as the differences between said phase voltages, said method comprising the steps of:

generating voltage reference signals having waveforms with a plurality of phases;

determining one of (1) a normal mode, (2) a rectangle mode and (3) a zero correction mode of operation of said inverter in response to values and polarities of said voltage reference signals; wherein

the normal mode is determined when the amplitude of the waveforms of all three phases of the voltage reference signals are over a preset value;

the rectangle mode is determined when at least one of the following conditions exist: (1) the amplitudes of the waveforms of at least two phases of the voltage reference signals are less than or equal to the preset value, and (2) the amplitudes of the waveforms of at least two phases of the voltage reference signals are less than or equal to twice the preset value and the signs of said at least two phases of the voltage reference signals are of different polarities with respect to each other; and

the zero correction mode is determined when the amplitude of the waveform of one phase of the voltage reference signals is less than or equal to the preset value, and the amplitudes of the waveforms of the other two phases of the voltage reference signals are less than or equal to twice the preset value and the other two phases have the same polarity;

using the voltage reference signals during the normal mode as a reference value for controlling said inverter; and

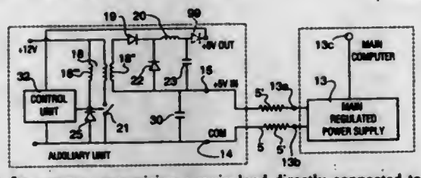
in at least one of said determined rectangle and zero correction modes, converting the voltage reference signals to converted voltage reference signals in accordance with a preset algorithm such that each phase voltage based on said converted voltage reference signals has a controlled pulse width greater than or equal to predetermined minimum width and such that the resulting line voltages do not change when compared to said line voltages generated using said voltage reference signals;

wherein the step of converting said voltage reference signals to said converted voltage reference signals in said rectangle mode takes place at one of (1) a fixed time when the frequency of said voltage reference signals is less than a prefixed value, and (2) at a time which is determined by a predetermined phase of said voltage reference signals when the frequency of said voltage reference signals is greater than or equal to said prefixed value.

## 5,502,634
## REGULATED AUXILIARY POWER SUPPLY

Tom Lavrisa, Kanata, Canada, assignor to Mitel Corporation, Kanata, Canada

PCT No. PCT/CA92/00443, § 371 Date Apr. 11, 1994, § 102(e) Date Apr. 11, 1994, PCT Pub. No. WO93/07674, PCT Pub. Date Apr. 15, 1993
PCT Filed Oct. 9, 1992, Ser. No. 211,618
Claims priority, application Canada, Jan. 11, 1991, 2053382
Int. Cl.[6] H02M 7/53
U.S. Cl. 363—101 8 Claims




1. In a system comprising a main load directly connected to a main regulated power supply and an auxiliary load connected to said main regulated power supply by a line in which a voltage drop occurs, said main regulated supply being connected at a near end of said line, and an auxiliary regulated power supply being connected at a far end of said line, said auxiliary regulated power supply comprising:

a pair of input terminals connected to said far end of said line and receiving an input voltage therefrom;

a secondary voltage source;

a pair of secondary terminals connected to said secondary voltage source;

a pair of output terminals connected to said auxiliary load and supplying an output voltage;

means for adding voltage from said secondary voltage source to said input voltage to provide said output voltage;

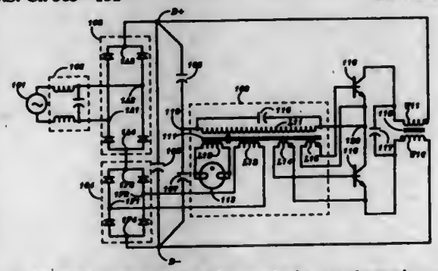
means for applying said output voltage to said output terminals; and

control means for sensing the voltage at said output terminals, said control means being operative to control said adding means in a feedback arrangement to maintain said output voltage at a constant level appropriate for said auxiliary load.

## 5,502,635
## PARALLEL RESONANT INTEGRATED INVERTER BALLAST FOR GAS DISCHARGE LAMPS

Andrzej A. Bobel, 201 Norman Ct., Des Plaines, Ill. 60016, assignor to Andrzej A. Bobel, Des Plaines, Ill.

Continuation-in-part of Ser. No. 5,817, Jan. 19, 1993, Pat. No. 5,371,438. This application Sep. 20, 1994, Ser. No. 309,037
Int. Cl.[6] H05B 37/00
U.S. Cl. 363—132 24 Claims



1. An energy conversion device employing an electronic converter having DC input terminals and provides a high frequency signal at its output terminals, the device comprising:

voltage source means providing an input current;



first rectifier means having first AC input terminals and first DC output terminals wherein said AC input terminals are connected to the voltage source means;

second rectifier means having second AC input terminals and second DC output terminals wherein said first and second DC output terminals are coupled to the DC input terminals;

capacitor means coupled to the DC input terminals;

semiconductor switching means coupled to the DC input terminals;

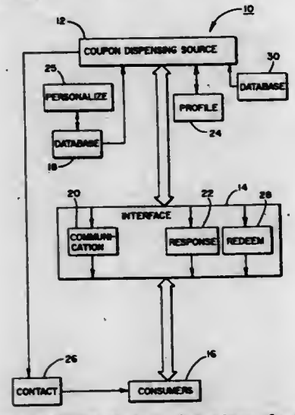
resonant oscillator circuit means coupled to the DC input terminals and to the semiconductor switching means wherein said resonant oscillator circuit draws a current from the DC input terminals, and further wherein the resonant oscillator circuit develops an alternating voltage at the output terminals and said oscillator circuit comprises: (i) a resonant inductor having a primary winding coupled to the output terminals; (ii) a resonant capacitor coupled to the output terminals and in parallel with the primary winding of the resonant inductor; and (iii) a switching feedback loop coupled to the resonant inductor and responsive to instantaneous magnitude of the alternating voltage and operable to deliver to the semiconductor switching means a switching signal proportional to the instantaneous magnitude of the alternating voltage; and

input-output means coupled to the resonant inductor and connected to AC input terminals of the second rectifier means wherein the input-output means provides (i) a substantially constant magnitude high frequency signal at the output terminals, and (ii) a substantially sinusoidal input current.

## 5,502,636
## PERSONALIZED COUPON GENERATING AND PROCESSING SYSTEM

F.G.E. Clarke, Essex, Conn., assignor to R.R. Donnelley & Sons Company, Chicago, Ill.

Filed Jan. 31, 1992, Ser. No. 830,318
Int. Cl.[6] G06F 151/00
U.S. Cl. 364—401 7 Claims




1. A promotional coupon processing scheme for identifying a group of consumers responsive to certain categories of products and promoting coupon-based transactions from the consumers related at least to those specific products, said scheme comprising the steps of:

(a) informing consumers of the availability of coupons for predefined products from an identified coupon-dispensing source geographically located remote from the consumers;

(b) providing a communication medium for said group of consumers responsive to the predefined products to inform said coupon-dispensing source of specific coupon requests corresponding to desired ones of said specific products;

(c) receiving at said coupon-dispensing source said specific coupon requests along with selected predefined demographic "profile" data from said responsive group of consumers making said coupon requests;

(d) creating an individualized consumer profile data record in a consumer profile database at said coupon-dispensing source for each consumer in said responsive group of consumers at said coupon-dispensing source from said specific request and profile information received from said responsive group of consumers making said coupon requests;

(e) in response to receiving said specific coupon requests from said responsive group of consumers and creating said individualized consumer profile data record in said consumer profile database for each consumer in said responsive group of consumers, using said specific request and profile information supplied by said responsive group of consumers and stored in said consumer profile database to prepare personalized promotional coupons at said coupon-dispensing source corresponding only to said respective specific coupon requests of said responsive group of consumers;

(f) in response to receiving said specific coupon requests from said responsive group of consumers and creating said individualized consumer profile data record in said consumer profile database for each consumer in said responsive group of consumers, forwarding said personalized promotional coupons from said coupon-dispensing source only to corresponding ones of said responsive group of consumers at locations remote from points of purchase;

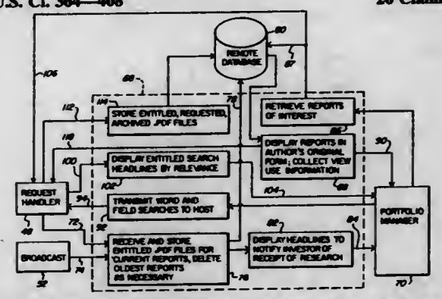
(g) providing means for monitoring the subsequent redemption of said personalized coupons; and

(h) receiving and recording data corresponding to said monitored redemption of personalized coupons at said coupon-dispensing source to create a redemption database therefrom.

## 5,502,637
## INVESTMENT RESEARCH DELIVERY SYSTEM

Roland C. Beaulieu, Littleton, and David R. Cutright, Newton, both of Mass., assignors to Thomson Shared Services, Inc., Boston, Mass.

Filed Jun. 15, 1994, Ser. No. 260,025
Int. Cl.[6] G11B 19/00
U.S. Cl. 364—408 26 Claims




1. A device for delivering brokers' investment research to institutional investors comprising:

a plurality of author stations at brokers' locations for converting investment research into a portable document format and for generating entitlement information regarding distribution of the research and subject information regarding the subject matter of the research;

a host for receiving the portable document format research and associated entitlement and subject information from the author stations and for receiving profiles of institutional investors' interests from the institutional investors, said host for comparing the profiles to the subject information and for generating instructions regarding notifying institutional investors to receipt of research of interest to them, said host also

for generating instructions based upon the entitlement information regarding remote storage of the portable document format research;

a transmitter at the host location for broadcasting the portable document format research, and for transmitting the remote storage and notification instructions to the institutional investors;

a remote database at the institutional investors' locations for receiving the remote storage instructions, and for receiving and storing the portable document format research according to the remote storage instructions, and also for discarding the portable format research which has been stored on the institutional investors' databases for the longest time; and

a view station at the institutional investor location and in communication with said institutional investor database for receiving and executing the notification instruction to notify the institutional investor to receipt of research of interest to the institutional investor, said view station for rendering portable document format research stored on said institutional investor database to enable immediate display of the research in the brokers' original forms.

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**5,502,638**

## SYSTEM FOR OBSTACLE AVOIDANCE PATH PLANNING FOR MULTIPLE-DEGREE-OF-FREEDOM MECHANISM

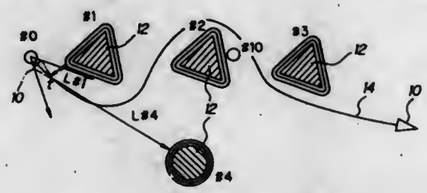
**Toru Takenaka, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Feb. 8, 1993, Ser. No. 14,611**

**Claims priority, application Japan, Feb. 10, 1992, 4-057447**

**Int. Cl.[6] G06F *13/376***

**U.S. Cl. 364—424.02** **25 Claims**




1. A system for obstacle avoidance path planning for a multiple-degree-of-freedom mechanism moving from a predetermined point to a goal avoiding an obstacle, comprising:

first means for defining a viscous drag coefficient distribution on the obstacle;

second means for describing a time required for the mechanism to move from the predetermined point to the goal with a functional, using the viscous drag coefficient distribution;

third means for determining a path on the basis of the variational principle with the viscous drag coefficient distribution such that the functional has an extreme value; and

fourth means for driving the mechanism along the determined path.

**5,502,639**

## CONTROLLING APPARATUS OF STEERING ANGLE OF REAR WHEELS OF FOUR-WHEEL STEERING VEHICLE

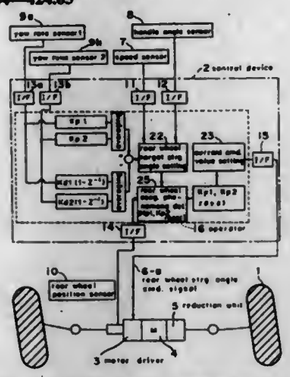
**Takashi Fukunaga, and Akiyoshi Segawa, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Division of Ser. No. 119,642, Sep. 13, 1993, abandoned, which is a division of Ser. No. 743,225, Aug. 9, 1991, Pat. No. 5,274,555. This application Feb. 22, 1995, Ser. No. 392,626**

**Claims priority, application Japan, Aug. 18, 1990, 2-212861; Dec. 28, 1990, 2-409044; Apr. 2, 1991, 3-69708**

**Int. Cl.[6] B62D *5/04***

**U.S. Cl. 364—424.05** **3 Claims**




3. A controlling apparatus for controlling a steering angle of rear wheels of a four-wheel steering vehicle, and comprising a steering wheel angle sensor for detecting and outputting a steering wheel angle signal indicative of a current steering wheel angle of the vehicle, a speed sensor for detecting and outputting a speed signal indicative of a current speed of the vehicle, and a yaw rate sensor for detecting and outputting a signal indicative of a current yaw rate of the vehicle, wherein the steering angle of the rear wheels is established according to an operating position of an electric motor which drives the rear wheels via a reduction gear, said controlling apparatus further comprising:

a position detector for detecting and outputting a detection signal indicative of a current steering angle of the rear wheels;

an operating unit for (a) receiving the steering wheel angle signal from the steering wheel angle sensor, the speed signal from the speed sensor, the yaw rate signal from the yaw rate sensor and the detection signal from the position detector, (b) applying a predetermined gain to the yaw rate signal to obtain an adjusted yaw rate signal indicative of an adjusted current yaw rate, (c) calculating a desired steering angle of the rear wheels from the current steering wheel angle indicated by the steering wheel angle signal, the current speed indicated by the speed signal, and the adjusted current yaw rate indicated by the adjusted yaw rate signal, (d) calculating a steering angle command signal indicative of a difference between the desired steering angle of the rear wheels and the current steering angle of the rear wheels indicated by the detection signal, and (e) outputting the steering angle command value to a motor driver of the electric motor;

wherein said operating unit includes means for judging that the rear wheels are vibrating when the difference between the desired steering angle of the rear wheels and the current steering angle of the rear wheels repeatedly fluctuates between positive and negative values at least a predetermined number of times within a preset time interval and an absolute peak value of the difference is at least a preset value during the preset time interval, and wherein said operating unit further includes means for reducing a value of the gain applied to the yaw rate signal when said operating unit judges that the rear wheels are vibrating, the gain being reduced to an extent that the absolute peak value of the difference becomes less than the preset value.



**5,502,640**

## ROUTE SELECTION METHOD AND APPARATUS THEREFOR

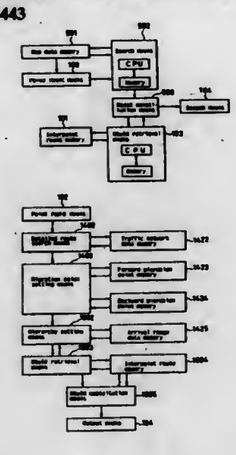
**Takeshi Yagyu, Osaka, and Yoshiki Ueyama, Sakai, both of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan**

**Continuation of Ser. No. 853,562, Mar. 18, 1992, abandoned. This application Jun. 22, 1994, Ser. No. 264,246**

**Claims priority, application Japan, Mar. 19, 1991, 3-054538; Sep. 4, 1991, 3-223881**

**Int. Cl.[6] G06G *7/78*; G08G *1/123*; G01C *21/00***

**U.S. Cl. 364—443** **18 Claims**




1. A route selection method comprising the steps of:

defining, in advance, a connection network that includes a plurality of points representing points on a map between which a person may travel;

storing, in advance in a memory, various combinations of pairs of said points, wherein each pair of points includes a first point representing an arbitrary starting point on said map, a second point representing an arbitrary destination point on said map, and at least one transit point, if said transit point exists, said transit point corresponding to one of said plurality of points in said connection network that is located between said first point and said second point in that pair of points and through which a person must travel in progressing from said first point to said second point in that pair of points;

selecting any two points from said plurality of points in said connection network;

searching said memory for a first pair of points corresponding to said selected two points and retrieving a first transit point associated with said first pair of points if said first transit point exists;

searching said memory repeatedly for additional pairs of points stored therein and retrieving transit points associated with each additional pair of points retrieved, wherein a first point in each of said additional pairs of points corresponds to one of said selected two points and a second point in each of said additional pairs of points corresponds to a transit point retrieved in a preceding searching operation, if present, until a pair of points having no transit point associated therewith is located; and

determining a route between said two selected points by combining said two selected points with all of said transit points retrieved during said searching and retrieving operations.

**5,502,641**

## RELATIVE GPS METHOD AND APPARATUS THAT IS ABLE TO CORRECT FOR MOMEMTARY SIGNAL INTERRUPTION

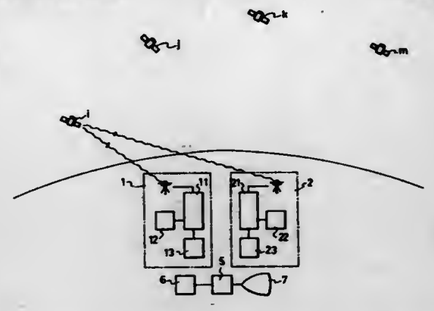
**Hidetoshi Isomura, Atsugi, Japan, assignor to Sokkia Co., Ltd., Tokyo, Japan**

**Filed Aug. 12, 1994, Ser. No. 289,224**

**Claims priority, application Japan, Dec. 27, 1993, 5-330982**

**Int. Cl.[6] G05D *1/00***

**U.S. Cl. 364—449** **4 Claims**




1. A relative positioning GPS using at least four GPS satellites which travel on satellite orbits and a GPS surveying system having a first receiving apparatus for receiving radio waves to be transmitted from each of said GPS satellites and a second receiving apparatus for receiving radio waves to be transmitted from each of said GPS satellites, said relative positioning GPS comprising the steps of:

disposing said first receiving apparatus in a known point;

disposing said second receiving apparatus in an unknown point;

measuring an integrated carrier phase of the radio waves to be received by each of said receiving apparatuses;

recording said integrated carrier phase at every predetermined interval of time; and

obtaining three-dimensional coordinate values of the unknown point based on the recorded integrated carrier phase,

wherein, when interruption of receiving of the radio waves to be transmitted from said GPS satellites has occurred during said measuring and recording steps, said interruption of receiving is detected and a cycle slip included in said measured integrated carrier phase is corrected after ceasing of said interruption of receiving and,

wherein correction of said cycle slip comprises the steps of:

obtaining an average value of a rate of change of an integrated carrier phase at a predetermined time before said interruption of receiving and a rate of change of an integrated carrier phase at a predetermined time after ceasing of said interruption of receiving;

calculating a correction amount of a real number value by multiplying said average value by a time between said predetermined time before said interruption of receiving and said predetermined time after ceasing of said interruption of receiving;

calculating a correction amount of an integer number value by rounding said correction amount of said real number value to a nearest integer number; and

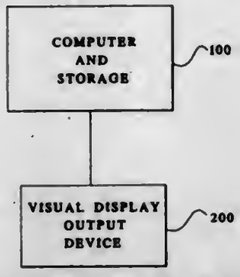
correcting said cycle slip included in said integrated carrier phase after said ceasing of said interruption of receiving by adding said correction amount of said integer number value to said integrated carrier phase at said predetermined time before said interruption of receiving.

**5,502,642**

## HSL NEIGHBORHOODS IN CMY COLOR SPACE

**Wilhelm Dichter, Tewksbury, Mass., assignor to Linotype-Hell AG, Germany**

**Continuation of Ser. No. 974,516, Nov. 12, 1992, abandoned. This application May 4, 1995, Ser. No. 434,862**
**Int. Cl.[6] H04N *1/46***
**U.S. Cl. 364—581** **10 Claims**




1. A method for color manipulation of a color image stored in a computer in digital image processing wherein the color image is visually displayed by an output device of the computer, comprising the steps of:

providing a CMY color space having a gray line therein, the gray line being a line which passes through the CMY color space and has absence of color therealong;

defining a three-dimensional neighborhood in said CMY color space for the color manipulation of the color image as visually displayed on the computer output device by defining boundaries thereof based on at least one H, S, and L (hue, saturation, and luminance) correction range with respect to the gray line;

assigning a weighting within the three-dimensional neighborhood based on H, S, L positions of color points within the neighborhood;

checking for pixels of the color image to be manipulated whether color values of those pixels lie inside or outside the three-dimensional neighborhood, and if they lie inside the neighborhood, then utilizing the assigned weighting for those color values to change the color value of those pixels to create a new color image which has been color manipulated in accordance with the defined H, S, L neighborhood; and

visually displaying the new color image on the computer output device.

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**5,502,643**

## METHOD OF AND AN APPARATUS FOR SETTING UP PARAMETERS WHICH ARE USED TO MANUFACTURE A SEMICONDUCTOR DEVICE

**Masato Fujinaga, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Dec. 15, 1992, Ser. No. 991,362**
**Claims priority, application Japan, Apr. 16, 1992, 4-096215**
**Int. Cl.[6] G06F *17/50***
**U.S. Cl. 364—488** **22 Claims**

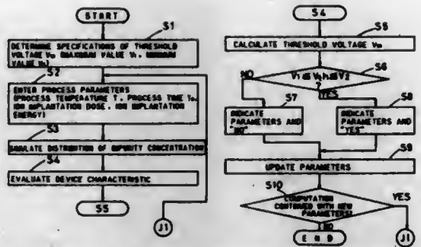
1. A method of setting up process parameters which are used in a manufacturing process of a semiconductor device, comprising the steps of:

(a) entering a plurality of process parameters;

(b) calculating an impurity concentration C which will be observed in said semiconductor device using said process parameters, said impurity concentration C being a function of a position z within said semiconductor device;

(c) judging whether said impurity concentration C has a predetermined value;

(d) if a judgement at said step (c) is "No," updating said process parameters and repeating said steps (b) and (c) until said judgement at said step (c) becomes "Yes;" and




(e) determining said process parameters with which said judgement at said step (c) is "Yes" as process parameters to be obtained, wherein

said step (b) involves defining a boundary region between abutting first and second materials and performing a calculation using a model in which said impurity concentration C continuously varies with said position z across said boundary region.

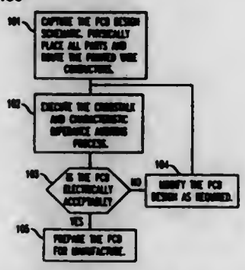
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**5,502,644**

## PROCESS AND APPARATUS FOR AUDITING CROSSTALK AND CHARACTERISTIC IMPEDANCES OF PRINTED WIRING BOARDS

**Eric A. Hamilton, Butler; Attilio J. Rainal, Morristown, and Jere C. Shank, Green Village, all of N.J., assignors to AT&T Corp., Murray Hill, N.J.**

**Filed Apr. 7, 1994, Ser. No. 225,012**
**Int. Cl.[6] G06F *17/50***
**U.S. Cl. 364—488** **10 Claims**




1. A method of auditing crosstalk between conductors in a printed wiring board (PWB) comprising the steps of:

defining conductors into conduction nets;

selecting conduction nets one at a time and designating as idle;

designating nearby conduction nets other than the selected conduction net as driven in an active condition;

computing a response of the selected conduction net and developing therefrom a plurality of crosstalk parameters including a coherent sum, a coherent-incoherent sum and an incoherent sum;

evaluating the crosstalk parameters to determine the effect of crosstalk on the selected conduction net;

integrating the crosstalk design parameters into a design and manufacturing process of the PWB.

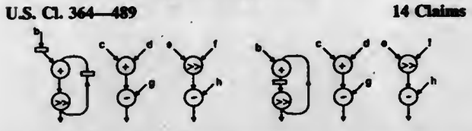


**5,502,645**

## BEHAVIORAL SYNTHESIS FOR RECONFIGURABLE DATAPATH STRUCTURES

**Lisa Guerra, Berkeley, Calif.; Miodrag Potkonjak, Plainsboro, N.J., and Jan Rabaey, Berkeley, Calif., assignors to NEC USA, Inc., Princeton, N.J.**

**Filed Nov. 5, 1993, Ser. No. 148,637**
**Int. Cl.[6] G06F *17/50***
**U.S. Cl. 364—489** **14 Claims**



1. A method of synthesizing datapaths for providing built-in-self-repair of hardware circuits comprising the steps of:

defining a circuit to be synthesized as a control data flow graph;

applying at least one of resource allocation, scheduling and reassignment methods to synthesize datapaths for circuit design for minimal area design so that up to a predetermined quantity of hardware units in the design can be faulty with the circuit being operational; and

providing a synthesized behavioral level circuit description in accordance with the circuit design for minimal area design.

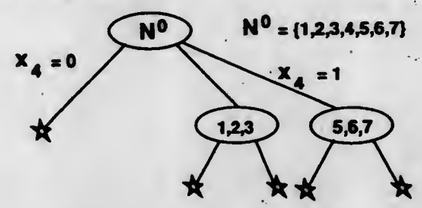
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**5,502,646**

## SELECTION OF PARTIAL SCAN FLIP-FLOPS TO BREAK FEEDBACK CYCLES

**Srimat T. Chakradhar, No. Brunswick, and Arunkumar Balakrishnan, Piscataway, both of N.J., assignors to NEC USA, Inc., Princeton, N.J.**

**Filed Dec. 2, 1993, Ser. No. 161,140**
**Int. Cl.[6] G01I *31/28***
**U.S. Cl. 364—489** **14 Claims**




1. A method of determining an optimal quantity of scan flip-flops required to eliminate feedback loops in a sequential logic circuit, comprising the steps of:

a) deriving an S-graph of the sequential logic circuit;

b) applying minimum feedback vertex set (MFVS) preserving transformations to the S-graph to reduce the S-graph to non-empty, compressed SCCs (strongly connected components);

c) performing a partitioned branch and bound method to solve the compressed SCCs of the graph;

d) applying integer linear programming (ILP) to obtain an optimal solution or lower bound for the MFVS of the S-graph, and

e) if a lower bound is obtained in step (d), repeat steps (c) and (d) or

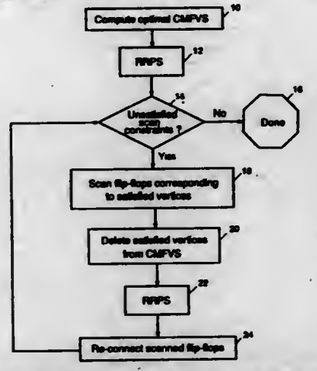
f) if any optimal solution is obtained is step (d), incorporating the quantity of scan flip-flops obtained as the optimal solution into the sequential logic circuit for enabling partial scan testing of the sequential logic circuit.

**5,502,647**

## RESYNTHESIS AND RETIMING FOR OPTIMUM PARTIAL SCAN TESTING

**Srimat T. Chakradhar, No. Brunswick, and Sujit Dey, Plainsboro, both of N.J., assignors to NEC USA, Inc., Princeton, N.J.**

**Filed Dec. 1, 1993, Ser. No. 161,221**
**Int. Cl.[6] G01R *31/28***
**U.S. Cl. 364—489** **12 Claims**




1. A method of selecting scan flip flops for partial scan testing of sequential circuits comprising the steps of:

determining a circuit minimum feedback vertex set (CMFVS) to break loops at flip flops and gates in the circuit;

if a vertex of the CMFVS has a path from a primary input or to a primary output perform output splitting transformations to the vertex by adding gates to modify the circuit;

if a basic cycle of the circuit has more CMFVS vertices than flip flops, then perform cycle splitting by adding gates to the circuit to modify the circuit so that the quantity of CMFVS vertices is not more than the quantity of the flip flops in the cycle; and

selecting scan flip flops in the modified circuit corresponding to vertices in the CMFVS for partial scan testing of the circuit.

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**5,502,648**

## DATA PROCESSING METHOD OF GENERATING INTEGRATED CIRCUITS USING PRIME IMPLICANTS

**Jonathan T. Kaplan, New York, N.Y., assignor to Massachusetts Institute of Technology, Cambridge, Mass.**

**Continuation-in-part of Ser. No. 510,728, Apr. 18, 1990, Pat. No. 5,237,513, and a continuation-in-part of Ser. No. 439,555, Nov. 20, 1989, abandoned. This application Apr. 2, 1993, Ser. No. 41,546**
**Int. Cl.[6] G06F *17/50***
**U.S. Cl. 364—490** **26 Claims**

1. In a data processing system having at least one processor and a memory, a method of producing a schematic description of an integrated circuit comprised of pass and restoring logic networks that performs a specified function, comprising the processor performing the steps of:

a) storing in memory a representation of the function in a set of data structures;

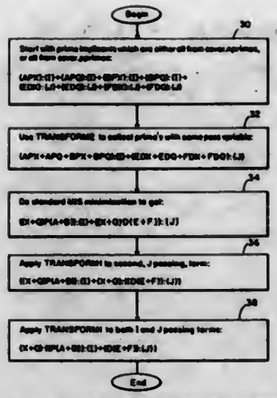
b) finding prime implicants of the representation held in the data structures;

c) selecting prime implicants to be used in generating the integrated circuit layout by;

1) determining which prime implicant when added to already selected prime implicants create a most efficient partial cover where initially the partial cover is empty;

2) adding the most efficient prime implicant to the already selected prime implicant, to generate a new partial cover;

3) repeating these steps until the partial cover covers the function; and




d) generating a schematic description of an integrated circuit layout from the selected prime implicants.

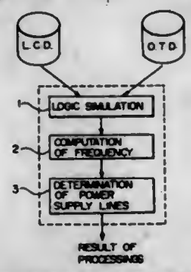
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**5,502,649**

## METHOD AND APPARATUS FOR DETERMINING POWER SUPPLY WIRINGS OF A SEMICONDUCTOR DEVICE

**Yukio Hirata, Kasugai, Japan, assignor to Fujitsu Limited, Kawasaki, and Fujitsu VLSI Limited, Kasugai, both of, Japan**

**Continuation of Ser. No. 795,148, Nov. 20, 1991, abandoned. This application Jun. 23, 1995, Ser. No. 494,146**
**Claims priority, application Japan, Nov. 21, 1990, 2-316789**
**Int. Cl.[6] H01L *21/66***
**U.S. Cl. 364—490** **9 Claims**




1. A method of determining power supply wirings of a semiconductor device, comprising the steps of:

executing a logic simulation based on both data concerning each of logic circuit blocks constituting the semiconductor device and data concerning signals for testing operations of the semiconductor device;

computing a respective operational frequency of the logic circuit blocks based on a result of the logic simulation; and

determining a respective. wiring width of each power supply line for supplying each of the logic circuit blocks with powers, in accordance with the respective operational frequency of the logic circuit blocks,

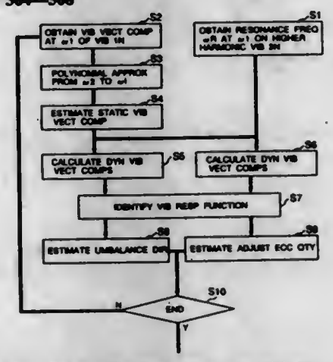
wherein, when the respective power supply line for each logic circuit block comprises at least one basic power supply line having a predetermined wiring width, the step of determining a respective wiring width includes the substeps of determining the number of the basic power supply line constituting the respective power supply line for each logic circuit block, according to the operational frequency of the logic circuit block concerned, and determining both a wiring width of the power supply line concerned and a wiring space between each basic power supply line.

**5,502,650**

## APPARATUS FOR ADJUSTING ROTOR

**Katsuhiko Naruse, Yokohama; Shinzou Ogawa, Tokyo; Yukio Watanabe, and Fukumi Shimizu, both of Yokohama, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Apr. 1, 1993, Ser. No. 43,371**
**Claims priority, application Japan, Apr. 1, 1992, 4-079834**
**Int. Cl.[6] G01H *1/14*; G01M *7/02***
**U.S. Cl. 364—508** **7 Claims**




1. An apparatus for adjusting a rotor, comprising:

a plurality of displacement sensors for detecting shaft vibration of a rotor at a plurality of positions on the rotor, and for respectively outputting a plurality of vibration signals as a result thereof;

a rotation pulse sensor for detecting a rotational speed of the rotor and a reference position in a circumferential direction of the rotor, and for respectively outputting a rotational speed signal and a rotational pulse signal as a result thereof;

a preprocessor responsive to the signals output from the rotation pulse sensor and the plurality of displacement sensors, for filtering out frequency components beyond a predetermined frequency of the signals output from the rotation pulse sensor and the plurality of displacement sensors, and A/D converting the filtered signals into digital sensor signals;

a frequency analyzer responsive to the A/D converted vibration signals at respective plurality of positions and the rotational speed signal, for analyzing spectra of the A/D converted vibration signals at the respective plurality of positions and the rotational pulse signal;

a degree analyzer responsive to the analyzed spectra of the vibration signals at the respective plurality of positions and the rotational pulse signal, for extracting vibration vectors indicative of amplitudes and phase delay from the rotational pulse signal of the vibration signals at the rotational speed and at a frequency which is an integer number of times higher than the rotational speed of the rotor;

an adjustment quantity calculator for computing the vibration vector when the rotor is stopped as a static component by extrapolation from the vibration vectors of rotational speed components obtained by vibration displacement and rotational pulse signals at different rotational speeds of the rotor, for extracting dynamic components due to unbalance of the rotor by subtracting the static component from the vibration vectors, for estimating a natural vibration frequency of the rotor on the basis of a vibration component which is an integer number of times higher than the rotational speed of the rotor and that matches the natural vibration frequency of the rotor, for identifying a vibration response function of the rotor from the dynamic components and the natural vibration frequency of the rotor, from which a residual unbalance quantity of the rotor is computed, and for estimating an amount and a direction of eccentricity to be adjusted at a coupling portion of the rotor so as to adjust the residual unbalance quantity at the coupling portion of the rotor;



a real time monitor for estimating a tendency of vibration increase and decrease and indicating the obtained unbalance direction and eccentric quantity of the rotor to be adjusted; and

a vibration status monitor for discriminating whether or not the vibration vector obtained by the degree analyzer lies within a predetermined decision range.

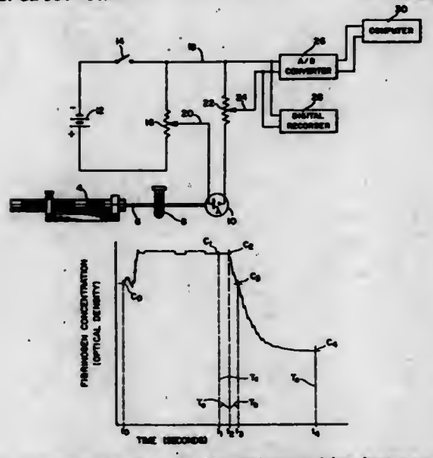
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**5,502,651**

## POTENTIOPHOTOMETRIC FIBRINOGEN DETERMINATION

**R. David Jackson, and Wallace E. Carroll, both of 1556 San Leandro La., Santa Barbara, Calif. 93108**

**Filed May 2, 1994, Ser. No. 236,330**
**Int. Cl.[6] G01N *33/86***
**U.S. Cl. 364—509** **32 Claims**




1. A method of testing a liquid sample comprising the steps of:

(a) developing a series of analog electrical voltage signals having voltage amplitudes proportional to the optical density of the liquid sample;

(b) converting the developed analog voltage signals into a series of digital voltage value signals;

(c) injecting a coagulant into a liquid sample, thereby producing an abrupt change in the optical density of the liquid sample, said abrupt change producing an abrupt change in the amplitude of the electrical analog signals which, in turn, produces an abrupt change in the value of digital voltage signal;

(d) recording the instant time of said abrupt change in said value of said digital voltage signal;

(e) monitoring said voltage digital signal values for a first predetermined minimum significant quantity $c_1$;

(f) recording the instant time and the value of the voltage digital signal of said first predetermined quantity $c_1$;

(g) monitoring for a differential change in the voltage digital signal values that include a second predetermined quantity $c_2$, which is at least equal to said first predetermined quantity, a third predetermined quantity $c_3$ and a fourth predetermined quantity $c_4$, said first ($c_1$) and second ($c_2$) predetermined quantities occurring within a first predetermined time period $T_a$, said second $c_2$and third $c_3$ predetermined quantities occurring within a second predetermined time period $T_b$, and said first $c_1$ and said fourth $c_4$ predetermined quantities occurring within a third predetermined time period $T_c$;

(h) recording the instant time and voltage digital signal value for each of said first ($c_1$), second ($c_2$), third ($c_3$) and fourth ($c_4$) predetermined quantities, said first predetermined time period $T_a$ being defined by the time difference between the instant times of said first ($c_1$) and second ($c_2$) predetermined quantities, said second predetermined time period $T_b$being defined by the time difference between the instant times of said second ($c_2$) and third ($c_3$) predetermined quantities, and said third predetermined time period $T_c$ being defined by the time difference between the instant times of said first ($c_1$) and fourth ($c_4$) predetermined quantities;

(i) subtracting the value of the voltage digital signal of said first predetermined quantity $c_1$ from the value of said digital signal of said fourth predetermined quantity $c_4$ to derive a delta voltage value signal, said delta voltage value having a value which exceeds the digital voltage value of said first predetermined quantity $c_1$by at least threefold;

(j) using the foregoing steps to develop a delta voltage value signal for each of two calibrating samples having known values of optical density in units of mass;

(k) determining the relationship between the known values of optical density of the aforesaid two calibrating samples and the corresponding developed delta signals of said two calibrating samples;

(l) developing a delta voltage signal for a test sample having unknown optical density in units of mass using the steps indicated hereinabove; and

(m) determining the optical density of the test sample in units of mass from its developed delta voltage signal using the mean relationship between the two calibrating samples of known optical density in units of mass and the voltage values of the corresponding developed voltage delta signals to derive, from the delta voltage signals developed for the test sample of unknown optical density, the optical density of the test sample in units of mass.

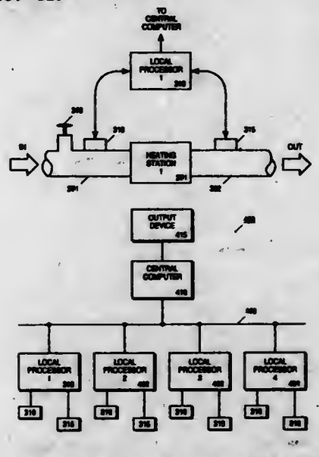
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**5,502,652**

## METHOD AND APPARATUS FOR MEASURING HEAT TRANSFER IN SMALL DIAMETER PIPES USING ACOUSTIC SIGNALS

**Austin C. Hoggatt, 4601 Grass Valley Rd., Oakland, Calif. 94605; Martin Graham, 3060 Buena Vista Way, Berkeley, Calif. 94708; David D. Cudaback, 6639 Longwalk Dr., Oakland, Calif. 94611; Melvin P. Klein, 1140 Keith Ave., Berkeley, Calif. 94708; John W. Otvos, 110 Raven Hill Rd., Orinda, Calif. 94563, and Paul L. Richards, 900 Euclid Ave., Berkeley, Calif. 94708**

**Filed Aug. 24, 1994, Ser. No. 296,015**
**Int. Cl.[6] G06F *15/20***
**U.S. Cl. 364—510** **7 Claims**




1. A system for measuring energy consumption in a mass transfer heat delivery system having a multiplicity of stations, the system for measuring energy consumption comprising:

a plurality of metering circuits, each metering circuit for metering energy consumption of at least one station, each metering including:

an inlet meter for being coupled to an inlet pipe of a first station, the inlet pipe for carrying a liquid into the station, the inlet meter comprising:

a transducer set in contact with liquid, the transducer set for transmitting an acoustic signal through the liquid of the inlet pipe and for detecting a flow rate of liquid through the inlet pipe using the acoustic signal; and

circuitry for detecting a temperature of the liquid in the inlet pipe;

an outlet meter for being coupled to an outlet pipe of the first station, the outlet pipe for carrying the liquid away from the first station, the outlet meter for detecting a temperature of the liquid at the outlet pipe;

a local processor coupled to receive electrical signals output by the inlet meter and the outlet meter, the local processor for calculating the flow rate of liquid through the inlet pipe and for calculating a difference between the temperature of liquid at the inlet pipe and the temperature of liquid at the outlet pipe, the local processor for transmitting results of the calculations;

a network link coupled to each of the local processors of the plurality of metering apparatae, the network link for communicating results calculated by the local processors; and

a central processor coupled to receive the results calculated by the local processors.

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**5,502,653**

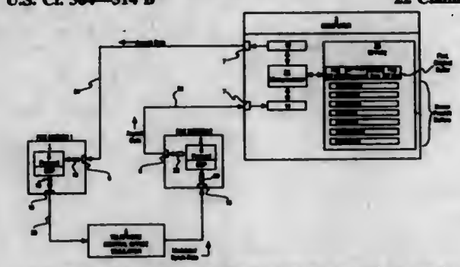
## TESTING DATA TRANSMISSIONS BETWEEN FAX MODEMS THROUGH REAL TIME SYNCHRONIZATION AND RESYNCHRONIZATION OF ASYNCHRONOUS DATA

**Glenn M. Lewis, Fair Oaks, Calif., assignor to Intel Corporation, Santa Clara, Calif.**

**Filed Sep. 15, 1993, Ser. No. 121,611**

**Int. Cl.[6] H03K 7/08;9/08**

**U.S. Cl. 364—514 B** **22 Claims**



1. A method for testing data transmissions sent via a synchronous connection between first and second data transmission devices through the use of a computer having memory, the computer being coupled to the first and second data transmission devices via first and second asynchronous connections, respectively, the method comprising the steps of:

(A) storing in memory a first sequence of data bits partitioned into units with each unit comprising N data bits;

(B) storing in memory N−1 preshifted sequences of data bits with the data bits of each preshifted sequence being partitioned into units comprising N data bits, the first preshifted sequence formed by shifting the first sequence by one bit, and subsequent preshifted sequences formed by shifting the preceding preshifted sequence by one bit;

(C) transmitting the data bits of the first sequence to the first device via the first asynchronous connection for re transmission to the second device via the synchronous connection;

(D) receiving as input to the computer via the second asynchronous connection an input sequence of data bits transmitted from the second device, the input sequence partitioned into input units with each input unit comprising N data bits;

(F) synchronizing the input sequence of data bits with one of the first and the N−1 preshifted sequences of data bits being designated as a synchronized sequence;

(G) resynchronizing the input sequence of data bits with one of the first and N−1 preshifted sequences of data bits being designated as a resynchronized sequence when a bit disparity between corresponding units of the input sequence and the synchronized sequence occurs;

(H) determining the cause of the bit disparity by calculating a bit shift number corresponding to a number of data bits the resynchronized sequence is shifted from the synchronized sequence;

(I) continuing synchronization of the input sequence of data bits with the resynchronized sequence;

(J) redesignating the resynchronized sequence as the synchronized sequence when a bit disparity between corresponding units of the input sequence and the resynchronized sequence occurs; and

(K) performing steps (G) through (J) until all data bits of the first sequence have been transmitted and subsequently received by the computer.

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**5,502,654**

## METHOD FOR ANALYZING LIGHT INTENSITY DISTRIBUTION IN PROJECTION SYSTEMS

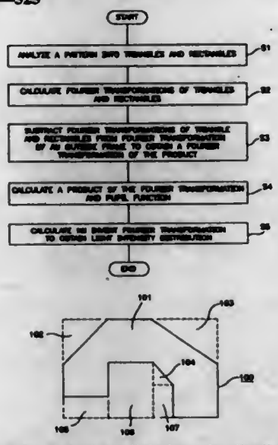
**Koichi Sawahata, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Oct. 31, 1994, Ser. No. 332,144**

**Claims priority, application Japan, Jan. 29, 1993, 5-271111**

**Int. Cl.[6] G02B 15/00**

**U.S. Cl. 364—525** **20 Claims**




1. A method for analyzing a light intensity distribution on a flat surface in a projection system wherein a pattern is projected by use of a light through a pupil on said flat surface, said method comprising the steps of:

analyzing said pattern into plural polygonal elements where a combination of said polygonal elements constitutes said pattern;

calculating Fourier transformations of vertexes of each of said polygonal elements except for said pattern for subsequent addition and subtraction of said Fourier transformations of all said polygonal elements to thereby obtain a Fourier transformation of said pattern;

calculating a product of said Fourier transformation of said pattern and a pupil function for said pupil; and

calculating an invert Fourier transformation of said product to thereby obtain a light intensity distribution.



**5,502,655**

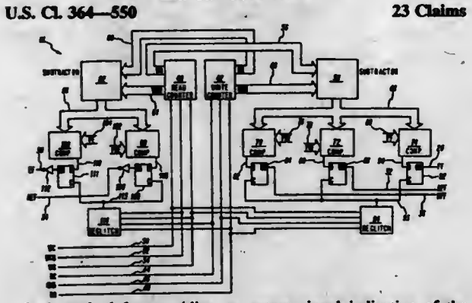
## DIFFERENCE COMPARSION BETWEEN TWO ASYNCHRONOUS POINTERS AND A PROGRAMMABLE VALUE

**David C. McClure, Carrollton, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.**

**Continuation of Ser. No. 101,281, Aug. 2, 1993, abandoned, which is a continuation of Ser. No. 870,878, Apr. 20, 1992, abandoned, which is a continuation of Ser. No. 454,408, Dec. 21, 1989, Pat. No. 5,121,346, which is a continuation-in-part of Ser. No. 332,289, Mar. 31, 1989, abandoned. This application Apr. 1, 1994, Ser. No. 221,986**

**Int. Cl.[6] G06F 19/00**

**U.S. Cl. 364—550** **23 Claims**



1. A method for providing an output signal indicative of the difference between a first and a second clock signal which are asynchronous with respect to each other, comprising the steps of:

counting the number of first clock pulses of said first clock signal in a first counter, and the number of second clock pulses of said second clock signal in a second counter;

subtracting the count of said first counter from the count of said second counter to generate a difference value;

comparing the difference value generated in said subtracting step to a predetermined number; and

causing said output signal to be a first logic level if said difference is greater than said predetermined number.

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**5,502,656**

## DATA LOGGER HAVING A RAM THAT ACCEPTS ELECTRO-MAGNETICALLY A SENSOR TABLE AND A SAMPLE TABLE

**Malcolm Fulcher, and Trevor Storeton-West, both of London, Great Britain, assignors to The Minister of Agriculture Fisheries and Food in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England**

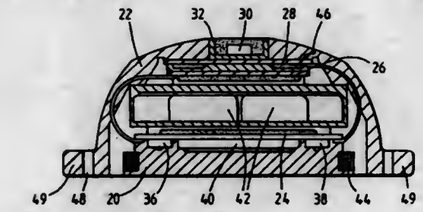
**PCT No. PCT/GB93/00827, § 371 Date Oct. 19, 1994, § 102(e) Date Oct. 19, 1994, PCT Pub. No. WO93/22713, PCT Pub. Date Nov. 11, 1993**

**PCT Filed Apr. 21, 1993, Ser. No. 318,810**

**Claims priority, application United Kingdom, Apr. 30, 1992, 9209394**

**Int. Cl.[6] G01B 21/00**

**U.S. Cl. 364—550** **12 Claims**




1. A data logger including

a housing containing at least one sensor;

programmable control means;

a Random Access Memory (RAM) providing data storage means for storing data from the at least one sensor;

power means;

electro-magnetic transfer means for accessing the logger and for recovering data from the data storage means from external to the housing, wherein the programmable control means includes a pre-programmed Erasable Programmable Read Only Memory (EPROM) containing control instructions including an operating program, and a sensor driver for each of said at least one sensor;

the RAM is adapted to accept, from external to the housing and via the electro-magnetic transfer means, a sensor table accessible by the operating program for commanding the appropriate sensor driver to operate the required sensor and a sample table accessible by the operating program containing instructions on the operation of each sensor to evoke a desired sampling regime; and

a power up coil is provided within the housing to enable power from external to the housing to be supplied during programming and during recovery of data.

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**5,502,657**

## THREE-DIMENSIONAL MEASURING METHOD AND SYSTEM

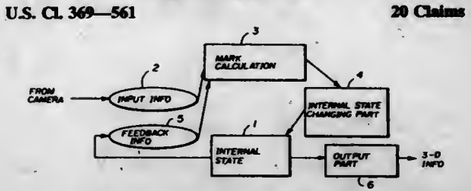
**Toshio Endoh, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan**

**Filed Jan. 11, 1993, Ser. No. 2,385**

**Claims priority, application Japan, Jan. 10, 1992, 4-002537**

**Int. Cl.[6] G01B 7/004**

**U.S. Cl. 369—561** **20 Claims**




1. A three-dimensional measuring method adapted for obtaining three-dimensional information related to an image including at least one object based on input information which describes the image, said three-dimensional measuring method adapted to be utilized during control operations of a robotic device, said image comprising a plurality of pixels, said three-dimensional measuring method comprising the steps of:

(a) selecting information necessary for calculating mark values of presumed information from the input information, each of said mark values being used to evaluate the appropriateness of the presumed information, said presumed information modeling said image;

(b) calculating mark values corresponding to each pixel of the image based on the information selected by said step (a) and based on feedback information related to said presumed information which is derived from an internal state, said internal state including information related to the object corresponding to each pixel of the image;

(c) adding the mark values for each pixel calculated in said step (b) for each object so as to obtain a total mark value;

(d) arbitrarily changing the internal state so as to reduce the total mark value;

(e) outputting the internal state in which the total mark value is a local minimum as the three-dimensional information; and

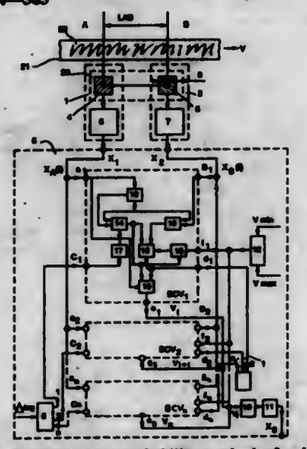
(f) controlling movement of a robotic device based on the internal state output during said outputting step (e).

## 5,502,658

### SAMPLED-CONTINUOUS PROBABILITY METHOD OF VELOCITY MEASUREMENT OF THE OBJECT HAVING INFORMATIVELY-STRUCTURAL INHOMOGENEITY

Arkadi Rolin, 12 Woodbridge Pl., Langhorne, Pa. 19053

Continuation of Ser. No. 634,468, Dec. 27, 1990, abandoned. This application Jul. 22, 1994, Ser. No. 278,827
Int. Cl.[6] G06F 17/00
U.S. Cl. 364—565 3 Claims



1. A sampled-continuous probability method of velocity measurements of an object having informatively-structural inhomogeneity by periodic execution of a cycle of said velocity measurement with determination of time during which a selected local part of the object moves along a measuring base of a zone of observation, the method comprising the steps of:

before beginning of an execution of said cycles of velocity measurement:

—positioning said measuring base of said zone of observation parallel to the direction of motion of the object,

—dispositioning in said zone of observation in direction of motion of the object first and second zones of sensing said inhomogeneity,

—selecting a dominant informative component of said informatively-structural inhomogeneity of the object in said sensing zones;

in each of said cycles of velocity measurement:

—selecting a local part of the object in said first zone of sensing in the beginning of a respective cycle of velocity measurement,

—determining in said local part an informative aggregate of chosen informative signs of the dominant informative component of said inhomogeneity,

—memorizing said informative aggregate signs for identification of an image of said selected local part of said object, simultaneously,

—starting determining a time of moving said local part along said measuring base of a known length,

—continuously selecting local parts of said object in said second zone of sensing,

—determining said informative aggregate of said chosen informative signs in said continuously selected local parts,

—comparing said memorized informative aggregate of said signs with said determined informative aggregates of said signs during an interval of time of identification,

—determining said time of motion of said local part of the object along said measuring base at a moment of coincidence of the compared aggregates of said signs,

—computing a velocity of said object,

—erasing a value of the velocity of the object memorized in a preceding cycle of the velocity measurement,

—memorizing said computed value of the velocity of the object at the end of the current cycle of velocity measurement or instead of said memorizing,

—saving said value of the velocity of the object, memorized from a last cycle of velocity measurement, when said coincidence is absent at the moment of finishing of said interval of time of identification;

beginning of each cycle of velocity measurement on a command formed after beginning of a preceding cycle of velocity measurement after a given interval of time of shifting of the cycle but within the preceding cycle;

in each cycle of velocity measurement selecting a total time of execution of last stages including determining, computing, erasing and memorizing, smaller than minimum possible working step of time quantization of velocity to be measured, so that each cycle of the velocity measurements begins within a preceding cycle of the same.

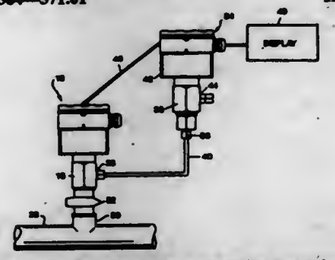
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## 5,502,659

### METHOD AND APPARATUS FOR CALIBRATING MOISTURE SENSORS

Olaf F. Braster, Greenwood; Klaus C. Maier, and W. Patrick McCarthy, both of Indianapolis, all of Ind., assignors to Endress+Hauser, Inc., Greenwood, Ind.

Filed Jun. 6, 1994, Ser. No. 254,323
Int. Cl.[6] G01C 25/00
U.S. Cl. 364—571.01 11 Claims



1. An apparatus for calibrating a measuring transmitter which provides an output signal proportional to a parameter of interest measured by a sensor in the measuring transmitter without removing the measuring transmitter from its normal operating position, the apparatus comprising:

a housing;

a calibration sensor element located in the housing for sensing said parameter of interest;

a tube for coupling the housing to the measuring transmitter, thereby exposing the calibration sensor to the same parameter of interest as the measuring sensor in the measuring transmitter;

means for processing data related to the parameter of interest detected by the calibration sensor, for processing data related to the parameter of interest detected by the measuring sensor, for comparing the processed data related to the parameter of interest detected by the calibration sensor to processed data related to the parameter of interest detected by the measuring sensor, and for determining at least one correction value based on the comparison; and

a communication link for transmitting data related to the parameter of interest detected by the measuring sensor to the data processing means and for transmitting the correction value to the measuring transmitter to recalibrate the measuring sensor.

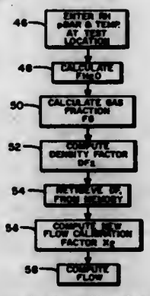


## 5,502,660

### DYNAMIC GAS DENSITY COMPENSATION IN PULMONARY GAS ANALYZER SYSTEMS

David M. Anderson, St. Paul, and Shawn McCutcheon, White Bear Lake, both of Minn., assignors to Medical Graphics Corporation, St. Paul, Minn.

Filed Mar. 24, 1994, Ser. No. 217,153
Int. Cl.[6] G01L 27/00
U.S. Cl. 364—571.03 5 Claims




1. A method of dynamically calibrating a flowmeter in a gas measuring system whose output varies with changes in ambient conditions of the gas being measured, comprising:

(a) entering at a first predetermined calibration time known as constants, a known temperature, a known barometric pressure and a known relative humidity:

(b) calculating a first density factor, $DF_1$, of said gas at said known temperature, said known barometric pressure and said known relative humidity;

(c) digitizing and storing said density factor, $DF_1$ in a nonvolatile memory of a microprocessor for later retrieval;

(d) injecting a known volume of a respiratory gas mixture having the calculated density factor, $DF_1$ through said flowmeter and determining the integral of uncalibrated flow;

(e) calculating a proportionality factor, $K_1$, by dividing said known volume by the integral of uncalibrated flow of the respiratory gas mixture;

(f) digitizing and storing said proportionality factor, $K_1$, in said nonvolatile memory of said microprocessor for later retrieval;

(g) sensing at a second later calibration time an ambient temperature, an ambient barometric pressure and an ambient relative humidity;

(h) calculating a second density factor, $DF_2$, of said gas using said ambient relative humidity;

(i) using said first density factor, $DF_1$, and said proportionality factor, $K_1$, stored in said nonvolatile memory and said calculated second density factor, $DF_2$, to compute a new proportionality constant, $K_1$; and

(j) using said proportionality factor, $K_1$, to compute a calibrated flow reading adjusted for variations in ambient temperature, barometric pressure and relative humidity when the gas is being measured.

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## 5,502,661

### CHECKING DESIGN FOR TESTABILITY RULES WITH A VHDL SIMULATOR

Wolfgang Glunz, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Oct. 7, 1993, Ser. No. 132,821
Claims priority, application European Pat. Off., Jan. 15, 1992, 92117650
Int. Cl.[6] G06F 11/00
U.S. Cl. 364—578 2 Claims

1. A method for checking conformance of a digital circuit design with a given set of testability design rules, comprising the steps of:

building a circuit description of the digital circuit design to be checked using a circuit description language that permits use of a user defined, non-standard logic;

```
--Phase 1
-- set BlueGirl for transfer of 0
BlueGirl <= (false, "0",1,HIGH) ; -- BlueGirl has pin number 1
-- apply one clock cycle
Clock    <= (false,"1",2,HIGH) ; -- Clock has pin number 2
wait for 6 ns;
Clock    <= (false,"0",2,HIGH) ;
wait for 6 ns;
-- apply datain (the input A of ALU) and set AlsoGirl to Address
-- then T1:
DataIn   <= (true , "0",3,HIGH) ; -- DataIn has pin number 3
AlsoGirl <= (false, "1",4,HIGH) ; -- AlsoGirl has pin number 4
-- set BlueGirl for transfer of ALU output
BlueGirl <= (false,"1",1,HIGH) ;
-- apply one clock cycle
Clock    <= (false,"1",2,HIGH) ;
wait for 6 ns;
Clock    <= (false, "0",2,HIGH) ;
wait for 6 ns;
-- now the value for the A input of the ALU has reached the ALU
-- apply datain (for B input of ALU)
-- then T2:
DataIn   <= (true , "0",3,HIGH) ;
AlsoGirl <= (true , "0",4,HIGH) ; -- now B is symbolic 0
--Phase 2
-- The ALU should now check its inputs and provide the symbolic output values
check_port(1) <= true; -- the ALU has the HYT-bit 1
wait for 0) -- send the event to the ALU
--Phase 3
-- now request the outputs of the ALU to external outputs
-- this phase is hybrid in this example.
-- now check the outputs.
Assert (Output.symbolic = true) and (Output.signal = 101) report
"Simulator does not convey the symbolic value of the ALU output"
severity ERROR;
```

providing a circuit dependent sequence of stimuli using said circuit description language;

providing a simulator which builds up a simulation model when said circuit description is loaded into it;

applying the stimuli to the circuit description by loading the circuit description and the stimuli into the simulator and allowing the simulator to process the stimuli as applied to the circuit description until the simulator has no more events to process; and

switching the simulator model into a check mode in which each component of the circuit checks a testability state and issues error messages if an illegal state was found.

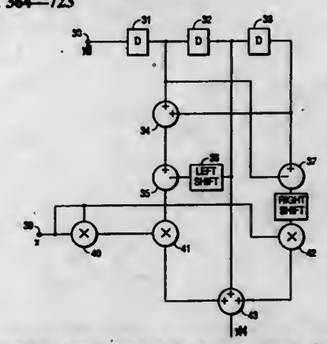
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## 5,502,662

### METHOD AND APPARATUS FOR QUADRATIC INTERPOLATION

Lance Greggain, Woodbridge, Canada, assignor to Genesis Microchip Inc., Markham, Canada

Continuation of Ser. No. 172,065, Dec. 23, 1993, Pat. No. 5,379,241. This application Oct. 26, 1994, Ser. No. 329,163
The portion of the term of this patent subsequent to Jan. 3, 2012, has been disclaimed.
Int. Cl.[6] G06F 7/38
U.S. Cl. 364—723 3 Claims




1. A quadratic interpolator generating an output signal sample y(x) for each of a plurality of reference values x and based on known signal samples y(−1), y(0), and y(1) spaced apart a predetermined equal amount, x being in a range of one-half of said predetermined equal amount on either side of respective one of said known signal samples, said quadratic interpolator comprising:

means for outputting a first signal having value a=y(−1)+y(1)−2y(0) and a second signal having value b=(y(1)−y(−1))/2; and

means for inputting x, for determining $x^2$, for receiving the first signal and the second signal, for producing a third signal having value x times b, for producing a fourth signal having

value $x^2$ times a, and for adding the third signal, the fourth signal and the y(0), and in response generating the output signal sample y(x).

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**5,502,663**

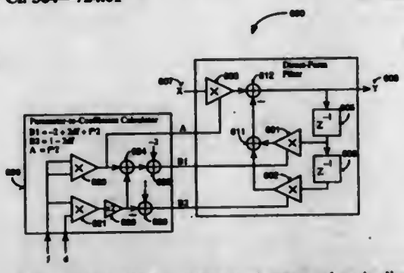
## DIGITAL FILTER HAVING INDEPENDENT DAMPING AND FREQUENCY PARAMETERS

**Richard F. Lyon, Los Altos, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.**

**Division of Ser. No. 990,666, Dec. 14, 1992, Pat. No. 5,355,329. This application Oct. 7, 1994, Ser. No. 319,524**

**Int. Cl.[6] G06F *15/31***

**U.S. Cl. 364—724.01** **14 Claims**



1. A filter for generating a sequence of output values in discrete time from a sequence of input values comprising:

a direct-form filter controlled by a plurality of filter coefficients;

a means for generating said filter coefficients as polynomial functions of a damping parameter signal and a frequency parameter signal by implementing multipliers and adders to combine said damping and frequency parameter signals, wherein said damping parameter signal and said frequency parameter signal are independently adjustable.

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**5,502,664**

## FILTER DEVICE INCLUDING SRAM AND EEPROM DEVICES

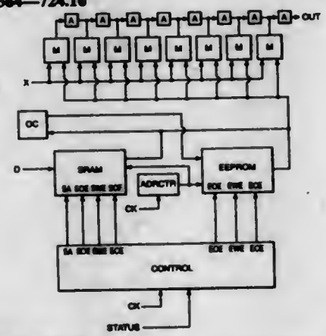
**Guoliang Shou; Sunao Takatori, and Makoto Yamamoto, all of Tokyo, Japan, assignors to Yozan Inc., Tokyo, Japan**

**Filed Mar. 23, 1994, Ser. No. 216,826**

**Claims priority, application Japan, Mar. 25, 1993, 5-092450; Apr. 8, 1993, 5-107738**

**Int. Cl.[6] G06F *15/31***

**U.S. Cl. 364—724.16** **4 Claims**



1. A filter device comprising:

a SRAM for storing a plurality of predetermined multiplier values, said SRAM having a plurality of addresses;

an EEPROM connected to said SRAM, said EEPROM having addresses which correspond to said addresses of said SRAM;

a plurality of multipliers connected in parallel for multiplying an input data by one of said plurality of predetermined multiplier values from one of said SRAM and said EEPROM;

a control circuit for reading one of said predetermined multiplier values stored in said SRAM and for writing said read multiplier value in said EEPROM at an address corresponding to an address of said read multiplier value stored in said SRAM so that said multipliers remain stored in said SRAM while being changed, said multipliers being transferred to said EEPROM after becoming settled; and

means for generating an output signal based on output from said multipliers.

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**5,502,665**

## GALOIS FIELD MULTIPLIER

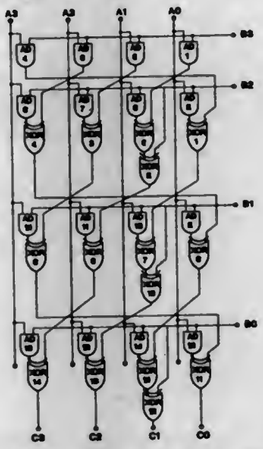
**Jin Hyeock Im, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea**

**Filed Nov. 18, 1994, Ser. No. 341,183**

**Claims priority, application Rep. of Korea, Nov. 20, 1993, 24860/1993**

**Int. Cl.[6] G06F *7/00***

**U.S. Cl. 364—746.1** **6 Claims**



1. A Galois field multiplier for operating a mutiplicand and a multiplier of a Galois field, comprising:

a first operating unit including first AND gates each ANDing a value of a corresponding bit of the multiplicand and a value of the most significant bit of the multiplier; and

a plurality of additional operating units corresponding to the remaining bits of the multiplier from the second most significant bit to the least significant bit, each of the additional operating units including:

second AND gates each ANDing the value of the corresponding bit of the multiplicand and a value of one of the remaining bite of the multiplier,

first exclusive OR gates each operating on a corresponding output value of the second AND gates and a corresponding output value obtained by rotating left output values of a preceding operating unit, and

second exclusive OR gates each operating on an output value of one of the first exclusive OR gates respectively corresponding to terms of a polynomial which characterizes a present Galois field, and a value of the most significant bit of the output value of the preceding operating unit,

wherein each of the additional operating units is connected to the preceding operating unit being either the first operating unit or one of the additional operating units.



**5,502,666**

**Patent Not Issued For This Number**

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**5,502,667**

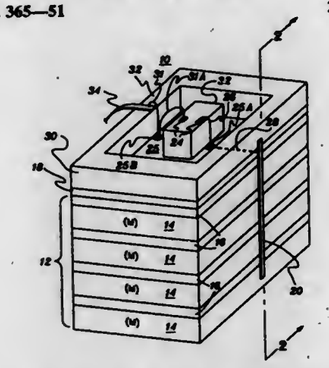
## INTEGRATED MULTICHIP MEMORY MODULE STRUCTURE

**Claude L. Bertin; Wayne J. Howell, both of South Burlington; Erik L. Hedberg, Essex Junction; Howard K. Kalter, Colchester, and Gordon A. Kelley, Jr., Essex Junction, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Sep. 13, 1993, Ser. No. 120,876**

**Int. Cl.[6] G11C *5/02***

**U.S. Cl. 365—51** **26 Claims**



1. An integrated multichip memory module which emulates to external circuitry a single chip memory architecture., said integrated multichip memory module comprising:

a memory subunit having N memory chips (wherein N≧2), each memory chip of the memory subunit having M memory devices (wherein M≧2), along with two substantially parallel planar main surfaces and an edge surface, at least one planar main surface of each memory chip being coupled to a planar main surface of an adjacent memory chip of the memory subunit such that said memory subunit has a stack structure; and

logic means electrically connected to each of the N memory chips for coordinating external circuitry communication with said N memory chips of said memory subunit such that an integrated memory architecture with said N×M memory devices exists which appears to said external circuitry to comprise said single chip memory structure with N×M memory devices; and

wherein said memory subunit further includes a logic chip, said logic chip having two substantially parallel planar main surfaces, one of said planar main surfaces of said logic chip being coupled to a planar main surface of an adjacent memory chip of the memory subunit, said logic chip being separate from said logic means.

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**5,502,668**

## SEMICONDUCTOR MEMORY DEVICE CAPABLE OF LOW-VOLTAGE PROGRAMMING

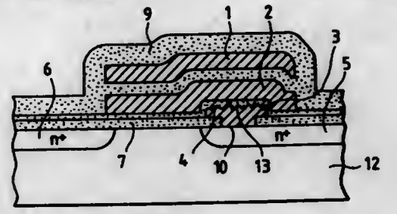
**Noriyuki Shimoji, and Hidemi Takasu, both of Kyoto, Japan, assignors to Rohm Co., Ltd., Kyoto, Japan**

**Continuation of Ser. No. 924,843, Aug. 4, 1992, abandoned. This application Feb. 25, 1994, Ser. No. 201,730**

**Claims priority, application Japan, Aug. 16, 1991, 3-205872; Aug. 16, 1991, 3-205873**

**Int. Cl.[6] H01L *29/68***

**U.S. Cl. 365—185.28** **9 Claims**



1. An FET memory comprising:

a silicon substrate;

a floating gate;

a tunnel insulating layer provided between the floating gate and a diffusion region of the silicon substrate on a data line side; and

a silicon plate provided on the silicon substrate and having a plurality of adjacent asperities extending into the tunnel insulating layer to produce a localized increase in electric field strength within the tunnel insulating layer, the asperities being placed close to the floating gate to enhance electron injection into the floating gate.

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**5,502,669**

## ELECTRICALLY ERASABLE AND PROGRAMMABLE READ ONLY MEMORY DEVICE HAVING SELECTIVELY ERASABLE SECTORS

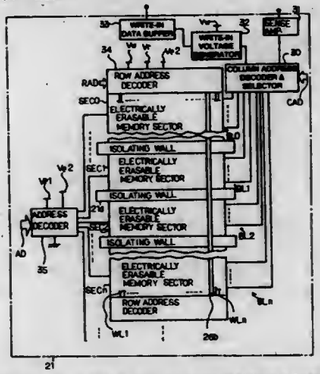
**Kenji Saitoh, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Dec. 2, 1994, Ser. No. 353,235**

**Claims priority, application Japan, Dec. 2, 1993, 5-302577**

**Int. Cl.[6] G11C *11/34*; H01L *29/00***

**U.S. Cl. 365—185.27** **5 Claims**



1. An electrically erasable and programmable read only memory device fabricated on a semiconductor substrate of a first conductivity type, comprising:

a first well of a second conductivity type opposite to said first conductivity type, and formed in a surface portion of said semiconductor substrate;

a second well of said first conductivity type nested into said first well;

a memory cell array implemented by a plurality of electrically erasable and programmable memory cells formed in said second well for storing data bits;

an isolating wall means extending from said surface portion of said semiconductor substrate through said first and second wells into a bottom portion of said semiconductor substrate, for electrically dividing said second well into a plurality of sections, and for forming said plurality of electrically erasable and programmable memory cells into a plurality of memory sectors in said sections;

a write-in and read-out means for selectively writing data bits into and reading out said data bits from said plurality of electrically erasable and programmable read only memory cells; and

an erasing means having a biasing circuit that selectively biases said plurality of sections, for concurrently erasing the data bits stored in the electrically erasable and programmable read only memory cells of each memory sector using a Fowler-Nordheim tunneling current.

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**5,502,670**

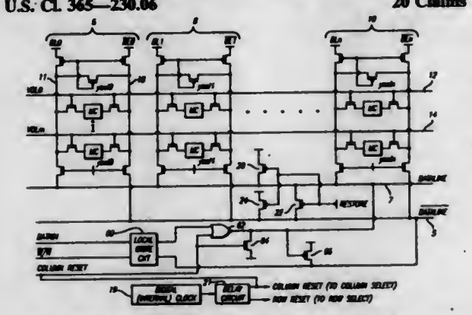
## SINGLE CYCLE FLUSH FOR RAM MEMORY

**Pradip Banerjee; Atul V. Ghia, both of San Jose, and Simon Lau, Fremont, all of Calif., assignors to Sony Corporation, and Sony Electronics, Inc., Park Ridge, N.J.**

**Filed Nov. 30, 1994, Ser. No. 346,739**

**Int. Cl.[6] G11C *7/00***

**U.S. Cl. 365—230.06** **20 Claims**



13. A digital memory with a plurality of memory cells comprising:

one or more word lines coupled to the plurality of cells;

one or more data lines coupled to the plurality of cells;

one or more bit lines coupled to the one or more data lines;

a digital clock coupled to the one or more data lines, the digital clock changing the voltage on the one or more data lines during a memory reset cycle; and

a delay circuit coupled to the digital clock and further coupled to one or more of the word lines such that one or more of the word lines enables access to the plurality of cells after the voltage on the one or more data lines changes during a memory reset cycle.

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**5,502,671**

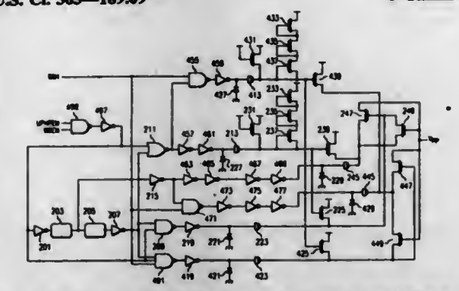
## APPARATUS AND METHOD FOR A SEMICONDUCTOR MEMORY CONFIGURATION-DEPENDENT OUTPUT BUFFER SUPPLY CIRCUIT

**Jeffrey E. Koelling, Dallas, and Hugh P. McAdams, McKinney, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Aug. 31, 1994, Ser. No. 298,827**

**Int. Cl.[6] G11C *7/02***

**U.S. Cl. 365—189.09** **9 Claims**



1. A buffer supply circuit for energizing a buffer amplifier array having a first group and a second group of buffer amplifiers; said circuit comprising:

a control signal indicative of said first group and said second group being coupled to said buffer supply circuit;

a first charge pump circuit responsive to a first input signal, said first charge pump circuit having a first pump capacitor selected for use with said first group of said buffer amplifiers; and

a second charge pump circuit partially integrated with said first charge pump and activated by said first input signal and by said control signal; an output of said second charge pump circuit being coupled to an output of said first charge pump circuit, said second charge pump circuit having second capacitor selected for use with said second group of said buffer amplifiers.

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**5,502,672**

## DATA OUTPUT BUFFER CONTROL CIRCUIT

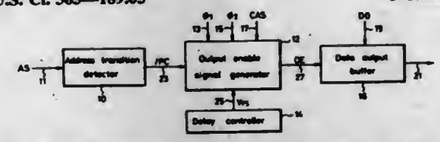
**Gi W. Kwon, Kyoungki-do, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Kyoungki-do, Rep. of Korea**

**Filed Feb. 2, 1995, Ser. No. 382,757**

**Claims priority, application Rep. of Korea, Feb. 3, 1994, 94-1939**

**Int. Cl.[6] G11C *7/00***

**U.S. Cl. 365—189.05** **3 Claims**



1. In a semiconductor memory device having a plurality of memory cells and a data output buffer for transferring a data signal from said memory cells to external peripheral circuits, a circuit for controlling said data output buffer, comprising:

address transition detection means for detecting a transition of an address signal to generate an address transition detect signal in a pulse form;

delay control means for generating a delay control signal, said delay control signal having a logic value set by a manufacturer according to whether said semiconductor memory device has a repaired memory cell; and

output enable signal generation means for generating an output enable signal at a time point delayed by a time period from the generation of the address transition detect signal from said address transition detection means, the time period being determined based on a logic value of the delay control signal from said delay control means, said output enable signal generation means outputting the output enable signal to said data output buffer to control an operating point of said data output buffer.



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**5,502,673**

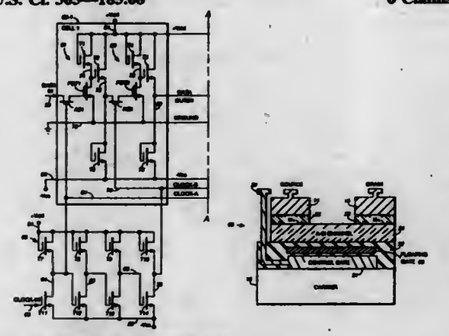
## NON-VOLATILE REGISTER SYSTEM UTILIZING THIN-FILM FLOATING-GATE AMORPHOUS TRANSISTORS

**Salvatore R. Riggio, Jr., Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Continuation of Ser. No. 261,356, Jun. 16, 1994, Pat. No. 5,452,250. This application Jul. 19, 1995, Ser. No. 503,959**

**Int. Cl.[6] G11C *16/06***

**U.S. Cl. 365—185.08** **6 Claims**



1. A register system comprising:

a register having a plurality of register cells, each of said register cells comprising first and second stages, each of said stages comprising a thin-film amorphous floating-gate transistor having a control gate, a drain, a source, a channel extending between said drain and said source, an insulator between said control gate and said channel, and a floating gate embedded in said insulator, said channel being conductive when a voltage signal of a first polarity is applied between said control gate and said source and non-conductive when a voltage signal of a polarity opposite to said first polarity is applied between said control gate and said source, a data-in line, a data-out line, an analog switch comprising a thin-film amorphous transistor having a gate for turning said analog switch on and off in response to switching signals applied thereto, and a drain and a source connected between said data-in line and said control gate of said thin-film amorphous floating-gate transistor for coupling a data bit signal on said data-in line to said control gate when said analog switch is turned on to thereby capacitively charge said floating gate to represent such data bit and each of said register cells having its data-out line of its first stage coupled to the data-in line of its second stage;

a first terminal connected to said register for receiving data;

a second terminal connected to said register for providing data therefrom;

a third terminal connected to said register for receiving power;

a switching pulse generator connected to said analog switches of each of said register cells, for supplying a first switching pulse to said analog switches of each of said first stages to write data bits into said first stages and a second switching pulse to said analog switches of each of said second stages to transfer the data bits in each of said first stages into each of said second stages; and

wherein said thin-film amorphous floating-gate transistors of said register cells are operative to non-volatilely store data bits when power is ceased to be supplied to said third terminal.

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**5,502,674**

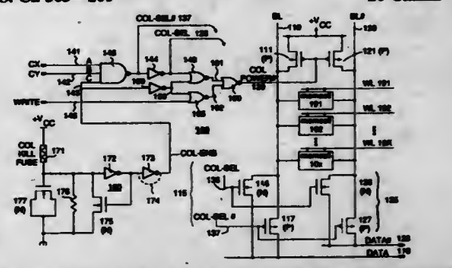
## METHOD AND APPARATUS FOR REPAIR OF MEMORY BY REDUNDANCY

**Michael J. Griffus; Robert G. Pollachek, both of Vancouver, Wash., and Giao N. Pham, Austin, Tex., assignors to Sharp Microelectronics Technology, Inc., Camas, Wash., and Sharp Kabushiki Kaisha, Osaka, Japan**

**Division of Ser. No. 44,958, Apr. 8, 1993, Pat. No. 5,323,353. This application Apr. 6, 1994, Ser. No. 223,686**

**Int. Cl.[6] G11C *13/00***

**U.S. Cl. 365—200** **20 Claims**



3. A method for producing a plurality of integrated circuits each containing a memory device, the memory device of each produced integrated circuit having one or more memory blocks for storing data and a corresponding one or more bitlines operatively coupled to the memory blocks for carrying the data, the bitlines of operational memory blocks being normally biased to a reference voltage when data is read from the memory device, said method comprising the steps of:

(a) providing a plurality of switchable coupling means on each integrated circuit for selectively coupling or decoupling corresponding ones of the bitlines to a reference voltage source in response to a respective plurality of switch command signals supplied to the switchable coupling means;

(b) providing a plurality of programmable designating means on each integrated circuit for selectively designating each memory block of the integrated circuit as being operational or non-operational, the programmable designating means being operatively coupled to control the switch command signals and cause the switchable coupling means of memory blocks designated as non-operational to decouple their respective bitlines from the reference voltage source;

(c) testing the memory blocks of each integrated circuit for conformance to a prespecified set of performance criteria; and

(d) programming the designating means of each integrated circuit to designate as non-operational, one or more memory blocks of the integrated circuit that is found during said testing to be nonconforming.

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**5,502,675**

## SEMICONDUCTOR MEMORY DEVICE HAVING A MULTI-BIT INPUT/OUTPUT CONFIGURATION WHICH IS CAPABLE OF CORRECTING A BIT FAILURE

**Tohru Kohno, Chiba, and Masao Nakano, Kawasaki, both of, Japan, assignors to Fujitsu Limited, Kanagawa, Japan**

**Continuation of Ser. No. 997,142, Dec. 8, 1992, abandoned, which is a continuation of Ser. No. 533,640, Jun. 5, 1990, abandoned. This application Jun. 4, 1994, Ser. No. 254,412**

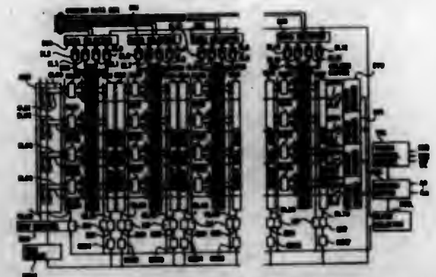
**Claims priority, application Japan, Jun. 6, 1989, 1-143413**

**Int. Cl.[6] G11C *7/00*; G06F *11/00***

**U.S. Cl. 365—200** **28 Claims**

1. A semiconductor memory device including a plurality of memory cell arrays, each array having memory cells connected to a plurality of word lines and bit lines, said semiconductor memory device comprising:

row selection means for simultaneously activating a plurality of word lines;



a plurality of column selection driving means for simultaneously activating a plurality of column selection lines independently of each other, each of said activated column selection lines connected to a different one of said column selection driving means; and

a plurality of data selector means for selecting from memory cells selected by simultaneously activated word lines and column selection lines, each of said memory cells selected by said data selector means being associated with a different word line and different column selection line than any other memory cell to be selected by said data selector means,

each selected memory cell, associated with each of said plurality of data selector means, is selected with a same word line and a same column selection line as selected memory cells that are associated with other data selector means.

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**5,502,676**

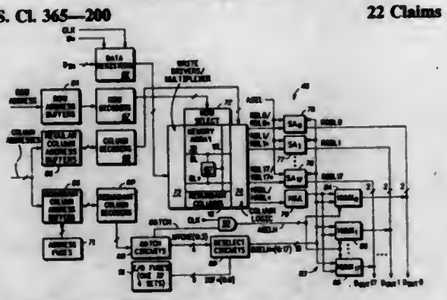
**INTEGRATED CIRCUIT MEMORY WITH COLUMN REDUNDANCY HAVING SHARED READ GLOBAL DATA LINES**

**Perry H. Pelley, III, and Hamed Ghasemi, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Apr. 24, 1995, Ser. No. 426,994**

**Int. Cl.[6] G11C *7/00***

**U.S. Cl. 365—200** **22 Claims**



1. An integrated circuit memory, comprising:

a memory array having a plurality of memory cells organized in a plurality of rows and a plurality of columns;

a redundant column of memory cells; and

a read global data line, selectively coupled to either a column of the plurality of columns or the redundant column of memory cells, the redundant column of memory cells for replacing a defective column of the plurality of columns;

wherein either a regular data signal corresponding to data from the column of the plurality of memory cells and a redundant data signal corresponding to data from the redundant column are emitter summed onto the read global data line.

**5,502,677**

**SEMICONDUCTOR MEMORY DEVICE INCORPORATING A TEST MODE THEREIN TO PERFORM AN AUTOMATIC REFRESH FUNCTION**

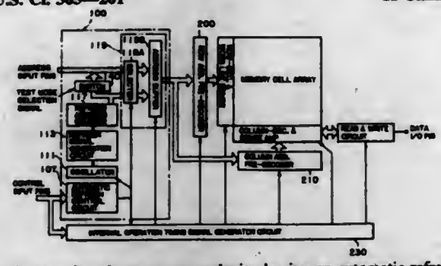
**Shinya Takahashi, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan**

**Filed Jun. 3, 1994, Ser. No. 253,773**

**Claims priority, application Japan, Jun. 15, 1993, 5-143354**

**Int. Cl.[6] G11C *13/00***

**U.S. Cl. 365—201** **11 Claims**



1. A semiconductor memory device having an automatic refresh function and a test mode for measuring a refresh period, comprising:

(a) an automatic refresh control circuit for shifting a potential of a first node from a first logic level to a second logic level on detection of change-over to an automatic refresh mode;

(b) a refresh signal generation circuit for refreshing an internal circuit by shifting a potential of a second node from the first logic level to the second logic level after a lapse of prescribed time from the potential of the first node being shifted from the first logic level to the second logic level;

(c) a counter circuit for renewing data stored therein and outputting an address signal having either the first logic level or the second logic level when the potential of the second node shifts from the first logic level to the second logic level;

(d) a switch circuit for informing a potential state of an address signal terminal by setting the address signal terminal to either a first state or a second state in response to a content of the address signal output from the counter circuit when the test mode is instructed; and

(e) an address signal input circuit for outputting the address signal fed through the address signal terminal when the potential of the first node reveals the first logic level and for outputting the address signal fed through the counter circuit when the potential of the first node reveals the second logic level.

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**5,502,678**

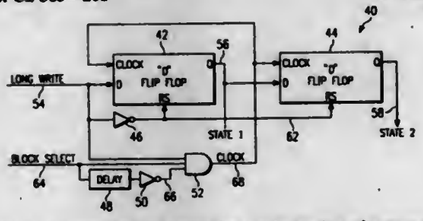
**FULL MEMORY CHIP LONG WRITE TEST MODE**

**David C. McClure, Carrollton, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.**

**Filed Sep. 30, 1994, Ser. No. 315,337**

**Int. Cl.[6] G11C *29/00***

**U.S. Cl. 365—201** **48 Claims**



33. A structure for performing long write testing of a memory chip comprising:

a memory chip divided into a plurality of memory blocks, with each memory block of the plurality of memory blocks having a plurality of memory cells, a plurality of rows, a plurality of columns, a plurality of wordlines, a plurality of bitlines true, and a plurality of bitlines complement;

a plurality of block select signals, with each block select signal associated with a memory block;

means, associated with a first memory block of the plurality of memory blocks, for placing the first memory block of the plurality of memory blocks into a long write test mode upon selecting the first memory block, and turning off the plurality of wordlines of the first memory block and forcing at least the bitlines true or the bitlines complement of the first memory block to a low logic level wherein the first memory; block remains in the long write test mode until selected again; and

means, associated with a second memory block of the plurality of memory blocks, for placing the second memory block of the plurality of memory blocks into the long write test mode upon selecting the second memory block, and turning off the plurality of wordlines of the second memory block and forcing at least the bitlines true or the bitlines complement of the second memory block to the low logic level, wherein the second memory block remains in the long write test mode until selected again,

wherein placing the first memory block into the long write test mode followed by placing the second memory block into the long write test mode constitutes a "domino" style entry into the long write test mode.



**5,502,680**

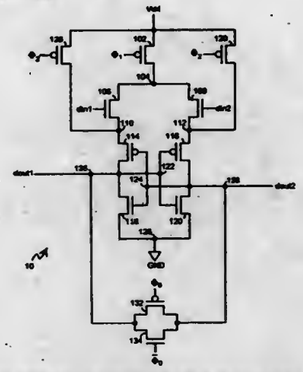
**SENSE AMPLIFIER WITH PULL-UP CIRCUIT FOR ACCELERATED LATCHING OF LOGIC LEVEL OUTPUT DATA**

**He Du, 1182 W. Hamilton Ave., Campbell, Calif. 95008, and Yun-Ti Wang, 4299 Neriasa Cir., Fremont, Calif. 94555**

**Filed Feb. 16, 1995, Ser. No. 389,293**

**Int. Cl.[6] G11C *11/40***

**U.S. Cl. 365—205** **16 Claims**



1. A sense amplifier circuit providing a latched logic level output indicative of a differential voltage between first and second signal lines, comprising:

first means connected to said first and second signal lines, for generating, in response to a first control signal being activated, a differential voltage across first and second nodes indicative of said differential voltage between said first and second signal lines,

second means connected to said first and second nodes, for connecting, in response to a second control signal being activated after said first control signal has initially been activated, a first reference voltage to said first and second nodes, causing said first means to cease generating said differential voltage across said first and second nodes, and

third means connected to said first and second nodes, for providing said latched logic level output such that a logic state of said latched logic level output is determined by said differential voltage generated by said first means, and a voltage level of said latched logic level output is determined by said first reference voltage connected to said first and second nodes by said second means.

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**5,502,679**

**ELECTRICALLY ERASABLE NONVOLATILE MEMORY HAVING DISCHARGING CIRCUITS**

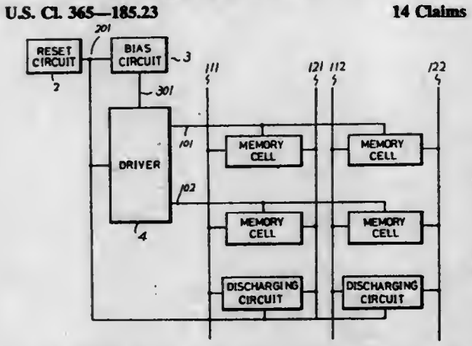
**Katsuya Hamamoto, Tokyo, Japan, assignor to Seiko Instruments Inc., Japan**

**Filed Apr. 25, 1994, Ser. No. 232,613**

**Claims priority, application Japan, Apr. 28, 1993, 5-102944**

**Int. Cl.[6] G11C *16/02***

**U.S. Cl. 365—185.23** **14 Claims**



12. A memory device comprising: a memory cell; a selecting line electrically connected to the memory cell; a control line electrically connected to the memory cell; driving means for driving the memory cell; reset means for producing a reset signal; and discharge means electrically connected to the reset means and the memory cell and receptive of the reset signal for electrically discharging the selecting line and the control line in response to the reset signal.

**5,502,681**

**COLUMN START SIGNAL GENERATION CIRCUIT FOR MEMORY DEVICE**

**Chun S. Park, Choongchungbook, Rep. of Korea, assignor to LG Semicon Co., Ltd., Choongchungbook, Rep. of Korea**

**Filed Apr. 26, 1995, Ser. No. 428,987**

**Claims priority, application Rep. of Korea, Apr. 30, 1994, 9561/1994**

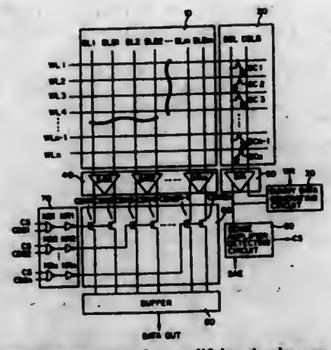
**Int. Cl.[6] G11C *7/02***

**U.S. Cl. 365—210** **7 Claims**

1. A column start signal generation circuit for a memory device, comprising:

dummy data storage means including a plurality of dummy cells for storing dummy data, each of said plurality of dummy cells being connected to a corresponding one of a plurality of word lines and a first dummy bit line or a second dummy bit line, said second dummy bit line being complementary to said first dummy bit line;

dummy data generation means for outputting the dummy data to said plurality of dummy cells in said dummy data storage means in response to a state of a write signal inputted therein;



sense amplification means for amplifying the dummy data from one of said plurality of dummy cells in said dummy data storage means connected to an enabled one of said plurality of word lines; and

sense amplification sensing means for sensing a level of an output signal from said sense amplification means and outputting a column start signal in accordance with the sensed result.

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**5,502,682**

**SEMICONDUCTOR INTEGRATED CIRCUIT FOR CONTROLLING POWER SOURCE**

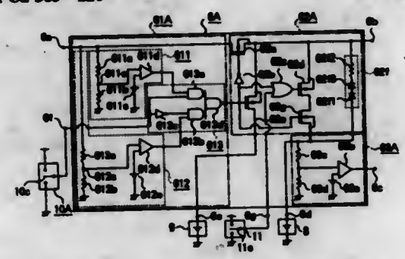
**Yoshimasa Yoshimura, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Feb. 6, 1995, Ser. No. 386,807**

**Claims priority, application Japan, Feb. 7, 1994, 6-013362; Dec. 27, 1994, 6-325825**

**Int. Cl.[6] G11C *13/00***

**U.S. Cl. 365—226** **20 Claims**



1. A semiconductor integrated circuit for controlling a power source, comprising:

an external power source potential node to which an external power source potential is supplied;

an internal power source potential node for transmitting an internal power source potential;

a backup power source potential node to which a backup power source potential is supplied from a backup power source;

a setting node to which a setting signal is supplied which indicates a first state where a rated value of said external power source potential to be supplied to said external power source potential node is a first potential or a second state where said rated value is a second potential;

power source potential discriminating means which receives said external power source potential to be supplied to said external power source potential node and said setting signal to be supplied to said setting node, which obtains a first power source potential on the basis of said external power source potential if said setting signal indicates said first state to subject said first power source potential and a first reference potential to a comparison, which transmits a switching signal indicating use of said external power source potential to be supplied to said external power source potential node if said first power source potential is higher than said first reference potential or use of said backup power source potential to be supplied to said backup power source potential node if said first power source potential is lower than said first reference potential, which obtains a second power source potential on the basis of said external power source potential if said setting signal indicates said second state to subject said second power source potential and a second reference potential to a comparison, which transmits a switching signal indicating use of said external power source potential to be supplied to said external power source potential if said second power source potential is higher than said second reference potential or use of said backup power source potential to be supplied to said backup power source potential node if said second power source potential is lower than said second reference potential; and

power source switching means which receives said switching signal from said power source potential discriminating means, which makes said external power source potential node and said internal power source potential node to be conductive if said switching signal indicates use of said external power source potential and which makes said backup power source potential node and said internal power source potential node to be conductive if said switching signal indicates use of said backup power source potential.

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**5,502,683**

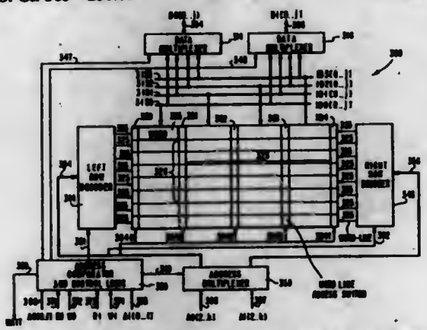
**DUAL PORTED MEMORY WITH WORD LINE ACCESS CONTROL**

**Alessandro Marchioro, Ferney Voltaire, France, assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Apr. 20, 1993, Ser. No. 49,921**

**Int. Cl.[6] G11C *8/00***

**U.S. Cl. 365—230.05** **3 Claims**



1. A dual ported computer memory apparatus having a first and a second set of address lines for receiving a first and second address on a first and second port respectively, a first and a second data multiplexer connected respectively to a first and a second set of data lines, a plurality of word lines each comprising two or more words, the words having a plurality of storage cells, the words being organized in an array, the apparatus further comprising:

a first and second decoder, located at opposite ends of the word lines, the first decoder connected to a first section of each word line and the second decoder connected to a second section of each word line, the decoders each being able to electrically enable one separate section of a word line;

one or more boundaries of access switches, an access switch in a boundary being located between two words at a position in a word line, the access switches in a given boundary being at the same position in each word line so that the boundary of switches define one or more columns of words, the access switches being able to electrically connect or disconnect one or more words from other words in the word line;

a control logic circuit that divides each first and second sets of address lines into a first and second set of column address lines and the first and second set of word address lines, respectively, and uses the first and second set of column address lines to open selected access switches and to connect the first and second sets of data lines through the first and second data multiplexers to a first and second bit line set, respectively, the first and second bit line sets being respectively connected to a first and second column of words to be accessed; and

an address multiplexer, using the first and second word address, for determining which word line the first and second decoders each drive respectively, so that the first decoder drives a first section of word lines and the second decoder drives a second section of word lines, the word to be accessed in the first column is accessed by the first data multiplexer, and the word to be accessed in the second column is accessed by the second data multiplexer.



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**5,502,684**

**SEMICONDUCTOR MEMORY HAVING HIGH SPEED AND LOW POWER DATA READ/WRITE CIRCUIT**

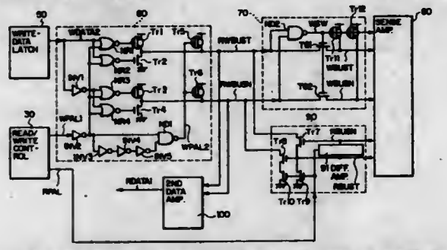
**Yasuji Koshikawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Dec. 7, 1994, Ser. No. 351,650**

**Claims priority, application Japan, Dec. 15, 1993, 5-314638**

**Int. Cl.[6] G11C *7/00***

**U.S. Cl. 365—230.06** **8 Claims**



1. A semiconductor memory comprising a pair of read/write buses through which write data signals are transferred in a write operation and read data signals are transferred in a read operations, a first bus driving circuit responding to a write-data and driving one of said read/write buses to a first potential and the other of said read/write buses to a second potential during said write operation, said first bus driving circuit having a precharge circuit for precharging both of said read/write buses to a precharge level in response to a completion of said write operation; a second bus driving circuit responding to a read-data and driving one of said read/write buses to a third potential and the other of said read/write buses to a fourth potential during the read operation, and a third bus driving circuit cooperating with said precharge circuit to precharge both of said read/write buses to said precharge level for a predetermined period of time in response to the completion of said write operation.

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**5,502,685**

**CONTINUOUS BATCH MIX SPRAYER**

**Franklin P. Orlando, Morgan Hill, Calif., assignor to FMC Corporation, Chicago, Ill.**

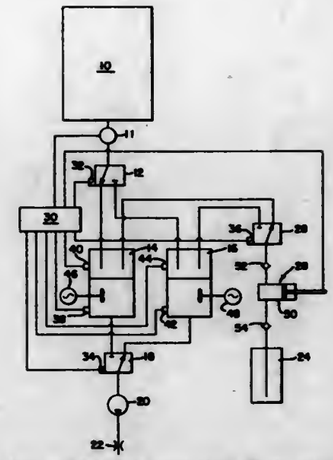
**Filed Dec. 3, 1993, Ser. No. 161,024**

**Int. Cl.[6] B01F *15/02;15/04***

**U.S. Cl. 366—132** **12 Claims**

1. An apparatus for mixing a first fluid with a second fluid, comprising:

a main first fluid tank;



a first fluid switch in fluid connection with the main first fluid tank;

a first mixing tank in fluid connection with the first fluid switch;

a second mixing tank in fluid connection with the first fluid switch, wherein the first fluid switch switches between the first mixing tank and the second mixing tank;

a means for providing a measured amount of a second fluid to the first mixing tank and the second mixing tank;

a mixture switch in fluid connection with the first mixing tank and the second mixing tank, wherein the mixture switch switches between the first mixing tank and the second mixing tank;

a main sprayer pump in fluid connection with the mixture switch; and

a sprayer nozzle in fluid connection with the main sprayer pump.

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**5,502,686**

**METHOD AND APPARATUS FOR IMAGING A BOREHOLE SIDEWALL**

**Efraim Dory, Kingston upon Thames; Martin Evans, Norwich, both of, England, and Albert A. Alexy, Katy, Tex., assignors to Western Atlas International, Houston, Tex.**

**Filed Aug. 1, 1994, Ser. No. 283,840**

**Int. Cl.[6] G01V *1/00***

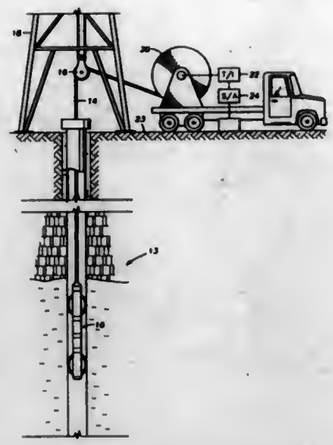
**U.S. Cl. 367—34** **16 Claims**

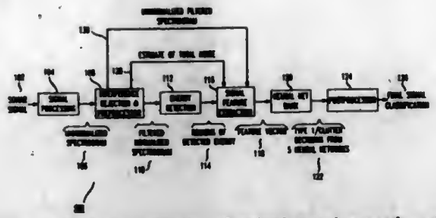
1. A unitary tool-mounted borehole sidewall imaging system comprising:

first means for circumferentially imaging the physical texture and composition of the sidewall of a borehole along a selected depth interval as a function of the acoustic reflectivity of discrete earth formations penetrated by said borehole to provide a first image;

second means for concurrently imaging the physical texture and composition of said borehole sidewall along said selected depth interval as a function of the resistivity of the discrete earth formations penetrated by said borehole to provide a second image; and

means for combining said first and second images.





(2) inputting to a plurality of trained neural networks said textural features and said signal processing parameters of said spectrogram, wherein each of said plurality of trained neural networks is trained to favor a different subset of said textural features and said signal processing parameters; and

(3) classifying components of said sonar signal as characteristic texture or clutter using said trained neural network.

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**5,502,687**

**METHOD FOR DATUMIZING SEISMIC DATA BY FORWARD MODELING**

Scott W. Mackay, Englewood, Colo., assignor to Western Atlas International, Inc., Houston, Tex.

Filed Jul. 1, 1993, Ser. No. 86,166
Int. Cl.[6] G01V *1/36*
U.S. Cl. 367—54 15 Claims




1. A method for datumizing geophysical data comprising the steps of:

(a) time-shifting the geophysical data from a surface elevation to a datum;

(b) forward-modeling said geophysical data beneath said surface elevation using a velocity substantially equal to zero; and

(c) forward-modeling said geophysical data between said surface elevation and said datum using a preselected replacement velocity.

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**5,502,688**

**FEEDFORWARD NEURAL NETWORK SYSTEM FOR THE DETECTION AND CHARACTERIZATION OF SONAR SIGNALS WITH CHARACTERISTIC SPECTROGRAM TEXTURES**

Michael C. Recchione, Nutley, and Anthony P. Russo, Bloomfield, both of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Nov. 23, 1994, Ser. No. 344,450
Int. Cl.[6] H04B *11/00*; G01S *3/86*
U.S. Cl. 367—131 11 Claims

1. A method for characterizing a sonar signal captured by sonar listening devices, the method comprising the steps of:

(1) characterizing a spectrogram generated from a sonar signal in terms of textural features and signal processing parameters;

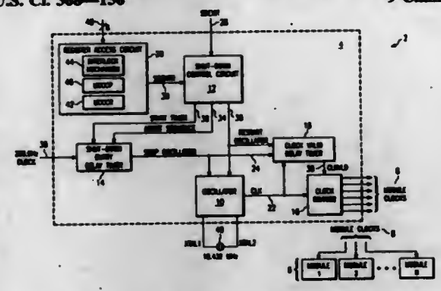
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**5,502,689**

**CLOCK GENERATOR CAPABLE OF SHUT-DOWN MODE AND CLOCK GENERATION METHOD**

Joseph W. Peterson; Alan F. Hendrickson; Dale E. Gulick, and Dean Grumelose, all of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 918,622, Jul. 21, 1992, abandoned.
This application Feb. 24, 1994, Ser. No. 201,077
Int. Cl.[6] G04F *5/00*; G06F *1/00*
U.S. Cl. 368—156 9 Claims



1. A clock generator for an electrical system, said clock generator capable of providing at least one output clock signal, said clock generator comprising:

means for producing said at least one output clock signal;

means for disabling said means for producing upon reception of a disable activation signal;

means for receiving a shut-down entry request signal;

means for verifying that said received shut-down entry request signal meets a predetermined protocol requirement, said means for verifying comprising at least two registers, said means for verifying generating said disable activation signal upon verification that a received shut-down entry request signal does meet said predetermined protocol requirement, which disable activation signal is conducted to said means for disabling.

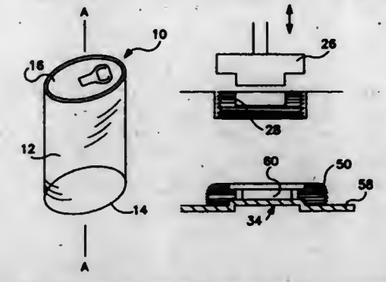


**5,502,690**

**WATCH CASE FORMED FROM A DISPOSABLE BEVERAGE CAN**

Robert Wohlfahrt, Luzern, Switzerland, assignor to Crash Holding AG, Zug, Switzerland

Division of Ser. No. 177,929, Jan. 6, 1994, which is a continuation-in-part of Ser. No. 946,363, Dec. 18, 1992, abandoned. This application Mar. 6, 1995, Ser. No. 399,195
Int. Cl.[6] G04B *37/00*
U.S. Cl. 368—276 4 Claims




1. A timepiece having a watch casing formed by compressing a disposable metal beverage can bearing indicia comprising: a metal watch casing having a sidewall portion having an inner surface defining an opening for receiving means for displaying time and an outer circumferential surface, said sidewall portion comprises multi-layer folds of metal bearing random indicia on the outer circumferential surface; and means for displaying time mounted in said opening.

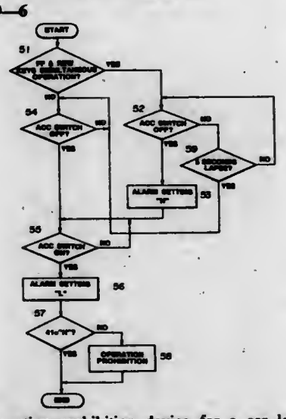
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**5,502,691**

**OPERATION PROHIBITION DEVICE FOR A CAR LOADING AUDIO INSTRUMENT**

Michihiro Asano, Sagamihara, Japan, assignor to Nakamichi Corporation, Tokyo, Japan

Continuation of Ser. No. 95,602, Jul. 21, 1993, Pat. No. 5,418,761. This application Dec. 2, 1994, Ser. No. 349,072
Claims priority, application Japan, Jul. 29, 1992, 4-222009; Jul. 29, 1992, 4-222010
Int. Cl.[6] H04B *1/20*
U.S. Cl. 369—6 9 Claims




1. An operation prohibition device for a car loading audio instrument comprising;

at least two power supply lines connected together and extending from a car battery to said car loading audio instrument, but not through an accessory switch;

means to detect said two power supply lines being disconnected from each other;

and means to prohibit said car loading audio instrument from being operated when said means to detect said two power supply lines being disconnected detects said two power supply lines being disconnected from each other to provide a prohibition instruction to said instrument.

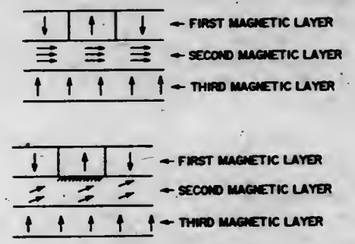
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**5,502,692**

**METHOD AND APPARATUS FOR RECORDING, REPRODUCING AND OVERWRITING INFORMATION ON OR FROM A MAGNETOOPTIC DISK HAVING THREE MAGNETIC LAYERS**

Yoichi Osato, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 578,210, Sep. 6, 1990, abandoned.
This application Mar. 24, 1993, Ser. No. 37,179
Claims priority, application Japan, Sep. 6, 1989, 1-231845
Int. Cl.[6] G11B *13/04*; *11/12*
U.S. Cl. 369—13 11 Claims




1. A magneto-optical recording method for initializing a magneto-optical recording medium and for recording and overwriting a binary signal on the magneto-optical recording medium, which includes a first magnetic layer having a low Curie point and a high coercive force having a perpendicular magnetic anisotropy, a third magnetic layer having a higher Curie point and a lower coercive force than those of the first magnetic layer and a second layer provided between the first and third magnetic layers and having an in-surface magnetic anisotropy at room temperature and exhibiting a perpendicular magnetic anisotropy when temperature rises, said method comprising the steps of:

rotating the recording medium;

applying to the recording medium an initialization external perpendicular magnetic field for orienting a magnetizing direction of the third magnetic layer in a uniform perpendicular direction;

applying to the recording medium an initialization external in-surface magnetic field for orienting a magnetizing direction of the second magnetic layer in an in-surface direction;

thereafter, irradiating the recording medium with a light beam having a first non-zero power level while applying a perpendicular biasing magnetic field to the recording medium, the temperature of the first magnetic layer being caused to rise higher than its Curie point, and the temperature of the third magnetic layer being caused to rise near its Curie point to orient the magnetizing direction of the second magnetic layer in the perpendicular direction of the biasing magnetic field and to orient the magnetizing direction of the first magnetic layer in a stable direction relative to the magnetizing direction of the third magnetic layer;

irradiating the recording medium with a light beam having a second non-zero power level, lower than the first power level, while applying a perpendicular biasing magnetic field to the recording medium, the temperature of the first magnetic layer being caused to rise near its Curie point to orient the magnetizing direction of the first magnetic layer in a stable direction relative to the magnetizing direction of the third magnetic layer; and

selecting the first and second power levels according to information to be recorded.

2. A magneto-optical recording apparatus for recording and overwriting a binary signal on a magneto-optical recording medium, said apparatus comprising:

a magneto-optical recording medium including a first magnetic layer which has a low Curie point and a high coercive force and has a perpendicular magnetic anisotropy, a third magnetic layer having a higher Curie point and a lower coercive force than those of the first magnetic layer, and a second magnetic layer which is provided between the first and third magnetic layers and has an in-surface magnetic anisotropy at room temperature and exhibits a perpendicular magnetic anisotropy when temperature rises;

means for rotating said recording medium;

initialization magnetic field applying means for applying an initialization in-surface magnetic field to the recording medium to set the magnetization direction of the second magnetic layer in a uniform in-surface direction and for applying an initialization, perpendicular magnetic field to the recording medium to set the magnetization direction of the third magnetic layer in a uniform perpendicular direction, said initialization magnetic field applying means facing said recording medium at a first position;

recording bias magnetic field applying means for applying a perpendicular magnetic field to said recording medium, said recording bias magnetic field applying means facing said recording medium at a second position spaced from the first position; and

laser beam generating and irradiating means for generating a laser beam having first and second non-zero power levels in accordance with the binary signal to be recorded, and for irradiating said recording medium with the laser beam, said laser beam generating and irradiating means confronting said recording bias magnetic field applying means with respect to said recording medium.

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**5,502,693**

**MAGNETIC RECORDING SYSTEM FOR COMPENSATING LEAKAGE FLUX**

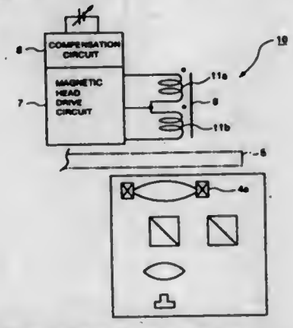
**Ricardo M. Okamoto; Kouichi Matsumoto; Isao Kotani; Satoshi Kuroda; Hiroyuki Ishikawa, and Kenji Fukui, all of Tokyo, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan**

**Filed Mar. 17, 1994, Ser. No. 214,478**

**Claims priority, application Japan, Mar. 18, 1993, 5-085607**

**Int. Cl.[6] G11B *11/00***

**U.S. Cl. 369—13** **8 Claims**




1. A magnetic recording system comprising:

a magnetic head including an electro-magnetic transducer having at least one coil for applying a magnetic field for recording/erasing of data with respect to a recording medium; and

a magnetic head drive circuit having means for supplying a processing electric current to said at least one coil for applying said magnetic field, and having means for

generating a compensation direct electric current and means for adding said compensation direct electric current to said processing electric current, said compensation direct current having an amplitude so as to cause said at least one Coil to generate a bias magnetic field for eliminating an undesirable leakage magnetic field applied on said recording medium other than said processing magnetic field necessitated for recording/erasing of data.

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**5,502,694**

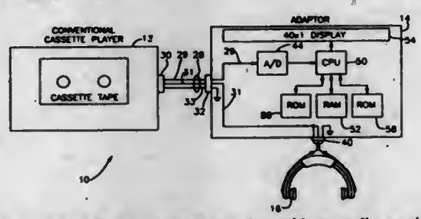
**METHOD AND APPARATUS FOR COMPRESSED DATA TRANSMISSION**

**Daniel S. Kwoh, 3975 Hampstead Rd., La Canada, Flintridge, Calif. 91011, and Hing Y. Ngai, 6922 Lofty Grove Dr., Rancho Palos Verdes, Calif. 90274**

**Filed Jul. 22, 1994, Ser. No. 279,479**

**Int. Cl.[6] G11B *19/00***

**U.S. Cl. 369—25** **16 Claims**




1. A method for transmitting text data with an audio or video program from a transmitter to a receiver, the method comprising the steps of:

arranging the data into groups;

assigning a unique code to each group;

encoding the data so that the codes represent the groups;

transmitting from the transmitter to the receiver the groups and their assigned codes;

storing at the receiver a table correlating each group to its assigned code;

transmitting from the transmitter to the receiver the program and the encoded data; and

decoding the encoded data from the table stored in the storing step.

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**5,502,695**

**REPRODUCING APPARATUS HAVING A SINGLE MICROPROCESSOR TO PERFORM DATA RETRIEVAL AND DISC REPRODUCTION CONTROL**

**Yoshihiro Miura, Tokyo; Koji Takagi; Takashi Morita, both of Kanagawa, and Fumihiko Yoshii, Tokyo, all of, Japan, assignors to Sony Corporation, Japan**

**Division of Ser. No. 20,179, Feb. 22, 1993, Pat. No. 5,359,580, which is a continuation of Ser. No. 626,216, Dec. 12, 1990, abandoned. This application Jul. 23, 1993, Ser. No. 96,770**

**Claims priority, application Japan, Jan. 9, 1990, 2-002149**

**Int. Cl.[6] G11B *7/00***

**U.S. Cl. 369—32** **3 Claims**

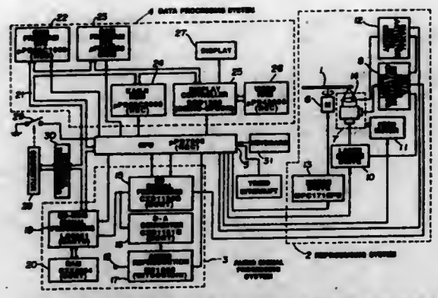
1. A disk reproducing apparatus for an optical disc on which data is recorded, the reproducing apparatus reproducing data recorded on the disc as reproduced data, and, in response to a user input, performing data retrieval, wherein the data to be reproduced is selected, the apparatus comprising:

external connection means for connecting the apparatus to an external interface;

a main body section including:

an optical pickup means for providing signals in response to the disc,





a signal processing means for processing the signals from the optical pickup means to provide reproduced data,

disc rotating driving means for rotationally driving the optical disc,

a feed motor means for moving the optical pickup means radially relative to the optical disc,

a feed motor control means for controlling the feed motor means,

an input means for receiving the user input, and

a control means, including a single central processing unit operating in response to a program having a main routine and a subroutine, for:

generating a timed interrupt;

executing the main routine to perform a data retrieval operation in response to the input means,

in response to the timed interrupt:

suspending the data retrieval operation, and

executing the subroutine to perform the data reproduction control operation, including controlling the feed motor control means; and

resuming main routine to continue the data retrieval operation upon completion of the disc reproduction control operation subroutine, and

the single central processing unit in the control means additionally operating in response to the main routine to: determine when the external interface is connected to the apparatus, and

when the single central processing unit determines that the external interface is connected to the apparatus, to reset the single central processing unit,

display means, attached to the main body section and receiving the reproduced data from the signal processing means, for displaying the reproduced data.

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**5,502,696**

**CD-ROM SUBCODE R-W CHANNEL DE-INTERLEAVING AND DE-SCRAMBLING METHOD AND APPARATUS**

**Tony J. Yoon, San Jose; Michael J. McGrath, Sunnyvale, and Phuc Tran, Milpitas, all of Calif., assignors to Cirrus Logic, Inc., Fremont, Calif.**

**Filed Sep. 23, 1994, Ser. No. 311,069**

**Int. Cl.[6] G11B *17/22***

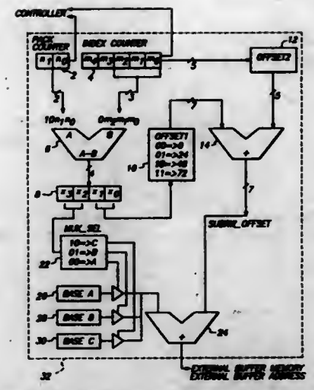
**U.S. Cl. 369—32** **20 Claims**

1. A method of de-interleaving and de-scrambling encoded data read from an optical media source and transmitting an address value with a corresponding byte of data, comprising the steps of:

a. reading a current byte of data from the optical media source;

b. generating a first offset value representing a pack of data to which the current byte of data belongs, using a read pack number and a read index number, both corresponding to a position of the current byte of data within a current packet of data as stored within the optical media source;

c. generating a second offset value representing a position of the current byte of data within the pack of data, using the read index number;



d. adding the first offset value to the second offset value to form a base offset value for the current byte of data, wherein the base offset value represents a de-interleaved and de-scrambled position of the current byte of data within the current packet of data; and

e. adding the base offset value to a base address value to form an address value wherein the address value represents a location within a memory storage device where the current byte of data is to be stored.

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**5,502,697**

**DISC PROCESSING APPARATUS HAVING ROTATABLE STOCKER AND MOVING DRIVE UNIT**

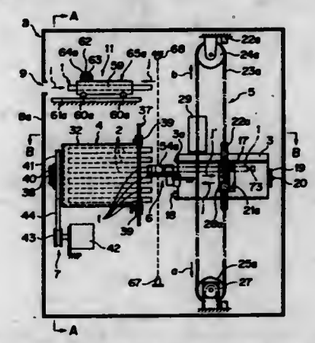
**Yoshitsugu Taki, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Continuation of Ser. No. 20,999, Feb. 22, 1993, abandoned. This application Jan. 19, 1995, Ser. No. 376,119**

**Claims priority, application Japan, Feb. 25, 1992, 4-073189**

**Int. Cl.[6] G11B *17/30;17/08***

**U.S. Cl. 369—34** **8 Claims**



1. A disc processing apparatus for processing discs enclosed in respective cartridges and each having top and bottom playing surfaces, comprising:

a stocker having means defining a plurality of storage locations for removably storing respective cartridges therein in a predetermined order, said storage locations being arranged one after the other in a sequence direction with cartridges stored at said locations being aligned substantially in parallel to each other;

means mounting said stocker for movement only in rotation about a fixed axis which extends perpendicular to said sequence direction and is substantially centered in said sequence direction in respect to said plurality of storage locations;

means for rotating said stocker by 180 degrees about said fixed axis between a first position and a second position in which said order in which the cartridges are stored and said top and bottom playing surfaces of the disc in each cartridge are reversed;

drive means having an input/output port for loading and/or unloading a cartridge therethrough in directions parallel to said fixed axis, and means for reading and/or writing information on one of said surfaces of the respective disc of a cartridge loaded in said drive means;

means for rectilinearly transporting said drive means only in a first direction parallel to said sequence direction of the storage locations with said stocker in either said first position or said second position of the stocker so that the input/output port of said drive means can be confronted with a selected one of the plurality of storage locations of said stocker; and

carrier means mounted at said drive means and movable therewith for transporting a selected cartridge in a second direction which is parallel to said fixed axis and perpendicular to said first direction so as to transport said selected cartridge between said stocker and said input/output port of the drive means.

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**5,502,698**

**AUTOMATIC ATTITUDE CORRECTING SYSTEM FOR OPTICAL DISC DEVICE**

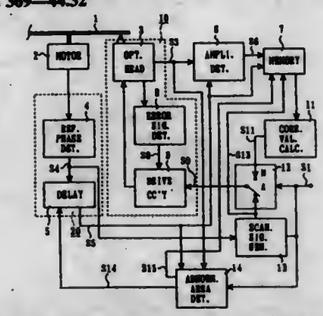
**Masaki Mochizuki, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan**

**Filed Sep. 21, 1994, Ser. No. 310,226**

**Claims priority, application Japan, Sep. 22, 1993, 5-259186; Nov. 5, 1993, 5-299154; Dec. 13, 1993, 5-341945**

**Int. Cl.[6] G11B *7/00***

**U.S. Cl. 369—44.32** **14 Claims**




1. Automatic attitude correcting system adapted to be used on an optical disc device, said optical disc device using optical head means for reading information recorded on an optical disc which is revolving, said system correcting an attitude of said optical head means, said system comprising:

attitude control means for controlling said attitude of said optical head means with respect to the optical disc;

angular position indicating means for outputting a positional signal indicating an angular position of the optical disc;

scanning signal generating means for generating a scanning signal and for supplying the scanning signal to said attitude control means, where a DC level of the scanning signal varies stepwise at a predetermined interval;

amplitude detecting means for detecting an amplitude of an output of said optical head means in response to said positional signal;

correcting value calculation means for generating a correcting value calculated from an output of said amplitude detecting means and for supplying the correcting value to said attitude control means causing said amplitude detecting means to generate a maximum output from said amplitude detecting means.

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**5,502,699**

**DISC REPRODUCTION APPARATUS**

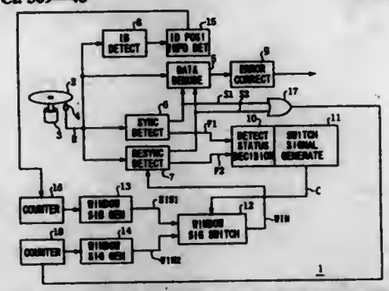
**Yoshimori Yamasaki, Kanagawa; Takayoshi Chiba; Hideki Kobunaya, both of Tokyo, and Yutaka Ishikawa, Kanagawa, all of, Japan, assignors to Sony Corporation, and NEC Corporation, both of Tokyo, Japan**

**Filed May 11, 1994, Ser. No. 240,850**

**Claims priority, application Japan, May 14, 1993, 5-136742**

**Int. Cl.[6] G11B *7/013;5/09***

**U.S. Cl. 369—48** **11 Claims**




1. A disc reproduction apparatus for reproducing an information signal from a disc recording medium on which a first synchronization pattern is formed along a recording track in predetermined cycles, and more than one second synchronization pattern with fewer bits than said first synchronization pattern are formed between said first synchronization patterns adjacent to each other, comprising:

reproducing means for obtaining a reproduction signal from said disc recording medium;

first synchronization pattern detecting means for detecting said first synchronization pattern from said reproduction signal;

second synchronization pattern detecting means for fetching said reproduction signal based on a specified window signal and detecting said second synchronization pattern from said fetched reproduction signal;

window signal generating means for generating said window signal whose window width changes based on the result of detection by said first or second synchronization pattern detecting means; and

demodulating means for demodulating said information signal from said reproduction signal based on the result of detection by said first and second synchronization pattern detecting means.

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**5,502,700**

**POWER SAVING METHOD AND APPARATUS FOR INTERMITTENTLY READING REPRODUCTION APPARATUS**

**Akira Shinada, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Division of Ser. No. 88,674, Jul. 7, 1993. This application Sep. 28, 1994, Ser. No. 314,064**

**Claims priority, application Japan, Jul. 9, 1992, 4-204231; Feb. 5, 1993, 5-040738**

**Int. Cl.[6] G11B *5/09***

**U.S. Cl. 369—50** **4 Claims**

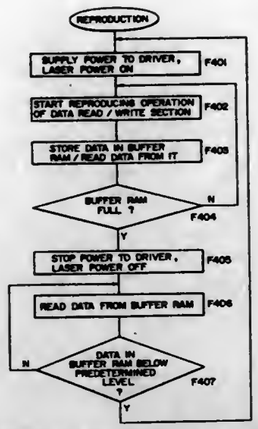
1. Any one of a reproducing apparatus and a recording/reproducing apparatus comprising:

data reading means for reading data from a recording medium;

driven means, supplied with a drive signal from a driving means, for driving the recording medium with respect to the data reading means;

buffer memory means into which reproduced data read from the recording medium by the data reading means is written at a first transfer rate and from which the stored reproduced data is read at a second transfer rate, the second transfer rate being lower than the first transfer rate;






switching means for selectively switching off power to the driving means such that the driving means does not provide the drive signal to the driven means; and

control means for controlling an on/off switching operation of the switching means according to an amount of the reproduced data accumulated in the storage means.

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**5,502,701**

**OPTICAL DISC RECORDING APPARATUS WHICH CONTROLS RE-RECORDING AFTER A DISTURBANCE AS A FUNCTION OF THE CAPACITY OF AN INPUT BUFFER MEMORY**

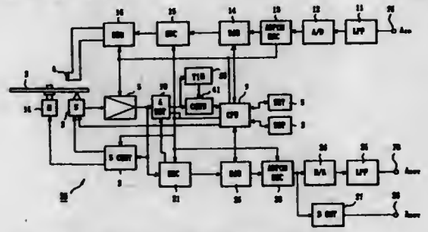
**Junichi Kudo, Tokyo, and Ryosuke Senoguchi, Kanagawa, both of, Japan, assignors to Sony Corporation, Tokyo, Japan**

**Division of Ser. No. 18,765, Feb. 17, 1993, abandoned. This application Jun. 10, 1994, Ser. No. 258,651**

**Claims priority, application Japan, Feb. 29, 1992, 4-078842**

**Int. Cl.[6] G11B *7/00***

**U.S. Cl. 369—54** **1 Claim**



1. An optical disc recording apparatus comprising:

memory means for storing input data in sequence at a first transmission rate, and reading out the stored input data at a second transmission rate which is faster than the first transmission rate and outputting the data read at the second transmission rate as clusters of recording data

recording means for interleaving the recording data and adding cluster connecting sectors, each cluster connecting sector having a data length long enough to cover a distance to rearrange data through interleaving before and after each cluster of recording data and for recording the interleaved data on an optical disc;

first detecting means for detecting an abnormality of the recording operation of said recording means and outputting an output signal as an abnormality detected result;

second detecting means for monitoring a capacity of said memory means for storing the input data and outputting an output signal as a monitored result; and

control means for controlling said recording means corresponding to the output signal from said first detecting means and the output signal from said second detecting means to stop re-recording of data after a detected abnormality if the memory means has insufficient storage capacity to store input data.

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**5,502,702**

**OPTICAL DISC RECORDING DEVICE USING BASIC RECORDING INFORMATION AND PROJECTION TIME CONTROL**

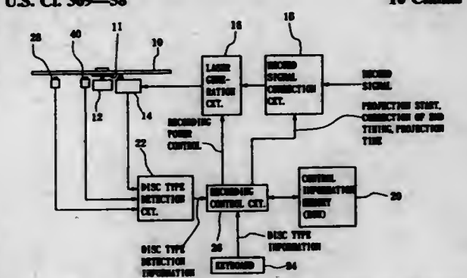
**Yukihisa Nakajo, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan**

**Filed Aug. 5, 1994, Ser. No. 286,755**

**Claims priority, application Japan, Aug. 9, 1993, 5-218194; Nov. 9, 1993, 5-303343**

**Int. Cl.[6] G11B *3/90***

**U.S. Cl. 369—58** **10 Claims**




1. An optical disc recording device for recording on an optical disc, the optical disc recording device comprising;

control information storage means for storing a plurality of control information for controlling a laser modulation system used during a recording mode for a plurality of disc types:

disc type detection means for detecting the type of the optical disc and generating information on the type of the optical disc; and

recording control means for using the information on the disc type of the optical disc on which recording is to be made to read out control information corresponding to the the disc type of the optical disc from the control information storage means and for using contents of the control information to perform recording on the optical disc;

wherein said control information storage means also stores basic control information which is irrelevant to the type of the optical disc; and

wherein said recording control means reads out the basic control information and uses contents of the basic control information when said disc type detection means has not detected the type of the optical disc.

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**5,502,703**

**OPTICAL DISC REPRODUCING APPARATUS**

**Yoichi Yamada, and Tomohiko Kimura, both of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan**

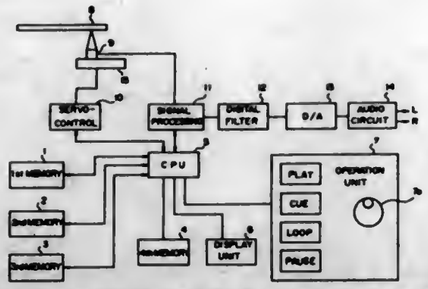
**Filed Aug. 25, 1994, Ser. No. 295,536**

**Claims priority, application Japan, Aug. 27, 1993, 5-213023**

**Int. Cl.[6] G11B *7/00***

**U.S. Cl. 369—60** **12 Claims**

1. An optical disc reproducing apparatus for repeatedly reproducing information recorded on an optical disc over a desired




repeated reproduction interval from a starting position to an ending position of the optical disc, said apparatus comprising:

an optical pickup for reading the information recorded on the optical disc;

a reproducing means for reproducing the information read by said optical pickup;

a moving means for moving said optical pickup from the ending position back to a predetermined position, which is positioned at a vicinity of the starting position on a side near the ending position of the starting position, in a repeated reproduction operation;

a first memory for storing the information, which is recorded from the starting position to the predetermined position and is read by said optical pickup, the predetermined position being predetermined such that the information stored in said first memory have an information amount corresponding to a time enough for said moving means to move said optical pickup from the ending position back to the predetermined position;

a second memory for temporarily and successively storing the information read by said optical pickup, from the predetermined position to the ending position, to successively output the stored information, with a time delay relative to the information read by said optical pickup, to said reproducing means; and

a controller for controlling said reproducing means to switch an object of reproduction from the information read by said optical pickup to the information of said first memory when said optical pickup arrives at the ending position and to reproduce the information of said first memory while said moving means moves said optical pickup from the ending position back to the predetermined position and to switch the object of reproduction from the information of the first memory to the information of the second memory when said reproducing means finishes reproducing the information at the predetermined position of the first memory, and to start reproducing the information of the second memory next to the predetermined position, with the time delay to compensate a time difference between the information reproduced from the first memory and the information read by the optical pickup at the predetermined position.

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**5,502,704**

**DISC RECORDING AND/OR REPRODUCING APPARATUS**

**Kiyoshi Ohmori, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Filed Mar. 24, 1992, Ser. No. 856,723**

**Claims priority, application Japan, Mar. 29, 1991, 3-091552; Jan. 15, 1991, 3-293831**

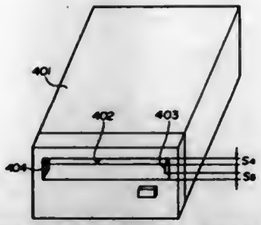
**Int. Cl.[6] G11B *33/02;5/016***

**U.S. Cl. 369—77.2** **3 Claims**

1. A disc recording or reproducing apparatus which incorporates means for allowing only the loading into the disc recording or reproducing apparatus of an optical disc cartridge having a cartridge main body housing an optical disc therein, the cartridge main body including at least a guide section on at least one lateral side edge thereof parallel to a direction of insertion of the optical disc cartridge into the disc recording or reproducing apparatus, and preventing the loading into the disc recording or playback apparatus of a magnetic disc cartridge housing a magnetic disc of the same radius as the optical disc therein and having a cartridge thickness lesser than the thickness of the optical disc cartridge and no guide section on a lateral side edge of the magnetic disc cartridge, comprising

loading means having a cartridge insertion opening for loading the optical disc cartridge onto a disc loading section, and

mistaken insertion inhibiting means having one or more protuberances for restricting a dimension of the cartridge insertion opening to be smaller than a corresponding dimension of the magnetic disc cartridge so as to block insertion of the magnetic disc cartridge into the cartridge insertion opening but for mating with the guide section of the optical disc cartridge so as not to prevent insertion of the optical disc cartridge into the cartridge insertion opening.




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**5,502,705**

**CARTRIDGE-HOLDER LOCKING DEVICE FOR A MAGNETOOPTICAL DISK PLAYER**

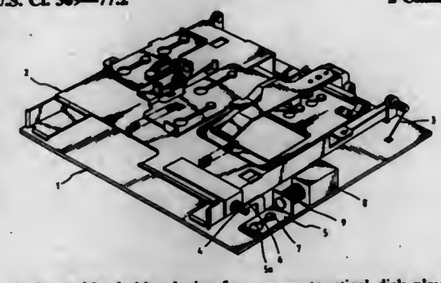
**Seoung-Joon Ahn, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea**

**Filed May 27, 1994, Ser. No. 250,672**

**Claims priority, application Rep. of Korea, Jun. 1, 1993, 93-9001**

**Int. Cl.[6] G11B *33/02***

**U.S. Cl. 369—77.2** **2 Claims**



1. A cartridge-holder device for a magnetooptical disk player comprising:

a cartridge holder rotatably mounted on a rear side of a deck of said player to pivot between an open, cartridge insertion/removal position, and a loaded, disk playing position;

means for elastically biasing said cartridge holder to pivot toward said open position;

a locking pin fixed to one side of said cartridge holder; and

locking/releasing means mounted on said deck for engaging said locking pin to lock said cartridge holder in said loaded position against a bias of said biasing means, and for releasing said locking pin to allow said biasing means to move said cartridge holder to said open position, said locking/releasing means comprising:

a slide plate positioned to slide along said deck from a first position to other positions;

a locking piece attached to said slide plate, said locking piece having an edge for locking said locking pin and therefore said cartridge holder, in the loaded position when said slide plate is in said first position;

said locking piece further having a sloped surface at a part thereof which meets said locking pin when said cartridge holder is moved from said open position to said loaded position and said slide plate is in said first position, whereby a forced movement of said cartridge holder towards said loaded position forces movement of said locking piece and said slide.,plate away from said first position until said locking pin moves past said sloped surface;

a solenoid having a housing and a shaft, said solenoid being positioned on said deck and said shaft being connected to said slide plate; and

a spring surrounding said shaft between said slide plate and said housing for biasing said slide plate toward said first position, whereby actuation of said solenoid causes said shaft to move said slide plate away from said first position, and deactivation of said solenoid causes said spring to move said slide plate back to said first position.



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**5,502,706**

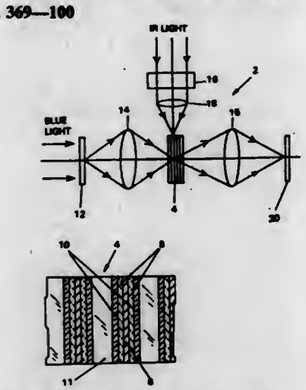
**OPTICAL STORAGE MEDIUM UTILIZING ELECTRON TRAPPING FILM LAYERS SANDWICHED WITH ELECTRODES**

**Xiangyang Yang, Gaithersburg; Charles Y. Wrigley, Ijamsville, and Joseph Lindmayer, Potomac, all of Md., assignors to Quantex Corporation, Rockville, Md.**

**Continuation-in-part of Ser. No. 207,628, Mar. 9, 1994, abandoned, which is a continuation of Ser. No. 921,008, Jul. 28, 1992, Pat. No. 5,321,270, which is a continuation of Ser. No. 721,345, Jul. 1, 1991, Pat. No. 5,134,686, which is a continuation-in-part of Ser. No. 419,479, Oct. 10, 1989, Pat. No. 5,029,253. This application Jul. 8, 1994, Ser. No. 271,992**

**Int. Cl.[6] G11C *13/00;* G11B *3/70;* G03C *1/00***

**U.S. Cl. 369—100** **16 Claims**




1. A three-dimensional optical memory, comprising:

at least two thin film layers of electron trapping material for storing and releasing information in the form of excited electrons trapped at, and released from, an electron trapping level;

wherein each of said thin film layers of electron trapping material is sandwiched between a pair of insulating layers and a pair of transparent electrodes.

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**5,502,707**

**DIFFRACTION GRATING AND OPTICAL PICKUP APPARATUS WITH DIFFRACTING GRATING**

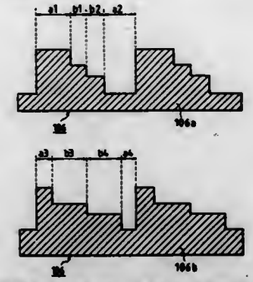
**Yoshiaki Komma, Kyoto, and Seiji Nishino, Osaka, both of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Division of Ser. No. 19,537, Feb. 18, 1993, Pat. No. 5,400,311. This application Nov. 14, 1994, Ser. No. 339,714**

**Claims priority, application Japan, Feb. 21, 1992, 4-034657**

**Int. Cl.[6] G11B *7/00;* G02B *5/18***

**U.S. Cl. 369—103** **11 Claims**




1. A diffraction grating having a non-concentric grating pattern, comprising N grating portions having stair-like cross-sectional configurations, each grating portion having M steps arrayed in order of their heights along a grating pitch thereof, where M and N are arbitrary positive integers, wherein a ratio of widths of said M steps constituting each grating portion is differentiated at first and second grating portions Pi and Pj on a surface of said diffraction grating, so as to satisfy the following relation:

$$W(Pi,1):W(Pi,2):\cdots:W(Pi,k):\cdots:W(Pi,M)\neq W(Pj,1):W(Pj,2):\cdots:W(Pj,k):\cdots:W(Pj,M)$$

where W(Pi,k) and W(Pj,k) represent widths of k-th steps in the first and second grating portions Pi and Pj, respectively, i and j are positive integers different from each other and satisfying conditions $1 \leq i \leq N$ and $1 \leq j \leq N$, while k is a positive integer satisfying a condition $1 \leq k \leq M$.

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**5,502,708**

**OPTICAL SCANNING DEVICE**

**Yasuaki Morimoto, Shiba, Japan, assignor to Deutsche Thomson-Brandt GmbH, Villingen-Schwenningen, Germany**

**PCT No. PCT/EP92/02761, § 371 Date Sep. 12, 1994, § 102(e) Date Sep. 12, 1994, PCT Pub. No. WO93/12523, PCT Pub. Date Jun. 24, 1993**

**PCT Filed Nov. 28, 1992, Ser. No. 244,707**

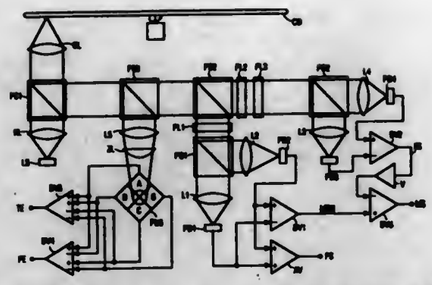
**Claims priority, application Germany, Dec. 11, 1991, 41 40 806.3**

**Int. Cl.[6] G11B *7/00***

**U.S. Cl. 369—110** **19 Claims**

1. Optical scanning device which is suitable for reading both an optical and a magneto-optic recording medium as well as a magneto-optic recording medium (CD) upon which items of data are stored on top of one another in both a magnetic layer (MO) and by means of pits (P), wherein the light beam from a light source (LS) is focused on the recording medium (CD) and is reflected by the recording medium (CD) through a first λ/2 plate (PL1) to a first polarization beam splitter (PO1) which guides the light beam in dependence on its direction of polarization onto a first or second photodetector (PD1, PD2), wherein the output of the first and of the second photodetector (PD1, PD2) are connected to respective inputs of a first differential amplifier (DV1), said scanning device further comprising:

a second (DV2) and a third (DV3) differential amplifier having respective inverting and non-inverting input connections and



respective output connections, the output connection of the first (DV1) and second (DV2) differential amplifiers being respectively coupled to the non-inverting and inverting input connections of the third (DV3) differential amplifier from whose output connection a substantially crosstalk free data signal (MS) obtained from the magnetic layer MO of the recording medium is available;

third (PD3) and fourth (PD4) photodetectors respectively connected to the inverting and non-inverting input connections of the second (DV2) differential amplifier;

a second polarization beam splitter (PO2) arranged to direct light reflected from the recording medium, in dependence on its direction of polarization, onto said third (PD3) and fourth (PD4) photodetectors; and

a second λ/2 plate (PL2) and a λ/4 plate (PL3) arranged in an optical path of said reflected light between said recording medium and said second polarization beam splitter (PO2).

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**5,502,709**

**APPARATUS FOR RECORDING IMAGES ON INTERIOR SURFACE OF CYLINDER**

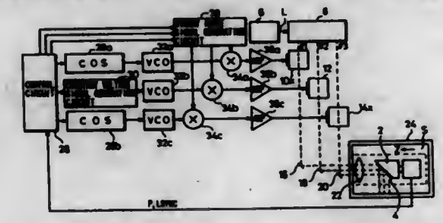
**Hidetoshi Shinoda, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Jun. 6, 1995, Ser. No. 470,119**

**Claims priority, application Japan, Sep. 7, 1994, 6-213763; Sep. 7, 1994, 6-213772; May 11, 1995, 7-113328**

**Int. Cl.[6] G11B 7/00; G02B 26/08**

**U.S. Cl. 369—119** **10 Claims**



1. An apparatus for recording images on a recording sheet held on an interior surface of a cylinder with a plurality of light beams modulated according to image information and running parallel to each other at a predetermined interval, comprising:

light beam generating means for generating said plurality of light beams;

optical scanning means disposed on a central axis of said cylinder and rotated thereabout, comprising a mirror surface inclined with respect to the central axis of the cylinder, for scanning said recording sheet with each light beam incident upon said mirror surface along the central axis of the cylinder and reflected by the mirror surface which is rotating;

light beam deflecting means for deflecting light beams selected from said plurality of light beams off the central axis of the cylinder to give each of said selected light beams an angle of incidence upon said mirror surface in order for the plurality of light beams reflected by the mirror surface to be separated at said predetermined interval from each other on the recording sheet; and

control means for controlling the direction and amount in which each of said selected light beams is deflected by said light beam deflecting means, in synchronism with the rotation of said scanning means.

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**5,502,710**

**RECORDING BIT EXTRACTION BY CALCULATING CURVATURE OF PIXELS IN SCANNING PROBE MICROSCOPE**

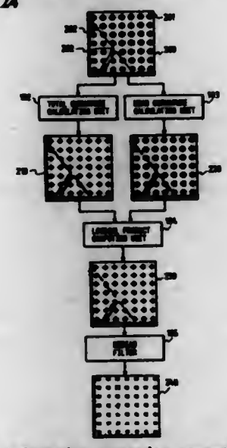
**Teruyoshi Washizawa, Atsugi; Katsunori Hatanaka, Yokohama; Kunihiro Sakai, Isehara; Takahiro Oguchi, Yamato; Akihiko Yamano, and Shunichi Shido, both of Sagamihara, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Mar. 8, 1994, Ser. No. 207,864**

**Claims priority, application Japan, Mar. 8, 1993, 5-046978; Apr. 5, 1993, 5-078186; Jun. 29, 1993, 5-159487**

**Int. Cl.[6] G11B 9/00**

**U.S. Cl. 369—124** **8 Claims**



1. An image information processing apparatus for processing image information, comprising:

total curvature calculating means for calculating a total curvature at each pixel of the image information;

mean curvature calculating means for calculating a mean curvature at each pixel of the image information;

logical product computing means for computing a logical product of outputs from said total curvature calculating means and said mean curvature calculating means; and

a median filter for filtering an output from said logical product computing means.

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**5,502,711**

**DUAL DIGITAL PHASE LOCKED LOOP CLOCK CHANNEL FOR OPTICAL RECORDING**

**Alan R. Clark; Robert A. Hutchins, both of Tucson, Ariz., and Ara S. Patapoutian, Westboro, Mass., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Mar. 20, 1995, Ser. No. 407,124**

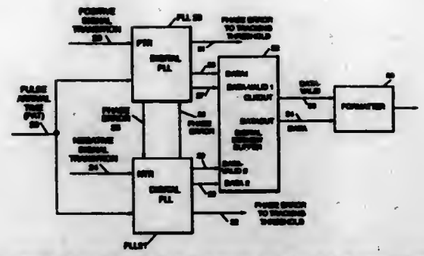
**Int. Cl.[6] G11B 7/00**

**U.S. Cl. 369—124** **17 Claims**

1. A digital channel for use in the threshold detection of a coding modulated binary data stream, comprising;

an input binary data stream having negative and positive transitions that define one binary state of said data stream,





a threshold-establishing and transition-detecting network connected to receive said input data stream,

said threshold-establishing and transition-detecting network providing an output of one polarity corresponding to detection of a said positive transition, providing an output of a polarity opposite to said one polarity corresponding to detection of a said negative transition, and providing a time-of-arrival output,

first and second digital phase locked loop networks,

each of said phase locked loop networks having a transition input, a time-of-arrival input, a phase-error input, a data-valid output, and a data output,

each of said phase locked loop networks having an internal digital phase detector connected to receive input from said transition input and said time-of-arrival input, and operable to generate a phase-error output,

each of said phase locked loop networks having an internal digital loop filter connected to receive input from said phase detector phase-error output, to receive input from said phase-error input, and providing an output to said data-valid output and said data output,

means connecting said phase-error output of said first phase locked loop network to said phase-error input of said second phase locked loop network,

means connecting said phase-error output of said second phase locked loop network to said phase-error input of said first phase locked loop network,

means connecting said output of said one polarity to said transition input of said first phase locked loop network,

means connecting said output of said opposite polarity to said transition input of said second phase locked loop network,

means connecting said time-of-arrival output to said transition inputs of said first and second phase locked loop networks, and

a digital deskew buffer network connected to receive said data-valid outputs and said data outputs of said phase locked loop networks.

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**5,502,712**

**ROUTING SYSTEM IN DATA COMMUNICATION WITH FRAME RELAY PROCEDURE CONTROL**

**Kunihiko Akita, Tokyo, Japan, assignor to NEC Corporation, Japan**

**Filed Oct. 27, 1994, Ser. No. 330,254**

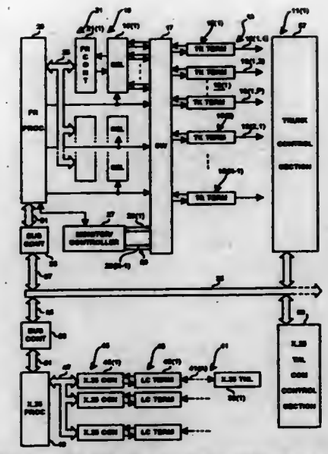
**Claims priority, application Japan, Jan. 29, 1993, 5-292551**

**Int. Cl.[6] H04L 12/24**

**U.S. Cl. 370—16** **10 Claims**

1. A routing system for use in each station of first through N-th exchange stations of a data communication network in selecting an alternative route from a plurality of transit trunks connecting said each station to others of said exchange stations to send a call with no interruption through said alternative route, where N represents an integer which is equal at least to two, said routing system including a trunk control section comprising:

trunk terminator groups physically terminating said transit trunks to receive incoming signals and to send outgoing signals through said transit trunks;



a switch for switching said incoming signals into switch output signals and transmitted signals into said outgoing signals;

selecting means for conveying said switch output signals as conveyed signals and switch input signals as said transmitted signals and for selecting said alternative route;

frame relay communication control means for processing said conveyed signals into processed signals and controlled signals into said switch input signals in accordance with frame relay protocols;

frame relay procedure processing means for processing said processed signals into frame relay output signals and frame relay input signals into said controlled signals and for finding a fault sent through said transit trunks to locate a faulty trunk transmitting said fault, to produce a fault indication signal indicative of said faulty trunk during presence of said fault, to make said frame relay output signals carry said fault indication signal, to control said switch, and to make said selecting means select said alternative route in place of said faulty trunk during presence of said fault;

monitor and control means Connected to said frame relay procedure processing means, said monitor and control means for executing layer 1 and layer 2 protocols on said faulty trunk for restoration of said fault while said switch is controlled; and

input-output means for processing said frame relay output signals into reception data signals and transmission data signals into said frame relay input signals.

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**5,502,713**

**SOFT ERROR CONCEALMENT IN A TDMA RADIO SYSTEM**

**Tomas Lagerqvist, Stockholm; Tor B. Minde, Gammelstad; Peter Mustel, Luleå, and Hans Nilsson, Spånga, all of, Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden**

**Filed Dec. 7, 1993, Ser. No. 162,605**

**Int. Cl.[6] H04L 1/20**

**U.S. Cl. 370—17** **20 Claims**

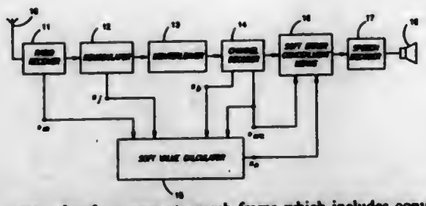
11. A radio system for receiving TDMA signals of the type utilizing convolutional coding, comprising:

means for receiving signals that are convolutionally coded into channels,

means for demodulating the signals received by said receiver;

means for decoding the channels of the demodulated signals into speech frames;

means for concealing errors in the information included in the speech frames; said means for concealing errors including means for determining a quality value and a selected param-



eter value for a present speech frame which includes convolutional coding, means for determining a quality value and a selected parameter value for at least one first previous speech frame which includes convolutional coding; and means for calculating the interpolated value of the present speech frame using an interpolation function that utilizes at least the quality value and the selected parameter value of the present speech frame and the first previous speech frame;

means for decoding the speech frame in accordance with the interpolated value calculated by said means for concealing errors; and

means for reproducing the signals in accordance with the decoded speech frames.

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**5,502,714**

**METHOD FOR SELECTING A FREE LINK AND AN ARRANGEMENT HEREFOR**

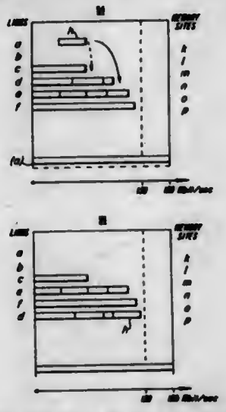
**Krister Sallberg, Lund, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden**

**Filed May 2, 1994, Ser. No. 236,280**

**Claims priority, application Sweden, May 3, 1993, 9301513**

**Int. Cl.[6] H04J** *3/14;3/22*

**U.S. Cl. 370—17** **14 Claims**



1. A method for selecting a free link for a requested connection from among a plurality of available links coordinated to form a route in accordance with the particular resource requirement of the requested connection and in dependence on the current resource seizure of connections that have already been established on utilized links, wherein the requested connection and the connections that have already been established have the same or different resource requirements, and wherein the current resource seizure of each link resulting from said established connections is stored in a memory, the method including the steps of:

a) sorting each link in the memory in one of a plurality of link allocated memory sites which correspond to the current resource seizure of the link or the free or unused resource capacity of the link, wherein said memory sites are ordered in said memory in accordance with a link capacity associated with each memory site;

b) upon occurrence of said requested connection having said particular resource requirement, choosing a memory site depending on the particular resource requirement;

c) evaluating whether the chosen memory site and a link associated therewith has free capacity for the particular resource requirement; and

d) when at least one of the sorted links in the chosen memory site has free capacity for the particular resaource requirement, accepting the establishment of the requested connection via the link among the sorted links in the route that after seizure would have the least amount of residual resource capacity.

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**5,502,715**

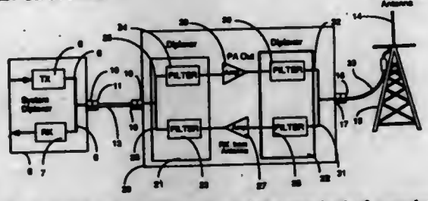
**INTEGRATED DIPLEXER-AMPLIFIER FOR NEAR ANTENNA INSTALLATION**

**James R. Penny, P.O. Box 4328, Fayetteville, Ark. 72702-4328**

**Filed Mar. 16, 1995, Ser. No. 406,015**

**Int. Cl.[6] H04B** *3/36;* **H04L** *5/14*

**U.S. Cl. 370—26** **16 Claims**



1. An integrated microwave assembly comprised of a predetermined number of bandpass filters connected to a predetermined number of RF amplifiers with signal flow in two different directions with amplification, and RF power output as required, to overcome signal losses associated with coaxial cable or other connections to an antenna system, and where such an integrated assembly is intended to mount directly to a tower, near to an antenna and particularly adapted to surviving the weather elements and some lightning effects, and where the beneficial use of the invention is for microwave communications, especially useful to microwave cellular telephone systems, personal (PCS) communications systems and personal (PCN) communications networks in the 800 MHz to 5 GHz and where the physical placement of the bandpass filters is located within dual metallic, or, metallic coated waveguide extrusion, or, molding having minimal, or, seamless construction and said assembly composed of:

a first combline bandpass filter having a waveguide configuration and including a plurality of high Q resonators;

a second combline bandpass filter having a waveguide configuration and including a plurality of high Q resonators;

said first and second bandpass filters being electrically connected at one end, inside the waveguide cavity, forming a common connector port therefore being adapted to accommodate two frequency spectrums at the same time with insertion losses of less than one dB in each bandpass filter;

the center frequency of said first bandpass filter approximately that of a transmission source; the center frequency of the second bandpass filter approximately that of the receiving source;

an input of an amplifier for transmitting is placed at the output port of bandpass filter one;

an output of an amplifier for receiving is connected to the second bandpass filter where the increased RF signal level is conducted to the common port of the two bandpass filters for ultimate conduction to a radio system for signal processing;

a third combline bandpass filter having a waveguide configuration and including a plurality of high Q resonators;

a fourth bandpass combline filter having a waveguide configuration and including a plurality of high Q resonators;

said third and fourth bandpass filters being electrically connected to a common port; the center frequency of said third bandpass filter is approximately that of the transmission source; the center frequency of the fourth bandpass filter approximates that of the desired receiving frequency;

the output of the transmitting RF power amplifier four is connected to bandpass filter three, adjusted as above, for the desired transmitting frequency; and,

the input signal port of the receiving amplifier is connected to the output port of bandpass filter four, above designated as the receiving filter; the received signal, now amplified, is conducted to the input port of the second bandpass filter for conduction, via the common bandpass filter connection, to the remotely located, coaxial cable connected, radio system.

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**5,502,716**

**ARRANGEMENT FOR DISCRIMINATING SIGNALS ON A DUPLEX LINE WITHOUT INTERRUPTING DUPLEX TRAFFIC**

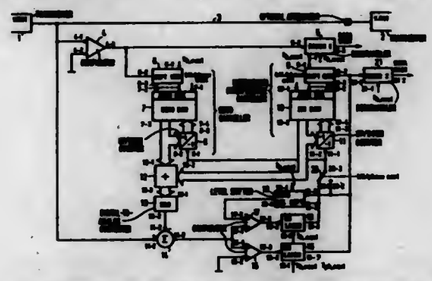
**Gertjan Rhebergen, Hilversum, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**

**Continuation of Ser. No. 933,531, Aug. 7, 1992, abandoned. This application Jul. 25, 1994, Ser. No. 279,983**

**Claims priority, application European Pat. Off., Aug. 20, 1991, 91202115**

**Int. Cl.[6] H04B** *3/20;* **H04J** *3/08*

**U.S. Cl. 370—27** **23 Claims**



1. Telecommunication system with a two-wire transmission line for digital duplex traffic, comprising:

means for tapping the digital duplex traffic, having an output at which the digital duplex traffic is provided,

discrimination means coupled to the output of the tapping means for discriminating digital simplex traffic in one transmission direction from the digital duplex traffic,

echo cancelling means coupled to an output of the discrimination means, and

means for determining a difference between the digital duplex traffic derived from the output of the tapping means and a signal, which signal is derived from an output signal of the echo cancelling means, the digital simplex traffic in the other transmission direction being derived from the difference,

so that only one echo cancelling means and only one tapping means are needed and the duplex traffic is not interrupted.

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**5,502,717**

**METHOD AND APPARATUS FOR ESTIMATING ECHO CANCELLATION TIME**

**Sangil Park, Austin, Tex., assignor to Motorola Inc., Schaumburg, Ill.**

**Filed Aug. 1, 1994, Ser. No. 283,322**

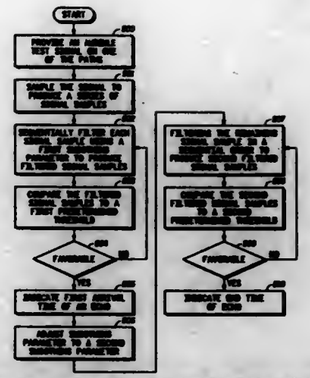
**Int. Cl.[6] H04J** *1/00*

**U.S. Cl. 370—32.1** **13 Claims**

1. In a full duplex system, a method for estimating echo cancellation time, the method comprises the steps of:

a sampling a signal on at least a transmitting path or a receiving path in the full duplex system to produce a series of signal samples;





b filtering, in a sequential order, signal samples of the series of signal samples to produce filtered signal samples, wherein the filtering is done using a first smoothing parameter;

c comparing, in the sequential order, the filtered signal samples with a first predetermined threshold until a first filtered signal sample of the filtered signal samples is a first predetermined relationship to the first predetermined threshold;

d when the first filtered signal sample is the first predetermined relationship to the first predetermined threshold, indicating an arrival time of an echo;

e when the first filtered signal sample is the first predetermined relationship to the first predetermined threshold, adjusting the smoothing filter to have a second smoothing parameter, wherein the second smoothing parameter is greater than the first smoothing parameter;

f filtering, in the sequential order, remaining signal samples of the series of signal samples to produce a series of second filtered signal samples, wherein the filtering is done using the second smoothing parameter;

g comparing each of the second filtered signal samples with a second predetermined threshold until a second filtered signal sample is a second predetermined relationship to the second predetermined threshold, wherein the first predetermined threshold is greater than the second predetermined threshold; and

h when the second filtered signal sample is the second predetermined relationship to the second predetermined threshold, indicating an end time of the echo.

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**5,502,718**

**DEVICE FOR SWITCHING HIGH SPEED PROTOCOL UNITS, AND CORRESPONDING SWITCHING PROCEDURE**

**Thao Lane, Cesson Sevigne, and Didier Mallorcy, Chevaigne, both of, France, assignors to Quest Standard Telematique S.A., Cesson Sevigne, France**

**Filed Sep. 13, 1994, Ser. No. 305,263**

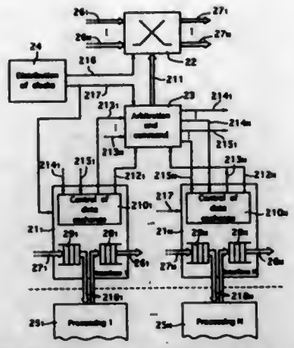
**Claims priority, application France, Sep. 13, 1993, 93 11071**

**Int. Cl.[6] H04Q** *11/04;* **H04J** *3/02*

**U.S. Cl. 370—58.2** **13 Claims**

1. A high speed switching device among a multiplicity of processing modules for enabling exchanges of data organized into protocol units, comprising:

a multiplicity of switching interface modules each including a FIFO input memory connected to an input bus and a FIFO output memory connected to an output bus, each of the memories including at least one space which is able to contain one of the protocol units, and data exchange controlling means, each of the switching interface modules being capable of being connected to one of the processing modules, in such a way that the processing module may inscribe data in the input memory and read data in the said output memory;



a switching module, capable of connecting each of the input buses with each of the output buses;

an arbitration and command module commanding switching effected by the switching module, as a function of requests received from the data exchange controlling means in the switching interface modules, and the arbitration and command module delivering corresponding connection commands to the date exchange controlling means once switching has been effected;

the data exchange controlling means from one of the switching interface modules transmitting a request, which indicates at least one destination switching interface module, to the arbitration and command module once the protocol unit has been inscribed in the input memory; and

the arbitration and command module commanding a corresponding switching once the output memory of the destination switching interface module has at least one free place.

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**5,502,719**

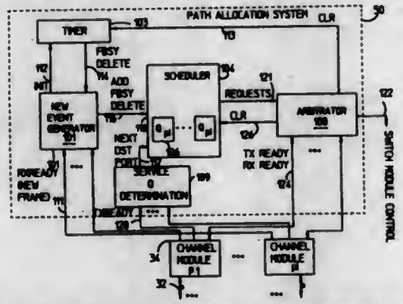
**PATH ALLOCATION SYSTEM AND METHOD HAVING DOUBLE LINK LIST QUEUES IMPLEMENTED WITH A DIGITAL SIGNAL PROCESSOR (DSP) FOR A HIGH PERFORMANCE FIBER OPTIC SWITCH**

**Robert H. Grant; Bent Stoevhase; Robin Purohit, all of Toronto, and David Book, Thornhill, all of, Canada, assignors to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed Oct. 27, 1994, Ser. No. 330,044**

**Int. Cl.[6] H04J *13/00***

**U.S. Cl. 370—58.2** **20 Claims**




1. A path allocation system for allocating paths through a fiber optic switch for interconnecting fiber optic ports, comprising:

a queue corresponding to each of said ports, each said queue for storing addresses received from said ports and identifying data destined for a corresponding port, said addresses being arranged in an order by a link list wherein each of said addresses has an associated pointer indicating a successive address; and

a processor for controlling said queues, said processor for storing said addresses received from said ports in said queues, said processor for generating and storing said pointers in said queues, said processor for retrieving addresses from said queues in said order defined by said link list, and said processor for causing transfer of data corresponding to said addresses to corresponding ports.

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**5,502,720**

**PACKET COLLECTING CIRCUIT IN DATA-FLOW TYPE SYSTEM**

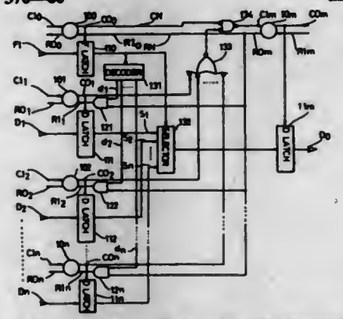
**Tsuyoshi Muramatsu, Kashiwa, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Oct. 2, 1992, Ser. No. 956,094**

**Claims priority, application Japan, Jan. 3, 1991, 3-283757**

**Int. Cl.[6] H04J *3/02***

**U.S. Cl. 370—60** **22 Claims**



1. A packet collecting circuit for collecting packets asynchronously applied from a plurality of flow paths and for outputting the packets to a flow path in a succeeding stage, comprising:

a plurality of packet transferring means, each coupled to a respective one of said plurality of flow paths, for transferring data applied from a respective flow path to the flow path in the succeeding stage;

flag transferring means, coupled to one of said plurality of flow paths, for transferring a flag from a preceding stage which designates one of said plurality of flow paths; and

selecting means, coupled to said flag transferring means and said plurality of packet transferring means, for enabling a selected packet transferring means to transfer a packet through said selecting means to the flow path in the succeeding stage in accordance with the flag transferred by said flag transferring means;

wherein said flag transferring means comprises:

self-synchronous type flag transfer controlling means for generating a first pulse signal indicative of a flag transfer and a first transfer acknowledging signal indicative of permission and inhibition of transfer, in response to receipt of a second transfer acknowledging signal indicative of permission and inhibition of transfer and a second pulse signal indicative of a flag transfer from a preceding stage; and

flag holding means for holding and outputting the flag applied from the preceding stage in response to the first pulse signal from said flag transfer controlling means; and

wherein each of said plurality of packet transferring means includes

self-synchronous type first transfer controlling means for generating a respective third pulse signal indicative of a packet transfer and a respective third transfer acknowledging signal indicative of permission and inhibition of transfer, in response to a respective fourth transfer acknowledging signal indicative of permission and inhibition of transfer and a respective fourth pulse signal indicative of a packet transfer from a respective preceding stage; and



first packet holding means for holding and outputting a packet applied from a respective flow path in response to the respective third pulse signal from said first transfer controlling means; and

wherein the flow path of said succeeding stage includes

self-synchronous type second transfer controlling means for generating a fifth pulse signal for packet transfer and the second transfer acknowledging signal indicative of permission and inhibition of transfer, in response to a fifth transfer acknowledging signal indicative of permission and inhibition of transfer and a respective third pulse signal from said plurality of packet transferring means; and

second packet holding means for holding and outputting a packet applied from one of said plurality of packet transferring means in response to the fifth pulse signal from said second transfer controlling means.

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**5,502,721**

**PACKET DATA TRANSFER IN A CELLULAR RADIO SYSTEM**

**Pekka Pohjakallio, Espoo, Finland, assignor to Nokia Telecommunications Oy, Espoo, Finland**

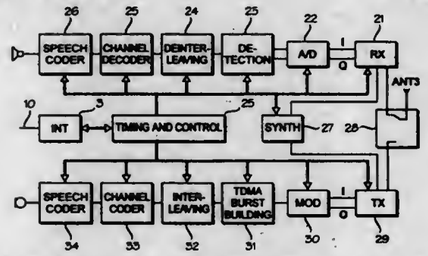
**PCT No. PCT/FI93/00319, § 371 Date Apr. 14, 1994, § 102(e) Date Apr. 14, 1994, PCT Pub. No. WO94/05094, PCT Pub. Date Mar. 3, 1994**

**PCT Filed Aug. 13, 1993, Ser. No. 211,746**

**Claims priority, application Finland, Aug. 14, 1992, 923667**

**Int. Cl.[6] H04J *3/16*; H04B *1/00***

**U.S. Cl. 370—60.1** **13 Claims**




8. Mobile station for a digital cellular radio system comprising base stations for communication with mobile radio stations, each one of the base stations comprising at least one organization channel shared by all of the mobile radio stations for sending pages from the respective base station to the mobile stations, for sending connection requests from the mobile stations to the respective base station, and for sending channel assignments to the mobile stations so as to establish an actual circuit-switched connection on another channel wherein each said mobile station comprises:

means for sending a random-access-type packet data transfer request on a random-access-type organization channel, said data transfer request having a first length;

means for receiving a timing advance corresponding to the distance between the respective mobile station and the respective base station from the respective base station;

means for transferring user data in packet format interleaved with connection request messages to the respective base station on at least one random-access-type organization channel in data messages having a second length higher than said data transfer request and not resulting in a normal circuit-switched connection establishment; and

means for timing the transmission of said data messages with respect to the operation of the respective base station by means of the timing advance information.

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**5,502,722**

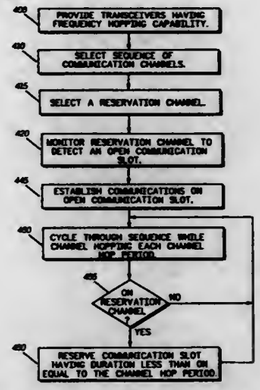
**METHOD AND APPARATUS FOR A RADIO SYSTEM USING VARIABLE TRANSMISSION RESERVATION**

**Tracy L. Fulghum, Sunrise, Fla., assignor to Motorola, Inc., Schaumburg, Ill.**

**Filed Aug. 1, 1994, Ser. No. 283,868**

**Int. Cl.[6] H04B *7/00***

**U.S. Cl. 370—69.1** **16 Claims**




1. A method of operating a radio communication system, the radio communication system having first and second transceivers, the method comprising the steps of:

selecting a sequence of communication channels;

selecting a reservation channel from among the sequence of communication channels;

providing a channel hop period for channel hopping on the sequence of communication channels;

at the first transceiver:

cycling through each channel of the sequence of communication channels within a communication slot, while channel hopping at an interval equal to the channel hop period; and

reserving a communication slot of a slot duration less than the channel hop period for a subsequent cycle through the sequence of communication channels by transmitting a reservation signal for the slot duration when on the reservation channel;

at the second transceiver:

monitoring the reservation channel to detect an open communication slot indicated by an absence of a reservation signal on the reservation channel, including the steps of:

monitoring the reservation channel for a monitor period of at least a hop cycle period to detect an open communication slot having a duration of at least the channel hop period; and

when an open communication slot is not detected within the monitor period, monitoring the reservation channel to detect an open communication slot having a duration less than the channel hop period; and

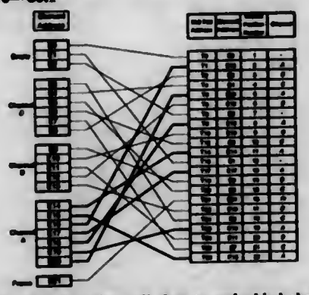
establishing communications in the open communication slot on the sequence of communication channels, when an open communication slot exists.

5,502,723

## METHOD FOR ASSIGNING CELL SLOTS TO ONE OR MORE COMMUNICATION CHANNELS BY MAPPING THE CHANNELS TO CELL SLOTS BASED ON A ONE-TO-ONE TRANSFORMATION

Ray W. Sanders, Los Angeles, Calif., assignor to Circuit Path Network Systems, Los Angeles, Calif.

Continuation of Ser. No. 239,204, May 6, 1994, abandoned.
This application Oct. 4, 1995, Ser. No. 538,839
Int. Cl.[6] H04J 3/24
U.S. Cl. 370—60.1 4 Claims



1. A method of allocating cell slots to embedded channels, said cell slots being apportioned into frames, said method comprising the steps of:

a) logically identifying each of said cell slots of said frames with one of a contiguous range of element addresses;

b) apportioning a number, equal to none, one or more, of said cell slots to each of said embedded channels by assigning to each of said embedded channels a unique and contiguous subset of said element addresses equal to said apportioned number; and

c) transforming each element address of said contiguous range of element addresses on a one-to-one basis into a cell slot address, said cell slot address connoting a relative cell slot position within said frames.

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5,502,724

## COMMUNICATION MEDIUM ACCESS CONTROL PROTOCOL FOR WIRELESS COMMUNICATION

Jeane S. Chen, Ossining, N.Y.; Stanley L. Frickes, San Jose, Calif.; Bryan R. Hartlen, Oshawa, Canada; Tom D. Kurata, Saratoga, Calif.; Jacek P. Maryan, Mississauga; Dan N. McKay, Don Mills, both of, Canada, and Timothy F. Williams, Mahwah, N.J., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 14, 1994, Ser. No. 338,715
Claims priority, application Canada, Nov. 15, 1993, 2103134
Int. Cl.[6] H04L 12/413; H04B 7/204
U.S. Cl. 370—85.3 22 Claims

1. A method for controlling access to a communication medium intended for sharing by at least two stations for peer-to-peer communications therebetween, said method comprising the steps of:

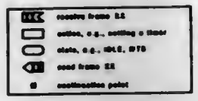
sensing said communication medium at a first station to determine if said communication medium is in use;

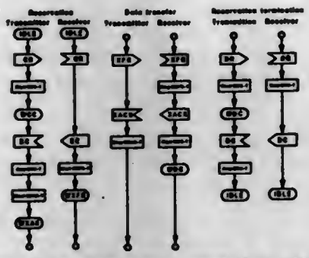
transmitting a connection request message from said first station to a second station if said first station determines that said communication medium is not in use;

transmitting a connection confirm message from said second station to said first station for temporarily reserving said communication medium for use by only said first and second stations;

transmitting data messages from said first station to said second station;

transmitting an acknowledgement message from said second station to said first station in response to said second station receiving a last one of said data messages;





transmitting a disconnect request message from said first station to said second station in response to receiving said acknowledgement message; and

transmitting a disconnect confirm message from said second station to said first station in response to receiving said disconnect request message for terminating said reservation of said communication medium.

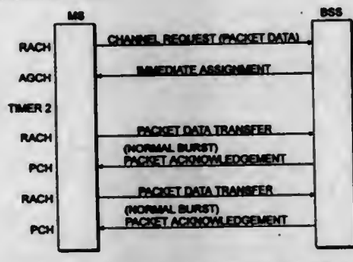
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5,502,725

## METHOD AND SYSTEM FOR SENDING SHORTER SERVICE NUMBER IN PLACE OF ALL BUT FIRST PACKET, IN PLACE OF LONGER DESTINATION ADDRESS, FOR INCREASING USER DATA CONTENT OF PACKET DATA TRANSFER

Pekka Pohjakallio, Espoo, Finland, assignor to Nokia Telecommunications Oy, Espoo, Finland

Filed Apr. 14, 1994, Ser. No. 211,738
Claims priority, application Finland, Aug. 14, 1992, 923668
Int. Cl.[6] H04J 3/26; H04L 12/56
U.S. Cl. 370—94.1 10 Claims




1. A method for transferring packet data from a transmitting party over a transfer network to a receiving party based on a destination address of the receiving party, comprising:

the transmitting party sending the destination address to the transfer network only once for each transfer transaction, at the beginning of each transfer transaction;

the transfer network allocating to the transmitting party a service number at the beginning of each transfer transaction so as to identify the transmitting party and the destination address, the service number being shorter than the destination address;

the transfer network sending the allocated service number to the transmitting party;

the transmitting party utilizing the allocated service number in place of the destination address in data packets subsequently sent during the transfer transaction; and

the transfer network identifying the data packets sent by the transmitting party on the basis of the service number and forwarding the data packets on the basis of the destination address associated with said service number.



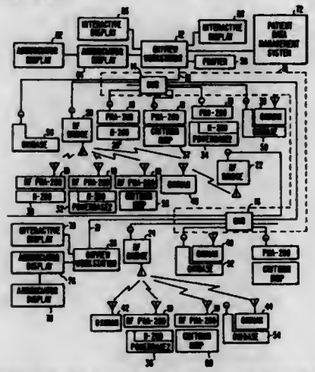
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5,502,726

## SERIAL LAYERED MEDICAL NETWORK

Michael Fischer, San Antonio, Tex., assignor to Nellcor Incorporated, Pleasanton, Calif.

Filed Jan. 31, 1992, Ser. No. 829,146
Int. Cl.[6] H04J 3/24; H04L 29/02;12/56
U.S. Cl. 370—94.1 12 Claims



7. A network having a plurality of nodes coupled together over a communication medium, comprising:

at least first and second nodes coupled to said communication medium;

a plurality of virtual services associated with at least one device coupled to said first node;

means, at said first node, for receiving and temporarily storing a plurality of parcels from said virtual services, each parcel containing a parcel information field and a virtual address header;

means, at said first node, for multiplexing said plurality of parcels into a single packet, said single packet comprising a packet header and a packet information field, with said plurality of parcels being in said packet information field of said single packet;

means, at said first node, for transmitting said single packet over said communication medium during a single session;

means, at said second node, for receiving said single packet from said communications medium;

means, at said second node, for demultiplexing said received packet into a plurality of parcels; and

means, at said second node, for directing each of said parcels to the virtual address specified in said virtual address header information;

wherein said virtual address header comprises:

a source tag byte with a first range of values identifying instruments and a second range of values identifying workstation-based functions;

a destination tag byte with said first range of values identifying instruments and said second range of values identifying said workstation-based functions;

a parcel information length byte indicating the length of said parcel information field;

a parcel flag byte for indicating a kind of action conveyed in said parcel information field, a type of addressing used and a precedence level;

an originator service identifier byte indicating a source virtual service;

a recipient service identifier byte indicating a destination virtual service; and

a pair of action code bytes indicating an action to be taken in processing said parcel information field at an application layer in said destination virtual service.

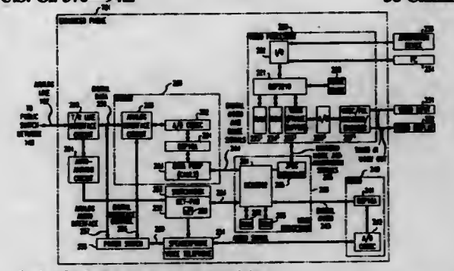
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5,502,727

## IMAGE AND AUDIO COMMUNICATION SYSTEM HAVING GRAPHICAL ANNOTATION CAPABILITY

Anthony J. Catanzaro, Jackson; Steven C. Dzik, Somerset; Charles Hull, Wall; Mahendra Pratap, Cliffwood Beach; Jerome Prestinario, Bridgewater; Minakanagurki V. Ranganath, Lincroft, and John F. Ribera, Howell, all of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Apr. 20, 1993, Ser. No. 49,727
Int. Cl.[6] H04M 11/00
U.S. Cl. 370—94.2 38 Claims



1. A telephone apparatus comprising

means for acquiring an audio signal, image signal and graphical annotation signal,

first means for encoding said acquired audio signal into a group of digital audio signals for periodic transmission at a first periodic rate over an analog line connected to said apparatus,

second means for encoding said acquired image signal, as a group of digital image signals, and for encoding said acquired annotation signal, as a group of digital annotation signals, and for transmitting said digital image signals and digital annotation signals interleaved with said digital audio signals over said analog line such that the digital audio signals are transmitted in synchronization, within a predetermined tolerance, with the digital image signals and digital annotation signals, and

wherein said digital audio signals are transmitted during a first time interval and wherein

said digital image signals and digital annotation signals are transmitted during a second time interval following said first time interval.

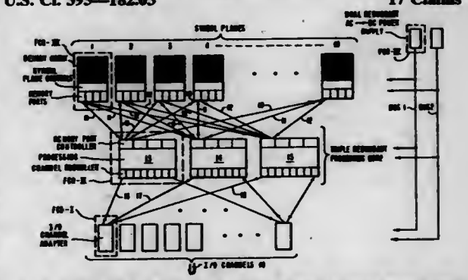
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5,502,728

## LARGE, FAULT-TOLERANT, NON-VOLATILE, MULTIPORTED MEMORY

Thomas B. Smith, III, Wilton, Conn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 14, 1992, Ser. No. 837,528
Int. Cl.[6] G06F 11/00;11/08
U.S. Cl. 395—182.03 17 Claims



1. A large, fault tolerant, highly reliable semiconductor data storage (memory).system in which a memory function is striped across multiple symbol planes, which comprise memory fault containment regions, each memory fault containment region

including each said symbol plane which stores at least one bit of any given memory word accessed in the semiconductor data storage system,

a processing core including at least a memory port controller for accessing the multiple symbol planes in parallel, said memory port controller further including an error correction/detection mechanism for error checking all data fetched from the memory and for generating error correction and detection code bits for all data to be stored in memory, each said symbol plane including means for generating FETCH-RESPONSE sequencing information which signals the arrival of any data fetched from memory at the memory port controller and thence to a requesting processor or link, said sequencing information being generated in each symbol plane,

an ECC/Voter selection mechanism in each said processor core for continuously monitoring a plurality of input links from a plurality of signal planes to identify FETCH-RESPONSE sequencing information on the input to said processing core, said selection mechanism including majority voting means to determine that a majority of the input links being monitored contain such FETCH-RESPONSE sequencing information, means responsive to such determination for enabling the error detection/correction circuit means in said processing core to check all data appearing on the input links from the symbol planes for errors subsequent to the receipt of said FETCH-RESPONSE sequencing information, said error correction circuitry remaining in the disabled state until such sequencing information is detected.

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**5,502,729**

**METHOD OF TESTING FOR STUCK-AT FAULT IN A SYNCHRONOUS CIRCUIT**

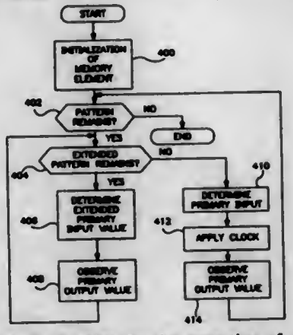
**Tsuneo Nakata, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan**

**Filed Jan. 28, 1993, Ser. No. 10,180**

**Claims priority, application Japan, Jan. 28, 1992, 4-012742**

**Int. Cl.[6] G01R *31/28***

**U.S. Cl. 371—22.3** **13 Claims**




13. A method of testing for the generation of a fault of a synchronous sequential circuit comprising a memory element and a combinational circuit, said method comprising the steps of:

applying a time series test pattern to said synchronous sequential circuit;

applying an extended time series test pattern to said synchronous sequential circuit without applying a system clock to said synchronous sequential circuit;

observing a first primary output value from said combinational circuit;

determining a first primary input value based on the observation of said first primary output value by applying said system clock to said synchronous sequential circuit; and

observing a second primary output value by applying said system clock to said synchronous sequential circuit when the system clock is applied to said combinational circuit.

**5,502,730**

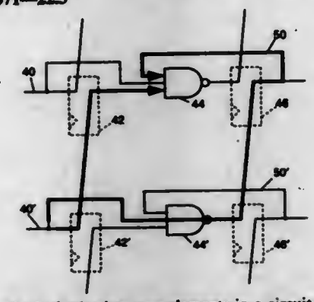
**PARTIAL SCAN TESTABILITY UTILIZING RECONVERGENCE THROUGH SEQUENTIAL ELEMENTS**

**Rabindra K. Roy, Plainsboro, N.J., and Toshinobu Ono, Yokohama, Japan, assignors to NEC USA, Inc., Princeton, N.J., and NEC Corporation, Tokyo, Japan**

**Filed Jan. 10, 1994, Ser. No. 258,585**

**Int. Cl.[6] H04B *17/00***

**U.S. Cl. 371—22.3** **18 Claims**




1. A method of selecting scan elements in a circuit to be tested having sequential elements comprising the steps of:

(a) finding reconvergence structures in the: circuit to be tested;

(b) determining harmful reconvergence structures containing memory elements;

(c) for each respective memory element in a harmful reconvergence structure, providing a count commensurate with the number of harmful reconvergence structures containing each respective memory element;

(d) removing a memory element having the highest count; and

(e) repeating steps (a) to (d) with the memory element in step (d) removed.

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**5,502,731**

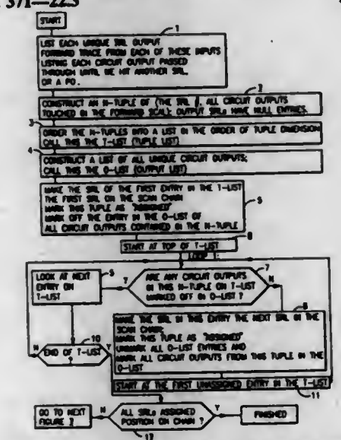
**DELAY TEST COVERAGE WITHOUT ADDITIONAL DUMMY LATCHES IN A SCAN-BASED TEST DESIGN**

**David Meltzer, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Aug. 18, 1994, Ser. No. 292,375**

**Int. Cl.[6] G06F *11/00***

**U.S. Cl. 371—22.3** **3 Claims**




1. A method of configuring a digital integrated logic circuit having



a plurality of interconnected combinational circuits each having at least one input signal and at least one output signal, and having a plurality of daisy chained flip-flops arranged as a scan chain of shift register latches:

wherein the output of each of the shift register latches is connected to either:

at least one of the inputs of one of the plurality of interconnected combinational elements

or to a primary output of said digital integrated circuit; and is connected to

the scan chain input of another shift register latch, by

a method comprising the steps of:

determining the order of connection of said shift register latches in said scan chain to maximize the number of circuits tested for AC delay faults, and in the process assigning a scan chain order by:

a. creating a list of all shift register latches (SRLs) in the scan chain with all the combinational circuit outputs traceable from said primary output:

b. sorting said list in tile order of number of circuit outputs controlled by being touched in a forward trace of said combinational circuits;

c. listing each unique combinational circuit output:

d. sequentially assigning the order of the SRLs in the scan chain so that adjacent SRLs do not control any of the same circuit outputs; or

e. when successful assignment according to step d. is not possible then assigning adjacent SRLs so that the fewest common circuit outputs are controlled by adjacent SRLs or if any remain unassigned, then sequentially inserting an output shift register latch between adjacent SRLs.

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**5,502,732**

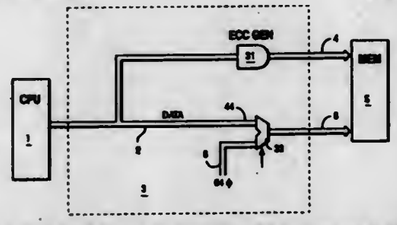
**METHOD FOR TESTING ECC LOGIC**

**Ronald X. Arroyo; William E. Burky; Tricia A. Gruwell, all of Austin, and Joaquin Hinojosa, Round Rock, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Sep. 20, 1993, Ser. No. 123,829**

**Int. Cl.[6] H03M *13/00***

**U.S. Cl. 371—30** **16 Claims**




1. A method of testing an error checking and correction (ECC) system in a data processing system having a memory, said method comprising the steps of:

supplying a first bit pattern to said ECC system, said first bit pattern including a plurality of bits each set to a logical state;

generating first check bits at said ECC system based upon said first bit pattern;

inducing an error by storing said first check bits within said memory in association with a second bit pattern, said second bit pattern including a plurality of bits wherein at least one bit among said plurality of bits within said second bit pattern is set to a different logical state than a corresponding bit within said first bit pattern;

generating second check bits at said ECC system based upon said second bit pattern; and

comparing said first check bits with said second check bits to determine if said ECC system detected said error, wherein an error is detected when logical states of one or more corresponding bit positions within said first check bits and said second check bits differ.

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**5,502,733**

**DATA TRANSFER DEVICE**

**Tetsuji Kishi, and Ichiro Okabayashi, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

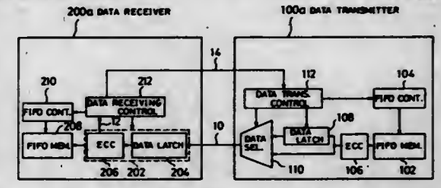
**Continuation of Ser. No. 848,848, Mar. 9, 1992, abandoned.**

**This application Mar. 2, 1994, Ser. No. 205,144**

**Claims priority, application Japan, Mar. 8, 1991, 3-043476**

**Int. Cl.[6] G08C *25/02***

**U.S. Cl. 371—32** **8 Claims**




8. A data transfer device for use in each of a plurality of processor elements which are linked to one another through an interconnection network having a plurality of paths, said data transfer device comprising:

a data receiver including,

address generating means for sequentially generating addresses to be transmitted,

address holding means for holding the address from said address generating means,

address transmitting means for transmitting either the address from said address generating means or the address held by said address holding means as a retransmission address,

data receiving means for receiving data transferred according to the address transmitted from said address transmitting means, checking the presence of errors in the received data, outputting the received data, and generating an error detecting signal when the received data has errors,

data receiving control means for controlling the operations of said address generating means, address holding means and address transmitting means according to the generation of the error detecting signal by said data receiving means for retransmitting addresses in response to said error detecting signal, and

address retransmission terminating means for outputting a retransmission inhibiting signal so as to terminate the address retransmitting operations of said data receiving control means when the error detecting signal related to the same data is generated by said data receiving means a predetermined number of times,

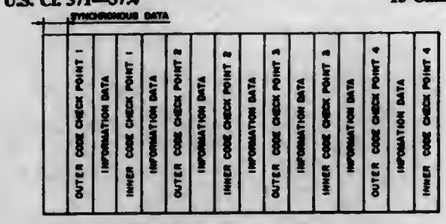
said data receiver for use in receiving data transferred from other processor elements; and

error pass storage means for holding a retransmission address held by said address holding means as an address of a fault path of said interconnection network when the retransmission inhibiting signal is received from said address retransmission terminating means, and for inhibiting said address generating means from generating an address corresponding to the address of the fault path.

## 5,502,734
## CODE TRANSMITTING METHOD

Motokazu Kushida, Musashino, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 29,354, Mar. 10, 1993, which is a continuation of Ser. No. 491,812, Mar. 12, 1990, abandoned. This application Nov. 2, 1994, Ser. No. 333,231
Claims priority, application Japan, Mar. 18, 1989, 1-67364
Int. Cl.[6] H03M 13/00
U.S. Cl. 371—37.4 13 Claims




1. A code transmitting method comprising:

(a) a first step of sampling information codes on a code matrix having the information codes two-dimensionally arranged, horizontally and vertically, to form a first error detection or correction check codes and adding the first error detection or correction check codes along the horizontal direction of the code matrix so that the plurality of first error detection or correction check codes are dispersed therein without being adjacent to each other in the horizontal direction of the code matrix;

(b) a second step of sampling the information codes of the code matrix provided by said first step to form second error detection or correction check codes, and adding the second error detection or correction check codes to the code matrix provided by said first step so that the first and second error detection or correction check codes are dispersed therein, so that the plurality of second error detection or correction check codes are dispersed therein without being adjacent to each other in the horizontal direction of the code matrix, said information codes being double error detection or correction encoded by the first and second error detection or correction check codes; and

(c) a third step of sequentially transmitting, for each horizontal line, the codes of the code matrix provided by said second step.

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## 5,502,735
## MAXIMUM LIKELIHOOD SEQUENCE DETECTOR

Andrew Cooper, Wokingham, England, assignor to Nokia Mobile Phones (U.K.) Limited, Camberley, United Kingdom

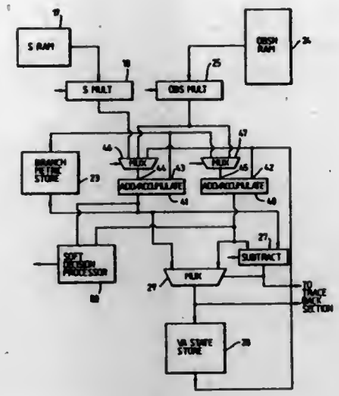
Continuation of Ser. No. 731,854, Jul. 16, 1991, Pat. No. 5,375,129. This application Sep. 13, 1994, Ser. No. 305,254
Int. Cl.[6] G06F 11/10
U.S. Cl. 371—43 20 Claims

1. An arrangement for receiving a convolutionally encoded signal transmitted over a dispersive communications channel, comprising:

equalising means having an input for receiving the convolutionally encoded signal for equalising the convolutionally encoded signal in accordance with terms provided from at least one first data source;

decoding means for subsequently decoding the equalised convolutionally encoded signal in accordance with terms provided from at least one second data source; and

a single maximum likelihood (ML) detector for estimating received data symbols in the received convolutionally encoded signal, said signle ML detector having an input that is time multiplexed between said at least one first data source of said equalising means and said at least one second stat source of said decoding means.

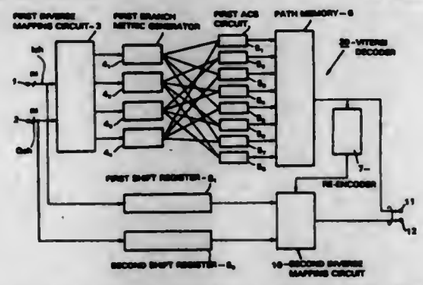



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## 5,502,736
## VITERBI DECODER FOR DECODING ERROR-CORRECTING ENCODED INFORMATION SYMBOL STRING

Toshiya Todoroki, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed May 20, 1993, Ser. No. 65,145
Claims priority, application Japan, May 26, 1992, 4-133758
Int. Cl.[6] G06F 11/10; H03M 13/12
U.S. Cl. 371—43 18 Claims




1. A Viterbi decoder for decoding an error-correcting encoded information symbol string from first multi-value soft decision data and second multi-value soft decision data each of which is mapped onto one of a plurality of transmission symbol points, the error-correcting encoded information symbol string being generated by error-correcting encoding an information symbol string by means of a feedback-type convolutional encoder, the error-correcting encoded information symbol string comprising noncoding bits which are not under influence of the convolutional encoder, information bits which are under influence of the convolutional encoder and a redundant bit which is generated by the convolutional encoder, the Viterbi decoder comprising:

decoding means for decoding the information bits and the redundant bit of the error-correcting encoded information symbol string from the first multi-value soft decision data and the second multi-value soft decision data;

first data holding means for holding the first multi-value soft decision data for a set period of time;

second data holding means for holding the second multi-value soft decision data for the set period of time; and

inverse mapping means for decoding the noncoding bits of the error-correcting information symbol string by finding a representative symbol point of a subset of the transmission symbol points to maximize a Euclidean distance of each of a plurality of subsets of the transmission symbol points, indicated by the decoded information bits and the decoded redundant bit generated by re-encoding information bits among the plurality of subsets using the first multi-value soft decision data received from the first data holding means and the second multi-value soft decision data received from the second data holding means, and by inverse mapping a found representative symbol point onto data corresponding to the found representative symbol point.

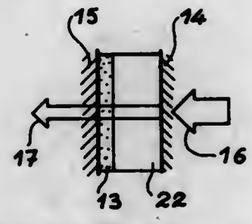


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## 5,502,737
## LASER CAVITY PASSIVELY SWITCHED BY A SATURABLE ABSORBER AND LASER INCORPORATING SAID CAVITY

Isabelle Chartier, Grenoble; Bernard Ferrand, Voreppe; Denis Pelenc, Meylan, and Christophe Wyon, Grenoble, all of, France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Nov. 14, 1994, Ser. No. 340,296
Claims priority, application France, Nov. 15, 1993, 93 13563
Int. Cl.[6] H01S 3/113
U.S. Cl. 372—11 18 Claims




1. A laser cavity, which comprises:

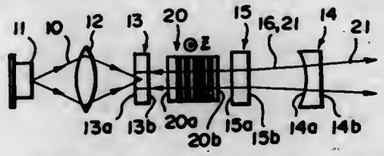
a solid, active laser medium, a saturable absorber, an entrance mirror and an exit mirror, wherein the saturable absorber comprises a thin saturable absorber material film deposited directly on the solid, active medium.

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## 5,502,738
## POLARIZATION CONTROL ELEMENT AND SOLID-STATE LASER SYSTEM

Hiroaki Hyuga, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 28, 1993, Ser. No. 127,374
Claims priority, application Japan, Jan. 16, 1992, 4-278709
Int. Cl.[6] H01S 3/10
U.S. Cl. 372—21 19 Claims




1. A polarization control element comprising a crystal possessing a birefringence with incidence and exit end faces thereof angularly cut to produce an angle with respect to a principle axis of the crystal;

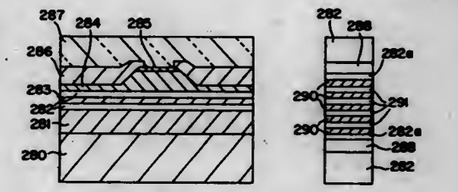
wherein the thicknesses and reflectivities of said end faces of said polarization control element are adjusted so that said polarization element acts as a Fabry-Perot etalon thereby producing a linearly polarized beam in a single longitudinal mode.

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## 5,502,739
## SEMICONDUCTOR LASER DEVICE

Isao Kidoguchi, Mino; Kiyoshi Ohsaka, Moriguchi; Hideto Adachi, Mino; Satoshi Kamiyama, Sanda; Masaya Mannoh, Hirakata, and Takeshi Uemoyama, Kyoto, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 223,215, Apr. 5, 1994. This application Mar. 1, 1995, Ser. No. 396,506
Claims priority, application Japan, Apr. 5, 1993, 5-77845; Apr. 5, 1993, 5-77854; Jul. 28, 1993, 5-186022; Aug. 6, 1993, 5-195859
Int. Cl.[6] H01S 3/19
U.S. Cl. 372—45 5 Claims




1. A semiconductor laser device comprising:

a quantum well layer including a well layer and a barrier layer for light emission; and

an optical guide layer to confine light generated in the quantum well layer within the quantum well layer, the optical guide layer including an electron distribution control layer which has an energy band gap of a magnitude different from an energy band gap of the optical guide layer and thereby controls the distribution of electrons in the optical guide layer and the quantum well layer,

wherein the electron distribution control layer includes a high barrier layer which has energy band gap greater than an energy band gap of the optical guide layer, and

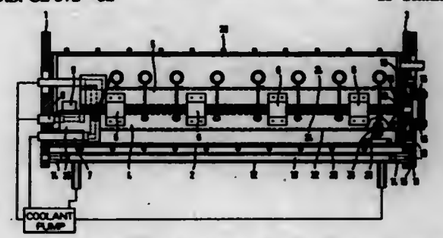
a thickness of the high barrier layer is greater than the de Broglie wavelength of an electron.

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## 5,502,740
## STRIPLINE LASER RESONATOR

Wolfgang Welsch, Baldham; Hans Krueger, Munich; Peter Mannsach, Unterhaching; Klemens Haebner, Ottobrunn, and Karlheinz Arndt, Munich, all of, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 31, 1993, Ser. No. 115,408
Claims priority, application European Pat. Off., Aug. 31, 1992, 92114861
Int. Cl.[6] H01S 3/097
U.S. Cl. 372—82 13 Claims




1. A radio frequency, diffusion-cooled stripline laser, comprising:

first and second metal electrodes, said first metal electrode being a base electrode;

means for mounting said first and second metal electrodes to define a discharge gap therebetween;

means for cooling said first and second metal electrodes;

an unstable resonator including first and second resonator mirrors at respective opposite ends of said discharge gap, said first resonator mirror being affixed to said first metal electrode and said second resonator mirror being free of said first metal electrode;

a housing including first and second face plates and an outside wall connecting said first and second face plates to form a vacuum tight enclosure enclosing said first and second metal electrodes and said unstable resonator, said first face plate being connected to said first electrode;

a plurality of spacer rods defining a coolant space within said spacer rods and said first and second resonator mirrors being firmly indirectly connected to said spacer rods to define an invariable spacing of said first and second resonator mirrors; and

coolant traversing said plurality of spacer rods within said coolant space.

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**5,502,741**

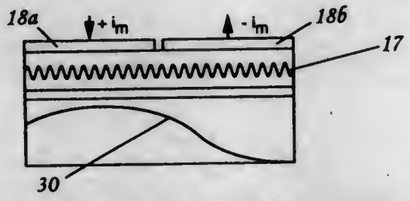
**DIRECT AMPLITUDE MODULATION OF LASERS**

**John E. Carroll, and Mark C. Nowell, both of Cambridge, United Kingdom, assignors to Northern Telecom Limited, Montreal, Canada**

**Filed Mar. 22, 1994, Ser. No. 216,301**

**Int. Cl.[6] H01S** *3/096;3/10;3/18*

**U.S. Cl. 372—96** **6 Claims**




1. A method of amplitude modulating a distributed feedback (DFB) laser that has a DFB optical cavity defining an optical axis of laser emission therein, which optical cavity has a plane of substantial symmetry normal to said axis, in which method a bias current, which is distributed substantially symmetrically with respect to said plane of substantial symmetry is applied to the DFB optical cavity, upon which bias current is superimposed a modulation current distributed substantially anti-symmetrically with respect to said plane.

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**5,502,742**

**HEAT TREATING FURNACE WITH REMOVABLE FLOOR, ADJUSTABLE HEATING ELEMENT SUPPORT, AND THREADED CERAMIC GAS INJECTION NOZZLE**

**Charles Kellogg, Warrington, and Charles Schmidt, Meadowbrook, both of Pa., assignors to Abar Ipsen Industries, Inc., Bensalem, Pa.**

**Filed Feb. 26, 1993, Ser. No. 23,354**

**Int. Cl.[6] F27B** *5/02;5/16*

**U.S. Cl. 373—128** **31 Claims**

1. A hot zone enclosure for a heat treating furnace comprising:

a front wall;

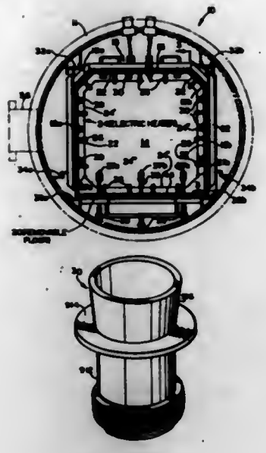
a back wall;

an upper assembly including a pair of side walls and a top wall that are assembled for handling as a unit;

a floor that is formed separately from said upper assembly and for independent movement relative thereto; and

an exhaust duct that is affixed to the exterior of the hot zone enclosure so as to be removable with the hot zone enclosure from the heat treating furnace;

said hot zone enclosure having a substantially rectangular cross section.



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**5,502,743**

**HIGH TEMPERATURE FURNACE**

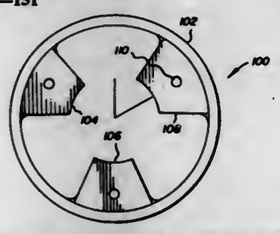
**David S. Conochie, Hawthern East; Shane M. Neecowen, Fairfield; Rory A. D. Poulter, Altona, and Gregory McLeod, Westlake, all of, Australia, assignors to Comalco Aluminium Limited, Victoria, and Commonwealth Scientific and Industrial Research Organization, Campbell, both of, Australia**

**Continuation-in-part of Ser. No. 793,375, Jan. 2, 1992, abandoned. This application Oct. 18, 1993, Ser. No. 136,834**

**Claims priority, application Australia, Mar. 5, 1990, PJ8931**

**Int. Cl.[6] H05B** *6/22*

**U.S. Cl. 373—151** **38 Claims**




1. A method for the preparation of a product by heating a charge of reactants to a high temperature wherein said reactants undergo a reaction to form said product, at least one of said reactants and said product having a low thermal conductivity, said reaction having a high heat of reaction, which method comprises

—providing a furnace configuration comprising an outer shell which enables control of gaseous atmosphere inside the furnace during operation, an induction means adjacent said outer shell, a thermal insulating layer insulating said induction means, a charge receiving space within said insulating layer for receiving said charge, said charge being placed in the charge receiving space such that the charge occupies a volume defined between an inner limit of the charge and an outer limit of the charge, said inner limit of the charge being defined as a part of the charge which is farthest from said insulating layer, induction susceptor means positioned within said charge receiving space, said induction susceptor means having a coupling portion that provides a continuous conductive path for induced current within said susceptor means,

— energizing said induction means to thereby heat said susceptor means and to cause the charge located adjacent said susceptor means to increase in temperature and to undergo said reaction of said charge to produce said product and to form a progressing zone front for substantially completely-reacted charge, wherein said progressing zone front emanates away from said susceptor means as time elapses,

—wherein said susceptor means is positioned within said charge in said charge receiving space such that a cross-sectional center of area of said susceptor means in a radial direction is within about 30–90% of a radial distance from the inner limit of the charge to the outer limit of the charge and the charge of reactants located between the inner limit of the charge and an inner part of said susceptor means has substantially reacted when the progressing zone front reaches said outer limit of the charge.



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**5,502,744**

**DATA CODING SYSTEM**

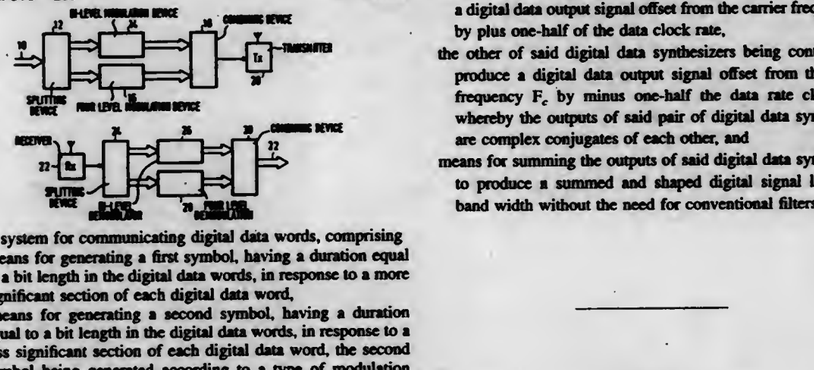
**Christopher B. Marshall, Stein, Germany, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Aug. 4, 1993, Ser. No. 102,012**

**Claims priority, application United Kingdom, Aug. 21, 1992, 9217819**

**Int. Cl.[6] H04L** *27/00;5/12*

**U.S. Cl. 375—259** **27 Claims**



1. A system for communicating digital data words, comprising

a) means for generating a first symbol, having a duration equal to a bit length in the digital data words, in response to a more significant section of each digital data word,

b) means for generating a second symbol, having a duration equal to a bit length in the digital data words, in response to a less significant section of each digital data word, the second symbol being generated according to a type of modulation having a greater number of states than the modulation type resulting in the first symbol,

c) means for combining the first and second symbols to provide an encoded symbol,

d) means for transmitting the encoded symbol,

e) means for receiving the transmitted encoded signal,

f) means for separating a received signal into first and second symbols,

g) means for deriving a more significant section of received data from the first symbol,

h) means for deriving a less significant section of received data from the second symbol, and

i means for combining the more significant section and the less significant section of the received data to provide an output digital data word.

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**5,502,745**

**BPSK MODULATOR FOR A DIGITAL SIGNAL TRANSMITTER**

**Bruce H. Williams, Sandy; Rov E. Greeff, and Glenn A. Arbanas, both of Salt Lake City, all of Utah, assignors to Unisys Corp., Blue Bell, Pa.**

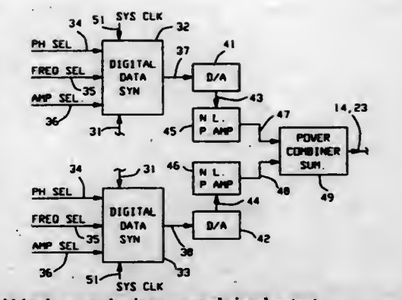
**Filed Dec. 21, 1993, Ser. No. 171,058**

**Int. Cl.[6] H04L** *25/03*

**U.S. Cl. 375—282** **9 Claims**

1. An improved digital data modulator for a digital signal transmitter, comprising:

latch means having an output coupled to a digital data stream and an input coupled to a digital data rate clock,




said latch-means having a control signal output,

a pair of digital data synthesizers, each said digital data synthesizer having a controlled input coupled to the output of said latch means,

said latch means for selectably controlling the frequency offset of each digital data synthesizers,

one of said digital data synthesizers being controlled to produce a digital data output signal offset from the carrier frequency $F_c$ by plus one-half of the data clock rate,

the other of said digital data synthesizers being controlled to produce a digital data output signal offset from the carrier frequency $F_c$ by minus one-half the data rate clock rate, whereby the outputs of said pair of digital data synthesizers are complex conjugates of each other, and

means for summing the outputs of said digital data synthesizers to produce a summed and shaped digital signal limited in band width without the need for conventional filters.

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**5,502,746**

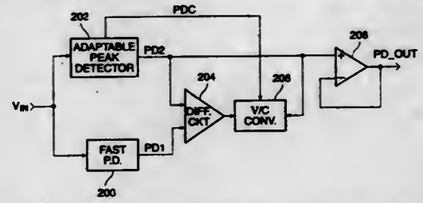
**DUAL STAGE DIFFERENTIAL ADAPTIVE PEAK DETECTOR FOR DATA COMMUNICATIONS RECEIVERS**

**Ismail H. Ozguc, Sunnyvale, Calif., assignor to Exar Corporation, San Jose, Calif.**

**Filed May 16, 1994, Ser. No. 243,624**

**Int. Cl.[6] H04L** *25/06;25/10*

**U.S. Cl. 375—317** **21 Claims**




1. A peak detect circuit for use in communication receivers comprising:

a first peak detector having an input for receipt of an input signal, the first peak detector detecting a peak value of the input signal at a first rate of detection;

a second adaptable peak detector having an input for receipt of the input signal, the second adaptable peak detector detecting a peak of the input signal at a variable rate of detection; and

control circuit coupled between the first peak detector and the second adaptable peak detector for adjusting the variable rate of detection for the second adaptable peak detector in response to an output of the first peak detector and an output of the second adaptable peak detector.

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5,502,747

## METHOD AND APPARATUS FOR FILTERING AN ELECTRONIC ENVIRONMENT WITH IMPROVED ACCURACY AND EFFICIENCY AND SHORT FLOW-THROUGH DELAY

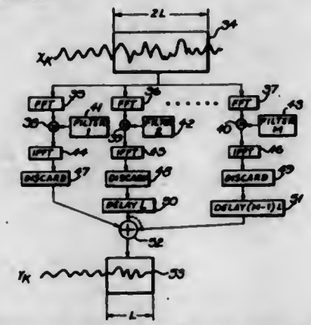
David S. McGrath, New South Wales, Australia, assignor to Lake DSP Pty Limited, Maroubra, Australia

Filed Jul. 7, 1993, Ser. No. 87,125

Claims priority, application Australia, Jul. 7, 1992, PL3386; Jul. 7, 1992, PL3387; Apr. 20, 1993, PL8357

Int. Cl.[6] H04B 1/10

U.S. Cl. 375—350 26 Claims




2. A method for building a digital filter with a long impulse response and low latency built by operating a number of smaller component filters in parallel and combining their outputs by addition, with each component filter operating with a different delay such that the net operation of the ensemble of said component filters is the same as a single filter with a longer impulse response, and the latency of the ensemble is equal to the shortest latency of said component filters wherein one or more of said component filters is implemented as a time-domain finite impulse response filter, built with multiply and add operations, and the remainder of said component filters are implemented using a fast convolution method, such that time-domain filter provides the lowest latency portion of the ensemble impulse response, and fast-convolution filter provide the longer filter components, wherein said fast-convolution filters are built using a Modified Discrete Fourier Transform method comprising the steps of:

receiving an input vector x(k) of length N, where each element of x(k) is real;

means for creating a complex vector x'(l) of length N/2 according to the following:

$$x'(l) = \left[ x(l) - jx\left(l + \frac{N}{2}\right) \right] e^{\frac{-\pi j l}{N}} \quad \text{for } 0 \le l < \frac{N}{2} \text{ ; and}$$

computing an N/2 point Discrete Fourier Transform (DFT) of x'(l) to give the N/2 complex result vector Z(p):

$$Z(p) = DFT_{\left(\frac{N}{2}\right)}[x'(l)],$$

and a complementary Inverse Modified Discrete Fourier Transform method.

5,502,748

## DETECTION OF SYNCHRONISATION DATA

James H. Wilkinson, Tadley, England, assignor to Sony Corporation, Tokyo, Japan, and Sony United Kingdom Limited, Middlesex, England

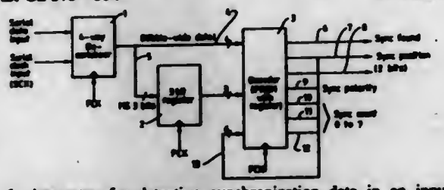
Continuation of Ser. No. 35,708, Mar. 23, 1993, abandoned.

This application Jan. 19, 1995, Ser. No. 375,238

Claims priority, application United Kingdom, Jun. 4, 1992, 9211857

Int. Cl.[6] H04L 7/00; H04J 3/06

U.S. Cl. 375—354 17 Claims




1. Apparatus for detecting synchronization data in an input serial-bit digital signal formed of a series of word blocks each including a predetermined serial group of m bits forming said synchronization data, the apparatus comprising:

a deserialiser for deserialising the input signal to form parallel-bit p-bit words where p<m;

a delay for receiving only p-1 bits of each p-bit word from said deserialiser and for delaying only the received p-1 bits by one p-bit word period; and

logic means coupled to said deserialiser and said delay for receiving one of said p-bit words from said deserialiser and for receiving delayed p-1 bits which are adjacent to the received p-bit word in a preceding or succeeding word from said delay so as to form successive groups of 2p-1 bits, the logic means being arranged:

to detect an initial portion of said synchronization data by comparing bit sequences in one of said groups of 2p-1 bits with the bit sequence at the beginning of said predetermined group of m bits;

on detection of said initial portion of the synchronization data, to compare bits of one or more succeeding groups of 2p-1 bits with succeeding bits of said predetermined m bits in dependence upon the position of said initial portion in the corresponding 2p-1 bits; and

on detection of all m bits of the synchronization data, to generate a control signal for controlling alignment of the bits of the words of the input signal in parallel form in dependence upon the position of said initial portion of the synchronization data in the corresponding 2p-1 bits.

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5,502,749

## RADIO RECEIVER APPARATUS AND PHASE CORRECTING METHOD THEREOF

Shinji Ozaki, Saitama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 18, 1994, Ser. No. 214,447

Claims priority, application Japan, Mar. 30, 1993, 5-096826

Int. Cl.[6] H04L 7/00; H04J 3/06

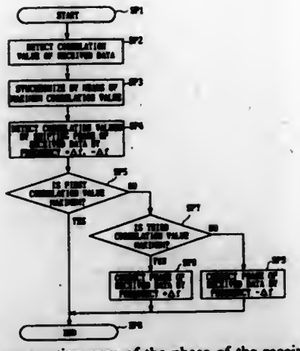
U.S. Cl. 375—368 16 Claims

4. A method for phase correction of a radio receiver apparatus in which a transmission signal is received on the basis of a reference pattern inserted in the transmission signal by a transmitter at a predetermined timing, comprising the steps of:

calculating a first correlation value between said reference pattern and received data, and simultaneously calculating a second correlation value and a third correlation value in the case of a lagging phase and a leading phase by changing the frequency of said received data;

judging whether said first correlation value obtained by said calculating is the largest value among the first, second, and third correlation values obtained by said calculating; and






effecting a correction ppm of the phase of the received data on the basis of a result of said judging, where ppm has a magnitude such that $0 \le ppm \le hppm/2$, hppm being the maximum value of said lagging or leading phase.

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5,502,750

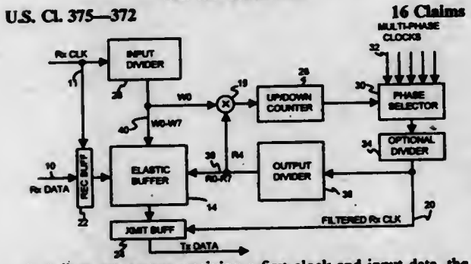
## DIGITAL JITTER ATTENUATOR USING SELECTION OF MULTI-PHASE CLOCKS AND AUTO-CENTERING ELASTIC BUFFER FOR A TOKEN RING NETWORK

Ramon S. Co, Trabuco Canyon, and Lance K. Lee, Milpitas, both of Calif., assignors to Pericom Semiconductor Corp., San Jose, Calif.

Filed Jun. 15, 1994, Ser. No. 259,910

Int. Cl.[6] H04L 7/00

U.S. Cl. 375—372 16 Claims




1. A jitter attenuator, receiving a first clock and input data, the jitter attenuator buffering and re-transmitting the input data with a second clock, the second clock having less jitter than the first clock, the jitter attenuator comprising:

an input divider, receiving the first clock, for generating a plurality of write clocks, the write clocks having a lower frequency than the first clock, the first clock having a frequency that is a multiple of the frequency of the write clocks;

an elastic buffer, receiving the input data at the rate of the first clock and providing the input data for re-transmission at the rate of the second clock;

an output divider, receiving the second clock, for generating a plurality of read clocks, the read clocks having a lower frequency than the second clock, the second clock having a frequency that is a multiple of the frequency of the read clocks;

a plurality of multi-phase clocks for generating the second clock;

a feedback loop, receiving the plurality of multi-phase clocks, for adjusting the phase of the second clock by selecting a clock in the plurality of multi-phase clocks for generating the second clock in response to the difference in phase between at least one of the plurality of write clocks and at least one of the plurality of read clocks;

whereby jitter in the first clock is attenuated in the second clock.

5,502,751

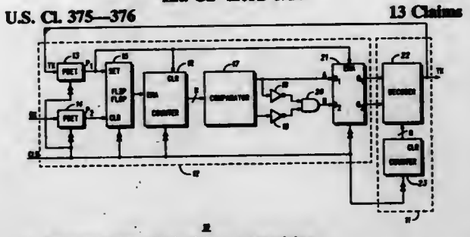
## DIGITAL PHASE LOCKED LOOP

Maverick M. Killian, Ft. Worth, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 30, 1994, Ser. No. 269,245

Int. Cl.[6] H03D 3/24

U.S. Cl. 375—376 13 Claims




1. A digital phase locked loop comprising:

first register means for storing a first input, said first register means having a first input, a second input coupled to receive a reference signal, an output, and a clock input coupled to receive a clock signal;

first counting means for counting, said first counting means having an enable input coupled to said output of said first register means, a clear input coupled to said first input of said first register means, a clock input coupled to receive said clock signal, and an output;

comparing means for comparing the output of said first counting means to a stored signal, said comparing means having an input coupled to said output of said first counting means and an output; and

oscillating means for providing an oscillating output, said oscillating means having an input coupled to said output of said comparing means, a clock input coupled to receive said clock signal, and an output coupled to said first input of said first register means.

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5,502,752

## CLOCK RATE MATCHING IN INDEPENDENT NETWORKS

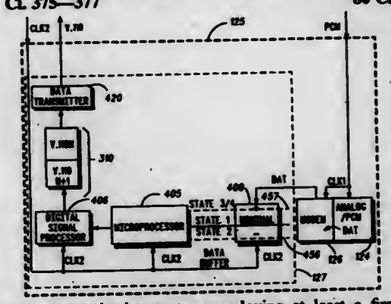
Nimrod Averbuch, Buffalo Grove, and Steven V. Schatz, McHenry, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 660,454, Feb. 22, 1991, abandoned.

This application Apr. 28, 1993, Ser. No. 49,248

Int. Cl.[6] H04L 7/00; H04J 3/22

U.S. Cl. 375—377 80 Claims




24. A communication system employing at least a first and second data interface for matching clock rates between independent networks, the first data interface employing a transmitter having as input at least network information bits and at least data bits conveyed at a first clock rate, the second data interface coupled to a destination network having a third clock rate, the communication system comprising:

means, at the first data interface, for providing a second clock having a second clock rate;

means, at the first data interface, for accepting at least a predetermined number of network information bits and at least a predetermined number of data bits conveyed at a first clock rate;

means, at the first data interface, for determining the difference between said first clock rate and said second clock rate;

means, at the first data interface and responsive to said means for determining, for setting at least one network information bit to a predetermined value to represent a selected clock compensation state;

means, at the first data interface, for transmitting said at least one network information bit representing a selected clock compensation state to the second data interface;

means, at the second data interface, for receiving said at least one network information bit representing a selected clock compensation state;

means, at the second data interface and responsive to the receipt of said at least one network information bit, for determining said selected clock compensation state; and

means, at the second data interface and responsive to said means for determining, for altering said received data bits by an integer multiple of data bits to adjust said second clock rate to match said third clock rate.

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**5,502,753**

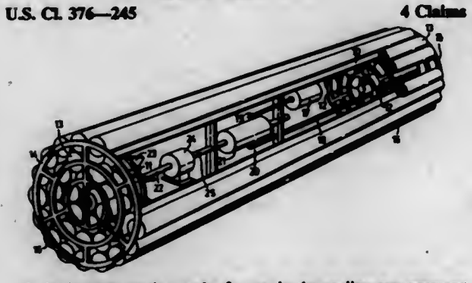
**INSTRUMENTATION PROBE**

**Michael T. Flaman, 20 Treeline Court, Etobicoke, Ontario, Canada**

**Division of Ser. No. 948,443, Sep. 22, 1992, Pat. No. 5,365,554. This application Sep. 29, 1994, Ser. No. 314,121**

**Int. Cl.[6] G21C *17/00***

**U.S. Cl. 376—245** **4 Claims**



1. An instrumentation probe for use in the on-line measurement and recording one or more physical parameters within a fluid duct without connection to external instrumentation, comprising an elongate support frame for being mounted within the fluid duct, and measuring and recording means mounted on the frame, said measuring and recording means comprising:

at least one sensor responsive to a physical parameter to be measured and recorded,

scribe means coupled to said at least one sensor for recording a measurement of said physical parameter, a volume driven recording chart, and

means for driving the recording chart comprising a longitudinally extending rotary shaft carrying an impeller responsive to fluid flow through the duct for rotating the shaft at a measurable speed, said shaft being coupled to the recording chart through a speed reducing mechanism for driving the chart at said measurable speed,

wherein said scribe and said recording chart are mounted in said frame such that said scribe records variations in said physical parameter over time on said recording chart.

**5,502,754**

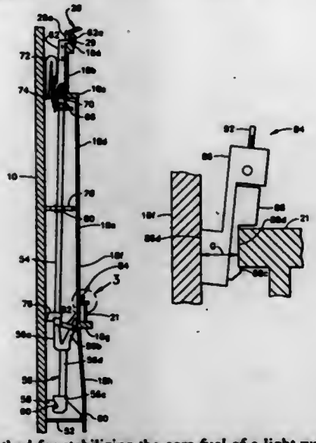
**LATERAL RESTRAINT FOR CORE PLATE OF BOILING WATER REACTOR**

**John G. Erbes, Mt. View, Calif., assignor to General Electric Company, San Jose, Calif.**

**Filed Feb. 2, 1995, Ser. No. 382,748**

**Int. Cl.[6] G21C *19/00***

**U.S. Cl. 376—302** **4 Claims**



1. A method for stabilizing the core fuel of a light water reactor of the type having a multiplicity of fuel assemblies supported by a core plate attached along its periphery to a core shroud support ring of a shroud concentrically arranged inside a reactor pressure vessel, comprising the steps of installing first, second and third spacers between an outer circumferential surface of the core plate and an inner circumferential surface of the shroud, said first, second and third spacers being wedged with preload between said circumferential surfaces at first, second and third azimuthal positions respectively.

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**5,502,755**

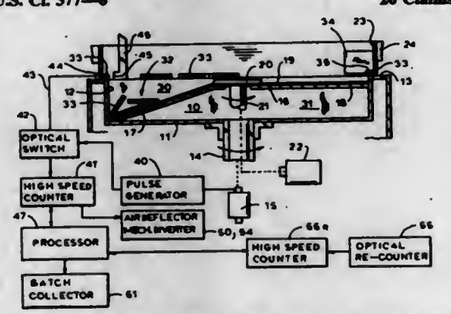
**HIGH SPEED, HIGH ACCURACY PARTS COUNTING SYSTEM**

**Thomas O. Nagel, Blairstown, N.J., and Daniel J. Ellis, Wilkes-Barre, Pa., assignors to Trion Industries, Inc., Wilkes-Barre, Pa.**

**Filed Apr. 10, 1995, Ser. No. 419,171**

**Int. Cl.[6] G06M *7/00***

**U.S. Cl. 377—6** **20 Claims**




1. In a system for high speed, high accuracy counting of like workpieces, and of the type comprising conveying means for conveying the workpieces in predetermined alignment and in a single file manner, a sensor for sensing the passage of a workpiece past a predetermined sensing location, and an exit path for workpieces being conveyed beyond the sensor, the improvement characterized by

(a) motion signal generating means associated with said conveying means for generating motion signals in response to movement of said conveying means and representing the extent of such movement,

(b) said signal generating means generating a plurality of detectable motion signals in response to movement of said conveying means through a distance corresponding to the length of a single workpiece, and

(c) a controllable counter for receiving and accumulating a count of motion signals from said signal generating means,

(d) at least one of said counter and signal generating means being associated with said sensor, whereby motion signals are counted only while a workpiece is sensed by said sensor.



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**5,502,756**

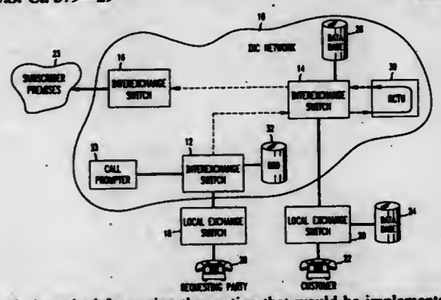
**REMOTE TEST CALL UNIT AND SERVICE**

**Michael A. Crocker, Pickerington, Ohio; V. R. Gopala Rao, Holmdel; Meah A. Shahabuddin, Lincroft, both of N.J., and Barbara H. Stark, Alpharetta, Ga., assignors to AT&T Corp., Murray Hill, N.J.**

**Filed Oct. 28, 1992, Ser. No. 967,650**

**Int. Cl.[6] H04M *1/24;3/42***

**U.S. Cl. 379—29** **12 Claims**




1. A method for testing the routing that would be implemented for a telephone call that originates at a first telephone station having a first telephone number and is placed to a second telephone station having a second telephone number, the method comprising the steps of:

receiving at a remote call test unit (RCTU) a first telephone call from a third telephone station having a third telephone number;

placing a test call from the remote call test unit to the second telephone station in response to receiving the first telephone call, said test call emulating the originating of a call from the first telephone station to the second telephone station, wherein said emulating comprises supplying with the test call at least a portion of the first telephone number; and

interconnecting the first call with the test call.

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**5,502,757**

**LOCATION DEPENDENT SERVICE FOR A WIRELESS TELEPHONE**

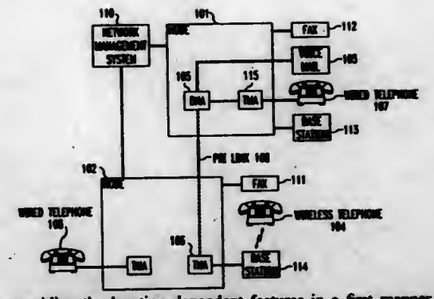
**Bruce M. Bales, Louisville, and John C. Moran, Denver, both of Colo., assignors to AT&T Corp., Murray Hill, N.J.**

**Filed Dec. 22, 1993, Ser. No. 173,813**

**Int. Cl.[6] H04Q *7/22***

**U.S. Cl. 379—58** **27 Claims**

1. A method for providing location dependent features and location independent features for a telecommunication unit across a telecommunication switching system having a plurality of switching nodes where the telecommunication unit is connectable to any of the switching nodes, comprising the steps of:




providing the location dependent features in a first manner at first switching node in response to a first set of control information upon the telecommunication unit being connected to the first switching node;

providing the location dependent features in a second manner at second switching node in response to a second set of control information upon the telecommunication unit being connected to the second switching node; and

providing location independent features in a fixed manner regardless of which switching node the telecommunication unit is connected.

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**5,502,758**

**MOBILE TERMINAL POSITION INFORMATION DETECTION METHOD AND SYSTEM USING THE METHOD**

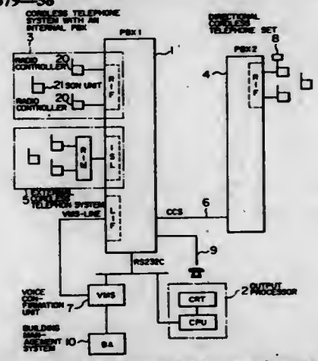
**Takuo Tsuzaki, Hiratsuka; Yasuhide Tabuchi, Fukuoka, and Yasumasa Ishiwata, Yokosuka, all of, Japan, assignors to Hitachi, Ltd., Tokyo, and Hitachi Software Engineering Co., Ltd., Yokohama, both of, Japan**

**Continuation of Ser. No. 89,506, Jul. 21, 1993, Pat. No. 5,434,904. This application Apr. 28, 1995, Ser. No. 430,256**

**Claims priority, application Japan, Jul. 21, 1992, 4-194196**

**Int. Cl.[6] H04Q *7/20*; G01S *3/02***

**U.S. Cl. 379—58** **6 Claims**




1. A communication system which comprises one or more mobile terminals which communicate by radio and output positions signals indicative of positions of said mobile terminals, at least one mobile terminal control unit for detecting said position signals, an exchange connected to said at least one mobile terminal control unit for storing data including position information related to said position signals detected by said at least one mobile terminal control unit and connecting said mobile terminals with said at least one mobile terminal control unit, and an output processing apparatus for analyzing position information contained in said data stored in said exchange, said output processing apparatus comprising;

means for receiving said data from said exchange;

means for analyzing loci of said mobile terminals based on said data;

means for monitoring a reception of said data; and

means for controlling said exchange to delete said data concerning a mobile terminal from said exchange, when said data concerning said mobile terminal is not received for a predetermined time.

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**5,502,759**

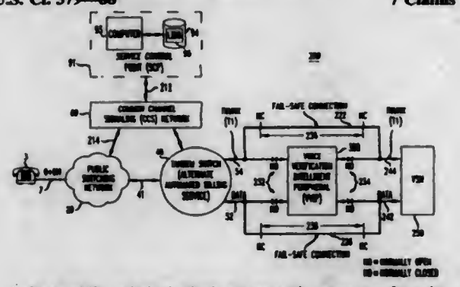
## APPARATUS AND ACCOMPANYING METHODS FOR PREVENTING TOLL FRAUD THROUGH USE OF CENTRALIZED CALLER VOICE VERIFICATION

**Jane Cheng, Spring Valley Rockland; Edgar Martinez, East White Plains, both of N.Y., and Jayant Naik, Stamford Fairfield, Conn., assignors to Nynex Science & Technology, Inc., White Plains, N.Y.**

**Filed May 13, 1993, Ser. No. 61,115**

**Int. Cl.[6] H04M *1/56***

**U.S. Cl. 379—88** **7 Claims**



1. In a public switched telephone network, apparatus for selectively extending a call through the network from a caller placing the call via an access facility connected to the network, to a destination number, said apparatus comprising:

a switching network connected to the caller and the destination number by the public switched telephone network, responsive to an instruction, for selectively routing a call therethrough so as to connect a caller to a destination number;

an indicia validator, connected to said switching network, for determining, in response to a first message containing a query to a line information database (LIDB), whether a pre-defined indicia for said caller signifies that said call should be routed through said switching network means and, in response thereto, generating a second message responsive to said query, said indicia validator having a common channel signaling network and a service control point, said common channel signaling network being connected to said service control point and to both said switching network and a voice processor, said service control point including:

a database;

means for storing said database; and

a database processor, connected to said storing means and to said common channel signaling network, for interrogating said database in response to said first message and, in response to a result of said interrogation, generating said second message, the contents of said second message being determined by an indication stored within said database and associated with an indicia contained within said first message; and

said voice processor, connected to said switching network and to said indicia validator, for obtaining said indicia from said caller and, in response thereto, producing said first message containing the indicia and, in response to said second message, generating said instruction to said switching network;

said voice processor comprising:

a tandem switch connected to said switching network and to said common channel signaling network;

a voice service node for verbally communicating with a caller and obtaining voice responses therefrom so as to extract said indicia from said caller;

a voice verifier, connected in series, both in a voice path and a data path, between said tandem switch and said voice service node, for verifying the voice of said caller before the call is completed; and

wherein in said voice processor:

said voice service node generates, in response to said indicia, said first message and passes said first message through said voice verifier to said tandem switch for subsequent application to said common channel signaling network;

said tandem switch receives said second message from said common channel signaling network;

said voice verifier intercepts all call processing messages flowing between said tandem switch and said voice service node and holds said second message from the tandem switch until said voice verifier has completed a successful voice verification of the caller; and

said voice verifier passes said second message onward to said voice service node to generate said instruction, said instruction subsequently being passed through said voice verifier to said tandem switch and onward thereby to said switching network.

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**5,502,760**

## TELEPHONE-LINE DEDICATING APPARATUS

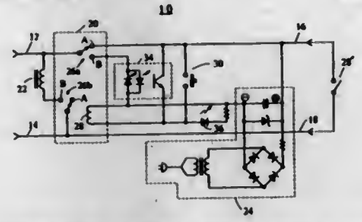
**Wayne Gilbert, Honolulu, Hi., and Nobuaki Yokoyama, Tokyo, Japan, assignors to General Research of Electronics, Inc., Tokyo, Japan**

**Filed Nov. 10, 1994, Ser. No. 337,121**

**Claims priority, application Japan, Nov. 10, 1993, 5-304728**

**Int. Cl.[6] H04M *11/00***

**U.S. Cl. 379—90** **5 Claims**



1. A telephone-line dedicating apparatus which is connected between an external telephone-line and a specified telephone-line utilization apparatus such as a telephone-set, facsimile machine or the like and which upon energization causes one or more other telephone-line utilization apparatus to be unable to function connected to said external telephonel-ine, comprising:

impedance insertion means for inserting impedance means across said external telephone-line to decrease the telephone-line DC voltage level, in response to the operative condition of said specified telephone-line utilization apparatus; and

operating-current path setting means including a DC power supply and establishing an operating-current path from said DC power supply to said specified telephone-line utilization apparatus through said impedance means when said impedance means has been inserted across said external telephone-line.



**5,502,761**

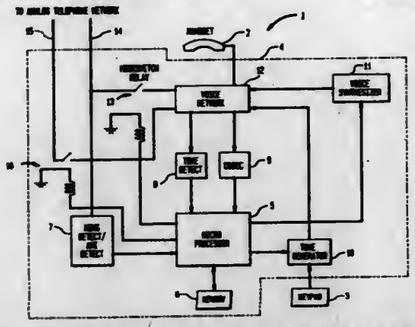
## APPARATUS AND METHOD FOR RELAYING CALLING INFORMATION TO A PAGER OR ALTERNATE TELEPHONE

**Michael G. Duncan; Pamela P. Saegert, both of Austin, and Gordon D. Ford, Round Rock, all of Tex., assignors to Rolm Company, Santa Clara, Calif.**

**Filed Mar. 24, 1994, Ser. No. 217,468**

**Int. Cl.[6] H04M *1/56;11/00***

**U.S. Cl. 379—142** **16 Claims**



1. An apparatus for use in a base telephone used in a public or private telephone network, the public or private network operative to transfer calling information identifying a calling party, said calling information including the telephone number of said calling party when said calling party calls a called party at said base telephone, said apparatus adapted to connect to a first telephone line and a second telephone line comprising:

a receiver adapted to receive said calling information at said telephone over the first telephone line, said calling information being received in a format selected from a group including digital and analog formats;

a memory for storing said calling information;

means for generating telephony voice prompts;

means for transmitting said voice prompts to the calling party when said telephone is not answered after a predetermined number of rings, wherein said voice prompts inform the calling party that the calling party, by pressing specific button on the calling party's telephone, will cause said calling information to be automatically relayed to the called party at a remote receiver;

means responsive to said pressing of said specific button for disconnecting said calling party from said receiver and relaying said calling information stored in said memory to said remote receiver over the second telephone line while concurrently freeing said first telephone line to receive independent calling information from a second calling party for storage by said memory, wherein said independent calling information from said second calling party can be simultaneously received over the first telephone line as said calling information from a first calling party is relayed to said remote receiver over the second telephone line.

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**5,502,762**

## SYSTEM AND METHOD FOR SIMULTANEOUSLY CONTROLLING RINGING AT LOCAL AND REMOTE TELEPHONES

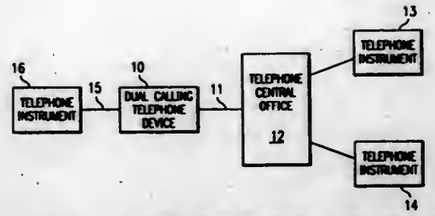
**Brian J. Andrew, and Jo E. Andrew, both of 4401 Southgate, Plano, Collin County, Tex. 75024**

**Filed Jun. 10, 1994, Ser. No. 258,343**

**Int. Cl.[6] H04M *3/56;3/42***

**U.S. Cl. 379—202** **23 Claims**

1. A telephone device operable to receive an incoming call from a calling telephone instrument on a subscriber telephone line coupled to said telephone device and to connect said incoming call to a first telephone instrument coupled to said telephone device and



to connect said incoming call to a selected second telephone instrument, said telephone device comprising:

means for initiating and maintaining a three-way conference connection on said subscriber telephone line between said calling telephone instrument, said telephone device, and said second telephone instrument, said three-way conference connection initiated by said incoming call directed to said subscriber telephone line;

monitoring and connecting means for monitoring said first telephone instrument during said three-way conference connection, applying a locally generated ringing cadence, and connecting said first telephone instrument to said three-way conference connection when said monitoring detects that said first telephone instrument is answered;

transceiver means coupled to said first telephone instrument and said subscriber telephone line operable to monitor energy signals from said telephone subscriber line and said first telephone instrument, said energy signals including DTMF inputs, dial tones, busy signals, ringing cadences and telephone line energy, and to generate DTMF tones in response to said detection of said monitored energy signals;

a digital processor coupled to said transceiver means, said digital processor operable to receive input signals from said first telephone instrument and said transceiver means and to generate outputs to said first telephone instrument and said transceiver means under control instructions stored in an electronic memory, said stored control instructions operable to control said three-way conference connection means, said monitoring and connecting means, said transceiver means and said first telephone instrument; and

circuitry coupled to and controlled by said digital processor for generating ringing cadences and busy signals for communication to said first telephone instrument.

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**5,502,763**

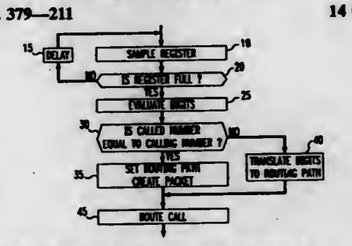
## TELECOMMUNICATIONS SERVICE ACCESS ARRANGEMENT

**Henry T. Brendzel, Millburn, N.J., assignor to AT&T Corp., Murray Hill, N.J.**

**Filed Oct. 28, 1994, Ser. No. 330,467**

**Int. Cl.[6] H04M *3/42***

**U.S. Cl. 379—211** **14 Claims**



1. A call handling method comprising the steps of:

detecting when a called number equals a calling number; and
in response to the detection, providing a service to the calling party that is other than connecting the calling party to its own number.

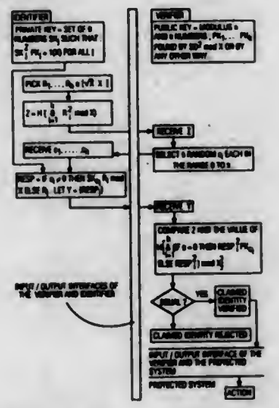
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5,502,764

## METHOD, IDENTIFICATION DEVICE AND VERIFICATION DEVICE FOR IDENTIFICAITON AND/OR PERFORMING DIGITAL SIGNATURE

David Naccache, Maisons-Alfort, France, assignor to Thomson Consumer Electronics S.A., Courbevoie, France

PCT No. PCT/EP92/00045, § 371 Date Jan. 24, 1994, § 102(e) Date Jan. 24, 1994, PCT Pub. No. WO92/14318, PCT Pub. Date Aug. 20, 1992
PCT Filed Jan. 11, 1992, Ser. No. 94,058
Claims priority, application European Pat. Off., Jan. 11, 1991, 91400301
Int. Cl.[6] H04K 1/00
U.S. Cl. 380—23 13 Claims



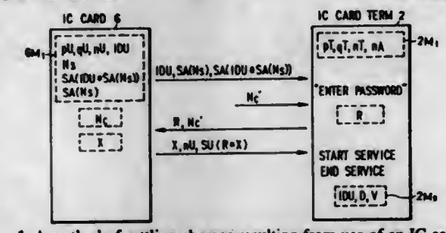

1. Method for identification and/or performing digital signature, wherein data are computed by an authority and recorded on an identification device U, comprising the first steps of:
choosing and publishing a modulus X, a power d and a function H, wherein X is a product of at least two big prime numbers, d is a number greater than 1, and H is a one-way pseudo-random function, and comprising the following second steps:
computing a set $\{PK_1, \ldots, PK_k\}$ of k small prime numbers $PK_i$ such that each $PK_i$ has a root modulo X;
concatenating said small prime numbers $PK_i$ with pattern data PN, especially a part of X, and with specific information data ID which contain information about said identification device U and producing seed data SD such that $SD^d \bmod X=(PK_1 \& \ldots \& PK_k \& PN \& ID)$, wherein in case of $(PK_1 \& \ldots \& PK_k \& PN \& ID)$ having no d-th root either the order of the $PK_i$ can be permuted until a root is found or a small arbitrary string J can be appended to $(PK_1 \& \ldots \& PK_k \& PN \& ID)$ in such a way that $(J \& PK_1 \& \ldots \& PK_k \& PN \& ID)$ has a d-th root;
recording on said identification device U said seed data SD and/or said modulus X and/or said function H and/or a set $\{SK_1, \ldots, SK_k\}$ of numbers $SK_i$ which are defined by $SK_i{}^d PK_i \bmod X=1$.

5,502,765

## METHOD AND APPARATUS FOR SETTLEMENT OF ACCOUNTS BY IC CARDS

Ginya Ishiguro; Toshiyasu Muta; Kazutaka Sakita, all of Yokosuka; Shoji Miyaguchi, Yokohama; Tatsuaki Okamoto, Yokosuka, and Atsushi Fujioka, Yokohama, all of, Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Division of Ser. No. 119,850, Sep. 13, 1993, Pat. No. 5,396,558. This application Oct. 31, 1994, Ser. No. 331,745
Claims priority, application Japan, Sep. 18, 1992, 4-249293; Sep. 18, 1992, 4-249294; Nov. 18, 1992, 4-308688; Nov. 26, 1992, 4-317254; Nov. 26, 1992, 4-317255
Int. Cl.[6] H04L 9/30
U.S. Cl. 380—24 6 Claims




1. A method of settling charges resulting from use of an IC card that has been issued from a management center through an IC card dispenser and that has been used to obtain a service at an IC card terminal, said IC card terminal having terminal information memory means into which are written from said management center a master public key nA for verifying a master digital signature SA created by said management center by use of master keys pA and qA, terminal secret keys pT and qT for enabling said IC card terminal to create a digital signature, a terminal public key nT for verifying said digital signature created by said IC card terminal, a terminal identification number IDT and a second master digital signature SA2 created by use of said master keys pA and qA for information including said terminal identification number IDT and said terminal public key nT, said IC card having card information memory means into which are written from said management center said master public key nA, card secret keys pU and qU for enabling said IC card to create a digital signature, a card public key nU for verifying said digital signature created by said IC card, a card identification number IDU, a first master digital signature SA1 created by use of said master keys pA and qA for information including said card identification number IDU and said card public key nU, amount value information V and a third master digital signature SA3 for information including said amount value information V and said card identification number IDU, said method comprising:
a step wherein said IC card transmits said card public key nU, said card identification number IDU and said first master digital signature SA1 to said IC card terminal;
a step wherein said IC card terminal verifies said first master digital signature SA1 received from said IC card and, if it is valid, transmits an authentication notice to said IC card;
a step wherein said IC card creates a card digital signature SU for information including said amount value information V by use of said card secret keys pU and qU, and transmits said amount value information V and said card digital signature SU to said IC card terminal upon receiving said authentication notice from said IC card terminal;
a step wherein said IC card terminal verifies said card digital signature SU received from said IC card by use of said card public key nU and, if said amount value information V received from said IC card is correct and said amount value V is larger than a charge needed to carry out a requested service, initiates said service;
a step wherein, after completion of said service, said IC card terminal creates an updated remaining amount value V' in which said charge for said service is subtracted from said amount value V and also creates a terminal digital signature ST for information including said updated remaining amount value V' and said card identification number IDU by use of said terminal secret keys pT and qT;
a step wherein said IC card terminal transmits said terminal digital signature ST, said updated remaining amount value V', said second master digital signature SA2, said terminal public key nT and said terminal identification number IDT to said IC card; and
a step wherein said IC card verifies said second master digital signature SA2 and said terminal digital signature ST received from said IC card terminal by use of said master public key nA and said terminal public key nT, respectively, and, if they are valid, stores said updated remaining amount value V' in said card information memory means.



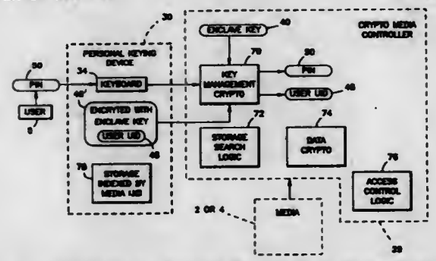
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5,502,766

## DATA ENCLAVE AND TRUSTED PATH SYSTEM

William E. Boebert, Minneapolis; Thomas R. Markham, Anoka, and Robert A. Olmsted, Minnetonka, all of Minn., assignors to Secure Computing Corporation, Roseville, Minn.

Continuation of Ser. No. 870,556, Apr. 17, 1992, Pat. No. 5,276,735. This application Oct. 26, 1993, Ser. No. 142,904
The portion of the term of this patent subsequent to Apr. 17, 2012, has been disclaimed.
Int. Cl.[6] H04K 1/00
U.S. Cl. 380—25 11 Claims




1. A data enclave for securing data carried on physical units of fixed and removable media in a network including a server and one or more workstations, one or more of the workstations including the physical units of fixed media, comprising:
protected storage in the server and in each of the workstations;
a crypto media controller in each Workstation that can be used to read the fixed media and the removable media;
a personal keying device assigned to each user in the enclave;
an enclave key, a copy held in the protected storage in the server and in each of the workstations and used to protect other keys stored or transmitted on the network;
a personal identification number (PIN) for each user in the enclave;
an access vector associated with each media key to form media key/access vector pairs, the pairs stored in the personal keying devices, and used to represent the possible conditions of access to the data encrypted on the media for the user assigned to the personal keying device holding the media key/access vector pair or pairs;
the media key/access vector pairs stored in the personal keying devices enciphered with a combined key including the user's PIN and the enclave key;
device attributes assigned to each Workstation, and used to represent the security attributes of the workstations; and
each crypto media controller including logic for (i) reading a unit of media using the media key received from the personal keying device of the user seeking access to the data, (ii) decrypting a media key/access vector pair received from a personal keying device using the enclave key stored in the controller and the user PIN entered by a user in the personal keying device used by the user seeking access to the data, (iii) decrypting the data on the media using the media key, and (iv) restricting access to the decrypted data based on the access vector and the device attributes for the Workstation from which access is attempted.

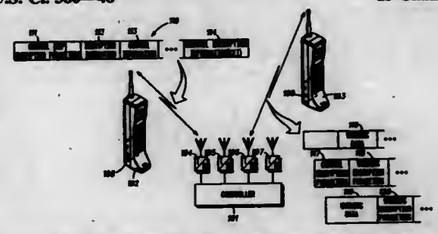
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5,502,767

## METHOD FOR MAINTAINING SECURE INFORMATION SYNCHRONIZATION ON A CONTROL CHANNEL

Michael Sasuta, 1661 Blackburn Dr., Mundelein, Ill. 60060, and Alan L. Wilson, 3720 Alder Dr., Hoffman Estates, Ill. 60195-1505

Filed May 27, 1994, Ser. No. 250,073
Int. Cl.[6] H04L 9/12
U.S. Cl. 380—48 13 Claims



7. A method for a secure communication unit to maintain secure information synchronization on a control channel, the method comprising the steps of:
a) periodically receiving control encryption parameters on the control channel, wherein the control encryption parameters are encrypted using a first encryption algorithm;
b) transmitting a request on the control channel, wherein the request is encrypted using the first encryption algorithm;
c) receiving on the control channel an assignment to a working channel, wherein the assignment is encrypted using the first encryption algorithm;
d) affiliating with the working channel;
e) while affiliated with the working channel, receiving working encryption parameters, wherein the working encryption parameters are encrypted using a second encryption algorithm; and
f) while affiliated with the working channel, receiving the control encryption parameters, wherein the control encryption parameters are encrypted using the second encryption algorithm.

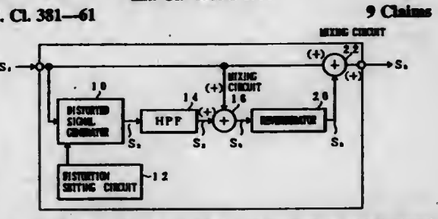
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5,502,768

## REVERBERATOR

Kazuaki Shioda, Shizuoka, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Japan

Continuation of Ser. No. 125,591, Sep. 23, 1993, abandoned. This application Mar. 17, 1995, Ser. No. 406,778
Claims priority, application Japan, Sep. 28, 1992, 4-281100
Int. Cl.[6] H03G 3/00
U.S. Cl. 381—61 9 Claims




1. A reverberator for generating a reverberation-added signal from an audio input tone signal having a frequency characteristic, said reverberator avoiding flutter echo when said input to signal has sinusoidal wave form properties and comprising:

an input receiving said input tone signal;

distorted signal generating means coupled to said input, said distorted signal generating means distorting said input tone signal to introduce, into said input tone signal, a plurality of signal components exhibiting different frequencies including frequencies higher the frequency characteristic of the input tone signal, said distorted signal generating means outputting a distorted signal, said distorted signal generating means distorting said input tone signal by clipping peak magnitude portions of sinusoidal wave form properties of the input tone signal while retaining the remaining portions of the sinusoidal wave form properties;

predetermined high frequency band signal passing means for passing a signal in a predetermined frequency band of the frequencies of said distorted signal which frequencies are higher than the frequency characteristic of the input tone signal;

tone signal mixing means for mixing said input tone signal with said high frequency band signal; and

reverberation adding means for adding reverberation to said mixed tone signal and for outputting a reverberation-added signal in which flutter echo is avoided.

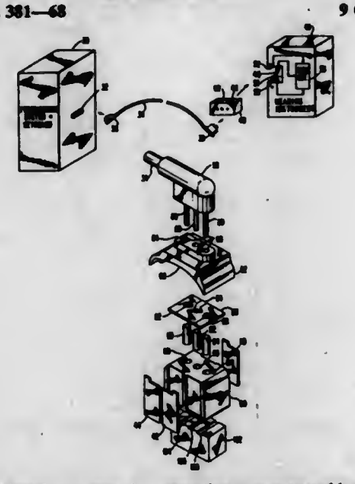
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**5,502,769**

## INTERFACE MODULE FOR PROGRAMMABLE HEARING INSTRUMENT

**Mark Gilbertson, Eden Prairie, Minn., assignor to Starkey Laboratories, Inc., Eden Prairie, Minn.**

**Filed Apr. 28, 1994, Ser. No. 233,922**
**Int. Cl.[6] H04R 25/00**
**U.S. Cl. 381—68** **9 Claims**



1. An interface system for connecting a programmable hearing instrument having a programmable circuit and a battery receptacle with at least three electrical contacts therein to a source of programming signals, the system comprising:

an interface module having a rectangular, block-shaped insertion element for insertion into the battery receptacle of the hearing instrument, said insertion element having a plurality of flat contact plates formed on flat sides of said insertion element for respectively contacting the electrical contacts in the battery receptacle to which the programmable circuit is connected;

an electronic circuit module containing electronic components and having a plurality of external electrical contacts and being formed to reside within a hollow portion of said insertion element of said interface module and wherein said interface module includes means for making electrical contact between said plurality of external electrical contacts and said plurality of flat contact plates, respectively; and

conductor means for electrically connecting the source of programming signals to said plurality of flat contact plates of said interface module to which said electronic circuit module is connected, whereby the programming signals from the source of programming signals are connected to said electronic circuit module and to the programmable circuit,

wherein said means for making electrical contact comprises a plurality of metal tubes contacting respectively at first ends thereof said plurality of external electrical contacts and extending through a plurality of apertures formed in a flat surface of said insertion element and electrically connected at second ends thereof to said plurality of flat contact plates.

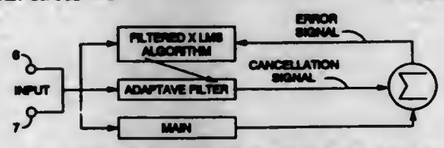
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**5,502,770**

## INDIRECTLY SENSED SIGNAL PROCESSING IN ACTIVE PERIODIC ACOUSTIC NOISE CANCELLATION

**Sen M. Kuo, Houston, Tex.; Minjiang Ji, DeKalb, Ill.; M. Kathryn Christensen, Lenexa, Kans., and Robert A. Herold, Peoria Heights, Ill., assignors to Caterpillar Inc., Peoria, Ill.**

**Filed Nov. 29, 1993, Ser. No. 158,328**
**Int. Cl.[6] G10K 11/16**
**U.S. Cl. 381—71** **17 Claims**




1. The method of providing an indirectly sensed noise input signal for introduction at an active noise cancellation system input, comprising in combination the steps of:

generating a signal representative of said noise, said signal having sequential pulses within repeating periods,

dividing, an increment of said sequential pulses, out of the sequential pulses in each individual period,

forming each said increment of said sequential pulses into a single, controlled width, converted pulse signal, per period,

reducing the amplitude of each said converted pulse signal,

A filtering from each said converted pulse signal all frequencies above a predetermined value, and, blocking any direct current from said input of said active noise cancellation system.

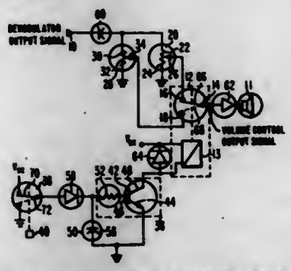
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**5,502,771**

## CLOCK RADIO VOLUME CONTROL APPRARATUS

**Joseph Rhodes, and Michael Delumere, both of Trenton, N.J., assignors to Delfitz, Inc., Trenton, N.J.**

**Filed Mar. 10, 1995, Ser. No. 402,259**
**Int. Cl.[6] H03G 3/00**
**U.S. Cl. 381—104** **19 Claims**



1. A clock radio volume control apparatus having a selectively operable supplemental volume control means for use in sleep mode, said apparatus comprising:



A. a speaker means;

B. a primary switch means including:

(1) a relay coil means;

(2) a common terminal means electrically connected to said speaker means to supply a signal thereto for audible transmission therefrom;

(3) a first terminal means being normally electrically closed with respect to said common terminal means responsive to de-energizing of said relay coil means, said common terminal means and said first terminal means being responsive to become electrically open responsive to energizing of said relay coil means;

(4) a second terminal means being normally electrically open with respect to said common terminal responsive to de-energizing of said relay coil means, said common terminal means and said second terminal means being responsive to become electrically closed responsive to energizing of said relay coil means;

C. a primary volume control means including a primary potentiometer means adapted to selectively receive a radio input signal to control volume thereof, said primary volume control means being electrically connected with respect to said first terminal means of said primary switch means;

D. a sleep volume control means including a sleep potentiometer means adapted to receive a radio input signal to control volume thereof, said sleep volume control means being electrically connected with respect to said second terminal means of said primary switch means, said sleep volume control means being positioned electrically between the radio input signal and said primary switch means;

E. a coil control means operative to control energizing and de-energizing of said relay coil means, said coil control means including:

(1) a sleep switch means movable to a first position to transmit a sleep control signal therethrough and movable to an second position to cease generating of any electrical signal therethrough;

(2) a transistor means including an emitter means, a base means and a collector means, said base means being electrically connected to said sleep switch means to receive a sleep control signal therefrom and said transistor means being responsive to receiving a sleep control signal to become turned on and being otherwise turned off, said collector means of said transistor means being electrically connected to said relay coil means for energizing thereof responsive to said transistor means being turned on and for de energizing of said relay coil responsive to said transistor means being turned off;

(3) a load means positioned electrically between said base means of said transistor means and said sleep switch means to control current supplied to said base means of said transistor means;

(4) a relay coil de-energizing delay means comprising:

(a) a delay capacitor means electrically connected to said emitter of said transistor means, said delay capacitor means being responsive to energizing of said transistor means to become charged, said delay capacitor means being responsive to moving of said sleep switch means to the second position to discharge through said load means and said transistor means to maintain said transistor means turned on and said relay coil energized for a predefined period of time after movement of said sleep switch means to the second position; and

(b) a delay diode means positioned electrically in series between said sleep switch means and said load means and between said sleep switch means and said delay capacitor means to force discharging of said delay capacitor means through said base of said transistor means to keep said transistor means turned on and said relay coil means energized for a defined period of time after movement of said sleep switch means to the second position.

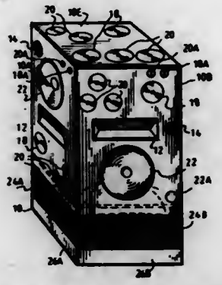
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**5,502,772**

## SPEAKER HAVING IMPROVED SOUND SQUARE, SOUND BANK, SOUND ANGLE, SOUND WEDGE AND SOUND RADIATORS

**Charles J. Felder, 2440 E. Tudor Rd. #997, Anchorage, Ak. 99507**

**Filed Jul. 18, 1994, Ser. No. 276,478**
**Int. Cl.[6] H04R 25/00**
**U.S. Cl. 381—188** **6 Claims**



1. A multi-dimensional speaker system comprising:

a) a housing;

b) a plurality of speakers being at least one mid-range horn producing sound in a middle range of octaves, at least one mid-range producing sound in a middle range of octaves, at least one tweeter producing sound in an upper range of octaves, at least one sub-woofer producing sound in a lower range of octaves, at least one woofer producing sound in a lowest range of octaves;

c) at least one multi-dimensional speaker system speaker baffle allowing sound produced within said speaker cabinet to resonate outwardly; and

d) a multi-dimensional speaker system spacer providing a space whereby said multi-dimensional speaker system speaker baffle is suspended away from a floor, thus, allowing increased and purer sound reproduction, said multi-dimensional speaker system having a multi-dimensional speaker system first side having an air baffle positioned at an upper right hand corner, a midrange positioned at a middle left hand side, a midrange control knob, a plurality of tweeters positioned at an upper left hand corner, a tweeter control knob, a sub-woofer positioned at a lower left side, a multi-dimensional speaker system first side speaker baffle positioned at the bottom, and multi-dimensional speaker system first side spacer positioned beneath said multi-dimensional speaker system baffle functioning to suspend said multi-dimensional speaker system baffle away from a floor, thus, allowing emanation of loader and purer sound production, a multi-dimensional speaker system second side having an air baffle positioned at a lower right hand corner, a midrange positioned at a middle right hand side, a midrange control knob, a plurality of tweeters positioned at a lower left hand corner, a tweeter control knob, a sub-woofer positioned at a lower left side, a multi-dimensional speaker system second side speaker baffle positioned at a bottom, and a multi-dimensional speaker system second side spacer positioned beneath said multi-dimensional speaker system baffle functioning to suspend said multi-dimensional speaker system baffle away from a floor, thus, allowing emanation of loader and purer sound production, a multi-dimensional speaker system third side having an air baffle positioned at an upper right hand corner, a midrange positioned at a middle left hand side, a midrange control knob, a plurality of tweeters positioned at an upper left hand corner, a tweeter control knob, a sub-woofer positioned at a lower left side, a multi-dimensional speaker system third side speaker baffle positioned at a bottom, and multi-dimensional speaker system third side spacer positioned beneath sd multi-dimensional speaker system baffle functioning to suspend said multi-dimensional speaker system baffle away from a floor, thus, allowing emanation of loader and purer sound produc-

tion, a multi-dimensional speaker system fourth side having an air baffle positioned at a lower right hand corner, a mid-range positioned at middle right hand side, a mid-range control knob, a plurality of tweeters positioned at a lower left hand corner, a tweeter control knob, a sub-woofer positioned at a lower left side, a multi-dimensional speaker system fourth side speaker baffle positioned at a bottom, and multi-dimensional speaker system fourth side spacer.

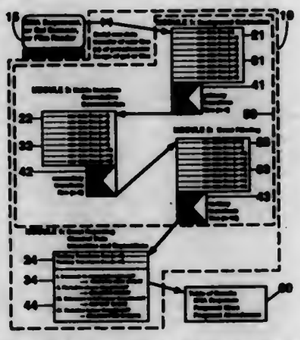
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**5,502,773**

## METHOD AND APPARATUS FOR AUTOMATED PROCESSING OF DNA SEQUENCE DATA

**Clark Tibbetts; James B. Golden, III, and Deborah L. Torgersen, all of Nashville, Tenn., assignors to Vanderbilt University, Nashville, Tenn.**

**Continuation-in-part of Ser. No. 763,457, Sep. 20, 1991, Pat. No. 5,365,455. This application Jul. 6, 1993, Ser. No. 88,208**
**Int. Cl.[6] G06K 9/00; G06F 15/18**
**U.S. Cl. 382—129** **7 Claims**



1. An apparatus for processing of raw image data from a polynucleotide sequencing machine comprising:

a. first, second, and third modules sequentially and operatively linked together to define a cascade processor means for performing a series of transformation operations on said raw image data, each of said transformation operations including steps for enhancement of nucleic acid sequence signals contained in said raw image data; and

b. each of said first, second, and third modules comprising a memory buffer and a neural network processor, wherein each of said modules implements one of said transformation operations.

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**5,502,774**

## AUTOMATIC RECOGNITION OF A CONSISTENT MESSAGE USING MULTIPLE COMPLIMENTARY SOURCES OF INFORMATION

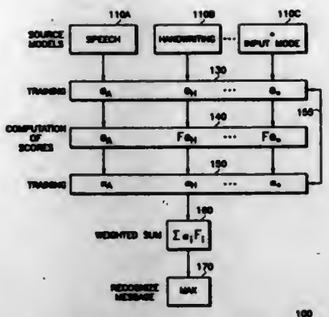
**Jerome R. Bellegarda, Goldens Bridge, and Dimitri Kanevsky, Ossining, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Continuation of Ser. No. 895,967, Jun. 9, 1992, abandoned. This application Sep. 6, 1994, Ser. No. 300,232**
**Int. Cl.[6] G06K 9/00**
**U.S. Cl. 382—159** **28 Claims**

1. In a message recognition system, a method of transforming a consistent message into a message recognizable by the computer, the method comprising the steps of:

(A) transforming the consistent message generated by a human in at least two formats into electrical signal representations of the consistent message;

(B) producing from said electrical signal representations of the consistent message a set of parameters for each said format;




(C) generating a likelihood score of recognition for each said set of parameters;

(D) using said sets of parameters to train a weighting coefficient for each of the at least two formats of the consistent message, wherein said step of training a weighting coefficient comprises the steps of

(i) partitioning the consistent message in each said format into one or more subunits, wherein each subunit corresponds to a piece of the consistent message,

(ii) grouping said subunits from each said format into a plurality of groups, wherein each group comprises one said subunit from each said format, and wherein each said subunit in one said group corresponds to the same piece of the consistent message,

(iii) determining a likelihood score of recognition for each said group of subunits,

(iv) determining a global score for the consistent message based on said likelihood scores of recognition, and

(v) using said global score to determine said weighting coefficients,

(E) generating a weighted expression based on said trained weighting coefficient and said likelihood scores of recognition; and

(F) selecting a candidate message unit that maximizes said weighted expression to transform said electrical signal representations of the consistent message into a computer recognizable message.

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**5,502,775**

## METHOD AND APPARATUS FOR ADJUSTING READ-OUT AND PROCESSING CONDITIONS FOR RADIATION IMAGES

**Hideya Takeo, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

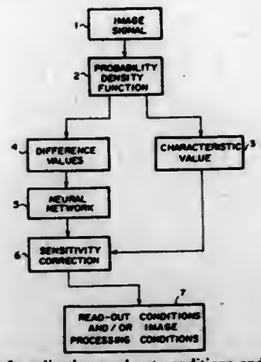
**Filed Dec. 28, 1992, Ser. No. 997,566**
**Claims priority, application Japan, Dec. 26, 1991, 3-345172**
**Int. Cl.[6] G06F 159/00**
**U.S. Cl. 382—169** **12 Claims**

1. A method for adjusting read-out conditions and/or image processing conditions for a radiation image, wherein a first image signal representing a radiation image is obtained by exposing a stimulable phosphor sheet, on which the radiation image has been stored, to stimulating rays, which cause the stimulable phosphor sheet to emit light in proportion to the amount of energy stored thereon during its exposure to radiation, the emitted light being detected,

a second image signal representing the radiation image is thereafter obtained by again exposing the stimulable phosphor sheet to stimulating rays, the light emitted by the stimulable phosphor sheet being detected, and

read-out conditions, under which the second image signal is to be obtained, and/or image processing conditions, under which the second image signal having been obtained is to be image processed, are adjusted on the basis of the first image signal,






the method for adjusting read-out conditions and/or image processing conditions for said radiation image comprising the steps of:

i) creating a probability density function of the first image signal,

ii) detecting a predetermined characteristic value of the first image signal from said probability density function,

iii) calculating a value of a difference between said characteristic value and each of values of the first image signal in said probability density function, said calculation being carried out for the whole first image signal,

iv) feeding information representing the values of the differences, which have been calculated for the whole first image signal, into a neural network, which receives said information representing said values of said differences and generates outputs representing temporary read-out conditions and/or temporary image processing conditions, information representing said temporary read-out conditions and/or said temporary image processing conditions being thereby fed out from said neural network, and

v) correcting said temporary read-out conditions and/or said temporary image processing conditions, which have been obtained from said neural network, in accordance with a level of said characteristic value, whereby the read-out conditions, under which the second image signal is to be obtained, and/or the image processing conditions, under which the second image signal having been obtained is to be image processed, are adjusted.

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**5,502,776**

## METHOD AND APPARATUS SELECTIVELY SETTING AN IMAGE PROCESSING CONDITION

**Naoki Manabe, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 77,497, Jun. 17, 1993, abandoned, which is a continuation of Ser. No. 651,561, Feb. 6, 1991, abandoned. This application Jan. 27, 1995, Ser. No. 379,005**
**Claims priority, application Japan, Feb. 20, 1990, 2-37218**
**Int. Cl.[6] G06K 9/36**
**U.S. Cl. 382—172** **14 Claims**

1. An image processing apparatus comprising:

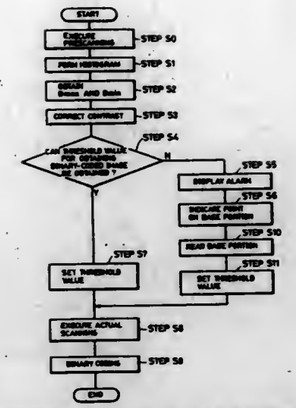
input means for inputting image signals representing an image;

designating means for manually designating an arbitrary portion of the image;

processing means for processing the image signals in accordance with a processing condition;

first setting means for setting a first processing condition of said processing means in accordance with a density level of the image in its entirety;

second setting means for setting a second processing condition of said processing means in accordance with a density level of the arbitrary portion of the image designated by said designating means;




discrimination means for discriminating whether or not the first processing condition, set by said first setting means, is suitable for an image processing by said processing means; and

selecting means for selecting one of the first and second processing conditions in accordance with the discrimination result of said discrimination means,

wherein said selecting means selects the first processing condition when said discrimination means discriminates that the first processing condition is suitable for the image processing, and selects said second processing condition when said discrimination means discriminates that the first processing condition is not suitable for the image processing.

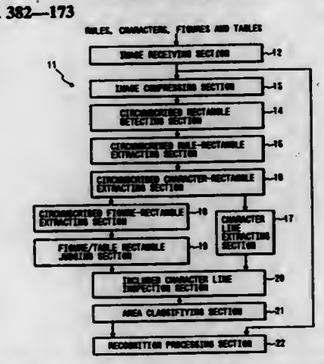
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**5,502,777**

## METHOD AND APPARATUS FOR RECOGNIZING TABLE AND FIGURE HAVING MANY LATERAL AND LONGITUDINAL LINES

**Yumiko Ikemure, Fukuoka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed May 18, 1994, Ser. No. 245,261**
**Claims priority, application Japan, Jun. 30, 1993, 5-162109**
**Int. Cl.[6] G06K 9/34**
**U.S. Cl. 382—173** **10 Claims**




1. A table and figure recognition method, comprising the steps of:

reading image information from a document, the image information denoting a table or a figure;

producing binary data from the image information, the binary data being formed of a group of black pixels;

detecting a rectangle circumscribed about the group of black pixels designating the binary data as a circumscribed rectangle;

extracting one or more lateral lines respectively composed of a plurality of black pixels which are placed in an inside area of the circumscribed rectangle and are adjacent to each other in a lateral direction of the document;

extracting one or more longitudinal lines respectively composed of a plurality of black pixels which are placed in the inside area of the circumscribed rectangle and are adjacent to each other in a longitudinal direction of the document;

counting the number $N_{P1}$ of black pixels composing the lateral lines and the longitudinal lines extracted;

counting the number $N_{P2}$ of black pixels which are placed in the inside area of the circumscribed rectangle and are adjacent to each other in the lateral direction, the longitudinal direction or a diagonal direction of the document;

calculating a ratio of the number $N_{P1}$ to the number $N_{P2}$;

recognizing the image information read from the document as a table in cases where the ratio calculated is higher than a prescribed value; and

recognizing the image information read from the document as a figure in cases where the ratio calculated is not higher than the prescribed value.

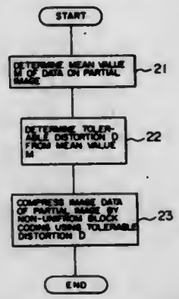
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**5,502,778**

**IMAGE DATA COMPRESSION METHOD FOR APPLYING DIFFERENT COMPRESSION RATIOS TO DIFFERENT PORTIONS OF AN IMAGE**

**Ken Ishikawa, Matsudo, and Shinichiro Miyaoka, Kawasaki, both of, Japan, assignors to Hitachi, Ltd., and Hitachi Medical Corporation, both of Tokyo, Japan**

**Continuation of Ser. No. 508,590, Apr. 13, 1990, abandoned. This application Feb. 12, 1992, Ser. No. 834,595**
**Claims priority, application Japan, Apr. 17, 1989, 1-095124**
**Int. Cl.[6] G06K 9/00**
**U.S. Cl. 382—239** **4 Claims**




1. An image data compression method comprising the steps of:

a) dividing a plane of an image into a plurality of partial images;

b) determining a n-th representative value of pixel values of a n-th partial image by using the pixel values from said n-th partial image;

c) determining a n-th value for controlling fidelity of said n-th partial image for image reconstruction on the basis of a predetermined function using only said n-th representative value;

d) compressing image data of said n-th partial image by use of said n-th value for controlling fidelity;

e) storing the compressed image data; and

f) applying steps (b) to (e) to all of the partial images to compress said image data.

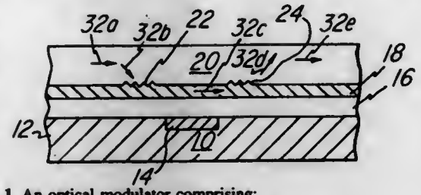
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**5,502,779**

**INTEGRATED OPTICAL MODULATOR AND WAVEGUIDE AND METHOD**

**Gregory A. Magel, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.**

**Division of Ser. No. 100,837, Jul. 30, 1993, Pat. No. 5,367,582, which is a division of Ser. No. 797,520, Nov. 22, 1991, Pat. No. 5,276,748. This application Nov. 7, 1994, Ser. No. 335,233**
**Int. Cl.[6] G02F 1/01; H01L 21/70**
**U.S. Cl. 385—1** **19 Claims**




1. An optical modulator comprising:

a. a substrate;

b. a lower cladding layer upon said substrate;

c. an interference layer upon said lower cladding layer;

d. a core layer upon said interference layer;

e. at least one grating in said modulator operable to couple light between said core layer and said interference layer; and

f. an electrical element to modulate light in said interference layer.

12. A method for forming an optical modulator comprising:

a. preparing a semiconductor substrate;

b. building a lower cladding layer upon said substrate;

c. depositing an interference layer upon said lower cladding layer;

d. depositing a core layer upon said interference layer;

e. forming gratings in said modulator operable to couple light between said core layer and said interference layer; and

f. forming an electronic element in said modulator to modulate light in said interference layer.

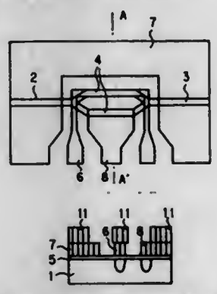
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**5,502,780**

**WAVEGUIDE TYPE OPTICAL DEVICE**

**Madabhushi Rangaraj, Tokyo, Japan, assignor to NEC Corporation, Japan**

**Continuation of Ser. No. 225,065, Apr. 8, 1994, abandoned. This application Mar. 9, 1995, Ser. No. 401,307**
**Claims priority, application Japan, Apr. 13, 1993, 5-085819**
**Int. Cl.[6] G02F 1/035**
**U.S. Cl. 385—3** **16 Claims**




7. A waveguide type optical device comprising:

a crystal substrate having an electro-optical effect;

a waveguide formed in said crystal substrate;

a buffer layer provided on said crystal substrate and having a dielectric constant of 1.1 to 40;

at least one pair of electrodes on said buffer layer; and

an additional pair of electrodes provided directly on said pair of electrodes,



at least one width of the additional pair of electrodes extending over the one of said pair of electrodes in a cantilevered fashion.

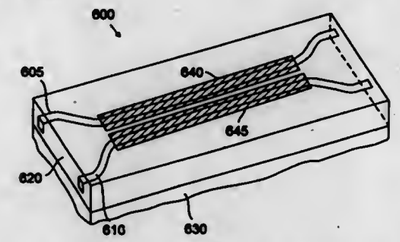
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**5,502,781**

**INTEGRATED OPTICAL DEVICES UTILIZING MAGNETOSTRICTIVELY, ELECTROSTRICTIVELY OR PHOTOSTRICTIVELY INDUCED STRESS**

**Yuan P. Li, Scotch Plains, and Raymond Wolfe, New Providence, both of N.J., assignors to AT&T Corp., Murray Hill, N.J.**

**Filed Jan. 25, 1995, Ser. No. 378,162**
**Int. Cl.[6] G02F 1/295; G02B 6/26; G01B 9/02**
**U.S. Cl. 385—4** **24 Claims**




1. An integrated optical switching or modulation device comprising:

a first and second channel waveguide formed in or on a substrate, each of said first and second channel waveguides having a refractive index, said refractive index of at least one of said first and second channel waveguides changing with an applied stress; and

a stress applying material affixed to a region of said device, said stress applying material selected from the group of magnetostrictive, electrostrictive or photostrictive materials, said stress applying material creating at least one region of stress in said device upon application of magnetic, electrical or photonic energy respectively, wherein at least one of said first and second channel waveguides is positioned in said at least one created region of stress.

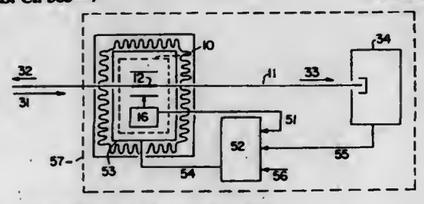
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**5,502,782**

**FOCUSED ACOUSTIC WAVE FIBER OPTIC REFLECTION MODULATOR**

**Ronald H. Smith, Chevy Chase, Md., assignor to Optelecom, Inc., Gaithersburg, Md.**

**Filed Jan. 9, 1995, Ser. No. 370,245**
**Int. Cl.[6] G02F 1/335**
**U.S. Cl. 385—7** **36 Claims**




1. An acousto-optic device comprising,

an optical fiber waveguide for propagating an optical carrier signal along an optical path,

carrier signal generating means providing an optical carrier signal to said optical fiber waveguide,

a focused acoustic wave transducer for modulating the optical carrier signal, said transducer including,

an inner electrode having an inner surface at least partially surrounding and in energy transfer relation with the optical fiber and an outer surface,

a thin shell of electromechanical conversion material having an inner and an outer surface with its inner surface being in the energy transfer relation with to the outer surface of said first electrode,

an outer electrode having an inner and an outer surface with its inner surface in energy transfer relation with the outer surface of said thin shell, and

electrical signal generating means connected to said inner and said outer electrodes and operable to apply an electrical signal across said thin shell of electromechanical conversion material to thereby produce inwardly and outwardly directed acoustic waves in said inner and said outer electrodes, respectively,

said inner electrode having a thickness and shape to focus said inwardly directed acoustic waves along a line near the center of the waveguide to induce strain producing a proportional change in the refractive index of the optical fiber waveguide at the line of focus to produce a phase shift in the optical carrier signal,

said outer electrode being formed of a material and having a thickness such that said outwardly directed acoustic waves are substantially completely attenuated therein.

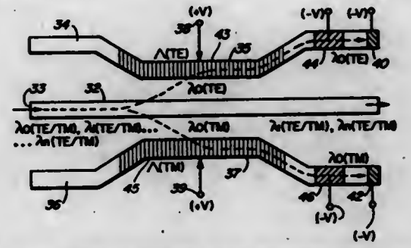
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**5,502,783**

**POLARIZATION INDEPENDENT OPTICAL DIRECTIONAL COUPLER WAVELENGTH TUNABLE FILTERS/RECEIVERS**

**Chi Wu, Nepean, Canada, assignor to Northern Telecom Limited, Montreal, Canada**

**Filed Aug. 18, 1994, Ser. No. 292,285**
**Int. Cl.[6] G02B 6/26**
**U.S. Cl. 385—42** **34 Claims**




1. A polarization independent optical directional coupler wavelength tunable filter comprising:

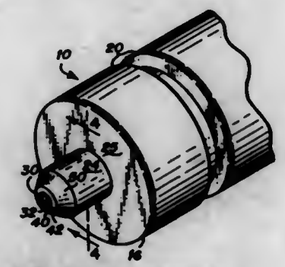
a first waveguide to receive and transfer therethrough an optical signal having a plurality of wavelength channels each having transverse electric (TE) and transverse magnetic (TM) polarization modes;

a second waveguide having at least a portion thereof in juxtaposition to said first waveguide;

a third waveguide having at least a portion thereof in juxtaposition to said first waveguide; and

wavelength tuning means associated with said waveguides to selectively couple said transverse electric polarization mode of one of said plurality of wavelength channels from said first waveguide to said second waveguide and to selectively couple said transverse magnetic polarization mode of said one of said plurality of wavelength channels from said first waveguide to said third waveguide.

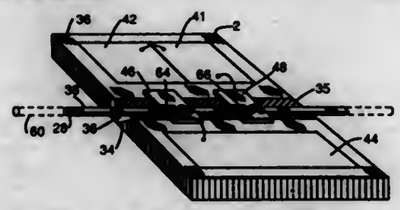
5,502,784
**HEAT INSULATING CONNECTOR FOR PLASTIC OPTICAL FIBERS**
Michel Y. Rondeau, San Jose, Calif., assignor to Valquest Medical, Inc., and Fibotech, Inc., both of San Jose, Calif.
Filed Jul. 1, 1994, Ser. No. 269,710
Int. Cl.[6] G02B 6/36
U.S. Cl. 385—66 19 Claims




1. An optical fiber connector, comprising:
a connector body member;
a metallic core member being disposed within said body member; such that a tip portion of said metallic core member projects outwardly from an end face of said body member; said core member having a bore formed therethrough;
an optical fiber being disposed within said core member bore;
a tubular heat insulating sleeve member being disposed around said optical fiber and within said core member bore;
an end portion of said sleeve member and an end portion of said optical fiber being disposed within said projecting tip portion of said metallic core member;
said tip portion being mechanically deformed, such that said bore is deformed and reduced in diameter, and such that inner surface portions of said bore are likewise deformed to make mechanical contact with said sleeve member; whereby said optical fiber and said sleeve member are mechanically held and engaged within said tip portion of said core member.

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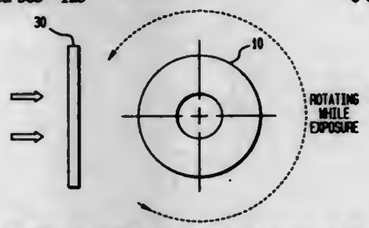
5,502,785
**INTEGRATED OPTICAL TRANSCEIVER CHIP**
David C. Wang, Rancho Palos Verdes, Calif., and C. Y. Chen, Kaohsiung Shien, Taiwan, assignors to Hughes Aircraft Company, Los Angeles, Calif.
Filed Feb. 28, 1994, Ser. No. 209,505
Int. Cl.[6] G02B 6/36
U.S. Cl. 385—92 17 Claims




9. An integrated optical transceiver comprising;
a substrate;
a D-shaped optical fiber having a core and a clad surrounding said core wherein said clad has a longitudinal flat surface side and a rounded side, and said D-shaped optical fiber is mounted on said substrate with said rounded side of said clad facing said substrate,
an input coupling grating superimposed on said longitudinal flat surface side of said clad;
an output coupling grating superimposed on said longitudinal flat surface side of said clad;
a light source mounted on said substrate and aligned with said input coupling grating for optical communication from said light source to said optical fiber; and
an optical detector mounted on said substrate and aligned with said output coupling grating for optical communication to said light detector from said optical fiber.

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5,502,786
**METHOD OF FORMING PHOTO-INDUCED DEVICE AND PRODUCT**
Daryl Inniss, Hillsborough; Ashish M. Vengsarkar, Chatham, and Qian Zhong, Scotch Plains, all of N.J., assignors to AT&T Corp., Murray Hill, N.J.
Division of Ser. No. 198,882, Feb. 17, 1994. This application Mar. 8, 1995, Ser. No. 399,090
Int. Cl.[6] G02B 6/02;6/34
U.S. Cl. 385—123 6 Claims



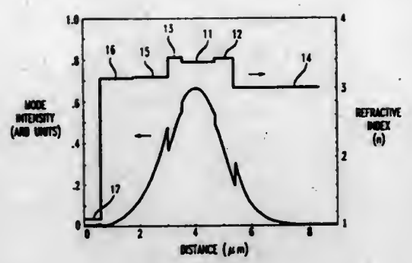

1. A method of forming photo-induced devices in an optical waveguide comprising the step of
circumferentially exposing the optical waveguide to an amount of light sufficient to form a photo-induced device without imparting a substantial amount of birefringence to the waveguide.
4. A photo-induced device comprising
a waveguide,
a waveguide core,
a cladding surrounding the core and having an index of refraction less than that of the waveguide core, and
a controlled birefringence resulting from writing the photo-induced device by exposing one side of the optical waveguide to light, and then
exposing an unexposed side to light in an amount sufficient to impart the desired birefringence to the written device.

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5,502,787
**ARTICLE COMPRISING A SEMICONDUCTOR WAVEGUIDE STRUCTURE**
Federico Capasso, Westfield; Alfred Y. Cho, Summit; Jerome Faist, Scotch Plains; Albert L. Hutchinson, Piscataway; Carlo Sirtori, Summit, and Deborah L. Sivco, Warren, all of N.J., assignors to AT&T Corp., Murray Hill, N.J.
Filed May 22, 1995, Ser. No. 445,821
Int. Cl.[6] G02B 6/02;6/16
U.S. Cl. 385—123 8 Claims

1. An article comprising a semiconductor structure comprising a waveguide for radiation of vacuum wavelength $\lambda$, said waveguide comprising a core region and a cladding region having a refractive index that is less than a refractive index of the core region;
CHARACTERIZED IN THAT said cladding region comprises doped semiconductor material having a dopant concentration N and a plasma radial frequency $\omega_p$, with N selected such that the doped semiconductor material has a complex refractive index that has a real part $n < 0.5\ \epsilon_\infty^{1/2}$ and an imaginary part $k<1$, where $\epsilon_\infty$ is the high-frequency lattice dielectric constant of the semiconductor material.






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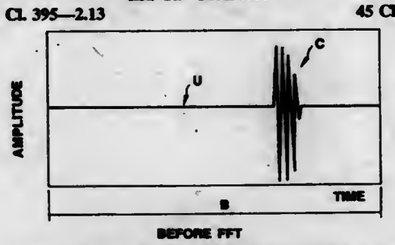
5,502,788
**RADIANT-HEAT DRIER STRIP WITH COOLING AIR DISTRIBUTOR ELEMENT**
Hans G. Platsch, Kupferstr. 40, D-70565 Stuttgart, Germany
Filed Dec. 20, 1993, Ser. No. 169,629
Claims priority, application Germany, Dec. 24, 1992, 42 44 003.3
Int. Cl.[6] B41F 23/04
U.S. Cl. 392—424 5 Claims




1. A radiant-heat drier strip for a radiant-heat drier for use in printing presses or coating machines, comprising:
a bar-shaped IR radiator element and an associated fixture; and
a cooling device adapted to be connected to a fan, in which the cooling device has a cooling-air distributor element which extends parallel to, and at a distance from, the radiator element and which supports, on a wall facing the radiator element, two parallel rows of air delivery nozzles distributed lengthwise of the radiator element and which have been placed in the vicinity of that side of the radiator element which faces the distributor element.

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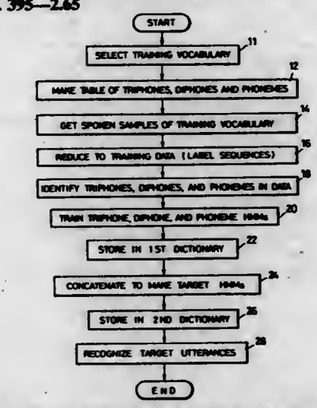
5,502,789
**APPARATUS FOR ENCODING DIGITAL DATA WITH REDUCTION OF PERCEPTIBLE NOISE**
Kenzo Akagiri, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan
Continuation of Ser. No. 664,300, Mar. 4, 1991, abandoned, and a continuation-in-part of Ser. No. 553,608, Jul. 18, 1990, Pat. No. 5,197,087. This application Mar. 12, 1993, Ser. No. 29,988
Claims priority, application Japan, Mar. 7, 1990, 2-53504; Mar. 14, 1990, 2-61248; Mar. 14, 1990, 2-61249
Int. Cl.[6] G10L 9/00
U.S. Cl. 395—2.13 45 Claims




1. Apparatus for encoding a digital signal comprised of a plurality of samples, said apparatus comprising:
frequency dividing means for dividing said digital signal comprised of said plurality of samples into a plurality of frequency divided signals within respective frequency bands;
encoding means for encoding said frequency divided signals including block segmentation means for segmenting each of said frequency divided signals into respective size blocks each having a respective number of said samples, orthogonal transformation means for orthogonally transforming said blocks to form coefficient data, and quantization means for quantizing said coefficient data with a number of bits to form an encoded digital signal;
transient detection means receiving at least the one of said plurality of frequency divided signals within the lowest of said frequency bands for detecting a transient in the received frequency divided signal within the lowest frequency band and for generating an output signal indicating that said transient has been detected; and
control means responsive to said output signal from said transient detection means for controlling the encoding performed by said encoding means of at least said frequency divided signal within said lowest frequency band so as to reduce the perceptibility of noise in the encoded digital signal.

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5,502,790
**SPEECH RECOGNITION METHOD AND SYSTEM USING TRIPHONES, DIPHONES, AND PHONEMES**
Jie Yi, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Dec. 21, 1992, Ser. No. 993,395
Claims priority, application Japan, Dec. 24, 1991, 3-341235; Jan. 13, 1992, 4-004287; Jan. 13, 1992, 4-004288
Int. Cl.[6] G10L 5/06
U.S. Cl. 395—2.65 22 Claims




1. A speech recognition method for recognizing a target vocabulary of words, phrases, or sentences, comprising the steps of:
(a) selecting a training vocabulary;
(b) listing in a table (8) all triphones, diphones, and phonemes occurring in said training vocabulary;
(c) obtaining spoken samples of said training vocabulary;
(d) reducing said spoken samples to training data comprising sequences of labels;
(e) identifying, in said training data, segments corresponding to the triphones, diphones, and phonemes in said table (8);
(f) using the labels obtained in step (d) and segments identified in step (e) to construct a triphone HMM for each triphone in said table (8), and diphone HMM for each diphone in said table (8), and a phoneme HMM for each phoneme in said table (8);
(g) storing each triphone HMM, diphone HMM, and phoneme HMM constructed in step (f) in a first dictionary (9) consisting of the HMMs thus stored;

(h) creating HMMs for the target vocabulary by concatenating HMMs from said first dictionary (9), using triphones HMMs if available in said first dictionary (9), using diphone HMMs when triphone HMMs are not available, and using phoneme HMMs when neither triphone nor diphone HMMs are available.

(i) storing the HMMs created in step (h) in a second dictionary (10); and

(j) recognizing an utterance by reducing the utterance to a sequence of labels, computing probabilities of producing said sequence of labels from each HMM in said second dictionary (10), and selecting an HMM giving maximum probability.

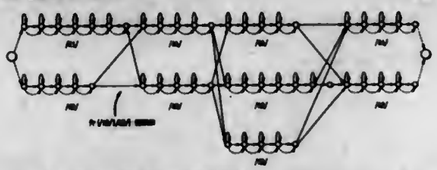
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5,502,791

## SPEECH RECOGNITION BY CONCATENATING FENONIC ALLOPHONE HIDDEN MARKOV MODELS IN PARALLEL AMONG SUBWORDS

Masafumi Nishimura, and Masaaki Okochi, both of Yokohama, Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 1, 1993, Ser. No. 114,709
Claims priority, application Japan, Sep. 29, 1992, 4-259301
Int. Cl.[6] G10L 9/00
U.S. Cl. 395—2.65 6 Claims



1. A speech recognizer comprising:

means for analyzing a word inputted as speech for its features and thus obtaining a label sequence or feature vector sequence corresponding to said word;

means for retaining hidden Markov models respectively for one or more allophones of subwords of each speech transformation candidate;

dictionary means for retaining a plurality of candidate words to be recognized;

means for composing a speech model by concatenating each hidden Markov model for allophones of each speech transformation candidate in parallel among subwords in correspondence to a candidate word;

means for determining a probability of a speech model composed with regard to each candidate word to output the label sequence or feature vector sequence of said word inputted as speech, and outputting the candidate word corresponding to a speech model of a highest probability as a result of recognition.

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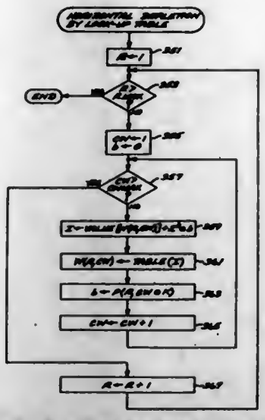
5,502,792

## METHOD FOR REDUCING PIXEL DENSITY ALONG ONE AXIS OF A MULTIPLE DIMENSION IMAGE REPRESENTATION

Ine-Shuenn Chen, Singapore, Singapore; Alan E. Cariffe, San Diego, and Anne P. Kadonaga, Del Mar, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 3, 1992, Ser. No. 925,720
Int. Cl.[6] G06F 15/00
U.S. Cl. 395—108 2 Claims

1. In a swath type printer having a movable carriage for supporting a plurality of print elements which are controlled to print dots on a rectilinear array of pixels each having an associated pixel data bit in a bit-mapped pixel data array which is logically organized in rows and columns to correspond to the printed pixel array, a method for depleting a pixel data array comprising the steps of:



(A) defining for all rows of the pixel data array a starting end such that the bits in each row are in a column sequence that starts at the starting end; and

(B) sequentially selecting the second through last in sequence bit in each row, and setting the selected bit to 0 if the immediately adjacent prior in column sequence bit is a 1 by:

(a) organizing each row of the pixel data array into non-overlapping immediately adjacent K-bit words which are in a sequence that starts at a starting end that is common for all rows;

(b) defining for all rows of the pixel data array a starting row such that the pixel data rows are in a sequence that starts with the starting row;

(c) sequentially selecting the first through last in sequence K-bit word in each row, and performing the following on the selected K-bit word:

(1) forming an index of K+1 bits comprised of the selected K-bit word and an additional bit that is the bit of the immediately prior in sequence K-bit word that is immediately adjacent the selected K-bit word, except for the first in sequence word in a row for which the additional bit is a 0;

(2) accessing a depleter look-up table with the index for the selected K-bit word to obtain a replacement K-bit word;

(3) replacing the selected K-bit word with the replacement K-bit word, whereby all K-bit words in the pixel data array are replaced with K-bit words retrieved from the look-up table.

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5,502,793

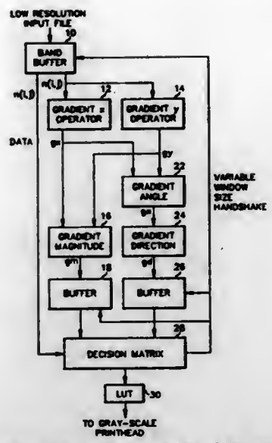
## RESOLUTION ENHANCEMENT SYSTEM FOR BINARY IMAGES

Yee S. Ng, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 30, 1992, Ser. No. 983,155
Int. Cl.[6] G06K 15/00; H04N 1/40
U.S. Cl. 395—109 30 Claims

1. An image processing system comprising: means for storing a binary bitmap image file including a plurality of pixel locations; means for determining a gradient magnitude corresponding to each pixel location of the binary bitmap image file; means for determining a gradient direction corresponding to each pixel location of the binary bitmap image file; decision matrix means for comparing a window of the binary bitmap image file and the gradient magnitudes and directions corresponding thereto to predetermined templates and generating a look-up-table address if a match occurs; a look-up-table for generating enhanced gray-scale image data in response to the look-up-table address and wherein the decision matrix means determines whether a central pixel of the window is a black or white pixel, whether the central pixel is located in a





single pixel width line, and the location of the central pixel with respect to the kink site.

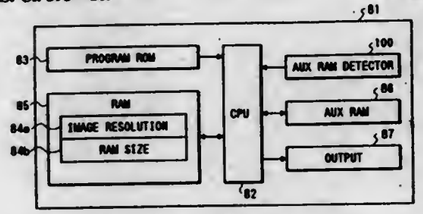
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5,502,794

## OUTPUT APPARATUS WITH CONTROLLABLE OUTPUT RESOLUTION

Masakatsu Sakurai, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 532,564, Jun. 4, 1990, abandoned.
This application May 23, 1994, Ser. No. 247,403
Claims priority, application Japan, Jun. 5, 1989, 1-141113; Jun. 5, 1989, 1-142370
Int. Cl.[6] G06K 15/00
U.S. Cl. 395—109 32 Claims



1. A document processing apparatus comprising:

changing means for changing an output resolution;

detecting means for detecting a change in memory capacity, with said detecting means including means for computing the memory capacity; and

control means for controlling a change in output resolution by the changing means on the basis of the result of the detection from the detecting means.

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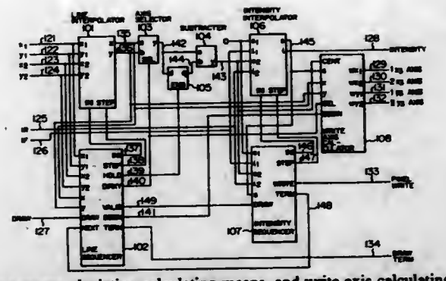
5,502,795

## ANTIALIAS LINE GENERATING METHOD AND ANTIALIAS LINE GENERATOR

Hiroshi Shirouzu, Fukuoka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 19, 1994, Ser. No. 293,186
Claims priority, application Japan, Aug. 31, 1993, 5-214657
Int. Cl.[6] G06F 15/62
U.S. Cl. 395—109 7 Claims

1. An antialias line generator based method, the antialias line generator including line interpolating means, intensity interpolating means, deviation calculating means, and write axis calculating means, the method comprising the steps of:



performing axis interpolation, with the line interpolating means, on the basis of axes of opposite ends of a line;

performing intensity interpolation, with the intensity interpolating means, on the basis of current intensity data and new pixel intensity data;

calculating a deviation, with the deviation calculating means, between the axes of the opposite ends of the line and an axis of a pixel subjected to intensity correction; and

performing calculation, with the write axis calculating means, which begins with an axis of the center of the line to be displayed, to determine an axis of one end of the line by subtracting ½ of the deviation from the center axis and to determine an axis of the other end of the line by adding ½ of the deviation to the center axis.

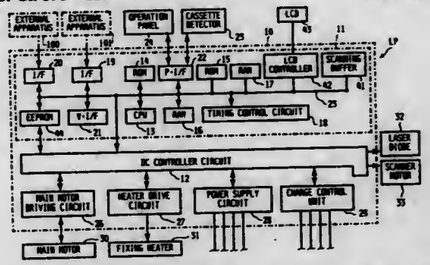
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5,502,796

## PRINT DEVICE CAPABLE OF PRINTING A FORMAT SHEET IN WHICH ITEMS ABOUT A PRINT DEVICE AND A DOCUMENT PROCESSOR ARE COMPLETED

Kiyoshi Takahashi, Aichi, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Jun. 25, 1992, Ser. No. 903,767
Claims priority, application Japan, Jul. 20, 1991, 3-204791
Int. Cl.[6] G06F 15/00
U.S. Cl. 395—115 16 Claims



1. A service support system integral to a print device, that receives print data and print instructions from a directly connected external apparatus having an application creating the print data and print instructions, the print device printing system information on a print medium, comprising:

connecting means for receiving the print data output from the external apparatus;

printing means for printing the print data on the print medium based on the print data received by said connecting means;

a format memory for storing format information data for printing forms containing item labels for identifying and providing characteristics of the print device, the external apparatus, an operating system, and a problem summary using a predetermined format;

an operating parameters data memory for storing operating parameters data of the print device and the connecting means for association with an appropriate item label stored in said format memory;

combining means for combining the format information data and the operating parameters data; and

control means for reading the format information data from said format memory according to a format print instruction from outside or inside of the print device, and for instructing said printing means to print the forms combined with the operating parameters on the print medium, wherein the forms include at least one labelled space for entry of information written by an operator concerning the external apparatus and a problem encountered.

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**5,502,797**

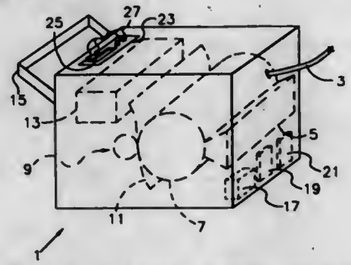
**APPARATUS WITH FLASH MEMORY CONTROL FOR REVISION**

**Craig P. Bush; Cyrus B. Clarke, and David B. Langer, all of Lexington, Ky., assignors to Lexmark International, Inc., Greenwich, Conn.**

**Filed Oct. 4, 1994, Ser. No. 317,444**

**Int. Cl.[6] G06H *15/00***

**U.S. Cl. 395—115** **2 Claims**




1. An apparatus controlled by an electronic data processor, an electronic data processor controlling said apparatus, non volatile random access memory capable of storing data which can be revised in part by said central data processor and capable of being selectively accessed for stored data by said central data processor (NVRAM), a flash memory of characteristics comparable to dynamic random access memory which retains stored data during power-off and which can be revised only by erasing all data of said flash memory, means to store in said NVRAM control data representing offset from current nominal data and data defining the current change from nominal from start of production of current control information, means to store control information in said flash memory based on said nominal data, means to receive from external of said apparatus and store in said flash memory revised control information which also defines new nominal data and the new change from nominal from start of production, means to find the difference of the previous change from nominal from start of production from the new change from nominal from start of production and to add the previous offset to said difference to determine an offset preserving the net offset for said previous current nominal data, and means to store in said NVRAM said determined offset data as new current offset data and said new change from nominal from start of production data.

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**5,502,798**

**IMAGE PROCESSING APPARATUS FOR SYNTHESIZING Z-AXIS COORDINATE DATA USING X- AND Y-DIRECTION INCREMENTS**

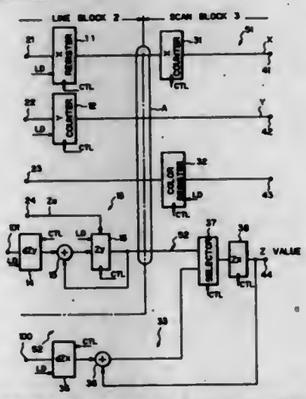
**Kazumasa Ito, Tokyo; Hiroshi Kato, Kanagawa, and Junichi Fujita, Tokyo, all of, Japan, assignors to Sony Corporation, Tokyo, Japan**

**Continuation of Ser. No. 951,110, Sep. 25, 1992, abandoned. This application Sep. 26, 1994, Ser. No. 311,907**

**Claims priority, application Japan, Sep. 27, 1991, 3-276529**

**Int. Cl.[6] G06F *15/62***

**U.S. Cl. 395—119** **5 Claims**




3. An apparatus for generating Z value coordinate data for polygonal image element including two-dimensional image information that includes pixels each having X-axis and Y-axis coordinates, comprising:

first means for producing a respective line initial Z value for each of a plurality of pixel lines each having a common Y-axis coordinate by incrementing an image element initial Z value by a Y-axis direction increment; and

second means for producing respective Z value coordinate data for each of the pixels in each pixel line, the second means including a circuit having an input coupled with the first means to receive the respective line initial Z value and operative to sequentially and repeatedly increment the respective line initial Z value by an X-axis direction Z increment;

wherein the first means comprises a first register for storing the Y-axis direction Z increment and a first accumulator means for producing the respective line initial Z value by storing the image element initial Z value as a first respective line initial Z value and adding the Y-axis direction Z increment thereto repeatedly to produce a sequence of respective line initial Z values; and

the circuit of the second means comprises a second register for storing the X-axis direction Z increment and second accumulator means for producing the respective Z value coordinate data for each of the pixels in each line by storing the respective line initial Z value produced by the first means and adding the X-axis direction Z increment thereto repeatedly to produce a sequence of respective Z value coordinate data each corresponding to a respective pixel of said each line.



**5,502,799**

**RENDERING APPARATUS, MULTISPECTRAL IMAGE SCANNER, AND THREE-DIMENSIONAL AUTOMATIC GONIO-SPECTROPHOTOMETER**

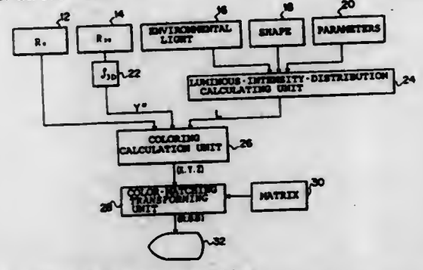
**Hiroyoshi Tsuji; Kazuhiko Suzuki; Keiko Watanabe; Atsushi Takagi; Hitoshi Takaoka, all of Aichi, and Goro Baba, Saitama, all of, Japan, assignors to Kabushiki Kaisha Toyoto Chuo Kenkyusho, Aichi, and Toyoto Jidosha Kabushiki Kaisha, Toyota, both of, Japan**

**Filed May 14, 1993, Ser. No. 61,093**

**Claims priority, application Japan, May 15, 1992, 4-123603; May 15, 1992, 4-123604; May 15, 1992, 4-123961**

**Int. Cl.[6] G06F *15/00***

**U.S. Cl. 395—131** **14 Claims**




1. A rendering apparatus comprising:

radiant-energy calculating means for determining a spectral radiance for each infinitesimal area of an object by using a spectral radiance of a light source irradiating the object, a spectral reflectance in the infinitesimal area of the object at a predetermined angular condition, and a three-dimensional spectral reflectance factor in a wide area of the object;

color-specification-value calculating means for calculating color specification values of a colorimetric system on the basis of the spectral radiance obtained for said each infinitesimal area;

transforming means for transforming the color specification values into image data for displaying an image of the object; and

display means for displaying the image of the object on the basis of the image data.

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**5,502,800**

**GRAPHIC DATA PROCESSING APPARATUS USING DISPLAYED GRAPHICS FOR APPLICATION PROGRAM SELECTION**

**Keiji Kitagawa, Raionzugaden Yurigaoka 415, 3-6-1 Takaishi, Asou-ku, Kawasaki-shi, Kanagawa-ken, and Ikuo Tani, Ibaraki, both of, Japan, assignors to Keiji Kitagawa, Kawasaki, Japan; Design Automation Inc., Nagaokakyo, and Omron Corporation, Kyoto, all of, Japan**

**Division of Ser. No. 654,182, Feb. 13, 1991, Pat. No. 5,337,402, which is a continuation-in-part of Ser. No. 443,832, Dec. 1, 1989, abandoned, which is a continuation of Ser. No. 60,910, Jun. 12, 1987. This application Aug. 3, 1994, Ser. No. 283,894**

**Claims priority, application Japan, Jun. 12, 1986, 61-137727**

**Int. Cl.[6] G06T *11/60***

**U.S. Cl. 395—133** **14 Claims**

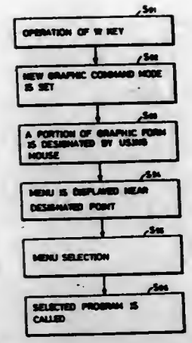
1. A graphic data processing apparatus operated by a plurality of high level drawing commands, said apparatus having a man-machine interface, comprising:

means for displaying a graphic form on a display screen,

means for designating a portion of said displayed graphic form,

means, responsive to a designation by said designating means, for specifying a type of said graphic form,

means for determining automatically a desired high level drawing command from a plurality of high level drawing commands associated with said specified type of graphic form, each of said high level drawing commands specifying a relationship that can be displayed among said specified type of graphic form and other graphic forms,




means for calling a high level drawing program according to said desired high level drawing command, and

means for drawing a graphic form on said display means according to said called high level drawing program, said high level drawing program having low level commands to produce said specified graphic form having drawing elements in said relationship corresponding to said desired high level drawing command.

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**5,502,801**

**METHOD AND SYSTEM FOR DRAWING NARROW LINES ON A COMPUTER DISPLAY**

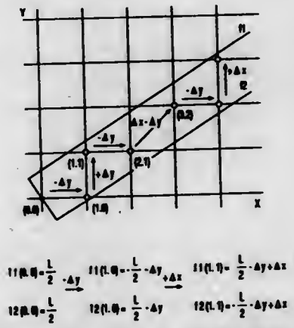
**Kazunori Takayanagi, Sagamihara; Nobuyoshi Tanaka, and Masaya Mori, both of Yamato, all of, Japan, assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Aug. 30, 1994, Ser. No. 298,528**

**Claims priority, application Japan, Sep. 1, 1993, 5-217262**

**Int. Cl.[6] G06T *11/00***

**U.S. Cl. 395—143** **4 Claims**




$$11(1,0)=\frac{1}{2}\cdot\Delta y \qquad 11(1,0)=-\frac{1}{2}\cdot\Delta y+\Delta x \qquad 11(1,0)=\frac{1}{2}\cdot\Delta y+\Delta x$$

$$12(1,0)=\frac{1}{2} \qquad 12(1,0)=\frac{1}{2}\cdot\Delta y \qquad 12(1,0)=-\frac{1}{2}\cdot\Delta y+\Delta x$$

1. A method for drawing a line by the operations of a computer on a display which allows pixels to be individually plotted at given coordinate points on said display, comprising the steps of:

(a) specifying a starting point and an end point of a line to be drawn; said line having, for at least part of its length, a positive slope greater than zero and less that 90°;

(b) defining an upper outline and a lower outline, said upper and lower outlines being lines spaced from said line by a selected amount W, where W is an amount greater than zero;

(c) setting said starting point as a current point;

(d) plotting a pixel corresponding to said current point on said display;

(e) determining if a first point and a second point are within a region between said upper outline and said lower outline, each

one of said first and second points having an X component and a Y component, the X component of said first point being incremented by a value so that it comes closer to said end point than said current point, and the Y component of said second point being incremented by said value so that it comes closer to said end point than said current point, and, if said first point is within said region, setting said first point as a current point and returning to said step (d);

(f) setting said second point as a current point if said first point is outside said region and said second point is within said region, and returning to said step (d);

(g) setting a third point as a current point the X and Y components of which are both incremented by said value so that said third point comes closer to said end point than said current point if neither said first point nor said second point is within said region, and returning to said step (d); and

(h) repeating said steps (d) to (g) until the current point is at or near said end point.

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**5,502,802**

**POLYGONAL IMAGE-DRAWING PROCESSOR**

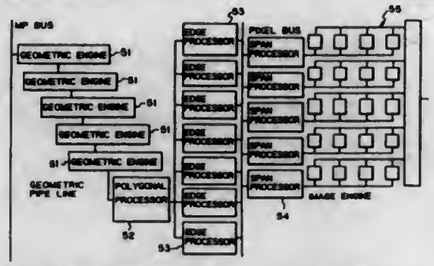
**Naoto Shiraishi, Mineo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan**

**Continuation of Ser. No. 932,357, Aug. 19, 1992, abandoned, which is a continuation-in-part of Ser. No. 727,832, Jul. 9, 1991. This application Jul. 14, 1995, Ser. No. 502,466**

**Claims priority, application Japan, Jul. 27, 1990, 2-199816**

**Int. Cl.[6] G06F 15/00**

**U.S. Cl. 395—143** **7 Claims**




1. A polygonal image-drawing processor comprising:

a device for providing a direction of a linear vector on each of sides constituting a polygon based on information about two end points and side information of the polygon, said direction of the linear vector being selected from eight directions defined in advance;

a device for dividing each of the sides constituting the polygon into two groups of right-handed and left-handed sides in accordance with the provided direction of the linear vector and the side information of the polygon;

a device for calculating an X address of an intersection point of each of the sides constituting the polygon with a horizontal scanning line by a digital differential analysis at every Y address, said digital differential analysis calculating said X address from the information about two end points and the provided direction of the linear vector on the basis of Bresenham algorithm;

a device for controlling the operation of an image memory so as to write X and Y addresses of a left-handed intersection point as an image-drawing starting point of the polygon on the horizontal scanning line and a right-handed intersection point as an image-drawing terminal point of the polygon on the horizontal scanning line respectively in a writing region thereof corresponding to each of the divided two groups, said left-handed intersection point corresponding to an intersection point of the left-handed side with the horizontal scanning line, said right-handed intersection point corresponding to an intersection point of the right-handed side with the horizontal scanning line; and

an image-drawing processing device for performing a coloring operation between the respective right-handed and left-handed sides based on the X and Y addresses written in the image memory so as to draw an image.

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**5,502,803**

**INFORMATION PROCESSING APPARATUS HAVING A GESTURE EDITING FUNCTION**

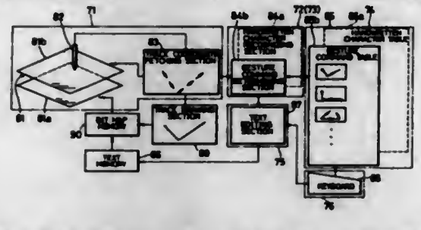
**Hiroichi Yoshida, Nara; Junko Morimura, Gose; Kazuhiko Matsuo, Yamatokoriyama, and Kazuhiko Takata, Habikino, all of, Japan, assignors to Sharp Kabushiki Kaisha, Japan**

**Filed Jan. 13, 1994, Ser. No. 181,129**

**Claims priority, application Japan, Jan. 18, 1993, 5-006097; Feb. 16, 1993, 5-026816**

**Int. Cl.[6] G06F 15/62**

**U.S. Cl. 395—146** **23 Claims**



1. An information processing apparatus having a gesture editing function comprising:

a display screen for displaying document information;

position indicating means for indicating a position on said display screen;

position detecting means for detecting a coordinate of a handwritten point or coordinates of a handwritten line drawing on said display screen, the handwritten point or line drawing being drawn using said position indicating means;

first memory means for storing a plurality of different coordinate systems used in computing a position of a displayed character or character string, wherein a position of a point of origin on the display screen of each different coordinate system differs depending on the coordinate system;

second memory means for storing reference strokes and edit instructions so as to have an association between each pair of reference strokes and edit instructions;

gesture judging means for judging a given edit instruction based on a result of a comparison between a shape of the handwritten line drawing and the reference stroke stared in said second memory means when an editing position for editing the document information is specified by the handwritten line drawing;

position computing means for selecting one of the different coordinate systems from said first memory means based on the given edit instruction and for computing a position of a character or character string corresponding to the editing position using a coordinate of the handwritten line drawing and the selected coordinate system; and

document editing means for editing a character or character string at the computed position based on the given edit instruction.



**5,502,804**

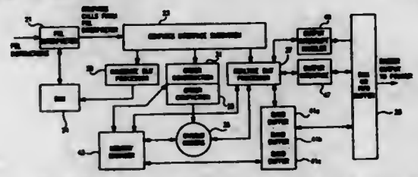
**METHOD AND APPARATUS FOR DISPLAYING A PAGE WITH GRAPHICS INFORMATION ON A CONTINUOUS SYNCHRONOUS RASTER OUTPUT DEVICE**

**Stephen R. Butterfield, Manhattan Beach; Donald E. Phillips, Garden Grove; Barbara B. Renshaw, Manhattan Beach; Steven K. Nelson, Harbor City, and Robert F. Housley, El Segundo, all of Calif., assignors to Peerless Systems Corporation, El Segundo, Calif.**

**Continuation of Ser. No. 74,016, Jun. 9, 1993, which is a continuation of Ser. No. 564,417, Aug. 8, 1990. This application Jul. 20, 1994, Ser. No. 277,788**

**Int. Cl.[6] G06T 11/00;11/60**

**U.S. Cl. 395—147** **3 Claims**



1. An apparatus for creating a page image which includes graphics information for display on a continuous synchronous raster output device, said apparatus comprising:

a) means for receiving and interpreting commands in a page description language which define the page image to be output;

b) means for generating a set of graphics orders which represent the page image being created from the interpreted page description languate commands, wherein a graphics order is a graphics function represented as a low level primitive, such that:

i) said graphics orders are processed into bands of bitmap images for delivery to the output device at a speed required by the output device so that the generated bands of graphics information needed to produce a complete page image use an amount of memory which is less than the amount of memory which would be needed to store the complete page image; and

ii) while the graphics information in a first one of said bands is being output by said output device, the bitmap images for a second one of said bands are being generated;

c) means for generating said bands of bitmap images from said graphics orders;

d) means for outputting said generated bands of bitmap images to said output device

wherein said graphics orders generation means comprises:

i) graphics interface subsystem means for receiving said interpreted page description language commands and passing said received commands to at least one of a memory manager means, a bit block transfer processor means and an order construction means coupled to a memory;

ii) said memory manager means for allocating and deallocating blocks of said memory in response to requests issued by said graphics interface subsystem means, said order construction means and an order compaction means;

iii) said bit block transfer processor means for drawing pixels in a user memory based upon a pixel drawing command passed by said graphics interface subsystem means;

iv) said order construction means for building graphics orders based upon bit block transfer arguments passed by said graphics interface subsystem means, which built graphics orders operate on a plurality of destination pixel groups;

v) said order compaction means for combining multiple orders operating on the same destination pixel groups built by said order construction means.

**5,502,805**

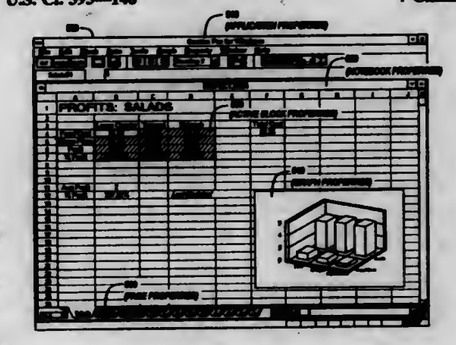
**SYSTEM AND METHODS FOR IMPROVED SPREADSHEET INTERFACE WITH USER-FAMILIAR OBJECTS**

**Charles R. Anderson, Santa Cruz; Robert W. Warfield, Aptos; Istvan Cseri, Scotts Valley; Murray K. Low; Weikuo Liaw, both of Santa Cruz, and Alan M. Bush, Menlo Park, all of Calif., assignors to Borland International, Inc., Scotts Valley, Calif.**

**Continuation of Ser. No. 866,658, Apr. 8, 1992, Pat. No. 5,416,895. This application Jun. 16, 1993, Ser. No. 78,877**

**Int. Cl.[6] G06F 17/30**

**U.S. Cl. 395—148** **7 Claims**




1. In a computer system including a processor, a storage device storing an electronic spreadsheet having a plurality of two-dimensional information-cell matrices, referred to as pages, that define a three-dimensional information-cell matrix, a screen device, and a pointing device for generating a first set of at least one signal designating locations on the screen device and a second set of at least one signal indicating at least one type of event at the designated screen location, a method for allowing a computer user to inspect and modify values corresponding to properties of objects displayed on the screen device, the method comprising operating the computer system to perform the steps of:

displaying said three-dimensional information-cell matrix on the screen device as a selected one of the plurality pages and a row of page identifiers for each of at least some of the other pages, wherein selecting a displayed page identifier causes the corresponding page to be displayed;

any given page of information cells in the three-dimensional matrix having a first set of properties with corresponding values;

any given selected block having a second set of properties with corresponding values, the second set of properties having at least one property that is not in said first set of properties;

in response to signals that include a given type of event, if that given type of event is within a particular page identifier, displaying a dialog box that includes a first list containing the first set of properties, each property on the first list being selectable, and a dialog pane containing elements for indicating and setting values corresponding to the selected property in the first list; and

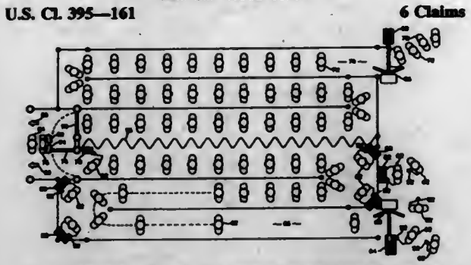
in response to signals that include the same given type of event, if that same given type of event is within a particular selected block of information cells, displaying a dialog box that includes a second list containing the second set of properties, each property on the second list being selectable, and a dialog pane containing elements for indicating and setting values corresponding to the selected property in the second list.

5,502,806

## WAITING LINE MANAGEMENT SYSTEM

Timothy S. Mahoney, 2278 Calle Riocco, Thousand Oaks, Calif. 91362, and Michael V. Ragsdale, 31264 La Baya Dr., Westlake Village, Calif. 91362

Filed Nov. 17, 1994, Ser. No. 341,630
Int. Cl.[6] G06F *15/82*
U.S. Cl. 395—161 6 Claims



1. In combination with a business establishment that has a plurality of separate attractions, each said attraction having a fixed usage capacity of customers per unit of time which said attraction can accommodate, the number of customers located within said business establishment exceeding said fixed usage capacity, a waiting line management system for customers to avail themselves of said attractions comprising:

means for establishing at each said attraction two separate waiting lines comprising a first waiting line and a second waiting line for queuing customers, said first waiting line not requiring reservations, said second waiting line requiring reservations, said second waiting line supplying preferential treatment for the customers to avail themselves of its respective said attraction;

at least one computer access terminal in conjunction with said business establishment, said computer access terminal having a display means for displaying a selectable menus of attractions and its associated time schedule, and recording means for recording customers selected attractions and its associated time schedule;

a plurality of access means usable in conjunction with said computer access terminals, each customer carrying his or her own access means, upon a customer connecting his or her own access means to said computer access terminal the customer being able to place selections according to time so as to schedule access to utilize said second waiting line at each said attraction thereby avoiding said first waiting line; and

each said second waiting line including a control means, activation of said control means being required for a customer to be placed within said second waiting line, activation of said control means being obtained by connection with said access means during an appropriate time slot that has been preselected by the customer.

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5,502,807

## CONFIGURABLE VIDEO SEQUENCE VIEWING AND RECORDING SYSTEM

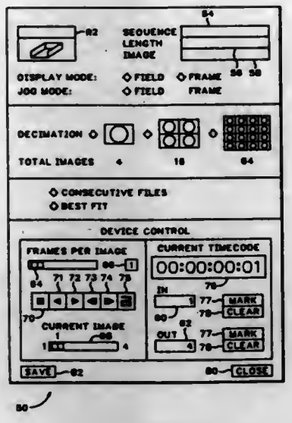
Jeffrey L. Beachy, Wilsonville, Oreg., assignor to Tektronix, Inc., Wilsonville, Oreg.

Filed Sep. 21, 1992, Ser. No. 947,620
Int. Cl.[6] G06T *13/00*
U.S. Cl. 395—152 5 Claims

1. A method of viewing and recording an animation sequence of graphic images comprising the steps of:

storing a specified number of graphic images of the animation sequence in a frame buffer according to a selected decimation factor; and

reading out from the frame buffer selected ones of the graphic images in sequence to provide a full size, real time display of the animation sequence represented by the selected graphic images on a display monitor.



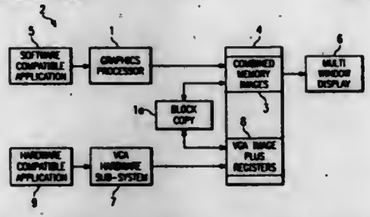

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5,502,808

## VIDEO GRAPHICS DISPLAY SYSTEM WITH ADAPTER FOR DISPLAY MANAGEMENT BASED UPON PLURAL MEMORY SOURCES

Marc Goddard, Vence, and Louis Tannyeres, St. Laurent-du-Var, both of, France, assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 919,691, Jul. 24, 1992, abandoned.
This application Oct. 7, 1994, Ser. No. 320,791
Claims priority, application European Pat. Off., Jul. 24, 1991, 91402072
Int. Cl.[6] G06F *15/00*
U.S. Cl. 395—162 12 Claims




1. A display adapter for connection between a host processor and a display unit of a data processing apparatus to provide management of the display unit in response to control signals from the host processor, said display adapter comprising:

a graphics processor adapted to be connected to the host processor;

a video memory having at least first and second dedicated memory parts, the first memory part of said video memory being adapted to be connected to the display unit;

said graphics processor being responsive to a software application and being connected to the first memory part for providing display data thereto;

a logic based hardware sub-system adapted to be connected to the host processor;

said logic based hardware sub-system being responsive to a hardware application and being connected to the second memory part for providing display data thereto; and

means operably associated with said first and second memory parts for deriving graphics data to provide displays from the first and/or the second memory parts of said video memory for transmission to the display unit, said means for deriving graphics data comprising means for transferring data stored in the second memory part to the first memory part such that data originating from the second memory part is storable with data stored in the first memory part as combined memory data in the first memory part for application to the display unit under the control of said graphics processor.



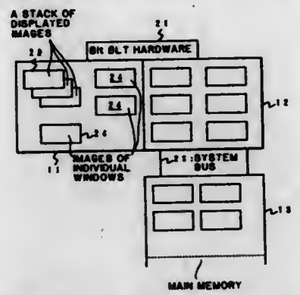
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5,502,809

## IMAGE STORAGE OF A CHANGEABLE DISPLAY

Hajime Takano, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Sep. 6, 1994, Ser. No. 301,874
Claims priority, application Japan, Sep. 16, 1993, 5-229993
Int. Cl.[6] G06F *12/00*
U.S. Cl. 395—164 3 Claims




1. An image storage of a changeable display comprising:

a display for displaying images,

a first VRAM (Video RAM) coupled to said display for storing displayed images,

a second VRAM coupled to said first VRAM for storing saved images,

a BitBLT hardware means coupled to said first and second VRAMs for transferring images between said first VRAM and said second VRAM,

a RAM main memory means coupled to said first and second VRAMs for storing saved images,

an image controller coupled to at least one of said VRAMs and RAM for controlling image transfer among said first VRAM, said second VRAM, and said RAM for storing saved images, and

an optimizer means coupled to at least said second VRAM for keeping optimum allocation of said second VRAM in accordance with a priority assigned to each image.

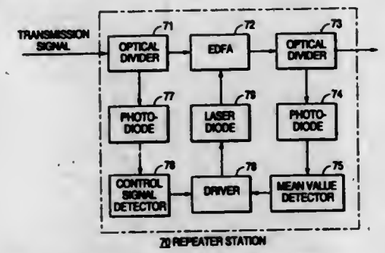
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5,502,810

## OPTICAL TRANSMISSION SYSTEM

Seiji Watanabe, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 22, 1993, Ser. No. 20,372
Claims priority, application Japan, Feb. 20, 1992, 4-070238
Int. Cl.[6] H04B *10/16*
U.S. Cl. 359—177 4 Claims




1. An optical transmission system, comprising:

first and second tributary stations, the first tributary station comprising:

a transmitter for transmitting a light data signal; and

a modulator for modulating an amplitude of said light data signal by a power control signal of plural bits;

a plurality of repeater stations provided in series between said first and second tributary stations, each of said repeater stations comprising:

an optical amplifier for amplifying said light data signal by a predetermined amplification factor;

a demodulator including an O/E converter for converting said amplified light data signal to provide a first electric data signal modulated by an electric power control signal, and means for providing said electric power control signal by detecting a peak value of said first electric data signal;

means for receiving the amplified light data signal from said optical amplifier and detecting a power of said amplified light data signal including an O/E converter for converting said light data signal modulated by said power control signal to provide a second electric data signal modulated by an electric power control signal, and means for calculating a mean value of said second electric data signal;

means for comparing said mean value to a reference signal to provide a difference signal; and

control means including a laser diode for controlling said amplification factor dependent on a light output power thereof to be supplied to said amplifier, and means for controlling an excitation current of said laser diode dependent on said electric power control signal and said difference signal.

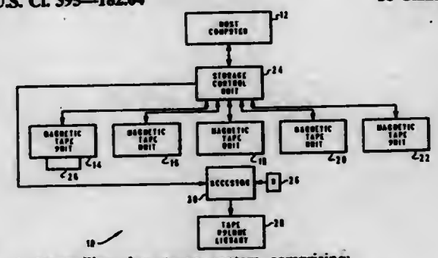
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5,502,811

## SYSTEM AND METHOD FOR STRIPING DATA TO MAGNETIC TAPE UNITS

Richard A. Ripberger, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 29, 1993, Ser. No. 129,228
Int. Cl.[6] G06F *11/34*
U.S. Cl. 395—182.04 18 Claims




1. An auxiliary data storage system, comprising:

a plurality of removable media data storage units;

an array of removable volumes for mounting on the removable media data storage units;

means for mounting the array of removable volumes on the plurality of removable media data storage units;

means for accessing the array at equivalent logical locations on each of the removable volumes of the array for storage or retrieval of a data file distributed across said array of removable volumes;

means, responsive to access of an array of removable volumes, for striping data to the removable volumes by bytes with the bytes being organized into at least a first logical packet for each volume and with the logical packet for some volumes being padded if insufficient data exists to complete the logical packet; and

means, responsive to access of an array of removable volumes, for striping data to the removable volumes by logical blocks and null marks, wherein null marks are placed in a subset of the volumes if a total number of logical blocks striped to said

array of removable volumes is not evenly divisible by a total number of volumes receiving striped data.

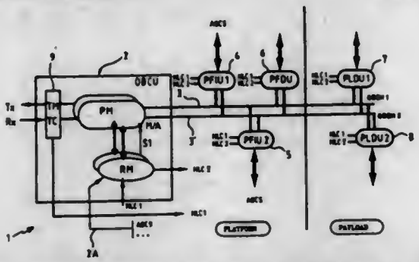
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**5,502,812**

## METHOD OF DETECTING AND PASSIVATING FAULTS IN A DATA PROCESSING SYSTEM AND DATA PROCESSING SYSTEM ADAPTED TO IMPLEMENT IT

**Xavier Leyre, Cannes, and Michel Senaux, Valbonne, both of, France, assignors to Aerospatiale Societe Nationale Industrielle, France**

**Continuation of Ser. No. 955,830, Oct. 2, 1992, abandoned. This application Apr. 6, 1995, Ser. No. 418,264**
**Claims priority, application France, Jan. 4, 1991, 91 12247**
**Int. Cl.[6] G06F *11/00***
**U.S. Cl. 395—182.08** **29 Claims**



1. A method of automatic fault detection and recovery in a data processing system, said data processing system comprising a central control unit, a plurality of system units, a bus, and a plurality of associated coupler units connecting said plurality of system units and said central control unit to said bus, wherein said central control unit comprises a watchdog circuit and a primary processor unit coupled to a reconfiguration module, and each of said plurality of coupler units further includes a corresponding, redundant backup coupler, said method comprising the steps of:

providing a second processor in parallel with said primary processor unit, said second processor not being in service while said primary processor unit is in service;

providing a backup reconfiguration module for said reconfiguration module, said backup reconfiguration module not being in service while said reconfiguration module is in service;

providing a backup bus for said bus;

providing at least one backup system unit for said plurality of system units;

coupling said reconfiguration module to said plurality of system units independently of said bus;

monitoring the operation of said central control unit and said plurality of system units;

upon detection of a fault, said watchdog circuit generating an alarm signal indicative of which component has malfunctioned within said data processing system;

classifying a fault type and severity based on said generated alarm signal; and

selecting one of a plurality of fault recovery options based on the type and severity of said detected fault.

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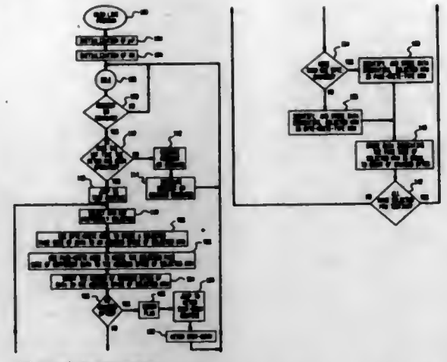
**5,502,813**

## METHOD AND APPARATUS FOR TESTING AN NVM

**Arno Muller, Westport, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.**

**Continuation of Ser. No. 695,624, May 3, 1991, abandoned. This application Jul. 13, 1994, Ser. No. 274,562**
**Int. Cl.[6] G01R *31/28***
**U.S. Cl. 395—183.01** **37 Claims**

1. Apparatus for testing the operational characteristics of an NVM comprising:



(a) a microprocessor

(b) a plurality of NVMs respectively connected to the microprocessor, each of the NVMs having an address space for storing data therein; and

(c) the microprocessor including:

i. means for selecting one of the plurality of NVMs;

ii. means for byte-write-mode writing first data byte-by-byte having a predetermined page size of bytes to the selected NVM for storage in the address space thereof;

iii. means for page-write-mode writing second data bytes-by-bytes having the predetermined page size of bytes to the selected NVM for storage in the address space thereof; and

iv. means for counting the number of bytes in the address space of the selected NVM that have changed as a result of writing the second data, after previously having written the first data, to the selected NVM where the operational characteristics of the selected NVM are dependent on the number of changed bytes.

8. In an electronic circuit including an NVM having an address space, a method of testing the operational characteristics of the NVM comprising the steps of:

(a) byte-write-mode writing first data byte-by-byte having a predetermined page size of bytes to the NVM for storing in the address space thereof;

(b) page-write-mode writing second data bytes-by-bytes having the predetermined page size of bytes to the NVM for storing in the address space thereof; and

(c) counting each byte in the address space of the NVM that has changed as a result of writing the second data, after previously having written the first data, to the NVM where the operational characteristics of the NVM are dependent on the number of changed bytes.

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**5,502,814**

## METHOD OF DETECTING DEFECTIVE MEMORY LOCATIONS IN COMPUTER SYSTEM

**Kazuhiro Yuuki, and Satoru Sakai, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

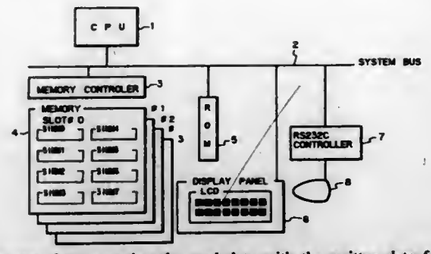
**Filed Jun. 29, 1993, Ser. No. 83,179**
**Claims priority, application Japan, Jun. 30, 1992, 4-172107**
**Int. Cl.[6] G06F *12/06;11/20***
**U.S. Cl. 395—183.08** **12 Claims**

1. A computer system having a central processing unit, a system bus, a memory controller connected to said central processing unit through said system bus, a memory connected to said memory controller, said memory including a plurality of slots, and each of said slots including a plurality of memory modules, said computer system comprising:

means for writing data to a memory address for diagnosing a main memory including a plurality of slots, each of said plurality of slots including a plurality of memory modules;

means for reading the written data from said memory address of said main memory;





means for comparing the read data with the written data for determining whether or not they agree with each other;

means for determining a slot number of one of said plurality of slots corresponding to the memory address, when said comparing means determines that the read data disagree with the written data;

means for determining a memory size corresponding to the determined slot number;

means for determining relationships between data bit positions and memory module numbers of said plurality of memory modules according to the determined memory size, and for determining a memory module number corresponding to a disagreeing data bit position of the read data compared to the written data as an abnormal memory according to the determined relationships; and

means for specifying the slot number and the memory module number of the abnormal memory.

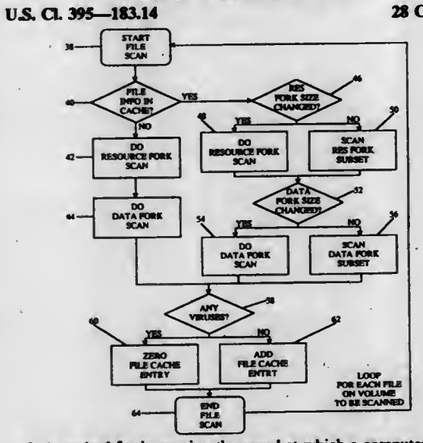
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**5,502,815**

## METHOD AND APPARATUS FOR INCREASING THE SPEED AT WHICH COMPUTER VIRUSES ARE DETECTED

**Paul D. Cozza, HC 61, Box 023A, Damariscotta, Me. 04543**

**Filed Mar. 30, 1992, Ser. No. 860,048**
**Int. Cl.[6] G06F *11/00;11/30***
**U.S. Cl. 395—183.14** **28 Claims**



1. A method for increasing the speed at which a computer scans for the presence of a computer virus, said method comprising the steps of:

gathering initial state information about an initial state of a file;

storing said initial state information in a scan information cache on a non-volatile storage medium;

gathering current state information about a current state of said file;

determining whether said initial state information for said file stored in said scan information cache differs from said current state information thereby indicating the potential presence of a computer virus which alters the current state information of said file;

scanning said file, for only a subset of all viruses, if said file is determined to have initial state information in said scan information cache which is the same as said current state information, said subset including only viruses would not cause an alteration in said current state information for said file.

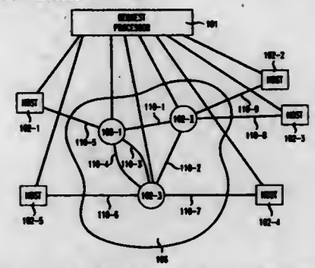
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**5,502,816**

## METHOD OF ROUTING A REQUEST FOR A VIRTUAL CIRCUIT BASED ON INFORMATION FROM CONCURRENT REQUESTS

**Rainer Gawlick, Boston, Mass.; Charles R. Kalmanek, Jr., Short Hills, and Kajamalai G. Ramakrishnan, Berkeley Heights, both of N.J., assignors to AT&T Corp., Murray Hill, N.J.**

**Filed Mar. 25, 1994, Ser. No. 218,390**
**Int. Cl.[6] G06F *15/173;* H04J *3/26***
**U.S. Cl. 395—200.15** **9 Claims**



1. A method of routing a set of requests for virtual circuits comprising the steps of:

receiving a set of requests for virtual circuits wherein each request is specified by one or more parameters; and

routing each request in said set of requests on a path through a network, wherein said path is selected as a function of one or more parameters of a plurality of the requests.

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**5,502,817**

## ULTRA HIGH SPEED PARALLEL DATA FUSION SYSTEM

**Norris Krone, Annandale; Roger Pierson, Castleton, both of Va.; Glenn Connor, Laurel, and Virgil Davis, Fulton, both of Md., assignors to University Research Foundation, Inc., Greenbelt, Md.**

**Filed Apr. 2, 1993, Ser. No. 42,273**
**Int. Cl.[6] G06F *13/38;* H04J *3/02***
**U.S. Cl. 395—200.16** **5 Claims**

2. A high speed data collection, processing and distribution system for coupling a plurality of digital data sources to a plurality of digital data processors, comprising:

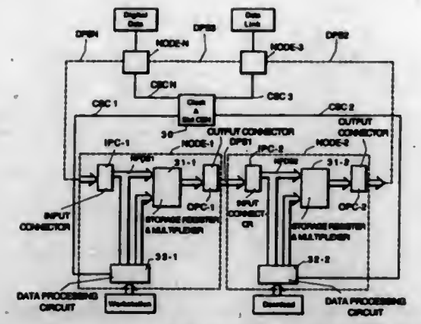
a plurality of segmented parallel data paths and a plurality of nodes connecting said segmented parallel data paths to a limitless ring, each node of said plurality of nodes including:

an input connector means for connecting the end of one of said segments of parallel data paths on a one-for-one basis,

a data multiplexer,

a plurality of node parallel data paths in said node corresponding to said segmented parallel data paths, respectively, and connected to said input connector means and said data multiplexer such that data input to said multiplexer data corresponds to respective ones of said segmented parallel data paths,

a processor means coupled to said node parallel data paths, and as a second input to said multiplexer means,



a common source of clock signals and means for generating a slot signal for each node connected to said processor means for controlling the timing thereof, and wherein:

each said node further including:

a receiver FIFO buffer memory for storing messages in bit parallel fashion,

an address matcher circuit connected to said input connector means for detecting if a node specific incoming message on said segmented parallel data paths is addressed to the node and causing said incoming node specific message to be stored in the receiver FIFO buffer memory,

means for asynchronously writing said receiver FIFO buffer memory from the parallel paths on the ring and reading said receiver FIFO buffer memory by said processor means.

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**5,502,818**

**PROCEDURE FOR THE DETERMINATION OF MESSAGE IDENTIFICATION IN THE DATA TRANSMISSION NETWORK OF AN ELEVATOR SYSTEM**

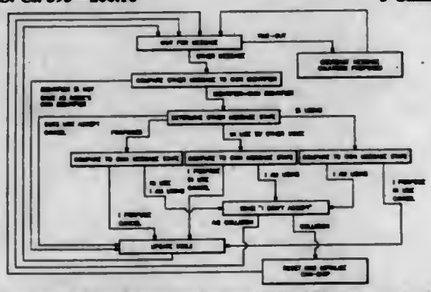
**Lauri Lamberg, Hyvinkaa, Finland, assignor to Kone Elevator GmbH, Baar, Switzerland**

**Continuation of Ser. No. 822,204, Jan. 17, 1992, abandoned. This application Jun. 15, 1994, Ser. No. 261,209**

**Claims priority, application Finland, Jan. 17, 1991, 910260**

**Int. Cl.[6] G06F *13/00*; H04Q *5/02***

**U.S. Cl. 395—200.16** **5 Claims**



1. A method for determining message identifiers in a controller area network (CAN) of an elevator system having a plurality of nodes, wherein a predetermined number of predetermined message identifiers are used in the transmission of messages between nodes of said network, said method being implemented simultaneously by each node in the network and comprising the steps of:

monitoring data transmissions taking place in the network, and storing those message identifiers being used by other nodes of the network, and storing a respective message state of each message identifier being used by other nodes of the network;

selecting a message identifier, from among said predetermined message identifiers, that is not among those message identifiers being used by other nodes of the network, and waiting for a first delay period, the duration of said first delay period being equal to a predetermined delay period plus a random delay period;

following expiry of the first delay period, performing an availability test by sending an "I propose" message containing the selected message identifier and a random number into the network, the random delay period preventing simultaneous transmission of "I propose" messages from each node in the network, and the random number ensuring that a detectable collision occurs even if "I propose" messages are transmitted simultaneously and waiting for a second period of time;

if no cancellation reply is received from another node and a message collision is not detected before expiry of the second delay period, sending an "In use" message containing the selected message identifier into the network, and waiting for a third delay period;

if no cancellation reply is received from another node and a message collision is not detected before expiry of the third delay period, sending an "I am using" message containing the selected message identifier into the network;

wherein said "I propose", "In use" and "I am using" messages constitute messages having progressively higher message states and wherein, following the transmission of each said "I propose", "In use", and "I am using" messages, a node sends a cancellation message to another node if it receives, from the other node, a message having the same message identifier and any one of an equal or a lower message state; and

if, before the expiry of each of the first and second delay periods, no message is received from another node of the network whose respective message state is either "I propose" or "In use", reducing said stored message state of the message identifier associated with said other nodes.

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**5,502,819**

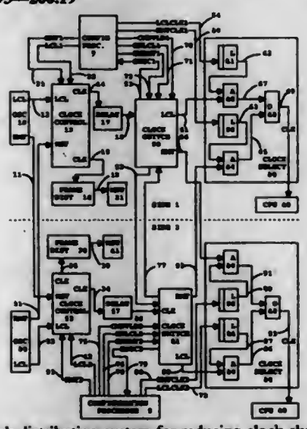
**CLOCK DISTRIBUTION SYSTEM FOR REDUCING CLOCK SKEW BETWEEN PROCESSORS IN A DUAL SIDED TIGHTLY COUPLED SYSTEM**

**Gregory Aldrich, San Jose; Stephen S.-C. Si, Sunnyvale; Eugene T. Wang, Fremont, all of Calif., and Gary A. Woffinden, Rexburg, Id., assignors to Amdahl Corporation, Sunnyvale, Calif.**

**Filed Nov. 2, 1992, Ser. No. 970,127**

**Int. Cl.[6] G06F *13/00***

**U.S. Cl. 395—200.19** **13 Claims**



1. A clock distribution system for reducing clock skew between tightly coupled central processing units in a multi-processor system where said multi-processor system includes a configuration processor for generating a plurality of configuration signals including a first configuration signal and a second configuration signal, a first clock for generating a first local clock and a first remote clock, a second clock for generating a second local clock and a second remote signal, a first processor having a first central processing unit and a first master storage unit, a second processor having a second central processing unit and a second master storage unit, a first clock controller for generating a first delayed clock signal from said first local clock or said second remote clock in accordance with said configuration signals and a second clock controller for generating a second delayed clock signal from said first remote clock or said second local clock in accordance with said configuration signals, said clock distribution system comprising:

distribution means connected to said configuration processor, said first clock controller and said second clock controller for receiving said first delayed clock signal, said second delayed clock signal and said configuration signals and for distributing in accordance with said configuration signals either (1) said first delayed clock to said first central processing unit and said second delayed clock to said second central processing unit, or (2) said first delayed clock signal to both said first and said second central processing unit, or (3) said second delayed clock signal to both said first and said second central processing unit.



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**5,502,820**

**MICROPROCESSOR HAVING HIGH SPEED, LOW NOISE OUTPUT BUFFERS**

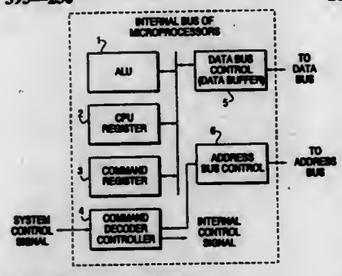
**Atsushi Hiraishi, Oume; Takashi Akioka, Hitachi; Yutaka Kobayashi, Katsuta; Yuji Yokoyama, Hitachi; Masahiro Iwamura, Hitachi; Tatsumi Yamauchi, Hitachi; Shigeru Takahashi, Hitachiohta; Hideaki Uchida, and Akira Ide, both of Takasaki, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Division of Ser. No. 608,370, Nov. 2, 1990, Pat. No. 5,398,318. This application Feb. 8, 1995, Ser. No. 385,656**

**Claims priority, application Japan, Nov. 2, 1989, 1-284731**

**Int. Cl.[6] H03K *17/16*; G06F *13/00***

**U.S. Cl. 395—250** **28 Claims**



1. A microprocessor comprising:

an internal bus for transmitting signals;

an arithmetic and logical operation unit, connected to said internal bus, for conducting arithmetic and logical operations;

a data bus control unit, connected to said internal bus, for controlling input/output of data between a data bus and said internal bus;

a CPU register, connected to said internal bus, for loading said data from said data bus control unit;

an instruction register, connected to said internal bus, for loading instruction data from said data bus control unit;

an instruction decoder for decoding instructions;

an internal/external control unit for controlling internal and external circuits; and

an address bus control unit coupled between an address bus and said internal/external control unit for controlling the address bus;

wherein at least one of said internal/external control unit for outputting control signals, said data bus control unit for outputting data and said address bus control unit includes an output data buffer having a circuit for charging and discharging an external load comprising:

a plurality of output transistors coupled in parallel with each other, one end of each transistor being coupled to a power supply terminal or to a ground terminal, and another end of each transistor being coupled to the external load through an output terminal,

wherein said plurality of output transistors forms an output buffer circuit coupled to an input terminal through driving circuits, and

wherein at least one of said plurality of output transistors has characteristics different from characteristics of the other output transistors of said plurality of output transistors wherein starting times of said at least one of said output transistors will be different from starting times of said other output transistors during both charging and discharging operations of said external load.

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**5,502,821**

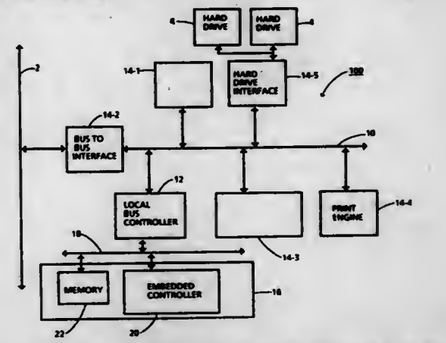
**METHOD OF DETERMINING DEVICES REQUESTING THE TRANSFER OF DATA SIGNALS ON A BUS**

**Uoc H. Nguyen, Long Beach; Sam S. Su, Rowland Hts., and Li-Fung Cheung, Alhambra, all of Calif., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Jun. 29, 1992, Ser. No. 909,511**

**Int. Cl.[6] G06F *13/00***

**U.S. Cl. 395—280** **1 Claim**



1. A method for determining readiness of devices in a digital data bus system to transfer data signals, the bus system including a bus having a clock line for communicating a clock signal, address lines for communicating address signals, data lines for communicating data signals, and control lines for communicating control signals, a plurality of devices, each device connected to the bus and having an address on the bus, at least one device being a source device capable of sending data signals and at least one device being a destination device capable of receiving data signals, and a bus controller connected to the bus for controlling the bus, the control lines including bus request lines connecting each device to the bus controller for communicating a bus request signal from a device to the bus controller, the bus request signal for indicating that the device is ready to send or receive data signals,

the method comprising the steps of:

the bus controller storing into matching logic the identities of possible source and destination devices,

generating a list of device pairs and the direction of data flow between which the transfer of data signals will be allowed,

generating, by a source device, a bus request signal on the bus request lines indicating whether the source device is ready to send data signals on the data lines;

generating, by a destination device, a bus request signal on the bus request lines indicating whether the destination device is ready to receive data signals on the data lines; and

receiving, by the matching logic, the bus request signal generated by the source device and the bus request signal generated by the destination device and, provided the pair of destination and source device are a pair allowed to

transfer data signals, deciding based on the received bus request signals whether the pair of the destination and source devices is ready to send and receive data signals.

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**5,502,822**

## ASYNCHRONOUS DATA TRANSMISSION SYSTEM

**Makoto Takebe, Kanagawa, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan**

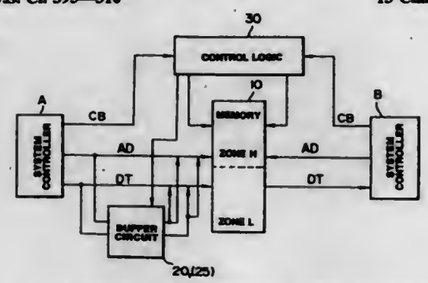
**PCT No. PCT/JP91/00632, § 371 Date Nov. 12, 1992, § 102(e) Date Nov. 12, 1992, PCT Pub. No. WO91/18346, PCT Pub. Date Nov. 28, 1991**

**PCT Filed May 14, 1991, Ser. No. 938,837**

**Claims priority, application Japan, May 14, 1990, 2-123461**

**Int. Cl.[6] G06F *13/38***

**U.S. Cl. 395—310** **13 Claims**




1. An asynchronous data transmission system for asynchronously transmitting data from a first system controller to a second system controller wherein first and second memories for writing therein output data of said first system controller and for reading out the written data to said second system controller are provided, said first system controller performing its data writing operation to said first and second memories during a predetermined period, and said second system controller performing its data reading operation from said first and second memories at a period different from the writing period of said first system controller, said system comprising:

first control means for controlling the data writing operation of the first system controller so that the output data of the first system controller is alternately written into said first and second memories in response to data transmission of said first system controller to said second system controller;

second control means, at the time when said first system controller is about to perform the writing operating, if said second system controller is performing the reading operation over one of said first and second memories, for allowing said first system controller to immediately write the output data of said first system controller into the other memory opposite to said one of said first and second memories over which said second system controller is performing the reading operation;

identification storage means for identifying which of said first and second memories is used during the writing operation of said first system controller and for updating and storing identification data each time the writing operation of said first system controller is performed;

third control means, at the time when said second system controller is about to receive data, if said first system controller is not performing the writing operation, for selecting one of said first and second memories over which the data writing operation was just performed based on the data stored in said identification storage means and allowing said second system controller to immediately read out data from the selected memory; and

fourth control means, at the time when said second system controller is about to perform the reading operation, if said first system controller is performing the writing operation, for allowing said second system controller to immediately read out the data from the other memory opposite to said one of said first and second memories over which said first system controller is performing the writing operation.

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**5,502,823**

## BUS SYSTEM WITH VIRTUAL LOGICAL BUFFER

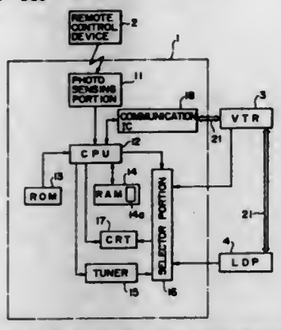
**Shigeo Tanaka, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Filed Feb. 16, 1993, Ser. No. 18,207**

**Claims priority, application Japan, Feb. 13, 1992, 4-059499**

**Int. Cl.[6] G06F *13/10***

**U.S. Cl. 395—310** **3 Claims**




1. A bus system, including electronic units connected with a bus line and controlled according to program controlling data transmitted over the bus line, the bus system comprising:

program storage means for storing a plurality of program data including the program controlling data;

a communication circuit connected to the bus line, for transmitting the program controlling data to the electronic units via the bus line; and

memory means including a virtual logical buffer for temporarily storing the program controlling data in units of frames, and supplying the program controlling data to the communication circuit to be transmitted to the electronic units;

controlling means including a first control unit for controlling a transfer of the program controlling data from the program storage means to the memory means, and a second control unit for supplying interrupt signals to the virtual logical buffer at predetermined time intervals and thereby controlling a transfer of the program controlling data in units of bits from the virtual logical buffer to the communication circuit.

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**5,502,824**

## PERIPHERAL COMPONENT INTERCONNECT "ALWAYS ON" PROTOCOL

**Thomas F. Heil, Easley, S.C., assignor to NCR Corporation, Dayton, Ohio**

**Filed Dec. 28, 1992, Ser. No. 997,427**

**The portion of the term of this patent subsequent to Feb. 21, 2012, has been disclaimed.**

**Int. Cl.[6] G06F *13/364***

**U.S. Cl. 395—293** **7 Claims**

1. A component interconnect apparatus, comprising:

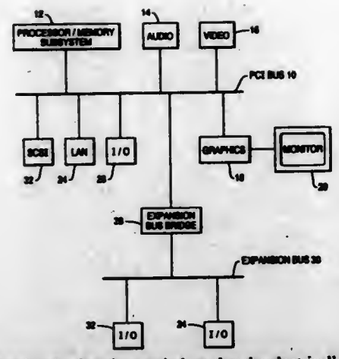
(a) a plurality of electrically conductive signal connections coupled between a plurality of electronic devices for communicating electrical signals between the electronic devices,

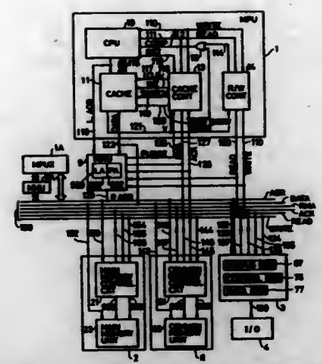
(b) a central arbiter device for selecting by arbitration a first one of the electronic devices for actively and exclusively driving one or more of the electrically conductive signal connections to a logic 1 or 0 value during a first time period, and for selecting by arbitration a second device for actively and exclusively driving the electrically conductive signal connections to a logic 1 or 0 value during a second time period following the first time period, so that the electrically conductive signal connections are never left floating for an extended period, thereby eliminating the need for pull-up resistors coupled to the electrically conductive signal connections;

(c) each electronic device that requests exclusive control of the electrically conductive signal connections having a request signal line and grant signal line connected to the central arbiter device, the request signal line indicating to the central arbiter device that the device desires use of the electrically conductive signal connections, and the grant signal line indicating to the device that access to the electrically conductive signal connections has been granted by the central arbiter device; and

(d) the central arbiter device further comprising arbitration parking means for asserting the grant signal line to a selected device not requesting access to the electrically conductive signal connections when no other device is requesting access to the electrically conductive signal connections, thereby effectively designating the selected device as a default owner of the electrically conductive signal connections, so that the electrically conductive signal connections will not float.






a first memory means coupled to said bus means for storing data, to said first memory means a first memory address region of said plurality of memory address regions being assigned, and said first memory means being accessed with said physical address which is output to said bus means and belongs to said first memory address region;

a device coupled to said bus means including a second memory means for storing data, to said device a second memory address region of said plurality of memory address regions being assigned, and said second memory means being accessed with said physical address which is output to said bus means and belongs to said second memory address region; and

a control signal generating means coupled to said bus means for receiving said physical address and for generating a control signal to be delivered to said cache control means in response to said physical address which belongs to said second memory address region, wherein said control signal received by said cache control means inhibits said data storing operation of said cache memory.

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**5,502,825**

## DATA PROCESSING SYSTEM WITH AN ENHANCED CACHE MEMORY CONTROL

**Tadahiko Nishimukai, Sagamihara; Atsushi Hasegawa, Koganei, and Masaru Matsumura, Hachioji, all of, Japan, assignors to Hitachi, Ltd., and Hitachi Micro Computer Engineering, Ltd., both of Tokyo, Japan**

**Continuation of Ser. No. 804,739, Dec. 11, 1991, which is a continuation of Ser. No. 183,401, Apr. 8, 1988, Pat. No. 5,148,526, which is a continuation of Ser. No. 694,126, Jan. 23, 1985, abandoned. This application Mar. 29, 1995, Ser. No. 413,110**

**Claims priority, application Japan, Jan. 23, 1984, 59-8572; Jun. 1, 1984, 59-110764**

**Int. Cl.[6] G06F *12/00***

**U.S. Cl. 395—375** **16 Claims**

1. A data processing system in which a plurality of memory address regions are assigned, said data processing system comprising:

a bus means;

a processing means coupled to said bus means for executing an instruction and for generating a logical address;

a cache memory coupled to said processing means for storing data;

a cache control means coupled to said cache memory for controlling a data storing operation of said cache memory;

an address converter means coupled to said processing means and said bus means for converting said logical address into a physical address which belongs to said plurality of memory address regions and for outputting said physical address to said bus means;

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**5,502,826**

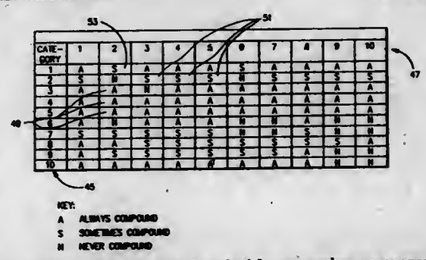
## SYSTEM AND METHOD FOR OBTAINING PARALLEL EXISTING INSTRUCTIONS IN A PARTICULAR DATA PROCESSING CONFIGURATION BY COMPOUNDING INSTRUCTIONS

**Stamatis Vassiliadis, Vestal, and Bartholomew Blaner, Newark Valley, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Continuation of Ser. No. 13,982, Feb. 5, 1993, abandoned, which is a continuation of Ser. No. 519,384, May 4, 1990, abandoned. This application Jan. 25, 1994, Ser. No. 186,221**

**Int. Cl.[6] G06F *9/44***

**U.S. Cl. 395—375** **8 Claims**




1. A computer implemented method for processing a sequence of binary encoded scalar instructions, each instruction including an operation code, prior to fetching for execution in a data processing system, which places constraints on parallel instruction execution, including the steps of:

transferring said sequence of binary encoded scalar instructions from a data storage unit to an instruction compounding unit;

assigning each operation code in said sequence of instructions to one of a plurality categories based on a function performed by said data processing system in response to said operation code, the number of said categories being less than the number of operation codes in said sequence of instructions;

storing in said data processing system matrix data that encodes which instruction pairs in said sequence of instructions are compoundable based on the category assigned to the operation code of each adjacent instruction of said instruction pairs;

processing groups of instructions in said compounding unit to generate a compounding instruction for instruction pairs by comparing to said matrix data the category assigned in said assigning step respectively to each instruction of the instruction pairs in said group of instructions.

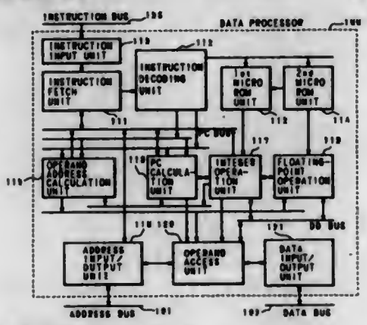
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**5,502,827**

**PIPELINED DATA PROCESSOR FOR FLOATING POINT AND INTEGER OPERATION WITH EXCEPTION HANDLING**

**Toyohiko Yoshida, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 135,869, Oct. 13, 1993, abandoned, which is a continuation of Ser. No. 614,339, Nov. 13, 1990, abandoned. This application May 12, 1995, Ser. No. 439,716**
**Claims priority, application Japan, Nov. 16, 1989, 1-299395**
**Int. Cl.[6] G06F *9/38***
**U.S. Cl. 395—375** **5 Claims**




2. A data processor comprising:

an instruction decoding unit for decoding an instruction;

a first operation unit coupled to said instruction decoding unit for executing a first kind of operation instruction decoded in said instruction decoding unit;

a second operation unit coupled to said instruction decoding unit for executing a second kind of operation instruction decoded in said instruction decoding unit and for outputting an exception signal when an arithmetic operation exception occurs during execution of said second kind of operation instruction;

a control unit, coupled to said second operation unit, for accepting said exception and for activating an exception processing handler when said exception signal is asserted during execution of said second king of operation instruction;

a register, coupled to said control unit, and to said first operation unit for selectively controlling the time when said control unit accepts said exception, and wherein

when said register stores a first value, said control unit accepts said exception and activates the exception processing handler after said first operation unit executes a first given one of said first kind of operation instruction and before said first operation unit executes a next one of said first kind of operation instruction and, when said register stores a second value, said control unit accepts said exception and activates said exception processing after said first operation unit executes a first kind of operation instruction and before said second operation unit executes a next second kind of operation instruction; and

wherein each of said first and second kinds of operation instructions are executed by said first and second operation units regardless of the status of the value stored in said register.

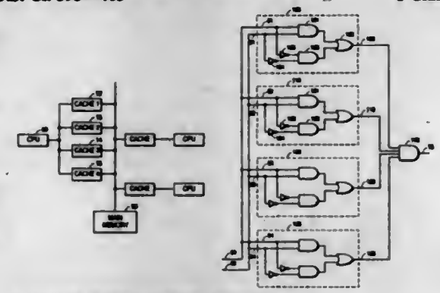
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**5,502,828**

**REDUCING MEMORY ACCESS IN A MULTI-CACHE MULTIPROCESSING ENVIRONMENT WITH EACH CACHE MAPPED INTO DIFFERENT AREAS OF MAIN MEMORY TO AVOID CONTENTION**

**Salim A. Shah, Austin, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.**

**Filed Dec. 18, 1992, Ser. No. 993,005**
**Int. Cl.[6] G06F *12/08***
**U.S. Cl. 395—403** **1 Claim**




1. A cache memory system, comprising:

a first Central Processing Unit (CPU), said first CPU outputting a memory access request including a memory address;

a shared memory bus;

a main memory;

a plurality of cache memories connected to be directly accessible by said first CPU and connected to access said main memory through said shared memory bus, each of said cache memories having an associated memory address range indicating a range of addresses which are permitted to be stored in said each of said cache memories; and

a second CPU with copy back, said second CPU having at least one associated cache memory connected to said main memory through said shared memory bus to carry out said copy back to said main memory,

wherein each of said cache memories connected to said first CPU monitors an address of a memory access request transmitted over said shared memory bus to determine if said address on said shared memory bus lies within its associated memory address range, such that said each of said cache memories connected to said first CPU is accessed to search an address of said copy back only when said address of said copy back lies within said associated memory address range.

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**5,502,829**

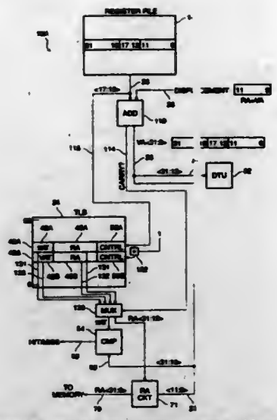
**APPARATUS FOR OBTAINING DATA FROM A TRANSLATION MEMORY BASED ON CARRY SIGNAL FROM ADDER**

**Howard G. Sachs, Belvedere, Calif., assignor to Intergraph Corporation, Huntsville, Ala.**

**Filed Nov. 3, 1993, Ser. No. 148,219**
**Int. Cl.[6] G06F *12/10***
**U.S. Cl. 395—417** **21 Claims**

1. In a computing system having an addressable translation memory for translating virtual addresses, the virtual addresses being formed by adding a displacement address to a base address, an apparatus for obtaining data from the translation memory comprising:






a first adder for adding the displacement address to the base address, the adder including carry indicating circuitry for generating a carry indicating signal indicating whether the addition of the displacement address to the base address results in a carry;

addressing circuitry, coupled to the translation memory, for addressing the translation memory with a subset of bits from the base address so that the translation memory outputs multiple address translation entries substantially simultaneously; and

a multiplexer, coupled to the translation memory and to the carry indicating circuitry, for selecting one of the address translations output from the translation memory in response to the carry indicating signal.

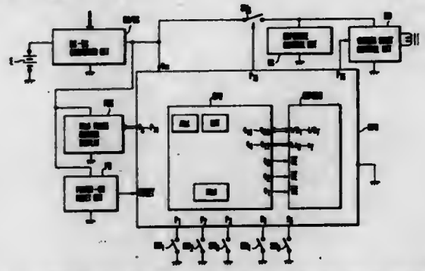
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**5,502,830**

**CAMERA WITH MEMORY ADDRESS DESIGNATION FEATURE**

**Yoshihiko Aihara, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 560,217, Jul. 25, 1990, abandoned, which is a continuation of Ser. No. 139,972, Dec. 31, 1987, abandoned. This application Sep. 8, 1993, Ser. No. 117,658**
**Claims priority, application Japan, Jan. 12, 1987, 62-3131**
**Int. Cl.[6] G06F *12/06*; G03B *17/00***
**U.S. Cl. 395—421.07** **4 Claims**



1. A camera provided with a memory circuit having a plurality of addresses, comprising:

a) an information portion for storing an information value corresponding to a number of times that a new film cartridge is loaded in the camera;

b) an address designation circuit for designating addresses on the basis of the information value stored in said information portion, said designation circuit designating a different address each time that the information value in said information portion changes a predetermined number of times; and

c) a control circuit for effecting at least one of writing and reading photographic information to and from the addresses designated by said address designating circuit.

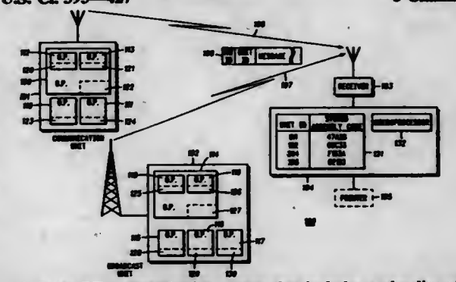
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**5,502,831**

**METHOD FOR DETECTING UNAUTHORIZED MODIFICATION OF A COMMUNICATION OR BROADCAST UNIT**

**Gary W. Grube, Palatine, and Timothy W. Markison, Hoffman Estates, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.**

**Continuation of Ser. No. 23,298, Feb. 26, 1993. This application Aug. 13, 1993, Ser. No. 106,029**
**Int. Cl.[6] G06F *12/14***
**U.S. Cl. 395—427** **8 Claims**



1. In an RF communication system that includes a plurality of communication units, wherein each of the communication units includes at least one module and at least one software program, a method of detecting an unauthorized modification of a communication unit of the plurality of communication units, the method comprises the steps of:

a. detecting, by the communication unit, expiration of a predetermined time period;

b. when the predetermined time period has expired, transmitting, by the communication unit, a message via an RF communication resource, wherein the message includes a unit identification code and an assembly code, the assembly code based on, at least in part, an identification code of the at least one module and an identification code of the at least one software program;

c. receiving, by an RF receiver, the message;

d. transporting the message from the RF receiver to a database unit;

e. accessing, by the database unit, a stored assembly code based on the unit identification code;

f. comparing, by the database unit, the assembly code to the stored assembly code;

g. indicating, by the database unit, that an unauthorized modification of the communication unit has occurred when the assembly code does not substantially match the stored assembly code.

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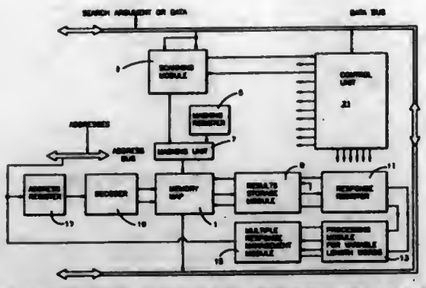
**5,502,832**

**ASSOCIATIVE MEMORY ARCHITECTURE**

**Tahar Ali-Yahia, Vivo Jeay, and Michel Dana, Paris, both of, France, assignors to France Telecom-Etablissement Autonome De Droit Public, Paris, France**

**Filed Jan. 28, 1993, Ser. No. 10,600**
**Claims priority, application France, Jan. 31, 1992, 92 01082**
**Int. Cl.[6] G06F *12/04***
**U.S. Cl. 395—435** **5 Claims**

1. An associative memory allowing for the comparison of search data with a multiplicity of data stored in at least one data register and available at the outpupts of said data register, comprising:



Comparison means (1, 3, 5, and 7) with inputs connected to the outputs of the data register for processsing the search data and comparing the search data with the stored data, these comparison means supplying result data at no less than one output, said comparison means including a masking unit, a preprocessing unit, and a memory map, said preprocessing unit generating, on the basis of the search data, comparison data to execute a plurality of comparison functioas in the memory map, said masking unit being connected to an output of the preprocessing unit and to an input of the memory map and being operable to mask at least one part of a word of a comparison datum so that the unmasked part of the word is compared, in the memory map, with the corresponding parts of the words of the stored data;

Manipulation means with at least one input connected to the output of the comparison means for processing the result data obtained after comparison of the search data with the stored data;

A control unit (21) to control information exchanges between the comparison means and the manipulation means, wherein the manipulation means include a processing unit for variable-length word associations (13), each search datum and stored datum, including a word or an association of variable length words.

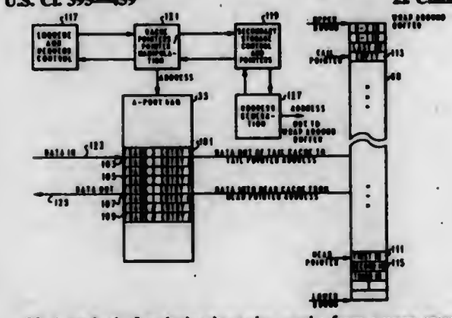
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**5,502,833**

**SYSTEM AND METHOD FOR MANAGEMENT OF A PREDICTIVE SPLIT CACHE FOR SUPPORTING FIFO QUEUES**

**Jonathan W. Byrn, and Gary S. Delp, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Mar. 30, 1994, Ser. No. 221,140**
**Int. Cl.[6] G06F *12/00;13/00***
**U.S. Cl. 395—459** **22 Claims**



22. A method of replacing items in a cache from a wrap around buffer, the method comprising:

dividing the cache into a tail portion and a head portion;

beginning ageing of items upon first being written to the tail portion of the cache;

responsive to demand, reading an oldest item in the cache from the head portion;

responsive to an excess number of items in the cache, moving an oldest item from the tail portion to the wrap around buffer;

responsive to an opening in the head portion and presence of an item in the wrap around buffer, moving an oldest item in the wrap around buffer to the head portion;

responsive to an opening in the head portion and lack of any items in the wrap around buffer, moving the oldest item in the tail portion directly to the head portion.

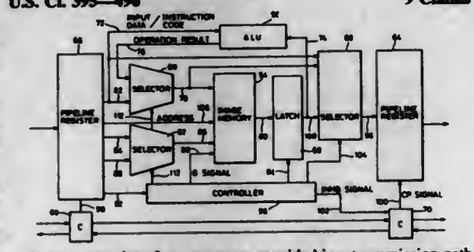
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**5,502,834**

**MEMORY INTERFACE APPARATUS FOR CARRYING OUT COMPLEX OPERATION PROCESSING**

**Katsumi Arata, Tenri; Shinichi Yoshida, Kashihara, and Tsuyoshi Muramatsu, Tenri, all of, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Mar. 22, 1994, Ser. No. 215,564**
**Claims priority, application Japan, Mar. 22, 1993, 5-061675**
**Int. Cl.[6] G06F *13/12***
**U.S. Cl. 395—496** **9 Claims**



1. A memory interface apparatus provided in a transmission path of a data packet including an instruction code, a generation number, and data, and responsive to an input of the data packet for accessing a predetermined memory, comprising:

first holding means for holding the data packet from said transmission path to provide the instruction code, the generation number modified by the data, and the data separately;

memory access means for accessing said predetermined memory according to said instruction code;

means for receiving an output of said predetermined memory;

operating means having two inputs connected so as to receive data from said first holding means and an output of said receiving means, respectively, for carrying out an operation specified by the instruction code from said first holding means with respect to a value at said two inputs for output of a result;

input selecting means responsive to a select signal for selecting one of data from said first holding means and an output of said operating means to apply a selected result to said predetermined memory as data;

output means for producing a data packet including a result of a series of complex operations carried out by said first holding means, said predetermined memory, and said operating means for output;

transmission control means for controlling transmission of a data packet on said transmission path carried out by said first holding means and said output means; and

control means responsive to the instruction code from said first holding means for controlling said operating means, said memory access means, said predetermined memory, said receiving means, said input selecting means, said output means, and said transmission control means so that a series of complex operation processing is carried out including an access to said predetermined memory specified by said instruction code.

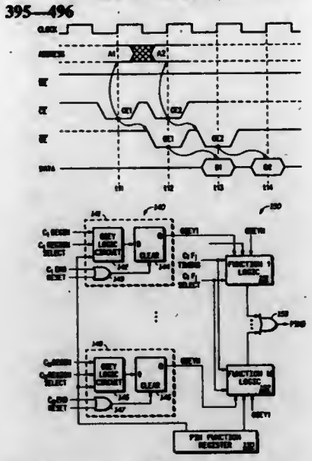


**5,502,835**

**METHOD FOR SYNCHRONOUSLY ACCESSING MEMORY**

**Chinh H. Le; Gerald E. Vauk, Jr., both of Austin, Tex., and Terry E. Downs, Farmington Hills, Mich., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Aug. 31, 1994, Ser. No. 298,885**
**Int. Cl.[6] G06F *12/00***
**U.S. Cl. 395—496** **14 Claims**



9. A method for an integrated circuit microprocessor to synchronously access memory, comprising the steps of:

externally driving a first address for a first memory access during a first clock period;

activating a first external control signal during said first clock period to indicate an address phase of said first memory access;

externally driving a second address for a second memory access during a second clock period;

activating said first external control signal during said second clock period to indicate an address phase of said second memory access; and

receiving and internally latching a first data element accessed by said first address during a third clock period immediately subsequent to said second clock period.

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**5,502,836**

**METHOD FOR DISK RESTRIPING DURING SYSTEM OPERATION**

**Robert P. Hale, and Robert J. Beard, both of Irvine, Calif., assignors to AST Research, Inc., Irvine, Calif.**

**Continuation of Ser. No. 795,658, Nov. 21, 1991, abandoned.**
**This application Jul. 19, 1995, Ser. No. 504,144**
**Int. Cl.[6] G06F *11/20***
**U.S. Cl. 395—497.01** **5 Claims**

1. A method of expanding a striped hard disk array for a computer system during computer system operation, said hard disk array controlled by a hard disk controller which reports to a computer operating system an original data storage capacity of the array when the array is in a first fully operational configuration and which receives requests for access to the array from said operating system, the first fully operational configuration of the array having at least two original physical disk drives with data striped across the disks, wherein the corresponding stripe for each disk in the array is one row, the method comprising the steps of:

(a) adding at least one added physical disk drive to the two original disk drives in the disk array to create an upgraded data storage capacity in a second fully operational configuration of the array, the second fully operational configuration comprising the original disk drives and the added disk drive, said upgraded storage capacity being an increase from said original data storage capacity;

(b) selecting a row in the disk array for expansion to incorporate a portion of the added disk;

(c) waiting for a predetermined delay period during which the operating system issues no requests for access to the disk array;

(d) preventing access by the operating system to the disk array once the predetermined period expires;

(e) selecting a data block in the original disk drives in the disk array for expansion;

(f) relocating said data block to fill a storage location created in the selected row by the addition of the added disk drive;

(g) identifying with a first indicator the next free location in the array to be expanded;

(h) identifying with a second indicator the next data block in the array to be relocated;

(i) permitting the operating system to access the hard disk array; and

(j) reporting to the operating system said upgraded storage capacity of the second fully operational configuration of the array.

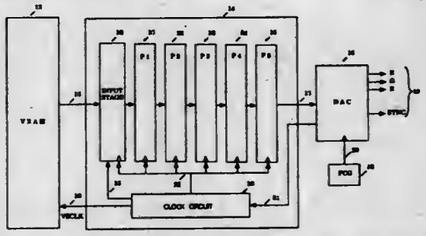
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**5,502,837**

**METHOD AND APPARATUS FOR CLOCKING VARIABLE PIXEL FREQUENCIES AND PIXEL DEPTHS IN A MEMORY DISPLAY INTERFACE**

**Bradley W. Hoffert, Mountain View, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.**

**Filed Aug. 11, 1992, Ser. No. 928,513**
**Int. Cl.[6] G09G *1/28;* G06F *1/12;1/04***
**U.S. Cl. 395—550** **16 Claims**



1. A circuit for synchronizing pixel data being processed through a memory display interface, comprising:

circuitry for sensing a pixel clock signal, the pixel clock signal synchronizing a plurality of color pixels for transfer over a pixel bus;

circuitry for generating a pipeline clock signal synchronous with the pixel clock signal, the pipeline clock signal synchronizing a pixel processing pipeline including a plurality of pixel processing stages to propagate a plurality of pixels through the memory interface;

circuitry for generating a shift clock signal, the shift clock signal enabling transfer of the plurality of pixels from a VRAM frame buffer to the memory display interface over a video bus;

circuitry for sequencing the plurality of pixels into the pixel processing pipeline according to the frequency of the pixel clock signal and a predetermined pixel depth.

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**5,502,838**

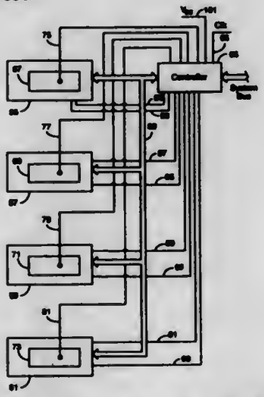
**TEMPERATURE MANAGEMENT FOR INTEGRATED CIRCUITS**

**Dan Kikinis, Saratoga, Calif., assignor to Consilium Overseas Limited, Geneva, Switzerland**

**Filed Apr. 28, 1994, Ser. No. 234,344**

**Int. Cl.[6] G06F 17/40**

**U.S. Cl. 395—550** **13 Claims**



1. In a single integrated circuit (IC) chip having first and second functional circuits occupying distinct first and second regions of the chip, a system for selective regional temperature control, comprising:

a first temperature sensor within the region of the first functional circuit and a first clock rate adjusting circuit supplying operational frequency to the first functional circuit;

a second temperature sensor within the region of the second functional circuit and a second clock rate adjusting circuit supplying operational frequency to the second functional circuit; and

logic control circuitry connected to the first and second temperature sensors and to the first and second clock rate adjusting circuits;

wherein the logic control circuitry signals the first clock rate adjusting circuit to lower clock rate to the first functional circuit in response to increasing temperature sensed by the first temperature sensor, and signals the second clock rate adjusting circuit to lower clock rate to the second functional circuit in response to increasing temperature sensed by the second temperature sensor.

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**5,502,839**

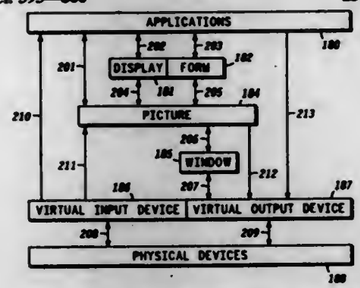
**OBJECT-ORIENTED SOFTWARE ARCHITECTURE SUPPORTING INPUT/OUTPUT DEVICE INDEPENDENCE**

**Frank C. Kolnick, Willowdale, Canada, assignor to Motorola, Inc., Schaumburg, Ill.**

**Continuation of Ser. No. 619, Jan. 5, 1987, abandoned. This application Jun. 2, 1989, Ser. No. 361,738**

**Int. Cl.[6] G06F 13/00**

**U.S. Cl. 395—800** **23 Claims**




1. A virtual input interface in a data processing system, said interface comprising:

means for accepting input from at least one physical device and for converting said physical device input into virtual input, said means comprising a virtual input manager process responsive to said at least one physical input device for generating a picture, said picture comprising one or more picture elements, each picture element comprising a plurality of device-independent data structures in a predetermined, standard data format, at least one of said data structures comprising a plurality of different data fields each containing information describing said picture element; and

means responsive to said virtual input for performing processing operations upon said virtual input, said means comprising a console manager process for performing processing operations on said one or more picture elements.

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**5,502,840**

**METHOD AND APPARATUS FOR ADVISING A REQUESTING PROCESS OF A CONTENTION SCHEME TO EMPLOY TO ACCESS A SHARED RESOURCE**

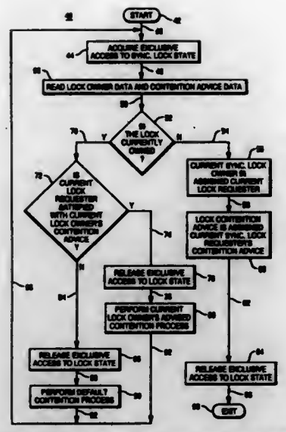
**Richard R. Barton, Lexington, S.C., assignor to NCR Corporation, Dayton, Ohio**

**Continuation of Ser. No. 308,984, Sep. 6, 1994, abandoned, which is a continuation of Ser. No. 987,990, Dec. 9, 1992, abandoned, which is a continuation of Ser. No. 645,073, Jan. 18, 1991, abandoned. This application Jul. 3, 1995, Ser. No. 497,961**

**Int. Cl.[6] G06F 13/14**

**U.S. Cl. 395—726** **6 Claims**






1. A method for use in a multiple processor computer system for advising a requesting process of a state of a synchronization lock of a requested process, comprising the steps of:

a. storing data representing the state of the synchronization lock of the requested process in a memory within the computer system, the data including a synchronization lock owner portion, a synchronization lock advice portion containing a contention process, and synchronization lock availability portion;

b. acquiring exclusive access to said data by a first processor;

c. reading said data by said first processor;

d. determining from said synchronization lock owner portion of said data if said synchronization lock of said requested process is currently owned by either the requesting process or another process executing on a second processor within the computer system by the first processor and if it is owned determining if said contention process indicated in said advice portion of said data is appropriate for the requesting process;

e. if said contention process is appropriate, releasing said exclusive access to said data and performing said contention process indicated by said advice portion of said data by the first processor; and

f. if said contention process is not appropriate, releasing said exclusive access to said data and performing a default contention process predetermined by said requesting process by the first processor.

VOL
1184
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# DESIGN PATENTS

## GRANTED MAR. 26, 1996

### ERRATA

| For CLASS | See PATENT NO. |
|---|---|
| D10–075 | D 368,270 |

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1184
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1996
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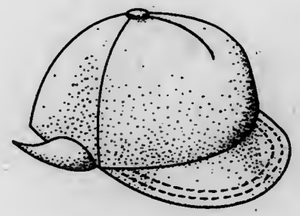
# DESIGNS

MARCH 26, 1996

368,151
**FROZEN CONFECTION**
Connie A. Kellogg, and Daryl D. Spors, both of Green Bay, Wis., assignors to Good Humor Corporation, Green Bay, Wis.
Filed Feb. 10, 1995, Ser. No. 34,785
Term of patent 14 years
U.S. Cl. D1—102



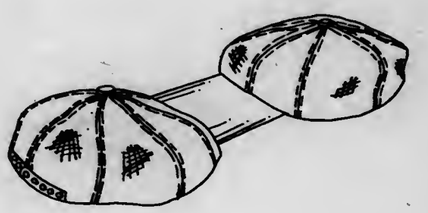
368,153
**EAR SHADING CAP**
Chris B. Amey, 2100 Axel Ct., Placerville, Calif. 95667
Filed Nov. 3, 1994, Ser. No. 30,132
Term of patent 14 years
U.S. Cl. D2—879



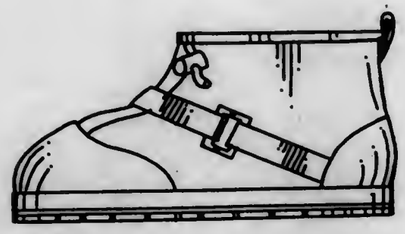
368,152
**INFUSION PACKET**
Michael J. Cahill, and Geoffrey W. Vernon, both of Kenilworth, United Kingdom, assignors to Thomas J. Lipton Co., Division of Conopco, Inc., Englewood Cliffs, N.J.
Filed Oct. 6, 1993, Ser. No. 13,932
Claims priority, application United Kingdom, Apr. 7, 1993, 2030302
Term of patent 14 years
U.S. Cl. D1—199



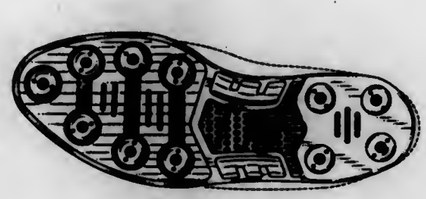
368,154
**NOVELTY BASEBALL CAP**
Michael P. Pelkey, Box 114, Jericho, Vt. 05465
Continuation-in-part of Ser. No. 4,272, Feb. 1, 1993, abandoned. This application Dec. 12, 1994, Ser. No. 32,004
Term of patent 14 years
U.S. Cl. D2—882



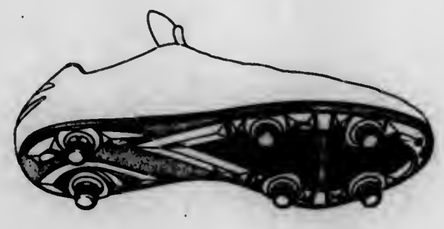
368,155
PROTECTIVE OVERSHOE
Scott D. Hardy, Ferrisburg, Vt., and W. Woodward Nash, Morristown, N.J., assignors to New England Overshoe Company, Inc., Middlebury, Vt.
Filed Aug. 1, 1994, Ser. No. 26,615
Term of patent 14 years
U.S. Cl. D2—911



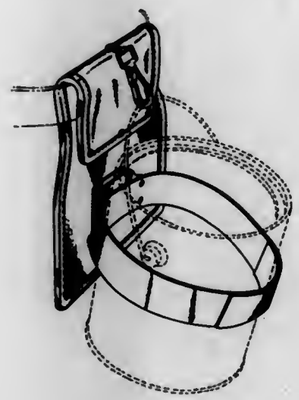
368,157
SHOE SOLE
John J. Erickson, Brockton, Mass., assignor to Acushnet Company, Fairhaven, Mass.
Filed Aug. 8, 1994, Ser. No. 26,893
Term of patent 14 years
U.S. Cl. D2—962



368,156
SHOE SOLE
Mark A. Longbottom, 15 Thackeray Grove, Lockwood, Huddersfield, England, and Simon J. Peel, 5 Meadow Bank, Holmfirth, Huddersfield, England
Filed May 27, 1994, Ser. No. 23,598
Term of patent 14 years
U.S. Cl. D2—962

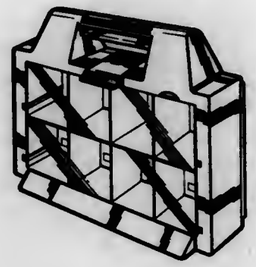


368,158
PAINT CAN HOLDER
Michael Dancyger, and Larry Litwin, both of 811 W. 58th St., Los Angeles, Calif. 90037
Filed Dec. 3, 1994, Ser. No. 31,680
Term of patent 14 years
U.S. Cl. D3—215

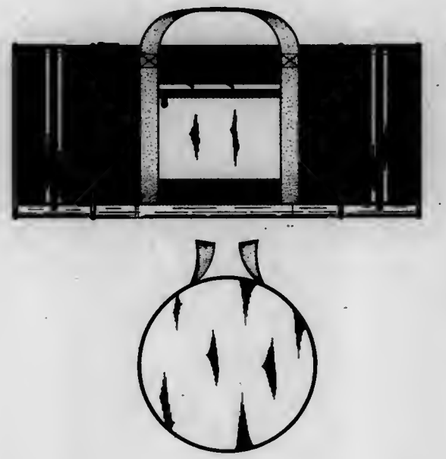




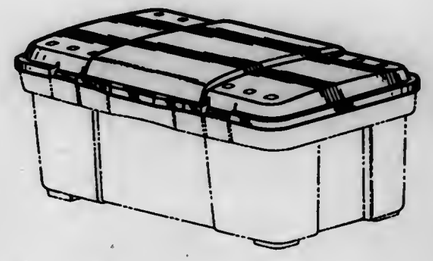
368,159
PARTS BIN
Randall W. Calmeise, Oakwood Village, and John A. Vura, Wooster, both of Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio
Filed Jul. 7, 1994, Ser. No. 25,666
Term of patent 14 years
U.S. Cl. D3—283



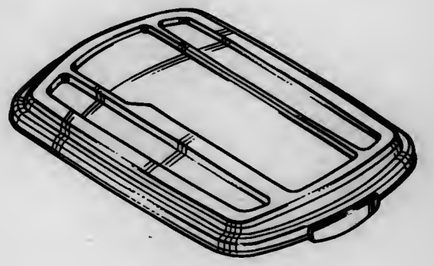
368,160
SPORT BAG
Michael R. Carretta, Tranquility, N.J., assignor to M. R. Carretta & Co., Inc., Allamuchy, N.J.
Filed Mar. 9, 1995, Ser. No. 35,911
Term of patent 14 years
U.S. Cl. D3—286



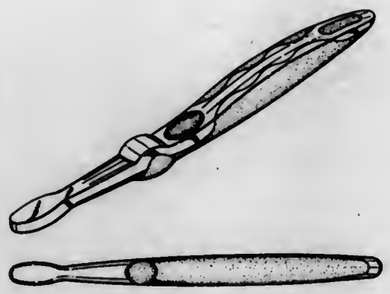
368,161
STORAGE LOCKER LID
D. Scott Miller, Orlando, Fla., assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Dec. 15, 1994, Ser. No. 32,283
Term of patent 14 years
U.S. Cl. D3—326



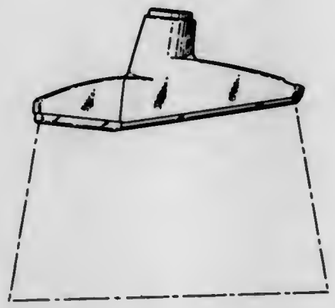
368,162
LID FOR STORAGE CONTAINER
D. Scott Miller, Orlando, Fla., assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Dec. 15, 1994, Ser. No. 32,284
Term of patent 14 years
U.S. Cl. D3—326



368,163
TOOTHBRUSH HANDLE
Thomas Overthun, San Francisco, Calif., assignor to Gillette Canada Inc., Kirkland, Canada
Filed Mar. 28, 1995, Ser. No. 36,836
Term of patent 14 years
U.S. Cl. D4—104



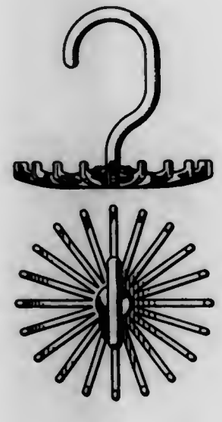
368,164
BROOM SHROUD
Paul A. Reeder, Columbus, Ohio, assignor to Vining Industries, Inc., Springfield, Ohio
Filed Aug. 4, 1995, Ser. No. 42,259
Term of patent 14 years
U.S. Cl. D4—199



368,165
CONVERTIBLE ARTIST'S EASEL AND TABLE
Joseph E. Foster, 64 N. 12th St., Harrisburg, Pa. 17103
Filed Feb. 7, 1995, Ser. No. 34,554
Term of patent 14 years
U.S. Cl. D6—311



368,166
TIE HANGER
Abraham Sacks, 4272 Sandburg Way, Irvine, Calif. 92715
Filed Mar. 15, 1995, Ser. No. 36,215
Term of patent 14 years
U.S. Cl. D6—315

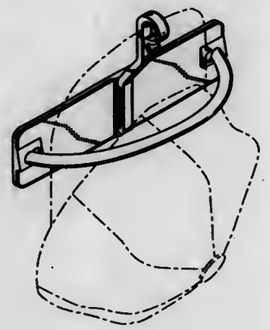




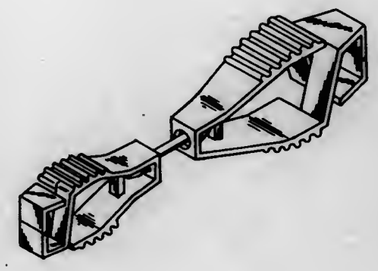
368,167
BOOT HOOK
Romarino Zeri, 4114 Glencoe Ave., Marina Del Rey, Calif. 90292
Filed Mar. 27, 1995, Ser. No. 36,725
Term of patent 14 years
U.S. Cl. D6—317



368,168
CAP HOLDER
Rodney R. Bennett, 31 N. Acorn Dr., North Salt Lake, Utah 84054
Filed Mar. 6, 1995, Ser. No. 35,768
Term of patent 14 years
U.S. Cl. D6—323



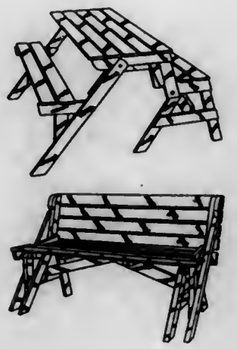
368,169
GARMENT CLIP
Jo E. Coker, 113 Lakewood Dr., Baytown, Tex. 77520
Continuation-in-part of Ser. No. 17,576, Jan. 18, 1994, abandoned. This application Nov. 22, 1994, Ser. No. 31,328
Term of patent 14 years
U.S. Cl. D6—326



368,170
SEPARATOR PANEL FOR FIREARM RANGE
Michael R. Spielvogel, Tampa, Fla., assignor to Gun Range Authority, Inc., Tampa, Fla.
Filed Mar. 24, 1994, Ser. No. 20,326
Term of patent 14 years
U.S. Cl. D6—332



368,171
CONVERTIBLE BENCH TABLE
David H. Snell, 206 Three Elms Road, Hereford HR4 0RF, United Kingdom
Filed Jan. 23, 1995, Ser. No. 33,898
Term of patent 14 years
U.S. Cl. D6—336



368,172
CHAIR
Hermann Locher, Schwanden, Switzerland, assignor to Girolex Entwicklungs AG, Koblenz, Switzerland
Filed Apr. 18, 1995, Ser. No. 37,630
Claims priority, application WIPO, Jan. 19, 1994, DM/031 051
Term of patent 14 years
U.S. Cl. D6—366



368,173
FUTON FRAME
Russ Kramer, 1740 Harbor Pl., South Pasadena, Fla. 33707
Filed Aug. 12, 1994, Ser. No. 27,076
Term of patent 14 years
U.S. Cl. D6—370

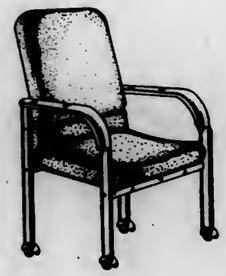


368,174
CHAISE LOUNGE
Sally S. Lewis, 8727 Melrose Ave., Los Angeles, Calif. 90069-5086
Division of Ser. No. 14,491, Oct. 21, 1993. This application May 31, 1995, Ser. No. 39,605
Term of patent 14 years
U.S. Cl. D6—377





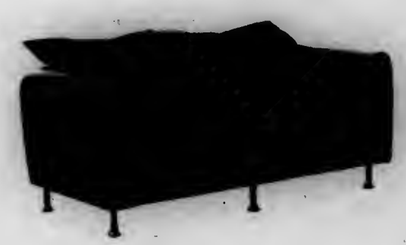
368,175
CHAIR
Wei-Kuan Wang, Taipei Hsien, Taiwan, assignor to SEDA Chemical Products Co., Ltd., Taipei Hsien, Taiwan
Filed May 4, 1995, Ser. No. 38,373
Term of patent 14 years
U.S. Cl. D6—379



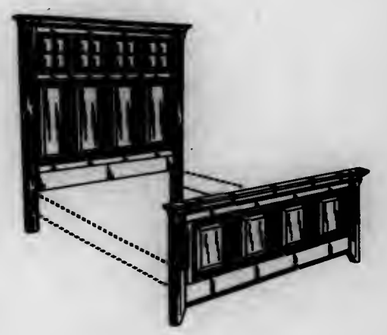
368,176
SEAT
Pascal Mourgue, Paris, France, assignor to Cinna, Serriers-de-Briord, France
Filed Jun. 7, 1994, Ser. No. 24,127
Claims priority, application Hague Agreement, Jan. 3, 1994, DM/028302
Term of patent 14 years
U.S. Cl. D6—381



368,177
SOFA
Pascal Mourgue, Paris, France, assignor to Cinna of Briord, Serriers de Briord, France
Filed May 30, 1995, Ser. No. 39,496
Claims priority, application Hague Agreement, Jan. 9, 1995, DM/031767
Term of patent 14 years
U.S. Cl. D6—381



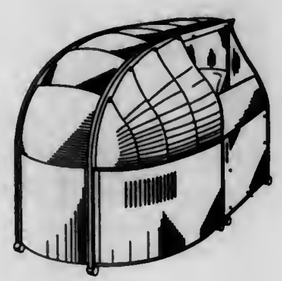
368,178
HEADBOARD AND FOOTBOARD SET FOR A BED
Guy A. Walters, III, High Point, and Avis E. Tobin, Jr., Thomasville, both of N.C., assignors to Thomasville Furniture Industries, Inc., Thomasville, N.C.
Filed Oct. 20, 1994, Ser. No. 29,974
Term of patent 14 years
U.S. Cl. D6—393



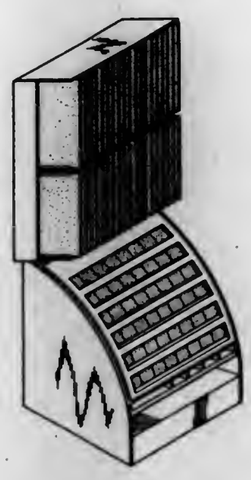
368,179
BED
Merlin A. Brunner, Appleton, and Harvey J. Drabein, Weyauwega, both of Wis., assignors to Simmons Juvenile Products Company, Inc., New London, Wis.
Filed Sep. 30, 1994, Ser. No. 29,246
Term of patent 14 years
U.S. Cl. D6—395



368,180
COMPUTER WORKSTATION
Douglas Ball, 178 Senneville Road, Senneville, Quebec, Canada
Filed Jul. 6, 1994, Ser. No. 25,592
Term of patent 14 years
U.S. Cl. D6—397



368,181
CARPET DISPLAY
Walter Dabrowski, 18 Keeble Cresc, Ajax, Ontario, Canada
Filed Aug. 5, 1993, Ser. No. 11,470
Term of patent 14 years
U.S. Cl. D6—409

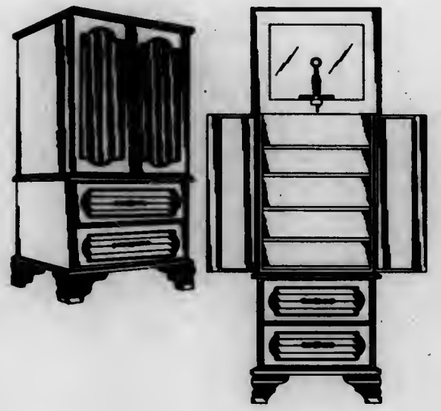


368,182
NIGHT STAND
Guy A. Walters, III, High Point, and Avis E. Tobin, Jr., Thomasville, both of N.C., assignors to Thomasville Furniture Industries, Inc., Thomasville, N.C.
Filed Oct. 28, 1994, Ser. No. 29,986
Term of patent 14 years
U.S. Cl. D6—436

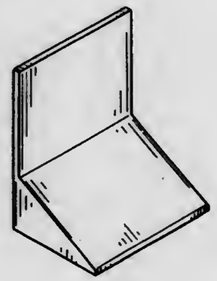




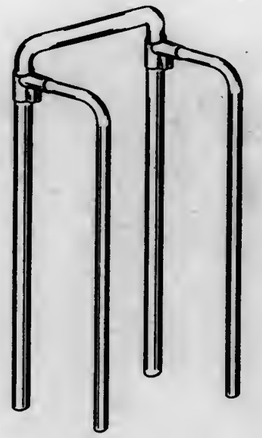
368,183
MUSICAL JEWELRY ARMOIRE
Bohr-Wian Shih, 2597 Sumac Ln., Boise, Id. 83706, and Barry Shih, 2F, No. 321, Patch Road, Sec. 4, Taipei 10563, Taiwan
Filed Nov. 3, 1994, Ser. No. 30,649
Term of patent 14 years
U.S. Cl. D6—440



368,184
DISPLAY STAND
Craig D. Eley, P.O. Box 316, Orchard, Nebr. 68764
Filed Feb. 6, 1995, Ser. No. 34,518
Term of patent 14 years
U.S. Cl. D6—449



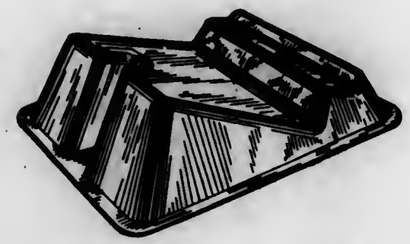
368,185
SUPPORT FOR A NON SELF-SUPPORTING CONTAINER
Mark W. Sawyer, Indianapolis, Ind., assignor to Wilmarc, Inc., Thorntown, Ind.
Filed Mar. 1, 1994, Ser. No. 19,373
Term of patent 14 years
U.S. Cl. D6—462



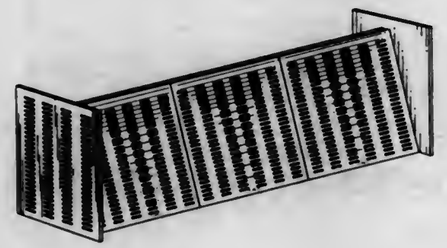
368,186
THREE TIER COOLING RACK
Frank Tiemann, Braham, Minn., assignor to T & L Nifty Products, Inc., Cambridge, Minn.
Filed Feb. 10, 1995, Ser. No. 34,895
Term of patent 14 years
U.S. Cl. D6—465



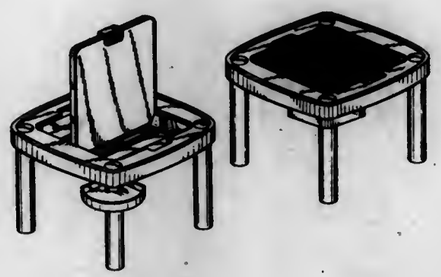
368,187
ENGINE STAND
Stanley Johnson, Pewaukee, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.
Filed Apr. 24, 1995, Ser. No. 37,990
Term of patent 14 years
U.S. Cl. D6—466



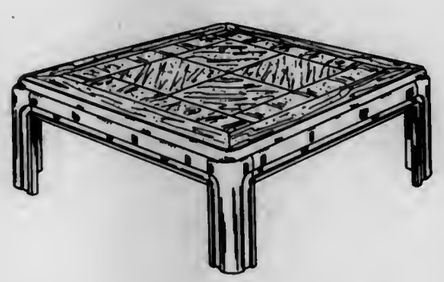
368,188
DISPLAY ISLAND
Paul R. Lechleiter, Powell, and Mark B. Artus, Beechwold, both of Ohio, assignors to Blockbuster Entertainment Corporation, Ft. Lauderdale, Fla.
Filed Dec. 6, 1994, Ser. No. 31,808
Term of patent 14 years
U.S. Cl. D6—471



368,189
MULTIPURPOSE TABLE
Jay M. Bro, Plano; Richard P. Machos, Coppell, and Peter J. Myers, Plano, all of Tex., assignors to Today's Kids, Inc., Booneville, Ark.
Filed Feb. 10, 1995, Ser. No. 34,782
Term of patent 14 years
U.S. Cl. D6—480

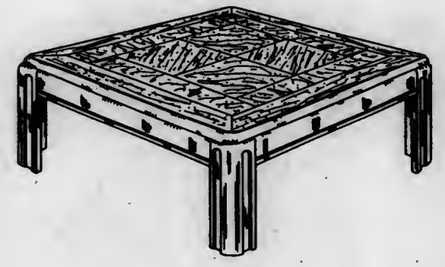


368,190
TABLE
Bob Mitchell, Lenoir, N.C., assignor to Master Design Furniture, Inc., Greensboro, N.C.
Filed Jul. 1, 1994, Ser. No. 25,450
Term of patent 14 years
U.S. Cl. D6—484

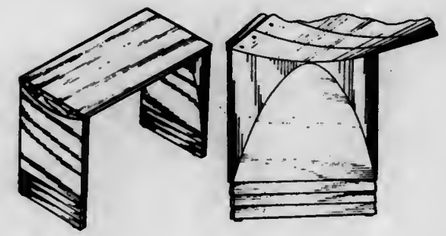




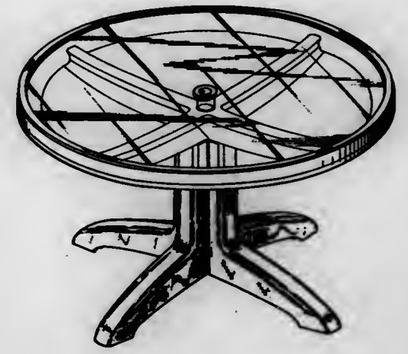
368,191
TABLE
Bob Mitchell, Lenoir, N.C., assignor to Master Design Furniture, Inc., Greensboro, N.C.
Filed Jul. 1, 1994, Ser. No. 25,452
Term of patent 14 years
U.S. Cl. D6—484



368,192
TABLE
Paul Haigh, Greenwich, Conn.; William A. Heisler, East Grand Rapids, Mich.; James W. Ross, Grand Rapids, Mich., and William C. Small, Greenville, Mich., assignors to Steelcase Inc., Grand Rapids, Mich.
Filed Oct. 28, 1994, Ser. No. 30,402
Term of patent 14 years
U.S. Cl. D6—484



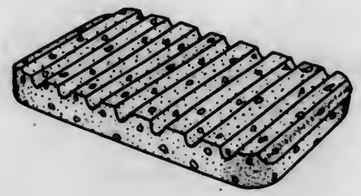
368,193
GLASS TOP TABLE
Glenn T. Walters, Port Washington, Wis., assignor to Bemis Manufacturing Company, Sheboygan Falls, Wis.
Filed Dec. 20, 1994, Ser. No. 32,520
Term of patent 14 years
U.S. Cl. D6—486



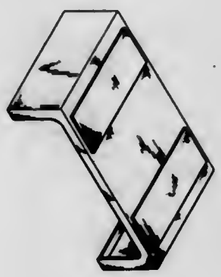
368,194
SHOWER CADDY
William W. Emery, Berkeley Heights, and Russell A. Fritts, Warren, both of N.J., assignors to Better Sleep Mfg. Co., Berkeley Heights, N.J.
Filed May 25, 1995, Ser. No. 39,244
Term of patent 14 years
U.S. Cl. D6—525



368,195
BAR SOAP PAD
Joseph D. Scott, 20 Knoble Pl., Apt. #2, Hawthorne, N.J. 07506, and Harley H. Matthews, Verona, N.J., assignors to Joseph D. Scott, Hawthorne, N.J.
Filed Dec. 29, 1994, Ser. No. 32,842
Term of patent 14 years
U.S. Cl. D6—536



368,196
DISPENSER
Philip C. Durocher, Thornhill, Canada, assignor to Colgate-Palmolive Co., New York, N.Y.
Filed Jan. 13, 1995, Ser. No. 33,457
Term of patent 14 years
U.S. Cl. D6—553



368,197
QUILT HANGER
Kenneth V. Fulayter, and Thyra M. Fulayter, both of 982 W. 19th St., Upland, Calif. 91784
Filed Feb. 23, 1995, Ser. No. 35,250
Term of patent 14 years
U.S. Cl. D6—553



368,198
BLIND SLAT MATERIAL
Thas Zorbas, Silverwood, Lot 51, Canns Road, Bedfordale, Western Australia, Australia
Filed Apr. 12, 1994, Ser. No. 21,226
Term of patent 14 years
U.S. Cl. D6—577





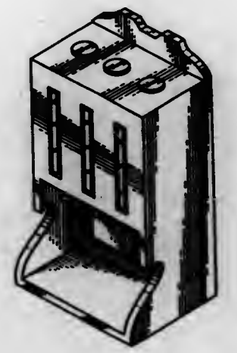
368,199
PORTABLE COLLAPSIBLE COMBINED MAT AND BODY REST
Holland Winslow, and Philip Winslow, both of 303 Ferguson Ave., Newport News, Va. 23601
Filed Sep. 27, 1994, Ser. No. 28,963
Term of patent 14 years
U.S. Cl. D6—596



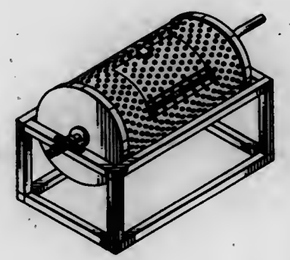
368,200
DISKETTE STORAGE CASE
David S. Gould, Duluth, and Stephen P. Chininis, Norcross, both of Ga., assignors to Gould Plastics, Inc., Lawrenceville, Ga.
Filed Oct. 20, 1994, Ser. No. 29,957
Term of patent 14 years
U.S. Cl. D6—631



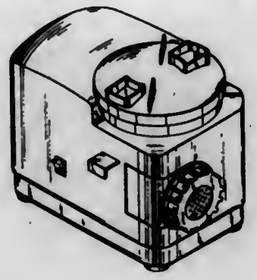
368,201
DRINK DISPENSER
Roger Kahler, Box 25, Wimer, S. Dak. 57580
Filed Nov. 1, 1994, Ser. No. 30,113
Term of patent 14 years
U.S. Cl. D7—308



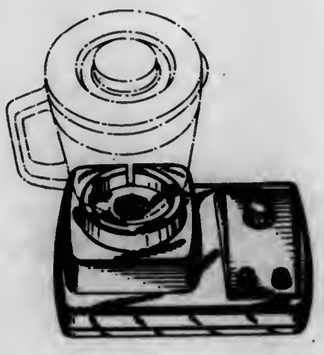
368,202
SCALING, PEELING, MIXING, GRINDING, AND CLEANING MACHINE
Rowland H. Goble, 145 W. Crystal Lake Ave., Lake Mary, Fla. 32746-2913
Filed Mar. 24, 1995, Ser. No. 36,689
Term of patent 14 years
U.S. Cl. D7—372



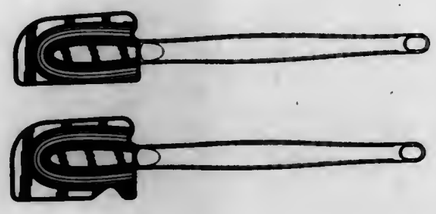
368,203
PASTA MAKER
Maxwell Hsu, Taipei, Taiwan, assignor to Airlux Electrical Co., Ltd., Taipei, Taiwan
Filed Jan. 14, 1994, Ser. No. 17,538
Term of patent 14 years
U.S. Cl. D7—376



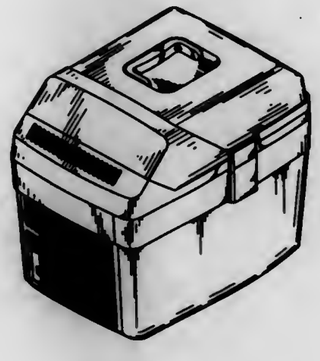
368,204
BLENDER BASE
Maria Jonke, Munzgasse 1, A-5202 Salzburg, Austria
Filed Dec. 22, 1993, Ser. No. 16,745
Term of patent 14 years
U.S. Cl. D7—386



368,205
SPATULA HEAD
Kevin Rausch, Cross Junction, Va., assignor to Rubbermaid Commercial Products Inc., Winchester, Va.
Filed Feb. 9, 1995, Ser. No. 34,644
Term of patent 14 years
U.S. Cl. D7—401.2

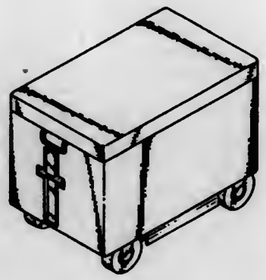


368,206
COMBINED PORTABLE HEAT INSULATED CODER AND WARMER
Heiner Wedi, Emsdetten, Germany, assignor to WAECO-Wahning & Co. GmbH, Emsdetten, Germany
Filed Mar. 5, 1993, Ser. No. 5,558
Claims priority, application Germany, Sep. 8, 1992, M 92 06 536.8
Term of patent 14 years
U.S. Cl. D7—605





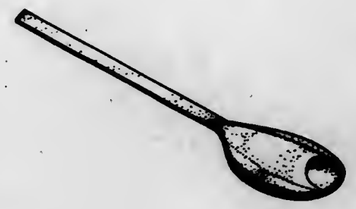
368,207
ICE CHEST ON WHEELS
Roland A. Januzzi, 5819 Whispering Pines Dr., Lorain, Ohio 44053-3772
Filed Feb. 24, 1995, Ser. No. 35,334
Term of patent 14 years
U.S. Cl. D7—605



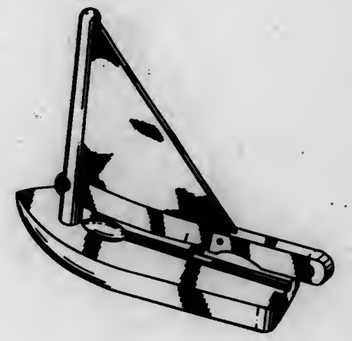
368,208
HOLDER FOR CHOPSTICKS
Will Lachapelle, 2514 25th Ave. West, Seattle, Wash. 98199
Filed Jul. 15, 1994, Ser. No. 25,966
Term of patent 14 years
U.S. Cl. D7—642



368,209
SPOON
Shelley T. Decker, 5 Paula La., New City, N.Y. 10956
Filed Oct. 3, 1994, Ser. No. 29,320
Term of patent 14 years
U.S. Cl. D7—653



368,210
CLAM OPENER
Kenneth Arellano, 192 Dupont Pl., Bridgeport, Conn. 06610
Filed Nov. 14, 1994, Ser. No. 31,212
Term of patent 14 years
U.S. Cl. D7—693



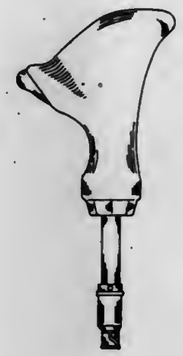
368,211
COMPOST AERATOR
Björn-Åke Sköld, Norrköping, Sweden, assignor to Bjorn-Ake Skold Design AB, Norrkoping, Sweden
Filed Sep. 16, 1994, Ser. No. 28,507
Claims priority, application Sweden, Mar. 16, 1994, 94-0623
Term of patent 14 years
U.S. Cl. D8—1



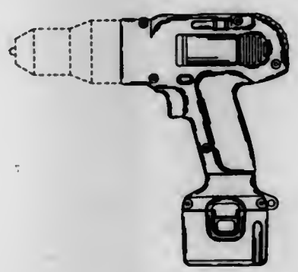
368,212
WELDER PLIERS
Harry R. Johnston, Contesville, Pa., assignor to One Twelve Incorporated - PA, Contesville, Pa.
Filed Nov. 14, 1994, Ser. No. 30,964
Term of patent 14 years
U.S. Cl. D8—52



368,213
SUPER ERGONOMIC RATCHET DRIVER
Joel S. Marks, 10508 Wilkins Ave., Los Angeles, Calif. 90024
Filed Nov. 24, 1992, Ser. No. 1,786
Term of patent 14 years
U.S. Cl. D8—61



368,214
CORDLESS POWER TOOL HOUSINGS
Donald W. Zarwelle, 805 Jamieson Rd., Lutherville, Md. 21093
Continuation of Ser. No. 11,808, Aug. 13, 1993, abandoned.
This application Nov. 3, 1994, Ser. No. 333,889
Term of patent 14 years
U.S. Cl. D8—68

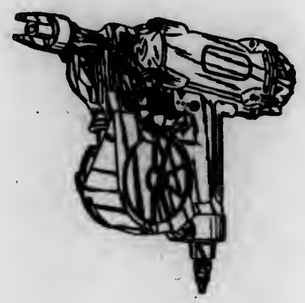




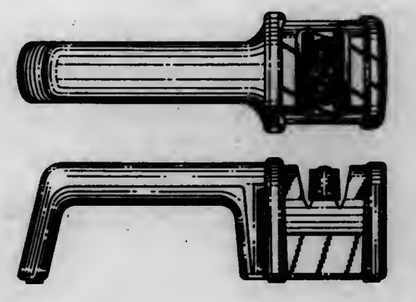
368,215
DISPENSER FOR FOAMABLE COMPOSITIONS
Noelle M. Dye, Charlestown, Mass., assignor to Sealed Air Corporation, Saddle Brook, N.J.
Filed Dec. 21, 1994, Ser. No. 32,572
Term of patent 14 years
U.S. Cl. D8—68



368,216
PNEUMATIC NAILING MACHINE
Takeo Hattori, Tokyo, Japan, assignor to Max Co., Ltd., Tokyo, Japan
Filed Feb. 17, 1995, Ser. No. 35,031
Term of patent 14 years
U.S. Cl. D8—68



368,217
KNIFE SHARPENER
Daniel D. Friel, Greenville, Del., assignor to Edgecraft Corporation, Avondale, Pa.
Continuation-in-part of Ser. No. 7,828, Apr. 30, 1993, Pat. No. Des. 357,395. This application Sep. 16, 1994, Ser. No. 28,586
Term of patent 14 years
U.S. Cl. D8—93



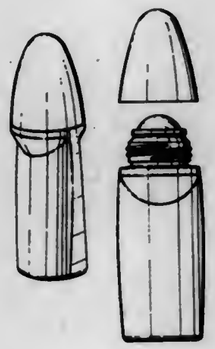
368,218
SUPPORT BRACKET
Richard A. Klein, III, P.O. Box 1768, North Conway, N.H. 03860
Filed Mar. 20, 1995, Ser. No. 36,431
Term of patent 14 years
U.S. Cl. D8—354



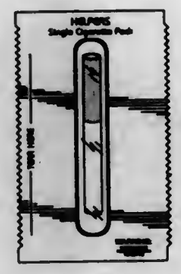
368,219
GUTTER CLIP
William F. Protz, Jr., Lake Forest, Ill., assignor to Santa's Best, Northfield, Ill.
Filed Apr. 3, 1995, Ser. No. 34,685
Term of patent 14 years
U.S. Cl. D8—371



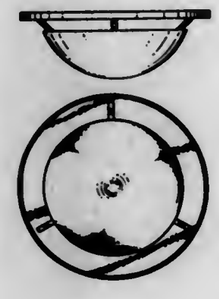
368,220
COMBINED ROLL-ON DISPENSER BOTTLE AND CAP
David Bicknell, Cambridge; Martin C. Bunce, and John Lamb, both of London, all of, United Kingdom, assignors to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.
Filed Aug. 3, 1994, Ser. No. 26,697
Claims priority, application United Kingdom, Feb. 3, 1994, 2036771
Term of patent 14 years
U.S. Cl. D9—338



368,221
COMBINED PACKAGE WITH A CIGARETTE
Cordia K. Montague, P.O. Box 670688, Chugiak, Ak. 99567
Filed Oct. 3, 1994, Ser. No. 29,313
Term of patent 14 years
U.S. Cl. D9—416

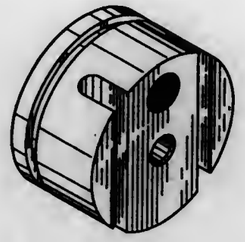


368,222
CONTAINER INSERT FOR DISPENSING COMESTIBLES
Rich Hoefer, 13375 Melanie La., Molt, Mont. 59057
Filed Jun. 2, 1994, Ser. No. 23,898
Term of patent 14 years
U.S. Cl. D9—434

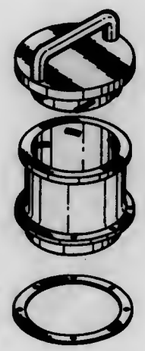




368,223
END CAP FOR PRESSURE VESSEL
Robert D. Williamson, 1490 Golfcrest Pl., Vista, Calif. 92083
Filed Mar. 21, 1994, Ser. No. 20,152
Term of patent 14 years
U.S. Cl. D9—435



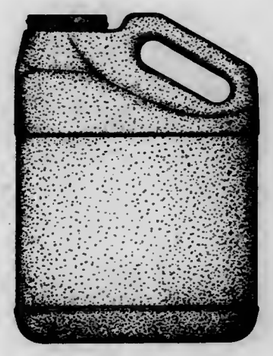
368,224
LID FOR CONTAINERS FOR WASTE FILTERS
Peter L. Arndt, 10 Spruce St., Hazlet, N.J. 07730
Filed Aug. 31, 1994, Ser. No. 27,773
Term of patent 14 years
U.S. Cl. D9—436



368,225
CAP FOR COSMETIC PRODUCT CONTAINER
Peter Bertolini, Shelton, Conn., and Mark Iain, West Nyack, N.Y., assignors to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.
Filed Feb. 1, 1995, Ser. No. 34,307
Term of patent 14 years
U.S. Cl. D9—444



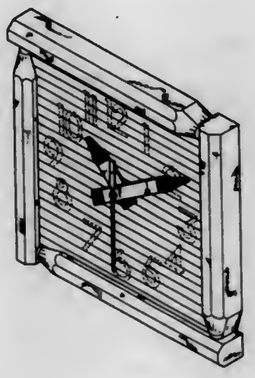
368,226
PLASTIC BOTTLE
Carl D. Ring, Oakland, Tenn., assignor to Ring Can Corporation, Oakland, Tenn.
Filed Jan. 25, 1994, Ser. No. 17,920
Term of patent 14 years
U.S. Cl. D9—528



368,227
COMBINATION CLOCK AND NIGHTLIGHT
Carol M. Danko, and Duane Danko, both of 1874 Rank Rd., Grass Lake, Mich. 49240
Filed Mar. 1, 1995, Ser. No. 35,530
Term of patent 14 years
U.S. Cl. D10—5



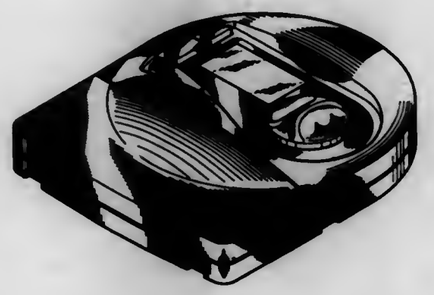

368,228
CLOCK
Su-Yuan Yu, 58, Ma Yuan West St., Taichung, Taiwan
Filed Oct. 24, 1994, Ser. No. 30,285
Term of patent 14 years
U.S. Cl. D10—6



368,229
WATCH
Carlo Crocco, Lugano, Switzerland, assignor to MDM SA, Geneve, Geneva, Switzerland
Filed Jul. 30, 1993, Ser. No. 11,223
Claims priority, application Hague Agreement, Apr. 8, 1993, DMA/002 111
Term of patent 14 years
U.S. Cl. D10—30



368,230
IRRIGATION TIMER
Uzi Cohen, Rishon Le-Zion; Charle Hamiaha, Kfar Saba, and Atzmon Kesovsky, Ramat-Hasharon, all of, Israel, assignors to Motorola, Inc., Schaumberg, Ill.
Filed Apr. 5, 1995, Ser. No. 37,167
Term of patent 14 years
U.S. Cl. D10—40





368,231
BRACELET
David McFadden, 251 Vineyard Dr. #204, Broadview Hts., Ohio 44147
Filed Nov. 21, 1994, Ser. No. 31,172
Term of patent 14 years
U.S. Cl. D11—4



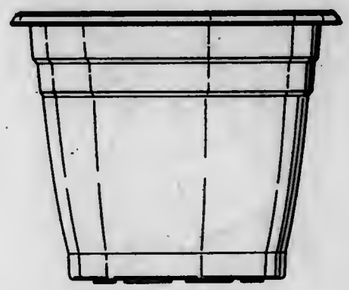
368,232
GEMSTONE
Shlomo Bachar, 235 W. 75th St., New York, N.Y. 10023
Division of Ser. No. 999, Nov. 2, 1992, Pat. No. Des. 350,708.
This application May 26, 1994, Ser. No. 23,570
Term of patent 14 years
U.S. Cl. D11—90



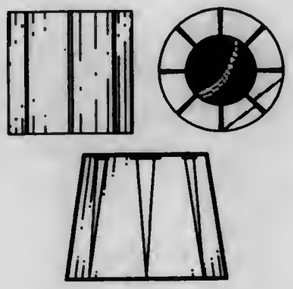
368,233
PORTRAIT FLOWER
Lawrence A. Spickelmier, 41044 Big Bear Blvd., Sp. 15, P.O. Box 3593, Big Bear Lake, Calif. 92315
Filed Nov. 29, 1994, Ser. No. 31,483
Term of patent 14 years
U.S. Cl. D11—117



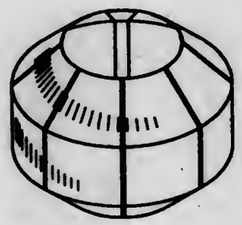
368,234
FLOWER POT
Thomas Dickinson, and Bradley D. Gale, both of St. Louis, Mo., assignors to Contico International, Inc., St. Louis, Mo.
Filed Dec. 5, 1994, Ser. No. 31,754
Term of patent 14 years
U.S. Cl. D11—152



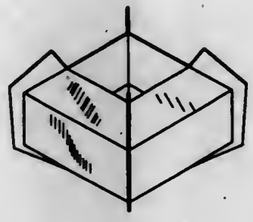
368,235
FLOWER POT COVER
Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to Highland Supply Corporation, Highland, Ill.
Continuation-in-part of Ser. No. 808,359, Dec. 16, 1991, which is a continuation-in-part of Ser. No. 710,272, Jun. 4, 1991, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, Ser. No. 411,249, Sep. 22, 1989, Pat. No. Des. 358,113, Ser. No. 411,247, Sep. 22, 1989, and Ser. No. 411,245, Sep. 22, 1989. This application Jan. 14, 1993, Ser. No. 3,785
The portion of the term of this patent subsequent to Oct. 24, 2009, has been disclaimed.
Term of patent 14 years
U.S. Cl. D11—164



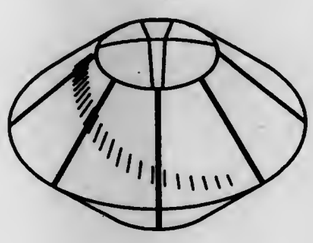
368,236
FLOWER POT COVER
Jon S. Sharyock, Bethany, Okla., assignor to Highland Supply Corporation, Highland, Ill.
Filed May 18, 1993, Ser. No. 8,589
Term of patent 14 years
U.S. Cl. D11—164



368,237
FLOWER POT COVER WITH FINS
Jon S. Sharyock, Bethany, Okla., assignor to Highland Supply Corporation, Highland, Ill.
Filed May 26, 1993, Ser. No. 8,740
The portion of the term of this patent subsequent to Aug. 15, 2009, has been disclaimed.
Term of patent 14 years
U.S. Cl. D11—164

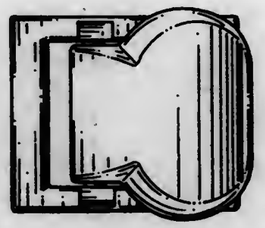


368,238
FLOWER POT COVER
Jon S. Sharyock, Bethany, Okla., assignor to Highland Supply Corporation, Highland, Ill.
Filed May 25, 1993, Ser. No. 8,857
The portion of the term of this patent subsequent to Mar. 5, 2010, has been disclaimed.
Term of patent 14 years
U.S. Cl. D11—164

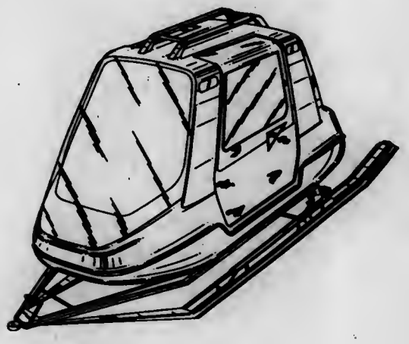




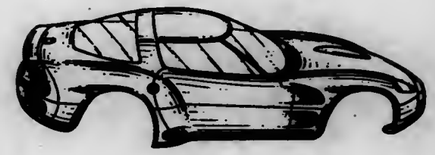
368,239
BUCKLE CLOSURE
Sergio G. Lozano, Beaverton, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Aug. 7, 1995, Ser. No. 42,810
Term of patent 14 years
U.S. Cl. D11—216



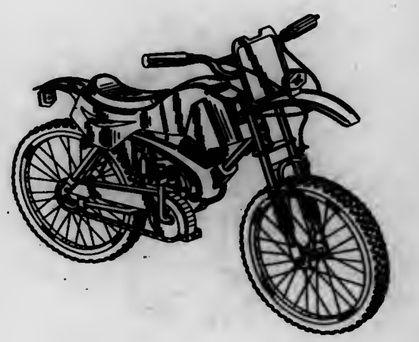
368,240
SCOOTER SLEIGH
Stefan Pekkari, Umea, Sweden, assignor to Bengt Ingvar Jacobsson, Ursviken, Sweden
Filed Dec. 3, 1993, Ser. No. 15,976
Claims priority, application Sweden, Jun. 3, 1993, 93-1316
Term of patent 14 years
U.S. Cl. D12—6



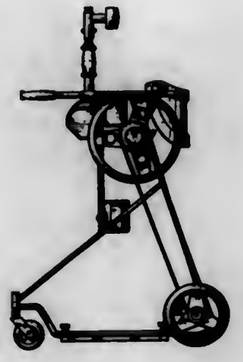
368,241
AUTOMOBILE BODY
Steven D. Winter, 2120 Ocean Dr., Oxnard, Calif. 93035
Continuation-in-part of Ser. No. 12,165, Aug. 25, 1993, abandoned, which is a continuation-in-part of Ser. No. 813,297, Dec. 18, 1991, abandoned. This application Jun. 1, 1994, Ser. No. 23,821
Term of patent 14 years
U.S. Cl. D12—92



368,242
BICYCLE
David K. Camfield, and Daniel F. Brashear, both of Olney, Ill., assignors to Roadmaster Corporation, Olney, Ill.
Filed Nov. 14, 1994, Ser. No. 30,963
Term of patent 14 years
U.S. Cl. D12—111



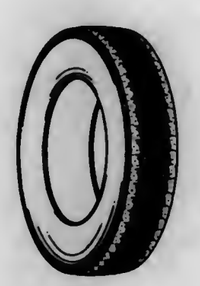
368,243
**PORTABLE MOBILE STAND**
Brian J. Nester, Agoura Hills, and Hans J. Evertse, Camarillo, both of Calif., assignors to Nester Machine Company, Inc., Westlake Village, Calif.
Filed Oct. 11, 1994, Ser. No. 29,586
Term of patent 14 years
U.S. Cl. D12—128



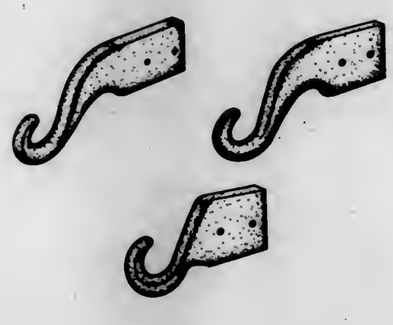
368,244
**TIRE**
Laurie W. Killian, Louisville, Ky., assignor to Michelin Recherche et Technique S.A., Granges-Paccot, Switzerland
Filed Sep. 20, 1994, Ser. No. 28,693
Term of patent 14 years
U.S. Cl. D12—147



368,245
**AUTOMOBILE TIRE**
Tatsuya Miyazaki, Kobe, Japan, assignor to Sumitomo Rubber Industries, Ltd., Kobe, Japan
Filed Dec. 8, 1994, Ser. No. 32,157
Claims priority, application Japan, Jun. 8, 1994, 6-16948
Term of patent 14 years
U.S. Cl. D12—147

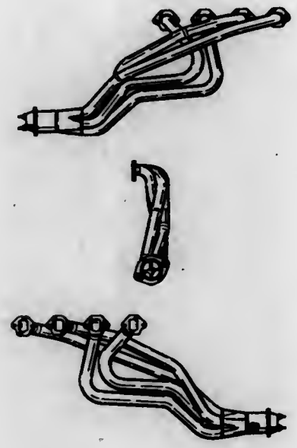


368,246
**ADD-ON VEHICLE TOW HOOK**
Bobby E. Hinnant, 107 Lamont St., Belhaven, N.C. 27810, and Guy H. Shavender, Hwy. 99 North, Pantego, N.C. 27860
Filed Jul. 14, 1994, Ser. No. 25,887
Term of patent 14 years
U.S. Cl. D12—162

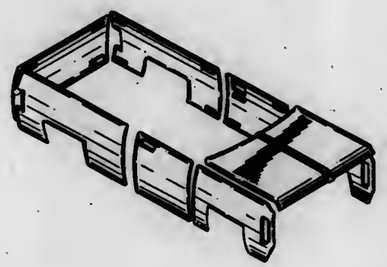




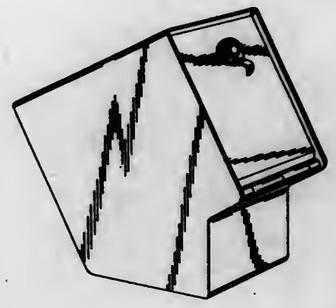
368,247
**AUTOMOTIVE NON-STOCK EXHAUST HEADER**
Mack L. Jones, M.A.C. Products, 43214 Black Deer Loop, Unit #113, Temecula, Calif. 92590-3473
Filed Dec. 30, 1994, Ser. No. 32,888
Term of patent 14 years
U.S. Cl. D12—194



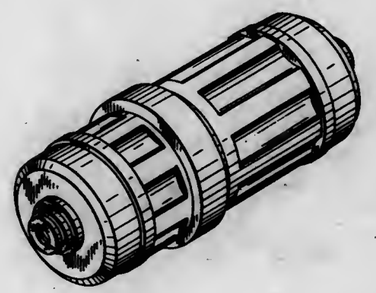
368,248
**PROTECTIVE CAMOUFLAGE PANEL SET FOR VEHICLES**
Ricky Bryant, 892 Rodgers Rd., Centerville, Tenn. 37033
Filed Nov. 21, 1994, Ser. No. 31,250
Term of patent 14 years
U.S. Cl. D12—196



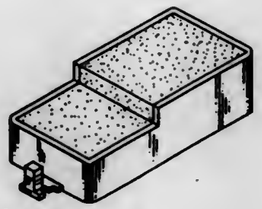
368,249
**VEHICLE SAFE**
Hugo Ferrer, 428 Minot Ave., Chula Vista, Calif. 91910-4832
Filed Jun. 18, 1993, Ser. No. 9,573
Term of patent 14 years
U.S. Cl. D12—423



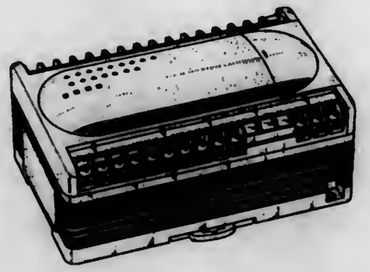
368,250
**BOOT FOR AN ELECTRICAL PLUG AND RECEPTACLE**
Cosmo Castaldo, Westbury, N.Y., assignor to Leviton Manufacturing Co., Inc., Little Neck, N.Y.
Filed Jan. 19, 1994, Ser. No. 17,711
Term of patent 14 years
U.S. Cl. D13—156



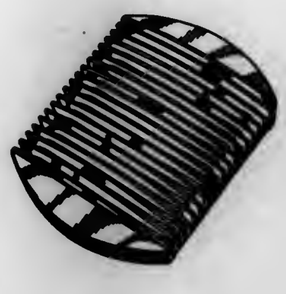
368,251
SOLID STATE SURGE PROTECTOR MODULE FOR TELEPHONE COMMUNICATION LINES
Paramjeet S. Mahajan, Deer Park, and Timothy J. Roach, St. James, both of N.Y., assignors to TII Industries Inc., Copiague, N.Y.
Filed May 10, 1993, Ser. No. 8,899
Term of patent 14 years
U.S. Cl. D13—160



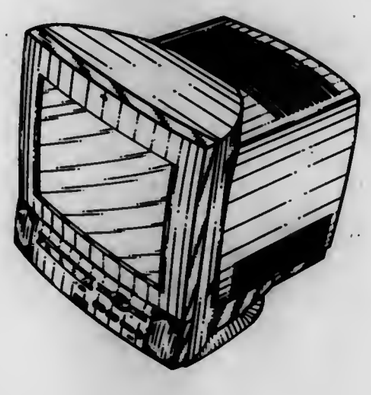
368,252
PROGRAMMABLE LOGIC CONTROLLER
Tatsunobu Nakai, Osaka, Japan, assignor to Idec Izumi Corporation, Osaka, Japan
Filed Mar. 29, 1994, Ser. No. 20,581
Claims priority, application Japan, Jan. 4, 1993, 5-30187
Term of patent 14 years
U.S. Cl. D13—162



368,253
HEAT SINK
Clane Graves, Provo, Utah, assignor to Rockford Corporation, Tempe, Ariz.
Filed Jul. 19, 1993, Ser. No. 10,951
Term of patent 14 years
U.S. Cl. D13—179

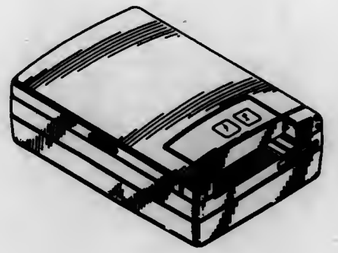


368,254
COMPUTER ENCLOSURE
James C. Meschter, San Francisco; Lawrence E. Barbera, San Mateo; Jonathan P. Ive, and Daniele G. De Iuliis, both of San Francisco, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.
Filed Feb. 27, 1995, Ser. No. 35,375
Term of patent 14 years
U.S. Cl. D14—100

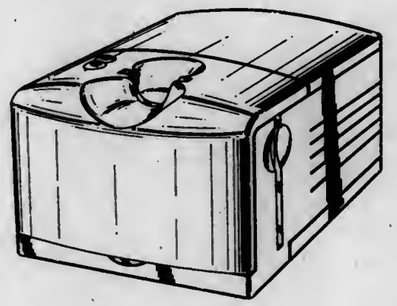




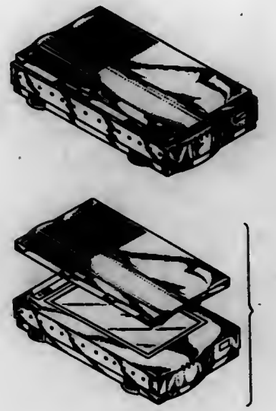
368,255
BUSINESS CARD SCANNER
Kazunari Sasaki, Nagano, and Hironori Shirakura, Fukuoka, both of, Japan, assignors to Seiko Epson Corp., Nagano, and Mitsumi Electric Co., Ltd., Fukuoka, both of, Japan
Filed Sep. 24, 1993, Ser. No. 13,451
Claims priority, application Japan, Mar. 26, 1993, 5-8712
Term of patent 14 years
U.S. Cl. D14—107



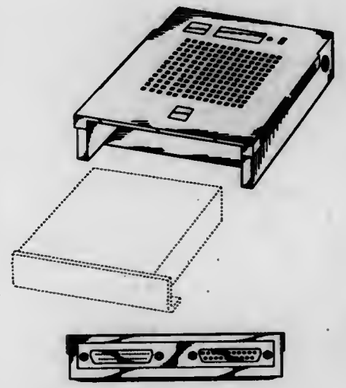
368,256
SCANNER FOR USE WITH A COMPUTER
Scott E. Stropkay, Carlisle, and Mark A. Nichols, Boston, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.
Filed Jul. 28, 1994, Ser. No. 26,471
Term of patent 14 years
U.S. Cl. D14—107



368,257
TRANSPARENCY SCANNER
Tony Chen, and Thomas Chang, both of Hsinchu, Taiwan, assignors to UMAX Data System Inc., Taiwan
Filed May 3, 1995, Ser. No. 38,437
Term of patent 14 years
U.S. Cl. D14—107



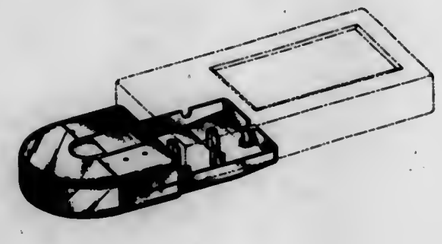
368,258
COMBINED PORTABLE BATTERY CHARGER CRADLE AND FLOPPY DISK DRIVE CASE
Peter A. Ojeda, St. Joseph, Mich., assignor to Zenith Data Systems Corporation, Buffalo Grove, Ill.
Filed Aug. 23, 1994, Ser. No. 27,520
Term of patent 14 years
U.S. Cl. D14—114



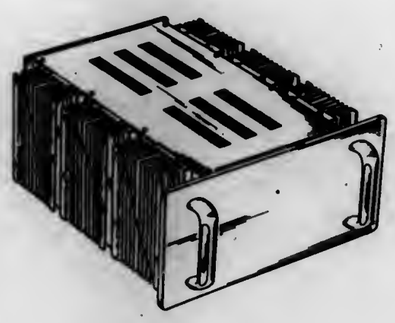
368,259
MULTIFUNCTIONAL FACSIMILE, COPIER, SCANNER PRINTER
David C. Bishop, and Peter J. Mendel, both of Lexington, Ky., assignors to Lexmark International, Inc., Greenwich, Conn.
Filed Mar. 23, 1995, Ser. No. 36,644
Term of patent 14 years
U.S. Cl. D14—118



368,260
WIRELESS DIFFUSE INFRARED LAN TRANSCEIVER
Ellen L. Oschmann, Winnetka, and Jeffrey P. Welch, Libertyville, both of Ill., assignors to Spectrix Corporation, Evanston, Ill.
Filed Oct. 12, 1994, Ser. No. 29,654
Term of patent 14 years
U.S. Cl. D14—137



368,261
POWER AMPLIFIER
Vladimir V. Shusharin, 3015 Brighton 13th St., Ste. 3J, Brooklyn, N.Y. 11235
Filed Jan. 3, 1994, Ser. No. 17,874
Term of patent 14 years
U.S. Cl. D14—188

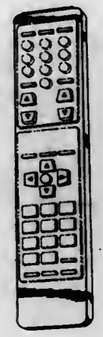


368,262
SELECTIVE CALL RECEIVER
William J. Scheid, Coral Springs, Fla., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Apr. 26, 1995, Ser. No. 38,045
Term of patent 14 years
U.S. Cl. D14—191

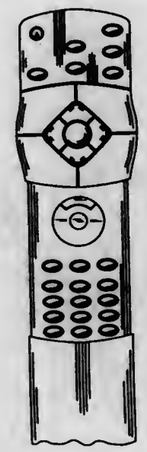




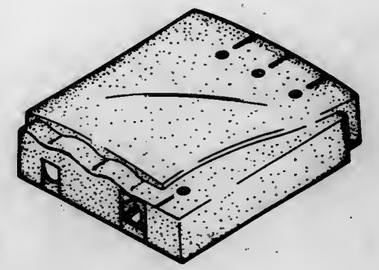
368,263
REMOTE CONTROL UNIT
John S. Hendricks, Potomac, Md., assignor to Discovery Communications, Inc., Bethesda, Md.
Division of Ser. No. 2,322, Dec. 3, 1992, Pat. No. Des. 354,059. This application Jul. 12, 1994, Ser. No. 25,794
Term of patent 14 years
U.S. Cl. D14—218



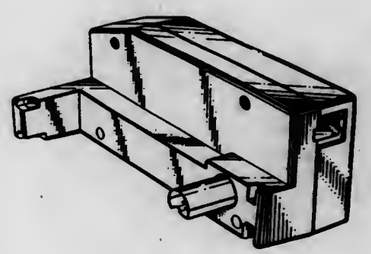
368,264
REMOTE HAND CONTROLLER
David W. Lalturi, Palo Alto, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.
Division of Ser. No. 8,197, May 11, 1993. This application Sep. 29, 1994, Ser. No. 29,085
Term of patent 14 years
U.S. Cl. D14—219



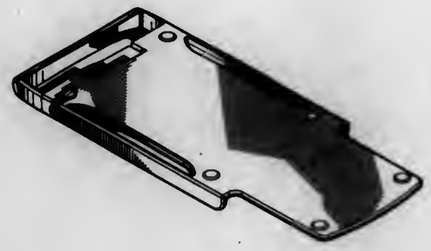
368,265
RINGING ADAPTER BOX FOR TELEPHONE
Caesar Y. K. Fan, No. 36, Gwo Shing St., Taoyuan, Taiwan
Filed Jan. 10, 1995, Ser. No. 33,306
Term of patent 14 years
U.S. Cl. D14—241



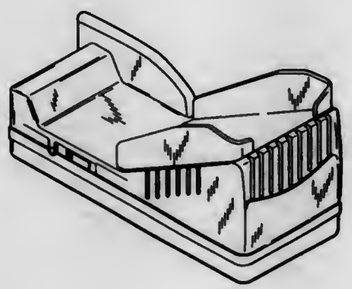
368,266
REMOTE COMMUNICATIONS INTERFACE
Steven A. McClain, Burnaby, and Freddie K. H. Tsang, Vancouver, Canada, assignors to TVI Interactive Systems Inc., Burnaby, Canada
Continuation-in-part of Ser. No. 28,682, Mar. 31, 1994, Pat. No. Des. 362,445. This application Sep. 29, 1994, Ser. No. 29,153
Term of patent 14 years
U.S. Cl. D14—242



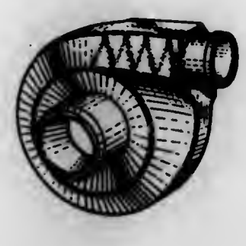
368,267
**PROTECTIVE COVER FOR A PCMCIA RADIO MODEM CARD**
Roman P. Rak, Delta, and William E. Fenton, Port Coquitlam, both of, Canada, assignors to Motorola, Inc., Schaumburg, Ill.
Filed Nov. 10, 1994, Ser. No. 30,849
Term of patent 14 years
U.S. Cl. D14—242



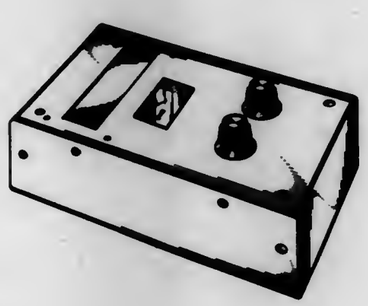
368,268
**TELEPHONE CRADLE**
John E. Nichols, 1627 E. Butler Dr., Phoenix, Ariz. 85020; Steven D. Dodds, 16630 S. 28th Pl., Phoenix, Ariz. 85048, and Briggs B. Edney, 325 S. Cathy Ct., Chandler, Ariz. 85226
Filed Dec. 30, 1994, Ser. No. 32,850
Term of patent 14 years
U.S. Cl. D14—251



368,269
**COMPRESSOR HOUSING FOR A DIESEL TURBOCHARGER**
Randy J. Chapman, 955 Jones Rd., Yuba City, Calif. 95991
Filed Dec. 27, 1994, Ser. No. 32,734
Term of patent 14 years
U.S. Cl. D15—5

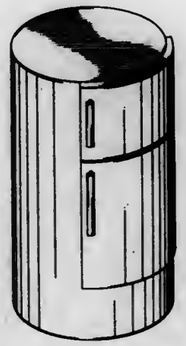


368,270
**ANTENNA PERFORMANCE ANALYZER**
Martin F. Jue, Starkville, Miss., assignor to MFJ Enterprises, Inc., Starkville, Miss.
Continuation of Ser. No. 10,962, Jul. 21, 1993, abandoned.
This application Oct. 3, 1994, Ser. No. 29,324
Term of patent 14 years
U.S. Cl. D10—75





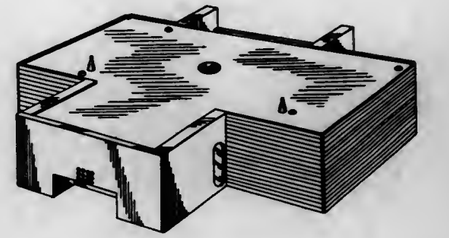
368,271
**CYLINDRICAL COMBINED REFRIGERATOR AND FREEZER**
Matthew C. Montgomery, 1801 Benton Rd., Bossier City, La. 71111
Filed Apr. 25, 1995, Ser. No. 37,956
Term of patent 14 years
U.S. Cl. D15—85



368,272
**EYEGLASS FLOTATION RETAINER**
Steven Starr, 9830 County Rd. 389, New Bloomfield, Mo. 65063, and Curtis W. Shipley, 7514 Rte. M, Jefferson City, Mo. 65101
Filed Jan. 3, 1995, Ser. No. 33,000
Term of patent 14 years
U.S. Cl. D16—339



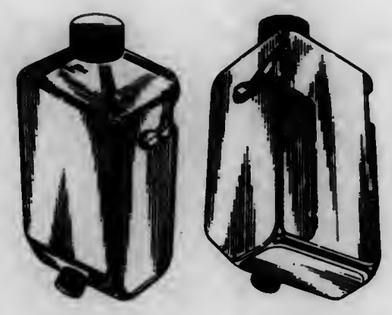
368,273
**MEDIA INPUT TRAY UNIT FOR INK JET PRINTER**
Paul T. Dubose, Escondido, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Mar. 3, 1995, Ser. No. 35,663
Term of patent 14 years
U.S. Cl. D18—49



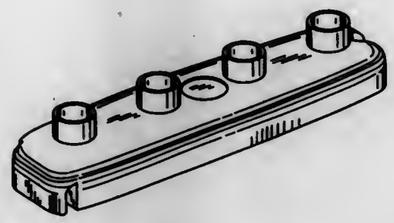
368,274
**PRINTER**
John W. Gamett, and Peter J. Mendel, both of Lexington, Ky., assignors to Lexmark International, Inc., Greenwich, Conn.
Filed Sep. 9, 1994, Ser. No. 28,200
Term of patent 14 years
U.S. Cl. D18—55



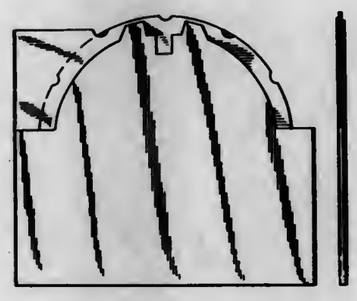
368,275
INK CONTAINER FOR A PRINTER
Kenichi Sakurai, and Hisashi Murega, both of Tokyo, Japan, assignors to Kabushiki Kaisha Gokushokenkyusho, Tokyo, Japan
Filed Sep. 13, 1994, Ser. No. 28,348
Claims priority, application Japan, Mar. 18, 1994, 6-6886
Term of patent 14 years
U.S. Cl. D18—56



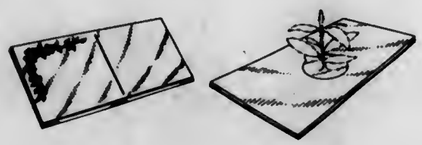
368,277
MARKER HOLDER
Matthew J. Schuster, 2023 N. Emerson St., Portland, Oreg. 97217, and Michael E. Stencel, 2325 SW. Thomas Pl., Gresham, Oreg. 97080
Filed Apr. 7, 1995, Ser. No. 37,248
Term of patent 14 years
U.S. Cl. D19—85



368,278
ROTATING DISC FOR PRINTING INFORMATION
Michel S. Schwartz, 166-25 Powells Cover Blvd., Beechurst, N.Y. 11357
Filed Mar. 10, 1995, Ser. No. 35,979
Term of patent 14 years
U.S. Cl. D20—18

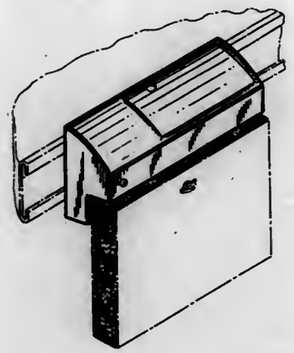


368,276
PLANT SPROUTING POSTCARD
Linda F. Buzby, 703 Polo Cir., Bryn Mawr, Pa. 19010
Filed Oct. 16, 1992, Ser. No. 553
Term of patent 14 years
U.S. Cl. D19—2

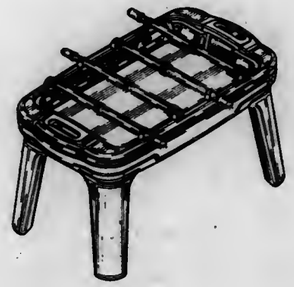




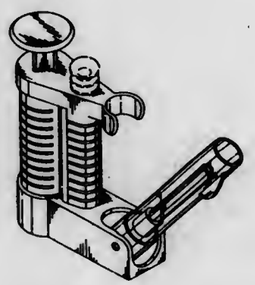
368,279
COMBINED COUPON HOLDER AND ADVERTISING DISPLAY FOR STORE SHELVING
Frederic H. Dalial, New York, N.Y., assignor to Media Holdings, Inc., New York, N.Y.
Filed Jan. 5, 1995, Ser. No. 33,154
Term of patent 14 years
U.S. Cl. D20—43



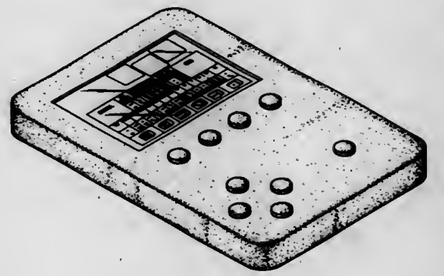
368,281
ACTIVITY TABLE
Patrick Brown, Strongsville; Joseph C. Cacciola; William K. Ford, both of Hudson; John R. Nottingham, Chagrin Falls, and John W. Spirk, Gates Mills, all of Ohio, assignors to The Little Tikes Company, Hudson, Ohio
Filed Feb. 7, 1995, Ser. No. 34,523
Term of patent 14 years
U.S. Cl. D21—11



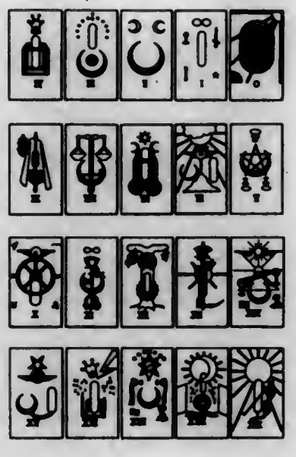
368,280
TOY PROJECTILE LAUNCHER
Robert L. Brown, Cincinnati, Ohio, assignor to Tonka Corporation, Pawtucket, R.I.
Filed May 2, 1994, Ser. No. 22,263
Term of patent 14 years
U.S. Cl. D21—3



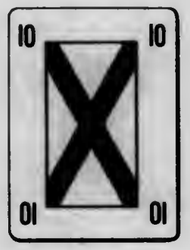
368,282
ELECTRONIC GAME HOUSING
Sheng G. Lin, Tsu-Pei, Taiwan, assignor to Holtek Microelectronics Inc., Hsinchu, Taiwan
Filed Feb. 1, 1995, Ser. No. 34,328
Term of patent 14 years
U.S. Cl. D21—13



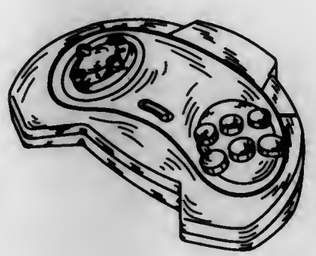
368,283
SET OF FRONT FACES FOR TAROT CARDS
Frits van der Ploeg, Ruwaardstraat 49c, 3023 PT Rotterdam, Netherlands
Filed Apr. 14, 1994, Ser. No. 21,330
Claims priority, application Hague Agreement, Jan. 18, 1993, DM/027613
Term of patent 14 years
U.S. Cl. D21—42



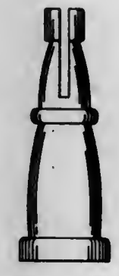
368,284
SET OF PLAYING CARDS
Glenn J. Canda, Henderson, Nev., assignor to Liberty Playing Card Company, Inc., Arlington, Tex.
Filed Sep. 15, 1994, Ser. No. 28,444
Term of patent 14 years
U.S. Cl. D21—44




368,285
CONTROL PAD
Johnny D. Couch, San Jose, and Sarah M. Richmond, Foster City, both of Calif., assignors to Sega Enterprises, Ltd., Japan
Filed Jan. 3, 1995, Ser. No. 32,643
Term of patent 14 years
U.S. Cl. D21—48



368,286
GAME PIECE
Richard G. Friend, 465 NE. 181st Box 500, Portland, Oreg. 97230
Filed May 3, 1995, Ser. No. 38,305
Term of patent 14 years
U.S. Cl. D21—51

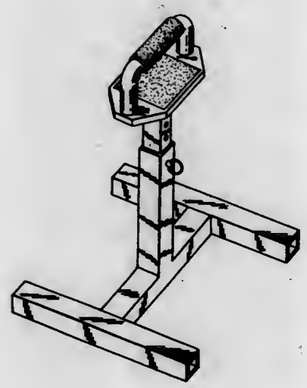




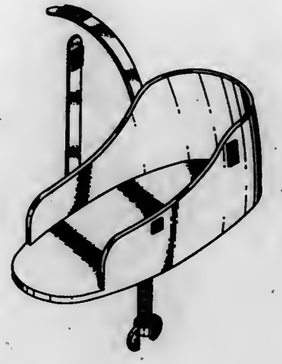
368,287
TOY RIDE-IN TRUCK
Christopher G. Walter, Suffield, Ohio, assignor to The Little Tikes Company, Hudson, Ohio
Filed Jul. 29, 1994, Ser. No. 25,213
Term of patent 14 years
U.S. Cl. D21—78



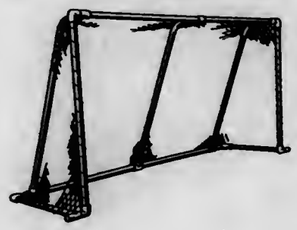
368,288
PHYSICAL EXERCISE SUPPORT
Mike Kasbohm, St. Louis Park, Minn., assignor to SpecTech, Inc., Minneapolis, Minn.
Filed May 23, 1994, Ser. No. 23,288
Term of patent 14 years
U.S. Cl. D21—191



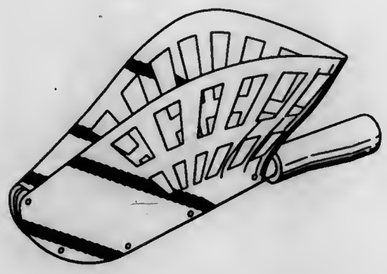
368,289
ORTHOPEDIC BOOT WEIGHT BAR
Mark Cotten, P.O. Box 157, Washington, Ky. 41096-0157
Filed Apr. 28, 1995, Ser. No. 38,169
Term of patent 14 years
U.S. Cl. D21—196



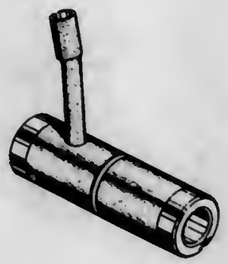
368,290
FOLDABLE FRAME FOR A SOCCER GOAL
Zbigniew J. Lobos, and Elsa S. Lobos, both of 4347 Exeter Road, London Ontario, Canada
Filed Jul. 18, 1994, Ser. No. 26,869
Claims priority, application Canada, Feb. 25, 1994, 1994-0378
Term of patent 14 years
U.S. Cl. D21—200



368,291
CATCHER AND THROWER FOR AERIAL PROJECTILE
Richard A. Sullivan, Manchester; Edward Reid, Madison, and Harris Winoker, Asbury Park, all of N.J., assignors to Airsport Inc., Lyndhurst, N.J.
Filed Feb. 8, 1995, Ser. No. 34,586
Term of patent 14 years
U.S. Cl. D21—210



368,292
GOLF CLUB PUTTER HEAD
Timothy B. Willoughby, 754 Balroyal Ct., Indianapolis, Ind. 46234
Filed Oct. 18, 1994, Ser. No. 29,848
Term of patent 14 years
U.S. Cl. D21—218



368,293
BOWLING SCORING CONSOLE
Shawn O. Barrett, Grayslake, Ill., assignor to Brunswick Bowling & Billiards Corporation, Muskegon, Mich.
Filed Sep. 19, 1994, Ser. No. 28,553
Term of patent 14 years
U.S. Cl. D21—233

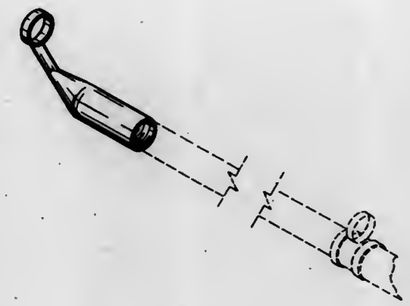


368,294
SIGHT FOR AN ARCHERY BOW
Jack La See, P.O. Box 463, Abbotsford, Wis. 54405
Filed May 9, 1994, Ser. No. 22,560
Term of patent 14 years
U.S. Cl. D22—107

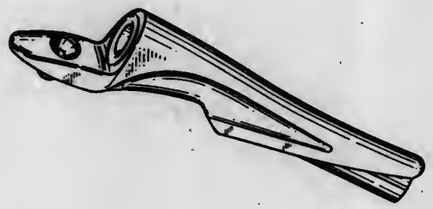




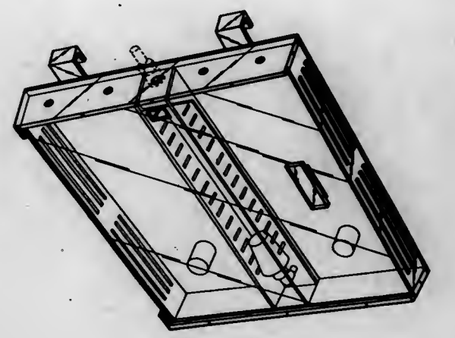
368,295
FISHING ROD TIP
Rolando P. Mata, 1305 Road 42, Pasco, Wash. 99301
Filed Sep. 19, 1994, Ser. No. 28,552
Term of patent 14 years
U.S. Cl. D22—143



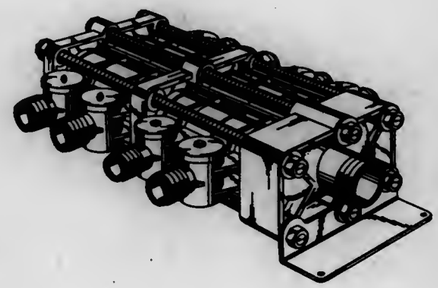
368,296
LINE GUIDE FOR A FISHING ROD
Shinya Takizawa, Musashino; Shuichi Kimura, and Masaru Akiba, both of Higashikurume, all of, Japan, assignors to Daiwa Seiko, Inc., Higashikurume, Japan
Filed Jan. 4, 1995, Ser. No. 33,067
Claims priority, application Japan, Jul. 8, 1994, 6-28396; Dec. 15, 1994, 6-38340
Term of patent 14 years
U.S. Cl. D22—143



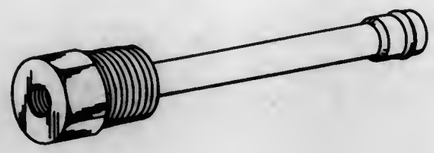
368,297
COMBINED AQUARIUM FILTER AND AERATOR
Eugene W. Dunlap, 4239 Gannett Ave., St. Louis, Mo. 63116-1403
Filed May 11, 1994, Ser. No. 22,775
Term of patent 14 years
U.S. Cl. D23—210



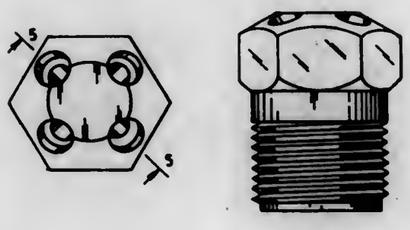
368,298
MULTIPLE WATER LINE VALVED MANIFOLD
Leonard L. Miller, and Thomas E. Brunholtz, both of McPherson, Kans., assignors to Midtec, Inc. of America, McPherson, Kans.
Filed May 17, 1994, Ser. No. 23,066
Term of patent 14 years
U.S. Cl. D23—233



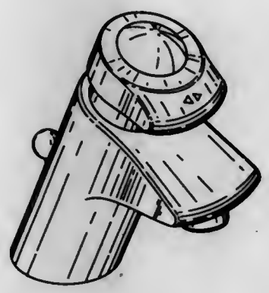
368,299
PROBE CHECK VALVE
George L. Ratledge, P.O. Box 1595, Clovis, N.M. 88101
Filed Nov. 29, 1994, Ser. No. 31,500
Term of patent 14 years
U.S. Cl. D23—235



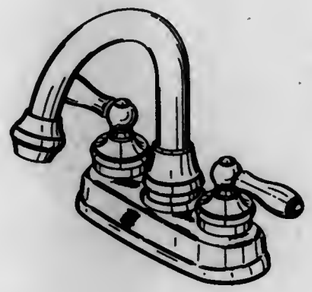
368,300
DISTRIBUTOR VALVE BODY
Stephen G. Grenga, Newark, N.Y., assignor to Spinco Metal Products, Inc., Newark, N.Y.
Filed May 8, 1995, Ser. No. 38,558
Term of patent 14 years
U.S. Cl. D23—235




368,301
FAUCET
Hans Lobermeier, Menden, Germany, assignor to Friedrich Grohe Aktiengesellschaft, Hemer, Germany
Filed Apr. 7, 1995, Ser. No. 37,228
Claims priority, application Germany, Jan. 31, 1994, 94 08 507.2
Term of patent 14 years
U.S. Cl. D23—238

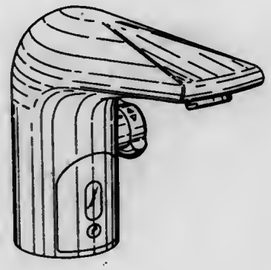


368,302
FAUCET
Frederic C. Doughty, S. Pasadena, and Darren M. Mark, Castaic, both of Calif., assignors to Embert Inc., Newark, Del.
Filed Jan. 25, 1995, Ser. No. 33,981
Term of patent 14 years
U.S. Cl. D23—241

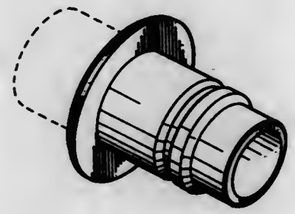




368,303
FAUCET
Hans Lobermeier, Menden, Germany, assignor to Friedrich Grohe Aktiengesellschaft, Hemer, Germany
Filed Apr. 6, 1995, Ser. No. 37,218
Claims priority, application Germany, Jan. 31, 1994, M 94 08 476.9
Term of patent 14 years
U.S. Cl. D23—243



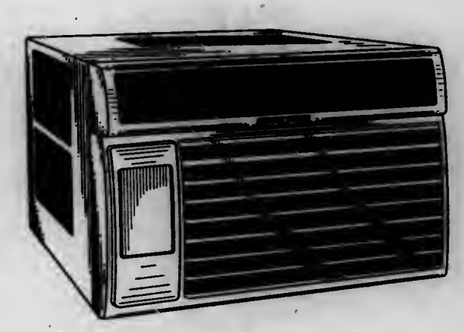
368,304
COMBINED HOSE AND FLOW LINE COUPLING MEMBER
Leigh W. Morrison, Victoria, Australia, assignor to Australasian Steel Products Pty. Ltd., Victoria, Australia
Filed Dec. 19, 1994, Ser. No. 32,451
Term of patent 14 years
U.S. Cl. D23—262



368,305
AIR CONDITIONER
Masao Shigemori, Yokohama; Satoshi Nanjo, Tokyo, and Makoto Yanagida, Yokohama, all of, Japan, assignors to Fujitsu General Limited, Japan
Filed Jan. 27, 1995, Ser. No. 34,898
Claims priority, application Japan, Sep. 19, 1994, 6-28388
Term of patent 14 years
U.S. Cl. D23—351



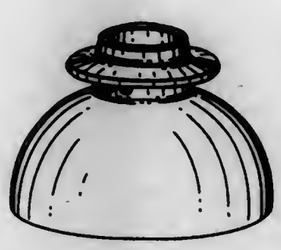
368,306
ROOM AIR CONDITIONER
Charles M. Marino; Renganwamy Ramakrishnan; Eric H. Albrecht; Roger D. Counter, all of Bexar County, Tex.; Michael Zambelli, and Jonathan Marks, both of New York, N.Y., assignors to U.S. Natural Resources, Inc., San Antonio, Tex.
Filed Jan. 20, 1995, Ser. No. 33,828
Term of patent 14 years
U.S. Cl. D23—353



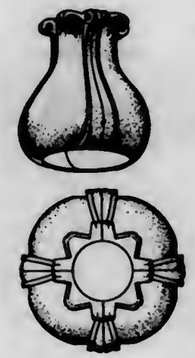
368,307
EVAPORATIVE COOLER PAD CONVERING PLATE
Mickey Miller, P.O. Box 20672, Bullhead City, Ariz. 86439
Filed Jan. 17, 1995, Ser. No. 33,635
Term of patent 14 years
U.S. Cl. D23—354



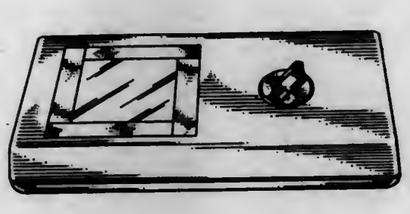
368,309
EARPLUG FOR A HEARING AID
Yoshiyuki Naritawa, Kokubunji, Japan, assignor to Rion Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 1, 1994, Ser. No. 26,590
Term of patent 14 years
U.S. Cl. D24—106



368,308
MOTOR HOUSING FOR A CEILING FAN
William S. Davis, Jr., Fort Worth, Tex., assignor to Davoil, Inc., Fort Worth, Tex.
Filed Feb. 9, 1995, Ser. No. 34,635
Term of patent 14 years
U.S. Cl. D23—411



368,310
SKIN ANALYZER
Loren R. Ouellette, Laguna Hills, Calif., assignor to Microline Technologies, Inc., Laguna Hills, Calif.
Filed Sep. 1, 1994, Ser. No. 28,002
Term of patent 14 years
U.S. Cl. D24—186





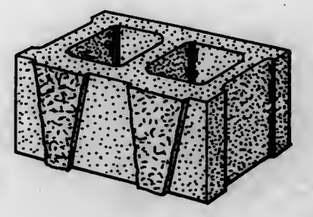
368,311
BABY BOTTLE
Allan Cockram, 797 Lee Ridge Road, Edmonton, Alberta, Canada
Filed Jun. 27, 1995, Ser. No. 41,137
Term of patent 14 years
U.S. Cl. D24—197



368,312
TRAINING CUP
Allan Cockram, 797 Lee Ridge Road, Edmonton, Alberta, Canada
Filed Jun. 27, 1995, Ser. No. 41,138
Term of patent 14 years
U.S. Cl. D24—197



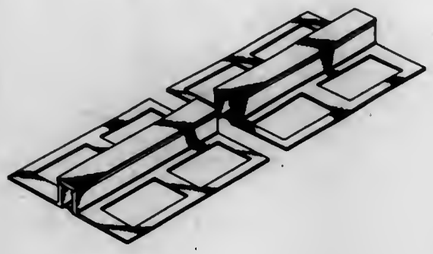
368,313
SPLIT FACE CONCRETE BLOCK
John W. Schulz, Jr., 1420 S. Casaloma Dr., Appleton, Wis. 54915
Filed Oct. 6, 1994, Ser. No. 29,458
Term of patent 14 years
U.S. Cl. D25—118



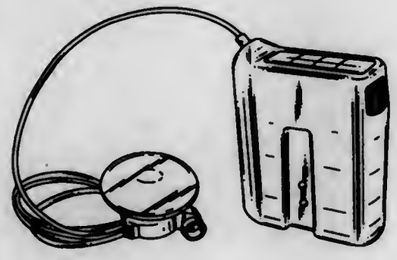
368,314
ROOM DIVIDER UPPER COVER LINING
Ching-Hua Lin, Taipei, Taiwan, assignor to UB Office Systems, Inc., Taipei, Taiwan
Filed Jul. 6, 1994, Ser. No. 26,085
Term of patent 14 years
U.S. Cl. D25—121



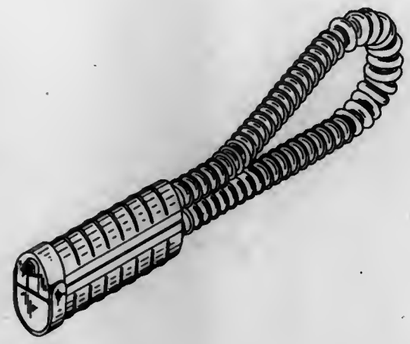
368,315
EXPANSION STRIP FOR TILED SURFACES
Alan J. E. Davies, Hednesford, England, assignor to McKechnie UK Limited, Walsall, England
Filed Dec. 21, 1994, Ser. No. 32,563
Claims priority, application United Kingdom, Jun. 30, 1994, 2040846
Term of patent 14 years
U.S. Cl. D25—124



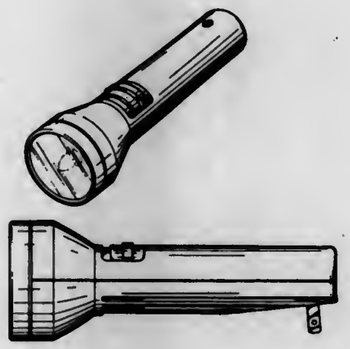
368,316
COMBINED MINER'S LAMP AND POWER SUPPLY PACK THEREFOR
Bjorn Jansson, Motala, Sweden, assignor to Itab Industri AB, Jonkoping, Sweden
Filed Sep. 17, 1993, Ser. No. 27,461
Claims priority, application Sweden, Mar. 17, 1993, 93-0662
Term of patent 14 years
U.S. Cl. D26—39



368,317
FLASHLIGHT
Thomas Swyst, Arlington, Mass., assignor to Black & Decker Inc., Newark, Del.
Filed Feb. 21, 1995, Ser. No. 35,088
Term of patent 14 years
U.S. Cl. D26—43

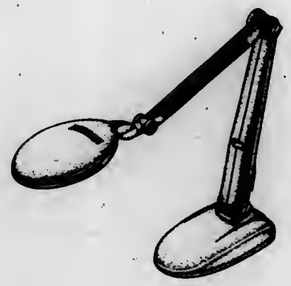


368,318
LARGE SIZE RECHARGEABLE FLASHLIGHT
David A. Furth, Skaneateles; Mark A. Ferguson, Jamesville; Peter F. Lynch, and Scott W. Oziecki, both of Skaneateles, all of N.Y., assignors to Eveready Battery Company, Inc., St. Louis, Mo.
Filed Jan. 24, 1995, Ser. No. 33,918
Term of patent 14 years
U.S. Cl. D26—49





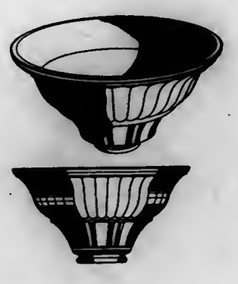
368,319
DESK LAMP
Huo-Tu Huang, No. 9, Lane 379, Chung-Hwa Road, Su-Lin, Taipei, Taiwan
Filed Apr. 28, 1995, Ser. No. 38,088
Term of patent 14 years
U.S. Cl. D26—65



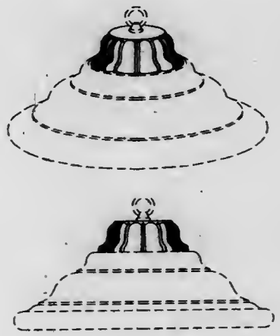
368,320
GLASS SHADE
Chun F. Sung, No. 1427, Ren-Ay Rd., Chi-Ding Li, Jwu-Nan Jenn, Miau-Li Hsien, Taiwan
Filed Nov. 3, 1994, Ser. No. 30,641
Term of patent 14 years
U.S. Cl. D26—131



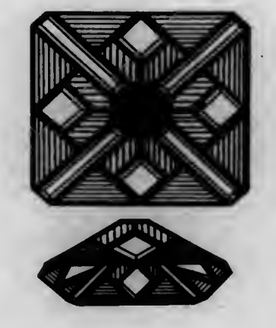
368,321
LAMP GLASS SHADE
Patrick S. Dolan, 1901 NW. Upshur St., Portland, Oreg. 97209
Filed Dec. 28, 1994, Ser. No. 32,528
Term of patent 14 years
U.S. Cl. D26—133



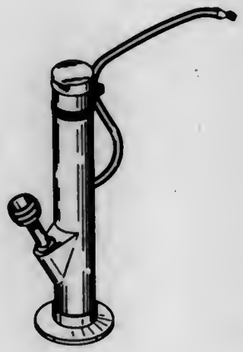
368,322
LAMP GLASS SHADE
Patrick S. Dolan, 1901 NW. Upshur St., Portland, Oreg. 97209
Filed Dec. 21, 1994, Ser. No. 32,555
Term of patent 14 years
U.S. Cl. D26—133



368,323
BOUND GLASS FIXTURE LAMPSHADE
Richard W. McDowell, Palos Verdes, Calif., assignor to Cordelia Lighting Inc., Commerce, Calif.
Filed Oct. 24, 1994, Ser. No. 30,245
Term of patent 14 years
U.S. Cl. D26—136



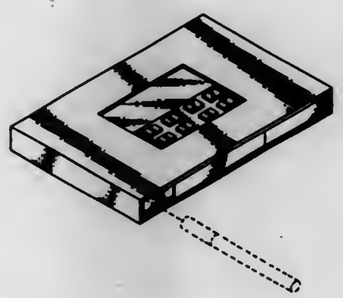
368,324
TOBACCO HOOKAH
Randolph S. Heine, Pinellas Park, Fla., assignor to New Tradition Pipe Company, Pinellas Park, Fla.
Filed Apr. 11, 1995, Ser. No. 37,358
Term of patent 14 years
U.S. Cl. D27—162



368,325
TOBACCO HOOKAH
Randolph A. Heine, Pinellas Park, Fla., assignor to New Tradition Pipe Company, Pinellas Park, Fla.
Filed Jun. 16, 1995, Ser. No. 40,388
Term of patent 14 years
U.S. Cl. D27—162

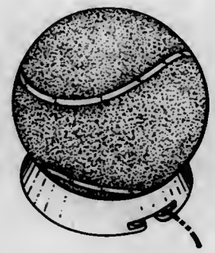


368,326
TIMER ACTIVATED CIGARETTE DISPENSER
Adonis M. Reid, 11900 Olmstead Dr., Fayetteville, Ga. 30214-9010
Filed Mar. 7, 1995, Ser. No. 35,830
Term of patent 14 years
U.S. Cl. D27—186





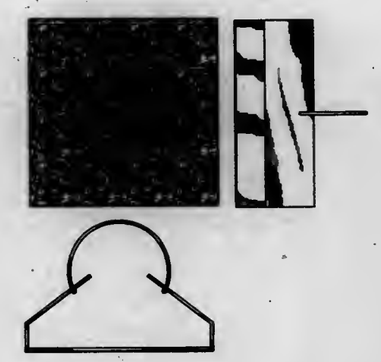
368,327
DENTAL FLOSS DISPENSER
Steven B. Dunn, Beverly Hills, Calif., assignor to Munchkin Bottling, Inc., Van Nuys, Calif.
Filed Jun. 16, 1994, Ser. No. 24,195
The portion of the term of this patent subsequent to Feb. 20, 2010, has been disclaimed.
Term of patent 14 years
U.S. Cl. D28—64



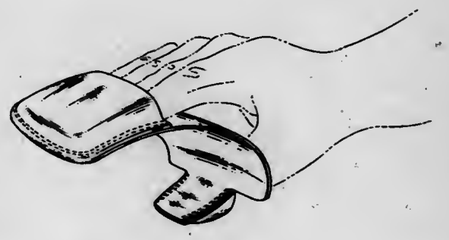
368,328
LIPSTICK CASE
Susan R. Wacker, New York, N.Y., assignor to Elizabeth Arden Company, Division of Conopco, Inc., New York, N.Y.
Filed Dec. 2, 1994, Ser. No. 31,710
Term of patent 14 years
U.S. Cl. D28—85



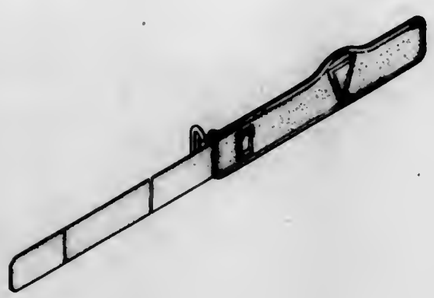
368,329
COMBINED EAR AND MOUTH PROTECTOR
Raymond Parada, 20-31 35th St., Astoria, N.Y. 11105
Filed Apr. 22, 1994, Ser. No. 21,726
Term of patent 14 years
U.S. Cl. D29—112



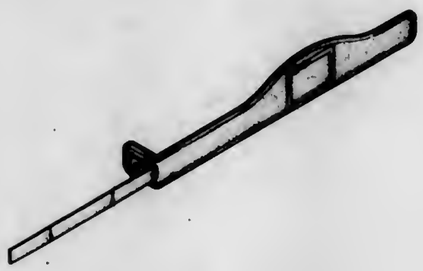
368,330
THERMAL INSULATING FINGER PAD
Florida C. Robinson, Denver, Colo., assignor to Williamson Enterprises, Santa Monica, Calif.
Filed Sep. 14, 1994, Ser. No. 28,451
Term of patent 14 years
U.S. Cl. D29—119



368,331
ELBOW PROTECTOR
Pang-Ching Chiang, 6Fl., No. 293, Sec. 4, Chunghsiao E. Rd., Taipei, Taiwan
Filed Nov. 10, 1994, Ser. No. 31,215
Term of patent 14 years
U.S. Cl. D29—121



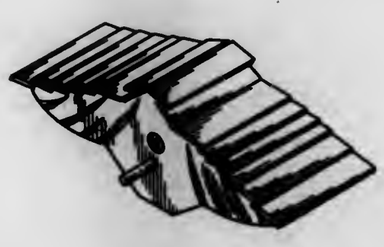
368,332
KNEE PROTECTOR
Pang-Ching Chiang, 6Fl., No. 293, Sec. 4, Chunghsiao E. Rd., Taipei, Taiwan
Filed Nov. 10, 1994, Ser. No. 31,216
Term of patent 14 years
U.S. Cl. D29—121



368,333
FIRE EXTINGUISHER SEAL
Fred Self, 933 Parkside Dr., Richmond, Calif. 94803
Filed Nov. 8, 1994, Ser. No. 30,781
Term of patent 14 years
U.S. Cl. D29—129



368,334
FLYING WING BIRD HOUSE
Kenneth Prehart, P.O. Box 834, Tannersville, Pa. 18372
Filed Mar. 31, 1995, Ser. No. 36,963
Term of patent 14 years
U.S. Cl. D30—111

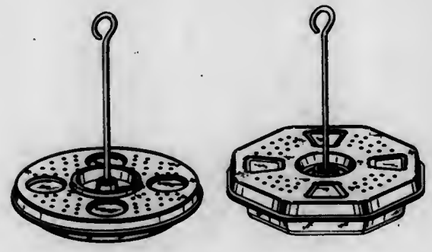




368,335
CAT BED
John T. St. John, Site 4 Compartment 2 RR. 3, Belle River, Ontario, Canada
Filed Jan. 26, 1995, Ser. No. 34,067
Term of patent 14 years
U.S. Cl. D30—118



368,336
BUTTERFLY FEEDER
Arthur C. Brown, P.O. Box 277, West Kingston, R.I. 02892
Filed Sep. 28, 1994, Ser. No. 29,046
Term of patent 14 years
U.S. Cl. D30—121



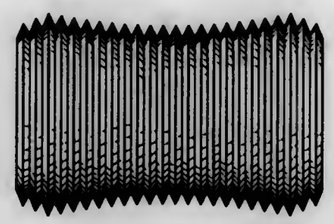
368,337
BIRD FEEDER
Frank R. Dickinson, Granite, N.H., assignor to Pocket Mountain Enterprises, Inc., Ossipee, N.H.
Filed Sep. 2, 1994, Ser. No. 28,016
Term of patent 14 years
U.S. Cl. D30—127



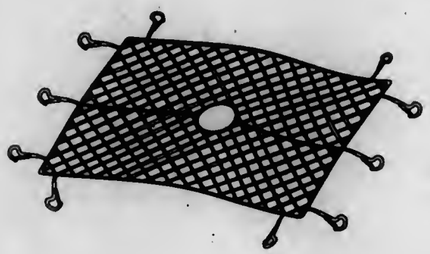
368,338
POST SURGERY PROTECTIVE GARMENT FOR DOGS AND CATS
Linda S. Levengood, 4147 Elmhurst Rd., Toledo, Ohio 43613
Filed Apr. 26, 1995, Ser. No. 38,011
Term of patent 14 years
U.S. Cl. D30—144



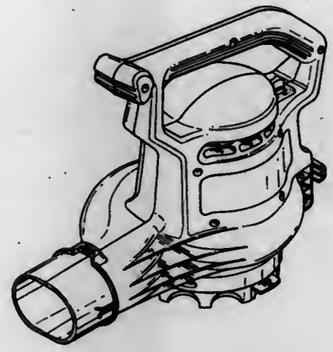
368,339
CHEW TOY FOR DOGS
Anthony O'Rourke, Malibu; Charles Byrne, Mammoth Lakes, and Michael Morgan, Los Angeles, all of Calif., assignors to Booda Products, Inc., Gardena, Calif.
Filed Jun. 23, 1994, Ser. No. 9,909
Term of patent 14 years
U.S. Cl. D30—160



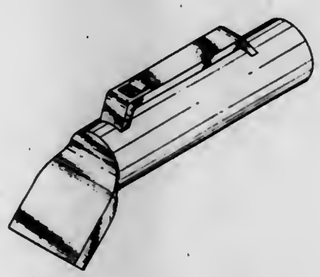
368,340
FLEXIBLE NET FOR A DISHWASHER RACK
Christine Mussmacher, and Arthur J. Dean, Jr., both of 217 Joslen Blvd., Hudson, N.Y. 12534
Filed Nov. 7, 1994, Ser. No. 30,767
Term of patent 14 years
U.S. Cl. 32—3



368,341
CONVERTIBLE ELECTRIC BLOWER VACUUM
Anthony N. Pink, Shorewood, Minn., assignor to The Toro Company, Bloomington, Minn.
Filed Nov. 14, 1994, Ser. No. 31,005
Term of patent 14 years
U.S. Cl. D32—15

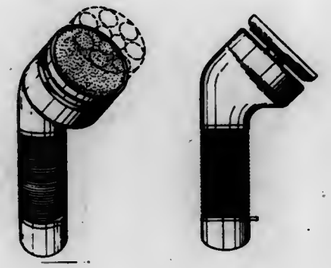


368,342
VACUUM CLEANER FOR SMALL ANIMALS
Christine Founds, 828 ½ 4th Ave., Pinole, Calif. 94564
Filed Aug. 22, 1994, Ser. No. 27,424
Term of patent 14 years
U.S. Cl. D32—18

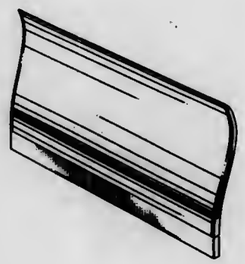




368,343
MULTI-PURPOSE HAND-HELD ROTARY DRIVE CLEANING TOOL
Albert W. Gebhard, and Patricia A. Gebhard, both of 2101 E. Alameda, Denver, Colo. 80209
Filed Jun. 13, 1994, Ser. No. 24,306
Term of patent 14 years
U.S. Cl. D32—35



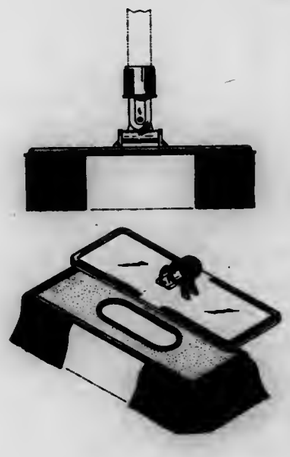
368,344
SCRAPER
Alan M. Hansen, 18304 SW. Westview Dr., Lake Oswego, Oreg. 97034
Filed Apr. 21, 1995, Ser. No. 37,826
Term of patent 14 years
U.S. Cl. D32—46



368,345
EXTENDABLE SCRAPER
David C. Fisher, 1208 Huntingdon Dr., Knoxville, Tenn. 37919-8420
Filed Apr. 28, 1995, Ser. No. 38,178
Term of patent 14 years
U.S. Cl. D32—49



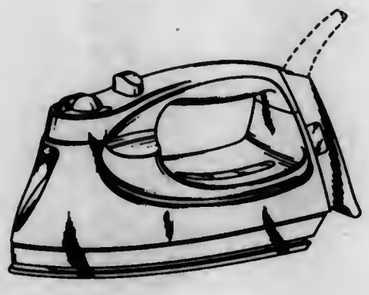
368,346
MOP HEAD
Alan P. Kiefer, Verona, N.J., assignor to Kiefer Brushes, Inc., Verona, N.J.
Filed Jan. 9, 1995, Ser. No. 33,268
Term of patent 14 years
U.S. Cl. D32—50



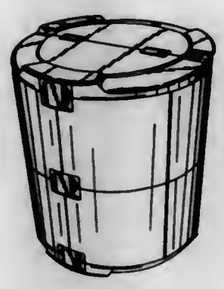
368,347
**PAIL**
Cory J. Kruger, Gardner, Mass., assignor to Sterilite Corporation, Townsend, Mass.
Filed Jun. 30, 1994, Ser. No. 26,289
Term of patent 14 years
U.S. Cl. D32—53



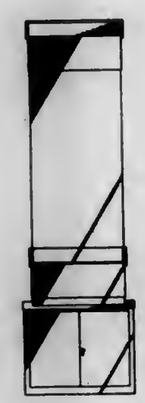
368,348
**ELECTRIC STEAM IRON**
Michael J. Loomis, Watertown, and Stuart Naft, Fairfield, both of Conn., assignors to Black & Decker Inc., Newark, Del.
Filed Jun. 22, 1995, Ser. No. 40,611
Term of patent 14 years
U.S. Cl. D32—70



368,349
**COMPOST BARREL**
Björn-Åke Sköld, Norrköping, Sweden, assignor to Bjorn-Ake Skold Design AB, Norrkoping, Sweden
Filed Jul. 21, 1994, Ser. No. 26,287
Claims priority, application Sweden, Jan. 21, 1994, 94 0150
Term of patent 14 years
U.S. Cl. D34—1



368,350
**HOME RECYCLE BIN**
Christian P. Kamm, Fairview Park, Ohio, assignor to Wilkinson Company, Inc., Stow, Ohio
Division of Ser. No. 13,850, Oct. 4, 1993. This application Apr. 17, 1995, Ser. No. 37,545
Term of patent 14 years
U.S. Cl. D34—1



# LIST OF PATENTEES

TO WHOM

## PATENTS WERE ISSUED ON THE 26th DAY OF MARCH, 1996

NOTE— Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).


Aavid Laboratories, Inc.: *See*—
Larson, Ralph I.; Phillips, Richard J.; Guzowski, Lawrence; and Samarov, Victor M., 5,502,582, Cl. 359-49.000.
Abar Ipsen Industries, Inc.: *See*—
Kellogg, Charles; and Schmidt, Charles, 5,502,742, Cl. 373-128.000.
ABB K.K.: *See*—
Pfister, Markus; and Wieckert, Christian, 5,501,431, Cl. 266-242.000.
Abbott Laboratories: *See*—
Barnes, Thomas L.; Colburn, James W.; Danial, Catherine L.; Jones, William R., Jr.; and Longman, Millard D., 5,500,992, Cl. 29-525.000.
Baugher, Bennett W.; Chamberlain, Aurora J.; Devereaux, Sharon M.; and Ungemach, Frank S., 5,501,985, Cl. 436-518.000.
Saldivar, Louis, Jr.; and Rutnarak, Sangvorn, 5,501,982, Cl. 436-150.000.
Abe, Nobuo: *See*—
Katoh, Akio; and Abe, Nobuo, 5,502,351, Cl. 313-141.000.
Abe, Sou; and Kishimoto, Shinichi, to Ajinomoto Co., Inc. Method for crystallization of α-L-aspartyl-L-phenylalanine methyl ester. 5,501,712, Cl. 23-295.00R.
Abe, Tetsuya; Ishii, Kazuhiko; and Yokoshima, Minoru, to Nippon Kayaku Kabushiki Kaisha. Onium salt, photopolymerization initiator, energy ray-curing composition containing the initiator, and cured product. 5,502,083, Cl. 522-31.000.
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Ishinaga, Hiroyuki; Ikeda, Masami; Abe, Tsutomu; Karita, Seiichiro; and Arashima, Teruo, 5,502,479, Cl. 347-93.000.
Abe, Yukino: *See*—
Nakayama, Minoru; Sawai, Toshiya; Hayakawa, Masaharu; Murata, Shizuo; and Abe, Yukino, 5,501,884, Cl. 428-1.000.
Abitibi-Price, Inc.: *See*—
Bond, Luke D.; Mills, Charles C.; Whiting, Philip; Koutz, Stanley L.; Hazlebeck, David A.; and Downey, Kevin W., 5,501,799, Cl. 210-721.000.
Aboujaoude, Jodi F., to Xerox Corporation. System for collecting statistical data on remotely monitored machines. 5,502,543, Cl. 355-202.000.
Abraham, Leslie R.: *See*—
Mueller, Eric J.; Benting, Gary M.; Abraham, Leslie R.; and Dretzka, Phillip C., 5,501,603, Cl. 434-419.000.
Abraham, Michael: *See*—
Pokrowsky, Peter; Kiefer, Eckehard; Abraham, Michael; Stenkamp, Bernd; Ehrfeld, Wolfgang; and Zetterer, Thomas, 5,502,567, Cl. 356-367.000.
Abram, Izo, to France Telecom. Optical transmission process and system for sending solitons over very long distances. 5,502,588, Cl. 359-154.000.
ACCO USA, Inc.: *See*—
D'Amore, Michael, 5,501,128, Cl. 83-599.000.
Achard, Thomas: *See*—
Handke, Günther; Silye, Edward W.; Raabis, Toivo; Achard, Thomas; and Raulf, Matthias, 5,501,438, Cl. 267-226.000.
Acker, Jody L. Fishing pole alert device. 5,501,027, Cl. 43-17.000.
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Gobush, William; Pelletier, Diane; and Days, Charles, 5,501,463, Cl. 273-184.00R.
Adachi, Hideo: *See*—
Nagasaki, Tatsuo; Mori, Takeshi; and Adachi, Hideo, 5,502,488, Cl. 348-300.000.
Adachi, Hideto: *See*—
Kidoguchi, Isao; Ohsaka, Kiyoshi; Adachi, Hideto; Kamiyama, Satoshi; Manaou, Masaya; and Uenoyama, Takeshi, 5,502,739, Cl. 372-45.000.
Adachi, Yoshio, to AUE Institute, Ltd. Circuit elements that are ultrasonically welded together. 5,502,631, Cl. 361-760.000.
Adair, James H.; Singh, Rajiv K.; Eisenstadt, William R.; and Staehle, Sherry S., to University of Florida. Patterned deposition of thin films. 5,501,877, Cl. 427-249.000.
Adams, Alfred A., to Group Lotus Limited. Method and apparatus for forming a moulded article incorporating a reinforcing structure. 5,501,832, Cl. 264-510.000.
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Lafontaine, Daniel M.; Hastings, Roger; and Adams, Daniel O., 5,501,228, Cl. 128-692.000.
Adams, Julian; Beaulieu, Pierre L.; Déziel, Robert; DiMaio, John; Grenier, Louis; Lavallée, Pierre; and Moss, Neil, to BioMega Boehringer Ingelheim Research Inc. Antiherpes pentapeptide derivatives having a substituted aspartic acid side chain. 5,502,036, Cl. 514-17.000.
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Welch, Wallace W.; Anghelo, Python V.; Triplett, William F.; and Adams, Katherine A., 5,501,466, Cl. 273-355.000.
Adams, Mark D.: *See*—
Hastings, Gregg A.; Adams, Mark D.; Fraser, Claire M.; Lee, Norman H.; Kirkness, Ewen P.; Blake, Judith A.; Fitzgerald, Lisa M.; Drake, Fred H.; and Gowan, Maxine, 5,501,969, Cl. 435-240.200.
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Addey, Caroline V. P.; Peaker, Malcolm; and Wilde, Colin J., to British Technology Group Limited. Control of secretion of milk. 5,502,163, Cl. 530-300.000.
Advanced Micro Devices: *See*—
Schnizlein, Paul G.; and Norris, David E., 5,502,409, Cl. 327-99.000.
Advanced Micro Devices, Inc.: *See*—
Buchanan, James M., 5,502,397, Cl. 324-754.000.
Peterson, Joseph W.; Hendrickson, Alan F.; Gulick, Dale E.; and Grumlose, Dean, 5,502,689, Cl. 368-156.000.
Shah, Salim A., 5,502,828, Cl. 395-403.000.
Tran, Thang; Gnaspathy, Gopi; Goddard, Michael D.; and Thaden, Robert, 5,502,414, Cl. 327-434.000.
Advantage Lift Systems, Inc.: *See*—
Fletcher, Robert H., 5,501,296, Cl. 187-210.000.
Aerospatiale Societe Nationale Industrielle: *See*—
Leyre, Xavier; and Senaux, Michel, 5,502,812, Cl. 395-182.080.
Piau, Gérard P., 5,502,394, Cl. 324-646.000.
Afting, Ernest-Guenter: *See*—
Haigwood, Nancy L.; Afting, Ernest-Guenter; Mullenbach, Guy; and Paques, Eric P., 5,501,853, Cl. 424-94.640.
Agano, Toshitaka, to Fuji Photo Film Co., Ltd. Image reading and recording apparatus using a stimulable phosphor sheet and a thermosensitive recording medium. 5,502,465, Cl. 347-264.000.
Agari, Norimasa; and Kuwahara, Hideki, to Nippon Thompson Company, Ltd. Track rail fixing structure for linear motion units. 5,501,528, Cl. 384-45.000.
Agency of Industrial Science & Technology: *See*—
Homma, Keiko; and Arai, Tatsuo, 5,501,656, Cl. 601-33.000.
Agfa-Gevaert N.V.: *See*—
Kiekens, Eric; and Callant, Paul, 5,502,205, Cl. 548-360.500.
Leenders, Luc; Oelbrandt, Leo; Van den Bogaert, Jan; and Desie, Guido, 5,501,150, Cl. 101-466.000.
Leonard, Jacques, 5,502,302, Cl. 250-234.000.
Van Rompuy, Ludo; and Coppens, Paul, 5,501,939, Cl. 430-204.000.
AGI Incorporated: *See*—
Ambergen, G.; and van Dijk, O., 5,501,062, Cl. 53-452.000.
Agricultural Genetics Company Limited: *See*—
Meadows, Martin-Paul; Ellis, Deborah J.; and Jarrett, Paul, 5,501,852, Cl. 424-93.461.
Aguirre Arregui, Ignacio: *See*—
Errasti Iriarte, Iosu; and Aguirre Arregui, Ignacio, 5,501,066, Cl. 53-556.000.
Ahn, Seoung-joon, to Samsung Electronics Co., Ltd. Cartridge-holder locking device for a magnetooptical disk player. 5,502,705, Cl. 369-77.200.
Ai, Chiayu; Wyant, James C.; Shao, Lian-Zhen; and Parks, Robert E., to Wyko Corporation. Method and apparatus for absolute optical measurement of entire surfaces of flats. 5,502,566, Cl. 356-359.000.
Aihara, Masaki: *See*—
Sonoyama, Mitsuyoshi; Suzaki, Kentaro; Aihara, Masaki; Suzaki, Hirokatsu; Miyahara, Shoji; Kojima, Norio; and Okada, Masatoshi, 5,501,058, Cl. 53-204.000.
Aihara, Yoshihiko, to Canon Kabushiki Kaisha. Camera with memory address designation feature. 5,502,830, Cl. 395-421.070.
Air Products and Chemicals, Inc.: *See*—
Waller, Francis J.; and Studer, David W., 5,502,243, Cl. 560-232.000.
Aisin Aw Co., Ltd.: *See*—
Inuzuka, Takeshi; Hattori, Masashi; Kaigawa, Masato; Hojo, Yasuo; Tabata, Atsushi; and Shirai, Kenji, 5,501,642, Cl. 477-107.000.
Taniguchi, Takao; Tsukamoto, Kazumasa; Hayabuchi, Masahiro; and Ando, Masahiko, 5,501,645, Cl. 477-130.000.
Aisin Seiki Kabushiki Kaisha: *See*—
Ogawa, Tetsuyuki; and Nakayoshi, Hideki, 5,501,585, Cl. 418-171.000.
Aizawa, Kaoru: *See*—
Ichikawa, Hiroki; Aizawa, Kaoru; and Okuno, Toshimitsu, 5,501,897, Cl. 428-261.000.
Ajinomoto Co., Inc.: *See*—
Abe, Sou; and Kishimoto, Shinichi, 5,501,712, Cl. 23-295.00R.

Akagiri, Kenzo, to Sony Corporation. Apparatus for encoding digital data with reduction of perceptible noise. 5,502,789, Cl. 395-2.130.

Akasaki, Yutaka: *See*—
Imai, Akira; Ishii, Toru; Tokida, Akihiko; and Akasaki, Yutaka, 5,501,927, Cl. 430-78.000.

Akioka, Takashi: *See*—
Hiraishi, Atsushi; Akioka, Takashi; Kobayashi, Yutaka; Yokoyama, Yuji; Iwamura, Masahiro; Yamauchi, Tatsumi; Takahashi, Shigeru; Uchida, Hideaki; and Ide, Akira, 5,502,820, Cl. 395-250.000.

Akita, Kunihiko, to NEC Corporation. Routing system in data communication with frame relay procedure control. 5,502,712, Cl. 370-16.000.

Akiyama, Satoshi: *See*—
Hori, Kenjiro; Akiyama, Satoshi; Suzuki, Hideki; and Takubo, Takefumi, 5,502,550, Cl. 355-246.000.

Alamar Biosciences Laboratory, Inc.: *See*—
Lancaster, Michael V.; and Fields, Rebecca D., 5,501,959, Cl. 435-32.000.

Albany International Corp.: *See*—
Brookstein, David; Rose, Donald; Dent, Robin; Dent, John; and Skelton, John, 5,501,133, Cl. 87-33.000.

Albayrak, Celal: *See*—
Rössling, Georg; Albayrak, Celal; Rothe, Matthias; and Siegert, Joachim, 5,501,863, Cl. 424-489.000.

Albertrack, Jade H.: *See*—
Hall, Jeff W.; Barrow, Steven M.; Albertrack, Jade H.; and Tisinger, Eric W., 5,502,370, Cl. 323-284.000.

Albright, Scot P.; and Chamberlin, Rhodes R., to Photon Energy, Inc. Photovoltaic cell having a p-type polycrystalline layer with large crystals. 5,501,744, Cl. 136-258.000.

Alcatel SEL Aktiengesellschaft: *See*—
Ohnsorge, Horst, 5,502,586, Cl. 359-117.000.

Alcon Laboratories, Inc.: *See*—
DeSantis, Louis M., 5,502,052, Cl. 514-236.200.

Aldecoa, Julin A.: *See*—
Gruenstern, Robert G.; Bast, Ronald J.; Aldecoa, Julin A.; and Miller, Lawrence F., 5,501,918, Cl. 429-120.000.

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Aldrich, Gregory; Si, Stephen S.-C.; Wang, Eugene T.; and Woffinden, Gary A., to Amdahl Corporation. Clock distribution system for reducing clock skew between processors in a dual sided tightly coupled system. 5,502,819, Cl. 395-200.190.

Alesi, Daniel E.: *See*—
Green, David T.; Bolanos, Henry; Alesi, Daniel E.; and Toso, Kenneth E., 5,501,689, Cl. 606-139.000.

Alexy, Albert A.: *See*—
Dory, Efraim; Evans, Martin; and Alexy, Albert A., 5,502,686, Cl. 367-34.000.

Ali-Yahia, Taher; and Dana, Michel, to France Telecom-Etablissement Autonome De Droit Public. Associative memory architecture. 5,502,832, Cl. 395-435.000.

Allen-Bradley Company, Inc.: *See*—
Kertzman, Russel J.; Seibel, Brian J.; and Busse, Doyle, 5,502,360, Cl. 318-805.000.

Allen, Curtis G.; Perrone, David H.; and Rossi, David M., to Litton Systems, Inc. Method for bonding thermally-mismatched elements of a traveling wave tube. 5,501,390, Cl. 228-124.100.

Allen, Martin A.; and Fetcko, John T., to Exxon Chemical Patents, Inc. Method and apparatus for coating a six-sided fibrous batting. 5,501,872, Cl. 427-180.000.

Allen, William J. Method for programming antifuses for reliable programmed links. 5,502,395, Cl. 324-713.000.

Allied Colloids Limited: *See*—
Burke, Anthony J., 5,501,774, Cl. 162-164.100.

AlliedSignal Inc.: *See*—
Unger, Peter D.; and Rohrbach, Ronald P., 5,502,082, Cl. 521-141.000.
Woodruff, James R.; and Robinson, Michael J., 5,501,103, Cl. 73-514.290.

Allison, Donald W.: *See*—
Marshall, Connie T.; Lemmons, Thomas R.; and Allison, Donald W., 5,502,504, Cl. 348-565.000.

Alloy Surfaces Co. Inc.: *See*—
Baldi, Alfonso L.; and Clark, Frank J., 5,501,751, Cl. 149-14.000.

Allred, Johnny W.; and Fleck, Vincent J., Jr., to United States of America, National Aeronautics and Space Administration. Single acting translational/rotational brake. 5,501,303, Cl. 188-67.000.

Almquist, Thomas A.; and Smalley, Dennis R., to 3D Systems, Inc. Thermal stereolithography. 5,501,824, Cl. 264-401.000.

Al-Samadi, Riad A.; and Benedek, Andrew, to Zenon Environmental, Inc. Microfiltration enhanced reverse osmosis for water treatment. 5,501,798, Cl. 210-652.000.

Altmann, Rainer: *See*—
Resch, Reinhard; van Zanten, Anton; Lauer, Rainer, deceased; Schroff-Lauer, Regina, heir; Lauer, Joacha, heir; Altmann, Rainer; Binder, Jürgen; and Meyer, Michael-Raymond, 5,501,514, Cl. 303-115.400.

Alton, Kenneth D.: *See*—
Marko, Paul D.; and Alton, Kenneth D., 5,502,437, Cl. 340-825.470.

AM S.r.l.: *See*—
Miotto, Onorio, 5,501,023, Cl. 36-50.500.

Amada Company Limited: *See*—
Armstrong, Donald L.; Yoneda, Akiyoshi; and Okada, Kunihiko, 5,501,129, Cl. 83-848.000.

Amande, Jean-Claude: *See*—
Lemaire, Christophe; Amande, Jean-Claude; Chambon, Bernard; and Larue, Joseph, 5,501,776, Cl. 203-18.000.

Amano, Tadashi: *See*—
Hiyama, Tadayoshi; Yokota, Toru; and Amano, Tadashi, 5,502,123, Cl. 526-88.000.

Amanuma, Tatsuo; Terui, Nobuhiko; Miyamoto, Hidenori; and Omi, Junichi, to Nikon Corporation. Electrically powered camera. 5,502,536, Cl. 354-400.000.

Amari, Fumiya: *See*—
Orimoto, Hiroyuki; Suzuki, Saburo; and Amari, Fumiya, 5,501,590, Cl. 425-526.000.

Ambergen, G.; and van Dijk, O., to AGI Incorporated. Process and machines for manufatuuring one-piece boxes and boxes made thereby. 5,501,062, Cl. 53-452.000.

Amdahl Corporation: *See*—
Aldrich, Gregory; Si, Stephen S.-C.; Wang, Eugene T.; and Woffinden, Gary A., 5,502,819, Cl. 395-200.190.

Amemiya, Shinji: *See*—
Oda, Kenzo; Nagamine, Akira; and Amemiya, Shinji, 5,501,606, Cl. 439-140.000.

American Cyanamid Company: *See*—
Galante, Rocco J., 5,502,191, Cl. 544-284.000.
Gange, David M., 5,502,071, Cl. 514-415.000.

Amici, Robert M.: *See*—
LaFleur, Edward E.; Work, William J.; Amici, Robert M.; Bortnick, Newman M.; and Holy, Norman L., 5,502,106, Cl. 525-57.000.

Amoco Corporation: *See*—
Bartos, Thomas M.; Rosen, Bruce I.; and Rosenfeld, Jeffrey I., 5,502,247, Cl. 562-486.000.
Garg, Arvind K.; and McAnear, Jack, 5,501,279, Cl. 166-372.000.
Hall, Richard A.; O'Connell, Michael G.; and Taylor, Evelyn A., 5,501,804, Cl. 210-805.000.
Ngo, David D., 5,501,941, Cl. 430-270.150.
Puri, Rajen, 5,501,273, Cl. 166-252.500.

Anan, Naoki; Takagi, Bungo; and Miyamura, Kazuya, to Menicon Co., Ltd. Soft contact lens with a back surface whose central and intermediate portions are formed by different ellipsoidal surfaces continuously contiguous to each other. 5,502,517, Cl. 351-160.00H.

Anderson, Brian; Brodsky, Anatol; and Burgess, Lloyd, to University of Washington. Analytical sensor using grating light reflection spectroscopy. 5,502,560, Cl. 356-128.000.

Anderson, Charles R.; Warfield, Robert W.; Cseri, Istvan; Low, Murray K.; Liaw, Weikuo; and Bush, Alan M., to Borland International, Inc. System and methods for improved spreadsheet interface with user-familiar objects. 5,502,805, Cl. 395-148.000.

Anderson Corporation: *See*—
Hanson, Craig; Gallagher, John; and Schneider, Kirk, 5,501,888, Cl. 428-38.000.

Anderson, David M.; and McCutcheon, Shawn, to Medical Graphics Corporation. Dynamic gas density compensation in pulmonary gas analyzer systems. 5,502,660, Cl. 364-571.030.

Anderson, Karen L.; and Anderson, Keith E. Dental care educational and tooth fairy visit kit with magic dust. 5,501,602, Cl. 434-263.000.

Anderson, Keith E.: *See*—
Anderson, Karen L.; and Anderson, Keith E., 5,501,602, Cl. 434-263.000.

Andersson, Sven-Börje: *See*—
Hill, Ira; Malmborg, Bengt E.; Oldham, Ronald G.; Turner, James E.; Ellis, Michael P.; and Andersson, Sven-Börje, 5,501,236, Cl. 131-270.000.

Ando, Masahiko: *See*—
Taniguchi, Takao; Tsukamoto, Kazumasa; Hayabuchi, Masahiro; and Ando, Masahiko, 5,501,645, Cl. 477-130.000.

Ando, Masayuki, to Taimei Kinzoku Kogyo Co., Ltd. Plate valve. 5,501,427, Cl. 251-228.000.

Ando, Seigo; and Matsufuji, Yasuhiro, to NKK Corporation. Apparatus for magnetic inspection using magnetic shield, with specific relation of distance E between magnetic sensors and distance L between each magnetic sensor and the object to be inspected, to obtain optimum S/N. 5,502,382, Cl. 324-242.000.

Andoh, Masako: *See*—
Ohsori, Akira; Andoh, Masako; and Morita, Yasushi, 5,501,856, Cl. 424-428.000.

Andrei, Maria; Roggero, Arnaldo; Soprani, Massimo; and Gandini, Alberto, to Enitricerche S.p.A. Solid polymeric electrolyte including a cross-linked polyether encompassing an ion compound and a liquid plasticizer. 5,501,920, Cl. 429-192.000.

Andreas, Heinz; Hummel, Karl-Ernst; Klotz, Arthur; and Schermuly, Thomas, to Filterwerk Mann & Hummel GmbH. Activated carbon filter for venting a fuel tank. 5,501,723, Cl. 96-131.000.

Andrew, Brian J.; and Andrew, Jo E. System and method for simultaneously controlling ringing at local and remote telephones. 5,502,762, Cl. 379-202.000.





Andrew, Jo E.: *See*—
Andrew, Brian J.; and Andrew, Jo E., 5,502,762, Cl. 379-202.000.

Andrews, David R.; and Sudhakar, Anantha R., to Schering Corporation. Steroid intermediates and processes for their preparation. 5,502,183, Cl. 540-46.000.

Anelva Corporation: *See*—
Mashiro, Supica, 5,502,355, Cl. 315-111.210.

Angerbauer, Rolf; Fey, Peter; Hübach, Walter; Philipps, Thomas; Bischoff, Hilmar; Petzinna, Dieter; Schmidt, Delf; and Thomas, Günter, to Bayer Aktiengesellschaft. Polysubstituted pyridines useful for treating lipoproteinaanemia and arteriosclerosis. 5,502,057, Cl. 514-277.000.

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Anghelo, Python V.: *See*—
Welch, Wallace W.; Anghelo, Python V.; Triplett, William F.; and Adams, Katherine A., 5,501,466, Cl. 273-355.000.

Anika Research, Incorporated: *See*—
Kuo, Jing-Wen; Swann, David A.; and Prestwich, Glenn D., 5,502,081, Cl. 514-777.000.

Ansart, Denis R. H.; Hernandez, Didier; and Martinez, Rodolphe, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "SNECMA". Fixing arrangement for a thermal protection tile in a combustion chamber. 5,501,071, Cl. 60-39.320.

Ansel, George M.: *See*—
Liu, Lin-Shih; Raza, Syed B.; Nazarian, Hagop; Ansel, George M.; Douglass, Stephen M.; and Hunt, Jeffery S., 5,502,403, Cl. 326-46.000.

Anspach Effort, Inc., The: *See*—
Anspach, William E., Jr.; Reid, William S.; Del Rio, Eddy H.; and Anspach, William E., III, 5,501,695, Cl. 606-232.000.

Anspach, William E., III: *See*—
Anspach, William E., Jr.; Reid, William S.; Del Rio, Eddy H.; and Anspach, William E., III, 5,501,695, Cl. 606-232.000.

Anspach, William E., Jr.; Reid, William S.; Del Rio, Eddy H.; and Anspach, William E., III, to Anspach Effort, Inc., The. Fastener for attaching objects to bones. 5,501,695, Cl. 606-232.000.

Antenna Company, The: *See*—
Gomez, Francisco X., 5,502,452, Cl. 343-715.000.

Antkowiak, Thomas A.; Hall, James E.; Lawson, David F.; Schreffler, John R.; and Stayer, Mark L., Jr., to Bridgestone Corporation. Method of preparing polymer using allyl-and xylyl-amine containing initiators. 5,502,131, Cl. 526-180.000.

Antkowiak, Thomas A.: *See*—
Lawson, David F.; Antkowiak, Thomas A.; Hall, James E.; and Stayer, Mark L., Jr., 5,502,130, Cl. 526-180.000.

Antonelli, Joseph A.; Becton, Lee A. E.; Devlin, Brian P.; and Scopazzi, Christopher, to Du Pont de Nemours, E. I., and Company. Stable aqueous metallic flake dispersion using phosphated acrylic polymer dispersant. 5,502,113, Cl. 525-287.000.

Anvik Corporation: *See*—
Duna, Thomas J.; and Jain, Kanti, 5,502,563, Cl. 356-352.000.

Aoki, Kazuo: *See*—
Kawana, Eishirou; Ogawa, Hitoshi; Ishida, Koichi; and Aoki, Kazuo, 5,501,629, Cl. 451-28.000.

Aoki, Takuya: *See*—
Miyashita, Yukio; Shimasaki, Yuichi; Oketani, Toshikazu; Hatcho, Seiji; Matsumoto, Seiji; Aoki, Takuya; Saito, Akihisa; Komatsuda, Takashi; and Kato, Hiroaki, 5,501,073, Cl. 60-284.000.

Aoki, Toshinari: *See*—
Okawa, Takashi; Aoki, Toshinari; Matsunaga, Hiroshi; and Igarashi, Hideo, 5,502,244, Cl. 560-345.000.

Aono, Kenji: *See*—
Takahashi, Kazuyoshi; Otsuka, Naoji; Ebata, Tokihide; Hirabayashi, Hiromitsu; Tajika, Hiroshi; Koitabashi, Noribumi; Arai, Atsushi; Aono, Kenji; and Sugimoto, Hitoshi, 5,502,464, Cl. 346-25.000.

Apple Computer, Inc.: *See*—
Lyon, Richard F., 5,502,663, Cl. 364-724.010.

Applied Science and Technology, Inc.: *See*—
Besen, Matthew M.; Sevillano, Evelio; and Smith, Donald K., 5,501,740, Cl. 118-723.0MP.

Appa, William P., to Rehrig Pacific Company, Inc. Height extension for crates and the like. 5,501,352, Cl. 220-4.260.

Aprogenex, Inc.: *See*—
Cubbage, Michael L.; Bresser, Joel; Blick, Mark; and Ju, Shyh C., 5,501,952, Cl. 435-6.000.

Ara, Yoji: *See*—
Kaburagi, Yoshiaki; Shoda, Shoichiro; Kimura, Tetsuo; Ara, Yoji; Mukai, Takanori; Nakamura, Masaaki; and Yokoi, Katsuyuki, 5,502,475, Cl. 347-102.000.

Arai, Atsushi: *See*—
Takahashi, Kazuyoshi; Otsuka, Naoji; Ebata, Tokihide; Hirabayashi, Hironitsu; Tajika, Hiroshi; Koitabashi, Noribumi; Arai, Atsushi; Aono, Kenji; and Sugimoto, Hitoshi, 5,502,464, Cl. 346-25.000.

Arai, Hideo: *See*—
Murai, Toshinari; Iino, Eiichi; Arai, Hideo; Fusegawa, Izumi; and Yamagishi, Hirotoshi, 5,501,172, Cl. 117-15.000.

Arai, Hitoshi: *See*—
Nakaya, Chitose; Bito, Yoshitaka; Yamamoto, Etsuji; Nishimura, Hiroshi; Takeuchi, Hiroyuki; Watanabe, Shigeru; Miyajima, Akihiro; and Arai, Hitoshi, 5,502,384, Cl. 324-309.000.

Arai, Ikuo: *See*—
Yamaguchi, Seiji; Yamaura, Takeshi; Ogata, Takatsugu; Suzuki, Tsutomu; and Arai, Ikuo, 5,502,393, Cl. 324-639.000.

Arai, Masatoshi: *See*—
Kimura, Tsuneo; and Arai, Masatoshi, 5,502,096, Cl. 524-356.000.

Arai, Tatsuo: *See*—
Homma, Keiko; and Arai, Tatsuo, 5,501,656, Cl. 601-33.000.

Arai, Yasuo, to National Laboratory for High Energy Physics. Voltage-controlled oscillating circuit. 5,502,418, Cl. 331-57.000.

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Erskine, Timothy J., 5,501,675, Cl. 604-263.000.
Jhuboo, Abdel-Nasser; and Rebours, Pierre, 5,501,665, Cl. 604-65.000.

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Haigwood, Nancy L.; Afting, Ernest-Guenter; Mullenbach, Guy; and Paques, Eric P., 5,501,853, Cl. 424-94.640.

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Bernstein, Elliot, 5,501,003, Cl. 29-827.000.

Belinsky, Sidney I. Floating terminal. 5,501,625, Cl. 441-3.000.

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Bellio, Stephen L.; Condon, Mark J.; and Mueller, James F., to Charles Stark Draper Laboratory Inc., The. Automatic sheet printing and alignment system. 5,501,148, Cl. 101-232.000.

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Benson, David K.: *See—*
Pernicka, John C.; Benson, David K.; and Tracy, C. Edwin, 5,502,292, Cl. 219-121.640.

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Benton, Robert L., to Thomson Saginaw Ball Screw Co., Inc. Ball nut and screw assembly with preload retaining ball return tube clamp. 5,501,118, Cl. 74-441.000.

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McClure, Robert G., 5,501,009, Cl. 29-882.000.

Bergeron, Raymond C. Power bucket. 5,501,024, Cl. 37-184.000.

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Bernstein, Ralph; Tahiliani, Vasu H.; Rabinowitz, Mario; and Grace, Richard, to Electric Power Research Institute, Inc. Retrodictive molecular and particle in-situ snares. 5,501,112, Cl. 73-864.000.

Berry, Joe R., to Bowen Tools, Inc. Method and apparatus for displacing a top drive torque track. 5,501,286, Cl. 175-52.000.

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Berson, William; and Auslander, Judith D., to Pitney Bowes Inc. Bar code scanner for reading a visible ink and a luminescent invisible ink. 5,502,304, Cl. 250-271.000.

Bert, Christophe; and Urffer, Daniel, to Societe Europeenne Des Produits Refractaires. Fused ceramic beads. 5,502,012, Cl. 501-103.000.

Bertin, Claude L.; Hedberg, Erik L.; and Howell, Wayne J., to International Business Machines Corporation. Semiconductor stack structures and fabrication/sparing methods utilizing programmable spare circuit. 5,502,333, Cl. 257-685.000.

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Betters, Thomas H.: *See—*
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Betts, Geoffrey. Packaging of hand tools. 5,501,330, Cl. 206-349.000.

Betz, Dieter; Herrmann, Reinhold; and Hammer, Uwe, to Robert Bosch GmbH. Ignition coil set for a multicylinder internal combustion engine. 5,501,205, Cl. 123-635.000.

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Bhatt, Girish M.; and Johnson, Dale B., to JWI Ltd. Melt-extruded monofilament comprised of a blend of polyethylene terephthalate and a thermoplastic polyurethane. 5,502,120, Cl. 525-440.000.

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Biegler, Robert M., to Minnesota Mining and Manufacturing Company. Filter for photothermographic developer. 5,502,533, Cl. 354-300.000.

Biesinger, Mark G.; and Biesinger, Matthew M. Method and system for processing film by speed and activating agent concentration temperature control. 5,502,532, Cl. 354-298.000.

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Billingham, Paul R. File box closure catch. 5,501,356, Cl. 220-324.000.

Binder, Jürgen: *See—*
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Bioglan Ireland (R&D) Limited: *See—*
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BioMega Boehringer Ingelheim Research Inc.: *See—*
Adams, Julian; Beaulieu, Pierre L.; Déziel, Robert; DiMaio, John; Grenier, Louis; Lavallée, Pierre; and Moss, Neil, 5,502,036, Cl. 514-17.000.

BioSepra, Inc.: *See—*
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Birbaum, Jean-Luc: *See—*
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Birch, Christopher H.; van Staden, Christian V.; Brooks, Walter R.; Nicholas, Paul D.; and Lawrence, Steven S., to Scientific-Atlanta, Inc. Synchronizing waveform generator. 5,502,499, Cl. 348-523.000.

Bird, Susan K.: *See—*
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Bitumar R. & D.: *See—*
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Björklund, Jan-Peter, to Optiroc Oy Ab. Apparatus for filling a sack with a flowable material. 5,501,254, Cl. 141-65.000.

Blache, Claire: *See—*
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Black, Gary D.: *See—*
Ayres, George E.; Black, Gary D.; Bowen, Larry; Brackmann, Warren A.; Keaveney, Benedict; and Kilpatrick, John D., 5,501,332, Cl. 206-246.000.

Black, Sidney L. Arm braced slingshot. 5,501,207, Cl. 124-20.100.

Blackstone, Michael M.; and Nuckolls, Hugh E., to Chemstone, Inc. Pulping wood using fatty acid esters of polyoxyalkalene glycols to enhance pulping uniformity and pulp yield. 5,501,769, Cl. 162-76.000.

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Blaszak, Robert: *See—*
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Blau, Reed J.: *See—*
Lund, Gary K.; and Blau, Reed J., 5,501,823, Cl. 264-3.100.

Blechen, Frederick C.; Kelley, Michael W.; and Lyndon, David K., to Boeing Company, The. Aircraft automatic throttle forward stop servo system and method. 5,502,364, Cl. 318-618.000.

Blevin, John H.; DeMarco, Robert W.; Dempsey, Peter A. A.; Jimenez, Raphael; and Levy, Roger H., to AT&T Corp. Address management for remote terminals in digital loop transmission systems. 5,502,438, Cl. 340-825.520.

Blick, Mark: *See—*
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Blise, Bernard G. Vise. 5,501,440, Cl. 269-253.000.

Block and Company, Inc.: *See—*
Yang, John S., 5,502,294, Cl. 235-7.00R.

Bloom, Iris B. K.; Fehervari, Agota F.; Gaudiana, Russell A.; Minns, Richard A.; and Schild, Howard G., to Polaroid Corporation. Process for protecting a binary image with a siloxane durable layer that is not removable by hexane, isopropanol or water. 5,501,940, Cl. 430-253.000.

Bloswick, Donald: *See—*
Howell, Glade; Bean, Jeff W.; Gooch, Judith L.; Bloswick, Donald; and Brown, Don R., 5,501,476, Cl. 280-230.000.

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Blume, Robert H. Mailable documents, apparatus and method. 5,501,560, Cl. 412-37.000.

Blumel, Barry W.: *See—*
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Board of Control of Michigan Technology University: *See—*
Zhang, Yiu; Crittenden, John C.; Hand, David W.; and Perram, David L., 5,501,801, Cl. 210-748.000.

Bobel, Andrzej A., to Bobel, Andrzej A. Parallel resonant integrated inverter ballast for gas discharge lamps. 5,502,635, Cl. 363-132.000.

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Bogartz, Stuart P. Compressed gas fueling system. 5,501,200, Cl. 123-527.000.

Bohlmann, Rolf; Kunzer, Hermann; Muhn-Seipoldy, Hans-Peter; Nishino, Yukishige; and Schneider, Martin, to Schering Aktiengesellschaft. 11β-substituted 14,17-ethanoestratrienes, process for their production and their use as pharmaceutical agents. 5,502,046, Cl. 514-182.000.

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Boitiaux, Jean-Paul: *See—*
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Bolanos, Henry: *See—*
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Bonaa, Kaare H.: *See—*
Breivik, Harald; Borretzen, Bernt; Dahl, Knut H.; Krokan, Hans E.; and Bonaa, Kaare H., 5,502,077, Cl. 514-560.000.

Bond, Luke D.; Mills, Charles C.; Whiting, Philip; Koutz, Stanley L.; Hazlebeck, David A.; and Downey, Kevin W., to Abitibi-Price, Inc.; and General Atomics. Method to remove inorganic scale from a supercritical water oxidation reactor. 5,501,799, Cl. 210-721.000.

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Bonislawski, John M., Jr., to Xerox Corporation. Dual polarity commutated roll elctrostatic cleaner with acoustic transfer assist. 5,500,969, Cl. 15-1.510.

Bonnet, Henri, to United Parcel Service of America, Inc. Suspended tilting tray package sorting apparatus. 5,501,313, Cl. 198-370.090.

Bonrath, Werner; Karge, Reinhard; and Pauling, Horst, to Hoffmann-La Roche Inc. Process for the manufacture of 5-cyano-4-lower alkyl-oxazoles. 5,502,212, Cl. 548-236.000.

Bonsignori, Alberto: *See—*
Dostert, Philippe; Pevarello, Paolo; Heidempergher, Franco; Varasi, Mario; Bonsignori, Alberto; and Roncucci, Romeo, 5,502,079, Cl. 514-620.000.

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Grant, Robert H.; Stoevhase, Bent; Purohit, Robin; and Book, David, 5,502,719, Cl. 370-58.200.

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Anderson, Charles R.; Warfield, Robert W.; Caeri, Istvan; Low, Murray K.; Liaw, Weikuo; and Bush, Alan M., 5,502,805, Cl. 395-148.000.

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Kontos, Stavros B., 5,501,668, Cl. 604-96.000.

Boston, Timothy A.: *See*—
Atteberry, Lonnie D.; Boston, Timothy A.; Crayton, John W.; Rieb-schlager, Jeffrey J.; and Ryter, Noel J., 5,502,378, Cl. 324-204.000.

Botteri, Benito: *See*—
Clodfelter, Robert G.; and Botteri, Benito, 5,501,284, Cl. 169-54.000.

Bourg, John; Mitchell, James; Mirotznik, Mark; Roth, Bradley; Subramanian, Sankaran; Cherukuri, Murali; Zablocky, Paul G.; Pohida, Thomas J.; Smith, Paul D.; Frisauf, Walter S.; and Tschudin, Rolf G., to United States of America, Health and Human Services. Pulsed low frequency EPR spectrometer and imager. 5,502,386, Cl. 324-316.000.

Bourson, Lucien, to Elf Atochem S.A. Papermaking process and paper produced therefrom. 5,501,771, Cl. 162-158.000.

Bovenzi, Robert A.; Depatie, Jean F.; and Dunn, Michael D., to Eastman Kodak Company. Aperture/shutter mechanism with damping member. 5,502,524, Cl. 354-230.000.

Bowe, Ann E.: *See*—
Mahr, Anna M.; Bowe, Ann E.; Ruff-Roberts, Alyson L.; and Klinger, Katherine W., 5,501,954, Cl. 435-6.000.

Bowen, James H. Ergonomic keyboard. 5,502,460, Cl. 345-168.000.

Bowen, Larry: *See*—
Ayres, George E.; Black, Gary D.; Bowen, Larry; Brackmann, Warren A.; Keaveney, Benedict; and Kilpatrick, John D., 5,501,332, Cl. 206-246.000.

Bowen, Perry G., III. Propeller drive. 5,501,623, Cl. 440-75.000.

Bowen Tools, Inc.: *See*—
Berry, Joe R., 5,501,286, Cl. 175-52.000.

Boyle, John P.: *See*—
Fischbeck, Kyra; and Boyle, John P., 5,501,041, Cl. 49-55.000.

Braam, Harm: *See*—
Ordelman, Hendrik J.; Tenmink, Gerhard; Stokkers, Herman W. H.; and Braam, Harm, 5,501,480, Cl. 280-304.100.

Brach, Paul J.: *See*—
Fuller, Timothy J.; Mammino, Joseph; Brach, Paul J.; Blaszak, Robert; Finsterwalder, Robert N.; and Badesha, Santokh S., 5,501,881, Cl. 427-421.000.

Brack, Alfred: *See*—
Raue, Roderich; Brack, Alfred; and Lange, Karl-Heinrich, 5,502,171, Cl. 534-579.000.

Brackmann, Warren A.: *See*—
Ayres, George E.; Black, Gary D.; Bowen, Larry; Brackmann, Warren A.; Keaveney, Benedict; and Kilpatrick, John D., 5,501,332, Cl. 206-246.000.

Braford-Goldberg, Sarah R.; Easton, Alan M.; Klein, Barbara K.; McKearn, John P.; and Olins, Peter O., to G. D. Searle & Co. Interleuken-3 (IL-3) human/murine hybrid polypeptides and recombinant production of the same. 5,501,962, Cl. 435-69.520.

Brake, Bobby G.: *See*—
Onan, David D.; and Brake, Bobby G., 5,501,277, Cl. 166-293.000.

Brake Pro, Inc.: *See*—
Shepley, Christopher C.; and Carter, David R., 5,501,728, Cl. 106-36.000.

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Brandes, Jürgen, to Siemens Aktiengesellschaft. Asynchronous machine with a short-circuit rotor. 5,502,362, Cl. 318-471.000.

Brandhorst, Gerd; Herold, Wolf-Dietrich; and Heiduczek, Ralf, to Thera Patent GmbH & Co. KO Gesellschaft Fur Industrielle Schutzrechte. Device for emptying a film tube. 5,501,368, Cl. 222-95.000.

Brandon, Fred J.: *See*—
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Brandt, Charles D.: *See*—
Burk, Albert A., Jr.; Barrett, Donovan L.; Hobgood, Hudson M.; Clarke, Rowland C.; Eldridge, Graeme W.; and Brandt, Charles D., 5,501,173, Cl. 117-84.000.

Brandt, Inc.: *See*—
Adams, Thomas P.; Karpathian, Kerry; Klemp, Roger; and Murphy, Thomas S., 5,501,632, Cl. 453-3.000.

Brasier, Olaf P.; Maier, Klaus C.; and McCarthy, W. Patrick, to Endress+Hauser, Inc. Method and apparatus for calibrating moisture sensors. 5,502,659, Cl. 364-571.010.

Braudaway, Gordon W.; and Delp, Helen R., to International Business Machines Corporation. Method and apparatus for creating and displaying faithfull color images on a computer display. 5,502,458, Cl. 345-153.000.

Braun, Eric E.: *See*—
Lanzdorf, Daniel J.; Betters, Thomas H.; Braun, Eric E.; Konop, Chad O.; and Steiner, James L., 5,501,567, Cl. 414-408.000.

Braussen, Gilles: *See*—
Gautier, Pascal; Braussen, Gilles; Gouthier, Bernard; Deswert, Ghislaine; and Totino, Ernest, 5,501,582, Cl. 417-420.000.

Breakefield, Xandra O.: *See*—
Geller, Alfred I.; and Breakefield, Xandra O., 5,501,979, Cl. 435-320.100.

Breda, Jøren; Bakke, Jens; and Caspersen, Sverre, to Kvaerner Energy a.s. Pulling and connecting tool for subsea conduits. 5,501,549, Cl. 405-169.000.

Breed Automotive Technology, Inc.: *See*—
Trevillyan, Dennis A.; and Parrish, Jeffrey L., 5,501,487, Cl. 280-736.000.

Breitbarth, Richard. Caffeine containing composition. 5,502,056, Cl. 514-263.000.

Breivik, Harald; Borretzen, Bernt; Dahl, Knut H.; Krokan, Hans E.; and Bonaa, Kaare H., to Norsk Hydro A.S. Fatty acid composition. 5,502,077, Cl. 514-560.000.

Brendzel, Henry T., to AT&T Corp. Telecommunications service access arrangement. 5,502,763, Cl. 379-211.000.

Bresser, Joel: *See*—
Cubbage, Michael L.; Bresser, Joel; Blick, Mark; and Ju, Shyh C., 5,501,952, Cl. 435-6.000.

Breuer, Bert; Stöcker, Jörg; and Roth, Jürgen, to Continental Aktiengesellschaft. Method and device for detecting hydroplaning conditions for vehicle tires. 5,502,433, Cl. 340-438.000.

Bricker, Mark C.; and Van Rheenen, Paul R., to Rohm and Haas Company. Polymer emulsion agent for cross-linking a polymer emulsion and method for making a polymer film. 5,502,089, Cl. 524-44.000.

Bridgestone Corporation: *See*—
Astkowiak, Thomas A.; Hall, James E.; Lawson, David P.; Schreffler, John R.; and Stayer, Mark L., Jr., 5,502,131, Cl. 526-180.000.
Hergenrother, William L.; Smith, W. Novis; Muratore, Anthony J., III; Sigle, Jay C.; and Nemeth, Mark T., 5,502,129, Cl. 526-176.000.
Lawson, David P.; Astkowiak, Thomas A.; Hall, James E.; and Stayer, Mark L., Jr., 5,502,130, Cl. 526-180.000.

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Santi, John, 5,501,203, Cl. 123-572.000.

Briggs, Keith A. System for imaging a region. 5,501,222, Cl. 128-661.070.

Brigham and Women's Hospital, Inc.: *See*—
Pier, Gerald, 5,502,039, Cl. 514-23.000.

Bright, Simon W. J.; Byrom, David; and Fentem, Philip A., to Zeneca Limited. Production of polyhydroxy alkanoate in plants. 5,502,273, Cl. 800-205.000.

Brion, Francis; Buendia, Jean; Diolez, Christian; and Vivat, Michel, to Roussel Uclaf. Process for the preparation of hydrocortisone. 5,502,182, Cl. 540-30.000.

Brion, Francis; Buendia, Jean; Diolez, Christian; and Vivat, Michel, to Roussel Uclaf. Process for preparation of $\Delta^{4,9(11),16}$ pregnatriene-3,20-diones. 5,502,223, Cl. 552-602.000.

Brisco, David P., to Halliburton Company. Casing filling and circulating apparatus and method. 5,501,280, Cl. 166-373.000.

Bristol-Myers Squibb Company: *See*—
North, Jeffrey T., 5,502,220, Cl. 549-396.000.

Britcher, Susan F.: *See*—
Dorsey, Bruce D.; Huff, Joel R.; and Britcher, Susan F., 5,502,053, Cl. 514-239.200.

British Broadcasting Corporation: *See*—
Graham, Alexander T., 5,502,482, Cl. 348-140.000.

British Technology Group Limited: *See*—
Addey, Caroline V. P.; Peaker, Malcolm; and Wilde, Colin J., 5,502,163, Cl. 530-300.000.

Brocchetti, Diego: *See*—
Legname, Giuseppe; Gromo, Gianni; Modena, Daniela; and Brocchetti, Diego, 5,501,970, Cl. 435-240.100.

Brock, George W.: *See*—
Czarnecki, Wlodzimierz S.; Brock, George W.; Gandola, Kent R.; de Lellis, Joseph; and Meancher, Christopher P., 5,502,528, Cl. 354-106.000.

Broderick, Kevin B.: *See*—
Song, Joo H.; and Broderick, Kevin B., 5,501,864, Cl. 426-3.000.

Brodie, Alan D.: *See*—
Meisburger, Dan; Brodie, Alan D.; Chadwick, Curt; Desai, Anil; Dohse, Hans; Emge, Dennis; Greene, John; Johnson, Ralph; Ling, Ming-Yie; McMurtry, John; Becker, Barry; Paul, Ray; Robinson, Mike; Simmons, Richard; Smith, David E. A.; Taylor, John; Veneklasen, Lee; Walters, Dean; Wieczorek, Paul; Wong, Sam; Dutta, April; Lele, Surendra; Rough, Kirkwood; Pearce-Percy, Henry; Jau, Jack Y.; Lin, Chun C.; Nguyen, Hoi T.; Oyang, Yen-Jen; Hutcheson, Timothy L.; Clark, David J.; Pan, Chung-Shih; Bhaskar, Chetana; Kirk, Chris; Munro, Eric; Gibilisco, John; and Sandland, Paul, 5,502,306, Cl. 250-310.000.

Brodsky, Anatol: *See*—
Anderson, Brian; Brodsky, Anatol; and Burgess, Lloyd, 5,502,560, Cl. 356-128.000.

Bronicki, Lucien Y.: *See*—
Goldman, Daniel; Siniakevith, Boris; Doron, Benjamin; Bronicki, Lucien Y.; and Yaffe, Eli, 5,501,160, Cl. 110-229.000.

Brooks, Walter R.: *See*—
Birch, Christopher H.; van Staden, Christian V.; Brooks, Walter R.; Nicholas, Paul D.; and Lawrence, Steven S., 5,502,499, Cl. 348-523.000.

Brookstein, David; Rose, Donald; Dent, Robin; Dent, John; and Skelton, John, to Albany International Corp. Apparatus for making a braid structure. 5,501,133, Cl. 87-33.000.

Bronson, Lars. Matrix band and matrix retainer for a front-tooth matrix. 5,501,595, Cl. 433-39.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Muto, Kiyoshi, 5,502,546, Cl. 355-208.000.
Suzuki, Masahiko, 5,502,472, Cl. 347-69.000.
Takahashi, Kiyoshi, 5,502,796, Cl. 395-115.000.

Brotz, Gregory R. Illuminated clipboard. 5,502,623, Cl. 362-99.000.

Brown, Alan D.; Dickinson, Roger P.; and Wythes, Martin J., to Pfizer Inc. Indole derivatives as 5-$HT_1$-like agonists. 5,502,065, Cl. 514-339.000.

Brown, Claude E. Selective harvesting machine. 5,501,067, Cl. 56-121.400.

Brown, David L.: *See*—
Nguyen, Philip D.; Weaver, Jim D.; and Brown, David L., 5,501,274, Cl. 166-276.000.

Brown, Don R.: *See*—
Howell, Glade; Bean, Jeff W.; Gooch, Judith L.; Bloswick, Donald; and Brown, Don R., 5,501,476, Cl. 280-230.000.

Brown, Geoffrey D.: *See*—
Cogen, Jeffrey M.; Keogh, Michael J.; and Brown, Geoffrey D., 5,502,288, Cl. 174-113.00R.

Browne, Bruce, to B and P Plastics. Slammer for use in playing milk cap type games. 5,501,468, Cl. 273-424.000.

Brownell, George L.: *See*—
Smeal, Thomas W.; and Brownell, George L., 5,501,830, Cl. 264-308.000.

Brum, Roger D.; and Currier, David T., to Southwest Aerospace Corporation. Towed vehicle deployment apparatus having guide to reduce line pull-off angle. 5,501,411, Cl. 242-397.000.

Brunnhofer, Erwin, to Technoflow Tube-Systems GmbH. Fuel-injection system for motor-vehicle engine. 5,501,196, Cl. 123-497.000.

Bryant, Vincent C.; and Gregg, Lauren S. Closable net for underwater operation and method of use. 5,501,026, Cl. 43-12.000.

Bryson, Keith. Press for compressing the contents of a food can. 5,501,144, Cl. 100-116.000.

Bucceri, Anthony M.: *See*—
Psinakis, Thomas J.; Arthur, John E., III; and Bucceri, Anthony M., 5,502,454, Cl. 343-791.000.

Buchanan, James M., to Advanced Micro Devices, Inc. Integrated circuit testing apparatus and method. 5,502,397, Cl. 324-754.000.

Buchholz, Richard F., to Georgia-Pacific Corporation. Spray-dried urea-formaldehyde and lignosulfonate compositions. 5,501,720, Cl. 71-28.000.

Buchmann, Bernd: *See*—
Skuballa, Werner; Buchmann, Bernd; Heindl, Josef; Fröhlich, Wolfgang; Ekerdt, Roland; and Giesen, Claudia, 5,502,075, Cl. 514-461.000.

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Buendia, Jean: *See*—
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Bühne, Gerd: *See*—
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Bujak, Walter E., Jr., to Carrier Corporation. Fluid flow control for HVAC system with valve position readjustment to equalize conditioning rates in multiple zones. 5,501,265, Cl. 165-22.000.

Buliga, Gregory S.; Miller, Mark S.; Powell, William F.; Lis, Daniel G.; Krishnamurthy, R. G.; Witte, Vernon C.; and Tomski, Sharon, to Kraft Foods, Inc. Fat-free tablespread and method of making. 5,501,869, Cl. 426-658.000.

Bundy, Don, to Mid-America Automotive, Inc. Universal stainless steel truck step and adjustable support rod. 5,501,475, Cl. 280-166.000.

Bundy, Gordon L.: *See*—
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Burckhardt, Jean, to Hoffmann-La Roche Inc. Amplification and detection of nucleic acids in blood samples. 5,501,963, Cl. 435-91.200.

Burdet, Bruno; Rüttimann, Angust; Santer, Jean-Marie; and Siegfried, Theodor, to Hoffmann-La Roche Inc. Method for the production of (3-alkoxycarbonyl-2-butenyl)triphenylphosphonium salts. 5,502,236, Cl. 558-460.000.

Burgdorf, Mårten: *See*—
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Burgess, Lloyd: *See*—
Anderson, Brian; Brodsky, Anatol; and Burgess, Lloyd, 5,502,560, Cl. 356-128.000.

Burk, Albert A., Jr.; Barrett, Donovan L.; Hobgood, Hudson M.; Clarke, Rowland C.; Eldridge, Graeme W.; and Brandt, Charles D., to Westinghouse Electric Corporation. Method for epitaxially growing α-silicon carbide on a-axis α-silicon carbide substrates. 5,501,173, Cl. 117-84.000.



Burke, Anthony J., to Allied Colloids Limited. Production of filled paper. 5,501,774, Cl. 162-164.100.

Burke, John J.; Gorczyca, Joanne P.; and Drewno, Gregory W., to BASF Corporation. Aqueous based solvent free degreaser composition. 5,501,816, Cl. 252-174.210.

Burky, William E.: *See*—
Arroyo, Ronald X.; Burky, William E.; Gruwell, Tricia A.; and Hinojosa, Joaquin, 5,502,732, Cl. 371-30.000.

Burn, Timothy C.: *See*—
Tenen, Daniel G.; Pahl, Heike L.; and Burn, Timothy C., 5,502,176, Cl. 536-24.100.

Burns, David R.; and Turner, Victor C., to Gilbarco Limited. Air/vapour separation device. 5,501,246, Cl. 137-179.000.

Burstein, Paul: *See*—
Pavelle, Richard; Burstein, Paul; Ferber, Leon; and Latanision, Ronald M., 5,501,846, Cl. 422-211.000.

Busch, Frederick J., to Avtron Manufacturing, Inc. Apparatus for controlling the duty cycle of a pulse generator. 5,502,376, Cl. 324-166.000.

Buser, Beat: *See*—
Eugster, Hans; Reuter, Herbert; and Buser, Beat, 5,501,810, Cl. 252-89.100.

Bush, Alan M.: *See*—
Anderson, Charles R.; Warfield, Robert W.; Caeri, Istvan; Low, Murray K.; Liaw, Weikuo; and Bush, Alan M., 5,502,805, Cl. 395-148.000.

Bush, Craig P.; Clarke, Cyrus B.; and Langer, David B., to Lexmark International, Inc. Apparatus with flash memory control for revision. 5,502,797, Cl. 395-115.000.

Bush House Pty Ltd: *See*—
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Busse, Doyle: *See*—
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Bussler, Brett H., to Monsanto Company. Safening herbicidal pyrazolylsulfonylureas. 5,502,025, Cl. 504-107.000.

Butcher, Ronald S.; and Forbes, James W. Retractable guide assembly for changing the effective width of a railroad freight car container well. 5,501,556, Cl. 410-94.000.

Butterfield, Stephen R.; Phillips, Donald E.; Reashaw, Barbara B.; Nelson, Steven K.; and Hossley, Robert F., to Peerless Systems Corporation. Method and apparatus for displaying a page with graphics information on a continuous synchronous raster output device. 5,502,804, Cl. 395-147.000.

Buysch, Hans-Josef; Dohm, Joachim; Hesse, Carsten; Rechner, Johann; and Kaufmann, Dieter, to Bayer Aktiengesellschaft. Process for preparing diaryl carbonates. 5,502,232, Cl. 558-270.000.

Buzzetti, Franco; Longo, Antonio; and Di Salle, Enrico, to Farmitalia Carlo Erba S.r.l. Fluorinated 4-aminoandrostadienone derivatives and process for their preparation. 5,502,044, Cl. 514-177.000.

Byers, Kevin M.: *See*—
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Bylemans, Dany: *See*—
Borovsky, Dov; De Loof, Arnold; and Bylemans, Dany, 5,501,976, Cl. 435-252.300.

Byrd, Timothy N. Tracheostomy tube holder and associated tube holding method. 5,501,216, Cl. 128-207.170.

Byrn, Jonathan W.; and Delp, Gary S., to International Business Machines Corporation. System and method for management of a predictive split cache for supporting FIFO queues. 5,502,833, Cl. 395-459.000.

Byrom, David: *See*—
Bright, Simon W. J.; Byrom, David; and Fentem, Philip A., 5,502,273, Cl. 800-205.000.

C.E.A. S.p.A.: *See*—
Mattiuzzo, Mario, 5,501,090, Cl. 70-458.000.

Cabot Safety Corporation: *See*—
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Cadet, Gardy; and Valdes, Jorge L., to AT&T Corp. Acoustic analysis of gas mixtures. 5,501,098, Cl. 73-24.010.

Cadle, Terry M.; Landgraf, Carl J.; and Mayer, Georgia M., to Zenith Sintered Products, Inc. Bearing support insert. 5,501,529, Cl. 384-432.000.

Cageao, Ronald A.: *See*—
Steppan, David D.; Cageao, Ronald A.; Nodelman, Neil H.; Slack, William E.; and Sanna, Frank, Jr., 5,502,150, Cl. 528-60.000.

Cairns, James W., to Nolu Plastics, Inc. Three-piece clamping assembly. 5,501,544, Cl. 403-400.000.

Calabrese, Salvatore J. Pile assembly and method employing external mandrel. 5,501,550, Cl. 405-232.000.

Calderara, Reto: *See*—
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Calgon Corporation: *See*—
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Elliott, David L.; Falcione, Ronald J.; and Hunter, Wood E., 5,501,773, Cl. 162-163.000.

Callant, Paul: *See*—
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Cameron, Charles: *See*—
Sarrazin, Patrick; Cameron, Charles; Boitiaux, Jean-Paul; and Dufresne, Pierre, 5,502,269, Cl. 585-668.000.

Campbell, John; Dalton, Raymond F.; and Quan, Peter M., to Zeneca Limited. Bis(dialkylthiophosphoryl)amines as metal extractants. 5,502,250, Cl. 564-12.000.

Canada Brick: *See—*
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Canestrale, David J., Jr.: *See—*
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Canfield, Barth A.: *See—*
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Canich, Jo Ann M.: *See—*
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Canson, Paul W. Truck bed extension apparatus. 5,501,500, Cl. 296-26.000.

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Hori, Kenjiro; Akiyama, Satoshi; Suzuki, Hideki; and Takubo, Takefumi, 5,502,550, Cl. 355-246.000.
Ishinaga, Hiroyuki; Ikeda, Masami; Abe, Tsutomu; Karita, Seiichiro; and Arashima, Teruo, 5,502,479, Cl. 347-93.000.
Kaburagi, Yoshiaki; Shoda, Shoichiro; Kimura, Tetsuo; Ara, Yoji; Mukai, Takanori; Nakamura, Masaaki; and Yokoi, Katsuyuki, 5,502,475, Cl. 347-102.000.
Kaihara, Shoji; and Fukahori, Hidehiko, 5,502,530, Cl. 354-149.100.
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Kato, Shigeki; Kadowaki, Hidejiro; Ishida, Yasuhiko; Takamiya, Makoto; Ashiwa, Jun; and Ueda, Shinji, 5,502,466, Cl. 356-356.000.
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Mizoguchi, Shigeru, 5,501,534, Cl. 400-54.000.
Mizoguchi, Yoshiyuki, 5,502,525, Cl. 354-247.000.
Mori, Sunao; Mihara, Tadashi; and Kodera, Yasuto, 5,502,584, Cl. 359-90.000.
Nakajima, Toshifumi, 5,502,574, Cl. 358-400.000.
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Sakurai, Masakatsu, 5,502,794, Cl. 395-109.000.
Shikakura, Akihiro; Kashida, Motokazu; and Watanabe, Ikuo, 5,502,570, Cl. 358-335.000.
Shinjo, Kenji; Takiguchi, Takao; Kitayama, Hiroyuki; Katagiri, Kazuharu; Yamashita, Masataka; Terada, Masahiro; Togano, Takeshi; and Asaoka, Masanobu, 5,501,818, Cl. 252-299.610.
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Sudo, Toshiyuki; Taniguchi, Naosato; and Morishima, Hideki, 5,502,581, Cl. 359-10.000.
Suzuki, Yasuyuki; and Yamashita, Takashi, 5,502,548, Cl. 355-219.000.
Takahashi, Kazuyoshi; Otsuka, Naoji; Ebata, Tokihide; Hirabayashi, Hiromitsu; Tajika, Hiroshi; Koitabashi, Noribumi; Arai, Atsushi; Aono, Kenji; and Sugimoto, Hitoshi, 5,502,464, Cl. 346-25.000.
Ueda, Osamu; and Takahashi, Koji, 5,502,486, Cl. 348-239.000.
Ushiro, Tatsuzo; and Kaneda, Kitahiro, 5,502,607, Cl. 360-130.240.
Washizawa, Teruyoshi; Hatanaka, Katsunori; Sakai, Kunihiro; Oguchi, Takahiro; Yamano, Akihiko; and Shido, Shunichi, 5,502,710, Cl. 369-124.000.
Watanabe, Kenjiro, 5,502,469, Cl. 347-14.000.
Yamamoto, Noboru; Nakamura, Kenji; and Majima, Masao, 5,502,589, Cl. 359-174.000.
Yukimachi, Hiroshi; Komatsu, Teruo; Azeta, Takahiro; Waragai, Tsuyoshi; Araki, Tomoyuki; and Hoshii, Osamu, 5,501,444, Cl. 271-127.000.

Cantrell, Ben H.; and Lewis, Bernard L., to Navy, The United States of America as represented by the Secretary of the. Method and means for short pulse interference rejection. 5,502,448, Cl. 342-381.000.

Capen, Ronald R., to Union Switch & Signal Inc. Method and apparatus for inductively receiving cab signaling on board a railway vehicle. 5,501,416, Cl. 246-63.00R.

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Romine, H. Ernest; Nanni, Edward J.; Carel, Mark W.; and Southard, W. Mark, 5,501,788, Cl. 208-45.000.
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Cory, George J. Indoor household animal deterrent device. 5,501,179, Cl. 119-712.000.
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Coutts, Graeme F.; and Edwards, Jeffrey C., to Expro North Sea Limited. Pressure relief valve. 5,501,242, Cl. 137-1.000.
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Collings, George F.; Stout, Neil P.; Cowell, Christopher S.; and Plas, Stephen J., 5,501,868, Cl. 426-623.000.
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Cozza, Paul D. Method and apparatus for increasing the speed at which computer viruses are detected. 5,502,815, Cl. 395-183.140.
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Kim, Jong-Hoon; and Kim, Seong-Dae, 5,502,510, Cl. 348-701.000.
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Dentinger, Aaron M.; Swift, David C.; and Faris, Sadeg M., to Reveo, Inc. Desktop-based projection display system for stereoscopic viewing of displayed imagery over a wide field of view. 5,502,481, Cl. 348-51.000.

Dentsply Research & Development Corp.: *See—*
Tateosian, Louis H.; Shaffer, Scott E.; and Latta, Mark A., 5,502,087, Cl. 523-115.000.

Depatie, Jean F.: *See—*
Bovenzi, Robert A.; Depatie, Jean F.; and Dunn, Michael D., 5,502,524, Cl. 354-230.000.

De Peuter, Frans L. J.: *See—*
Westhof, Luc B. J.; Turhan, Ibrahim; Tessier, George G.; and De Peuter, Frans L. J., 5,501,819, Cl. 252-503.000.

Desai, Anil: *See—*
Meisburger, Dan; Brodie, Alan D.; Chadwick, Curt; Desai, Anil; Dohse, Hans; Emge, Dennis; Greene, John; Johnson, Ralph; Ling, Ming-Yie; McMurtry, John; Becker, Barry; Paul, Ray; Robinson, Mike; Simmons, Richard; Smith, David E. A.; Taylor, John; Veneklasen, Lee; Walters, Dean; Wieczorek, Paul; Wong, Sam; Dutta, April; Lele, Surendra; Rough, Kirkwood; Pearce-Percy, Henry; Jau, Jack Y.; Lin, Chun C.; Nguyen, Hoi T.; Oyang, Yen-Jen; Hutcheson, Timothy L.; Clark, David J.; Pan, Chung-Shih; Bhaskar, Chetana; Kirk, Chris; Munro, Eric; Gibilisco, John; and Sandland, Paul, 5,502,306, Cl. 250-310.000.

Desai, Basavaraj R., to Picture Productions. Method and apparatus for processing photosensitive sheet material. 5,502,535, Cl. 354-324.000.

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DeSantis, Louis M., to Alcon Laboratories, Inc. Use of a combination of apraclonidine and timolol to control intraocular pressure. 5,502,052, Cl. 514-236.200.

Desarzens, Pierre; and Dinger, Rudolf, to Asulab S.A. Measuring device with connection for a removable sensor. 5,502,396, Cl. 324-713.000.

Desie, Guido: *See—*
Leenders, Luc; Oelbrandt, Leo; Van den Bogaert, Jan; and Desie, Guido, 5,501,150, Cl. 101-466.000.

Design Automation Inc.: *See—*
Kitagawa, Keiji; and Tani, Ikuo, 5,502,800, Cl. 395-133.000.

Deswert, Ghislaine: *See—*
Gautier, Pascal; Braussen, Gilles; Gouthier, Bernard; Deswert, Ghislaine; and Totino, Ernest, 5,501,582, Cl. 417-420.000.

Deusser, Hans; Kerner, Dieter; Meyer, Jürgen; Michael, Günther; and Stubbe, Andreas, to Degussa Aktiengesellschaft. Toner containing pigment and surface modified pyrogenically produced aluminum oxide. 5,501,933, Cl. 430-110.000.

Deutsch, Alina: *See—*
Arjavalingam, Gnanalingam; Deutsch, Alina; Kopcsay, Gerard V.; and Tam, James K., 5,502,392, Cl. 324-638.000.

Deutsche Aerospace Airbus GmbH: *See—*
Bauer, Richard, 5,501,414, Cl. 244-124.000.

Deutsche Thomson-Brandt GmbH: *See—*
Morimoto, Yasuaki, 5,502,708, Cl. 369-110.000.
Scholz, Werner, 5,502,408, Cl. 326-105.000.

Deve, Herve E., to Minnesota Mining and Manufacturing Company. Ceramic fiber tow reinforced metal matrix composite. 5,501,906, Cl. 428-366.000.

Devereaux, Sharon M.: *See—*
Baugher, Bennett W.; Chamberlain, Aurora J.; Devereaux, Sharon M.; and Ungemach, Frank S., 5,501,985, Cl. 436-518.000.

Deville, Francoise: *See—*
Farooq, Amjad; Cesar, Regis; and Deville, Francoise, 5,501,806, Cl. 252-8.800.

Devlin, Brian P.: *See—*
Antonelli, Joseph A.; Becton, Lee A. E.; Devlin, Brian P.; and Scopazzi, Christopher, 5,502,113, Cl. 525-287.000.

Dey, Sujit: *See—*
Chakradhar, Srimat T.; and Dey, Sujit, 5,502,647, Cl. 364-489.000.

Déziel, Robert: *See—*
Adams, Julian; Beaulieu, Pierre L.; Déziel, Robert; DiMaio, John; Grenier, Louis; Lavallée, Pierre; and Moss, Neil, 5,502,036, Cl. 514-17.000.

Dhawan, Suman: *See—*
Talwar, Gursaran P.; Upadhyay, Shakti N.; and Dhawan, Suman, 5,501,855, Cl. 424-195.100.

Dichter, Wilhelm, to Linotype-Hell AG. HSL neighborhoods in CMY color space. 5,502,642, Cl. 364-581.000.

Dickinson, Roger P.: *See—*
Brown, Alan D.; Dickinson, Roger P.; and Wythes, Martin J., 5,502,065, Cl. 514-339.000.

Dideco S.r.l.: *See—*
Mantovani, Marco; Sarti, Stephano; and Panzani, Ivo, 5,501,840, Cl. 422-101.000.

Didwania, Hanuman P.: *See—*
Sarkar, Jawed M.; and Didwania, Hanuman P., 5,501,770, Cl. 162-100.000.

Dietrich, Douglas W.: *See—*
Masteller, Millard S.; and Dietrich, Douglas W., 5,501,747, Cl. 148-311.000.

Dihlan, Denis: *See—*
Cassagne, Philippe; and Dihlan, Denis, 5,501,153, Cl. 102-307.000.

Dilger, Werner; and Kilian, Friedrich, to Trumpf GmbH & Co. Bending press. 5,501,095, Cl. 72-461.000.

DiMaio, John: *See—*
Adams, Julian; Beaulieu, Pierre L.; Déziel, Robert; DiMaio, John; Grenier, Louis; Lavallée, Pierre; and Moss, Neil, 5,502,036, Cl. 514-17.000.

DiMarco, Bernard: *See—*
McColloch, Rex J.; Cella, Stephen D.; and DiMarco, Bernard, 5,502,428, Cl. 335-172.000.

Dinella, Donald; Lal, Sudarshan; Morton, Kim L.; and Nicol, David A., to AT&T Corp. Method for testing solder mask material. 5,501,777, Cl. 205-791.000.

Dinger, Rudolf: *See—*
Desarzens, Pierre; and Dinger, Rudolf, 5,502,396, Cl. 324-713.000.

Dingrong, Qian, to Shanghai Institute of Technical Physics, Academia Sinica. Optical transistor. 5,502,585, Cl. 359-108.000.

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Diolez, Christian: *See—*
Brion, Francis; Buendia, Jean; Diolez, Christian; and Vivat, Michel, 5,502,182, Cl. 540-30.000.
Brion, Francis; Buendia, Jean; Diolez, Christian; and Vivat, Michel, 5,502,223, Cl. 552-602.000.

Dirks, Klaus-Peter: *See—*
Sommer, Walter; Lange, Wilhelm; and Dirks, Klaus-Peter, 5,501,317, Cl. 198-464.200.

Di Salle, Enrico: *See—*
Buzzetti, Franco; Longo, Antonio; and Di Salle, Enrico, 5,502,044, Cl. 514-177.000.

Disrud, Jeff A., to Riverwood International Corporation. Overhead pusher lug assembly for packaging machines. 5,501,318, Cl. 198-732.000.

Distler, Dietrich: *See—*
Beier, Alfred; Distler, Dietrich; Panagiotis, Adamis; and Gaegel, Paul, 5,501,121, Cl. 74-568.00R.

Dixit, Suresh C.; Goldman, David; Hu, John J.; and Sethachutkul, Krish, to Hoffmann-La Roche Inc. Dispersing agents for use with hydrofluoroalkane propellants. 5,502,076, Cl. 514-510.000.

Doan, David G., to Doan, Robert L. Occupant propelled three wheeled vehicle. 5,501,478, Cl. 280-282.000.

Doan, Robert L.: *See—*
Doan, David G., 5,501,478, Cl. 280-282.000.

Dobbelstein, Arnold, deceased (by Hildegard Dobbelstein, Christiane Dobbelstein, legal representatives): *See—*
Schwarte, Stephan; Dobbelstein, Arnold, deceased; Niemann, Jürgen; Lassmann, Walter; Piontek, Susanne; Poth, Ulrich; and Eikelmann, Klaus, 5,502,101, Cl. 524-460.000.

Dobbelstein, Hildegard, Christiane Dobbelstein, legal representatives: *See—*
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Doche, Claude, to Commissariat a l'Energie Atomique. System for the storage and transportation of flat objects such as extra-flat boxes and its portable rack. 5,501,564, Cl. 414-331.000.

Doctor, Alan P.: *See—*
Baliga, Shankar B.; Rullman, George; and Doctor, Alan P., 5,502,307, Cl. 250-338.300.

Doerr, Michael: *See—*
Beckmann, Stefan; Zentel, Rudolf; Doerr, Michael; and Eich, Manfred, 5,502,135, Cl. 526-262.000.

Dohku, Takeshi; Yoshida, Kazuo; Koba, Kazunori; and Miyake, Kazuyuki, to Hitachi Zosen Corporation. Cleaning method and cleaning apparatus. 5,501,240, Cl. 134-61.000.

Dohm, Joachim: *See*—
Buysch, Hans-Josef; Dohm, Joachim; Hesse, Carsten; Rechner, Johann; and Kaufmann, Dieter. 5,502,232, Cl. 558-270.000.

Dohse, Hans: *See*—
Meisburger, Dan; Brodie, Alan D.; Chadwick, Curt; Desai, Anil; Dohse, Hans; Emge, Dennis; Greene, John; Johnson, Ralph; Ling, Ming-Yie; McMurtry, John; Becker, Barry; Paul, Ray; Robinson, Mike; Simmons, Richard; Smith, David E. A.; Taylor, John; Veneklasen, Lee; Walters, Dean; Wieczorek, Paul; Wong, Sam; Dutta, April; Lele, Surendra; Rough, Kirkwood; Pearce-Percy, Henry; Jau, Jack Y.; Lin, Chun C.; Nguyen, Hoi T.; Oyang, Yen-Jen; Hutcheson, Timothy L.; Clark, David J.; Pan, Chung-Shih; Bhaskar, Chetana; Kirk, Chris; Munro, Eric; Gibilisco, John; and Sandland, Paul, 5,502,306, Cl. 250-310.000.

Doi, Hideki: *See*—
Naito, Yasuo; Doi, Hideki; and Fujimoto, Chialki, 5,501,109, Cl. 73-862.191.

Doi, Kousuke: *See*—
Hosoda, Hiroshi; Numata, Remi; Doi, Kousuke; Tokutake, Nobuo; Kohara, Hidekatsu; and Nakayama, Toshimasa, 5,501,936, Cl. 430-191.000.

Doi, Toshiya; Soeta, Atsuko; Takeuchi, Seizi; Kamo, Tomoichi; and Matsuda, Shinpei, to Hitachi, Ltd. Laminated super conductor oxide with strontium, calcium, copper and at least one of thallium, lead, and bismuth. 5,502,029, Cl. 505-234.000.

Doke, Michael J.: *See*—
Sharp, Charles A., III; Doke, Michael J.; Howarth, Richard A.; and Recine, Leonard J., Sr., 5,501,076, Cl. 62-3.600.

Donaldson Company, Inc.: *See*—
Theisen, Jeffrey J.; and Connelly, John F., 5,501,791, Cl. 210-90.000.

Donn, Günter, to Hoechst Aktiengesellschaft. Maize resistant to aryloxyphenoxyalkanecarboxylic acid herbicides. 5,502,271, Cl. 800-200.000.

Donofrio, Matt. Golf putter head. 5,501,461, Cl. 273-171.000.

Doornek, James R., to Douglas Dynamics, Inc. Dispenser apparatus for spreading particulate material. 5,501,405, Cl. 239-683.000.

Dora, Gordon L. Method for improving quantitative recovery of microorganisms from specimens containing blood components. 5,501,960, Cl. 435-34.000.

Doron, Benjamin: *See*—
Goldman, Daniel; Siniakevith, Boris; Doron, Benjamin; Bronicki, Lucien Y.; and Yaffe, Eli, 5,501,160, Cl. 110-229.000.

Dorrell, Donald E. Apparatus for dissipating wave energy. 5,501,546, Cl. 405-25.000.

Dorsey, Bruce D.; Huff, Joel R.; and Britcher, Susan F., to Merck & Co., Inc. HIV protease inhibitor compounds. 5,502,053, Cl. 514-239.200.

Dory, Efraim; Evans, Martin; and Alexy, Albert A., to Western Atlas International. Method and apparatus for imaging a borehole sidewall. 5,502,686, Cl. 367-34.000.

Dörzbach-Lange, Cornelia: *See*—
Pohmer, Klaus; Weber, Rainer; Dörzbach-Lange, Cornelia; Stachulla, Karlheinz; Moretto, Hans-Heiarich; and Wienand, Manfred, 5,502,251, Cl. 564-82.000.

Dostert, Philippe; Pevarello, Paolo; Heidempergher, Franco; Varasi, Mario; Bonsignori, Alberto; and Roncucci, Romeo, to Farmitalia Carlo Erba S.r.l. N-phenylalkyl substituted α-amino carboxamide derivatives and process for their preparation. 5,502,079, Cl. 514-620.000.

Douglas Dynamics, Inc.: *See*—
Doornek, James R., 5,501,405, Cl. 239-683.000.

Douglass, Stephen M.: *See*—
Liu, Lin-Shih; Raza, Syed B.; Nazarian, Hagop; Ansel, George M.; Douglass, Stephen M.; and Hunt, Jeffery S., 5,502,403, Cl. 326-46.000.

Dow Corning Asia, Ltd.: *See*—
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Dow Corning Corporation: *See*—
Flanagam, Ora L.; and Williams, Dwight E., 5,501,811, Cl. 252-174.150.
Liles, Donald T.; Lee, Kenneth M.; and Murray, David L., 5,502,107, Cl. 525-63.000.
Loboda, Mark J.; and Pernisz, Udo C., 5,501,875, Cl. 427-222.000.
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DowElanco: *See*—
Zettler, Mark W.; Tobey, Richard E.; and Leng, Ronald B., 5,502,235, Cl. 558-425.000.

Dowell, a division of Schlumberger Technology Corporation: *See*—
Card, Roger J.; Howard, Paul R.; Fernad, Jean-Pierre; and Constien, Vernon G., 5,501,275, Cl. 166-280.000.

Downer, John S.; and Downer, Paul A., to Vineyard Industry Products Co. Trellis wire support assembly. 5,501,035, Cl. 47-47.000.

Downer, Paul A.: *See*—
Downer, John S.; and Downer, Paul A., 5,501,035, Cl. 47-47.000.

Downey, Kevin W.: *See*—
Bond, Luke D.; Mills, Charles C.; Whiting, Philip; Koutz, Stanley L.; Hazlebeck, David A.; and Downey, Kevin W., 5,501,799, Cl. 210-721.000.

Downs, Terry E.: *See*—
Le, Chinh H.; Vauk, Gerald E., Jr.; and Downs, Terry E., 5,502,835, Cl. 395-496.000.

Dr. Johannes Heidenhain GmbH: *See*—
Stettner, Rudolf; and Feichtinger, Kurt, 5,501,096, Cl. 73-1.00J.

Drake, Fred H.: *See*—
Hastings, Gregg A.; Adams, Mark D.; Fraser, Claire M.; Lee, Norman H.; Kirkness, Ewen F.; Blake, Judith A.; Fitzgerald, Lisa M.; Drake, Fred H.; and Gowan, Maxine, 5,501,969, Cl. 435-240.200.

Draper, Richard W.: *See*—
Hou, Donald; Draper, Richard W.; Lee, Gary M.; and Mas, Janet L., 5,502,186, Cl. 540-576.000.

Drebushenko, Tina. Recyclable bottle carrier. 5,501,322, Cl. 206-151.000.

Dretzka, Phillip C.: *See*—
Mueller, Eric J.; Benting, Gary M.; Abraham, Leslie R.; and Dretzka, Phillip C., 5,501,603, Cl. 434-419.000.

Drewno, Gregory W.: *See*—
Burke, John J.; Gorczyca, Joanne P.; and Drewno, Gregory W., 5,501,816, Cl. 252-174.210.

Dries, Thomas: *See*—
Schulhmann, Detlef E.; Dries, Thomas; Wilhelm, Adolf; Scheidecker, Dieter; Lohmann, Harald; Murschall, Ursula; Peiffer, Herbert; and Schloegl, Gunter, 5,501,901, Cl. 428-323.000.

Driscoll, Rusty: *See*—
Powell, Ken R.; and Driscoll, Rusty, 5,502,559, Cl. 356-73.000.

DSM Desotech. Inc.: *See*—
Szum, David M., 5,502,145, Cl. 528-28.000.

Du, He; and Wang, Yun-Ti. Sense amplifier with pull-up circuit for accelerated latching of logic level output data. 5,502,680, Cl. 365-205.000.

Du Pont Canada Inc.: *See*—
Ng, Howard C., 5,502,155, Cl. 528-349.000.

Du Pont de Nemours, E. I., and Company: *See*—
Antonelli, Joseph A.; Becton, Lee A. E.; Devlin, Brian P.; and Scopazzi, Christopher, 5,502,113, Cl. 525-287.000.
Edwards, Donald W.; Popper, Peter; Rule, David P.; and Walker, William C., 5,501,250, Cl. 139-450.000.
Huynh-Ba, Gia, 5,502,111, Cl. 525-239.000.
Iwasyk, John M., 5,502,154, Cl. 528-310.000.
Niedenzu, Philipp M.; Hertzimer, Scott M.; and Chaney, Ronald L., 5,501,732, Cl. 106-447.000.
Pearlstein, Richard W.; and Ulrich, James F., 5,502,270, Cl. 800-200.000.
Smith, Charles A., 5,501,910, Cl. 428-447.000.
Ward, Michael D.; and Ebersole, Richard C., 5,501,986, Cl. 436-525.000.

Duarte, Fernando C. Chilled oxygen for an ionization device. 5,501,845, Cl. 422-186.190.

Dubach, Werner F., to Createchnic AG. Central sealing pin cap. 5,501,377, Cl. 222-521.000.

Ducote, Edgar A.. Remote steering of on-highway motor vehicles. 5,501,288, Cl. 180-24.010.

Ducugnon, Jean; and Faure, Eugene, to P.I.V. S.A. Axially compact unitized lip seal. 5,501,469, Cl. 277-37.000.

Dufresne, Pierre: *See*—
Sarrazin, Patrick; Cameron, Charles; Boitiaux, Jean-Paul; and Dufresne, Pierre, 5,502,269, Cl. 585-668.000.

Duggan, James A., to Dana Corporation. Bearing cup retainer strap for universal joint. 5,501,638, Cl. 464-130.000.

Duncan, Michael G.; Saegert, Pamela P.; and Ford, Gordon D., to Rolm Company. Apparatus and method for relaying calling information to a pager or alternate telephone. 5,502,761, Cl. 379-142.000.

Duncan, Walter M.; Celli, Francis G.; Henck, Steven A.; Paranjpe, Ajit P.; Mahlum, Douglas L.; and Taylor, Larry A., to Texas Instruments Incorporated. Temperature sensor and method. 5,501,637, Cl. 374-126.000.

Dunn, Douglas S.: *See*—
Hill, Jeffrey B.; Ouderkirk, Andrew J.; Stubbs, Daniel P.; Jackson, Robert S.; and Dunn, Douglas S., 5,501,944, Cl. 430-321.000.

Dunn, Michael D.: *See*—
Boveanzi, Robert A.; Depatie, Jean F.; and Dunn, Michael D., 5,502,524, Cl. 354-230.000.

Dunn, Pak-Kong; Nip, Kwok-Ban; and Lin, Chi-Man, to Motorola, Inc. Circuit for providing a voltage ramp signal. 5,502,410, Cl. 327-140.000.

Dunn, Thomas J.; and Jain, Kanti, to Anvik Corporation. Transporter for optical spectrum analyzer in alignment system. 5,502,563, Cl. 356-352.000.

Duong, Quoc Dinh; and Boisvert, Rhéal, to Bitumar R. & D. Asphalt composition and process for obtaining same. 5,501,730, Cl. 106-281.100.

DuPont-Mitsui Fluorochemicals Co., Ltd.: *See*—
Saito, Takumi, 5,502,097, Cl. 524-389.000.

Durel Corporation: *See*—
Kimball, Robert A., 5,502,357, Cl. 315-209.00R.

Dutta, April: *See*—
Meisburger, Dan; Brodie, Alan D.; Chadwick, Curt; Desai, Anil; Dohse, Hans; Emge, Dennis; Greene, John; Johnson, Ralph; Ling, Ming-Yie; McMurtry, John; Becker, Barry; Paul, Ray; Robinson, Mike; Simmons, Richard; Smith, David E. A.; Taylor, John; Veneklasen, Lee; Walters, Dean; Wieczorek, Paul; Wong, Sam; Dutta, April; Lele, Surendra; Rough, Kirkwood; Pearce-Percy, Henry; Jau, Jack Y.; Lin, Chun C.; Nguyen, Hoi T.; Oyang, Yen-Jen; Hutcheson, Timothy L.; Clark, David J.; Pan, Chung-Shih; Bhaskar, Chetana; Kirk, Chris; Munro, Eric; Gibilisco, John; and Sandland, Paul, 5,502,306, Cl. 250-310.000.





Dutzmann, Stefan: *See*—
Heinemann, Ulrich; Dehne, Heinz-Wilhelm; Dutzmann, Stefan; and Erdelen, Christoph, 5,502,233, Cl. 558-256.000.

Duvvury, Charvaka, to Texas Instruments Incorporated. Silicon controlled rectifier and method for forming the same. 5,502,317, Cl. 257-107.000.

Dwivedi, Ratnesh K.; Becker, Kurt J.; White, Danny R.; Keck, Steven D.; and Mortenson, Mark G., to Lanxide Technology Company, LP. Macrocomposite bodies and production methods. 5,501,263, Cl. 164-97.000.

Dworsky, Lawrence N.; and Jaskie, James E., to Motorola, Inc. Electron source. 5,502,347, Cl. 313-309.000.

Dworsky, Lawrence N.: *See*—
Moyer, Curtis D.; Dworsky, Lawrence N.; and Kane, Robert C., 5,502,348, Cl. 313-310.000.

Dyer, Daniel R.; and Sparks, James R., to U.S. Natural Resources, Inc. Chipper knife. 5,501,256, Cl. 144-241.000.

Dynax Corporation: *See*—
Kleiner, Eduard K.; and Karydas, Athanasios, 5,502,225, Cl. 554-42.000.

Dzik, Steven C.: *See*—
Catanzaro, Anthony J.; Dzik, Steven C.; Hull, Charles; Pratap, Mahendra; Prestinario, Jerome; Ranganath, Minakanagurki V.; and Ribera, John F., 5,502,727, Cl. 370-94.200.

D2B Systems Company Limited: *See*—
van Steenbrugge, Bernard, 5,502,436, Cl. 340-825.050.

E-Systems, Inc.: *See*—
Zablotney, Joseph H.; and Gorman, Steven F., 5,502,450, Cl. 342-451.000.

E-Z Burr Tool Company: *See*—
Robinson, William A.; and Robinson, William R., 5,501,554, Cl. 408-153.000.

Earl, Bonnie M.: *See*—
Franklin, Dana; and Earl, Bonnie M., 5,501,324, Cl. 206-279.000.

Earnhart, Edgar G.: *See*—
Glozer, Gary R.; Earnhart, Edgar G.; Le Beau, Brett J., Sr.; Marek, Andrea E.; Trick, Rudy; and Vianco, James E., 5,501,594, Cl. 425-549.000.

East, Amanda H.; and Janse Van Rensburg, Richard W., to Videojet Systems Limited. Ink jet head with ink cavity resonance. 5,502,473, Cl. 347-73.000.

Easter, William M., to Riverwood International Corporation. Method and apparatus for clearing excess beverage containers from a beverage container packaging machine. 5,501,061, Cl. 53-443.000.

Eastern Company, The: *See*—
Wright, Raymond L., 5,501,551, Cl. 405-259.400.

Eastman Chemical Company: *See*—
Fillers, Carl F.; Barron, Jerry A.; and Middlemas, Eric D., 5,502,249, Cl. 562-608.000.
Liang, Shaowo, 5,502,234, Cl. 558-314.000.
Liang, Shaowo; Price, Timothy W.; Nolen, Timothy R.; Compton, Daniel B.; and Attride, David C., 5,502,257, Cl. 568-433.000.
Matayabas, James C., Jr.; MacKenzie, Peter B.; and Hyatt, John A., 5,502,137, Cl. 528-393.000.
Scott, Christopher E.; Small, James D., Jr.; Yang, Hsinjin; Yacobucci, Paul D.; and Stack, Gary M., 5,502,121, Cl. 525-444.000.

Eastman Kodak Company: *See*—
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Cullum, Dennis F.; and Silva, Fernando G., 5,502,522, Cl. 354-106.000.
Czarnecki, Wlodzimierz S.; Brock, George W.; Gandola, Kent R.; de Lellis, Joseph; and Mencher, Christopher P., 5,502,528, Cl. 354-106.000.
Estelle, Lee R.; and Lawther, Joel S., 5,502,597, Cl. 359-793.000.
Freund, Michael N., 5,502,377, Cl. 324-175.000.
Glozer, Gary R.; Earnhart, Edgar G.; Le Beau, Brett J., Sr.; Marek, Andrea E.; Trick, Rudy; and Vianco, James E., 5,501,594, Cl. 425-549.000.
Harris, Clark E.; and Kappler, John A., 5,501,415, Cl. 242-596.700.
Ng, Yee S., 5,502,793, Cl. 395-109.000.
Obermeier, Ernst; Heinzl, Joachim; Krause, Peter; Hochwind, Bernhard; and Zollner, Alfred, 5,502,471, Cl. 347-65.000.
Olexy, Anthony M.; Urbon, Michael P.; and Westlake, Paul D., 5,501,449, Cl. 271-292.000.
Olliver, Richard, 5,502,541, Cl. 355-38.000.
Stephenson, Stanley W., III; and Seamans, Tom, 5,502,531, Cl. 354-217.000.
Willand, Craig S.; Robello, Douglas R.; Urankar, Edward J.; and Ulman, Abraham, 5,501,821, Cl. 252-582.000.
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Easton, Alan M.: *See*—
Braford-Goldberg, Sarah R.; Easton, Alan M.; Klein, Barbara K.; McKearn, John P.; and Olins, Peter O., 5,501,962, Cl. 435-69.520.

Easton, Raymond J.: *See*—
Lynch, Marine D.; Bernklau, James W.; Davis, Corey L.; Easton, Raymond J.; Lach, Robert E.; and Paulson, Richard D., 5,502,534, Cl. 354-323.000.

Eaton Corporation: *See*—
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Scott, George E., 5,501,010, Cl. 29-889.300.

Ebata, Hironari: *See*—
Kawasaki, Somei; Iseki, Masami; and Ebata, Hironari, 5,502,419, Cl. 332-109.000.

Ebata, Tokihide: *See*—
Takahashi, Kazuyoshi; Otsuka, Naoji; Ebata, Tokihide; Hirabayashi, Hiromitsu; Tajika, Hiroshi; Koitabashi, Noribumi; Arai, Atsushi; Aono, Kenji; and Sugimoto, Hitoshi, 5,502,464, Cl. 346-25.000.

Ebe, Akinori; Ogata, Kiyoshi; Nishiyama, Satoshi; Kuratani, Naoto; and Okazaki, Taizo, to Nissin Electric Co., Ltd. Copper crystal film coated organic substrate. 5,501,911, Cl. 428-457.000.

Eberle, Wolfgang: *See*—
Weber, Martin; and Eberle, Wolfgang, 5,502,122, Cl. 525-534.000.

Ebersole, Richard C.: *See*—
Ward, Michael D.; and Ebersole, Richard C., 5,501,986, Cl. 436-525.000.

Eckhout, Thomas L., to Winget, Larry J. Snap-on air bag cover. 5,501,485, Cl. 280-728.300.

ECO Innovations Ltd.: *See*—
Hattingh, Lukas M.; and Kruger, Marthinus G., 5,501,046, Cl. 52-266.000.

Ecosir Corp.: *See*—
Syverson, Charles D.; and Curtiss, William P., 5,502,368, Cl. 322-28.000.

Ecolab Inc.: *See*—
Fernholz, Peter J., 5,501,742, Cl. 134-25.200.
Man, Victor F., 5,501,815, Cl. 252-174.170.

Ecopol, LLC: *See*—
Sinclair, Richard G.; and Lipinsky, Edward S., 5,502,158, Cl. 528-354.000.

ED. Scharwächter GmbH & Co., KG: *See*—
Klötting, Bernd-Alfred, 5,501,421, Cl. 248-288.300.

Edlinger, Alfred, to Holderbank Financiere Glarus AG. Process for producing pig iron and cement clinker. 5,501,721, Cl. 75-434.000.

Edmunds, Cyril G.: *See*—
Hart, Steven C.; Edmunds, Cyril G.; and Kryk, Gerald M., 5,502,549, Cl. 355-245.000.

Edstrom Industries, Inc.: *See*—
Edstrom, William E., Sr.; and Grkavac, George J., 5,501,177, Cl. 119-72.500.

Edstrom, William E., Sr.; and Grkavac, George J., to Edstrom Industries, Inc. Animal watering valve. 5,501,177, Cl. 119-72.500.

Edwards, Donald W.; Popper, Peter; Rule, David P.; and Walker, William C., to Du Pont de Nemours, E. I., and Company. Method for deleting and reintroducing yarns to a textile process. 5,501,250, Cl. 139-450.000.

Edwards, Jeffrey C.: *See*—
Coutts, Graeme F.; and Edwards, Jeffrey C., 5,501,242, Cl. 137-1.000.
Coutts, Graeme F.; and Edwards, Jeffrey C., 5,501,272, Cl. 106-250.010.

Edwards, Thomas C. Non-contact rotary vane gas expanding apparatus. 5,501,586, Cl. 418-264.000.

Edwards-Cofie, Sophia. Multi purpose vibrating foot stool. 5,501,682, Cl. 601-61.000.

Effenberger, Alfred, to R. Stahl Blasformtechnik GmbH. Blow-moulding machine with calibration stations. 5,501,591, Cl. 425-529.000.

Egawa, Kunihiko; Kubo, Yoshio; Nagai, Takayuki; Uchikawa, Fusaoki; Miyashita, Shoji; and Higuma, Hiroko, to Mitsubishi Denki Kabushiki Kaisha. Process for preparing superconducting wire. 5,501,746, Cl. 148-98.000.

Eguchi, Kouji: *See*—
Yamamoto, Takaharu; Tahara, Teruji; and Eguchi, Kouji, 5,501,874, Cl. 427-212.000.

Ehleiter, James A.: *See*—
Cheesman, Robert R.; Ehleiter, James A.; Gass, Don N.; Tatsak, Gary B.; and Fletcher, R. Ian, 5,501,793, Cl. 210-160.000.

Ehrenberg, Stefan; Engel, Aloysius; and Henk, Hermann, to Bayer Aktiengesellschaft. Reactive dyestuffs based on a substituted barbituric acid. 5,502,174, Cl. 534-635.000.

Ehrfeld, Wolfgang: *See*—
Pokrowsky, Peter; Kiefer, Eckehard; Abraham, Michael; Stenkamp, Bernd; Ehrfeld, Wolfgang; and Zetterer, Thomas, 5,502,567, Cl. 356-367.000.

Eich, Manfred: *See*—
Beckmann, Stefan; Zentel, Rudolf; Doerr, Michael; and Eich, Manfred, 5,502,135, Cl. 526-262.000.

Eicher, Joachim: *See*—
Lessmöllmann, Christoph; Eicher, Joachim; and Reinecke, Holger, 5,501,784, Cl. 205-67.000.

Eikelmann, Klaus: *See*—
Schwarte, Stephan; Dobbelstein, Arnold, deceased; Niemann, Jürgen; Lassmann, Walter; Piontek, Susanne; Poth, Ulrich; and Eikelmann, Klaus, 5,502,101, Cl. 524-460.000.

Einloft, Sandra: *See*—
Chauvin, Yves; Einloft, Sandra; and Olivier, Helene, 5,502,018, Cl. 502-213.000.

Eisenstadt, William R.: *See*—
Adair, James H.; Singh, Rajiv K.; Eisenstadt, William R.; and Stachle, Sherry S., 5,501,877, Cl. 427-249.000.

Eisenwerk Bruehl GmbH: *See*—
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Eka Nobel AB: *See*—
Nicholass, John F.; and Zettinger, Piotr, 5,502,218, Cl. 549-329.000.

Ekerdt, Roland: *See*—
Skuballa, Werner; Buchmann, Bernd; Heindl, Josef; Fröhlich, Wolfgang; Ekerdt, Roland; and Giesen, Claudia, 5,502,075, Cl. 514-461.000.

Ekstein, Penny. Children's toy with peek-a-boo activation. 5,501,627, Cl. 446-175.000.

Eldredge, David A.; and Ress, Robert A., Jr., to United Technologies Corporation. Fan blade attachment for gas turbine engine. 5,501,575, Cl. 416-144.000.

Eldridge, Graeme W.: *See—*
Burk, Albert A., Jr.; Barrett, Donovan L.; Hobgood, Hudson M.; Clarke, Rowland C.; Eldridge, Graeme W.; and Brandt, Charles D., 5,501,173, Cl. 117-84.000.

Electric Power Research Institute, Inc.: *See—*
Bernstein, Ralph; Tahiliani, Vasu H.; Rabinowitz, Mario; and Grace, Richard, 5,501,112, Cl. 73-864.000.

Elf Atochem S.A.: *See—*
Bourson, Lucien, 5,501,771, Cl. 162-158.000.

Eli Lilly and Company: *See—*
Cullinan, George J.; and Sato, Masahiko, 5,502,074, Cl. 514-443.000.
Hui, Kwan Y.; Jones, Charles D.; Jungheim, Louis N.; and Pennington, Pamela A., 5,502,061, Cl. 514-311.000.
O'Doherty, George O. P., 5,502,040, Cl. 514-27.000.
Sucholeiki, Irving, 5,502,246, Cl. 562-426.000.

Elizabeth Arden Co., Division of Conopco, Inc.: *See—*
Cho, Suk H.; and DeFlorio, Victor, 5,502,226, Cl. 554-154.000.

Elkins, James C.: *See—*
Ramsay, Thomas E.; and Elkins, James C., 5,502,576, Cl. 358-444.000.

Elliott, David L.; Falcione, Ronald J.; and Hunter, Wood E., to Calgon Corporation. Cellulosic modified lignin and cationic polymer composition and process for making improved paper or paperboard. 5,501,772, Cl. 162-163.000.

Elliott, David L.; Falcione, Ronald J.; and Hunter, Wood E., to Calgon Corporation. Cellulosic, modified lignin and cationic polymer composition and process for making improved paper or paperboard. 5,501,773, Cl. 162-163.000.

Elliott, Michael: *See—*
Casida, John E.; Elliott, Michael; and Pulman, David A., 5,502,073, Cl. 514-436.000.

Ellis, Daniel J.: *See—*
Nagel, Thomas O.; and Ellis, Daniel J., 5,502,755, Cl. 377-6.000.

Ellis, Deborah J.: *See—*
Meadows, Martin-Paul; Ellis, Deborah J.; and Jarrett, Paul, 5,501,852, Cl. 424-93.461.

Ellis, Ernest W.; Foley, Diane M.; and Arnold, Dana R., to Rexham Graphics Inc. Ablation-transfer imaging/recording. 5,501,938, Cl. 430-201.000.

Ellis, Michael P.: *See—*
Hill, Ira; Malmborg, Bengt E.; Oldham, Ronald G.; Turner, James E.; Ellis, Michael P.; and Andersson, Sven-Börje, 5,501,236, Cl. 131-270.000.

Elsag International N.V.: *See—*
Maguire, Justin M., Jr., 5,502,616, Cl. 361-681.000.

Eterman, Warren B. Disposable/reusable sun filter. 5,502,516, Cl. 351-47.000.

Elzenbeck, Manfred; and Haar, Klaus. Work-box. 5,501,355, Cl. 220-23.200.

Emerson, Khateeta: *See—*
Ho, Guo-Jie; Mathre, David A.; Song, Zhiguo; and Emerson, Khateeta, 5,502,165, Cl. 530-341.000.

Emery, Vincent C.; Bavin, Peggy J.; and Walker, Patrick, to Royal Free Hospital School of Medicine. PCR diagnosis of human papilloma virus type 16. 5,501,947, Cl. 435-5.000.

Emge, Dennis: *See—*
Meisburger, Dan; Brodie, Alan D.; Chadwick, Curt; Desai, Anil; Dohse, Hans; Emge, Dennis; Greene, John; Johnson, Ralph; Ling, Ming-Yie; McMurtry, John; Becker, Barry; Paul, Ray; Robinson, Mike; Simmons, Richard; Smith, David E. A.; Taylor, John; Veneklasen, Lee; Walters, Dean; Wieczorek, Paul; Wong, Sam; Dutta, April; Lele, Surendra; Rough, Kirkwood; Pearce-Percy, Henry; Jau, Jack Y.; Lin, Chun C.; Nguyen, Hoi T.; Oyang, Yen-Jen; Hutcheson, Timothy L.; Clark, David J.; Pan, Chung-Shih; Bhaskar, Chetana; Kirk, Chris; Munro, Eric; Gibilisco, John; and Sandland, Paul, 5,502,306, Cl. 250-310.000.

Emhart Inc.: *See—*
Cummings, Gerald F., 5,502,291, Cl. 219-98.000.
Shahriar, Niakan, 5,501,244, Cl. 137-98.000.

Emitec Gesellschaft fuer Emissionstechnologie mbH: *See—*
Humpolik, Bohumil; and Bayer, Jürgen, 5,502,023, Cl. 29-890.000.
Wieres, Ludwig, 5,501,391, Cl. 228-248.100.

Emoto, Kazuhiro: *See—*
Kondo, Akihiro; Morimoto, Kiyofumi; and Emoto, Kazuhiro, 5,501,930, Cl. 430-59.000.

Endo, Eimatsu, to Kabushiki Kaisha Endo Seisakusho. Hollow club head with weighted sole plate. 5,501,459, Cl. 273-167.00H.

Endo, Yasuharu: *See—*
Yui, Toshitake; Yamashita, Yoshiro; Hiraoka, Eisuke; Endo, Yasuharu; and Hashimoto, Ken, 5,501,726, Cl. 106-20.00R.

Endoh, Shigeru: *See—*
Kamiyama, Takao; Yokoshima, Yasuhiro; and Endoh, Shigeru, 5,501,115, Cl. 73-865.800.

Endoh, Toshio, to Fujitsu Limited. Three-dimensional measuring method and system. 5,502,657, Cl. 369-561.000.

Endress+Hauser, Inc.: *See—*
Brasier, Olaf F.; Maier, Klaus C.; and McCarthy, W. Patrick, 5,502,659, Cl. 364-571.010.

Engel, Aloysius: *See—*
Ehrenberg, Stefan; Engel, Aloysius; and Henk, Hermann, 5,502,174, Cl. 534-635.000.

Engelen, Helmut; and Nikl, Horst, to Volkswagen AG. Motor vehicle having a common liquid supply for a liquid-cooled drive engine and hydraulic power steering. 5,501,184, Cl. 123-41.290.

Engelhardt, Fritz; Riegel, Ulrich; and Kleiner, Hans-Jerg, to Cassella Aktiengesellschaft. Process for the preparation of cyclic vinylphosphonic esters. 5,502,231, Cl. 558-110.000.

Engelskirchen, Konrad; Fischer, Herbert; Kottwitz, Beatrix; Upadek, Horst; and Nitsch, Christian, to Henkel Kommanditgesellschaft auf Aktien. Detergents and cleaning preparations containing selected builder systems. 5,501,814, Cl. 252-174.170.

Engle, Thomas H. System for positioning and supporting trailers on railcars. 5,501,566, Cl. 414-333.000.

Eniricerche S.p.A.: *See—*
Andrei, Maria; Roggero, Arnaldo; Soprani, Massimo; and Gandini, Alberto, 5,501,920, Cl. 429-192.000.

Eno, Kenneth M. Gable top carton having a U-shaped stake seal and method and apparatus for forming. 5,501,394, Cl. 229-137.000.

Ensign-Bickford Company, The: *See—*
Thureson, Gary R.; Davis, Eric R.; Pellon, Steven R.; Zappalorti, Alvaro; and Gladden, Ernest L., 5,501,151, Cl. 102-275.700.

Envirex Inc.: *See—*
Cheesman, Robert R.; Ehleiter, James A.; Gass, Don N.; Tatsak, Gary B.; and Fletcher, R. Ian, 5,501,793, Cl. 210-160.000.

Environment, Canada, Her Majesty the Queen in right of, as represented by the Minister of the: *See—*
Côté, Pierre L.; and Van der Sloot, Hans A., 5,502,268, Cl. 588-259.000.

Environmental Products Corporation: *See—*
Powell, Ken R.; and Driscoll, Rusty, 5,502,559, Cl. 356-73.000.

Eoff, Larry S.: *See—*
Weaver, Jim; Ravi, Krishna M.; Eoff, Larry S.; Gdanski, Rick; and Wilson, J. Michael, 5,501,276, Cl. 166-291.000.

Erbes, John G., to General Electric Company. Lateral restraint for core plate of boiling water reactor. 5,502,754, Cl. 376-302.000.

Erdelen, Christoph: *See—*
Fuchs, Rainer; Fischer, Reiner; Erdelen, Christoph; and Stendel, Wilhelm, 5,502,070, Cl. 514-406.000.
Heinemann, Ulrich; Dehne, Heinz-Wilhelm; Dutzmann, Stefan; and Erdelen, Christoph, 5,502,233, Cl. 558-256.000.

Erdman, David T.: *See—*
Wasleski, Daniel M.; Erdman, David T.; and Newallis, Peter E., 5,502,190, Cl. 544-243.000.

Erkkila, Ruth M.; Carlson, James G.; Evans, Christopher M.; Greczyna, James A.; Kumar, Ramesh C.; Norman, Colin F.; and Rotto, Nelson T., to Minnesota Mining and Manufacturing Company. Magnetic recording medium having a binder system including a non halogenated vinyl polymer and a polyurethane polymer each with specified pendant groups. 5,501,903, Cl. 428-328.000.

Errasti Iriarte, Iosu; and Aguirre Arregui, Ignacio, to ULMA, S. Coop. Ltda. Stretchable film tray wrapping machine. 5,501,066, Cl. 53-556.000.

Erskine, Timothy J., to Becton, Dickinson and Company. Safety catheter assembly having safety stop push button. 5,501,675, Cl. 604-263.000.

Ertle, Raymond J.: *See—*
Ertle, Raymond T.; and Ertle, Raymond J., 5,501,826, Cl. 264-118.000.

Ertle, Raymond T.; and Ertle, Raymond J., to Cylatec Corp. Process for manufacturing lightweight inorganic particles. 5,501,826, Cl. 264-118.000.

Eshleman, Roger D.: *See—*
Stevers, Paul H.; and Eshleman, Roger D., 5,501,159, Cl. 110-188.000.

Esselte Dymo N.V.: *See—*
Day, Robert C. L., 5,501,539, Cl. 400-621.000.

Estelle, Lee R.; and Lawther, Joel S., to Eastman Kodak Company. Wide-angle photographic lens system and a photographic camera. 5,502,597, Cl. 359-793.000.

Etcon Corporation: *See—*
Rocci, Joseph; and Kirby, David W., 5,502,280, Cl. 174-84.00R.

Ethicon Endo-Surgery: *See—*
Measamer, John P.; Welch, Robert F.; and Swensgard, Brett, 5,501,690, Cl. 606-146.000.

Ethicon, Inc.: *See—*
Demarest, David; and Hodulik, Michael G., 5,500,991, Cl. 29-407.080.
Failla, Stephen J.; Stokes, Michael J.; Price, Daniel W.; Rarey, Charles M.; and Thompson, Bennie, 5,501,654, Cl. 600-204.000.

Etienne Lacroix Tous Artifices S.A.: *See—*
Cassagne, Philippe; and Dihlan, Denis, 5,501,153, Cl. 102-307.000.

Eugster, Carl; Eugster, Conrad H.; Haldemann, Walter; and Rivara, Giorgio, to Marigen, S.A. Bioteenside esters and phosphatides with vitamin-D and vitamin-E compounds. 5,502,224, Cl. 552-653.000.

Eugster, Conrad H.: *See—*
Eugster, Carl; Eugster, Conrad H.; Haldemann, Walter; and Rivara, Giorgio, 5,502,224, Cl. 552-653.000.

Eugster, Hans; Reuter, Herbert; and Buser, Beat, to Henkel Kommanditgesellschaft auf Aktien. Process for increasing the apparent density of spray-dried detergents. 5,501,810, Cl. 252-89.100.

Euromold: *See—*
Mirebeau, Pierre; Galaj, Stanislas; and Prigent, Madeleine, 5,502,279, Cl. 174-73.100.

Evans, Brian J.: *See—*
Daniloff, Yuri; Robins, Simon P.; Evans, Brian J.; Pratt, David A.; and Lungard, Robert, 5,502,197, Cl. 546-281.000.

Evans, Christopher M.: *See—*



Erkkila, Ruth M.; Carlson, James G.; Evans, Christopher M.; Greczyna, James A.; Kumar, Ramesh C.; Norman, Colin F.; and Rotto, Nelson T., 5,501,903, Cl. 428-328.000.

Evans, Jeffrey J.; Guth, Leslie A.; and Ray, Urmi, to AT&T Corp. Method for stripping conformal coatings from circuit boards. 5,501,761, Cl. 156-344.000.

Evans, Martin: *See—*
Dory, Efraim; Evans, Martin; and Alexy, Albert A., 5,502,686, Cl. 367-34.000.

Eveready Battery Company, Inc.: *See—*
Swierbut, Wendi M.; and Nardi, John C., 5,501,924, Cl. 429-224.000.

Exar Corporation: *See—*
Ozguc, Ismail H., 5,502,746, Cl. 375-317.000.

Expro North Sea Limited: *See—*
Coutts, Graeme F.; and Edwards, Jeffrey C., 5,501,242, Cl. 137-1.000.
Coutts, Graeme F.; and Edwards, Jeffrey C., 5,501,272, Cl. 106-250.010.

Exxon Chemical Patents, Inc.: *See—*
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Crowther, Donna J.; Fisher, Richard A.; Canich, Jo Ann M.; Hlatky, Gregory G.; and Turner, Howard W., 5,502,124, Cl. 526-127.000.
Peacock, Andrew J., 5,502,112, Cl. 525-240.000.

Ezzell, Stephen A.: *See—*
St. Clair, Anne K.; Ezzell, Stephen A.; Taylor, Larry T.; and Boston, Harold G., 5,502,156, Cl. 528-353.000.

F.C.I. (France Chirurgie Instrumentation): *See—*
Ritleng, Pierre, 5,501,232, Cl. 128-898.000.

Fabrica D'Armi P. Beretta S.p.A.: *See—*
Beretta, Ugo G., 5,501,135, Cl. 89-196.000.

Fagerquist, Randy L.: *See—*
Katerberg, James A.; and Fagerquist, Randy L., 5,502,474, Cl. 347-75.000.

Failla, Stephen J.; Stokes, Michael J.; Price, Daniel W.; Rarey, Charles M.; and Thompson, Bennie, to Ethicon, Inc. Endoscopic instrument having articulating element. 5,501,654, Cl. 600-204.000.

Faist, Jerome: *See—*
Capasso, Federico; Cho, Alfred Y.; Faist, Jerome; Hutchinson, Albert L.; Sirtori, Carlo; and Sivco, Deborah L., 5,502,787, Cl. 385-123.000.

Fakhri, Omar. Method for the treatment of psoriasis with electric current. 5,501,705, Cl. 607-75.000.

Falcione, Ronald J.: *See—*
Elliott, David L.; Falcione, Ronald J.; and Hunter, Wood E., 5,501,772, Cl. 162-163.000.
Elliott, David L.; Falcione, Ronald J.; and Hunter, Wood E., 5,501,773, Cl. 162-163.000.

Falco, Robert N., to Cabot Safety Corporation. Seal plate attachment for earmuffs. 5,500,958, Cl. 2-209.000.

Fang, Yean-Kuen: *See—*
Kuo, Lee-Ching; Ho, Fang-Chuan; Lee, William; and Fang, Yean-Kuen, 5,502,595, Cl. 359-589.000.

Faris, Sadeg M.: *See—*
Dentinger, Aaron M.; Swift, David C.; and Faris, Sadeg M., 5,502,481, Cl. 348-51.000.

Farmatic Research, Inc.: *See—*
Hall, William M., Sr., 5,501,542, Cl. 403-306.000.

Farmitalia Carlo Erba S.r.l.: *See—*
Buzzetti, Franco; Longo, Antonio; and Di Salle, Enrico, 5,502,044, Cl. 514-177.000.
Dostert, Philippe; Pevarello, Paolo; Heidempergher, Franco; Varasi, Mario; Bonsignori, Alberto; and Roncucci, Romeo, 5,502,079, Cl. 514-620.000.

Farooq, Amjad; Cesar, Regis; and Deville, Francoise, to Colgate-Palmolive Co. Concentrated liquid fabric softening composition. 5,501,806, Cl. 252-8.800.

Faure, Eugene: *See—*
Ducugnon, Jean; and Faure, Eugene, 5,501,469, Cl. 277-37.000.

Faust, Gottfried: *See—*
Scharfenberg, Peter; Liebscher, Jürgen; Knoll, Alexander; Uschmajew, Aleksej; Rolfs, Andreas; Lohman, Dieter; Faust, Gottfried; and Morgenstern, Eveline, 5,502,051, Cl. 514-235.500.

Fava, Ermenegildo. Automatic assembly for delivering coffee infusions, with means for ejecting the coffee dry grounds. 5,501,138, Cl. 99-287.000.

Fazen, Paul J.: *See—*
Sneddon, Larry G.; Beck, Jeffrey S.; and Fazen, Paul J., 5,502,142, Cl. 528-7.000.

Federico, Joseph A., to Delaware Capital Formation Inc. Universal modular apparatus for selectively forming curved concave and convex sections of a refrigerated display case. 5,501,516, Cl. 312-116.000.

Feero, Andrew A. Method of alleviating carpal tunnel syndrome. 5,501,657, Cl. 601-40.000.

Fehervari, Agota F.: *See—*
Bloom, Iris B. K.; Fehervari, Agota F.; Gaudiana, Russell A.; Minns, Richard A.; and Schild, Howard G., 5,501,940, Cl. 430-253.000.

Fehrenbach, Donald E.; and Waeghe, Allan J. Kickstand bumper. 5,501,479, Cl. 280-293.000.

Feichtinger, Kurt: *See—*
Stettner, Rudolf; and Feichtinger, Kurt, 5,501,096, Cl. 73-1.00J.

Felder, Charles J. Speaker having improved sound square, sound bank, sound angle, sound wedge and sound radiators. 5,502,772, Cl. 381-188.000.

Feldkamp, Bernward; and Schliepershötter, Bernd, to Klöckner-Humboldt-Deutz AG. Machine having devices to reduce transmissions of structure-borne noise. 5,502,342, Cl. 310-51.000.

Fentem, Philip A.: *See—*
Bright, Simon W. J.; Byrom, David; and Fentem, Philip A., 5,502,273, Cl. 800-205.000.

Ferag AG: *See—*
Stauber, Hans-Ulrich, 5,501,127, Cl. 83-100.000.

Feraud, Jean-Pierre: *See—*
Card, Roger J.; Howard, Paul R.; Feraud, Jean-Pierre; and Constien, Vernon G., 5,501,275, Cl. 166-280.000.

Ferber, Leon: *See—*
Pavelle, Richard; Burstein, Paul; Ferber, Leon; and Latanision, Ronald M., 5,501,846, Cl. 422-211.000.

Fernholz, Peter J., to Ecolab Inc. Method for dispensing solid rinse aids. 5,501,742, Cl. 134-25.200.

Ferralli, Michael W., to Technology Licensing Company. Impact spray cladding of innerduct liner. 5,501,873, Cl. 427-195.000.

Ferrand, Bernard: *See—*
Chartier, Isabelle; Ferrand, Bernard; Pelenc, Denis; and Wyon, Christophe, 5,502,737, Cl. 372-11.000.

Ferrin, Frank J.; and Turner, Paul N., to Honeywell Inc. Method and appartus for producing a symbology display into a night vision system. 5,502,455, Cl. 345-9.000.

Fetcko, John T.: *See—*
Allen, Martin A.; and Fetcko, John T., 5,501,872, Cl. 427-180.000.

Feuling, James J. Combustion chamber system having an improved valve arrangement. 5,501,191, Cl. 123-310.000.

Fey, Peter: *See—*
Angerbauer, Rolf; Fey, Peter; Hübach, Walter; Philipps, Thomas; Bischoff, Hilmar; Petzinna, Dieter; Schmidt, Delf; and Thomas, Günter, 5,502,057, Cl. 514-277.000.

Fibotech, Inc.: *See—*
Rondeau, Michel Y., 5,502,784, Cl. 385-66.000.

Fichtel & Sachs AG: *See—*
Handke, Günther; Silye, Edward W.; Raabis, Toivo; Achard, Thomas; and Raulf, Matthias, 5,501,438, Cl. 267-226.000.

Fiege, Helmut: *See—*
Hagedorn, Ferdinand; Fiege, Helmut; Sölner, Robert; and Helm, Rudolf, 5,502,256, Cl. 568-25.000.

Fields, Rebecca D.: *See—*
Lancaster, Michael V.; and Fields, Rebecca D., 5,501,959, Cl. 435-32.000.

Figge, Siegfried; and Leistner, Martin K., to Sigma Tool & Machine. Anti-friction Tee-nut with deflected edges. 5,501,558, Cl. 411-176.000.

Fillers, Carl F.; Barron, Jerry A.; and Middlemas, Eric D., to Eastman Chemical Company. Process for the removal of iodine from acetyl compounds. 5,502,249, Cl. 562-608.000.

Filterwerk Mann & Hummel GmbH: *See—*
Andress, Heinz; Hummel, Karl-Ernst; Klotz, Arthur; and Schermuly, Thomas, 5,501,723, Cl. 96-131.000.

Fini, Anthony W., Jr. Band brake holder/lever. 5,501,304, Cl. 188-77.00W.

Finley, Brenda L.; and Wright, Ralph W., Jr. Floor covering underlayment. 5,501,895, Cl. 428-194.000.

Finsterwalder, Robert N.: *See—*
Fuller, Timothy J.; Mammino, Joseph; Brach, Paul J.; Blaszak, Robert; Finsterwalder, Robert N.; and Badesha, Santokh S., 5,501,881, Cl. 427-421.000.

Fiorido, Antonino F., to Matermacc S.r.l. Single-seed dispenser of a pneumatic precision sower. 5,501,366, Cl. 221-211.000.

firm Hermann Heye, The: *See—*
Hermening, Heinz; Schwarzer, Siegfried; and Seidel, Hans-Georg, 5,501,316, Cl. 198-457.000.

Firma Carl Freudenberg: *See—*
Föttinger, Walter; Grimm, Hansjörg; and Schaut, Gerhard, 5,501,898, Cl. 428-287.000.
Hamaekers, Arno, 5,501,531, Cl. 384-536.000.
Spies, Karl-Heinz; Schweikert, Willi; Barth, Armin; and Sander, Hans-Gerhard, 5,501,075, Cl. 60-605.100.

Firma Fedag: *See—*
Wörwag, Peter, 5,500,979, Cl. 15-349.000.

First Plast S.R.L.: *See—*
Mantelli, Giulio, 5,501,547, Cl. 405-121.000.

Firth, John R.; Perez, Anthony R.; and Meyer, Ronald A., to Safety Syringes, Inc. Disposable self-shielding hypodermic syringe. 5,501,672, Cl. 604-177.000.

Fischbach, Max: *See—*
Torborg, Kevin; and Fischbach, Max, 5,501,021, Cl. 34-594.000.

Fischbeck, Kyra; and Boyle, John P. Window guard for cats. 5,501,041, Cl. 49-55.000.

Fischer, Georg; and Glätzer, Edgar, to Benz & Hilgers GmbH. Apparatus for packaging individual objects, especially foodstuff packages. 5,501,065, Cl. 53-535.000.

Fischer, Herbert: *See—*
Engelskirchen, Konrad; Fischer, Herbert; Kottwitz, Beatrix; Upadek, Horst; and Nitsch, Christian, 5,501,814, Cl. 252-174.170.

Fischer, Michael, to Nellcor Incorporated. Serial layered medical network. 5,502,726, Cl. 370-94.100.

Fischer, Reiner: *See—*
Fuchs, Rainer; Fischer, Reiner; Erdelen, Christoph; and Stendel, Wilhelm, 5,502,070, Cl. 514-406.000.

Fischer, Stephen A.; Arora, Kartar S.; Grinstein, Reuben; McCurry, Patrick M., Jr.; and Giordan, Judith C., to Henkel Corporation. Thickener for aqueous compositions. 5,501,813, Cl. 252-174.170.

Fischer, Wilhelm C.; and Gabara, Thaddeus J., to AT&T Corp. Low-power-dissipation CMOS circuits. 5,502,407, Cl. 326-95.000.

Fisher, Gary R. Treatment device to aid in long-term cessation of smoking. 5,501,697, Cl. 606-204.000.

Fisher, Richard A.: *See*—
Crowther, Donna J.; Fisher, Richard A.; Canich, Jo Ann M.; Hlatky, Gregory G.; and Turner, Howard W., 5,502,124, Cl. 526-127.000.

Fiskars Inc.: *See*—
Concari, Gabriel E.; and Westberg, Rhonda M., 5,501,019, Cl. 33-494.000.

Fisons Corporation: *See*—
Rosamond, James D.; and Pierson, Myles E., 5,502,164, Cl. 530-329.000.

Fitzgerald, Lisa M.: *See*—
Hastings, Gregg A.; Adams, Mark D.; Fraser, Claire M.; Lee, Norman H.; Kirkness, Ewen F.; Blake, Judith A.; Fitzgerald, Lisa M.; Drake, Fred H.; and Gowan, Maxine, 5,501,969, Cl. 435-240.200.

Fitzpatrick, Timothy D.: *See*—
Haviv, Fortuna; Fitzpatrick, Timothy D.; Swenson, Rolf E.; Nichols, Charles J.; and Mort, Nicholas A., 5,502,035, Cl. 514-15.000.

Flaman, Michael T. Instrumentation probe. 5,502,753, Cl. 376-245.000.

Flanigam, Ora L.; and Williams, Dwight E., to Dow Corning Corporation. Azeotropes of octamethyltrisiloxane and aliphatic or alicyclic alcohols. 5,501,811, Cl. 252-174.150.

FleaXperts, Inc.: *See*—
Pitman, Judith L., 5,501,032, Cl. 43-129.000.

Fleck, Vincent J., Jr.: *See*—
Allred, Johnny W.; and Fleck, Vincent J., Jr., 5,501,303, Cl. 188-67.000.

Fleetwood Enterprises Inc.: *See*—
Kunz, James R., 5,501,504, Cl. 296-164.000.

Fletcher, R. Ian: *See*—
Cheesman, Robert R.; Ehleiter, James A.; Gass, Don N.; Tatsak, Gary B.; and Fletcher, R. Ian, 5,501,793, Cl. 210-160.000.

Fletcher, Robert H., to Advantage Lift Systems, Inc. Dual post single screw automotive screw lift system. 5,501,296, Cl. 187-210.000.

Flinder University of South Australia, The: *See*—
Berry, Michael N.; Town, Michael-Harold; Kresse, Georg-Burkhard; and Herrmann, Uwe, 5,501,958, Cl. 435-18.000.

Flohr, Peter, to Heinrich Kopp AG. Contact-separating device for circuit breakers. 5,502,285, Cl. 200-400.000.

Flores, Juan C.; and Rausch, Marvin D., to University of Massachusetts. Group 4 metal amidinate catalysts and addition polymerization process using same. 5,502,128, Cl. 526-160.000.

FloTool International, Inc.: *See*—
Rosen, Howard J., 5,500,987, Cl. 24-351.000.

Flynn, Gary A., to Merrell Pharmaceuticals Inc. Cyclohex-2-enyl acetamides. 5,502,253, Cl. 564-210.000.

Flynn, Richard M.: *See*—
Moore, George G. I.; Flynn, Richard M.; and Guerra, Miguel A., 5,502,094, Cl. 524-145.000.

FMC Corporation: *See*—
Orlando, Franklin P., 5,502,685, Cl. 366-132.000.
Peake, Clinton J.; and Cullen, Thomas G., 5,502,054, Cl. 514-242.000.
Thorp, Dean S.; Caropreso, Frank E.; Tieckelmann, Robert H.; and Lapham, Donald, III, 5,501,802, Cl. 210-758.000.
Williams, Michael R.; and Long, Matthew W., 5,501,424, Cl. 251-1.300.

Fobbe, Helmut: *See*—
Geist, Michael; Strauss, Udo; Fobbe, Helmut; Arlt, Klaus; Jouck, Walter; and Cibura, Klaus, 5,501,779, Cl. 904-501.000.

Foley, Diane M.: *See*—
Ellis, Ernest W.; Foley, Diane M.; and Arnold, Dana R., 5,501,938, Cl. 430-201.000.

Foley/PLP Co.: *See*—
Martz, William, 5,501,068, Cl. 56-255.000.

Folsom, Marc D.; and Paxton, Donald J., to Morton International, Inc. Fully extended pleat for passenger air bag fold. 5,501,489, Cl. 280-743.100.

Forbes, James W.: *See*—
Butcher, Ronald S.; and Forbes, James W., 5,501,556, Cl. 410-94.000.

Ford, Gordon D.: *See*—
Duncan, Michael G.; Saegert, Pamela P.; and Ford, Gordon D., 5,502,761, Cl. 379-142.000.

Ford, James D.; and Tuck, Larry C., to Hennessy Industries, Inc. Sliding chip guard for a brake lathe. 5,500,989, Cl. 29-27.00R.

Ford Motor Company: *See*—
Young, Darryl L.; and Blumel, Barry W., 5,501,270, Cl. 165-151.000.

Forman, Michael R., to Schneider (USA) Inc. Laser bonding of angioplasty balloon catheters. 5,501,759, Cl. 156-272.800.

Foster, David C. Rotating back scrubber. 5,500,972, Cl. 15-28.000.

Foster, Donald C.: *See*—
Holly, Richard D.; and Foster, Donald C., 5,502,034, Cl. 514-12.000.

Foster-Miller, Inc.: *See*—
Kovar, Robert; and Wallis, Roland R., Jr., 5,501,831, Cl. 264-503.000.

Foster, Steven G., to General Electric Company. Digital generation of a dynamic apodization correction. 5,501,220, Cl. 128-661.010.

Foster, Steven G.; and Wheeler, Mark H., to General Electric Company. Time gain compensation implementation. 5,501,221, Cl. 128-660.060.

Föttinger, Walter; Grimm, Hanajörg; and Schaut, Gerhard, to Firma Carl Freudenberg. Interior equipment part for vehicles. 5,501,898, Cl. 428-287.000.

Foukaraki, Evangelia: *See*—
Katerinopoulos, Haralambos E.; Iatridou, Helene; Foukaraki, Evangelia; Malekzadeh, Mohammad N.; Kuhn, Michael A.; and Haugland, Richard P., 5,501,980, Cl. 436-74.000.

Fournier, Jay A.: *See*—
Augustine, Robert L.; Fournier, Jay A.; Paine, John B., III; Shafer, Kenneth H.; and Tanielyan, Setrak K., 5,502,019, Cl. 502-314.000.

Framatome Connectors International: *See*—
Lenoir, Michel, 5,501,613, Cl. 439-540.100.

France Telecom: *See*—
Abram, Izo, 5,502,588, Cl. 359-154.000.

France Telecom-Etablissement Autonome De Droit Public: *See*—
Ali-Yahia, Tahar; and Dana, Michel, 5,502,832, Cl. 395-435.000.
Semenkoff, Mathilde; Ronarc 'H, Daniel; and Guibert, Marcel, 5,502,591, Cl. 359-341.000.

Frances, Jean-Marc: *See*—
Cavezzan, Jacques; and Frances, Jean-Marc, 5,502,084, Cl. 522-99.000.

Francis, Gerald T.: *See*—
Francis, Steven R.; Francis, Gerald T.; and Francis, Gregory J., 5,501,049, Cl. 52-387.000.

Francis, Gregory J.: *See*—
Francis, Steven R.; Francis, Gerald T.; Francis, Robert G.; and Francis, Gregory J., 5,501,049, Cl. 52-387.000.

Francis, Robert G.: *See*—
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Franhofer-Gesellschaft Zur Forderung Der Angewandten Forschung E.V.: *See*—
Werle, Peter, 5,502,562, Cl. 356-349.000.

Franklin, Dana; and Earl, Bonnie M., to Samsonite Corporation. Soft-sided luggage case with interfitting and foldably separate packing compartments. 5,501,324, Cl. 206-279.000.

Frantz, Inc.: *See*—
Frantz, Matthew H., 5,501,454, Cl. 273-55.00B.

Frantz, Matthew H., to Frantz, Inc. Football kicking tee. 5,501,454, Cl. 273-55.00B.

Franz, Dieter: *See*—
Pfab, Peter; Wahl, Peter; and Franz, Dieter, 5,502,213, Cl. 548-564.000.

Fraser, Claire M.: *See*—
Hastings, Gregg A.; Adams, Mark D.; Fraser, Claire M.; Lee, Norman H.; Kirkness, Ewen F.; Blake, Judith A.; Fitzgerald, Lisa M.; Drake, Fred H.; and Gowan, Maxine, 5,501,969, Cl. 435-240.200.

Freedman, David; Wang, Guozheng; and Kadouri, Avinoam, to New Brunswick Scientific Co., Inc. Method and apparatus for anchorage and suspension cell culture. 5,501,971, Cl. 435-240.230.

Fresenius AG: *See*—
Weidler, Burghard; Sommermeyer, Klaus; Henning, Klaus; and Bepperling, Frank, 5,502,043, Cl. 514-60.000.

Freund, Michael N., to Eastman Kodak Company. Method and apparatus for measuring rotary movement of a shaft. 5,502,377, Cl. 324-175.000.

Friauf, Walter S.: *See*—
Bourg, John; Mitchell, James; Mirotznik, Mark; Roth, Bradley; Subramanian, Sankaran; Cherukuri, Murali; Zablocky, Paul G.; Pohida, Thomas J.; Smith, Paul D.; Friauf, Walter S.; and Tschudin, Rolf G., 5,502,386, Cl. 324-316.000.

Frickes, Stanley L.: *See*—
Chen, Jeane S.; Frickes, Stanley L.; Hartlen, Bryan R.; Kurata, Tom D.; Maryan, Jacek P.; McKay, Dan N.; and Williams, Timothy F., 5,502,724, Cl. 370-85.300.

Fried. Krupp AG Hoesch-Krupp: *See*—
Bartzick, Gerd; and Bühne, Gerd, 5,501,252, Cl. 140-152.000.

Frigo, Nicholas J., to AT&T Corp. Network comprising a space division photonic switch and a terminal which forms an output signal from an input signal. 5,502,587, Cl. 359-118.000.

Fritsch, Georg; and Schuster, Hans G., to Siemens Aktiengesellschaft. Method for manufacturing a thermistor having a negative temperature coefficient in multi-layer technology. 5,500,996, Cl. 29-612.000.

Frohlich, Wolfgang: *See*—
Skuballa, Werner; Buchmann, Bernd; Heindl, Josef; Frohlich, Wolfgang; Ekerdt, Roland; and Giesen, Claudia, 5,502,075, Cl. 514-461.000.

Fromm, Gerald, to Paul Troester Maschinenfabrik. Multi-purpose calendar. 5,501,145, Cl. 100-158.00R.

Fryar, Richard D., Jr.: *See*—
Conway, Anthony J.; Conway, Philip J.; and Fryar, Richard D., Jr., 5,501,669, Cl. 604-97.000.

Frye, Paul E. Massage table roller mechanism. 5,501,658, Cl. 601-99.000.

Fu, Xiaoyong; Thiruvengadam, Tiruvettipuram K.; Tana, Chou-Hong; Lee, Junning; and Colon, Cesar, to Schering Corporation. Process for preparing delta 9,11 and 21-chloro corticosteroids. 5,502,222, Cl. 552-595.000.

Fuchikami, Takamasa; Wakasa, Noriko; He, De-Hua; Miyake, Takanori; Okada, Takashi; Fujimura, Atsushi; Sasakibara, Hiroyuki; Kanou, Yoshiaki; and Saito, Toshihiro, to Tosoh Corporation; and Sagami Chemical Research Center. Process for preparing lactones. 5,502,217, Cl. 549-325.000.

Fuchs, Eberhard; and Witzel, Tom, to BASF Aktiengesellschaft. Preparation of lactams. 5,502,185, Cl. 540-538.000.

Fuchs, Karlheinz, to Hoechst AG. Economy and plumping chrome tanning. 5,501,709, Cl. 8-94.270.





Fuchs, Rainer; Fischer, Reiner; Erdelen, Christoph; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Substituted 3,4-hetaryl-pyrazolines. 5,502,070, Cl. 514-406.000.

Fuderer, Erich: *See*—
Stalmeir, Joseph; and Fuderer, Erich, 5,501,305, Cl. 188-167.000.

Fuisz, Richard C., to Fuisz Technologies Ltd. Rapidly dispersable compositions containing polydextrose. 5,501,858, Cl. 424-439.000.

Fuisz Technologies Ltd.: *See*—
Fuisz, Richard C., 5,501,858, Cl. 424-439.000.

Fuji Electric Co., Ltd.: *See*—
Kitamura, Akio; and Fujishima, Naoto, 5,502,323, Cl. 257-335.000.
Kiuchi, Shin, 5,501,517, Cl. 361-101.000.
Ogino, Shinji; Urushidani, Tatsuo; and Kanemaru, Hiroshi, 5,502,003, Cl. 437-189.000.

Fuji Impulse Co., Ltd.: *See*—
Hashimoto, Yasuo, 5,501,765, Cl. 156-583.300.

Fuji Oil Co., Ltd.: *See*—
Maeda, Hirokazu; Furuta, Hitoshi; Takahashi, Taro; and Shimizu, Hiroshi, 5,501,860, Cl. 424-464.000.

Fuji Photo Film Co., Ltd.: *See*—
Agano, Toshitaka, 5,502,465, Cl. 347-264.000.
Hyuga, Hiroaki, 5,502,738, Cl. 372-21.000.
Kato, Eiichi; and Osawa, Sadao, 5,501,929, Cl. 430-49.000.
Kawasaki, Hidetoshi, 5,501,407, Cl. 242-348.400.
Mizuta, Akira; and Yamamuro, Toshikazu, 5,501,094, Cl. 72-382.000.
Shinada, Hidetoshi, 5,502,709, Cl. 369-119.000.
Takagi, Yoshihiro; and Inagaki, Yoshio, 5,501,946, Cl. 430-573.000.
Takahashi, Shinsuke; and Shibata, Norio, 5,501,737, Cl. 118-410.000.
Takeo, Hideya, 5,502,775, Cl. 382-169.000.
Yoda, Akira; Usami, Yoshinori; and Ohtsuka, Shuichi, 5,502,580, Cl. 358-518.000.

Fuji Photo Optical Co., Ltd.: *See*—
Ohno, Kazunori; and Tanaka, Yasuhiko, 5,502,523, Cl. 354-219.000.

Fuji Xerox Co., Ltd.: *See*—
Imai, Akira; Ishii, Toru; Tokida, Akihiko; and Akasaki, Yutaka, 5,501,927, Cl. 430-78.000.
Kita, Shinji; Ogatsu, Hitoshi; and Murai, Kazumasa, 5,502,579, Cl. 358-518.000.
Tsuruoka, Ryoichi, 5,502,545, Cl. 355-207.000.
Yui, Toshitake; Yamashita, Yoshiro; Hiraoka, Eisuke; Endo, Yasuharu; and Hashimoto, Ken, 5,501,726, Cl. 106-20.00R.

Fujie, Akihiko: *See*—
Iwamoto, Toshiro; Fujie, Akihiko; Nitta, Kumiko; Tsurumi, Yasuhisa; Shigematsu, Nobuharu; Kasahara, Chiyoshi; Hino, Motohiro; and Okuhara, Masakuni, 5,502,033, Cl. 514-11.000.

Fujii, Akihiko: *See*—
Shibata, Kenichiro; Fujii, Akihito; and Sakamoto, Toshihiro, 5,502,015, Cl. 501-151.000.

Fujii, Hiroshi: *See*—
Senshu, Yoichirou; Ota, Shuichi; Fujii, Hiroshi; Uetake, Akihiro; Sawada, Takashi; Hasegawa, Shinichi; Suzuki, Kazuyoshi; and Morii, Tetsuro, 5,502,608, Cl. 360-132.000.

Fujimori, Isao: *See*—
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Fujimoto, Chialki: *See*—
Naito, Yasuo; Doi, Hideki; and Fujimoto, Chialki, 5,501,109, Cl. 73-862.191.

Fujimoto, Keisuke: *See*—
Mizukami, Hiroshi; Kajitani, Koji; Fujimoto, Keisuke; and Uenohara, Norihisa, 5,501,312, Cl. 192-89.230.

Fujimura, Atsushi: *See*—
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Fujimura, Hideo: *See*—
Takiguchi, Ryohei; Saito, Hitoshi; Torii, Masanori; Hasegawa, Jun; Fujimura, Hideo; and Nakamura, Yoshinori, 5,502,024, Cl. 503-227.000.

Fujinaga, Masato, to Mitsubishi Denki Kabushiki Kaisha. Method of and an apparatus for setting up parameters which are used to manufacture a semiconductor device. 5,502,643, Cl. 364-488.000.

Fujinami, Yasushi, to Sony Corporation. Apparatus for reproducing and decoding multiplexed data from a record medium with means for controlling data decoding as a function of synchronization errors. 5,502,573, Cl. 358-339.000.

Fujino, Noboru; and Ueda, Hisashi, to Kabushiki Kaisha Shinkawa. Device for storing thin plate-form parts. 5,501,565, Cl. 414-331.000.

Fujioka, Atsushi: *See*—
Ishiguro, Ginya; Muta, Toshiyasu; Sakita, Kazutaka; Miyaguchi, Shoji; Okamoto, Tatsuaki; and Fujioka, Atsushi, 5,502,765, Cl. 380-24.000.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Iwamoto, Toshiro; Fujie, Akihiko; Nitta, Kumiko; Tsurumi, Yasuhisa; Shigematsu, Nobuharu; Kasahara, Chiyoshi; Hino, Motohiro; and Okuhara, Masakuni, 5,502,033, Cl. 514-11.000.

Fujishima, Naoto: *See*—
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Fujita, Akitaka: *See*—
Hayashi, Mitsutoshi; Fujita, Akitaka; Nagashima, Shingo; and Fujimori, Isao, 5,501,548, Cl. 405-143.000.

Fujita, Junichi: *See*—
Ito, Kazumasa; Kato, Hiroshi; and Fujita, Junichi, 5,502,798, Cl. 395-119.000.

Fujita, Minoru; and Kida, Masaaki, to Wako Pure Chemical Industries, Ltd. Process for quantitatively lysing liposomes and a process for determining the amount of an analyte using same. 5,501,953, Cl. 435-6.000.

Fujita, Osamu; and Ohmae, Katsuhiko, to Mitsubishi Denki Kabushiki Kaisha. Fault detection method and apparatus for air bag activation device. 5,501,486, Cl. 280-735.000.

Fujita, Toshio: *See*—
Watanabe, Rikizou; Takahashi, Norio; Kimura, Hirofumi; and Fujita, Toshio, 5,501,835, Cl. 420-54.000.

Fujitsu Limited: *See*—
Endoh, Toshio, 5,502,657, Cl. 369-561.000.
Hirata, Yukio, 5,502,649, Cl. 364-490.000.
Ikeda, Motohisa, 5,502,327, Cl. 257-539.000.
Ikemasu, Shinichirou; Hasegawa, Yoshiki; and Konno, Yasuhiko, 5,502,332, Cl. 257-620.000.
Ito, Hidenobu; and Mizuno, Hiroko, 5,502,629, Cl. 363-60.000.
Kataoka, Yuji, 5,502,305, Cl. 250-282.000.
Kawai, Hiroaki; Watanabe, Mitsuo; Sato, Shinichi; Shinoda, Ichiro; and Itoh, Motohiko, 5,502,296, Cl. 235-462.000.
Kawana, Eishirou; Ogawa, Hitoshi; Ishida, Koichi; and Aoki, Kazuo, 5,501,629, Cl. 451-28.000.
Kohno, Tohru; and Nakano, Masao, 5,502,675, Cl. 365-200.000.
Myokan, Kenichi, 5,502,605, Cl. 360-99.080.
Nakamura, Shunji, 5,501,992, Cl. 437-31.000.
Nakata, Tsuneo, 5,502,729, Cl. 371-22.300.
Yuuki, Kazuhiro; and Sakai, Satoru, 5,502,814, Cl. 395-183.080.

Fujitsu VLSI Limited: *See*—
Hirata, Yukio, 5,502,649, Cl. 364-490.000.

Fukahori, Hidehiko: *See*—
Kaihara, Shoji; and Fukahori, Hidehiko, 5,502,530, Cl. 354-149.100.

Fukai, Masayuki: *See*—
Okamura, Naomi; Hino, Takao; Nimura, Akio; Fukai, Masayuki; Shimizu, Keizi; Teramae, Harumi; and Hata, Chiaki, 5,501,370, Cl. 222-111.000.

Fukami, Syouichi. Tag fastening device. 5,501,002, Cl. 29-811.200.

Fukasawa, Tetsuhiko: *See*—
Yamamoto, Shinya; Yamada, Kiyohiro; Fukasawa, Tetsuhiko; Watanabe, Yasushi; Hisanaga, Shigeru; Nagasaku, Eiichi; and Iwanami, Shigeki, 5,501,584, Cl. 418-15.000.

Fukuda, Hideo: *See*—
Futaesaku, Norio; Fukuda, Hideo; Itou, Yoshiharu; Baba, Hiromitsu; and Maruyama, Isao, 5,502,207, Cl. 548-435.000.

Fukui, Kenji: *See*—
Okamoto, Ricardo M.; Matsumoto, Kouichi; Kotani, Isao; Kuroda, Satoshi; Ishikawa, Hiroyuki; and Fukui, Kenji, 5,502,693, Cl. 369-13.000.

Fukui, Tamami: *See*—
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Fukunaga, Takashi; and Segawa, Akiyoshi, to Matsushita Electric Industrial Co., Ltd. Controlling apparatus of steering angle of rear wheels of four-wheel steering vehicle. 5,502,639, Cl. 364-424.050.

Fukuoka, Yoshihito, to Sanshin Kogyo Kabushiki Kaisha. Engine starter mounting arrangement. 5,501,188, Cl. 123-179.250.

Fukuzawa, Tadashi; Hisano, Teiji; Morita, Tetsuji; and Ikarugi, Koichi, to International Business Machines Corporation. Method and apparatus for measuring the flying height of a magnetic head above a disk surface at three wavelengths. 5,502,565, Cl. 356-357.000.

Fulcher, Malcolm; and Storeton-West, Trevor, to United Kingdom of Great Britain and Northern Ireland, The Minister of Agriculture Fisheries and Food in Her Britannic Majesty's Government of the. Data logger having a RAM that accepts electro-magnetically a sensor table and a sample table. 5,502,656, Cl. 364-550.000.

Fulghum, Tracy L., to Motorola, Inc. Method and apparatus for a radio system using variable transmission reservation. 5,502,722, Cl. 370-69.100.

Fuller, Timothy J.; Mammino, Joseph; Brach, Paul J.; Blaszak, Robert; Finsterwalder, Robert N.; and Badesha, Santokh S., to Xerox Corporation. Coated fuser member processes. 5,501,881, Cl. 427-421.000.

Fullin, Joe. Sealing device for metallic containers. 5,501,357, Cl. 220-325.000.

Funami, Yasuo; Nishi, Manabu; Watanabe, Yoshimi; and Senda, Shunya, to Showa Corporation. Controller for Hall effect sensor using cyclically varying power. 5,502,383, Cl. 324-251.000.

Funck, Gordon W.; and Lang, Harold K., to Molex Incorporated. Grounded IC card. 5,502,620, Cl. 361-753.000.

Funk, Gregory A.; Dandekar, Hemant W.; and Hobbs, Simon H., to UOP. Process for concurrent hydrolysis of esters and separation of products using a simulated moving bed. 5,502,248, Cl. 562-606.000.

Furay, David M., to Integral Peripherals, Inc. Disk drive with rail mounting arrangement. 5,502,604, Cl. 360-97.010.

Furuhashi, Hiroyuki: *See*—
Murakami, Naomi; Usui, Miyuki; Furuhashi, Hiroyuki; and Ueki, Satoshi, 5,502,114, Cl. 525-301.000.

Furuta, Hitoshi: *See*—
Maeda, Hirokazu; Furuta, Hitoshi; Takahashi, Taro; and Shimizu, Hiroshi, 5,501,860, Cl. 424-464.000.

Furuta, Yoshiaki: *See*—
Muta, Junji; and Furuta, Yoshiaki, 5,501,618, Cl. 439-699.200.

Furuya, Seiichi: *See*—
Kikuchi, Teishin; Yamauchi, Hiroyuki; Furuya, Seiichi; and Kan, Kenichi, 5,501,120, Cl. 74-543.000.
Fuse, Toshihiko; and Okumachi, Eiji, to Nippon Piller Packing Co., Ltd. Non-contacting shaft sealing device with grooved face pattern. 5,501,470, Cl. 277-96.100.
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Osterhout, Joseph C.; Hensley, Steven P.; Demetzensky, Alex; and Swanson, Howard E., 5,502,612, Cl. 361-117.000.

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Modrak, James P., 5,502,160, Cl. 428-359.000.
de Nevers, Clark C.; Nelson, Jeffrey L.; Newsome, Steven T.; Oyler, Patrick R.; and Patterson, Robert A., 5,501,132, Cl. 86-24.000.

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Herman, Leann M.: *See*—
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Kish, Fred A.; Steranka, Frank M.; DeFevere, Dennis C.; Robbins, Virginia M.; and Uebbing, John, 5,502,316, Cl. 257-94.000.
Lauw, Hiang; Radke, Garold; and Macleod, Cheryl A., 5,501,725, Cl. 106-20.00A.
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Hilpert, Hans, to Hoffmann-La Roche Inc. 1H-isoindole-1,3-dione compounds. 5,502,210, Cl. 548-465.000.

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Hirata, Keisuke. Eardrum perforation patch and eardrum undersurface scraper. 5,501,700, Cl. 606-215.000.

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Ho, Shu-Mou. Luggage handle assembly. 5,500,981, Cl. 16-115.000.
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Hobday, Robert. Bottomless receptacle and bi-frustoconical liner system. 5,501,358, Cl. 220-404.000.
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Donn, Günter, 5,502,271, Cl. 800-200.000.
Giani, Carlo; Wullbrandt, Dieter; Rothert, Reinhardt; and Meiwes, Johannes, 5,501,966, Cl. 435-105.000.
Hammer, Klaus-Dieter; Siebrecht, Manfred; Mans, Leo; Krama, Theo; and Winter, Hermann, 5,501,886, Cl. 428-34.800.
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Schach, Thomas; and Papenfuhs, Theodor, 5,502,260, Cl. 568-938.000.
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Ordonez, Kathy P.; and Salamone, Salvatore J., 5,501,987, Cl. 436-534.000.
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Hoisington, Paul A.; and Cockett, Michael A., to Spectra, Inc. Ink jet printhead with ink viscosity control. 5,502,467, Cl. 347-6.000.
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Rijkers, Marinus P. W. M.; and Vrinzen, Alexander P. M., 5,502,238, Cl. 560-41.000.
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Holmes, William K., to U.S. Elevator. Process and apparatus for preventing corrosion of a hydraulic elevator cylinder. 5,501,299, Cl. 187-272.000.
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Ferrin, Frank J.; and Turner, Paul N., 5,502,455, Cl. 345-9.000.
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Hosoi, Yoshinobu, to Nidek Co., Ltd. Optometric apparatus. 5,502,519, Cl. 351-204.000.
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Hou, Donald; Draper, Richard W.; Lee, Gary M.; and Mas, Janet L., to Schering Corporation. Process for preparing intermediates for the synthesis of D1 antagonists. 5,502,186, Cl. 540-576.000.
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Hummitzsch, Karl. Seat with spring-loaded lumbar support. 5,501,507, Cl. 297-284.400.
Humphrey, John; and Wieser, Dean. Switch point roller assist apparatus. 5,501,418, Cl. 246-453.000.
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Hung, Yuh-Jou. Hanging apparatus for brake cord of a bicycle. 5,501,302, Cl. 188-24.210.
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Hynecek, Jaroslav, to Texas Instruments Incorporated. Bipolar gate charge coupled device with clocked virtual phase. 5,502,318, Cl. 257-217.000.
Hyre, Jon J. Apparatus for filtering and purifying side-stream and second-hand tobacco smoke. 5,501,234, Cl. 131-187.000.
Hyuga, Hiroaki, to Fuji Photo Film Co., Ltd. Polarization control element and solid-state laser system. 5,502,738, Cl. 372-21.000.
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Ichikawa, Hiroki; Aizawa, Kaoru; and Okuno, Toshimitsu, to Nitto Denko Corporation. Tracking resistant pressure-sensitive adhesive tape. 5,501,897, Cl. 428-261.000.
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Westhof, Luc B. J.; Turhan, Ibrahim; Tessier, George G.; and De Peuter, Frans L. J., 5,501,819, Cl. 252-503.000.
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Hiraishi, Atsushi; Akioka, Takashi; Kobayashi, Yutaka; Yokoyama, Yuji; Iwamura, Masahiro; Yamauchi, Tatsumi; Takahashi, Shigeru; Uchida, Hideaki; and Ide, Akira, 5,502,820, Cl. 395-250.000.
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Idemitsu Petrochemical Co., Ltd.: *See*—
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Ieda, Kazuhiro: *See*—
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Iguchi, Yuichiro; Kimura, Michio; and Oka, Koichiro, to Toray Industries, Inc. Method of making thiol methacrylate or acrylate and a lens made therefrom. 5,502,141, Cl. 526-286.000.
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Ikemoto, Shinichi, to Kel Corporation. Flexible cable connector. 5,501,610, Cl. 439-498.000.
Ikemure, Yumiko, to Matsushita Electric Industrial Co., Ltd. Method and apparatus for recognizing table and figure having many lateral and longitudinal lines. 5,502,777, Cl. 382-173.000.
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Im, Jin Hyeock, to Goldstar Co., Ltd. Galois field multiplier. 5,502,665, Cl. 364-746.100.
Imai, Akira; Ishii, Toru; Tokida, Akihiko; and Akasaki, Yutaka, to Fuji Xerox Co., Ltd. Electrophotographic photoreceptors. 5,501,927, Cl. 430-78.000.
Imai, Hiroshi, to Nippondenso Co., Ltd. Power semiconductor device with a gate withstand-voltage test terminal. 5,502,399, Cl. 324-765.000.
Imai, Yuji; Tanaka, Yasuaki; and Wakamoto, Shinji, to Nikon Corporation. Method of and apparatus for detecting plane position. 5,502,311, Cl. 250-548.000.
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Ingram, Steve; Moncrief, Frank; and McNamara, Charles, to Riverwood International Corporation. Apparatus and method for pushing articles into receptacle. 5,501,064, Cl. 53-473.000.
Inniss, Daryl; Vengsarkar, Ashish M.; and Zhong, Qian, to AT&T Corp. Method of forming photo-induced device and product. 5,502,786, Cl. 385-123.000.
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Joly, Jean-François; Benazzi, Eric; Chaigne, Frédéric; Bernhard, Jean-Yves; and Viltard, Jean-Charles, 5,501,847, Cl. 423-531.000.
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Barbee, Steven G.; Heinz, Tony F.; Hsiao, Yiping; Li, Leping; Ratzlaff, Eugene H.; and Wong, Justin W., 5,501,766, Cl. 156-627.100.
Bassous, Ernest; Halbout, Jean-Marc; Iyer, Subramanian S.; and Kesan, Vijay P., 5,501,787, Cl. 205-124.000.
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Bertin, Claude L.; Howell, Wayne J.; Hedberg, Erik L.; Kaher, Howard K.; and Kelley, Gordon A., Jr., 5,502,667, Cl. 365-51.000.
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Byrn, Jonathan W.; and Delp, Gary S., 5,502,833, Cl. 395-459.000.
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Inuzuka, Takeshi; Hattori, Masashi; Kaigawa, Masato; Hojo, Yasuo; Tabata, Atsushi; and Shirai, Kenji, to Aisin Aw Co., Ltd. Shift control system for vehicular automatic transmission. 5,501,642, Cl. 477-107.000.
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Ishiguro, Ginya; Muta, Toshiyasu; Sakita, Kazutaka; Miyaguchi, Shoji; Okamoto, Tatsuaki; and Fujioka, Atsushi, to Nippon Telegraph and Telephone Corporation. Method and apparatus for settlement of accounts by IC cards. 5,502,765, Cl. 380-24.000.
Ishiguro, Shinji; and Morino, Toshiharu, to Tomey Corporation. Contact lens for intraocular observation. 5,501,217, Cl. 128-645.000.
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Ishii, Takashi; Watanabe, Tamio; and Nagano, Toru, to Yazaki Corporation. Electrical connector. 5,501,620, Cl. 439-752.000.
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Ishikawa, Ken; and Miyaoka, Shinichiro, to Hitachi, Ltd.; and Hitachi Medical Corporation. Image data compression method for applying different compression ratios to different portions of an image. 5,502,778, Cl. 382-239.000.
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Ishikawa, Takao; Oishi, Tomoji; and Maekawa, Sachiko, to Hitachi, Ltd. Material for use as a transparent conductive film and method for making a transparent conductive film using the material. 5,501,883, Cl. 428-1.000.
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Ito, Kazumasa; Kato, Hiroshi; and Fujita, Junichi, to Sony Corporation. Image processing apparatus for synthesizing Z-axis coordinate data using X- and Y-direction increments. 5,502,798, Cl. 395-119.000.
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Iwakura, Tomoatsu; and Kawakatsu, Yukako, to Mitsubishi Petrochemical Co., Ltd. Catalyst for production of ethylene oxide and process for producing the catalyst. 5,502,020, Cl. 502-317.000.
Iwamoto, Toshiro; Fujie, Akihiko; Nitta, Kumiko; Tsurumi, Yasuhisa; Shigematsu, Nobuharu; Kasahara, Chiyoshi; Hino, Motohiro; and Okuhara, Masakuni, to Fujisawa Pharmaceutical Co., Ltd. Antimicrobial polypeptide compound a pharmaceutical composition comprising the same, and a method for treating infectious diseases. 5,502,033, Cl. 514-11.000.
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Ohmamyuda, Yukio; Kimura, Shigeru; Tanabe, Toru; Iwasaki, Kazuhisa; Seto, Takao; Kitamura, Hideki; and Senoo, Yasushi, 5,502,432, Cl. 340-436.000.
Iwasyk, John M., to Du Pont de Nemours, E. I., and Company. Apparatus for processing materials. 5,502,154, Cl. 528-310.000.
Iwata, Ken; Katayama, Tatsuo; and Nakajima, Hiroshi, to Unitika Ltd. Process for producing fructose 2,6-bisphosphate and purification process thereof. 5,501,965, Cl. 435-94.000.
Iwata, Naoki; Saito, Takeshi; Yano, Hidetoshi; Takagaki, Hiromitsu; Nishido, Kazuhiro; Komuro, Ichiro; Sawa, Shigeki; and Shima, Nobuhiro, to Ricoh Company, Ltd. Developing device for an image forming apparatus. 5,502,552, Cl. 355-259.000.
Iyer, Subramanian S.: *See*—
Bassous, Ernest; Halbout, Jean-Marc; Iyer, Subramanian S.; and Kesan, Vijay P., 5,501,787, Cl. 205-124.000.
Izumi, Takayoshi: *See*—
Ootani, Toshihiro; and Izumi, Takayoshi, 5,501,838, Cl. 422-65.000.
J.G. Karl Schmidt GmbH & Co.: *See*—
Gongea, Adrian-Marius, 5,500,955, Cl. 2-24.000.
J. M. Voith GmbH: *See*—
Kotitschke, Gerhard; and Schiel, Christian, 5,501,775, Cl. 162-360.300.
J. Prime Industries, Inc.: *See*—
Smith, Jack V.; and Carter, Jesse M., 5,500,954, Cl. 2-9.000.
Ja, Li: *See*—
Marks, Tobin J.; Ja, Li; and Yang, Xinmin, 5,502,017, Cl. 502-103.000.
Jablonski, David. Shoulder straps for beach chair. 5,501,505, Cl. 297-4.000.
Jackson, Hiram S.: *See*—
Scherer, Henry W.; Biller, Bruce A.; Jackson, Hiram S.; Swanson, Roy T.; and Zabel, David W., 5,502,427, Cl. 337-176.000.
Jackson, Paul F.: *See*—
Chapdelaine, Marc J.; Davenport, Timothy W.; Garcia-Davenport, Laura E.; Jackson, Paul F.; McKinney, Jeffrey A.; and McLaren, Charles D., 5,502,048, Cl. 514-213.000.
Jackson, Peter J., to Racal Health & Safety Limited. Gas flow control valves. 5,501,213, Cl. 128-205.240.
Jackson, R. David; and Carroll, Wallace E. Potentiophotometric fibrinogen determination. 5,502,651, Cl. 364-509.000.
Jackson, Robert S.: *See*—
Hill, Jeffrey B.; Ouderkirk, Andrew J.; Stubbs, Daniel P.; Jackson, Robert S.; and Dunn, Douglas S., 5,501,944, Cl. 430-321.000.
Jacobs Suchard AG: *See*—
Zumbe, Albert; and Bade, Anne-Marie, 5,501,865, Cl. 426-548.000.
Jacobsen, Eric J.: *See*—
Ayer, Donald E.; Bundy, Gordon L.; and Jacobsen, Eric J., 5,502,187, Cl. 544-117.000.
Jacobson, Glenn R. Vegetable aerating device. 5,501,241, Cl. 134-95.200.
Jacobson, Judith M.: *See*—
Rohrbacher, Richard D.; and Jacobson, Judith M., 5,500,976, Cl. 15-320.000.
Rohrbacher, Richard D.; and Jacobson, Judith M., 5,501,396, Cl. 239-7.000.
Jaffa, David; and Szarka, Sandor, to Precision Screen Machines, Inc. Automatic doffing system. 5,501,147, Cl. 101-118.000.
Jaffe, James M.: *See*—
Owen, William H.; and Jaffe, James M., 5,502,295, Cl. 235-380.000.
Jäger, Horst; Arnold, Siegbert; and Sommer, Richard, to Bayer Aktiengesellschaft. Process for the preparation of a substituted 2-amino-1-sulphonaphthalene. 5,502,173, Cl. 534-598.000.
Jain, Kanti: *See*—
Dunn, Thomas J.; and Jain, Kanti, 5,502,563, Cl. 356-352.000.
Jalco Co., Ltd.: *See*—
Hata, Shuji, 5,501,131, Cl. 84-464.00R.
James, Gilbert. Method for making a smooth-surface ceramic. 5,502,013, Cl. 501-153.000.
James, Lawrence E.: *See*—
Massonne, Klemens; Konrad, Gerd; Sandison, Mark D.; Moffitt, Gregory E.; James, Lawrence E.; and Banger, John, 5,502,188, Cl. 544-173.000.
Jameson, David H., to International Business Machines Corporation. Electronic musical keyboard instruments comprising an immovable pointing stick. 5,502,276, Cl. 84-645.000.
Jamieson, Thomas H., to Lockheed Missiles & Space Company, Inc. Wide-aperture infrared lenses with hyper-hemispherical fields of view. 5,502,592, Cl. 359-355.000.
Janaswamy, Anand: *See*—
Warmerdam, Leo F. P.; and Janaswamy, Anand, 5,502,632, Cl. 363-98.000.
Janesky, Lawrence M. Sub-floor drain conduit for water-control systems. 5,501,044, Cl. 52-169.500.
Jang, Wen-Yueh, to Winbond Electronics Corporation. Process for making a bipolar junction transistor with a self-aligned base contact. 5,501,991, Cl. 437-31.000.
Janke, Jeffrey S.; and Parkins, Ronald L., to Woods Equipment Corporation. Rotary machine system having hollow tube shaft and plural output shafts. 5,501,636, Cl. 464-48.000.
Janse Van Rensburg, Richard W.: *See*—
East, Amanda H.; and Janse Van Rensburg, Richard W., 5,502,473, Cl. 347-73.000.
Janssen, Bernd: *See*—
Haupt, Andreas; Janssen, Bernd; Ritter, Kurt; Klinge, Dagmar; Keilhauer, Gerhard; Romerdahl, Cynthia; Barlozzari, Teresa; and Qian, Xiao-dong, 5,502,032, Cl. 514-17.000.
Japan Servo Co., Ltd.: *See*—
Sasaki, Naotaka; and Kawamata, Shunichi, 5,502,463, Cl. 345-204.000.
Japan Synthetic Rubber Co., Ltd.: *See*—
Ueshima, Toshihumi; Hasegawa, Ko; Teramoto, Toshio; Nakajima, Tatsuo; and Konomoto, Takeyoshi, 5,502,095, Cl. 524-269.000.
Japan Tobacco Inc.: *See*—
Kobayashi, Kazutaka; Kojima, Kineo; Harada, Takeshi; Hohrai, Hiroshi; and Hayafuji, Ikuo, 5,500,997, Cl. 29-740.000.
Watanabe, Tomoichi, 5,501,235, Cl. 131-84.100.
Jarrett, Paul: *See*—
Meadows, Martin-Paul; Ellis, Deborah J.; and Jarrett, Paul, 5,501,852, Cl. 424-93.461.
Jaskie, James E.: *See*—
Dworsky, Lawrence N.; and Jaskie, James E., 5,502,347, Cl. 313-309.000.
Jau, Jack Y.: *See*—
Meisburger, Dan; Brodie, Alan D.; Chadwick, Curt; Desai, Anil; Dohse, Hans; Emge, Dennis; Greene, John; Johnson, Ralph; Ling, Ming-Yie; McMurtry, John; Becker, Barry; Paul, Ray; Robinson, Mike; Simmons, Richard; Smith, David E. A.; Taylor, John; Veneklasen, Lee; Walters, Dean; Wieczorek, Paul; Wong, Sam; Dutta, April; Lele, Surendra; Rough, Kirkwood; Pearce-Percy, Henry; Jau, Jack Y.; Lin, Chun C.; Nguyen, Hoi T.; Oyang, Yen-Jen; Hutcheson, Timothy L.; Clark, David J.; Pan, Chung-Shih; Bhaskar, Chetana; Kirk, Chris; Munro, Eric; Gibilisco, John; and Sandland, Paul, 5,502,306, Cl. 250-310.000.
Jeanjean, Francis: *See*—
Labeeuw, Bernard; Gully, Danielle; Jeanjean, Francis; Molimard, Jean-Charles; and Boigegrain, Robert, 5,502,059, Cl. 514-296.000.
Jelich, Klaus: *See*—
Rivadeneira, Eric; and Jelich, Klaus, 5,502,194, Cl. 546-257.000.
Jenkins, Robert E. Condenser unit. 5,501,269, Cl. 165-110.000.
Jensen, Ole R. Two-piece ostomy appliance and low-profile coupling ring assembly. 5,501,677, Cl. 604-338.000.
Jeong, Jin-Dong: *See*—
Chang, Eui-Young; Kang, Sung-Cheol; Jeong, Jin-Dong; and Seok, Tae K., 5,501,084, Cl. 62-264.000.

Jinbo, Susumu: *See*—
Shimada, Shigeru; Jinbo, Susumu; and Ishi, Hideyuki. 5,502,152, Cl. 528-71.000.
Joachim Uhing KG GmbH & Co.: *See*—
Schlüter-Wehlfeil, Jürgen-Ulrich. 5,501,543, Cl. 403-321.000.
Jodelet, François, to Skis Rossignol SAS. Process for the manufacture of a shaped ski. 5,501,825, Cl. 264-46.500.
Johann, Gerhard: *See*—
Harde, Christoph; Johann, Gerhard; Krüger, Gabriele; Roes, Richard; Tarara, Gerhard; and Gates, Peter S., 5,502,028, Cl. 504-227.000.
Johansen, Neil: *See*—
Ray, John D.; and Johansen, Neil, 5,501,981, Cl. 436-123.000.
Johns Hopkins University, The: *See*—
Kumar, Nishkay, 5,502,168, Cl. 530-388.400.
Johnson, Alan W.: *See*—
Hauser, Ray M.; and Johnson, Alan W., 5,501,640, Cl. 475-83.000.
Johnson, Dale B.: *See*—
Bhatt, Girish M.; and Johnson, Dale B., 5,502,120, Cl. 525-440.000.
Johnson, David A. Retaining sling swivels. 5,501,025, Cl. 42-85.000.
Johnson, F. Scott; and Taylor, Kelly, to Texas Instruments Incorporated. Stacked barrier-diffusion source and etch stop for double polysilicon BJT with patterned base link. 5,502,330, Cl. 257-588.000.
Johnson Matthey Public Limited Company: *See*—
Harda, Graham A.; and Ralph, Thomas R., 5,501,915, Cl. 429-42.000.
Johnson, Paul W. Method of laminating a porcelain veneer to a tooth. 5,501,600, Cl. 433-227.000.
Johnson, Ralph: *See*—
Meisburger, Dan; Brodie, Alan D.; Chadwick, Curt; Desai, Anil; Dohse, Hans; Enge, Dennis; Greene, John; Johnson, Ralph; Ling, Ming-Yie; McMurtry, John; Becker, Barry; Paul, Ray; Robinson, Mike; Simmons, Richard; Smith, David E. A.; Taylor, John; Veenkinson, Lee; Walters, Dean; Wieczorek, Paul; Wong, Sam; Dutta, April; Lele, Surendra; Rough, Kirkwood; Pearce-Percy, Henry; Jen, Jack Y.; Liu, Chen C.; Nguyen, Hoi T.; Oyang, Yen-Jen; Hutcheson, Timothy L.; Clark, David J.; Pan, Cheng-Shih; Bhaskar, Chetana; Kirk, Chris; Munro, Eric; Gibilisco, John; and Sandland, Paul, 5,502,306, Cl. 250-310.000.
Johnson, Walter A. L.: *See*—
Mackinlay, Jock D.; and Johnson, Walter A. L., 5,502,577, Cl. 358-468.000.
Joly, Jean-François; Benazzi, Eric; Chaigne, Frédéric; Bernhard, Jean-Yves; and Viltard, Jean-Charles, to Institut Francais Du Petrole. Process for purifying impure sulphuric acid. 5,501,847, Cl. 423-531.000.
Jones, Charles D.: *See*—
Hsi, Kwan Y.; Jones, Charles D.; Jungheim, Louis N.; and Pennington, Pamela A., 5,502,061, Cl. 514-311.000.
Jones, Daniel K. Patching pan device. 5,501,402, Cl. 239-650.000.
Jones, Richard S., to Union Switch & Signal Inc. Highway crossing control. 5,502,367, Cl. 318-281.000.
Jones, Robert J.: *See*—
Matteucci, Mark D.; Jones, Robert J.; and Lin, Kuei-Ying, 5,502,177, Cl. 536-26.600.
Jones, William R., Jr.: *See*—
Barnes, Thomas L.; Colburn, James W.; Dasial, Catherine L.; Jones, William R., Jr.; and Longman, Millard D., 5,500,992, Cl. 29-525.000.
Joo, Bong K.: *See*—
Jung, Dae S.; Joo, Bong K.; Kim, Sang Y; and Yoon, Han S., 5,502,322, Cl. 257-330.000.
Josephs, Harold, to Josephs, Harold. Safety guard assembly for fork lift trucks. 5,501,297, Cl. 187-222.000.
Joslyn Manufacturing Company: *See*—
Osterhout, Joseph C.; Hensley, Steven P.; Demetzensky, Alex; and Swanson, Howard E., 5,502,612, Cl. 361-117.000.
Jouck, Walter: *See*—
Geist, Michael; Strauss, Udo; Fobbe, Helmut; Arlt, Klaus; Jouck, Walter; and Cibura, Klaus, 5,501,779, Cl. 904-501.000.
Jourdan, Sabine: *See*—
Decotignie, Philippe; and Jourdan, Sabine, 5,502,571, Cl. 358-335.000.
Ju, Shyh C.: *See*—
Cubbage, Michael L.; Bresser, Joel; Blick, Mark; and Ju, Shyh C., 5,501,952, Cl. 435-6.000.
Jung, Dae S.; Joo, Bong K.; Kim, Sang Y; and Yoon, Han S., to Hyundai Electronics Industries Co., Ltd. Transistor having a nonuniform doping channel. 5,502,322, Cl. 257-330.000.
Jung, Hae-Mook, to Daewoo Electronics Co., Ltd. Motion vector detection apparatus. 5,502,492, Cl. 348-413.000.
Junge, Bodo; Hartwig, Wolfgang; Meier, Heinrich; Schohe-Loop, Rudolf; Gao, Zhan; Schmidt, Bernard; de Jonge, Maarten; and Schuurman, Teunis, to Bayer Aktiengesellschaft. 4-heterocyclyl-substituted dihydropyridines. 5,502,064, Cl. 514-336.000.
Jungheim, Louis N.: *See*—
Hsi, Kwan Y.; Jones, Charles D.; Jungheim, Louis N.; and Pennington, Pamela A., 5,502,061, Cl. 514-311.000.
JWI Ltd.: *See*—
Bhatt, Girish M.; and Johnson, Dale B., 5,502,120, Cl. 525-440.000.
Kaburagi, Yoshiaki; Shoda, Shoichiro; Kimura, Tetsuo; Ara, Yoji; Mukai, Takanori; Nakamura, Masaaki; and Yokoi, Katsuyuki, to Canon Kabushiki Kaisha. Ink jet recording apparatus provided with fixating means. 5,502,475, Cl. 347-102.000.
Kabushiki Kaisha Ace Denken: *See*—
Takemoto, Takatoshi; Tsuboa, Koichi; Kadomatsu, Hideyuki; and Sasaki, Etsuro, 5,501,446, Cl. 271-188.000.
Kabushiki Kaisha Daikin Seisakusho: *See*—
Kajitani, Koji; Mizukami, Hiroshi; and Uenohara, Norihisa, 5,501,310, Cl. 192-48.300.
Mizukami, Hiroshi; Kajitani, Koji; Fujimoto, Keisuke; and Uenohara, Norihisa, 5,501,312, Cl. 192-89.230.
Kabushiki Kaisha Endo Seisakusho: *See*—
Endo, Eimatsu, 5,501,459, Cl. 273-167.00H.
Kabushiki Kaisha Iseki Kaihatsu Koki: *See*—
Hayashi, Mitsutoshi; Fujita, Akitaka; Nagashima, Shingo; and Fujimori, Isao, 5,501,548, Cl. 405-143.000.
Kabushiki Kaisha Kawai Gakki Seisakusho: *See*—
Shioda, Kazushi, 5,502,768, Cl. 381-61.000.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Takebe, Makoto, 5,502,822, Cl. 395-310.000.
Kabushiki Kaisha Seibu Giken: *See*—
Kuma, Toshimi, 5,501,007, Cl. 29-846.000.
Kabushiki Kaisha Shinkawa: *See*—
Fujino, Noboru; and Ueda, Hisashi, 5,501,565, Cl. 414-331.000.
Takeuchi, Takashi, 5,501,388, Cl. 228-1.100.
Yamazaki, Noboru; Torihata, Minoru; and Maki, Shinji, 5,501,569, Cl. 414-676.000.
Kabushiki Kaisha Shukoh: *See*—
Sakuma, Shusuke, 5,501,429, Cl. 256-1.000.
Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Ichikawa, Takashi; and Sumi, Iseo, 5,501,510, Cl. 301-37.230.
Kabushiki Kaisha Topcon: *See*—
Suzuki, Yasuo, 5,501,017, Cl. 33-200.000.
Kabushiki Kaisha Toshiba: *See*—
Hosoi, Takashi, 5,500,982, Cl. 16-297.000.
Inoue, Yoko; and Sumata, Shuichi, 5,502,331, Cl. 257-617.000.
Kobayashi, Kazutaka; Kojima, Kineo; Harada, Takeshi; Hohrai, Hiroshi; and Hayafuji, Ikuo, 5,500,997, Cl. 29-740.000.
Miyazaki, Satoshi; Ben-Brahim, Lazhar; and Kurosawa, Ryoichi, 5,502,633, Cl. 363-98.000.
Nadahara, Souichi; Yamabe, Kikuo; Kobayashi, Hideyuki; Terasaka, Kunihiro; Yamamoto, Akihiro; and Yanahisa, Naohiko, 5,502,010, Cl. 437-247.000.
Naruse, Katsuhiko; Ogawa, Shinzou; Watanabe, Yukio; and Shimizu, Fukumi, 5,502,650, Cl. 364-508.000.
Shiki, Eiichi, 5,501,224, Cl. 128-661.100.
Takano, Shouji, 5,502,542, Cl. 355-69.000.
Usui, Yoshiyuki, 5,501,218, Cl. 128-653.200.
Wada, Shinobu, 5,502,398, Cl. 324-760.000.
Yamada, Takashi, 5,502,320, Cl. 257-302.000.
Yamaguchi, Seiji; Yamaura, Takeshi; Ogata, Takatsugu; Suzuki, Tsutomu; and Arai, Ikuo, 5,502,393, Cl. 324-639.000.
Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Kimura, Kazuya; Kawamura, Chuichi; Ito, Masafumi; and Makino, Yoshihiro, 5,501,579, Cl. 417-269.000.
Yamamoto, Shinya; Yamada, Kiyohiro; Fukasuma, Tetsuhiko; Watanabe, Yasushi; Hisanaga, Shigeru; Nagasaku, Eiichi; and Iwasani, Shigeki, 5,501,584, Cl. 418-15.000.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Tsuji, Hiroyoshi; Suzuki, Kazuhiko; Watanabe, Keiko; Takagi, Atsushi; Takaoka, Hitoshi; and Baba, Goro, 5,502,799, Cl. 395-131.000.
Kadomatsu, Hideyuki: *See*—
Takemoto, Takatoshi; Tsubota, Koichi; Kadomatsu, Hideyuki; and Sasaki, Etsuro, 5,501,446, Cl. 271-188.000.
Kadonaga, Anne P.: *See*—
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Kadouri, Aviaoam: *See*—
Freedman, David; Wang, Guozheng; and Kadouri, Aviaoam, 5,501,971, Cl. 435-240.230.
Kadowaki, Hidejiro: *See*—
Kato, Shigeki; Kadowaki, Hidejiro; Ishida, Yasuhiko; Takamiya, Makoto; Ashiwa, Jun; and Ueda, Shinji, 5,502,466, Cl. 356-356.000.
Kageyama, Atsuhisa: *See*—
Kawabata, Minoru; and Kageyama, Atsuhisa, 5,502,508, Cl. 348-652.000.
Kaha, Manfred; Wu, Carl C.; and Zain, Saadi, to United States of America, Navy. Unitary transducer with variable resistivity. 5,502,345, Cl. 310-358.000.
Kai, Hiroyuki: *See*—
Takase, Akira; Kai, Hiroyuki; Nishida, Kuniyoshi; and Masui, Moriyasu, 5,502,252, Cl. 564-169.000.



Kai, Tsutomu; Murata, Kazuyuki; Kuwahara, Yasuhiro; Ono, Hitoshi; Mikami, Tsutomu; Saetake, Tomoko; and Kojima, Akio, to Matsushita Electric Industrial Co., Ltd. Imaging apparatus having a counterfeiting prevention function. 5,502,575, Cl. 358-405.000.
Kaigawa, Masato: *See*—
Inuzuka, Takeshi; Hattori, Masashi; Kaigawa, Masato; Hojo, Yasuo; Tabata, Atsushi; and Shirai, Kenji, 5,501,642, Cl. 477-107.000.
Kaihara, Shoji; and Fukahori, Hidehiko, to Canon Kabushiki Kaisha. Camera using single motor to drive a flash illumination-angle varying mechanism and other camera operations. 5,502,530, Cl. 354-149.100.
Kainz, Jürgen: *See*—
Hohner, Gerd; Heinrichs, Franz-Leo; and Kainz, Jürgen, 5,502,104, Cl. 524-556.000.
Kaiser, Dieter; and Wintrich, Franz, to RWE Entsorgung. Process for the identification of randomly shaped and/or plane materials by determination of the structure of the materials through application of electromagnetic and/or acoustic waves. 5,501,344, Cl. 209-578.000.
Kaiserman, Howard B.: *See*—
van den Bergh, Carlo J.; Kaiserman, Howard B.; and Ouweadijk, Marja, 5,501,820, Cl. 252-549.000.
Kaish, Norman. Patient operated system for testing and recording a biological condition of the patient. 5,501,231, Cl. 128-725.000.
Kajikuri, Hiroshi; Tojima, Hideto; Nakamura, Tomokazu; and Kitamura, Masaru, to Sumitomo Chemical Company, Limited. Process for producing ε-caprolactam. 5,502,184, Cl. 540-536.000.
Kajitani, Koji: Mizukami, Hiroshi; and Uenohara, Norihisa, to Kabushiki Kaisha Daikin Seisakusho. Motorcycle clutch device. 5,501,310, Cl. 192-48.300.
Kajitani, Koji: *See*—
Mizukami, Hiroshi; Kajitani, Koji; Fujimoto, Keisuke; and Uenohara, Norihisa, 5,501,312, Cl. 192-89.230.
Kajuch, Pete, to Master Lock Company. Deadbolt with infinitely adjustable backset. 5,501,492, Cl. 292-1.500.
Kakigami, Takuji: *See*—
Baba, Yutaka; Usui, Toshinao; Kakigami, Takuji; Ozeki, Yoshiro; Tsukamoto, Katsura; Asaoda, Nobuyuki; and Itoh, Nobuyuki, 5,502,209, Cl. 548-454.000.
Kakishima, Hiroyuki: *See*—
Miyauchi, Mikiyoshi; and Kakishima, Hiroyuki, 5,501,519, Cl. 366-78.000.
Kako, Hajime: *See*—
Miyoshi, Sotsuo; Otsuda, Hidetoshi; Kako, Hajime; Ohuchi, Hirofumi; Kawamura, Satoshi; and Miyake, Toshihiko, 5,501,201, Cl. 123-571.000.
Kakuda, Takami; Matsuura, Takanobu; Sagesaka, Yuko; and Kawasaki, Toshio, to Ito En, Ltd. Product and method for inhibiting caffeine stimulation with theanine. 5,501,866, Cl. 426-594.000.
Kalchauer, Wilfried: *See*—
Mautner, Konrad; Goetze, Ulrich; Schinabeck, Anton; and Kalchauer, Wilfried, 5,502,230, Cl. 556-468.000.
Kaldany, Antoine, to InterMED, Inc. Subcutaneous drug delivery device. 5,501,664, Cl. 604-57.000.
Kalkstein, Aric: *See*—
Tsach, Uri; and Kalkstein, Arie, 5,502,363, Cl. 318-568.110.
Kalmanek, Charles R., Jr.: *See*—
Gawlick, Rainer; Kalmanek, Charles R., Jr.; and Ramakrishnan, Kajamalai G., 5,502,816, Cl. 395-200.150.
Kalter, Howard K.: *See*—
Bertin, Claude L.; Howell, Wayne J.; Hedberg, Erik L.; Kalter, Howard K.; and Kelley, Gordon A., Jr., 5,502,667, Cl. 365-51.000.
Kambara, Shigeru: *See*—
Yoshimoto, Hisaya; Kambara, Shigeru; and Matsumoto, Ikuo, 5,502,344, Cl. 310-344.000.
Kamihata, Tomio: *See*—
Tsukada, Katsumi; Nakamura, Norio; Nimura, Minoru; Sucmori, Hiroyuki; Kamihata, Tomio; and Yamazaki, Mutsuaki, 5,502,617, Cl. 361-686.000.
Kamiyama, Satoshi: *See*—
Kidoguchi, Isao; Ohnaka, Kiyoshi; Adachi, Hideto; Kamiyama, Satoshi; Maanou, Masaya; and Uenoyama, Takeshi, 5,502,739, Cl. 372-45.000.
Kamiyama, Takao; Yokoshima, Yasuhiro; and Endoh, Shigeru, to Shonan Gosei-jushi, Seisakusho K.K.; Yokoshima & Company; and Get Inc. Method of inspecting a pipe liner bag. 5,501,115, Cl. 73-865.800.
Kamo, Tomoichi: *See*—
Doi, Toshiya; Soeta, Atsuko; Takeuchi, Seizi; Kamo, Tomoichi; and Matsuda, Shinpei, 5,502,029, Cl. 505-234.000.
Kamps, Rolf, to Stocko Verschlusstechnik GmbH & Co. Machine for mounting rivets, snaps and the like. 5,501,001, Cl. 29-788.000.
Kan, Kenichi: *See*—
Kikuchi, Teishin; Yamauchi, Hiroyuki; Furuya, Seiichi; and Kan, Kenichi, 5,501,120, Cl. 74-543.000.
Kanakkanatt, Sebastian V., to University of Akron, The. Method of using multichromic polymers in packaging. 5,501,945, Cl. 430-338.000.
Kanbe, Satoshi: *See*—
Osada, Naomi; Kohno, Toshiro; and Kanbe, Satoshi. 5,502,477, Cl. 347-176.000.
Kandel, Walter. Highly visible, point of impact, firearm target-shatterable face sheet embodiment. 5,501,467, Cl. 273-378.000.
Kane, Robert C.: *See*—
Moyer, Curtis D.; Dworsky, Lawrence N.; and Kane, Robert C., 5,502,348, Cl. 313-310.000.
Kaneda, Kitahiro: *See*—
Ushiro, Tatsuro; and Kaneda, Kitahiro, 5,502,607, Cl. 360-130.240.
Kaneharu, Kenji; Igashiro, Toshihiko; Watanabe, Ikuo; Okada, Masanori; and Matsudaira, Jun-ichi, to Nippon Soken Inc.; and Toyota Jidosha Kabushiki Kaisha. Fuel injection apparatus. 5,501,194, Cl. 123-470.000.
Kanemaru, Hiroshi: *See*—
Ogino, Shinji; Urushidani, Tatsuo; and Kanemaru, Hiroshi, 5,502,003, Cl. 437-189.000.
Kanevsky, Dimitri: *See*—
Bellegarda, Jerome R.; and Kanevsky, Dimitri, 5,502,774, Cl. 382-159.000.
Kanezaki, Takashi: *See*—
Okamoto, Masaya; and Kanezaki, Takashi, 5,502,134, Cl. 524-537.000.
Kanezawa, Akio: *See*—
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Rocci, Joseph; and Kirby, David W., 5,502,280, Cl. 174-84.00R.
Kirby, John J.: *See*—
Porter, Michael R.; Mulcahey, Charles E.; and Kirby, John J., 5,501,164, Cl. 112-176.000.
Kirchmayr, Rudolf: *See*—
Hao, Zhimin; Iqbal, Abul; and Kirchmayr, Rudolf, 5,502,196, Cl. 546-271.000.
Kirk, Chris: *See*—
Meisburger, Dan; Brodie, Alan D.; Chadwick, Curt; Desai, Anil; Dohse, Hans; Emge, Dennis; Greene, John; Johnson, Ralph; Ling, Ming-Yie; McMurtry, John; Becker, Barry; Paul, Ray; Robinson, Mike; Simmons, Richard; Smith, David E. A.; Taylor, John; Veneklasen, Lee; Walters, Dean; Wieczorek, Paul; Wong, Sam; Dutta, April; Lele, Surendra; Rough, Kirkwood; Pearce-Percy, Henry; Jau, Jack Y.; Lin, Chun C.; Nguyen, Hoi T.; Oyang, Yen-Jen; Hutcheson, Timothy L.; Clark, David J.; Pan, Chung-Shih; Bhaskar, Chetana; Kirk, Chris; Munro, Eric; Gibiliaco, John; and Sandland, Paul, 5,502,306, Cl. 250-310.000.
Kirkness, Ewen F.: *See*—
Hastings, Gregg A.; Adams, Mark D.; Fraser, Claire M.; Lee, Norman H.; Kirkness, Ewen F.; Blake, Judith A.; Fitzgerald, Lisa M.; Drake, Fred H.; and Gowan, Maxine, 5,501,969, Cl. 435-240.200.
Kischkel, Dimar; Schmid, Karl; Syldath, Andreas; and Krohaus, Thomas, to Henkel Kommanditgesellschaft auf Aktien. Process for stabilizing aqueous zeolite suspensions using a linear fatty alcohol polyglycol ether having a specific degree of ethoxylation. 5,501,817, Cl. 252-174.250.
Kish, Fred A.; Steranka, Frank M.; DeFevere, Dennis C.; Robbins, Virginia M.; and Uebbing, John, to Hewlett-Packard Company. Wafer bonding of light emitting diode layers. 5,502,316, Cl. 257-94.000.
Kishi, Tetsuji; and Okabayashi, Ichiro, to Matsushita Electric Industrial Co., Ltd. Data transfer device. 5,502,733, Cl. 371-32.000.

Kishimoto, Shinichi: *See*—
Abe, Sou; and Kishimoto, Shinichi, 5,501,712, Cl. 23-295.00R.
Kisida, Hiroi: *See*—
Shuto, Akira; Kisida, Hiroi; Takada, Yoji; and Ishiwatari, Takao, 5,502,242, Cl. 560-221.000.
Kisslig, Heinz. Adapter for use with clamping devices on multi-hole-machine-tool workpiece tables. 5,501,437, Cl. 269-99.000.
Kistler Instrumente AG: *See*—
Sonderegger, Hans C.; Calderara, Reto; and Cavalloni, Claudio, 5,501,111, Cl. 73-862.642.
Kita, Shinji; Ogatsu, Hitoshi; and Murai, Kazumasa, to Fuji Xerox Co., Ltd. Color image processing method and apparatus capable of adjusting the UCR ratio. 5,502,579, Cl. 358-518.000.
Kitagawa, Hidemasa: *See*—
Toyoda, Toshihiro; Mori, Yoshihiro; and Kitagawa, Hidemasa, 5,502,512, Cl. 348-706.000.
Kitagawa, Keiji; and Tani, Ikuo, to Kitagawa, Keiji; Design Automation Inc.; and Omron Corporation. Graphic data processing apparatus using displayed graphics for application program selection. 5,502,800, Cl. 395-133.000.
Kitamura, Akio; and Fujishima, Naoto, to Fuji Electric Co., Ltd. Lateral type field effect transistor. 5,502,323, Cl. 257-335.000.
Kitamura, Hideki: *See*—
Ohmamyuda, Yukio; Kimura, Shigeru; Tanabe, Toru; Iwasaki, Kazuhisa; Seto, Takao; Kitamura, Hideki; and Senoo, Yasushi, 5,502,432, Cl. 340-436.000.
Kitamura, Masaru: *See*—
Kajikuri, Hiroshi; Tojima, Hideto; Nakamura, Tomokazu; and Kitamura, Masaru, 5,502,184, Cl. 540-536.000.
Kitamura, Takehiko, to Sumitomo Heavy Industries, Ltd. Mold having opposed offset cooling channels. 5,501,592, Cl. 425-547.000.
Kitayama, Hiroyuki: *See*—
Shinjo, Kenji; Takiguchi, Takao; Kitayama, Hiroyuki; Katagiri, Kazuharu; Yamashita, Masataka; Terada, Masahiro; Togano, Takeshi; and Asaoka, Masanobu, 5,501,818, Cl. 252-299.610.
Kiuchi, Shin, to Fuji Electric Co., Ltd. Current detecting device with temperature compensating device. 5,501,517, Cl. 361-101.000.
Kiwi Packaging Limited: *See*—
McElroy, Peter M., 5,501,395, Cl. 229-148.000.
Kiyozumi, Katsuyuki: *See*—
Otsude, Akio; Yamauchi, Tokushi; Mitsuyasu, Kei; Kuroki, Yoshifumi; Ohnishi, Naoki; and Kiyozumi, Katsuyuki, 5,502,423, Cl. 315-291.000.
KLA Instruments Corporation: *See*—
Meisburger, Dan; Brodie, Alan D.; Chadwick, Curt; Desai, Anil; Dohse, Hans; Enge, Dennis; Greene, John; Johnson, Ralph; Ling, Ming-Yie; McMurtry, John; Becker, Barry; Paul, Ray; Robinson, Mike; Simmons, Richard; Smith, David E. A.; Taylor, John; Veneklasen, Lee; Walters, Dean; Wieczorek, Paul; Wong, Sam; Dutta, April; Lele, Surendra; Rough, Kirkwood; Pearce-Percy, Henry; Jau, Jack Y.; Lin, Chun C.; Nguyen, Hoi T.; Oyang, Yen-Jen; Hutcheson, Timothy L.; Clark, David J.; Pan, Chung-Shih; Bhaskar, Chetana; Kirk, Chris; Munro, Eric; Gibilisco, John; and Sandland, Paul, 5,502,306, Cl. 250-310.000.
Kleentek Industrial Co., Ltd.: *See*—
Kawasaki, Mariko, 5,501,783, Cl. 204-665.000.
Klein, Barbara K.: *See*—
Braford-Goldberg, Sarah R.; Easton, Alan M.; Klein, Barbara K.; McKearn, John P.; and Olins, Peter O., 5,501,962, Cl. 435-69.520.
Klein, Melvin P.: *See*—
Hoggatt, Austin C.; Graham, Martin; Cudaback, David D.; Klein, Melvin P.; Otvos, John W.; and Richards, Paul L., 5,502,652, Cl. 364-510.000.
Kleiner, Eduard K.; and Karydas, Athanasios, to Dynax Corporation. Perfluoroalkyl terminated urethane lubricants. 5,502,225, Cl. 554-42.000.
Kleiner, Hans-Jerg; Regnat, Dieter; and Röschert, Horst, to Hoechst Aktiengesellschaft. Process for preparing 2,2'-bis(halomethyl)-1,1'-binaphthyl. 5,502,261, Cl. 570-196.000.
Kleiner, Hans-Jerg: *See*—
Engelhardt, Fritz; Riegel, Ulrich; and Kleiner, Hans-Jerg, 5,502,231, Cl. 558-110.000.
Klemp, Roger: *See*—
Adams, Thomas P.; Karpathian, Kerry; Klemp, Roger; and Murphy, Thomas S., 5,501,632, Cl. 453-3.000.
Klenk, Rainer: *See*—
Mack, Richard B.; and Klenk, Rainer, 5,501,448, Cl. 271-280.000.
Kleve, Robert E. Typewriter cartridge apparatus having an outer housing with inner loop attached ribbon cartridge. 5,501,536, Cl. 400-208.000.
Klinge, Dagmar: *See*—
Haupt, Andreas; Janssen, Bernd; Ritter, Kurt; Klinge, Dagmar; Keilhauer, Gerhard; Romerdahl, Cynthia; Barlozzari, Teresa; and Qian, Xiao-dong, 5,502,032, Cl. 514-17.000.
Klinger, Katherine W.: *See*—
Mahr, Anna M.; Bowe, Ann E.; Ruff-Roberts, Alyson L.; and Klinger, Katherine W., 5,501,954, Cl. 435-6.000.
Klöckner-Humboldt-Deutz AG: *See*—
Feldkamp, Bernward; and Schliepenskötter, Bernd, 5,502,342, Cl. 310-51.000.
Klostermeyer, Hermann: *See*—
Schoelling, Rainer; Graefe, Detlef; Klostermeyer, Hermann; and Greisinger, Martin, 5,502,281, Cl. 174-92.000.
Klotz, Arthur: *See*—
Andress, Heinz; Hummel, Karl-Ernst; Klotz, Arthur; and Schermuly, Thomas, 5,501,723, Cl. 96-131.000.
Klubitschko, Gerd: *See*—
Stepanek, Premek; Klubitschko, Gerd; and Messerschmidt, Werner, 5,501,483, Cl. 280-625.000.
Klueger, Herbert D., to Chrysler Corporation. Vehicle hinge assembly with translating pivot. 5,500,985, Cl. 16-354.000.
Klötting, Bernd-Alfred, to ED. Scharwächter GmbH & Co., KG. Stay bar support for vehicle door stop. 5,501,421, Cl. 248-288.300.
Kmiecik-Lawrynowicz, Grazyna E.: *See*—
Patel, Raj D.; Hopper, Michael A.; Gerroir, Paul J.; and Kmiecik-Lawrynowicz, Grazyna E., 5,501,935, Cl. 430-137.000.
Knierim, David L., to Tektronix, Inc. Ink jet print head drive with normalization. 5,502,468, Cl. 347-19.000.
Knoll, Alexander: *See*—
Scharfenberg, Peter; Liebacher, Jürgen; Knoll, Alexander; Uschmajew, Aleksej; Rolfs, Andreas; Lohman, Dieter; Faust, Gottfried; and Morgenstern, Eveline, 5,502,051, Cl. 514-235.500.
Knorr-Bremse AG: *See*—
Stalmeir, Joseph; and Fuderer, Erich, 5,501,305, Cl. 188-167.000.
Kok, Józef: *See*—
Kiedik, Maciej; Krueger, Andrzej; Kolt, Józef; Korek, Antoni; Balcerowiak, Wojciech; Hetper, Jacek; Majchrzak, Maria; Niedziela, Jan; Kościuk, Ryszard; Rzodeczko, Anna; Mróz, Jerzy; and Swiderski, Zbigniew, 5,502,016, Cl. 502-11.000.
Koba, Kazunori: *See*—
Dohku, Takeshi; Yoshida, Kazuo; Koba, Kazunori; and Miyake, Kazuyuki, 5,501,240, Cl. 134-61.000.
Kobayashi, Hideyuki: *See*—
Nadahara, Souichi; Yamabe, Kikuo; Kobayashi, Hideyuki; Terasaka, Kunihiro; Yamamoto, Akihito; and Yasuhisa, Naohiko, 5,502,010, Cl. 437-247.000.
Kobayashi, Hiroshi, to Sony Corporation. Tape guide roller with flange and tapered surface for use in video tape recorder. 5,501,386, Cl. 226-190.000.
Kobayashi, Kazutaka; Kojima, Kineo; Harada, Takeshi; Hohrai, Hiroshi; and Hayafuji, Ikuo, to Japan Tobacco Inc.; and Kabushiki Kaisha Toshiba. Work mounting apparatus. 5,500,997, Cl. 29-740.000.
Kobayashi, Kiyoshi; Katsuno, Makoto; and Kobayashi, Takahisa, to Wako Pure Chemical Industries, Ltd. Anti hCG-β core monoclonal antibody, its production and use. 5,501,988, Cl. 436-548.000.
Kobayashi, Shigeru: *See*—
Chiba, Takatoshi; and Kobayashi, Shigeru, 5,501,716, Cl. 55-215.000.
Kobayashi, Takahisa: *See*—
Kobayashi, Kiyoshi; Katsuno, Makoto; and Kobayashi, Takahisa, 5,501,988, Cl. 436-548.000.
Kobayashi, Takashi: *See*—
Saitoh, Toshio; Takizawa, Teruhiro; Maki, Naoki; Kobayashi, Takashi; Shibata, Masayuki; Yoshioka, Ken; Sonobe, Tadasi; and Suzuki, Fumio, 5,502,613, Cl. 361-19.000.
Kobayashi, Yutaka: *See*—
Hiraishi, Atsushi; Akioka, Takashi; Kobayashi, Yutaka; Yokoyama, Yuji; Iwamura, Masahiro; Yamauchi, Tatsumi; Takahashi, Shigeru; Uchida, Hideaki; and Ide, Akira, 5,502,820, Cl. 395-250.000.
Kobunaya, Hideki: *See*—
Yamasaki, Yoshimori; Chiba, Takayoshi; Kobunaya, Hideki; and Ishikawa, Yutaka, 5,502,699, Cl. 369-48.000.
Koch, Dietrich: *See*—
Leicht, Werner; Koch, Dietrich; and Giesselmann, Juergen, 5,501,122, Cl. 74-606.00R.
Kodera, Yasuto: *See*—
Mori, Sunao; Mihara, Tadashi; and Kodera, Yasuto, 5,502,584, Cl. 359-90.000.
Koellermeyer, Albrecht; and Schnitzer, Detlef, to Mercedes-Benz AG. Motor vehicle gear wheel change transmission with a retarder brake. 5,501,641, Cl. 475-107.000.
Koelling, Jeffrey E.; and McAdams, Hugh P., to Texas Instruments Incorporated. Apparatus and method for a semiconductor memory configuration-dependent output buffer supply circuit. 5,502,671, Cl. 365-189.090.
Kohara, Hidekatsu: *See*—
Hosoda, Hiroshi; Numata, Remi; Doi, Kousuke; Tokutake, Nobuo; Kohara, Hidekatsu; and Nakayama, Toshimasa, 5,501,936, Cl. 430-191.000.
Kohlberg, Ira, to Mandex, Inc. Method and apparatus for improving the signal-to-clutter ratio of an airborne earth penetrating radar. 5,502,444, Cl. 342-22.000.
Kohler Co.: *See*—
King, James L.; and Mintner, Timothy J., 5,501,185, Cl. 123-73.0AD.
Kohno, Nobuo, to Sony Corporation. Ink ribbon. 5,501,537, Cl. 400-240.400.
Kohno, Takanobu; and Ozue, Tadashi, to Sony Corporation. Rotating head type recording/reproducing apparatus which uses wide recording heads to record a single pilot signal over three tracks and preventing overwriting of the pilot signal by the next head scan. 5,502,603, Cl. 360-77.140.
Kohno, Toru; and Nakano, Masao, to Fujitsu Limited. Semiconductor memory device having a multi-bit input/output configuration which is capable of correcting a bit failure. 5,502,675, Cl. 365-200.000.
Kohno, Toshiro: *See*—
Osada, Naomi; Kohno, Toshiro; and Kanbe, Satoshi, 5,502,477, Cl. 347-176.000.
Koitabashi, Noribumi: *See*—



Takahashi, Kazuyoshi; Otsuka, Naoji; Ebata, Tokihide; Hirabayashi, Hiromitsu; Tajika, Hiroshi; Koitabashi, Noribumi; Arai, Atsushi; Aono, Kenji; and Sugimoto, Hitoshi, 5,502,464, Cl. 346-25.000.
Kojima, Akio: *See*—
Kai, Tsutomu; Murata, Kazuyuki; Kuwahara, Yasuhiro; Ono, Hitoshi; Mikami, Tsutomu; Suetake, Tomoko; and Kojima, Akio, 5,502,575, Cl. 358-405.000.
Kojima, Kineo: *See*—
Kobayashi, Kazutaka; Kojima, Kineo; Harada, Takeshi; Hohrai, Hiroshi; and Hayafuji, Ikuo, 5,500,997, Cl. 29-740.000.
Kojima, Masaaki; Tabata, Kazuhiro; Uzuhashi, Yuji; and Ito, Yoshiki, to Ina Food Industry Co., Ltd. Low gel strength agar-agar. 5,502,181, Cl. 536-123.100.
Kojima, Norio: *See*—
Sonoyama, Mitsuyoshi; Suzaki, Kentaro; Aihara, Masaki; Suzuki, Hirokatsu; Miyahara, Shoji; Kojima, Norio; and Okada, Masatoshi, 5,501,058, Cl. 53-204.000.
Kok, Chong M.: *See*—
Toh, Huan K.; and Kok, Chong M., 5,502,139, Cl. 526-284.000.
Kokubo, Kazuyuki: *See*—
Mori, Kazuo; Shigeeda, Tetsuya; Kokubo, Kazuyuki; Yonezawa, Norihiro; and Nakatsu, Kimihide, 5,502,606, Cl. 360-107.000.
Kolnick, Frank C., to Motorola, Inc. Object-oriented software architecture supporting input/output device independence. 5,502,839, Cl. 395-800.000.
Kolton, Chester; and Spater, Stuart S., to B&G Plastics, Inc. Garment hanger. 5,501,378, Cl. 223-87.000.
Komatsu, Hiroyuki: *See*—
Takase, Satoshi; Imaide, Takuya; Kinugasa, Toshiro; and Komatsu, Hiroyuki, 5,502,483, Cl. 348-208.000.
Komatsu, Teruo: *See*—
Yukimachi, Hiroshi; Komatsu, Teruo; Azeta, Takahiro; Waragai, Tsuyoshi; Araki, Tomoyuki; and Hoshii, Osamu, 5,501,444, Cl. 271-127.000.
Komatsuda, Takashi: *See*—
Miyashita, Yukio; Shimasaki, Yuichi; Oketani, Toshikazu; Hatcho, Seiji; Matsumoto, Seiji; Aoki, Takuya; Saito, Akihisa; Komatsuda, Takashi; and Kato, Hiroaki, 5,501,073, Cl. 60-284.000.
Kometani, Kazuo: *See*—
Ukai, Hidehito; Kometani, Kazuo; Horie, Kazuyuki; and Nakayama, Toshiaki, 5,502,283, Cl. 181-228.000.
Komma, Yoshiaki; and Nishino, Seiji, to Matsushita Electric Industrial Co., Ltd. Diffraction grating and optical pickup apparatus with diffracting grating. 5,502,707, Cl. 369-103.000.
Komoda, Hideaki: *See*—
Ueyama, Yasuhiro; Ochiai, Keiichi; Satake, Tetsuo; Komoda, Hideaki; and Hatanaka, Hideo, 5,501,896, Cl. 428-323,000.
Komuro, Ichiro: *See*—
Iwata, Naoki; Saito, Takeshi; Yano, Hidetoshi; Takagaki, Hiromitsu; Nishido, Kazuhiro; Komuro, Ichiro; Sawa, Shigeki; and Shima, Nobuhiro, 5,502,552, Cl. 355-259.000.
Konami Co., Ltd.: *See*—
Hirata, Takashi; and Matsuura, Kazuhito, 5,501,455, Cl. 273-86.00B.
Kondo, Akihiro; Morimoto, Kiyofumi; and Emoto, Kazuhiro, to Sharp Kabushiki Kaisha. Electrophotographic photoreceptor containing enamine derivative. 5,501,930, Cl. 430-59.000.
Kondo, Masao; Ito, Shinichi; and Nakazono, Hiroki, to Yamaha Corporation. Automatic accompaniment apparatus implementing smooth transition to fill-in performance. 5,502,275, Cl. 84-635.000.
Kondo, Naoki, to YKK Corporation. Slider inserting apparatus for concealed slide fastener and concealed slide fastener finishing machine. 5,501,000, Cl. 29-767.000.
Kondoh, Katsuyoshi, to Sumitomo Electric Industries, Ltd. Method of making sintered contact component. 5,501,833, Cl. 419-33.000.
Kondratyev, Alexi, to Neuromed Technologies, Inc. Pro-cytotoxic drug conjugates for anticancer therapy. 5,502,037, Cl. 514-21.000.
Kone Elevator GmbH: *See*—
Lamberg, Lauri, 5,502,818, Cl. 395-200.160.
Kong, Kin Y.: *See*—
Roopnarine, ; Myrick, Thomas; and Kong, Kin Y., 5,501,604, Cl. 439-19.000.
Konica Corporation: *See*—
Matsumoto, Shinji; Nakajima, Atsushi; Maejima, Katsumi; Kawakami, Sota; and Nakatani, Koichi, 5,501,937, Cl. 430-200.000.
Yamada, Yasushi, 5,502,556, Cl. 355-320.000.
Konno, Yasuhiko: *See*—
Ikemasu, Shinichirou; Hasegawa, Yoshiki; and Konno, Yasuhiko, 5,502,332, Cl. 257-620.000.
Konomoto, Takeyoshi: *See*—
Ueshima, Toshifumi; Hasegawa, Ko; Teramoto, Toshio; Nakajima, Tatsuo; and Konomoto, Takeyoshi, 5,502,095, Cl. 524-269.000.
Konop, Chad O.: *See*—
Lanzdorf, Daniel J.; Betters, Thomas H.; Braun, Eric E.; Konop, Chad O.; and Steiner, James L., 5,501,567, Cl. 414-408.000.
Konrad, Gerd: *See*—
Massonne, Klemens; Konrad, Gerd; Sandison, Mark D.; Moffitt, Gregory E.; James, Lawrence E.; and Banger, John, 5,502,188, Cl. 544-173.000.
Kontos, Stavros B., to Boston Scientific Corporation. Angioplasty balloon catheter and adaptor. 5,501,668, Cl. 604-96.000.
Kopcsay, Gerard V.: *See*—
Arjavalingam, Gnanalingam; Deutsch, Alina; Kopcsay, Gerard V.; and Tam, James K., 5,502,392, Cl. 324-638.000.
Korek, Antoni: *See*—
Kiedik, Maciej; Krueger, Andrzej; Kolt, Józef; Korek, Antoni; Balcerowiak, Wojciech; Hetper, Jacek; Majchrzak, Maria; Niedziela, Jan; Kościuk, Ryszard; Rzodeczko, Anna; Mróz, Jerzy; and Swiderski, Zbigniew, 5,502,016, Cl. 502-11.000.
Korenaga, Hideaobu; Takashima, Makoto; and Iino, Tadashi, to Yazaki Corporation. Display apparatus for vehicles. 5,502,456, Cl. 345-9.000.
Kornfeld, Hans-Joachim: *See*—
Schmode, Hartmut; Storm, Siegfried; Thiele, Helmut; Wiebe, Ulrich; David, Bernd; Hetland, Detley; Kornfeld, Hans-Joachim; and Salten, Johann-Georg, 5,500,998, Cl. 29-751.000.
Kościuk, Ryszard: *See*—
Kiedik, Maciej; Krueger, Andrzej; Kolt, Józef; Korek, Antoni; Balcerowiak, Wojciech; Hetper, Jacek; Majchrzak, Maria; Niedziela, Jan; Kościuk, Ryszard; Rzodeczko, Anna; Mróz, Jerzy; and Swiderski, Zbigniew, 5,502,016, Cl. 502-11.000.
Koshikawa, Yasuji, to NEC Corporation. Semiconductor memory having high speed and low power data read/write circuit. 5,502,684, Cl. 365-230.060.
Kostanski, Donald B.: *See*—
Deneeha, Gary L., deceased; Kostanski, Donald B.; Carter, Frank L.; and Shinners, Jeffrey G., 5,501,323, Cl. 206-278.000.
Kotani, Isao: *See*—
Okamoto, Ricardo M.; Matsumoto, Kouichi; Kotani, Isao; Kuroda, Satoshi; Ishikawa, Hiroyuki; and Fukui, Kenji, 5,502,693, Cl. 369-13.000.
Kotera, Shinichi: *See*—
Hayashi, Shigeki; Ueda, Hiroyuki; Ogiri, Tadakazu; Kotera, Shinichi; Morishita, Hiroki; Moriuchi, Yasuhiko; Yasuda, Kohichi; and Ishida, Naoyuki, 5,502,554, Cl. 355-271.000.
Kotitschke, Gerhard; and Schiel, Christian, to J. M. Voith GmbH. Wet press for a paper making machine. 5,501,775, Cl. 162-360.300.
Kotter, Dale K.: *See*—
McManus, Gary J.; Motes, Billy G.; Bird, Susan K.; and Kotter, Dale K., 5,501,080, Cl. 62-55.500.
Kottwitz, Beatrix: *See*—
Engelskirchen, Konrad; Fischer, Herbert; Kottwitz, Beatrix; Upadek, Horst; and Nitsch, Christian, 5,501,814, Cl. 252-174.170.
Koutz, Stanley L.: *See*—
Bond, Luke D.; Mills, Charles C.; Whiting, Philip; Koutz, Stanley L.; Hazlebeck, David A.; and Downey, Kevin W., 5,501,799, Cl. 210-721.000.
Kovar, Robert; and Wallis, Roland R., Jr., to Foster-Miller, Inc. Method for preparing interpenetrated polymer films. 5,501,831, Cl. 264-503.000.
Kowski, Paul G.: *See*—
Delmore, Michael D.; Maier, Gary W.; Kowski, Paul G.; and Hauschulz, Rodney W., 5,501,738, Cl. 118-663.000.
Koyama, Nobuhiko, to Nippondenso Co., Ltd. Fuel vapor control apparatus for an internal combustion engine. 5,501,198, Cl. 123-520.000.
Koyanagi, Osamu; Hirasawa, Kunio; Tsukushi, Masanori; Kurosawa, Yukio; Sato, Tadashi; and Ohshita, Yousichi, to Hitachi, Ltd. Switch mechanism. 5,502,290, Cl. 218-78.000.
Koz, Mark C. Digital color TV for personal computers. 5,502,503, Cl. 348-552.000.
Kozak, William G.; Chovatia, Dharmesh; and Smith, George A., to Henkel Corporation. Method for separating materials. 5,501,796, Cl. 210-638.000.
Kraft Foods, Inc.: *See*—
Buliga, Gregory S.; Miller, Mark S.; Powell, William F.; Lis, Daniel G.; Krishnamurthy, R. G.; Witte, Vernon C.; and Tomski, Sharon, 5,501,869, Cl. 426-658.000.
Krallmann, Anton; Blum, Thomas; and Schinkel, Ingo, to Wolff Walsrode Aktiengesellschaft. Matt biaxially stretched polypropylene film and a process for producing the same. 5,501,905, Cl. 428-339.000.
Krams, Theo: *See*—
Hamaner, Klaus-Dieter; Siebrecht, Manfred; Mass, Leo; Krams, Theo; and Winter, Hermann, 5,501,886, Cl. 428-34.800.
Kraus, Manfred G., to 478336 B.C. Ltd. Folded single sheet mailer. 5,501,392, Cl. 229-92.300.
Krause, Peter: *See*—
Obermeier, Ernst; Heinzl, Joachim; Krause, Peter; Hochwind, Bernhard; and Zollner, Alfred, 5,502,471, Cl. 347-65.000.
Kravets, Alexander. Method of fuel combustion. 5,501,162, Cl. 110-347.000.
Kreis, Helmut; Moll, Anton; and Stiegler, Karl H., to Linde Aktiengesellschaft. Apparatus and process for cryogenic separation of air and liquid distributor for a mass transfer column. 5,501,079, Cl. 62-36.000.
Kresse, Georg-Burkhard: *See*—
Berry, Michael N.; Towa, Michael-Harold; Kresse, Georg-Burkhard; and Herrmann, Uwe, 5,501,958, Cl. 435-18.000.
Kreuzer, Franz-Heinrich: *See*—
Zahn, Ingo P.; Kreuzer, Franz-Heinrich; and Weitzel, Hans-Peter, 5,502,206, Cl. 548-406.000.
Krieger, John M.: *See*—
Milazzo, Charles R.; and Krieger, John M., 5,501,134, Cl. 89-139.000.
Krishman, R.: *See*—
Landers, Robert J.; Mahant-Shetti, Shivaling S.; Krishman, R.; and Mutukrishnan, C., 5,502,404, Cl. 326-50.000.
Krishnamurthy, R. G.: *See*—
Buliga, Gregory S.; Miller, Mark S.; Powell, William F.; Lis, Daniel G.; Krishnamurthy, R. G.; Witte, Vernon C.; and Tomski, Sharon, 5,501,869, Cl. 426-658.000.

Krishnaa, Venkataram; and Rutherford, Winfeld S., to Reichhold Chemicals, Inc. Textile coating and method of using the same. 5,502,138, Cl. 526-273.000.
Krohnen, Thomas: *See*—
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Kiedik, Maciej; Krueger, Andrzej; Kołt, Józef; Korek, Antoni; Balcerowiak, Wojciech; Hetper, Jacek; Majchrzak, Maria; Niedziela, Jan; Kościuk, Ryszard; Rzodeczko, Anna; Mróz, Jerzy; and Swiderski, Zbigniew, 5,502,016, Cl. 502-11.000.
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Fuller, Timothy J.; Mammino, Joseph; Brach, Paul J.; Blaszak, Robert; Finsterwalder, Robert N.; and Badesha, Santokh S., 5,501,881, Cl. 427-421.000.
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Gesemann, Hans-Jürgen; Seffner, Lutz; and Völker, Karin, 5,501,876, Cl. 427-226.000.
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Marchello, John L., to Danmar Products, Inc. Shock absorbing strap cover. 5,500,951, Cl. 2-2.000.
Marchioro, Alessandro, to International Business Machines Corporation. Dual ported memory with word line access control. 5,502,683, Cl. 365-230.050.
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Stepanek, Premek; Klubitschko, Gerd; and Messerschmidt, Werner, 5,501,483, Cl. 280-625.000.
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Reinicke, Robert H.; and Schappell, Derek T., 5,501,425, Cl. 251-129.150.
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Stovall, Therese K.; and Tomlinson, John J., 5,501,268, Cl. 165-1.000.
Martin, Roland: *See*—
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Hou, Donald; Draper, Richard W.; Lee, Gary M.; and Mas, Janet L., 5,502,186, Cl. 540-576.000.
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Rolt, Kenneth D.; and Lele, Padmakar P., 5,501,655, Cl. 601-3.000.
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Kajuch, Pete, 5,501,492, Cl. 292-1.500.
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Ozaki, Keiichi; Kato, Sanae; and Masuda, Yoshimi, 5,501,605, Cl. 439-34.000.
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Takase, Akira; Kai, Hiroyuki; Nishida, Kuniyoshi; and Masui, Moriyasu, 5,502,252, Cl. 564-169.000.

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Mathre, David A.: *See*—
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Matrana, Barry A.: *See*—
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Doi, Toshiya; Soeta, Atsuko; Takeuchi, Seizi; Kamo, Tomoichi; and Matsuda, Shinpei, 5,502,029, Cl. 505-234.000.

Matsudaira, Jun-ichi: *See*—
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Matsufuji, Yasuhiro: *See*—
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Yoshimoto, Hisaya; Kambara, Shigeru; and Matsumoto, Ikuo, 5,502,344, Cl. 310-344.000.

Matsumoto, Katsuru; Hirayama, Nobuhiro; Uchiyama, Kenji; Kawasaki, Shoji; Fukui, Tamami; and Uramoto, Katsuo, to Mitsui Toatsu Chemicals, Incorporated. Resin composition for electrophotographic toner. 5,502,110, Cl. 525-221.000.

Matsumoto, Kouichi: *See*—
Okamoto, Ricardo M.; Matsumoto, Kouichi; Kotani, Isao; Kuroda, Satoshi; Ishikawa, Hiroyuki; and Fukui, Kenji, 5,502,693, Cl. 369-13.000.

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Miyashita, Yukio; Shimasaki, Yuichi; Oketani, Toshikazu; Hatcho, Seiji; Matsumoto, Seiji; Aoki, Takuya; Saito, Akihisa; Komatsuda, Takashi; and Kato, Hiroaki, 5,501,073, Cl. 60-284.000.

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Katsumata, Toru; and Matsunaga, Nobuyuki, 5,502,093, Cl. 524-91.000.

Matsunase, Takeo; and Takada, Takashi, to Toray Industries, Inc. High tenacity and high toughness acrylic sulfide fibers, a process for production thereof, and composite materials prepared by using it. 5,502,090, Cl. 524-3.000.

Matsumuma, Kenji: *See*—
Yamamoto, Takehisa; Nishioka, Takao; Matsumuma, Kenji; and Yamakawa, Akira, 5,502,011, Cl. 501-97.000.

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Matsushita Electric Corporation of America: *See*—
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Matsushita Electric Industrial Co., Ltd.: *See*—
Fukunaga, Takashi; and Segawa, Akiyoshi, 5,502,639, Cl. 364-424.050.
Hori, Yoshikazu, 5,502,314, Cl. 257-10.000.
Ikemure, Yumiko, 5,502,777, Cl. 382-173.000.
Kai, Tsutomu; Murata, Kazuyuki; Kuwahara, Yasuhiro; Ono, Hitoshi; Mikami, Tsutomu; Suetake, Tomoko; and Kojima, Akio, 5,502,575, Cl. 358-405.000.
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Kidoguchi, Isao; Ohnaka, Kiyoshi; Adachi, Hideto; Kamiyama, Satoshi; Manaou, Masaya; and Uenoyama, Takeshi, 5,502,739, Cl. 372-45.000.
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Komma, Yoshiaki; and Nishino, Seiji, 5,502,707, Cl. 369-103.000.
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Onitsuka, Yasuto, 5,501,004, Cl. 29-827.000.
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Saitou, Shinji, 5,502,381, Cl. 324-209.000.
Shirouzu, Hiroshi, 5,502,795, Cl. 395-109.000.
Toyoda, Toshihiro; Mori, Yoshihiro; and Kitagawa, Hidemasa, 5,502,512, Cl. 348-706.000.
Ueyama, Yasuhiro; Ochiai, Keiichi; Satake, Tetsuo; Komoda, Hideaki; and Hatanaka, Hideo, 5,501,896, Cl. 428-323.000.
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Yamada, Yuichiro; Suzuki, Naoki; Houchin, Ryuzo; Nomura, Noboru; Yano, Kousaku; and Terai, Yuka, 5,501,739, Cl. 118-729.000.

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Okude, Akio; Yamauchi, Tokushi; Mitsuyasu, Kei; Kuroki, Yoshifumi; Ohnishi, Naoki; and Kiyozumi, Katsuyuki, 5,502,423, Cl. 315-291.000.
Tsukamoto, Katsuya; and Saito, Takshi, 5,502,453, Cl. 343-756.000.

Matsushita, Tadashi, to Sharp Kabushiki Kaisha. Flash memory having inclined channel. 5,502,321, Cl. 257-316.000.

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Matteucci, Mark D.; Jones, Robert J.; and Lin, Kuei-Ying, to Gilead Sciences, Inc. Pyrimidine derivatives for labeled binding partners. 5,502,177, Cl. 536-26.600.

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Przytulla, Dietmar; and Burgdorf, Mirten, 5,501,334, Cl. 206-386.000.

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Yoshie, Toru, 5,501,387, Cl. 227-120.000.

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Mayer, David J.; Price, Donald D.; Mao, Jianren; and Lyle, John W., to Virginia Commonwealth University. Method for the treatment of pain. 5,502,058, Cl. 514-289.000.

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Mayfield, Thomas B. Treatment for contaminated material. 5,501,973, Cl. 435-244.000.

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Suetsugu, Hajime; Nakazumi, Tadataka; Takami, Akihide; and Takemoto, Takashi, 5,501,074, Cl. 60-285.000.
Takebayashi, Hiroyuki, 5,501,206, Cl. 123-674.000.

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Koelling, Jeffrey E.; and McAdams, Hugh P., 5,502,671, Cl. 365-189.090.

McAleavey, Michael E. Apparatus and method for controlling tension in a web. 5,501,412, Cl. 242-417.100.

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Garg, Arvind K.; and McAnear, Jack, 5,501,279, Cl. 166-372.000.

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McCarthy, W. Patrick: *See*—
Braster, Olaf F.; Maier, Klaus C.; and McCarthy, W. Patrick, 5,502,659, Cl. 364-571.010.

McClive, William J. Wheel coupling for attaching a vehicular device to a wheel of an automotive vehicle. 5,501,482, Cl. 280-503.000.

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McClure, David C., to SGS-Thomson Microelectronics, Inc. Full memory chip long write test mode. 5,502,678, Cl. 365-201.000.

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McColloch, Rex J.; Cella, Stephen D.; and DiMarco, Bernard, to Siemens Energy & Automation Inc. Circuit breaker with one-piece crossbar including an integrally molded operating arm. 5,502,428, Cl. 335-172.000.

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Mitsui Mining & Smelting Co., Ltd.: *See*—
Hayashi, Takao; Kasahara, Nobuyoshi; Sato, Norihiro; and Kawaratani, Kouichi, 5,501,907, Cl. 428-389.000.
Mitsui Petrochemical Industries, Ltd.: *See*—
Tanaka, Hiroshi; Morishige, Kozo; Watanabe, Katsushi; and Kashiyama, Shigetoshi, 5,501,887, Cl. 428-35.200.
Mitsui Toatsu Chemicals, Incorporated: *See*—
Matsumoto, Katsuru; Hirayama, Nobuhiro; Uchiyama, Kenji; Kawasaki, Shoji; Fukui, Tamami; and Uramoto, Katsuo, 5,502,110, Cl. 525-221.000.
Mitsuyasu, Kei: *See*—
Okude, Akio; Yamauchi, Tokushi; Mitsuyasu, Kei; Kuroki, Yoshifumi; Ohnishi, Naoki; and Kiyozumi, Katsuyuki, 5,502,423, Cl. 315-291.000.
Miura, Kimiyoshi: *See*—
Sakashita, Takeshi; Shimoda, Tomoaki; Miura, Kimiyoshi; Tominari, Kenichi; and Kanezawa, Akio, 5,502,153, Cl. 528-198.000.
Miura, Yoshihiro; Takagi, Koji; Morita, Takashi; and Yoshii, Fumihiko, to Sony Corporation. Reproducing apparatus having a single microprocessor to perform data retrieval and disc reproduction control. 5,502,695, Cl. 369-32.000.
Miwa, Akimasa: *See*—
Lee, Yuan C.; Inoue, Shinji; Tsujimoto, Akinori; and Miwa, Akimasa, 5,501,841, Cl. 422-101.000.
Miyaguchi, Shoji: *See*—
Ishiguro, Ginya; Muta, Toshiyasu; Sakita, Kazutaka; Miyaguchi, Shoji; Okamoto, Tatsuaki; and Fujioka, Atsushi, 5,502,765, Cl. 380-24.000.
Miyahara, Shoji: *See*—
Sonoyama, Mitsuyoshi; Suzaki, Kentaro; Aihara, Masaki; Suzuki, Hirokatsu; Miyahara, Shoji; Kojima, Norio; and Okada, Masatoshi, 5,501,058, Cl. 53-204.000.
Miyajima, Akihiro: *See*—
Nakaya, Chitose; Bito, Yoshitaka; Yamamoto, Etsuji; Nishimura, Hiroshi; Takeuchi, Hiroyuki; Watanabe, Shigeru; Miyajima, Akihiro; and Arai, Hitoshi, 5,502,384, Cl. 324-309.000.
Miyake, Kazuyuki: *See*—
Dohku, Takeshi; Yoshida, Kazuo; Koba, Kazunori; and Miyake, Kazuyuki, 5,501,240, Cl. 134-61.000.
Miyake, Takanori: *See*—
Fuchikami, Takamasa; Wakasa, Noriko; He, De-Hua; Miyake, Takanori; Okada, Takashi; Fujimura, Atsushi; Sasakibara, Hiroyuki; Kanou, Yoshiaki; and Saito, Toshihiro, 5,502,217, Cl. 549-325.000.
Miyake, Toshihiko: *See*—
Miyoshi, Sotsuo; Okada, Hidetoshi; Kako, Hajime; Obuchi, Hirofumi; Kawamura, Satoshi; and Miyake, Toshihiko, 5,501,201, Cl. 123-571.000.
Miyamoto, Hidenori: *See*—
Amanuma, Tatsuo; Terui, Nobuhiko; Miyamoto, Hidenori; and Omi, Junichi, 5,502,536, Cl. 354-400.000.
Miyamoto, Sampei: *See*—
Matsui, Katsuaki; Miyamoto, Sampei; and Kikuchi, Hidekazu, 5,502,415, Cl. 327-536.000.
Miyamura, Kazuya: *See*—
Anan, Naoki; Takagi, Bungo; and Miyamura, Kazuya, 5,502,517, Cl. 351-160.00H.
Miyaoka, Shinichiro: *See*—
Ishikawa, Ken; and Miyaoka, Shinichiro, 5,502,778, Cl. 382-239.000.
Miyashita, Satoru; Atobe, Mitsuro; Karasawa, Yasushi; Takemoto, Kiyohiko; and Ouki, Yasuhiro, to Seiko Epson Corporation. Ink jet recording head and process for producing the same. 5,502,470, Cl. 347-45.000.
Miyashita, Shoji: *See*—
Egawa, Kunihiko; Kubo, Yoshio; Nagai, Takayuki; Uchikawa, Fussoki; Miyashita, Shoji; and Higuma, Hiroko, 5,501,746, Cl. 148-98.000.
Miyashita, Yukio; Shimasaki, Yuichi; Oketani, Toshikazu; Hascho, Seiji; Matsumoto, Seiji; Aoki, Takuya; Saito, Akihisa; Komatsuda, Takashi; and Kato, Hiroaki, to Honda Giken Kogyo Kabushiki Kaisha. Ignition timing control system for internal combustion engines. 5,501,073, Cl. 60-284.000.
Miyauchi, Mikiyoshi; and Kakishima, Hiroyuki, to Toshiba Machine Co., Ltd. Screw head for injection molding machine. 5,501,519, Cl. 366-78.000.
Miyawaki, Hiroshi; Oka, Takayuki; and Tsuji, Masaaki, to Noritsu Koki Co., Ltd. Printing/developing apparatus. 5,502,540, Cl. 355-22.000.
Miyazaki, Hiroya: *See*—
Nagai, Kenichi; Miyazaki, Hiroya; and Mitsue, Naoki, 5,501,530, Cl. 384-516.000.
Miyazaki, Satoshi; Ben-Brahim, Lazhar; and Kurosawa, Ryoichi, to Kabushiki Kaisha Toshiba. Method and apparatus for controlling an inverter. 5,502,633, Cl. 363-98.000.
Miyazawa, Toshiki; and Sakaguchi, Masahide, to Hidaka Seiki Kabushiki Kaisha. Die-punch machine. 5,501,092, Cl. 72-43.000.
Miyoshi, Sotsuo; Okada, Hidetoshi; Kako, Hajime; Obuchi, Hirofumi; Kawamura, Satoshi; and Miyake, Toshihiko, to Mitsubishi Denki Kabushiki Kaisha. Flow quantity valve controller and manufacturing method for flow quantity valve. 5,501,201, Cl. 123-571.000.
Mizoguchi, Shigeru, to Canon Kabushiki Kaisha. Electronic apparatus which is automatically initialized when normal operation is resumed after the apparatus has been in a low power consumption mode. 5,501,534, Cl. 400-54.000.
Mizoguchi, Takashi: *See*—
Watanabe, Fumie; Mizoguchi, Takashi; and Iwafune, Masatoshi, 5,502,098, Cl. 524-404.000.
Mizoguchi, Yoshiyuki, to Canon Kabushiki Kaisha. Shutter blades for increasing uniformity of oblique incident light. 5,502,525, Cl. 354-247.000.
Mizui, Takuji: *See*—
Mori, Sachio; Takechi, Shozo; Kida, Shiro; Mizui, Takuji; and Ichihashi, Teruhisa, 5,502,216, Cl. 549-310.000.
Mizukami, Hiroshi; Kajitani, Koji; Fujimoto, Keisuke; and Uenohara, Norihisa, to Kabushiki Kaisha Daikin Seisakusho. Clutch assembly cone spring having wear protection means. 5,501,312, Cl. 192-89.230.
Mizukami, Hiroshi: *See*—
Kajitani, Koji; Mizukami, Hiroshi; and Uenohara, Norihisa, 5,501,310, Cl. 192-48.300.
Mizuno, Hiroko: *See*—
Ito, Hidenobu; and Mizuno, Hiroko, 5,502,629, Cl. 363-60.000.
Mizuta, Akira; and Yamamuro, Toshikazu, to Fuji Photo Film Co., Ltd. Method for bending a metal thin plate. 5,501,094, Cl. 72-382.000.
Mochizuki, Masaki, to Victor Company of Japan, Ltd. Automatic attitude correcting system for optical disc device. 5,502,698, Cl. 369-44.320.
Modena, Daniela: *See*—
Legname, Giuseppe; Gromo, Gianni; Modena, Daniela; and Brocchetti, Diego, 5,501,970, Cl. 435-240.100.
Modrak, James P., to Hercules Incorporated. Polyolefin-polyarylate alloy fibers and their use in hot-mix compositions for making and repairing geoways. 5,502,160, Cl. 428-359.000.
Moen, Laura K.; and Clark, Gary F., to Center for Innovative Technology, The. Potent inhibitor of HIV reverse transcriptase. 5,502,041, Cl. 514-54.000.
Moffitt, Gregory E.: *See*—
Massonne, Klemens; Konrad, Gerd; Sandison, Mark D.; Moffitt, Gregory E.; James, Lawrence E.; and Banger, John, 5,502,188, Cl. 544-173.000.
Mogea International, n.v./Rijksuniversiteit te Leiden: *See*—
Offringa, Remko; De Groot, Marcellus J. A.; Hooykaas, Paul J. J.; and Van Den Elzen, Petrus J. M., 5,501,967, Cl. 435-172.300.
Moh, Sungwon R.; Potter, Scott T.; Ramirez, Frank D.; and Salazar, Edilberto I., to Pitney Bowes Inc. Load current limiting circuit for PWM controlled brushless motor. 5,502,361, Cl. 318-254.000.

Molder, Karl-Peter; Teetz, Wolfgang; and Zieschang, Rolf, to ZKS-Stickmaschinen Gesellschat mit beschrankter Haftung. System for holding a tubular workpiece in an embroidery machine. 5,501,163, Cl. 112-102.000.

Molecular Devices Corporation: *See*—
Wada, Henry G.; McConnell, Harden M.; and Hafeman, Dean G., 5,501,956, Cl. 435-11.000.

Molecular Probes, Inc.: *See*—
Katerinopoulos, Haralambos E.; Iatridou, Helene; Foukaraki, Evangelia; Malekzadeh, Mohammad N.; Kuhn, Michael A.; and Haugland, Richard P., 5,501,980, Cl. 436-74.000.

Molex Incorporated: *See*—
Funck, Gordon W.; and Lang, Harold K., 5,502,620, Cl. 361-753.000.

Molgaard, Erik: *See*—
Heilesen, Joergen, 5,501,031, Cl. 43-78.000.

Molimard, Jean-Charles: *See*—
Labeeuw, Bernard; Gully, Danielle; Jeanjean, Francis; Molimard, Jean-Charles; and Boigegrain, Robert, 5,502,059, Cl. 514-296.000.

Moll, Anton: *See*—
Kreis, Helmut; Moll, Anton; and Stiegler, Karl H., 5,501,079, Cl. 62-36.000.

Moncrief, Frank: *See*—
Ingram, Steve; Moncrief, Frank; and McNamara, Charles, 5,501,064, Cl. 53-473.000.

Monitoring Technology Corp.: *See*—
Hernandez, Walter; and Sutermeister, Richard, 5,501,105, Cl. 73-660.000.

Monroe, Robert C., to Hudson Products Corporation. Static efficiency enhancer for axial fans. 5,501,576, Cl. 416-239.000.

Monsanto Company: *See*—
Bussler, Brett H., 5,502,025, Cl. 504-107.000.

Monteiro, Luciano T. S. Mechanical cam clamp. 5,501,435, Cl. 269-24.000.

Montgomery, Kenneth C.: *See*—
Pojer, Peter; Montgomery, Kenneth C.; Huynh, Chi P.; and Milligan, Brian, 5,501,708, Cl. 8-94.260.

Moon, C. Robert: *See*—
Roberts, Peter M.; Davidson, John B.; and Moon, C. Robert, 5,501,125, Cl. 81-177.850.

Moon, Jong: *See*—
Shin, Hyun-koock; Park, Kyu-chara; Moon, Jong; and Shim, Tae-eara, 5,501,995, Cl. 437-41.000.

Moore, Eric R.: *See*—
Swann, George R.; and Moore, Eric R., 5,501,123, Cl. 74-822.000.

Moore, George G. I.; Flynn, Richard M.; and Guerra, Miguel A., to Minnesota Mining and Manufacturing Company. Physiologically acceptable emulsions containing perfluorocarbon ether hydrides and methods for use. 5,502,094, Cl. 524-145.000.

Moran, John C.: *See*—
Bales, Bruce M.; and Moran, John C., 5,502,757, Cl. 379-58.000.

Morawsky, Natalie: *See*—
Mudge, Paul R.; Leighton, John C.; Wanigatunga, Sirisoma; and Morawsky, Natalie, 5,501,851, Cl. 424-70.160.

Moreau, Gregory J. Bicycle. 5,501,477, Cl. 280-281.100.

Moretto, Hans-Heinrich: *See*—
Pohmer, Klaus; Weber, Rainer; Dörzbach-Lange, Cornelia; Stachulla, Kartheinz; Moretto, Hans-Heinrich; and Wienand, Manfred, 5,502,251, Cl. 564-82.000.

Morgan Construction Company: *See*—
Starvaski, Raymond R., 5,501,410, Cl. 242-363.000.

Morgan, Gary L.: *See*—
Harrison, Charles; Peng, Zhi X.; Range, Gladys V.; and Morgan, Gary L., 5,501,113, Cl. 73-865.500.

Morgan, Jeffery A.: *See*—
McAllise, Gregg A.; and Morgan, Jeffery A., 5,500,977, Cl. 15-320.000.

Morgan, Julia A. Treating apneahypopnea/snoring in humans. 5,502,067, Cl. 514-397.000.

Morgenstern, Eveline: *See*—
Scharfenberg, Peter; Liebacher, Jürgen; Knoll, Alexander; Uschmajew, Aleksej; Rolfs, Andreas; Lohman, Dieter; Faust, Gottfried; and Morgenstern, Eveline, 5,502,051, Cl. 514-235.500.

Mori, Kazuhiro; Uchida, Naoya; and Tatematsu, Susumu, to Hoshizaki Denki Kabushiki Kaisha. Auger type ice making machine. 5,501,081, Cl. 62-135.000.

Mori, Kazuo; Shigeeda, Tetsuya; Kokubo, Kazuyuki; Yonezawa, Norihiro; and Nakatsu, Kimihide, to Mitsubishi Denki Kabushiki Kaisha. Rotary magnetic head device having plural magnetic heads which are independently movable. 5,502,606, Cl. 360-107.000.

Mori, Masaya: *See*—
Takayanagi, Kazunori; Tanaka, Nobuyoshi; and Mori, Masaya, 5,502,801, Cl. 395-143.000.

Mori, Sachio; Takechi, Shozo; Kida, Shiro; Mizui, Takuji; and Ichihashi, Terubisa, to Shionogi & Co., Ltd. Lignan analogues, methods of preparation thereof and anti-hyperlipemic agents. 5,502,216, Cl. 549-310.000.

Mori, Sunao; Mihara, Tadashi; and Kodera, Yasuto, to Canon Kabushiki Kaisha. Process for producing ferroelectric liquid crystal device. 5,502,584, Cl. 359-90.000.

Mori, Takeshi: *See*—
Nagasaki, Tatsuo; Mori, Takeshi; and Adachi, Hideo, 5,502,488, Cl. 348-300.000.

Mori, Toshiyuki: *See*—
Inaba, Tadashi; Mori, Toshiyuki; Nagashima, Masahiro; and Kawada, Kosuke, 5,501,262, Cl. 160-178.200.

Mori, Yoshihiro: *See*—
Toyoda, Toshihiro; Mori, Yoshihiro; and Kitagawa, Hidemasa, 5,502,512, Cl. 348-706.000.

Morii, Tetsuro: *See*—
Sesaka, Yoichirou; Ota, Shuichi; Fujii, Hiroshi; Uetake, Akihiro; Sawada, Takashi; Hasegawa, Shinichi; Suzuki, Kazuyoshi; and Morii, Tetsuro, 5,502,608, Cl. 360-132.000.

Morimoto, Kiyofumi: *See*—
Kondo, Akihiro; Morimoto, Kiyofumi; and Emoto, Kazuhiro, 5,501,930, Cl. 430-59.000.

Morimoto, Yasuaki, to Deutsche Thomson-Brandt GmbH. Optical scanning device. 5,502,708, Cl. 369-110.000.

Morimura, Junko: *See*—
Yoshida, Hiroichi; Morimura, Junko; Matsuo, Kazuhiko; and Takata, Kazuhiko, 5,502,803, Cl. 395-146.000.

Morino, Toshiharu: *See*—
Ishiguro, Shinji; and Morino, Toshiharu, 5,501,217, Cl. 128-645.000.

Morishige, Kozo: *See*—
Tanaka, Hiroshi; Morishige, Kozo; Watanabe, Katsushi; and Kashiyama, Shigetoshi, 5,501,887, Cl. 428-35.200.

Morishima, Hideki: *See*—
Sudo, Toshiyuki; Taniguchi, Naosato; and Morishima, Hideki, 5,502,581, Cl. 359-10.000.

Morishita, Hiroki: *See*—
Hayashi, Shigeki; Ueda, Hiroyuki; Ogiri, Tadakazu; Kotera, Shinichi; Morishita, Hiroki; Moriuchi, Yasuhiko; Yasuda, Kohichi; and Ishida, Naoyuki, 5,502,554, Cl. 355-271.000.

Morita, Takashi: *See*—
Miura, Yoshihiro; Takagi, Koji; Morita, Takashi; and Yoshii, Fumihiko, 5,502,695, Cl. 369-32.000.

Morita, Tetsuji: *See*—
Fukuzawa, Tadashi; Hisano, Teiji; Morita, Tetsuji; and Ikarugi, Koichi, 5,502,565, Cl. 356-357.000.

Morita, Yasushi: *See*—
Obtori, Akira; Andoh, Masako; and Morita, Yasushi, 5,501,856, Cl. 424-428.000.

Moriuchi, Yasuhiko: *See*—
Hayashi, Shigeki; Ueda, Hiroyuki; Ogiri, Tadakazu; Kotera, Shinichi; Morishita, Hiroki; Moriuchi, Yasuhiko; Yasuda, Kohichi; and Ishida, Naoyuki, 5,502,554, Cl. 355-271.000.

Moriyama, Takaaki: *See*—
Obura, Masahiro; Yoshikawa, Takao; Tokunaga, Yasuyuki; Moriyama, Takaaki; and Inoue, Tetsuo, 5,502,085, Cl. 522-106.000.

Morris, Bernard L.: *See*—
Chen, Che-Tsung; Gabara, Thaddeus J.; Morris, Bernard L.; and Smooha, Yehuda, 5,502,328, Cl. 257-546.000.

Morris, James C.; and Stetman, Joe G., to Smith & Nephew DonJoy, Inc. Ankle brace. 5,501,659, Cl. 602-27.000.

Morros, Jorge: *See*—
Macaudiere, Pierre; Morros, Jorge; Tourre, Jean-Michel; and Tressaud, Alain, 5,501,733, Cl. 106-461.000.

Morrow Associated Enterprises: *See*—
Morrow, Darrell R.; and Morrow, Leslie D., 5,500,980, Cl. 16-16.000.

Morrow, Darrell R.; and Morrow, Leslie D., to Morrow Associated Enterprises. Carpet strips and methods of making carpet strips and other extruded articles. 5,500,980, Cl. 16-16.000.

Morrow, Leslie D.: *See*—
Morrow, Darrell R.; and Morrow, Leslie D., 5,500,980, Cl. 16-16.000.

Mort, Nicholas A.: *See*—
Haviv, Foruna; Fitzpatrick, Timothy D.; Swenson, Rolf E.; Nichols, Charles J.; and Mort, Nicholas A., 5,502,035, Cl. 514-15.000.

Mortenson, Mark G.: *See*—
Dwivedi, Ratnesh K.; Becker, Kurt J.; White, Danny R.; Keck, Steven D.; and Mortenson, Mark G., 5,501,263, Cl. 164-97.000.

Morton International, Inc.: *See*—
Folsom, Marc D.; and Paxton, Donald J., 5,501,489, Cl. 280-743.100.
Saderholm, Davin G.; Rasmussen, Kirk; and Shaklik, Brian M., 5,501,484, Cl. 280-728.200.
Saderholm, Davin G.; Shaklik, Brian M.; and Rasmussen, Kirk H., 5,501,488, Cl. 280-739.000.

Morton, Kim L.: *See*—
Dinella, Donald; Lal, Sudarshan; Morton, Kim L.; and Nicol, David A., 5,501,777, Cl. 205-791.000.

Moss, Neil: *See*—
Adams, Julian; Beaulieu, Pierre L.; Déziel, Robert; DiMaio, John; Grenier, Louis; Lavallée, Pierre; and Moss, Neil, 5,502,036, Cl. 514-17.000.

Motes, Billy G.: *See*—
McManus, Gary J.; Motes, Billy G.; Bird, Susan K.; and Kotter, Dale K., 5,501,080, Cl. 62-55.500.

Motorola, Inc.: *See*—
Averbuch, Nimrod; and Schatz, Steven V., 5,502,752, Cl. 375-377.000.
Duna, Pak-Kong; Nip, Kwok-Ban; and Liu, Chi-Man, 5,502,410, Cl. 327-140.000.
Dworsky, Lawrence N.; and Jaskie, James E., 5,502,347, Cl. 313-309.000.
Fulghum, Tracy L., 5,502,722, Cl. 370-69.100.
Gehman, John B., Jr.; and O'Connell, Richard P., 5,501,006, Cl. 29-840.000.





Grube, Gary W.; and Markison, Timothy W., 5,502,831, Cl. 395-427.000.

Hall, Jeff W.; Barrow, Steven M.; Alberkrack, Jade H.; and Tisinger, Eric W., 5,502,370, Cl. 323-284.000.

Holm, Paige; and Gable, Benjamin W., 5,501,990, Cl. 437-23.000.

Killian, Maverick M., 5,502,751, Cl. 375-376.000.

Kolnick, Frank C., 5,502,839, Cl. 395-800.000.

Le, Chinh H.; Vauk, Gerald E., Jr.; and Downs, Terry E., 5,502,835, Cl. 395-496.000.

Li, Changming; Bai, Lijun; and Ke Lian, Keryn, 5,501,922, Cl. 429-218.000.

Marko, Paul D.; and Alton, Kenneth D., 5,502,437, Cl. 340-825.470.

Moyer, Curtis D.; Dworsky, Lawrence N.; and Kane, Robert C., 5,502,348, Cl. 313-310.000.

Newell, Michael; Sokola, Raymond; and Heine, David, 5,502,422, Cl. 333-207.000.

Park, Sangil, 5,502,717, Cl. 370-32.100.

Pelley, Perry H., III; and Ghassemi, Hamed, 5,502,676, Cl. 365-200.000.

Stuhlmiller, Gary L., 5,502,413, Cl. 327-361.000.

Swirbel, Thomas J., 5,501,943, Cl. 430-313.000.

Traynor, Kevin M.; and Hsu, Hengwei, 5,502,406, Cl. 326-68.000.

Mount Sinai Hospital Corporation: *See*—
Dennis, James W.; Siminovitch, Krtherine A.; and Datti, Alessandro, 5,501,957, Cl. 435-15.000.

Moyer, Curtis D.; Dworsky, Lawrence N.; and Kane, Robert C., to Motorola, Inc. Ballistic charge transport device with integral active contaminant absorption means. 5,502,348, Cl. 313-310.000.

Moynihan, Edward R.; Hoisington, Paul A.; and Gailus, David W., to Spectra, Inc. Method of making a perovskite thin-film ink jet transducer. 5,500,988, Cl. 29-25.350.

Mozingo, Robert E., to Case Corporation. Anti-rollback mechanism for a loader mechanism of an off-highway implement. 5,501,570, Cl. 414-700.000.

Mronga, Norbert: *See*—
Schmid, Raimund; Mronga, Norbert; Ostertag, Werner; and Schmidt, Helmut, 5,501,731, Cl. 106-417.000.

Mróz, Jerzy: *See*—
Kiedik, Maciej; Krueger, Andrzej; Kolt, Józef; Korek, Antoni; Balcerowiak, Wojciech; Hetper, Jacek; Majchrzak, Maria; Niedziela, Jan; Kościuk, Ryszard; Rzodeczko, Anna; Mróz, Jerzy; and Swiderski, Zbigniew, 5,502,016, Cl. 502-11.000.

MTU Motoren- und Turbinen-Union Friedrichshafen GmbH: *See*—
Leicht, Werner; Koch, Dietrich; and Giesselmann, Juergen, 5,501,122, Cl. 74-606.00R.

Mudge, Paul R.; Leighton, John C.; Wanigatunga, Sirisoma; and Morawsky, Natalie, to National Starch and Chemical Investment Holding Corporation. Emulsion polymers for use in hair fixatives. 5,501,851, Cl. 424-70.160.

Mudra, Robert E. Three wire television remote control operable with key closures or data pulses. 5,502,513, Cl. 348-734.000.

Mueller, Eric J.; Benting, Gary M.; Abraham, Leslie R.; and Dretzka, Phillip C., to Wenger Corporation. Modularized visual training aid for classroom instruction. 5,501,603, Cl. 434-419.000.

Mueller, James P.: *See*—
Bellio, Stephen L.; Condon, Mark J.; and Mueller, James F., 5,501,148, Cl. 101-232.000.

Mueller, Klaus: *See*—
Gremion, François; Issartel, Jean-Paul; and Mueller, Klaus, 5,501,786, Cl. 205-109.000.

Mueller, Richard A.: *See*—
Khanna, Ish K.; Mueller, Richard A.; and Weier, Richard M., 5,502,193, Cl. 546-116.000.

Muetschele, Ulrich; and Schindler, Harald, to Robert Bosch GmbH. Blocking device for tool holder of hand power tool and hand power tool provided therewith. 5,501,555, Cl. 408-241.00R.

Muhn-Seipoldy, Hans-Peter: *See*—
Bohlmann, Rolf; Kunzer, Hermann; Muhn-Seipoldy, Hans-Peter; Nishino, Yukishige; and Schneider, Martin, 5,502,046, Cl. 514-182.000.

Mukai, Takanori: *See*—
Kaburagi, Yoshiaki; Shoda, Shoichiro; Kimura, Tetsuo; Ara, Yoji; Mukai, Takanori; Nakamura, Masaaki; and Yokoi, Katsuyuki, 5,502,475, Cl. 347-102.000.

Mukawa, Hiroshi, to Sony Corporation. Disc table for disc recording/reproducing apparatus and method for producing same. 5,501,760, Cl. 156-305.000.

Mulcahey, Charles E.: *See*—
Porter, Michael R.; Mulcahey, Charles E.; and Kirby, John J., 5,501,164, Cl. 112-176.000.

Mullenbach, Guy: *See*—
Haigwood, Nancy L.; Afting, Ernest-Guenter; Mullenbach, Guy; and Paques, Eric P., 5,501,853, Cl. 424-94.640.

Muller, Arno, to Pitney Bowes Inc. Method and apparatus for testing an NVM. 5,502,813, Cl. 395-183.010.

Müller, Harald; and Ueba, Yoshinobu, to Sumitomo Electric Industries, Ltd. Organic superconductor and process for producing the same. 5,501,778, Cl. 204-157.620.

Muller, Robert E.; Tinari, Robert; and Canestrale, David J., Jr. Combination drinking cup and megaphone. 5,501,363, Cl. 220-630.000.

Müller, Wolfgang; and Wunderlin, Viktor, to Inventio AG. Cableless elevator system. 5,501,295, Cl. 187-406.000.

Munk, Michael. Ultrasonic fogging device with agitation chamber. 5,501,401, Cl. 239-431.000.

Muñoz, Jose C., to McGuire-Nicholas Company, Inc. Modular utility belt. 5,501,379, Cl. 224-240.000.

Munro, Eric: *See*—
Meisburger, Dan; Brodie, Alan D.; Chadwick, Curt; Desai, Anil; Dohse, Hans; Emge, Dennis; Greene, John; Johnson, Ralph; Ling, Ming-Yie; McMurtry, John; Becker, Barry; Paul, Ray; Robinson, Mike; Simmons, Richard; Smith, David E. A.; Taylor, John; Veneklasen, Lee; Walters, Dean; Wieczorek, Paul; Wong, Sam; Dutta, April; Lele, Surendra; Rough, Kirkwood; Pearce-Percy, Henry; Jau, Jack Y.; Lin, Chun C.; Nguyen, Hoi T.; Oyang, Yen-Jen; Hutcheson, Timothy L.; Clark, David J.; Pan, Chung-Shih; Bhaskar, Chetana; Kirk, Chris; Munro, Eric; Gibilisco, John; and Sandland, Paul, 5,502,306, Cl. 250-310.000.

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Kita, Shinji; Ogatsu, Hitoshi; and Murai, Kazumasa, 5,502,579, Cl. 358-518.000.

Murai, Toshinari; Iino, Eiichi; Arai, Hideo; Fusegawa, Izumi; and Yamagishi, Hirotoshi, to Shin-Etsu Handotai Co., Ltd. Method of growing silicon single crystals. 5,501,172, Cl. 117-15.000.

Murakami, Katsuhiko: *See*—
Yamaoka, Yuichi; Murakami, Katsuhiko; and Suzuki, Mikio, 5,501,430, Cl. 266-236.000.

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Arata, Katsumi; Yoshida, Shinichi; and Muramatsu, Tsuyoshi, 5,502,834, Cl. 395-496.000.

Murase, Hiroshi, to NEC Corporation. Method of forming flat surface of insulator film of semiconductor device. 5,502,007, Cl. 437-225.000.

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Muratore, Anthony J., III: *See*—
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Marshall, David L., 5,501,949, Cl. 435-5.000.

Murobushi, Hidenobu: *See*—
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Murphy, Thomas S.: *See*—
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Murray, David L.: *See*—
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Murschall, Ursula: *See*—
Schulhmann, Detlef E.; Dries, Thomas; Wilhelm, Adolf; Scheidecker, Dieter; Lohmann, Harald; Murschall, Ursula; Peiffer, Herbert; and Schloegl, Gunter, 5,501,901, Cl. 428-323.000.

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Musig Tuning Corporation: *See*—
Gannon, J. William; and Weyler, Rex A., 5,501,130, Cl. 84-454.000.

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Muta, Junji; and Furuta, Yoshiaki, to Sumitomo Wiring Systems, Ltd. L-shaped bulb socket. 5,501,618, Cl. 439-699.200.

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Mutek Analytic GmbH: *See*—
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Muth, Dorel; and McGuinness, Dennis, to Babcock & Wilcox Company, The. Titanium tube seal welding head enclosure. 5,501,389, Cl. 228-29.000.

Muth, Ross R.: *See*—
Liu, Cheng-Kung; Bennett, Steven L.; Kennedy, John; Kaplan, Donald S.; and Muth, Ross R., 5,502,159, Cl. 528-354.000.

Muto, Kiyoshi, to Brother Kogyo Kabushiki Kaisha. Image fixing heater having standby temperature control. 5,502,546, Cl. 355-208.000.

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Mycone Dental Supply Co.: *See*—
Spielberg, Jerry, 5,501,666, Cl. 604-68.000.

Myerson, Joel, to Hewlett Packard Company. Entrapped non-enzymatic macromolecules for chemical sensing. 5,501,836, Cl. 422-57.000.

Myokan, Kenichi, to Fujitsu Limited. Spindle motor of disk apparatus including an improved spindle hub. 5,502,605, Cl. 360-99.080.

Myrick, Thomas: *See—*
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Nagai, Takayuki: *See—*
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Nagamine, Akira: *See—*
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Nagano, Toru: *See—*
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Nagashima, Shingo: *See—*
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Nagashima, Tetsuya: *See—*
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Nagel, Scott, to Sencore, Inc. Method and apparatus for controlling expanded sweeps. 5,502,511, Cl. 348-704.000.

Nagel, Thomas O.; and Ellis, Daniel J., to Trion Industries, Inc. High speed, high accuracy parts counting system. 5,502,755, Cl. 377-6.000.

Nagy, Michael J.: *See—*
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Naik, Jayant: *See—*
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Naito, Yasuo; Doi, Hideki; and Fujimoto, Chialki, to Mitsubishi Denki Kabushiki Kaisha. Torsion torque detecting device, a slip detecting device, a road friction coefficient detecting device and a torsion torque detecting method. 5,501,109, Cl. 73-862.191.

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Nakahata, Hideaki: *See—*
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Nakajima, Atsushi: *See—*
Matsumoto, Shinji; Nakajima, Atsushi; Maejima, Katsumi; Kawakami, Sota; and Nakatani, Koichi, 5,501,937, Cl. 430-200.000.

Nakajima, Hiroshi: *See—*
Iwata, Ken; Katayama, Tatsuo; and Nakajima, Hiroshi, 5,501,965, Cl. 435-94.000.

Nakajima, Takeo: *See—*
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Nakajo, Yukihisa, to Yamaha Corporation. Optical disc recording device using basic recording information and projection time control. 5,502,702, Cl. 369-58.000.

Nakamichi Corporation: *See—*
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Nakamichi Yamasaki: *See—*
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Nakamura, Hiroya: *See—*
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Nakamura, Isao: *See—*
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Nakamura, Kenji: *See—*
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Nakamura, Masaaki: *See—*
Kaburagi, Yoshiaki; Shoda, Shoichiro; Kimura, Tetsuo; Ara, Yoji; Mukai, Takaaori; Nakamura, Masaaki; and Yokoi, Katsuyuki, 5,502,475, Cl. 347-102.000.

Nakamura, Masaharu: *See—*
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Nakamura, Norio: *See—*
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Nakamura, Shuichi: *See—*
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Nakamura, Shunji, to Fujitsu Limited. Method of manufacturing bipolar transistor having ring-shaped emitter and base. 5,501,992, Cl. 437-31.000.

Nakamura, Tomokazu: *See—*
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Nakamura, Yoshinori: *See—*
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Nakanishi, Teruo, 5,501,048, Cl. 52-296.000.

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Nakano, Masao: *See—*
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Nakano, Yoshitomo: *See—*
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Nakasu, Masatoshi: *See—*
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Nakasuji, Kazuyuki; and Takashima, Masaki, to Sumitomo Metal Industries, Ltd.; and Sanyo Special Alloys, Ltd. Nonmagnetic ferrous alloy with excellent corrosion resistance and workability. 5,501,834, Cl. 420-36.000.

Nakata, Tetsuro; and Ueta, Motomu, to Sony Corporation. Special effect video apparatus for achieving extended dimming and fading effects. 5,502,505, Cl. 348-595.000.

Nakata, Tsuneo, to Fujitsu Limited. Method of testing for stuck-at fault in a synchronous circuit. 5,502,729, Cl. 371-22.300.

Nakatani, Koichi: *See—*
Matsumoto, Shinji; Nakajima, Atsushi; Maejima, Katsumi; Kawakami, Sota; and Nakatani, Koichi, 5,501,937, Cl. 430-200.000.

Nakatsu, Kimihide: *See—*
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Nakatsuji, Masahiro: *See—*
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Nakaya, Chisose; Bito, Yoshitaka; Yamamoto, Etsuji; Nishimura, Hiroshi; Takeuchi, Hiroyuki; Watanabe, Shigeru; Miyajima, Akihiro; and Arai, Hitoshi, to Hitachi, Ltd.; and Hitachi Medical Corporation. Image reconstruction method in nuclear magnetic resonance imaging apparatus. 5,502,384, Cl. 324-309.000.

Nakaya, Teruomi: *See—*
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Nakayama, Hiroo, to Tefco International Co., Ltd. Process for manufacturing electroformed patterns. 5,501,785, Cl. 205-67.000.

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Ukai, Hidehito; Kometani, Kazuo; Horie, Kazuyuki; and Nakayama, Toshiaki, 5,502,283, Cl. 181-228.000.

Nakayama, Toshimasa: *See—*
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Nakayama, Yoshiaki: *See—*
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Nakayoshi, Hideki: *See—*
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Nakazato, Atsuro; Sekiguchi, Yoshinori; Kawashima, Yutaka; and Hatayama, Katsuo, to Taisho Pharmaceutical Co., Ltd. Aminoalkylthiazole derivative. 5,502,202, Cl. 548-198.000.

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Nalco Chemical Company: *See—*
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Nanbu, Yasuo; and Yoshida, Makoto, to Matsushita Electric Industrial Co., Ltd. Driving control apparatus of motor-driven compressor utilized for automobile. 5,502,365, Cl. 318-798.000.

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Nanni, Edward J.: *See—*
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Narabu, Shin-ichi: *See—*
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Narumiya, Junichi: *See—*
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National Aerospace Laboratory of Science & Technology: *See—*
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National Health Equipment, Inc.: *See—*
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National Laboratory for High Energy Physics: *See—*
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National Science Council: *See—*
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Nazarian, Hagop: *See—*
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NCR Corporation: *See—*
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Koshikawa, Yasuji, 5,502,684, Cl. 365-230.060.
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Sukegawa, Osamu; and Ihara, Hirobumi, 5,502,583, Cl. 359-59.000.
Takano, Hajime, 5,502,809, Cl. 395-164.000.
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Nelson, Steven K.: *See—*
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Neukirchinger, Peter: *See—*
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New England Medical Center Hospital: *See—*
Selker, Harry P.; and Griffith, John L., 5,501,229, Cl. 128-696.000.

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Gayfer, Robert, 5,501,513, Cl. 303-73.000.

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Nichols, Lawrence R., to Davidson Textron Inc. Method of manufacturing a trim panel using core block spacer means. 5,501,829, Cl. 264-261.000.

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Nidek Co., Ltd.: *See*—
Hosoi, Yoshinobu, 5,502,519, Cl. 351-204.000.
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Yasagi, Akihiko; Watanabe, Yukiyoshi; and Narabu, Shin-ichi, 5,502,204, Cl. 548-251.000.

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Imai, Yuji; Tanaka, Yasuaki; and Wakamoto, Shinji, 5,502,311, Cl. 250-548.000.
Kanno, Hideo; and Nasu, Nobuyoshi, 5,502,599, Cl. 359-827.000.
Katano, Yuji, 5,502,526, Cl. 354-288.000.
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Kikuchi, Teishin; Yamauchi, Hiroyuki; Furuya, Seiichi; and Kan, Kenichi, 5,501,120, Cl. 74-543.000.

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Tsukada, Katsumi; Nakamura, Norio; Nimura, Minoru; Suemori, Hiroyuki; Kamihata, Tomio; and Yamazaki, Mutsuaki, 5,502,617, Cl. 361-686.000.

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Abe, Tetsuya; Ishii, Kazuhiko; and Yokoshima, Minoru, 5,502,083, Cl. 522-31.000.

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Fuse, Toshihiko; and Okumachi, Eiji, 5,501,470, Cl. 277-96.100.
Ohba, Kanji; Nakajima, Takeo; and Tamura, Yuichi, 5,501,471, Cl. 277-96.100.

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Yoshida, Mitsuhiro; Sato, Susumu; and Nanno, Hisashi, 5,502,149, Cl. 528-60.000.

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Kanehara, Kenji; Igashira, Toshihiko; Watanabe, Ikuo; Okada, Masanori; and Matsudaira, Jun-ichi, 5,501,194, Cl. 123-470.000.

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Ishiguro, Ginya; Muta, Toshiyasu; Sakita, Kazutaka; Miyaguchi, Shoji; Okamoto, Tatsuaki; and Fujioka, Atsushi, 5,502,765, Cl. 380-24.000.

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Agari, Norimasa; and Kuwahara, Hideki, 5,501,528, Cl. 384-45.000.

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Imai, Hiroshi, 5,502,399, Cl. 324-765.000.
Iritani, Kunio; and Isaji, Akira, 5,501,267, Cl. 165-29.000.
Kato, Yoshihiro; Hotta, Toshiaki; and Shimizu, Masaki, 5,502,424, Cl. 335-284.000.
Katoh, Akio; and Abe, Nobuo, 5,502,351, Cl. 313-141.000.
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Koyama, Nobuhiko, 5,501,198, Cl. 123-520.000.
Ukai, Hidehito; Kometani, Kazuo; Horie, Kazuyuki; and Nakayama, Toshiaki, 5,502,283, Cl. 181-228.000.
Yamamoto, Shinya; Yamada, Kiyohiro; Fukanuma, Tetsuhiko; Watanabe, Yasushi; Hisanaga, Shigeru; Nagasaku, Eiichi; and Iwanami, Shigeki, 5,501,584, Cl. 418-15.000.
Yamashita, Yukihiro; Iida, Hisashi; and Honjoh, Keiji, 5,501,204, Cl. 123-588.000.

Nisato, Dino: *See*—
Baroni, Marco; Croci, Tiziano; Landi, Marco; Guzzi, Umberto; and Nisato, Dino, 5,502,063, Cl. 514-318.000.

Nishi, Manabu: *See*—
Funami, Yasuo; Nishi, Manabu; Watanabe, Yoshimi; and Senda, Shunya, 5,502,383, Cl. 324-251.000.

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Takase, Akira; Kai, Hiroyuki; Nishida, Kuniyoshi; and Masui, Moriyasu, 5,502,252, Cl. 564-169.000.

Nishido, Kazuhiro: *See*—
Iwata, Naoki; Saito, Takeshi; Yano, Hidetoshi; Takagaki, Hiromitsu; Nishido, Kazuhiro; Komuro, Ichiro; Sawa, Shigeki; and Shima, Nobuhiro, 5,502,552, Cl. 355-259.000.

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Nishikawa Rubber Co., Ltd.: *See*—
Yamasaki, Nakamichi; Tsuda, Kenji; Okuda, Hiroyuki; and Tenno, Toshinari, 5,502,262, Cl. 585-241.000.

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Komma, Yoshiaki; and Nishino, Seiji, 5,502,707, Cl. 369-103.000.

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Bohlmann, Rolf; Kunzer, Hermann; Muhn-Seipoldy, Hans-Peter; Nishino, Yukishige; and Schneider, Martin, 5,502,046, Cl. 514-182.000.

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Nagaoka, Takashi; Ueda, Shinjiro; Sakagami, Seiji; Nishiuchi, Akira; and Sakurai, Hirofumi, 5,501,583, Cl. 417-423.400.

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Nishizawa, Hiroshi; Saitoh, Takayuki; Itoh, Tatsuo; and Mashita, Kiyotaka, to Goi Chemical Company, Ltd. Method of preparing unsaturated dimers of α-methylstyrenes. 5,502,264, Cl. 585-406.000.

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Wakahara, Tatsuo, 5,501,311, Cl. 192-85.00R.
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Nissei ASB Machine Co., Ltd.: *See*—
Orimoto, Hiroyuki; Suzuki, Saburo; and Amari, Fumiya, 5,501,590, Cl. 425-526.000.

Nissin Electric Co., Ltd.: *See*—
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Nitsch, Christian: *See*—
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Nitta, Kumiko: *See*—
Iwamoto, Toshiro; Fujie, Akihiko; Nitta, Kumiko; Tsurumi, Yasuhisa; Shigematsu, Nobuharu; Kasahara, Chiyoshi; Hino, Motohiro; and Okuhara, Masakuni, 5,502,033, Cl. 514-11.000.

Nitto Denko Corporation: *See*—
Ichikawa, Hiroki; Aizawa, Kaoru; and Okuno, Toshimitsu, 5,501,897, Cl. 428-261.000.
Ohura, Masahiro; Yoshikawa, Takao; Tokunaga, Yasuyuki; Moriyama, Takaaki; and Inoue, Tetsuo, 5,502,085, Cl. 522-106.000.

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Ando, Seigo; and Matsufuji, Yasuhiro, 5,502,382, Cl. 324-242.000.
Inoue, Tadashi; Tsuru, Kiyoshi; Okita, Tomoyoshi; and Hiasa, Michihito, 5,501,749, Cl. 148-621.000.
Yamaoka, Yuichi; Murakami, Katsuhiko; and Suzuki, Mikio, 5,501,430, Cl. 266-236.000.

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Iida, Yasunchu; Honda, Satoru; Asai, Sachio; Nakamura, Isao; Noguchi, Hidenori; and Tomioka, Takao, 5,501,780, Cl. 204-192.150.

Nokia Mobile Phones (U.K.) Limited: *See*—
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Pohjakallio, Pekka, 5,502,721, Cl. 370-60.100.
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Liang, Shaowo; Price, Timothy W.; Nolen, Timothy R.; Compton, Daniel B.; and Attride, David C., 5,502,257, Cl. 568-433.000.

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Noone, Michael J.: *See*—
Hannah, Marcia G.; Mehrer, George W.; Noone, Michael J.; Stahl, Kermit E.; and Quaranta, Joseph, 5,501,056, Cl. 52-748.100.

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Garceau, Bernard F., 5,501,428, Cl. 254-424.000.

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Erkkila, Ruth M.; Carlson, James G.; Evans, Christopher M.; Greczyna, James A.; Kumar, Ramesh C.; Norman, Colin F.; and Rotto, Nelson T., 5,501,903, Cl. 428-328.000.

Norris, David E.: *See*—
Schnizlein, Paul G.; and Norris, David E., 5,502,409, Cl. 327-99.000.

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Breivik, Harald; Borretzen, Bernt; Dahl, Knut H.; Krokan, Hans E.; and Bonaa, Kaare H., 5,502,077, Cl. 514-560.000.
Gjestland, Haavard; and Westengen, Håkon, 5,501,748, Cl. 148-538.000.

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Wu, Chi, 5,502,783, Cl. 385-42.000.

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Larson, John; and Raum, Jack R., 5,501,319, Cl. 198-778.000.

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McGill, Robert E., 5,502,387, Cl. 324-318.000.

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Marks, Tobin J.; Ja, Li; and Yang, Xinmin, 5,502,017, Cl. 502-103.000.

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Lermite, Christophe; Amande, Jean-Claude; Chambon, Bernard; and Larue, Joseph, 5,501,776, Cl. 203-18.000.

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Starnes, Robert L.; Trackman, Philip C.; and Katkocin, Dennis M., 5,501,968, Cl. 435-193.000.

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Rosen, Jonathan J.; Hillstead, Richard A.; Weldon, Thomas D.; Larsen, Charles E.; and Williams, David O., 5,501,671, Cl. 604-168.000.

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Matsumoto, Masahiro; and Nozue, Kazunobu, 5,501,624, Cl. 440-88.000.

NSK Ltd.: *See*—
Asai, Hiromitsu; and Uchiyama, Takahiko, 5,501,526, Cl. 384-13.000.
Nagai, Kenichi; Miyazaki, Hiroya; and Mitsue, Naoki, 5,501,530, Cl. 384-516.000.

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Ueshima, Toshihumi; Hasegawa, Ko; Teramoto, Toshio; Nakajima, Tatsuo; and Konomoto, Takeyoshi, 5,502,095, Cl. 524-269.000.

Nuckolls, Hugh E.: *See*—
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Hosoda, Hiroshi; Numata, Remi; Doi, Kousuke; Tokutake, Nobuo; Kohara, Hidekatsu; and Nakayama, Toshimasa, 5,501,936, Cl. 430-191.000.

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Cheng, Jane; Martinez, Edgar; and Naik, Jayant, 5,502,759, Cl. 379-88.000.

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Simpson, Richard; and Oakland, Erick, 5,502,401, Cl. 326-38.000.

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Kita, Shinji; Ogatsu, Hitoshi; and Murai, Kazumasa, 5,502,579, Cl. 358-518.000.

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Kawasa, Eishirou; Ogawa, Hitoshi; Ishida, Koichi; and Aoki, Kazuo, 5,501,629, Cl. 451-28.000.

Ogawa, Shinzou: *See—*
Naruse, Katsuhiko; Ogawa, Shinzou; Watanabe, Yukio; and Shimizu, Fukumi, 5,502,650, Cl. 364-508.000.

Ogawa, Tetsuyuki; and Nakayoshi, Hideki, to Aisin Seiki Kabushiki Kaisha. Oil pump having a sealing mechanism for a pumping chamber. 5,501,585, Cl. 418-171.000.

Ogawa, Yasuji; and Yoichi, Hideo, to Wacom Co., Ltd. Optical position detecting unit, optical coordinate input unit and optical position detecting method employing a pattern having a sequence of 1's and 0's. 5,502,568, Cl. 356-375.000.

Ogihara, Nobuaki, to Hasbro, Inc. Game apparatus. 5,501,457, Cl. 273-127.00C.

Ogino, Masaaki: *See—*
Shioyama, Tsutomu; Hamano, Naoki; and Ogino, Masaaki, 5,501,908, Cl. 428-395.000.

Ogino, Shinji; Urushidani, Tatsuo; and Kanemaru, Hiroshi, to Fuji Electric Co., Ltd. Silicon carbide electronic device manufacturing method. 5,502,003, Cl. 437-189.000.

Ogiri, Tadakazu: *See—*
Hayashi, Shigeki; Ueda, Hiroyuki; Ogiri, Tadakazu; Kotera, Shinichi; Morishita, Hiroki; Moriuchi, Yasuhiko; Yasuda, Kohichi; and Ishida, Naoyuki, 5,502,554, Cl. 355-271.000.

Oguchi, Takahiro; *See—*
Washizawa, Teruyoshi; Hatanaka, Katsunori; Sakai, Kunihiro; Oguchi, Takahiro; Yamano, Akihiko; and Shido, Shunichi, 5,502,710, Cl. 369-124.000.

Ohba, Kanji; Nakajima, Takeo; and Tamura, Yuichi, to Nippon Pillar Packing Co., Ltd. Mechanical seal with blade-like sealing end. 5,501,471, Cl. 277-96.100.

Ohmae, Katsuhiko: *See—*
Fujita, Osamu; and Ohmae, Katsuhiko, 5,501,486, Cl. 280-735.000.

Ohnamyuda, Yukio; Kimura, Shigeru; Tanabe, Toru; Iwasaki, Kazuhisa; Seto, Takao; Kitamura, Hideki; and Senoo, Yasushi, to Stanley Electric Co., Ltd. Apparatus and method of warning rear-end collision. 5,502,432, Cl. 340-436.000.

Ohmori, Kiyoshi, to Sony Corporation. Disc recording and/or reproducing apparatus. 5,502,704, Cl. 369-77.200.

Ohnaka, Kiyoshi: *See—*
Kidoguchi, Isao; Ohnaka, Kiyoshi; Adachi, Hideto; Kamiyama, Satoshi; Mannou, Masaya; and Uenoyama, Takeshi, 5,502,739, Cl. 372-45.000.

Ohnishi, Naoki: *See—*
Okude, Akio; Yamauchi, Tokushi; Mitsuyasu, Kei; Kuroki, Yoshifumi; Ohnishi, Naoki; and Kiyozumi, Katsuyuki, 5,502,423, Cl. 315-291.000.

Ohnishi, Shuichi; and Suzuki, Atsushi, to Terumo Kabushiki Kaisha. Heater element for a tube connecting device. 5,502,293, Cl. 219-543.000.

Ohno, Kazunori; and Tanaka, Yasuhiko, to Fuji Photo Optical Co., Ltd. Inverted Galilean finder for camera. 5,502,523, Cl. 354-219.000.

Ohnsorge, Horst, to Alcatel SEL Aktiengesellschaft. Optical network including branch points featuring three interconnected bidirectional optical waveguides having free ends with reflectionless terminations. 5,502,586, Cl. 359-117.000.

Ohshita, Youichi: *See—*
Koyanagi, Osamu; Hirasawa, Kunio; Tsukushi, Masanori; Kurosawa, Yukio; Sato, Tadashi; and Ohshita, Youichi, 5,502,290, Cl. 218-78.000.

Ohtori, Akira; Andoh, Masako; and Morita, Yasushi, to Senju Pharmaceutical Co., Ltd. Controlled-release pharmaceutical preparation for intra-ocular implant. 5,501,856, Cl. 424-428.000.

Ohtsubo, Shinji, to NGK Insulators, Ltd. Ceramic parts having small hole(s) and method of manufacturing the same. 5,501,892, Cl. 428-131.000.

Ohtsuka, Shuichi: *See—*
Yoda, Akira; Usami, Yoshinori; and Ohtsuka, Shuichi, 5,502,580, Cl. 358-518.000.

Ohuchi, Hirofumi: *See—*
Miyoshi, Sotsuo; Okada, Hidetoshi; Kako, Hajime; Ohuchi, Hirofumi; Kawamura, Satoshi; and Miyake, Toshihiko, 5,501,201, Cl. 123-571.000.

Ohura, Masahiro; Yoshikawa, Takao; Tokunaga, Yasuyuki; Moriyama, Takaaki; and Inoue, Tetsuo, to Nitto Denko Corporation. Pressure-sensitive adhesive having excellent heat-resistance, adhesive sheets thereof, and methods for producing them. 5,502,085, Cl. 522-106.000.

Oie, Yoshihiro; and Itatani, Hiroshi, to PI Material Research Laboratory. Process for preparing polyimide resins. 5,502,143, Cl. 528-12.000.

Oishi, Tomoji: *See—*
Ishikawa, Takao; Oishi, Tomoji; and Maekawa, Sachiko, 5,501,883, Cl. 428-1.000.

Oka, Koichiro: *See—*
Iguchi, Yuichiro; Kimura, Michio; and Oka, Koichiro, 5,502,141, Cl. 526-286.000.

Oka, Takayuki: *See—*
Miyawaki, Hiroshi; Oka, Takayuki; and Tsuji, Masaaki, 5,502,540, Cl. 355-22.000.

Okabayashi, Ichiro: *See—*
Kishi, Tetsuji; and Okabayashi, Ichiro, 5,502,733, Cl. 371-32.000.

Okada, Hidetoshi: *See—*
Miyoshi, Sotsuo; Okada, Hidetoshi; Kako, Hajime; Ohuchi, Hirofumi; Kawamura, Satoshi; and Miyake, Toshihiko, 5,501,201, Cl. 123-571.000.

Okada, Kunihiko: *See—*
Armstrong, Donald L.; Yoneda, Akiyoshi; and Okada, Kunihiko, 5,501,129, Cl. 83-848.000.

Okada, Masanori: *See—*
Kanehara, Kenji; Igashira, Toshihiko; Watanabe, Ikuo; Okada, Masanori; and Matsudaira, Jun-ichi, 5,501,194, Cl. 123-470.000.

Okada, Masatoshi: *See—*
Sonoyama, Mitsuyoshi; Suzuki, Kentaro; Aihara, Masaki; Suzuki, Hirokatsu; Miyahara, Shoji; Kojima, Norio; and Okada, Masatoshi, 5,501,058, Cl. 53-204.000.

Okada, Miyuki, to Sony Corporation. Video camera and video signal reproducing apparatus with shake detection and correction operation. 5,502,484, Cl. 348-208.000.

Okada, Takashi: *See—*
Puchikami, Takamasa; Wakasa, Noriko; He, De-Hua; Miyake, Takanori; Okada, Takashi; Fujimura, Atsushi; Sasakibara, Hiroyuki; Kanou, Yoshiaki; and Saito, Toshihiro, 5,502,217, Cl. 549-325.000.

Okamoto, Masaya; and Kasezaki, Takashi, to Idemitsu Petrochemical Co., Ltd. Resin composition containing a polycarbonate-polydimethylsiloxane. 5,502,134, Cl. 524-537.000.

Okamoto, Masayoshi; Yoshikawa, Takatoshi; Ieda, Kazuhiro; and Horii, Hiroshi, to Sanyo Electric Co., Ltd. Hand written character input system/allowing change of size of character writing frames. 5,502,461, Cl. 345-173.000.

Okamoto, Osamu; and Nakaya, Teruomi, to National Aerospace Laboratory of Science & Technology. Three-dimensional free motion apparatus. 5,501,114, Cl. 73-865.600.

Okamoto, Ricardo M.; Matsumoto, Kouichi; Kotani, Isao; Kuroda, Satoshi; Ishikawa, Hiroyuki; and Fukui, Kenji, to Nippon Steel Corporation. Magnetic recording system for compensating leakage flux. 5,502,693, Cl. 369-13.000.

Okamoto, Tatsuaki: *See—*
Ishiguro, Ginya; Muta, Toshiyasu; Sakita, Kazutaka; Miyaguchi, Shoji; Okamoto, Tatsuaki; and Fujioka, Atsushi, 5,502,765, Cl. 380-24.000.

Okamoto, Yoshihiko, to Hitachi, Ltd. Method of forming light beam and method of fabricating semiconductor integrated circuits. 5,502,001, Cl. 437-173.000.

Okamura, Naomi; Hino, Takao; Nimura, Akio; Fukai, Masayuki; Shimizu, Keizi; Teramae, Harumi; and Hata, Chiaki, to Taoka Chemical Company, Limited. Container with nozzle cap. 5,501,370, Cl. 222-111.000.

Okawa, Takashi; Aoki, Toshinari; Matsunaga, Hiroshi; and Igarashi, Hideo, to Mitsubishi Gas Chemical Company, Inc. Process for producing isocyanates. 5,502,244, Cl. 560-345.000.

Okazaki, Taizo: *See—*
Ebe, Akinori; Ogata, Kiyoshi; Nishiyama, Satoshi; Kuratani, Naoto; and Okazaki, Taizo, 5,501,911, Cl. 428-457.000.

Oketani, Toshikazu: *See—*
Miyashita, Yukio; Shimasaki, Yuichi; Oketani, Toshikazu; Hatcho, Seiji; Matsumoto, Seiji; Aoki, Takuya; Saito, Akihisa; Komatsuda, Takashi; and Kato, Hiroaki, 5,501,073, Cl. 60-284.000.

Oki Electric Industry Co., Ltd.: *See—*
Matsui, Katsuaki; Miyamoto, Sampei; and Kikuchi, Hidekazu, 5,502,415, Cl. 327-536.000.
Takahashi, Shinya, 5,502,677, Cl. 365-201.000.
Yi, Jie, 5,502,790, Cl. 395-2.650.

Okita, Tomoyoshi: *See—*
Inoue, Tadashi; Tsuru, Kiyoshi; Okita, Tomoyoshi; and Hiasa, Michihito, 5,501,749, Cl. 148-621.000.

Okochi, Masaaki: *See—*
Nishimura, Masafumi; and Okochi, Masaaki, 5,502,791, Cl. 395-2.650.

Okubo, Akihiko; and Ito, Takeshi, to Yamaha Hatsudoki Kabushiki Kaisha. Lubricating system for engine. 5,501,190, Cl. 123-196.00M.

Okuda, Hiroyuki: *See—*
Yamasaki, Nakamichi; Tsuda, Kenji; Okuda, Hiroyuki; and Tenno, Toshiaari, 5,502,262, Cl. 585-241.000.

Okude, Akio; Yamauchi, Tokushi; Mitsuyasu, Kei; Kuroki, Yoshifumi; Ohnishi, Naoki; and Kiyozumi, Katsuyuki, to Matsushita Electric Works, Ltd. Discharge lamp lighting device. 5,502,423, Cl. 315-291.000.

Okuhara, Masakuni: *See—*
Iwamoto, Toshiro; Fujie, Akihiko; Nitta, Kumiko; Tsurumi, Yasuhisa; Shigematsu, Nobuharu; Kasahara, Chiyoshi; Hino, Motohiro; and Okuhara, Masakuni, 5,502,033, Cl. 514-11.000.

Okumachi, Eiji: *See—*
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Okumura, Yoshinori: *See—*
Hachisuka, Atsushi; and Okumura, Yoshinori, 5,502,324, Cl. 257-384.000.

Okuno, Toshimitsu: *See—*
Ichikawa, Hiroki; Aizawa, Kaoru; and Okuno, Toshimitsu, 5,501,897, Cl. 428-261.000.

Oldham, Ronald G.: *See—*
Hill, Ira; Malmborg, Bengt E.; Oldham, Ronald G.; Turner, James E.; Ellis, Michael P.; and Andersson, Sven-Börje, 5,501,236, Cl. 131-270.000.





Olexy, Anthony M.; Urbon, Michael P.; and Westlake, Paul D., to Eastman Kodak Company. Sorting apparatus and sorting and processing apparatus. 5,501,449, Cl. 271-292.000.

Olins, Peter O.: *See—*
Braford-Goldberg, Sarah R.; Easton, Alan M.; Klein, Barbara K.; McKearn, John P.; and Olins, Peter O., 5,501,962, Cl. 435-69.520.

Oliphant, Larry J., to Gillette Canada, Inc. Yarn coating assembly and applicator. 5,501,734, Cl. 118-234.000.

Olivier, Helene: *See—*
Chauvin, Yves; Einloft, Sandra; and Olivier, Helene, 5,502,018, Cl. 502-213.000.

Olliver, Richard, to Eastman Kodak Company. Photographic printer and method for automatically detecting panoramic format image frames. 5,502,541, Cl. 355-38.000.

Olmsted, Robert A.: *See—*
Boebert, William E.; Markham, Thomas R.; and Olmsted, Robert A., 5,502,766, Cl. 380-25.000.

Olsen, Floyd W., to International Business Machines Corporation. Adiabatic conductor analyzer method and system. 5,502,390, Cl. 324-537.000.

Olsen, Hans, to Coloplast A/S. Adapter for use in connection with ostomy equipment. 5,501,678, Cl. 604-344.000.

Olsen, Ib I. Fabrication of alkane polymer electrolyte. 5,501,921, Cl. 429-192.000.

Olympus Optical Co., Ltd.: *See—*
Kimura, Akiteru; Matsuzaki, Miki; Tanaka, Atsuhiko; and Inoue, Masatoshi, 5,502,598, Cl. 359-814.000.
Nagasaki, Tatsuo; Mori, Takeshi; and Adachi, Hideo, 5,502,488, Cl. 348-300.000.
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Omi, Junichi: *See—*
Amanuma, Tatsuo; Terui, Nobuhiko; Miyamoto, Hidenori; and Omi, Junichi, 5,502,536, Cl. 354-400.000.

Omron Corporation: *See—*
Kitagawa, Keiji; and Tani, Ikuo, 5,502,800, Cl. 395-133.000.
Sawada, Akira; Kumamoto, Hiroshi; and Suzuki, Takashi, 5,501,538, Cl. 400-304.000.

Onan, David D.; and Brake, Bobby G., to Halliburton Company. Combating lost circulation during the drilling of wells. 5,501,277, Cl. 166-293.000.

Onda, Kenichi: *See—*
Takahashi, Tadashi; Onda, Kenichi; Kanouda, Akihiko; Horie, Hideaki; Hagiwara, Syuya; Uchiyama, Noriyuki; and Saito, Sadamu, 5,502,430, Cl. 336-232.000.

Onitsuka, Yasuto, to Matsushita Electric Industrial Co., Ltd. Outer-lead bonding apparatus and method therefor. 5,501,004, Cl. 29-827.000.

Onitsuka, Yasuto, to Matsushita Electric Industrial Co., Ltd. Mounting device of electronic components and a mounting method. 5,501,005, Cl. 29-833.000.

Ono, Hitoshi: *See—*
Kai, Tsutomu; Murata, Kazuyuki; Kuwahara, Yasuhiro; Ono, Hitoshi; Mikami, Tsutomu; Suetake, Tomoko; and Kojima, Akio, 5,502,575, Cl. 358-405.000.

Ono, Toshinobu: *See—*
Roy, Rabindra K.; and Ono, Toshinobu, 5,502,730, Cl. 371-22.300.

Ono, Tosio, to Mitsubishi Denki Kabushiki Kaisha. Wafer aligning apparatus. 5,501,568, Cl. 414-417.000.

Ootani, Toshihiro; and Izumi, Takayoshi, to Toa Medical Electronics Co., Ltd. Automated immunochemical analyzer. 5,501,838, Cl. 422-65.000.

Optelecom, Inc.: *See—*
Smith, Ronald H., 5,502,782, Cl. 385-7.000.

Optiroc Oy Ab: *See—*
Björklund, Jan-Peter, 5,501,254, Cl. 141-65.000.

Ordelman, Hendrik J.; Temmink, Gerhard; Stokkers, Herman W. H.; and Braam, Harm. Auxiliary frame for a wheelchair and wheelchair for use with an auxiliary frame. 5,501,480, Cl. 280-304.100.

Ordonez, Kathy P.; and Salamone, Salvatore J., to Hoffmann-La Roche Inc. Dual analyte immunoassay for methamphetamine and amphetamine. 5,501,987, Cl. 436-534.000.

Orient Chemical Industries, Ltd.: *See—*
Sugawara, Shuji; Sukata, Kazuaki; and Yamanaka, Shun-ichiro, 5,501,932, Cl. 430-110.000.
Sukata, Kazuaki; Yamanaka, Shun-ichiro; and Sugawara, Shuji, 5,501,934, Cl. 430-110.000.

Origin Medsystems, Inc.: *See—*
Chin, Albert K., 5,501,653, Cl. 600-204.000.

Orimoto, Hiroyuki; Suzuki, Saburo; and Amari, Fumiya, to Nissei ASB Machine Co., Ltd. Apparatus for manufacturing biaxially oriented, thermally stable blown containers. 5,501,590, Cl. 425-526.000.

Orlando, Franklin P., to FMC Corporation. Continuous batch mix sprayer. 5,502,685, Cl. 366-132.000.

Ormat Industries Ltd: *See—*
Goldman, Daniel; Siniakevith, Boris; Doron, Benjamin; Bronicki, Lucien Y.; and Yaffe, Eli, 5,501,160, Cl. 110-229.000.

Osada, Naomi; Kohno, Toshiro; and Kanbe, Satoshi, to Victor Company of Japan, Ltd. Thermal transfer type color printer. 5,502,477, Cl. 347-176.000.

Osato, Yoichi, to Canon Kabushiki Kaisha. Method and apparatus for recording, reproducing and overwriting information on or from a magneto-optic disk having three magnetic layers. 5,502,692, Cl. 369-13.000.

Osawa, Sadao: *See—*
Kato, Eiichi; and Osawa, Sadao, 5,501,929, Cl. 430-49.000.

Oshkosh Truck Corporation: *See—*
Lanzdorf, Daniel J.; Betters, Thomas H.; Braun, Eric E.; Konop, Chad O.; and Steiner, James L., 5,501,567, Cl. 414-408.000.

Osterhout, Joseph C.; Hensley, Steven P.; Demetzensky, Alex; and Swanson, Howard E., to Joslyn Manufacturing Company. Secondary surge arrester with isolating and indicating features. 5,502,612, Cl. 361-117.000.

Ostertag, Werner: *See—*
Schmid, Raimund; Mronga, Norbert; Ostertag, Werner; and Schmidt, Helmut, 5,501,731, Cl. 106-417.000.

Ota, Akitsu: *See—*
Yoshida, Risaburo; Nakamura, Kiyotomo; Ota, Akitsu; and Taguchi, Mitsuaki, 5,501,350, Cl. 216-20.000.

Ota, Shuichi: *See—*
Senshu, Yoichirou; Ota, Shuichi; Fujii, Hiroshi; Uetake, Akihiro; Sawada, Takashi; Hasegawa, Shinichi; Suzuki, Kazuyoshi; and Morii, Tetsuro, 5,502,608, Cl. 360-132.000.

Othy, Inc.: *See—*
Salyer, Brian D., 5,501,686, Cl. 606-79.000.

Otsuka, Naoji: *See—*
Takahashi, Kazuyoshi; Otsuka, Naoji; Ebata, Tokihide; Hirabayashi, Hiromitsu; Tajika, Hiroshi; Koitabashi, Noribumi; Arai, Atsushi; Aono, Kenji; and Sugimoto, Hitoshi, 5,502,464, Cl. 346-25.000.

Otsuka Pharmaceutical Factory, Inc.: *See—*
Tanaka, Hiroshi; Morishige, Kozo; Watanabe, Katsushi; and Kashiyama, Shigetoshi, 5,501,887, Cl. 428-35.200.

Ott, Richard: *See—*
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Otvos, John W.: *See—*
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Ouderkirk, Andrew J.: *See—*
Hill, Jeffrey B.; Ouderkirk, Andrew J.; Stubbs, Daniel P.; Jackson, Robert S.; and Dunn, Douglas S., 5,501,944, Cl. 430-321.000.

Ouki, Yasuhiro: *See—*
Miyashita, Satoru; Atobe, Mitsuro; Karasawa, Yasushi; Takemoto, Kiyohiko; and Ouki, Yasuhiro, 5,502,470, Cl. 347-45.000.

Ouwendijk, Marja: *See—*
van den Bergh, Carlo J.; Kaiserman, Howard B.; and Ouwendijk, Marja, 5,501,820, Cl. 252-549.000.

Owen, Keith J.: *See—*
Hunt, Mark A.; Owen, Keith J.; and Hughes, Michael D., 5,502,627, Cl. 362-286.000.

Owen, William H.; and Jaffe, James M., to Xicor, Inc. Wireless powering and communication system for communicating data between a host system and a stand-alone device. 5,502,295, Cl. 235-380.000.

Owens, William M.; and Croston, Victor, to Globe Machine Manufacturing Company. Wooden I-beam assembly machine and control system therefor. 5,501,752, Cl. 156-64.000.

OxiDyn, Incorporated: *See—*
Kasting, John R., Jr.; and Potter, Ronald G., 5,501,844, Cl. 422-186.150.

Oyang, Yen-Jen: *See—*
Meisburger, Dan; Brodie, Alan D.; Chadwick, Curt; Desai, Anil; Dohse, Hans; Emge, Dennis; Greene, John; Johnson, Ralph; Ling, Ming-Yie; McMurtry, John; Becker, Barry; Paul, Ray; Robinson, Mike; Simmons, Richard; Smith, David E. A.; Taylor, John; Veneklasen, Lee; Walters, Dean; Wieczorek, Paul; Wong, Sam; Dutta, April; Lele, Surendra; Rough, Kirkwood; Pearce-Percy, Henry; Jau, Jack Y.; Lin, Chun C.; Nguyen, Hoi T.; Oyang, Yen-Jen; Hutcheson, Timothy L.; Clark, David J.; Pan, Chung-Shih; Bhaskar, Chetana; Kirk, Chris; Munro, Eric; Gibilisco, John; and Sandland, Paul, 5,502,306, Cl. 250-310.000.

Oyler, Patrick R.: *See—*
de Nevers, Clark C.; Nelson, Jeffrey L.; Newsome, Steven T.; Oyler, Patrick R.; and Patterson, Robert A., 5,501,132, Cl. 86-24.000.

Ozaki, Keiichi; Kato, Sanae; and Masuda, Yoshimi, to Yazaki Corporation. Wiring harness assembly for vehicles. 5,501,605, Cl. 439-34.000.

Ozaki, Shinji, to Sony Corporation. Radio receiver apparatus and phase correcting method thereof. 5,502,749, Cl. 375-368.000.

Ozeki, Yoshiro: *See—*
Baba, Yutaka; Usui, Toshinao; Kakigami, Takuji; Ozeki, Yoshiro; Tsukamoto, Katsura; Asaeda, Nobuyuki; and Itoh, Nobuyuki, 5,502,209, Cl. 548-454.000.

Ozguc, Ismail H., to Exar Corporation. Dual stage differential adaptive peak detector for data communications receivers. 5,502,746, Cl. 375-317.000.

Ozue, Tadashi: *See—*
Kohno, Takanobu; and Ozue, Tadashi, 5,502,603, Cl. 360-77.140.

P.I.V. S.A.: *See—*
Ducugnon, Jean; and Faure, Eugene, 5,501,469, Cl. 277-37.000.

Paakkunainen, Matti, to GS-Hydro Oy. Procedure and apparatus for forming a rectangular collar at the end of a pipe. 5,501,093, Cl. 72-123.000.

Paavola, Juha: *See—*
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Pac-Tec, Inc.: *See—*
Hedgewick, Peter, 5,502,593, Cl. 359-547.000.

Pacific Scientific Company: *See—*
Harrison, Charles; Peng, Zhi X.; Range, Gladys V.; and Morgan, Gary L., 5,501,113, Cl. 73-865.500.

Pahl, Heike L.: *See—*
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Pai Lung Machinery Mill Co., Ltd.: *See—*

Chen, Wan-Yih, 5,501,085, Cl. 66-104.000.
Paine, John B., III: *See—*
Augustine, Robert L.; Fournier, Jay A.; Paine, John B., III; Shafer, Kenneth H.; and Tanielyan, Setrak K., 5,502,019, Cl. 502-314.000.
Paladinetti, Anthony C., Jr.: *See—*
Brancher, rodney E.; and Paladinetti, Anthony C., Jr., 5,501,472, Cl. 277-178.000.
Palazzo, David T. Liquid storage tank sump. 5,501,243, Cl. 137-15.000.
Palfinger Aktiengesellschaft: *See—*
Wimmer, Eckhard, 5,501,346, Cl. 212-349.000.
Pall Corporation: *See—*
Pall, David B.; and Gsell, Thomas C., 5,501,795, Cl. 210-508.000.
Pall, David B.; and Gsell, Thomas C., to Pall Corporation. Device for depletion of the leucocyte content of blood and blood components. 5,501,795, Cl. 210-508.000.
Palm, Edward B. Inflatable restraint device and method of manufacturing same. 5,501,259, Cl. 156-156.000.
Palmieri, Vincenzo; Preciso, Renato; Ruzinov, Vladimir L.; Stark, Sergei Y.; and Kulik, Il'Ya I., to Istituto Nazionale Di Fisica Nucleare. Method of producing radiofrequency resonating cavities of the weldless type. 5,500,995, Cl. 29-599.000.
Pan, Chung-Shih: *See—*
Meisburger, Dan; Brodie, Alan D.; Chadwick, Curt; Desai, Anil; Dohse, Hans; Emge, Dennis; Greene, John; Johnson, Ralph; Ling, Ming-Yie; McMurtry, John; Becker, Barry; Paul, Ray; Robinson, Mike; Simmons, Richard; Smith, David E. A.; Taylor, John; Veneklasen, Lee; Walters, Dean; Wieczorek, Paul; Wong, Sam; Dutta, April; Lele, Surendra; Rough, Kirkwood; Pearce-Percy, Henry; Jau, Jack Y.; Lin, Chun C.; Nguyen, Hoi T.; Oyang, Yen-Jen; Hutcheson, Timothy L.; Clark, David J.; Pan, Chung-Shih; Bhaskar, Chetana; Kirk, Chris; Munro, Eric; Gibilisco, John; and Sandland, Paul, 5,502,306, Cl. 250-310.000.
Panaqiotis, Adamis: *See—*
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Pangborn, Donald R.: *See—*
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Panzani, Ivo: *See—*
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Panzer, Armin: *See—*
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Paolino, Gerald A., to Praxair Technology, Inc. System and method for operating an integrated gas turbine and cryogenic air separation plant under turndown conditions. 5,501,078, Cl. 62-21.000.
Pape, Kerstin; and Berneth, Horst, to Bayer Aktiengesellschaft. Process for the preparation of pyrazole azo dyestuffs. 5,502,172, Cl. 534-591.000.
Papeafuhs, Theodor: *See—*
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Paques, Eric P.: *See—*
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Laermer, Franz; and Schilp, Andrea, 5,501,893, Cl. 428-161.000.
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Roberts, Peter M.; Davidson, John B.; and Moon, C. Robert, 5,501,125, Cl. 81-177.850.
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Robins, Simon P.: *See*—
Daniloff, Yuri; Robins, Simon P.; Evans, Brian J.; Pratt, David A.; and Langard, Robert, 5,502,197, Cl. 546-281.000.
Robinson, Michael J.: *See*—
Woodruff, James R.; and Robinson, Michael J., 5,501,103, Cl. 73-514.290.
Robinson, Mike: *See*—
Meisburger, Dan; Brodie, Alan D.; Chadwick, Curt; Desai, Anil; Dohse, Hans; Emge, Dennis; Greene, John; Johnson, Ralph; Ling, Ming-Yie; McMurtry, John; Becker, Barry; Paul, Ray; Robinson, Mike; Simmons, Richard; Smith, David E. A.; Taylor, John; Veneklasen, Lee; Walters, Dean; Wieczorek, Paul; Wong, Sam; Dutta, April; Lele, Surendra; Rough, Kirkwood; Pearce-Percy, Henry; Jau, Jack Y.; Lin, Chun C.; Nguyen, Hoi T.; Oyang, Yen-Jen; Hutcheson, Timothy L.; Clark, David J.; Pan, Chung-Shih; Bhaskar, Chetana; Kirk, Chris; Munro, Eric; Gibilisco, John; and Sandland, Paul, 5,502,306, Cl. 250-310.000.
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Conte, Gino, 5,501,474, Cl. 280-11.200.
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Williamson, Cecil M., 5,501,102, Cl. 73-304.00R.
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Conway, Anthony J.; Conway, Philip J.; and Fryar, Richard D., Jr., 5,501,669, Cl. 604-97.000.
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Davis, John E., 5,502,309, Cl. 250-353.000.
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Rody, Jean: *See*—
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Rogers, Norman D.: *See*—
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Bricker, Mark C.; and Van Rheenen, Paul R., 5,502,089, Cl. 524-44.000.
LaFleur, Edward E.; Work, William J.; Amici, Robert M.; Bortnick, Newman M.; and Holy, Norman L., 5,502,106, Cl. 525-57.000.
Lange, Barry C.; Ashmore, John W.; Wissinger-Cornille, Jane; and Tice, Colin M., 5,502,027, Cl. 504-225.000.
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Kuga, Kaeko; and Uemura, Takuzo, 5,502,480, Cl. 348-46.000.
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Shimoji, Noriyuki; and Takasu, Hidemi, 5,502,668, Cl. 365-185.280.
Yoshimoto, Hisaya; Kambara, Shigeru; and Matsumoto, Ikuo, 5,502,344, Cl. 310-344.000.
Rohm, Gunter Horst: *See*—
Weichler, Helmut, 5,501,137, Cl. 92-5.00R.
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Rohrbacher, Richard D.; and Jacobson, Judith M., to Cyclone Surface Cleaning, Inc. Mobile cyclonic power wash system with water reclamation and rotary union. 5,500,976, Cl. 15-320.000.
Rohrbacher, Richard D.; and Jacobson, Judith M., to Cyclone Surface Cleaning, Inc. Mobile cyclonic power wash system with water reclamation and rotary. 5,501,396, Cl. 239-7.000.
Rokhvarg, Alexander, to Transistor Devices, Inc. Power factor corrected rectification. 5,502,630, Cl. 363-84.000.
Rokos, George A.: *See*—
Mennie, Douglas U.; Rokos, George A.; and Geib, Joseph J., 5,501,631, Cl. 453-3.000.
Rolfs, Andreas: *See*—
Scharfenberg, Peter; Liebacher, Jürgen; Knoll, Alexander; Uschmajew, Aleksej; Rolfs, Andreas; Lohman, Dieter; Faust, Gottfried; and Morgenstern, Eveline, 5,502,051, Cl. 514-235.500.
Roller Bearing Company of America: *See*—
Williams, Richard R.; Preston, Peter C.; and Macfarland, Willard C., Jr., 5,501,533, Cl. 384-572.000.
Rollins, Neal A.; and Rooyakkers, John A., to Kimberly-Clark Corporation. Elongated element comprising helically patterned adhesive. 5,501,756, Cl. 156-167.000.
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Duncan, Michael G.; Saegert, Pamela P.; and Ford, Gordon D., 5,502,761, Cl. 379-142.000.
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Haupt, Andreas; Janssen, Bernd; Ritter, Kurt; Klinge, Dagmar; Keilhauer, Gerhard; Romerdahl, Cynthia; Barlozzari, Teresa; and Qian, Xiao-dong, 5,502,032, Cl. 514-17.000.
Romine, H. Ernest; Nanni, Edward J.; Carel, Mark W.; and Southard, W. Mark, to Conoco Inc. Self-stabilizing pitch for carbon fiber manufacture. 5,501,788, Cl. 208-45.000.
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Rondeau, Michel Y., to Valquest Medical, Inc.; and Fibotech, Inc. Heat insulating connector for plastic optical fibers. 5,502,784, Cl. 385-66.000.
Roopnarine, ; Myrick, Thomas; and Kong, Kin Y., to Honeybee Robotics, Inc. Flexible band-gears for conducting power/signal across rotary joint. 5,501,604, Cl. 439-19.000.
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Rosamond, James D.; and Pierson, Myles E., to Fisons Corporation. Peptide compounds having therapeutic activity. 5,502,164, Cl. 530-329.000.
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Rose, Donald: *See*—
Brookstein, David; Rose, Donald; Dent, Robin; Dent, John; and Skelton, John, 5,501,133, Cl. 87-33.000.
Rosemount Inc.: *See*—
Sittler, Fred C.; and Howard, Kathryn M., 5,502,380, Cl. 324-207.210.
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Rosen, Howard J., to FloTool International, Inc. Pin clip. 5,500,987, Cl. 24-351.000.
Rosen, Jonathan J.; Hillstead, Richard A.; Weldon, Thomas D.; Larsen, Charles E.; and Williams, David O., to Novoste Corporation. Vascular blood containment device. 5,501,671, Cl. 604-168.000.
Rosenfeld, Jeffrey I.: *See*—
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Roskamp Champion: *See*—
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Ross, Jay: *See*—
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Ross, Robert J.: *See*—
Soltis, Lawrence A.; and Ross, Robert J., 5,501,054, Cl. 52-730.700.
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Roth, Bradley: *See*—
Bourg, John; Mitchell, James; Mirotznik, Mark; Roth, Bradley; Subramanian, Sankaran; Cherukuri, Murali; Zablocky, Paul G.; Pohida, Thomas J.; Smith, Paul D.; Friauf, Walter S.; and Tschudin, Rolf G., 5,502,386, Cl. 324-316.000.
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Roy, Rabindra K.; and Ono, Toshinobu, to NEC USA, Inc.; and NEC Corporation. Partial scan testability utilizing reconvergence through sequential elements. 5,502,730, Cl. 371-22.300.
Royal Free Hospital School of Medicine: *See*—
Emery, Vincent C.; Bavin, Peggy J.; and Walker, Patrick, 5,501,947, Cl. 435-5.000.
Ruegg, Hans: *See*—
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Ruel, Raymond. Shingled tile block siding facade for buildings. 5,501,050, Cl. 52-513.000.
Ruff-Roberts, Alyson L.: *See*—
Mahr, Anna M.; Bowe, Ann E.; Ruff-Roberts, Alyson L.; and Klinger, Katherine W., 5,501,954, Cl. 435-6.000.
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Ryczek, Lawrence J.; and Hubbell, Ruth E., to Eaton Corporation. Magneto-optical current measurement apparatus. 5,502,373, Cl. 324-96.000.
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S. C. Johnson & Son, Inc.: *See*—
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Sabo, Kristine K., to Respironics, Inc. Non-rebreathing valve and valve element therefor. 5,501,214, Cl. 128-205.240.
Sachs, Howard G., to Intergraph Corporation. Apparatus for obtaining data from a translation memory based on carry signal from adder. 5,502,829, Cl. 395-417.000.
Sadanaga, Eiji: *See*—
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Saderholm, Davin G.; Rasmussen, Kirk; and Shaklik, Brian M., to Morton International, Inc. Rivetless cushion retaining ring with tabs which lock the ring in place after rotation. 5,501,484, Cl. 280-728.200.
Saderholm, Davin G.; Shaklik, Brian M.; and Rasmussen, Kirk H., to Morton International, Inc. Airbag with alternate deployment modes. 5,501,488, Cl. 280-739.000.
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Safariland Ltd., Inc.: *See*—
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Saito, Takshi: *See*—
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Saito, Takumi, to DuPont-Mitsui Fluorochemicals Co., Ltd. Fluororesin powder liquid dispersion capable of forming thick coatings. 5,502,097, Cl. 524-389.000.
Saito, Toshihiro: *See*—
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Saitoh, Kenji, to NEC Corporation. Electrically erasable and programmable read only memory device having selectively erasable sectors. 5,502,669, Cl. 365-185.270.
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Saitoh, Toshio; Takizawa, Teruhiro; Maki, Naoki; Kobayashi, Takashi; Shibata, Masayuki; Yoshioka, Ken; Sonobe, Tadasi; and Suzuki, Fumio, to Hitachi, Ltd. Superconducting magnet abnormality detection and protection apparatus. 5,502,613, Cl. 361-19.000.
Saitou, Shinji, to Matsushita Electric Industrial Co., Ltd. Stress sensor using magnetostriction thin film. 5,502,381, Cl. 324-209.000.
Saji, Tomohide, to Suzuki Motor Corporation. Trim mounting structure. 5,501,052, Cl. 52-716.500.
Sak, Robert F. Syringe system providing retraction of needle cannula into disposable cartridge. 5,501,670, Cl. 604-110.000.
Sakagami, Seiji: *See*—
Nagaoka, Takashi; Ueda, Shinjiro; Sakagami, Seiji; Nishiuchi, Akira; and Sakurai, Hirofumi, 5,501,583, Cl. 417-423.400.
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Sakai, Keiji; Yamamoto, Hiroyuki; and Kurata, Yukio, to Sharp Kabushiki Kaisha. Fiber optic face plate for a seamless modular display. 5,502,457, Cl. 345-87.000.
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Sakashita, Takeshi; Shimoda, Tomoaki; Miura, Kimiyoshi; Tominari, Kenichi; and Kanezawa, Akio, to GE Plastics Japan Ltd. Method for preparing optical-grade polycarbonate compositions. 5,502,153, Cl. 528-198.000.
Sakata, Goro, to Casio Computer Co., Ltd. Filter device and electronic musical instrument using the filter device. 5,502,277, Cl. 84-661.000.
Sakatani, Atsushi; Sasai, Osamu; and Suzuki, Masaji, to Sumitomo Wiring Systems, Ltd. Connector. 5,501,619, Cl. 439-752.000.
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Sakuma, Shusuke, to Kabushiki Kaisha Shukoh. Partition pole system. 5,501,429, Cl. 256-1.000.
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Sakurai, Masakatsu, to Canon Kabushiki Kaisha. Output apparatus with controllable output resolution. 5,502,794, Cl. 395-109.000.
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Salazar, Edilberto I.: *See*—
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Saldivar, Louis, Jr.; and Rutnarak, Sangvorn, to Abbott Laboratories. Method of using a disposable reagent pack. 5,501,982, Cl. 436-150.000.
Sallberg, Krister, to Telefonaktiebolaget L M Ericsson. Method for selecting a free link and an arrangement herefor. 5,502,714, Cl. 370-17.000.
Salmon, Brian: *See*—
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Salvin, Roger P.; and Schultheiss, Adrian, to Ciba-Geigy Corporation. Photosensitive composition containing water as solvent or dispersant. 5,501,942, Cl. 430-280.100.
Salyer, Brian D., to Othy, Inc. Tool driver. 5,501,686, Cl. 606-79.000.
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Samsel, W. Scott, to United States Surgical Corporation. Method for grinding needle points on surgical grade needle blanks. 5,501,630, Cl. 451-49.000.
Samsonite Corporation: *See*—
Franklin, Dana; and Earl, Bonnie M., 5,501,324, Cl. 206-279.000.
King, William L., 5,501,308, Cl. 190-102.000.
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Ahn, Seoung-joon, 5,502,705, Cl. 369-77.200.
Chang, Eui-Young; Kang, Sung-Cheol; Jeong, Jin-Dong; and Seok, Tae K., 5,501,084, Cl. 62-264.000.
Choi, Min-ho; and Song, In-yong, 5,502,557, Cl. 355-326.00R.
Choi, Sung-gyu, 5,502,487, Cl. 348-239.000.
Han, Woo-sung, 5,501,581, Cl. 417-415.000.
Kim, Bum-Sik, 5,502,319, Cl. 257-231.000.
Kim, Tae D., 5,501,083, Cl. 62-228.400.
Lee, Chang H., 5,502,366, Cl. 320-2.000.
Lee, Hyun Sub, 5,500,984, Cl. 16-309.000.
Lee, Jae-Bong, 5,502,358, Cl. 318-6.000.
Park, Chang-soo, 5,502,004, Cl. 437-190.000.
Park, Tae J.; Hwang, Ho D.; and Kwon, Joong Y., 5,502,498, Cl. 348-500.000.
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Sanders, Ray W., to Circuit Path Network Systems. Method for assigning cell slots to one or more communication channels by mapping the channels to cell slots based on a one-to-one transformation. 5,502,723, Cl. 370-60.100.
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Sandison, Mark D.: *See*—
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Sano, Kiyoshi, to Taihei Kogyo Co., Ltd. Toothbrush. 5,500,975, Cl. 15-167.100.
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Niedospial, John J.; Hoover, Linn C.; Mallon, Michael T.; and Hoyes, James E., 5,501,676, Cl. 604-283.000.
Sansalone, Salvatore N. Diving mask. 5,502,515, Cl. 351-43.000.
Sanshin Industries Co., Ltd.: *See*—
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Fukuoka, Yoshihito, 5,501,188, Cl. 123-179.250.
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Suzuki, Shintaro; and Matsushita, Toru, 5,501,339, Cl. 206-586.000.
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Santer, Jean-Marie: *See*—
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Santi, John, to Briggs & Stratton Corporation. Dynamic gas seal for internal combustion engines. 5,501,203, Cl. 123-572.000.
Sanwa Kagaku Kenkyusho Co., Ltd.: *See*—
Baba, Yutaka; Usui, Toshinao; Kakigami, Takuji; Ozeki, Yoshiro; Tsukamoto, Katsura; Asaeda, Nobuyuki; and Itoh, Nobuyuki, 5,502,209, Cl. 548-454.000.
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Sarkar, Jawed M.; and Didwania, Hanuman P., to Nalco Chemical Company. Enzymes in combination with polyelectrolytes for enhancing the freeness of clarified sludge in papermaking. 5,501,770, Cl. 162-100.000.
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Sasse, Klaus; Wachtler, Peter; Ludwig, Georg-Wilhelm; and Paulus, Wilfried, to Bayer Aktiengesellschaft. 1-thiocarbamoyl-5-hydroxy-pyrazoles as microbicides. 5,502,069, Cl. 514-404.000.

Sasuta, Michael; and Wilson, Alan L. Method for maintaining secure information synchronization on a control channel. 5,502,767, Cl. 380-48.000.

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Sato, Hironobu, to Sanyo Electric Co., Ltd. Electric motor and method of producing the same. 5,502,341, Cl. 310-42.000.

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Hayakawa, Hideaki; Gocho, Tetsuo; and Sato, Junichi, 5,502,008, Cl. 437-225.000.

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Kawai, Hiroaki; Watanabe, Mitsuo; Sato, Shinichi; Shinoda, Ichiro; and Itoh, Motohiko, 5,502,296, Cl. 235-462.000.

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Sato, Tadashi: *See*—
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Sato, Toshihiko: *See*—
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Satori, Kazutoshi, to Yamashita Rubber Kabushiki Kaisha. Liquid sealing and vibration isolator. 5,501,433, Cl. 267-140.130.

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Sauer Inc.: *See*—
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Iwata, Naoki; Saito, Takeshi; Yano, Hidesoshi; Takagaki, Hiromitsu; Nishido, Kazuhiro; Komuro, Ichiro; Sawa, Shigeki; and Shima, Nobuhiro, 5,502,552, Cl. 355-259.000.

Sawada, Akira; Kumamoto, Hiroshi; and Suzuki, Takashi, to Omron Corporation. Apparatus and method for adjusting character spacing. 5,501,538, Cl. 400-304.000.

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Senshu, Yoichirou; Ota, Shuichi; Fujii, Hiroshi; Uetake, Akihiro; Sawada, Takashi; Hasegawa, Shinichi; Suzuki, Kazuyoshi; and Morii, Tetsuro, 5,502,608, Cl. 360-132.000.

Sawahata, Koichi, to NEC Corporation. Method for analyzing light intensity distribution in projection systems. 5,502,654, Cl. 364-525.000.

Sawai, Toshiya: *See*—
Nakayama, Minoru; Sawai, Toshiya; Hayakawa, Masaharu; Murata, Shizuo; and Abe, Yukino, 5,501,884, Cl. 428-1.000.

Sawzik, Patricia J.: *See*—
Hattler, Brack G.; Borovetz, Harvey S.; Reeder, Gary D.; Sawzik, Patricia J.; and Walters, Frank R., 5,501,663, Cl. 604-26.000.

Sayles, Philip W. One-step test device. 5,501,837, Cl. 422-58.000.

Sayo, Noboru; Sano, Noboru; and Kumobayashi, Hidenori, to Takasago International Corporation. Process for producing cyclohexylbutyric acid derivative. 5,502,221, Cl. 549-549.000.

Schach, Thomas; and Papenfuhs, Theodor, to Hoechst Aktiengesellschaft. Process for preparing multiply fluorinated nitrobenzenes. 5,502,260, Cl. 568-938.000.

Schappell, Derek T.: *See*—
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Scharfenberg, Peter; Liebscher, Jürgen; Knoll, Alexander; Uschmajew, Aleksej; Rolfs, Andreas; Lohman, Dieter; Faust, Gottfried; and Morgenstern, Eveline, to Arzneimittelwerk Dresden GmbH. 3-aminopyrroles, methods for their synthesis and for their pharmaceutical use. 5,502,051, Cl. 514-235.500.

Schatz, Steven V.: *See*—
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Scheer, David C.; and Gee, Homer T., to Intel Corporation. Computer system with an interconnection receptacle suitable for different external connectors. 5,501,608, Cl. 439-218.000.

Scheffler, Robert G., to Magic Music Cassette Company. High speed recorded information duplicating equipment. 5,502,601, Cl. 360-32.000.

Scheidecker, Dieter: *See*—
Schulhmann, Detlef E.; Dries, Thomas; Wilhelm, Adolf; Scheidecker, Dieter; Lohmann, Harald; Murschall, Ursula; Peiffer, Herbert; and Schloegl, Gunter, 5,501,901, Cl. 428-323.000.

Scheie, Carl E., to Wilson Sporting Goods Co. Golf club set with constant projected topline angle. 5,501,460, Cl. 273-167.00R.

Schemmann, Hugo; and Hüsgen, Theo, to U.S. Philips Corporation. Small motor with permanent-magnet rotor. 5,502,359, Cl. 310-40.0MM.

Scheppe, Jonathan L.: *See*—
Dingwall, Andrew G. F.; and Scheppe, Jonathan L., 5,502,445, Cl. 342-51.000.

Scherer, Henry W.; Biller, Bruce A.; Jackson, Hiram S.; Swanson, Roy T.; and Zabel, David W., to S&C Electric Company. Fuse assembly with low exhaust and replaceable cartridge. 5,502,427, Cl. 337-176.000.

Schering Agrochemicals Limited: *See*—
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Schering Aktiengesellschaft: *See*—
Bohlmann, Rolf; Kunzer, Hermann; Muhn-Seipoldy, Hans-Peter; Nishino, Yukishige; and Schneider, Martin, 5,502,046, Cl. 514-182.000.
Rössling, Georg; Albayrak, Celal; Rothe, Matthias; and Siegert, Joachim, 5,501,863, Cl. 424-489.000.
Skuballa, Werner; Buchmann, Bernd; Heindl, Josef; Fröhlich, Wolfgang; Ekerdt, Roland; and Giesen, Claudia, 5,502,075, Cl. 514-461.000.

Schering Corporation: *See*—
Andrews, David R.; and Sudhakar, Anantha R., 5,502,183, Cl. 540-46.000.
Fu, Xiaoyong; Thiruvengadam, Tiruvettipuram K.; Tann, Chou-Hong; Lee, Junning; and Colon, Cesar, 5,502,222, Cl. 552-595.000.
Hou, Donald; Draper, Richard W.; Lee, Gary M.; and Mas, Janet L., 5,502,186, Cl. 540-576.000.

Schermuly, Thomas: *See*—
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Schieferstein, Ludwig; Zauns-Huber, Rudolf; Conradi, Joachim; and Ruscheinsky, Emil, to Henkel Kommanditgesellschaft auf Aktien. Aqueous dispersions of new amphiphilic co-oligomers for the washing- and cleaning-resistant oiling of leather and skins and their use. 5,501,707, Cl. 8-94.230.

Schiel, Christian: *See*—
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Schild, Howard G.: *See*—
Bloom, Iris B. K.; Fehervari, Agota F.; Gaudiana, Russell A.; Minns, Richard A.; and Schild, Howard G., 5,501,940, Cl. 430-253.000.

Schilp, Andrea: *See*—
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Schinabeck, Anton: *See*—
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Schindler, Harald: *See*—
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Schinkel, Ingo: *See*—
Krallmann, Anton; Blum, Thomas; and Schinkel, Ingo, 5,501,905, Cl. 428-339.000.

Schlapfer, Johannes F.; and Hess, Martin, to Synthes (U.S.A.). Osteosynthetic fixation device. 5,501,684, Cl. 606-73.000.

Schleinz, Robert J.; Conrad, Daniel J.; and Kucherovsky, Joseph S., to Kimberly-Clark Corporation. Dual substrate, single-pass printing process. 5,501,149, Cl. 101-416.100.

Schlichter, Stefan: *See*—
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Schlieperskötter, Bernd: *See*—
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Schlüter-Wohlfeil, Jürgen-Ulrich, to Joachim Uhing KG GmbH & Co. Quick locking device for axial locking. 5,501,543, Cl. 403-321.000.

Schmid, Karl: *See*—
Kischkel, Ditmar; Schmid, Karl; Syldath, Andreas; and Krohnen, Thomas, 5,501,817, Cl. 252-174.250.



Schmid, Raimund; Mronga, Norbert; Ostertag, Werner; and Schmidt, Helmut, to BASF Aktiengesellschaft. Carbon-containing luster pigments. 5,501,731, Cl. 106-417.000.

Schmidt, Bernard: *See*—
Junge, Bodo; Hartwig, Wolfgang; Meier, Heinrich; Schohe-Loop, Rudolf; Gao, Zhan; Schmidt, Bernard; de Jonge, Maarten; and Schuurman, Teunis, 5,502,064, Cl. 514-336.000.

Schmidt, Charles: *See*—
Kellogg, Charles; and Schmidt, Charles, 5,502,742, Cl. 373-128.000.

Schmidt, Delf: *See*—
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Schmidt, Edward M.: *See*—
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Schmidt, Helmut: *See*—
Schmid, Raimund; Mronga, Norbert; Ostertag, Werner; and Schmidt, Helmut, 5,501,731, Cl. 106-417.000.

Schmidt Holding Europe GmbH: *See*—
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Schmitt, Paul S.: *See*—
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Schmode, Hartmut; Storm, Siegfried; Thiele, Helmut; Wiebe, Ulrich; David, Bernd; Hetland, Detley; Kornfeld, Hans-Joachim; and Salten, Johann-Georg, to Weidmüller Interface GmbH & Co. Tongs for dressing conductor ends. 5,500,998, Cl. 29-751.000.

Schneider Electric SA: *See*—
Blanchard, Christian; Lauraire, Michel; and Vigouroux, Didier, 5,502,426, Cl. 335-132.000.

Schneider, Erwin; and Göhring, Frank, to VDO Adolf Schindling AG. Method for the recognition of idling in connection with a load-shifting device of an internal combustion engine controlled by throttle valve. 5,501,193, Cl. 123-339.140.

Schneider (USA) Inc.: *See*—
Forman, Michael R., 5,501,759, Cl. 156-272.800.

Schneider, Kirk: *See*—
Hanson, Craig; Gallagher, John; and Schneider, Kirk, 5,501,888, Cl. 428-38.000.

Schneider, Martin: *See*—
Bohlmann, Rolf; Kunzer, Hermann; Muhn-Seipoldy, Hans-Peter; Nishino, Yukishige; and Schneider, Martin, 5,502,046, Cl. 514-182.000.

Schnitzer, Detlef: *See*—
Koellermeyer, Albrecht; and Schnitzer, Detlef, 5,501,641, Cl. 475-107.000.

Schnizlein, Paul G.; and Norris, David E., to Advanced Micro Devices. Clock switcher circuit. 5,502,409, Cl. 327-99.000.

Schober, Barton J.; Piedrahita, Carlos A.; and Pialet, Joseph W., to Lubrizol Corporation, The. Electrorheological fluids containing particles of a polar solid material and an inactive polymeric material. 5,501,809, Cl. 252-73.000.

Schoelling, Rainer; Graefe, Detlef; Klostermeyer, Hermann; and Greisinger, Martin, to RXS Schrumpftechnik-Garnituren GmbH. Cable sleeve of plastic composed of a slotted socket pipe and seal members at the face end. 5,502,281, Cl. 174-92.000.

Schohe-Loop, Rudolf: *See*—
Junge, Bodo; Hartwig, Wolfgang; Meier, Heinrich; Schohe-Loop, Rudolf; Gao, Zhan; Schmidt, Bernard; de Jonge, Maarten; and Schuurman, Teunis, 5,502,064, Cl. 514-336.000.

Scholz, Werner, to Deutsche Thomson-Brandt GmbH. Circuit for decoding 2T encoded binary signals. 5,502,408, Cl. 326-105.000.

Schomburg, Gerhard; and Gilges, Martin, to Studiengesellschaft Kohle mbH. Deactivation of the inner surfaces of capillaries. 5,502,169, Cl. 204-454.000.

Schreffler, John R.: *See*—
Antkowiak, Thomas A.; Hall, James E.; Lawson, David F.; Schreffler, John R.; and Stayer, Mark L., Jr., 5,502,131, Cl. 526-180.000.

Schroff-Lauer, Regina, heir: *See*—
Resch, Reinhard; van Zantea, Anton; Lauer, Rainer, deceased; Schroff-Lauer, Regina, heir; Lauer, Joscha, heir; Altmann, Rainer; Binder, Jürgen; and Meyer, Michael-Raymond, 5,501,514, Cl. 303-115.400.

Schulhmann, Detlef E.; Dries, Thomas; Wilhelm, Adolf; Scheidecker, Dieter; Lohmann, Harald; Murschall, Ursula; Peiffer, Herbert; and Schloegl, Gunter, to Hoechst Aktiengesellschaft. Biaxially orientated polypropylene multilayer film, process for its production, and its use. 5,501,901, Cl. 428-323.000.

Schulkin, William V.; and Mirken, Mark C. Basketball glove. 5,500,956, Cl. 2-161.100.

Schulthess, Adrian: *See*—
Salvia, Roger P.; and Schulthess, Adrian, 5,501,942, Cl. 430-280.100.

Schumacher, Daniel L.; and Wood, John, to Hewlett-Packard Company. Mirrored pin assignment for two sided multi-chip layout. 5,502,621, Cl. 361-760.000.

Schuster, Georg, to Walhalla-Kalk Entwicklungs-Und Vertriebsgesellschaft. Highly reactive reagents and compositions for purifying exhaust gases and wastewater, production and use thereof. 5,502,021, Cl. 502-400.000.

Schuster, Hans G.: *See*—
Fritsch, Georg; and Schuster, Hans G., 5,500,996, Cl. 29-612.000.

Schuster, Norbert, to Siemens Aktiengesellschaft. Measuring process for obtaining a switching command in a rapid changeover device. 5,502,340, Cl. 307-87.000.

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Junge, Bodo; Hartwig, Wolfgang; Meier, Heinrich; Schohe-Loop, Rudolf; Gao, Zhan; Schmidt, Bernard; de Jonge, Maarten; and Schuurman, Teunis, 5,502,064, Cl. 514-336.000.

Schwarte, Stephan; Dobbelstein, Arnold, deceased (by Hildegard Dobbelstein, Christiane Dobbelstein, legal representatives); Niemann, Jürgen; Lassmann, Walter; Piontek, Susanne; Poth, Ulrich; and Elkelmann, Klaus, to BASF Lacke + Farben, AG. Process for the production of a multicoat finish and aqueous basecoats suitable for this process. 5,502,101, Cl. 524-460.000.

Schwartz, Ansel M.: *See*—
Mako, Frederick M.; and Godlove, Terry F., 5,502,353, Cl. 315-5.000.

Schwartz-Feldman, Jean. Mixing syringe. 5,501,371, Cl. 222-136.000.

Schwarz, Alexander; and Wilchek, Meir, to BioSepra, Inc. Chromatography adsorbents utilizing mercapto heterocyclic ligands. 5,502,022, Cl. 502-401.000.

Schwarzer, Siegfried: *See*—
Hermening, Heinz; Schwarzer, Siegfried; and Seidel, Hans-Georg, 5,501,316, Cl. 198-457.000.

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Spies, Karl-Heinz; Schweikert, Willi; Barth, Armin; and Sander, Hans-Gerhard, 5,501,075, Cl. 60-605.100.

Sciacero, James R.; and Hittel, John P., to MicroTest, Inc. Apparatus for measuring the crosstalk in a cable. 5,502,391, Cl. 324-628.000.

Scientific-Atlanta, Inc.: *See*—
Birch, Christopher H.; van Staden, Christian V.; Brooks, Walter R.; Nicholas, Paul D.; and Lawrence, Steven S., 5,502,499, Cl. 348-523.000.

SCIMED Life Systems, Inc.: *See*—
Lafontaine, Daniel M.; Hastings, Roger; and Adams, Daniel O., 5,501,228, Cl. 128-692.000.
Ressemann, Thomas V.; Vrba, Anthony C.; and Hackett, Steven S., 5,501,694, Cl. 606-159.000.

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Katerberg, James A.; and Fagerquist, Randy L., 5,502,474, Cl. 347-75.000.

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Antonelli, Joseph A.; Becton, Lee A. E.; Devlin, Brian P.; and Scopazzi, Christopher, 5,502,113, Cl. 525-287.000.

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Scurry, Margaret L. S.: *See*—
Van Durrett, William; Hieronymus, Gerald W.; Poind, Marguerite A.; Price, Todd D.; Scurry, Margaret L. S.; and Steene, William C., 5,501,571, Cl. 414-786.000.

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Boebert, William E.; Markham, Thomas R.; and Olmsted, Robert A., 5,502,766, Cl. 380-25.000.

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Chaudhuri, Bhabatosh; Stephan, Christine; Seeboth, Peter; and Riezman, Howard, 5,501,975, Cl. 435-252.300.

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Fukunaga, Takashi; and Segawa, Akiyoshi, 5,502,639, Cl. 364-424.050.

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Kerkman, Russel J.; Seibel, Brian J.; and Busse, Doyle, 5,502,360, Cl. 318-805.000.

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Hermening, Heinz; Schwarzer, Siegfried; and Seidel, Hans-Georg, 5,501,316, Cl. 198-457.000.

Seiko Epson Corporation: *See*—
Miyashita, Satoru; Atobe, Mitsuro; Kanasawa, Yasushi; Takemoto, Kiyohiko; and Ouki, Yasuhiro, 5,502,470, Cl. 347-45.000.
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Hamamoto, Katsuya, 5,502,679, Cl. 365-185.230.

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Sencore, Inc.: *See*—
Nagel, Scott, 5,502,511, Cl. 348-704.000.
Senda, Shunya: *See*—
Funami, Yasuo; Nishi, Manabu; Watanabe, Yoshimi; and Senda, Shunya, 5,502,383, Cl. 324-251.000.
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Obtori, Akira; Andoh, Masako; and Morita, Yasushi, 5,501,856, Cl. 424-428.000.
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Seok, Tae K.: *See*—
Chang, Eui-Young; Kang, Sung-Cheol; Jeong, Jin-Dong; and Seok, Tae K., 5,501,084, Cl. 62-264.000.
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Dixit, Suresh C.; Goldman, David; Hu, John J.; and Sethachutkul, Krish, 5,502,076, Cl. 514-510.000.
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Besen, Matthew M.; Sevillano, Evelio; and Smith, Donald K., 5,501,740, Cl. 118-723.0MP.
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Messing, Norbert; and Kimmich, Siegfried, 5,501,117, Cl. 74-420.000.
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Pollman, John A.; Seymour, Raymond K.; Singer, Paul H.; and Rajotte, Paul T., 5,502,286, Cl. 200-401.000.
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McClure, David C., 5,502,655, Cl. 364-550.000.
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Pietrobon, Giovanni, 5,502,416, Cl. 327-538.000.
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Meyer, Jacques, 5,502,500, Cl. 348-525.000.
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Shafer, Kenneth H.: *See*—
Augustine, Robert L.; Fournier, Jay A.; Paine, John B., III; Shafer, Kenneth H.; and Tanielyan, Setrak K., 5,502,019, Cl. 502-314.000.
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Shahabuddin, Meah A.: *See*—
Crocker, Michael A.; Rao, V. R. Gopala; Shahabuddin, Meah A.; and Stark, Barbara H., 5,502,756, Cl. 379-29.000.
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Saderholm, Davin G.; Rasmussen, Kirk; and Shaklik, Brian M., 5,501,484, Cl. 280-728.200.
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Hamilton, Eric A.; Rainal, Attilio J.; and Shank, Jere C., 5,502,644, Cl. 364-488.000.
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Ai, Chiayu; Wyant, James C.; Shao, Lian-Zhen; and Parks, Robert E., 5,502,566, Cl. 356-359.000.
Sharp, Charles A., III; Doke, Michael J.; Howarth, Richard A.; and Recine, Leonard J., Sr., to Marlow Industries, Inc. Compact thermoelectric refrigerator and module. 5,501,076, Cl. 62-3.600.
Sharp Kabushiki Kaisha: *See*—
Arata, Katsumi; Yoshida, Shinichi; and Muramatsu, Tsuyoshi, 5,502,834, Cl. 395-496.000.
Griffus, Michael J.; Pollachek, Robert G.; and Pham, Giao N., 5,502,674, Cl. 365-200.000.
Kondo, Akihiro; Morimoto, Kiyofumi; and Emoto, Kazuhiro, 5,501,930, Cl. 430-59.000.
Matsushita, Tadashi, 5,502,321, Cl. 257-316.000.
Muramatsu, Tsuyoshi, 5,502,720, Cl. 370-60.000.
Sakai, Keiji; Yamamoto, Hiroyuki; and Kurata, Yukio, 5,502,457, Cl. 345-87.000.
Yoshida, Hiroichi; Morimura, Junko; Matsuo, Kazuhiko; and Takata, Kazuhiko, 5,502,803, Cl. 395-146.000.
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Shepley, Christopher C.; and Carter, David R., to Brake Pro, Inc. Friction material. 5,501,728, Cl. 106-36.000.
Sherlock, Thomas M. Security device. 5,501,086, Cl. 70-58.000.
Sherman, David M., to Intermec Corporation. Method and apparatus for detecting the presence of a surface bearing a bar code symbol. 5,502,297, Cl. 235-472.000.
Shibata, Kenichiro; Fujii, Akihito; and Sakamoto, Toshihiro, to Sumitomo Electric Industries, Ltd. Infrared transmitting barium fluoride sintered body. 5,502,015, Cl. 501-151.000.
Shibata, Masayuki: *See*—
Saitoh, Toshio; Takizawa, Teruhiro; Maki, Naoki; Kobayashi, Takashi; Shibata, Masayuki; Yoshioka, Ken; Sonobe, Tadasi; and Suzuki, Fumio, 5,502,613, Cl. 361-19.000.
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Shida, Yoshitaka, executor: *See*—
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Washizawa, Teruyoshi; Hatanaka, Katsunori; Sakai, Kunihiro; Oguchi, Takahiro; Yamano, Akihiko; and Shido, Shunichi, 5,502,710, Cl. 369-124.000.
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Mori, Kazuo; Shigeeda, Tetsuya; Kokubo, Kazuyuki; Yonezawa, Norihiro; and Nakatsu, Kimihide, 5,502,606, Cl. 360-107.000.
Shigematsu, Nobuharu: *See*—
Iwamoto, Toshiro; Fujie, Akihiko; Nitta, Kumiko; Tsurumi, Yasuhisa; Shigematsu, Nobuharu; Kasahara, Chiyoshi; Hino, Motohiro; and Okuhara, Masakuni, 5,502,033, Cl. 514-11.000.
Shih, Wu-tung. Golf practice device for playing. 5,501,462, Cl. 273-176.0FA.
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Shikata, Shinichi: *See*—
Higaki, Kenjiro; Nakahata, Hideaki; Hachigo, Akihiro; and Shikata, Shinichi, 5,501,909, Cl. 428-408.000.
Shiki, Eiichi, to Kabushiki Kaisha Toshiba. Ultrasonic diagnostic apparatus. 5,501,224, Cl. 128-661.100.
Shikoku Kakoki Co., Ltd.: *See*—
Ueda, Michio; Suzuki, Akio; Suenaga, Yoshiro; and Ishikawa, Takayuki, 5,501,763, Cl. 156-504.000.
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Iwata, Naoki; Saito, Takeshi; Yano, Hidetoshi; Takagaki, Hiromitsu; Nishido, Kazuhiro; Komuro, Ichiro; Sawa, Shigeki; and Shima, Nobuhiro, 5,502,552, Cl. 355-259.000.
Shimada, Shigeru; Jinbo, Susumu; and Isii, Hideyuki, to Hodogaya Chemical Co., Ltd. Carboxyl group-containing polyoxyalkylene derivative. 5,502,152, Cl. 528-71.000.
Shimano Inc.: *See*—
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Miyashita, Yukio; Shimasaki, Yuichi; Oketani, Toshikazu; Hatcho, Seiji; Matsumoto, Seiji; Aoki, Takuya; Saito, Akihisa; Komatsuda, Takashi; and Kato, Hiroaki, 5,501,073, Cl. 60-284.000.
Shimizu, Fukumi: *See*—
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Shimizu, Hiroshi: *See*—
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Shimizu, Keizi: *See*—
Okamura, Naomi; Hino, Takao; Nimura, Akio; Fukai, Masayuki; Shimizu, Keizi; Teramae, Harumi; and Hata, Chiaki, 5,501,370, Cl. 222-111.000.
Shimizu, Kunio; and Nakano, Yoshitomo, to Sony Corporation. Recording and/reproducing apparatus having no capstan and no pinch roller and method of controlling the same. 5,502,602, Cl. 360-73.140.
Shimizu, Masaki: *See*—
Kato, Yoshihiro; Hotta, Toshiaki; and Shimizu, Masaki, 5,502,424, Cl. 335-284.000.
Shimoda, Tomoaki: *See*—
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Shimoji, Noriyuki; and Takasu, Hidemi, to Rohm Co., Ltd. Semiconductor memory device capable of low-voltage programming. 5,502,668, Cl. 365-185.280.
Shimokawa, Kenji; and Kawamura, Norikazu, to Nippon Steel Corporation; and Nippon Hoso Kyokai. Garnet polycrystalline film for magneto-optical recording medium. 5,501,913, Cl. 428-694.0ML.
Shin-Etsu Chemical Co., Ltd.: *See*—
Hiyama, Tadayoshi; Yokota, Toru; and Amano, Tadashi, 5,502,123, Cl. 526-88.000.
Inoue, Yoshio; Takahashi, Masaharu; Igarashi, Minoru; and Sekiguchi, Susumu, 5,502,146, Cl. 528-34.000.
Kimura, Tsuneo; and Arai, Masatoshi, 5,502,096, Cl. 524-356.000.
Shin-Etsu Handotai Co., Ltd.: *See*—
Murai, Toshinari; Iino, Eiichi; Arai, Hideo; Fusegawa, Izumi; and Yamagishi, Hirotoshi, 5,501,172, Cl. 117-15.000.
Shin, Hyun-koock; Park, Kyu-charn; Moon, Jong; and Shim, Tae-earn, to Samsung Electronics Co., Ltd. Method for manufacturing a gate electrode of a MOS transistor. 5,501,995, Cl. 437-41.000.
Shin, Jung-hyun: *See*—
Park, Won-noo; Shin, Jung-hyun; and Park, Young-hun, 5,502,336, Cl. 257-754.000.
Shinada, Akira, to Sony Corporation. Power saving method and apparatus for intermittently reading reproduction apparatus. 5,502,700, Cl. 369-50.000.
Shinada, Hidetoshi, to Fuji Photo Film Co., Ltd. Apparatus for recording images on interior surface of cylinder. 5,502,709, Cl. 369-119.000.
Shinjo, Kenji; Takiguchi, Takao; Kitayama, Hiroyuki; Katagiri, Kazuharu; Yamashita, Masataka; Terada, Masshiro; Togano, Takeshi; and Asaoka, Masanobu, to Canon Kabushiki Kaisha. Ferroelectric chiral smectic liquid crystal composition and liquid crystal device using same. 5,501,818, Cl. 252-299.610.
Shinners, Jeffrey G.: *See*—
Denesha, Gary L., deceased; Kostanski, Donald B.; Carter, Frank L.; and Shinners, Jeffrey G., 5,501,323, Cl. 206-278.000.
Shinoda, Ichiro: *See*—
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Shinohara, Keiji, to Sony Corporation. Metal wiring. 5,502,334, Cl. 257-751.000.
Shinto Scientific Co., Ltd.: *See*—
Nomura, Toshio, 5,501,097, Cl. 73-9.000.
Shioda, Kazuaki, to Kabushiki Kaisha Kawai Gakki Seisakusho. Reverberator. 5,502,768, Cl. 381-61.000.
Shionogi & Co., Ltd.: *See*—
Mori, Sachio; Takechi, Shozo; Kida, Shiro; Mizui, Takuji; and Ichihashi, Teruhisa, 5,502,216, Cl. 549-310.000.
Takase, Akira; Kai, Hiroyuki; Nishida, Kuniyoshi; and Masui, Moriyasu, 5,502,252, Cl. 564-169.000.
Shioyama, Tsutomu; Hamano, Naoki; and Ogino, Masaaki, to Bando Chemical Industries, Ltd. Rubber composition and transmission belt using the same. 5,501,908, Cl. 428-395.000.
Shirai, Kenji: *See*—
Inuzuka, Takeshi; Hattori, Masashi; Kaigawa, Masato; Hojo, Yasuo; Tabata, Atsushi; and Shirai, Kenji, 5,501,642, Cl. 477-107.000.
Shirai, Masanari, to Canon Kabushiki Kaisha. Sealing device, process cartridge, image forming apparatus and assembling method of the process cartridge. 5,502,547, Cl. 355-215.000.
Shiraishi, Masami: *See*—
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Shiraishi, Naoto, to Ricoh Company, Ltd. Polygonal image-drawing processor. 5,502,802, Cl. 395-143.000.
Shirouzu, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Antialias line generating method and antialias line generator. 5,502,795, Cl. 395-109.000.
Shoda, Shoichiro: *See*—
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Shonan Gosei-jushi, Seisakusho K.K.: *See*—
Kamiyama, Takao; Yokoshima, Yasuhiro; and Endoh, Shigeru, 5,501,115, Cl. 73-865.800.
Shou, Gaoliang; Takatori, Sunao; and Yamamoto, Makoto, to Yozan Inc. Filter device including SRAM and EEPROM devices. 5,502,664, Cl. 364-724.160.
Showa Corporation: *See*—
Funami, Yasuo; Nishi, Manabu; Watanabe, Yoshimi; and Senda, Shunya, 5,502,383, Cl. 324-251.000.
Shuhsiang, Wu C. Laser record protection folder. 5,501,326, Cl. 206-307.100.
Shukushima, Satoshi, to Sumitomo Electric Industries, Ltd. Method of making heat-resistant coated electrically conductive wire. 5,501,882, Cl. 427-496.000.
Shuto, Akira; Kisida, Hiroei; Takada, Yoji; and Ishiwatari, Takao, to Sumitomo Chemical Company, Limited. Propiolate ester compound an acaricide containing the same as an active ingredient and an acaricidal method. 5,502,242, Cl. 560-221.000.
Shutske, Gregory M.; Kapples, Kevin J.; and Tomer, John D., to Hoechst-Roussel Pharmaceuticals Inc. Certain 6,7-dihydro-3(2-nitrophenyl)-1,2-benzisoxazol-4(5H)-ones as intermediates. 5,502,203, Cl. 548-241.000.
Shuttleworth, Derek: *See*—
Parker, Dane K.; and Shuttleworth, Derek, 5,501,880, Cl. 427-389.900.
Shveima, Joseph S., to Phillips Petroleum Company. Chromium ribbon-like silicate clay α-olefin catalysts. 5,502,265, Cl. 585-530.000.
Si, Stephen S.-C.: *See*—
Aldrich, Gregory; Si, Stephen S.-C.; Wang, Eugene T.; and Wolfindea, Gary A., 5,502,819, Cl. 395-200.190.
Siebrecht, Manfred: *See*—
Hammer, Klaus-Dieter; Siebrecht, Manfred; Mans, Leo; Krams, Theo; and Winter, Hermann, 5,501,886, Cl. 428-34.800.
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Siegfried, Theodor: *See*—
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Siemens Aktiengesellschaft: *See*—
Brandes, Jürgen, 5,502,362, Cl. 318-471.000.
Fritsch, Georg; and Schuster, Hans G., 5,500,996, Cl. 29-612.000.
Glunz, Wolfgang, 5,502,661, Cl. 364-578.000.
Kunze, Dieter, 5,502,282, Cl. 174-93.000.
Psaros, Georgios, 5,501,212, Cl. 128-205.120.
Schuster, Norbert, 5,502,340, Cl. 307-87.000.
Welsch, Wolfgang; Krueger, Hans; Mannnach, Peter; Huebner, Klemens; and Arndt, Karlheinz, 5,502,740, Cl. 372-82.000.
Siemens Automotive Corporation: *See*—
Hall, Bryan C., 5,501,195, Cl. 123-470.000.
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McColloch, Rex J.; Cella, Stephen D.; and DiMarco, Bernard, 5,502,428, Cl. 335-172.000.
Siemens Medical Systems, Inc.: *See*—
Phelps, Robert N.; and Yao, Lin X., 5,501,219, Cl. 128-660.070.
Sievers Instruments, Inc.: *See*—
Ray, John D.; and Johansen, Neil, 5,501,981, Cl. 436-123.000.
SIG Schweizerische Industrie-Gesellschaft: *See*—
Leaherr, Harald; and Strohner, Franz, 5,501,559, Cl. 411-373.000.
Sigle, Jay C.: *See*—
Hergenrother, William L.; Smith, W. Novis; Murastore, Anthony J., III; Sigle, Jay C.; and Nemeth, Mark T., 5,502,129, Cl. 526-176.000.
Sigma Tool & Machine: *See*—
Figge, Siegfried; and Leistner, Martin K., 5,501,558, Cl. 411-176.000.
Silva, Fernando G.: *See*—
Cullum, Dennis F.; and Silva, Fernando G., 5,502,522, Cl. 354-106.000.
Silver, Spencer F.; Leinen, Roger W.; and Delgado, Joaquin, to Minnesota Mining and Manufacturing Company. Pressure-sensitive adhesive comprising solid tacky microspheres and macromonomer-containing binder copolymer. 5,502,108, Cl. 525-77.000.
Silye, Edward W.: *See*—
Handke, Günther; Silye, Edward W.; Raabis, Toivo; Achard, Thomas; and Raulf, Matthias, 5,501,438, Cl. 267-226.000.
Siminovitch, Katherine A.: *See*—
Dennis, James W.; Siminovitch, Katherine A.; and Datti, Alessandro, 5,501,957, Cl. 435-15.000.
Simkowski, Donald J., to Goldco Industries, Inc. Conveying system for unstable articles having a neck ring. 5,501,552, Cl. 406-52.000.
Simkowski, Donald J., to Goldco Industries, Inc. Device utilizing fluid for effecting nested alignment of articles and particularly undecorated cans. 5,501,553, Cl. 406-88.000.
Simmel, Thomas L.; and McDarren, Deborah J., to Link Group International. Cam-operated, synchronized marching soldier trackway. 5,501,628, Cl. 446-332.000.
Simmons, Richard: *See*—

Meisburger, Dan; Brodie, Alan D.; Chadwick, Curt; Desai, Anil; Dohse, Hans; Emge, Dennis; Greene, John; Johnson, Ralph; Ling, Ming-Yie; McMurtry, John; Becker, Barry; Paul, Ray; Robinson, Mike; Simmons, Richard; Smith, David E. A.; Taylor, John; Veneklasen, Lee; Walters, Dean; Wieczorek, Paul; Wong, Sam; Dutta, April; Lele, Surendra; Rough, Kirkwood; Pearce-Percy, Henry; Jau, Jack Y.; Lin, Chun C.; Nguyen, Hoi T.; Oyang, Yen-Jen; Hutchesoa, Timothy L.; Clark, David J.; Pan, Chung-Shih; Bhaskar, Chetana; Kirk, Chris; Munro, Eric; Gibilisco, John; and Sandland, Paul, 5,502,306, Cl. 250-310.000.

Simonds, Gary L., to Bear Archery Inc. Molded archery bow limb. 5,501,208, Cl. 124-86.000.

Simpson, Richard; and Oakland, Erick, to Texas Instruments Incorporated. Controllable width or gate. 5,502,401, Cl. 326-38.000.

Sinclair, Richard G.; and Lipinsky, Edward S., to Ecopol, LLC. Degradable polymer composition. 5,502,158, Cl. 528-354.000.

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Pollman, John A.; Seymour, Raymond K.; Singer, Paul H.; and Rajotte, Paul T., 5,502,286, Cl. 200-401.000.

Singh, Rajiv K.: *See*—
Adair, James H.; Singh, Rajiv K.; Eisenstadt, William R.; and Staehle, Sherry S., 5,501,877, Cl. 427-249.000.

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Goldman, Daniel; Siniaksevith, Boris; Doron, Benjamin; Bronicki, Lucien Y.; and Yaffe, Eli, 5,501,160, Cl. 110-229.000.

Sirtori, Carlo: *See*—
Capasso, Federico; Cho, Alfred Y.; Faist, Jerome; Hutchinson, Albert L.; Sirtori, Carlo; and Sivco, Deborah L., 5,502,787, Cl. 385-123.000.

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Misera, Stephen C.; Kerr, Thomas P.; and Siskos, William R., 5,501,013, Cl. 29-897.312.

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Brookstein, David; Rose, Donald; Dent, Robin; Dent, John; and Skelton, John, 5,501,133, Cl. 87-33.000.

Skirde, Eckhard, to Sauer Inc. Hydrostatic axial piston pump with three bearing arrangement. 5,501,578, Cl. 417-199.100.

Skis Rossignol SAS: *See*—
Jodelet, François, 5,501,825, Cl. 264-46.500.

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Nodelman, Neil H.; Steppan, David D.; Magnotta, Albert; Loring, Robert M.; Keegan, Richard E.; and Slack, William E., 5,502,147, Cl. 528-49.000.
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Picard, Joseph A.; and Sliskovic, Drago R., 5,502,198, Cl. 546-335.000.

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Slotboom, Jan W.; Woerlee, Pierre H.; and Woltjer, Reinout, to U.S. Philips Corporation. Semiconductor device provided having a programmable element with a high-conductivity buried contact region. 5,502,326, Cl. 257-530.000.

Slusarczyk, Robert. Warmup device for racket sports. 5,501,451, Cl. 273-29.00A.

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Scott, Christopher E.; Small, James D., Jr.; Yang, Hsinjin; Yacobucci, Paul D.; and Stack, Gary M., 5,502,121, Cl. 525-444.000.

Smalley, Dennis R.: *See*—
Almquist, Thomas A.; and Smalley, Dennis R., 5,501,824, Cl. 264-401.000.

Smeal, Thomas W.; and Brownell, George L., to Aristech Chemical Corporation. Laminating resins having low organic emissions. 5,501,830, Cl. 264-308.000.

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Pugach, Joseph; Smeal, Thomas W.; and Karp, Howard S., 5,502,240, Cl. 560-99.000.

Smith, Adlai H.; Hunter, Robert O., Jr.; and McArthur, Bruce B., to Litel Instruments. High power masks and methods for manufacturing same. 5,501,925, Cl. 430-5.000.

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Smith, Brad L.; and Wilkins, Gary E., to Hoechst Celanese Corporation. Process for recovering dimethyl terephthalate. 5,502,239, Cl. 560-78.000.

Smith, Charles A., to Du Pont de Nemours, E. I., and Company. Embossed glass/plastic laminate. 5,501,910, Cl. 428-447.000.

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Besea, Matthew M.; Sevillano, Evelio; and Smith, Donald K., 5,501,740, Cl. 118-723.0MP.

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Kozak, William G.; Chovatia, Dharmesh; and Smith, George A., 5,501,796, Cl. 210-638.000.

Smith, Jack V.; and Carter, Jesse M., to J. Prime Industries, Inc. Safety shield system. 5,500,954, Cl. 2-9.000.

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Bourg, John; Mitchell, James; Mirotznik, Mark; Roth, Bradley; Subramanian, Sankaran; Cherukuri, Murali; Zablocky, Paul G.; Pohida, Thomas J.; Smith, Paul D.; Frisauf, Walter S.; and Tschudin, Rolf G., 5,502,386, Cl. 324-316.000.

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Smitt, Asbjørn, to Contex A/S. Optical scanner having a variable resolution. 5,502,578, Cl. 358-474.000.

Smooha, Yehuda: *See*—
Chen, Che-Tsung; Gabara, Thaddeus J.; Morris, Bernard L.; and Smooha, Yehuda, 5,502,328, Cl. 257-546.000.

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Pellet, Marc, 5,501,011, Cl. 29-890.010.

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Lechevalier, Michel, 5,501,245, Cl. 137-117.000.

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Ansart, Denis R. H.; Hernandez, Didier; and Martinez, Rodolphe, 5,501,071, Cl. 60-39.320.

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Chauvin, Jean-Michel; and Claude, Jean M., 5,501,359, Cl. 220-452.000.

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Sohn, Edward J. S.: *See*—
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Sokkia Co., Ltd.: *See*—
Isomura, Hidetoshi, 5,502,641, Cl. 364-449.000.

Sokola, Raymond: *See*—
Newell, Michael; Sokola, Raymond; and Heine, David, 5,502,422, Cl. 333-207.000.

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Toh, Huan K.; and Kok, Chong M., 5,502,139, Cl. 526-284.000.

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Keller, Gary E.; Suggs, Gregory M.; Solheim, John A.; and Lim, Nip T., 5,501,328, Cl. 206-315.600.

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Hagedorn, Ferdinand; Fiege, Helmut; Sölner, Robert; and Helm, Rudolf, 5,502,256, Cl. 568-25.000.

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Sommer, Richard: *See*—
Jäger, Horst; Arnold, Siegbert; and Sommer, Richard, 5,502,173, Cl. 534-598.000.

Sommer, Walter; Lange, Wilhelm; and Dirks, Klaus-Peter, to Krupp Maschinentechnik Gesellschaft mit beschränkter Haftung. Apparatus for receiving and advancing container lids of ferromagnetic material. 5,501,317, Cl. 198-464.200.

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Merker, Walter H., Jr.; and Sommerfeld, Howard R., 5,501,347, Cl. 213-32.00C.

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Weidler, Burghard; Sommermeyer, Klaus; Henning, Klaus; and Bepperling, Frank, 5,502,043, Cl. 514-60.000.

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Song, Chang J. Key fob and attachment. 5,501,089, Cl. 70-456.00R.

Song, In-yong: *See*—
Choi, Min-ho; and Song, In-yong, 5,502,557, Cl. 355-326.00R.

Song, Joo H.; and Broderick, Kevin B., to Wm. Wrigley Jr. Company. Method of making sugar-containing chewing gum with prolonged sweetness intensity. 5,501,864, Cl. 426-3.000.

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Ho, Guo-Jie; Mathre, David A.; Song, Zhiguo; and Emerson, Khateeta, 5,502,165, Cl. 530-341.000.

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Saitoh, Toshio; Takizawa, Teruhiro; Maki, Naoki; Kobayashi, Takashi; Shibata, Masayuki; Yoshioka, Ken; Sonobe, Tadasi; and Suzuki, Fumio, 5,502,613, Cl. 361-19.000.

Sonoyama, Mitsuyoshi; Suzaki, Kentaro; Aihara, Masaki; Suzuki, Hirokatsu; Miyahara, Shoji; Kojima, Norio; and Okada, Masatoshi, to Kawasaki Steel Corporation; and Tsubakimoto Chain Co. Coil packing line equipped with independently reciprocating carriages. 5,501,058, Cl. 53-204.000.

Sony Corporation: *See*—
Akagiri, Kenzo, 5,502,789, Cl. 395-2.130.
Banerjee, Pradip; Ghia, Atul V.; and Lau, Simon, 5,502,670, Cl. 365-230.060.
Fujinami, Yasushi, 5,502,573, Cl. 358-339.000.
Hayakawa, Hideaki; Gocho, Tetsuo; and Sato, Junichi, 5,502,008, Cl. 437-225.000.
Ito, Kazumasa; Kato, Hiroshi; and Fujita, Junichi, 5,502,798, Cl. 395-119.000.
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Kobayashi, Hiroshi, 5,501,386, Cl. 226-190.000.
Kohno, Nobuo, 5,501,537, Cl. 400-240.400.
Kohno, Takanobu; and Ozue, Tadashi, 5,502,603, Cl. 360-77.140.
Kudo, Junichi; and Senoguchi, Ryosuke, 5,502,701, Cl. 369-54.000.
Miura, Yoshihiro; Takagi, Koji; Morita, Takashi; and Yoshii, Fumihiko, 5,502,695, Cl. 369-32.000.
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Nakata, Tetsuro; and Ueta, Motomu, 5,502,505, Cl. 348-595.000.
Ohmori, Kiyoshi, 5,502,704, Cl. 369-77.200.
Okada, Miyuki, 5,502,484, Cl. 348-208.000.
Ozaki, Shinji, 5,502,749, Cl. 375-368.000.
Senshu, Yoichirou; Ota, Shuichi; Fujii, Hiroshi; Uetake, Akihiro; Sawada, Takashi; Hasegawa, Shinichi; Suzuki, Kazuyoshi; and Morii, Tetsuro, 5,502,608, Cl. 360-132.000.
Shimizu, Kunio; and Nakano, Yoshitomo, 5,502,602, Cl. 360-73.140.
Shinada, Akira, 5,502,700, Cl. 369-50.000.
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Tanaka, Shigeo, 5,502,823, Cl. 395-310.000.
Teramoto, Kazumori; and Sugeno, Naoyuki, 5,501,916, Cl. 429-94.000.
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Sony Electronics, Inc.: *See*—
Banerjee, Pradip; Ghia, Atul V.; and Lau, Simon, 5,502,670, Cl. 365-230.060.

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Soprani, Massimo: *See*—
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Sorensen, Troy; and Grieger, Eric, to Micron Technology, Inc. Method for gettering noble metals from mineral acid solution. 5,501,767, Cl. 156-662.100.

Southard, W. Mark: *See*—
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Southcorp Water Heaters USA, Inc.: *See*—
Nogles, Thomas G., 5,501,012, Cl. 29-890.051.

Southwest Aerospace Corporation: *See*—
Brum, Roger D.; and Carrier, David T., 5,501,411, Cl. 242-397.000.

Southwest Research Institute: *See*—
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Sowden, Harry S., to McNeil-PPC, Inc. Analgesic tablet container. 5,501,337, Cl. 206-528.000.

Sparks, James R.: *See*—
Dyer, Daniel R.; and Sparks, James R., 5,501,256, Cl. 144-241.000.

Spater, Stuart S.: *See*—
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Spectra, Inc.: *See*—
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Moynihan, Edward R.; Hoisington, Paul A.; and Gailus, David W., 5,500,988, Cl. 29-25.350.

Speil, Walter; Ihlemann, Arndt; and Kecker, Johann, to Ina Walzlager Schaeffler KG. Connection of a guide rail of a valve actuation device with a camshaft bearing. 5,501,187, Cl. 123-90.220.

Spetzler, Robert F. Method for securing a cranial piece in position. 5,501,685, Cl. 606-75.000.

Spielberg, Jerry, to Mycone Dental Supply Co. Needleless injector. 5,501,666, Cl. 604-68.000.

Spies, Karl-Heinz; Schweikert, Willi; Barth, Armin; and Sander, Hans-Gerhard, to Firma Carl Freudenberg. Elastic mounting apparatus for mounting a turbocharger housing on an internal combustion engine. 5,501,075, Cl. 60-605.100.

Spivey, Brett: *See*—
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Springmann, Hartmut. Hand-scrubbing brush. 5,500,971, Cl. 15-23.000.

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Srchem, Inc.: *See*—
Wood, Louis L., 5,502,117, Cl. 525-435.000.

Stachulla, Karlheinz: *See*—
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Stalmeir, Joseph; and Fuderer, Erich, to Knorr-Bremse AG. Device for generating a reversible working stroke. 5,501,305, Cl. 188-167.000.

Standley, David L., to Rockwell International Corporation. Current ratio circuit for multi-color imaging. 5,502,299, Cl. 250-208.200.

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Ohmamyuda, Yukio; Kimura, Shigeru; Tanabe, Toru; Iwasaki, Kazuhisa; Seto, Takao; Kitamura, Hideki; and Senoo, Yasushi, 5,502,432, Cl. 340-436.000.

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Stark, Timothy D., to Geosynthetics, Inc. Stabilized fluid barrier member and method for making and using same. 5,501,753, Cl. 156-70.000.

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Starnes, Robert L.; Trackman, Philip C.; and Katkocin, Dennis M., to Novo Nordisk A/S. Thermostable cyclodextrin glycosyl transferase and processes using it. 5,501,968, Cl. 435-193.000.

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State of Oregon acting by and through the Oregon State Board of Higher Education, acting for and on behalf of The Oregon Health Sciences University and The University of Oregon: *See*—
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Stauber, Hans-Ulrich, to Ferag AG. Apparatus for trimming flat multi-sheet printed products. 5,501,127, Cl. 83-100.000.

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Stepanek, Premek; Klubitschko, Gerd; and Messerschmidt, Werner, to Marker Deutschland GmbH. Automatic release ski binding. 5,501,483, Cl. 280-625.000.
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Steppan, David D.; Cageao, Ronald A.; Nodelman, Neil H.; Slack, William E.; and Sanns, Frank, Jr., to Bayer Corporation. Linear HDI urethane prepolymers for rim application. 5,502,150, Cl. 528-60.000.
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Stokes, Michael J.: *See—*
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Stoltefuss, Jürgen; Goldmann, Siegfried; Straub, Alexander; Bechem, Martin; Gross, Rainer; Hebisch, Siegbert; Hütter, Joachim; and Rounding, Howard-Paul, to Bayer Aktiengesellschaft. 2-amino-4-quinolyl-dihydropyridines, processes for their preparation, and their use. 5,502,062, Cl. 514-314.000.
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Dalziel, Warren L., 5,501,515, Cl. 312-9.310.
Storch, Ernesto E.: *See—*
Storch, Herman; and Storch, Ernesto E., 5,501,055, Cl. 52-741.100.
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Fulcher, Malcolm; and Storeton-West, Trevor, 5,502,656, Cl. 364-550.000.
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Datta, Pabitra; Poliniak, Eugene S.; Ritt, Peter M.; Collins, Brian T.; and Stork, Harry R., 5,501,928, Cl. 430-23.000.
Storm, Siegfried: *See—*
Schmode, Hartmut; Storm, Siegfried; Thiele, Helmut; Wiebe, Ulrich; David, Bernd; Hetland, Detley; Kornfeld, Hans-Joachim; and Salten, Johann-Georg, 5,500,998, Cl. 29-751.000.
Stout, Neil P.: *See—*
Collings, George P.; Stout, Neil P.; Cowell, Christopher S.; and Plas, Stephen J., 5,501,868, Cl. 426-623.000.
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Straeter, William F.: *See—*
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Stromberg, Per S. Collapsible container. 5,501,354, Cl. 220-7.000.
Struijk, Johannes J.: *See—*
Holsheimer, Jan; and Struijk, Johannes J., 5,501,703, Cl. 407-46.000.
Stubbe, Andreas: *See—*
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Todokoro, Masatoshi; and Shiraishi, Masami, 5,501,601, Cl. 434-169.000.
Stuhlmiller, Gary L., to Motorola, Inc. Switchable constant gain summing circuit. 5,502,413, Cl. 327-361.000.
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Cartmell, James V.; Sturtevant, Wayne R.; Bausmith, William E., III; and Wolf, Michael L., 5,501,661, Cl. 602-58.000.
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Su, Sam S.: *See—*
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Suda, Minoru; Nakasu, Masatoshi; and Iijima, Tetsuo, to Hitachi, Ltd. Power transistor device having collector voltage clamped to stable level over wide temperature range. 5,502,338, Cl. 257-570.000.
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Suetake, Tomoko: *See—*
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Suetsugu, Hajime; Nakazumi, Tadataka; Takami, Akihide; and Takemoto, Takashi, to Mazda Motor Corporation. Exhaust gas purifying system. 5,501,074, Cl. 60-285.000.
Sugawara, Shuji; Sukata, Kazuaki; and Yamanaka, Shun-ichiro, to Orient Chemical Industries, Ltd. Charge control agent and toner for developing electrostatic images. 5,501,932, Cl. 430-110.000.
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Sugiyama, Kenji; and Nakamura, Hiroya, to Victor Company of Japan, Ltd. Orthogonal transform coding apparatus and decoding apparatus. 5,502,491, Cl. 348-403.000.
Sugiyama, Norihide; Murohushi, Hidenobu; and Nakamura, Masaru, to Asahi Glass Company Ltd. Process for producing a perfluoro copolymer. 5,502,132, Cl. 526-247.000.
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Sukegawa, Osamu; and Ihara, Hirohumi, to NEC Corporation. Liquid crystal display device capable of compensating for a positioning error between a drain line and a display electrode. 5,502,583, Cl. 359-59.000.
Sulkowski, David J., to Pirelli Armstrong Tire Corporation. Tire tread having a circumferential groove deeper than tread element height. 5,501,258, Cl. 152-209.00R.
Sulzbach, Frank C., to Texas Instruments Incorporated. Method of forming a durable wideband anti-reflection coating for infrared windows. 5,502,442, Cl. 342-2.000.
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Sumitomo Chemical Company, Limited: *See—*
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Shibata, Kenichiro; Fujii, Akihito; and Sakamoto, Toshihiro, 5,502,015, Cl. 501-151.000.
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Sumitomo Heavy Industries, Ltd.: *See—*
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Sumitomo Metal Industries, Ltd.: *See—*
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Sumitomo Rubber Industries, Ltd.: *See—*
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Sumitomo Wiring Systems, Ltd.: *See—*
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Sun Company, Inc. (R&M): *See—*
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Suncast Corporation: *See—*
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Sundberg, Henric. Aeration drum for composting toilet. 5,501,978, Cl. 435-290.300.
Sundholm, Göran. Fire-fighting equipment. 5,501,282, Cl. 169-37.000.
Sunx Limited: *See—*
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Suzuki, Kazuhiko: *See—*
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Suzuki, Kazuo; and Yamamoto, Yukihiro, to Nippon Steel Corporation. Harmonic wave generating element for coherent light having short wavelength. 5,502,590, Cl. 359-332.000.
Suzuki, Kazuyoshi: *See—*
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Suzuki, Kenzaburo; and Nakatsuji, Masahiro, to Nikon Corporation. Zoom lens incorporating vibration-proofing function. 5,502,594, Cl. 359-557.000.
Suzuki, Masahiko, to Brother Kogyo Kabushiki Kaisha. Droplet jet apparatus. 5,502,472, Cl. 347-69.000.
Suzuki, Masahiro, to Nikon Corporation. Camera which compresses digital image data in correspondence with the focus control or the stop value of the camera. 5,502,485, Cl. 348-231.000.
Suzuki, Masaji: *See—*
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Suzuki, Mikio: *See—*
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Suzuki, Shintaro; and Matsushita, Toru, to Sanshin Kogyo Kabushiki Kaisha. Packing box with cradle shaped portion. 5,501,339, Cl. 206-586.000.
Suzuki, Takashi: *See—*
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Suzuki, Tetsuji: *See—*
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Suzuki, Toshinobu, to Olympus Optical Co., Ltd. Immersion microscope objective. 5,502,596, Cl. 359-657.000.
Suzuki, Tsutomu: *See—*
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Suzuki, Yasuo, to Kabushiki Kaisha Topcon. Method and apparatus for measuring a frame configuration. 5,501,017, Cl. 33-200.000.
Suzuki, Yasuyuki; and Yamashita, Takashi, to Canon Kabushiki Kaisha. Contact-type charging member which includes an insulating metal oxide in a surface layer thereof. 5,502,548, Cl. 355-219.000.
Swan, William E., to Container Research Corporation. Collapsible container. 5,501,333, Cl. 206-386.000.
Swann, David A.: *See—*
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Swann, George R.; and Moore, Eric R., to Chick Machine Tool, Inc. Indexing apparatus. 5,501,123, Cl. 74-822.000.
Swanson, Howard E.: *See—*
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Swenson, Jody A., to Utah State University Foundation. Analog switched-capacitor vector quantizer. 5,502,441, Cl. 341-172.000.
Swenson, Rolf E.: *See—*
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Swierbut, Wendi M.; and Nardi, John C., to Eveready Battery Company, Inc. Alkaline cell having a cathode including a tin dioxide additive. 5,501,924, Cl. 429-224.000.
Swift, David C.: *See—*
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Swirbel, Thomas J., to Motorola, Inc. Method of patterning an inorganic overcoat for a liquid crystal display electrode. 5,501,943, Cl. 430-313.000.
Syldath, Andreas: *See—*
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Syntecn Gewebe Technik GmbH: *See—*
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Synthes (U.S.A.): *See—*
Schlapfer, Johannes F.; and Hess, Martin, 5,501,684, Cl. 606-73.000.
Syverson, Charles D.; and Curtiss, William P., to Ecoair Corp. Hybrid alternator with voltage regulator. 5,502,368, Cl. 322-28.000.
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Szum, David M., to DSM Desotech, Inc. Coating system for glass strength retention. 5,502,145, Cl. 528-28.000.
Tabata, Atsushi: *See—*
Inuzuka, Takeshi; Hattori, Masashi; Kaigawa, Masato; Hojo, Yasuo; Tabata, Atsushi; and Shirai, Kenji, 5,501,642, Cl. 477-107.000.
Tabata, Kazuhiro: *See—*
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Tachibana, Keiji; Ishii, Susumu; Kumaki, Michio; and Genba, Takeo, to Hitachi Building Equipment Engineering Co., Ltd. Refrigeration purge and/or recovery apparatus. 5,501,082, Cl. 62-149.000.
Tachikawa, Mamoru: *See—*
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Tagg, Richard L., to Poly-John Enterprises Corporation. Flush system for outdoor portable toilets. 5,500,960, Cl. 4-318.000.
Tagg, Richard L., to Polyjohn Enterprises Corporation. Outdoor toilet cabana. 5,500,962, Cl. 4-476.000.
Taguchi, Mitsuaki: *See—*
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Taihei Kogyo Co., Ltd.: *See—*
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Takada, Takashi: *See—*
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Takagaki, Hiromitsu: *See—*
Iwata, Naoki; Saito, Takeshi; Yano, Hidetoshi; Takagaki, Hiromitsu; Nishido, Kazuhiro; Komuro, Ichiro; Sawa, Shigeki; and Shima, Nobuhiro, 5,502,552, Cl. 355-259.000.
Takagaki, Tadao, to Sumitomo Bakelite Co., Ltd. Process for production of a bag having linear ribs. 5,501,757, Cl. 156-196.000.
Takagi, Atsushi: *See—*
Tsuji, Hiroyoshi; Suzuki, Kazuhiko; Watanabe, Keiko; Takagi, Atsushi; Takaoka, Hitoshi; and Baba, Goro, 5,502,799, Cl. 395-131.000.
Takagi, Bungo: *See—*
Anan, Naoki; Takagi, Bungo; and Miyamura, Kazuya, 5,502,517, Cl. 351-160.00H.
Takagi, Koji: *See—*
Miura, Yoshihiro; Takagi, Koji; Morita, Takashi; and Yoshii, Fumihiko, 5,502,695, Cl. 369-32.000.
Takagi, Yoshihiro; and Inagaki, Yoshio, to Fuji Photo Film Co., Ltd. Pre-fogged direct reversal silver halide photographic material. 5,501,946, Cl. 430-573.000.
Takahashi, Kazuyoshi; Otsuka, Naoji; Ebata, Tokihide; Hirabayashi, Hiromitsu; Tajika, Hiroshi; Koitabashi, Noribumi; Arai, Atsushi; Aono, Kenji; and Sugimoto, Hitoshi, to Canon Kabushiki Kaisha. Fixater and recording apparatus using the same. 5,502,464, Cl. 346-25.000.
Takahashi, Kiyoshi, to Brother Kogyo Kabushiki Kaisha. Print device capable of printing a format sheet in which items about a print device and a document processor are completed. 5,502,796, Cl. 395-115.000.
Takahashi, Koji: *See—*
Ueda, Osamu; and Takahashi, Koji, 5,502,486, Cl. 348-239.000.
Takahashi, Masaharu: *See—*
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Takahashi, Norio: *See—*
Watanabe, Rikizou; Takahashi, Norio; Kimura, Hirofumi; and Fujita, Toshio, 5,501,835, Cl. 420-54.000.
Takahashi, Ryusaku: *See—*
Takanashi, Itsuo; Nakagaki, Shintaro; Negishi, Ichiro; Suzuki, Tetsuji; Tatsumi, Fujiko; Takahashi, Ryusaku; and Maeno, Keiichi, 5,502,490, Cl. 358-296.000.
Takahashi, Shigeru: *See—*
Hiraishi, Atsushi; Akioka, Takashi; Kobayashi, Yutaka; Yokoyama, Yuji; Iwamura, Masahiro; Yamauchi, Tatsumi; Takahashi, Shigeru; Uchida, Hideaki; and Ide, Akira, 5,502,820, Cl. 395-250.000.
Takahashi, Shinsuke; and Shibata, Norio, to Fuji Photo Film Co., Ltd. Coating method and apparatus having an exchangeable resisting body insertable in the reservoir. 5,501,737, Cl. 118-410.000.
Takahashi, Shinya, to Oki Electric Industry Co., Ltd. Semiconductor memory device incorporating a test mode therein to perform an automatic refresh function. 5,502,677, Cl. 365-201.000.
Takahashi, Tadashi; Onda, Kenichi; Kanouda, Akihiko; Horie, Hideaki; Hagiwara, Syuya; Uchiyama, Noriyuki; and Saito, Sadamu, to Hitachi, Ltd. Flat transformer and power supply unit having flat transformer. 5,502,430, Cl. 336-232.000.
Takahashi, Taro: *See—*
Maeda, Hirokazu; Furuta, Hitoshi; Takahashi, Taro; and Shimizu, Hiroshi, 5,501,860, Cl. 424-464.000.
Takami, Akihide: *See—*
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Takamiya, Makoto: *See—*
Kato, Shigeki; Kadowaki, Hidejiro; Ishida, Yasuhiko; Takamiya, Makoto; Ashiwa, Jun; and Ueda, Shinji, 5,502,466, Cl. 356-356.000.
Takamura, Kozo: *See—*
Kaneh, Akio; and Takamura, Kozo, 5,502,352, Cl. 313-141.000.
Takanashi, Itsuo; Nakagaki, Shintaro; Negishi, Ichiro; Suzuki, Tetsuji; Tatsumi, Fujiko; Takahashi, Ryusaku; and Maeno, Keiichi, to Victor Company of Japan, Ltd. Display unit having a light-to-light conversion element. 5,502,490, Cl. 358-296.000.
Takano, Hajime, to NEC Corporation. Image storage of a changeable display. 5,502,809, Cl. 395-164.000.
Takano, Shouji, to Kabushiki Kaisha Toshiba. Image-forming apparatus with an exposure-light intensity adjusting function for a two-sided original. 5,502,542, Cl. 355-69.000.
Takaoka, Hitoshi: *See—*
Tsuji, Hiroyoshi; Suzuki, Kazuhiko; Watanabe, Keiko; Takagi, Atsushi; Takaoka, Hitoshi; and Baba, Goro, 5,502,799, Cl. 395-131.000.
Takarazawa, Yukie, executor: *See—*
Shida, Yukimori, deceased; Shida, Chieko, executor; Shida, Yoshitaka, executor; Shida, Mutsuko, executor; Takarazawa, Yukie, executor; and Shida, Emiko, executor, 5,501,719, Cl. 72-25.000.
Takasago International Corporation: *See—*
Sayo, Noboru; Sano, Noboru; and Kumobayashi, Hidenori, 5,502,221, Cl. 549-549.000.
Takase, Akira; Kai, Hiroyuki; Nishida, Kuniyoshi; and Masui, Moriyasu, to Shionogi & Co., Ltd. Process of producing intermediates for use in production of alkoxyiminoacetamides and intermediates to be used therein. 5,502,252, Cl. 564-169.000.
Takase, Satoshi; Imaide, Takuya; Kinugasa, Toshiro; and Komatsu, Hiroyuki, to Hitachi, Ltd. Video camera apparatus. 5,502,483, Cl. 348-208.000.
Takashima, Makoto: *See—*



Korenaga, Hidenobu; Takashima, Makoto; and Iino, Tadashi, 5,502,456, Cl. 345-9.000.
Takashima, Masaki: *See—*
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Takasu, Hidemi: *See—*
Shimoji, Noriyuki; and Takasu, Hidemi, 5,502,668, Cl. 365-185.280.
Takata, Kazuhiko: *See—*
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Takatori, Sunao: *See—*
Shou, Guoliang; Takatori, Sunao; and Yamamoto, Makoto, 5,502,664, Cl. 364-724.160.
Takayama, Kenichi, to Usui Kokusai Sangyo Kaisha Ltd. Temperature sensitive fluid fan coupling. 5,501,183, Cl. 123-41.120.
Takayama, Toru; and Takemura, Yasuhiko, to Semiconductor Energy Laboratory Co., Ltd. Method of making semiconductor device/circuit having at least partially crystallized semiconductor layer. 5,501,989, Cl. 437-21.000.
Takayanagi, Kazunori; Tanaka, Nobuyoshi; and Mori, Masaya, to International Business Machines Corporation. Method and system for drawing narrow lines on a computer display. 5,502,801, Cl. 395-143.000.
Takebayashi, Hiroyuki, to Mazda Motor Corporation. Air-fuel ratio control system for engine. 5,501,206, Cl. 123-674.000.
Takebe, Makoto, to Kabushiki Kaisha Komatsu Seisakusho. Asynchronous data transmission system. 5,502,822, Cl. 395-310.000.
Takechi, Shozo: *See—*
Mori, Sachio; Takechi, Shozo; Kida, Shiro; Mizui, Takuji; and Ichihashi, Teruhisa, 5,502,216, Cl. 549-310.000.
Takeda Chemical Industries, Ltd.: *See—*
Makino, Tadashi; Yamada, Masayuki; and Kikuta, Jun-ichi, 5,501,861, Cl. 424-464.000.
Takemoto, Kiyohiko: *See—*
Miyashita, Satoru; Atobe, Mitsuro; Karasawa, Yasushi; Takemoto, Kiyohiko; and Ouki, Yasuhiro, 5,502,470, Cl. 347-45.000.
Takemoto, Takashi: *See—*
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Takemoto, Takatoshi; Tsubota, Koichi; Kadomatsu, Hideyuki; and Sasaki, Etsuro, to Kabushiki Kaisha Ace Denken. Paper strip transporting apparatus. 5,501,446, Cl. 271-188.000.
Takemoto Yushi Kabushiki Kaisha: *See—*
Noda, Ippei; and Ishikawa, Masami, 5,501,904, Cl. 428-331.000.
Takemura, Yasuhiko: *See—*
Takayama, Toru; and Takemura, Yasuhiko, 5,501,989, Cl. 437-21.000.
Takenaka, Toru, to Honda Giken Kogyo Kabushiki Kaisha. System for obstacle avoidance path planning for multiple-degree-of-freedom mechanism. 5,502,638, Cl. 364-424.020.
Takeo, Hideya, to Fuji Photo Film Co., Ltd. Method and apparatus for adjusting read-out and processing conditions for radiation images. 5,502,775, Cl. 382-169.000.
Takeuchi, Hiroyuki: *See—*
Nakaya, Chitose; Bito, Yoshitaka; Yamamoto, Etsuji; Nishimura, Hiroshi; Takeuchi, Hiroyuki; Watanabe, Shigeru; Miyajima, Akihiro; and Arai, Hitoshi, 5,502,384, Cl. 324-309.000.
Takeuchi, Kasumi: *See—*
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Takeuchi, Kiyoshi, to Kao Corporation. Cap with a hinged top lid. 5,501,348, Cl. 215-235.000.
Takeuchi, Seizi: *See—*
Doi, Toshiya; Soeta, Atsuko; Takeuchi, Seizi; Kamo, Tomoichi; and Matsuda, Shinpei, 5,502,029, Cl. 505-234.000.
Takeuchi, Takashi, to Kabushiki Kaisha Shinkawa. Wire bonding apparatus. 5,501,388, Cl. 228-1.100.
Taki, Yoshitsugu, to Sony Corporation. Disc processing apparatus having rotatable stocker and moving drive unit. 5,502,697, Cl. 369-34.000.
Takiar, Hem P.; and Lin, Peng-Cheng, to National Semiconductor Corporation. Stacked multi-chip modules and method of manufacturing. 5,502,289, Cl. 174-266.000.
Takiguchi, Ryohei; Saito, Hitoshi; Torii, Masanori; Hasegawa, Jun; Fujimura, Hideo; and Nakamura, Yoshinori, to Dai Nippon Printing Co., Ltd. Heat transfer image-receiving sheet. 5,502,024, Cl. 503-227.000.
Takiguchi, Takao: *See—*
Shinjo, Kenji; Takiguchi, Takao; Kitayama, Hiroyuki; Katagiri, Kazuharu; Yamashita, Masataka; Terada, Masahiro; Togano, Takeshi; and Asaoka, Masanobu, 5,501,818, Cl. 252-299.610.
Takizawa, Teruhiro: *See—*
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Takubo, Takefumi: *See—*
Hori, Kenjiro; Akiyama, Satoshi; Suzuki, Hideki; and Takubo, Takefumi, 5,502,550, Cl. 355-246.000.
Tal, Zeev. Device for squeezing the contents of flexible tubes. 5,501,369, Cl. 222-103.000.
Tallier, Bernard: *See—*
Babey, Jacques; Salmon, Brian; De Borst, Eric; and Tallier, Bernard, 5,501,233, Cl. 131-84.100.
Talwar, Gursaran P.; Upadhyay, Shakti N.; and Dhawan, Suman. Neem oil as a male contraceptive. 5,501,855, Cl. 424-195.100.
Tam, David C.: *See—*
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Tam, James K.: *See—*
Arjavalingam, Gunnalingam; Deutsch, Alina; Kopcsay, Gerard V.; and Tam, James K., 5,502,392, Cl. 324-638.000.
Tamglass Engineering Oy: *See—*
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Tamura, Yuichi: *See—*
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Tanabe, Toru: *See—*
Ohmamyuda, Yukio; Kimura, Shigeru; Tanabe, Toru; Iwasaki, Kazuhisa; Seto, Takao; Kitamura, Hideki; and Senoo, Yasushi, 5,502,432, Cl. 340-436.000.
Tanaka, Atsuhiko: *See—*
Kimura, Akiteru; Matsuzaki, Miki; Tanaka, Atsuhiko; and Inoue, Masatoshi, 5,502,598, Cl. 359-814.000.
Tanaka, Hiroshi; Morishige, Kozo; Watanabe, Katsushi; and Kashiyama, Shigetoshi, to Mitsui Petrochemical Industries, Ltd.; and Otsuka Pharmaceutical Factory, Inc. Resin laminate. 5,501,887, Cl. 428-35.200.
Tanaka, Nobuyoshi: *See—*
Takayanagi, Kazunori; Tanaka, Nobuyoshi; and Mori, Masaya, 5,502,801, Cl. 395-143.000.
Tanaka, Shigeo, to Sony Corporation. Bus system with virtual logical buffer. 5,502,823, Cl. 395-310.000.
Tanaka, So; and Iiyama, Michitomo, to Sumitomo Electric Industries, Ltd. Process for preparing high crystallinity oxide thin film. 5,501,175, Cl. 117-108.000.
Tanaka, Yasuaki: *See—*
Imai, Yuji; Tanaka, Yasuaki; and Wakamoto, Shinji, 5,502,311, Cl. 250-548.000.
Tanaka, Yasuhiko: *See—*
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Tani, Ikuo: *See—*
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Tani, Masayuki: *See—*
Yamaashi, Kimiya; Tani, Masayuki; Tanikoshi, Koichiro; Futakawa, Masayasu; Tanifuji, Shinya; Kawabata, Atsushi; Watanabe, Norito; and Maeda, Kazunari, 5,502,497, Cl. 348-473.000.
Tanielyan, Setrak K.: *See—*
Augustine, Robert L.; Fournier, Jay A.; Paine, John B., III; Shafer, Kenneth H.; and Tanielyan, Setrak K., 5,502,019, Cl. 502-314.000.
Tanifuji, Shinya: *See—*
Yamaashi, Kimiya; Tani, Masayuki; Tanikoshi, Koichiro; Futakawa, Masayasu; Tanifuji, Shinya; Kawabata, Atsushi; Watanabe, Norito; and Maeda, Kazunari, 5,502,497, Cl. 348-473.000.
Tanigawa, Fumiyoshi, to Sumitomo Wiring Systems, Ltd. Method for producing a wear-detection probe for a brake lining material. 5,501,828, Cl. 264-138.000.
Taniguchi, Naosato: *See—*
Sudo, Toshiyuki; Taniguchi, Naosato; and Morishima, Hideki, 5,502,581, Cl. 359-10.000.
Taniguchi, Takao; Tsukamoto, Kazumasa; Hayabuchi, Masahiro; and Ando, Masahiko, to Aisin Aw Co., Ltd. Control system for vehicular automatic transmissions with a quick-shift hydraulic system for manual shifting. 5,501,645, Cl. 477-130.000.
Tanikoshi, Koichiro: *See—*
Yamaashi, Kimiya; Tani, Masayuki; Tanikoshi, Koichiro; Futakawa, Masayasu; Tanifuji, Shinya; Kawabata, Atsushi; Watanabe, Norito; and Maeda, Kazunari, 5,502,497, Cl. 348-473.000.
Tann, Chou-Hong: *See—*
Fu, Xiaoyong; Thiruvengadam, Tiruvettipuram K.; Tann, Chou-Hong; Lee, Junning; and Colon, Cesar, 5,502,222, Cl. 552-595.000.
Tannyeres, Louis: *See—*
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Taoka Chemical Company, Limited: *See—*
Okamura, Naomi; Hino, Takao; Nimura, Akio; Fukai, Masayuki; Shimizu, Keizi; Teramae, Harumi; and Hata, Chiaki, 5,501,370, Cl. 222-111.000.
Tap Holdings Inc.: *See—*
Haviv, Fortuna; Fitzpatrick, Timothy D.; Swenson, Rolf E.; Nichols, Charles J.; and Mort, Nicholas A., 5,502,035, Cl. 514-15.000.
Tarantino, Elia R., to ID Technology. Beaker cover. 5,501,839, Cl. 422-99.000.
Tarara, Gerhard: *See—*
Harde, Christoph; Johana, Gerhard; Krüger, Gabriele; Rees, Richard; Tarara, Gerhard; and Gates, Peter S., 5,502,028, Cl. 504-227.000.
Tasch, Uri; and Kalkstein, Arie, to University of Maryland-Baltimore County. Apparatus for controlling angular positioning and stiffness modulations of joint of robotic manipulator. 5,502,363, Cl. 318-568.110.
Tatematsu, Susumu: *See—*
Mori, Kazuhiro; Uchida, Naoya; and Tatematsu, Susumu, 5,501,081, Cl. 62-135.000.
Tateosian, Louis H.; Shaffer, Scott E.; and Latta, Mark A., to Dentsply Research & Development Corp. Dental composition, prosthesis, and method for making dental prosthesis. 5,502,087, Cl. 523-115.000.
Tatsak, Gary B.: *See—*
Cheesman, Robert R.; Ehleiter, James A.; Gass, Don N.; Tatsak, Gary B.; and Fletcher, R. Ian, 5,501,793, Cl. 210-160.000.
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Takanashi, Itsuo; Nakagaki, Shintaro; Negishi, Ichiro; Suzuki, Tetsuji; Tatsumi, Fujiko; Takahashi, Ryusaku; and Maeno, Keiichi, 5,502,490, Cl. 358-296.000.
Tatsumi, Yasuyuki: *See*—
Isshiki, Shigehiro; Sato, Masami; Tatsumi, Yasuyuki; and Yoshimi, Yutaka, 5,501,643, Cl. 474-268.000.
Tattermusch, Peter; and Huch, Thomas, to Mercedes-Benz AG. Motor vehicle air spring. 5,501,432, Cl. 267-64.240.
Taylor, Evelyn A.: *See*—
Hall, Richard A.; O'Connell, Michael G.; and Taylor, Evelyn A., 5,501,804, Cl. 210-805.000.
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Meisburger, Dan; Brodie, Alan D.; Chadwick, Curt; Desai, Anil; Dohse, Hans; Emge, Dennis; Greene, John; Johnson, Ralph; Ling, Ming-Yie; McMurtry, John; Becker, Barry; Paul, Ray; Robinson, Mike; Simmons, Richard; Smith, David E. A.; Taylor, John; Veneklasen, Lee; Walters, Dean; Wieczorek, Paul; Wong, Sam; Dutta, April; Lele, Surendra; Rough, Kirkwood; Pearce-Percy, Henry; Jau, Jack Y.; Lin, Chun C.; Nguyen, Hoi T.; Oyang, Yen-Jen; Hutcheson, Timothy L.; Clark, David J.; Pan, Chung-Shih; Bhaskar, Chetana; Kirk, Chris; Munro, Eric; Gibilisco, John; and Sandland, Paul, 5,502,306, Cl. 250-310.000.
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Taylor, Peter J.: *See*—
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Technoflow Tube-Systems GmbH: *See*—
Brunnhofer, Erwin, 5,501,196, Cl. 123-497.000.
Technology Licensing Company: *See*—
Ferralli, Michael W., 5,501,873, Cl. 427-195.000.
Technology Partnership Ltd., The: *See*—
Hastings, Nicholas J.; Taylor, Peter J.; and Gutsell, Graham S., 5,501,535, Cl. 400-88.000.
Teetz, Wolfgang: *See*—
Molder, Karl-Peter; Teetz, Wolfgang; and Zieschang, Rolf, 5,501,163, Cl. 112-102.000.
Tefco International Co., Ltd.: *See*—
Nakayama, Hiroo, 5,501,785, Cl. 205-67.000.
Teicher, Beverly A.; and Huang, Zhen-Dong, to Dana Farber Cancer Institute. 1,2-benzoquinones and methods for making and using same. 5,502,214, Cl. 548-950.000.
Teijin Limited: *See*—
Murayama, Sadamitsu, 5,501,879, Cl. 427-381.000.
Saika, Isamu; and Inagaki, Kenji, 5,501,891, Cl. 428-71.000.
Tektronix, Inc.: *See*—
Beachy, Jeffrey L., 5,502,807, Cl. 395-152.000.
Knierim, David L., 5,502,468, Cl. 347-19.000.
Neal, Meade M.; Crawford, Clark W.; Reeves, Barry D.; and Rise, James D., 5,502,476, Cl. 347-103.000.
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Rodney, Stanley; and Barr, Larry H., 5,501,154, Cl. 102-331.000.
Telefonaktiebolaget L M Ericsson: *See*—
Sallberg, Krister, 5,502,714, Cl. 370-17.000.
Telefonaktiebolaget LM Ericsson: *See*—
Lagerqvist, Tomas; Minde, Tor B.; Mustel, Peter; and Nilsson, Hans, 5,502,713, Cl. 370-17.000.
Leeb, Karl-Erik, 5,501,008, Cl. 29-849.000.
Temic Bayern-Chemie Airgab GmbH: *See*—
Zeuner, Siegfried; Ruge, Hans-Peter; and Neukirchinger, Peter, 5,501,152, Cl. 102-292.000.
Temmink, Gerhard: *See*—
Ordelman, Hendrik J.; Temmink, Gerhard; Stokkers, Herman W. H.; and Braam, Harm, 5,501,480, Cl. 280-304.100.
Tenen, Daniel G.; Pahl, Heike L.; and Burn, Timothy C., to Beth Israel Hospital, Boston Association. Myeloid cell specific promoter. 5,502,176, Cl. 536-24.100.
Tenmax Trading Corp.: *See*—
Wang, Michael, 5,502,619, Cl. 361-697.000.
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Yamasaki, Nakamichi; Tsuda, Kenji; Okuda, Hiroyuki; and Tenno, Toshinari, 5,502,262, Cl. 585-241.000.
Terada, Masahiro: *See*—
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Okamura, Naomi; Hino, Takao; Nimura, Akio; Fukai, Masayuki; Shimizu, Keizi; Teramae, Harumi; and Hata, Chiaki, 5,501,370, Cl. 222-111.000.
Teramoto, Kazunori; and Sugeno, Naoyuki, to Sony Corporation. Battery having a through-hole and heat dissipating means. 5,501,916, Cl. 429-94.000.
Teramoto, Toshio: *See*—
Ueshima, Toshihumi; Hasegawa, Ko; Teramoto, Toshio; Nakajima, Tatsuo; and Kononoto, Takeyoshi, 5,502,095, Cl. 524-269.000.
Terasaka, Kunihiro: *See*—
Nadahara, Souichi; Yamabe, Kikuo; Kobayashi, Hideyuki; Terasaka, Kunihiro; Yamamoto, Akihito; and Yasuhisa, Naohiko, 5,502,010, Cl. 437-247.000.
Terrill, Arnold M., to Torrington Company, The. Trunnion roller bearing retainer. 5,501,532, Cl. 384-572.000.
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Tetzlaff, Steven K.: *See*—
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Tews, Richard R.; Weyenberg, Jeffrey M.; and Rasmussen, Noel J., to Kimberly-Clark Corporation. Apparatus and method of reducing the force to expel a tampon from a tampon applicator and the applicator itself. 5,501,063, Cl. 53-452.000.
Texaco Inc.: *See*—
Garrett, Kenneth D.; and Rogers, Norman D., 5,501,278, Cl. 166-369.000.
Texas Instruments Incorporated: *See*—
Cho, Chih-Chen; and Liu, Hung-Yu, 5,501,174, Cl. 117-108.000.
Duncan, Walter M.; Celii, Francis G.; Henck, Steven A.; Paranjpe, Ajit P.; Mahlum, Douglas L.; and Taylor, Larry A., 5,501,637, Cl. 374-126.000.
Duvvury, Charvaka, 5,502,317, Cl. 257-107.000.
Goddard, Marc; and Tannyeres, Louis, 5,502,808, Cl. 395-162.000.
Hynecek, Jaroslav, 5,502,318, Cl. 257-217.000.
Johnson, F. Scott; and Taylor, Kelly, 5,502,330, Cl. 257-588.000.
Koelling, Jeffrey E.; and McAdams, Hugh P., 5,502,671, Cl. 365-189.090.
Landers, Robert J.; Mahant-Shetti, Shivaling S.; Krishman, R.; and Mutukrishnan, C., 5,502,404, Cl. 326-50.000.
Magel, Gregory A., 5,502,779, Cl. 385-1.000.
Mehendale, Mahesh M., 5,502,402, Cl. 326-40.000.
Mei, Chia-Cu P., 5,501,994, Cl. 437-40.000.
Simpson, Richard; and Oakland, Erick, 5,502,401, Cl. 326-38.000.
Sulzbach, Frank C., 5,502,442, Cl. 342-2.000.
Th. Goldschmidt AG: *See*—
Dessi, Natvarlei; and Wisotzki, Klaus, 5,502,175, Cl. 536-18.300.
Thaden, Robert: *See*—
Tran, Thang; Ganapathy, Gopi; Goddard, Michael D.; and Thaden, Robert, 5,502,414, Cl. 327-434.000.
Thayer, Henry. Vehicular door. 5,501,503, Cl. 296-146.800.
Theis, Christoph: *See*—
Bordeianu, Radu; and Theis, Christoph, 5,502,125, Cl. 526-140.000.
Theisen, Jeffrey J.; and Connelly, John F., to Donaldson Company, Inc. Pressure isolation valve and bypass valve; and filter head assembly incorporating same. 5,501,791, Cl. 210-90.000.
Thera Patent GmbH & Co. KG Gesellschaft Fur Industrielle Schutzrechte: *See*—
Brandhorst, Gerd; Herold, Wolf-Dietrich; and Heiduczek, Ralf, 5,501,368, Cl. 222-95.000.
Thiele, Helmut: *See*—
Schmode, Hartmut; Storm, Siegfried; Thiele, Helmut; Wiebe, Ulrich; David, Bernd; Hetland, Detley; Kornfeld, Hans-Joachim; and Salten, Johann-Georg, 5,500,998, Cl. 29-751.000.
Thiokol Corporation: *See*—
Lund, Gary K.; and Blau, Reed J., 5,501,823, Cl. 264-3.100.
Thiruvengadam, Tiruvettipuram K.: *See*—
Fu, Xiaoyong; Thiruvengadam, Tiruvettipuram K.; Tann, Chou-Hong; Lee, Juaning; and Colon, Cesar, 5,502,222, Cl. 552-595.000.
Thom, Kelsey C., Jr., to Roskamp Champion. Irregular flow steam conditioner. 5,501,143, Cl. 99-516.000.
Thomas & Betts Corporation: *See*—
Lord, Randal B., 5,502,301, Cl. 250-227.140.
Thomas, Günter: *See*—
Angerbauer, Rolf; Fey, Peter; Hübsch, Walter; Philipps, Thomas; Bischoff, Hilmar; Petzinna, Dieter; Schmidt, Delf; and Thomas, Günter, 5,502,057, Cl. 514-277.000.
Thomas, Mammen: *See*—
Chua, Hua-Thye; Chan, Andrew K.; Birkner, John M.; Whitten, Ralph G.; Bechtel, Richard L.; and Thomas, Mammen, 5,502,315, Cl. 257-50.000.
Thomas, Sherrill G.; and Ball, Larry G., to General Electric Company. Electric circuitry for preventing contactor tip contamination in dry switching applications. 5,502,609, Cl. 361-6.000.
Thompson, Bennie: *See*—
Failla, Stephen J.; Stokes, Michael J.; Price, Daniel W.; Rarey, Charles M.; and Thompson, Bennie, 5,501,654, Cl. 600-204.000.
Thompson, Debra Tak: *See*—
Thompson, Kenneth, 5,501,491, Cl. 283-70.000.



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Plancich, Mitchell A.; and Thompson, Merall L., 5,501,072, Cl. 60-221.000.
Thompson, Wayne J.; Ghosh, Arun K.; Huff, Joel R.; and Lee, Hee Y., to Merck & Co., Inc. HIV protease inhibitors. 5,502,060, Cl. 514-307.000.
Thomson Composants Militaires et Spatiaux: *See*—
Mabboux, Henri; and Mermet-Guyennet, Michel, 5,502,278, Cl. 174-52.400.
Thomson Consumer Electronics, Inc.: *See*—
Datta, Pabitra; Poliniak, Eugene S.; Ritt, Peter M.; Collins, Brian T.; and Stork, Harry R., 5,501,928, Cl. 430-23.000.
Hailey, James E., Sr.; and Virag, David E., 5,502,496, Cl. 348-462.000.
Runnreich, Mark F.; and Canfield, Barth A., 5,502,501, Cl. 348-526.000.
Thomson Consumer Electronics S.A.: *See*—
Naccache, David, 5,502,764, Cl. 380-23.000.
Thomson Saginaw Ball Screw Co., Inc.: *See*—
Benton, Robert L., 5,501,118, Cl. 74-441.000.
Thomson Shared Services, Inc.: *See*—
Beaulieu, Roland C.; and Cutright, David R., 5,502,637, Cl. 364-408.000.
Thorp, Dean S.; Caropreso, Frank E.; Tieckelmann, Robert H.; and Lapham, Donald, III, to FMC Corporation. Method for treating water using an organic sanitizer and a persulfate. 5,501,802, Cl. 210-758.000.
Three Bond Co., Ltd.: *See*—
Kuo, Chung-Mien; and Clarson, Stephen J., 5,502,144, Cl. 528-18.000.
Thureson, Gary R.; Davis, Eric R.; Pellon, Steven R.; Zappalorti, Alvaro; and Gladden, Ernest L., to Easign-Bickford Company, The. Alternate signal path isolation member and non-electric detonator cap including the same. 5,501,151, Cl. 102-275.700.
Tibbetts, Clark; Golden, James B., III; and Torgersen, Deborah L., to Vanderbilt University. Method and apparatus for automated processing of DNA sequence data. 5,502,773, Cl. 382-129.000.
Tice, Colin M.: *See*—
Lange, Barry C.; Ashmore, John W.; Wissinger-Cornille, Jane; and Tice, Colin M., 5,502,027, Cl. 504-225.000.
Tieckelmann, Robert H.: *See*—
Thorp, Dean S.; Caropreso, Frank E.; Tieckelmann, Robert H.; and Lapham, Donald, III, 5,501,802, Cl. 210-758.000.
Tiemann, Ralf: *See*—
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Tinari, Robert: *See*—
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Tisinger, Eric W.: *See*—
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Titan Kogyo Kabushiki Kaisha: *See*—
Harada, Hidefumi; Inoue, Yasuo; and Sadanaga, Eiji, 5,501,264, Cl. 164-97.000.
Toa Medical Electronics Co., Ltd.: *See*—
Ootani, Toshihiro; and Izumi, Takayoshi, 5,501,838, Cl. 422-65.000.
Tobey, Richard E.: *See*—
Zettler, Mark W.; Tobey, Richard E.; and Leng, Ronald B., 5,502,235, Cl. 558-425.000.
Todokoro, Masatoshi; and Shiraishi, Masami, to Stuff Co., Ltd.; and Works Co., Ltd. Educational drawing toy with sound-generating function. 5,501,601, Cl. 434-169.000.
Todoroki, Toshiya, to NEC Corporation. Viterbi decoder for decoding error-correcting encoded information symbol string. 5,502,736, Cl. 371-43.000.
Togano, Takeshi: *See*—
Shinjo, Kenji; Takiguchi, Takao; Kitayama, Hiroyuki; Katagiri, Kazuharu; Yamashita, Masataka; Terada, Masahiro; Togano, Takeshi; and Asaoka, Masanobu, 5,501,818, Cl. 252-299.610.
Toh, Huan K.; and Kok, Chong M., to Sola International Holdings Ltd. Cross-linkable polymeric composition. 5,502,139, Cl. 526-284.000.
Tojima, Hideto: *See*—
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Tokida, Akihiko: *See*—
Imai, Akira; Ishii, Toru; Tokida, Akihiko; and Akasaki, Yutaka, 5,501,927, Cl. 430-78.000.
Tokiwa Kogyo Co., Ltd.: *See*—
Shida, Yukimori, deceased; Shida, by Chieko, executor; Shida, by Yoshitaka, executor; Shida, by Mutsuho, executor; Takarazawa, by Yukie, executor; and Shida, by Emiko, executor, 5,501,719, Cl. 72-25.000.
Toko, Inc.: *See*—
Arakawa, Koji, 5,502,628, Cl. 363-20.000.
Tokunaga, Yasuyuki: *See*—
Ohura, Masahiro; Yoshikawa, Takao; Tokunaga, Yasuyuki; Moriyama, Takaaki; and Inoue, Tetsuo, 5,502,085, Cl. 522-106.000.
Tokutake, Nobuo: *See*—
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Tokyo Electron Kyushu Limited: *See*—
Shiraishi, Masatoshi; and Hamada, Tomoko, 5,501,870, Cl. 427-8.000.
Tokyo Electron Limited: *See*—
Shiraishi, Masatoshi; and Hamada, Tomoko, 5,501,870, Cl. 427-8.000.
Tokyo Gas Co., Ltd.: *See*—
Hayashi, Mitsutoshi; Fujita, Akitaka; Nagashima, Shingo; and Fujimori, Isao, 5,501,548, Cl. 405-143.000.
Tokyo Metropolitan: *See*—
Yamaguchi, Seiji; Yamaura, Takeshi; Ogata, Takatsugu; Suzuki, Tsutomu; and Arai, Ikuo, 5,502,393, Cl. 324-639.000.
Tokyo Ohka Kogyo Co., Ltd.: *See*—
Hosoda, Hiroshi; Numata, Remi; Doi, Kousuke; Tokutake, Nobuo; Kohara, Hidekatsu; and Nakayama, Toshimasa, 5,501,936, Cl. 430-191.000.
Tokyo Seimitsu Co., Ltd.: *See*—
Ikeda, Hotaka; and Nakamura, Masaharu, 5,501,104, Cl. 73-629.000.
Tomat, Ferruccio; and Bordignon, Giuseppe, to Danieli & C. Officine Meccaniche SpA. Method for the multiple receipt and discharge of rolled sections onto a cooling plate and device performing such method. 5,501,314, Cl. 198-418.100.
Tomer, John D.: *See*—
Shutske, Gregory M.; Kapples, Kevin J.; and Tomer, John D., 5,502,203, Cl. 548-241.000.
Tomey Corporation: *See*—
Ishiguro, Shinji; and Morino, Toshiharu, 5,501,217, Cl. 128-645.000.
Tominari, Kenichi: *See*—
Sakashita, Takeshi; Shimoda, Tomoaki; Miura, Kimiyoshi; Tominari, Kenichi; and Kanezawa, Akio, 5,502,153, Cl. 528-198.000.
Tomioka, Takao: *See*—
Iida, Yasunchu; Honda, Satoru; Asai, Sachio; Nakamura, Isao; Noguchi, Hidenori; and Tomioka, Takao, 5,501,780, Cl. 204-192.150.
Tomlinson, John J.: *See*—
Stovall, Therese K.; and Tomlinson, John J., 5,501,268, Cl. 165-1.000.
Tomski, Sharon: *See*—
Buliga, Gregory S.; Miller, Mark S.; Powell, William F.; Lis, Daniel G.; Krishnamurthy, R. G.; Witte, Vernon C.; and Tomski, Sharon, 5,501,869, Cl. 426-658.000.
Tonen Corporation: *See*—
Murakami, Naomi; Usui, Miyuki; Furuhashi, Hiroyuki; and Ueki, Satoshi, 5,502,114, Cl. 525-301.000.
Toppan Printing Co., Ltd.: *See*—
Yoshida, Risaburo; Nakamura, Kiyotomo; Ota, Akitsu; and Taguchi, Mitsuaki, 5,501,350, Cl. 216-20.000.
Toray Industries, Inc.: *See*—
Iguchi, Yuichiro; Kimura, Michio; and Oka, Koichiro, 5,502,141, Cl. 526-286.000.
Matsunase, Takeo; and Takada, Takashi, 5,502,090, Cl. 524-3.000.
Torborg, Kevin; and Fischbach, Max, to White Consolidated Industries, Inc. Common idler strap for use in a clothes dryer. 5,501,021, Cl. 34-594.000.
Torgersen, Deborah L.: *See*—
Tibbetts, Clark; Golden, James B., III; and Torgersen, Deborah L., 5,502,773, Cl. 382-129.000.
Torihata, Minoru: *See*—
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Torii, Masanori: *See*—
Takiguchi, Ryohei; Saito, Hitoshi; Torii, Masanori; Hasegawa, Jun; Fujimura, Hideo; and Nakamura, Yoshinori, 5,502,024, Cl. 503-227.000.
Torp, Clyde A., Jr.; Hall, Michael R.; Miessler, Paul R.; and Vogler, Michael R., to Suncast Corporation. Even-coil edging for cartonless packaging. 5,501,036, Cl. 47-33.000.
Torrington Company, The: *See*—
Peilloud, Fernand; and Blache, Claire, 5,501,110, Cl. 73-862.321.
Terrill, Arnold M., 5,501,532, Cl. 384-572.000.
Tortu, Matthew P.; and Ross, Jay, to Tortu, Matthew P. Fuel recovery system. 5,501,255, Cl. 141-95.000.
Toshiba Machine Co., Ltd.: *See*—
Miyauchi, Mikiyoshi; and Kakishima, Hiroyuki, 5,501,519, Cl. 366-78.000.
Toso Co., Ltd.: *See*—
Inaba, Tadashi; Mori, Toshiyuki; Nagashima, Masahiro; and Kawada, Kosuke, 5,501,262, Cl. 160-178.200.
Toso, Kenneth E.: *See*—
Green, David T.; Bolanos, Henry; Alesi, Daniel E.; and Toso, Kenneth E., 5,501,689, Cl. 606-139.000.
Tosoh Corporation: *See*—
Fuchikami, Takamasa; Wakasa, Noriko; He, De-Hua; Miyake, Takanori; Okada, Takashi; Fujimura, Atsushi; Sasakibara, Hiroyuki; Kanou, Yoshiaki; and Saito, Toshihiro, 5,502,217, Cl. 549-325.000.
Totino, Ernest: *See*—
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Tourre, Jean-Michel: *See*—
Macaudiere, Pierre; Morros, Jorge; Tourre, Jean-Michel; and Tressaud, Alain, 5,501,733, Cl. 106-461.000.
Town, Michael-Harold: *See*—
Berry, Michael N.; Town, Michael-Harold; Kresse, Georg-Burkhard; and Herrmann, Uwe, 5,501,958, Cl. 435-18.000.
Toy, Lora G.; and Pinnau, Ingo, to Membrane Technology and Research, Inc. Natural gas treatment process using PTMSP membrane. 5,501,722, Cl. 95-50.000.

Toyoda Boshoku Kabushiki Kaisha: *See*—
Ukai, Hidehito; Kometani, Kazuo; Horie, Kazuyuki; and Nakayama, Toshiaki, 5,502,283, Cl. 181-228.000.
Toyoda, Toshihiro; Mori, Yoshihiro; and Kitagawa, Hidemasa, to Matsushita Electric Industrial Co., Ltd. Apparatus and method for digital video and audio processing a plurality of pictures and sounds. 5,502,512, Cl. 348-706.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Kanehara, Kenji; Igashira, Toshihiko; Watanabe, Ikuo; Okada, Masanori; and Matsudaira, Jun-ichi, 5,501,194, Cl. 123-470.000.
Toyoto Jidosha Kabushiki Kaisha: *See*—
Tsuji, Hiroyoshi; Suzuki, Kazuhiko; Watanabe, Keiko; Takagi, Atsushi; Takaoka, Hitoshi; and Baba, Goro, 5,502,799, Cl. 395-131.000.
Trackman, Philip C.: *See*—
Starnes, Robert L.; Trackman, Philip C.; and Katkocin, Dennis M., 5,501,968, Cl. 435-193.000.
Tracy, C. Edwin: *See*—
Pernicka, John C.; Benson, David K.; and Tracy, C. Edwin, 5,502,292, Cl. 219-121.640.
Tran, Phuc: *See*—
Yoon, Tony J.; McGrath, Michael J.; and Tran, Phuc, 5,502,696, Cl. 369-32.000.
Tran, Thang; Ganapathy, Gopi; Goddard, Michael D.; and Thaden, Robert, to Advanced Micro Devices, Inc. Circuit for delaying data latching from a precharged bus and method. 5,502,414, Cl. 327-434.000.
Transistor Devices, Inc.: *See*—
Rokhvarg, Alexander, 5,502,630, Cl. 363-84.000.
Traynor, Kevin M.; and Hsu, Hengwei, to Motorola, Inc. Low power level shift circuit and method therefor. 5,502,406, Cl. 326-68.000.
Tressaud, Alain: *See*—
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Trevillyan, Dennis A.; and Parrish, Jeffrey L., to Breed Automotive Technology, Inc. Driver side all mechanical inflator for airbag systems. 5,501,487, Cl. 280-736.000.
Trick, Rudy: *See*—
Glozer, Gary R.; Earnhart, Edgar O.; Le Beau, Brett J., Sr.; Marek, Andrea E.; Trick, Rudy; and Vianco, James E., 5,501,594, Cl. 425-549.000.
Trimble Navigation Limited: *See*—
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Trion Industries, Inc.: *See*—
Nagel, Thomas O.; and Ellis, Daniel J., 5,502,755, Cl. 377-6.000.
Triplett, William F.: *See*—
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Trocki, Mark: *See*—
Trombley, Frederick W., III; and Trocki, Mark, 5,501,674, Cl. 604-247.000.
Trombley, Frederick W., III; and Trocki, Mark, to Medrad, Inc. Intravenous catheter with needle cover and blood collection tube. 5,501,674, Cl. 604-247.000.
Trott, Arthur F., to Linvatec Corporation. Suture anchor for soft tissue fixation. 5,501,683, Cl. 606-72.000.
Trott, Arthur F., to Linvatec Corporation. Unitary anchor for soft tissue fixation. 5,501,696, Cl. 606-232.000.
Trumpf GmbH & Co.: *See*—
Dilger, Werner; and Kilian, Friedrich, 5,501,095, Cl. 72-461.000.
Truong, Myhanh T.: *See*—
Barrows, Thomas H.; Truong, Myhanh T.; and Suszko, Paul R., 5,502,092, Cl. 521-64.000.
Trustees of Boston University, The: *See*—
Hartig, Kent, 5,502,339, Cl. 307-31.000.
Trützscher GmbH & Co. KG: *See*—
Leifeld, Ferdinand; Schlichter, Stefan; Windges, Bernhard; and Günkinger, Siegfried, 5,500,986, Cl. 19-159.00A.
Tsai, Jin-Bo. Double-trip handle type flush control mechanism for ballfloat toilets. 5,500,961, Cl. 4-325.000.
Tsai, Tsung C. Magnetic energy reinforcing device. 5,502,425, Cl. 335-304.000.
Tschudia, Rolf G.: *See*—
Bourg, John; Mitchell, James; Mirotznik, Mark; Roth, Bradley; Subramanian, Sankaran; Cherukuri, Murali; Zablocky, Paul G.; Pohida, Thomas J.; Smith, Paul D.; Friauf, Walter S.; and Tschudin, Rolf G., 5,502,386, Cl. 324-316.000.
Tsubakimoto Chain Co.: *See*—
Sonoyama, Mitsuyoshi; Suzaki, Kentaro; Aihara, Masaki; Suzuki, Hirokatsu; Miyahara, Shoji; Kojima, Norio; and Okada, Masatoshi, 5,501,058, Cl. 53-204.000.
Tsubota, Koichi: *See*—
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Tsuchiya, Toshihiro, to Nisso Industry Co., Ltd. Device for raising aquarium fish and its receptable assembly. 5,501,614, Cl. 439-574.000.
Tsuda, Kenji: *See*—
Yamasaki, Nakamichi; Tsuda, Kenji; Okuda, Hiroyuki; and Tenno, Toshinari, 5,502,262, Cl. 585-241.000.
Tsuji, Hiroyoshi; Suzuki, Kazuhiko; Watanabe, Keiko; Takagi, Atsushi; Takaoka, Hitoshi; and Baba, Goro, to Kabushiki Kaisha Toyota Chuo Kenkyusho; and Toyoto Jidosha Kabushiki Kaisha. Rendering apparatus, multispectral image scanner, and three-dimensional automatic gopio-spectrophotometer. 5,502,799, Cl. 395-131.000.
Tsuji, Masaaki: *See*—
Miyawaki, Hiroshi; Oka, Takayuki; and Tsuji, Masaaki, 5,502,540, Cl. 355-22.000.
Tsujimoto, Akinori: *See*—
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Tsukada, Katsumi; Nakamura, Norio; Nimura, Minoru; Suemori, Hiroyuki; Kamihata, Tomio; and Yamazaki, Mutsuaki, to Seiko Epson Corporation. Electronic device having a flat, card-like casing enclosing components for a complete computer system. 5,502,617, Cl. 361-686.000.
Tsukamoto, Katsura: *See*—
Baba, Yutaka; Usui, Toshinao; Kakigami, Takuji; Ozeki, Yoshiro; Tsukamoto, Katsura; Asaeda, Nobuyuki; and Itoh, Nobuyuki, 5,502,209, Cl. 548-454.000.
Tsukamoto, Katsuya; and Saito, Takshi, to Matsushita Electric Works, Ltd. Planar antenna having polarizer for converting linear polarized waves into circular polarized waves. 5,502,453, Cl. 343-756.000.
Tsukamoto, Kazumasa: *See*—
Taniguchi, Takao; Tsukamoto, Kazumasa; Hayabuchi, Masahiro; and Ando, Masahiko, 5,501,645, Cl. 477-130.000.
Tsukushi, Masanori: *See*—
Koyanagi, Osamu; Hirasawa, Kunio; Tsukushi, Masanori; Kurosawa, Yukio; Sato, Tadashi; and Ohshita, Youichi, 5,502,290, Cl. 218-78.000.
Tsuru, Kiyoshi: *See*—
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Tsurumi, Yasuhisa: *See*—
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Tsuruoka, Ryoichi, to Fuji Xerox Co., Ltd. Jam processing device suitable for use in an image forming apparatus. 5,502,545, Cl. 355-207.000.
Tsuzuki, Takuo; Tabuchi, Yasuhide; and Ishiwata, Yasumasa, to Hitachi, Ltd.; and Hitachi Software Engineering Co., Ltd. Mobile terminal position information detection method and system using the method. 5,502,758, Cl. 379-58.000.
Tu, Yue-Feng. Umbrella with alarming and lighting functions. 5,502,624, Cl. 362-102.000.
Tube Technology Pty., Ltd.: *See*—
Goleby, Leslie D., 5,501,053, Cl. 52-729.500.
Tuck, Larry C.: *See*—
Ford, James D.; and Tuck, Larry C., 5,500,989, Cl. 29-27.00R.
Tully, Tara S. Pet feeding apparatus. 5,501,176, Cl. 119-61.000.
Tung, Lin C. Multiple rotation materials processor. 5,501,522, Cl. 366-219.000.
Turhan, Ibrahim: *See*—
Westhof, Luc B. J.; Turhan, Ibrahim; Tessier, George G.; and De Peuter, Frans L. J., 5,501,819, Cl. 252-503.000.
Turner, Howard W.: *See*—
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Turner, James E.: *See*—
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Turner, Paul N.: *See*—
Ferrin, Frank J.; and Turner, Paul N., 5,502,455, Cl. 345-9.000.
Turner, Victor C.: *See*—
Burns, David R.; and Turner, Victor C., 5,501,246, Cl. 137-179.000.
Twenty-First Century Research Corporation: *See*—
Dassel, Mark W.; and Vassiliou, Eustathios, 5,502,245, Cl. 562-413.000.
Tytko, Andrej: *See*—
Hansel, Jozef; Kwasniewski, Jerzy; Tytko, Andrej; and Lankosz, Leslaw, 5,502,379, Cl. 324-207.140.
UCAR Carbon Technology Corporation: *See*—
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Uchida, Hideaki: *See*—
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Uchida, Naoya: *See*—
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Uchikawa, Fusaoki: *See*—
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Uchiyama, Kenji: *See*—
Matsumoto, Katsuru; Hirayama, Nobuhiro; Uchiyama, Kenji; Kawasaki, Shoji; Fukui, Tamami; and Uramoto, Katsuo, 5,502,110, Cl. 525-221.000.
Uchiyama, Noriyuki: *See*—
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Uchiyama, Takahiko: *See*—



Asai, Hiromitsu; and Uchiyama, Takahiko, 5,501,526, Cl. 384-13.000.
Ueba, Yoshinobu: *See*—
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Uebbing, John: *See*—
Kish, Fred A.; Steranka, Frank M.; DeFevere, Dennis C.; Robbins, Virginia M.; and Uebbing, John, 5,502,316, Cl. 257-94.000.
Ueda, Hiroyuki: *See*—
Hayashi, Shigeki; Ueda, Hiroyuki; Ogiri, Tadakazu; Kotera, Shinichi; Morishita, Hiroki; Moriuchi, Yasuhiko; Yasuda, Kohichi; and Ishida, Naoyuki, 5,502,554, Cl. 355-271.000.
Ueda, Hisashi: *See*—
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Ueda, Michio; Suzuki, Akio; Suenaga, Yoshiro; and Ishikawa, Takayuki, to Shikoku Kakoki Co., Ltd. Tape joining apparatus. 5,501,763, Cl. 156-504.000.
Ueda, Osamu; and Takahashi, Koji, to Canon Kabushiki Kaisha. Image sensing apparatus which can detect optical characteristics of an image to control title insertion. 5,502,486, Cl. 348-239.000.
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Kato, Shigeki; Kadowaki, Hidejiro; Ishida, Yasuhiko; Takamiya, Makoto; Ashiwa, Jun; and Ueda, Shinji, 5,502,466, Cl. 356-356.000.
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Uenoyama, Takeshi: *See*—
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Errasti Iriarte, Iosu; and Aguirre Arregui, Ignacio, 5,501,066, Cl. 53-556.000.
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Ulrich, Nathan T., to University of Pennsylvania, The Trustees of the. Methods and apparatus for mechanically intelligent grasping. 5,501,498, Cl. 294-106.000.
Ungemach, Frank S.: *See*—
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Unger, Peter D.; and Rohrbach, Ronald P., to AlliedSignal Inc. Low density materials having good compression strength and articles formed therefrom. 5,502,082, Cl. 521-141.000.
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Bai, Xinlai, 5,502,127, Cl. 526-143.000.
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United Kingdom of Great Britain and Northern Ireland, The Minister of Agriculture Fisheries and Food in Her Britannic Majesty's Government of the: *See*—
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Agriculture: *See*—
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Decotignie, Philippe; and Jourdan, Sabine, 5,502,571, Cl. 358-335.000.
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Schemmann, Hugo; and Hüsgen, Theo, 5,502,359, Cl. 310-40.0MM.
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Gravener, Roy D., 5,501,693, Cl. 606-157.000.
Green, David T.; Bolanos, Henry; Alesi, Daniel E.; and Toso, Kenneth E., 5,501,689, Cl. 606-139.000.
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Unitika Ltd.: *See*—
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University of Arkansas, Board of Trustees of the: *See*—
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University of California, The Regents of the: *See*—
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Borovsky, Dov; De Loof, Arnold; and Bylemans, Dany, 5,501,976, Cl. 435-252.300.
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Sneddon, Larry G.; Beck, Jeffrey S.; and Fazen, Paul J., 5,502,142, Cl. 528-7.000.
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Urushidani, Tatsuo: *See*—
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Usui, Shinichi, to Nippon Precision Circuits Inc. Integrated circuit device. 5,502,431, Cl. 338-308.000.
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Usui, Yoshiyuki, to Kabushiki Kaisha Toshiba. Method of scanning in MRI. 5,501,218, Cl. 128-653.200.
Utagawa, Ken, to Nikon Corporation. Focus adjustment device having predictive function. 5,502,537, Cl. 354-402.000.
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Swenson, Jody A., 5,502,441, Cl. 341-172.000.
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Valdes, Jorge L.: *See*—
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Valentine, James M.; and Peter-Hoblyn, Jeremy D., to Platinum Plus, Inc. Operation of diesel engines with reduced particulate emission by utilization of platinum group metal fuel additive and pass-through catalytic oxidizer. 5,501,714, Cl. 44-358.000.
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van Bezeij, Nico J., to Eisenwerk Bruehl GmbH. Cylinder block for an internal combustion engine. 5,501,189, Cl. 123-193.100.
Van de Graaf, Peter; and Horsten, Anton J. J., to Minnesota Mining and Manufacturing Company. Wave filter with flexible tensioning members. 5,501,794, Cl. 210-493.300.
van den Bergh, Carlo J.; Kaiserman, Howard B.; and Ouwendijk, Marja, to Lever Brothers Company, Division of Conopco, Inc. Aqueous enzymatic detergent compositions. 5,501,820, Cl. 252-549.000.
Van den Bogaert, Jan: *See*—
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Van Durrett, William; Hieronymus, Gerald W.; Poad, Marguerite A.; Price, Todd D.; Scurry, Margaret L. S.; and Steene, William C., to International Business Machines Corporation. Automated palletizing system. 5,501,571, Cl. 414-786.000.
Van Es, Bert, to Cordis Corporation. Catheter packaging. 5,501,341, Cl. 206-364.000.
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van Steenbrugge, Bernard, to D2B Systems Company Limited. Method of identifying a signal path and signal processing apparatus. 5,502,436, Cl. 340-825.050.
van Vooren, Cornelis B., to Schmidt Holding Europe GmbH. Spreading apparatus and a distribution chamber therefor. 5,501,403, Cl. 239-662.000.
van Zantea, Anton: *See*—
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Vassiliadis, Stamatis; and Blaner, Bartholomew, to International Business Machines Corporation. System and method for obtaining parallel existing instructions in a particular data processing configuration by compounding instructions. 5,502,826, Cl. 395-375.000.
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VDO Adolf Schindling AG: *See*—
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Walsh, Sylvia. Grading stake with indicator flag. 5,501,170, Cl. 116-209.000.
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Wasleski, Daniel M.; Erdman, David T.; and Newallis, Peter E., to Bayer Corporation. Process for the production of dialkyl pyrimidylphosphates. 5,502,190, Cl. 544-243.000.
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Watanabe, Rikizou; Takahashi, Norio; Kimura, Hirofumi; and Fujita, Toshio, to Hitachi Metals, Ltd. Heat-resistant, austenitic cast steel and exhaust equipment member made thereof. 5,501,835, Cl. 420-54.000.
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Weder, Donald E.; and Straeter, William F., to Highland Supply Corporation. Decorative assembly for a floral grouping. 5,501,059, Cl. 53-397.000.
Weder, Donald E.; and Bergstrand, John W., to Highland Supply Corporation. Method for wrapping individual floral groupings with wrapping material having sizing marks thereon. 5,501,060, Cl. 53-399.000.
Weder, Donald E., to Highland Supply Corporation. Basket lining material having a cohesive thereon and method. 5,501,360, Cl. 220-460.000.
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Welt, Jack W. Fastener and drill bit gauge. 5,501,020, Cl. 33-555.200.
Weltrowski, Marek; and Masri, Merle S., to Water & Oil Technologies, Inc. Method for treatment of cellulose fabrics to improve their dyeability with reactive dyes. 5,501,711, Cl. 8-543.000.
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Wennerbo, Orjan E. V.; and Martyn, Kyle G., to Voac Hydraulics Boras AB. Control system for a hydraulic motor. 5,501,136, Cl. 91-446.000.
Werle, Peter, to Franhofer-Gesellschaft Zur Forderung Der Angewandten Forschung E.V. Method and apparatus for absolute interferometry using a measurement beam and a reference beam having parallel wave fronts and sharing a single beam path. 5,502,562, Cl. 356-349.000.
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Williams, Michael R.; and Long, Matthew W., to FMC Corporation. Wire cutting insert for gate valve. 5,501,424, Cl. 251-1.300.
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Wilson, Paul A. Coupon holder and dispensing apparatus. 5,501,383, Cl. 224-411.000.
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Sugawara, Shuji; Sukata, Kazuaki; and Yamanaka, Shun-ichiro, 5,501,932, Cl. 430-110.000.
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Yamanaka, Tetsu; Sugaya, Keago; and Ikezima, Syouichi, to Riso Kagaku Corporation. Cylindrical drum assembly including a steacil sheet for use with a stencil printing machine. 5,501,146, Cl. 101-116.000.
Yamano, Akihiko: *See*—
Washizawa, Teruyoshi; Hatanaka, Katsunori; Sakai, Kunihiro; Oguchi, Takahiro; Yamano, Akihiko; and Shido, Shunichi, 5,502,710, Cl. 369-124.000.
Yamaoka, Yuichi; Murakami, Katsuhiko; and Suzuki, Mikio, to NKK Corporation. Immersion nozzle for continuous casting. 5,501,430, Cl. 266-236.000.
Yamasaki, Hiroyuki: *See*—
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Yamasaki, Nakamichi; Tsuda, Kenji; Okuda, Hiroyuki; and Teano, Toshinari, to Nakamichi Yamasaki; and Nishikawa Rubber Co., Ltd. Process for the conversion of vulcanized rubbers into oils by use of supercritical aqueous fluids. 5,502,262, Cl. 585-241.000.
Yamasaki, Yoshimori; Chiba, Takayoshi; Kobunaya, Hideki; and Ishikawa, Yutaka, to Sony Corporation; and NEC Corporation. Disc reproduction apparatus. 5,502,699, Cl. 369-48.000.
Yamashita, Masataka: *See*—
Shinjo, Kenji; Takiguchi, Takao; Kitayama, Hiroyuki; Katagiri, Kazuharu; Yamashita, Masataka; Terada, Masahiro; Togano, Takeshi; and Asaoka, Masanobu, 5,501,818, Cl. 252-299.610.
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Yamashita, Yoshiro: *See*—
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Yamashita, Yukihiro; Iida, Hisashi; and Honjoh, Keiji, to Nippondenso Co., Ltd. Assist air control apparatus for internal combustion engine. 5,501,204, Cl. 123-588.000.
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Yang, Sheng-Hsing; and Lin, Jyh-Kuang, to United Microelectronics Corporation. Method of manufacture of high coupling ratio single polysilicon floating gate EPROM or EEPROM cell. 5,501,996, Cl. 437-43.000.
Yang, Xiangyang; Wrigley, Charles Y.; and Lindmayer, Joseph, to Quantex Corporation. Optical storage medium utilizing electron trapping film layers sandwiched with electrodes. 5,502,706, Cl. 369-100.000.
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Yewer, Edward H., Jr. Support belt with high tension cinching system. 5,500,959, Cl. 602-19.000.
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Yock, Paul O. Angioplasty apparatus facilitating rapid exchange and method. 5,501,227, Cl. 128-662.060.
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Yukimachi, Hiroshi; Komatsu, Teruo; Azeta, Takahiro; Waragai, Tsuyoshi; Araki, Tomoyuki; and Hoshii, Osamu, to Canon Kabushiki Kaisha. Sheet supply apparatus. 5,501,444, Cl. 271-127.000.
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Zeuner, Siegfried; Ruge, Hans-Peter; and Neukirchinger, Peter, to Temic Bayern-Chemie Airgab GmbH. Air bag gas generator with spontaneous ignition agent. 5,501,152, Cl. 102-292.000.
Zhang, Hong, to Robert Bosch GmbH. Method and arrangement for actuating an automatic transmission. 5,501,644, Cl. 477-97.000.
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Zitka, Frank L. Topless container carrier. 5,501,499, Cl. 294-159.000.
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478336 B.C. Ltd.: *See*—
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TO WHOM

PATENTS WERE ISSUED ON THE 26th DAY OF MARCH, 1996

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Erickson, Kenneth W.: *See*—
Zylstra, Henry J.; and Erickson, Kenneth W., Re. 35,190, Cl. 363-146.000.
Fliegel, Frederick M.: *See*—
Hickernell, Fred S.; Cho, Frederick Y.; and Fliegel, Frederick M., Re. 35,191, Cl. 437-53.000.
Gortz, Norman. Fluid dispensing apparatus with prestressed bladder. Re. 35,187, Cl. 222-105.000.
Hickernell, Fred S.; Cho, Frederick Y.; and Fliegel, Frederick M., to Motorola, Inc. Method for reducing heterostructure acoustic charge transport device SAW drive power requirements. Re. 35,191, Cl. 437-53.000.
Howard, Terence, to Bell-Fruit Manufacturing Company Limited. Gaming and amusement machines and reels for them. Re. 35,188, Cl. 273-143.00R.
Motorola, Inc.: *See*—
Hickernell, Fred S.; Cho, Frederick Y.; and Fliegel, Frederick M., Re. 35,191, Cl. 437-53.000.
Müeller, Rolf, to Papst Licensing GmbH. Drive arrangement with collectorless d.c. motor. Re. 35,189, Cl. 318-254.000.
Papst Licensing GmbH: *See*—
Müeller, Rolf, Re. 35,189, Cl. 318-254.000.
Phoenix Surgical Products, Inc.: *See*—
Reese, H. William, Re. 35,192, Cl. 604-51.000.
Reese, H. William, to Phoenix Surgical Products, Inc. Post-surgical anesthesia at a continuous and progressively decreasing administration rate. Re. 35,192, Cl. 604-51.000.
Square D Company: *See*—
Zylstra, Henry J.; and Erickson, Kenneth W., Re. 35,190, Cl. 363-146.000.
Zylstra, Henry J.; and Erickson, Kenneth W., to Square D Company. Plug-in power supply. Re. 35,190, Cl. 363-146.000.

# LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

BASF Aktiengesellschaft: *See*—
Volkert, Otto, B1 5,096,933, Cl. 521-131.000.
Brown, Ernest C.; and Buske, Walter E., to Kansallis-Osake-Pankki. Method of cooking foods. B1 4,471,000, Cl. 426-523.000.
Buske, Walter E.: *See*—
Brown, Ernest C.; and Buske, Walter E., B1 4,471,000, Cl. 426-523.000.
Gibbons, Charles E.; Tanner, Cynthia L.; and Whillock, Allan A., to International Paper Company. Non-foil composite structures for packaging juice. B1 1,033,376, Cl. 428-34.200.
International Paper Company: *See*—
Gibbons, Charles E.; Tanner, Cynthia L.; and Whillock, Allan A., B1 1,033,376, Cl. 428-34.200.
Kansallis-Osake-Pankki: *See*—
Brown, Ernest C.; and Buske, Walter E., B1 4,471,000, Cl. 426-523.000.
Sanshin Kogyo Kabushiki Kaisha: *See*—
Suzuki, Tomonori, B1 4,621,595, Cl. 123-41.720.
Suzuki, Tomonori, to Sanshin Kogyo Kabushiki Kaisha. Water-cooled four-cycle internal combustion engine for outboard motors. B1 4,621,595, Cl. 123-41.720.
Tanner, Cynthia L.: *See*—
Gibbons, Charles E.; Tanner, Cynthia L.; and Whillock, Allan A., B1 1,033,376, Cl. 428-34.200.
Volkert, Otto, to BASF Aktiengesellschaft. Process for the preparation of polyurethane rigid foams having a low thermal conductivity and their use. B1 5,096,933, Cl. 521-131.000.
Whillock, Allan A.: *See*—
Gibbons, Charles E.; Tanner, Cynthia L.; and Whillock, Allan A., B1 1,033,376, Cl. 428-34.200.

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Acushnet Company: *See*—
Erickson, John J., 368,157, Cl. D2-962.000.
Airlux Electrical Co., Ltd.: *See*—
Hsu, Maxwell, 368,203, Cl. D7-376.000.
Airsport Inc.: *See*—
Sullivan, Richard A.; Reid, Edward; and Winoker, Harris, 368,291, Cl. D21-210.000.
Akiba, Masaru: *See*—
Takizawa, Shinya; Kimura, Shuichi; and Akiba, Masaru, 368,296, Cl. D22-143.000.
Albrecht, Eric H.: *See*—
Marino, Charles M.; Ramakrishnan, Rengaswamy; Albrecht, Eric H.; Constser, Roger D.; Zambelli, Michael; and Marks, Jonathan, 368,306, Cl. D23-353.000.
Amey, Chris B. Ear shading cap. 368,153, Cl. D2-879.000.
Apple Computer, Inc.: *See*—
Laituri, David W., 368,264, Cl. D14-219.000.
Meschter, James C.; Barbera, Lawrence E.; Ive, Jonathan P.; and De Iuliis, Daniele G., 368,254, Cl. D14-100.000.
Arellano, Kenneth. Clam opener. 368,210, Cl. D7-693.000.
Arndt, Peter L. Lid for containers for waste filters. 368,224, Cl. D9-436.000.
Artus, Mark B.: *See*—
Lechleiter, Paul R.; and Artus, Mark B., 368,188, Cl. D6-471.000.
Australasian Steel Products Pty. Ltd.: *See*—
Morrison, Leigh W., 368,304, Cl. D23-262.000.
Bachar, Shlomo. Gemstone. 368,232, Cl. D11-90.000.
Ball, Douglas. Computer workstation. 368,180, Cl. D6-397.000.
Barbera, Lawrence E.: *See*—
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Barrett, Shawn O., to Brunswick Bowling & Billiards Corporation. Bowling scoring console. 368,293, Cl. D21-233.000.
Bemis Manufacturing Company: *See*—
Walters, Glenn T., 368,193, Cl. D6-486.000.
Bengt Ingvar Jacobsson: *See*—
Pekkari, Stefan, 368,240, Cl. D12-6.000.
Bennett, Rodney R. Cap holder. 368,168, Cl. D6-323.000.
Bertolini, Peter; and Iaia, Mark, to Chesebrough-Pond's USA Co., Division of Conopco, Inc. Cap for cosmetic product container. 368,225, Cl. D9-444.000.
Better Sleep Mfg. Co.: *See*—
Emery, William W.; and Fritts, Russell A., 368,194, Cl. D6-525.000.
Bicknell, David; Bunce, Martin C.; and Lamb, John, to Chesebrough-Pond's USA Co., Division of Conopco, Inc. Combined roll-on dispenser bottle and cap. 368,220, Cl. D9-338.000.
Bishop, David C.; and Mendel, Peter J., to Lexmark International, Inc. Multifunctional facsimile, copier, scanner printer. 368,259, Cl. D14-118.000.
Bjorn-Ake Skold Design AB: *See*—
Sköld, Björn-Åke, 368,211, Cl. D8-1.000.
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Briggs & Stratton Corporation: *See*—
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Bro, Jay M.; Machos, Richard P.; and Myers, Peter J., to Today's Kids, Inc. Multipurpose table. 368,189, Cl. D6-480.000.
Brown, Arthur C. Butterfly feeder. 368,336, Cl. D30-121.000.
Brown, Patrick; Cacciola, Joseph C.; Ford, William K.; Nottingham, John R.; and Spirk, John W., to Little Tikes Company, The. Activity table. 368,281, Cl. D21-11.000.
Brown, Robert L., to Tonka Corporation. Toy projectile launcher. 368,280, Cl. D21-3.000.
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Brunner, Merlin A.; and Draheim, Harvey J., to Simmons Juvenile Products Company, Inc. Bed. 368,179, Cl. D6-395.000.
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Bryant, Ricky. Protective camouflage panel set for vehicles. 368,248, Cl. D12-196.000.
Bunce, Martin C.: *See*—
Bicknell, David; Bunce, Martin C.; and Lamb, John, 368,220, Cl. D9-338.000.
Buzby, Linda F. Plant sprouting postcard. 368,276, Cl. D19-2.000.
Byrne, Charles: *See*—
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Cacciola, Joseph C.: *See*—
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Cahill, Michael J.; and Vernon, Geoffrey W., to Thomas J. Lipton Co., Division of Conopco, Inc. Infusion packet. 368,152, Cl. D1-199.000.
Calmeise, Randall W.; and Vura, John A., to Rubbermaid Incorporated. Parts bin. 368,159, Cl. D3-283.000.
Camfield, David K.; and Brashear, Daniel F., to Roadmaster Corporation. Bicycle. 368,242, Cl. D12-111.000.
Carretta, Michael R., to M. R. Carretta & Co., Inc. Sport bag. 368,160, Cl. D3-286.000.
Castaldo, Cosmo, to Leviton Manufacturing Co., Inc. Boot for an electrical plug and receptacle. 368,250, Cl. D13-156.000.
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Chapman, Randy J. Compressor housing for a diesel turbocharger. 368,269, Cl. D15-5.000.
Chen, Tony; and Chang, Thomas, to UMAX Data System Inc. Transparency scanner. 368,257, Cl. D14-107.000.
Chesebrough-Pond's USA Co., Division of Conopco, Inc.: *See*—
Bertolini, Peter; and Iaia, Mark, 368,225, Cl. D9-444.000.
Bicknell, David; Bunce, Martin C.; and Lamb, John, 368,220, Cl. D9-338.000.
Chiang, Pang-Ching. Elbow protector. 368,331, Cl. D29-121.000.
Chiang, Pang-Ching. Knee protector. 368,332, Cl. D29-121.000.
Chininis, Stephen P.: *See*—
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Cockram, Allan. Baby bottle. 368,311, Cl. D24-197.000.
Cockram, Allan. Training cup. 368,312, Cl. D24-197.000.
Cohen, Uzi; Hamisha, Charle; and Kosovsky, Atzmon, to Motorola, Inc. Irrigation timer. 368,230, Cl. D10-40.000.
Coker, Jo E. Garment clip. 368,169, Cl. D6-326.000.
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Contico International, Inc.: *See*—
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Cordelia Lighting Inc.: *See*—
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Cotten, Mark. Orthopedic boot weight bar. 368,289, Cl. D21-196.000.
Couch, Johnny D.; and Richmond, Sarah M., to Sega Enterprises, Ltd. Control pad. 368,285, Cl. D21-48.000.
Crocco, Carlo, to MDM SA, Geneve. Watch. 368,229, Cl. D10-30.000.
Dabrowski, Walter. Carpet display. 368,181, Cl. D6-409.000.
Daiwa Seiko, Inc.: *See*—
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Dallal, Frederic H., to Media Holdings, Inc. Combined coupon holder and advertising display for store shelving. 368,279, Cl. D20-43.000.
Dancyger, Michael; and Litwin, Larry. Paint can holder. 368,158, Cl. D3-215.000.
Danko, Carol M.; and Danko, Duane. Combination clock and nightlight. 368,227, Cl. D10-5.000.
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Davies, Alan J. E., to McKechnie UK Limited. Expansion strip for tiled surfaces. 368,315, Cl. D25-124.000.
Davis, William S., Jr., to Davoil, Inc. Motor housing for a ceiling fan. 368,308, Cl. D23-411.000.
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Dean, Arthur J., Jr.: *See*—
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Dickinson, Frank R., to Pocket Mountain Enterprises, Inc. Bird feeder. 368,337, Cl. D30-127.000.
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Dodds, Steven D.: *See*—
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Dolan, Patrick S. Lamp glass shade. 368,322, Cl. D26-133.000.
Doughty, Frederic C.; and Mark, Darren M., to Embart Inc. Faucet. 368,302, Cl. D23-241.000.
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Dubson, Paul T., to Hewlett-Packard Company. Media input tray unit for ink jet printer. 368,273, Cl. D18-49.000.
Dunlap, Eugene W. Combined aquarium filter and aerator. 368,297, Cl. D23-210.000.
Dunn, Steven B., to Munchkin Bottling, Inc. Dental floss dispenser. 368,327, Cl. D28-64.000.
Durocher, Philip C., to Colgate-Palmolive Co. Dispenser. 368,196, Cl. D6-553.000.
Dye, Noelle M., to Sealed Air Corporation. Dispenser for foamable compositions. 368,215, Cl. D8-68.000.
Edgecraft Corporation: *See*—
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Eley, Craig D. Display stand. 368,184, Cl. D6-449.000.
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Ericksen, John J., to Acushnet Company. Shoe sole. 368,157, Cl. D2-962.000.
Eveready Battery Company, Inc.: *See*—
Furth, David A.; Ferguson, Mark A.; Lynch, Peter F.; and Osiecki, Scott W., 368,318, Cl. D26-49.000.
Evertse, Hans J.: *See*—
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Fan, Caesar Y. K. Ringing adapter box for telephone. 368,265, Cl. D14-241.000.
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Ferrer, Hugo. Vehicle safe. 368,249, Cl. D12-423.000.
Fisher, David C. Extendable scraper. 368,345, Cl. D32-49.000.
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Founds, Christine. Vacuum cleaner for small animals. 368,342, Cl. D32-18.000.
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Friel, Daniel D., to Edgecraft Corporation. Knife sharpener. 368,217, Cl. D8-93.000.
Friend, Richard G. Game piece. 368,286, Cl. D21-51.000.
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Furth, David A.; Ferguson, Mark A.; Lynch, Peter F.; and Osiecki, Scott W., to Eveready Battery Company, Inc. Large size rechargeable flashlight. 368,318, Cl. D26-49.000.
Gale, Bradley D.: *See*—
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Gebhard, Albert W.; and Gebhard, Patricia A. Multi-purpose hand-held rotary drive cleaning tool. 368,343, Cl. D32-35.000.
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Grenga, Stephen G., to Spinco Metal Products, Inc. Distributor valve body. 368,300, Cl. D23-235.000.
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Heine, Randolph S., to New Tradition Pipe Company. Tobacco hookah. 368,324, Cl. D27-162.000.
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Januzzi, Roland A. Ice chest on wheels. 368,207, Cl. D7-605.000.
Johnson, Stanley, to Briggs & Stratton Corporation. Engine stand. 368,187, Cl. D6-466.000.
Johnston, Harry R., to One Twelve Incorporated - PA. Welder pliers. 368,212, Cl. D8-52.000.
Jones, Mack L. Automotive non-stock exhaust header. 368,247, Cl. D12-194.000.
Jonke, Maria. Blender base. 368,204, Cl. D7-386.000.
Jue, Martin F., to MFJ Enterprises, Inc. Antenna performance analyzer. 368,270, Cl. D10-75.000.
Kabushiki Kaisha Gakushukenkyusha: *See*—
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Kahler, Roger. Drink dispenser. 368,201, Cl. D7-308.000.
Kamm, Christian P., to Wilkinson Company, Inc. Home recycle bin. 368,350, Cl. D34-1.000.
Kasbohm, Mike, to SpecTech, Inc. Physical exercise support. 368,288, Cl. D21-191.000.
Kellogg, Connie A.; and Spors, Daryl D., to Good Humor Corporation. Frozen confection. 368,151, Cl. D1-102.000.
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Kramer, Russ. Futon frame. 368,173, Cl. D6-370.000.
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Lachapelle, Will. Holder for chopsticks. 368,208, Cl. D7-642.000.
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La See, Jack. Sight for an archery bow. 368,294, Cl. D22-107.000.
Lechleiter, Paul R.; and Artas, Mark B., to Blockbuster Entertainment Corporation. Display island. 368,188, Cl. D6-471.000.
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Lewis, Sally S. Chaise lounge. 368,174, Cl. D6-377.000.
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Little Tikes Company, The: *See*—
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Magee, Jack M., 9,485, Cl. Plt.-65.000.
Magee, Jack M., 9,486, Cl. Plt.-65.000.
Magee, Jack M., 9,487, Cl. Plt.-65.000.
Magee, Jack M., to Magee, Jack M.; and Flowerwood Nsy Inc. Ilex hybrid variety named 'Conad'. 9,484, Cl. Plt.-65.000.
Magee, Jack M., to Magee, Jack M.; and Flowerwood Nsy Inc. Ilex hybrid variety named 'Conal'. 9,485, Cl. Plt.-65.000.
Magee, Jack M., to Magee, Jack Mitchell; and Flowerwood Nsy Inc. Ilex hybrid variety named 'Conin'. 9,486, Cl. Plt.-65.000.
Magee, Jack M., to Magee, Jack Mitchell; and Flowerwood Nsy Inc. Ilex hybrid variety named 'Conaf'. 9,487, Cl. Plt.-65.000.
Magee, Jack Mitchell: *See*—
Magee, Jack M., 9,486, Cl. Plt.-65.000.
Magee, Jack M., 9,487, Cl. Plt.-65.000.
Oleesen, Mogens N.; and Oleesen, Pernille, to Bear Creek Gardens, Inc. Miniature rose plant named 'Poulprima'. 9,482, Cl. Plt.-10.000.
Oleesen, Mogens N.; and Oleesen, Pernille, to Bear Creek Gardens, Inc. Miniature rose plant named 'Poulhappy'. 9,483, Cl. Plt.-10.000.
Oleesen, Pernille: *See*—
Oleesen, Mogens N.; and Oleesen, Pernille, 9,482, Cl. Plt.-10.000.
Oleesen, Mogens N.; and Oleesen, Pernille, 9,483, Cl. Plt.-10.000.
Planteakwekerij P. Van Geest B.V., The: *See*—
van Geest, J., 9,491, Cl. Plt.-88.900.
van Geest, J., to Planteakwekerij P. Van Geest B.V., The. Ficus plant named Indigo. 9,491, Cl. Plt.-88.900.




# CLASSIFICATION OF PATENTS

ISSUED MARCH 26, 1996

NOTE—First number, class; second number, subclass; third number, patent number

**CLASS 2**
2 5,500,951
5,500,952
9 5,500,953
5,500,954
24 5,500,955
161.1 5,500,956
169 5,500,957
209 5,500,958

**CLASS 4**
318 5,500,960
325 5,500,961
476 5,500,962

**CLASS 5**
9.1 5,500,963
607 5,500,964
654 5,500,965

**CLASS 7**
169 5,500,966

**CLASS 8**
94.23 5,501,707
94.26 5,501,708
94.27 5,501,709
158 5,500,967
402 5,501,710
543 5,501,711

**CLASS 14**
71.7 5,500,968

**CLASS 15**
1.51 5,500,969
22.1 5,500,970
23 5,500,971
28 5,500,972
29 5,500,973
104.33 5,500,974
167.1 5,500,975
320 5,500,976
5,500,977
347 5,500,978
349 5,500,979

**CLASS 16**
16 5,500,980
115 5,500,981
297 5,500,982
304 5,500,983
309 5,500,984
354 5,500,985

**CLASS 19**
159 A 5,500,986

**CLASS 23**
295 R 5,501,712

**CLASS 24**
351 5,500,987

**CLASS 29**
25.35 5,500,988
27 R 5,500,989
243.525 5,500,990
407.08 5,500,991
525 5,500,992
597 5,500,993
598 5,500,994
599 5,500,995
612 5,500,996
740 5,500,997
751 5,500,998
753 5,500,999
767 5,501,000
788 5,501,001
811.2 5,501,002
827 5,501,003
5,501,004
833 5,501,005
840 5,501,006
846 5,501,007
849 5,501,008
882 5,501,009
889.3 5,501,010
890 5,502,023
890.01 5,501,011
890.051 5,501,012
897.312 5,501,013

**CLASS 30**
50 5,501,014
164.9 5,501,015
260 5,501,016

**CLASS 33**
200 5,501,017
290 5,501,018
494 5,501,019
555.2 5,501,020

**CLASS 34**
594 5,501,021

**CLASS 36**
2.00 R 5,501,022
50.5 5,501,023

**CLASS 37**
184 5,501,024

**CLASS 42**
85 5,501,025

**CLASS 43**
12 5,501,026
17 5,501,027
5,501,028
26 5,501,029
57.1 5,501,030
78 5,501,031
129 5,501,032
131 5,501,033
132.1 5,501,034

**CLASS 44**
307 5,501,713
358 5,501,714

**CLASS 47**
33 5,501,036
47 5,501,035
58 5,501,037
70 5,501,038
72 5,501,039
82 5,501,040

**CLASS 49**
55 5,501,041

**CLASS 51**
307 5,501,715

**CLASS 52**
39 5,501,042
92.1 5,501,043
169.5 5,501,044
232 5,501,045
266 5,501,046
273 5,501,047
296 5,501,048
387 5,501,049
513 5,501,050
646 5,501,051
716.5 5,501,052
729.5 5,501,053
730.7 5,501,054
741.1 5,501,055
748.1 5,501,056
761 5,501,057

**CLASS 53**
204 5,501,058
397 5,501,059
399 5,501,060
443 5,501,061
452 5,501,062
5,501,063
473 5,501,064
535 5,501,065
556 5,501,066

**CLASS 55**
215 5,501,716

**CLASS 56**
121.4 5,501,067
255 5,501,068
400.100 5,501,069

**CLASS 60**
39.32 5,501,071
39.34 5,501,070
221 5,501,072
284 5,501,073
285 5,501,074
605.1 5,501,075

**CLASS 62**
3.6 5,501,076
21 5,501,078
36 5,501,079
55.5 5,501,080
135 5,501,081
149 5,501,082
228.4 5,501,083
264 5,501,084
323.1 5,501,088
364 5,501,077

**CLASS 65**
104 5,501,717

**CLASS 66**
104 5,501,085

**CLASS 70**
58 5,501,086
370 5,501,087
456 R 5,501,089
458 5,501,090

**CLASS 71**
9 5,501,718
28 5,501,720

**CLASS 72**
13.4 5,501,091
25 5,501,719
43 5,501,092
123 5,501,093
382 5,501,094
461 5,501,095

**CLASS 73**
1 J 5,501,096
9 5,501,097
24.01 5,501,098
29.01 5,501,099
37.7 5,501,100
147 5,501,101
304 R 5,501,102
514.29 5,501,103
629 5,501,104
660 5,501,105
861.038 5,501,106
862.191 5,501,109
862.23 5,501,107
862.321 5,501,110
862.57 5,501,108
862.642 5,501,111
864 5,501,112
865.5 5,501,113
865.6 5,501,114
865.8 5,501,115

**CLASS 74**
89.14 5,501,116
420 5,501,117
441 5,501,118
490.09 5,501,119
543 5,501,120
568 R 5,501,121
606 R 5,501,122
822 5,501,123

**CLASS 75**
434 5,501,721

**CLASS 81**
58.2 5,501,124
177.85 5,501,125
418 5,501,126

**CLASS 83**
100 5,501,127
599 5,501,128
848 5,501,129

**CLASS 84**
454 5,501,130
464 R 5,501,131
613 5,502,274
635 5,502,275
645 5,502,276
661 5,502,277

**CLASS 86**
24 5,501,132

**CLASS 87**
33 5,501,133

**CLASS 89**
139 5,501,134
196 5,501,135

**CLASS 91**
446 5,501,136

**CLASS 92**
5 R 5,501,137

**CLASS 95**
50 5,501,722

**CLASS 96**
131 5,501,723

**CLASS 99**
287 5,501,138
323.9 5,501,139
349 5,501,140
426 5,501,141
482 5,501,142
516 5,501,143

**CLASS 100**
116 5,501,144
158 R 5,501,145

**CLASS 101**
116 5,501,146
118 5,501,147
232 5,501,148
416.1 5,501,149
466 5,501,150

**CLASS 102**
275.7 5,501,151
292 5,501,152
307 5,501,153
331 5,501,154
529 5,501,155

**CLASS 104**
89 5,501,156

**CLASS 106**
10 5,501,724
20 A 5,501,725
20 R 5,501,726
35 5,501,727
36 5,501,728
250.01 5,501,272
274 5,501,729
281.1 5,501,730
417 5,501,731
447 5,501,732
461 5,501,733

**CLASS 108**
115 5,501,157
165 5,501,158

**CLASS 110**
188 5,501,159
229 5,501,160
344 5,501,161
347 5,501,162

**CLASS 112**
102 5,501,163
176 5,501,164
475.06 5,501,165

**CLASS 114**
230 5,501,166
363 5,501,167
5,501,168
364 5,501,169

**CLASS 116**
209 5,501,170
234 5,501,171

**CLASS 117**
15 5,501,172
84 5,501,173
108 5,501,174
5,501,175

**CLASS 118**
234 5,501,734
300 5,501,735
410 5,501,737
500 5,501,736
663 5,501,738
723 MP 5,501,740
729 5,501,739

**CLASS 119**
61 5,501,176
72.5 5,501,177
74 5,501,178
712 5,501,179
858 5,501,180

**CLASS 122**
6 A 5,501,181

**CLASS 123**
18 R 5,501,182
41.12 5,501,183
41.29 5,501,184
41.72 B1 4,621,595
73 AD 5,501,185
90.16 5,501,186
90.22 5,501,187
179.25 5,501,188
195.1 5,501,189
196 M 5,501,190
310 5,501,191
336 5,501,192
339.14 5,501,193
470 5,501,194
5,501,195
497 5,501,196
509 5,501,197
520 5,501,198
5,501,199
527 5,501,200
571 5,501,201
572 5,501,202
5,501,203
588 5,501,204
635 5,501,205
674 5,501,206

**CLASS 124**
20.1 5,501,207
86 5,501,208

**CLASS 125**
21 5,501,209

**CLASS 126**
276 5,501,210

**CLASS 128**
205.12 5,501,212
205.24 5,501,213
5,501,214
207.15 5,501,215
207.17 5,501,216
645 5,501,217
653.2 5,501,218
660.06 5,501,221
660.07 5,501,219
661.01 5,501,220
661.07 5,501,222
661.09 5,501,223
661.10 5,501,224
662.06 5,501,227
665 5,501,225
691 5,501,226
692 5,501,228
696 5,501,229
5,501,230
725 5,501,231
898 5,501,232

**CLASS 131**
84.1 5,501,233
5,501,235
187 5,501,234
270 5,501,236
297 5,501,237
331 5,501,238

**CLASS 132**
275 5,501,239

**CLASS 134**
13 5,501,741
25.2 5,501,742
61 5,501,240
95.2 5,501,241

**CLASS 136**
248 5,501,743
258 5,501,744
5,501,745

**CLASS 137**
1 5,501,242
15 5,501,243
98 5,501,244
117 5,501,245
179 5,501,246
316 5,501,247

**CLASS 138**
98 5,501,248

**CLASS 139**
450 5,501,250

**CLASS 140**
53 5,501,251
152 5,501,252

**CLASS 141**
40 5,501,253
63 5,501,254
95 5,501,255

**CLASS 144**
2 Z 5,501,257
241 5,501,256

**CLASS 148**
98 5,501,746
311 5,501,747
538 5,501,748
621 5,501,749

**CLASS 149**
2 5,501,750
14 5,501,751

**CLASS 152**
209 R 5,501,258

**CLASS 156**
64 5,501,752
70 5,501,753
71 5,501,754
153 5,501,755
156 5,501,259
167 5,501,756
196 5,501,737
198 5,501,758
247 5,501,260
272.8 5,501,759
305 5,501,760
344 5,501,761
470 5,501,762
504 5,501,763
580 5,501,764
583.3 5,501,765
627.1 5,501,766
662.1 5,501,767

**CLASS 160**
168.1 5,501,261
178.2 5,501,262

**CLASS 162**
9 5,501,768
76 5,501,769
100 5,501,770
158 5,501,771
163 5,501,772
5,501,773
164.1 5,501,774
360.3 5,501,775

**CLASS 164**
97 5,501,263
5,501,264
113 5,501,266

**CLASS 165**
1 5,501,268
22 5,501,265

29 5,501,267
110 5,501,269
151 5,501,270
173 5,501,271

**CLASS 166**

252.5 5,501,273
276 5,501,274
280 5,501,275
291 5,501,276
293 5,501,277
369 5,501,278
372 5,501,279
373 5,501,280
387 5,501,281

**CLASS 169**

37 5,501,282
54 5,501,284

**CLASS 172**

22 5,501,283

**CLASS 174**

52.4 5,502,278
73.1 5,502,279
84 R 5,502,280
92 5,502,281
93 5,502,282
113 R 5,502,287
5,502,288
266 5,502,289

**CLASS 175**

27 5,501,285
52 5,501,286
173 5,501,287

**CLASS 180**

24.01 5,501,288
68.5 5,501,289
69.1 5,501,290
127 5,501,291
220 5,501,292
268 5,501,293
271 5,501,294

**CLASS 181**

228 5,502,283

**CLASS 187**

210 5,501,296
222 5,501,297
272 5,501,299
289 5,501,300
406 5,501,295

**CLASS 188**

24.19 5,501,298
5,501,301
24.21 5,501,302
67 5,501,305
77 W 5,501,304
167 5,501,305
218 XL 5,501,306
319 5,501,307

**CLASS 190**

102 5,501,308

**CLASS 192**

3.29 5,501,309
48.3 5,501,310
85 R 5,501,311
89.23 5,501,312

**CLASS 198**

370.09 5,501,313
418.1 5,501,314
445 5,501,315
457 5,501,316
464.2 5,501,317
732 5,501,318
778 5,501,319
810.04 5,501,320

**CLASS 200**

85 A 5,502,284
400 5,502,285
401 5,502,286

**CLASS 203**

18 5,501,776

**CLASS 204**

157.62 5,501,778
192.15 5,501,780
269 5,501,781
270 5,501,782
454 5,502,169
665 5,501,783

**CLASS 205**

67 5,501,784
5,501,785
109 5,501,786
124 5,501,787
791 5,501,777

**CLASS 206**

5 5,501,321
151 5,501,322
223 5,501,331
246 5,501,332
278 5,501,323
279 5,501,324
303 5,501,325
307.1 5,501,326
308.1 5,501,327
315.6 5,501,328
320 5,501,329
349 5,501,330
361 5,501,340
364 5,501,341
378 5,501,342
386 5,501,333
5,501,334
427 5,501,335
505 5,501,336
528.0 5,501,337
545 5,501,338
586 5,501,339

**CLASS 208**

45 5,501,788
146 5,501,789

**CLASS 209**

240 5,501,343
578 5,501,344

**CLASS 210**

86 5,501,790
90 5,501,791
141 5,501,792
160 5,501,793
493.5 5,501,794
508 5,501,795
638 5,501,796
651 5,501,797
652 5,501,798
721 5,501,799
747 5,501,800
748 5,501,801
758 5,501,802
787 5,501,803
805 5,501,804

**CLASS 211**

113 5,501,345

**CLASS 212**

349 5,501,346

**CLASS 213**

32 C 5,501,347

**CLASS 215**

235 5,501,348
252 5,501,349

**CLASS 216**

20 5,501,350

**CLASS 218**

78 5,502,290

**CLASS 219**

98 5,502,291
121.64 5,502,292
543 5,502,293

**CLASS 220**

4.21 5,501,351
4.26 5,501,352
6 5,501,353
7 5,501,354
23.2 5,501,355
324 5,501,356
325 5,501,357
404 5,501,358
452 5,501,359
460 5,501,360
529 5,501,361
612 5,501,362
630 5,501,363

**CLASS 221**

12 5,501,364
63 5,501,365
211 5,501,366

**CLASS 222**

55 5,501,367
95 5,501,368
103 5,501,369
105 Re.35,187
111 5,501,370
136 5,501,371
207 5,501,372
386 5,501,373
391 5,501,374
402.13 5,501,375
521 5,501,377

**CLASS 223**

87 5,501,378
111 5,501,376

**CLASS 224**

240 5,501,379
243 5,501,380
5,501,381
253 5,501,382
411 5,501,383
539 5,501,384

**CLASS 225**

96 5,501,385

**CLASS 226**

190 5,501,386

**CLASS 227**

120 5,501,387

**CLASS 228**

1.1 5,501,388
29 5,501,389
124.1 5,501,390
248.1 5,501,391

**CLASS 229**

92.3 5,501,392
92.8 5,501,393
137 5,501,394
148 5,501,395

**CLASS 235**

7 R 5,502,294
380 5,502,295
462 5,502,296
472 5,502,297

**CLASS 239**

7 5,501,396
124 5,501,397
171 5,501,398
310 5,501,399
394 5,501,400
431 5,501,401
650 5,501,402
662 5,501,403
676 5,501,404
683 5,501,405

**CLASS 242**

118.11 5,501,406
348.4 5,501,407
356.5 5,501,408
362.2 5,501,409
363 5,501,410
397 5,501,411
417.1 5,501,412
596.7 5,501,415

**CLASS 244**

3.15 5,501,413
124 5,501,414

**CLASS 246**

63 R 5,501,416
5,501,417
453 5,501,418

**CLASS 248**

188.7 5,501,419
280.11 5,501,420
288.3 5,501,421
419 5,501,422
441.1 5,501,423

**CLASS 250**

205 5,502,298
208.2 5,502,299
216 5,502,300
227.14 5,502,301
234 5,502,302
252.1 5,502,303
271 5,502,304
282 5,502,305
310 5,502,306
338.3 5,502,307
338.5 5,502,308
353 5,502,309
492.1 5,502,310
548 5,502,311
559.1 5,502,312
559.26 5,502,313

**CLASS 251**

1.3 5,501,424
129.15 5,501,425
149.1 5,501,426
228 5,501,427

**CLASS 252**

8.6 5,501,805
8.8 5,501,806
18 5,501,807
73 5,501,809
89.1 5,501,810
174.15 5,501,811
174.17 5,501,812
5,501,813
5,501,814
5,501,815
174.21 5,501,816
174.25 5,501,817
299.61 5,501,818
503 5,501,819
549 5,501,820
582 5,501,821

**CLASS 254**

424 5,501,428

**CLASS 256**

1 5,501,429

**CLASS 257**

10 5,502,314
50 5,502,315
94 5,502,316
107 5,502,317
217 5,502,318
231 5,502,319
302 5,502,320
316 5,502,321
330 5,502,322
335 5,502,323
384 5,502,324
421 5,502,325
530 5,502,326
539 5,502,327
546 5,502,328
5,502,329
570 5,502,330
588 5,502,331
617 5,502,332
620 5,502,333
685 5,502,334
731 5,502,335
5,502,336
754 5,502,337
773 5,502,337

**CLASS 264**

1.37 5,501,822
3.1 5,501,823
46.5 5,501,825
118 5,501,826
138 5,501,828
261 5,501,829
308 5,501,830
401 5,501,824
460 5,501,827
503 5,501,831
510 5,501,832

**CLASS 266**

236 5,501,430
242 5,501,431

**CLASS 267**

64.24 5,501,432
140.11 5,501,434
140.13 5,501,433
226 5,501,438

**CLASS 269**

24 5,501,435
47 5,501,436
99 5,501,437
253 5,501,440
289 R 5,501,441

**CLASS 270**

98 5,501,442
5,501,443

**CLASS 271**

127 5,501,444
145 5,501,445
188 5,501,446
276 5,501,447
280 5,501,448
292 5,501,449

**CLASS 273**

26 R 5,501,450
29 A 5,501,451
35 R 5,501,452
55 B 5,501,454
78 5,501,453
86 R 5,501,455
94 5,501,456
127 C 5,501,457
143 R Re.35,188
148 B 5,501,458
167 H 5,501,459
167 R 5,501,460
171 5,501,461
176 FA 5,501,462
184 R 5,501,463
187.2 5,501,464
355 5,501,466
378 5,501,467
424 5,501,468

**CLASS 277**

37 5,501,469
96.1 5,501,470
5,501,471
178 5,501,472

**CLASS 279**

62 5,501,473

**CLASS 280**

11.2 5,501,474
166 5,501,475
230 5,501,476
281.1 5,501,477
282 5,501,478
293 5,501,479
304.1 5,501,480
476.1 5,501,481
503 5,501,482
625 5,501,483
728.2 5,501,484
728.3 5,501,485
735 5,501,486
736 5,501,487
739 5,501,488
743.1 5,501,489

**CLASS 281**

21.1 5,501,490

**CLASS 283**

70 5,501,491

**CLASS 292**

1.5 5,501,492
258 5,501,493
362 5,501,494
340 5,501,495

**CLASS 294**

26 5,501,496
86.4 5,501,497
106 5,501,498
159 5,501,499

**CLASS 296**

26 5,501,500
64 5,501,501
136 5,501,502
146.8 5,501,503
164 5,501,504

**CLASS 297**

4 5,501,505
215.15 5,501,506
284.4 5,501,507
397 5,501,508
452.18 5,501,509

**CLASS 301**

37.23 5,501,510

**CLASS 303**

9.64 5,501,511
15 5,501,512
73 5,501,513
115.4 5,501,514

**CLASS 307**

31 5,502,339
87 5,502,340

**CLASS 310**

40 MM4 5,502,359
42 5,502,341
51 5,502,342
220 5,502,343
344 5,502,344
358 5,502,345

**CLASS 312**

9.31 5,501,515
116 5,501,516

**CLASS 313**

141 5,502,351
5,502,352
247 5,502,346
309 5,502,347
310 5,502,348
404 5,502,349
5,502,350

**CLASS 315**

5 5,502,353
111.01 5,502,354
111.21 5,502,355
111.91 5,502,356
209 R 5,502,357
291 5,502,423

**CLASS 318**

6 5,502,358
254 Re.35,189
5,502,361
281 5,502,367
471 5,502,362
568.11 5,502,363
618 5,502,364
798 5,502,365
805 5,502,360

**CLASS 320**

2 5,502,366

**CLASS 322**

28 5,502,368

**CLASS 323**

273 5,502,369
284 5,502,370

**CLASS 324**

72 5,502,371
72.5 5,502,372
96 5,502,373
127 5,502,374
133 5,502,375
166 5,502,376
175 5,502,377
204 5,502,378
207.14 5,502,379
207.21 5,502,380
209 5,502,381
242 5,502,382
251 5,502,383
309 5,502,384
5,502,385
316 5,502,386
318 5,502,387
438 5,502,388
453 5,502,389
537 5,502,390
628 5,502,391
638 5,502,392
639 5,502,393
646 5,502,394
713 5,502,395
5,502,396
754 5,502,397
760 5,502,398
765 5,502,399

**CLASS 326**

30 5,502,400
38 5,502,401
40 5,502,402
46 5,502,403
50 5,502,404
66 5,502,405
68 5,502,406
95 5,502,407
105 5,502,408

**CLASS 327**

99 5,502,409
140 5,502,410
156 5,502,411
333 5,502,412
361 5,502,413
434 5,502,414
536 5,502,415
538 5,502,416
541 5,502,417

**CLASS 331**

57 5,502,418

**CLASS 332**

109 5,502,419
135 5,502,420

**CLASS 333**

81 R 5,502,421
207 5,502,422



**CLASS 335**

132 5,502,426
172 5,502,428
284 5,502,424
304 5,502,425

**CLASS 336**

192 5,502,429
232 5,502,430

**CLASS 337**

176 5,502,427

**CLASS 338**

308 5,502,431

**CLASS 340**

436 5,502,432
438 5,502,433
630 5,502,434
632 5,502,435
825 5,502,443
825.05 5,502,436
825.47 5,502,437
825.52 5,502,438

**CLASS 341**

51 5,502,439
157 5,502,440
172 5,502,441

**CLASS 342**

2 5,502,442
22 5,502,444
51 5,502,445
357 5,502,446
373 5,502,447
381 5,502,448
417 5,502,449
451 5,502,450

**CLASS 343**

700 MS 5,502,451
715 5,502,452
756 5,502,453
791 5,502,454

**CLASS 345**

9 5,502,455
5,502,456
87 5,502,457
153 5,502,458
158 5,502,459
168 5,502,460
173 5,502,461
185 5,502,462
204 5,502,463

**CLASS 346**

25 5,502,464

**CLASS 347**

6 5,502,467
14 5,502,469
19 5,502,468
45 5,502,470
65 5,502,471
69 5,502,472
73 5,502,473
75 5,502,474
93 5,502,479
102 5,502,475
103 5,502,476
176 5,502,477
237 5,502,478
264 5,502,465

**CLASS 348**

46 5,502,480
51 5,502,481
140 5,502,482
208 5,502,483
5,502,484
5,502,485
231 5,502,486
239 5,502,487
5,502,488
300 5,502,491
403 5,502,492
413 5,502,493
426 5,502,494
5,502,496
462 5,502,497
473 5,502,498
500 5,502,499
523 5,502,500
525 5,502,501
526 5,502,502
546 5,502,503
552 5,502,504
565 5,502,505
595 5,502,489
607 5,502,506
5,502,507
652 5,502,508
669 5,502,509
701 5,502,510
704 5,502,511
706 5,502,512
734 5,502,513
771 5,502,514

**CLASS 351**

43 5,502,515
47 5,502,516
160 H 5,502,517
160 R 5,502,518
204 5,502,519
206 5,502,520
221 5,502,521

**CLASS 354**

106 5,502,522
5,502,527
5,502,528
127.1 5,502,529
149.1 5,502,530
217 5,502,531
219 5,502,523
230 5,502,524
247 5,502,525
288 5,502,526
298 5,502,532
300 5,502,533
323 5,502,534
324 5,502,535
400 5,502,536
402 5,502,537
5,502,538
484 5,502,539

**CLASS 355**

22 5,502,540
38 5,502,541
69 5,502,542
202 5,502,543
204 5,502,544
207 5,502,545
208 5,502,546
215 5,502,547
219 5,502,548
245 5,502,549
246 5,502,550
256 5,502,551
259 5,502,552
260 5,502,553
271 5,502,554
311 5,502,555
320 5,502,556
326 R 5,502,557

**CLASS 356**

28.5 5,502,558
73 5,502,559
128 5,502,560
336 5,502,561
349 5,502,562
352 5,502,563
355 5,502,564
356 5,502,466
357 5,502,565
359 5,502,566
367 5,502,567
375 5,502,568

**CLASS 358**

296 5,502,490
310 5,502,569
335 5,502,570
5,502,571
5,502,572
339 5,502,573
400 5,502,574
405 5,502,575
444 5,502,576
447 5,502,495
468 5,502,577
474 5,502,578
518 5,502,579
5,502,580

**CLASS 359**

10 5,502,581
49 5,502,582
59 5,502,583
90 5,502,584
108 5,502,585
117 5,502,586
118 5,502,587
154 5,502,588
174 5,502,589
177 5,502,810
332 5,502,590
341 5,502,591
355 5,502,592
547 5,502,593
557 5,502,594
589 5,502,595
657 5,502,596
793 5,502,597
814 5,502,598
827 5,502,599

**CLASS 360**

15 5,502,600
32 5,502,601
73.14 5,502,602
77.14 5,502,603
97.01 5,502,604
99.08 5,502,605
107 5,502,606
130.24 5,502,607
132 5,502,608

**CLASS 361**

6 5,502,609
18 5,502,610
19 5,502,613
85 5,502,611
101 5,501,517
117 5,502,612
534 5,502,614
647 5,502,615
681 5,502,616
686 5,502,617
695 5,502,618
697 5,502,619
753 5,502,620
760 5,502,621
5,502,631
801 5,502,622

**CLASS 362**

99 5,502,623
102 5,502,624
119 5,502,625
216 5,502,626
286 5,502,627

**CLASS 363**

20 5,502,628
60 5,502,629
84 5,502,630
98 5,502,632
5,502,633
101 5,502,634
132 5,502,635
146 Re.35,190

**CLASS 364**

401 5,502,636
408 5,502,637
424.02 5,502,638
424.05 5,502,639
443 5,502,640
449 5,502,641
488 5,502,643
5,502,644
489 5,502,645
5,502,646
5,502,647
490 5,502,648
5,502,649
508 5,502,650
509 5,502,651
510 5,502,652
514 B 5,502,653
525 5,502,654
550 5,502,655
5,502,656
551.01 5,501,518
565 5,502,658
571.01 5,502,659
571.03 5,502,660
578 5,502,661
581 5,502,642
723 5,502,662
724.01 5,502,663
724.16 5,502,664
746.1 5,502,665

**CLASS 365**

51 5,502,667
185.08 5,502,673
185.23 5,502,679
185.27 5,502,669
185.28 5,502,668
189.05 5,502,672
189.09 5,502,671
200 5,502,674
5,502,675
5,502,676
201 5,502,677
5,502,678
205 5,502,680
210 5,502,681
226 5,502,682
230.05 5,502,683
230.06 5,502,670
5,502,684

**CLASS 366**

78 5,501,519
132 5,502,685
139 5,501,520
208 5,501,521
219 5,501,522
263 5,501,523
306 5,501,524

**CLASS 367**

34 5,502,686
54 5,502,687
131 5,502,688

**CLASS 368**

156 5,502,689
276 5,502,690

**CLASS 369**

6 5,502,691
13 5,502,692
5,502,693
25 5,502,694
32 5,502,695
5,502,696
34 5,502,697
44.32 5,502,698
48 5,502,699
50 5,502,700
54 5,502,701
58 5,502,702
60 5,502,703
77.2 5,502,704
5,502,705
100 5,502,706
103 5,502,707
110 5,502,708
119 5,502,709
124 5,502,710
5,502,711
561 5,502,657

**CLASS 370**

16 5,502,712
17 5,502,713
5,502,714
26 5,502,715
27 5,502,716
32.1 5,502,717
58.2 5,502,718
5,502,719
60 5,502,720
60.1 5,502,721
5,502,723
69.1 5,502,722
85.3 5,502,724
94.1 5,502,725
5,502,726
94.2 5,502,727

**CLASS 371**

22.3 5,502,729
5,502,730
5,502,731
30 5,502,732
32 5,502,733
37.4 5,502,734
43 5,502,735
5,502,736

**CLASS 372**

5,502,737
11 5,502,738
21 5,502,739
45 5,502,740
82 5,502,741
96 5,502,742
128 5,502,743
151 5,502,744
5,502,745
5,502,746
5,502,747
5,502,748
5,502,749
5,502,750
5,502,751
5,502,752
5,502,753
403 5,502,754
417 5,502,755
435 5,502,684

**CLASS 379**

29 5,502,756
58 5,502,757
5,502,758
88 5,502,759
90 5,502,760
142 5,502,761
202 5,502,762
211 5,502,763

**CLASS 380**

23 5,502,764
24 5,502,765
25 5,502,766
48 5,502,767

**CLASS 381**

61 5,502,768
68 5,502,769
71 5,502,770
104 5,502,771
188 5,502,772

**CLASS 382**

129 5,502,773
159 5,502,774
169 5,502,775
172 5,502,776
173 5,502,777
239 5,502,778

**CLASS 383**

103 5,501,525

**CLASS 384**

13 5,501,526
45 5,501,527
5,501,528
432 5,501,529
516 5,501,530
536 5,501,531
572 5,501,532
5,501,533

**CLASS 385**

1 5,502,779
3 5,502,780
4 5,502,781
7 5,502,782
42 5,502,783
66 5,502,784
92 5,502,785
123 5,502,786
5,502,787

**CLASS 392**

424 5,502,788

**CLASS 395**

2.13 5,502,789
2.65 5,502,790
5,502,791
108 5,502,792
109 5,502,793
5,502,794
5,502,795
115 5,502,796
5,502,797
119 5,502,798
131 5,502,799
133 5,502,800
143 5,502,801
5,502,802
146 5,502,803
147 5,502,804
148 5,502,805
152 5,502,807
161 5,502,806
162 5,502,808
164 5,502,809
182.03 5,502,728
182.04 5,502,811
182.08 5,502,812
183.01 5,502,813
183.08 5,502,814
183.14 5,502,815
200.15 5,502,816
200.16 5,502,817
5,502,818
200.19 5,502,819
250 5,502,820
280 5,502,821
293 5,502,824
310 5,502,822
5,502,823
375 5,502,825
5,502,826
5,502,827
5,502,828
5,502,829
421.07 5,502,830
427 5,502,831
435 5,502,832
459 5,502,833
496 5,502,834
5,502,835
497.01 5,502,836
550 5,502,837
5,502,838
726 5,502,840
800 5,502,839

**CLASS 400**

54 5,501,534
88 5,501,535
208 5,501,536
240.4 5,501,537
304 5,501,538
621 5,501,539

**CLASS 402**

73 5,501,540

**CLASS 403**

41 5,501,541
306 5,501,542
321 5,501,543
400 5,501,544

**CLASS 404**

14 5,501,545

**CLASS 405**

25 5,501,546
121 5,501,547
143 5,501,548
169 5,501,549
232 5,501,550
259.4 5,501,551

**CLASS 406**

52 5,501,552
88 5,501,553

**CLASS 407**

46 5,501,703

**CLASS 408**

153 5,501,554
241 R 5,501,555

**CLASS 410**

94 5,501,556

**CLASS 411**

55 5,501,557
176 5,501,558
373 5,501,559

**CLASS 412**

37 5,501,560

**CLASS 414**

11 5,501,561
111 5,501,562
137.1 5,501,563
351 5,501,564
5,501,565
333 5,501,566
408 5,501,567
417 5,501,568
676 5,501,569
700 5,501,570
786 5,501,571

**CLASS 415**

74 5,501,574
121.2 5,501,572
173.5 5,501,573

**CLASS 416**

144 5,501,575
239 5,501,576

**CLASS 417**

9 5,501,577
199.1 5,501,578
269 5,501,579
410.3 5,501,580
415 5,501,581
420 5,501,582
423.4 5,501,583

**CLASS 418**

15 5,501,584
171 5,501,585
264 5,501,586

**CLASS 419**

33 5,501,833

**CLASS 420**

36 5,501,834
54 5,501,835

### CLASS 422

57 5,501,836
58 5,501,837
65 5,501,838
99 5,501,839
101 5,501,840
5,501,841
174 5,501,842
186.15 5,501,844
186.19 5,501,845
186.3 5,501,843
211 5,501,846

### CLASS 423

531 5,501,847
706 5,501,848

### CLASS 424

59 5,501,849
5,501,850
70.16 5,501,851
97.461 5,501,852
94.64 5,501,853
136.1 5,501,854
195.1 5,501,855
428 5,501,856
438 5,501,857
439 5,501,858
450 5,501,859
464 5,501,860
5,501,861
489 5,501,863

### CLASS 425

116 5,501,587
5,501,588
526 5,501,589
5,501,590
529 5,501,591
547 5,501,592
5,501,593
549 5,501,594

### CLASS 426

3 5,501,864
523 B1 4,471,000
538 5,501,862
548 5,501,865
594 5,501,866
601 5,501,867
623 5,501,868
658 5,501,869

### CLASS 427

8 5,501,870
160 5,501,871
180 5,501,872
195 5,501,873
212 5,501,874
222 5,501,875
226 5,501,876
249 5,501,877
377 5,501,878
381 5,501,879
389.9 5,501,880
421 5,501,881
496 5,501,882

### CLASS 428

1 5,501,883
5,501,884
9 5,501,885
34.2 B1 Re.33,376
34.8 5,501,886
35.2 5,501,887
38 5,501,888
57 5,501,894
66.5 5,501,889
68 5,501,890
71 5,501,891
131 5,501,892
161 5,501,893
194 5,501,895
261 5,501,897
287 5,501,898
288 5,501,899
323 5,501,896
5,501,900
5,501,901
5,501,902
328 5,501,903
331 5,501,904
339 5,501,905
359 5,502,160
366 5,501,906
389 5,501,907
395 5,501,908
408 5,501,909
447 5,501,910
457 5,501,911
604 5,501,912
694 ML 5,501,913

### CLASS 429

36 5,501,914
42 5,501,915
94 5,501,916
101 5,501,917
120 5,501,918
192 5,501,919
5,501,920
5,501,921
218 5,501,922
224 5,501,924

### CLASS 430

5 5,501,925
5,501,926
23 5,501,928
49 5,501,929
59 5,501,930
78 5,501,927
109 5,501,931
110 5,501,932
5,501,933
5,501,934
137 5,501,935
191 5,501,936
200 5,501,937
201 5,501,938
204 5,501,939
253 5,501,940
270.15 5,501,941
280.1 5,501,942
313 5,501,943
321 5,501,944
338 5,501,945
573 5,501,946

### CLASS 433

39 5,501,595
86 5,501,596
141 5,501,597
197 5,501,598
215 5,501,599
227 5,501,600

### CLASS 434

169 5,501,601
263 5,501,602
419 5,501,603

### CLASS 435

5 5,501,947
5,501,948
5,501,949
6 5,501,951
5,501,952
5,501,953
5,501,954
7.93 5,501,955
11 5,501,956
15 5,501,957
18 5,501,958
32 5,501,959
34 5,501,960
39 5,501,961
69.52 5,501,962
91.2 5,501,963
5,501,964
94 5,501,965
105 5,501,966
172.3 5,501,967
193 5,501,968
240.1 5,501,970
240.2 5,501,969
240.23 5,501,971
240.49 5,501,972
244 5,501,973
5,501,974
252.3 5,501,975
5,501,976
266 5,501,977
290.3 5,501,978
320.1 5,501,979

### CLASS 436

74 5,501,980
123 5,501,981
150 5,501,982
518 5,501,983
5,501,984
5,501,985
525 5,501,986
534 5,501,987
548 5,501,988

### CLASS 437

21 5,501,989
23 5,501,990
31 5,501,991
5,501,992
34 5,501,993
40 5,501,994
41 5,501,995
43 5,501,996
5,501,997
52 5,501,998
5,501,999
53 Re.35,191
60 5,502,000
173 5,502,001
182 5,502,002
189 5,502,003
190 5,502,004
195 5,502,005
5,502,006
225 5,502,007
5,502,008
239 5,502,009
247 5,502,010

### CLASS 439

19 5,501,604
34 5,501,605
140 5,501,606
142 5,501,607
218 5,501,608
277 5,501,609
404 5,501,611
498 5,501,610
499 5,501,612
540.1 5,501,613
574 5,501,614
578 5,501,615
585 5,501,616
676 5,501,617
699.2 5,501,618
752 5,501,619
5,501,620

### CLASS 440

52 5,501,621
71 5,501,622
75 5,501,623
88 5,501,624

### CLASS 441

3 5,501,625

### CLASS 446

104 5,501,626
175 5,501,627
332 5,501,628

### CLASS 451

28 5,501,629
49 5,501,630

### CLASS 453

3 5,501,631
5,501,632
17 5,501,633

### CLASS 454

136 5,501,634

### CLASS 460

112 5,501,635

### CLASS 464

48 5,501,636
130 5,501,638
145 5,501,639

### CLASS 474

268 5,501,643

### CLASS 475

83 5,501,640
107 5,501,641

### CLASS 477

97 5,501,644
107 5,501,642
130 5,501,645

### CLASS 482

11 5,501,646
38 5,501,647
57 5,501,648
88 5,501,649

### CLASS 501

97 5,502,011
103 5,502,012
135 5,502,014
151 5,502,015
153 5,502,013

### CLASS 502

11 5,502,016
103 5,502,017
213 5,502,018
314 5,502,019
317 5,502,020
400 5,502,021
401 5,502,022
227 5,502,024

### CLASS 504

107 5,502,025
139 5,502,026
225 5,502,027
227 5,502,028

### CLASS 505

234 5,502,029

### CLASS 507

126 5,502,030

### CLASS 512

13 5,502,031

### CLASS 514

11 5,502,033
12 5,502,034
15 5,502,035
17 5,502,032
5,502,036
5,502,037
21 5,502,039
23 5,502,038
26 5,502,040
27 5,502,041
54 5,502,042
59 5,502,043
60 5,502,044
177 5,502,045
182 5,502,046
5,502,047
183 5,502,048
213 5,502,049
224.8 5,502,051
235.5 5,502,052
236.2 5,502,053
239.2 5,502,050
241 5,502,054
242 5,502,055
250 5,502,056
263 5,502,057
277 5,502,058
289 5,502,059
296 5,508,060
307 5,502,061
311 5,502,062
314 5,502,063
318 5,502,064
336 5,502,065
339 5,502,066
360 5,502,067
397 5,502,068
5,502,069
404 5,502,070
406 5,502,071
415 5,502,072
418 5,502,073
436 5,502,074
443 5,502,075
461 5,502,076
510 5,502,077
560 5,502,078
567 5,502,079
620 5,502,080
654 5,502,081
777

### CLASS 521

64 5,502,092
131 B1 5,096,933
141 5,502,082

### CLASS 522

31 5,502,083
99 5,502,084
106 5,502,085

### CLASS 523

108 5,502,086
115 5,502,087

### CLASS 524

3 5,502,090
34 5,502,088
44 5,502,089
55 5,502,091
91 5,502,093
145 5,502,094
269 5,502,095
356 5,502,096
389 5,502,097
404 5,502,098
413 5,502,099
430 5,502,100
460 5,502,101
494 5,502,102
534 5,502,103
537 5,502,134
556 5,502,104
837 5,502,105

### CLASS 525

57 5,502,106
63 5,502,107
77 5,502,108
141 5,502,109
221 5,502,110
239 5,502,111
240 5,502,112
287 5,502,113
301 5,502,114
326.3 5,502,115
415 5,502,116
435 5,502,117
437 5,502,118
439 5,502,119
440 5,502,120
444 5,502,121
534 5,502,122

### CLASS 526

88 5,502,123
127 5,502,124
140 5,502,125
142 5,502,126
143 5,502,127
160 5,502,128
176 5,502,129
180 5,502,130
5,502,131
5,502,132
262 5,502,135
264 5,502,136
273 5,502,138
283 5,502,140
284 5,502,139
286 5,502,141
347 5,502,133

### CLASS 528

7 5,502,142
12 5,502,143
18 5,502,144
28 5,502,145
34 5,502,146
49 5,502,147
60 5,502,148
5,502,149
5,502,150
5,502,151
68 5,502,152
71 5,502,153
198 5,502,154
310 5,502,134
349 5,502,155
353 5,502,156
5,502,157
354 5,502,158
5,502,139
5,502,137
393 5,502,161
494 5,502,162
498

### CLASS 530

300 5,502,163
329 5,502,164
341 5,502,165
350 5,502,166
387.3 5,502,167
388.4 5,502,168

### CLASS 534

575 5,502,170
579 5,502,171
591 5,502,172
598 5,502,173
655 5,502,174

### CLASS 536

18.3 5,502,175
24.1 5,502,176
26.6 5,502,177
32 5,502,178
114 5,502,179
123 5,502,180
123.1 5,502,181

### CLASS 540

30 5,502,182
46 5,502,183
536 5,502,184
538 5,502,185
576 5,502,186

### CLASS 544

117 5,502,187
173 5,502,188
216 5,502,189
243 5,502,190
284 5,502,191

### CLASS 546

49 5,502,192
116 5,502,193
257 5,502,194
271 5,502,195
5,502,196
281 5,502,197
335 5,502,198
342 5,502,199

### CLASS 548

119 5,502,200
152 5,502,201
198 5,502,202
236 5,502,212
241 5,502,203
251 5,502,204
360.5 5,502,205
406 5,502,206
435 5,502,207
453 5,502,208
454 5,502,209
465 5,502,210
518 5,502,211
564 5,502,213
950 5,502,214

### CLASS 549

274 5,502,215
310 5,502,216
325 5,502,217
329 5,502,218
347 5,502,219
396 5,502,220
549 5,502,221

### CLASS 552

595 5,502,222
602 5,502,223
653 5,502,224

### CLASS 554

42 5,502,225
154 5,502,226

### CLASS 556

1 5,502,227
28 5,501,808
57 5,502,228
406 5,502,229
468 5,502,230

### CLASS 558

110 5,502,231
256 5,502,233
270 5,502,232
314 5,502,234
425 5,502,235
460 5,502,236

### CLASS 560

21 5,502,237
41 5,502,238
78 5,502,239
99 5,502,240
157 5,502,241
221 5,502,242
232 5,502,243
345 5,502,244

### CLASS 562

413 5,502,245
426 5,502,246
486 5,502,247
606 5,502,248
608 5,502,249

### CLASS 564

12 5,502,250
82 5,502,251
169 5,502,252
210 5,502,253
230 5,502,255
259 5,502,254

### CLASS 568

25 5,502,256
433 5,502,257
754 5,502,259
938 5,502,260

### CLASS 570

196 5,502,261

### CLASS 585

241 5,502,262
5,502,263
406 5,502,264
530 5,502,265
668 5,502,269
802 5,502,266

### CLASS 588

250 5,502,267
259 5,502,268



### CLASS 600

38 5,501,650
198 5,501,651
200 5,501,652
204 5,501,653
5,501,654

### CLASS 601

3 5,501,655
33 5,501,656
40 5,501,657
61 5,501,682
99 5,501,658

### CLASS 602

19 5,500,959
27 5,501,659
58 5,501,661

### CLASS 604

20 5,501,662
26 5,501,663
51 Re.35,192
57 5,501,664
65 5,501,665
68 5,501,666
96 5,501,667
5,501,668
97 5,501,669
110 5,501,670
168 5,501,671
177 5,501,672
191 5,501,673
247 5,501,674
263 5,501,675
283 5,501,676
338 5,501,677
344 5,501,678
393 5,501,679

### CLASS 606

9 5,501,680
21 5,501,681
72 5,501,683
73 5,501,684
75 5,501,685
79 5,501,686
94 5,501,687
103 5,501,688
139 5,501,689
146 5,501,690
148 5,501,691
5,501,692
157 5,501,693
159 5,501,694
204 5,501,697
205 5,501,698
215 5,501,700
232 5,501,695
5,501,696

### CLASS 607

9 5,501,701
20 5,501,702
69 5,501,704
75 5,501,705

### CLASS 623

16 5,501,706

### CLASS 800

200 5,502,270
5,502,271
5,502,272
205 5,502,273

### CLASS 904

301 5,501,779

## CLASSIFICATION OF DESIGNS

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D1— | 102 | 368,151 | | 462 | 368,185 | | 371 | 368,219 | | 162 | 368,252 | | 78 | 368,287 | | 133 | 368,321 |
| | 199 | 368,152 | | 465 | 368,186 | D9— | 338 | 368,220 | | 179 | 368,253 | | 191 | 368,288 | | | 368,322 |
| D2— | 879 | 368,153 | | 466 | 368,187 | | 416 | 368,221 | D14— | 100 | 368,254 | | 196 | 368,289 | | 136 | 368,323 |
| | 882 | 368,154 | | 471 | 368,188 | | 434 | 368,222 | | 107 | 368,255 | | 200 | 368,290 | D27— | 162 | 368,324 |
| | 911 | 368,155 | | 480 | 368,189 | | 435 | 368,223 | | | 368,256 | | 210 | 368,291 | | | 368,325 |
| | 962 | 368,156 | | 484 | 368,190 | | 436 | 368,224 | | | 368,257 | | 218 | 368,292 | | 186 | 368,326 |
| | | 368,157 | | | 368,191 | | 444 | 368,225 | | 114 | 368,258 | | 233 | 368,293 | D28— | 64 | 368,327 |
| D3— | 215 | 368,158 | | | 368,192 | | 528 | 368,226 | | 118 | 368,259 | D22— | 107 | 368,294 | | 85 | 368,328 |
| | 283 | 368,159 | | 486 | 368,193 | D10— | 5 | 368,227 | | 137 | 368,260 | | 143 | 368,295 | D29— | 112 | 368,329 |
| | 286 | 368,160 | | 525 | 368,194 | | 6 | 368,228 | | 188 | 368,261 | | | 368,296 | | 119 | 368,330 |
| | 326 | 368,161 | | 536 | 368,195 | | 30 | 368,229 | | 191 | 368,262 | D23— | 210 | 368,297 | | 121 | 368,331 |
| | | 368,162 | | 553 | 368,196 | | 40 | 368,230 | | 218 | 368,263 | | 233 | 368,298 | | | 368,332 |
| D4— | 104 | 368,163 | | | 368,197 | | 75 | 368,270 | | 219 | 368,264 | | 235 | 368,299 | | | |
| | 199 | 368,164 | | 577 | 368,198 | D11— | 4 | 368,231 | | 241 | 368,265 | | | 368,300 | | 129 | 368,333 |
| D6— | 311 | 368,165 | | 596 | 368,199 | | 90 | 368,232 | | 242 | 368,266 | | 238 | 368,301 | D30— | 111 | 368,334 |
| | 315 | 368,166 | | 631 | 368,200 | | 117 | 368,233 | | | 368,267 | | 241 | 368,302 | | 118 | 368,335 |
| | 317 | 368,167 | D7— | 308 | 368,201 | | 152 | 368,234 | | 251 | 368,268 | | 243 | 368,303 | | 121 | 368,336 |
| | 323 | 368,168 | | 372 | 368,202 | | 164 | 368,235 | D15— | 5 | 368,269 | | 262 | 368,304 | | 127 | 368,337 |
| | 326 | 368,169 | | 376 | 368,203 | | | 368,236 | | 85 | 368,271 | | 351 | 368,305 | | 144 | 368,338 |
| | 332 | 368,170 | | 386 | 368,204 | | | 368,237 | D16— | 339 | 368,272 | | 353 | 368,306 | | 160 | 368,339 |
| | 336 | 368,171 | | 401.2 | 368,205 | | | 368,238 | D18— | 49 | 368,273 | | 354 | 368,307 | 32— | 3 | 368,340 |
| | 366 | 368,172 | | 605 | 368,206 | | 216 | 368,239 | | 55 | 368,274 | | 411 | 368,308 | | 15 | 368,341 |
| | 370 | 368,173 | | | 368,207 | D12— | 6 | 368,240 | | 56 | 368,275 | D24— | 106 | 368,309 | | 18 | 368,342 |
| | 377 | 368,174 | | 642 | 368,208 | | 92 | 368,241 | D19— | 2 | 368,276 | | 186 | 368,310 | | 35 | 368,343 |
| | 379 | 368,175 | | 653 | 368,209 | | 111 | 368,242 | | 85 | 368,277 | | 197 | 368,311 | | 46 | 368,344 |
| | 381 | 368,176 | | 693 | 368,210 | | 128 | 368,243 | D20— | 18 | 368,278 | | | 368,312 | | 49 | 368,345 |
| | | 368,177 | D8— | 1 | 368,211 | | 147 | 368,244 | | 43 | 368,279 | D25— | 118 | 368,313 | | 50 | 368,346 |
| | 393 | 368,178 | | 52 | 368,212 | | | 368,245 | D21— | 3 | 368,280 | | 121 | 368,314 | | 53 | 368,347 |
| | 395 | 368,179 | | 61 | 368,213 | | 162 | 368,246 | | 11 | 368,281 | | 124 | 368,315 | | 70 | 368,348 |
| | 397 | 368,180 | | 68 | 368,214 | | 194 | 368,247 | | 13 | 368,282 | D26— | 39 | 368,316 | D34— | 1 | 368,349 |
| | 409 | 368,181 | | | 368,215 | | 196 | 368,248 | | 42 | 368,283 | | 43 | 368,317 | | | 368,350 |
| | 436 | 368,182 | | | 368,216 | | 423 | 368,249 | | 44 | 368,284 | | 49 | 368,318 | | | |
| | 440 | 368,183 | | 93 | 368,217 | D13— | 156 | 368,250 | | 48 | 368,285 | | 65 | 368,319 | | | |
| | 449 | 368,184 | | 354 | 368,218 | | 160 | 368,251 | | 51 | 368,286 | | 131 | 368,320 | | | |

## CLASSIFICATION OF PLANTS

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P.— | 10 | 9,482 | | 65 | 9,484 | | | 9,486 | | 87.12 | 9,488 | | | 9,490 | | | |
| | | 9,483 | | | 9,485 | | | 9,487 | | | 9,489 | | 88.9 | 9,491 | | | |

# GEOGRAPHICAL INDEX

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(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)


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## PATENTS


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| 01 : | 5,501,257 | | 5,501,191 | | 5,501,822 | | 5,502,592 | | 5,501,258 | | 5,501,634 |
| | 5,501,508 | | 5,501,200 | | 5,501,824 | | 5,502,610 | | 5,501,265 | | 5,501,667 |
| | 5,502,443 | | 5,501,210 | | 5,501,836 | | 5,502,622 | | 5,501,357 | | 5,501,670 |
| | Re.33,376 | | 5,501,219 | | 5,501,845 | | 5,502,632 | | 5,501,365 | | 5,501,683 |
| 02 : | 5,502,772 | | 5,501,222 | | 5,501,848 | | 5,502,645 | | 5,501,401 | | 5,501,695 |
| 04 : | Re.35,191 | | 5,501,226 | | 5,501,853 | | 5,502,651 | | 5,501,532 | | 5,501,696 |
| | Re.35,192 | | 5,501,227 | | 5,501,921 | | 5,502,652 | | 5,501,628 | | 5,501,867 |
| | 5,500,976 | | 5,501,244 | | 5,501,925 | | 5,502,653 | | 5,501,630 | | 5,501,877 |
| | 5,501,006 | | 5,501,247 | | 5,501,926 | | 5,502,663 | | 5,501,689 | | 5,501,943 |
| | 5,501,014 | | 5,501,251 | | 5,501,956 | | 5,502,670 | | 5,501,693 | | 5,501,976 |
| | 5,501,179 | | 5,501,261 | | 5,501,959 | | 5,502,680 | | 5,501,714 | | 5,502,437 |
| | 5,501,290 | | 5,501,296 | | 5,501,968 | | 5,502,685 | | 5,502,036 | | 5,502,673 |
| | 5,501,328 | | 5,501,299 | | 5,502,000 | | 5,502,694 | | 5,502,042 | | 5,502,722 |
| | 5,501,396 | | 5,501,322 | | 5,502,002 | | 5,502,696 | | 5,502,072 | 13 : | 5,501,061 |
| | 5,501,436 | | 5,501,331 | | 5,502,073 | | 5,502,723 | | 5,502,159 | | 5,501,064 |
| | 5,501,452 | | 5,501,340 | | 5,502,177 | | 5,502,746 | | 5,502,286 | | 5,501,077 |
| | 5,501,685 | | 5,501,352 | | 5,502,197 | | 5,502,750 | | 5,502,304 | | 5,501,313 |
| | 5,501,735 | | 5,501,379 | | 5,502,263 | | 5,502,754 | | 5,502,312 | | 5,501,318 |
| | 5,501,843 | | 5,501,383 | | 5,502,274 | | 5,502,784 | | 5,502,361 | | 5,501,335 |
| | 5,501,990 | | 5,501,385 | | 5,502,287 | | 5,502,785 | | 5,502,564 | | 5,501,525 |
| | 5,502,347 | | 5,501,390 | | 5,502,289 | | 5,502,792 | | 5,502,636 | | 5,501,671 |
| | 5,502,348 | | 5,501,393 | | 5,502,295 | | 5,502,804 | | 5,502,728 | | 5,501,728 |
| | 5,502,357 | | 5,501,411 | | 5,502,298 | | 5,502,805 | | 5,502,813 | | 5,501,872 |
| | 5,502,370 | | 5,501,412 | | 5,502,299 | | 5,502,806 | 10 : | 5,501,250 | | 5,501,902 |
| | 5,502,391 | | 5,501,423 | | 5,502,300 | | 5,502,819 | | 5,501,263 | | 5,501,949 |
| | 5,502,413 | | 5,501,425 | | 5,502,306 | | 5,502,821 | | 5,501,472 | | 5,502,160 |
| | 5,502,566 | | 5,501,464 | | 5,502,308 | | 5,502,829 | | 5,501,986 | | 5,502,428 |
| | 5,502,711 | | 5,501,468 | | 5,502,309 | | 5,502,836 | | 5,502,048 | 15 : | 5,501,808 |
| | 5,502,811 | | 5,501,482 | | 5,502,315 | | 5,502,837 | | 5,502,091 | | 5,502,760 |
| 05 : | 5,501,069 | | 5,501,491 | | 5,502,316 | | 5,502,838 | | 5,502,111 | 16 : | 5,501,080 |
| | 5,501,455 | | 5,501,493 | | 5,502,325 | 08 : | 5,501,106 | | 5,502,154 | | 5,501,767 |
| | 5,502,561 | | 5,501,496 | | 5,502,350 | | 5,501,273 | | 5,502,192 | 17 : | 5,501,036 |
| | 5,502,715 | | 5,501,501 | | 5,502,372 | | 5,501,279 | | 5,502,270 | | 5,501,039 |
| 06 : | Re.35,187 | | 5,501,504 | | 5,502,395 | | 5,501,308 | 12 : | 5,500,954 | | 5,501,059 |
| | 5,500,952 | | 5,501,515 | | 5,502,403 | | 5,501,324 | | 5,500,992 | | 5,501,060 |
| | 5,500,957 | | 5,501,574 | | 5,502,405 | | 5,501,552 | | 5,501,020 | | 5,501,128 |
| | 5,500,963 | | 5,501,577 | | 5,502,412 | | 5,501,553 | | 5,501,022 | | 5,501,129 |
| | 5,500,987 | | 5,501,580 | | 5,502,440 | | 5,501,616 | | 5,501,026 | | 5,501,166 |
| | 5,501,032 | | 5,501,608 | | 5,502,446 | | 5,501,657 | | 5,501,192 | | 5,501,248 |
| | 5,501,035 | | 5,501,651 | | 5,502,459 | | 5,501,706 | | 5,501,208 | | 5,501,342 |
| | 5,501,051 | | 5,501,653 | | 5,502,462 | | 5,501,744 | | 5,501,215 | | 5,501,347 |
| | 5,501,067 | | 5,501,659 | | 5,502,494 | | 5,501,981 | | 5,501,241 | | 5,501,360 |
| | 5,501,086 | | 5,501,662 | | 5,502,503 | | 5,502,292 | | 5,501,243 | | 5,501,361 |
| | 5,501,099 | | 5,501,697 | | 5,502,522 | | 5,502,604 | | 5,501,363 | | 5,501,450 |
| | 5,501,112 | | 5,501,698 | | 5,502,528 | | 5,502,687 | | 5,501,380 | | 5,501,460 |
| | 5,501,141 | | 5,501,711 | | 5,502,551 | | 5,502,757 | | 5,501,381 | | 5,501,466 |
| | 5,501,154 | | 5,501,722 | | 5,502,558 | 09 : | 5,501,044 | | 5,501,487 | | 5,501,631 |
| | 5,501,167 | | 5,501,741 | | 5,502,577 | | 5,501,107 | | 5,501,575 | | 5,501,636 |
| | 5,501,170 | | 5,501,799 | | 5,502,585 | | 5,501,151 | | 5,501,586 | | 5,501,640 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 5,501,650 | | 5,501,899 | | 5,501,332 | | 5,501,068 | | 5,502,435 | | 5,501,268 |
| | 5,501,750 | | 5,501,938 | | 5,501,596 | | 5,501,078 | | 5,502,474 | | 5,501,458 |
| | 5,501,753 | | 5,501,940 | | 5,501,658 | | 5,501,231 | | 5,502,756 | | 5,501,509 |
| | 5,501,770 | | 5,501,954 | | 5,501,688 | | 5,501,266 | 40 : | 5,501,207 | | 5,501,652 |
| | 5,501,804 | | 5,501,979 | | 5,501,951 | | 5,501,283 | | 5,501,274 | | 5,501,732 |
| | 5,501,859 | | 5,501,993 | | 5,501,962 | | 5,501,304 | | 5,501,275 | | 5,502,137 |
| | 5,501,864 | | 5,502,013 | | 5,502,190 | | 5,501,415 | | 5,501,276 | | 5,502,234 |
| | 5,501,869 | | 5,502,022 | | 5,502,520 | | 5,501,420 | | 5,501,277 | | 5,502,249 |
| | 5,501,922 | | 5,502,032 | 32 : | 5,501,028 | | 5,501,442 | | 5,501,280 | | 5,502,257 |
| | 5,501,941 | | 5,502,039 | | 5,501,839 | | 5,501,449 | | 5,501,475 | | 5,502,535 |
| | 5,501,985 | | 5,502,081 | 33 : | 5,500,988 | | 5,501,494 | | 5,501,672 | | 5,502,773 |
| | 5,502,017 | | 5,502,121 | | 5,501,372 | | 5,501,513 | | 5,501,788 | 48 : | 5,500,966 |
| | 5,502,035 | | 5,502,128 | | 5,501,443 | | 5,501,523 | | 5,501,977 | | 5,501,076 |
| | 5,502,145 | | 5,502,176 | | 5,501,829 | | 5,501,541 | | 5,502,030 | | 5,501,102 |
| | 5,502,193 | | 5,502,214 | | 5,501,890 | | 5,501,545 | | 5,502,265 | | 5,501,168 |
| | 5,502,247 | | 5,502,227 | 34 : | 5,500,980 | | 5,501,551 | | 5,502,504 | | 5,501,174 |
| | 5,502,248 | | 5,502,246 | | 5,500,991 | | 5,501,566 | 41 : | 5,501,025 | | 5,501,176 |
| | 5,502,280 | | 5,502,339 | | 5,501,098 | | 5,501,594 | | 5,501,256 | | 5,501,178 |
| | 5,502,294 | | 5,502,356 | | 5,501,144 | | 5,501,604 | | 5,501,338 | | 5,501,234 |
| | 5,502,378 | | 5,502,451 | | 5,501,147 | | 5,501,622 | | 5,501,467 | | 5,501,260 |
| | 5,502,427 | | 5,502,582 | | 5,501,162 | | 5,501,625 | | 5,501,725 | | 5,501,269 |
| | 5,502,452 | | 5,502,621 | | 5,501,182 | | 5,501,627 | | 5,501,980 | | 5,501,278 |
| | 5,502,513 | | 5,502,637 | | 5,501,236 | | 5,501,648 | | 5,502,038 | | 5,501,281 |
| | 5,502,601 | | 5,502,642 | | 5,501,255 | | 5,501,704 | | 5,502,255 | | 5,501,286 |
| | 5,502,612 | | 5,502,816 | | 5,501,320 | | 5,501,743 | | 5,502,468 | | 5,501,424 |
| | 5,502,620 | | 4,471,000 | | 5,501,329 | | 5,501,766 | | 5,502,476 | | 5,501,518 |
| | 5,502,635 | 26 : | 5,500,951 | | 5,501,378 | | 5,501,787 | | 5,502,534 | | 5,501,576 |
| | 5,502,752 | | 5,500,985 | | 5,501,451 | | 5,501,795 | | 5,502,807 | | 5,501,637 |
| | 5,502,767 | | 5,501,010 | | 5,501,461 | | 5,501,821 | 42 : | 5,501,009 | | 5,501,713 |
| | 5,502,831 | | 5,501,024 | | 5,501,505 | | 5,501,842 | | 5,501,012 | | 5,501,745 |
| 18 : | 5,500,958 | | 5,501,049 | | 5,501,533 | | 5,501,881 | | 5,501,013 | | 5,501,952 |
| | 5,501,043 | | 5,501,118 | | 5,501,589 | | 5,501,964 | | 5,501,030 | | 5,501,960 |
| | 5,501,349 | | 5,501,259 | | 5,501,593 | | 5,501,974 | | 5,501,056 | | 5,501,973 |
| | 5,501,399 | | 5,501,270 | | 5,501,666 | | 5,502,010 | | 5,501,123 | | 5,501,994 |
| | 5,501,428 | | 5,501,293 | | 5,501,668 | | 5,502,047 | | 5,501,159 | | 5,502,052 |
| | 5,501,497 | | 5,501,297 | | 5,501,676 | | 5,502,050 | | 5,501,173 | | 5,502,112 |
| | 5,501,542 | | 5,501,384 | | 5,501,677 | | 5,502,164 | | 5,501,214 | | 5,502,124 |
| | 5,501,617 | | 5,501,397 | | 5,501,681 | | 5,502,225 | | 5,501,225 | | 5,502,267 |
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## DESIGN PATENTS

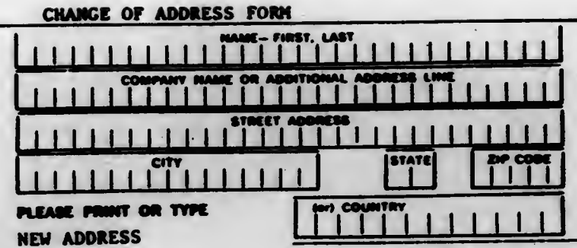
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| | 368,327 | | 368,293 | 31 : | 368,184 | | 368,191 | 46 : | 368,201 | | |

## PLANT PATENTS

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| 28 : | 9,484 | | 9,485 | | 9,486 | | 9,487 | | | | | | | | |

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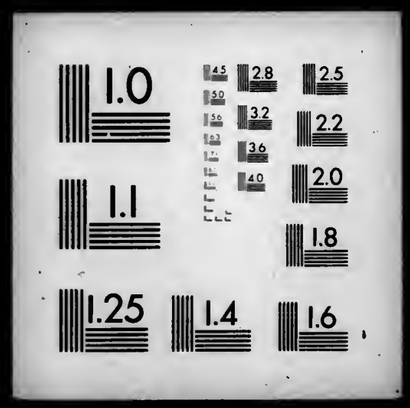
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